CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

State Water Resources Control Board

RECEIVED
February 13, 2018
Commission on
State Mandates

February 13, 2018

VIA DROP BOX

Heather Halsey
Executive Director
Commission on State Mandates
980 Ninth Street, Suite 300
Sacramento, CA 95814

California Regional Water Quality Control Board, San Diego Region, Order No. R9-2015-0001, Provisions A.2, A.3.b, A.4, B, E.3.c(2), E.3.d, E.5., E.5.e, E.6, F, and Attachment E; and Order No. R9-2015-0100, Provision B.3.c, 15-TC-02

County of Orange, Orange County Flood Control District, and the Cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Lake Forest, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano, Claimants

SAN DIEGO WATER BOARD AND PARTIAL STATE WATER RESOURCES CONTROL BOARD ADMINISTRATIVE RECORDS

Dear Ms. Halsey:

By letter dated December 14, 2017, the Commission on State Mandates (Commission) issued a Notice of Complete Test Claim, Renaming of Matter, Request for Administrative Record, and Tentative Hearing Date in the above Test Claim (Notice). Within the Notice, the Commission requested that the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) and the State Water Resources Control Board (State Water Board) (collectively Water Boards) provide copies of the official administrative records of their respective agencies for adoption or review of San Diego Water Board Order Nos. R9-2015-0001 and R9-2015-0100. The administrative record(s) were due on or before January 15, 2018 but the Commission granted the Water Boards' request for extension, with the records now due on February 14.

The San Diego Water Board has prepared the official administrative record for adoption of Order Nos. R9-2015-0001 and R9-2015-0100. Because the record for development of many of the challenged provisions in these orders began with development and adoption of Order No. R9-2013-0001, later amended by the 2015 orders, the record is inclusive of the documents for all three orders and is substantially identical to the record submitted for 14-TC-03. In addition, as previously noted, petitions for review of Order No. R9-2015-0001 were filed with the State Water Board and identified as SWRCB/OCC File A-2456 (a) through (l). The administrative record submitted herewith also includes these petitions for review, responses to the petitions and some correspondence regarding the petitions. The complete State Water Board record has not been included because the State Water Board has not taken any action related to the

petitions or the San Diego Water Board's Orders. If the San Diego Water Board orders related to this Test Claim are modified by action of the State Water Board, the San Diego Water Board, or a court, we will advise the Commission accordingly.

Please do not hesitate to contact me with any questions. I can be reached at (619) 521-3012 or by email at catherine.hagan@waterboards.ca.gov.

Sincerely,

Catherine George Hagan

Catherine George Hagan
Attorney IV

cc: Service List via Commission Drop Box

ADMINISTRATIVE RECORD INDEX[1]
FOR
ORDER NO. R9-2013-0001,
AS AMENDED BY ORDER NOS. R9-2015-0001 AND R9-2015-0100
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT
AND WASTE DISCHARGE REQUIREMENTS FOR
DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s)
DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The following is the index to the Administrative Record for Order No. R9-2013-0001, adopted on May 8, 2013, as amended by Order No. R9-2015-0001, adopted on February 15, 2015, and Order No. R9-2015-0100, adopted on November 18, 2015. Each electronic format document has an assigned document number in the Administrative Record Index.

[1] This record is submitted to the Commission on State Mandates for 15-TC-02 and at the Commission's request includes the State Water Resources Control Board's partial record for Petitions for Review of Order No. R9-2015-0100 (SWRCB/OCC File A-2456(a)-(l)) is included at the end of the San Diego Water Board's record for convenience and is marked with Bates series SB00000-SB010256.

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3. June 27, 2012 Focused Meeting
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8. September 5, 2012 Focused Meeting Wrap Up
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A003	5/10/2015	Report of Waste Discharge submitted by Riverside County Copermittees	000335
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1. ADMINISTRATIVE DRAFT REGIONAL MS4 PERMIT			
B001	4/9/2012	Administrative Draft Regional MS4 Permit	000637
B002	4/9/2012	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Availability of Administrative Draft Regional MS4 Permit	000810
2. APRIL 25, 2012 PUBLIC WORKSHOP			
B003	4/2/2012	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Notice of Public Workshop for Administrative Draft Regional MS4 Permit	000811
		ATTACHMENT: Notice of Public Workshop	
B004	4/25/2012	Workshop Agenda	000815
B005	4/25/2012	Workshop Sign In Sheet	000816
B006	4/25/2012	Board Presentation: Concepts and Approach	000825
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B008	4/25/2012	Board Presentation: Process	000871
B009	4/25/2012	Staff Handout: Process for Stakeholder Comments and Recommendations	000879
B010	4/25/2012	Speaker Slips	000881
B011	4/25/2012	Written Submittal from Michael McKeenan	000895
B012	4/25/2012	Written Submittal from John Stump	000907

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3. JUNE 27, 2012 FOCUSED MEETING			
B013	6/21/2012	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Revised Procedures for Focused Meetings	000908
		ATTACHMENT: Notice of Revised Administrative Draft Regional MS4 Permit Focused Meeting Procedures and Schedule	
B014	6/27/2012	June 27, 2012 Focused Meeting Agenda	000917
B015	6/27/2012	June 27, 2012 Focused Meeting Sign In Sheet	000918
B016	6/27/2012	Handout from San Diego County Copermittees	000922
B017	6/27/2012	June 27, 2012 Focused Meeting Notes	000927
4. JULY 11, 2012 FOCUSED MEETING			
B018	7/6/2012	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding July 11, 2012 Focused Meeting Agenda and June 27, 2012 Focused Meeting Notes	000937
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		ATTACHMENT: July 11, 2012 Focused Meeting Agenda	
B019	7/11/2012	July 11, 2012 Focused Meeting Agenda	000949
B020	7/11/2012	July 11, 2012 Focused Meeting Sign In Sheet	000950
B021	7/11/2012	Handout from San Diego County Copermittees	000955
B022	7/11/2012	July 11, 2012 Focused Meeting Notes	000965
5. JULY 25, 2012 FOCUSED MEETING			
B023	7/20/2012	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding July 25, 2012 Focused Meeting Agenda and July 11, 2012 Focused Meeting Notes	000991
		ATTACHMENT: July 11, 2012 Focused Meeting Notes	
		ATTACHMENT: July 25, 2012 Focused Meeting Agenda	
B024	7/25/2012	July 25, 2012 Focused Meeting Agenda	001022

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5. JULY 25, 2012 FOCUSED MEETING			
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B027	7/25/2012	July 25, 2012 Focused Meeting Notes	001067
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		ATTACHMENT: July 25, 2012 Focused Meeting Notes	
B029	8/17/2012	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding August 22, 2012 Focused Meeting Agenda	001163
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B033	8/22/2012	Handout from San Diego County Copermittees Land Development Workgroup	001185
B034	8/22/2012	Handout from Building Industry Association of San Diego County	001194
B035	8/22/2012	Handout from Building Industry Association of Southern California	001229
B036	8/22/2012	Handout from Rancho Mission Viejo	001234
B037	8/22/2012	August 22, 2012 Focused Meeting Notes	001244
7. AUGUST 30, 2012 SAN DIEGO REGION HYDROMODIFICATION MANAGEMENT MEETING			
B038	8/13/2012	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Meeting Organized by the Orange County Copermittees on Hydromodification Management	001278

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B039	8/23/2012	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Meeting Organized by the Orange County Copermittees on Hydromodification Management	001280
		ATTACHMENT: Hydromodification Management Meeting Information	
B040	8/30/2012	San Diego Region Hydromodification Management Meeting Agenda	001284
B041	8/30/2012	Presentation by Eric Stein: Managing Hydromodification: The Next Generation	001286
B042	8/30/2012	Presentation by Eric Berntsen: Hydromodification Regulations in California	001309
B043	8/30/2012	Presentation by Iraj Nasseri: Flood Mitigation and Water Conservation	001343
B044	8/30/2012	Presentation by Chris Bowles: Hydromodification Regulation and Rehabilitation Approaches	001388
B045	8/30/2012	Presentation by Derek Booth: Landscape Stratification, Watershed Processes, and Hydromodification Control	001418
B046	10/10/2012	San Diego Region Hydromodification Management Meeting Summary Report: Recommended Hydromodification Management Approaches and Tools for the Regional Municipal Storm Water Permit	001458
8. SEPTEMBER 5, 2012 FOCUSED MEETING WRAP UP			
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		ATTACHMENT: September 5, 2015 Focused Meeting Wrap Up Workshop Agenda	
B048	9/5/2012	Focused Meeting Wrap Up Agenda	001532
B049	9/5/2012	Focused Meeting Wrap Up Sign In Sheet	001533
B050	9/5/2012	Staff Handout: Concept Summaries	001537
9. COMMENT LETTERS ON ADMINISTRATIVE DRAFT REGIONAL MS4 PERMIT			
B051		Comment Letters on Administrative Draft Regional MS4 Permit (combined into one file – listed below)	001538
	9/11/2012	• Unified Port District of San Diego	
	9/12/2012	• City of Chula Vista	
	9/13/2012	• City of Dana Point	

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	9/13/2012	• City of National City	
	9/13/2012	• Peck Pool Services	
	9/13/2012	• Riverside County Copermittees	
	9/14/2012	• Building Industry Association of Southern California	
	9/14/2012	• Building Industry Association of San Diego County	
	9/14/2012	• Business Leadership Alliance	
	9/14/2012	• Cities of Aliso Viejo, Lake Forest, and Santee	
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	9/14/2012	• City of Del Mar	
	9/14/2012	• City of Oceanside	
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	9/14/2012	• Industrial Environmental Association	
	9/14/2012	• Natural Resources Defense Council	
	9/14/2012	• Rancho Mission Viejo	
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	9/14/2012	• San Diego North Economic Development Council	

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	9/14/2012	• Southern California Gas Company	
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	9/14/2012	• Ventura County Watershed Protection District	
B052	9/20/2012	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Comments Received on the Administrative Draft Regional MS4 Permit	004002
10. REVISED ADMINISTRATIVE DRAFT REGIONAL MS4 PERMIT			
B053	10/12/2012	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Availability of Revised Administrative Draft Regional MS4 Permit	004003
B054	10/12/2012	Revised Administrative Draft Regional MS4 Permit (with changes shown in Tracked Changes)	004004
B055	10/19/2012	Revised Administrative Draft Regional MS4 Permit (clean version with changes accepted)	004242
B056	1022/2012	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Availability of Clean Version of Revised Administrative Draft Regional MS4 Permit	004440
11. OCTOBER 24, 2012 FINAL FOCUSED MEETING			
B057	9/28/2012	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding a Final Focused Meeting on the Administrative Draft Regional MS4 Permit	004441
B058	10/5/2012	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Final Focused Meeting Agenda	004442
		ATTACHMENT: Final Focused Meeting Agenda	
B059	10/24/2012	Final Focused Meeting Agenda	004444
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C002	10/31/2012	Transmittal Letter and Notice of Availability of Tentative Order for Public Review and Comment to the San Diego County Copermittees, Orange County Copermittees, and Riverside County Copermittees for Tentative Order No. R9-2013-0001, San Diego Region MS4 Permit Reissuance	004804
C003	10/31/2012	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Notice of Release of San Diego Regional MS4 Permit, Tentative Order No. R9-2013-0001 for Public Review and Comment	004811
C004	11/21/2012	Proof of Newspaper Publication in San Diego Union Tribune: Notice of Public Comment Period for Tentative Order No. R9-2013-0001, Regional MS4 Permit	004812
C005	11/21/2012	Proof of Newspaper Publication in The Press-Enterprise: Notice of Public Comment Period for Tentative Order No. R9-2013-0001, Regional MS4 Permit	004813
C006	11/23/2012	Proof of Newspaper Publication in The Register: Notice of Public Comment Period for Tentative Order No. R9-2013-0001, Regional MS4 Permit	004815
2. NOVEMBER 13, 2012 BOARD WORKSHOP (AGENDA ITEM NO. 10)			
C007	10/12/2012	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Notice of Public Workshop for Tentative Order No. R9-2013-0001, Regional MS4 Permit	004817
		ATTACHMENT: Notice of Public Workshop	
C008	11/8/2012	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Reminder of Public Workshop for Tentative Order No. R9-2013-0001, Regional MS4 Permit	004820
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C012	11/13/2012	EOSR Supporting Document 2: Regional MS4 Permit Timeline	005161

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C019	11/13/2012	Board Meeting Sign In Sheet	005192
C020	11/13/2012	Speaker Cards for Agenda Item No. 10	005197
C021	11/13/2012	Powerpoint Presentation by Board Staff	005242
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C024	11/13/2012	Written Testimony by San Diego County Copermittees	005295
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C026	11/13/2012	Powerpoint Presentation by San Diego Coastkeeper	005346
C027	11/13/2012	Powerpoint Presentation by Natural Resource Defense Counsel	005358
C028	11/13/2012	Board Agenda Item No. 10 Transcript	005378
3. DECEMBER 12, 2012 CONTINUATION OF BOARD WORKSHOP (AGENDA ITEM NO. 11)			
C029	11/27/2012	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Continuation of Public Workshop for Tentative Order No. R9-2013-0001, Regional MS4 Permit	005379
		ATTACHMENT: Notice of Workshop Continuation	

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		ATTACHMENT: Revised Notice of Workshop Continuation	
C031	12/12/2012	Board Meeting Agenda	005389
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C032	12/12/2012	Executive Officer Summary Report (EOSR)	005397
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C036	12/12/2012	Supplemental EOSR	005407
C037	12/12/2012	EOSR Supporting Document 4: Letter from City of Del Mar	005413
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C039	12/12/2012	EOSR Supporting Document 6: Regional Storm Water Program Expenditures FY2011/12	005418
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C041	12/12/2012	EOSR Supporting Document 8: Letter from County of San Diego	005420
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C043	12/12/2012	Speaker Cards for Agenda Item No. 11	005437
C044	12/12/2012	Powerpoint Presentation by Board Staff	005469
C045	12/12/2012	Powerpoint Presentation by Environmental Groups	005493
C046	12/12/2012	Powerpoint Presentation by San Diego County Copermittees	005501
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C052	11/2/2012	Comments from County of San Diego Office of County Counsel	005568
C053	11/5/2012	Comments from City of Carlsbad	005573
C054	11/5/2012	Comments from City of Del Mar	005575
C055	11/5/2012	Comments from City of Encinitas	005581
C056	12/4/2012	Comments from City of San Diego	005585
C057	12/10/2012	Comments from Pala Pauma Valley Community Sponsor Group	005587
C058	12/10/2012	Comments from South Laguna Civic Association	005589
C059	12/12/2012	Comments from Associated General Contractors of America, San Diego Chapter	005609
C060	12/12/2012	Comments from Continental Maritime of San Diego	005611
C061	12/12/2012	Comments from David J. Akers, P.E.	005612
C062	12/12/2012	Comments from San Diego Association of Realtors	005615
C063	12/12/2012	Comments from California State 38th District Senator Mark Wyland	005617
C064	12/14/2012	Comments from Jamul Dulzura Community Planning Group	005618
C065	12/14/2012	Comments from Ramona Community Planning Group	005620
C066	12/19/2012	Comments from City of San Diego Office of the City Attorney	005622
C067	12/19/2012	Comments from the San Diego Port Tenants Association	005626
C068	1/4/2013	Comments from Julian Community Planning Group	005628
C069	1/4/2013	Comments from Otay Land Company	005630
C070	1/4/2013	Comments from County of San Diego Fire Authority	005632

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4. COMMENTS ON TENTATIVE ORDER NO. R9-2013-0001 [Cont'd]			
C071	1/5/2013	Comments from Professor Hector Valtierra	005634
C072	1/7/2013	Comments from City of San Diego Transportation & Storm Water Department	005637
C073	1/8/2013	Comments from City of Imperial Beach	005640
C074	1/8/2013	Comments from Curious Company	005642
C075	1/8/2013	Comments from EcoLayers, Inc.	005644
C076	1/8/2013	Comments from Otay Ranch New Homes	005646
C077	1/8/2013	Comments from San Diego County Copermittees	005648
C078	1/8/2013	Comments from San Elijo Lagoon Conservancy	005971
C079	1/9/2013	Comments from Carol T. Crossman	005972
C080	1/9/2013	Comments from City of Poway	005974
C081	1/9/2013	Comments from County of San Diego Department of Environmental Health	005976
C082	1/9/2013	Comments from Riverside County Transportation Department	005978
C083	1/9/2013	Comments from Southern Cross Property Consultants	005983
C084	1/10/2013	Comments from City of Dana Point	005985
C085	1/10/2013	Comments from City of Mission Viejo	005988
C086	1/10/2013	Comments from City of Rancho Santa Margarita	005990
C087	1/10/2013	Comments from City of Vista	005992
C088	1/10/2013	Comments from Department of the Navy	005994
C089	1/10/2013	Comments from Riverside County Copermittees	005996
C090	1/10/2013	Comments from County of San Diego Office of County Counsel	006270
C091	1/10/2013	Comments from South County Economic Development Council	006275
C092	1/11/2013	Comments from San Diego Chapter of the American Society of Landscape Architects	006276
C093	1/11/2013	Comments from Building Industry Association of Southern California (BIASC) and Construction Industry Coalition on Water Quality (CICWQ)	006278

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4. COMMENTS ON TENTATIVE ORDER NO. R9-2013-0001 [Cont'd]			
C094	1/11/2013	Comments from Coastal Environmental Rights Foundation (CERF), Environmental Health Coalition (EHC), and San Diego Coastkeeper (SDCK)	006311
C095	1/11/2013	Comments from City of Chula Vista	006315
C096	1/11/2013	Comments from City of Del Mar	006318
C097	1/11/2013	Comments from City of Encinitas	006321
C098	1/11/2013	Comments from City of Laguna Hills	006323
C099	1/11/2013	Comments from City of National City	006325
C100	1/11/2013	Comments from City of San Juan Capistrano	006328
C101	1/11/2013	Comments from City of Santee	006330
C102	1/11/2013	Comments from Clean Water Now	006332
C103	1/11/2013	Comments from United State Environmental Protection Agency, Region IX	006338
C104	1/11/2013	Comments from County of San Diego Department of Public Works	006344
C105	1/10/2013	Comments from East Otay Mesa Property Owners Association	006432
C106	1/11/2013	Comments from The Escondido Creek Conservancy	006435
C107	1/11/2013	Comments from Friends of Rose Canyon, Friends of Rose Creek, and Rose Creek Watershed Alliance	006437
C108	1/11/2013	Comments from Gable PR	006439
C109	1/11/2013	Comments from Industrial Environmental Association	006441
C110	1/11/2013	Comments from Laguna Bluebelt Coalition	006446
C111	1/11/2013	Comments from Latitude 33 Planning & Engineering	006448
C112	1/11/2013	Comments from Los Peñasquitos Lagoon Foundation	006450
C113	1/11/2013	Comments from Marston+Marston, Inc.	006457
C114	1/11/2013	Comments from Metropolitan Water District of Southern California	006459
C115	1/11/2013	Comments from Natural Resource Defense Council (NRDC)	006462
C116	1/11/2013	Comments from Nuffer, Smith, Tucker, Inc.	006830

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4. COMMENTS ON TENTATIVE ORDER NO. R9-2013-0001 [Cont'd]			
C117	1/11/2013	Comments from Orange County Copermittees	006832
C118	1/11/2013	Comments from Otay Mesa Property Owners Association	007332
C119	1/11/2013	Comments from Peter M. Hekman, Jr.	007335
C120	1/11/2013	Comments from Project Design Consultants	007337
C121	1/11/2013	Comments from San Diego Canyonlands	007340
C122	1/11/2013	Comments from San Diego County Taxpayers Association	007341
C123	1/11/2013	Comments from San Diego Gas & Electric Company	007342
C124	1/11/2013	Comments from San Diego Unified Port District Attorney	007346
C125	1/11/2013	Comments from San Diego Regional Chamber of Commerce	007355
C126	1/11/2013	Comments from San Diego Unified Port District	007357
C127	1/11/2013	Comments from Sheppard, Mullin, Richter & Hampton LLP	007361
C128	1/11/2013	Comments from Southern California Gas Company	007363
C129	1/11/2013	Comments from South Laguna Civic Association	007367
C130	1/11/2013	Comments from Transition IT, LLC	007387
C131	1/17/2013	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Availability of Comments Received on Tentative Order No. R9-2013-0001	007389
5. RESPONSES TO COMMENTS AND REVISED TENTATIVE ORDER NO. R9-2013-0001			
C132	3/27/2013	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Availability of Revised Tentative Order No. R9-2013-0001 and Responses to Comments	007390
C133	3/27/2013	Responses to Comments Received on Tentative Order No. R9-2013-0001	007392
C134	3/27/2013	Revised Tentative Order No. R9-2013-0001 (with changes shown in Tracked Changes)	007664
C135	4/3/2013	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Availability of Word Version of Revised Tentative Order No. R9-2013-0001	008052

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1. APRIL 10-11, 2013 BOARD ADOPTION HEARING (AGENDA ITEM NO. 8)			
D001	3/6/2013	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Notice of Public Hearing to Consider Adoption of Tentative Order No. R9-2013-0001, Regional MS4 Permit	008053
		ATTACHMENT: Notice of Public Hearing	
D002	3/7/2013	Proof of Newspaper Publication in San Diego Union Tribune: Notice of Public Hearing for Tentative Order No. R9-2013-0001, Regional MS4 Permit	008057
D003	3/7/2013	Proof of Newspaper Publication in The Register: Notice of Public Hearing for Tentative Order No. R9-2013-0001, Regional MS4 Permit	008058
D004	3/8/2013	Proof of Newspaper Publication in The Press-Enterprise: Notice of Public Hearing for Tentative Order No. R9-2013-0001, Regional MS4 Permit	008059
D005	3/15/2013	Notice of Hearing Procedures and Order of Proceedings	008060
D006	3/15/2013	Request from Mayor of the City of San Diego and County of San Diego Board of Supervisors for Modification of Public Hearing Procedures	008067
D007	3/18/2013	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Availability of Notice of Hearing Procedures and Order of Proceedings for Public Hearing	008069
		ATTACHMENT: Hearing Procedures and Order of Proceedings	
D008	3/18/2013	Request from Clean Water Now for Allotment of Speaking Time at Public Hearing	008077
D009	3/18/2012	Request from Surfrider to Allotment of Speaking Time at Public Hearing	008081
D010	3/20/2013	Request from Riverside County Board of Supervisors and Riverside County Flood Control and Water Conservation District Board of Supervisors to Modify Public Hearing Procedures	008083
D011	3/21/2013	Request from NRDC for Allotment of Speaking Time at Public Hearing	008085
D012	3/21/2013	Request from Riverside County Flood Control and Water Conservation District for Modification of Public Hearing Procedures	008086
D013	3/21/2013	Request from Orange County and Orange County Flood Control District for Modification of Public Hearing Procedures	008089
D014	3/22/2013	Request from City of Del Mar for Modification of Public Hearing Procedures	008091
D015	3/22/2013	Request from City of Escondido for Modification of Public Hearing Procedures	008094

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1. APRIL 10-11, 2013 BOARD ADOPTION HEARING (AGENDA ITEM NO. 8) [Cont'd]			
D016	3/22/2013	Request from City of San Diego for Modification of Public Hearing Procedures	008096
D017	3/22/2013	Request from City of San Marcos for Modification of Public Hearing Procedures	008106
D018	3/22/2013	Request from Cities of Lake Forest, Aliso Viejo, and Santee for Modification of Public Hearing Procedures	008109
D019	3/22/2013	Request from County of San Diego for Modification of Public Hearing Procedures	008111
D020	3/22/2013	Request from San Diego County Regional Airport Authority for Modification of Public Hearing Procedures	008114
D021	3/22/2013	Request from Vista Chamber of Commerce for Modification of Public Hearing Procedures	008116
D022	3/26/2013	Request from Oceanside Chamber of Commerce for Modification of Public Hearing Procedures	008117
D023	3/26/2013	Request from Orange County Board of Supervisors for Modification of Public Hearing Procedures	008118
D024	3/27/2013	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Memorandum Regarding Designated Party Status	008120
		ATTACHMENT: Memorandum to Parties and Interested Persons Regarding Requests for Designated Party Status	
D025	4/1/2013	Request from Building Industry Coalition for Modification of Public Hearing Procedures	008123
D026	4/1/2013	Request from Environmental Groups for Designated Party Status and Modification of Public Hearing Procedures	008125
D027	4/9/2013	Request from San Diego Port Tenants Association for Modification of Public Hearing Procedures	008131
D028	4/3/2013	Memorandum to Parties and Interested Person Regarding Ruling on Objections, Requests for Alternative Procedures, and Requests for Designation as Additional Parties to the Proceedings	008132
		ATTACHMENT: Revised Hearing Procedures and Order of Proceedings	
D029	4/10/2013	Board Meeting Agenda	008151
BOARD PACKAGE FOR AGENDA ITEM NO. 8 (listed below as separate documents)			
D030	4/10/2013	Executive Officer Summary Report (EOSR)	008157
D031	4/10/2013	EOSR Supporting Document 1: Regional MS4 Permit Map	008167
D032	4/10/2013	EOSR Supporting Document 2: Tentative Order No. R9-2013-0001, released October 31, 2012	008168
D033	4/10/2013	EOSR Supporting Document 3: Regional MS4 Permit Timeline	008495

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SECTION D: ORDER NO. R9-2013-0001 ADOPTION PROCESS [Cont'd]			
1. APRIL 10-11, 2013 BOARD ADOPTION HEARING (AGENDA ITEM NO. 8) [Cont'd]			
D034	4/10/2013	EOSR Supporting Document 4: Notice of Public Review and Comment for Tentative Order	008502
D035	4/10/2013	EOSR Supporting Document 5: Comments Received on Tentative Order No. R9-2013-0001	008509
D036	4/10/2013	EOSR Supporting Document 6: Responses to Comments	010780
D037	4/10/2013	EOSR Supporting Document 7: Revised Tentative Order No. R9-2013-0001, released March 27, 2013	011052
D038	4/10/2013	EOSR Supporting Document 8: Notice of Public Hearing, dated March 5, 2013 and Hearing Procedures and Order of Proceedings, dated March 15, 2013	011440
DOCUMENTATION FROM AGENDA ITEM NO. 8 (listed below as separate documents)			
D039	4/10/2013	April 10, 2013 Board Meeting Sign In Sheet	011449
D040	4/10/2013	Sign In Sheet to Support Agenda Item No. 8	011453
D041	4/10/2013	Sign In Sheet to Oppose Agenda Item No. 8	011455
D042	4/10/2013	Speaker Cards for Agenda Item No. 8	011457
D043	4/10/2013	Powerpoint Presentation by Board Staff	011605
D044	4/10/2013	Powerpoint Presentation by San Diego County Copermittees	011635
D045	4/10/2013	Handout: Proposed Changes to Tentative Order by San Diego County Copermittees	011694
D046	4/10/2013	Powerpoint Presentation by Orange County Copermittees	011814
D047	4/10/2013	April 10, 2013 Board Meeting Minutes	011885
D048	4/10/2013	April 10, 2013 Board Agenda Item No. 8 Transcript 1 of 2	011895
D049	4/10/2013	April 10, 2013 Board Agenda Item No. 8 Transcript 2 of 2	0011896
D050	4/11/2013	April 11, 2013 Board Meeting Sign In Sheet	011897
D051	4/11/2013	Powerpoint Presentation by Riverside County Copermittees	011900
D052	4/11/2013	Powerpoint Presentation by County of San Diego	011948
D053	4/11/2013	Powerpoint Presentation by San Diego Unified Port District	011964

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1. APRIL 10-11, 2013 BOARD ADOPTION HEARING (AGENDA ITEM NO. 8) [Cont'd]			
D054	4/11/2013	Powerpoint Presentation by Environmental Groups	011968
D055	4/11/2013	Powerpoint Presentation by Building Industry Coalition	012009
D056	4/11/2013	Powerpoint Presentation by San Diego Gas & Electric	012035
D057	4/11/2013	April 11, 2013 Board Meeting Minutes	012059
D058	4/11/2013	April 11, 2013 Board Agenda Item No. 8 Transcript	012063
2. MAY 8, 2013 CONTINUATION OF BOARD ADOPTION HEARING (AGENDA ITEM NO. 9)			
D059	4/19/2013	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Notice of Public Hearing Continuation and Availability of Proposed Errata to Tentative Order No. R9-2013-0001	012064
D060	4/19/2013	Notice of Public Hearing Continuation	012065
D061	4/19/2013	Errata Sheet (OPTION 1) for Tentative Order No. R9-2013-0001	012068
D062	4/19/2013	Errata Sheet (OPTION 2) for Tentative Order No. R9-2013-0001	012086
D063	5/2/2013	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Availability of Documents Pertaining to May 8, 2013 Board Meeting Agenda Item No. 9	012102
D064	5/2/2013	Corrected Errata Sheet (OPTION 1) for Tentative Order No. R9-2013-0001	012103
D065	5/2/2013	Corrected Errata Sheet (OPTION 2) for Tentative Order No. R9-2013-0001	012123
D066	5/2/2013	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Availability of Memorandum Regarding Order on Procedural Issues and Order of Proceedings for Continued Public Hearing	012141
		ATTACHMENT: Memorandum to Parties and Interested Persons Regarding Order on Procedural Issues and Order of Proceedings for Continued Public Hearing	
D067	5/8/2013	Board Meeting Agenda	012142
BOARD PACKAGE FOR AGENDA ITEM NO. 9 (listed below as separate documents)			
D068	5/8/2013	Executive Officer Summary Report (EOSR)	012148

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2. MAY 8, 2013 CONTINUATION OF BOARD ADOPTION HEARING (AGENDA ITEM NO. 9) [Cont'd]			
D069	5/8/2013	EOSR Supporting Document 1: Option 1 Errata (removal of Provision B.3.c)	012152
D070	5/8/2013	EOSR Supporting Document 2: Option 2 Errata (retention of Provision B.3.c, with modifications)	012170
D071	5/8/2013	EOSR Supporting Document 3: Revised Tentative Order incorporating Option 1 and 2 Errata	012186
D072	5/8/2013	EOSR Supporting Document 4: City of San Diego Cost Benefit Analysis Report	012550
D073	5/8/2013	Supplemental EOSR	012586
D074	5/8/2013	EOSR Supporting Document 5: Comment Letters on Cost Benefit Analysis	012589
D075	5/8/2013	EOSR Supporting Document 6: Regional Storm Water Program Expenditures FY2011/12	012631
BOARD PACKAGE FOR AGENDA ITEM NO. 9 [Cont'd] (listed below as separate documents)			
D076	5/8/2013	EOSR Supporting Document 7: Comprehensive Load Reduction Plan Estimated Cost	012632
D077	5/8/2013	EOSR Supporting Document 8: Storm Water Program Budgets for 31 Copermittees	012633
D078	5/8/2013	EOSR Supporting Document 9: Comment Letter from United States Congress, dated April 2, 2013	012757
D079	5/8/2013	EOSR Supporting Document 10: Comment Letter from California State Legislature, dated April 4, 2013	012759
D080	5/8/2013	EOSR Supporting Document 11: USEPA Response to United States Congress, dated April 24, 2013	012761
D081	5/8/2013	EOSR Supporting Document 12: Corrected Option 1 Errata (removal of Provision B.3.c)	012764
D082	5/8/2013	EOSR Supporting Document 13: Corrected Option 2 Errata (retention of Provision B.3.c, with modifications)	012784
DOCUMENTATION FROM AGENDA ITEM NO. 9 (listed below as separate documents)			
D083	5/8/2013	Board Meeting Sign In Sheet	012802
D084	5/8/2013	Speaker Cards for Agenda Item No. 9	012805
D085	5/8/2013	Powerpoint Presentation by San Diego County Copermittees	012831
D086	5/8/2013	Powerpoint Presentation by Orange County Copermittees	012834
D087	5/8/2013	Powerpoint Presentation by Riverside County Copermittees	012851
D088	5/8/2013	Powerpoint Presentation by County of San Diego	012867

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SECTION D: ORDER NO. R9-2013-0001 ADOPTION PROCESS [Cont'd]			
2. MAY 8, 2013 CONTINUATION OF BOARD ADOPTION HEARING (AGENDA ITEM NO. 9) [Cont'd]			
D089	5/8/2013	Powerpoint Presentation by City of San Diego	012885
D090	5/8/2013	Powerpoint Presentation by Environmental Groups	012889
D091	5/8/2013	Powerpoint Presentation by Building Industry Coalition	012901
D092	5/8/2013	Powerpoint Presentation by San Diego Gas & Electric	012913
D093	5/8/2013	Board Meeting Minutes	012928
D094	5/8/2013	Board Agenda Item No. 9 Transcript 1 of 2	012938
D095	5/8/2013	Board Agenda Item No. 9 Transcript 2 of 2	012939
3. ADOPTED ORDER NO. R9-2013-0001			
D096	5/8/2013	Order No. R9-2013-0001, NPDES No. CAS010266, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements of Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds Within the San Diego Region (includes Attachments A-F, listed below)	012940
		• Attachment A - Discharge Prohibitions and Special Protections	
		• Attachment B - Standard Permit Provisions and General Provisions	
		• Attachment C - Acronyms, Abbreviations and Definitions	
		• Attachment D - Jurisdictional Runoff Management Program Annual Report Form	
		• Attachment E - Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2013-0001	
		• Attachment F - Fact Sheet / Technical Report for Order No. R9-2013-0001, NPDES No. CAS0109266	
D097	5/24/2013	Email to San Diego County, Orange County, and Riverside County Copermittees Transmitting an Electronic Copy of Adopted Order No. R9-2013-0001	013297
		ATTACHMENT: Transmittal Letter for Order No. R9-2013-0001	
		ATTACHMENT: Order No. R9-2013-0001, complete with Attachments A-F	

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1. JULY 1, 2014 PUBLIC MEETING			
E001	6/5/2014	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Public Meeting to Initiate Orange County Permit Renewal Process	013659
		ATTACHMENT: Invitation to Meeting to Discuss Report of Waste Discharge and Enrollment of Orange County Copermittees in the Regional MS4 Permit	
E002	7/1/2014	Meeting Agenda	013663
E003	7/1/2014	Meeting Sign In Sheet	013664
E004	7/1/2014	Staff Handout: Tentative Schedule for Orange County MS4 Permit Reissuance	013668
E005	7/1/2014	Powerpoint Presentation by Orange County Copermittees on Report of Waste Discharge	013669
E006	7/1/2014	Powerpoint Presentation by Board Staff on Land Development Planning Requirements in Regional MS4 Permit	013714
E007	7/1/2014	Powerpoint Presentation by Board Staff on Potential Modification to Regional MS4 Permit Based on Orange County Copermittees Report of Waste Discharge	013730
2. TENTATIVE ORDER NO. R9-2015-0001			
E008	9/18/2014	Tentative Order No. R9-2015-0001, An Order Amending Order No. R9-2013-0001, NPDES No. CAS0109266, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements of Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds Within the San Diego Region	013747
E009	9/18/2014	Attachment No.1 to Tentative Order No. R9-2015-0001 (Proposed Amendments to Order No. R9-2013-0001, including Attachments A-E)	013755
E010	9/18/2014	Attachment No.2 to Tentative Order No. R9-2015-0001 (Proposed Amendments to Fact Sheet (Attachment F) for Order No. R9-2013-0001)	013894
E011	9/18/2014	Letter and Notice of Opportunity to Comment to the San Diego County Copermittees, Orange County Copermittees, and Riverside County Copermittees for Tentative Order No. R9-2015-0001, An Order amending the Regional MS4 Permit for the San Diego Region (Order No. R9-2013-0001)	014138
E012	9/18/2014	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Availability of Tentative Order No. R9-2015-0001, An Order Amending Order No. R9-2013-0001	014144
E013	9/19/2016	Proof of Newspaper Publication in The Register: Notice of Opportunity to Comment on Tentative Order No. R9-2015-0001	014145

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2. TENTATIVE ORDER NO. R9-2015-0001 [Cont'd]			
E014	9/19/2016	Proof of Newspaper Publication in The Press-Enterprise: Notice of Opportunity to Comment on Tentative Order No. R9-2015-0001	014147
E015	9/19/2016	Proof of Newspaper Publication in San Diego Union Tribune: Notice of Opportunity to Comment on Tentative Order No. R9-2015-0001	014148
3. OCTOBER 8, 2014 BOARD WORKSHOP (AGENDA ITEM NO. 7)			
E016	9/5/2014	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Notice of Public Workshop for Tentative Order No. R9-2015-0001, An Order Amending Order No. R9-2013-0001	014149
		ATTACHMENT: Notice of Public Workshop	
E017	9/30/2014	Invitations to San Diego Water Board Public Workshop Emailed to Elected Officials for Orange County Copermittees (combined into one file - listed below)	014154
		• Mayor of Aliso Viejo	
		• Mayor of Dana Point	
		• Mayor of Laguna Beach	
		• Mayor of Laguna Woods	
		• Mayor of Laguna Niguel	
		• Mayor of Mission Viejo	
		• County of Orange Supervisor	
		• Mayor of Rancho Santa Margarita	
		• Mayor of San Clemente	
		• Mayor of San Juan Capistrano	
E018	10/8/2014	Board Meeting Agenda	014214
E019	10/8/2014	Executive Officer Summary Report (EOSR)	014229
E020	10/8/2014	EOSR Supporting Document 1: Tentative Order No. R9-2015-0001 (including Attachment Nos. 1 and 2)	014236

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3. OCTOBER 8, 2014 BOARD WORKSHOP (AGENDA ITEM NO. 7)			
E021	10/8/2014	EOSR Supporting Document 2: Transmittal Letter Announcing Availability of Tentative Order No. R9-2015-0001	014627
E022	10/8/2014	EOSR Supporting Document 3: Notice of Public Workshop	014633
E023	10/8/2014	EOSR Supporting Document 4: Map of San Juan Hydrologic Unit	014636
E024	10/8/2014	Board Meeting Sign In Sheet	014637
E025	10/8/2014	Speaker Cards for Agenda Item No. 10	014640
E026	10/8/2014	Powerpoint Presentation by Board Staff	014653
E027	10/8/2014	Powerpoint Presentation by Orange County Copermittees	014669
E028	10/8/2014	Powerpoint Presentation by San Diego County Copermittees	014701
E029	10/8/2014	Powerpoint Presentation by Building Industry Coalition	014706
E030	10/8/2014	Various Handouts from Stakeholders to Board	014722
E031	10/8/2014	Board Meeting Minutes	014785
E032	10/8/2014	Board Agenda Item No. 7 Recordings (3 parts provided in WMA file format)	014793
4. COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001			
E033	11/10/2014	Comments from County of San Diego Office of County Counsel	014794
E034	11/12/2014	Comments from S. Wayne Rosenbaum	014795
E035	11/19/2014	Comments from Coastal Environmental Rights Foundation (CERF) and San Diego Coastkeeper (SDCK)	014802
E036	11/19/2014	Comments from Construction Industry Coalition on Water Quality (CICWQ)	014805
E037	11/19/2014	Comments from City of Aliso Viejo	014858
E038	11/19/2014	Comments from City of Del Mar	014859
E039	11/19/2014	Comments from City of Lake Forest	014862
E040	11/19/2014	Comments from City of San Diego	014914
E041	11/19/2014	Comments from County of Orange	014953

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SECTION E: TENTATIVE ORDER NO. R9-2015-0001 AND WORKSHOPS [Cont'd]			
4. COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001 [Cont'd]			
E042	11/19/2014	Comments from County of San Diego Department of Public Works	015490
E043	11/19/2014	Comments from Industrial Environmental Association	015492
E044	11/19/2014	Comments from Riverside County Copermittees	015494
E045	11/19/2014	Comments from San Diego Unified Port District	015771
E046	11/19/2014	Comments from Tory R. Walker Engineering	015788
E047	12/1/2014	Comments from Bruce Posthumus	015789
E048	11/25/2014	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Availability of Comments Received on Tentative Order No. R9-2015-0001	015790
SECTION E: TENTATIVE ORDER NO. R9-2015-0001 AND WORKSHOPS [Cont'd]			
5. RESPONSES TO COMMENTS AND REVISED TENTATIVE ORDER NO. R9-2015-0001			
E049	1/21/2015	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Availability of Responses to Comments and Revised Tentative Order No. R9-2015-0001	015791
E050	1/21/2015	Responses to Comments Received on Tentative Order No. R9-2015-0001	015794
E051	1/21/2015	Revised Tentative Order No. R9-2015-0001 (with changes shown in Tracked Changes and yellow highlight)	015926
E052	1/21/2015	Revised Attachment No.1 to Tentative Order No. R9-2015-0001 (Proposed Amendments to Order No. R9-2013-0001, including Attachments A-E) (with changes shown in Tracked Changes and yellow highlight)	015935
E053	1/21/2015	Revised Attachment No.2 to Tentative Order No. R9-2015-0001 (Proposed Amendments to Fact Sheet (Attachment F) for Order No. R9-2013-0001) (with changes shown in Tracked Changes and yellow highlight)	016183

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SECTION F: ORDER NO. R9-2015-0001 ADOPTION PROCESS			
1. FEBRUARY 11, 2015 BOARD ADOPTION HEARING (AGENDA ITEM NO. 10)			
F001	1/9/2015	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Notice of Public Hearing to Consider Adoption of Tentative Order No. R9-2015-0001, An Order Amending Order No. R9-2013-0001	016324
		ATTACHMENT: Notice of Public Hearing	
		ATTACHMENT: Letter to San Diego County, Orange County, and Riverside County Copermittees Regarding Notice of Public Hearing for Tentative Order No. R9-2015-0001, An Order Amending Order No. R9-2013-0001, the Regional MS4 Permit for the San Diego Region	
F002	1/11/2015	Proof of Newspaper Publication in The Register: Notice of Public Hearing for Tentative Order No. R9-2015-0001, An Order Amending Order No. R9-2013-0001	016330
F003	1/11/2015	Proof of Newspaper Publication in San Diego Union Tribune: Notice of Public Hearing for Tentative Order No. R9-2015-0001, An Order Amending Order No. R9-2013-0001	016332
F004	1/15/2015	Proof of Newspaper Publication in The Press-Enterprise: Notice of Public Hearing for Tentative Order No. R9-2015-0001, An Order Amending Order No. R9-2013-0001	016333
F005	1/30/2015	Request from Orange County and Orange County Flood Control District for Modification of Public Hearing Procedures	016334
F006	2/10/2015	Email Response from San Diego Water Board Legal Counsel to Orange County and Orange County Flood Control District Request to Modify Public Hearing Procedures	016336
F007	2/11/2015	Board Meeting Agenda	016338
F008	2/11/2015	Executive Officer Summary Report (EOSR)	016351
F009	2/11/2015	EOSR Supporting Document 1: Revised Tentative Order No. R9-2015-0001 (includes Attachment Nos. 1 and 2), released January 21, 2015	016357
F010	2/11/2015	EOSR Supporting Document 2: Map Showing Orange County Copermittees Jurisdictional Boundaries	016755
F011	2/11/2015	EOSR Supporting Document 3: October 8, 2014 Executive Officer Summary Report	016756
F012	2/11/2015	EOSR Supporting Document 4: Comment Letters	016763
F013	2/11/2015	EOSR Supporting Document 5: Responses to Comments	017758
F014	2/11/2015	EOSR Supporting Document 6: San Diego Water Board Comment Letter to State Water Board on Receiving Water Limitations	017890
F015	2/11/2015	EOSR Supporting Document 7: Notice of Public Hearing	017894

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SECTION F: ORDER NO. R9-2015-0001 ADOPTION PROCESS [Cont'd]			
1. FEBRUARY 11, 2015 BOARD ADOPTION HEARING (AGENDA ITEM NO. 10) [Cont'd]			
F016	2/11/2015	Board Meeting Sign In Sheet	017895
F017	2/11/2015	Speaker Cards for Agenda Item No. 10	017899
F018	2/11/2015	Powerpoint Presentation by Board Staff	017923
F019	2/11/2015	Powerpoint Presentation by Orange County Copermittees	017933
F020	2/11/2015	Powerpoint Presentation by San Diego County	017960
F021	2/11/2015	Board Staff Handout: Errata Sheet	017967
F022	2/11/2015	Orange County Copermittees Handout: Proposed Errata for Fact Sheet	017972
F023	2/11/2015	San Diego County Handout: Proposed Prior Lawful Approval Permit Language	017974
F024	2/11/2015	Board Meeting Minutes	017975
F025	2/11/2015	Board Agenda Item No. 10 Transcript	017985
2. ADOPTED ORDER NO. R9-2015-0001 AND AMENDED ORDER NO. R9-2013-0001			
F026	2/11/2015	Order No. R9-2015-0001, An Order Amending Order No. R9-2013-0001, NPDES No. CAS0109266, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements of Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds Within the San Diego Region (including Attachment Nos. 1 and 2, listed below)	018152
		Attachment No.1 to Order No. R9-2015-0001 (Amendments to Order No. R9-2013-0001, including Attachments A-E)	
		Attachment No.2 to Order No. R9-2015-0001 (Amendments to Fact Sheet (Attachment F) for Order No. R9-2013-0001)	
F027	2/11/2015	Conformed Copy of Order No. R9-2013-0001, as Amended by Order No. R9-2015-0001 (includes Attachments A-E)	018545
F028	2/11/2015	Conformed Copy of Fact Sheet (Attachment F) for Order No. R9-2013-0001, as Amended by Order No. R9-2015-0001	018791

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SECTION F: ORDER NO. R9-2015-0001 ADOPTION PROCESS [Cont'd]			
2. ADOPTED ORDER NO. R9-2015-0001 AND AMENDED ORDER NO. R9-2013-0001 [Cont'd]			
F029	3/3/2015	Letter to San Diego County, Orange County, and Riverside County Copermittees Transmitting of Order No. R9-2015-0001	018926
		ENCLOSURE: Order No. R9-2015-0001 with Attachment Nos. 1 and 2	
		ENCLOSURE: Conformed Copy of Order No. R9-2013-0001, as Amended by Order No. R9-2015-0001, complete with Attachments A-F	
F030	3/4/2015	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Availability of Adopted Order No. R9-2015-0001 and Conformed Copy of Order No. R9-2013-0001, as Amended by Order No. R9-2015-0001	019704
SECTION G: TENTATIVE ORDER NO. R9-2015-0100 AND WORKSHOPS			
1. APRIL 28, 2015 PUBLIC WORKSHOP			
G001	4/2/2015	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Notice of Public Workshops to Discuss Prior Lawful Approval and Alternative Compliance Pathway for Receiving Water Limitations Proposed Amendments to Order No. R9-2013-0001	019706
		ATTACHMENT: Notice of Public Workshop - Proposed Amendments to Order No. R9-2013-0001, as amended by Order No. R9-2015-0001, to Incorporate a Definition of Prior Lawful Approval for Priority Development Projects and an Alternative Compliance Pathway for Receiving Water Limitations	
SECTION G: TENTATIVE ORDER NO. R9-2015-0100 AND WORKSHOPS [Cont'd]			
1. APRIL 28, 2015 PUBLIC WORKSHOP [Cont'd]			
G002	4/21/2015	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Revised Notice of Public Workshops to Discuss Prior Lawful Approval and Alternative Compliance Pathway for Receiving Water Limitations Proposed Amendments to Order No. R9-2013-0001	019710
		ATTACHMENT: Revised Notice of Public Workshop - Proposed Amendments to Order No. R9-2013-0001, as amended by Order No. R9-2015-0001, to Incorporate a Definition of Prior Lawful Approval for Priority Development Projects and an Alternative Compliance Pathway for Receiving Water Limitations	

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SECTION G: TENTATIVE ORDER NO. R9-2015-0100 AND WORKSHOPS [Cont'd]			
1. APRIL 28, 2015 PUBLIC WORKSHOP [Cont'd]			
G003	4/22/2015	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Agenda for April 28, 2015 Public Workshop to Discuss Prior Lawful Approval and Alternative Compliance Pathway for Receiving Water Limitations Proposed Amendments to Order No. R9-2013-0001, and Availability of Draft Prior Lawful Approval Language and Draft Alternative Compliance Pathway for Receiving Water Limitations	019714
		ATTACHMENT: April 28, 2015 Public Workshop Agenda	
G004	4/28/2015	Public Workshop Agenda	019716
G005	4/28/2015	Public Workshop Sign In Sheet	019717
G006	4/28/2015	Staff Handout: Draft Definition of Prior Lawful Approval for Priority Development Projects	019720
G007	4/28/2015	Staff Handout: Draft Alternative Compliance Pathway for Receiving Water Limitations	019721
G008	4/28/2015	Handouts from Building Industry Coalition on Prior Lawful Approval Language	019723
G009	4/28/2015	Handout from San Diego County Copermittees on Alternative Compliance Pathway	019744
G010	4/28/2015	Summary of Prior Lawful Approval Language Workshop Discussions	019748
G011	4/28/2015	Summary of Alternative Compliance Pathway Workshop Discussions	019751
2. MAY 21, 2015 PUBLIC WORKSHOP			
G012	5/14/2015	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding May 21, 2015 Public Workshop on Prior Lawful Approval and Alternative Compliance Option for Receiving Water Limitations	019755
		ATTACHMENT: Revised Draft Definition of Prior Lawful Approval for Priority Development Projects, Revised May 14, 2015	
		ATTACHMENT: Revised Draft Alternative Compliance Pathway for Receiving Water Limitations, Revised May 14, 2015	
		ATTACHMENT: Summary of April 28, 2015 Prior Lawful Approval Language Workshop Discussions	
		ATTACHMENT: Summary of April 28, 2015 Alternative Compliance Pathway Workshop Discussions	
		ATTACHMENT: May 21, 2015 Public Workshop Agenda	
G013	5/21/2015	Public Workshop Agenda	019770

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SECTION G: TENTATIVE ORDER NO. R9-2015-0100 AND WORKSHOPS [Cont'd]			
2. MAY 21, 2015 PUBLIC WORKSHOP [Cont'd]			
G014	5/21/2015	Public Workshop Sign In Sheet	019771
G015	5/21/2015	Powerpoint Presentation from San Diego County Copermittees on Alternative Compliance Pathway	019775
G016	5/21/2015	Handout from San Diego County Copermittees on Alternative Compliance Pathway	019784
G017	5/21/2015	Summary of Prior Lawful Approval Language Workshop Discussions	019785
G018	5/21/2015	Summary of Alternative Compliance Pathway Workshop Discussions	019788
3. JUNE 30, 2015 PUBLIC WORKSHOP			
G019	6/2/2015	Proposed Revisions to Draft Alternative Compliance Pathway for Receiving Water Limitations from the San Diego County, Orange County, and Riverside County Copermittees	019794
G020	6/3/2015	Proposed Revisions to Draft Alternative Compliance Pathway for Receiving Water Limitations from the Environmental Community	019801
G021	6/11/2015	Proposed Revisions to Draft Definition of Prior Lawful Approval for Priority Development Projects from the County of San Diego, City of San Diego, and Building Industry Coalition	019805
G022	6/23/2015	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding June 30, 2015 Public Workshop on Prior Lawful Approval and Alternative Compliance Option for Receiving Water Limitations	019807
		ATTACHMENT: Second Revised Draft Definition of Prior Lawful Approval for Priority Development Projects, Revised June 23, 2015	
		ATTACHMENT: Second Revised Draft Alternative Compliance Pathway for Receiving Water Limitations, Revised June 23, 2015	
		ATTACHMENT: June 30, 2015 Public Workshop Agenda	
G023	6/30/2015	Public Workshop Agenda	019816
G024	6/30/2015	Public Workshop Sign In Sheet	019817
G025	6/30/2015	Powerpoint Presentation from Board Staff	019821
G026	6/30/2015	Public Workshop Summary	019837

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SECTION G: TENTATIVE ORDER NO. R9-2015-0100 AND WORKSHOPS [Cont'd]			
4. TENTATIVE ORDER NO. R9-2015-0100			
G027	7/31/2015	Tentative Order No. R9-2015-0100, An Order Amending Order No. R9-2013-0001, NPDES No. CAS0109266, as Amended by Order No. R9-2015-0001, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements of Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds Within the San Diego Region	019841
G028	7/31/2015	Attachment No.1 to Tentative Order No. R9-2015-0100 (Proposed Amendments to Order No. R9-2013-0001, as Amended by Order No. R9-2015-0001, including Attachments A-E)	019848
G029	7/31/2015	Attachment No.2 to Tentative Order No. R9-2015-0100 (Proposed Amendments to Fact Sheet (Attachment F) for Order No. R9-2013-0001, as Amended by Order No. R9-2015-0001)	020102
G030	7/29/2015	Proof of Newspaper Publication in The Press-Enterprise: Notice of Opportunity to Comment and Public Hearing on Tentative Order No. R9-2015-0100	020246
G031	7/29/2015	Proof of Newspaper Publication in San Diego Union Tribune: Notice of Opportunity to Comment and Public Hearing on Tentative Order No. R9-2015-0100	020247
G032	7/29/2015	Proof of Newspaper Publication in The Register: Notice of Opportunity to Comment and Public Hearing on Tentative Order No. R9-2015-0100	020248
G033	7/31/2015	Email to Riverside County, San Diego County, and Orange County Copermittees Transmitting Cover Letter for Tentative Order No. R9-2015-0100, An Order Amending Order No. R9-2013-0001, NPDES No. CAS0109266, as Amended by Order No. R9-2015-0001 and Notice of Opportunity to Comment and Public Hearing	020250
		ATTACHMENT: Letter Notifying Riverside County, San Diego County, and Orange County Copermittees of Availability of Tentative Order No. R9-2015-0100 and Notice of Opportunity to Comment and Public Hearing	
		ATTACHMENT: Notice of Opportunity to Comment and Public Hearing	
G034	7/31/2015	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Availability of Tentative Order No. R9-2015-0100, An Order Amending Order No. R9-2013-0001, as Amended by Order No. R9-2015-0001	020258
		ATTACHMENT: Notice of Opportunity to Comment and Public Hearing	
5. COMMENTS ON TENTATIVE ORDER NO. R9-2015-0100			
G035	9/10/2015	Comments from City of Menifee	020262
G036	9/10/2015	Comments from San Diego Coastkeeper, Coastal Environmental Rights Foundation, and Surfrider Foundation San Diego Chapter	020267

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SECTION G: TENTATIVE ORDER NO. R9-2015-0100 AND WORKSHOPS [Cont'd]			
5. COMMENTS ON TENTATIVE ORDER NO. R9-2015-0100			
G037	9/11/2015	Comments from City of Santee	020286
G038	9/11/2015	Comments from San Diego Coastkeeper and Coastal Environmental Rights Foundation	020288
G039	9/14/2015	Comments from City of Dana Point	020292
G040	9/14/2015	Comments from City of Escondido	020305
G041	9/14/2015	Comments from City of Laguna Beach	020307
G042	9/14/2015	Comments from City of Lake Forest	020317
G043	9/14/2015	Comments from City of San Clemente	020321
G044	9/14/2015	Comments from City of San Diego	020325
G045	9/14/2015	Comments from City of San Juan Capistrano	020342
G046	9/14/2015	Comments from Construction Industry Coalition on Water Quality (CICWQ)	020347
G047	9/14/2015	Comments from County of Orange and Orange County Flood Control District	020400
G048	9/14/2015	Comments from County of San Diego Department of Public Works	020411
G049	9/14/2015	Comments from Riverside County Copermittees	020427
G050	9/14/2015	Comments from San Diego County Copermittees	020716
G051	9/14/2015	Comments from San Diego Unified Port District	020724
G052	9/14/2015	Comments from South Laguna Civic Association	020868
G053	11/3/2015	Comments from Safari Highlands Ranch LLC	020881
6. RESPONSES TO COMMENTS AND ERRATA SHEET FOR TENTATIVE ORDER NO. R9-2015-0100			
G054	11/4/2015	Responses to Comments Received on Tentative Order No. R9-2015-0100	020887
G055	11/4/2015	Errata Sheet for Tentative Order No. R9-2015-0100	020958
G056	11/5/2015	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Availability of Responses to Comments and Errata Sheet for Tentative Order No. R9-2015-0100	020965

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SECTION G: TENTATIVE ORDER NO. R9-2015-0100 AND WORKSHOPS [Cont'd]			
6. RESPONSES TO COMMENTS AND ERRATA SHEET FOR TENTATIVE ORDER NO. R9-2015-0100			
G057	11/10/2015	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Availability of REVISED Responses to Comments and Errata Sheet for Tentative Order No. R9-2015-0100	020967
G058	11/10/2015	Revised Responses to Comments Received on Tentative Order No. R9-2015-0100	020968
G059	11/10/2015	Revised Errata Sheet for Tentative Order No. R9-2015-0100	021040
SECTION H: ORDER NO. R9-2015-0100 ADOPTION PROCESS			
1. NOVEMBER 18, 2015 BOARD ADOPTION HEARING (AGENDA ITEM NO. 11)			
H001	7/31/2015	Email to Riverside County, San Diego County, and Orange County Copermittees Transmitting Cover Letter for Tentative Order No. R9-2015-0100, An Order Amending Order No. R9-2013-0001, NPDES No. CAS0109266, as Amended by Order No. R9-2015-0001 and Notice of Opportunity to Comment and Public Hearing	021047
		ATTACHMENT: Letter Notifying Riverside County, San Diego County, and Orange County Copermittees of Availability of Tentative Order No. R9-2015-0100 and Notice of Opportunity to Comment and Public Hearing	
		ATTACHMENT: Notice of Opportunity to Comment and Public Hearing	
H002	7/31/2015	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Availability of Tentative Order No. R9-2015-0100, An Order Amending Order No. R9-2013-0001, as Amended by Order No. R9-2015-0001	021055
		ATTACHMENT: Notice of Opportunity to Comment and Public Hearing	
H003	7/29/2015	Proof of Newspaper Publication in The Press-Enterprise: Notice of Opportunity to Comment and Public Hearing on Tentative Order No. R9-2015-0100	021059
H004	7/29/2015	Proof of Newspaper Publication in San Diego Union Tribune: Notice of Opportunity to Comment and Public Hearing on Tentative Order No. R9-2015-0100	021060
H005	7/29/2015	Proof of Newspaper Publication in The Register: Notice of Opportunity to Comment and Public Hearing on Tentative Order No. R9-2015-0100	021061
H006	11/13/2015	Email to Copermittees, Stakeholders, and Other Interested Persons Regarding the Public Hearing Speaker Schedule in Response to Requests for Time Allocations to Present Testimony	021063
H007	11/18/2015	Board Meeting Agenda	021065

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SECTION H: ORDER NO. R9-2015-0100 ADOPTION PROCESS			
1. NOVEMBER 18, 2015 BOARD ADOPTION HEARING (AGENDA ITEM NO. 11) [Cont'd]			
H008	11/18/2015	Executive Officer Summary Report (EOSR)	021079
H009	11/18/2015	EOSR Supporting Document 1: Tentative Order No. R9-2015-0100 (includes Attachment Nos. 1 and 2)	021087
H010	11/18/2015	EOSR Supporting Document 2: Map of Santa Margarita Hydrologic Unit Showing Riverside County Copermittees' Jurisdictional Boundaries	021492
H011	11/18/2015	EOSR Supporting Document 3: Comment Letters	021493
H012	11/18/2015	EOSR Supporting Document 4: Responses to Comments	022112
H013	11/18/2015	EOSR Supporting Document 5: Errata Sheet listing additional changes to the Tentative Order and Attachments	022183
H014	11/18/2015	EOSR Supporting Document 6: State Water Board Order WQ 2015-0075	022190
H015	11/18/2015	EOSR Supporting Document 7: San Diego Water Board and Santa Ana Water Board Agreement Letters for Single Regional Water Board Designation to Regulate MS4 Discharges from the Cities of Menifee, Murrieta, and Wildomar	022270
H016	11/18/2015	EOSR Supporting Document 8: Notice of Public Hearing	022317
H017	11/18/2015	Supplemental EOSR	022319
H018	11/18/2015	EOSR Supporting Document 9: Supporting Materials for September 10, 2015 Environmental Groups Comment Letter	022323
H019	11/18/2015	EOSR Supporting Document 10: USEPA comment letters	022364
H020	11/18/2015	EOSR Supporting Document 11: November 3, 2015 Safari Highlands Ranch comment letter	022384
H021	11/18/2015	EOSR Supporting Document 12: Revised Responses to Comments	022390
H022	11/18/2015	EOSR Supporting Document 13: Revised Errata Sheet listing additional changes to the Tentative Order and Attachments	022462
H023	11/18/2015	Board Meeting Sign In Sheet	022469
H024	11/18/2015	Speaker Cards for Agenda Item No. 11	022474
H025	11/18/2015	Powerpoint Presentation by Board Staff	022498
H026	11/18/2015	Powerpoint Presentation by Orange County Copermittees	022523
H027	11/18/2015	Powerpoint Presentation by Cities of Laguna Beach and Dana Point	022549

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SECTION H: ORDER NO. R9-2015-0100 ADOPTION PROCESS			
1. NOVEMBER 18, 2015 BOARD ADOPTION HEARING (AGENDA ITEM NO. 11) [Cont'd]			
H028	11/18/2015	Powerpoint Presentation by San Diego County Copermittees	022556
H029	11/18/2015	Powerpoint Presentation by Building Industry Coalition	022573
H030	11/18/2015	Powerpoint Presentation by San Diego Coastkeeper	022592
H031	11/18/2015	Board Meeting Minutes	022621
H032	11/18/2015	Board Agenda Item No. 11 Transcript	022627
2. ADOPTED ORDER NO. R9-2015-0100 AND AMENDED ORDER NO. R9-2013-0001			
H033	11/18/2015	Order No. R9-2015-0100, An Order Amending Order No. R9-2013-0001, NPDES No. CAS0109266, as Amended by Order No. R9-2015-0001, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements of Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds Within the San Diego Region (including Attachment Nos. 1 and 2, listed below)	022917
		Attachment No.1 to Order No. R9-2015-0100 (Amendments to Order No. R9-2013-0001, as Amended by Order No. R9-2015-0001, including Attachments A-E)	
		Attachment No.2 to Order No. R9-2015-0100 (Amendments to Fact Sheet (Attachment F) for Order No. R9-2013-0001, as Amended by Order No. R9-2015-0001)	
H034	11/18/2015	Conformed Copy of Order No. R9-2013-0001, as Amended by Order Nos. R9-2015-0001 and R9-2015-0100 (includes Attachments A-F, listed below)	023324
		• Attachment A - Discharge Prohibitions and Special Protections	
		• Attachment B - Standard Permit Provisions and General Provisions	
		• Attachment C - Acronyms, Abbreviations and Definitions	
		• Attachment D - Jurisdictional Runoff Management Program Annual Report Form	
		• Attachment E - Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2013-0001, as amended by Order Nos. R9-2015-0001 and R9-2015-0100	
		• Attachment F - Fact Sheet / Technical Report for Order No. R9-2013-0001, NPDES No. CAS0109266, as amended by Order Nos. R9-2015-0001 and R9-2015-0100	
H035	11/25/2015	Email to San Diego County, Orange County, and Riverside County Copermittees Transmitting an Electronic Copy of Adopted Order No. R9-2015-0100 and Conformed Copy of Order No. R9-2013-0001, as amended by Order Nos. R9-2015-0001 and R9-2015-0100	023722
		ATTACHMENT: Transmittal Letter for Order No. R9-2015-0100, An Order Amending Order No. R9-2013-0001, NPDES No. CAS0109266, as Amended by Order No. R9-2015-0001	
		ATTACHMENT: Order No. R9-2015-0100 with Attachment Nos. 1 and 2	

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SECTION H: ORDER NO. R9-2015-0100 ADOPTION PROCESS			
2. ADOPTED ORDER NO. R9-2015-0100 AND AMENDED ORDER NO. R9-2013-0001			
H035 [Cont'd]		ATTACHMENT: Conformed Copy of Order No. R9-2013-0001, as Amended by Order Nos. R9-2015-0001 and R9-2015-0100, complete with Attachments A-F	023722
H036	11/25/2015	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Availability of Adopted Order No. R9-2015-0001 and Conformed Copy of Order No. R9-2013-0001, as Amended by Order No. R9-2015-0001	024533
		ATTACHMENT: Order No. R9-2015-0100 with Attachment Nos. 1 and 2	
		ATTACHMENT: Conformed Copy of Order No. R9-2013-0001, as Amended by Order Nos. R9-2015-0001 and R9-2015-0100, complete with Attachments A-F	
SECTION I: BOARD STAFF MEETINGS AND COMMUNICATIONS WITH STAKEHOLDERS			
1. PRE-ADMINISTRATIVE DRAFT REGIONAL MS4 PERMIT MEETINGS AND COMMUNITIONS			
I001	2/8/2011	San Diego Water Board Regional MS4 Permit Team Meeting with San Diego County Copermittees Regarding Upcoming Report of Waste Discharge Submittal and San Diego Water Board Plans for Regional MS4 Permit (documents from meeting listed below)	025339
		• Meeting Agenda	
		• Meeting Sign In Sheet	
		• Handout from San Diego County Copermittees: Suggested Topics	
I002	2/17/2011	City of Santee Handout from San Diego Water Board Regional MS4 Permit Team Meeting with City of Santee Storm Water Program Staff	025342
I003	2/17/2011	City of San Diego Handout from San Diego Water Board Regional MS4 Permit Team Meeting with City of San Diego Storm Water Program Staff	025348
I004	2/18/2011	Memorandum from County of San Diego Summarizing Different Existing Storm Water Permitting Strategies	025355
I005	4/21/2011	San Diego Water Board Regional MS4 Permit Team Meeting with San Diego Coastkeeper (documents from meeting listed below)	025452
		• Meeting Agenda	
		• Handout from San Diego Coastkeeper: Monitoring Plan	
I006	4/21/2011	Agenda from San Diego Copermittees Regional Management Committee Meeting	025476

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1. PRE-ADMINISTRATIVE DRAFT REGIONAL MS4 PERMIT MEETINGS AND COMMUNITIONS			
I007	4/27/2011	San Diego Water Board Regional MS4 Permit Team Meeting with Orange County Copermittees (documents from meeting listed below)	025478
		• Meeting Agenda	
		• Powerpoint Presentation from Orange County Copermittees: Orange County's Monitoring and Reporting Program	
I008	6/28/2011	Powerpoint Presentation from San Diego County Copermittees on Vision for Storm Water Management	025502
2. MEETINGS AND COMMUNITIONS DURING ADMINISTRATIVE DRAFT REGIONAL MS4 PERMIT REVIEW PROCESS			
I009	4/2/2012	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Notice of Public Workshop for Administrative Draft Regional MS4 Permit	025512
		ATTACHMENT: Notice of Public Workshop	
1010	4/9/2012	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Availability of Administrative Draft Regional MS4 Permit	025516
I011	4/23/2012	Email from City of San Diego to San Diego Water Board Regional MS4 Permit Team Providing Process and Technical Comments for April 25, 2012 Public Workshop	025517
I012	4/26/2012	Email from City of Escondido to San Diego Water Board Regional MS4 Permit Team Providing Recommendations for Focused Meeting Process	025519
I013	5/2/2012	Sign In Sheet for Meeting with San Diego County Copermittees to Discuss Focused Meeting Process	025521
I014	5/3/2012	Email from San Diego Water Board Regional MS4 Permit Team to USEPA About Focused Meeting Process	025523
I015	5/8/2012	Email from San Diego Water Board Regional MS4 Permit Team to San Diego County Copermittees Acknowledging Receipt of Focused Meeting Process Proposal	025524
I016	5/10/2012	Email from San Diego Water Board Regional MS4 Permit Team to Riverside County Copermittees Documenting Meeting and Meeting Attendees	025526
I017	5/10/2012	Letter from The County Counsel for County of Orange and Orange County Flood Control District to San Diego Water Board Legal Counsel Requesting an Opinion on San Diego Water Board Authority to Adopt a Regional MS4 Permit	025527

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2.	**MEETINGS AND COMMUNITIONS DURING ADMINISTRATIVE DRAFT REGIONAL MS4 PERMIT REVIEW PROCESS [Cont'd]**		
I018	5/14/2012	Email from County of Orange Following Up from Meeting with San Diego Water Board Regional MS4 Permit Team to Discuss Focused Meeting Process	025529
		ATTACHMENT: Orange County Copermittees and San Diego Water Board Regional MS4 Permit Team Meeting Sign In Sheet	
I019	5/15/2012	Email from San Diego Water Board Regional MS4 Permit Team to San Diego County, Orange County, and Riverside County Copermittees Regarding Selection of a Facilitator for the Focused Meeting Process	025532
I020	5/17/2012	Email from San Diego County Copermittees to San Diego Water Board Regional MS4 Permit Team Requesting Modification to Focused Meetings Schedule	025533
I021	5/17/2012	Letter from Orange County Copermittees to San Diego Water Board Executive Officer Regarding Concerns About Regional MS4 Permit and Focused Meetings	025535
I022	5/18/2012	Email from San Diego Coastkeeper to San Diego Water Board Regional MS4 Permit Team Regarding Focused Meeting Process	025538
I023	5/18/2012	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists with Update on Focused Meetings Process	025539
I024	5/21/2012	Letter from Office of County Counsel for County of Riverside to San Diego Water Board Legal Counsel Requesting an Opinion on San Diego Water Board Authority to Adopt a Regional MS4 Permit	025545
I025	5/22/2012	Letter from Riverside County Copermittees to San Diego Water Board Regional MS4 Permit Team Requesting Modification to Focused Meetings Schedule	025548
I026	6/1/2012	Letter from Riverside County Copermittees to San Diego Water Board Executive Officer Requesting Modification to Focused Meetings Schedule	025549
I027	6/7/2012	Letter from San Diego County, Orange County, and Riverside County Copermittees to San Diego Water Board Executive Officer Providing Recommendations for Focused Meeting Process	025552
I028	6/15/2012	Letter from Industrial Environmental Association to San Diego Water Board Regional MS4 Permit Team to Participate in Focused Meetings Process	025561
I029	6/21/2012	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Revised Procedures for Focused Meetings	025565
		ATTACHMENT: Notice of Revised Administrative Draft Regional MS4 Permit Focused Meeting Procedures and Schedule	

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2.	**MEETINGS AND COMMUNITIONS DURING ADMINISTRATIVE DRAFT REGIONAL MS4 PERMIT REVIEW PROCESS [Cont'd]**		
I030	7/3/2012	Letter from Orange County Copermittees to San Diego Water Board Executive Officer Providing Topic Recommendations for July 11, 2012 Focused Meeting	025566
I031	7/3/2012	Letter from San Diego Coastkeeper to San Diego Water Board Regional MS4 Permit Team Providing Topic Recommendations for July 11, 2012 Focused Meeting	025568
I032	7/3/2012	Letter from San Diego Copermittees to San Diego Water Board Regional MS4 Permit Team Providing Topic Recommendations for July 11, 2012 Focused Meeting	025570
I033	7/6/2012	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding July 11, 2012 Focused Meeting Agenda and June 27, 2012 Focused Meeting Notes	025571
		ATTACHMENT: June 27, 2012 Focused Meeting Notes	
		ATTACHMENT: July 11, 2012 Focused Meeting Agenda	
I034	7/9/2012	Email from San Diego Water Board Regional MS4 Permit Team to Riverside County Copermittees Regarding Offer for Meeting to Summarize June 27, 2012 Focused Meeting Discussions	025594
I035	7/10/2012	Letter from Riverside County Copermittees to San Diego Water Board Chairman Regarding San Diego Water Board Decision to Proceed with Focused Meetings and Preclusion of Riverside County Copermittees from Participating	025596
I036	7/12/2012	Email from Orange County to San Diego Water Board Regional MS4 Permit Team Requesting a Workshop on Hydromodification	025607
I037	7/17/2012	Email from Orange County to San Diego Water Board Regional MS4 Permit Team Requesting a Meeting	025608
I038	7/19/2012	Email from San Diego County Copermittees Existing Development Workgroup to San Diego Water Board Regional MS4 Permit Team Requesting a Meeting	025609
I039	7/19/2012	Email from San Diego Coastkeeper to San Diego Water Board Regional MS4 Permit Team Regarding Potential Discussion Items for Next Focused Meeting	025610
I040	7/20/2012	Email from San Diego Water Board Regional MS4 Permit Team to San Diego County Copermittees Monitoring Workgroup Regarding Allotment of Time for Monitoring Presentation at Focused Meeting	025612
I041	7/20/2012	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding July 25, 2012 Focused Meeting Agenda and July 11, 2012 Focused Meeting Notes	025614
		ATTACHMENT: July 11, 2012 Focused Meeting Notes	
		ATTACHMENT: July 25, 2012 Focused Meeting Agenda	

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2.	**MEETINGS AND COMMUNITIONS DURING ADMINISTRATIVE DRAFT REGIONAL MS4 PERMIT REVIEW PROCESS [Cont'd]**		
I042	7/24/2012	Email from San Diego County Copermittees Land Development Workgroup to San Diego Water Board Regional MS4 Permit Team Requesting a Meeting	025645
I043	7/24/2012	Email from Orange County Copermittees to San Diego Water Board Regional MS4 Permit Team Regarding Meeting Time and Location	025648
I044	7/24/2012	Letter from San Diego Water Board Executive Officer to Riverside County Copermittees Regarding Decision to Proceed with Focused Meetings	025649
I045	7/26/2012	Email from San Diego Water Board Regional MS4 Permit Team to San Diego County Copermittees Land Development Workgroup Regarding Followup Meeting	025652
I046	7/26/2012	Email from San Diego Water Board Regional MS4 Permit Team to San Diego County Copermittees Monitoring Workgroup Regarding Followup Meeting	025656
I047	7/31/2012	Email from San Diego County Copermittees Existing Development Workgroup Regarding Discussion Topics for Meeting with San Diego Water Board Regional MS4 Permit Team	025658
I048	8/6/2012	Email from San Diego Water Board Regional MS4 Permit Team to Building Industry Association Regarding Request for Meeting	025659
I049	8/7/2012	Email from San Diego County Copermittees Existing Development Workshop to San Diego Water Board Regional MS4 Permit Team to Requesting Additional Followup Meeting	025661
I050	8/7/2012	Email from Orange County to San Diego Water Board Regional MS4 Permit Team with Update on Hydromodification Management Meeting	025662
I051	8/13/2012	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding July 25, 2012 Focused Meeting Notes	025663
		ATTACHMENT: July 25, 2012 Focused Meeting Notes	
I052	8/17/2012	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding August 22, 2012 Focused Meeting Agenda	025729
		ATTACHMENT: August 22, 2012 Focused Meeting Agenda	
I053	8/20/2012	Email from San Diego County Copermittees Monitoring Workgroup to San Diego Water Board Regional MS4 Permit Team Regarding Follow-up Meeting	025732
I054	8/20/2012	Email from Legal Workgroup for Copermittees to San Diego Water Board Legal Counsel with Update on Legal Concerns	025734

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2.	**MEETINGS AND COMMUNITIONS DURING ADMINISTRATIVE DRAFT REGIONAL MS4 PERMIT REVIEW PROCESS [Cont'd]**		
I055	8/23/2012	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Meeting Organized by the Orange County Copermittees on Hydromodification Management	025736
		ATTACHMENT: Hydromodification Management Meeting Information	
I056	8/24/2012	Email from San Diego Coastkeeper to San Diego Water Board Regional MS4 Permit Team Requesting Meeting with San Diego Green Building Council	025740
I057	8/31/2012	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Focused Meeting Wrap Up Workshop	025742
		ATTACHMENT: September 5, 2015 Focused Meeting Wrap Up Workshop Agenda	
I058	9/7/2012	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding San Diego Water Board Response to Legal Issues Raised by County of Orange and County of Riverside	025808
		ATTACHMENT: Letter from San Diego Water Board Legal Counsel to County or Orange Office of County Counsel and County of Riverside Office of County Counsel Responding to Legal Concerns Raised	
I059	9/13/2012	Notice and Agenda for California Stormwater Quality Association (CASQA) September 13, 2012 Meeting/Webcast	025814
I060	9/20/2012	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Comments Received on the Administrative Draft Regional MS4 Permit	025815
I061	10/1/2012	Letter from State Water Board Executive Director to All Regional Water Board Executive Officers Regarding the Inclusion of a Reopener Provision for Receiving Water Limitations in MS4 Permits	025816
I062	10/5/2012	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Final Focused Meeting Agenda	025818
		ATTACHMENT: Final Focused Meeting Agenda	

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2. MEETINGS AND COMMUNITIONS DURING ADMINISTRATIVE DRAFT REGIONAL MS4 PERMIT REVIEW PROCESS [Cont'd]			
I063	10/12/2012	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Availability of Revised Administrative Draft Regional MS4 Permit	025820
I064	10/22/2012	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Availability of Clean Version of Revised Administrative Draft Regional MS4 Permit	025821
I065	10/25/2012	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Availability of Panel Recommendations Summary from August 30, 2012 Hydromodification Management Meeting	025822
3. MEETINGS AND COMMUNITIONS DURING TENTATIVE ORDER NO. R9-2013-0001 DEVELOPMENT PROCESS			
I066	10/12/2012	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Notice of Public Workshop for Tentative Order No. R9-2013-0001, Regional MS4 Permit	025823
		ATTACHMENT: Notice of Public Workshop	
I067	10/31/2012	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Notice of Release of San Diego Regional MS4 Permit, Tentative Order No. R9-2013-0001 for Public Review and Comment	025826
I068	11/8/2012	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Reminder of Public Workshop for Tentative Order No. R9-2013-0001, Regional MS4 Permit	025827
I069	11/27/2012	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Continuation of Public Workshop for Tentative Order No. R9-2013-0001, Regional MS4 Permit	025828
		ATTACHMENT: Notice of Workshop Continuation	
I070	12/7/2012	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Revised Notice of Public Workshop Continuation for Tentative Order No. R9-2013-0001, Regional MS4 Permit	025833
		ATTACHMENT: Revised Notice of Workshop Continuation	
I071	1/14/2013	Letter from City of Lake Forest to San Diego Water Board Executive Officer and Santa Ana Water Board Executive Officer Requesting Designation of Santa Ana Water Board to Regulate MS4 Discharges from the City of Lake Forest	025838

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I072	1/24/2013	Letter from Building Industry Association to San Diego Water Board Executive Officer Requesting Time for Presentation on Proposed Permit Language at February 2013 Board Meeting	025843
I073	1/24/2013	Email from USEPA to San Diego Water Board Regional MS4 Permit Team Commenting on Potential Alternative Compliance Pathway Language to Include in Tentative Order No. R9-2013-0001	025844
I074	3/5/2013	Email from San Diego Water Board Regional MS4 Permit Team to USEPA Regarding Proposed Changes to Tentative Order No. R9-2013-0001 in Response to Comments	025847
I075	3/6/2013	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Notice of Public Hearing to Consider Adoption of Tentative Order No. R9-2013-0001, Regional MS4 Permit	025848
		ATTACHMENT: Notice of Public Hearing	
I076	3/11/2013	Letter from Department of the Navy to San Diego Water Board Chairman Regarding Consistent Regulation of Storm Water Discharges	025852
I077	3/15/2013	Letter from Mayor of the City of San Diego and County of San Diego Board of Supervisors to San Diego Water Board Executive Officer Requesting Modifications to Public Hearing Procedures	025854
I078	3/18/2013	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Availability of Notice of Hearing Procedures and Order of Proceedings for Public Hearing	025856
		ATTACHMENT: Hearing Procedures and Order of Proceedings	
I079	3/18/2013	Email from Clean Water Now to San Diego Water Board Executive Officer Requesting Allotment of Speaking Time at Public Hearing	025864
I080	3/18/2013	Email from Surfrider to San Diego Water Board Regional MS4 Permit Team Requesting Allotment of Speaking Time at Public Hearing	025868
I081	3/20/2013	Letter from Riverside County Board of Supervisors and Riverside County Flood Control and Water Conservation District Board of Supervisors to San Diego Water Board Executive Officer Requesting Modifications to Public Hearing Procedures	025870
I082	3/21/2013	Email from Natural Resources Defense Council to San Diego Water Board Regional MS4 Permit Team Requesting Allotment of Speaking Time at Public Hearing	025872
I083	3/21/2013	Letter from Riverside County Flood Control and Water Conservation District to San Diego Water Board Regional MS4 Permit Team Requesting Modifications to Public Hearing Procedures	025873

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3. MEETINGS AND COMMUNITIONS DURING TENTATIVE ORDER NO. R9-2013-0001 DEVELOPMENT PROCESS [Cont'd]			
I084	3/21/2013	Letter from Orange County and Orange County Flood Control District to San Diego Water Board Regional MS4 Permit Team Requesting Modifications to Public Hearing Procedures	025876
I085	3/22/2013	Letter from City of Del Mar to San Diego Water Board Executive Officer Requesting Modifications to Public Hearing Procedures	025878
I086	3/22/2013	Letter from City of Escondido to San Diego Water Board Executive Officer Requesting Modifications to Public Hearing Procedures	025881
I087	3/22/2013	Letter from City of San Diego to San Diego Water Board Executive Officer Requesting Modifications to Public Hearing Procedures	025883
I088	3/22/2013	Letter from City of San Marcos to San Diego Water Board Executive Officer Requesting Modifications to Public Hearing Procedures	025893
I089	3/22/2013	Letter from Cities of Lake Forest, Aliso Viejo, and Santee to San Diego Water Board Regional MS4 Permit Team Requesting Modifications to Public Hearing Procedures	025896
I090	3/22/2013	Letter from County of San Diego to San Diego Water Board Executive Officer Requesting Modifications to Public Hearing Procedures	025898
I091	3/22/2013	Letter from San Diego County Regional Airport Authority to San Diego Water Board Regional MS4 Permit Team Requesting Modifications to Public Hearing Procedures	025901
I092	3/22/2013	Letter from Vista Chamber of Commerce to San Diego Water Board Executive Officer Requesting Modifications to Public Hearing Procedures	025903
I093	3/26/2013	Letter from Oceanside Chamber of Commerce to San Diego Water Board Executive Officer Requesting Modifications to Public Hearing Procedures	025904
I094	3/26/2013	Letter from Orange County Board of Supervisors to San Diego Water Board Executive Officer Requesting Modifications to Public Hearing Procedures	025905
I095	3/27/2013	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Availability of Revised Tentative Order No. R9-2013-0001 and Responses to Comments	025907
I096	3/27/2013	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Memorandum Regarding Designated Party Status	025909
		ATTACHMENT: Memorandum to Parties and Interested Persons Regarding Requests for Designated Party Status	025918

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3. MEETINGS AND COMMUNITIONS DURING TENTATIVE ORDER NO. R9-2013-0001 DEVELOPMENT PROCESS [Cont'd]			
I097	4/1/2013	Letter from Building Industry Coalition to San Diego Water Board Regional MS4 Permit Team Requesting Modifications to Public Hearing Procedures	025912
I098	4/1/2013	Letter from NRDC, San Diego Coastkeeper, and Orange County Coastkeeper to San Diego Water Board Executive Officer Requesting Designated Party Status and Modifications to Public Hearing Procedures	025914
I099	4/2/2013	Letter from San Diego County Members of the United States Congress to USEPA Region IX Administrator Requesting Review of Regional MS4 Permit	025920
I100	4/3/2013	Memorandum to Parties and Interested Person Regarding Ruling on Objections, Requests for Alternative Procedures, and Requests for Designation as Additional Parties to the Proceedings	025922
		ATTACHMENT: Revised Hearing Procedures and Order of Proceedings	
I101	4/4/2013	Letter from San Diego Region Members of the California State Legislature to San Diego Water Board Chairman Requesting a Delay of the Regional MS4 Permit Adoption Hearing	025941
I102	4/9/2013	Letter from San Diego Port Tenants Association to San Diego Water Board Executive Officer Requesting Modifications to Public Hearing Procedures	025943
I103	4/18/2013	Agenda and Handouts from Orange County Copermittees Meeting with San Diego Water Board Regional MS4 Permit Team	025944
I104	4/19/2013	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Notice of Public Hearing Continuation and Availability of Proposed Errata to Tentative Order No. R9-2013-0001	025972
I105	4/24/2013	Letter from USEPA Region IX to the San Diego County Members of the United State Congress Regarding Regional MS4 Permit	025973
I106	4/24/2013	Agenda and Handout from San Diego Gas and Electric Meeting with San Diego Water Board Regional MS4 Permit Team	025976
I107	5/2/2013	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Availability of Documents Pertaining to May 8, 2013 Board Meeting Agenda Item No. 9	025978
I108	5/2/2013	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Availability of Memorandum Regarding Order on Procedural Issues and Order of Proceedings for Continued Public Hearing	025979
		ATTACHMENT: Memorandum to Parties and Interested Persons Regarding Order on Procedural Issues and Order of Proceedings for Continued Public Hearing	
I109	5/2/2013	Letter from San Diego Water Board Executive Officer to the San Diego Region Members of the California State Legislature Regarding the Request to Delay the Regional MS4 Permit Adoption Hearing	025980

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3. MEETINGS AND COMMUNITIONS DURING TENTATIVE ORDER NO. R9-2013-0001 DEVELOPMENT PROCESS [Cont'd]			
I110	5/24/2013	Email to San Diego County, Orange County, and Riverside County Copermittees Transmitting an Electronic Copy of Adopted Order No. R9-2013-0001	025985
		ATTACHMENT: Transmittal Letter for Order No. R9-2013-0001	
		ATTACHMENT: Order No. R9-2013-0001, complete with Attachments A-F	
4. MEETINGS AND COMMUNITIONS DURING TENTATIVE ORDER NO. R9-2015-0001 DEVELOPMENT PROCESS			
I111	3/12/2014	Letter from City of Laguna Hills to San Diego Water Board Executive Officer and Santa Ana Water Board Executive Officer Requesting Designation of San Diego Water Board to Regulate MS4 Discharges from the City of Laguna Hills	026704
I112	4/4/2014	Letter from City of Lake Forest to San Diego Water Board Executive Officer Clarifying January 14, 2013 Request for Designation of Santa Ana Water Board to Regulate MS4 Discharges from the City of Lake Forest	026708
I113	6/5/2014	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Public Meeting to Initiate Orange County Permit Renewal Process	026711
		ATTACHMENT: Invitation to Meeting to Discuss Report of Waste Discharge and Enrollment of Orange County Copermittees in the Regional MS4 Permit	
I114	6/24/2014	San Diego Water Board Regional MS4 Permit Team Meeting with Orange County Copermittees Regarding Report of Waste Discharge and Process to Incorporate Orange County Copermittees into the Regional MS4 Permit	026715
		● Meeting Agenda	
		● Meeting Sign In Sheet	
I115	7/21/2014	Email from USEPA to San Diego Water Board Regional MS4 Permit Team and Santa Ana Water Board MS4 Permitting Staff Regarding Meeting to Coordinate and Align MS4 Permits	026718
		ATTACHMENT: Agenda for Regional Board 8/Regional Board 9/USEPA Discussion of OC MS4 Permits	
I116	8/22/2014	Email from City of Lake Forest to San Diego Water Board Regional MS4 Permit Team Providing a Summary of Differences Between San Diego Water Board and Santa Ana Water Board MS4 Permits	026722
		ATTACHMENT: Summary of Regional MS4 Permit Differences	
I117	8/25/2014	Email from City of Lake Forest to San Diego Water Board Regional MS4 Permit Team Providing a Recommended Findings and Permit Language for Single Water Board Regulation	026737
		ATTACHMENT: Proposed Language for use in the San Diego Regional Permit for OC	

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4. MEETINGS AND COMMUNITIONS DURING TENTATIVE ORDER NO. R9-2015-0001 DEVELOPMENT PROCESS [Cont'd]			
I118	9/5/2014	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Notice of Public Workshop for Tentative Order No. R9-2015-0001, An Order Amending Order No. R9-2013-0001	026741
		ATTACHMENT: Notice of Public Workshop	
I119	9/8/2014	Letter from City of Laguna Woods to San Diego Water Board Executive Officer and Santa Ana Water Board Executive Officer Requesting Designation of San Diego Water Board to Regulate MS4 Discharges from the City of Laguna Woods	026746
I120	9/8/2014	Sign In Sheet for San Diego County Copermittees and Building Industry Association Meeting with the San Diego Water Board Executive Officer and Regional MS4 Permit Team Regarding Language to Clarify Prior Lawful Approval for Development Projects in the Regional MS4 Permit	026747
I121	9/9/2014	Email from Building Industry Coalition to San Diego County Regarding Proposed Language to Define Prior Lawful Approval for Development Projects in the Regional MS4 Permit	026749
		ATTACHMENT: Proposed Prior Lawful Approval Language for the Regional MS4 Permit	
I122	9/12/2014	Email from City of San Diego to San Diego Water Board Regional MS4 Permit Team Regarding Alternative Proposed Language to Define Prior Lawful Approval for Development Projects in the Regional MS4 Permit	026752
		ATTACHMENT: Draft Prior Lawful Approval Permit Language - Option (1)	
		ATTACHMENT: Draft Prior Lawful Approval Permit Language - Option (2)	
I123	9/18/2014	Email from San Diego Water Board Regional MS4 Permit Team to Building Industry Coalition and San Diego County Regarding Proposed Draft Prior Lawful Approval Permit Language	026755
I124	9/18/2014	Letter and Notice of Opportunity to Comment to the San Diego County Copermittees, Orange County Copermittees, and Riverside County Copermittees for Tentative Order No. R9-2015-0001, An Order Amending the Regional MS4 Permit for the San Diego Region (Order No. R9-2013-0001)	026756
I125	9/18/2014	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Availability of Tentative Order No. R9-2015-0001, An Order Amending Order No. R9-2013-0001	026762
I126	9/30/2014	Invitations to San Diego Water Board Public Workshop Emailed to Elected Officials for Orange County Copermittees (combined into one file)	026763

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4. MEETINGS AND COMMUNITIONS DURING TENTATIVE ORDER NO. R9-2015-0001 DEVELOPMENT PROCESS [Cont'd]			
I127	10/2/2014	Email from Building Industry Coalition to San Diego Water Board Executive Officer Requesting Allotment of Time for Presentation at October 8, 2014 Board Workshop	026823
I128	10/29/2014	Email from San Diego Water Board to South Orange County Monitoring Stakeholders Regarding a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County	026825
		ATTACHMENT: Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County	
		ATTACHMENT: Notice of Availability of Draft Letter Directive to Establish Requirements for Implementation of a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County (Water Code Section 13383)	
		ATTACHMENT: Proposed Water Code Section 13383 Directive Letter	
I129	11/25/2014	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Availability of Comments Received on Tentative Order No. R9-2015-0001	026898
I130	1/9/2015	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Notice of Public Hearing to Consider Adoption of Tentative Order No. R9-2015-0001, An Order Amending Order No. R9-2013-0001	026899
		ATTACHMENT: Notice of Public Hearing	
		ATTACHMENT: Letter to San Diego County, Orange County, and Riverside County Copermittees Regarding Notice of Public Hearing for Tentative Order No. R9-2015-0001, An Order Amending Order No. R9-2013-0001, the Regional MS4 Permit for the San Diego Region	
I131	1/20/2015	Letter from USEPA Region IX to the State Water Board Regarding State Water Board Draft WQ Order Responding to Petitions Challenging Los Angeles County MS4 Permit	026905
I132	1/21/2015	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Availability of Responses to Comments and Revised Tentative Order No. R9-2015-0001	026909
I133	1/30/2015	Letter from Orange County and Orange County Flood Control District to San Diego Water Board Executive Officer Requesting Modifications to Public Hearing Procedures	026912

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SECTION I: BOARD STAFF MEETINGS AND COMMUNICATIONS WITH STAKEHOLDERS [Cont'd]			
4. MEETINGS AND COMMUNITIONS DURING TENTATIVE ORDER NO. R9-2015-0001 DEVELOPMENT PROCESS [Cont'd]			
I134	2/10/2015	Email Response from San Diego Water Board Legal Counsel to Orange County and Orange County Flood Control District Responding to Request for Modifications to Public Hearing Procedures	026914
I135	2/10/2015	Email from San Diego Water Board Regional MS4 Permit Team to the Cities of Laguna Hills, Laguna Woods, and Lake Forest Regarding Finalized San Diego Water Board Letter of Agreement for Designation of Single Water Board to Regulate MS4 Discharges from the Cities of Laguna Hills, Laguna Woods, and Lake Forest	026916
		ATTACHMENT: San Diego Water Board Agreement Letter for Regional Water Board Designation for Regulation Municipal Separate Storm Sewer System Discharges in the Cities of Laguna Woods, Laguna Hills, and Lake Forest, Orange County	
I136	3/3/2015	Letter to San Diego County, Orange County, and Riverside County Copermittees Transmitting of Order No. R9-2015-0001	026942
		ENCLOSURE: Order No. R9-2015-0001 with Attachment Nos. 1 and 2	
		ENCLOSURE: Conformed Copy of Order No. R9-2013-0001, as Amended by Order No. R9-2015-0001, complete with Attachments A-F	
I137	3/4/2015	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Availability of Adopted Order No. R9-2015-0001 and Conformed Copy of Order No. R9-2013-0001, as Amended by Order No. R9-2015-0001	027720
5. MEETINGS AND COMMUNITIONS DURING TENTATIVE ORDER NO. R9-2015-0100 DEVELOPMENT PROCESS			
I138	3/3/2015	Email from San Diego Water Board Regional MS4 Permit Team to City of San Diego and USEPA Regarding Proposed Revisions to Los Peñasquitos Sediment TMDL Requirements in Regional MS4 Permit	027722
		ATTACHMENT: Proposed Revisions to Los Peñasquitos Sediment TMDL Requirements in Regional MS4 Permit	
I139	3/18/2015	Email from Riverside County Copermittees to San Diego Water Board Regional MS4 Permit Team Regarding Meeting to Discuss Upcoming Report of Water Discharge Submittal and Process to Incorporate Riverside County Copermittees into the Regional MS4 Permit	027728
I140	4/2/2015	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Notice of Public Workshops to Discuss Prior Lawful Approval and Alternative Compliance Pathway for Receiving Water Limitations Proposed Amendments to Order No. R9-2013-0001	027731
		ATTACHMENT: Notice of Public Workshop - Proposed Amendments to Order No. R9-2013-0001, as amended by Order No. R9-2015-0001, to Incorporate a Definition of Prior Lawful Approval for Priority Development Projects and an Alternative Compliance Pathway for Receiving Water Limitations	

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SECTION I: BOARD STAFF MEETINGS AND COMMUNICATIONS WITH STAKEHOLDERS [Cont'd]			
5. MEETINGS AND COMMUNITIONS DURING TENTATIVE ORDER NO. R9-2015-0100 DEVELOPMENT PROCESS [Cont'd]			
I141	4/15/2015	Sign In Sheet for Riverside County Copermittees Technical Advisory Committee Meeting and Meeting to Discuss Upcoming Report of Water Discharge Submittal and Process to Incorporate Riverside County Copermittees into the Regional MS4 Permit	027735
I142	4/21/2015	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Revised Notice of Public Workshops to Discuss Prior Lawful Approval and Alternative Compliance Pathway for Receiving Water Limitations Proposed Amendments to Order No. R9-2013-0001	027738
		ATTACHMENT: Revised Notice of Public Workshop - Proposed Amendments to Order No. R9-2013-0001, as amended by Order No. R9-2015-0001, to Incorporate a Definition of Prior Lawful Approval for Priority Development Projects and an Alternative Compliance Pathway for Receiving Water Limitations	
I143	4/22/2015	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Agenda for April 28, 2015 Public Workshops to Discuss Prior Lawful Approval and Alternative Compliance Pathway for Receiving Water Limitations Proposed Amendments to Order No. R9-2013-0001, and Availability of Draft Prior Lawful Approval Language and Draft Alternative Compliance Pathway for Receiving Water Limitations	027742
		ATTACHMENT: April 28, 2015 Public Workshop Agenda	
I144	4/30/2015	Email from City of Murrieta to San Diego Water Board Regional MS4 Permit Team Regarding Regulation by San Diego Water Board of MS4 Discharges from the City of Murrieta and Flexibility for Implementation of TMDL Requirements in the Santa Ana Region	027744
		ATTACHMENT: Amendment of Order R8-2010-0033	
		ATTACHMENT: Language from Page 3 of 6	
I145	5/1/2015	Email from Building Industry Coalition to Coastal Environmental Rights Foundation Regarding Proposed Prior Lawful Approval Language	027756
		ATTACHMENT: Proposed Prior Lawful Approval Language	
I146	5/6/2015	Email from Building Industry Coalition to San Diego Water Board Regional MS4 Permit Team Regarding Vested Rights	027762
		ATTACHMENT: Vested Rights, Preemption, and the Subdivision Map Act	

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5. MEETINGS AND COMMUNITIONS DURING TENTATIVE ORDER NO. R9-2015-0100 DEVELOPMENT PROCESS [Cont'd]			
I147	5/7/2015	Email from Coastal Environmental Rights Foundation to Building Industry Coalition Responding to Proposed Prior Lawful Approval Language	027767
I148	6/22/2015	Letter from City of Murrieta to San Diego Water Board Executive Officer and Santa Ana Water Board Executive Officer Requesting Designation of San Diego Water Board to Regulate MS4 Discharges from the City of Murrieta	027772
I149	6/23/2015	Letter from City of Wildomar to San Diego Water Board Executive Officer and Santa Ana Water Board Executive Officer Requesting Designation of San Diego Water Board to Regulate MS4 Discharges from the City of Wildomar	027776
I150	6/23/2015	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding June 30, 2015 Public Workshop on Prior Lawful Approval and Alternative Compliance Option for Receiving Water Limitations	027780
		ATTACHMENT: Second Revised Draft Definition of Prior Lawful Approval for Priority Development Projects, Revised June 23, 2015	
		ATTACHMENT: Second Revised Draft Alternative Compliance Pathway for Receiving Water Limitations, Revised June 23, 2015	
		ATTACHMENT: June 30, 2015 Public Workshop Agenda	
I151	6/25/2015	Letter from City of Menifee to San Diego Water Board Executive Officer and Santa Ana Water Board Executive Officer Requesting Designation of San Ana Water Board to Regulate MS4 Discharges from the City of Menifee	027789
I152	7/13/2015	Email from San Diego Coastkeeper to San Diego Water Board Regional MS4 Permit Team Regarding the Draft Prior Lawful Approval Language Presented at the June 30, 2015 Public Workshop	027794
I153	7/31/2015	Email to Riverside County, San Diego County, and Orange County Copermittees Transmitting Cover Letter for Tentative Order No. R9-2015-0100, An Order Amending Order No. R9-2013-0001, NPDES No. CAS0109266, as Amended by Order No. R9-2015-0001 and Notice of Opportunity to Comment and Public Hearing	027796
		ATTACHMENT: Letter Notifying Riverside County, San Diego County, and Orange County Copermittees of Availability of Tentative Order No. R9-2015-0100 and Notice of Opportunity to Comment and Public Hearing	
		ATTACHMENT: Notice of Opportunity to Comment and Public Hearing	

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SECTION I: BOARD STAFF MEETINGS AND COMMUNICATIONS WITH STAKEHOLDERS [Cont'd]			
5. MEETINGS AND COMMUNITIONS DURING TENTATIVE ORDER NO. R9-2015-0100 DEVELOPMENT PROCESS [Cont'd]			
I154	7/31/2015	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Availability of Tentative Order No. R9-2015-0100, An Order Amending Order No. R9-2013-0001, as Amended by Order No. R9-2015-0001	027804
		ATTACHMENT: Notice of Opportunity to Comment and Public Hearing	
I155	10/26/2015	Letter from San Diego Water Board Executive Officer to the Cities of Menifee, Murrieta, and Wildomar Regarding Finalized San Diego Water Board Letter of Agreement for Designation of Single Water Board to Regulate MS4 Discharges from the Cities of Menifee, Murrieta, and Wildomar	027808
I156	11/5/2015	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Availability of Responses to Comments and Errata Sheet for Tentative Order No. R9-2015-0100	027833
I157	11/10/2015	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Availability of REVISED Responses to Comments and Errata Sheet for Tentative Order No. R9-2015-0100	027835
I158	11/13/2015	Email to Copermittees, Stakeholders, and Other Interested Persons Regarding the Public Hearing Speaker Schedule in Response to Requests for Time Allocations to Present Testimony	027836
I159	11/25/2015	Email to San Diego County, Orange County, and Riverside County Copermittees Transmitting an Electronic Copy of Adopted Order No. R9-2015-0100 and Conformed Copy of Order No. R9-2013-0001, as amended by Order Nos. R9-2015-0001 and R9-2015-0100	027838
		ATTACHMENT: Transmittal Letter for Order No. R9-2015-0100, An Order Amending Order No. R9-2013-0001, NPDES No. CAS0109266, as Amended by Order No. R9-2015-0001	
		ATTACHMENT: Order No. R9-2015-0100 with Attachment Nos. 1 and 2	
		ATTACHMENT: Conformed Copy of Order No. R9-2013-0001, as Amended by Order Nos. R9-2015-0001 and R9-2015-0100, complete with Attachments A-F	
I160	11/25/2015	Email to San Diego County MS4 Permit, Orange County MS4 Permit, and Riverside County MS4 Permit Lyris Lists Regarding Availability of Adopted Order No. R9-2015-0001 and Conformed Copy of Order No. R9-2013-0001, as Amended by Order No. R9-2015-0001	028649
		ATTACHMENT: Order No. R9-2015-0100 with Attachment Nos. 1 and 2	
		ATTACHMENT: Conformed Copy of Order No. R9-2013-0001, as Amended by Order Nos. R9-2015-0001 and R9-2015-0100, complete with Attachments A-F	

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SECTION J: REFERENCES			
1. SAN DIEGO WATER BOARD REFERENCES			
PREVIOUS SAN DIEGO WATER BOARD MS4 PERMITS			
J001	1/24/2007	San Diego Water Board Order No. R9-2007-0001, NPDES No. CAS0108758, Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego County, the San Diego Unified Port District, and the San Diego County Regional Airport Authority (including attachments and Fact Sheet), adopted January 24, 2007	029455
J002	12/7/2007	Addendum No. 1 to San Diego Water Board Order No. R9-2007-0001, NPDES Permit No. CAS0108758, An Addendum Extending Selected Due Dates for Order No. R9-2007-0001 as a Result of the October 2007 Wildfires in San Diego County, adopted December 12, 2007	029696
J003	9/10/2008	Addendum No. 2 to San Diego Water Board Order No. R9-2007-0001, NPDES Permit No. CAS0108758, An Addendum Extending the Due Date for the Illicit Discharge Detection and Elimination Reporting Requirements and Changing the Bioassessment Monitoring Program for Order No. R9-2007-0001, adopted September 10, 2008	029699
J004	12/16/2009	San Diego Water Board Order No. R9-2009-0002, NPDES No. CAS0108740, Waste Discharge Requirements for Discharges of Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watershed of the County of Orange, the Incorporated Cities of Orange County, and the Orange County Flood Control District with the San Diego Region (including attachments and Fact Sheet), adopted December 16, 2009	029703
J005	11/10/2010	San Diego Water Board Order No. R9-2010-0016, NPDES No. CAS0108766, Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the County of Riverside, the Incorporated Cities of Riverside County, and the Riverside County Flood Control and Water Conservation District with the San Diego Region (including attachments and Fact Sheet), adopted November 10, 2010	030088
ADOPTED SAN DIEGO WATER BOARD TOTAL MAXIMUM DAILY LOAD (TMDL) RESOLUTIONS			
J006	8/14/2002	San Diego Water Board Resolution No. R9-2002-0123, Total Maximum Daily Load (TMDL) for Diazinon in Chollas Creek Watershed, San Diego County (includes Attachment A – Basin Plan Amendment, and Technical Report), adopted August 14, 2002	030478

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1. SAN DIEGO WATER BOARD REFERENCES [Cont'd]			
ADOPTED SAN DIEGO WATER BOARD TOTAL MAXIMUM DAILY LOAD (TMDL) RESOLUTIONS [Cont'd]			
J007	2/9/2005	San Diego Water Board Resolution No. R9-2005-0019, A Resolution Adopting an Amendment to the Water Quality Control Plan for the San Diego Region to Incorporate a Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin, San Diego Bay (includes Attachment A – Basin Plan Amendment, and Technical Report), adopted February 9, 2005	030563
J008	2/9/2005	San Diego Water Board Resolution No. R9-2005-0036, A Resolution Adopting an Amendment to the Water Quality Control Plan for the San Diego Region (9) to Incorporate Total Maximum Daily Loads (TMDLs) for Total Nitrogen and Total Phosphorus in the Rainbow Creek Watershed, San Diego County (includes Attachment A – Basin Plan Amendment, and Technical Report), adopted February 9, 2005	030751
J009	6/13/2007	San Diego Water Board Resolution No. R9-2007-0043, A Resolution Adopting an Amendment to the Water Quality Control Plan for the San Diego Region (9) to Incorporate Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek, Tributary to San Diego Bay, and the Revised the Toxic Pollutants Section of Chapter 3 to Reference the California Toxics Rule (includes Attachment A – Basin Plan Amendment, and Technical Report), adopted June 13, 2007	031241
J010	6/11/2008	San Diego Water Board Resolution No. R9-2008-0027, A Resolution to Adopt an Amendment to the Water Quality Control Plan for the San Diego Region (9) to Incorporate Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay (includes Attachment A – Basin Plan Amendment, and Technical Report), adopted June 11, 2008	031722
J011	2/10/2010	San Diego Water Board Resolution No. R9-2010-0001, A Resolution Amending the Water Quality Control Plan for the San Diego Basin (9) to Incorporate Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creek in the San Diego Region (Including Tecolote Creek) (includes Attachment A – Basin Plan Amendment, and Technical Report), adopted February 10, 2010	032208
J012	6/13/2012	San Diego Water Board Resolution No. R9-2012-0033, A Resolution Amending the Water Quality Control Plan for the San Diego Basin (9) to Incorporate the Total Maximum Daily Load for Sedimentation in Los Peñasquitos Lagoon (includes Attachment A – Basin Plan Amendment, and Staff Report), adopted June 13, 2012	033272
J013	6/26/2014	San Diego Water Board Resolution No. R9-2014-0020, Resolution on Commitment to an Alternative Process for Achieving Water quality Objectives for Biostimulatory Substances in Loma Alta Slough (includes draft Technical Report), adopted June 26, 2014	033727
J014	9/8/1994	Water Quality Control Plan for the San Diego Basin, dated September 8, 1994 (with amendments on or before April 4, 2011 incorporated)	033945

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1. SAN DIEGO WATER BOARD REFERENCES [Cont'd]			
OTHER SAN DIEGO WATER BOARD REFERENCES [Cont'd]			
J015	3/25/2009	San Diego Water Board Executive Officer Letter to San Diego County Copermittees, Finding of Adequacy for the January 2, 2009 Updated Countywide Standard Urban Stormwater Mitigation Plan (SUSMP) Requirements for Development Applications, dated March 25, 2009	034465
J016	11/5/2009	San Diego Water Board Legal Counsel (Catherine Hagan) Memorandum, Regulatory Authority for Imposing Numeric Effluent Limits on Dry Weather, Non-Storm Water Discharges, In Municipal Storm Water Permits, dated November 5, 2009	034475
J017	12/16/2009	Clean Water Action Sections 305(b) and 303(d) Integrated Report for the San Diego Region (not included in Administrative Record but can be accessed at http://www.waterboards.ca.gov/sandiego/water_issues/programs/303d_list/index.shtml)	034483
J017	7/14/2010	San Diego Water Board Resolution No. R9-2010-0066, Approval of the Hydromodification Management Plan for the County of San Diego, the Incorporated Cities of San Diego County, the San Diego Unified Port District, and the San Diego County Regional Airport Authority, adopted July 14, 2010	043693
J019	9/8/2010	San Diego Water Board Order No. R9-2010-0003, NPDES No. CAG679001, General Waste Discharge Requirements for Discharges of Hydrostatic Test Water and Potable Water to Surface Waters and Storm Drains or Other Conveyance Systems within the San Diego Region, adopted September 8, 2010	043697
J020	10/26/2010	San Diego Water Board Legal Counsel (Catherine Hagan) Memorandum, Tentative Order No. R9-2010-0016, Regulation of Non-Storm Water Discharges, Consideration of Economics and Unfunded State Mandates, dated October 26, 2010	043779
J021	6/20/2013	San Diego Water Board Executive Officer Letter to Orange County Copermittees, Conditional Finding of Adequacy for the December 16, 2011 Model Water Quality Management Plan (Model WQMP) for South Orange County MS4 Permit Order No. R9-2009-0002, NPDES No. CAS108740, dated June 20, 2013	043791
J022	7/31/2013	San Diego Water Board Executive Officer Letter to Orange County Copermittees, San Diego Water Board Comments on Revised South Orange County Hydromodification Plan (HMP) dated October 25, 2012 Required by MS4 Permit Order No. R9-2009-0002, NPDES No. CAS108740	043794
J023	9/16/2013	San Diego Water Board Executive Officer Letter to Riverside County Copermittees, Conditional Finding of Adequacy for the Water Quality Management Plan (Model WQMP) for the Santa Margarita Region of Riverside County, MS4 Permit Order No. R9-2010-0016, NPDES No. CAS0108766, dated September 16, 2013	043798
J024	12/9/2013	San Diego Water Board Executive Officer Letter to Orange County Copermittees, South Orange County Hydromodification Management Plan Exemptions and Early Enrollment Under Order No. R9-2013-0001, dated December 9, 2013	043801
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1. SAN DIEGO WATER BOARD REFERENCES [Cont'd]			
OTHER SAN DIEGO WATER BOARD REFERENCES [Cont'd]			
J025	4/8/2014	San Diego Water Board Executive Officer Letter to Riverside County Copermittees, San Diego Water Board Comments on Proposed Final Santa Margarita Region (SMR) Hydromodification Plan dated March 2014 Required by Order No. R9-2010-0016, NPDES No. CAS0108766, dated April 8, 2014	043804
J026	6/24/2015	San Diego Water Board Order No. R9-2015-0013, NPDES No. CAG919003, General Waste Discharge Requirements for Groundwater Extraction Discharges to Surface Waters within the San Diego Region, adopted June 24, 2015	043808
2. COPERMITTEE REFERENCES			
SAN DIEGO COUNTY COPERMITTEE REFERENCES			
J027	1/2/2009	Countywide Model SUSMP, Standard Urban Stormwater Mitigation Plan Requirements for Development Applications, dated January 2, 2009	043993
J028	3/1/2011	Final Hydromodification Management Plan, Prepared for County of San Diego, California, dated March 2011	044137
J029	6/1/2011	2011 Long-Term Effectiveness Assessment, San Diego Stormwater Copermittees Urban Runoff Management Programs, Final Report, dated June 2011	044450
J030	6/24/2011	Report of Waste Discharge submitted by San Diego County Copermittees	044772
ORANGE COUNTY COPERMITTEE REFERENCES			
J031	10/12/2012	[Proposed Final] South Orange County Hydromodification Management Plan (HMP)	044883
J032	12/20/2013	Model Water Quality Management Plan (Model WQMP) for South Orange County, dated December 20, 2013	044979
J033	5/29/2014	Report of Waste Discharge submitted by Orange County Copermittees	045069
RIVERSIDE COUNTY COPERMITTEE REFERENCES			
J034	3/5/2014	2014 Water Quality Management Plan for the Santa Margarita Region of Riverside County, not dated	045292
J035	5/1/2014	Santa Margarita Region Hydromodification Management Plan, dated May 2014	045695
J036	5/10/2015	Report of Waste Discharge submitted by Riverside County Copermittees	045806

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3. STATE WATER BOARD REFERENCES			
J037	10/28/1968	State Water Board Resolution No. 68-16, Statement of Policy with Respect to Maintaining High Quality of Waters in California, adopted October 28, 1968	046108
J038	2/11/1993	Definition of "Maximum Extent Practicable", Memorandum Issued by State Water Resources Control Board, Office of Chief Counsel, Senior Staff Counsel, dated February 11, 1993	046110
J039	6/17/1999	State Water Board Order WQ 99-05, Own Motion Review of the Petition of Environmental Health Coalition to Review Waste Discharge Requirements Order No. 96-03, NPDES Permit No. CAS0108740 for Storm water and Urban Runoff from the Orange County Flood Control District and the Incorporated Cities of Orange County within the San Diego Region, Issued by the California Regional Water Quality Control Board, San Diego Region, SWRCB/OCC File A-1041, adopted June 17, 1999	046116
J040	10/5/2000	State Water Board Order WQ 2000-11, In the Matter of Petitions of the Cities of Bellflower, et al., the City of Arcadia, and Western States Petroleum Association, Review of January 26, 2000 Action of the Regional Board and Actions and Failures to Act by Both the California Regional Water Quality Control Board, Los Angeles Region and Its Executive Officer, Pursuant to Order No. 96-054, Permit for Municipal Storm Water and Urban Run-Off Discharges with Los Angeles County [NPDES No. CAS614001], SWRCB/OCC Files A-1280, A-1280(a) and A-1280(b), adopted October 5, 2000	046120
J041	11/15/2001	State Water Board Order WQ 2001-15, In the Matter of Petitions of Building Industry Association of San Diego County and Western States Petroleum Association, For Review of Waste Discharge Requirements Order No. 2001-01 for Urban Runoff from San Diego County [NPDES No. CAS0108758], Issued by the California Regional Water Quality Control Board, San Diego Region, SWRCB/OCC Files A-1362, A-1362(a), adopted November 15, 2001	046151
J042	1/1/2005	NPDES Stormwater Cost Survey, Prepared for California State Water Resources Control Board, dated January 2005	046169
J043	2/24/2005	Policy for Implementation of Toxic Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California, adopted under State Water Board Resolution No. 2005-0019 on February 24, 2005	046465
J044	2/1/2007	Surface Water Ambient Monitoring Program (SWAMP) Bioassessment Procedures 2007, Standard Operating Procedures for Collecting Benthic Macroinvertebrate Samples and Associated Physical and Chemical Data for Ambient Bioassessments in California, dated February 2007	046465

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3. STATE WATER BOARD REFERENCES [Cont'd]			
J045	9/16/2008	Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality, adopted under State Water Board Resolution No. 2008-0070 on September 16, 2008	046577
J046	6/1/2009	Surface Water Ambient Monitoring Program (SWAMP) Bioassessment Procedures 2010, Standard Operating Procedures for Collecting Stream Algae Samples and Associated Physical Habitat and Chemical Data for Bioassessments in California, dated June 2009, updated May 2010	046615
J047	10/2/2009	State Water Board Order No. 2009-0009-DWQ, NPDES No. CAS000002, National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities, adopted October 2, 2009 (as amended by Order No. 2010-0014-DWQ, adopted November 16, 2010, and Order No. 2012-0006-DWQ, adopted July 17, 2012)	046696
J048	3/20/2012	State Water Board Resolution No. 2012-0012, Approving Exceptions to the California Ocean Plan for Selected Discharges into Areas of Special Biological Significance, Including Special Protections for Beneficial Uses, and Certifying a Program Environmental Impact Report, adopted March 20, 2012	046966
J049	6/19/2012	State Water Board Resolution No. 2012-0031, Amending the General Exception to the California Ocean Plan for Selected Discharges into Areas of Special Biological Significance, Including Special Protections for Beneficial Uses, adopted June 19, 2012	046993
J050	10/16/2012	California Ocean Plan, adopted under State Water Board Resolution No. 2012-0056 on October 16, 2012	047018
J051	11/18/2014	State Water Board Order 2014-0194-DWQ, General Order No. CAG140001, Statewide National Pollutant Discharge Elimination System (NPDES) Permit for Drinking Water System Discharges to Waters of the United States, adopted November 18, 2014	047097
J052	6/16/2015	State Water Board Order WQ 2015-0075, In the Matter of Review of Order No. R4-2012-0175, NPDES Permit No. CAS004001, Waste Discharge Requirements for Municipal Separate Storm Sewer System (MS4) Discharges within the Coastal Watersheds of Los Angeles County, Except Those Discharges Originating from the City of Long Beach MS4, Issued by the California Regional Water Quality Control Board, Los Angeles Region, SWRCB/OCC Files A-2236 (a)-(kk), adopted June 16, 2015	047208
4. REFERENCES FROM OTHER REGIONAL WATER BOARDS			
LOS ANGELES WATER BOARD REFERENCES			
J053	1/1/2003	Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003, Los Angeles County Municipal Storm Water Permit, A Report to the California Regional Water Quality Control Board, Los Angeles Region, dated January 2003	047288

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4. REFERENCES FROM OTHER REGIONAL WATER BOARDS [Cont'd]			
J054	6/1/2004	Alternative Approaches to Stormwater Quality Control, Prepared for the Los Angeles Regional Water Quality Control Board, dated June 2004	047306
J055	6/8/2010	Los Angeles Water Board Order No. R4-2010-0108, NPDES Permit No. CAS004002, Waste Discharge Requirements for Storm Water (Wet Weather) and Non-storm Water (Dry Weather) Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Discharges within the Ventura County Watershed Protection District, County of Ventura and the Incorporated Cities Therein, adopted July 8, 2010	047399
J056	11/8/2012	Los Angeles Water Board Order No. R4-2012-0175 as amended by State Water Board Order WQ 2015-0075, NPDES Permit No. CAS004001, Waste Discharge Requirements for Municipal Separate Storm Sewer System (MS4) Discharges within the Coastal Watersheds of Los Angeles County, Except Those Discharges Originating from the City of Long Beach MS4, adopted November 8, 2012, and amended June 16, 2015	047532
SANTA ANA WATER BOARD REFERENCES			
J057	5/22/2009	Santa Ana Water Board Order No. R8-2009-0030, NPDES No. CAS618030, as amended by Order No. R8-2010-0062 Waste Discharge Requirements for the County of Orange, Orange County Flood Control District and the Incorporated Cities of Orange County within the Santa Ana Region, Areawide Urban Storm Water Runoff, Orange County, adopted May 22, 2010, and amended October 29, 2010	047852
J058	1/29/2010	Santa Ana Water Board Order No. R8-2010-0033, NPDES No. CAS 618033, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for the Riverside County Flood Control and Water Conservation District, the County of Riverside, and the Incorporated Cities of Riverside County within the Santa Ana Region, adopted January 29, 2010	047945
J059	10/22/2015	Third Draft of Santa Ana Water Board Order No. R8-2015-0001, NPDES Permit No. CAS 618030, National Pollutant Discharge Elimination System ("NPDES") Permit and Waste Discharge Requirements, Orange County Flood Control District, the County of Orange, and the Incorporated Cities therein within the Santa Ana Region, Area-wide Urban Runoff, Santa Ana Region, released for public comment on October 22, 2015	048179
5. USEPA REFERENCES			
J060	11/16/1990	Environmental Protection Agency, 40 CFR Parts 122, 123, and 124, National Pollutant Discharge Elimination System Permit Application Regulations for Storm Water Discharges; Final Rule, Federal Register, Vol. 55, No. 222, dated Friday, November 16, 1990	048424
J061	07/01/1992	NPDES Storm Water Sampling Guidance, United States Environmental Protection Agency, Office of Water (EN-336), EPA 833-B-92-001, dated July 1992	048527

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5. USEPA REFERENCES [Cont'd]			
J062	11/1/1992	Guidance Manual for the Preparation of Part 2 of the NPDES Permit Application for Discharges from Municipal Separate Storm Sewer Systems, United States Environmental Protection Agency, Office of Water (EN-336), EPA 833-B-92-002, dated November 1992	048704
J063	8/1/1995	Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms (First Edition), U.S. Environmental Protection Agency, National Exposure Research Laboratory – Cincinnati, Office of Research and Development, Cincinnati, Ohio 45268, EPA/600/R-95-136, dated August 1995	048850
J064	5/1/1996	Liquid Assets: A Summertime Perspective on the Importance of Clean Water to the Nation's Economy, United States Environmental Protection Agency, Office of Water (4102), Washington, DC 20460, EPA 800-R-96-002, dated May 1996	049523
J065	8/26/1996	Federal Register Vol. 61, No. 166, Notices, Environmental Protection Agency (EPA), [FRL-5559-9], Interim Permitting Approach for Water Quality-Based Effluent Limitations in Storm Water Permits, 61 FR 43761, dated Monday, August 26, 1996	049555
J066	8/1/1999	Preliminary Data Summary of Urban Storm Water Best Management Practices, United States Environmental Protection Agency, Office of Water (4303), Washington, DC 20460, EPA 821-R-99-012, dated August 1999	049558
J067	9/1/1999	Storm Water Management Fact Sheet, Storm Water Discharges to Storm Sewers, United States Environmental Protection Agency, Office of Water, Washington, DC, EPA 832-F-99-022, dated September 1999	049772
J068	9/1/1999	Storm Water Management Fact Sheet, Visual Inspection, United States Environmental Protection Agency, Office of Water, Washington, DC, 832-F-99-046, dated September 1999	049777
J069	12/8/1999	Environmental Protection Agency, 40 CFR Parts 122, 123, and 124, National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule, Report to Congress on the Phase II Storm Water Regulations; Notice, Federal Register, Vol. 64, No. 235, dated Wednesday, December 8, 1999	049783
J070	3/1/2000	Storm Water Phase II Compliance Assistance Guide, United States Environmental Protection Agency, Office of Water (4204), EPA 833-R-00-002, dated March 2000	049919
J071	10/1/2002	Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms (Fourth Edition), U.S. Environmental Protection Agency, Office of Water (4303T), 1200 Pennsylvania Avenue, NW, Washington, DC 20460, EPA-821-R-02-013, dated October 2002	050016
J072	11/22/2002	Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs, Memorandum Issued from United States Environmental Protection Agency, Washington, DC 20460, Office of Water, Director of Office of Wetlands, Oceans and Watersheds and Director of Office of Wastewater Management, dated November 22, 2002	050366

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5. USEPA REFERENCES [Cont'd]			
J073	1/7/2003	Watershed-Based National Pollutant Discharge Elimination System (NPDES) Permitting Policy Statement, Memorandum Issued from United States Environmental Protection Agency, Washington, DC 20460, Office of Water, Assistant Administrator, dated January 7, 2003	050372
J074	7/29/2005	Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 2303(d), 305(b) and 314 of the Clean Water Act, United States Environmental Protection Agency, Office of Water, Office of Wetland, Oceans and Watersheds, Assessment and Watershed Protection Division, Watershed Branch, dated July 29, 2005	050376
J075	3/5/2007	Using Green Infrastructure to Protect Water Quality in Stormwater, CSO, Nonpoint Source and Other Water Programs, Memorandum Issued from United States Environmental Protection Agency, Washington, DC 20460, Office of Water, Assistant Administrator, dated March 5, 2007	050465
J076	7/1/2007	National Management Measures to Control Nonpoint Source Pollution from Hydromodification, United States Environmental Protection Agency, Office of Water, Washington, DC 20460 (4503T), EPA 841-B-07-002, dated July 2007	050467
J077	8/1/2007	Watershed-based National Pollutant Discharge Elimination System (NPDES) Permitting Technical Guidance, U.S. Environmental Protection Agency, Office of Wastewater Management, Water Permits Division, 1200 Pennsylvania Avenue, NW, Washington, DC 20460, EPA 833-B-07-004, dated August 2007	050754
J078	12/1/2007	Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices, United States Environmental Protection Agency, Nonpoint Source Control Branch (4503T), 1200 Pennsylvania Avenue, NW, Washington, DC 20460, EPA 841-F-07-006, dated December 2007	050861
J079	1/1/2008	Evaluating the Effectiveness of Municipal Stormwater Programs, United States Environmental Protection Agency and the EPA Region III states of Pennsylvania, Maryland, Delaware, District of Columbia, Virginia and West Virginia, EPA 833-F-07-010, dated January 2008	050898
J080	9/1/2008	Managing Wet Weather with Green Infrastructure, Municipal Handbook, Funding Options, EPA-833-F-08-007, dated September 2008	050904
J081	12/1/2008	Managing Wet Weather with Green Infrastructure, Municipal Handbook, Green Infrastructure Retrofit Policies, EPA-833-F-08-008, dated December 2008	050920
J082	12/1/2008	Managing Wet Weather with Green Infrastructure, Municipal Handbook, Green Streets, EPA-833-F-08-009, dated December 2008	050943
J083	12/1/2008	Managing Wet Weather with Green Infrastructure, Municipal Handbook, Rainwater Harvesting Policies, EPA-833-F-08-010, dated December 2008	050962
J084	1/1/2009	Managing Wet Weather with Green Infrastructure, Municipal Handbook, Incentive Mechanisms, EPA-833-F-09-001, dated January 2009	050978

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J085	12/1/2009	Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act, United States Environmental Protection Agency, Office of Water (4503T), Washington, DC 20460, EPA 841-B-09-001, dated December 2009	051013
J086	4/1/2010	MS4 Permit Improvement Guide, U.S. Environmental Protection Agency, Office of Water, Office of Wastewater Management, Water Permits Division, EPA 833-R-10-001, dated April 2010	051076
J087	5/1/2010	Green Infrastructure in Arid and Semi-Arid Climates, EPA-833-B-10-002, dated May 2010	051195
J088	6/1/2010	National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document, United States Environmental Protection Agency, Office of Wastewater Management (4203M), EPA 833-R-10-003, dated June 2010	051204
J089	6/1/2010	National Pollutant Discharge Elimination System Test of Significant Toxicity Technical Document, United States Environmental Protection Agency, Office of Wastewater Management (4203M), EPA 833-R-10-004, dated June 2010	051277
J090	9/1/2010	U.S. Environmental Protection Agency NPDES Permit Writers' Manual, U.S. Environmental Protection Agency, Office of Wastewater Management, Water Permits Division, State and Regional Branch, EPA 833-K-10-001, dated September 2010	051393
J091	11/12/2010	Revisions to the November 22, 2002 Memorandum "Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs," [Draft] Memorandum Issued from United States Environmental Protection Agency, Washington, DC 20460, Office of Water, Director of Office of Wetlands, Oceans and Watersheds and Director of Office of Wastewater Management, dated November 12, 2010	051662
J092	10/7/2011	NPDES Permit No. DC000021, Authorization to Discharge Under the National Pollutant Discharge Elimination System, Municipal Separate Storm Sewer System Permit, issued by the U.S. Environmental Protection Agency, Region III, Water Protection Division on October 7, 2011 (includes Fact Sheet)	051669
J093	10/27/2011	Achieving Water Quality Through Integrated Municipal Stormwater and Wastewater Plans, Memorandum Issued from United States Environmental Protection Agency, Washington, DC 20460, Office of Water, Acting Assistant Administrator, dated October 27, 2011	051761
J094	4/1/2012	The Economic Benefits of Protecting Healthy Watersheds, United States Environmental Protection Agency, EPA 841-N-12-004, dated April 2012	051764
J095	5/18/2012	Environmental Protection Agency, 40 CFR Parts 136, 260, et al., Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act; Analysis and Sampling Procedures; Final Rule, Federal Register, Vol. 77, No. 97, dated Friday, May 18, 2012	051768

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5. USEPA REFERENCES [Cont'd]			
J096	11/26/2014	Revisions to the November 22, 2002 Memorandum "Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs," [Final] Memorandum Issued from United States Environmental Protection Agency, Washington, DC 20460, Office of Water, Director of Office of Wetlands, Oceans and Watersheds and Director of Office of Wastewater Management, dated November 26, 2014	051858
6. OTHER REFERENCES			
J097	8/1/1996	Forest Service Specifications for Construction of Roads & Bridges, United States Department of Agriculture, Forest Service, Engineering Staff, Washington Office, EM-7700-100, dated August 1996, Revised	051870
J098	1/1/2003	California Stormwater Quality Association Stormwater Best Management Practice Handbook, Municipal, dated January 2003	052525
J099	3/1/2003	Watershed Protection Research Monograph No. 1, Impacts of Impervious Cover on Aquatic Systems, Center for Watershed Protection, dated March 2003	052825
J100	7/1/2003	The Practice of Low Impact Development, Prepared for U.S. Department of Housing and Urban Development, Office of Policy Development and Research, Washington, DC, dated July 2003	052983
J101	5/1/2005	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams by Peter R. Ode, et al, Article in Environmental Management Vol. 35, No. 4, pp. 493-504, published May 2005	053114
J102	8/1/2004	Model Monitoring Program for Municipal Separate Storm Sewer Systems in California, A report from the Stormwater Monitoring Coalition's Model Monitoring Technical Committee, Technical Report #419, dated August 2004	053127
J103	9/4/2005	The National Stormwater Quality Database, Version 1.1, A Compilation and Analysis of NPDES Stormwater Monitoring Information, research paper by Alex Maestre and Robert Pitt, Department of Civil and Environmental Engineer, University of Alabama, Tuscaloosa, AL 35294, dated September 4, 2005	053257
J104	12/30/2005	Managing Runoff to Protect Natural Streams: The Latest Development on Investigation and Management of Hydromodification in California, Proceedings of a Special Technical Workshop Co-sponsored by: California Stormwater Quality Association (CASQA), Stormwater Monitoring Coalition (SMC), University of Southern California Sea Grant (USC Sea Grant), Southern California Coastal Water Research Project Technical Report #475, dated December 30, 2005	053704
J105	1/1/2006	Guidance for Municipal Stormwater Funding, Prepared by National Association of Flood and Stormwater Management Agencies, dated January 2006	053737
J106	6/1/2006	Rooftop to Rivers, Green Strategies for Controlling Stormwater and Combined Sewer Overflows, Natural Resources Defense Council, dated June 2006	053877

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J107	6/19/2006	State Water Panel Recommendations to the California State Water Resources Control Board, The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial, and Construction Activities, dated June 19, 2006	053931
J108	8/11/2006	San Gabriel River Regional Monitoring Program, Submitted to the Los Angeles Regional Water Quality Control Board by Los Angeles County Sanitation Districts, dated December 2004, Revised August 11, 2006	053955
J109	2007	Fundamentals of Urban Runoff Management: Technical and Institutional Issues, North American Lake Management Society, 2nd Edition, dated 2007	054039
J110	2007	Rural Roads: A Construction and Maintenance Guide for California Landowners, University of California, Division of Agriculture and Natural Resources, Publication 8262, published 2007	054366
J111	3/20/2007	Sources, Patterns and Mechanisms of Storm Water Pollutant Loading from Watersheds and Land Uses of the Greater Los Angeles Area, California, USA, Southern California Coastal Water Research Project Technical Report 510, dated March 20, 2007	054389
J112	8/1/2007	Urban Subwatershed Restoration Manual Series, Urban Stormwater Retrofit Practices, Version 1.0, Center for Watershed Protection Manual 3, dated August 2007	054492
J113	8/1/2008	Agua Hedionda Watershed Management Plan – Final, Produced for City of Vista, California, dated August 2008	054898
J114	2009	Urban Stormwater Management in the United States, National Research Council of the National Academies, Division of Earth and Life Studies, Water Science and Technology Board, Committee on Reducing Stormwater Discharge Contributions to Water Pollution, published 2009	054492
J115	4/1/2010	Low Impact Development Manual for Southern California: Technical Guidance and Site Planning Strategies, Prepared for the Southern California Stormwater Monitoring Coalition by the Low Impact Development Center, Inc., dated April 2010	055660
J116	3/1/2011	Monitoring Urban Pesticide Runoff in California 2008-2009, California Environmental Protection Agency, California Department of Pesticide Regulation, Environmental Monitoring Branch, Surface Water Protection Program, 1001 I Street, Sacramento, CA 95812, Report 249, dated March 2011	055873
J117	6/1/2011	Green City, Clean Waters, The City of Philadelphia's Program for Combined Sewer Overflow Control, Program Summary, Amended by the Philadelphia Water Department June 1, 2011	055929
J118	7/13/2011	Ventura County Technical Guidance Manual for Stormwater Quality Control Measures, Manual Update 2011, dated July 13, 2011	055977
J119	2012	The Quality of Our Nation's Waters, Effects of Urban Development on Stream Ecosystems in Nine Metropolitan Study Areas Across the United States, National Water-Quality Assessment Program, Circular 1373, U.S. Department of the Interior, U.S. Geological Survey, dated 2012	056567

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6. OTHER REFERENCES [Cont'd]			
J120	4/1/2012	Hydromodification Assessment and Management in California, Southern California Coastal Water Research Project Technical Report 667, dated April 2012	056719
J121	4/1/2012	Environmental Sensitive Road Maintenance Practices for Dirt and Gravel Roads, United States Department of Agriculture, Forest Service, National Technology & Development Program, 770-Tranportation Management 1177 1802-SDTDC, dated April 2012	056870
J122	7/1/2012	Best Management Practices for Mosquito Control in California, Recommendations of the California Department of Public Health and the Mosquito and Vector Control Association of California, dated July 2012	057006
J123	10/10/2012	San Diego Region Hydromodification Management Meeting Summary Report: Recommended Hydromodification Management Approaches and Tools for the Regional Municipal Storm Water Permit	057068
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6. OTHER REFERENCES [Cont'd]			
J124	2007-2013	Document Submittals from the San Diego County Copermittees: Jurisdictional Urban Runoff Management Plans (JURMPs) Watershed Urban Runoff Management Plans (WURMPs) Regional Urban Runoff Management Plan (RURMP) RURMP Annual Reports WURMP Annual Reports Receiving Waters and Urban Runoff Monitoring Program Annual Reports	57077
BINDER 3: SECTION J, DOCUMENT 124 [Cont'd]			
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6. OTHER REFERENCES [Cont'd]			
J124 [Cont'd]		JURMP Annual Reports (Carlsbad, Chula Vista, Coronado, Del Mar, El Cajon, Encinitas, and Imperial Beach)	111228
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J124 [Cont'd]		JURMP Annual Reports (La Mesa, Lemon Grove, National City, Oceanside, and Poway)	129484
BINDER 5: SECTION J, DOCUMENT 124 [Cont'd]			
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6. OTHER REFERENCES [Cont'd]			
J124 [Cont'd]		JURMP Annual Reports (San Diego, San Diego County, San Marcos)	141426
BINDER 6: SECTION J, DOCUMENT 124 [Cont'd]			
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6. OTHER REFERENCES [Cont'd]			
J124 [Cont'd]		JURMP Annual Reports (Santee, San Diego Airport Authority, Solana Beach, and Vista)	162222
BINDER 7: SECTION J, DOCUMENT 125 and 126			
SECTION J: REFERENCES [Cont'd]			
6. OTHER REFERENCES [Cont'd]			
J125	2009-2015	Document Submittals from the South Orange County Copermittees:	172981
		Jurisdictional Urban Runoff Management Plans (JURMPs)	
		Watershed Workplans	
		JURMP Annual Reports	
		Receiving Waters and MS4 Discharge Runoff Monitoring Program Annual Reports	

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J126	2010-2015	Document Submittals from the Riverside County Copermittees:	194215
		Jurisdictional Urban Runoff Management Plans (JURMPs)	
		Watershed Workplans	
		JURMP Annual Reports	
		Receiving Waters and MS4 Discharge Runoff Monitoring Program Annual Reports	

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SECTION K: STATE WATER RESOURCES CONTROL BOARD PETITION DOCUMENTS			
1. PETITIONS			
K001	12/17/2015	Petition A-2456(a): San Diego Coastkeeper/Costal Environmental Rights Foundation [R9-2015-0100] [CAS0109266]	SB000001
K002	12/18/2015	Petition A-2456(b): City of Rancho Santa Margarita [R9-2015-0100] [CAS0109266]	SB000058
K003	12/18/2015	Petition A-2456(c): City of Laguna Hills [R9-2015-0100] [CAS0109266]	SB000481
K004	12/18/2015	Petition A-2456(d): County of Orange/Orange County Flood Control District [R9-2015-0100] [CAS0109266]	SB000904
K005	12/18/2015	Petition A-2456(e): City of Dana Point [R9-2015-0100 - NPDES No. CAS0109266]	SB001517
K006	12/18/2015	Petition A-2456(f): City of Laguna Beach [R9-2015-0100 - NPDES No. CAS0109266]	SB001577
K007	12/18/2015	Petition A-2456(g): City of Mission Viejo [R9-2015-0100] [CAS0109266]	SB001633
K008	12/18/2015	Petition A-2456(h): City of Laguna Niguel [R9-2015-0100] [CAS0109266]	SB002079
K009	12/18/2015	Petition A-2456(i): Riverside County Flood Control/Water Conservation District et al [R9-2015-0100] [CAS0109266]	SB002502
K010	12/18/2015	Petition A-2456(j): City of San Clemente [R9-2015-0100 - NPDES No. CAS0109266]	SB002562
K011	12/18/2015	Petition A-2456(k): City of San Juan Capistrano [R9-2015-0100 - NPDES No. CAS0109266]	SB002985
K012	12/18/2015	Petition A-2456(l): City of Aliso Viejo [R9-2015-0100 - NPDES No. CAS0109266]	SB003408
2. COMPLETE PETITION LETTER			
K013	3/15/2016	Letter to All Petitioners and Their Counsel of Record and to All Interested Persons: Order No. R9-2015-0100, an Order Amending Order No. R9-2013-001, NPDES No. CAS0109266, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4) Draining the Watersheds within the San Diego Region.	SB003831
3. RESPONSE TO PETITION			
K014	7/31/2015	Letter: City of Aliso Viejo: Public Comments Received Regarding Approval of San Diego Regional Board Order No. R9-2013-0001 as Amended by Order Nos. R9-2015-0001 and R9-2015-0100	SB003837
K015	5/16/2016	Letter: SWRCB/OCC File A-2456 (A thru L); Petitions of San Diego Coastkeeper, et al., (Waste Discharge Requirements Order No. R9-2015-0100 [NPDES Permit CAS0109266], Municipal Regional Stormwater NPDES Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems Draining the Watersheds Within the San Diego Region) San Diego Regional Water Quality Control Board	SB003855

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3. RESPONSE TO PETITION [Cont'd]			
K016	5/16/2016	Letter: Clean Water Now: Public Comments Received Regarding Approval of San Diego Regional Board Order No. R9-2013-0001 as Amended by Order Nos. R9-2015-0001 and R9-2015-0100	SB003864
K017	5/12/2016	Letter: County of San Diego: Public Comments Received Regarding Approval of San Diego Regional Board Order No. R9-2013-0001 as Amended by Order Nos. R9-2015-0001 and R9-2015-0100	SB003870
K018	5/16/2016	Letter: Cities of Dana Point and Laguna Beach Response to San Diego Coastkeeper and Coastal Environmental Rights Foundation.	SB003882
K019	5/16/2016	Letter: Cities of Dana Point and Laguna Beach Response to Orange County and Orange County Flood Control District	SB010072
K020	5/16/2016	Letter: City of Mission Viejo: Public Comments Received Regarding Approval of San Diego Regional Board Order No. R9-2013-0001 as Amended by Order Nos. R9-2015-0001 and R9-2015-0100	SB010074
K021	5/16/2016	Letter: County of Orange and Orange County Flood Control District: Public Comments Received Regarding Approval of San Diego Regional Board Order No. R9-2013-0001 as Amended by Order Nos. R9-2015-0001 and R9-2015-0100	SB010076
K022	5/16/2016	Letter: Riverside County Flood Control and Water Conversation District, Riverside County, and the Cities of Murrieta, Temecula, and Wildomar: Public Comments Received Regarding Approval of San Diego Regional Board Order No. R9-2013-0001 as Amended by Order Nos. R9-2015-0001 and R9-2015-0100	SB010104
K023	5/16/2016	Letter: City of San Clemente: Public Comments Received Regarding Approval of San Diego Regional Board Order No. R9-2013-0001 as Amended by Order Nos. R9-2015-0001 and R9-2015-0100	SB010136
K024	5/16/2016	Letter: San Diego Coastkeeper and Coastal Environmental Rights Foundation: Public Comments Received Regarding Approval of San Diego Regional Board Order No. R9-2013-0001 as Amended by Order Nos. R9-2015-0001 and R9-2015-0100	SB010154
K025	4/29/2016	Letter: San Diego County Regional Airport Authority: Public Comments Received Regarding Approval of San Diego Regional Board Order No. R9-2013-0001 as Amended by Order Nos. R9-2015-0001 and R9-2015-0100	SB010175
K026	5/16/2016	Letter: San Diego Regional Water Quality Control Board: Public Comments Received Regarding Approval of San Diego Regional Board Order No. R9-2013-0001 as Amended by Order Nos. R9-2015-0001 and R9-2015-0100	SB010177
K027	5/16/2016	Letter: City of San Juan Capistrano: Public Comments Received Regarding Approval of San Diego Regional Board Order No. R9-2013-0001 as Amended by Order Nos. R9-2015-0001 and R9-2015-0100	SB010184
4. REQUESTS FOR ABEYANCE			
K028	11/9/2016	Request for Abeyance (A-2456(a))	SB010202
K029	12/2/2016	Request for Abeyance (A-2456(b))	SB010211

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4. REQUESTS FOR ABEYANCE [Cont'd]			
K030	12/2/2016	Request for Abeyance (A-2456(c))	SB010217
K031	12/1/2016	Request for Abeyance (A-2456(d))	SB010223
K032	12/2/2016	Request for Abeyance (A-2456(e))	SB010230
K033	12/2/2016	Request for Abeyance (A-2456(f))	SB010232
K034	12/5/2016	Request for Abeyance (A-2456(g))	SB010234
K035	12/2/2016	Request for Abeyance (A-2456(h))	SB010236
K036	12/6/2016	Request for Abeyance (A-2456(i))	SB010242
K037	12/5/2016	Request for Abeyance (A-2456(j))	SB010249
K038	12/5/2016	Request for Abeyance (A-2456(k))	SB010251
K039	12/5/2016	Request for Abeyance (A-2456(l))	SB010253
5. OWN MOTION ORDER			
K040	12/6/2016	State Water Resources Control Board: Order WQ-2016-0090: For Review of Waste Discharge Requirements Order No. R9-2015-0100, an Order Amending Order No. R9-2013-0001 for Discharges from the Municipal Separate Storm Sewer System (MS4) Draining the Watershed within the San Diego Region.	SB010255

REPORT OF WASTE DISCHARGE
Application for Renewal of NPDES Municipal Stormwater Permit for San Diego County

Submitted to the San Diego Regional Water Quality Control Board on behalf of the Copermittees to Order No. R9-2007-0001

County of San Diego
City of Carlsbad
City of Chula Vista
City of Coronado
City of Del Mar
City of El Cajon
City of Encinitas
City of Escondido
City of Imperial Beach
City of La Mesa
City of Lemon Grove
City of National City
City of Oceanside
City of Poway
City of San Diego
City of San Marcos
City of Santee
City of Solana Beach
City of Vista
San Diego Unified Port District
San Diego County Regional Airport Authority

June 24, 2011

Prepared with the Assistance of Larry Walker Associates

Executive Summary

Urban runoff from the municipalities in San Diego County is regulated by an NPDES Permit (Regional Board Order No. R9-2007-0001) which is typically renewed every five years. As part of the renewal process the Copermittees must prepare a Report of Waste Discharge (ROWD) that serves as an application for issuance of a new waste discharge permit. The ROWD must include the following:

- Updated Copermittee contact information;
- Proposed changes to the Copermittees' urban runoff management programs (see Sections 2 and 3);
- Proposed changes to the Copermittees' water quality monitoring programs (see Section 2.B and related attachments);
- Justification for proposed changes; and
- Any other information necessary for the reissuance of the Permit.

To support the development of the ROWD the Copermittees conducted numerous meetings to assess and identify changes to their urban runoff management programs. A core set of principles guided the Copermittees' development of the ROWD and recommendations for changes:

- Simplified reporting;
- Streamlined and more meaningful assessment;
- Better coordinated water quality monitoring;
- Enhanced watershed and Total Maximum Daily Load (TMDL) focus; and
- Increased emphasis on strategic planning.

The Copermittees identified a number of specific recommendations for changes to existing management and monitoring requirements. If adopted, these changes would be in effect on adoption of the new Order. They are identified and discussed in detail in ROWD Section 2.

Parallel to the evaluation of the current urban runoff management and monitoring programs, the Copermittees identified the need to develop an iterative, adaptive urban runoff management approach focused on watersheds. This approach would build on the changes to core requirements described in ROWD Section 2. It is introduced in Section 1 and expanded upon in Section 3. The central feature of the Copermittees' recommended Watershed Adaptive Management Strategy is the "Watershed Plan." A single plan for each watershed would help streamline and refocus efforts and make best use of limited resources. The watershed appears to be the appropriate scale at which to integrate the many programs and activities targeting water quality improvement. Furthermore, this scale is consistent with other regulatory programs and policies (e.g. TMDLs and Basin Plans). While it is critical that decision-making remain within the discretion of each jurisdiction, the creation of Watershed Plans would encourage each Copermittee to carefully consider the impact of its management decisions on priority watershed water quality conditions. The suggested content and framework for the Watershed Plan is presented in Section 3.

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Section 1 Introduction

1.A REPORT OF WASTE DISCHARGE PURPOSE AND ORGANIZATION

This Report of Waste Discharge (ROWD) serves as a legally required application[1] for issuance of a new waste discharge permit for the Copermittees in San Diego County. The permit will replace the current waste discharge Order No. R9-2007-0001 (2007 Order)[2]. Section J.2.d of the 2007 Order sets out a timeframe and minimum requirements for the development and submittal of a ROWD prior to the scheduled expiration of the 2007 Order. The ROWD must include the following:

1) Names, titles, and mailing addresses of primary Copermittee contacts (**Table 1.2**);
2) Proposed changes to the Copermittees' urban runoff management programs (see Sections 2 and 3);
3) Proposed changes to the Copermittees' water quality monitoring programs (see Section 2.B and related attachments);
4) Justification for proposed changes (see above as applicable); and
5) Any other information necessary for the reissuance of the Permit.

The organization and content of the ROWD are as follows:

Section 1: Introduction – Includes a general description of the Permit coverage area, relevant application information, background to ROWD development, and a brief discussion of general permitting issues, some of which are addressed in more detail in Sections 2 and 3.

[1] Section J.2.d of the 2007 Order mandates that the Copermittees submit this application and address the issues identified in the ROWD. The Copermittees therefore are legally mandated to submit this document and to make the recommended modifications set forth herein. Because the Copermittees are legally compelled to submit this application, nothing in this ROWD should be construed as an invitation to the RWQCB to regulate the Copermittees in any particular way. Please see Section 1.F.v of this ROWD for further discussion of this issue.

[2] California Regional Water Quality Control Board San Diego Region Order No. R9-2007-0001 NPDES No. CAS0108758, Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego County, the San Diego Unified Port District, and the San Diego County Regional Airport Authority.

Section 2: Recommended Modifications[3] to Order R9-2007-001 Management and Monitoring Programs – Provides background and recommendations for establishing updated core program requirements in the new Permit. This information and any new findings that the Copermittees acquire each year will be used to identify program enhancements as part of the Watershed Adaptive Management Strategy, which is discussed in Section 3.

Section 3: Watershed Adaptive Management Strategy – Provides a detailed discussion of an iterative, watershed-based adaptive management strategy for water quality protection. The strategy contains two primary processes for program improvement:

- *Watershed Plan Development*. Establishment of an overall management program for each watershed at the outset of the new Permit, including management objectives, assessment metrics, strategies and actions (i.e., BMPs), based on the recommended improvements to core programs presented in Section 2 and the Copermittees' understanding of pollutant sources in each watershed; and,

- *Adaptive Management*. As needed adjustments to management actions that will enhance effectiveness based on new BMP effectiveness data, source identification findings, monitoring data results, or in response to deficiencies in program assessment results.

1.B REGION AND MS4 DESCRIPTION

Bounded by the Pacific Ocean on the west and Mexico to the south, the San Diego region occupies more than 4,200 square miles in the southwest corner of the continental United States. At the beginning of 2010, the region had an estimated population of 3,224,432[4], an increase of more than 400,000 people (15 percent) from April 2000 Census figures. While the San Diego region is expected to grow at a slower pace in the coming decades, the impacts of increasing population and urbanization will continue to be felt. Within the region, each of the entities below owns or operates a municipal separate storm sewer system (MS4), through which it discharges urban runoff into waters of the United States.

1. County of San Diego (Principal Permittee)
2. City of Carlsbad
3. City of Chula Vista
4. City of Coronado
5. City of Del Mar
12. City of National City
13. City of Oceanside
14. City of Poway
15. City of San Diego
16. City of San Marcos

[3] This ROWD uses terms such as "recommended modifications", "proposed changes", "requests" etc. because the requirements of Section J.2.d of the 2007 Order mandate that the ROWD address such program improvements. The use of these and similar terms in the ROWD must be interpreted in accordance with footnote 1 above and Section 1.F.v of this document.

[4] SANDAG Regional Growth Forecast, 2011.

6. City of El Cajon
7. City of Encinitas
8. City of Escondido
9. City of Imperial Beach
10. City of La Mesa
11. City of Lemon Grove
17. City of Santee
18. City of Solana Beach
19. City of Vista
20. San Diego Unified Port District
21. San Diego County Regional Airport Authority

Municipal urban runoff management programs in the San Diego region were initiated with the July 1990 adoption of Regional Water Quality Control Board (RWQCB) Order No. 90-42, but in many respects started fresh when that Permit was reissued in February 2001. The current Permit was reissued in January 2007. It added a number of new and increasingly prescriptive requirements for jurisdictions to implement, including expanded requirements for low impact development BMPs, treatment control BMPs, and BMP maintenance tracking for new development; hydromodification management plans; specific street sweeping and MS4 maintenance requirements; and expanded water quality monitoring programs among others[5].

Also notable is the 2007 Order's increased emphasis on watershed management principles and practices. Unlike previous permits, it specifically requires the implementation of a minimum number of watershed activities that go above and beyond core management requirements to reduce pollutant discharges causing high priority water quality problems in each of the nine watersheds identified in **Table 1.1**. These activities are developed, implemented, and assessed within the context of Watershed Urban Runoff Management Program (WURMPs), which are required for each watershed. Since urban runoff does not conform to jurisdictional boundaries, watershed-based urban runoff management requirements are intended to help focus programs on the most important water quality problems in each watershed.

Collectively, these and other requirements represented a significant increase in effort over previous permit cycles. Copermittees are now nearing the end of a third Permit cycle, and have conducted in-depth reviews of their management programs with an eye toward continued program improvement. The results of this review are described as applicable throughout the remainder of this ROWD and in the Copermittees' Long-term Effectiveness Assessment (LTEA), which is submitted under separate cover.

[5] As discussed in Section 1.F.v of the ROWD, many of these new and increasingly prescriptive provisions are the subject of a successful Test Claim before the Commission on State Mandates which is currently being challenged in the California courts.

Table 1.1: Watersheds and Responsible Copermittees under Order No. R9-2007-001

Watershed	Area (sq. mi.)	Population (2000)	Responsible Copermittees
1. Santa Margarita	750 total; 197 in San Diego County	27,124 in San Diego County	• County of San Diego
2. San Luis Rey	562	148,515	• City of Oceanside (lead) • City of Vista • County of San Diego
3. Carlsbad	211	496,128	• City of Carlsbad (lead) • City of Encinitas • City of Escondido • City of Oceanside • City of San Marcos • City of Solana Beach • City of Vista • County of San Diego
4. San Dieguito	346	147,626	• City of Escondido (lead) • City of Del Mar • City of Poway • City of San Diego • City of Solana Beach • County of San Diego
5. Los Penasquitos	94	227,599	• City of Poway (lead) • City of Del Mar • City of San Diego • County of San Diego
6. Mission Bay	68	220,803	• City of San Diego
7. San Diego	434	505,032	• City of El Cajon (lead) • City of La Mesa • City of San Diego • City of Santee • County of San Diego
8. San Diego Bay	415	932,845	• San Diego Unified Port District (lead) • City of Chula Vista • City of Coronado • City of Imperial Beach • City of La Mesa • City of Lemon Grove • City of National City • City of San Diego • County of San Diego • San Diego County Regional Airport Authority
9. Tijuana	1,750 total; 467 in U.S.	1.4 million total; 77,344 in San Diego County	• County of San Diego (lead) • City of Imperial Beach • City of San Diego

1.C APPLICANT INFORMATION

The administrative and technical contact information for each Copermittee is provided in **Table 1.2**. The first 20 of these parties were initially named as Copermittees under Order No. 90-42 in July 1990. The San Diego County Regional Airport Authority was added as the 21st Copermittee on August 13, 2003. No additional Copermittees have been added since that time.

Table 1.2: Copermittee Contact Information

Copermittee	Primary Administrative Contact (Official Mailing Contact)	Primary Technical Contact (Day-to-day Contact)
1. County of San Diego (Principal Permittee)	Cid Tesoro LUEG Program Manager 5201 Ruffin Rd., Ste P. San Diego, CA 92123	Jon Van Rhyn Water Quality Program Manager 5201 Ruffin Rd., Ste P. San Diego, CA 92123
2. City of Carlsbad	Elaine Lukey Environmental Manager 1635 Faraday Avenue Carlsbad, CA 92008	Elaine Lukey Environmental Manager 1635 Faraday Avenue Carlsbad, CA 92008
3. City of Chula Vista	Khosro Aminpour Senior Civil Engineer 1800 Maxwell Road Chula Vista, CA 91911	Khosro Aminpour Senior Civil Engineer 1800 Maxwell Road Chula Vista, CA 91911
4. City of Coronado	Scott Huth Director of Public Services 101 B Avenue Coronado, CA 92118	Kimberly Godby Supervisor - Services 101 B Avenue Coronado, CA 92118
5. City of Del Mar	Kathleen Garcia Director, Planning & Community Development 1050 Camino Del Mar Del Mar, CA 92014	Mikhail Ogawa Clean Water Manager 1050 Camino Del Mar Del Mar, CA 92014
6. City of El Cajon	Dennis Davies Deputy Director of Public Works 200 Civic Center Way, 4th Floor El Cajon, CA 92020	Jaime Campos Associate Civil Engineer 200 Civic Center Way, 4th Floor El Cajon, CA 92020
7. City of Encinitas	Erik Steenblock Clean Water Program Manager 505 S. Vulcan Avenue Encinitas, CA 92024	Erik Steenblock Clean Water Program Manager 505 S. Vulcan Avenue Encinitas, CA 92024
8. City of Escondido	Lori Vereker Utilities Director 201 North Broadway Escondido, CA 92025	Cheryl Filar Env. Programs Manager 201 N. Broadway Escondido, CA 92025
9. City of Imperial Beach	Hank Levien Public Works Director 825 Imperial Beach Blvd. Imperial Beach, CA 91932	Chris Helmer Env. Programs Manager 825 Imperial Beach Blvd. Imperial Beach, CA 91932

Copermittee	Primary Administrative Contact (Official Mailing Contact)	Primary Technical Contact (Day-to-day Contact)
10. City of La Mesa	Joe Kuhn Storm Water Program Manager 8130 Allison Avenue La Mesa, CA 91941	Joe Kuhn Storm Water Program Manager 8130 Allison Avenue La Mesa, CA 91941
11. City of Lemon Grove	Cora Long Stormwater Policy Analyst 3232 Main Street Lemon Grove, CA 91945	Cora Long Stormwater Policy Analyst 3232 Main Street Lemon Grove, CA 91945
12. City of National City	Din Daneshfar Principal Civil Engineer 1243 National City Blvd. National City, CA 91950	Barby Tipton Storm-water Inspector 1243 National City Blvd. National City, CA 91950
13. City of Oceanside	Mo Lahsaie Clean Water Prog. Coordinator 300 N. Coast Highway Oceanside, CA 92054	Mo Lahsaie Clean Water Prog. Coordinator 300 N. Coast Highway Oceanside, CA 92054
14. City of Poway	Malik Tamimi Stormwater Program Administrator P.O. Box 789 Poway, CA 92074	Malik Tamimi Stormwater Program Administrator P.O. Box 789 Poway, CA 92074
15. City of San Diego	Kris McFadden Deputy Director City of San Diego Transportation & Stormwater Dept. 9370 Chesapeake Drive, Suite 100, MS 1900 San Diego, CA 92123	Drew Kleis Program Manager City of San Diego Transportation & Stormwater Dept. 9370 Chesapeake Drive, Suite 100, MS 1900 San Diego, CA 92123
16. City of San Marcos	Erica Ryan Stormwater Program Manager 1 Civic Center Drive San Marcos, CA 92069	Reed Thornberry Stormwater Analyst 1 Civic Center Drive San Marcos, CA 92069
17. City of Santee	Pedro Orso-Delgado Deputy City Manager/Development Services Director 10601 Magnolia Avenue Santee, CA 92071	Helen Perry Stormwater Program Manager 10601 Magnolia Avenue Santee, CA 92071
18. City of Solana Beach	Dan Goldberg Principle Civil Engineer 635 South Highway 101 Solana Beach, CA 92075	Taryn Dunbar Assistant Civil Engineer 635 South Highway 101 Solana Beach, CA 92075
19. City of Vista	Paul Hartman Storm Water Program Manager 200 Civic Center Drive Vista, CA 92084	Paul Hartman Storm Water Program Manager 200 Civic Center Drive Vista, CA 92084
20. San Diego Unified Port District	Karen Holman Manager, Environmental Programs P.O. Box 120488 San Diego, CA 92112-0488	Karen Holman Manager, Environmental Programs P.O. Box 120488 San Diego, CA 92112-0488

Copermittee	Primary Administrative Contact (Official Mailing Contact)	Primary Technical Contact (Day-to-day Contact)
21. San Diego County Regional Airport Authority	Paul Manasjan Director, Environmental Affairs P.O. Box 82776 San Diego, CA 92138-2776	Richard Gilb Manager, Environmental Affairs P.O. Box 82776 San Diego, CA 92138-2776

1.D BACKGROUND TO ROWD DEVELOPMENT

Prior to initiating work on the ROWD, the Copermittees recognized a need for dialogue on long-term strategic planning. Considerations included:

- In addition to the 2007 Order, Copermittees are faced with new and more stringent water quality mandates, including total maximum daily loads (TMDLs) and Areas of Special Biological Significance (ASBS). There is an urgent need to integrate and streamline the many programs and activities required by these different regulations so that limited resources can be prioritized and put to their best use.
- There is an increasing need for improved efficiency and effectiveness, and reduced redundancy in programs.
- There is a need to connect Copermittee activities to demonstrated improvements in water quality.
- There is an ever-increasing reality of diminishing resources at the local level.

It is in this context that spurred Copermittees to develop an overarching 20-year vision that would help guide watershed management decision-making that is both effective in improving water quality and efficient in the use of public funds. The results of the Copermittees' visioning process, which took place between September and November of 2010, are summarized in Section 1.E. Results from the visioning provide an important foundation upon which specific recommendations in this ROWD are based. The vision will continue to be used beyond the timeframe of this Permit reissuance.

In addition to visioning, the Copermittees conducted an extensive Permit review process between May 2010 and June 2011 that was wholly or partially dedicated to reissuance topics. Some of the more important forums for discussion are discussed below.

Reporting and Assessment Standards Evaluation Workshops. In February 2010, two Copermittee workgroups (the Regional WURMP Workgroup and the Fiscal, Reporting and Assessment Workgroup) jointly initiated a project to begin developing recommended reporting and assessment standards for Jurisdictional Urban Runoff Management Programs (JURMPs). Between May 25 and July 10, 2010, workshops were held to help promote consistency in how Copermittee programs are reported and assessed. The results of the workshops are reflected in the final recommendations of this ROWD.

Meetings with RWQCB Staff. Critical dialogue between Copermittees and RWQCB staff took place on the following dates:

- Feb. 8, 2011
- April 6, 2011
- April 19, 2011

The first meeting dealt with broad conceptual issues. During the meeting, RWQCB staff informed the Copermittees of its intention to issue a single municipal stormwater permit for the San Diego region. Under this scenario, the upcoming San Diego County reissuance would represent the first leg of a process that would eventually bring in south Orange and south Riverside Counties. RWQCB staff also expressed a desire for more emphasis on using water quality monitoring information to drive management actions under the new Permit, with a corresponding decrease in jurisdictional reporting.

The second meeting included an overview of results from the Copermittees' Watershed Visioning workshops, and how they are likely to inform the ROWD. The remainder of the meeting was dedicated to "brainstorming" ideas for a new permit, with much of the discussion focusing on: (1) an overall adaptive management permit framework, (2) watershed and TMDL integration, (3) the role of reporting and assessment, and (4) permit performance standards.

The third meeting focused solely on water quality monitoring issues and approaches. Copermittees presented preliminary results and recommendations from their ongoing extensive review of monitoring programs. That content, which has since undergone additional refinement, is reflected in this ROWD (Section 2.b. and related attachments) as well as the LTEA.

Permit Reissuance Workgroup Meetings. After the initial meeting with RWQCB staff, the Copermittees established a dedicated workgroup (subordinate to the Regional Program Planning Subcommittee) to oversee the development of the ROWD and LTEA. This workgroup was responsible for generating potential content, overseeing consultant support, interfacing with RWQCB staff, and keeping Copermittees informed and updated.

Regional Monitoring ROWD Sub-workgroup Meetings. A dedicated workgroup (subordinate to the Regional Monitoring Workgroup) was also formed to review existing monitoring approaches, develop recommendations for potential changes to monitoring programs, oversee consultant support related to monitoring content in the LTEA and ROWD, interface with RWQCB staff, and ensure Copermittee participation throughout the review process.

Copermittee Permit Reissuance Workshops. To ensure broad and inclusive input from all 21 Copermittees, four workshops were held to allow discussion among Copermittee representatives regarding reissuance topics and potential content.

- Workshop 1: March 29, 2011

- Workshop 2: April 26, 2011
- Workshop 3: May 31, 2011
- Workshop 4: June 16, 2011

The purpose of these workshops was to brief Copermittees on ongoing content development, to seek their input, and to validate and refine potential recommendations developed by the ROWD workgroups described above. The first two workshops addressed both monitoring and broader ROWD content. The third focused solely on monitoring issues. The last workshop provided an opportunity for Copermittees to comment on and discuss the draft ROWD and LTEA documents.

Additional Input from Regional Workgroups. On April 7, 2011, the County of San Diego requested that all Copermittee workgroups provide subject area input on reissuance. Workgroups were specifically asked to identify anything within their respective subject areas that should be modified in, removed from, or added to, the current Permit. Input provided by these workgroups is reflected as applicable in ROWD Section 2.

The recommendations and discussion presented in this ROWD represent a consensus of Copermittees as developed through this extended dialogue. However, it should also be understood that consensus is not always unanimity. Individual jurisdictions reserve the right to dissent from, or address issues not reflected in, the content of this ROWD during the remainder of the permit reissuance process.

1.E A VISION FOR URBAN RUNOFF MANAGEMENT IN SAN DIEGO

The San Diego region continues to face many challenges associated with protecting its precious and finite water resources. Urban runoff has been identified as impacting the water quality of the region's ocean, bays, streams, and other water bodies. Local jurisdictions have important responsibilities to implement programs to protect and improve the quality of these watersheds and water bodies, but often find that progress is hampered by resource limitations and a lack of knowledge or consensus on how best to move forward. This desire for additional clarity and coordination led the Copermittees to pursue a series of visioning workshops in Fall 2010. Over the course of five workshops, the Copermittees identified a consensus-based strategy for protecting water quality and local watersheds in a long-term, sustainable manner. While this strategy addresses some issues that are beyond the scope of the Copermittees' responsibilities under the2007 Order, it provides a comprehensive, iterative, and adaptive strategy that the Copermittees wish to pursue in the next and future permit terms.

1.E.i Visioning Effort

Five regional Copermittee workshops were held to develop consensus-based vision, goals, and objectives for the future state of urban runoff and surface water protection in the San Diego region:

- Workshop 1: September 2, 2010

- Workshop 2: September 14, 2010
- Workshop 3: October 4, 2010
- Workshop 4: October 14, 2010
- Workshop 5: November 30, 2010

Each workshop was professionally facilitated to ensure that all objectives were completed within the projected scope of the workshops, and that all participants had sufficient opportunity to provide input. Ground rules were agreed upon at the first meeting. All workshops were attended by a majority of Copermittees. A planning workgroup also met extensively between the workshops to review and document results, and to prepare materials for ensuing discussion.

1.E.ii Vision, Goals, Objectives

A vision statement and supporting goals were crafted by the Copermittees (**Table 1.3**) to guide the planning of specific activities and programs over a 20-year horizon.

Table 1.3: Watershed Vision, Goals, and Objectives

Vision	Our vision is for the protection of water quality in our streams, bays, ocean, and other water bodies that benefits wildlife, recreation, the environment, and other community needs as supported by sustainable stormwater management.
Goal 1	Protect and restore appropriate beneficial uses for prioritized water bodies impacted by stormwater. Objectives • Establish source, constituent, and water body priorities for each watershed • Promote beneficial use designation and water quality objectives that are scientifically valid • Reduce flows and pollutant loads from stormwater that adversely impact receiving water integrity • Promote watershed stewardship as a social standard • Support the identification and development of sustainable projects that provide diverse habitats and water quality benefits
Goal 2	Achieve sustainable stormwater management that balances social, economic, and environmental needs. Objectives • Promote public policy that supports sustainable stormwater management • Obtain public support for long-term and reliable funding for stormwater programs • Involve the public in understanding and defining sustainable stormwater management
Goal 3	Focus stormwater management on sources and practices that jurisdictions have the ability to affect or control. Objectives • Identify the pollutant of concern loads that are attributable to stormwater • Work with regulatory agencies and other parties to ensure that pollutant sources are re-assigned to the appropriate regulatory process (air, water, and waste) • Promote public policy that reduces pollutants of concern through source product

	replacement/substitution/application
Goal 4	Support development of a regulatory framework and establish an organizational structure that facilitates implementation of the most effective and efficient stormwater management program. <u>Objectives</u> • Focus assessment on information needed to implement the most effective control strategies and adaptive management • Establish and organizational and workload structure that focuses stormwater program implementation at the watershed or other appropriate scale • Streamline program implementation, reporting, and assessment • Develop TMDL implementation plans that integrate sustainable stormwater management.

Although each goal in the Copermittees' Vision is relevant to the programs and activities required under the 2007 Order, Goal 4 is particularly relevant to the reissuance process*. To achieve Goal 4 – Support development of a regulatory framework and establish an organizational structure that facilitates implementation of the most effective and efficient stormwater management program* – the Copermittees have identified a watershed adaptive management framework that should serve as the basis for the Permit renewal process. The framework is described in detail in Section 3.

1.E.iii Key Concepts from the Copermittees' Vision

The following five key concepts were distilled from the visioning workshops. These concepts establish a set of guiding principles for permit reissuance, and inform the remainder of this ROWD.

- *Simplified reporting* (e.g., JURMP checklist, integrating multiple reports into a single watershed-based report)
- *Streamlined and more meaningful assessment* (e.g., collaborative efforts to assess the efficiency of BMPs and pollutant-generating activities)
- *Better coordinated water quality monitoring* (increased regional / watershed efficiencies)
- *Enhanced TMDL focus* (e.g., better integration of WURMP and TMDL programs)
- *Increased emphasis on strategic planning* (e.g., regionally coordinated efforts on addressing program funding, regulatory changes, and true source control initiatives)

1.F GENERAL PERMITTING ISSUES

This section introduces some of the general issues that should be explored in more depth during the Permit reissuance process. Some of these issues are explored in further detail in ROWD Sections 2 and 3.

1.F.i Adoption of a Region-wide Permit

During the south Orange and south Riverside County Permit hearing processes, and in meetings with San Diego Copermittees to date, RWQCB staff has expressed its intention to adopt a single, region-wide

Permit covering the portions of all three Counties within Region 9 boundaries. Under this scenario, San Diego would be the first in, and the others would follow on their next scheduled reissuances (December 2014 and October 2015, respectively), or sooner.

While a single, region-wide Permit might present some potential process efficiencies, there a number of issues that warrant additional discussion with Copermittees and RWQCB staff. Among the outstanding questions to be addressed are the following:

- How would the Permit be structured?
- What other permitting authorities in the U.S. have considered or adopted region-wide permits? Is staff reviewing those permits and re-issuance processes? If so, what were the key issues and concerns raised, and how were they resolved?
- Would all three regions have identical conditions, or would some requirements be unique to individual regions?
- Could specific conditions in any of the individual Permits be omitted from the region-wide Permit, or would the starting point be the sum of all existing conditions in the three Permits?
- Would the three regions be required to collaborate? If so, how?
- Would there be a single region-wide "principal" Copermittee? If so, what would its responsibilities be?

The ideas and recommendations presented in this ROWD can be addressed either within or outside of a consolidated, region-wide Permit structure. It is, however, critical that the details of a proposed Permit structure be put forth as early as possible. We therefore recommend that a dialogue dedicated solely to Permit structure be initiated with RWQCB staff and representatives of all three Permit regions, and that these discussions initially be held independently of those involving other permitting issues.

1.F.ii Watershed-Based Adaptive Management

The Copermittees feel strongly that a reissued Permit must be predicated on an adaptive management framework. Moreover, the watershed appears to be the appropriate scale at which to integrate the many programs and activities targeting water quality improvement. Watershed-based adaptive management will help ensure that programs and activities are effectively addressing the pollutant-generating sources and activities causing each watershed's priority water quality problems. This is critical to ensuring the best use of limited resources. The Watershed Adaptive Management Strategy described in ROWD Section 3 is also in line with the desire expressed by RWQCB staff to issue a watershed-based Permit that is more strategic and less prescriptive.

1.F.iii Timeline for Establishing and Updating Watershed-Based Programs

Under the reissued Permit, it is inevitable that program modifications will initially be necessary in response to new requirements, and also as part of an ongoing adaptive management process. In both cases, it is critical that consistency and quality of effort be foremost considerations, and that Copermittees be provided the time necessary to carry these changes through. Rather than setting out generic schedules for program updates, the reissued Permit should realistically reflect all of the intermediate steps necessary to fully implement each new or modified mandate, and the time needed to complete it. This is particularly true as we transition from the existing JURMP/WURMP structure to a Watershed Plan approach (see Section 3). Among the process considerations that may be relevant to each are the following:

- Collaborative or individual development and approval of new programs, collaborative standards, or Watershed Plans;
- RWQCB review and/or approval of new or modified core programs, Watershed Plans, annual reports, or other key work products;
- Development of reporting and assessment standards to ensure consistency amongst Copermittees, and to allow watershed and regional consolidation of results;
- Development and adoption of ordinances or other legal authorities;
- Modification of individual Copermittee programs in accordance with new Permit requirements, group standards, program implementation results, monitoring results, or other feedback;
- Adoption of modified budgets to support increased implementation costs; and
- Development of new or modified monitoring programs.

1.F.iv MS4 Action Levels

Action Levels, as applied in the south Orange and south Riverside County permits that were recently adopted by the RWQCB, are triggers used to define specific follow up actions to be undertaken by Copermittees when results of monitoring at MS4 outfalls exceed prescribed limits. Both permits incorporate two forms of Action Levels, non-stormwater dry weather action level (NALs) for dry weather discharges and Stormwater Action Levels (SALs) for wet weather discharges.

The Copermittees recognize the presence of NALs and SALs in the Orange and Riverside permits, and acknowledge the stated intention of RWQCB staff to utilize them in the Region-wide Permit. At the same time, RWQCB staff has expressed a desire to issue a Permit that is more strategic, less prescriptive, watershed-based, and more oriented to the evaluation of changes in MS4 discharge quality. While it is

unclear how RWQCB staff propose to use Action Levels to support this updated approach, it is clear that MS4 outfall monitoring would be a critical component of it. Prior to the adoption of the reissued Permit, Copermittees wish to explore with RWQCB staff an appropriate application of Action Levels that would make best use of limited resources and contribute to actual improvements in water quality. Some of the Copermittees' initial considerations for discussion are summarized below. The following is based on the Copermittees' review of the south Orange and south Riverside County Permits, and is intended to further discussions with RWQCB staff.

Potential Use of Action Levels as Triggers for Immediate Investigations

Comparison of MS4 outfall monitoring results to NALs and SALs is not likely to improve the Copermittees' ability to identify and abate illegal connections and illicit discharges (IC/IDs) to the storm drain system. ROWD Section 2.B and Attachment 1-1 discuss how implementation of a similar IC/ID program under the 2007 Order has had a very low success rate in identifying IC/IDs. Since NALs and SALs are assessed at the "end of pipe", an even lower success rate would be expected since the point of monitoring is further downstream and therefore further removed from potential upstream sources. In addition, samples submitted for laboratory analysis can often take weeks to return results. This further reduces the usefulness of NALs and SALs as tools to abate IC/IDs, particularly for discharges that are transient in nature. As explained in ROWD Section 2.B., the Copermittees suggest that a more appropriate trigger for immediate IC/ID investigations would be observations at the time of a field visit.

Potential Use of Action Levels for Long-Term Program Planning

Though limited in their ability to help Copermittees detect IC/IDs, Action Levels could be more useful in guiding the review, analysis, and refinement of Copermittees' programs over a longer-term period. For example, a statistically valid analysis of change in MS4 results over time could be explored as a determinant of program success. However, if sample sizes or analytical timeframes are too limited, the usefulness and validity of results would be compromised. Given the significant cost of water quality monitoring, consideration may need to be given to pooling and analyzing results over broader geographic scales (e.g., regionally) and longer time frames than those envisioned in the south Orange and south Riverside Permits. Moreover, to remain consistent with a strategic and watershed-based approach, Action Levels should be limited to constituents identified as watershed priorities. Information on MS4 outfall results for non-priority constituents could be utilized at periodic intervals to assess the appropriateness of watershed priorities, but follow-up action in the form of programmatic response to results should be limited to firmly established watershed priorities. Finally, the possibility of relief from some prescriptive Permit requirements based on demonstrated progress toward compliance with NALs and/or SALs should be explored. In instances where a Copermittee can demonstrate that core requirements are unrelated to priority water quality problems in the watershed, NAL and SAL results might be used to support a reduction in, or removal of, certain core requirements. This should be further discussed as part of the development of a watershed adaptive management strategy.

1.F.v Unfunded Mandates

The 2007 Order imposes a number of requirements that the Copermittees allege constitute an unfunded state mandate under Government Code Title 2, Division 4, Part 7 (State-Mandated Local Costs). A test claim was filed by the County of San Diego on June 20, 2008, and 19 other Copermittees were added in August 2008. The State Mandates Commission conducted a hearing on March 26, 2010, and issued a final Statement of Decision on March 30, 2010. In it, the Commission partially approved the Copermittees' test claim, finding that the following activities required under the 2007 Order constitute a reimbursable state-mandated new program or higher level of service:

- Street sweeping / reporting [Permit Sections D.3.a.(5) and J.3.a.(3)(c)(x-xv)]
- MS4 cleaning / reporting [Permit Sections D.3.a.(3) andJ.3.a.(3)(c)(iv)-(viii)]
- Educational component [Permit Sections D.5.a.(1)-(2); D.5.b.(1)(c)-(d); D.5.b.(3)]
- Watershed activities [Permit Sections E.2.f and E.2.g]
- Regional URMP [Permit Sections F.1, F.2, and F.3]
- All Copermittee collaboration [Permit Section L.1.a.(3)-(6)]
- Program effectiveness assessment [Permit Sections I.1 and I.2]
- Long-term effectiveness assessment [Permit Section I.5]

The Commission also found that the Low Impact Development and Hydromodification Plan development requirements were new programs or increased levels of service that exceeded the requirements of federal law, but concluded that the Copermittees had adequate fee authority to fund those two program elements. On July 20, 2010, the Department of Finance filed a Petition for Writ of Administrative Mandamus to overturn the Commission's decision. In August 2010, the Copermittees filed a cross-petition also challenging the Commission's decision with respect to the Copermittees' fee authority for Low Impact Development and Hydromodification Plan development, and the use of SB 310 Fee Authority for developing Watershed Management Plans. It is uncertain when a final judicial resolution of this lawsuit will be obtained, but the Copermittees anticipate that a final decision may be issued in 2012.

Assuming that the Commission's decision is at least partially upheld by the courts, some requirements of the 2007 Order, if carried through to the new Permit, will continue to constitute unfunded mandates. As such, the State legislature would either be required to appropriate funding to reimburse Copermittees for these costs, or the mandates would have to be suspended.

This also has bearing on the content of this ROWD. While the Copermittees have worked in good faith to identify and describe potential improvements to existing programs and Permit approaches, it must be

emphasized that the content of this document has not been evaluated against the requirements of Government Code Title 2, Division 4, Part 7. It is our expectation that in developing specific Permit requirements, RWQCB staff will conduct such analysis as they determine necessary, and that responsibility for doing so is entirely with the RWQCB. This position is supported by the Commission's March 2010 Statement of Decision, wherein they specifically contradicted State Board claims that a ROWD can be considered a "proposal" by dischargers, i.e., that ideas put forth by the Copermittees do not constitute unfunded mandates because they suggested them.

The Copermittees maintain that the specific content and suggestions put forth in this ROWD are intended solely to advance ongoing dialogue with RWQCB staff, and to identify potential options to be explored in a reissued permit. As such, the development and adoption of specific permit provisions remain solely the responsibility of the RWQCB and its staff. In addition, as noted in footnote 1 on page 1 of this ROWD, the Copermittees are legally required to submit this ROWD and to address the program changes as set forth in Section J.2.d of the 2007 Order; thus, the content and suggestions in this ROWD are legally mandated and should not be construed as being voluntary.

Section 2 Recommended Modifications to Order R9-2007-0001 Management and Monitoring Programs

Copermittees are currently implementing comprehensive stormwater management programs consistent with the 2007 Order. As part of the development of this Report of Waste Discharge (ROWD) they have carefully evaluated their current programs to identify opportunities for improvement.

ROWD Section 2.A discusses each of the primary jurisdictional program components ("core programs") contained in sections D, I, and J of the 2007 Order , first by providing an brief overview of the current Permit-defined effort and then providing recommendations for modifying the core program. Modifications to Permit Section E (Watershed Urban Runoff Management Program) are not addressed. The Copermittees' recommendations for watershed-based adaptive management contained in ROWD Section 3 should be considered a recommended alternative to Permit Section E. However, given that the Watershed Plans discussed in ROWD Section 3 represent an iterative process whereby specific strategies would be developed and modified over time, it is likely that Copermittees would require, with justification, additional flexibility to modify core programs within a watershed.

Regional Urban Runoff Management Program (Permit Section F) requirements are not addressed here. As discussed in ROWD Section 3.C, the Copermittees recommend that the reissued Permit not contain prescriptive regional implementation requirements, but that they be allowed to use regional activities and programs as an option for partially or wholly satisfying specific Watershed Plan requirements.

ROWD Section 2.B discusses alternatives to the existing monitoring program. Attachments 2.1-2.3 provide detailed analysis to justify these proposed changes.

2.A MODIFICATIONS TO CORE JURISDICTIONAL STORMWATER MANAGEMENT PROGRAMS

This section describes specific recommended modifications to core jurisdictional programs that, if adopted, would be effective on issuance of the new Order. As described in ROWD Section 3, these core requirements would also be subject to modification as part of the development and updating of Watershed Plans.

The Copermittees recommend that, with justification and RWQCB staff approval, the Order allow the future modification of jurisdictional core requirements during the development and updating of the Watershed Plans described in ROWD Section 3. Under the Watershed Plans, Copermittee efforts would increasingly be directed to the constituents and sources of most importance to each Watershed Management Area. Corresponding modifications to core requirements must be allowed to ensure that Copermittee resources can be used where they're most needed.

The remainder of this section applies only to those core requirements effective upon Permit reissuance. This content should be considered to represent a starting point and informational basis for considering and developing the updated core program requirements that will be identified in the new Permit.

During the development of Watershed Plans after the adoption of the new Permit, each Copermittee would optimize the implementation of the various core programs in order to target watershed priorities and maximize the efficiency of its overall implementation efforts in the watershed. These adjustments would need to meet clearly-defined criteria designed to provide reasonable assurance that the adjustments, when considered cumulatively, would enhance the overall efficiency and effectiveness of a Copermittee's actions in a watershed.

In subsequent years after the Watershed Plan has begun implementation, the Copermittees would continue to consider and implement modifications to core programs as part of an iterative, watershed-based adaptive management process that should also be clearly defined in the new Permit.

2.A.i Development Planning Component (Permit Section D.1)

Existing Core Program

Each Copermittee implements a Development Planning Component to minimize the short- and long-term impacts on receiving water quality from new development and redevelopment. Jurisdictions are currently implementing the following general control measures associated with this Component:

- Assessing and modifying general plans to ensure that land use decisions are adequately guided by water quality and watershed protection principles.
- Revising environmental review processes to include requirements for evaluation of water quality effects and identification of appropriate mitigation measures.
- Educating municipal staff and affected parties to ensure their understanding of applicable water quality laws and requirements and methods for minimizing the impact of development on water quality.
- Implementing a development project approval procedure so that priority projects are required to implement: source control BMPs; site design/landscape characteristics, where feasible; structural treatment control BMPs; and buffer zones for natural water bodies, where feasible.
- Requiring the development a Standard Urban Storm Water Mitigation Plan (SUSMP) for all new development and significant redevelopment projects falling under specified priority project categories.
- Requiring all priority projects to mitigate the water quality storm volume or flow through the use of infiltration, filtration or other treatment control BMPs.
- Developing and implementing a hydromodification management plan (HMP). The HMP requires that post-project runoff flow rates and durations do not exceed pre-project flow rates and durations where the increased flow rates and durations result in increased potential for erosion or other adverse impacts on beneficial uses.
- Developing a monitoring program to assess the impacts of the recently adopted Regional HMP.

Recommendations for Program Modification

Limits on Further Updates to Existing SUSMP and HMP Programs

The Copermittees recommend that existing SUSMP and HMP programs be evaluated over the next 5-10 years, and that future Permit modifications not be considered until results have been observed and monitoring data have been collected to provide a sufficient basis to validate and refine existing approaches. Other than allowing minor modifications needed to improve programs and realize efficiencies, changes to SUSMP and HMP requirements should not be considered until such time, i.e., not sooner than the 2017 Permit reissuance.

The 2007 Order required multiple updates to Copermittee SUSMP and HMP initiatives, each of which required an extensive effort on behalf of the Copermittees, e.g., to take documents through their respective adoption processes, to update technical reference manuals, and to re-train staff and the regional consulting community. Copermittees have spent considerable time and money to develop and update these approaches. SUSMP changes under the 2007 Order were substantive and incorporated a whole new LID approach that requires time to validate. These programs need time to mature and for Copermittees and the development community to gain experience in implementing them. They should not be substantively modified in the new Permit. Instead, results should be collected for a minimum of 5-10 years. Any future modifications to the programs should be based on observations made from implementing the SUSMP and HMP programs rather than incorporation of new or different requirements for which such analysis has not yet been conducted.

Limits on the Applicability of SUSMP and HMP Requirements

The Copermittees recommend that the applicability of all existing SUSMP and HMP requirements be evaluated during the reissuance process. We suggest the following principles inform this review and deliberation:

- *<u>Requirements for all projects (small "mom and pop," road widening, etc.) should reflect relative risk and cost-effectiveness</u>. Small projects often do not present the same threat to water quality as larger developments, but the financial burden of meeting Permit requirements can be proportionally much greater than for large developers. Likewise, significant limitations and constraints exist for incorporating HMP requirements into new linear projects (e.g., road widening). The tiering of requirements should be explored, e.g., based on size (for projects between 5000 square feet and 1 acre versus projects greater than an acre) or location (less risk if project is not near an impaired water body). Lower risk projects might be limited to meeting general source control and/or LID requirements, and HMP and TCBMP requirements introduced only above defined thresholds.*
- *<u>Impracticability provisions should apply to HMP facilities</u>. These provisions in the 2007 Order apply only to treatment control BMPs (TCBMPs). However, the same considerations that could make TCBMP placement impracticable also apply to HMP facilities. The Permit should allow impracticability determinations for HMP facilities. As an example, the San Francisco Municipal*

Regional Permit has an impracticability provision that includes considerations of space limitations and reasonable cost.

The Copermittees also believe that additional focused discussions on the applicability of specific SUSMP and HMP requirements would help to better focus the Permit where it will have the greatest impact and cost-efficiency.

Baseline Requirements for HMP Projects

The Copermittees recommend that the "pre-project" baseline used in the 2007 Order for HMP projects be retained in the reissued Permit.

The 2007 Order requires that Copermittee HMP requirements be implemented through local SUSMPs so that post-project runoff discharge rates and durations do not exceed estimated pre-project discharge rates and durations where the increased discharge rates and durations will result in increased potential for erosion or other significant adverse impacts to beneficial uses. Copermittees have put forth considerable effort and expense in meeting these requirements, which is especially difficult for road improvements and redevelopment projects in particular.

Under the south Orange and south Riverside Orders, HMP requirements must be implemented so that estimated post-project runoff discharge rates and durations do not exceed pre-development discharge rates and durations (i.e., naturally occurring conditions). Copermittees are concerned about the potential imposition of this more restrictive standard for the San Diego Region.

Changing the baseline to "pre-development" will make it impracticable for cities to meet increased traffic capacity demands for existing roads and will greatly hamper plans to densify existing urban areas through redevelopment and infill projects as an alternative to continued urban sprawl. Moreover, there is an existing, unanswered legal question about whether the Copermittees' police power authority would provide them with sufficient legal authority to regulate runoff based upon pre-development, as opposed to pre-project, discharge rates and durations. Until there is sufficient legal clarity on the authority of Copermittees to so regulate, the language in the 2007 Order should be maintained. The Copermittees believe that any substantive modifications to current HMP requirements should be based on analysis of data and implementation experience over the next 5-10 years, as well as a thorough analysis of the legal authority needed to support them.

TCBMP Maintenance Inspection Requirements

The Copermittees recommend that the TCBMP maintenance verification requirements of the 2007 Order be modified to reduce duplication, and to increase flexibility in allocating staffing resources.

The 2007 Order requires annual verification of the effective operation and maintenance of each approved treatment control BMP by responsible parties. Moreover, it requires that Copermittees conduct independent inspections of all high priority TCBMPs, 50% of projects with drainage inserts, and a minimum of 20% of the total number of projects with approved treatment control BMPs.

Under the south Orange and south Riverside Orders, Copermittees are given greater flexibility in the selection of methods to verify effective TCBMP operation. In particular, these Copermittees must verify maintenance and effective operation of TCBMPs through a combination of "inspections, self-certifications, surveys, or other equally effective approaches." While both Permits contain minimum inspection requirements for projects with high priority TCBMPs, they do not independently require that the effective operation and maintenance each inventoried TCBMP be annually certified by the responsible party. Moreover, the south Riverside Permit does not require that at least 50 percent of projects with drainage insert treatment control BMPs be inspected annually, as do the San Diego and south Orange County Permits. Clearly, the conditions of the south Orange and south Riverside Permits are more flexible, and allow a more efficient use of Copermittee resources than does the 2007 Order. Moreover, differences in approaches between the three permits should be more fully explored and better aligned in the future.

2.A.ii Construction Activities Component (Permit Section D.2)

Existing Core Program

Each Copermittee implements a Construction Component to minimize the near-term impacts of construction activities on receiving water quality. Jurisdictions are currently implementing the following general control measures associated with this Component:

- Implementing a plan review processes to incorporate jurisdictional requirements.
- Creating a prioritized watershed-based inventory of all construction sites prior to the rainy season.
- Requiring minimum BMPs for high, medium, and low priority construction sites during all phases of construction.
- Inspecting construction sites at defined frequencies during the wet and dry seasons.
- Obtaining legal authority through the jurisdictional construction ordinances and permits to regulate all construction sites.
- Notifying the RWQCB of non-compliant sites via a reporting system.

Recommendations for Program Modification

The Copermittees recommend that they be given greater flexibility in implementing their Construction Components. At a minimum, this should include greater discretion in determining appropriate construction site inspection frequencies.

The 2007 Order establishes both priorities <u>and</u> mandated minimum inspection frequencies for regulated construction sites. This leaves Copermittees very little room in adjusting site requirements or inspection strategies for individual sites. For example, the current Permit does not allow a Copermittee to reduce inspection frequencies on inactive sites that have been stabilized. Moreover, construction sites disturbing greater than one acre of land area are concurrently subject to oversight and inspection by RWQCB staff under the State Construction General Permit (CGP), which has been reissued since the adoption of the 2007 Order . Copermittees should have the ability to take these and other relevant

considerations into account when establishing specific requirements and oversight strategies for these sites. In contrast, Permit Section D.3.b identifies industrial and commercial source types that must be addressed by the program, but leaves critical details such as site prioritization and inspection priorities up to individual Copermittees. Construction program requirements should be structured in a way that similarly allows Copermittees the discretion to best use the resources available to them.

2.A.iii Municipal (Existing Development; Permit Section D.3.a)

The Existing Development Component of the 2007 Order encompasses several sub-components which are addressed in further detail below.

Existing Core Program

Each Copermittee implements a Municipal sub-component to minimize pollutants in runoff from municipal facilities and activities. Municipal operations encompass a wide variety of activities and facility types (i.e., sources), some of which have the potential to generate pollutant loads in runoff. Jurisdictions are currently implementing the following general control measures associated with this sub-component:

- Developing a prioritized, watershed-based inventory of municipal sources, including at least the following high priority sources and activities:
    - Roads, streets, highways, and parking facilities;
    - Flood management projects and flood control devices;
    - Areas and activities tributary to a CWA Section 303(d) impaired water body segment, where an area or activity generates pollutants for which the water body segment is impaired. Areas and activities within or adjacent to or discharging directly to coastal lagoons or other receiving waters within environmentally sensitive areas;
    - Municipal waste facilities (active or closed landfills; publicly-owned treatment works; solid waste transfer facilities; land application sites; corporate yards; and household hazardous waste collection facilities);
    - Municipal airfields;
    - Parks and recreation facilities;
    - Special event venues following special events;
    - Power washing; and
    - Other sources determined to be significant by the Copermittee.
- Requiring and implementing BMPs at these and other specified sources or facilities (MS4s and structural controls; application, storage, and disposal of pesticides, herbicides and fertilizers at municipal areas and activities; and municipal sanitary sewers).
- Inspecting facilities for compliance, including annual inspections at high priority municipal sources.
- Enforcing stormwater ordinances as necessary.

Recommendations for Program Modification

The Copermittees recommend that the reissued Permit provide a mechanism either to entirely avoid the inclusion in their inventories of facilities and activities not considered to contribute a significant pollutant load to the MS4, or to remove them when determined appropriate. Additionally, the new Permit should not establish minimum inspection frequencies for any source or source type.

The 2007 Order prescribes the types of municipal facilities and activities that must be addressed by Copermittee programs, including those that must be considered high priority (and therefore inspected at least annually). In practice, many factors determine the threat-to-water-quality of an individual activity or site. Copermittees have multiple years of experience and inspection data that would often justify a decrease in priority or inspection frequency of an individual site. However, since the prescriptive language of the 2007 Order does not allow them this flexibility, facilities and activities not posing a significant threat-to-water-quality continue to be inventoried and inspected, often tying up limited resources.

As is already the case with Section D.3.b.(1) of the 2007 Order (industrial and commercial source identification), municipal inventories should include only those activities and facilities "that could contribute a significant pollutant load to the MS4" rather than requiring that all sources be addressed regardless of threat-to-water-quality. These changes would allow limited Copermittee resources to be better aligned with actual priorities and needs.

2.A.iv Industrial and Commercial (Existing Development; Permit Section D.3.b)

Existing Core Program

Each Copermittee implements an Industrial and Commercial sub-component to reduce the discharge of pollutants in runoff from business sites and activities. Commercial and industrial operations encompass a wide variety of activities and facility types (i.e., sources), many of which have the potential to generate pollutant loads in runoff. Jurisdictions are currently implementing the following general control measures associated with this sub-component:

- Compiling and prioritizing a watershed-based inventory of industrial sites and all high priority commercial sites "that could contribute a significant pollutant load to the MS4". At a minimum, this includes the business types listed in **Table 2.1**.
- Requiring businesses to implement minimum BMPs.
- Inspecting 100% of high priority sites annually, and 25% of all inventoried sources annually.
- Enforcing ordinances at non-compliant sites.
- Reporting industrial sites that may require coverage under the General Industrial Permit to the RWQCB.
- Participating in the development and implementation of a program to reduce the discharge of pollutants from mobile businesses.

Recommendations for Program Modification

The Copermittees recommend that they be given more flexibility in implementing their Industrial and Commercial Components, at a minimum to include greater discretion in determining appropriate inspection frequencies.

The Copermittees believe it is important to utilize their limited resources to focus on the highest threat to water quality sources. While the 2007 Order provides the Copermittees some flexibility in prioritizing sites and inspections, it does not encourage an efficient use of inspection resources.

For example, the 2007 Order requires that the Copermittees develop an inventory (with minimum facility types prescribed by the Permit) and within that inventory identify and annually inspect all high priority facilities. It further requires that each Copermittee perform inspections at 25% of all of its inventoried sites. In many cases, Copermittee resources would be better spent by increasing their focus on the facilities they consider the highest threat to water quality. For instance, if a Copermittee chooses to re-inspect a high priority facility, subsequent inspections should count toward their total inspection obligations (currently to inspect 25% of the total inventory). This is, however, not allowed under the 2007Order. To address such inefficiencies, it makes more sense to allow Copermittees greater discretion in setting their inspection priorities.

Table 2.1: Minimum requirements for Commercial and Industrial Source Inventories

Commercial Sources
• Automobile/Airplane/Boat/Equipment mechanical repair, maintenance, fueling, cleaning • Auto or other vehicle parking lots and storage facilities • Auto and other vehicle body repair or painting • Painting and coating • Mobile auto or other vehicle washing • Botanical or zoological gardens and exhibits • Retail or wholesale fueling • Nurseries and greenhouses • Pest control services • Masonry • Eating or drinking establishments • Cemeteries • Mobile carpet, drape or furniture cleaning • Pool and fountain cleaning • Cement mixing or cutting • Marinas • Landscaping • Port-a-potty servicing • Other commercial sites/sources that the Copermittee determines may contribute a significant pollutant load to the MS4 • Golf courses, parks and other recreational areas/facilities • Any commercial site or source tributary to a Clean Water Act section 303(d) impaired water body, where the site or source generates pollutants for which the water body is impaired • Any commercial site or source within or directly adjacent to or discharging directly to a coastal lagoon or other receiving water within an environmentally sensitive area
Industrial Sources
• Facility that contributes a significant pollutant load to the Copermittee's MS4 • Industrial facility is subject to section 313 Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA) • Industrial site is tributary to a 303(d)-listed water body and generates pollutants for which the water body is impaired • Industrial facilities subject to the statewide General Industrial Permit (SIC codes 0211 through 5171 in particular, although full SWRCB list should be considered • Industrial facilities located within or adjacent to (i.e., within 200 feet) of a coastal lagoon or a receiving water body within an environmentally sensitive area (ESA) or discharges directly to a receiving water body.

2.A.v Residential (Existing Development; Permit Section D.3.c)

Existing Core Program

Copermittees implement a Residential Component to prevent and reduce pollutants in runoff from residential land use areas and activities. Jurisdictions are currently implementing the following general control measures associated with this sub-component:

- Identifying high priority sources. The following activities have been identified as high priority sources of pollutants:
    - Automobile repair, maintenance, washing, and parking;
    - Home and garden care activities and product use (pesticides, herbicides, and fertilizers); and
    - Disposal of household hazardous waste, pet waste, and green waste.
- Additional criteria for identifying minimum high priority residential sources include:
    - Residential sources the Copermittee determines may contribute significant pollutant loads to the MS4;
    - Any residence tributary to a 303(d)-impaired water body, where the residence generates pollutants for which the water body is impaired; and
    - Any residence within or directly adjacent to or discharging directly to a coastal lagoon or other receiving waters within an environmentally sensitive area.
- Requiring BMP implementation.
- Educating residents.
- Responding to complaints.
- Enforcing jurisdictional ordinances, as necessary.

Recommendations for Program Modification

Except as indicated under Education below, the Copermittees do not have recommendations for modification of the residential requirements of the 2007 Order at this time.

2.A.vi Illicit Discharge Detection and Elimination Component (Permit Section D.4)

Existing Core Program

Each Copermittee implements an Illicit Discharge Detection and Elimination Component to eliminate illicit connections and illegal discharges into and from the MS4. Jurisdictions are currently implementing the following general control measures associated with this Component:

- Implementing a program to actively seek and eliminate illicit discharges and connections into its MS4.

- Developing and updating MS4 maps.
- Implementing dry weather field screening and analytical monitoring of MS4 outfalls and other portions of its MS4 to detect illicit discharges and connections.
- Investigating and inspecting potential IC/IDs based on monitoring results and other information.
- Eliminating identified IC/IDs.
- Preventing and responding to sewage and other spills.
- Using public hotlines and other methods to facilitate IC/ID reporting.

Recommendations for Program Modification

As described in Section 2.B.v, the Dry Weather Field Screening and Analytical Monitoring Program, intended to support IC/ID investigations, is not an efficient use of resources, is no longer necessary given other more effective measures that are implemented by the Copermittees (e.g., facility inspections, complaint hotline responses, and public employee surveillance). This program should therefore be discontinued in its current form (see analysis, Attachment1-1) The Copermittees do not have additional recommendations for modification of the IDDEC requirements of the 2007 Order at this time.

2.A.vii Education Component (Permit Section D.5)

Existing Core Program

Each Copermittee implements an Education Component to measurably increase the knowledge of target audiences within its jurisdiction regarding MS4s, the impacts of urban runoff on receiving waters, and potential BMPs. The education component also seeks to provide measurable changes in the behavior of these entities so as to reduce pollutant releases to MS4s and the environment.

The Education Component addresses the following six target audiences:

- Municipal Departments and Personnel
- Construction Site Owners and Developers
- Industrial Owners and Operators
- Commercial Owners and Operators
- Residential Community, General Public, and School Children
- Quasi-Governmental Agencies/Districts (i.e., educational institutions, water districts, sanitation districts)

In addition to these individual efforts, Copermittees implement a Regional Residential Education Program under Section F.1 of the 2007 Order, and within each Watershed Management Area (WMA) develop and implement watershed-based education strategies (Permit Section E.2.f.(4)). For each Permit year, no less than two Watershed Water Quality Activities and two Watershed Education Activities must be in an active implementation phase.

Recommendations for Program Modification

The core educational requirements of the 2007 Order Section D.5 should not be substantially modified at this time. However, the Copermittees recommend that the watershed education requirements of Section E.2.f.(4) and the Regional Residential Education Program required under Section F.1 be removed, and that Copermittees instead be allowed to develop and implement educational activities as needed to support the Watershed Plan strategies described in Section 3 of this ROWD. As described, Copermittees should identify and implement the jurisdictional and regional education activities that they determine to be necessary to support established Watershed Plan objectives.

2.A.viiiPublic Participation (Permit Section D.6)

Existing Core Program

Each Copermittee implements a Public Participation Component to incorporate public participation in the development of its JURMP.

Recommendations for Program Modification

The Copermittees do not have recommendations for modification of the public participation requirements of the 2007 Order at this time.

2.A.ix Reporting and Assessment (Permit Sections I and J)

Existing Core Program

Per Sections I and J of the 2007 Order, Copermittees annually report on and assess the progress and effectiveness of their JURMP, WURMP, and RURMP elements. Annual assessments, which are part of the JURMP Annual Report, typically include:

- Assessment of the effectiveness of:
    - Significant jurisdictional activities and BMPs;
    - Implementation of each major JURMP component (Development Planning, Construction, Municipal, Industrial/Commercial, Residential, Illicit Discharge Detection and Elimination, and Education); and
    - Implementation of the Jurisdictional Urban Runoff Management Program as a whole.
- Identification and utilization of measurable targeted outcomes, assessment measures, and assessment methods for each of the above items.
- Utilization of outcome levels 1-6.
- Utilization of monitoring data and analysis from the Receiving Waters Monitoring Program.

Recommendations for Program Modification

The Copermittees recommend that the reporting and assessment requirements of the 2007 Order be significantly streamlined and simplified. Additional dialogue between the Copermittees and RWQCB

staff should be focused on identifying the most efficient and effective reporting and assessment approaches under a reissued Permit.

The Copermittees also recommend that jurisdictional compliance be monitored through the Watershed annual reports (see Section 3.B.iii).

RWQCB staff would have other means such as meetings and audits available to them to further evaluate jurisdictional compliance. With this change in emphasis, it's unlikely that JURMP Annual Reports would be necessary in the future.

JURMP Annual Reports in particular currently consume an inordinate amount of Copermittee resources to complete. Likewise, their sheer volume makes it very difficult for RWQCB staff to complete timely reviews. This is critical since the 2007 Order relies primarily on the jurisdictional reports for evaluating Copermittee progress and compliance. Assuming a significantly greater focus on watershed programs under the reissued Permit, this will likely be unnecessary. RWQCB staff could instead focus on evaluating Copermittee compliance within the context of each applicable Watershed Annual Report. Other aspects of core jurisdictional compliance could be evaluated in other ways (e.g., audits or specific information requests) and on different time scales (e.g., biannually or as-needed).

2.B MODIFICATIONS TO MONITORING PROGRAMS

The existing monitoring program is summarized in the monitoring attachment of the LTEA report, submitted separately. This section of the ROWD describes preliminary modifications to the monitoring program along with a summary of supporting data analysis. Details of the data analysis are presented in Attachments 2.1 to 2.3. Results from the Copermittees' visioning process informed the Copermittees' modifications to monitoring programs as follows:

- Monitoring results should aid Copermittees in establishing watershed priorities and adjusting watershed plans through the adaptive management strategy (see Goal 1)
- Monitoring should be more responsive to the Copermittees' needs within an adaptive management context (see Goal 4)
- Monitoring activities should be coordinated or leveraged with other monitoring programs including the implementation of TMDLs (see "Key Concepts" in ROWD Section 1.E.iii)
- Monitoring reports should be streamlined (see "Key Concepts", in ROWD Section 1.E.iii)
- Monitoring activities should aid watershed managers in developing watershed priorities based on the contribution of MS4s to identified watershed receiving water issues, the potential for beneficial use impacts, and the Copermittees' ability to control and assess compliance with performance standards, as applicable. (see Goals 1 and 4)

The preliminary monitoring approach emphasizes a Question-Driven Process consistent with the approach taken through the current permit term. In alignment with the Copermittees' proposed adaptive management process, the various monitoring efforts described in this section are designed to inform and assess watershed-based management decisions.

2.B.i Conceptual Monitoring Framework

The Copermittees have developed a Conceptual Watershed Monitoring Framework (Conceptual Framework) designed to serve the needs of the Watershed Plans, and to support the overall goal of reducing discharges of pollutants to the MEP. The Conceptual Framework is shown diagrammatically in **Figure 2.1**.

This framework recognizes that the fundamental purpose of the NPDES permit program is protection of receiving water quality, to support viable beneficial uses of the receiving waters. This underlying purpose then provides the basis for the permit requirements and the content of the Watershed Plans.

The Conceptual Framework incorporates monitoring activities involving two time frames:

- Long-term monitoring (typically conducted for more than 5 years) includes ongoing compliance monitoring of receiving waters, MS4 outfalls, and includes HMP and TMDL compliance monitoring, and
- Short-term monitoring (typically conducted for less than 5 years) involving Targeted Studies that are of limited duration and that are watershed-driven, as-needed, and may include monitoring of receiving waters or MS4 Outfalls, HMP and TMDL monitoring, Source Identification and Prioritization studies, and watershed-specific Targeted Studies, including BMP Effectiveness Studies.

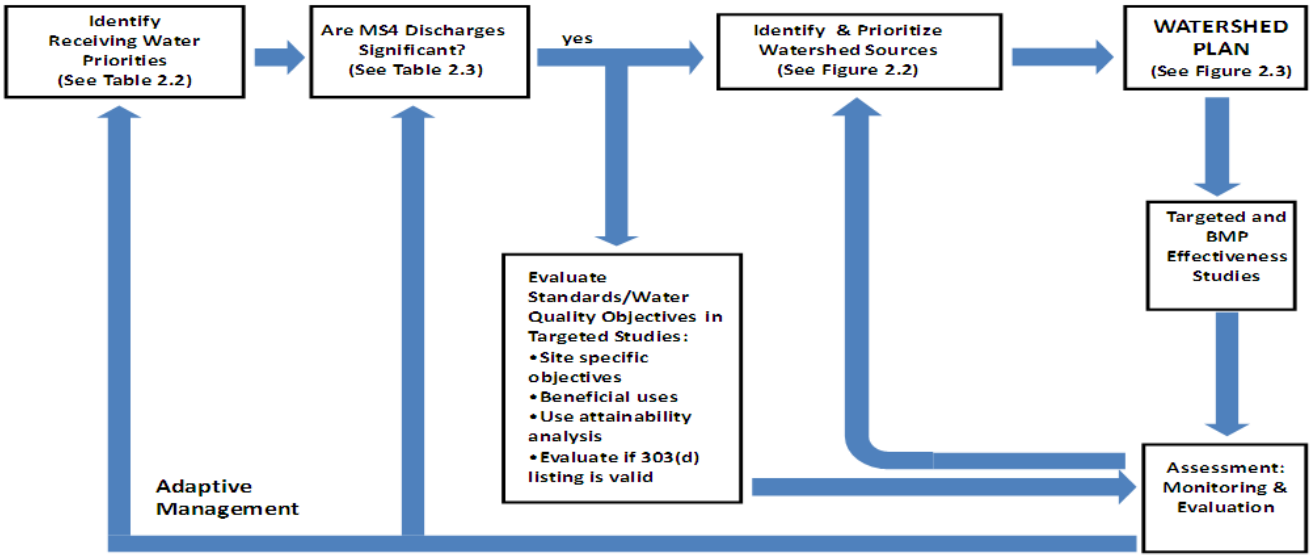

Figure 2.1: Conceptual Framework for Watershed Monitoring

The principal purpose of receiving water monitoring is to assess attainment of designated beneficial uses. Watershed receiving water priorities (Watershed priorities) are well established through prior monitoring of receiving waters in San Diego County (see Attachment 2-1, as well as the LTEA report, submitted separately).

With watershed priorities well established for the next permit cycle, monitoring can be reduced in receiving waters and those efforts refocused to determine to what degree discharges from the MS4s contribute to the identified watershed priorities. Receiving water monitoring may still be necessary to help assess stormwater program effectiveness, as shown in the feedback loop on the Conceptual Framework diagram (Figure 2.1). In this context receiving water priorities also may be revised. The Copermittees' participation in TMDLs also may involve receiving water monitoring to determine the effectiveness of TMDL implementation.

If MS4s are found to contribute significantly to receiving water issues, then follow-up investigation may be implemented within watersheds as indicated in Figure 2-1 (see box under "if yes"). For constituents for which MS4 discharges contribute significantly to confirmed receiving water issues, source identification and prioritization studies may be performed on a constituent-specific basis. Such follow-up investigations may involve monitoring in the form of watershed-driven targeted studies.

The results of the watershed-driven source investigations may then be used in the watershed planning process to develop strategies for reduction of the high priority sources of discharges of the subject constituent.

The Conceptual Framework includes the analysis of appropriate data to evaluate program effectiveness and identify data gaps, if any. This completes the monitoring information cycle to guide the alternate adaptive management approach.

2.B.ii Question-Driven Process

The conceptual framework addresses and clarifies the management questions developed by the Southern California Stormwater Monitoring Coalition (SMC) and listed in the current Permit:

1. Are conditions in receiving waters protective, or likely to be protective, of beneficial uses?
2. What is the extent and magnitude of the current or potential receiving water problems?
3. What is the relative urban runoff contribution to the receiving water problem(s)?
4. What are the sources of urban runoff that contribute to receiving water problem(s)?
5. Are conditions in receiving waters getting better or worse?

For monitoring of receiving waters and MS4 outfalls, including HMP and TMDL monitoring, – a question-driven approach was used to guide the identification of more specific questions or sub-questions, and from those sub-questions were derived the specific activities that may guide monitoring activities for the next permit term. The sub-questions and associated activities are described below for the receiving water and MS4 outfall monitoring categories.

Approaches for source identification, responses to potential action level exceedances, and potential development of watershed-driven targeted studies, as-needed, are outlined below.

2.B.iii Receiving Water Monitoring

In reviewing available receiving water monitoring data, the Copermittees determined the following:

- Watershed priorities are already well-established for the watersheds of San Diego County, based on prior monitoring by the Copermittees and others.
- Existing mass loading stations (MLS) and temporary watershed assessment stations (TWAS) should be consolidated into a smaller number of representative TWAS, with reduced monitoring frequency. Monitoring of 3 to 5 receiving waters stations once every five years should suffice for assessment of long-term trends of constituents per SMC Question 5 (see analysis, Attachment 2-1). In the future, watershed Copermittees will consider the need for focused receiving water studies as initiated through the Watershed Plans.
- Participation in the SMC Regional Monitoring Program is anticipated to be continued, to provide a statistically-sound, representative sampling of receiving water quality in the region's watersheds.
- The Ambient Bay and Lagoon Monitoring program (ABLM) is anticipated to be coordinated with the periodic Bight program monitoring, and integrated with the Copermittees' responsibility to conform to the Statewide Sediment Quality Objectives regulatory program.
- The 2010 HMP Monitoring Plan will continue to be implemented under the next permit.
- Receiving water monitoring conducted in response to adopted TMDLs should replace receiving water monitoring required by the Permit where applicable.
- Where appropriate, the Permit should allow for the trade-off of required monitoring elements in consideration of participation to support the RWQCB's Basin Planning priorities (i.e., evaluating or validating the appropriateness of beneficial use designations and water quality objectives).
- As under the 2007Order, the new Permit should allow a trade-off of required monitoring elements in consideration of participation in the Southern California Bight Regional Monitoring effort. The benefits of participation include regionally consistent data collection, additional in-depth data analysis and the leveraging of San Diego County resources with resources from outside the county.
- The Coastal Storm Drain Monitoring (CSDM) Program (which includes both MS4 outfall and receiving water monitoring) is essentially complete and should be discontinued (see analysis, Attachment 2-2). The CSDM Program has demonstrated that coastal storm drain flows cause few ocean or bay bacterial standard exceedances during dry weather. Less than 2 percent of paired receiving water and coastal storm drain samples collected from 2007-2010 indicate a "linkage", where elevated storm drain concentrations correlate with observed receiving water exceedances of AB 411 bacterial criteria. Of 1,647 individual receiving water bacteria indicator

samples analyzed, only 32 corresponded with elevated bacteria levels in coastal storm drain outfall discharges (3.5 % of paired samples for *Enteroccocus*, 1.5 % of paired samples for Fecal Coliform, and 0.9 % of paired samples for Total Colifoms).

SMC Management questions 1, 2, and 5 address receiving waters. Questions 1 and 2 have been well answered through the receiving water monitoring performed by the Copermittees, as well as work performed by others, including water quality impairments identified per CWA Section 303(d) and Bight Regional Monitoring Studies. Management question 5 addresses the issue of long-term trends; it is assumed that this question will be addressed on a continuing basis over the long term through the Copermittees continued participation in Bight Regional Monitoring Studies.

Preliminary receiving water sub-questions were developed, along with preliminary receiving water monitoring activities to guide the proposed approach in a more targeted manner through the next Permit term, as presented in **Table 2.2**. The management questions shown in Table 2.2 are meant to provide context for the more specific, technical monitoring sub-questions and associated monitoring activities. Monitoring results from any given activity may only partially contribute to answers for the overarching "big picture" management questions.

2.B.iv MS4 Outfall Monitoring

Under an updated approach, the principal role of MS4 Outfall Monitoring in the Conceptual Framework is to provide information on the relative contribution of MS4 discharges of priority constituents to receiving waters. It is recognized that the Permit may include requirements for performance metrics for MS4 discharges, and that outfall monitoring may be required to make the relevant assessments of discharge quality.

In reviewing available MS4 outfall monitoring data collected under the current Permit, the Copermittees determined the following:

- The ongoing MS4 outfall monitoring programs, which include both randomly selected and targeted sites, should be continued, with modifications to the number and distribution of sites as necessary to improve efficiency and value of the data. In particular, outfall monitoring should be evaluated with respect to established watershed priorities and TMDLs, and coordinated so as to provide information on the relative contribution of MS4s to receiving water issues. Outfall monitoring is anticipated to continue during both wet and dry weather conditions where appropriate for safe access and not disturbing critical habitat (Attachment 2-3). Additionally, a focused group of chemical analyses addressing the watershed priorities as is done in the current MS4 Outfall Program should be continued.
- Monitoring of representative outfalls should be considered for TMDL constituents in watersheds where the Copermittees are responsible parties in a TMDL implementation plan and where the outfalls are part of the monitoring plan.
- As described above, the CSDM program (which includes both MS4 outfall and receiving water monitoring) is essentially complete and should be discontinued (see analysis, Attachment 2-2). In addition to the low incidence of correspondence between elevated coastal storm drain outfall bacteria discharge levels and receiving water AB411 exceedances (as described above), the

number of coastal storm drain discharges that reach receiving waters has decreased during the past eight years, from 73 percent to 23 percent. This decrease in discharge flows reaching the receiving waters demonstrates a lower risk of a linkage occurring between coastal storm drains and receiving waters.

- The Dry Weather Field Screening and Analytical Monitoring Program characterizes discharges in the MS4s using a limited list of constituents. This overlaps with the current MS4 Outfall Monitoring Program, which expands the list of constituents and tailors the list to support watershed planning. To avoid this duplication of effort, the MS4 outfall monitoring should be conducted under the MS4 Outfall Monitoring Program instead of the Dry Weather Program (see analysis, Attachment 1-1).

Table 2.2: Preliminary Receiving Water Monitoring Sub-Questions and Activities

Management Question	Preliminary Monitoring Sub-Question	SMC QST No.	Preliminary Monitoring Activity
1. Are the aquatic ecosystems healthy?	What are conditions of benthic fauna in receiving waters?	1,2	Committed to completion of SMC Southern California bioassessment monitoring.
2. How is the health of the streams/rivers affected by urban runoff changing over time?	How are conditions in receiving waters that are affected by urban runoff discharges changing over time?	1,5	Wet Weather: Monitor at 3 to 5 MLS stations (locations to be determined) once per permit term for 3 events during Bight Regional Monitoring Survey. Dry Weather: Monitor at 3 to 5 MLS stations once per permit term (locations to be determined) for 2 events during Bight Regional Monitoring Survey.
3. What are additional receiving water quality problems?	Where data are lacking, what is receiving water quality with respect to watershed priorities and regulatory mandates?	1,2	Focused receiving water monitoring with a minimum of one special study per WMA per permit term coordinated with the Watershed Plans or substitute an equivalent regionally coordinated study (e.g., Bacteria/REC1 Beneficial Use Study) with RWQCB staff approval to evaluate: • Receiving Water Priorities • Triennial Review Priorities • Beneficial Uses and Basin Plan Objectives • 303(d) listings • TMDLs • Impact of MS4 outfalls on receiving waters

Table 2.2: Preliminary Receiving Water Monitoring Sub-Questions and Activities

Management Question	Preliminary Monitoring Sub-Question	SMC QST No.	Preliminary Monitoring Activity
4. How effective are our management actions to meet TMDL requirements?	What is the progress in achieving and complying with adopted TMDLs and WLAs?	1,5, Targeted	Perform compliance monitoring for: • Chollas Creek Diazinon TMDL • Shelter Island Yacht Basin Dissolved Copper TMDL • Chollas Creek Dissolved Copper, Lead and Zinc TMDL • Revised Project 1- Indicator Bacteria TMDLS for Twenty Beaches and Creeks in San Diego Region • Project II – Indicator Bacteria TMDLs in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay
5. Are the bays and estuaries healthy and protective of estuarine beneficial uses?	What is the condition of sediments in enclosed bays and estuaries with respect to the statewide sediment quality objectives?	1,2	Submit a Work Plan to comply with the requirements of State Water Resources Control Board Resolution No. 2008-0070 – Adoption of a Water Quality Control Plan for Enclosed bays and estuaries – Part 1 Sediment Quality

Table 2.2: Preliminary Receiving Water Monitoring Sub-Questions and Activities

Management Question	Preliminary Monitoring Sub-Question	SMC QST No.	Preliminary Monitoring Activity
6. How is the Hydromodification Management Plan being implemented?	a. Do field observations confirm that the HMP appropriately defines the flow rate (expressed as a function of the 2-year runoff event) that initiates movement of channel bed or bank materials? b. Are mitigation facilities adequately meeting flow duration design criteria outlined in the HMP? c. What is the effect of development on downstream cross section incision and widening?	Targeted	a.b.c. Per Revised July 14, 2010 Section 8 of the Hydromodification Management Plan and California Regional Water Quality Control Board, San Diego Region, Resolution No. R9-2010-0066

SMC management question 3 addresses the relative contribution of MS4 discharges to receiving water constituent levels. Preliminary focused MS4 outfall monitoring sub-questions were developed along with preliminary MS4 outfall monitoring activities; see **Table 2.3** below. The management questions shown in Table 2.3 are meant to provide context for the more specific, technical monitoring sub-questions and associated monitoring activities. Monitoring results from any given activity may only partially contribute to answers for the overarching "big picture" management questions.

Table 2.3: Preliminary MS4 Outfall Monitoring Sub-Questions to SMC Question No. 3 and Preliminary Activities

Management Question	Preliminary Monitoring Sub-Question	Preliminary Monitoring Activity
1. Are the MS4s a potential source of priority constituents to receiving waters?	How do representative outfall concentrations compare to concentrations of priority constituents in receiving water?	An analysis of the MS4 outfall monitoring results collected under the 2007 Permit will be conducted when program is completed in 3 years.
2. Is it a system-wide or area-specific water quality issue?	How do MS4 outfall discharge characteristics differ within or between watersheds? (Note: Important for regional issues such as TDS & Bacteria)	An analysis of the MS4 outfall monitoring results collected under the 2007 Permit will be conducted when current program is completed in 3 years.
3. When is the best time to focus management actions and/or BMP implementation?	How do wet weather outfall concentrations compare to dry weather within and among watersheds?	An analysis of the MS4 outfall monitoring results collected under the 2007 Permit will be conducted when current program is completed in 3 years.
4. Which factors influence MS4 outfall discharge water quality?	How do wet season dry weather discharges differ from dry season dry weather discharges? What are the patterns and factors affecting wet weather discharge characteristics?	Perform monitoring to distinguish wet season dry weather from dry season dry weather. Perform appropriate data analysis (e.g., multivariate analysis including land use, geology, drainage acreage, antecedent rainfall conditions, etc.).
5. Are MS4 outfalls water quality improving overtime?	How do representative MS4 outlet discharge concentrations, loads, and flows change over time? (i.e. trends)	Continue to monitor at a sub-set of random MS4 outfall sites to assess long-term trend line

Table 2.3: Preliminary MS4 Outfall Monitoring Sub-Questions to SMC Question No. 3 and Preliminary Activities

Management Question	Preliminary Monitoring Sub-Question	Preliminary Monitoring Activity
6. Are MS4s outfalls meeting Permit Action Levels (if applicable)?	Do discharge concentrations at MS4 Outfall discharges meet permit action levels (if applicable)?	Conduct wet and dry weather monitoring at representative selected sites.
7. What outfalls ("priority outfalls") are contributing most to receiving water?	What outfalls contribute most to loadings for constituents identified as receiving waters priorities? (based on representative outfalls)?	Use monitoring results in numbers 1-3 and 5 and perform data analysis which may include modeling
8. To what extent is watershed plan implementation affecting discharge quality at priority MS4 outfalls?	How do discharge characteristics change over longer term (i.e. trends) at priority outfalls?	Monitor outfalls identified in assessment of number 6

2.B.v Source Identification

The principal role of Source Identification in the Conceptual Framework is to identify and prioritize pollutant generating activities and source categories. Identification of high-priority sources is an important step in support of the watershed planning process, to help inform the development of effective pollutant reduction strategies for particular priority constituents in particular watersheds.

In reviewing available source identification information, the Copermittees determined the following:

- The Copermittees should consider developing a more comprehensive approach to source identification, on a *constituent-specific basis*. These source identification efforts should focus on constituents identified as watershed priorities, and would likely include prioritization of sources based on magnitude, controllability, and other factors.
- The ongoing residential source identification program, which provides information on water quality of discharges from residential land uses, should be completed as planned and then discontinued.
- As described above, the CSDM Program (which includes both MS4 outfall and receiving water monitoring) is essentially complete and should be discontinued (see analysis, Attachment 2-2).
    - Only 4 of the 227 (1.7 percent) coastal storm drains monitored over the past three years were linked more than once to a nearby AB411 exceedance in the ocean or bay. These four coastal storm drains have ongoing source abatement programs.
    - In addition, upcoming Bacteria TMDL monitoring will overlap with CSDM Program requirements. The TMDL will require an implementation plan to assess and prioritize receiving water exceedances caused by outfall discharges.
- The Dry Weather Field Screening and Analytical Monitoring Program, intended to support IC/ID investigations, is not an efficient use of resources, has had a very low success rate in identifying

ICs and IDs, and is no longer necessary given other more effective measures that are implemented by the Copermittees (i.e., facility inspections, complaint hotline responses, public employee surveillance). This program should therefore be discontinued in its current form (see analysis, Attachment 1-1). IC/ID investigations as conducted under the Dry Weather Program are less efficient in detecting and eliminating IC/IDs than hotline call responses (over 1,600 annually), business inspections (over 6,000 annually), and visual surveys of the stormwater conveyance system performed during routine system maintenance and/or cleaning. Based on the number of samples collected through the Dry Weather Program over the past three years, only 3.7 percent of samples collected resulted in a successful detection and elimination of an illicit discharge (87 successful IC/ID investigations out of 23,635 sample analyses from 2007-2009). Copermittees observed that more IC/IDs were identified through complaint referrals than through the Dry Weather Program. The City of Oceanside reported in 2009-2010 that 86 out of 87 IC/IDs identified through their hotline were eliminated, whereas only one IC/ID was identified and resolved through their Dry Weather Program.

SMC management question 4 addresses the sources of MS4 discharges that contribute to receiving water constituent levels. The Copermittees will consider approaching this question principally through a source identification process for individual priority constituents.

As shown in **Figure 2.2**, the Copermittees' preliminary constituent-specific source identification process includes the following steps:

- Step 1: Compile known information on the priority constituent. This information includes potential sources and movement of a particular constituent within the urban watershed. Data generated by others and literature research on the priority constituent will be compiled and analyzed as appropriate.
- Step 2: Based on the compiled information generated on the priority constituent, identify data gaps, if any. Targeted studies may be performed where appropriate. For example, targeted studies to improve our understanding of the fate of a constituent in the environment might be considered.
- Step 3: Based on the information compiled, develop an inventory of sources and consider how to prioritize them within the watershed for potential follow-up action. Examples of prioritization criteria include relative magnitude and controllability.

Figure 2.2: Schematic of Preliminary Source Identification Process

The process outlined above is directed at improving the understanding of the fate, transport, and sources of priority constituents within urban watersheds. Steps 1 and 2 may be conducted at a regional scale to reduce costs. Step 3 will likely be applied within a watershed for that particular priority constituent.

2.B.vi Preliminary Watershed Responses to MS4 Monitoring Results

In the event that the RWQCB imposes NALs or SALs in the new permit, Copermittees recommend that the Permit include an iterative approach for responses to potential exceedances of those NALs or SALs. The overall goal is to provide for a range of responses that is comprehensive, consistent and appropriate to the measured outfall levels. The preliminary approach is outlined in **Figure 2.3**.

If initial field observations indicate a potential illegal discharge that is characterized by unusual odor, color, or sheen, etc, then an immediate response will be initiated. If warranted, a field investigation will be initiated to follow the observed flow upstream, in an attempt to observe the source, with additional water quality measurements performed as needed.

If there is no evidence of a potential illegal discharge, then the follow-up actions would fall into one of the following three categories:

- The receiving water has an active TMDL Implementation Plan, in which case the exceedance will be addressed through the relevant Watershed Plan.
- The constituent is an established watershed priority, in which case the constituent is addressed through the preliminary source identification process (see description above) and the data are fed into the watershed planning process.
- For constituents not covered under a TMDL implementation plan and which are not priority constituents, additional follow-up monitoring will be performed to verify the persistence of the exceedance. If the exceedance does persist, the measured outfall levels will be compared to receiving water levels for the constituent to provide an assessment of the relative contribution of the discharge to the in-stream levels. If the discharge is substantially contributing to the receiving water exceedance, then the constituent will be included in the watershed planning process. If the exceedance is not persistent, then no further action is required and routine monitoring will continue.

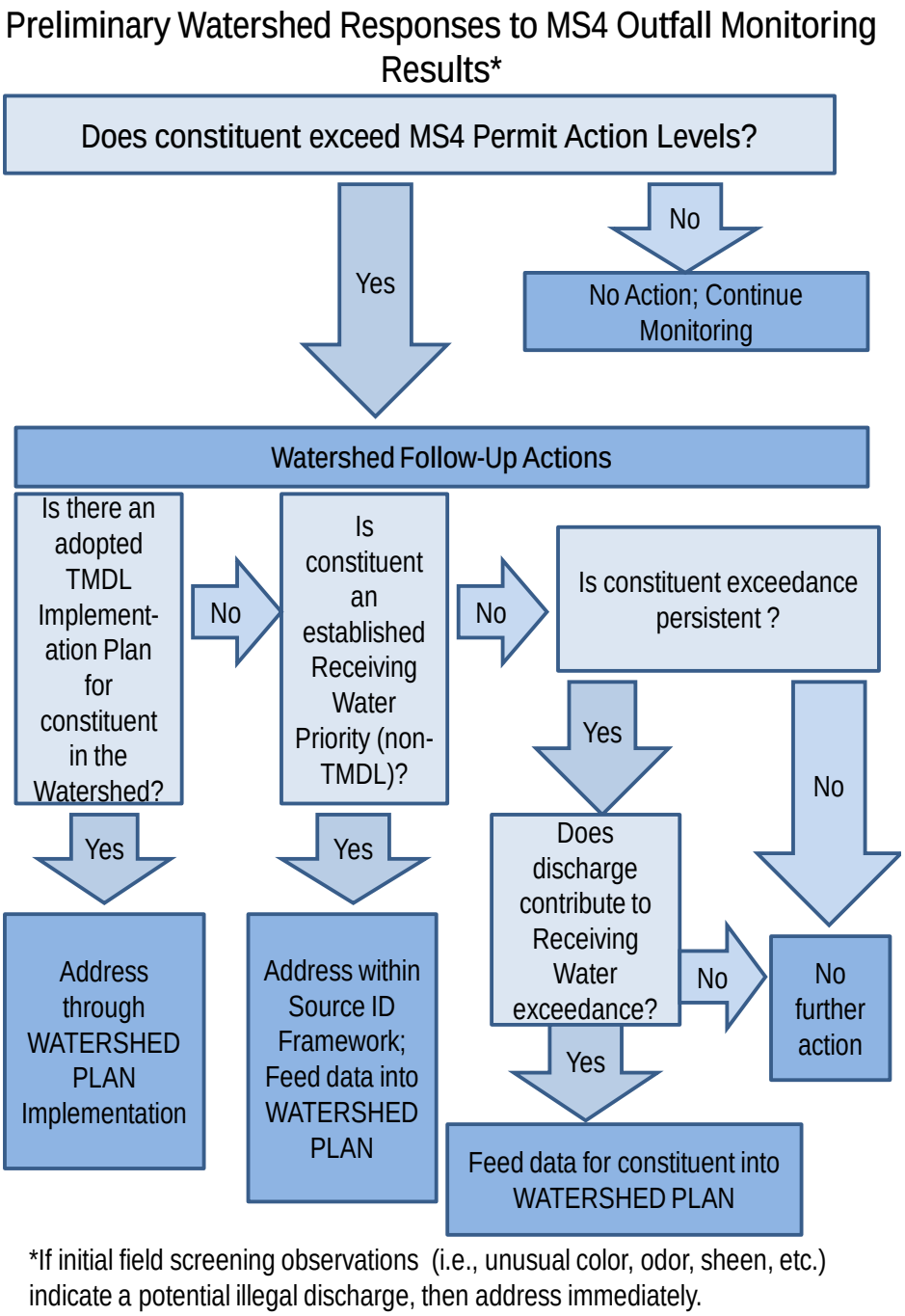

Figure 2.3: Preliminary Strategy for Responses to MS4 Outfall Exceedances

2.B.vii Targeted Studies

Copermittees would periodically evaluate the need for targeted studies to support the watershed adaptive management strategy. Examples of targeted studies include investigation of sources of MS4 contributions to receiving water priorities, participation in Bight Regional Monitoring projects, assessment of TMDL compliance strategies, evaluation of BMP effectiveness, and investigation of the appropriateness of beneficial uses or water quality objectives.

Section 3 Watershed Adaptive Management Strategy

In ROWD Section 1 the concept of watershed adaptive management was presented as the strategy for prioritizing, structuring and directing the Copermittees' stormwater management efforts. The translation of that strategy into an implementation document is represented by the development of a Watershed Plan. The development, implementation, and assessment and iterative updating of these Plans is described below.

3.A WATERSHED ADAPTIVE MANAGEMENT STRATEGY

As noted in Section 1, the Copermittees support a permitting approach that facilitates the implementation of the most effective and efficient stormwater management programs. Consequently, the Permit should be predicated on an adaptive management framework such as the one shown in **Figure 3.1**. As indicated, the Copermittees recognize that the Permit must continue to contain a "core" set of required activities. This is both appropriate and desirable for the purpose of defining what initially constitutes compliance. However, the Permit must also allow for modifications to core requirements when a Copermittee proposes and justifies a more effective or efficient suite of stormwater control measures. Two of the key factors expected to inform adaptive management decisions are watershed water quality priorities and BMP effectiveness data. Over time, core activities – which are typically established as generic preventive measures – should be evaluated with respect to whether they effectively address the pollutant-generating sources and activities causing a watershed's priority water quality problems, and adjusted as determined appropriate by the Copermittee with Regional Board staff approval to enhance efficiency. This is critical to ensuring the best use of limited resources.

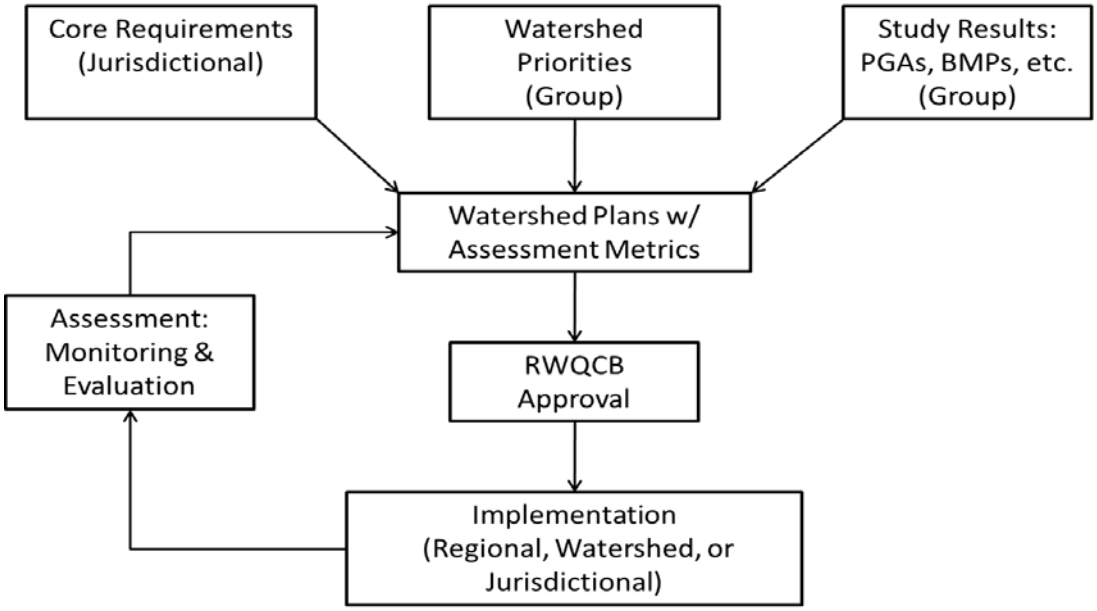

Figure 3.1: Watershed Adaptive Management Strategy

The Copermittees support the development of criteria to govern the adaptive management process so that modifications to core requirements are proposed and justified based on sound and impartial information. These criteria should either be developed during the Permit reissuance process, or as an early deliverable under the new Permit. In either case, to be workable in practice, the Permit's adaptive management provisions must also represent a reasonable balance of specificity and flexibility. Each Copermittee should remain responsible for selecting and proposing the combination of activities and controls that will result in the most effective and efficient stormwater program within its jurisdictional boundaries. A "one-size-fits-all" application of adaptive management requirements is neither effective nor desirable. Similarly, each jurisdiction should be held accountable for the implementation of its jurisdictional program and a determination as to whether it has met the Permit's "maximum extent practicable" performance standard. This is not to say that every jurisdiction should be completely independent in managing its program. For example, Figure 3.1 shows that watershed pollutant and source prioritization, as well as studies to evaluate BMP effectiveness or to characterize pollutant generating activities (PGAs), would be appropriate activities for implementation by groups of Copermittees at the watershed or regional scale. Other activities where economies of scale could be realized through group implementation might include public education and water quality monitoring. In most cases, however, identifying the appropriate scale of implementation is best left to jurisdictional discretion. The establishment of clear assessment metrics will play an important role in determining whether watershed plan implementation is on the right track and achieving desired results.

The Watershed Adaptive Management Strategy would also benefit from a well-defined role for RWQCB staff in reviewing and approving proposed modifications to core requirements. This is necessary not only to evaluate the appropriateness of proposed programs and changes, but to provide Copermittees with a level of certainty with regard to what constitutes compliance.

The central feature of the Copermittees' recommended Watershed Adaptive Management Strategy is the "Watershed Plan" as shown in **Figure 3.1**. A single plan for each watershed (i.e. replacing the URMPs – regional, watershed, and jurisdictional) would help streamline and refocus efforts and make best use of limited resources. The watershed appears to be the appropriate scale at which to integrate the many programs and activities targeting water quality improvement. Furthermore, this scale is consistent with other regulatory programs and policies (e.g. TMDLs and Basin Plans). While it is critical that decision-making remain within the discretion of each jurisdiction, the creation of Watershed Plans would encourage each Copermittee to carefully consider the impact of its management decisions on priority watershed water quality conditions. Enhancing the Permit's watershed focus would also enable Copermittees to better integrate TMDL and ASBS goals into Permit compliance activities. In fact, the Copermittees see the potential for Watershed Plans developed and implemented under the Permit to serve a similar function as the load reduction plans currently required by TMDLs. Better integration of TMDL and Permit programs is consistent with the Copermittees' Vision presented in Section 1 and could provide significant administrative cost savings.

3.B WATERSHED PLAN DEVELOPMENT

The Copermittees support the development of Watershed Plans for the nine major Watershed Management Areas (WMAs) currently identified in the 2007Order. Copermittees might also instead

elect to develop Watershed Plans specific to hydrologic areas within a WMA if determined appropriate (e.g., San Diego Bay and Carlsbad WMAs). Watershed Plans would be developed during the first year and implemented and periodically updated throughout the remainder of the Permit cycle. Watershed leads are summarized in **Table 3.1** below. Watershed Plans will be prepared at the watershed level but specific requirements may be implemented at the regional, watershed, and/or jurisdictional scale.

Table 3.1 Watershed Management Areas (WMAs) and Lead Jurisdictions

WMA	Lead Jurisdiction
Santa Margarita	County of San Diego
San Luis Rey	City of Oceanside
Carlsbad	City of Carlsbad
San Dieguito	City of Escondido
Penasquitos	City of Poway
Mission Bay	City of San Diego
San Diego River	City of El Cajon
San Diego Bay	Port of San Diego
Tijuana	County of San Diego

The Watershed Plans represent a continuation and refinement of the Watershed Urban Runoff Management Programs (WURMPs) developed under the 2007 Order. On the surface the two are very similar. WURMPs were completed for each of the WMAs with the goals of improving Copermittee understanding of water quality issues and concerns, enhancing stakeholder participation, and augmenting jurisdictional programs to more effectively address watershed specific issues. The Watershed Plan would further these goals by strategically focusing jurisdictional, watershed, and regional efforts toward the highest priority constituents and sources in each WMA. By making watersheds the primary foci of Permit programs, Copermittees would also be better able to address other regulatory requirements such as those associated with TMDLs and ASBS programs.

A key feature of Watershed Plans is that they incorporate a combination of planning, implementation, and assessment activities at the most appropriate scales to confer and demonstrate watershed-scale benefits. In essence they provide a unified comprehensive implementation plan for each WMA that identifies the jurisdictional, watershed, and regional activities and control measures that will be pursued. As illustrated in Figure 3.1, the development of the Watershed Plan is described below and includes the following steps:

1. Establishing the watershed priorities(constituents and sources);
2. Modifying jurisdictional core stormwater program implementation strategies to address the highest priority issues and concerns (including the incorporation of BMP effectiveness and source identification findings);
3. Identifying assessment and reporting objectives and metrics; and
4. Obtaining approval by the RWQCB Executive Officer.

3.B.i Establishing Watershed Priorities

In evaluating existing water quality conditions and establishing stormwater management priorities for a watershed, the Copermittees would consider a variety of data and information sources. These include existing water quality data and assessments, WURMPs, WURMP Annual Reports, TMDLs, LTEAs, focused analysis, current monitoring programs, and regulatory requirements. This evaluation will assist in identifying and prioritizing the watershed issues and may support the need to establish different priorities within a watershed. In establishing watershed priorities Copermittees may consider the following: pollutants or issues of concern, watershed characteristics, and a prioritization process to consider multiple issues in determining the watershed priorities. Each is discussed briefly below. Priorities will be established in the beginning of the Permit term and adjusted as needed in subsequent years.

The Copermittees have implemented an extensive monitoring program for many years with the data being used to identify Pollutants and Issues of Concern in previous regulatory documents. Such work provides an excellent foundation for establishing watershed priorities. In addition to pollutants, additional issues of concern may include stream bank erosion or benthic community conditions. In evaluating the previous monitoring programs, consideration will be given to historical trends, land-based pollutant loadings, designated uses, and persistent water quality impacts based on the triad of chemistry, toxicity, and benthic community data. The Copermittees may consider common pollutants/Issues of Concern and choose to prioritize these at the jurisdictional, watershed or regional scale, as defined in the Watershed Plan. In addition consideration may be given to differentiate between wet and dry weather issues.

Key watershed characteristics will vary by watershed but notable characteristics may include sensitive species or ecosystems (i.e., North County Multiple Habitat Conservation Program), 303(d) listed water bodies, ASBS, areas prone to flooding, channel erosion, tidally influenced waterbodies, groundwater recharge areas, presence of septic system, and age of infrastructure. These types of factors will be taken into account when determining the stormwater program activities most effective in each watershed. For example, it may be an effective use of resources to target components of an illicit discharge/illegal connection program in a watershed with aging infrastructure. Additional considerations may also include land use and growth patterns. Understanding the dominant land use within each watershed can help to direct resources on the program components most applicable to each watershed. For example, areas of watersheds predominantly made up of industrial/commercial land uses would benefit from placing emphasis on the industrial/commercial component of their stormwater program over the residential component.

Once the characterization is complete, the Copermittees would consider a number of other factors in prioritizing watershed issues. This prioritization would assist them in identifying the key stormwater program implementation activities that will address the pollutants or issues of concern as discussed above. These factors may include:

- Applicability of regulatory drivers such as 303(d) listing, approved TMDLs, 13267 water quality violations

- Optimizing ongoing implementation efforts (e.g., addressing the PGAs and/or source categories that are the major contributors of the pollutants of concern) to address water quality issues,
- Ability to serve as an "umbrella issue" that encompasses multiple community goals including recreation, habitat enhancement, etc.
- Ability to address primary stakeholder concerns including beach closures, drainage issues, etc.
- Feasibility to address within regulatory and time constraints

3.B.ii Refining Core Stormwater Programs to Address Watershed Priorities

The Copermittees are currently implementing comprehensive, jurisdictional stormwater management programs in a broad-based, preventive manner and consistent with the 2007 Order (see Section 2). In this capacity they've directed their resources to a wide range of activities and pollutants throughout the region. Although the Copermittees will continue to implement the core requirements for each program component, they must remain responsible for selecting and proposing which combination of activities and controls will result in the most effective and efficient stormwater program within their jurisdictional boundaries. Similarly, each Copermittee should also be held accountable for the quality of its jurisdictional program and a determination as to whether it has met the "maximum extent practicable" performance standard established by the Permit. Specific tasks chosen to address the priorities will be identified in each Copermittee's sections of the Watershed Plans. Copermittees should be given the ability to assess and prioritize their current stormwater management programs to identify opportunities for making better use of their resources for the relevant water quality issues in each watershed.

As an example, all Copermittees would be required by the new Permit to have a commercial/industrial program component that includes the following core control measures: maintaining an inventory, prioritizing businesses with the potential to discharge pollutants, inspecting businesses, requiring BMP implementation, and conducting enforcement actions, if necessary. However, depending on the watershed priority, the Copermittees may focus on business categories that have the highest potential to address the watershed priorities. By allowing watershed-based modifications to the core stormwater program, the jurisdictions may optimize their level of effort within one program component or across components (e.g., a jurisdiction may wish to focus on nurseries in a watershed where nutrients are the pollutant of concern and less on automobile repair shops). Likewise the jurisdiction may decide to focus on inspections and less so on outreach material). The intent of the watershed approach is to avoid the creation of additive requirements by focusing core program requirements on the pollutants or issues of concern within a watershed.

Copermittees would also consider previous LTEA findings and any relevant new BMP efficiency findings that may become available after the adoption of the new Permit.

3.B.iii Identifying Assessment and Reporting Metrics

Assessment is a critical component of an iterative adaptive management approach to incrementally improving the measurability of programs. Depending on the specific objectives, assessments and corresponding metrics may reflect different time intervals.

- **Short-term metrics** are typically conducted within intervals less than 5 years in duration.[6] Some assessments (e.g. documenting implementation) might occur annually, with others (e.g., behavior change) requiring more time. In general, short-term metrics would be limited to Outcome Levels 1-4 (implementation of Permit requirements, changes in awareness or behavior, and reduction of pollutant loads).
- **Long-term metrics** would typically be assessed at frequencies ranging from 5 -20 years. They would initially examine changes in urban runoff and receiving water quality. But over time, they could also be used to explore the relationship of program implementation to these "higher" Outcome Levels. In this context, water quality standards represent an ideal for guiding programs in achieving long-term compliance, and for defining the interim measures, actions, and program modifications necessary to achieve that end. As previously discussed, the Copermittees' ability to meaningfully assess long-term changes depends on many critical considerations such as the number and variability of data points and level of changes being measured.

The Copermittees will continue to assess the effectiveness of their Watershed Plans as well as the specific jurisdictional and regional activities implemented in support of them. The establishment of clear assessment metrics will play an important role in determining whether programs are on the right track and achieving desired results. It should be emphasized that reporting and assessment in a group setting (i.e., at the watershed and regional scales) require a higher degree of comparability between results than is currently needed for the jurisdictional analysis of programs and activities. Moreover, even where such comparability exists, the interpretation of common metrics (e.g., summaries of inspection results) can also be compromised if underlying data and information (e.g., classification of violation types, or thresholds for issuing violations) are also dissimilar. Because of this, the Copermittees recognize a need to further explore the development and Copermittee adoption of reporting and assessment standards under the reissued Permit. As such, it is important to remember that the development, adoption, and implementation of standards can take a significant amount of time. In this respect, the new Permit should realistically reflect the work that needs to be completed, and allow sufficient time to do so.

The 2007 Permit also requires the submittal of a number of reports including the JURMP WURMP, and RURMP Annual Reports from the Copermittees. The Watershed Plan will incorporate reporting formats and frequencies developed regionally for use in meeting Permit requirements. In the interest of streamlining this effort, the Copermittees recommend the submittal of one report for each of the nine watersheds (i.e. nine watershed reports). Each report would summarize the Copermittees efforts in the watershed, the assessment of activities and monitoring within the watershed, and, where applicable, activities and other efforts conducted to comply with TMDLs.

3.B.iv Approving Watershed Plans

A well-defined role for RWQCB staff in reviewing and approving any modifications to core requirements is necessary not only to evaluate the appropriateness of proposed programs and changes, but to provide

[6] Municipal Stormwater Program Effectiveness Assessment Guidance, CASQA, May 2007.

Copermittees with a level of certainty with regard to what constitutes compliance. Consequently the Copermittees propose that the Watershed Plans and modifications of such Plans require the approval of the RWQCB Executive Officer. Such approval will also aid in developing budgets and obtaining funds for the Watershed Plan implementation.

3.C WATERSHED PLAN IMPLEMENTATION

Watershed Plans will be prepared at the watershed level but may be implemented at the regional, watershed, and/or jurisdictional scale. This will allow the Copermittees to leverage their resources and provide efficiencies for the stormwater program as appropriate, as well as provide accountability for the Copermittees and RWQCB. This section describes an approach that might be used by the Copermittees in collaboratively addressing regional, watershed, and jurisdictional issues so that there is an effective integration of the programs.

As described, the RWQCB has indicated that they will pursue a region-wide Permit that would encompass the jurisdictions in the urbanized portions of San Diego County, south Orange County and south Riverside County. Once adopted the region-wide Permit would supersede the existing Permit. Notwithstanding the Copermittees comments in Section 1, if a region-wide Permit is developed and adopted, it should support the ability of the Copermittees to develop the Watershed Plans as described within this ROWD.

Regional coordination and collaboration should continue to be encouraged under the new Permit. Under a Region-wide Permit, this might also occur an inter-county basis (between the three counties; San Diego, Orange and Riverside). The emphasis of coordination, however, would likely remain on a countywide basis (between Copermittees within San Diego County). The Copermittees might continue to use the framework that has been established for the Regional Working Bodies, which includes the Regional Management Committee, the Regional Program Planning Subcommittee, and the Regional Workgroups. Some of the program activities that may be the focus of collaboration include:

- Public education;
- Training;
- Monitoring;
- BMP effectiveness assessments;
- Pollutant generating characterization studies; and
- Development of standards, model programs, and guidance documents.

As noted previously, the Watershed Plans will be developed by the Copermittees sharing a watershed. The Copermittees may continue to use the existing framework that has been established for the Watershed Working Bodies or may choose to include other dischargers as part of TMDL programs, or coordinate with other watershed groups and any appropriate regional coordinating groups. Some of the program activities that may be the focus of the watershed collaboration include:

- Establishing watershed priorities;

- TMDL implementation plan strategies and BMPs;
- Monitoring; and
- Pilot projects/studies.

As identified in Section 3.B.ii above, each Watershed Plan would have a jurisdictional (Core Requirements) section that is prepared by the Copermittees to identify how each will implement their stormwater programs to support the Watershed Plans. The jurisdictional section should have clear goals and performance standards so that Copermittees and the RWQCB can assess if the plan has been implemented as intended, whether programs are on the right track and achieving desired results, and to determine if the Copermittee is in compliance.

3.D. WATERSHED PLAN ASSESSMENT AND ACCOUNTABILITY

As noted in Section 3.B.iii the Watershed Plans should include reporting and assessment metrics and include a combination of short-term and long-term metrics that is best suited for demonstrating long-term program success and interim progress toward it. The reporting and effectiveness assessments will be conducted consistent with the California Stormwater Quality Association (CASQA) *Municipal Program Effectiveness Assessment Guidance Manual* (2007, or as amended) and will be focused at the watershed scale to assist the Copermittees and the RWCQB in determining if the goals, targets, waste load allocations (WLAs), or other metrics established by the Copermittees are being achieved or to evaluate progress toward achieving them. One report will be submitted for each Watershed Plan, but jurisdictional results will be included as appropriate.

These effectiveness assessments will allow the Copermittees to determine if the activities identified within the Watershed Plans are achieving the desired outcomes and to assist the Copermittees in allocating their limited resources toward the most effective programs and solutions.

3.E. ADAPTIVE MANAGEMENT

3.E.i Scope of Watershed Plan Modifications

The Watershed Plan modifications may be limited to changes to BMPs or control measures that, when considered in combination, are intended to enhance the overall effectiveness and efficiency of a Copermittee's implementation efforts within a watershed. However, each Copermittee remains responsible for selecting and proposing which combination of activities and controls will result in the most effective and efficient stormwater program within its jurisdictional boundaries and is responsible for the quality of its jurisdictional program. Modifications may include any combination of the following:

- Modifying Core Requirements to increase their effectiveness and efficiency,
- Increasing the implementation rate of more effective and efficient BMPs, or
- Decreasing the implementation rate of less effective and efficient BMPs.

3.E.ii Modifying Watershed Plans

Copermittees will consider and recommend enhancements to core requirements identified in the Watershed Plans when they obtain new BMP effectiveness or source identification findings, or when information is gained from an evaluation of the assessment metrics. Consistent with the initial preparation of the watershed plan there should be a criteria established for identifying and proposing modifications or enhancements that are based on sound and impartial information. Copermittees will identify these enhancements consistent with the time frame established for the assessment metrics (i.e. some enhancement may be identified sooner than others) and as part of the Copermittee's compliance reporting requirements. Ultimately approval by the RWQCB of the modifications in a timely manner will serve all parties well.

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Section 4 Conclusions

Per Section J.2.d of Order No. R9-2007-0001, this Report of Waste Discharge (ROWD) serves as an application for issuance of a new waste discharge permit for the San Diego Municipal Stormwater Copermittees. We are now nearing the end of a third Permit cycle, and have conducted in-depth reviews of our management and monitoring programs with an eye toward continued improvement.

As a whole, the Copermittees have concluded that the next Permit cycle represents an important opportunity for program improvement, but that the way forward is fundamentally different than that embodied in the 2007 Order. This ROWD describes a vision that emphasizes iterative, adaptive urban runoff management approaches, and a predominant focus on watersheds as the focal point of these efforts. This updated approach is largely based on a review of existing programs, but also on an extensive visioning process collaboratively conducted by the Copermittees in Fall 2010, and subsequent discussions with RWQCB staff in early 2011. RWQCB staff has informed the Copermittees of its intention to issue a single Region-wide Order for the San Diego, south Orange, and south Riverside regions, to increasingly emphasize water quality monitoring information as a driver of watershed-based management, and to decrease the current Order's emphasis on detailed jurisdictional reporting.

A core set of principles have guided the Copermittees' development of this ROWD:

- Simplified reporting;
- Streamlined and more meaningful assessment;
- Better coordinated water quality monitoring;
- Enhanced watershed and Total Maximum Daily Load (TMDL) focus; and
- Increased emphasis on strategic planning.

As a starting point for program modification, the Copermittees identified a number of specific recommendations for change to existing management and monitoring requirements. These are identified and discussed in detail in ROWD Section 2. Building on this, ROWD Section 3 further describes a process for modifying program approaches in accordance with established watershed priorities, and as necessary to improve programs over time. In accordance with this approach, the following key principles should guide the development and implementation of Watershed Plans under a reissued Order:

- Watershed Adaptive Management should drive the planning, review, and modification of Copermittee programs;
- Watershed Plans should identify watershed priorities (constituents and sources) and be the vehicle for implementing the Watershed Adaptive Management Strategy;
- Watershed priorities should be the primary driver for determining how individual Copermittees prioritize, develop, and implement stormwater program activities within their jurisdictions;
- Watershed requirements should focus, rather than add to, core jurisdictional program requirements within a watershed;

- Implementation of Watershed Plans should be carried out at the most efficient and effective scale – either jurisdictional, watershed, or regional;
- RWQCB staff should approve the Watershed Plans; and
- With very limited exception, Permit compliance should be assessed at the individual Copermittee level.

Finally, it should be noted that this ROWD represents the results of an extended discussion that can in no way be considered complete. The Copermittees believe that it goes a long way toward describing a workable vision for the future. But, as described throughout, many important details have yet to be discussed (Watershed Plan approvals, mechanisms and standards for program modification, performance metrics, monitoring requirements, etc.). Further discussion of these and other critical details must necessarily precede the finalization or endorsement of any new Permit requirements.

ATTACHMENT 1-1

JURISDICTIONAL ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM AND DRY WEATHER FIELD SCREENING AND ANALYTICAL MONITORING EVALUATION

ATTACHMENT 1-1 JURISDICTIONAL ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM AND DRY WEATHER FIELD SCREENING AND ANALYTICAL MONITORING EVALUATION

The purpose of the Jurisdictional Illicit Discharge Detection and Elimination Program is to detect and eliminate illegal connections and illicit discharges (IC/IDs) to the Municipal Separate Storm Sewer System (MS4). In support of the Illicit Discharge Detection and Elimination Program, a Dry Weather Field Screening and Analytical Monitoring Program (Dry Weather (DWM) Program) is a requirement of the San Diego Regional Water Quality Control Board Municipal Permit (Order No. R9-2007-0001).

An evaluation of the DWM Program was conducted to answer the following question:

Does the DWM Program successfully detect and eliminate illicit dry weather discharges?

Evaluation of the DWM Program found that:

- IC/ID investigations are less efficient in detecting and eliminating IC/IDs than hotline call responses (over 1,600 annually), business inspections (over 6,000 annually), and visual survey of the stormwater conveyance system during routine maintenance and/or cleaning. Based on the number of samples collected through the Dry Weather Program over the past three years, only 3.7 percent of samples collected resulted in a successful detection and elimination of an illicit discharge (87 successful IC/IDs out of 23,635 sample analyses from 2007-2009). Copermittees observed that more IC/IDs were identified through complaint referrals than through the Dry Weather program. The City of Oceanside reported in 2009-2010 that 86 out of 87 IC/IDs identified through their hotline were eliminated whereas only one IC/ID was identified and resolved through their Dry Weather Program.
- In addition to the inefficiency of the DWM Program to detect IC/IDs compared to hotline calls or inspections, the follow-up investigations which are required within two business days are rarely effective. Typically, it takes a week or more for laboratory analytical data to be reported, and if action levels are exceeded, an upstream investigation must be conducted within 2 business days of receipt of the data. With so many transient sources it is unrealistic to expect an upstream investigation conducted over a week after the IC/ID was observed to detect the source of the IC/ID. Requiring that other priorities be shifted to conduct the investigation is not an effective use of resources and does not necessarily result in the elimination of more IC/IDs.
- Identification of an action level exceedance from a storm drain outfall discharge does not necessarily indicate detection of IC/IDs. Exceedances can be caused by other sources, such as ingress of nitrate-bearing groundwater into the storm drain system, resulting in nitrate exceedances. If nitrate reduction subsequently occurs in ponded water, ammonia may also be detected. Exceedances may also be caused by saline intrusion, resulting in high conductivity, or alkalization of the runoff in a concrete channel, resulting in higher pH. Within the current permit, exceedances from these common causes currently still require a prompt upstream investigation by many jurisdictions to confirm that there is no IC/ID upstream, diverting attention away from more effective activities.

- The DWM Program characterizes discharges in the MS4s using a limited number of constituents. This overlaps with the MS4 Outfall Monitoring Program, which expands the list of constituents and tailors the list to support watershed planning. In fact, efficiencies have been gained through incorporating parts of the MS4 Outfall Monitoring Program into the DWM Program. However, the MS4 Outfall Monitoring Program has the advantage of focusing on watershed priority pollutants and not on a standard list of constituents that includes the use of field test kits that may have chemical interferences which can limit their usefulness.
- The MS4 Outfall Monitoring Program could be used to assess discharges from the storm drain system. The detection of IC/IDs could be addressed through those methods proven to be most effective to date: stormwater hotline complaints, facility inspections and public employee surveillance. Additionally, in the modified MS4 Outfall program anticipated in the next Permit, Copermittees propose that if initial field screening observations (i.e., unusual color, odor, sheen, etc.) indicate a potential illegal discharge, then it will be addressed immediately.
- Indicator bacteria are the constituent with the highest frequency above action levels from the period of 2007-2009. IC/ID investigations are typically not successful at identifying sources of bacterial indicators related to anthropogenic activities (e.g. re-growth in storm drains and wildlife scat are common sources as opposed to illicit discharges). The introduction of the Revised Total Maximum Daily Loads for Indicator Bacteria Project I – Twenty Beaches and Creeks in the San Diego Region Total Maximum Daily Load (Bacteria Project – I TMDL) for many watersheds in the region will require additional monitoring, source investigations, and treatment of bacteria. Any IC/ID component incorporating bacteria investigation should simultaneously fulfill other parallel regulatory MS4 requirements to ensure that monitoring efforts are optimized.
- Diazinon and Chlorpyrifos are no longer commercially available. These pesticides have been detected above action levels in no more than 0.3% of samples over the past three years. The analysis of organophosphate compounds is no longer a useful analysis for this program.
- The transient nature of many IC/IDs frequently causes difficulties in identifying the source of an IC/ID, even when a suspected IC/ID is detected. Often, based on exceedances of NPDES dry weather action levels, it can be concluded that an “activity” or group of “activities” have occurred in a sub-drainage area, but the source cannot be pinpointed. The nature of nonpoint source pollution may result in a timing disconnect between the “activity” producing a pollutant (e.g., over fertilizing a lawn) and the transport mechanism of the pollutant into the MS4 system (e.g., runoff from over irrigation hours after the application of the fertilizer). Unless the IC/ID activity is actually occurring and being transported into the MS4 system during the field screening and subsequent upstream investigations, the precise source and location of the IC/ID cannot be identified. In these circumstances the IC/ID is addressed through other means, such as education, and periodic reconnaissance of the area. Additionally, other program elements such as more stringent development standards and inspections of municipal, industrial and commercial facilities are preventive measures to reduce the likelihood of IC/IDs.

Conclusions:

- The conclusion of this evaluation is that the DWM Program should be discontinued in its current form. IC/ID investigations are less efficient in detecting and eliminating IC/IDs than hotline call responses (over 1,600 annually), business inspections (over 6,000 annually), and visual survey of the stormwater conveyance system during routine maintenance activities. During the permit term a comprehensive range of stormwater program elements have been implemented to decrease the likelihood of IC/IDs, and have been shown to be more efficient than the DWM Program. In addition, the MS4 Outfall Monitoring Program also samples outfall discharges. To avoid this duplication of effort, the MS4 outfall monitoring should be conducted under the MS4 Outfall Monitoring Program instead of the DWM Program. Additionally, Copermittees propose that in the MS4 outfall discharge program under the next Permit that if initial field screening observations (i.e., unusual color, odor, sheen, etc.) indicate a potential illegal discharge, then it will be addressed immediately.

Supporting Documentation

Jurisdictions conduct a separate DWM Program as described in each Jurisdictional Urban Runoff Management Program (JURMP) Annual Report. Dry weather samples are collected from the jurisdictions' MS4 to detect and eliminate IC/IDs. Samples are collected from May 1 through September 30 each Permit monitoring year. The results of the 2007, 2008, and 2009 DWM Program are included in the data assessment. The DWM Program primarily answers two core management questions, which address urban runoff discharges in the MS4: 3) What is the relative urban runoff contribution to the receiving water problem(s)? and 4) What are the sources of urban runoff that contribute to receiving water problem(s)?

During the 2007, 2008, and 2009 DWM Program monitoring years, out of 23,635 individual field and analytic samples, 1,258 samples had results measured above the dry weather action levels (Table 1) for an exceedance rate of only 5.3-percent. Table 1 also shows the exceedance rate for each analyte measured under the DWM Program. The analyte with the highest rate of results above the action level for 2007-2009 was total coliforms (25-percent), and Enterococcus was the constituent with the second highest exceedance rate (15-percent). Out of 1,091 dry weather samples collected from the region and analyzed for Diazinon, there was one dry weather action level exceedance. Of 1,089 dry weather samples collected and analyzed for Chlorpyrifos, only one sample (in Point Loma) was reported as an action level exceedance. Among the four dissolved metals for which analyses were conducted (i.e., cadmium, lead, copper, and zinc), the action level exceedance rate was less than 2-percent. Dissolved copper had the greatest number of reported exceedances (21 exceedances in 1,067 samples). Dissolved lead was found to be above the dry weather action level in five of 1,060 samples and dissolved cadmium exceeded the action level in one of 1,065 samples. Six exceedances out of 1,068 samples were reported for dissolved zinc in the region. The dissolved metals action levels are based on the CTR hardness based criteria.

Table 1. 2007, 2008, and 2009 Jurisdictional Dry Weather Program Monitoring Data Summary of Action Level Exceedances

Constituent Group	Constituent	Number of Dry Weather Samples Collected Regionally	Number of Dry Weather Action Level Exceedances	Percentage of Action Level Exceedances (%)
General chemistry	pH	2868	80	3%
	Oil & grease	976	8	1%
	Ammonia (NH_3-N)	2821	164	6%
	Methylene blue active substance (MBAS)	1515	119	8%
Nutrients	Orthophosphate (PO_4-P)	2844	117	4%
	Nitrate (NO_3-N)	2837	156	5%
Metals	Cadmium (dissolved)	1065	1	0%
	Copper (dissolved)	1067	21	2%
	Lead (dissolved)	1060	5	0%
	Zinc (dissolved)	1068	6	1%
Pesticides	Chlorpyrifos	1089	1	0.09%
	Diazinon	1091	1	0.09%
Bacteria	Total coliforms	1111	283	25%
	Fecal coliforms	1112	127	11%
	Enterococci	1111	169	15%
Grand Total		**23,635**	**1.258**	**5.3%**

* For conductivity and turbidity the action levels adopted by the Dry Weather Workgroup are based on best professional judgment and are excluded from this table.

When the Regional Monitoring Program implemented the analysis of organophosphate pesticides in 2001, it was based on the threat of these pesticides entering the region's receiving waters, evidence of persistent exceedances of Diazinon and Chlorpyrifos, and evidence of pesticide-induced acute and chronic toxicity to *Ceriodaphnia dubia*. DWM Program results for Chlorpyrifos and Diazinon over the past seven years are shown in Table 2. The dry weather exceedance rates for Diazinon and Chlorpyrifos have steadily declined over the past six years of monitoring and have been less than 1% in each year over the past five years. With respect to the USEPA ban on the pesticides Diazinon and Chlorpyrifos and the infrequent (or lack of) detections for these analytes in the DWM Program, this analysis could be justifiably removed from the next Permit constituent list..

Table 2. Jurisdictional Dry Weather Monitoring Program Results for Chlorpyrifos and Diazinon for the Period 2003–2009

Monitoring Year	Analyte	Number of Dry Weather Samples Collected Regionally	Number of Dry Weather Action Level Exceedances	Percentage of Action Level Exceedances
2003	Chlorpyrifos	373	117	31.4%
2004	Chlorpyrifos	241	1	0.4%
2005	Chlorpyrifos	285	0	0%
2006	Chlorpyrifos	382	1	0.3%
2007	Chlorpyrifos	333	0	0%
2008	Chlorpyrifos	387	1	0.3%
2009	Chlorpyrifos	369	0	0%
2003	Diazinon	373	129	34.6%
2004	Diazinon	240	6	2.5%
2005	Diazinon	286	2	0.7%
2006	Diazinon	377	2	0.5%
2007	Diazinon	333	0	0%
2008	Diazinon	389	0	0%
2009	Diazinon	369	1	0.3%

During the past three years (2007-2009) an IC/ID was detected for 118 (5-percent) of the action level exceedances. Of the 118 IC/IDs, 87 were resolved (i.e., source was identified and eliminated). Compared to the stormwater hotline and inspection programs, the proportion of IC/IDs that are resolved in the DWM Program is much lower. Methods such as hotline call in programs and inspection programs meet the requirements of non-stormwater discharge elimination to the storm sewers, and Copermittees report the number of IC/IDs eliminated as a result of their hotline call-in program or inspection program in their Annual Jurisdictional Urban Runoff Management Plan Reports.

ATTACHMENT 2-1

RECEIVING WATER ASSESSMENT OF MASS LOADING STATIONS/ TEMPORARY WATERSHED ASSESSMENT STATIONS

ATTACHMENT 2-1: RECEIVING WATER ASSESSMENT OF MASS LOADING STATIONS/ TEMPORARY WATERSHED ASSESSMENT STATIONS

Wet and dry weather samples are collected at mass loading stations (MLS) and temporary watershed assessment stations (TWAS) within nine watershed management areas. Samples are collected per the requirements of Table 1 of the San Diego Regional Water Quality Control Board Order No. R9-2007-001 (Permit). The MLS stations have been consistently sampled for the last 10 to 15 years whereas the TWAS address specific questions beginning with the 2007 Permit and were not designed to be long term monitoring stations.

This monitoring is designed to answer core management questions 1, 2, and 5. The core monitoring management questions per the Permit are as follows:

1. *Are conditions in receiving waters protective, or likely to be protective, of beneficial uses?*
2. *What is the extent and magnitude of the current or potential receiving water problems?*
3. *What is the relative urban runoff contribution to the receiving water problem(s)?*
4. *What are the sources of urban runoff that contribute to receiving water problem(s)?*
5. *Are conditions in receiving waters getting better or worse?*

Analysis of receiving water data was conducted to evaluate progress so far on questions 1, 2 and 5. Additionally, the following sub-questions were analyzed to guide the Copermittees' monitoring recommendations for the next permit:

1. Have priority constituents changed over this current Permit cycle compared to the previous?
2a. How have the TWAS contributed to the understanding of the spatial extent and magnitude of receiving water problems?
2b. How do the monitoring results of the upstream TWAS compare to the downstream MLS?
2c. Can wet weather priority constituents be linked to land uses in the watersheds?
3. What frequency of sampling at the MLS is necessary to maintain the detection of long-term trends of receiving water quality?

Statistical analysis of the water quality data from the MLs and TWAS concluded that:

- Receiving water constituent priorities in 2010 are similar to the previous assessment conducted in 2005 for wet weather. Dry weather ambient monitoring was added in the 2007 Permit to address seasonal variability. With few exceptions, priority constituents are the same in all watersheds. Wet weather priorities, in general, are bacteria and sediment. Dry weather priorities, in general, are bacteria, nutrients and total dissolved solids (TDS). Synthetic pyrethroids, not analyzed under the previous Permit, are an emerging regional issue beginning to be addressed at the state and national levels.
- With few exceptions, the constituent priorities at TWAS and MLS across the region are similar. Constituent concentrations and patterns of occurrence are similar at TWAS and MLS in the same watershed.

- Additional constituent priorities were identified in Chollas Creek Watershed (copper and zinc) and Tijuana River Watershed (e.g., ammonia, surfactants (MBAS), and biological chemical oxygen demand). Both of these watersheds have unique characteristics compared to the rest of the region. Tijuana River is subject to periodic sewage discharges from across the international border and Chollas Creek has a high density of industrial facilities and transportation corridors.
- Statistical analysis of 8 to 18 years of wet weather receiving water data indicate that sampling frequency may be reduced from alternate years to once every five years without increasing the amount of time necessary to detect long term trends. Because wet weather data has a higher variability than dry weather data, it is assumed that a reduced frequency for ambient dry monitoring will also be appropriate.
- Statistical analysis of the wet weather receiving water data also showed that if a significant increasing or decreasing trend is observed, a reduction of sampling frequency from alternate years to every five years will not increase the time necessary to detect a significant trend.

Conclusions

Constituent priorities in receiving water are similar in 2010 to the previous 2005 assessment. Additionally, the upstream TWAS and downstream MLS have similar constituent priorities. Therefore, core monitoring questions 1 and 2 (i.e., impact to beneficial uses and the magnitude and lateral extent of problem) have been successfully addressed by the monitoring of the 2007 Permit. Because the constituent concentrations and patterns are generally similar at the TWAS and MLS, especially within a watershed, there is no added value to continuing TWAS monitoring in its current form. The similarity of priority constituents across the region support reducing the number of receiving water stations from the 2007 Permit. Several stations (3 to 5 across the region) close to the mouth of the watershed will be adequate to monitor receiving water conditions in the region. The region has the wet weather constituent priorities of bacteria and sediment and the dry weather constituent priorities of bacteria, nutrients and TDS. Resources can be reduced from receiving water monitoring and redirected to working on how to fix the problems by increasing emphasis on MS4 outfall monitoring, source identification and source abatement activities.

Wet weather sampling at the MLS may be reduced to once every five years. The statistical simulation results show that decreasing the sampling frequency to every five years will not affect the ability to detect long-term trends. This finding is further supported by the finding that receiving water priority constituents have not changed substantially at individual MLS during the past five years. Therefore, reduced receiving water monitoring will still allow for detection of trends in the long-term, answering management question 5.

Supporting Documentation

A list of watershed management area and mass loading station (MLS) acronyms is presented in Table 1.

Table 1. Watershed Management Area and Watershed Acronym List

Watershed Management Area	Watershed Name	Mass Loading Station
Santa Margarita	Santa Margarita River	SMR-MLS; SMR-MLS2
San Luis Rey River	San Luis Rey River	SLR-MLS
Carlsbad Watershed	Loma Alta Creek	LAC-TWAS-1
	Buena Vista Creek	BVC-TWAS-1
	Agua Hedionda Creek	AHC-MLS; AHC-TWAS-1
	Escondido Creek	ESC-MLS; ESC-TWAS-1
San Dieguito River	San Dieguito Creek	SDC-MLS; SDC-TWAS-1; SDC-TWAS-2
Los Peñasquitos River	Los Peñasquitos	LPC-MLS; LPC-TWAS-1; LPC-TWAS-2
Mission Bay and La Jolla	Tecolote Creek	TC-MLS
	Mission Bay	MB-TWAS-1; MB-TWAS-2
San Diego River	San Diego River	SDR-MLS; SDR-TWAS-1; SDR-TWAS-2; SDR-TWAS-3
San Diego Bay	Chollas Creek	CC-SD8(1)-MLS; CC-NF54
	Sweetwater River	SR-MLS; SR-TWAS-1
	Otay River	OR-TWAS-1
Tijuana River	Tijuana River	TJR-MLS; TJR-TWAS-1; TJR-TWAS-2

Sub-Question #1: *Have priority constituents changed over this current Permit cycle compared to the previous?*

Determination of whether or not receiving water priorities remained similar between the Baseline Long Term Effectiveness Assessment (BLTEA) and the current long term effectiveness assessment (LTEA) was made by comparing the two sets of results at the watershed level. The BLTEA analysis was conducted in 2005 and grouped wet and ambient data from the municipal separate storm sewer system (MS4) and the receiving waters, along with whether or not an constituent was included on the Section (§) 303(d) list. The LTEA analysis was conducted in 2010 and evaluated data from the MS4, receiving water (RW), wet, and ambient separately. In addition, inclusion of a constituent on the §303(d) list did not result in that constituent categorized as high priority. Constituent groups are used for the comparison of the BLTEA and the receiving waters LTEA. Priorities within watersheds were also evaluated. The purpose of this evaluation was to determine if the answer to management question #1 (conditions in receiving waters protective of beneficial uses) is the same in 2010 (LTEA) as the 2005 (BLTEA).

As shown in Table 2, wet weather priorities are similar between the BLTEA and the LTEA, as well as across the region. Cells highlighted orange are high priorities (greater than 50-percent exceedance of water quality benchmark (WQB)) and yellow cells are medium priorities (greater than 25-percent exceedance of WQBs, up to and including 50-percent exceedance of WQBs). A comparison of BLTEA and LTEA priority results at each MLS indicates that priorities remain similar between the two evaluations. Due to the dry weather ambient monitoring element initiated in the 2007 Permit, seasonal differences in priority constituents were identified in receiving water. Nutrients were not found to be a priority constituent during wet weather monitoring, but were a high priority constituent across many watersheds during dry weather conditions. These seasonal variations may in part be attributed to the differences in WQBs between seasons.

Since 2005, Copermittees participation in the Stormwater Monitoring Coalition (SMC) Regional Monitoring Program has provided additional ambient dry weather nutrient data. In general, during dry weather bacteria, nutrients, and TDS are constituent priorities found in watershed management areas across the region. In general, during wet weather, bacteria and sediments (total suspended sediments) are region-wide constituent priorities.

Table 2. Comparison of 2005 Baseline Long Term Effectiveness Assessment and 2010 Long Term Effectiveness Assessment Priority Results

Priority Group	BLTEA or LTEA	SMR-MLS	SLR-MLS	AHC-MLS	ESC-MLS	SDC-MLS	LPC-MLS	TC-MLS	SDR-MLS	CC-SD8(1)	SR-MLS	TJR-MLS
Baseline Long Term Effectiveness Assessment Priorities												
Bacteria	BLTEA											
Gross Pollutants	BLTEA											
Heavy Metals	BLTEA											
Nutrients	BLTEA											
Pesticides	BLTEA											
Sediment	BLTEA											
Total Dissolved Solids	BLTEA											
Toxicity	BLTEA											
Turbidity	BLTEA											
2010 Long Term Effectiveness Assessment Wet Weather Priorities												
Bacteria	LTEA-WET											
Gross Pollutants	LTEA-WET											
Heavy Metals	LTEA-WET											
Nutrients	LTEA-WET											
Pesticides	LTEA-WET											
Sediment	LTEA-WET											
Total Dissolved Solids	LTEA-WET											
Toxicity	LTEA-WET											
Turbidity	LTEA-WET											
2010 Long Term Effectiveness Assessment Dry Weather Priorities												
Bacteria	LTEA-DRY											
Gross Pollutants	LTEA-DRY											
Heavy Metals	LTEA-DRY											
Nutrients	LTEA-DRY											
Pesticides	LTEA-DRY											
Sediment	LTEA-DRY											
Total Dissolved Solids	LTEA-DRY											
Toxicity	LTEA-DRY											
Turbidity	LTEA-DRY											

BLTEA Priorities were based on Section 303(d) listing and combined wet and dry weather data
Orange highlights indicate high priorities (>50% exceedance of WQOs/WQBs), and yellow highlights indicate medium priorities (>25-50% exceedance of WQOs/WQBs)

Sub-Question #2a. How have the TWAS contributed to the understanding of the spatial extent and magnitude of receiving water problems?

and

Sub-Question #2b. How do the monitoring results of the upstream TWAS compare to the downstream MLS?

Priority constituents were also examined within watersheds to determine whether or not Priorities remained consistent throughout a watershed, and to help determine whether or not the TWAS have contributed to the understanding of the spatial extent and magnitude of receiving water quality problems. Three watersheds were examined in detail, and are presented in Table 3. The results demonstrate that Priorities remained consistent within the same watershed. Some differences in upstream and downstream relationships may be due to differences in the Basin Plan objectives in a specific hydrologic subarea (e.g. the TDS results for San Diego River stations).

Table 3. Agua Hedionda Creek, Escondido Creek, and San Diego River Mass Loading Station and Temporary Watershed Assessment Station Wet Weather Priority Constituent Comparison

Station	HSA	No. Samples	Assessment Scores - NPDES Monitoring - Wet Weather					
			Chemistry	Toxicity	IBI	Bacterio-logical	Nutrients	TDS
Agua Hedionda Hydrologic Area								
AHC-MLS	Los Monos (904.31)	9	TSS, Turbidity, Bifenthrin	*Hyalella azteca* acute	Very Poor	Fecal Coliforms		TDS
AHC-TWAS-1	Los Monos (904.31)	2	TSS, Turbidity, Chlorpyrifos, Bifenthrin	*Hyalella azteca* acute	Very Poor	Fecal Coliforms		TDS
Escondido Creek Hydrologic Area								
ESC-MLS	San Elijo (904.61)	9	Turbidity, Bifenthrin, TSS		NA	Fecal Coliforms		TDS
ESC-TWAS-1	Escondido (904.62)	2	Turbidity, Bifenthrin, TSS, Diazinon		Very Poor	Fecal Coliforms		TDS
San Diego River Hydrologic Area								
SDR-MLS	Mission San Diego (907.11)	9	Turbidity Bifenthrin		Very Poor	Fecal Coliforms		
SDR-TWAS-1	Mission San Diego (907.11)	2	Turbidity/Bifenthrin Surfactants (MBAS)	*Ceriodaphnia dubia* reproduction	Very Poor	Fecal Coliforms		TDS

Station	HSA	No. Samples	Assessment Scores - NPDES Monitoring - Wet Weather					
			Chemistry	Toxicity	IBI	Bacterio-logical	Nutrients	TDS
SDR-TWAS-2	Santee (907.12)	2	TSS/Turbidity Bifenthrin/Permethrin pH/BOD	*Hyalella azteca* acute survival	Very Poor	Fecal Coliforms		
SDR-TWAS-3	Santee (907.12)	2	Turbidity Bifenthrin		Very Poor	Fecal Coliforms		

-Orange highlights indicate high priorities (>50% exceedance of WQOs/WQBs), yellow highlights indicate medium priorities (>25-50% exceedance of WQOs/WQBs), blue indicates low priorities (≤25% exceedance of WQOs/WQBs). Only group scores of blue (low priority) are presented in the table.
-NA, not applicable no data collected

Sub-Question #2c.Can wet weather priority constituents be correlated to land uses in the watersheds?

A cluster evaluation was conducted to evaluate whether or not watersheds with similar land use also exhibited similar Priority constituent concentrations during wet conditions. The TWAS data were included to evaluate whether or not Priority constituent similarities between MLS and TWAS were found within watersheds.

Land use proportions upstream of each receiving water catchment (MLS or TWAS) were calculated using Geographic Information System (GIS), and compared using cluster analysis. The results of the analysis are presented in Figure 1. A map of the cluster results is presented in Figure 2. Several distinct land use group patterns were found, three of which are discussed here. Cluster "A" is defined by watersheds that contain relatively large proportions of industrial and agricultural land uses, and includes Agua Hedionda Creek (AHC-MLS and AHC-TWAS-1), San Dieguito Creek (SDC-MLS), Loma Alta Creek (LAC-TWAS-1), and Otay River (OR-TWAS-1). Cluster "C1" is defined by the highly urbanized watersheds, and includes relatively high proportions of public facilities, residential, transportation, and commercial land uses. This group includes Buena Vista Creek (BVC-TWAS-1), Sweetwater River (SR-MLS), Chollas Creek (CC-SD8(1)-MLS and CC-NF54-MLS), and portions of San Dieguito (SDC-TWAS-1). Finally, the most rural watersheds are characterized by Clusters "D1, D2, and E", which include relatively large proportions of vacant and undeveloped land, agriculture, and spaced rural residential land uses. Watersheds included in the cluster are portions of San Dieguito (SDC-TWAS-2), San Luis Rey (SLR-MLS and SLR-TWAS-1), Sweetwater River (SR-TWAS-1), Tijuana River (TJR-MLS, TJR-TWAS-1, TJR-TWAS-2), and Santa Margarita River (SMR-MLS and SMR-MLS2).

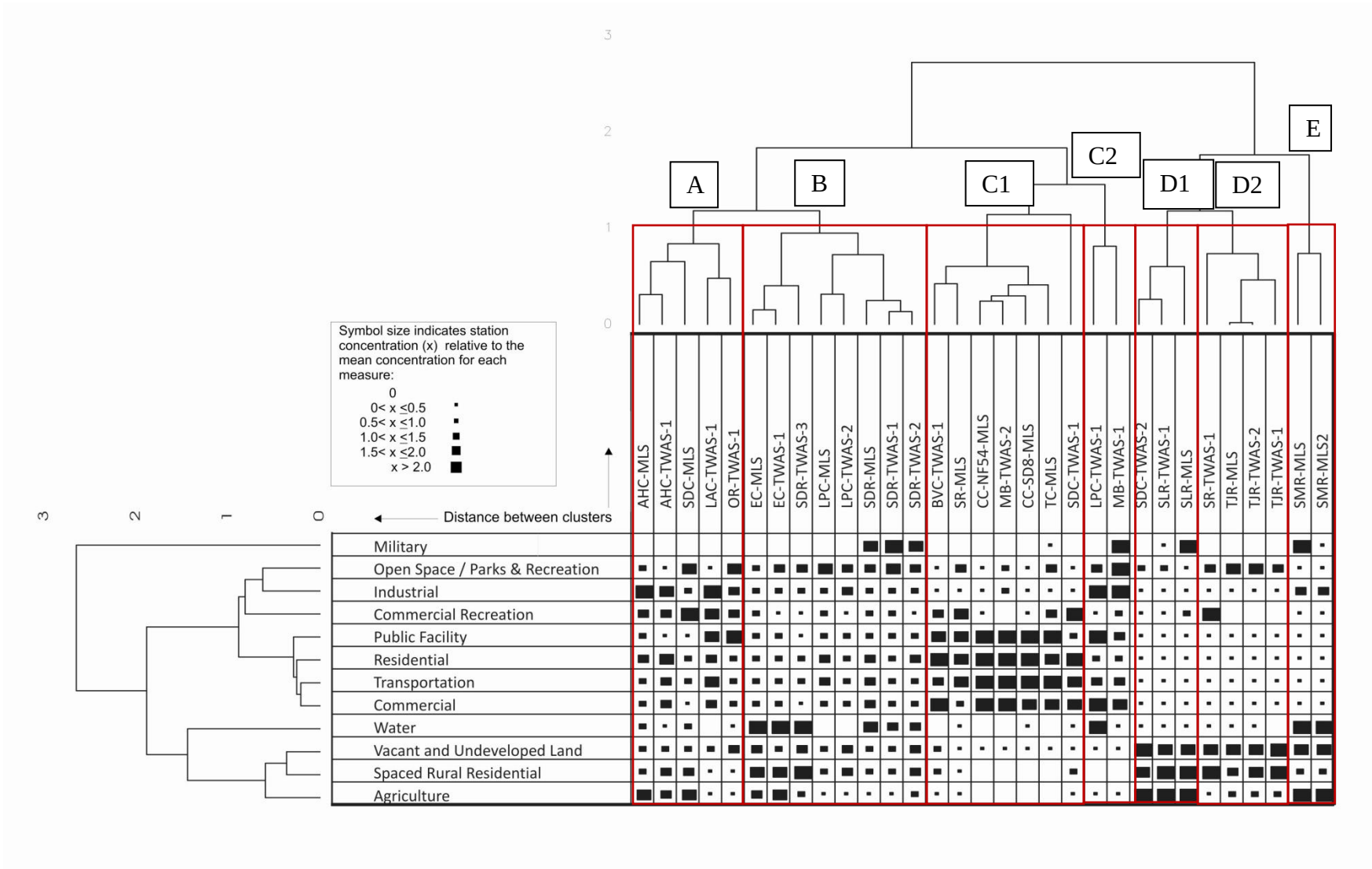

Figure 1. Land Use Cluster Analysis of the Mass Loading Station and Temporary Watershed Assessment Stations

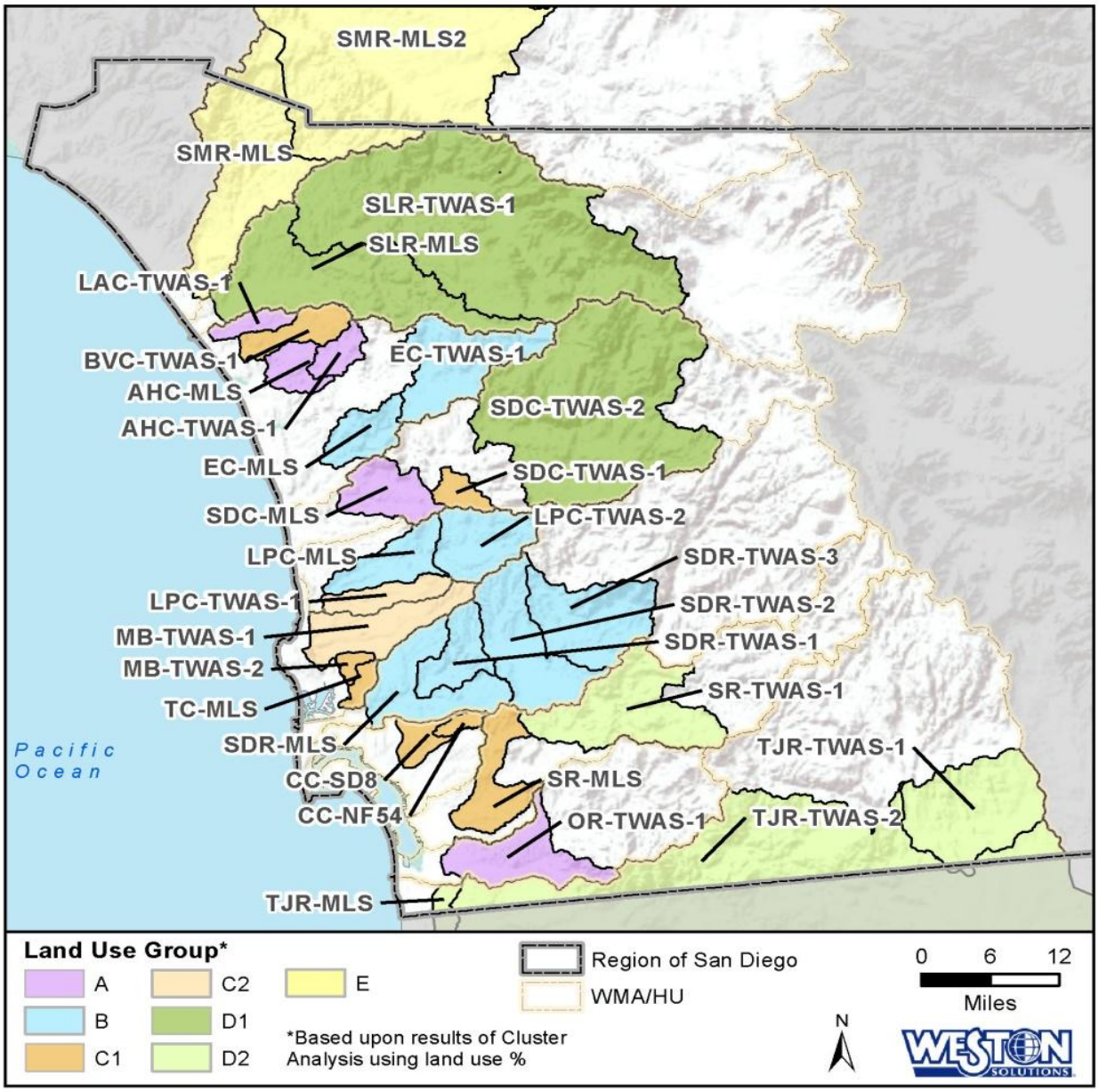

Figure 2. Land Use Cluster Analysis Results

The patterns of constituent concentrations at each MLS and TWAS were also evaluated using cluster analysis. The five-year LTEA dataset was used, and included wet weather data only, as receiving water constituent concentrations are expected to be more related to wash-off during wet events than during ambient conditions.

Results of the analysis are presented in Figure 3. In general, MLS and TWAS samples clustered together over time and a distinct sewage pattern was observed for Tijuana River (TJR-MLS and TJR-TWAS-2, highlighted blue) along with higher toxicity (highlighted orange). Chollas Creek (CC-SD8(1)-MLS) samples exhibited relatively higher concentrations of metals than other MLS and TWAS stations (highlighted purple). However, the groupings based on the water quality data do not directly correspond to the land use cluster analysis results. Therefore, based on constituent

concentrations, there does not appear to be a strong correlation between land use and constituent concentrations (i.e., individual land uses do not relate directly to stormwater concentrations). The exceptions are Tijuana River and Chollas Creek, which have unique activities. Tijuana River is subject to sewage discharge and Chollas Creek has a high density of industrial facilities and transportation corridors. The SDC-TWAS-2 grouping with the Tijuana River (TJR-MLS) sites was due to the post-fire stormwater monitoring results which were highly impacted by the 2007 San Diego Wildfires.

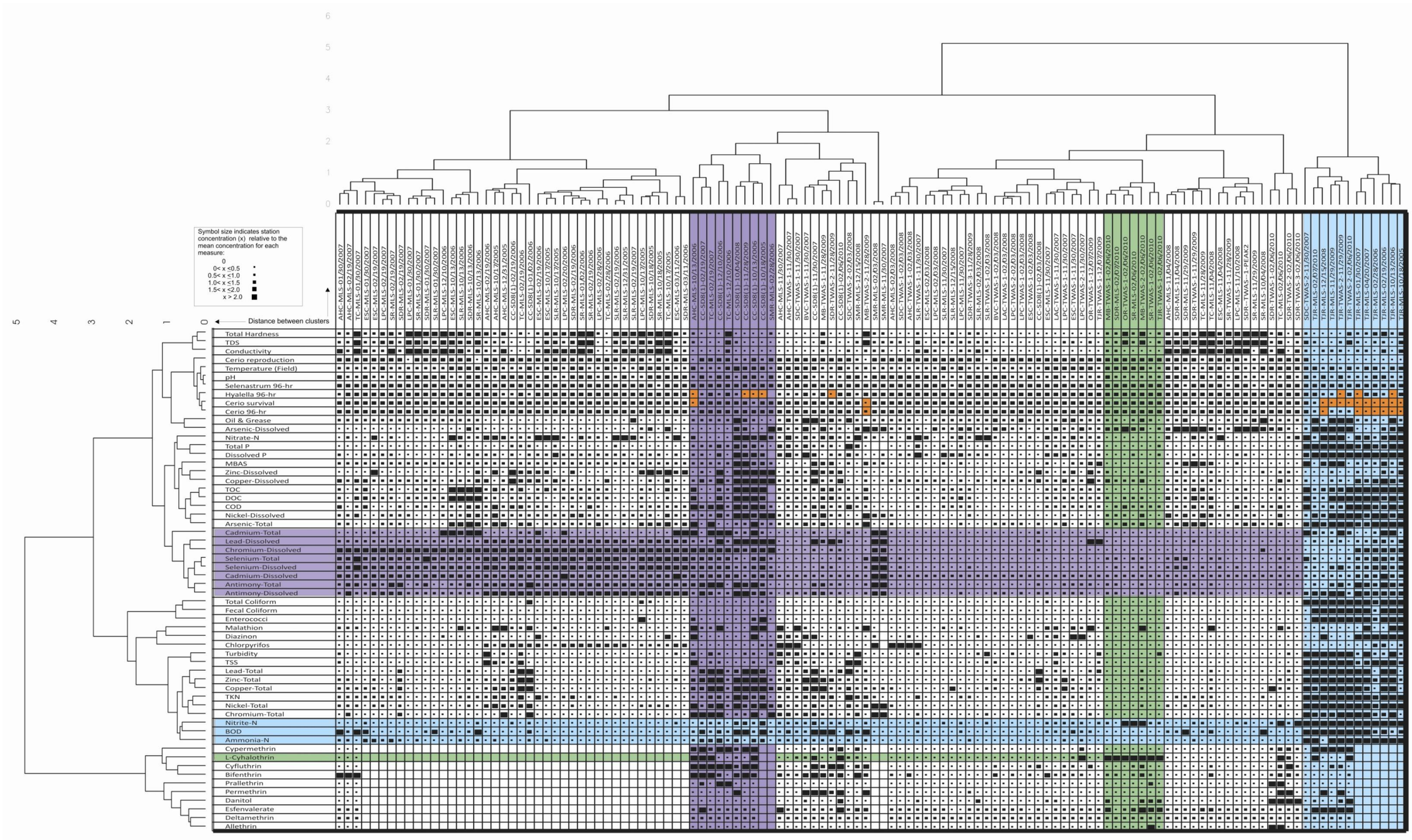

Figure 3. Cluster Analysis Results for Wet Weather Concentrations at Mass Loading Station and Temporary Watershed Assessment Stations during 2005-2010

Sub-Question #3: What frequency of sampling at the MLS is necessary to maintain the detection of long-term trends of receiving water quality?

A statistical analysis was conducted to determine whether or not a reduction in sample frequency from two wet weather events every other year to three wet weather events every five years at the MLS would decrease the Copermittees' ability to detect long-term receiving water trends. In particular, the question of whether a change in sampling frequency would affect Copermittees' ability to detect when the constituent concentrations fall below the WQB (or, for increasing trends, above the WQB) was evaluated.

The statistical analysis utilized the data from the existing program, between 8 and 18 years of data and 113 constituents at 10 MLS. The MLS and constituent combinations included all high priority constituents at each MLS, as well as constituents with greater than 50-percent detection frequency (more than half of the results were greater than the reporting limit). In addition, each MLS and constituent combination was tested for normality and log-normality (results in Attachment 1a). Only constituents that were found to be normal or log-normally distributed were included in the final statistical analysis dataset, because of the statistical method requirements. The final statistical analysis dataset included 66 analytes at 10 MLS. A full explanation of statistical tools utilized to assess the recommended monitoring program compared with the existing program is presented in Attachment 1a.

The existing data were used to evaluate trends (increasing, decreasing, or no trend), and the slope of the line was utilized to project future sampling results. Of the constituents included in the analysis, 2 were found to be significantly decreasing, 11 were found to be significantly increasing, and 53 did not exhibit a significant trend.

The statistical analysis included two scenarios, 1) the current program of two samples every other year and, 2) three samples every five years. The scenarios were compared to determine whether or not a reduction in monitoring frequency will increase the number of years it will take before the measured constituent of concern is observed below the WQO or WQB. Constituents that exhibited significant or non-significant decreasing or increasing trends were included in the analysis.

Comparison of the two scenarios found that, given the continuation of the existing trend line, decreasing the sampling frequency from two storm events every two years (n=5 per permit cycle) to three storm events every five years will not increase the amount of time necessary to detect when a decreasing or increasing trend crosses the WQO with 95-percent confidence. For MLS and constituent combinations that currently exhibit a significant increasing or decreasing trend, decreasing the sampling frequency will not decrease the ability to detect trends. For constituent and MLS combinations that do not exhibit significant trends, there is no difference between the two scenarios to detect when annual average concentrations first fall below or above the WQB or WQO with 95-percent confidence.

TSS was selected to illustrate the simulation results because it is often correlated to other constituents during storm events, including total phosphorus, bacteria, and total metals. Regionally, bacteria and TSS are Priority constituents during wet weather events. Therefore, evaluation to detect when these Priorities fall below WQOs is highlighted in the analysis. Results of the correlation analysis used to justify examination of TSS as a surrogate for other

constituents is included in Attachment 1b. Statistically significant correlations are highlighted yellow in the table (alpha=0.10).

Significantly Decreasing Trends

Only two of the 66 constituent and MLS combinations included in the statistical analysis exhibited statistical decreasing trends. These included total suspended solids (TSS) at Tecolote Creek Mass Loading Station (TC-MLS) and TDS at SLR-MLS. Figure 4 below illustrates the statistical assessment results for TC-MLS. The upper and lower 95-percent confidence interval is shown as a green and light blue line, respectively. Currently, there is a significantly decreasing trend for TSS at this MLS. Observed data are shown as black diamonds, and simulated data are shown as light blue diamonds. The existing program of two wet weather events every other year is compared to three events every five years at TC-MLS. Given the steep decreasing trend at TC-MLS (Figure 4), changes to the frequency of monitoring will not increase the amount of time required to detect when the 95-percent confidence interval falls below the wet weather water quality benchmark of 100 mg/L for TSS (shown in red on the graphs). As shown in Figure 4, the anticipated date to detect TSS concentrations below the WQO is during 2010 for both scenarios (shown as a vertical fuchsia line).

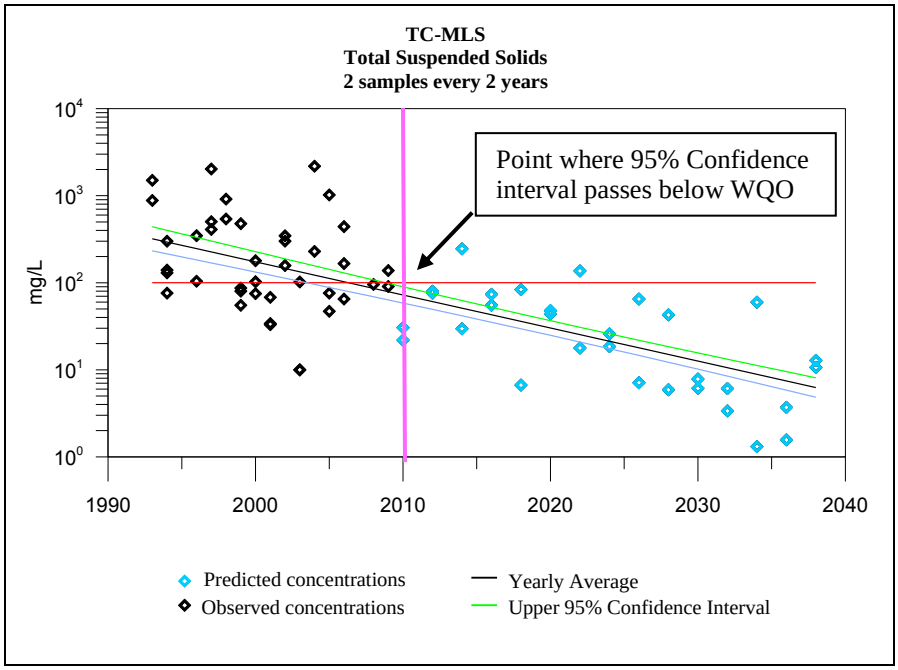

Figure 4. Statistical Analysis Results

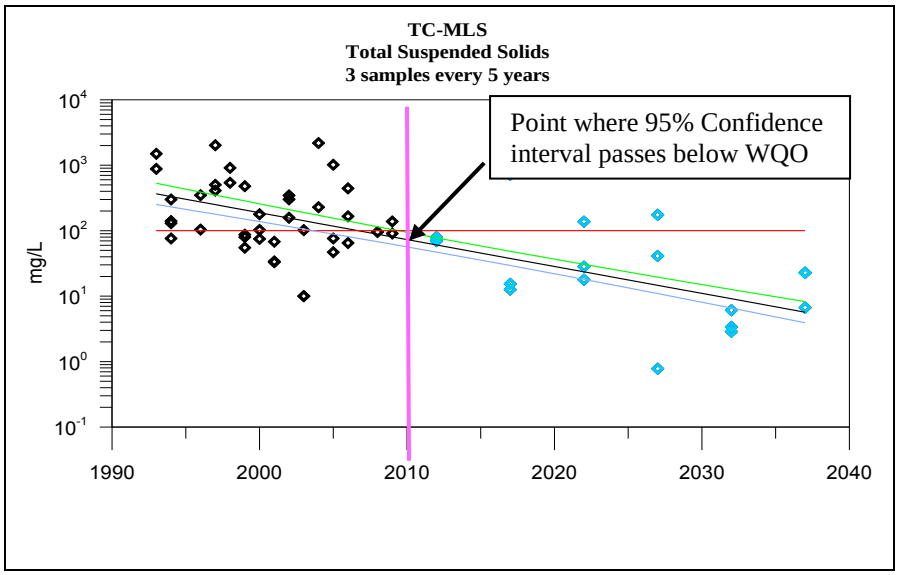

Comparison for Mass Loading Station with Significantly Decreasing Trend, Tecolote Creek Simulated Total Suspended Solids concentrations with Trend Line and 95-percent confidence interval bound

Significantly Increasing Trends

Eleven of the 66 constituent and MLS combinations included in the statistical analysis were found to be statistically increasing over time. Of these 11, four were turbidity, three were Total coliform, two were Fecal coliform, one was for TSS, and one was for total phosphorus.

The increasing trend shown in Figure 5 of TSS at Tijuana River MLS (TJR-MLS) (shown as the black line) illustrates the finding that if a significant increasing trend is observed, a reduction in sampling frequency will not affect the Copermittees' ability to detect it. Additional examples are provided in Attachment 1c that supports this conclusion.

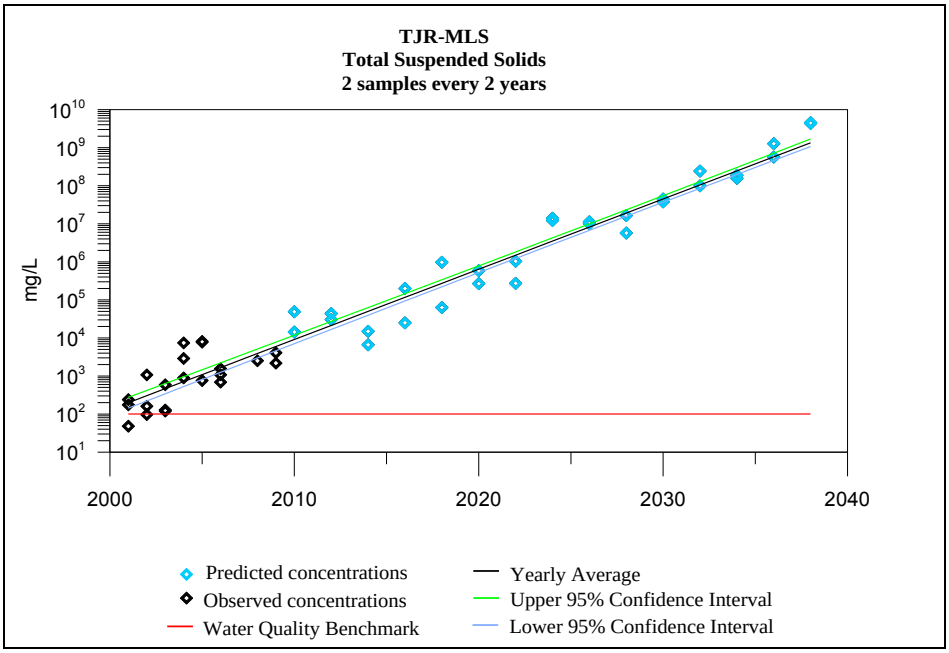

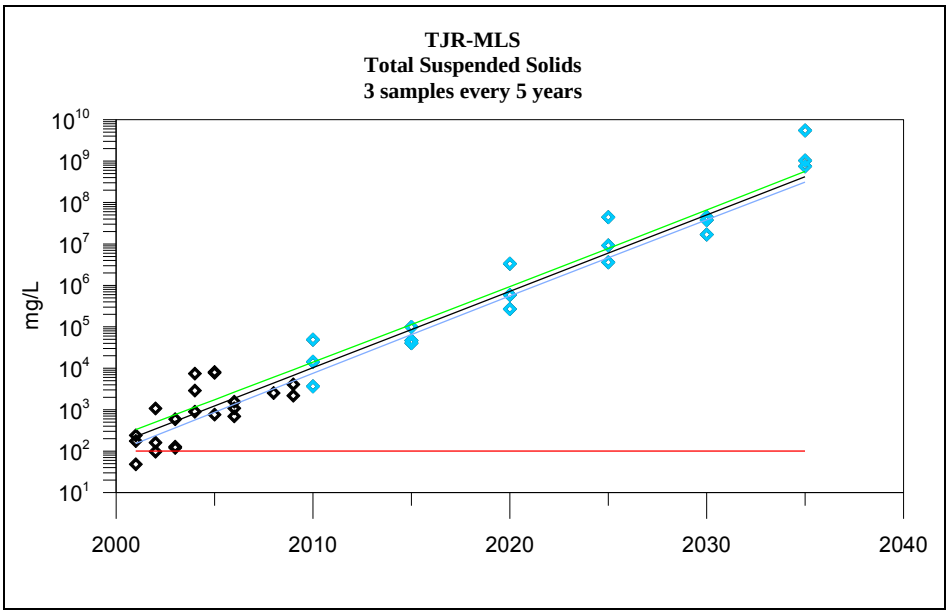

Figure 5. Statistical Analysis Results Comparison for Mass Loading Station with Significantly Increasing Trend, Tijuana River Simulated Total Suspended Solids concentrations with Trend Line and 95-percent confidence interval bound

No Significant Trends

Constituent and MLS combinations for which no significant increasing or decreasing trend has been observed present the worst case scenario for sample frequency reduction (53 of the 66 constituent and MLS pairs analyzed). The two scenarios are compared for TSS at Chollas Creek Mass Loading Station (CC-SD8(1)-MLS) and TSS at San Dieguito River (SDC-MLS) in Figure 6. The trend is generally decreasing at CC-SD8(1) and generally increasing at SDC-MLS.

In the CC-SD8(1) example, because a significant trend is not currently observed, the existing trend line will take a considerable amount of time before the upper 95-percent confident interval passes the WQB. As noted in Figure 6, although the average result is expected to cross the WQB in 2054 at the two year sampling frequency, and 2047 for the five year frequency, the 95-percent confidence interval is not predicted to fall below the WQB before the next 50 years. This finding is based on the variability of the data. Because the data are highly variable, sampling every two years actually makes it more difficult to predict when the average annual TSS concentrations will fall below the WQB. Therefore, decreasing the sample frequency from every other year to every five years will not decrease the Copermittees' ability to detect a decreasing trend. If the existing slope of the line changes to decrease faster, this scenario would result in less time to detect a trend in either instance.

At SDC-MLS a generally increasing TSS trend is observed. This example is included here to illustrate that although the current TSS levels are below the WQB, it is possible to predict when TSS concentrations will meet or exceed the WQB using either the current monitoring program or the reduced sampling frequency to every five years. In this instance, the average annual TSS concentrations are not expected to exceed the WQB within the next 50 years. The lower 95-percent confidence interval does not pass the WQB in this example.

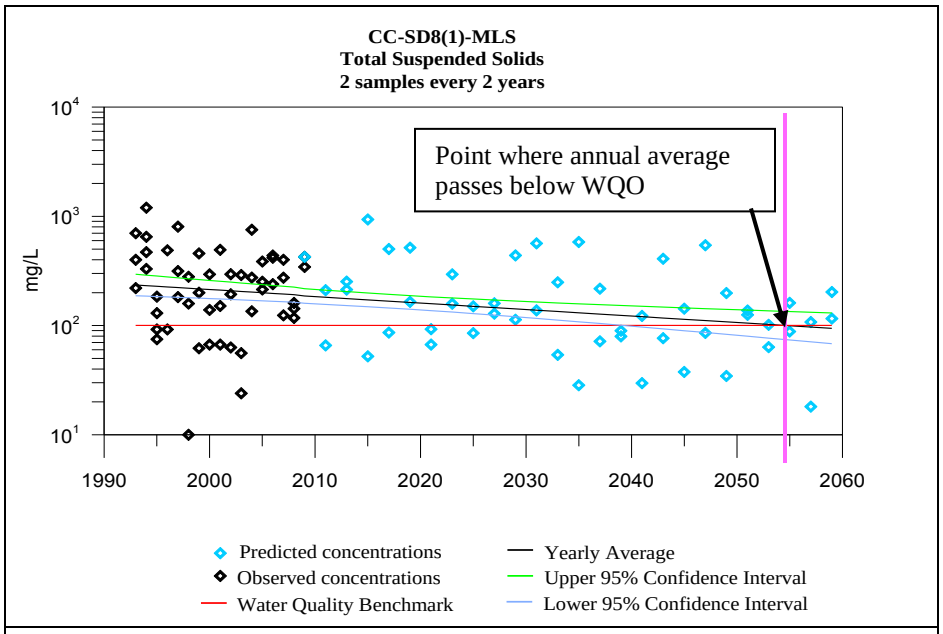
CC-SD8(1)-MLS
Total Suspended Solids
2 samples every 2 years
Point where annual average passes below WQO
mg/L
10^4
10^3
10^2
10^1
1990
2000
2010
2020
2030
2040
2050
2060
Predicted concentrations
Observed concentrations
Water Quality Benchmark
Yearly Average
Upper 95% Confidence Interval
Lower 95% Confidence Interval

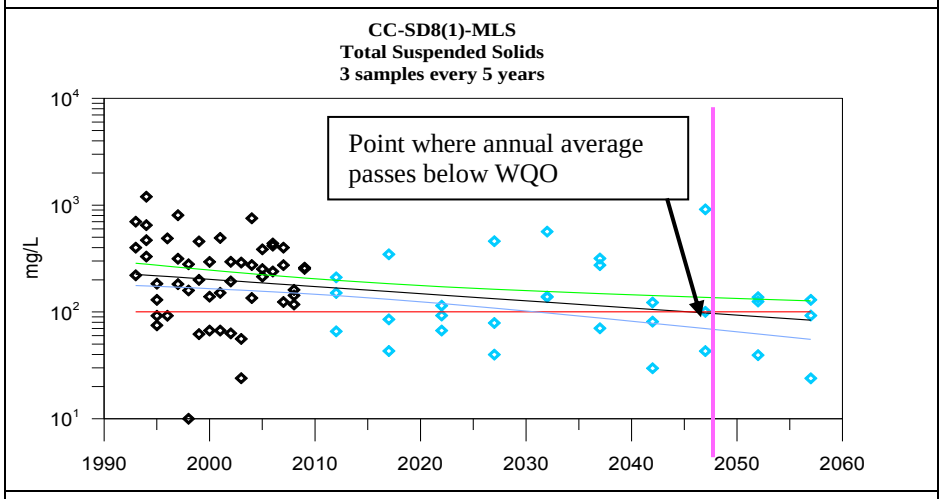
CC-SD8(1)-MLS
Total Suspended Solids
3 samples every 5 years
Point where annual average passes below WQO
mg/L
10^4
10^3
10^2
10^1
1990
2000
2010
2020
2030
2040
2050
2060

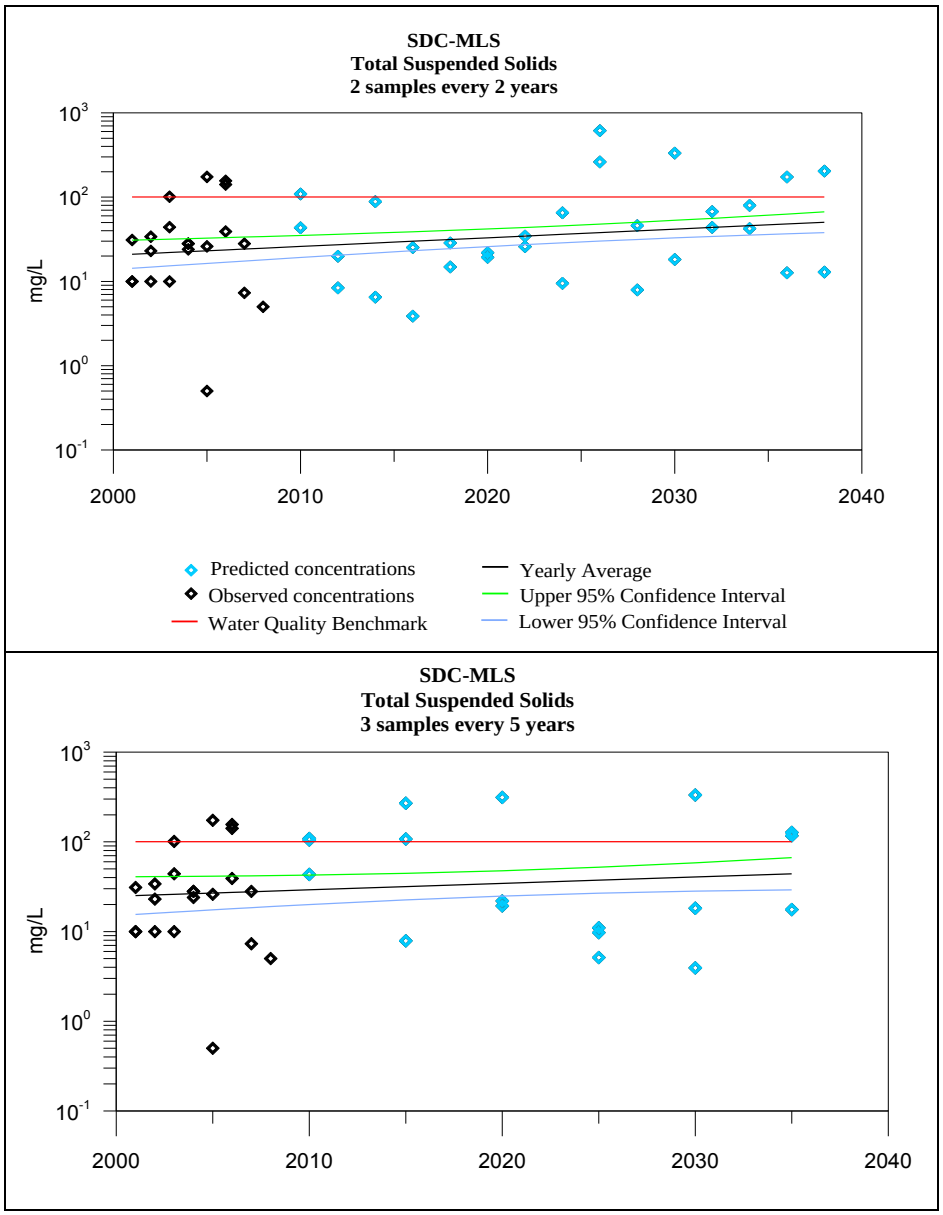

Figure 6. Tecolote Creek and Chollas Creek Simulated Total Suspended Solids concentrations with Trend Line and 95-percent confidence interval bound

ATTACHMENT 2-2

COASTAL STORM DRAIN MONITORING PROGRAM REVIEW

ATTACHMENT 2-2: COASTAL STORM DRAIN MONITORING PROGRAM REVIEW

The Coastal Storm Drain Monitoring Program met the overall monitoring program goals by complying with San Diego Regional Water Quality Control Board Order No. R9-2007-0001 (Permit), characterizing urban runoff discharges, identifying sources of bacteria, and helping to detect and eliminate illegal discharges. The Coastal Storm Drain Monitoring Program provided information that is intended to primarily answer the core management questions addressing urban runoff discharges, particularly core management question 3 and question 4 from the Permit, which are as follows:

3. What is the relative urban runoff contribution to the receiving water problem(s)?
4. What are the sources of urban runoff that contribute to receiving water problem(s)?

The Permit requires monitoring of indicator bacteria levels in urban runoff from coastal storm drain outfalls. Through a paired sampling design of the flowing coastal storm drain that reaches the ocean or bay and the nearby AB411 ocean or bay station, this program evaluates the relationship between coastal storm drain discharges and exceedances of bacteriological water quality standards in the coastal receiving waters.

An evaluation of the CSDM Program was conducted to answer the following question:

What is the impact of dry weather discharges from the coastal storm drains on the REC-1 beneficial use the adjacent coastal beach?

Evaluation of the results of the CSDM Program found that:

- The CSDM Program has demonstrated that coastal storm drain flows cause few ocean or bay bacterial exceedances during dry weather. Less than 2 percent of paired receiving water and coastal storm drain samples collected from 2007-2010 indicate a “linkage”, where elevated storm drain concentrations correlate with observed receiving water exceedance of AB 411 bacterial criteria. Of 1,647 individual receiving water bacteria indicator samples analyzed, only 32 corresponded with coastal storm drain outfall discharges (0.9% of Total coliform, 1.5% of Fecal coliform, and 3.4% of *Enterococcus* paired samples). In addition to the low incidence of linked coastal storm drain outfall discharge and receiving water AB411 exceedances, the number of coastal storm drain discharges that reach receiving waters has decreased during the past eight years from 73 percent to 23 percent. The decrease in discharge reaching the receiving waters demonstrates a lower risk of a linkage occurring between coastal storm drains and receiving waters.
- Results of the CSDM Program indicate that few storm drains contribute discharges that are linked to the AB411 exceedances in receiving waters. Only 4 of the 227 (1.7 percent) coastal storm drains monitored over the past three years corresponded more than once to a nearby AB411 exceedance in the ocean or bay. These four coastal storm drains have ongoing source abatement programs. An additional six coastal storm drains over the past three years each corresponded only once with an elevated coastal storm drain discharge to a nearby AB 411 exceedance in the ocean or bay.

- Of the ten coastal storm drain outfalls over the past three years linked to AB411 exceedances in the ocean or bay, five will be included in the implementation plans for the Revised Total Maximum Daily Loads for Indicator Bacteria Project – I Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek Bacteria TMDL). The Bacteria TMDL will cover the following hydrologic areas: San Luis Rey River HU 903.00, San Marcos HA 904.50, San Dieguito HU 905.00, Miramar Reservoir HA 906.10, Scripps HA 906.30, Tecolote HA 906.50, San Diego River HU 907.00, and Chollas HSA 908.22. These areas cover much of the coastline and will result in a duplication of effort between the CSDM Program and the Bacteria TMDL monitoring program.

Conclusions

The conclusion of this evaluation is that the CSDM Program should be discontinued, as it has shown that the correspondence between elevated coastal storm drain outfall discharges and AB411 exceedances in the receiving water is minimal (1.9 percent). In addition, upcoming Bacteria TMDL monitoring will overlap with CSDM Program requirements. The TMDL will require an implementation plan to assess and prioritize receiving water exceedances caused by outfall discharges. The very few stations that exhibit a link to AB411 indicator bacterial exceedances in the bay or ocean are addressed by special programs at those stations.

Supporting Documentation

Background

The CSDM Program has been implemented since 2001, and includes the cities of Oceanside, Carlsbad, Encinitas, Solana Beach, Del Mar, San Diego, and the San Diego Unified Port District. The cities of Coronado and Imperial Beach do not currently participate in the program because Coronado participates in a weekly bacteria beach monitoring program, and Imperial Beach coastal storm drains do not flow during dry weather.

Order 2007-0001 require the Copermittees to identify all coastal storm drains and sample those that are flowing on a monthly basis. Current active sites for each jurisdiction were selected based on the following considerations:

- Accessibility
- Safety for samplers
- Outfall conveys urban runoff from the Copermittees' MS4.

Samples were collected from all locations meeting the site selection criteria above, in the manner described below:

1. Samples will be collected at all flowing storm drain outlets, even if the discharge does not come into direct contact with the receiving water.
2. Storm drain outlet samples will be collected if the storm drain discharge infiltrates into the sand before reaching the receiving water.
3. Storm drain outlet samples will be collected if the flowing storm drain results in ponding between the drain and the receiving water.

4. Paired samples (both storm drain sample and receiving water sample) will be collected when storm drain flows are observed to reach the receiving water.

Monthly samples are collected at all flowing coastal storm drain outfalls, and paired samples are collected in the receiving water if the coastal storm drain discharge reaches the receiving water. A total of 471 unpaired samples were collected at coastal storm drain outfalls from 2007-2010, and a total of 549 paired samples were collected during the same timeframe (2007-2008, 2008-2009, and 2009-2010 Coastal Storm Drain Monitoring Program Annual Reports). In total, 1,569 samples were analyzed for *Enterococcus*, Fecal Coliform, and Total Coliform (4,707 analyses total).

Summary of receiving water samples collected from 2007-2010

The geometric mean and range of receiving water results from 2007-2010 are presented in Figure 1 through Figure 3. Except for *Enterococcus*, the geometric mean for all stations and bacteria indicators is below the AB411 benchmark. Coast 36 and CSD010 are the only two stations with geometric means above the AB411 criteria for *Enterococcus* (although there are some single sample exceedances). Fecal coliform has a few single samples that are above the AB411 standard, but no geometric means. Total coliform also has no stations with geometric means above the benchmark, just a few single samples.

These results corroborate the findings of the receiving water and outfall discharge linkage analysis, which demonstrate that 19 Enterococcus, 8 Fecal Coliform, and 5 Total Coliform receiving water exceedances were likely caused by storm drain discharges. In those instances where receiving water results indicated higher concentrations of indicator bacteria than observed in storm drain runoff discharges, there was not a causal relationship demonstrated between storm drain discharge and the receiving water exceedance (see Table 1). Overall, there were more receiving water samples above the AB411 standard than presented in Table 1 because in some samples the receiving water result was much higher than the storm drain discharge concentration. For example, Station CSD021 exceeded the receiving water standard for *Enterococcus* and Fecal coliform on 12/1/2008 (804 MPN/100mL, and 460 MPN/100mL, respectively), but the storm drain concentrations were much lower than the receiving water results (280 MPN/100mL, and 9 MPN/100mL, respectively).

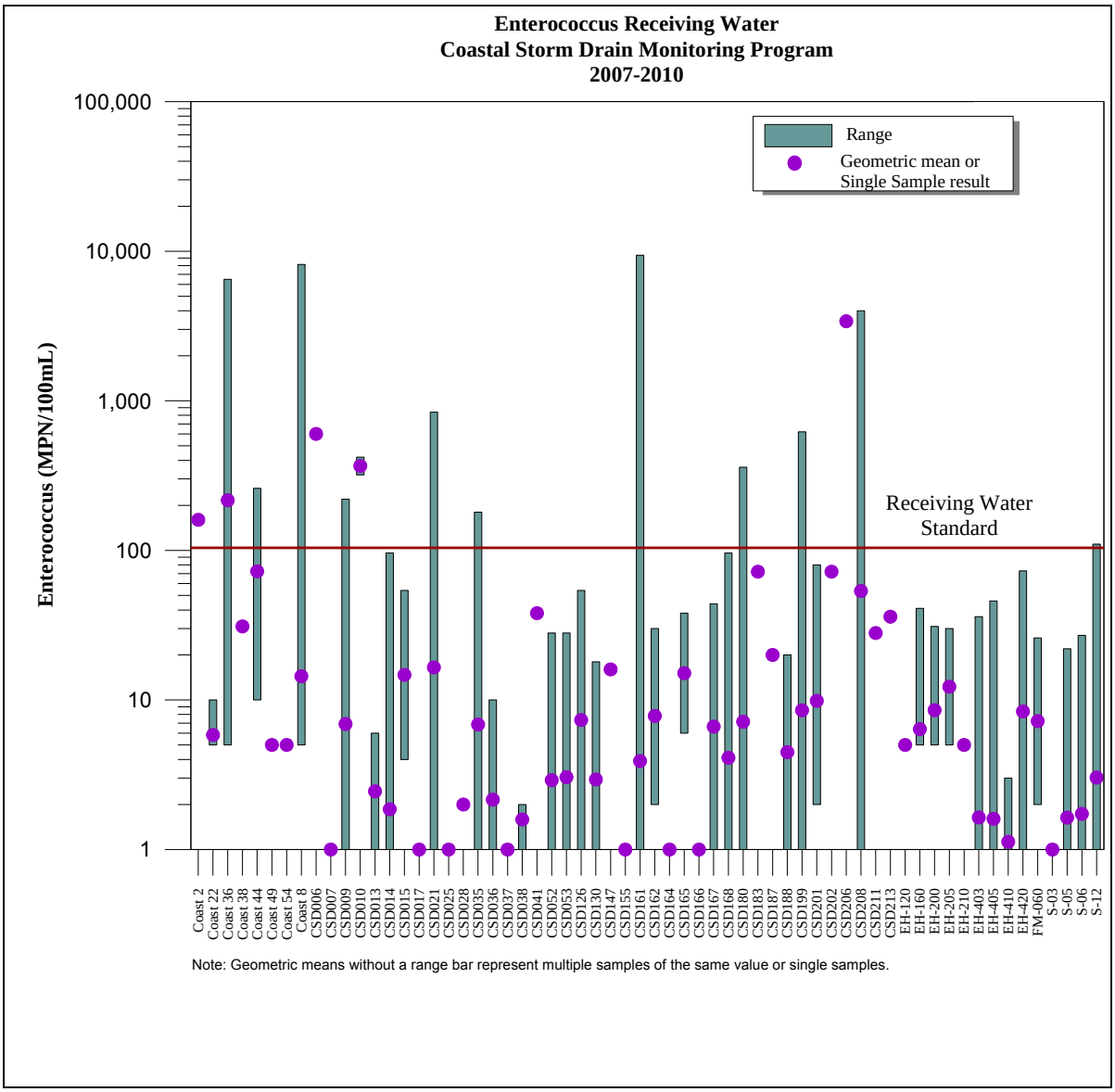

Figure 1. Summary of Coastal Storm Drain Monitoring Program Enterococcus Receiving Water Results 2007-2010

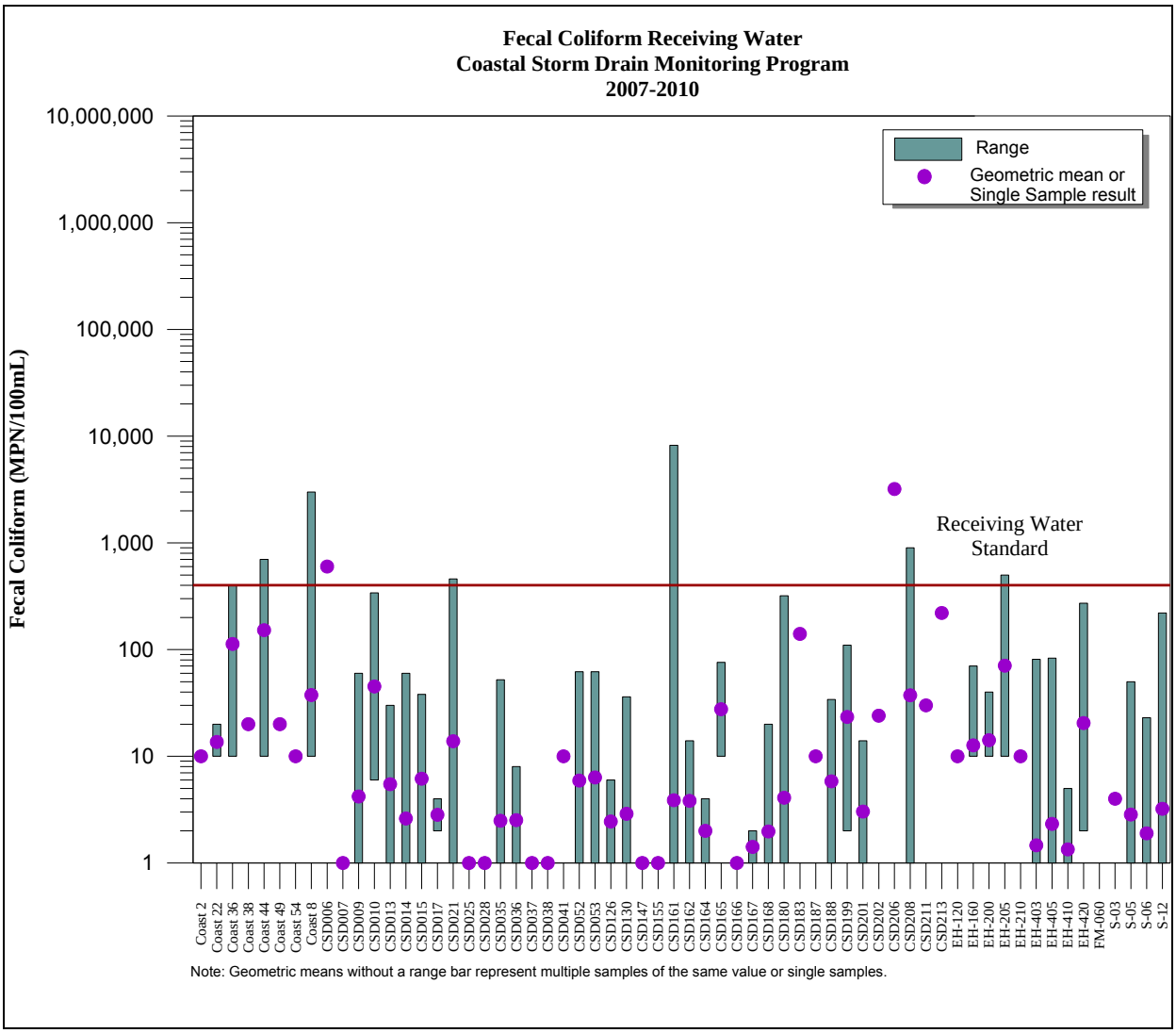

Figure 2. Summary of Coastal Storm Drain Monitoring Program Enterococcus Receiving Water Results 2007-2010

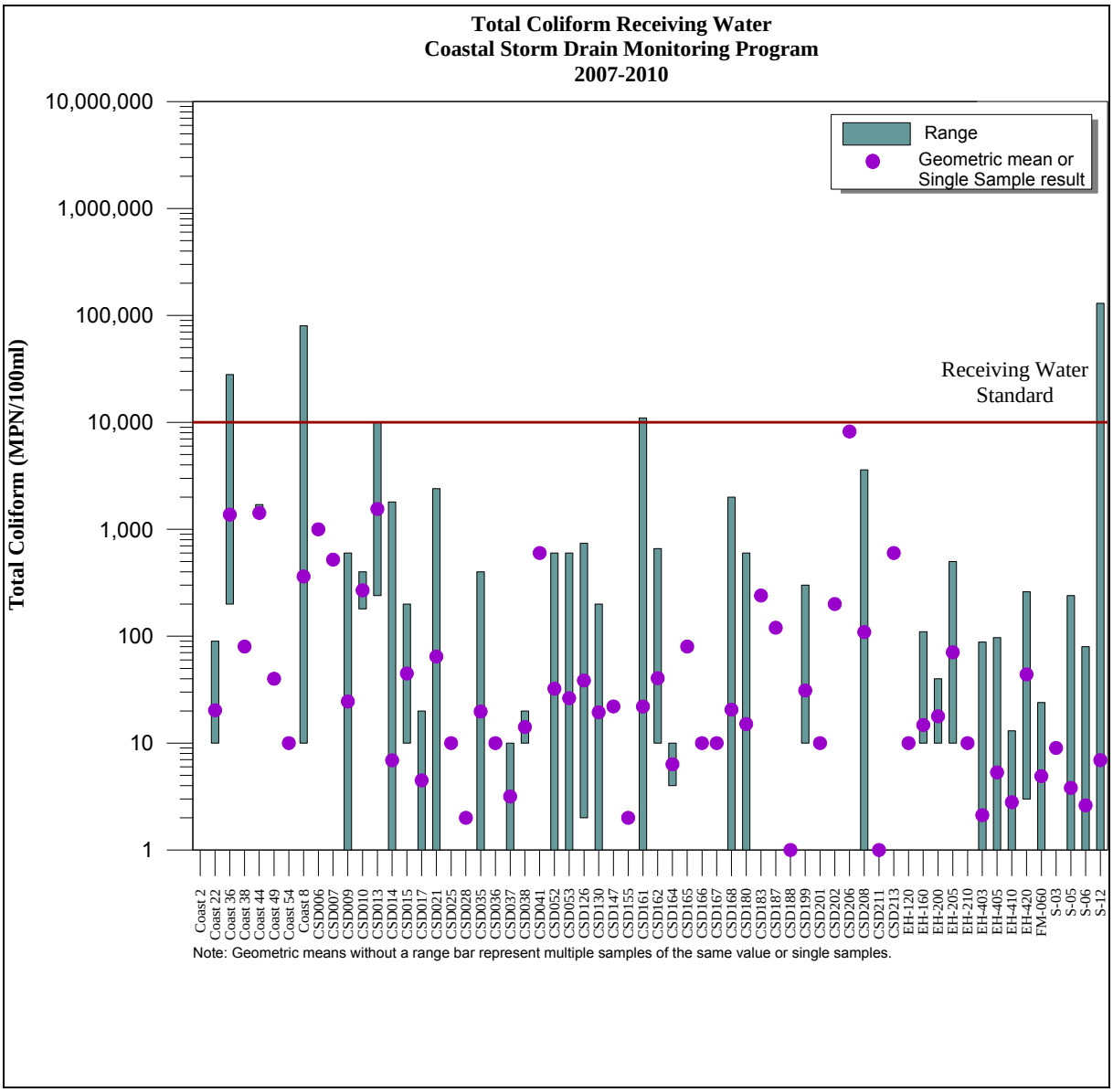

Figure 3. Summary of Coastal Storm Drain Monitoring Program Enterococcus Receiving Water Results 2007-2010

Coastal Storm Drain Outfall Discharge and Receiving Water Linkage Analysis

Sampling of the receiving water occurs when coastal storm drain outfall discharges reach the receiving waters. During the past three years of monitoring (2007-2010) 549 paired samples were collected. A paired sample consisted of one sample from the coastal storm drain outfall discharge and one from the receiving water. Of the 549 paired samples, 1.9 percent showed a link between storm drain outfalls and the receiving water (Table 1).

Table 1. Summary of Coastal Storm Drain Outfall and Receiving Water Linkages

Analyte	Number of Linked Samples	Total Number of Paired Samples	Percent Storm Drain Caused Receiving Water Exceedance
Enterococcus	19	549	3.5%
Fecal Coliform	8	549	1.5%
Total Coliform	5	549	0.9%
Total	**32**	**1,647**	**1.9%**

To further illustrate the relationships between receiving water and storm drain bacteria levels, and receiving water and storm drain action levels, a series of scatter plots referred to as adaptive monitoring diagrams were developed. The adaptive monitoring diagrams stratified the paired sampling data into categories, or quadrants and are essential tools in the implementation of understanding how storm drain flows can impact receiving waters. Figure 4 through Figure 6 summarize the results of Total Coliform, Fecal Coliform, and *Enterococcus* paired samples for 2007-2010.

The scatter plots are divided into five quadrants that are formed by superimposing a line of slope = 1 and two perpendicular lines that delineate the AB411 standard for the indicator of interest. For example, the five quadrants in Figure 1 through Figure 3 are formed by the 1:1 slope line and two lines delineating the AB411 standard line for Total Coliform (10,000 MPN/ 100mL). Receiving water bacteria levels in samples falling within quadrants above the 1:1 slope line (Quadrants II and III, and the upper part of Quadrant I) are higher in bacteria than the corresponding storm drain sample and are therefore, likely influenced by sources in addition to the storm drain discharge. Possible sources include birds, other marine wildlife, discharges from watercraft, and ocean bathers. Quadrant IV of the scatter plots includes the paired samples where elevated storm drain bacteria are likely to have caused or contributed significantly to the AB411 exceedance. Quadrant V includes the elevated storm drain samples that did not result in an AB411 exceedance. Table 2 describes the relationships associated with paired sample data falling into each quadrant.

Table 2. Adaptive Monitoring Description, Recreated from Coastal Storm Drain Monitoring Program 2009-2010 Annual Report

Quadrant	Area	Relationship/Possible Action
Lower Left	I	Storm drain and receiving water levels are below receiving water standards. The receiving waters support beneficial uses
Lower Right	I-A	Storm drain concentration is above receiving water criteria but below 95th percentile action level, receiving water is below receiving water criteria. No action necessary
	V	Storm drain concentration is above 95th percentile action level while receiving water concentration is below receiving water criteria. Highly elevated storm drain concentration does not cause receiving water exceedance, however, the magnitude of the exceedance warrants follow-up and possible investigation.
Upper Left	II	Storm drain less than receiving water standards, while criteria are exceeded in receiving water sample. It does not appear that storm drain flow is responsible for the receiving water exceedance.

Quadrant	Area	Relationship/Possible Action
Upper Right	III	Storm drain and receiving water samples are above receiving water criteria, and storm drain concentration is less than receiving water concentration. Storm drain contamination may contribute to receiving water exceedance, but other sources are also likely.
	IV	Storm drain and receiving water samples are above receiving water criteria, and storm drain concentration is greater than the receiving water concentration. Elevated storm drain concentration likely to have caused receiving water exceedance.

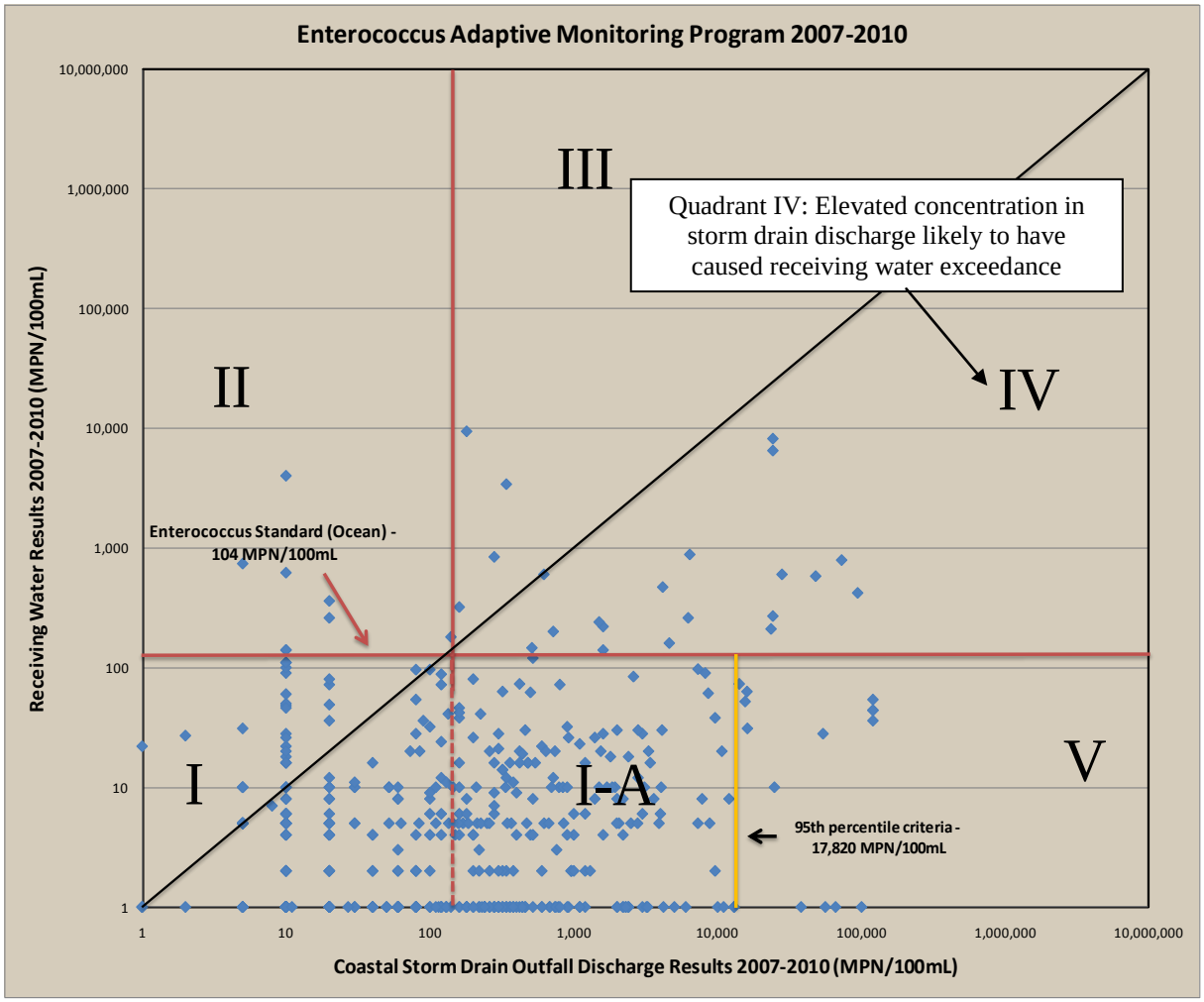

Figure 4. *Enterococcus* Adaptive Monitoring Results 2007-2010

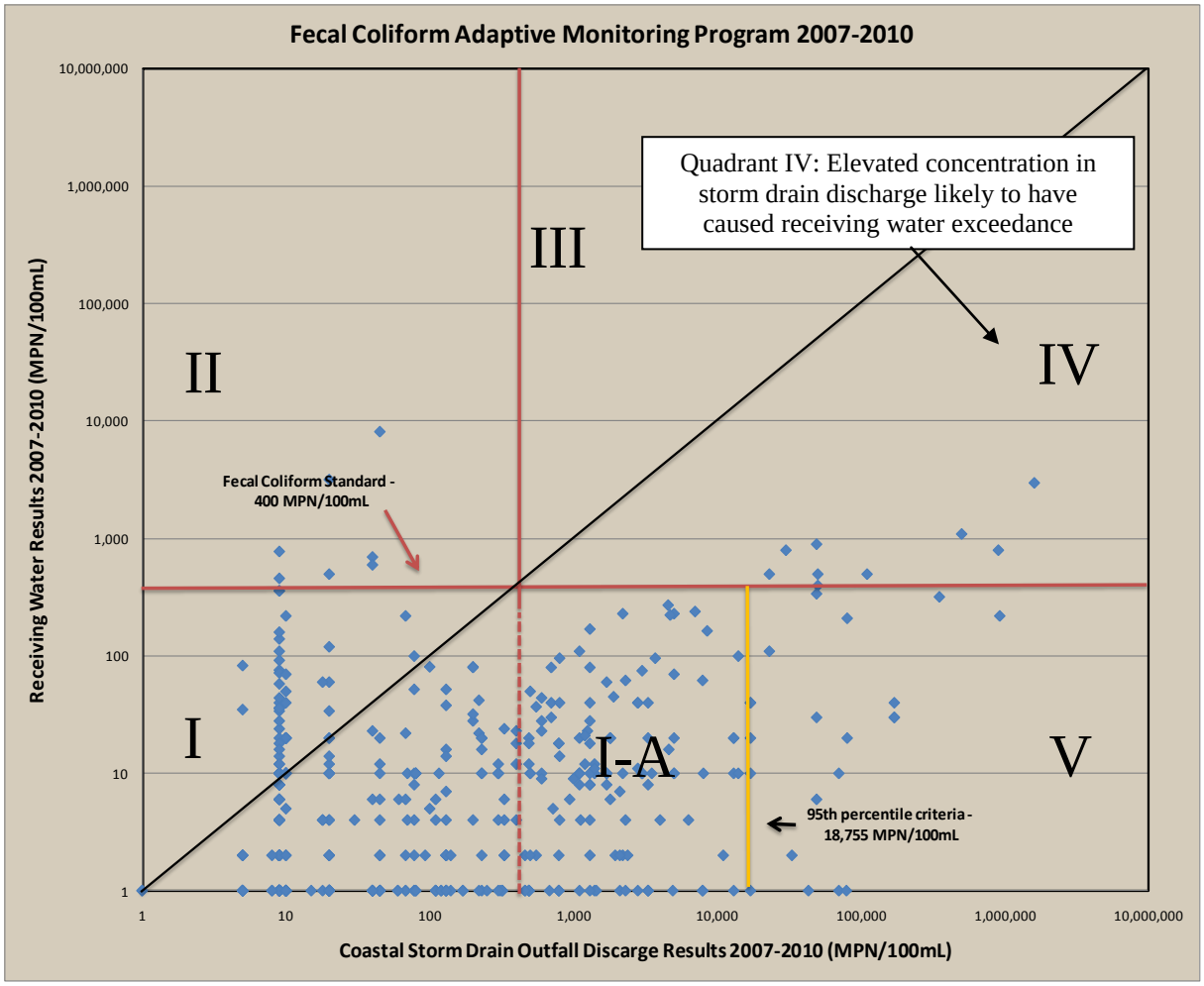

Figure 5. Fecal Coliform Adaptive Monitoring Results 2007-2010

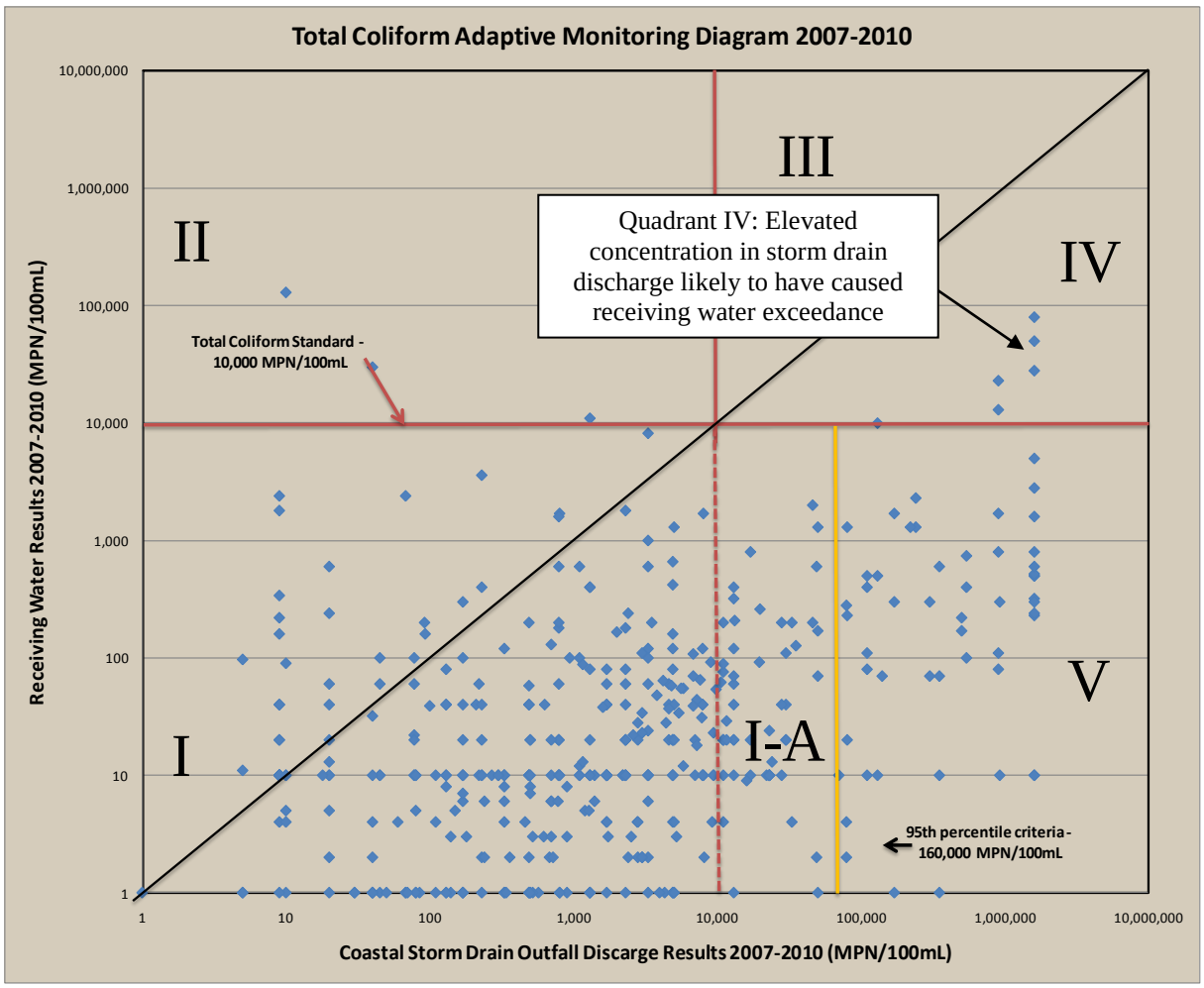

Figure 6. Total Coliform Adaptive Monitoring Results 2007-2010

The samples that fall into Quadrant IV in Figure 4 through Figure 6 are summarized in Table 5, which presents a seasonal breakdown of the coastal storm drain discharge and receiving water results where linkages are present. The majority of linked samples occurred during the winter months (11 of 19 *Enterococcus* samples, 4 of 7 Fecal Coliform, and 4 of 5 Total Coliform).

Table 3. Seasonal Summary of Coastal Storm Drain Discharge and Linked Receiving Water Samples

Month	*Enterococcus*	Fecal Coliform	Total Coliform	Season
May	1	0	0	Dry Season
June	1	1	0	
July	0	1	0	
August	3	1	0	
September	3	0	1	
Summer Total	**8**	**3**	**1**	
October	1	2	1	Wet Season
November	2	0	0	
December	1	0	0	
Jan	4	2	3	
Feb	2	0	0	
March	1	0	0	
April	0	0	0	
Winter Total	**11**	**4**	**4**	

Stations for which a linkage between coastal storm drain discharge and receiving water results has been observed are presented in Table 4. Of 227 stations included in the program, only four of the ten stations with a suspected linkage exhibit a chronic pattern of paired sample exceedances. These four stations represent 1.7 percent of the stations monitored within the CSDM Program. At two of these four stations, additional measures have already been taken to ensure the linkage between coastal storm drain discharges and receiving waters is eliminated. Effectiveness assessment of BMP implementation (Coast 8) is currently underway, and for CSD208 special monitoring is currently underway to understand and eliminate the source of bacteria. The sources of indicator bacteria exceedances at Coast 36 and Coast 44 have been identified. The outfall at Coast 36 is from Camp Pendleton and results have been forwarded to them for action. The two exceedances at Coast 44 were from commercial fishing activity and Oceanside Harbor Maintenance and Oceanside Code Enforcement have worked with the fisherman and the fish distributors to implement appropriate BMPs. The other six stations have exhibited a linkage between storm drain discharge and receiving water bacteria indicator results only once during the past three years. Four of the six stations will be monitored under the upcoming Bacteria TMDL. Therefore, additional special monitoring at these locations is not necessary.

Table 4. Summary of Coastal Storm Drain Outfall Monitoring Stations with Linkages to Receiving Water AB411 Exceedances

Station	Season Linkage Observed	Years Linkage Observed	HU	Water Body	Latitude	Longitude	Ongoing Actions
Coast 2	Winter (2008-2009)	1	902*	Oceanside Harbor	33.21303	-117.39474	Not an ongoing receiving water and storm drain outfall discharge linkage. No further action necessary.
Coast 36	Summer/Winter (2008-2010)	2	902*	Oceanside Harbor	33.21253	-117.39426	Source of flow identified. Results, photos, and details sent to Camp Pendleton for abatement.
Coast 44	Winter (2008-2010)	2	902*	Oceanside Harbor	33.20642	-117.38961	Source of flow identified. Oceanside Harbor Maintenance and Code Enforcement have implemented structural and administrative BMPs for the commercial fisherman and seafood transport and distribution companies.
Coast 8	Summer/Winter (2007-2010)	3	902*	Oceanside Harbor	33.20564	-117.3932	Effectiveness Assessment of BMP implementation ongoing
CSD006	Winter (2008-2009)	1	906	Vallecitos	32.85562	-117.25819	Included in Bacteria TMDL; Not an ongoing receiving water and storm drain outfall discharge linkage. No further action necessary.
CSD009	Winter (2008-2009)	1	906	Roseland Dr	32.852138	-117.26111	Included in Bacteria TMDL; Not an ongoing receiving water and storm drain outfall discharge linkage. No further action necessary.
CSD010	Summer (2008-2009)	1	906	Coast Blvd	32.850346	-117.27297	Included in Bacteria TMDL; Not an ongoing receiving water and storm drain outfall discharge linkage. No further action necessary.
CSD035	Winter (2007-2008)	1	906	Cortez Place	32.818586	-117.27428	Included in Bacteria TMDL; Not an ongoing receiving water and storm drain outfall discharge linkage. No further action necessary.
CSD208	Summer/Winter (2007-2010)	3	906	Cudahy	32.78679	-117.20791	Included in Bacteria TMDL, Special Monitoring through City of San Diego
EH-205	Summer (2008-2009)	1	908	Bessemer St	32.71803	-117.23344	Not an ongoing receiving water and storm drain outfall discharge linkage. No further action necessary.

* Hydrologic Unit designated as 902* is representative of stations in Oceanside Harbor. The harbor is listed as a coastal water body in Table 2-3 of the Water Quality Control Plan for the San Diego Basin (9). A Hydrologic Unit Basin Number has not been assigned to the harbor. According to SanGIS data, the stations fall into the 902 Hydrologic Unit, Santa Margarita.

The sample results shown in Quadrant IV of Figure 4 through Figure 6 are presented in Table 5.

Table 5. Coastal Storm Drain Discharge and Receiving Water Linkage Analysis Individual Results

Station	Date	Analyte	Months	Coastal Outfall Concentration (MPN/100 ml)	Coastal Receiving Water Concentration (MPN/100 ml)
Coast 2	2/4/2009	Enterococcus	Feb	4,611	160
Coast 36	9/2/2008	Enterococcus	Sept	24,196	6,488
Coast 36	6/1/2009	Enterococcus	June	4,150	470
Coast 36	11/9/2009	Enterococcus	Nov	23,500	210
Coast 36	9/1/2010	Enterococcus	Sept	72,700	790
Coast 44	3/10/2008	Enterococcus	March	512	146
Coast 44	1/11/2010	Enterococcus	Jan	6,240	260
Coast 8	1/17/2008	Enterococcus	Jan	24,196	8,164
Coast 8	5/12/2008	Enterococcus	May	24,196	269
CSD006	12/1/2008	Enterococcus	Dec	620	600
CSD009	11/10/2008	Enterococcus	Nov	1,600	220
CSD010	8/4/2008	Enterococcus	Aug	94,000	420
CSD035	1/14/2008	Enterococcus	Jan	1,600	140
CSD208	8/11/2008	Enterococcus	Aug	1,500	240
CSD208	8/5/2009	Enterococcus	Aug	28,000	600
CSD208	10/14/2009	Enterococcus	Oct	48,000	580
CSD208	1/13/2010	Enterococcus	Jan	6,400	880
CSD208	2/1/2010	Enterococcus	February	720	200
CSD208	9/7/2010	Enterococcus	Sept	520	120
Enterococcus: 19 Receiving Water Samples Likely Linked to Storm Drain Discharge					
Coast 44	1/11/2010	Fecal Coliform	Jan	50,000	500
Coast 8	10/8/2007	Fecal Coliform	Oct	500,000	1,100
Coast 8	1/17/2008	Fecal Coliform	Jan	30,000	800
Coast 8	6/2/2008	Fecal Coliform	June	110,000	500
Coast 8	10/21/2009	Fecal Coliform	Oct	1,600,000	3,000
Coast 8	2/15/2010	Fecal Coliform	February	900,000	800
CSD208	8/5/2009	Fecal Coliform	Aug	49,000	900
EH-205	7/23/2009	Fecal Coliform	July	23,000	500
Fecal Coliform: 8 Receiving Water Samples Likely Linked to Storm Drain Discharge					
Coast 36	9/2/2008	Total Coliform	Sept	1,600,000	23,000
Coast 8	1/17/2008	Total Coliform	Jan	1,600,000	50,000
Coast 8	1/31/2008	Total Coliform	Jan	90,000	23,000

Table 5. Coastal Storm Drain Discharge and Receiving Water Linkage Analysis Individual Results

Station	Date	Analyte	Months	Coastal Outfall Concentration (MPN/100 ml)	Coastal Receiving Water Concentration (MPN/100 ml)
Coast 8	1/12/2009	Total Coliform	Jan	90,000	13,000
Coast 8	10/21/2009	Total Coliform	Oct	1,600,000	80,000
Total Coliform: 5 Receiving Water Samples Likely Linked to Storm Drain Discharge					
In Total: 1.9 Percent (32 of 1,647) Receiving Water Samples Likely Linked to Storm Drain Discharge					

Coastal Storm Drain Discharge Frequency

During the time period of 2007-2010, coastal storm drain outfall discharges that reach the receiving water have decreased. Figure 7 illustrates the reduction of coastal storm drain outfall discharges, from approximately 73 percent of coastal storm drains discharging in 2002-2003 down to 23 percent discharging in 2009-2010. The reduced incidence of discharging outfalls translates to a reduced risk of beneficial use impairment in the coastal receiving waters.

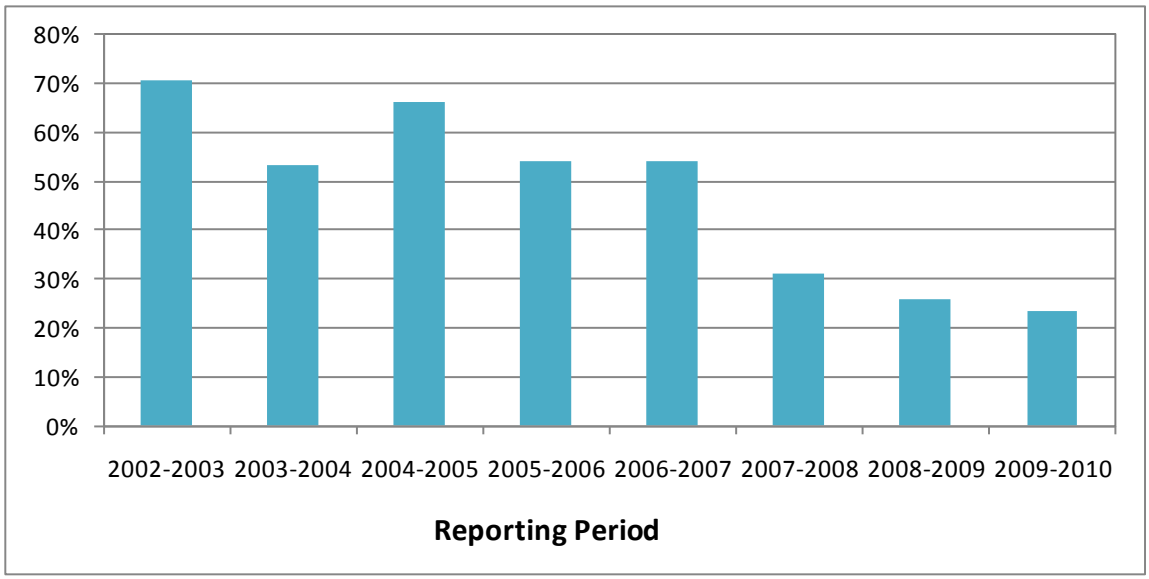

Figure 7. Proportion of Flowing Coastal Storm Drains, Reproduced from Figure 4-10 of Coastal Storm Drain Monitoring Program 2009-2010 Annual Report

ATTACHMENT 2-3

MS4 OUTFALL MONITORING PROGRAM REVIEW

ATTACHMENT 2-3: MS4 OUTFALL MONITORING PROGRAM REVIEW

The 2007 Permit required a municipal separate storm sewer system program (MS4 Program) to characterize constituent discharges from MS4 outfalls and to assess whether these discharges contribute to the water quality problems in the receiving waters. The MS4 Program addresses core management question #3 of the Permit (what is the relative urban runoff contribution to the receiving water problem(s)?). The MS4 Outfall Work Plan (Attachment to Copermittees Scope of Work for 2010-2011, 2010) consists of a random and targeted sampling design during dry weather and wet weather periods (Table 0-1).

Table 0-1: Summary of the MS4 Outfall Monitoring Design

Season	Design Type	Outfall Diameter	Number of Samples
Dry	Random	≥36 inches	54 per year
	Targeted	Any	200 per year
Wet	Random	≥36 inches	54 per year
	Targeted	Any	9 per Permit cycle

The following monitoring questions guide the different components of the MS4 Outfall monitoring program.

Random Program-

1. *What are the characteristics of discharges from MS4 outfalls in regard to high priority pollutants?*
2. *Are constituent loadings changing over time?*

Targeted Program-

3. *Which of the targeted MS4 outfalls have the greatest constituent loading?*
4. *Are the pollutants loading decreasing over time?*

A preliminary assessment of the MS4 Program was conducted to answer those questions that could be addressed with the data collected thus far which include questions 1 and 3. Table 0-2 shows the number of samples collected each year in each element of the five-year program. Except for the targeted wet weather element, which has only one year of data thus far, there were two years of monitoring data for evaluation.

Table 0-2: Summary of MS4 Program Monitoring Data Collection (2007-2010)

Program Year	Random Sites		Targeted Sites	
	Wet Weather	*Dry Weather*	*Wet Weather*	*Dry Weather**
2007-2008	0	0	0	9
2008-2009	39	40	0	178
2009-2010	50	35	3	172

*For targeted dry, number of sites differs by analyte and includes all sites sampled. An additional 28-29 sites visited were dry (~14%) and could not be sampled.

Key Findings

- On a regional basis, dry weather priority constituents from MS4 outfalls included: bacteria, nutrients, and TDS. Wet weather priority constituents included bacteria and TSS.
- In general, these regional MS4 outfall priorities match the priorities in receiving waters.
- MS4 targeted outfalls with the greatest pollutant loading differ somewhat by constituent and year. However, upon further data collection, priority MS4 outfalls will be identified.

Conclusions

The on-going MS4 Program will provide a sound basis for updating the design under the next Permit. In general, priority constituents in dry and wet weather conditions match the receiving water priorities. Preliminary results have indicated that high priority MS4 outfalls will be identified with a more robust data set at the completion of the current MS4 program in three years. When an adequate number of samples are collected, this program will allow for Copermittees to focus on key drainages to identify and abate sources, as warranted.

Supporting Documentation

The analysis of all data collected from the MS4 outfalls throughout the region was used to answer the following question:

> *Question 1: What are the characteristics of discharges from MS4 outfalls in regard to high priority pollutants?*

Storm drain discharge data were compared to receiving water benchmarks to determine if storm drain runoff has the potential to contribute to the receiving water problems.

Dry Weather – Of the ten constituents analyzed in the MS4 random program, dry weather priority constituents for MS4 outfall discharges included: total nitrogen, total phosphorus, TDS, fecal coliform and enterococcus for the region. Note that discharge results were compared to WQOs for receiving waters (RW) to determine priority rating, where greater than 50-percent detections were above WQO was considered high priority and greater than 25-percent frequency and less than or equal to 50-percent was considered medium priority (shown as percent above the receiving water –water quality objective (% above RW-WQB) in the following tables). The high priority and the medium priority constituents were evaluated using all of the data collected in the random and targeted monitoring elements of the MS4 Program. The results of the random program regionally represent the ten constituents sampled at randomly-selected outfalls in each watershed. The results of the targeted program support the regional results for these constituents, and also identify two additional constituents, chloride and sulfate (constituents of TDS), as priorities in some watersheds.

Table 0-3: Summarized Results of MS4 Random Outfalls Dry Weather Sampling

MS4 Random Dry		
Constituent	n	% Above RW-WQB
pH	75	3%
Nitrate as N	75	7%
Nitrate/Nitrite as N	75	7%
Nitrite as N	75	0%
Total Phosphorus	75	79%
Total Nitrogen	75	91%
Total Suspended Solids*	75	17%
Total Dissolved Solids	67	93%
Enterococcus	75	92%
Fecal Coliform	75	43%

Notes:
Discharge results compared to receiving water quality benchmarks.
*TSS-WQO is a narrative standard, the objective is a benchmark based on the overall median values and EMCs from the NSDQ, Version 1.0 (2004).
n= number of samples
High priority constituents shown in orange and medium priority constituents in yellow.

Table 0-4: Summarized Results of MS4 Targeted Outfalls Dry Weather Sampling

MS4 Targeted Dry		
Constituent	n	% Above RW-WQB
pH	95	5%
Nitrate as N	125	14%
Nitrate/Nitrite as N	56	7%
Nitrite as N	96	0%
Total Phosphorus	257	69%
Total Nitrogen	259	88%
Total Suspended Solids	228	4%
Total Dissolved Solids	260	90%
Enterococcus	355	80%
Fecal Coliform	352	42%
Chloride	41	68%
Sulfate	44	98%
Cadmium (Dissolved)	106	0%
Copper (Dissolved)	110	5%
Lead (Dissolved)	106	0%
Nickel (Dissolved)	6	0%
Zinc (Dissolved)	105	1%
Selenium, Total	33	15%
Ammonia as N	51	4%
Dissolved Oxygen	99	12%
Turbidity	52	12%
MBAS	32	22%
Chlorpyrifos	69	1%
Diazinon	73	0%
Malathion	45	0%
Oil & Grease	32	0%

Notes:
Discharge results compared to receiving water quality benchmarks.
Based on 202 different sites; 149 sites sampled in both 2008-2009 and 2009-2010.n= number of samples
High priority constituents shown in orange and medium priority constituents in yellow.

Preliminary dry weather priority ratings for monitored constituents by MLS drainage area are provided in Table 0-5 and Table 0-6 for the random and targeted MS4 outfall discharge results, respectively. These tables identify the number of MS4 samples within each MLS drainage area, and the priority identified based on these data. The ambient receiving water priorities based on the MLS monitoring results are also shown for comparison. In general, the priorities for the MS4 outfall discharges were largely consistent with the priorities identified in the corresponding receiving water.

Table 0-5: MS4 Random Dry Weather Results compared to Receiving Water Priorities by Watershed (MLS Drainage Area)

Constituent	AHC		CC-SD8(1)		EC		LPC		SDC		SDR		SLR		SMR		SR		TC		TJR	
	n	% Above RW-WQB	n	% Above RW-WQB	n	% Above RW-WQB	n	% Above RW-WQB	n	% Above RW-WQB	n	% Above RW-WQB	n	% Above RW-WQB	n	% Above RW-WQB	n	% Above RW-WQB	n	% Above RW-WQB	n	% Above RW-WQB
pH	2	0%	0	NA	1	0%	5	0%	2	0%	4	0%	8	0%	12	0%	4	0%	2	50%	2	50%
Nitrate as N	2	0%	0	NA	1	0%	5	0%	2	0%	4	0%	8	25%	12	25%	4	0%	2	0%	2	0%
Nitrate/Nitrite as N	2	0%	0	NA	1	0%	5	0%	2	0%	4	0%	8	25%	12	25%	4	0%	2	0%	2	0%
Nitrite as N	2	0%	0	NA	1	0%	5	0%	2	0%	4	0%	8	0%	12	0%	4	0%	2	0%	2	0%
Total Phosphorus	2	100%	0	NA	1	100%	5	60%	2	100%	4	75%	8	63%	12	75%	4	75%	2	100%	2	50%
Total Nitrogen	2	100%	0	NA	1	100%	5	60%	2	50%	4	100%	8	88%	12	92%	4	100%	2	100%	2	100%
Total Suspended Solids	2	0%	0	NA	1	0%	5	20%	2	0%	4	0%	8	25%	12	8%	4	0%	2	0%	2	50%
Total Dissolved Solids	2	100%	0	NA	1	100%	5	100%	2	100%	4	100%	8	100%	12	100%	4	100%	0	NA	2	0%
Enterococcus	2	50%	0	NA	1	100%	5	100%	2	100%	4	100%	8	88%	12	92%	4	100%	2	100%	2	100%
Fecal Coliform	2	0%	0	NA	1	0%	5	40%	2	0%	4	50%	8	50%	12	67%	4	50%	2	50%	2	0%
Ambient RW Priorities		Total Nitrogen (medium), TDS, Enterococcus, Fecal coliform, Toxicity (medium)		pH, Dissolved Phosphorus, Total Phosphorus, Total Nitrogen, Ammonia as N (medium), Bacteria (medium), Dissolved Cu, Total Selenium (medium); Toxicity (medium); and Turbidity, MBAS, COD, BOC, Oil and Grease (all medium)		Total Nitrogen, TDS, Enterococcus, Toxicity (medium)		Total Nitrogen (medium), Total Phosphorus, TDS, Enterococcus , Toxicity		Total Phosphorus (medium), Total Nitrogen, TDS, Enterococcus (medium) Fecal coliform (medium), BOD (medium), Toxicity (medium)		Dissolved Phosphorus, Total Phosphorus (medium),		Dissolved Phosphorus, Total Phosphorus, Total Nitrogen (medium), TDS, Enterococci (Med), Fecal Coliforms (Med)		Total Nitrogen, TDS, Chlorpyrifos		Total Phosphorus (medium), Total Nitrogen (medium) TDS, Enterococci (medium), Toxicity		Total Phosphorus (medium), Toxicity		Dissolved Phosphorus, Total Phosphorus, Total Nitrogen, Ammonia as N, Enterococcus, Fecal coliform, BOD, MBAS, Turbidity (medium), COD (medium), Toxicity

Discharge results compared to receiving water quality benchmarks. Ambient RW Priorities based NPDES Regional Program and does not include results from SMC or Third Party data.
NA – Either no data were collected upstream of the mass loading station, or stations were dry and no data collected

Table 0-6: MS4 Targeted Dry Weather Results compared to Receiving Water Priorities by Watershed (MLS Drainage Area)

Constituent	AHC		CC-SD8(1)		EC		LPC		SDC		SDR		SLR		SMR		SR		TC		TJR	
	n	% Above RW-WQB	n	% Above RW-WQB	n	% Above RW-WQB	n	% Above RW-WQB	n	% Above RW-WQB	n	% Above RW-WQB	n	% Above RW-WQB	n	% Above RW-WQB	n	% Above RW-WQB	n	% Above RW-WQB	n	% Above RW-WQB
pH	0	NA	1	0%	12	8%	1	0%	0	NA	25	4%	4	0%	0	NA	0	NA	0	NA	1	0%
Nitrate as N	5	60%	0	NA	16	13%	1	0%	0	NA	15	27%	25	20%	10	0%	5	0%	0	NA	0	NA
Nitrate/Nitrite as N	4	0%	0	NA	0	NA	8	25%	0	NA	20	5%	0	NA	0	NA	0	NA	0	NA	0	NA
Nitrite as N	5	0%	0	NA	6	0%	0	NA	0	NA	15	0%	25	0%	10	0%	5	0%	0	NA	0	NA
Total Phosphorus	9	67%	1	100%	18	50%	18	72%	0	NA	54	63%	28	71%	10	50%	5	60%	8	88%	7	100%
Total Nitrogen	9	78%	1	100%	18	78%	18	89%	0	NA	54	94%	28	96%	10	70%	5	100%	8	75%	7	86%
Total Suspended Solids	11	0%	8	0%	18	6%	18	0%	11	0%	54	6%	3	0%	9	0%	0	NA	8	0%	7	0%
Enterococcus	11	91%	8	88%	18	83%	19	89%	11	64%	54	74%	28	68%	10	60%	17	82%	8	100%	8	75%
Fecal Coliform	11	73%	8	0%	18	67%	19	63%	11	18%	54	35%	28	39%	10	20%	16	13%	8	50%	8	0%
Total Dissolved Solids	11	100%	0	NA	18	100%	19	100%	11	100%	54	81%	28	100%	10	80%	17	88%	0	NA	0	NA
Chloride	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	28	64%	1	0%	0	NA	0	NA	0	NA
Sulfate	11	100%	0	NA	17	100%	0	NA	0	NA	0	NA	0	NA	3	67%	0	NA	0	NA	0	NA
Cadmium (Dissolved)	0	NA	8	0%	10	0%	0	NA	0	NA	0	NA	0	NA	0	NA	16	0%	6	0%	7	0%
Copper (Dissolved)	0	NA	8	0%	10	0%	2	0%	0	NA	0	NA	0	NA	0	NA	16	0%	6	0%	7	0%
Lead (Dissolved)	0	NA	8	0%	10	0%	0	NA	0	NA	0	NA	0	NA	0	NA	16	0%	6	0%	7	0%
Nickel (Dissolved)	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	6	0%
Zinc (Dissolved)	0	NA	8	0%	10	0%	0	NA	0	NA	0	NA	0	NA	0	NA	16	0%	6	0%	7	0%
Selenium, Total	9	33%	0	NA	18	11%	0	NA	0	NA	0	NA	3	0%	0	NA	0	NA	0	NA	0	NA
Ammonia as N	0	NA	0	NA	10	10%	1	0%	0	NA	8	0%	1	0%	0	NA	0	NA	0	NA	0	NA
Dissolved Oxygen	0	NA	0	NA	10	0%	0	NA	0	NA	46	7%	4	0%	0	NA	0	NA	0	NA	7	86%
Turbidity	0	NA	0	NA	12	0%	1	0%	0	NA	0	NA	4	0%	0	NA	0	NA	0	NA	0	NA
MBAS	0	NA	0	NA	10	0%	1	0%	0	NA	1	0%	0	NA	0	NA	0	NA	0	NA	0	NA
Chlorpyrifos	5	20%	8	0%	10	0%	0	NA	0	NA	2	0%	0	NA	2	0%	0	NA	0	NA	7	0%
Diazinon	5	0%	8	0%	10	0%	0	NA	0	NA	2	0%	0	NA	2	0%	0	NA	0	NA	7	0%
Malathion	5	0%	8	0%	0	NA	0	NA	0	NA	2	0%	0	NA	2	0%	0	NA	0	NA	0	NA
Oil & Grease	0	NA	0	NA	10	0%	0	NA	0	NA	2	0%	3	0%	0	NA	0	NA	0	NA	0	NA
Ambient RW Priorities		Total Nitrogen (medium), TDS, Enterococcus, Fecal coliform, Toxicity (medium)		pH, Dissolved Phosphorus, Total Phosphorus, Total Nitrogen, Ammonia as N (medium), Bacteria (medium), Dissolved Cu, Total Selenium (medium); Toxicity (medium); and Turbidity, MBAS, COD, BOC, Oil and Grease (all medium)		Total Nitrogen, TDS, Enterococcus, Toxicity (medium)		Total Nitrogen (medium), Total Phosphorus, TDS, Enterococcus , Toxicity		Total Phosphorus (medium), Total Nitrogen, TDS, Enterococcus (medium) Fecal coliform (medium), BOD (medium), Toxicity (medium)		Dissolved Phosphorus, Total Phosphorus (medium),		Dissolved Phosphorus, Total Phosphorus, Total Nitrogen (medium), TDS, Enterococci (Med), Fecal Coliforms (Med)		Total Nitrogen, TDS, Chlorpyrifos		Total Phosphorus (medium), Total Nitrogen (medium) TDS, Enterococci (medium), Toxicity		Total Phosphorus (medium), Toxicity		Dissolved Phosphorus, Total Phosphorus, Total Nitrogen, Ammonia as N, Enterococcus, Fecal coliform, BOD, MBAS, Turbidity (medium), COD (medium), Toxicity

Discharge results compared to receiving water quality benchmarks. Ambient RW Priorities based NPDES Regional Program and does not include results from SMC or Third Party data.
NA – Either no data were collected upstream of the mass loading station, or stations were dry and no data collected

Overall, the five primary dry weather regional priority constituents in the MS4 outfall discharges are the same priorities identified in the receiving water as shown in Table 0-7. This table displays a check mark if the constituent was a priority in both the MS4 and receiving water.

Table 0-7: General Comparison of Dry Weather Regional MS4 Outfall Priority Constituents and Receiving Water Priorities by Watershed Management Area

Dry Weather Regional MS4 Priority Constituents	Receiving Waters by WMA*								
	SMR	SLR	CAR	SDC	LPC	MB	SDR	SDB	TJR
Total Nitrogen	✓	✓	✓	✓	✓	✓	✓	✓	✓
Total Phosphorus	*MS4*	✓	✓	✓	✓	✓	✓	✓	✓
TDS	✓	✓	✓	✓	✓	✓	✓	✓	✓
Enterococci	*MS4*	✓	✓	✓	✓	✓	✓	✓	✓
Fecal Coliform	*MS4*	✓	✓	✓	*MS4*	✓	*MS4*	✓	*RW*

✓=Both RW and MS4; MS4 indicates priority identified for MS4 only; RW indicates priority identified for RW only.

Wet Weather – Analysis of the constituents collected in the MS4 random wet weather program indicated priority constituents of fecal coliform and TSS (Table 0-8). The limited results of the targeted wet weather program (Table 0-9) supported the random regional results, with fecal coliform (high) and TSS (medium) identified as priority constituents. Turbidity was also a priority constituent in two of three sites.

Table 0-8: Summarized Results of MS4 Random Outfalls Wet Weather Sampling

MS4 Random Wet		
Constituent	n	% Above RW-WQB
pH	86	13%
Nitrate as N	73	4%
Nitrate/Nitrite as N	88	3%
Nitrite as N	73	0%
Total Phosphorus	89	0%
Total Dissolved Solids	76	21%
Total Suspended Solids	89	25%
Fecal Coliform	89	75%

No wet weather benchmark for Total Nitrogen or Enterococci
Based on n= 89 sites; analytes not collected at all sites.
Discharge results compared to receiving water quality benchmarks (RW-WQBs).

Table 0-9: Summarized Results of MS4 Targeted Outfalls Wet Weather Sampling

MS4 Targeted Wet		
Constituent	n	% Above RW-WQB
pH	3	0%
Nitrate as N	3	0%
Nitrite as N	3	0%
Total Phosphorus	3	0%
Dissolved Phosphate	3	0%
Total Suspended Solids	3	33%
Total Dissolved Solids	2	0%
Fecal Coliform	3	100%
Chloride	2	0%
Sulfate	2	0%
As (Dissolved)	3	0%
Cd (Dissolved)	3	0%
Cr (Dissolved)	3	0%
Cu (Dissolved)	3	33%
Ni (Dissolved)	3	0%
Pb (Dissolved)	3	0%
Sb (Dissolved)	3	0%
Zn (Dissolved)	3	0%
Selenium, Total	3	0%
Turbidity	3	67%
MBAS	3	33%
Ammonia as N	3	0%
Chemical Oxygen Demand	3	0%
Dissolved Oxygen	3	0%
Chlorpyrifos	3	0%
Diazinon	3	0%
Malathion	3	0%
Oil & Grease	3	0%

No wet weather benchmark for Total Nitrogen or Enterococci
Discharge results compared to wet weather receiving water quality benchmarks (RW-WQBs).

Overall, the two wet weather priority constituents in the MS4 outfall discharges match the priorities identified in the receiving water as shown in Table 0-10. Table 0-10

Table 0-10. General Comparison of Wet Weather Regional MS4 Outfall Priority Constituents and Receiving Water Priorities by Watershed Management Area

Wet Weather Regional MS4 Priority Constituents	Receiving Waters by WMA*								
	SMR	SLR	CAR	SDC	LPC	MB	SDR	SDB	TJR
Fecal Coliform	✓	✓	✓	✓	✓	✓	✓	✓	✓
TSS	✓	✓	RW	✓	RW	✓	RW	RW	✓

✓=Both RW and MS4; MS4 indicates priority identified for MS4 only; RW indicates priority identified for RW only.

Question 3: Which are the Targeted MS4 outfalls with the greatest constituent loading?

The instantaneous loads of the targeted MS4 outfalls from the dry program will be analyzed by constituent when additional data from the 200 monitored outfalls are collected. The MS4 outfall program is beginning year 3 of the 5-year program. Future analyses will consider not only load, but load/unit area to identify priority MS4 outfalls.

Additional questions answered in the MS4 Analysis:

1. *Is it likely that differences can be detected between seasons for analyte concentrations within watersheds, and among watersheds (both within and between seasons) at the end of the 2007 Permit MS4 monitoring program?*

To address this question, the average concentration, as well as the standard error, of an analyte measured in the MS4 program was calculated by season for each watershed management area. In Figure 0-1, these means with standard errors are plotted as side-by-side wet and dry result bars by watershed for the regional priority constituents. The graph demonstrates typically higher concentrations of bacteria and TSS in the wet weather samples. Conversely, total nitrogen and TDS concentrations tend to be higher in dry weather. Total phosphorus is less consistent, with some watersheds being higher in wet while others are higher in dry weather. Given the size of the error bars, however, these differences may not be significant. In general, these results indicate that detection of differences within and among watersheds (both within and between seasons), may be possible for some constituents (total phosphorus, enterococcus, some fecal, TDS, some TSS).

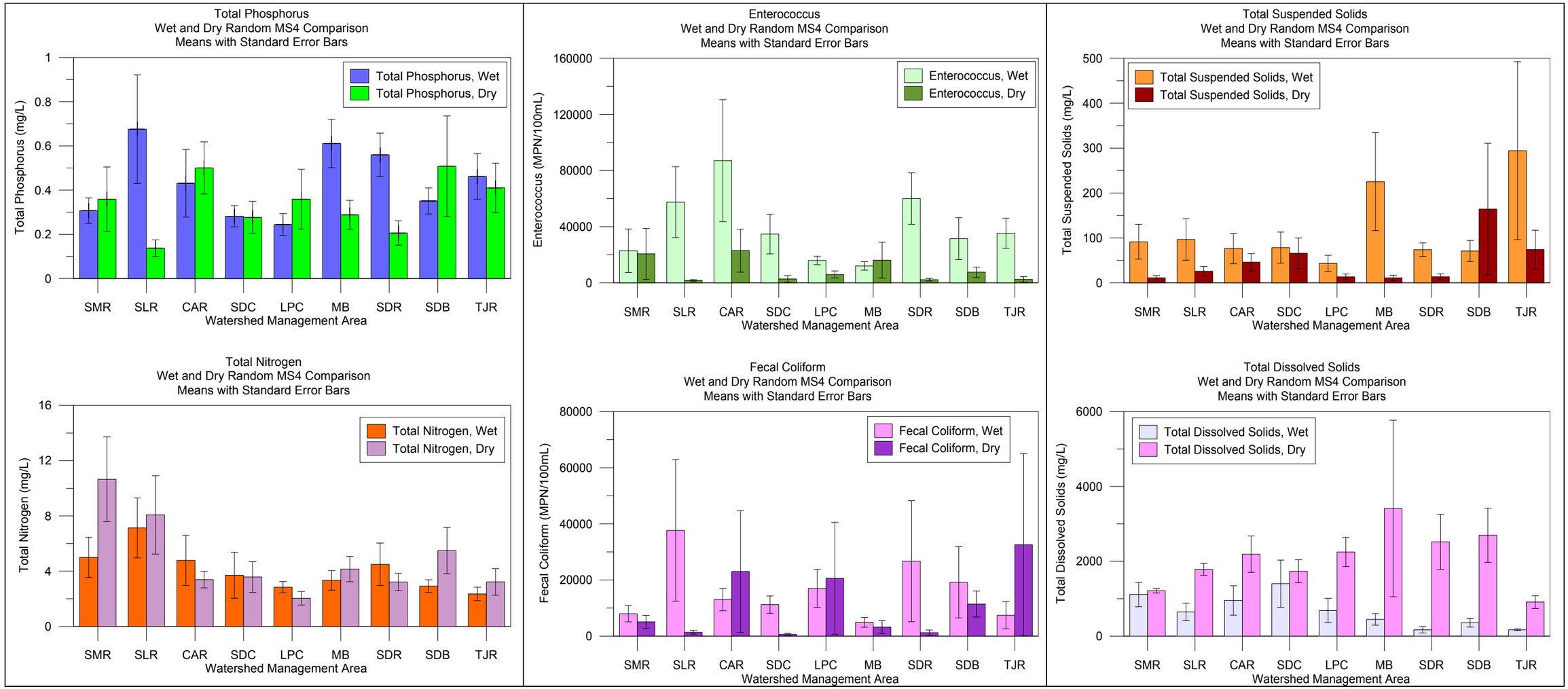

Figure 0-1. Mean Concentration with Standard Error by Analyte and Season for each WM

Report of Waste Discharge

Submitted by

The County of Orange, Orange County Flood Control District and Cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Lake Forest, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano

May 20, 2014

Report of Waste Discharge

Prepared for the California Regional Water Quality Control Board

May 20, 2014

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Mary Anne Skorpanich, Deputy Director
OC Public Works

2014 County of Orange Report of Waste Discharge for the San Diego Region

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Executive Summary

The Orange County Stormwater Program (the Program) is a cooperative municipal regulatory compliance initiative focused on the management of urban and stormwater runoff for the protection and enhancement of Orange County's creeks, rivers, streams, and coastal waters. The primary objective of the Program is to fulfill the commitment of the County of Orange, the Orange County Flood Control District and the cities of Orange County (collectively, the "Permittees"), to develop and implement a program that satisfies the requirements of area-wide Municipal Separate Storm Sewer System (MS4) National Pollutant Discharge Elimination System (NPDES) Permits.

The purpose of this document is to comply with the requirement for submittal of a "Report of Waste Discharge" (ROWD). This report discusses the Permittees' Fourth Term MS4 Permit compliance activities and accomplishments over the period June, 2009 to June, 2013. It identifies all of the activities, research and pilot studies the Permittees propose to undertake during the next permit term based upon a consideration of the effectiveness of the Program and need for additional pollutant control initiatives. The report requests coverage under a Fifth Term Permit that is specific to south Orange County.

The Permittees also consider a series of performance metrics to further enable the effectiveness of the Program's elements to be evaluated. This assessment of program effectiveness, comprising consideration of both the state of the aquatic environment and program performance metrics, is the basis for identifying the specific program activities and pilot studies the Permittees propose to undertake during the next permit term. These activities, which are identified as recommendations for program continuation, program enhancements, or program modifications, together with the Fifth Term MS4 Permit compliance milestones, are noted in each section of the report and are summarized in Section 7.0. The deliberate emphasis on program enhancement, rather than policy and programmatic change, is emblematic of a mature municipal stormwater program that is protective of water quality and is achieving meaningful environmental outcomes.

State of the Environment – Key Findings

This report includes an analysis of the state of water quality in Orange County and explores trends for four primary water quality issues on which the Permittees intend to focus during the Fifth Term. Key findings and trends are discussed for bacteria, total dissolved solids, nutrients and toxicity.

Bacteria

- The County's beaches support concentrated recreational activities for both residents and visitors and are important contributors to the local and regional economy.
- Concern about swimming safety is consistently high and epidemiology studies in dry weather show that some illness (for example, gastroenteritis) is associated with full immersion swimming in contaminated water.
- Contamination is very low during dry weather and has dropped steadily over time; beach report card grades are consistently high.

- Sources of contamination have been reduced through targeted actions; remaining issues during dry weather are localized and may have natural components.
- Contamination is more widespread during wet weather; wet weather flows are larger and qualitatively different.
- Health risks associated with wet weather flows are uncertain, but ongoing research and development focuses on improved monitoring tools and wet weather epidemiology studies.
- Progress on managing dry weather contamination demonstrates the efficacy of targeted BMPs appropriate to specific situations that may include natural sources (e.g., birds).

Dissolved Solids

- Persistent and widespread exceedances of total dissolved solids occur in channels and at discharge outfalls.
- Dissolved solids are a challenging to address because a large portion of these elevated levels derive from natural sources in regional groundwater.
- Understanding local geology is key to understanding sources of dissolved solids and the pathways they travel in the watershed.
- While the flood control system provides one pathway for dissolved solids in groundwater to reach the surface, other natural pathways (such as artesian springs) exist and there is evidence of historically elevated dissolved solids levels in surface water in the region.

Nutrients

- Nutrient levels in South Orange County streams and channels are frequently above commonly used thresholds that suggest increased likelihood of nutrient impacts. In contrast, there are much less frequent occurrences of impacts, such as macroalgal overgrowth, due to excessive nutrient levels.
- Nutrient issues are not limited to the urban portion of the County; regional monitoring data show nutrient enrichment and impacts such as increased macroalgal cover and/or lower dissolved oxygen in streams and estuaries in undeveloped regions.
- The major point sources of nutrients have been controlled. Therefore, nonpoint and diffuse sources such as leaching from upland soils and intrusions from shallow groundwater are increasingly important.
- Nutrients can be readily transported in and out of various reservoirs (e.g., sediments, groundwater) and undergo complex biological transformation and cycling. This makes traditional pollutant control strategies less effective for nutrients.

Improved management strategies may contribute to further progress, particularly in streams and channels, by accounting for site-specific conditions, promoting Low Impact Development, and accounting for broader regional sources.

Toxicity

- Toxicity in freshwater channels in all conditions (aquatic, sediment, wet and dry weather) occurs at low levels and is

sporadic, occurring at different locations at different times and varying unpredictably across test species.

- Aquatic toxicity in dry weather occurs in open (undeveloped) areas at levels equivalent to those in urban areas; suggesting that dry weather toxicity is not driven predominantly by urban pollutants.
- There are no apparent trends in toxicity over time.
- Metals, except for some instances of elevated copper, are at low levels and do not appear to contribute to aquatic toxicity in freshwater.
- The primary source of toxicity appears to be pesticides, with evidence that pyrethroids contribute to sediment toxicity.
- Use of organophosphate pesticides has declined virtually to zero but use of pyrethroid pesticides has increased and exceedances of thresholds for pyrethroid pesticides are high.
- Reported pesticide use in the County has declined from just over 2 million pounds a year in 1998 to just under 1 million pounds in 2011, due primarily to reduced use of indoor fumigants.
- There is a large data gap in our knowledge of retail pesticide sales and use.
- Pesticide use (which is regulated directly at the state and federal levels) presents a moving target for management because of the continued introduction of new products; the most effective management strategies are to continue to reduce dry weather runoff/flows and support education and outreach efforts to reduce pesticide use and runoff.

Controlling Pollutant Sources - Countywide/Jurisdictional Programs: Accomplishments

The management of sources of pollution from diffuse urban areas involves the strategic application of Best Management Practices (BMPs) to activities and drainage systems within the urban environment. The purpose of BMPs is to protect water quality by reducing pollutant loads and concentrations and by reducing discharges (volumetric flows and flow rates) causing stream channel erosion. Municipal efforts to prioritize, inspect and manage existing and new development, educate the public to encourage adoption of behaviors protective of water quality and to respond to illegal discharges or illicit connections are discussed in this section.

- The Model Municipal Activities Program ensures that BMPs are implemented and maintained at over 1,700 municipal facilities.

- The Model Integrated Pest Management Program ensures municipal conformance with an Integrated Pest Management Policy developed in partnership with University of California Cooperative Extension. Implementation of the policy is resulting in reductions in municipal fertilizer and pesticide use.

- Public awareness surveys conducted approximately every three years demonstrate increased levels of awareness regarding stormwater concerns and several positive behavior changes regarding car washing, use of landscape management products, and pet waste.

- The Program achieved over 155 million impressions through various forms of paid media, and over 5.5 million impressions at outreach events from 2008 to 2013.

- The Permittees initiated a strategic behavior-specific outreach program in 2012.

- Reductions in outdoor water use, retrofitting the residential environment to reduce outdoor water demand and elimination of runoff from irrigation are the foci of action-based outreach efforts initiated in 2013.

- The Permittees developed a significantly revised Model Water Quality Management Plan (WQMP) and Technical Guidance Document (TGD) to implement new requirements for the implementation of Low Impact Development (LID) BMPs.

- The Permittees implemented the new Model WQMP and TGD for all priority projects in north Orange County starting on August 17, 2011, and in south Orange County starting on December 20, 2013.

- During the permit term (through the FY2012-13 reporting period) 1,369 WQMPs for public and private projects were approved across all of Orange County for a total of 18,749 acres of development now that are now subject to Project WQMPs.

- South Orange County was mapped and a geodatabase was developed that includes conveyance systems, infiltration constraints, land use, and soil types. The County is using the geodatabase to evaluate channel susceptibility to hydromodification, and opportunities and constraints for infiltration and treatment BMP implementation at various scales.

- The Construction Program maintained an inventory of up to 12,060 construction sites, prioritized these sites regarding their threat to water quality, and inspected them at the frequency specified by the permit. Non-compliant sites were educated and required to implement BMPs as required.

- The Industrial/Commercial Program inventoried 14,000 sites and conducted inspections of these sites at frequencies specified by the permit.

- A new Mobile Business Pilot Model Program was developed and implemented.

- Residential sources of pollutants were addressed through the Model Residential Program, which included development of new outreach materials and continued outreach to Common Interest Areas and Homeowner's Associations.

- The Permittees continued to aggressively detect and eliminate Illicit Discharges and Illegal Connections (ID/IC) through discharge monitoring, source investigation, and enforcement.

- A spill reporting hotline (1-877-89-SPILL) provides a resource for public spill and water pollution reporting, and an iPhone reporting application was developed. All reports were responded to and resolved.

- The *Model Investigative Guidance for Orange County Illegal Discharges and Illicit Connections Program* was updated for the Non-stormwater Action Levels (NALs) based monitoring program by inclusion of a new *San Diego Region Dry Weather Numeric Action Level (NAL) Source Identification Guide*.

- Essential elements of the Countywide Area Spill Control Program were completed and implemented.

- The NALs monitoring program was fully implemented.

Controlling Pollutant Sources - Watershed Programs: Accomplishments

In addition to countywide and jurisdictional programs, the Permittees participated in water quality planning on the watershed scale. These efforts have led to multi-jurisdictional solutions to problems that cut across programs and jurisdictional boundaries. While the focus of watershed planning in south Orange County is on specific pollutants of concern associated with urban stormwater, particularly TMDLs, this management approach is also supportive of broader objectives such as watershed habitat restoration, consistent with the Practical Vision, and integrated water resource management.

- Extensive watershed mapping of hydromodification susceptibility, infiltration feasibility and regional BMP opportunity sites for the entire south Orange County area has been completed.

- Watershed Workplans for all six San Diego Region Watersheds were developed and implemented. These workplans describe the Watershed Permittees' collective watershed strategies to assess, prioritize and address water quality challenges within each watershed.

- Comprehensive Load Reduction Plans (CLRPs) were developed for Aliso Creek, San Juan Creek and San Clemente Coastal Streams Watersheds. These watershed CLRPs were developed to address bacteria pollutants and other watershed 303(d) listed constituents.

- Dana Point harbor was delisted for Indictor Bacteria and 17 shoreline stations were delisted for Enterococcus, Fecal Coliform and Total Coliform.

- Baby Beach TMDL dry weather load reductions have been achieved for total coliform and the 50% load reduction milestones for fecal coliform and Enterococcus have also been achieved. Wet weather data also supports the conclusion that TMDL load reductions have been achieved for total coliform and fecal coliform. Further reductions are needed for Enterococcus.

Plan Development

The Permittees have developed a strategic approach to stormwater management that is a cyclical process of measurement, analysis and program improvement.

- The Permittees have been implementing a strategic management approach that includes model programs specified in the permit and the DAMP, and watershed programs focused on specific water bodies and pollutants.

- The Program employs an iterative, adaptive management approach that includes monitoring, evaluation, program revision, BMP implementation adjustment/enhancement, and continued monitoring.

- The Program conducts annual and permit term (i.e. ROWD) using the guidance from CASQA approach.

- The ROWD recommends an evolution to a more holistic watershed management approach to support integrated water resource management and the optimization of watershed ecosystem services.

Program Management and Financing: Accomplishments

Program management includes maintaining a committee structure, participation in regional and statewide groups and tracking costs for compliance.

- The Program continued to operate with the County of Orange as the Principal Permittee during the permit term.

- The Program operated under a four-tier committee structure with participation at all levels by Permittee staff and management.

- An Implementation Agreement establishes responsibilities and provides a funding mechanism for cooperative activities. Funding has been sufficient to complete common program activities.

- The Program benefitted strongly from cooperation and representation among several regional and statewide groups including the California Stormwater Quality Association and the Southern California Coastal Water Research Project.

- Coordination with Orange County Transportation Authority (OCTA) on development of a Structural BMP Prioritization and Analysis Tool (SBPAT) to support disbursement of Measure M2 funding for water quality projects. SBPAT is a GIS-based decision support tool that is being used to identify and prioritize potential structural BMP retrofit projects throughout Orange County. To date Tier 1 funding of $8.6 million has been awarded to 85 projects and Tier 2 funding of $12.7 million has been awarded to 8 projects.

1.0 Introduction

The Story: Introduction

- Established in 1990, the Orange County Stormwater Program (the Program) is a cooperative regulatory partnership among the cities of Orange County, the County of Orange and the Orange County Flood Control District (collectively the Permittees) who operate an interconnected municipal storm drain system. Discharges of stormwater and urban runoff from this system are authorized by National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permits.

- The Program is focused on maintaining regulatory compliance of the Permittees with Clean Water Act mandates and mitigating the water quality impacts to streams, creeks and coastal waters that can arise from the imprint of urban development on the landscape.

- This Report of Waste Discharge (ROWD) constitutes the Permittees' application for a Fifth Term of NPDES Municipal Stormwater Permit that is specific to South Orange County and presents specific recommendations for the continuation and future development of the Program.

1.1 Overview

The Program is a cooperative regulatory partnership among the cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Lake Forest, Mission Viejo, Rancho Santa Margarita, San Clemente, San Juan Capistrano, the County of Orange and the Orange County Flood Control District (collectively the Permittees - See **Attachment 1.1 - Primary Permittee Contacts**) who operate an interconnected municipal storm drain system which discharges stormwater and urban runoff pursuant to National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System Permit (MS4 Permit). Clean Water Act Section 402(p) stipulates that MS4 permits must require the Permittees to:

- Effectively prohibit non-stormwater discharges to the storm drain system, and
- Implement controls to reduce the discharge of pollutants in stormwater to the Maximum Extent Practicable (MEP).

In anticipation of the expiration of the South Orange County MS4 Permit on December 16, 2014, this Report of Waste Discharge (ROWD):

- Describes the regulatory basis and environmental rationale for the Program and requests issuance of a Fifth Term Permit that is specific to south Orange County (see – "Introduction");
- Presents an assessment of the state of the environment for South Orange County with specific reference to swimming safety and aquatic ecosystem health and makes recommendations for the future allocation of monitoring resources (see – "State of the Environment");
- Evaluates jurisdictional pollutant control program effectiveness and makes recommendations for enhancing future program implementation (see – "Controlling Pollutant Sources: Jurisdictional Management Programs");
- Describes watershed-based planning in Orange County and makes recommendations for integrating Total Maximum Daily Load requirements into the Fifth Term Permit (see – "Controlling Pollutant Sources: Watershed Programs");
- Reviews the Program's jurisdictional and watershed planning processes and makes recommendations for a shift toward a "watershed management approach"

supportive of the restorative goals of the Clean Water Act (see – "Plan Development");
- Reviews the Program's management structure and describes current program financing including recommendations for future cost studies (see – "Program Management and Financing"); and
- Summarizes recommendations for the future direction of the Program with recommendations (see – "Summary and Conclusions").

In combination these discussions are intended to fulfill the requirements for the content of the Report of Waste Discharge (see R9-2009-0002 – Section K.2.b), which must include:

- Proposed changes to the Permittees' runoff management programs;
- Proposed changes to monitoring programs;
- Justification for proposed changes;
- Permittee and primary contact information; and
- Any other information for the reissuance of the Order.

1.2 Background

Urban Runoff and Water Quality

The Program is focused on mitigating the adverse impacts to creeks, streams, estuaries and coastal waters that can arise from the imprint of urban development on the landscape. Urbanization creates rooftops, driveways, roads and parking lots (Schueler and Holland, 2000) use the term *imperviousness* as the unifying theme for understanding the adverse hydrologic impacts of urbanization), which (1) increase the flow rate and volume of rainfall runoff (compared to pre-development conditions) and (2) provide a source of pollutants that are flushed or leached by rainfall runoff into surface water systems. These pollutants can include pathogens (disease causing bacteria, viruses and protozoan cysts from fecal sources), nutrients (bio-stimulatory substances such as nitrogen and phosphorus from fertilizers and organic wastes), sediments (sands and silts eroded from construction sites) and toxic organic and inorganic constituents (metals from automotive wear surfaces and pesticides applied to structures and landscapes).

> *There are four interrelated but separable effects of land-use changes on the hydrology of an area: changes in peak flow characteristics, changes in total runoff, changes in quality of water, and changes in the hydrologic amenities*
>
> Luna Leopold, 1968

For streams, creeks and coastal waters, urban runoff can result in:

- Water quality degradation from increased loadings of sediment, nutrients, metals, hydrocarbons, pesticides, and bacteria;
- Stream channel modification and habitat loss due to erosion or channel realignment for flood protection;
- Increased water temperatures resulting from solar energy absorption by urban surfaces and elimination of riparian shading; and
- Loss of groundwater recharge.

Water quality can be defined by both a set of concentrations, speciations, and physical partitions of organic and inorganic substances, and the composition and state of aquatic biota found in a waterbody (Meybeck and Helmer, 1992). Understanding these alternate definitions is highly significant to the ongoing development of the Program, the regulatory framework that impels it and the San Diego RWQCB's "Practical Vision (SDRWQCB 2013)."

Section 2.0 presents a comprehensive assessment of the "state of the environment" for South Orange County based on the results of long-term water quality monitoring and related special studies. However, from a regulatory compliance perspective the 303(d) has particular significance in setting the Program's specific pollutant priorities.

Regulatory History

The Program was initiated in 1990 as a cooperative local government response to a 1987 amendment to the federal Clean Water Act (CWA) that established National Pollutant Discharge System (NPDES) permit requirements for municipal operators of storm drain systems. This amendment was intended to specifically address the adverse water quality impacts of urban runoff. Permit application requirements were promulgated by US Environmental Protection Agency (EPA) in 1990 (40 CFR 122) and form the basis of the current program. There are two fundamental requirements:

- Effectively prohibit non-stormwater discharges to the storm drain system; and
- Implement controls to reduce the discharge of pollutants in stormwater to the Maximum Extent Practicable (MEP).

Orange County's first NPDES Permits were issued in 1990 with renewals in 1996, 2002 and 2009. The Permits require that surface water quality protection be a key consideration in local governments' oversight of construction and development, its regulation of industry and commerce, and in its construction, operation and maintenance of the public urban infrastructure.

There are separate NPDES Permits administered by the Santa Ana and San Diego Regional Water Quality Control Boards (RWQCBs). City and county jurisdictional boundaries rarely coincide with watershed boundaries and in Orange County five jurisdictions within the Program (County of Orange, Orange County Flood Control District and the cities of Lake Forest, Laguna Hills and Laguna Woods) are subject to both permits. For these jurisdictions, the designation provision in Water Code Section 13228 is an option for seeking a single set of permit requirements in instances, such as Orange County, where there is a trend of increasing divergence in permitting approaches between the Regional Boards. The adoption of the Fifth Term Permit will be an opportunity for the two of the split jurisdictions (Cities of Lake Forest and Laguna Hills) who have requested coverage under a single permit to have resolution of this issue.

> "*Maximum extent practicable (MEP) means to the maximum extent possible, taking into account equitable considerations of synergistic, additive, and competing factors, including but not limited to, gravity of the problem, fiscal feasibility, public health risks, societal concern, and social benefits.*"
>
> Elizabeth Miller Jennings, 1993

Management Approach

The management of water pollution arising from landscapes involves the strategic application of Best Management Practices (BMPs). The purpose of BMPs is to protect the beneficial uses of water resources principally through the reduction of pollutant loads and concentrations.

The Program's management approach is a process that involves:

1. Selecting and implementing BMPs to address site specific water quality problems based upon a consideration of

regulatory requirements and technical, institutional and economic feasibility;
2. Conducting comprehensive program effectiveness assessments to ensure that the BMPs are correctly implemented and to determine the effectiveness of BMPs in achieving water quality standards; and
3. Revising and/or enhancing BMPs if water quality standards are not being achieved.

This management approach is applied at two distinct scales: (1) activities conducted by the Permittees implementing jurisdictional programs based on the model programs in the Drainage Area Management Plan (DAMP); and (2) activities conducted by the Permittees and others participating in watershed programs addressing specific waterbody-pollutant combinations including the restorative goals of the Clean Water Act.

Drainage Area Management Plan

The **Drainage Area Management Plan (DAMP)** is the principal policy and program guidance document for the *Program*. The DAMP describes the agreements, structures and programs that:

- Identify urban impacts on receiving waters; produce environmental quality information to direct management activities, including prioritization of pollutants to support the development of specific controls to address these problems; and determine if aquatic resources are being protected;
- Improve existing municipal pollution prevention and removal best management practices (BMPs) to further reduce the amount of pollutants entering the storm drain system;
- Educate the public about the issues of urban stormwater and non-stormwater pollution and obtain their support in implementing pollution prevention BMPs;
- Ensure that all new development and significant redevelopment incorporates appropriate Site Design, Source Control, Treatment Control and LID BMPs to address specific water quality issues;
- Ensure that construction sites implement control practices that address control of construction related pollutants discharges including an effective combination of erosion and sediment controls and on-site hazardous materials and waste management;
- Ensure that existing development addresses discharges from industrial facilities, selected commercial businesses, residential development and common interest areas/homeowner associations.
- Detect and eliminate illegal discharges/illicit connections to the municipal storm drain system;
- Assess constituents of concern and manage urban runoff on a watershed basis with an emphasis on Total Maximum Daily Load (TMDL) obligations and the restorative goals of the Clean Water Act;
- Provide the framework for the program management activities and plan development, and
- Provide the legal authority for prohibiting unpermitted discharges into the storm drain system and for requiring

Best Management Practices

BMPs are defined as "schedules of activities, prohibitions of practices, maintenance procedures, and structural and/or managerial practices, that when used singly or in combination, prevent or reduce the release of pollutants to receiving waters." The types of BMPs are source control, runoff treatment, and flow control.

BMPs in new development and significant redevelopment;

The model programs in the DAMP are implemented individually by each of the Permittees according to jurisdictional DAMP/Local Implementation Plans (LIPs). The ongoing development of the DAMP is informed by annual and five year (i.e. ROWD) program effectiveness assessments.

Orange County – Physical Landscape

Orange County comprises 790 square miles of land area, beginning on a coastal plain and rising to an elevation of over 5,000 feet in the Puente Hills and Santa Ana Mountains to the north and east. The northwestern part of the county lies on the coastal plain of the Los Angeles Basin, while the southeastern end rises into the foothills of the Santa Ana Mountains. The landscape of Orange County presents urbanized watersheds encompassing 34 cities and a total population of 3.1 million people.

Most of Orange County's population resides in one of two shallow coastal valleys either the Santa Ana Valley or the Saddleback Valley. The County has a history of large planned communities, the most notable being the City of Irvine, City of Mission Viejo, City of Aliso Viejo, Coto de Caza, Anaheim Hills, Tustin Ranch, Tustin Legacy, Ladera Ranch, Talega and City of Rancho Santa Margarita. Population growth has slowed as the County has become largely built out (**Figures 1.1 – 1.5**).

Before urbanization, Orange County was drained by ephemeral streams and agricultural drainage ditches which were dry most of the year and carried measurable flow primarily during short duration flash floods and longer duration general winter storms. As urbanization progressed, man-made agricultural drainage ditches were enlarged to flood control channels and the few natural streams such as Santa Ana River, San Diego Creek and San Juan Creek were constrained within levees to provide flood protection (**Figures 1.6 -1.10**). Ephemeral flows in some of the man-made and natural channels have been replaced with continuous low flows created from urban and agricultural irrigation and shallow groundwater.

South Orange County comprises five principal watersheds (Laguna Coastal Streams, Aliso Creek, Dana Point Coastal Streams, San Juan Creek and San Clemente Coastal Streams). In addition, small areas of largely undeveloped land in the City of San Clemente and unincorporated Orange County extend into the San Mateo Creek Watershed. These watersheds are hydrologically separate from North Orange County and physically, hydrologically and jurisdictionally isolated from the adjacent counties of Riverside and San Diego by mountain ranges and/or large swaths of federal land.

Across south Orange County, residential land uses, spread across characteristically modified topography, predominate. Beneath the urbanized landscapes, mostly clay-rich soils overlie marine sediments such as the Monterey and Capistrano Formations. Shallow groundwater from these formations is likely the major determinant of dry weather stream water chemistry and the cause of phosphorus, chloride, sulfates and total dissolved solids (TDS) being identified as the cause of water quality impairments.

Fifth Term Permit

The complexion of the south Orange County landscape is distinct both within Orange County and across the region. For the Program, this landscape presents a number of unique water quality challenges. For example, to enable the Program to effectively prohibit non-stormwater discharges, efforts to

abate dry weather discharges must be allowed to distinguish and prioritize between shallow groundwater influences and genuinely aberrant urban conditions.

In the absence of large areas of industrial and commercial enterprise and little residential redevelopment, addressing pollutant wash-off from impervious surfaces in predominantly residential landscapes requires an emphasis on public infrastructure solutions complemented with education and outreach. This approach ensures that both modifications to drainage infrastructure and public support for the Program will be sustained over the long term.

The history and nature of South Orange County's development also has implications for stormwater regulation and permitting if the broader ecological outcomes contemplated in the Practical Vision and recent imperatives for integrated water resource management are to be achieved. For example, the highly modified stream systems that have been reconstructed to protect historic floodplain development and high land values mean that opportunities for alternate channel configurations will need to be identified through a watershed analysis and cannot be assumed to be presented by every modified channel segment.

For reasons identified above and which are discussed in greater detail in the subsequent sections of this report, this ROWD constitutes the request by the Permittees for a Fifth Term Permit that is unique to South Orange County.

Figure 1.1: Laguna Coastal Streams - Land Use

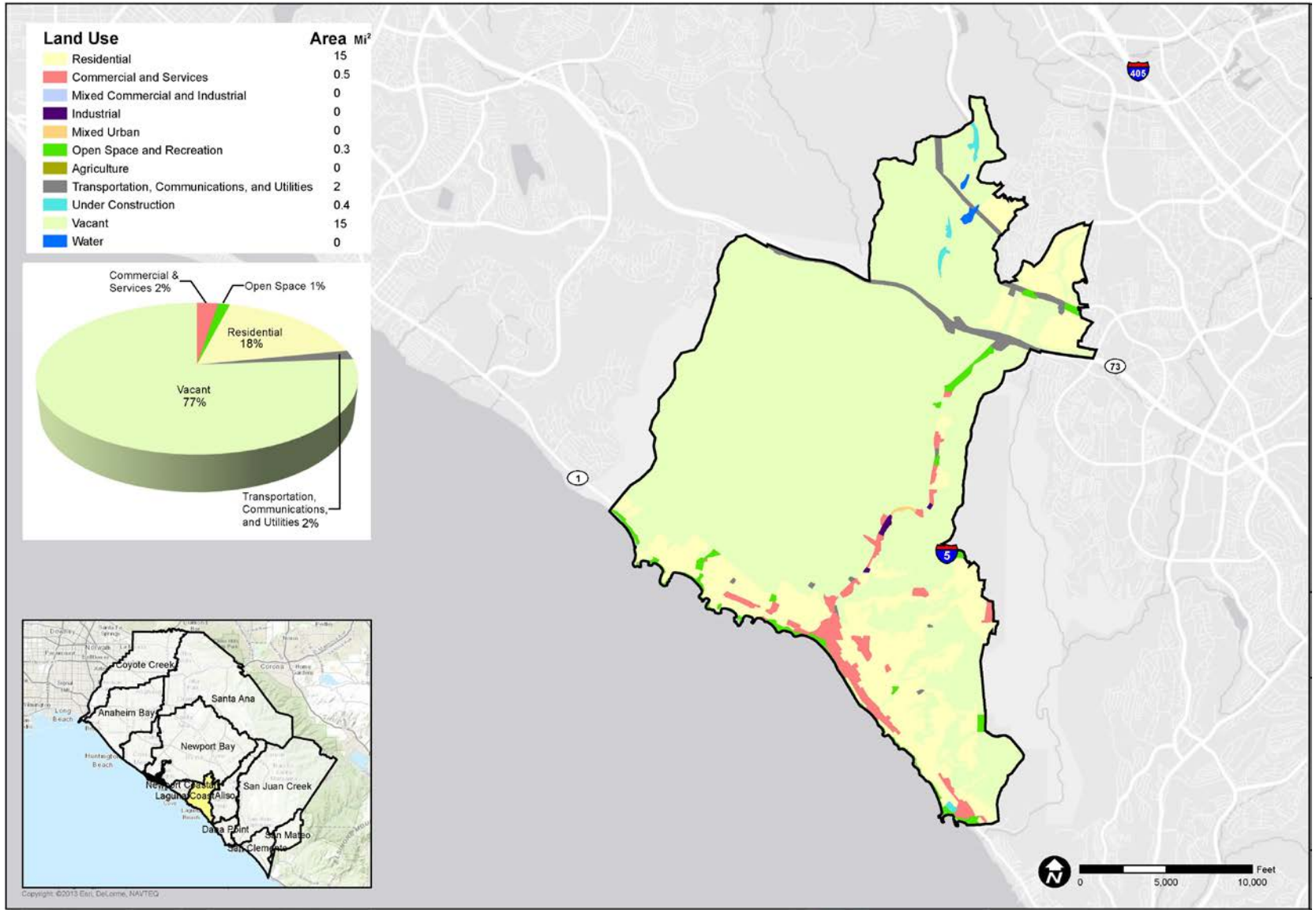

Figure 1.2: Dana Point Coastal Streams - Land Use

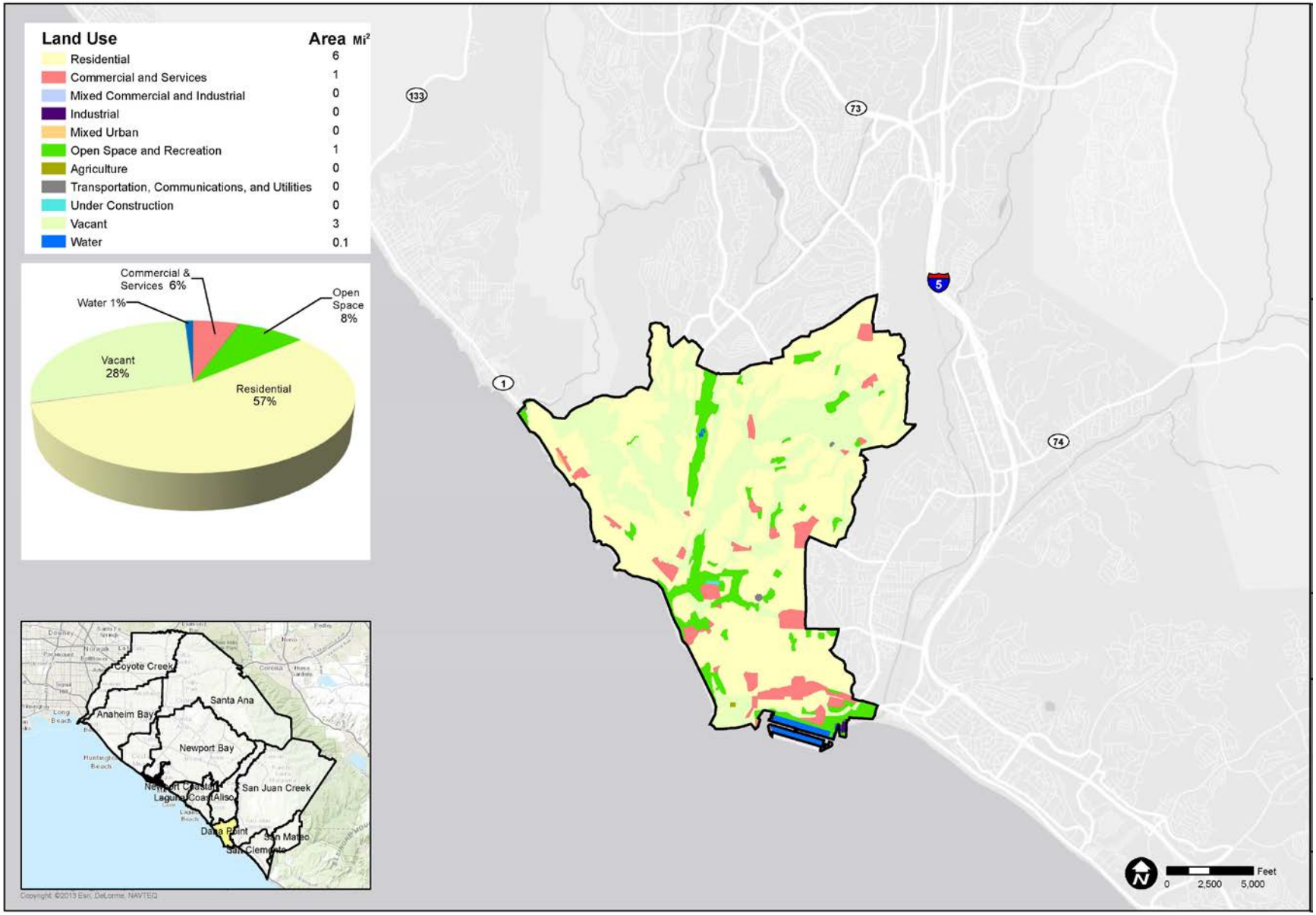

Figure 1.3: Aliso Creek - Land Use

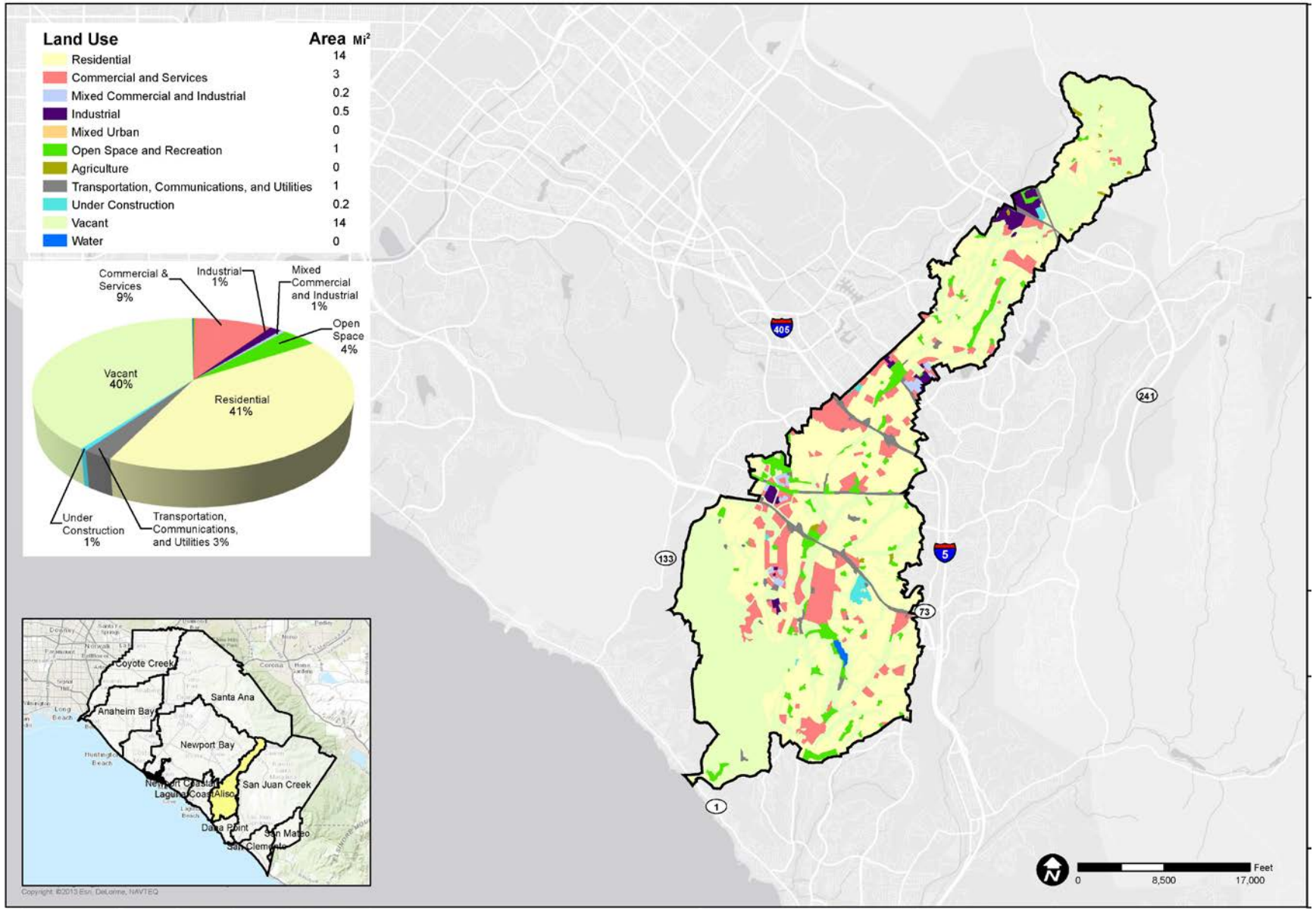

Figure 1.4: San Juan Creek – Land Use

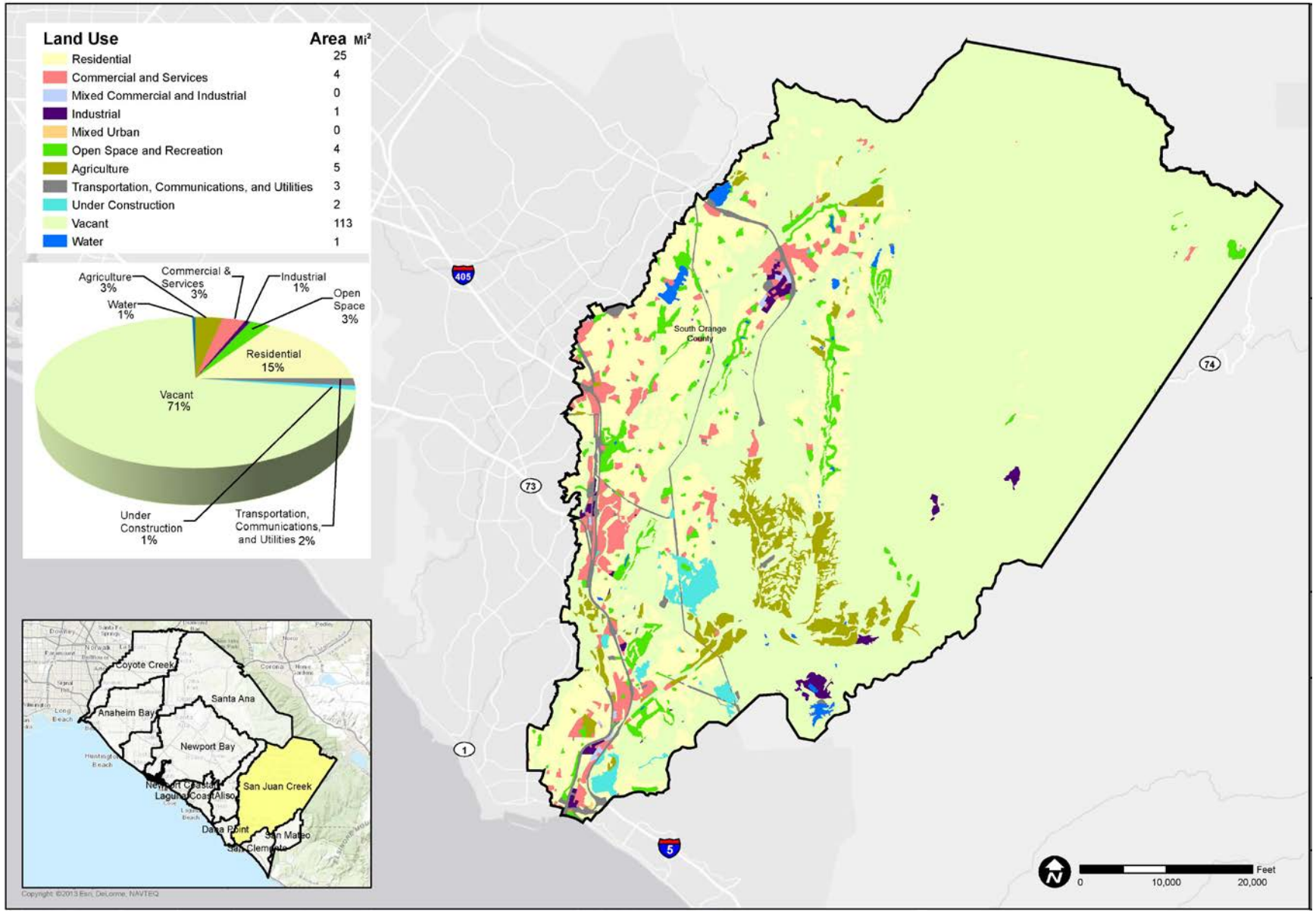

Figure 1.5: San Clemente Coastal Streams – Land Use

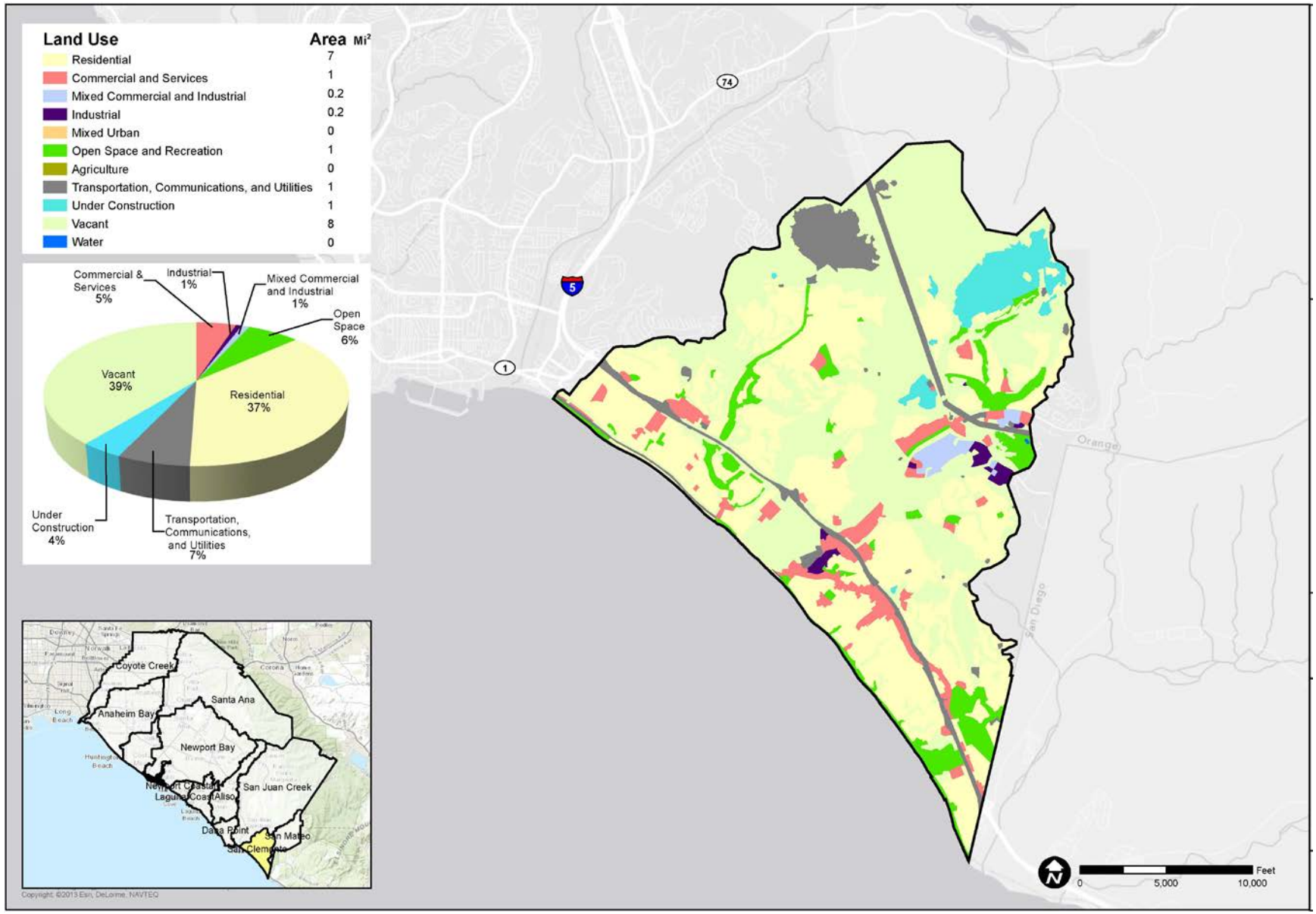

Figure 1.6: San Mateo Creek – Land Use

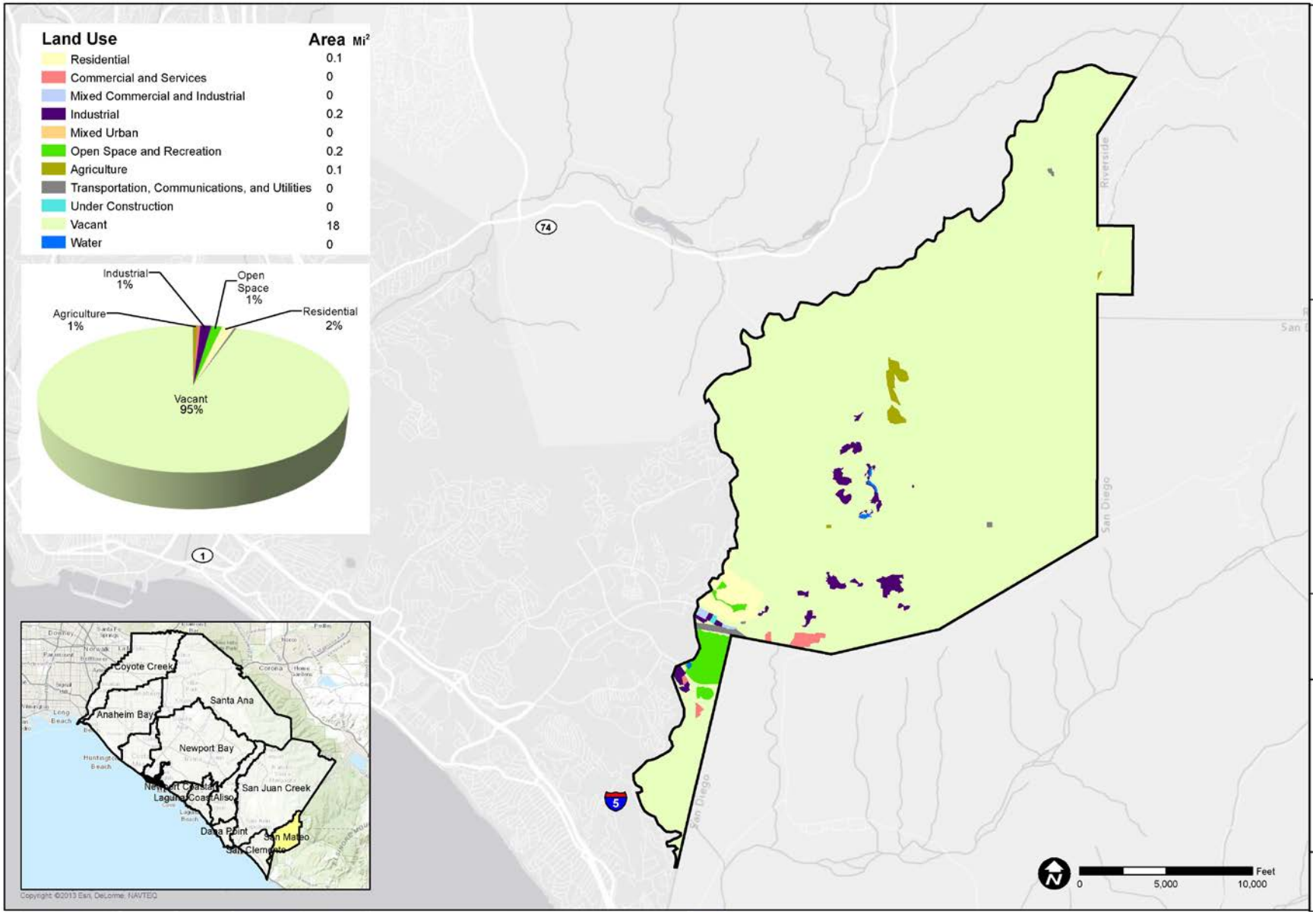

Figure 1.7: Laguna Coastal Streams – Main Stem Channel Type

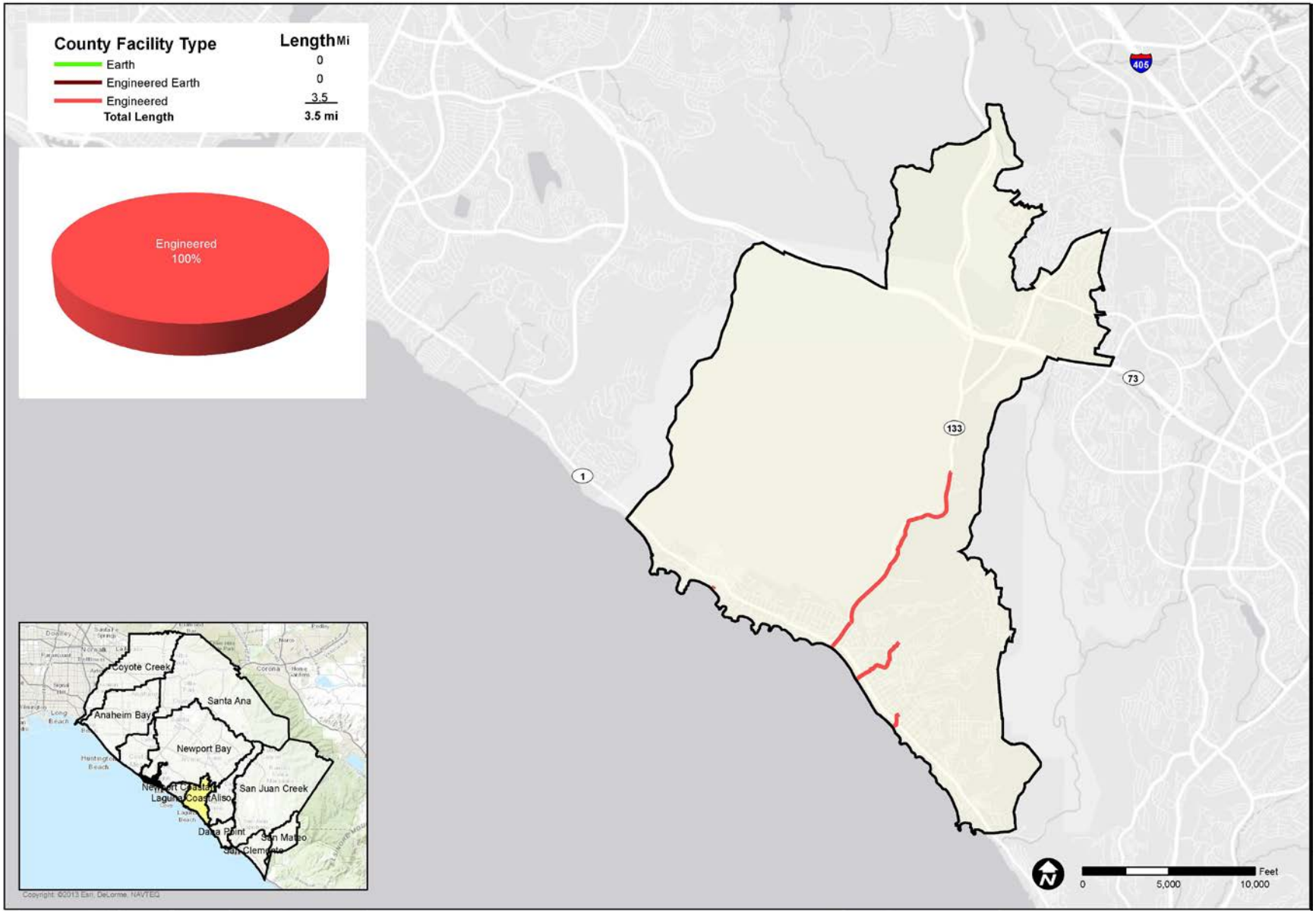

Figure 1.8: Dana Point Coastal Streams - Main Stem Channel Type

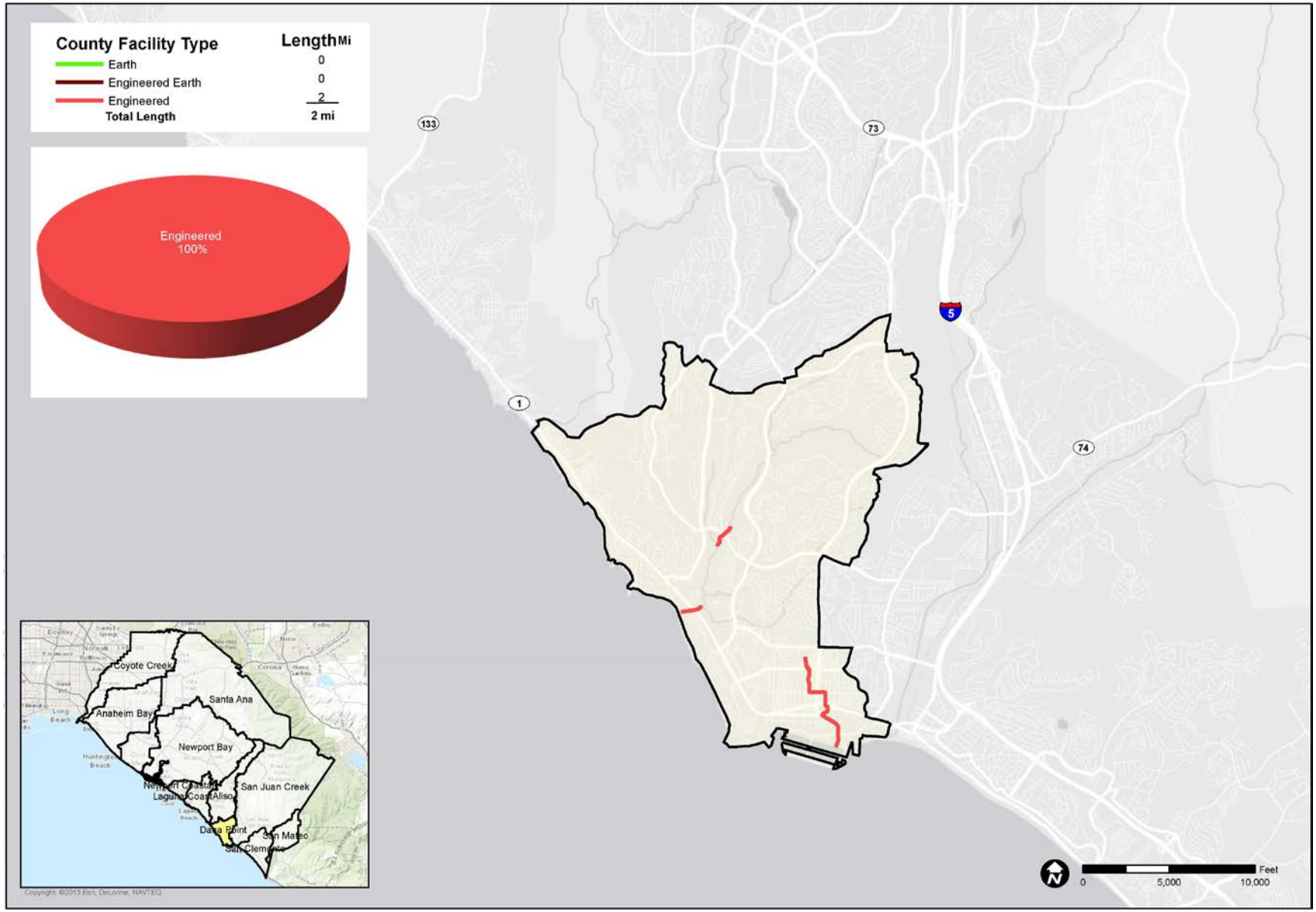

Figure 1.9: Aliso Creek - Main Stem Channel Type

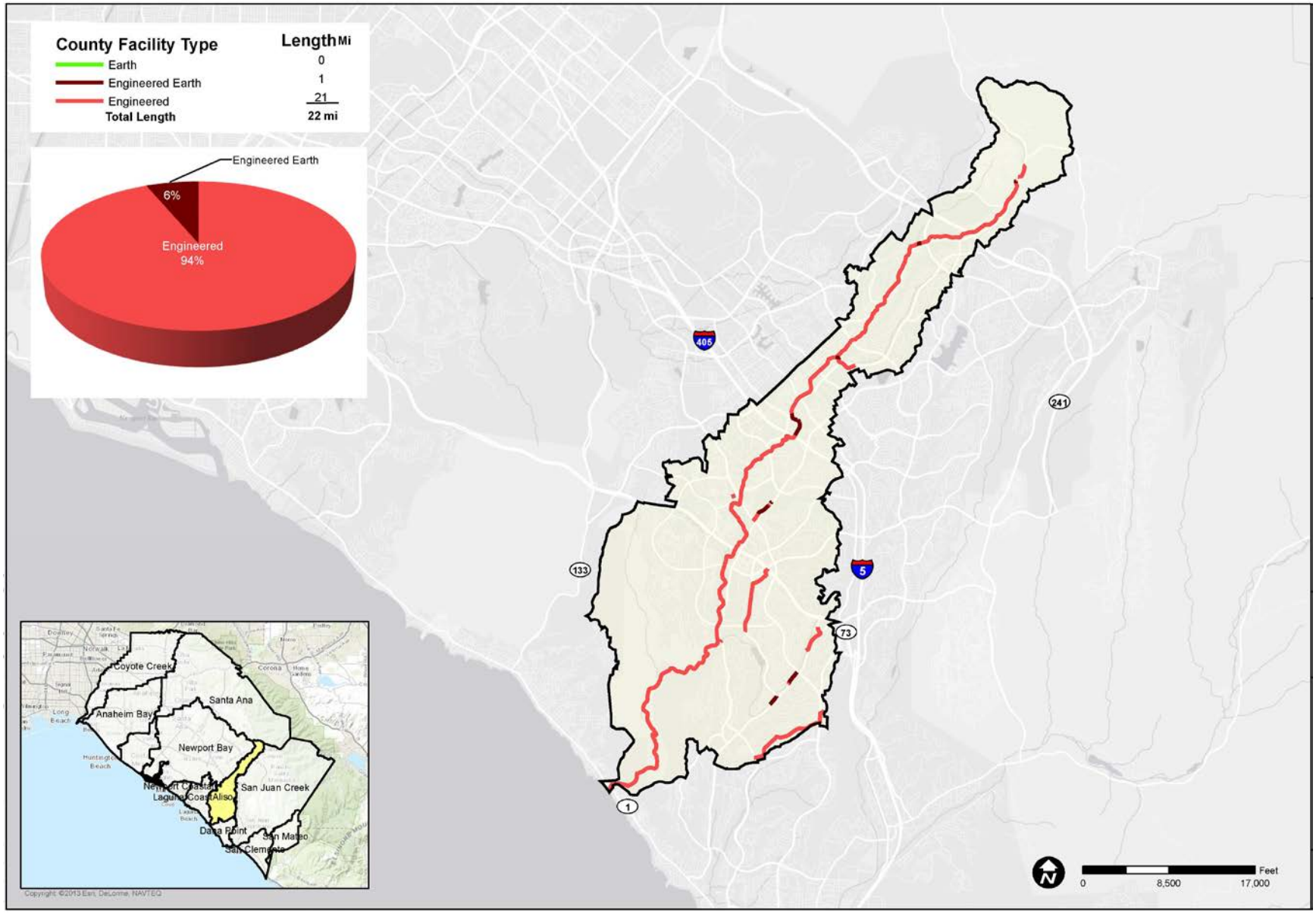

Figure 1.10: San Juan Creek – Main Stem Channel Type

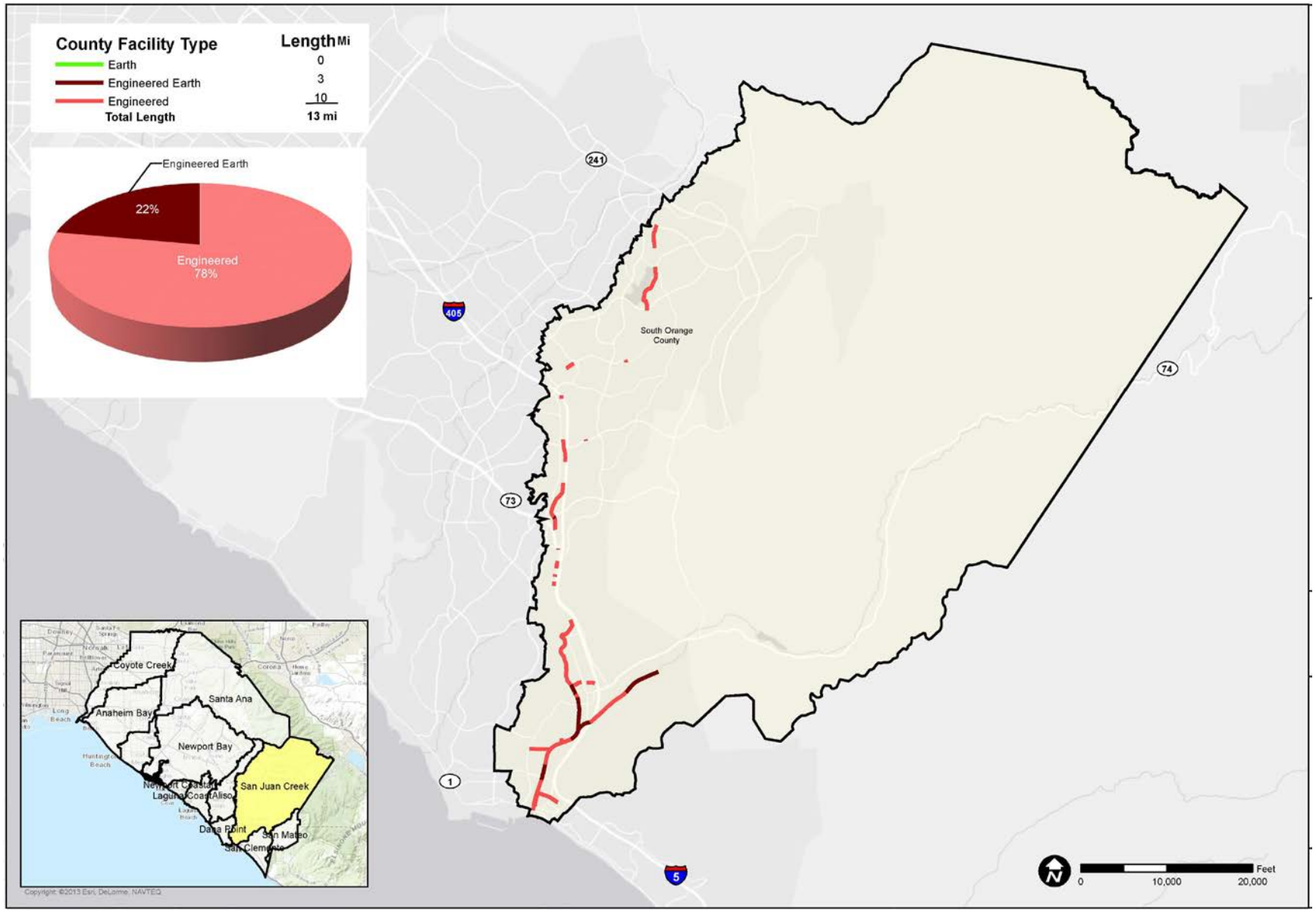

Figure 1.11: San Clemente Coastal Streams – Main Stem Channel Type

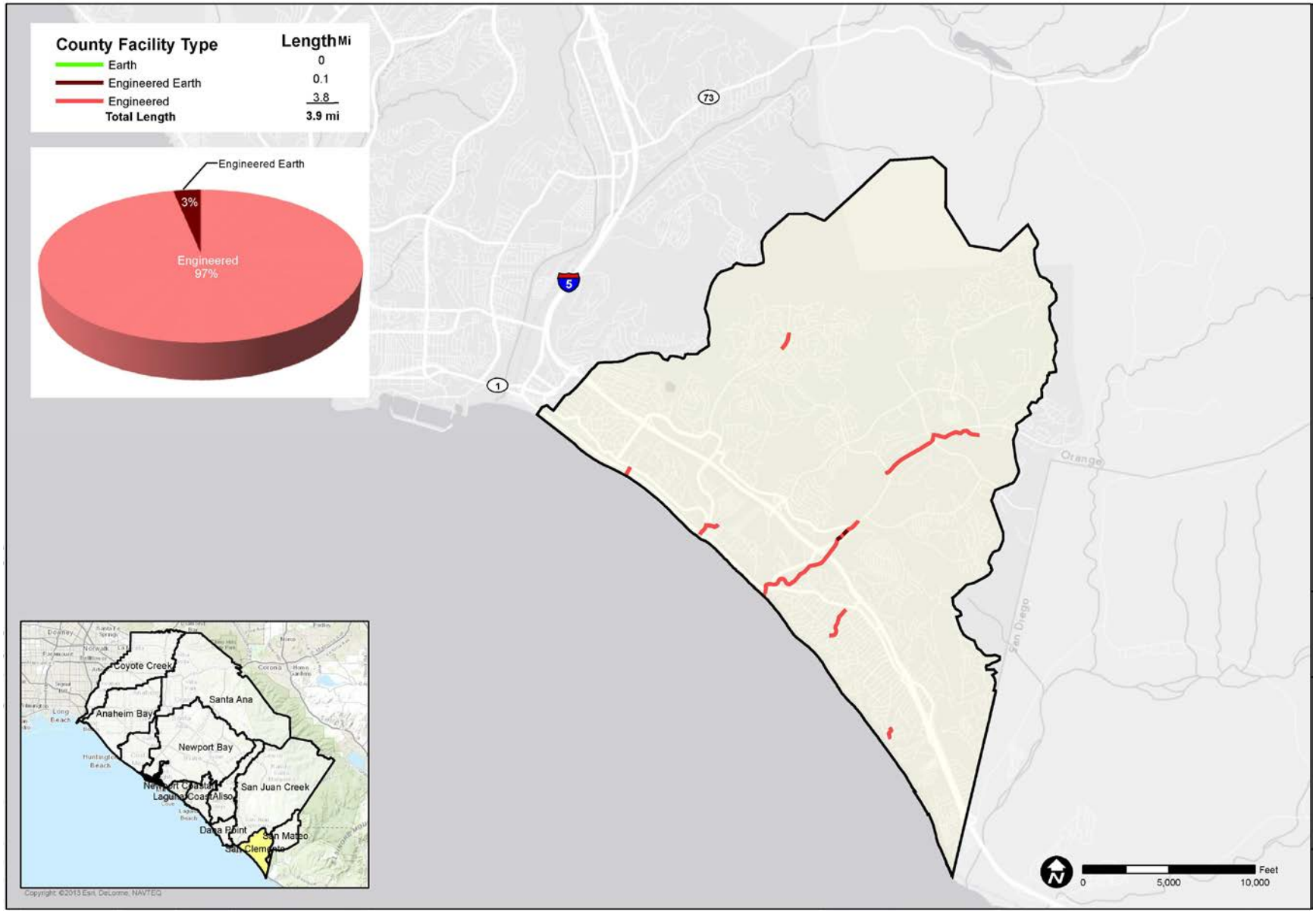

Orange County - Public Interest

A public that is informed and motivated to adopt practices protective of water quality can be a significant form of pollution source control. However, continually increasing public knowledge of and willingness to prevent water pollution at home and work is an ever-evolving process and significant challenge. In spite of this, public opinion surveys conducted in 2003, 2005, 2009 and 2012 indicate that Orange County residents have already become both more knowledgeable of environmental quality and are increasingly engaged in environmentally protective behaviors.

Preservation of the environment out of concern for future generations is the number one environmental concern reported by respondents in the most recent opinion survey. A notable eighty-eight percent of respondents reported being concerned about preserving the environment for their children. As a powerful motivator, the connection to future generations can help communicate *why* a particular issue is important and supplement *how* the individual can personally help prevent pollution. Perhaps not surprisingly, parents of children who brought home water quality information were also substantially more likely to perform a greater number of "stormwater safe" behaviors. Of the seven behaviors measured, parents of informed students were more than three times as likely to perform all seven behaviors (22 percent compared to only seven percent).

Orange County residents are clearly concerned about the environment and can be motivated to adopt practices that protect water quality. The Permittees intend to respond to this interest by supplementing continued investment in mass-media education campaigns with targeted outreach that zeroes in on key pollutants and addresses behaviors that most regularly contribute to that source of pollution. This supplemental approach will use Community Based Social Marketing (CBSM) to encourage target audiences to adopt specific BMPs; the process of CBSM is explained further in **Section 3.3.4**. This two pronged approach provides the Permittees the ability to foster long-term engagement while continuing to provide mass media communication that reaches the entire Orange County population.

1.3 Approach to Preparing Report of Waste Discharge

The ROWD assesses the current Program and identifies revisions to the management program in response to the information learned. Indeed, it is a basic requirement of the Permits' receiving water limitations provisions that the Program continue to adapt and evolve when urban runoff is determined to be causing or contributing to impairments of beneficial uses.

The development of the DAMP is informed by two discrete, yet related water quality planning processes: "countywide/jurisdictional," and "watershed-based" water quality management (see – "Plan Development"). Each process incorporates findings from annual assessments focused on determining whether desired programmatic outcomes are being achieved. Specifically:

- Are program elements being implemented effectively?
- Are environmental improvements being realized?

In this ROWD, the assessment of the Program has produced three types of "Recommendations":

1. **Program Continuation –** Requires no changes in implementation approach, policy or permitting
2. **Program Enhancements –** Requires shift in implementation approach
3. **Program Modifications –** Requires adjustments in policy and permitting

The "Recommendations" are presented throughout the ROWD and are summarized in "Recommendations for Fifth Term Permit."

1.4 References

San Diego Regional Water Quality Control Board (SDRWQCB). *San Diego Regional Water Board Practical Vision: Healthy Waters, Healthy People.* 2000. http://www.swrcb.ca.gov/sandiego/water_issues/Practical_Vision/docs/PV.pdf

Thomas R. Schuler and Heather K. Holland. *The Practice of Watershed Protection: Techniques for protecting our nation's streams, lakes, rivers and estuaries* (Maryland: Center for Watershed Protection, 2000).

2.0 State of the Environment

2.1 Overview

The Program's monitoring, assessment, and environmental research efforts are intended to track progress toward solving existing issues, identify emerging issues that could become issues in the future, and support research and development that improves our understanding of key processes and advances the efficiency and effectiveness of monitoring methods.

Monitoring is most often seen as a response to regulatory requirements, which it is, but it also provides information that guides the use of important resources and answers a set of fundamental questions of keen interest to both managers and the public. The State Water Resources Control Board has articulated the following four questions (based on the intent of the federal Clean Water Act) that provide a broad context for water quality monitoring in the state:

- Is our water safe to drink?
- Is it safe to swim in our waters?
- Is it safe to eat fish and shellfish from our waters?
- Are our aquatic ecosystems healthy?

This current assessment of the state of the environment for south Orange County (**Figure 2.1.1**) summarizes the results of long-term monitoring and related special studies that address the second and fourth of these questions (related to swimming safety and aquatic ecosystem health). These two issues are directly related to stormwater management priorities. The safety of drinking water is addressed by other agencies and programs that produce independent reports on drinking water quality. The safety of consuming local fish and shellfish is directly managed by the California Office of Environmental Health Hazard Assessment (OEHHA), supported by data and assessments conducted by the California Surface Water Ambient Monitoring Program (SWAMP) and others (the Beaches and Creeks TMDL for bacteria did not address the shellfish recreational use standard). In addition, the State Water Resources Control Board is in the process of conducting a statewide assessment of the potential contribution of contaminated sediments in enclosed bays and estuaries to the levels of contaminants in seafood tissue as well as shell beneficial use (SWRCB 2011).

Figure 2.1.1: The portion of South Orange County that is under the jurisdiction of the San Diego Regional Water Quality Control Board and is the focus of this Report. *Blue lines represent watershed boundaries.*

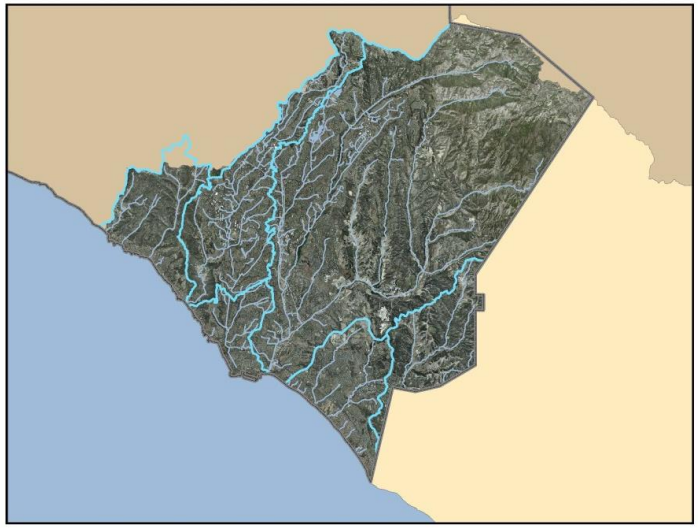

This Report therefore focuses on the two core management questions that are within the Stormwater Program's area of responsibility and that are not currently being assessed by other agencies. For each major question (e.g., Is it safe to swim in our waters?), monitoring and assessment should, over time, answer the following assessment questions:

- Is there a problem?
- If so, what is its magnitude and extent?
- What are the sources of the problem?
- Are conditions getting better or worse?
- Are management actions working as intended?

Monitoring, assessment, and research efforts should be tightly focused on one or more of these questions and be managed to ensure that resources are reallocated when questions are answered and new ones arise (**Figure 2.1.2**). Monitoring, assessment, and research should therefore be managed as a portfolio of resources invested in creating the information needed to meet the Program's goals, with the allocation of resources adjusted as needed. Assessment and research are included as a package with monitoring for two reasons. First, the information produced by ongoing monitoring programs is most useful when it is carefully analyzed, evaluated in the context of other related information, and applied to the basic questions motivating monitoring (i.e., assessed). Second, not all questions can be answered by routine monitoring and targeted special studies (i.e., research) are often needed to fill critical data gaps, develop more effective monitoring tools, and/or lay the groundwork for new management approaches. This approach follows the guidance contained in the Regional Board's recently adopted *Framework for Monitoring and Assessment (RWQCB 2012),* which emphasizes the importance of a sequential, question-driven approach supported by appropriate monitoring and assessment efforts that are adapted over time as knowledge improves and priorities shift.

Figure 2.1.2: Monitoring, assessment, and research provide the data and information required to answer the five key assessment questions. *Attention should shift among questions as information improves and priorities change, and the mix of monitoring, assessment, and research activities should be adjusted to correspond.*

The Program has identified three themes that help structure the assessment of the status and trends of environmental conditions in south Orange County and the accompanying recommendations for restructuring current monitoring programs:

- Theme 1: Focus on priority areas and constituents rather than trying to monitor all constituents, potential issues, and locations.

- Theme 2: Increase the integration of data from a wider range of sources in order to leverage the value and impact of the Program's efforts to address the five assessment questions.
- Theme 3: Continue evolving from a strictly discharge-specific approach to a risk prioritization approach that can highlight problem areas and support more flexible monitoring designs that include data driven adaptive triggers.

These three Report themes inform the following the section of progress toward meeting management goals for the four critical areas of concern (bacteria, dissolved solids, nutrients and toxicity). In these areas, there is a substantial amount of data available to support conclusions about progress, highlight remaining problem areas, and reexamine current monitoring designs to improve efficiency and effectiveness.

This Report begins with an evaluation of available data from the past ten years of monitoring in the region's water bodies in order to identify constituents whose concentrations and impacts have been successfully reduced, as well as those that remain of concern. This initial prioritization is then expanded and examined in greater detail in subsequent sections of this Report.

Subsequent sections examine these constituents in greater depth, the progress made and factors that contribute to continuing issues. Each section ends with recommendations for improving monitoring's effectiveness. A final section evaluates the study designs for the Dry Weather and the Coastal Ambient monitoring efforts, to assess whether their goals could be better met with different approaches.

2.2 Prioritization

The Story: Prioritization

- Prioritization is a valuable tool for the Program to use its resources wisely to focus on the most important issues.
- Initial prioritization is based on the overall frequency and magnitude of exceedances of compliance standards and other measures of problem severity.
- In inland channels, bacteria, dissolved solids, and nutrients are persistent issues over time, particularly in wet weather.
- For coastal discharges, there are no persistent issues in wet weather, while bacteria and nutrients are issues in dry weather.
- Some elevated toxicity is present in inland channels during wet weather, but overall toxicity is not different from that described for background conditions by the Stormwater Monitoring Coalition (SMC).
- There are no persistent issues in the coastal surfzone due to discharges, other than localized bacteria contamination at a handful of problem beaches and localized and moderate nutrient exceedances in wet weather.

The Program has measured a broad suite of contaminants and other measures of condition (i.e., toxicity, bioassessment) and the accumulated data from many years of monitoring provides a valuable opportunity to compare the severity of impacts and adjust their relative priority. In order to provide a consistent basis of comparison across indicators (with the exceptions of toxicity and bioassessment), an overall index of the extent to which indicators meet regulatory standards is used.

The index, developed by the Canadian Council of Ministers of the Environment (CCME) was used in the Report of Waste Discharge (ROWD) for the northern portion of the County and such frequency-based indices are widely used in water quality assessment (e.g., by the Central Coast Regional Water Quality Control Board and the Ventura Countywide Stormwater Quality Management Program). It provides a measure, scored from 0 – 100, of the frequency and magnitude of exceedances that can be tracked over time, with lower scores representing worse conditions and higher scores better conditions. This index which is a more effective means of communicating water quality results accounts for the number of indicators within each category (e.g., bacteria, metals) that exceed standards in each year, the percentage of individual samples that exceed standards, and the average magnitude of any such exceedances (CCME 2001).

Table 2.2.1: Overall summary of results of prioritization analysis. *Red represents persistent and widespread exceedances of regulatory thresholds, yellow occasional exceedances, and green few if any exceedances. Measures of exceedance used in this analysis accounted for both the frequency and the magnitude of exceedance. Note: Bacteria, dissolved solids, and nutrients may be problem constituents in channels, and bioassessment scores in urban areas are generally low.*

	Bacteria	Dissolved solids	Nutrients	Toxicity	Pesticides	Metals	Bioassessment
Channels							
Dry							
Wet							NA
Coastal							
Dry		NA					NA
Wet		NA					NA

2.2.1 Inland Channels

For inland channels, bacteria, dissolved solids, and nutrients are persistent issues over time. Toxicity is somewhat higher in wet than in dry weather, but is not substantially above background conditions described in SMC studies. Biological condition (i.e., bioassessment) is generally poor and is in the lower 50% of the distribution compared to other urban areas in southern California. The following figures present results of the prioritization analysis for these core constituents, beginning with **Figure 2.2.1**'s overall summary ranking of constituents based on monitoring data from receiving waters in inland channels.

Figure 2.2.2 presents a slightly different perspective with data collected from stormwater discharge points into inland channels prior to mixing with receiving water. No constituents in wet weather exceeded Stormwater Action Levels (SALs) (**Figure 2.2.2a**) which are higher than the Water Quality Objectives (WQO) that apply to dry weather discharges (**Figure 2.2.2b**) and receiving waters in channels (**Figure 2.2.1**). Nutrients and bacteria are persistent issues for dry weather discharges.

While toxicity is present in urban channels (**Table 2.2.2**), it is not higher, overall, in dry weather than the toxicity documented in the open (undeveloped) landuse by the SMC's regional monitoring program. Wet weather toxicity in the County's channels is higher in wet than in dryweather, and is somewhat higher in wet weather for *Americamysis bahia* than seen in the northern portion of the County, patterns discussed further in the subsequent section on toxicity.

Figure 2.2.1: Overall exceedance index for core monitoring constituents in inland channels, summarized over the 2003 – 2013 monitoring period. *The bar charts rank constituents based on their respective CCME exceedance indices in both dry and wet weather, with higher values indicating fewer and smaller exceedances. Note: pesticides and metals had considerably lower exceedance rates and magnitudes of exceedance than bacteria, dissolved solids, and nutrients.*

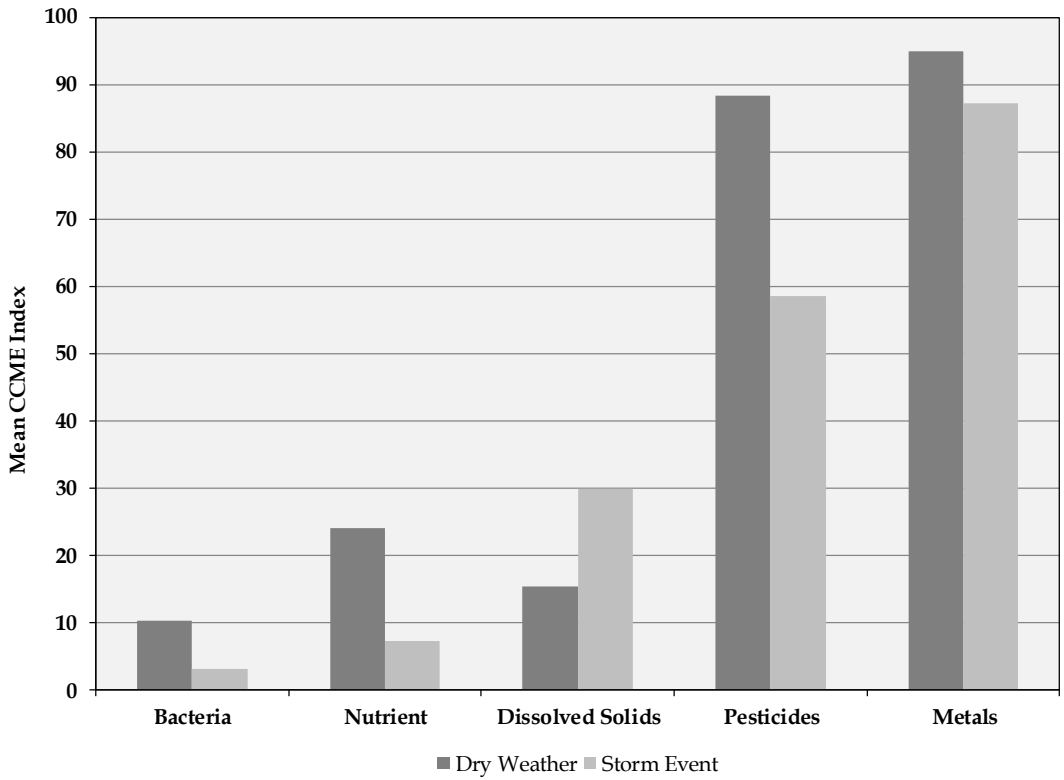

Figure 2.2.2: Comparison of individual constituent concentrations with a) stormwater action levels (SALs) for wet weather and b) water quality objectives (WQOs) for dry weather. *In the box and whiskers plot, the horizontal bar represents the median, with the upper and lower edge of the box the 75th and 25th percentiles of the distribution, respectively, and the whiskers the maximum and minimum values. Note: All constituents are below SALs in wet weather and only nutrients and bacteria are above NALs in dry weather.*

a)

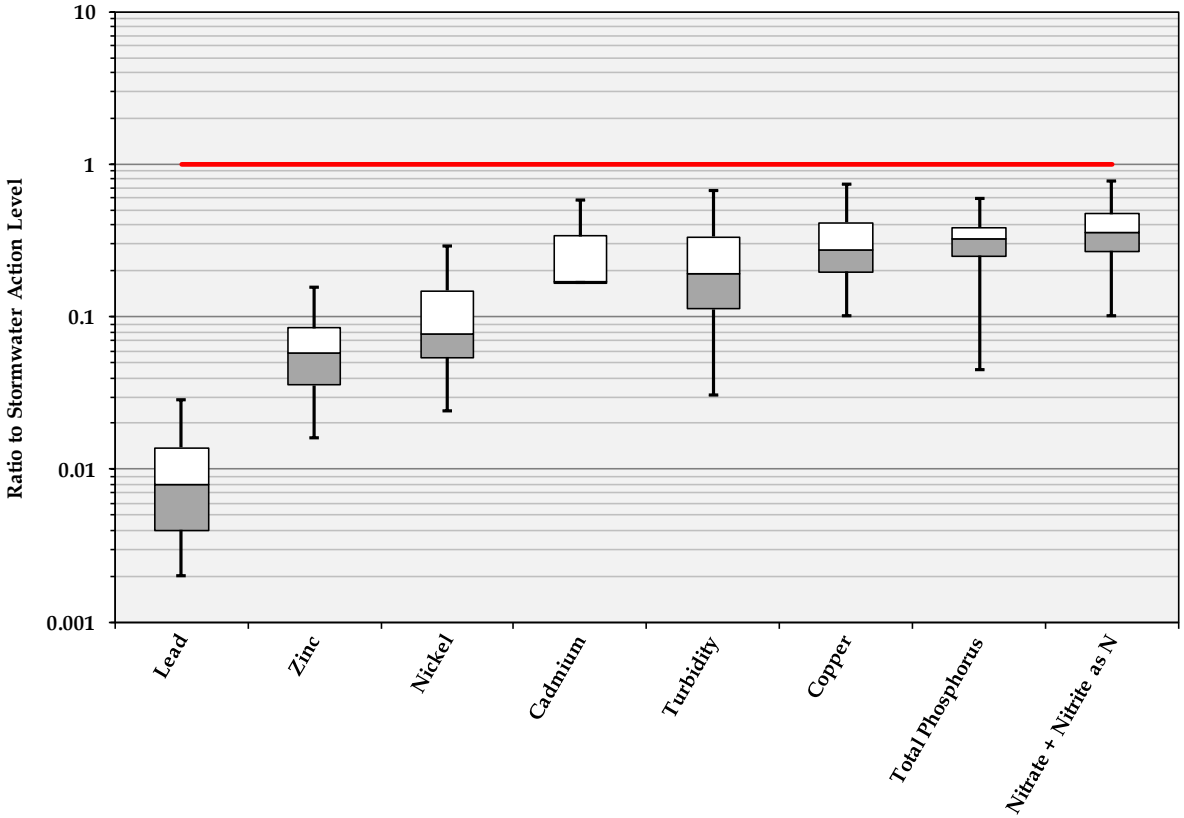

b)

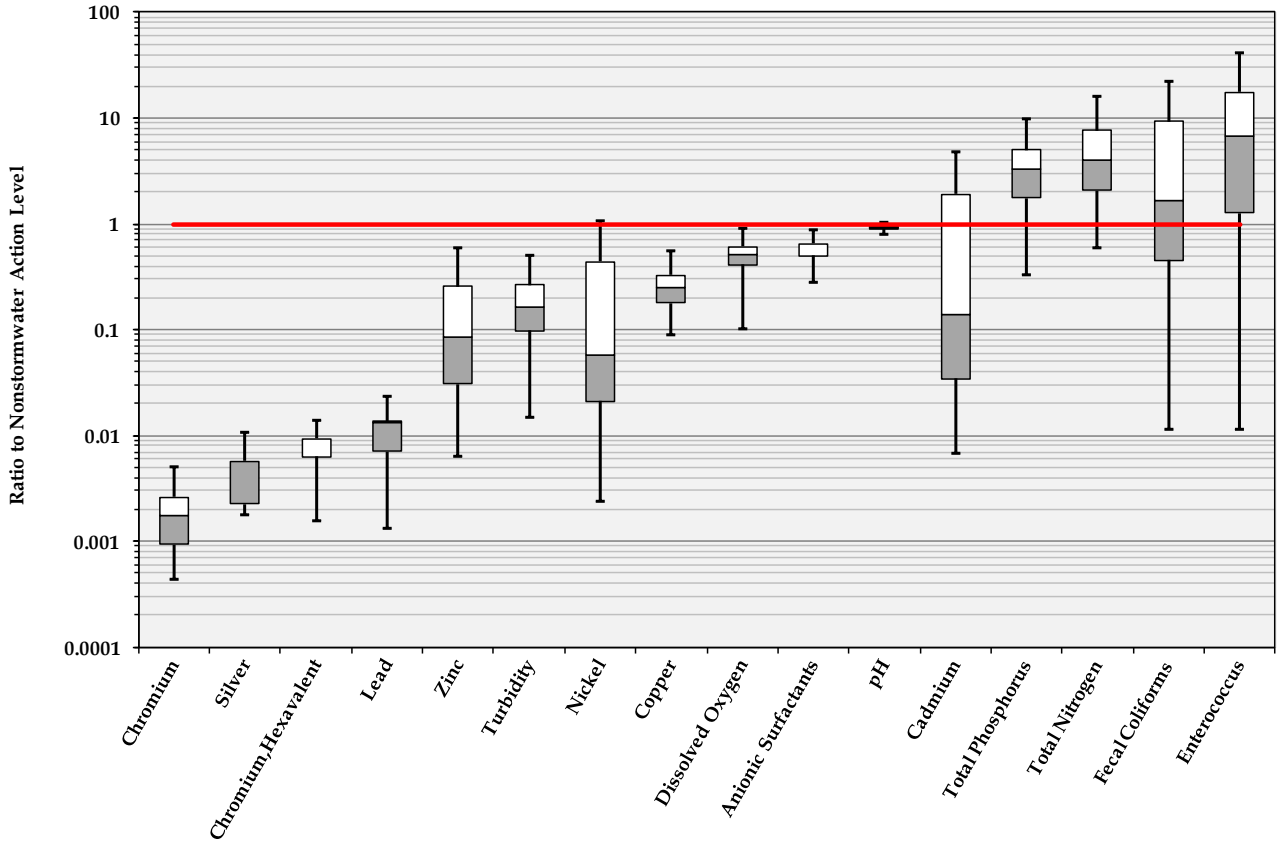
Ratio to Nonstormwater Action Level
100
10
1
0.1
0.01
0.001
0.0001
Chromium
Silver
Chromium,Hexavalent
Lead
Zinc
Turbidity
Nickel
Copper
Dissolved Oxygen
Anionic Surfactants
pH
Cadmium
Total Phosphorus
Total Nitrogen
Fecal Coliforms
Enterococcus

Table 2.2.2: Summary of the Program's toxicity testing in South Orange County from 2003 – 2012, an effort that includes 2548 tests on multiple species from a range of times, locations, and conditions. *Note: Toxicity levels are generally low except for one organism in wet weather that is susceptible to pesticides.*

Test Species	Dry Weather			Wet Weather			Sediment		
	n	Toxic	Nontoxic	n	Toxic	Nontoxic	n	Toxic	Nontoxic
Americamysis bahia	391	34%	66%	573	45%	55%			
Strongylocentrotus purpuratus	179	5%	95%	293	24%	76%			
Ceriodaphnia dubia	569	20%	80%	51	12%	88%			
Pimephales promelas	64	9%	91%	1	0%	100%			
Hyalella azteca	224	11%	89%	17	53%	47%	9	0%	100%
Overall	1593	18%	82%	946	36%	64%	9	0%	100%

Biological condition, as measured by macroinvertebrate bioassessment results, is uniformly poor at targeted monitoring sites in South Orange County channels (**Figure 2.2.3**). Studies conducted as part of the State Water Resources Control Board's effort to develop a statewide Biological Integrity policy indicate that alterations to physical habitat are a major cause of degraded biological conditions. The somewhat elevated toxicity in wet weather (**Table 2.2.3**) might be another contributing factor. Because the Biological Integrity policy, with its new scoring protocol, is still under development, and its technical background studies have not been completed and released, the Program will defer a more detailed consideration of biological condition for now. At that point, however, a causal assessment, using the approach recommended by the State Water Board, would be appropriate and informative.

Table 2.2.3: Summary of aquatic toxicity results from the past five years of Stormwater Monitoring Coalition (SMC) samples from random sites across the southern California region. *Sites were located in both open (i.e., undeveloped) and urban landuse types. The large majority of stream miles were nontoxic for acute toxicity (i.e., survival), with an equivalent amount of sporadic background toxicity, in both open and urban landuses. The majority of stream miles were toxic for chronic toxicity (i.e., reproduction) in the open landuse, a strikingly different pattern than seen in the urban landuse. Note: Toxicity patterns in open undeveloped areas are not substantially from those in urban areas.*

	% Stream Miles	
Ceriodaphnia Survival	**Open**	**Urban**
Toxic	2.1	2.4
Nontoxic	97.9	97.6
Ceriodaphnia Reproduction		
Toxic	63.0	37.4
Nontoxic	37.0	62.6

Figure 2.2.3: Cumulative frequency distribution of SMC bioassessment monitoring results across southern California in three distinct landuses. *The random sites within Orange County sampled as part of the SMC program are indicated on the curves for urban and open landuses. Targeted channel sites are shown along the X axis and Index of Biotic Integrity (IBI) scores for these sites, with one exception, fall in the lower 50% of the distribution compared to all urban landuse sites sampled as part of the SMC regional study. Note: Bioassessment IBI scores in urban areas are in the lower half of scores for urban areas in southern California.*

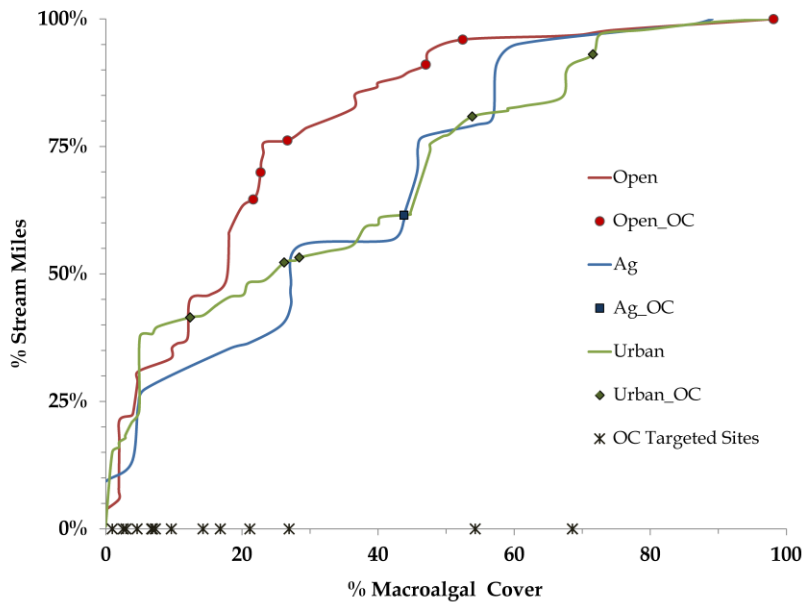

2.2.2 Coastal Surfzone

For the coastal surfzone, nutrients and bacteria are mild to moderate issues in wet weather, with most bacteria issues due to a small number of persistent problem beaches (**Figure 2.2.4**). Elevated nutrient concentrations in wet weather are a concern because they may contribute to regional eutrophication in coastal estuaries and to harmful algal blooms along the coast.

Figure 2.2.4: Overall exceedance index for core monitoring constituents in the coastal surfzone, summarized over the 2003 – 2013 monitoring period. *Note: Constituents measured at coastal discharge points rarely exceed standards, except occasionally for bacteria and nutrients in wet weather.*

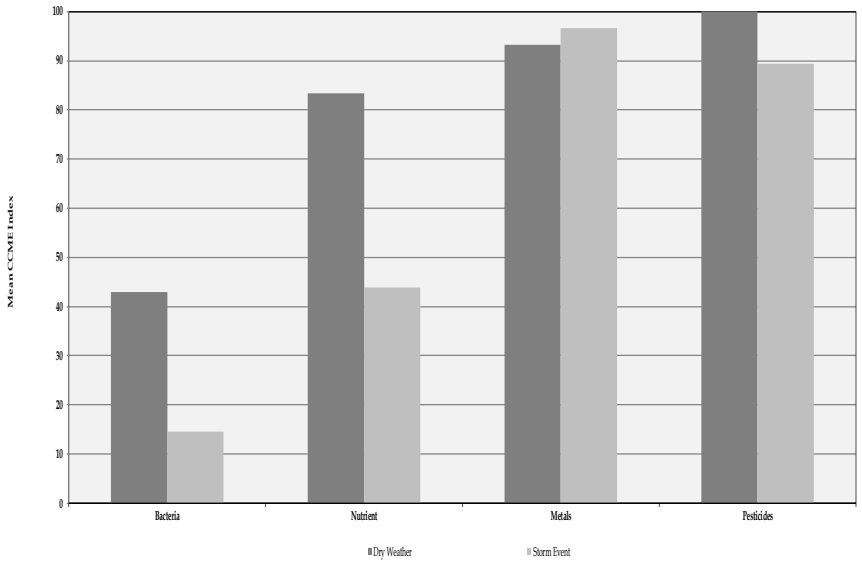

While **Figure 2.2.4** suggests that bacteria contamination is a moderate problem, particularly in wet weather, two other datasets present a different perspective. The data in **Figure 2.2.4** are drawn from the Program's monitoring at large coastal discharges, all of which are more likely to have elevated bacteria levels and thus represent a worst case estimate. In contrast, Heal the Bay beach report grades for a much larger set of South Orange County swimming beaches (**Figure 2.2.5**) show that the large majority of grades are in the A condition, even in wet weather and a more detailed examination of individual beaches (**Figure 2.2.6**) shows that bacteria shows continued improvement at some beaches over the past five years. However, **Figure 2.2.6** does not reflect recent dramatic improvements at these beaches because it summarizes data over the entire 2005 – 2013 period (see **Section 2.3** which reflects on the recent changes and provides a perspective of trends over time). The issues that do exist are localized to a few persistent problem beaches. For example, Heal the Bay has recently removed both Poche and Doheny beaches from its Beach Bummer list of the top 10 problem beaches in southern California. Thus, the data summarized for **Figure 2.2.4** do not provide the entire context for evaluating bacterial contamination at coastal beaches.

Figure 2.2.4 shows that nutrients may be a moderate issue in wet weather. However, unlike bacteria which cause relatively localized issues because they die off in seawater, nutrients can be a more regional concern due to their potential to contribute to plankton blooms and eutrophication both in local estuaries and the larger coastal ocean. A fuller assessment of potential nutrient impacts will depend on the developing state policy on Nutrient Numeric Endpoints (NNE) for coastal estuaries and Bight Program assessments of nutrients' potential contribution to plankton blooms in the coastal ocean.

Figure 2.2.5: Percentage of the time that swimming beaches are in each Heal the Bay report card category, averaged across all monitored beaches. *During dry weather beaches are in the A grade between 80 and 90% of the time. During wet weather the percentage of A grades drops, but has remained at about 80% for the past two years.*

a)

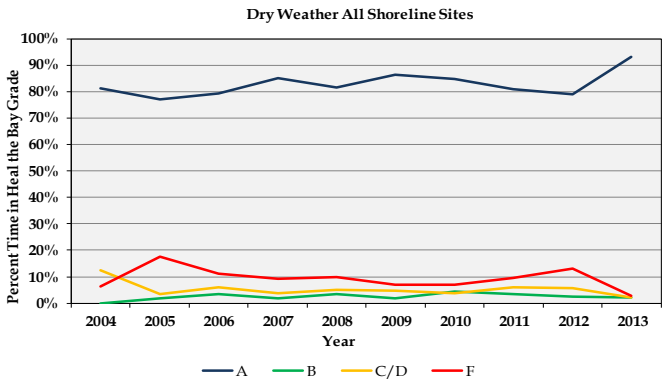

b)

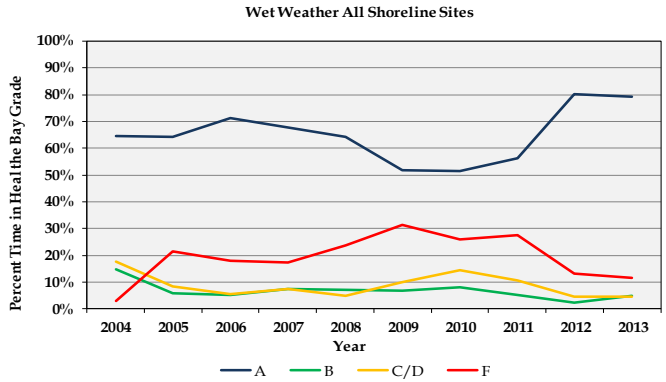

Figure 2.2.6: The overall percent exceedance of the AB411 *Enterococcus* standard over the time period 2005 - 2013. *Poche and Doheny, and to a lesser extent Pico, are the only persistent problem beaches and this summary figure overstates the problem because it does not clearly reflect significant recent improvements. This figure focuses on Enterococcus because it is the only one of the three AB411 indicators with any meaningful level of exceedance. Note: Exceedances of the Enterococcus standard occur at only a few problem beaches, which have improved dramatically in recent years.*

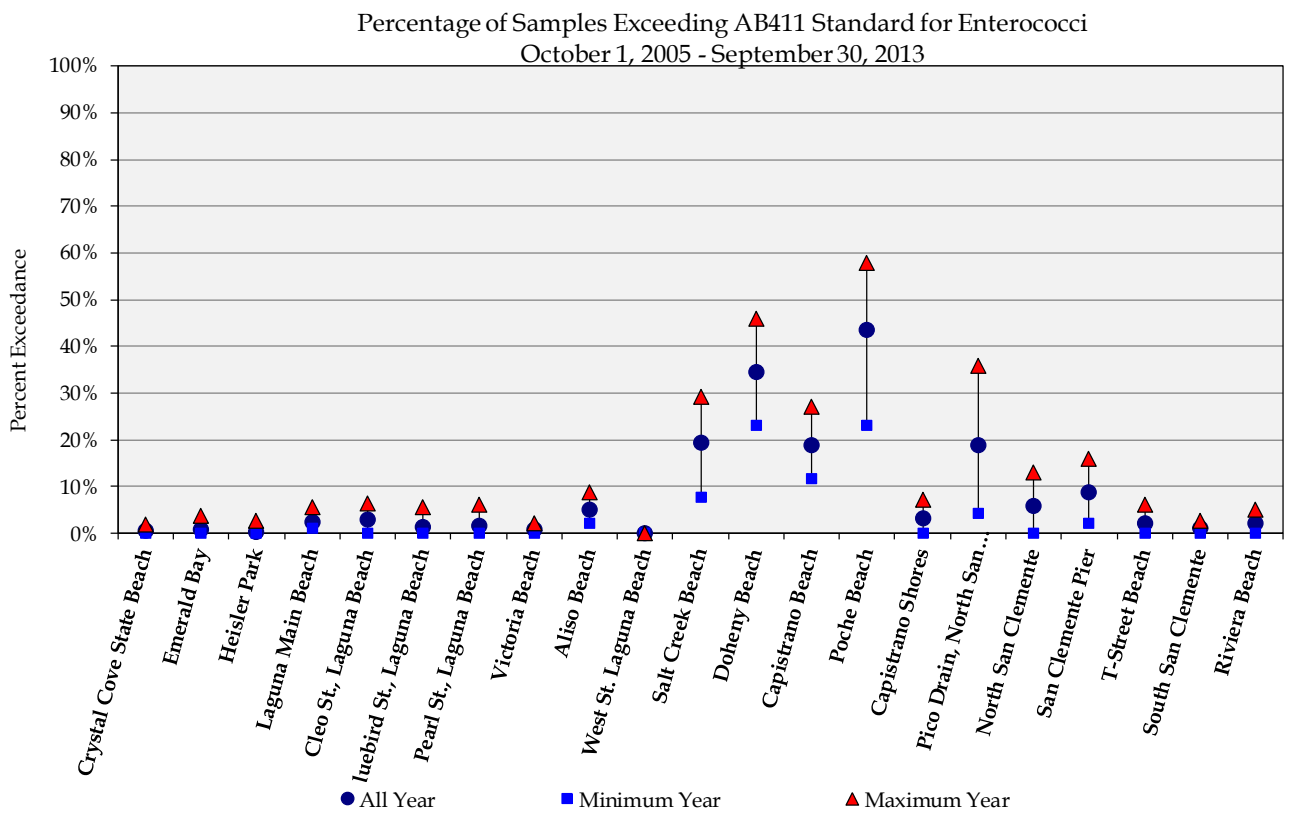

2.3 Bacteria

The Story: Bacteria

- The County's beaches support concentrated recreational activities for both residents and visitors and are important contributors to the local and regional economy.
- Concern about swimming safety is consistently high and epidemiology studies in dry weather show that some illness (for example, gastroenteritis) is associated with full immersion swimming in contaminated water.
- Contamination is very low during dry weather and has dropped steadily over time; beach report card grades are consistently high.
- Sources of contamination have been reduced through targeted actions; remaining issues during dry weather are localized and may have natural components.
- Contamination is more widespread during wet weather; wet weather flows are larger and qualitatively different.
- Health risks associated with wet weather flows are uncertain, but ongoing research and development focuses on improved monitoring tools and wet weather epidemiology studies.
- Progress on managing dry weather contamination demonstrates the efficacy of targeted BMPs appropriate to specific situations that may include natural sources (e.g., birds).

2.3.1 A Valued Resource

South Orange County's beaches (**Figure 2.3.1**) have been used for recreation at least as far back as the early 20th Century, and the local population as well as visitors from outside the region have enjoyed the opportunities they provide for sightseeing, picnicking, sunbathing, swimming, and surfing. The acceleration of urbanization and population growth in the last century increased beach usage at the same time as growing environmental awareness intensified concerns about contamination and its potential health impacts. The nexus of these two trends was illustrated dramatically in 1999 when persistent closures of Huntington State Beach due to contamination resulted in substantial economic impacts, anxiety about potential health effects, and concerted efforts to find and control the sources of contamination. While this event occurred in the north County, it affected perceptions among managers and the public throughout southern California. With over 100 million visits annually to southern California's beaches (nearly 40 million of which occur in Orange County) (Dwight et al. 2007) that contribute billions of dollars to the regional economy, the stakes related to contamination and public health are higher than ever.

The intensity of recreational use at beaches has stimulated a large amount of research, monitoring, and regulation at the federal, state, and local levels. These efforts have identified bacterial, protozoan, and viral pathogens that could be present when contaminated runoff and untreated sewage are released into the ocean (HCA 2012). Epidemiology studies in Santa Monica Bay (1995 & 2007/08) and at Doheny Beach (Colford et al. 2012) documented higher illness rates (e.g., gastroenteritis) among swimmers, especially near flowing stormdrains.

Figure 2.3.1: The beach is a popular recreational destination across the region.

These illnesses are not life threatening. However, the past history of beach contamination due to untreated sewage discharges (prior to passage of the federal Clean Water Act), along with current concerns about sewage spills and untreated storm-drain discharges, has led to constant vigilance and one of the preeminent beach water quality monitoring and improvement programs in the state (**Figure 2.3.2**). A unified monitoring program that improves coordination among monitoring efforts conducted by the Program and the water treatment agencies has been approved by the Regional Water Board and will be implemented shortly.

Figure 2.3.2: A Coordinated beach monitoring program conducted by the County Health Care Agency, the Program, and wastewater treatment agencies regularly monitors a large number of swimming sites. *Heal the Bay prepares weekly beach report card grades (inset figure and expanded* ***Figure*** **2.2.5***) that are made available on their website (www.healthebay.org).*

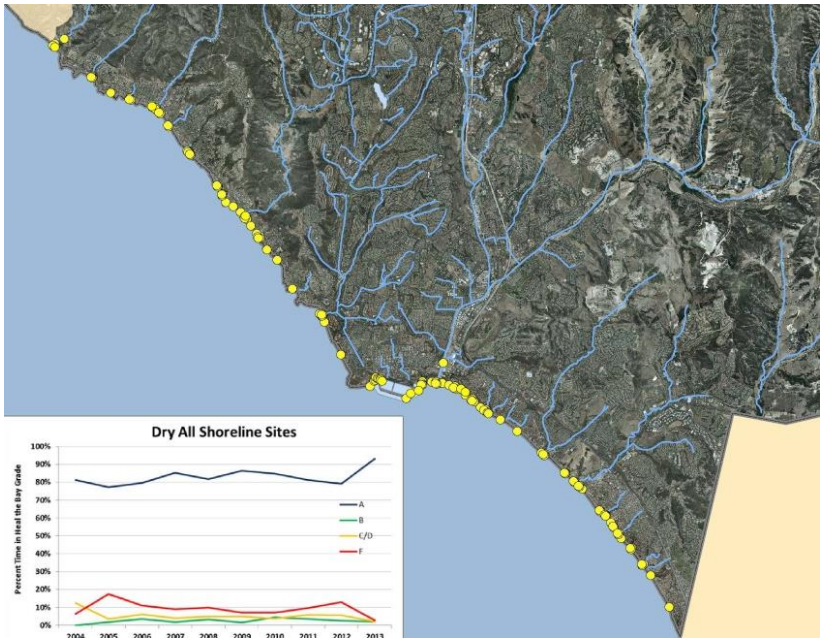

2.3.2 Progress during Dry Weather

Beach use and body contact recreation occur predominantly during the summer and in dry weather, although there is some use, mainly by surfers, during wet weather in the winter storm season. As a result, most regulation and monitoring focuses on dry weather conditions, using three bacterial indicators that indicate the presence of fecal pollution. These indicators are only indirect indicators of illness risk and not themselves pathogens, or disease agents. Thus, they do not provide a direct measure of potential health risk. However, they have been correlated with illness rates in dry weather when sewage contamination is present. They are more easily sampled and analyzed than the larger number of pathogens themselves. Long-term monitoring based on these indicators shows that exceedances of regulatory standards are also low and have been dropping over time and that the percentage of Heal the Bay report card grades of A has been at or above 80% in dry weather since 2004 (**Figure 2.3.2**).

This improvement in conditions during dry weather has been mirrored by a decrease over the past several years in beach closures due to contamination, as measured by Beach Mile Days (**Figure 2.3.3**). This metric is calculated by multiplying the length in days of each closure by the length (in miles) of beach affected and is a more accurate measure of the impact on beach users than the simple number of closures.

The improvement over time in these several measures of beach condition has resulted from a better understanding of contamination sources and targeted efforts to address the most severe of these sources. These efforts (**Figure 2.3.4**) initially focused on wastewater treatment plant improvements and treatment upgrades and have more recently expanded to include a wide range of localized BMPs (**Figure 2.3.5**) that have dramatically reduced the level of contamination at beaches and in the streams that discharges to the coastline. For example, the percent of *Enterococcus* exceedances at Salt Creek in Dana Point and the Pico stormdrain in San Clemente have dropped from 23 to 10% and from 22 to 4%, respectively, since 2005.

Figure 2.3.3: The total number of Beach Mile Days (the product of the length of beach posted times the length of beach posted) posted due to exceedances of standards during the April 1 – October 31 summer swimming season. *Beach Mile Days have declined substantially since 2000 and reached an all-time low in 2013. Adapted from HCA (2012).*

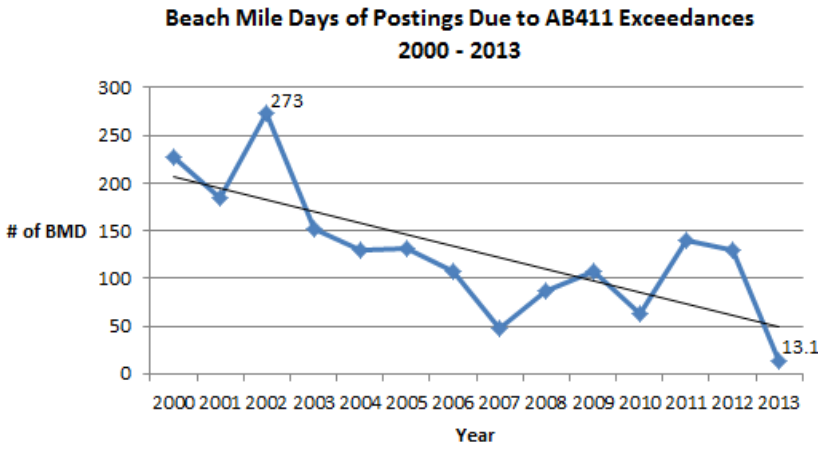

Figure 2.3.4: Timeline of significant actions in several categories that have contributed significantly to improved beach water quality.

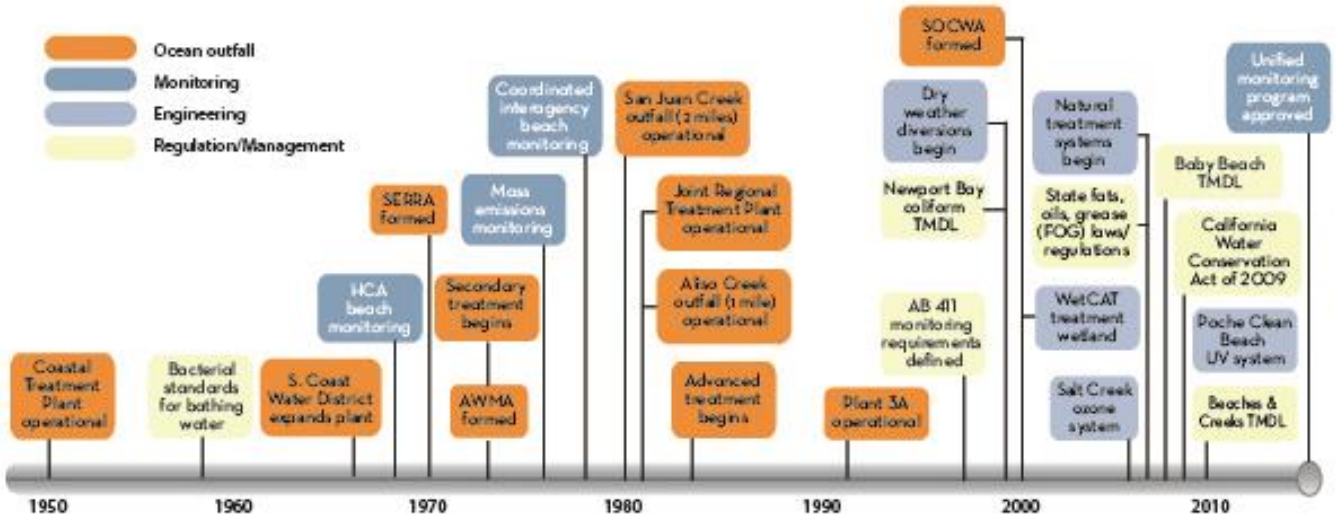

Figure 2.3.5: Coastal flow diversions that reroute dry weather flow to treatment plants that affect flow and/or bacterial loads.

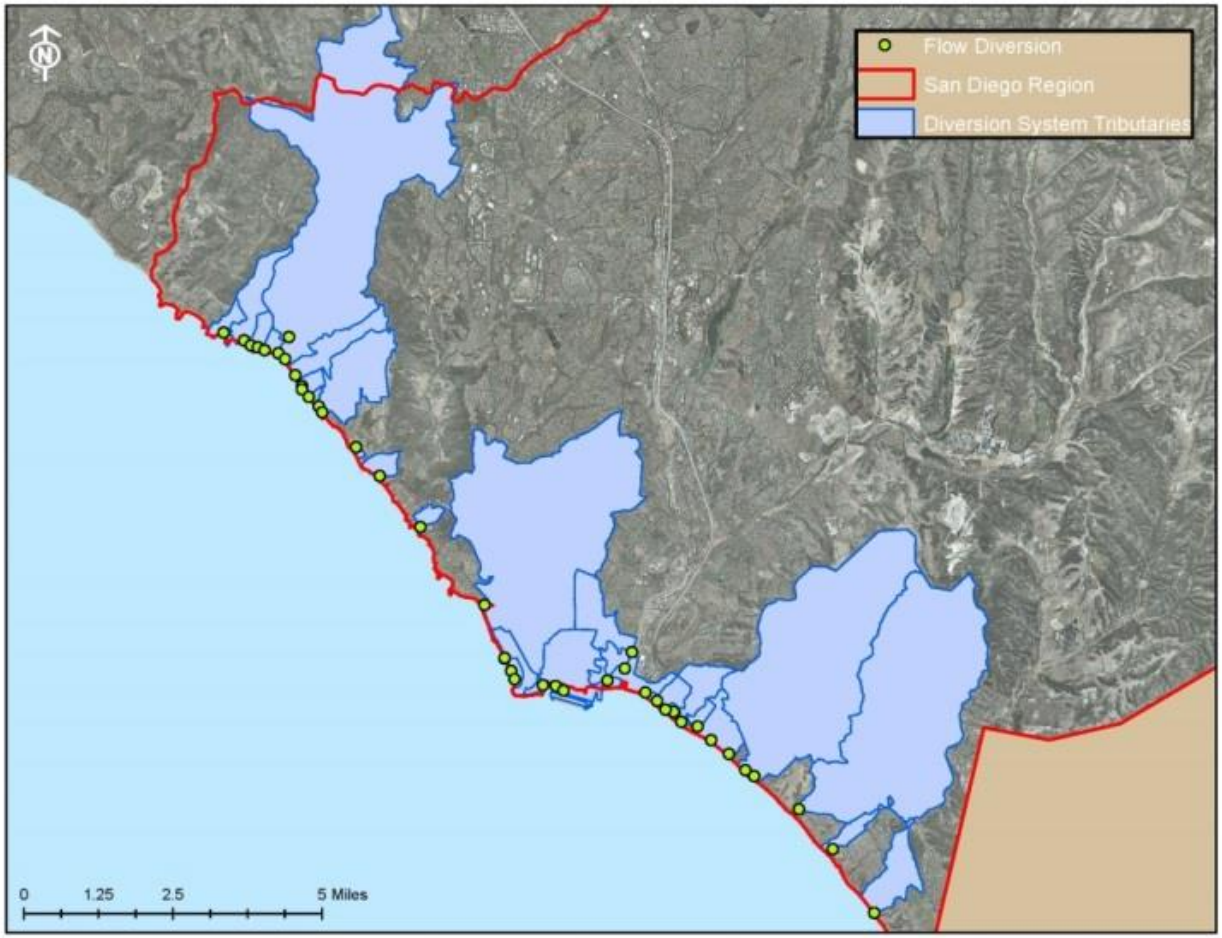

Beginning around 2000, County agencies and individual cities began improving their spill response and prevention capability, supported by a number of state laws and policies targeted at the discharge of FOG (fats, oils and grease, which can clog sewer lines), with the result that the numbers of spills and beach closures due to spills have declined dramatically (**Figure 2.3.6**).

Attention also focused on urban runoff from rivers, creeks, and stormdrains, which can contain high levels of bacterial indicators. A notable regional example is the long-term effort to document and reduce levels of bacterial contamination in Aliso Creek which has been ongoing since the lat 1990s.

a)

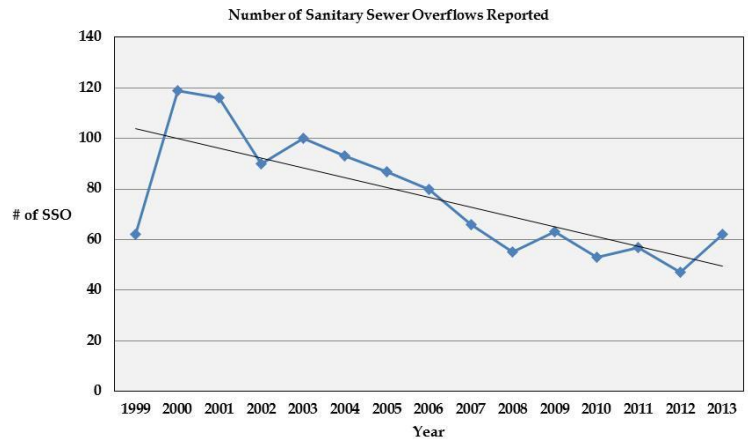

b)

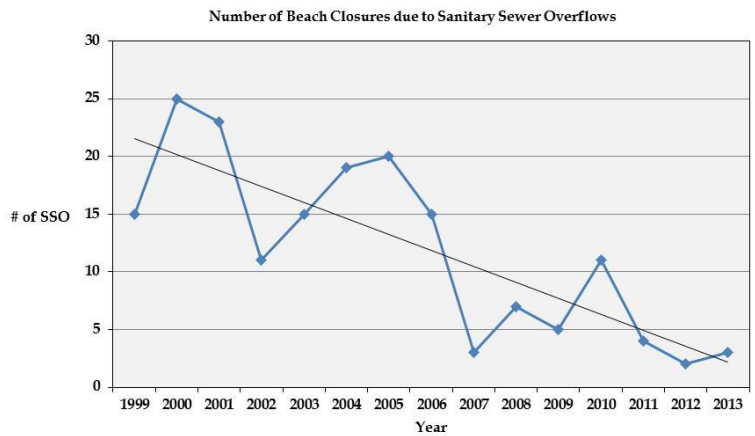

Figure 2.3.6: Two key metrics track the decreasing impact of sewage spills on beach condition in South Orange County over time. a) The number of reported sewage spills from 1999 through 2013. *The number of spills peaked in 2000 and has declined steadily since then (regression significant at p = 0 .001), reflecting increased attention to the causes of spills (primarily line blockages);* **b) the number of beach closures from 1999 through 2011 resulting from sewage spills.** *After peaking in 2000, the number of closures has declined steadily (regression significant at p <0.001), reflecting the reduction in the number of sewage spills and in the percentage of spills reaching the beach. Peaks in 2005 and 2010 are due to an unusual number of larger spills over 1000 gallons. Adapted from HCA (2012).*

2.3.3 Problem Beaches and Creeks

In response to persistent bacterial contamination issues at a number of creeks and beaches in the San Diego region, the San Diego Regional Water Board in 2007 adopted a Total Maximum Daily Loads for Indicator Bacteria, Project I - Beaches and Creeks in the San Diego Region, commonly referred to as the Beaches and Creeks TMDL. In the southern portion of the County, the primary focus of the TMDL was on a handful of persistent problem beaches (**Figure 2.2.6**). The TMDL was preceded by other individual actions, such as the Aliso Creek Directive issued by the Regional Water Board in 2001, also in response to elevated bacteria concentrations in the Aliso Creek watershed. These regulatory actions, combined with increased public and management attention to bacterial contamination (e.g., reduced sewage spills (**Figure 2.3.6**), have resulted in significant improvements to beach water quality. For example, both Poche and Doheny Beaches were recently removed from Heal the Bay's Beach Bummer list of the ten worst beaches in the region.

While actions to reduce bacterial inputs and improve water quality span the region (**Figure 2.3.5**), Aliso Creek and Poche and Doheny Beaches provide representative examples of the diversity of monitoring, assessment, prevention, and treatment efforts that combine to produce improvements over the past several years.

In addition to water conservation efforts that include the entire urbanized portion of the Aliso Creek watershed, four specific types of Best Management Practices (BMPs) have been implemented, including:

- **Treatment systems** such as sand filters, cartridge media filters, disinfection (ozone or Ultraviolet (UV) light, and dry weather diversions that send stormdrain flow to the sanitary sewer for treatment
- **Wetlands/channel restoration** that enhances a stream's natural capacity to absorb pollutant loads and restores riparian habitat
- **Landscape retrofits** such as weather-based irrigation controllers, edgescaping that replaces irrigated lawn area along the edge of a sidewalk, street curb, driveway, etc. with lower impact landscaping and permeable ground covering, and other irrigation improvements to improve water efficiency and reduce runoff
- **Catch basin retrofits** such as debris gates and in line baskets or filters that reduce the potential for bacterial growth by keeping trash out of catch basins

These actions have had noticeable effects, reducing fecal coliform levels below the regulatory standard at a key monitoring station in the lower watershed and reducing *Enterococcus* levels to near the standard (**Figure 2.3.7**).

Figure 2.3.7: Fecal indicator bacteria concentrations at Aliso Creek monitoring site CTPJ01 have significantly declined and now meet recreational water quality objectives (WQOs) for fecal coliform.

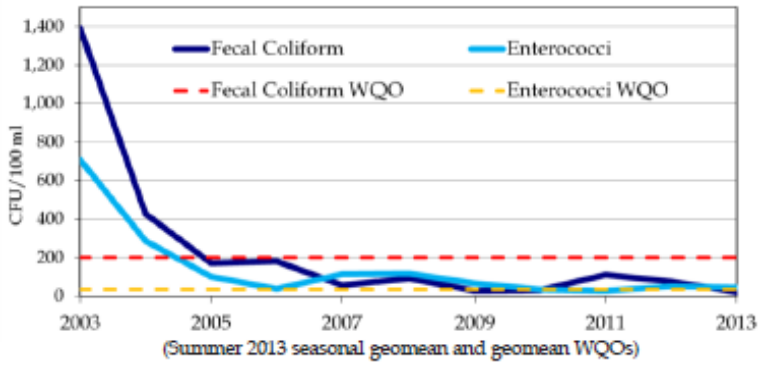

Bacterial indicator levels in the Aliso Creek watershed have declined over the past several years in concert with a decline in the average flowrate from urban discharges to the creek (**Figure 2.3.8**). While correlation of course does not necessarily equal causality, in this instance there is a strong case that the reduced flow of water contaminated with urban pollutants (including bacteria) has contributed to the reduced levels seen in the creek monitoring program.

The story of success at Poche and Doheny Beaches is equally dramatice but involves a different set of studies and BMPs. In concert with the epidemiology study at Doheny Beach in 2008-08, a source identification pilot project (or SIPP) identified leaking sanitary sewer infrastructure as a source of human fecal markers seen in the surfzone. Targeted repair efforts essentially removed this source. A parallel program at Poche Beach, the Poche Clean Beach Project, used state grant funds to construct a filtration and UV treatment system that reduced input of bacterial contamination from the the channel discharging to the beach.

Figure 2.3.8: The fecal coliform seasonal geomean in the Aliso Creek watershed plotted in comparison to the average dry weather flow rate in the creek. *Note: Fecal coliforms have declined in concert with reductions in flow of urban runoff to Aliso Creek.*

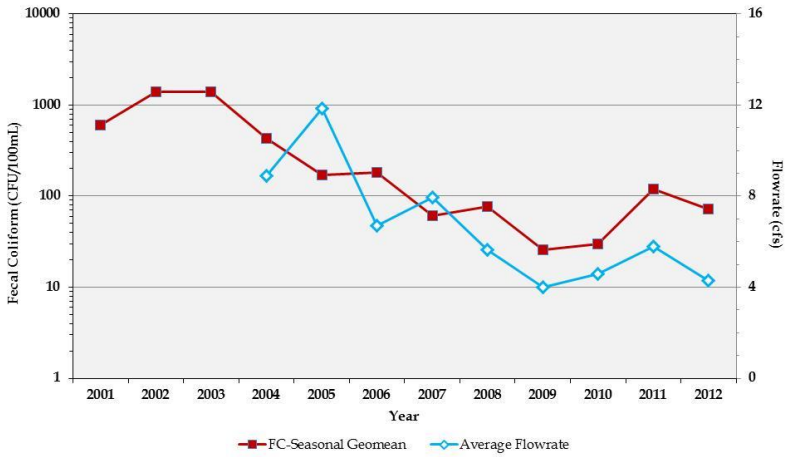

Additional studies identified another source of human fecal makers, this one airborne. Projects that involved genetic characerization as well as behavioral studies of seagulls found that seagulls feeding at the Prima Deshecha landfill in the upper watershed constituted a separate pathway for contamination. Better landfill maintenance, combined with falconry programs at both the landfill and the beach significantly reduce this source of contaminant input (**Figure 2.3.9**). Thus, the combination of modern genetics methods and the ancient practice of falconry provided an effective solution at Poche and Doheny Beaches.

Figure 2.3.9: The presence of an active falconry program to deter seagulls is associated with significant declines in bacterial contamination levels at both Poche (a) and Doheny (b) beaches. *Note: Falconry programs help reduce contaminant inputs from seagulls.*

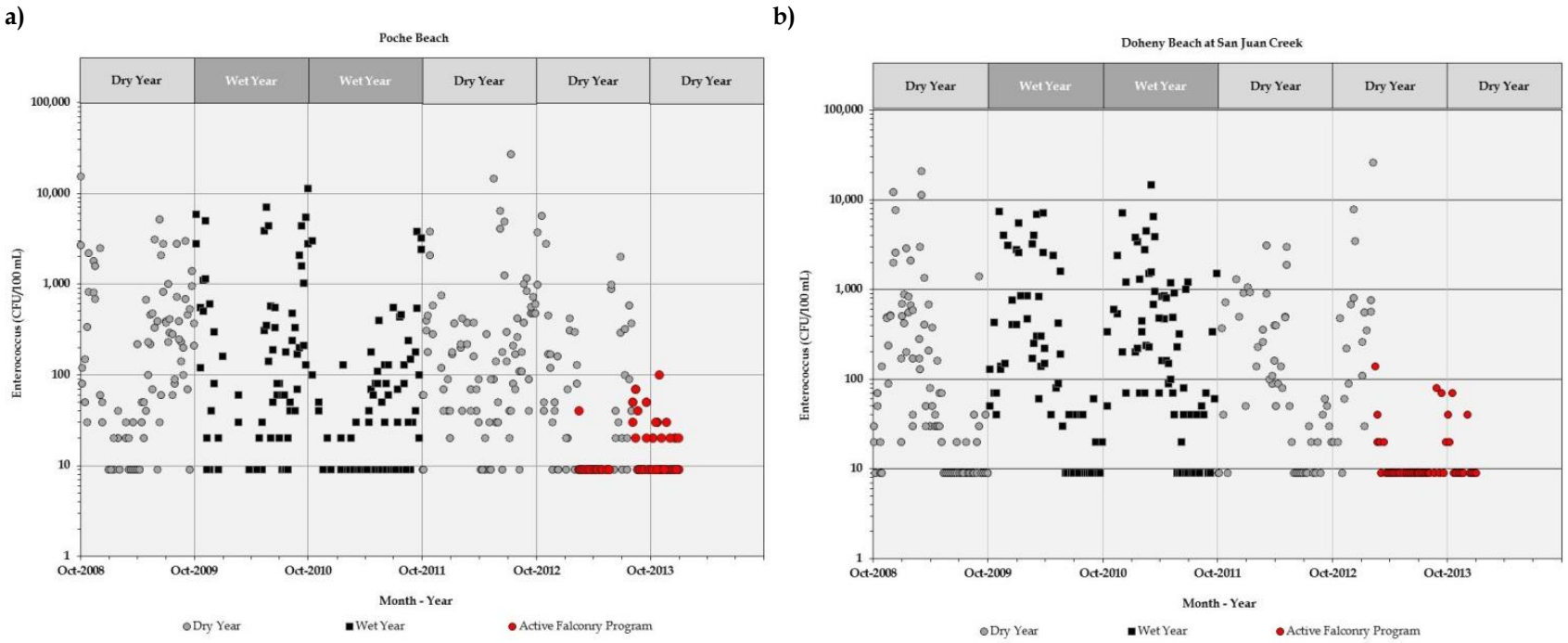

Ongoing efforts by cities and their stormwater programs to improve water conservation and reduce nuisance runoff have begun to ameliorate this problem. While concentrations of indicator bacteria in channels in both wet and dry weather combined continue to be elevated, the diversion of dry weather stormdrain and stream flows to treatment plants and other actions (**Figure 2.3.5**) has significantly reduced the volume of contaminated flows to beaches. Such efforts, along with the targeted identification and removal of specific problem sources, have also helped the County and watershed permittees make substantial progress toward improving conditions at the few problem beaches in the region. As a result of the effectiveness of these complementary actions, Orange County's beaches meet regulatory standards for the large majority of the time in dry weather and the health risks of swimming during dry weather conditions are very low, well understood, and well managed.

2.3.4 Continued Challenges in Wet Weather

In contrast to the progress achieved in maintaining clean beaches during dry weather conditions, significant challenges remain during wet weather. Channel flows during and immediately after wet weather storms are substantially higher than during dry weather (**Figure 2.3.11a vs. 2.3.11b**) which makes it infeasible to apply the management practices (e.g., diversion to treatment plants) that have been so successful in dry weather. In addition, these flows reach the beach more frequently (**Figure 2.3.10c**), which means that their loads of bacteria and other pathogens are delivered directly to the coastal ocean, with the result that beach grades worsen and exceedances of standards increase during wet weather (**Figure 2.3.11**). Nevertheless, the annual percentage of A grades for wet weather on the Heal the Bay report card has reached 70% in recent years (**Figure 2.3.11**). As a result of these characteristics of wet weather flow, the Orange County Health Care Agency issues routine health advisories recommending that the public stay out of the ocean during and for 72 hours after storms in order to avoid contact with potentially contaminated discharge. Despite this, there is significant recreational use during storms (**Figure 2.3.10d**), primarily by surfers taking advantage of the larger surf that often accompanies winter storms.

Figure 2.3.10: Photographs showing examples of the changes in flows during dry and wet weather and the subsequent changes in ocean water quality. *a) Dry weather flows are much smaller than b) wet weather flows; c) wet weather flows from stormdrains and channels typically reach the ocean in wet weather, in contrast to dry weather flows which rarely reach the ocean; d) surfers often take advantage of the large waves caused by winter storms, despite the increased exposure to contamination this may involve.*

Figure 2.3.11: The percentage of poor Heal the Bay report card grades at swimming beaches is much higher in wet weather than in dry weather (see insert in Figure 2.10), although the annual percentage of A grades has increased gradually in recent years to 80% and the percentage of F grades has dropped to 10% in the most recent monitoring year (2013). *Note: Heal the Bay beach grades in wet weather have improved recently and are mostly A.*

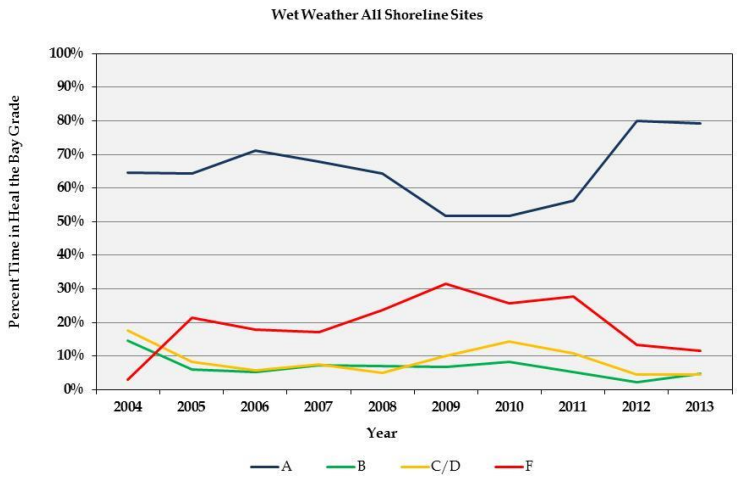

In addition to the higher flows in wet weather, there are two other aspects of this issue that complicate efforts to reduce wet weather contamination and its resultant potential health risks:

- Bacterial contamination in wet weather flows stems from a much wider range of sources than in dry weather
- Limitations in existing monitoring tools make it difficult to know when there is actually human fecal contamination and a resultant health problem

Rainfall and the resulting runoff from land surfaces mobilizes indicator bacteria from a wide range of sources, including humans and animals, soils, vegetation debris, and persistent bacterial films in gutters and stormdrains. These loads stem from sources in both urban and open areas, as documented in a number of studies that have correlated bacterial loading with rainfall and measured loading from both urban and natural landscapes. Controlling this large range of sources and the very large volumes of wet weather flow would present a daunting engineering problem. For example, the long-term (1986 – 2013) mean monthly flow of San Juan Creek in January, February, and March is approximately 6175, 9201, and 5095 acre feet, respectively. Because treating these runoff volumes is infeasible, approaches such as Low Impact Development (which reduces runoff) and amendments to the Basin Plan that include changing bacteria objectives, delisting of some concrete channels, and suspending objectives in highly modified flood control channels during periods of high flow may be called for.

Because of the different nature of wet weather flows and the indirect nature of monitoring indicators, it is impossible to draw firm conclusions about health risk in wet weather. Wet weather flows may actually include a large proportion of true pathogens or they may simply be mobilizing non-pathogenic indicator bacteria from multiple sources across the landscape and diluting a stable pool of human fecal pathogens. Epidemiological studies in dry weather, including in Santa Monica Bay in 1995 and 2007 - 08, and at Doheny Beach (Colford et al. (2012) have established a relationship between levels of indicator bacteria and health risk, as well as documenting that full immersion swimming closer to flowing stormdrains increases risk. In contrast, there are no epidemiological studies in wet weather that can help resolve the fundamental uncertainties that have so far precluded significant management actions.

New studies planned and underway should, over the next few years, provide significant insight into the nature and magnitude of health risks in wet weather as well as more powerful and targeted monitoring tools to support improved regulation and decision making.

2.3.5 Monitoring Methods

Current indicators do not measure pathogens directly and do not separate human vs. animal and other sources. This is problematic, especially in wet weather when higher flows mobilize indicator bacteria from a multitude of sources distributed widely across the landscape. The current bacterial indicators are present in soils, leaf litter, other forms of rotting biomass, biofilms in gutters and stormdrains, as well as in both domesticated animals and wildlife, and often recover and grow in the environment even after disinfection. In contrast, the pathogens responsible for human illness (about 90% of which are viruses) all derive from human fecal contamination. These shortcomings of traditional indicators make it difficult to reliably separate human from nonhuman sources, estimate health risk, and accurately track the sources of actual pathogens.

Recent research has led to new tools that resolve some of these handicaps, although further development remains to be done over the next few years. Ongoing research falls into three categories:

- Development of genetic markers that more reliably identify the presence of human fecal material
- Monitoring methods that directly measure the presence and abundance of pathogens, particularly viruses
- Wet weather epidemiology studies that will improve estimates of health risk from exposure to ocean waters during wet weather conditions

We now have the technology to reliably determine if there is a human fecal component to bacterial contamination, using the HF183 genetic marker from a *Bacteriodes* species that is present in large quantities in humans but not in other species. This marker is not itself a pathogen but does enable relatively accurate estimates of the percentage of time human fecal material is present. At present, it is most useful as a means of confirming / eliminating the presence of human sources, a key first step in microbial source tracking studies. However, it is not yet a suitable basis for revised regulatory standards because its persistence in the environment and its behavior compared to that of actual pathogens is poorly understood. A component of Bight '13 aims to improve our understanding of HF183's utility by measuring it, along with traditional indicators, in a number of coastal drainages across southern California in both wet and dry weather.

New monitoring methods that utilize digital polymerase chain reaction (dPCR) technology enable quantification of pathogenic viruses at very low detection limits. Researchers can now test for the presence of adenoviruses, noroviruses, and rotaviruses in environmental samples, although substantial further development is needed before these methods are available for routine application. Rotaviruses are related predominantly to gastrointestinal illness and some adenoviruses affect a broader range of membranes, including those in the nose and bronchia. Some noroviruses cause intense but shortlived (24 – 48 hour) illnesses that are not life threatening but are extremely unpleasant. With funding from the state of CA, the Southern California Coastal Water

Research Project is working with the Monterey Bay Aquarium Research Institute (MBARI) and researchers at Arizona State University to develop mobile digital PCR equipment that could enable new approaches to beach water quality monitoring, such as in situ sensors that provide a stream of real-time data. There are technical complications related to sample processing but once these are resolved, the digital PCR methods could provide the basis for updated standards.

The third area of research is the investigation of health effects associated with swimming and surfing in the ocean during wet weather conditions. SCCWRP is cooperating with the City and County of San Diego and USEPA this winter on a pilot wet weather epidemiology study that will follow a large sample of surfers to estimate the relationship between illness rates and the levels in ocean water of a number of indicator bacteria and pathogens. Plans are in place for a full epidemiology study at more locations during the winter of 2014/15. The results of these studies, in combination with quantitative risk assessment methods, could show that health risk is either lower or higher than the assumptions built into current regulations. In either case, the epidemiology studies, in combination with new monitoring methods, will provide the basis for improved regulations and more informed management decisions.

2.3.6 Recommendations

Past progress in identifying and controlling sources of contamination, the availability of a long time series of monitoring data, and the development of new monitoring and assessment tools provide the basis for this review of existing bacteria monitoring programs with the goal of improving their utility and efficiency. The following recommendations stem from a data-driven, risk prioritization approach that views monitoring, assessment, research, and management actions as a portfolio of related actions.

- Continue targeted data analyses of monitoring data to prioritize problem areas. Conduct additional source tracking studies as needed, using new monitoring methods based on genetic markers to identify potential sources of these issues such as infiltration into the MS4 from sewage lines. This effort should build on results of the Bight '13 Microbiology Study.
- Continue identifying opportunities to reduce and prevent flows in dry weather, where monitoring and source tracking data suggest the presence of human fecal contamination.
- Conduct statistical power analysis and optimization studies to improve existing monitoring program designs to improve efficiency and take advantage of available information about patterns and trends of contamination. **Figure 2.3.12** illustrates how statistical power analysis can provide information that can reduce and/or better target monitoring resources.
- Shift resources from routine monitoring to targeted source tracking and adaptive response, using new tools such as genetic markers of human fecal contamination as these become available.
- Continue supporting regional and collaborative research into better monitoring and source tracking tools.
- Improve understanding of health risk related to high wet weather flows, for example, through the Bight '13 Microbiology Study; follow results of the pilot wet weather epidemiology study planned for San Diego and consider

supporting the larger, follow-on study planned for 2014/2015.

- Conduct pilot mass balance studies to determine their utility for improving the prioritization of management actions.

Figure 2.3.12: Example analysis run with pesticide data to demonstrate statistical power analysis for a trend monitoring program. *The number of years of data required to detect varying amounts of change with different numbers of samples per year (5, 10, 20, 40) next to respective curves). This figure illustrates that increased sampling intensity often produces diminishing returns and that such analyses can inform tradeoffs among different types of sampling effort and the amount of change managers with to detect and/or the amount of time they can wait to detect a change. The figure also shows that the inherent variability in a system may make it impossible to detect small amounts of change with even large amounts of sampling effort.*

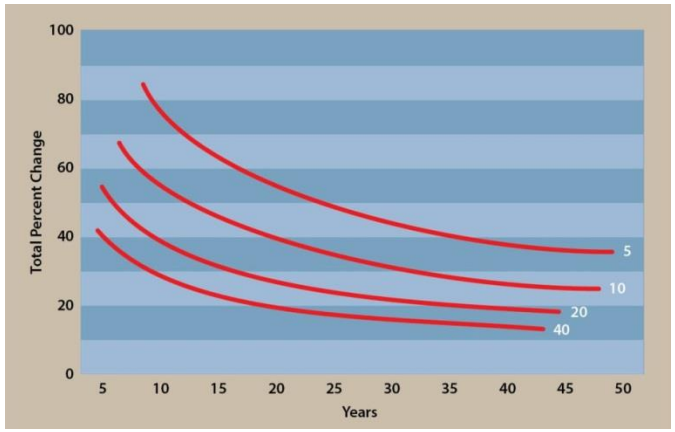

2.4 Dissolved Solids

The Story: Dissolved Solids

- Persistent and widespread exceedances of total dissolved solids occur in channels and at discharge outfalls.
- Dissolved solids are a challenging to address because a large portion of these elevated levels derive from natural sources in regional groundwater.
- Understanding local geology is key to understanding sources of dissolved solids and the pathways they travel in the watershed.
- While the flood control system provides one pathway for dissolved solids in groundwater to reach the surface, other natural pathways (such as artesian springs) exist and there is evidence of historically elevated dissolved solids levels in surface water in the region.

2.4.1 Natural Geology is Key

Dissolved solids refers to the amount of salt in water and can be a difficult water quality problem to address when concentrations are elevated. They can be toxic to fish and plants and require expensive processing in water reclamation systems to make the water drinkable or usable for irrigation. Dissolved solids, as general description of the amount of salt in water, consists of several other constituents including chloride, sulfate, nitrate, phosphate, calcium, magnesium, sodium, potassium, and sometimes a few trace metals such as cadmium, nickel, selenium, and zinc.

Total dissolved solids (TDS) consistently exceed the Basin Plan Objective (**Figure 2.4.1**) and these levels create the potential for detrimental impacts on the aquatic ecosystem; for example, TDS has been suspected as a causal factor in poor benthic macroinvertebrate community condition.

The key issue in deciding whether elevated dissolved solids represent a water quality problem, and thus a priority for management, depends directly on the source of these solids and the appropriate benchmark for comparison (**Figure 2.4.2**). Many creeks in South Orange County have elevated levels of dissolved solids that do not appear to be related to the urban sources. For example, the dissolved solids from common urban potable sources such as imported water from the Colorado River or northern California, or locally generated drinking water from deep groundwater supplies or from recycled water, are often at levels much lower than those measured in South Orange County creeks. Similarly, the shallow groundwater tables that provide most of the water to these streams are often much higher in dissolved solids than water from urban sources.

Figure 2.4.1: An overall exceedance index of the extent to which total dissolved solids meet regulatory standards in both a) wet and b) wet conditions is low (which means poor conditions) and has remained fairly steady since 2004.

a)

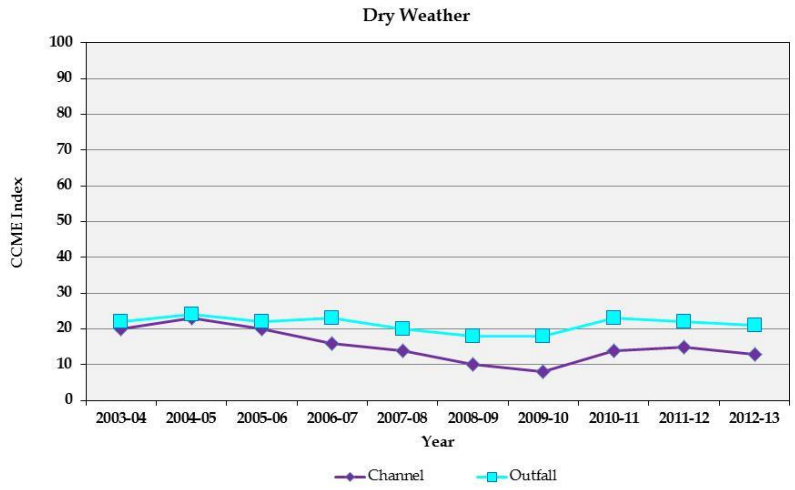

b)

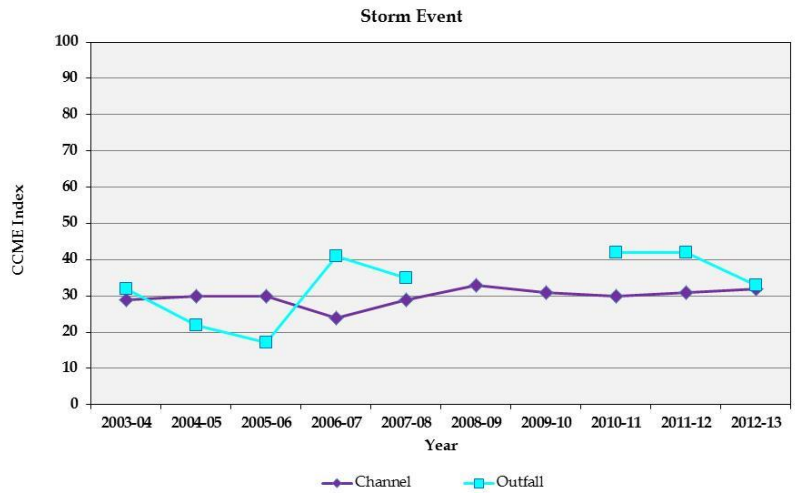

Local geology is the primary reason South Orange County creeks have dissolved solids higher than those in common urban sources of water. The coastal areas of South Orange County have salt-rich native soils, commonly referred to as marine sedimentary geology, with the result that creeks have elevated dissolved solids. Further, the creeks with elevated dissolved solids are not limited only to water bodies within urbanized areas. Natural reference creeks in coastal areas with this type of unique geology and little to no urban influence have levels of dissolved solids substantially above those in urban water sources (**Figure 2.4.2a**).

In contrast, the parts of South Orange County with geology more closely related to bedrock (i.e., igneous geology) and those soils found in the upland higher elevations closer to the Santa Ana mountains are much less related to marine sediments and thus have lower levels of dissolved solids (**Figure 2.4.2b**).

The Program has conducted several special studies to improve understanding of the relationships between natural and urban sources of dissolved solids in creeks. Studies in Oso Creek, which has elevated dissolved solids levels showed that dissolved solids concentrations in this Creek were comparable to those in three reference streams (**Figure 2.4.3a**), although loads of dissolved solids to Oso Creek were higher than those in natural streams (**Figure 2.4.3b**).

The Program has also conducted collaborative studies with researchers in the Geochemistry Group at University of Southern California's Department of Earth Sciences, using specialized testing of stable isotopes of hydrogen and oxygen. Physiographic conditions under which rain falls in the Sierra Nevada or Colorado River watersheds are very different from those in the County's low elevation coastal watersheds. These differences impart unique isotopic signatures that can help to uniquely identify the contribution from various sources. This study compared the isotopic signatures of groundwater emerging from weeps and springs in the urbanized areas of South Orange County to those from a range of potential sources including rain, natural groundwater, and urban sources (e.g., potable or recycled water). The stable isotopic signature for shallow groundwater from weeps and springs in urban areas is more similar to that of local rain water and natural reference streams and much less similar to the imported water that is the primary source of potable water in south Orange County.

Figure 2.4.2: Means and ranges of dissolved solids concentration in a) various water sources including rainwater, local potable, Colorado River potable, recycled, groundwater, and b) streams. *Data from these sources provide context as to which water source(s) most closely resemble surface waters with elevated dissolved solids.*

a)

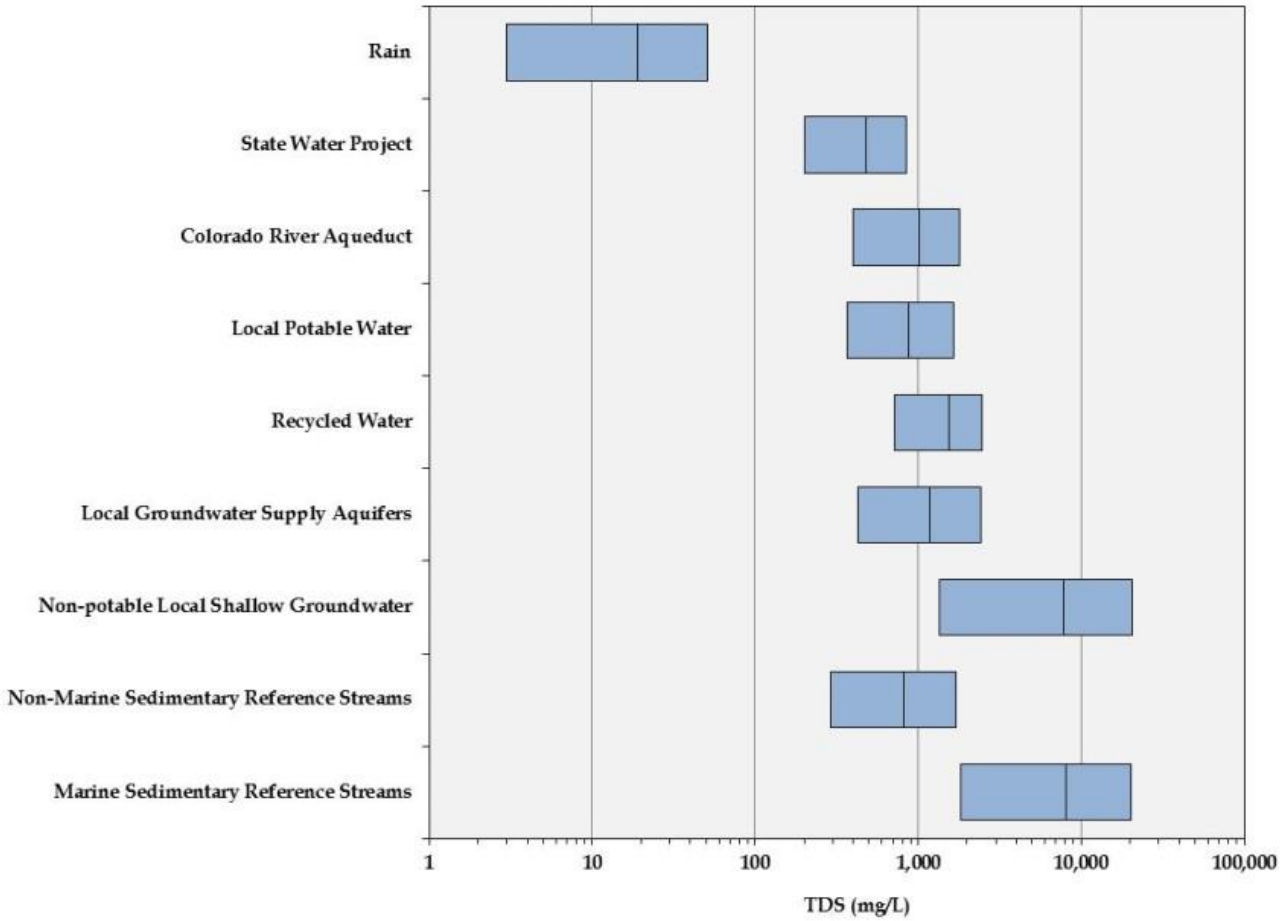

b)

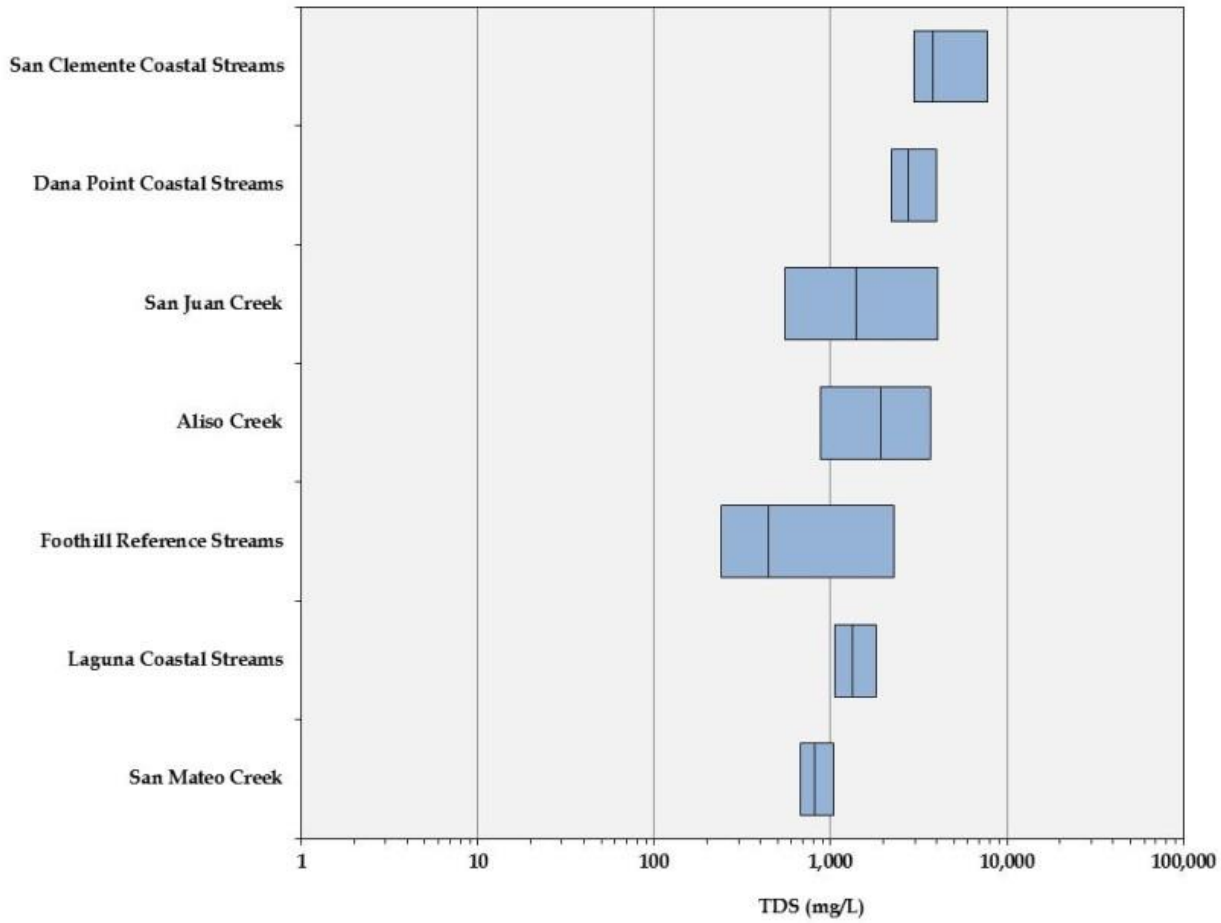
San Clemente Coastal Streams
Dana Point Coastal Streams
San Juan Creek
Aliso Creek
Foothill Reference Streams
Laguna Coastal Streams
San Mateo Creek
1
10
100
1,000
10,000
100,000
TDS (mg/L)

Figure 2.4.3: Ranges of dissolved solid concentrations (a) and loads (b) in Oso Creek in comparison to three reference streams of similar geology.

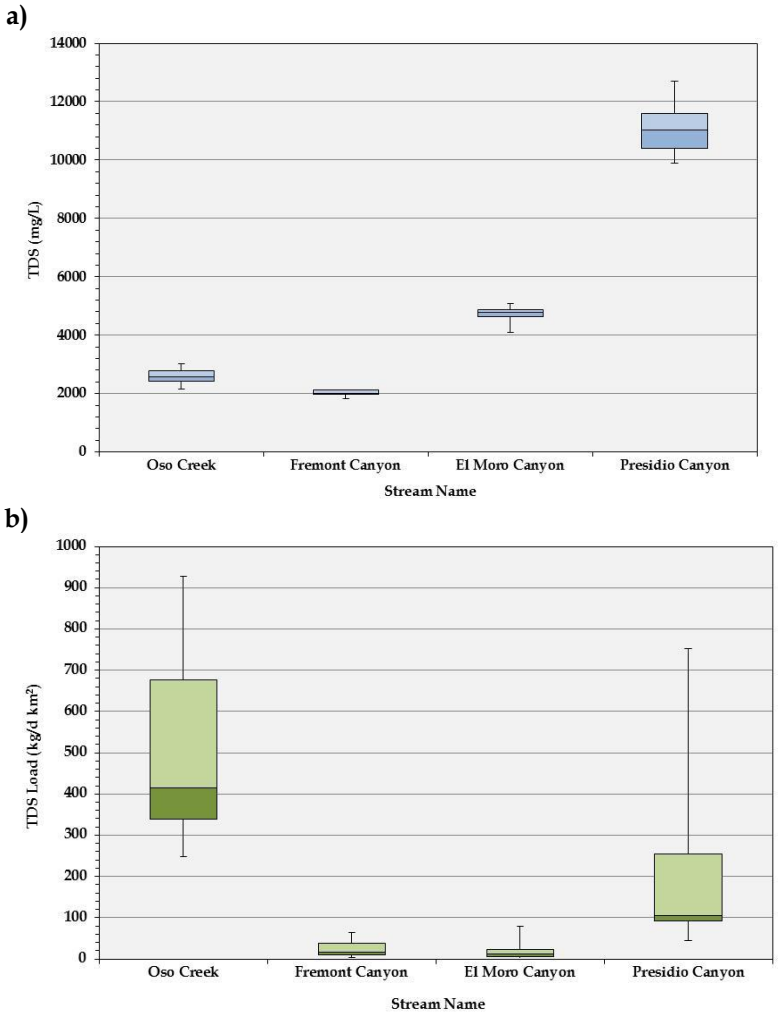

This study also compared shallow groundwater to the global meteoric water line, which describes the mean relationship between hydrogen and oxygen isotopes in water which has not been exposed to evaporation (**Figure 2.4.4**). The shallow groundwater in urban areas reflects conditions more similar to rainwater and reference streams than to an imported source of water.

Figure 2.4.4: Hydrogen and oxygen stable isotope compositions of shallow groundwater in urban creeks across south Orange County in comparison to rain, water from reference streams in undeveloped watersheds, and imported municipal water from Colorado River and the Sierra Nevada mountains.

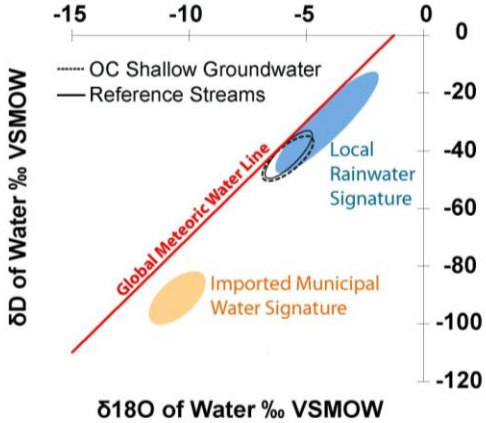

These three pieces of information have important implications for the Program's efforts to identify sources of dry weather flow, understand the underlying natural conditions in streams in the urbanized portions of South Orange County, and to then determine whether elevated dissolved solids in a particular watershed are an important management priority for the future.

2.4.2 Recommendations

- Conduct a mass balance study, even if at a crude level, to determine the extent to which the MS4 contributes to dissolved solid levels in the creeks
- Prepare a summary report on historic and contemporary conditions of dissolved solids across south Orange County
- Invest effort into understanding whether dissolved solids are important stressor on macroinvertebrate communities in the creeks to evaluate the environmental significance of elevated dissolved solid concentrations
- Continue evaluating changes in dissolved solids at key locations such as Oso Creek in concert with water conservation efforts to track changes in dissolved solids over time.

2.5 Nutrients

The Story: Nutrients

- Nutrient levels in South Orange County streams and channels are frequently above commonly used thresholds that suggest increased likelihood of nutrient impacts. In contrast, there are much less frequent occurrences of impacts, such as macroalgal overgrowth, due to excessive nutrient levels.
- Nutrient issues are not limited to the urban portion of the County; regional monitoring data show nutrient enrichment and impacts such as increased macroalgal cover and/or lower dissolved oxygen in streams and estuaries in undeveloped regions.
- The major point sources of nutrients have been controlled. Therefore, nonpoint and diffuse sources such as leaching from upland soils and intrusions from shallow groundwater are increasingly important.
- Nutrients can be readily transported in and out of various reservoirs (e.g., sediments, groundwater) and undergo complex biological transformation and cycling. This makes traditional pollutant control strategies less effective for nutrients.
- Improved management strategies may contribute to further progress, particularly in streams and channels, by accounting for site-specific conditions, promoting Low Impact Development, and accounting for broader regional sources.

2.5.1 A Complex Regional Problem

Elevated levels of nutrients have become an increasing national and regional concern in recent years because of their impacts on lakes, streams and estuaries. Nutrient enrichment leads to the overgrowth of algae in streams, (**Figure 2.5.1**) and estuaries (**Figure 2.5.2**) that can reduce dissolved oxygen, sometimes to the point of causing mortality to fish and other aquatic organisms. Dense algal mats can also cause aesthetic (visual and odor) impacts and impair beneficial uses such as boating and swimming. There is also concern that nutrient runoff has contributed to the observed increased incidence and severity of harmful algal blooms (HABs) in California and their toxic effects in the coastal ocean (**Figure 2.5.3**). For example, the Bight '08 Program found that anthropogenic nutrient inputs are co-located with algal bloom hotspots at subregional and seasonal / daily scales and onging regional studies are further investigating this potential connection. Finally, nutrients are involved in geochemical processes that can amplify ocean acidification impacts in estuaries.

Unlike most other pollutants, nutrients are involved in complex biological transformation and cycling processes (**Figure 2.5.4**) and storage in a variety of reservoirs. This complicates nutrient assessment and management in two important ways. First, nutrient impacts can persist even after inputs have been reduced or ended because nutrients stored in sediments, groundwater, and plants can move in and out of these reservoirs on a range of time scales. For example, studies conducted by the Southern California Coastal Water Research Project and others have shown that nutrients cycle in and out of the sediments in bays and estuaries on a seasonal basis and (Fenn et al. 2010) showed that large portions of several vegetation types in California (e.g., chaparral, oak woodlands,

coastal sage scrub, annual grassland) exceed the "critical load" for nitrogen deposition. Excess loading of nitrogen from aerial deposition can cause shifts in the plant community by, for example, changing conditions to favor invasive grasses and other nutrient sensitive species. Where loadings exceed the amount that can be assimilated by plants, rainfall can more easily wash excess nutrients out of soils and into streams.

Figure 2.5.1: Nutrient enrichment causes overgrowth of algae in streams, particularly in warmer, low flow conditions. a) algal mats in a slow moving stream. *Urban and natural watershed areas can supply excessive nutrients, so algal overgrowth and its secondary impacts (e.g., low dissolved oxygen) occur in both urban channels (b) and streams in undeveloped open space (c).*

a)

b)

c)

Figure 2.5.2: Almost all estuarine segments in the Southern California Bight show some degradation on at least one of the three response indicators of eutrophication: macroalgal cover, phytoplankton, and dissolved oxygen concentration. *Adapted from Bight '08 program data.*

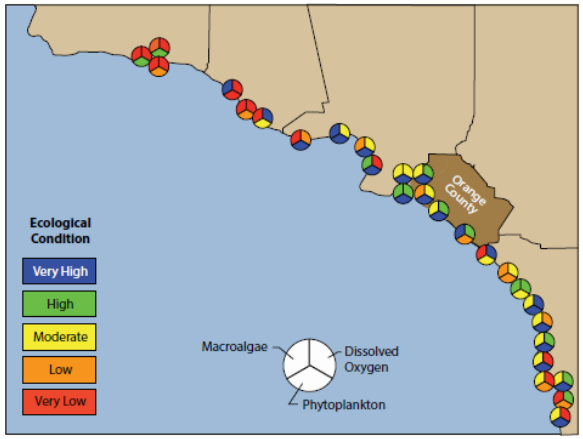

Figure 2.5.3: Bloom of the alga *Lingulodinium polyhedrum* in the coastal ocean off southern California. *This alga can be toxic to marine organisms.*

Figure 2.5.4: A graphical conceptual model of nutrient dynamics in a generalized estuarine system. *Nutrients derive from multiple sources, both natural and anthropogenic, spread across the watershed. Atmospheric deposition can exceed the carrying capacity of upland soils, leading to nutrient loading to streams during storm events. Nutrient loadings are higher in wet weather and they can be stored in and move through sediments, groundwater, and riparian and aquatic plants on different timescales. Because of these reservoirs, nutrients can require a lengthy period to move through the system and their impacts can continue long after inputs have been shut off. Note: Nutrients enter coastal systems through a variety of sources and pathways.*

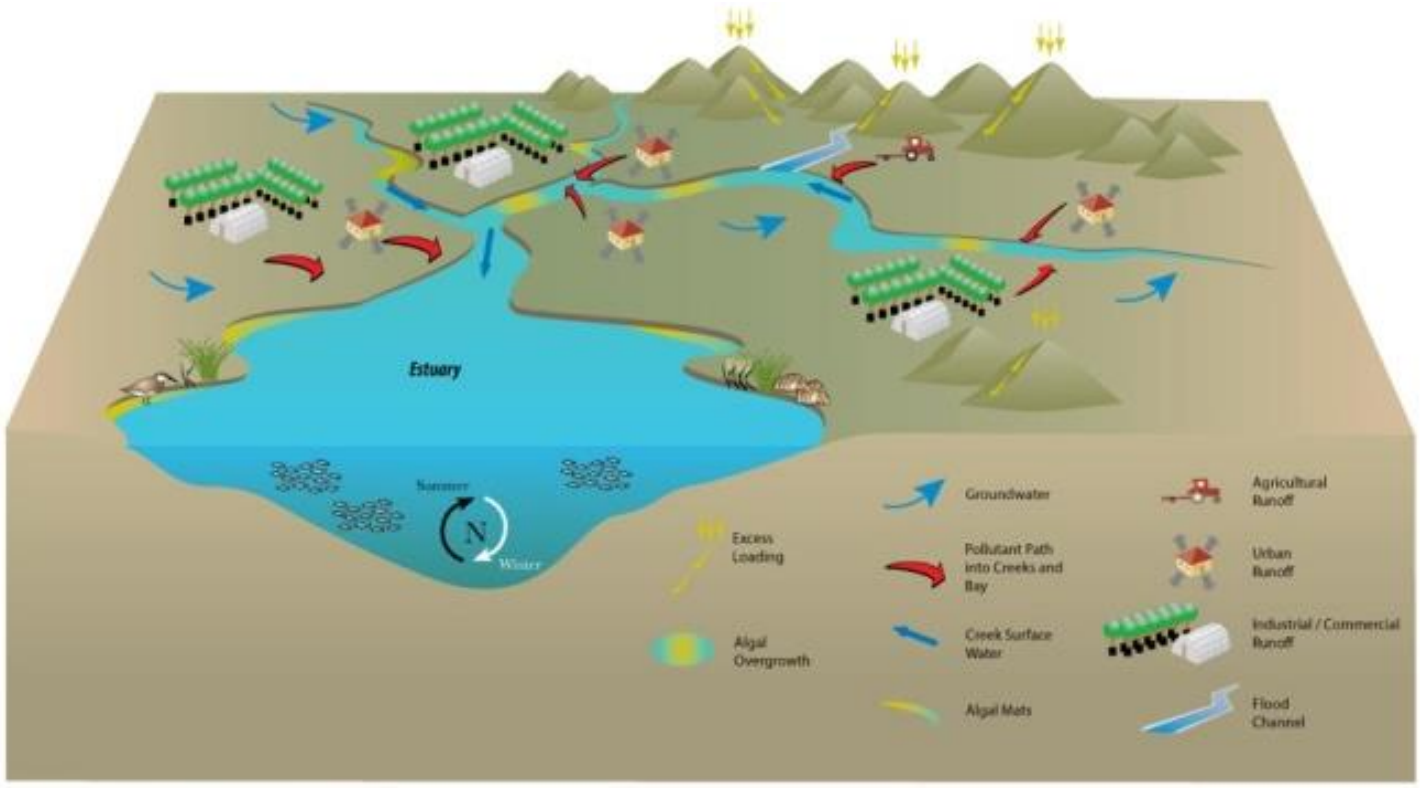

The second way in which nutrients differ from most other pollutants is that complex bio- and geochemical dynamics can cause very different effects at different locations or times in response to the same nutrient concentration or load. As a result, there is no consistent functional relationship between the exceedance of a single, numeric regulatory standard for nitrogen or phosphorus and the presence or severity of impacts from nutrient overenrichment.

2.5.2 Nutrient Patterns in South Orange County

The Program collects three types of data that help document the extent, severity, and changes over time in nutrient issues:

- Concentrations of nutrients and comparison of these data to commonly used thresholds(1 mg/l for total Nitrogen; 0.1 mg/L for total Phosphorus) that indicate likelihood of impacts
- The percent cover of algae, a measure of nutrient impacts on biological conditions in waterbodies
- Mass loads of nutrients at key mass emission stations

Figure 2.5.5a and **2.5.5b** shows that nutrients (total nitrogen and total phosphorus) commonly exceed thresholds in channels and that a frequency-based water quality index widely used in a number of monitoring and assessment programs has improved only slightly since 2000. While conditions are slightly better in dry weather in most years, the index values are consistently low (i.e., poor condition) in all years in both dry and wet weather.
However, this is not strictly an urban problem (see **Figures 2.5.1c and 2.5.6**). The Stormwater Monitoring Coalition (SMC) has for the past five years collected data from sites across southern California in urban, agricultural, and open (undeveloped) natural areas. The locations of SMC sites are selected randomly each year so that they can provide a statistically valid picture of regional conditions, which forms a valuable context for interpreting data from north County. **Figure 2.5.6** shows that targeted monitoring sites in South Orange County channels clustered in the lower end of the distribution (less than about 30% macroalgal cover) for the urban landuse. In other words, about half of the stream miles in southern California in the urban land use had a greater degree of macroalgal cover than did sites in channels in South Orange County. **Figure 2.5.6** also shows about half of the stream miles in southern California in the open (undeveloped) landuse had up to 20% macroalgal cover. Thus, while macroalgal cover is greater in the urban landuse, this problem also occurs in undeveloped streams in the region.

Figure 2.5.5 shows that elevated nutrient levels are pervasive in south County channels but **Figure 2.5.6** documents that the primary nutrient impact monitored in these channels, percent macroalgal cover, is at the lower end of the cumulative frequency distribution for the urban landuse in the region. Thus, nuisance algal growth is not always evident in streams when nutrients are above thresholds, which reflects the lack of a one-to-one correspondence between nutrient levels and impacts such as macroalgal cover and dissolved oxygen. Recognition of this issue is at the heart of the State Water Resources Control Board's attempt to develop a new approach to setting nutrient thresholds (see **Section 2.5.4** *New Management Approaches* below).

Figure 2.5.5: An overall index of the extent to which nutrients (total nitrogen and total phosphorus) meet thresholds in channels and outfalls, in both dry (a) and wet (b) weather is low (which means poor conditions) and has remained low over the monitoring period. *The index integrates the number of indicators and the percentage of samples higher than thresholds in each year, and the average magnitude of such excursions (CCME 2001). It provides a score, scaled from 0 - 100, that can readily be tracked over time. Note: Nutrients regularly exceed standards in channels in both wet and dry weather.*

Figure 2.5.6: The cumulative frequency distribution function of macroalgal cover in the three landuse types sampled by the Stormwater Monitoring Coalition's (SMC) regional program. *Fifty percent of the stream miles in the open landuse had about 20% or less macroalgal cover, while about 50% of the stream miles in the urban landuse had about 30% or less macroalgal cover. The majority of the County's targeted sites (situated along the X axis) had less than 30% macroalgal cover.*

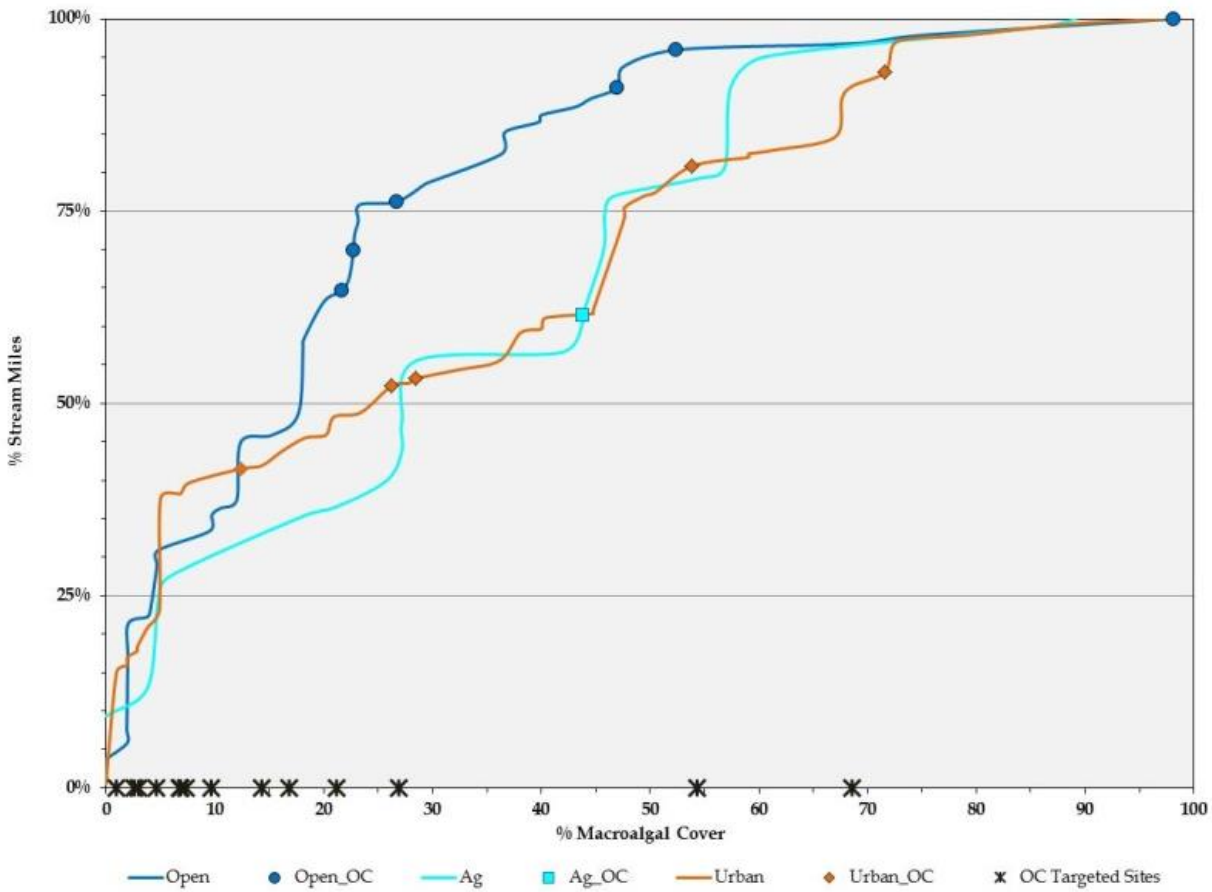

2.5.3 Nutrient Sources

As with many pollutants, the focus on sources of nutrient inputs has gradually shifted from distinct point sources to more widespread and diffuse sources as point sources have been identified, targeted for management action, and removed or reduced. Natural areas such as chaparral, oak woodlands, coastal sage scrub, and annual grassland can also be important sources of nutrient loading, particularly in wet weather. These areas have accumulated excess nutrients from aerial deposition (e.g., nitrogen oxides in smog) which can leach from soils during rain events. **Figure 2.5.7** shows that concentrations of nutrients in wet weather runoff from undeveloped open space are similar to those in runoff from urban sites. As a result, a narrow focus on urban sources of nutrients will miss an important category of inputs.

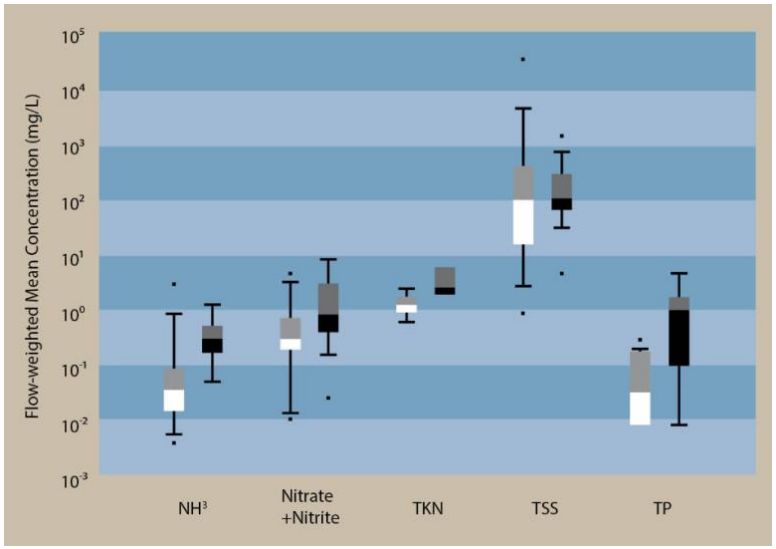

Figure 2.5.7: Wet weather flow-weighted mean concentrations of several forms of nutrients at urban (shaded boxes) and undeveloped open space (clear boxes) sites, as measured in the SCCWRP Natural Loadings Study. *These data document that natural areas are sources of nutrients at concentrations that are similar in some cases to those in runoff from urban sites. Boxes indicate the 25th and 75th percentiles and error bars indicate the 10th and 89th percentiles. From Stein and Yoon (2007).*

2.5.4 New Management Approaches

Improved knowledge about the lack of a tight correlation between nutrient levels and nutrient impacts, and about the importance of diffuse sources in open areas and in groundwater, has prompted the development of new management approaches at both the statewide and regional / local levels that more accurately measure and address the risk of impairment. For example, the State Water Resources Control Board's Nutrient Numeric Endpoint (NNE) project is developing methods (**Figure 2.5.8**) to derive a maximum allowable nutrient concentration in a particular stream reach, reservoir, or estuary based on local factors such as temperature, irradiance, and flow. The NNE's goal is to ensure that the key ecological indicators of macroalgae and dissolved oxygen remain within acceptable bounds.

Figure 2.5.8: The main user interface for the current version of the freshwater Nutrient Numeric Endpoint (NNE) biomass estimation spreadsheet tool. *In this figure, data fields are loaded with example data for illustrative purposes.*

USER INPUTS

Site:	
Analyst:	
Date:	

Nutrient Concentrations (mg/L)

	Average	Minimum	Maximum
Ammonia-N	0.03	0.02	0.05
Nitrite-N	0.001	0.001	0.001
Nitrate-N	0.14	0.05	0.2
Organic N	0.32	0.1	1
Total N (calc)	0.491	0.171	1.251
Inorganic P	0.0062	0.003	0.01
Organic P	0.0036	0.002	0.01
Total P (calc)	0.0098	0.005	0.02

Unshaded Solar Radiation (cal/cm^2/d)

	Average	Minimum	Maximum
Enter manually	614	561	649
Estimate	Latitude	Month Range	
	37.00	May	Aug

Stream Inputs

Stream Depth (m)	1
Stream Velocity (m/s)	0.3
Water Temperature (°C)	20.0
Days of Accrual (optional)	80
Canopy Closure	0% / 20% / 40% / 80%

Method & Target Selection

Select Method:	Revised QUAL2K, benthic chl a
Target Benthic Chl a (mg/m^2)	100
Corresponding Algal Density (g/m^2 AFDW)	40

California Benthic Biomass Tool, v12 (July 2006)

RESULTS

Less than or equal to Target
Greater than Target

Method	Max algal density, ave conditions (g/m^2 AFDW)	Benthic chlorophyll a estimate (mg/m^2)
Standard QUAL2K	53	133
Revised QUAL2K	45	112
Revised QUAL2K with accrual adj	32	79
Dodds '97, mean Chl a	13	32
Dodds '97, max Chl a	36	91
Dodds '02, mean Chl a	7	17
Dodds '02, max Chl a	35	86

Max algal contribution to DO deficit (mg/L)	1.39

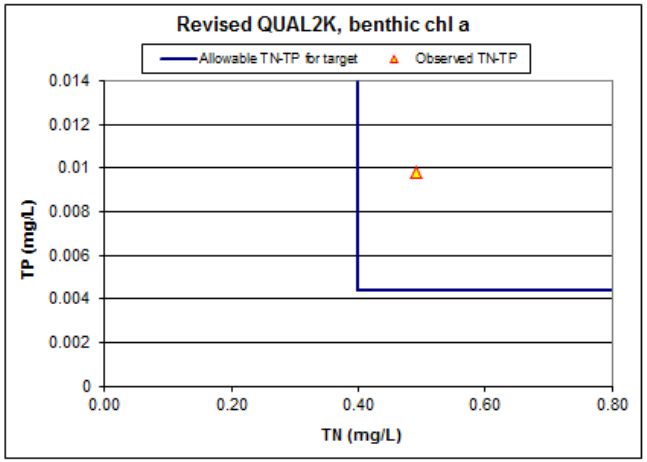

2.5.5 Recommendations

Past progress in identifying and controlling sources of contamination, the availability of a long time series of monitoring data, and the development of new monitoring and assessment tools provide the basis for this review of existing nutrient programs with the goal of improving their utility and efficiency. The following recommendations stem from a data-driven, risk prioritization approach that views monitoring, assessment, research, and management actions as a portfolio of related actions.

- Conduct an assessment of sources and practices that input to the MS4, to assess the significance of each to downstream issues.
- Continue identifying opportunities to reduce and prevent flows in dry weather.
- Pilot a regional mass balance nutrient model, even if elementary, to help prioritize monitoring and management attention; the Newport Bay watershed and SCCWRP coastal ocean nutrient mass balance models provide useful examples.
- Use available time series of data to streamline monitoring to improve its statistical and economic efficiency. Sampling effort could be reduced by identifying stations that essentially mimic each other and/or by reducing the spatial and/or temporal intensity of sampling. Monitoring could shift to a sentinel program with a lower frequency of monitoring intended to ensure conditions do not worsen.

2.6 Toxicity

The Story: Toxicity

- Toxicity in freshwater channels in all conditions (aquatic, sediment, wet and dry weather) occurs at low levels and is sporadic, occurring at different locations at different times and varying unpredictably across test species.
- Aquatic toxicity in dry weather occurs in open (undeveloped) areas at levels equivalent to those in urban areas; suggesting that dry weather toxicity is not driven predominantly by urban pollutants.
- There are no apparent trends in toxicity over time.
- Metals, except for some instances of elevated copper, are at low levels and do not appear to contribute to aquatic toxicity in freshwater.
- The primary source of toxicity appears to be pesticides, with evidence that pyrethroids contribute to sediment toxicity.
- Use of organophosphate pesticides has declined virtually to zero but use of pyrethroid pesticides has increased and exceedances of thresholds for pyrethroid pesticides are high.
- Reported pesticide use in the County has declined from just over 2 million pounds a year in 1998 to just under 1 million pounds in 2011, due primarily to reduced use of indoor fumigants.
- There is a large data gap in our knowledge of retail pesticide sales and use.
- Pesticide use (which is regulated directly at the state and federal levels) presents a moving target for management because of the continued introduction of new products; the most effective management strategies are to continue to reduce dry weather runoff/flows and support education and outreach efforts to reduce pesticide use and runoff.

2.6.1 Low but Puzzling Patterns in Toxicity

Since the publication of Rachel Carson's Silent Spring in 1962, concerns about the potentially destructive impacts of chemicals released into the environment have expanded, supported by an increasingly sophisticated understanding of their impacts and modes of action. Environmental monitoring now provides a range of tools, including sensitive sampling for specific chemicals at very low levels and toxicity tests (**Figure 2.6.1**) that integrate the effects on organisms of multiple chemicals in ambient water and sediments. These tools can indicate the potential for toxic effects before they become major events and provide the means for tracking and managing the distribution and impacts of anthropogenic chemicals.

Figure 2.6.1: The water flea *Ceriodaphnia* which is commonly used as a laboratory test organism in both acute and chronic aquatic toxicity tests

The Program's monitoring efforts to assess aquatic ecosystem health include a range of toxicity tests (**Table 2.2.2**) including aquatic tests in both dry and wet weather as well as toxicity tests on sediment collected from streams and channels. These tests use a variety of test organisms sensitive to different types of chemicals include and assess both acute (i.e., survival / death) and chronic (i.e., reproduction / growth) endpoints to document a range of potential toxic effects. **Table 2.2.2** summarizes the results of 2548 separate toxicity tests performed since 2003. The overall level of toxicity is low but is highest in wet weather. Winter storms wash accumulated contaminants off land surfaces and the first flush of storms is known to have higher levels of contamination. In addition, some contaminants, particularly synthetic pyrethroids, which are an increasingly common pesticide, bind to sediments where, depending on their solubility, they may be a primary cause of aquatic and/or sediment toxicity in urban streams (Holmes et al. 2008). However, the occurrence of toxicity is highly variable, shifting from site to site at different sampling times; a careful examination of the Program's data shows no consistent spatial patterns or trends over time. The relatively low level of toxicity, combined with the fact it appears sporadically, makes it difficult to control.

Table 2.2.2 (Repeated): Summary of the Program's toxicity testing in South Orange County since from 2003 - 2012, an effort that includes 2548 tests on multiple species from a range of times, locations, and conditions. *Note: Toxicity levels are generally low except for one organism in wet weather that is susceptible to pesticides.*

Test Species	Dry Weather		
	n	Toxic	Nontoxic
Americamysis bahia	391	34%	66%
Strongylocentrotus purpuratus	179	5%	95%
Ceriodaphnia dubia	569	20%	80%
Pimephales promelas	64	9%	91%
Hyalella azteca	224	11%	89%
Overall	1593	18%	82%

The Program also has the benefit of comparing data from its sites in South Orange County to a collection of sites from across southern California sampled by the regional Stormwater Monitoring Coalition (SMC). The locations of SMC sites are selected randomly each year so that they can provide a statistically valid picture of regional background conditions, which forms a valuable context for interpreting data from South Orange County.

A summary of the past five years of SMC aquatic toxicity testing data (**Table 2.2.3**, repeated below for convenience) shows puzzling patterns. Acute toxicity (i.e., mortality) occurs in only a small fraction of stream miles in both open and urban landuses. In contrast, chronic toxicity (i.e., reduced reproduction) is more prevalent in the open landuse than the urban landuse. There is chronic toxicity present in the urban landuse, but in a much smaller portion of stream miles than in undeveloped open space. These results suggest that there are sources of toxicity that are more widely spread throughout the region and may not necessarily be directly associated with urban runoff. Speculation has focused on aerial deposition of airborne contaminants or natural factors such as high conductivity or turbidity. For example, a special study conducted by the Program in the Oso Creek watershed found that high levels of dissolved solids (see **Section 2.4** on dissolved solids, above), which can be toxic to aquatic species, derived from natural geologic formations and had increased in recent decades as development patterns caused the

groundwater table to rise. However, no regionwide followup studies on the SMC's findings have to date been planned or conducted.

In addition to the generally low toxicity found in inland channels, the Program's toxicity testing in the surfzone up- and downcoast of stormwater discharge points has found virtually no toxicity in the nearshore marine environment.

Table 2.2.3: Summary of aquatic toxicity results from the past five years of Stormwater Monitoring Coalition (SMC) samples from random sites across the southern California region. *Sites were located in both open (i.e., undeveloped) and urban landuse types. The large majority of stream miles were nontoxic for acute toxicity (i.e., survival) in both landuse categories, with an equivalent amount of sporadic background toxicity in both open and urban landuses. The majority of stream miles were toxic for chronic toxicity (i.e., reproduction) in the open landuse, a strikingly different pattern than seen in the urban landuse.*

	% Stream Miles	
	Open	**Urban**
Ceriodaphnia Survival		
Toxic	2.1	2.4
Nontoxic	97.9	97.6
Ceriodaphnia Reproduction		
Toxic	63.0	37.4
Nontoxic	37.0	62.6

2.6.2 Metals not a Source of Toxicity

Toxicity is a useful indicator of ecological impacts but toxicity test results by themselves do not identify the specific pollutants or other stressors responsible for toxicity. Instead they can indicate the general category of pollutants, such as metals or organic pesticides, contributing to toxicity. The Program therefore combines three complementary lines of evidence to attempt to isolate the cause(s) of toxicity:

- Correlation between toxicity test results and chemical concentrations in the waters and sediments collected for toxicity tests
- Comparison of these chemical concentrations to regulatory standards in the California Toxics Rule (CTR) which are based on laboratory studies of test organisms' sensitivity to specific chemicals
- More detailed analyses of ambient water and sediments, called Toxicity Investigation Evaluations (TIEs), that sequentially remove classes of chemicals to determine whether toxicity drops in concert

Unfortunately, these studies have not succeeded in clearly identifying the sources of toxicity in the County's streams and channels. The sporadic nature of the toxicity signal makes it difficult to follow up on, correlations are inconsistent, and TIE methods have technical limitations that make their results less specific than desired. However, these methods have succeeded in ruling out metals as a source of toxicity and suggesting that the observed persistent toxicity patterns in the test species evaluated in urban streams and channels is due to organic compounds, likely pesticides.

Exceedances of CTR standards for metals are consistently low in both dry and wet weather (**Figure 2.6.2**) and there is no apparent trend over time. While copper and cadmium account for the large majority of these limited exceedances, neither metal is correlated with the occurrence of toxicity in streams and channels and has not been identified as a cause of freshwater toxicity in TIEs. This conclusion matches findings from the SMC's regional program (see **Table 2.2.3**), a regional

Figure 2.6.2: An overall index of the extent to which metals meet regulatory standards in channels and embayments is high (meaning few exceedances) and has remained steady since 2003, in all samples for both dry (a) and wet (b) weather. *This index accounts for the number of metals that exceed standards in each year, the percentage of individual samples that exceed standards, and the average magnitude of any such exceedances (CCME 2001). It provides a score, scaled from 0 - 100, that can readily be tracked over time.*

a)

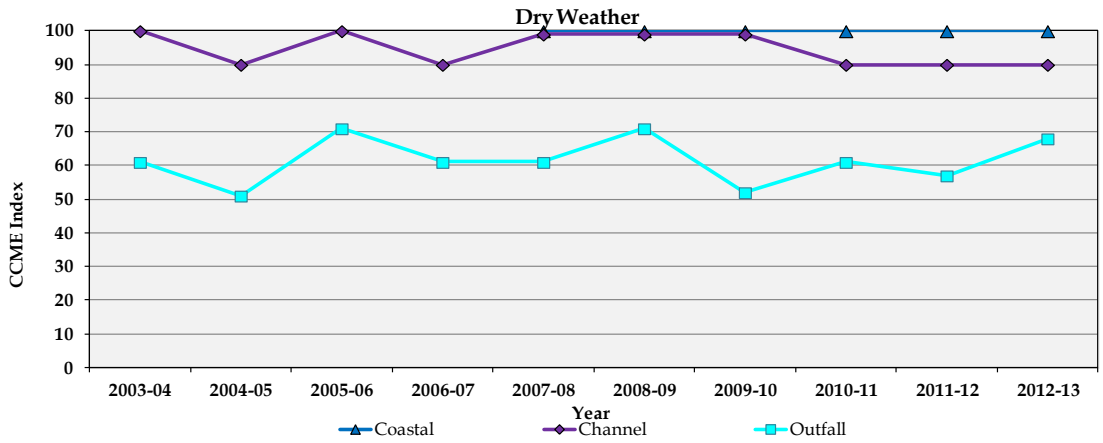

b)

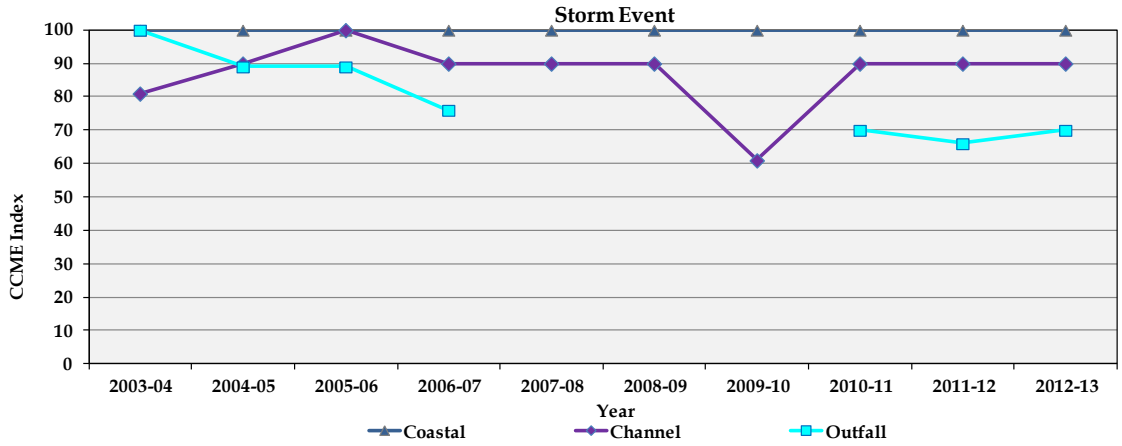

study of loadings from natural areas (**Figure 2.6.3**), as well as from watershed monitoring programs in the San Gabriel River and Los Angeles River watersheds.

While copper is a concern in harbors, the 2002 TMDL for Toxic Pollutants in San Diego Creek and Newport Bay estimated that antifouling paint on boat hulls represents nearly 90% of the loading of copper to the Bay. In addition, a Bight '08 study of discharges to Areas of Special Biological Significance (ASBS) (Schiff et al. 2011) found no significant differences between post storm metals concentration at ASBS discharge sites and at reference drainages. There was some evidence for a slight increase in copper at ASBS discharge sites but this may be due to particular coastal sources such as harbors and coastal developments with copper architectural features.

2.6.3 A Localized Source of Copper

A history of persistent exceedances of regulatory thresholds for copper in the Irvine Cove community triggered a detailed, two-year special study to identify and prioritize sources of copper for future source control efforts. This cooperative effort between the County and the City of Laguna Beach included additional sampling of stormwater runoff at multiple locations along with field reconnaissance to identify potential sources of copper. This information helped focus targeted sampling at specific potential sources to rule them in or out and characterize their contribution to copper levels in runoff. The study showed that copper was concentrated in runoff from Irvine Cove below the Pacific Coast Highway, a spatial pattern that ruled out brake pad dust as a major source. Further reconnaissance focused attention on residential architectural copper uses such as roofs, rain gutters, and flashing (**Figure 2.6.4**). Sampling during a storm event of runoff from homes with and without architectural copper features showed that the average level of copper in runoff from homes with copper features was nearly ten times higher than copper in runoff

Figure 2.6.3: Wet weather flow-weighted mean concentrations of metals at urban (shaded boxes) and undeveloped open space (clear boxes) sites, as measured in the regional study of runoff characteristics from natural drainages. *These data document that natural areas are sources of metals, although concentrations in runoff from natural drainages are somewhat lower than those at urban sites. Boxes indicate the 25th and 75th percentiles and error bars indicate the 10th and 89th percentiles. Dots represent extreme values.*

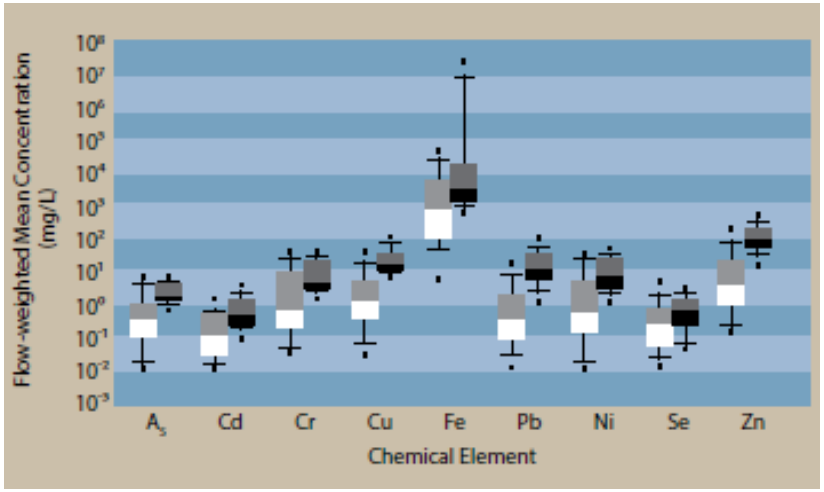

from homes without copper, and nearly six times the regulatory action level. Maximum levels of copper were more than 1000 times higher. This information is useful in ruling out other sources and highlights the difficulty of controlling all sources of contaminants from urbanized watersheds.

Figure 2.6.4: Aerial photograph of a portion of the Irvine Cove drainage area identifying various types of structural architectural copper uses.

2.6.4 Trends in Pesticide Use

While pesticides have been implicated as a cause of both aquatic and sediment toxicity, it has been extremely difficult to confirm their role largely because of technical challenges associated with TIEs. There are hundreds of pesticides in current use, neither certified laboratory methods nor toxic thresholds exist for many of these, and legacy pesticides such as DDT are still present in the environment. In addition, the population of pesticides in use changes continually over time in response to new regulatory requirements and increasing knowledge of their targets' physiology (**Figure 2.6.5**). Organochlorine pesticides (e.g., DDT, chlordane) were banned and replaced by organophosphate pesticides (e.g., diazinon and chlorpyrifos), whose use was tightly restricted and were in turn replaced by the synthetic pyrethroids (e.g., permethrin). Most recently, policies have tightened the use of pyrethroids, opening a door for increased use of fipronil. Newer pesticides are often toxic at much lower levels than older pesticides (e.g., pyrethroids exhibit toxic effects at the parts per trillion level), requiring the development of increasingly sensitive methods with lower detection limits. In addition, new pesticides often change the nature of toxicity and the types of organisms affected. This illustrates a core problem in pesticide monitoring, assessment, and management – the ever-changing cast of characters that pose a constant challenge to monitoring methods and the understanding of toxic processes.

Figure 2.6.5 shows that the use of organophosphate pesticides (chlorpyrifos and diazinon) has declined substantially since the early 1990s, even before their use in residential applications was banned in 2001 and 2004, respectively. Available data from the Program's monitoring efforts shows that, as a result, the exceedance index for organophosphate pesticides has increased (i.e., improved conditions) significantly in dry weather and to a lesser degree in wet weather (**Figure 2.6.6**). The slower rate of improvement in wet weather suggests that there may be reservoirs of these pesticides still present. Because agricultural uses must be reported and the reported use of these pesticides has declined to virtually zero (**Figure 2.6.5**), it is unlikely that still-permitted uses of these two pesticides are the source of the remaining wet weather exceedances. In contrast, the exceedance index for pyrethroid pesticides in wet weather is quite low (i.e., poor conditions), reflecting their increased use.

Figure 2.6.5: Trends in the use of the two most widely used organophosphate pesticides, diazinon and chlorpyrifos, and permethrin, the most widely used of the newer synthetic pyrethroids. *The organophosphates have virtually disappeared from the County after their residential use was banned by the USEPA, in 2001 for chlorpyrifos and 2004 for diazinon. Trends for all three pesticides are significant at the p <0.001 level.*

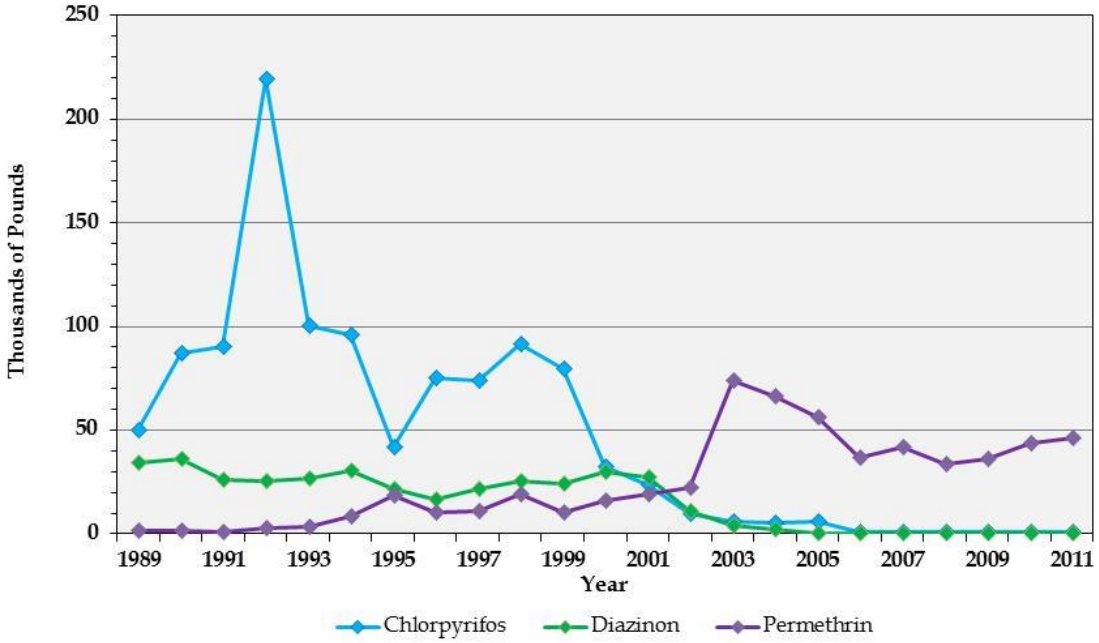

Figure 2.6.6: Trends over time in the exceedance index for a) organophosphate pesticides in dry weather and b) both organophosphate and pyrethroid pesticides in wet weather. *Higher values of the index indicate better conditions. Organophosphate pesticides reach an index value of 100 (no exceedances) in dry weather (a) and remain there, a trend significant at the p <0.001 level; pyrethroid exceedances appear in 2010 and increase quickly. While there are remaining exceedances for organophosphate pesticides in wet weather (b), the overall relationship between trends in the two types of pesticides reflects that in dry weather.*

a)

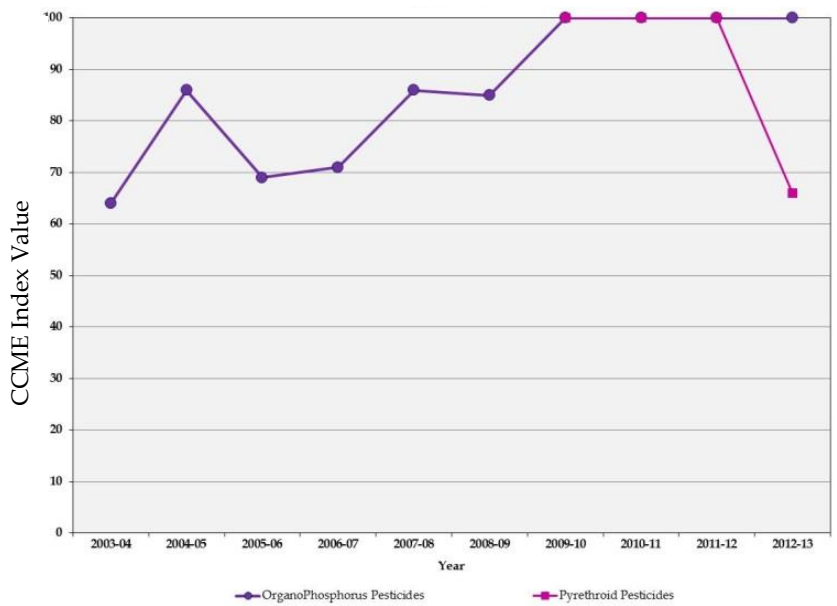

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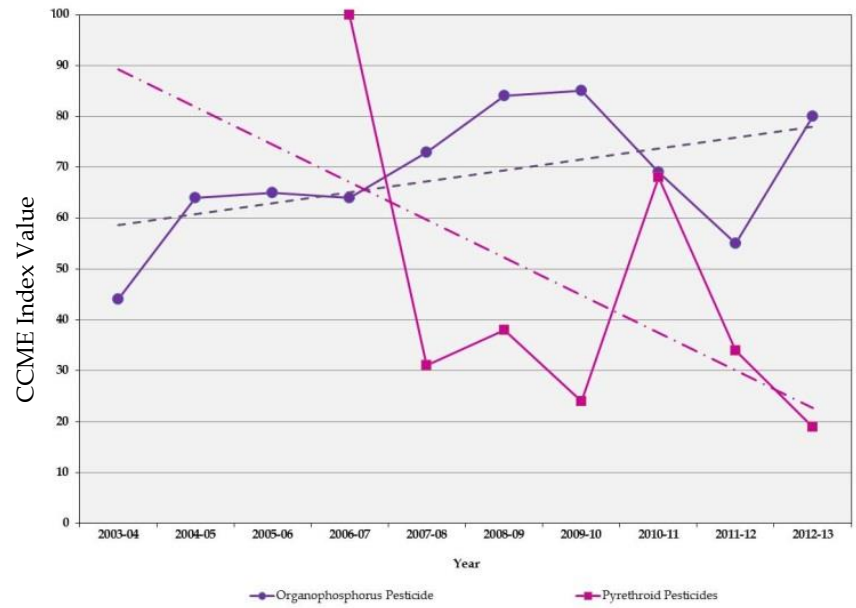

Despite the challenges of assessing pesticides' impacts in waterbodies, we do know that total reported pesticide use in Orange County has declined dramatically since 1998 (**Figure 2.6.7**). Inspection of detailed annual reports on the California Department of Pesticide Regulation's (CDPR) website shows this is due to declines in the use of glyphosate (i.e., Roundup) and a set of indoor fumigants used, for example, in termite treatment of homes and other structures. Glyphosate is an herbicide that is applied in the environment and there are some concerns about its potential water quality impacts. Indoor fumigants, in contrast, are not applied outdoors, degrade relatively quickly, and vent to the atmosphere. Because it has extended over nearly 15 years, this decline is likely due to a combination of causes, including changes in the real estate market (fumigation is required as a condition of sale), growing concern about health effects of toxic compounds, the greater use of spot applications of pesticides, and the increased availability of alternative non-pesticide treatments for indoor and structural pests.

The CDPR data show that large declines in pesticide use are possible, and provide promise that continued education and improved policy can contribute to environmental improvement. However, the chemicals that contributed most to the decline shown in **Figure 2.6.7** are not those (e.g., pyrethroids, fipronil) most often implicated in environmental toxicity. Further examination of the CDPR database would be needed to determine whether the aggregate amount of reported environmentally toxic pesticide applications has also declined in recent years. More importantly, there is a large and significant data gap related to retail purchases at hardware, gardening, and home improvement stores. Sales at these outlets are not reported to the CDPR and methods to reliably

Figure 2.6.7: Total reported pesticide use in Orange County, drawn from the California Department of Pesticide Regulation's website (www.cdpr. ca.gov). *The amount applied annually has declined by over 50% since 1998 (regression significant at p <0.001). Note: Overall pesticide use appears to be declining.*

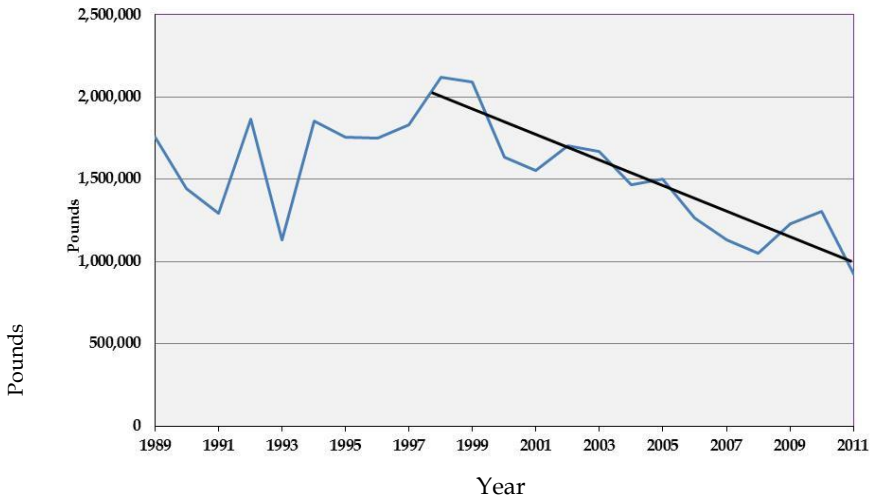

capture these data have not yet been developed.
Continued efforts to expand the scope of pesticide sales / use reporting and to improve education on proper application and the use of effective alternatives (e.g., botanical oils) could reduce the loading of pesticides to the County's water bodies. For example, CDPR has developed new regulations for pyrethroid application that should substantially reduce pyrethroids in urban runoff. Such efforts will be amplified by the continuing focus on water conservation to reduce dry weather runoff (e.g., through Low Impact Development practices) and on reducing overuse to minimize or prevent toxicity in wet weather runoff, which are the two delivery

pathways for moving pesticides from the landscape to water bodies.

2.6.5 Recommendations

Past progress in identifying and controlling sources of contamination, the availability of a long time series of monitoring data, and the development of new monitoring and assessment tools provide the basis for this review of existing toxicity monitoring programs with the goal of improving their utility and efficiency. The following recommendations stem from a data-driven, risk prioritization approach that views monitoring, assessment, research, and management actions as a portfolio of related actions.

- Reassess management concerns and priorities about metals impacts in freshwater channels, bays and estuaries, and the nearshore coastal zone.
- To the extent that metals, particularly copper, remain a concern because of potential impacts in bays and harbors, recognize that inputs from antifouling paint, which are not an urban runoff issue, are likely a more important source than watershed input.
- Improve information on the use of pesticides in the County, particularly by the largest applicators
- Work with other interested parties to fill the data gap related to retail sales of pesticides.
- Examine the CDPR database to develop a more thorough picture of trends in reported pesticide use.
- Use this information to expand and focus cooperate outreach efforts about proper pesticide application and the use of alternatives such as botanical oils that are effective, but nonlethal, insect deterrents.
- Use available data to streamline monitoring and improve its statistical and economic efficiency. Consider reducing the current focus on metals monitoring and targeting pesticide monitoring on less expensive representative constituents or surrogates. Consider reducing the frequency of sampling for sediment associated constituents to the Bight Program's sampling frequency.
- Given the overall low level of observed toxicity, consider increasing the use of adaptive responses (e.g., TIEs and other types of causal assessment) in place of intensive routine monitoring.
- Continue taking advantage of opportunities to reduce dry weather runoff to channels.
- Continue the productive relationship the University of California's South Coast Research and Extension Center and take advantage of opportunities for its Director to communicate the stormwater management perspective to CDPR.

2.7 Reconsideration of Monitoring Program Elements

The Story: Revisiting Program Designs

- The designs of two program elements deserve reconsideration because of increased knowledge, improved monitoring and assessment tools, and shifting management priorities.
- Such reconsideration and adaptation is fully in the spirit of the Regional Board's recently adopted Framework for Monitoring and Assessment.
- The Coastal Ambient Program has served its purpose and documented that coastal stormwater discharges are not causing any meaningful exceedances or impacts in the very nearshore coastal zone.
- The Bight Program's regional assessment of the effects of stormwater discharges on protected areas at larger spatial scales is a more effective approach to answering questions about the potential impacts of stormwater discharges.
- Efforts to reduce dry weather flow, in part through water conservation and reclamation efforts have produced substantial declines in the amount of dry weather stormwater discharge.
- These reductions have resulted in concomitant reductions in the loads of a range of problematic constituents and represent an effective means of controlling pollution from urban runoff.

2.7.1 Coastal Ambient Monitoring has Served Its Purpose

The potential impacts of coastal stormwater discharges on the marine ecosystem have long been a concern because of the pollutants they carry to the ocean. Impacts could occur at the point of initial discharge where they are most concentrated and/or at larger distances as discharge plumes mix into the coastal ocean.

The Program's Coastal Ambient monitoring effort samples directly in front of and at a short distance up- and downcoast of key discharge points. It is designed to determine whether stormwater pollutants are reaching the surfzone in concentrations that exceed water quality objectives and are causing measurable toxicity. However, the prioritization analysis shows that this is not the case, with only minor exceedances and virtually no toxicity detected. The length of time this monitoring has continued and its consistent results in both wet and dry years suggests these findings are robust and reliable.

While the Coastal Ambient monitoring has confirmed that nearfield effects in the immediate vicinity of coastal discharges are not occurring, questions about the possibility of farfield effects, particularly on protected areas (ASBSs and MPAs), have not yet been resolved. This requires a more substantial effort and is being addressed by a Bight Program study that integrated several types of information on a regional scale. The Bight study included three main parts:

- A pollution index of the likely intensity of stormwater pollution at specific protected areas
- A fishing pressure index of the effects of commercial and recreational fishing on key species

- A new assessment tool for measuring the condition of biological communities on rocky reefs

The pollution index was based on a plume dispersion model (**Figure 2.7.1**) (Rogowski et al. 2014) that estimated the probability that stormwater discharge plumes would overlap with specific protected areas. This was combined with a measure of pollutant loads to develop an estimated index of pollution intensity. The regional assessment will then compare the relative effects of fishing pressure (**Figure 2.7.2**) and pollution on the status of biological communities.

Figure 2.7.1: Illustration of the use of coastal discharge flow and coastal current data to produce probability exposure maps for a series of discharges and nearby protected areas in southern California. *The figure is organized by rows for (A) Newport Bay, and (B) Santa Ana River. Additionally, each column represents a different temporal model run including (a) annual, (b) the February 22, 2008 storm event, and (c) the December 15, 2008 storm event. Local ASBS are also displayed in all figures and defined in column (b). The X-axis is longitude and the Y-axis latitude. Colors represent probability of plume exposure as indicated at the bottom of the the figure. These probability exposure maps are then combined with estimates of pollutant loads for each discharge to derive a pollutant index for each protected area. From Figure 3, Rogowski et al. (2014).*

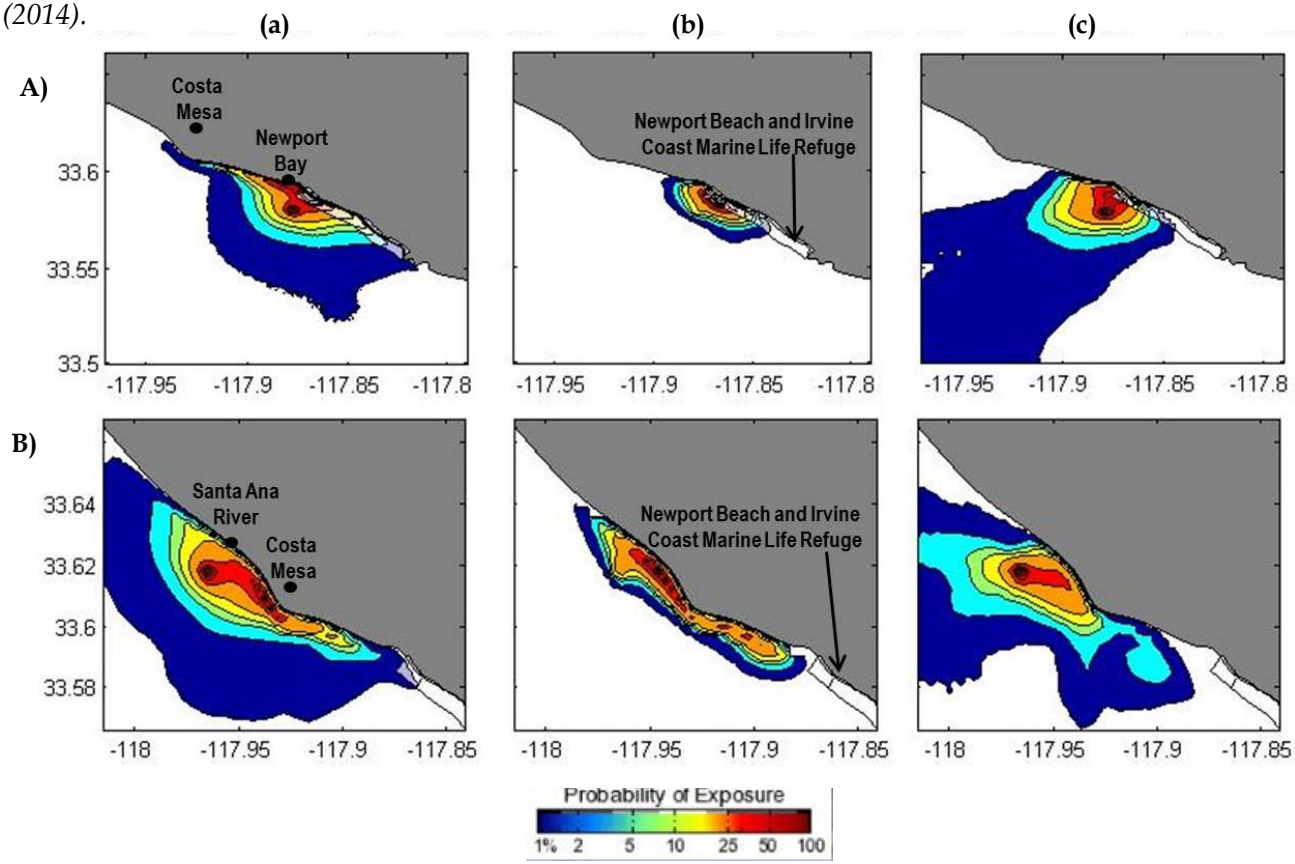

Figure 2.7.2: Schematic of the data integration and synthesis steps involved in producing an index of fishing pressure on protected areas in southern California. *From Update on Fishing Pressure Index presentation by SCCWRP, Ocean Science Trust, and Occidental College Vantuna Research Group, March 2, 2014.*

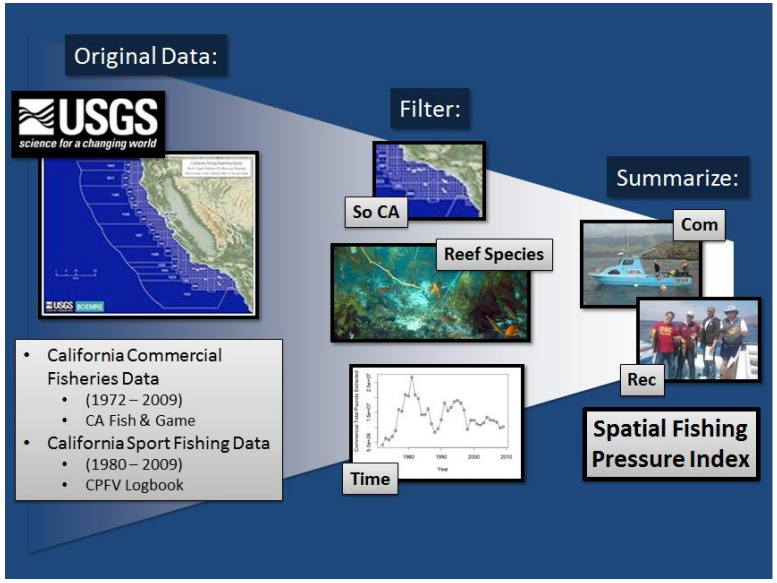

The integrated regional approach includes a more much more powerful and relevant set of questions and methods to address the potential impacts of coastal stormwater discharges on marine ecosystems. The Program's future efforts to assess the potential impacts of coastal discharges should therefore focus on contributing to this regional effort rather than continuing to monitor at extremely local scales in the vicinity of each discharge point.

2.7.2 Runoff Reduction, a Powerful All-Around Tool

Evidence from a number of the Program's monitoring efforts documents the value of water conservation and reduced urban runoff (i.e., discharge flow into streams and channels) in reducing pollutant inputs and their impacts. Water conservation and related efforts to reduce urban runoff therefore represent a potentially powerful all-around tool for addressing impacts of urban runoff. While water conservation efforts motivated by state and local policies provide the underlying impetus, pollutant control could add another important rationale for pursuing such policies as part of a larger, coordinated strategy. The effectiveness of such programs is dramatically illustrated by the declining trend of dry weather discharge flow to channels and streams from urban outfall (**Figure 2.7.3**).

Figure 2.7.3: Discharge of dry weather flow to channels and creeks from urban outfalls has declined dramatically despite an increase in regional population. *The decline spans both wet and dry years and is therefore not simply a result of drought conditions.*

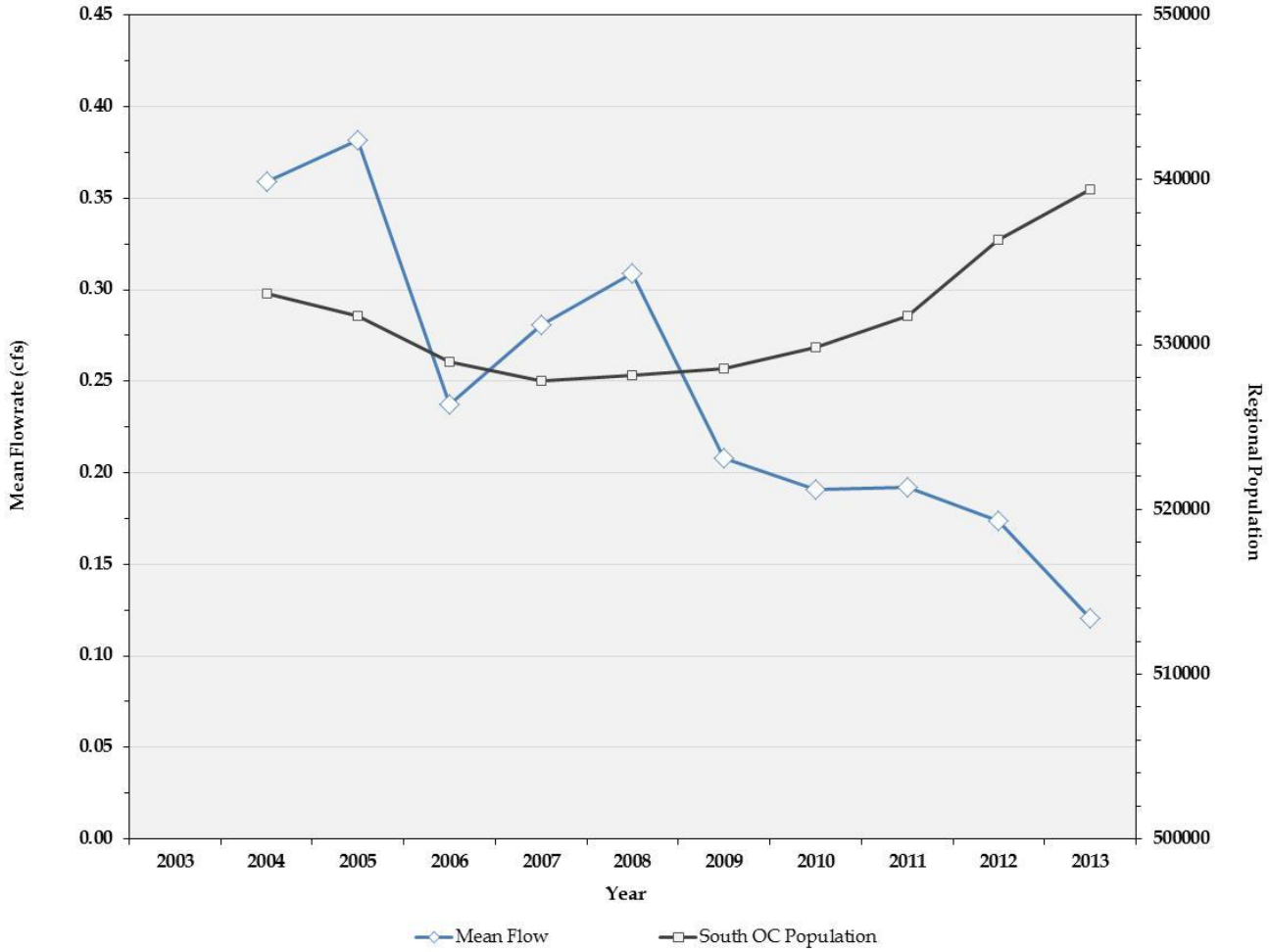

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3.0 Controlling Pollutant Sources: Jurisdictional Programs

3.1 Overview

The management of sources of pollution from diffuse urban areas involves the strategic application of Best Management Practices (BMPs) to activities and drainage systems within the urban environment. The purpose of BMPs is to protect water quality by reducing pollutant loads and concentrations and by reducing discharges (volumetric flows and flow rates) causing stream channel erosion.

The DAMP is the principal policy and program guidance document for the *Program*. At its core is a series of Model Programs that are individually implemented by the Permittees in accordance with DAMP/Local Implementation Plans (LIPs). These Model Programs are intended to enable the Permittees to:

- Improve existing municipal pollution prevention and removal BMPs to further reduce the amount of pollutants entering the storm drain system (**Model Municipal Activities and Model IPM Program**);
- Educate the public about the issues of urban stormwater and non-stormwater pollution and obtain their support in implementing pollution prevention BMPs (**Model Education and Outreach Program)**;
- Ensure that all new development and significant redevelopment incorporates appropriate Site Design, Source Control and Treatment Control BMPs to address specific water quality issues (**Model Land Development Program)**;
- Ensure that construction sites implement an effective combination of erosion and sediment controls and on-site hazardous materials and waste management (**Model Construction Program)**;
- Ensure that existing development addresses discharges from industrial facilities, selected commercial businesses, residential development and common interest areas/homeowner associations (**Model Existing Development**), and
- Detect and eliminate illegal discharges/illicit connections to the municipal storm drain system (**Model ID/IC Program)**.

3.2 Municipal Infrastructure and Integrated Pest Management

The Story: Municipal

- The Model Municipal Activities Program ensures that BMPs are implemented and maintained at over 1,700 municipal facilities.

- Municipal services, including trash and debris removal, solid waste collection, household hazardous waste disposal and street sweeping were established prior to the First Term MS4 Permits but are monitored and contribute to water quality protection.

- The Model Integrated Pest Management Program ensures municipal conformance with an Integrated Pest Management Policy developed in partnership with University of California Cooperative Extension. Implementation of the policy is resulting in reductions in municipal fertilizer and pesticide use.

3.2.1 Overview

The Permittees own and operate facilities and build and maintain much of the transportation, drainage and recreational infrastructure of the urban environment. To ensure that BMPs are incorporated into municipal areas and infrastructure maintenance programs, the Permittees have followed a systematic process of BMP evaluation of municipal areas, activities and drainage facilities since the First Term Permits. The Permittees also implement Integrated Pest Management (IPM) approaches at municipal sites to address sources of toxicity from municipal activities.

3.2.2 Municipal Activities Program Implementation and Assessment

The Model Municipal Activities Program has been implemented since 2002-03. It requires the Permittees to:

- Inventory municipal sites
- Prioritize municipal areas and maintenance activities based upon water quality threat
- Prepare BMP guidance
- Conduct inspections of municipal areas/facilities
- Implement Model Maintenance Procedures
- Conduct training
- Implement an IPM Policy
- Examine retrofit opportunities for municipal facilities

<u>Site Inventories</u>

Annually, the Permittees inspect over 1,700 municipal facilities comprising 27% high priority sites, 11% medium priority sites and 62% low priority sites.

<u>BMP Guidance</u>

The Permittees have produced BMP factsheets for the Model Municipal Program that are available at www.ocwatersheds.com. In addition to training, these BMP factsheets serve as the primary guidance for Permittee municipal maintenance procedures. The Permittees will complete a review of the municipal BMP factsheets in late 2014 or early 2015.

Training

Municipal training materials for "Municipal 101" were available for Permittee use as a "train the trainer" tool covering the minimum required BMPs discussed in the fact sheets. The focus of municipal training during the permit term was on development and implementation of jurisdictional IPM programs **(Table 3.2.1)**.

In the Fifth Term MS4 Permit, the Permittees will examine opportunities to enhance training formats with "flip the classroom" approaches that emphasize in-classroom discussion and hands-on application of concepts.

Table 3.2.1: Municipal Training

Date	Subject Matter/Title	Target Audience	Permittee Staff in Attendance
September 15, 2010	Integrated Pest Management (IPM) Training	Stormwater Program Managers	23
May 17, 2012	Implementing Integrated Pest Management Policy Within Local Jurisdictions: The Impacts of Pesticide Formulations and Exotic Pests	Municipal Training Instructors and Field Staff	52
May 15, 2013	Implementing Integrated Pest Management Policy Within Local Jurisdiction: The Who, What, Where and Why	Stormwater Program Managers and Field Staff	32

Inspection and BMP Implementation

Municipal Facilities

Inspectors implement the Model Municipal Program by ensuring implementation of the Model Maintenance Procedures. For each facility, inspectors categorize the degree of BMP implementation on site as "fully implemented," "partially implemented" or "not implemented."

Since 2008, more than 90% of facilities have consistently implemented all required BMPs. In addition, the number of facilities with no BMP implementation has decreased since 2009 from 2.4% to 0.28% of facilities **(Figure 3.2.1)**.

Figure 3.2.1: Municipal Area Inspections and BMP Implementation from 2008-09 to 2012-13

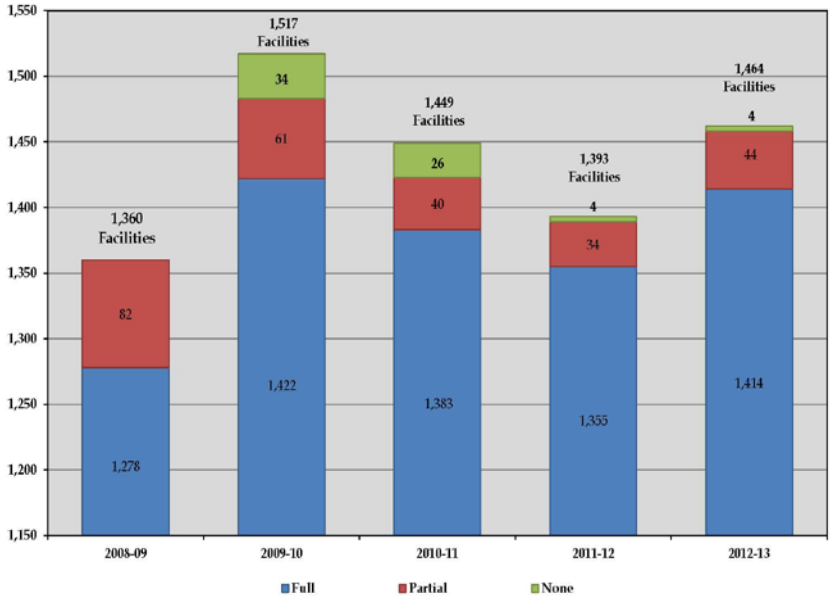

Between 2008 and 2013, a majority of Permittees reported inspecting an average of more than 90% of catch basins on an annual basis and 100% of catch basins on a bi-annual basis **(Figure 3.2.2)**. The percentage of drainage facilities requiring cleaning as a result of inspections has remained approximately 80% **(Figure 3.2.2)**.

Figure 3.2.2: Catch Basin Inspections Performed from 2008-09 to 2012-13

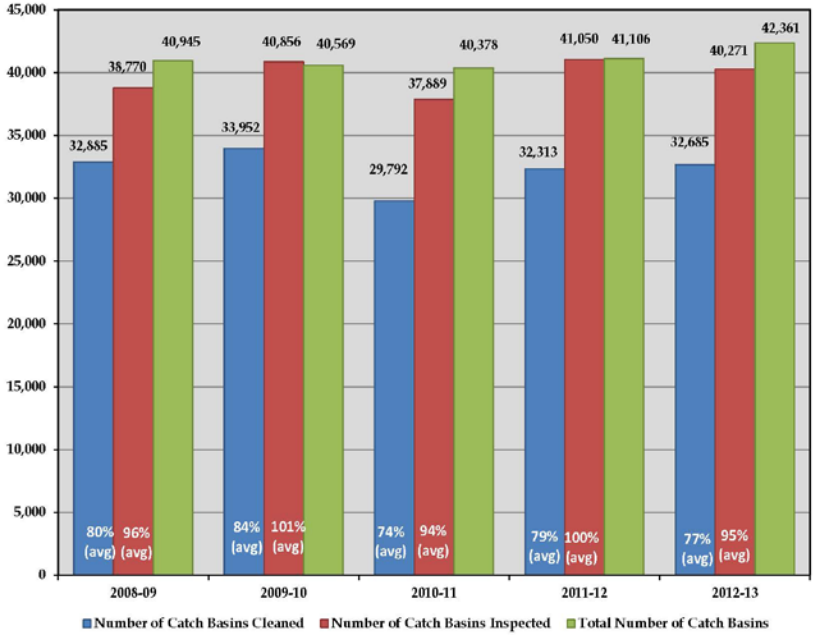

Municipal Services (Baseline BMPs)

Permittees collect data on a number of municipal activities that pre-date the adoption of MS4 permits for Orange County, but nonetheless contribute significantly to water quality protection. These "baseline BMPs" include storm drain cleaning, street sweeping, solid waste and household hazardous waste collection, used oil grant participation and trash and debris control.

Storm Drain Maintenance

The Permittees inspected and cleaned an average of 210 miles of storm drain and removed an average of 6,279 tons of material on an annual basis **(Figure 3.2.3)**.

Figure 3.2.3: Drainage Facility Maintenance and Material Removed from 2008-09 to 2012-13

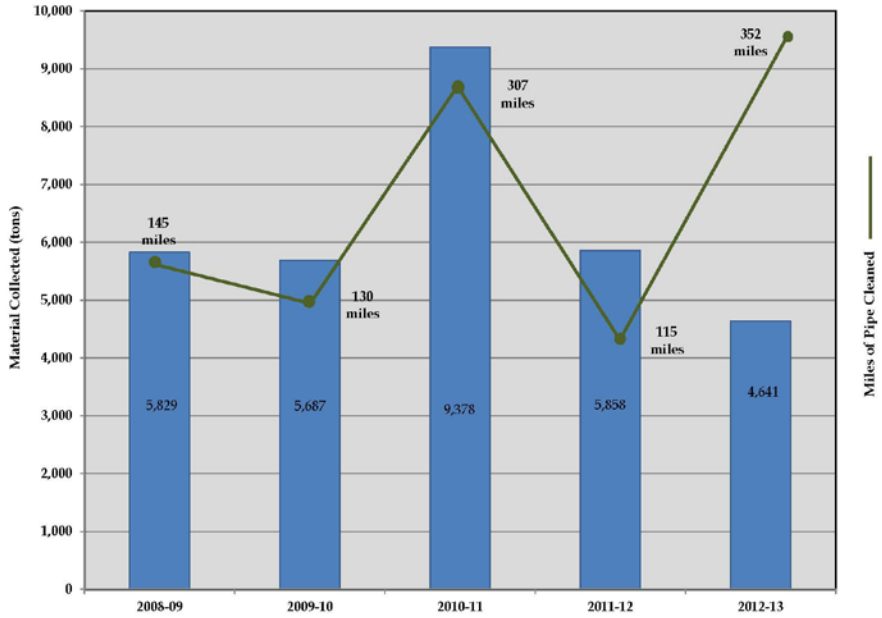

Household Hazardous Waste (HHW) Collection

OC Public Works finalized a memorandum of understanding

with OC Waste and Recycling on June 23, 2010 to ensure that household hazardous waste collection, transfer and disposal practices do not cause or contribute to water quality problems. The County, on behalf of the Permittees has collected an annual average of almost 3,600 tons of household hazardous waste since 2008 **(Figure 3.2.4).**

Figure 3.2.4: Tons of Household Hazardous Waste Collected from 2008-09 to 2012-13

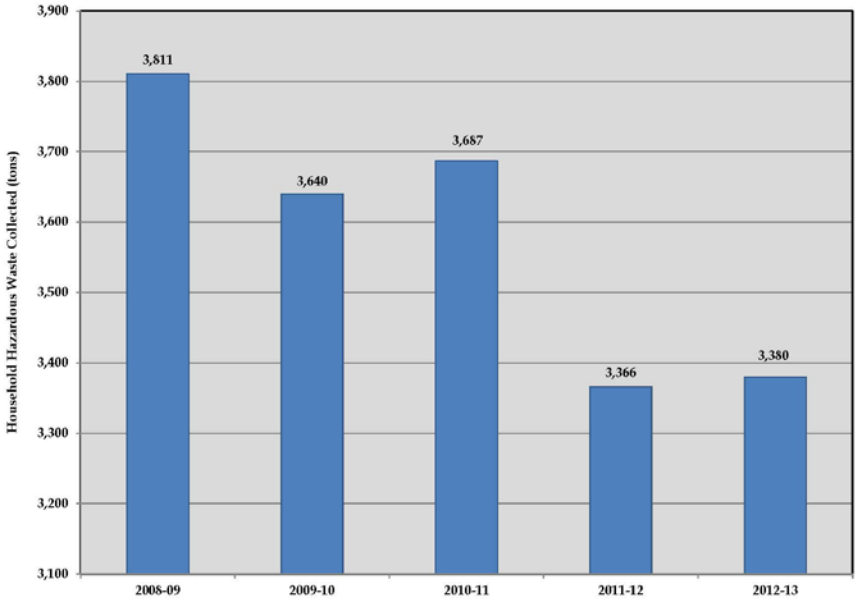

Used Oil Grant Participation

Nearly all of the Permittees and the County's Health Care Agency participated in the Used Oil Grant program during the past five years. Through these programs, hundreds of thousands of gallons of used oil and tens of thousands of used oil filters have been collected and disposed of properly, preventing these contaminants from entering the environment **(Figure 3.2.5)**.

Figure 3.2.5: Used Oil and Filters Collected from 2008-09 to 2012-13

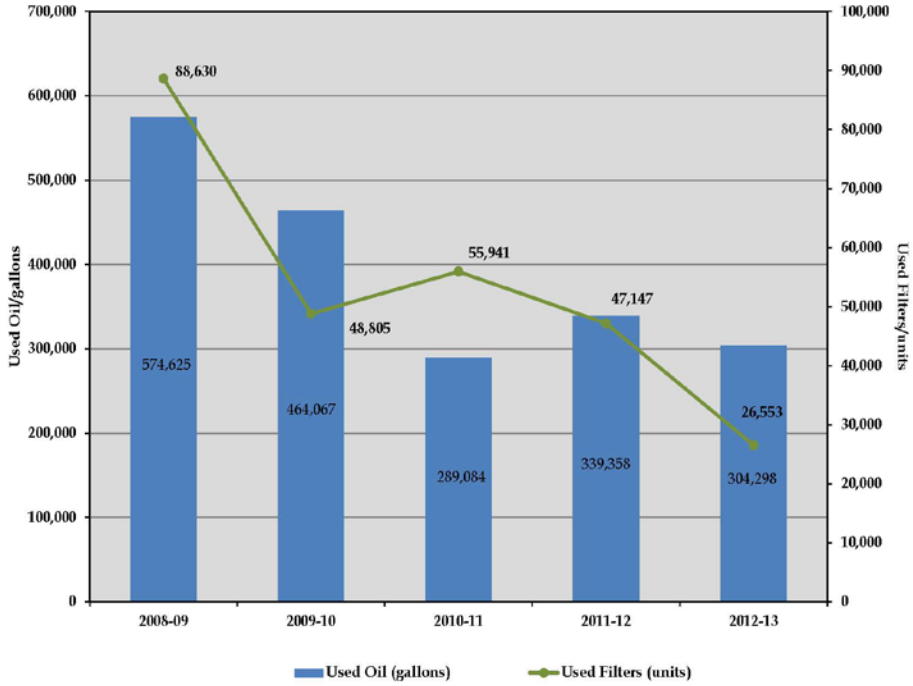

Trash & Debris Control

Trash can degrade surface water quality and negatively impact aquatic habitat. The Permittees utilize a combination of trash and debris controls to address this issue. Controls include structural BMPs such as debris booms, catch basin inserts and continuous deflection separation (CDS) units and source control BMPs such as public education and street sweeping. The Orange County Stormwater Program GIS Cloud layer includes locations of all trash and debris booms

(http://oc.giscloud.com/map/242085/orange-county-stormwater-program-san-diego-region).

The Permittees also engage the public in cleanup events throughout the year when requested and annually every September for Inner-Coastal & Watershed and Coastal Cleanup Day, resulting in the removal of thousands of pounds of trash and debris. The County also initiated a pilot Adopt A Channel program in 2012 whereby Disneyland Resort adopted a 2-mile segment of Anaheim Barber City Channel and a debris boom. Though the pilot adoption was within the Santa Ana Region, the County is in the process of expanding the program county-wide to promote community involvement in keeping trash out of local waterways and to supplement jurisdictional resources.

Additionally, ongoing efforts to characterize the flux of trash and debris through the County's urban watersheds may ultimately produce recommendations for enabling management and maintenance approaches to be more effectively prioritized. These efforts include the Newport Bay Trash Management Plan and South Orange County Trash and Litter Special Study described in Section 3.2.4 of the 2012-13 Unified Annual Report. Also, the Permittees collaborated on the Stormwater Monitoring Coalition's (SMC) Regional Bioassessment Study to incorporate trash and debris data from multiple sampling sites throughout southern California in 2012 and 2013. As a result of ongoing watershed and regional trash monitoring efforts, the Permittees would like to see the opportunity retained for jurisdictions to leverage the information arising from these studies to prioritize control efforts consistent with the MEP standard established by the statute.

Model Integrated Pest Management Program

Since pesticide-related water column toxicity is a priority issue of countywide concern, Integrated Pest Management (IPM) will continue to be a focus of the Program. A key component of an effective Integrated Pest Management (IPM) Program is an emphasis on maintaining plant health through proper fertilizer and pest management. Reducing unnecessary fertilizer and pesticide applications reduces the opportunity for these chemicals to inadvertently enter local waters through irrigation and rain events.

The Permittees formally adopted individual IPM Policies during the 2010-2011 reporting period based on an IPM Policy template developed with assistance from University of California Cooperative Extension (UCCE). The result has been the adoption of a set of basic IPM guidelines implemented by each public agency.

Fertilizer

Fertilizer usage is tracked and reported by total nitrogen, phosphorus and potassium applied per acre. Since 2010, the amount of all three nutrients applied per acre has decreased; nitrogen per acre decreased 49%, phosphorus per acre decreased 60% and potassium decreased by 55% **(Figure 3.2.6)**.

Figure 3.2.6: Fertilizer Applied per Acre 2008-09 to 2012-13

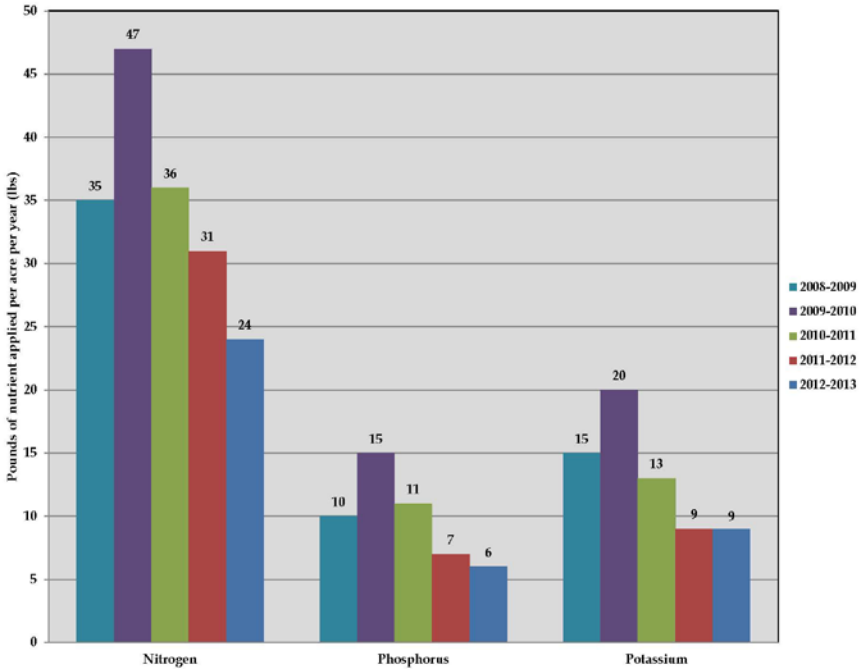

Figure 3.2.7: Active Ingredient Herbicide Applied 2008-09 to 2012-13

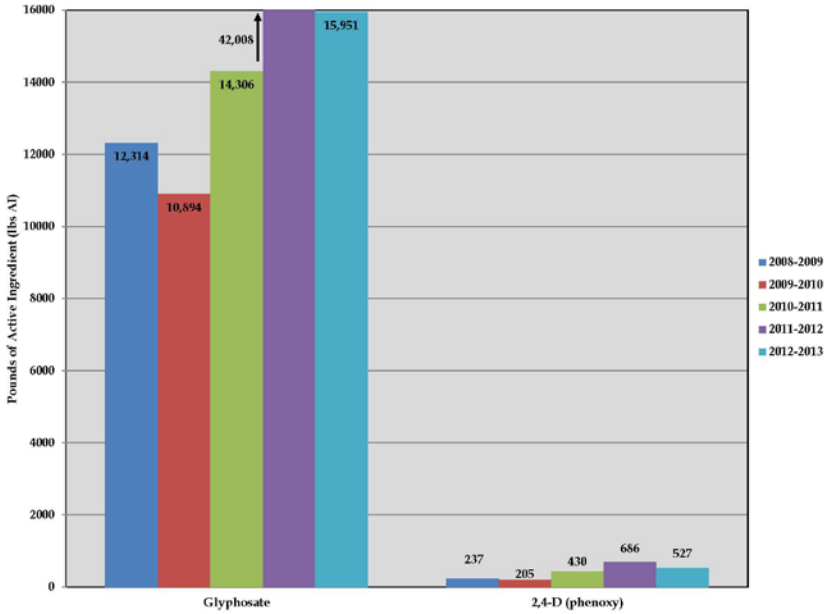

Pesticides

Permittees have utilized fewer pounds of insecticides on an annual basis since 2010, especially those recognized by research as having the greatest potential for causing aquatic toxicity. For the 2012-13 reporting year, Permittees reduced application of the herbicide glyphosate by 62% **(Figure 3.2.7)**. Additionally, Permittees reduced overall application of pyrethroid, organophosphate and phenylpyrazole pesticides by 47% collectively between 2012 and 2013 **(Figure 3.2.8)**.

Figure 3.2.8: Active Ingredient Pesticide Applied 2008-09 to 2012-13

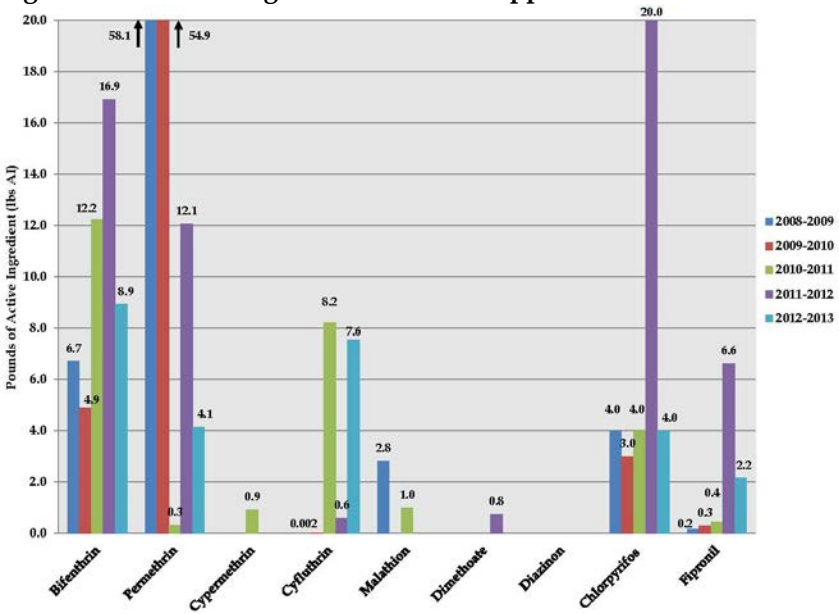

3.2.3 Municipal Retrofit Opportunities & the Practical Vision for Sustainable Water Supply

Municipal Retrofitting

Municipal stormwater retrofits and specifically regional stormwater retrofits are potentially an important tool in the municipal stormwater tool box. Municipal stormwater retrofits provide an opportunity to implement BMPs to provide treatment for existing urban areas, assist with achieving TMDL compliance, serve as offset mitigation for land development and contribute toward integrated water resource management.

Through the Orange County BMP Retrofit Opportunities Study numerous potential stormwater BMP retrofit sites were identified in various municipal right-of-ways. Water quality models have also been developed for some of the watersheds in Orange County that can help identify the water quality benefits of the proposed BMP sites. The Permittees will continue to identify public land suitable for stormwater retrofitting and projects supportive of the "*Practical Vision – A Vision for Achieving a Sustainable Local Water Supply* (SDRWQCB 2013)."

OCTA Environmental Cleanup Grant Program

The Permittees have also implemented trash and debris controls and regional retrofit projects through the Orange County Transportation Authority (OCTA) Measure M Environmental Cleanup Program. The structure of the Environmental Cleanup Program, its management and coordination with the Permittees was discussed in Section C-3.2.6.1 of the 2012-13 Unified Annual Report**. Section 6.0** of this report summarizes the two-tier grant process which provides funding for BMPs, including catchbasin screens and regional multi-jurisdictional projects.

Green Infrastructure

Green infrastructure is also an important tool in the municipal stormwater tool box. Green infrastructure incorporates LID concepts to help achieve stormwater management goals of improving water quality and reducing volume of stormwater runoff while also meeting infrastructure needs of municipalities in a sustainable manner. Opportunities exist for implementation of green infrastructure either as a part of municipal capital improvement projects (CIP) or as part of Green Street retrofit projects. Evaluation of how green

infrastructure can be incorporated into CIP or as part of green street retrofit projects will be undertaken.

3.2.4 Recommendations

Based upon consideration of the water quality priorities of the Program (bacteria, nutrients and pesticide related toxicity) and the evaluation of program implementation, the recommendations are:

1. **Enhance municipal training** to address common issues encountered through municipal related complaints and to utilize innovative education formats to encourage effective discussion-based learning. The four most common issues that occur are: trash/debris, pathogen/bacteria, hydrocarbons and exempt discharges (County of Orange PNIR data, n=205 municipal related complaints, 2008-2012). Training will focus on in-classroom engagement of concepts learned prior to the training session and focus on reducing issues and pollutants of concern through specific actions (e.g. runoff reduction to reduce bacteria loading).

2. **Develop a municipal green infrastructure program** that could include evaluation of opportunities for pilot green street projects of different land use/density configurations and development of a green street guidance manual.

3. **Examine public land retrofit opportunities** for regional BMPs and propose a program to evaluate previously identified regional retrofit opportunities in jurisdictionally owned areas for use in TMDL compliance and LID and/or hydromodification management alternative compliance. This effort will involve the development of watershed models and evaluation of the previously identified potential BMP retrofit sites. Previous reviews (e.g. 2005 RBF retrofit study) will be integrated with current mapping.

4. **Develop and initiate the implementation of individualized IPM Guidelines for each Permittee** with the goal of demonstrating significant and consistent reductions in fertilizer and pesticide applications based on the mission and goals outlined in jurisdictional IPM Policies.

5. **Conduct pilot soil and/or leaf tissue analysis to guide fertilizer use** to ensure nitrogen is not applied at annual rates above those recommended by UCCE research. The Permittees would identify the most fertilizer-intensive area by type (e.g. sports fields) and select one site for analysis. The analysis would assist Permittees in fine-tuning nitrogen application based on the needs of plants at the highest use areas.

6. **Improve methods for documenting usage of fertilizer and active ingredient of pesticide on an annual basis** to allow for more reliable data on the acreage receiving fertilizer applications. In collaboration with the UCCE, a standardized reporting method would be developed, improving reporting accuracy on both the amount of nitrogen and pesticides applied by Permittees on an annual basis. The objective would be to minimize fertilizer applications where annual rates exceed those recommended by UC research (174 -261 lbs. N/acre) while more accurately capturing the acreage to which fertilizer is applied.

7. **Expand training to include peer-reviewed online training**

courses offered by University of California IPM (UC IPM) and UCCE to ensure the IPM and water quality message reaches as many field staff as possible. Possible options include the UC IPM Urban Pesticide Runoff and Mitigation online training series developed by UC academics across the state to provide a more suitable method to reach field staff unable to attend in-person training. The online training consists of a series of courses directly addressing the impacts of pesticides on water quality as well as practices to mitigate these impacts (http://www.ipm.ucdavis.edu/training/upr-mitigation.html).

3.2.5 References

San Diego Regional Water Quality Control Board (SDRWQCB). *San Diego Regional Water Board Practical Vision: Healthy Waters, Healthy People.* 2000. http://www.swrcb.ca.gov/sandiego/water_issues/Practical_Vision/docs/PV.pdf

Implementation Schedule – Municipal Infrastructure & IPM

Proposed Municipal Program Actions	Recommendation[1]	Implementation Schedule[2]				
		2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
Municipal Facility Inventory						
Update and maintain GIS based storm drain conveyance inventory	C					
Inspection and Best Management Practice (BMP) Implementation at Municipal Facilities						
Inspect fixed facilities according to established prioritization	C					
Inspect municipal operations/activities annually	C					
Install, inspect and maintain basin inlet markings as necessary	C					
Implement and Track Baseline BMPs – Operations and Activities						
Conduct and track street sweeping activities	C					
Promote, facilitate, and track proper disposal of solid waste	C					
Promote, facilitate, and track HHW collection activities	C					
Promote, facilitate, and track proper collection and disposal of used oil	C					
Maintain debris booms as necessary	C					
Promote, facilitate, and track clean up events	C					
Municipal Training						
Conduct training for staff	C					

Proposed Municipal Program Actions	Recommendation[1]	Implementation Schedule[2]				
		2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
Develop and update BMP Fact Sheet and other training materials as necessary	C					
Develop an Integrated Pest Management Policy						
Develop and initiate the implementation of individualized IPM Guidelines for each Permittee	N			X		
Conduct pilot soil and/or leaf tissue analysis to guide fertilizer use	N			X		
Improve methods for documenting usage of fertilizer and active ingredient of pesticide on an annual basis	E	X				
Expand training to include peer-reviewed online training courses offered by UC IPM and UCCE	E		X			
Municipal Green Infrastructure Program						
Evaluation of opportunities for the development of pilot green street projects for different land use/density configurations	N	X				
Development of a green street WQMP template	N		X			
Development of green streets standard design specifications	N			X		
Implementation of one green street pilot project in the 5th term permit term.	N					X
Examine Retrofit Opportunities BMPs at Municipal Facilities						
Develop water quality models	N			X		
Integration of the previously identified potential BMP retrofit sites into the models and evaluation of use for TMDL compliance and/or LID and/or hydromodification management offset	E					X

1. C = Continue; E = Enhance; N = New
2. X = Performance Standard will be completed during this fiscal year. Gray shaded cells indicate ongoing implementation.

3.3 Public Outreach

The Story: Public Outreach

- Public awareness surveys conducted approximately every three years demonstrate increased levels of awareness regarding stormwater concerns and several positive behavior changes regarding car washing, use of landscape management products, and pet waste.

- The Program achieved over 155 million impressions through various forms of paid media, and over 5.5 million impressions at outreach events from 2008 to 2013.

- Outreach to school-age children provided water pollution prevention education to over 125,000 students and the Permittees helped support several targeted academic programs throughout the Fourth MS4 Permit term.

- The Permittees initiated a strategic behavior-specific outreach program in 2012.

- The Program enhanced partnerships with the Municipal Water District of Orange County, Chapman University and the University of California Cooperative Extension (UCCE) during the Fourth MS4 Permit term.

- Reductions in outdoor water use, retrofitting the residential environment to reduce outdoor water demand and elimination of runoff from irrigation are the foci of action-based outreach efforts initiated in 2013.

3.3.1 Overview

Ongoing education of the public about environmentally protective behaviors is essential foundational to improving water quality. The goal of the Education Program is to build engagement with residents, encourage and document the adoption of BMPs and increase the overall knowledge of Orange County residents and businesses regarding water quality protection. The Education Program was strategically re-branded from "Project Pollution Prevention" to "H_2OC" in 2012 to stress the importance to Orange County residents of water resource stewardship.

3.3.2 Public Outreach Program Accomplishments and Assessment

For the past decade, H_2OC (previously Project Pollution Prevention) has used public awareness surveys to assess awareness of and behavior change regarding stormwater issues. Survey results indicate small but significant increases in awareness around causes and prevention of stormwater pollution and increased levels of participation in BMPs. Most notably, survey results indicate several positive behavior changes among Orange County residents since 2003 including:

- Willingness to use a commercial car wash facility in lieu of home car washing (five percent increase);
- Proper use of lawn and garden fertilizers and pesticides (five percent increase); and
- Picking up waste and droppings from their pet (nine percent increase).

The Permittees will continue to conduct public awareness surveys to measure and assess awareness of Orange County

residents on water quality issues. These surveys will seek to measure water quality knowledge, current participation in stormwater safe behaviors, and willingness to participate in the same. Additional tracking of specific behavior campaigns, as discussed below, will be measured with pre-initiation and post-completion surveys to better evaluate effectiveness. Finally, the Permittees will continue to measure impressions garnered from the mass media campaigns. Collectively, these measures will help evaluate the success of the various public outreach efforts.

Media Outreach and Impressions

The Permittees have consistently improved the reach of paid advertising since the program began in 2003 and exceeded goals for achievement of impressions through media. The Permittees achieved the following from 2008 through 2013:

- 155 million total paid media impressions including traditional print (e.g. newspaper) ads, bus shelter and bus side posters, billboards, internet banner ads, radio, movie theater and television public service announcements, and gas pump banners; and
- More than 5.5 million grassroots impressions including outreach events like environmental fairs, beach and channel clean-up days, newsletters and workshops.

During the 2012-13 reporting year, the Permittees garnered a total of 40,218,892 impressions through various forms of media (**Figure 3.3.1**).

Earned Media

Earned media includes any unpaid publicity through sources like television (e.g. news reports), newspaper articles, social media (e.g. Facebook, Twitter, or blogs), or other media platform (e.g. podcasts, YouTube, etc). The inclusion of earned media into the total impression count provides a more accurate assessment of the true number of impressions earned, and helps increase public trust in the program overall. The Permittees garnered a total of 18,405,509 impressions from earned media during the 2012-13 reporting year **(Figure 3.3.1)**.

The Permittees will examine methods for increasing program presence on social media in the Fifth Term Permit to encourage residential adoption of specific BMPs associated with *action campaigns*. Development and implementation of these campaigns is described in **Section 3.3.4**.

Figure 3.3.1: Media Impressions by Region 2012-13

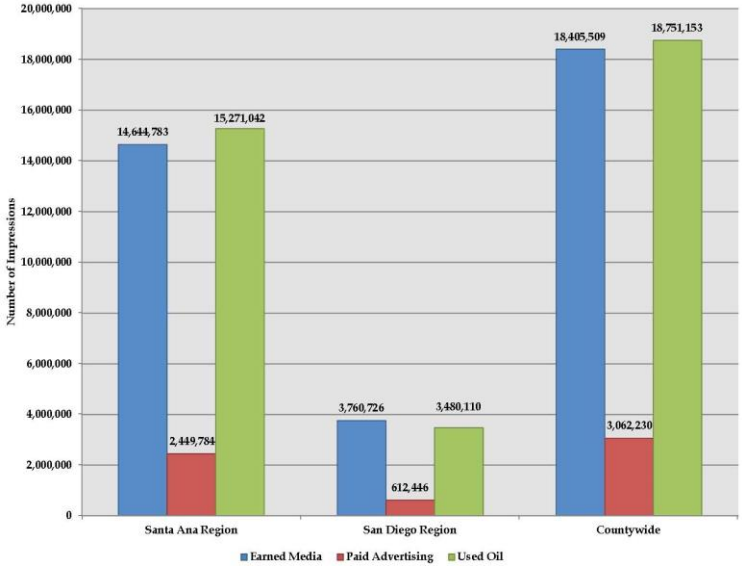

3.3.3 Youth Outreach

Children are crucial to the dissemination of water quality information as key messengers and influencers of parents' behavior. The 2012 Public Awareness Survey indicated that forty-six percent (46%) of adults with school-aged children at home received information about water pollution prevention, an increase of 20% over the 2009 Survey. Additionally, parents of students who brought home information were three times more likely to engage in 7 out of 7 identified "stormwater safe" behaviors (22% to 7%).

The Permittees have maintained and enhanced a robust school outreach program since 2008, including:

- Direct outreach to more than 125,000 students through provision of workbooks, support and assistance designing watershed education programs and funding of programming focused on addressing water quality issues;
- Achieved more than 400,000 total impressions through programs to educate teachers (i.e. Project WET) and the general public at the Discovery Science Center; and
- Development and support of targeted academic programs through partnerships with educational institutions in the community to ensure a consistent message and increase breadth of outreach (e.g. Municipal Water District of Orange County, Chapman University).

3.3.4. Behavior Specific Campaigns

There are a variety of actions an Orange County resident can take to help protect water quality, ranging from picking up after their dog to reporting illegal dumping. However, studies have shown that people can become easily overwhelmed when presented with multiple options, leading to inaction.

Through behavior-specific campaigns the Permittees will target narrow behaviors most likely to have a positive impact on water quality. Target behaviors will be selected by assessing public awareness survey data, water quality monitoring results and the needs of the Permittees.

Behavior-specific campaigns began in 2012; assessment of these efforts will serve as a robust foundation from which future campaigns are determined. Specific achievements include:

- Development of a comprehensive strategic plan in 2012 (2012 Strategic Plan) including extensive analysis of Orange County residents, ongoing biennial surveys, and independent research; and
- Prioritization of target behaviors based on public awareness surveys and water quality monitoring data.

The Permittees intend to employ best practices to implement behavior-specific campaigns using the Community Based Social Marketing (CBSM) model. CBSM steps include:

- Identifying barriers and motivators to an activity;
- Developing a strategy that utilizes tools to leverage those barriers and motivators in order to affect behavior change;
- Pilot the strategy; and
- Evaluate the strategy and refine it for broader implementation.

The Permittees will use these principles in tandem with mass media outreach efforts to continue fostering general public awareness of stormwater issues.

Targeted Outreach Campaigns

The 2012 Strategic Plan concluded that existing outreach efforts should be supplemented by targeted outreach to small, community-based groups in *action campaigns*. Evaluation of each *action campaign* includes setting baseline measures and conducting follow-up assessments using the CBSM model to create long term engagement and to track success.

Each *action campaign* focus is determined by assessing the following variables:

- *Identification of key pollutants* – the Permittees will examine and prioritize key pollutants based on level of harm they pose to the environment and prevalence in water quality data. Once identified, constituents of concern will be further prioritized by likelihood of education impacting the presence of these pollutants;
- *Determine return on investment (ROI)* – the Permittees will assess which behaviors would produce the largest ROI, predicted by assessing the number of people performing that action (i.e. prevalence) and the likelihood that those people would change that action. This step balances ease of performing a behavior and the potential environmental impact; and
- *Consideration of external opportunities and needs* – the final step considers opportunities to leverage campaign messages and tactics with existing programs and/or messaging elsewhere in the Orange County Stormwater Program or by other agencies or groups.

3.3.5 Runoff Reduction and Water Use Efficiency

Runoff reduction stresses onsite retention of runoff by utilizing BMPs to intercept, capture, and infiltrate rainwater to reduce runoff and pollutant loading. The Permittees will continue to build upon partnerships with water purveyors to marry water use efficiency and runoff reduction messaging, increasing message consistency and breadth. Since 2008, the Permittees have nurtured relationships with other agencies and community groups to accomplish the following:

- Collaborated with water utility providers on water use efficiency messaging by participating in stakeholder meetings and providing presentations on key stormwater pollution issues (e.g. Municipal Water District of Orange County).
- Utilized partnerships with the University of California Cooperative Extension (UCCE) to outreach to plant nursery owners and operators and other landscape representatives.

The Permittees will continue to foster these relationships to promote reductions in runoff and overall water use. Investment in coordination of programs and specific action campaigns will continue with campaigns such as the "Overwatering is Out" initiative launched in 2013.

3.3.6 Website Content and Usability

Public awareness surveys indicate that the number of residents seeking information about watersheds and water pollution prevention from the internet continues to increase. In order to ensure water quality data, watershed information and public education materials are available to the public in an easily accessible online format is important to the success of the program.

Building off of the San Diego Regional Water Quality Control Board *Practical Vision for Proactive Public Outreach and Communication* (SDRWQCB 2013), the Principal Permittee will review the ocwatersheds.com website to assess usability and with the goal of increasing access to mapping tools, water quality data and BMPs to prevent water pollution and urban runoff.

3.3.7 Recommendations

The Permittees intend to focus on the following:

1. **Emphasize outreach to school-age children** to continue building upon existing partnerships and increasing knowledge of the Orange County community as a whole through increasing knowledge of youth.

2. **Incorporate current strategic approach of using public awareness survey results to prioritize outreach efforts** based on behaviors of concern in tandem with water quality results to document small-scale behavior change over time.

3. **Coordinate with water supply agencies** to incorporate water use efficiency and runoff reduction messaging to maximize program reach and ensure requested behavior changes align with water use efficiency techniques supported by other agencies. Coordinate to encourage behaviors and develop programs supportive of building a sustainable local water supply as identified in the Practical Vision; including building social norms around water use efficiency and elimination of irrigation runoff.

4. **Develop focused outreach campaigns based on water quality and survey results** utilizing CBSM techniques to document changes in targeted behaviors. The Permittees will develop focused campaigns supportive of a singular message with the goal of reducing competing messaging that may lead to inaction. CBSM tactics will be utilized to target behaviors associated with water quality priorities identified by the Permittees.

5. **Encourage greater public participation in stormwater pollution prevention and elimination of non-stormwater discharges** through the use of CBSM and increased availability to online resources. *Action campaigns* would encourage residents to take an identified action and to share efforts with others.

6. **Social media calendars will synchronize outreach efforts and encourage direct participation in and sharing of program messaging.** Social media forms of earned media will complement *action campaign* elements by encouraging direct residential participation in programs. Activity on social media significantly increases with boosted posts and paid advertising; these unpaid and paid tools will support CBSM programs.

7. **Review website for usability and revise structure as needed to meet goals of increasing public use of web content.** The goal of the review will be to increase access to mapping tools, water quality data and BMPs to prevent water pollution

3.3.8 References

San Diego Regional Water Quality Control Board (SDRWQCB). *San Diego Regional Water Board Practical Vision: Healthy Waters, Healthy People*. 2000. http://www.swrcb.ca.gov/sandiego/water_issues/Practical_Vision/docs/PV.pdf

Implementation Schedule – Public Outreach

Proposed Public Outreach Actions	Recommendation[1]	Implementation Schedule[2]				
		2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
Foundational Program Elements						
Conduct public awareness surveys	C		X			X
Earned and Paid Media						
Develop and place paid media	C					
Develop social media channels	N	X				
Promote programs through social media channels	N					
Outreach to School Age Children						
Support outreach programs for school age children	C					
Website Content and Usability						
Review ocwatersheds.com website for usability	E	X	X			
Explore options for making water quality data more accessible and webpages are user-friendly	E	X	X			
Behavior Specific Campaigns						
Conduct Overwatering Is Out campaign	N					
Assess progress of Overwatering Is Out campaign	N	X	X			
Assess public awareness survey and water quality results	N		X			
Prioritize behaviors for Outreach	N		X			
Develop action campaign #2	N			X		

1. C = Continue; E = Enhance; N = New
2. X = Recommendations will be completed during this fiscal year.

Gray shaded cells indicate ongoing implementation.

3.4 New Development/Significant Redevelopment

The Story: New Development/Significant Redevelopment

- The Permittees developed a significantly revised Model Water Quality Management Plan (WQMP) and Technical Guidance Document (TGD) to implement new requirements for the implementation of Low Impact Development (LID) BMPs.

- The Permittees implemented the new Model WQMP and TGD for all priority projects in north Orange County starting on August 17, 2011, and in south Orange County starting on December 20, 2013.

- The Permittees are implementing region-specific approaches to hydromodification management.

- During the permit term (through the 2012-13 reporting period) 1,369 WQMPs for public and private projects were approved across all of Orange County for a total of 18,749 acres of development now that are now subject to Project WQMPs.

- South Orange County was mapped and a geodatabase was developed that includes conveyance systems, infiltration constraints, land use, and soil types. The County is using the geodatabase to evaluate channel susceptibility to hydromodification, and opportunities and constraints for infiltration and treatment BMP implementation at various scales.

3.4.1 Overview

Development creates rooftops, driveways, roads and parking lots which increase the timing and volume of rainfall runoff (compared to pre-development conditions) and provide a source of pollutants that are flushed or leached by rainfall runoff or dry weather runoff into surface water systems. Since the inception of the Program, it has been recognized that the incorporation of BMPs into a development project in its planning stages offers the most effective opportunity to limit increases in pollutant loads and preserve natural hydrologic processes. Consequently, the Program links new development and significant redevelopment BMP design, construction and site operation to the earliest phases of new development project planning, encompassed by the jurisdictional General Plans, environmental review and development permit approval processes.

The New Development/Significant Redevelopment Program has evolved over successive MS4 Permit terms from a narrow focus on discharge water quality to a broader consideration of the hydrologic impacts of land use change. Routine structural and non-structural BMPs implemented during the first two permit terms aimed to minimize the introduction of pollutants into the drainage system. In the third MS4 Permit term, the Permittees continued to implement routine structural and non-structural BMPs, but they also worked with project proponents to improve site design. The current Fourth Term Permits emphasize use of site design BMPs and bring the concepts of LID and hydromodification control to the forefront.

The Model WQMP describes the process that Permittees employ for developing a Project WQMP for individual new development and significant redevelopment projects, which, minimizes the effects of urbanization on site hydrology, runoff flow rates or velocities and pollutant loads. Following approval of the final project WQMP and construction of the

project, the Project WQMP will also serve to maintain the terms, conditions and requirements with the project proponent and their successors over the entire life of the project. The effects of urbanization will be minimized through implementation of practicable and enforceable project-based controls or stormwater BMPs, or through a combination of project-based and regional BMPs.

3.4.2 New Development/Significant Redevelopment Program Implementation and Assessment

Model Water Quality Management Plan (WQMP)

A new Model WQMP and TGD were developed during an eighteen month stakeholder process. Implementation of the new Model WQMP and TGD commenced on August 17, 2011, in north Orange County and on December 20, 2013, in south Orange County. This Model WQMP identifies appropriate LID practices and BMPs and alternative compliance programs for new development and significant redevelopment projects. LID BMPs must be selected based on a hierarchy of control types and sized to capture the maximum feasible portion of the design capture volume using the highest priority control type (e.g., retention). The next lower priority control type (biotreatment) can only be used for any portion of the design capture volume that cannot be feasibly captured by retention BMPs.

In accordance with the Model WQMP, new development and significant redevelopment projects meeting threshold criteria, are required to develop and implement a Project WQMP that includes LID and hydromodification control BMPs, where necessary, at the earliest conceptual planning stages of a project for early review. Depending upon the project size and characteristics, these may include:

- BMP site design measures;
- Implementing LID BMPs on-site;
- Constructing or participating in sub-regional/regional LID systems;
- Implementing hydromodification control BMPs; and
- Using alternative programs or treatment control BMPs.

In addition, the Model WQMP includes more rigorous requirements regarding assessing and abating hydromodification impacts. The effects of hydromodification can be mitigated with the use of LID strategies, site design and hydrologic source controls.

In south Orange County an interim hydromodification performance standard was applied to development and redevelopment projects starting in December 2010. This performance standard has been superseded by the requirements of the Hydromodification Management Plan (HMP).

Project WQMPs are required for private new development and significant redevelopment projects within Permittees' jurisdictions, and equivalent public agency capital projects undertaken by the Permittees that are either:

- "Priority Projects" meeting one of the criteria identified in the Permit, regardless of project size.

- "Non-Priority Projects" that do not qualify as one of the Priority Project Categories but meet one of the following:

    - Require discretionary action that will include a precise plan of development, except for those

projects exempted by the Water Quality Ordinance (as applicable), or

- Require issuance of a non-residential plumbing permit.

BMP Implementation

Since 2002, a total of 4,152 Project WQMPs have been approved, covering 40,461 acres which represents 9.3% of the area within Orange County subject to subject to the regulatory provisions of the Third and Fourth Term MS4 Permits (681.4 square miles). During the current Fourth Term MS4 permit term 1,369 WQMPs for public and private projects were approved for a total of 18,749 acres of development **(Figure 3.4.2)**.

Figure 3.4.2: Historical WQMPs and Acreage Covered

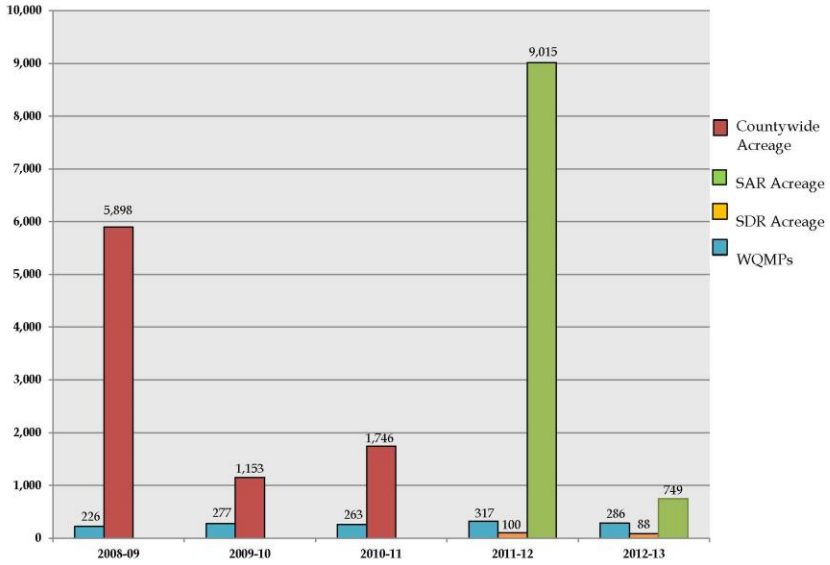

The Project WQMP for a Priority Project must include:

- Routine structural and non-structural Source Control BMPs;
- Site Design BMPs (as appropriate);
- Runoff retention BMPs, also referred to as LID BMPs – requirements may be met through either project specific (on-site) controls or, in cases of on-site infeasibility, regional or watershed management controls that provide equivalent or better treatment performance, subject to certain conditions described in the Model WQMP; and
- The mechanism(s) by which long-term operation and maintenance of all structural BMPs will be provided.

The Project WQMP for a Non-Priority Project must include:

- Routine structural and non-structural Source Control BMPs;
- Site Design BMPs (as appropriate); and
- The mechanism(s) by which long-term operation and maintenance of all structural BMPs will be provided.

Following approval of the Model WQMP in 2011, 9,764 acres of development in north Orange County have incorporated LID BMPs. Progress with implementation of the LID-based Model WQMP in south Orange County will be discussed in the FY2013-14 Annual Report.

Since each site with an approved Project WQMP may incorporate multiple BMPs, there is now in Orange County a growing inventory across the urban landscape of many thousands of BMPs. The emergence of Geographical Information System (GIS)-based software allows (1) strategically managing an inspection program to ensure the continued effectiveness of these BMPs and (2) evaluation of

the impact of constructing features in the urban landscape intended to be protective of water quality.

Training

To provide land developers, project proponents, and associated consultants and organizations with an overview of the new land development requirements, training for NPDES Program Managers, planners, plan checkers and the development community was provided in July and September 2011 for north Orange County and was repeated for south Orange County in October, 2013. The training provided an overview of the level of detail that must be included at each phase of the WQMP preparation process, site and watershed assessment methods, LID BMP selection and prioritization methods, LID BMP design standards and performance criteria, regional LID BMP options, watershed-based plans and LID alternative compliance options. All of the training modules have been posted to the OC Watersheds website (http://www.ocwatersheds.com/WQMP_FAQs.aspx) and YouTube.

General Plan Assessment and Development Standards Review

In October 2009, the Principal Permittee hosted a workshop for the Permittees to provide guidance on assessing their General Plans and development standards review to ensure the following LID principles are considered in their review, and considered for inclusion in some fashion as appropriate, in the General Plan and Local Coastal Plan (if applicable):

- Limit disturbance of natural water bodies and drainage systems; conserve natural areas; minimize soil compaction to landscaped areas; protect slopes and channels; and minimize impacts from stormwater and urban runoff on the biological integrity of natural drainage systems and water bodies;
- Minimize changes in hydrology and pollutant loading; ensure that post-development runoff rates and velocities from a site have no significant adverse impact on downstream erosion and stream habitat;
- Maximize the percentage of permeable surfaces to allow more percolation of storm water into the ground; construct streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided that public safety is not compromised;
- Preserve wetlands, riparian corridors, and buffer zones and establish reasonable limits on the clearing of vegetation from the project site;
- Encourage the use of water quality wetlands, biofiltration swales, watershed-scale retrofits, etc., where such measures are likely to be effective and technically and economically feasible;
- Provide for appropriate permanent measures to reduce storm water pollutant loads in storm water from the development site; and
- Establish development guidelines for areas particularly susceptible to erosion and sediment loss.

Enhancements in Methodologies

The County of Orange as Principal Permittee participates in a number of collaborative studies and initiatives on behalf of the Permittees that are aimed at the further development of

assessment techniques and methodologies to support more informed and consistent decision making across Southern California. Examples of current studies and initiatives affecting New Development/Significant Development include:

SMC – Phase 1 Hydromodification Study

The primary objective of this study was to find relationships between stream channel type and resistance that would allow prediction of channel response under changed conditions associated with increased impervious cover. Ultimately this effort will contribute to the establishment of stormwater management criteria to help minimize the impacts to stream channels from the conversion of undeveloped (or less developed) areas to residential, commercial, or other intensive land uses.

SMC – Low Impact Development Study

SMC developed a manual of practice for LID that provides:

- Details on how to use LID Principles and LID BMPs to reduce the impacts of land development or re-development on water resources at the project level;
- Guidance for municipalities, land use planners, land developers, consultants, design professionals who prepare stormwater engineering plans and specifications, and others in private industry and public service;
- A site planning and design reference that will facilitate the implementation of LID for projects in Southern California. It is designed to complement the Stormwater BMP Manual(s) that have been developed and are maintained by CASQA;
- A tool that can be applied at the site level for the development of integrated water and stormwater management regulatory compliance and resource protection programs; and
- The SMC LID Manual is available online at the California LID Portal (californialid.org).

SMC – Barriers to Low Impact Development Study

The purpose of this study was to dig deeper into potential barriers to LID by investigating the complex web of codes, processes and perceptions surrounding LID implementation.

<u>Hydromodification</u>

Hydrograph modification, or "hydromodification," refers to the changes in the magnitude and frequency of stream flows and its associated sediment load that can be the consequence of watershed urbanization due to increasing landscape imperviousness. In urban watersheds, hydromodification can become evident as channel erosion and sedimentation resulting in degradation of in-stream habitat. Another consequence of hydromodification can be channel realignment and modification which can similarly lead to degraded ecology.

Concern for the significance to stream ecology of the hydrologic impacts of urban runoff was the rationale for the inclusion of hydromodification control requirements in the Fourth Term Permits. These requirements also align with the Practical Vision's intention of focusing the State's regulatory

tools, in the San Diego region, on realizing the restorative goals of the Clean Water Act. The planning required of the Permittees for pollution prevention, pollution control and MS4 permit compliance, is thus evolving into a more holistic approach that integrates flood control, erosion control and water quality management.

In Orange County, BMP planning occurs on both a watershed scale and a site scale. However, the watershed in most cases is the appropriate scale for developing plans that consider both multiple stream system influences and effects and the setting of ecological objectives and restorative goals. In the absence of a holistic evaluation of the watershed, the benefit of unilaterally applying hydromodification control requirements to all development projects is not clear because it is harder to understand the relationship of a specific project to the surrounding landscape. It is also difficult to effectively evaluate the cumulative influences and effects that are involved[1].

The adverse environmental impacts that can arise from land development must, however, be understood for the lawful requirement of mitigation. Based on the takings clause of the U.S. and California constitutions and the Mitigation Fee Act, hydromodification control requirements applied to development projects must bear a reasonable relationship to the impacts of the project. Requiring hydrologic controls on projects draining to receiving waters not susceptible to hydromodification is contrary to these legal requirements. Such requirements may also be beyond the scope of a mandate intended to control the discharge of pollutants from a point source. The need for all hydromodification control requirements to be informed by a holistic and rigorous watershed analysis is considered in greater detail in **Attachment 3.4.1.**

Integrated Water Resource Management and Regional BMPs

The use of "Regional BMPs," in the Model WQMP is required to be a subordinate choice to on-site mitigation. This LID hierarchy is increasingly being viewed as obstructive, as California adapts to increasing uncertainty regarding the resilience of its water supply infrastructure by seeking to better retain stormwater in the landscape for local water supply augmentation. Regional BMPs are seen to be a key part of this adaptive effort (See Southern California Water Committee www.socalwater.org/).

Following two prior years of scant rainfall, calendar year 2013 closed as the driest year in recorded history for many areas of California. Early in 2014, on January 17, Gov. Edmund G. Brown Jr. declared a drought state of emergency and directed state officials to take all necessary actions in response. The policy framework for these actions is the California Water Action Plan (CWAP) (State of California, 2014).

One of the CWAP's key action items is a shift toward Integrated Water Resource Management approaches (IRWM). IWRM has long been practiced in other areas of the world and is now being championed by USEPA and California water leaders as the preferred management approach for solving the challenges of increasingly stringent water quality regulations and the water supply demands of a growing population.

The America Water Resources Association defines IWRM as:

> *The coordinated planning, development, protection, and management of water, land, and related resources in a*

[1] Urban Runoff Quality Management, WEF Manual of Practice No.23/ASCE Manual and Report on Engineering Practice No. 87.

manner that fosters sustainable economic activity, improves or sustains environmental quality, ensures public health and safety, and provides for the sustainability of communities and ecosystems.

IWRM is a management approach that requires collaboration among key water resources areas such as drinking water supply, wastewater treatment, flood management, and water quality protection to leverage resources and create multi-benefit projects. In the field of stormwater management, the term "multi-benefit projects" is often synonymous with the term "Regional BMPs." Such BMPs are typically conceived as constructed basins, under the management of a special distract, where basin design is optimized for local groundwater augmentation, flood control and runoff treatment and where the basin is receiving runoff from sub-watershed areas often in excess of 50 acres.

Since the use of "Regional BMPs," in the Model WQMP is required to be a subordinate choice to on-site mitigation, the CWAP's mandate for a policy shift toward IRWM in California has clear implications for future MS4 permitting. Indeed, in his observations on the future contribution of stormwater management to IRWM, the Executive Officer of the Santa Ana RWQCB observed (CASQA, 2013[2]) that while Regional BMP solutions potentially offered an opportunity to realize multiple benefits, consistent with IRWM, the "LID Hierarchy" of the Fourth Term Permits presents an impediment to constructing Regional BMPs.

These observations cause the recurring debate about the merits of centralized versus de-centralized approaches, or on-site versus regional controls, to creating a stormwater management infrastructure to be re-visited. While the Fourth Term Permits have required on-site BMPs to be constructed unless they can be determined to be infeasible, the Santa Ana Third Term Permit encouraged examination of regional approaches. The regional BMP emphasis was supported by technical guidance (see WEF/ASCE, 1998[3]) that contemplated stormwater quality being managed across the landscape in a drainage system retrofitted with basins and under the direct management of a special district. This guidance had concluded that constructing fewer regional controls would ultimately be both less expensive than a large number of on-site controls and more effective in the longer term since control outlets are larger and therefore easier to design, build, operate and maintain. Moreover, they could additionally capture the street runoff that would be missed by on-site controls and be large enough to offer opportunities for compatible uses such as recreation and ecological habitat. With the new imperative to have IWRM inform approaches to stormwater management, the permitting framework clearly needs to allow for on-site and off-site BMP "equivalency" to enable IRWM and water quality and restorative goals to be realized and optimized at the watershed level.

Mitigation for Restoration Projects

Rehabilitating highly modified streams, to improve ecological, recreational or water supply augmentation amenities, may require the use of impervious materials to the extent that Project WQMP criteria are met. Requiring mitigation for restoration projects in such instances may threaten project viability. Moreover, such projects would already be subject to regulation by the United States Army Corps of Engineers (USACOE) under CWA Section 404, by the State and Regional Boards under CWA Section 401, and by the Federal

[2] CASQA Quarterly Meeting, November, 2013

[3] Urban Runoff Quality Management, WEF Manual of Practice No.23/ASCE Manual and Report on Engineering Practice No. 87.

USFW and California DFG. Any environmental impacts of these projects will be mitigated as required by these agencies and therefore should be explicitly exempted from Project WQMP requirements.

Public Safety Projects

In specific instances, channel re-construction may need to be undertaken on an emergency basis when there is an imminent threat to public safety. Such projects may involve like-for-like replacement of hardened channels and there will be no time for the development, processing and plan check, and revisions of a Project WQMP for these projects. Emergency projects are provided exempt status in many other MS4 permits including the Santa Ana Region Permit (Order No. R8-2009-0030) and the Los Angeles County MS4 Permit (Order R4-2012-0175).

3.4.3 Recommendations:

1. **Implement an approach to hydromodification management that is informed by a watershed analysis and channel-specific protection and restoration goals.** The Permittees understand that, consistent with current published research, a "one-size-fits-all" approach for hydromodification management is not appropriate for highly modified urban stream systems. Pending a comprehensive watershed analysis, land development projects discharging runoff to engineered channels, should not be required to implement hydromodification management controls.

2. **Incorporate an IRWM element into the land planning/land development process.** The Permittees understand that an IRWM approach is needed to optimize attainment of water quality protection, water conservation, flood control, and stream protection goals. The Permittees therefore intend to incorporate an IRWM element into their land planning and land development processes so that as development projects begin entitlement this approach and opportunities to achieve this approach are evaluated. This recommendation will require a modified LID Hierarchy that establishes the equivalency of "On-site BMP" and "Off-Site /Regional BMP" solutions.

3. **Create an exemption from Project WQMP requirements for steam and watershed restoration projects**.

4. **Create an exemption for emergency public safety projects where delay would compromise public safety, public health and/or the environment**.

5. **Develop an internet based regional geodatabase.** To effectively implement an IRWM and watershed management approach, access to information that describes all of the key hydrologic process and landscape characteristics will be critical. The Permittees are developing and starting to use an internet-based regional geodatabase to give developers and municipal staff access to the geotechnical and hydrologic information necessary for evaluating the application of the LID hierarchy to sites.

6. **Pilot the use of technology to better track Project WQMP inspections and follow up actions needed.** To fully utilize the WQMP Submittal Tool and Database WQMP inspections could be performed with tablets or other devices where GIS information and other

information can immediately be uploaded to the database. The Permittees propose piloting the use of tablets or other devices linked to the Database for Project WQMP inspections by a select number of cities.

7. **Enhance the data collected for WQMPs to have a better understanding of water quality benefits on an annual basis.** The Permittees desire to perform a better assessment of the New Development/Significant Redevelopment Program. In order to better understand the effectiveness of the program, the Permittees propose to collect new critical data elements, and enhance data quality by integrating information into the WQMP Submittal Tool and Database. New data would include volumes of water treated, land area treated, and other relevant information needed to evaluate TMDL compliance, to identify developed/redeveloped areas that meet LID and/or hydromodification requirements, and to track BMP maintenance as a measure of effectiveness.

Implementation Schedule – Land Development

Proposed New Development/Significant Redevelopment Program Actions	Recommendation[1]	Implementation Schedule[2]				
		2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
New Development/Significant Redevelopment Program						
Development of Program Guidance	C					
Develop an internet-based regional geodatabase.	E		X			
Water Quality Management Plans (WQMPs)						
Integrate the use of emerging information technologies to better track WQMP inspections and follow up actions needed.	E			X		
Enhance the data collected for WQMPs to have a better understanding of water quality benefits on an annual basis.	E			X		
BMP Implementation						
Implement Model WQMP	C					
Training						
Deliver Model WQMP & TGD Training Modules	C					
"Help Desk"						
Provide "Help Desk" service	C					
General Plan Assessment and Development Standards Review						
Incorporate an integrated water resources approach element into the land planning/land development process.	M			X		

Proposed New Development/Significant Redevelopment Program Actions	Recommendation[1]	Implementation Schedule[2]				
		2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
Enhancements in Assessment Methodologies and Their Role in New Development/Significant Redevelopment						
Development of technical guidance	C					

1. C = Continuation; E = Enhancement; M=Modification (Requires adjustment to Policy/Permitting)
2. X = Recommendation will be completed during this fiscal year. Gray shaded cells indicate ongoing implementation

3.5 Construction

The Story: Construction

- The Construction Program maintained an inventory of up to 12,060 construction sites, prioritized these sites regarding their threat to water quality, and inspected them at the frequency specified by the permit. Non-compliant sites were educated and required to implement BMPs as required.

- BMP Guidance was updated to address the renewed Statewide General Construction Storm Water Permit, and Permittee construction inspection staff were trained accordingly.

- Three Qualified SWPPP Developer (QSD)/Qualified SWPPP Practitioner (QSP) training sessions were offered during the Permit term. Approximately 150 people attended this training.

3.5.1 Overview

The Permittees regulate construction activities and have responsibility for the construction and reconstruction of municipal facilities and infrastructure within their jurisdictions. Construction sites and activities are a significant potential source of sediment and other pollutants and have been a priority for the Program since the First Term MS4 Permits.

The Program requires effective BMP implementation by construction site owners, developers, contractors, and other responsible parties. All construction projects, regardless of size, must implement an effective combination of erosion and sediment controls and waste and materials management BMPs. To ensure that effective BMPs are implemented, each jurisdiction conducts inspections to verify the appropriateness and implementation of BMPs and takes enforcement action as necessary. Training is provided annually to support consistent countywide implementation.

3.5.2 Construction Program Implementation and Assessment

The Model Construction Program has been implemented since 2002-03. It requires the Permittees to:

- Inventory construction sites;
- Prioritize construction sites based upon water quality threat;
- Prepare BMP guidance;
- Conduct inspections of construction sites;
- Undertake enforcement; and
- Conduct training.

<u>Site Inventories</u>

Between 2008 and 2013, the Permittees reported annual construction site inventories ranging from 7,123 (2012-13) to 12,059 (2008-2009). Order R9-2009-002 does not designate construction sites as high, medium or low priority; rather, prioritization is based on site size and proximity to sediment-impaired receiving waters. However, for the ease of differentiation and reporting, sites will be categorized as

"high" "medium" and "low" priority based on the following factors:

HIGH: Any site 30 acres or larger; any site 1 acre or larger and tributary to a CWA section 303(d) water body segment impaired for sediment or within or directly adjacent to, or discharging directly to, the ocean or a receiving water within an ESA; or other sites determined by the Copermittees or the Regional Board as a significant threat to water quality.

MEDIUM: Construction sites with one acre or more of soil disturbance not meeting the criteria specified for 'high' priority sites.

LOW: Construction sites that are less than one acre in size.

The numbers of construction sites and relative proportions of low, medium, and high priority sites for the past five years are shown in **Figure 3.5.1**.

Figure 3.5.1: Construction Site Inspections & Prioritizations, 2008-09 to 2012-13

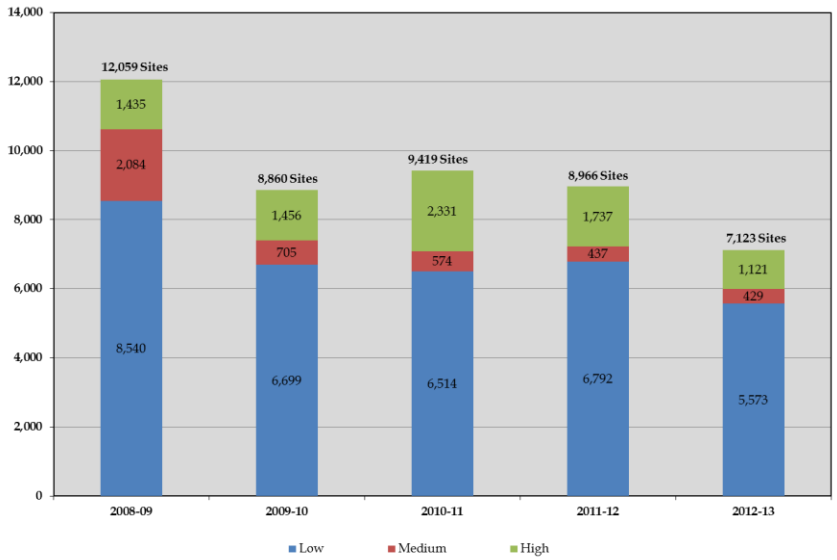

BMP Guidance

The Permittees have produced a *Construction Runoff Guidance Manual* and it is available at http://ocwatersheds.com/documents/bmp/constructionactivities. The manual was updated in late 2012 to ensure consistency with the renewed Construction General Permit (Order 2009-0009-DWQ) (CGP), to incorporate findings from an Erosion Control BMP Field Evaluation, and to provide guidance on dewatering activities and BMPs appropriate for small construction sites. The manual is the basis for the pre-wet season construction training held each September. CASQA updated their California Stormwater BMP Handbook for Construction in November 2009 as on online portal and the updated BMP Factsheets provide additional, up-to-date guidance for the Permittees.

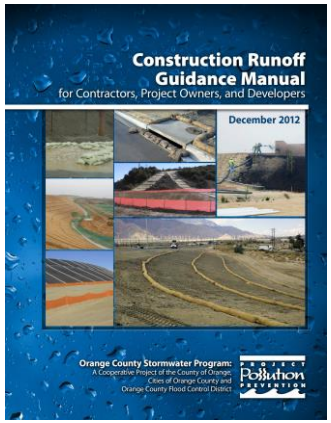

Inspection and Enforcement

Inspectors implement their jurisdictional program, which is based on the Model Construction Program, by enforcing compliance with grading or building permits, sediment and erosion control plans, and the Water Quality Ordinance(s). Enforcement actions taken by inspectors include, but are not limited to, education, verbal warnings and administrative actions under the Water Quality Ordinance (notice of violation, administrative compliance order, etc.), and written actions under Building/Grading Ordinances (corrective action notice, stop work order, etc.).

As a result of the inspections, between 2008-2013 the Permittees reported issuing 2,297 educational letters, 1,454 notices of non-compliance, 186 administrative compliance orders, 19 cease and desist orders, and 9 misdemeanor/infractions for a total of 3,965 enforcement actions (**Figure 3.5.2**).

Figure 3.5.2: Enforcement Actions Taken, 2008-09 to 2012-13

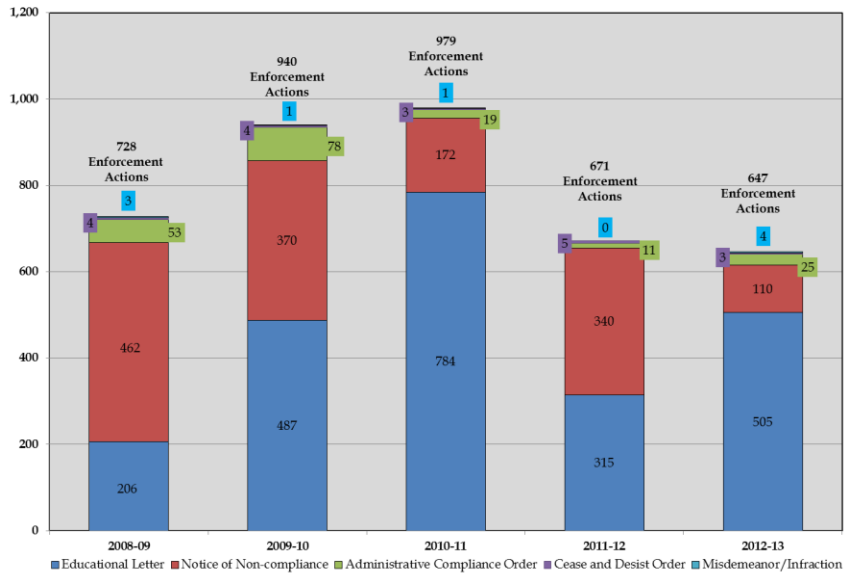

Figure 3.5.3: Construction Sites Out of Compliance, 2008-09 to 2012-13

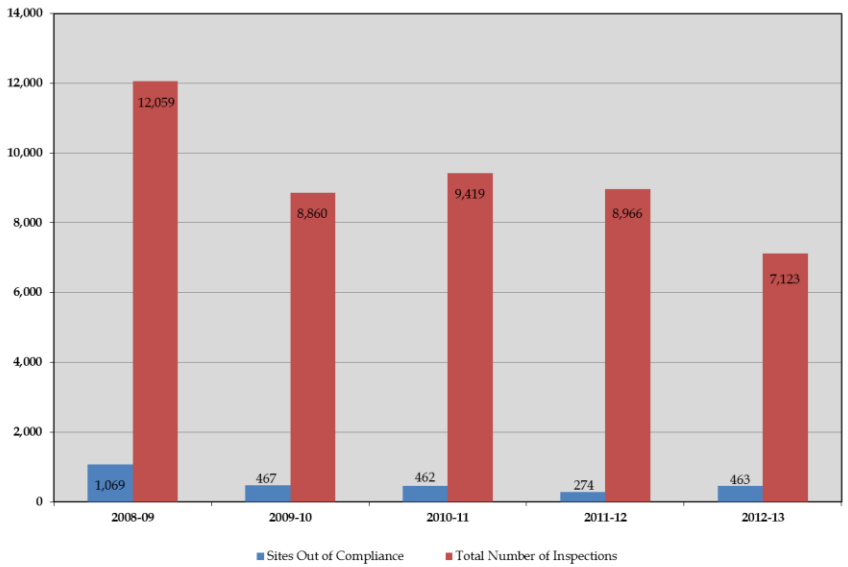

The number and type of enforcement activities vary greatly from year to year; however, the percentage of construction sites out of compliance is consistently under 10% **(Figure 3.5.3)**. This is a consistently high (i.e. >90%) level of compliance from year to year within the regulated community, which may be attributable to the long term impact of inspection programs, new guidance published by CASQA, and the implementation of the new Construction General Permit requirements, including new requirements for a *Qualified Stormwater Pollution Prevention Plan (SWPPP) Developer* to prepare a construction site's SWPPP, and a *Qualified SWPPP Practitioner* to ensure that the SWPPP is being correctly implemented.

The Fourth Term MS4 Permit requires significant inspection resources for both high priority and medium priority construction sites. Based on **Figure 3.5.2** and **Figure 3.5.3**, enforcement actions per capita and the proportion of construction sites out of compliance have decreased over the permit term. Therefore, it is appropriate to consider revising the inspection requirements and inspection frequency for the Fifth-Term MS4 Permit.

<u>Training</u>

Pre-wet season construction inspection training has been provided to inspectors each September during the permit term. A new module for Construction Inspectors, with a focus on interactive exercises for trainees, was developed and provided in September 2012. Qualified SWPPP Developer (QSD) and Qualified SWPPP Practitioner (QSP) training was provided three times in the permit term to NPDES Program staff and construction inspectors. The first QSD/QSP Training was provided on June 9, 13, and 14, 2011. The second QSD/QSP Training was provided on May 24, 29 and June 5, 2012. The third QSD/QSP Training was provided on April 2, 9 and 16, 2014. Approximately 50 staff attended each round of training.

3.5.3 Recommendations

The recommendations are:

1. **Reduce the frequency of inspection for "high" priority sites** from bi-weekly to twice during the wet season and reduce the frequency of inspection for "medium" priority sites from monthly to once during the wet season.

2. **Pilot a GIS and internet-based database to track construction sites**. In order to provide easier tracking of construction sites on a countywide basis, the Permittees will develop a GIS and internet-based database where information regarding each construction site can be entered. The Permittees would examine the benefits of such a database by piloting implementation with a select number of cities.

3. **Conduct pilot field-testing of personal electronic devices to document inspections onsite**. Use of tablets or other electronic devices during inspections will allow inspectors to immediately upload construction site information to the GIS based database. The Permittees would pilot the use of these technologies with a select number of cities.

4. **Conduct QSD/QSP Training.** The QSD/QSP Training developed by the State Board and CASQA provides a detailed understanding of the Construction General Permit. The Permittees propose providing this training to municipal staff every other year to ensure that inspectors and other municipal staff understand the CGP requirements that are to be implemented for construction projects in their jurisdiction. It is anticipated that with potential changes to the CGP being adopted in 2014 that municipal staff should be aware of these changes and any new or modified requirements for CGP compliance.

Implementation Schedule – Construction

Proposed Model Construction Program Actions	Recommendation[1]	Implementation Schedule[2]				
		2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
Inventory Construction Sites						
Maintain inventory of construction sites	C					
Pilot GIS based database system to maintain inventory of construction sites	E		X			
Prioritize Construction Sites based upon Water Quality Threat						
Prioritize as high, medium, low threat to water quality	C					
Prepare BMP Guidance						
Implement BMPs identified in the OC Construction Runoff Guidance Manual	C					
Conduct Inspections of Construction Sites						
Inspectors to pilot use of tablets or other device during inspections to upload information to the GIS based database	N			X		
Perform inspections for high priority sites twice during the wet season	N					
Perform inspections for medium priority sites once during the wet season	N					
Perform inspections for low priority sites once during the wet season	C					
Enforcement						
Enforcing compliance with grading or building permits, sediment and erosion control plans, and the Water Quality Ordinance	C					

Proposed Model Construction Program Actions	Recommendation[1]	Implementation Schedule[2]				
		2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
Training						
Conduct Training of construction inspectors annually prior to the wet season	C					
Conduct QSD/QSP Training	C	X		X		X

1. C = Continue; E = Enhance; N = New
2. X = Performance Standard will be completed during this fiscal year. Gray shaded cells indicate ongoing implementation

3.6 Existing Development

The Story: Industrial/Commercial

- The Industrial/Commercial Program inventoried 14,000 sites and conducted inspections of these sites at frequencies specified by the permit.
- The Program trained Authorized Inspectors and provided education and enforcement to address facilities lacking effective BMPs.
- A new Mobile Business Pilot Model Program was developed and implemented.
- Residential sources of pollutants were addressed through the Model Residential Program, which included development of new outreach materials and continued outreach to Common Interest Areas and Homeowner's Associations.

3.6.1 Overview

Stormwater discharges from commercial and industrial facilities can become contaminated when material management practices allow exposure of pollutant sources to stormwater and/or there is commingling of runoff with wastes. The Existing Development Model Program provides a programmatic framework to guide Permittees in the regulatory oversight of activities in commercial and industrial areas. Through inspections, outreach and requiring compliance with water quality ordinances, the Permittees are able to effect protection of the quality of urban and stormwater runoff from industrial and commercial facilities.

The Model Program also provides a framework, emphasizing education and outreach approaches, for addressing activities in residential and common interest areas that can threaten water quality.

3.6.2 Model Industrial/Commercial Program Implementation and Assessment

The Model Industrial/Commercial Program requires the Permittees to address the following:

- Identify and inventory commercial and industrial facilities;
- Establish model maintenance procedures;
- Develop and implement a program to address mobile businesses;
- Conduct inspections of food service establishments (FSEs);
- Conduct inspections and undertake enforcement
- Conduct training; and
- Conduct education and outreach.

<u>Facility Inventory and Inspection</u>

The Permittees maintain a database of industrial and commercial facilities that have a potential impact to water quality. This database documents all information related to the facility such as outreach, inspection, and any follow up actions required. Industrial and commercial facilities have been identified and inventoried per permit requirements for over ten years.

Following clarification of reporting practices in 2008, the total number of industrial facilities has remained relatively stable.

The significant drop in number of commercial facilities on the inventory between FY 2009-10 and FY 2010-11 is attributable to the removal of the food service establishments (FSEs) from the commercial inventory that year. The gradual decline in the number of both industrial and commercial facilities over the permit term is likely due to the economic downturn.

The Fourth-Term MS4 Permit specifies that a minimum of 20% of the total combined industrial and commercial facility inventories be inspected each year. Since permit adoption in 2009, the annual inspection average for the total combined industrial and commercial inventory has been between 40-46%. **Figure 3.6.1** and **Figure 3.6.2** show the total annual inventory and inspections of industrial and commercial facilities, respectively. This data excludes inspections at Food Service Establishments (FSEs), as these are inspected by the HCA and are tracked separately.

On April 1, 2014, the State Water Resources Control Board adopted a new Industrial General Permit which expands the list of facilities that are required to obtain coverage. The Orange County Stormwater Program will evaluate how this expansion and other changes to the statewide industrial program will impact the Permittees' Existing Development Model Program.

Figure 3.6.1: Industrial Facility Inventory and Inspections from 2008-09 to 2012-13
*

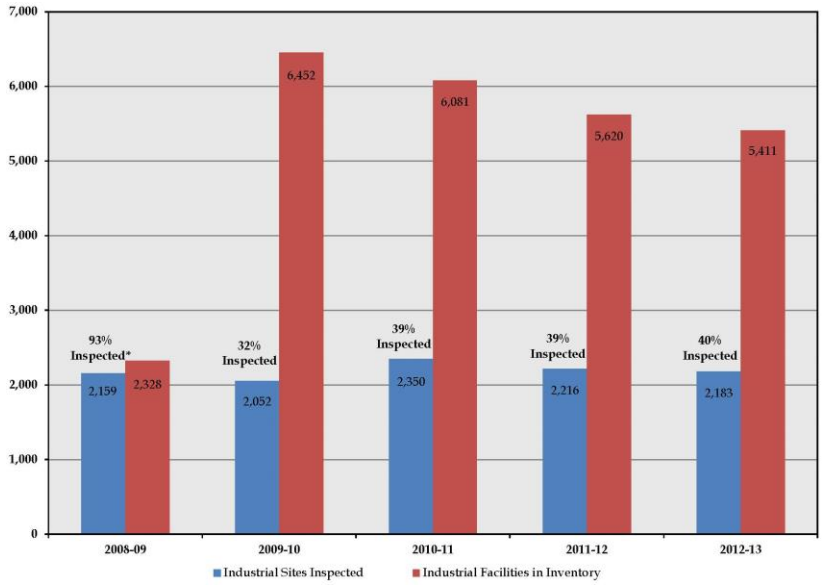

* Low number of industrial facilities in 2008-09 was due to a reporting issue that was subsequently clarified in 2009-10.

Figure 3.6.2: Commercial Facility Inventory and Inspections from 2008-09 to 2012-13

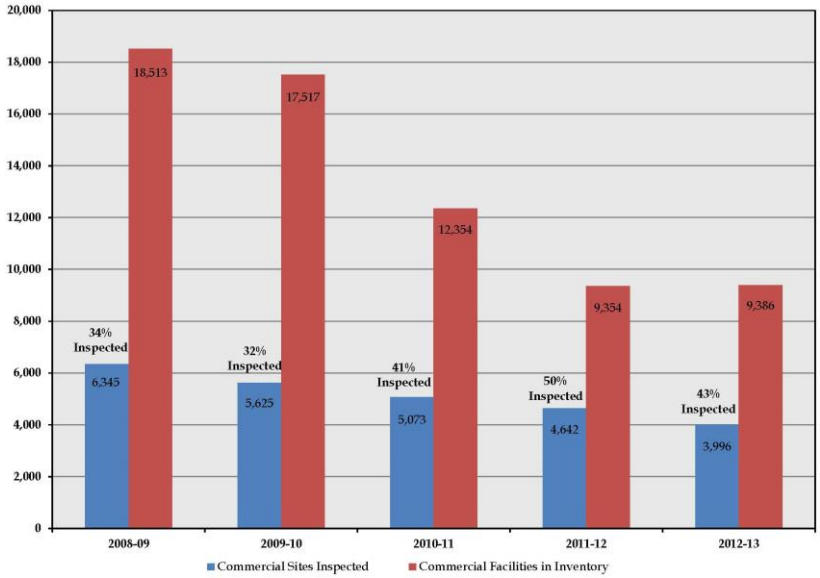

BMP Implementation

Twenty-four (24) model BMP fact sheets have been prepared (available at http://www.ocwatershed.com/IndustrialCommercialBusinessesActivities.aspx) which include a description of specific minimum source control BMPs for common industrial and commercial activities that may discharge pollutants. The California Stormwater Quality Association (CASQA) is currently updating the Industrial BMP Handbook and converting it to a web portal. The Orange County Stormwater Program will be giving consideration to incorporating the updated CASQA BMP fact sheets into the program.

Permittees gauge implementation of the required BMPs through the inspection program. Facilities fall into one of three categories; they have fully implemented, partially implemented, or not implemented any of the required BMPs. As illustrated in **Figure 3.6.3**, the majority (>80%) of industrial and commercial facilities were fully implementing BMPs as required upon inspection.

Figure 3.6.3: Industrial and Commercial Site Compliance Rates (excluding FSEs) from 2008-09 to 2012-13

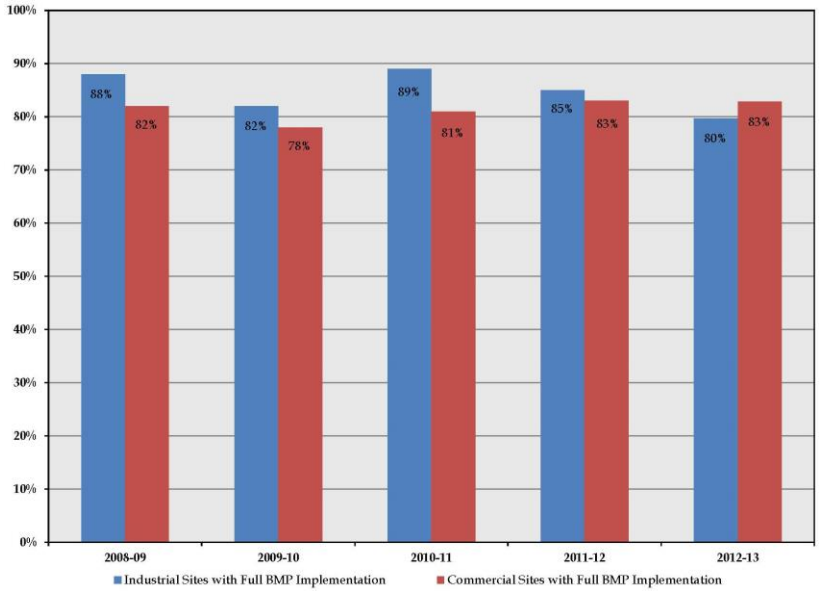

Enforcement Activities

Permittees are required to use a progressive enforcement approach and initiate enforcement actions where commercial and industrial facilities are found to be out of compliance. Enforcement for the industrial and commercial component of the Existing Development Program is the responsibility of

individual Permittees. Each Permittee has several different levels of enforcement to choose from for different types of situations. This includes – from least severe to most severe – issuance of an educational letter, a notice of non-compliance, an administrative compliance order, a cease and desist order, or a misdemeanor/infraction. Over the past five years, the Permittees conducted enforcement as necessary based on the results of the industrial and commercial inspections (**Figure 3.6.4**).

Figure 3.6.4: Industrial and Commercial Enforcement Actions (excluding FSEs) from 2008-09 to 2012-13

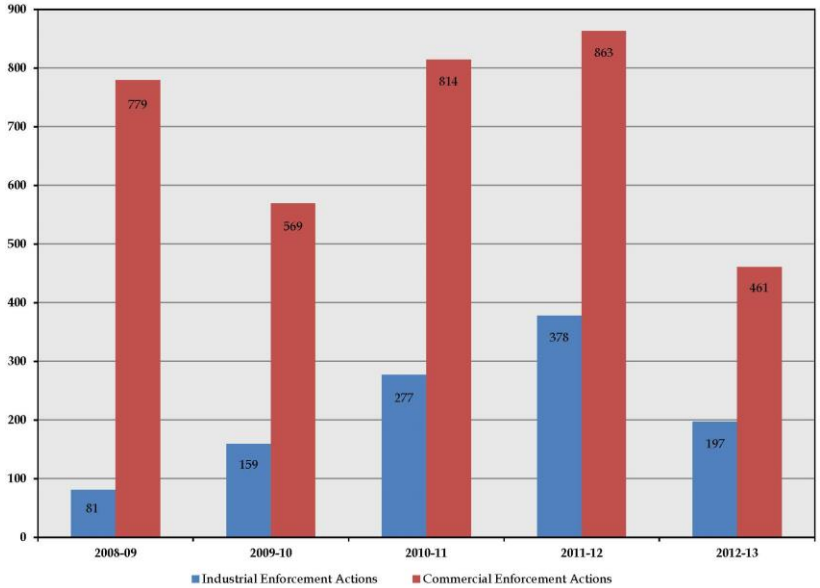

Where non-compliance is evident during inspections, inspection frequency and enforcement actions are increased until compliance is achieved. Increased follow-up and enforcement appear to be resulting in increased rates of compliance. **Figure 3.6.5** illustrates the number and type of enforcement actions taken at industrial and commercial facilities over the past five years. It appears that lower level enforcement actions such as educational letters and notices of non-compliance are typically successful in gaining compliance, although nearly every year, there are over 100 higher level enforcement actions taken against industrial and commercial facilities.

Figure 3.6.5: Industrial and Commercial Enforcement Actions by Enforcement Types (Excluding FSEs) from 2008-09 to 2012-13

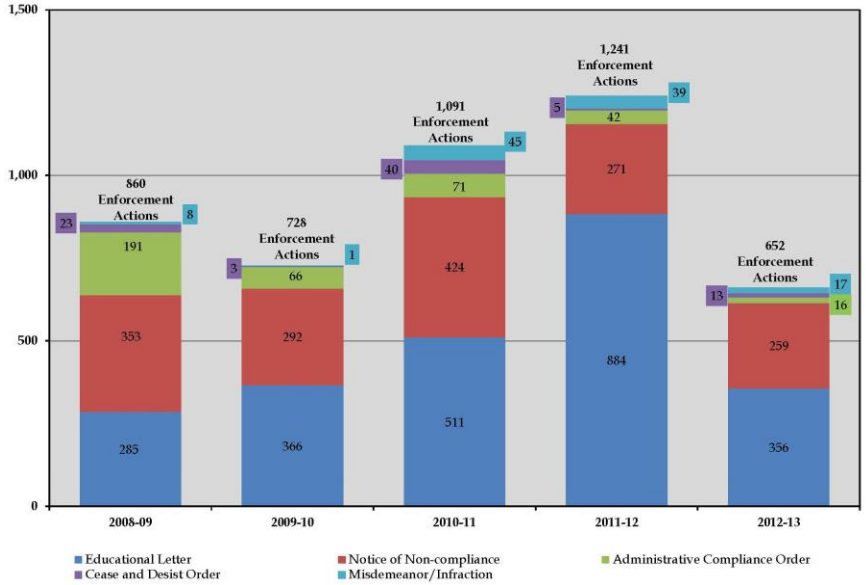

Food Facility Inspection Program

Orange County Health Care Agency (OCHCA) annually conducts up to three inspections of each food service establishment for compliance with the California Uniform Retail Food Facilities Law. The OCHCA inspectors identify NPDES issues during one of these three inspections and they

are forwarded to the respective Permittees for follow up. In **Figure 3.6.6**, a sharp decrease in the number of inspections per year is evident between FY 2008-09 and FY 2009-10, due to a clarification in reporting practices.

Figure 3.6.6: HCA Annual Inspections at Food Service Establishments from 2008-09 to 2012-13

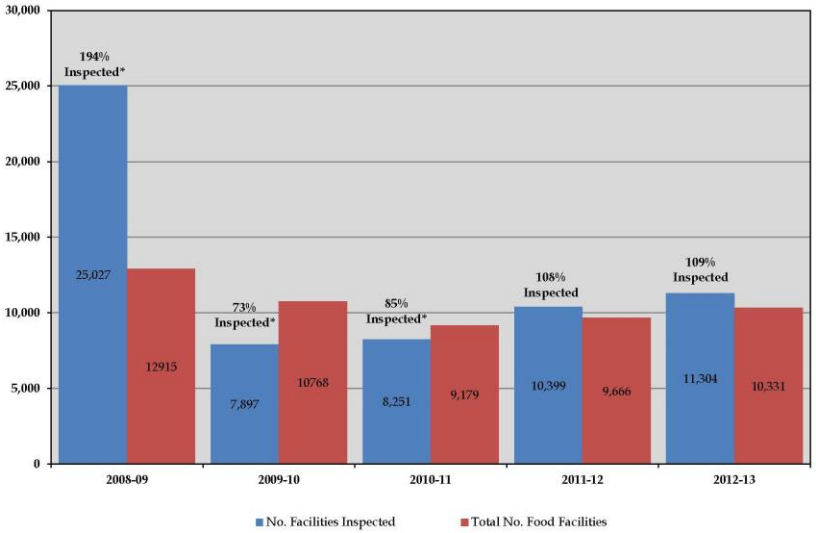

* High number of inspections in 2008-09, and low numbers of inspections in 2009-10 and 2010-11 due to reporting issues that were subsequently clarified in 2009-10 and 2011-12, respectively.

The numbers of inspections resulting in the detection of NPDES issues at FSEs is illustrated in **Figure 3.6.7**. Where these issues were found, Permittees followed up with the necessary enforcement actions. It appears that the numbers of inspections detecting issues has been slowly declining since 2009, from 34% to 24%.

Figure 3.67: NPDES Issues Discovered During Food Service Establishment Inspections Performed by HCA from 2008-09 to 2012-13

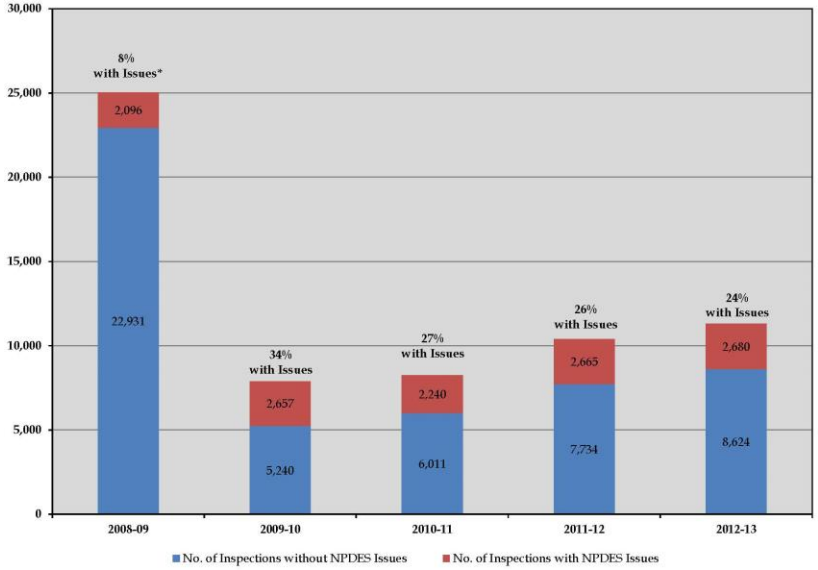

* High number of inspections in 2008-09 due to reporting issues that was subsequently clarified in 2009-10.

Mobile Business Model Pilot Program

Due to their transitory and regional nature, mobile businesses are a challenging component of the Model Existing Development Program. The Mobile Business Model Pilot Program, which was developed in 2009-2010 and commenced in 2010-2011, is a countywide approach to inventorying and regulating mobile businesses. There are five key elements to the Model Program:

1. Develop an inventory of mobile businesses operating within the County;
2. Identify and require implementation of minimum BMPs for mobile businesses;

3. Provide outreach to the mobile businesses;
4. Perform inspections or provide a self-certification process for the businesses; and
5. Conduct enforcement as necessary to ensure compliance.

In 2011, a web-based Mobile Business Database was developed to serve as a countywide inventory and repository for the information for each business pertaining to inspections and/or self-certification, outreach, and enforcement actions. The database allows Permittees to update the inventory with mobile businesses found to operate within their jurisdiction, as well as enter and track enforcement actions in their jurisdiction and countywide. The database tracks over 1,500 mobile businesses and includes information related to the business type, outreach, and enforcement information.

In order to assist surface cleaners in selecting and implementing the appropriate types of BMPs, a Model Surface Cleaner BMP Fact Sheet was developed in 2011. This BMP Fact Sheet provides the minimum control measures required of the mobile businesses.

A mass-mailing notification was distributed in June 2012 to all mobile detailing businesses in the countywide inventory in conjunction with an outreach workshop held on June 27, 2012. The notification included a workshop flier and mobile detailing brochure.

The Permittees implemented appropriate enforcement actions where necessary to ensure that Mobile Businesses were implementing the required BMPs **(Figure 3.6.9)**. The increase in enforcement actions in 2010-11 may be due to improved inventorying countywide after development of the Mobile Business Database (**Figure 3.6.8**).

Figure 3.6.8: Enforcement Actions Issued to Mobile Businesses in Orange County from 2008-09 to 2012-13

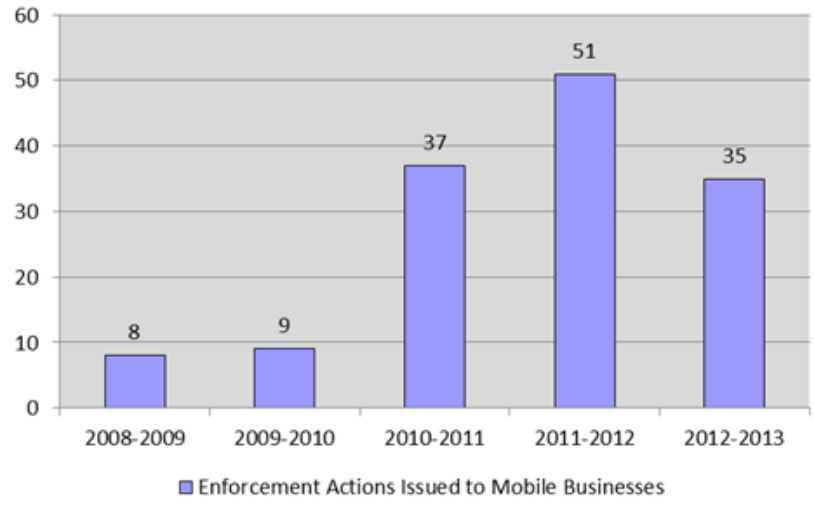

Figure 3.6.9: Types of Enforcement Actions Issued to Mobile Businesses from 2008-09 to 2012-13

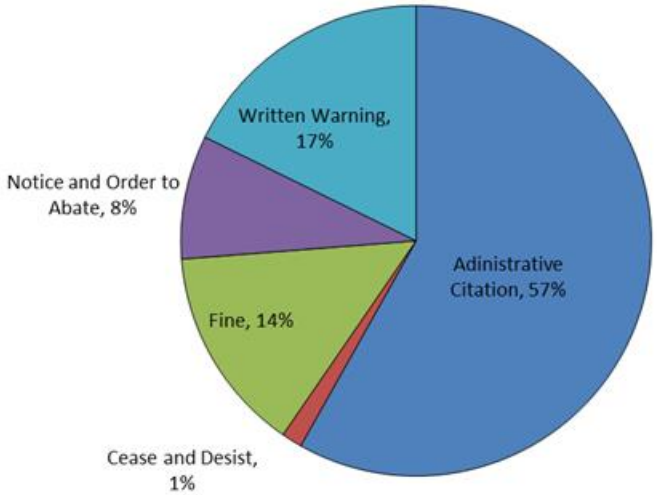

Training

Over the permit term the County developed the *Training Program Framework Core Competencies Document*. The *Training Program Framework Core Competencies* document defines the core competencies (knowledge, level of experience, and skills) necessary to ensure the capabilities of individuals carrying out specialized municipal stormwater program compliance responsibilities. It is expected that an individual or group of individuals who has/have developed these competencies will be able to affect jurisdictional conformance with the DAMP/ LIP and the compliance of their jurisdiction.

The Permittees developed and implemented the training program pursuant to Permit requirements and the DAMP. A region-wide training session was held specific to industrial and commercial inspections on April 7, 2009. The NPDES Inspection Sub-Committee also provided training on various subjects relevant to the Existing Development and ID/IC programs. This sub-committee meets quarterly to provide training to inspectors and others on issues related to spill response, inspection and enforcement.

3.6.3 Model Residential Program Implementation and Assessment

Residential areas comprise a significant portion of the land area of each Permittee's jurisdiction. The Model Residential Program was developed to further reduce pollutants potentially released into the environment from residential activities, including efforts to reduce over-watering. It encourages use of pollution prevention practices as the most effective method to protect receiving water quality and comprises:

- Best Management Practice (BMP) Requirements
- Source identification and prioritization
- Facilitation of hazardous waste collection
- Program Implementation
- Enforcement

During the 2012-13 reporting period, the LIP/PEA Sub-committee updated the eight (8) model BMP fact sheets which include a description of specific pollution-prevention activities for residential areas. The BMP fact sheets are available at http://ocwatersheds.com/documents/bmp/residentialactivities. Each fact sheet contains the following sections: targeted pollutants, required activities, and recommended activities.

BMP factsheets have been prepared for the following activities:

- Automobile Repair & Maintenance
- Automobile Washing
- Automobile Parking
- Home & Garden Care Activities
- Disposal of Pet Waste
- Disposal of Green Waste
- Household Hazardous Wastes
- Water Conservation

Four (4) Household Hazardous Waste Collection Centers, operated by the County of Orange Waste and Recycling Agency, are located at the following sites throughout the county:

- 1071 N. Blue Gum Street, Anaheim, CA 92806
- 17121 Nichols Street – Gate 6, Huntington Beach, CA 92647
- 6411 Oak Canyon, Irvine, CA 92618
- 32250 La Pata Avenue, San Juan Capistrano, CA 92675

The implementation of the residential program relies on education and outreach to notify and urge residents to observe the designated sets of BMPs for each of the high threat activities. Permittees encourage the implementation of the designated BMPs for each residence within its jurisdiction principally through the overall public education element of the Program. The Permittees have also developed a source identification procedure and prioritize residential areas based on proximity to Environmentally Sensitive Areas (ESAs). Over the last five years, the County (as manager of the reporting system) has responded to, or forwarded to Permittees, a total of 260 residential complaints (Figure 3.6.11).

Figure 3.6.10: Residential Complaints, County of Orange, from 2008-09 to 2012-13

Enforcement in residential areas begins with outreach and education and most often compliance is achieved without formal enforcement remedies. However, where necessary, the Permittees have the legal authority to increase the level of enforcement to gain compliance. Where necessary, enforcement actions were taken to achieve compliance. Indeed, between 2008-09 and 2011-12, the County has relied on formal enforcement actions to gain compliance in residential areas in only seven cases. These included two citations, three criminal cases, and two notices of non-compliance. However, many of the residential cases tracked by the County were referred to other agencies for follow-up and enforcement. The analysis of residential enforcement data performed only includes those actions taken by the County.

3.6.4 Common Interest Areas (CIAs) and Homeowner's Associations (HOAs) Program Implementation and Assessment

Orange County is home to over 3,000 CIAs/HOAs and common interest developments account for 80% of all new housing in the County. Within Orange County, approximately 90% of incorporated residential areas lie within 2. the purview of the maintenance associations that govern CIAs/HOAs. Permittees in the San Diego Region have implemented individual CIA/HOA programs since the Third-Term permits.

Nineteen (19) model BMP fact sheets were developed which include a description of specific pollution-prevention activities for CIAs/HOAs. The BMP Fact Sheets are available at http://ocwatersheds.com/documents/bmp/commoninterestactivities.

Enforcement of BMPs in common interest developments relies on the following mechanisms: public reporting hotline, analysis of dry weather/illicit discharge monitoring results, and municipal employee observations. During the permit term, the County responded to, or forwarded to Permittees, 37 complaints related to CIA/HOA issues. When necessary, enforcement may be accomplished in two ways: through enforcement of conditions and restrictions (CC&Rs) enacted by the associations or through the Permittees' enforcement processes.

3.6.5 Recommendations

1. Consider incorporating the updated CASQA BMP fact sheets into the Existing Development Model Program.

Implementation Schedule – Industrial, Commercial, Mobile Program

Industrial, Commercial, and Mobile Program Actions	Recommendation[1]	Implementation Schedule[2]				
		2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
Source Identification and Facility Inventory						
Maintain inventory of required industrial sites	C					
Maintain inventory of required commercial facilities	C					
Maintain inventory of required residential sites	N					
Facility Inspection Activities						
Annually inspect 20%of the industrial and commercial inventory, with 100% of the industrial and commercial inventory inspected over the permit term.	C					
Best Management Practice (BMP) Implementation						
Update BMP Fact Sheets for existing development as necessary	C					
Provide outreach to all industrial commercial facilities during the Permit term	C					
Enforcement Activities						
Conduct follow-up inspections and enforcement as necessary to ensure compliance	C					
Track types of enforcement actions by facility type	E					
Food Facility Inspection Program						
Maintain and update inventory of FSEs	C					

Industrial, Commercial, and Mobile Program Actions	Recommendation[1]	Implementation Schedule[2]				
		2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
Inspect FSEs according to prioritization	C					
Track follow-up and enforcement actions related to FSEs	E					
Mobile Business Model Pilot Program						
Maintain inventory of mobile businesses operating within the County focusing on automobile detailers, carpet cleaners, pet services	E					
Identify and require implementation of minimum BMPs for mobile businesses, focusing on automobile detailers, carpet cleaners, and pet services	E					
Provide outreach to the mobile businesses	C					
Perform inspections or provide a self-certification process for the businesses	C					
Conduct enforcement as necessary to ensure compliance	C					
Training						
Train inspections and field staff as necessary	C					

1. C = Continue; E = Enhance; N = New
2. X = Recommendation will be completed during this fiscal year. Gray shaded cells indicate ongoing implementation.

Implementation Schedule – Residential Program

Residential Program Actions	Recommendation[1]	Implementation Schedule[2]				
		2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
Source Identification and Prioritization						
Update and maintain residential source inventories as necessary	C					
Best Management Practice (BMP) Requirements						
Update BMP Fact Sheets as necessary	C					
Program Implementation						
Respond to notifications of NPDES issues from the public, municipal staff, and other regulatory agencies	C					
Facilitate proper collection and management of used oil and household hazardous waste	C					
Track amounts of used oil and HHW collected	C					
Enforcement						
Enforce ordinances as appropriate	C					
Track enforcement actions	C					

1. C = Continue; E = Enhance; N = New

2. X = Performance Standard will be completed during this fiscal year. Gray shaded cells indicate ongoing implementation.

Implementation Schedule – CIA/HOA Program

CIA/HOA Program Actions	Recommendation[1]	Implementation Schedule[2]				
		2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
Identification of CIA/HOA Areas and Activities of Concern						
Update inventory of CIA/HOAs as necessary	C					
Best Management Practices Implementation						
Update BMP Fact Sheets associated with activities of concern as necessary	C					
Program Implementation Strategy						
Develop guidance for inclusion in CCRs for CIA/HOAs	C					
Require new HOAs to include guidance in CCRs	E					
Perform outreach to CIA/HOAs	C					
Coordinate with UCCE and water districts to enhance approaches to IPM implementation and reducing irrigation runoff	C					
Enforcement						
Enforce ordinances as necessary to ensure BMPs are implemented as required	C					

1. C = Continue; E = Enhance; N = New

2. X = Performance Standard will be completed during this fiscal year. Gray shaded cells indicate ongoing implementation.

Implementation Schedule – CIA/HOA Program

Retrofitting Program Actions	Recommendation[1]	Implementation Schedule[2]				
		2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
Evaluate Opportunities for Retrofit						
Evaluate opportunities for retrofitting existing development to address constituents identified as the highest priorities in the Water Quality Implementation Plan	E					

1. C = Continue; E = Enhance; N = New

2. X = Performance Standard will be completed during this fiscal year. Gray shaded cells indicate ongoing implementation.

3.7 Illegal Discharges/Illicit Connections

The Story: ID/IC

- The requirement to effectively prohibit non-stormwater discharges into the MS4 is one of two fundamental requirements of the Clean Water Act stormwater mandate.

- The Permittees continued to aggressively detect and eliminate Illicit Discharges and Illegal Connections (ID/IC) through discharge monitoring, source investigation, and enforcement.

- A spill reporting hotline (1-877-89-SPILL) provides a resource for public spill and water pollution reporting, and a smartphone reporting application was developed. All reports were responded to and resolved.

- The *Model Investigative Guidance for Orange County Illegal Discharges and Illicit Connections Program* was updated for the Non-stormwater Action Levels (NALs) based monitoring program by inclusion of a new *San Diego Region Dry Weather Numeric Action Level (NAL) Source Identification Guide*.

- Essential elements of the Countywide Area Spill Control Program were completed and implemented.

- The NALs monitoring program was fully implemented.

3.7.1 Overview

It is a specific requirement of the Federal Clean Water Act that non-stormwater discharges, arising from illegal discharges and illicit connections (ID/IC) to the municipal storm drain system, must be effectively prohibited. Since the first term MS4 permit, a programmatic framework for detecting and quickly responding to non-stormwater discharges has been a key integral element of the Program.

3.7.2 Illegal Discharges/Illicit Connections Program Implementation and Assessment

The Model ID/IC Program provides guidance for Permittees when identifying, responding to, and mitigating the effects of non-stormwater discharges**.** The Model Program requires the Permittees to address the following:

- Detect illegal discharges and illicit connections;
- Enable public reporting;
- Investigate illegal discharges and illicit connections;
- Undertake enforcement; and
- Conduct Training.

<u>Detection of Illegal Discharges and Illicit Connections</u>

The Permittees implemented the NALs monitoring program during the Fourth Term MS4 Permit in south Orange County. The NALs monitoring program is outlined in the Fourth Term MS4 Permit and includes numeric action levels derived from Basin Plan objectives that, when exceeded, trigger the need for a source investigation. The NALs monitoring program uses a suite of water quality analyses conducted in the field and through contract laboratories. Field data is entered into the County's CBI MS4 on-line database system to which

Permittees have been provided with login information and have immediate access to all field data once it is entered into the system.

As part of the NALs monitoring program, outfall sites are visited and sampled twice annually; once in the dry season and once in the wet seasons (preceded by an absence of rain for 72 hours). Over the past four years, the Permittees have conducted a total of 175 site visits at 25 sites.

Reporting

The Permittees continue to field complaints stemming from numerous sources, including the water pollution telephone hotlines. Telephone and web-based reporting systems (both countywide and in individual cities) for the general public have been established and are advertised in the Program's public education materials, Orange County "White Pages" telephone directories, and Permittee websites.

The Permittees' field inspectors are trained to detect illegal discharges as part of their daily activities and, indeed, the majority of illegal discharges continue to be detected by Permittee staff. In addition, the Permittees promote hotline numbers, principally 1-877-89-SPILL, to receive water pollution complaints and incident information from the public and use database software to document the reported incidents which assists with the tracking of water pollution complaints by source. The Permittees also developed a smartphone application to provide another tool for the general public to use when reporting water pollution issues

Over the past five years there has been a decrease in the total number of complaints received (**Figure 3.7.1**).

Figure 3.7.1: Source of Complaints from 2008-09 to 2012-13

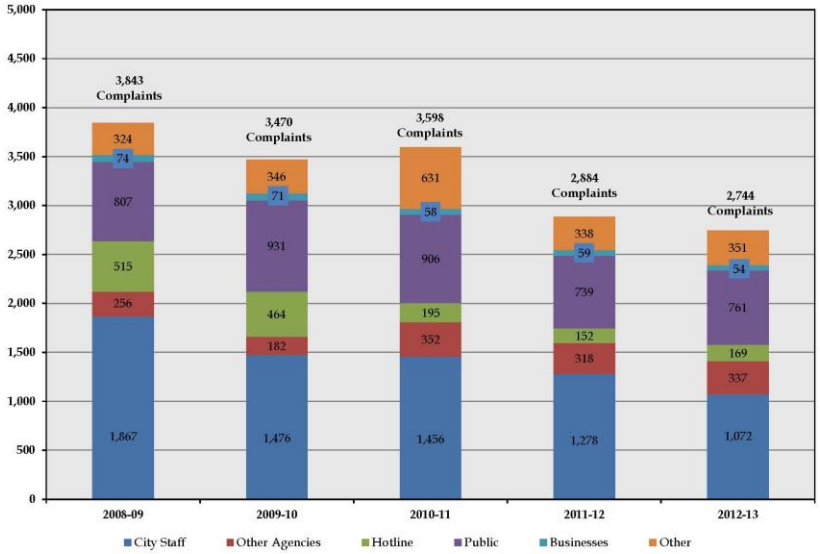

Investigate Illegal Discharges and Illicit Connections

Each Permittee has designated Authorized Inspectors to investigate compliance with, detect violations of, and take actions pursuant to their Water Quality Ordinance. Authorized Inspectors follow specific procedures documented in the *Model Investigative Guidance for Orange County Illegal Discharges and Illicit Connections Program* (*Investigative Guidance Manual*). The *Investigative Guidance Manual* was updated by the Permittees during the permit term. The revision included adding resources and tools as appendices and updating key resources, including an attachment specific to South County Permittees, the *San Diego Region Dry Weather Numeric Action Level (NAL) Source Identification Guide*.

The Permittees maintain records of information from a complaint, notification, or response request. To ensure that the necessary information is collected, the Permittees use pre-established forms to collect information. After the initial entry of the information on the Pollution Notification/Investigation Request (PNIR) or related form, the information is generally entered into a database. The data from the Permittees' databases is analyzed to increase the Permittees' awareness regarding the most problematic waste categories and facility activity types.

Figure 3.7.2 and **Figure 3.7.3** display results from the County-maintained PNIR database covering the 2008-09 to 2011-12 reporting periods. **Figure 3.7.2** provides a breakdown of the waste category under which each ID/IC discharge investigation was classified. The frequency of incident appears to be equally distributed all waste categories. **Figure 3.7.3** displays a breakdown of the facility activity type under which each ID/IC discharge investigation was classified.

Similarly there is no facility type or single land use that is pre-dominantly the subject of investigations.

The data used in the analysis includes information from the mobile business database which is a shared incident reporting database created specifically to ensure effective application of the Enforcement Consistency Guide to businesses operating from mobile premises across multiple jurisdictions. The experience with this database encourages consideration being given to creating a single countywide ID/IC database with the potential to streamline reporting and enable more detailed analyses to better identify priority activities and facility types of concern.

Figure 3.7.2: Waste Categories Encountered during ID/IC or Mobile Business Discharge Investigations

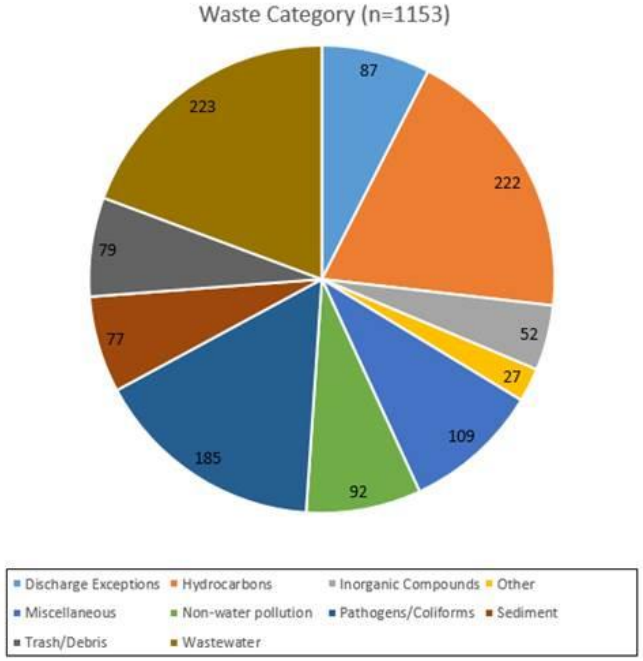

Figure 3.7.3: Facility Activity Types Encountered during ID/IC Discharge Investigations

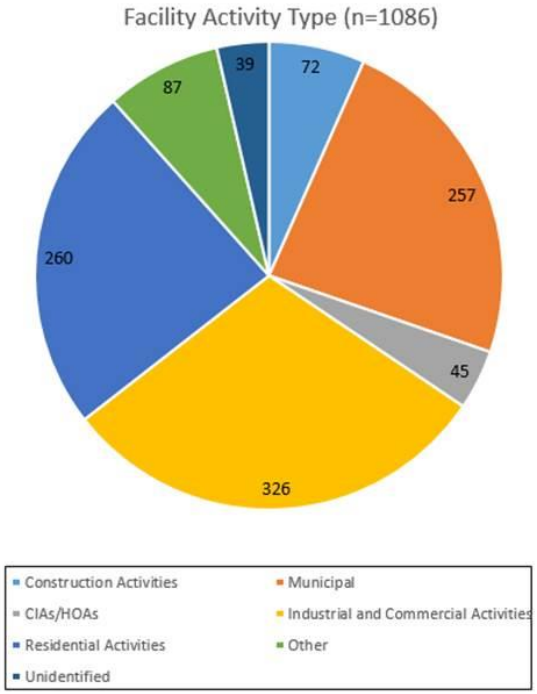

Enforcement

Enforcement actions are undertaken according to the adopted Water Quality Ordinances and accompanying Enforcement Consistency Guide. In instances of noncompliance, the Permittees adopted one of four types of remedies, including educational letters, administrative remedies, criminal remedies, or other civil or criminal remedies, as appropriate. **Figure 3.7.4** displays the number and type of enforcement actions undertaken during the past five reporting periods. The five year trend largely represents a decrease in the total number of enforcement actions. Given the correlating decrease in the total number of complaints received over the same time period, the decrease in the total number of enforcement actions indicates a change in behavior which is causing a decrease in the total number of ID/IC incidents occurring.

Figure 3.7.4: Enforcement Actions 2008-09 to 2012-13

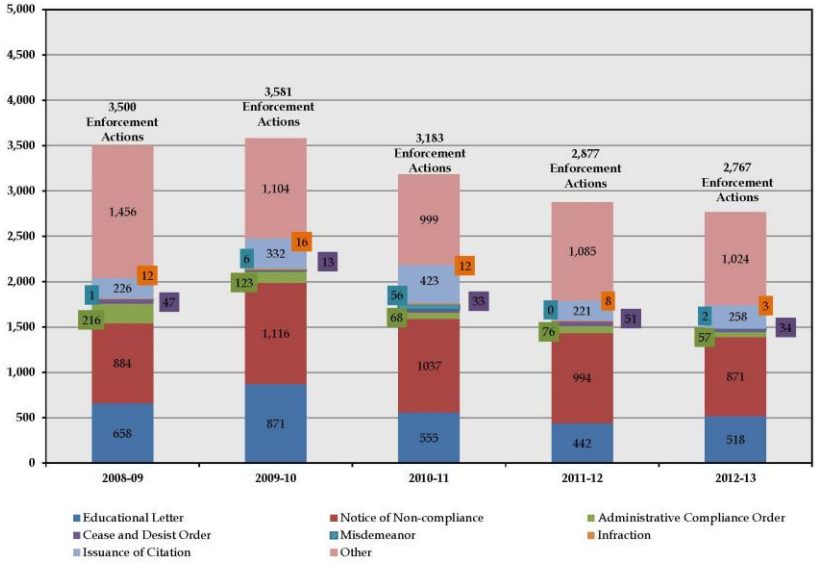

Training

During the permit term, the Permittees developed a training program, including curriculum content. The training program defined expertise and competency for each key area of jurisdictional stormwater program responsibility, including Authorized Inspectors. Illegal Discharges/Illicit Connections (ID/IC) Training Sessions for Authorized Inspectors and spill responders were conducted on May 18, 2010 (66 attendees) and April 16, 2013 (69 attendees). In addition, the NPDES

Inspection Sub-Committee also provided training on various subjects relevant to the ID/IC program. This sub-committee meets quarterly to provide training to Authorized Inspectors and others on issues related to spill response, inspection and enforcement. It also serves as a forum for the coordination and discussion of ongoing difficult or new enforcement, investigation, or enforcement issues and to profile cases or incidents.

Model Sewage Spill Response Procedures

Starting in 2000, the County and OCSD began development and implementation of a coordinated sewage spill prevention and response demonstration project (i.e. the "Countywide Area Spill Control (CASC) Program").

During the permit term, the CASC Program was activated three times in the San Diego Region: (1) March 23, 2010, to respond to a 1.4 million gallon sewage spill; (2) on June 25, 2010, to respond to a 2,400 gallon sewage spill; and, (3) on April 28, 2014, to respond to a 4,600 gallon biosolids spill. The March 23, 2010 incident was the largest CASC response to date, and the response was a major success – a berm was placed in Tijeras Creek to contain the spill and 2.5 million gallons were pumped from the containment and returned from the Santa Margarita Water District sewer system, minimizing both the beach closure area and the total number of beach closure days. For these reasons, the San Diego Regional Board reduced the *Potential Harm for Discharge Violations* score when assessing the Administrative Civil Liability (ACL) for this spill event.

CASC Response on March 23, 2010, Tijeras Creek

Actions Levels

In 2003, the Permittees began implementing the seasonal *Dry Weather Reconnaissance Program* on a countywide basis to monitor storm drain outfalls for the presence of illegal connections and illicit discharges (ID/IC). This Program's hybrid reconnaissance monitoring design combines probabilistic and targeted sampling and the use of formal statistical tools (tolerance intervals and control charts). This design enables the program to systematically prioritize problematic sites, compare conditions to the regional urban background, and track trends over time.

- A *tolerance interval* bound is the upper or lower confidence-interval bound of a quartile of the background data distribution. Tolerance intervals are

derived from the probabilistic site data and are used to quantify the key aspects of the regional background.

- *Control charts* are used to establish an upper or lower bound on a data distribution, based on previous monitoring data. They are created for each site and provide a means of tracking data at individual sites and identifying when new data values deviate substantially (either upward or downward) from previous experience.
- Used together, tolerance intervals and control charts provide a consistent and quantitative means of identifying sites that exhibit clearly aberrant values.

In its Fourth Term Permit for south Orange County the San Diego Regional Board has modified the dry weather reconnaissance-based monitoring to include NALs), based on Basin Plan objectives. Comparison of the approaches shows that the NALs-based program triggers investigative responses at a much higher frequency for many constituents (e.g. enterococci and reactive orthophosphate as P; **Figure 3.7.6** and **Figure 3.7.7** respectively).

Based upon historical data **(Figure 3.7.6)**, for example, the probability that a sample does not exceed the NAL for enterococci is approximately 3%. As a result, 32 out of 33 sampling events would be required to be investigated. In contrast, the probability that a sample does not exceed the enterococci tolerance interval is 90%, which ensures that investigative resources are applied to the most aberrant prioritized discharges.

Figure 3.7.5: Enterococci Exceedance Frequencies Associated with Dry Weather Reconnaissance Tolerance Intervals Compared with Exceedance Frequencies Associated with NALs.

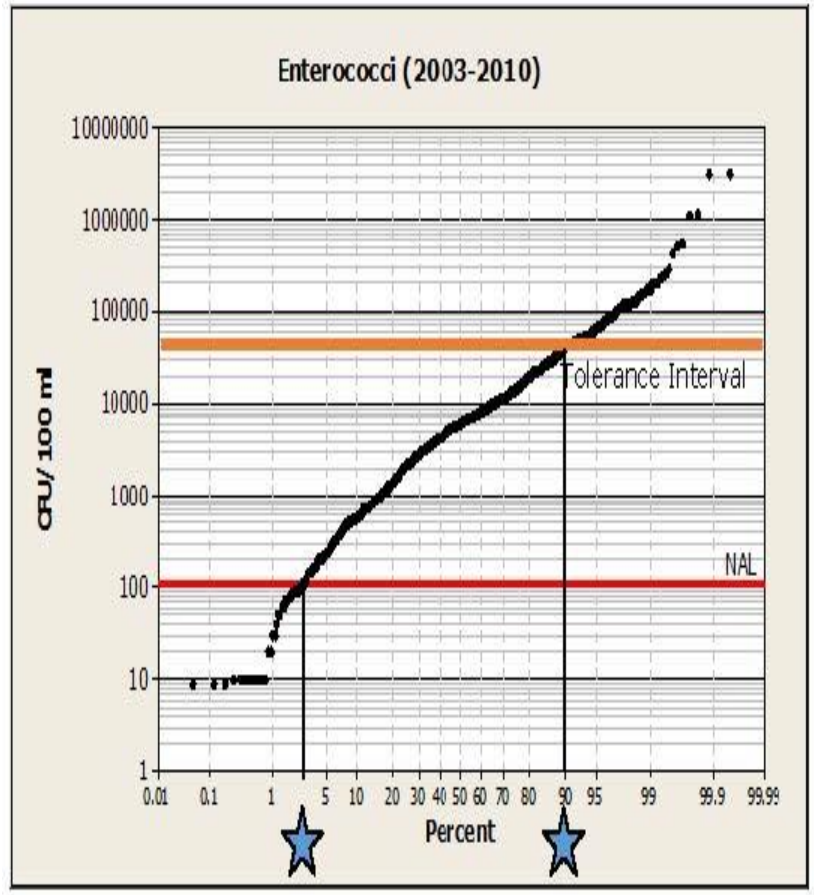

Figure 3.7.6: Reactive Orthophosphate as P Exceedance Frequencies Associated with Dry Weather Reconnaissance Tolerance Intervals Compared with Exceedance Frequencies Associated with NALs

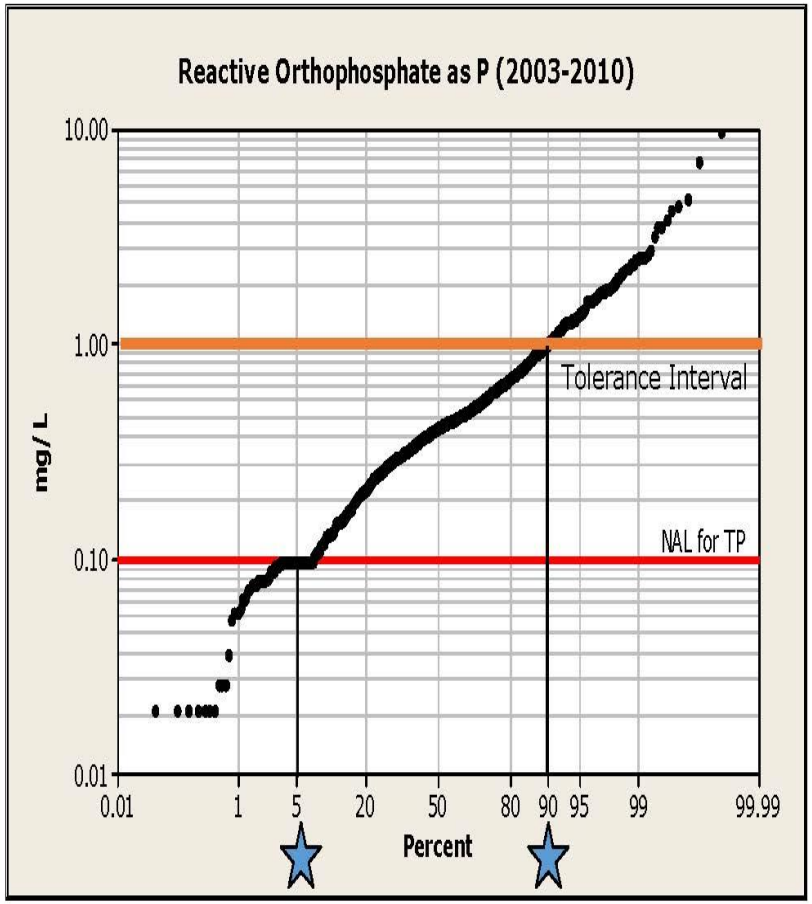

The impact of the switch from "action levels" to "NALs" is demonstrated in **Table 3.7.1**. Under the Dry Weather Reconnaissance Program protocol the Permittees conducted 274 site visits; whereas for the NAL-based program the Permittees conducted 45 site visits. Although the Permittees collected data and information for six times more stations as a part of the Dry Weather Reconnaissance Program, the NALs-based program identified more than six times the number of exceedances, thereby confounding the ability of the Permittees to prioritize investigative efforts.

The South Orange County Permittees have found strong positive linear relationships between phosphorus and metals associated with seepage and exfiltration of shallow groundwater from the Monterey and Capistrano marine sedimentary formations. Both formations are known to be enriched in trace metals and phosphorus and are prevalent across southern Orange County. This evidence suggests that many exceedances are due to non-ID/IC factors (i.e. local geology - Ni, Cd). These findings underscore the concern of the Permittees that the NALs preclude the Permittees from discriminating between instances of ID/IC and non-ID/IC conditions and is therefore inconsistent with a mandate that requires the effective prohibition through ordinance of non-stormwater discharges arising from ID/IC. See additional discussion of this issue in **Attachment 3.7.1.**

Table 3.7.1: Comparison of the 2011-12 NALs Data Collected in the San Diego Region with the Data from the Dry Weather Hybrid Reconnaissance Monitoring Program for the 2009-10 Reporting Period

Constituent	# of NAL Exceedances	% of NAL Exceedances	# of Reconnaissance Action Level Exceeedances	% of Reconnaissance Action Level Exceeedances
	2011-2012		2009-2010	
pH	1	2	0	0
TDS	42	93	0	0
Dissolved Oxygen	2	4	0	0
Turbidity	3	7	3	1
Surfactants	3	7	14	5
Total Coliforms	24	53	0	0
Fecal Coliforms	19	42	0	0
Enterococcus	42	93	0	0
Unionized Ammonia	3	7	8	3
Total Nitrogen	41	91	0	0
Total Phosphate	38	84	11	4
Cadmium	13	28	0	0
Copper	1	2	0	0
Nickel	7	15	0	0
Zinc	1	2	0	0
Total # of Site Visits	**45**		**274**	

3.7.3 Recommendations

The major elements of the program (e.g. the facilitation of public reporting of complaints, and the designation and training of Authorized Inspectors) continue to be vital and successful pieces of the Program. However, the NALs Program has proven to be less effective than the Dry Weather Reconnaissance Program. The recommendation is:

1. **Reinstate an approach, such as the Dry Weather Reconnaissance Program, that allows investigative resources to be directed toward abating priority aberrant discharges.**
2. **Continue implementation of CASC.**
3. **Consider development of a standardized reporting database potentially accessible by all Permittees.**

Implementation Schedule – ID/IC

Proposed ID/IC Program Actions	Recommendation[1]	Implementation Schedule[2]				
		2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
Detect Illegal Discharges and Illicit Connections						
Implement Dry Weather Reconnaissance Program monitoring approach to prioritize investigations on non-stormwater discharges arising from ID/IC.	N					
Facilitate Reporting						
Advertise telephone, web-based, and applications-based reporting systems	C					
Investigate Illegal Discharges and Illicit Connections						
Investigate compliance with, detect violations of, and take actions pursuant to each Permittee's respective Water Quality Ordinance and the *Investigative Guidance Manual*	C					
Maintain records of information from monitoring, a complaint, notification, or response request in an ID/IC database	C					
Evaluate using a standardized ID/IC record-keeping system and/or database amongst all Permittees	N		X			
Enforce upon Illegal Discharges and Illicit Connections						
Take enforcement actions according to each Permittee's respective Water Quality Ordinances and accompanying Enforcement Consistency Guide	C					

Proposed ID/IC Program Actions	Recommendation[1]	Implementation Schedule[2]				
		2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
Track enforcement actions	C					
Conduct Training						
Develop additional training modules as needed	E	X				
Conduct training of Authorized Inspectors	C					
Model Sewage Spill Response Procedures						
Implement CASC Program countywide	C					

1. C = Continue; E = Enhance; N = New
2. X = Recommendation will be completed during this fiscal year. Gray shaded cells indicate ongoing implementation.

4.0 Controlling Pollutant Sources: Watershed Programs

The Story: Watershed Programs

- Extensive watershed mapping of hydromodification susceptibility, infiltration feasibility and regional BMP opportunity sites for the entire south Orange County area has been completed.

- Watershed Workplans for all six San Diego Region Watersheds were developed and implemented. These workplans describe the Watershed Permittees' collective watershed strategies to assess, prioritize and address water quality challenges within each watershed.

- Comprehensive Load Reduction Plans (CLRPs) were developed for Aliso Creek, San Juan Creek and San Clemente Coastal Streams Watersheds. These watershed CLRPs were developed to address bacteria pollutants and other watershed 303(d) listed constituents.

- Dana Point harbor was delisted for Indictor Bacteria and 17 shoreline stations were delisted for *Enterococcus*, Fecal Coliform and Total Coliform.

- Baby Beach TMDL dry weather load reductions have been achieved for total coliform and the 50% load reduction milestones for fecal coliform and Enterococcus have also been achieved. Wet weather data also supports the conclusion that TMDL load reductions have been achieved for total coliform and fecal coliform. Further reductions are needed for Enterococcus.

4.1 Overview

Watershed management is the term used for the approach to water quality planning that places an emphasis on the watershed (the area draining into a river system, ocean or other body of water through a single outlet) as the planning area and looks to multi-jurisdictional solutions to problems that cut across programs and jurisdictional boundaries.

While the focus of watershed planning in south Orange County is on specific pollutants of concern associated with urban stormwater, particularly TMDLs, this management approach is also supportive of broader objectives such as watershed habitat restoration, consistent with the Practical Vision, and integrated water resource management.

There are six distinct watersheds within the San Diego Regional Board area which are identified in **Table 4.1** and shown **in Figure 4.1**

Table 4.1: San Diego Region Watersheds

Watershed Planning Area	Major Watercourses
Laguna Coastal Streams	Laguna Canyon Creek
Aliso Creek	Aliso Creek
Dana Point Coastal Streams	Salt Creek
San Juan Creek	San Juan Creek, Oso Creek, Trabuco Creek, Bell Canyon, Verdugo Canyon
San Clemente Coastal Streams	Prima Deshecha, Segunda Deshecha
San Mateo Creek	San Mateo Creek

Figure 4.1: Orange County Watershed Boundaries

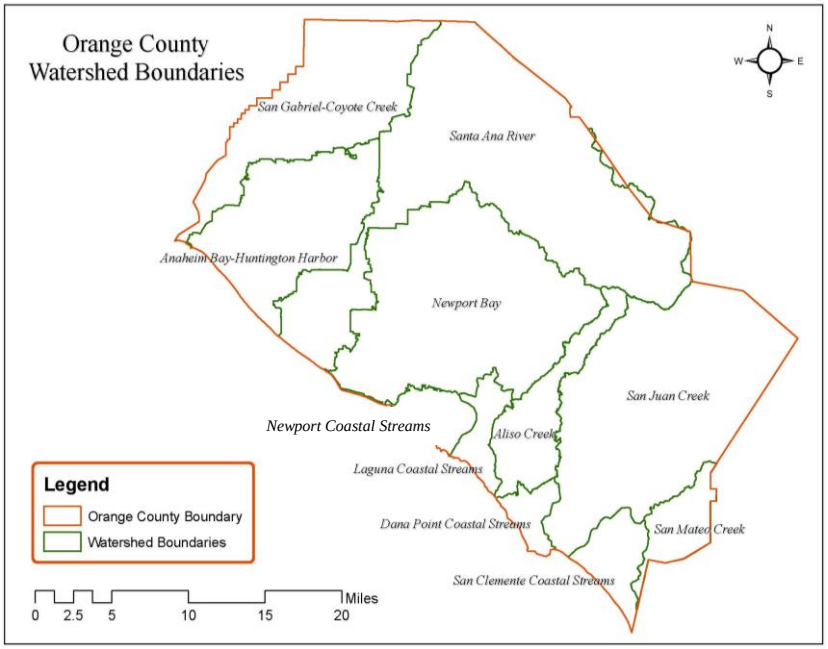

4.2 Non-TMDL Watershed Accomplishments

During the Fourth Term Permit, non-TMDL watershed management efforts—supportive of integrated water resource management—have included mapping of the landscape characteristics that are significant for hydrologic processes, adoption of an Integrated Regional Watershed Management Plan for south Orange County, preparation of Watershed Workplans for each of the six San Diego Region Watersheds, and engaging the public regarding local watershed issues.

Watershed Mapping Tool

A key element of watershed planning is identification of opportunities for regional and subregional stormwater management facilities. These facilities can play a critical role in more quickly realizing water quality, hydromodification, water supply and/or habitat goals compared to approaches that are exclusively reliant upon on-site mitigation.

Initial extensive watershed mapping of hydromodification susceptibility, infiltration feasibility and regional BMP opportunity sites for the entire south Orange County area has been completed and is available through the County's land records web-based portal, known as the Land Records 2.0 mapping tool: http://landrecords.ocpublicworks.com/ocsl/.

Integrated Regional Watershed Management Plan

Although it is not a permit requirement, the preparation of an Integrated Regional Watershed Management Plan (IRWMP) provides for a coordinated approach to resource management and capital improvement planning. This coordinated approach also leverages partnerships with regional stakeholders and existing programs and plans, such as TMDLs, and consolidated grants.

The State of California has been promoting integrated regional water management planning, as a means of achieving more sustainable water use. IRWMPs are a more efficient and effective way to manage water resources. It allows for regional prioritization of important watershed issues and for consensus to be reached on how to address those issues. Whereas watershed planning for stormwater management is focused on enhanced BMP implementation targeting specific

constituents of concern within a watershed, an IRWMP is an integrated plan for all water resources projects, including water supply, wastewater, flood management, stormwater and urban runoff, aquatic habitat, and recreation.

Governance for water quality programs is organized around three geographic sub-areas, or watershed management areas (WMAs)--North Orange County, Central Orange County, and South Orange County. Aliso Creek, San Juan Creek, Laguna Coastal Streams, Dana Point Coastal Streams, San Clemente Coastal Streams and San Mateo Creek (within Orange County) watersheds comprise the South Orange County WMA which falls wholly under the jurisdiction of the San Diego Regional Board.

The County of Orange, cities, and water and wastewater agencies of south Orange County formed the South Orange County Integrated Regional Water Management (IRWM) Group in 2004 and subsequently developed and adopted the South Orange County IRWMP in 2005.

In January 2007, the South Orange County IRWMP was one of seven statewide proposals recommended for funding. In July 2007, the South Orange County IRWM Group executed a Prop 50 IRWM Implementation Grant Agreement with the State Water Resources Control Board to receive grant funds in an amount of $25,000,000 for the seven highest ranking projects included in the IRWMP. One of the completed projects for which the water management strategy was water quality was the City of Laguna Beach's Heisler Park Marine Habitat Protection Project. This project was designed to reduce runoff to the ecological reserve. The park improvements include: a controlled and efficient irrigation system; bluff-top landscape grading; surface drain and pathway improvements; storm drain improvements; installation of three (3) urban runoff diversion automation systems in existing Continuous Deflection Separation (CDS) units; and coastal bluff stabilization.

An IRWMP update was initiated in 2012 to meet Prop 84 State guidelines and included a call for projects. 57 project forms were received. These projects were added to previous projects for a total of 139 projects now included in the IRWMP. Five of the top ten projects on the priority project list directly address water quality.

The updated plan was finalized in 2013 and adopted by the South Orange County WMA Executive Committee. The Final and Approved 2013 IRWMP is available at the following link: http://ocwatersheds.com/programs/ourws/wmaareas/wmasouthoc/soc_wma_irwmp

Watershed Workplans

Pursuant to Directive G of Order No. R9-2009-0002, Watershed Workplans were developed for each of the six watersheds in south Orange County. These Workplans describe the Watershed Permittees' development and implementation of a collective watershed strategy to assess and prioritize the water quality challenges within the watershed's receiving waters, identify and model sources of the highest priority water quality challenges, develop a watershed-wide BMP implementation strategy to abate highest priority water quality challenges, and a monitoring strategy to evaluate BMP effectiveness and changing water quality prioritization in each watershed.

The 2012-13 reporting period marked the tenth year of implementation of Watershed Action Plans/Watershed Workplans. The Watershed Workplans build on the considerable work and studies that have been completed collaboratively over a multi-year period. These include the following initiatives:

- Development and implementation of the *Drainage Area Management Plan (DAMP)/Jurisdictional Runoff Management Plans (JRMPs)*.
- *2005 Draft Identification of Retrofitting Opportunities Study* – this study identifies potential retrofit sites adjacent to or near existing flood control infrastructure under public ownership.
- *South Orange County IRWMP* – integrated regional watershed planning fosters development of holistic solutions to problems; addresses problems at the source; and integrates projects and programs throughout the region that have logical overlaps.
- *Southern California Coastal Water Research Project (SCCWRP) epidemiology and microbial source tracking study* – this study examined several new techniques for measuring traditional fecal indicator bacteria, new species of bacteria, and viruses to determine whether they yield a better relationship to human health outcomes than the indicators presently used in California.
- *Hydromodification controls* – these controls seek ways to mitigate erosion impacts by establishing requirements for controlling runoff from new development and significant redevelopment. These plans typically include decentralized storm water management systems and protection of natural drainage features, such as wetlands and stream corridors. Runoff is typically directed toward infiltration-based storm water BMPs, such as those included in the Watershed Workplans, that slow and treat runoff.

The Watershed Workplans consider the findings of the Receiving Waters and MS4 Discharge Monitoring Program in addition to other characterizations of receiving water quality. This data is used to inform management decisions in each of the watersheds, which includes guiding the type and location of BMPs to employ.

Water quality is assessed through a review of water quality standards and objectives, NPDES wet weather and non-stormwater monitoring data, indicator bacteria data for coastal waters collected from the Orange County Health Care Agency (OCHCA) and South Orange County Wastewater Authority (SOCWA), special studies conducted within the region, watershed management plans, and through informal data exchange and discussions with watershed residents, local conservation agents, and government officials.

Indicator bacteria exceedances (as determined by fecal indicator bacteria) at south county beaches and creeks, and the resulting potential for human health impacts, is currently the most significant concern for the region based upon MS4 permit and bacteria TMDL requirements. Consequently, indicator bacteria has been the primary focus of existing watershed water quality monitoring programs. As new data is collected through the Orange County Stormwater Program's regional monitoring efforts, future watershed specific TMDL monitoring and assessment efforts, and pollution source identification monitoring special studies, the characterization of receiving water quality will be expanded to include additional pollutants as priorities.

Changes in receiving water indicator bacteria levels concentrations have seen some positive improvements over the past few years. In general, the number of beach monitoring sites affected by the more stringent *Enterococcus* standard is showing a decreasing trend in the number of sites affected. These changes are attributed partially to 1) the cumulative effects of increasing attention on water conservation and 2) continued education of the public on the pollution prevention, but substantially to 3) implementation of structural BMPs at problematic sites.

Heal the Bay, a nonprofit environmental organization, reports the results of routine monitoring of beaches conducted by local health agencies and dischargers annually in their Beach Report Card. In the 2013 Beach Report Card, water quality in Orange County was reported as excellent with 93% A or B grades. Beach water quality during the winter dry weather was also very good with 86% A or B grades. Wet weather A and B grades (73%) were up four percent from last year and bested the five-year average by 17%.

Examples of special studies on pollutant source tracking for pollutants of concern in addition to and including indicator bacteria include:

Fecal Indicator Bacteria Special Study at Doheny Beach and Poche Beache

The San Juan Creek and San Clemente Coastal Streams Watershed Permittees have invested in source investigation studies and made long term capital investments in additional control measures to reduce runoff impacts on beach water quality at Doheny Beach and Poche Beach. The efforts undertaken during the Fourth Term Permit include:

- Completing the Prima Deschecha watershed study to identify sources and develop plans for additional BMPs to mitigate indicator bacteria levels at Poche Beach;
- Continuing operation of the Poche Beach ultraviolet treatment system to reduce indicator bacteria levels in watershed runoff;
- Conducting a pilot scale falconry project to discourage gulls from congregating at Poche Beach;
- Providing support for the scientific development of new microbial source tracking host-specific fecal source markers through contributions of in-kind services to the Source; and
- Providing support of scientific advancements to identify beaches affected by potential human sources through contributions of in-kind services to the Southern California Bight-13 Regional Monitoring Program Shoreline Microbiology Study.

The goal of the source investigations at Poche Beach and Doheny Beach, which are ongoing, are intended to develop a prioritization effort to identify and ultimately reduce the most important sources that represent a potential health risk for beach visitors.

Origin of Fecal Indicator Bacteria Impairments at Doheny State Beach

This study was designed to answer questions about the origin of bacteria impairments along Doheny State Beach from San Juan Creek. The study found that the native bird population accounts for the single largest percentage of fecal indicator bacteria variability and mass contribution in dry weather flows to the Pacific Ocean Shoreline at the beach.

Additionally, the main sources of fecal indicator bacteria in San Juan Creek appears to be concentrated at the pond at the mouth of San Juan Creek and not from the lower watershed.

Trace Metals

This is an ongoing study in the region, which includes monitoring for trace metals to better understand the nature of sources in runoff. In recent years, efforts lead by the County to characterize natural sources from ambient geology demonstrated that native soil attributes in specific areas are the primary contributor for many constituents of concern such as cadmium, nickel, chloride, sulfate, and selenium. Understanding the true source of naturally derived pollutants is important from not only a scientific basis but also from a management perspective.

Trash & Debris

This special study is ongoing and relates to trash monitoring in San Diego Region watersheds. The goals of the trash monitoring efforts are to help determine the extent of the issue and improve our understanding of managing trash in the environment using multiple efforts on both regional and local scales.

Oso Creek Dissolved Solids Study

This study was conducted to compile information on the impairments and assessed three aspects of water quality in Oso Creek, a subwatershed to San Juan Creek:

1. An evaluation of the current water quality condition of Oso Creek in comparison with three reference streams of similar geological characteristics;
2. Use of stable isotope measurements to assess whether current sulfate levels may be originating from sulfur based fertilizers; and,
3. A review of historic information to examine critical points in the development of the watershed over time that may have contributed to the impairments and may continue as potential barriers to corrective actions.

Three general and somewhat contrary water quality findings from this study are the key points of consideration for future efforts:

1. The dissolved solids are consistent with the geology and reference streams in terms of the concentrations,
2. The process of urbanization appears to have increased dissolved solid levels over the time period of the developed watershed history by increasing groundwater loadings, and
3. Successful efforts to decrease the domestic water runoff appear to have contributed to increases in dissolved solids concentration.

L01S03 Drainage Area Nitrogen and Phosphorus Source Investigation

Water quality data for the L01S03 drainage system in the San Juan Creek watershed has shown that the drainage area has elevated levels of nitrate-nitrogen and phosphorus. This study was conducted to investigate and identify the source of the elevated nutrients. The results of this drainage area source identification and investigation support that the source of

elevated nitrate-nitrogen and phosphorus source in the L01S03 drainage system originates from natural groundwater seepage in contact with the Capistrano Formation geology.

The watershed Permittees use the water quality monitoring data and findings from the special studies to develop BMP action plans. These action plans contribute to attaining receiving water quality objectives. Copies of the BMP action plans are included with each of the Watershed Workplans, which are available at the following links:

Aliso Creek:
http://ocwatersheds.com/programs/ourws/alisocreek/reportsstudies

Dana Point Coastal Streams:
http://ocwatersheds.com/programs/ourws/dpcoastalstreams/reportsstudies

Laguna Coastal Streams:
http://ocwatersheds.com/programs/ourws/lagunacoastalstreams/reportsstudies

San Clemente Coastal Streams:
http://ocwatersheds.com/programs/ourws/coastalstreams/sanclementecoastalreportsstudies

San Juan Creek:
http://ocwatersheds.com/programs/ourws/sanjuancreek/sjreportsstudies

San Mateo Creek:
http://ocwatersheds.com/programs/ourws/sanmateocreek/reportsstudies

Public Outreach and Participation

The governance structure for the WMAs, which was developed at the request of the Orange County Board of Supervisors, includes a variety of methods to engage the general public. The process provides balanced access and opportunity for participation in the IRWM process. It includes participating in stakeholder workshops, inclusion in the IRWM process, communication via email and information sharing via the County's website www.ocwatersheds.com.

Additionally, directive G of Order No. R9-2009-0002 includes a provision for public participation. The first drafts of the Watershed Workplans were posted on the www.ocwatersheds.com website in November 2010 for public review and comment prior to submittal to the San Diego Regional Water Quality Control Board. No comments specific to the plans were received. The south Orange County Permittees held the inaugural annual public stakeholder meeting the following year in December 2012 to identify issues of concern among residents in the watershed. Attendance for the meeting was low. Given the well-established stakeholder structure of the IRWM process, high level of public stakeholder involvement, and in the interest of a truly integrated approach to water resources, all of the south Orange County watershed permittees elected to integrate the annual public update of the Watershed Workplans into the IRWM stakeholder process. This approach also gives the south Orange County watershed Permittees the ability to reach the same stakeholders, as well as a broader audience, including water and sewer agencies and elected officials.

4.3 TMDL Watershed Accomplishments

Through the Fourth Term Permit term, the Permittees have made significant progress addressing the Beaches and Creeks TMDL and the Baby Beach TMDL. Accomplishments include:

Beaches and Creeks Bacteria TMDL

On February 10, 2010, the San Diego Regional Water Quality Control Board adopted indicator bacteria TMDLs for impaired beaches and creeks in the San Diego Region (Beaches and Creeks TMDLs). This TMDL includes over nine and a half miles of County beaches, the entire length of Aliso Creek and the lower mile of San Juan Creek.

As a first step to TMDL compliance, watershed Comprehensive Load Reduction Plans (CLRPs) were developed outlining the BMPs needed to meet TMDL Waste Load Allocations (WLAs) and special studies to identify sources of indicator bacteria and other listed pollutants in the watershed. In October 2012, Aliso and San Juan Creek Watershed Permittees submitted draft CLRPs to the San Diego Regional Water Quality Control Board for review. Subsequently, a draft CLRP for the San Clemente Coastal Streams Watershed was submitted in December 2012.

The CLRPs describe the approach taken by the Watershed Permittees in response to San Diego Regional Water Quality Control Board Resolution No. R9-2010-0001 (Amending the Water Quality Control Plan for the San Diego Basin [9] to Incorporate Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Beaches and Creeks in the San Diego Region [Including Tecolote Creek]). As described in the resolution, development of a watershed pollutant load reduction plan is a required step in the bacteria TMDL. To fulfill this requirement watershed CLRPs were developed to address bacteria pollutants and other watershed 303(d) listed constituents. Key CLRP elements include: assessing watershed conditions and setting priorities including development of a Watershed Monitoring and Assessment Program; assessing BMP effectiveness and developing a CLRP Implementation Strategy; developing individual Watershed Permittee BMP Action Plans; and, preparing a schedule for loading reductions to be achieved.

The 2010 Clean Water Act Section 303(d) list identifies the following pollutants/stressors for segments in the Aliso Creek Watershed: indicator bacteria, selenium, total nitrogen, total phosphorus, toxicity, Benzo[b]fluoranthene, Dieldrin, and sediment toxicity. San Juan Creek is listed for: indicator bacteria, chloride, sulfates, total dissolved solids, total nitrogen, total phosphorus, toxicity, DDE, Diazinon, and selenium. San Clemente Coastal Streams are listed for: indicator bacteria, phosphorus, turbidity, toxicity, cadmium and nickel. With the exception of indicator bacteria where TMDLs have been developed, current monitoring provides limited data on these other constituents at a watershed scale. Additional monitoring and data analysis is needed to calculate pollutant loads, identify hotspots, better define human health risks, habitat impacts, and in the case of toxicity determine the specific pollutants causing impairment. As a result initial CLRP efforts focus on bacteria TMDLs and a series of additional studies to collect the data necessary to understand the extent of impairment for other watershed pollutants.

The BMP Action Plans contained in the CLRPs detail current and proposed structural and non-structural BMP efforts. Projected watershed bacterial load reductions were calculated

based upon these plans to determine overall progress within the watershed and an expected reduction schedule.

By using an adaptive management approach, it is anticipated that the continual refinement of watershed BMP Action Plans and data gathered through CLRP Monitoring and Assessment Program will result in reductions consistent with bacteria TMDL WLAs and an improved understanding of watershed water quality impairments and the measures needed to address them.

Examples of BMPs in the action plans include two new wetlands constructed during the Fourth Term Permit, the Glenwood Wetland in Aliso Viejo which will treats runoff from 230 acres of golf course, residential and HOA common area and public parks; and the Oso Parkway Southside Wetland in Laguna Hills which treats 30 acres. Wetlands have proven to have high bacteria removal efficiency during dry weather. For example, the Wood Canyon Emergent Wetland at J02P08 in Aliso Viejo has reduced the concentration of indicator bacteria significantly--over 95% or 1 to 2-logs. The level of fecal coliform bacteria dropped to an average of 58 CFU/100 mL, which is lower than REC-1 water quality objective of 200 CFU/100mL. Both the Glenwood Wetland and the Oso Parkway Southside Wetland is expected to achieve similar bacteria removal efficiency.

Another BMP effective at bacterial removal are debris gates. The cities of Laguna Hills, Laguna Niguel and Lake Forest have installed debris gates at a number of catch basins to prevent gross pollutants from entering the MS4. Based on previous projects and studies, the debris gates are anticipated to provide an 85% reduction in debris in basins at pre-wet-season cleanout, and 68% reduction in number of basins containing any pollutant-laden debris that would contaminate influent water during dry weather. During wet weather an average of 85% decrease in debris quantity in catch basins yielding 85% decrease of first-flush pollutant constituents released to MS4 at start of each storm of rainy season has been observed.

The efforts to date to reduce bacteria impairments have proven successful. On October 11, 2011, USEPA issued its final decision regarding the water bodies and pollutants USEPA added to California's 2010 303(d) List, which also included State Water Board staff recommendations for additions, deletions or changes. The following list of segments were recommended for deletion in the 2010 Integrated report and were included in the final approved 2010 303(d) list: Dana Point harbor was delisted for Indictor Bacteria (Note: 0.03 mile was included on the 2010 303(d) list for *Enterococcus* and Total Coliform, and the listing for Total Coliform relates to the SHELL standard and not REC-1); 17 shoreline stations were delisted for *Enterococcus*, Fecal Coliform and Total Coliform; 2 shoreline stations were delisted for *Enterococcus* and Fecal Coliform; 2 shoreline stations were delisted for Fecal Coliform and Total Coliform; and 2 shoreline stations delisted for Fecal Coliform. Note that the 2006 303(d) list included whole segments that were later broken down to stations on the 2010 303(d) list. Several segments/stations were also changed from the all-encompassing Indicator Bacteria on the 2006 303(d) list to Total Coliform, Fecal Coliform, and/or Enterococcus on the 2010 303(d) list.

Baby Beach TMDL

In June 2008, the San Diego Regional Water Quality Control Board adopted indicator bacteria Total Maximum Daily Loads

(TMDLs) for Baby Beach in Dana Point Harbor. The TMDLs require 82.7-96.2% (dependent upon specific indicator bacteria) waste load reductions from the stormdrain system. Total Coliform, Fecal Coliform and *Enterocossus* wet weather reductions have to occur by December 31, 2019. Dry weather reductions for Total Coliform, Fecal Coliform and *Enterococcus* must occur by September 15, 2014.

Through implementation of BMPs to address several suspected bacteria sources, including measures such as manually removing bird feces from the beach, Baby Beach water quality has improved significantly. Data analysis for the 2012-13 reporting period indicates that dry weather TMDL load reductions have been achieved for total coliform and the 50% load reduction milestones for fecal coliform and Enterococcus have also been achieved. Wet weather data also supports the conclusion that TMDL load reductions have been achieved for total coliform and fecal coliform while further reductions are needed for Enterococcus. A recent microbial source tracking special study suggested that a portion of the remaining bacterial exceedances at Baby Beach may be of canine origin, prompting the County to increase enforcement of its policy banning dogs from the beach.

4.4 Recommendations

Aliso Creek Bacteria Investigations

There has been a dramatic reduction in bacteria concentrations in Aliso Creek since 2003 correlating with an increase in watershed Permittee BMP implementation and watershed wide water conservation efforts. This current Aliso Creek Monitoring Program was designed to track Creek bacteria concentrations over a ten year period. 2015 marks the tenth year of implementation of this program, and the following recommendations are made:

1) Reduce current Permittee quarterly progress reporting to an annual basis. Observed watershed bacteria reductions have shifted efforts away from new BMP projects to ongoing BMP maintenance decreasing the benefit of quarterly reporting. This change is consistent with R9-2009-0002 which specifies only an annual assessment of water quality data and municipality programs implemented within high-priority storm drain locations. Permittees will continue to meet quarterly to discuss efforts to reduce bacteria in the Aliso Creek watershed.

2) Continue implementation of monitoring and reporting described in the Revised Aliso Creek Program through December 2015 with 2015 annual reporting to include a reevaluation of the program relative to watershed bacteria TMDLs, the watershed Comprehensive Load Reduction Plan (CLRP), and related NPDES programs. Implementation of the program through 2015 will allow for an evaluation of the data relative to the initial ten year program design and developing fifth term permit NPDES programs.

5.0 Plan Development

5.1 Overview

The Story: Plan Development

- The Permittees have been implementing a strategic management approach that includes model programs specified in the permit and the DAMP, and watershed programs focused on specific water bodies and pollutants.

- The Program employs an iterative, adaptive management approach that includes monitoring, evaluation, program revision, BMP implementation adjustment/enhancement, and continued monitoring.

- The Program conducts annual and permit term (i.e. ROWD) using the guidance from CASQA approach.

- The ROWD recommends an evolution to a more holistic watershed management approach to support integrated water resource management and the optimization of watershed ecosystem services.

The Permittees have developed a strategic approach to stormwater management that is a cyclical process of measurement, analysis and program improvement. This approach is applied at two distinct scales: (1) regionally by the Permittees implementing jurisdictional programs based on the model programs in the DAMP; and (2) in specific watersheds by the Permittees and others participating in watershed programs addressing specific waterbody-pollutant combinations and the restorative goals of the Clean Water Act.

Two basic categories of assessment measure have been used related to (1) the shorter term confirmation of BMP implementation (Implementation or Process Measures, also termed Programmatic Indicators) and (2) the longer term verification of environmental improvement (Validation or Results Measures, including indicators of environmental change). This categorization of measures is intended to reflect two basic assessment questions: (1) are program elements being implemented correctly and effectively? And (2) are environmental improvements being realized?

> *…. Upon determination by either the permittees of the Regional Water Board that discharges are causing or contributing to an exceedance of an applicable Water Quality Standard, the permittees shall promptly notify and thereafter submit a report to the Regional Water Board that describes BMPs that are currently being implemented and additional BMPs that will be implemented to prevent or reduce any pollutants that are causing or contributing to the exceedances of Water Quality Standards. The report may be incorporated in the annual update to the Stormwater Management Plan unless the Regional Water Board directs an earlier submittal. WQO-99-05*

The planning process has been given particular regulatory significance by the approach to MS4 permitting in California. Indeed, the approach was developed as a model for fulfilling the Receiving Water Limitations and Discharges Prohibitions of the Permits. These provisions are based on State Water Resources Control Board Water Quality order 99-05 which creates an iterative management approach as the basis for compliance.

5.2 Plan Development and Effectiveness Assessment

Strategic Management Approach

The Permittees' strategic approach to stormwater management is defined by a cyclical (iterative) process, or *Quality Loop*, of measurement, analysis, and improvement of the program (Figure 5.1). An analogue for this approach is the formal environmental management system for which ISO 14001 establishes standards. It provides a structure that enables the Permittees to *think* about new ways of working, *measure* existing policies and procedures and/or just *implement* existing activities in different ways. The key is the continual search for improvement in the way that regulatory compliance is maintained and the surface water environment protected and enhanced through implementation of BMPs until protection of beneficial uses is achieved.

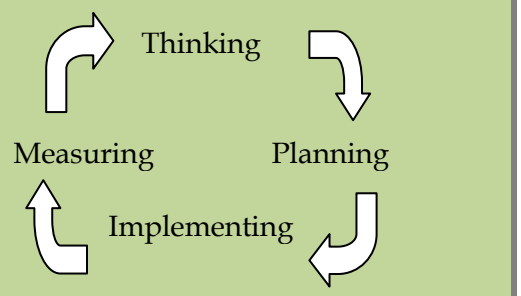

Figure 5.1: The Quality Loop (Gilbert & Gould, 1998)

Due to the episodic and highly variable nature of stormwater, strict compliance with regulatory water quality standards is problematic, especially for wet weather runoff discharges. In recognition of the nature of wet weather discharges, WQO 99-05 requires application of an iterative management process as the basis of compliance with the MS4 permit Receiving Water Limitations provisions. The Permits have required this process be conducted a minimum of once each year. This process is outlined in Figure 5.3.
Plan development occurs at two distinct scales: (1) activities conducted by the Permittees implementing BMPs in their DAMP/LIPs based on the model programs in the DAMP; and (2) activities conducted by the Permittees and others participating in watershed programs addressing specific waterbody-pollutant combinations.

Countywide/Jurisdictional BMPs are specified in the Permits, are applicable on a countywide basis and are proven and cost-effective. They include BMP requirements for municipal maintenance activities, public and business education and outreach, BMP requirements for land development and redevelopment, structural and non-structural BMP requirements for construction projects), BMPs for existing development and identification and elimination of illegal discharges/illicit connections.

For the watershed-based programs, the planning process has been focused principally on specific water quality problems in receiving waters, with impaired waters or TMDLs having a higher priority, and implementation of additional *Watershed BMPs* on an individual and/or collaborative basis. However, watershed-based planning has also led to a number restoration projects.

At both scales the approach uses information obtained from program effectiveness assessment, the countywide baseline water quality monitoring program, and from the additional water quality planning initiatives that have been or are currently being conducted in a number of the watersheds to determine those with beneficial use impairments potentially attributable to urban stormwater. New candidate BMPs can be prevention or removal oriented and can be considered either for updating *Countywide/Jurisdictional BMPs* or for incorporation as *Watershed BMPs*. New BMPs are generally identified from one or more of the following:

- A review of technical literature (such as the ASCE/EPA database);
- A review of existing control programs;
- Demonstration or research projects;
- Input from consulting firms and municipalities already involved in new BMP implementation; or
- Other sources.

New BMPs, chosen for broad implementation, are selected from candidate BMPs that have been field-tested and evaluated as to their pollutant removal efficiency and cost effectiveness. Methodologies for assessing Program and BMP effectiveness include conventional monitoring (such as water quality monitoring) and non-conventional monitoring. Conventional monitoring can provide a more direct indication of actual BMP performance, but is very challenging for a number of reasons. Water quality monitoring is costly, particularly given the highly variable nature of stormwater runoff, and targeted on a limited number of BMPs. Furthermore, not all BMPs are readily evaluated through water quality monitoring. Therefore, an accurate, quantifiable assessment of the cumulative effectiveness of current BMPs is difficult for a variety of reasons, including:

- A number of BMPs predate the Program which means that there is no "baseline" monitoring data representative of "pre-BMP" conditions;
- Since, to date, no watershed has been uniquely subject to a single BMP, the influence of an individual BMP upon the overall surface water quality cannot yet be readily determined;
- The temporal and spatial variability in water quality, particularly in wet weather, complicates any statistical correlation of the data with storm frequency, storm length and intensity, land use, or land management practices. This confounding factor in statistical analyses has been exacerbated by storm seasons in recent years that have varied much in their intensity, duration and volume;
- Many of the BMPs are implemented to address the issues associated with a specific land use. However, since the land uses are extremely varied within the watersheds, it has not proven possible to characterize the effects of those specific BMPs; and
- Factors other than chemical water quality may be more directly responsible for impairment of beneficial uses, yet all these factors combine in their effects and are difficult to separate one from another.

A method for evaluating overall stormwater program effectiveness on both a programmatic and individual BMP level has been documented by the California Stormwater Quality Association **(Figure 5.1)**. The approach presents a hierarchy of potential outcomes that can be evaluated ranging from programmatic permit compliance assessment to demonstrated changes in receiving water quality. Tiers 1-3 are assessment measures that support the shorter term confirmation of BMP implementation (Implementation or Process Measures, also termed Programmatic Indicators). Tiers 4-6 are assessment measures that reflect the longer term verification of environmental improvement (Validation or Results Measures, including indicators of environmental change).

Figure 5.1: CASQA Assessment Pyramid

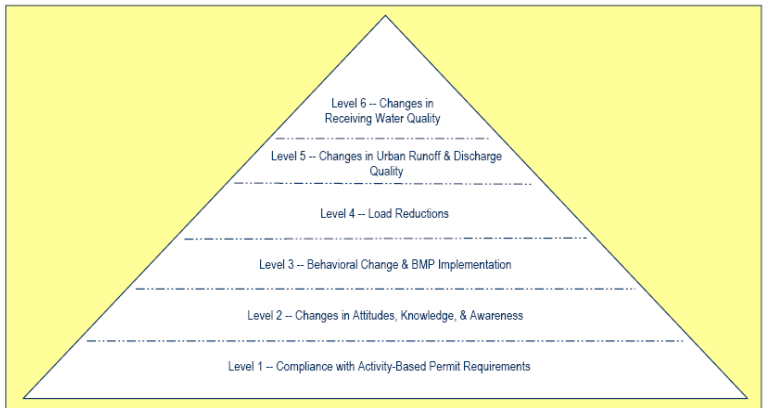

In addition, a number of important initiatives are being supported by the Permittees aimed at the further development of assessment techniques and methodologies to support more informed and consistent decision making across Southern California. Notable amongst these initiatives is the Regional Bioassessment Monitoring Program of the Stormwater Monitoring Coalition.

5.3 Watershed Approach

Managing water quality on a watershed basis, rather than jurisdictional basis (see **Table 5.1** for comparison), is generally recognized as offering a more holistic and thereby more effective basis for ultimately achieving meaningful environmental outcomes. Consequently, the ROWD recommends a watershed-based approach as a fundamental structure for the future of the Program.

Watershed

..that area of land, a bounded hydrologic system, within which all living things are inextricably linked by their common water course and where, as humans settled, simple logic demanded that they become part of a community.

John Wesley Powell, Scientist-Geographer

The development of a Watershed Plan would generally include the following steps:

- Conduct a watershed assessment to identify the watershed issues and establish desired beneficial use and ecosystem service outcomes;
- Establish watershed-specific implementation strategies to address the highest priority issues and concerns; and
- Submit to the Regional Board Executive Officer for review and approval.

A Watershed Plan is consistent with federal regulations regarding the development of NPDES permit conditions, as well as the implementation of storm water management programs, at a watershed scale (40 CFR §§ 122.26(a)(3)(ii), 122.26(a)(3)(v), and 122.26(d)(2)(iv)). This approach is also consistent with USEPA's Watershed-Based NPDES Permitting Policy Statement[1] which explains that, "[t]he utility of this tool relies heavily on a detailed, integrated, and inclusive watershed planning process." USEPA identifies a number of important benefits of watershed permitting, including more environmentally effective results; the ability to emphasize measuring the effectiveness of targeted actions on improvements in water quality; reduced cost of improving the quality of the nation's waters; and more effective implementation of watershed plans, including TMDLs, among others.

The watershed approach requires development and implementation of a comprehensive, collaborative, and prioritized Watershed Plan. A Watershed Plan will allow for the more effective linking of existing stormwater program elements to create an implementation strategy tailored to the needs of the watershed(s). In Orange County, such an approach would also present an opportunity to bring greater cogency to ongoing sub-regional and watershed initiatives, address the current impetus for integrated water resource management, and provide a framework for identifying projects that align with the restorative goals of the Practical Vision.

5.4 Recommendations

The recommendations are:

1. **Continue to implement the Strategic Countywide/Jurisdictional Management approach**.

[1] Memorandum from G. Tracy Meehan, III, Assistant Administrator to Water Division Directors, Regions I-IX, titled "Watershed-Based National Pollutant Discharge Elimination System (NPDES) Permitting Policy Statement," USEPA, December 3, 2002.

2. **Develop a comprehensive Watershed Plan** to evaluate the watershed and to prioritize implementation efforts and associated resource allocation.

3. **Develop pilot program(s) for regional water quality** or groundwater recharge BMPs

4. **Develop model program(s) for water retention credit trading** to facilitate off-site BMP implementation where appropriate and to address existing developed areas.

Implementation Schedule – Plan Development

Proposed Plan Development Actions	Recommendations[1]	Implementation Schedule[2]				
		2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
Strategic Management Approach						
Countywide/Jurisdictional Management approach	C					
Complete model program for a water quality/quantity trading	E		X			
Complete identification of regional runoff retention BMPs opportunity sites	E		X			
Complete model watershed management plan	N		X			

1. C = Continue; E = Enhance; N = New
2. X = Recommendations will be completed during this fiscal year. Gray shaded cells indicate ongoing implementation

Table 5.1 Comparison of Planning Processes		
	Local Implementation Plan	**Watershed Plans**
Area Covered by Plan	Defined by political (city/county) boundaries	Defined by hydrologic boundaries
Planning Process	Focused on reducing discharges of pollutants in urban runoff and stormwater pollution on a uniform countywide basis. Directed by DAMP/LIP in conformance with NPDES permits requirements.	Focused on improving local receiving water quality where it is adversely impacted by urban runoff and stormwater pollution (or other stressors). Directed by NPDES permit requirements and 303(d) list/TMDLs. Should optimize all watershed attributes and functions (water supply, energy, habitat, economic development, housing, trans…)
Framework	Directed by Orange County Stormwater Program committee structure and Regional Board review. Public consultation principally through California Environmental Quality Act (CEQA) process/Regional Board review.	Directed by broad participation among municipal and public agency stakeholders. Characterized by public participation.
Assessment	Based on information from countywide municipal and regional cooperative investigations of stormwater and receiving water quality	Based on information from watershed-specific investigations and are undertaken on an annual basis, or timescale appropriate

Table 5.1 Comparison of Planning Processes		
	and are undertaken on an annual and 5 year basis.	to the process, impact, or management strategy.
Planning	Broad based approach with emphasis on well established pollution prevention and source control measures.	Includes both pollutant specific approach, with emphasis on treatment controls and consideration of innovative regional solutions, and projects addressing restorative goals of the Clean Water Act.
Implementation	Individually by the Permittees.	Individually and collaboratively by Watershed Permittees and other agencies.
Monitoring	Considers pollutant load reduction.	Considers beneficial use attainment.

Figure 5.2: Strategic management flow diagram

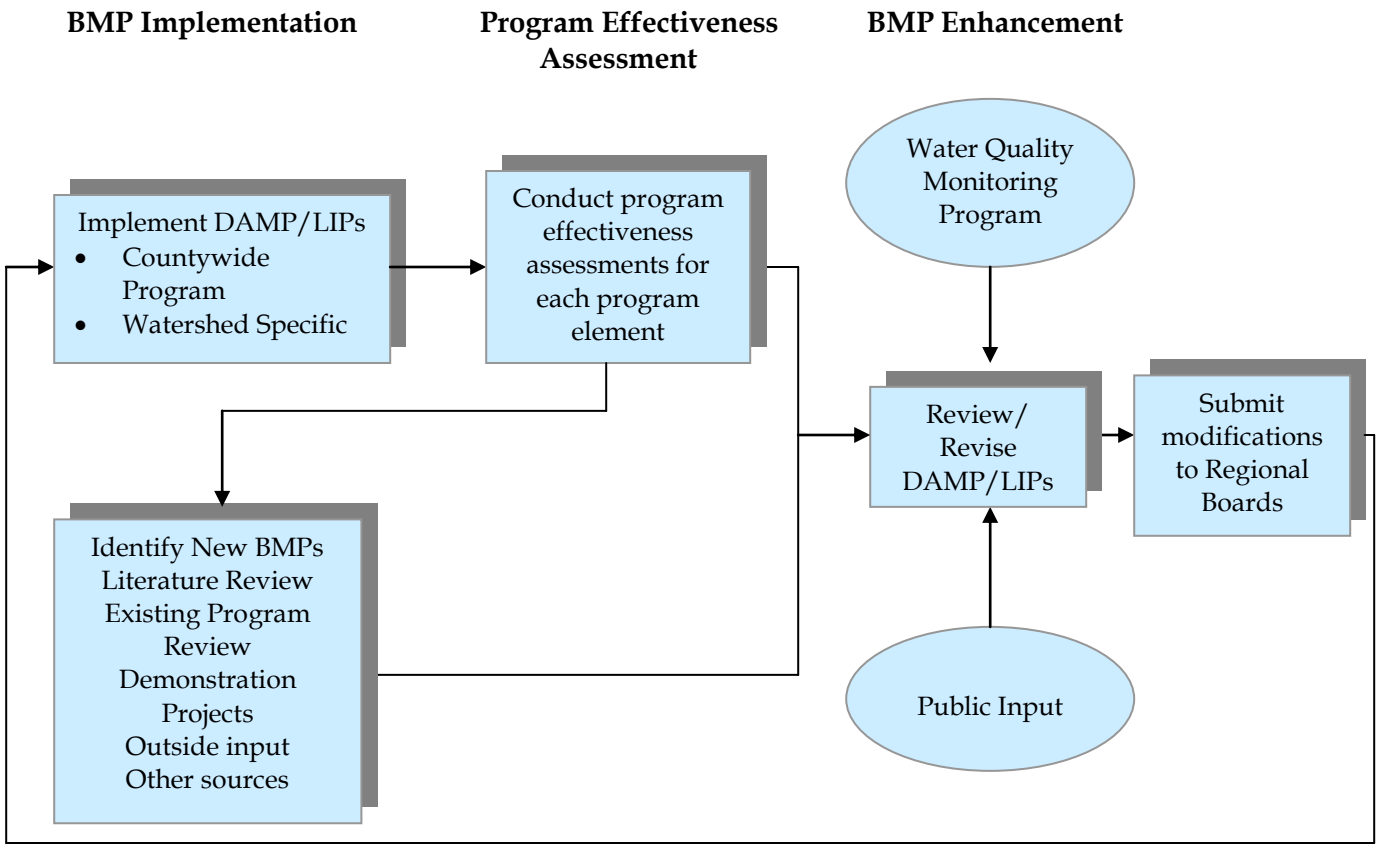

6.0 Program Management and Financing

The Story: Program Management/Financing

- The Program continued to operate with the County of Orange as the Principal Permittee during the permit term.

- The Program operated under a four-tier committee structure with participation at all levels by Permittee staff and management.

- An Implementation Agreement establishes responsibilities and provides a funding mechanism for cooperative activities. Funding has been sufficient to complete common program activities.

- The Program benefitted strongly from cooperation and representation among several regional and statewide groups including the California Stormwater Quality Association and the Southern California Coastal Water Research Project.

- Coordination with Orange County Transportation Authority (OCTA) on development of a Structural BMP Prioritization and Analysis Tool (SBPAT) to support disbursement of Measure M2 funding for water quality projects. SBPAT is a GIS-based decision support tool that is being used to identify and prioritize potential structural BMP retrofit projects throughout Orange County. To date Tier 1 funding of $8.6 million has been awarded to 85 projects and Tier 2 funding of $12.7 million has been awarded to 8 projects.

6.1 Overview

The Program is a cooperative regulatory compliance initiative comprised of 36 separate municipal entities. It addresses Clean Water Act mandates and is focused on the management of urban and stormwater runoff for the protection and enhancement of Orange County's creeks, streams, rivers and coastal waters. The County of Orange is the Principal Permittee and the cities and the Orange County Flood Control District are Co-Permittees on the permits. Principal Permittee and Permittee responsibilities are specified in the permit. Permittee collaboration and cooperation is enabled by an Implementation Agreement. The designation of a Principal Permittee has provided for cost effective management of the overall stormwater program by combining resources to complete those activities which benefit all of the Permittees.

To enable the development and implementation of the Program a program management framework has been established. This management framework comprises a four tier committee structure (Permittees, City Managers' Water Quality Committee, Technical Advisory Committee (TAC)/Planning Advisory Committee (PAC) and Program Committees/Task Forces/Ad Hoc Groups).

6.2 Program Implementation and Assessment

<u>Implementation Agreement</u>

A formal agreement enabling Permittee cooperation is the NPDES Stormwater Permit Implementation Agreement (the "Implementation Agreement") which establishes the responsibilities of the Permittees with respect to compliance with the Permits. The Implementation Agreement also

establishes a funding mechanism for the shared costs of the Program, based on each municipality's area and resident population, and formally recognizes the role of the TAC.

The Implementation Agreement, originally entered into in December of 1990, was amended in October of 1993 to include two additional Permittees (the cities of Laguna Hills and Lake Forest) and formally established the TAC. The Implementation Agreement was amended again, effective June 25, 2002, to include three additional Permittees (the cities of Aliso Viejo, Laguna Woods and Rancho Santa Margarita) and to incorporate modifications to the management structure and cost-sharing formulas.

The structure of the Agreement has accommodated the expansion of the Program and the significant escalation of shared costs with the adoption and implementation of the Third- and Fourth-Term MS4 Permits. It has also served as a model for cost sharing collaboration related to the Newport Bay TMDL compliance effort (including the related Nitrogen Selenium Management Program), Aliso Creek TMDL, San Juan Creek TMDL, Coyote Creek TMDL and Regional Harbor Monitoring Program.

Management Framework

The USEPA defines a management framework as "*a lasting process for partners working together. It's a support structure making it easier to coordinate efforts – a structure made of agreed upon standard operating procedures, timelines and forums for communicating with each other*" (USEPA, 2002). The four tier management framework was established in early 2002 to support the development and implementation of the Program.

The Permittee committees, subcommittees, task forces and ad-hoc working groups are shown in **Figure 6.1**.

Figure 6.1: Orange County Municipal NPDES Management Framework

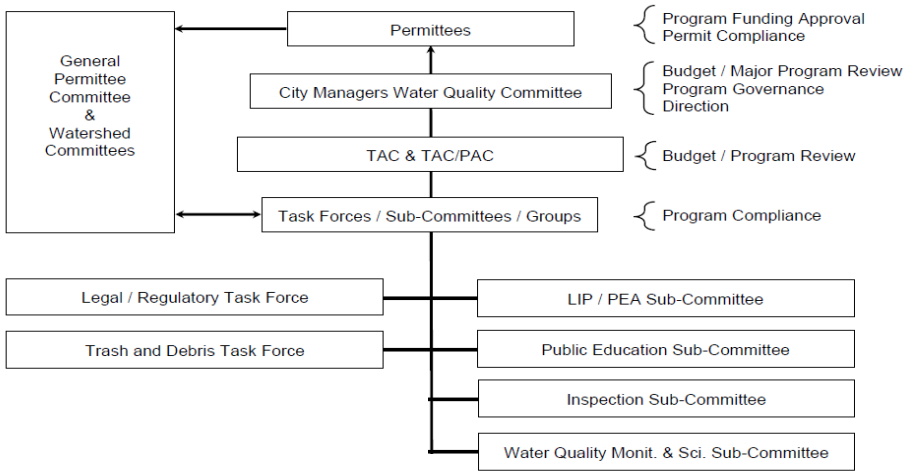

City Manager's Water Quality Committee

The City Manager's Water Quality Committee meets annually and as otherwise needed and provides budget and overall program review and governance direction. The Committee is comprised of several City Managers and is supported by County staff.

City Engineer's Technical Advisory Committee (TAC)/ Planning Advisory Committee (PAC)

The TAC acts in an advisory role to the Permittees and implements policy previously established by the Permittees. The TAC is comprised of one City Engineer, or selected

representative from each of the County Supervisorial Districts and a representative from the County of Orange. The TAC is expanded to the TAC/PAC when matters relating to land development are considered. It meets 4-6 times annually. Meetings of the TAC and the TAC/PAC are subject to the Brown Act.

General Permittee Committee

The General Permittee Committee is the principal forum for disseminating information for program coordinators. The Committee meets monthly (except November). The Committee periodically evaluates the need for creating standing sub-committees and ad hoc committees as needed in order to accomplish the objectives of the Orange County NPDES Stormwater Program.

Sub-Committees/Task Forces

The task forces, sub-committees and ad-hoc working groups provide for the continued development of the Program in specialized areas. The management framework is reviewed annually to ensure it meets program needs. All of the task forces, sub-committees and ad-hoc working groups have brought forward initiatives to meet the requirements of the Fourth Term Permits and to address Program needs under a consensus building process. The frequency (i.e. number of meetings) of meetings is undergoing re-evaluation with respect to the upcoming Fifth Term MS4 Permit as programs attain maturity and require less oversight.

Program Funding

Over the last 10 years the countywide cost of compliance with the permits has almost doubled from approximately $55m in FY2000-01 to $95m in FY2011-12. These costs are anticipated to continue to increase as the Program shifts toward a greater emphasis on watershed management approaches to address burgeoning TMDL requirements.

In FY2011-12, the funding sources used by the Permittees to meet these costs included: General Fund, Utility Tax, Separate Utility, Gas Tax, and Special District Fund, Others (Sanitation Fee, Fleet Maintenance, Community Services District, Water Fund, Sewer & Storm Drain Fee, Grants, and Used Oil Recycling Grants) (See Figure 6.2). While increasingly more stringent regulatory obligations prompt consideration being given to creation of dedicated stormwater funding, there are significant obstacles to overcome.

Figure 6.2: FY2011-12 Funding Sources

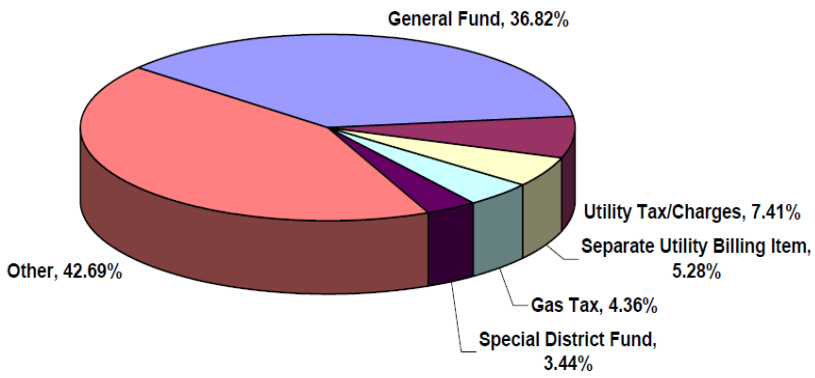

In November 1996, California voters approved Proposition 218 which requires that any new or increased property-related fee be subject to voter approval. Proposition 218 has created a significant hurdle for municipalities seeking to levy charges for storm water management programs that, with successive permits are becoming increasingly complex. The Proposition did create an exemption to the voter approval requirement for water, sewer and trash collection fees, and some municipalities adopted the position that stormwater fees were akin to water or sewer fees, and thus exempt from the voter approval requirement. However, the 2002 court decision in *Howard Jarvis Taxpayers Association v. City of Salinas* established definitively that storm water or storm drainage fees are property-related fees subject to Proposition 218, and are not exempt from voter approval requirements. Based on this ruling, any new or increased stormwater fee must be approved by 66% of voters (Office of the Independent Budget Analyst Report, City of San Diego, 2009).

The uncertainty regarding future compliance costs is a concern to the Permittees. Consequently, a costs study, including a review of funding options, will be completed in the next permit term.

6.3 Program Representation and Coordination with Other Agencies

Orange County Transportation Authority (OCTA)

The Principal Permitteee co-chairs the OCTA's Environmental Cleanup Allocation Committee which oversees the Environmental Cleanup Program (ECP). The ECP is intended to support improvements in overall water quality by providing funding for projects addressing transportation-generated pollution. The Committee has been meeting on a monthly basis since November 2007.

The Tier 1 Grant Program is designed to mitigate the more visible form of pollutants, such as litter and debris that collects on roadways and in storm drains prior to being deposited in waterways and the ocean. Tier 1 consists of funding for equipment purchases and upgrades to existing catch basins and related best management practices (BMPs) such as screens, filters, inserts and other streetscale low-flow diversion projects. A total of up to $19.5 million is available for the Tier 1 program over a seven-year window from 2011-12 through 2017-18.

The first Tier 1 call for projects was issued in February 2011. In August 2011, the Board approved the funding of 34 projects to 23 cities and the County of Orange, totaling more than $2.8 million. In August 2012, the Board approved a second round of funding with a total of $2.8 million awarded to 33 projects from 24 cities and the County.

The Tier 2 Grant Program consists of funding regional, potentially multi-jurisdictional, capital-intensive projects. Examples include constructed wetlands, detention/infiltration basins and bioswales, which mitigate pollutants including litter and debris, but also heavy metals, organic chemicals, sediment and nutrients. The Tier 2 program is funded with bond financing revenues with up to $38 million from the EAP allocated through fiscal year 2015-16. Beyond 2015-16, funding will be based on a pay-as-you-go basis.

To date Tier 1 funding of $8.6 million has been awarded to 85 projects and Tier 2 funding of $12.7 million has been awarded to 8 projects.

California Stormwater Quality Association

Since 1989, CASQA has assisted the State of California, USEPA, municipalities, special districts and businesses in developing and implementing effective water quality management programs in California. CASQA is a leader in helping California comply with the municipal and industrial NPDES stormwater mandates of the federal Clean Water Act. The Principal Permittee is active on the Board of Directors, Executive, Program Committee, Policy and Permitting Sub-Committee and Public Information – Public Participation Sub-Committee.

Stormwater Monitoring Coalition

The SMC was formed in 2001 and revised in 2008 by cooperative agreement of the Phase I municipal stormwater NPDES lead Permittees, Caltrans, the NPDES regulatory agencies in southern California, SCCWRP and USEPA Office of Research. The SMC seeks to improve the effectiveness of existing programs, particularly monitoring, by promoting standardization and coordination, and reducing duplication of effort across individual programs.

Southern California Coastal Water Research Project

The SCCWRP is a joint powers agency research institute focusing on the coastal ecosystems of Southern California from watersheds to the ocean. It was formed in 1969 to enhance the scientific understanding of linkages among human activities, natural events, and the health of the Southern California coastal environment; to communicate this understanding to decision makers and other stakeholders; and to suggest strategies for protecting the coastal environment. Current SCCWRP studies of particular significance to the Program include Bight '13, investigations into toxicity, trash and debris and microbiology, and the effort to better coordinate environmental monitoring in the Newport Bay watershed.

The Principal Permittee participated as a Commissioner on SCCWRP's governing board and as the Program's representative on the Commission Technical Advisory Group (CTAG).

6.4 Recommendations

The recommendations are:

1. **Retain the NPDES Stormwater Permit Implementation Agreement**.

2. **Continue the program management framework, albeit with a reduction in meeting frequencies**.

3. **Complete study of future stormwater compliance costs and funding alternatives**.

4. **Continue collaborative regional studies**.

Implementation Schedule – Program Management and Financing

Proposed Program Management and Financing Actions	Recommendations[1]	Implementation Schedule[2]				
		2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
Implementation Agreement						
Retain agreement	C					
Program Management Framework						
Retain management framework	C					
Program Costs and Funding						
Complete cost and funding options study	N			X		

1. C = Continue; E = Enhance; N = New
2. X = Recommendation will be completed during this fiscal year. Gray shaded cells indicate ongoing implementation

7.0 Recommendations for Fifth Term Permit

7.1 Overview

Established in 1990, the Program is a cooperative regulatory partnership of the Permittees who operate an interconnected municipal storm drain system which discharges stormwater and urban runoff and at the same time provides flood protection to the United States' sixth most populous county. In Orange County, the impact of urbanization on hydrologic systems and the adverse consequences of both changed hydrology and pollutant source creation are evident today in Orange County's principal drainage systems. However, at the same time, there are very significant water quality successes, such as coastal water quality along the entire length of the Orange County coastline and sources of bacteria contamination having been reduced through targeted actions that can unequivocally be attributed to the impact of the Program and the Permittees.

7.2 Future Program Development and Implementation

During the Fourth Term Permit period there has continued to be a significant allocation of resources the integration of LID and hydromodification control practices into local land development regulation. Going forward, this element of the Program will continue to be a major focus of activity as the Permittees look to create off-site and in-lieu fee options for alternative compliance pathways for land development and re-development. This focus also aligns with broader State Board integrated water resource management goals centered on better use of stormwater for local water supply augmentation, increasing interest in "green infrastructure" solutions and realization of the restorative goals of the Clean Water Act.

Development of a watershed-based planning approach is viewed as the most important next step to take in the development of the Program. Such an approach offers the opportunity for more comprehensively identifying the meaningful environmental and recreational amenities that can be realized in each watershed and the management strategies that will most effectively ensure their realization. These plans will also provide an opportunity, through linkage and integration, for cogency to be brought to a number of related restoration projects and sub-regional water management efforts such as the Integrated Regional Water Management Plans.

With respect to specific water quality constituents of concern, there will be additional effort directed toward pollutant control and research into the environmental significance of pesticide related toxicity, bacteria, and nutrients.

<u>Pesticides</u>

Synthetic pyrethroids have been identified as a significant urban runoff water quality issue on a statewide basis. Directly as a consequence of the efforts of CASQA, the Department of Pesticide Regulation enacted regulations that became effective in July, 2012, specifically intended to limit where structural pest control businesses can apply pesticides in an effort to protect water quality in urban areas. The rules restrict the use of 17 pyrethroid insecticides applied by businesses and significantly limit the amount of pesticides that can be applied outdoors, especially to concrete and other hard surfaces more susceptible to runoff. The regulations also prohibit outdoor pest control applicators and maintenance gardeners from

spraying when it rains or to standing water due to rainfall or watering. An evaluation of the regulations by UC Davis suggested that they could affect an 80% reduction in pyrethroid concentrations in runoff. Nonetheless, the Program will continue to seek to make additional progress with IPM policy implementation and general public education and outreach.

Bacteria

There is significant progress to be reported in Orange County regarding trends in bacterial contamination. Indeed, long-term monitoring of bacterial indicators of contamination shows that exceedances of regulatory standards are low and have been dropping over time and that the annual percentage of Heal the Bay report card grades of A has been between 93% and 97% since 2005. This very significant progress with respect to shoreline water quality underscores the impetus for action that comes from broad societal recognition of a problem, an unequivocally favorable cost-benefit analysis and the ability to implement pragmatic cost effective solutions.

In inland surface waters the issue of systemic elevated concentrations of bacteria persists. However, intensive monitoring of the Aliso Creek watershed appears to show that reductions in dry weather flow have produced significant reductions in bacterial concentrations. This finding points to the value of efforts to curtail outdoor water usage. Consequently, collaboration with water districts on water conservation themed education and outreach will continue to be the focus of efforts to engage the general public and sustain the ongoing reductions in bacteria concentrations being observed in inland surface waters.

Nutrients

Eutrophication of estuaries and coastal waters has been linked to anthropogenic changes in watersheds and is of concern because of the potential for harmful algal blooms, hypoxia, and impacts on aquatic food webs. Across Orange County's watersheds nutrients continue to present a regulatory concern although the environmental significance of nutrients and the specific contribution of urban sources is less understood in these other areas. Nutrient thresholds are frequently exceeded in the County's streams and channels. However, there are many less frequent occurrences of impacts, such as macroalgal overgrowth, due to these exceedances. Moreover nutrient problems are not limited to the urban portion of the County; regional monitoring data show nutrient enrichment and impacts such as increased macroalgal cover and/or lower dissolved oxygen in streams and estuaries in undeveloped regions. Pending further research, the Program will continue to effect reductions in municipal fertilizer use through implementation of the Program's IPM policy and encourage water quality-sensitive landscape maintenance practices in the general population through education and outreach.

7.3 Proposed Management Program

Based upon the prior discussion and in response to the findings of the environmental quality monitoring program, the Program proposes the following management program for the period of the Fifth Term MS4 Permit:

State of the Environment: Bacteria

- Continue targeted data analyses of monitoring data to prioritize problem areas. Conduct additional source

tracking studies as needed, using new monitoring methods based on genetic markers to identify potential sources of these problems such as infiltration into the MS4 from sewage lines. This effort should build on results of the Bight '13 Microbiology Study (**see Section 2.3.6**);

- Continue identifying opportunities to reduce and prevent flows in dry weather, where monitoring and source tracking data suggest the presence of human fecal contamination (**see Section 2.3.6**);

- Conduct statistical power analysis and optimization studies to improve existing monitoring program designs to improve efficiency and take advantage of available information about patterns and trends of contamination (**see Section 2.3.6**);

- Shift resources from routine monitoring to targeted source tracking and adaptive response, using new tools such as genetic markers of human fecal contamination as these become available (**see Section 2.3.6**);

- Continue supporting regional and collaborative research into better monitoring and source tracking tools (**see Section 2.3.6**);

- Improve understanding of health risk related to high wet weather flows, for example, through the Bight '13 Microbiology Study; follow results of the pilot wet weather epidemiology study planned for San Diego and consider supporting the larger, follow-on study planned for 2014-15 (**see Section 2.3.6**); and

- Conduct pilot mass balance studies to determine their utility for improving the prioritization of management actions (**see Section 2.3.6**).

State of the Environment: Dissolved Solids

- Conduct a mass balance study, even if at a crude level, to determine the extent to which the MS4 contributes to dissolved solid levels in the creek (see **Section 2.4.2**);

- Prepare a summary report on historic and contemporary conditions of dissolved solids across south Orange County (see **Section 2.4.2**);

- Invest effort into understanding whether dissolved solids are important stressor on macroinvertebrate communities in the creeks to evaluate the environmental significance of elevated dissolved solid concentrations (see **Section 2.4.2**); and

- Continue evaluating changes in dissolved solids at key locations such as Oso Creek in concert with water conservation efforts to track changes in dissolved solids over time (see **Section 2.4.2**).

State of the Environment: Nutrients

- Conduct an assessment of sources and practices that input to the MS4 to assess the significance of each to downstream issues (**see Section 2.5.5**);

- Continue identifying opportunities to reduce and prevent flows in dry weather (**see Section 2.5.5**);

- Pilot a regional mass balance nutrient model, even if elementary, to help prioritize monitoring and management attention; the Newport Bay watershed and SCCWRP coastal ocean nutrient mass balance models provide useful examples (**see Section 2.5.5**); and

- Use available time series of data to streamline monitoring to improve its statistical and economic efficiency. Sampling effort could be reduced by identifying stations that essentially mimic each other and/or by reducing the spatial and/or temporal intensity of sampling. Monitoring could shift to a sentinel program with a lower frequency of monitoring intended to ensure conditions do not worsen (**see Section 2.5.5**).

State of the Environment: Toxicity

- Reassess management concerns and priorities about metals impacts in freshwater channels, bays and estuaries, and the nearshore coastal zone (**see Section 2.6.5**);

- To the extent that metals, particularly copper, remain a concern because of potential impacts in bays and harbors, recognize that inputs from antifouling paint, which are not an urban runoff issue, are likely a more important source than watershed input (**see Section 2.6.5**);

- Improve information on the use of pesticides in the County, particularly by the largest applicators (**see Section 2.6.5**);

- Work with other interested parties to fill the data gap related to retail sales of pesticides (**see Section 2.6.5**);

- Examine the CDPR database to develop a more thorough picture of trends in reported pesticide use (**see Section 2.6.5**);

- Use this information to expand and focus cooperative outreach efforts about proper pesticide application and the use of alternatives such as botanical oils that are effective, but nonlethal, insect deterrents (**see Section 2.6.5**);

- Use available data to streamline monitoring and improve its statistical and economic efficiency. Consider reducing the current focus on metals monitoring and targeting pesticide monitoring on less expensive representative constituents or surrogates. Consider reducing the frequency of sampling for sediment associated constituents to the Bight Program's sampling frequency (**see Section 2.6.5**);

- Given the overall low level of observed toxicity, consider increasing the use of adaptive responses (e.g., TIEs and other types of causal assessment) in place of intensive routine monitoring (**see Section 2.6.5**);

- Continue taking advantage of opportunities to reduce dry weather runoff to channels (**see Section 2.6.5**); and

- Continue the productive relationship the University of California's South Coast Research and Extension

Center and take advantage of opportunities for its Director to communicate the stormwater management perspective to CDPR (**see Section 2.6.5**).

Controlling Pollutant Sources: Watershed Programs – Aliso Creek

- Reduce current Permittee quarterly progress reporting to an annual basis. Observed watershed bacteria reductions have shifted efforts away from new BMP projects to ongoing BMP maintenance decreasing the benefit of quarterly reporting. (**see Section 4.4**); and

- Continue implementation of monitoring and reporting described in the Revised Aliso Creek Program through December 2015 with 2015 annual reporting to include a reevaluation of the program relative to watershed bacteria TMDLs, the watershed Comprehensive Load Reduction Plan (CLRP), and related NPDES programs. (**see Section 4.4**).

Municipal Infrastructure and Integrated Pest Management

Continue current model programs and*:*

- Enhance municipal training to address common issues encountered through municipal related complaints and to utilize innovative education formats to encourage effective discussion-based learning. The four most common issues that occur are: trash/debris, pathogen/bacteria, hydrocarbons and exempt discharges. Training will focus on in-classroom engagement of concepts learned prior to the training session and focus on reducing issues and pollutants of concern through specific actions (e.g. runoff reduction to reduce bacteria loading) (**see Section 3.2.3**);

- Develop a municipal green infrastructure program that could include evaluation of opportunities for pilot green street projects of different land use/density configurations and development of a green street guidance manual (**see Section 3.2.3**);

- Examine public land retrofit opportunities for regional BMPs and propose a program to evaluate previously identified regional retrofit opportunities in jurisdictionally owned areas for use in TMDL compliance and LID and/or hydromodification management alternative compliance. This effort will involve the development of watershed models and evaluation of the previously identified potential BMP retrofit sites. Previous reviews (e.g. 2005 RBF retrofit study) will be integrated with current mapping (**see Section 3.2.3**);

- Develop and initiate the implementation of individualized IPM Guidelines for each Permittee with the goal of demonstrating significant and consistent reductions in fertilizer and pesticide applications based on the mission and goals outlined in jurisdictional IPM Policies (**see Section 3.2.3**);

- Conduct pilot soil and/or leaf tissue analysis to guide fertilizer use to ensure nitrogen is not applied at annual rates above those recommended by UCCE research. The Permittees would identify the most fertilizer-intensive area by type (e.g. sports fields) and select one site for analysis. The analysis would assist Permittees in fine-tuning nitrogen application based on

the needs of plants at the highest use areas (**see Section 3.2.3**)

- Improve methods for documenting usage of fertilizer and active ingredient of pesticide on an annual basis to allow for more reliable data on the acreage receiving fertilizer applications. In collaboration with the UCCE, a standardized reporting method would be developed, improving reporting accuracy on both the amount of nitrogen and pesticides applied by Permittees on an annual basis. The objective would be to minimize fertilizer applications where annual rates exceed those recommended by UC research (174 -261 lbs. N/acre) while more accurately capturing the acreage to which fertilizer is applied (**see Section 3.2.3**); and

- Expand training to include peer-reviewed online training courses offered by University of California IPM (UC IPM) and UCCE to ensure the IPM and water quality message reaches as many field staff as possible. Possible options include the UC IPM Urban Pesticide Runoff and Mitigation online training series developed by UC academics across the state to provide a more suitable method to reach field staff unable to attend in-person training. The online training consists of a series of courses directly addressing the impacts of pesticides on water quality as well as practices to mitigate these impacts (http://www.ipm.ucdavis.edu/training/upr-mitigation.html) (**see Section 3.2.3**).

Public Outreach

Continue current model program and:

- Emphasize outreach to school-age children to continue building upon existing partnerships and increasing knowledge of the Orange County community as a whole through increasing knowledge of youth (**see Section 3.3.7**);

- Incorporate current strategic approach of using public awareness survey results to prioritize outreach efforts based on behaviors of concern in tandem with water quality results to document small-scale behavior change over time (**see Section 3.3.7**);

- Coordinate with water supply agencies to incorporate water use efficiency and runoff reduction messaging to maximize program reach and ensure requested behavior changes align with water use efficiency techniques supported by other agencies. Coordinate to encourage behaviors and develop programs supportive of building a sustainable local water supply as identified in the Water Quality Implementation Plan; including building social norms around water use efficiency and elimination of irrigation runoff (**see Section 3.3.7**);

- Develop focused outreach campaigns based on water quality and survey results utilizing CBSM techniques to document changes in targeted behaviors. The Permittees will develop focused campaigns supportive of a singular message with the goal of reducing competing messaging that may lead to inaction. CBSM tactics will be utilized to target behaviors associated with water quality priorities identified in the Water Quality Implementation Plan (**see Section 3.3.7**);

- Encourage greater public participation in stormwater pollution prevention and elimination of non-stormwater discharges through the use of CBSM and increased availability to online resources. Action campaigns would encourage residents to take an identified action and to share efforts with others (**see Section 3.3.7**);

- Social media calendars will synchronize outreach efforts and encourage direct participation in and sharing of program messaging. Social media forms of earned media will complement action campaign elements by encouraging direct residential participation in programs. Activity on social media significantly increases with boosted posts and paid advertising; these unpaid and paid tools will support CBSM programs (**see Section 3.3.7**); and

- Review website for usability and revise structure as needed to meet goals of increasing public use of web content. The goal of the review will be to increase access to mapping tools, water quality data and BMPs to prevent water pollution (**see Section 3.3.7**).

New Development / Significant Redevelopment

- Implement an approach to hydromodification management that is informed by a watershed analysis and channel-specific protection and restoration goals. The Permittees understand that, consistent with current published research, a "one-size-fits-all" for hydromodification management is not appropriate for highly modified urban stream systems. Pending a watershed analysis, land development projects discharging runoff to engineered channels, should not be required to implement hydromodification management controls (see **Section 3.4.3**);

- Incorporate an IRWM element into the land planning/land development process. The Permittees understand that an integrated water resources management approach is needed to optimize attainment of water quality protection, water conservation, flood control, and stream protection goals. The Permittees therefore intend to incorporate an integrated water resources management element into their land planning and land development processes so that as development projects begin entitlement this approach and opportunities to achieve this approach are evaluated. This recommendation will require a modified LID Hierarchy that establishes the equivalency of "On-site BMP" and "Off-Site /Regional BMP" solutions (see **Section 3.4.3**);

- Create an exemption from Project WQMP requirements for steam and watershed restoration projects (see **Section 3.4.3**);

- Create an exemption for emergency public safety projects where delay would compromise public safety, public health and/or the environment (see **Section 3.4.3**);

- Develop an internet based regional geodatabase. To effectively implement an IRWM and watershed management approach, access to information that describes all of the key hydrologic process and landscape characteristics will be critical. The

Permittees are developing and starting to use an internet-based regional geodatabase to give developers and municipal staff access to the geotechnical and hydrologic information necessary for evaluating the application of the LID hierarchy to sites (see **Section 3.4.3**);

- Develop an internet based Project WQMP Submittal Tool and Database potentially in collaboration with Riverside and San Bernardino. The Permittees spend a significant amount of time plan checking and tracking Project WQMPs and so the permittees propose development of an internet based Project WQMP review tool to streamline the submittal and review of WQMPs, allow for enhanced tracking of WQMPs and WQMP inspections, and help with effectiveness assessments and annual reporting (see **Section 3.4.3**);

- Pilot the use of technology to better track Project WQMP inspections and follow up actions needed. To fully utilize the WQMP Submittal Tool and Database WQMP inspections could be performed with tablets or other devices where GIS information and other information can immediately be uploaded to the database. The Permittees propose piloting the use of tablets or other devices linked to the Database for Project WQMP inspections by a select number of cities (see **Section 3.4.3**); and

- Enhance the data collected for WQMPs to have a better understanding of water quality benefits on an annual basis. The Permittees desire to perform a better assessment of the New Development/Significant Redevelopment Program. In order to better understand the effectiveness of the program, the Permittees propose to collect new critical data elements, and enhance data quality by integrating information into the WQMP Submittal Tool and Database. New data would include volumes of water treated, land area treated, and other relevant information needed to evaluate TMDL compliance, to identify developed/redeveloped areas that meet LID and/or hydromodification requirements, and to track BMP maintenance as a measure of effectiveness (see **Section 3.4.3**).

Construction

Continue current model program and

- Reduce the frequency of inspection for "high" priority sites from bi-weekly to twice during the wet season and reduce the frequency of inspection for "medium" priority sites from monthly to once during the wet season (see **Section 3.5.3**);

- Pilot a GIS and internet-based database to track construction sites. In order to provide easier tracking of construction sites on a countywide basis, the Permittees will develop a GIS and internet-based database where information regarding each construction site can be entered. The Permittees would examine the benefits of such a database by piloting implementation with a select number of cities (see **Section 3.5.3**);

- Conduct pilot field-testing of personal electronic devices to document inspections onsite. Use of tablets

or other electronic devices during inspections will allow inspectors to immediately upload construction site information to the GIS based database. The Permittees would pilot the use of these technologies with a select number of cities (see **Section 3.5.3**); and

- Conduct QSD/QSP Training. The QSD/QSP Training developed by the State Board and CASQA provides a detailed understanding of the Construction General Permit. The Permittees propose providing this training to municipal staff every other year to ensure that inspectors and other municipal staff understand the CGP requirements that are to be implemented for construction projects in their jurisdiction. It is anticipated that with potential changes to the CGP being adopted in 2014 that municipal staff should be aware of these changes and any new or modified requirements for CGP compliance (**see Section 3.5.3**).

Existing Development

Continue current model program and

- Consider incorporating the updated CASQA BMP fact sheets into the Existing Development Model Program (see **Section 3.6.6**).

Illegal Discharges/Illicit Connections

- The major elements of the program (e.g. the facilitation of public reporting of complaints, and the designation and training of Authorized Inspectors) continue to be vital and successful pieces of the Program. However, the NALs Program has proven to be less effective than the Dry Weather Reconnaissance Program. The recommendation is (see **Section 3.7.3**):
    - Reinstate an approach, such as the Dry Weather Reconnaissance Program, that allows investigative resources to be directed toward abating priority aberrant discharges;
    - Continue implementation of CASC; and
    - Consider development of a standardized reporting database potentially accessible by all Permittees.

Plan Development

- Continue to implement the Strategic Countywide/Jurisdictional Management approach (**see Section 5.4**);
- Develop a comprehensive Watershed Plan to evaluate the watershed and to prioritize implementation efforts and associated resource allocation (**see Section 5.4**);
- Develop pilot program(s) for regional water quality or groundwater recharge BMPs (**see Section 5.4**); and
- Develop model program(s) for water retention credit trading to facilitate off-site BMP implementation where appropriate and to address existing developed areas (**see Section 5.4**).

Program Management and Financing

- Retain the NPDES Stormwater Permit Implementation Agreement (**see Section 6.4**);

- Continue the program management framework, albeit with a reduction in meeting frequencies (**see Section 6.4**);

- Complete study of future stormwater compliance costs and funding alternatives (**see Section 6.4**); and

- Continue collaborative regional studies (**see Section 6.4**).

Attachment 1.1: Permittee Contact List

NPDES Permittee Contact List
San Diego Region

	Aliso Viejo	Dana Point	Laguna Beach	Laguna Hills	Laguna Niguel	Laguna Woods	Lake Forest
Name	**Moy Yahya**	**Lisa Zawaski**	**Tracy Ingebrigtsen**	**Ken Rosenfield**	**Nancy Palmer**	**Chris Macon**	**Devin Slaven**
Title	Environmental Programs Manager	Senior Water Quality Engineer	Senior Water Quality Analyst	Director of Public Works	Senior Watershed Manager	Special Projects Manager	Water Quality Specialist
Address	12 Journey, Suite 100	33282 Golden Lantern	505 Forest Ave.	24035 El Toro Rd.	30111 Crown Valley Parkway	24264 El Toro Road	25550 Commercentre Dr. Ste.100
City,CA Zip	Aliso Viejo, CA 92656	Dana Point, CA 92629	Laguna Beach, CA 92651	Laguna Hills, CA 92653	Laguna Niguel, CA 92677	Laguna Woods, CA 92637	Lake Forest, CA 92630
Alternate Name	**Shaun Pelletier**	**Brad Fowler**	**Mike Phillips**	**Humza Javed**	**JC Herrera**	**Moy Yahya**	**Angel Fuertes**
Title	Director of Public Works/City Engineer	Director of Public Works	Environmental Specialist	Associate Civil Engineer	Civil Engineer Tech/WQ Analyst	Code Enforcement & Water Quality Mgr	Assistant City Engineer
Address	12 Journey, Suite 100	33282 Golden Lantern	505 Forest Ave.	24035 El Toro Rd.	30111 Crown Valley Parkway	24264 El Toro Road	25550 Commercentre Dr. Ste 100
City,CA Zip	Aliso Viejo, CA 92656	Dana Point, CA 92629	Laguna Beach, CA 92651	Laguna Hills, CA 92653	Laguna Niguel, CA 92677	Laguna Woods, CA 92637	Lake Forest, CA 92630

	Mission Viejo	Rancho Santa Margarita	San Clemente	San Juan Capistrano	Countywide Program	County of Orange	OC Flood Control District	Regional Water Quality Control Board
Name	**Joe Ames**	**Rae Beimer**	**Tom Bonigut**	**Ziad Mazboudi**	**Richard Boon**	**Chris Crompton**	**Greg Yi**	**James (Jimmy) Smith**
Title	Assistant City Engineer	Stormwater Program Manager	Assistant City Engineer	Senior Civil Engineer/NPDES Coord.	Stormwater Program Manager	Manager, Environmental Resources	Project Manager	Assistant Executive Officer
Address	200 Civic Center Drive	22112 El Paseo	910 Calle Negocio, Suite 100	32400 Paseo Adelanto	2301 N. Glassell Street	2301 N. Glassell Street	300 N. Flower Street, Suite 716	9174 Sky Park Court, Ste. 100
City,CA Zip	Mission Viejo, California 92691	Rancho Santa Margarita, CA 92688	San Clemente, CA 92673	San Juan Capistrano, CA 92675	Orange, CA 92865	Orange, CA 92865	Santa Ana, CA 92703	San Diego, CA 92123-4340
Alternate Name	**Richard Schlesinger**	**E. (Max) Maximous**	**Mary Vondrak**	**Keith Van Der Maaten**	**Chris Crompton**	**Tony Olmos**	**Vincent Gin**	**Tony Felix**
Title	City Engineer	City Engineer	Management Analyst II	Utilities Director	Manager, Environmental Resources	Assistant Director of OC Engineering	Admin Manager II	Water Resource Control Engineer
Address	200 Civic Center Drive	22112 El Paseo	910 Calle Negocio, Suite 100	32400 Paseo Adelanto	2301 N. Glassell Street	300 N. Flower	300 N. Flower Street, Suite 315	9174 Sky Park Court, Ste. 100
City,CA Zip	Mission Viejo, CA 92691	Rancho Santa Margarita, CA 92688	San Clemente, CA 92673	San Juan Capistrano, CA 92675	Orange, CA 92865	Santa Ana, CA 92702-4048	Santa Ana, CA 92703	San Diego, CA 92123-4340

Attachment 3.4.1: Recommendations for Fifth term Permit - Hydromodification

Recommendations for Fifth term Permit: Hydromodification

The Fifth Term Permit should include an initial or time limited exemption for conveyance channels that are engineered and regularly maintained for the capacity to convey peak flows from the 10-year or greater storm for ultimate build out condition from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean. The proposed exemption is necessary to provide adequate time to develop a prioritized approach informed by a holistic watershed analysis

Discussion

The Program has expended significant resources to map and characterize the County's drainage systems and create a geodatabase that includes significant information regarding channel attributes. The geodatabase identifies the susceptibility of channel and stream systems to hydromodification from increased flow rates and durations. These efforts have categorized three basic channel conditions;

1. Natural condition or minimally modified;
2. Large river channels that are highly engineered and modified; and
3. Channels with substantial modification for flood control, most of which are engineered and maintained.

The Program proposes to prioritize the hydromodification management approach to identify and fully protect near-natural condition channels. Engineered channels with substantial modification and flood control function will have a lower priority for hydromodification management. A holistic watershed analysis will evaluate and prioritize channel reaches or basins regarding their potential for rehabilitation or potentially improving their ecological functions. An initial limited time exemption will provide the time to determine which modified channels have potential for rehabilitation to a more natural state, as well as channels with more constraints that reduces their potential for rehabilitation. Highly modified channels require further evaluation for several reasons:

- Engineered channels were installed for the purpose of flood control and protection of public safety and property. Alterations to these channels may conflict with their primary function in the built environment. Additionally, engineered flood control channels generally have limited options for modification as they must provide their mandated service of flood control within a right-of-way constrained by adjacent development. In virtually all cases, it is likely to be cost prohibitive to purchase additional right of way so that flood control channels could modified to approximate a natural state.
- Studies[1] have shown that hydromodification is caused by storms up to the 10 year event. Engineered channels designed to convey the 10-year ultimate build out condition will therefore not experience hydromodification impacts. and if impacts or damage does occur, the Flood Control District is legally obligated to repair the channel and restore the design function.
- The pre-development stream channel pathways were dynamic and changed through time. These natural washes were modified to provide flood protection for developed areas, fundamentally changing the slope and composition of the bed material. This modification is evident in south Orange County as identified for both Prima Deshecha identified in **Figure**

1 and Segunda Deshecha identified in **Figure 2** below. In both cases the historic paths of these streams were straightened, and development in the area was built as close to the modified channel right-of-way as possible. There are few opportunities to change the condition of these streams as most changes would require additional right-of-way acquired through condemning existing development.

The adverse hydrologic impacts to stream systems that can arise from land development must, be understood as a basis for the lawful requirement of mitigation. Based on the takings clause of the U.S. and California constitutions and the Mitigation Fee Act, hydromodification control requirements applied to development projects must bear a reasonable relationship to the impacts of the project. Requiring hydrologic controls on projects draining to receiving waters not susceptible to hydromodification is contrary to these legal requirements. An initial exemption for engineered channels is consistent with this mitigation concept of relationship and nexus to impacts.

In addition to legal concerns regarding the overly broad application of hydromodification management controls, significant fiscal constraints confront restorative goals. The Prima Deshecha and Segunda Deshecha watersheds (**Figures 1 & 2**), for example, demonstrate the quite profound changes to these channel systems that have attended development of the landscape. Moreover, it is evident in **Figures 1** and **2** that a re-configuration of these channels toward more natural channel alignments will require more land. Because of the costs identified in **Table 1** it will be fiscally infeasible to restore in many instances. The watershed analysis is needed to identify modified channels that genuinely present opportunities for restoration or rehabilitation in south Orange County and which will benefit from hydromodification management.

Table 1 Average Property Costs in Orange County

Property Type	Cost (per square foot)	Cost (per acre)
Retail	$355.52	$15,486,451.20
Office	$249.47	$10,866,913.20
Industrial	$179.39	$7,814,228.40

Source: Loopnet.com

A final consideration is another aspect of state law. The Orange County Flood Control District has been delegated authority by the Legislature to construct channels and infrastructure for flood control purposes. These engineered channels are intended for the protection of public safety and property and are mandated by the Orange County Flood Control Act of 1927. Engineered channels serve the public health and safety through flood control protection. A significant portion of Orange County lies in a flood plain and the public needs the benefits of these flood control channels for protection of public safety and property.

Based on the above information a time limited (i.e. pending completion of a watershed analysis) exemption for engineered channels is warranted and should be provided in the Fifth Term Permit for all engineered channels in South Orange County. Provided below are **Figures 3-14** that identify the engineered channels and associated drainage areas in South Orange County, including specific jurisdictions, that would be exempt for discharges to an engineered channel conveyance system with the capacity to convey the 10-year ultimate condition that extends from the point of discharge to water

storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean.

The approach to hydromodification management should be to protect the highest quality streams from future impacts of increased volume and velocity of runoff that will cause hydromodification impacts. A secondary goal of hydromodification management can be restoration or rehabilitation of stream channels where it is feasible, however the watershed analysis needs to be completed first, to identify which streams restoration or rehabilitation is practical.

Figure 1: Prima Deshecha Watershed – 1947 vs. 2012 Alignment

Figure 2: Segunda Deshecha Watershed – 1947 vs. 2012 Alignment

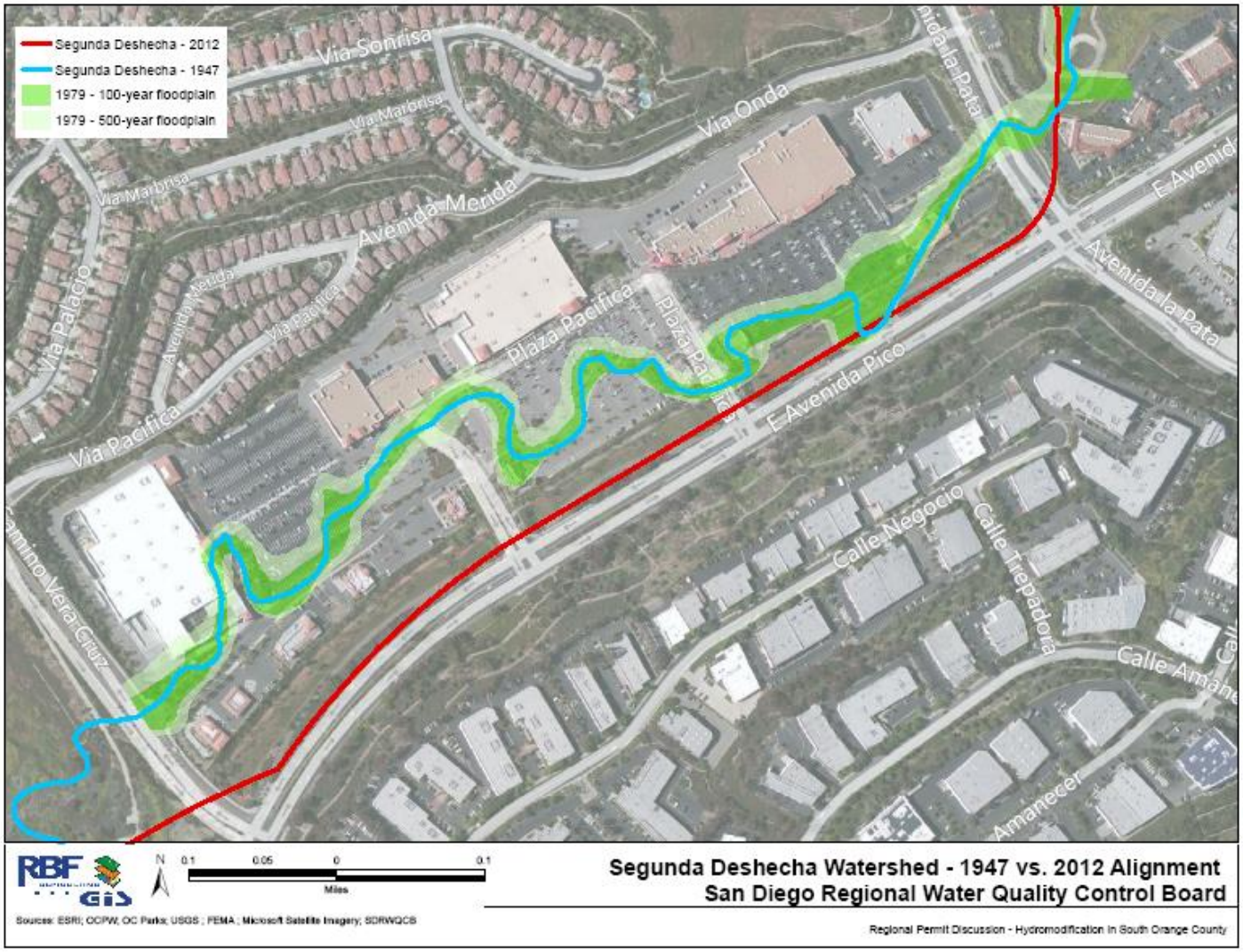

Figure 3: South Orange County Engineered Channels Exemption Areas

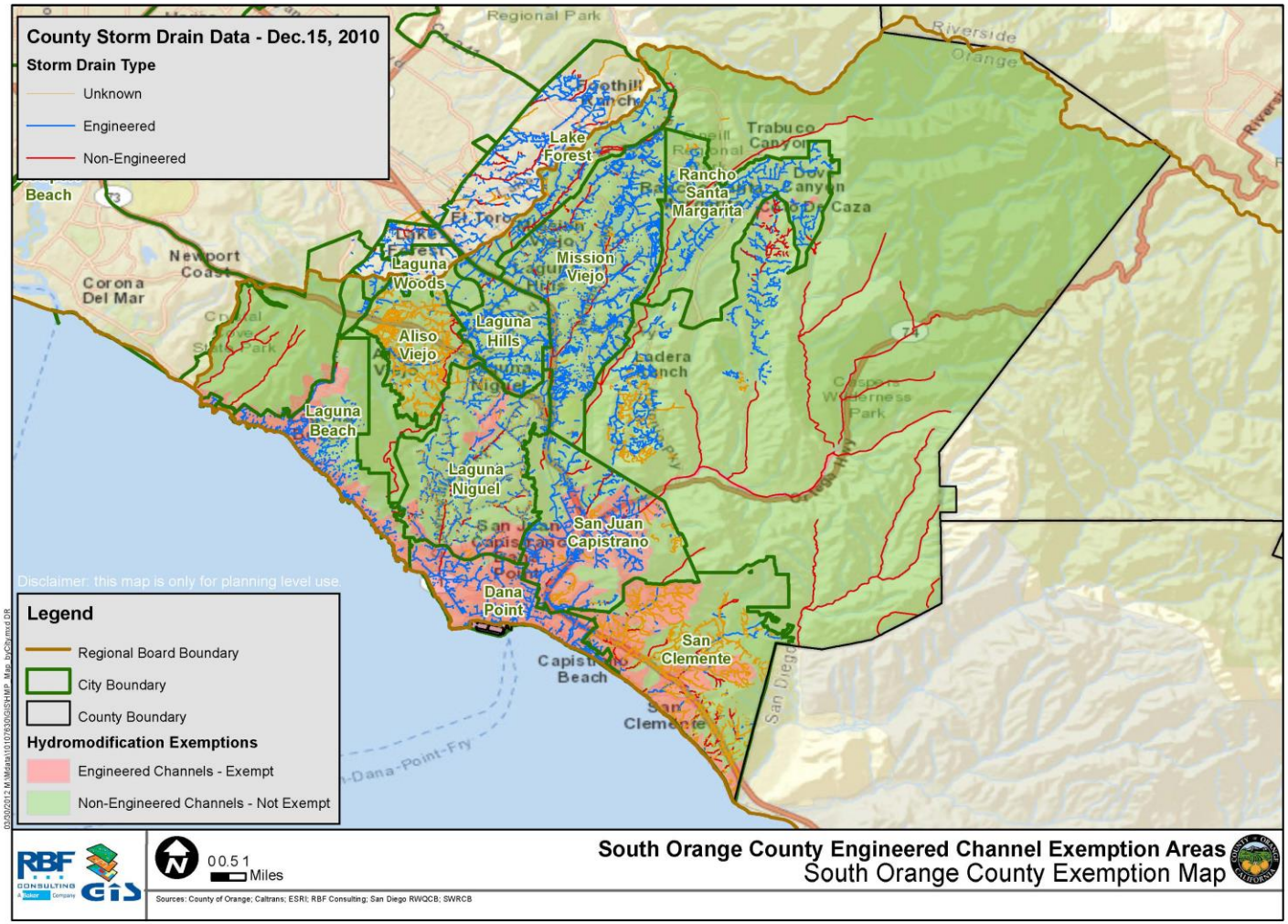

Figure 4: Lake Forest - South Orange County Engineered Channels Exemption Areas

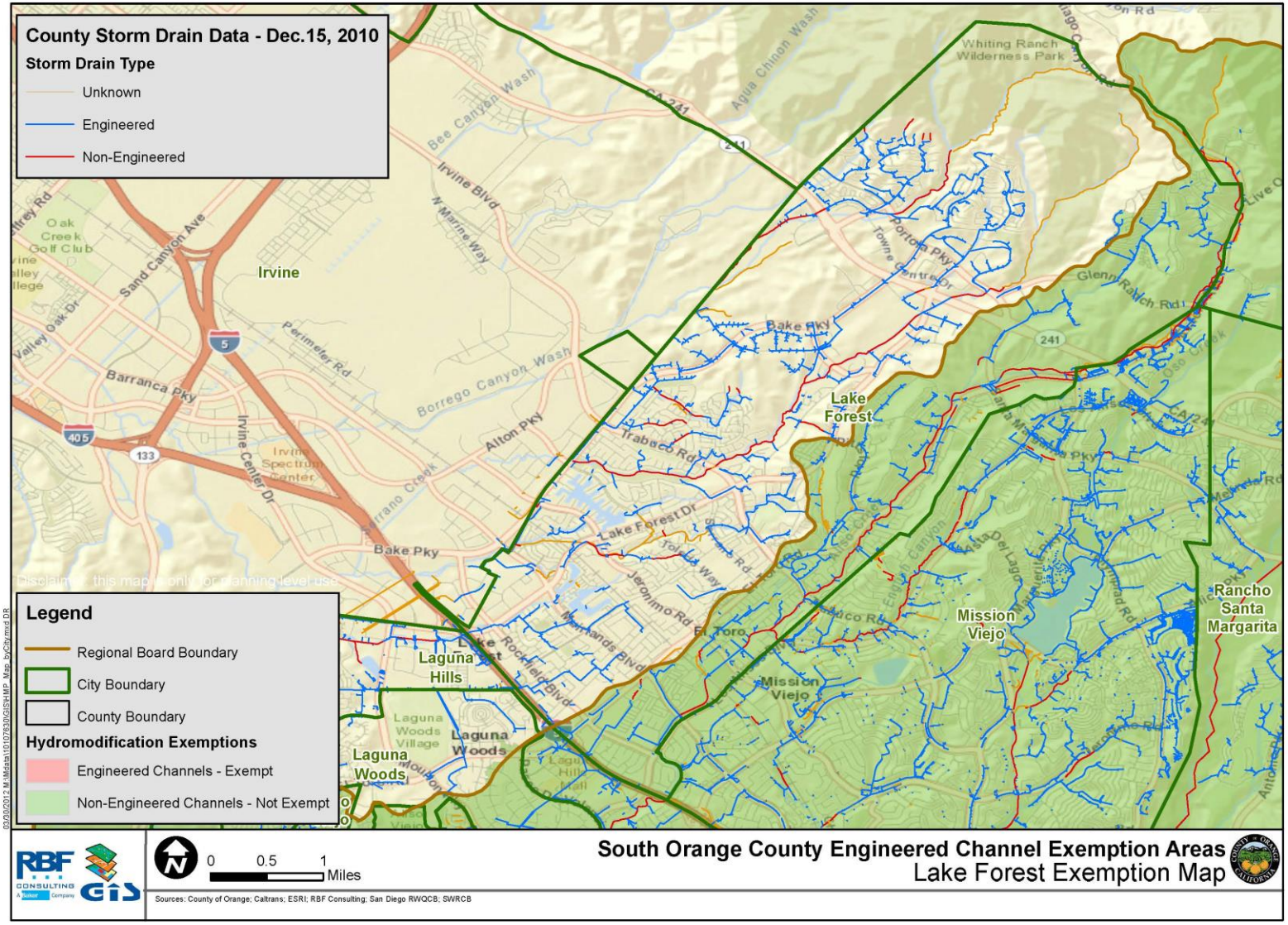

Figure 5: Laguna Woods - South Orange County Engineered Channels Exemption Areas

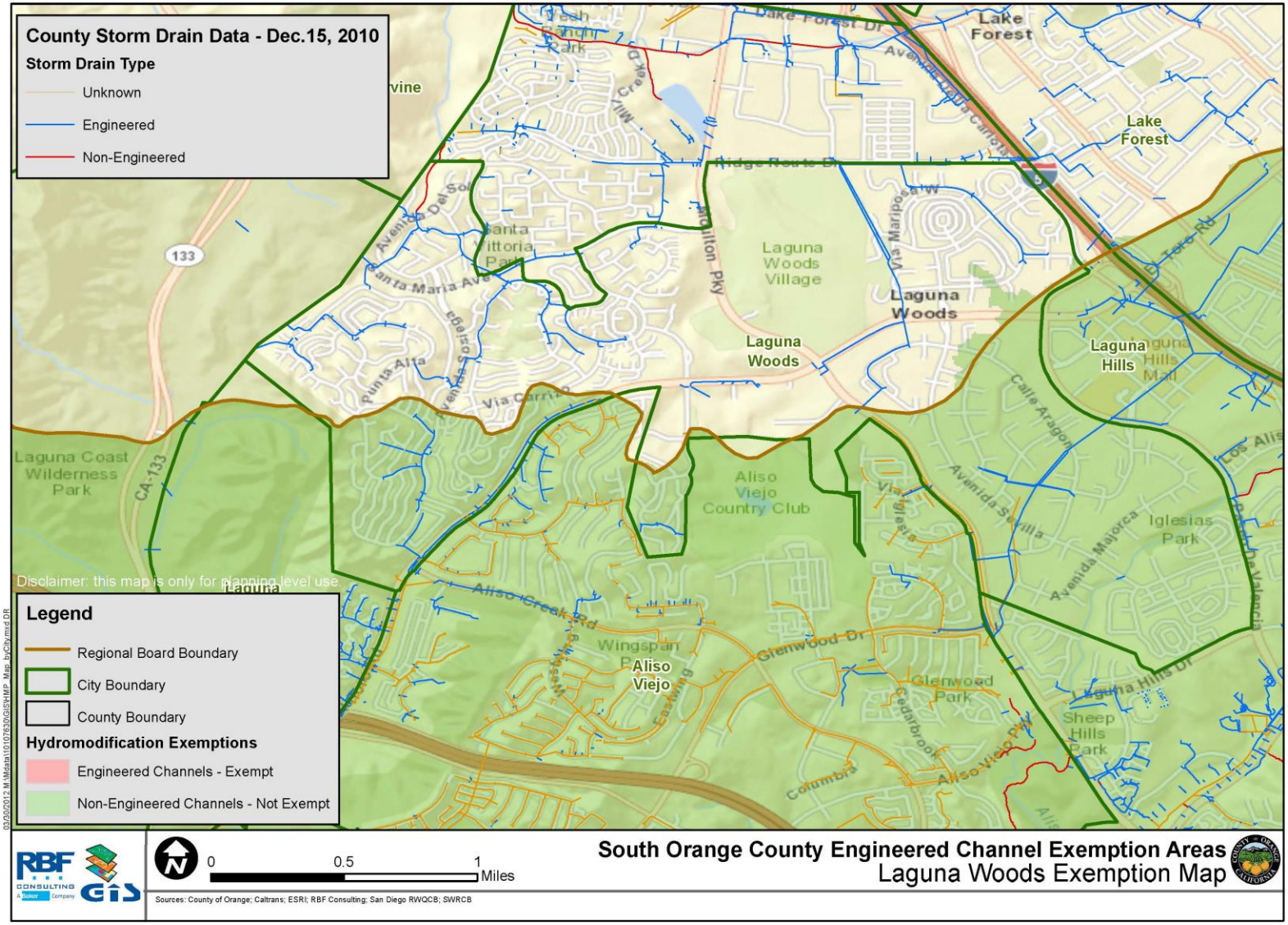

Figure 6: Rancho Santa Margarita - South Orange County Engineered Channels Exemption Areas

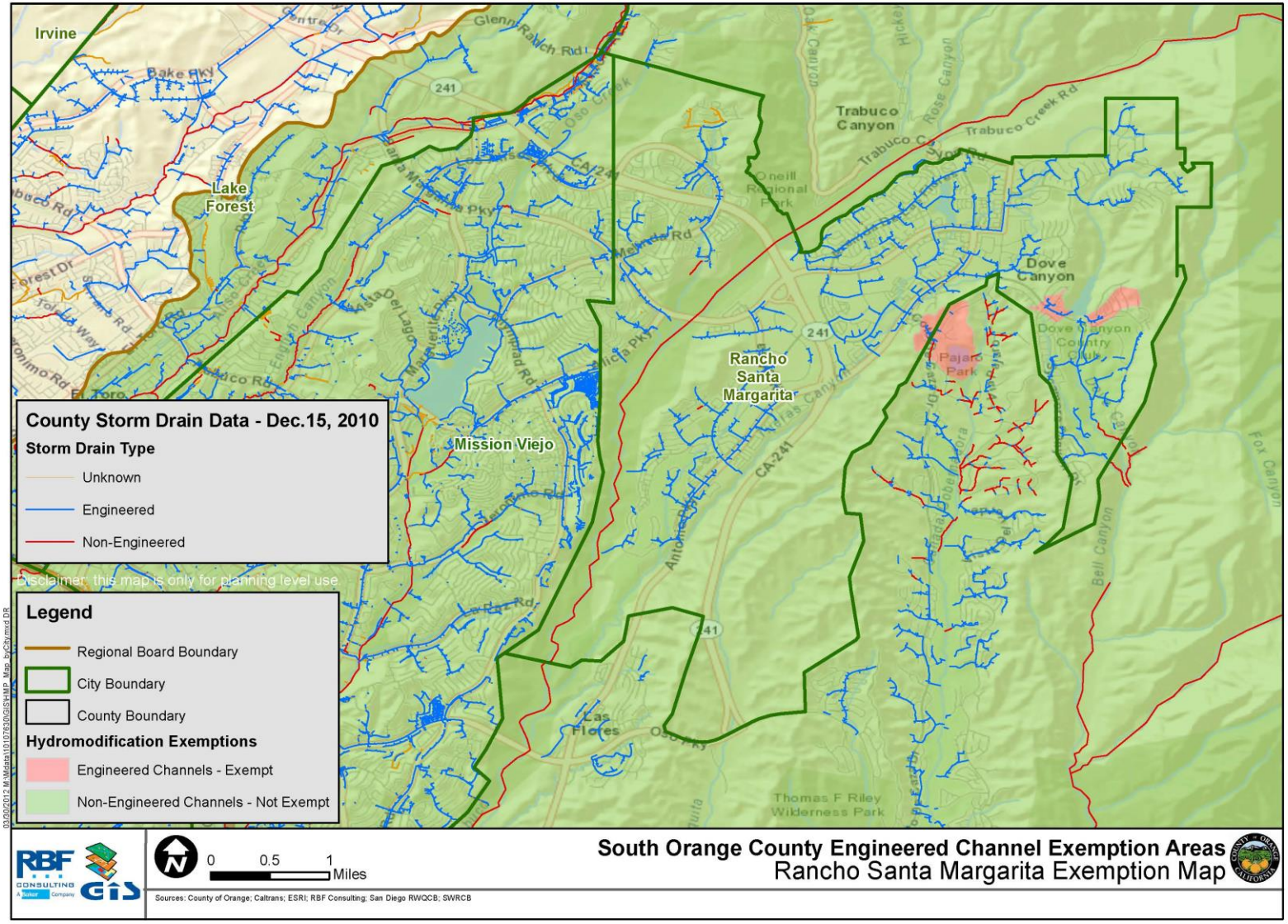

Figure 7: Mission Viejo - South Orange County Engineered Channels Exemption Areas

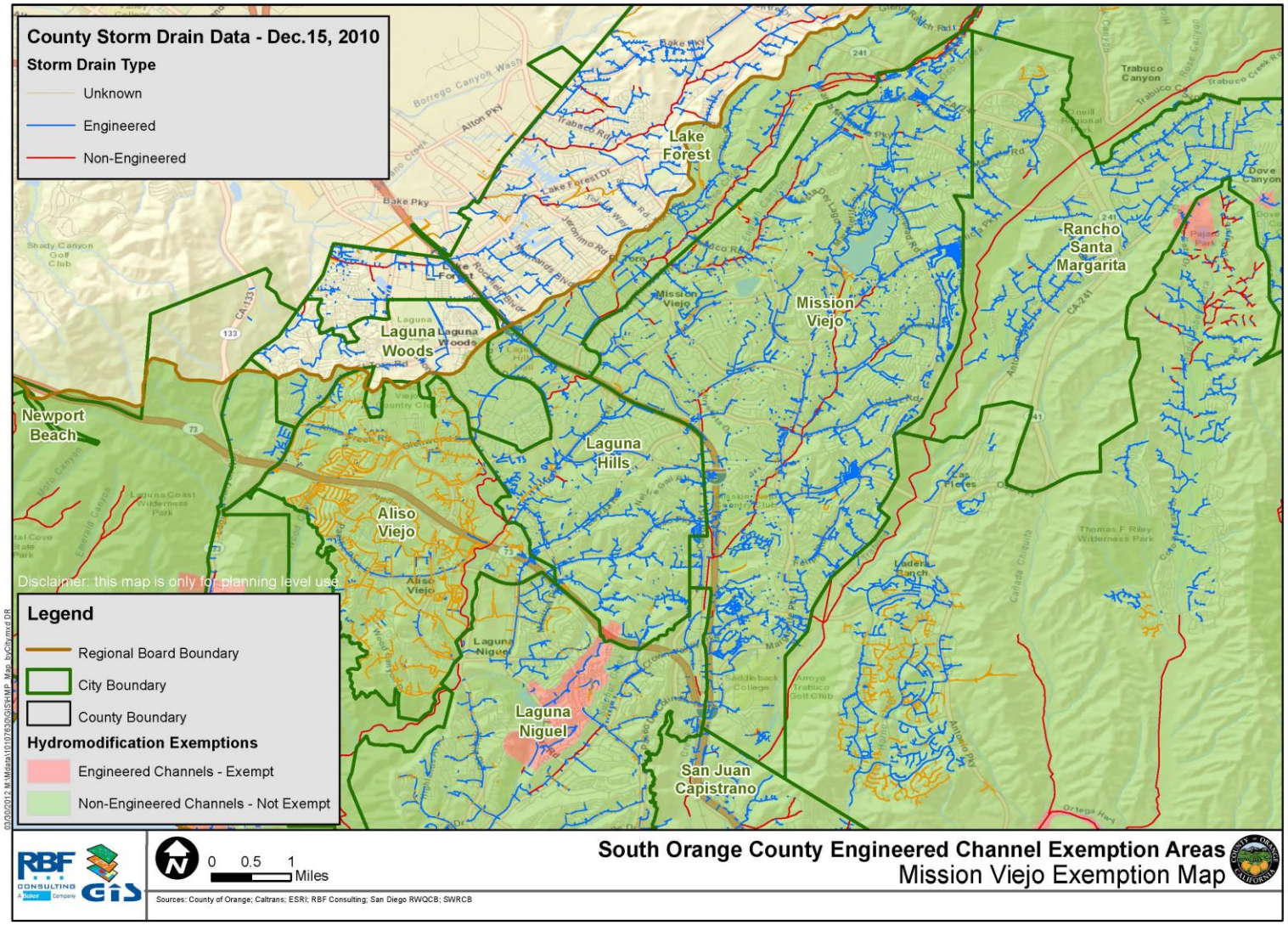

Figure 8: Laguna Hills - South Orange County Engineered Channels Exemption Areas

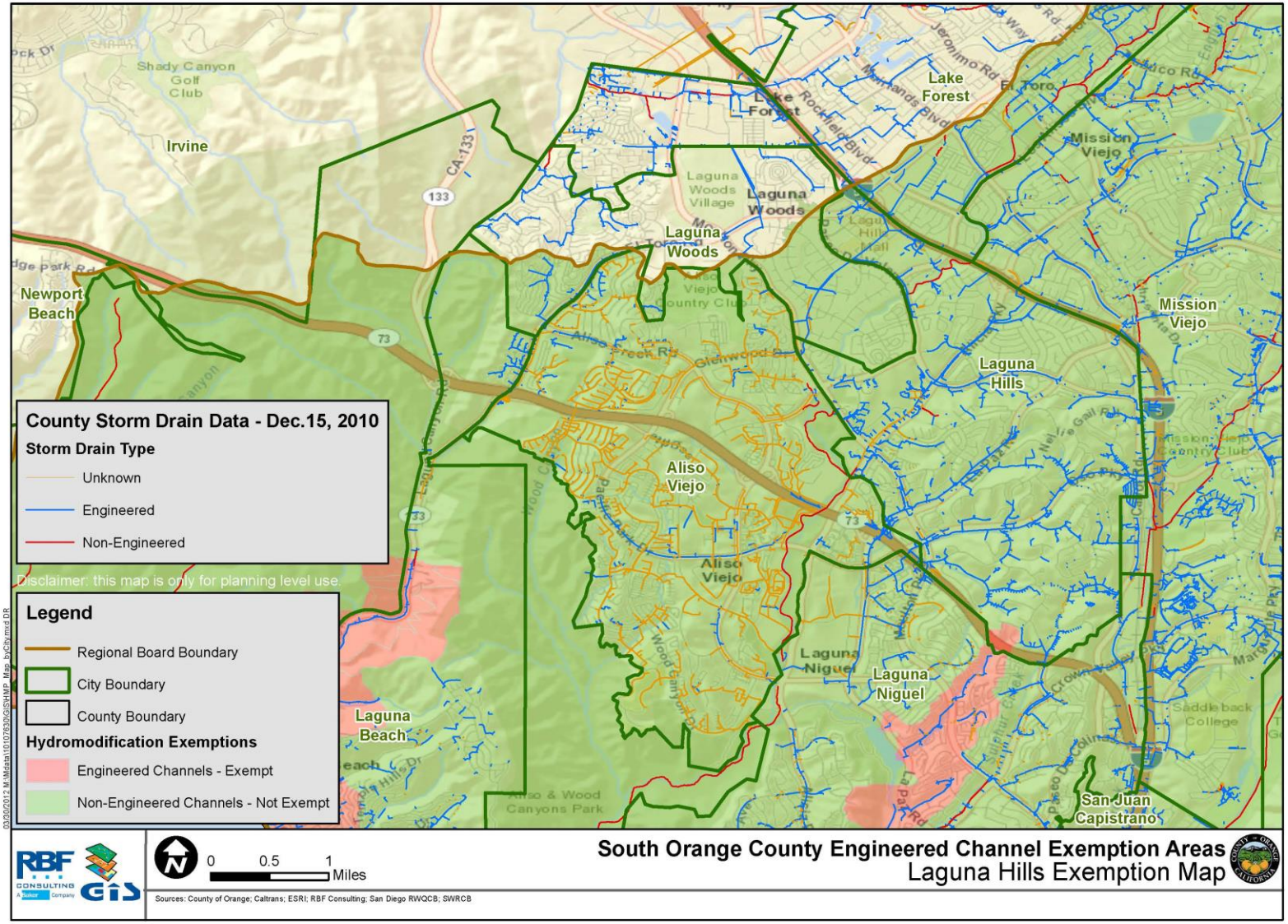

Figure 9: Aliso Viejo - South Orange County Engineered Channels Exemption Areas

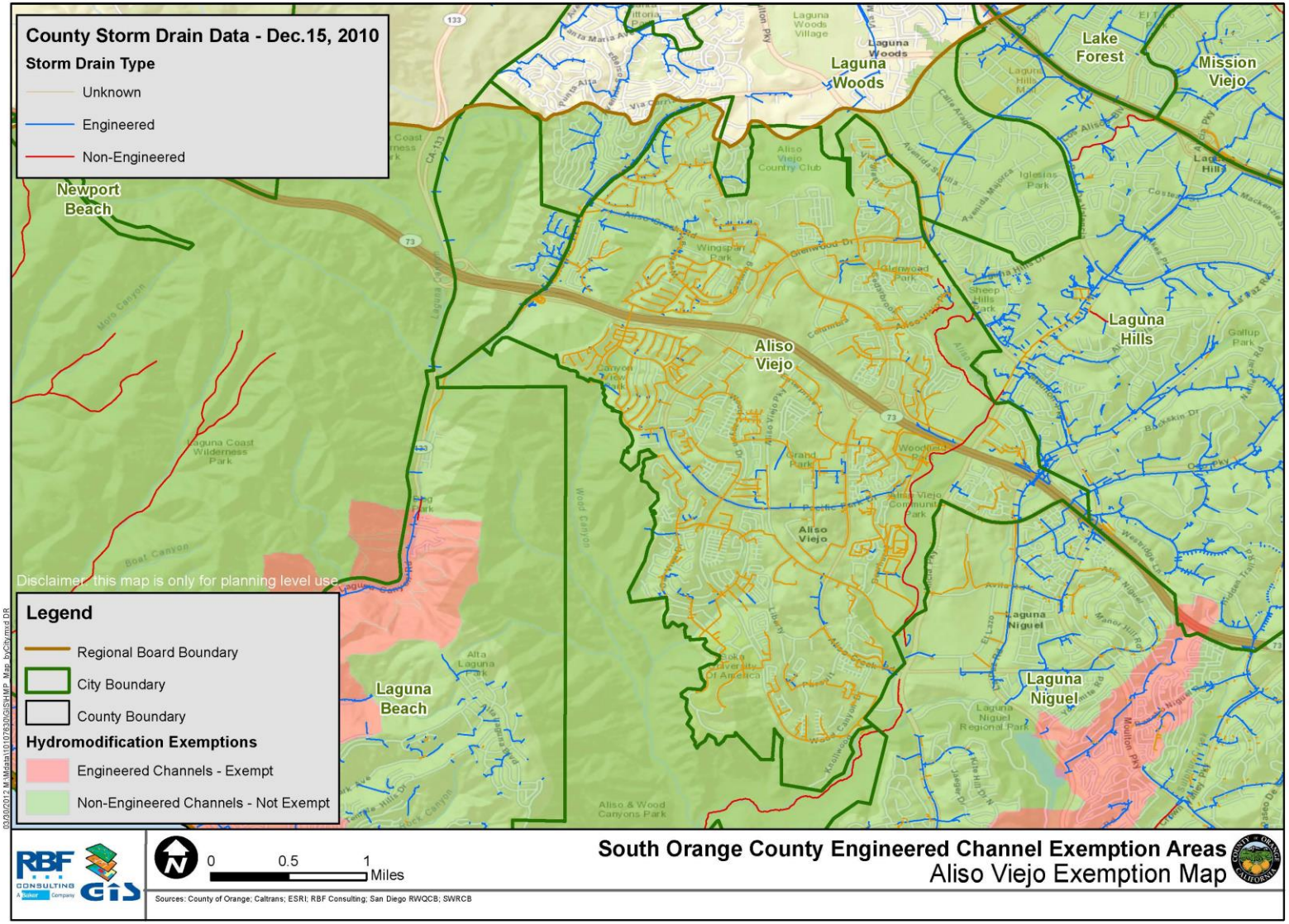

Figure 10: Laguna Beach - South Orange County Engineered Channels Exemption Areas

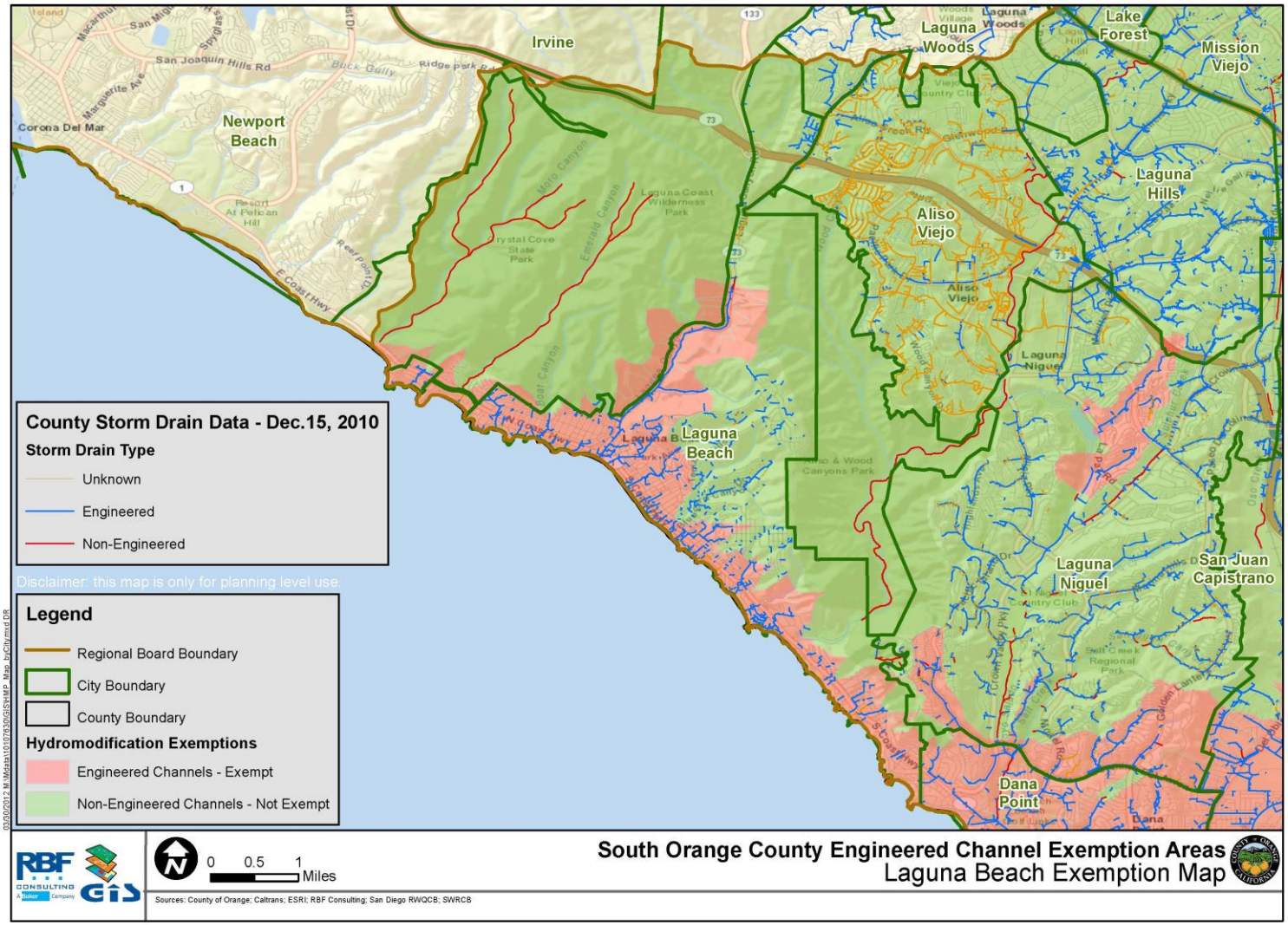

Figure 11: Ladera Ranch & Unincorporated County - South Orange County Engineered Channels Exemption Areas

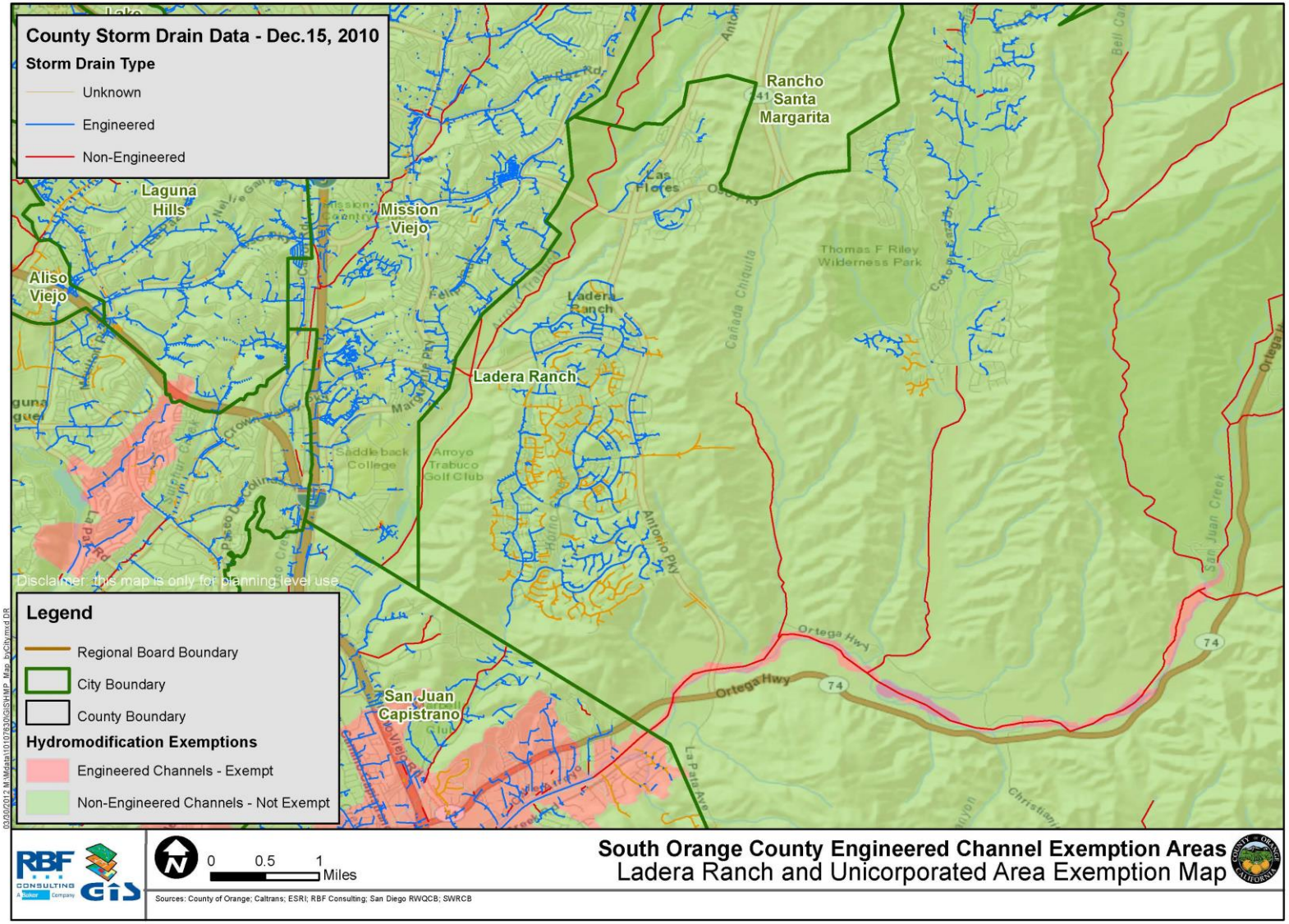

Figure 12: Laguna Niguel - South Orange County Engineered Channels Exemption Areas

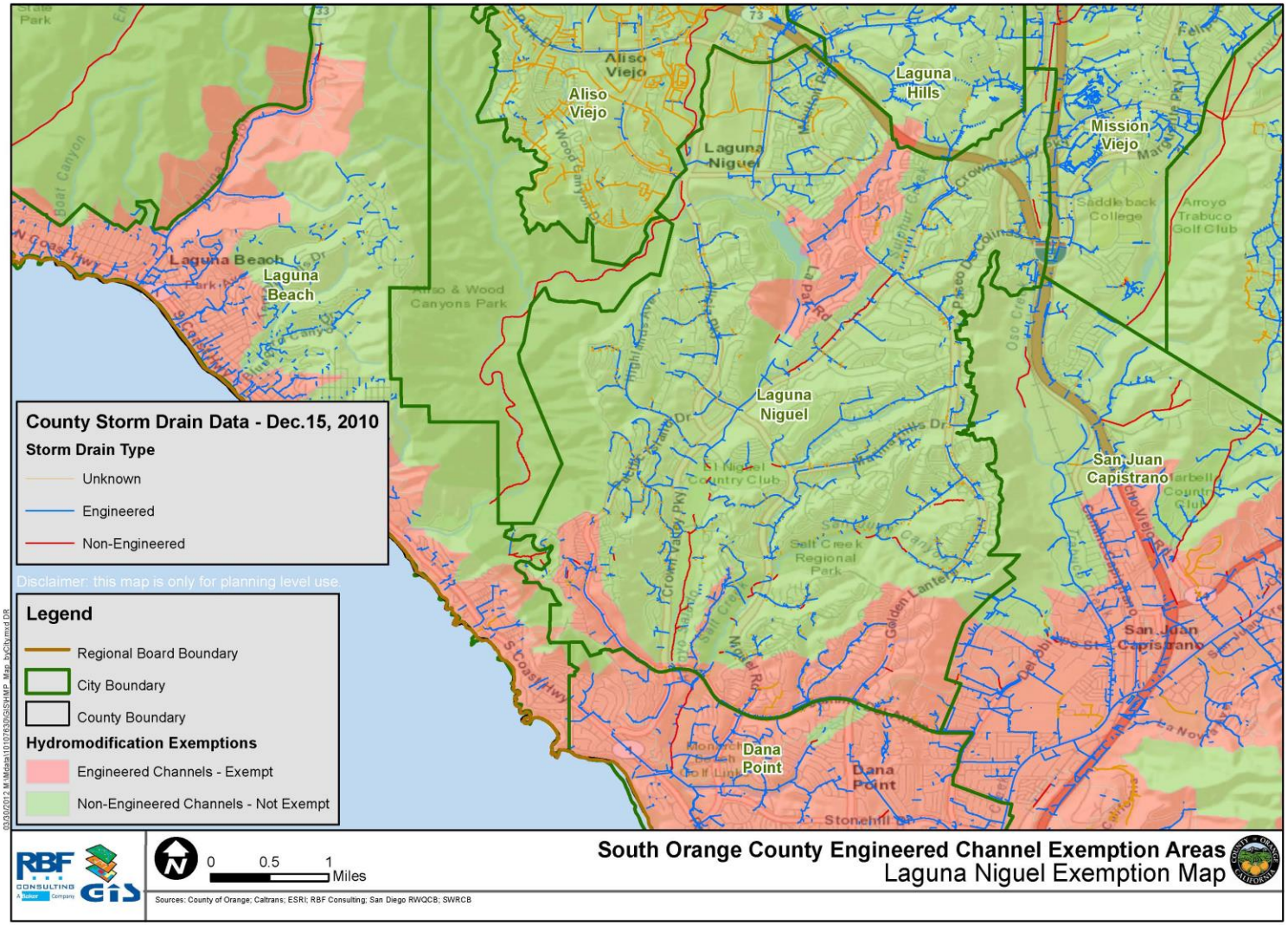

Figure 13: San Juan Capistrano - South Orange County Engineered Channels Exemption Areas

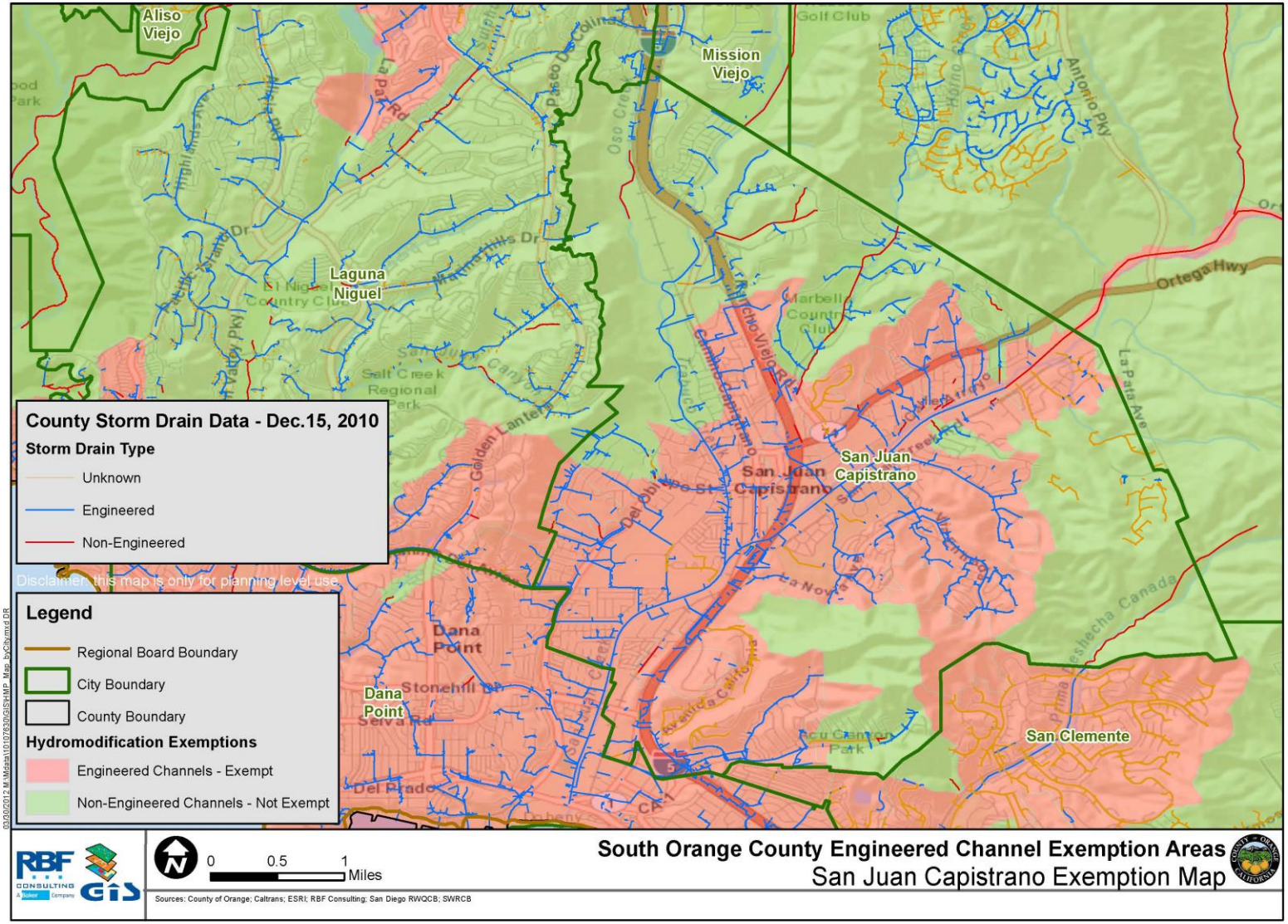
Aliso Viejo
Mission Viejo
Laguna Niguel
San Juan Capistrano
Dana Point
San Clemente
Ortega Hwy
Golf Club
Marbella Country Club
Salt Creek Regional Park
Aliso Creek
Oso Creek
Rancho Viejo Rd
Camino Capistrano
Del Obispo St
Golden Lantern
Stonehill Dr
Selva Rd
Del Prado
Antonio Pky
La Pata Ave
Avenida Pasatiempo
Avenida Calafia
Avenida Vista Hermosa
Calle Negocio
Calle Recodo
Calle Entrada
Calle Del Comercio
Calle Del Cerro
Calle Del Gallo
Calle Del Ciervo
Calle Del Zorro
Calle Del Oro
Calle Del Sol
Calle Del Mar
Calle Del Rio
Calle Del Lago
Calle Del Bosque
Calle Del Valle
Calle Del Cielo
Calle Del Tesoro
Calle Del Pueblo
Calle Del Pino
Calle Del Roble
Calle Del Sauce
Calle Del Nogal
Calle Del Olmo
Calle Del Arroyo
Calle Del Rosario
Calle Del Verde
Calle Del Azul
Calle Del Blanco
Calle Del Negro
Calle Del Rojo
Calle Del Amarillo
Calle Del Naranja
Calle Del Morado
Calle Del Gris
Calle Del Marrón
Calle Del Beige
Calle Del Dorado
Calle Del Plata
Calle Del Cobre
Calle Del Hierro
Calle Del Acero
Calle Del Bronce
Calle Del Estaño
Calle Del Zinc
Calle Del Níquel
Calle Del Cromo
Calle Del Manganeso
Calle Del Molibdeno
Calle Del Tungsteno
Calle Del Vanadio
Calle Del Titanio
Calle Del Circonio
Calle Del Hafnio
Calle Del Tantalio
Calle Del Niobio
Calle Del Rutenio
Calle Del Rodio
Calle Del Paladio
Calle Del Iridio
Calle Del Osmio
Calle Del Platino
Calle Del Oro
Calle Del Mercurio
Calle Del Plomo
Calle Del Bismuto
Calle Del Polonio
Calle Del Astato
Calle Del Radón
Calle Del Francio
Calle Del Radio
Calle Del Actinio
Calle Del Torio
Calle Del Protactinio
Calle Del Uranio
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Calle Del Americio
Calle Del Curio
Calle Del Berquelio
Calle Del Californio
Calle Del Einsteinio
Calle Del Fermio
Calle Del Mendelevio
Calle Del Nobelio
Calle Del Lawrencio
Calle Del Rutherfordio
Calle Del Dubnio
Calle Del Seaborgio
Calle Del Bohrio
Calle Del Hassio
Calle Del Meitnerio
Calle Del Darmstadtio
Calle Del Roentgenio
Calle Del Copernicio
Calle Del Nihonio
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Figure 14: Dana Point - South Orange County Engineered Channels Exemption Areas

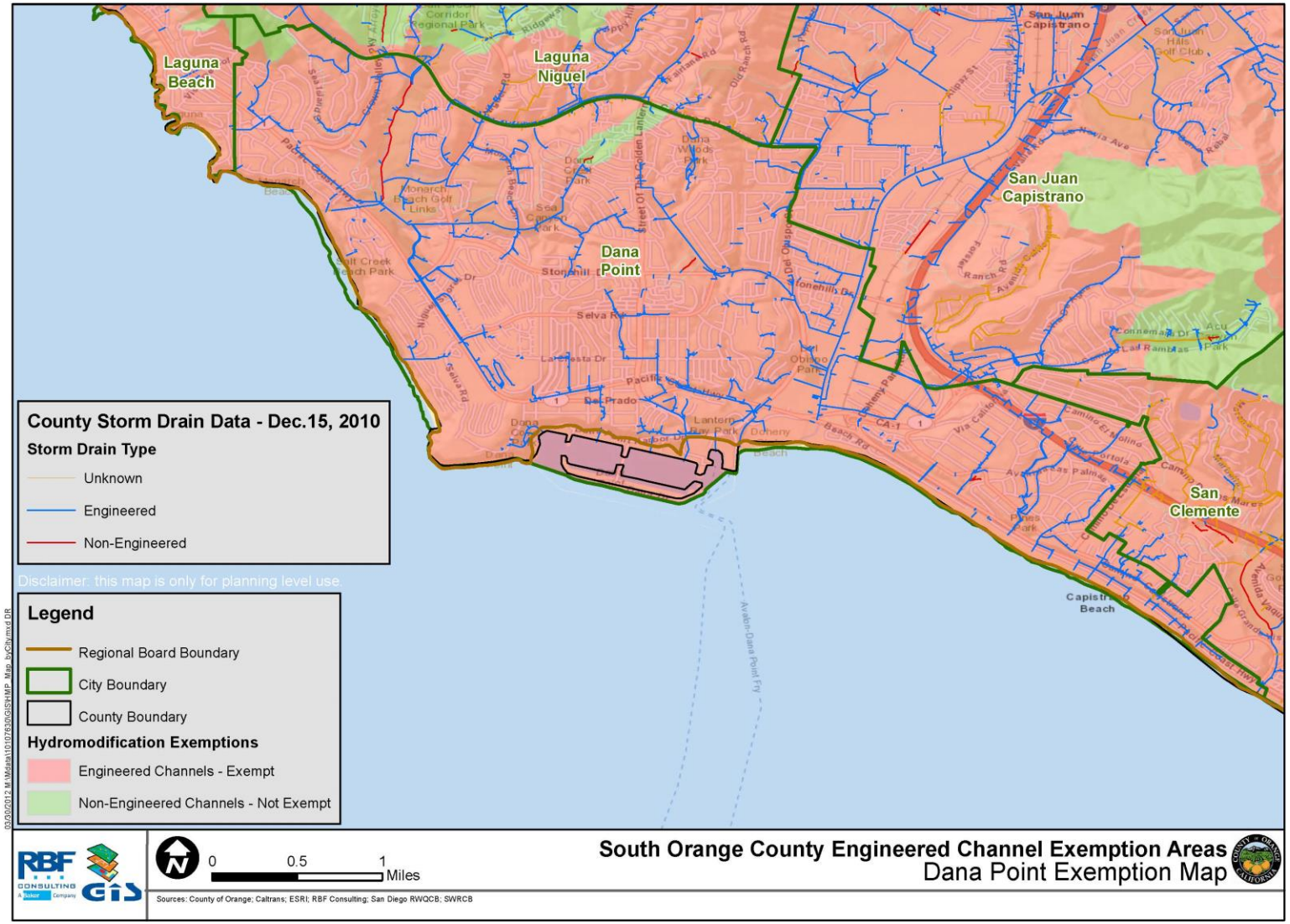

Figure 15: San Clemente - South Orange County Engineered Channels Exemption Areas

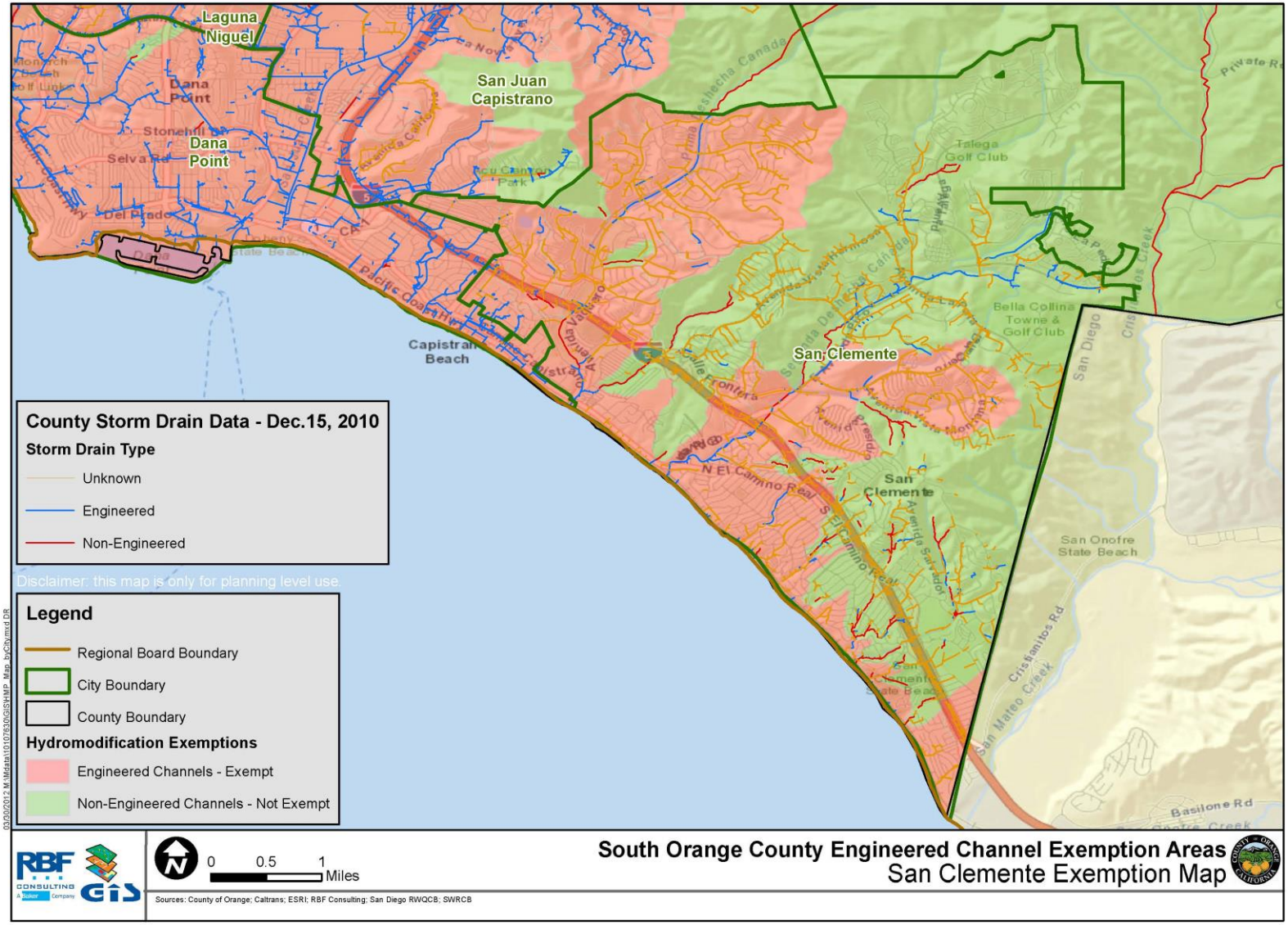

Attachment 3.7.1: Dry Weather Monitoring Rationale and Recommendations

The Fifth Term Permit must recognize that all discharges of pollutants from the MS4 are subject to the MEP standard.

Clean Water Act Sections 402(p)(3)(B)(ii) and (iii) require the Copermittees implement controls to effectively prohibit non-stormwater discharges into the MS4 and that such controls reduce pollutants to the maximum extent practicable (MEP). While federal law regulates "non-stormwater discharges" into the MS4, Section 402(p)(3)(B)(iii) expressly states that the "discharge of pollutants" shall be reduced to MEP. In drafting this section of the CWA, Congress expressly intended all discharges from MS4s to be subject to MEP as it used the term "pollutant" and did not differentiate between stormwater and non-stormwater, as the current Permit attempts to do. Therefore, the duty of the Copermittees to reduce the discharge of pollutants from the MS4 to MEP applies to both stormwater and non-stormwater pollutants.
Furthermore, the focus of the CWA and federal regulations is on a management program that includes a comprehensive planning process to reduce the discharge of pollutants to MEP.[1] One of the elements of the management program is the illicit discharge prevention program.[2] The control and limitation of illicit discharges into the MS4 is intended to achieve the overall MEP standard for discharges from the MS4. This is confirmed by the preamble to EPA regulations that discuss the required elements of the management program.

According to EPA:

> [Copermittees are required] to develop management programs for four types of pollutant sources which discharge to large and medium municipal storm sewer systems. Discharges from large and medium municipal storm sewer systems are usually expected to be composed primarily of: (1) Runoff from commercial and residential areas; (2) storm water runoff from industrial areas; (3) runoff from construction sites; and **(4) non-storm water discharges**. Part 2 of the permit application has been designed to allow [Copermittees] the opportunity to propose **MEP control measures for each of these components of the discharge**. 55 Fed Reg at 48052 (emphasis added).
> *See also* 55 Fed Reg at 48045 (stating "Part 2 of the proposed permit application [which includes the illicit discharge prevention requirement] is designed to . . . provide municipalities with the opportunity of proposing a comprehensive program of structural and non-structural control measures that will **control the discharge of pollutants, to the maximum extent practicable, from municipal storm sewers**.") (Emphasis added).

EPA's position is consistent with existing State Water Resources Control Board policy which states that discharges into the MS4 are to be controlled through an iterative, BMP based approach.[3] The State Board held:

> An NPDES permit is properly issued for "discharge of a pollutant" to waters of the United States. (Clean Water Act § 402(a).) The Clean Water Act defines "discharge of a pollutant" as an "addition" of a pollutant to waters of the United States from a point

[1] 40 CFR 122.26(d)(2)(iv).
[2] 40 CFR 122.26(d)(2)(iv)(B)(1).

[3] Specifically in State Board in Order No. WQ-2001-15, *In the Matter of the Petitions of Building Industry Assoc. of San Diego County and Western States Petroleum Assoc*. (2001).

> source. (Clean Water Act section 502(12). Section 402(p)(3)(B) authorizes the issuance of permits for discharges "from municipal storm sewers."
> We find that the permit language is overly broad because it applies the MEP standard not only to discharges "from" MS4s, but also to discharges "into" MS4s. . . [T]he specific language in this prohibition too broadly restricts all discharges "into" an MS4, and does not allow flexibility to use regional solutions, where they could be applied in a manner that fully protects receiving waters. It is important to emphasize that dischargers into MS4s continue to be required to implement a full range of BMPs, including source control. In particular, dischargers subject to industrial and construction permits must comply with all conditions in those permits prior to discharging storm water into MS4s.[4]

The State Board's decision in the Building Industry Association (BIA) matter makes clear that the CWA does not include a blanket prohibition on discharges of non-stormwater into the MS4. Fifth Term PermitFifth Term Permit
It is also technically infeasible in some cases to differentiate between non-stormwater or stormwater pollutants discharged from the MS4. Thus, just as the discharge of non-stormwater into the MS4 is subject to the effective prohibition standard, the discharge of pollutants in non-stormwater from the MS4 is subject to the MEP standard. Fifth Term Permit

The Fifth Term Permit must not seek to include language that creates an overly broad use of the term "prohibit."

The Fifth Term Permit should require the Permittees to "effectively prohibit non-stormwater discharges" but may exempt certain discharges that are not significant sources of pollutants from the prohibition. Section 402(p) does not require a full prohibition but rather an effective prohibition. The operative word is "effective", which recognizes the constraints of owning and operating a stormwater drainage system, which includes hundreds of miles of open channel. In addition, discharges that are not significant sources of pollutants are exempted from the prohibition. In a practical sense, the use of word "effective" also provides flexibility to assess the impacts of relatively benign discharges such as air condition condensate, individual car washing, and non-emergency fire-fighting flows or non-anthropogenic sources before instituting a prohibition.

The Fifth Term Permit should enable the Permittees to develop program specific action levels that meets the objectives of the IDDE program.

Future NALs for the IDDE program should not be based on water quality objectives at the 'end of pipe' . Instead, these values should be based on 'upset' values that reflect an abnormality for typical urban runoff. The State's own Blue Ribbon Panel, which was convened specifically to examine the feasibility of incorporating numeric effluent limits in stormwater permits, ultimately concluded that numeric limits were generally infeasible across all three stormwater activities,

[4] Id., at 9-10.

with few exceptions[5]. However, the Panel did agree that "upset values" or "action levels" could be established to assist Copermittees in identifying "bad actor" catchments which are clearly above the normal observed variability.

The rationale for this is provided in additional detail below.

Dry Weather Reconnaissance Program Approach

As a part of the IDDE program, the Copermittees had developed and implemented an innovative Dry Weather Reconnaissance Program, based upon statistically derived benchmarks to identify illegal discharges and illicit connections during the typically dry summer months of May through September using a suite of water quality analyses conducted in the field at designated random and targeted drains. A brief summary of that program is provided below.

- The Dry Weather Reconnaissance Program collected significant amounts of data and utilized a hybrid monitoring design that combined probabilistic sampling, targeted sampling, and formal statistical tools (tolerance intervals and control charts). This design enabled the program to systematically prioritize problematic sites, compare conditions to regional urban background, and track trends over time.
    - A *tolerance interval* bound is the upper or lower confidence-interval bound of a quantile of the background data distribution. Tolerance intervals are derived from the probabilistic site data and are used to quantify the key aspects of the regional background.
    - *Control charts* are used to establish an upper or lower bound on a data distribution, based on previous monitoring data. They are created for each site and provide a means of tracking data at individual sites and identifying when new data values deviate substantially from previous experience. The tolerance intervals are supplemented with control charts that track specific historical data, providing a second till to detect results that are out of the ordinary for the specific site.
    - Used together, tolerance intervals and control charts provide a consistent and quantitative means of identifying sites that exhibit excursions in pollutant values.
    - Tolerance intervals and control charts provide the means to discern between typical site conditions and illicit discharges.

The 2010-11 reporting period marked the ninth season of dry weather monitoring in the San Diego Region. Monitoring in the San Diego Region under the Dry Weather Reconnaissance Program was replaced in August 2011 with the NALs Monitoring Program (pursuant to Order No. R9-2009-0002). In order to demonstrate the effectiveness of the Dry Weather Reconnaissance Program, a comparison of this program and the NALs-based program is provided below.

Comparison of the Dry Weather Reconnaissance Program Approach and the NALs-based Approach

[5] *The Feasibility of Numeric Effluent Limits Applicable to Discharges of Stormwater Associated with Municipal, Industrial and Construction Activities, June 19, 2006*

First, a comparison of the probability of an exceedance using the tolerance interval-based approach compared to the NAL-based approach shows that the NALs-based approach requires increased resources since investigations are triggered at a much higher frequency for many constituents (e.g., enterococci and reactive orthophosphate as P – **Figures 1** and **2** below, respectively).

- The Dry Weather Reconnaissance Program is designed to detect "abnormal" results that are indicative of illicit discharges, typically short term, transient, non-stormwater discharges. The Permittees perform many more site visits but initiate fewer investigations, as they are able to discern between discharges that are most likely to be illicit and those that are not. These focused investigations are based on statistically valid data assessments, historical data for the site, and are most likely to be associated with illicit discharges.
- In contrast, the NAL-based program is designed to compare urban runoff from an outfall to a water quality objective that has been established for a receiving water. As demonstrated in the ROWD, chemistry results trigger exceedances of the NALs the majority of the time, which does <u>not</u> allow the Permittees to differentiate between typical site conditions and illicit discharges.
- For example, based on historical data, the probability that a sample does not exceed the NAL for enterococci or orthophosphate is ~ 3-5%. As a result, roughly 31 out of 33 sampling events would be required to be investigated for one or both constituents.
- In contrast, the probability that a sample does not exceed the enterococci or orthophosphate tolerance interval is 90%, which results in only 1 out of 10 sampling events requiring an investigation.
- Thus, the tolerance intervals allow for a true prioritization of the investigations whereas the NALs result in almost all events requiring investigations.

Figure 1: Enterococci Exceedance Frequencies Associated with Dry Weather Reconnaissance Tolerance Intervals Compared with Exceedance Frequencies Associated with NALs.

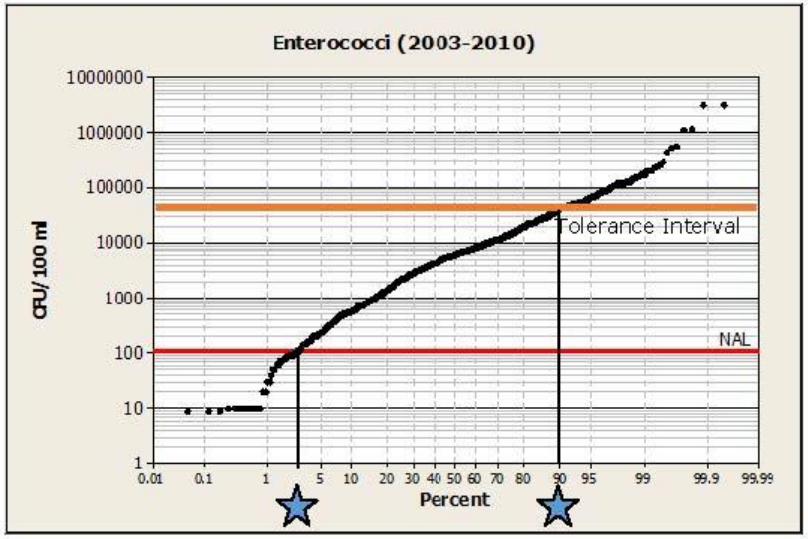

Figure 2: Reactive Orthophosphate as P Exceedance Frequencies Associated with Dry Weather Reconnaissance Tolerance Intervals Compared with Exceedance Frequencies Associated with NALs.

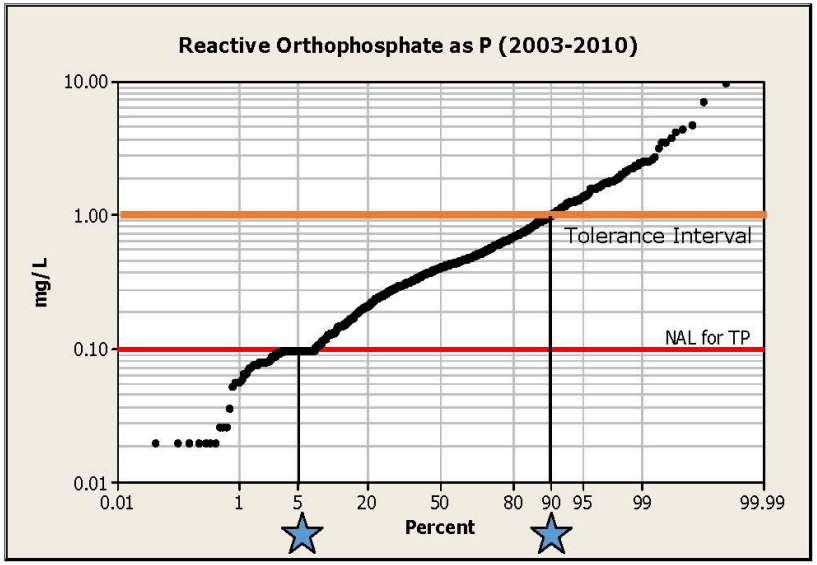

Second, efforts lead by the County to characterize natural sources from ambient geology have demonstrated that natural sources in specific areas are the primary contributor for many constituents of concern such as cadmium, nickel, total dissolved solids, chloride, and sulfate.

Monitoring and special studies show that many of the creeks in south Orange County have elevated levels of several constituents that do not appear to be related to the urban landscape. These constituents correlate poorly with urban attributes such as residential, industrial, and commercial land uses.

The Orange County Stormwater Program has monitored water quality for several years and found that naturally derived pollutants in surface waters can often exceed water quality criteria both in undeveloped catchments as well as in developed watersheds. In recent years, efforts led by the Program to characterize natural sources related to ambient geology have demonstrated that natural sources in specific areas are the primary contributor for many constituents of concern. The concentration ranges measured from the natural sources are shown in the table below.

Constituent	Concentration Range	Water Quality Criterion
Arsenic	<1 - 53 ppb	36 ppb[2]
Cadmium	<1 - 200 ppb	7.3 ppb[2]
Copper	1.2 - 23 ppb	18 ppb[2]
Nickel	6.4 - 1300 ppb	169 ppb[2]
Selenium	<1 - 220 ppb	5.0 ppb[2]
Zinc	<1 - 1800 ppb	379 ppb[2]
Chloride	470 - 2400 ppm	250 ppb[1]
Sulfate	1200 - 11000 ppm	250 ppb[1]
Total Dissolved Solids	3700 - 22000 ppm	500 ppb[1]
Total Nitrogen as N	<0.1 - 38 ppm	1.0 ppb[1]

Notes:
1) Basin Plan Water Quality Objective
2) California Toxics Rule, Criterion Continuous Concentration at hardness of 400 mg/L

Additionally, the Program is currently collaborating with the University of Southern California (USC) to develop a modeling approach that could "fingerprint" water sources based on their patterns of constituent concentrations. Such a

fingerprint, or chemical signature, for groundwater provides information about its source(s) and potential conveyance mechanism for constituents of concern. Physiographic conditions under which rain falls in Sierra Nevada or Colorado River watersheds are very different from those in Orange County's low elevation coastal watersheds. As a result, these differences impart unique isotopic fractionation on the water - a signature that acts as a fingerprint for various sources.

The Program's efforts, in collaboration with USC, recently have focused on sampling these new water quality tests for fingerprinting sources that provides a better approach for assessing natural contributions from anthropogenic, or human based activities. This work focused on collecting samples from natural streams, groundwater springs, domestic water sources, and urban channels to compare and contrast differences between the various water body types. Together with the information on constituent levels from ambient geology and source fingerprinting , this approach will provide a much better understanding about natural and anthropogenic sources of both water and contaminants to streams in south Orange County.

This effort is providing a more robust approach to interpret measured pollutant concentrations against in the context of natural background levels as well as to determine relative loading contributions from natural and anthropogenic inputs. This work is still underway, but will provide important information and assist in understanding the origin of non-stormwater discharges within the stormdrain system.
Until this work is completed, the Program will be unable to discriminate between instances of illicit discharges and conditions that are essentially artifacts of a constructed storm drain system and/or the local geology. The Program has found strong positive linear relationships between levels of metals associated with runoff and groundwater seepage from the Monterey and Capistrano marine sedimentary formations. Both formations are known to be enriched in trace metals and are common across southern Orange County. This evidence suggest that many exceedances of water quality criteria are due to non-illicit discharge factors (i.e., local geology).

Third, after the implementation of the NAL-based program for over a year, some clear differences between the previously established Dry Weather Reconnaissance Program and the NAL-based program have been evident (see **Table 1** below). Comparison of the 2011-2012 NALs data collected in the San Diego Region with the data from the Dry Weather Reconnaissance Monitoring program for the 2009-2010 reporting period shows how the ability to prioritize the IDDE investigations has been diminished.

Table 1: Comparison of 2011-2012 NALs Data Collected in the San Diego Region with the Data from the Dry Weather Reconnaissance Monitoring Program for the 2009-2010 Reporting Period

	NAL Exceedances 2011-2012		DW Pgm Action Level Exceedances 2009-2010	
Constituent	**Number**	**%**	**Number**	**%**
pH	1	2	0	0
TDS	42	93	0	0
Dissolved Oxygen	2	4	0	0
Turbidity	3	7	3	1
Surfactants	3	7	14	5
Total Coliform	24	53	0	0
Fecal Coliform	19	42	0	0
Enterococcus	42	93	0	0
Unionized Ammonia	3	7	8	3
Total N / Nitrate	41	91	0	0
Total P / Ortho PO4	38	84	11	4
Cadmium	13	28	0	0
Copper	1	2	0	0
Nickel	7	15	0	0
Zinc	1	2	0	0
Total # of Site Visits	**45**		**274**	

For the Dry Weather Reconnaissance Program, the Permittees conducted 274 site visits, whereas for the NAL-based program, the Permittees conducted 45 site visits.

- Although the Permittees collected data and information for six times more stations as a part of the Dry Weather Reconnaissance Program, the NALs-based program identified more than six times the number of exceedances.
    - Dry Weather Reconnissance Program – 274 site visits/36 exceedances (13%)
    - NALs-based Program – 45 site visits/240 exceedances (5x the number of visits)
- The Dry Weather Reconnaissance Program provides better spatial and temporal coverage than a NAL-based program. The number of sites visited during implementation of the current program was six times greater than the number of sites visited during implementation of the NAL-based program.

- The Dry Weather Reconnaissance program identified exceedances for four (4) constituents: turbidity, surfactants, unionized ammonia, and total phosphate
- The NALs-based program identified exceedances for all fifteen (15) constituents, with the top three associated with TDS, enterococcus, and total nitrogen
- For the NALs-based program, there was no ability to prioritize discharges for follow up investigation since many of the constituents exceeded the NALs 20-40% of the time.

The conclusions from the implementation of the Orange County NAL-based program to date are:

- The NAL program replaced an previously existing and effective program (the Dry Weather Reconnaissance program);
- The Dry Weather Reconnaissance Program resulted in focused source investigations for key constituents indicative of illicit discharges;
- The NAL program has required increased resources and has resulted in everything being a priority (thus, nothing is a priority). In addition, the NAL-based triggers have, in many cases been the result of constituents attributable to natural sources within the watersheds;
- There have been many exceedances that have been due to non-IDDE factors such as local geology (especially for nickel and cadmium);
- It has been very difficult to determine the endpoints, the sources, of the various non-stormwater discharges since the discharges are so co-mingled; and
- There is a strong need for a regionally-based prioritization so that there is not a mis-direction of limited resources.

Recommendations

The Regional Water Board staff review the results of the Orange County program to date and consider the revisions as proposed in order to assist with the prioritization of resources and water quality issues. If the Copermittees are required to continue to use the NAL-based program, they will lose the ability to prioritize the water quality issues and discriminate between true instances of IDDE and ambient urban conditions in a storm drain systems draining landscapes underlain by marine sedimentary formations containing phosphorous and a number of metals. The Copermittees fundamentally recommend that they be able to reinstate the Dry Weather Reconnaissance Program.

REPORT OF WASTE DISCHARGE

MAY 10, 2015

Submitted to:

SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD
(Order No. R9-2010-0016)

and

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY – REGION IX
(NPDES No. CAS0108766)

RIVERSIDE COUNTY

SANTA MARGARITA RIVER REGION

Principal Permittee:

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

Co-Permittees:

COUNTY OF RIVERSIDE, CITY of MURRIETA,
CITY of TEMECULA, and CITY of WILDOMAR

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1.0 Introduction

This Report of Waste Discharge (ROWD) is an application for renewal of Order No. R9-2010-0016, an area-wide National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Permit (2010 MS4 Permit). The MS4s covered under the 2010 MS4 Permit are owned and operated by the Riverside County Flood Control and Water Conservation District (District), the County of Riverside (County), and the Cities of Murrieta, Temecula and Wildomar (collectively, the Co-Permittees).

On November 10, 2010, the San Diego Regional Water Quality Control Board (Regional Board) adopted the 2010 MS4 Permit, which expires on November 10, 2015. Directive K.2.c of the 2010 MS4 Permit requires that a ROWD be submitted no later than 180 days prior to the expiration date. This ROWD has been prepared in consultation with the Co-Permittees and is submitted on their behalf. Table 1-2 lists the required elements for the ROWD and identifies where those elements can be found in the ROWD.

In order to protect lives and property and to prevent damage to the watershed, the Co-Permittees operate and maintain essential drainage infrastructure in the Santa Margarita Region (SMR). The County and the Cities maintain approximately 317 miles of drainage infrastructure in the SMR while the District maintains approximately 90 miles. Environmental stewardship and integrated water resource management continues to be an essential part of the Co-Permittees' responsibilities.

The diligent work performed by the Co-Permittees under the 2010 MS4 Permit has maintained Receiving Water quality and prevented new impairments despite continued growth in population and development within the region. As shown in Table 1-1, the population in the region is projected to have a steady growth rate and by 2020 the region's population is predicted to grow by 5.6%. The challenges posed by this growing population require the Co-Permittees to continue to adapt their BMPs and watershed programs to protect water quality.

Table 1-1 Santa Margarita Region Population Estimates

Co-Permittee	Year			
	Estimate 2015 (a)	Estimate 2016 (b)	Projected 2020 (b)	Change (2015 to 2020)
City of Murrieta	107,455	108,482	112,591	4.8%
City of Temecula	108,450 b	111,585b	119,422	10.1%
City of Wildomar	35,433	36,310	37,204	5.0%
Unincorporated County of Riverside	51,314	52,436	53,793	2.6%
Total	272,621	276,585	292,017	5.6%

Notes:

(a) Unless otherwise noted, populations were obtained from the State of California, Department of Finance, E-4 Population Estimates for Cities, Counties and the State, *2011-2014, with 2010 Census Benchmark*. Sacramento, California, May 2014.

(b) Data gathered from City of Temecula website, "Demographic Snapshot 2014 Report".

During the term of the 2010 MS4 Permit, the Co-Permittees developed and utilized various programs to help protect water quality. These programs include the development of the Individual Jurisdictional Runoff Management Plan (JRMP) that specifies management programs and activities required of each Co-Permittee, as well as the development of the SMR Monitoring and Reporting Program (MRP). The Upper Santa Margarita River Watershed Water Quality Workplan (Watershed Workplan) was also developed during the permit term to identify and prioritize water quality concerns.

The Co-Permittees have also developed new and improved ways to maximize finite resources to protect Receiving Waters more effectively. Such examples are creating a more efficient process to review priority development projects, WQMPs, and track inspections. The Co-Permittees continue to improve procedures to efficiently respond to spills and other illegal discharges. The Co-Permittees also continue to educate the public about improving water quality through different engagements such as hosting public education events, speaking to employees and customers at home improvement stores, and speaking to students at local schools. The Annual Reports submitted under the 2010 MS4 Permit (which are contained in Appendix C) describe the Co-Permittees' various water quality improvement programs in detail.

This ROWD builds on the discussion in the Annual Reports by highlighting the major accomplishments of the Co-Permittees' programs, describing the challenges that they face and discussing their continuing efforts to protect Receiving Water quality. To promote clarity, terms defined in the 2010 MS4 Permit are capitalized in this ROWD.

1.1 ROWD Required Elements Summary

Table 1-2 Location of Required ROWD Elements per Directive K.2.c of 2010 MS4 Permit

Required ROWD Element	ROWD Location
1) Proposed changes to the Co-Permittees' runoff management programs	Section 3.80, and Appendix C
2) Proposed changes to monitoring programs	Section 3.0 and Appendix C
3) Justification for proposed changes	Section 3.80 and Appendix C
4) Name and mailing addresses of the Co-Permittees	Section 1.2

1.2 Co-Permittee Contact Information

The table below provides the contact information for each of the Co-Permittees in the Santa Margarita Region that have either technical or administrative involvement in the MS4 Permit.

Table 1-3 Co-Permittee Contact Information

Co-Permittee	Primary Contact	Staff Contact	Address
District (Principal)	Warren D. Williams General Manager-Chief Engineer 951.955.1275	David Garcia Engineering Project Manager 951.955.1330 dhgarcia@rcflood.org	1995 Market Street Riverside, CA 92501
City of Murrieta	Bob Moehling City Engineer 951.461.6036. bmoehling@murrieta.org	Bill Woolsey Civil Engineer Associate 951.461.6073 wwoolsey@murrieta.org	1 Town Center 24601 Jefferson Avenue Murrieta, CA 92562
City of Temecula	Tom Garcia Director of Public Works 951.694.6411 tom.garcia@cityoftemecula.org	Aldo Licitra 951.694.6411 aldo.licitra@cityoftemecula.org	41000 Main Street Temecula, CA 92590
City of Wildomar	Dan York Public Works Director 951.677.7751 ext. 216 dyork@cityofwildomar.org	Matt Bennett Deputy City Engineer 951.677.7751 ext. 208 mbennett@cityofwildomar.org	23873 Clinton Keith Road, Suite 201 Wildomar, CA 92595
County of Riverside	Steve Horn Senior Management Analyst 951.955.1110 shorn@rceo.org	Claudia Steiding Senior Transportation Planner (Transportation Land Management Agency) 951.955.1694 csteiding@rctlma.org	4080 Lemon Street, 4th Floor Riverside, CA 92501

1.3 Regional Board Jurisdictional Area Exchange

- **City of Wildomar (San Diego Co-Permittee) -** The City of Wildomar requests that the San Diego Regional Board continue regulating all portions of the city, regardless of Regional Board jurisdictional boundaries, for matters pertaining to MS4 permitting.

- **City of Menifee (Santa Ana Co-Permittee) -** At this time during the SMR ROWD process, the City of Menifee request that the San Diego Regional Board continue designating the Santa Ana Regional Board as the sole regulator of the City of Menifee pertaining to MS4 permitting.

2.0 Santa Margarita Region Permit Area Overview

2.1 Physiography and Geology

The upper Santa Margarita River watershed is defined as that portion of the Santa Margarita River watershed above the confluence of Murrieta and Temecula Creeks, and includes the City of Temecula and portions of the Cities of Menifee, Murrieta, Wildomar, unincorporated County areas, portions of the Cleveland and San Bernardino National Forests, the Cahuilla, Ramona, Pauma, and Pechanga Indian Reservations and properties under the jurisdiction of Caltrans and a variety of special districts. The watershed is bounded by several mountain ranges, including the Santa Ana and Santa Margarita mountains to the North and the Palomar Mountains to the South. The upper Santa Margarita watershed includes areas in Riverside and San Diego Counties and encompasses approximately 588 square miles.

The upper Santa Margarita watershed includes two major sub-basins, drained by Temecula and Murrieta Creeks. Temecula Creek has a drainage area of 366 square miles, with steep rugged topography in the Palomar and Thomas Mountain areas and rolling hills below. The upper 316 square miles of this basin is controlled by Vail Lake (completed in 1949). Murrieta Creek has a drainage area of 222 square miles, with over 50 square miles controlled by Skinner Reservoir (completed in 1974). Approximately 13 square miles are tributary to Diamond Valley Lake. Although the watershed area is somewhat smaller and less rugged than the Temecula Basin, flood flows have the potential to create greater damage as they flow through the cities of Temecula and Murrieta.

Temecula and Murrieta Creeks join along the Elsinore fault zone at the head of Temecula Canyon to form the Santa Margarita River. The Temecula Canyon is approximately five miles long, and is a steep, narrow, and rocky canyon. The San Diego-Riverside county line crosses through the Temecula Canyon. From here, the river traverses 27 miles to the Pacific Ocean.[1]

2.2 Permit Area

The Permit Area is defined as the urbanized area served by the Co-Permittees' MS4 facilities. The Permit Area is located within the area delineated by the County boundary line on the south and the limits of the jurisdiction of the San Diego Regional Board on the north, east, and west. The area encompasses approximately 751 square miles, about 10 percent of the Riverside County. It may seem that with increased population growth within the region that urban land use should have increased, however, data shows that only approximately 9% of the region is designated as Urban Land Use. The remaining portion of the region consists of either: Open space, Preserves, Rural Residential (>1ac.), or Agriculture. The Santa Margarita River Watershed Area Land Use Map is attached as Appendix B.

[1] Santa Margarita Watershed Study: Hydrologic and Watershed Processes, Phillips, Williams and Associates, Ltd., October 26, 1998, page 1.

3.0 SMR Water Quality Data Efforts and Outcomes

3.1 Summary

The SMR includes the portion of the Santa Margarita River Watershed within Riverside County. The monitoring station locations are shown in Figure 3-1 below, and are described in detail in the SMR Monitoring Report (see Appendix C). The SMR monitoring program has two general categories of monitoring stations: Receiving Water stations and MS4 outfall stations:

- Receiving Water monitoring stations are in waters of the U.S., and include reference streams and mass loading stations; and
- MS4 outfall stations are discharge points that are major outfalls.

While accomplishments from implementation of the SMR Monitoring and Reporting Program (MRP) are discussed in this section, the entire MRP is attached as Appendix C.

Each year, the Co-Permittees collect water quality samples at Receiving Water and MS4 outfall stations with various sampling frequencies, ultimately resulting in the collection of approximately 56 water quality samples. Anywhere from 80 to 243 constituents per sample undergo laboratory analysis for a full range of potential pollutants including pesticides, nutrients, metals and bacterial indicators. Only a small minority of the analytes were found to have exceeded federal and state Water Quality Standards. Although we only see a small group of constituents within the region having exceedances, the same class of constituents are seen statewide exceeding Water Quality Standards as evident from the CWA 303(d) list of waterbody impairments. The Co-Permittees are making strides in minimizing the exceedances of these particular constituents. The Co-Permittees' stormwater programs continue to adapt in order to protect Receiving Water quality. Accomplishments are highlighted in Section 3.5 below and in the Co-Permittee's individual JRMP annual reports.

Figure 3-1 SMR Monitoring Stations

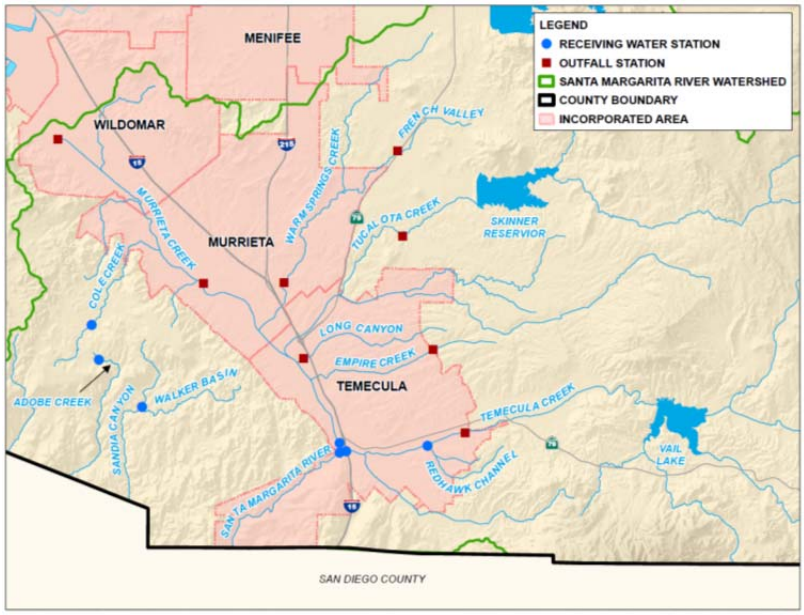

3.2 Analysis Assessment of Water Quality Data

Figure 3-2 SMR Dry Weather Exceedances FYs 2012-2014

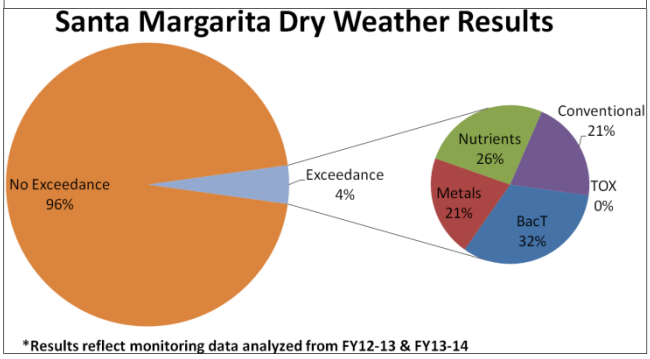

Figure 3-3 SMR Wet Weather Exceedances FYs 2012-2014

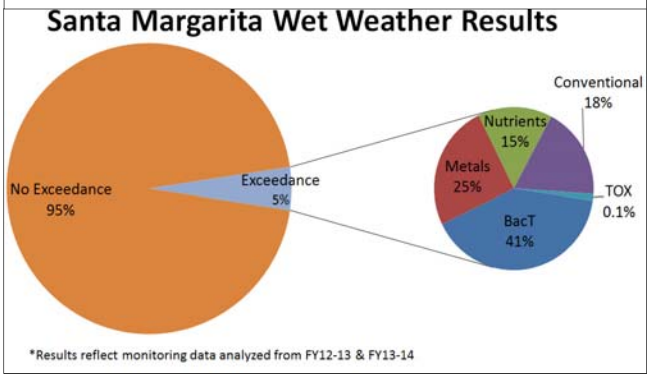

Overall, water quality conditions in SMR Receiving Waters are improving based on the number of waterbody-pollutant pairings in the upper Santa Margarita River watershed. Significant improvements are observed in the water quality sampling data sets. The results are discussed more fully in Section 3.6 (Effectiveness Assessment).

Under the Wet Weather monitoring program, approximately three water quality samples are collected at six Receiving Water stations, as well as one water quality sample from eight MS4 outfall stations. With additional sampling at the outfalls, 11 proximate Receiving Water locations are collected. This results in nearly 1,600 water quality data points.

Additionally, under the Dry Weather monitoring program, approximately two water quality samples are collected at six Receiving Water stations, as well as one water quality sample from eight MS4 outfall stations. With additional sampling at the outfalls, 11 proximate Receiving Water locations are collected. This results in over 1,300 water quality data points. As seen in Figures 3-2 and 3-3, out of the 2,900 water quality data points collected during the permit term, the SMR has only seen approximately 5% exceedances. Long-term trend data, as limited to the mass loading Receiving Water stations, are available in Attachment I (Long-Term Instantaneous Loads and Trends) of the 2013-2014 SMR Monitoring Annual Report attached as Appendix C.

The Co-Permittees have been working diligently to determine the sources of the high priority pollutants by conducting special studies (see Section 3.7.1) and engaging with special work groups (i.e. Nutrient Initiative Group).

3.3 Inherent Limitations to Analyzing Stormwater Quality Data

There are inherent limitations to analyzing water quality data from stormwater. Stormwater runoff greatly contrasts from the wastewater treatment and monitoring process. Discharges from mechanically treated wastewater effluent and industrial discharges usually:

- Come from a single or a few readily identifiable sources;
- Are generally consistent in flow rate and chemical character from day to day; and
- Can be easily instrumented.

Conversely, rain events producing urban runoff and non-point source flows are difficult to collect and analyze due to the fact that they:

- Come from multitudes of unidentifiable or hidden sources, many of which are non-urban in nature:
  - Natural leaching of soils
  - Wildlife
  - Aerial deposition
  - Wildfires
  - State, federal or tribal lands
- Vary widely in flow rate in response to precipitation events
- Vary widely in chemical character at any given moment due to:
  - Unidentified episodic issues related to natural phenomena
  - Magnitude of rainfall and extent of contributing area
  - Potential one-time illicit discharges that were not identified at the time of sampling
  - Unforeseen or unidentified consequences of land use changes
- Are subject to significant natural random variation; and
- Cannot be easily instrumented due to the variation in depth and velocity within water courses or natural stream beds.

Because ephemeral stormwater flows are particularly random in character, it may take many years before statistically significant trends can be identified from the outfall monitoring data in order to properly assess the overall effectiveness of an Urban Runoff water quality control measure.

3.4 Bioassessment Data

Bioassessment is a field collection method in which the health of a specific ecological population of interest is evaluated (e.g. aquatic insects, algae, fish, plants, etc.).

One population evaluated under this monitoring program were insects that live in the bottom substrate of the Receiving Waters. Where sufficient flows exist to support them, these organisms can provide a measure of water quality because they have a very diverse community structure, live a large portion of their lives in water as larvae or adults, have various sensitivities to natural and anthropogenic impacts, are easy to collect, and have life histories that are well studied. Similarly, algae populations were evaluated because they respond to increased stress due to natural and anthropogenic impacts in ways different than aquatic insects, and thereby together provide a picture of the water quality.

Dry weather bioassessments were performed according to the MRP at four designated Receiving Water stations (Lower Murrieta Creek, Lower Temecula Creek, Redhawk Channel, and Upper Santa Margarita River), as well as at two reference stations (Adobe Creek and Sandia Creek). All bioassessments were performed within the appropriate index period in Dry Weather (May 1st to July 30th).

During the Permit Term, the overall biological health, as determined by the SoCal IBI scores[2], was "Poor" or "Very Poor" for the lower watershed stations. Reference sites (e.g., sites higher in the watershed with limited, to no impacts from urbanization) were rated as "Fair". Figure 4-1 depicts the historical summary of SoCal IBI Scores for the SMR monitoring stations.

Figure 4-1: Summary of SoCal IBI Scores for All Monitoring Stations (Spring 2006–Spring 2014)

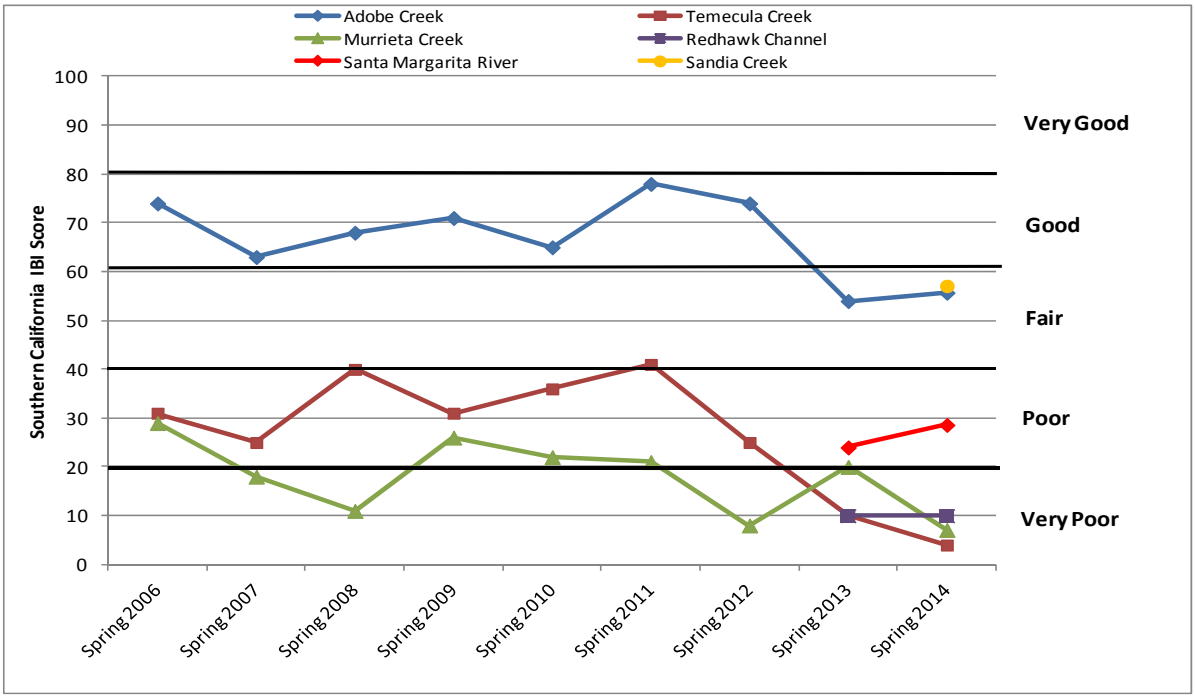

Several differences between the reference sites and the receiving water sites were identified. This affects the overall IBI score and examples of these differences include the following:

- Riparian vegetation differs among the stations monitored. The majority of the monitoring stations are located lower in the watershed and have very little canopy coverage as compared to the reference sites. This tends to impact the water temperatures at the sites.
- Water temperatures measured at the majority of the Receiving Water sites were higher than those recorded at the reference sites. Similar to the previous reporting year, these differences in temperature were most likely due to the amount of overhead tree canopy surrounding the creeks. This, coupled with smaller wetted width at the reference sites, can lead to a denser tree canopy directly overhead of a stream, resulting in lower instream temperatures.
- A large difference noted between stations was the percentage gradient (slope) of the stream. Both reference stations have very high gradients (~2-4%), while the lower watershed stations ranged

[2] The SoCal IBI was developed to assess the biological integrity of freshwater streams in the southern California coastal region. Methods described in the *Quantitative Tool for Assessing the Integrity of SoCal Coastal Streams* (Ode et al., 2005) were used to calculate the Southern California Index of Biological Integrity (SoCal IBI) to evaluate the overall health of the benthic macro invertebrate community, based on the counts of various species contained in the taxonomy results.

from very low to moderate (~0.7-1.5%). The steeper gradients create riffles and microhabitats that tend to yield higher IBI scores.

Overall the SMR is a dynamic system with large seasonal variations in flow, from dry streambeds to high-energy flows. This arid hydrological regime is typical in the southwestern region of California and can have significant impacts on bioassessment results.

Mediterranean climates, such as those in southern California, tend to have extremes in rainfall patterns, oscillating from periods of rainfall above normal to those very much below normal. As presented in Table 8 of the 2013-2014 Monitoring Annual Report (Attachment C), since the 1992-1993 reporting year, only three of the 21 periods have experienced at least "normal" (average) rainfall totals. Droughts influence the BMI community by decreasing overall base flows, increasing temperature, and potentially increasing algal growth. In a report on the patterns of BMI communities in non-perennial streams, Mazor et al. (2012)[3] found that as stream flow decreases, overall IBI scores tended to decrease. In general, data suggests that a historic drought period may negatively influence the IBI scores.

It seems likely that the biological community are more responsive to the amount of water present than they are to water quality. The drought appears to inhibit our ability to clearly isolate water quality as the sole cause of low IBI scores. The method used for bioassessment does not adequately distinguish between the effects of simply not having sufficient water present (e.g., arid or drought conditions) and the effects of poor water quality on the target populations. Therefore falling IBI scores are not necessarily an indicator of worsening water quality in an arid region.

3.5 Monitoring Program Accomplishments

- Updated and enhanced the Consolidated Monitoring Program to incorporate new monitoring collection methods and data analysis protocols.
- Developed watershed boundaries and land use information for all monitoring stations;
- Reorganized the technical content of the Monitoring Annual Report;
- Added fire map information to assist with assessing potential Pollutant sources;
- Enhanced monitoring databases to be compatible with SCCWRP/SMC standard reporting protocols;
- Enhanced monitoring methods to incorporate use of automatic sampling equipment where appropriate;
- Designed and constructed the District's LID BMP Demonstration and Testing Facility. The project acts as a laboratory for testing the water quality and water conservation benefits of LID features;

[3] Mazor, R.D., K. Schiff, P. Ode, and E. Stein. Final Report on Bioassessment in Nonperennial Streams. Report to the State Water Resources Control Board. Southern California Coastal Water Research Project Technical Report 695. June 2012.

- Implemented several programs to detect IC/IDs, including field and MS4 facility inspections, IC/ID based Dry Weather outfall monitoring. Performed annual mock storm event exercises that involve physical inspections of storm drains and Receiving Waters;

- Operating procedures for Non-Stormwater Action Levels was developed during the permit term to help with IC/ID follow-up and reporting procedures. This allowed for consistency between Co-Permittees within the region;

- Participated in the Santa Margarita Watershed Nutrient Initiative – Stakeholder Group. The group was formed to address nutrient issues in the Santa Margarita River watershed. The group hopes to set regulatory targets based on state of the science techniques to ensure the biological, chemical, and physical integrity of the Santa Margarita River and its tributaries;

- Continued participation in regional and statewide monitoring and science efforts such as the Southern California Monitoring Coalition (SMC) to develop:

  – Lab inter-calibration of chemical, bioassessment and Toxicity testing methods

  – Testing methods for bioassessment and Toxicity in Southern California streams

  – A stormwater research needs report for southern California

- Continued participation with SCCWRP on the development of the Regional Watershed Monitoring Program for Southern California. Co-Permittees have representatives on the SMC Executive Committee and the Bioassessment Technical Subcommittee.

3.6 Effectiveness Assessment

A cumulative analysis and evaluation of monitoring data indicate that the Co-Permittees' stormwater programs have been effective in preventing further impairment of SMR Receiving Waters even during a time of population growth in the region. The SMR water quality data is encouraging, and the Co-Permittees continue to assess their programs and adapt their efforts to improve water quality throughout the region.

As set forth in the SMR Monitoring Annual Reports, water quality conditions in Receiving Waters appear to be improving. This is based on a decreasing number of exceedances for 303(d)-listed constituents in the SMR. The pollutants with an increase of concentration are addressed through various programs and management activities. The following pollutant waterbody combinations at historically monitored mass loading stations have exhibited statistically significant long-term trends:

- TDS at Murrieta Creek during dry weather—decreasing concentrations
- Nitrogen (total) at Murrieta Creek during dry weather—decreasing concentrations
- Sulfate at Temecula Creek during wet and dry weather—decreasing concentrations
- Fecal coliform at Temecula Creek during wet and dry weather—decreasing counts
- *E. coli* at Temecula Creek during dry weather—decreasing counts
- Manganese at Murrieta Creek during dry weather—increasing concentrations

- The Co-Permittees initiated a Special Study to determine the cause(s) of the high concentrations of Iron and Manganese in the Region. The study is discussed briefly in Section 3.6.1.

The overall effectiveness of the Co-Permittees program is assessed based on the analysis of water quality data obtained as part of the MRP. The data has been collected and analyzed throughout the current permit term. However, the monitoring requirements of the 2010 MS4 Permit were not implemented until Fiscal Year 2012-2013. Although the initial Receiving Water quality data is encouraging, additional time and data is needed to fully assess the monitoring program results.

3.7 Watershed Program Highlights

The Co-Permittees can report the following accomplishments during the entire period of the 2010 MS4 Permit:

- Development of Best Management Practice (BMP) handbook to standardize post-construction selection and design in Riverside County. The handbook became effective September 2011.
- Development of the Upper Santa Margarita River Watershed Water Quality Workplan. Implementation began in June 2012, after submittal to Regional Board.
- Revised Co-Permittee monitoring programs to reflect new 2010 MS4 Permit changes. The changes were put into effect as of October 2012.
- Development of the Co-Permittees' Individual JRMPs. Implementation of JRMPs began in June 2012.
- Development of a Water Quality Management Plan (WQMP) that addresses post-construction stormwater runoff management for New Priority Development Projects and Redevelopment Projects. The WQMP became effective on July 11, 2014.
- Development and enhancements to the design template for developing project-specific WQMPs. The WQMP Template became effective on July 11, 2014.
- Development of the Santa Margarita Region (SMR) Hydromodification Management Plan (HMP). The Compliance plan became effective on July 11, 2014.
- Developed the Santa Margarita Region Hydrology Model (SMRHM) software to help developers analyze projects to meet the HMP requirements. The software became free to the public to download on July 11, 2014.
- Development of WQMP and HMP training and education courses. The courses were developed in 2014 to introduce the new development programs.
- Development of the Stormwater and Water Conservation Tracking Tool in collaboration with the Santa Ana Region Co-Permittees in Riverside County. The tracking tool became available to the public for use in 2014.
- Development and maintenance of Co-Permittee databases to track construction sites of 1-acre or larger in size. In addition, the Co-Permittees have standardized a construction reporting spreadsheet used for Annual Reports, updated inspection forms, and enhanced the construction outreach program.

- Creation of Co-Permittee databases to track industrial and commercial facilities.
- Continuation of the Riverside County Stormwater Pollution Prevention public education program which offers educational resources and free brochures targeting residents, businesses, developers, contractors, and elementary school children.
- Participation in regional and statewide monitoring efforts such as the Southern California Stormwater Monitoring Coalition (SMC), Southern California Coastal Water Commission and National Water Resources Institute.
- Participation in the California Stormwater Quality Association (CASQA), including various leadership roles.
- Continued partnership in the Upper Santa Margarita Region Integrated Regional Watershed Management Plan
- Performance of multiple special studies during the 2010 MS4 Permit term that have helped to identify causes of pollutants within the Santa Margarita Region. These studies are discussed further in Section 3.7.1

3.7.1 Special Studies Conducted

Sediment Toxicity – The goal of the study was to assess the quality of stream sediments and possible contamination from MS4 runoff in receiving waters. The workplan was finalized, based on approval of the Water Board, in May 2013. The results of monitoring metals, organochlorine pesticides, and synthetic pyrethroid pesticides in sediment indicated that the concentrations were generally below target threshold and effect levels.

Trash and Litter Investigation – The goal of the study was to provide information regarding BMP effectiveness for trash and to help guide management actions and BMP implementation for trash in the SMR. The study was submitted to the Regional Board in 2013 along with the Monitoring Annual Report. The report found that trash and litter was not a significant issue in the receiving waters within SMR.

Agricultural, Federal, Tribal and State Input Study – This study investigates the water quality of agricultural, federal, and tribal runoff that is discharged into the Co-Permittees' MS4. The goal of the study was to characterize stormwater flows that are not regulated by the Co-Permittees but have influence upstream of their MS4s. The preliminary findings have found that the highest levels of pollutant concentrations were measured from agriculture land use. The second year of required monitoring for the special study is currently being completed within FY 2014-2015. A final report is anticipated to be submitted with the 2014-2015 Monitoring Annual report.

Low-Impact Development (LID) Retention Impacts Study – The Co-Permittees participated in the development of the special study in order to assess the impacts of LID on surface flows, the potential relationship to beneficial uses, and the effects on water supply rights of down downstream jurisdictions. The LID Retention Impacts Study was prepared in lieu of the required "MS4 and Receiving Water Maintenance Study" (required under Attachment E, Section II.E.S of the 2010 Order) and the "Intermittent and Ephemeral Stream Perennial Conversion Study" (required under Attachment E, Section II.E.6 of the 2010 Order), as described in correspondence received from the Regional Board dated September 14, 2012.

Per agreements with Board staff, a study scope was prepared to evaluate whether or not LID requirements were likely to have a significant impact on storm flows and base flows to the Santa Margarita Gorge. The project team met with Regional Board staff and jointly developed a modeling approach that would provide an indication as to whether or not further assessment would be required. The study and findings were subject to a peer review conducted under the direction of the Southern California Coastal Watershed Research Project (SCCWRP).

The results of this study indicate that the retention of surface runoff will result in greater evaporation and less stormwater runoff to the Santa Margarita Gorge when LID is implemented, as compared to traditional stormwater BMPs only, but greater stormwater runoff then under current conditions. The reduced streamflow at the Gorge under future full build-out with LID for both new and existing development conditions may impact downstream beneficial uses**.**

The peer review comments reflect issues that may need to be addressed for a more comprehensive modeling exercise. However, given the results of this conceptual modeling study and considering the comments from the peer review panel, our preliminary conclusion is that the impacts from LID implementation in the Upper Santa Margarita River watershed would not be significant under likely development scenarios, and no further actions are recommended.

Source Assessment of Iron and Manganese Study – The Co-Permittees initiated a study investigating the persistent exceedances of iron and manganese water quality objectives (WQOs) within SMR. The Co-Permittees initiated a source analysis indicating that iron and manganese concentrations in Receiving Waters are strongly associated with the geology located throughout the SMR. Additional sources, including MS4 contributions were evaluated, but the weight of evidence suggests that iron and manganese concentrations are consistent with the local geology. High concentrations were also observed in reference streams from undeveloped watersheds of similar geological characteristic. The preliminary results are evidence that natural sources are the cause of elevated levels of iron and manganese in Receiving Waters.

3.8 Proposed Program Modifications and Revisions

3.8.1 SMR Monitoring Program

The Co-Permittees request several revisions and/or modifications to the monitoring program.

Removal of Carbamate Pesticides from Constituent List

In the upcoming 2015-2016 Monitoring Year, the Co-Permittees request that Carbamate Pesticides be removed from the constituent lists, based on the data collected during the Permit term. As evidenced by the results of the Monitoring Annual Reports (e.g., Attachment H, Detected Results located within Appendix C), the Carbamate Pesticides have not been detected in the water quality samples. Furthermore this list of Carbamate Pesticides includes many compounds that have been banned by EPA or are in process of cancelling registrations for use (e.g. Carbofuran). This request is in conformance with the requirements of 40 CFR 122.44. With the removal of these constituents, the Co-Permittees will focus on detected constituents that potentially threaten water quality.

Receiving Water Monitoring Revisions

The 2010 Permit focused on the correlation of the water quality chemistry, toxicity, and stream assessment findings to help identify water quality priorities. However, the data collected from outfalls and receiving water stations was limited due to the severe drought conditions. In several cases there was no

flow in the Receiving Water. In the case of the stream assessment program (see Section 3.4), results yielded low IBI scores induced by drought. The Co-Permittees recommend that the next Permit term refocus monitoring efforts towards reliable data collection such as:

- A detailed reconnaissance of region-wide outfalls to identify intermittent and persistent sources of urban runoff into receiving waters, prioritize those locations, and then relocate the outfall monitoring stations to the high priority outfall locations.
- Limit Receiving Water monitoring to the three mass loading stations (i.e., Adobe, Temecula, and Murrieta) as these locations have historical data available for long-term trend comparison. These long-term stations may provide better utility for data comparisons as programs are implemented.
- As described above in Section 3.4, the drought appears to inhibit the Co-Permittees' ability to use IBI scores to correlate the bioassessment results with water quality impacts. The method used for bioassessment does not adequately distinguish between the effects of simply not having sufficient water present and the effects of poor water quality on the target populations. We note that as the drought continues the IBI scores decrease; therefore, falling IBI scores may not be a reliable indicator of worsening water quality in an arid region. The arid conditions may mask an accurate assessment of the water quality impacts on a stream. The Co-Permittees request that the Regional Board suspend stream assessment until an appropriate protocol is developed for arid region.

Revision of the Definition of Wet/Rainy Season

The Co-Permittees request that the Wet/Rainy Season be modified from October 1st to April 30th, to October 1st to May 31st. The extension would more accurately reflect the watershed's precipitation season, and extend the period for successful Wet Weather sampling opportunities.

3.8.2 Proposed JRMP Revisions

The Co-Permittees do not foresee major changes to their JRMPs at this time. However, the City of Temecula and the County are in the process of a minor revision to their standards to emphasize erosion control as the most important measure for keeping sediment onsite during construction.

4.0 Additional Comments on Proposed Permit

- **Previous Comments** - The Co-Permittees previously have expressed concerns regarding inclusion in the San Diego Regional Board's Regional Permit (Order No. R9-2013-0001, as modified by Order No. R9-2015-0001). The Co-Permittees' concerns and legal objections to inclusion in a regional permit are set out more fully in our written comment letter dated January 10, 2013, in Order No. R9-2013-0001 and November 19, 2014 regarding Order R9-2015-0001. For your convenience, these comments are included as Appendix D.

- **Receiving Water Limitations Language -** The Riverside County Co-Permittees continue to believe strongly that every MS4 Permit should incorporate a clear and achievable path to compliance for Co-Permittees. The Co-Permittees are actively participating in the workshops held by Regional Board staff concerning this important topic.

  The focus of the Watershed Workplan is on an iterative, flexible, and priority-setting approach that is intended to enable the Co-Permittees to focus on the most important water quality impairments in the SMR, and improve water quality. As we have previously commented, if the Co-Permittees have no protection from automatic liability for exceedances of water quality standards, they must address each such exceedance, even when that exceedance may be transitory or of minimal environmental or public health consequence. Stretching resources to address such issues diverts limited Co-Permittee resources from the most important threats to water quality and delays overall water quality improvement.

  State Board staff has already strongly signaled its support of alternative compliance language in MS4 permits, as set forth in the draft Order on the petitions challenging the 2012 Los Angeles County MS4 Permit. The Co-Permittees look forward to working with Regional Board staff, permittees from Orange and San Diego Counties, and the other stakeholders to develop appropriate alternative compliance language.

- **Prior Lawful Approval Language -** The Co-Permittees request language that allows each Co-Permittee to evaluate each project independently, in order to determine at their sole discretion, compliance as it relates to Prior Lawful Approval.

- **CEQA Processing Considerations** – Programmatic requirements that entail structural improvements such as retrofits and/or BMPs will trigger CEQA compliance. Future Permit language should discuss lead agency designation and consider CEQA processing in future workplan implementation timelines.

Appendix A
2015 SMR MS4 Facility Map

APPENDIX A
SANTA MARGARITA RIVER WATERSHED
2015 ROWD
MS4 PERMIT AREA FACILITIES MAP
EXHIBIT SMR-1

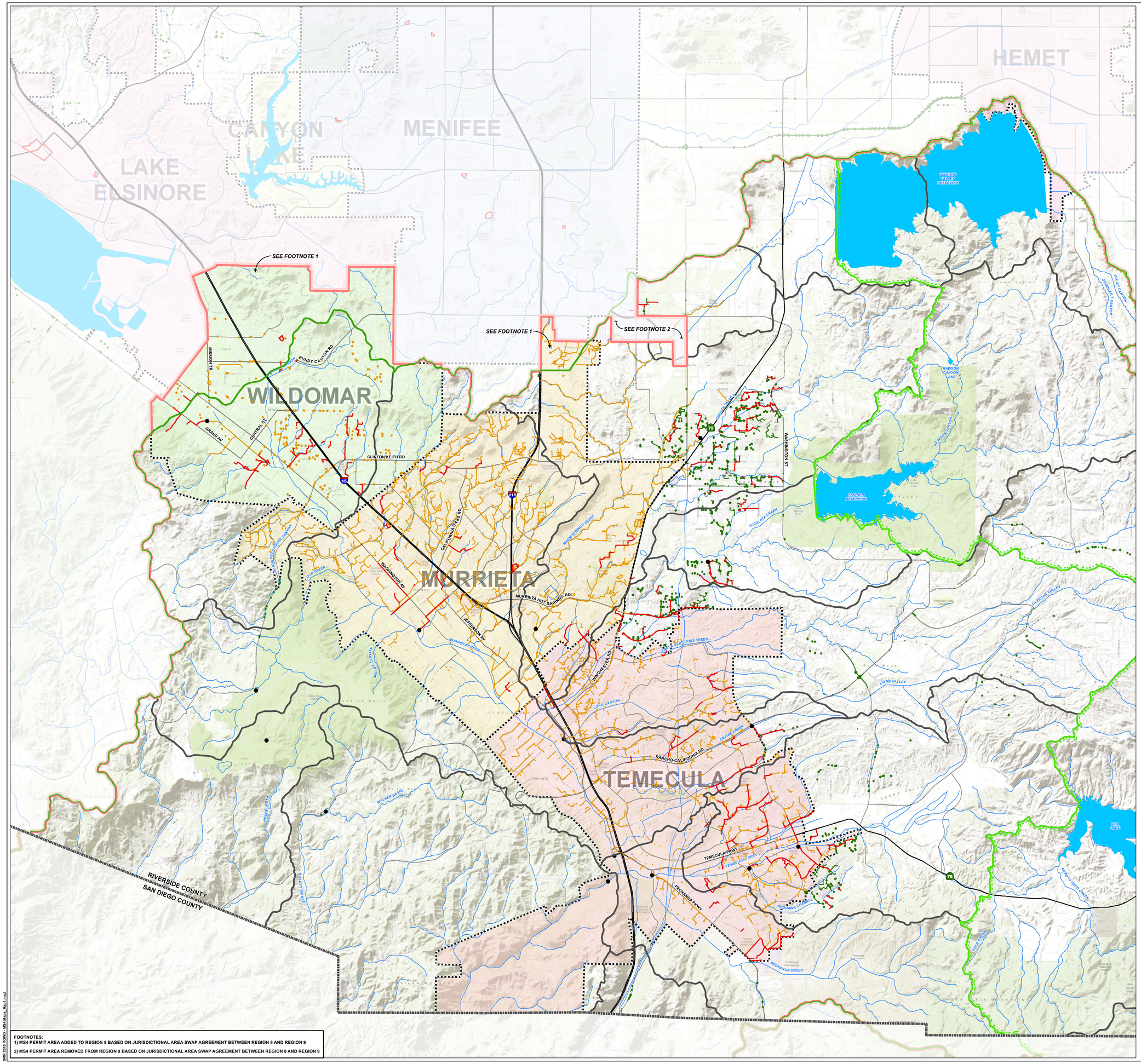
HEMET
MENIFEE
CANYON LAKE
LAKE ELSINORE
WILDOMAR
MURRIETA
TEMECULA
SEE FOOTNOTE 1
SEE FOOTNOTE 1
SEE FOOTNOTE 2
DIAMOND VALLEY RESERVOIR
SKINNER RESERVOIR
VAIL LAKE
MISSION TR
BUNDY CANYON RD
GRAND AV
CENTRAL ST
CLINTON KEITH RD
WASHINGTON AV
CALIFORNIA OAKS RD
WASHINGTON ST
MURRIETA HOT SPRINGS RD
JEFFERSON AV
WINCHESTER RD
RANCHO CALIFORNIA RD
TEMECULA PKWY
PECHANGA PKWY
RIVERSIDE COUNTY
SAN DIEGO COUNTY
WARM SPRINGS CREEK
TUCALOTA CREEK
MURRIETA CREEK
COLD CREEK
LONG CANYON
EMPIRE CREEK
WALKER BASIN
ANZA CANYON
PECHANGA CREEK
REDHAWK CREEK
GLEASON VALLEY
LONG VALLEY
PAUBA VALLEY
ARROYO TRABUCO CREEK
ROSE CREEK
RAWSON CANYON LAKE
BEAUMONT CANYON
HALEY CANYON
DOCHMAN CANYON
BEAUMONT CANYON
Temecula
Murrieta
Pechanga Reservation
Pechanga Reservation
Santa Rosa Plateau Preserve
Temecula Public Campground
Cahuilla Indian Reservation
Cahuilla Indian Reservation
Vail Lake Resort
Vail Lake Campground
Vail Lake Campground
Vail Lake Campground

APPENDIX A
SANTA MARGARITA RIVER WATERSHED
2015 ROWD
MS4 PERMIT AREA FACILITIES MAP
EXHIBIT SMR-2

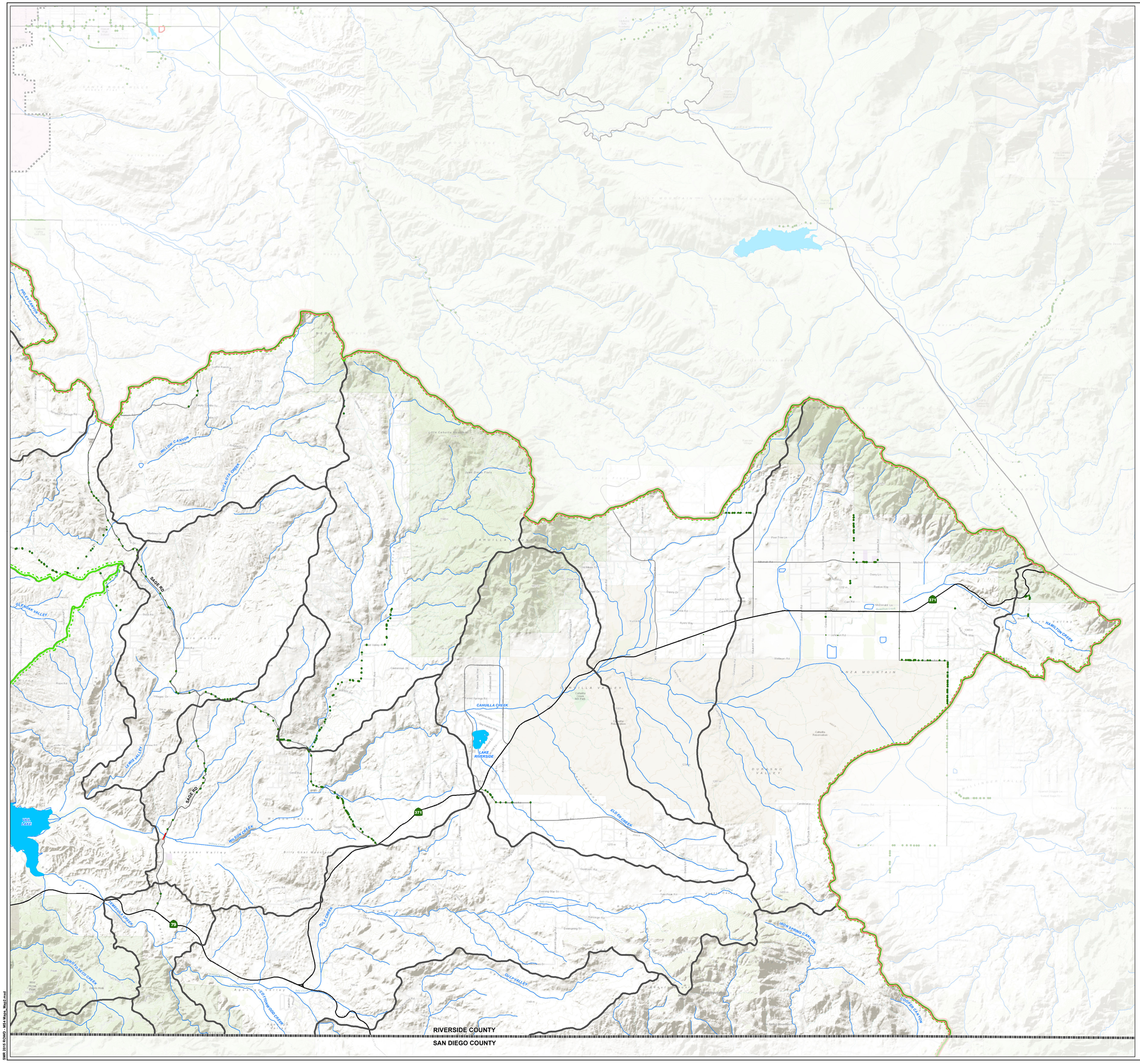

CITY MS4 FACILITIES
COUNTY MS4 FACILITIES
RCFC&WCD MS4 FACILITIES
SANTA MARGARITA RIVER WATERSHED BOUNDARY
SANTA MARGARITA RIVER MS4 PERMIT AREA BOUNDARY
AREA CONTROLLED BY VAIL LAKE & LAKE SKINNER
HUC SUBWATERSHEDS
MONITORING STATIONS
WATERBODIES
WATERCOURSES
RIVERSIDE COUNTY BOUNDARY
INCORPORATED AREAS
FREEWAYS/HIGHWAYS
PRIMARY ROADS
SECONDARY ROADS

N

0 0.5 1 1.5 2 MILES

UPDATED MARCH 2015

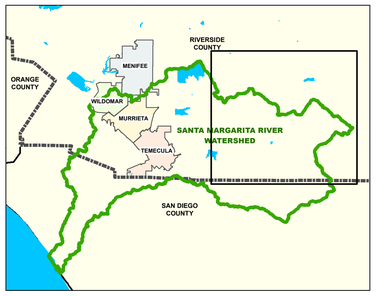

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SMR 2015 ROWD - MS4 Maps_Map2.mxd

Appendix B
2015 SMR Land Use Map

APPENDIX B
SANTA MARGARITA RIVER WATERSHED 2015 ROWD
AREA LANDUSE MAP - EXHIBIT SMR-1

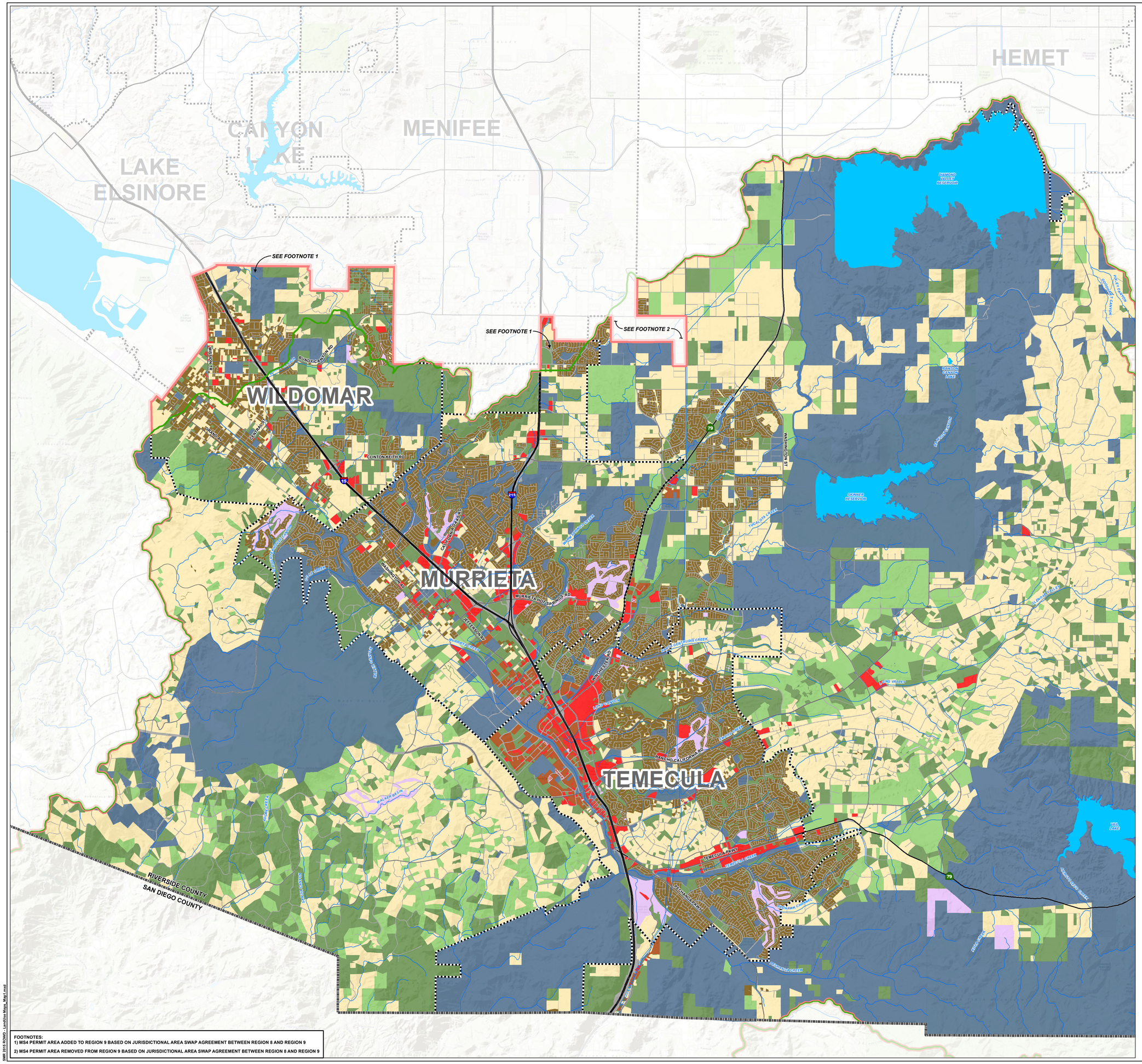

LEGEND:

- SANTA MARGARITA RIVER WATERSHED BOUNDARY
- SANTA MARGARITA RIVER MS4 PERMIT AREA BOUNDARY
- WATERBODIES
- WATERCOURSES
- RIVERSIDE COUNTY BOUNDARY
- INCORPORATED AREAS
- FREEWAYS/HIGHWAYS
- PRIMARY ROADS
- SECONDARY ROADS

NON-URBAN LAND USE:

- AGRICULTURAL
- EXEMPT
- PRESERVES OPEN SPACE
- RURAL RESIDENTIAL (1 ACRE OR MORE)

URBAN LAND USE:

- COMMERCIAL
- INDUSTRIAL
- PARKS AND RECREATION
- STREETS
- URBAN RESIDENTIAL (LESS THAN 1 ACRE)

N

0 0.5 1 1.5 2 MILES

UPDATED MARCH 2015

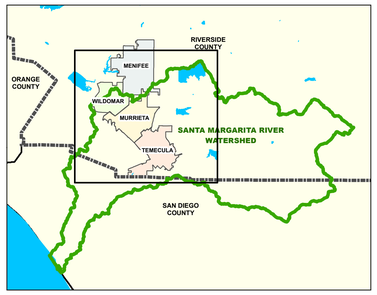

FOOTNOTES:
1) MS4 PERMIT AREA ADDED TO REGION 9 BASED ON JURISDICTIONAL AREA SWAP AGREEMENT BETWEEN REGION 8 AND REGION 9

2) MS4 PERMIT AREA REMOVED FROM REGION 9 BASED ON JURISDICTIONAL AREA SWAP AGREEMENT BETWEEN REGION 8 AND REGION 9

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SMR 2015 ROWD - Landuse Maps_Map1.mxd

APPENDIX B
SANTA MARGARITA RIVER WATERSHED
2015 ROWD
AREA LANDUSE MAP - EXHIBIT SMR-2

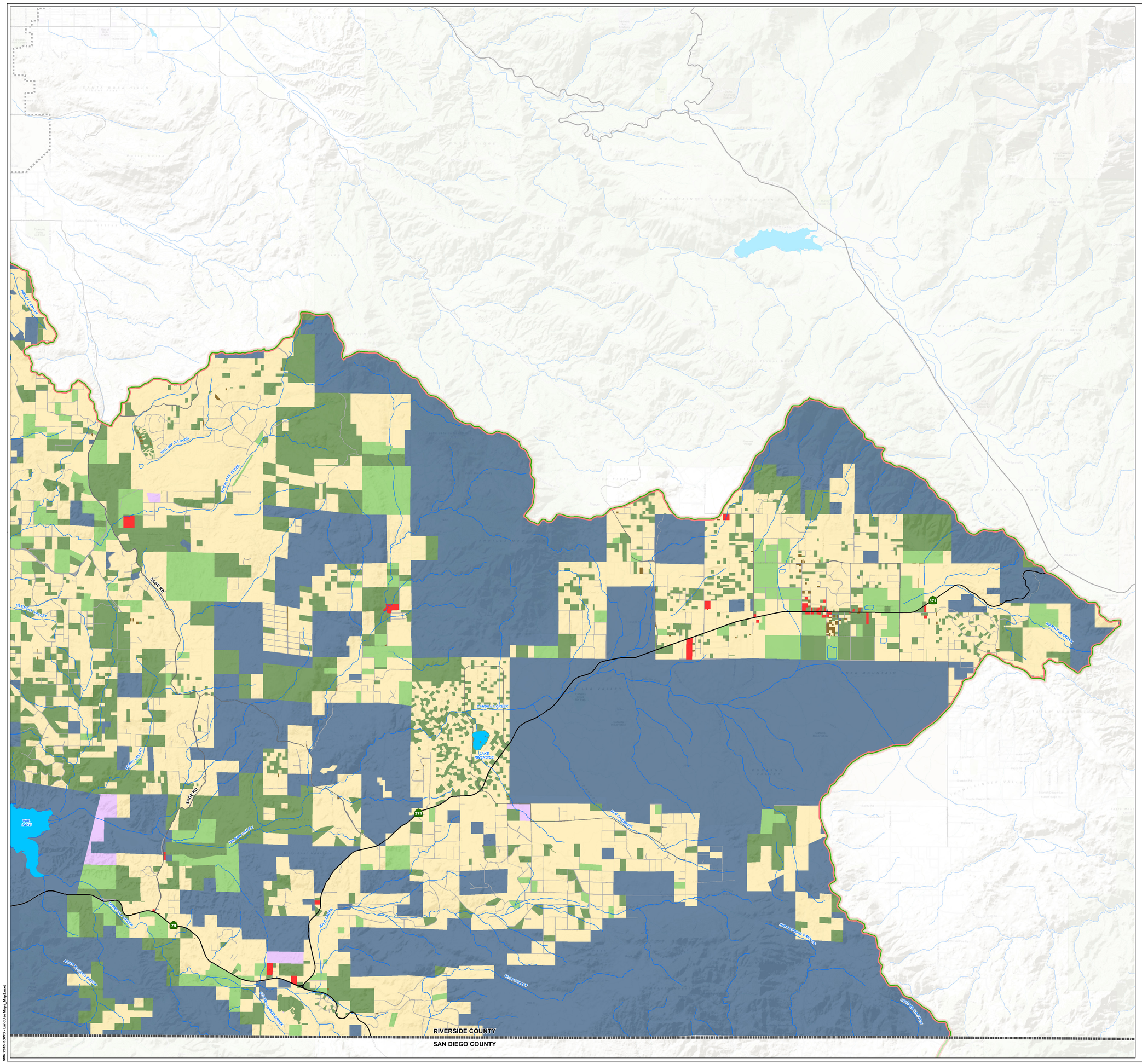

LEGEND:

- SANTA MARGARITA RIVER WATERSHED BOUNDARY
- SANTA MARGARITA RIVER MS4 PERMIT AREA BOUNDARY
- WATERBODIES
- WATERCOURSES
- RIVERSIDE COUNTY BOUNDARY
- INCORPORATED AREAS
- FREEWAYS/HIGHWAYS
- PRIMARY ROADS
- SECONDARY ROADS

NON-URBAN LAND USE:

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- EXEMPT
- PRESERVES OPEN SPACE
- RURAL RESIDENTIAL (1 ACRE OR MORE)

URBAN LAND USE:

- COMMERCIAL
- INDUSTRIAL
- PARKS AND RECREATION
- STREETS
- URBAN RESIDENTIAL (LESS THAN 1 ACRE)

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UPDATED MARCH 2015

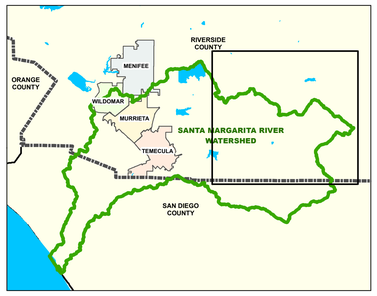

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SMR 2015 ROWD - Landlse Map_Map2.mxd

Appendix C
FY13-14 JRMP / Monitoring Annual Report References

(Note: Due to its large size, this attachment is provided in electronic format only)

Appendix D
2013 Riverside County Co-Permittees Comments for San Diego Regional MS4 permit

WARREN D. WILLIAMS
General Manager-Chief Engineer

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RIVERSIDE COUNTY FLOOD CONTROL
AND WATER CONSERVATION DISTRICT

November 19, 2014

sent via email 11/19/14: Laurie.Walsh@waterboards.ca.gov

Ms. Laurie Walsh, P.E., WRC Engineer
CRWQCB - San Diego Region
2375 Northside Drive, Suite 100
San Diego, CA 92108

Dear Ms. Walsh:

Re: Comment - Tentative Order No. R9-2015-0001Place ID:65801LWalsh

This letter is written by the Riverside County Flood Control and Water Conservation District (District), on behalf of itself, the County of Riverside and the Cities of Murrieta, Temecula, and Wildomar (collectively, the Riverside County Co-Permittees) regarding Tentative Order No. R9-2015-0001 (Tentative Order). The Tentative Order proposes to add the County of Orange and other agencies located in South Orange County within the existing San Diego County Municipal Separate Storm Sewer System (MS4) Permit. The Riverside County Co-Permittees appreciate the opportunity provided by the San Diego Regional Water Quality Control Board (Regional Board) to offer its comments on the Tentative Order.

The Riverside County Co-Permittees wish to reiterate their concerns regarding a Regional MS4 Permit for San Diego, Orange, and Riverside Counties. Those concerns are set out more fully in our written comment letter dated January 10, 2013, on Order No. R9-2013-0001. The Riverside County Co-Permittees will be submitting a Report of Waste Discharge prior to the expiration of their current MS4 Permit, seeking either modification to the Regional Permit or an individual permit covering only those Co-Permittees. For your convenience, the January 10, 2013 comments are attached to this letter. The Co-Permittees request that this comment letter and attachments be added to the record for the Tentative Order, since most of the issues raised in those comments still pertain to the Tentative Order. The Co-Permittees also request that the oral testimony of Riverside County Co-Permittees on Order No. R9-2013-0001 be included in the record for the Tentative Order. The Riverside County Co-Permittees support the South Orange County Co-Permittees general approach to the issues raised by the Tentative Order.

Notwithstanding the Riverside County Co-Permittees' concerns to a Regional Permit, and subject to it, the Co-Permittees offer the following observations regarding the Tentative Order.

1. Need for Path to Compliance

As set forth in our written and oral comments on Order No. R9-2013-0001, the Riverside County Co-Permittees continue to believe strongly that every MS4 permit, including the Tentative Order, should

incorporate a clear and achievable path to compliance for Co-Permittees. As the Executive Officer and staff indicated in the hearings on Order No. R9-2013-0001, the San Diego County Co-Permittees will be out of compliance with the Permit's receiving water limitations (RWL) provisions for years. We agree with staff's assessment, and state further, that the lack of a provision to allow Co-Permittees to be considered in compliance with the RWL provisions leaves the Co-Permittees open to possible enforcement by third-parties and, as importantly, threatens the compliance approach that has been successfully employed by the Riverside County Co-Permittees to address water quality impairments in the Santa Margarita Region.

The Riverside County Co-Permittees agree with staff that a MS4 permit which allows the Permittees to adopt a "fail early and fail often" iterative approach to water quality is preferable to a permit which simply mandates certain actions. The Santa Margarita River Watershed Water Quality Workplan in Riverside County follows an iterative, flexible, and priority-setting approach that is intended to enable the Co-Permittees to focus on the most important water quality impairments in the Region, and make real, quantifiable improvements in water quality. As we have previously commented, if the Co-Permittees have no protection from liability for exceedances of water quality standards, they must address each such exceedance, even when that exceedance may be transitory or of minimal environmental or public health consequence. Stretching resources to address such issues diverts limited Co-Permittee resources from the most important threats to water quality and delays overall water quality improvement.

Recognizing this deficiency in the 2001 MS4 Permit for the Los Angeles County Co-Permittees, in its 2012 Permit, the Los Angeles Water Board adopted a path to compliance with RWLs through the development of adaptive and prioritized watershed management plans. The Riverside County Co-Permittees believe that a similar approach to RWL compliance should be included in the Tentative Order.

2. Hydromodification Provisions

While most of the substantive changes in the Tentative Order have specific application only to San Diego and/or South Orange Counties, the Riverside County Co-Permittees support exemptions for engineered channels and large river reaches in Provision E.3.c.(2)(e). This provision also provides an interim timeframe exemption for the implementation of hydromodification management BMP requirements for priority development projects.

The exemptions identified in Provision E.3.c.(2)(e) are appropriate and reasonable, and should be made permanent exemptions moving forward.

3. Basin Planning and Water Quality Improvement Plan (WQIP) General Comments

For the WQIPs to ultimately succeed, they need to be based upon regionally appropriate water quality standards. These water quality standards require review to ensure that they reflect sustainable conditions for beneficial uses, explicitly consider regulatory policy and environmental trade-offs

inherent in the protection of beneficial uses, and address the nature and impact of stormwater upon beneficial uses.

The Riverside County Co-Permittees would like to thank the Regional Board and staff for working with the Santa Margarita River Nutrient Initiative Group on such a review. This group, which includes dischargers, tribal interests, interested non-profits, scientists, and Regional Board staff, is using a scientifically based and rigorous approach to evaluate potential water quality targets for, and sources of, nutrients in the Santa Margarita Watershed. It is our belief that this effort will lead to more considered, effective, and appropriate management of local receiving waters, and thereby promote quicker and more effective environmental outcomes. It may also assist with the identification and development of innovative and alternative programs to manage nutrients within the Region. This effort will inform the development of the Santa Margarita River Watershed Water Quality Workplan and other regulatory programs.

The Co-Permittees request and encourage Regional Board staff to work with other stakeholders to consider, prioritize, and address other perceived constraints and inconsistencies within the San Diego Region Basin Plan. Such efforts will ultimately result in a better focus of local and regional compliance programs, including the WQIPs, on actions that are more likely to effectively and quickly address public health risks and environmental risks to receiving waters. Such an approach is exactly in line with staff's emphasis on workable solutions to these challenges.

The Riverside County Co-Permittees appreciate the opportunity to comment on the Tentative Order. Should you have any questions regarding these comments, please contact David Garcia at 951.955.1330/dhgarcia@rcflood.org.

Very truly yours,

for JASON E. UHLEY
Chief of Watershed Protection Division

Attachment

DHG:cw
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RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

January 10, 2013

Mr. Wayne Chiu, P.E.
California Regional Water Quality
Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego, California 92123-4340

Dear Mr. Chiu:

Re: Tentative Order No. R9-2013-0001
Regional MS4 Permit
Place ID: 786088Wchiu

The Riverside County Flood Control and Water Conservation District (District) is submitting this comment letter on the above listed Tentative Draft Order on behalf of the Riverside County MS4 Copermittees within the San Diego Region (Riverside County Copermittees) which includes the District, the County of Riverside and the Cities of Murrieta, Temecula and Wildomar. Tentative Draft Order R9-2013-0001 (Draft Permit) was drafted by Board staff to cover Phase I municipal separate storm sewer system (MS4) Copermittees in San Diego County, southern Orange County, and the portion of southwestern Riverside County within the Santa Margarita Hydrologic Unit.

The Riverside County Copermittees have previously commented that the San Diego Water Board lacks authority to adopt a regional permit covering Orange and Riverside Counties, in addition to San Diego County; a comment which is discussed in further detail below and in the attached legal comments. Notwithstanding such objection, and subject to it, the Riverside County Copermittees are providing comments on the Draft Permit.

In the workshop on the Administrative Draft Order held on April 22, 2012 San Diego Water Board staff identified the following desired outcomes for the proposed permit:

- Improving the quality of water discharged from the MS4
- Restoring or enhancing Beneficial Uses and Receiving Water quality

It was further identified by Board staff that to be able to meet those goals, the proposed regional MS4 permit needed to be 1) Strategic, 2) Adaptive, and 3) Synergistic.

Notwithstanding the concerns of the Riverside County Copermittees with regard to the legal authority to issue a regional MS4 permit, the Copermittees agree that being able to adapt and direct resources toward specific water quality priorities in a given watershed, rather than all potential problems simultaneously, is more likely to result in actual and meaningful improvements in water quality. However, to be able to achieve those improvements the MS4 Permit must be crafted to provide the Copermittees with the ability to truly and fully

adaptively manage their programs to focus resources on those BMP strategies and monitoring efforts that are identified as being most effective, consistent with the MEP standard, at addressing watershed priorities.

Unfortunately, many provisions in the Draft Permit, including but not limited to the Receiving Water limitation provisions in Provision A and others discussed in this letter, still do not fully support the achievement of those outcomes. The Draft Permit does not provide the Copermittees with the flexibility to be fully strategic in managing their resources nor the ability to fully adapt their programs to focus on the highest priority water quality needs of the watershed. This comment letter and the other documents submitted herewith (a redline of the Draft Permit and Legal Comments) identify some suggestions which, if adopted by the San Diego Water Board, will help to address these limitations and facilitate the desired improvements.

This comment letter is organized as follows:

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As noted, the Riverside County Copermittees also are submitting a redline of the Draft Permit ("Redline") that proposes alternative language intended at achieving solutions to the various issues raised in this letter, and a Legal Comment document ("Legal Comments") that provides additional legal context for the various issues raised in this letter. The Riverside County Copermittees reserve their right, in the context of filing a Report of Waste Discharge ("ROWD") prior to the expiration of Order R9-2010-0016 (the 2010 MS4 Permit), to again address these issues and others relevant and appropriate to the SMR.

1 BACKGROUND

The Riverside County Copermittees were issued an extensive and prescriptive MS4 Permit in November 2010 which greatly expanded monitoring obligations, required special studies, a jurisdictional runoff management program, and Watershed Workplan requirements that were very different than the requirements set forth in the previous MS4 Permit issued to the Copermittees. Development and implementation of the 2010 MS4 Permit compliance requirements has been very expensive, especially in comparison to the relatively few demonstrated impairments of Beneficial Uses in the region and the Copermittees' resources. These requirements have left other important societal needs unfulfilled by the Riverside County Copermittees during a period of unprecedented and continuing economic distress. Further, the Riverside County Copermittees are still in the process of developing and implementing these 2010 MS4 Permit requirements, which is a serious concern given the very different compliance approach proposed in the Draft Permit. The Copermittees hope that the compliance efforts under the current MS4 Permit are taken into account when they submit their ROWD at the expiration of the 2010 MS4 Permit.

2 General Comments

2.1 Regional Permit

The Riverside County Copermittees respectfully submit that the San Diego Water Board is not authorized under the Clean Water Act or under its implementing regulations to issue a regional permit to Copermittees in San Diego County, South Orange County and the Santa Margarita Region (SMR) of Riverside County. As discussed more fully in the Legal Comments, the only circumstance under which the San Diego Water Board could issue such a permit would be if the Copermittees in these counties agreed to such a permit. Additionally, while the Draft Permit purports to affect the conduct of the Riverside County Copermittees upon expiration of the 2010 MS4 Permit in November 2015, the Riverside County Copermittees have not submitted a ROWD requesting coverage under a regional permit. Because no application has been made for the regional permit, which is a requirement set forth in the CWA regulations, the San Diego Water Board lacks jurisdiction to name the Riverside County Copermittees on the Draft Permit at this time.

Notwithstanding the above, the Riverside County Copermittees are submitting the comments in this letter based on:

- The San Diego Water Board staff's stated intent to enroll the Riverside County Copermittees in this permit upon expiration of the 2010 MS4 Permit.
- Statements made by San Diego Water Board staff that this comment period would serve as the primary opportunity for the Riverside County Copermittees to influence their next term MS4 Permit. The Riverside County Copermittees are entitled, as part of the ROWD process, to again raise relevant issues regarding permit provisions, but have undertaken in these comments to address major current concerns.

2.2 Outcome Focus

As mentioned above, the Copermittees agree that being able to adapt and direct resources toward addressing the specific water quality priorities in a given watershed, rather than all potential problems simultaneously, is more likely to result in actual/meaningful improvements in water quality. However, to be able to achieve those improvements, the MS4 Permit must fully integrate the following principles:

- **The Jurisdictional Program requirements must be fully flexible:** The Permit must be written in a way that allows the Copermittees to truly and adaptively manage their programs to fully focus their existing resources on those BMP strategies and monitoring efforts that are identified within the Water Quality Improvement Plan (WQIP) as being most effective, consistent with the Maximum Extent Practicable (MEP) standard, at addressing the watershed's priorities. We understand this to be the goal of the San Diego Water Board as well. While some elements of the Draft Permit embody this need, others do not and require dedication of resources to specific pre-defined efforts, regardless of the identified need for that effort in the watershed. The specific program areas that need more work to this end are:

    - The approach to addressing Non-stormwater discharges
    - Development Planning
    - Retrofitting
    - Channel Rehabilitation

These issues and proposed new language to address these issues are included throughout this letter and/or in the attached Redline.

- **Basin Plan updates need to be Prioritized by the San Diego Water Board:** For outcome-based permitting to be successful, the desired outcomes must be achievable by and appropriate to the Copermittee. To do that, the outcomes must take into account the background conditions in the watershed, and be appropriate for the attainment of Beneficial Uses in the specific waterbody, based on the specific conditions within and influencing that waterbody. The values in the Basin Plan should be comprehensively re-evaluated to ensure that water quality standards are scientifically justified to protect Beneficial Uses. Without updating the Basin Plan, the outcomes that the Copermittees target in the WQIPs would be arbitrary and not guaranteed to achieve the desired beneficial use improvements. Such an update should be pursued aggressively, led by and adequately funded by the San Diego Water Board, with participation by the MS4 Copermittees and other dischargers and stakeholders in the watershed.

- **Other Dischargers need to be Similarly Regulated by the San Diego Water Board:** The MS4 Copermittees are not the only dischargers of pollutants in the watershed. For example, the SMR of Riverside County includes State Lands (such as Caltrans), Tribal Lands, Agricultural Operators, Industrial Permit dischargers, Construction Permit dischargers, Phase II entities, Water Districts, and 'De Minimus' dischargers issued general permit coverage; all of which:

- Have separate regulatory programs (such as permits or waivers) implemented by the San Diego Water Board;
- May discharge pollutants, including non-stormwater, that can affect the quantity and quality of runoff, both directly within Receiving Waters, and in runoff discharges that may enter into and be discharged from the MS4; and
- Cannot be regulated by the Copermittees for the quantity and quality of their runoff because of their separate permits or waivers granted by the NPDES Program Administrator.

As such, while MS4 Copermittees can implement programs to reduce pollutants in discharges that are within their legal jurisdiction, no amount of effort by the MS4 Copermittees can be expected to fully attain water quality standards in the Receiving Waters. The only way to achieve that outcome will be for the NPDES Program Administrator (the San Diego Water Board in most cases) to directly regulate each of these entities to similar levels and standards as set forth by this Permit.

2.3 Responsibility for meeting goals of CWA

The CWA requires Copermittees subject to any MS4 permit, including the Draft Permit, only to address discharges from their MS4s. 33 U.S.C. § 1342(p)(3)(B). The Copermittees are not required to restore Beneficial Uses in any Receiving Water, or to address sources of pollution to those Receiving Waters that are not being discharged into or from those MS4s. However, in various provisions in the Draft Permit, there is a suggestion that the Copermittees are solely responsible for attaining water quality standards in their respective Receiving Waters. The San Diego Water Board must make clear in the Draft Permit that the responsibilities of the Copermittees are limited to their MS4s and the requirements of the CWA for municipal stormwater dischargers. Redline changes have been proposed in the above referenced portions of the Draft Permit to address this issue.

3 Specific Comments

The following comments represent specific high level concerns that the Riverside County Copermittees have identified at this time. Additional comments on the Draft Permit can be found in the Redline, as well as in the attached Legal Comments.

3.1 Findings

The Riverside County Copermittees have two separate sets of comments on the Findings. The first addresses the need for additional findings, with respect to aspects of California law and the physical setting of the SMR. The second set of comments focuses on existing Findings in the Draft Permit.

3.1.1 Needed Additional Findings

The Findings in the Draft Permit fail to fully address the context and conditions under which the proposed permit requirements are to be applied. A more complete explanation of this background is necessary to ensure that the Provisions ultimately included in the Draft Permit are credible, appropriate and legally required, and that the Permit Provisions (which must stem from the Findings) reflect the

context of the broader issues that affect MS4s within the region. The Riverside County Copermittees request that San Diego Water Board staff work with the MS4 Copermittees to expand the Findings, including the addition of findings to address the following:

California Water Law

California law requires that downstream entities must accept runoff from up-gradient properties. Owners and operators of MS4s are not exempt from this legal mandate, even if that runoff contains pollutants. Moreover, flood control districts, including the District, are mandated by the California Legislature (Legislature) to protect the lives and property of residents from floodwaters. The Riverside County Copermittees request that a finding, in the form set forth in the Redlines, be added to the Draft Permit.

Flooding

Many areas that would be under the jurisdiction of the Draft Permit are subject to periodic catastrophic flooding, which results from natural conditions, specifically the presence of mountains and hilly areas in close proximity to development, along with the effect of strong Pacific storms. This flooding would occur even in the absence of development. The Legislature recognized the importance of this issue in the early 20th Century, when it established flood control districts across the state, including in Riverside, Orange and San Diego Counties. Such flooding has, and if not controlled, could result in loss of life and widespread property damage. Further, the flooding can mobilize significant amounts of pollutants from industrial, commercial, residential and agricultural lands, damaging watercourses, habitat, and the Beneficial Uses therein. MS4 systems are designed and constructed to mitigate these impacts. The Riverside County Copermittees request that a finding in the form set forth in the Redline be added to the Draft Permit.

Flood Control District Acts

As noted above, the Legislature established Flood Control Districts in Orange, Riverside, and San Diego Counties through a series of Flood Control Acts. The Legislature determined that protection of life and property from the effects of flooding through the implementation of flood control improvements was a priority, and assigned those Districts with the sole responsibility to design, construct and maintain those improvements necessary to manage and contain floodwaters to prevent such negative impacts, as well as to conserve floodwaters for beneficial use. As noted above, these improvements represent fundamental water quality BMPs inasmuch as they reduce the widespread exposure of runoff to pollutants. The Flood Control Districts, while owners and operators of MS4s, have no authority or powers beyond those granted by the Legislature. The Legislature did not provide the Flood Control Districts, for example, the authority to regulate land uses within the municipal jurisdictions of Riverside County, nor to control the volume or quality of runoff discharged by those land uses. Findings describing the legislative priority for flood control and the limitations on the governing power of the Flood Control Districts should be added to set forth the appropriate role of the Flood Control Districts as MS4 Copermittees. The Riverside County Copermittees request that a finding, in the form set forth in the Redline, be added to the Draft Permit.

Limits on Extent of Permittee Legal Authority

The MS4 Copermittees lack the authority to regulate many significant sources of pollutants that may impact Receiving Waters. For example, the Copermittees cannot regulate pollutants discharged from federal and state lands, facilities, tribal lands, special districts, utilities, agricultural lands, or railroads. Moreover, the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) preclude local regulation of pesticides. The Riverside County Copermittees request that a finding in the form set forth in the Redline be added to the Draft Permit.

3.1.2 Comments on Existing Findings

Findings 3 and 15 (and elsewhere in Draft Permit)

In Findings 3 and 15 (and throughout the Draft Permit), it is stated that the CWA requires controls to reduce the discharge of pollutants "in stormwater" to the MEP. Finding 15, moreover, states that non-stormwater discharges from the MS4 are "not considered stormwater discharges and therefore are not subject to the MEP standard, stating that the MEP standard "is explicitly for 'Municipal . . . Stormwater Discharges" from the MS4s.

These conclusions are directly contrary to the plain language of the CWA, as set forth in the November 16, 1990 preamble accompanying the CWA stormwater regulations. Those authorities provide that the MEP standard applies to *all* pollutants discharged from the MS4, notwithstanding that some may be transported by non-stormwater. Additionally, the Redline reflects deletion of the limitation of the MEP standard to stormwater discharges in multiple locations, reflecting federal law. For a further discussion of this issue, please see the Legal Comments. The Riverside County Copermittees also request deletion of Finding 15.

Finding 11

This Finding states that "[r]ivers, streams and creeks in developed areas used [to convey runoff] . . . are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and Receiving Water." This statement is incorrect and must be deleted (as reflected in the Redline). For reasons more fully set forth in the Legal Comments, natural streams cannot be considered MS4; there is no MS4 "outfall" from a channelized river or stream to a natural stream; and, USEPA itself requires a distinction between MS4s and Receiving Waters.

Finding 12

This Finding states that as operators of MS4s, "Copermittees cannot passively receive and discharge pollutants from third parties." By providing free and open access to an MS4 that conveys discharges to Waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not prohibit or otherwise control. This statement is incorrect and must be deleted (as set forth in the Redline). As the discussion in the Legal Comments indicates, municipalities must maintain the MS4 to protect the lives and property of their citizens and to prevent nuisance. Flood Control Districts have a statutory obligation to operate and maintain such MS4, an obligation which is not affected by

either the CWA or the terms of the Draft Permit. While an MS4 operator has the obligation to effectively prohibit the entry of non-stormwater into the MS4, it does not have legal responsibility for such discharges, which are the responsibility of the discharger itself and subject to the jurisdiction of the San Diego Water Board, pursuant to Water Code section 13260 *et seq.*

Finding 28

This Finding recites that the San Diego Water Board finds that the requirements of the Draft Permit "are not more stringent than the minimum federal requirements." The Riverside County Copermittees disagree with this finding, as it is not supported by the evidence, *i.e.*, the many requirements in the Draft Permit which exceed the federal MEP standard. Moreover, any decision by the San Diego Water Board to adopt "other provisions" going beyond MEP is not a federal requirement, but rather a discretionary decision taken by a state agency under authorization in the CWA. *See Defenders of Wildlife v. Browner,* 191 F.3d 1159, 1164-65 (9th Cir. 1999). Please see discussion in the Legal Comments. The Finding also indicates that the San Diego Water Board has developed an economic analysis of the Draft Permit. As set forth in the Legal Comments, the Riverside County Copermittees challenge the adequacy of that analysis.

Finding 29

This finding purports to find that the Draft Permit does not constitute an unfunded state mandate. The Riverside County Copermittees disagree with the conclusions set forth in this finding. More importantly, the finding is without legal effect because exclusive jurisdiction as to whether a state mandate exists, and whether it is unfunded lies with the Commission on State Mandates. Government Code §§ 17751 and 17552; *Lucia Mar Unified School District v. Honig* (1988) 44 Cal.3d 830, 837; *Hayes v. Commission on State Mandates* (1992) 11 Cal.App.4th 1546, 1596-97. The finding of an agency that has no jurisdiction to make that finding is entitled to no weight and should be deleted, as shown in the Redline. For an additional discussion of these issues, please see the Legal Comments.

Finding 31

The Riverside County Copermittees believe that the Receiving Water Limitation ("RWL") language set forth in the Draft Permit renders compliance with the permit impossible, since exceedances of water quality standards occur routinely through no fault of the MS4 Permittees. Thus, unless the RWL is modified to provide the Copermittees with a means to be in compliance, those Copermittees risk the threat of arbitrary San Diego Water Board enforcement or the bringing of citizen suit lawsuits under the CWA, which could nullify compliance with all other terms set forth in the Draft Permit, as discussed more fully in the Legal Comments. The exposure to third party litigation from the proposed RWL language is one of the most significant threats to an otherwise collaborative approach to achieving long term water quality improvement. This threat was emphasized by the recent bringing of a citizen suit lawsuit against the City of Malibu, the County of Los Angeles and the Los Angeles County Flood Control District based on similar language in the 2001 Los Angeles County MS4 Permit. The Riverside County Copermittees have suggested modifications to Provision A in the Redline and as discussed below and in the Legal Comments that are intended to better support the Iterative Process for compliance authorized by the State Water Resources Control Board in Order No.

2001-15, through the WQIP process. The Copermittees also note that the State Board considered the problems with the RWL language at a recent workshop, which may eventually result in modifications which should, if applicable, be reflected in the Draft Permit. Other requested changes to the Findings are set forth in the Redline.

3.2 Provision A, Prohibitions and Limitations

As noted above, the requirements set forth in Provision A are of great concern to the Riverside County Copermittees. The Copermittees generally support an approach to compliance that utilizes WIQPs as the implementing mechanism for the 'Iterative Process' described in Provision A.4, and that by implementing that iterative process in accordance with A.4, that the Copermittee should be in compliance with Provisions A.1 and A.2. The Redline reflects edits of Provision A to clarify the linkage between the prohibitions and limitations in Provisions A.1. through A.3. and Provision A.4 – which is described as the method for complying with the prohibitions and limitations. It must be noted, however, that the Riverside County Copermittees do not agree with the approach suggested, that any WQIP-based compliance approach be necessarily accompanied by a Reasonable Assurance Analysis. Such analyses can be extremely complex, expensive and time-intensive to develop, and similar analyses are commonly developed within TMDL models; taking a number of years to develop and refine. Given that the Santa Margarita Watershed has no adopted TMDLs; thus, comprehensive pollutant transport and BMP models are not available for the suite of constituents that might be considered for prioritization within a WQIP for the Santa Margarita Watershed. In the context of a TMDL, such models would be developed by the combined resources of the San Diego Water Board and a range of stakeholders and dischargers. Undertaking such an exercise solely with the public resources of the 275,000 residents of the SMR is beyond the financial ability of the Copermittees and would shift the responsibility for development of TMDLs from the San Diego Water Board to the Copermittees. Comments on Provision A can be found below, in the Redline and in the Legal Comments.

3.2.1 Overview of Key Issues

As noted above, an overriding issue for the Riverside County Copermittees is having a permit that, while being appropriately proactive and aggressive at addressing the prioritized water quality conditions with the Receiving Waters, is one that all Copermittees can remain in compliance with while implementing those requirements. As presently drafted (and as made clear by statements in the Fact Sheet), Provision A imposes immediate potential liability on every Copermittee if monitoring in the Receiving Waters reflects exceedances of water quality standards that may have been caused or contributed to by MS4 discharges. San Diego Water Board staff has repeatedly indicated in workshop presentations that they expect that Copermittees will not be able to comply with the Receiving Water Limitations and Discharge Prohibitions for some time. Staff has separately indicated that they are interested in having the Copermittees undertake bold initiatives in trying to address urban runoff pollution, and that the Copermittees have actually been encouraged to "fail early and fail often" as this would reflect such progress in refining these initiatives. The iterative, flexible and priority-setting approach reflected in the WQIP is intended to allow the Copermittees to focus on the most important problems in their watershed. The entire approach is endangered, however, by RWL provisions which would allow either the San Diego Water Board or a citizen plaintiff to sue the Copermittees for any individual exceedance of the

RWLs. Under the current version of Provision A, the unmitigated risk of such actions leads not to bold initiatives but rather to attempts to minimize liability.

As set forth in the Legal Comments, this approach is not mandated by the CWA, State Board orders or the opinion of the Ninth Circuit Court of Appeals in *Natural Resources Defense Council v. County of Los Angeles*, 673 F.3d 880 (9th Cir. 2011), *reversed*, 568 U.S. __ (January 8, 2013). As importantly, the threat of immediate potential noncompliance actually interferes with the ability of the Copermittees, including the Riverside County Copermittees, to comply with the Draft Permit. Instead of being able to focus on pollutants of highest concern in the watershed, as called for in the WQIP, the Copermittees will be forced to try to address every pollutant monitored, since the exceedance of any water quality standard leads to immediate potential liability. Moreover, because citizen plaintiffs are entitled to injunctive relief under Section 505(a) of the CWA, a federal judge could order the Copermittees to undertake steps completely independent of the WQIP or other compliance provisions in the Draft Permit.

The Riverside County Copermittees do not object to compliance provisions that will provide a means to achieve real improvement in water quality. The Copermittees are willing to undertake these Provisions, because the success or failure is in their control. Compliance with the requirements of Provision A, however, is beyond the control of the Copermittees. Based on the statements made during the workshop process, the Riverside County Copermittees believe that the San Diego Water Board is serious about working with the Copermittees on a permit that provides flexibility and problem solving approaches. To ensure that this flexibility is not lost, the Draft Permit must tie in compliance with Provisions A.1 through A.3 to a process set forth in Provision A.4. This approach is shown in the Redline and is discussed further below.

3.2.2 Comments in support of specific changes

Provision A, Introduction

The introduction notes that pollutants "in stormwater discharges" from the MS4 must be controlled to the MEP. As discussed above, the CWA does not differentiate between stormwater and non-stormwater discharges from the MS4; both must be controlled to the MEP standard. The Riverside County Copermittees have requested revised language in the Redline. Additionally, the linkage between compliance with Discharge Prohibitions (Provision A.1), Receiving Water Limitations (Provision A.2) and Effluent Limitations (Provision A.3) should be noted as being defined by Provision A.4. This change is reflected in the Redline.

A.1.a

First, language must be added providing that compliance may be addressed through the process set forth in Provision A.4. This language is provided in the Redline. Second, the Provision prohibiting discharges which are "threatening to cause" a condition of pollution, etc., is unenforceable, because it prohibits an action that, with respect to MS4 operators, is beyond their control. Moreover, there is no authority for such provisions in the Porter-Cologne Act. The Riverside County Copermittees request

deletion of this phrase, as shown in the Redline. Additionally, as set forth in the Legal Comments, the Provision improperly expands the Discharge Prohibitions to Waters of the State.

A.1.b

40 CFR § 122.26(d)(2)(iv)(B)(1) clarifies that the requirement for an MS4 Copermittee to "effectively prohibit" the discharge of Non-stormwater/illegal discharges into its MS4s is to be accomplished through "a program, including inspections, to implement and enforce an ordinance, orders or similar means…". The language of this Provision should reflect federal law in this respect. The Redline reflects this change.

A.1.c

First, this Provision requires the Copermittees to comply with the Basin Plan prohibitions listed in Attachment A. This list is over-inclusive, as it contains requirements that are not applicable to some or all of the Copermittees' MS4 discharges, or to the Riverside County Copermittees in particular. The Riverside County Copermittees request that this Provision be amended to read as follows: "Discharges from MS4s are subject to all applicable waste Discharge Prohibitions in the Basin Plan." This change is noted in the Redline. Second, language must be added providing that compliance with this restriction can be obtained through the process set forth in Provision A.4. This language is provided in the Redline.

A.2.a

First, this Provision and Provisions A.1. and A.3 should be linked to the iterative process described in A.4. Please see the Redline.

Second, not all plans, policies, etc. set forth in Provision A.2.a.(1)-(4) may qualify as "water quality standards" or be applicable to all the MS4 Copermittees. These subsections should be deleted, and replaced with a reference to "Water Quality Standards," which is a defined term in the Draft Permit (This change is reflected in the Redline). Otherwise, the MS4 Permit would become over inclusive with respect to what is considered a water quality standard. Such standards must be established in accordance with federal and state law. If this process has not been followed for a particular requirement, it is not a "water quality standard."

A.3.a

As discussed above, this Provision erroneously states that pollutants "in stormwater discharges" from MS4s must be reduced to the MEP. Please see the Redline.

A.3.b

This Provision should also provide that compliance with a TMDL constitutes compliance with Provisions A.1 and A.2, for those pollutants/waterbodies subject to the TMDL.

A.4.a

The Riverside County Copermittees support an approach whereby compliance with Provisions A.1 through A.3 are achieved through a truly iterative approach, one which reflects the intent of the

precedential State Water Board Order Nos. 99-05 and 2001-015. As set forth in the Redline, the Riverside County Copermittees believe that they and the other Copermittees under the Draft Permit should be considered in compliance with Provisions A.1, A.2 and A.3, as applicable, through development of the WQIP, unless the San Diego Water Board denies approval of a WQIP or amendment thereof. This ensures that the Iterative Process which is the focus of the WQIP, is utilized to provide a means to be in compliance for the Copermittees.

A.4.c

This Provision should be deleted, as is reflected in the Redline. Again, this Provision defeats the purpose of an iterative approach to compliance with the Provisions A.1 through A.3, because it allows the San Diego Water Board to enforce any provision of the Draft Permit, including those provisions at any time. The San Diego Water Board obviously retains full ability to enforce the provisions of the Draft Permit, including with respect to the failure of the Copermittees to carry out required provisions. To short circuit the WQIP/JRMP process, however, is to defeat the entire intent of the Draft Permit.

3.3 Provision B, Water Quality Improvement Plans

3.3.1 Overview of Key Issues

- The goals and requirements of the WQIP need to be aligned with the requirements of the CWA that were established specifically for MS4 permits, and not impose the restoration of Receiving Waters entirely upon MS4 Copermittees.
- The WQIP should focus on addressing sources of pollutants within the jurisdiction of the respective Copermittees.
- The BMP strategies identified in the WQIP should fully inform the selection and design of programs identified in the JRMP. Some minor edits were proposed in Provision B, with additional edits as warranted in Provisions D and E.

3.3.2 Comments in support of specific changes

Introductory paragraph

The introductory language implies that the WQIP should be designed to unilaterally protect, preserve, enhance, and restore water quality and Beneficial Uses in waters of the state. As noted in Section 2.3 above, MS4 Copermittees are responsible only for discharges from their MS4s, not the unilateral protection of Beneficial Uses within their watersheds.

Redline edits were provided to:

- Tie the goals of the WQIP to the requirements of the CWA applicable to MS4 Permits.
- Replace 'waters of the state' with 'Receiving Waters' to be consistent with federal law.
- Clarify the linkage between Provision A and Provision B.

Additionally, Redline edits were provided to clarify that the strategies identified in the WQIP are intended to guide the specific actions that will be implemented by the Copermittees pursuant to Provision E.

B.1

The Riverside Copermittees support the redlines of the San Diego County Copermittees with regard to setting forth that the WQIP for the Santa Margarita Watershed Management Area (WMA) would commence upon enrollment of the Riverside County Copermittees into the Order.

B.2.e.

Two changes have been proposed, as shown in the Redline:

- The introductory paragraph includes language that clarifies that the Numeric Goals are not enforceable compliance standards, effluent limitations, or Receiving Water limitations. This clarification is consistent with San Diego Water Board staffs' verbally stated intent.
- Provision B.2.e.(1) as written requires that the final Numeric Goals be "capable of demonstrating the achievement of the restoration and/or protection of water quality standards in Receiving Waters". As discussed in Provision 2.3 above, meeting WQS in Receiving Waters is a goal of the overall NPDES regulatory programs under the CWA and not as a requirement to be accomplished alone by MS4 Copermittees. Redline edits have been provided to clarify that such goals are only required to be for MS4 discharges.

B.3.

In the Redline, edits were made to the introductory paragraph to ensure that the requirements are consistent with federal law. The CWA requires the 'effective prohibition' of non-stormwater discharges, not 'preventing' or 'eliminating' them.

Edits were also made to Provision B.3.a. to link the strategies more clearly to the Numeric Goals developed pursuant to Provision B.2.e, as well as to link them to the JRMP programs in Provision E.

B.5

In the Redline, edits were made to the introductory paragraph to clarify that the WQIP (and by extension the JRMP and Monitoring programs) are intended to meet the requirements of Provisions A.1, A.2, and A.3. The Tentative Order particularly excluded Provision A.1.b. (dealing with non-stormwater discharges). However, as discussed in the attached Legal Comments, the CWA requires that illegal discharges must be addressed via a program (as included in Provision E.2), and it is appropriate that the program be guided by the priorities and strategies included in the WQIP.

Other edits were made to clearly link Provision B.5 to the applicable requirements of Provision F.

3.4 Provision C, Action Levels

3.4.1 Overview of Key Issues

- The Action Levels (non-stormwater, and stormwater) applicable within each watershed should only be those that are associated with the priority water quality conditions in that watershed, or that are 303(d) listed for that watershed. For example, if Zinc is not a priority pollutant for a watershed, and is not 303(d) listed, there should not be a Zinc action level. This change is needed because Provision D requires analysis for all 'action level' parameters. Analysis for pollutants that are not a priority for a watershed is a waste of Copermittee resources.
- The Copermittees should be able to establish alternative action levels that are appropriate to the WMA within their WQIP. Such alternative action levels would be subject to Executive Officer approval as part of the WQIP approval process.
- Footnote 8 and 10 need to clarify that the NALs and SALs are not enforceable limitations.
- Various references to 'waters of the state' need to be changed to Receiving Waters for consistency with the Draft Order and the CWA.

Please see the Redline for further detailed comments and language changes.

3.5 Provision D, Monitoring and Assessment

The Riverside County Copermittees appreciate the changes in the monitoring program reflected in the Draft Permit, as compared to the Administrative Draft. However, elements of the revised requirements are still infeasible for the Riverside County Copermittees. The comments below identify modifications of areas of the monitoring requirement's which can significantly improve the Copermittees' ability to implement and comply with the requirements, while still maintaining appropriate jurisdictional accountability and assessment requirements to guide the implementation of the WQIPs and JRMP programs. The Redline provides further detailed comments and language changes.

3.5.1 Overview of Key Issues

- Dry Weather MS4 Outfall Monitoring
  - The level of effort dedicated to monitoring and addressing outfalls with non-stormwater discharges should be commensurate with the potential impact that discharge has on a Receiving Water. If a discharge, whether persistent or transient, has no or little potential for impacting a flowing Receiving Water, (e.g. due to infiltration, evaporation, or treatment of the flows), the outfall should be de-emphasized relative to other outfalls that have discharges that have connectivity to a flowing Receiving Water.
  - Outfall Dry Weather Field Screening – As currently drafted, the number of required visual inspections of outfalls during dry weather required per Provision D.2.a.(2)(a) and Provision D.2.b.(1) is both excessive and disproportionate. This will particularly impact smaller jurisdictions, which may be required to do more visual inspections of MS4 outfalls than would larger jurisdictions with more outfalls and more resources.
  - Similarly, as written, the Persistent Flow Outfall Monitoring requirements of Provision D.2.b.(2)(b) are excessive and also will disproportionately impact smaller jurisdictions.

Jurisdictions with several hundred outfalls will likely have significantly more resources to perform the required monitoring than smaller jurisdictions with fewer outfalls, yet both are required to implement the same level of persistent flow monitoring.

- Assessment Requirements
  - The assessment requirements require modeled extrapolation of monitored outfall data to non-monitored outfalls for the purposes of calculating loads from each outfall in each jurisdiction. Such extrapolations though modeling or other calculations will not accurately reflect actual jurisdictional loads, and have no benefit that directly analyzing the monitored data cannot more accurately provide.

3.5.2 Other Global Issues

- As currently drafted, MS4s operated by a flood control district within a city or county would be effectively double-counted for identification of outfalls in each jurisdiction and for performance of the load calculations from each jurisdiction. Additionally, Flood Control Districts have no land use or enforcement authorities outside of the MS4 and rely on the local Copermittee to address pollutant sources and discharges to their MS4. Redline edits have been included to clarify the relationship between districts and the municipal jurisdictions they serve for the purposes of outfall monitoring and the assessment requirements.
- Timelines for monitoring and assessments were clarified throughout and linked to specific reporting requirements of Provision F in the Redline.

3.5.3 Comments in support of specific changes

D.1.a.(3) and D.1.e.

The Redline clarifies that the Receiving Water monitoring described in these sections must be conducted as applicable to the WMA and the Copermittees' MS4 discharges, because some of the monitoring requirements only apply to MS4 discharges to certain waterbodies. Not all Copermittees within a WMA will have discharges to that waterbody.

D.1.b.

The Redline proposes language to allow for alternative long-term monitoring stations to be identified. Using the SMR as an example, the Copermittees might wish to utilize a location other than the existing stations due to the influence of groundwater during dry weather and/or the general lack of MS4 contributions in dry weather to those locations.

Table D-1 and D-6

The Redline proposes an addition to the list of field observations, an assessment for flow connectivity of any MS4 discharges to the sampled Receiving Water. It is important to know whether the sampled Receiving Water included a contribution of flows from MS4 discharges, or whether the data reflect conditions in the absence of an apparent MS4 discharge contribution.

D.2.a.(2)

The Redline clarifies that the identification of annual outfall monitoring requirements is based on municipal Copermittee boundaries, inclusive of Flood Control District MS4 outfalls within their jurisdiction.

The Redline clarifies that the field screening requirements apply to those outfalls in the Copermittee's inventory that are 'accessible'. If an outfall is inaccessible for safety reasons or due to habitat restrictions, it would not need to be field screened.

The Redline simplifies the 'tiers' in Provision D.2.a.(2)(a) by removing the lower tier (i), and expanding the second tier (ii) to cover all Copermittees with 500 or less outfalls. This resolves the disproportionality that occurs for Copermittees with a number of outfalls near the current 125 outfall threshold. For example, as currently drafted, a city with 150 outfalls would be required to do 150 visual inspections per year, but a smaller city with 120 outfalls would be required to do 192 visual inspections per year. The Redline also maintains the 80% requirement from the first tier to help smaller Copermittees manage their workload for meeting the field screening requirements while also conducting the additional source identifications that are required under the Draft Permit.

The Redline includes edits to Footnote 19 to clarify that persistent flow should effectively be a discharge that is hydraulically connected to a flowing Receiving Water. Any other discharges that are not affecting a flowing Receiving Water (such as pooled or ponded water) would be addressed as a Transient Discharge, with source IDs any time an obvious illegal discharge (i.e. color or odor) is identified.

D.2.a.(3)

The Redline incorporates edits proposed by the San Diego County Copermittees to require 10% of the samples in each WMA to be from a first storm event. As described in the comments of the San Diego County Copermittees, this will help avoid overly skewing of the data to 'first flush' data, while still incorporating such data into the data and analyses.

D.2.b.(1)

The Redline removes the requirement that the number of visual inspections performed be equivalent to the number of inspections required under Provision D.2.a.(2)(a).

As areas within a jurisdiction are confirmed not to have non-stormwater discharges, inspections of other outfalls would have to be perpetually (and unnecessarily) increased to maintain compliance with this requirement. For example, if a Copermittee had 150 outfalls, but after the transitional period it confirmed that 100 of those outfalls had no evidence of non-stormwater discharges to flowing Receiving Waters, it would have to visit the remaining 50 outfalls for up to three times a year to meet the requirement in this Provision. As the Copermittee got closer to eliminating non-stormwater flows at more outfalls, inspections at the remaining outfalls would quickly become excessive and unreasonable. Removing this requirement will better incentivize the elimination of non-stormwater

flows, as a Copermittee can look forward to reducing its workload in areas confirmed to not have non-stormwater flows.

D.2.b.(2)(b)

While the Riverside County Copermittees support the San Diego County Copermittees' proposal to reduce the number of required outfalls from 10 to 5 persistently flowing outfalls per WMA, the Riverside County Copermittees believe that applying the same minimum bar to all Copermittees is inappropriate and disproportionately affects smaller Copermittees that have commensurately less staff and resources.

The Riverside County Copermittees propose requiring monitoring of the top 10% of the prioritized persistent flow outfalls, with a lower and upper limit of 1 and 5 respectively, as shown in the redlines. With this change, the level of effort required of any individual Copermittee would scale consistent with the number of persistent flow outfalls within each Copermittees' jurisdiction.

Additionally, the Riverside County Copermittees request changing the requirement of Provision D.2.b.(2)(b)(ii) to require annual monitoring rather than semi-annual monitoring. With this change, a Copermittee could focus more of their annual budget on conduction Source ID efforts – which can result in eliminating problematic non-stormwater flows, rather than on a second monitoring event. Copermittees would still have the option to conduct a second monitoring event if they have more resources available and want to remove the outfall from their monitoring list sooner in accordance with Sub-Provisions [a] through [d].

D.2.b.(2)(e)

The Riverside County Copermittees support the San Diego County Copermittees' comments regarding allowing for a tailored list of constituents to be developed for each WMA. The Redline incorporates those edits.

D.3.

The Riverside County Copermittees support the changes recommended by the San Diego County Copermittees to this section, and these changes are reflected in the Redline.

D.4.a.(2)

This Provision as drafted would require the MS4 Copermittees to make comprehensive evaluations of Beneficial Uses that are beyond their expertise or the scope of an MS4 permit. Such evaluations and determinations would require advanced studies and cannot be answered with the monitoring data collected through this permit. This Provision should either be deleted or, alternatively the Riverside County Copermittees request that the assessments be focused on determining the status and progress toward addressing any Numeric Goals established for those Receiving Waters in the WQIP. Please see the Redline.

D.4.b.(1)

The Redline clarifies that outfall assessments are to be done for the area covered by each Municipal Copermittee (consistent with the proposed definition), and that the data to be used by each Municipal Copermittee would include the data collected from any Flood Control District Copermittee operated MS4s within its jurisdiction. This ensures that jurisdictional data is not double reported for Flood Control District MS4s within a city or county.

For Sub-Provision D.4.b.(1)(c)(iv) three key changes are requested in the Redline:

1) Annual volumes and pollutant loads should only be calculated from the monitored outfalls with persistent discharge to a flowing Receiving Water. This is directly applicable to the purpose of the Draft Permit and an important change, because volume and pollutant data extrapolated to non-monitored MS4 outfalls would be inaccurate and potentially misused if taken out of context. It is understood that San Diego Water Board staff want to ensure that jurisdictional accountability is maintained. However, since MS4 outfall monitoring will be conducted within each jurisdiction, inter-jurisdiction comparisons and accountability can be accomplished using the monitoring data directly without such extrapolations.
2) Added language to require a Copermittee to include in its jurisdictional load calculations any discharge that was demonstrated to have entered another Copermittees' MS4 before being discharged into the flowing Receiving Waters. This is important to ensure that each Copermittee maintains accountability for pollutants discharged to flowing Receiving Waters from within its jurisdiction.
3) The Redline proposes that the calculations of pollutant loads be only for the priority water quality constituents identified in the WQIP.

D.4.b.(2)(b)

Two key changes are recommended in the Redline:

1) Annual volumes and pollutant loads should only be calculated from the monitored outfalls for the monitored storm events. This is an important change because volume and pollutant data extrapolated to non-monitored events would be inaccurate and potentially misused if taken out of context. It is understood that San Diego Water Board staff want to ensure that jurisdictional accountability is maintained, so the Redline proposes that data from the monitored outfalls be extrapolated to identify loads for each jurisdiction during each monitored event. With this information, inter-jurisdiction comparisons and the desired 'accountability' can be accomplished using the monitoring data directly without such extrapolations to non-monitored events.
2) The Redline requests that calculations of pollutant loads be performed only for the priority water quality constituents identified in the WQIP.

D.4.b.(2)(c)

The Redline edits are consistent with those proposed by the San Diego County Copermittees, with minor modifications for clarity.

D.4.d.(2)(c)

It would be difficult to proactively determine the pollutant load reductions that *would* be necessary to demonstrate that discharges *are not* causing or contributing to exceedances of Receiving Water Limitations. Instead it would make more sense to calculate the necessary pollutant load reductions where the discharge has been demonstrated to be causing or contributing to such exceedances. In such circumstances, the necessary parameters would be known to calculate the needed load reduction. These changes are set forth in the Redline.

3.6 Provision E.1, Legal Authority

3.6.1 Overview of Key Issues

The Riverside County Copermittees note that Provision E.1, relating to the establishment of adequately legal authority, exceeds the requirements of federal CWA regulations in several respects. The federal regulations at 40 CFR 122.26(d)(2)(i)(A)-(F), provide explicit guidance for the Copermittees in developing the necessary legal authority to control MS4 discharges within its jurisdiction. However, several of the subsections of Provision E.1 go beyond these federal requirements, with respect to areas not within the responsibility of MS4 dischargers, such as negotiating with non-Copermittee entities. The Riverside County Copermittees have provided requested changes in the Redline, which are explained briefly below.

3.6.2 Comments in support of specific changes

E.1.a(1)

Changes in the Redline to accurately reflect the language of 40 CFR 122.26(d)(2)(i)(B).

E.1.a(2)

Changes in the Redline to accurately reflect the language of 40 CFR 122.26(d)(2)(i)(A). In addition, the Provision as written improperly requires the Copermittees to control the quality of runoff from sites covered by the state general permits for industrial activity and construction. These general permits are enforced by the State Board and the regional boards, and it is a state responsibility which cannot be handed off to the Municipal Copermittees.

E.1.a(3)

Changes in the Redline to accurately reflect the language of 40 CFR 122.26(d)(2)(i)(C).

E.1.a(5)

The Redline requests deletion of this Provision, which is not a requirement for municipal stormwater dischargers set forth in the CWA regulations. The Provision also improperly requests the Municipal Copermittees to attempt to negotiate with third parties the contribution of pollutants to the Copermittees' MS4. The Copermittees have no jurisdiction over such parties. The San Diego Water

Board has such jurisdiction, and should take responsibility for addressing non-MS4 sources of pollutants that may ultimately enter the MS4.

E.1.a(6)

Changes in the Redline to reflect accurately the language of 40 CFR 122.26(d)(2)(i)(E).

E.1.a(7)

The Redline requests deletion of this Provision, which is not a requirement for municipal stormwater dischargers set forth in the CWA regulations.

E.1.a(8)

The Redline requests deletion of this Provision, which is not a requirement for municipal stormwater dischargers set forth in the CWA regulations.

E.1.a(9)

The Redline requests deletion of this Provision, which is not a requirement for municipal stormwater dischargers set forth in the CWA regulations.

E.1.a(10)

The Redline requests both correction of the language in this Provision to comport with the federal regulations in 40 CFR 122.26(d)(2)(i)(F) and deletion of the second clause of this Provision, which is not found in 40 CFR 122.26(d)(2)(i)(F). Moreover, the requirement to inspect and monitor in the first clause of this Provision covers the issues set forth in the second clause. It is therefore unnecessary.

3.7 Provision E.2, IDDE

3.7.1 Overview of Key Issues

- The Draft Permit requires the Copermittees to address all non-stormwater discharges from the MS4 as illegal discharges, and then describes certain sources that need not be prohibited. This is effectively a 'guilty until proven innocent' provision, where a Copermittee will be required to expend potentially significant resources conducting source identification efforts any time non-stormwater is observed discharging from the MS4. In addition to the issues discussed in the Legal Comments, the Provision raises two practical and logistical problems:

    - This requirement is entirely independent of the determination that there are in fact any significant pollutants in such a discharge. A Copermittee could be spending substantial sums tracking (and then potentially enforcing upon) the source of a discharge that is not negatively impacting Receiving Waters. This not only is a waste of public resources, but would undermine the credibility of stormwater programs.
    - The San Diego Water Board and the State Water Board do not treat non-stormwater flows in the same manner across all of their regulatory mechanisms. For example, Order

> No. R9-2008-0002 allows non-stormwater discharges to occur, POTWs are issued permits for their discharges and agricultural operators can discharge irrigation water. The Copermittees should not be forced to conduct an expensive source investigation, only to find that the discharge complies with a permit or a waiver granted by the Water Board. The Copermittee would have no ability to address such a discharge as an 'illegal discharge', and further would have no ability to recuperate their costs for the source identification.

The best way to address these issues, is to require the Copermittee to have and enforce an effective prohibition of illegal discharges of *pollutants* (through statutes, ordinances, permits, contracts, orders or similar means), and then allow the Copermittee full discretion to determine which non-stormwater discharges have the potential to negatively impact Receiving Waters, consistent with the WQIP priorities – and address those as illegal discharges.

- Several categories of non-stormwater discharge that were previously conditionally exempt consistent with the CWA, are required by the Draft Permit to be treated as illegal discharges, unless they have coverage under another order issued by the San Diego Water Board. In addition to the problems identified above for conducting enforcement in the absence of a pollutant discharge, the San Diego Water Board, not the Copermittees, is responsible for evaluating coverage, need for coverage, and compliance with other orders issued by the Water Board. The Copermittees have neither authority nor jurisdiction. Please see the Redline.
- Several categories of non-stormwater discharge that were previously conditionally exempt consistent with the CWA, are required by the draft permit to be 'controlled' or otherwise prohibited by the Copermittees. The Fact Sheet further describes that such controls are warranted because they could potentially contain pollutants. However, the CWA only requires controls where the discharges are determined to be a significant source of pollutants. Please see Legal Comments for a further discussion of this issue as well as the Redline.
- The Draft Permit eliminates the conditional exemptions for Landscape Irrigation, Irrigation Water, and Lawn Watering (collectively 'irrigation runoff'). The San Diego Water Board has provided no data demonstrating that these discharge categories have contributed a significant pollutant load to Receiving Waters within Riverside County. Information discussed in the Fact Ssheet focuses on data from other counties. The only data from Riverside County is public educational material referring to irrigation runoff; this material, however, was adapted from public education material from other counties. That public educational material was intended to help prevent such discharges from becoming a significant source of impact on the Receiving Waters, and did not constitute a determination that such discharges are in fact, actually a significant source that needs to be subject to a prohibition. See the discussion in the Legal Comments as well as the Redline.
- The Draft Permit, in Provision E.2.a.(7) requires efforts to minimize or eliminate all non-stormwater flows, including those that are natural, conditionally exempt, or otherwise permitted by the San Diego Water Board, regardless of whether or not such discharges are not contributing pollutants to the MS4. Such a requirement conflicts with the prior Provisions E.2.a.(1) through

(5), which state conditions where such discharges need not be prohibited. The requirement should therefore be removed, as set forth in the Redline.

3.7.2 Comments in support of specific changes

E.2.a.(1) and (3)

The Riverside County Copermittees request that this Provision be deleted (as shown in the Redline) and the categories of non-stormwater discharges be re-incorporated into Provision E.2.a.(3). The apparent premise of Provision E.2.a(1) as drafted is that since the San Diego Water Board requires those discharges to have coverage under a separate order, they are illegal if they lack such coverage. The MS4 Copermittees, however, are not responsible for enforcing discharge coverage under separate San Diego Water Board orders; that is the responsibility of the San Diego Water Board itself. Requiring the Copermittees to enforce such entities for their lack of coverage under a separate San Diego Order shifts that responsibility from the Board to Copermittees. This is not authorized by the CWA or the Porter-Cologne Water Quality Act. The Copermittees are, under the CWA, only required to address such discharges as illegal discharges if the discharge is found to be contributing a significant pollutant load to the MS4. By moving those categories to Provision E.2.a.(3), as shown in the Redline, the Copermittees will still be required to treat such discharges as illegal discharges if and when they are found to be contributing significant pollutants to the MS4. This proposed approach is consistent with other MS4 permits in the state, including prior San Diego Water Board orders, and is further consistent with the approach taken for the WQIP, which is intended to allow the Copermittees to focus resources on addressing the specific impacts that MS4 discharges are having on Receiving Water quality.

E.2.a.(2)

This Provision requires the Copermittees to treat water line breaks as illegal discharges, which in turn requires the Copermittee to conduct enforcement measures. Water main breaks are accidental occurrences, or may be the result of acts of nature. It is no more appropriate to treat accidents as illegal and subject to enforcement than it would be for a city to declare vehicular accidents as illegal, and conduct enforcement against those involved. This language needs to be removed as shown in the Redline. Additionally, as discussed in the Legal Comments, a recent case from the federal district court in Virginia suggests that the regulation of mere flow may exceed the authority of the CWA.

E.2.a.(4)

The Redline clarifies that if the 'statues, ordinances, permits, contracts, orders or similar means' are enacted/adopted by a Copermittee, the categories of non-stormwater discharges listed do not need to be treated as illegal discharges. Otherwise, the language could be read to imply that, for example, if it was infeasible for a particular resident to direct wash water to landscaped areas, that the Copermittee would be required to treat that residents' discharge as illegal and enforce upon them.

E.2.a.(5)

Contrary to the provisions of the CWA regulations, prior MS4 permits issued by the San Diego Water Board and other permits in the state, the Draft Permit requires implementation of BMPs, where

feasible, during emergency firefighting activities. During such emergencies, all focus of public resources must appropriately be dedicated to protecting life and property. Any diversions from that mission would only serve to diminish and potentially compromise that mission. The Redline proposes language consistent with that adopted by the San Diego Water Board in 2010 for the Riverside County MS4 Permit (Order R9-2010-0016).

E.2.a.(7)

Provisions E.2.a.(1) through E.2.a.(6) describe circumstances where non-stormwater discharges need not be prohibited. This Provision then requires the Copermittees to minimize such 'conditionally allowed' flows anyway. This requirement exceeds the scope of the CWA and its implementing regulations and makes no sense. The Redline requests deletion of these Provisions.

E.2.b.(1)(d)

This Provision requires the MS4 Copermittees to map all known private outfalls to Receiving Waters. Such a requirement is beyond the scope of an MS4 permit and should be removed, as shown in the Redline. The Draft Permit does not require a Copermittee to address private outfalls to Receiving Waters; this is the responsibility of the San Diego Water Board, which governs all waste dischargers under the authority of the CWA or the Porter-Cologne Act.

E.2.b.(4)

This Provision requires the Copermittees, in conjunction with a spill, to 'prevent contamination of surface water, groundwater, and soil.'This requirement is clearly beyond the scope of an MS4 permit issued under the CWA (which regulates only discharges of water containing pollutants *from* the MS4 to Receiving Waters) and must be removed, as shown in the Redline. The Draft Permit could more appropriately require the Copermittees to 'coordinate, to the extent possible, with spill response teams to prevent entry of spills into the MS4.'

E.2.d.(2)(e)

The Redline requests edits to clarify that the intent of this Provision is to document and attempt to quantify any obvious sources of non-stormwater illegal discharges in response to the outfall monitoring, and that it is not necessary to conduct a full source identification any time there is evidence of water near an outfall.

New Provisions E.2.d.(3)(e)-(f)

The Redline adds two new provisions to this section to address a gap in potential outcomes from a source identification effort. These Provisions address scenarios where a Copermittee identifies A) the illegal discharge is coming from another upstream Copermittees' MS4, or B) that the discharge has been authorized by the San Diego Water Board, either through an order or waiver of WDRs. In the first scenario, the responsibility to continue the source identification, and conduct enforcement, would be transferred to the upstream Copermittee. In the second scenario, the responsibility for follow-up would fall on the San Diego Water Board, after receiving relevant information from the Copermittee. This Provision also provides for reimbursement to the Copermittee for the cost of the source identification, since the San Diego Water Board required the Copermittee to conduct the investigation,

while not commensurately prohibiting all non-storm water discharges from all other sources regulated by the Water Boards.

3.8 Provision E.3, Development Planning

3.8.1 Overview of Key Issues

- Priority Development Projects - The Tentative Order identifies categories of projects that are to be defined as 'Priority Development Projects' (PDPs), which in turn will be required to comply with specific water quality and Hydromodification mitigation and quantitative requirements. The criteria for PDPs is quite broad and would include the majority of development projects, from small convenience stores and residences, to mega malls and specific plan developments. The Fact Sheet describes that while some smaller project types may not have significant pollutant loads, they may have a hydrologic impact upon Receiving Waters. However, it is important to recognize that pursuant to Provision E.3.a., All projects are required to implement a variety of LID principles such as disconnecting impervious surfaces, draining impervious surfaces to landscaped areas, and minimization of soil compaction in landscaped areas. Since such LID principles will be implemented wherever feasible consistent with the MEP standard, these smaller development projects are unlikely to create a pollutant or hydrologic impact. Additionally, the Fact Sheet advocates incentivizing LID design concepts and green infrastructure and building principles. Accordingly, the Redline requests changes to Provision E.3.b.(3) as described in Provision 3.8.2 below. The Legal Comments further note the potential impact of the Virginia case (*Virginia Dept. of Transp. v. U.S. Environmental Protection* Agency) holding that the CWA does not regulate stormwater as a pollutant.
- Design Capture Volume – There are two problems with how the Draft Permit defines the Design Capture Volume:
    - The Draft Permit changes the 'design capture volume' from previous permits by eliminating the term 'runoff'. Prior permits described that the design capture volume is the volume of stormwater runoff from the 24-hour 85th percentile storm event. This permit changes that to be the volume of stormwater produced from a 24-hour 85th percentile storm event. The elimination of the term 'runoff' means that BMPs would need to be sized potentially much larger than previously. For example, if the 85th percentile storm is 1" and a BMP is designed to treat 1 acre of residential land with a coefficient of runoff of 0.6, then under the current permits the BMP must be sized to hold 2,178 cubic feet of water. However, under the language of the Draft Permit, the BMP treating the same area would be required to hold 3,630 cubic feet of water, a 70% increase in BMP size. Accordingly, the Redline restores the term 'runoff'.
    - Additionally, the Draft Permit defines the Design Capture Volume alternatively as: *"the volume of storm water that would be retained onsite if the site was fully undeveloped and naturally vegetated, as determined using continuous simulation modeling techniques based on site-specific soil conditions and typical native vegetative cover."* In addition, to the problem identified above regarding the volume of storm water runoff, this language does not provide a temporal standard for determining which volume to

calculate from a continuous simulation model. Additionally, such models are not commonly used among general practitioners in the civil engineering community. The Redlines propose an alternative and simpler approach for this second definition: "The volume of stormwater runoff produced from a 24-hour 85th percentile storm event, that would be retained onsite in the pre-project condition." This definition is advantageous for several reasons: 1) it is simple for any civil engineer to understand, calculate, and comply with and is based on the same storm and hydrologic calculations as the first option, 2) it respects natural hydrology for the site, which may have had runoff in the pre-project condition, and as such, is more compatible with the intent of LID to mimic natural hydrology, and 3) as a result it is less likely to result in potential degradation of Beneficial Uses downstream, from reductions in flows beyond the pre-project condition.

- Pre-Project vs Pre-Development – Both the Storm Water Pollutant Control BMP requirements and the Hydromodification Management BMP requirements in the Draft Permit specify a 'pre-development' condition as the mitigation standard for all PDPs. In addition to the legal problems with such a standard as set forth in the Legal Comments, there are practical problems with the standard.
    - The presumption made in the discussions in the Fact Sheet are that all Receiving Waters can, and will, be restored to a fully natural condition - effectively to a natural floodplain. This presumption does not address reality, which is that development has occurred in those floodplains over many generations. The San Diego Water Board obviously lacks the authority to force homeowners and businesses to vacate such floodplains to effectuate restored natural conditions. Such an action would represent an unconstitutional taking. Moreover, the Legislature, in the Flood Control Acts covering all three counties proposed to be covered by the Draft Permit, has specifically authorized Flood Control Districts to construct flood control structures required to protect the lives and properties of the citizens.
    - Mitigation to a pre-development condition also may not be necessary to protect Receiving Waters from the effects of Hydromodification. If, for example a Receiving Water with existing development tributary to it, has not experienced increased erosion due to that existing development, there is no reason to require Hydromodification mitigation to anything more than the existing condition. In the counter-example, if under the existing condition the Receiving Water has experienced increased erosion due to that existing development, then, legal issues aside, there would be technical benefit to mitigating to that pre-development condition.

  The Redline proposes alternative language that requires mitigation to a pre-development standard only where it is legal and technically justified based on the conditions of the Receiving Water.
- Alternative Compliance – The alternative compliance project options as set forth in the Draft Permit pose two key problems:

- Several statements are conflicting and thus confusing as to what the required standard is for the various alternative compliance projects. For example, throughout Provision E.3.c. it is stated that 'a PDP may be allowed to comply with Provision E.3.c.(1)(a) and/or Provision E.3.c.(2) if they …'. This language can be mis-read to imply that the project must comply both with Provisions E.3.c.(1)(a) and E.3.c.(2) *and* implement the alternative compliance project (thus negating the benefit of alternative compliance). The Redline clarifies this language.
- The Biofiltration option set forth in the Draft Permit arbitrarily, and without technical basis or justification, **doubles** the sizing standard for biofiltration BMPs from 0.75 times the design capture volume (as set forth in the 2010 MS4 Permit and the 2009 Orange County Permit) to 1.5 times the design capture volume. The existing 0.75 standard was set due to the fact that 1) the 85th percentile 24-hour storm occurs over a period of time, and 2) such BMPs have outflows and will regain some capacity during the storm event, and as such, do not need to instantaneously hold the entire 'Design Capture Volume' to have fully treated that volume. In fact, studies have shown that in addition to yielding excellent pollutant concentration reductions, LID Biofiltration BMPs are excellent at reducing the volume of runoff similar to retention BMPs. According to the ASCE International BMP database 60% or more of the long-term volume of runoff from a site can be retained within a Bioretention BMP (Bioretention BMPs are the primary 'biofiltration' BMP now allowed in Riverside County). In comparison, a Retention BMP sized to hold the runoff from the 85th percentile storm event (the Design Capture Volume) will end up retaining approximately 80% of the long-term volume of runoff. Thus, by simple proportions, a Bioretention BMP sized to 'hold' 100% of the Design Capture Volume may also be able to retain 80% of the long-term volume of runoff. $\left(\frac{0.75\times DCV}{60\%\ retained}=\frac{1.0\times DCV}{80\%\ retained}\right)$. This is being validated through Bioretention BMPs that have been constructed and are being monitored for such volume reductions at the Riverside County Flood Control District's headquarters in Riverside. Further, Biofiltration BMPs have the added benefit of providing better overall treatment of back to back storms. Where a Retention BMP would be full after the first storm, fully bypassing the second storm without treatment, a Biofiltration BMP will have restored some capacity after the first storm, providing for treatment of some or all of the second of the back to back storms. Thus, the attached redlines propose changing the sizing factor for Biofiltration BMPs to 1.0 times the Design Capture Volume. The Redline proposes changes consistent with these comments.

3.8.2 Comments in support of specific changes

Introduction

Provision E.3.g (Strategies to address the highest priority water quality conditions) was moved to the beginning to support and better integrate the development planning programs in the JRMP with the strategies developed in the WQIP.

E.3.a.(3)

The Redline changes the title of this section (and other appropriate references to this Provision) to refer to LID Principles, as identified in the CASQA LID Manual for Southern California (https://www.casqa.org/LIDDemo/LowImpactDevelopmentManual/tabid/242/Default.aspx)

E.3.b.(1)(c) (New Provision)

This Provision was added to clarify the requirements if a project that was already subjected to SSMP requirements redevelops a portion of the site.

E.3.b.(2)

The Redline edits shown for this Provision are primarily to simplify this Provision, by grouping various categories by their applicable square footage threshold and including some of the specifics in the definitions (Attachment C). Other changes (beyond reorganization) include:

- Removing the addition of 'driveways' from subsection (g) as described in Provision 3.8.1 of this letter.
- Adding a footnote for parking lots, to clarify that the trigger would not include parking lots that are not exposed to runoff, such as subterranean or covered parking lots. It is beneficial to not have parking lots exposed to runoff; excluding such parking lots from being defined as a PDP is a good way to encourage such practices.
- Hillside development projects were not included as it is not believed to be necessary anymore with the relatively low threshold (10,000 square feet) identified for other categories included in this and other recent MS4 permits.
- The definition for "Environmentally Sensitive Areas" from existing MS4 permits was restored to include the language referring to discharges that are not commingled with flows from adjacent or other upstream lands (note that the change is shown in the definitions per the re-organization suggested above).

E.3.b.(3)

- The PDP exemption for sidewalks, bicycle lanes, or trails, [E.3.b.(3)(a)] has been expanded to as shown in the Redline to include driveways and parking lots. If those projects implement criteria already described in that section, they are also unlikely to create an impact to Receiving Waters. Further, including those project types in that exemption will further incentivize developers to utilize those LID Principles.
- The exemption described in Provision E.3.b(3)(b), was modified as shown in the Redline, and as discussed in the comment letter submitted by the Riverside County Transportation Department. Please see that letter for a justification for the requested changes.
- As shown in the Redline, the exemptions for new and redeveloped single family residences [E.3.b.(3)(c) and (d)] were consolidated into a new provision [E.3.b.(3)(c)], covering all single family residential projects (both new and redeveloped). The key difference is that such projects would be considered exempt if they are both 1) not part of a larger common plan of development or planned subdivision, and 2) successfully incorporate each of the applicable source control and LID Principles identified in Provision E.2.a.(2)-(3) to the MEP.

- A new Provision-E.3.b.(3)(d), titled 'Watershed Protection Projects' was added in the Redline. The project types described therein are all projects that are undertaken to rehabilitate or prevent environmental, social, and economic damage within the watershed, including Receiving Waters. These projects, while they may in some cases require some level of impervious surfaces to be constructed, are 1) not designed for human use or activity that would generate pollutants, or are designed specifically to mitigate such pollutants; and 2) will implement each of the applicable source control and LID Principles identified in Provision E.2.a.(2)-(3) to the MEP.

E.3.c.(1)

In addition to the edits discussed in Provision 3.8.1 of this letter, the Redline removed subprovision E.3.c.(1)(c) , for two reasons:

- The requirements that must be met to when implementing an alternative compliance project are more fully described in Provision E.3.c.(3).
- The language, as drafted, appeared to require double-mitigation. It requires that: 1) conventional treatment is required to treat the entire volume not retained onsite, and 2) the pollutant load discharged must also be mitigated with an alternative compliance project. Such a scenario would be requiring double-mitigation. The Redline provides a clearer and more simple mitigation standard.

E.3.c.(2)

The Riverside County Copermittees have two concerns with this Provision:

- The first concern is the universal requirement to mitigate to the 'pre-development' standard, as discussed above in section 3.8.1 of this letter. The Copermittees in the Redline propose that this language be changed to the 'pre-project' condition. For new development projects, the 'pre-project' condition will be equivalent to the 'pre-development' condition. For redevelopment projects, the standard would be the conditions that exist onsite prior to the construction of the project. This is appropriate, because in many areas, particularly in areas of existing development that would be subject to 'redevelopment', Receiving Waters are engineered and maintained to 1) provide flood protection for the public, 2) ensure that floodwaters don't comingle with pollutants on adjacent private properties and 3) to ensure that the existing development draining to that system does not cause erosion. In cases where the Receiving Waters are not engineered and maintained, and erosion problems caused by existing development are observed, language has been added to the Redline to provide for additional standards to be developed in the WQIP, based on the WQIP priorities.
- Additionally, the Redline proposes an additional exemption from HMP requirements for projects that discharge into conveyance channels that are engineered and maintained for the build-out condition all the way from the project to a waterbody that is sufficiently resistant to Hydromodification. This language is consistent with the above discussions, and ensures the PDPs are not required to mitigate for non-existent impacts. Please see the specific language in the Redline. The engineered channel exemption can be found in other recent MS4 permits, including the recently adopted Los Angeles County MS4 Permit.

E.3.c.(3)(a) and (b)

These two Provisions were re-written in the Redline to be simpler and clearer on what BMPs, criteria, sizing standards are required for what type of project. This alternative language still meets the intent of the Draft Permit, while being easier to understand and comply with. Aside from simplifying the language, the following other changes were made in the Redline:

- The alternative compliance options must be determined to provide an equal or greater overall water quality benefit for the WMA.
- Additional options were provided for who can design the alternative compliance projects
- All alternative compliance projects are required to be consistent with the strategies in the WQIP. While the specific alternative compliance project would not be required to be identified in the WQIP, the goal of this language is to ensure that allowing the alternative compliance project would not in any way be detrimental to or contrary to the strategies in the WQIP.
- Requirements E.3.c.(3)(a)(iv) and (v) were removed entirely, as they conflict with E.3.c.(3)(a)(iii) which allowed the projects to be in the same WMA (preferably the same HSA)
- Changed the sizing factor for Biofiltration BMPs to 1.0 as discussed in section 3.8.1 of this letter, and deleted the option [d] which required triple mitigation by requiring Biofiltration + Conventional Treatment + Alternative Compliance projects.
- Added Conventional Treatment Control BMPs as an alternative compliance option, only where it has been shown to be technically infeasible to meet E.3.c.(1) and technically infeasible to implement LID Biofiltration Treatment Control BMPs.

E.3.c.(3)(c)

Redline edits in this section are primarily to simplify and consolidate the requirements. Sub-Provision [C] was removed, as it was duplicative of the mitigation standards for the alternative compliance project are specified in E.3.c.(3)(b) and E.3.c.(3)(c)(i)[a].

3.9 Provision E.4, Construction

3.9.1 Overview of Key Issues

This Riverside County Copermittees' comments and edits are set forth in the Redline.

- One key issue for the Copermittees is the edit shown in the Redline to Provision E.4.c, which clarifies that the Copermittees are responsible for *requiring* BMPs at private construction sites, and *implementing* BMPs at Copermittee construction sites.

3.9.2 Comments in support of specific changes

The Redline edits include comments supporting the requested edits.

3.10 Provision E.5., Existing Development

3.10.1 Overview of Key Issues

The Draft Permit includes requirements for advanced programs to identify opportunities and implement programs to facilitate the construction of Retrofit and Stream/Channel/Habitat Rehabilitation projects on private properties. Such requirements are clearly beyond the requirements of the CWA for a management plan to be implemented by an MS4 Copermittee. The Riverside County Copermittees request deletion of these requirements.

Alternatively, the Riverside County Copermittees have the following comments:

While these retrofitting and rehabilitation approaches can be helpful and/or needed in some circumstances, they are not required in all circumstances, nor are required to address all pollutants that may be identified in a WQIP as the highest priority water quality conditions. For example, some pollutants are best addressed with regulatory source controls at the state or federal level, such as the removal of copper from brake pads, and controls on pesticides, while other pollutants can be adequately addressed through inspections and enforcement. There are several problems with requiring Copermittee resources to be invested in such Retrofit and/or Rehabilitation strategies (collectively referred to as 'retrofit'):

- Land Ownership: The land that could potentially be identified for retrofit would likely not be owned by a Copermittee. The Copermittee therefore has no ability to force the property owner to retrofit their property. Although the Copermittee could potentially implement programs to "facilitate" implementation, such a program would still be limited by the rights of the individual property owner. Even if a Copermittee were to attempt to purchase a privately owned existing development for the purposes of retrofit (a step going far beyond any requirements in the CWA or the Porter-Cologne Act), such a process can take many years, and if the owner is unwilling to sell, the retrofit project could never be realized. In any scenario, the process to facilitate such "retrofits" is extremely costly and lengthy, with no guarantee of a benefit to water quality. Retrofits should only be undertaken where the Copermittee identifies it as a necessary step to addressing the MS4 contributions to Receiving Water problems to the MEP. Otherwise, it forces the Copermittee to utilize resources very ineffectively, which is contrary to the goals of the WQIP and may actually be detrimental to water quality.
- Permitting: Aside from the limitations discussed above, stream/channel/habitat restorations have the additional complexities of requiring other regulatory permits that are not the discretion of the San Diego Water Board nor the Copermittees to issue. Such projects can take many decades to implement, and thus, are not expected to be highly effective at addressing the goals of the WQIP, except in rare circumstances.

Redline edits have been provided to clarify that these strategies and programs should only be used when, and to the extent directed by the strategies developed in the WQIP.

3.10.2 Comments in support of specific changes

E.5.b.(1)(b) and (d)

BMP implementation requirements of Provision E.5.b.(1)(b) and (d) have been clarified in the Redline to require the Copermittee to implement BMPs on their existing development, and require implementation of BMPs on private existing development.

E.5.c.(1)(a)(iv)

The Riverside County Copermittees request deletion of this Provision. The Copermittees should be provided the flexibility to schedule inspections as they see fit, provided that the schedules they establish pursuant to E.5.c.(1)(a), and the minimum frequency in E.5.c.(1)(a)(i) are met. Requiring 20% every year will be difficult to track as businesses may be opened or closed throughout the year and throughout the permit term.

Additionally, the Riverside Copermittees understand that other Copermittees may be recommending that E.5.c.(1)(a)(i) be changed to 'once per permit term'. The Riverside Copermittees believe that the current language of 'once every five years' is more appropriate for two reasons: 1) not all Copermittees (i.e. OC and Riverside) will be enrolled into the permit at the beginning of the 'permit term', and 2) not all businesses will be in existence at the beginning of the permit term. Accordingly it is more appropriate to simply require the minimum to be once every five years, that way a program manager can simply look at the last time a facility was inspected, and use that date to schedule the next inspection.

3.11 Provision E.6, Enforcement Response Plans

3.11.1 Overview of Key Issues

The Riverside County Copermittees' edits and comments are shown in the Redline and discussed below.

3.11.2 Comments in support of specific changes

E.6.d.

The terminology in this Provision was changed in the Redline from 'escalated' enforcement to 'progressive' enforcement. The proposed language better reflects the nature of enforcement actions, which are not simply 'escalated' or 'not escalated', as implied by Provision E.6.d.(2), but are progressive as needed in response to the severity of the violation. Since every violation comes with a unique set of circumstances, it is not reasonable to presume that a single set of 'triggers' will universally result in the same level of enforcement.

3.12 Provision E.7, Public Education

3.12.1 Overview of Key Issues

The Riverside County Copermittees' edits and comments are shown in the Redline.

3.13 Provision, E.8 Fiscal Analysis

3.13.1 Overview of Key Issues

The requirement that the Copermittees "must secure all the resources necessary to comply with this Order" exceeds the requirements of the CWA and illegally intrudes on the home rule authority of municipalities to govern themselves. This must be deleted. Please also see Legal Comments.

With regard to other provisions, the Riverside County Copermittees' edits and comments are shown in the Redline.

3.14 Provision F

3.14.1 Overview of Key Issues

- F.1 – WQIP Submittal
  - Based on the schedule for the initial submittal of the Priority Water Quality Conditions and Numeric Goals, and the subsequent 60-day public review, only one month would be left for the Copermittees to finalize strategies based on those conditions and goals and the public input received. This is an insufficient amount of time. The Redline requests modifications to the schedule that would provide for the submittal of the final WQIP within 24 months (instead of 18), to provide additional time for the development of strategies.
- F.1 and F.2.
  - The schedules for submittals should be linked to the receipt of comments on prior submittals, or the approval of prior submittals, rather than the permit adoption date. If it is tied to the permit adoption date, the submittal dates could become out of sync with the comment periods or San Diego Water Board approvals if any unexpected delays occur (for example if the San Diego Water Board is delayed in approving a document, or posting a document online for public comment). The Redline requests appropriate modifications.
  - Implementation dates for the plans are unclear / undefined. The Redline clarifies this issue.
- F.3. Progress Reports
  - The reporting requirements across the transitional period were unclear. Redlines are provided to clarify and consolidate.
  - The Regional Monitoring and Assessment Report language was revised to be consistent with the requirements of the Integrated Assessment of the Water Quality Improvement Plan, rather than an additional, slightly different report, due at the same time.

3.15 Attachments B and C

Comments and edits to Attachments B and C are shown in the Redline.

Very truly yours,

for JASON E. UHLEY
Chief of Watershed Protection Division

CP:cw
P8/

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

TENTATIVE
ORDER NO. R9-2013-0001
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The San Diego County Copermittees in Table 1a are subject to waste discharge requirements set forth in this Order.

Table 1a. San Diego County Copermittees

Municipal Copermittees	
City of Carlsbad	City of Oceanside
City of Chula Vista	City of Poway
City of Coronado	City of San Diego
City of Del Mar	City of San Marcos
City of El Cajon	City of Santee
City of Encinitas	City of Solana Beach
City of Escondido	City of Vista
City of Imperial Beach	County of San Diego
City of La Mesa	San Diego County Regional Airport Authority
City of Lemon Grove	San Diego Unified Port District
City of National City	

After the San Diego Water Board receives and considers the Orange County Copermittees' Report of Waste Discharge and makes any necessary changes to the Order, the Orange County Copermittees in Table 1b will become subject to waste discharge requirements set forth in this Order after expiration of Order No. R9-2009-0002, NPDES No. CAS0108740 on or after December 16, 2014.

Table 1b. Orange County Copermittees

Municipal Copermittees	
City of Aliso Viejo	City of Rancho Santa Margarita
City of Dana Point	City of San Clemente
City of Laguna Beach	City of San Juan Capistrano
City of Laguna Hills	City of Laguna Woods
City of Laguna Niguel	County of Orange
City of Lake Forest	~~Orange County Flood Control District~~

City of Mission Viejo	
Special District Copermittee	
Orange County Flood Control District	

After the San Diego Water Board receives and considers the Riverside County Copermittees' Report of Waste Discharge and makes any necessary changes to this Order, the Riverside County Copermittees in Table 1c will become subject to waste discharge requirements set forth in this Order after expiration of Order No. R9-2010-0016, NPDES No. CAS0108766 on or after November 10, 2015.

Table 1c. Riverside County Copermittees

Municipal Copermittee	
City of Murrieta	County of Riverside
City of Temecula	~~Riverside County Flood Control and Water Conservation District~~
City of Wildomar	
Special District Copermittee	
Riverside County Flood Control and Water Conservation District	

The Orange County Copermittees and Riverside County Copermittees may become subject to the requirements of this Order at a date earlier than the expiration date of their current Orders subject to the conditions described in Provision F.6 of this Order if the Copermittees in the respective county receive a notification of coverage from the San Diego Water Board.

The term Copermittee in this Order refers to any San Diego County, Orange County, or Riverside County Copermittee covered under this Order, unless specified otherwise.

This Order provides permit coverage for the Copermittee discharges described in Table 2.

Table 2. Discharge Locations and Receiving Waters

Discharge Points	Locations throughout San Diego Region
Discharge Description	Municipal Separate Storm Sewer System (MS4) Discharges
Receiving Waters	Inland Surface Waters, Enclosed Bays and Estuaries, and Coastal Ocean Waters of the San Diego Region

Table 3. Administrative Information

This Order was adopted by the San Diego Water Board on:	**Month Day, 2013**
This Order will become effective on:	**Month Day, 2013**
This Order will expire on:	**Month Day, 2018**
The Copermittees must file a Report of Waste Discharge in accordance with Title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than 180 days in advance of the Order expiration date.	

I, David W. Gibson, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on Month Day, 2013.

TENTATIVE

David W. Gibson
Executive Officer

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ATTACHMENTS

Attachment A - Discharge Prohibitions and Special Protections A-1
Attachment B - Standard Permit Provisions and General Provisions B-1
Attachment C - Acronyms, Abbreviations and Definitions C-1
Attachment D - Jurisdictional Runoff Management Program Annual Report Form D-1
Attachment E - Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2013-0001 ..... E-1
Attachment F - Fact Sheet / Technical Report for Order No. R9-2013-0001 ..... F-1

I. FINDINGS

Comment [A1]: See discussions in section 3.1 of the comment letter

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), finds that:

JURISDICTION

1. **MS4 Ownership or Operation.** Each of the Copermittees owns or operates an MS4, through which it discharges storm water and non-storm water into waters of the U.S. within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the U.S.

Many geographical areas subject to this Order are subject to the threat of periodic catastrophic flooding resulting from natural conditions, specifically the presence of mountains and hilly areas in close proximity to urban development and the effect of period strong Pacific Ocean storms. Such flooding would occur in the absence of development. The Legislature recognized the importance of this issue when it established flood control districts across the state, including in Orange, Riverside and San Diego Counties. Such flooding has in the past, and if not controlled, could in the future result in loss of life and property damage. Such flooding can also mobilize significant Pollutants from industrial, commercial, residential and agricultural lands, damaging watercourses and the beneficial uses thereof, including habitat. MS4s are designed and constructed to mitigate such impacts.

2. Riverside County Flood Control and Water Conservation District.

Comment [A2]: See discussion in section 3.1.1 of the comment letter.

In 1945, the California Legislature enacted the Riverside County Flood Control and Water Conservation District Act, establishing the Riverside County Flood Control and Water Conservation District (District). The objects and purposes of the Act are to provide for the control and conservation of flood and storm waters and for the protection of watercourses, watersheds, public highways, life and property within the District from damage or destruction from flood waters. Among its other powers, the District also has the power to conserve, reclaim and save such waters for beneficial use. However the Act does not provide the District with the power to control the volume or quality of discharges that runs off of private property, which may end up in the District's flood control system. The District is governed by the District's Board of Supervisors as a separate legal entity from the County of Riverside.

Many of the flood management systems that the District operates are defined by the Clean Water Act as an MS4, and include many of the larger MS4s within the Santa Margarita watershed region of Riverside County (SMR). District does not however

own or operate streets, catch basins or storm drains smaller than 36 inches that collect runoff from the incorporated and unincorporated jurisdictions within the SMR, and commonly connect into the District's flood management system. Such systems are typically owned and operated by either the County of Riverside or the incorporated Cities within the SMR.

The waters and pollutants that may enter the regional receiving waters and/or the District's flood management systems come from various sources. These sources can include storm water and non-storm water from the Municipal Copermittees under this permit as well as from other NPDES and non-NPDES permittees, including industrial waste water dischargers, waste water treatment facilities, industrial and construction stormwater dischargers, water suppliers, tribal lands, other state and federal government entities, and Caltrans. Sources can also include discharges from Phase II entities such as school districts and discharges from entities that have been granted waste discharge requirements or waivers of waste discharge requirements, including agricultural operations.

The District does not own or operate any municipal sanitary sewer systems, public streets, roads, or highways. The District has no planning, zoning, development permitting or other land use authority, thus, it has no permitting or governing authority over industrial or commercial facilities, residents, new developments or re-development projects, and development construction sites located in any incorporated or unincorporated areas within its service area, including the SMR. The Copermittees that have such authority are responsible for implementing a storm water management program to address pollutants discharged from such industrial and commercial facilities, residential areas, new development and re-development projects, and development construction sites within their jurisdictional boundaries. Nonetheless, as an owner and operator of an MS4, the District is required to control pollutant discharges into and from its MS4, such as through interagency agreements among Copermittees and other owners of a MS4, the contribution of pollutants from one portion of the MS4 to another portion of the MS4 within their jurisdiction.

2. **Legal and Regulatory Authority.** This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]) adopted by the United States Environmental Protection Agency (USEPA), and chapter 5.5, division 7 of the California Water Code (CWC) (commencing with section 13370). This Order serves as an NPDES permit for discharges from MS4s to surface waters. This Order also serves as waste discharge requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

   The San Diego Water Board has the legal authority to issue a regional MS4 permit pursuant to its authority under CWA section 402(p)(3)(B) and 40 CFR 122.26(a)(1)(v). The USEPA also made it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide permits (55 Federal Register [FR] 47990, 48039-48042). The regional nature of this Order will ensure consistency of regulation within watersheds and is expected

to result in overall cost savings for the Copermittees and San Diego Water Board.

The federal regulations make it clear that the Copermittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators (40 CFR 122.26(a)(3)(vi)). This Order does not require the Copermittees to manage storm water outside of their jurisdictional boundaries, but rather to work collectively to improve storm water management within watersheds.

3. **CWA NPDES Permit Conditions.** Pursuant to CWA section 402(p)(3)(B), NPDES permits for storm water discharges from MS4s must include requirements to effectively prohibit non-storm water discharges into MS4s, and require controls to reduce the discharge of pollutants from the MS4s ~~in storm water~~ to the maximum extent practicable (MEP), and to require other provisions as the San Diego Water Board determines are appropriate to control such pollutants. This Order prescribes conditions to assure compliance with the CWA requirements for owners and operators of MS4s to effectively prohibit non-storm water discharges in to the MS4s, and require controls to reduce the discharge of pollutants ~~in storm water~~ from the MS4s to the MEP.

Comment [A3]: See discussion in section 3.1.2 of the comment letter.

4. **CWA and CWC Monitoring Requirements.** CWA section 308(a) and 40 CFR 122.41(h),(j)-(l) and 122.48 require that NPDES permits must specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s also specify additional monitoring and reporting requirements in 40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c). CWC section 13383 authorizes the San Diego Water Board to establish monitoring, inspection, entry, reporting and recordkeeping requirements. This Order establishes monitoring and reporting requirements to implement federal and State requirements.

5. **Total Maximum Daily Loads.** CWA section 303(d)(1)(A) requires that "[e]ach state shall identify those waters within its boundaries for which the effluent limitations…are not stringent enough to implement any water quality standard applicable to such waters." The CWA also requires states to establish a priority ranking of impaired water bodies known as Water Quality Limited Segments and to establish Total Maximum Daily Loads (TMDLs) for such waters. This priority list of impaired water bodies is called the Clean Water Act Section 303(d) List of Water Quality Limited Segments, commonly referred to as the 303(d) List. The CWA requires the 303(d) List to be updated every two years.

   TMDLs are numerical calculations of the maximum amount of a pollutant that a water body can assimilate and still meet water quality standards. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point sources (waste load allocations or WLAs) and non-point sources (load allocations or LAs), background contribution, plus a margin of safety. Discharges from MS4s are point source discharges. The federal regulations (40 CFR 122.44(d)(1)(vii)(B)) require that NPDES permits to incorporate water quality based effluent limitations (WQBELs) developed to protect a narrative water quality criterion, a numeric water

quality criterion, or both, consistent with the assumptions and requirements of any available WLA for the discharge. Requirements of this Order implement the TMDLs adopted by the San Diego Water Board and approved by USEPA.

6. **Non-Storm Water Discharges.** Pursuant to CWA section 402(p)(3)(B)(ii), this Order requires each Copermittee to effectively prohibit discharges of non-storm water into its MS4. Nevertheless, non-storm water discharges into and from the MS4s continue to be reported to the San Diego Water Board by the Copermittees and other persons. Monitoring conducted by the Copermittees, as well as the 303(d) List, have identified dry weather, non-storm water discharges from the MS4s as a source of pollutants causing or contributing to receiving water quality impairments in the San Diego Region. The federal regulations (40 CFR 122.26(d)(2)(iv)(B)(1)) require the Copermittees to have a program to prevent illicit discharges to the MS4. The federal regulations, however, allow for specific categories of non-storm water discharges or flows to be addressed as illicit discharges only where such discharges are identified as sources of pollutants to waters of the U.S.

7. **In-Stream Treatment Systems.** Pursuant to federal regulations (40 CFR 131.10(a)), in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S. Authorizing the construction of a runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to accepting waste assimilation as an appropriate use for that water body. Runoff treatment must occur prior to the discharge of runoff into receiving waters. Treatment control best management practices (BMPs) must not be constructed in waters of the U.S. Construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body.

DISCHARGE CHARACTERISTICS AND RUNOFF MANAGEMENT

8. **Point Source Discharges of Pollutants.** Discharges from the MS4s may contain waste, as defined in the CWC, and pollutants that adversely affect the quality of the waters of the state. A discharge from an MS4 is a "discharge of pollutants from a point source" into waters of the U.S. as defined in the CWA. Storm water and non-storm water discharges from the MS4s may contain pollutants that cause or threaten to cause a violation of surface water quality standards, as outlined in the Water Quality Control Plan for the San Diego Basin (Basin Plan). ~~Storm water and non-storm water discharges from the MS4s are subject to the conditions and requirements established in the Basin Plan for point source discharges.~~

9. **Potential Beneficial Use Impairment.** The discharge of pollutants and/or increased flows from MS4s may cause or threaten to cause the concentration of pollutants to exceed applicable receiving water quality objectives and impair or threaten to impair designated beneficial uses or which may result~~ing~~ in a condition of pollution, contamination, or nuisance. In addition, the reduction of flows below the

existing condition may impact negatively impact beneficial uses.

10. **Pollutants Generated by Land Development.** Land development has created and continues to create new sources of non-storm water discharges and pollutants in storm water discharges as human population density increases. This brings higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash. Pollutants from these sources are dumped or washed off the surface by non-storm water or storm water flows into and from the MS4s. When development converts natural vegetated pervious ground cover to impervious surfaces such as paved highways, streets, rooftops, and parking lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving a developed area without BMPs that can maintain pre-development conditions will contain greater pollutant loads and have significantly greater runoff volume, velocity, and peak flow rate than pre-development runoff from the same area.

11. **Runoff Discharges to Receiving Waters.** The MS4s discharge runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within the eleven hydrologic units comprising the San Diego Region. ~~Historic and current development makes use of natural drainage patterns and features as conveyances for runoff. Rivers, streams and creeks in developed areas used in this manner are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and receiving water.~~ Numerous receiving water bodies and water body segments have been designated as impaired by the San Diego Water Board pursuant to CWA section 303(d).

Comment [A4]: See discussion in section 3.1.2 of the comment letter.

Pollutants in Runoff. The most common pollutants in runoff discharged from the MS4s include total suspended solids, sediment, pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., cadmium, copper, lead, and zinc), petroleum products and polynuclear aromatic hydrocarbons, synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus), oxygen-demanding substances (e.g., decaying vegetation, animal waste), detergents, and trash. ~~As operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not effectively prohibit or otherwise control.~~ These discharges may cause or contribute to a condition of pollution or a violation of water quality standards. California law requires downstream landowners, including owners and operators of MS4, to accept upstream flows, even if that flow contains Pollutants. Failure to do can create conditions.

Comment [A5]: See discussion in section 3.1.2 of the comment letter.

Limitation on Powers of Copermittees. This Order regulates the discharge of non-stormwater into and Pollutants from non-agricultural Anthropogenic sources from the MS4s owned and/or operated by the Copermittees. The Copermittees lack legal

Comment [A6]: This finding is based on Findings I.B and I.C in Order R8-2010-33, applicable to portions of Riverside County within the Santa Ana region.

jurisdiction over discharges into their MS4 from agricultural activities, State and federal facilities, public schools and hospitals, utilities, railroads, special districts, Native American tribal lands, wastewater management agencies and other point and non-point source discharges otherwise permitted by the Water Board. The Water Board recognizes that the Copermittees should not be held responsible for discharges from such facilities or Pollutants in those discharges. Also, certain activities and sources that generate pollutants present in urban runoff may be beyond the ability of the Copermittees to prevent or eliminate. Examples of these activities and sources include, but are not limited to: emissions from internal combustion engines, brake pad wear and tear, atmospheric deposition, non-Anthropogenic sources of bacteria (including wildlife and feral cats and dogs), the regulation of pesticides and leaching of naturally occurring nutrients and minerals from local soils. This Order is not intended to address background or naturally occurring Pollutants or flows.

12.

13. **Human Health and Aquatic Life Impairment.** Pollutants in runoff discharged from the MS4s can threaten and adversely affect human health and aquatic organisms. Adverse responses of organisms to chemicals or physical agents in runoff range from physiological responses such as impaired reproduction or growth anomalies to mortality. Increased volume, velocity, rate, and duration of storm water runoff greatly accelerate the erosion of downstream natural channels. This alters stream channels and habitats and can adversely affect aquatic and terrestrial organisms.

14. **Water Quality Effects.** The Copermittees' water quality monitoring data submitted to date documents various persistent exceedances of Basin Plan water quality objectives for runoff-related pollutants at various watershed monitoring stations. Persistent toxicity has also been observed at several watershed monitoring stations. In addition, bioassessment data indicate that the majority of the monitored receiving waters have Poor to Very Poor Index of Biological Integrity (IBI) ratings. ~~These findings indicate that runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in the San Diego Region. Non-storm water discharges from the MS4s have been shown to contribute significant levels of pollutants and flow in arid, developed Southern California watersheds, and contribute significantly to exceedances of applicable receiving water quality objectives.~~

Comment [A7]: These statements are completely unsubstantiated.

15. ~~**Non-Storm Water and Storm Water Discharges.** Non-storm water discharges from the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard of CWA section 402(p)(3)(B)(iii), which is explicitly for "Municipal … *Stormwater Discharges* (emphasis added)" from the MS4s. Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s must be effectively prohibited.~~

Comment [A8]: See discussion in section 3.1.2 of the comment letter.

16. **Best Management Practices.** Waste and pollutants which are deposited and accumulate in MS4 drainage structures may~~will~~ be discharged from these structures

to waters of the U.S. unless they are removed. These discharges may cause or contribute to, or threaten to cause or contribute to, a condition of pollution in receiving waters. For this reason, pollutants in storm water discharges from the MS4s can be and must be effectively reduced in runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Pollution prevention is the reduction or elimination of pollutant generation at its source and is the best "first line of defense". Source control BMPs (both structural and non-structural) minimize the contact between pollutants and runoff, therefore keeping pollutants onsite and out of receiving waters. Treatment control BMPs remove pollutants that have been mobilized by storm water or non-storm water flows.

17. **BMP Implementation.** Runoff needs to be addressed during the three major phases of development (planning, construction, and use) in order to reduce the discharge of storm water pollutants to the MEP, effectively prohibit non-storm water discharges, and protect receiving waters. Development which is not guided by water quality planning policies and principles can result in increased pollutant load discharges, flow rates, and flow durations which can negatively affect receiving water beneficial uses. Construction sites without adequate BMP implementation result in sediment runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. Existing development can generate substantial pollutant loads which are discharged in runoff to receiving waters. Retrofitting areas of existing development with storm water pollutant control and hydromodification management BMPs may in many cases be ~~is~~ necessary to address storm water discharges from existing development that may cause or contribute to a condition of pollution or a violation of water quality standards.

Comment [A9]: It is not necessary in all cases.

18. **Long Term Planning and Implementation.** Federal regulations require municipal storm water permits to expire 5 years from adoption, after which the permit must be renewed and reissued. The San Diego Water Board recognizes that the degradation of water quality and impacts to beneficial uses of the waters in the San Diego Region occurred over several decades. The San Diego Water Board further recognizes that a decade or more may be necessary to realize demonstrable improvement to the quality of waters in the Region. This Order includes a long term planning and implementation approach that will require more than a single permit term to complete.

WATER QUALITY STANDARDS

19. **Basin Plan.** The San Diego Water Board adopted the Water Quality Control Plan for the San Diego Basin (Basin Plan) on September 8, 1994 that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for receiving waters addressed through the plan. The Basin Plan was subsequently approved by the State Water

Resources Control Board (State Water Board) on December 13, 1994. Subsequent revisions to the Basin Plan have also been adopted by the San Diego Water Board and approved by the State Water Board. Requirements of this Order implement the Basin Plan.

The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Process Supply (PROC), Industrial Service Supply (IND), Ground Water Recharge (GWR), Contact Water Recreation (REC1), Non-contact Water Recreation (REC2), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Freshwater Replenishment (FRSH), Hydropower Generation (POW), and Preservation of Biological Habitats of Special Significance (BIOL). The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region: Navigation (NAV), Commercial and Sport Fishing (COMM), Estuarine Habitat (EST), Marine Habitat (MAR), Aquaculture (AQUA), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN), and Shellfish Harvesting (SHELL).

20. **Ocean Plan.** The State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, and 2005. The State Water Board adopted the latest amendment on April 21, 2005 and it became effective on February 14, 2006. The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean. Requirements of this Order implement the Ocean Plan.

    The Ocean Plan identifies the following beneficial uses of ocean waters of the state to be protected: Industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture; preservation and enhancement of designated Areas of Special Biological Significance; rare and endangered species; marine habitat; fish spawning and shellfish harvesting

21. **Sediment Quality Control Plan**. On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes: 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

22. **National Toxics Rule and California Toxics Rule.** USEPA adopted the National Toxics Rule (NTR) on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the NTR applied in California. On May 18, 2000, USEPA adopted the California Toxics Rule (CTR). The CTR promulgated

new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants.

23. **Antidegradation Policy.** This Order is in conformance with the federal Antidegradation Policy described in 40 CFR 131.12, and State Water Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality Waters in California*. Federal regulations at 40 CFR 131.12 require that the State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. State Water Board Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies.

CONSIDERATIONS UNDER FEDERAL AND STATE LAW

24. **Coastal Zone Act Reauthorization Amendments.** Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states with approved coastal zone management programs to address non-point source pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point source pollution: agriculture, silviculture, urban, marinas, and hydromodification. This Order addresses the management measures required for the urban category, with the exception of septic systems. The runoff management programs developed pursuant to this Order fulfills the need for coastal cities to develop a runoff non-point source plan identified in the Non-Point Source Program Strategy and Implementation Plan. The San Diego Water Board addresses septic systems through the administration of other programs.

25. **Endangered Species Act.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 USC sections 1531 to 1544). This Order requires compliance with receiving water limits, and other requirements to protect the beneficial uses of waters of the State. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

26. **Report of Waste Discharge Process.** The waste discharge requirements set forth in this Order are based upon the Report of Waste Discharge submitted by the San Diego County Copermittees prior to the expiration of Order No. R9-2007-0001 (NPDES No. CAS0109266). The Orange County and Riverside County Copermittees are not immediately covered by the waste discharge requirements in this Order. The San Diego Water Board understands that each municipality is

unique although the Counties share watersheds and geographical boundaries. The Order will continue to use the Report of Waste Discharge process prior to initially making Orange County or Riverside County Copermittees subject to the requirements of this Order.

The federal regulations (40 CFR 122.21(d)(2)) and CWC section 13376 impose a duty on the Copermittees to reapply for continued coverage through submittal of a Report of Waste Discharge no later than 180 days prior to expiration of a currently effective permit. This requirement is set forth in the Orange County Copermittees' and Riverside County Copermittees' currently effective permits at Provisions K.2.b and K.2.c, respectively. The Orange County Permit, Order No. R9-2009-0002 (NPDES No. CAS0108740) expires on December 16, 2014 and the Riverside County MS4 Permit, Order No. R9-2010-0016 (NPDES No. CAS0108766) expires on November 10, 2015.

Unless the Orange County or Riverside County Copermittees apply for and receive early coverage under this Order, the Orange County Copermittees' and the Riverside County Copermittees' respective permits will be superseded by this Order upon expiration of their respective permits, subject to any necessary revisions to the requirements of this Order made after the San Diego Water Board considers their respective Reports of Waste Discharge through the public process provided in 40 CFR 124.

Comment [A10]: Please see Comment Letter and Legal Comments regarding regional permit authority,

27. **Integrated Report and Clean Water Act Section 303(d) List.** The San Diego Water Board and State Water Board submit an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. USEPA issued its *Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act* on July 29, 2005, which advocates the use of a five category approach for classifying the attainment status of water quality standards for water bodies in the Integrated Report. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 in the Integrated Report are placed on the 303(d) List.

Water bodies with available data and/or information that indicate at least one beneficial use is not being supported or is threatened, but a TMDL is not required, are included in Category 4 in the Integrated Report. Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

Implementation of the requirements of this Order may allow the San Diego Water Board to include surface waters impaired by discharges from the Copermittees'

MS4s in Category 4 in the Integrated Report for consideration during the next 303(d) List submittal by the State to USEPA.

28. **Economic Considerations.** The California Supreme Court has ruled that although CWC section 13263 requires the State and Regional Water Boards (collectively Water Boards) to consider factors set forth in CWC section 13241 when issuing an NPDES permit, the Water Board may not consider the factors to justify imposing pollutant restrictions that are less stringent than the applicable federal regulations require. (*City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 618, 626-627.) However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

As noted in the following finding, the San Diego Water Board finds that the requirements in this permit are not more stringent than the minimum federal requirements. Therefore, a CWC section 13241 analysis is not required for permit requirements that implement the effective prohibition on the discharge of non-storm water into the MS4 or for controls to reduce the discharge of pollutants ~~in storm water~~ to the MEP, or other provisions that the San Diego Water Board has determined appropriate to control such pollutants, as those requirements are mandated by federal law. Notwithstanding the above, the San Diego Water Board has developed an economic analysis of the requirements in this Order. The economic analysis is provided in the Fact Sheet.

Comment [A11]: See discussion in section 3.1.2 of the Comment Letter and also Legal Comments..

29. ~~**Unfunded Mandates.** This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following:~~

Comment [A12]: See discussion in section 3.1.2 of the comment letter and in the Legal Comments.

~~**a.** This Order implements federally mandated requirements under CWA section 402 (33 USC section 1342(p)(3)(B)).~~

~~**b.** The local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental and new dischargers who are issued NPDES permits for storm water and non-storm water discharges.~~

~~**c.** The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order.~~

~~**d.** The Copermittees have requested permit coverage in lieu of compliance with the complete effective prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)) and in lieu of numeric restrictions on their MS4 discharges (i.e. effluent limitations).~~

~~**e.** The local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under State law predates the enactment of Article XIIIB, Section (6) of the California Constitution.~~

~~f. The provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state develops a TMDL, federal law requires that permits must contain water quality based effluent limitations consistent with the assumptions and requirements of any applicable wasteload allocation (40 CFR 122.44(d)(1)(vii)(B)).~~

~~See the Fact Sheet for further discussion of unfunded mandates.~~

30. **California Environmental Quality Act.** The issuance of waste discharge requirements and an NPDES permit for the discharge of runoff from MS4s to waters of the U.S. is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 et seq.) in accordance with CWC section 13389.

STATE WATER BOARD DECISIONS

31. **Compliance with Prohibitions and Limitations.** The receiving water limitation language specified in this Order is consistent with language recommended by the USEPA and established in State Water Board Order WQ 99-05, *Own Motion Review of the Petition of Environmental Health Coalition to Review Waste Discharge Requirements Order No. 96-03, NPDES Permit No. CAS0108740*, adopted by the State Water Board on June 17, 1999. The receiving water limitation language in this Order requires storm water discharges from MS4s to not cause or contribute to a violation of water quality standards, which is to be achieved through an iterative approach requiring the implementation of improved and better-tailored BMPs over time. Implementation of the iterative approach to comply with receiving water limitations based on applicable water quality standards is necessary to ensure that Pollutant ~~storm water~~ discharges from the MS4 will not ultimately cause or contribute to violations of water quality standards and will not create conditions of pollution, contamination, or nuisance.

Comment [A13]: See discussion in section 3.1.2 of the comment letter.

Comment [A14]: Please see discussion in section 3.1.2 of the Comment Letter and Legal Comments.

32. **Special Conditions for Areas of Special Biological Significance.** On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving an exception to the Ocean Plan effective prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges. State Water Board Resolution No. 2012-0012 requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, effective prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject terms and conditions of State Water Board Resolution No. 2012-0012. The Special

Protections contained in Attachment B to Resolution No. 2012-0012, applicable to these discharges, are hereby incorporated into this Order as if fully set forth herein.

ADMINISTRATIVE FINDINGS

33. **Executive Officer Delegation of Authority.** The San Diego Water Board by prior resolution has delegated all matters that may legally be delegated to its Executive Officer to act on its behalf pursuant to CWC section 13223. Therefore, the Executive Officer is authorized to act on the San Diego Water Board's behalf on any matter within this Order unless such delegation is unlawful under CWC section 13223 or this Order explicitly states otherwise.

34. **Standard Provisions.** Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR 122.42, are provided in Attachment B to this Order.

35. **Fact Sheet.** The Fact Sheet for this Order contains background information, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of this Order. The Fact Sheet is hereby incorporated into this Order and constitutes part of the Findings of this Order.

36. **Public Notice.** In accordance with State and federal laws and regulations, the San Diego Water Board notified the Copermittees, and interested agencies and persons of its intent to prescribe waste discharge requirements for the control of discharges into and from the MS4s to waters of the U.S. and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet.

37. **Public Hearing.** The San Diego Water Board held a public hearing on Month Day, 2013 and heard and considered all comments pertaining to the terms and conditions of this Order. Details of the public hearing are provided in the Fact Sheet.

38. **Effective Date.** This Order serves as an NPDES permit pursuant to CWA section 401 or amendments thereto, and becomes effective fifty (50) days after the date of its adoption, provided that the Regional Administrator, USEPA, Region IX, does not object to this Order.

39. **Review by the State Water Board.** Any person aggrieved by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with CWC section 13320 and California Code of Regulations, title 23, sections 2050, et seq. The State Water Board must receive the petition by 5:00 p.m., 30 days after the San Diego Water Board action, except that if the thirtieth day following the action falls on a Saturday, Sunday or State holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the

Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

THEREFORE, IT IS HEREBY ORDERED that the Copermittees, in order to meet the provisions contained in division 7 of the CWC and regulations adopted thereunder, and the provisions of the CWA and regulations adopted thereunder, must each comply with the following:

II. PROVISIONS

A. PROHIBITIONS AND LIMITATIONS

Comment [A15]: See discussion in section 3.2 of the comment letter.

The purpose of this provision is to describe the conditions under which storm water and non-storm water discharges into and from MS4s are to be effectively prohibited or limited. The goal of the prohibitions and limitations is to protect the water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through the implementation of water quality improvement strategies and runoff management programs that effectively prohibit non-storm water discharges into the Copermittees' MS4s, and reduce pollutants in ~~storm water~~ discharges from the Copermittees' MS4s to the MEP. The process for determination of compliance with the Discharge Prohibitions (A.1), Receiving Water Limitations (A.2), and Effluent Limitations (A.3) is defined in Provisions A.3.b and A.4.

1. Discharge Prohibitions

a. Discharges from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters ~~of the state~~ are to be ~~prohibited.~~ effectively prohibited, unless the Regional Board determines such discharges are addressed by the Copermittee through A.3.b or A.4, including any modifications.~~prohibited.~~

Comment [A16]: See discussion in section 3.2.2 of the comment letter.

b. Non-storm water discharges into MS4s are to be effectively prohibited through a program consistent with the requirements of provision E.2. of this order, including inspections, to implement and enforce an ordinance, orders or similar means to prevent illicit discharges to the MS4, unless such discharges are either authorized by a separate NPDES permit, or the discharge is a category of non-storm water discharges or flows that must be addressed pursuant to Provisions E.2.a.(1)-(5) of this Order.

Comment [A17]: See discussion in section 3.2.2 of the comment letter.

c. Discharges from MS4s are subject to all applicable waste discharge prohibitions in the Basin Plan, included in Attachment A to this Order, unless the Regional Board determines such discharges are addressed by the Copermittee through A.3.b or A.4, including any modifications.

Comment [A18]: See discussion in section 3.2.2 of the comment letter.

d. Storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No.

2012-0012 applicable to these discharges, included in Attachment A to this Order. All other discharges from the Copermittees' MS4s to ASBS are ~~to be effectively~~ prohibited.

2. Receiving Water Limitations

Comment [A19]: See discussion in section 3.2.2 of the comment letter.

a. Discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters, including but not limited to all applicable provisions ~~contained in:~~below, unless the Regional Board determines such discharges are addressed by the Copermittee through A.3.b or A.4::~~contained in:~~

(1) The San Diego Water Board's Basin Plan, including beneficial uses, water quality objectives, and implementation plans;

(2) State Water Board plans for water quality control including the following:

(a) Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries (Thermal Plan), and

(b) The Ocean Plan, including beneficial uses, water quality objectives, and implementation plans;

(3) State Water Board policies for water and sediment quality control including the following:

(a) Water Quality Control Policy for the Enclosed Bays and Estuaries of California,

(b) Sediment Quality Control Plan which includes the following narrative objectives for bays and estuaries:

(i) Pollutants in sediments shall not be present in quantities that, alone or in combination, are toxic to benthic communities, and

(ii) Pollutants shall not be present in sediments at levels that will bioaccumulate in aquatic life to levels that are harmful to human health,

(c) The Statement of Policy with Respect to Maintaining High Quality of Waters in California;[1]

(4) Priority pollutant criteria promulgated by the USEPA through the following:

[1] State Water Board Resolution No. 68-16

(a) National Toxics Rule (NTR)[2] (promulgated on December 22, 1992 and amended on May 4, 1995), and

(b) California Toxics Rule (CTR).[3,4]

b. Discharges from MS4s composed of storm water runoff must not alter natural ocean water quality in an ASBS.

[2] 40 CFR 131.36
[3] 65 Federal Register 31682-31719 (May 18, 2000), adding Section 131.38 to 40 CFR
[4] If a water quality objective and a CTR criterion are in effect for the same priority pollutant, the more stringent of the two applies.

3. Effluent Limitations

a. TECHNOLOGY BASED EFFLUENT LIMITATIONS

Comment [A20]: See discussion in section 3.2.2 of the comment letter.

Pollutants in ~~storm water~~ discharges from MS4s must be reduced to the MEP.[5]

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

This Order establishes water quality based effluent limitations (WQBELs) consistent with the assumptions and requirements of all available TMDL waste load allocations (WLAs) assigned to discharges from the Copermittees' MS4s. Each Copermittee must comply with applicable WQBELs established for the TMDLs in Attachment E to this Order, pursuant to the applicable TMDL compliance schedules.

4. Compliance with Discharge Prohibitions and Receiving Water Limitations

Comment [A21]: See discussion in section 3.2.2 of the comment letter.

Each Copermittee must achieve compliance with Provisions A.1.a~~,~~ through A.1.c and A.2.a of this Order through timely implementation of control measures and other actions as specified in Provisions B and E of this Order, including any modifications. The Water Quality Improvement Plans required under Provision B must be designed and adapted to ultimately achieve compliance with Provisions A.1.a~~,~~ through A.1.c and A.2.a~~.~~, as described in Provision B.2.~~.~~

a. If exceedance(s) of water quality standards persist in receiving waters notwithstanding implementation of this Order, the Copermittees must comply with the following procedures:

(1) For exceedance(s) of a water quality standard in the process of being addressed by the Water Quality Improvement Plan, the Copermittee(s) must implement the Water Quality Improvement Plan as accepted by the San Diego Water Board, and update the Water Quality Improvement Plan, as necessary, pursuant to Provision F.2.c;

(2) Upon a determination by either the Copermittees or the San Diego Water Board that discharges from the MS4 are causing or contributing to a new exceedance of an applicable water quality standard not addressed by the Water Quality Improvement Plan, the Copermittees must submit the following updates to the Water Quality Improvement Plan pursuant to Provision F.2.c or as part of the Annual Report required under Provision F.3.b, unless the San

[5] This does not apply to MS4 discharges which receive subsequent treatment to reduce pollutants in storm water discharges to the MEP prior to entering receiving waters (e.g., low flow diversions to the sanitary sewer). Runoff treatment must occur prior to the discharge of runoff into receiving waters per Finding 7.

Diego Water Board directs an earlier submittal:

(a) The water quality improvement strategies being implemented that are effective and will continue to be implemented,

(b) Water quality improvement strategies (i.e. BMPs, retrofitting projects, stream and/or habitat rehabilitation or restoration projects, adjustments to jurisdictional runoff management programs, etc.) that will be implemented to reduce or eliminate any pollutants or conditions that are causing or contributing to the exceedance of water quality standards,

(c) Updates to the schedule for implementation of the existing and additional water quality improvement strategies, and

(d) Updates to the monitoring and assessment program to track progress toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a of this Order;

(3) The San Diego Water Board may require the incorporation of additional modifications to the Water Quality Improvement Plan required under Provision B. The applicable Copermittees must submit any modifications to the update to the Water Quality Improvement Plan within 90 days of notification that additional modifications are required by the San Diego Water Board, or as otherwise directed;

(4) Within 90 days of the San Diego Water Board determination that the update to the Water Quality Improvement Plan meets the requirements of this Order, the applicable Copermittees must revise the jurisdictional runoff management program documents to incorporate the updated water quality improvement strategies that have been and will be implemented, the implementation schedule, and any additional monitoring required; and

(5) Each Copermittee must implement the updated Water Quality Improvement Plan.

b. The procedure set forth above to achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order do not have to be repeated for continuing or recurring exceedances of the same water quality standard(s) following implementation of scheduled actions unless directed to do otherwise by the San Diego Water Board.

c. Nothing in Provisions A.4.a and A.4.b prevents the San Diego Water Board from enforcing any of provisions B through I of this Order while the applicable Copermittees prepare and implement the above update to the Water Quality Improvement Plan and jurisdictional runoff management programs.

B. WATER QUALITY IMPROVEMENT PLANS

The purpose of this provision is to develop Water Quality Improvement Plans (WQIPs) that guide the Copermittees' jurisdictional runoff management programs towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plans is to ~~protect, preserve, enhance, and restorerestore the~~address the impacts of MS4 discharges so that such discharges do not impair water quality and designated beneficial uses of receiving waters~~. of the state.~~ Therefore, implementation of the WQIPs also provides the basis for complying with Provisions II.A.1, II.A.2, and II.A.3, as described in Provision II.A.4. This goal will be accomplished through an adaptive planning and management process that identifies the highest priority water quality conditions within a watershed and implements strategies through the jurisdictional runoff management programs to achieve improvements in the quality of discharges from the MS4s ~~and~~ to receiving waters. As such, the requirements outlined in Provision E may be modified for consistency with the WQIP priorities for the applicable Watershed Management Area, if appropriate justification is provided approved within the WQIP.

Comment [A22]: See section 3.3 of the comment letter for discussions of the changes requested herein.

Comment [A23]: See discussion in section 3.3.2 of the comment letter.

1. Watershed Management Areas

Comment [A24]: See discussion in section 3.3.2 of the comment letter.

The Copermittees must develop a Water Quality Improvement Plan for each of the Watershed Management Areas in Table B-1. A total of ten Water Quality Improvement Plans must be developed for the San Diego Region.

Development of the Water Quality Improvement Plan for the Santa Margarita River Watershed Management Area shall commence upon notification of coverage of the Riverside County Copermittees under this Order. Until this time, the County of San Diego shall use the water quality priorities in the Santa Margarita River Watershed Urban Runoff Management Plan, developed pursuant to Order No. R9-2007-0001, to guide implementation of Provisions D and E within its jurisdiction

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
San Juan (901.00)	South Orange County	- Aliso Creek - San Juan Creek - San Mateo Creek - Pacific Ocean - Heisler Park ASBS	- City of Aliso Viejo[1] - City of Dana Point[1] - City of Laguna Beach[1] - City of Laguna Hills[1] - City of Laguna Niguel[1] - City of Laguna Woods[1] - City of Lake Forest[1] - City of Mission Viejo[1] - City of Rancho Santa Margarita[1] - City of San Clemente[1] - City of San Juan Capistrano[1] - County of Orange[1] - Orange County Flood Control District[1]

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
Santa Margarita (902.00)	Santa Margarita River	- Murrieta Creek - Temecula Creek - Santa Margarita River - Santa Margarita Lagoon - Pacific Ocean	- City of Murrieta[2] - City of Temecula[2] - City of Wildomar[2] - County of Riverside[2] - County of San Diego[3] - Riverside County Flood Control and Water Conservation District[2]
San Luis Rey (903.00)	San Luis Rey River	- San Luis Rey River - San Luis Rey Estuary - Pacific Ocean	- City of Oceanside - City of Vista - County of San Diego
Carlsbad (904.00)	Carlsbad	- Loma Alta Slough - Buena Vista Lagoon - Agua Hedionda Lagoon - Batiquitos Lagoon - San Elijo Lagoon - Pacific Ocean	- City of Carlsbad - City of Encinitas - City of Escondido - City of Oceanside - City of San Marcos - City of Solana Beach - City of Vista - County of San Diego
San Dieguito (905.00)	San Dieguito River	- San Dieguito River - San Dieguito Lagoon - Pacific Ocean	- City of Del Mar - City of Escondido - City of Poway - City of San Diego - City of Solana Beach - County of San Diego
Penasquitos (906.00)	Penasquitos	- Los Penasquitos Lagoon - Pacific Ocean	- City of Del Mar - City of Poway - City of San Diego - County of San Diego
	Mission Bay	- Mission Bay - Pacific Ocean - San Diego Marine Life Refuge ASBS	- City of San Diego
San Diego (907.00)	San Diego River	- San Diego River - Pacific Ocean	- City of El Cajon - City of La Mesa - City of San Diego - City of Santee - County of San Diego
Pueblo San Diego (908.00) Sweetwater (909.00) Otay (910.00)	San Diego Bay	- Sweetwater River - Otay River - San Diego Bay - Pacific Ocean	- City of Chula Vista - City of Coronado - City of Imperial Beach - City of La Mesa - City of Lemon Grove - City of National City - City of San Diego - County of San Diego - San Diego County Regional Airport Authority - San Diego Unified Port District
Tijuana (911.00)	Tijuana River	- Tijuana River - Tijuana Estuary - Pacific Ocean	- City of Imperial Beach - City of San Diego - County of San Diego

Notes:
1. The Orange County Copermittees will be covered under this Order after expiration of Order No. R9-2009-0002, or earlier if the Orange County Copermittees meet the conditions in Provision F.6.
2. The Riverside County Copermittees will be covered under this Order after expiration of Order No. R9-2010-0016, or earlier if the Riverside County Copermittees meet the conditions in Provision F.6.
3. The County of San Diego is required to implement the requirements of Provision B for its jurisdiction within the Santa

Margarita River Watershed Management Area until the Riverside County Copermittees have been notified of coverage under this Order.

2. Priority Water Quality Conditions

The Copermittees must identify the water quality priorities within each Watershed Management Area that will be addressed by the Water Quality Improvement Plan. Where appropriate, Watershed Management Areas may be separated into subwatersheds to focus water quality prioritization and jurisdictional runoff management program implementation efforts by receiving water.

a. Assessment of Receiving Water Conditions

The Copermittees must consider the following, at a minimum, to identify water quality priorities based on impacts of MS4 discharges on receiving water beneficial uses:

(1) Receiving waters listed as impaired on the CWA Section 303(d) List of Water Quality Limited Segments (303(d) List);

(2) TMDLs adopted and under development by the San Diego Water Board;

(3) Receiving waters recognized as sensitive or highly valued by the Copermittees, including estuaries designated under the National Estuary Program under CWA section 320, wetlands defined by the State or U.S. Fish and Wildlife Service's National Wetlands Inventory as wetlands, and receiving waters identified as ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (Attachment A);

(4) The receiving water limitations of Provision A.2;

(5) Known historical versus current physical, chemical, and biological water quality conditions;

(6) Available, relevant, and appropriately collected and analyzed physical, chemical, and biological receiving water monitoring data, including, but not limited to, data describing:

(a) Chemical constituents,

(b) Water quality parameters (i.e. pH, temperature, conductivity, etc.),

(c) Toxicity Identification Evaluations for both receiving water column and sediment,

(d) Trash impacts,

(e) Bioassessments, and

(f) Physical habitat;

(7) Available evidence of erosional impacts in receiving waters due to accelerated flows (i.e. hydromodification);

(8) Available evidence of adverse impacts to the chemical, physical, and biological integrity of receiving waters; and

(9) The potential improvements in the overall condition of the Watershed Management Area that can be achieved.

b. ASSESSMENT OF IMPACTS FROM MS4 DISCHARGES

The Copermittees must consider the following, at a minimum, to identify the potential impacts to receiving waters that may be caused or contributed to by discharges from the Copermittees' MS4s:

(1) The discharge prohibitions of Provision A.1 and effluent limitations of Provision A.3; and

(2) Available, relevant, and appropriately collected and analyzed storm water and non-storm water monitoring data from the Copermittees' MS4 outfalls;

(3) Locations of each Copermittee's MS4 outfalls that discharge to receiving waters;

(4) Locations of MS4 outfalls that are known to persistently discharge non-storm water to receiving waters likely causing or contributing to impacts on receiving water beneficial uses;

(5) Locations of MS4 outfalls that are known to discharge pollutants in storm water causing or contributing to impacts on receiving water beneficial uses; and

(6) The potential improvements in the quality of discharges from the MS4 that can be achieved.

c. IDENTIFICATION OF PRIORITY WATER QUALITY CONDITIONS

(1) The Copermittees must use the information gathered for Provisions B.2.a and B.2.b to develop a list of priority water quality conditions as pollutants, stressors and/or receiving water conditions that are the highest threat to receiving water quality or that most adversely affect the physical, chemical, and biological integrity of receiving waters. The list must include the following information for each priority water quality condition:

(a) The beneficial use(s) associated with the priority water quality condition;

(b) The geographic extent of the priority water quality condition within the Watershed Management Area, if known;

(c) The temporal extent of the priority water quality condition (e.g., dry weather and/or wet weather);

(d) The Copermittees with MS4s discharges that may cause or contribute to the priority water quality condition; and

(e) An assessment of the adequacy of and data gaps in the monitoring data to characterize the conditions causing or contributing to the priority water quality condition, including a consideration of spatial and temporal variation.

(2) The Copermittees must identify the highest priority water quality conditions to be addressed by the Water Quality Improvement Plan, and provide a rationale for selecting a subset of the water quality conditions identified pursuant to Provision B.2.c.(1) as the highest priorities.

d. IDENTIFICATION OF MS4 SOURCES OF POLLUTANTS AND/OR STRESSORS

The Copermittees must identify and prioritize known and suspected sources of storm water and non-storm water pollutants and/or other stressors within their jurisdiction, associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c. ~~The identification of known and suspected sources of pollutants and/or stressors that cause or contribute to the highest priority water quality conditions as identified for Provision B.2.c must~~ considering the following:

(1) Pollutant generating facilities, areas, and/or activities within the Watershed Management Area, including:

(a) Each Copermittee's inventory of construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas,

(b) Publicly owned parks and/or recreational areas,

(c) Open space areas,

(d) All currently operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste,,, and

(e) Areas not within the Copermittees' jurisdictions (e.g., Phase II MS4s, tribal lands, state lands, federal lands) that are known or suspected to be discharging to the Copermittees' MS4s;

(2) Locations of the Copermittees' MS4s, including the following:

(a) All major MS4 outfalls [per 40CFR 122.26 (b)(5)] that discharge to receiving waters, and

(b) Locations of major structural controls for storm water and non-storm water (e.g., retention basins, detention basins, major infiltration devices, etc.);

(3) Other known and suspected sources of non-storm water or pollutants in storm water discharges to receiving waters within the Watershed Management Area, including the following:

(a) Other MS4 outfalls (e.g., Phase II Municipal and Caltrans),

(b) Other NPDES permitted discharges,

(c) Any other discharges that may be considered point sources (e.g., private outfalls), and

(d) Any other discharges that may be considered non-point sources (e.g., agriculture, wildlife or other natural sources);

(4) Review of available data, including but not limited to:

(a) Findings from the Copermittees' illicit discharge detection and elimination programs,

(b) Findings from the Copermittees' MS4 outfall discharge monitoring,

(c) Findings from the Copermittees' receiving water monitoring,

(d) Findings from the Copermittees' MS4 outfall discharge and receiving water assessments, and

(e) Other available, relevant, and appropriately collected data, information, or studies related to pollutant sources and/or stressors that contribute to the highest priority water quality conditions as identified for Provision B.2.c.

(5) The adequacy of the available data to identify and prioritize sources and/or stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c.

e. NUMERIC GOALS AND SCHEDULES

Comment [A25]: See discussion in section 3.3.2 of the comment letter.

The Copermittees must develop and incorporate action levels, interim and final numeric goals[6] and schedules into the Water Quality Improvement Plan. Numeric goals must be used to support Water Quality Improvement Plan implementation and measure progress towards addressing the highest priority water quality conditions identified under Provision B.2.c. . Action Levels, Numeric goals are not enforceable compliance standards, effluent limitations, or receiving water limitations. When establishing numeric goals and corresponding schedules, the Copermittees must consider the following:

(1) Final numeric goals must be based on measureable criteria or indicators, to be achieved in ~~the receiving waters and/or~~ MS4 discharges for the highest priority water quality conditions which will ~~be capable of demonstrating the achievement of the restoration and/or protection~~ comply with the Receiving Water Limitations (A.2) of this Order; ~~water quality standards in receiving waters;~~

(2) Interim numeric goals must be based on measureable criteria or indicators capable of demonstrating incremental progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges; and

(3) Schedules must be adequate for measuring progress toward achieving the interim and final numeric goals required for Provisions B.2.e.(1) and B.2.e.(2). Schedules must incorporate the following:

(a) Interim dates for achieving the interim numeric goals,

(b) Compliance schedules for any applicable TMDLs in Attachment E to this Order,

(c) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A),

(d) Achievement of the final numeric goals in the receiving waters and/or MS4 discharges for the highest water quality priorities must be as soon as possible, and

[6] Interim and final numeric goals may take a variety of forms such as TMDL established WQBELs, action levels, pollutant concentration, load reductions, number of impaired water bodies delisted from the List of Water Quality Impaired Segments, Index of Biotic Integrity (IBI) scores, or other appropriate metrics. Interim and final numeric goals are not necessarily limited to one criterion or indicator, but may include multiple criteria and/or indicators. Except for TMDL established WQBELs, interim and final numeric goals and corresponding schedules may be revised through the adaptive management process under Provision B.5.

(e) Final dates for achieving the final numeric goals must not initially extend more than 10 years beyond the effective date of this Order, unless a longer period of time is authorized by the San Diego Water Board Executive Officer through an approved WQIP or the schedule includes an applicable TMDL in Attachment E to this Order[7].

Comment [A26]: Clarify that a longer period can be granted through the WQIP process.

[7] Achievement of final numeric goals within 10 years represents progress towards attainment of water quality standards, but is not a requirement to fully attain all applicable water quality standards or all priority receiving water conditions within 10 years.

3. Water Quality Improvement Strategies and Schedules

Comment [A27]: See discussion in section 3.3.2 of the comment letter.

The Copermittees must develop specific water quality improvement strategies to address the highest priority water quality conditions identified within a Watershed Management Area. The water quality improvement strategies must address the highest priority water quality conditions by ensuring the effective prohibition of~~preventing or eliminating~~ non-storm water discharges to and from the MS4, reducing pollutants in ~~storm water~~ discharges from the MS4 to the MEP, as applicable to the priority water quality conditions established per provision B.2. ~~and restoring and/or protecting the water quality standards of receiving waters~~.

a. Water Quality Improvement Strategies

The Copermittees must identify and prioritize water quality improvement strategies based on their likely effectiveness and efficiency, and design the JRMP programs to focus resources on those strategies to~~implement strategies to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, improve the physical, chemical, and biological receiving water conditions, and~~ achieve the interim and final numeric goals in accordance with the schedules required for Provision B.2.e.(3). The following water quality improvement strategies must be included and described in the Water Quality Improvement Plan:

(1) Specific strategies and/or activities that may be implemented by one or more Copermittees within their jurisdictions through the jurisdictional runoff management programs that will address the highest priority water quality conditions within the Watershed Management Area, in accordance with the following requirements:

(a) Strategies and/or activities must, at a minimum, be described for each jurisdictional runoff management program component where strategies to address the highest priority water quality conditions are required under Provision E;

(b) The Water Quality Improvement Plan must describe the circumstances or conditions when and where the strategies or/activities should be or will be implemented, but specific details about how each Copermittee will implement the strategies and/or activities within its jurisdiction are not required; and

(c) Descriptions of strategies and/or activities must include any monitoring, information collection, special studies, and/or data analysis that is necessary to assess the effectiveness of the strategy and/or activity toward addressing the highest priority water quality conditions.

(2) Additional strategies and/or activities that may be implemented within the Watershed Management Area on a jurisdictional, sub-watershed, or watershed scale by one or more Copermittees, not specifically required under

Provision E, which are designed to achieve the interim and final numeric goals identified in Provisions B.2.e.(1) and B.2.e.(2);

b. IMPLEMENTATION SCHEDULES

(1) The Copermittees must develop schedules for implementing the water quality improvement strategies identified under Provision B.3.a to achieve the interim and final numeric goals identified under Provision B.2.e.(1) and B.2.e.(2). Schedules must be developed for both the water quality improvement strategies implemented by each Copermittee within its jurisdiction and for strategies that the Copermittees choose to implement on a collaborative basis.

(2) The Copermittees must incorporate the implementation compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

4. Water Quality Improvement Monitoring and Assessment Program

a. The Copermittees in each Watershed Management Area must develop and incorporate an integrated monitoring and assessment program into the Water Quality Improvement Plan that assesses: 1) the progress toward achieving the numeric goals and schedules, 2) the progress toward addressing the highest priority water quality conditions for each Watershed Management Area, and 3) each Copermittee's overall efforts to implement the Water Quality Improvement Plan.

b. The monitoring and assessment program must incorporate the monitoring and assessment requirements of Provision D, which may allow the Copermittees to modify the program to be consistent with and focus on the highest priority water quality conditions for each Watershed Management Area.

c. For Watershed Management Areas with applicable TMDLs, the monitoring and assessment program must incorporate the specific monitoring and assessment requirements of Attachment E.

d. For Watershed Management Areas with any ASBS, the water quality monitoring and assessment program must incorporate the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

5. Iterative Approach and Adaptive Management Process

Comment [A28]: See discussion in section 3.3.2 of the comment letter.

The Copermittees in each Watershed Management Area must implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management

programs to become more effective toward achieving compliance with Provisions A.1, A.2, and A.3.~~A.1.a, A.1.c and A.2.a~~, and must include the following:

a. RE-EVALUATION OF PRIORITY WATER QUALITY CONDITIONS

The priority receiving water quality conditions, and numeric goals and corresponding schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.2.c and B.2.e, may be re-evaluated by the Copermittees as needed during the term of this Order as part of the Annual Report. Re-evaluation and recommendations for modifications to the priority water quality conditions, and numeric goals and corresponding schedules must be provided in the Regional Monitoring and Assessment Report pursuant to F.3.c~~Report of Waste Discharge~~, and must consider the following:

(1) Achieving the outcome of improved water quality in MS4 discharges and receiving waters through implementation of the water quality improvement strategies identified in the Water Quality Improvement Plan;

(2) Progress toward achieving interim and final numeric goals in receiving waters and/or MS4 discharges for the highest priority water quality conditions in the Watershed Management Area,

(3) Progress toward achieving outcomes according to established schedules;

(4) New information developed when the requirements of Provisions B.2.a-c have been re-evaluated;

(5) New policies or regulations that may affect identified numeric goals;

(6) Spatial and temporal accuracy of monitoring data collected to inform prioritization of water quality conditions and implementation strategies to address the highest priority water quality conditions;

(7) Availability of new information and data from sources other than the jurisdictional runoff management programs within the Watershed Management Area that informs the effectiveness of the actions implemented by the Copermittees;

(8) San Diego Water Board recommendations; and

(9) Recommendations for modifications solicited through a public participation process.

b. ADAPTATION OF STRATEGIES AND SCHEDULES

The water quality improvement strategies and schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.3, must be re-evaluated and adapted as new information becomes available to result in more effective and efficient measures to achieve the numeric goals established pursuant to

Provision B.2.e. Re-evaluation of and modifications to the water quality improvement strategies, if determined to be necessary, must be provided in the applicable Annual Report per F.3.b.(3)., and must consider the following:

(1) Modifications to the priority water quality conditions, and numeric goals and corresponding schedules based on Provision B.5.a;

(2) Measurable or demonstrable reductions of non-storm water discharges to and from each Copermittee's MS4;

(3) Measurable or demonstrable reductions of pollutants in ~~storm water~~ discharges from each Copermittee's MS4 to the MEP;

(4) New information developed when the requirements of Provisions B.2.b and B.2.d have been re-evaluated;

(5) Efficiency in implementing the Water Quality Improvement Plan;

(6) San Diego Water Board recommendations; and

(7) Recommendations for modifications solicited through a public participation process.

c. ADAPTATION OF MONITORING AND ASSESSMENT PROGRAM

The water quality improvement monitoring and assessment program, included in the Water Quality Improvement Plan pursuant to Provisions B.4, must be re-evaluated and adapted when new information becomes available. Re-evaluation and recommendations for modifications to the monitoring and assessment program, pursuant to the requirements of Provision D, may be provided in the Annual Report, but must be provided in the Report of Waste Discharge.

6. Water Quality Improvement Plan Submittal, Updates, and Implementation

a. The Copermittees must submit the Water Quality Improvement Plans in accordance with the requirements of Provision F.1.

b. The Copermittees must submit proposed updates to the Water Quality Improvement Plan for acceptance by the San Diego Water Board Executive Officer in accordance with the requirements of Provision F.2.c.

c. The Copermittees must commence with implementation of the Water Quality Improvement Plans ~~immediately after acceptance by the San Diego Water Board, in accordance with the schedules, or subsequently updated schedules, within the Water Quality Improvement Plan.~~in accordance with Provision F.1.b.(5).

C. ACTION LEVELS

Comment [A29]: See comment letter section 3.4 for a discussion of the redlines shown herein.

The purpose of this provision is for the Copermittees to incorporate numeric non-stormwater action levels (NALs) and stormwater action levels (SALs) in the Water Quality Improvement Plans (Provision B), and numeric non-stormwater action levels (NALs) in the Illicit Discharge Detection and Elimination (IDDE) program (Provision E.2.).

- For the purposes of the WQIPs, ~~T~~the goal of the action levels is to guide ~~Water Quality Improvement Plan~~ the implementation efforts and measure progress towards the protection of the identified high priority water quality conditions and associated designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through monitoring and assessing the quality of the MS4 discharges during the implementation of the Water Quality Improvement Plans.

- For the purposes of the IDDE program, the goal of the non-stormwater action levels is to assist in determining whether a persistent non-stormwater discharge into or from the MS4 contains pollutants at levels that have the potential to negatively affect the identified high priority water quality conditions.

Action levels will be developed and incorporated into the WQIP (Provision B) and the IDDE Program (Provision E). Depending upon the goals/objectives for the use of the action levels and the priority receiving water conditions, the constituents and values at which they are set may differ between watersheds. Copermittees may develop Watershed Management Area specific numeric action levels for non-stormwater and stormwater MS4 discharges using an approach approved by the Regional Board or use the default non-stormwater and stormwater action levels prescribed in C.1 and C.2 below.

The Copermittees will submit the action levels as a part of the WQIP and JRMP submittals. The action levels currently established will serve as the interim action levels until revised action levels are completed and approved. Exceedances of the action levels are not subject to enforcement or non-compliance actions under this Order.

1. Default Non-Storm Water Action Levels[8]

~~The Copermittees must develop and incorporate numeric non-storm water action levels (NALs) into the Water Quality Improvement Plan to: 1) support the development and prioritization of water quality improvement strategies for addressing non-storm water discharges to and from the MS4s, 2) assess the effectiveness of the water quality improvement strategies toward addressing MS4~~

Comment [A30]: As discussed in section 2.4 of the Riverside comment letter.

[8] NALs are not ~~considered by the San Diego Water Board to be~~ enforceable limitations under this Order.

~~non-storm water discharges, required pursuant to Provision D.4.b.(1), and 3) support the detection and elimination of non-storm water and illicit discharges to and from the MS4, required pursuant to Provision E.2.~~[9]

a. The following NALs must be incorporated as applicable to the WMA and the Copermittees' MS4 discharges,~~:~~ if the Copermittees do not establish numeric action levels within the WQIP based on watershed priorities:

(1) Non-Storm Water Discharges from MS4s to Ocean Surf Zone

Table C-1. Non-Storm Water Action Levels for Discharges from MS4s to Ocean Surf Zone

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Total Coliform	MPN/100 ml	1,000	-	10,000/1,000[1]	OP
Fecal Coliform	MPN/100 ml	200[2]	-	400	OP
Enterococci	MPN/100 ml	35	-	104[3]	OP

Abbreviations/Acronyms
AMAL – average monthly action level
OP – Ocean Plan water quality objective
MDAL – maximum daily action level
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Total coliform density NAL is 1,000 MPN/100 ml when the fecal/total coliform ratio exceeds 0.1.
2. Fecal coliform density NAL is 200 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas."

[9] ~~The Copermittees may utilize NALs or other benchmarks currently established by the Copermittees as interim NALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.~~

(2) Non-Storm Water Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Table C-2. Non-Storm Water Action Levels for Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Turbidity	NTU	75	-	225	OP
pH	Units	Within limit of 6.0 to 9.0 at all times			OP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	35	-	104[3]	BP
Priority Pollutants	ug/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
OP – Ocean Plan water quality objective
NTU – Nephelometric Turbidity Units
ug/L – micrograms per liter
MDAL – maximum daily action level
BP – Basin Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas" and is not applicable to waterbodies that are not designated with the water contact recreation (REC-1) beneficial use.

Table C-3. Non-Storm Water Action Levels for Priority Pollutants

Parameter	Units	Freshwater (CTR)		Saltwater (CTR)	
		MDAL	AMAL	MDAL	AMAL
Cadmium	ug/L	**	**	16	8
Copper	ug/L	*	*	5.8	2.9
Chromium III	ug/L	**	**	-	-
Chromium VI	ug/L	16	8.1	83	41
Lead	ug/L	*	*	14	2.9
Nickel	ug/L	**	**	14	6.8
Silver	ug/L	*	*	2.2	1.1
Zinc	ug/L	*	*	95	47

Abbreviations/Acronyms:
CTR – California Toxic Rule
AMAL – average monthly action level
ug/L – micrograms per liter
MDAL – maximum daily action level

Notes:
* Action levels developed on a case-by-case basis (see below)
** Action levels developed on a case-by-case basis (see below), but calculated criteria are not to exceed Maximum Contaminant Levels (MCLs) under the California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64431

The Cadmium, Copper, Chromium (III), Lead, Nickel, Silver and Zinc NALs for MS4 discharges to freshwater receiving waters will be developed on a case-by-case basis because the freshwater criteria are based on site-specific water quality data (receiving water hardness). For these priority pollutants, refer to ~~the following equations (~~40 CFR 131.38.b.2 for details~~) will be required~~:

~~Cadmium (Total Recoverable) = exp(0.7852[ln(hardness)] - 2.715)~~
~~Chromium III (Total Recoverable) = exp(0.8190[ln(hardness)] + 0.6848)~~
~~Copper (Total Recoverable) = exp(0.8545[ln(hardness)] - 1.702)~~
~~Lead (Total Recoverable) = exp(1.273[ln(hardness)] - 4.705)~~
~~Nickel (Total Recoverable) = exp(.8460[ln(hardness)] + 0.0584)~~
~~Silver (Total Recoverable) = exp(1.72[ln(hardness)] - 6.52)~~
~~Zinc (Total Recoverable) = exp(0.8473[ln(hardness)] + 0.884)~~

Comment [A31]: Consistent with SD Permittee recommendations.

(3) Non-Storm Water Discharges from MS4s to Inland Surface Waters

Table C-4. Non-Storm Water Action Levels for Discharges from MS4s to Inland Surface Waters

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Dissolved Oxygen	mg/L	Not less than 5.0 in WARM waters and not less than 6.0 in COLD waters			BP
Turbidity	NTU	-	20	See MDAL	BP
pH	Units	Within limit of 6.5 to 8.5 at all times			BP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	33	-	61[3]	BP
Total Nitrogen	mg/L	-	1.0	See MDAL	BP
Total Phosphorus	mg/L	-	0.1	See MDAL	BP
MBAS	mg/L	-	0.5	See MDAL	BP
Iron	mg/L	-	0.3	See MDAL	BP
Manganese	mg/L	-	0.05	See MDAL	BP
Priority Pollutants	ug/L	See Table C-3			

Abbreviations/Acronyms:

AMAL – average monthly action level
BP – Basin Plan water quality objective
COLD – cold freshwater habitat beneficial use
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
MDAL – maximum daily action level
WARM – warm freshwater habitat beneficial use
MBAS – Methylene Blue Active Substances
MPN/100 ml – most probable number per 100 milliliters
ug/L – micrograms per liter

Notes:

1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for freshwater "designated beach areas" and is not applicable to waterbodies that are not designated with the water contact recreation (REC-1) beneficial use.

b. NALs must be identified, developed and incorporated in the Water Quality Improvement Plan for any pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in Receiving waters ~~of the state~~ associated with the highest priority water quality conditions related to non-storm water discharges from the MS4s. NALs must be based on:

(1) Applicable water quality standards which may be dependent upon site-specific or receiving water-specific conditions or assumptions to be identified by the Copermittees; or

(2) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. ~~For the NALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary NALs specific to the Watershed Management Area at levels greater than the NALs required by Provisions C.1.a and C.1.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for addressing non-~~

~~storm water discharges to and from the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and from the MS4. The secondary NALs may be developed using an approach acceptable to the San Diego Water Board.~~

d. Dry weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.b may be utilized to develop or revise NALs based on watershed-specific data, subject to San Diego Water Board Executive Officer approval.

2. Default Storm Water Action Levels[10]

The Copermittees must develop and incorporate numeric storm water action levels (SALs) in the Water Quality Improvement Plans to: 1) support the development and prioritization of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s, and 2) assess the effectiveness of the water quality improvement strategies toward reducing pollutants in storm water discharges, required pursuant to Provision D.4.b.(2).[11]

a. The following SALs for discharges of storm water from the MS4 must be incorporated~~:~~ if the Copermittees do not establish stormwater action levels within the WQIP based on watershed priorities::~~:~~

Table C-5. Storm Water Action Levels for Discharges from MS4s to Receiving Waters

Parameter	Units	Action Level
Turbidity	NTU	126
Nitrate & Nitrite (Total)	mg/L	2.6
Phosphorus (Total P)	mg/L	1.46
Cadmium (Total Cd)*	µg/L	3.0
Copper (Total Cu)*	µg/L	127
Lead (Total Pb)*	µg/L	250
Zinc (Total Zn)*	µg/L	976

Abbreviations/Acronyms:
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
ug/L – micrograms per liter

Notes:
* The sampling must include a measure of receiving water hardness at each MS4 outfall. If a total metal concentration exceeds the corresponding metals SAL in Table C-5, that concentration must be compared to the California Toxics Rule criteria and the USEPA 1-hour maximum concentration for the detected level of receiving water hardness associated with that sample. If it is determined that the sample's total metal concentration for that specific metal exceeds that SAL, but does not exceed the applicable USEPA 1-hour maximum concentration criterion for the measured level of hardness, then the sample result will not be considered above the SAL for that measurement.

[10] SALs are not ~~considered by the San Diego Water Board to be~~ enforceable limitations under this Order.
[11] The Copermittees may utilize SALs or other benchmarks currently established by the Copermittees as interim SALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

b. SALs must be identified, developed and incorporated in the Water Quality Improvement Plan for pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in Receiving waters ~~of the state~~ associated with the highest water quality priorities related to storm water discharges from the MS4s. SALs must be based on:

(1) Federal and State water quality guidance and/or water quality standards; and

(2) Site-specific or receiving water-specific conditions; or

(3) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. ~~For the SALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary SALs specific to the Watershed Management Area at levels greater than the SALs required by Provisions C.2.a and C.2.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s. The secondary SALs may be developed based on the approaches recommended by the State Water Board's Storm Water Panel[12] or using an approach acceptable to the San Diego Water Board.~~

d. Wet weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.c may be used to develop or revise SALs based upon watershed-specific data, subject to San Diego Water Board Executive Officer approval.

~~[12] Storm Water Panel Recommendations to the California State Water Resources Control Board: The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities (June 2006)~~

D. MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS

Comment [A32]: See discussion in section 3.5 of the comment letter.

The purpose of this provision is for the Copermittees to monitor and assess the impact on the chemical, physical, and biological conditions of receiving waters caused by discharges from the Copermittees' MS4s under wet weather and dry weather conditions. The goal of the monitoring and assessment program is to inform the Copermittees about the nexus between the health of receiving waters and the water quality condition of the discharges from their MS4s to those receiving waters.~~.~~ This goal will be accomplished through monitoring and assessing the conditions of the receiving waters, discharges from the MS4s to those receiving waters, pollutant sources and/or stressors, and effectiveness of the water quality improvement strategies implemented as part of the Water Quality Improvement Plans.

1. Receiving Water Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the condition of the receiving waters in each Watershed Management Area during dry weather and wet weather. Following acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct long-term receiving water monitoring during implementation of the Water Quality Improvement Plan to assess the long term trends and determine if water quality conditions in receiving waters are improving. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following receiving water monitoring procedures:

a. TRANSITIONAL RECEIVING WATER MONITORING

Beginning October 1st or May 1st (whichever is sooner) following enrollment under this order and until~~Until~~ the monitoring requirements of Provisions D.1.b-e are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following receiving water monitoring in the Watershed Management Area:

(1) Continue the receiving water monitoring programs required in Order Nos. R9-2007-0001~~,~~ (Attachment A, Section II. A. 1-5),~~,~~ R9-2009-0002, and R9-2010-0016;

(2) Continue the monitoring in the Hydromodification Management Plans approved by the San Diego Water Board;

(3) Participate in the following regional receiving water monitoring programs, as applicable to the Watershed Management Area and each Copermittees' MS4 discharges:

Comment [A33]: See discussion in section 3.5.3 of the comment letter.

(a) Storm Water Monitoring Coalition Regional Monitoring,

(b) Southern California Bight Regional Monitoring, and

(c) Sediment Quality Monitoring;

(4) Implement the monitoring programs developed as part of any implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) for the TMDLs in Attachment E to this Order; and

(5) For Watershed Management Areas with ASBS, implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

b. LONG-TERM RECEIVING WATER MONITORING STATIONS

The Copermittees must select at least one long-term receiving water monitoring station from among the existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees to be representative of the receiving water quality in the Watershed Management Area. Additional or alternative long-term receiving water monitoring stations may~~must~~ be selected where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

Comment [A34]: See discussion in section 3.5.3 of the comment letter.

c. DRY WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three dry weather monitoring events at each of the long-term receiving water monitoring stations. At least one monitoring event must be conducted during the dry season (May 1 – September 30) and at least one monitoring event must be conducted during a dry weather period during the wet season (October 1 – April 30), after the first wet weather event of the season, with an antecedent dry period of at least 72 hours following a storm event producing measureable rainfall of greater than 0.1 inch.

(1) Dry Weather Receiving Water Field Observations

For each dry weather monitoring event, the Copermittees must record field observations consistent with Table D-1 at each long-term receiving water monitoring station.

Table D-1. Field Observations for Receiving Water Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) • Assessment of any observed connectivity of MS4 discharges to a flowing receiving water. • Station description (i.e. deposits or stains, vegetation condition, structural condition, and observable biology) • Presence and assessment of trash in and around station

Comment [A35]: See discussion in section 3.5.3 of the comment letter.

(2) Dry Weather Receiving Water Field Monitoring

For each dry weather monitoring event, if conditions allow the collection of the data, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

Table D-2. Field Monitoring Parameters for Receiving Water Monitoring Stations

Parameters
• pH • Temperature • Specific conductivity • Dissolved oxygen • Turbidity

(3) Dry Weather Receiving Water Analytical Monitoring

For each dry weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity,

dissolved oxygen, turbidity, hardness, and indicator bacteria Grab samples may also be collected for the analyses described in (f) where MS4 discharge runoff constitutes less than ten percent of the flow;

Comment [A36]: The receiving water stations in Riverside County either do not receive runoff from MS4 discharges or receive deminimus flows during dry weather conditions. The flow at these stations during dry weather consists virtually entirely of rising groundwater. Background receiving water quality conditions In such cases composite samples of receiving waters not affected by MS4 discharges is not warranted.

(d) For all other constituents where runoff constitutes more than ten percent of the flow, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable NAL constituents, and

(v) Constituents listed in Table D-3.

Table D-3. Analytical Monitoring Constituents for Receiving Water Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Pesticides	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1]	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Mercury • Nickel • Selenium • Thallium • Zinc	• Organophosphate Pesticides • Pyrethroid Pesticides	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

• Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia			

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(4) Dry Weather Receiving Water Toxicity Monitoring

For each dry weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for toxicity in accordance with Table D-4:

Table D-4. Dry Weather Toxicity Testing for Receiving Water Monitoring Stations

Freshwater Organism	Test Approach	USEPA Protocol[2]
Pimephales promelas	1 acute 1 chronic[1]	EPA-821-R-02-012
Hyalella Azteca	1 acute 1 chronic[1]	EPA-821-R-02-012
Psuedokirchneriella subcapitata	1 acute 1 chronic[1]	EPA-821-R-02-013

Notes:
1. Chronic toxicity testing is not required at receiving water monitoring stations located at mass loading stations if the channel flows are diverted year-round during dry weather conditions to the sanitary sewer for treatment.
2. USEPA protocols must be utilized for toxicity testing unless alternate toxicity testing protocols have been approved by the San Diego Water Board.

(5) Dry Weather Receiving Water Bioassessment Monitoring

Bioassessment monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must conduct bioassessment monitoring during at least one dry weather monitoring event at each long-term receiving water monitoring station as follows:

(a) The following bioassessment samples and measurements must be collected:

(i) Macroinvertebrate samples must be collected in accordance with the "Reachwide Benthos (Multihabitat) Procedure" in the most current Surface Water Ambient Monitoring Program (SWAMP) Bioassessment Standard Operating Procedures (SOP), and amendments, as applicable;[13]

(ii) The "Full" suite of physical habitat characterization measurements

[13] Ode, P.R.. 2007. Standard operating procedures for collecting macroinvertebrate samples and associated physical and chemical data for ambient bioassessments in California. California State Water Resources Control Board Surface Water Ambient Monitoring Program (SWAMP) Bioassessment SOP 001. http://www.swrcb.ca.gov/water_issues/programs/swamp/tools.shtml#monitoring

must be collected in accordance with the most current SWAMP Bioassessment SOP, and as summarized in the SWAMP Stream Habitat Characterization Form – Full Version;[14] and

(iii) Freshwater algae samples must be collected in accordance with the SWAMP Standard Operating Procedures for Collecting Algae Samples.[15] Analysis of samples must include algal taxonomic composition (diatoms and soft algae) and algal biomass.

(b) The bioassessment samples, measurements, and appropriate water chemistry data must be used to calculate the following:

(i) An Index of Biological Integrity (IBI) for macroinvertebrates for each monitoring station where bioassessment monitoring was conducted, based on the most current calculation method;[16] and

(ii) An IBI for algae for each monitoring station where bioassessment monitoring was conducted, when a calculation method is developed.[17]

(c) In lieu of the requirements of Provision D.1.c.(5)(a), the Copermittees may conduct the bioassessment monitoring in accordance with the "Triad" assessment approach[18] to calculate the IBIs required for Provision D.1.c.(5)(b). The Copermittees must conduct sampling, analysis, and reporting of specified in-stream biological and habitat data according to the protocols specified in the SCCWRP Technical Report No. 539, or subsequent protocols, if developed.

(6) Dry Weather Receiving Water Hydromodification Monitoring

In addition to the hydromodification monitoring conducted as part of the Copermittees' Hydromodification Management Plans, hydromodification monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must collect the

[14] Available at: http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/reports/fieldforms_fullversion052908.pdf

[15] Fetscher et al. 2009. Standard Operating Procedures for Collecting Stream Algae Samples and Associated Physical Habitat and Chemical Data for Ambient Bioassessments in California.

[16] The most current calculation method at the time the Order was adopted is outlined in "A Quantitative Tool for Assessing the Integrity of Southern California Coastal Streams" (Ode, et al. 2005. Environmental Management. Vol. 35, No. 1, pp. 1-13). If an updated or new calculation method is developed, either both (i.e. current and updated/new) methods must be used, or historical IBIs must be recalculated with the updated or new calculation method.

[17] When a calculation method is developed, IBIs must be calculated for all available and appropriate historical data.

[18] Stormwater Monitoring Coalition Model Monitoring Technical Committee, 2004. Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California. Technical Report #419. August 2004.

following hydromodification monitoring observations and measurements within an appropriate domain of analysis during at least one dry weather monitoring event for each long-term receiving water monitoring station:

(a) Channel conditions, including:

(i) Channel dimensions,

(ii) Hydrologic and geomorphic conditions, and

(iii) Presence and condition of vegetation and habitat;

(b) Location of discharge points;

(c) Habitat integrity;

(d) Photo documentation of existing erosion and habitat impacts, with location (i.e. latitude and longitude coordinates) where photos were taken;

(e) Measurement or estimate of dimensions of any existing channel bed or bank eroded areas, including length, width, and depth of any incisions; and

(f) Known or suspected cause(s) of existing downstream erosion or habitat impact, including flow, soil, slope, and vegetation conditions, as well as upstream land uses and contributing new and existing development.

d. WET WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three wet weather monitoring events at each long-term receiving water monitoring station. At least one wet weather monitoring event must be conducted during the first wet weather event of the wet season (October 1 – April 30), and at least one wet weather monitoring event during a wet weather event that occurs after February 1.

(1) Wet Weather Receiving Water Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each long-term receiving water monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event;

(b) The flow rates and volumes measured or estimated (data from nearby

USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(d) Presence and assessment of trash in and around station.

(2) Wet Weather Receiving Water Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

(3) Wet Weather Receiving Water Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) Constituents listed in Table D-3.

(4) Wet Weather Receiving Water Toxicity Monitoring

For each wet weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for toxicity in accordance with Table D-5:

Table D-5. Wet Weather Toxicity Testing for Receiving Water Monitoring Stations

Freshwater Organism	Test Approach	USEPA Protocol[1]
Pimephales promelas	1 acute	EPA-821-R-02-012
Hyalella Azteca	1 acute	EPA-821-R-02-012
Psuedokirchneriella subcapitata	1 acute	EPA-821-R-02-013

Notes:
1. USEPA protocols must be utilized for toxicity testing unless alternate toxicity testing protocols have been approved by the San Diego Water Board.

e. OTHER RECEIVING WATER MONITORING REQUIREMENTS

(1) Regional Monitoring

The Copermittees must participate in the following regional receiving waters monitoring programs, as applicable to the Watershed Management Area and the Copermittee's MS4 discharges:

(a) Storm Water Monitoring Coalition Regional Monitoring; and

(b) Southern California Bight Regional Monitoring.

(2) Sediment Quality Monitoring

The applicable Copermittees must perform sediment monitoring to assess compliance with sediment quality receiving water limits applicable to MS4

discharges to enclosed bays and estuaries. The monitoring may be performed either by individual or multiple affected Copermittees to assess compliance with receiving water limits, or through participation in a water body monitoring coalition. The Copermittees must identify sediment sampling stations that are spatially representative of the sediment within the water body segment or region of interest. Sediment quality monitoring must be conducted in conformance with the monitoring requirements set forth in the State Water Board Sediment Quality Control Plan.

(3) ASBS Monitoring

For Watershed Management Areas with ASBS, the applicable Copermittees must implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

f. ALTERNATIVE WATERSHED MONITORING REQUIREMENTS

The San Diego Water Board may direct the Copermittees to participate in an effort to develop alternative watershed monitoring with other regulated entities, other interested parties, and the San Diego Water Board to refine, coordinate, and implement regional monitoring and assessment programs to determine the status and trends of water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and/or 3) streams. As directed by the San Diego Water Board, such alternative watershed monitoring would be done in place and stead of the commensurate requirements set forth in Provision D.1.

2. MS4 Outfall Discharge Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the discharges from the major MS4 outfalls to receiving waters in each Watershed Management Area during dry weather and wet weather. Following acceptance of the Water Quality Improvement Plans and schedule for implementation of monitoring for each Watershed Management Area, the Copermittees must conduct MS4 outfall discharge monitoring during implementation of the Water Quality Improvement Plan to assess the effectiveness of their jurisdictional runoff management programs toward effectively prohibiting non-storm water discharges into the MS4 and reducing pollutants in ~~storm water~~ discharges ~~to and~~ from their MS4s to the MEP. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following MS4 outfall monitoring procedures:

Comment [A37]: Suggest same edits for SD and OC.

a. TRANSITIONAL MS4 OUTFALL DISCHARGE MONITORING

Beginning October 1st or May 1st (whichever is sooner) following enrollment under this order and until~~Until~~ the monitoring requirements of Provisions D.2.b-c

are incorporated into a Water Quality Improvement Plan and schedule for implementation of monitoring that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following monitoring of MS4 outfall discharges to flowing receiving waters ~~monitoring~~ in the Watershed Management Area:

(1) MS4 Outfall Discharge Monitoring Station Inventory

Each Municipal Copermittee must identify all major MS4 outfalls (including those operated by a Special District Copermittee) that discharge directly to receiving waters within its jurisdiction and geo-locate those outfalls on a map of the MS4 pursuant to Provision E.2.b.(1). This information must be compiled into a MS4 outfall discharge monitoring station inventory, and must include the following information:

(a) Latitude and longitude of MS4 outfall point of discharge;

(b) Watershed Management Area;

(c) Hydrologic subarea;

(d) Outlet size;

(e) Accessibility (i.e. safety and without disturbance of critical habitat);

(f) Approximate drainage area; and

(g) Classification of whether the MS4 outfall is known to have persistent dry weather flows, transient dry weather flows, no dry weather flows, or unknown dry weather flows.

(2) Transitional Dry Weather MS4 Outfall ~~Discharge~~ Field Screening ~~Monitoring~~

Until the monitoring requirements of Provision D.2.b are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, each Municipal Copermittee must perform the following dry weather MS4 outfall field screening monitoring to identify non-storm water and illicit discharges being discharged from MS4s within its jurisdiction in accordance with Provision E.2.c, to determine which discharges are transient ~~flows~~ and which are persistent discharges to flowing receiving waters~~flows~~, and prioritize the dry weather MS4 discharges that will be investigated and eliminated in accordance with Provision E.2.d. ~~Each Copermittee must conduct the following dry weather MS4 outfall discharge field screening monitoring within its jurisdiction:~~

Comment [A38]: Suggested change of title to better characterize the requirements of this section, compared to that of D.2.b.

Comments in this section are discussed in section 3.5.3 of the comment letter.

Comment [A39]: Duplicative of previous sentence

(a) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Frequency

Each Municipal Copermittee must field screen the accessible MS4 outfalls in its inventory developed pursuant to Provision D.2.a.(1) as follows:

(i) ~~For Copermittees with less than 125 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 80 percent of the outfalls must be visually inspected two times per year during dry weather conditions.~~

(ii) For Municipal Copermittees with ~~125 major MS4 outfalls or more, but~~ less than or equal to 500 MS4 outfalls~~,~~ that discharge to receiving waters within a Watershed Management Area, ~~all~~ at least 80 percent of the accessible outfalls must be visually inspected at least annually during dry weather conditions.

(iii) For Municipal Copermittees with more than 500 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 500 outfalls must be visually inspected at least annually during dry weather conditions. Copermittees with more than 500 major MS4 outfalls within a Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(iv) Municipal Copermittees with more than 500 major MS4 outfalls within its jurisdiction that are located in more than one Watershed Management Area, at least 500 major MS4 outfalls within its inventory must be visually inspected at least annually during dry weather conditions. Copermittees with more than 500 major MS4 outfalls in more than one Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;

[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and

[e] Flow rate.

(v) Inspections of major MS4 outfalls conducted in response to public reports and staff or contractor reports and notifications may count toward the required visual inspections of MS4 outfall discharge monitoring stations.

(b) Transitional Dry Weather MS4 Outfall Discharge Field Screening Visual Observations

(i) An antecedent dry period of at least 72 hours following any storm event producing measurable rainfall greater than 0.1 inch is required prior to conducting field screening visual observations during a field screening monitoring event.

(ii) During the field screening monitoring event, each Municipal Copermittee must record visual observations consistent with Table D-6 at each MS4 outfall discharge monitoring station inspected.

Table D-6. Field Screening Visual Observations for MS4 Outfall Discharge Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) - Flow source(s) suspected or identified from non-storm water source investigation - Flow source(s) eliminated during non-storm water source identification • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) - Known or suspected source(s) of pooled or ponded water • Assessment of any observed MS4 discharge ~~with~~ to a flowing receiving water. • Station description (i.e. deposits or stains, vegetation condition, structural condition, observable biology) • Presence and assessment of trash in and around station • Evidence or signs of illicit connections or illegal dumping

(iii) Each Municipal Copermittee must implement the requirements of Provisions E.2.d.(2)(c)-(e) based on the field observations.

(iv) Each Copermittee must evaluate field observations together with existing information available from prior reports, inspections and monitoring results to determine whether any observed flowing,

pooled, or ponded waters are likely to be transient or persistent flow.[19]

Comment [A40]: See footnote edits

(c) Transitional Dry Weather MS4 Outfall Discharge Field Screening ~~Monitoring~~ Records

Based upon the results of the transitional dry weather MS4 outfall discharge field screening monitoring conducted pursuant to Provisions D.2.a.(2)(a)-(b), each Municipal Copermittee must update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow.

(3) Transitional Wet Weather MS4 Outfall Discharge Monitoring

Comment [A41]: See discussion in section 3.5.3 of the comment letter.

Until the monitoring requirements of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(a) Transitional Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees must select at least five wet weather MS4 outfall discharge monitoring stations from the inventories developed pursuant to Provision D.2.a.(1) that are representative of storm water discharges from areas consisting primarily of residential, commercial, industrial, and typical mixed-use land uses present within the Watershed Management Area.

(b) Transitional Wet Weather MS4 Outfall Discharge Monitoring Frequency

Each wet weather MS4 outfall discharge monitoring station selected pursuant to Provision D.2.a.(3)(a) must be monitored twice during the wet season (October 1 – April 30~~)).~~) in the transitional period. The~~). One~~ wet weather monitoring ~~event~~events shall be selected to be representative of the range of hydrologic conditions experienced in the region. At least 10% of samples~~event~~ must be conducted during the first wet weather event of the wet season, ~~and~~to include~~and one wet weather monitoring event~~ at least one such sample in each Watershed Management Area~~, a month after the first wet weather event of the wet season.~~

[19] Persistent flow, for the purposes of provision II.D.2.b.(2) is defined as the presence of an MS4 discharge that is hydraulically connected to a flowing receiving~~, pooled, or ponded~~ water more than 72 hours after a measureable rainfall event of 0.1 inch or greater, during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

(c) Transitional Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded of the flow from~~at~~ each wet weather MS4 outfall discharge monitoring station:

(i) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(ii) The flow rates and volumes measured or estimated from the outfall (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(iii) ~~Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and~~

(iv) Presence ~~and assessment~~ of trash in and around station.

Comment [A42]: This isn't appropriate for a wet weather event.

Comment [A43]: This isn't appropriate for a wet weather event.

(d) Transitional Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(e) Transitional Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, and indicator bacteria;

(iv) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant

concentrations and runoff flows using one of the following techniques:

[a] Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

[b] Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

[c] If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours;

(v) Only one analysis of the composite of aliquots is required;

(vi) The samples must be analyzed for the following constituents:

[a] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

[b] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and

[c] Constituents listed in in Table D-7.

Table D-7. Analytical Monitoring Constituents for Wet Weather MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Nickel • Selenium • Thallium • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(f) Other Transitional Wet Weather MS4 Outfall Discharge Monitoring

The San Diego County Copermittees must continue the wet weather MS4 outfall monitoring program developed under Order No. R9-2007-0001, as approved by the San Diego Water Board, through its planned completion.

b. DRY WEATHER MS4 OUTFALL DISCHARGE MONITORING

Each Municipal Copermittee must perform the following dry weather MS4 outfall monitoring within its jurisdiction to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. ~~Each Copermittee must conduct the following dry weather MS4 outfall discharge monitoring within its jurisdiction:~~

(1) Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Each Municipal Copermittee must continue to perform the dry weather MS4 outfall discharge field screening monitoring in accordance with the requirements of Provision D.2.a.(2). ~~The~~ however the Municipal Copermittee may adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of persistent ~~flow~~ non-storm water illegal discharges from the MS4 to flowing receiving waters in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan. ~~, provided the~~

Comment [A44]: Repetitive of previous sentence

Comment [A45]: See discussion in section 3.5.3 of the comment letter.

~~number of visual inspections performed is equivalent to the number of visual inspections required under Provision D.2.a.(2)(a).~~

Comment [A46]: See comments in comment letter

(2) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring

Each Municipal Copermittee must perform the following non-storm water monitoring of MS4 outfalls that persistently ~~flow MS4 outfall~~ discharge to flowing receiving waters ~~monitoring~~ to determine which persistent non-storm water discharges contain concentrations of pollutants below NALs, and which persistent non-storm water discharges impact receiving water quality during dry weather. ~~Each Copermittee must conduct the following non-storm water persistent flow MS4 outfall discharge monitoring within its jurisdiction:~~

Comment [A47]: Repetitive of previous sentence.

(a) Prioritization of Non-Storm Water Persistent Flow MS4 Outfalls

Based upon the dry weather MS4 outfall discharge field screening monitoring records developed pursuant to Provision D.2.a.(2)(c), each Municipal Copermittee must identify and prioritize the MS4 outfalls within its jurisdiction that have~~with~~ persistent discharges to flowing receiving waters ~~flows~~ based on the highest priority water quality conditions identified in the Water Quality Improvement Plan and any additional criteria developed by the Copermittee, which may include historical data and data from sources other than what the Copermittee collects.

(b) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring Frequency

Comment [A48]: See comment letter section 3.5.3

(i) Based on the prioritization of major MS4 outfalls developed under Provision D.2.b.(2)(a), each Municipal Copermittee must identify, at a minimum, the top 10 percent of the~~10~~ highest priority major MS4 outfalls with non-storm water persistent flows that the Copermittee will monitor within each Watershed Management Area within its jurisdiction, with a minimum of one persistent ~~flow~~discharge outfall, and a maximum of 5 required per WMA. The location of the selected highest priority non-storm water persistent ~~flow~~ discharge MS4 outfall monitoring stations must be identified on the map required pursuant to Provision E.2.b.(1).

(ii) Each of the highest priority non-storm water persistent flow MS4 outfall monitoring stations identified pursuant to Provision D.2.b.(2)(b)(i) must be monitored under dry weather conditions at least ~~semi~~ annually until one of the following occurs:

[a] The non-storm water discharges have been effectively eliminated (i.e. no flowing, pooled, or ponded water) for three consecutive dry weather monitoring events; or

[b] The source(s) of the persistent flows has been identified as a category of non-storm water discharges that does not require an NPDES permit and does not have to be addressed as an illicit discharge because it was not identified as a source of pollutants (i.e. constituents in non-storm water discharge do not exceed NALs), and the persistent flow can be re-prioritized to a lower priority; or

[c] The constituents in the persistent flow non-storm water discharge do not exceed NALs, and the persistent flow can be re-prioritized to a lower priority; or

[d] The source(s) of the persistent flows has been identified as a non-storm water discharge authorized by a separate NPDES permit.

(iii) Where the criteria under Provision D.2.b.(2)(c)(ii) are not met, but the threat to water quality has been reduced by the Copermittee, the highest priority persistent flow MS4 outfall monitoring stations may be reprioritized accordingly for continued dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1).

(iv) Each Municipal Copermittee must document removal or re-prioritization of the highest priority persistent flow MS4 outfall monitoring stations identified under Provision D.2.b.(2)(b) in the Annual Report. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized MS4 major outfall in the Watershed Management Area within its jurisdiction, unless there are no remaining qualifying major MS4 outfalls within the Copermittee's jurisdiction in the Watershed Management Area.

(c) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Observations

During each semi-annual monitoring event, each Municipal Copermittee must record field observations consistent with Table D-6 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(d) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Monitoring

During each ~~semi-annual~~ monitoring event, if conditions allow the collection of the data, each Municipal Copermittee must monitor and record the parameters in Table D-2 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(e) Non-Storm Water Persistent Flow MS4 Outfall Discharge Analytical Monitoring

Comment [A49]: See discussion in section 3.5.3 of the comment letter.

During each semi-annual monitoring event in which measurable flow from the MS4 outfall to a flowing receiving water is present, each Municipal Copermittee must collect and analyze samples from each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) During development of the WQIP, for each WMA, consider the following sources to select constituents for collection of~~Collect~~ grab or composite samples to be analyzed at a qualified analytical laboratory::~~for the following constituents:~~

[a] Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,
[b] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,
[c] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,
[d] Applicable NAL constituents, and
[e] Constituents listed in Table D-8, unless the Copermittee has historical data that can demonstrate or provide justification that the analysis of the constituent is not necessary.

(iv) Copermittees may adjust the analytical list for a given WMA in successive monitoring events to add or eliminate constituents based on data that can demonstrate or provide justification regarding need or lack of need for the analysis of specific constituents.

Table D-8. Analytical Monitoring Constituents for Persistent Flow MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Total Hardness • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen	• Cadmium • Copper • Lead • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

• Ammonia		

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

~~(iv)~~(v) If the Copermittee identifies and eliminates the source of the persistent flow non-storm water discharge, analysis of the sample is not required.

c. WET WEATHER MS4 OUTFALL DISCHARGE MONITORING

The Copermittees must perform wet weather MS4 outfall monitoring to identify sources areas of pollutants in ~~storm water~~ discharges from the MS4s in the Watershed Management Area. The Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(1) Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees may adjust the wet weather MS4 outfall discharge monitoring locations and frequencies in the Watershed Management Area, as needed, to identify sources of pollutants in storm water discharges from MS4s in the Watershed Management Area in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of stations is at least equivalent to the number of stations required under Provision D.2.a.(3)(a).

(2) Wet Weather MS4 Outfall Discharge Monitoring Frequency

The Copermittees must monitor the wet weather MS4 outfall discharge monitoring stations in the Watershed Management Area at an appropriate frequency to identify source areas of pollutants in ~~storm water~~ discharges from the MS4s causing or contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan.

(3) Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or

estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

~~(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and~~

~~(d) Presence and assessment of trash in and around station.~~

Comment [A50]: These are inappropriate for wet weather observations.

(4) Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(5) Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

(iii) If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours.

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and

(iv) Applicable SAL constituents.

3. Special Studies

Comment [A51]: See discussion in section 3.5.3 of the comment letter.

a. Within the term of this Order, the Copermittees must initiate~~develop and implement~~ the following special studies:

(1) At least two~~three~~ special studies in each Watershed Management Area to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that cause or contribute to highest priority water quality conditions identified in the Water Quality Improvement Plan.

(2) At least one~~two~~ special study~~studies~~ for the San Diego Region to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that are impacting receiving waters on a regional basis in the San Diego Region.

(3) One of the two~~three~~ special studies in each Watershed Management Area may be replaced by a special study implemented pursuant to Provision D.3.a.(2).

b. The special studies must, at a minimum, be in conformance with the following criteria:

(1) The special studies must be related to the highest priority water quality conditions identified by the Copermittees in the Watershed Management Area and/or for the entire San Diego Region;

(2) The special studies developed pursuant to Provision D.3.a.(1) must:

(a) Be implemented within the applicable Watershed Management Area, and

(b) Require some form of participation by all the Copermittees within the Watershed Management Area;

(3) The special studies developed pursuant to Provision D.3.a.(2) must:

(a) Be implemented within the San Diego Region, and

(b) Require some form of participation by all Copermittees covered under the requirements of this Order.

c. Special studies developed to identify sources of pollutants and/or stressors should be pollutant and/or stressor specific and based on historical monitoring data and monitoring performed pursuant to Provisions D.1 and D.2. Development of source identification special studies should include the following:

(1) A compilation of known information on the specific pollutant and/or stressor, including data on potential sources and movement of the pollutant and/or stressor within the watershed. Data generated by the Copermittees and others, as well as information available from a literature research on the pollutant and/or stressor should be compiled and analyzed as appropriate.

(2) An identification of data gaps, based on the compiled information generated on the specific pollutant and/or stressor in Provision D.3.d.(1). Source identification special studies should be developed to fill identified data gaps.

(3) A monitoring plan that will collect and provide data the Copermittees can utilize to do the following:

(a) Quantify the relative loading or impact of a pollutant and/or stressor from a particular source or pollutant generating activity;

(b) Improve understanding of the fate of a pollutant and/or stressor in the environment;

(c) Develop an inventory of known and suspected sources of a pollutant and/or stressor in the Watershed Management Area; and/or

(d) Prioritize known and suspected sources of a pollutant and/or stressor based on relative magnitude in discharges, geographical distribution (i.e.,

regional or localized), frequency of occurrence in discharges, human health risk, and controllability.

d. Special studies initiated prior to the termacceptance of thethis Orderthe Water Quality Improvement Plan that meet the requirements of Provision D.3.b and are implementedcompleted during the term of this Order may be utilized to fulfill the special study requirements of Provision D.3.a.

e. The Copermittees must submit the monitoring plans for the special studies in the Water Quality Improvement Plans required pursuant to Provision F.1.

f. The Copermittees are encouraged to share the results of the special studies regionally among the Copermittees to provide information useful in improving and adapting the management of non-storm water and storm water runoff through the implementation of the Water Quality Improvement Plans.

4. Assessment Requirements

Each Copermittee must evaluate the data collected pursuant to Provisions D.1, D.2 and D.3, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E, to assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a. Assessments must be performed as described in the following provisions:

a. RECEIVING WATERS ASSESSMENTS

(1) The Copermittees must assess and report the conditions of the receiving waters in the Watershed Management Area as follows:

(a) Based on data collected pursuant to Provision D.1.a, the assessments under Provision D.4.a.(2) must be included in the transitionalfirst Annual Report required pursuant to Provision F.3.b.(21).

Comment [A52]: See our edits to that section

(b) Based on the data collected pursuant to Provisions D.1.a-e, the assessments required under Provision D.4.a.(2) must be included in the Report of Waste Discharge required pursuant to Provision F.5.b.

(2) The Copermittees must assess the status and trends of receiving water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under dry weather and wet weather conditions, as those conditions are affected by discharges from the Copermittees' MS4, to determine the progress towards meeting interim or final goals of the Water Quality Implementation Plan for the Watershed Management Area. For each of the three types of receiving waters that are present in each Watershed Management Area the applicable Copermittees must:

Comment [A53]: See discussion in section 3.5.3 of the comment letter.

(a) Determine whether or not the conditions of the receiving waters are meeting any applicable numeric goals established pursuant to provision B.2.e.~~protective of the designated beneficial uses~~;

~~(b) Identify the most critical beneficial uses that must be protected or restored to ensure overall health of the receiving water;~~

~~(c) Determine whether or not those critical beneficial uses are being protected and where those beneficial used must be restored;~~

~~(d)~~(b) Identify short-term and/or long-term improvements or degradation of Receiving Water conditions related to those numeric goals~~those critical beneficial uses~~;

~~(e)~~(c) Identify data gaps in the monitoring data necessary to assess Provisions D.4.a.(2)(a)-(d).

b. MS4 OUTFALL DISCHARGES ASSESSMENTS

(1) Non-Storm Water Discharges Reduction Assessments

Comment [A54]: See discussion in section 3.5.3 of the comment letter for key changes. Other changes are described in comments below.

(a) ~~Each Copermittee must assess and report the progress of its illicit discharge detection and elimination program, required to be implemented pursuant to Provision E.2, toward reducing and effectively prohibiting non-storm water and illicit discharges into the MS4 within its jurisdiction as follows:~~

~~(i) Based on data collected pursuant to Provisions D.2.a.(2), the assessments under Provision D.4.b.(1)(b) must be included when complete in the Annual Report required pursuant to Provision F.3.b.(1).~~

~~(ii) Based on the data collected pursuant to Provisions D.2.b, the assessments required under Provision D.4.b.(1)(c) must be included in the first Annual Report required pursuant to Provision F.3.b.(1), and annually thereafter.~~

~~(iii) Based on the data collected pursuant to Provisions D.2.b, the assessment required under Provision D.4.b.(1)(c) must be included in the Report of Waste Discharge required pursuant to F.5.b.~~

Comment [A55]: For clarity and simplicity, these timelines were integrated into the following sections.

(b) Based on the transitional dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.a.(2), each

Municipal Copermittee must assess and report the following, as applicable to discharges from the MS4 (including Special District Copermittee MS4s) to flowing receiving waters within their jurisdiction, in the Annual Report required pursuant to Provision F.3.b.(2):~~:~~

(i) Identify the known and suspected controllable sources (e.g. facilities, areas, land uses, pollutant generating activities) of transient and persistent flow discharges to flowing receiving waters~~flows~~ within the Copermittee's jurisdiction in the Watershed Management Area;

(ii) Identify sources of transient and persistent flow discharges to flowing receiving waters~~flows~~ within the Copermittee's jurisdiction in the Watershed Management Area that have been reduced or eliminated; and

(iii) Identify modifications to the field screening monitoring locations and frequencies for the MS4 outfalls in its inventory necessary to identify and eliminate sources of persistent flow non-storm water discharges to flowing receiving waters, pursuant to Provision D.2.b.(1).

(c) Based on the dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b, each Municipal Copermittee must assess and report the following, as applicable to discharges from the MS4 (including Special District Copermittee MS4s) within their jurisdiction, in each Annual Report required pursuant to F.3.b.(3) and in the Report of Waste Discharge required pursuant to Provision F.5.b.:~~:~~

(i) The assessments required pursuant to Provision D.4.b.(1)(a~~b~~);

(ii) Based on the data collected and applicable NALs in the Water Quality Improvement Plan, rank the MS4 outfalls in the Copermittee's jurisdiction according to potential threat to receiving water quality, and produce a prioritized list of major MS4 outfalls for follow-up action to update the Water Quality Improvement Plan, with the goal of eliminating persistent flow non-storm water discharges to flowing receiving waters and/or pollutant loads in order of the ranked priority list through targeted programmatic actions and source investigations;

(iii) For the highest priority major MS4 outfalls with persistent flow discharges to a flowing receiving water~~flows~~ that are in exceedance of NALs, identify the known and suspected sources within the Copermittee's jurisdiction in the Watershed Management Area that may cause or contribute to the NAL exceedances;

(iv) Each Copermittee must analyze the data collected pursuant to Provision D.2.b.(2), and: ~~utilize a model or other method, to calculate or estimate the non-storm water volumes and pollutant loads collectively discharged from all the major MS4s outfalls in its jurisdiction identified as having persistent dry weather flows during~~

Comment [A56]: Per edits to that section

Comment [A57]: Per edits to that section

Comment [A58]: Per edits above

Comment [A59]: Edits to this section (and sub-sections) is different than SD edits.

~~the monitoring year. These calculations or estimates must be updated annually. Each Copermittee must calculate or estimate:~~

[a] Calculate or estimate annual non-storm water volumes and pollutant loads (associated with the priority constituents identified in the WQIP) collectively discharged from the monitored persistently flowing ~~Copermittee's~~ major MS4 outfalls discharging to flowing receiving waters within the Copermittee's jurisdiction, or discharged into another Copermittee's MS4 as demonstrated through provision E.2.d.~~with an estimate of the percent contribution from each known and suspected source for each MS4 outfall~~;

[b] Identify ~~identify~~ and quantify, where feasible, known sources of non-stormwater flows not ~~[b] Annual non-storm water volumes and pollutant loads from areas or facilities~~ subject to the Copermittee's legal authority that are discharged from the Copermittee's major MS4 outfalls to downstream receiving waters.

Comment [A60]: This is to help ensure jurisdictional accountability for what is being discharged from their jurisdiction.

(v) Each Copermittee must review the data collected pursuant to Provision D.2.b and findings from the assessments required pursuant to Provision D.4.b.(1)(c)(i)-(iv) ~~once per Permit termon an annual basis, and then report~~ within the Regional Monitoring and Assessment Report per Provision F.3.c., the following ~~to~~:

[a] Identify reductions and progress in achieving reductions in non-storm water and illicit discharges to the Copermittee's MS4 in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction, with an estimate, if possible, of the non-storm water volume and/or pollutant load reductions attributable to specific water quality strategies implemented by the Copermittee; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittee in the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction.

(vi) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(v).

(2) Storm Water Pollutant Discharges Reduction Assessments

(a) ~~The Copermittees must assess and report the progress of the water quality improvement strategies, required to be implemented pursuant to~~

~~Provisions B and E, toward reducing pollutants in storm water discharges from the MS4s within the Watershed Management Area as follows:~~

~~(i) Based on data collected pursuant to Provisions D.2.a.(3), the assessments under Provision D.4.b.(2)(b) must be included in the first Annual Report required pursuant to Provision F.3.b.(1).~~

~~Based on the data collected pursuant to Provisions D.2.c, the assessments required under ProvisionProvision first Annual Report required pursuant to Provision F.3.b.(1), and annually thereafter.~~

~~Based on the data collected pursuant to Provisions D.2.c, the assessment required under Provisions D.4.b.(2)(c)-(d) must be included in the Report of Waste Discharge required pursuant to F.5.b.~~

(b) Based on the transitional wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.a.(3) the Copermittees must assess and report the following in the Transitional Period Monitoring Report required pursuant to Provision F.3.b.(2):

(i) The Copermittees must analyze the monitoring data collected pursuant to Provision D.2.a.(3), and utilize a watershed model or other method, to calculate or estimate: ~~storm water volumes and pollutant loads discharged from the MS4s in each Copermittee's jurisdiction within the Watershed Management Area. The Copermittees must calculate or estimate the following for each monitoring year:~~

[a] The average storm water runoff coefficient for each land use type within the Watershed Management Area;

[b] The volume of storm water and pollutant loads discharged from each of the Copermittee's monitored major MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each monitored storm event with measurable rainfall greater than 0.1 inch, for each of the priority water quality constituents identified in the WQIP;

[c] The total volume and pollutant loads potentially discharged from each Municipal Copermittee's jurisdiction within the watershed management area, for each monitored event, extrapolated from the data produced from the monitored outfalls.

~~The pollutant loads discharged from each of the Copermittee's major MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch; and~~

~~[d] The percent contribution of storm water volumes and pollutant loads discharged from each land use type within the drainage basin to each of the Copermittee's major MS4 outfalls in its~~

Comment [A61]: See discussion in section 3.5.3 of the comment letter.

Comment [A62]: Removed as this was confusing as it was duplicative of the subsections below.

Comment [A63]: There is no need to perform this analysis for other pollutants not identified as priorities in the WQIP.

~~jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch.~~

(ii) Identify modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify ~~sources~~ pollutants in storm water discharges from the MS4s in the Watershed Management Area pursuant to Provision D.2.c.(1).

(c) Based on the wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.c the Copermittees must assess and report (i) and (ii) below in the annual reports required per F.3.b.(3), and (i) through (iv) below in the Regional Monitoring and Assessment Report required per F.3.c. ~~the following~~:

(i) The assessments required pursuant to Provision D.4.b.(2)(a~~b~~);

(ii) Based on the data collected and applicable SALs in the Water Quality Improvement Plan, analyze and compare the monitoring data to the analyses and assumptions used to develop the Water Quality Improvement Plans, including strategies developed per Provision B.3, and evaluate whether ~~,rank the MS4 outfalls in the Watershed Management Area according to potential threat to receiving water quality, and produce a prioritized list of major MS4~~ there is a need to update the Water Quality Improvement Plan;

(iii) The Copermittees must review the data collected pursuant to Provision D.2.c and findings from the assessments required pursuant to Provisions D.4.b.(2)(c)(i)-(ii) ~~on an annual basis~~ to:

[a] Identify reductions and progress in achieving reductions in pollutant concentrations and/or pollutant loads from different land uses and/or drainage areas discharging from the Copermittees' MS4s in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing pollutants in ~~storm water~~ discharges from the MS4s to receiving waters within the Watershed Management Area to the MEP, with an estimate, if possible, of the pollutant load reductions attributable to specific water quality strategies implemented by the Copermittees; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittees in the Watershed Management Area toward reducing pollutants in ~~storm water~~ discharges from the MS4s to receiving waters in the Watershed Management Area to the MEP.

(iv) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(iii).

Comment [A64]: See discussion in section 3.5.3 of the comment letter.

Comment [A65]: Per edits to that section

Comment [A66]: Per edits above

(d) Within the Regional Monitoring and Assessment report required pursuant to F.3.c.~~The~~ Copermittees must evaluate all the data collected pursuant to Provision D.2.c, and incorporate new outfall monitoring data into time series plots for each long-term monitoring constituent for the Watershed Management Area, and perform statistical trends analysis on the cumulative long-term wet weather MS4 outfall discharge water quality data set.

c. SPECIAL STUDIES ASSESSMENTS

The Copermittees must in the applicable annual report required pursuant to F.3.b.,~~annually~~ evaluate the results and findings from the special studies developed and implemented pursuant to Provision D.3, and assess their relevance to the Copermittees' efforts to characterize receiving water conditions, understand sources of pollutants and/or stressors, and control and reduce the discharges of pollutants from the MS4 outfalls to receiving waters in the Watershed Management Area. The Copermittees must report the results of the special studies assessments applicable to the Watershed Management Area, and identify any necessary modifications or updates to the Water Quality Improvement Plan based on the results in the Annual Reports required pursuant to Provision F.3.b.

d. INTEGRATED ASSESSMENT OF WATER QUALITY IMPROVEMENT PLAN

As part of the iterative approach and adaptive management process required for the Water Quality Improvement Plan pursuant to Provision B.5, the Copermittees in each Watershed Management Area must integrate the data collected pursuant to Provisions D.1-D.3, the findings from the assessments required pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to assess the effectiveness of, and identify necessary modifications to, the Water Quality Improvement Plan as follows:

(1) The Copermittees must re-evaluate the priority water quality conditions and numeric goals for the Watershed Management Area, as needed, during the term of this Order pursuant to Provision B.5.a. The re-evaluation and recommendations for modifications to the priority water quality conditions, and/or numeric goals and corresponding schedules may be provided in the Annual Reports required pursuant to Provision F.3.b, but must at least be provided in the Regional Monitoring and Assessment Report ~~of Waste Discharge~~ pursuant to Provision F.3.c~~5.b~~. The priority water quality conditions and numeric goals for the Watershed Management Area must be re-evaluated as follows:

(a) Re-evaluate the receiving water conditions in the Watershed Management Area in accordance with Provision B.2.a;

(b) Re-evaluate the impacts on receiving waters in the Watershed Management Area from MS4 discharges in accordance with Provision B.2.b;

(c) Re-evaluate the identification of MS4 sources of pollutants and/or stressors in accordance with Provision B.2.d;

(d) Identify beneficial uses of the receiving waters that are protected or must be restored in accordance with Provision D.4.a;

(e) Evaluate the progress toward achieving the interim and final numeric goals for restoring impacted beneficial uses in the receiving waters.

(2) The Copermittees must re-evaluate the water quality improvement strategies for the Watershed Management Area during the term of this Order pursuant to Provision B.5.b. The re-evaluation and recommendations for modifications to the water quality improvement strategies and schedules may be provided in the Annual Reports required pursuant to Provision F.3.b, but must at least be provided in the Regional Monitoring and Assessment Report pursuant to Provision F.3.c~~must be provided in the Annual Reports required pursuant to Provision F.3.b, and provided in the Report of Waste Discharge pursuant to Provision F.5.b~~. The water quality improvement strategies for the Watershed Management Area must be re-evaluated as follows:

(a) Identify the non-storm water and storm water pollutant loads from the Copermittees' MS4 outfalls in the Watershed Management Area, calculated or estimated pursuant to Provisions D.4.b;

(b) Identify the non-storm water and storm water pollutant load reductions, or other improvements to receiving water or water quality conditions, that are necessary to attain the interim and final numeric goals identified in the WQIP~~for restoring impacted beneficial uses in the receiving waters~~;

(c) Identify any~~the~~ non-storm water and storm water pollutant load reductions, or other improvements to the quality of MS4 discharges, that are necessary for the Copermittees to ~~demonstrate that non-storm water and storm water~~ reduce discharges of pollutants from their MS4s that have been demonstrated to be~~are not~~ causing or contributing to exceedances of receiving water limitations;

Comment [A67]: See discussion in section 3.5.3 of the comment letter.

(d) Evaluate the progress of the water quality improvement strategies toward achieving the interim and final numeric goals identified in the WQIP~~for restoring impacted beneficial uses in the receiving waters~~.

(3) The Copermittees must re-evaluate and adapt the water quality monitoring and assessment program for the Watershed Management Area when new information becomes available to improve the monitoring and assessment

program pursuant to Provision B.5.c. The re-evaluation and recommendations for modifications to the monitoring and assessment program may be provided in the Annual Reports required pursuant to Provision F.3.b, but must at least be provided in the Regional Monitoring and Assessment Report ~~of Waste Discharge~~ pursuant to Provision F.3.c~~5.b~~. Modifications to the water quality monitoring and assessment program must be consistent with the requirements of Provision D.1-D.3. The re-evaluation of the water quality monitoring and assessment program for the Watershed Management Area must consider the data gaps identified by the assessments required pursuant to Provisions D.4.a-b, and results of the special studies implemented pursuant to Provision D.4.c.

5. Monitoring Provisions

Each Copermittee must comply with all the monitoring, reporting, and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

E. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS

The purpose of this provision is for each Copermittee to implement a program to control the contribution of pollutants to and the discharges from the MS4 within its jurisdiction. The goal of the jurisdictional runoff management programs is to implement strategies that effectively prohibit non-storm water discharges to the MS4 and reduce the discharge of pollutants in ~~storm water~~ to the MEP. This goal will be accomplished through implementing the jurisdictional runoff management programs in accordance with the strategies identified in the Water Quality Improvement Plans.

Each Copermittee must update its jurisdictional runoff management program document, in accordance with Provision F.2.a, to incorporate all the requirements of Provision E, consistent with their legal authority. Until the Copermittee has updated its jurisdictional runoff management program document with the applicable requirements of Provision E, the Copermittee must continue implementing its current jurisdictional runoff management program.

Modification of Jurisdictional Runoff Management Program Requirements

Modifications shall be considered and where selected, proposed according to the process in Provision B.5. Proposed modifications may increase, decrease, and/or replace minimum requirements identified in Provision E.

1. Legal Authority Establishment and Enforcement

Comment [A68]: See discussion in section 3.6 of the comment letter.

a. Each Copermittee must establish, maintain, and enforce adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 through statute, ordinance, permit, or series of contracts, ~~order, or similar means~~ which~~. This legal authority must~~, at a minimum, authorize the Copermittee to:

(1) Effectively prohibit through ordinance, order or other similar means~~Prohibit and eliminate all~~ illicit discharges ~~and illicit connections~~ to its MS4;

(2) Control, through ordinance, permit, contract, order or similar means the contribution of pollutants in discharges to the MS4 by storm water discharges ~~of runoff~~ associated with industrial and construction activity~~ to its MS4~~, and ~~control~~ the quality of storm water discharges ~~runoff~~ from sites of industrial and construction activity~~sites~~, whose discharges have not been separately authorized through~~ that do not, including industrial and construction sites which~~ have coverage under the statewide General Permit for Discharges of Storm Water Associated with Industrial Activities (Industrial General Permit) or General Permit for Discharges of Storm Water Associated with Construction Activities (Construction General Permit)~~, as well as to those sites which do not;~~

Comment [A69]: See discussion in section 3.6.2 of the comment letter.

(3) Control, through ordinance, order or similar means the discharge to the MS4 of spills, dumping, or disposal of materials other than storm water~~ into its~~

Comment [A70]: See discussion in section 3.6.2 of the comment letter.

~~MS4~~;

(4) Control through interagency agreements among Copermittees the contribution of pollutants from one portion of the MS4 to another portion of the MS4;

(5) ~~Control, by coordinating and cooperating with other owners of the MS4 such as Caltrans, the U.S. federal government, or sovereign Native American Tribes through interagency agreements, where possible, the contribution of from their portion of the MS4 to the portion of the MS4 within the Copermittee's jurisdiction;~~

(6) Require compliance with conditions in its ~~statutes,~~ ordinances, permits, contracts, or orders~~, or similar means to hold dischargers to its MS4 accountable for their contributions of pollutants and flows~~;

(7) ~~Require the use of BMPs to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;~~

(8) ~~Require documentation on the effectiveness of BMPs implemented to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;~~

(9) ~~Utilize enforcement mechanisms to require compliance with its statutes, ordinances, permits, contracts, orders, or similar means; and~~

(10) Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with permit conditions~~its statutes, ordinances, permits, contracts, orders, or similar means and with the requirements of this Order~~, including the prohibition of illicit discharges and connections to its MS4; ~~the Copermittee must also have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from industrial facilities, including construction sites, discharging into its MS4.~~

b. With the first Annual Report required pursuant to Provision F.3.b, each Copermittee must submit a statement certified by its Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative that the Copermittee has taken the necessary steps to obtain and maintain full legal authority within its jurisdiction to implement and enforce each of the requirements contained in this Order.

2. Illicit Discharge Detection and Elimination

Each Copermittee must implement a program to actively detect and eliminate illicit discharges and improper disposal into the MS4, or otherwise require the discharger

Comment [A71]: See discussion in section 3.6.2 of the comment letter.

Comment [A72]: See discussion in section 3.6.2 of the comment letter.

Comment [A73]: See discussion in section 3.6.2 of the comment letter.

Comment [A74]: See discussion in section 3.6.2 of the comment letter.

Comment [A75]: See discussion in section 3.7 of the comment letter.

to apply for and obtain a separate NPDES permit. The illicit discharge detection and elimination program must be implemented in accordance with the strategies identified in the Water Quality Improvement Plan and include, at a minimum, the following requirements:

STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the illicit discharge detection and elimination program to address ~~non-storm water and~~ illicit discharges and connections that the Copermittee has identified as potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate~~ additional~~ BMPs, focus education, and/or increase/decrease frequency of inspections in specific areas); and

(2) The strategies and/or activities ~~must~~ may be modified from ~~consistent with~~ the default requirements of Provisions E.2.b-e~~a-d~~ ~~and~~ to be consistent with the strategies identified in the Water Quality Improvement Plan;

(3) The requirements of the programs as outlined in the following sub-provisions may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality improvement Plan(s).

a. NON-STORM WATER DISCHARGES

To the extent allowable by law, each~~Each~~ Copermittee must address all non-storm water discharges ~~from~~into the MS4 as illicit discharges, where the likelihood exists that they are a source of pollutants to the Receiving Waters, unless ~~a non-storm water~~the discharge is either identified as a discharge authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that is consistent with~~must be addressed pursuant to~~ the following requirements:

(1) ~~Discharges of non-storm water to the MS4 from the following categories must be addressed as illicit dischargeunless the discharge has coverage under NPDES Permit No. CAG919001 (Order No. R9-2007-0034, or subsequent order) for discharges to San Diego Bay, or NPDES Permit No. CAG919002 (Order No. R9-2008-0002, or subsequent order) for discharges to surface waters other than San Diego Bay.~~

Comment [A76]: See discussion in section 3.7.2 of the comment letter.

~~(a) Uncontaminated pumped ground water;~~

~~(b) Discharges from foundation drains;~~[20]

~~(c) Water from crawl space pumps; and~~

~~(d) Water from footing drains.~~[19]

(2) Discharges of non-storm water from water line flushing and water main breaks to the MS4 must be addressed as illicit discharges unless the discharge has coverage under a valid NPDES Permit, ~~No. CAG 679001~~ (Order No. R9-2010-0003, or a subsequent order). This category includes potable water line flushing ~~and water main break~~ discharges from water purveyors issued a water supply permit by the California Department of Public Health or federal military installations. Discharges from recycled or reclaimed water lines to the MS4 must be addressed as illicit discharges, unless the discharges have coverage under a separate NPDES permit.

Comment [A77]: See discussion in section 3.7.2 of the comment letter.

(3) Discharges of non-storm water into the MS4 from the following categories must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the individual discharge as a source of pollutants to receiving waters:

Comment [A78]: See discussion in section 3.7.2 of the comment letter.

(a) Diverted stream flows;

(b) Rising ground waters;

(c) Uncontaminated ground water infiltration to MS4s;

(d) Uncontaminated pumped ground water;

(e) Springs;

(f) Water from crawl space pumps;

~~(e)~~(g) Flows from riparian habitats and wetlands;

(h) Landscape irrigation;

(i) Irrigation water;

(j) Lawn watering;

Comment [A79]: See Legal Comments discussion.

[20] ~~Provision E.2.a.(1) only applies to this category on non-storm water if the system is designed to be located at or below the highest historical groundwater table to actively or passively extract groundwater during any part of the year.~~

~~(d)~~(k) Discharges from potable water sources;

~~(e)~~(l) Discharges from foundation drains;[21] ~~and~~

(m)Discharges from footing drains. .[21]

(4) Discharges of non-storm water into the MS4 from the following categories must be controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means. ~~Discharges of non-storm water to the MS4 from the following categories not controlled by the requirements given below through~~ If such statutes, ordinances, permits, contracts, orders, or similar means have not been enacted by the Copermittee, the applicable categories below must be addressed by the Copermittee as illicit discharges.

(a) Air conditioning condensation

The discharge of air conditioning condensation should~~must~~ be directed to landscaped areas or other pervious surfaces where feasible.

(b) Individual residential vehicle washing

(i) The discharge of wash water ~~must~~ should be directed to landscaped areas or other pervious surfaces where feasible; and

(ii) Minimize the use of water for vehicle washing, use as little washing detergent and other vehicle wash products as possible, wash vehicles at commercial wash facilities, and implement other practices or behaviors that will prevent the discharge of pollutants associated with individual residential vehicle washing from entering the MS4.

(c) Dechlorinated swimming pool discharges

(i) Eliminate residual chlorine, algaecide, filter backwash, or other pollutants from swimming pools prior to discharging to the MS4; and

(ii) The discharge of saline swimming pool water must be directed to the sanitary sewer, landscaped areas, or other pervious surfaces that can accommodate the volume of water, unless the saline swimming pool water can be discharged via a pipe or concrete channel directly to a naturally saline water body (e.g. Pacific Ocean).

(5) Firefighting discharges to the MS4 must be addressed by the Copermittee as

Comment [A80]: See discussion in section 3.7.2 of the comment letter.

Comment [A81]: See discussion in section 3.7.2 of the comment letter.

[21] ~~Provision E.2.a.(3) only applies to this category of non-storm water discharge if the system is designed to be located above the highest historical groundwater table at all times of the year, and the system is only expected to discharge non-storm water under unusual circumstances.~~

follows:illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a significant source of pollutants to receiving waters. Firefighting discharges to the MS4 not identified as a significant source of pollutants to receiving waters, must be addressed, at a minimum, as follows:

(a) Non-emergency firefighting discharges

(i) Building fire suppression system maintenance discharges (e.g.., sprinkler line flushing) to the MS4 must be addressed as illicit discharges unless appropriate BMPs are implemented.

(ii) Non-emergency firefighting discharges (i.e., discharges from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems) must be addressed by a program, to be developed and implemented by the Copermittee in conjunction with the local Fire Authority/District, to reduce or eliminate pollutants in such discharges from entering the MS4.

(b) Emergency firefighting discharges (i.e., flows necessary for the protection of life or property) do not require BMPs and need not be prohibited.

Each Copermittee should develop and encourage implementation of BMPs to reduce or eliminate pollutants in emergency firefighting discharges to the MS4s and receiving waters within its jurisdiction. During emergency situations, priority of efforts should be directed toward life, property, and the environment (in descending order). BMPs should not interfere with immediate emergency response operations or impact public health and safety.

(6) If the Copermittee or San Diego Water Board identifies any category of non-storm water discharges listed under Provisions E.2.a.(1)-(4) as a source of pollutants to receiving waters, the category must be effectively prohibited through ordinance, order, or similar means and addressed as an illicit discharge.

(7) Each Copermittee must, where feasible, reduce or eliminate non-storm water discharges listed under Provisions E.2.a.(1)-(4) into its MS4 whether or not the non-storm water discharge has been identified as an illicit discharge, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit.

Comment [A82]: See discussion in section 3.7.2 of the comment letter.

b. Prevent And Detect Illicit Discharges And Connections

Each Copermittee must include the following measures within its program to prevent and detect illicit discharges to the MS4:

(1) Each Copermittee must maintain an updated map of its entire MS4 and the corresponding drainage areas. The accuracy of the MS4 map must be confirmed during the field screening required pursuant to Provision E.2.c. The MS4 map must be included as part of the jurisdictional runoff management program document. Any geographic information system (GIS) layers or files used by the Copermittee to maintain the MS4 map must be made available to the San Diego Water Board upon request. The MS4 map must identify the following:

(a) All segments of the MS4 owned, operated, and maintained by the Copermittee;

(b) All known locations of inlets that discharge and/or collect runoff into the Copermittee's MS4;

(c) All known locations of connections with other MS4s not owned or operated by the Copermittee (e.g. Caltrans MS4s);

(d) All known locations of major MS4 outfalls as defined by 40 CFR §122.26(b)(5-6) ~~and private outfalls,~~ that discharge runoff collected from areas within the Copermittee's jurisdiction;

Comment [A83]: See discussion in section 3.7.2 of the comment letter.

(e) All segments of receiving waters within the Copermittee's jurisdiction that receive and convey runoff discharged from the Copermittee's MS4 outfalls;

(f) Locations of the MS4 outfalls, identified pursuant to Provision D.2.a.(1), within its jurisdiction; and

(g) Locations of the non-storm water persistent flow MS4 outfall discharge monitoring stations, identified pursuant to Provision D.2.b.(2)(b), within its jurisdiction.

(2) Each Copermittee must use Copermittee personnel and contractors to assist in identifying and reporting illicit discharges and connections during their daily employment activities.

(3) Each Copermittee must promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges to or from the MS4, including the following methods for public reporting:

(a) Operate a public hotline, which can be Copermittee-specific or shared by the Copermittees, and must be capable of receiving reports in both English and Spanish 24 hours per day and seven days per week; and

(b) Designate an e-mail address for receiving electronic reports from the public, which can be Copermittee-specific or shared by the Copermittees, and must be prominently displayed on the Copermittee's webpage and the Regional Clearinghouse required pursuant to Provision F.4.

(4) Each Copermittee must implement practices and procedures (including a notification mechanism) to prevent, respond to, contain, and clean up any spills that may discharge into the MS4 within its jurisdiction from any source. Such practices and procedures may include the coordination with other parties, such as sanitary sewer operators. The Copermittee must coordinate, to the extent possible, with spill response teams to prevent entry of spills into the MS4~~, and prevent contamination of surface water, ground water, and soil.~~ The Copermittee must coordinate spill prevention, containment, and response activities throughout all appropriate internal~~Copermittee~~ departments, programs, and agencies.

Comment [A84]: See discussion in section 3.7.2 of the comment letter.

(5) Each Copermittee must implement practices and procedures to ~~prevent~~ control and limit infiltration of seepage from sanitary sewers owned by a Copermittee agency (including private laterals and failing septic systems) to the MS4.

(6) Each Copermittee shall~~must~~ coordinate, when necessary, with upstream Copermittees and/or entities to prevent illicit discharges from upstream sources into the MS4 within its jurisdiction.

c. FIELD SCREENING

Each Copermittee must conduct field screening (i.e. visual observations, field testing, and/or analytical testing) of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4 in accordance with the dry weather MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

d. INVESTIGATE AND ELIMINATE ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to investigate and eliminate illicit discharges to the MS4 to comply with provision A.1.b:

(1) Each Copermittee must prioritize and determine when follow-up investigations will be performed in response to visual observations and/or water quality monitoring data collected during an investigation of a detected non-storm water ~~or~~ illicit discharge into or from the MS4. The criteria for prioritizing investigations must consider the following:

(a) Pollutants identified as causing or contributing to the highest water quality

priorities identified in the Water Quality Improvement Plan;

(b) Pollutants identified as causing or contributing, or threatening to cause or contribute to impairments in water bodies on the 303(d) List and/or in environmentally sensitive areas (ESAs), located within its jurisdiction;

(c) Pollutants identified from sources or land uses known to exist within the area, drainage basin, or watershed that discharges to the portion of the MS4 within its jurisdiction included in the investigation;

(d) Pollutants identified as causing or contributing to an exceedance of a NAL in the Water Quality Improvement Plan, where the source has not been identified as natural or otherwise permitted; and

(e) Pollutants identified as an immediate and significant threat to human health or the environment.

(2) Each Copermittee must implement procedures to investigate and inspect portions of its MS4 that, based on reports or notifications, field screening, or other appropriate information, indicate a reasonable potential of receiving, containing, or discharging pollutants due to illicit discharges, or illicit connections~~, or other sources of non-storm water~~. The procedures must include the following:

(a) Each Copermittee must develop criteria to:

(i) Assess the validity of each report or notification received; and

(ii) Prioritize the response to each report or notification received.

(b) Each Copermittee must prioritize and respond to each valid report or notification (e.g., public reports, staff or contractor reports and notifications, etc.) of an incident in a timely manner.

(c) ~~Each~~In accordance with the procedures defined in Provision E.2.d.(1), each~~Each~~ Copermittee must investigate and seek to identify the source(s) of discharges of non-storm water illicit discharges or illicit connections ~~where flows are~~ observed into and from the MS4 during the field screening required pursuant to Provision D.2.b.(1) as follows:

(i) Obvious illicit discharges (i.e., unusual color or odor) must be immediately investigated to identify the source(s) of non-storm water illegal discharges;

(ii) The investigation must include field investigations to identify sources or potential sources for the discharge, unless the source or potential source has already been identified during previous investigations; and

(iii) The investigation may include follow-up field investigations and/or reviewing Copermittee inventories and other land use data to identify potential sources of the discharge.

(d) Each Copermittee must maintain records and a database of the following information:

(i) Location of incident, including hydrologic subarea, portion of MS4 receiving the non-storm water ~~or~~ illicit discharge, and point of discharge or potential discharge from MS4 to receiving water;

(ii) Source of information initiating the investigation (e.g., public reports, staff or contractor reports and notifications, field screening, etc.);

(iii) Date the information used to initiate the investigation was received;

(iv) Date the investigation was initiated;

(v) Dates of follow-up investigations;

(vi) Identified or suspected source of the illicit discharge or connection, if determined;

(vii) Known or suspected related incidents, if any;

(viii) Result of the investigation; and

(ix) If a source cannot be identified and the investigation is not continued, a rationale for why a discharge does not pose a threat to water quality and/or does not require additional investigation.

(e) Each Copermittee must ~~track~~ document, and where feasible quantify, any readily~~and seek to~~ identifiable~~y~~ the source(s) of non-storm water illegal discharges from the MS4 where there is evidence of non-storm water ~~having been discharged~~illegal discharges or connections into or from the MS4 (e.g., pooled water), in accordance with MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.

Comment [A85]: See discussion in section 3.7.2 of the comment letter.

(3) Each Copermittee must initiate the implementation of procedures, in a timely manner, to eliminate all detected and identified illicit discharges and connections within its jurisdiction. The procedures must include the following responses:

(a) Each Copermittee must enforce its legal authority, as required under Provision E.1, to eliminate illicit discharges and connections to the MS4.

(b) If the Copermittee identifies the source as a controllable source of non-storm water ~~or~~ illicit discharge or connection, the Copermittee must implement its Enforcement Response Plan pursuant to Provision E.6 and enforce its legal authority to effectively prohibit and with the goal of eliminating~~e~~ illicit discharges and connections to its MS4.

(c) If the Copermittee identifies the source of the discharge as a category of non-storm water discharges in Provision E.2.a, and the discharge is in exceedance of NALs in the Water Quality Improvement Plan, then the Copermittee must determine if: (1) this is an isolated incident or set of circumstances that will be addressed through its Enforcement Response Plan pursuant to Provision E.6, or (2) the category of discharge must be addressed through the effective prohibition of that category of discharge as an illicit discharge pursuant to Provision E.2.a.(6).

(d) If the Copermittee suspects the source of the non-storm water discharge as natural in origin (i.e. non-anthropogenically influenced) and in conveyance into the MS4, then the Copermittee must document and provide the data and evidence necessary to demonstrate to the San Diego Water Board that it is natural in origin and does not require further investigation.

(e) If the Copermittee identifies that the discharge is coming from another Copermittees' jurisdiction, the receiving Copermittee must document and provide the findings to the upstream Copermittee. The obligation to implement the requirements of provision E.2.d.(3) are thenceforth the responsibility of the upstream Copermittee.

(f) If the Copermittee identifies the source as a non-storm water discharge that has been separately authorized by the San Diego Water Board, or that is contributing pollutants to the MS4 and that may require coverage under a WDR from the San Diego Water Board, the Copermittee shall provide all relevant findings to the San Diego Water Board and may back charge the Regional Board for the entire cost of conducting the source investigation.

Comment [A86]: See discussion in section 3.7.2 of the comment letter.

~~(e)~~(g) If the Copermittee is unable to identify and document the source of a recurring non-storm water discharge to or from the MS4, then the Copermittee must ~~address the discharge as an illicit discharge and~~ update its jurisdictional runoff management program to address the common and suspected sources of the non-storm water discharge within its jurisdiction in accordance with the Copermittee's priorities.

(4) Each Copermittee must submit a summary of the non-storm water discharges and illicit discharges and connections investigated and eliminated within its jurisdiction with each Annual Report required under Provision F.3.b of this Order.

3. Development Planning

Comment [A87]: See discussion in section 3.8 of the comment letter.

Each Copermittee must, within their jurisdiction, use their land use and planning

authorities, to the extent that they may lawfully impose requirements, to implement a development planning program in accordance with the strategies identified in the Water Quality Improvement Plan and includes, at a minimum, the following requirements:

STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Comment [A88]: See discussion in section 3.8.2 of the comment letter.

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the development planning program to address development and redevelopment projects that may become sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional or alternative BMPs, focus education, increase frequency of verifications and/or inspections, alternative compliance options);

(2) Each Copermittee must identify areas within its jurisdiction where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting and/or stream, channel, or habitat rehabilitation projects;

(3) Each Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify regional alternative compliance projects that Priority Development Projects may be allowed or should be encouraged to implement or participate in implementing; and

(4) The requirements of the programs as outlined in the following sub-provisions may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality improvement Plan(s).~~The strategies and/or activities must be consistent with the requirements of Provisions E.3.a-c and E.3.e-f and the strategies identified in the Water Quality Improvement Plan.~~

a. BMP REQUIREMENTS FOR ALL DEVELOPMENT PROJECTS

Each Copermittee, as practical and feasible, must prescribe the following BMP requirements during the planning process (i.e. prior to project approval and issuance of local permits) for all development projects (regardless of project type or size), where local permits are issued, including unpaved roads and flood management projects, except emergency / public safety projects implemented for the protection of persons and property:

(1) General Requirements

(a) Onsite BMPs must be located so as to remove pollutants from runoff prior to its discharge to any receiving waters, and as close to the source as possible; and

(b) Structural BMPs must not be constructed within a waters of the U.S.. ~~or waters of the state.~~

(2) Source Control BMP Requirements

The following source control BMPs must be implemented at all development projects where applicable and feasible:

(a) Prevention of illicit discharges into the MS4;

(b) Storm drain system stenciling or signage;

(c) Properly designed outdoor material storage areas;

(d) Properly designed outdoor work areas;

(e) Properly designed trash storage areas; and

(f) Any additional BMPs determined necessary by the Copermittee to minimize pollutant generation at each project.

(3) Low Impact Development (LID) ~~BMP Requirements~~Principles

Comment [A89]: See discussion in section 3.8.2 of the comment letter.

The following LID ~~BMPs~~ Principles must be implemented at all development projects where applicable and feasible:

(a) Maintenance or restoration of natural storage reservoirs and drainage corridors (including topographic depressions, areas of permeable soils, natural swales, and ephemeral and intermittent streams);[22]

(b) Buffer zones for natural water bodies (where buffer zones are technically infeasible, require project applicant to include other buffers such as trees, access restrictions, etc.);

(c) Conservation of natural areas within the project footprint including existing trees, other vegetation, and soils;

[22] Development projects proposing to dredge or fill materials in waters of the U.S. must obtain a CWA Section 401 Water Quality Certification. Projects proposing to dredge or fill waters of the state must obtain waste discharge requirements.

(d) Construction of streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided public safety is not compromised;

(e) Minimization of the impervious footprint of the project;

(f) Minimization of soil compaction to landscaped areas;

(g) Disconnection of impervious surfaces through distributed pervious areas;

(h) Landscaped or other pervious areas designed and constructed to effectively receive and infiltrate, retain and/or treat runoff from impervious areas, prior to discharging to the MS4;

(i) Small collection strategies located at, or as close as possible to, the source (i.e. the point where storm water initially meets the ground) to minimize the transport of runoff and pollutants to the MS4 and receiving waters;

(j) Use of permeable materials for projects with low traffic areas and appropriate soil conditions;

(k) Landscaping with native or drought tolerant species; and

(l) Harvesting and using precipitation.

b. PRIORITY DEVELOPMENT PROJECTS

(1) Definition of Priority Development Project

Priority Development Projects include the following:

(a) All new development projects that fall under the Priority Development Project categories listed under Provision E.3.b.(2) (where a new development project feature, such as a parking lot, falls into a Priority Development Project category, the entire project footprint is subject to Priority Development Project requirements); and

(b) Those redevelopment projects that create, add, or replace at least 5,000 square feet of impervious surfaces on an already developed site, and the redevelopment project is a Priority Development Project category listed under Provision E.3.b.(2) (where redevelopment results in an increase of less than fifty percent of the impervious surfaces of a previously existing development, and the existing development was not subject to Priority Development Project requirements, the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) apply only to the addition or replacement, and not to the entire development; where redevelopment

results in an increase of more than fifty percent of the impervious surfaces of a previously existing development, the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) apply to the entire development).

(c) Projects where redevelopment results in an increase of more than fifty percent of impervious surfaces of a previously existing development, and the existing development *was* subject to previous Priority Project Development Requirements, only the altered portion of development is subject to the new Priority Development Project requirements.

Comment [A90]: See discussion in section 3.8.2 of the comment letter.

(2) Priority Development Project Categories

Comment [A91]: See discussion in section 3.8.2 of the comment letter.

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This category includes commercial, industrial, residential, mixed-use, and public development projects on public or private land which fall under the planning and building authority of the Copermittee.

(b) New development projects that create 5,000 square feet or more of impervious surfaces (collectively over the entire project site), and are designed for support one or more of the following uses (see Appendix for definitions):

(i) Automotive repair shop
(ii) Restaurant
(iii) Parking lot[23]
(iv) Street, road, highway, freeway
(v) Retail gasoline outlet (RGO)

Comment [A92]: See footnote

~~(b) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.~~

~~(c) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812), where the land area for development is 5,000 square feet or more.~~

~~(d) Hillside development projects. This category includes any development which creates 5,000 square feet or more of impervious surface which is~~

[23] Excluding parking lots that are not subject to runoff, such as but not limited to covered or subterranean parking lots

located in an area with known erosive soil conditions, where the development will grade on any natural slope that is twenty-five percent or greater.

(e)(c) New development projects that create 2,500 square feet or more of impervious surfaces (collectively over the entire project site), and are Environmentally sensitive areas (ESAs). This category includes any development located within, directly adjacent to, or discharging directly to an ESA, which either creates 2,500 square feet of impervious surface on a proposed project site or increases the area of imperviousness of a proposed project site to 10 percent or more of its naturally occurring condition. "Directly adjacent to" means situated within 200 feet of the ESA. "Discharging directly to" means outflow from a drainage conveyance system that collects runoff from the subject development or redevelopment site and terminates at or in receiving waters within the ESA and is not commingled with flows from adjacent or other upstream lands.

(f) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce that has 5,000 square feet or more of impervious surface.

(g) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface that is 5,000 square feet or more used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

(h) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

(i)(d) Large development projects. This category includes any post-construction pollutant-generating new development projects that result in the permanent disturbance of one acre or more of land.

(3) Priority Development Project Exemptions

Comment [A93]: See discussion in section 3.8.2 of the comment letter.

Each Copermittee has the discretion to exempt the following projects from being defined as Priority Development Projects:

(a) New paved sidewalks, driveways, parking lots, bicycle lanes, or trails that meet the following criteria:

(i) Designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas; OR

(ii) Designed and constructed to be hydraulically disconnected from paved streets or roads; OR

(iii) Designed and constructed with permeable pavements or surfaces in accordance with USEPA Green Streets guidance.[24]

(b) Any impervious surface that is 5,000 square feet or more used for the transportation of automobiles, trucks, motorcycles, and other vehicles that is designed and constructed to the Maximum Extent Practicable in accordance with the USEPA Green Streets Guidance "Managing Wet Weather with Green Infrastructure: Green Streets"[25]. ~~Retrofitting of existing paved alleys, streets or roads that meet the following criteria:~~

~~(i) Must be two lanes or less; AND~~

~~(ii) Must be a retrofitting project implemented as part of an alternative compliance project option under Provision E.3.c.(3)(b)(v) to achieve the performance requirements of Provisions E.3.c.(1) and/or E.3.c.(2) for a Priority Development Project; AND~~

~~(iii) Designed and constructed in accordance with the USEPA Green Streets guidance.[26]~~

(c) Single-family residential projects that meet the following criteria:

(i) Must not be constructed as part of a larger development or proposed subdivision;

(ii) Successfully incorporate and document that they have incorporated, each of the applicable Source Control and LID BMP strategies identified in provisions E.3.a.(2)-(3) to the MEP.

~~(c) New single family residences that meet the following criteria:~~

~~(i) Must not be constructed as part of a larger development or proposed subdivision; AND~~

~~(ii) Designed and constructed to be certified under the U.S. Green Building Council (USGCB) Leadership in Energy and Environmental Design (LEED) for Homes green building certification program, receiving at least four (4) Surface Water Management credits under the Sustainable Sites category[27] OR~~

~~Designed and constructed with structural BMPs that will achieve the~~

[24] USEPA. 2008. http://water.epa.gov/infrastructure/greeninfrastructure/upload/gi_munichandbook_green_streets.pdf and http://water.epa.gov/infrastructure/greeninfrastructure/gi_policy.cfm#municipalhandbook ~~See "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).~~

~~[26] Ibid.~~

~~[27] See LEED for Homes rating system at http://www.usgbc.org~~

~~performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite~~

~~(d) Redevelopment of existing single family residences that meet the following criteria:~~

~~(i) Designed and constructed to be certified under the USGCB LEED for Homes green building certification program, receiving at least four (4) Surface Water Management credits under the Sustainable Sites category;[28] OR~~

~~(ii) Designed and constructed with structural BMPs that will achieve the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite.~~

(d) Watershed Protection Projects that meet the following criteria:

(i) Projects undertaken to rehabilitate or prevent environmental, social, and economic damage to the watershed, including receiving waters, by providing one or more of the following:

- Water quality protection by the proper management of stormwater and floodplains
- Flood risk reduction to adjacent land uses, stored matter and stockpiled material
- Elimination of the comingling of stormwater and hazardous materials
- Erosion Mitigation
- Restoration of Rivers and Ecosystems
- Groundwater Recharge
- Creation of new open space and wetlands
- Programs for water conservation, stormwater capture and management
- Retrofit projects constructed to improve water quality or address hydromodification.

(ii) AND are not expected to be pollutant generating or are designed to reduce existing pollutant loads

(iii) AND incorporate and document that they have incorporated, each of the applicable Source Control and LID BMP strategies identified in provisions E.3.a.(2)-(3) to the MEP.

(e) Emergency public safety projects in any of the Priority Development Categories may be excluded if the delay caused due to the requirement for a SSMP compromises public safety, public health and/or environmental protection

[28] ~~See LEED for Homes rating system at http://www.usgbc.org~~

c. Priority Development Project Structural BMP Performance Requirements

In addition to the BMP requirements listed for all development projects under Provision E.3.a, Priority Development Projects must also implement structural BMPs that conform to performance requirements below. If watershed-specific performance requirements are ~~may be~~ developed as part of a Water Quality Improvement Plan; these requirements would take precedence over the general performance requirements below. The watershed-specific requirement must provide at least equal protection as the general performance requirements below.

(1) Storm Water Pollutant Control BMP Requirements

Comment [A94]: See discussion in section 3.8.2 of the comment letter.

Each Copermittee must require each Priority Development Project to implement onsite structural BMPs to control pollutants in storm water that may be discharged from a project as follows:

(a) Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite the pollutants contained in the design capture volume. The design capture volume is equivalent to:

(i) The volume of storm water runoff produced from a 24-hour 85th percentile storm event;[29] OR

(ii) The volume of storm water runoff produced from a 24-hour 85th percentile storm event, that would be retained onsite ~~if~~ in the pre-project condition. ~~site was fully undeveloped and naturally vegetated~~, ~~as determined using continuous simulation modeling techniques based on site-specific soil conditions and typical native vegetative cover.~~

(b) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of~~to~~ complying with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1)(a).

~~(c) If a Priority Development project is allowed to utilize alternative compliance pursuant to Provisions E.3.c.(1)(b), flow-thru conventional~~

[29] This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals. The volume is a single event-based volume that occurs after an extended dry period.

~~treatment control BMPs must be implemented to treat the portion of the design capture volume that is not retained onsite. Additionally, project applicants must mitigate for the portion of the pollutant load in the design capture volume that is not retained onsite through one or more alternative compliance options under Provision E.3.c.(3). Conventional treatment control BMPs must be sized and designed to:~~

~~(i) Remove pollutants from storm water to the MEP;~~

~~(ii) Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;~~

~~(iii) Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Conventional treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of conventional treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.~~

(2) Hydromodification Management BMP Requirements

Comment [A95]: See discussion in section 3.8.2 of the comment letter.

Each Copermittee must require each Priority Development Project disturbing greater than one acre to implement management measures~~onsite structural BMPs~~ to ensure ~~manage hydromodification~~ that ~~may be caused by~~ storm water runoff discharged from the~~a~~ project won't cause adverse Hydromodification impacts in the downstream receiving waters as follows:

The Copermittees in each Watershed Management Area may establish within the WQIP, watershed specific mitigation requirements that will apply to priority development projects, based on the susceptibility of the receiving waters to Hydromodification impacts caused by the project, and consistent with the priorities and strategies identified in the WQIP. Such requirements may be uniform across a Hydrologic Unit, or identified at an appropriate smaller scale to ensure that receiving waters are properly protected.

(a) Post-project runoff flow rates and durations must not exceed pre-project ~~development (naturally occurring)~~ runoff flow rates and durations by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat conditions downstream of Priority Development Projects~~)~~.

(i) In evaluating the range of flows that results in increased potential for

erosion of natural (non-hardened) channels, the lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks.

~~(ii) For artificially hardened channels, analysis to identify the lower boundary must use characteristics of a natural stream segment similar to that found in the watershed. The lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or erodes the toe of the channel banks.~~

~~(iii)~~(ii) The Copermittees may use monitoring results collected pursuant to Provision D.1.a.(2) to re-define the range of flows resulting in increased potential for erosion, or degraded instream habitat conditions, as warranted by the data.

(b) Priority Development Projects ~~Post-project runoff flow rates and durations~~ must implement appropriate measures to minimize the ~~compensate for~~ the loss of sediment supply delivered ~~due~~ to the Receiving Waters, consistent with WQIP priorities, ~~development project,~~ should loss of sediment supply be anticipated to occur as a result of the development project.

(c) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of~~to comply with~~ the performance requirements of Provisions E.3.c.(2)(a)-(b).

(d) Exemptions

Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provisions E.3.c.(2)(a)-(b) where the project:

(i) Discharges storm water runoff into existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;

(ii) Discharges of storm water into conveyance channels whose bed and bank are engineered and maintained for the 10-year ultimate development flow rate all the way from the point of discharge from the project to an water body that is sufficiently resistant to hydromodification (water storage reservoirs, lakes, enclosed embayments, pacific ocean, or other water bodies identified in the WQIP);

~~(ii)~~(iii) Is a redevelopment Priority Development Project that meets the alternative compliance requirements of Provision E.3.c.(3)(b)(ii); or

~~(iii)~~(iv) Discharges storm water runoff into other areas identified by the San Diego Water Board as exempt from the requirements of Provisions E.3.c.(2)(a)-(b), through an approved WQIP.

(3) Alternative Compliance to Onsite Structural BMP Performance Requirements

Comment [A96]: See discussion in section 3.8.2 of the comment letter.

(a) Applicability

At the discretion of each Copermittee, Priority Development Projects may be allowed to implement one or more of the alternative compliance project options described in E.3.c.(3)(b) below, in lieu of complying with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2), under the following conditions:

(i) The Copermittee must determine that implementation of the alternative compliance option will have an equal or greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite;

(ii) The alternative compliance options must be designed by a registered professional engineer, geologist, architect, biologist, hydrologist, landscape architect, or other appropriate certified professional;

(iii) The alternative compliance option must be consistent with the strategies developed within the WQIP, for the highest priority water quality conditions.

(iv) The alternative compliance options must be implemented within the same Watershed Management Area as the Priority Development Project, and preferably within the same hydrologic subarea;

(v) The alternative compliance options must have reliable sources of funding for operation and maintenance.

(b) Alternative Compliance Options

(i) *LID Biofiltration Treatment Control BMPs*

LID biofiltration treatment control BMPs may be used as an alternative compliance option if the BMPs are sized and designed to:

[a] Remove pollutants from storm water to the MEP; AND
[b] Have an appropriate surface loading rate to prevent erosion, scour and channeling; AND
[c] Biofilter at least 1.0 times the design capture volume that is not reliably retained onsite

(ii) *LEED Certified Redevelopment Projects*

Priority Development Projects that are designed and constructed to be certified under the USGCB LEED for New Construction and Major Renovations green building certification program, or other locally accepted certification of equivalent effectiveness, may be considered as an acceptable alternative compliance option if the project meets the following criteria:

[a] The project is designed to receive at least: One (1) Site Design credit, and Two (2) Stormwater Design credits under the Sustainable Sites category.[30] , and

[b] The existing and future configuration of the receiving water must not be unnaturally altered or adversely impacted by the project.

(iii) *Watershed-Based Planned Development Projects*

Priority Development Projects greater than 100 acres in total project size (or smaller than 100 acres in size yet part of a larger common plan of development that is over 100 acres) may be considered as an acceptable alternative compliance option if the project meets the following conditions:

[a] The Priority Development Project was planned utilizing watershed and/or subwatershed based water quality, hydrologic, and fluvial geomorphologic planning principles that implement regional LID BMPs in accordance with the performance and location criteria of this Order and acceptable to the San Diego Water Board;

[b] Regional LID BMPs may be used provided that the BMPs capture and retain the volume of runoff produced from the design capture volume defined in Provision E.3.c.(1)(a)(i) and that such controls are located upstream of receiving waters;

[c] Regional LID BMPs must clearly exhibit that they will not result in a net impact from pollutant loadings over and above the impact caused by capture and retention of the design capture volume;

[d] Any portion of the design capture volume that is not retained by the regional LID BMPs must be treated using biofiltration BMPs; and

[e] Where regional LID BMPs are demonstrated to the Copermittee as technically infeasible to retain the entire design capture volume, any volume up to and including the design capture volume not retained by regional LID BMPs, nor treated by biofiltration BMPs, must be treated using conventional treatment control BMPs and the project applicant must implement additional alternative compliance project, in-lieu fee and/or water quality

[30] See LEED for New Construction and Major Renovations rating system at http://www.usgbc.org

credit system options below.

(iv) *Offsite Projects*

Offsite Projects, such as but not limited to Regional BMPs; Retrofitting Projects; Channel, Stream or Habitat Rehabilitation Projects; Water Supply Augmentation Projects; or other Offsite Projects proposed by a project proponent, may be considered as an acceptable alternative compliance option if the offsite project meets the following requirements:

- The project must provide a net result of at least the same level of pollutant removal, and/or protection from potential downstream and upstream erosion in the receiving water as would be required to meet the performance requirements of Provision E.3.c.(1) and E.3.c.(2), as applicable.
- The project must be consistent with the strategies identified in the WQIP.
- The project must be constructed and operational prior to occupancy being granted for the PDP.

(v) *Conventional Treatment Control BMPs*

Onsite Conventional Treatment Control BMPs may be used as an alternative compliance option, only if the following criteria have been met:

[a] It has been demonstrated to the satisfaction of the Copermittee that it is technically infeasible to comply with the onsite requirements of E.3.c.(1), AND

[b] It has been demonstrated to the satisfaction of the Copermittee that it is technically infeasible to implement onsite Biofiltration Treatment Control BMPs, AND

[c] The Conventional Treatment Control BMPs will remove pollutants from storm water to the MEP; AND

[d] The Conventional Treatment Control BMPs will filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two; AND

[e] The Conventional Treatment Control BMPs are ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Conventional treatment control BMPs with a low removal

efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of conventional treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

~~(a) Applicability~~

~~At the discretion of each Copermittee, Priority Development Projects may be allowed to utilize an alternative option to comply with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) under the following conditions:~~

~~(i) The Copermittee must determine that implementation of the alternative compliance option will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite;~~

~~(ii) The alternative compliance options must be designed by a registered professional engineer, geologist, architector landscape architect;~~

~~(iii) The alternative compliance options must be implemented within the same hydrologichydrologic unit as the Priority Development Project, and preferably within the same hydrologic subarea;~~

~~(iv) Receiving waters must not be utilized to convey storm water runoff to the alternative compliance options;~~

~~(v) The pollutants in storm water runoff from the Priority Development Project must be treated to the MEP by the alternative compliance options prior to being discharged to receiving waters;~~

~~(vi) Unless otherwise allowed by Provision E.3.c.(3)(b), the alternative compliance options must have a net result of at least the same level of pollutant removal as would have been achieved if the Priority Development Project had fully complied with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1) onsite;~~

~~(vii) Unless otherwise allowed by Provision E.3.c.(3)(b), the alternative compliance options must have a net result of at least the same level of protection from potential downstream and upstream erosion in the receiving water as would have been achieved if the Priority Development Project had fully complied with the hydromodification management BMP performance requirements of Provision E.3.c.(2) onsite; and~~

~~(viii) The alternative compliance options utilized by the Priority Development Project must have reliable sources of funding for operation and maintenance.~~

~~(b) Alternative Compliance Project Options~~

~~The Copermittee may allow implementation of one or more of the following project options as part of an alternative approach to complying with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2):~~

~~(i) *Onsite LID Biofiltration Treatment Control BMPs*~~

~~The Copermittee may allow Priority Development Projects to utilize onsite LID biofiltration treatment control BMPs to comply with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1). Onsite LID biofiltration treatment control BMPs must be sized and designed to:~~

~~[a] Remove pollutants from storm water to the MEP; AND~~
~~[b] Have an appropriate surface loading rate to prevent erosion, scour and channeling within the BMP; AND~~
~~[c] Biofilter at least 1.5 times the design capture volume that is not reliably retained onsite; OR~~
~~[d] Biofilter up to the design capture volume that is not reliably retained onsite, AND 1) treat the remaining portion of the design capture volume not retained onsite with conventional treatment control BMPs in accordance with Provision E.3.c.(1)(c), and 2) if necessary, mitigate for the portion of the pollutant load in the design capture volume not retained onsite through one or more alternative compliance project, in-lieu fee and/or water quality credit system options below.~~

~~(ii) *LEED Certified Redevelopment Projects*~~

~~The Copermittee may allow redevelopment Priority Development Projects to comply with designed and constructed to be certified under the USGCB LEED for New Construction and Major Renovations green building certification program. The Priority Development Project must receive at least one (1) Site Design credit and two (2) Stormwater Design credits under the Sustainable Sites category.[31] In addition, the existing and future configuration of the receiving water must not be unnaturally altered or adversely impacted by storm water flow rates and durations discharged from the site.~~

~~(iii) *Watershed Based Planned Development Projects*~~

~~The Copermittee may allow Priority Development Projects greater than 100 acres in total project size (or smaller than 100 acres in size~~

~~[31] See LEED for New Construction and Major Renovations rating system at http://www.usgbc.org~~

~~yet part of a larger common plan of development that is over 100 acres) to comply with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2). The Priority Development Project must comply with the following conditions:~~

~~[a] The Priority Development Project was planned utilizing watershed and/or subwatershed based water quality, hydrologic, and fluvial geomorphologic planning principles that implement regional LID BMPs in accordance with the performance and location criteria of this Order and acceptable to the San Diego Water Board;~~

~~[b] Regional LID BMPs may be used provided that the BMPs capture and retain the volume of runoff produced from the design capture volume defined in Provision E.3.c.(1)(a)(i) and that such controls are located upstream of receiving waters;~~

~~[c] Regional LID BMPs must clearly exhibit that they will not result in a net impact from pollutant loadings over and above the impact caused by capture and retention of the design capture volume;~~

~~[d] Any portion of the design capture volume that is not retained by the regional LID BMPs must be treated using biofiltration BMPs; and~~

~~[e] Where regional LID BMPs are demonstrated to the Copermittee as technically infeasible to retain the entire design capture volume, any volume up to and including the design capture volume not retained by regional LID BMPs, nor treated by biofiltration BMPs, must be treated using conventional treatment control BMPs and the project applicant must implement additional alternative compliance project, in-lieu fee and/or water quality credit system options below.~~

~~(iv) *Offsite Regional BMPs*~~

~~[a] The Copermittee may allow Priority Development Projects to utilize offsite regional BMPs to comply with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1) if the offsite regional BMPs have the capacity to receive and retain at least 1.1 times the design capture volume that is not reliably retained onsite.~~

~~[b] The Copermittee may allow Priority Development Projects to utilize offsite regional BMPs to comply with the hydromodification management BMP performance requirements of Provision E.3.c.(2) if the offsite regional BMPs have the capacity to manage the storm water flows rates and durations from the site such that the receiving waters are protected from the potential for increased erosion that would be caused if the unmanaged portion of the runoff was discharged from the site.~~

~~(v) *Offsite Retrofitting Projects*~~

~~The Copermittee may allow Priority Development Projects to utilize offsite retrofitting projects to comply with the storm water pollutant control and hydromodification management BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) if the retrofitting projects have been identified within the strategies included in the Water Quality Improvement Plan, or identified as potential retrofitting projects by the Copermittee pursuant to Provision E.5.~~

~~(vi) *Offsite Channel, Stream, or Habitat Rehabilitation Projects*~~

~~The Copermittee may allow Priority Development Projects to utilize offsite channel, stream, or habitat rehabilitation projects to comply with the hydromodification management BMP performance requirements of Provision E.3.c.(2) if the rehabilitation projects have been identified within the strategies included in the Water Quality Improvement Plan, or identified as potential channel rehabilitation projects by the Copermittee pursuant to Provision E.5. The channel, stream, or habitat rehabilitation project cannot be utilized for pollutant treatmentexcept where artificial wetlands areand located upstream of receiving waters.~~

~~(vii) *Offsite Regional Water Supply Augmentation Projects*~~

~~The Copermittee may allow Priority Development Projects to utilize offsite regional water supply augmentation projects (i.e. groundwater recharge, recycled water, storm water harvesting) to comply with the storm water pollutant control and hydromodification management BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) if the projects have been identified within the strategies included in the Water Quality Improvement Plan.~~

~~(viii) *Project Applicant Proposed Alternative Compliance Projects*~~

~~The Copermittee may allow one or more Priority Development Project applicant(s) to propose and implement alternative compliance projects to comply with the storm water pollutant control and hydromodification management BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) if the alternative compliance projects are consistent with, and will address the highest water quality priorities of the Water Quality Improvement Plan, and comply with the requirements of Provision E.3.c.(3)(a).~~

(c) Alternative Compliance In-Lieu Fee Option

The Copermittee may develop and implement an alternative compliance in-lieu fee option, individually or with other Copermittees and/or entities, as a means for designing, developing, constructing, operating and/or maintaining offsite alternative compliance projects under Provision E.3.c.(3)(b). Priority Development Projects allowed to utilize the

alternative compliance in-lieu fee option must comply with the following conditions:

(i) The in-lieu fee must be collected and held in accordance with the Mitigation Fee Act and all other applicable development fee laws. ~~transferred to the Copermittee (for public projects) or an escrow account (for private projects) prior to the date construction of the Priority Development Project is initiated~~.

(ii) If the in-lieu fee is applied to the development, design, ~~and~~ construction, operation and maintenance of offsite alternative compliance projects, the following conditions must be met:

[a] The offsite alternative compliance projects must meet ~~allow~~ the criteria identified within E.3.c.(3)(b)-, for each Priority Development Project relying on~~to comply with~~ the alternative compliance project;~~onsite BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2);~~

[b] The offsite alternative compliance projects must be constructed as soon as possible, but no later than 4 years after the certificate of occupancy is granted for the first Priority Development Project that contributed funds toward the construction of the offsite alternative compliance projects, unless a longer period of time is provided for in an approved WQIP~~authorized by the San Diego Water Board Executive Officer~~;

~~[c] The in-lieu fee for the Priority Development Project must include mitigation of the pollutant loads and increased storm water flow rates and durations that are allowed to discharge from the site before the offsite alternative compliance projects are constructed; and~~

[d] The in-lieu fee must also include the cost to operate and maintain the offsite alternative compliance projects for the anticipated life of the constructed priority development project.

(iii) If the in-lieu fee applies only~~is applied~~ to the operation and maintenance of offsite alternative compliance projects that have already been constructed, the offsite alternative compliance projects must meet~~allow~~ the requirements of E.3.c.(3)(a)(iv) and (v) as applicable, for each Priority Development Project relying on~~to comply with~~ the alternative compliance project..~~onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2).~~

(d) Alternative Compliance Water Quality Credit System Option

The Copermittee may develop and implement an alternative compliance water quality credit system option, individually or with other Copermittees

Comment [A97]: Please see Legal Comments.

and/or entities, provided that such a credit system clearly exhibits that it will not allow discharges from Priority Development Projects to cause or contribute to a net impact over and above the impact caused by projects meeting the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2). Any credit system that a Copermittee chooses to implement must be submitted to the San Diego Water Board Executive Officer for review and acceptance as part of the Water Quality Improvement Plan.

(4) Long-Term Structural BMP Maintenance

Each Copermittee must require the project applicant to submit proof of the mechanism under which ongoing long-term maintenance of all structural BMPs will be conducted.

(5) Infiltration and Groundwater Protection

(a) Structural BMPs designed to primarily function as large, centralized infiltration devices (such as large infiltration trenches and infiltration basins) must not cause or contribute to an exceedance of an applicable groundwater quality objective. At a minimum, such infiltration BMPs must be in conformance with the design criteria listed below, unless the development project applicant demonstrates to the Copermittee that one or more of the specific design criteria listed below are not necessary to protect groundwater quality. The design criteria listed below do not apply to small infiltration systems dispersed throughout a development project.

(i) Runoff must undergo pretreatment such as sedimentation or filtration prior to infiltration;

(ii) Pollution prevention and source control BMPs must be implemented at a level appropriate to protect groundwater quality at sites where infiltration BMPs are to be used;

(iii) Infiltration BMPs must be adequately maintained to remove pollutants in storm water to the MEP;

(iv) The vertical distance from the base of any infiltration BMP to the seasonal high groundwater mark must be at least 10 feet. Where groundwater basins do not support beneficial uses, this vertical distance criteria may be reduced, provided groundwater quality is maintained;

(v) The soil through which infiltration is to occur must have physical and chemical characteristics (e.g., appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses;

(vi) Infiltration BMPs must not be used for areas of industrial or light

industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee, unless first treated or filtered to remove pollutants prior to infiltration; and

(vii) Infiltration BMPs must be located a minimum of 100 feet horizontally from any water supply wells.

(b) The Copermittee may develop, individually or with other Copermittees, alternative mandatory design criteria to that listed above for infiltration BMPs which are designed to primarily function as centralized infiltration devices. Before implementing the alternative design criteria in the development planning process the Copermitee(s) must:

(i) Notify the San Diego Water Board of the intent to implement the alternative design criteria submitted; and

(ii) Comply with any conditions set by the San Diego Water Board.

d. BMP DESIGN MANUAL UPDATE

Each Copermittee must update and implement its BMP Design Manual[32] pursuant to Provision F.2.b. ~~Until the Copermittee has updated its BMP Design Manual with the requirements of Provisions E.3.a-c, the Copermittee must continue implementing its current BMP Design Manual. Unless directed otherwise by the San Diego Water Board, the Copermittee must implement the BMP Design Manual within 180 days of completing the update.~~ The update of the BMP Design Manual must include the following:

Comment [A98]: This info was incorporated into F.2.b.

(1) Updated procedures to determine the nature and extent of storm water requirements applicable to a potential development or redevelopment projects. These procedures must inform project applicants of the storm water management requirements applicable to their project including, but not limited to, general requirements for all development projects, structural BMP design procedures and requirements, hydromodification management requirements, requirements specific to phased projects, and procedures specific to private developments and public improvement projects;

(2) Updated procedures to identify ~~pollutants and conditions of concern for selecting~~ the most appropriate structural BMPs that consider, at a minimum, the following:

(a) The requirements of E.3.c.(1) and (2)

~~(a)~~(b) Receiving water quality (including pollutants for which receiving waters are listed as impaired under the CWA section 303(d) List);

[32] The BMP Design Manual was formerly known as the Standard Storm Water Mitigation Plan under Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016.

~~(b)~~(c) Pollutants, stressors, and/or receiving water conditions that cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

~~(c)~~(d) Land use type of the project and pollutants associated with that land use type; and

~~(d)~~(e) Pollutants expected to be present onsite.

(3) Updated procedures for designing structural BMPs, including any updated performance requirements to be consistent with the requirements of Provision E.3.c for all structural BMPs listed in the BMP Design Manual;

(4) Long-term maintenance criteria for each structural BMP listed in the BMP Design Manual; and

(5) Alternative compliance criteria, in accordance with the requirements under Provision E.3.c.(3), if the Copermittee elects to allow Priority Development Projects within its jurisdiction to utilize alternative compliance.

e. PRIORITY DEVELOPMENT PROJECT BMP IMPLEMENTATION AND OVERSIGHT

Each Copermittee must implement a program that requires and confirms structural BMPs on all Priority Development Projects are designed, constructed, and maintained to remove pollutants in storm water to the MEP.

(1) Structural BMP Approval and Verification Process

(a) Each Copermittee must require and confirm that for all Priority Development Project applications that have not received prior lawful approval by the Copermittee by 18 months after the commencement of coverage under this Order, the requirements of Provision E.3 are implemented. For project applications that have received prior lawful approval by 18 months after the commencement of coverage under this Order, the Copermittee may allow previous land development requirements to apply.

(b) Each Copermittee must identify the roles and responsibilities of their various municipal departments in implementing the structural BMP requirements, including each stage of a project from application review and approval through BMP maintenance and inspections.

(c) Each Copermittee must require and confirm that appropriate easements and ownerships are properly recorded in public records and the information is conveyed to all appropriate parties when there is a change in project or site ownership.

(d) Each Copermittee must require and confirm that prior to occupancy and/or intended use of any portion of the Priority Development Project, each structural BMP is inspected to verify that it has been constructed and is operating in compliance with all of its specifications, plans, permits, ordinances, and the requirements of this Order.

(2) Priority Development Project Inventory and Prioritization

(a) Each Copermittee must develop, maintain, and update ~~at~~regularly~~at least annually~~, a watershed-based database to track and inventory all constructed Priority Development Projects and associated structural BMPs within its jurisdiction. Inventories must be accurate and complete beginning from January 2002 for the San Diego County Copermittees, February 2003 for the Orange County Copermittees, and July 2005 for the Riverside County Copermittees~~.~~, where data is available.~~.~~ The use of an automated database system, such as GIS, is highly recommended. The database must include, at a minimum, the following information:

(i) Priority Development Project location (address and hydrologic subarea);

(ii) Descriptions of structural BMP type(s);

(iii) Date(s) of construction;

(iv) Party responsible for structural BMP maintenance;

(v) Dates and findings of structural BMP maintenance verifications; and

(vi) Corrective actions and/or resolutions when applicable.

(b) Each Copermittee must prioritize the Priority Development Projects with structural BMPs within its jurisdiction. The designation of Priority Development Projects as high priority must consider the following:

(i) The highest water quality priorities identified in the Water Quality Improvement Plan;

(ii) Receiving water quality;

(iii) Number and sizes of structural BMPs;

(iv) Recommended maintenance frequency of structural BMPs;

(v) Likelihood of operation and maintenance issues of structural BMPs;

(vi) Land use and expected pollutants generated; and

(vii) Compliance record.

(3) Structural BMP Maintenance Verifications and Inspections

Each Copermittee is required to verify that structural BMPs on each Priority

Development Project are adequately maintained, and continue to operate effectively to remove pollutants in storm water to the MEP through inspections, self-certifications, surveys, or other equally effective approaches.

(a) All (100 percent) of the structural BMPs at Priority Development Projects that are designated as high priority must be inspected directly by the Copermittee annually prior to each rainy season;

(b) For verifications performed through a means other than direct Copermittee inspection, adequate documentation must be required by the Copermittee to provide assurance that the required maintenance of structural BMPs at each Priority Development Project has been completed; and

(c) Appropriate follow-up measures (including re-inspections, enforcement, etc.) must be conducted to ensure that structural BMPs at each Priority Development Project continue to reduce pollutants in storm water to the MEP as originally designed.

f. DEVELOPMENT PROJECT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all development projects, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

g. ~~STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS~~

Comment [A99]: This section was moved to the beginning of provision E.3.

~~Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the development planning program to address development and redevelopment projects that may become sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:~~

~~(5) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, increase frequency of verifications and/or inspections, alternative compliance options);~~

~~(6) Each Copermittee must identify areas within its jurisdiction where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting and/or stream, channel, or habitat rehabilitation projects;~~

~~(7) Each Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify regional alternative compliance projects that Priority Development Projects may be allowed or should be encouraged to implement or participate in implementing; and~~

~~(8) The strategies and/or activities must be consistent with the requirements of Provisions E.3.a-c and E.3.e-f and the strategies identified in the Water Quality Improvement Plan.~~

4. Construction Management

Each Copermittee must implement a construction management program in accordance with the strategies identified in the Water Quality Improvement Plan and includes, at a minimum, the following requirements:

STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Comment [A100]: This section was moved from provision E.4.f, Changes are shown in Redline

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the construction management program to address construction sites that the Copermittee has identified as potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, and/or increase/decrease frequency of inspections for specific types of sites and/or activities); and

(2) The strategies and/or activities must be consistent with the requirements of Provisions E.4.c-e and the strategies identified in the Water Quality Improvement Plan.

(3) The requirements of the programs as outlined in the following sub-provisions may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality improvement Plan(s).

a. PROJECT APPROVAL PROCESS

Prior to issuance of any local permit(s) that allows the commencement of construction projects that involve ground disturbance or soil disturbing activities that has the reasonable potential to discharge a pollutant load to and from the MS4, as defined in each Copermittees' JRMP~~can potentially generate pollutants in storm water runoff~~, each Copermittee must:

(1) Require a ~~site-specific~~ Pollution Control Plan~~pollution control~~, construction BMP, and/or erosion and sediment control plan, to be submitted by the project applicant to the Copermittee;

(2) Confirm the Pollution Control Plan~~pollution control~~, construction BMP, and/or erosion and sediment control plan, complies with the local grading ordinance, other applicable local ordinances, and the requirements of this Order;

(3) Confirm the Pollution Control Plan~~pollution control~~, construction BMP, and/or erosion and sediment control plan, includes seasonally appropriate and effective BMPs and management measures described in Provision E.4.c, as applicable to the project; and

(4) Verify that the project applicant has obtained coverage under ~~applicable permits, including, but not limited to~~ the Construction General Permit~~, Clean Water Act Section 401 Water Quality Certification and Section 404 Permit, and California Department of Fish and Game Streambed Alteration Agreement~~.

b. CONSTRUCTION SITE INVENTORY AND TRACKING

(1) Each Copermittee must maintain, and update ~~at least monthly~~regularly, a watershed-based inventory of all construction projects issued a local permit that allows ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff. The use of an automated database system, such as GIS, is highly recommended. The inventory must include:

(a) Relevant contact information for each site (e.g., name, address, phone, and email for the owner and contractor);

(b) The basic site information including location (address and hydrologic subarea), Waste Discharge Identification (WDID) number (if applicable), size of the site, and approximate area of disturbance;

(c) Whether or not the site is considered a high threat to water quality, as defined in Provision E.4.b.(2) below;

(d) The project start and ~~anticipated~~ completion dates;

~~(e) Current construction phase;~~

~~(f)~~(e) The required inspection frequency, as defined in the Copermittee's jurisdictional runoff management program document;

~~(g)~~(f) The date the Copermittee accepted and/or approved the ~~site-specific~~ pollution control plan, construction BMP, and/or erosion and sediment control plan; and

~~(h)~~(g) Whether or not there are ongoing enforcement actions administered to the site.

Comment [A101]: Some of the info can only be updated based on an inspection, which may or may not be monthly year round for all sites.

Comment [A102]: The anticipated completion date is often unknown and can fluctuate based on unpredictable and unforeseen circumstances. Keeping track of accurate dates in an inventory would be difficult and would not add significant value to the database. Construction Inspectors keep a close eye on the progress of projects and would not need to rely on inventory data to achieve effective stormwater management and oversight. Once a project is completed, the date can be entered into the database,.

(2) Each Copermittee must identify all construction sites within its jurisdiction that represent a high threat to downstream surface water quality. The designation of construction sites as high threat to water quality must consider the following:

(a) Sites located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Sites located within the same hydrologic subarea and tributary to a water body segment listed as impaired for sediment on the CWA section 303(d) List;

(c) Sites located within, directly adjacent to, or discharging directly to a receiving water within an ESA; and

(d) Other sites determined by the Copermittees or the San Diego Water Board as a high threat to water quality.

c. CONSTRUCTION SITE BMP IMPLEMENTATION

Comment [A103]: See discussion in section 3.9.1 of the comment letter.

Each Copermittee must implement, or require the implementation of effective BMPs (for Copermittee construction sites and private construction sites, respectively) to reduce discharges of pollutants in ~~storm water~~ runoff from construction sites to the MEP, and effectively prohibit~~prevent~~ non-storm water discharges from construction sites into the MS4. These BMPs must be site specific, seasonally appropriate, and construction phase appropriate. BMPs must be implemented at each construction site year round. Dry season BMP implementation must plan for and address unseasonal rain events that may occur during the dry season (May 1 through September 30). Copermittees must implement, or require the implementation of, BMPs in the following categories:

(1) Project Planning;

(2) Good Site Management “Housekeeping”, including waste management;

(3) Non-storm Water Management;

(4) Erosion Control;

(5) Sediment Control;

(6) Run-on and Run-off Control; and

(7) Active/Passive Sediment Treatment Systems, where applicable.

d. CONSTRUCTION SITE INSPECTIONS

Each Copermittee must conduct construction site inspections to require and confirm compliance with its local permits and applicable local ordinances, and the requirements of this Order. Priority for site inspections must consider threat to water quality pursuant to Provision E.4.b as well as the nature of the construction activity, topography, and the characteristics of soils and receiving water quality.

(1) Inspection Frequency

(a) Each Copermittee must conduct inspections at all inventoried sites, including high threat to water quality sites, at an appropriate frequency for each phase of construction to confirm~~ensure~~ the site reduces the discharge of pollutants in runoff~~storm water~~ from construction sites to the MEP, and effectively prevents non-storm water discharges from entering the MS4.

(b) Each Copermittee must establish appropriate inspection frequencies for high threat to water quality sites, and all other sites, for each phase of construction. Inspection frequencies appropriate for addressing the highest water quality priorities identified in the Water Quality Improvement Plan, and for complying with the requirements of this Order must be identified in each Copermittee's jurisdictional runoff management program document.

(c) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e., re-inspection, enforcement) necessary to require and confirm site compliance with its local permits and applicable local ordinances, and the requirements of this Order.

(2) Inspection Content

Inspections of construction sites by the Copermittee must include, at a minimum:

(a) Verification of coverage under the Construction General Permit (Notice of Intent (NOI) and/or WDID number) during initial inspections, when applicable;

(b) Assessment of compliance with its local permits and applicable local ordinances related to pollution prevention, including the implementation and maintenance of applicable BMPs;

(c) Assessment of BMP adequacy and effectiveness;

(d) Visual observations of actual non-storm water discharges;

(e) Visual observations of actual or potential discharge of sediment and/or construction related materials from the site;

(f) Visual observations of actual or potential illicit connections; and

(g) If any violations are found and BMP corrections are needed, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried construction sites. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Site name, location (address and hydrologic subarea), and WDID number (if applicable);

(b) Inspection date;

(c) Weather condition during~~Approximate amount of rainfall since last~~ inspection;

(d) Description of problems observed with BMPs and indication of need for BMP addition/repair/replacement and any scheduled re-inspection, and date of re-inspection;

(e) Descriptions of any other specific inspection comments which must, at a minimum, include rationales for longer compliance time;

(f) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(g) Resolution of problems noted and date problems fixed.

e. CONSTRUCTION SITE ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried construction sites, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

5. Existing Development Management

Comment [A104]: See discussion in section 3.10 of the comment letter.

Each Copermittee must implement an existing development management program in accordance with the strategies identified in the Water Quality Improvement Plan. and includes, at a minimum, the following requirements:

STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Comment [A105]: Moved from sub-provision e. Changes shown in redline

Each Copermittee must implement the water quality improvement strategies, where necessary, to address areas of existing development within its jurisdiction that are identified as sources of pollutants and/or stressors contributing to the highest priority water quality conditions in the Watershed Management Area. For the existing development management program, the following strategies must be implemented:

(1) Specific Existing Development Management Program Strategies

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented within its jurisdiction to address areas of existing development that the Copermittee has identified as sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(a) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, and/or increase/decrease frequency of inspections for specific types of facilities, areas and/or activities);

(b) The facilities and/or areas within the Copermittee's jurisdiction where the strategies and/or activities will be implemented; and

(2) The requirements of the programs as outlined in the following sub-provisions may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality improvement Plan(s).~~The strategies and/or activities must be consistent with the requirements of Provisions E.5.b-d and the strategies identified in the Water Quality Improvement Plan.~~

a. EXISTING DEVELOPMENT INVENTORY AND TRACKING

Each Copermittee must maintain, and update at least annually, a watershed-based inventory of the existing development within its jurisdiction that ~~may~~has the reasonable potential to~~may~~ discharge a high priority pollutant load to and from the MS4, as defined in the Copermittee's JRMP. The use of an automated database system, such as GIS, is highly recommended. The inventory must, at a minimum, evaluate and include the following if identified as a source of a high priority pollutant~~include~~:

(1) Name, location (hydrological subarea and address, if applicable) of the following types of existing development with its jurisdiction:

(a) Commercial facilities or areas;

(b) Industrial facilities;

(c) Copermittee owned Municipal facilities, including:

(i) MS4 and related structures,[33]

(ii) Roads, streets, and highways,

(iii) Parking facilities,

(iv) Municipal airfields,

(v) Parks and recreation facilities,

(vi) Flood management projects and flood control devices and structures,

(vii) Operating or closed municipal landfills,

(viii) Publicly owned treatment works (including water and wastewater treatment plants) and sanitary sewer collection systems,

(ix) Corporate yards, including maintenance and storage yards for materials, waste, equipment, and vehicles,

(x) Hazardous waste collection facilities,

(xi) Other treatment, storage or disposal facilities for municipal waste, and

(xii) Other Copermittee owned municipal facilities that the Copermittee determines may contribute a significant high priority pollutant load to the MS4; and

(d) Residential areas, which may be designated by one or more of the following:

(i) Residential management area,

(ii) Drainage basin or area,

(iii) Land use (e.g., single family, multi-family, rural),

(iv) Neighborhood,

[33] The inventory may refer to the MS4 map required to be maintained pursuant to Provision E.2.b.(1).

(v) Common Interest Area,

(vi) Home Owner Association,

(vii) Mobile home park, and/or

(viii) Other designations accepted by the San Diego Water Board Executive Officer.

(2) A description of the facility or area, including the following information:

(a) Classification as commercial, industrial, municipal, or residential;

(b) Status of facility or area as active or inactive;

(c) Identification if a business is a mobile business;

(d) SIC Code or NAICS Code, if applicable;

(e) Industrial General Permit NOI and/or WDID number, if applicable;

(f) Identification if a residential area is or includes a Common Interest Area / Home Owner Association, or mobile home park;

(g) Identification of pollutants generated and potentially generated by the facility or area;

(h) Whether the facility or area is adjacent to an ESA;

(i) Whether the facility or area is tributary to and within the same hydrologic subarea as a water body segment listed as impaired on the CWA section 303(d) List and generates pollutants for which the water body segment is impaired; and

(j) Whether the facility or area contributes or potentially contributes to the highest priority water quality conditions identified in the Water Quality Improvement Plan.

(3) An annually updated map showing the location of inventoried existing development, watershed boundaries, and water bodies.

b. EXISTING DEVELOPMENT BMP IMPLEMENTATION AND MAINTENANCE

Each Copermittee must designate a minimum set of BMPs required for all inventoried existing development, including special event venues. The designated minimum BMPs must be specific to facility or area types and pollutant generating activities, as appropriate.

(1) Commercial, Industrial, and Municipal Facilities and Areas

(a) Pollution Prevention

Each Copermittee must require the use of appropriate pollution prevention methods by the commercial, industrial, and municipal facilities and areas in its inventoried existing development, as determined necessary by the Copermittee to address the priorities and strategies addressed in the WQIP.

(b) BMP Implementation

Comment [A106]: See discussion in section 3.10.2 of the comment letter.

Each Copermittee must ~~implement, or~~ require the implementation of, designated BMPs at commercial facilities and areas, industrial facilities, and implement designated BMPs at municipal facilities in its inventoried existing development, as determined necessary by the Copermittee to address the priorities and strategies addressed in the WQIP.

(c) BMP Operation and Maintenance

(i) Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development.

(ii) Each Copermittee must implement a schedule of operation and maintenance activities for its MS4 and related structures (including but not limited to catch basins, storm drain inlets, detention basins, etc.), and verify proper operation of all its municipal structural treatment controls designed to reduce pollutants (including floatables) in storm water discharges to or from its MS4s and related drainage structures. Operation and maintenance activities may include, but is not limited to, the following:

[a] Inspections of the MS4 and related structures;
[b] Cleaning of the MS4 and related structures; and
[c] Proper disposal of materials removed from cleaning of the MS4 and related structures.

(iii) Each Copermittee must implement a schedule of operation and maintenance for public streets, unpaved roads, paved roads, and paved highways and freeways within its jurisdiction to minimize pollutants that can be discharged in storm water.

(iv) Each Copermittee must implement the following controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers:

[a]~~.~~ Copermittees that operate both a municipal sanitary sewer system and a MS4 must implement controls and measures to

prevent and eliminate seeping sewage from infiltrating the MS4.

[b]- Copermittees that do not operate both a municipal sanitary sewer system and a MS4 must coordinate with sewering agencies to keep themselves informed of relevant and appropriate maintenance activities and sanitary sewage projects in their jurisdiction that may cause or contribute to seepage of sewage into the MS4.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Comment [A107]: See discussion in section 3.10.2 of the comment letter.

Each Copermittee must implement BMPs, or require the implementation of BMPs, to reduce pollutants in runoffstorm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from commercial facilities and areas, industrial facilities;, and implement such BMPs at municipal facilities in its inventoried existing development. Such BMPs must include, as appropriate, educational activities, permits, certifications and other measures for applicators and distributors.

(2) Residential Areas

(a) Pollution Prevention

Each Copermittee must promote and encourage the use of pollution prevention methods, where appropriate, by the residential areas in its inventoried existing development.

(b) BMP Implementation

Each Copermittee must promote and encourage the implementation of designated BMPs at residential areas in its inventoried existing development.

(c) BMP Operation and Maintenance

Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at residential areas in its inventoried existing development.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must promote and encourage the implementation of BMPs to reduce pollutants in runoffstorm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from residential areas in its inventoried existing development.

c. Existing Development Inspections

Each Copermittee must conduct inspections of inventoried existing development that have been identified by the Copermittee as having the reasonable potential to discharge pollutant loads from their MS4, to ensure compliance with applicable local ordinances and permits, and the requirements of this Order.

(1) Inspection Frequency

(a) Each Copermittee must establish appropriate inspection frequencies for inventoried existing development in accordance with the following requirements:

(i) At a minimum, inventoried existing development must be inspected once every five years utilizing one or more of the following methods:

[a] Drive-by inspections by Copermittee municipal and contract staff,
[b] Onsite inspections by Copermittee municipal and contract staff, and/or
[c] Inspections by volunteer monitoring or patrol programs trained by the Copermittee;

(ii) The frequency of inspections must be appropriate to confirm that BMPs are being implemented to reduce the discharge of pollutants in runoff~~storm water~~ from the MS4 to the MEP and effectively prohibit non-storm water discharges to the MS4;

(iii) The frequency of inspections must be based on the potential for a facility or area to discharge non-storm water and pollutants in storm water, and should reflect the priorities set forth in the Water Quality Improvement Plan;

~~(iv) Each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development;[34] and~~

~~(v)~~(iv) Inventoried existing development must be inspected by the Copermittee, as needed, in response to valid public complaints and findings from the Copermittee's municipal and contract staff or volunteer monitoring or patrol program inspections.

(b) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e. education and outreach, re-inspection, enforcement) necessary to require and confirm compliance with its applicable local

Comment [A108]: Recommend keeping this instead of SD proposed 'during the permit term'. The 'during the permit term' language is problematic for businesses that are added to the inventory during the permit term. For example, if a business is added to the inventory one month before the expiration of the permit, it may not be reasonable to expect it to be immediately inspected. It is also problematic for Riverside (and OC?), who may be added to the permit less than two years before the end of the permit term.

Comment [A109]: See discussion in section 3.10.2 of the comment letter.

~~[34] If any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspection may count toward the total annual inspection requirement. This requirement excludes linear municipal facilities (i.e., MS4, streets, roads and highways).~~

ordinances and permits and the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

(2) Inspection Content

(a) Inspections of existing development by the Copermittee or volunteer monitoring or patrol programs must include, at a minimum:

(i) Visual inspections for actual non-storm water discharges, if present;

(ii) Visual inspections for actual or potential discharge of pollutants, if present;

(iii) Visual inspections for actual or potential illicit connections, if present; and

(iv) Verification that the description of the facility or area in the inventory, required pursuant to Provision E.5.a.(2), has not changed.

(b) Onsite inspections of existing development by the Copermittee must include, at a minimum:

(i) Assessment of compliance with its applicable local ordinances and permits related to non-storm water and storm water discharges and runoff;

(ii) Assessment of the implementation of the designated BMPs;

(iii) Verification of coverage under the Industrial General Permit, when applicable; and

(iv) If any problems or violations are found, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried existing development. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Name and location of facility or area (address and hydrologic subarea) consistent with the inventory name and location, pursuant to Provision E.5.a.(1);

(b) Inspection and re-inspection date(s);

(c) Inspection method(s) (i.e. drive-by, onsite);

(d) Observations and findings from the inspection(s);

(e) For onsite inspections of existing development by Copermittee municipal or contract staff, the records must also include, as applicable:

(i) Description of any problems or violations found during the inspection(s),

(ii) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6, and

(iii) The date problems or violations were resolved.

d. EXISTING DEVELOPMENT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried existing development, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

e. RETROFITTING AND REHABILITATION~~STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS~~

~~Each Copermittee must implement the water quality improvement strategies, where necessary, to address areas of existing development within its jurisdiction that are identified as sources of pollutants and/or stressors contributing to the highest priority water quality conditions in the Watershed Management Area. For the existing development management program, the following strategies must be implemented:~~

~~(3) Specific Existing Development Management Program Strategies~~

~~Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented within its jurisdiction to address areas of existing development that the Copermittee has identified as sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:~~

~~(a) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, and/or increase/decrease frequency of inspections for specific types of facilities, areas and/or activities);~~

~~(b) The facilities and/or areas within the Copermittee's jurisdiction where the strategies and/or activities will be implemented; and~~

~~(c)~~(a) ~~The strategies and/or activities must be consistent with the requirements of Provisions E.5.b-d and the strategies identified in the Water Quality Improvement Plan.~~

~~(4)~~(3) Retrofitting Areas of Existing Development

Where identified in the WQIP as a required strategy to address the highest priority water quality conditions, each~~Each~~ Copermittee must describe in its jurisdictional runoff management program document, a program to retrofit areas of existing development within its jurisdiction to address identified sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must, where necessary pursuant to the strategies identified in the WQIP, identify areas of existing development as candidates for retrofitting, focusing on areas where retrofitting will address pollutants and/or stressors that contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for retrofitting projects may be utilized to reduce pollutants that may be discharged in storm water from areas of existing development, and/or address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of retrofitting projects, where needed in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting projects; and

(e) Where retrofitting projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional retrofitting projects (i.e. projects that can receive and/or treat storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment) adjacent to and/or downstream of the areas of existing development.

~~(5)~~(4) Stream, Channel and/or Habitat Rehabilitation in Areas of Existing Development

Where identified in the WQIP as a required strategy to address the highest priority water quality conditions, each~~Each~~ Copermittee must describe in its jurisdictional runoff management program document, a program to rehabilitate streams, channels, and/or habitats in areas of existing development within its jurisdiction to address the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must, where necessary pursuant to the strategies identified in the WQIP, identify streams, channels, and/or habitats in areas of existing development as candidates for rehabilitation, focusing on areas where stream, channel, and/or habitat rehabilitation projects will address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for stream, channel, and/or habitat rehabilitation projects may be utilized to address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters, rehabilitate channelized or hydromodified streams, restore wetland and riparian habitat, restore watershed functions, and/or ~~restore~~ protect beneficial uses of receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of stream, channel, and/or habitat rehabilitation projects, where needed, in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance stream, channel, and/or habitat rehabilitation projects; and

(e) Where stream, channel, and/or habitat rehabilitation projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional stream, channel, and/or habitat rehabilitation projects (i.e. projects that can receive storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment).

(5) Upon Regional Board Executive Officer approval the Copermittees may reallocate resources in the WQIPs for retrofit and rehabilitation project(s).

6. Enforcement Response Plans

Each Copermittee must develop and implement an Enforcement Response Plan as part of its jurisdictional runoff management program document. The Enforcement Response Plan must describe the applicable approaches and options to enforce its legal authority established pursuant to Provision E.1, as necessary, to achieve compliance with the requirements of this Order. Copermittees may continue to utilize and implement established, equivalent guidelines and procedures for enforcement. If such equivalent guidelines and procedures have not been developed, ~~T~~the Enforcement Response Plan must include the following:

a. ENFORCEMENT RESPONSE PLAN COMPONENTS

The Enforcement Response Plan must include the following individual components:

(1) Illicit Discharge Detection and Elimination Enforcement Component;

(2) Development Planning Enforcement Component;

(3) Construction Management Enforcement Component; and

(4) Existing Development Enforcement Component.

b. ENFORCEMENT RESPONSE APPROACHES AND OPTIONS

Each component of the Enforcement Response Plan must describe the enforcement response approaches that the Copermittee will implement to compel compliance with its statutes, ordinances, permits, contracts, orders, or similar means, and the requirements of this Order. The description must include the protocols for implementing progressively stricter enforcement responses. The enforcement response approaches must include appropriate sanctions, as legally appropriate, to compel compliance, including, at a minimum, the following tools or their equivalent:

(1) Verbal and written notices of violation;

(2) Cleanup requirements;

(3) Fines;

(4) Bonding requirements;

(5) Administrative and criminal (if intentional or criminally negligent) penalties;

(6) Liens;

(7) Stop work orders; and

(8) Permit and occupancy denials.

c. CORRECTION OF VIOLATIONS

(1) Violations must be corrected in a timely manner with the goal of correcting the violations within 30 calendar days after the violations are discovered, or prior to the next predicted rain event, whichever is sooner.

(2) The status of the enforcement actions~~If more than 30 calendar days are required to achieve compliance, then a rationale~~ must be recorded and updated in the applicable electronic database or tabular system used to track violations.

Comment [A110]: This is just asking for paperwork violations if someone forgets to write a specific justification – even if all appropriate steps are being diligently pursued. Request alternatively to simply require that the status be updated as appropriate.

d. ~~ESCALATED~~ PROGRESSIVE ENFORCEMENT

Comment [A111]: See discussion in section 3.11.2 of the comment letter.

(1) The Enforcement Response Plan must include a definition of "~~escalated~~ progressive enforcement." ~~Escalated~~ Progressive enforcement must include a series of enforcement actions that match the severity of the violations and include distinct, progressive steps. ~~any enforcement scenario where a violation or other non-compliance is determined to cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan~~. ~~Escalated~~ Progressive enforcement may be defined differently for development planning, construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and/or residential areas.

(2) Where the Copermittee determines ~~escalated~~ the identified progressive enforcement steps ~~is~~are not required, a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

(3) ~~Escalated~~ Progressive enforcement actions must continue to increase in severity, as necessary, to compel compliance as soon as possible.

e. REPORTING OF NON-COMPLIANT SITES

(1) Each Copermittee must notify the San Diego Water Board in writing within ~~22~~5 calendar~~2 working~~ days of issuing escalated enforcement (as defined in the Copermittee's Enforcement Response Plan) to a construction site that poses a significant threat to water quality as a result of violations or other non-compliance with its permits and applicable local ordinances, and the requirements of this Order. Written notification may be provided electronically by email.

(2) Each Copermittee must notify the San Diego Water Board of non-filers under the Industrial General Permit and Construction General Permit by email to Nonfilers_R9@waterboards.ca.gov.

7. Public Education and Participation

Each Copermittee must implement, individually or with other Copermittees, a public education and participation program in accordance with the strategies identified in the Water Quality Improvement Plan to promote and encourage the development of programs, management practices, and behaviors that reduce the discharge of pollutants in runoff~~storm water~~ to the MEP, prevent controllable non-storm water discharges from entering the MS4, and protect water quality standards in receiving waters.

STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Comment [A112]: Recommended move from (c)

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented within its jurisdiction, as applicable, to educate the public and encourage public participation to address potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) The target audiences and/or areas within the Copermittee's jurisdiction where the strategies and/or activities will be implemented;

(2) Provide specific details about how the strategies and/or activities will be implemented (e.g. educational topics, materials and/or activities, public outreach and participation programs and/or opportunities);

(3) Each Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify and implement regional public education and participation activities, programs and opportunities;

(4) Each Copermittee must incorporate a mechanism for evaluating and assessing educational and other public outreach activities, as needed, to identify progress and incorporate modifications necessary to increase the effectiveness of the public education and participation program.

(5) The requirements of the programs as outlined in the following sub-provisions

may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality improvement Plan(s).

a. PUBLIC EDUCATION

The public education program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) Educational activities, public information activities, and other appropriate outreach activities intended to reduce pollutants associated with the ~~application of pesticides, herbicides and fertilizer- and other pollutants of concern in storm water discharges to and from its MS4 to the MEP, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed to address the~~ highest priority water quality conditions identified in the Water Quality Improvement Plan;

(2) Educational activities, public information activities, and other appropriate outreach activities to facilitate the proper management and disposal of used oil and toxic materials; and

(3) Appropriate education and training measures for specific target audiences, such as construction site operators, residents, underserved target audiences and school-aged children, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed, based on high risk behaviors and pollutants of concern.

b. PUBLIC PARTICIPATION

The public participation program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) A process for members of the public to participate in updating the highest priority water quality conditions, numeric goals, and water quality improvement strategies in the Water Quality Improvement Plan.

(2) Opportunities for members of the public to participate in providing the Copermittee recommendations for improving the effectiveness of the water quality improvement strategies implemented within its jurisdiction.

(3) Opportunities for members of the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in ~~storm wate~~r discharges from

the MS4, and/or ~~restoration and~~ protection of the quality of receiving waters.

8. Fiscal Analysis

a. ~~Each Copermittee must secure the resources necessary to meet all the requirements of this Order~~.

b. Each Copermittee must conduct an annual fiscal analysis of its jurisdictional runoff management program in its entirety. The fiscal analysis must include the following:

(1) Identification of the various categories of expenditures necessary to implement the requirements of this Order, including a description of the specific capital, operation and maintenance, and other expenditure items to be accounted for in each category of expenditures;

(2) The staff resources needed and allocated to meet the requirements of this Order, including any development, implementation, and enforcement activities required;

(3) The estimated expenditures for Provisions E.8.b.(1) and E.8.b.(2) for the current fiscal year; and

(4) The source(s) of funds that are proposed to meet the necessary expenditures described in Provisions E.8.b.(1) and E.8.b.(2), including legal restrictions on the use of such funds, for the current fiscal year and next fiscal year.

c. Each Copermittee must submit a summary of the annual fiscal analysis with each Annual Report required pursuant to Provision F.3.b.

d. Each Copermittee must provide the documentation used to develop the summary of the annual fiscal analysis upon request by the San Diego Water Board.

Comment [A113]: Since the monitoring period is different than a fiscal year, we won't be able to consistently and accurately report monitoring costs incurred by the Copermittees. (which are a big part of overall budgets)

Comment [A114]: Please see Legal Comments.

F. REPORTING

Comment [A115]: See discussion in section 3.14 of the comment letter.

The purpose of this provision is to determine and document compliance with the requirements set forth in this Order. The goal of reporting is to communicate to the San Diego Water Board and the people of the State of California the implementation status of each jurisdictional runoff management program and compliance with the requirements of this Order. This goal is to be accomplished through the submittal of specific deliverables to the San Diego Water Board by the Copermittees.

1. Water Quality Improvement Plans

Comment [A116]: See discussion in section 3.14.1 of the comment letter.

The Copermittees for each Watershed Management Area must develop and submit the Water Quality Improvement Plan in accordance with the following requirements:

a. WATER QUALITY IMPROVEMENT PLAN DEVELOPMENT

Each Water Quality Improvement Plan must be developed in accordance with the following process:

(1) Priority Water Quality Conditions and Numeric Goals

(a) The Copermittees must implement a public participation process to solicit data and information to be utilized in the development and identification of the priority water quality conditions for the Watershed Management Area.

(b) The Copermittees are encouraged to involve the public and key stakeholders as early and often as possible during the development of the priority water quality conditions and numeric goals to be included in the Water Quality Improvement Plan.

(c) Within 6 months after the commencement of coverage under this Order, the Copermittees must develop and submit the Water Quality Improvement Plan requirements of Provision B.2 to the San Diego Water Board. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of 60 days.

(d) The Copermittees must revise the priority water quality conditions and numeric goals based on comments received and/or recommendations or direction from the San Diego Water Board Executive Officer.

(2) Water Quality Improvement Strategies and Schedules

(a) The Copermittees are encouraged to involve the public and key stakeholders as early and often as possible during the development of the water quality improvement strategies and schedules to be included in the Water Quality Improvement Plan.

(b) Within 9 months after receipt~~the commencement~~ of public comments and/or recommendations from the Executive Officer per (1)(c) above~~coverage under this Order~~, the Copermittees must develop and submit the Water Quality Improvement Plan requirements of Provision B.3 to the San Diego Water Board. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of 60 days.

(c) The Copermittees must revise the water quality improvement strategies and schedules based on comments received and/or recommendations or direction from the San Diego Water Board Executive Officer.

b. WATER QUALITY IMPROVEMENT PLAN SUBMITTAL

(1) Within 6~~18~~ months after receipt~~the commencement~~ of public comments and/or recommendations from the Executive Officer per (2)(c) above~~coverage under this Order~~, the Copermittees for each Watershed Management Area must submit a complete Water Quality Improvement Plan in accordance with the requirements of Provision B to the San Diego Water Board. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of 30 days.

(2) Based on the comments received, the San Diego Water Board will determine whether to hold a public hearing or to limit public input to submittal of written comments. If no hearing is held the San Diego Water Board will notify the Copermittees within 6 months that the Water Quality Improvement Plan has been accepted as complete following its review and determination that the Water Quality Improvement Plan meets the requirements of this Order.

(3) The Copermittees must revise the Water Quality Improvement Plan based on comments received and/or recommendations or direction from the San Diego Water Board Executive Officer.

(4) The Water Quality Improvement Plan must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance by the San Diego Water Board.

(5) Copermittees must commence with implementation of the BMP strategies identified in the Water Quality Improvement Plan no later than the fiscal year (July 1) following San Diego Water Board approval of the Water Quality Improvement Plan, and the monitoring strategies identified in the Water Quality Improvement Plan no later than October 1st (or May 1st, whichever is sooner) following the San Diego Water Board approval of the Water Quality Improvement Plan.

2. Updates

Comment [A117]: See discussion in section 3.14.1 of the comment letter.

a. Jurisdictional Runoff Management Program Document Updates

Each Copermittee must update its jurisdictional runoff management program document in accordance with the following requirements:

(1) Each Copermittee is encouraged to involve the public and key stakeholders as early and often as possible to solicit recommendations for updates to its jurisdictional runoff management program document.

(2) Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E and the strategies identified in the applicable WQIPs no later than 6~~18~~ months after approval~~the commencement~~ of the applicable Water Quality Improvement Plans (or updates thereto).~~coverage under this Order.~~

(3) The updated JRMP document must be implemented beginning July 1st following completion of the update, unless directed otherwise by the Executive Officer.

~~(3)~~(4) Each Copermittee must submit any subsequent updates to its jurisdictional runoff management program, with a rationale for the modifications, either in the Annual Report required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge required pursuant to Provision F.5.b.

~~(4)~~(5) The Copermittee must revise the modifications as directed by the San Diego Water Board Executive Officer.

~~(5)~~(6) Updated jurisdictional runoff management program documents must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of submitting the Annual Report.

b. BMP Design Manual Updates

Each Copermittee must update its BMP Design Manual in accordance with the following requirements:

(1) Each Copermittee must update its BMP Design Manual to incorporate the requirements of Provisions E.3.a-d, and E.3.g. no later than 6~~18~~ months after approval~~the commencement~~ of the applicable Water Quality Improvement Plans..

Comment [A118]: This is necessary for the WQIP strategies to inform the Development Planning process

(2) Unless directed otherwise by the San Diego Water Board, the Copermittee must implement the updated BMP Design Manual within 180 days of

Comment [A119]: An implementation date was missing from the Tentative Order

completing updates to the BMP Design Manual.

~~(1)~~(3) Until the Copermittee begins implementation of its updated BMP Design Manual, the Copermittee must continue implementing its current BMP Design Manual~~coverage under this Order~~.

Comment [A120]: This was moved to here

~~(2)~~(4) Subsequent updates must be consistent with the requirements of Provisions E.3.a-d and must be submitted as part of the Annual Reports required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge required pursuant to Provision F.5.b.

~~(3)~~(5) Updated BMP Design Manuals must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of completing the update.

c. WATER QUALITY IMPROVEMENT PLAN UPDATES

The Water Quality Improvement Plans must be updated in accordance with the following process:

(1) The Copermittees must implement a public participation process to solicit data and information to be utilized in updating the Water Quality Improvement Plan.

(2) The Copermittees are encouraged to involve the public and key stakeholders as early and often as possible during the updates to the Water Quality Improvement Plan.

(3) The Copermittees for each Watershed Management Area must submit requested updates to the Water Quality Improvement Plan, with the public input received and the rationale for the requested updates, either in the Annual Reports required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The requested updates are considered accepted by the San Diego Water Board if no response is provided to the Copermittee after 3 months of submitting the request.

(4) The Copermittees must revise the requested updates as directed by the San Diego Water Board Executive Officer.

(5) Updated Water Quality Improvement Plans must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance of the requested updates by the San Diego Water Board.

3. Progress Reporting

Comment [A121]: See discussion in section 3.14.1 of the comment letter.

a. PROGRESS REPORT PRESENTATIONS

The Copermittees for each Watershed Management Area must appear before the San Diego Water Board, as requested by the San Diego Water Board, to provide progress reports on the implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs.

b. ANNUAL REPORTS

Comment [A122]: See discussion in section 3.14.1 of the comment letter.

(1) Transitional Period JRMP Reports: Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (Attachment D or accepted revision) no later than October 31 of each year prior to the implementation of updated JRMP programs pursuant to F.2.a. Each Copermittee must submit the information on the Jurisdictional Runoff Management Program Annual Report Form specific to the area within its jurisdiction in each Watershed Management Area.

(2) Transitional Period Monitoring Report: The transitional period monitoring conducted pursuant to D.1.a and D.2.a. shall be reported in a single report that covers the entire reporting period from the initiation of the transitional period monitoring (as described in D.1.a and D.2.a.), through September 30th following approval of the Water Quality Improvement Plan. The Transitional Period Monitoring Report shall include the assessments required per D.4.a.(1)(a), D.4.b.(1)(a) and D.4.b.(2)(a); and be submitted by January 31st following completion of the above mentioned transitional period.

~~(1)~~(3) Post-Transitional Annual Reports – Following the initial transitional period after enrollment into this Order, the~~The~~ Copermittees for each Watershed Management Area must submit an combined Annual Report for each reporting period no later than January 31 of the following year. The annual reporting period consists of two periods: 1) July 1 to June 30 of the following year for the jurisdictional runoff management programs, 2) October 1 to September 30 of the following year for the monitoring and assessment programs~~. The first Annual Report must be prepared for the reporting period beginning July 1 after commencement of coverage under this Order, and upon San Diego Water Board determination that the Water Quality Improvement Plan meets the requirements of this Order to June 30 in the following year for the jurisdictional runoff management programs, and September 30 in the following year for the monitoring and assessment programs.~~ Annual Reports must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Each Annual Report must include the following:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, summarized and presented in tabular and graphical form;

(b) Progress of the special studies required pursuant to Provision D.3, and the results or findings when a special study, or each phase of a special study, is completed;

(c) The findings from the applicable assessments required pursuant to Provision D.4;

Comment [A123]: Not all are required annually.

(d) The progress of implementing the Water Quality Improvement Plan, including, but not limited to, the following:

(i) The progress toward achieving the interim and final numeric goals for the highest water quality priorities for the Watershed Management Area,

(ii) The water quality improvement strategies that were implemented and/or no longer implemented by each of the Copermittees during the reporting period and previous reporting periods, and are planned to be implemented during the next reporting period,

(iii) Proposed modifications to the water quality improvement strategies, with public input received and rationale for the proposed modifications,

(iv) Previously proposed modifications or updates incorporated into the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document and implemented by the Copermittees in the Watershed Management Area, and

(v) Proposed modifications or updates to the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document;

(e) A completed Jurisdictional Runoff Management Program Annual Report Form (Attachment D or accepted revision) for each Copermittee in the Watershed Management Area, certified by a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative.

~~(2) Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (Attachment D or accepted revision) no later than October 31 of each year until the first Annual Report is required to be submitted. Each Copermittee must submit the information on the Jurisdictional Runoff Management Program Annual Report Form specific to the area within its jurisdiction in each Watershed Management Area.~~

Comment [A124]: Adapted into new section (1)

~~(3)~~(4) Each Copermittee must provide any data or documentation utilized in

developing the Annual Report upon request by the San Diego Water Board. ~~AnyAny~~Copermittee~~Any~~ monitoring data utilized in developing the Annual Report must be uploaded to the California Environmental Data Exchange Network (CEDEN).[35] Any Copermittee monitoring and assessment data utilized in developing the Annual Report must be provided on the Regional Clearinghouse required pursuant to Provision F.4.

C. Regional Monitoring and Assessment Report

(1) The Copermittees must submit a Regional Monitoring and Assessment Report no later than 180 days in advance of the expiration date of this Order. The Regional Monitoring and Assessment Report may be submitted as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The Regional Monitoring and Assessment Report shall incorporate the Integrated Assessment of the Water Quality Improvement Plan per D.4.d.

~~(1) The Copermittees must review the receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, and findings from the assessments required pursuant to Provision D.4, to assess the following:~~

~~(2)~~

~~(3) The beneficial uses of the receiving waters within the San Diego Region that are protected or must be restored;~~

~~(4)~~

~~(5) The progress toward restoring impacted beneficial uses in the receiving waters within the San Diego Region; and~~

~~(6)~~

~~(7) Pollutants or conditions of emerging concern that may impact beneficial uses in the receiving waters within the San Diego Region.~~

~~(8)~~

~~(9) The Regional Monitoring and Assessment Report must include recommendations for improving the implementation and assessment of the Water Quality Improvement Plans and jurisdictional runoff management programs.~~

(2) Each Copermittee must provide any data or documentation utilized in developing the Regional Monitoring and Assessment Report upon request by the San Diego Water Board. Any monitoring and assessment data utilized in developing the Regional Monitoring and Assessment Report must be provided on the Regional Clearinghouse required pursuant to Provision F.4.

[35] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

4. Regional Clearinghouse

The Copermittees must develop, update, and maintain an internet-based Regional Clearinghouse that is made available to the public no later than 18 months after the effective date of this Order.[36]

a. The Copermittees, through the Regional Clearinghouse, must make the following documents and data available, organized by Watershed Management Area, which may be linked to other internet-based data portals and databases where the original documents are stored:

(1) Water Quality Improvement Plan for the Watershed Management Area, and all updated versions with date of update;

(2) Annual Reports for the Watershed Management Area;

(3) Jurisdictional Runoff Management Program document for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(4) BMP Design Manual for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(5) Reports from special studies (e.g. source identification, BMP effectiveness assessment) conducted in the Watershed Management Area;

(6) Monitoring data collected pursuant to Provision D for each Watershed Management Area must be uploaded to CEDEN,[37] with links to the uploaded data; and

(7) Available GIS data, layers, and/or shapefiles used to develop the maps generated and maintained by the Copermittees for the Water Quality Improvement Plans, Annual Reports, and jurisdictional runoff management program documents.

b. The Copermittees, through the Regional Clearinghouse, must make the following information and documents available:

(1) Contact information (point of contact, phone number, email address, and mailing address) for each Copermittee;

[36] The Copermittee may elect to develop and maintain the clearinghouse(s) provided by other Copermittees or agencies.

[37] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

(2) Public hotline number for reporting non-storm water and illicit discharges for each Copermittee;

(3) Email address for reporting non-storm water and illicit discharges for each Copermittee;

(4) Link to each Copermittee's website, if available, where the public may find additional information about the Copermittee's storm water management program and for requesting records for the implementation of its program;

(5) Information about opportunities for the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in ~~storm water~~ discharges from the MS4, and/or restoration and protection of the quality of receiving waters; and

(6) Reports from regional monitoring programs in which the Copermittees participate (e.g. Southern California Monitoring Coalition, Southern California Coastal Water Research Project Bight Monitoring);

(7) Regional Monitoring and Assessment Reports; and

(8) Any other information, data, and documents the Copermittees determine as appropriate for making available to the public.

5. Report of Waste Discharge

a. The Orange County Copermittees and the Riverside County Copermittees are required to submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders. The San Diego Water Board will review and consider the Reports of Waste Discharge to determine whether modification to this Order, pursuant to the requirements of Provision H, will be required prior the Orange County Copermittees and/or Riverside County Copermittees becoming covered under this Order. The current Orders for the Orange County Copermittees and Riverside County Copermittees are rescinded upon notification of coverage under this Order except for enforcement purposes.

b. The Copermittees subject to the requirements of this Order must submit to the San Diego Water Board a complete Report of Waste Discharge as an application for the re-issuance of this Order and NPDES permit. The Report of Waste Discharge must be submitted no later than 180 days in advance of the expiration date of this Order. The Report of Waste Discharge must contain the following minimum information:

(1) Names and addresses of the Copermittees;

(2) Names and titles of the primary contacts of the Copermittees;

(3) Proposed changes to the Copermittees' Water Quality Improvement Plans and the supporting justification;

(4) Proposed changes to the Copermittees' jurisdictional runoff management programs and the supporting justification;

(5) Any other information necessary for the re-issuance of this Order;

(6) Any information to be included as part of the Report of Waste Discharge pursuant to the requirements of this Order; and

(7) Any other information required by federal regulations for NPDES permit reissuance.

6. Application for Early Coverage

a. The Orange County Copermittees, collectively, or Riverside County Copermittees, collectively, may apply for early coverage under this Order by submitting a Report of Waste Discharge Form 200, with a written request for early coverage under this Order.

Comment [A125]: This form requests information that is not applicable to MS4s.

b. The San Diego Water Board will review the application for early coverage. A notification of coverage under this Order will be issued to the Copermittees in the respective county by the San Diego Water Board upon completion of the early coverage application requirements. The effective coverage date will be specified in the notification of coverage. The Copermittees in the respective county are authorized to have MS4 discharges pursuant to the requirements of this Order starting on the effective coverage date specified in the notification of coverage. The existing Order for the respective county is rescinded upon the effective coverage date specified in the notification of coverage except for enforcement purposes.

7. Reporting Provisions

Each Copermittee must comply with all the reporting and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

G. PRINCIPAL WATERSHED COPERMITTEE RESPONSIBILITIES

1. The Copermittees within each Watershed Management Area must designate a Principal Watershed Copermittee and notify the San Diego Water Board of the name of the Principal Watershed Copermittee. ~~An individual Copermittee should not be designated a Principal Watershed Copermittee for more than two Watershed Management Areas.~~ The notification may be submitted with the Water Quality Improvement Plan required pursuant to Provision F.1 of this Order.

2. The Principal Watershed Copermittee is responsible for, at a minimum, the following:

a. Serving as liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues, and when necessary and appropriate, representing the Copermittees in the Watershed Management Area before the San Diego Water Board.

b. Facilitating the development of the Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order

c. Coordinating the submittal of the deliverables required by Provisions F.1, F.2, F.3.a, and F.3.b of this Order.

d. Coordinating the development of~~and developing~~, with the other Principal Watershed Copermittees, the requirements of Provisions F.3.c, F.4, and F.5.b of this Order.

H. MODIFICATION OF PROGRAMS

1. Modifications of the Order may be initiated by the San Diego Water Board or by the Copermittees, including as part of the ROWD process applicable to the Orange County and Riverside County Copermittees. Requests by Copermittees must be made to the San Diego Water Board.

2. Minor modifications to the Order may be made by the San Diego Water Board Executive Officer, where the proposed modification complies with all the effective prohibitions and limitations, and other requirements of this Order.

3. Proposed modifications to the Order outside of the WQIP process that are not minor require amendment of this Order in accordance with this Order's rules, policies, and procedures.

4. The San Diego Water Board may re-open and modify this Order at any time prior to its expiration, after opportunity for public comment and a public hearing, if the State Water Board determines that revisions are warranted to those provisions of the Order addressing compliance with water quality standards in the receiving water and/or those provisions of the Order establishing an iterative process for implementation of management practices to assure compliance with water quality standards in the receiving water.

I. STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

Each Copermittee must comply with all the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

ATTACHMENT A

DISCHARGE PROHIBITIONS AND SPECIAL PROTECTIONS

1. Basin Plan Waste Discharge Prohibitions

California Water Code Section 13243 provides that a Regional Water Board, in a water quality control plan, may specify certain conditions or areas where the discharge of waste or certain types of waste is not permitted. The following waste discharge effective prohibitions in the Water Quality Control Plan for the San Diego Basin (Basin Plan) are applicable to any person, as defined by Section 13050(c) of the California Water Code, who is a citizen, domiciliary, or political agency or entity of California whose activities in California could affect the quality of waters of the state within the boundaries of the San Diego Region.

1. The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in California Water Code Section 13050, is prohibited.

2. The discharge of waste to land, except as authorized by waste discharge requirements or the terms described in California Water Code Section 13264 is prohibited.

3. The discharge of pollutants or dredged or fill material to waters of the United States except as authorized by a National Pollutant Discharge Elimination System (NPDES) permit or a dredged or fill material permit (subject to the exemption described in California Water Code Section 13376) is prohibited.

4. Discharges of recycled water to lakes or reservoirs used for municipal water supply or to inland surface water tributaries thereto are prohibited, unless this San Diego Water Board issues a NPDES permit authorizing such a discharge; the proposed discharge has been approved by the State Department of Health Services (DHS) and the operating agency of the impacted reservoir; and the discharger has an approved fail-safe long-term disposal alternative.

5. The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the San Diego Water Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

6. The discharge of waste in a manner causing flow, ponding, or surfacing on lands not owned or under the control of the discharger is prohibited, unless the discharge is authorized by the San Diego Water Board.

7. The dumping, deposition, or discharge of waste directly into waters of the state, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the San Diego Water Board.

8. Any discharge to a storm water conveyance system that is not composed entirely of "*storm water*" is effectively prohibited unless authorized by the San Diego Water Board. [The federal regulations, 40 CFR 122.26(b)(13), define storm water as storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from fire fighting activities.] [§122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

9. The unauthorized discharge of treated or untreated sewage to waters of the state or to a storm water conveyance system is prohibited.

10. The discharge of industrial wastes to conventional septic tank/subsurface disposal systems, except as authorized by the terms described in California Water Code Section 13264, is prohibited.

11. The discharge of radioactive wastes amenable to alternative methods of disposal into the waters of the state is prohibited.

12. The discharge of any radiological, chemical, or biological warfare agent into waters of the state is prohibited.

13. The discharge of waste into a natural or excavated site below historic water levels is prohibited unless the discharge is authorized by the San Diego Water Board.

14. The discharge of sand, silt, clay, or other earthen materials from any activity, including land grading and construction, in quantities which cause deleterious bottom deposits, turbidity or discoloration in waters of the state or which unreasonably affect, or threaten to affect, beneficial uses of such waters is prohibited.

15. The discharge of treated or untreated sewage from vessels to Mission Bay, Oceanside Harbor, Dana Point Harbor, or other small boat harbors is prohibited.

16. The discharge of untreated sewage from vessels to San Diego Bay is prohibited.

17. The discharge of treated sewage from vessels to portions of San Diego Bay that are less than 30 feet deep at mean lower low water (MLLW) is prohibited.

18. The discharge of treated sewage from vessels, which do not have a properly functioning US Coast Guard certified Type I or Type II marine sanitation device, to portions of San Diego Bay that are greater than 30 feet deep at mean lower low water (MLLW) is prohibited.

2. Attachment B to State Water Board Resolution 2012-0012

Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges

I. PROVISIONS FOR POINT SOURCE DISCHARGES OF STORM WATER AND NONPOINT SOURCE WASTE DISCHARGES

The following terms, effective prohibitions, and special conditions (hereafter collectively referred to as special conditions) are established as limitations on point source storm water and nonpoint source discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in Areas of Special Biological Significance (ASBS), as required for State Water Quality Protection Areas pursuant to California Public Resources Code Sections 36700(f) and 36710(f). These Special Protections are adopted by the State Water Board as part of the California Ocean Plan (Ocean Plan) General Exception.

The special conditions are organized by category of discharge. The State Water Resources Control Board (State Water Board) and Regional Water Quality Control Boards (Regional Water Boards) will determine categories and the means of regulation for those categories [e.g., Point Source Storm Water National Pollutant Discharge Elimination System (NPDES) or Nonpoint Source].

A. PERMITTED POINT SOURCE DISCHARGES OF STORM WATER

1. General Provisions for Permitted Point Source Discharges of Storm Water

   a. Existing storm water discharges into an ASBS are allowed only under the following conditions:

      (1) The discharges are authorized by an NPDES permit issued by the State Water Board or Regional Water Board;

      (2) The discharges comply with all of the applicable terms, effective prohibitions, and special conditions contained in these Special Protections; and

      (3) The discharges:

         (i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

         (ii) Are designed to prevent soil erosion;

         (iii) Occur only during wet weather;

         (iv) Are composed of only storm water runoff.

   b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

   c. The discharge of trash is effectively prohibited.

d. Only discharges from existing storm water outfalls are allowed. Any proposed or new storm water runoff discharge shall be routed to existing storm water discharge outfalls and shall not result in any new contribution of waste to an ASBS (i.e., no additional pollutant loading). “Existing storm water outfalls” are those that were constructed or under construction prior to January 1, 2005. “New contribution of waste” is defined as any addition of waste beyond what would have occurred as of January 1, 2005. A change to an existing storm water outfall, in terms of re-location or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges are effectively prohibited except as provided below:

(1) The term “non-storm water discharges” means any waste discharges from a municipal separate storm sewer system (MS4) or other NPDES permitted storm drain system to an ASBS that are not composed entirely of storm water.

(2) (i) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability or occur naturally:

(a) Discharges associated with emergency fire fighting operations.

(b) Foundation and footing drains.

(c) Water from crawl space or basement pumps.

(d) Hillside dewatering.

(e) Naturally occurring groundwater seepage via a storm drain.

(f) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(ii) An NPDES permitting authority may authorize non-storm water discharges to an MS4 with a direct discharge to an ASBS only to the extent the NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

2. Compliance Plans for Inclusion in Storm Water Management Plans (SWMP) and Storm Water Pollution Prevention Plans (SWPPP).

The discharger shall specifically address the effective prohibition of non-storm water runoff and the requirement to maintain natural water quality for storm water discharges to an ASBS in an ASBS Compliance Plan to be included in its SWMP or a SWPPP, as appropriate to permit type. If a statewide permit includes a SWMP, then the discharger shall prepare a stand-alone compliance plan for ASBS discharges. The ASBS Compliance Plan is subject to approval by the Executive Director of the State Water Board (statewide permits) or

Executive Officer of the Regional Water Board (for permits issued by Regional Water Boards).

a. The Compliance Plan shall include a map of surface drainage of storm water runoff, showing areas of sheet runoff, prioritize discharges, and describe any structural Best Management Practices (BMPs) already employed and/or BMPs to be employed in the future. Priority discharges are those that pose the greatest water quality threat and which are identified to require installation of structural BMPs. The map shall also show the storm water conveyances in relation to other features such as service areas, sewage conveyances and treatment facilities, landslides, areas prone to erosion, and waste and hazardous material storage areas, if applicable. The SWMP or SWPPP shall also include a procedure for updating the map and plan when changes are made to the storm water conveyance facilities.

b. The ASBS Compliance Plan shall describe the measures by which all non-authorized non-storm water runoff (e.g., dry weather flows) has been eliminated, how these measures will be maintained over time, and how these measures are monitored and documented.

c. For Municipal Separate Storm Sewer System (MS4s), the ASBS Compliance Plan shall require minimum inspection frequencies as follows:

   (1) The minimum inspection frequency for construction sites shall be weekly during rainy season;

   (2) The minimum inspection frequency for industrial facilities shall be monthly during the rainy season;

   (3) The minimum inspection frequency for commercial facilities (e.g., restaurants) shall be twice during the rainy season; and

   (4) Storm water outfall drains equal to or greater than 18 inches (457 mm) in diameter or width shall be inspected once prior to the beginning of the rainy season and once during the rainy season and maintained to remove trash and other anthropogenic debris.

d. The ASBS Compliance Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff, that are necessary to comply with these special conditions, will be achieved through BMPs. Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that such installation would pose a threat to health or safety. BMPs to control storm water runoff discharges (at the end-of-pipe) during a design storm shall be designed to achieve on average the following target levels:

   (1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

   (2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges. The baseline for the reduction is the effective date of the Exception. The

baseline for these determinations is the effective date of the Exception, and the reductions must be achieved and documented within four (4) years of the effective date.

e. The ASBS Compliance Plan shall address erosion control and the prevention of anthropogenic sedimentation in ASBS. The natural habitat conditions in the ASBS shall not be altered as a result of anthropogenic sedimentation.

f. The ASBS Compliance Plan shall describe the non-structural BMPs currently employed and planned in the future (including those for construction activities), and include an implementation schedule. The ASBS Compliance Plan shall include non-structural BMPs that address public education and outreach. Education and outreach efforts must adequately inform the public that direct discharges of pollutants from private property not entering an MS4 are effectively prohibited. The ASBS Compliance Plan shall also describe the structural BMPs, including any low impact development (LID) measures, currently employed and planned for higher threat discharges and include an implementation schedule. To control storm water runoff discharges (at the end-of-pipe) during a design storm, permittees must first consider using LID practices to infiltrate, use, or evapotranspirate storm water runoff on-site.

g. The BMPs and implementation schedule shall be designed to ensure that natural water quality conditions in the receiving water are achieved and maintained by either reducing flows from impervious surfaces or reducing pollutant loading, or some combination thereof.

h. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents in storm water runoff that alter natural ocean water quality and the sources of these constituents.

(2) The report shall describe BMPs that are currently being implemented, BMPs that are identified in the SWMP or SWPPP for future implementation, and any additional BMPs that may be added to the SWMP or SWPPP to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the BMPs.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits), the discharger shall revise its ASBS Compliance Plan to incorporate any new or modified BMPs that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised SWMP or SWPPP, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural ocean water quality conditions due to the same constituent.

(5) Compliance with this section does not excuse violations of any term, effective prohibition, or condition contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within one year from the effective date of the Exception, the discharger shall submit a written ASBS Compliance Plan to the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that describes its strategy to comply with these special conditions, including the requirement to maintain natural water quality in the affected ASBS. The ASBS Compliance Plan shall include a time schedule to implement appropriate non-structural and structural controls (implementation schedule) to comply with these special conditions for inclusion in the discharger's SWMP or SWPPP, as appropriate to permit type.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these special conditions shall be implemented.

d. Within four (4) years of the effective date of the Exception, any structural controls identified in the ASBS Compliance Plan that are necessary to comply with these special conditions shall be operational.

e. Within four (4) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water, pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data, and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

(1) for municipalities, a demonstration of significant hardship to discharger ratepayers, by showing the relationship of storm water fees to annual household income for residents within the discharger's jurisdictional area, and the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or
(2) for other governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process.

B. NONPOINT SOURCE DISCHARGES

[NOT INCLUDED]
[PROVISIONS FOR NONPOINT SOURCE DISCHARGES NOT APPLICABLE]

II. ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES

[NOT INCLUDED]
[ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES NOT APPLICABLE]

III. ADDITIONAL REQUIREMENTS – WATERFRONT AND MARINE OPERATIONS

[NOT INCLUDED]
[ADDITIONAL REQUIREMENTS FOR WATERFRONT AND MARINE OPERATIONS NOT APPLICABLE]

IV. MONITORING REQUIREMENTS

Monitoring is mandatory for all dischargers to assure compliance with the Ocean Plan. Monitoring requirements include both: (A) core discharge monitoring, and (B) ocean receiving water monitoring. The State and Regional Water Boards must approve sampling site locations and any adjustments to the monitoring programs. All ocean receiving water and reference area monitoring must be comparable with the Water Boards' Surface Water Ambient Monitoring Program (SWAMP).

Safety concerns: Sample locations and sampling periods must be determined considering safety issues. Sampling may be postponed upon notification to the State and Regional Water Boards if hazardous conditions prevail.

Analytical Chemistry Methods: All constituents must be analyzed using the lowest minimum detection limits comparable to the Ocean Plan water quality objectives. For metal analysis, all samples, including storm water effluent, reference samples, and ocean receiving water samples, must be analyzed by the approved analytical method with the lowest minimum detection limits (currently Inductively Coupled Plasma/Mass Spectrometry) described in the Ocean Plan.

A. CORE DISCHARGE MONITORING PROGRAM

1. General sampling requirements for timing and storm size:

   Runoff must be collected during a storm event that is greater than 0.1 inch and generates runoff, and at least 72 hours from the previously measurable storm event. Runoff samples shall be collected when post-storm receiving water is sampled, and analyzed for the same constituents as receiving water and reference site samples (see section IV B) as described below.

2. Runoff flow measurements

   a. For municipal/industrial storm water outfalls in existence as of December 31, 2007, 18 inches (457mm) or greater in diameter/width (including multiple outfall pipes in combination having a width of 18 inches, runoff flows must be measured or calculated, using a method acceptable to and approved by the State and Regional Water Boards.
   b. This will be reported annually for each precipitation season to the State and Regional Water Boards.

3. Runoff samples – storm events

   a. For outfalls equal to or greater than 18 inches (0.46m) in diameter or width:

      (1) samples of storm water runoff shall be analyzed during the same storm as receiving water samples for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination, ; and

      (2) samples of storm water runoff shall be analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS

      (3) If an applicant has no outfall greater than 36 inches, then storm water runoff from the applicant's largest outfall shall be further analyzed during the same storm as receiving water samples for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates).

   b. For outfalls equal to or greater than 36 inches (0.91m) in diameter or width:

      (1) samples of storm water runoff shall be analyzed during the same storm as receiving water samples for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

      (2) samples of storm water runoff shall be further analyzed during the same storm as receiving water samples for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides

(pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates) and

(3) samples of storm water runoff shall be analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

c. For an applicant not participating in a regional monitoring program [see below in Section IV (B)] in addition to (a.) and (b.) above, a minimum of the two largest outfalls or 20 percent of the larger outfalls, whichever is greater, shall be sampled (flow weighted composite samples) at least three times annually during wet weather (storm event) and analyzed for all Ocean Plan Table A constituents, Table B constituents for marine aquatic life protection (except for toxicity, only chronic toxicity for three species shall be required), DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, and Ocean Plan indicator bacteria. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one (the largest) such discharge shall be sampled annually in each Region.

4. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may reduce or suspend core monitoring once the storm runoff is fully characterized. This determination may be made at any point after the discharge is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

B. OCEAN RECEIVING WATER AND REFERENCE AREA MONITORING PROGRAM

In addition to performing the Core Discharge Monitoring Program in Section II.A above, all applicants having authorized discharges must perform ocean receiving water monitoring. In order to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS, dischargers may choose either (1) an individual monitoring program, or (2) participation in a regional integrated monitoring program.

1. Individual Monitoring Program: The requirements listed below are for those dischargers who elect to perform an individual monitoring program to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within the affected ASBS. In addition to Core Discharge Monitoring, the following additional monitoring requirements shall be met:

   a. Three times annually, during wet weather (storm events), the receiving water at the point of discharge from the outfalls described in section (IV)(A)(3)(c) above shall be sampled and analyzed for Ocean Plan Table A constituents, Table B constituents for marine aquatic life, DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, salinity, chronic toxicity (three species), and Ocean Plan indicator bacteria.

      The sample location for the ocean receiving water shall be in the surf zone at the point of discharges; this must be at the same location where storm water runoff is sampled. Receiving water shall be sampled at approximately the same time prior to (pre-storm) and during (or immediately after) the same storm (post storm). Reference water quality shall also be sampled and analyzed for the same constituents pre-storm and post-storm, during the same storms when receiving water is sampled. Reference stations will be

determined by the State Water Board's Division of Water Quality and the applicable Regional Water Board(s).

b. Sediment sampling shall occur at least three times during every five (5) year period. The subtidal sediment (sand or finer, if present) at the discharge shall be sampled and analyzed for Ocean Plan Table B constituents for marine aquatic life, DDT, PCBs, PAHs, pyrethroids, and OP pesticides. For sediment toxicity testing, only an acute toxicity test using the amphipod Eohaustorius estuarius must be performed.

c. A quantitative survey of intertidal benthic marine life shall be performed at the discharge and at a reference site. The survey shall be performed at least once every five (5) year period. The survey design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The results of the survey shall be completed and submitted to the State Water Board and Regional Water Board at least six months prior to the end of the permit cycle.

d. Once during each five (5) year period, a bioaccumulation study shall be conducted to determine the concentrations of metals and synthetic organic pollutants at representative discharge sites and at representative reference sites. The study design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The bioaccumulation study may include California mussels (Mytilus californianus) and/or sand crabs (Emerita analoga or Blepharipoda occidentalis). Based on the study results, the Regional Water Board and the State Water Board's Division of Water Quality, may adjust the study design in subsequent permits, or add or modify additional test organisms (such as shore crabs or fish), or modify the study design appropriate for the area and best available sensitive measures of contaminant exposure.

e. Marine Debris: Representative quantitative observations for trash by type and source shall be performed along the coast of the ASBS within the influence of the discharger's outfalls. The design, including locations and frequency, of the marine debris observations is subject to approval by the Regional Water Board and State Water Board's Division of Water Quality.

f. The monitoring requirements of the Individual Monitoring Program in this section are minimum requirements. After a minimum of one (1) year of continuous water quality monitoring of the discharges and ocean receiving waters, the Executive Director of the State Water Board (statewide permits) or Executive officer of the Regional Water Board (Regional Water Board permits) may require additional monitoring, or adjust, reduce or suspend receiving water and reference station monitoring. This determination may be made at any point after the discharge and receiving water is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

2. Regional Integrated Monitoring Program: Dischargers may elect to participate in a regional integrated monitoring program, in lieu of an individual monitoring program, to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS. This regional approach shall characterize natural water quality, pre- and post-storm, in ocean reference areas near the mouths of identified open space watersheds and the effects of the discharges on natural water quality (physical, chemical, and toxicity) in the ASBS receiving waters, and should include benthic marine aquatic life and bioaccumulation components. The design of the ASBS stratum of a regional integrated monitoring program may deviate from the otherwise prescribed individual

monitoring approach (in Section IV.B.1) if approved by the State Water Board's Division of Water Quality and the Regional Water Boards.

a. Ocean reference areas shall be located at the drainages of flowing watersheds with minimal development (in no instance more than 10% development), and shall not be located in CWA Section 303(d) listed waterbodies or have tributaries that are 303(d) listed. Reference areas shall be free of wastewater discharges and anthropogenic non-storm water runoff. A minimum of low threat storm runoff discharges (e.g. stream highway overpasses and campgrounds) may be allowed on a case-by-case basis. Reference areas shall be located in the same region as the ASBS receiving water monitoring occurs. The reference areas for each Region are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean reference water samples must be collected from each station, each from a separate storm. A minimum of one reference location shall be sampled for each ASBS receiving water site sampled per responsible party. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

b. ASBS ocean receiving water must be sampled in the surf zone at the location where the runoff makes contact with ocean water (i.e. at "point zero"). Ocean receiving water stations must be representative of worst-case discharge conditions (i.e. co-located at a large drain greater than 36 inches, or if drains greater than 36 inches are not present in the ASBS then the largest drain greater than18 inches.) Ocean receiving water stations are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean receiving water samples must be collected during each storm season from each station, each from a separate storm. A minimum of one receiving water location shall be sampled in each ASBS per responsible party in that ASBS. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

c. Reference and receiving water sampling shall commence during the first full storm season following the adoption of these special conditions, and post-storm samples shall be collected when annual storm water runoff is sampled. Sampling shall occur in a minimum of two storm seasons. For those ASBS dischargers that have already participated in the Southern California Bight 2008 ASBS regional monitoring effort, sampling may be limited to only one storm season.

d. Receiving water and reference samples shall be analyzed for the same constituents as storm water runoff samples. At a minimum, constituents to be sampled and analyzed in reference and discharge receiving waters must include oil and grease, total suspended solids, Ocean Plan Table B metals for protection of marine life, Ocean Plan PAHs, pyrethroids, OP pesticides, ammonia, nitrate, phosphates, and critical life stage chronic toxicity for three species. In addition, within the range of the southern sea otter, indicator bacteria or some other measure of fecal contamination shall be analyzed.

3. Waterfront and Marine Operations: In addition to the above requirements for ocean receiving water monitoring, additional monitoring must be performed for marinas and boat launch and pier facilities:

a. For all marina or mooring field operators, in mooring fields with 10 or more occupied moorings, the ocean receiving water must be sampled for Ocean Plan indicator bacteria, residual chlorine, copper, zinc, grease and oil, methylene blue active substances (MBAS), and ammonia nitrogen.

   (1) For mooring field operators opting for an individual monitoring program (Section IV.B.1 above), this sampling must occur weekly (on the weekend) from May through October.

   (2) For mooring field operators opting to participate in a regional integrated monitoring program (Section IV.B.2 above), this sampling must occur monthly from May through October on a high use weekend in each month. The Water Boards may allow a reduction in the frequency of sampling, through the regional monitoring program, after the first year of monitoring.

b. For all mooring field operators, the subtidal sediment (sand or finer, if present) within mooring fields and below piers shall be sampled and analyzed for Ocean Plan Table B metals (for marine aquatic life beneficial use), acute toxicity, PAHs, and tributyltin. For sediment toxicity testing, only an acute toxicity test using the amphipod Eohaustorius estuarius must be performed. This sampling shall occur at least three times during a five (5) year period. For mooring field operators opting to participate in a regional integrated monitoring program, the Water Boards may allow a reduction in the frequency of sampling after the first sampling effort's results are assessed.

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ATTACHMENT B

STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

1. Standard Permit Provisions

Code of Federal Regulations Title 40 Section 122.41 (40 CFR 122.41) includes conditions, or provisions, that apply to all National Pollutant Discharge Elimination System (NPDES) permits. Additional provisions applicable to NPDES permits are in 40 CFR 122.42. All applicable provisions in 40 CFR 122.41 and 40 CFR 122.42 must be incorporated into this Order and NPDES permit. The applicable 40 CFR 122.41 and 40 CFR 122.42 provisions are as follows:

a. DUTY TO COMPLY [40 CFR 122.41(a)]

The Copermittee must comply with all of the provisions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

(1) The Copermittee must comply with effluent standards or effective prohibitions established under Section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or effective prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement. [40 CFR 122.41(a)(1)]

(2) The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to a civil penalty not to exceed $25,000 per day for each violation. The CWA provides that any person who *negligently* violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than 2 years, or both. Any person who *knowingly* violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both. Any person who knowingly violates Section 301, 302, 303, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, and who knows at that time that he thereby places another person in imminent danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of

not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.
[40 CFR 122.41(a)(2)]

(3) Any person may be assessed an administrative penalty by the San Diego Regional Water Quality Control Board (San Diego Water Board), State Water Resources Control Board (State Water Board), or United States Environmental Protection Agency (USEPA) for violating Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.
[40 CFR 122.41(a)(3)]

b. DUTY TO REAPPLY [40 CFR 122.41(b)]

If a Copermittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Copermittee must apply for and obtain a new permit.

c. NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE [40 CFR 122.41(c)]

It shall not be a defense for a Copermittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

d. DUTY TO MITIGATE [40 CFR 122.41(d)]

The Copermittee must take all reasonable steps to minimize or prevent any discharge or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

e. PROPER OPERATION AND MAINTENANCE [40 CFR 122.41(e)]

The Copermittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Copermittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by a Copermittee only when the operation is necessary to achieve compliance with the conditions of this permit.

f. PERMIT ACTIONS [40 CFR 122.41(f)]

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Copermittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

g. PROPERTY RIGHTS [40 CFR 122.41(g)]

This permit does not convey any property rights of any sort, or any exclusive privilege.

h. DUTY TO PROVIDE INFORMATION [40 CFR 122.41(h)]

The Copermittee must furnish to the San Diego Water Board, State Water Board, or USEPA within a reasonable time, any information which the San Diego Water Board, State Water Board, or USPEA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Copermittee must also furnish to the San Diego Water Board, State Water Board, or USPEA upon request, copies of records required to be kept by this permit.

i. INSPECTION AND ENTRY [40 CFR 122.41(i)]

The Copermittee must allow the San Diego Water Board, State Water Board, USEPA, and/or their authorized representative (including an authorized contractor acting as their representative), upon presentation of credentials and other documents as may be required by law, to:

(1) Enter upon the Copermittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit; [40 CFR 122.41(i)(1)]

(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit; [40 CFR 122.41(i)(2)]

(3) Inspect and photograph at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; [40 CFR 122.41(i)(3)] and

(4) Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location. [40 CFR 122.41(i)(4)]

j. MONITORING AND RECORDS [40 CFR 122.41(j)]

(1) Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity. [40 CFR 122.41(j)(1)]

(2) Except for records of monitoring information required by this permit related to the Copermittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five (5) years (or longer as required by 40 CFR Part 503), the

Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time. [40 CFR 122.41(j)(2)]

(3) Records for monitoring information must include: [40 CFR 122.41(j)(3)]

(a) The date, exact place, and time of sampling or measurements; [40 CFR 122.41(j)(3)(i)]
(b) The individual(s) who performed the sampling or measurements; [40 CFR 122.41(j)(3)(ii)]
(c) The date(s) analyses were performed; [40 CFR 122.41(j)(3)(iii)]
(d) The individual(s) who performed the analyses; [40 CFR 122.41(j)(3)(iv)]
(e) The analytical techniques or methods used; [40 CFR 122.41(j)(3)(v)] and
(f) The results of such analyses. [40 CFR 122.41(j)(3)(vi)]

(4) Monitoring must be conducted according to test procedures under 40 CFR Part 136 unless another method is required under 40 CFR Subchapters N or O. [40 CFR 122.41(j)(4)]

In the case of pollutants for which there are no approved methods under 40 CFR Part 136 or otherwise required under 40 CFR Subchapters N and O, monitoring must be conducted according to a test procedure specified in the permit for such pollutants. [40 CFR 122.44(i)(1)(iv)]

(5) The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. [40 CFR 122.41(j)(5)]

k. SIGNATORY REQUIREMENT [40 CFR 122.41(k)]

(1) All applications, reports, or information submitted to the San Diego Water Board, State Water Board, or USEPA must be signed and certified. (See 40 CFR 122.22) [40 CFR 122.41(k)(1)]

(a) *For a municipality, State, Federal, or other public agency.* [All applications must be signed] [b]y either a principal executive officer or ranking elected official. [40 CFR 122.22(a)(3)]

(b) All reports required by permits, and other information requested by the San Diego Water Board, State Water Board, or USEPA must be signed by a person described in paragraph (a) of this section, or by a duly authorized representative of that person. A person is a duly authorized representative only if: [40 CFR 122.22(b)]

(i) The authorization is made in writing by a person described in paragraph (a) of this section; [40 CFR 122.22(b)(1)]

(ii) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company, (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) [40 CFR 122.22(b)(2)] and,

(iii) The written authorization is submitted to the San Diego Water Board and State Water Board. [40 CFR 122.22(b)(3)]

(c) *Changes to authorization.* If an authorization under paragraph (b) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (b) of this section must be submitted to the San Diego Water Board prior to or together with any reports, information, or applications to be signed by an authorized representative. [40 CFR 122.22(c)]

(d) *Certification.* Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." [40 CFR 122.22(d)]

(2) The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both. [40 CFR 122.41(k)(2)]

I. REPORTING REQUIREMENTS [40 CFR 122.41(l)]

(1) *Planned changes.* The Copermittee must give notice to the San Diego Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when: [40 CFR 122.41(l)(1)]

(a) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); [40 CFR 122.41(l)(1)(i)] or

(b) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which

are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1).
[40 CFR 122.41(l)(1)(ii)]

(c) The alteration or addition results in a significant change in the Copermittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. [40 CFR 122.41(l)(1)(iii)]

(2) *Anticipated noncompliance*. The Copermittee must give advance notice to the San Diego Water Board or State Water Board of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.
[40 CFR 122.41(l)(2)]

(3) *Transfers*. This permit is not transferable to any person except after notice to the San Diego Water Board. The San Diego Water Board may require modification or revocation and reissuance of the permit to change the name of the Copermittee and incorporate such other requirements as may be necessary under the CWA.
[40 CFR 122.41(l)(3)]

(4) *Monitoring reports.* Monitoring results must be reported at the intervals specified elsewhere in this permit. [40 CFR 122.41(l)(4)]

(a) Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the San Diego Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices. [40 CFR 122.41(l)(4)(i)]

(b) If the Copermittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or another method required for an industry-specific waste stream under 40 CFR Subchapters N or O, the results of this monitoring must be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the San Diego Water Board or State Water Board.
[40 CFR 122.41(l)(4)(ii)]

(c) Calculations for all limitations which require averaging of measurements must utilize an arithmetic mean unless otherwise specified in the permit.
[40 CFR 122.41(l)(4)(iii)]

(5) *Compliance schedules*. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date. [40 CFR 122.41(l)(5)]

(6) *Twenty-four hour reporting.*

(a) The Copermittee must report any noncompliance that may endanger health or the environment. Any information must be provided orally within 24 hours from the time the Copermittee becomes aware of the circumstances. A written submission must also be provided within five (5) days of the time the Copermittee becomes aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6)(i)]

(b) The following must be included as information which must be reported within 24 hours under this paragraph: [40 CFR 122.41(l)(6)(ii)]

(i) Any unanticipated bypass that exceeds any effluent limitation in the permit (See 40 CFR 122.41(g)). [40 CFR 122.41(l)(6)(ii)(A)]

(ii) Any upset which exceeds any effluent limitation in the permit. [40 CFR 122.41(l)(6)(ii)(B)] and,

(iii) Violation of a maximum daily discharge limitation for any of the pollutants listed by the San Diego Water Board in the permit to be reported within 24 hours. (See 40 CFR 122.44(g)) [40 CFR 122.41(l)(6)(ii)(C)]

(c) The San Diego Water Board may waive the above-required written report on a case-by-case basis if the oral report has been received within 24 hours. [40 CFR 122.41(l)(6)(iii)]

(7) *Other noncompliance.* The Copermittee must report all instances of noncompliance not reported in accordance with the standard provisions required under 40 CFR 122.41(l)(4), (5), and (6), at the time monitoring reports are submitted. The reports must contain the information listed in the standard provisions required under 40 CFR 122.41(l)(6). [40 CFR 122.41(l)(7))]

(8) *Other information.* When the Copermittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the San Diego Water Board, State Water Board, or USEPA, the Copermittee must promptly submit such facts or information. [40 CFR 122.41(l)(8)]

~~**m. BYPASS** [40 CFR 122.41(m)]~~

~~(1) *Definitions.*~~

~~(a) "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. [40 CFR 122.41(m)(1)(i)] or~~

~~(b) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be~~

Comment [A126]: While this is a standard condition for NPDES permits, it is manifestly inapplicable to MS4 permits. Since BMPs constructed to comply with the Order include bypass provisions to protect their entirety, the Copermittees would have to notify the Regional Board whenever a storm was predicted. This provision should be deleted.

~~expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.~~
~~[40 CFR 122.41(m)(1)(ii)]~~

~~(2) *Bypass not exceeding limitations*. The Copermittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the standard provisions required under 40 CFR 122.41(m)(3) and (4).~~
~~[40 CFR 122.41(m)(2)]~~

~~(3) *Notice*.~~

~~(a) *Anticipated bypass*. If the Copermittee knows in advance of the need for a bypass, it must submit a notice, if possible at least ten days before the date of the bypass. [40 CFR 122.41(m)(3)(i)] or~~

~~(b) *Unanticipated bypass*. The Copermittee must submit notice of an unanticipated bypass in accordance with the standard provisions required under 40 CFR 122.41(l)(6) (24 hour notice).~~
~~[40 CFR 122.41(m)(3)(ii)]~~

~~(4) *Prohibition of Bypass*.~~

~~(a) Bypass is prohibited, and the San Diego Water Board may take enforcement action against a Copermittee for bypass, unless:~~
~~[40 CFR 122.41(m)(4)(i)]~~

~~(i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; [40 CFR 122.41(m)(4)(i)(A)]~~
~~(ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance;~~
~~[40 CFR 122.41(m)(4)(i)(B)] and,~~
~~(iii) The Copermittee submitted notice in accordance with the standard provisions required under 40 CFR 122.41(m)(3).~~
~~[40 CFR 122.41(m)(4)(i)(C)]~~

~~(b) The San Diego Water Board may approve an anticipated bypass, after considering its adverse effects, if the San Diego Water Board determines that it will meet the three conditions listed above.~~
~~[40 CFR 122.41(m)(4)(ii)]~~

~~n.~~m. **UPSET** [40 CFR 122.41(n)]

(1) *Definition.* "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Copermittee. An upset does not

include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. [40 CFR 122.41(n)(1)]

(2) *Effect of an upset*. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the standard provisions required under 40 CFR 122.41(n)(3) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. [40 CFR 122.41(n)(2)]

(3) *Conditions necessary for a demonstration of upset*. A Copermittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that: [40 CFR 122.41(n)(3)]

(a) An upset occurred and that the Copermittee can identify the cause(s) of the upset; [40 CFR 122.41(n)(3)(i)]
(b) The permitted facility was at the time being properly operated; [40 CFR 122.41(n)(3)(ii)] and
(c) The Copermittee submitted notice of the upset in accordance with the standard provisions required under 40 CFR 122.41(l)(6)(ii)(B) (24-hour notice). [40 CFR 122.41(n)(3)(iii)]
(d) The Copermittee complied with any remedial measures pursuant to the standard provisions required under 40 CFR 122.41(d). [40 CFR 122.41(n)(3)(iii)]

(4) *Burden of proof*. In any enforcement proceeding, the Copermittee seeking to establish the occurrence of an upset has the burden of proof. [40 CFR 122.41(n)(4)]

~~o.~~n. STANDARD PERMIT PROVISIONS FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS

[40 CFR 122.42(c)]

The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the San Diego Water Board or State Water Board under 40 CFR 122.26(a)(1)(v) must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report must include:

(1) The status of implementing the components of the storm water management program that are established as permit conditions; [40 CFR 122.42(c)(1)]

(2) Proposed changes to the storm water management programs that are established as permit conditions. Such proposed changes must be consistent with 40 CFR 122.26(d)(2)(iii); [40 CFR 122.42(c)(2)] and

(3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under 40 CFR 122.26(d)(2)(iv) and (v); [40 CFR 122.42(c)(3)]

(4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; [40 CFR 122.42(c)(4)]

(5) Annual expenditures and budget for year following each annual report; [40 CFR 122.42(c)(5)]

(6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; [40 CFR 122.42(c)(6)]

(7) Identification of water quality improvements or degradation. [40 CFR 122.42(c)(7)]

~~p.~~o. **STANDARD PERMIT PROVISIONS FOR STORM WATER DISCHARGES** [40 CFR 122.42(d)]

The initial permits for discharges composed entirely of storm water issued pursuant to 40 CFR 122.26(e)(7) must require compliance with the conditions of the permit as expeditiously as practicable, but in no event later than three years after the date of issuance of the permit.

2. General Provisions

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. The general provisions applicable to this Order and NPDES permit are as follows:

a. DISCHARGE OF WASTE IS A PRIVILEGE

No discharge of waste into the waters of the State, whether or not such discharge is made pursuant to waste discharge requirements, shall create a vested right to continue such discharge. All discharges of waste into waters of the State are privileges, not rights. [CWC Section 13263(g)]

b. DURATION OF ORDER AND NPDES PERMIT

(1) *Effective date*. This Order and NPDES permit becomes effective on the 50th day after its adoption provided the USEPA has no objection. If the USEPA objects to its issuance, this Order shall not become effective until such objection is withdrawn. This Order supersedes Order No. R9-2007-0001 upon the effective date of this Order, and supersedes Order Nos. R9-2009-0002 and R9-2010-0016 upon their expiration or earlier notice of coverage.

(2) *Expiration*. This Order and NPDES permit expires five years after its effective date. [40 CFR 122.46(a)]

(3) *Continuation of expired order*. After this Order and NPDES permit expires, the terms and conditions of this Order and NPDES permit are automatically continued pending issuance of a new permit if all requirements of the federal NPDES regulations on the continuation of expired permits (40 CFR 122.6) are complied with.

c. AVAILABILITY

A copy of this Order must be kept at a readily accessible location and must be available to on-site personnel at all times.

d. CONFIDENTIALITY OF INFORMATION

Except as provided for in 40 CFR 122.7, no information or documents submitted in accordance with or in application for this Order will be considered confidential, and all such information and documents shall be available for review by the public at the San Diego Water Board office.

Claims of confidentiality for the following information will be denied:
[40 CFR 122.7(b)]

(1) The name and address of any permit applicant or Copermittee;
[40 CFR 122.7(b)(1)] and

(2) Permit applications and attachments, permits, and effluent data.
[40 CFR 122.7(b)(2)]

e. EFFLUENT LIMITATIONS

(1) *Interim effluent limitations*. The Copermittee must comply with any interim effluent limitations as established by addendum, enforcement action, or revised waste discharge requirements which have been, or may be, adopted by the San Diego Water Board.

(2) *Other effluent limitations and standards*. If any applicable toxic effluent standard or effective prohibition (including any schedule of compliance specified in such effluent standard or effective prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant and that standard or effective prohibition is more stringent than any limitation on the pollutant in the permit, the San Diego Water Board shall institute proceedings under these regulations to modify or revoke and reissue the permit to conform to the toxic effluent standard or effective prohibition. [40 CFR 122.44(b)(1~~)]}]}].~~}]

f. DUTY TO MINIMIZE OR CORRECT ADVERSE IMPACTS

The Copermittee must take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this Order, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the noncompliance.

g. PERMIT ACTIONS

The filing of a request by the Copermittee for modification, revocation and reissuance, or termination of this Order, or a notification of planned change in or anticipated

noncompliance with this Order does not stay any condition of this Order. (See 40 CFR 122.41(f)) In addition, the following provisions apply to this Order:

(1) Upon application by any affected person, or on its own motion, the San Diego Water Board may review and revise the requirements in this Order. All requirements must be reviewed periodically. [CWC Section 13263(e)]

(2) This Order may be terminated or modified for cause, including, but not limited to, all of the following: [CWC Section 13381]

(a) Violation of any condition contained in the requirements of this Order. [CWC Section 13381(a)]

(b) Obtaining the requirements in this Order by misrepresentation, or failure to disclose fully all relevant facts. [CWC Section 13381(b)]

(c) A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge. [CWC Section 13381(c)]

(3) When this Order is transferred to a new owner or operator, such requirements as may be necessary under the CWC may be incorporated into this Order.

h. NPDES PERMITTED NON-STORM WATER DISCHARGES

The San Diego Water Board has, in prior years, issued a limited number of individual NPDES permits for non-storm water discharges to MS4s. The San Diego Water Board or State Water Board may in the future, upon prior notice to the Copermittee(s), issue an NPDES permit for any non-storm water discharge (or class of non-storm water discharges) to an MS4. A Copermittee will not be held responsible for pollutants in its MS4 discharge originating from an NPDES-permitted non-storm water discharge.

Comment [A127]: This comment reflects the appropriate responsibility between NPDES dischargers.

i. MONITORING

In addition to the standard provisions required under 40 CFR 122.41(j) and (l)(4), the following general monitoring provisions apply to this Order:

(1) Where procedures are not otherwise specified in Order, sampling, analysis and quality assurance/quality control must be conducted in accordance with the Quality Assurance Management Plan (QAMP) for the State of California's Surface Water Ambient Monitoring Program (SWAMP), adopted by the State Water Resources Control Board (State Water Board).

(2) Pursuant to 40 CFR 122.41(j)(2) and CWC Section 13383(a), each Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five (5) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time.

Comment [A128]: This provision and the provision in Attachment B 1.j(2) conflict. The Water Board should reconcile these provisions or delete one.

(3) All chemical, bacteriological, and toxicity analyses must be conducted at a laboratory certified for such analyses by the California Department of Public Health or a laboratory approved by the San Diego Water Board.

(4) For priority toxic pollutants that are identified in the California Toxics Rule (CTR) (65 Fed. Reg. 31682), the Copermittees must instruct their laboratories to establish calibration standards that are equivalent to or lower than the Minimum Levels (MLs) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP). If a Copermittee can demonstrate that a particular ML is not attainable, in accordance with procedures set forth in 40 CFR Part 136, the lowest quantifiable concentration of the lowest calibration standard analyzed by a specific analytical procedure (assuming that all the method specified sample weights, volumes, and processing steps have been followed) may be used instead of the ML listed in Appendix 4 of the SIP. The Copermittee must submit documentation from the laboratory to the San Diego Water Board for approval prior to raising the ML for any priority toxic pollutant.

j. ENFORCEMENT

(1) The San Diego Water Board is authorized to enforce the terms of this Order under several provisions of the CWC, including, but not limited to, CWC Sections 13385, 13386, and 13387.

(2) Nothing in this Order shall be construed to protect the Copermittee from its liabilities under federal, state, or local laws.

(3) The CWC provides for civil and criminal penalties comparable to, and in some cases greater than, those provided for under the CWA.

(4) Except as provided in the standard conditions required under 40 CFR 122.41(m) and (n), nothing in this Order shall be construed to relieve the Copermittee from civil or criminal penalties for noncompliance.

(5) Nothing in this Order shall be construed to preclude the institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties to which the Copermittee is or may be subject to under Section 311 of the CWA.

(6) Nothing in this Order shall be construed to preclude institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authoring preserved by Section 510 of the CWA.

k. SEVERABILITY

The provisions of this Order are severable, and if any provision of this Order, or the application of any provisions of this Order to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this Order shall not be affected thereby.

l. APPLICATIONS

Any application submitted by a Copermittee for reissuance or modification of this Order must satisfy all applicable requirements specified in federal regulations as well as any additional requirements for submittal of a Report of Waste Discharge specified in the CWC and the California Code of Regulations.

m. IMPLEMENTATION

All plans, reports and subsequent amendments submitted in compliance with this Order must be implemented immediately (or as otherwise specified). All submittals by Copermittees must be adequate to implement the requirements of this Order.

n. REPORT SUBMITTALS

(1) All report submittals must include an executive summary, introduction, conclusion, recommendations, and signed certified statement.

(2) Each Copermittee must submit a signed certified statement covering its responsibilities for each applicable submittal.

(3) The Principal Watershed Copermittee(s) must submit a signed certified statement covering its responsibilities for each applicable submittal and the sections of the submittals for which it is responsible.

(4) Unless otherwise directed, the Copermittees must submit one hard copy and one electronic copy of each report required under this Order to the San Diego Water Board, and one electronic copy to the USEPA.

(5) The Copermittees must submit reports and provide notifications as required by this Order to the following:

EXECUTIVE OFFICER
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
9174 SKY PARK COURT, SUITE 100
SAN DIEGO CA 92123-4340
Telephone: (858) 467-2952 Fax: (858) 571-6972

EUGENE BROMLEY
US ENVIRONMENTAL PROTECTION AGENCY
REGION IX
PERMITS ISSUANCE SECTION (W-5-1)
75 HAWTHORNE STREET
SAN FRANCISCO CA 94105

ATTACHMENT C

ACRONYMS AND ABBREVIATIONS

AMAL	Average Monthly Action Level
ASBS	Area(s) of Special Biological Significance
BMP	Best Management Practice
Basin Plan	Water Quality Control Plan for the San Diego Basin
CEQA	California Environmental Quality Act
CCR	California Code of Regulations
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWC	California Water Code
CZARA	Coastal Zone Act Reauthorization Amendments of 1990
ESAs	Environmentally Sensitive Areas
GIS	Geographic Information System
IBI	Index of Biological Integrity
LID	Low Impact Development
MDAL	Maximum Daily Action Level
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
NAL	Non-Storm Water Action Level
NAICS	North American Industry Classification System
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
ROWD	Report of Waste Discharge (application for NPDES reissuance)
SAL	Storm Water Action Level
San Diego Water Board	California Regional Water Quality Control Board, San Diego Region
SIC	Standard Industrial Classification Code
State Water Board	State Water Resources Control Board
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
WDID	Waste Discharge Identification Number
WLA	Waste Load Allocation
WQBEL	Water Quality Based Effluent Limitation

DEFINITIONS

Active/Passive Sediment Treatment - Using mechanical, electrical or chemical means to flocculate or coagulate suspended sediment for removal from runoff from construction sites prior to discharge.

Anthropogenic Litter – Trash generated from human activities, not including sediment.

Automotive Repair Shop – a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539 or equivalent NAICS code.

Average Monthly Action Level – The highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month, or the geometric mean for bacteria, as applicable.

Beneficial Uses - The uses of water necessary for the survival or wellbeing of man, plants, and wildlife. These uses of water serve to promote tangible and intangible economic, social, and environmental goals. "Beneficial Uses" ~~of the waters of the State~~ that may be protected include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. Existing beneficial uses are uses that were attained in the surface or ground water on or after November 28, 1975; and potential beneficial uses are uses that would probably develop in future years through the implementation of various control measures. "Beneficial Uses" are equivalent to "Designated Uses" under federal law. [California Water Code Section 13050(f)].

Best Management Practices (BMPs) - Defined in 40 CFR 122.2 as schedules of activities, effective prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. In the case of municipal discharge permits, BMPs may be used in the place of numeric effluent limits.

Bioassessment - The use of biological community information to evaluate the biological integrity of a water body and its watershed. With respect to aquatic ecosystems, bioassessment is the collection and analysis of samples of the benthic macroinvertebrate community together with physical/habitat quality measurements associated with the sampling site and the watershed to evaluate the biological condition (i.e. biotic integrity) of a water body.

Biofiltration - Practices that use vegetation and amended soils to detain and treat runoff from impervious areas. Treatment is through filtration, infiltration, adsorption, ion exchange, and biological uptake of pollutants.

Biological Integrity - Defined in Karr J.R. and D.R. Dudley. 1981. Ecological perspective on water quality goals. *Environmental Management* 5:55-68 as: "A balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitat of the region." Also referred to as ecosystem health.

BMP Design Manual – A plan developed to eliminate, reduce, or mitigate the impacts of runoff from development projects, including Priority Development Projects.

Channel Rehabilitation and Improvement – Remedial measures or activities for the purpose of improving or restoring the environmental health of streams, channels or river systems. Techniques may vary from in-stream restoration techniques to off-line stormwater management practices installed in the system corridor or upland areas. Rehabilitation techniques may include, but are not limited to the following: riparian zone restoration, constructed wetlands, bank stabilization, channel modifications, and day lighting of drainage systems.

Comment [A129]: This term should be defined in Attachment C given its use in the Order.

Clean Water Act Section 303(d) Water Body - An impaired water body in which water quality does not meet applicable water quality standards and/or is not expected to meet water quality standards, even after the application of technology based pollution controls required by the CWA. The discharge of runoff to these water bodies by the Copermittees is significant because these discharges can cause or contribute to violations of applicable water quality standards.

Construction Site – Any project, including projects requiring coverage under the Construction General Permit, that involves soil disturbing activities greater than 10,000 square feet including, but not limited to, clearing, grading, disturbances to ground such as stockpiling, and excavation. This does not include interior construction activities such as interior remodeling, plumbing, electrical, or mechanical work.

Contamination - As defined in the Porter-Cologne Water Quality Control Act, contamination is "an impairment of the quality of waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste whether or not waters of the State are affected."

Copermittee – An incorporated city within the County of Orange, County of Riverside, or County of San Diego in the San Diego Region~~,~~ (Region 9),~~,~~ the County of Orange, the County of Riverside, the County of San Diego, the Orange County Flood Control District, the Riverside County Water Conservation and Flood Control District, the San Diego Regional Airport Authority, or the San Diego Unified Port District. See also "Municipal Copermittee" and "Special District Copermittee".

Comment [A130]: As set forth above, the Riverside County Copermittees make a distinction in these classes of Copermittees based on their respective legal authorities.

Copermittees – All of the individual Copermittees, collectively, unless the obligation in question is directed to one or a sub-group of Copermittees.

Comment [A131]: This clarifies that not all obligations in the Order directed to "Copermittees" are in fact applicable to all Copermittees.

Critical Channel Flow (Qc) – The channel flow that produces the critical shear stress that initiates bed movement or that erodes the toe of channel banks. When measuring Qc, it should be based on the weakest boundary material – either bed or bank.

Daily Discharge – Defined as either: (1) the total mass of the constituent discharged over the calendar day or any 24 hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g. concentration.)

The Daily Discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day, or other 24 hour period other than a day), or by the arithmetic mean of analytical results from one or more grab samples taken over the course of a

day.

Development Projects - Construction, rehabilitation, redevelopment, or reconstruction of any public or private residential project, industrial~~,~~ or commercial facility, or any other projects designed for post-construction human activity or occupation and involving land disturbance activities.

Comment [A132]: This definition clarifies the nature of Development Projects covered under the Order.

Direct Discharge to an Environmentally Sensitive Area – refers to outflow from a drainage conveyance system that collects runoff from the subject development or redevelopment site and terminates at or in receiving waters within the ESA, and is not commingled with flows from adjacent or other upstream lands.

Dry Season –May 1 to September 30.

Dry Weather – Weather is considered dry if the preceding 72 hours has been without measurable precipitation (>0.1 inch).

Enclosed Bays – Enclosed bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost bay works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays do not include inland surface waters or ocean waters.

Erosion – When land is diminished or worn away due to wind, water, or glacial ice. Often the eroded debris (silt or sediment) becomes a pollutant via storm water runoff. Erosion occurs naturally but can be intensified by land clearing activities such as farming, development, road building, and timber harvesting. This permit is concerned particularly with non-naturally occurring Erosion that eventually results in a Sediment discharge from MS4s into Receiving Waters.

Environmentally Sensitive Areas (ESAs) - Areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; areas designated as preserves or their equivalent under the Natural Communities Conservation Program within the Cities and County of Orange; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.

Estuaries – Waters, including coastal lagoons, located at the mouth of streams that serve as areas of mixing fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and ocean water. Estuaries do not include inland surface waters or ocean waters.

Existing Development – Any area that has been developed and exists for municipal, commercial, industrial, or residential purposes, uses, or activities. May include areas that are not actively used for its originally developed purpose, but may be re-purposed or redeveloped

for another use or activity.

Flow Duration – The long-term period of time that flows occur above a threshold that causes significant sediment transport and may cause excessive erosion damage to creeks and streams (not a single storm event duration). The simplest way to visualize this is to consider a histogram of pre- and post-project flows using long-term records of hourly data. To maintain pre-development flow duration means that the total number of hours (counts) within each range of flows in a flow-duration histogram cannot increase between the pre- and post-development condition. Flow duration within the range of geomorphologically significant flows is important for managing erosion.

Grading - The cutting and/or filling of the land surface to a desired slope or elevation.

Hazardous Material – Any substance that poses a threat to human health or the environment due to its toxicity, corrosiveness, ignitability, explosive nature or chemical reactivity. These also include materials named by the USEPA in 40 CFR 116 to be reported if a designated quantity of the material is spilled into the waters of the U.S. or emitted into the environment.

Hazardous Waste - Hazardous waste is defined as "any waste which, under Section 600 of Title 22 of this code, is required to be managed according to Chapter 30 of Division 4.5 of Title 22 of this code" [CCR Title 22, Division 4.5, Chapter 11, Article 1].

Household Hazardous Waste – Paints, cleaning products, and other hazardous wastes generated during home improvement or maintenance activities.

Hydromodification – The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

Illicit Connection – Any connection to the MS4 that conveys an illicit discharge.

Illicit Discharge - Any discharge to the MS4 that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from fire fighting activities [40 CFR 122.26(b)(2)]. Discharges from natural sources or from conditionally exempt sources described in this Order are not considered Illicit Discharges.

Inactive Areas – Areas of construction activity that are not active and those that have been active and are not scheduled to be re-disturbed for at least 14 days.

Infiltration – Water other than wastewater that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow [40 CFR 35.2005(20)].

Comment [A133]: Wrong definition. Should be defining infiltration (of stormwater into soil)

Inland Surface Waters – Includes all surface waters of the U.S.~~State~~ that do not include the ocean, enclosed bays, or estuaries.

Jurisdictional Runoff Management Program Document – A written description of the specific jurisdictional runoff management measures and programs that each Copermittee will implement to comply with this Order and ensure that illicit discharges are effectively prohibited, and storm water pollutant discharges in runoff are reduced to the MEP and do not cause or contribute to a violation of water quality standards.

Low Impact Development (LID) – A storm water management and land development strategy that emphasizes conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions.

Low Impact Development Best Management Practices (LID BMPs) – LID BMPs include schedules of activities, effective prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States through storm water management and land development strategies that emphasize conservation ~~s~~and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions. LID BMPs include retention practices that do not allow runoff, such as infiltration, rain water harvesting and reuse, and evapotranspiration. LID BMPs also include flow-through practices such as biofiltration that may have some discharge of storm water following pollutant reduction.

Major Outfall – As defined in the Code of Federal Regulations, a major outfall is a MS4 outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (i.e. discharge from a single conveyance other than a circular pipe which is associated with a drainage area of more than 50 acres); or, for MS4s that receive storm water from lands zoned for industrial activity (based on comprehensive zoning plans or equivalent), a MS4 outfall that discharges from a single pipe with an inside diameter of 12 inches or more or from its equivalent (i.e. discharge from other than a circular pipe associated with a drainage area of 2 acres or more).

Maximum Daily Action Level (MDAL) –The highest allowable daily discharge of a pollutant, over a calendar day (or 24 hour period). For pollutants with action levels expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with action levels expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

Maximum Extent Practicable (MEP) – The technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) ~~for storm water~~ that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) in combination with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than BAT. A definition for MEP is not provided either in the statute or in the regulations. Instead the definition of MEP is dynamic and will be defined by the following process over time: municipalities propose their definition of MEP by way of their runoff management programs. Their total collective and individual activities conducted pursuant to the runoff management programs becomes their proposal for MEP as it applies both to their overall effort, as well as to specific activities (e.g., MEP for street sweeping, or MEP for MS4 maintenance). In the absence of a proposal acceptable to the San Diego Water Board, the San Diego Water Board

defines MEP.

In a memo dated February 11, 1993, entitled "Definition of Maximum Extent Practicable," Elizabeth Jennings, Senior Staff Counsel, SWRCB addressed the achievement of the MEP standard as follows:

> "*To achieve the MEP standard, municipalities must employ whatever Best Management Practices (BMPs) are technically feasible (i.e., are likely to be effective) and are not cost prohibitive. The major emphasis is on technical feasibility. Reducing pollutants to the MEP means choosing effective BMPs, and rejecting applicable BMPs only where other effective BMPs will serve the same purpose, or the BMPs would not be technically feasible, or the cost would be prohibitive. In selecting BMPs to achieve the MEP standard, the following factors may be useful to consider:*
>
> *a. Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?*
> *b. Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?*
> *c. Public Acceptance: Does the BMP have public support?*
> *d. Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?*
> *e. Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc.?*
>
> *The final determination regarding whether a municipality has reduced pollutants to the maximum extent practicable can only be made by the Regional or State Water Boards, and not by the municipal discharger. If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit derived, it would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs that would address a pollutant source, or to pick a BMP based solely on cost, which would be clearly less effective. In selecting BMPs the municipality must make a serious attempt to comply and practical solutions may not be lightly rejected. In any case, the burden would be on the municipal discharger to show compliance with its permit. After selecting a menu of BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented."*

Monitoring Year – October 1 to September 30

Municipal Copermittee – Any Copermittee, exclusive of Special District Copermittees.

Comment [A134]: This definition clarifies distinction between municipal and special district copermittees.

Municipal Separate Storm Sewer System (MS4) – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designated or used for collecting or conveying storm water;

(iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.226. Copermittees need only comply with permit conditions relating to "discharges from the municipal separate storm sewers for which they are operators." 40 CFR 122.26(a)(vi).

Comment [A135]: These changes correct a citation and clarifies the responsibility of the copermittees as to other MS4s.

National Pollutant Discharge Elimination System (NPDES) - The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the CWA.

Non-Storm Water - All discharges to and from a MS4 that do not originate from precipitation events (i.e., all discharges from a MS4 other than storm water). ~~Non-storm water includes illicit discharges and NPDES permitted discharges.~~

Comment [A136]: This is overly limiting, There are other types of Non-storm discharges that do not fit these two categories (e.g. irrigated agriculture, natural flows, conditionally exempt flows, others). Rather than trying to identify all types of non-stormwater discharges, suggest just deleting this sentence.

Nuisance - As defined in the Porter-Cologne Water Quality Control Act, a nuisance is "anything which meets all of the following requirements: 1) Is injurious to health, or is indecent, or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. 2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. 3) Occurs during, or as a result of, the treatment or disposal of wastes."

Ocean Waters – the territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the State Board's California Ocean Plan.

Order – Unless otherwise specified, refers to this Order, Order No. R9-2013-0001 (NPDES No. CAS0109266)

Outfall – *Outfall* means a *point source* as defined by 40 CFR 122.2 at the point where a MS4 discharges to waters of the United States and does not include open conveyances connecting two MS4s, or pipes, tunnels or other conveyances which connect segments of the same stream or other waters of the United States and are used to convey waters of the United. 40 CFR 122.26(b)(9).

Comment [A137]: This federal regulatory definition clarifies the nature of an outfall.

Parking Lot – a land area or facility for the tempraory parking or storage of motor vehicles used personally, for business, or for commerce.

Comment [A138]: Definition placed in Attachment C for consistency.

Persistent Flow - Persistent flow is defined as the presence of an MS4 discharge that is hydraulically connected to a flowing~~, pooled, or ponded~~ receiving water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

Comment [A139]: Changes reflect the necessity of a connection to flowing receiving waters. Discharges that are pooled are not discharges to waters of the United States. Please see Comment Letter section 3.5.3.

Person - A person is defined as an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof [40 CFR 122.2].

Point Source - Any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, landfill leachate collection systems, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return

flows from irrigated agriculture or agricultural storm water runoff.

Pollutant - Any agent that may cause or contribute to the degradation of water quality such that a condition of pollution or contamination is created or aggravated.

Pollution - As defined in the Porter-Cologne Water Quality Control Act, pollution is "the alteration of the quality of the waters of the State by waste, to a degree that unreasonably affects the either of the following: 1) The waters for beneficial uses; or 2) Facilities that serve these beneficial uses." Pollution may include contamination.

Pollution Prevention - Pollution prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control BMPs, treatment control BMPs, or disposal.

Pre-Project~~Development~~ Runoff Conditions – Runoff conditions that exist~~existed~~ onsite immediately before the ~~existing development was constructed, or exists onsite before~~ planned development activities occur. Pre-development is not intended to be interpreted as that period before any human-induced land disturbance has occurred. 64 FR 68761.

Comment [A140]: This definition reflects the exact language used by U.S. EPA in the Federal Register. Moreover, it avoids the constitutional and statutory problems with requiring developers to mitigate for impacts not attributable to their project. It also is consistent with the CEQA standard for project impact mitigation.

Priority Development Projects - New development and redevelopment projects defined under Provision E.3.b of Order No. R9-2012-0011.

Properly Designed – Designed in accordance with the Copermittee's BMP Design Manual and/or any appropriate design requirements set forth by the Copermittee and based on widely accepted design criteria and in accordance with this Order.

Comment [A141]: This definition is required to address this standard, which is mentioned in the Order but not defined.

Rainy Season (aka Wet Season) –October 1 to April 30

Receiving Waters – Waters of the United States.

Receiving Water Limitations - Waste discharge requirements issued by the San Diego Water Board typically include both: (1) "Effluent Limitations" (or "Discharge Limitations") that specify the technology-based or water-quality-based effluent limitations; and (2) "Receiving Water Limitations" that specify the water quality objectives in the Basin Plan as well as any other limitations necessary to attain those objectives. In summary, the "Receiving Water Limitations" provision is the provision used to implement the requirements of CWA section 402(p)(3)(B).

Redevelopment - The creation, addition, and or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include trenching and resurfacing associated with utility work; parking lots; resurfacing existing roadways; cutting and reconfiguring of surface parking lots; new sidewalk construction, pedestrian ramps, or bike lane on existing roads; and routine replacement of damaged pavement, such as pothole repair and emergency restoration and public safety projects.

Comment [A142]: The changes requested in this definition appropriately exempts de minimis or emergency/public safety projects.

Reporting Period – The period of information that is reported in the Annual Report. The reporting period consists of two components: 1) July 1 to June 30, consistent with the fiscal

year, for the implementation of the jurisdictional runoff management programs, and 2) October 1 to September 30, consistent with the monitoring year for the monitoring and assessment programs. Together, these two time periods constitute the reporting year for the Annual Report due January 31 following the end of the monitoring year.

Restaurant – a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812).

Retail gasoline outlet (RGO) – a business that sells automotive or truck fuel to the general public with a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

Retain –Keep or hold in a particular place, condition, or position without discharge to ~~surface~~ Receiving W~~w~~aters.

Retrofitting – Storm water management practices put into place after development has occurred in watersheds where the practices previously did not exist~~.~~ or are ineffective.~~.~~ Retrofitting of developed areas is intended to improve water quality, protect downstream channels, reduce flooding, or meet other specific objectives. Retrofitting developed areas may include, but is not limited to replacing roofs with green roofs, disconnecting downspouts or impervious surfaces to drain to pervious surfaces, replacing impervious surfaces with pervious surfaces, installing rain barrels, installing rain gardens, and trash area enclosures.

Runoff - All flows in a storm water conveyance system that consists of the following components: (1) storm water (wet weather flows) and (2) non-storm water including dry weather flows.

San Diego Water Board – As used in this document the term "San Diego Water Board" is synonymous with the term "Regional Board" as defined in Water Code section 13050(b) and is intended to refer to the California Regional Water Quality Control Board for the San Diego Region as specified in Water Code Section 13200.

Sediment - Soil, sand, and minerals washed from land into water. Sediment resulting from anthropogenic sources (i.e. human induced land disturbance activities) that is discharged into Receiving Waters is considered a pollutant. This Order regulates only the discharges of sediment from anthropogenic sources into Receiving Waters and does not regulate naturally occurring sources of sediment. Sediment can destroy fish-nesting areas, clog animal habitats, and cloud waters so that sunlight does not reach aquatic plants.

Special District Copermittee – A separate legal entity that may own or operate MS4 systems, but has no land use authorities outside of their MS4. The Riverside County Flood Control and Water Conservation District [and Orange County Flood Control District?] is a [are] Special District Copermittee[s].

Source Control BMP – Land use or site planning practices, or structural or nonstructural measures that aim to prevent runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between pollutants and runoff.

Storm Water – Per 40 CFR 122.26(b)(13), means storm water runoff, snowmelt runoff and surface runoff and drainage. ~~Surface runoff and drainage pertains to runoff and drainage resulting from precipitation events.~~

Comment [A143]: Relocation of definition to Attachment C.

Comment [A144]: Definition added for clarity and consistency with prior redlines

Comment [A145]: Edit clarifies intent of definition.

Stream, Channel, or Habitat Rehabilitation – Measures or activities for the purpose of improving or restoring the environmental health (i.e. physical, chemical and biological integrity) of streams, channels, or river systems. Rehabilitation techniques may include, but are not limited to, riparian zone restoration, constructed wetlands, bank stabilization, channel reconfiguration, and daylighting drainage systems.

Street, Road, Highway, Freeway– Any paved impervious surface that is used for the transportation of automobiles, trucks, motorcycles, and other vehicles, with an ADT of at least 100 vehicles per day.

Comment [A146]: Definition relocated to Attachment C.

Comment [A147]: Consistent with RGO definition.

Structural BMPs - A subset of BMPs which detains, retains, filters, removes, or prevents the release of pollutants to surface waters from development projects in perpetuity, after construction of a project is completed.

Total Maximum Daily Load (TMDL) - The maximum amount of a pollutant that can be discharged into a water body from all sources (point and non-point) and still maintain water quality standards. Under CWA section 303(d), TMDLs must be developed for all water bodies that do not meet water quality standards after application of technology-based controls.

Toxicity - Adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies). The water quality objectives for toxicity provided in the Basin Plan, state in part…"All waters shall be free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life….The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge".

Treatment Control BMP – Any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media absorption or any other physical, biological, or chemical process.

Unpaved Road – Any long, narrow stretch without pavement used for traveling by motor passenger vehicles between two or more points. Unpaved roads are generally constructed of dirt, gravel, aggregate or macadam and may be improved or unimproved.

Waste - As defined in CWC Section 13050(d), "waste includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal."

Article 2 of CCR Title 23, Chapter 15 (Chapter 15) contains a waste classification system that applies to solid and semi-solid waste, which cannot be discharged directly or indirectly to water of the state and which therefore must be discharged to land for treatment, storage, or disposal in accordance with Chapter 15. There are four classifications of waste (listed in order of highest to lowest threat to water quality): hazardous waste, designated waste, non-hazardous solid waste, and inert waste.

Water Quality Objective - Numerical or narrative limits on constituents or characteristics of

water designated to protect designated beneficial uses of the water. [California Water Code Section 13050 (h)]. California's water quality objectives are established by the State and Regional Water Boards in the Water Quality Control Plans. Numeric or narrative limits for pollutants or characteristics of water designed to protect the beneficial uses of the water. In other words, a water quality objective is the maximum concentration of a pollutant that can exist in a receiving water and still generally ensure that the beneficial uses of the receiving water remain protected (i.e., not impaired). Since water quality objectives are designed specifically to protect the beneficial uses, when the objectives are violated the beneficial uses are, by definition, no longer protected and become impaired. This is a fundamental concept under the Porter Cologne Act. Equally fundamental is Porter Cologne's definition of pollution. A condition of pollution exists when the water quality needed to support designated beneficial uses has become unreasonably affected or impaired; in other words, when the water quality objectives have been violated. These underlying definitions (regarding beneficial use protection) are the reason why all waste discharge requirements implementing the federal NPDES regulations require compliance with water quality objectives. (Water quality objectives are also called water quality criteria in the CWA.)

Water Quality Standards - Water quality standards, as defined in Clean Water Act section 303(c) consist of the beneficial uses (e.g., swimming, fishing, municipal drinking water supply, etc.,) of a water body and criteria (referred to as water quality objectives in the California Water Code) necessary to protect those uses. Under the Water Code, the water boards establish beneficial uses and water quality objectives in water quality control or basin plans. Together with an anti-degradation policy, these beneficial uses and water quality objectives serve as water quality standards under the Clean Water Act. In Clean Water Act parlance, state beneficial uses are called "designated uses" and state water quality objectives are called "criteria." Throughout this Order, the relevant term is used depending on the statutory scheme.

Waters of the State - Any water, surface or underground, including saline waters within the boundaries of the State [CWC section 13050 (e)]. The definition of the Waters of the State is broader than that for the Waters of the United States in that all water in the State is considered to be a Waters of the State. ~~regardless of circumstances or condition.~~

Comment [A148]: The intent of the definition is to cover natural water sources, and not anthropogenic structures that collect runoff to reduce volume/velocity or pollutants.

Waters of the United States - As defined in the 40 CFR 122.2, the Waters of the U.S. are defined as: "(a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate "wetlands;" (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters otherwise defined as waters of the United States under this definition: (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial seas; and (g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA."

Watershed - That geographical area which drains to a specified point on a water course, usually a confluence of streams or rivers (also known as drainage area, catchment, or river basin).

Wet Season (aka Rainy Season) –October 1 to April 30

Wet Weather – Weather is considered wet if there is a storm event of 0.1 inches and greater and the following 72 hours, unless otherwise defined by the Copermittee for the purposes of monitoring consistent with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), or developed pursuant to another regulatory mechanism.

Comment [A149]: This is important as the monitoring requirements require you to sample the first 'Wet Weather' event. 0.1" of rainfall doesn't result in runoff in all watersheds. Copermittees should be able to define mobilization criteria to identify storms that are likely to produce runoff in that drainage area consistent with this EPA guidance.

LEGAL AND FACT SHEET COMMENTS ON TENTATIVE ORDER R9-2013-0001 MADE ON BEHALF OF THE RIVERSIDE COUNTY COPERMITTEES

This document provides comments on various legal issues raised by Tentative Order No. R9-2013-0001 (the "Draft Permit") and associated attachments, including Attachment F, the Fact Sheet/Technical Report ("Fact Sheet"), and are made on behalf of the Riverside County Flood Control & Water Conservation District ("District"), the County of Riverside and the Cities of Murrieta, Temecula and Wildomar (collectively, the "Riverside County Copermittees").

These legal comments are in addition to the other comments on the Draft Permit and attachments made by the Riverside County Copermittees (including the Comment Letter dated January 10, 2013 and signed by Jason E. Uhley, Chief of the District's Watershed Protection Division) and the redline attachment ("Redline"), as well as any comments or testimony which may be offered at the public hearing(s) on the Draft Permit. The Comment Letter and Redline also discuss legal issues. The Riverside County Copermittees appreciate this opportunity to comment and welcome any questions that Water Board staff may have.

These comments are submitted subject to the same reservations set forth in the Comment Letter regarding the Water Board's lack of authority, in the absence of agreement by the Riverside County Copermittees or the filing of a Report of Waste Discharge ("ROWD"), to issue a regional municipal separate storm sewer system ("MS4") permit to the Riverside County Copermittees. Submission of these comments does not waive this objection.

Request for Additional Public Comment

Before turning to comments on the Draft Permit, the Riverside County Copermittees wish to note that in view of the extensive comments made by them, as well as what we anticipate will be extensive comments by the South Orange County and San Diego County Copermittees, as well as from other stakeholders, it would greatly facilitate the permit adoption process if the Water Board were to release a revised Tentative Order for further review and comment prior to final adoption of the Permit. This will enable the Water Board staff to address the comments in a more orderly fashion and provide all parties with the opportunity to see how staff proposes to incorporate the comments in the Draft Permit.

Comments on Findings

Finding 2 and Fact Sheet Section VII.B: This finding recites that the Water Board "has the legal authority to issue a regional MS4 permit pursuant to its authority under Clean Water Act ("CWA") section 402(p)(3)(B) and 40 CFR 122.26(a)(i)(v)." Section VII.B of the Fact Sheet provides a more detailed rationale for this finding (at pages F-22-23).

The Riverside County Copermittees respectfully disagree with this finding and the analysis provided in the Fact Sheet. We do not believe that a regional MS4 permit is authorized under the CWA or the implementing regulations, absent agreement by the copermittees to be bound by such a MS4 permit (as is the case with the Bay Area MS4 permit covering discharges into the Bay).

The CWA itself does not explicitly authorize MS4 permits that, like the Draft Permit, cross county lines. CWA section 402(p)(3)(B) provides only that "[p]ermits for discharges from municipal storm sewers . . . may be issued on a system- or jurisdiction-wide basis." This language, contrary to the conclusion in Finding 2, indicates that a multi-county permit, covering several distinct non-interconnected municipal stormwater "systems" in multiple watersheds with multiple receiving waters, is not one issued on a "system-wide" basis and that an MS4 permit covering multiple jurisdictions in three different counties is not one issued on a "jurisdiction-wide basis." Because neither "system-wide" nor "jurisdiction-wide" are defined in the CWA, however, the CWA regulations must also be reviewed.

The regulatory provision cited in Finding 2, 40 CFR § 122.26(a)(1)(v), does not add clarity, since it merely repeats the "system-wide" and "jurisdiction-wide" language of the Act and the regulations define neither term. The regulations do, however, suggest that "system-wide" is not intended to cover multiple large MS4s in different jurisdictions. The regulations, at 40 CFR § 122.26(a)(1)(v) state that in making the determination to designate a system-wide or jurisdiction-wide basis" the permitting authority should consider the location of the "discharge" with respect to waters of the United States, the size of the discharge, the quantity and nature of the pollutants discharge and other relevant factors.

The Draft Permit covers multiple "discharges" into receiving waters located in three separate counties and the size, quality and nature of the discharges vary widely, due to varying hydrologic and climatic conditions in the three areas.

The Fact Sheet cites 40 CFR § 122.26(a)(3)(iv), which provides, in relevant part, that the Water Board "may issue one systemwide permit covering all, or a portion of all municipal separate storm systems in adjacent or interconnected large or medium municipal separate storm sewer systems." This provision does not, however, authorize issuance of a regional MS4 permit covering multiple counties and multiple watersheds that are not interconnected and which do not share a common receiving water. In fact, the only common fact uniting the various MS4s in the three counties under the Water Board's jurisdiction is that common jurisdiction.

First, even if the subject MS4 facilities otherwise met the criteria specified in the federal regulations (which, as noted below, they do not), the prospective permittees must apply for such a MS4 permit, as set forth in the first sentence of 40 CFR § 122.26(a)(3)(iv): "*One permit application may be submitted for all or a portion of all* municipal separate storm sewers within adjacent or interconnected large or medium municipal separate storm sewer systems." (emphasis supplied). No such application has been filed with respect to the Draft Permit. Only the San Diego County copermittees submitted a ROWD for MS4 facilities within that county.[1]

[1] Moreover, the fact that permittees have the ability to determine the geographic scope of the permit is reinforced by the language in 40 CFR § 122.26(a)(3)(iii)(B), which allows an individual municipality to submit "a distinct permit application which only covers discharges from the [MS4] for which the owner is responsible . . ." If a permittee can "opt out" of a multi-MS4 permit by submitting a individual permit application, a permitting authority such as a water board cannot impose a multi-MS4 permit on that permittee.

Second, this provision requires that the MS4s to be covered in the permit be "adjacent or interconnected." This is not true with respect to the MS4s proposed to be included within the Draft Permit. For example, the MS4 within the Santa Margarita Region of Riverside County is not "interconnected" with any other MS4s except those within that region. This is true also of the MS4s within South Orange County and San Diego County, which are not interconnected. Additionally, none of the MS4s in the three counties is "adjacent" to each other – each is separated by miles of non-urban area. In the SMR for example, the confluence of Temecula and Murrieta Creeks to form the Santa Margarita River is miles upstream of Rainbow Creek, the first discharge from San Diego County to the River. And, the confluence of Temecula and Murrieta Creeks is over 30 miles from the discharge of the Santa Margarita River to the Pacific Ocean.

The next inquiry is whether the three separate county MS4s could be considered, together, to form a single "large municipal separate storm sewer system." The federal MS4 regulations define this term as follows:

> *Large municipal separate storm sewer system* means all municipal separate storm sewers that are either:
>
> (i) Located in an incorporated place with a population of 250,000 or more . . . ."
>
> (ii) Located in the counties listed in Appendix H, except municipal separate storm sewers that are located in the incorporated places, townships or towns within such counties; or
>
> (iii) Owned or operated by a municipality other than those described [in paragraphs (i) and (ii)] . . . and that are designated by the Director as part of the large or medium municipal separate storm sewer system due to the interrelationship between the discharges of the designated storm sewer and the discharges from municipal separate storm sewers described [in paragraphs (i) and (ii)]. In making this determination the Director may consider the following factors:
>
> (A) Physical interconnections between the municipal separate storm sewers;
>
> (B) The location of discharges from the designated municipal separate storm sewer relative to discharges from municipal separate storm sewers described in [paragraph (i)];
>
> (C) The quantity and nature of pollutants discharged to waters of the United States;
>
> (D) The nature of the receiving waters; and
>
> (E) Other relevant factors, or
>
> (iv) The Director may, upon petition, designate as a large municipal separate storm sewer system, municipal separate storm sewers located within the boundaries of a region

> defined by a storm water management regional authority based on a jurisdictional, watershed, or other appropriate basis that includes one or more of the systems described [in paragraphs (i), (ii) or (iii)].

40 CFR § 122.26(b)(4).

None of paragraphs (i), (ii) or (iii) authorizes a regional MS4 permit such as that envisioned in the Draft Permit. The Draft Permit applies beyond a single incorporated place, County or municipality. Of these paragraphs, only paragraph (iv) could arguably be used to define the MS4s in the three Counties as a single MS4 and thus authorize a regional permit. The key limiting language is, however, "within the boundaries of a region **defined by a storm water management regional authority,** based on a jurisdictional, watershed, or other appropriate basis . . . ." A regional water board is not a stormwater management regional authority. This is clear from the MS4 regulations, which provide that a "**regional authority may be responsible for submitting a permit application"** under certain conditions. 40 CFR § 122.26(a)(3)(iii)(C). Clearly, a Water Board is not responsible for submitting MS4 permit applications.

U.S. EPA, in the Preamble to the final Phase I MS4 regulations (55 Fed Reg. 47990, November 16, 1990), further illuminated the meaning of the regulatory language. The Preamble indicates that commenters proposed eight different MS4 permitting options:

> Option 1 – systems owned or operated by incorporated places augmented by integrated discharges; Option 2 – systems owned or operated by incorporated places augmented with significant other municipal discharges; Option 3 – systems owned or operated by counties; Option 4 – systems owned and operated by States or State departments of transportation; Option 5 – systems within the boundaries of an incorporated place; Option 6 – systems within the boundaries of counties; Option 7 – systems in census designated urbanized areas; and Option 8 – systems defined by watershed boundaries.

55 Fed Reg. at 48039. None of these options encompasses the fact pattern presented by the Draft Permit, which covers multiple counties and multiple watersheds, are not interconnected, do not share common receiving waters and are located in separate census designated urbanized areas.

In explaining the derivation of 40 CFR 122.26(b)(4)(iv), U.S. EPA noted that it was "an outgrowth of comments on all options, especially Option 4 (State owned systems/State highways) and Option 8 (watersheds)." 55 Fed. Reg. at 48040. Thus, the Caltrans MS4 permit (which applies statewide) is authorized under paragraph (iv), since the "storm water management regional authority" defining the region to be covered is Caltrans itself. No such single authority exists for the three-county area proposed to be included in the Draft Permit, which also would encompass multiple watersheds.

Moreover, paragraph (iv) provides that the regional authority must "petition" the U.S. EPA Director to have a single MS4 designated within the boundaries of the region defined by the regional authority. Because California has been delegated NPDES permitting authority, a regional authority would presumably need to petition its Water Board to authorize such a regional permit. Since no such regional authority exists to establish the geographical basis for a

three-county MS4 permit, there is no such entity to "petition" the Water Board to establish a regional permit. This is clear from the Preamble to the Phase I regulations, which indicate that "regional storm water authorities" established by "some States or counties" may "petition the Director [or its state designee] to assume a regional role. 55 Fed. Reg. at 48042. It is clear from the Preamble that it is not the Water Board that has the authority to make such a petition, but rather the "storm water authorities" (i.e., municipalities, districts and Caltrans).

It should be noted that the Bay Area Regional MS4 Permit was a joint Bay Area Water Board and copermittee effort, coordinated by the Bay Area Stormwater Agencies Management Association ("BASMAA"). It is not the case that the Bay Area Water Board imposed this regional MS4 permit. The copermittees, coordinated by BASMAA, themselves determined to develop a regional MS4 permit. Further, all of the copermittees to the Bay Area Regional MS4 Permit discharge to a common receiving water, San Francisco Bay. Also, an Alaska MS4 permit cited in a letter from the Office of Chief Counsel to county counsel for Orange and Riverside Counties was issued to several municipalities and entities within a single "borough," which is equivalent in Alaska to a county.

Additionally, neither the Riverside County Copermittees nor those in South Orange County have filed ROWDs with the San Diego Water Board, which serve as the application for an NPDES MS4 permit in California. Water Code § 13260. The current Riverside County MS4 permit for the Santa Margarita Region provides that the ROWD is not required to be filed until May 2015, 180 days prior to the November 10, 2015 expiration date of that permit. Order R9-2010-0016, Part II.K.2.c.

> This ROWD must include:
>
> (1) Proposed changes to the Copermittees' runoff management programs; (2) Proposed changes to monitoring programs; (3) Justification for proposed changes; (4) Name and mailing addresses of the Copermittees; (5) Names and titles of primary contacts of the Copermittees; (6) Any other information necessary for the reissuance of this Order and (7) Any other information required by federal regulations for permit reapplications.

Id. It should be noted that several items of this ROWD are specifically intended to assist in the formulation of a new, SMR-specific MS4 permit, including proposed changes to the runoff management and monitoring programs, as well as justification for such changes, information necessary for "reissuance" of the SMR MS4 permit and information required by the federal regulations for MS4 permit reapplications.

As a simple jurisdictional matter, the Water Board cannot issue a regional MS4 permit to MS4 dischargers that have not applied for it. Moreover, as noted above, the SMR copermittees are entitled to apply for an MS4 permit applicable to their jurisdiction. Further, each individual copermittee has the right to apply for a MS4 permit covering only its discharges, as has the City of Long Beach in the Los Angeles Region.

Finding 3, Finding 15, in Fact Sheet Section VII.A and in Multiple Locations Throughout Draft Permit: In Finding 3, the Fact Sheet and in multiple locations throughout the Draft Permit (which are identified in the redline of the Draft Permit submitted with these comments by the Riverside County Copermittees ("Redline")), it is stated that the maximum extent practicable ("MEP") applies only to "storm water" discharges from the MS4. This is not correct.[2]

In fact, the Clean Water Act does not distinguish between non-stormwater and stormwater in terms of MS4 discharges which must be controlled to the MEP standard. *See* 33 U.S.C. § 1342(p)(3)(B)(iii)(the MS4 permit "shall require controls to reduce the discharge of pollutants to the maximum extent practicable . . . ." While the heading of 33 U.S.C. § 1342(p) refers to "Municipal and industrial stormwater discharges," this is not dispositive, as 33 U.S.C. § 1342(p)(3)(B)(ii), which requires the effective prohibition of "non-stormwater discharges" into the MS4. Thus, the language of this heading does not in fact support the argument that the MEP standard applies only to pollutants in stormwater discharges.

That both non-stormwater and stormwater must be controlled to the MEP standard was made clear by U.S. EPA itself in the preamble to the final Phase I stormwater regulations. In that preamble, U.S. EPA made it clear that "MEP control measures" would be implemented to address not only pollutants in "storm water" but also from "non-storm water discharges." As the preamble states:

> "Permittees are required to develop management programs for four types of pollutant sources which discharge to large and medium municipal storm sewer systems. Discharges from [such systems] are usually expected to be composed primarily of: (1) Runoff from commercial and residential areas; (2) storm water runoff from industrial areas; (3) runoff from construction sites; and (4) *non-storm water discharges*. Part 2 of the permit application has been designed to allow [permittees] the opportunity to propose *MEP control measures for each* of these components of the discharge."

55 Fed. Reg. at 48052 (emphasis supplied).

This language sets forth USEPA's understanding of the plain language of the CWA: "pollutants" must be controlled to the MEP from any MS4 "discharge," not merely pollutants in stormwater.

Finding 11: This finding, in relevant part, states that "[h]istoric and current development makes use of natural drainage patterns and features as conveyances for runoff. Rivers, streams and creeks in developed areas used in this manner are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and receiving water." This conclusion is legally incorrect.

First, under no circumstance can a natural stream constitute an MS4. The definition of "MS4" in the CWA regulations (a definition found in Attachment C of the Draft Permit) refers to a

[2] Finding 15 also states, erroneously, that the MEP standard "is explicitly for "Municipal . . . *Stormwater Discharges* (emphasis added)" from the MS4.

"conveyance or system of conveyances" "owned or operated" by a municipality. 40 CFR §122.26(b)(8). In California, natural rivers and streams are not "owned" nor "operated" by the municipality through which they flow. Moreover, a municipality obviously cannot "operate" a natural creek or stream. In further support of the point that a MS4 is an artificial, not natural, watercourse, the types of "conveyances" identified in the regulation ("roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains") all refer to anthropogenic structures, not natural streams. 40 CFR § 122.26(b)(8).

Second, a "receiving water" cannot also be an MS4, as is plain from the CWA regulations. An MS4 is itself defined as discharging to waters of the United States. 40 C.F.R. §122.26(b)(8). An MS4 cannot, in essence, discharge to itself. Moreover, an "outfall" from an MS4 (the point at which the discharge enters a receiving water) does not, pursuant to 40 C.F.R §122.26 (b)(9), include conveyances connecting "segments of the same stream or other waters of the United States and are used to convey waters of the United States."

Moreover, U.S. EPA, in the Preamble to the initial version of the MS4 regulations (53 Fed. Reg. 49416 (Dec. 7, 1988)) expressly determined that "streams, wetlands and other water bodies that are waters of the United States are not storm sewers for the purposes of this rule" and that "stream channelization, and stream bed stabilization, which occur in waters of the United States" were not subject to National Pollutant Discharge Elimination System ("NPDES") permits under Section 402 of the CWA. 53 Fed. Reg. at 49442.

Additionally, the United States Supreme Court recently reversed the Ninth Circuit Court of Appeals and ruled that flows from sections of the Los Angeles and San Gabriel Rivers that are comprised of concrete flood control channels are not a "discharge" under the CWA, confirming that such rivers, even if improved, are "receiving waters" along with any natural portions of those rivers. *Los Angeles County Flood Control Dist. v. Natural Resources Defense Council*, 568 U.S. __(January 8, 2013) (slip op.).

The above-cited statement in the finding is incorrect and should be stricken, as recommended in the Redline.

Finding 12: This finding states, in relevant part, that "[a]s operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not prohibit or otherwise control." This statement is legally incorrect, and ignores the salient point that the "discharger" of a pollutant is primarily responsible for controlling/permitting that discharge, under both the CWA and the Porter-Cologne Act. For example, under the Porter-Cologne Act, any persons discharging or proposing to discharge "waste" into waters of the state must file a report of waste discharge and obtain a waste discharge requirement. Water Code §§ 13260, 13263. The operator of the MS4 into which that water eventually flows is not "essentially accepting" responsibility for the discharge. The responsibility of the MS4 operator is established under the CWA, and that is to effectively prohibit non-stormwater discharges into [the MS4] and to control the discharge of pollutants from the MS4 to the MEP.

Moreover, the statement ignores the fact that in California, downstream property owners (including municipalities owning and operating MS4 facilities) must accept the flow of upstream waters. In fact, for a downstream municipality to block such flow would constitute an inverse condemnation or the creation of a nuisance under California law. *See Arreola v. County of Monterey* (2002) 99 Cal.App.4th 722 (obstruction of flood waters by improperly designed highway constituted inverse condemnation and nuisance).

Finding 28 and Fact Sheet Section VI: In the Finding, it is stated that the Water Board "finds that the requirements in this permit are not more stringent than the minimum federal requirements" and that therefore "a CWC section 13241 analysis is not required." The Finding further recites that notwithstanding this fact, "the San Diego Water Board has developed an economic analysis of the requirements in this Order."

For the reasons set forth in the comments of the Riverside County Copermittees, numerous provisions in the Draft Permit are in fact more stringent than the requirements of the CWA and its implementing regulations and therefore require an adequate Water Code § 13241 analysis. Unfortunately, this analysis is not provided in the Fact Sheet.

First, the economic analysis set forth in the Fact Sheet does not meet the requirements of Section 13241, as it does not analyze the six specific factors required to be analyzed under the section. Second, the analysis uses cost data from other sources, only a few of which were from the municipalities proposed to be included under the Draft Permit. These data are also a number of years old; the most recent study referenced in the Fact Sheet, the one done for the State Board by Cal State Sacramento, was dated January 2005 and included decade-old cost data from the City of Encinitas that dated from 2002-2003.

Third, the section of the Fact Sheet discussing the benefits of water quality notes that "there have been no studies for the San Diego Region to quantify the added value that surface waters with healthy water quality can provide." Thus, the Water Board has no evidence with which to compare the costs and benefits of the programs set forth in the Draft Permit. Moreover, the discussion makes the incorrect assumption that the alternative to the programs in the Draft Permit would be no controls on pollutants in urban runoff. As the Fact Sheet correctly notes, the Draft Permit is the fifth term MS4 permit for the copermittees. The previous four permits all contained increasingly complex and expensive control requirements, both structural and non-structural, designed to improve the quality of MS4 discharges. Thus, an appropriate cost analysis must compare the incremental costs of the programs set forth in the Draft Permit and the incremental benefits attributable to that permit. This has not been done in the Fact Sheet. Finally, the analysis does not recognize that the receiving waters provided economic benefits to residents of the San Diego Region long before issuance of the first MS4 permits in 1990. It is thus illogical to suggest that these pre-existing economic benefits would be lost if the Draft Permit is not adopted.

Finding 29 and Fact Sheet Section VII.F: The finding and the supporting argument in the Fact Sheet represents an attempt by Water Board staff to address whether the requirements of the Draft Permit represent an unfunded state mandate. That attempt, however, is beyond the scope of the Water Board's powers, since the *only* agency charged by the Legislature with determining

the presence of a state mandate, and whether that mandate is unfunded, is the Commission on State Mandates. Govt. Code § 17552; *Kinlaw v. State of California* (1991) 54 Cal.3d 326, 333. The Water Board has no jurisdiction to make a legal finding or discuss in the Fact Sheet that the Draft Permit, in whole or in part, does not constitute an unfunded state mandate.

Additionally fact sheets are required, under the CWA regulations, to provide the legal authority and reasons for each substantive permit provision (40 CFR § 124.8(a)(4); 40 CFR § 124.56(a)). *See also City of Rancho Cucamonga v. Regional Water Quality Control Board-Santa Ana Region* (2006), 135 Cal.App.4th 1377, 1382 (stating that fact sheets contains "the legal and factual grounds for the Water Board's recommendation to adopt the . . . permit"). Finding 29 and the discussion in Section VII.F of the Fact Sheet do not relate to any Draft Permit provision, nor provide legal authority or justification for the Draft Permit's adoption. As such, the finding and Fact Sheet discussion are surplussage and should be deleted.

The Riverside County Copermittees disagree with each of the arguments set forth in the Finding and Fact Sheet as to why the Draft Permit does not constitute an unfunded state mandate. Nevertheless, because the exclusive arena for such disagreements is the Commission on State Mandates, whose jurisdiction does not commence unless and until a test claim is filed before the Commission, the Copermittees need not and will not address those arguments.

Comments on Provisions in Draft Permit

Provision A and Fact Sheet Section VIII.A:

Lack of True Iterative Compliance Process

As set forth in the Redline and in the Comment Letter, the Riverside County Copermittees believe that to effectuate the iterative approach to compliance with water quality standards and other discharge prohibitions in the Draft Permit, the copermittees must be provided with the means to be in compliance. Based on monitoring, exceedances of water quality standards are occurring in the receiving waters subject to the Draft Permit, as set forth in Table G-14 to the latest 2011-2012 monitoring report submitted by the Riverside County Copermittees. Thus, if the copermittees are not provided an iterative means to be in compliance, which was contemplated by State Board's Order No. 2001-15, the copermittees will be issued an illegal MS4 permit, since it is a permit with which they cannot comply. This violates the intent of Congress in the CWA, which "is presumed not to have intended absurd (impossible) results." *Hughey v. JMS Development Corp.*, 78 F.3d 1523, 1529 (11th Cir. 1996); *accord, Mississippi River Revival v. City of Minneapolis*, 319 F.3d 1013, 1017-1018 (8th Cir. 2003).

With regard to the iterative process, Water Board staff has indicated numerous times during the workshop process that achievement of water quality standards is expected to take many years. The entire WQIP approach is aimed at the eventual attainment of such standards, as are the TMDLs issued to other copermittees, which have final compliance dates years into the future.

This approach is, however, put into jeopardy by the requirement, as expressed in the Fact Sheet at F-39, that the discharge prohibition and receiving water limitation provisions are

"independently applicable, meaning that compliance with one provision does not provide a 'safe harbor' where there is non-compliance with another provision (i.e., compliance with Provision A.4 does not shield a Copermittee who may have violated Provision A.1.a, A.1.c, or A.2.a from an enforcement action." While the Fact Sheet appropriately notes how this process should work through Provision A.4 (which "essentially requires the Copermittees to implement additional BMPs until MS4 discharges no longer cause or contribute to a violation of water quality standards") it also states that despite this iterative process, "the San Diego Water Board retains the discretion to take other appropriate enforcement and the iterative process does not shield dischargers from citizen suits under the CWA." Fact Sheet at F-40.

The consequences of this approach cannot be overemphasized. Despite the copermittees' good faith undertaking to follow the iterative process outlined in Provision A.4, a Water Board enforcement proceeding or a citizen suit can be brought for violations of water quality standards and, if the citizen plaintiff is successful, a federal judge is empowered to use his/her injunctive powers under Section 505(a) of the CWA to throw out the WQIP, JRMP or other compliance efforts of the copermittees and require other efforts. In such a case, the time and money spent by the copermittees in trying to comply with the Draft Permit, as well as the effort spent by the copermittees and Water Board staff in developing the Draft Permit's terms, are completely wasted.

Thus, the essential conundrum of Provision A, as presently drafted, is clearly exposed. Even though a copermittee may spend significant sums and undertake significant tasks under its WQIP or JRMP, be conducting expensive monitoring and special studies, and be in *full compliance* with all of the programmatic requirements of the Draft Permit, it would still face either a Water Board enforcement action or a citizen suit under Section 505 of the CWA. And, such a suit would allege exceedances of water quality standards (some of which are hardly capable of laboratory detection, much less control) that the Water Board acknowledges cannot be achieved for years.

Provision A is not, however, required by the CWA, as held by the Ninth Circuit in *Defenders of Wildlife v. Browner*, 191 F.3d 1159 (9th Cir. 1999). The holding in *Browner* is further reflected in State Board Order WQ 2001-15 (which the Fact Sheet acknowledges incorporates an "iterative process") which states:

> [O]ur [receiving water limitation] language, similar to the U.S. EPA's permit language discussed in the Browner case, **does not require strict compliance with water quality standards.** Our language requires that **storm water management plans be designed to achieve compliance with water quality standards**. **Compliance is to be achieved over time, through an iterative approach requiring improved BMPs**. As pointed out by the Browner court, there is nothing inconsistent between this approach and the determination that the Clean Water Act does not mandate strict compliance with water quality standards.

Order WQ 2001-15 at 7 (emphasis added). Thus, Provision A is inconsistent with the State Board's own precedential order, which requires the iterative approach effectuated by the suggested Redline changes.[3]

In further support, it may be noted that the U.S. EPA-drafted MS4 permit for the District of Columbia does not contain the type of language found in Provision A, but rather requires "an iterative and an adaptive management process for pollutant reduction and for achieving applicable water quality standard and/or total maximum daily load (TMDL) compliance." DC MS4 Permit Fact Sheet, page 5 (attached as Exhibit A).

Also, despite the assertion in the Fact Sheet that the copermittees are seeking a "safe harbor" from liability, this is incorrect. Every provision of an MS4 permit is subject to enforcement; given the complexity of the Draft Permit, the failure by a copermittee to comply with any provision could lead to such enforcement.

As noted above, MS4 discharges may not be achieving compliance with strict water quality standards, as recognized by the Issue Paper released by State Board staff in preparation for a November 20, 2012 workshop on receiving water limitation issues raised by *NRDC v. County of Los Angeles*. That Issue Paper stated that as "the storm water management programs of municipalities have matured, **an increasing body of monitoring data indicates that water quality standards are in fact not being met by many MS4s.**" (State Board Issue Paper, Page 2, emphasis supplied) (*see* Exhibit B.)

Perhaps most importantly, requiring strict and immediate compliance with discharge prohibition and receiving water limitations inhibits, not supports, the philosophy of the Draft Permit, which is to encourage the copermittees to focus on the most significant problems in their watersheds and to prioritize their resources to address those problems. Provision A, by contrast, discourages innovative approaches or prioritization, since all pollutants exceeding water quality standards create liability. Moreover, as discussed above, in the event of a citizen suit being brought such as that in the *NRDC* case, a federal judge could award injunctive relief to a successful plaintiff that could completely ignore or supplant the WQIP and other permit terms.

For additional discussion of receiving water limitations issues, please see Exhibit C, a letter submitted by the District to the State Board in connection with the recent workshop held by the State Board on receiving water limitations language. The Riverside County Copermittees hereby reference and incorporate this Exhibit into these comments.

The Riverside County Copermittees support a true iterative process that requires refinement and amendment of the WQIP and associated BMPs when receiving water limitation violations are recorded. That is the essence of the iterative process; the identification of problems and the development of BMPs to attempt to address those problems.

[3] While the Fact Sheet cites as authority *Natural Resources Defense Council v. County of Los Angeles*, discussed above, the Ninth Circuit was simply responding to language in the former Los Angeles County MS4 permit, and did not determine that such non-iterative language was required by the CWA.

The Redline proposes a means to achieve compliance using the WQIPs, which are intended to bring the copermittees into compliance with the discharge prohibition and receiving water limitation provisions of the Draft Permit over time. The Redline links compliance with Provisions A.1, A.2 and A.3 to A.4, which indicates that compliance is obtained through the preparation and updating of the WQIPs.

It must be noted, however, that the Riverside County Copermittees do not agree with the approach suggested by others, that any WQIP-based compliance approach be necessarily accompanied by a "Reasonable Assurance Analysis." Such an analysis could be extremely complex, expensive and time intensive to develop. Generally, such analyses are developed in the preparation of TMDLs and take a number of years to develop and refine. Given that the Santa Margarita Watershed has no adopted TMDLs, there are no comprehensive pollutant transport or BMP models available for the suite of constituents that might be considered for prioritization within a WQIP for that watershed. In the context of a TMDL, such models would be developed by the combined resources of the Water Board, stakeholders and dischargers. Requiring such an exercise to be undertaken solely with the public resources of the residents of the SMR is beyond the Copermittees' financial ability and would shift responsibility for development of TMDLs from the Water Board to the Copermittees.

Discussion in Fact Sheet

The Fact Sheet discussion also contains a number of legal and factual errors. First, the statement on page F-34 that non-stormwater discharges from the MS4 are subject to NPDES permitting requirements is unsupported by the plain language of the CWA, which (as noted above) applies the MEP standard to *all* discharges of pollutants from the MS4, not just those in stormwater. Also, such discharges are not subject to separate requirements under the NPDES program, as suggested on F-34, and non-storm water discharges are not the same, legally, as "illicit discharges." Please see discussion below.

Similarly, the Fact Sheet's conclusion that "Regional Water Boards are not limited by the iterative MEP approach to storm water regulation in crafting appropriate regulations for non-storm water discharges" is incorrect. The Fact Sheet correctly states that MEP has not been defined in the CWA or by U.S. EPA in the CWA regulations. However, the Fact Sheet incorrectly concludes that MEP is "ultimately defined" by the Water Boards or the State Board. What constitutes "MEP" is a question of federal law under the CWA, not a matter for definition by agencies which merely have been delegated the authority to enforce the CWA in California. The only source for such a finding is a memorandum from a State Board attorney, not case authority.

Moreover, Provisions B-E of the Draft Permit, far from establishing a "minimum framework" for the copermittees to achieve the MEP standard, sets forth in many cases requirements that far exceed the plain requirements of the CWA, the implementing regulations and in some cases even state law, or which require the copermittees to undertake steps that are not "practicable." These requirements are identified in the comments of the Riverside County Copermittees. In such respects, those requirements do not represent a "minimum framework" for MEP.

Other Issues

The Riverside County Copermittees also object to the provision in A.1.a and other portions of the Draft Permit that prohibit certain discharges into "waters of the state." The CWA regulates discharges into waters of the United States, which are surface waters. Expanding the prohibition to cover waters of the state expands the scope of the Draft Permit to protect groundwater, as a matter of state law. It should be noted that the recent Los Angeles County MS4 Permit appropriately applies this prohibition to waters of the United States.

Provision B.5: As noted in the Comment Letter, the CWA requires that illegal discharges into the MS4 be addressed by a program of steps taken to address such discharges. The Redline emphasizes that this program be guided by WQIP priorities, which is consistent with the overall intent of the Draft Program.

Provision E.2.a and E.2.a.(7): These provisions require the Copermittees to, as a part of their Illicit Discharge Detection and Elimination (IDDE) program, address all non-stormwater discharges as "illicit discharges," thus requiring the copermittees to "reduce or eliminate non-stormwater discharges" whether or not the discharges have been identified as "illicit."

The Fact Sheet asserts that "Provision E.2.a.(7) is consistent with the requirements of the CWA section 402(p)(3)(B)(ii) and 40CFR 122.26(d)(1)(v)(B). That assertion is not correct. Section 402(p)(3)(B)(ii) of the CWA states that MS4 permits "shall include a requirement to *effectively prohibit* non-stormwater discharges into the storm sewers" (emphasis supplied). The CWA regulations include two provisions designed to begin implementation of the "effective prohibition." The first provision requires MS4 permittees to perform a screening analysis, intended to provide sufficient information to develop priorities for a program to detect and remove illicit discharges. 40 CFR 122.26(d)(1)(iv)(D). The second requires MS4 permittees to develop a recommended site-specific management plan to detect and remove illicit discharges (or ensure they are covered by an NPDES permit) and to control improper disposal to MS4s. 40 CFR 122.26(d)(1)(iv)(D) and 122.26(d)(2)(B). The MS4 permittees are required to identify the non-stormwater discharge as an illicit discharge prior to having an obligation to effectively prohibit it. There is not otherwise a presumption to reduce or eliminate it.

40 CFR 122.26(d)(1)(v)(B), cited in the Fact Sheet, requires "[a] description of the existing program to identify illicit connections to the municipal storm sewer system. The description should include inspection procedures and methods for detecting and preventing illicit discharges, and describe areas where this program has been implemented."

The provision and rationale within the Fact Sheet blur the distinction between the copermittees' need to "effectively" prohibit non-stormwater discharges and to detect and eliminate illicit discharges.

- The requirement is "effectively prohibit" non-stormwater discharges, not "reduce or eliminate" non-stormwater discharges.
- Although copermittees are required to have a program to prevent illicit discharges to the MS4, non-stormwater discharges should only be addressed as illicit discharges where

such discharges are identified as sources of pollutants that may cause or contribute to an exceedance of a water quality objective.

- The IDDE program is established to detect and eliminate "illicit discharges", not non-stormwater discharges in general.

Please see the Redline for modifications to Provision E.2 addressing these issues.

Provision E.2.a.(3): In the Redline, the Riverside County Copermittees request that categories of irrigation runoff discharges (landscape irrigation, irrigation water and lawn watering) be considered as conditionally exempt discharges (not subject to treatment as illicit discharges).

The rationale for not including irrigation runoff discharges lacks a legal and factual basis. As noted in the Comment Letter, the only factual basis for this provision with respect to the Riverside County Copermittees is discussion in a public information informational brochure, which was itself based on a similar document from Orange County. Fact Sheet F-76. Despite assertions to the contrary in the Fact Sheet, this brochure does not represent a determination by the Riverside County Copermittees that irrigation runoff is a category of non-stormwater discharge that must be effectively prohibited. The other evidence in support of prohibiting the conditional exemption for irrigation runoff is entirely from different areas of the region, with different urban development patterns, lithology and hydrology. No specific determination has been made by the Copermittees (or the Water Board) that irrigation runoff in the Santa Margarita Region has actually been shown to be significant source of pollutants to receiving waters in the SMR.

EPA, in the preamble to the federal MS4 regulations, required that a *permittee* must make a finding that the "irrigation water" discharges must be a "source of pollutants to waters of the United States . . . ." 55 Fed. Reg. 48037. Moreover, such discharges must represent a "significant" source of pollutants to waters of the United States "under certain conditions." U.S. EPA, *Guidance Manual for the Preparation of Part 2 of the NPDES Permit Application for Discharges from Municipal Separate Storm Sewer Systems,* November 1992 ("EPA Part 2 Guidance Manual"), at p. 6-33. These conditions require a focus not on an entire category of discharges, but rather a discharger-by-discharger examination.

In the MS4 regulatory preamble, EPA stated that "[i]n general, municipalities will not be held responsible for prohibited some specific components of discharges or flows listed below through their [MS4], even though such components may be considered non-storm water discharges, unless such discharges *are specifically identified on a case-by-case basis as needing to be addressed."* 55 Fed. Reg. 47995 (emphasis supplied). In the Guidance Manual, EPA states:

> If an applicant knows . . . that landscape irrigation water from a ***particular site*** flows through and picks up pesticides **or *excess*** nutrients from fertilizer applications, there may be a reasonable potential for a storm water discharge to result in a water quality impact. In such an event, the applicant should contact the NPDES permitting authority to request that the authority order ***the discharger*** . . . to obtain a separate NPDES permit (or in this case, the discharge could be controlled through the storm water management program of the MS4).

EPA Part 2 Guidance Manual, p. 6-33 (emphasis added). Read in this context of this language, the Water Board has no power greater than a municipality in terms of its ability to identify non-stormwater discharges as "illicit" and thus required to be regulated, and must identify specific discharges, and not entire categories of discharges. *See* 55 Fed. Reg. 48037. This has not been done in the Fact Sheet.

Provision E.3(c): This provision requires the Copermittees to compel development projects that may not result in a hydromodification impact to the applicable receiving waters, to implement on-site or "alternative compliance" hydromodification mitigation measures and to use using "pre-development (naturally occurring)" runoff reference condition as applied to sites that are, in fact, developed.

The Riverside County Copermittees are concerned that implementing these requirements would subject the Copermittees to liability under the takings clauses of the U.S. and California Constitutions as well as under the Mitigation Fee Act because of the questionable nexus between such a project's lack of actual hydromodification impacts upon the receiving waters, and the hydromodification management measures required in the Draft Permit.

When imposing a condition on a development permit, a local government is required under the federal and state constitutions to establish that the condition bears a reasonable relationship to the impacts of the development project. This rule applies even to legislatively enacted requirements and impact fees or exactions.[4] Moreover, fees imposed on a discretionary ad hoc basis are subject to heightened scrutiny under a two-part test. First, local governments must show that there is a substantial relationship between the burden created by the impact of development and any fee or exaction.[5] Second, a development project's impacts must bear a "rough proportionality" to any development fee or exaction.[6] Under California law, the *Nollan/Dolan* heightened scrutiny test also applies to in-lieu fees.[7]

The Legislature has memorialized these requirements in the Mitigation Fee Act, which establishes procedures that local governments must follow to impose impact fees.[8] Irrespective of whether the hydromodification management requirements are implemented by legislative act or on an ad hoc basis, the copermittees' attempt to enforce them as proposed in the Draft Permit would likely result in claims by developers and property owners alleging unconstitutional takings of private property and violations of the Mitigation Fee Act. This is because a developer could argue that limiting hydromodification impacts of already developed property to its "naturally occurring" state, or requiring hydromodification mitigation measures for impacts not imposed by the project, would not have a legally sufficient nexus to the impact of the development project.

In addition, the Copermittees wish to bring the Water Board's attention to a recent case, *Virginia Dept. of Transportation v. United States Environmental Protection Agency*, Civ. Action No.

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[4] *Building Indus. Ass'n v. City of Patterson* (2009)171 Cal. App. 4th 886, 898.
[5] *Nollan v. California Coastal Comm'n*, 483 U.S. 825, 837 (1987).
[6] *Dolan v. City of Tigard*, 512 U.S. 374, 391 (1994).
[7] *Ehrlich v. City of Culver City* (1996) 12 Cal. 4th 854, 876.
[8] Cal. Gov't Code §§ 66000-66025.

1:12-CV-775 (E.D. Va. January 3, 2013) (slip op.), which is attached for the Water Board's convenience as Exhibit D. In this case, a federal district judge found that the CWA did not authorize U.S. EPA to regulate stormwater itself as a pollutant. The impact of this case is not known at this time, as it will probably be appealed to the Fourth Circuit Court of Appeals. Still, any approach to hydromodification which focuses on flows *per se*, as opposed to pollutants, may not withstand legal scrutiny.

Provision E.3.c.(3)(c)(i): This provision requires the entire alternative compliance in-lieu fee to be transferred to the copermittee or an escrow account prior to construction of a Priority Development Project (PDP). This provision is problematic, as development fees (which would include the in-lieu fees) are collected at the time of building permit issuance. In large-scale projects, permits may be issued (and development fees collected) in phases. Further, for master-planned developments, fees are generally negotiated through a development agreement to be collected based on certain development milestones. Therefore, collecting and holding the entire in-lieu fee prior to construction interferes with the development practice and may violate the Mitigation Fee Act and local development ordinances. The Redline requests that in-lieu fees be collected in accordance with state and local law.

Provision E.5: In addition to other comments on this provision and others in the Draft Permit relating to retrofitting, any requirements in Draft Permit relating to the retrofitting of engineered channels and other structures employed for flood control purposes must be consistent with the judgment of the flood control districts, to which the Legislature has assigned sole authority for the protection of the lives and property of their citizens from flooding. (Please see Comment Letter and proposed new findings in Redline for further discussion). Due to the urbanization of the counties over the past 150 years, as well as the particular topography and weather conditions found in Southern California, there is a great risk of flooding and hence the need for flood control structures and channels. The flood control districts have both the expertise and the sole legal authority to determine whether retrofitting of flood control structures can be accomplished in light of their statutory obligations, and that expertise and authority must be recognized in the Draft Permit.

Provision E.8: As noted in the Redline, the first requirement under Fiscal Analysis, that each "Copermittee must secure the resources necessary to meet all the requirements of this Order" has been deleted. This requirement is not found in the CWA regulations, which require only the conduct of a fiscal analysis. Moreover, this requirement intrudes on the home rule power of cities and counties by requiring, in essence, that municipal budgets must reflect the priority of compliance with the Order over any competing obligation, including police, fire protection and public health. A key issue in complying with stormwater and MS4 obligations is the ability of municipalities to afford the increasing costs associated with those obligations. In California, of course, the ability to raise taxes to pay for such obligations has been severely curtailed through several voter-approved propositions.

The Riverside County Copermittees request that Provision E.8.a be deleted.

EXHIBIT A

NPDES Permit No. DC0000221

AUTHORIZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM MUNICIPAL SEPARATE STORM SEWER SYSTEM PERMIT

In compliance with the provisions of the Clean Water Act, 33 U.S.C. §§ 1251 *et seq.*

Government of the District of Columbia
The John A. Wilson Building
1350 Pennsylvania Avenue, N.W.
Washington, D.C. 20004

is authorized to discharge from all portions of the municipal separate storm sewer system owned and operated by the District of Columbia to receiving waters named:

Potomac River, Anacostia River, Rock Creek and stream segments tributary to each such water body

in accordance with the Stormwater Management Program(s) dated February 19, 2009, subsequent updates, and related reports, strategies, effluent limitations, monitoring requirements and other conditions set forth in Parts I through IX herein.

The effective issuance date of this permit is: October 7, 2011.

This permit and the authorization to discharge shall expire at midnight, on: October 7, 2016.

Signed this 30th day of September, 2011.

Jon M. Capacasa, Director
Water Protection Division
U.S. Environmental Protection Agency
Region III

1. DISCHARGES AUTHORIZED UNDER THIS PERMIT

1.1 Permit Area

This permit covers all areas within the jurisdictional boundary of the District of Columbia served by, or otherwise contributing to discharges from, the Municipal Separate Storm Sewer System (MS4) owned or operated by the District of Columbia. This permit also covers all areas served by or contributing to discharges from MS4s owned or operated by other entities within the jurisdictional boundaries of the District of Columbia unless those areas have separate NPDES MS4 permit coverage or are specifically excluded herein from authorization under the District's stormwater program. Hereinafter these areas collectively are referred to as "MS4 Permit Area".

1.2 Authorized Discharges

This permit authorizes all stormwater point source discharges to waters of the United States from the District of Columbia's MS4 that comply with the requirements of this permit. This permit also authorizes the discharge of stormwater commingled with flows contributed by process wastewater, non-process wastewater, or stormwater associated with industrial activity provided such discharges are authorized under separate NPDES permits.

This permit authorizes the following non-stormwater discharges to the MS4 when appropriate stormwater activities and controls required through this permit have been applied and which are: (1) discharges resulting from clear water flows, roof drainage, dechlorinated water line flushing, landscape irrigation, ornamental fountains, diverted stream flows, rising ground waters, uncontaminated ground water infiltration to separate storm sewers, uncontaminated pumped ground water, discharges from potable water sources, foundation drains, air conditioning condensation, irrigation waters, springs, footing drains, lawn watering, individual resident car washing, flows from riparian habitats and wetlands, dechlorinated swimming pool discharges, wash water, fire fighting activities, and similar types of activities; and (2) which are managed so that water quality is not further impaired and that the requirements of the federal Clean Water Act, 33 U.S.C. §§ 1251 *et seq.*, and EPA regulations are met.

1.3 Limitations to Coverage

1.3.1 Non-stormwater Discharges

The permittee, as defined herein, shall effectively prohibit non-stormwater discharges into the MS4, except to the extent such discharges are regulated with an NPDES permit.

1.3.2 Waivers and Exemptions

This permit does not authorize the discharge of any pollutant from the MS4 which arises from or is based on any existing waivers and exemptions that may otherwise apply and are not consistent with the Federal Clean Water Act and other pertinent guidance, policies, and regulations. This narrative prohibition on the applicability of such waivers and exemptions extends to any activity that would otherwise be authorized under District law, regulations or

ordinance but which impedes the reduction or control of pollutants through the use of stormwater control measures and/or prevents compliance with the narrative /numeric effluent limits of this permit. Any such discharge not otherwise authorized may constitute a violation of this permit.

1.4 Discharge Limitations

The permittee must manage, implement and enforce a stormwater management program (SWMP) in accordance with the Clean Water Act and corresponding stormwater NPDES regulations, 40 C.F.R. Part 122, to meet the following requirements:

1.4.1. Effectively prohibit pollutants in stormwater discharges or other unauthorized discharges into the MS4 as necessary to comply with existing District of Columbia Water Quality Standards (DCWQS);

1.4.2. Attain applicable wasteload allocations (WLAs) for each established or approved Total Maximum Daily Load (TMDL) for each receiving water body, consistent with 33 U.S.C. § 1342(p)(3)(B)(iii); 40 C.F.R. § 122.44(k)(2) and (3); and

1.4.3. Comply with all other provisions and requirements contained in this permit, and in plans and schedules developed in fulfillment of this permit.

Compliance with the performance standards and provisions contained in Parts 2 through 8 of this permit shall constitute adequate progress toward compliance with DCWQS and WLAs for this permit term.

2. LEGAL AUTHORITY, RESOURCES AND STORMWATER PROGRAM ADMINSTRATION

2.1 Legal Authority

2.1.1 The permittee shall use its existing legal authority to control discharges to and from the Municipal Separate Storm Sewer System in order to prevent or reduce the discharge of pollutants to achieve water quality objectives, including but not limited to applicable water quality standards. To the extent deficiencies can be addressed through regulation or other Executive Branch action, the permittee shall remedy such deficiencies within 120 days. Deficiencies that can only be addressed through legislative action shall be remedied within 2 years of the effective date of this permit, except where otherwise stipulated, in accordance with the District's legislative process. Any changes to or deficiencies in the legal authority shall be explained in each Annual Report.

2.1.2 No later than 18 months following the effective date of this permit, the District shall update and implement Chapter 5 of Title 21 of District of Columbia Municipal Regulations (Water Quality and Pollution) ("updated DC Stormwater Regulations"), to address the control of stormwater throughout the MS4 Permit Area. Such regulations shall be consistent with this

FACT SHEET

National Pollutant Discharge Elimination System (NPDES)
Municipal Separate Storm Sewer System (MS4)
Permit No. DC0000221 (Government of the District of Columbia)

NPDES PERMIT NUMBER: DC0000221 (Reissuance)

FACILITY NAME AND MAILING ADDRESS:

Government of the District of Columbia
The John A. Wilson Building
1350 Pennsylvania Avenue, N.W.
Washington, D.C. 20004

MS4 ADMINISTRATOR NAME AND MAILING ADDRESS:

Director, District Department of the Environment
1200 First Street, N.E., 6th Floor
Washington, D.C. 20002

FACILITY LOCATION:

District of Columbia's Municipal Separate Storm Sewer System (MS4)

RECEIVING WATERS:

Potomac River, Anacostia River, Rock Creek, and Stream Segments Tributary
To Each Such Water Body

INTRODUCTION:

Today's action finalizes reissuance of the District of Columbia Municipal Separate Storm Sewer System (MS4) Permit. In the Final Permit EPA has continued to integrate the adaptive management approach with enhanced control measures to address the complex issues associated with urban stormwater runoff within the corporate boundaries of the District of Columbia, where stormwater discharges via the Municipal Separate Storm Sewer System (MS4).

Since the United States Environmental Protection Agency, Region III (EPA) issued the District of Columbia (the District) its first MS4 Permit in 2000, the Agency has responded to a number of legal challenges involving both that Permit (as well as amendments thereto) and the second-round MS4 Permit issued in 2004. For the better part of ten years, the Agency has worked with various parties in the litigation, including the District and two non-governmental organizations, Defenders of Wildlife and Friends of the Earth, to address the concerns of the various parties. The Agency has engaged in both litigation and negotiation, including formal

mediation.[1] These activities ultimately led to an enhanced stormwater management strategy in the District, consisting of measurable outputs for addressing the issues raised during the litigation and mediation process.

FACILITY BACKGROUND AND DESCRIPTION:

The Government of the District of Columbia owns and operates its own MS4, which discharges stormwater from various outfall locations throughout the District into its waterways.[2]

On April 21, 2010 EPA public noticed the Draft Permit. The Draft Fact Sheet published with that Draft Permit contains more extensive permit background information, and the reader is referred to that document for the history of the District of Columbia MS4 permit.

The public comment period closed on June 4, 2010. EPA received comments from 21 individual commenters and an additional 53 form letters. The Draft Permit, Draft Fact Sheet, and comments received on those documents are all available at: http://www.epa.gov/reg3wapd/npdes/draft_permits.html. The Final Permit reflects many of the comments received. EPA is simultaneously releasing a responsiveness summary responding to these comments.

ACTION TO BE TAKEN:

EPA is today reissuing the District of Columbia NPDES MS4 Permit. The Final Permit replaces the 2004 Permit, which expired on August 18, 2009 and has been administratively extended since that time. The Final Permit incorporates concepts and approaches developed from studies and pilot projects that were planned and implemented by the District under the 2000 and 2004 MS4 permits and modifying Letters of Agreement, and implements Total Maximum Daily Loads (TMDLs) that have been finalized since the prior permit was issued, including the Chesapeake Bay TMDL. A number of applicable measurable performance standards have been incorporated into the Final Permit. These and other changes between the 2004 Permit and today's Final Permit are reflected in a Comparison Document that is part of today's Permit issuance.

WATER QUALITY IN DISTRICT RECEIVING WATERS:

The District's *2008 Integrated Report to the Environmental Protection Agency and U.S. Congress Pursuant to Sections 305(b) and 303(d) Clean Water Act*[3] documents the serious water

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1 A procedural history of Permit appeals can be viewed at the EPA Environmental Appeals Board web: http://yosemite.epa.gov/oa/EAB_Web_Docket.nsf/77355bee1a56a5aa8525711400542d23/b5e5b68e89edabe98525714f00731c6f!OpenDocument&Highlight=2.municipal.

2 Portions of the District are served by a combined sanitary and storm sewer system. The discharges from the combined sewer system are not subject to the MS4 permit, but are covered under NPDES Permit No. xxxx issued to the District of Columbia Water and Sewer Authority.

3 District Department of the Environment, *The District of Columbia Water Quality Assessment, 2008 Integrated Report to the Environmental Protection Agency and U.S. Congress Pursuant to Sections 305(b) and 303(d) Clean Water Act* (hereinafter "2008 Integrated Report").

quality impairments in the surface waters in and around the District. A number of the relevant designated uses are not being met, *e.g.*, aquatic life, fish consumption, and full body contact, and there are a number of specific pollutants of concern that have been identified (for additional discussion on relevant TMDLs *see* Section 4.10 of this Final Fact Sheet).

Commenters on the Draft Permit expressed some frustration over very slow progress or even lack of progress after a decade of implementation of the MS4 program and even longer for other water quality programs. EPA appreciates this concern. Although the District's receiving waters are affected by a range of discharge sources, discharges from the MS4 are a significant contributor of pollutants and cause of stream degradation. EPA also recognizes, however, that stormwater management efforts that achieve a reversal of the ongoing degradation of water quality caused by urban stormwater discharges entail a long term, multi-faceted approach.

Consistent with the federal stormwater regulations for characterizing discharges from the MS4 (40 C.F.R. §122.26(d)(2)(iii)), the first two permit terms for the District's MS4 program required end-of-pipe monitoring to determine the type and severity of pollutants discharging via the system. The monitoring program was not designed to evaluate receiving water quality *per se*, therefore detection of trends or patterns was not reasonably possible. Today's Final Permit includes requirements for a Revised Monitoring Program, and one of the objectives for the program is to use a suite of approaches and indicators to evaluate and track water quality over the long-term (*see* discussion of Section 5.1 in this Final Fact Sheet).
There have been identified improvements in some areas. For example the *2008 Integrated Report* noted improvements in the diversity of submerged aquatic vegetation in the Potomac River, as well as improvements in fish species richness in Rock Creek. Biota metrics are often the best indicators of the integrity of any aquatic system.

EPA also notes that there are a variety of indirect measures indicative of improvement. The federal stormwater regulations foresaw the difficulty, especially in the near-term, of detecting measurable improvement in receiving waters, and relied instead on indirect measures, such as estimates of pollutant load reductions (40 C.F.R. §122.26(d)(2)(v)). The District documents these types of indirect measures in its annual reports, *e.g.*, tons of solids collected from catch basin clean-outs, amount of household hazardous waste collected, number of trees planted, square footage of green roofs installed, and many other measures of success.[4]

EPA believes that documenting trends in water quality, whether improvements, no change, or even further degradation, is an important element of a municipal water quality program. Today's Final Permit recognizes this principle, both in the types of robust measures required as well as the transition to new monitoring paradigms. EPA encourages all interested parties to provide the District with input during the development of these program elements.

THIS FACT SHEET:

(http://ddoe.dc.gov/ddoe/frames.asp?doc=/ddoe/lib/ddoe/information2/water.reg.leg/DC_IR_2008_Revised_9-9-2008.pdf)

4 District MS4 Annual Reports can be found at: http://ddoe.dc.gov/ddoe/cwp/view,a,1209,q,495855.asp

This Final Fact Sheet is organized to correspond with the chronological organization and numbering in today's Final Permit. Where descriptions or discussions may be relevant to more than one element of the Final Permit the reader will be referred to the relevant section(s).

To keep today's Final Fact Sheet of readable length, many of the elements included in the fact sheet published with the Draft Permit (Draft Fact Sheet) on April 21, 2010 have not been repeated, but are referenced. Readers are referred to the Draft Fact Sheet published with the Draft Permit for additional discussion on provisions that have been finalized as proposed.[5] The Final Fact Sheet does discuss significant changes since the 2004 Permit (even if discussed in the Draft Fact Sheet). The Final Fact Sheet also contains additional explanation of the Final Permit where commenters requested additional clarification. In addition, this Final Fact Sheet explains modifications to the Final Permit where provisions were changed in response to comments.

In many cases EPA made a number of very simple modifications to the Final Permit, *e.g.*, a word, phrase, or minor reorganization, simply for purposes of clarification. These modifications were not intended to change the substance of the permit provisions, only to clarify them. Most of those types of edits are not discussed in this Final Fact Sheet, but EPA has provided a Comparison Document of the Draft and Final Permits for readers who would like that level of detail.

Many commenters noted that the Draft Permit was not logically organized. EPA agrees. The major reorganization principles include:

1) There is a new Section 3, Stormwater Management Program (SWMP) Plan consolidating the various plans, strategies and other documents developed in fulfillment of permit requirements.
2) All implementation measures, *i.e.*, those stipulating management measures and implementation policies, are included in Section 4 of today's Final Permit. This includes "Source Identification" elements (Section 3 in the Draft Permit) and "Other Applicable Provisions" elements (Section 8 in the Draft Permit), which included TMDL requirements.
3) All monitoring requirements are consolidated in Section 5 of the Final Permit.
4) All reporting requirements are consolidated in Section 6 of the Final Permit.

EPA also refers readers to the Responsiveness Summary released today along with the Final Permit and Final Fact Sheet, for responses to comments and questions received on the Draft Permit. That document contains additional detailed explanations of the rationale for changes made to the Draft Permit in the Final Permit.

Finally, EPA made significant effort to avoid appending or incorporating by reference other documents containing permit requirements into the Final Permit. In the interest of clarity

5 The Permit and Fact Sheet proposed on April 21, 2010 can be viewed at: http://www.epa.gov/reg3wapd/npdes/draft_permits.html

and transparency EPA, to the extent possible, has included all requirements directly in the permit. Thus, EPA reviewed a variety of documents with relevant implementation measures, *e.g.*, TMDL Implementation Plans and the 2008 Modified Letter of Agreement to the 2004 permit[6], and translated elements of those plans and strategies into specific permit requirements that are now contained in the Final Permit. This Fact Sheet provides an explanation of the sources of provisions that are significant and are a direct result of one of those strategies.

1. DISCHARGES AUTHORIZED UNDER THIS PERMIT

(1.2 Authorized Discharges): The Final Permit authorizes certain non-stormwater discharges, including discharges from water line flushing. One commenter noted that many of these discharges, especially from potable water systems, contain concentrations of chlorine that may exceed water quality standards. EPA agrees, and has therefore clarified that dechlorinated water line flushing is authorized to be discharged under the Final Permit.

(1.4 Discharge Limitations): Comments on the language in Part 1.4 varied widely. Some commenters did not believe it was reasonable to require discharges to meet water quality standards. Other commenters believed this to be an unambiguous requirement of the Clean Water Act.

Today's Final Permit is premised upon EPA's longstanding view that the MS4 NPDES permit program is both an iterative and an adaptive management process for pollutant reduction and for achieving applicable water quality standard and/or total maximum daily load (TMDL) compliance. *See generally,* "National Pollutant Discharge Elimination System Permit Application Regulations for Stormwater Discharges," 55 F.R. 47990 (Nov. 16, 1990).

EPA is aware that many permittees, especially those in highly urbanized areas such as the District, likely will be unable to attain all applicable water quality standards within one or more MS4 permit cycles. Rather the attainment of applicable water quality standards as an incremental process is authorized under section 402(p)(3)(B)(iii) of the Clean Water Act, 33 U.S.C. § 1342(p)(3)(B)(iii), which requires an MS4 permit "to reduce the discharge of pollutants to the maximum extent practicable" (MEP) "and such other provisions" deemed appropriate to control pollutants in municipal stormwater discharges. To be clear, the goal of EPA's stormwater program is attainment of applicable water quality standards, but Congress expected that many municipal stormwater dischargers would need several permit cycles to achieve that goal.

Specifically, the Agency expects that attainment of applicable water quality standards in waters to which the District's MS4 discharges, requires staged implementation and increasingly more stringent requirements over several permitting cycles. During each cycle, EPA will continue to review deliverables from the District to ensure that its activities constitute sufficient progress toward standards attainment. With each permit reissuance EPA will continue to increase

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6 District Department of the Environment, *Modification to the Letter of Agreement dated November 27, 2007 for the NPDES Municipal Separate Storm Sewer (MS4) Permit DC0000222* (2008) http://www.epa.gov/reg3wapd/npdes/pdf/DCMS4/Letter.PDF

stringency until such time as standards are met in all receiving waters. Therefore today's Final Permit is clear that attainment of applicable water quality standards and consistency with the assumptions and requirements of any applicable WLA are requirements of the Permit, but, given the iterative nature of this requirement under CWA Section 402(p)(3)(B)(iii), the Final Permit is also clear that "compliance with all performance standards and provisions contained in the Final Permit shall constitute adequate progress toward compliance with DCWQS and WLAs for this permit term" (Section 1.4).

EPA believes that permitting authorities have the obligation to write permits with clear and enforceable provisions and thus the determination of what is the "maximum extent practicable" under a permit is one that must be made by the permitting authority and translated into provisions that are understandable and measurable. In this Final Permit EPA has carefully evaluated the maturity of the District stormwater program and the water quality status of the receiving waters, including TMDL wasteload allocations. In determining whether certain measures, actions and performance standards are practicable, EPA has also looked at other programs and measures around the country for feasibility of implementation. Therefore today's Final Permit does not qualify any provision with MEP thus leaving this determination to the discretion of the District. Instead each provision has already been determined to be the maximum extent practicable for this permit term for this discharger.

EPA modified the language in the Final Permit to provide clarity on the expectations consistent with the preceding explanation. Specifically Section 1.4.2 of the Final Permit requires that discharges 'attain' applicable wasteload allocations rather than just 'be consistent' with them, since the latter term is somewhat ambiguous.

In addition, the general discharge limitation 'no increase in pollutant loadings from discharges from the MS4 may occur to receiving waters' was removed because of the difficulty in measuring, demonstrating and enforcing this provision. Instead, consistent with EPA's belief that the Final Permit must include all of the enforceable requirements that would achieve this principle, the following discharge limitation is substituted: "comply with all other provisions and requirements contained in this permit, and in plans and schedules developed in fulfillment of this permit."

In addition, EPA made the following modifications: "Compliance with <u>the</u> performance standards and provisions contained in <u>Parts 2 through 8 of</u> this permit shall constitute adequate progress towards compliance with DCWQS <u>and WLAs for this permit term</u>" (*underlined text added*) (Section 1.4 of the Final Permit). EPA eliminated circularity with the addition of "Parts 2 through 8", clarifying that this requirement does not circle back to include the statements in 1.4.1 and 1.4.2, but rather interprets them. Also, although WLAs are a mechanism for attainment of water quality standards, EPA added the specific language "and WLAs" to make this concept explicit rather than just implicit. In addition this revised language emphasizes that the specific measures contained in the Final Permit, while appropriate for this permit term, will not necessarily constitute full compliance in subsequent permit terms. It is the expectation that with each permit reissuance, additional or enhanced requirements will be included with the objective

of ensuring that MS4 discharges do not cause or contribute to an exceedance of applicable water quality standards, including attainment of relevant WLAs.

2. LEGAL AUTHORITY, RESOURCES, AND STORMWATER PROGRAM ADMINISTRATION

(2.1 Legal Authority): Several commenters pointed out that there were a number of requirements in the Draft Permit without clear compliance schedules or deadlines, or with deadlines that did not correspond well to others in the permit. In the Final Permit, EPA has made several revisions to address these comments. For example, EPA changed a requirement that deficiencies in legal authority must be remedied "as soon as possible" to a 120-day requirement for deficiencies that can be addressed through regulation, and two years for deficiencies that require legislative action (Section 2.1.1). Also, EPA increased the compliance schedule for updating the District's stormwater regulation from twelve months to eighteen months, *id.,* so that this action could be adequately coordinated with the development of the District's new offsite mitigation/payment-in-lieu program (for more discussion see Section 4.1.3 below).

(2.2 Fiscal Resources): One commenter suggested eliminating the reference to the District's Enterprise Fund since funding was likely to come from a number of different budgets within the District. EPA agrees with this comment and has removed this reference.

On the other hand, many commenters noted that the implementation costs of the District's stormwater program will be significant. EPA agrees. The federal stormwater regulations identify the importance of adequate financial resources [40 C.F.R. §122.26(d)(1)(vi) and (d)(2)(vi)]. In addition, after seeing notable differences in the caliber of stormwater programs across the country, EPA recognizes that dedicated funding is critical for implementation of effective MS4 programs.[7,8,9] In 2009 the District established, and in 2010 revised, an impervious-based surface area fee for service to provide core funding to the stormwater program[10] (understanding that stormwater-related financing may still come from other sources as they fulfill multiple purposes, *e.g.,* street and public right-of-way retrofits). In conjunction with the 2010 rule-making to revise the fee the District issued a Frequently Asked Questions document[11] that indicates the intent to restrict this fee to its original purpose, *i.e.,* dedicated funding to implement the stormwater program and comply with MS4 permit requirements. EPA believes this action is essential, and he expects that the District will maintain a dedicated source of funding for the stormwater program.

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7 National Research Council, *Urban Stormwater Management in the United States* (2009) National Academy of Sciences http://www.nap.edu/catalog.php?record_id=12465

8 National Association of Flood and Stormwater Agencies, Funded by EPA, *Guidance for Municipal Stormwater Funding* (2006) http://www.nafsma.org/Guidance%20Manual%20Version%202X.pdf

9 EPA, *Funding Stormwater Programs* (2008) http://www.epa.gov/npdes/pubs/region3_factsheet_funding.pdf

10 District of Columbia, Rule 21-566 Stormwater Fees, http://www.dcregs.dc.gov/Gateway/RuleHome.aspx?RuleID=474056

11 District of Columbia, FAQ Document *Changes to the District's Stormwater Fee* (2010) http://ddoe.dc.gov/ddoe/frames.asp?doc=/ddoe/lib/ddoe/information2/water.reg.leg/Stormwater_Fee_FAQ_10-5-10_-final.pdf

EXHIBIT B

CALIFORNIA Water Boards

EDMUND G. BROWN JR. GOVERNOR

MATTHEW RODRIQUEZ SECRETARY FOR ENVIRONMENTAL PROTECTION

State Water Resources Control Board

State Water Resources Control Board

Issue Paper
Municipal Storm Water Permit Receiving Water Limitations
Board Workshop
November 20, 2012

ISSUE:

The State Water Resources Control Board (State Water Board) has been asked, in public comments received on National Pollutant Discharge Elimination System (NPDES) permits for Municipal Separate Storm Sewer Systems (MS4s), to adopt permit provisions that create a partial or complete exemption from enforcement for violations of water quality standards while a discharger engages in an iterative process of improving controls (commonly referred to as a "safe harbor" provision). The State Water Board has scheduled a public workshop to consider the issue.

DISCUSSION:

Background:

The Clean Water Act generally requires NPDES permits to include technology-based effluent limitations and any more stringent limitations necessary to meet water quality standards. In the context of NPDES permits for MS4s, however, the Clean Water Act does not reference the requirement to meet water quality standards. MS4 discharges must meet a technology-based standard of reducing pollutants in the discharge to the Maximum Extent Practicable (MEP), but requirements to meet water quality standards are at the discretion of the permitting agency.[1] Further, under the Porter-Cologne Water Quality Control Act, waste discharge requirements must implement applicable water quality control plans, including water quality objectives; however, the Porter-Cologne Act also affords the State Water Board and regional water quality control boards (collectively, Water Boards) flexibility to consider other factors, such as economics, when establishing any NPDES permit requirements that are more stringent than required by the Clean Water Act.[2]

The State Water Board has exercised its discretion with regard to requiring compliance with water quality standards in MS4 permits by directing, in precedential orders, that MS4 permits contain provisions requiring discharges to be controlled so as not to cause or contribute to exceedances of water quality standards in receiving waters.[3] However, consistent with federal

[1] 33 U.S.C. § 1342(p); *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159.

[2] Wat. Code, §§ 13241, 13263; *City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613.

[3] SWRCB Order WQ 98-01 (*Environmental Health Coalition*), WQ 99-05 (*Environmental Health Coalition)*.

law, the State Water Board has found it appropriate to implement Best Management Practices (BMPs) in lieu of numeric water quality-based effluent limitations to meet water quality standards.[4] Additionally, in lieu of "strict compliance" with water quality standards, the State Water Board has prescribed an iterative process whereby an exceedance of a water quality standard triggers a process of BMP improvements: reporting of the violation, submission of a report describing proposed improvements to BMPs expected to better meet water quality standards, and implementation of these new BMPs.

While the Water Boards have generally directed dischargers to achieve compliance with water quality standards by improving control measures through the iterative process, the iterative process does not provide a "safe harbor" to MS4 permittees: that is, when a discharger is shown to be causing or contributing to an exceedance of water quality standards, that discharger is in violation of the relevant discharge prohibitions and receiving water limitations of the permit and potentially subject to enforcement by the Water Boards or through a citizen suit, even if the discharger is actively engaged in the iterative process. Despite the lack of a safe harbor provision, however, the Water Boards have, as a matter of practice, declined to initiate enforcement actions against MS4 permittees who have been actively engaged in the iterative process. The Water Boards' decisions to decline to include a safe harbor in MS4 permits have been upheld by courts of appeal.[5]

Need for and Purpose of Workshop:

The lack of a safe harbor in the iterative process was recently highlighted by the Ninth Circuit's decision in a citizen suit brought by the Natural Resources Defense Council (NRDC) against the County of Los Angeles and the Los Angeles County Flood Control District for violations of the receiving water limitations of their MS4 permit. The Ninth Circuit confirmed that, as the receiving water limitations of the Water Boards' MS4 permits are currently drafted, engagement in the iterative process does not excuse liability for violations of water quality standards.[6]

As the storm water management programs of municipalities have matured, an increasing body of monitoring data indicates that water quality standards are in fact not being met by many MS4s. MS4s accordingly assert that the receiving water limitations and iterative process provisions of the Water Boards' permits do not afford them with a viable path to compliance for these violations, which may take years of technical efforts to correct, especially for wet weather discharges. MS4s argue that they are increasingly vulnerable to citizen suits and/or Water Board enforcement. This concern has been raised by the California Stormwater Quality Association (CASQA) in comments on the proposed Phase II MS4 permit and by the California Department of Transportation (Caltrans) in comments on the Caltrans MS4 permit adopted

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[4] *See* SWRCB Orders WQ 91-03 (*Citizens for a Better Environment)*, WQ 98-01 (*Environmental Health Coalition*), WQ 2001-15 (*Building Industry Association of San Diego County*); *See also* 40 C.F.R. § 122.44(k); Interim Permitting Approach for Water Quality-Based Effluent Limitations In Storm Water Permits, USEPA, September 1995. In such orders and guidance, the State Water Board and Environmental Protection Agency acknowledge that the storm water program may evolve over time to incorporate stricter limitations, including improved BMPs to meet water quality standards or numeric water quality based effluent limitations.

[5] *Building Industry Assn. of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866; *City of Rancho Cucamonga v. Regional Water Quality Control Bd.* (2006) 135 Cal.App.4th 1377; see also *Natural Resources Defense Council v. County of Los Angeles* (9th Cir. 2011) 673 F.3d 880, 897, n.7.

[6] *Natural Resources Defense Council v. County of Los Angeles, supra*, 673 F.3d at p. 897. On July 13, 2012, the United States Supreme Court granted review of this case on other grounds.

September 19, 2012, as well as by numerous MS4s and interested persons in comments on both permits. The issue is additionally relevant to the Phase I MS4 permits issued by the regional water quality control boards.[7]

At the same time, the environmental community has commented that the iterative process has been underutilized and ineffective to date in bringing MS4 discharges into compliance with water quality standards. Environmental parties argue that direct enforcement of water quality standards is necessary to protect water quality, especially in such second- or third-generation permits where dischargers have already had a number of years to come into compliance.

Because of the broad applicability of any policy decisions regarding the receiving water limitations and iterative process provisions, the State Water Board is holding a public workshop to consider several alternatives in addressing the issue and to seek public input on these alternatives. Following the workshop, the State Water Board may propose revisions to the receiving water limitations in the Caltrans MS4 and Phase II MS4 permits, and as necessary, re-open those permits after public review and comment, to make the revisions.

ALTERNATIVES FOR CONSIDERATION:

The State Water Board may consider the alternatives below, individually or in combination, to address concerns with the receiving water limitations in the Caltrans or Phase II MS4 permits. While the listed alternatives attempt to capture the range of alternatives before the State Water Board, the Board welcomes comments proposing other options and will not be limiting its consideration to the alternatives as listed in this issue paper.

The receiving water limitations language prescribed by State Water Board Order WQ 99-05 is attached as Attachment 1 and forms the basis of Alternative 1. CASQA has submitted specific proposed language for the Receiving Water Limitations provision of the proposed Phase II MS4 permit (CASQA Proposal). The CASQA Proposal is attached as Attachment 2 and is referenced as appropriate in the discussion of the alternatives below.

Alternative 1: Keep the status quo of no safe harbor.

This alternative makes no changes to the existing State Water Board approach or to the current language of the adopted Caltrans MS4 permit or the proposed Phase II MS4 permit. As stated previously, the current MS4 permit provisions laying out the iterative process are based on language set forth in precedential State Water Board orders. (See Attachment 1.) Alternative 1 adheres to the prescribed language. Under this alternative, the Water Boards may choose to exercise their enforcement discretion to refrain from taking action against dischargers engaged in good faith implementation of the iterative process; however, they would not be constrained from enforcing the receiving water limitations when an MS4 causes or contributes to exceedances of water quality standards. As a limitation within an NPDES permit, dischargers who cause or contribute to an exceedance of water quality standards could be subject to citizen suits.

[7] Note that the issue is not relevant to any other NPDES permits, including permits for storm water discharges associated with industrial activity, because all other NPDES permits must include technology-based effluent limitations and any more stringent limitations necessary to meet water quality standards. (33 U.S.C. § 1311(b)(1)(C).)

Alternative 2: No safe harbor, but provide greater clarity and specificity for iterative process implementation and wet weather data analysis.

Greater clarity and specificity in the MS4 permits as to the iterative process requirements may result in increased efforts to improve controls and achieve compliance. Such clarity and specificity may include:

1. Clarification on how compliance with the relevant discharge prohibitions and receiving water limitations is determined, including type and frequency of monitoring;
2. Clarification that dischargers must begin the iterative process after documentation of violations without waiting to be directed to do so by the Water Boards;
3. Specification of the minimum efforts that will constitute meaningful compliance with the iterative process;
4. Specification of the scope of any corrective action, including whether it applies only at the location where exceedances are measured or throughout the relevant watershed;
5. Specification of additional wet weather data analysis to better define and assess the impact of municipal storm water discharges on receiving waters, as well as the efficacy of specific best management practices.

As the MS4 program continues to mature and more data becomes available, this alternative may be enhanced by the development of water quality-based effluent limitations for pollutants, as appropriate, as a means of determining compliance with receiving water limitations. In addition, the enhanced wet weather data could be used to identify surrogates that could be used as a measure of protecting beneficial uses. In time, the data could be used to develop actual wet weather water quality standards or wet weather implementation provisions for existing water quality standards that could be applied consistently on a statewide basis.

Given the nature of storm water discharges and of MS4s, questions such as where and how compliance with water quality standards should be measured and how narrowly or broadly corrective actions should be applied, pose complicated technical issues that require careful study and consideration. These challenges notwithstanding, water quality improvements are more likely to be achieved as the iterative process becomes automatic and dischargers follow clear guidelines for determining and addressing non-compliance with permit terms. Such improvements may dissuade the Water Boards and the public from bringing enforcement actions/citizen suits for all except the most egregious and repeated violations.

In addition to being a stand-alone alternative, Alternative 2 may be considered in combination with Alternatives 3 through 5. The CASQA Proposal incorporates some greater specificity in the iterative process requirements as a component of its proposed receiving water limitations.

Alternative 3: Safe harbor that applies only if a discharger is in compliance with the implementation provisions of an approved TMDL.

Under Alternative 3, the receiving water limitations would be amended to provide a safe harbor for permittees that are in compliance with the implementation provisions of a TMDL. In effect, as long as the permittee is in compliance with the TMDL (including any compliance schedule) the terms of the TMDL would replace the requirement to comply with water quality standards for the pollutants that are covered by the TMDL.

The CASQA Proposal contemplates a safe harbor for dischargers in compliance with a TMDL as a component of the receiving water limitations.

Alternative 4: Safe harbor that applies if a discharger is in compliance with the implementation provisions of an approved TMDL, as in Alternative 3, and, in addition, that applies when the discharger engages in good faith compliance with the iterative process for exceedances caused by wet weather discharges.

In addition to the safe harbor for TMDL implementation, Alternative 4 would provide a safe harbor when dischargers engage in the iterative process in good faith to address violations of permit terms caused by wet weather discharges. Thus, if a storm water discharge from an MS4 is causing or contributing to an exceedance of a water quality standard in the receiving water, the exceedance would not constitute a violation of the permit as long as the discharger was engaged in good faith efforts to address the exceedance through improved controls. Alternative 4 recognizes that wet weather discharges from MS4s frequently cause or contribute to violations of water quality standards and allows the MS4s time to address these violations by improving control measures.

However, the safe harbor would not extend to dry weather discharges. Non-storm water discharges are generally prohibited in MS4 permits and only a few categories of non-storm water discharges are exempted from the prohibition, with the condition that these exempted discharges also be prohibited if they are identified as sources of pollutants to receiving waters.

Alternative 5: Full safe harbor.

This alternative would provide a full safe harbor to dischargers complying with the implementation provisions of a TMDL or engaging in the iterative process to address exceedances caused by wet or dry weather discharges.

The CASQA Proposal attached provides for a full safe harbor.

Attachments Removed

EXHIBIT C

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RIVERSIDE COUNTY FLOOD CONTROL
AND WATER CONSERVATION DISTRICT

November 13, 2012

Honorable Members of the State Water Resources Control Board
Attn: Ms. Jeanine Townsend, Clerk to the Board
State Water Resources Control Board
1001 I Street, 24th Floor
Sacramento, CA 95814

Dear Honorable Board Members and Ms. Townsend:

Re: Comment Letter – Receiving Water Limitations Language Workshop

I am writing on behalf of the Riverside County Flood Control and Water Conservation District ("District") regarding the State Water Resources Control Board's consideration of Receiving Water Limitations ("RWL") language in MS4 permits. This review was triggered by a decision of the Ninth Circuit United States Court of Appeals in *Natural Resources Defense Council v. County of Los Angeles* (9th Cir. 2011) 673 F.3d 880, *cert granted,* __ U.S. __ (June 25, 2012) ("*NRDC*"). This letter is being submitted in advance of the State Board's November 20, 2012 workshop on reform of the RWL language to be incorporated into MS4 permits as a matter of statewide policy.

The District is the Principal Permittee for three Phase I MS4 permits applicable to municipalities across Riverside County: Order R8-2010-0033, issued by the Santa Ana Regional Water Board to municipalities within the Santa Ana River Region of Riverside County; Order R9-2010-016, issued by the San Diego Regional Water Board to municipalities within the Santa Margarita Region of Riverside County; and Order R7-2008-0001, issued by the Colorado River Regional Water Board to municipalities within the Whitewater River Region of Riverside County. Given our unique perspective as the manager of three Phase 1 MS4 permits, the District and its staff thus, have considerable experience and expertise in developing and administering MS4 permits, and a keen understanding of the issues that the above mentioned court case creates.

The District strongly supports reform of the RWL language to make clear the State Board's often-expressed intention that MS4 Permittees' compliance with RWL be effectuated through an iterative process. However, under the Ninth Circuit's interpretation, any MS4 discharge that causes or contributes to an exceedance of a Water Quality Standard subjects the MS4 Permittee to civil penalty liability, injunctive relief and the payment of attorneys' fees in an action brought by a citizen plaintiff, even where the Permittee is fully implementing the programmatic requirements of their MS4 Permit.

The District supports the California Stormwater Quality Association's ("CASQA") efforts to obtain RWL language that ensures that the iterative process favored by the State Board is honored. The District also supports the comments of the California State Association of Counties, and believes the proposed RWL language attached to those comments is a step in the right direction.

This letter contains additional District comments about the RWL language and the iterative process. We believe that they are best expressed in terms of correcting misperceptions regarding the current RWL language, as interpreted by the Ninth Circuit.

Misperception Number One: Strict compliance with Water Quality Standards is required of MS4 Permittees by the Clean Water Act.

The Clean Water Act provides that MS4 discharges must control pollutants in discharges from the MS4 to the "Maximum Extent Practicable" (33 U.S.C. § 1342(p)(3)(B)(iii)). Unlike the case with other NPDES Permittees, the Clean Water Act does not require that municipalities strictly comply with Water Quality Standards, as determined by the Ninth Circuit in *Browner v. Defenders of Wildlife*. The State Board's own precedential Order WQ 2001-15 recognizes this fact and states that the RWL language was intended to be consistent with the *Browner* case. In that Order, which interpreted RWL language similar to that in *NRDC*, the Board stated:

> *[O]ur language, similar to the U.S. EPA's permit language discussed in the Browner case, does not require strict compliance with water quality standards. Our language requires that storm water management plans be designed to achieve compliance with water quality standards. Compliance is to be achieved over time, through an iterative approach requiring improved BMPs. As pointed out by the Browner court, there is nothing inconsistent between this approach and the determination that the Clean Water Act does not mandate strict compliance with water quality standards. [Order WQ 2001-15 at 7 (emphasis added)].*

Unfortunately, the Ninth Circuit completely disregarded this language, and the Order, in holding that strict compliance was required of MS4 Permittees.

USEPA itself has issued MS4 permits (in non-delegated states) that do not contain RWL language requiring strict compliance with Water Quality Standards. Therefore, it is clear that such compliance is not required by the Clean Water Act nor is such compliance established by USEPA policy. The most prominent example of a recent MS4 permit promulgated by USEPA is that for the District of Columbia ("DC Permit") (relevant portions of which are attached as Exhibit A), which was adopted in 2011.

Part 1.4 of the DC Permit contains the requirements relating to Water Quality Standards and provides, in relevant part: "Compliance with the performance standards and provisions contained in Parts 2 through 8 of the permit shall constitute adequate progress towards compliance with DCWQS [water quality standards] and WLAs [established under TMDLs] for this permit term." The DC Permit Fact Sheet explains the rationale for that language as follows [DC Permit Fact Sheet, Pages 5-6, emphasis added, attached as Exhibit B]:

> *Comments on the language in Part 1.4 varied widely. Some commenters did not believe it was reasonable to require discharges to meet water quality standards. Other commenters believed this to be an unambiguous requirement of the Clean Water Act.*

> *Today's Final Permit is premised upon* **EPA's longstanding view that the MS4 NPDES permit program is both an iterative and an adaptive management process for pollutant reduction and for achieving applicable water quality standard and/or total maximum daily load (TMDL) compliance.** *See generally, "National Pollutant Discharge Elimination System Permit Application Regulations for Stormwater Discharges," 55 F.R. 47990 (Nov. 16, 1990).*
>
> **EPA is aware that many Permittees, especially those in highly urbanized areas such as the District, likely will be unable to attain all applicable water quality standards within one or more MS4 permit cycles.** *Rather the attainment of applicable water quality standards* **as an incremental process** *is authorized under section 402(p)(3)(B)(iii) of the Clean Water Act, 33 U.S.C. § 1342(p)(3)(B)(iii), which requires an MS4 permit "to reduce the discharge of pollutants to the maximum extent practicable" (MEP) "and such other provisions" deemed appropriate to control pollutants in municipal stormwater discharges.* **To be clear, the goal of EPA's stormwater program is attainment of applicable water quality standards, but Congress expected that many municipal stormwater dischargers would need several permit cycles to achieve that goal.**
>
> *Specifically, the Agency expects that attainment of applicable water quality standards in waters to which the District's MS4 discharges, requires staged implementation and increasingly more stringent requirements over several permitting cycles. During each cycle, EPA will continue to review deliverables from the District to ensure that its activities constitute sufficient progress toward standards attainment. With each permit reissuance EPA will continue to increase stringency until such time as standards are met in all receiving waters.* **Therefore today's Final Permit is clear that attainment of applicable water quality standards and consistency with the assumptions and requirements of any applicable WLA are requirements of the Permit, but, given the iterative nature of this requirement under CWA Section 402(p)(3)(B)(iii), the Final Permit is also clear that "compliance with all performance standards and provisions contained in the Final Permit shall constitute adequate progress toward compliance with DCWQS and WLAs for this permit term" (Section 1.4).**

USEPA is now proposing clarifying changes to this language and to other sections of the DC Permit as the result of a settlement with various parties. However, those changes do not require strict compliance with Water Quality Standards, but rather compliance through the programs developed under the Permit.

The State Board is thus, free to adopt new RWL language that effectuates its previously expressed intent that MS4 permits not require strict compliance with Water Quality Standards with regard to contributions from discharges from MS4s.

Misperception Number Two: The MS4 Permittees are Seeking a "Safe Harbor" that would Insulate them from Responsibility Under the Clean Water Act.

While State Board staff's "Issue Paper" uses the term "safe harbor" in describing the iterative process, the District believes that this is fundamentally misleading. Even a cursory review of the terms of a typical MS4 permit in California reveals that it is full of compliance points. In the three MS4 Permits in which the District serves as Principal Permittee, literally every sentence is a separate point of compliance.

This fact is supported by the language of the Permits themselves. For example, in Order R8-2010-0033 Part XX.G provides: **"The Permittees must comply with all terms, requirements, and conditions of this Order. Any violation of this Order constitutes a violation of the CWA, its regulations and the California Water Code, and is grounds for enforcement action . . . ."** (emphasis added). Similar provisions are contained in the other two Riverside County MS4 Permits. Even without the strict Water Quality Standard language imposed under the Ninth Circuit's opinion, there is no "safe harbor" from liability under the Clean Water Act or, where applicable, the California Water Code, for any Permittee that fails to fully implement each the detailed and prescriptive requirements of its MS4 Permit.

There is a fundamental difference however, between fully complying with activities within the control and responsibility of the Permittees, such as monitoring, implementing BMPs and performing other programmatic requirements of the MS4 Permit; and being forced to guarantee that MS4 discharges will not cause or contribute to exceedances of Water Quality Standards in Receiving Waters, a guarantee that the Permittees' have no ability to make.

What the District and other MS4 Permittees seek is relief from what is essentially "guaranteed non-compliance" where a Permittee can be found in violation of their MS4 Permit even if the exceedance occurs at no fault of or failure by the Permittee, or put another way, even in circumstances where there is nothing a Permittee could have done to prevent that exceedance from occurring. In such a case, the Permittee can be held liable for potentially millions of dollars in legal costs, penalties and other expenses. We note that the City of Malibu, a city of only 13,000 residents, spent more than $2 million in defending against a citizen suit filed with respect to its MS4 Permit and more than $6 million to settle the case, including payment of $750,000 in attorney fees to plaintiffs. Given the tremendous financial challenges faced by every California municipality, including the District, the County of Riverside and the Permittee cities within the County, such a diversion of resources that otherwise would be directed at clean water programs or other vital municipal programs is a poor policy choice. And, as noted, it is not a policy choice that is required by the Clean Water Act, nor is it required by USEPA in their own Permits.

The District recognizes that regulatory enforcement actions and citizen suits are authorized by the Clean Water Act and that such suits may be an appropriate remedy where, for example, a Permittee has failed to comply with the programmatic requirements of its MS4 Permit. Where, however, the Permittees are complying with those requirements in good faith but, due to circumstances beyond

their control, their MS4 discharge causes or contributes to a Water Quality Standard exceedance in Receiving Waters, a citizen suit based on those exceedances potentially throws away the work done by the Permittees and the Water Boards under the MS4 Permit, as discussed below.

Misperception Number Three: MS4 can achieve compliance with strict Water Quality Standards.

MS4 Permittees cannot guarantee that discharges from their MS4s will in fact, not cause or contribute to an exceedance of Water Quality Standards in a Receiving Water. The monitoring conducted under our MS4 Permits reflects exceedances of various Water Quality Standards in Receiving Waters, and we understand that such results are typical for MS4 discharges around the state (please see Pages 2-3 of the CASQA comment letter dated November 2, 2012). The extreme variability of stormwater quality and quantity itself (which, in Southern California, arrives infrequently and from widely varying storm sizes) combined with a multitude of potential pollutant sources beyond a Permittee's ability to truly "control", make it impossible for a municipality to ensure that no discharges from its MS4 will ever cause or contribute to exceedances of Water Quality Standards in Receiving Waters. This was recognized by the Issue Paper released by State Board staff in preparation for the November 20th workshop, which found that as "the storm water management programs of municipalities have matured, **an increasing body of monitoring data indicates that water quality standards are in fact not being met by many MS4s**" (Issue Paper, Page 2 (emphasis supplied)).

Thus, even if municipal Permittees are to be held strictly liable for the ensuring that no discharges from their MS4s cause or contribute to an exceedance of Water Quality Standards, as the Ninth Circuit has interpreted the current RWL language, those Permittees have no ability to attain those standards. The reasons are several-fold and include the following:

1) Unlike an industrial NPDES Permittee, a municipal Permittee is not typically the source of the pollutants in the MS4 discharge (whether wet or dry). The municipality can regulate sources to some degree (through, for example, the operation of structural and non-structural BMPs and implementation of an Illegal Connection/Illicit Discharge program), but the municipality cannot guarantee that pollutants will not enter the MS4 and then be discharged into the Receiving Waters.

2) Municipalities cannot control natural sources of pollutants that are discharged through the MS4. Monitoring has indicated that many pollutants are likely from natural and not anthropogenic sources.

3) While Permittees conduct extensive public education programs as part of their MS4 programs, municipalities cannot "control" human behavior, or "prevent" an individual from taking an action that might cause pollution to enter the MS4. As an example, a resident may, despite all ordinances, regulations, potential penalties or enforcement, public outreach, available BMPs, etc., choose not to pick up after their pets, and

stormwater may, through no fault of the Permittee, pick up animal waste and deposit into the MS4.

4) MS4 Permittees cannot "prevent" flows from entering their MS4. To protect the health and property of their residents, MS4 operators must allow the legitimate flows of water into their drains. This is especially true for the District, which is charged directly by the Legislature [in Water Code App. §48-9] with the task of taking necessary steps to protect the people, properties and watersheds of Riverside County from the negative impacts of flooding. The District cannot, in effect, cause flooding by preventing flows from entering their storm drain, simply because such flows may contain pollutants that cause a violation of the Receiving Waters Limitation provisions of their MS4 Permits. In fact, California law requires downstream property owners (such as MS4 operators) to accept flows from upstream property owners.

5) Further, the authorities granted to flood control districts, such as this District, by the Legislature are narrow and do not include the authority to condition or regulate the quality or nature of stormwater runoff discharged from up gradient properties. This responsibility is appropriately assigned by the Legislature to the Regional Boards.

Similarly, MS4 Permittees cannot guarantee compliance with Water Quality Standards in dry weather. "Alternative 4" in the staff's Issue Paper suggests an alternative RWL approach that would not extend the iterative approach to dry weather discharges. The District submits that this alternative does not reflect the reality of urban runoff. Monitoring conducted under the Riverside County MS4 Permits reflects exceedances of Water Quality Standards during dry weather as well as wet weather. There is no justification for imposition of strict liability for exceedances during such conditions, for the following reasons:

1) During dry weather, other NPDES-permitted discharges continue to flow into the Receiving Waters. For example, much of the flow in the Santa Ana River during dry weather conditions is from non-MS4 sources, such as publicly owned treatment works. Additionally, numerous other separate NPDES-permitted discharges will occur, potentially at concentrations of pollutants that exceed Water Quality Standards. Evidence generated during the *NRDC* case involving the County of Los Angeles, for example, indicated that NPDES permits covering hundreds of these dischargers, including POTWs allowed the discharge of pollutants at concentrations *greater* than Water Quality Standards. Because of these discharges, which are legal and authorized by the Regional Boards, the MS4 Permittees have essentially no more control over compliance with Water Quality Standards in dry weather than they would have during wet weather conditions.

2) Accidental or even intentional illicit discharges by third parties into the MS4 obviously can occur during dry weather as well as wet weather. Such discharges would potentially have an even greater impact on sampling, since they are not diluted by large volumes of stormwater. For example, a vehicular accident recently caused hundreds of gallons of

asphalt tar to enter Sandia Creek, a Receiving Water in Riverside County. While this spill was not discharged through an MS4, if the vehicular accident had occurred in another portion of the watershed, the spill could feasibly have entered into and been discharged from an MS4. Similarly in many places throughout the State, sanitary sewer systems are owned and operated by special districts that have no relation to the MS4 Permittees that own or operate the MS4 systems. Nevertheless, an overflow of such sanitary sewer systems may cause an unavoidable discharge into, and from a Permittee-owned MS4. Such accidental or illicit discharges cannot be "prevented" or "controlled" by the Permittees except to the extent that they can be cleaned up or blocked if promptly reported. However, if the discharge has reached Receiving Waters and caused a measured exceedance of Water Quality Standards, under the Ninth Circuit's interpretation, liability for civil penalties, injunctive relief and attorneys fees will attach to the MS4 Permittee.

3) Enforcing strict Water Quality Standard limits in dry or wet weather is counter-productive to the watershed planning-based MS4 Permits currently being promulgated by many regional water boards. Enforcing such limits will divert Permittee attention and resources from watershed-based, monitoring-heavy compliance programs, as will be discussed in greater detail below.

In essence, under the Ninth Circuit's interpretation of the current RWL language, the District, and potentially every other MS4 Permittee in the state, is in violation of its Permit any time that an exceedance of a Water Quality Standard is recorded and attributed to a discharge from its MS4. This means that the Regional Water Boards have issued, and continue to adopt permits that include RWL language **which cannot be complied with**. The Clean Water Act, however, does not require Permittees to achieve the impossible. *See, e.g., Hughey v. JMS Development Corp.* (11th Cir. 1996) 78 F.3d 1523, 1530 ("In interpreting the liability provisions of the CWA, we realize that Congress is presumed not to have intended absurd (impossible) results.").

Misperception Number Four: The Current RWL Language is more Protective of Receiving Water Quality.

This statement is not only untrue but maintaining the current RWL language actually **impedes** efforts to protect Receiving Water Quality.

We understand that some stakeholders believe that there should be Numeric Effluent Limitations (NELs) contained in the MS4 Permits for purposes of accountability. In response, we note that many MS4 permits now contain numeric Stormwater and Non-stormwater Action Levels ("SALs" and "NALs") or other numeric targets or goals, the exceedance of which trigger specific compliance responses by the Permittees. It is these action levels (which were advocated by the Blue Ribbon Panel established by the State Board to investigate the appropriateness of NELs in MS4 permits) which provide such "numeric" accountability. This is in addition to the numerous other compliance documentation and reporting provisions required of MS4 Permittees that also provide measures of accountability.

More importantly, the current RWL language as interpreted by the Ninth Circuit actually impedes efforts by municipalities to protect water quality. First, by requiring immediate compliance, the language undermines efforts to bring Water Quality Standard-impaired waterbodies into compliance through the Total Maximum Daily Load ("TMDL") program. TMDLs are designed with the recognition that, due to the complexity of the issues causing the waterbody to be impaired in the first place, meeting these requirements cannot be achieved immediately. Therefore, TMDL compliance plans include timelines to achieve such compliance over periods of years and sometimes decades.

Second, most MS4 permits have begun incorporating sophisticated watershed management plans, which prioritize pollutants by waterbody and attempt, through aggressive monitoring and source identification efforts, to identify and address the sources of those prioritized pollutants. Municipalities subject to strict RWL language will have no ability to prioritize pollutants, since they must address any pollutant that exceeds a Water Quality Standard, irrespective of the relative impact that that discharge may have had upon the environment or beneficial uses. Moreover, these watershed management plan approaches employ cooperative monitoring and other watershed-based approaches. Permittees faced with potential liability for any exceedance of Water Quality Standards in Receiving Waters that may be caused or contributed to by discharges of their MS4s, will not likely volunteer to cooperate on any watershed-based approach, if cooperation could subject them to additional unnecessary liability.

Third, in a citizen suit brought under the Clean Water Act, a federal judge is free to impose any appropriate injunctive relief to enforce a permit (33 U.S.C. § 1365(a)). Thus, for example, a court could ignore the provisions of a MS4 permit in ordering municipal defendants to address Water Quality Standard exceedances in Receiving Water. This means that the thousands of people-hours invested in the Permit's development, implementation and oversight by municipalities, the Regional Water Boards and other stakeholders would be wasted. In essence, under the Ninth Circuit's reading of the RWL language, all other language in an MS4 permit appears to be superfluous, since the RWL language would control all compliance efforts. This result, of course, is not required by plain language of the Clean Water Act.

Fourth, if a municipality is in unavoidable and automatic non-compliance with the requirements of its MS4 Permit, it will be unable to justify budgeting for water quality management programs and BMPs otherwise required by the Permit as the municipality will simply receive no benefit from making compliance investments. To gain public support for stormwater programs, a municipality must demonstrate to its residents that such investments will constitute compliance with the Permit.

Discussion of Alternatives

The State Board staff's Issue Paper sets forth five alternatives for consideration. Alternative 1, no change in the current RWL language, is completely unacceptable to the District (and, we believe, to other municipalities across the state) because it fails to address the "guaranteed non-compliance" problem of the current language.

Alternative 2, which proposes to maintain the language that puts the MS4 Permittees in a situation of unavoidable and potentially "guaranteed" non-compliance, but would add greater specification as to how the iterative process might be carried out, is also unacceptable as the MS4 Permittees will still have no viable means to ensure their compliance with the RWL language. While the District does not object in principle to RWL language that spells out clearly, and in achievable terms, what is required of MS4 Permittees when exceedances are recorded, such a change alone does not address the fundamental issues identified in this letter.

Alternative 3, which proposes to provide an iterative process for compliance with the RWL only for pollutants being addressed by dischargers in compliance with an approved TMDL, is better than the first two alternatives, but is still entirely insufficient. By failing to provide a viable means for compliance with the RWL language for non-TMDL pollutants, this alternative language would force Permittees into unavoidable non-compliance, and require them to redirect their efforts and resources away from the TMDL activities, to those other pollutants, due to the strict liability attached to those exceedances. This would be a poor policy choice, as pollutants that are not subject to a TMDL may have significantly less, or even no impact on beneficial uses in the Receiving Waters, as noted in the CASQA comment letter.

Alternative 4, which excludes dry weather discharges from the iterative process to comply with the RWL, is unacceptable for the reasons previously set forth regarding an MS4 Permittees inability to truly "prevent" or "control" accidental or illegal dry weather discharges.

Alternative 5, which provides viable means for compliance with the RWL, for all types of MS4 discharges, is the only viable solution among the alternatives presented by State Board staff. In an era of limited budgets, the only and best way to make progress toward improving the quality our Receiving Waters, is to provide MS4 Permittees the ability to prioritize their efforts, as required in the Watershed Management Plan provisions contained in the most recent MS4 Permits, including the Los Angeles County Permit and the proposed Regional Permit for the San Diego Regional Water Board. As previously discussed, such prioritization cannot occur in the context of strict liability for the exceedance of Water Quality Standards in the Receiving Waters. For all of the reasons set forth in this letter, no other alternative makes policy sense or is congruent with the Maximum Extent Practicable standard in the Clean Water Act.

The District would add that Alternative 5 should additionally incorporate the concept of achieving RWL compliance through watershed management plans, and requests the Board to direct staff to work with stakeholders to ensure that any revised RWL language does not force intermittent or minor exceedances of Water Quality Standards to become de-facto higher priorities than those set by the watershed stakeholders.

In summary, the District supports CASQA, the California State Association of Counties and other municipal stakeholders in advocating for a fully iterative and viable approach to compliance with RWL language in both wet and dry weather conditions. Only when such an approach is in place and endorsed by the State Board will Permittees, including the District, feel confident that they can focus

fully on efforts to address pollutants in discharges into and from their MS4s, and not on preparing for costly and pointless litigation.

The District therefore, respectfully requests the State Board direct its staff to commence development of new language providing for an enforceable, iterative and viable process for MS4 Permittees to comply with the RWL language included in MS4 permits.

We wish to thank you and State Board staff for your consideration of these comments and any further comments, written or oral, that the District may make on these important issues.

Very truly yours,

Steve Thomas

for WARREN D. WILLIAMS
General Manager-Chief Engineer

CP:cw
P8/150189

EXHIBIT D

FILED
JAN - 3 2013
CLERK, U.S. DISTRICT COURT
ALEXANDRIA, VIRGINIA

IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF VIRGINIA
Alexandria Division

VIRGINIA DEPARTMENT OF TRANSPORTATION, ET AL, Plaintiffs, -v- UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, ET AL, Defendants.	Civil Action No. 1:12-CV-775

Memorandum Opinion

Before the Court is the Plaintiffs' motion for judgment on the pleadings under Federal Rule of Civil Procedure 12(c). The Defendants opposed the motion, and the Plaintiffs replied. The Court heard oral arguments on December 14, 2012 and now issues this memorandum opinion and accompanying order granting the Plaintiffs' motion.

Background

The Clean Water Act, 33 U.S.C. § 1251 et seq., establishes the basic structure for regulating discharge of pollutants into the waters of the United States, and provides certain mechanisms to improve and maintain the quality of surface waters.

One such mechanism is the requirement that states identify "designated uses" for each body of water within their borders, as well as "water quality criteria" sufficient to support those uses. 33 U.S.C. § 1313(c)(2)(A). The Environmental Protection Agency ("EPA") evaluates the uses and criteria developed by the states, and either approves them or else proposes and

promulgates its own set of standards. § 1313(c)(3).

Once the standards are in place, each state is required to maintain a list—also subject to approval or modification by EPA—of its waterbodies that are "impaired" because they do not meet their respective water quality criteria. 33 U.S.C. § 1313(d)(1)(A). For each waterbody on the impaired list, the state is required to establish a set of total maximum daily loads ("TMDLs") sufficient to bring the body back into compliance with its water quality criteria. § 1313(d)(1)(C). Each TMDL establishes the maximum amount of a pollutant that may be added to the waterbody daily from all sources (runoff, point sources, etc.). EPA is required to publish a list of pollutants suitable for maximum daily load measurement, § 1314(a)(2)(D), and it has determined that *all* pollutants are suitable for TMDLs, *see* Total Maximum Daily Loads Under Clean Water Act, 43 Fed. Reg. 60,662. Therefore, any pollutant that falls within the relatively broad definition of "pollutant" set forth in § 1362(6) may be regulated via TMDL. EPA can approve or modify as it sees fit TMDLs proposed by the states. § 1313(d)(2).

Here the state in question is Virginia, and the waterbody is a 25-mile long tributary of the Potomac River, located in Fairfax County, called Accotink Creek. The creek has been the subject of litigation in the past that is not relevant to this matter except the result: EPA was required to set TMDLs for Accotink Creek once Virginia failed to do so by a certain date. Specifically, the creek had been identified as having "benthic impairments," which is to say the community of organisms that live on or near the bottom of the creek were not as numerous or healthy as they should be. EPA was to set appropriate TMDLs to improve the health of the benthic community in Accotink Creek.

On April 18, 2011, EPA established a TMDL for Accotink Creek which limited the flow rate of stormwater into Accotink Creek to 681.8 ft^3/acre-day. The TMDL was designed to

regulate the amount of sediment in the Accotink, because EPA believed sediment was a primary cause of the benthic impairment. Both parties agree that sediment is a pollutant, and that stormwater is not. EPA refers to stormwater flow rate as a "surrogate" for sediment.

The Plaintiffs are now challenging the TMDL on multiple grounds, but presently before the Court is a single issue: Does the Clean Water Act authorize the EPA to regulate the level of a pollutant in Accotink Creek by establishing a TMDL for the flow of a nonpollutant into the creek?

Analysis

I. Standard of Review

Count I of the complaint, at issue here, is brought under the Administrative Procedures Act. *See* Comp. ¶ 169. The APA "confines judicial review of executive branch decisions to the administrative record of proceedings before the pertinent agency." *Shipbuilders Council of Am. V. U.S. Dept. of Homeland Sec.*, 770 F. Supp. 2d 793, 802 (E.D. Va. 2011). As such, the district court "sits as an appellate tribunal," and APA claims can be resolved equally well in the context of Rule 12 or Rule 56. *Univ. Med. Ctr. Of S. Nev. V. Shalala*, 173 F.3d 438, 441 n. 3 (D.C. Cir. 1999).

Because Count I presents a question of statutory interpretation, the Court reviews EPA's decision using the two-step analysis set forth in *Chevron, U.S.A., Inc. v. NRDC, Inc.*, 467 U.S. 837 (1984). For a given question of statutory interpretation, the first step under *Chevron* is to determine whether Congress addressed the "precise question at issue." 467 U.S. at 842. "If the intent of Congress is clear, that is the end of the matter . . . ." *Id.* If the Court cannot find that Congress has squarely addressed the question, the Court must move to Chevron's second step. In

the second step of statutory construction under *Chevron*, the Court must determine whether the agency's interpretation of the statute is "permissible." *Id.* at 843. The agency's construction is permissible if it is reasonable, but it need not be what the Court considers the *best* or *most reasonable* construction. *See id.* at 845. The Court is not to simply impose its own construction on the statute, but instead it gives deference to any reasonable statutory construction by the agency. *Id.* at 843.

II. Chevron Step One

Whether statutory ambiguity exists so that the issue cannot be settled at *Chevron's* first step is for the Court to decide, and the Court "owe[s] the agency no deference on the existence of ambiguity." *Am. Bar Ass'n v. FTC*, 430 F.3d 457, 468 (D.C. Cir. 2005). The Court begins the inquiry by "employing traditional tools of statutory construction." *Chevron*, 467 U.S. at 843 n.9. As always, the analysis begins with the text of the statute. *Nat'l Elec. Mfrs. Ass'n v. U.S. Dept'l of Energy*, 654 F.3d 496, 504 (4th Cir. 2011).

The text of the statute that requires states to establish their own TMDLs, 33 U.S.C. § 1313(d)(1)(C), is:

> Each State shall establish for the waters identified in paragraph (1)(A) of this subsection, and in accordance with the priority ranking, **the total maximum daily load, for those pollutants which the Administrator identifies** under section 1314(a)(2) of this title as suitable for such calculation. Such load shall be established at a level necessary to implement the applicable water quality standards with seasonal variations and a margin of safety which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality. (emphasis added)

The next subsection, § 1313(d)(2), grants EPA the authority to set TMDLs when the state

has not done so adequately. "Pollutant" is a statutorily defined term. 33 U.S.C. § 1362(6).

The Court sees no ambiguity in the wording of this statute. EPA is charged with establishing TMDLs for the appropriate pollutants; that does not give them authority to regulate nonpollutants. The parties agree that sediment is a pollutant under 33 U.S.C. § 1362(6), and stormwater is not. Then how does EPA claim jurisdiction over setting TMDLs for stormwater?

EPA frames the stormwater TMDL as a surrogate. EPA's research apparently indicates that the "[sediment] load in Accotink Creek is a function of the amount of stormwater runoff generated within the watershed." Def. Opp. at 8. And EPA believes that framing the TMDL in terms of stormwater flow rate is superior to simply expressing it in terms of maximum sediment load.

The DC Circuit has considered and rejected a similar attempt by EPA to take liberties with the way Congress intended it to express its TMDLs. In *Friends of the Earth, Inc. v. Env. Protection Agency*, EPA had promulgated TMDLs for the Anacostia River that expressed the maximum load of certain pollutants in terms of annual and seasonal amounts. 446 F.3d 140, 143 (D.C. Cir. 2006). The court found that expressing a TMDL in terms of annual or seasonal maximums was not allowed, because the statute granted authority only for daily loads. *Id.* at 148. The court reached its conclusion even though EPA apparently made a strong argument that expressing TMDLs in terms of annual or seasonal loads was an effective and reasonable approach. *See id.* Presumably a daily load could have been derived by simply dividing the annual load by 365, yet the court still required expression in the terms dictated by Congress.

Here too, EPA hopes to express a TMDL in terms other than those contemplated by the statute, arguing that such an expression is the most effective method. But, as *Friends of the Earth* illustrates, EPA may not regulate something over which it has no statutorily granted power—

annual loads or nonpollutants—as a proxy for something over which it *is* granted power—daily loads or pollutants.

EPA's argument that its surrogate approach should be allowed because the statute does not specifically forbid it fails. EPA is not explicitly forbidden from establishing total maximum *annual* loads any more than they are explicitly barred from establishing TMDLs for nonpollutants. The question is whether the statute grants the agency the authority it is claiming, not whether the statute explicitly withholds that authority. And in this case, as in *Friends of the Earth*, the statute simply does not grant EPA the authority it claims.

The dicta in *Weyerhaeuser Co. v. Costle* is not as helpful to EPA's case as it would like. 590 F.2d 1011, 1022 n.6 (D.C. Cir. 1978). It is true that the court said in a footnote "[i]t is well recognized that EPA can use pollution parameters that are not harmful in themselves, but act as indicators of harm." *Id.* But in that case, the non-harmful pollution parameters the EPA sought to regulate were components of the effluent commonly discharged from paper mills, *id.* at 1022, making them effluents themselves. And power to regulate effluents is expressly granted to the EPA in the relevant statutory section. *See* 33 U.S.C. § 1314(b).

EPA would like to create the impression that Congress has given it loose rein to determine exactly what it could and could not regulate. On page 16 of its opposition to this motion, EPA points out that "Congress authorized EPA to determine which pollutants were suitable for TMDL calculation and measurement." (Internal quotes removed). While this may be true, EPA glosses over the fact that 33 U.S.C. § 1314(a)(2)(D) only gives EPA the power to regulate pollutants as that term is defined—by Congress—elsewhere in the statute. And, as discussed above, sediment is a pollutant for these purposes, but stormwater is not.

In a similar vein, EPA regulations which imply that the agency has discretion to set the

TMDL as it sees fit do not bear on the question now before the Court. EPA has promulgated a regulation allowing TMDLs to be "expressed in terms of either mass per time, toxicity, or other appropriate measure," 40 C.F.R. § 130.2(i), and another that allows TMDLs to be expressed as a "property of pollution," 50 Fed. Reg. 1774, 1776 (Jan. 11, 1985). But, EPA citing these regulations to demonstrate that the surrogate TMDL approach is permissible is mere bootstrapping. To the extent the regulations allow EPA to set TMDLs for nonpollutants, they exceed the statutory authority of EPA.

The plain language of the statute trumps all, but legislative history also supports Plaintiffs' argument. Congress's intent to limit EPA's discretion in this context is evidenced by the committee record cited by Plaintiffs, which has also been used by the Ninth Circuit, in which Senator Randolph, Chairman of the Senate committee that amended the act in 1972, explained, "We have written into law precise standards and definite guidelines on how the environment should be protected. We have done more than just provide broad directives [for] administrators to follow." Pl. Mot. 7, *citing Nw. Envtl. Def. Ctr. v. Brown*, 640 F.3d 1063, 1072 (9th Cir. 2011). Congress created a statutory scheme that included a precise definition of the word "pollutant," and then gave EPA authority to set TMDLs for those pollutants. Senator Randolph's comments strongly imply that Congress did not intend anything more or less than what is written in the statute.

The Court considers the language of 33 U.S.C. § 1313(d)(1)(C) to be unambiguous. Congress has spoken directly on the question at issue, and its answer is that EPA's authority does not extend to establishing TMDLs for nonpollutants as surrogates for pollutants. The legislative history of the CWA is consistent with this reading. Therefore, this Court finds EPA's interpretation of § 1313 and the related provisions to be impermissibly broad based on analysis

under the first step of *Chevron* analysis.

III. Chevron Step Two

Because the Court considers Congress's intent to be clear and unambiguously expressed by the language of the statute, it need not move to the second step of *Chevron* analysis. But the Court notes that there is substantial reason to believe EPA's motives go beyond "permissible gap-filling."

Page 9 of EPA's opposition says, "stormwater flow rates as a surrogate would more effectively address the process by which sediment impairs aquatic life in Accontink Creek." If the sediment levels in Accotink Creek have become dangerously high, what better way to address the problem than by limiting the amount of sediment permitted in the creek? If sediment level is truly "a function of" the amount of stormwater runoff, as EPA claims, then the TMDL could just as easily be expressed in terms of sediment load.

In fact, the Board of Supervisors of Fairfax County argued at the December 14th hearing (without objection from EPA) that EPA has approved 3,700 TMDLs for sediment nationwide, and in Virginia has addressed 111 benthic impairments with TMDLs. None of them regulated the flow rate of stormwater. By comparison, EPA has tried out its novel approach of regulating sediment via flow in only four instances nationwide, and all four attempts were challenged in court. One has settled, the other three are still pending.

The Court suspects that the decision to regulate stormwater flow as a surrogate for sediment load would not constitute a permissible construction of § 1313(d)(1)(C), even given the deference due at *Chevron's* second step. This is especially likely because EPA is attempting to increase the extent of its own authority via flow TMDLs, which courts must examine carefully.

See Brown & Williamson Tobacco Corp. v. Food & Drug Admin., 153 F.3d 155, 161-62 (4th Cir. 1998). EPA's attempt to set TMDLs for nonpollutants probably goes beyond "permissible gap-filling" and is instead an impermissible construction of the statute.

Conclusion

The language of § 1313(d)(1)(C) is clear. EPA is authorized to set TMDLs to regulate pollutants, and pollutants are carefully defined. Stormwater runoff is not a pollutant, so EPA is not authorized to regulate it via TMDL. Claiming that the stormwater maximum load is a surrogate for sediment, which is a pollutant and therefore regulable, does not bring stormwater within the ambit of EPA's TMDL authority. Whatever reason EPA has for thinking that a stormwater flow rate TMDL is a better way of limiting sediment load than a sediment load TMDL, EPA cannot be allowed to exceed its clearly limited statutory authority. For these reasons, the Plaintiffs' motion for Rule 12(c) judgment on the pleadings on Count I of their complaint is granted.

January 3, 2013
Alexandria, Virginia

/s/ LOG
Liam O'Grady
United States District Judge

FILED
JAN - 3 2013
CLERK, U.S. DISTRICT COURT
ALEXANDRIA, VIRGINIA

IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF VIRGINIA
Alexandria Division

VIRGINIA DEPARTMENT OF TRANSPORTATION, ET AL, Plaintiffs, -v- UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, ET AL, Defendants.	Civil Action No. 1:12-CV-775

Order

In accordance with the memorandum opinion that accompanies this order, it is now **ORDERED**:

1. Plaintiffs' motion (Dkt. No. 29) for judgment on the pleadings as to Count I of the complaint is **GRANTED**.
2. The clerk shall enter judgment in favor of the Plaintiffs.
3. The Accotink Creek TMDL is remanded to EPA for reconsideration consistent with this order.

January 3, 2013
Alexandria, Virginia

/s/
Liam O'Grady
United States District Judge

ADMINISTRATIVE DRAFT

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

TENTATIVE
ORDER NO. R9-2012-0011
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The San Diego County Copermittees in Table 1a are subject to waste discharge requirements set forth in this Order.

Table 1a. San Diego County Copermittees

City of Carlsbad	City of Oceanside
City of Chula Vista	City of Poway
City of Coronado	City of San Diego
City of Del Mar	City of San Marcos
City of El Cajon	City of Santee
City of Encinitas	City of Solana Beach
City of Escondido	City of Vista
City of Imperial Beach	County of San Diego
City of La Mesa	San Diego County Regional Airport Authority
City of Lemon Grove	Unified Port District of San Diego
City of National City	

The Orange County Copermittees in Table 1b are subject to waste discharge requirements set forth in this Order upon expiration of Order No. R9-2009-0002, NPDES No. CAS0108740 on December 16, 2014.

Table 1b. Orange County Copermittees

City of Aliso Viejo	City of Ranch Santa Margarita
City of Dana Point	City of San Clemente
City of Laguna Beach	City of San Juan Capistrano
City of Laguna Hills	City of Laguna Woods
City of Laguna Niguel	County of Orange
City of Lake Forest	Orange County Flood Control District
City of Mission Viejo	

The Riverside County Copermittees in Table 1c are subject to waste discharge requirements set forth in this Order upon expiration of Order No. R9-2010-0016, NPDES No. CAS0108766 on November 10, 2015.

Table 1c. Riverside County Copermittees

City of Murrieta	County of Riverside
City of Temecula	Riverside County Flood Control and Water Conservation District
City of Wildomar	

The Orange County Copermittees and Riverside County Copermittees may enroll under this Order at a date earlier than the expiration date of their current Orders subject to the conditions described in Provision F.6 of this Order and the Copermittees in the respective county receive a Notice of Enrollment (NOE) from the San Diego Water Board.

The term Copermittee in this Order refers to any San Diego County, Orange County, or Riverside County Copermittee enrolled under this Order, unless specified otherwise.

This Order provides permit coverage for the Copermittee discharges described in Table 2.

Table 2. Discharge Locations and Receiving Waters

Discharge Points	Locations throughout San Diego Region
Discharge Description	Municipal Separate Storm Sewer System (MS4) Discharges
Receiving Waters	Inland Surface Waters, Enclosed Bays and Estuaries, and Coastal Ocean Waters of the San Diego Region

Table 3. Administrative Information

This Order was adopted by the San Diego Water Board on:	**Month Day, 2012**
This Order will become effective on:	**Month Day, 2012**
This Order will expire on:	**Month Day, 2017**
The Copermittees must file a Report of Waste Discharge (ROWD) in accordance with Title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than 180 days in advance of the Order expiration date.	

I, David W. Gibson, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on Month Day, 2012.

TENTATIVE

David W. Gibson
Executive Officer

ADMINISTRATIVE DRAFT

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I. FINDINGS

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), finds that:

JURISDICTION

1. **MS4 Ownership or Operation.** Each of the Copermittees owns or operates an MS4, through which it discharges storm water and non-storm water into waters of the U.S. within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the U.S.

2. **Legal and Regulatory Authority.** This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]) adopted by the United States Environmental Protection Agency (USEPA), and chapter 5.5, division 7 of the California Water Code (CWC) (commencing with section 13370). This Order serves as an NPDES permit for discharges from MS4s to surface waters. This Order also serves as waste discharge requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

3. **CWA Technology Based Standards and Prohibitions.** Pursuant to CWA section 402(p)(3)(B), NPDES permits for storm water discharges from MS4s must include requirements to effectively prohibit non-storm water discharges into MS4s, and require controls to reduce the discharge of pollutants in storm water to the maximum extent practicable (MEP).

4. **CWA NPDES Permit Conditions.** Pursuant to CWA section 402(a)(2), NPDES permits must prescribe conditions to assure compliance with CWA section 402(p)(3)(B) and 40 CFR 122.26(d)(2)(iv)(B). This Order prescribes conditions to assure compliance with the CWA requirements for owners and operators of MS4s to effectively prohibit non-storm water discharges in to the MS4s, and require controls to reduce the discharge of pollutants in storm water from the MS4s to the MEP.

5. **CWA and CWC Monitoring Requirements.** Pursuant to 40 CFR 122.48, NPDES permits must specify requirements for recording and reporting monitoring results. In addition, CWC sections 13267 and 13383 authorize the San Diego Water Board to require technical and monitoring reports. This Order establishes monitoring and reporting requirements to implement federal and State requirements.

6. **Total Maximum Daily Loads.** CWA section 303(d)(1)(A) requires that "[e]ach state shall identify those waters within its boundaries for which the effluent limitations…are not stringent enough to implement any water quality standard applicable to such waters." The CWA also requires states to establish a priority ranking of impaired water bodies known as Water Quality Limited Segments and to establish Total Maximum Daily Loads (TMDLs) for such waters. This priority list of impaired water bodies is called the Clean Water Act Section 303(d) List of Water Quality Limited Segments, commonly referred to as the 303(d) List. The CWA requires the 303(d) List to be updated every two years. Requirements of this Order implement the TMDLs adopted by the San Diego Water Board and approved by USEPA.

7. **Non-Storm Water Discharges.** Pursuant to CWA section 402(p)(3)(B)(ii), this Order requires each Copermittee to effectively prohibit discharges of non-storm water into its MS4. Nevertheless, non-storm water discharges into and from the MS4s continue to be reported to the San Diego Water Board by the Copermittees and other persons. Monitoring conducted by the Copermittees, as well as the 303(d) List, have identified dry weather, non-storm water discharges from the MS4s as a source of pollutants causing or contributing to receiving water quality impairments in the San Diego Region. The federal regulations [40 CFR 122.26(d)(2)(iv)(B)] require the Copermittees to have a program to prevent all types of non-storm water discharges, or illicit discharges, from entering the MS4. The federal regulations, however, allow for specific categories of non-storm water discharges or flows to be addressed as illicit discharges only where such discharges are identified as sources of pollutants to waters of the U.S.

8. **In-Stream Treatment Systems.** Pursuant to federal regulations [40 CFR 131.10(a)], in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S. Authorizing the construction of a runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to accepting waste assimilation as an appropriate use for that water body. Runoff treatment must occur prior to the discharge of runoff into receiving waters. Treatment control best management practices (BMPs) must not be constructed in waters of the U.S. or state. Construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body.

DISCHARGE CHARACTERISTICS AND RUNOFF MANAGEMENT

9. **Point Source Discharges of Pollutants.** Discharges from the MS4s contain waste, as defined in the CWC, and pollutants that adversely affect the quality of the waters of the state. A discharge from an MS4 is a "discharge of pollutants from a point source" into waters of the U.S. as defined in the CWA. Storm water and non-storm water discharges from the MS4s contain pollutants that cause or threaten to cause a violation of surface water quality standards, as outlined in the Basin Plan. Storm water and non-storm water discharges from the MS4s are subject to the conditions and requirements established in the Basin Plan for point source discharges.

10. **Potential Beneficial Use Impairment.** The discharge of pollutants and/or increased flows from MS4s may cause or threaten to cause the concentration of pollutants to exceed applicable receiving water quality objectives and impair or threaten to impair designated beneficial uses resulting in a condition of pollution, contamination, or nuisance.

11. **Pollutants Generated by Land Development.** Land development has created and continues to create new sources of non-storm water discharges and pollutants in storm water discharges as human population density increases. This brings higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash. Pollutants from these sources are dumped or washed off the surface by non-storm water or storm water flows into and from the MS4s. When development converts natural vegetated pervious ground cover to impervious surfaces such as paved highways, streets, rooftops, and parking lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving a developed area contains greater pollutant loads and is significantly greater in runoff volume, velocity, and peak flow rate than pre-development runoff from the same area.

12. **Runoff Discharges to Receiving Waters.** The MS4s discharge runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within the eleven hydrologic units comprising the San Diego Region. Numerous receiving water bodies and water body segments have been designated as impaired by the San Diego Water Board pursuant to CWA section 303(d).

13. **Pollutants in Runoff.** The most common pollutants in runoff discharged from the MS4s include total suspended solids, sediment, pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., cadmium, copper, lead, and zinc), petroleum products and polynuclear aromatic hydrocarbons, synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus), oxygen-demanding substances (decaying vegetation, animal waste), detergents, and trash.

14. **Human Health and Aquatic Life Impairment.** Pollutants in runoff discharges from the MS4s can threaten and adversely affect human health and aquatic organisms. Adverse responses of organisms to chemicals or physical agents in runoff range from physiological responses such as impaired reproduction or growth anomalies to mortality. Increased volume, velocity, rate, and duration of storm water runoff greatly accelerate the erosion of downstream natural channels. This alters stream channels and habitats and can adversely affect aquatic and terrestrial organisms.

15. **Water Quality Effects.** The Copermittees' water quality monitoring data submitted to date documents persistent exceedances of Basin Plan water quality objectives for runoff-related pollutants at various watershed monitoring stations. Persistent toxicity has also been observed at several watershed monitoring stations. In addition, bioassessment data indicate that the majority of the monitored receiving waters have

Poor to Very Poor Index of Biotic Integrity (IBI) ratings. These findings indicate that runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in the San Diego Region. Non-storm water discharges from the MS4s have been shown to contribute significant levels of pollutants and flow in arid, developed Southern California watersheds, and contribute significantly to exceedances of applicable receiving water quality objectives.

16. **Non-Storm Water Discharges.** Non-storm water discharges from the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard from CWA 402(p)(3)(B)(iii), which is explicitly for "Municipal … *Stormwater Discharges* (emphasis added)" from the MS4s. Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s must be effectively prohibited.

17. **Best Management Practices.** Pollutants can be effectively reduced in runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Pollution prevention is the reduction or elimination of pollutant generation at its source and is the best "first line of defense". Source control BMPs (both structural and non-structural) minimize the contact between pollutants and runoff, therefore keeping pollutants onsite and out of receiving waters. Treatment control BMPs remove pollutants that have been mobilized by storm water or non-storm water flows.

18. **BMP Implementation.** Runoff needs to be addressed during the three major phases of development (planning, construction, and use) in order to reduce the discharge of storm water pollutants to the MEP, effectively prohibit non-storm water discharges, and protect receiving waters. Development which is not guided by water quality planning policies and principles can result in increased pollutant load discharges, flow rates, and flow durations which can negatively affect receiving water beneficial uses. Construction sites without adequate BMP implementation result in sediment runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. Existing development can generate substantial pollutant loads which are discharged in runoff to receiving waters.

19. **Long Term Planning and Implementation.** Federal regulations require municipal storm water permits to expire 5 years from adoption, after which the permit must be renewed and reissued. The San Diego Water Board recognizes that the degradation of water quality and impacts to beneficial uses of the waters in the San Diego Region occurred over several decades. The San Diego Water Board further recognizes that a decade or more may be necessary to realize demonstrable improvement to the quality of waters in the Region. This Order includes a long term planning and implementation approach that will require more than a single permit term to complete.

WATER QUALITY STANDARDS

20. **Basin Plan.** The San Diego Water Board adopted a Water Quality Control Plan for the San Diego Basin (Basin Plan) on September 8, 1994 that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for receiving waters addressed through the plan. The Basin Plan was subsequently approved by the State Water Resources Control Board (State Water Board) on December 13, 1994. Subsequent revisions to the Basin Plan have also been adopted by the San Diego Water Board and approved by the State Water Board. Requirements of this Order implement the Basin Plan.

    The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Process Supply (PROC), Industrial Service Supply (IND), Ground Water Recharge (GWR), Contact Water Recreation (REC1), Non-contact Water Recreation (REC2), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Freshwater Replenishment (FRSH), Hydropower Generation (POW), and Preservation of Biological Habitats of Special Significance (BIOL). The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region: Navigation (NAV), Commercial and Sport Fishing (COMM), Estuarine Habitat (EST), Marine Habitat (MAR), Aquaculture (AQUA), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN), and Shellfish Harvesting (SHELL).

21. **Ocean Plan.** The State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, and 2005. The State Water Board adopted the latest amendment on April 21, 2005 and it became effective on February 14, 2006. The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean. Requirements of this Order implement the Ocean Plan.

    The Ocean Plan identifies the following beneficial uses of ocean waters of the state to be protected: Industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture; preservation and enhancement of designated Areas of Special Biological Significance; rare and endangered species; marine habitat; fish spawning and shellfish harvesting

22. **Sediment Quality Control Plan**. On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret

the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

23. **National Toxics Rule and California Toxics Rule.** USEPA adopted the NTR on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the National toxics Rule (NTR) applied in California. On May 18, 2000, USEPA adopted the California Toxics Rule (CTR). The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants

24. **Antidegradation Policy.** This Order is in conformance with the federal Antidegradation Policy described in 40 CFR 131.12, and State Water Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality Waters in California*. Federal regulations at 40 CFR 131.12 require that the State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The San Diego Water Board's Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies.

CONSIDERATIONS UNDER FEDERAL LAW

25. **Coastal Zone Act Reauthorization Amendments.** Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states with approved coastal zone management programs to address non-point pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point pollution: agriculture, silviculture, urban, marinas, and hydromodification. This Order addresses the management measures required for the urban category, with the exception of septic systems. The runoff management programs developed pursuant to this Order fulfill the need for coastal cities to develop a runoff non-point source plan identified in the Non-Point Source Program Strategy and Implementation Plan. The San Diego Water Board addresses septic systems through the administration of other programs.

26. **Endangered Species Act.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 USCA sections 1531 to 1544). This Order requires compliance with receiving water limits, and other requirements to protect the beneficial uses of waters of the State. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

CONSIDERATIONS UNDER STATE LAW

27. **Unfunded Mandates.** This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following:

    a. This Order implements federally mandated requirements under CWA section 402. (33 USC 1342(p)(3)(B).)

    b. The local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental and new dischargers who are issued NPDES permits for storm water and non-storm water discharges.

    c. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order.

    d. The Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC 1311(a)) and in lieu of numeric restrictions on their MS4 discharges (i.e. effluent limitations).

    e. The local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under State law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

    f. The provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards. (33 USC 1313(d).) Once the USEPA or a state develops a TMDL, federal law requires that permits must contain effluent limitations consistent with the assumptions and requirements of any applicable wasteload allocation. (40 CFR 122.44(d)(1)(vii)(B).)

28. **California Environmental Quality Act.** The issuance of WDRs and an NPDES permit for the discharge of runoff from MS4s to waters of the U.S. is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 et seq.) in accordance with CWC section 13389.

STATE WATER BOARD DECISIONS

29. **Compliance with Prohibitions and Limitations.** The receiving water limitation language specified in this Order is consistent with language recommended by the USEPA and established in State Water Board Order WQ-99-05, *Own Motion Review of the Petition of Environmental Health Coalition to Review Waste Discharge Requirements Order No. 96-03, NPDES Permit No. CAS0108740*, adopted by the State Water Board on June 17, 1999. The receiving water limitation language in this Order requires compliance with water quality standards, which for storm water discharges is to be achieved through an iterative approach requiring the

implementation of improved and better-tailored BMPs over time. Implementation of the iterative approach to comply with receiving water limitations based on applicable water quality standards is necessary to ensure that storm water discharges from the MS4 ultimately will not cause or contribute to violations of water quality standards and the creation of conditions of pollution, contamination, or nuisance.

30. **Special Conditions for Areas of Special Biological Significance.** On March 20, 2012, the State Water Board approved Resolution No. 2012-001**X** approving an exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges. The Resolution requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBSs. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject terms and conditions of the Resolution. The Special Protections contained in Attachment B to the Resolution applicable to these discharges are hereby incorporated in this Order as if fully set forth herein.

ADMINISTRATIVE FINDINGS

31. **Executive Officer Delegation of Authority.** The San Diego Water Board by prior resolution has delegated all matters that may legally be delegated to its Executive Officer to act on its behalf pursuant to CWC section 13223. Therefore, the Executive Officer is authorized to act on the San Diego Water Board's behalf on any matter within this Order unless such delegation is unlawful under CWC section 13223 or this Order explicitly states otherwise.

32. **Standard Provisions.** Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR 122.42, are provided in Attachment B to this Order.

33. **Fact Sheet.** The Fact Sheet for this Order contains background information, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of this Order. The Fact Sheet is hereby incorporated into this Order and constitutes part of the Findings of this Order.

34. **Public Notice.** The San Diego Water Board notified the Copermittees, and interested agencies and persons of its intent to prescribe WDRs for MS4 discharges of pollutants to waters of the U.S. and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet.

35. **Public Hearing.** The San Diego Water Board held a public hearing on Month Day, 2012 and heard and considered all comments pertaining to the terms and conditions of this Order. Details of the public hearing are provided in the Fact Sheet.

II. PROVISIONS

THEREFORE, IT IS HEREBY ORDERED that the Copermittees, in order to meet the provisions contained in division 7 of the CWC and regulations adopted thereunder, and the provisions of the CWA and regulations adopted thereunder, must each comply with the following:

A. PROHIBITIONS AND LIMITATIONS

The purpose of this provision is to describe the conditions under which storm water and non-storm water discharges into and from MS4s are prohibited or limited. The goal of this provision is to protect, preserve, enhance, and restore the water quality and designated beneficial uses of waters of the state. This goal will be accomplished through implementation of control measures that effectively prohibit non-storm water discharges into and from the Copermittees' MS4s, and reduce pollutants in storm water discharges from the Copermittees' MS4s to the MEP.

1. Discharge Prohibitions

a. Discharges into and from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the state are prohibited.

b. Non-storm water discharges into and from MS4s are prohibited, unless such discharges are either authorized by a separate NPDES permit, or the discharge is a category of non-storm water discharges or flows that must be addressed pursuant to Provisions E.2.a.(1)-(5) of this Order.

c. Discharges from MS4s are subject to all waste discharge prohibitions in the Basin Plan, included in Attachment A to this Order.

d. Discharges from MS4s to ASBS are prohibited. Storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-001**X** applicable to these discharges, included in Attachment A to this Order.

2. Receiving Water Limitations

a. Discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters, including but not limited to all applicable provisions contained in:

(1) The San Diego Water Board's Basin Plan, including beneficial uses, water quality objectives, and implementation plans;

(2) State Water Board plans for water quality control including the following:

(a) Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries (Thermal Plan), and

(b) The Ocean Plan, including beneficial uses, water quality objectives, and implementation plans;

(3) State Water Board policies for water and sediment quality control including the following:

(a) Water Quality Control Policy for the Enclosed Bays and Estuaries of California,

(b) Sediment Quality Control Plan which includes the following narrative objectives:

(i) Pollutants in sediments shall not be present in quantities that, alone or in combination, are toxic to benthic communities, and

(ii) Pollutants shall not be present in sediments at levels that will bioaccumulate in aquatic life to levels that are harmful to human health,

(c) The Statement of Policy with Respect to Maintaining High Quality of Waters in California (State Water Board Resolution No. 68-16).

(4) Priority pollutant criteria promulgated by the USEPA through the following:

(a) National Toxics Rule (NTR)[1] (promulgated on December 22, 1992 and amended on May 4, 1995), and

(b) California Toxics Rule (CTR)[2,3]

b. Discharges from MS4s composed of storm water runoff must not alter natural ocean water quality in an ASBS.

c. Discharges from MS4s must not cause or contribute to the violation of any receiving water limitations expressed as water quality based effluent limitations (WQBELs) required to meet the WLAs established for the TMDLs in Attachment E to this Order, pursuant to the applicable TMDL compliance schedules.

[1] 40 CFR 131.36
[2] 65 Federal Register 31682-31719 (May 18, 2000), adding Section 131.38 to 40 CFR
[3] If a water quality objective and a CTR criterion are in effect for the same priority pollutant, the more stringent of the two applies.

3. Effluent Limitations

a. Pollutants in storm water discharges from MS4s must be reduced to the MEP.[4]

b. Pollutants in discharges from MS4s must be reduced to comply with any effluent limitations expressed as WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order, pursuant to the applicable TMDL compliance schedules.

4. Compliance with Discharge Prohibitions and Receiving Water Limitations

Each Copermittee must comply with the discharge prohibitions and receiving water limitations of this Order through timely implementation of control measures and other actions as specified in Provisions B and E of this Order, including any modifications.

a. If exceedance(s) of water quality standards persist in receiving waters notwithstanding implementation of this Order, the Copermittees must comply with the following procedures:

(1) Upon a determination by either the Copermittees or the San Diego Water Board that discharges from the MS4 are causing or contributing to an exceedance of an applicable water quality standard, the Copermittees must submit the following updates to the Water Quality Improvement Plan required under Provision B as part of the Annual Report required under Provision F.3.b, unless the San Diego Water Board directs an earlier submittal:

(a) The water quality improvement strategies being implemented that are effective and will continue to be implemented;

(b) Additional water quality improvement strategies (i.e. BMPs, retrofitting projects, stream and/or habitat rehabilitation or restoration projects) that will be implemented to reduce or eliminate any pollutants or conditions that are causing or contributing to the exceedance of water quality standards;

(c) Updates to the schedule for implementation of the existing and additional water quality improvement strategies; and

(d) Updates, when necessary, to the schedule for achieving compliance with the discharge prohibitions and receiving water limitations of this Order;

[4] This does not apply to MS4 discharges which receive subsequent treatment to reduce pollutants in storm water discharges to the MEP prior to entering receiving waters (e.g., low flow diversions to the sanitary sewer). Runoff treatment must occur prior to the discharge of runoff into receiving waters per Finding 8.

(2) The San Diego Water Board may require the incorporation of additional modifications to the Water Quality Improvement Plan required under Provision B. The applicable Copermittees must submit any modifications to the update to the Water Quality Improvement Plan within 30 days of notification that additional modifications are required by the San Diego Water Board, or as otherwise directed;

(3) Within 30 days of the San Diego Water Board determination that the update to the Water Quality Improvement Plan meets the requirements of this Order, the Copermittees must revise the jurisdictional runoff management program documents to incorporate the updated water quality improvement strategies that have been and will be implemented, the implementation schedule, and any additional monitoring required; and

(4) The Copermittees must implement the revised jurisdictional runoff management programs and updated jurisdictional monitoring and assessment component of the Water Quality Improvement Plan.

b. The Copermittees must repeat the procedure set forth above to comply with discharge prohibitions and receiving water limitations of this Order for continuing or recurring exceedances of the same water quality standard(s) following implementation of scheduled actions unless directed to do otherwise by the San Diego Water Board.

c. Nothing in Provisions A.4.a and A.4.b prevents the San Diego Water Board from enforcing any provision of this Order while the applicable Copermittees prepare and implement the above update to the Water Quality Improvement Plan and jurisdictional runoff management programs.

B. WATER QUALITY IMPROVEMENT PLANS

The purpose of this provision is to develop Water Quality Improvement Plans that guide the Copermittees' jurisdictional runoff management program implementation efforts towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plan is to attain the reasonable protection, preservation, enhancement, and restoration of water quality and designated beneficial uses of waters of the state. This goal will be accomplished through an adaptive planning and management process that identifies the highest water quality priorities within a watershed and implements strategies, control measures, and BMPs to achieve improvements in the quality of discharges from the MS4s and receiving waters.

The Copermittees must develop Water Quality Improvement Plans that 1) prioritize water quality issues resulting from discharges to and from the MS4s within each Watershed Management Area, 2) identify pollutant sources and other stressors associated with those water quality priorities, 3) define numeric targets and schedules to achieve improvement of water quality priorities, 4) describe water quality improvement strategies to achieve numeric targets, and 5) execute a coordinated monitoring and assessment program to determine progress towards achieving improved water quality.

The Copermittees must implement all the requirements of Provision B no later than 12 months after the adoption of this Order, or in accordance with Provision F.5.a of this Order.

1. Watershed Management Areas

The Copermittees must develop Water Quality Improvement Plans for each of the Watershed Management Areas in Table B-1. A total of nine Water Quality Improvement Plans must be developed for the San Diego Region.

Table B-1. Watershed Management Areas

Watershed Management Area	Hydrologic Unit(s)	Major Surface Water Bodies	Responsible Copermittees
South Orange County	San Juan (901.00)	Aliso Creek San Juan Creek San Mateo Creek Pacific Ocean	- City of Aliso Viejo[1] - City of Dana Point[1] - City of Laguna Beach[1] - City of Laguna Hills[1] - City of Laguna Niguel[1] - City of Laguna Woods[1] - City of Lake Forest[1] - City of Mission Viejo[1] - City of Rancho Santa Margarita[1] - City of San Clemente[1] - City of San Juan Capistrano[1] - County of Orange[1] - Orange County Flood Control District[1]

Table B-1. Watershed Management Areas

Watershed Management Area	Hydrologic Unit(s)	Major Surface Water Bodies	Responsible Copermittees
Santa Margarita River	Santa Margarita (902.00)	Murrieta Creek Temecula Creek Santa Margarita River Santa Margarita Lagoon Pacific Ocean	- City of Murrieta[2] - City of Temecula[2] - City of Wildomar[2] - County of Riverside[2] - County of San Diego[3] - Riverside County Flood Control and Water Conservation District[2]
San Luis Rey River	San Luis Rey (903.00)	San Luis Rey River San Luis Rey Estuary Pacific Ocean	- City of Escondido - City of Oceanside - City of Vista - County of San Diego
Carlsbad	Carlsbad (904.00)	Buena Vista Lagoon Agua Hedionda Lagoon Batiquitos Lagoon San Elijo Lagoon Pacific Ocean	- City of Carlsbad - City of Encinitas - City of Escondido - City of Oceanside - City of San Marcos - City of Solana Beach - City of Vista - County of San Diego
San Dieguito River	San Dieguito (905.00)	San Dieguito River San Dieguito Lagoon Pacific Ocean	- City of Del Mar - City of Escondido - City of Poway - City of San Diego - City of Solana Beach - County of San Diego
Penasquitos	Penasquitos (906.00)	Los Penasquitos Lagoon Mission Bay Pacific Ocean	- City of Del Mar - City of Poway - City of San Diego - County of San Diego
San Diego River	San Diego (907.00)	San Diego River Pacific Ocean	- City of El Cajon - City of La Mesa - City of Poway - City of San Diego - City of Santee - County of San Diego
San Diego Bay	Pueblo San Diego (908.00) Sweetwater (909.00) Otay (910.00)	Sweetwater River Otay River San Diego Bay Pacific Ocean	- City of Chula Vista - City of Coronado - City of Imperial Beach - City of La Mesa - City of Lemon Grove - City of National City - City of San Diego - County of San Diego - San Diego County Regional Airport Authority - Unified Port of San Diego
Tijuana River	Tijuana (911.00)	Tijuana River Tijuana Estuary Pacific Ocean	- City of Imperial Beach - City of San Diego - County of San Diego

Notes:
1. The Orange County Copermittees will be enrolled under this Order upon expiration of Order No. R9-2009-0002, or earlier if the Orange County Copermittees meet the conditions in Provision F.6.
2. The Riverside County Copermittees will be enrolled under this Order upon expiration of Order No. R9-2010-0016, or earlier if the Riverside County Copermittees meet the conditions in Provision F.6.
3. The County of San Diego will not be required to implement the requirements of Provision B for the Santa Margarita River Watershed Management Area until the Riverside County Copermittees are enrolled under this Order. Until then, the County of San Diego is responsible for implementing and complying with the requirements of Provisions D.1, D.4.a.(1)&(3), E, F.2.a-b, F.3.b, and F.4 for the areas of the Santa Margarita River Watershed Management Area within its jurisdiction.

2. Identification of Water Quality Priorities

The Copermittees must identify the water quality priorities within each Watershed Management Area that will be addressed by the Water Quality Improvement Plan. Where appropriate, Watershed Management Areas may be separated into subwatersheds to focus water quality prioritization and jurisdictional runoff management program implementation efforts by receiving water.

a. Assessment of Receiving Water Conditions

The Copermittees must review pollutant sources, discharges, and receiving water conditions and assess the following, at a minimum, to determine the degree of adverse impacts to receiving water beneficial uses:

(1) Receiving waters listed as impaired on the CWA Section 303(d) List of Water Quality Limited Segments (303(d) List);

(2) TMDLs adopted and under development by the San Diego Water Board;

(3) Receiving waters recognized as sensitive or highly valued by the Copermittees, including estuaries designated under the National Estuary Program under CWA section 320, wetlands defined by the State or U.S. Fish and Wildlife Service's National Wetlands Inventory as wetlands, and receiving waters identified as ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-001**X** (Attachment A);

(4) Water quality standards established in the Basin Plan;

(5) Known historical versus current physical, chemical, and biological water quality conditions;

(6) All available physical, chemical, and biological receiving water monitoring data, including, but not limited to, data describing:

(a) Chemical constituents;

(b) Water quality parameters (i.e. pH, temperature, conductivity, etc.);

(c) Toxicity Identification Evaluations for both receiving water column and sediment;

(d) Trash impacts;

(e) Bioassessments; and

(f) Physical habitat.

(7) Available evidence of erosional impacts in receiving waters due to accelerated flows (i.e. hydromodification); and

(8) Available evidence of adverse impacts to the chemical, physical, and biological integrity of receiving waters.

b. IDENTIFY PRIORITY POLLUTANTS AND RECEIVING WATER CONDITIONS

The Copermittees must use the information gathered in Provision B.2.a. to develop a list of water quality priorities as pollutants and/or receiving water conditions that are the highest threat to water quality or that most adversely affect the physical, chemical, and biological integrity of receiving waters. The Copermittees must identify the highest water quality priorities to be addressed by the Water Quality Improvement Plan.

c. POLLUTANT SOURCE AND/OR STRESSOR IDENTIFICATION

The Copermittees must identify known and suspected storm water and non-storm water pollutant sources and any other stressors causing or contributing to the highest water quality priorities. The identification of known and suspected sources of the highest water quality priorities as identified for Provision B.2.b must consider the following:

(1) Pollutant generating facilities or areas within the Watershed Management Area, including:

(a) Each Copermittee's inventory of construction, municipal, commercial, industrial, and residential facilities, areas, and/or activities,

(b) Publicly owned parks and/or recreational areas,

(c) Open space areas,

(d) All currently operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste, and

(e) Areas not within the Copermittees' jurisdictions (e.g., tribal lands, state lands, federal lands) that may be pollutant sources related to the highest water quality priorities within the Watershed Management Area;

(2) Locations of the Copermittees' MS4s, including the following:

(a) All MS4 outfalls that discharge to receiving waters, and

(b) Locations of major structural controls for storm water and non-storm water (e.g., retention basins, detention basins, major infiltration devices, etc.);

(3) Other known and suspected sources of non-storm water or pollutants in storm water discharges to receiving waters within the Watershed Management Area, including the following:

(a) Other MS4 outfalls (e.g., Phase II Municipal and Caltrans),

(b) Other NPDES permitted discharges,

(c) Any other discharges that may be considered point sources (e.g., private outfalls), and

(d) Any other discharges that may be considered non-point sources (e.g., agriculture, wildlife or other natural sources);

(4) Review of available data, including but not limited to:

(a) Findings from the Copermittees' illicit discharge detection and elimination programs,

(b) Findings from the Copermittees' MS4 outfall monitoring,

(c) Findings from the Copermittees' receiving water monitoring,

(d) Findings from the Copermittees' MS4 discharges and receiving water assessments, and

(e) Any other available data, information, or studies related to pollutant sources and conditions that contribute to the highest water quality priorities as identified for Provision B.2.b.

d. NUMERIC TARGETS AND SCHEDULES

The Copermittees must develop and incorporate interim and final numeric targets[5] and schedules into the Water Quality Improvement Plans. Numeric targets and schedules must be used to measure progress towards addressing the highest water quality priorities and an ultimate outcome of protections, preservation, enhancement, and restoration of receiving water beneficial uses. When developing numeric targets and corresponding schedules, the Copermittees must consider the following:

[5] Interim and final numeric targets may take a variety of forms such as pollutant concentration, load reductions, number of impaired water bodies delisted from the List of Water Quality Impaired Segments, Index of Biotic Integrity (IBI) scores, or other appropriate metrics. Interim and final numeric targets are not necessarily limited to one criterion or indicator, but may include multiple criteria and/or indicators.

(1) Final numeric targets must be based on measureable criteria or indicators, to be achieved in the receiving waters and/or MS4 discharges for the highest water quality priorities which will result in the restoration and/or protection of water quality standards in receiving waters;

(2) Interim numeric targets must be based on measureable criteria or indicators that can demonstrate incremental progress toward achieving the final numeric targets in the receiving waters and/or MS4 discharges; and

(3) Schedules must be adequate for measuring progress toward achieving the interim and final numeric targets required for Provisions B.2.d.(1) and B.2.d.(2). Schedules must incorporate the following:

(a) Interim dates for achieving the interim numeric targets,

(b) Compliance schedules for any applicable TMDLs in Attachment E to this Order,

(c) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-001**X** (see Attachment A),

(d) Achievement of the final numeric targets in the receiving waters and/or MS4 discharges for the highest water quality priorities must be as soon as possible, and

(e) Final dates for achieving the final numeric targets must not extend more than 10 years beyond the date this Order is adopted, unless the schedule includes an applicable TMDL in Attachment E to this Order.

3. Water Quality Improvement Strategies and Schedules

The Copermittees must develop specific water quality improvement strategies to address the highest water quality priorities identified within a Watershed Management Area. The water quality improvement strategies must address the highest water quality priorities by preventing or eliminating non-storm water discharges to and from the MS4, reducing pollutants in storm water discharges from the MS4 to the MEP, and restoring and/or protecting the water quality standards of receiving waters.

a. WATER QUALITY IMPROVEMENT STRATEGIES

The water quality improvement strategies must prioritize and implement the following measures to achieve the interim and final numeric targets in accordance with the schedules required for Provision B.2.c:

(1) Structural and/or non-structural BMPs that are designed to achieve the interim and final numeric targets in the receiving waters and/or MS4 discharges;

(2) Retrofitting projects for areas of existing development known or suspected to contribute to the highest water quality priorities, and where retrofitting will contribute to reducing or eliminating non-storm water discharges to the MS4 and/or reducing pollutants in storm water discharges from the MS4 to the MEP;

(3) Stream and/or habitat rehabilitation or restoration projects where stream and/or habitat rehabilitation or restoration are necessary for, or will contribute to demonstrable improvements in the physical, chemical, and biological receiving water conditions and restoration and/or protection of water quality standards in receiving waters; and

(4) Other water quality improvement strategies that will result in preventing or eliminating non-storm water discharges to and from the MS4, reducing pollutants in storm water discharges from the MS4 to the MEP, and restoring and/or protecting the water quality standards of receiving waters.

b. IMPLEMENTATION SCHEDULES

(1) The Copermittees must develop schedules for implementing the water quality improvement strategies identified under Provision B.3.a to achieve the interim and final numeric targets in the receiving waters and/or MS4 discharges for the highest water quality priorities in the Watershed Management Area. Schedules must be developed for both the water quality improvement strategies implemented by each Copermittee within its jurisdiction and for strategies that will be implemented by multiple Copermittees on a collaborative basis.

(2) The Copermittees must incorporate the implementation compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-001**X** (see Attachment A).

4. Water Quality Improvement Monitoring and Assessment

The Copermittees in each Watershed Management Area must develop an integrated program to assess the progress toward achieving the numeric targets and schedules, and the progress toward addressing the highest water quality priorities for each Watershed Management Area. The water quality improvement monitoring and assessment program must include the monitoring and assessment requirements of Provision D. For Watershed Management Areas with applicable TMDLs, the water quality monitoring and assessment program must incorporate the specific monitoring and assessment requirements of Attachment E. For Watershed

Management Areas with any ASBS, the water quality monitoring and assessment program must also incorporate the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-001**X** (see Attachment A).

5. Adaptive Management Process

a. WATER QUALITY IMPROVEMENT PLAN ADAPTIVE MANAGEMENT PROCESS

(1) The Copermittees in each Watershed Management Area must implement the iterative process, at least once every 3 years, adapting the Water Quality Improvement Plan to become more effective, based on, but not limited to the following considerations:

(a) Achieving the outcome of improved water quality in MS4 discharges and receiving waters through implementation of the water quality improvement strategies identified in the Water Quality Improvement Plan;

(b) Progress toward achieving interim and final numeric targets in receiving waters and/or MS4 discharges for the highest water quality priorities in the Watershed Management Area,

(c) Appropriateness of the highest water quality priorities identified for the Watershed Management Area;

(d) Progress toward achieving outcomes according to established schedules;

(e) Spatial and temporal accuracy of monitoring data collected to inform prioritization of water quality problems and implementation measures to address the highest water quality problems;

(f) Availability of new information and data from sources other than the jurisdictional runoff management programs within the Watershed Management Area that informs the effectiveness of the actions implemented by the Copermittees;

(g) San Diego Water Board recommendations; and

(h) Recommendations for modifications to the Water Quality Improvement Plan solicited through a public participation process.

(2) Based on the results of the iterative process required pursuant to Provision B.5.a.(1), the Copermittees must report any modifications necessary to improve the effectiveness of the Water Quality Improvement Plan in the Annual Report required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge (ROWD) required pursuant to Provision F.5.b.

(3) The Copermittees must implement any modifications to the Water Quality Improvement Plan in accordance with the schedules developed pursuant to Provisions B.2.d and B.3.b, unless directed otherwise by the San Diego Water Board.

b. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ADAPTIVE MANAGEMENT PROCESS

(1) Each Copermittee in the Watershed Management Area must implement the iterative process, at least annually, adapting its jurisdictional runoff management program to become more effective, based on, but not limited to the following:

(a) Measurable or demonstrable reductions of non-storm water discharges to and from each Copermittee's MS4;

(b) Measurable or demonstrable reductions of pollutants in storm water discharges from each Copermittee's MS4 to the MEP;

(c) Efficiency in implementing the Water Quality Improvement Plan;

(d) San Diego Water Board recommendations; and

(e) Recommendations for modifications to each Copermittee's jurisdictional runoff management program solicited through a public participation process.

(2) Based on the results of the iterative process required pursuant to Provision B.5.b.(1), each Copermittee must report any modifications necessary to improve the effectiveness its jurisdictional runoff management program document in the Annual Report required pursuant to Provision F.3.b, or as part of the ROWD required pursuant to Provision F.5.b.

(3) Each Copermittee must implement any modifications to its jurisdictional runoff management program in accordance with the schedules developed pursuant to Provisions B.2.d and B.3.b, unless directed otherwise by the San Diego Water Board.

6. Water Quality Improvement Plan Implementation

The Copermittees must commence with implementation of the Water Quality Improvement Plan no later than 180 days after submission, unless otherwise directed in writing by the San Diego Water Board.

C. ACTION LEVELS

The purpose of this provision is for the Copermittees to incorporate numeric non-storm water and storm water action levels in the Water Quality Improvement Plans. The action levels will be used to measure progress towards attaining the reasonable protection, preservation, enhancement, and restoration of water quality and designated beneficial uses of waters of the state. This goal will be accomplished through monitoring and assessing the quality of the MS4 discharges during the implementation of the Water Quality Improvement Plans.

The Copermittees must incorporate numeric action levels in the Water Quality Improvement Plans to direct and focus the Copermittees' jurisdictional runoff management program implementation efforts for addressing MS4 discharges to receiving waters. The numeric action levels will be used as part of the MS4 discharges assessments required under Provision D.4.a, and each Copermittee's program to detect and eliminate non-storm water and illicit discharges to the MS4 required under Provision E.2. Numeric action levels must be developed for non-storm water and storm water MS4 discharges, as follows:

1. Non-Storm Water Action Levels

a. The following non-storm water action levels (NALs) must be incorporated in the Water Quality Improvement Plan:

(1) Non-Storm Water Discharges from MS4s to Ocean Surf Zone

Table C-1. Non-Storm Water Action Levels for Discharges from MS4s to Ocean Surf Zone

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Total Coliform	MPN/100 ml	1,000	-	10,000/1,000[1]	OP
Fecal Coliform	MPN/100 ml	200[2]	-	400	OP
Enterococci	MPN/100 ml	35	-	104[3]	OP

Abbreviations/Acronyms
AMAL – average monthly action level
MDAL – maximum daily action level
OP – Ocean Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Total coliform density shall not exceed 1,000 MPN/100 ml when the fecal/total coliform ratio exceeds 0.1
2. Fecal coliform density may not exceed 200 MPN per 100 ml during any 30 day period
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas"

(2) Non-Storm Water Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Table C-2. Non-Storm Water Action Levels for Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Turbidity	NTU	75	-	225	OP
pH	Units	Within limit of 6.0 to 9.0 at all times			OP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	35	-	104[3]	BP
Priority Pollutants	ug/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
OP – Ocean Plan water quality objective
NTU – Nephelometric Turbidity Units
ug/L – micrograms per liter
MDAL – maximum daily action level
BP – Basin Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Based on a minimum of not less than five samples for any 30-day period
2. No more than 10 percent of total samples may exceed 400 MPN per 100 ml during any 30 day period
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas"

Table C-3. Non-Storm Water Action Levels for Priority Pollutants

Parameter	Units	Freshwater (CTR)		Saltwater (CTR)	
		MDAL	AMAL	MDAL	AMAL
Cadmium	ug/L	**	**	16	8
Copper	ug/L	*	*	5.8	2.9
Chromium III	ug/L	**	**	-	-
Chromium VI	ug/L	16	8.1	83	41
Lead	ug/L	*	*	14	2.9
Nickel	ug/L	**	**	14	6.8
Silver	ug/L	*	*	2.2	1.1
Zinc	ug/L	*	*	95	47

Abbreviations/Acronyms:
CTR – California Toxic Rule
AMAL – average monthly action level
ug/L – micrograms per liter
MDAL – maximum daily action level

Notes:
* Action levels developed on a case-by-case basis (see below)
** Action levels developed on a case-by-case basis (see below), but calculated criteria are not to exceed Maximum Contaminant Levels (MCLs) under the California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64431

The Cadmium, Copper, Chromium (III), Lead, Nickel, Silver and Zinc NALs for MS4 discharges to freshwater receiving waters will be developed on a case-by-case basis because the freshwater criteria are based on site-specific water quality data (receiving water hardness). For these priority pollutants, the following equations (40 CFR 131.38.b.2) will be required:

Cadmium (Total Recoverable) = exp(0.7852[ln(hardness)] -2.715)
Chromium III (Total Recoverable) = exp(0.8190[ln(hardness)] + .6848)
Copper (Total Recoverable) = exp(0.8545[ln(hardness)] - 1.702)
Lead (Total Recoverable) = exp(1.273[ln(hardness)] - 4.705)
Nickel (Total Recoverable) = exp(.8460[ln(hardness)] + 0.0584)
Silver (Total Recoverable) = exp(1.72[ln(hardness)] - 6.52)
Zinc (Total Recoverable) = exp(0.8473[ln(hardness)] + 0.884)

(3) Non-Storm Water Discharges from MS4s to Inland Surface Waters

Table C-4. Non-Storm Water Action Levels for Discharges from MS4s to Inland Surface Waters

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Dissolved Oxygen	mg/L	Not less than 5.0 in WARM waters and not less than 6.0 in COLD waters			BP
Turbidity	NTU	-	20	See MDAL	BP
pH	Units	Within limit of 6.5 to 8.5 at all times			BP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	33	-	61[3]	BP
Total Nitrogen	mg/L	-	1.0	See MDAL	BP
Total Phosphorus	mg/L	-	0.1	See MDAL	BP
MBAS	mg/L	-	0.5	See MDAL	BP
Iron	mg/L	-	0.3	See MDAL	BP
Manganese	mg/L	-	0.05	See MDAL	BP
Priority Pollutants	ug/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
BP – Basin Plan water quality objective
COLD – cold freshwater habitat beneficial use
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
MDAL – maximum daily action level
WARM – warm freshwater habitat beneficial use
MBAS – Methylene Blue Active Substances
MPN/100 ml – most probable number per 100 milliliters
ug/L – micrograms per liter

Notes:
1. Based on a minimum of not less than five samples for any 30-day period
2. No more than 10 percent of total samples may exceed 400 MPN per 100 ml during any 30 day period
3. This value has been set to the Basin Plan water quality objective for freshwater "designated beach areas"

b. If not identified in Provision C.1.a, NALs must be identified and incorporated in the Water Quality Improvement Plan for any pollutants or waste constituents causing or contributing, or threatening to cause or contribute to a condition of pollution or nuisance in waters of the state associated with the highest water quality priorities related to non-storm water discharges from the MS4s. NALs must be based on:

(1) Applicable water quality standards which may be dependent upon site-specific or receiving water-specific conditions or assumptions to be identified by the Copermittees; or

(2) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

2. Storm Water Action Levels

a. The following storm water action levels (SALs) for discharges of storm water from the MS4 must be incorporated in the Water Quality Improvement Plan:

Table C-5. Storm Water Action Levels for Discharges from MS4s to Receiving Waters

Parameter	Units	Action Level
Turbidity	NTU	126
Nitrate & Nitrite (Total)	mg/L	2.6
Phosphorus (Total P)	mg/L	1.46
Cadmium (Total Cd)*	µg/L	3.0
Copper (Total Cu)*	µg/L	127
Lead (Total Pb)*	µg/L	250
Zinc (Total Zn)*	µg/L	976

Abbreviations/Acronyms:
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
ug/L – micrograms per liter

Notes:
* The sampling must include a measure of receiving water hardness at each MS4 outfall. If a total metal concentration exceeds the corresponding metals SAL in Table C-5, that concentration must be compared to the California Toxics Rule criteria and the USEPA 1-hour maximum concentration for the detected level of receiving water hardness associated with that sample. If it is determined that the sample's total metal concentration for that specific metal exceeds that SAL, but does not exceed the applicable USEPA 1-hour maximum concentration criterion for the measured level of hardness, then the sample result will not be considered as an excursion above the SAL for that measurement.

b. If not identified in Provision C.2.a, SALs must be identified and incorporated in the Water Quality Improvement Plan for pollutants or waste constituents causing or contributing, or threatening to cause or contribute to a condition of pollution or nuisance in waters of the state associated with the highest water quality priorities related to storm water discharges from the MS4s. SALs must be based on:

(1) Federal and State water quality guidance and/or water quality standards; and

(2) Site-specific or receiving water-specific conditions; or

(3) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. Wet weather monitoring and assessment data from MS4 outfalls collected in accordance with Provision D.1.b may be used to develop or revise SALs based upon watershed-specific data. Revision of SALs is subject to San Diego Water Board approval.

D. MONITORING AND ASSESSMENT REQUIREMENTS

The purpose of this provision is for the Copermittees to monitor and assess the chemical, physical, and biological impact on receiving waters caused by discharges from the Copermittees' MS4s under wet weather and dry weather conditions. The goal of this provision is to inform the Copermittees about the nexus between the health of receiving waters and the water quality condition of the discharges from their MS4s. This goal will be accomplished through implementing and complying with the monitoring and assessment requirements of this Order.

The Copermittees must implement the following minimum monitoring and assessment requirements:

1. Jurisdictional Monitoring Requirements

a. DRY WEATHER JURISDICTIONAL MONITORING [D.1.a]

For dry weather days,[6] each Copermittee must implement the following minimum monitoring requirements within its jurisdiction:

(1) Non-Storm Water MS4 Monitoring Program [D.1.a.(1)]

Each Copermittee must develop and conduct a program to monitor and characterize non-storm water flows and pollutant loads during dry weather conditions within its jurisdiction. The non-storm water MS4 monitoring program must be utilized to detect and eliminate non-storm water discharges and illicit discharges and connections to the Copermittee's MS4. Any available monitoring data not collected specifically to meet these requirements may be utilized by the Copermittee. The non-storm water MS4 monitoring program must meet the following minimum requirements:

(a) Non-Storm Water MS4 Monitoring Stations [D.1.a.(1)(a)]

Each Copermittee must identify the non-storm water MS4 monitoring stations within its jurisdiction that will be screened and monitored during dry weather days to identify non-storm water discharges and illicit discharges and connections to the MS4. Non-storm water MS4 monitoring stations must be selected in accordance with the following guidelines and criteria:

(i) A grid system consisting of perpendicular north-south and east-west lines spaced ¼ mile apart must be overlayed on a map of the Copermittee's MS4. All cells that contain a segment of the Copermittee's MS4 must be identified;

[6] Dry weather day is defined as any day with less than 0.1 inches of rain observed on each of the previous 3 days.

(ii) At least one non-storm water MS4 monitoring station must be selected in each cell containing a segment of the Copermittee's MS4, which must consist of one of the following:

[a] A major outfall,
[b] Other outfall point, or
[c] Other point of access (e.g., manhole);

(iii) Each non-storm water MS4 monitoring station should be located downstream of any areas that are known or suspected to be sources of non-storm water discharges and/or illicit discharges or connections to the MS4;

(iv) Each non-storm water MS4 monitoring station must be located to the degree practicable at the farthest outfall, manhole, or other accessible location downstream in the MS4, within each cell;

(v) In addition to the non-storm water MS4 monitoring stations identified in accordance with Provisions D.1.a.(1)(a)(i)-(iv) above, each Copermittee must identify stations that will be screened and monitored during dry weather days to identify non-storm water discharges from sources not directly under the jurisdiction of the Copermittee.[7] These stations must be selected in accordance with the following guidelines and criteria:

[a] Stations should be located at or prior to the point of discharge into the Copermittee's MS4, but may be located downstream of the source as long as the station remains appropriate for characterizing the discharge from the source not within the authority of the Copermittee to control,
[b] Any non-storm water MS4 monitoring station identified in accordance with Provisions D.1.a.(1)(a)(i)-(iv) and located at the point of discharge or directly downstream of a known or suspected source of non-storm water discharges not within the authority of the Copermittee to control may also be utilized as a station to monitor the source not within the authority of the Copermittee to control;

(vi) The following factors should be considered in determining the location of each non-storm water MS4 monitoring station:

[a] Safety of personnel and accessibility of the location,
[b] Total area draining to the location,
[c] Population density of the area draining to the location,
[d] Traffic density,
[e] Age of the structures or buildings in the area,

[7] Sources not directly under the jurisdiction of and subject to regulation by the Copermittee may include lands or areas under the jurisdiction of other Copermittees, owners or operators of federal and state lands or facilities, tribal lands, special districts, etc.

[f] History of the area,
[g] Land use types draining to the location,
[h] Hydrological conditions, and
[i] Recommendations from the San Diego Water Board; and

(vii) No more than 500 non-storm water MS4 monitoring stations need to be selected by each Copermittee within its jurisdiction for any given year.

(b) Non-Storm Water MS4 Station Prioritization [D.1.a.(1)(b)]

Based on the first year of non-storm water field observations collected consistent with the Provision D.1.a.(1)(c)(i), each Copermittee must identify the high priority non-storm water MS4 monitoring stations. The non-storm water MS4 monitoring stations that meet the following criteria must be identified as high priority:

(i) The Copermittee has not identified and eliminated the source of the non-storm water discharges; or

(ii) The Copermittee has not been able to eliminate the source of an identified illicit discharge, and

(iii) The non-storm water discharges and/or illicit discharges are known or suspected to contribute and/or contain pollutants that cause or contribute, or threaten to cause or contribute to a condition of pollution or nuisance associated with the highest water quality priorities related to discharges from the MS4s.

(iv) The Copermittee may also designate any non-storm water MS4 monitoring stations that do not meet the criteria above as high priority.

(c) Non-Storm Water Monitoring Procedures [D.1.a.(1)(c)]

Each Copermittee must monitor the non-storm water MS4 monitoring stations within its jurisdiction as follows:

(i) *Non-Storm Water Field Observations* [D.1.a.(1)(c)(i)]

[a] Monitoring events for each non-storm water MS4 monitoring station must be scheduled as follows:
[1] During the first year of enrollment under this Order, the Copermittee must record field observations consistent with Table D-1 at each non-storm water MS4 monitoring station within its jurisdiction at least one time per month;

Table D-1. Field Observations for Non-Storm Water MS4 Monitoring Stations

Field Observations
• Station identification and location. • Presence of flow, or pooled or ponded water. • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate), - Flow characteristics (i.e. presence of floatables, surface scum, or sheens, odor, color), - Flow source(s) suspected or identified from non-storm water source investigation, and - Flow source(s) eliminated during non-storm water source identification. • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, or sheens, odor, color), and - Known or suspected source(s) of pooled or ponded water. • Station description (i.e. deposits or stains, vegetation condition, structural condition, observable biology). • Presence and assessment of trash in and around station. • Evidence or signs of illicit connections or illegal dumping.

[2] For any stations monitoring sources not within the authority of the Copermittee to control where flows are observed during the first year of enrollment under this Order, the Copermittee must develop a field screening and monitoring schedule that can characterize the monthly non-storm water discharges and pollutant loads from the sources in or discharging to the Copermittee's MS4;

[3] High priority non-storm water MS4 monitoring stations must be monitored in accordance with the following:

A. Each Copermittee must designate at least 5 high priority non-storm water MS4 monitoring stations that are representative of non-storm water discharges from areas consisting primarily of residential, commercial, and industrial land uses present within and directly under the Copermittee's jurisdiction. Where there are less than 5 non-storm water MS4 monitoring stations within a Copermittee's jurisdiction, all stations must be designated as high priority, and

B. Each Copermittee must develop a monitoring schedule that can characterize the monthly non-storm water discharges and pollutant loads in or discharging from the high priority non-storm water MS4 monitoring stations;

[4] At least 10 percent of the non-storm water MS4 monitoring stations not identified as high priority must be screened and monitored each month. In addition, each non-storm water MS4 monitoring station must be screened and monitored at least once per year. If non-storm water flows are observed at

any non-storm water MS4 monitoring stations not identified as high priority, then they must become high priority pursuant to Provision D.1.a.(1)(b).

[b] For each monitoring events required above, the narrative descriptions and observations in Table D-1 must be recorded at each non-storm water MS4 monitoring station.

(ii) *Non-Storm Water Field Monitoring* [D.1.a.(1)(c)(ii)]

If flows, or pooled or ponded water are present during the field observations required under Provision D.1.a.(1)(c)(i), the Copermittee must monitor and record the parameters in Table D-2:

Table D-2. Field Monitoring Parameters for Non-Storm Water MS4 Monitoring Stations

Parameters
• pH • Temperature • Specific conductivity • Dissolved oxygen • Turbidity • Total chlorine • Total copper* • Total phenol • Detergents (or surfactants)* • Total hardness* • Reactive phosphorus* • Nitrate* • Ammonia as nitrogen*

* Field measurement not required if flow is observed and collection of a sample for analysis is required.

(iii) *Non-Storm Water Analytical Monitoring* [D.1.a.(1)(c)(iii)]

If flows are present during the field observations required under Provision D.1.a.(1)(c)(i), samples must be collected and analyzed as follows:

[a] If the Copermittee identifies and eliminates the source of non-storm water discharge, analysis of the sample is not required, but encouraged;

[b] During the first year of enrollment under this Order, samples must be collected if flows are observed at non-storm water MS4 monitoring stations. Samples must be analyzed for the following constituents, unless the Copermittee has historical data that can demonstrate or provide justification that the analysis of the constituent is not necessary:

[1] Any pollutants identified as the highest priority for the Watershed Management Area in the Water Quality Improvement Plan,

[2] Any pollutants or constituents that the Copermittee has identified as a potential concern to receiving waters requiring additional data collection,

[3] Constituents listed in Table D-3;

Table D-3. Analytical Monitoring Constituents for Non-Storm Water MS4 Monitoring Stations

Conventionals, Nutrients, Hydrocarbons	Pesticides	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Total Phosphorus • Dissolved Phosphorus • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia • Oil and Grease	• Diazinon • Chlorpyrifos • Pyrethroids	• Cadmium • Copper • Lead • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

[c] **After** the first year of enrollment under this Order, samples must be collected from all high priority non-storm water MS4 monitoring stations for analysis at least two times per year. Samples must be collected at least once during the dry season (May-September) and at least once after the first storm event of the wet season (October-April). Samples must be analyzed for the following constituents:

[1] Any pollutants identified as the highest priority for the Watershed Management Area in the Water Quality Improvement Plan,

[2] Any pollutants or constituents that the Copermittee has identified as a potential concern to receiving waters requiring additional data collection, and

[3] Constituents listed in Table D-3 must be analyzed at least once per year;

[d] Samples must be collected from all non-storm water MS4 monitoring stations not identified as high priority for analysis if flows are observed during required field screening and monitoring events. Samples must be analyzed for the following constituents, unless the Copermittee has historical data that can demonstrate or provide justification that the analysis of the constituent is not necessary:

[1] Any pollutants identified as the highest priority for the Watershed Management Area in the Water Quality Improvement Plan,

[2] Any pollutants or constituents that the Copermittee has identified as a potential concern to receiving waters requiring additional data collection, and

[3] Constituents listed in Table D-3.

(2) Dry Weather Ambient Receiving Water Monitoring Program [D.1.a.(2)]

Each Copermittee must develop and conduct a program to monitor and characterize the ambient conditions of the receiving waters utilized for conveying non-storm water within and through its jurisdiction. Any available monitoring data not collected specifically to meet these requirements may be utilized by the Copermittee. The dry weather ambient receiving water monitoring program must meet the following minimum requirements:

(a) Dry Weather Ambient Receiving Water Monitoring Stations [D.1.a.(2)(a)]

Each Copermittee must identify the dry weather ambient receiving water monitoring stations that will be screened and monitored. Any location in a receiving water that is already monitored by the Copermittee or another entity may also be utilized as a dry weather ambient receiving water monitoring station. The monitoring stations must be selected in accordance with the following criteria:

(i) The following factors should be considered in determining the location of each dry weather ambient receiving water monitoring station:

[a] Permission to cross private property and public land,
[b] Safety of personnel and accessibility of the location,
[c] Location can complement or supplement historical ambient receiving water data,
[d] Location should not be in close proximity to any MS4 outfalls or other point source discharges to the receiving water,
[e] Natural or relatively unaltered areas in receiving waters are preferred, and
[f] Recommendations from the San Diego Water Board;

(ii) Locate at least one monitoring station in the lowest part of the Watershed Management Area near the boundary of its jurisdiction;

(iii) Locate at least one monitoring station located in the uppermost part of the Watershed Management Area near the boundary of its jurisdiction; and

(iv) The monitoring stations identified in Provisions D.1.a.(2)(a)(ii) and D.1.a.(2)(a)(iii) must be hydraulically connected.

(b) Dry Weather Ambient Receiving Water Monitoring Procedures [D.1.a.(2)(b)]

Each Copermittee must monitor the dry weather ambient receiving water monitoring stations as follows:

(i) *Dry Weather Ambient Receiving Water Field Observations* [D.1.a.(2)(b)(i)]

Monitoring events for each monitoring station must be scheduled as follows:

[a] During the first year of enrollment under this Order, the Copermittee must record field observations consistent with Table D-4 at each dry weather ambient receiving water monitoring station at least one time per month; and

Table D-4. Field Observations for Dry Weather Ambient Receiving Water Monitoring Stations

Field Observations
• Station identification and location. • Presence of flow, or pooled or ponded water. • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate), - Flow characteristics (i.e. presence of floatables, surface scum, or sheens, odor, color), • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, or sheens, odor, color),. • Station description (i.e. deposits or stains, vegetation condition, structural condition, observable biology). • Presence and assessment of trash in and around station.

[b] For any monitoring stations where flows are observed during the first year of enrollment under this Order, the Copermittee must develop a field screening and monitoring schedule that can characterize the monthly flows and pollutant loads in the receiving water.

(ii) *Dry Weather Ambient Receiving Water Field Monitoring* [D.1.a.(2)(b)(ii)]

If flow, or pooled or ponded water is present during the field observations required under Provision D.1.a.(2)(b)(i), the Copermittee must monitor and record the parameters in Table D-2.

(iii) *Dry Weather Ambient Receiving Water Analytical Monitoring* [D.1.a.(2)(b)(iii)]

If flows are present during the field observations required under Provision D.1.a.(2)(b)(i), samples of the ambient receiving water flows must be collected and analyzed as follows:

[a] During the first year of enrollment under this Order, samples must be collected for each observation of flow in the ambient receiving water monitoring stations for analysis. Samples must be analyzed for the following constituents:

[1] Any pollutants identified as the highest priority for the Watershed Management Area in the Water Quality Improvement Plan,

[2] Any non-storm water pollutants or constituents that the Copermittee has identified as a potential concern to receiving waters requiring additional data collection, and
[3] Constituents listed in Table D-3; and

[b] **After** the first year of enrollment under this Order, samples of flows observed at ambient receiving water monitoring stations must be collected for analysis at least two times during the remaining term of this Order. Samples must be collected at least once during the dry season (May-September) and at least once after the first storm event of the wet season (October-April). Samples must be analyzed for the following constituents:
[1] Any pollutants identified as the highest priority for the Watershed Management Area in the Water Quality Improvement Plan,
[2] Any pollutants or constituents that the Copermittee has identified as a potential concern to receiving waters requiring additional data collection,
[3] Constituents listed in Table D-3 must be analyzed at least once per year.

b. WET WEATHER JURISDICTIONAL MONITORING [D.1.b]

For wet weather days,[8] each Copermittee must implement the following minimum monitoring requirements within its jurisdiction:

(1) Storm Water MS4 Outfall Monitoring Program [D.1.b.(1)]

Each Copermittee must develop and conduct a program to monitor and characterize the storm water flows and pollutant loads from the MS4 outfalls within its jurisdiction during wet weather days. Any available monitoring data not collected specifically to meet these requirements may be utilized by the Copermittee. The monitoring program must meet the following minimum requirements:

(a) Storm Water MS4 Outfall Monitoring Stations [D.1.b.(1)(a)]

Each Copermittee must identify the wet weather MS4 outfall monitoring stations within its jurisdiction that will be monitored and sampled during wet weather days. Any non-storm water MS4 monitoring station identified under Provision D.1.a.(1)(a) may also be utilized as a storm water MS4 outfall monitoring station. Monitoring stations must be selected in accordance with the following guidelines and criteria:

(i) The following factors should be considered in determining the location of each wet weather MS4 outfall monitoring station:

[8] Wet weather day defined as any day with 0.1 inches of rain or greater and the following 3 days.

[a] Safety of personnel and accessibility of the location,
[b] Total area draining to the location,
[c] Population density of the area draining to the location,
[d] Traffic density,
[e] Age of the structures or buildings in the area,
[f] History of the area,
[g] Land use types draining to the location,
[h] Hydrological conditions, and
[i] Recommendations from the San Diego Water Board.

(ii) Each wet weather MS4 outfall monitoring station must consist of one of the following:

[a] A major outfall, or
[b] Other outfall point, or
[c] Other point of access (e.g., manhole), only as an alternate location if safety during wet weather discharge sampling at available outfall locations discharging to receiving waters is a significant concern and limits accessibility;

(iii) Each Copermittee must designate at least 5 monitoring stations that are representative of storm water flows from areas consisting primarily of residential, commercial, and industrial land uses present within the Copermittee's jurisdiction. Where there are less than 5 MS4 outfalls within a Copermittee's jurisdiction, all MS4 outfalls must be designated as wet weather MS4 outfall monitoring stations.

(iv) Any monitoring station that does not have any SAL exceedances for 3 successive years may be replaced with a different monitoring station.

(b) Storm Water MS4 Outfall Monitoring Procedures [D.1.b.(1)(b)]

Each Copermittee must develop monitoring procedures to be consistent with the following criteria:

(i) A narrative description must be provided of the station identification and location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event which generated the sampled discharge and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event;

(ii) Flow rates and volumes for each monitoring station must be measured or estimated during each monitoring event in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), sections 3.2.1 or 3.2.2, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board;

(iii) Each Copermittee must develop and implement a monitoring frequency during the wet season to characterize pollutant discharges from the MS4 outfalls within its jurisdiction. At a minimum, storm water samples must be collected from two storm events occurring at least one month apart for each monitoring station. Samples must be collected as follows:

[a] Grab samples may be collected only for pH, temperature, specific conductivity, dissolved oxygen, hardness, oil and grease, and indicator bacteria,

[b] For all other constituents, one of the following methods must be used to collect the samples:

[1] A 24-hour composite sample, using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours. Results of the analyses of individual grab samples may be averaged to obtain the daily average,

[2] A flow-weighted composite sample for either the entire discharge or for the first 3 hours of the discharge. The flow-weighted composite sample for the storm water discharge may be taken with a continuous sampler or as a combination of a minimum of three sample aliquots taken in each hour of discharge for the entire discharge or for the first three hours of the discharge, with each aliquot being separated by a minimum period of fifteen minutes. Only one analysis of the composite of aliquots is required, or

[3] A minimum of one grab sample may be collected for storm water discharges from holding ponds or other impoundments with a retention period greater than 24 hours;

(iv) Storm water MS4 outfall monitoring stations must be monitored and sampled during the first wet weather event of the wet season. Samples must be analyzed for the following constituents:

[a] Any pollutants contributing to the highest water quality priorities for the Watershed Management Area as identified in the Water Quality Improvement Plan,

[b] Any non-storm water pollutants or constituents that the Copermittee has identified as a potential concern to receiving waters requiring additional data collection, and

[c] Constituents listed in Table D-5.

Table D-5. Analytical Monitoring Constituents for Wet Weather MS4 Outfall Monitoring Stations

Conventionals, Nutrients, Hydrocarbons	Pesticides	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity[1] • Total Hardness • pH • Specific Conductivity • Temperature • Dissolved Oxygen • Biological Oxygen Demand, 5-day • Chemical Oxygen Demand • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus[1] • Dissolved Phosphorus • Nitrite[1,2] • Nitrate[1,2] • Total Kjeldhal Nitrogen • Ammonia • Oil and Grease	• Diazinon • Chlorpyrifos • Pyrethroids	• Arsenic • Cadmium[1] • Chromium • Copper[1] • Iron • Lead[1] • Manganese • Mercury • Nickel • Selenium • Silver • Thallium • Zinc[1]	• Total Coliform • Fecal Coliform[3] • *Enterococcus*

Notes:
1. Constituent with a storm water action level (SAL) specified under Provision C.2.
2. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
3. *E. Coli* may be substituted for Fecal Coliform.

(v) Samples collected after the first wet weather monitoring event and during the remaining period of the wet season must be analyzed for the following constituents:

[a] Any pollutants contributing to the highest water quality priorities for the Watershed Management Area as identified in the Water Quality Improvement Plan.

[b] Any pollutants or constituents that the Copermittee has identified as a potential concern to receiving waters requiring additional data collection.

(2) Storm Water Pollutant Source Identification Monitoring Program [D.1.b.(2)]

Each Copermittee must develop and conduct a program within its jurisdiction to identify the sources of pollutants in storm water discharged from the Copermittee's MS4 during wet weather conditions. Any available monitoring data not collected specifically to meet these requirements may be utilized by the Copermittee. The storm water pollutant source identification monitoring

program must include focused monitoring which moves upstream into each MS4 outfall drainage area as necessary to identify sources of the highest water quality priorities in the receiving waters. The wet weather source identification monitoring program must begin no later than the wet season following the date the San Diego Water Board determines that the Water Quality Improvement Plan meets the requirements of this Order.

2. Watershed Monitoring Requirements

a. WATERSHED MONITORING STATIONS [D.2.a]

The Copermittees must identify watershed monitoring stations within the Watershed Management Area. The watershed monitoring stations must be selected in accordance with the following criteria:

(1) All mass loading stations (MLSs) previously established by the Copermittees in each Watershed Management Area must continue to be utilized as watershed monitoring stations;

(2) All temporary watershed assessment stations (TWASs), bioassessment stations, and stream assessment stations previously established by the Copermittees must be considered for continued use as watershed monitoring stations;

(3) Any dry weather ambient receiving water monitoring station identified pursuant to Provision D.1.a.(2)(a) may be considered for use as a watershed monitoring station;

(4) At least one reference watershed monitoring station must be selected for each Watershed Management Area; and

(5) At least one watershed monitoring station located between and hydrologically connected to each MLS and each reference station must be selected for each Watershed Management Area.

b. DRY WEATHER WATERSHED MONITORING [D.2.b]

The Copermittees must develop and conduct a program to monitor the condition of the receiving waters in each Watershed Management Area during dry weather conditions. Any available monitoring data not collected specifically to meet these requirements may be utilized by the Copermittees. For dry weather days, the Copermittees must develop and/or update its written dry weather watershed monitoring procedures to be consistent with the following criteria:

(1) Dry Weather Watershed Field Observations [D.2.b.(1)]

For each dry weather watershed monitoring event, the Copermittee must record field observations consistent with Table D-4 at each monitoring station. Dry weather watershed monitoring is required at least every two years for each monitoring station. At least two dry weather watershed monitoring events must be scheduled for each watershed monitoring station per monitoring year. One monitoring event is required during the dry season (May-September) and one monitoring event is required on a dry weather day during the wet season (October-April), after the first storm event.

(2) Dry Weather Watershed Field Monitoring [D.2.b.(2)]

If flow, or pooled or ponded water is present during the dry weather watershed monitoring event required pursuant to Provision D.2.b.(1), and conditions allow the collection of the data, the Copermittee must monitor and record the parameters in Table D-2.

(3) Dry Weather Watershed Analytical Monitoring [D.2.b.(3)]

Samples from each monitoring station must be collected for analysis at least every two years. At least two dry weather watershed analytical monitoring events must be scheduled for each watershed monitoring station per monitoring year. Samples must be collected once during the dry season (May-September) and once on a dry weather day during the wet season (October-April), after the first storm event. Analytical monitoring samples must be collected and analyzed as follows:

(a) Grab samples may be collected only for pH, temperature, specific conductivity, dissolved oxygen, hardness, oil and grease, and indicator bacteria;

(b) For all other constituents, time-weighted composites composed of 24 discrete hourly samples must be collected; and

(c) Analysis for the following constituents is required:

(i) Any other pollutants contributing to the highest water quality priorities for the Watershed Management Area as identified in the Water Quality Improvement Plan,

(ii) Any pollutants that the Copermittee has identified as a potential concern to receiving waters requiring additional data collection, and

(iii) Constituents listed in Table D-5.

(4) Dry Weather Watershed Toxicity Monitoring [D.2.b.(4)]

Samples from each monitoring station must be collected for toxicity testing at least every two years. At least two dry weather watershed toxicity monitoring events must be scheduled for each watershed monitoring station per monitoring year. Samples must be collected once during the dry season (May-September) and once on a dry weather day during the wet season (October-April), after the first storm event. Toxicity testing must be conducted in accordance with the following table:

Table D-6. Toxicity Testing for Dry Weather Watershed Monitoring Station Flows

Dry Weather Watershed Monitoring Station	Freshwater Organisms	Estuarine and Marine Organisms
Mass Loading Stations[1]	3 acute[2] 3 chronic[2]	1 chronic[3]
Others Stations	3 acute[2] 3 chronic[2]	None

Notes:
1. Dry weather toxicity testing at a mass loading station may be omitted if the channel flows are diverted year-round during dry weather conditions to the sanitary sewer for treatment.
2. The presence of acute toxicity must be determined in accordance with USEPA protocol EPA-821-R-02-012. The presence of chronic toxicity must be determined in accordance with USEPA protocol EPA-821-R-02-013. Toxicity testing must include the use of *Pimephales promelas* (fathead minnow), *Hyalella azteca*, and *Psuedokirchneriella subcapitata* (formerly *Selenastrum capricornutum*, unicellular algae).
3. The presence of chronic marine toxicity must be determined in accordance with USEPA guidance EPA 600/R95/136, except for chronic mysid tests which must be conducted in accordance with USEPA protocol EPA-821-R-02-014. *Americamysis bahia* may be used as a marine test organism if *Holmesimysis costata* cannot be reasonably obtained. The use of, and justification for, *A. bahia* must be clearly reported in the Annual Report.

(5) Dry Weather Watershed Bioassessment Monitoring [D.2.b.(5)]

Bioassessment monitoring for each monitoring station is required at least every two years. Bioassessment monitoring is required to be conducted in May or June for each watershed monitoring station, and must be conducted as follows:

(a) The following bioassessment samples and measurements must be collected:

(i) Macroinvertebrate samples must be collected in accordance with the "Reachwide Benthos (Multihabitat) Procedure" in the most current Surface Water Ambient Monitoring Program (SWAMP) Bioassessment Standard Operating Procedures (SOP), and amendments, as applicable;[9]

[9] Ode, P.R.. 2007. Standard operating procedures for collecting macroinvertebrate samples and associated physical and chemical data for ambient bioassessments in California. California State Water Resources Control Board Surface Water Ambient Monitoring Program (SWAMP) Bioassessment SOP 001. http://www.swrcb.ca.gov/water_issues/programs/swamp/tools.shtml#monitoring

(ii) The "Full" suite of physical habitat characterization measurements must be collected in accordance with the most current SWAMP Bioassessment SOP, and as summarized in the SWAMP Stream Habitat Characterization Form – Full Version;[10] and

(iii) Freshwater algae samples must be collected in accordance with the SWAMP Standard Operating Procedures for Collecting Algae Samples.[11] Analysis of samples must include algal taxonomic composition (diatoms and soft algae) and algal biomass.

(b) The bioassessment samples, measurements, and appropriate water chemistry data must be used to calculate the following:

(i) An Index of Biotic Integrity (IBI) for macroinvertebrates for each monitoring station where bioassessment monitoring was conducted, based on the most current calculation method;[12] and

(ii) An IBI for algae for each monitoring station where bioassessment monitoring was conducted, when a calculation method is developed.[13]

(6) Dry Weather Watershed Hydromodification Monitoring [D.2.b.(6)]

In addition to the hydromodification monitoring conducted as part of the Copermittees' Hydromodification Management Plans, for any year dry weather watershed monitoring is required, hydromodification monitoring is required to be conducted at least once during the dry weather season (May-September) for each monitoring station. The following hydromodification monitoring observations and measurements must be collected within an appropriate domain of analysis for the monitoring station:

(a) Channel conditions, including:

(i) Channel dimensions,

(ii) Hydrologic and geomorphic conditions, and

(iii) Presence and condition of vegetation and habitat;

[10] Available at: http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/reports/fieldforms_fullversion052908.pdf
[11] Fetscher et al. 2009. Standard Operating Procedures for Collecting Stream Algae Samples and Associated Physical Habitat and Chemical Data for Ambient Bioassessments in California.
[12] The most current calculation method at the time the Order was adopted is outlined in "A Quantitative Tool for Assessing the Integrity of Southern California Coastal Streams" (Ode, et al. 2005. Environmental Management. Vol. 35, No. 1, pp. 1-13). If an updated or new calculation method is developed, either both (i.e. current and updated/new) methods must be used, or historical IBIs must be recalculated with the updated or new calculation method.
[13] When a calculation method is developed, IBIs must be calculated for all available and appropriate historical data.

(b) Location of discharge points;

(c) Habitat integrity;

(d) Photo documentation of existing erosion and habitat impacts, with location (i.e. latitude and longitude coordinates) where photos were taken;

(e) Measurement or estimate of dimensions of any existing channel bed or bank eroded areas, including length, width, and depth of any incisions; and

(f) Known or suspected cause(s) of existing downstream erosion or habitat impact, including flow, soil, slope, and vegetation conditions, as well as upstream land uses and contributing new and existing development.

(7) Dry Weather Watershed Sediment Quality Monitoring [D.2.b.(7)]

Sediment monitoring must be performed by the Copermittees to assess compliance with sediment quality receiving water limits applicable to MS4 discharges to enclosed bays and estuaries. The monitoring may be performed either by individual or multiple Copermittees to assess compliance with receiving water limits, or through participation in a water body monitoring coalition. The Copermittees must identify sediment sampling stations that are spatially representative of the sediment within the water body segment or region of interest. Sediment quality monitoring must be conducted at least once every two years between June and September. Sediment quality monitoring must be conducted in conformance with the monitoring requirements set forth in the State Water Board Sediment Quality Control Plan.

c. WET WEATHER WATERSHED MONITORING [D.2.c]

The Copermittees in each Watershed Management Area must develop and conduct a program to monitor the condition in receiving waters and characterize storm water flows during wet weather days of the wet season. Any available monitoring data not collected specifically for this Order that meet the monitoring requirements may be utilized by the Copermittee. For wet weather days, the Copermittees must develop and/or update its written wet weather watershed monitoring procedures to be consistent with the following criteria:

(1) Wet Weather Watershed Field Observations [D.2.c.(1)]

Wet weather watershed monitoring events are required at least once every two years for each dry weather watershed monitoring station. Each monitoring station must be monitored during at least two wet weather events

in any period (July 1 to June 30) that monitoring is required, including the first wet weather event of the wet season beginning October 1 and ending April 30, and at least one wet weather event after February 1. For each wet weather watershed monitoring event, the following narrative descriptions and observations must be recorded at each monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event;

(b) The flow rates and volumes measured or estimated. Data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board;

(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(d) Presence and assessment of trash in and around station.

(2) Wet Weather Watershed Field Monitoring [D.2.c.(2)]

For each wet weather watershed monitoring event, the parameters in Table D-2 must be monitored and recorded.

(3) Wet Weather Watershed Analytical Monitoring [D.2.c.(3)]

Samples from each wet weather watershed monitoring station must be collected for analysis at least two times during the term of this Order, at least once for the first wet weather event of the wet season, and at least once for a wet weather event after February 1. Wet weather samples must be collected and analyzed as follows:

(a) Grab samples may be collected only for pH, temperature, specific conductivity, dissolved oxygen, hardness, oil and grease, and indicator bacteria;

(b) For all other constituents, one of the following methods must be used to collect the samples:

(i) A 24-hour composite sample, using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours. Results of the analyses of individual grab samples may be averaged to obtain the daily average, or

(ii) A flow-weighted composite sample for either the entire discharge or for the first 3 hours of the discharge. The flow-weighted composite sample for the storm water discharge may be taken with a continuous sampler or as a combination of a minimum of three sample aliquots taken in each hour of discharge for the entire discharge or for the first three hours of the discharge, with each aliquot being separated by a minimum period of fifteen minutes. Only one analysis of the composite of aliquots is required; and

(c) Analysis for the following constituents is required:

(i) Any other pollutants contributing to the highest water quality priorities for the Watershed Management Area as identified in the Water Quality Improvement Plan,

(ii) Any water pollutants or constituents that the Copermittee has identified as a potential concern to receiving waters requiring additional data collection, and

(iii) Constituents listed in Table D-5.

(4) Wet Weather Watershed Toxicity Monitoring [D.2.c.(4)]

Samples from each wet weather watershed monitoring station must be collected for toxicity testing at least two times during the term of this Order, at least once for the first wet weather event of the wet season, and at least once for a wet weather event after February 1. Toxicity testing must be conducted in accordance with the following table:

Table D-7. Toxicity Testing for Wet Weather Watershed Monitoring Station Flows

Wet Weather Watershed Monitoring Station	Freshwater Organisms	Estuarine and Marine Organisms
Mass Loading Stations	3 acute[1]	1 acute[2] 2 chronic[2]
Others Stations	None	None

Notes:
1. The presence of acute toxicity must be determined in accordance with USEPA protocol EPA-821-R-02-012. Toxicity testing must include the use of *Pimephales promelas* (fathead minnow), *Hyalella azteca*, and *Psuedokirchneriella subcapitata* (formerly *Selenastrum capricornutum*, unicellular algae).
2. The presence of acute toxicity must be determined in accordance with USEPA protocol EPA-821-R-02-012. The presence of chronic marine toxicity must be determined in accordance with USEPA guidance EPA 600/R95/136, except for chronic mysid tests which must be conducted in accordance with USEPA protocol EPA-821-R-02-014. *Americamysis bahia* may be used as a marine test organism if *Holmesimysis costata* cannot be reasonably obtained. The use of, and justification for, *A. bahia* must be clearly reported in the Annual Report.

d. ALTERNATIVE WATERSHED MONITORING REQUIREMENTS [D.2.d]

In lieu of implementing the watershed monitoring requirements under Provisions D.2.a-c, the San Diego Water Board may direct the Copermittees to participate with other regulated entities, other interested parties, and the San Diego Water Board in the development, refinement, implementation, and coordination of regional monitoring and assessment programs to determine the status and trends of water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams.

e. WATERSHED MANAGEMENT AREA SPECIAL STUDIES [D.2.e]

(1) Within the term of this Order, the Copermittees must implement at least three special studies in each Watershed Management Area. The Copermittees are to determine which special studies will be developed and implemented in the Watershed Management Area. The monitoring plans for the Watershed Management Area special studies must be submitted with the Water Quality Improvement Plan required pursuant to Provision F.1. The Watershed Management Area special studies must, at a minimum, be in conformance with the following criteria:

(a) The special studies must be related to the highest water quality priorities identified by the Copermittees within the Watershed Management Area;

(b) The special studies must be implemented within the Watershed Management Area;

(c) The special studies must require some form of participation by all Copermittees within the Watershed Management Area; and

(d) One of the three required special studies may be implemented as part of a regional special study required pursuant to Provision D.3.

(2) The Copermittees must report the progress and findings of the Watershed Management Area Special Studies as part of the Annual Report for each Watershed Management Area, as required pursuant to Provision F.3.b.

3. Regional Special Studies

Within the term of this Order, the Copermittees must develop and implement at least two regional special studies for the San Diego Region. The Copermittees must determine which regional special studies will be developed and implemented. The regional special studies must be identified in the Water Quality Improvement Plans required pursuant to Provision F.1. The regional special studies must, at a minimum, be in conformance with the following criteria:

a. The special studies must be related to a water quality priority issue or potential water quality concern identified by the Copermittees for the entire San Diego Region;

b. The special studies must be implemented within the San Diego Region; and

c. The special studies must require some form of participation by all Copermittees enrolled under this Order.

4. Assessment Requirements

Each Copermittee must evaluate the data collected pursuant to Provisions D.1, D.2 and D.3 to identify causes of exceedances of action levels developed pursuant to Provision C, assess the quality of the discharges into and from the MS4s, and assess the quality of receiving waters. Each Copermittee must also assess the progress of the water quality improvement strategies required pursuant to Provision B.3 in restoring and protecting beneficial uses of receiving waters. Assessments must be performed as described in the following provisions:

a. MS4 DISCHARGES ASSESSMENTS [D.4.a]

(1) Jurisdictional Non-Storm Water Discharges Reduction Assessment [D.4.a.(1)]

(a) Non-Storm Water Action Levels [D.4.a.(1)(a)]

Each Copermittee must analyze the jurisdictional non-storm water monitoring data collected pursuant to Provision D.1.a and identify causes of NAL exceedances. The analysis must include, but not be limited to, all of the following considerations:

(i) For non-storm water discharges from the Copermittee's MS4 outfalls to receiving waters within the Copermittee's jurisdiction causing exceedances of NALs, the Copermittee must analyze its municipal, commercial, industrial, and residential inventories and activities, and other land use data, and identify sources or potential sources that may have caused or contributed to the NAL exceedances;

(ii) Each Copermittee must provide non-storm water monitoring and analytical data to demonstrate that NAL exceedances were caused by pollutants which are not anthropogenic in origin; and

(iii) Each Copermittee must provide non-storm water monitoring and analytical data to demonstrate that NAL exceedances were caused by pollutants which originate from sources or potential sources not within the authority of the Copermittee to control (e.g. Phase II dischargers or Caltrans).

(b) Calculate Jurisdictional Non-Storm Water Discharges and Pollutant Loads [D.4.a.(1)(b)]

Each Copermittee must analyze the jurisdictional non-storm water monitoring data collected pursuant to Provision D.1.a to calculate non-storm water discharges and pollutant loads from the MS4s and receiving waters in each jurisdiction. These calculations must be updated annually in the Annual Report required per Provision F.3.b. Each Copermittee must calculate:

(i) Monthly non-storm water discharges and pollutant loads from each known or potential source not within the authority of the Copermittee to control to an MS4 or receiving waters within the Copermittee's jurisdiction;

(ii) Monthly non-storm water discharges and pollutant loads from the Copermittee's MS4 outfalls to receiving waters within the Copermittee's jurisdiction, with an estimate of the percent contribution from each land use type within the drainage basin for each MS4 outfall;

(iii) Monthly non-storm water flows and pollutant loads in receiving waters at the downstream boundary of the Copermittee's jurisdiction; and

(iv) Monthly non-storm water flows and pollutant loads in receiving waters from areas or facilities subject to the Copermittee's legal authority that are discharged from the Copermittee's MS4 to downstream receiving waters.

(c) Review Progress and Evaluate Jurisdictional Actions [D.4.a.(1)(c)]

Each Copermittee must review the NAL exceedances, discharge and flow analyses, and pollutant load analyses required pursuant to Provisions D.4.a.(1)(a) and D.4.a.(1)(b) on an annual basis to:

(i) Identify reductions and progress in achieving reductions in non-storm water and illicit discharges and connections from different land uses and/or drainage areas to its MS4;

(ii) Assess the effectiveness of current actions being implemented by the Copermittee toward the reduction or elimination of non-storm water discharges from the MS4 within its jurisdiction; and

(iii) Identify modifications necessary to increase the effectiveness of the jurisdictional runoff management program toward reducing or eliminating non-storm water discharges to and from the MS4 within its jurisdiction.

(2) Watershed Management Area Non-Storm Water Assessment [D.4.a.(2)]

(a) Calculate Watershed Non-Storm Water Flows and Pollutant Loads [D.4.a.(2)(a)]

The Copermittees must analyze the jurisdictional non-storm water and watershed monitoring data collected per Provisions D.1.a and D.2.b to calculate non-storm water flows and pollutant loads in receiving waters for each Watershed Management Area. These calculations must be updated annually in the Annual Report required per Provision F.3.b. The Copermittees must develop or utilize appropriate methods or models to calculate:

(i) Monthly non-storm water runoff flows and pollutant loads at each watershed monitoring station from different land uses and drainage basins;

(ii) Monthly non-storm water flows and pollutant loads at each watershed monitoring station from all the Copermittees' MS4 outfalls to receiving waters, with an estimate of the percent contribution from different land uses; and

(iii) Monthly non-storm water flows and pollutant loads at each watershed monitoring station, with an estimate of the percent contribution from both areas or facilities subject to the Copermittees' legal authority and areas or facilities not subject to the Copermittees' legal authority.

(b) Evaluate Water Quality Improvement Strategies [D.4.a.(2)(b)]

The Copermittees in each Watershed Management Area must review the non-storm water flow and pollutant load analyses required pursuant to Provision D.4.a.(2)(a) on an annual basis to:

(i) Assess the effectiveness of the water quality improvement strategies being implemented within the Watershed Management Area toward reducing or eliminating non-storm water discharges and pollutant loads from entering and discharging from the MS4 to receiving waters; and

(ii) Identify modifications necessary to increase the effectiveness of the water quality improvement strategies toward reducing or eliminating non-storm water discharges and pollutant loads from entering and discharging from the MS4 to receiving waters.

(3) Jurisdictional Storm Water Pollutant Discharges Reduction Assessment [D.4.a.(3)]

(a) Storm Water Action Levels [D.4.a.(3)(a)]

(i) For storm water discharges from the Copermittee's storm water MS4 outfall monitoring stations with analytical monitoring data indicating exceedances of SALs, the Copermittee must analyze its municipal, commercial, industrial, and residential inventories and activities, and other land use data and identify sources or potential sources that may have caused or contributed to the SAL exceedances;

(ii) Each Copermittee must provide storm water monitoring and analytical data to demonstrate that SAL exceedances were caused by the constituents in storm water discharges from the MS4 which are not anthropogenic in origin; and

(iii) Each Copermittee must provide storm water monitoring and analytical data to demonstrate that SAL exceedances were caused by the constituents in storm water discharges from the MS4 which originate from sources or potential sources not within the authority of the Copermittee to control.

(b) Calculate Jurisdictional Storm Water Discharges and Pollutant Loads [D.4.a.(3)(b)]

Each Copermittee must analyze the jurisdictional storm water monitoring data collected pursuant to Provision D.1.b to calculate storm water discharges and pollutant loads from the MS4s in each jurisdiction. These calculations must be updated annually in the Annual Report required per Provision F.3.b. Each Copermittee must calculate or estimate:

(i) The monthly mean rainfall estimates (or summary of weather bureau data) and the monthly average number of storm events;

(ii) The average storm water runoff coefficient for each land use type within the Copermittee's jurisdiction;

(iii) The volume of storm water discharged from each of the Copermittee's MS4 outfalls to receiving waters within its jurisdiction for each storm event;

(iv) The pollutant loads from each of the Copermittee's MS4 outfalls to receiving waters within its jurisdiction for each storm event; and

(v) The percent contribution of pollutant loads from each land use type within the drainage basin to storm water discharges for each MS4 outfall within its jurisdiction, for each storm event.

(c) Review Progress and Evaluate Jurisdictional Actions [D.4.a.(3)(c)]

Each Copermittee must review the SAL exceedances, discharge analyses, and pollutant load analyses required pursuant to Provisions D.4.a.(3)(a) and D.4.a.(3)(b) on an annual basis to:

(i) Identify reductions and progress in achieving reductions in pollutant concentrations and/or pollutant loads from different land uses and/or drainage areas discharging from its MS4;

(ii) Assess the effectiveness of current actions being implemented by the Copermittee toward the reduction of pollutants in storm water discharges from the MS4 within its jurisdiction to the MEP; and

(iii) Identify modifications necessary to increase the effectiveness of the jurisdictional runoff management program toward reducing pollutants in storm water discharges from the MS4 within its jurisdiction to the MEP.

(4) Watershed Management Area Storm Water Assessment [D.4.a.(4)]

(a) Calculate Watershed Storm Water Flows and Pollutant Loads [D.4.a.(4)(a)]

The Copermittees must analyze the jurisdictional storm water and watershed monitoring data collected per Provisions D.1.b and D.2.c to calculate storm water flows and pollutant loads in receiving waters for each Watershed Management Area. These calculations must be updated annually in the Annual Report required per Provision F.3.b. The Copermittees must develop or utilize appropriate methods or models to calculate:

(i) Storm water runoff flows and pollutant loads at each watershed monitoring station from different land uses and drainage basins;

(ii) Storm water flows and pollutant loads at each watershed monitoring station from all the Copermittees' MS4 outfalls, with an estimate of the percent contribution from different land uses; and

(iii) Storm water pollutant loads in receiving waters at each watershed monitoring station, with an estimate of the percent contribution from both areas or facilities subject to the Copermittees' legal authority and areas or facilities not within the authority of the Copermittees to control.

(b) Evaluate Water Quality Improvement Strategies [D.4.a.(4)(b)]

The Copermittees in each Watershed Management Area must review the storm water flow and pollutant load analyses required pursuant to Provision D.4.a.(4)(a) on an annual basis to:

(i) Assess the effectiveness of the water quality improvement strategies being implemented in each Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to the MEP; and

(ii) Identify modifications necessary to increase the effectiveness of the water quality improvement strategies toward reducing pollutants in storm water discharges from the MS4s to the MEP.

b. RECEIVING WATERS ASSESSMENTS [D.4.b]

The Copermittees must annually perform assessments of receiving waters based on data collected pursuant to Provision D.2 and any appropriate receiving water monitoring data available from other sources. The receiving waters assessments must analyze the status and trends of water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under dry weather and wet weather conditions. For each of the three types of receiving waters, the Copermittees in each Watershed Management Area must:

(1) Identify the most critical beneficial uses that must be protected or restored to ensure overall health of the receiving water;

(2) Determine whether or not those critical beneficial uses are being protected or must be restored; and

(3) Identify short-term and/or long-term improvements or degradation of those critical beneficial uses.

c. WATER QUALITY IMPROVEMENT ASSESSMENTS [D.4.c]

The Copermittees in each Watershed Management Area must review the numeric targets in the Water Quality Improvement Plan, the data collected pursuant to Provisions D.1 and D.2, and the findings from the assessments required pursuant to Provisions D.4.a and D.4.b to assess the following:

(1) Beneficial uses of the receiving waters that are protected or must be restored;

(2) Appropriateness of final dry weather and wet weather numeric targets for the highest water quality priorities that will restore the impacted beneficial uses in the receiving waters;

(3) Non-storm water and storm water pollutant load reductions, or other improvements to receiving water or water quality conditions, that are necessary to attain the final numeric targets for restoring impacted beneficial uses in the receiving waters;

(4) Non-storm water and storm water pollutant load reductions necessary for the Copermittees to demonstrate that non-storm water and storm water discharges from their MS4s are not causing or contributing to exceedances of water quality objectives or impacts to beneficial uses in receiving waters;

(5) Non-storm water and storm water pollutant loads from their MS4s and/or receiving water flows that may be attributed to sources or potential sources not within the authority of the Copermittee to control and other non-anthropogenic sources identified by the Copermittees;

(6) Progress of the water quality improvement strategies toward attaining non-storm water and storm water pollutant load reductions or improvements to water quality conditions; and

(7) Progress toward achieving the interim and final numeric targets for restoring impacted beneficial uses in the receiving waters.

5. Monitoring Provisions

Each Copermittee must comply with all the monitoring, reporting, and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

E. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS

The purpose of this provision is for each Copermittee to implement a program to control the contribution of pollutants to and the discharges from the MS4 with its jurisdiction. The goal of this provision is to reduce the discharge of pollutants in storm water to the MEP and effectively prohibit non-storm water discharges to provide the reasonable protection, preservation, enhancement, and restoration of water quality and designated beneficial uses of waters of the state. This goal will be accomplished through compliance with the jurisdictional runoff management program requirements.

Each Copermittee must implement all the requirements of Provision E no later than 12 months after the adoption of this Order, or in accordance with Provision F.5.a. Each Copermittee must update its jurisdictional runoff management program document, in accordance with Provision F.2.a, to include all the requirements of Provision E. The jurisdictional runoff management programs implemented by each Copermittee must be consistent with the Water Quality Improvement Plan for the applicable Watershed Management Area required by Provision B. Until the Copermittee has updated its jurisdictional runoff management program document with the requirements of Provision E, the Copermittee must continue implementing its current jurisdictional runoff management program.

1. Legal Authority Establishment and Enforcement

a. Each Copermittee must establish, maintain, and enforce adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 through statute, ordinance, permit, contract, order, or similar means. This legal authority must, at a minimum, authorize the Copermittee to:

(1) Prohibit and eliminate all illicit discharges and illicit connections to its MS4;

(2) Control the contribution of pollutants in discharges of runoff associated with industrial and construction activity to its MS4 and control the quality of runoff from industrial and construction sites, including industrial and construction sites which have coverage under the statewide General Permit for Discharges of Storm Water Associated with Industrial Activities (Industrial General Permit) or General Permit for Discharges of Storm Water Associated with Construction Activities (Construction General Permit), as well as to those sites which do not;

(3) Control the discharge of spills, dumping, or disposal of materials other than storm water into its MS4;

(4) Control through interagency agreements among Copermittees the contribution of pollutants from one portion MS4 to another portion of the MS4;

(5) Control through interagency agreements with other owners of the MS4 such as Caltrans, the U.S. federal government, or sovereign Native American Tribes, where possible, the contribution of pollutants from one portion of the MS4 to another portion of the MS4;

(6) Require compliance with conditions in its statutes, ordinances, permits, contracts, orders, or similar means to hold dischargers to its MS4 accountable for their contributions of pollutants and flows;

(7) Require the use of BMPs to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(8) Require documentation on the effectiveness of BMPs implemented to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(9) Utilize enforcement mechanisms to require compliance with its statutes, ordinances, permits, contracts, orders, or similar means; and

(10) Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with its statutes, ordinances, permits, contracts, orders, or similar means and with the requirements of this Order, including the prohibition of illicit discharges and connections to its MS4; the Copermittee must also have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from industrial facilities, including construction sites, discharging into its MS4.

b. With the first Annual Report required by Provision F.3.b, each Copermittee must submit a statement certified by its Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative that the Copermittee has taken the necessary steps to obtain and maintain full legal authority within its jurisdiction to implement and enforce each of the requirements contained in this Order.

2. Illicit Discharge Detection and Elimination

Each Copermittee must implement a program to actively detect and eliminate illicit discharges and improper disposal into the MS4, or otherwise require the discharger to apply for and obtain a separate NPDES permit. The illicit discharge detection and elimination program must include, at a minimum, the following requirements:

a. Non-Storm Water Discharges

Each Copermittee must address all non-storm water discharges as illicit discharges, unless a non-storm water discharge is either identified as a discharge authorized by a separate NPDES permit, or identified as a category of

non-storm water discharges or flows that must be addressed pursuant to the following requirements:

(1) Discharges of non-storm water to the MS4 from the following categories must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG919001 (Order No. R9-2007-0034, or subsequent order) for discharges to San Diego Bay, or NPDES Permit No. CAG919002 (Order No. R9-2008-0002, or subsequent order) for discharges to surface waters other than San Diego Bay:

(a) Uncontaminated pumped ground water;

(b) Discharges from foundation drains;

(c) Water from crawl space pumps; and

(d) Water from footing drains.

(2) Discharges of non-storm water from water line flushing and water main breaks to the MS4 must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG 679001 (Order No. R9-2010-0003, or subsequent order). This includes water line flushing and water main break discharges from water purveyors issued a water supply permit by the California Department of Public Health or federal military installations. Discharges from recycled or reclaimed water lines to the MS4 must be addressed as illicit discharges, unless the discharges have coverage under a separate NPDES permit.

(3) Discharges of non-storm water to the MS4 from the following categories must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a source of pollutants to receiving waters:

(a) Diverted stream flows;

(b) Rising ground waters;

(c) Uncontaminated ground water infiltration to MS4s;

(d) Springs;

(e) Flows from riparian habitats and wetlands; and

(f) Discharges from potable water sources.

(4) Discharges of non-storm water to the MS4 from the following categories must be controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means. Discharges of non-storm water to the MS4 from the following categories not controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means must be addressed by the Copermittee as illicit discharges.

(a) Air conditioning condensation

The discharge of air conditioning condensation must be directed to landscaped areas or other pervious surfaces where feasible;

(b) Individual residential vehicle washing

(i) The discharge of wash water must be directed to landscaped areas or other pervious surfaces where feasible, and

(ii) Minimize the use of water for vehicle washing, use as little washing detergent and other vehicle wash products as possible, wash vehicles at commercial wash facilities, and implement other practices or behaviors that will prevent the discharge of pollutants associated with individual residential vehicle washing from entering the MS4; and

(c) Dechlorinated swimming pool discharges

(i) Eliminate residual chlorine, algaecide, filter backwash, or other pollutants from swimming pools prior to discharging to the MS4, and

(ii) The discharge of saline swimming pool water to the MS4 must be directed to the sanitary sewer, landscaped areas, or other pervious surfaces that can accommodate the volume of water.

(5) Firefighting discharges to the MS4 must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a significant source of pollutants to receiving waters. Firefighting discharges to the MS4 not identified as a significant source of pollutants to receiving waters, must be addressed, at a minimum, as follows:

(a) Non-emergency firefighting discharges

(i) Building fire suppression system maintenance discharges (e.g. sprinkler line flushing) to the MS4 must be addressed as illicit discharges.

(ii) Non-emergency firefighting discharges (i.e., discharges from controlled or practice blazes, firefighting training, and maintenance

activities not associated with building fire suppression systems) must be addressed by a program, to be developed and implemented by the Copermittee, to reduce or eliminate pollutants in such discharges from entering the MS4.

(b) Emergency firefighting discharges

Each Copermittee must develop and encourage implementation of BMPs to reduce or eliminate pollutants in emergency firefighting discharges to the MS4s and receiving waters within its jurisdiction. During emergency situations, priority of efforts should be directed toward life, property, and the environment (in descending order). BMPs should not interfere with immediate emergency response operations or impact public health and safety.

(6) If the Copermittee or San Diego Water Board identifies any category of non-storm water discharges listed under Provisions E.2.a.(1)-(4) as a source of pollutants to receiving waters, the category must be prohibited through ordinance, order, or similar means and addressed as an illicit discharge.

b. PREVENT AND DETECT ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to prevent and detect illicit discharges to the MS4:

(1) Each Copermittee must maintain an updated map of its entire MS4 and the corresponding drainage areas. The accuracy of the MS4 map must be confirmed during non-storm water MS4 monitoring events. The MS4 map must be included as part of the jurisdictional runoff management program document. Any geographic information system (GIS) layers or files used by the Copermittee to maintain the MS4 map must be made available to the San Diego Water Board upon request. The MS4 map must identify the following:

(a) All segments of the MS4 owned, operated, and maintained by the Copermittee,

(b) All known locations of inlets that discharge and/or collect runoff into the Copermittee's MS4,

(c) All known locations of connections with other MS4s not owned or operated by the Copermittee (e.g. Caltrans MS4s),

(d) All known locations of MS4 outfalls and private outfalls that discharge runoff collected from areas within the Copermittee's jurisdiction,

(e) All segments of receiving waters within the Copermittee's jurisdiction that receive and convey runoff discharged from the Copermittee's MS4 outfalls

(i.e., receiving water segments that are both a receiving water and part of the MS4), and

(f) Locations of the non-storm water MS4 monitoring stations, identified pursuant to Provision D.1.a.(1)(a), within its jurisdiction;

(2) Each Copermittee must use Copermittee personnel and contractors to assist in identifying and reporting illicit discharges and connections during their daily activities;

(3) Each Copermittee must promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges to or from the MS4. Each Copermittee must facilitate public reporting through development and operation of a public hotline. Public hotlines can be Copermittee-specific or shared by the Copermittees. All public hotlines must be capable of receiving reports in both English and Spanish 24 hours per day and seven days per week;

(4) Each Copermittee must implement practices and procedures (including a notification mechanism) to prevent, respond to, contain, and clean up any spills that may discharge into the MS4 from any source. The Copermittee must coordinate with spill response teams to prevent entry of spills into the MS4, and prevent contamination of surface water, ground water, and soil. The Copermittee must coordinate spill prevention, containment, and response activities throughout all appropriate Copermittee departments, programs, and agencies; and

(5) Each Copermittee must implement practices and procedures to prevent and limit infiltration of seepage from sanitary sewers (including private laterals and failing septic systems) to the MS4.

c. Field Screening And Monitoring

Each Copermittee must conduct field screening and monitoring of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4 in accordance with the jurisdictional non-storm water MS4 monitoring program requirements in Provision D.1.a.(1).

d. Investigate and Eliminate Illicit Discharges And Connections

Each Copermittee must include the following measures within its program to investigate and eliminate illicit discharges to the MS4:

(1) Each Copermittee must prioritize and determine when follow-up investigations will be performed in response to water quality monitoring data collected during an investigation of a detected non-storm water or illicit discharge to or from the MS4. The criteria for follow-up investigations must include the following:

(a) Pollutants identified as causing or contributing to the highest water quality priorities identified in the Water Quality Improvement Plan;

(b) Pollutants identified as causing or contributing, or threatening to cause or contribute to impairments in water bodies on the 303(d) List and/or in environmentally sensitive areas (ESAs), located within its jurisdiction;

(c) Pollutants identified from sources or land uses known to exist within the area, drainage basin, or watershed that discharges to the portion of the MS4 within its jurisdiction included in the investigation;

(d) Pollutants identified as causing or contributing to and exceedance of an NAL described in Provision C.1; and

(e) Pollutants identified as a threat to human health or the environment.

(2) Each Copermittee must implement procedures to investigate and inspect portions of its MS4 that, based on reports or notifications, field screening and monitoring, or other appropriate information, indicate a reasonable potential of receiving, containing, or discharging pollutants due to illicit discharges, illicit connections, or other sources of non-storm water. The procedures must include the following:

(a) Each Copermittee must respond to each report or notification (e.g., public hotline reports, staff or contractor reports and notifications, etc.) of an incident in a timely manner. The Copermittee may develop criteria to assess the validity of, and prioritize the response to, each report or notification received;

(b) Each Copermittee must immediately investigate and seek to identify the source(s) of discharges of non-storm water where flows are observed in and from the MS4 during the field screening and monitoring required pursuant to Provision D.1.a.(1). The investigation must include field investigations to identify sources or potential sources for the discharge, unless the source or potential source has already been identified during previous investigations;

(c) Each Copermittee must investigate and seek to identify the source(s) of non-storm water discharges from the MS4 where there is evidence of non-storm water having been discharged into or from the MS4 (e.g., pooled

water). The investigation may include field investigations, reviewing Copermittee inventories, and other land use data to identify potential sources of the discharge; and

(d) Each Copermittee must maintain records and a database of the investigations, including the following information:

(i) Location of incident, including hydrologic subarea, portion of MS4 receiving the non-storm water or illicit discharge, and point of discharge or potential discharge from MS4 to receiving water,

(ii) Source of information initiating the investigation (e.g., public hotline reports, staff or contractor reports and notifications, monitoring data, etc.),

(iii) Date the information used to initiate the investigation was received,

(iv) Date the investigation was initiated,

(v) Dates of follow-up investigations,

(vi) Identified or suspected source of the illicit discharge or connection, if determined,

(vii) Known or suspected related incidents, if any,

(viii) Result of the investigation, and

(ix) If a source cannot be identified and the investigation is not continued, a rationale for why a discharge does not pose a threat to water quality and/or does not require additional investigation.

(3) Each Copermittee must initiate the implementation of procedures, in a timely manner, to eliminate all detected and identified illicit discharges and connections within its jurisdiction. The procedures must include the following:

(a) Each Copermittee must enforce its legal authority, as required under Provision E.1, to eliminate illicit discharges and connections to its MS4. If the Copermittee identifies the source as a controllable source of non-storm water or illicit discharge or connection, the Copermittee must implement its Enforcement Response Plan pursuant to Provision E.6 and enforce its legal authority to prohibit and eliminate illicit discharges and connections to its MS4;

(b) If the Copermittee identifies the source of the discharge as a category of non-storm water discharges in Provision E.2.a, and the discharge to or from the MS4 is in exceedance of NALs developed under Provision C.1, then the Copermittees must determine if this is an isolated incident or set of circumstances, or if the category of discharge must be addressed through the prohibition of that category of discharge as an illicit discharge pursuant to Provision E.2.a.(6);

(c) If the Copermittee suspects the source of the non-storm water discharge as natural in origin (i.e. non-anthropogenically influenced) and in conveyance into the MS4, then the Copermittee must collect the data and evidence necessary to demonstrate to the San Diego Water Board that it is natural in origin; and

(d) If the Copermittee is unable to identify and document the source of a recurring non-storm water discharge to or from the MS4, then the Copermittee must address the discharge as an illicit discharge and update its jurisdictional runoff management program to address the common and suspected sources of the non-storm water discharge within its jurisdiction in accordance with the Copermittee's priorities.

(4) Each Copermittee must submit a summary of the non-storm water discharges and illicit discharges and connections investigated and eliminated within its jurisdiction with each Annual Report required under Provision F.3.b of this Order.

3. Development Planning

Each Copermittee must use their land use/planning authorities to implement a development planning program that includes, at a minimum, the following requirements.

a. Permanent BMP Requirements for All Development Projects

Each Copermittee must prescribe the following BMP requirements during the planning process (i.e. prior to project approval and issuance of grading or building permits) for all development projects (regardless of project type or size), where local permits are issued, including unpaved roads and flood management projects:

(1) General Requirements

(a) All BMPs must be located so as to remove pollutants from runoff prior to its discharge to any receiving waters, and as close to the source as possible;

(b) Multiple development projects may use shared permanent BMPs as long as construction of any shared BMP is completed prior to the use or occupation of any development project from which the BMP will receive runoff; and

(c) Permanent BMPs must not be constructed within a waters of the U.S. or waters of the state.

(2) Source Control BMP Requirements

The following source control BMPs must be implemented at all development projects where applicable and feasible:

(a) Prevention of illicit discharges into the MS4;

(b) Storm drain system stenciling or signage;

(c) Properly designed outdoor material storage areas;

(d) Properly designed outdoor work areas;

(e) Properly designed trash storage areas; and

(f) Any additional BMPs necessary to minimize pollutant generation at each project.

(3) Low Impact Development (LID) BMP Requirements

The following LID BMPs must be implemented at all development projects where applicable and feasible:

(a) Maintenance or restoration of natural storage reservoirs and drainage corridors (including topographic depressions, areas of permeable soils, natural swales, and ephemeral and intermittent streams);[14]

(b) Buffer zones for natural water bodies (where buffer zones are technically infeasible, require project applicant to include other buffers such as trees, access restrictions, etc.);

(c) Conservation of natural areas within the project footprint including existing trees, other vegetation, and soils;

(d) Construction of streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided public safety is not compromised;

(e) Minimization of the impervious footprint of the project;

(f) Minimization of soil compaction to landscaped areas;

(g) Disconnection of impervious surfaces through distributed pervious areas;

[14] Development projects proposing to dredge or fill materials in waters of the U.S. must obtain a CWA Section 401 Water Quality Certification. Projects proposing to dredge or fill waters of the State must obtain Waste Discharge Requirements.

(h) Landscaped or other pervious areas designed and constructed to effectively receive and infiltrate, retain and/or treat runoff from impervious areas, prior to discharge to the MS4;

(i) Small collection strategies located at, or as close as possible to, the source (i.e. the point where storm water initially meets the ground) to minimize the transport of runoff and pollutants to receiving waters;

(j) Use of permeable materials for projects with low traffic areas and appropriate soil conditions;

(k) Landscaping with native or drought tolerant species; and

(l) Harvesting and using precipitation.

(4) Long-Term Permanent BMP Maintenance

Each Copermittee must require the project applicant to submit proof of the mechanism under which ongoing long-term maintenance of all permanent BMPs will be conducted.

(5) Infiltration and Groundwater Protection

(a) Infiltration and treatment control BMPs designed to primarily function as large, centralized infiltration devices (such as large infiltration trenches and infiltration basins) must not cause or contribute to an exceedance of an applicable groundwater quality objective. At a minimum, such infiltration and treatment control BMPs must be in conformance with the design criteria listed below, unless the development project applicant demonstrates to the Copermittee that one or more of the specific design criteria listed below are not necessary to protect groundwater quality. The design criteria listed below do not apply to small infiltration systems dispersed throughout a development project.

(i) Runoff must undergo pretreatment such as sedimentation or filtration prior to infiltration;

(ii) Pollution prevention and source control BMPs must be implemented at a level appropriate to protect groundwater quality at sites where infiltration treatment control BMPs are to be used;

(iii) Infiltration treatment control BMPs must be adequately maintained to remove pollutants in storm water to the MEP;

(iv) The vertical distance from the base of any infiltration treatment control BMP to the seasonal high groundwater mark must be at least 10 feet. Where groundwater basins do not support beneficial uses, this vertical distance criteria may be reduced, provided groundwater quality is maintained;

(v) The soil through which infiltration is to occur must have physical and chemical characteristics (e.g., appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses;

(vi) Infiltration treatment control BMPs must not be used for areas of industrial or light industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee, unless first treated or filtered to remove pollutants prior to infiltration; and

(vii) Infiltration treatment control BMPs must be located a minimum of 100 feet horizontally from any water supply wells.

(b) The Copermittees may collectively or individually develop alternative mandatory design criteria to that listed above for infiltration and treatment control BMPs which are designed to primarily function as centralized infiltration devices. Before implementing the alternative design criteria in the development planning process the Copermitee(s) must:

(i) Notify the San Diego Water Board of the intent to implement the alternative design criteria submitted; and

(ii) Comply with any conditions set by the San Diego Water Board.

b. PRIORITY DEVELOPMENT PROJECTS

(1) Definition of Priority Development Project

Priority Development Projects include the following:

(a) All new development projects that fall under the Priority Development Project categories listed under Provision E.3.b.(2). Where a new development project feature, such as a parking lot, falls into a Priority Development Project category, the entire project footprint is subject to Priority Development Project requirements; and

(b) Those redevelopment projects that create, add, or replace at least 5,000 square feet of impervious surfaces on an already developed site, or the redevelopment project is a Priority Development Project category listed under Provision E.3.b.(2). Where redevelopment results in an increase of less than fifty percent of the impervious surfaces of a previously existing development, and the existing development was not subject to Priority Development Project requirements, the performance and sizing requirements discussed in Provisions E.3.c.(2) and E.3.c.(3) apply only to the addition or replacement, and not to the entire development. Where

redevelopment results in an increase of more than fifty percent of the impervious surfaces of a previously existing development, the performance and sizing requirements apply to the entire development.

(2) Priority Development Project Categories

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This category includes commercial, industrial, residential, mixed-use, and public development projects on public or private land which fall under the planning and building authority of the Copermittee.

(b) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

(c) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812), where the land area for development is 5,000 square feet or more.

(d) Hillside development projects. This category includes any development which creates 5,000 square feet or more of impervious surface which is located in an area with known erosive soil conditions, where the development will grade on any natural slope that is twenty-five percent or greater.

(e) Environmentally sensitive areas (ESAs). This category includes any development located within, directly adjacent to, or discharging directly to an ESA, which either creates 2,500 square feet of impervious surface on a proposed project site or increases the area of imperviousness of a proposed project site to 10 percent or more of its naturally occurring condition. “Directly adjacent to” means situated within 200 feet of the ESA. “Discharging directly to” means outflow from a drainage conveyance system that collects runoff from the subject development or redevelopment site and terminates at or in receiving waters within the ESA.

(f) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce that has 5,000 square feet or more of impervious surface.

(g) Streets, roads, highways, freeways, and residential driveways. This category is defined as any paved impervious surface that is 5,000 square feet or more used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

(h) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

(i) Large development projects. This category includes any post-construction pollutant-generating new development projects that result in the disturbance of one acre or more of land.

(3) Priority Development Project Exemptions

Each Copermittee has the discretion to exempt the following projects from being defined as Priority Development Projects:

(a) Sidewalks constructed as part of new streets or roads and designed to direct storm water runoff to adjacent vegetated areas;

(b) Bicycle lanes that are constructed as part of new streets or roads but are not hydraulically connected to the new streets or roads and designed to direct storm water runoff to adjacent vegetated areas;

(c) Impervious trails constructed and designed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas;

(d) Sidewalks, bicycle lanes, or trails constructed with permeable surfaces.

c. Priority Development Project Permanent BMP Performance and Sizing Requirements

In addition to the BMP requirements listed for all development projects under Provision E.3.a, Priority Development Projects must also implement permanent BMPs that conform to performance and sizing requirements.

(1) Source Control BMP Requirements

Each Copermittee must require each Priority Development Project to implement applicable source control BMPs listed under Provision E.3.a.(2).

(2) Retention and Treatment Control BMP Requirements

Each Copermittee must require each Priority Development Project to implement BMPs to retain and treat pollutants onsite in the following order:

(a) Each Priority Development Project must be required to implement LID BMPs as described in Provision E.3.a.(3);

(b) Each Priority Development Project must be required to implement LID BMPs that are sized and designed to retain the volume equivalent to runoff produced from a 24-hour 85th percentile storm event[15] ("design capture volume");

(c) If onsite retention using LID BMPs is technically infeasible per Provision E.3.c.(4), flow-thru LID and/or conventional treatment control BMPs must be implemented to treat the portion of the design capture volume that is not retained onsite. Flow-thru LID treatment control BMPs must be designed for an appropriate surface loading rate to prevent erosion, scour and channeling within the BMP. Additionally, project applicants must perform mitigation for the portion of the pollutant load in the design capture volume that is not retained onsite, as described in Provision E.3.c.(4)(c).

(d) All onsite treatment control BMPs must:

(i) Be correctly sized and designed so as to remove pollutants from storm water to the MEP;

(ii) Be sized to comply with the following numeric sizing criteria:

[a] Volume-based treatment control BMPs must be designed to mitigate (infiltrate, filter, or treat) the remaining portion of the design capture volume that was not retained onsite; or

[b] Flow-based treatment control BMPs must be designed to mitigate (filter or treat) either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event; or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two.

(iii) Be ranked with high or medium pollutant removal efficiency for the project's most significant pollutants of concern. Treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted

[15] This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals.

which exhibits that implementation of treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

(3) Hydromodification Management BMP Requirements

Each Copermittee must require each Priority Development Project to implement hydromodification management BMPs so that:

(a) Post-project runoff flow rates and durations do not exceed pre-development (naturally occurring) runoff flow rates and durations by more than 10 percent (for the range of flows that result in increased potential for erosion or degraded channel conditions downstream of Priority Development Projects).

(i) In evaluating the range of flows that results in increased potential for erosion of natural (non-hardened) channels, the lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks.

(ii) For artificially hardened channels, analysis to identify the lower boundary must use characteristics of a natural stream segment similar to that found in the watershed. The lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or erodes the toe of the channel banks.

(iii) The Copermittees may use monitoring results pursuant to Provision D.2.b.(6) to re-define the range of flows resulting in increased potential for erosion or degraded channel conditions, as warranted by the data.

(b) Post-project runoff flow rates and durations must compensate for the loss of sediment supply due to the development project, should loss of sediment supply occur as a result of the development project.

(c) If hydromodification management BMPs are technically infeasible per Provision E.3.c.(4), project applicants must perform mitigation for the portion of the runoff volume that is not controlled and will cause or contribute to increased potential for erosion of receiving waters downstream of the Priority Development Project, as described in Provision E.3.c.(4)(c).

(d) Exemptions

Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP requirements where the project:

(i) Discharges storm water runoff into underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;

(ii) Discharges storm water runoff into conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; or

(iii) Discharges storm water runoff into other areas identified by the San Diego Water Board as exempt from the requirements of Provisions E.3.c.(3)(a)-(c).

(4) Alternative Compliance for Technical Infeasibility

At the discretion of each Copermittee, alternative compliance may be allowed for certain Priority Development Projects to comply with Provisions E.3.c.(2) and E.3.c.(3), subject to the following requirements:

(a) Applicability

Priority Development Projects may be allowed alternative compliance if:

(i) The Copermittee reviews and approves site-specific hydrologic and/or design analysis performed by a registered professional engineer, geologist, architect, or landscape architect;

(ii) The project applicant demonstrates, and the Copermittee determines and documents, that retention LID and/or hydromodification management BMPs per Provisions E.3.c.(2) and E.3.c.(3) were incorporated into the project design to the maximum extent technically feasible given the project site conditions;

(iii) The project applicant is required to perform mitigation described in Provision E.3.c.(4)(c) with a net result of at least the same level of water quality protection as would have been achieved if the Priority Development Project had fully implemented the retention LID and hydromodification management BMP requirements under Provisions E.3.c.(2) and E.3.c.(3) onsite.

(b) Criteria For Technical Infeasibility

Each Copermittee must develop, or develop in collaboration with the other Copermittees, criteria to determine technical infeasibility for fully

implementing the retention LID and hydromodification management BMP requirements under Provisions E.3.c.(2) and E.3.c.(3) and include these requirements in the Permanent BMP Sizing Criteria Design Manual pursuant to Provision E.3.d. Technical infeasibility may result from conditions including, but not limited to:

(i) Locations that cannot meet the infiltration and groundwater protection requirements in Provision E.3.a.(5) due to the presence of shallow bedrock, contaminated soils, near surface groundwater, underground facilities, or utilities;

(ii) Brownfield development sites or other locations where pollutant mobilization is a documented concern;

(iii) The design of the site precludes the use of soil amendments, plantings of vegetation, or other designs that can be used to infiltrate and evapotranspirate runoff;

(iv) Soils cannot be sufficiently amended to provide for the requisite infiltration rates;

(v) Locations with geotechnical hazards;

(vi) Insufficient onsite and/or offsite demand for storm water use;

(vii) Modifications to an existing building to manage storm water are not feasible due to structural or plumbing constraints; and

(viii) Smart growth and infill or redevelopment locations where the density and/or nature of the project would create significant difficulty for compliance with Provisions E.3.c.(2) and E.3.c.(3) onsite.

(c) Mitigation

Priority Development Projects that meet the Copermittee's technical infeasibility criteria developed pursuant to Provision E.3.c.(4)(b) must be required to mitigate for the increased flow rates, increased flow durations, and/or increased pollutant loads expected to be discharged from the site. For the pollutant load in the volume of storm water not retained onsite with retention LID BMPs, or increased potential erosion of downstream receiving waters not fully controlled onsite with hydromodification management BMPs, the Copermittee must require the project applicant to either 1) implement an offsite mitigation project, and/or 2) provide sufficient funding for a public or private offsite mitigation project via a mitigation fund.

(i) *Mitigation Project Locations*

Offsite mitigation projects must be implemented within the same hydrologic unit as the Priority Development Project, and preferably within the same hydrologic subarea. Mitigation projects outside of

the hydrologic subarea but within the same hydrologic unit may be approved provided that the project applicant demonstrates that mitigation projects within the same hydrologic subarea are infeasible and that the mitigation project will address similar potential impacts expected from the Priority Development Project.

(ii) *Mitigation Project Types*

Offsite mitigation projects must include, where applicable and feasible, retrofitting opportunities and stream and/or habitat rehabilitation or restoration opportunities identified in the Water Quality Improvement Plans, identified pursuant to Provision B.3.a. Other offsite mitigation projects may include green streets or infrastructure projects, or regional BMPs upstream of receiving waters. In-stream rehabilitation or restoration measures to protect or prevent adverse physical changes to creek bed and banks must not include the use of non-naturally occurring hardscape material such as concrete, riprap, or gabions. Project applicants seeking to utilize these alternative compliance provisions may propose other offsite mitigation projects, which the Copermittees may approve if they meet the requirements of Provision E.3.c.(4)(a).

(iii) *Mitigation Project Timing*

The Copermittee and/or project applicant must develop a schedule for the completion of offsite mitigation projects, including milestone dates to identify, fund, design, and construct the projects. Offsite mitigation projects must be completed upon the granting of occupancy for the first project that contributed funds toward the offsite mitigation project, unless a longer period is authorized by the San Diego Water Board.

(iv) *Mitigation Fund*

A Copermittee may choose to implement additional mitigation programs (e.g., pollutant credit system, mitigation fund) as a means for developing and implementing offsite mitigation projects, provided the projects conform to the requirements for project locations, types, and timing described above.

d. UPDATE PERMANENT BMP SIZING CRITERIA DESIGN MANUAL (BMP DESIGN MANUAL)

Each Copermittee must update its Permanent BMP Sizing Criteria Design Manual (BMP Design Manual)[16] pursuant to Provision F.2.b or Provision F.5.a. Until the Copermittee has updated its BMP Design Manual with the requirements of Provision E.3.c, the Copermittee must continue implementing its current BMP Design Manual. Unless directed otherwise by the San Diego Water Board, the

[16] The Permanent BMP Sizing Criteria Design Manual was formerly known as the Standard Storm Water Mitigation Plan under Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016.

Copermittee must implement the BMP Design Manual within 180 days of completing the update. The update of the BMP Design Manual must include the following:

(1) Updated procedures to determine the nature and extent of storm water requirements applicable to a potential development or redevelopment project. These procedures must inform project applicants of the storm water management requirements applicable to their project including, but not limited to, general requirements for all development projects, LID and conventional BMP design procedures and requirements, hydromodification management requirements, requirements specific to phased projects, and procedures specific to private developments and public improvement projects;

(2) Updated procedures to identify pollutants and conditions of concern for selecting the most appropriate permanent BMPs that consider, at a minimum, the following:

(a) Receiving water quality (including pollutants for which receiving waters are listed as impaired under CWA section 303(d));

(b) Priority pollutants or receiving water conditions contributing to the highest water quality priorities identified in the Water Quality Improvement Plan;

(c) Land use type of the project and pollutants associated with that land use type; and

(d) Pollutants expected to be present onsite.

(3) Updated procedures for designing permanent BMPs, including any updated performance and sizing requirements to be consistent with the requirements of Provision E.3.c for all BMPs listed in the BMP Design Manual;

(4) Long-term maintenance criteria for each BMP listed in the BMP Design Manual; and

(5) Criteria and mitigation requirements, in accordance with the requirements under Provision E.3.c.(4), if the Copermittee elects to allow alternative compliance for technical infeasibility within its jurisdiction.

e. PRIORITY DEVELOPMENT PROJECT BMP IMPLEMENTATION AND OVERSIGHT

Each Copermittee must implement a program to ensure permanent BMPs on all Priority Development Projects are designed, constructed, and maintained to remove pollutants in storm water to the MEP.

(1) Permanent BMP Approval and Verification Process

(a) Each Copermittee must ensure that for all Priority Development Project applications that have not received prior lawful approval by the Copermittee by 12 months after the adoption of this Order, or pursuant to Provision F.5.a, the requirements of Provision E.3 are implemented. For project applications that have received prior lawful approval by 12 months after the adoption of this Order, or pursuant to Provision F.5.a, the Copermittee may allow previous land development requirements to apply.

(b) Each Copermittee must identify the roles and responsibilities of various municipal departments in implementing the permanent BMP requirements, including each stage of a project from application review and approval through BMP maintenance and inspections.

(c) Each Copermittee must ensure that appropriate easements and ownerships are properly recorded in public records and the information is conveyed to all appropriate parties when there is a change in project or site ownership.

(d) Each Copermittee must ensure that prior to occupancy and/or intended use of any portion of the Priority Development Project, each permanent BMP must be inspected to verify that they have been constructed and are operating in compliance with all of its specifications, plans, permits, ordinances, and the requirements of this Order.

(2) Priority Development Project Inventory and Prioritization

(a) Each Copermittee must develop and continuously maintain a watershed-based database to track and inventory all Priority Development Projects and associated permanent BMPs. Inventories must be accurate and complete beginning from January 2002 for the San Diego County Copermittees, February 2003 for the Orange County Copermittees, and July 2005 for the Riverside County Copermittees. The database must include, at a minimum, the following information:

(i) Priority Development Project location (address and hydrologic subarea);

(ii) Descriptions of BMP type(s);

(iii) Date(s) of construction;

(iv) Party responsible for permanent BMP maintenance;

(v) Dates and findings of permanent BMP maintenance verifications; and

(vi) Corrective actions and/or resolutions.

(b) Each Copermittee must prioritize the Priority Development Projects with permanent BMPs within its jurisdiction. The designation of Priority Development Projects as high priority must consider the following:

(i) The highest water quality priorities identified in the Water Quality Improvement Plan;

(ii) Receiving water quality;

(iii) Number and sizes of permanent BMPs;

(iv) Recommended maintenance frequency of permanent BMPs;

(v) Likelihood of operation and maintenance issues of permanent BMPs;

(vi) Land use and expected pollutants generated; and

(vii) Compliance record.

(3) Permanent BMP Maintenance Verifications and Inspections

Each Copermittee is required to verify that permanent BMPs on each Priority Development Project are adequately maintained, and continue to operate effectively to remove pollutants in storm water to the MEP through inspections, self-certifications, surveys, or other equally effective approaches.

(a) All (100 percent) of the permanent BMPs at Priority Development Projects that are designated as high priority must be inspected directly by the Copermittee annually prior to each rainy season;

(b) For verifications performed through a means other than direct Copermittee inspection, adequate documentation must be required by the Copermittee to provide assurance that the required maintenance of permanent BMPs at each Priority Development Project has been completed; and

(c) Appropriate follow-up measures (including re-inspections, enforcement, etc.) must be conducted to ensure that permanent BMPs at each Priority Development Project continue to reduce pollutants in storm water to the MEP as originally designed.

f. DEVELOPMENT PROJECT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all development projects, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

4. Construction Management

Each Copermittee must implement a construction management program that includes, at a minimum, the following requirements:

a. Project Approval Process

Prior to approval and issuance of any construction, grading, or building permits for a project each Copermittee must:

(1) Require a project-specific storm water pollution prevention plan (SWPPP), or equivalent construction BMP or erosion control plan, to be submitted by the project applicant for the Copermittee's approval;

(2) Ensure the SWPPP, or equivalent construction BMP or erosion control plan, complies with the local grading ordinance, other applicable local ordinances, and the requirements of this Order;

(3) Ensure the SWPPP, or equivalent construction BMP or erosion control plan, includes seasonally appropriate and effective BMPs and management measures described in Provision E.4.c, as applicable to the project; and

(4) Verify that the project applicant has obtained coverage under applicable permits, including, but not limited to the Construction General Permit, Clean Water Act Section 401 Water Quality Certification and Section 404 Permit, and California Department of Fish and Game Streambed Alteration Agreement.

b. Construction Site Inventory and Tracking

(1) Each Copermittee must maintain, and update at least monthly, a watershed-based inventory of all construction sites requiring construction, grading, or building permits within its jurisdiction. The inventory must include:

(a) Relevant contact information for each site (e.g., name, address, phone, and email for the owner and contractor);

(b) The basic site information including location (address and hydrologic subarea), Waste Discharge Identification (WDID) number (if applicable), size of the site, and approximate area of disturbance;

(c) Whether or not the site is considered a high threat to water quality, as defined in Provision E.4.b.(2) below;

(d) The project start and anticipated completion dates;

(e) Current construction phase;

(f) The required inspection frequency, as defined in the Copermittee's jurisdictional runoff management program document;

(g) The date the Copermittee approved the project-specific SWPPP, or equivalent construction BMP or erosion control plan; and

(h) Whether or not there are ongoing enforcement actions administered to the site.

(2) Each Copermittee must identify all construction sites within its jurisdiction that represent a high threat to downstream surface water quality. At a minimum, high threat to water quality sites must include:

(a) Sites located within a hydrologic subarea where sediment is known or suspected to contribute to the highest water quality priorities identified in the Water Quality Improvement Plan;

(b) Sites located within the same hydrologic subarea and tributary to a CWA section 303(d) water body segment impaired for sediment;

(c) Sites located within, directly adjacent to, or discharging directly to a receiving water within an ESA; and

(d) Other sites determined by the Copermittees or the San Diego Water Board as a high threat to water quality.

c. Construction Site BMP and Management Measure Implementation

Each Copermittee must implement, or require the implementation of effective BMPs to reduce discharges of pollutants in storm water from construction sites to the MEP, and prevent non-storm water discharges into the MS4. These BMPs must be site specific, seasonally appropriate, and construction phase appropriate. BMPs and management measures must be implemented at each construction site year round. Dry season BMP implementation must plan for and address unseasonal rain events that may occur during the dry season (May 1 through September 30). Copermittees must implement, or require the implementation of, BMPs and management measures in the following categories:

(1) Project Planning;

(2) Good Site Management "Housekeeping", including waste management;

(3) Non-storm Water Management;

(4) Erosion Control;

(5) Sediment Control;

(6) Run-on and Run-off Control; and

(7) Active/Passive Sediment Treatment Systems, where applicable.

d. CONSTRUCTION SITE INSPECTIONS

Each Copermittee must conduct construction site inspections to ensure compliance with its permits and applicable local ordinances, and the requirements of this Order. Priority for site inspections must consider threat to water quality pursuant to Provision E.4.b as well as the nature of the construction activity, topography, and the characteristics of soils and receiving water quality.

(1) Inspection Frequency

(a) Each Copermittee must conduct inspections at all inventoried sites, including high threat to water quality sites, at an appropriate frequency for each phase of construction to ensure the site reduces the discharge of pollutants in storm water from construction sites to the MEP, and prevents non-storm water discharges from entering the MS4.

(b) Each Copermittee must establish appropriate inspection frequencies for high threat to water quality sites, and all other sites, for each phase of construction. Inspection frequencies appropriate for addressing the highest water quality priorities identified in the Water Quality Improvement Plan, and for complying with the requirements of this Order must be identified in each Copermittee's jurisdictional runoff management program document.

(c) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e., re-inspection, enforcement) necessary to ensure site compliance with its permits and applicable local ordinances, and the requirements of this Order.

(2) Inspection Content

Inspections of construction sites by the Copermittee must include, at a minimum:

(a) Verification of coverage under the Construction General Permit (Notice of Intent (NOI) and/or WDID number) during initial inspections, when applicable;

(b) Assessment of compliance with its permits and applicable local ordinances related to pollution prevention, including the implementation and maintenance of applicable BMPs;

(c) Assessment of BMP adequacy and effectiveness;

(d) Visual observations of actual non-storm water discharges;

(e) Visual observations of actual or potential discharge of sediment and/or construction related materials from the site;

(f) Visual observations of actual or potential illicit connections; and

(g) If any violations are found and BMP enhancements are needed, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried construction sites. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Site name, location (address and hydrologic subarea), and WDID number (if applicable);

(b) Inspection date;

(c) Weather conditions during inspection;

(d) Approximate amount of rainfall since last inspection;

(e) Description and photo documentation of problems observed with BMPs and indication of need for BMP addition/repair/replacement and any scheduled re-inspection, and date of re-inspection;

(f) Descriptions of any other specific inspection comments which must, at a minimum, include rationales for longer compliance time.;

(g) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(h) Resolution of problems noted and date problems fixed.

e. CONSTRUCTION SITE ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried construction sites, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

5. Existing Development Management

Each Copermittee must implement an existing development management program that includes, at a minimum, the following requirements:

a. EXISTING DEVELOPMENT INVENTORY AND TRACKING

Each Copermittee must maintain an updated watershed-based inventory of all its existing development that may potentially generate a pollutant load to and from the MS4. The use of an automated database system, such as GIS, is highly recommended. The inventory must, at a minimum, include:

(1) Name, location (address and hydrological subarea) of each facility, area, and/or activity;

(2) A description of the facility, area, and/or activity, including classification as municipal, commercial, industrial, or residential;

(3) The following municipal facilities:

(a) Flood management and flood control devices and structures,

(b) Operating or closed municipal landfills,

(c) Publicly owned treatment works (including water and wastewater treatment plants) and sanitary sewer collection systems,

(d) Corporate yards, including maintenance and storage yards for materials, waste, equipment, and vehicles,

(e) Hazardous waste collection facilities, and

(f) Other treatment, storage or disposal facilities for municipal waste;

(4) Identification if a business is a mobile business;

(5) SIC Code, if applicable;

(6) Industrial General Permit NOI and/or WDID number, if applicable;

(7) Identification if an area is a Common Interest Area (CIA) / Home Owner Association (HOA), or mobile home park;

(8) Identification of pollutants generated and potentially generated by the facility, area, and/or activity;

(9) Status of facility, area, and/or activity as active or inactive;

(10) Whether the facility, area, and/or activity is adjacent to an ESA;

(11) Whether the facility, area, and/or activity is tributary to and within the same hydrologic subarea as a CWA section 303(d) water body segment and generates pollutants for which the water body segment is impaired;

(12) Whether the facility, area, and/or activity contributes or potentially contributes to the highest water quality priorities identified in the Water Quality Improvement Plan; and

(13) A continually updated map showing the location of inventoried existing development, watershed boundaries, water bodies, and pollutants generated at the inventoried existing development.

b. RETROFITTING AND CHANNEL REHABILITATION IN AREAS OF EXISTING DEVELOPMENT

Each Copermittee must develop and implement a program to retrofit areas of existing development to reduce the discharge of pollutants in storm water from the MS4 to the MEP and effectively prohibit non-storm water discharges into its MS4, and rehabilitate channels to restore impaired beneficial uses of streams within its jurisdiction.

(1) Each Copermittee must identify areas of existing development as candidates for retrofitting, and channels in areas of existing development as candidates for rehabilitation within its jurisdiction. Areas of existing development must be selected based on a likelihood that retrofitting and channel rehabilitation will address the highest water quality priorities identified in the Water Quality Improvement Plan prepared pursuant to Provision B.

(2) Each Copermittee must evaluate and rank the areas of existing development identified pursuant to Provisions E.5.a and E.5.b.(1) for retrofitting and channel rehabilitation. The evaluation must include an assessment of those areas where pollutant removal from storm water and effective prohibition of non-storm water discharges through retrofitting existing development will provide the most benefit to water quality. The evaluation must also include an assessment of the channels within its jurisdiction where channel rehabilitation will improve beneficial uses of streams within the Copermittee's jurisdiction. Data collected during the implementation of the Water Quality Improvement Plan must be used to inform each area assessment and rank determination.

(3) Each Copermittee must implement retrofit and channel rehabilitation projects that address the highest water quality priorities identified in the Water Quality Improvement Plan pursuant to Provision B.3.a. The Copermittee must encourage private landowners to implement retrofit and channel rehabilitation projects whenever practical. Private landowners should be encouraged through the Copermittee's use of subsidies, penalties, or other incentives.

(4) Each Copermittee must evaluate the flood management and flood control devices and structures in its inventory to determine if it is feasible to retrofit the device or structure, to provide additional pollutant removal from storm water. A Copermittee must consider the highest water quality priorities identified in their Water Quality Improvement Plan as part of each assessment.

(5) Where retrofitting and channel rehabilitation within specific areas of existing development are determined to be infeasible to restore and protect receiving waters from the highest water quality priorities identified in the Water Quality Improvement Plan, each Copermittee must identify, develop, and implement regional retrofitting and channel rehabilitation projects (i.e. projects that can receive and/or treat storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment) adjacent to and/or downstream of the areas of existing development. The Copermittees may collaborate and cooperate with each other to develop regional retrofitting and channel rehabilitation projects. The Copermittees are also encouraged to partner with existing efforts in other Watershed Management Areas, and the Integrated Regional Water Management (IRWM) Groups in San Diego County, South Orange County, and Southwest Riverside County.

c. EXISTING DEVELOPMENT BMP IMPLEMENTATION AND MAINTENANCE

(1) Pollution Prevention

Each Copermittee must require the use of pollution prevention methods by the inventoried existing development.

(2) Designate BMPs

Each Copermittee must designate a minimum set of BMPs required for all inventoried existing development, including special event venues, that have the potential to generate pollutants. The designated minimum BMPs must be specific to facility types and pollutant-generating activities, as appropriate.

(3) BMP Implementation

Each Copermittee must implement, or require the implementation of, designated BMPs at inventoried existing development that have the potential to generate pollutants. A Copermittee must require additional pollution prevention measures and enhanced BMPs at inventoried existing development that discharges pollutants identified as contributing to the highest water quality priorities in the Water Quality Improvement Plan.

(4) BMP Operation and Maintenance

Each Copermittee must operate and maintain, or require the operation and maintenance of designated BMPs at all inventoried existing development.

(a) Each Copermittee must implement a schedule of operation and maintenance activities for its MS4 and related structures (including but not limited to catch basins, storm drain inlets, detention basins, etc.), and verify proper operation of all its municipal structural treatment controls designed to reduce pollutants (including floatables) in storm water discharges to or from its MS4s and related drainage structures.

(b) Each Copermittee must implement procedures during the operation and maintenance of public streets, unpaved roads, paved roads, and paved highways and freeways that will reduce the contribution of storm water pollutants to the MEP and effectively prohibit non-storm water pollutants from the MS4 to receiving water bodies. During maintenance of unpaved roads, each Copermittee must examine the feasibility of replacing existing culverts or designing new culverts/bridge crossings to maintain natural stream geomorphology.

(c) Each Copermittee must implement controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers. Copermittees that operate both a municipal sanitary sewer system and a MS4 must implement controls and measures to prevent and eliminate seeping sewage from infiltrating the MS4. Copermittees that do not operate both a municipal sanitary sewer system and a MS4 must keep themselves informed of relevant and appropriate maintenance activities and sanitary sewage projects in their jurisdiction that may cause or contribute to seepage of sewage into the MS4.

(5) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must implement procedures, or require the implementation of procedures, to reduce the contribution of pollutants in storm water to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from inventoried existing development into and from the MS4s. The Copermittee must require additional pollution prevention measures and enhanced BMPs at inventoried existing development that discharges pesticides, herbicides, or fertilizers identified as contributing to the highest water quality priorities in the Water Quality Improvement Plan. Such BMPs must include, as appropriate educational activities, permits, certifications and other measures for applicators and distributors.

d. EXISTING DEVELOPMENT INSPECTIONS

Each Copermittee must conduct inspections of inventoried existing development to ensure compliance with applicable local ordinances and permits, and the requirements of this Order.

(1) Inspection Frequency

(a) Each Copermittee must establish appropriate inspection frequencies for inventoried existing development based on the priorities set forth in the Water Quality Improvement Plan, and the potential for discharging pollutants via storm water and non-storm water runoff. At a minimum, inventoried existing development must be inspected once every five years. Inventoried existing development must also be inspected within six months of any change in property ownership or change in pollutant generating activity. The frequency of inspection at inventoried existing development must be appropriate to ensure that applied BMPs are sufficient to reduce the discharge of pollutants in storm water from the MS4 to the MEP and effectively prohibit non-storm water discharges to the MS4.

(b) Inventoried existing development must be inspected, as needed, in response to valid public complaints and findings from the Copermittee's municipal and contract staff inspections.

(c) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e. re-inspection, enforcement) necessary to ensure compliance with its applicable local ordinances and permits, the most current jurisdictional runoff management program document, the Water Quality Improvement Plan, and the requirements of this Order.

(2) Inspection Content

Inspections of existing development by the Copermittee must include, at a minimum:

(a) Assessment of compliance with its applicable local ordinances and permits related to non-storm water and storm water discharges and runoff;

(b) Assessment of the implementation, maintenance and effectiveness of the designated minimum and/or enhanced BMPs;

(c) Verification of coverage under the Industrial General Permit (NOI and/or WDID number), when applicable;

(d) Visual observations of actual non-storm water discharges;

(e) Visual observations of actual or potential discharge of pollutants;

(f) Visual observations of actual or potential illicit connections; and

(g) If any violations are found and BMP enhancements are needed, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried existing development. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must be sufficiently detailed in order to determine compliance with the requirements of this Order and any progress made towards addressing the highest water quality priorities identified in the Water Quality Improvement Plan. Inspection records must include, at a minimum:

(a) Existing development name and location (address and hydrologic subarea);

(b) Inspection and re-inspection date(s);

(c) Weather conditions during inspection;

(d) Description and photo documentation of problems observed with BMPs and indication of need for BMP addition/repair/replacement and any scheduled re-inspection, and date of re-inspection;

(e) Description of actions to reduce pollutants in storm water runoff to the MEP and actions to effectively prohibit non-storm discharges into the MS4 at the inventoried existing development;

(f) Photo documentation of observed actions or BMPs to reduce pollutants in storm water runoff to the MEP and actions to effectively prohibit non-storm discharges into the storm drain;

(g) If the facility, area, and/or activity has been designated or identified as a contributor to the highest water quality priorities identified in the Water Quality Improvement Plan, then the inspection report must include a description of any specific or additional actions taken to reduce or eliminate the contribution of the facility, area, and/or activity to the highest water quality priorities;

(h) Descriptions of any other specific inspection comments which must, at a minimum, include rationales for longer compliance time;

(i) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(j) Resolution of problems noted and date problems fixed.

e. EXISTING DEVELOPMENT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried existing development, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

6. Enforcement Response Plans

Each Copermittee must develop and implement an Enforcement Response Plan as part of its jurisdictional runoff management program document. The Enforcement Response Plan must include the protocols for progressively stricter responses, including timeframes allowed for corrections of problems, and for various field violation scenarios. The Enforcement Response Plan must include, at a minimum, the following requirements:

a. ILLICIT DISCHARGE DETECTION AND ELIMINATION ENFORCEMENT COMPONENT

The Enforcement Response Plan must describe required enforcement actions to eliminate non-storm water discharges and illicit discharges or connections to the Copermittee's MS4.

(1) The Enforcement Response Plan must include a definition of "high level enforcement" for non-storm water discharges and illicit discharges or connections. "High level enforcement" for non-storm water discharges and illicit discharges or connections may be defined differently for construction sites, municipal, commercial, industrial, and residential areas of existing development.

(2) Non-storm water discharges and illicit discharges or connections must be addressed with an escalating series of enforcement actions as follows:

(a) If the non-storm water discharge and illicit discharge or connection is a source of pollutants contributing to the highest water quality priorities identified in the Water Quality Improvement Plan, then high level enforcement actions must be immediately issued, and subsequent high level enforcement actions must continue to escalate, as necessary, to compel the elimination of the discharge or connection as soon as possible; or

(b) If the non-storm water discharge and illicit discharge or connection is not a source of pollutants contributing to the highest water quality priorities identified in the Water Quality Improvement Plan, then escalating enforcement actions must be issued, and enforcement actions must result in the elimination of the discharge or connection as quickly as the Copermittee's available resources allow.

(3) If the Copermittee identifies the source, and the source is a controllable non-storm water discharge (i.e. anthropogenically influenced) or a controllable illicit discharge or connection, then the Copermittee must implement the following:

(a) Immediately enforce its legal authority to eliminate controllable sources of non-storm water and illicit discharges or connections upon identifying the source; and

(b) For controllable sources of non-storm water discharges and illicit discharges or connections that cannot be eliminated immediately upon identification, the discharge or connection must be eliminated in a timely manner with the goal of eliminating the discharge or connection within 10 business days after the source is identified. If more than 10 business days are required to eliminate the discharge or connection, a rationale must be recorded in the electronic database or equivalent tabular system used to track the investigations of non-storm water and illicit discharges and connections.

(4) If the Copermittee identifies the source as a non-storm water discharge to or from the MS4 that is in exceedance of NALs developed pursuant to Provision C.1, and in violation or threatened violation of an existing separate NPDES permit (e.g. the groundwater dewatering NPDES permit), then the Copermittee must report, within three business days, the findings to the San Diego Water Board including all pertinent information regarding the discharger and discharge characteristics.

b. DEVELOPMENT PROJECTS ENFORCEMENT COMPONENT

The Enforcement Response Plan must describe required enforcement actions to compel compliance with the Copermittee's BMP Design Manual requirements for development projects.

(1) The Enforcement Response Plan must include a definition of "high level enforcement" for development projects.

(2) The enforcement process must include appropriate sanctions to compel compliance with requirements of the Copermittee's BMP Design Manual or this Order. Sanctions must include, at a minimum, the following tools or their equivalent:

(a) Non-monetary penalties;

(b) Fines;

(c) Bonding requirements;

(d) Administrative and criminal penalties;

(e) Liens; and

(f) Permit or occupancy denials.

(3) Occupancy must be denied until a development project is in full compliance with the Copermittee's BMP Design Manual requirements. Documentation of full compliance with the Copermittee's BMP Design Manual requirements must be recorded in the electronic database or equivalent tabular system used to track development projects.

(4) Violations or other non-compliance that contribute or potentially contribute to the highest water quality priorities identified in the Water Quality Improvement Plan must be issued high level enforcement actions. High level enforcement actions must continue to escalate, as necessary, to compel compliance as soon as possible.

(5) For violations of permanent BMP maintenance requirements, all violations must be corrected in a timely manner with the goal of correcting them before the next rain event but no longer than 10 business days after the violations are discovered. If more than 10 business days are required for compliance, a rationale must be recorded in the electronic database or equivalent tabular system used to track permanent BMP inspections.

c. CONSTRUCTION / EXISTING DEVELOPMENT ENFORCEMENT COMPONENT

The Enforcement Response Plan must describe required enforcement actions to compel compliance with its permits and applicable local ordinances, and the requirements of this Order, at construction sites and areas of existing development.

(1) The Enforcement Response Plan must include a definition of "high level enforcement" for construction sites and areas of existing development. "High level enforcement" may be defined differently for construction sites, municipal, commercial, industrial, and residential areas of existing development.

(2) The enforcement process must include, at a minimum, appropriate sanctions to compel compliance, such as:

(a) Verbal and written notices of violation;

(b) Cleanup requirements;

(c) Fines;

(d) Bonding requirements;

(e) Administrative and criminal penalties;

(f) Liens;

(g) Stop work orders; and

(h) Permit and occupancy denials.

(3) Violations or other non-compliance that contribute or potentially contribute to the highest water quality priorities identified in the Water Quality Improvement Plan must be issued high level enforcement actions. High level enforcement actions must continue to escalate, as necessary, to compel compliance as soon as possible.

(4) All violations must be corrected in a timely manner with the goal of correcting them before the next rain event but no longer than 10 business days after the violations are discovered. If more than 10 business days are required for compliance, then a rationale must be recorded in the electronic database or equivalent tabular system used to track construction site and existing development inspections.

d. REPORTING OF NON-COMPLIANT SITES

(1) Each Copermittee must notify the San Diego Water Board in writing within 48 hours of issuing high level enforcement (as defined in the Copermittee's Enforcement Response Plan) to a construction site that poses a significant threat to water quality as a result of violations or other non-compliance with its permits and applicable local ordinances, and the requirements of this Order.

(2) Each Copermittee must notify the San Diego Water Board of non-filers under the Industrial General Permit and Construction General Permit by email to Nonfilers_R9@waterboards.ca.gov.

7. Public Education and Participation

a. Each Copermittee must implement a public education program, as appropriate, to promote and encourage management practices, control techniques and systems, design and engineering methods, and behaviors that reduce the discharge of pollutants in storm water to the MEP, prevent controllable non-storm

water discharges from entering the MS4, and protect water quality standards in receiving waters. The public education program must include, at a minimum, the following:

(1) Educational activities, public information activities, and other appropriate outreach activities to reduce pollutants associated with the application of pesticides, herbicides and fertilizer in storm water discharges to and from its MS4 to the MEP;

(2) Educational activities, public information activities, and other appropriate outreach activities to facilitate the proper management and disposal of used oil and toxic materials; and

(3) Appropriate education and training measures for construction site operators and other target audiences, as determined by the Copermittee(s).

b. Each Copermittee must incorporate a mechanism for public participation and where necessary intergovernmental coordination in updating, developing, and implementing its jurisdictional runoff management program.

8. Fiscal Analysis

a. Each Copermittee must secure the resources necessary to meet all the requirements of this Order.

b. Each Copermittee must conduct an annual fiscal analysis of the following:

(1) The capital and operation and maintenance expenditures necessary to implement the requirements of this Order;

(2) The staff resources needed and allocated to meet the requirements of this Order, including any development, implementation, and enforcement activities required;

(3) The estimated expenditures for Provisions E.8.b.(1) and E.8.b.(2) during the reporting period, the preceding reporting period, and the next reporting period; and

(4) The source of funds that are proposed to meet the necessary expenditures described in Provisions E.8.b.(1) and E.8.b.(2), including legal restrictions on the use of such funds.

c. Each Copermittee must submit a summary of the annual fiscal analysis with each Annual Report required pursuant to Provision F.3.b.

d. Each Copermittee must provide the documentation used to develop the summary of the annual fiscal analysis upon request by the San Diego Water Board.

F. REPORTING

The purpose of this provision is to determine and document compliance with the requirements set forth in this Order. The goal of this provision is to communicate to the San Diego Water Board and the people of the State of California the implementation status of each jurisdictional runoff management program and compliance with the requirements of this Order. This goal is to be accomplished through the submittal of specific deliverables to the San Diego Water Board by the Copermittees.

1. Water Quality Improvement Plans

The Copermittees for each Watershed Management Area must develop and submit a complete Water Quality Improvement Plan in accordance with the requirements of Provision B, no later than 12 months after the adoption of this Order for a 30 day public review and comment period. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of 30 days. Based on the comments received, the San Diego Water Board will determine whether to hold a public hearing or to limit public input to submittal of written comments. If no hearing is held the San Diego Water Board will notify the Copermittees that the Water Quality Improvement Plan has been accepted as complete following its review and determination that the Water Quality Improvement Plan meets the requirements of this Order. Water Quality Improvement Plans must be made available on the Regional Clearinghouse required pursuant to Provision F.4.

2. Updates

a. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATES

Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E. The update must be completed no later than 12 months after the adoption of this Order. Updated jurisdictional runoff management program documents must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Subsequent updates may be submitted as part of the Annual Reports, and updated jurisdictional runoff management program documents must be made available on the Regional Clearinghouse.

b. PERMANENT BMP SIZING CRITERIA DESIGN MANUAL UPDATES

Each Copermittee must update its BMP Design Manual to incorporate the requirements of Provision E.3.d. The update must be completed no later than 12 months after the adoption of this Order. Updated BMP Design Manuals must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Subsequent updates may be submitted as part of the Annual Reports. Updated BMP Design Manuals must be made available on the Regional Clearinghouse.

c. WATER QUALITY IMPROVEMENT PLAN UPDATES

The Copermittees for each Watershed Management Area must submit updates to the Water Quality Improvement Plan as part of the Annual Reports. Updated Water Quality Improvement Plans must be made available on the Regional Clearinghouse required pursuant to Provision F.4.

3. Progress Reporting

a. PROGRESS REPORT PRESENTATIONS

The Copermittees for each Watershed Management Area must appear before the San Diego Water Board, as requested by the San Diego Water Board, to provide progress reports on the implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs.

b. ANNUAL REPORTS

(1) The Copermittees for each Watershed Management Area must submit an Annual Report for each reporting period, which begins July 1 and ends June 30 in the following year, no later than October 31 following the end of the reporting period. The first Annual Report must be prepared for the reporting period beginning from the date the San Diego Water Board determines that the Water Quality Improvement Plan meets the requirements of this Order to June 30 in the following year. Annual Reports must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Each Annual Report must include the following:

(a) The jurisdictional and watershed monitoring data collected pursuant to Provisions D.1 and D.2, summarized and presented in tabular and graphical form;

(b) Progress of the special studies required pursuant to Provisions D.2 and D.3, and the results or findings when a special study, or each phase of a special study, is completed;

(c) The findings from the assessments required pursuant to Provision D.4;

(d) The progress of implementing the Water Quality Improvement Plan, including, but not limited to, the following:

(i) The progress toward achieving the interim and final numeric targets for the highest water quality priorities for the Watershed Management Area,

(ii) The water quality improvement strategies that were implemented and/or no longer implemented by each of the Copermittees during

the reporting period and previous reporting periods, and are planned to be implemented during the next reporting period,

(iii) Previously proposed modifications or updates incorporated into the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document and implemented by the Copermittees in the Watershed Management Area, and

(iv) Proposed modifications or updates to the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document;

(e) A completed Jurisdictional Runoff Management Program Annual Report Form (Attachment D) for each Copermittee in the Watershed Management Area, certified by a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative.

(2) Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (Attachment D) no later than October 31 of each year until the first Annual Report is required to be submitted.

(3) Each Copermittee must provide any data or documentation utilized in developing the Annual Report upon request by the San Diego Water Board. Any monitoring data utilized in developing the Annual Report must be uploaded to the California Environmental Data Exchange Network (CEDEN).[17] Any monitoring and assessment data utilized in developing the Annual Report must be provided on the Regional Clearinghouse required pursuant to Provision F.4.

c. Regional Monitoring and Assessment Report

(1) The Copermittees must submit a Regional Monitoring and Assessment Report no later than 180 days in advance of the expiration date of this Order. The Regional Monitoring and Assessment Report may be submitted as part of the ROWD required pursuant to Provision F.5.b. The Copermittees must review the jurisdictional and watershed monitoring data, data analyses, and assessments required pursuant to Provision D.4, to assess the following:

(a) The beneficial uses of the receiving waters within the San Diego Region that are protected or must be restored;

[17] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

(b) The progress toward restoring impacted beneficial uses in the receiving waters within the San Diego Region; and

(c) Pollutants or conditions of emerging concern that may impact beneficial uses in the receiving waters within the San Diego Region.

(2) The Regional Monitoring and Assessment Report must include recommendations for improving the implementation and assessment of the Water Quality Improvement Plans and jurisdictional runoff management programs.

(3) Each Copermittee must provide any data or documentation utilized in developing the Regional Monitoring and Assessment Report upon request by the San Diego Water Board. Any monitoring and assessment data utilized in developing the Regional Monitoring and Assessment Report must be provided on the Regional Clearinghouse required pursuant to Provision F.4.

4. Regional Clearinghouse

The Copermittees must develop, update, and maintain an internet-based Regional Clearinghouse that can be used to store, disseminate, and share the Copermittees' Water Quality Improvement Plans, Annual Reports, jurisdictional runoff management program documents, monitoring data, special studies, and any other data or information generated by the Copermittees during the implementation of this Order. Monitoring data collected pursuant to Provision D must be uploaded to CEDEN,[18] with links to the uploaded data available on the Regional Clearinghouse. The Regional Clearinghouse may be linked to other internet-based data portals and databases where the original documents and data are stored. The Regional Clearinghouse must be available and accessible to members of the public. The Regional Clearinghouse must be developed and made available to the public no later than 12 months after the adoption of this Order.

5. Report of Waste Discharge

a. The Orange County Copermittees and the Riverside County Copermittees, are required to submit a complete ROWD pursuant to the requirements of their current Orders and are enrolled under this Order upon expiration of their current Orders. Upon expiration of their current Orders, the Copermittees in each county must comply with the requirements of this Order by July 1 after enrollment under this Order, unless early enrollment is granted pursuant to Provision F.6 of this

[18] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

Order. The current Orders for the Orange County Copermittees and Riverside County Copermittees are rescinded upon their expiration date except for enforcement purposes.

b. The Copermittees must submit to the San Diego Water Board a complete ROWD as an application for the re-issuance of this NPDES permit. The ROWD must be submitted no later than 180 days in advance of the expiration date of this Order. The ROWD must contain the following minimum information:

(1) Names and addresses of the Copermittees;

(2) Names and titles of the primary contacts of the Copermittees;

(3) Proposed changes to the Copermittees' Water Quality Improvement Plans and the supporting justification;

(4) Proposed changes to the Copermittees' jurisdictional runoff management programs and the supporting justification;

(5) Any other information necessary for the re-issuance of this Order; and

(6) Any other information required by federal regulations for NPDES permit reissuance.

6. Application for Early Enrollment

a. The Orange County Copermittees, collectively, or Riverside County Copermittees, collectively, may apply for early enrollment under this Order by submitting a Report of Waste Discharge Form 200 for each individual Copermittee in the respective county, with a written request for early enrollment under this Order that certifies the following conditions have been met:

(1) A Water Quality Improvement Plan has been developed in accordance with the requirements of Provision B, which can and will be implemented immediately upon enrollment under this Order;

(2) Each Copermittee in the county has updated its jurisdictional runoff management program document to incorporate the requirements of Provision E, which can and will be implemented immediately upon enrollment under this Order; and

(3) Each Copermittee in the county has updated its BMP Design Manual to incorporate the requirements of Provision E.3.d, which can and will be implemented immediately upon enrollment under this Order.

b. The San Diego Water Board will review the application for early enrollment and associated documents for completeness. A Notice of Enrollment (NOE) under this Order will be issued to the Copermittees in the respective county by the San Diego Water Board upon completion of the early enrollment application requirements. The effective enrollment date will be specified in the NOE and the Copermittees in the respective county are authorized to have MS4 discharges pursuant to the requirements of this Order starting on the date specified in the NOE. The existing Order for that county is rescinded upon the effective enrollment date specified in the NOE except for enforcement purposes.

7. Reporting Provisions

Each Copermittee must comply with all the reporting and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

G. PRINCIPAL WATERSHED COPERMITTEE RESPONSIBILITIES

1. The Copermittees within each Watershed Management Area must designate a Principal Watershed Copermittee and notify the San Diego Water Board of the name of the Principal Watershed Copermittee. An individual Copermittee should not be designated a Principal Watershed Copermittee for more than two Watershed Management Areas. The notification may be submitted with the Water Quality Improvement Plan required pursuant to Provision F.1 of this Order.

2. The Principal Watershed Copermittee is responsible for, at a minimum, the following:

a. Serving as liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues, and when necessary and appropriate, representing the Copermittees in the Watershed Management Area before the San Diego Water Board.

b. Facilitating the development of the Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order

c. Coordinating the submittal of the deliverables required by Provisions F.1, F.2, F.3.a, and F.3.b of this Order.

d. Coordinating and developing, with the other Principal Watershed Copermittees, the requirements of Provisions F.3.c, F.4, and F.5.b of this Order.

H. MODIFICATION OF PROGRAMS

1. Modifications of the Order may be initiated by the San Diego Water Board or by the Copermittees. Requests by Copermittees must be made to the San Diego Water Board.

2. Minor modifications to the Order may be made by the San Diego Water Board where the proposed modification complies with all the prohibitions and limitations, and other requirements of this Order.

3. Proposed modifications that are not minor require amendment of this Order in accordance with this Order's rules, policies, and procedures.

I. STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

Each Copermittee must comply with all the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

ADMINISTRATIVE DRAFT

ATTACHMENT A

DISCHARGE PROHIBITIONS

1. Basin Plan Waste Discharge Prohibitions

California Water Code Section 13243 provides that a Regional Water Board, in a water quality control plan, may specify certain conditions or areas where the discharge of waste or certain types of waste is not permitted. The following waste discharge prohibitions in the Water Quality Control Plan for the San Diego Basin (Basin Plan) are applicable to any person, as defined by Section 13050(c) of the California Water Code, who is a citizen, domiciliary, or political agency or entity of California whose activities in California could affect the quality of waters of the state within the boundaries of the San Diego Region.

1. The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in California Water Code Section 13050, is prohibited.

2. The discharge of waste to land, except as authorized by waste discharge requirements or the terms described in California Water Code Section 13264 is prohibited.

3. The discharge of pollutants or dredged or fill material to waters of the United States except as authorized by a National Pollutant Discharge Elimination System (NPDES) permit or a dredged or fill material permit (subject to the exemption described in California Water Code Section 13376) is prohibited.

4. Discharges of recycled water to lakes or reservoirs used for municipal water supply or to inland surface water tributaries thereto are prohibited, unless this San Diego Water Board issues a NPDES permit authorizing such a discharge; the proposed discharge has been approved by the State Department of Health Services (DHS) and the operating agency of the impacted reservoir; and the discharger has an approved fail-safe long-term disposal alternative.

5. The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the San Diego Water Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

6. The discharge of waste in a manner causing flow, ponding, or surfacing on lands not owned or under the control of the discharger is prohibited, unless the discharge is authorized by the San Diego Water Board.

7. The dumping, deposition, or discharge of waste directly into waters of the state, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the San Diego Water Board.

8. Any discharge to a storm water conveyance system that is not composed entirely of "*storm water*" is prohibited unless authorized by the San Diego Water Board. [The federal regulations, 40 CFR 122.26(b)(13), define storm water as storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from fire fighting activities.] [§122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

9. The unauthorized discharge of treated or untreated sewage to waters of the state or to a storm water conveyance system is prohibited.

10. The discharge of industrial wastes to conventional septic tank/subsurface disposal systems, except as authorized by the terms described in California Water Code Section 13264, is prohibited.

11. The discharge of radioactive wastes amenable to alternative methods of disposal into the waters of the state is prohibited.

12. The discharge of any radiological, chemical, or biological warfare agent into waters of the state is prohibited.

13. The discharge of waste into a natural or excavated site below historic water levels is prohibited unless the discharge is authorized by the San Diego Water Board.

14. The discharge of sand, silt, clay, or other earthen materials from any activity, including land grading and construction, in quantities which cause deleterious bottom deposits, turbidity or discoloration in waters of the state or which unreasonably affect, or threaten to affect, beneficial uses of such waters is prohibited.

15. The discharge of treated or untreated sewage from vessels to Mission Bay, Oceanside Harbor, Dana Point Harbor, or other small boat harbors is prohibited.

16. The discharge of untreated sewage from vessels to San Diego Bay is prohibited.

17. The discharge of treated sewage from vessels to portions of San Diego Bay that are less than 30 feet deep at mean lower low water (MLLW) is prohibited.

18. The discharge of treated sewage from vessels, which do not have a properly functioning US Coast Guard certified Type I or Type II marine sanitation device, to portions of San Diego Bay that are greater than 30 feet deep at mean lower low water (MLLW) is prohibited.

2. Attachment B to State Water Board Resolution 2012-001X

Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges

I. PROVISIONS FOR POINT SOURCE DISCHARGES OF STORM WATER AND NONPOINT SOURCE WASTE DISCHARGES

The following terms, prohibitions, and special conditions (hereafter collectively referred to as special conditions) are established as limitations on point source storm water and nonpoint source discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in Areas of Special Biological Significance (ASBS), as required for State Water Quality Protection Areas pursuant to California Public Resources Code Sections 36700(f) and 36710(f). These Special Protections are adopted by the State Water Board as part of the California Ocean Plan (Ocean Plan) General Exception.

The special conditions are organized by category of discharge. The State Water Resources Control Board (State Water Board) and Regional Water Quality Control Boards (Regional Water Boards) will determine categories and the means of regulation for those categories [e.g., Point Source Storm Water National Pollutant Discharge Elimination System (NPDES) or Nonpoint Source].

A. PERMITTED POINT SOURCE DISCHARGES OF STORM WATER

1. General Provisions for Permitted Point Source Discharges of Storm Water

   a. Existing storm water discharges into an ASBS are allowed only under the following conditions:

      (1) The discharges are authorized by an NPDES permit issued by the State Water Board or Regional Water Board;

      (2) The discharges comply with all of the applicable terms, prohibitions, and special conditions contained in these Special Protections; and

      (3) The discharges:

         (i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

         (ii) Are designed to prevent soil erosion;

         (iii) Occur only during wet weather;

         (iv) Are composed of only storm water runoff.

   b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

   c. The discharge of trash is prohibited.

d. Only discharges from existing storm water outfalls are allowed. Any proposed or new storm water runoff discharge shall be routed to existing storm water discharge outfalls and shall not result in any new contribution of waste to an ASBS (i.e., no additional pollutant loading). “Existing storm water outfalls” are those that were constructed or under construction prior to January 1, 2005. “New contribution of waste” is defined as any addition of waste beyond what would have occurred as of January 1, 2005. A change to an existing storm water outfall, in terms of re-location or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges are prohibited except as provided below:

(1) The term “non-storm water discharges” means any waste discharges from a municipal separate storm sewer system (MS4) or other NPDES permitted storm drain system to an ASBS that are not composed entirely of storm water.

(2) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability or occur naturally:

(i) Discharges associated with emergency fire fighting operations.

(ii) Foundation and footing drains.

(iii) Water from crawl space or basement pumps.

(iv) Hillside dewatering.

(v) Naturally occurring groundwater seepage via a storm drain.

(vi) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

2. Compliance Plans for Inclusion in Storm Water Management Plans (SWMP) and Storm Water Pollution Prevention Plans (SWPPP).

The discharger shall specifically address the prohibition of non-storm water runoff and the requirement to maintain natural water quality for storm water discharges to an ASBS in an ASBS Compliance Plan to be included in its SWMP or a SWPPP, as appropriate to permit type. If a statewide permit includes a SWMP, then the discharger shall prepare a stand-alone compliance plan for ASBS discharges . The ASBS Compliance Plan is subject to approval by the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (for permits issued by Regional Water Boards).

a. The Compliance Plan shall include a map of surface drainage of storm water runoff, showing areas of sheet runoff, prioritize discharges, and describe any structural Best Management Practices (BMPs) already employed and/or BMPs to be employed in the future. Priority discharges are those that pose the greatest water quality threat and which

are identified to require installation of structural BMPs. The map shall also show the storm water conveyances in relation to other features such as service areas, sewage conveyances and treatment facilities, landslides, areas prone to erosion, and waste and hazardous material storage areas, if applicable. The SWMP or SWPPP shall also include a procedure for updating the map and plan when changes are made to the storm water conveyance facilities.

b. The ASBS Compliance Plan shall describe the measures by which all non-authorized non-storm water runoff (e.g., dry weather flows) has been eliminated, how these measures will be maintained over time, and how these measures are monitored and documented.

c. For Municipal Separate Storm Sewer System (MS4s), the ASBS Compliance Plan shall require minimum inspection frequencies as follows:

   (1) The minimum inspection frequency for construction sites shall be weekly during rainy season;

   (2) The minimum inspection frequency for industrial facilities shall be monthly during the rainy season;

   (3) The minimum inspection frequency for commercial facilities (e.g., restaurants) shall be twice during the rainy season; and

   (4) Storm water outfall drains equal to or greater than 18 inches (457 mm) in diameter or width shall be inspected once prior to the beginning of the rainy season and once during the rainy season and maintained to remove trash and other anthropogenic debris.

d. The ASBS Compliance Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff, that are necessary to comply with these special conditions, will be achieved through BMPs. Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that such installation would pose a threat to health or safety. BMPs to control storm water runoff discharges (at the end-of-pipe) during a design storm shall be designed to achieve on average the following target levels:

   (1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

   (2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges. The baseline for the reduction is the effective date of the Exception. The baseline for these determinations is the effective date of the Exception, and the reductions must be achieved and documented within four (4) years of the effective date.

e. The ASBS Compliance Plan shall address erosion control and the prevention of anthropogenic sedimentation in ASBS. The natural habitat conditions in the ASBS shall not be altered as a result of anthropogenic sedimentation.

f. The ASBS Compliance Plan shall describe the non-structural BMPs currently employed and planned in the future (including those for construction activities), and include an implementation schedule. The ASBS Compliance Plan shall include non-structural BMPs that address public education and outreach. Education and outreach efforts must adequately inform the public that direct discharges of pollutants from private property not entering an MS4 are prohibited. The ASBS Compliance Plan shall also describe the structural BMPs, including any low impact development (LID) measures, currently employed and planned for higher threat discharges and include an implementation schedule. To control storm water runoff discharges (at the end-of-pipe) during a design storm, permittees must first consider using LID practices to infiltrate, use, or evapotranspirate storm water runoff on-site.

g. The BMPs and implementation schedule shall be designed to ensure that natural water quality conditions in the receiving water are achieved and maintained by either reducing flows from impervious surfaces or reducing pollutant loading, or some combination thereof.

h. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents in storm water runoff that alter natural ocean water quality and the sources of these constituents.

(2) The report shall describe BMPs that are currently being implemented, BMPs that are identified in the SWMP or SWPPP for future implementation, and any additional BMPs that may be added to the SWMP or SWPPP to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the BMPs.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits), the discharger shall revise its ASBS Compliance Plan to incorporate any new or modified BMPs that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised SWMP or SWPPP, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural ocean water quality conditions due to the same constituent.

(5) Compliance with this section does not excuse violations of any term, prohibition, or condition contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within one year from the effective date of the Exception, the discharger shall submit a written ASBS Compliance Plan to the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that describes its strategy to comply with these special conditions, including the requirement to maintain natural water quality in the affected ASBS. The ASBS Compliance Plan shall include a time schedule to implement appropriate non-structural and structural controls (implementation schedule) to comply with these special conditions for inclusion in the discharger's SWMP or SWPPP, as appropriate to permit type.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these special conditions shall be implemented.

d. Within four (4) years of the effective date of the Exception, any structural controls identified in the ASBS Compliance Plan that are necessary to comply with these special conditions shall be operational.

e. Within four (4) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water, pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data, and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

   If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

   The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

   (1) for municipalities, a demonstration of significant hardship to discharger ratepayers, by showing the relationship of storm water fees to annual household income for residents within the discharger's jurisdictional area, and the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or

(2) for other governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process.

B. NONPOINT SOURCE DISCHARGES

[NOT INCLUDED]
[PROVISIONS FOR NONPOINT SOURCE DISCHARGES NOT APPLICABLE]

II. ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES

[NOT INCLUDED]
[ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES NOT APPLICABLE]

III. ADDITIONAL REQUIREMENTS – WATERFRONT AND MARINE OPERATIONS

[NOT INCLUDED]
[ADDITIONAL REQUIREMENTS FOR WATERFRONT AND MARINE OPERATIONS NOT APPLICABLE]

IV. MONITORING REQUIREMENTS

Monitoring is mandatory for all dischargers to assure compliance with the Ocean Plan. Monitoring requirements include both: (A) core discharge monitoring, and (B) ocean receiving water monitoring. The State and Regional Water Boards must approve sampling site locations and any adjustments to the monitoring programs. All ocean receiving water and reference area monitoring must be comparable with the Water Boards' Surface Water Ambient Monitoring Program (SWAMP).

Safety concerns: Sample locations and sampling periods must be determined considering safety issues. Sampling may be postponed upon notification to the State and Regional Water Boards if hazardous conditions prevail.

Analytical Chemistry Methods: All constituents must be analyzed using the lowest minimum detection limits comparable to the Ocean Plan water quality objectives. For metal analysis, all samples, including storm water effluent, reference samples, and ocean receiving water samples, must be analyzed by the approved analytical method with the lowest minimum detection limits (currently Inductively Coupled Plasma/Mass Spectrometry) described in the Ocean Plan.

A. CORE DISCHARGE MONITORING PROGRAM

1. General sampling requirements for timing and storm size:

   Runoff must be collected during a storm event that is greater than 0.1 inch and generates runoff, and at least 72 hours from the previously measurable storm event. Runoff samples shall be collected when post-storm receiving water is sampled, and analyzed for the same

constituents as receiving water and reference site samples (see section IV B) as described below.

2. Runoff flow measurements

   a. For municipal/industrial storm water outfalls in existence as of December 31, 2007, 18 inches (457mm) or greater in diameter/width (including multiple outfall pipes in combination having a width of 18 inches, runoff flows must be measured or calculated, using a method acceptable to and approved by the State and Regional Water Boards.
   b. This will be reported annually for each precipitation season to the State and Regional Water Boards.

3. Runoff samples – storm events

   a. For outfalls equal to or greater than 18 inches (0.46m) in diameter or width:

      (1) samples of storm water runoff shall be analyzed during the same storm as receiving water samples for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination, ; and

      (2) samples of storm water runoff shall be analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS

      (3) If an applicant has no outfall greater than 36 inches, then storm water runoff from the applicant's largest outfall shall be further analyzed during the same storm as receiving water samples for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates).

   b. For outfalls equal to or greater than 36 inches (0.91m) in diameter or width:

      (1) samples of storm water runoff shall be analyzed during the same storm as receiving water samples for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

      (2) samples of storm water runoff shall be further analyzed during the same storm as receiving water samples for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates) and

      (3) samples of storm water runoff shall be analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

   c. For an applicant not participating in a regional monitoring program [see below in Section IV (B)] in addition to (a.) and (b.) above, a minimum of the two largest outfalls or 20 percent of the larger outfalls, whichever is greater, shall be sampled (flow weighted

composite samples) at least three times annually during wet weather (storm event) and analyzed for all Ocean Plan Table A constituents, Table B constituents for marine aquatic life protection (except for toxicity, only chronic toxicity for three species shall be required), DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, and Ocean Plan indicator bacteria. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one (the largest) such discharge shall be sampled annually in each Region.

4. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may reduce or suspend core monitoring once the storm runoff is fully characterized. This determination may be made at any point after the discharge is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

B. OCEAN RECEIVING WATER AND REFERENCE AREA MONITORING PROGRAM

In addition to performing the Core Discharge Monitoring Program in Section II.A above, all applicants having authorized discharges must perform ocean receiving water monitoring. In order to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS, dischargers may choose either (1) an individual monitoring program, or (2) participation in a regional integrated monitoring program.

1. Individual Monitoring Program: The requirements listed below are for those dischargers who elect to perform an individual monitoring program to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within the affected ASBS. In addition to Core Discharge Monitoring, the following additional monitoring requirements shall be met:

   a. Three times annually, during wet weather (storm events), the receiving water at the point of discharge from the outfalls described in section (IV)(A)(3)(c) above shall be sampled and analyzed for Ocean Plan Table A constituents, Table B constituents for marine aquatic life, DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, salinity, chronic toxicity (three species), and Ocean Plan indicator bacteria.

      The sample location for the ocean receiving water shall be in the surf zone at the point of discharges; this must be at the same location where storm water runoff is sampled. Receiving water shall be sampled at approximately the same time prior to (pre-storm) and during (or immediately after) the same storm (post storm). Reference water quality shall also be sampled and analyzed for the same constituents pre-storm and post-storm, during the same storms when receiving water is sampled. Reference stations will be determined by the State Water Board's Division of Water Quality and the applicable Regional Water Board(s).

   b. Sediment sampling shall occur at least three times during every five (5) year period. The subtidal sediment (sand or finer, if present) at the discharge shall be sampled and analyzed for Ocean Plan Table B constituents for marine aquatic life, DDT, PCBs, PAHs, pyrethroids, and OP pesticides. For sediment toxicity testing, only an acute toxicity test using the amphipod Eohaustorius estuarius must be performed.

c. A quantitative survey of intertidal benthic marine life shall be performed at the discharge and at a reference site. The survey shall be performed at least once every five (5) year period. The survey design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The results of the survey shall be completed and submitted to the State Water Board and Regional Water Board at least six months prior to the end of the permit cycle.

d. Once during each five (5) year period, a bioaccumulation study shall be conducted to determine the concentrations of metals and synthetic organic pollutants at representative discharge sites and at representative reference sites. The study design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The bioaccumulation study may include California mussels (Mytilus californianus) and/or sand crabs (Emerita analoga or Blepharipoda occidentalis). Based on the study results, the Regional Water Board and the State Water Board's Division of Water Quality, may adjust the study design in subsequent permits, or add or modify additional test organisms (such as shore crabs or fish), or modify the study design appropriate for the area and best available sensitive measures of contaminant exposure.

e. Marine Debris: Representative quantitative observations for trash by type and source shall be performed along the coast of the ASBS within the influence of the discharger's outfalls. The design, including locations and frequency, of the marine debris observations is subject to approval by the Regional Water Board and State Water Board's Division of Water Quality.

f. The monitoring requirements of the Individual Monitoring Program in this section are minimum requirements. After a minimum of one (1) year of continuous water quality monitoring of the discharges and ocean receiving waters, the Executive Director of the State Water Board (statewide permits) or Executive officer of the Regional Water Board (Regional Water Board permits) may require additional monitoring, or adjust, reduce or suspend receiving water and reference station monitoring. This determination may be made at any point after the discharge and receiving water is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

2. Regional Integrated Monitoring Program: Dischargers may elect to participate in a regional integrated monitoring program, in lieu of an individual monitoring program, to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS. This regional approach shall characterize natural water quality, pre- and post-storm, in ocean reference areas near the mouths of identified open space watersheds and the effects of the discharges on natural water quality (physical, chemical, and toxicity) in the ASBS receiving waters, and should include benthic marine aquatic life and bioaccumulation components. The design of the ASBS stratum of a regional integrated monitoring program may deviate from the otherwise prescribed individual monitoring approach (in Section IV.B.1) if approved by the State Water Board's Division of Water Quality and the Regional Water Boards.

   a. Ocean reference areas shall be located at the drainages of flowing watersheds with minimal development (in no instance more than 10% development), and shall not be located in CWA Section 303(d) listed waterbodies or have tributaries that are 303(d) listed. Reference areas shall be free of wastewater discharges and anthropogenic non-storm water runoff. A minimum of low threat storm runoff discharges (e.g. stream highway overpasses and campgrounds) may be allowed on a case-by-case basis.

Reference areas shall be located in the same region as the ASBS receiving water monitoring occurs. The reference areas for each Region are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean reference water samples must be collected from each station, each from a separate storm. A minimum of one reference location shall be sampled for each ASBS receiving water site sampled per responsible party. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

b. ASBS ocean receiving water must be sampled in the surf zone at the location where the runoff makes contact with ocean water (i.e. at "point zero"). Ocean receiving water stations must be representative of worst-case discharge conditions (i.e. co-located at a large drain greater than 36 inches, or if drains greater than 36 inches are not present in the ASBS then the largest drain greater than18 inches.) Ocean receiving water stations are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean receiving water samples must be collected during each storm season from each station, each from a separate storm. A minimum of one receiving water location shall be sampled in each ASBS per responsible party in that ASBS. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

c. Reference and receiving water sampling shall commence during the first full storm season following the adoption of these special conditions, and post-storm samples shall be collected when annual storm water runoff is sampled. Sampling shall occur in a minimum of two storm seasons. For those ASBS dischargers that have already participated in the Southern California Bight 2008 ASBS regional monitoring effort, sampling may be limited to only one storm season.

d. Receiving water and reference samples shall be analyzed for the same constituents as storm water runoff samples. At a minimum, constituents to be sampled and analyzed in reference and discharge receiving waters must include oil and grease, total suspended solids, Ocean Plan Table B metals for protection of marine life, Ocean Plan PAHs, pyrethroids, OP pesticides, ammonia, nitrate, phosphates, and critical life stage chronic toxicity for three species. In addition, within the range of the southern sea otter, indicator bacteria or some other measure of fecal contamination shall be analyzed.

3. Waterfront and Marine Operations: In addition to the above requirements for ocean receiving water monitoring, additional monitoring must be performed for marinas and boat launch and pier facilities:

a. For all marina or mooring field operators, in mooring fields with 10 or more occupied moorings, the ocean receiving water must be sampled for Ocean Plan indicator bacteria, residual chlorine, copper, zinc, grease and oil, methylene blue active substances (MBAS), and ammonia nitrogen.

(1) For mooring field operators opting for an individual monitoring program (Section IV.B.1 above), this sampling must occur weekly (on the weekend) from May through October.

(2) For mooring field operators opting to participate in a regional integrated monitoring program (Section IV.B.2 above), this sampling must occur monthly from May through October on a high use weekend in each month. The Water Boards may allow a reduction in the frequency of sampling, through the regional monitoring program, after the first year of monitoring.

b. For all mooring field operators, the subtidal sediment (sand or finer, if present) within mooring fields and below piers shall be sampled and analyzed for Ocean Plan Table B metals (for marine aquatic life beneficial use), acute toxicity, PAHs, and tributyltin. For sediment toxicity testing, only an acute toxicity test using the amphipod Eohaustorius estuarius must be performed. This sampling shall occur at least three times during a five (5) year period. For mooring field operators opting to participate in a regional integrated monitoring program, the Water Boards may allow a reduction in the frequency of sampling after the first sampling effort's results are assessed.

ADMINISTRATIVE DRAFT

ATTACHMENT B

STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

1. Standard Permit Provisions

Code of Federal Regulations Title 40 Section 122.41 (40 CFR 122.41) includes conditions, or provisions, that apply to all National Pollutant Discharge Elimination System (NPDES) permits. Additional provisions applicable to NPDES permits are in 40 CFR 122.42. All applicable provisions in 40 CFR 122.41 and 40 CFR 122.42 must be incorporated into this Order and NPDES permit. The applicable 40 CFR 122.41 and 40 CFR 122.42 provisions are as follows:

a. DUTY TO COMPLY [40 CFR 122.41(a)]

The Copermittee must comply with all of the provisions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

(1) The Copermittee must comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement. [40 CFR 122.41(a)(1)]

(2) The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to a civil penalty not to exceed $25,000 per day for each violation. The CWA provides that any person who *negligently* violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than 2 years, or both. Any person who *knowingly* violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both. Any person who knowingly violates Section 301, 302, 303, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, and who knows at that time that he thereby places another person in imminent danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of

not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.
[40 CFR 122.41(a)(2)]

(3) Any person may be assessed an administrative penalty by the San Diego Regional Water Quality Control Board (San Diego Water Board), State Water Resources Control Board (State Water Board), or United States Environmental Protection Agency (USEPA) for violating Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.
[40 CFR 122.41(a)(3)]

b. DUTY TO REAPPLY [40 CFR 122.41(b)]

If a Copermittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Copermittee must apply for and obtain a new permit.

c. NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE [40 CFR 122.41(c)]

It shall not be a defense for a Copermittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

d. DUTY TO MITIGATE [40 CFR 122.41(d)]

The Copermittee must take all reasonable steps to minimize or prevent any discharge or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

e. PROPER OPERATION AND MAINTENANCE [40 CFR 122.41(e)]

The Copermittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Copermittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by a Copermittee only when the operation is necessary to achieve compliance with the conditions of this permit.

f. PERMIT ACTIONS [40 CFR 122.41(f)]

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Copermittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

g. PROPERTY RIGHTS [40 CFR 122.41(g)]

This permit does not convey any property rights of any sort, or any exclusive privilege.

h. DUTY TO PROVIDE INFORMATION [40 CFR 122.41(h)]

The Copermittee must furnish to the San Diego Water Board, State Water Board, or USEPA within a reasonable time, any information which the San Diego Water Board, State Water Board, or USPEA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Copermittee must also furnish to the San Diego Water Board, State Water Board, or USPEA upon request, copies of records required to be kept by this permit.

i. INSPECTION AND ENTRY [40 CFR 122.41(i)]

The Copermittee must allow the San Diego Water Board, State Water Board, USEPA, and/or their authorized representative (including an authorized contractor acting as their representative), upon presentation of credentials and other documents as may be required by law, to:

(1) Enter upon the Copermittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit; [40 CFR 122.41(i)(1)]

(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit; [40 CFR 122.41(i)(2)]

(3) Inspect and photograph at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; [40 CFR 122.41(i)(3)] and

(4) Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location. [40 CFR 122.41(i)(4)]

j. MONITORING AND RECORDS [40 CFR 122.41(j)]

(1) Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity. [40 CFR 122.41(j)(1)]

(2) Except for records of monitoring information required by this permit related to the Copermittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five (5) years (or longer as required by 40 CFR Part 503), the

Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time. [40 CFR 122.41(j)(2)]

(3) Records for monitoring information must include: [40 CFR 122.41(j)(3)]

(a) The date, exact place, and time of sampling or measurements; [40 CFR 122.41(j)(3)(i)]
(b) The individual(s) who performed the sampling or measurements; [40 CFR 122.41(j)(3)(ii)]
(c) The date(s) analyses were performed; [40 CFR 122.41(j)(3)(iii)]
(d) The individual(s) who performed the analyses; [40 CFR 122.41(j)(3)(iv)]
(e) The analytical techniques or methods used; [40 CFR 122.41(j)(3)(v)] and
(f) The results of such analyses. [40 CFR 122.41(j)(3)(vi)]

(4) Monitoring must be conducted according to test procedures under 40 CFR Part 136 unless another method is required under 40 CFR Subchapters N or O. [40 CFR 122.41(j)(4)]

In the case of pollutants for which there are no approved methods under 40 CFR Part 136 or otherwise required under 40 CFR Subchapters N and O, monitoring must be conducted according to a test procedure specified in the permit for such pollutants. [40 CFR 122.44(i)(1)(iv)]

(5) The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. [40 CFR 122.41(j)(5)]

k. SIGNATORY REQUIREMENT [40 CFR 122.41(k)]

(1) All applications, reports, or information submitted to the San Diego Water Board, State Water Board, or USEPA must be signed and certified. (See 40 CFR 122.22) [40 CFR 122.41(k)(1)]

(a) *For a municipality, State, Federal, or other public agency.* [All applications must be signed] [b]y either a principal executive officer or ranking elected official. [40 CFR 122.22(a)(3)]

(b) All reports required by permits, and other information requested by the San Diego Water Board, State Water Board, or USEPA must be signed by a person described in paragraph (a) of this section, or by a duly authorized representative of that person. A person is a duly authorized representative only if: [40 CFR 122.22(b)]

(i) The authorization is made in writing by a person described in paragraph (a) of this section; [40 CFR 122.22(b)(1)]

(ii) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company, (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) [40 CFR 122.22(b)(2)] and,

(iii) The written authorization is submitted to the San Diego Water Board and State Water Board. [40 CFR 122.22(b)(3)]

(c) *Changes to authorization.* If an authorization under paragraph (b) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (b) of this section must be submitted to the San Diego Water Board prior to or together with any reports, information, or applications to be signed by an authorized representative. [40 CFR 122.22(c)]

(d) *Certification.* Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." [40 CFR 122.22(d)]

(2) The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both. [40 CFR 122.41(k)(2)]

I. REPORTING REQUIREMENTS [40 CFR 122.41(l)]

(1) *Planned changes.* The Copermittee must give notice to the San Diego Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when: [40 CFR 122.41(l)(1)]

(a) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); [40 CFR 122.41(l)(1)(i)] or

(b) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which

are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1). [40 CFR 122.41(l)(1)(ii)]

(c) The alteration or addition results in a significant change in the Copermittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. [40 CFR 122.41(l)(1)(iii)]

(2) *Anticipated noncompliance*. The Copermittee must give advance notice to the San Diego Water Board or State Water Board of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements. [40 CFR 122.41(l)(2)]

(3) *Transfers*. This permit is not transferable to any person except after notice to the San Diego Water Board. The San Diego Water Board may require modification or revocation and reissuance of the permit to change the name of the Copermittee and incorporate such other requirements as may be necessary under the CWA. [40 CFR 122.41(l)(3)]

(4) *Monitoring reports.* Monitoring results must be reported at the intervals specified elsewhere in this permit. [40 CFR 122.41(l)(4)]

(a) Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the San Diego Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices. [40 CFR 122.41(l)(4)(i)]

(b) If the Copermittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or another method required for an industry-specific waste stream under 40 CFR Subchapters N or O, the results of this monitoring must be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the San Diego Water Board or State Water Board. [40 CFR 122.41(l)(4)(ii)]

(c) Calculations for all limitations which require averaging of measurements must utilize an arithmetic mean unless otherwise specified in the permit. [40 CFR 122.41(l)(4)(iii)]

(5) *Compliance schedules*. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date. [40 CFR 122.41(l)(5)]

(6) *Twenty-four hour reporting.*

(a) The Copermittee must report any noncompliance that may endanger health or the environment. Any information must be provided orally within 24 hours from

the time the Copermittee becomes aware of the circumstances. A written submission must also be provided within five (5) days of the time the Copermittee becomes aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6)(i)]

(b) The following must be included as information which must be reported within 24 hours under this paragraph: [40 CFR 122.41(l)(6)(ii)]

(i) Any unanticipated bypass that exceeds any effluent limitation in the permit (See 40 CFR 122.41(g)). [40 CFR 122.41(l)(6)(ii)(A)]
(ii) Any upset which exceeds any effluent limitation in the permit. [40 CFR 122.41(l)(6)(ii)(B)] and,
(iii) Violation of a maximum daily discharge limitation for any of the pollutants listed by the San Diego Water Board in the permit to be reported within 24 hours. (See 40 CFR 122.44(g)) [40 CFR 122.41(l)(6)(ii)(C)]

(c) The San Diego Water Board may waive the above-required written report on a case-by-case basis if the oral report has been received within 24 hours. [40 CFR 122.41(l)(6)(iii)]

(7) *Other noncompliance.* The Copermittee must report all instances of noncompliance not reported in accordance with the standard provisions required under 40 CFR 122.41(l)(4), (5), and (6), at the time monitoring reports are submitted. The reports must contain the information listed in the standard provisions required under 40 CFR 122.41(l)(6). [40 CFR 122.41(l)(7))]

(8) *Other information.* When the Copermittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the San Diego Water Board, State Water Board, or USEPA, the Copermittee must promptly submit such facts or information. [40 CFR 122.41(l)(8)]

m. BYPASS [40 CFR 122.41(m)]

(1) *Definitions.*

(a) "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. [40 CFR 122.41(m)(1)(i)] or

(b) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production. [40 CFR 122.41(m)(1)(ii)]

(2) *Bypass not exceeding limitations*. The Copermittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the standard provisions required under 40 CFR 122.41(m)(3) and (4). [40 CFR 122.41(m)(2)]

(3) *Notice.*

(a) *Anticipated bypass*. If the Copermittee knows in advance of the need for a bypass, it must submit a notice, if possible at least ten days before the date of the bypass. [40 CFR 122.41(m)(3)(i)] or

(b) *Unanticipated bypass*. The Copermittee must submit notice of an unanticipated bypass in accordance with the standard provisions required under 40 CFR 122.41(l)(6) (24-hour notice). [40 CFR 122.41(m)(3)(ii)]

(4) *Prohibition of Bypass.*

(a) Bypass is prohibited, and the San Diego Water Board may take enforcement action against a Copermittee for bypass, unless: [40 CFR 122.41(m)(4)(i)]

(i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; [40 CFR 122.41(m)(4)(i)(A)]

(ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; [40 CFR 122.41(m)(4)(i)(B)] and,

(iii) The Copermittee submitted notice in accordance with the standard provisions required under 40 CFR 122.41(m)(3). [40 CFR 122.41(m)(4)(i)(C)]

(b) The San Diego Water Board may approve an anticipated bypass, after considering its adverse effects, if the San Diego Water Board determines that it will meet the three conditions listed above. [40 CFR 122.41(m)(4)(ii)]

n. UPSET [40 CFR 122.41(n)]

(1) *Definition.* "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Copermittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. [40 CFR 122.41(n)(1)]

(2) *Effect of an upset*. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the standard provisions required under 40 CFR 122.41(n)(3) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. [40 CFR 122.41(n)(2)]

(3) *Conditions necessary for a demonstration of upset*. A Copermittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that: [40 CFR 122.41(n)(3)]

(a) An upset occurred and that the Copermittee can identify the cause(s) of the upset; [40 CFR 122.41(n)(3)(i)]
(b) The permitted facility was at the time being properly operated; [40 CFR 122.41(n)(3)(ii)] and
(c) The Copermittee submitted notice of the upset in accordance with the standard provisions required under 40 CFR 122.41(l)(6)(ii)(B) (24-hour notice). [40 CFR 122.41(n)(3)(iii)]
(d) The Copermittee complied with any remedial measures pursuant to the standard provisions required under 40 CFR 122.41(d). [40 CFR 122.41(n)(3)(iii)]

(4) *Burden of proof*. In any enforcement proceeding, the Copermittee seeking to establish the occurrence of an upset has the burden of proof. [40 CFR 122.41(n)(4)]

O. STANDARD PERMIT PROVISIONS FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS [40 CFR 122.42(c)]

The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the San Diego Water Board or State Water Board under 40 CFR 122.26(a)(1)(v) must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report must include:

(1) The status of implementing the components of the storm water management program that are established as permit conditions; [40 CFR 122.42(c)(1)]

(2) Proposed changes to the storm water management programs that are established as permit conditions. Such proposed changes must be consistent with 40 CFR 122.26(d)(2)(iii); [40 CFR 122.42(c)(2)] and

(3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under 40 CFR 122.26(d)(2)(iv) and (v); [40 CFR 122.42(c)(3)]

(4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; [40 CFR 122.42(c)(4)]

(5) Annual expenditures and budget for year following each annual report; [40 CFR 122.42(c)(5)]

(6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; [40 CFR 122.42(c)(6)]

(7) Identification of water quality improvements or degradation. [40 CFR 122.42(c)(7)]

p. STANDARD PERMIT PROVISIONS FOR STORM WATER DISCHARGES [40 CFR 122.42(d)]

The initial permits for discharges composed entirely of storm water issued pursuant to 40 CFR 122.26(e)(7) must require compliance with the conditions of the permit as expeditiously as practicable, but in no event later than three years after the date of issuance of the permit.

2. General Provisions

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. The general provisions applicable to this Order and NPDES permit are as follows:

a. DISCHARGE OF WASTE IS A PRIVILEGE

No discharge of waste into the waters of the State, whether or not such discharge is made pursuant to waste discharge requirements, shall create a vested right to continue such discharge. All discharges of waste into waters of the State are privileges, not rights. [CWC Section 13263(g)]

b. DURATION OF ORDER AND NPDES PERMIT

(1) *Effective date*. This Order and NPDES permit becomes effective on the date of its adoption provided the USEPA has no objection. If the USEPA objects to its issuance, this Order shall not become effective until such objection is withdrawn. This Order supersedes Order No. R9-2007-0001 upon the effective date of this Order, and supercedes Order Nos. R9-2009-0002 and R9-2010-0016 upon their expiration.

(2) *Expiration*. This Order and NPDES permit expires five years after adoption. [40 CFR 122.46(a)]

(3) *Continuation of expired order*. After this Order and NPDES permit expires, the terms and conditions of this Order and NPDES permit are automatically continued pending issuance of a new permit if all requirements of the federal NPDES regulations on the continuation of expired permits (40 CFR 122.6) are complied with.

c. AVAILABILITY

A copy of this Order must be kept at a readily accessible location and must be available to on-site personnel at all times.

d. CONFIDENTIALITY OF INFORMATION

Except as provided for in 40 CFR 122.7, no information or documents submitted in accordance with or in application for this Order will be considered confidential, and all such information and documents shall be available for review by the public at the San Diego Water Board office.

Claims of confidentiality for the following information will be denied: [40 CFR 122.7(b)]

(1) The name and address of any permit applicant or Copermittee; [40 CFR 122.7(b)(1)] and

(2) Permit applications and attachments, permits, and effluent data. [40 CFR 122.7(b)(2)]

e. EFFLUENT LIMITATIONS

(1) *Interim effluent limitations*. The Copermittee must comply with any interim effluent limitations as established by addendum, enforcement action, or revised waste discharge requirements which have been, or may be, adopted by the San Diego Water Board.

(2) *Other effluent limitations and standards*. If any applicable toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant and that standard or prohibition is more stringent than any limitation on the pollutant in the permit, the San Diego Water Board shall institute proceedings under these regulations to modify or revoke and reissue the permit to conform to the toxic effluent standard or prohibition. [40 CFR 122.44(b)(1)]

f. DUTY TO MINIMIZE OR CORRECT ADVERSE IMPACTS

The Copermittee must take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this Order, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the noncompliance.

g. PERMIT ACTIONS

The filing of a request by the Copermittee for modification, revocation and reissuance, or termination of this Order, or a notification of planned change in or anticipated noncompliance with this Order does not stay any condition of this Order. (See 40 CFR 122.41(f)) In addition, the following provisions apply to this Order:

(1) Upon application by any affected person, or on its own motion, the San Diego Water Board may review and revise the requirements in this Order. All requirements must be reviewed periodically. [CWC Section 13263(e)]

(2) This Order may be terminated or modified for cause, including, but not limited to, all of the following: [CWC Section 13381]

(a) Violation of any condition contained in the requirements of this Order. [CWC Section 13381(a)]

(b) Obtaining the requirements in this Order by misrepresentation, or failure to disclose fully all relevant facts. [CWC Section 13381(b)]

(c) A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge. [CWC Section 13381(c)]

(3) When this Order is transferred to a new owner or operator, such requirements as may be necessary under the CWC may be incorporated into this Order.

h. NPDES PERMITTED NON-STORM WATER DISCHARGES

The San Diego Water Board has, in prior years, issued a limited number of individual NPDES permits for non-storm water discharges to MS4s. The San Diego Water Board or State Water Board may in the future, upon prior notice to the Copermittee(s), issue an NPDES permit for any non-storm water discharge (or class of non-storm water discharges) to an MS4.

i. MONITORING

In addition to the standard provisions required under 40 CFR 122.41(j) and (l)(4), the following general monitoring provisions apply to this Order:

(1) Where procedures are not otherwise specified in Order, sampling, analysis and quality assurance/quality control must be conducted in accordance with the Quality Assurance Management Plan (QAMP) for the State of California's Surface Water Ambient Monitoring Program (SWAMP), adopted by the State Water Resources Control Board (State Water Board).

(2) Pursuant to 40 CFR 122.41(j)(2) and CWC Section 13383(a), each Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five (5) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time.

(3) All chemical, bacteriological, and toxicity analyses must be conducted at a laboratory certified for such analyses by the California Department of Public Health or a laboratory approved by the San Diego Water Board.

(4) For priority toxic pollutants that are identified in the California Toxics Rule (CTR) (65 Fed. Reg. 31682), the Copermittees must instruct their laboratories to establish calibration standards that are equivalent to or lower than the Minimum Levels (MLs) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP). If a Copermittee can demonstrate that a particular ML is not attainable, in accordance

with procedures set forth in 40 CFR Part 136, the lowest quantifiable concentration of the lowest calibration standard analyzed by a specific analytical procedure (assuming that all the method specified sample weights, volumes, and processing steps have been followed) may be used instead of the ML listed in Appendix 4 of the SIP. The Copermittee must submit documentation from the laboratory to the San Diego Water Board for approval prior to raising the ML for any priority toxic pollutant.

j. ENFORCEMENT

(1) The San Diego Water Board is authorized to enforce the terms of this Order under several provisions of the CWC, including, but not limited to, CWC Sections 13385, 13386, and 13387.

(2) Nothing in this Order shall be construed to protect the Copermittee from its liabilities under federal, state, or local laws.

(3) The CWC provides for civil and criminal penalties comparable to, and in some cases greater than, those provided for under the CWA.

(4) Except as provided in the standard conditions required under 40 CFR 122.41(m) and (n), nothing in this Order shall be construed to relieve the Copermittee from civil or criminal penalties for noncompliance.

(5) Nothing in this Order shall be construed to preclude the institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties to which the Copermittee is or may be subject to under Section 311 of the CWA.

(6) Nothing in this Order shall be construed to preclude institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authoring preserved by Section 510 of the CWA.

k. SEVERABILITY

The provisions of this Order are severable, and if any provision of this Order, or the application of any provisions of this Order to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this Order shall not be affected thereby.

l. APPLICATIONS

Any application submitted by a Copermittee for reissuance or modification of this Order must satisfy all applicable requirements specified in federal regulations as well as any additional requirements for submittal of a Report of Waste Discharge specified in the CWC and the California Code of Regulations.

m. IMPLEMENTATION

All plans, reports and subsequent amendments submitted in compliance with this Order must be implemented immediately (or as otherwise specified). All submittals by Copermittees must be adequate to implement the requirements of this Order.

n. REPORT SUBMITTALS

(1) All report submittals must include an executive summary, introduction, conclusion, recommendations, and signed certified statement.

(2) Each Copermittee must submit a signed certified statement covering its responsibilities for each applicable submittal.

(3) The Principal Watershed Copermittee(s) must submit a signed certified statement covering its responsibilities for each applicable submittal and the sections of the submittals for which it is responsible.

(4) Unless otherwise directed, the Copermittees must submit one hard copy and one electronic copy of each report required under this Order to the San Diego Water Board, and one electronic copy to the USEPA.

(5) The Copermittees must submit reports and provide notifications as required by this Order to the following:

EXECUTIVE OFFICER
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
9174 SKY PARK COURT, SUITE 100
SAN DIEGO CA 92123-4340
Telephone: (858) 467-2952 Fax: (858) 571-6972

EUGENE BROMLEY
US ENVIRONMENTAL PROTECTION AGENCY
REGION IX
PERMITS ISSUANCE SECTION (W-5-1)
75 HAWTHORNE STREET
SAN FRANCISCO CA 94105

ADMINISTRATIVE DRAFT

ATTACHMENT C

ACRONYMS AND ABBREVIATIONS

AMAL	Average Monthly Action Level
ASBS	Area(s) of Special Biological Significance
BMP	Best Management Practice
BMP Design Manual	Permanent BMP Sizing Criteria Design Manual
Basin Plan	Water Quality Control Plan for the San Diego Basin
CEQA	California Environmental Quality Act
CCR	California Code of Regulations
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWC	California Water Code
CZARA	Coastal Zone Act Reauthorization Amendments of 1990
ERP	Enforcement Response Plan
ESAs	Environmentally Sensitive Areas
GIS	Geographic Information System
IBI	Index of Biotic Integrity
LID	Low Impact Development
MDAL	Maximum Daily Action Level
MEP	Maximum Extent Practicable
ML	Minimum Level
MS4	Municipal Separate Storm Sewer System
NAL	Non-Storm Water Action Level
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
ROWD	Report of Waste Discharge (application for NPDES reissuance)
SAL	Storm Water Action Level
San Diego Water Board	California Regional Water Quality Control Board, San Diego Region
SIC	Standard Industrial Classification Code
State Water Board	State Water Resources Control Board
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
WDID	Waste Discharge Identification Number
WLA	Waste Load Allocation
WQBEL	Water Quality Based Effluent Limitation

ADMINISTRATIVE DRAFT

DEFINITIONS

Active/Passive Sediment Treatment - Using mechanical, electrical or chemical means to flocculate or coagulate suspended sediment for removal from runoff from construction sites prior to discharge.

Anthropogenic Litter – Trash generated from human activities, not including sediment.

Average Monthly Action Level – The highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month.

Beneficial Uses - The uses of water necessary for the survival or well being of man, plants, and wildlife. These uses of water serve to promote tangible and intangible economic, social, and environmental goals. "Beneficial Uses" of the waters of the State that may be protected include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. Existing beneficial uses are uses that were attained in the surface or ground water on or after November 28, 1975; and potential beneficial uses are uses that would probably develop in future years through the implementation of various control measures. "Beneficial Uses" are equivalent to "Designated Uses" under federal law. [California Water Code Section 13050(f)].

Best Management Practices (BMPs) - Defined in 40 CFR 122.2 as schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. In the case of municipal storm water permits, BMPs may be used in place of numeric effluent limits.

Bioassessment - The use of biological community information to evaluate the biological integrity of a water body and its watershed. With respect to aquatic ecosystems, bioassessment is the collection and analysis of samples of the benthic macroinvertebrate community together with physical/habitat quality measurements associated with the sampling site and the watershed to evaluate the biological condition (i.e. biotic integrity) of a water body.

Biocriteria - Under the CWA, numerical values or narrative expressions that define a desired biological condition for a water body that are legally enforceable. The USEPA defines biocriteria as: "numerical values or narrative expressions that describe the reference biological integrity of aquatic communities inhabiting waters of a given designated aquatic life use… (that)…describe the characteristics of water body segments least impaired by human activities."

Biofiltration - Practices that use vegetation and amended soils to detain and treat runoff from impervious areas. Treatment is through filtration, infiltration, adsorption, ion exchange, and biological uptake of pollutants.

Biological Integrity - Defined in Karr J.R. and D.R. Dudley. 1981. Ecological perspective on water quality goals. *Environmental Management* 5:55-68 as: "A balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitat of the region." Also referred to as ecosystem health.

Clean Water Act Section 303(d) Water Body - An impaired water body in which water quality does not meet applicable water quality standards and/or is not expected to meet water quality standards, even after the application of technology based pollution controls required by the CWA. The discharge of runoff to these water bodies by the Copermittees is significant because these discharges can cause or contribute to violations of applicable water quality standards.

Construction Site – Any project, including projects requiring coverage under the Construction General Permit, that involves soil disturbing activities including, but not limited to, clearing, grading, disturbances to ground such as stockpiling, and excavation.

Contamination - As defined in the Porter-Cologne Water Quality Control Act, contamination is "an impairment of the quality of waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste whether or not waters of the State are affected."

Copermittee – An incorporated city within the County of Orange, County of Riverside, or County of San Diego in the San Diego Region, the County of Orange, the County of Riverside, the County of San Diego, the Orange County Flood Control District, the Riverside County Water Conservation and Flood Control District, the San Diego Regional Airport Authority, or the Unified Port District of San Diego.

Copermittees – All of the individual Copermittees, collectively.

Critical Channel Flow (Qc) – The channel flow that produces the critical shear stress that initiates bed movement or that erodes the toe of channel banks. When measuring Qc, it should be based on the weakest boundary material – either bed or bank.

Daily Discharge – Defined as either: (1) the total mass of the constituent discharged over the calendar day or any 24 hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g. concentration.)

The Daily Discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day, or other 24 hour period other than a day), or by the arithmetic mean of analytical results from one or more grab samples taken over the course of a day.

Development Projects - Construction, rehabilitation, redevelopment, or reconstruction of any public or private residential project, industrial, commercial, or any other projects.

Dry Season – The period of time from May 1 to September 30 when rainfall is not expected to occur the San Diego.

Dry Weather – Weather is considered dry if the preceding 72 hours has been without precipitation.

Enclosed Bays – Enclosed bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost bay works is less than 75 percent

of the greatest dimension of the enclosed portion of the bay. Enclosed bays do not include inland surface waters or ocean waters.

Erosion – When land is diminished or worn away due to wind, water, or glacial ice. Often the eroded debris (silt or sediment) becomes a pollutant via storm water runoff. Erosion occurs naturally but can be intensified by land clearing activities such as farming, development, road building, and timber harvesting.

Environmentally Sensitive Areas (ESAs) - Areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; areas designated as preserves or their equivalent under the Natural Communities Conservation Program within the Cities and County of Orange; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.

Estuaries – Waters, including coastal lagoons, located at the mouth of streams that serve as areas of mixing fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and ocean water. Estuaries do not include inland surface waters or ocean waters.

Existing Development – Any area that has been developed and exists for municipal, commercial, industrial, or residential purposes, uses, or activities. May include areas that are not actively used for its originally developed purpose, but may be re-purposed or redeveloped for another use or activity.

Flow Duration – The long-term period of time that flows occur above a threshold that causes significant sediment transport and may cause excessive erosion damage to creeks and streams (not a single storm event duration). The simplest way to visualize this is to consider a histogram of pre- and post-project flows using long-term records of hourly data. To maintain pre-development flow duration means that the total number of hours (counts) within each range of flows in a flow-duration histogram cannot increase between the pre- and post-development condition. Flow duration within the range of geomorphologically significant flows is important for managing erosion.

Grading - The cutting and/or filling of the land surface to a desired slope or elevation.

Hazardous Material – Any substance that poses a threat to human health or the environment due to its toxicity, corrosiveness, ignitability, explosive nature or chemical reactivity. These also include materials named by the USEPA in 40 CFR 116 to be reported if a designated quantity of the material is spilled into the waters of the U.S. or emitted into the environment.

Hazardous Waste - Hazardous waste is defined as “any waste which, under Section 600 of Title 22 of this code, is required to be managed according to Chapter 30 of Division 4.5 of Title 22 of this code” [CCR Title 22, Division 4.5, Chapter 11, Article 1].

Household Hazardous Waste – Paints, cleaning products, and other wastes generated during home improvement or maintenance activities.

Hydromodification – The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, interflow and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

Illicit Connection – Any connection to the MS4 that conveys an illicit discharge.

Illicit Discharge - Any discharge to the MS4 that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from fire fighting activities [40 CFR 122.26(b)(2)].

Inactive Areas – Areas of construction activity that are not active and those that have been active and are not scheduled to be re-disturbed for at least 14 days.

Infiltration – Water other than wastewater that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow [40 CFR 35.2005(20)].

Inland Surface Waters – Includes all surface waters of the State that do not include the ocean, enclosed bays, or estuaries.

Jurisdictional Runoff Management Program Document – A written description of the specific jurisdictional runoff management measures and programs that each Copermittee will implement to comply with this Order and ensure that storm water pollutant discharges in runoff are reduced to the MEP and do not cause or contribute to a violation of water quality standards.

Low Impact Development (LID) – A storm water management and land development strategy that emphasizes conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions.

Low Impact Development Best Management Practices (LID BMPs) – LID BMPs include schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States through storm water management and land development strategies that emphasize conservation sand the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions. LID BMPs include retention practices that do not allow runoff, such as infiltration, rain water harvesting and reuse, and evapotranspiration. LID BMPs also include flow-through practices such as biofiltration that may have some discharge of storm water following pollutant reduction.

Major Outfall – As defined in the Code of Federal Regulations, a major outfall is a MS4 outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (i.e. discharge from a single conveyance other than a circular pipe which is associated with a drainage are of more than 50 acres); or, for MS4s that receive storm water from lands zoned for industrial activity (based on comprehensive zoning plans or equivalent), a MS4 outfall that

discharges from a single pipe with an inside diameter of 12 inches or more or from its equivalent (i.e. discharge from other than a circular pipe associated with a drainage area of 2 acres or more).

Maximum Daily Action Level (MDAL) –The highest allowable daily discharge of a pollutant, over a calendar day (or 24 hour period). For pollutants with action levels expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with action levels expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

Maximum Extent Practicable (MEP) – The technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) for storm water that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) in combination with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than BAT. A definition for MEP is not provided either in the statute or in the regulations. Instead the definition of MEP is dynamic and will be defined by the following process over time: municipalities propose their definition of MEP by way of their runoff management programs. Their total collective and individual activities conducted pursuant to the runoff management programs becomes their proposal for MEP as it applies both to their overall effort, as well as to specific activities (e.g., MEP for street sweeping, or MEP for MS4 maintenance). In the absence of a proposal acceptable to the San Diego Water Board, the San Diego Water Board defines MEP.

In a memo dated February 11, 1993, entitled "Definition of Maximum Extent Practicable," Elizabeth Jennings, Senior Staff Counsel, SWRCB addressed the achievement of the MEP standard as follows:

> "*To achieve the MEP standard, municipalities must employ whatever Best Management Practices (BMPs) are technically feasible (i.e., are likely to be effective) and are not cost prohibitive. The major emphasis is on technical feasibility. Reducing pollutants to the MEP means choosing effective BMPs, and rejecting applicable BMPs only where other effective BMPs will serve the same purpose, or the BMPs would not be technically feasible, or the cost would be prohibitive. In selecting BMPs to achieve the MEP standard, the following factors may be useful to consider:*
>
> *a. Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?*
> *b. Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?*
> *c. Public Acceptance: Does the BMP have public support?*
> *d. Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?*
> *e. Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc.?*
>
> *The final determination regarding whether a municipality has reduced pollutants to the maximum extent practicable can only be made by the Regional or State Water Boards, and not by the municipal discharger. If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those*

where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit derived, it would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs that would address a pollutant source, or to pick a BMP based solely on cost, which would be clearly less effective. In selecting BMPs the municipality must make a serious attempt to comply and practical solutions may not be lightly rejected. In any case, the burden would be on the municipal discharger to show compliance with its permit. After selecting a menu of BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented."

Monitoring Year – The monitoring year begins annually on July 1st and ends on June 30th.

Municipal Separate Storm Sewer System (MS4) – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designated or used for collecting or conveying storm water; (iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.26.

National Pollutant Discharge Elimination System (NPDES) - The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the CWA.

Non-Storm Water - All discharges to and from a MS4 that do not originate from precipitation events (i.e., all discharges from a MS4 other than storm water). Non-storm water includes illicit discharges and NPDES permitted discharges.

Nuisance - As defined in the Porter-Cologne Water Quality Control Act, a nuisance is "anything which meets all of the following requirements: 1) Is injurious to health, or is indecent, or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. 2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. 3) Occurs during, or as a result of, the treatment or disposal of wastes."

Ocean Waters – the territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the State Board's California Ocean Plan.

Order – Unless otherwise specified, refers to this Order, Order No. R9-2012-0011 (NPDES No. CAS0109266)

Permanent BMP Sizing Criteria Design Manual – A plan developed to eliminate, reduce, or mitigate the impacts of runoff from development projects, including Priority Development

Projects.

Person - A person is defined as an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof [40 CFR 122.2].

Point Source - Any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, landfill leachate collection systems, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

Pollutant - Any agent that may cause or contribute to the degradation of water quality such that a condition of pollution or contamination is created or aggravated.

Pollution - As defined in the Porter-Cologne Water Quality Control Act, pollution is "the alteration of the quality of the waters of the State by waste, to a degree that unreasonably affects the either of the following: 1) The waters for beneficial uses; or 2) Facilities that serve these beneficial uses." Pollution may include contamination.

Pollution Prevention - Pollution prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control BMPs, treatment control BMPs, or disposal.

Permanent BMPs - A subset of BMPs including structural and non-structural controls which detain, retain, filter, remove, or educate to prevent the release of pollutants to surface waters from development projects in perpetuity, after construction of a project is completed.

Pre-Development Runoff Conditions (Discharge Rates, Durations, Etc.) – Runoff conditions that existed onsite before the existing development was constructed, or exists onsite before planned development activities occur. This definition includes natural watershed hydrology before any human induced land alterations.

Priority Development Projects - New development and redevelopment projects defined under Provision E.3.b of Order No. R9-2012-0011.

Rainy Season (aka Wet Season) – The period of time from October 1 to April 30 when the San Diego Region experiences the most rainfall.

Receiving Waters – Waters of the United States.

Receiving Water Limitations - Waste discharge requirements issued by the San Diego Water Board typically include both: (1) "Effluent Limitations" (or "Discharge Limitations") that specify the technology-based or water-quality-based effluent limitations; and (2) "Receiving Water Limitations" that specify the water quality objectives in the Basin Plan as well as any other limitations necessary to attain those objectives. In summary, the "Receiving Water Limitations" provision is the provision used to implement the requirement of CWA section 301(b)(1)(C) that NPDES permits must include any more stringent limitations necessary to meet water quality standards.

Redevelopment - The creation, addition, and or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening,

the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include trenching and resurfacing associated with utility work; resurfacing existing roadways; new sidewalk construction, pedestrian ramps, or bike lane on existing roads; and routine replacement of damaged pavement, such as pothole repair.

Retain –Keep or hold in a particular place, condition, or position without discharge to surface waters.

Runoff - All flows in a storm water conveyance system that consists of the following components: (1) storm water (wet weather flows) and (2) non-storm water including dry weather flows.

San Diego Water Board – As used in this document the term "San Diego Water Board" is synonymous with the term "Regional Board" as defined in Water Code section 13050(b) and is intended to refer to the California Regional Water Quality Control Board for the San Diego Region as specified in Water Code Section 13200.

Sediment - Soil, sand, and minerals washed from land into water. Sediment resulting from anthropogenic sources (i.e. human induced land disturbance activities) is considered a pollutant. This Order regulates only the discharges of sediment from anthropogenic sources and does not regulate naturally occurring sources of sediment. Sediment can destroy fish-nesting areas, clog animal habitats, and cloud waters so that sunlight does not reach aquatic plants.

Shared Treatment Control BMP - BMPs used by multiple developments to infiltrate, filter, or treat the required volume or flow prior to discharge to a receiving water. This could include, for example, a treatment BMP at the end of an enclosed storm drain that collects runoff from several commercial developments.

Source Control BMP – Land use or site planning practices, or structural or nonstructural measures that aim to prevent runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between pollutants and runoff.

State Water Quality Protection Area – A nonterrestrial marine or estuarine area designated to protect marine species or biological communities from an undesirable alteration in natural water quality, including, but not limited to, areas of special biological significance that have been designated by the State Water Board through its water quality control planning process. Areas of special biological significance are a subset of State Water Quality Protection Areas, and require special protection as determined by the State Water Resources Control Board pursuant to the California Ocean Plan adopted and reviewed pursuant to Article 4 (commencing with Section 13160) of Chapter 3 of Division 7 of the California Water Code and pursuant to the Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California (California Thermal Plan) adopted by the State Water Board.

Storm Water – Per 40 CFR 122.26(b)(13), means storm water runoff, snowmelt runoff and surface runoff and drainage. Surface runoff and drainage pertains to runoff and drainage resulting from precipitation events.

Total Maximum Daily Load (TMDL) - The maximum amount of a pollutant that can be discharged into a water body from all sources (point and non-point) and still maintain water quality standards. Under CWA section 303(d), TMDLs must be developed for all water bodies that do not meet water quality standards after application of technology-based controls.

Toxicity - Adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies). The water quality objectives for toxicity provided in the Basin Plan, state in part…"All waters shall be free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life….The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge".

Treatment Control BMP – Any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media absorption or any other physical, biological, or chemical process.

Unpaved Road – Any long, narrow stretch without pavement used for traveling by motor passenger vehicles between two or more points. Unpaved roads are generally constructed of dirt, gravel, aggregate or macadam and may be improved or unimproved.

Waste - As defined in CWC Section 13050(d), "waste includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal."

Article 2 of CCR Title 23, Chapter 15 (Chapter 15) contains a waste classification system that applies to solid and semi-solid waste, which cannot be discharged directly or indirectly to water of the state and which therefore must be discharged to land for treatment, storage, or disposal in accordance with Chapter 15. There are four classifications of waste (listed in order of highest to lowest threat to water quality): hazardous waste, designated waste, non-hazardous solid waste, and inert waste.

Water Quality Objective - Numerical or narrative limits on constituents or characteristics of water designated to protect designated beneficial uses of the water. [California Water Code Section 13050 (h)]. California's water quality objectives are established by the State and Regional Water Boards in the Water Quality Control Plans. Numeric or narrative limits for pollutants or characteristics of water designed to protect the beneficial uses of the water. In other words, a water quality objective is the maximum concentration of a pollutant that can exist in a receiving water and still generally ensure that the beneficial uses of the receiving water remain protected (i.e., not impaired). Since water quality objectives are designed specifically to protect the beneficial uses, when the objectives are violated the beneficial uses are, by definition, no longer protected and become impaired. This is a fundamental concept under the Porter Cologne Act. Equally fundamental is Porter Cologne's definition of pollution. A condition of pollution exists when the water quality needed to support designated beneficial uses has become unreasonably affected or impaired; in other words, when the water quality objectives have been violated. These underlying definitions (regarding beneficial use protection) are the reason why all waste discharge requirements implementing the federal NPDES regulations require compliance with water quality objectives. (Water quality objectives are also called water quality criteria in the CWA.)

Water Quality Standards - Water quality standards, as defined in Clean Water Act section 303(c) consist of the beneficial uses (e.g., swimming, fishing, municipal drinking water supply, etc.,) of a water body and criteria (referred to as water quality objectives in the California Water Code) necessary to protect those uses. Under the Water Code, the water boards establish beneficial uses and water quality objectives in water quality control or basin plans. Together with an anti-degradation policy, these beneficial uses and water quality objectives serve as water quality standards under the Clean Water Act. In Clean Water Act parlance, state beneficial uses are called "designated uses" and state water quality objectives are called "criteria." Throughout this Order, the relevant term is used depending on the statutory scheme.

Waters of the State - Any water, surface or underground, including saline waters within the boundaries of the State [CWC section 13050 (e)]. The definition of the Waters of the State is broader than that for the Waters of the United States in that all water in the State is considered to be a Waters of the State regardless of circumstances or condition. Under this definition, a MS4 is always considered to be a Waters of the State.

Waters of the United States - As defined in the 40 CFR 122.2, the Waters of the U.S. are defined as: "(a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate "wetlands;" (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters otherwise defined as waters of the United States under this definition: (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial seas; and (g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA."

Watershed - That geographical area which drains to a specified point on a water course, usually a confluence of streams or rivers (also known as drainage area, catchment, or river basin).

Wet Season (aka Rainy Season) – The period of time from October 1 to April 30 when the San Diego Region experiences the most rainfall.

Wet Weather – Weather is considered wet if there is a storm event of 0.1 inches and greater and the following 72 hours.

ATTACHMENT D

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

FY _____

I. COPERMITTEE INFORMATION

Copermittee Name:

Copermittee Primary Contact Name:

Copermittee Primary Contact Information:
Address:
City: County: State: Zip:
Telephone: Fax: Email:

II. LEGAL AUTHORITY

Has the Copermittee established adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 that complies with Order No. R9-2012-0011?	YES NO	☐ ☐
A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority?	YES NO	☐ ☐

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

Was an update of the jurisdictional runoff management program document required or recommended by the San Diego Water Board?	YES NO	☐ ☐
If YES to the question above, did the Copermittee update its jurisdictional runoff management program document and make it available on the Regional Clearinghouse?	YES NO	☐ ☐

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

Has the Copermittee implemented a program to actively detect and eliminate illicit discharges and connections to its MS4 that complies with Order No. R9-2012-0011?	YES NO	☐ ☐

Number of non-storm water discharges reported by the public	
Number of non-storm water discharges detected by Copermittee staff or contractors	
Number of non-storm water discharges investigated by the Copermittee	
Number of sources of non-storm water discharges identified	
Number of non-storm water discharges eliminated	
Number of sources of illicit discharges or connections identified	
Number of illicit discharges or connections eliminated	
Number of enforcement actions issued	
Number of high level enforcement actions issued	

V. DEVELOPMENT PLANNING PROGRAM

Has the Copermittee implemented a development planning program that complies with Order No. R9-2012-0011?	YES NO	☐ ☐
Was an update to the Permanent BMP Sizing Criteria Design Manual required or recommended by the San Diego Water Board?	YES NO	☐ ☐
If YES to the question above, did the Copermittee update its Permanent BMP Sizing Criteria Design Manual and make it available on the Regional Clearinghouse?	YES NO	☐ ☐

Number of proposed development projects in review	
Number of Priority Development Projects in review	
Number of Priority Development Projects approved	
Number of approved Priority Development Projects exempt from any BMP requirements	
Number of approved Priority Development Projects requiring mitigation	
Number of Priority Development Projects granted occupancy	

Number of completed Priority Development Projects in inventory	
Number of high priority Priority Development Project permanent BMP inspections	
Number of Priority Development Project permanent BMP violations	
Number of enforcement actions issued	
Number of high level enforcement actions issued	

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM
FY _____

VI. CONSTRUCTION MANAGEMENT PROGRAM

Has the Copermittee implemented a construction management program that complies with Order No. R9-2012-0011?	**YES**	☐
	NO	☐

Number of construction sites in inventory	
Number of active construction sites in inventory	
Number of inactive construction sites in inventory	
Number of construction sites closed/completed during reporting period	
Number of construction site inspections	
Number of construction site violations	
Number of enforcement actions issued	
Number of high level enforcement actions issued	

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

Has the Copermittee implemented an existing development management program that complies with Order No. R9-2012-0011?	**YES**	☐
	NO	☐

	Municipal	Commercial	Industrial	Residential
Number of existing developments in inventory				
Number of existing development inspections				
Number of follow-up inspections				
Number of existing development violations				
Number of enforcement actions issued				
Number of high level enforcement actions issued				

VIII. PUBLIC EDUCATION AND PARTICIPATION

Has the Copermittee implemented a public education program that complies with Order No. R9-2012-0011?	**YES**	☐
	NO	☐
Has the Copermittee implemented a mechanism for public participation and where necessary intergovernmental coordination that complies with Order No. R9-2012-0011?	**YES**	☐
	NO	☐

IX. FISCAL ANALYSIS

Has the Copermittee attached to this form a summary of its fiscal analysis that complies with Order No. R9-2012-0011?	**YES**	☐
	NO	☐

X. CERTIFICATION

I [☐ Principal Executive Officer ☐ Ranking Elected Official ☐ Duly Authorized Representative] certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature	Date
Print Name	Title
Telephone Number	Email

ADMINISTRATIVE DRAFT

ATTACHMENT E

SPECIFIC PROVISIONS FOR TOTAL MAXIMUM DAILY LOADS APPLICABLE TO ORDER NO. R9-2012-0011

These provisions implement Total Maximum Daily Loads (TMDLs), adopted by the San Diego Water Board and approved by USEPA under Clean Water Act section 303(c), which are applicable to discharges regulated under this Order. The provisions and schedules for implementation of the TMDLs described below must be incorporated into the Water Quality Improvement Plans, required pursuant to Provision B of this Order, for the specified Watershed Management Areas.

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed
2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin
3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed
4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek
5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay
6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2002-0123

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	August 14, 2002
State Water Board Approval Date:	July 16, 2003
Office of Administrative Law Approval Date:	September 11, 2003
US EPA Approval Date:	November 3, 2003

(3) TMDL Effective Date: September 11, 2003

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, Unified Port District of San Diego

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for Chollas Creek consist of the following:

(1) Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedule under Specific Provision 1.c:

Table 1.1
Receiving Water Limitations as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Diazinon	Acute	0.08 µg/L	1 hour
	Chronic	0.05 µg/L	4 days

(2) Effluent Limitations

Discharges from the MS4s must not contain concentrations that exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 1.c:

Table 1.2
Effluent Limitations as Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation	Averaging Period
Diazinon	Acute	0.072 µg/L	1 hour
	Chronic	0.045 µg/L	4 days

(3) Best Management Practices

The following BMPs for Chollas Creek must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area and implemented by the Responsible Copermittees:

(a) The Responsible Copermittees must implement BMPs capable of achieving the WQBELs under Specific Provision 1.b for Chollas Creek.

(b) The Responsible Copermittees must implement the Diazinon Toxicity Control Plan and Diazinon Public Outreach/Education Program as described in the report titled, *Technical Report for Total Maximum Daily Load for Diazinon in Chollas Creek Watershed, San Diego County*, dated August 14, 2002, including subsequent modifications, in order to achieve the WQBELs under Specific Provision 1.b.

(c) The Responsible Copermittees should coordinate the BMPs to address this TMDL with Caltrans wherever and whenever possible.

c. Compliance Schedule

The Responsible Copermittees were required to achieve their WLA by December 31, 2010. The Responsible Copermittees must be in compliance with the WQBELs under Specific Provision 1.b.

d. Specific Monitoring and Assessment Requirements

(a) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

(b) The Responsible Copermittees must monitor the effluent of the MS4 outfalls for diazinon within the Chollas Creek watershed, and calculate or estimate the monthly and annual diazinon loads, in accordance with the requirements of Provisions D.1, D.4.a.(1)(b), and D.4.a.(3)(b) of this Order. The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0019

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	September 22, 2005
Office of Administrative Law Approval Date:	December 2, 2005
US EPA Approval Date:	February 8, 2006

(3) TMDL Effective Date: December 2, 2005

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Shelter Island Yacht Basin

(6) Responsible Copermittee: City of San Diego

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for Shelter Island Shoreline Park consist of the following:

(1) Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedule under Specific Provision 2.c:

Table 2.1
Receiving Water Limitations as Concentrations in Shelter Island Yacht Basin

Constituent	Exposure Duration	Effluent Limitation	Averaging Period
Dissolved Copper	Acute	4.8 µg/L	1 hour
	Chronic	3.1 µg/L	4 days

(2) Effluent Limitations

Discharges from the MS4s must not contain pollutant loads that exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 2.c:

Table 2.2
Effluent Limitations as Annual Loads in MS4 Discharges to Shelter Island Yacht Basin

Constituent	Effluent Limitation
Dissolved Copper	30 kg/yr

(3) Best Management Practices

The Responsible Copermittee must implement BMPs capable of achieving the WQBELs under Specific Provision 2.b for Shelter Island Yacht Basin

c. COMPLIANCE SCHEDULE

The Responsible Copermittee was required to achieve its WLA upon the effective date of the TMDL, December 2, 2005. The Responsible Copermittee must be in compliance with the WQBELs under Specific Provision 2.b.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

The Responsible Copermittee must monitor the effluent of its MS4 outfalls for dissolved copper, and calculate or estimate the monthly and annual dissolved copper loads, in accordance with the requirements of Provisions D.1, D.4.a.(1)(b), and D.4.a.(3)(b) of this Order. The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0036

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	November 16, 2005
Office of Administrative Law Approval Date:	February 1, 2006
US EPA Approval Date:	March 22, 2006

(3) TMDL Effective Date: February 1, 2006

(4) Watershed Management Area: Santa Margarita River

(5) Water Body: Rainbow Creek

(6) Responsible Copermittee: County of San Diego

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for Rainbow Creek consist of the following

(1) Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedule under Specific Provision 3.c.(1):

Table 3.1
Receiving Water Limitations as Concentrations in Rainbow Creek

Constituent	Receiving Water Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(2) Effluent Limitations

(a) Discharges from the MS4s must not contain concentrations that exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 3.c.(1):

Table 3.2
Effluent Limitations as Concentrations in MS4 Discharges to Rainbow Creek

Constituent	Effluent Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(b) Pollutant loads from given land uses discharging to and from the MS4s must not exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 3.c.(1):

Table 3.3
Effluent Limitations as Annual Loads in MS4 Discharges to Rainbow Creek

Land Use	Total N	Total P
Commercial nurseries	116 kg/yr	3 kg/yr
Park	3 kg/yr	0.1 kg/yr
Residential areas	149 kg/yr	12 kg/yr
Urban areas	27 kg/yr	6 kg/yr

Interim effluent limitations expressed as pollutant loads are given in the compliance schedule under Specific Provision 3.0.

(3) Best Management Practices

(a) The Responsible Copermittee must implement BMPs capable of achieving the WQBELs under Specific Provision 3.b for Rainbow Creek.

(b) The Responsible Copermittee should coordinate the BMPs to address this TMDL with Caltrans and other sources wherever and whenever possible.

c. COMPLIANCE SCHEDULE

(1) WLA Compliance Date

The Responsible Copermittee is required to achieve its WLAs, thus must be in compliance with the WQBELs under Specific Provision 3.b, by December 31, 2021.

(2) Interim Compliance Requirements

Table 3.4
Interim Effluent Limitations as Annual Loads in MS4 Discharges from Specific Land Uses to Rainbow Creek

	Total N Interim Effluent Limitations (kg/yr)			Total P Interim Effluent Limitations (kg/yr)		
	Interim Compliance Date			Interim Compliance Date		
Land Use	**2009**	**2013**	**2017**	**2009**	**2013**	**2017**
Commercial nurseries	399	299	196	20	16	10
Park	5	3	3	0.15	0.10	0.10
Residential areas	507	390	260	99	74	47
Urban areas	40	27	27	9	6	6

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

The Responsible Copermittee must implement the Sampling and Analysis Plan for Rainbow Creek Nutrient Reduction TMDL Implementation Water Quality Monitoring, dated January 2010. The results of any monitoring conducted during the reporting period, and assessment of whether the interim and final WQBELs have been achieved must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2007-0043

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2007
State Water Board Approval Date:	July 15, 2008
Office of Administrative Law Approval Date:	October 22, 2008
US EPA Approval Date:	December 18, 2008

(3) TMDL Effective Date: October 22, 2008

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, Unified Port District of San Diego

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELsfor Chollas Creek consist of the following:

(1) Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedule under Specific Provision 4.c.(1):

Table 4.1
Receiving Water Limitations as Concentrations in Chollas Creek

Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$(0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$(0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$(0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$(0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER.

(2) Effluent Limitations

Discharges from the MS4s must not contain pollutant loads that exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 4.c.(1):

Table 4.2
Effluent Limitations as Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER.

(3) Best Management Practices

(a) The Responsible Copermittee must implement BMPs capable of achieving the WQBELs under Specific Provision 4.b for Chollas Creek.

(b) The Responsible Copermittees should coordinate the BMPs to address this TMDL with Caltrans and the U.S. Navy wherever and whenever possible.

c. COMPLIANCE SCHEDULE

(1) WLA Compliance Date

The Responsible Copermittee is required to achieve the WLA, thus must be in compliance with the WQBELs under Specific Provision 4.b, by October 22, 2028.

(2) Interim Compliance Requirements

The Responsible Copermittee must comply with the following interim WQBELs by the interim compliance date:

Table 4.3
Interim Effluent Limitations as Concentrations in MS4 Discharges to Chollas Creek

Interim Compliance Date	Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
October 22, 2018	Dissolved Copper	Acute	1.2 x 90% x (0.96) x $e^{[0.9422 \times \ln(\text{hardness}) - 1.700]}$ x WER*	1 hour
		Chronic	1.2 x 90% x (0.96) x $e^{[0.8545 \times \ln(\text{hardness}) - 1.702]}$ x WER*	4 days
	Dissolved Lead	Acute	1.2 x 90% x [1.46203 – 0.145712 x ln(hardness)] x $e^{[1.273 \times \ln(\text{hardness}) - 1.460]}$ x WER*	1 hour
		Chronic	1.2 x 90% x [1.46203 – 0.145712 x ln(hardness)] x $e^{[1.273 \times \ln(\text{hardness}) - 4.705]}$ x WER*	4 days
	Dissolved Zinc	Acute	1.2 x 90% x (0.978) x $e^{[0.8473 \times \ln(\text{hardness}) + 0.884]}$ x WER*	1 hour
		Chronic	1.2 x 90% x (0.986) x $e^{[0.8473 \times \ln(\text{hardness}) + 0.884]}$ x WER*	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER.

d. Specific Monitoring and Assessment Requirements

(a) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*, when it is amended to include monitoring requirements for the Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

(b) The Responsible Copermittees must monitor the effluent of the MS4 outfalls discharging to Chollas Creek for dissolved copper, lead, and zinc, and calculate or estimate the monthly and annual dissolved copper, lead, and zinc loads, in accordance with the requirements of Provisions D.1, D.4.a.(1)(b), and D.4.a.(3)(b) of this Order. The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2008-0027

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 11, 2008
State Water Board Approval Date:	June 16, 2009
Office of Administrative Law Approval Date:	September 15, 2009
US EPA Approval Date:	October 26, 2009

(3) TMDL Effective Date: September 15, 2009

(4) Watershed Management Areas: See Table 5.0

(5) Water Bodies: See Table 5.0

(6) Responsible Copermittees: See Table 5.0

Table 5.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County	Dana Point Harbor	Baby Beach	-City of Dana Point -County of Orange
San Diego Bay	San Diego Bay	Shelter Island Shoreline Park	-Unified Port of San Diego

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Receiving Water Limitations

(a) Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedules under Specific Provisions 5.c.(1)(a) and 5.c.(2):

Table 5.1
Receiving Water Limitations as Bacteria Densities in the Water Body

	Receiving Water Limitations	
Constituent	**Single Sample Maximum[1,2]**	**30-Day Geometric Mean[2]**
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.

(b) If the above receiving water limitations are not met in the receiving water, the Responsible Copermittees must demonstrate that the discharges from the MS4s are not causing or contributing to the violation of receiving water limitations. The Copermittee must provide data that demonstrate the discharges from the MS4s are meeting the effluent limitations under Specific Provision 5.b.(2).

(2) Effluent Limitations

Discharges from the MS4s must not contain densities that exceed the following effluent limitations by the end of the compliance schedules under Specific Provisions 5.c.(1)(a) and 5.c.(2) to demonstrate the discharge is not causing or contributing to a violation of receiving water quality standards:

Table 5.2
Effluent Limitations as Bacteria Densities in MS4 Discharges to the Water Body

	Effluent Limitations	
Constituent	**Single Sample Maximum[1,2]**	**30-Day Geometric Mean[2]**
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.

Interim effluent limitations expressed as pollutant loads are given in the compliance schedule under Specific Provision 5.c.

(3) Best Management Practices

(a) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 5.0 fulfill the Bacteria Load Reduction Plan (BLRP) requirements in Resolution No. R9-2008-0027.

(b) The Responsible Copermittee must implement BMPs capable of achieving the WQBELs under Specific Provision 5.0 for the segments or areas of the water bodies listed in Table 5.0

c. COMPLIANCE SCHEDULE

(1) Baby Beach in Dana Point Harbor

(a) WLA Compliance Dates

The Responsible Copermittees for MS4 discharges to Baby Beach are required to achieve the WLA, thus must be in compliance with the WQBELs under Specific Provision 5.0, according to the following compliance schedule:

Table 5.3
Compliance Schedule Dates to Achieve Baby Beach WLAs

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform	September 15, 2014	September 15, 2009
Fecal Coliform		September 15, 2009
Enterococcus		September 15, 2019

(b) Interim Compliance Requirements

The Responsible Copermittees for MS4 discharges to Baby Beach must comply with the following interim WQBELs by the interim compliance date:

Table 5.4
Interim Effluent Limitations as Loads in MS4 Discharges to Baby Beach

Constituent	Interim Compliance Date	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	5.32×10^9 MPN/day	NA*
Fecal Coliform	September 15, 2012	0.59×10^9 MPN/day	NA*
Enterococcus	September 15, 2012	0.42×10^9 MPN/day	NA**
	September 15, 2016	NA*	207×10^9 MPN/30days

Notes:
* The WQBELs under Specific Provision 5.b must already be achieved by the given interim compliance date.
** There is no corresponding interim WQBEL for the given interim compliance date.

(2) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park is required to achieve the WLA, thus must be in compliance with the WQBELs under Specific Provision 5.0, by December 31, 2012.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) Monitoring Stations

(a) The Responsible Copermittees must designate the MS4 outfalls within their jurisdiction discharging to the segments or areas of the water bodies listed in Table 5.0 as high priority non-storm water MS4 monitoring stations, in accordance with the requirements of Provision D.1.

(b) The Responsible Copermittees must establish at least one monitoring station within the receiving water body.

(2) Monitoring Procedures

(a) The Responsible Copermittees must monitor the effluent of the designated MS4 outfalls within their jurisdiction discharging during dry weather conditions to the segments or areas of the water bodies listed in Table 5.0 in accordance with the dry weather jurisdictional monitoring requirements of Provision D.1.a.(1)(b). Samples required to be submitted to a laboratory for analysis must include analysis for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(b) The Responsible Copermittees must monitor, within the first 24 hours of each storm event,[19] the effluent of the designated MS4 outfalls within their jurisdiction discharging to the segments or areas of the water bodies listed in Table 5.0 in accordance with the wet weather jurisdictional monitoring requirements of Provision D.1.b.(1)(b) of this Order. Samples required to be submitted to a laboratory for analysis must include analysis for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(c) The Responsible Copermittees must collect samples from the monitoring stations within the receiving water body for each dry weather and wet weather MS4 outfall monitoring event. Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs have been achieved.

(b) The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

[19] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2010-0001

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 10, 2010
State Water Board Approval Date:	December 14, 2010
Office of Administrative Law Approval Date:	April 4, 2011
US EPA Approval Date:	June 22, 2011

(3) TMDL Effective Date: April 4, 2011

(4) Watershed Management Areas: See Table 6.0

(5) Water Bodies: See Table 6.0

(6) Responsible Copermittees: See Table 6.0

Table 6.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	-City of Laguna Beach -County of Orange -Orange County Flood Control District
		at Heisler Park - North	
	Pacific Ocean Shoreline	at Main Laguna Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Woods -County of Orange -Orange County Flood Control District
		Laguna Beach at Ocean Avenue	
		Laguna Beach at Cleo Street	
		Arch Cove at Bluebird Canyon Road	
		Laguna Beach at Dumond Drive	
	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Hills -City of Laguna Niguel -City of Laguna Woods -City of Lake Forest -City of Mission Viejo -County of Orange -Orange County Flood Control District
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	
	Aliso Creek Mouth	at mouth	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County (cont'd)	Pacific Ocean Shoreline	Aliso Beach at West Street	-City of Dana Point -City of Laguna Beach -City of Laguna Niguel -County of Orange -Orange County Flood Control District
		Aliso Beach at Table Rock Drive	
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)	
		at Salt Creek (large outlet)	
		Salt Creek Beach at Salt Creek service road	
		Salt Creek Beach at Strand Road	
	Pacific Ocean Shoreline	at San Juan Creek	-City of Dana Point -City of Laguna Hills -City of Laguna Niguel -City of Mission Viejo -City of Rancho Santa Margarita -City of San Juan Capistrano -County of Orange -Orange County Flood Control District
	San Juan Creek	lower 1 mile	
	San Juan Creek Mouth	at mouth	
	Pacific Ocean Shoreline	at Poche Beach	-City of San Clemente -County of Orange -Orange County Flood Control District
		Ole Hanson Beach Club Beach at Pico Drain	
		San Clemente City Beach at El Portal Street Stairs	
		San Clemente City Beach at Mariposa Street	
		San Clemente City Beach at Linda Lane	
		San Clemente City Beach at South Linda Lane	
		San Clemente City Beach at Lifeguard Headquarters	
		under San Clemente Municipal Pier	
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	
		San Clemente State Beach at Riviera Beach	
		Can Clemente State Beach at Cypress Shores	
San Luis Rey River	Pacific Ocean Shoreline	at San Luis Rey River mouth	-City of Oceanside -City of Vista -County of San Diego

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
Carlsbad	Pacific Ocean Shoreline	at Moonlight State Beach	-City of Carlsbad -City of Encinitas -City of Escondido -City of Oceanside -City of San Marcos -City of Solana Beach -City of Vista -County of San Diego
San Dieguito River	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	-City of Del Mar -City of Escondido -City of Poway -City of San Diego -City of Solana Beach -County of San Diego
Penasquitos	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	-City of Del Mar -City of Poway -City of San Diego -County of San Diego
	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	-City of San Diego
		La Jolla Shores Beach at Caminito del Oro	
		La Jolla Shores Beach at Vallecitos	
		La Jolla Shores Beach at Avenida de la Playa	
		at Casa Beach, Children's Pool	
		South Casa Beach at Coast Boulevard	
		Whispering Sands Beach at Ravina Street	
		Windansea Beach at Vista de la Playa	
		Windansea Beach at Bonair Street	
		Windansea Beach at Playa del Norte	
		Windansea Beach at Palomar Avenue	
		at Tourmaline Surf Park	
		Pacific Beach at Grand Avenue	
	Tecolote Creek	Entire reach and tributaries	-City of San Diego

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I- Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
San Diego River	Forrester Creek	lower 1 mile	-City of El Cajon -City of La Mesa -City of Santee -County of San Diego
	San Diego River	lower 6 miles	-City of El Cajon -City of La Mesa -City of San Diego -City of Santee -County of San Diego
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	
San Diego Bay	Chollas Creek	lower 1.2 miles	-City of La Mesa -City of Lemon Grove -City of San Diego -County of San Diego

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for segments or areas of the water bodies listed in Table 6.0 consist of the following:

(1) Receiving Water Limitations

(a) Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedules under Specific Provision 6.c.(1):

Table 6.1
Receiving Water Limitations as Bacteria Densities and Allowable Exceedance Frequencies in the Water Body

	Receiving Water Limitations			
Constituent	Single Sample Maximum[1,2] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[3]	30-Day Geometric Mean[2] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform	10,000	22% / 0%	1,000	0%
Fecal Coliform	400	22% / 0%	200	0%
Enterococcus	104[4] / 61[5]	22% / 0%	35[4] / 33[5]	0%

Notes:
1. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
3. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. The 0% single sample maximum allowable exceedance frequency applies to dry weather days.
4. This *Enterococcus* receiving water limitation applies to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
5. This *Enterococcus* receiving water limitations applies to segments or areas of creeks or creek mouths listed in Table 6.0.

Interim receiving water limitations expressed as allowable exceedance frequencies are given in the compliance schedule under Specific Provision 6.c.

(b) If the above receiving water limitations are not met in the receiving water, the Responsible Copermittees must demonstrate that the discharges from the MS4s are not causing or contributing to the violation of receiving water limitations. The Copermittee must provide data that demonstrate the discharges from the MS4s are meeting the effluent limitations under Specific Provision 6.b.(2).

(2) Effluent Limitations

Discharges from the MS4s must not contain densities that exceed the following effluent limitations by the end of the compliance schedules under Specific Provision 6.c.(1) to demonstrate the discharge is not causing or contributing to a violation of receiving water quality standards:

Table 6.2
Effluent Limitations as Bacteria Densities and Allowable Exceedance Frequencies in MS4 Discharges to the Water Body

	Effluent Limitations			
Constituent	Single Sample Maximum[1,2] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[3]	30-Day Geometric Mean[2] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform	10,000	22% / 0%	1,000	0%
Fecal Coliform	400	22% / 0%	200	0%
Enterococcus	104[4] / 61[5]	22% / 0%	35[4] / 33[5]	0%

Notes:
1. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.
3. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. The 0% single sample maximum allowable exceedance frequency applies to dry weather days
4. This *Enterococcus* effluent limitation applies to MS4 discharges to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
5. This *Enterococcus* effluent limitation applies to MS4 discharges to segments or areas of creeks or creek mouths listed in Table 6.0.

Interim effluent limitations expressed as allowable exceedance frequencies are given in the compliance schedule under Specific Provision 6.c.

(3) Best Management Practices

(a) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 6.0 fulfill the Comprehensive Load Reduction Plan (CLRP) requirements in Resolution No. R9-2010-0001.

(b) The Responsible Copermittee must implement BMPs capable of achieving the WQBELs under Specific Provision 6.b for the segments or areas of the water bodies listed in Table 6.0.

(c) The Responsible Copermittees should coordinate the BMPs to address this TMDL with Caltrans and owners/operators of small MS4s wherever and whenever possible.

c. COMPLIANCE SCHEDULE

(1) WLA Compliance Dates

The Responsible Copermittees for MS4 discharges to a segment or area of the water bodies listed in Table 6.0 are required to achieve the WLA, thus must be in compliance with the WQBELs under Specific Provision 6.b, according to the following compliance schedule:

Table 6.3
Compliance Schedule Dates to Achieve Indicator Bacteria WLAs

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform	April 4, 2021	April 4, 2031
Fecal Coliform		
Enterococcus		

(2) Interim Compliance Requirements

The Responsible Copermittees must comply with the following interim WQBELs by the interim compliance dates:

(a) Interim Dry Weather WQBELs

The Responsible Copermittee must calculate the "existing" exceedance frequencies of the 30-day geometric mean water quality objectives for each of the indicator bacteria by analyzing the monitoring data collected between January 1, 2002 and April 4, 2011. "Existing" exceedance frequencies may be calculated by segment or area of a water body, or by water body, and/or by Watershed Management Area listed in Table 6.0. Separate "existing" exceedance frequencies must be calculated for beaches and creeks/creek mouths.

The Responsible Copermittees must achieve a 50 percent reduction in the "existing" exceedance frequency of the 30-day geometric mean WQBELs for the segments or areas of the water bodies listed in Table 6.0 by the interim compliance dates for achieving the interim dry weather WQBELs given in Table 6.5. A 50 percent reduction in the "existing" exceedance frequency is equivalent to half of the "existing" exceedance frequency of the 30-day geometric mean WQBELs.

The "existing" exceedance frequencies and the interim dry weather allowable exceedance frequencies (i.e. interim dry weather WQBELs) calculated by the Responsible Copermittees must be included in the Water Quality Improvement Plans for the applicable Watershed Management Areas.

(b) Interim Wet Weather WQBELs

The Responsible Copermittees must achieve the interim wet weather WQBELs in Table 6.4, expressed as interim allowable exceedance frequencies, by the interim compliance dates for achieving the interim wet weather WQBELs given in Table 6.5.

Table 6.4
Interim Wet Weather WQBELs Expressed as
Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	38%	37%	39%
		at Heisler Park - North			
	Pacific Ocean Shoreline	at Main Laguna Beach			
		Laguna Beach at Ocean Avenue			
		Laguna Beach at Cleo Street			
		Arch Cove at Bluebird Canyon Road			
		Laguna Beach at Dumond Drive			
	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	41%	41%	42%
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	41%	41%	42%
	Aliso Creek Mouth	at mouth	41%	41%	42%
	Pacific Ocean Shoreline	Aliso Beach at West Street	36%	36%	36%
		Aliso Beach at Table Rock Drive			
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)			
		at Salt Creek (large outlet)			
		Salt Creek Beach at Salt Creek service road			
		Salt Creek Beach at Strand Road			

Table 6.4 (Cont'd)
Interim Wet Weather WQBELs Expressed as
Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County (cont'd)	Pacific Ocean Shoreline	at San Juan Creek	44%	44%	48%
	San Juan Creek	lower 1 mile	44%	44%	47%
	San Juan Creek Mouth	at mouth	44%	44%	47%
	Pacific Ocean Shoreline	at Poche Beach	35%	35%	36%
		Ole Hanson Beach Club Beach at Pico Drain			
		San Clemente City Beach at El Portal Street Stairs			
		San Clemente City Beach at Mariposa Street			
		San Clemente City Beach at Linda Lane			
		San Clemente City Beach at South Linda Lane			
		San Clemente City Beach at Lifeguard Headquarters			
		under San Clemente Municipal Pier			
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)			
		San Clemente State Beach at Riviera Beach			
		Can Clemente State Beach at Cypress Shores			
San Luis Rey River	Pacific Ocean Shoreline	at San Luis Rey River mouth	45%	44%	47%
Carlsbad	Pacific Ocean Shoreline	at Moonlight State Beach	40%	40%	41%
San Dieguito River	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	33%	33%	36%

Table 6.4 (Cont'd)
Interim Wet Weather WQBELs Expressed as
Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
Penasquitos	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	26%	26%	26%
	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	37%	37%	37%
		La Jolla Shores Beach at Caminito del Oro			
		La Jolla Shores Beach at Vallecitos			
		La Jolla Shores Beach at Avenida de la Playa			
		at Casa Beach, Children's Pool			
		South Casa Beach at Coast Boulevard			
		Whispering Sands Beach at Ravina Street			
		Windansea Beach at Vista de la Playa			
		Windansea Beach at Bonair Street			
		Windansea Beach at Playa del Norte			
		Windansea Beach at Palomar Avenue			
		at Tourmaline Surf Park			
		Pacific Beach at Grand Avenue			
	Tecolote Creek	Entire reach and tributaries	49%	49%	51%
San Diego River	Forrester Creek	lower 1 mile	46%	43%	49%
	San Diego River	lower 6 miles	46%	43%	49%
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	46%	43%	51%
San Diego Bay	Chollas Creek	lower 1.2 miles	41%	41%	43%

(c) Interim WQBEL Compliance Dates

The Responsible Copermittees must achieve the interim WQBELs under Specific Provisions 6.c.(2)(a) and 6.c.(2)(b) by the interim compliance dates given in Table 6.5.

Table 6.5
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs
South Orange County	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	April 4, 2016	April 4, 2021
		at Heisler Park - North		
	Pacific Ocean Shoreline	at Main Laguna Beach	April 4, 2016	April 4, 2021
		Laguna Beach at Ocean Avenue		
		Laguna Beach at Cleo Street		
		Arch Cove at Bluebird Canyon Road		
		Laguna Beach at Dumond Drive		
	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	April 4, 2016	April 4, 2021
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	April 4, 2018	April 4, 2021
	Aliso Creek Mouth	at mouth	April 4, 2018	April 4, 2021
	Pacific Ocean Shoreline	Aliso Beach at West Street	April 4, 2016	April 4, 2021
		Aliso Beach at Table Rock Drive		
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)		
		at Salt Creek (large outlet)		
		Salt Creek Beach at Salt Creek service road	April 4, 2017	April 4, 2021
		Salt Creek Beach at Strand Road	April 4, 2017	April 4, 2021

Table 6.5 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs
South Orange County (cont'd)	Pacific Ocean Shoreline	at San Juan Creek	April 4, 2016	April 4, 2021
	San Juan Creek	lower 1 mile	April 4, 2018	April 4, 2021
	San Juan Creek Mouth	at mouth	April 4, 2016	April 4, 2021
	Pacific Ocean Shoreline	at Poche Beach	April 4, 2016	April 4, 2021
		Ole Hanson Beach Club Beach at Pico Drain	April 4, 2016	April 4, 2021
		San Clemente City Beach at El Portal Street Stairs	April 4, 2017	April 4, 2021
		San Clemente City Beach at Mariposa Street		
		San Clemente City Beach at Linda Lane	April 4, 2016	April 4, 2021
		San Clemente City Beach at South Linda Lane	April 4, 2018	April 4, 2021
		San Clemente City Beach at Lifeguard Headquarters	April 4, 2017	April 4, 2021
		under San Clemente Municipal Pier		
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	April 4, 2018	April 4, 2021
		San Clemente State Beach at Riviera Beach	April 4, 2016	April 4, 2021
		Can Clemente State Beach at Cypress Shores	April 4, 2017	April 4, 2021
San Luis Rey River	Pacific Ocean Shoreline	at San Luis Rey River mouth	April 4, 2017	April 4, 2021
Carlsbad	Pacific Ocean Shoreline	at Moonlight State Beach	April 4, 2016	April 4, 2021
San Dieguito River	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	April 4, 2016	April 4, 2021

Table 6.5 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs
Penasquitos	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	April 4, 2016	April 4, 2021
	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande		
		La Jolla Shores Beach at Caminito del Oro		
		La Jolla Shores Beach at Vallecitos		
		La Jolla Shores Beach at Avenida de la Playa		
		at Casa Beach, Children's Pool		
		South Casa Beach at Coast Boulevard		
		Whispering Sands Beach at Ravina Street		
		Windansea Beach at Vista de la Playa		
		Windansea Beach at Bonair Street		
		Windansea Beach at Playa del Norte		
		Windansea Beach at Palomar Avenue		
		at Tourmaline Surf Park		
		Pacific Beach at Grand Avenue		
	Tecolote Creek	Entire reach and tributaries		
San Diego River	Forrester Creek	lower 1 mile	April 4, 2018	April 4, 2021
	San Diego River	lower 6 miles		
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach		
San Diego Bay	Chollas Creek	lower 1.2 miles	April 4, 2018	April 4, 2021

d. Specific Monitoring and Assessment Requirements

(1) Monitoring and Assessment Requirements for Beaches

(a) Monitoring Stations

(i) The Responsible Copermittees must designate the MS4 outfalls within their jurisdiction discharging to the Pacific Ocean Shoreline segments or areas listed in Table 6.0 as high priority non-storm water MS4 monitoring stations, in accordance with the requirements of Provision D.1 of this Order.

(ii) For the Pacific Ocean Shoreline segments or areas listed in Table 6.0 with MS4 outfalls, the Responsible Copermittees must establish at least one monitoring station within the receiving water.

(b) Monitoring Procedures

(i) The Responsible Copermittees must monitor the effluent of the designated MS4 outfalls within their jurisdiction discharging during dry weather to the Pacific Ocean Shoreline segments or areas listed in Table 6.0 in accordance with the dry weather jurisdictional monitoring requirements of Provision D.1.a.(1)(b) of this Order. Samples required to be submitted to a laboratory for analysis must include analysis for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(ii) The Responsible Copermittees must monitor, within the first 24 hours of each storm event,[20] the effluent of the designated MS4 outfalls within their jurisdiction discharging to the Pacific Ocean Shoreline segments or areas listed in Table 6.0 in accordance with the wet weather jurisdictional monitoring requirements of Provision D.1.b.(1)(b) of this Order. Samples required to be submitted to a laboratory for analysis must include analysis for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(iii) The Responsible Copermittees must collect samples from the monitoring stations within the receiving water body for each dry weather and wet weather MS4 outfall monitoring event. Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs for the Pacific Ocean Shoreline segments or areas listed in Table 6.0 have been achieved.

(ii) The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

[20] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(2) Monitoring and Assessment Requirements for Creeks and Creek Mouths

(a) Monitoring Stations

(i) The Responsible Copermittees must establish at least one receiving water monitoring station at or near the mouth of the creeks listed in Table 6.0.

(ii) The Responsible Copermittees must establish at least one receiving water monitoring station upstream of the station established for Specific Provision 6.d.(2)(a)(i). At least one monitoring station must be established for each Responsible Copermittee at the most downstream location within its jurisdiction, and one monitoring station at the most upstream location within its jurisdiction.

(iii) The Responsible Copermittees must identify the MS4 outfalls discharging to the segments or areas of the creeks and creek mouths listed in Table 6.0. The Responsible Copermittees must identify the MS4 outfalls that are monitored in accordance with the dry weather jurisdictional monitoring requirements of Provision D.1.a.(1)(b) of this Order and the wet weather jurisdictional monitoring requirements of Provision D.1.b.(1)(a) of this Order.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations within the first 24 hours of each storm event.[21]

(iii) Samples collected from receiving water monitoring stations must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the receiving water monitoring data to assess whether the interim and final receiving water WQBELs for the creeks and creek mouths listed in Table 6.0 have been achieved.

[21] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(ii) If the receiving water WQBELs for the creeks and creek mouths listed in Table 6.0 have not been achieved, the Responsible Copermittees must review the MS4 outfall monitoring data to assess whether the interim and final effluent WQBELs have been achieved.

(iii) The Responsible Copermittee must identify and incorporate additional MS4 outfall and receiving water monitoring stations and/or adjust monitoring frequencies to identify sources causing exceedances of the receiving water WQBELs.

(iv) The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

000810

Laurie Walsh - Administrative Draft of Regional MS4 Permit

From: <lyris@swrcb18.waterboards.ca.gov>
To: LWalsh@waterboards.ca.gov
Date: 4/9/2012 11:04 AM
Subject: Administrative Draft of Regional MS4 Permit

Stakeholders:

The San Diego Water Board is considering the development and adoption of a Regional Municipal Separate Storm Sewer System Storm Water NPDES Permit (Regional MS4 Permit) that will be issued to municipal Copermittees in San Diego County, Southern Orange County and Riverside County. Currently, each of these counties within the San Diego Region has its own municipal storm water permit. In order to better achieve regulatory consistency as well as maximum efficiency and economy of resources, the San Diego Water Board developed a single Regional MS4 Permit based on the boundaries of the San Diego Region instead of county political boundaries. Under this approach, the permit will uniformly regulate all three counties within the San Diego Region.

An administrative draft of the Regional MS4 Permit is posted on the San Diego Water Boards website at http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml. At the upcoming April 25, 2012 workshop, the San Diego Water Board will inform stakeholders about the administrative draft review process, focused work group meetings, and the formal public review and permit adoption schedule. Workshop participants may present comments and ask clarifying questions regarding the Regional MS4 Administrative Draft Permit. Written comments may also be submitted in advance to help frame discussion during the Workshop. The San Diego Water Board may respond to, but will not necessarily provide oral or written responses to, the comments received prior to or at the Workshop. **Written comments received by the San Diego Water Board on or before June 15, 2012 will be considered in development of the Tentative Order.**

A copy of the Notice of Public Workshop, which includes all pertinent workshop information, is also posted on the San Diego Water Board's website at the link provided above.

Regards,
San Diego Water Board
Regional MS4 Permit Team

You are currently subscribed to reg9_riversideco_ms4permit as: lwalsh@waterboards.ca.gov.

To unsubscribe click here: http://swrcb18.waterboards.ca.gov/u?id=500886.85d32d801af47be2dd00c692f1c0dfcd&n=T&l=reg9_riversideco_ms4permit&o=327319

(It may be necessary to cut and paste the above URL if the line is broken)

or send a blank email to leave-327319-500886.85d32d801af47be2dd00c692f1c0dfcd@swrcb18.waterboards.ca.gov

000811

Wayne Chiu - Notice of Public Workshop

From: Laurie Walsh
To: reg9_sandiegoco_ms4permit@swrcb18.waterboards.ca.gov; reg9_riversideco_m...
Date: 4/2/2012 2:26 PM
Subject: Notice of Public Workshop
Attachments: Final Regional MS4 Storm Water Permit-Workshop Notice San .pdf

Interested Parties:

The San Diego Water Board is considering the development and adoption of a Regional Municipal Separate Storm Sewer System (MS4) Storm Water NPDES Permit that will be issued to municipal Copermittees in San Diego County, Southern Orange County and Riverside County. Currently, each of these counties within the San Diego Region has its own MS4 Storm Water Permit. In order to better achieve regulatory consistency as well as maximum efficiency and economy of resources, the San Diego Water Board has initiated work to develop a single Regional MS4 Storm Water Permit based on the boundaries of the San Diego Region instead of county political boundaries. Under this approach, the permit being developed will uniformly regulate all three counties within the San Diego Region.

The San Diego Water Board will accept comments regarding the administrative draft of the Regional MS4 Storm Water Permit at an upcoming workshop. Attached is the Notice of Public Workshop which includes all pertinent information. **The administrative draft of the Tentative Order will be available at the San Diego Water Boards website on or before April 9, 2012.**

Regards,
San Diego Water Board
Regional MS4 Storm Water Permit Team

California Regional Water Quality Control Board

San Diego Region

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http:// www.waterboards.ca.gov/sandiego

NOTICE OF PUBLIC WORKSHOP

A workshop will be held
to receive comments regarding an administrative draft of
Tentative Order No. R9-2012-0011, NPDES No. CAS01092662
Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region

Wednesday, April 25, 2012
from 9:30 a.m. - 12:00 p.m.
California Regional Water Quality Control Board, San Diego Region
Regional Water Board Room
San Diego Water Board Office Building
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

SUBJECT OF WORKSHOP

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) will accept comments regarding the administrative draft of a Regional NPDES Permit for Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region (Regional MS4 Storm Water Permit) (Tentative Order No. R9-2012-0011). A quorum of San Diego Water Board members may be present. The administrative draft of the Tentative Order will be available **on or before April 9th, 2012** and can be viewed at:

http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

BACKGROUND

The San Diego Water Board is considering the development and adoption of a Regional Municipal Separate Storm Sewer System (MS4) Storm Water NPDES Permit that will be issued to municipal Copermittees in San Diego County, Southern Orange County and Riverside County. Currently, each of these counties within the San Diego Region has its own MS4 Storm Water Permit. In order to better achieve regulatory consistency as well as maximum efficiency and economy of resources, the San Diego Water Board has initiated work to develop a single Regional MS4 Storm Water Permit based on the boundaries of the San Diego Region instead of county political boundaries. Under this approach, the permit being developed will uniformly regulate all three counties within the San Diego Region. The Regional MS4 Storm Water Permit will also provide opportunities for a comprehensive monitoring framework, incentive for a regional collaborative approach, and opportunities for regional cost efficiencies amongst the Copermittees. Upon adoption by the San Diego Water Board, this Regional MS4 Storm Water

Permit will be issued to all 39 Copermittees in a phased manner according to the expiration dates of their current MS4 Storm Water permit.

PROCEDURAL MATTERS

The April 25, 2012, Workshop will be informal and conducted to facilitate discussion on the Regional MS4 Storm Water Permit concept. There will be no sworn testimony or cross-examination of participants. San Diego Water Board staff will summarize significant elements of the Regional MS4 Storm Water Permit and explain the process for stakeholder representatives to participate in a series of focused meetings with the San Diego Water Board. The tentative focused meeting schedule and associated Regional MS4 Storm Water Permit sections selected for discussion are:

May 16, 2012 – Water Quality Improvement Plans

May 23, 2012 – Monitoring and Assessment Requirements

June 6, 2012 – Jurisdictional Programs

June 13, 2012 – Reporting Requirements

Workshop participants may present comments and ask clarifying questions regarding the Regional MS4 Storm Water Permit. Written comments may also be submitted in advance to help frame discussion during the Workshop. The San Diego Water Board may respond to, but will not necessarily provide oral or written responses to, the comments received prior to or at the Workshop. The San Diego Water Board will, however, consider these comments in the development of a Tentative Order. The San Diego Water Board will issue a separate public hearing notice announcing the release of a Tentative Order for public review and comment, the deadline for submission of comments, and the date of the public hearing for the San Diego Water Board to consider the comments received, public testimony, and adoption of a Tentative Order. Once released, the Tentative Order will serve as the public comment draft permit for purposes of applicable public notice requirements under the Code of Federal Regulations (40 C.F.R. § 124.10) and Water Code section 13167.5, subdivision (b). Therefore, interested persons submitting comments in advance of the Workshop must resubmit any comments they wish the San Diego Water Board to respond to during the public comment period that will be established for the future Tentative Order.

To ensure a productive and efficient Workshop, and to ensure that all attending have an opportunity to participate, oral presentations from any interested persons may be **limited to three (3) minutes** or otherwise limited at the discretion of the San Diego Water staff conducting the Workshop. Participants with similar comments are requested to make joint presentations.

ELECTRONIC MAIL LIST SUBSCRIPTION

The San Diego Water Board has established an electronic mail list specifically for information and notices on the development of a Regional MS4 Storm Water Permit. The San Diego Water Board will use the email list to notify interested persons of upcoming important events and the availability of on-line documents. Persons interested in receiving future notices and information on this specific project can subscribe to one (1) of the electronic mail lists titled "Orange County MS4 Permit, " Riverside County MS4 Permit, or "San Diego MS4 Permit ", located on the San Diego Water Board website at:

http://www.waterboards.ca.gov/resources/email_subscriptions/reg9_subscribe.shtml

Persons who wish to receive hard copy notices of future notices or meetings on the Regional MS4 Storm Water Permit in lieu of electronic notices should submit a request to Mr. Wayne Chiu, Water Resource Control Engineer, 9174 Sky Park Court, Suite 100, San Diego, CA 92123.

Please bring this matter to the attention of any person known to you who may be affected by the administrative draft of the Regional MS4 Storm Water Permit.

INFORMATION REGARDING WORKSHOP

If you have any questions or wish to receive a hard copy of the Tentative Order, please contact Wayne Chiu (858) 637-5558 or via e-mail at wchiu@waterboards.ca.gov.

WORKSHOP AGENDA

Administrative Draft of
Tentative Order No. R9-2012-0011, NPDES No. CAS0109266
Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region

Wednesday, April 25, 2012
9:30 a.m. - 12:00 p.m.

1. Introduction & Proposed Tentative Order Timeline (Eric Becker)

2. San Diego Water Board Staff Presentations

   Why, Concepts & General Approach (Wayne Chiu)
   Specific Elements & Significant Changes (Laurie Walsh)
   Focused Meeting Process (Wayne Chiu)

3. Break – 10 minutes

4. Comments & Questions (All)

Permit Team
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Eric Becker, Senior Engineer- EBecker@waterboards.ca.gov
Wayne Chiu, Staff Engineer- WChiu@waterboards.ca.gov
Laurie Walsh, Staff Engineer- LWalsh@waterboards.ca.gov
Christina Arias, Staff Engineer- CArias@waterboards.ca.gov

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http://www.waterboards.ca.gov/resources/email_subscriptions/reg9_subscribe.shtml

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Regional MS4 Permit

Administrative Draft

Tentative Order No. R9-2012-0011

Regional Water Quality Control Board

San Diego Region

Restore and maintain the physical, chemical, and biological integrity of the Nation's waters

Improve and protect water quality

An effective permit is required for water quality improvement and protection

Effectively prohibit non-storm water discharges into storm sewers

Require controls to reduce the discharge of pollutants in storm water to the maximum extent practicable

Restore and maintain the physical, chemical, and biological integrity of receiving waters

Actions

Measure or count “beans”

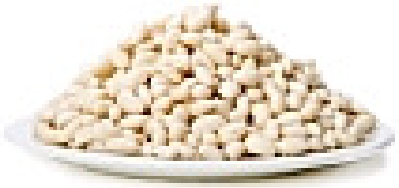

Does not track progress or measure improvement

Focusing on actions has not been effective

Outcomes

Actions

Track progress toward goals and measure improvements

Focus on desired outcomes for actions to become effective

Strategic

❶

Adaptive

❷

Synergistic

❸

Strategic

❶

Have a plan to achieve the desired outcome

What is the plan?
What is the desired outcome?

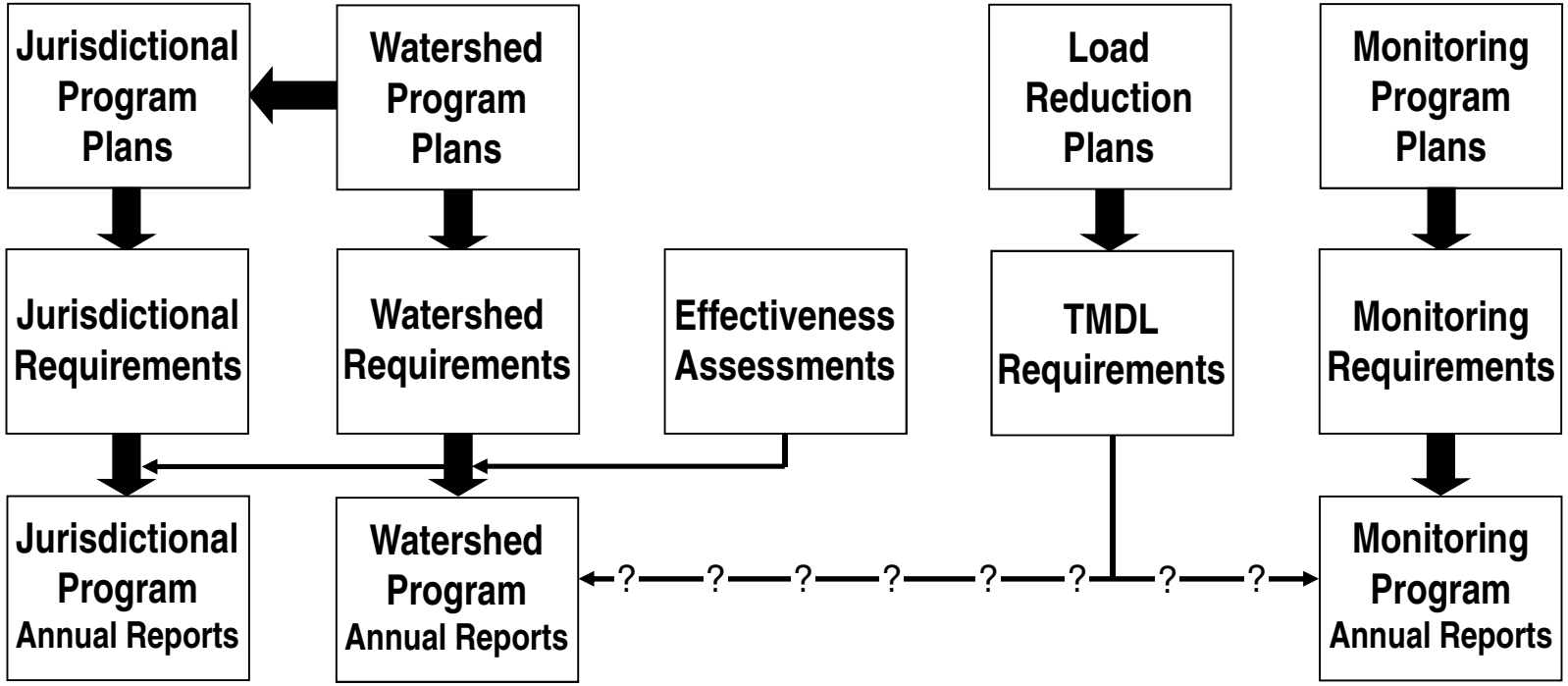

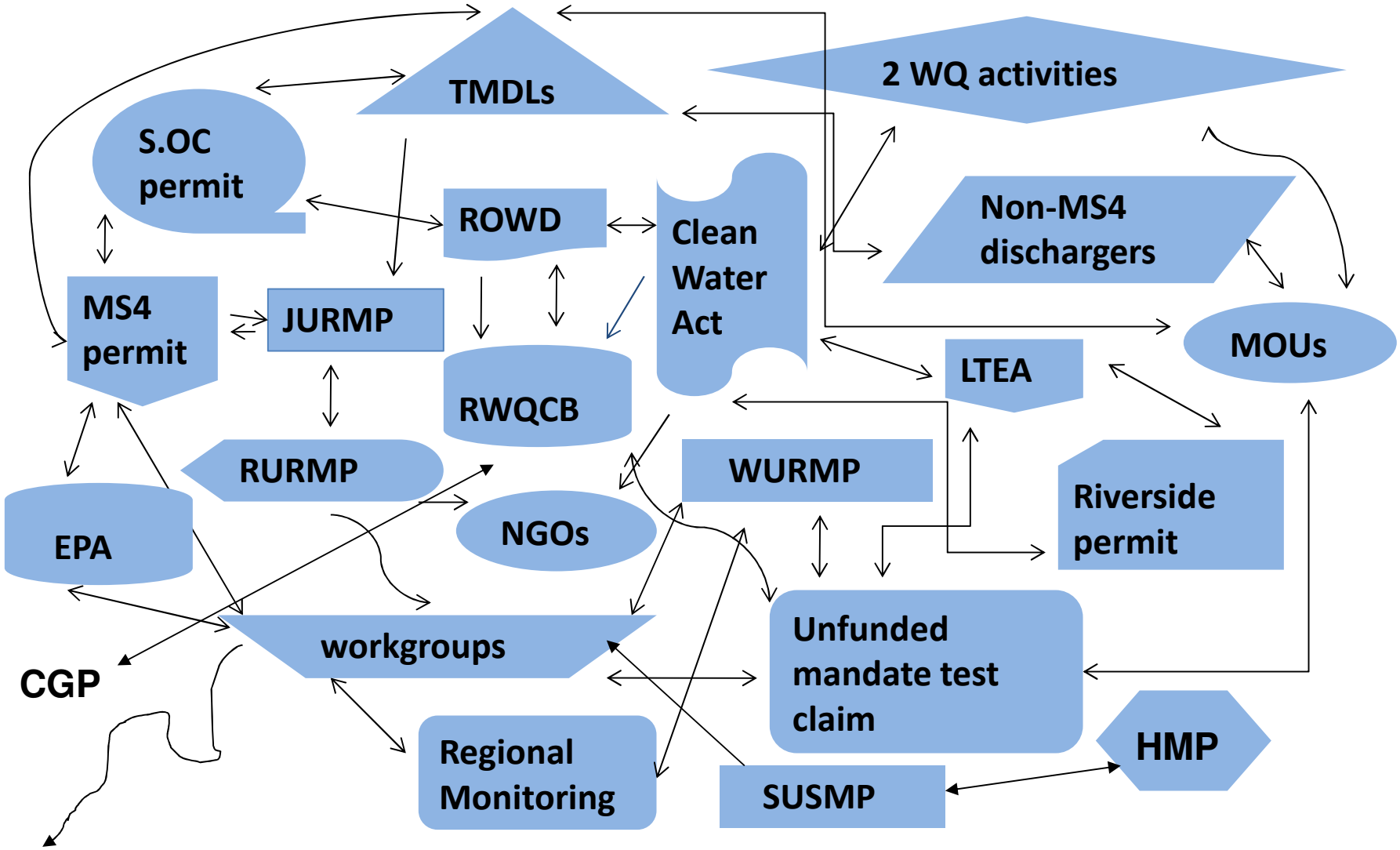
TMDLs
2 WQ activities
S.OC permit
ROWD
Clean Water Act
Non-MS4 dischargers
MS4 permit
JURMP
MOUs
LTEA
RWQCB
RURMP
WURMP
Riverside permit
EPA
NGOs
workgroups
Unfunded mandate test claim
CGP
HMP
Regional Monitoring
SUSMP

Progress

?

Progress
toward desired outcome

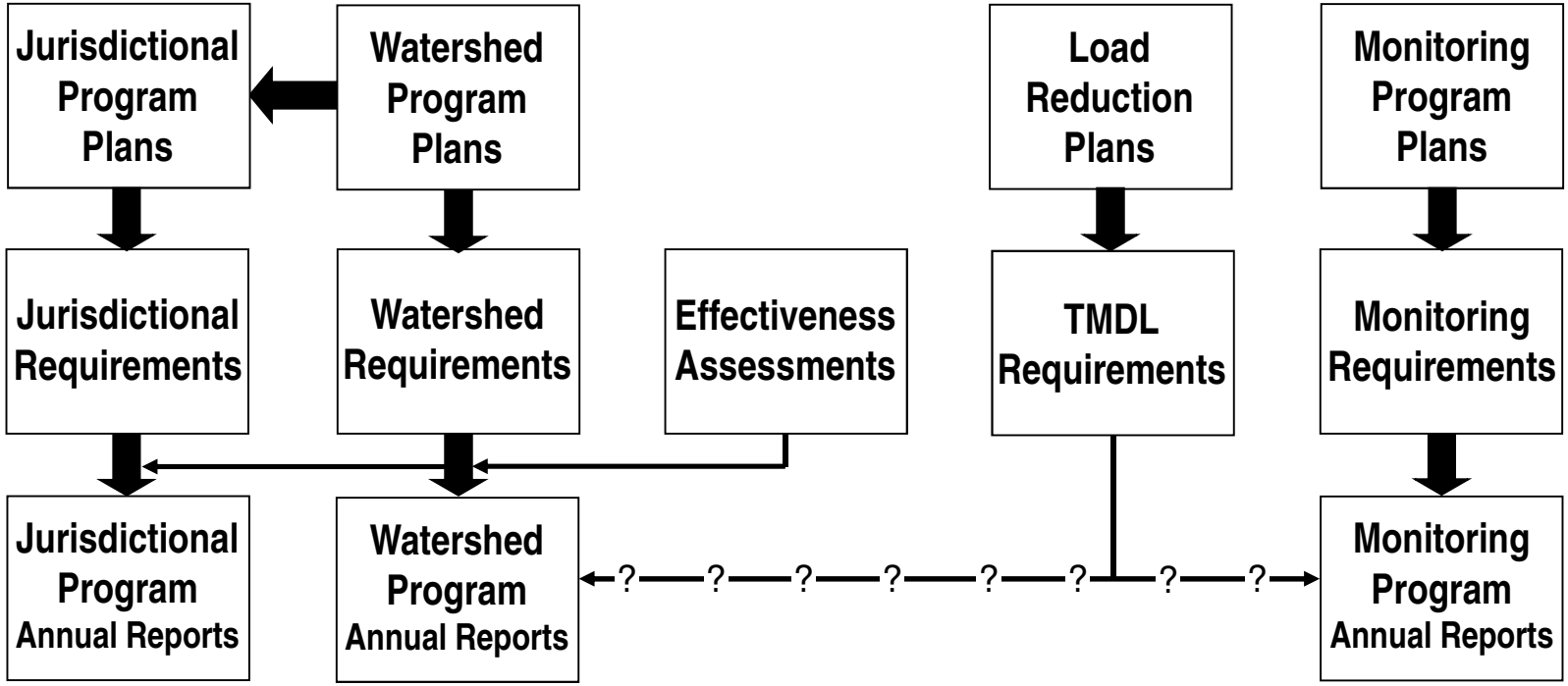
Jurisdictional Program Plans
Watershed Program Plans
Load Reduction Plans
Monitoring Program Plans
Jurisdictional Requirements
Watershed Requirements
Effectiveness Assessments
TMDL Requirements
Monitoring Requirements
Jurisdictional Program Annual Reports
Watershed Program Annual Reports
Monitoring Program Annual Reports

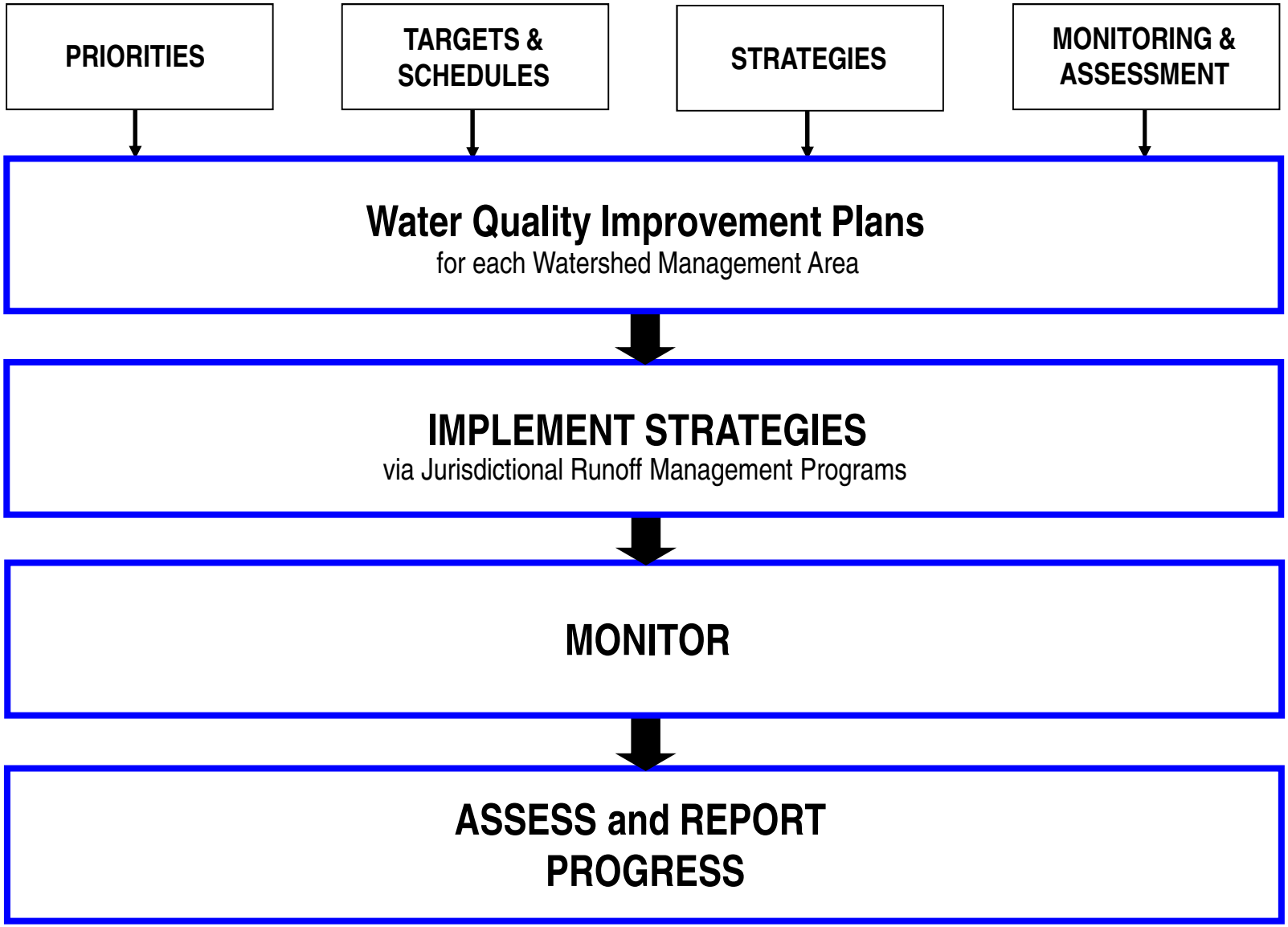
PRIORITIES
TARGETS & SCHEDULES
STRATEGIES
MONITORING & ASSESSMENT
Water Quality Improvement Plans
for each Watershed Management Area
IMPLEMENT STRATEGIES
via Jurisdictional Runoff Management Programs
MONITOR
ASSESS and REPORT PROGRESS

Adaptive

❷

Modify the plan, when needed,
to achieve the desired outcomes

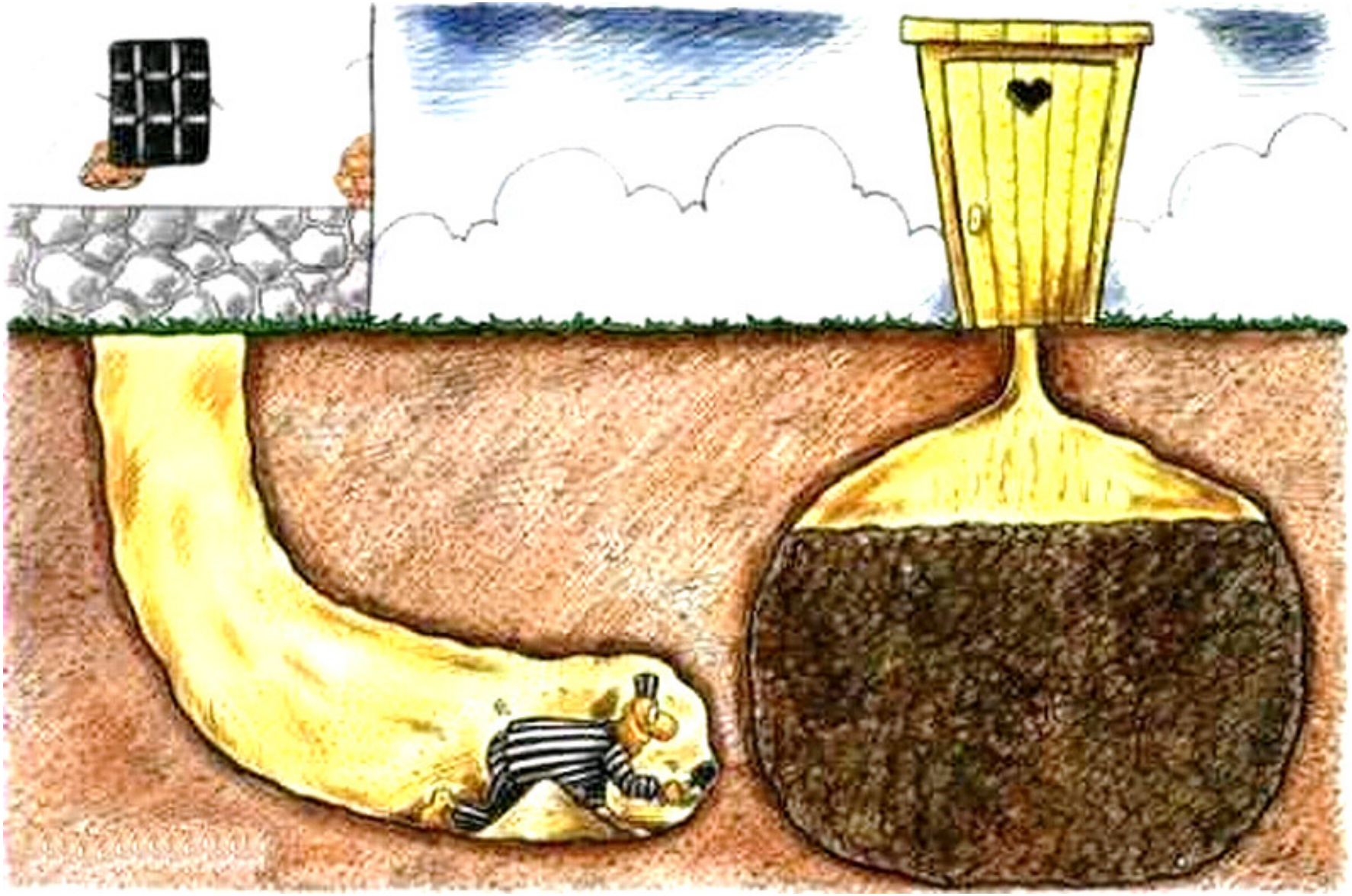

What is supposed to be modified?

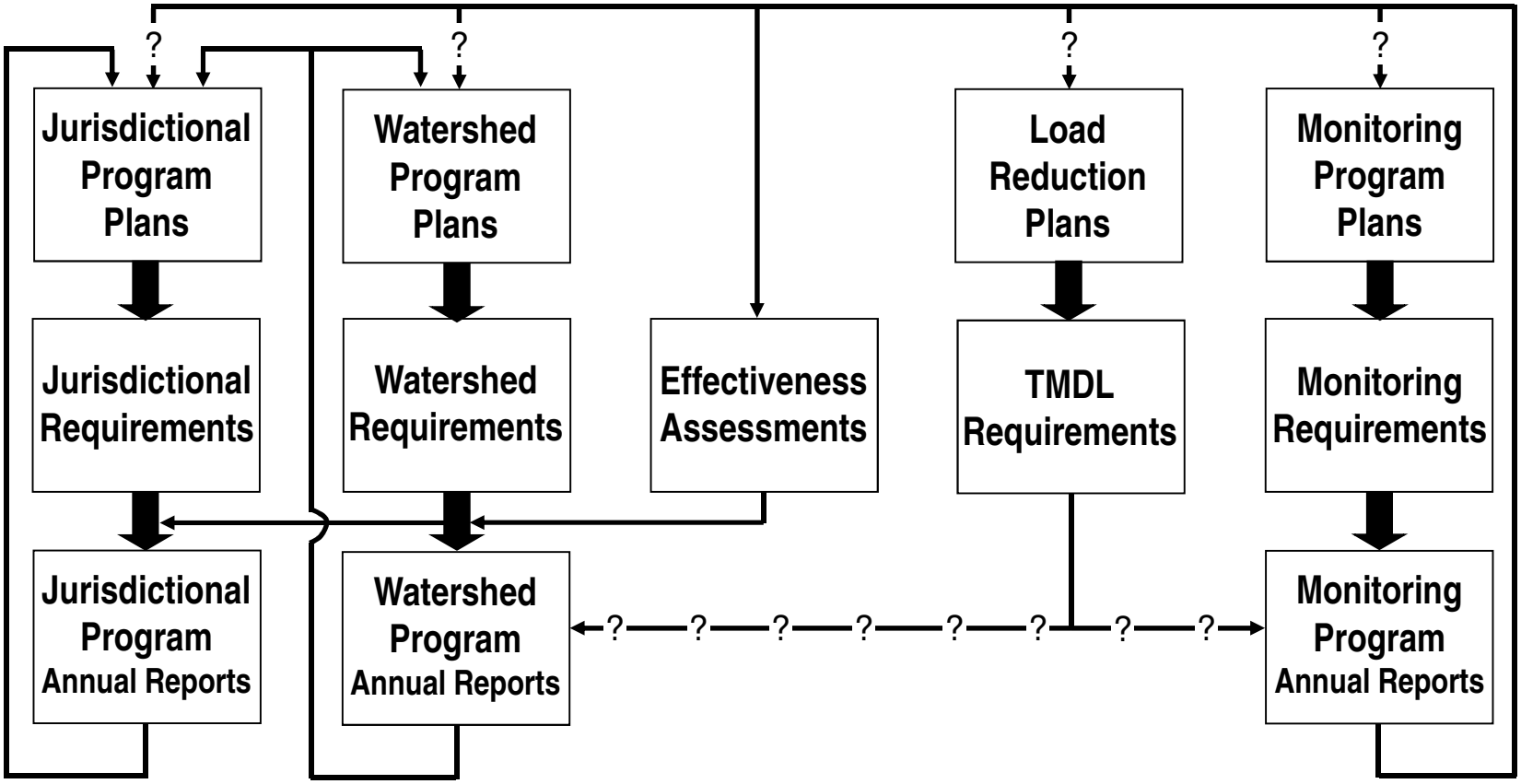

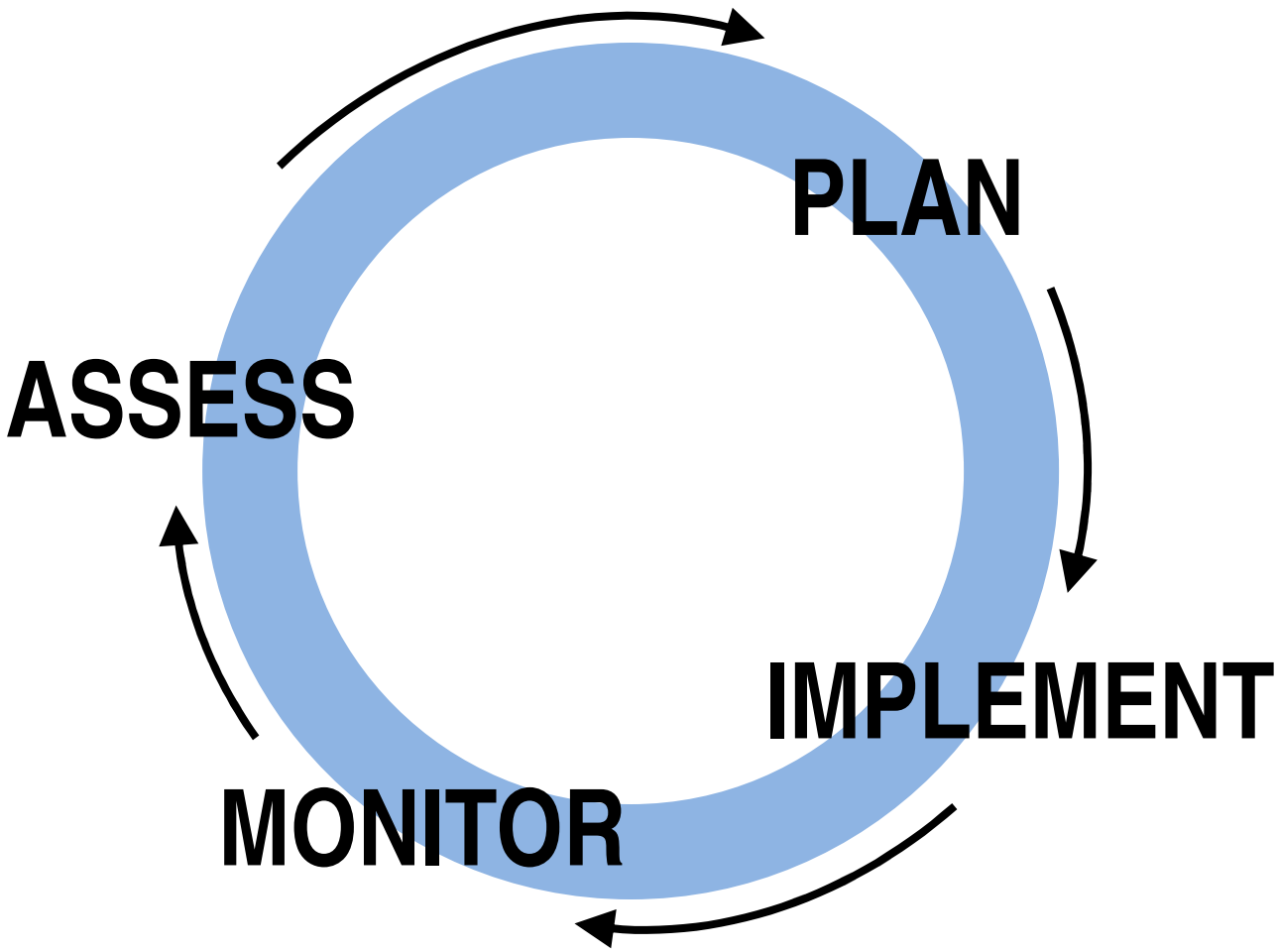
PLAN
IMPLEMENT
MONITOR
ASSESS

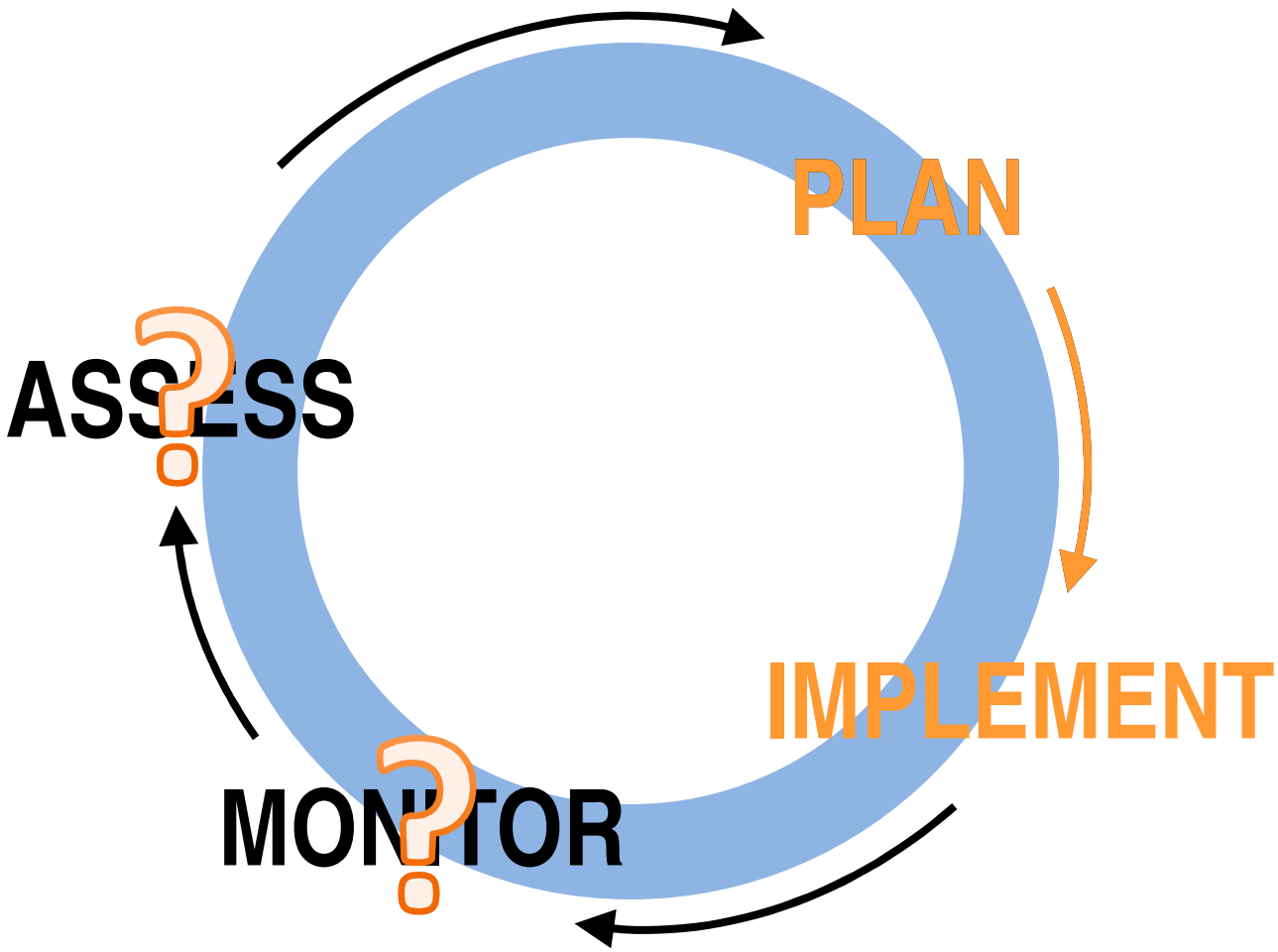
PLAN
IMPLEMENT
MONITOR
ASSESS

- Data / Findings
- Priorities / Targets / Desired Outcomes
- Strategies
- Schedules

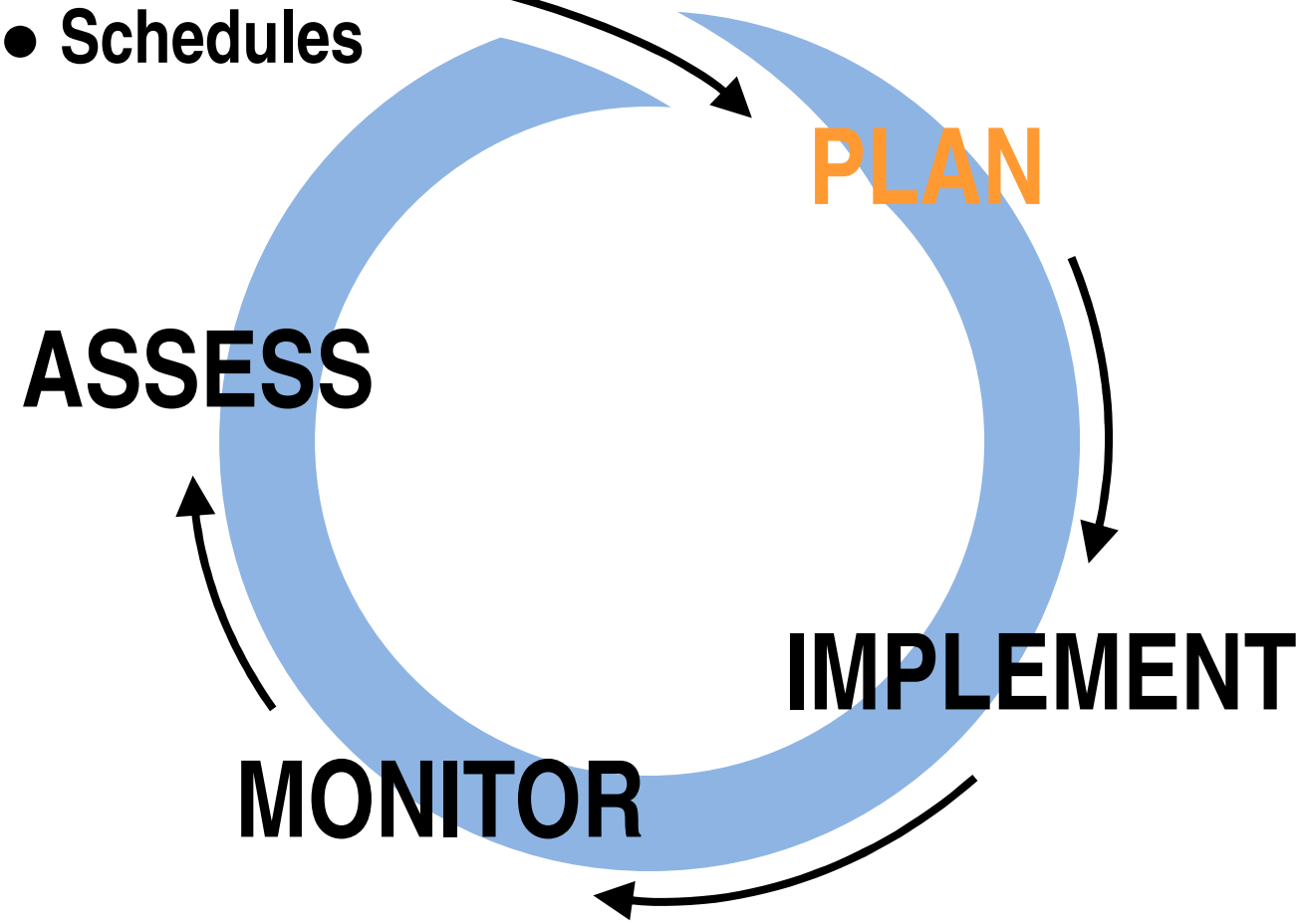

- Data / Findings
- Priorities / Targets / Desired Outcomes
- Strategies
- Schedules

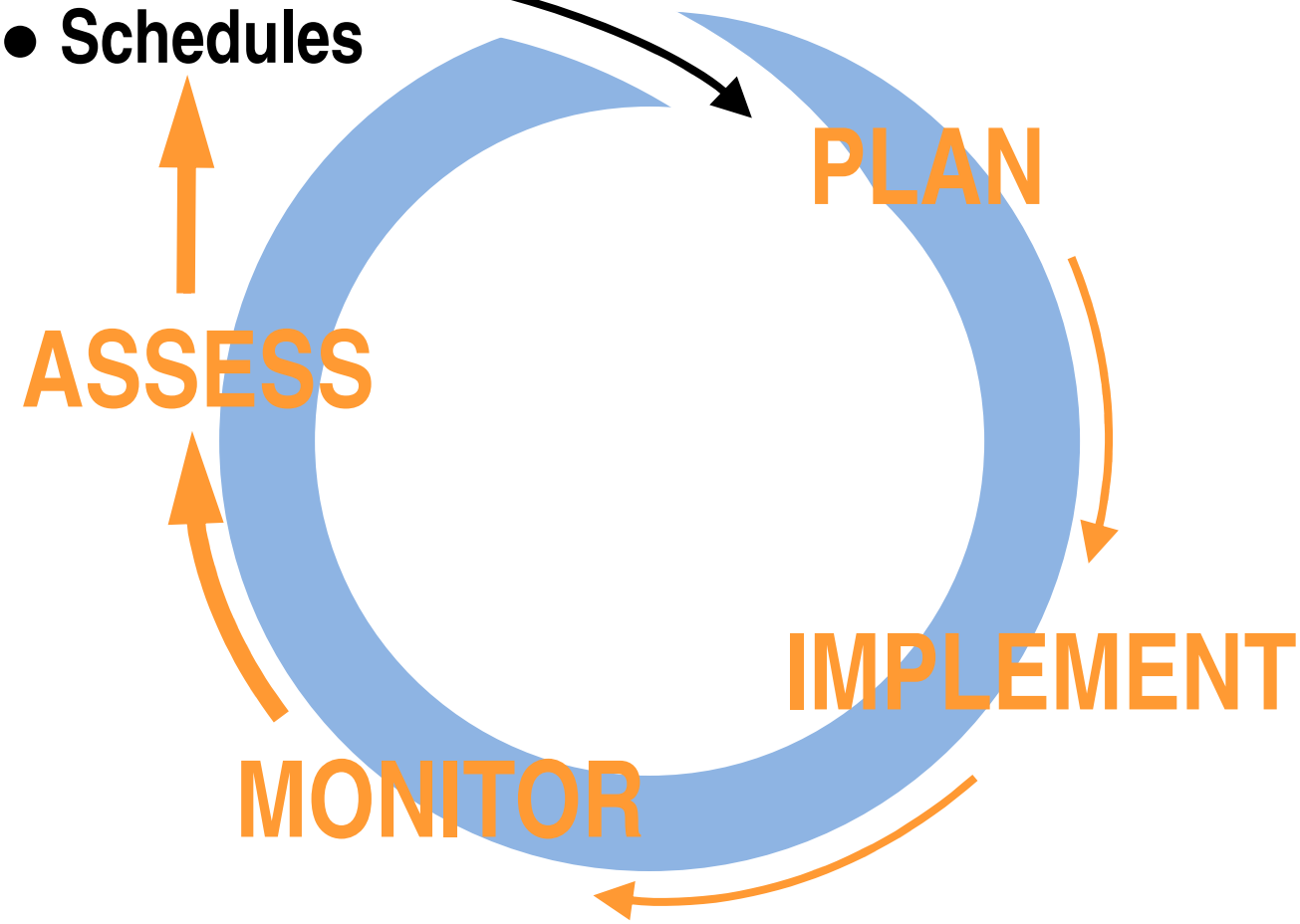

Synergistic

❸

Combine efforts and resources to increase the effectiveness of the plan toward achieving the desired outcomes

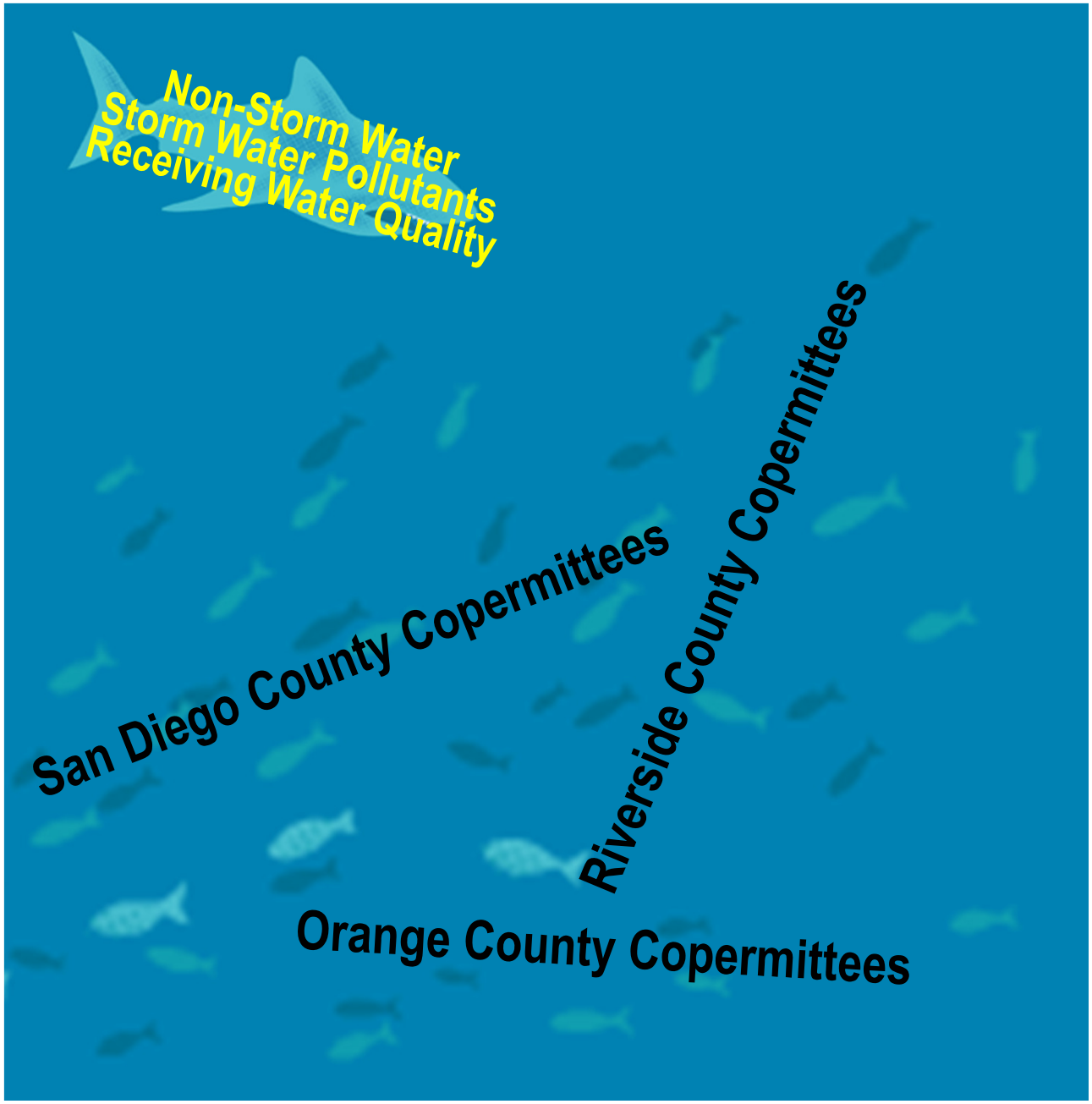
Non-Storm Water
Storm Water Pollutants
Receiving Water Quality
San Diego County Copermittees
Riverside County Copermittees
Orange County Copermittees

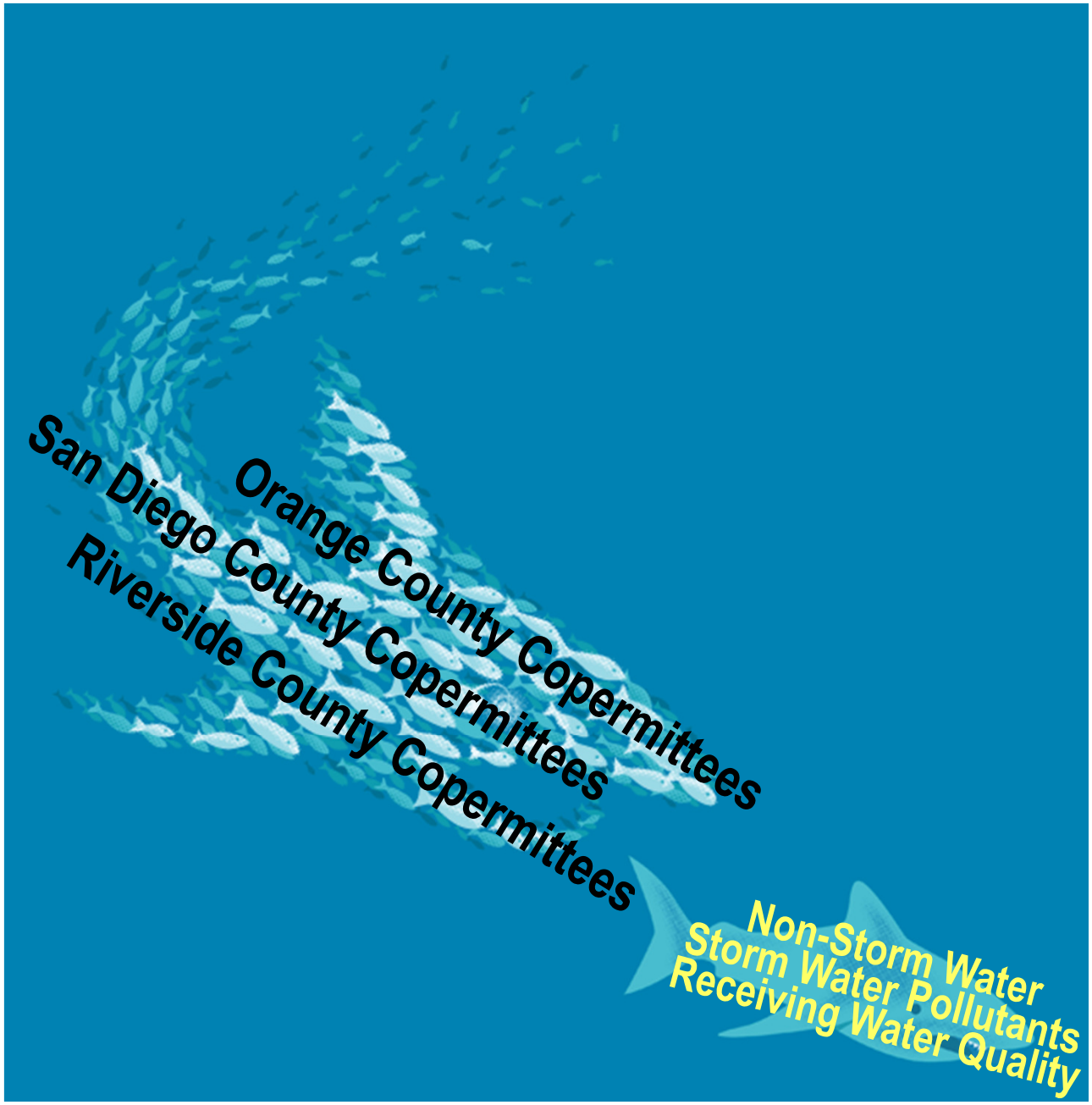
San Diego County Copermittees
Orange County Copermittees
Riverside County Copermittees
Non-Storm Water
Storm Water Pollutants
Receiving Water Quality

RWQCB
Copermittees
Other
Gov't Agencies
Public
Academia
NGOs
Non-Storm Water
Storm Water Pollutants
Receiving Water Quality

Strategic

❶

Adaptive

❷

Synergistic

❸

The New Paradigm…

Action oriented

Outcome oriented

An effective permit is required for water quality improvement and protection

Effectively prohibit non-storm water discharges into storm sewers

Require controls to reduce the discharge of pollutants in storm water to the maximum extent practicable

Restore and maintain the physical, chemical, and biological integrity of receiving waters

Wayne Chiu, P.E.
Water Resource Control Engineer
Regional Water Quality Control Board
San Diego Region

Keeping our sites on **Outcomes**

Laurie Walsh P.E.
Water Resource Control Engineer
San Diego Water Board

Outcomes

Improving the Quality of Water Discharged from MS4 System

&

Restoring Beneficial Uses and Receiving Water Quality

time for change

Permit Provisions

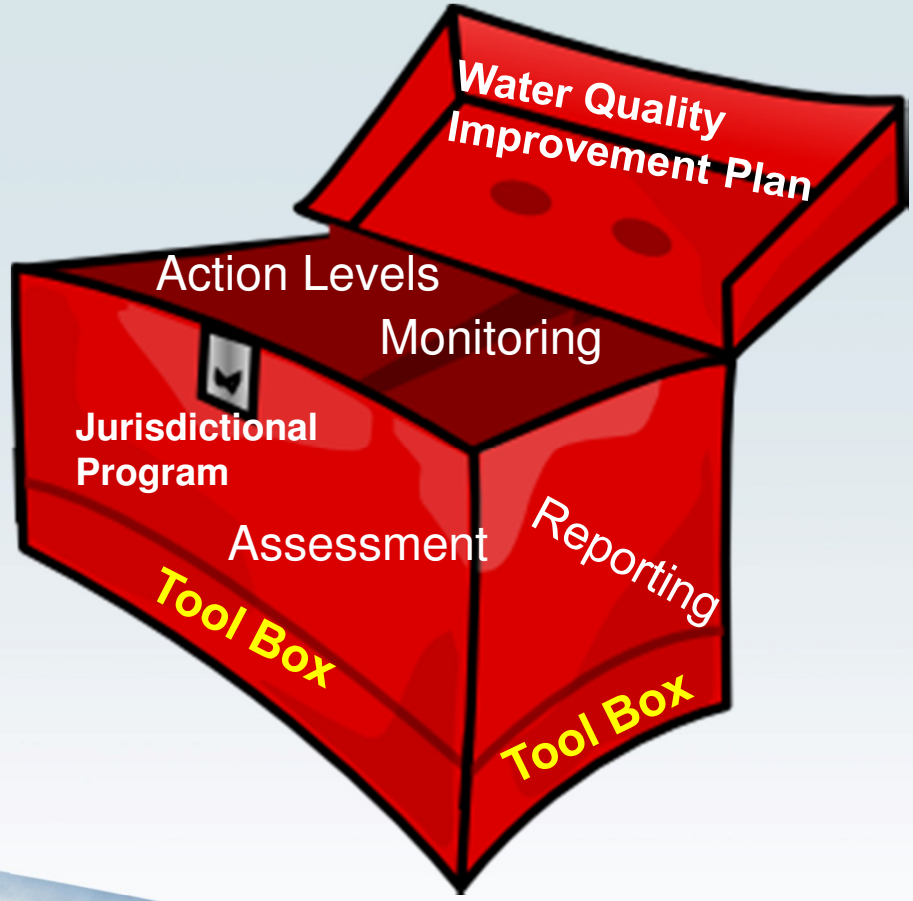

Water Quality Improvement Plan

Purpose: Copermittees to collectively develop Plans that guide jurisdictional programs towards achieving the outcomes of *improved water quality* in both MS4 discharges and *receiving waters* and *attainment of Beneficial Uses*

Water Quality Improvement Plan

1. **Prioritize** water quality issues resulting from discharges to/from MS4 within a Watershed
2. **ID** pollutant sources associated with priorities
3. **Define** numeric targets and schedules to achieve improvement in priorities
4. **Describe** strategies to achieve targets
5. **Describe** a coordinated monitoring/assessment program
6. **Adapt** plan/programs, as necessary

Action Levels

- Values same as previous permits
- Used as assessment tool in setting priorities and strategies rather than trigger for action

Monitoring and Assessment

Purpose: Monitor and assess chemical, physical, biological impact on receiving waters under wet and dry conditions.

Goal: Provide useful info to Copermittees regarding the nexus between health of receiving waters and condition of discharges from MS4

Monitoring

- More Focused
- Feed into assessments

Assessment

- Jurisdictional Scale
- Watershed Scale

~~Actions~~

~~Measure or count "beans"~~

Outcomes:

1) Has Water Quality gotten better or Worse ?
2) Are Ben Uses supported or Not ?

Jurisdictional Program

Illicit Discharge Detection and Elimination

- Moved Non-Storm Water Requirements to IDDE
- Focus on elimination of non-storm water flows

Development / ReDevelopment

<u>Priority Development Projects</u>

- Alternative Compliance for Technical Infeasibility (AKA Waiver Program)
- Off Site Mitigation
  - Projects
  - Fund / Bank

Existing Development

- Aligned retrofit with WQIP priorities
- Inspection frequencies determined by CoPermittees

Enforcement Response Plans

- Describes a focused and progressive enforcement scheme to rapidly address violations

Reporting
3 Counties

Existing	**Proposed**
59 reports	9 Annual Reports

- 39 JRMPS
- 16 WURMPs
- 1 RURMP
- 3 Receiving Water

REPORTING

- Annual reports
  - Jurisdictional Report = 2 pages
  - Summaries / Assessments
- Progress Reporting
  - Oral Watershed Status Reports
- Regional Clearinghouse

"We are required to ensure that all inhabitants of the planet have access to their daily bread, clean air to breathe and clean water to drink, because we know that, if we want justice and peace, we must protect the habitat that sustains us."

Pope Benedict XVI
Vatican's April 2011 Statement on Global Warming

Laurie Walsh, **P.E.**
Water Resource Control Engineer
Regional Water Quality Control Board
San Diego Region

Process for Stakeholder Comments and Recommendations

Administrative Draft
Tentative Order No. R9-2012-0011
Regional MS4 Permit

Desired Process Results

Understand stakeholder concerns better

Identify alternative approaches and solutions

Improve permit requirements

Focused Meetings

Focused Meeting Topics

Water Quality Improvement Plans

Monitoring and Assessment Requirements

Jurisdictional Runoff Management Programs

Reporting

Stakeholder Representatives

Copermittees	3 x 2
Environmental Community	2
Development Community	2
USEPA	1

Written Comments

DUE: JUNE 15, 2012

PLEASE

Be specific

Focus on desired outcomes to be achieved

Provide constructive criticism

Recommend alternatives and solutions

Thank You

Laurie Walsh
lwalsh@waterboards.ca.gov
858-467-2970

Wayne Chiu
wchiu@waterboards.ca.gov
858-637-5558

California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court ♠ Suite 100 ♠ San Diego ♠ California ♠ 92123

Process for Stakeholder Comments and Recommendations

Administrative Draft Tentative Order No. R9-2012-0011

FOCUSED MEETINGS

Meeting Topic	Scheduled Date
Water Quality Improvement Plans	May 16, 2012
Monitoring and Assessment Requirements	May 23, 2012
Jurisdictional Runoff Management Programs	June 6, 2012
Reporting	June 13, 2012

Select stakeholder representatives will be invited to attend and participate in the focused meetings. Representatives from the following stakeholder groups will be invited:

Stakeholder Group	Number of Representatives
San Diego County Copermittees	2
Orange County Copermittees	2
Riverside County Copermittees	2
Environmental Community	2
Development Community	2
USEPA	1

Please see other side of this page for stakeholder representative selection process.

WRITTEN COMMENTS

Due: June 15, 2012

Submit written comments to lwalsh@waterboards.ca.gov and wchiu@waterboards.ca.gov.

PLEASE

Be specific

Focus on desired outcomes to be achieved

Provide constructive criticism

Recommend alternatives and solutions

The San Diego Water Board will not provide written responses to written comments submitted on the administrative draft. Written comments will be considered during the revision and preparation of Tentative Order No. R9-2012-0011 for the formal public review and comment period.

Process for Stakeholder Comments and Recommendations

Administrative Draft Tentative Order No. R9-2012-0011

Focused Meeting Stakeholder Representative Selection Process

San Diego County, Orange County, and Riverside County Copermittees

1. Each county may select up to 2 stakeholder representatives to attend the focused meetings. The stakeholder representatives from each county do not necessarily have to be the same for every focused meeting.

2. The Principle Copermittee from each county is responsible for submitting the names of the selected stakeholder representatives to the Regional Permit Team by email (lwalsh@waterboards.ca.gov and wchiu@waterboards.ca.gov) by **May 9, 2012**. The following information must be provided:

   a. Names of selected stakeholder representatives and the meetings they will attend; and

   b. Contact information (email and telephone number) of the selected stakeholder representatives.

Environmental Community and Development Community

1. Members of these stakeholder groups may nominate representatives (including self-nominations) for consideration by the Regional Permit Team.

2. Nominations are to be submitted to the Regional Permit Team by email (lwalsh@waterboards.ca.gov and wchiu@waterboards.ca.gov) by **May 4, 2012**. Nominations must include the following information:

   a. Name of the nominee;

   b. Qualifications of the nominee (i.e. experience with MS4 permits and meeting topics);

   c. Meetings the nominee is interested in and able to attend; and

   d. Contact information (email and telephone number) of the nominee.

3. The Regional Permit Team will notify the nominees if they have been invited to participate as stakeholder representatives by **May 9, 2012**.

♦ PLEASE PRINT LEGIBLY THROUGHOUT

PRINT NAME: BRAD FOWLER

REQUEST TO SPEAK AT PUBLIC WORKSHOP

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

MEETING DATE: 4-25-12

TITLE/AFFILIATION: CITY OF DANA POINT

ADDRESS: 33282 GOLDEN LANTERN, DANA POINT, CA

TELEPHONE: 949-248-3582

- After completing this card, please provide to San Diego Water Board Staff
- Please state your name and affiliation prior to commenting.

♦ PLEASE PRINT LEGIBLY THROUGHOUT

PRINT NAME: Rosanna Lacarra

REQUEST TO SPEAK AT PUBLIC WORKSHOP

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

MEETING DATE: 4/25/2012

TITLE/AFFILIATION: City of Coronado / LaRoc Environmental

ADDRESS: PO Box 324, Carlsbad, CA 92018

TELEPHONE: (760) 533-1875

- After completing this card, please provide to San Diego Water Board Staff
- Please state your name and affiliation prior to commenting.

♦ PLEASE PRINT LEGIBLY THROUGHOUT

PRINT NAME: MICHAEL McSWEENEY

REQUEST TO SPEAK AT PUBLIC WORKSHOP

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

MEETING DATE: 11/25/12

TITLE/AFFILIATION: SR. Policy Advisor of BIA

ADDRESS: 9201 SPECTRUM center BLVD # 110 SD 92123

TELEPHONE: 858-514-7004

- After completing this card, please provide to San Diego Water Board Staff
- Please state your name and affiliation prior to commenting.

♦ PLEASE PRINT LEGIBLY THROUGHOUT

PRINT NAME: Kris McFadden

REQUEST TO SPEAK AT PUBLIC WORKSHOP

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

MEETING DATE: 4/25/12

TITLE/AFFILIATION: Deputy Director City of San Diego

ADDRESS: 9320 Chesapeake Dr.

TELEPHONE: 858 541 4320

- After completing this card, please provide to San Diego Water Board Staff
- Please state your name and affiliation prior to commenting.

♦ PLEASE PRINT LEGIBLY THROUGHOUT

PRINT NAME: Casey Anderson

REQUEST TO SPEAK AT PUBLIC WORKSHOP

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

MEETING DATE: 4/25/12

TITLE/AFFILIATION: San Diego County Farm Bureau

ADDRESS: 1670 E. Valley Parkway, Escondido, 92027

TELEPHONE: 760-745-3023

- After completing this card, please provide to San Diego Water Board Staff
- Please state your name and affiliation prior to commenting.

PLEASE PRINT LEGIBLY THROUGHOUT

PRINT NAME: John Stump

REQUEST TO SPEAK AT PUBLIC WORKSHOP

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

MEETING DATE: 4/25/2012

TITLE/AFFILIATION: Chairman Sierra Club

ADDRESS: 4133 Poplar City Heights 92105

TELEPHONE: jwstump@cox.net 619-281-4688

- After completing this card, please provide to San Diego Water Board Staff
- Please state your name and affiliation prior to commenting.

♦ PLEASE PRINT LEGIBLY THROUGHOUT

PRINT NAME: Tory Walker

REQUEST TO SPEAK AT PUBLIC WORKSHOP

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

MEETING DATE: 4/25/12

TITLE/AFFILIATION: President, Tory R. Walker Engineering

ADDRESS: 122 Civic Center Drive, #206, Vista, CA 92084

TELEPHONE: 760 414 9212

- After completing this card, please provide to San Diego Water Board Staff
- Please state your name and affiliation prior to commenting.

♦ PLEASE PRINT LEGIBLY THROUGHOUT

PRINT NAME: Claudio Padres

REQUEST TO SPEAK AT PUBLIC WORKSHOP

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

MEETING DATE: 4/25/12

TITLE/AFFILIATION: Senior Engineer / RCFC

ADDRESS: 1995 Market St., Riverside

TELEPHONE: 951 955 8602

- After completing this card, please provide to San Diego Water Board Staff
- Please state your name and affiliation prior to commenting.

♦ PLEASE PRINT LEGIBLY THROUGHOUT

PRINT NAME: RICHARD BOON

REQUEST TO SPEAK AT PUBLIC WORKSHOP

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

MEETING DATE: 4/25

TITLE/AFFILIATION: CHIEF / ORANGE COUNTY STORMWATER PROGRAM

ADDRESS: 2301 N. GLASSELL ST ORANGE CA 92806

TELEPHONE: 714 955 0670

- After completing this card, please provide to San Diego Water Board Staff
- Please state your name and affiliation prior to commenting.

♦ PLEASE PRINT LEGIBLY THROUGHOUT

PRINT NAME: Cid Tesoro

REQUEST TO SPEAK AT PUBLIC WORKSHOP

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

MEETING DATE: 4/25/12

TITLE/AFFILIATION: Program Manager, County of San Diego

ADDRESS: 5201 Ruffin Rd, San Diego, CA 92123

TELEPHONE: 858 495-5318

- After completing this card, please provide to San Diego Water Board Staff
- Please state your name and affiliation prior to commenting.

♦ PLEASE PRINT LEGIBLY THROUGHOUT

PRINT NAME: TROY BANKSTON

REQUEST TO SPEAK AT PUBLIC WORKSHOP

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

MEETING DATE: 4/25/12

TITLE/AFFILIATION: Deputy Director, Public Works, County of San Diego

ADDRESS: 5201 Ruffin Rd, San Diego, CA 92123

TELEPHONE: 858 694 2125

- After completing this card, please provide to San Diego Water Board Staff
- Please state your name and affiliation prior to commenting.

♦ PLEASE PRINT LEGIBLY THROUGHOUT

PRINT NAME: DENNIS BOWLING

REQUEST TO SPEAK AT PUBLIC WORKSHOP

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

MEETING DATE: 4/25/12

TITLE/AFFILIATION: APWA WATER RESOURCES COMM.

ADDRESS: 5620 FRIARS RD, SAN DIEGO 92110

TELEPHONE: 619 688-1447

- After completing this card, please provide to San Diego Water Board Staff
- Please state your name and affiliation prior to commenting.

♦ PLEASE PRINT LEGIBLY THROUGHOUT

PRINT NAME: MICHAEL BEANAN

REQUEST TO SPEAK AT PUBLIC WORKSHOP

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

MEETING DATE: WED, APRIL 25, 2012

TITLE/AFFILIATION: VICE PRESIDENT, SOUTH LAGUNA CIVIC ASSOC.

ADDRESS: PO 9668

TELEPHONE: 949.887.7911

- After completing this card, please provide to San Diego Water Board Staff
- Please state your name and affiliation prior to commenting.

PLEASE PROVIDE ALISO CREEK AND OCEAN OUTFALL COASTAL RECEIVING WATER PLUME MAP - THANKS, MIKE

♦ PLEASE PRINT LEGIBLY THROUGHOUT

PRINT NAME: Jill Witkowski

REQUEST TO SPEAK AT PUBLIC WORKSHOP

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

MEETING DATE: 4/25/12

TITLE/AFFILIATION: San Diego Coastkeeper Legal Clinic Director

ADDRESS: 2825 Dewey Rd, Suite 200

TELEPHONE: 619.758.7743

- After completing this card, please provide to San Diego Water Board Staff
- Please state your name and affiliation prior to commenting.

Senate Select Committee on California Job Creation and Retention
Informational Hearing – October 6, 2011

Impacts of Regulation of Storm Water Runoff in California

Today's hearing will discuss issues that have arisen in the context of the storm water regulatory program, as implemented by the State Water Resources Control Board, and the impacts of the program on municipalities, businesses and individuals throughout California. Information concerning the scope and applicability of the storm water regulatory program is outlined below.

In examining the regulatory scheme in California for the control of storm water runoff, the Little Hoover Commission recently observed:

> "No topic dominated the Commission's study like storm water regulation. It is the area in which the [State Water Boards'] patchwork of permits has an effect on virtually everyone in California. More than 30,000 storm water discharges are subject to permits (compared to about 2,200 permits for wastewater treatment) that regulate the behavior of large and small cities, construction sites and industry. A diverse group of water users – the military, small and large businesses, home builders, local governments and more – face enormous costs as they try and control and limit storm water pollution." [1]

Storm water discharges are generated by runoff from land and impervious areas such as paved streets, parking lots, and building rooftops during rainfall and snow events that often contain pollutants. Federal and state laws impose regulatory controls on storm sewer discharges. Municipalities are required to obtain and comply with a state-issued federal regulatory permit limiting the quantity and quality of water runoff that can be discharged from storm sewer systems. In addition, permits for discharges associated with industrial activity must comply with technology-based effluent limitations, as well as any more stringent limitations necessary to meet water quality standards.

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[1] *Clearer Structure, Cleaner Water: Improving Performance and Outcomes at the State Water Boards*, Executive Summary, January 22, 2009

A. History and Development of California's Storm Water Regulatory Scheme

The quality of the nation's waters is governed by an extraordinarily complex statutory and regulatory scheme that imposes regulatory and administrative responsibilities on both the federal and state governments. The federal Clean Water Act (CWA)[2] regulates the discharge of pollutants into navigable waters, prohibiting discharges from "point sources"[3] unless certain statutory exceptions apply.

Part of the federal Clean Water Act is the National Pollutant Discharge Elimination System (NPDES), which is the primary means for enforcing effluent and water-quality standards established by the EPA and state governments. The NPDES sets out the conditions under which the federal EPA or a state with an approved water quality control program can issue permits for the discharge of pollutants in wastewater. In California, wastewater discharge requirements are the equivalent of the NPDES permits required by federal law.

1) Early categorical exemption for storm water: In the 1970s, the U.S. EPA adopted regulations categorically exempting discharges from a number of classes of point sources, including separate storm sewers containing only storm runoff uncontaminated by any industrial or commercial activity. Environmental groups challenged this exemption in federal court, which held that a storm sewer is a "point source" and the EPA did not have the authority to exempt categories of point sources from the Clean Water Act's NPDES permit requirements.[4] Although the court acknowledged the practical problems relating to storm sewer regulation, the court found the EPA had the flexibility under the CWA to design regulations that would overcome these problems.

In 1987, Congress amended the CWA in order to mandate the control of storm water discharges in municipal, industrial and construction arenas. Storm water discharges became regulated as point source discharges and subject to a broader array of pollution control requirements. For example, discrete standards could be imposed, limiting the degree to which specified chemicals may be present in discharges. These standards are expressed as effluent limits, which may be established for any pollutant found in storm water discharges. The primary method for controlling storm water discharges is with best management practices (BMPs).

2) Storm water discharges now fully regulated: The federal CWA mandates NPDES permits for storm water discharges "associated with industrial activity," discharges from large and medium-sized municipal storm sewer systems, and certain other discharges. The law sets out a

---

[2] 33 U.S.C. § 1251 et seq.

[3] Federal law defines a "point source" as "any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged." (33 U.S.C. § 1362(14).)

[4] *Natural Resources Defense Council v. Costle* (D.C. Cir 1977) 568 F.2d 1369

timetable for promulgation of the first of a two-phase overall program of storm water regulation.[5] In 1990, the US EPA issued the Phase I Rule regulating large discharge sources.

The 1987 amendments to the CWA mandated a second stage of storm water regulation by ordering the US EPA to identify and address sources of pollution not covered by the Phase I Rule. Under the Phase II Rule, NPDES permits are required for discharges from small municipal separate storm sewer systems ("small MS4s") and storm water discharges from construction activity disturbing between one and five acres.[6] Small MS4s may seek permission to discharge by submitting an individualized set of Best Management Practices (BMPs), either in the form of an individual permit application, or in the form of a notice of intent to comply with a general permit.

3) <u>Maximum extent practicable</u>: The goal of the NPDES program is to reduce the discharge of pollutants to the "maximum extent practicable" (MEP), and to eliminate non-storm water discharges. The relevant federal law declares that "permits for discharges from municipal storm sewers...shall require controls to reduce the discharge of pollutants to the *maximum extent practicable*, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants."[7] To ensure this scheme would be administratively workable, Congress placed a moratorium on many new types of required storm water permits until 1994, and created a phased approach to necessary municipal storm water permitting depending on the size of the municipality.

4) <u>California law</u>: Under the federal Clean Water Act, nature and extent of the controls in an NPDES permit depends on the applicable state water quality standards for the affected water bodies.[8] Each state is required to develop water quality standards that establish the desired condition of a waterway. A water quality standard for any given water segment has two components: (1) the designated beneficial uses of the water body and (2) the water quality criteria sufficient to protect those uses.

Each state is free to enforce its own water quality laws so long as its effluent limitations are not "*less stringent*" than those set forth in the CWA.[9] California law was enacted to "ensure consistency with the requirements for state programs implementing the Federal [CWA]."[10] California law also provides that the state and regional water boards shall "issue *waste discharge*

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[5] 33 U.S.C. § 1342(p)(2)-(4)

[6] 40 C.F.R. §§ 122.26; 122.34

[7] 33 U.S.C. § 1342(p)(3)(B)

[8] *Communities for Better Environment v. State Water Resources Control Bd.* (2003) 109 Cal.App.4th 1089

[9] 33 U.S.C. § 1370

[10] Water Code § 13372

requirements[11] ... which apply and ensure compliance with all applicable provisions [of the Clean Water Act], together with any more stringent effluent standards or limitations necessary to implement water quality control plans, or for the protection of beneficial uses, or to prevent nuisance."[12]

Thus, state-issued NPDES storm water permits may specify procedures to control pollutants to the maximum extent practicable (MEP), but may additionally impose such other provisions as the US EPA administrator or the State determines appropriate for the control of these pollutants.[13]

B. The State Water Resources Control Board

The State Water Resources Control Board (State Water Board) has several storm water regulatory program areas, which include the regulation of storm water runoff from construction activities, specific industrial activities, roads and highways, and from large and small municipal storm sewer systems.

Phase 1 of the municipal storm water program regulates storm water permits for medium and large municipalities.[14] Phase II regulates smaller municipalities, including non-traditional small operations, such as military bases, public campuses, and prison and hospital complexes. The Phase II permit is currently undergoing review in 2011. The largest, single municipal discharger in California is the California Department of Transportation (Caltrans) and their network of highways and road facilities. The Caltrans permit is also under review and renewal in 2011.

In addition, the Industrial General Permit is currently undergoing public review. Under the expiring permit, specific industrial activities must employ the best technology available to reduce pollutants in their discharges. They are also required to develop both a storm water pollution prevention plan and a way to monitor their progress. According to the State Water Board, there are approximately 10,000 active Industrial General permit holders.

1) Renewal of Phase II Municipal and Industrial Permits: As noted above, these permits are currently undergoing review. In discussing this process, the State Water Board notes that,

> "While early program efforts focused on controlling pollutants and implementing good management practices, the program is now also emphasizing holistic strategies aimed at not only preventing problems but providing many community benefits. Storm water is an important resource and Low Impact Development and Green Infrastructure techniques are now capitalizing on opportunities in California. The goal is to capture the water that runs off concrete and non-

[11] Water Code section 13374 provides that "the term 'waste discharge requirements' as referred to in this division is the equivalent of the term 'permits' as used in the [Clean Water Act]."

[12] Water Code, § 13377

[13] *Building Industry Assn. of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866

[14] Phase 1 permits apply to medium (pop. 100,000 – 250,000) and large (pop. > 250,000) municipalities

> permeable surfaces and use it, for example, to water trees, plants and other living things on the same plot of land from which it would flow away. Groundwater supplies are replenished, too, and the amount of pollutants that flow into our waterways is reduced."

Effluent Limitations: In documents describing the changes it proposes for the Industrial General Permit, the State Water Board points out that previous industrial permits have required dischargers who detected a pollutant in "significant quantities" to implement clean-up procedures when appropriate, and assess whether additional BMPs are necessary. It notes that, heretofore, the State Water Board has not established numeric limits on the amount of specified pollutants that can be discharged in storm water emanating from these sites. According to the State Water Board, this has resulted in inconsistent interpretations and difficulty in enforcement. Despite the fact that no other state has imposed these numeric limits, the fact sheet accompanying the draft permits states:

> "The State Water Board is mindful that, for storm water permits, US EPA has recommended the use of BMPs in lieu of numeric effluent limitations, and the limited use of sampling and analysis in storm water permits, because it is generally difficult to calculate numeric effluent limitations for the widely variable flows associated with storm water and to monitor such intermittent discharges. In reissuing this General Permit, however, the State Water Board has concluded that it is feasible to require numeric effluent limitations and sampling and analysis requirements in certain circumstances."[15]

Parenthetically, a recent report of the National Academies of Science noted among other things, "The uncertainties and variabilities surrounding both the nature of the storm water discharges and the capabilities of various pollutant controls . . . make it much more difficult to set precise limits in advance for storm water sources."[16]

The State Water Board argues that, in addition to BMPs, the US EPA *authorizes* the use of numeric effluent limitations,[17] and that it is the "best professional judgment (BPJ) of the State Water Board staff that dischargers employing [the best available technology] and the [best control technology] can reduce the pollutants in their storm water effluent to achieve concentrations at or below" [18] the point at which the numeric limits will be applied.

---

[15] NPDES General Permit Fact Sheet for Storm Water Discharges Associated with Industrial Activities, January 28, 2011

[16] *Urban Stormwater Management in the United States*, National Academies of Science, 2008, p. 84. The report also notes that the current approach to regulating storm water "seems inadequate to overcome the unique challenges of stormwater," and as applied to storm water, it is a "poor fit." (Id., at p. 83)

[17] 40 C.F.R. 122.44(k) These US EPA regulations (40 C.F.R. Subchapter N) establish effluent limitation *guidelines* for storm water discharges from facilities in eleven industrial sectors, but no state has yet imposed these guidelines as numeric limits..

[18] Draft Industrial Permit, January 28, 2011, p.8

New controls in Phase II Municipal permit: As described above, both large and small municipal sewer system operators must comply with permits that regulate storm water entering their systems under a two-phase system. The Phase II draft permit will regulate smaller municipalities, including non-traditional small operations, such as military bases, public campuses, and prison and hospital complexes.

The new Phase II permit under review at the State Water Board implements and enhances actions required to control specified listed pollutants and pollutants of concern – in some cases by imposing Total Maximum Daily Loads that may be discharged by these municipalities. In addition, the draft permit requires more specific and comprehensive storm water monitoring, including monitoring of the storm water for specified pollutants. The draft permit also requires implementation of so-called Low Impact Development practices. It requires municipalities to inspect industrial and commercial businesses in their jurisdictions, and perform follow-up effectiveness assessments.

Low Impact Development: It its discussion of Low Impact Development (LID) the State Water Board notes that, in January 2005, it adopted "sustainability" as a "core value" for all of its activities and programs, and directed staff to consider sustainability in all future policies, guidelines, and regulatory actions. According to the State Water Board:

> "LID is a 'sustainable' practice that benefits water supply and contributes to water quality protection. Unlike traditional storm water management, which collects and conveys storm water runoff through storm drains, pipes, or other conveyances to a centralized storm water facility, LID takes a different approach by using site design and storm water management to maintain the site's pre-development runoff rates and volumes. The goal of LID is to mimic a site's predevelopment hydrology by using design techniques that infiltrate, filter, store, evaporate, and detain runoff close to the source of rainfall. LID has been a proven approach in other parts of the country and is seen in California as an alternative to conventional storm water management. The Water Boards are advancing LID in California in various ways.
>
> LID provides economical as well as environmental benefits. LID practices result in less disturbance of the development area, conservation of natural features, and less expensive than traditional storm water controls. The cost savings applies not only to construction costs, but also to long-term maintenance and life cycle cost. LID provides multiple opportunities to retrofit existing highly urbanized areas and can be applied to a range of lot sizes.
>
> LID includes specific techniques, tools, and materials to control the amount of impervious surface, increase infiltration, improve water quality by reducing runoff from developed sites, and reduce costly infrastructure. LID practices include; bioretention facilities or rain gardens, grass swales and channels, vegetated rooftops, rain barrels, cisterns, vegetated filter strips, and permeable pavements."

2) <u>Evaluation of economic costs</u>: California law governing the issuance of storm and wastewater permits requires consideration of several factors, including "economic considerations."[19] These economic considerations are not defined, nor do they specify a particular manner of compliance. Therefore, the matter is within the sole discretion of the State Water Board.[20]

In addition, the Legislature has stated its intent that "activities and factors which may affect the quality of the waters of the state shall be regulated to attain the highest water quality which is reasonable, considering all demands being made and to be made on those waters and the total values involved, beneficial and detrimental, economic and social, tangible and intangible."[21]

In issuing federal NPDES storm water permits, the State Water Board is required to impose controls to reduce the discharge of pollutants to the "maximum extent practicable," (MEP) but that standard is rather broad, and may include "such other provisions that [the state] determines is appropriate."[22] There is no requirement that the State Water Board conduct a cost-benefit analysis prior to issuance of a storm water permit. In adopting storm water permits, the State Water Board has declared that "costs should be considered in determining MEP, but that a cost-benefit analysis is not required."

Because the State Water Board is largely exempt from the rulemaking provisions of the Administrative Procedure Act (APA), it need not consider the effect of the permit on business, including the ability of California businesses to compete with businesses in other states, or any other economic issues required by the APA.

In explanatory notes for the current draft Phase II storm water permits, the State Water Board notes that the US EPA has clarified that the MEP standard should be applied in a site-specific, flexible manner, taking into account cost considerations as well as water quality effects. It notes that permittees are expected to incur incremental costs in implementing the BMPs required by the order issuing the general permit, such as the cost of complying with the Standard Urban Stormwater Mitigation Plans, hydromodification[23] controls, and Low Impact Development requirements. It adds that permittees will also incur additional costs in bringing non-compliant discharges into compliance through the iterative process, which strengthens the controls with each five-year permit cycle.

<u>Focus has been on economic consequences of impairment of water quality</u>: The State Water Board has stated that, in considering the cost of compliance with its storm water permits, it is

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[19] See Water Code §§ 13263, 13241

[20] *City of Arcadia v. State Water Resources Control Bd.* (2006) 135 Cal.App.4th 1392. The court deferred to the expertise of the State Water Board on economic considerations.

[21] Water Code § 13000

[22] *Building Industry Assn. of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866

[23] Hydromodicifation is the alteration of the natural flow of water, usually caused by urbanization.

also important to consider the costs of impairment – the negative impact of pollution on the economy and the positive impact of improved water quality. Although it may be appropriate and necessary to consider the cost of compliance, the board and its staff believe that it is also important to consider the larger economic impacts of implementation of the storm water management program. For example, the Board states, "economic benefits may result through program implementation, and alternative costs (as well as environmental impacts) may be incurred by not fully implementing the program."[24]

In the Fact Sheet accompanying the current Draft MS4 Storm Water Permit, the State Water Board states:

> "It is also important to consider the cost of not implementing a storm water management program. Urban runoff in southern California has been found to cause illness in people bathing near storm drains. A study of south Huntington Beach and north Newport Beach found that an illness rate of about 0.8% among bathers at those beaches resulted in about $3 million annually in health-related expenses. Extrapolation of such numbers to the beaches and other water contact recreation areas in the state would increase these numbers significantly. Storm water runoff and its impact on receiving waters also negatively affects the tourism industry…Effects on tourism from storm water runoff (e.g. beach closures) can have a significant impact on the economy. The experience of Huntington Beach provides an example of the potential economic impact of poor water quality. Approximately eight miles of Huntington Beach were closed for two months in the middle of summer of 1999, impacting beach visitation and the local economy." [25]

The State Water Board further contends that storm water program costs are not all attributable to compliance with permits. It states that many program components and their associated costs existed before any MS4 permits were issued. Therefore, storm drain maintenance, street sweeping and trash/litter collection costs cannot be attributed to permit compliance since these practices have long been implemented before any storm water permit was issued. Thus, according to the Board, the true cost resulting from permit requirements is some fraction of the total storm water program costs.

3) Regulatory fees recently increased: In addition to the projected increases in compliance costs that will be borne by the municipalities and businesses that are subject to the pending Phase II General Storm Water Permits described herein, the Board voted on September 19, 2011 to increase substantially the core regulatory fees applicable to all entities subject to any regulation by the State Water Board.

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[24] See, e.g., Order WQ 2000-11

[25] Fact Sheet, Draft Phase II Small MS4 General Permit, June 7, 2011

The annual regulatory fees that are payable to the State Water Board by those subject to the NPDES program (which includes those who are regulated under the storm water permit program) were increased by 60.6 percent above the FY 2010-11 fee schedule.

At the September 19th meeting, the State Water Board also approved a staff recommendation to raise regulatory fees charged to agricultural entities regulated pursuant to the Board's Irrigated Lands Regulatory Program by *354.7 percent*.

C. State Regulatory and Administrative Hearing Processes

The Administrative Procedure Act (APA) establishes minimum procedural requirements applicable to quasi-legislative and quasi-judicial actions by state agencies. Generally, an action is considered a quasi-legislative process if the rule or restriction applies generally to a large group of individuals or entities. A "regulation" means every rule, regulation, order, or standard of *general application*.[26] On the other hand, the APA also defines a set of protocols that govern administrative adjudication, or quasi-judicial actions.

The determination of whether an administrative action is quasi-legislative or quasi-adjudicative can have implications for the type of process that must be followed, whether ex parte contacts are allowed, and the standard for judicial review.

1) Adoption of regulations (quasi legislative): Chapter 3.5 of the APA[27] governs the process for adoption, amendment, or repeal of regulations by state agencies charged with the implementation of statutes, and for legal review of those regulatory actions. The APA authorizes an agency considering adopting, amending, or repealing a regulation to consult with interested persons before initiating regulatory action, and requires the agency to do so if the regulation involves complex or numerous proposals. The APA requires a state agency to include in a Notice of Proposed Action to adopt, amend or repeal a regulation, an Initial Statement of Reasons for proposing to take the regulatory action, which shall include a description of any reasonable alternatives that would lessen any adverse impact on small business, and the agency's reasons for rejecting those reasonable alternatives.[28] The APA requires every agency to prepare a Final Statement of Reasons that must include, among other things, a summary of each objection or recommendation made regarding the specific regulation, together with an explanation of how the proposed action has been changed to accommodate each objection or recommendation, or the reasons for making no change to the proposed regulation.[29] Under the APA, the Office of Administrative Law (OAL) reviews, and approves or rejects proposed regulations.

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[26] Govt. Code § 11342.600

[27] Govt. Code § 11340 et seq.

[28] The APA also states that the agency is not required, in this initial statement, to artificially construct alternatives, describe unreasonable alternatives, or justify why it has not described alternatives.

[29] Govt. Code § 11346.9

State Water Board exemption: In 1992, the Legislature passed AB 3359 (Sher), which enacted Government Code section 11352, specifically exempting NPDES permits, waste discharge requirements, and waivers of any water quality certification, from the procedural requirements of the APA governing administrative rulemaking and adoption of regulations.[30] Thus, when issuing storm water permits, the State Water Board is not required to evaluate the costs to affected persons, discuss alternatives to the regulatory action, and comply with other quasi-legislative rulemaking procedures of the APA.[31]

The State Water Board sponsored the 1992 legislation. In support of the bill, the State Water Board stated that the APA contains a very broad definition of "regulation," but that the adoption of the various plans and permits are controlled by specific procedures specified in the Porter-Cologne Water Quality Act. The board stated further that if, as can be expected, these plans are rejected by OAL, state water use regulation will be thrown into turmoil. It claimed that all elements of existing basin plans, beneficial use designations, and water quality objectives and discharge prohibitions could be invalidated.

Notably, the State Water Board wrote that the federal Clean Water Act permits and all general permits, including permits for storm drainage, might need to be issued on an individual discharger basis, instead of the current practice of issuing general permits.[32]

Prior to enactment of this exemption, the State Water Board took the position that actions of the Board that affect individuals and small groups are quasi-judicial, while actions that affect large groups are usually quasi-legislative.[33] This is a logical construct, in that general permits, such as the storm water permits in question, typically cover discharges from entities throughout the state that are engaged in a wide variety of activities. The Industrial General Permit governing storm water discharges is a statewide permit that applies to dischargers engaged in numerous different industrial activities. Similarly, municipal storm water permits are deemed "individual permits," yet they may have nearly 100 cities listed as permittees.

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[30] Govt. Code § 11352 (b) specifies that the issuance, denial, or revocation of waste discharge requirements and permits pursuant to Section 13377 of the Water Code are exempt from the APA requirements for adoption of regulations. Section 13377 of the Water Code authorizes the State Water Board or the Regional Water Boards to issue permits pursuant to the federal Clean Water Act. (Waste discharge requirements under state law are equivalent to NPDES permits under federal law. See, Water Code § 13374).

[31] AB 739 (Laird), Stats. 2007, ch. 610 added subdivision (c) to Section 11352 of the Government Code, exempting from the APA the development, issuance and use of guidance documents relating to municipal storm water programs and permits.

[32] Senate Floor Analysis of AB 3359 (Sher), August 25, 1992

[33] Memorandum from William R. Attwater, Chief Counsel, to Regional Water Board members, August 13, 1992.

2) **Administrative adjudication – (quasi-judicial)**: Chapters 4.5 and Chapter 5 of the APA[34] govern the conduct of administrative adjudicatory proceedings. An "adjudicative proceeding" means an evidentiary hearing for determination of facts pursuant to which an agency formulates and issues a decision."[35]

In this context, a "decision" is an agency action of specific application that determines a legal right, duty, privilege, immunity, or other legal interest of a particular "person," which may include an individual, partnership, corporation, governmental subdivision or unit of a governmental subdivision, or public or private organization or entity of any character.[36]

Among other provisions, the APA provides a mechanism by which an agency may conduct an adjudicative proceeding under an informal hearing procedure.[37] The informal hearing process is intended to satisfy due process and public policy requirements in a manner that is simpler and more expeditious than hearing procedures otherwise required by statute, for use in appropriate circumstances.[38]

The State Water Resources Control Board has typically used the informal hearing process in adopting General Storm Water permits, and has adopted a regulation that provides for use of this process.[39]

In practice, during informal hearings, entities that will be required to comply with the General Storm Water Permit do not received mailed notice of the proposed permit, have no meaningful opportunities to meet with Board staff prior to adoption, and, during the adoption hearing itself, are only permitted to address the Board members for a time period not to exceed 3 minutes.

Ex parte communications: The APA prohibits ex parte communications[40] in connection with adjudicatory proceedings, with specified exceptions. The administrative adjudication process in the APA is limited to decisions of an agency that determine a legal right, duty, privilege,

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[34] Govt. Code § 11400 et seq.

[35] Govt. Code § 11405.20

[36] Govt. Code §§ 11405.50, 11405.70

[37] Govt. Code § 11445.10 et seq.

[38] Govt. Code § 11445.10(b)(1). The other statutory bases for using the informal hearing procedure include proceedings where there is no disputed issue of material fact; where the monetary amount is limited to no more than $1,000; a student disciplinary sanction involving less than 10 days suspension; and licensing disciplinary actions involving license suspension of less than five days

[39] 23 Cal. Code Regs. § 648.7

[40] Government Code § 11430.10 provides in part that, "[w]hile the proceeding is pending there shall be no communication, direct or indirect, regarding any issue in the proceeding, to the presiding officer from an employee or representative of an agency that is a party or from an interested person outside the agency, without notice and opportunity for all parties to participate in the communication."

immunity or other legal interest of a particular person.[41] By contrast, ex parte communications are permitted during quasi-legislative, or regulatory, proceedings, provided they are disclosed on the record.

The issue of whether the action is quasi-adjudicative or quasi-legislative is relevant to the propriety of ex parte communications with Board members who act on the matter. Ex parte communication rules are more restrictive for quasi-adjudicative matters.

The State Water Board has adopted ex parte communication rules[42] that authorize communication with Board members only when the communications are concerning a procedural matter that is not in controversy, and when the communication comes in the form of advice from Water Board staff in an adjudicative proceeding that is non-prosecutorial.

In contrast to its past practices, the State Water Board now regards the adoption of general permits, such as the storm water permits, as a quasi-judicial proceeding, not a quasi-legislative one. As a result, no participation by or communication with Members of the State Water Board is authorized once a draft storm water permit has been prepared by Water Board staff. For this reason, no Members of the State Water Board will be attending today's Committee meeting, because the draft storm water permits have been released.

In January 2009, the Little Hoover Commission issued a comprehensive report on the State Water Boards, in which it suggested that:

> "Ex parte rules must be reformed to allow more communication between decision-makers and stakeholders. The regulated community should have greater opportunity to talk with board members who have such significant power to influence their activities. The boards should adopt rules similar to those used by other state regulatory boards such as the Integrated Waste Management Board, which allow communication between regulators and the regulated as long as it is disclosed at public meetings. These new rules should extend to executive officers if they are issuing permits."[43]

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[41] See Govt. Code § 11405.50

[42] 23 Cal. Code Regs. §648

[43] *Clearer Structure, Cleaner Water: Improving Performance and Outcomes at the State Water Boards*, January 22, 2009

CREAC CDC
4133 Poplar
City Heights, CA 92105
blowirbuilding@cox.net

4/25/2012

RE Comments on Administrative Draft

Dear Sir/Madam

Thank you for a well organized workshop on the draft administrative permit. Initial comments follow.

1. Stakeholder groups should be representative of the community not equal numbers of special interests from those that cause the environmental abuse & burden - Developers

2. All requirements should eliminate very the use of the "rural Q" in making any calculations of run off.

3. The concept of limited resources should not be allowed for governments that are and have been issuing development building permits that cause or contribute to the storm water pollution

4. Any new reporting requirements must create a full and transparent public record

5. Local school and community college districts must be included in any permits

Thank you for a great start. Please respond in writing and notice me of future meetings.

John Stump

000908

Wayne Chiu - Notice of Revised Procedures and Schedule for Focused Meetings on Regional MS4 Permit

From: <lyris@swrcb18.waterboards.ca.gov>
To: Wayne Chiu <wchiu@waterboards.ca.gov>
Date: 6/21/2012 11:40 AM
Subject: Notice of Revised Procedures and Schedule for Focused Meetings on Regional MS4 Permit
Attachments: 062012 Final Focused Meeting Notice - Regional MS4 Permit.pdf

Please see attached notice of revised administrative draft Regional Municipal Separate Storm Sewer System (MS4) Permit focused meeting procedures and schedule.

Please note the stakeholder participation has been expanded by including an audience and allowing representative stakeholder groups to rotate members at the meeting table.

If you have questions, please contact me at:

Eric Becker, P.E.
Senior Water Resources Control Engineer
Southern Watershed Unit
SDRWQCB
9174 Sky Park Court, Suite 100
San Diego, CA 92123
(858) 492-1785
(858) 571-6972
EBecker@waterboards.ca.gov

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or send a blank email to leave-354834-508206.5e12452d2cea9a5676faf89bcbc2cb99@swrcb18.waterboards.ca.gov

CALIFORNIA Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

June 20, 2012

NOTICE OF REVISED ADMINISTRATIVE DRAFT REGIONAL MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) PERMIT FOCUSED MEETING PROCEDURES AND SCHEDULE

The San Diego Water Board is developing a Regional Municipal Separate Storm Sewer System (MS4) Storm Water NPDES Permit that will cover municipal Copermittees in San Diego County, Southern Orange County and Riverside County (Tentative Order No. R9-2012-0011). The San Diego Water Board has released for public review and comment, an administrative draft version of the Tentative Order, also referred to as the Regional MS4 Permit. A follow-up public staff level workshop was held on April 25, 2012 to introduce the Regional MS4 Permit to a large diverse group of stakeholders. The administrative draft of the Regional MS4 Permit is available on the following webpage:

http://www.swrcb.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

The focused meeting procedures and schedule, set forth below, incorporate revisions made by the San Diego Water Board Regional MS4 Permit Team (Regional Permit Team) in response to stakeholder comments and concerns received during the April 25, 2012 workshop and subsequent letters from and meetings with the Orange County, Riverside County, and San Diego County Copermittees (collectively referred to as Copermittees). The Regional Permit Team has also selected a professional facilitator, as requested by the Copermittees, to assist in conducting the focused meetings. Facilitator-suggested revisions to the focused meeting procedures and schedule are included herein. As evidenced by the attendance of approximately 130 people at the April 25, 2012 workshop, the number of Copermittees and interested stakeholders in this matter is quite large. The San Diego Water Board is establishing these procedures and schedule to ensure an orderly, efficient, and impartial focused meeting process to review and discuss the administrative draft permit and to provide a fair opportunity for representatives of Copermittee, environmental non-governmental organization, and development community groups to participate in the meetings. The procedures and schedule set forth below will remain in effect unless modified by the Regional Permit Team.

Focused Meetings Objective

The Regional Permit Team seeks to improve the administrative draft permit prior to its release for formal review and comment through a series of focused technical meetings. The objective of the focused meetings is for the Regional Permit Team to gain a greater understanding of the constraints or limitations the administrative draft permit provisions present to Copermittee storm water program managers, non-government environmental organizations, and the development/business community. The focused meetings will be limited to technical issue discussions about the specific terms and conditions of the administrative draft permit.

Stakeholder Participation

Participation at the focused meetings is structured to provide for an appropriate level of participation by key stakeholder groups, while preserving the ability for the meeting facilitator to ensure a collaborative technical discussion on the administrative draft permit. Meeting

participants are divided into two groups: a limited group to be seated at the meeting table and an audience group. The total number of participants at the meeting table will be limited to twenty-five (25) subdivided into representative stakeholder groups as described in the table below.

Groups of stakeholders can share their seats at the table and rotate particular topic experts from the audience to the table depending on the topic being discussed. To maximize the diversity of perspectives on the proposed permit provisions, the Regional Permit Team encourages each Copermittee group to consider designating table participants within the group from different jurisdictions.

Stakeholder Group	Participants at the Table
San Diego County Copermittees	5
Orange County Copermittees	5
Riverside County Copermittees	3
Environmental Community	3
Development/Business Community	3
USEPA	1
San Diego Water Board Permit Team	5

Ample audience seating will be provided so that interested persons can attend the focused meetings. Audience members will be allowed to ask questions and make comments at the end of each meeting.

Focused Meeting Agenda Topics

Administrative draft permit topics and associated key questions summarized below will be discussed at the following specified meeting dates.

Meeting Date	Topic Discussion Questions
June 27, 2012 and July 11, 2012	**ASSESSMENT and PLANNING** 1. In what ways can the proposed provisions of the administrative draft permit be modified to better assess if the Copermittees' jurisdictional runoff management programs are effectively prohibiting non-storm water discharges to their MS4s? 2. In what ways can the proposed provisions of the administrative draft permit be modified to better assess if the Copermittees' jurisdictional runoff management programs are reducing pollutants in storm water to the maximum extent practicable (MEP)? 3. In what ways can the proposed provisions of the administrative draft permit be modified to better assess that improvements are being achieved in the physical chemical, and biological conditions of receiving waters as a result of implementing the Copermittees' Water Quality Improvement Plans? 4. How can adaptive management or the "iterative process" be incorporated into the proposed provisions of the administrative draft permit better? 5. How can the proposed provisions of the administrative draft permit be modified to support a Copermittee's ability to plan and/or procure resources for its jurisdictional runoff management program?

Meeting Date	Topic Discussion Questions
	6. How can the proposed provisions of the administrative draft permit be modified to reduce or eliminate any conflicts with other requirements (e.g. TMDLs, ASBS) or programs (e.g. flood management, vector control, water supply, recycled water, groundwater recharge)?
July 25, 2012	**ASSESSMENT and MONITORING** 1. In what ways can the proposed provisions of the administrative draft permit be changed to improve how the Copermittees collect data to assess whether their jurisdictional runoff management programs are effectively prohibiting non-storm water discharges to their MS4s? 2. In what ways can the proposed provisions of the administrative draft permit be changed to improve how the Copermittees collect data to assess whether their jurisdictional runoff management programs are reducing pollutants in storm water to the MEP? 3. In what ways can the proposed provisions in the administrative draft permit be changed to improve how the Copermittees collect data to assess whether improvements to the physical, chemical, and biological conditions of receiving waters are being achieved as a result of implementing their Water Quality Improvement Plans?
August 22, 2012	**PLANNING and IMPLEMENTATION** 1. How can adaptive management or the "iterative process" be incorporated into the proposed provisions of the administrative draft permit better? 2. How can the proposed provisions of the administrative draft permit be modified to support a Copermittee's ability to plan and/or procure resources for its jurisdictional runoff management program? 3. How can the proposed provisions of the administrative draft permit be modified to reduce or eliminate any conflicts with other requirements (e.g. TMDLs, ASBS) or programs (e.g. flood management, vector control, water supply, recycled water, groundwater recharge)? 4. How can the proposed provisions of the administrative draft permit be modified to support a Copermittee's ability to implement and enforce its jurisdictional runoff management program to effectively prohibit non-storm water discharges to and from its MS4, and reduce pollutants in storm water discharges from its MS4 to the MEP? 5. How can the proposed provisions of the administrative draft permit be modified to promote retrofitting of existing development and/or implementing projects that can restore or rehabilitate receiving waters as good tools to use as pollution control strategies? 6. How can the proposed provisions of the administrative draft permit be modified to allow the Copermittees to better focus their resources on improving water quality?

Focused Meeting Minutes

CoPermittee stakeholder groups will prepare meeting minutes and provide them to the Regional Permit Team for review and dissemination to all stakeholder groups one week prior to the next focused meeting via the San Diego County, Orange County, and Riverside County MS4 Permit Lyris email lists. Signup for a subscription to any one of these lists at http://www.waterboards.ca.gov/resources/email_subscriptions/reg9_subscribe.shtml

Focused Meeting Schedule and Locations

The focused meetings will begin on June 27, 2012 and conclude on September 5, 2012 as described in the table below. The focused meetings are scheduled to begin at 9:30 a.m. and end at 3:30 p.m. Meeting locations will be at the following different locations in the central portion of the San Diego Region 9 boundaries in an effort to equalize travel time among the meeting participants. The Regional Permit Team will summarize the results of the focused meeting process at its September 5, 2012 workshop.

Meeting Dates	Topic	Location
June 27, 2012	Assessment and Planning	City of Oceanside San Luis Rey Wastewater Treatment Plant 3950 North River Road Oceanside, CA 92057 **Jim Turner Conference Room**
July 11, 2012	Assessment and Planning	City of Escondido 201 North Broadway Escondido, CA 92025 **Mitchell Conference Room**
July 25, 2012	Assessment and Monitoring	City of Carlsbad Faraday Center 1635 Faraday Avenue Carlsbad, CA 92008 **Faraday Center Room 173**
August 22, 2012	Planning and Implementation	City of Vista 200 Civic Center Drive Vista, CA 92084 **Community Room**
September 5, 2012	Focused Meetings Wrap-up San Diego Water Board Workshop	San Diego Water Board 9174 Sky Park Court, Suite 100 San Diego, CA 92123-4340 **Board Meeting Room**

By letter dated June 4, 2012, Riverside County Flood Control and Water Conservation District (District) reported that the Santa Margarita Copermittees could not prepare for and attend the focused meetings scheduled for June 27 and July 11, 2012 or any subsequent meetings scheduled between mid-September and mid–November, 2012 due to work on other storm water program compliance priorities.

The District requested that the meetings be rescheduled to begin no earlier than the week of July 23, 2012. By letter dated June 7, 2012, San Diego County, Department of Public Works made a similar request on behalf of the Orange County and Riverside County (Santa Margarita) Copermittees. The San Diego Water Board carefully considered these requests in finalizing the schedule for the focused meetings and determined that the meetings should proceed as described in the above table in order to maintain momentum towards finalizing a final Draft Permit for public review and comment later this year.

The Regional Permit Team will endeavor to keep stakeholder groups that may miss a scheduled focused meeting informed through the prompt circulation of meeting minutes and additional opportunities to speak with the Regional Permit Team between the scheduled meeting dates.

Other Procedural Matters

Focused meeting participants and other interested persons may submit written comments to the address below on the administrative draft permit until Friday, September 14, 2012 at 5:00 p.m. The San Diego Water Board will not provide written responses to written comments submitted on the administrative draft permit. All written comments, as well as comments received during the focused meetings, will be reviewed and considered in the Regional Permit Team's development of a final Draft Permit that will be released for public comment. The San Diego Water Board will issue a separate public hearing notice announcing the release of a final Draft Permit for public review and comment, the deadline for submission of final comments, and the date of the public hearing for the Board to consider the comments received, public testimony, and adoption of a final Regional MS4 Permit. Submit written comments on the administrative draft permit to Laurie Walsh via e-mail at lwalsh@waterboards.ca.gov and/or by US mail at 9174 Sky Park Court, Suite 100, San Diego, CA 92123-4340.

Meeting Directions and Parking

Meeting Dates	Location	Directions	Parking
June 27, 2012	City of Oceanside San Luis Rey Wastewater Treatment Plant 3950 North River Road Oceanside, CA 92057 **Jim Turner Conference Room**	Take Interstate 15 to I-76 west OR take Interstate 5 to I-76 east to Douglas. Make a left on to Douglas and a left on North River Road. The gate of the facility is at the end of the road.	Free Parking at the Plant.
July 11, 2012	City of Escondido 201 North Broadway Escondido, CA 92025 **Mitchell Conference Room**	See Attached Map.	Free Parking in designated areas. See Attached Map for areas where Free Parking is unlimited. Pay close attention of restricted duration parking lots if you choose to park somewhere other than the unrestricted lot.
July 25, 2012	City of Carlsbad Faraday Center 1635 Faraday Avenue Carlsbad, CA 92008 **Faraday Center Room 173**	See Attached Map.	Free Parking in the lot at the Faraday Center.

Meeting Dates	Location	Directions	Parking
August 22, 2012	City of Vista 200 Civic Center Drive Vista, CA 92084 **Community Room**	Take Interstate 15 to I-78 west OR take Interstate 5 to I- 78 east to Civic Center Drive exit, go north on Civic Center approximately 1.1 miles to stoplight at Alta Vista, turn right on Alta Vista and right into parking lot, follow signs within Civic Center Complex to the Community Room.	Free Parking, After turning right on Alta Vista, turn right into the Civic Center parking lot. Follow signs within Civic Center Complex to Community Room.
September 5, 2012	San Diego Water Board 9174 Sky Park Court, Suite 100 San Diego, CA 92123-4340 **Board Meeting Room**	Interstate 15 - take the Balboa Ave. exit - turn right (west). Proceed to the 2nd stoplight, which is Ruffin Road – turn left. Turn right on Sky Park Court. Our building is located at the end of the court – veer to the right into the parking lot.	Free Parking

CONTACTS FOR ADDITIONAL INFORMATION
The San Diego Water Board Regional MS4 Permit Team includes the following staff:

David Barker – Supervising Water Resource Control Engineer
Eric Becker – Senior Water Resource Control Engineer
Wayne Chiu – Water Resource Control Engineer
Laurie Walsh - Water Resource Control Engineer
Christina Arias - Water Resource Control Engineer

Questions or requests for additional information regarding this notice should be directed to Laurie Walsh at (858) 467-2970 or via e-mail at lwalsh@waterboards.ca.gov.

Escondido City Hall
201 North Broadway

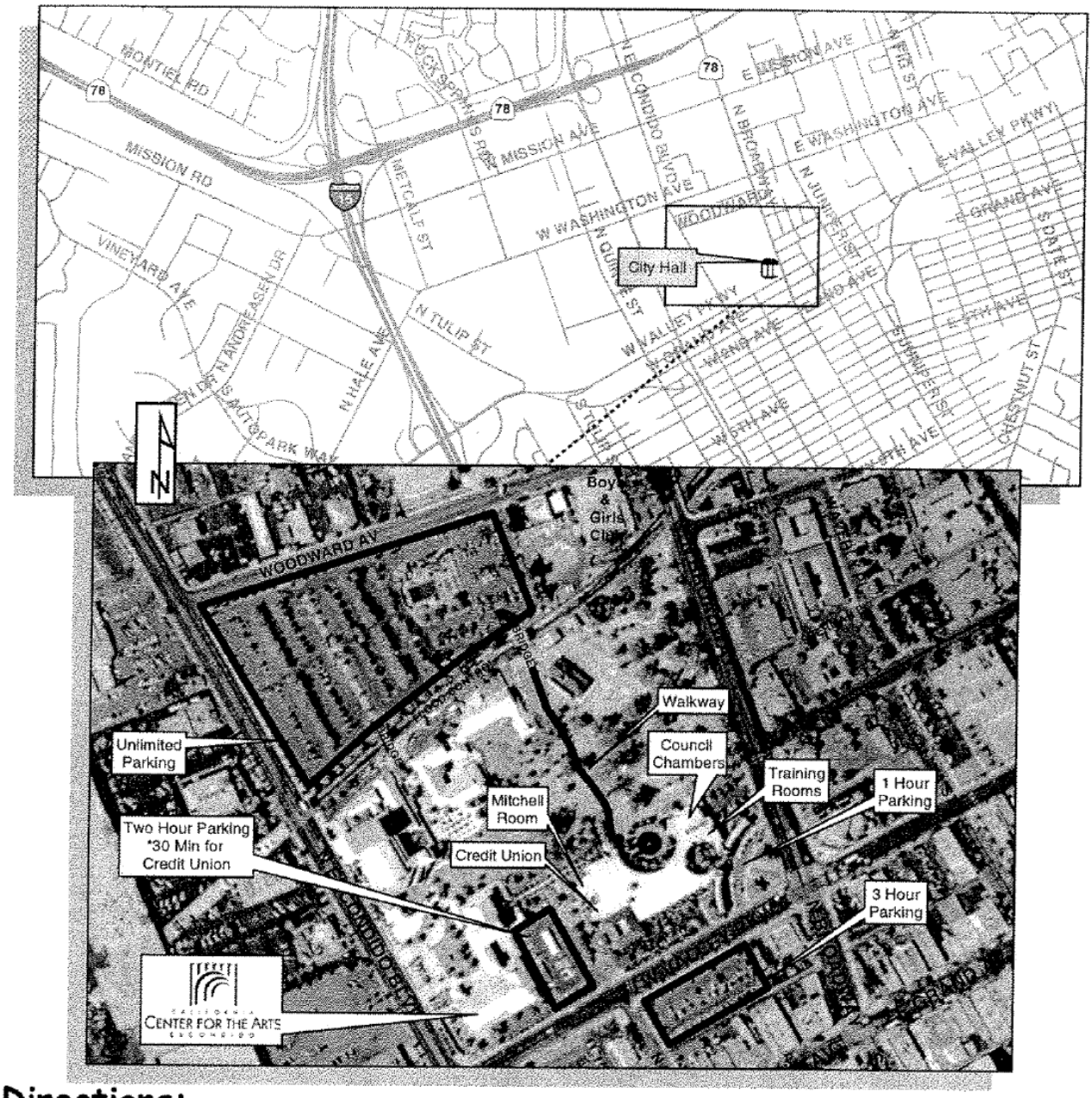

Directions:

From Interstate 15:

Take Valley Parkway (Downtown) exit and head east. When Valley Parkway crosses over Centre City Parkway it becomes Second Avenue. Turn left onto Escondido Blvd. Cross over Valley Parkway, turn right into the parking lot just after the CA Center for the Arts.

From Highway 78:

Continue east on Highway 78 into Escondido. When 78 ends at the light, turn right on Broadway. Just past Washington Ave, turn right on Woodward Ave. The parking lot is on the left, just on the other side of the Boys & Girls Club.

PLACE: CITY OF CARLSBAD
FARADAY CENTER
1635 FARADAY AVENUE
ROOM 173
CARLSBAD, CA. 92008

FROM INTERSTATE 5

EXIT INTERSTATE 5 AT CANNON RD.
GO EAST TO FARADAY AVE. AND TURN RIGHT (EAST).
CONTINUE ALONG FARADAY AVE. 1635 FARADAY AVE.
WILL BE ON THE RIGHT.

FROM SAN MARCOS (EAST)

GO WEST ON PALOMAR AIRPORT RD.
TURN RIGHT (NORTH) AT EL CAMINO REAL
GO TO FARADAY AVE. AND TURN LEFT (WEST)
CONTINUE ON FARADAY AVE PAST COLLEGE BLVD.
1635 FARADAY AVE. WILL BE ON THE LEFT

FROM OCEANSIDE (NORTH)

GO SOUTH ON EL CAMINO REAL TO FARADAY AVE.
TURN RIGHT (WEST) ON FARADAY AVE.
CONTINUE ON FARADAY AVE. PAST COLLEGE BLVD.
1635 FARADAY AVE. WILL BE ON THE LEFT

FROM ENCINITAS (SOUTH)

GO NORTH ON EL CAMINO REAL TO FARADAY AVE.
TURN LEFT (WEST) ON FARADAY AVE.
CONTINUE ON FARADAY AVE. PAST COLLEGE BLVD.
1635 FARADAY AVE. WILL BE ON THE LEFT

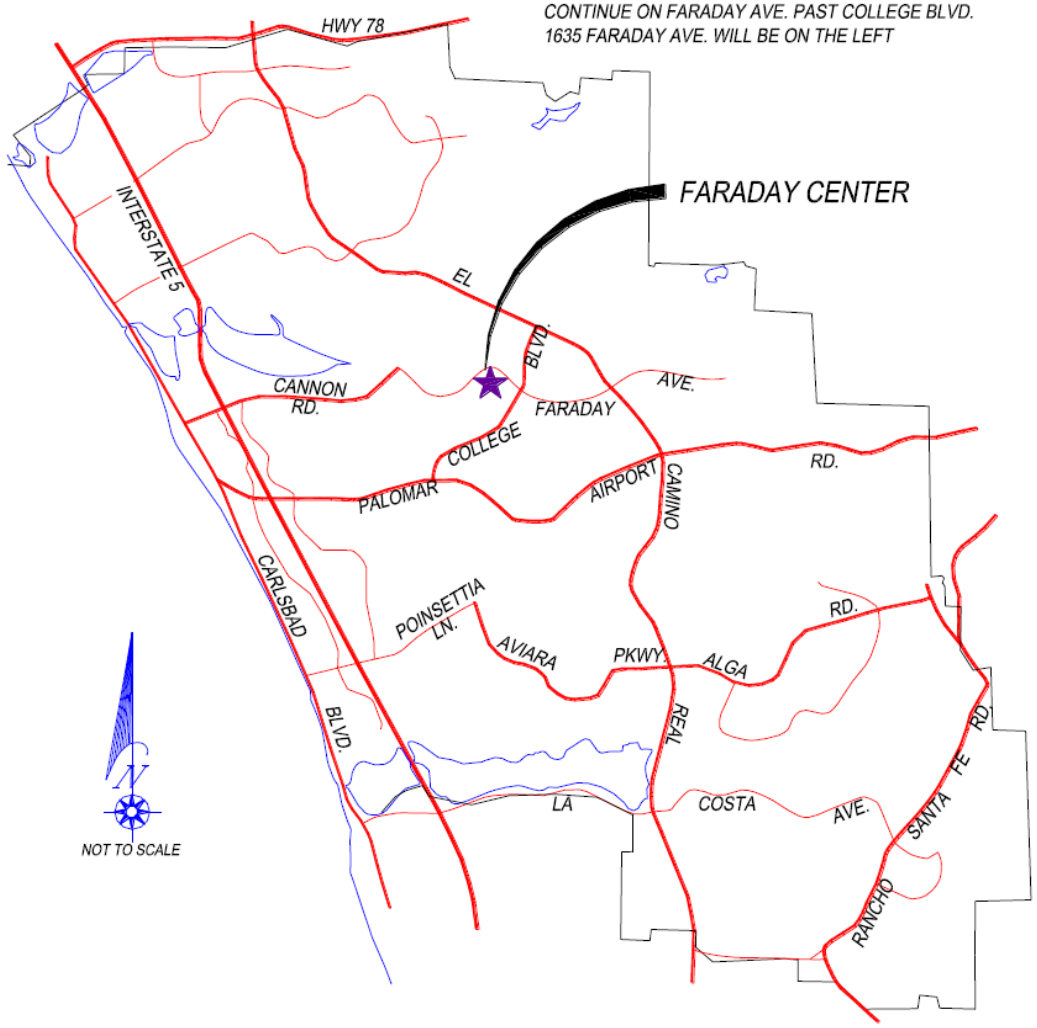

FOCUSED MEETING AGENDA

Administrative Draft of
Tentative Order No. R9-2012-0011, NPDES No. CAS0109266
Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region

Wednesday, June 27, 2012
9:30 a.m. - 3:30 p.m.

9:30 a.m. - 9:40 p.m.	Introductions Table Participants
9:40 a.m. - 9:55 p.m.	Meeting Procedures and Objectives Lewis Michaelson, Katz & Associates
9:55 a.m. - 10:10 p.m.	Background & Intent Wayne Chiu, San Diego Water Board
10:10 a.m. - 11:30 a.m.	Assessment & Iterative Process Table Participants
11:30 a.m. - 12:30 p.m.	Lunch
12:30 p.m. - 1:30 p.m.	Assessment & Action Levels Table Participants
1:30 p.m. - 1:45 p.m.	Break
1:45 p.m. - 3:00 p.m.	Assessment & Planning Table Participants
3:00 p.m. - 3:30 p.m.	Comments & Questions (All)

ELECTRONIC MAIL LIST SUBSCRIPTION
The San Diego Water Board has established an electronic mail list specifically for information and notices on the development of a Regional MS4 Storm Water Permit. The San Diego Water Board will use the email list to notify interested persons of upcoming important events and the availability of on-line documents. Persons interested in receiving future notices and information on this specific project can subscribe to one (1) of the electronic mail lists titled “Orange County MS4 Permit, “ Riverside County MS4 Permit, or “San Diego MS4 Permit ”, located on the San Diego Water Board website at:

http://www.waterboards.ca.gov/resources/email_subscriptions/reg9_subscribe.shtml

FOCUSED MEETING
Administrative Draft Tentative Order No. R9-2012-0011
June 27, 2012

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FOCUSED MEETING
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June 27, 2012

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FOCUSED MEETING
Administrative Draft Tentative Order No. R9-2012-0011
June 27, 2012

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FOCUSED MEETING
Administrative Draft Tentative Order No. R9-2012-0011
June 27, 2012

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SDRWQCB Focused Meeting #1
June 27, 2012

SD County Copermittee Vision

"Our vision is for the protection of water quality in our streams, bays, ocean, and other water bodies that benefits wildlife, recreation, the environment, and other community needs as supported by sustainable stormwater management."

SD County Copermittee Visioning and Goal Setting 2010

SD County Copermitee Goals

- Protect and restore appropriate beneficial uses for prioritized water bodies impacted by stormwater.
- Achieve sustainable stormwater management that balances social, economic, and environmental needs.
- Focus stormwater management on sources and practices that jurisdictions have the ability to affect or control.
- Support development of a regulatory framework and establish an organizational structure that facilitates implementation of the most effective and efficient stormwater management program.

SD County Copermittee Visioning and goal setting 2010

SD County ROWD Objectives

- Emphasis on Strategic Planning
- Enhanced Watershed and TMDL Focus
- Streamlined & Meaningful Assessment
- Coordinated & Strategic WQ Monitoring
- Simplified & Meaningful Reporting
- Emphasis on Adaptive Management
- Clear Understanding of Compliance

Long-Term vs. Annual Processes

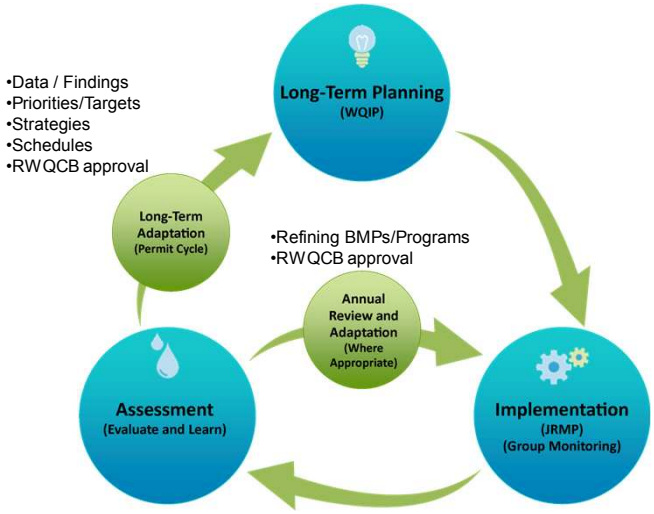

Key Concepts

How can adaptive management or the "iterative process" be incorporated into the draft permit better?

Clarify in the permit:

- Define compliant adaptive management as approved plan iteration
- Allowance for replacement of required activities with more efficient activities
- Adaptation distinctions:
  - Annually review and consider adaptation of control strategies
  - Periodically review and consider adaptation of goals & priorities

How can the draft permit be modified to support a Copermittees' ability to plan and/or procure resources?

Clarify in the permit:

- Different purposes of WQIP & JRMP
  - WQIP serves as guidance for watershed priorities
  - JRMP identifies full suite of control strategies for implementation
- Allowance for jurisdiction-specific goals, priorities, activities focused on WQIP priorities
- Consideration of environmental, social and economic factors
- Allowance for replacement of required activities with more efficient activities
- Copermittees' responsibilities are limited to their MS4 discharges and their impacts on receiving waters
- Sufficient time to develop/update plans, obtain RWQCB approval, budget and implement

How can the draft permit be modified to improve program and goal assessment?

Clarify in the permit:

- Assessment structure facilitates development of strategic, adaptive management in WQIP
  - Goals/Objectives/Outcomes
  - Sources/Pollutant Generating Activities
  - Program/BMP efficiencies
- Use a question/objective-driven approach
- Statistically supported representative approaches to program assessment is used where appropriate (e.g., monitoring) focused on WQIP priorities

How can the proposed provisions be modified to reduce or eliminate conflicts with other requirements or programs?

- Sync plan development and update schedules with other regulatory deadlines
- RWQCB to address:
  - conflicts with CEQA (e.g., definitions)
  - conflicts with groundwater regulations
  - habitat needs (e.g., flows)
  - other RWQCB-issued NPDES Permits

California Regional Water Quality Control Board, San Diego Region
Regional MS4 Permit Focused Meeting

Meeting Notes

Date	Location	Agenda Topics
6/27/2012 Start time: 9:30 AM End time: 3:40 PM	City of Oceanside San Luis Rey WWTP 3950 North River Road Oceanside, CA 92057 Jim Turner Conf Room	• Meeting Procedures and Objectives • Background and Intent • Assessment and Iterative Process • Assessment and Action Levels • Assessment and Planning • Next Focused Meeting • Audience Comments

I. Introductions

Table participants introduced themselves. Lewis Michaelson (Facilitator) ensured the appropriate representatives were at the table, per the June 20, 2012, San Diego Regional Water Quality Control Board (SD RWQCB) Notice.

San Diego County Copermittees (5): Drew Kleis (City of San Diego), Jon Van Rhyn (County of San Diego), Mikhail Ogawa (City of Del Mar), Todd Snyder (County of San Diego), Elaine Lukey (City of Carlsbad)

Orange County Copermittees (5): Ziad Mazboudi (City of San Juan Capistrano), Lisa Zawaski (City of Dana Point), Grant Sharp (Orange County Flood Control District), Ryan Baron (County of Orange), Richard Boon (County of Orange)

Environmental Community (3): Thom Spanos (San Diego Coastkeeper), Rick Wilson (Surfrider), Michael Hazzard (Clean Water Now! Carlsbad)

Development/Business Community (3): Thom Fuller (San Diego Business Industry Association), Dennis Bowling (American Public Works Association), Tory Walker (San Diego Business Industry Association), Mike McSweeney* (BIA), Wayne Rosenbaum* (BIA), Mark Grey* (BIA) **Indicates representatives rotated during the meeting.*

U.S. Environmental Protection Agency (US EPA) (1): John Kemmerer

San Diego Water Board Permit Team: David Barker, Wayne Chiu, Laurie Walsh, Eric Becker

Riverside County MS4 Copermittees were invited to the focused meeting but were unable to attend due to prior commitments to other compliance issues.

South Orange County has a request in to look at the legal basis for issuing a regional permit. Pending clarification of that request, the County of Orange will participate in the focused meetings.

SD RWQCB Executive Management is represented at these meetings by David Barker, Division Chief.

II. Meeting Procedures and Objectives

Lewis Michaelson (Facilitator) provided a brief presentation on Collaborative Dialogue Principles, including the theory of collaborative dialogue and the ground rules for collaborative dialogue. In theory, collaborative dialogue is interest-based dialogue, not position-based dialogue, and uses objective criteria to attain a "win-win" solution. The ground rules for collaborative dialogue are: 1) everyone's perspective is valued; 2) listen to understand, not to debate; 3) be hard on the issues – soft on the people; 4) avoid right-wrong paradigms; 5) everyone has an equal opportunity to participate; 6) what's past is past – focus on the future.

III. Background and Intent

The SD RWQCB (Wayne Chiu) provided background on how the administrative draft permit was developed, how the focused meetings were envisioned to run, and what is hoped to be accomplished from this point forward. From February to May of 2011, SD RWQCB staff met with several Riverside, Orange County, and San Diego Copermittees and members of the San Diego environmental community to solicit feedback on what they found useful or not useful about existing stormwater management programs, what could be improved, what could work better, and what they would want to see work differently in a regional permit. The SD RWQCB then received the Report of Waste Discharge (ROWD) from the San Diego Copermittees. From the meetings and ROWD, there were similar, overlapping concerns and ideas, which boiled down to five basic principles:

- Simplified and more useful reporting;
- Better coordinated and more useful monitoring;
- More meaningful assessment;
- Integration of Total Maximum Daily Load (TMDL) requirements into the MS4 permits; and,
- More emphasis on strategic planning, with more flexibility in implementing the programs (adaptive management).

Using that feedback, the SD RWQCB developed the administrative draft permit. The focused meetings are the next step in this collaborative process. The purpose of the focused

meetings is to get feedback on the administrative draft permit, keeping in mind that all elements in the administrative draft permit will remain in the permit. The form in which the elements are included is still open to change so long as the changes will be more cost effective, more efficient, more useful for Copermittees, and/or ultimately achieve improvements in water quality. The focused meetings are a unique opportunity for stakeholders to better understand what the SD RWQCB is trying to accomplish with this permit and for the SD RWQCB to better understand what stakeholders see as potential constraints or limitations in the proposed permit requirements. After these focused meetings, there will still be the same public process with any tentative order, including a public comment period, and a public permit adoption hearing.

Requirements included in the administrative draft permit were based on the current Riverside MS4 permit. The structure of the permit, however, was changed to focus the permit on goals and how to best achieve those goals, not simply plan development and implementation. The ultimate goal is to improve water quality, but there is a holistic approach in the administrative draft permit that encourages consideration of issues on a watershed scale as well as issues like water resources, climate change, and flood control management, in addition to water quality.

The SD RWQCB has a long-term vision for this permit. Although required to have 5-year permit terms, the SD RWQCB does not expect all water quality problems to be fixed in 5 years. The idea is that this permit will, at the five year mark, be renewed almost as-is. This will allow the SD RWQCB to become more familiar with the Copermittees' programs and to work as a supportive agency helping the Copermittees rather than an enforcement agency focused on each and every incident.

IV. Assessment and Iterative Process

The SD RWQCB (Wayne Chiu) explained how the iterative process is the main focus of the permit. The iterative process is embedded in the prohibitions and limitations section of the permit. The prohibitions and limitations are the end goal and are an expression of the requirements set forth in the Clean Water Act (CWA). Per the CWA, for municipal permits, there are two basic requirements/objectives: (1) effectively prohibit non-stormwater discharges, and (2) require controls to reduce pollutants in stormwater discharges from MS4s to the maximum extent practicable (MEP). In addition, the overall objective of the CWA is to restore and maintain the physical, chemical, and biological integrity of receiving waters. Understanding that these objectives cannot be achieved in one permit cycle, the iterative process is necessary. The Monitoring and Assessment Section (Section D) spells out how to assess the effectiveness of the municipal storm water programs in achieving those three objectives of the CWA.

Stakeholders (Ziad Mazboudi, City of San Juan Capistrano, County of Orange Copermittees; Drew Kleis, City of San Diego, County of San Diego Copermittees) agreed with

the basic goals of the permit and acknowledged that the iterative process is key to being successful in implementing and achieving those goals.

County of Orange Copermittees (Ziad Mazboudi, City of San Juan Capistrano) added he would like to see some common sense combined with the common goals, including recognition of financial constraints in implementation of the permit.

County of Orange Copermittees (Richard Boon, County of Orange and Lisa Zawaski, City of Dana Point) would like to see "effectively prohibit non-stormwater discharges" instead of "prohibit" in the permit language. This is directly from the CWA language and would provide latitude in the implementation of the permit and protect copermittees from unwarranted exposure to non-compliance. For example, with "prohibit" language, the test of compliance is if there is an illegal discharge / illicit connection (ID/IC) present within the jurisdiction; however, with the "effectively prohibit" language, other considerations come into play (economic, technical, social, etc.) and the presence of an ID/IC does not immediately result in non-compliance.

County of San Diego Copermittees (Drew Kleis, City of San Diego) believe that program planning is essential to achieving an iterative process and that a broader approach should be taken in terms of assessment activities and goals. The assessment should not be limited to assessing whether or not those three specific goals are reached, it should also include what information the programs need for adaptive management. County of San Diego Copermittees (Jon Van Rhyn, County of San Diego) discussed the need for a thorough discussion of the plans and plan process before fully addressing assessment. Assessment is set up when a plan is designed. In designing plans, the objectives are going to make specific commitments. In implementation, strategies to achieve those objectives are implemented. Some will work; some will not work. New knowledge may become available. The adaptive management process should be a learning lab of sorts. The SD RWQCB (Wayne Chiu) agreed there should be some assessment of the actual strategies implemented; however, that may not need to be included in the permit. The permit is looking for progress toward the three CWA objectives (improvements in discharge quality, improvements in receiving water quality, and reduction of non-stormwater discharges in the MS4).

County of San Diego Copermittees (Todd Snyder, County of San Diego) asked for clarification between assessment and compliance, specifically requesting language in the permit that would state if a Water Quality Improvement Plan is approved by the SD RWQCB, then implementation of that plan would constitute compliance with the permit. The Environmental Community (Thom Spanos, SD Coastkeeper) requested clarification on what compliance would be with reduction of pollutants. The SD RWQCB (Wayne Chiu) lined out the points of compliance: (1) Water Quality Improvement Plan submitted; (2) All required elements are included in the Plan; (3) Implementation of the Plan; (4) Assessment of the Plan. In terms of assessment, the point of compliance is that the assessment is completed and that information is used to improve programs and plans; nothing within the plan itself

(targets, schedules, etc.) is a point of compliance. Compliance is a track record of implementation and forward progress. The San Diego Copermittees (Todd Snyder, County of San Diego and Mikhail Ogawa, City of Del Mar) and County of Orange Copermittees (Ziad Mazboudi, City of San Juan Capistrano) would like that interpretation of compliance put explicitly into the permit. The SD RWQCB (Wayne Chiu) reminded the stakeholders that everything in the permit is written as requirement language, not explanation; explanations can go in the Fact Sheet for the permit. Stakeholders are encouraged to submit language for consideration that captures the aforementioned intent but is still stated as a requirement.

San Diego Copermittees (Mikhail Ogawa, City of Del Mar; Drew Kleis, City of San Diego; and, Elaine Lukey, City of Carlsbad) requested that permit language clearly include the ability to tailor assessment programs. Monitoring of receiving water and outfall data, from experience, cannot be tied directly to specific program implementation. County of Orange Copermittees (Grant Sharp, Orange County Flood Control District) agreed that while 50% of their annual budget is allocated to permit-required monitoring, it is a great challenge to correlate monitoring data to program actions. Additional assessment tools, such as observations or reports from non-governmental organizations (NGOs), such as Heal the Bay or the Natural Resources Defense Council (NRDC), are helpful to adequately assess program implementation. The Environmental Community (Thom Spanos, SD Coastkeeper) volunteered that SD Coastkeeper does have a lot of monitoring data; the permit should allow consideration of those data. The SD RWQCB (Wayne Chiu) acknowledged that the ability to tailor assessment programs could be expanded upon in the permit; however, collection of water quality monitoring data is still necessary to determine if conditions are improving. Furthermore, the permit does try to encourage Copermittees to work with other agencies or groups that are collecting monitoring data, and monitoring data are not limited to water quality monitoring data; monitoring data include anything being done to monitor progress.

The Development Community (Thom Fuller, BIA) requested clarification on the monitoring program being a tool to improve water quality. The SD RWQCB (Wayne Chiu) clarified that monitoring is a tool but it is also the feedback loop that indicates whether or not other tools are working and if changes are necessary. The monitoring requirements also have incorporated a set of special studies that Copermittees may use as tools.

San Diego Copermittees (Todd Snyder, County of San Diego) questioned how the permit achieves the goal of streamlined reporting; with the adaptive management context, a significant amount of changes are expected and the RWQCB may have significantly more pieces of unique programs to review which would also be subject to public review. The SD RWQCB (Wayne Chiu) explained that under current permit regulations, the SD RWQCB receives on the order of 60 reports each year with 60 plans to be familiar with. Under the administrative draft permit, that is reduced to 9 reports and 9 plans.

V. Assessment and Action Levels

The SD RWQCB (Wayne Chiu) explained that as the Riverside and Orange County permits were developed, Action Levels were incorporated, creating a whole new program. The original intent of Action Levels was to force Copermittees to actively address, in response to the data collected, non-stormwater discharges. In this regional permit, the approach is different. Rather than being a reactive set of requirements, in the new permit approach, the Action Levels are part of the assessment tools, part of the way to prioritize issues. However, the Action Levels used for the Riverside and Orange County permits are being used in the regional permit due to the RWQCB's approach of utilizing the requirements from the most recently adopted permit (the Riverside Permit in this case) as the foundation of the next permit, and consideration of the anti-backsliding requirements of the Clean Water Act..

The Development Community (Wayne Rosenbaum, BIA) expressed concern that due to the RWQCB staff's interpretation of anti-backsliding policy, stakeholders will have to live with the language and content of the permit in perpetuity. In addition, the permit is highly complex when it comes to assessment. The Development Community would prefer the approach taken with the Hydromodification Plan (HMP) be taken with this permit; allow the stakeholders to develop a program that makes sense, using all intellectual property and expert knowledge available, then come back to the SD RWQCB with the best program possible. With the assessment requirements in the permit, it does not seem to allow for this type of approach.

The County of Orange Copermittees (Richard Boon, County of Orange) shared that having dry weather numeric action levels set by the Basin Plan has resulted in the misdirection of resources; the numeric action levels have not led to addressing real ID/IC issues. The SD RWQCB (Wayne Chiu) responded that the values will not change but how the numeric action levels are applied is different in this regional permit. In this regional permit, the NALs and SALs are tools to better assess and prioritize resources. The Action Levels section lays out the Action Levels that have to be incorporated into the Water Quality Improvement Plan. How those Action Levels are used in the Water Quality Improvement Plan is in the Assessment Section. Within those assessments, there is a section where the monitoring data are compared to NALs and SALs. Then, that information is used to assess the Water Quality Improvement Plan and prioritize strategies. The intent is for Action Levels to become a measure of progress, not an alarm for immediate action. The SD RWQCB (Laurie Walsh) clarified that the Water Quality Improvement Plans are used to establish pollutant priorities. The Action Levels are to be used to measure progress, not to determine compliance. The San Diego Copermittees (Drew Kleis, City of San Diego) would like that language included in the permit to make the prioritization commitment clearer.

The Environmental Community (Thom Spanos, SD Coastkeeper) asked how Copermittees can change their Water Quality Improvement Plans outside the required

three-year adaptive management process. The SD RWQCB (Laurie Walsh) explained that Copermittees can always modify their Water Quality Improvement Plans more frequently; the permit just sets the minimum timeframe.

The Development Community (Wayne Rosenbaum, BIA) brought up the issue of distinguishing between stormwater and non-stormwater. With the hydromodification systems, the drain out is longer than the 3-day stormwater definition. Perhaps there is a better way to define stormwater that would not catch the hydromodification systems under the non-stormwater definition. There is a concern that much time and resources will be spent tracking non-stormwater discharges to hydromodification systems.

VI. Assessment and Planning

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The U.S. EPA (John Kemmerer) has been working with the RWQCB since January. The Water Quality Improvement Plans are a good approach for allowing flexibility. The bottom line is that with TMDLs, those waste load allocations need to be incorporated into the permit. The ultimate bottom line is water quality improvement on a watershed basis.

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The County of Orange Copermittees (Ziad Mazboudi, City of San Juan Capistrano) asked what the timeframe is to align the three counties under the regional permit. The SD RWQCB (Wayne Chiu) responded that San Diego Copermittees will be enrolled when the permit is adopted. As the Orange County and Riverside County permits expire, then the Orange County and Riverside Copermittees will come under the regional permit. There is, however, a clause that would allow earlier enrollment by the Orange County or Riverside Copermittees, so long as they have fulfilled their requirements under their current permit, including hydromodification and a model Water Quality Management Plan (WQMP), and have a Water Quality Improvement Plan submitted to the RWQCB.

The County of Orange Copermittees (Ryan Baron, County of Orange) asked what the basis was for implementing a regional permit. The SD RWQCB (Wayne Chiu) responded that there were two main factors: 1) At this point, all three permits have basically the same elements and requirements; and, 2) the RWQCB is under resource constraints with fewer

resources to administer multiple permits. The County of Orange Copermittees (Ryan Baron, County of Orange) are concerned that all Copermittees will not have had an opportunity to submit an ROWD to shape this regional permit. The SD RWQCB (Wayne Chiu) has spoken with the Copermittees of all three counties and has found similar issues across the three counties. The SD RWQCB (Eric Becker) will discuss the ROWD issue with legal counsel.

VII. Next Focused Meeting

The next focused meeting is set to address similar topics as this focused meeting. Based on the progress and direction of the discussions at the first meeting, stakeholders may have some recommendations on different or additional topics that are germane and timely to discuss at the second meeting, and thus were asked to propose topics for discussion to the SD RWQCB (Laurie Walsh) no later than Tuesday, July 3. The agenda for the meeting will be distributed Friday, July 6.

VIII. Audience Comments

Question: Is there any intent to have technical discussion in the focused meetings?

Response: The discussion level at the focused meetings will primarily remain at the conceptual level.

Question: Should specific language drafts be brought to the table at future focused meetings?

Response: Specific language drafts should be submitted in writing before September 14. The discussion level at the focused meetings will primarily remain at the conceptual level.

Question: Regarding Action Levels and Assessment, is the intent of Section D.4.a that Copermittees must follow up on all exceedances of NALs?

Response: Intent is that Copermittees will prioritize and ultimately address all exceedances on a prioritized basis.

There were several comments about revisiting and discussing several technical aspects in the permit requirements. SD RWQCB responded that there were some aspects of the permit requirements, such as Action Levels and design or performance criteria, that would not be changed. The way those requirements are applied and complied with, however, can still be changed in the permit and will be discussed in subsequent focused meetings.

IX. Meeting Adjourned

000937

Wayne Chiu - Regional MS4 Permit July 11, 2012 Focused Meeting Agenda + June 27th Mtg Notes

From: <lyris@swrcb18.waterboards.ca.gov>
To: Wayne Chiu <wchiu@waterboards.ca.gov>
Date: 7/6/2012 5:24 PM
Subject: Regional MS4 Permit July 11, 2012 Focused Meeting Agenda + June 27th Mtg Notes
Attachments: 20120627MeetingNotes_Final_.pdf; FOCUSED MEETING JULY 11 AGENDA.pdf

Stakeholders,

Attached are the July 11, 2012 Focused Meeting Agenda and the June 27, 2012 Focused Meeting Notes.

The July 11, 2012 Focused Meeting will be held in the City of Escondido Mitchell Conference Room located at the City's Civic Center, 201 North Broadway, Escondido, CA 92025. Please note a map showing locations of free parking is attached to the Focused Meeting Notice found at http://www.waterboards.ca.gov/sandiego/docs/Final_Focused_Meeting_Notice_Regional_MS4_Permit.pdf

Regional Board MS4 Permit Team

You are currently subscribed to reg9_sandiegoco_ms4permit as: wchiu@waterboards.ca.gov.

To unsubscribe click here: http://swrcb18.waterboards.ca.gov/u?id=508208.cee2a373662e566393e62f0af18d11cf&n=T&l=reg9_sandiegoco_ms4permit&o=360935

(It may be necessary to cut and paste the above URL if the line is broken)

or send a blank email to leave-360935-508208.cee2a373662e566393e62f0af18d11cf@swrcb18.waterboards.ca.gov

California Regional Water Quality Control Board, San Diego Region
Regional MS4 Permit Focused Meeting

Meeting Notes

Date	Location	Agenda Topics
6/27/2012 Start time: 9:30 AM End time: 3:40 PM	City of Oceanside San Luis Rey WWTP 3950 North River Road Oceanside, CA 92057 Jim Turner Conf Room	• Meeting Procedures and Objectives • Background and Intent • Assessment and Iterative Process • Assessment and Action Levels • Assessment and Planning • Next Focused Meeting • Audience Comments

I. Introductions

Table participants introduced themselves. Lewis Michaelson (Facilitator) ensured the appropriate representatives were at the table, per the June 20, 2012, San Diego Regional Water Quality Control Board (SD RWQCB) Notice.

San Diego County Copermittees (5): Drew Kleis (City of San Diego), Jon Van Rhyn (County of San Diego), Mikhail Ogawa (City of Del Mar), Todd Snyder (County of San Diego), Elaine Lukey (City of Carlsbad)

Orange County Copermittees (5): Ziad Mazboudi (City of San Juan Capistrano), Lisa Zawaski (City of Dana Point), Grant Sharp (Orange County Flood Control District), Ryan Baron (County of Orange), Richard Boon (County of Orange)

Environmental Community (3): Thom Spanos (San Diego Coastkeeper), Rick Wilson (Surfrider), Michael Hazzard (Clean Water Now! Carlsbad)

Development/Business Community (3): Thom Fuller (San Diego Business Industry Association), Dennis Bowling (American Public Works Association), Tory Walker (San Diego Business Industry Association), Mike McSweeney* (BIA), Wayne Rosenbaum* (BIA), Mark Grey* (BIA) **Indicates representatives rotated during the meeting.*

U.S. Environmental Protection Agency (US EPA) (1): John Kemmerer

San Diego Water Board Permit Team: David Barker, Wayne Chiu, Laurie Walsh, Eric Becker

Riverside County MS4 Copermittees were invited to the focused meeting but were unable to attend due to prior commitments to other compliance issues.

South Orange County has a request in to look at the legal basis for issuing a regional permit. Pending clarification of that request, the County of Orange will participate in the focused meetings.

SD RWQCB Executive Management is represented at these meetings by David Barker, Division Chief.

II. Meeting Procedures and Objectives

Lewis Michaelson (Facilitator) provided a brief presentation on Collaborative Dialogue Principles, including the theory of collaborative dialogue and the ground rules for collaborative dialogue. In theory, collaborative dialogue is interest-based dialogue, not position-based dialogue, and uses objective criteria to attain a "win-win" solution. The ground rules for collaborative dialogue are: 1) everyone's perspective is valued; 2) listen to understand, not to debate; 3) be hard on the issues – soft on the people; 4) avoid right-wrong paradigms; 5) everyone has an equal opportunity to participate; 6) what's past is past – focus on the future.

III. Background and Intent

The SD RWQCB (Wayne Chiu) provided background on how the administrative draft permit was developed, how the focused meetings were envisioned to run, and what is hoped to be accomplished from this point forward. From February to May of 2011, SD RWQCB staff met with several Riverside, Orange County, and San Diego Copermittees and members of the San Diego environmental community to solicit feedback on what they found useful or not useful about existing stormwater management programs, what could be improved, what could work better, and what they would want to see work differently in a regional permit. The SD RWQCB then received the Report of Waste Discharge (ROWD) from the San Diego Copermittees. From the meetings and ROWD, there were similar, overlapping concerns and ideas, which boiled down to five basic principles:

- Simplified and more useful reporting;
- Better coordinated and more useful monitoring;
- More meaningful assessment;
- Integration of Total Maximum Daily Load (TMDL) requirements into the MS4 permits; and,
- More emphasis on strategic planning, with more flexibility in implementing the programs (adaptive management).

Using that feedback, the SD RWQCB developed the administrative draft permit. The focused meetings are the next step in this collaborative process. The purpose of the focused

meetings is to get feedback on the administrative draft permit, keeping in mind that all elements in the administrative draft permit will remain in the permit. The form in which the elements are included is still open to change so long as the changes will be more cost effective, more efficient, more useful for Copermittees, and/or ultimately achieve improvements in water quality. The focused meetings are a unique opportunity for stakeholders to better understand what the SD RWQCB is trying to accomplish with this permit and for the SD RWQCB to better understand what stakeholders see as potential constraints or limitations in the proposed permit requirements. After these focused meetings, there will still be the same public process with any tentative order, including a public comment period, and a public permit adoption hearing.

Requirements included in the administrative draft permit were based on the current Riverside MS4 permit. The structure of the permit, however, was changed to focus the permit on goals and how to best achieve those goals, not simply plan development and implementation. The ultimate goal is to improve water quality, but there is a holistic approach in the administrative draft permit that encourages consideration of issues on a watershed scale as well as issues like water resources, climate change, and flood control management, in addition to water quality.

The SD RWQCB has a long-term vision for this permit. Although required to have 5-year permit terms, the SD RWQCB does not expect all water quality problems to be fixed in 5 years. The idea is that this permit will, at the five year mark, be renewed almost as-is. This will allow the SD RWQCB to become more familiar with the Copermittees' programs and to work as a supportive agency helping the Copermittees rather than an enforcement agency focused on each and every incident.

IV. Assessment and Iterative Process

The SD RWQCB (Wayne Chiu) explained how the iterative process is the main focus of the permit. The iterative process is embedded in the prohibitions and limitations section of the permit. The prohibitions and limitations are the end goal and are an expression of the requirements set forth in the Clean Water Act (CWA). Per the CWA, for municipal permits, there are two basic requirements/objectives: (1) effectively prohibit non-stormwater discharges, and (2) require controls to reduce pollutants in stormwater discharges from MS4s to the maximum extent practicable (MEP). In addition, the overall objective of the CWA is to restore and maintain the physical, chemical, and biological integrity of receiving waters. Understanding that these objectives cannot be achieved in one permit cycle, the iterative process is necessary. The Monitoring and Assessment Section (Section D) spells out how to assess the effectiveness of the municipal storm water programs in achieving those three objectives of the CWA.

Stakeholders (Ziad Mazboudi, City of San Juan Capistrano, County of Orange Copermittees; Drew Kleis, City of San Diego, County of San Diego Copermittees) agreed with

the basic goals of the permit and acknowledged that the iterative process is key to being successful in implementing and achieving those goals.

County of Orange Copermittees (Ziad Mazboudi, City of San Juan Capistrano) added he would like to see some common sense combined with the common goals, including recognition of financial constraints in implementation of the permit.

County of Orange Copermittees (Richard Boon, County of Orange and Lisa Zawaski, City of Dana Point) would like to see "effectively prohibit non-stormwater discharges" instead of "prohibit" in the permit language. This is directly from the CWA language and would provide latitude in the implementation of the permit and protect copermittees from unwarranted exposure to non-compliance. For example, with "prohibit" language, the test of compliance is if there is an illegal discharge / illicit connection (ID/IC) present within the jurisdiction; however, with the "effectively prohibit" language, other considerations come into play (economic, technical, social, etc.) and the presence of an ID/IC does not immediately result in non-compliance.

County of San Diego Copermittees (Drew Kleis, City of San Diego) believe that program planning is essential to achieving an iterative process and that a broader approach should be taken in terms of assessment activities and goals. The assessment should not be limited to assessing whether or not those three specific goals are reached, it should also include what information the programs need for adaptive management. County of San Diego Copermittees (Jon Van Rhyn, County of San Diego) discussed the need for a thorough discussion of the plans and plan process before fully addressing assessment. Assessment is set up when a plan is designed. In designing plans, the objectives are going to make specific commitments. In implementation, strategies to achieve those objectives are implemented. Some will work; some will not work. New knowledge may become available. The adaptive management process should be a learning lab of sorts. The SD RWQCB (Wayne Chiu) agreed there should be some assessment of the actual strategies implemented; however, that may not need to be included in the permit. The permit is looking for progress toward the three CWA objectives (improvements in discharge quality, improvements in receiving water quality, and reduction of non-stormwater discharges in the MS4).

County of San Diego Copermittees (Todd Snyder, County of San Diego) asked for clarification between assessment and compliance, specifically requesting language in the permit that would state if a Water Quality Improvement Plan is approved by the SD RWQCB, then implementation of that plan would constitute compliance with the permit. The Environmental Community (Thom Spanos, SD Coastkeeper) requested clarification on what compliance would be with reduction of pollutants. The SD RWQCB (Wayne Chiu) lined out the points of compliance: (1) Water Quality Improvement Plan submitted; (2) All required elements are included in the Plan; (3) Implementation of the Plan; (4) Assessment of the Plan. In terms of assessment, the point of compliance is that the assessment is completed and that information is used to improve programs and plans; nothing within the plan itself

(targets, schedules, etc.) is a point of compliance. Compliance is a track record of implementation and forward progress. The San Diego Copermittees (Todd Snyder, County of San Diego and Mikhail Ogawa, City of Del Mar) and County of Orange Copermittees (Ziad Mazboudi, City of San Juan Capistrano) would like that interpretation of compliance put explicitly into the permit. The SD RWQCB (Wayne Chiu) reminded the stakeholders that everything in the permit is written as requirement language, not explanation; explanations can go in the Fact Sheet for the permit. Stakeholders are encouraged to submit language for consideration that captures the aforementioned intent but is still stated as a requirement.

San Diego Copermittees (Mikhail Ogawa, City of Del Mar; Drew Kleis, City of San Diego; and, Elaine Lukey, City of Carlsbad) requested that permit language clearly include the ability to tailor assessment programs. Monitoring of receiving water and outfall data, from experience, cannot be tied directly to specific program implementation. County of Orange Copermittees (Grant Sharp, Orange County Flood Control District) agreed that while 50% of their annual budget is allocated to permit-required monitoring, it is a great challenge to correlate monitoring data to program actions. Additional assessment tools, such as observations or reports from non-governmental organizations (NGOs), such as Heal the Bay or the Natural Resources Defense Council (NRDC), are helpful to adequately assess program implementation. The Environmental Community (Thom Spanos, SD Coastkeeper) volunteered that SD Coastkeeper does have a lot of monitoring data; the permit should allow consideration of those data. The SD RWQCB (Wayne Chiu) acknowledged that the ability to tailor assessment programs could be expanded upon in the permit; however, collection of water quality monitoring data is still necessary to determine if conditions are improving. Furthermore, the permit does try to encourage Copermittees to work with other agencies or groups that are collecting monitoring data, and monitoring data are not limited to water quality monitoring data; monitoring data include anything being done to monitor progress.

The Development Community (Thom Fuller, BIA) requested clarification on the monitoring program being a tool to improve water quality. The SD RWQCB (Wayne Chiu) clarified that monitoring is a tool but it is also the feedback loop that indicates whether or not other tools are working and if changes are necessary. The monitoring requirements also have incorporated a set of special studies that Copermittees may use as tools.

San Diego Copermittees (Todd Snyder, County of San Diego) questioned how the permit achieves the goal of streamlined reporting; with the adaptive management context, a significant amount of changes are expected and the RWQCB may have significantly more pieces of unique programs to review which would also be subject to public review. The SD RWQCB (Wayne Chiu) explained that under current permit regulations, the SD RWQCB receives on the order of 60 reports each year with 60 plans to be familiar with. Under the administrative draft permit, that is reduced to 9 reports and 9 plans.

V. Assessment and Action Levels

The SD RWQCB (Wayne Chiu) explained that as the Riverside and Orange County permits were developed, Action Levels were incorporated, creating a whole new program. The original intent of Action Levels was to force Copermittees to actively address, in response to the data collected, non-stormwater discharges. In this regional permit, the approach is different. Rather than being a reactive set of requirements, in the new permit approach, the Action Levels are part of the assessment tools, part of the way to prioritize issues. However, the Action Levels used for the Riverside and Orange County permits are being used in the regional permit due to the RWQCB's approach of utilizing the requirements from the most recently adopted permit (the Riverside Permit in this case) as the foundation of the next permit, and consideration of the anti-backsliding requirements of the Clean Water Act..

The Development Community (Wayne Rosenbaum, BIA) expressed concern that due to the RWQCB staff's interpretation of anti-backsliding policy, stakeholders will have to live with the language and content of the permit in perpetuity. In addition, the permit is highly complex when it comes to assessment. The Development Community would prefer the approach taken with the Hydromodification Plan (HMP) be taken with this permit; allow the stakeholders to develop a program that makes sense, using all intellectual property and expert knowledge available, then come back to the SD RWQCB with the best program possible. With the assessment requirements in the permit, it does not seem to allow for this type of approach.

The County of Orange Copermittees (Richard Boon, County of Orange) shared that having dry weather numeric action levels set by the Basin Plan has resulted in the misdirection of resources; the numeric action levels have not led to addressing real ID/IC issues. The SD RWQCB (Wayne Chiu) responded that the values will not change but how the numeric action levels are applied is different in this regional permit. In this regional permit, the NALs and SALs are tools to better assess and prioritize resources. The Action Levels section lays out the Action Levels that have to be incorporated into the Water Quality Improvement Plan. How those Action Levels are used in the Water Quality Improvement Plan is in the Assessment Section. Within those assessments, there is a section where the monitoring data are compared to NALs and SALs. Then, that information is used to assess the Water Quality Improvement Plan and prioritize strategies. The intent is for Action Levels to become a measure of progress, not an alarm for immediate action. The SD RWQCB (Laurie Walsh) clarified that the Water Quality Improvement Plans are used to establish pollutant priorities. The Action Levels are to be used to measure progress, not to determine compliance. The San Diego Copermittees (Drew Kleis, City of San Diego) would like that language included in the permit to make the prioritization commitment clearer.

The Environmental Community (Thom Spanos, SD Coastkeeper) asked how Copermittees can change their Water Quality Improvement Plans outside the required

three-year adaptive management process. The SD RWQCB (Laurie Walsh) explained that Copermittees can always modify their Water Quality Improvement Plans more frequently; the permit just sets the minimum timeframe.

The Development Community (Wayne Rosenbaum, BIA) brought up the issue of distinguishing between stormwater and non-stormwater. With the hydromodification systems, the drain out is longer than the 3-day stormwater definition. Perhaps there is a better way to define stormwater that would not catch the hydromodification systems under the non-stormwater definition. There is a concern that much time and resources will be spent tracking non-stormwater discharges to hydromodification systems.

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The Development Community (Tory Walker, SD BIA and Vista Chamber of Commerce) questioned how adaptation and flexibility will be given to Copermittees, raising the San Diego HMP as an example. The SD HMP was developed by top-notch technical experts with decades of hydrologic experience. In spite of that, trying to bring concepts from the northwest, through the Bay area, and down to San Diego has resulted in an HMP with serious need for modification. Without flexibility, the Copermittees are constrained to the HMP as-is. The SD RWQCB (Wayne Chiu) re-stated that every element in the administrative draft permit will remain in the permit; how the elements are implemented is still subject to discussion.

The San Diego Copermittees (Jon Van Rhyn, County of San Diego) raised the issue that adaptive management is fundamentally different than management; there needs to be a structured commitment to the learning process which may not be clear in the administrative draft permit.

The County of Orange Copermittees (Ziad Mazboudi, City of San Juan Capistrano) asked what the timeframe is to align the three counties under the regional permit. The SD RWQCB (Wayne Chiu) responded that San Diego Copermittees will be enrolled when the permit is adopted. As the Orange County and Riverside County permits expire, then the Orange County and Riverside Copermittees will come under the regional permit. There is, however, a clause that would allow earlier enrollment by the Orange County or Riverside Copermittees, so long as they have fulfilled their requirements under their current permit, including hydromodification and a model Water Quality Management Plan (WQMP), and have a Water Quality Improvement Plan submitted to the RWQCB.

The County of Orange Copermittees (Ryan Baron, County of Orange) asked what the basis was for implementing a regional permit. The SD RWQCB (Wayne Chiu) responded that there were two main factors: 1) At this point, all three permits have basically the same elements and requirements; and, 2) the RWQCB is under resource constraints with fewer

resources to administer multiple permits. The County of Orange Copermittees (Ryan Baron, County of Orange) are concerned that all Copermittees will not have had an opportunity to submit an ROWD to shape this regional permit. The SD RWQCB (Wayne Chiu) has spoken with the Copermittees of all three counties and has found similar issues across the three counties. The SD RWQCB (Eric Becker) will discuss the ROWD issue with legal counsel.

VII. Next Focused Meeting

The next focused meeting is set to address similar topics as this focused meeting. Based on the progress and direction of the discussions at the first meeting, stakeholders may have some recommendations on different or additional topics that are germane and timely to discuss at the second meeting, and thus were asked to propose topics for discussion to the SD RWQCB (Laurie Walsh) no later than Tuesday, July 3. The agenda for the meeting will be distributed Friday, July 6.

VIII. Audience Comments

Question: Is there any intent to have technical discussion in the focused meetings?

Response: The discussion level at the focused meetings will primarily remain at the conceptual level.

Question: Should specific language drafts be brought to the table at future focused meetings?

Response: Specific language drafts should be submitted in writing before September 14. The discussion level at the focused meetings will primarily remain at the conceptual level.

Question: Regarding Action Levels and Assessment, is the intent of Section D.4.a that Copermittees must follow up on all exceedances of NALs?

Response: Intent is that Copermittees will prioritize and ultimately address all exceedances on a prioritized basis.

There were several comments about revisiting and discussing several technical aspects in the permit requirements. SD RWQCB responded that there were some aspects of the permit requirements, such as Action Levels and design or performance criteria, that would not be changed. The way those requirements are applied and complied with, however, can still be changed in the permit and will be discussed in subsequent focused meetings.

IX. Meeting Adjourned

FOCUSED MEETING AGENDA

Administrative Draft of
Tentative Order No. R9-2012-0011, NPDES No. CAS0109266
Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region

Wednesday, July 11, 2012
9:30 a.m. - 3:30 p.m.

9:30 a.m. - 9:40 p.m.	Introductions, Table Participants
9:40 a.m. - 9:50 p.m.	Meeting Recap & Feedback, Lewis Michaelson, Katz & Associates
9:50 a.m. - 10:00 p.m.	Focused Meeting Intent, David Barker, San Diego Water Board
10:00 a.m. - 11:30 a.m.	Water Quality Improvement Plan Priority Setting & Approval Process, Table Participants
11:30 a.m. - 12:30 p.m.	Lunch
12:30 p.m. - 1:30 p.m.	JURMP Relationship With Water Quality Improvement Plan, Table Participants
1:30 p.m. - 1:45 p.m.	Break
1:45 p.m. - 3:00 p.m.	Adaptive Management Areas of Permit, Table Participants
3:00 p.m. - 3:30 p.m.	Comments & Questions (All)

ELECTRONIC MAIL LIST SUBSCRIPTION
The San Diego Water Board has established an electronic mail list specifically for information and notices on the development of a Regional MS4 Storm Water Permit. The San Diego Water Board will use the email list to notify interested persons of upcoming important events and the availability of on-line documents. Persons interested in receiving future notices and information on this specific project can subscribe to one (1) of the electronic mail lists titled “Orange County MS4 Permit, “ Riverside County MS4 Permit, or “San Diego MS4 Permit ”, located on the San Diego Water Board website at:

http://www.waterboards.ca.gov/resources/email_subscriptions/reg9_subscribe.shtml

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San Diego RWQCB
Permit Reissuance Focused Meeting

July 11, 2012

WQIP and JRMP Approval Process

Discharge Prohibitions

- Change "prohibit non-storm water discharges from MS4" to "effectively prohibit …"

Iterative Process

- Include reference to A.4. in sections A.1, A.2, and A.3 to define compliance through the iterative process. Explicit language is needed in light of 9th Circuit Court's finding of the separate enforceability of these provisions.

WQIP and JRMP Approval Process

Concept: The intent of the Permit is for dischargers to submit WQIP and JRMP updates for approval. Compliance is achieved through the submittal, implementation, and update of approved plans. Jurisdictional accountability comes from review and approval of jurisdictional commitments.

Examples:

- If there are 6 dischargers in one WMA, and 5 dischargers' commitments are approved when the WQIP is submitted, any re-submittals need to focus on individual dischargers, not the entire watershed.
- There appears to be no approval process for the JRMP update in year 1 of the permit.
- There is no timeline for approval of annual updates in years 2, 3, 4, 5.
- From previous workshops, "Numeric Targets" are not enforceable.

Action Items:

1. Insert language clarifying identification of individual jurisdictional commitments in WQIP, and insert language clarifying RWQCB approval of individual jurisdictional commitments.
2. Add language to include RWQCB approval timeline for JRMP updates in year 1.
3. Add language in II.F. stating there is a specific (e.g., 90-day) RWQCB approval timeline for annual updates in years 2, 3, 4, 5.
4. Add language to permit, not fact sheet, about non-enforceability of Numeric Targets

WQIP and JRMP Approval Process

Concept: WQBELs in TMDLs are currently expressed as either:

a) Achievement of receiving water limitations, or

b) Achievement of a receiving water limitation applied at the MS4 outfall, and applied as a concentration instead of a load.

Action Item: Add other means of demonstrating compliance with WQBELs, for example:

- Load-based compliance with Waste Load Allocations
- Implementation of EO-approved TMDL compliance plan
- Compliance with exceedance limitations expressed as 'days' or 'frequency' (Bacteria TMDL for Beaches & Creeks)
- Other means of compliance identified in future TMDL language

Adaptive Management Areas of Permit

Concept: The intent of the Permit is to allow for adaptation of Permit programs, strategies, and procedures to enable Copermittees to more effectively and efficiently achieve their goals. Modifications need not be additive. Modifications must be reasonably expected to result in equal or greater overall effectiveness. Modifications can include adjustments to level of effort or methods either geographically, across permit components, or within permit components.

Examples:

- Geographic / Level of Effort Adjustment: Refer to Slides #6 and #7
- Within Permit Component / Level of Effort Adjustment: Modifying IDDE procedures in Section II.E.2.d. (less water quality sampling, more observations)
- Within Permit Component / Method Adjustment: Modifying inspection procedures in Section II.E.5.: Refer to Slide #8
- Across Permit Component / Level of Effort Adjustment: Reducing inspection frequencies in Section II.E.5., and increasing education activities in Section II.E.7.

Action Item: To make clear what is eligible for adaptation, insert language in Section II.B.5. (Adaptive Management Process) clarifying what sections of the Permit "shall be considered, as appropriate," by each Copermittee for adaptation.

Adaptive Management Areas of Permit: Residential Example

Concept: Permit intent is to allow for adaptation of:

- Residential inventory content
- Tools used to address Residential land use as source: O+E, IC/ID complaint response, inspections, street sweeping, MS4 cleaning
- Any other tools needed, providing that residential land use is a source of a WQIP priority

Example: If a Copermittee is in Watersheds 1 and 2 in the figure (slide 7), and residential land use is only a priority in Watershed 1, the Copermittee could conduct IC/ID complaint response in Watershed 2, and conduct any combination of other tools in Watershed 1 to address the priority.

Action Item: Clarify language, where appropriate, to allow modifications to inventories and control strategies with supporting rationale and justification.

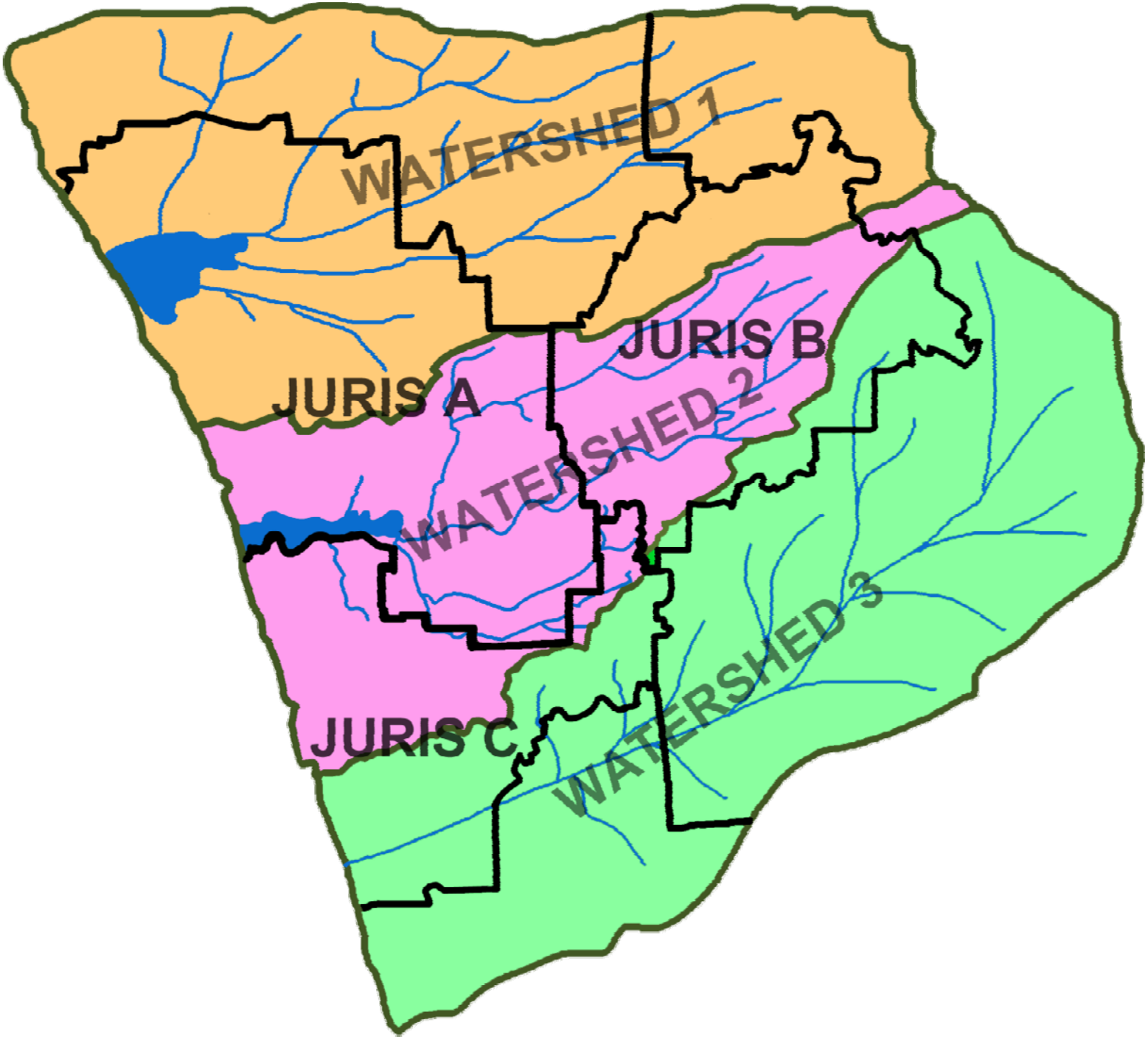
WATERSHED 1
JURIS A
JURIS B
WATERSHED 2
JURIS C
WATERSHED 3

Adaptive Management Areas of Permit: Inspections

Concept: Permit intent is to allow for adaptation of Provision E requirements to allow modifications to inspection methodology as a result of adaptive management

Example: Use of multiple inspection methods to effectively and efficiently verify implementation of BMPs

- "Traditional" Inspections (internal, single business, some external)
- Property-Based Inspections (external-focused on PGAs, internal if necessary, multiple-businesses on one property)
- Patrols or complaint based inspections

Action Item: Clarify language, where appropriate, to allow modifications to inspection methods and requirements with supporting rationale and justification

Adaptive Management Areas of Permit: Long-Term vs. Annual Processes

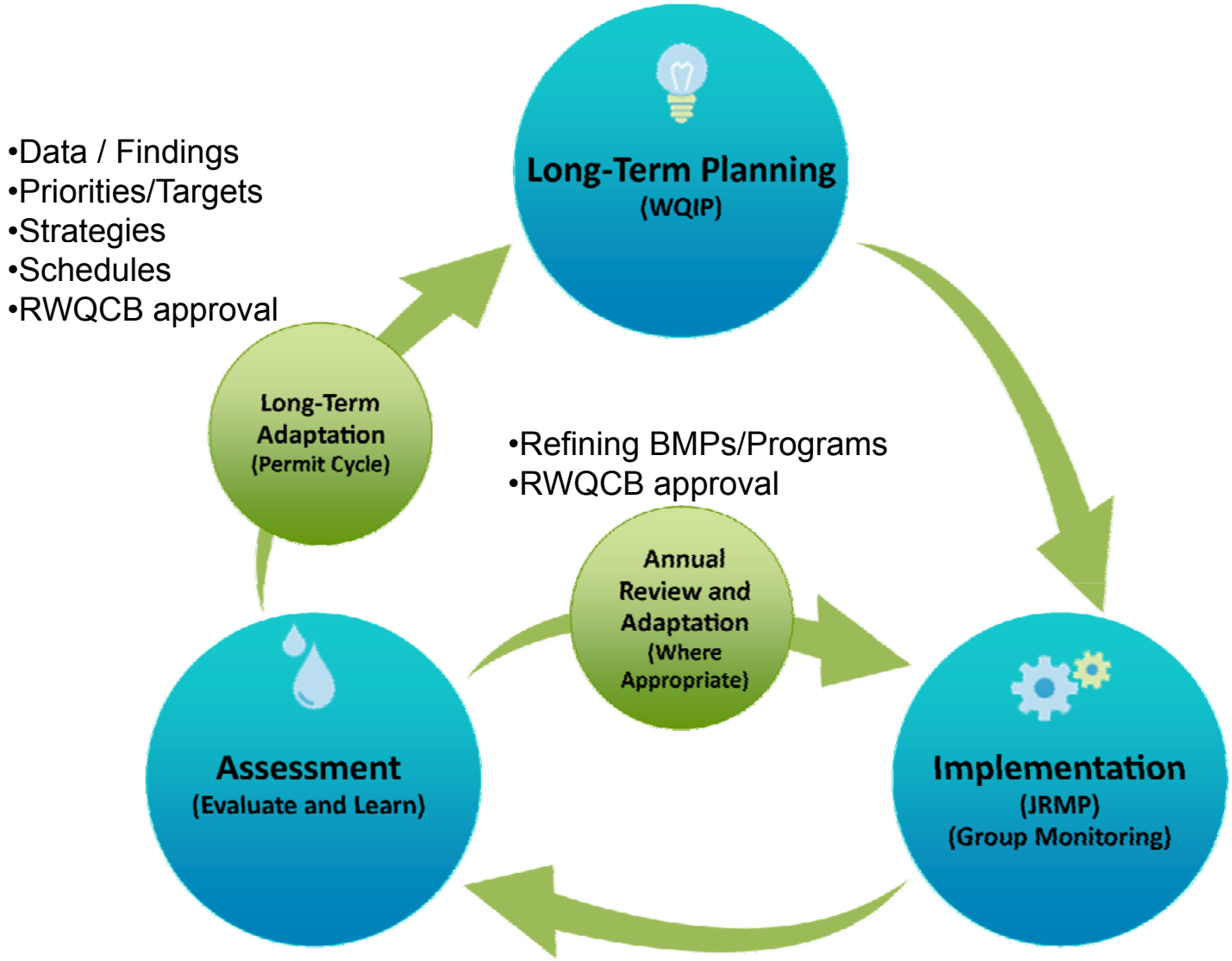

Adaptive Management Areas of Permit: Strategic Monitoring & Assessment

Concept: Require development of Strategic Monitoring and Assessment Plan as part of the WQIP to inform adaptive management. Key plan characteristics:

- Addresses the following areas of assessment:
  - Goals/Outcomes/3 primary objectives (Non-SW discharges, MEP, Rcvg Wtrs)
  - Sources/Pollutant Generating Activities
  - Programs/BMPs
- Provides individual Copermittee measurability
- Utilizes a strategic, question-driven approach
- Prioritizes (geographic, pollutant, water body, etc.)
- Ability to use a statistically supported approach for assessment

Example: Increase efficiencies in IDDE Programs with observational methods (or other strategies); monitoring does not have to be water quality sampling

Action Items:

- Structure initial requirements according to above in Section II.D.
- Adjust language in Section II.B. to require a strategic monitoring and assessment plan as a part of the WQIPs.

California Regional Water Quality Control Board, San Diego Region
Regional MS4 Permit Focused Meeting

Meeting Notes

Date	Location	Agenda Topics
7/11/2012 Start time: 9:30 AM End time: 3:10 PM	City of Escondido 201 North Broadway Escondido, CA 92025 Mitchell Conference Room	• Meeting Recap & Feedback • Focused Meeting Intent • Water Quality Improvement Plan Priority Setting & Approval Process • JRMP Relationship with Water Quality Improvement Plan • Adaptive Management Areas of Permit • Other Topics • Audience Comments

I. Introductions

Table participants introduced themselves. Lewis Michaelson (Facilitator) ensured the appropriate representatives were at the table, per the June 20, 2012, San Diego Regional Water Quality Control Board (SD RWQCB) Notice.

San Diego County Copermittees (5): Drew Kleis (City of San Diego), Jon Van Rhyn (County of San Diego), Mikhail Ogawa (City of Del Mar), Todd Snyder (County of San Diego), Elaine Lukey (City of Carlsbad)

Orange County Copermittees (5): Ziad Mazboudi (City of San Juan Capistrano), Joe Ames (City of Mission Viejo), Grant Sharp (Orange County Flood Control District), Ryan Baron (County of Orange), Chris Crompton (County of Orange), Nancy Palmer* (City of Laguna Niguel) **Indicates representatives rotated during the meeting.*

Environmental Community (3): Colin Kelly (Orange County Coastkeeper), Jill Witkowski (San Diego Coastkeeper), Roger Butow (Clean Water Now! Coalition), Thom Spanos* (San Diego Coastkeeper) **Indicates representatives rotated during the meeting.*

Development/Business Community (3): Thom Fuller (San Diego Business Industry Association), Dennis Bowling (American Public Works Association), Bryn Evans (Industrial Environmental Association), Wayne Rosenbaum* (BIA), Mike McSweeney* (BIA) **Indicates representatives rotated during the meeting.*

U.S. Environmental Protection Agency (US EPA) (1): Cindy Lin

San Diego Water Board Permit Team: David Barker, Wayne Chiu, Laurie Walsh, Eric Becker

It was noted that Riverside County MS4 Copermittees were invited to the focused meeting but were unable to attend.

II. Meeting Recap & Feedback

Lewis Michaelson (Facilitator) reflected on the effectiveness of the June 27 Focused Meeting. It seemed that much of the meeting consisted of stakeholders asking questions of the Regional Water Quality Control Board (RWQCB). Today's meeting should consist more of the opposite; questions from the RWQCB and input from the stakeholders.

As requested at the June 27 meeting, a number of stakeholders provided suggestions on topics for today's meeting. Those suggestions were incorporated into the agenda. Lewis reviewed the agenda for today's meeting.

III. Focused Meeting Intent

David Barker (RWQCB) provided information on the intent of the focused meetings. He is the San Diego Water Board Chief of the Surface Water Basins Branch, which encompasses the NPDES wastewater and stormwater programs, including municipal, construction, and industrial stormwater programs. The team that developed the MS4 administrative draft permit is within his Branch. David is here to observe the meetings and assist staff in framing issues for discussion. He is also here as a representative of executive management, including Executive Officer David Gibson, and will do his best to respond to broad policy issues and the Board's process of bringing the permit to adoption.

Although the specific causes of water quality impairments within the San Diego Region are not all known, it is known that most water quality impairments occur downstream of, or within, urbanized settings, and are therefore directly affected by dry weather flows and urban runoff. Thus, there is a continuing need for comprehensive, innovative, and effective stormwater regulation. Creative and non-traditional approaches are needed to address these challenges.

With these challenges in mind, the RWQCB has put considerable thought and effort into proposing the administrative draft permit, which provides an adaptive management pathway for Copermittees to address water quality issues in an iterative process. Under this process, water quality improvement objectives will be regularly prioritized and assessed.

Unlike current prescriptive permits, this administrative draft permit puts the Copermittees in the driver's seat, allowing deployment of resources to achieve goals that will have the greatest water quality improvements.

The RWQCB would really like to hear thoughts from the stakeholders about what should be in the draft permit. The administrative draft permit was released April 9, 2012. By the time written comments are due in September, it will have been available for public review and comment for more than five months. To communicate detailed ideas on specific permit language, the RWQCB would appreciate that detailed language be submitted as written comments. The RWQCB values the stakeholders' thoughts and insights on permit language and will closely consider all submissions.

During this extended review and comment period on the administrative draft permit, the RWQCB has allocated four days for focused meetings to meet with interested stakeholders and listen to ideas on how to improve the administrative draft permit. The schedule for the focused meetings was selected in order to maintain momentum for finalizing the final draft of the permit later this fall. The RWQCB does not anticipate scheduling additional focused meetings prior to release of the final draft permit, other than perhaps a special session on the hydromodification requirements as suggested at the June 27 focused meeting. With recognition that four focused meetings is not enough time for exhaustive, detailed review of the full administrative draft permit, the focused meetings are structured to discuss key issues at a conceptual level. Stakeholders can be most influential on shaping the next iteration of this permit by providing quality input and feedback on the key issues at the conceptual level. The focused meetings are a golden opportunity to have productive discussions in a fair and impartial setting.

David reminded the stakeholders that while these focused meetings may not allow for detailed discussions on all issues of concern, all stakeholders will have an opportunity to review and provide detailed comments on any aspect of the draft permit again later this fall.

Several stakeholders (Roger Butow, Clean Water Now! Coalition; Todd Snyder, San Diego Copermittees; Ziad Mazboudi, City of San Juan Capistrano) strongly support a stand alone hydromodification meeting prior to the written comment deadline. Ziad Mazboudi (City of San Juan Capistrano) is working with Tory Walker and others to hold a symposium with field experts and would want the hydromodification meeting to be held after the symposium. The RWQCB will have a game plan for a hydromodification meeting ready to roll out by the next focused meeting.

Roger Butow (Clean Water Now! Coalition) asked if the legal issues over the legitimacy of the consolidated permit have been addressed by RWQCB counsel. David Barker (RWQCB) stated the RWQCB's official position is that they do have the legal authority to issue this regional general permit; RWQCB counsel is expected to confirm that authority. David mentioned there is a parallel legal track of meetings underway where RWQCB counsel is working with attorneys of the Copermittees. Any legal opinion issued will be open for public review and scrutiny.

IV. Water Quality Improvement Plan Priority Setting & Approval Process

Laurie Walsh (RWQCB) explained that in pre-drafts of the permit the Water Quality Improvement Plan was originally called a Water Quality Management Plan. The title of the plan was changed to "Improvement" instead of "Management" because the goal of the plan is water quality improvement.

The Water Quality Improvement Plan is in the beginning of the permit because of its high importance to the permit. The Water Quality Improvement Plan sets the road map through which the Copermittees will achieve improved water quality. It gives the Copermittees complete control to set priorities with rationale, set schedules, set targets, etc. From meeting with stakeholders, the RWQCB understands that there are not enough

resources to do everything all at once; the Water Quality Improvement Plans are the Copermittees' opportunity to set priorities.

The approval process for the Water Quality Improvement Plans is outlined in the administrative draft permit. The RWQCB is looking for input on any impediments to developing and implementing the Water Quality Improvement Plans, specifically within the timeframe identified in the administrative draft permit.

San Diego Coastkeeper would be open to a staggered submittal of Water Quality Improvement Plans for the nine watersheds so that public review is not all within the same 30-day period.

Jill Witkowski (San Diego Coastkeeper) suggested a phased review period for the Water Quality Improvement Plans where the first phase is review of the priorities and the second phase is review of the full Water Quality Improvement Plan. This may assist in keeping prioritization consistent across watershed management areas. Ziad Mazboudi (City of San Juan Capistrano) expressed concern that a separate review of the priorities is leaning toward micro-managing. Jon Van Rhyn (County of San Diego) said it is an interesting concept; however, the more the process is extended, the more the Copermittees would have to confront the realities of the time needed to budget, which could affect how fast programs move forward. Jon admitted there may need to be a multi-year planning process upfront where the priorities are laid out at the highest level and made open to feedback before proceeding with details of the Water Quality Improvement Plan. Drew Kleis (City of San Diego) agreed with the concept of getting iterative feedback in the process of developing the Water Quality Improvement Plans to ensure development of the plan stays on track.

Jill Witkowski (San Diego Coastkeeper) pointed out there is good direction in the permit on how to assess receiving water conditions, but there is not good guidance on where the bar should be set; it is not clear if the Copermittees will be aiming low or aiming high in their plans. Ziad Mazboudi (City of San Juan Capistrano) explained that the bar could be set high, but the reality of reaching that level may be driven by available resources. Drew Kleis (City of San Diego) acknowledged that Total Maximum Daily Loads (TMDLs) and other regulations will be major factors in determining priorities. There also may not be high priorities in every watershed; there may be tradeoffs that a certain watershed is not as high as another because of TMDLs or other regulations. By allowing that prioritization, the net benefit of a jurisdiction's efforts can be maximized. The frank reality is that prioritization will be driven by regulations and there will be issues that are medium or low priorities. Eric Becker (RWQCB) explained that the permit was purposefully set up so there could be differences across watersheds. Todd Snyder (County of San Diego) concurred that the intent is there will be different prioritizations across different watersheds.

Jill Witkowski (SD Coastkeeper) raised the concern that in watersheds with TMDLs, the only priority might be the TMDL although there are other issues within the watershed. Eric Becker (RWQCB) clarified that the TMDL might be the top priority and efforts to satisfy the TMDL may not allow for other priorities at that time. Other priorities are still on the list, but resources may not be allocated to them until the TMDL is satisfied. Jill Witkowski (SD

Coastkeeper) is concerned that areas on the cusp of becoming TMDLs and ASBSs may not receive attention needed to prevent them from becoming TMDLs and ASBSs.

Mikhail Ogawa (City of Del Mar) explained that aiming high and capturing as many pollutants as possible is an iterative process within the plan development. For example, bacteria may be the highest priority pollutant because of a bacteria TMDL in the watershed; however, as the plan is developed it may be found that additional pollutants can be targeted at the same time using the same methods as those for bacteria. At that point, the priorities may be adjusted to reflect those findings. Therefore, having a phased approach to approving the priorities and then the Water Quality Improvement Plans may not be efficient. Jill Witkowski (SD Coastkeeper) conceded Mikhail's point about priorities changing during plan development and reiterated that it is still important to the environmental community to have sufficient information about how and why priorities are set.

Elaine Lukey (City of Carlsbad) explained that the Copermittees are not starting from scratch in creating watershed priorities. The Copermittees have many years of experience looking at 303(d) listings, impairments, etc., and already have good programs in place to address watershed priorities. The San Diego Copermittees have had Watershed Urban Runoff Management Plans (WURMPs) for 10 years, and there are priorities in those existing WURMPs. The priorities may change based on a TMDL or other regulations; however, looking at the WURMPs is a good place to start to understand the current watershed priorities.

Wayne Chiu (RWQCB) asked stakeholders to provide suggestions as to how to put priority setting guidelines in the permit without limiting the Copermittees' ability to have flexibility in setting priorities and prevent Copermittees from setting the bar too low. Jill Witkowski (SD Coastkeeper) suggested having a tiered approach to priority setting: the baseline tier would be TMDLs, the next tier might be mid-range priorities, and the next tier might be long-range priorities. Jon Van Rhyn (County of San Diego) responded that there are two program elements defined in the permit that are implemented concurrently: the Water Quality Improvement Plans and the Jurisdictional Urban Runoff Management Plans (JRMPs). The Water Quality Improvement Plans are about establishing priorities and following an adaptive management strategy. The JRMPs have baseline requirements and are about establishing an extensive set of activities. The Water Quality Improvement Plans are not entirely independent of the rest of the permit, including the JRMPs.

Drew Kleis (City of San Diego) referred the group to slide 2 of a handout the San Diego Copermittees prepared for this meeting. The San Diego Copermittees would like to have a reference to permit section A.4 in sections A.1, A.2, and A.3 so that compliance with discharge prohibitions, receiving water limitations, and effluent limitations is clearly defined as implementation of the iterative process. They believe explicit language is needed in light of the 9th Circuit Court's finding of the separate enforceability of these provisions. Drew asked Cindy Lin (US EPA) if there is a possibility of revising Provision A to define compliance through the iterative process. Cindy replied that this is still an NPDES permit and there needs to be clarity regarding compliance points. There is, however, a lot of creative

language in other permits within California, so it is not out of the toolbox to have creative language in this permit.

Drew Kleis (City of San Diego) explained that the Copermittees are not looking to walk away from responsibility, but it is easier to budget for a plan if the plan is the compliance pathway. Jill Witkowski (SD Coastkeeper) asked how linking section A.4 to sections A.1-A.3 accomplishes that. Drew explained that at some point a City Manager or politician will question why certain actions or plans are being done. By linking the iterative process clearly to compliance, Copermittees' staff will be able to defend those questions.

Elaine Lukey (City of Carlsbad) referred the group to slide 3 of the San Diego Copermittees' handout. This slide contains suggestions of what would work for the Copermittees regarding permit language for determining compliance:

1. Insert language clarifying identification of individual jurisdictional commitments in the Water Quality Improvement Plans, and insert language clarifying RWQCB approval of individual jurisdictional commitments.
2. Add language to include RWQCB approval timeline for JRMP updates in year 1.
3. Add language in II.F. stating there is a specific (e.g., 90-day) RWQCB approval timeline for annual updates in years 2, 3, 4, 5.
4. Add language to permit, not fact sheet, about non-enforceability of Numeric Targets.

Todd Snyder (County of San Diego) followed that this ties back into the issue of Section A and why it is important that the permit clearly outline the points of compliance for the Water Quality Improvement Plans that Wayne Chiu (RWQCB) lined out at the June 27 MS4 Focused Meeting (1. Submit Water Quality Improvement Plan; 2. Include all required elements in the plan; 3. Implement the plan; and, 4. Assess the plan). Implementation of the Board-approved Water Quality Improvement Plan should constitute compliance. The approval process is critical to that.

Wayne Chiu (RWQCB) responded that the permit writing team does understand the over-arching concern and tried as much as possible to incorporate that concept into the permit language. The RWQCB will consider any recommendation put forth for revised permit language.

Joe Ames (City of Mission Viejo) asked for clarification about whether a goal under a certain priority could be a research project. Laurie Walsh (RWQCB) clarified that the goals are the water quality standards; numeric targets are interim goals to reach the water quality standards; a research project can be a strategy to reach the numeric targets and water quality goals. Cindy Lin (US EPA) concurred that under the Water Quality Improvement Plans there are priorities, under those priorities there are goals (i.e., water quality standards, waste allocations, etc.), under those goals are monitoring plans or targets to use to achieve the water quality objectives or criteria, and then there are the actions or controls implemented to reach those targets. Mikhail Ogawa (City of Del Mar) followed up that as adaptive management is a learning process, there is inherently an expectation that some of

the actions or controls implemented may not work as effectively or efficiently as planned. However, a failed strategy, action, or control does not imply that the Copermittees are not attempting to reach their priorities; it is part of the adaptive management process.

Chris Crompton (County of Orange) is uncomfortable with the idea of this permit trying to replace TMDLs, as the RWQCB has stated before that CLRPs could be modified slightly and become the Water Quality Improvement Plans. This permit is a municipal stormwater permit. It does not incorporate all the stakeholders that a TMDL process does. In addition to bringing in parties besides municipalities, the TMDL process also allows for longer timeframes than under this permit. This MS4 permit aims to fix issues that can be controlled by the jurisdictions; there are significant issues and sources that the jurisdictions cannot control. Eric Becker (RWQCB) asked for suggestions on changing language in the permit to cover TMDLs. Todd Snyder (County of San Diego) referenced slide 4 of the San Diego Copermittees' handout. The concept is that the WQBELs used to interpret TMDLs in the draft permit are expressed as either (a) achievement of receiving water limitations or (b) achievement of a receiving water limitation applied at the MS4 outfall and applied as a concentration instead of a load. The San Diego Copermittees would like to add other means of demonstrating compliance with WQBELs. For example, load-based compliance with Waste Load Allocations, implementation of EO-approved TMDL compliance plan, compliance with exceedance limitations expressed as "days" or "frequency," and/or other means of compliance identified in future TMDL language. These other means of demonstrating compliance with WQBELs acknowledge that MS4s are part of the TMDL solution but not the entire picture.

Cindy Lin (US EPA) provided an example from a Los Angeles TMDL (Dominguez Channel Greater Los Angeles Long Beach Harbor TMDL) where they are trying to reduce the distance between TMDLs and permit language. The TMDL offers four different ways of demonstrating compliance, thereby providing clarity in the expectations. Sometimes it does not make sense to try to meet the water quality standard level.

Wayne Chiu (RWQCB) asked Cindy Lin (US EPA) if that meant that language can be placed within this permit that states the Copermittees would be in compliance with discharge limits and receiving water limits if they have a numeric set of criteria that are met as part of the iterative process. Cindy responded that the compliance point must always be defined. It is the details of how the water quality standard is met. Different numeric metrics can be provided as long as they show that the water quality standard is met.

Wayne Chiu (RWQCB) acknowledged that everyone is highly concerned about the 9th Circuit Court Decision and the RWQCB has been struggling with how to make the language provide some level of assurance that there would be no requirement of enforcement or threat of third party lawsuits if the first two requirements are not met as long as they are implementing a Water Quality Improvement Plan with the full intent of meeting those requirements in the future. The 9th Circuit Court Decision, however, says those provisions are separate and enforceable. Wayne asked for the EPA's position on this. Is the EPA saying that there is some alternative language that could be placed in the permit that the EPA

would accept as being in compliance with discharge prohibitions and receiving water limitations but not necessarily through actual receiving water quality data?

Cindy Lin (US EPA) responded that the 9th Circuit Court Decision is a legal issue on which she has been directed not to comment. Regarding alternative language, Cindy explained that EPA Region IX has been strong and consistent that Copermittees either meet compliance through WQBELs or through quantitative measures. "Quantitative measures" are purposely not defined to provide some interpretation in how to meet compliance.

Wayne Rosenbaum (SD BIA) recommended looking at other, recent permits regarding compliance language and, also, building into Provision A some enforcement structure.

The Environmental and Development Communities (Colin, Wayne R) believe the solution will not be a safe harbor solution, nor will it be something where Copermittees should put up walls to protect themselves from potential litigation. They would prefer not to spend money on litigation unless critically important; they would prefer to help Copermittees implement or assess effective programs and be more involved in the creation of those programs. The permit will not provide complete security from litigation; however, dealing responsibly with the Environmental and Development Communities will reduce liability.

Ryan Baron (County of Orange) acknowledged the RWQCB's multiple requests for stakeholders to submit language, but questioned if there is a statewide effort going on to suggest model language to the State Water Resources Control Board (SWRCB) and asked how difficult it is to change language provided by the EPA for the permit. Wayne Chiu (RWQCB) explained that the EPA has the final say on the permit language. Cindy Lin (US EPA) concurred, explaining that when the permit is presented to the EPA, they can approve it, reject it with recommendations for re-submittal, or decide to issue their own NPDES permit.

Chris Crompton (County of Orange) suggested that the CASQA conversations with the SWRCB may be the solution to this effort as they are working on language for section A and alternate ways of dealing with the 9th Circuit Court Decision.

V. JRMP Relationship with Water Quality Improvement Plan

Laurie Walsh (RWQCB) explained that one objective of the RWQCB is to work closer with the Copermittees, as they have tried to do with this permit process. The permit team met with various stakeholders to talk about things to improve in the stormwater program and to get feedback on key issues. The permit team then went back and wrote the administrative draft permit, trying to address all the key issues the stakeholders had identified, including flexibility to put resources where best suited. The RWQCB is now looking for action items similar to the handout provided by the San Diego Copermittees. Laurie led off with topic discussion question #5 from the June 20, 2012, San Diego Regional Water Quality Control Board (SD RWQCB) Notice: "How can the proposed provisions of the administrative draft permit be modified to support a Copermittee's ability to plan and/or procure resources for its jurisdictional runoff management program?"

Jill Witkowski (SD Coastkeeper) said one of the things unclear with how Water Quality Improvement Plans work together with JRMPs is how the priority setting at the watershed level, with numeric targets and strategies, gets implemented at each jurisdiction to achieve the targets. It is unclear who is responsible for making sure goals in the Water Quality Improvement Plans actually happen and everyone participates in the improvement together.

Jon Van Rhyn (County of San Diego) responded that the big issue has been to maintain separation of group versus individual responsibilities. The general understanding is there may be some things committed to in a group setting, but in the end there will still be multiple Copermittees in a watershed that will have their own stand alone plans to follow through and implement.

Ziad Mazboudi (City of San Juan Capistrano) said that every Copermittee will make sure they are working under the umbrella of the Water Quality Improvement Plans; however, there may be a jurisdiction where a particular pollutant is not an issue. In that case, the jurisdiction would document it, present it, and move to the next prioritized pollutant in the plan. The ultimate enforcement will have to be from the RWQCB.

Elaine Lukey (City of Carlsbad) directed everyone to slide 7 of the San Diego Copermittees' handout.. For illustrative purposes, the graphic is provided below.

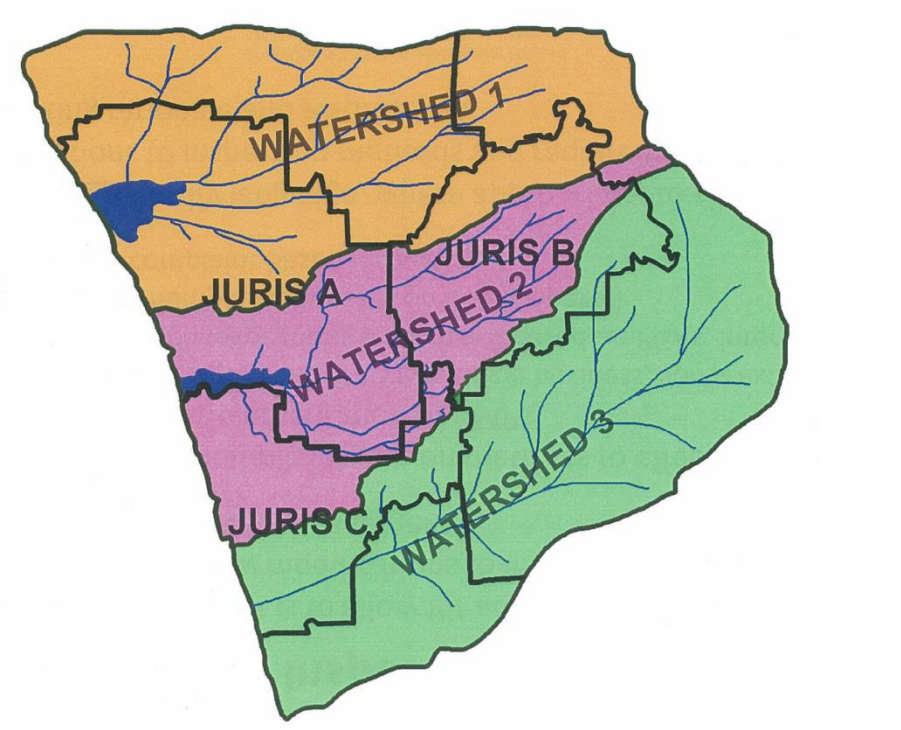

The colored areas are the watersheds; the black lines are the jurisdictional boundaries. The blue lines are receiving waters.

Elaine Lukey (City of Carlsbad) provided an example where Watershed 2 (pink) has bacteria as the top priority but the portion of Jurisdiction C that is in Watershed 2 doesn't have any identified sources of bacteria at the watershed scale. In that case, Jurisdiction C

could address their priority in Watershed 3 (green), doing more intense work in Watershed 3 (green) than in Watershed 2 (pink).

Mikhail Ogawa (City of Del Mar) provided another example where Watershed 2 may have bacteria as a group priority, but Jurisdiction C may decide with rationale and justification that they will focus on nutrients because receiving water in Watershed 2 in Jurisdiction C is impaired for nutrients. The San Diego Copermittees are hoping the RWQCB will look at these not only as individual watersheds, but also look across watersheds and across jurisdictions to get the entire picture.

Wayne Chiu (RWQCB) acknowledged that a very important aspect of this permit is RWQCB oversight. The RWQCB is ultimately responsible for making sure Copermittees are implementing the plans, but they also have to take into consideration that priorities may force them to focus on one watershed over another one as each Copermittee has different circumstances and different priorities because of watershed areas. This permit requires a lot of involvement by RWQCB staff to understand those intricate details. The streamlined reporting in this permit means the RWQCB staff is looking at fewer plans but with more details.

Nancy Palmer (City of Laguna Niguel) shared that South Orange County has been using some of its Integrated Regional Water Management (IRWM) money to develop regional action projects. To do so, they had to find contracting entities under the IRWM that crossed the boundaries; e.g., the Municipal Water District of Orange County is administering a grant for smart landscaping improvements. All the cities in South Orange County have a piece of that pie, but it is administered through a different agency by a grant opportunity. This is an example of an inter-jurisdictional project that is being managed by an identified entity. There are, however, certain projects that become orphans because they are inter-jurisdictional, highly complex, difficult to move forward, or extremely expensive. In the current administrative draft of the permit, there are requirements that regional BMPs are acceptable so long as the BMP is built during the first phase of the project. That does not typically work. It is, however, common in the community development field that for community parks a certain amount of park in lieu fees are collected during the development process and when a certain percentage of buildout is reached, the park is then built using those fees. Nancy suggests those clauses in the administrative draft permit be re-thought.

Colin Kelly (OC Coastkeeper) countered Nancy's argument stating that there have been severe deficiencies with programs that allow BMPs to be developed toward the end of large projects. Especially with the bad economy, some developments have ended up with no BMPs or orphaned BMPs. Colin acknowledged, however, that there are development differences across the jurisdictions and watersheds; some jurisdictions still have high demand for new development so those developments are completed, while other jurisdictions have several developments that have been halted due to low demand and the economy.

Laurie Walsh (RWQCB) informed the group that this topic will be discussed at a future focused meeting and again encouraged stakeholders to submit permit language suggestions.

Jill Witkowski (SD Coastkeeper) asked for more information on how to review the Water Quality Improvement Plans together with the JRMPs. The public needs adequate time to review the reports altogether to check for orphan priorities. Then there needs to be time and a process to resolve conflicts between jurisdictions. Laurie Walsh (RWQCB) said they are interested in hearing more ideas on timing for the public vetting process. Wayne Chiu (RWQCB) explained that orphaned priorities, conflicts between jurisdictions, and other issues would come to light with the audits of the jurisdictions' programs.

Wayne Chiu (RWQCB) explained that they tried to incorporate into the permit a concept of individual jurisdictional accountability as much as possible. There is the Water Quality Improvement Plan that ties jurisdictions together; however, each jurisdiction will be reviewed based on its own merits and own implementation of its portion of achieving the objectives of the Water Quality Improvement Plan. This will require RWQCB staff to look at programs on an individual and watershed scale.

Drew Kleis (City of San Diego) said the Copermittees are very focused on having individual measurability and responsibility. The numeric targets may be set for each Copermittee and that becomes their piece of the pie in addressing implementation of the Water Quality Improvement Plans. Subchapters in and attachments to the Water Quality Improvement Plans will clearly state what each jurisdiction's commitments are. It will be critical to look across watersheds to understand jurisdictional commitments.

Grant Sharp (County of Orange), as someone who helps put together a JRMP for a Copermittee subject to multiple MS4 permits, is highly interested in how the JRMP relates to the Water Quality Improvement Plan. Grant shared that the County of Orange is subject to two separate Phase I MS4 Permits, but the County does not prepare a separate JRMP for each permit. The County prepares one JRMP that covers both permits. The JRMP should document everything being done within the jurisdictional boundaries; it should be a clearinghouse for data; it should be a document that states who, what, and how things are going to be done from the priorities within the Water Quality Improvement Plans. The priorities of the Water Quality Improvement Plans do not need to be reiterated in the JRMPs, just referenced so that the JRMP does not have to be revised every time the WQIP is revised.

Wayne Chiu (RWQCB) explained that the JRMPs establish the programs and lay out who is responsible for doing what within the jurisdiction or each component within the permit. This administrative draft permit has removed some specifics of how often, what frequency of inspections are required to allow discretion by the Copermittee in terms of inspections and enforcement. All actions must still work towards meeting the three basic requirements/objectives of the permit. The RWQCB wants to see outcomes from the Copermittees' actions, whether they are successes or failures. If they are failure, then Copermittees are expected to figure out why their actions failed and revise their plans.

Todd Snyder (County of San Diego) agreed that it is important to see the JRMP to understand how things are being prioritized for jurisdictions in multiple watersheds. This is especially significant to the discussion of phasing plan submittal. To understand commitments in Water Quality Improvement Plans, one needs to understand commitments

at jurisdictional levels (JRMPs). It is unclear how a phased plan submittal process for public review would accommodate this issue.

Chris Crompton (County of Orange) questioned why Section B and Section F are separated in the administrative draft permit. The draft permit seems to have conflicting language about whether the plans are expected to be revised annually or only once every three years. He recommended aligning the JRMP and Water Quality Improvement Plan sections, keeping Sections B, F, and E (TMDLs) closer together either as sequential sections or a combined section.

Jon Van Rhyn (County of San Diego) believes that structurally one of the hardest issues to address in this permit is the annual reporting. Copermittees have to document watershed and jurisdictional commitments, then generate annual reports. Jon does not believe the administrative draft permit fully anticipates all the issues implied in getting through these multiple plans and reports. The San Diego Copermittees, Orange County Copermittees, and SD Coastkeeper volunteered to develop suggested language to address these issues.

Jon Van Rhyn (County of San Diego) appreciated that the RWQCB has taken steps toward streamlined reporting; however, when reporting is too streamlined, it makes it difficult to maintain transparency. In addition, in the administrative draft permit, it appears that JRMP annual reports continue until watershed reports start (Attachment D), but it is unclear as to what happens with JRMP reports after that.

Wayne Chiu (RWQCB) acknowledged Jon's comments and said perhaps having reporting components in one section would be more helpful. With regard to streamlined reporting, the administrative draft permit does focus more on reports on the watershed level than the jurisdictional level. The RWQCB plans to review the jurisdictional level more through audits and working closer with Copermittees. The RWQCB understands that the transparency allowed through streamlined reporting is not fully fleshed out. Wayne continued that the concept behind the regional clearinghouse was to provide documentation and thus transparency to the public. The regional clearinghouse at this time is primarily focused on monitoring data, not inspection or activity data, but that is an area where the RWQCB is open to suggestions. Jon Van Rhyn (County of San Diego) suggested working with the environmental and development communities to develop ways to include things in the clearinghouse that show transparency and robust programs.

Jill Witkowski (SD Coastkeeper) admitted the two-page jurisdictional annual report is a bit terrifying because very little information is provide compared to previous reports. The two-page format does not reflect the work being done. Jill would prefer to see a dashboard-type setup that shows progress bars toward achieving goals; something that is a meaningful summary that still touts the work being done.

Chris Crompton (County of Orange) is also concerned with such a short report as Copermittees ultimately have to defend their programs through audits. Having a thicker report with more information greatly assists with collecting adequate data for such audits.

Wayne Chiu (RWQCB) and Eric Becker (RWQCB) acknowledged the stakeholders' concerns. They explained the Copermittees would still need to maintain the data to support their reports. The RWQCB is open to making the jurisdictional reports a two-page minimum,

allowing the Copermittees to provide additional pages for sufficient information to annually describe their programs and efforts.

VI. Adaptive Management Areas of Permit

Laurie Walsh (RWQCB) stated the administrative draft permit includes some areas for adaptive management. The RWQCB would like to see if those sections are well-received by the stakeholders or if there are other areas to add adaptive management within the permit.

Thom Spanos (SD Coastkeeper) voiced Coastkeeper's support for adaptive management. He specifically highlighted the adaptive management in the JRMP Section of the administrative draft permit where it states that Copermittees are to look at all available data. Thom asked of the Copermittees what SD Coastkeeper and other NGOs could do to make their data useful to the Copermittees.

Drew Kleis (City of San Diego) replied that the Water Quality Improvement Plans and JRMPs first need to be developed so that the Copermittees understand the questions or issues they are to address with the monitoring data. For the data to be useful, they will need to answer a question or issue identified in the Water Quality improvement Plans or JRMPs. Jon Van Rhyn (County of San Diego) noted that the San Diego Copermittees have used SD Coastkeeper's and other NGO's monitoring data in the past. Elaine Lukey (City of Carlsbad) noted that the data need to be strategic, fit into the Water Quality Improvement Plan, be collected in a manner that follows standard protocol, and analyzed in a certified laboratory. Elaine also noted that the Copermittees' stormwater hotlines are always open to receiving notice from NGOs and the public of any observed pollutant generating activities (PGAs).

Regarding the adaptive management areas of the permit, Mikhail Ogawa (City of Del Mar) referred to slide 5 of the San Diego Copermittees' handout. For the San Diego Copermittees, it is unclear in the administrative draft permit what is or is not up for adaptive management. The San Diego Copermittees provided examples of adaptive management based on their understanding of the administrative draft permit, including geographic adjustments, level of effort adjustments within a permit component, method adjustments within a permit component, and level of effort adjustments across permit components. San Diego Copermittees suggested inserting language in Section II.B.5 to clarify what sections of the permit "shall be considered, as appropriate," by each Copermittee for adaptation.

Wayne Chiu (RWQCB) clarified that everything within the Water Quality Improvement Plans is up for adaptation. How the jurisdictional programs are implemented can be adapted through what is discovered in implementing the Water Quality Improvement Plans. For example, the numeric action levels for non-stormwater are based on the water quality objectives. While there is a set of numeric action levels that must be included, that does not mean that all those numeric action levels must be used during implementation of the plan; resources, including monitoring data analysis, can be prioritized on specific pollutants with numeric action levels. Other examples include the LID and hydromodification requirements. The requirements must be in the permit even though meeting those requirements onsite may be a challenge. The performance standards should be used to drive the way the

programs are implemented; such that the programs achieve the goals of those standards through alternate methods (e.g., offsite projects, regional BMP projects, etc.).

Bryn Evans (Industrial Environmental Association) supports the described level of adaptation for the Copermittees. The required monitoring and inspections for industrial sites through other NPDES permits may come into play with adaptive management.

Mike McSweeney (BIA) expressed frustration with the time constraints of the focused meetings and written comment period. The BIA is feeling time-pressured to digest what has been proposed, talk it through with other stakeholders, and provide quality feedback.

David Barker (RWQCB) explained that the focused meetings are a vetting process for the administrative draft permit. There have been four day-long meetings scheduled and dedicated to discussing key issues, along with a five-month schedule for receiving written comments on the administrative draft. After the administrative draft process, there will be another review period for the draft permit, including public hearings and the opportunity for submitting more written comments.

Colin Kelly (OC Coastkeeper) feels there is ample time provided in this permit development process. Jill Witkowski (SD Coastkeeper) concurred with Colin. Elaine Lukey (City of Carlsbad) shared appreciation for the process and the time given in development of this permit.

Jill Witkowski (SD Coastkeeper) referenced Section B.5.a.1.(h) (page 20) of the administrative draft permit where it says public comment will be solicited for the Water Quality Improvement Plans and asked how that will look and at what point public participation will be invited. She also asked how that will dove-tail with the annual reports, as the permit language is vague on the issue. Jill encouraged early, informed public participation for the best results.

Jon Van Rhyn (County of San Diego) admitted it is unknown at this point how the public participation process will work; however, it will be set up during the planning process; therefore, it is critical that the public is part of the development of the plan. Jill Witkowski (SD Coastkeeper) agreed and would appreciate public involvement early in the process.

Elaine Lukey (City of Carlsbad) stated that some areas of the permit dictate that Copermittees must do X, Y, and Z. She suggested adding the language “for the priorities that fit with the watershed” to those required activities.

Chris Crompton (County of Orange) shared in his experience that changes and adaptation are inherently a slow-moving process. Wayne Chiu (RWQCB) explained that the RWQCB is not expecting adaptation every six months or every year. Some issues may not yield significant results even on the 5-year basis. Chris Crompton (County of Orange) agreed that there should be minor course corrections on an annual basis. Todd Snyder (County of San Diego) referred to the San Diego Copermittees’ handout (see graphic below), explaining the mid-course corrections will be the smaller loop and will be minor changes; the overall or big-picture questions and adaptations will be the outer loop on a 5-year or longer term.

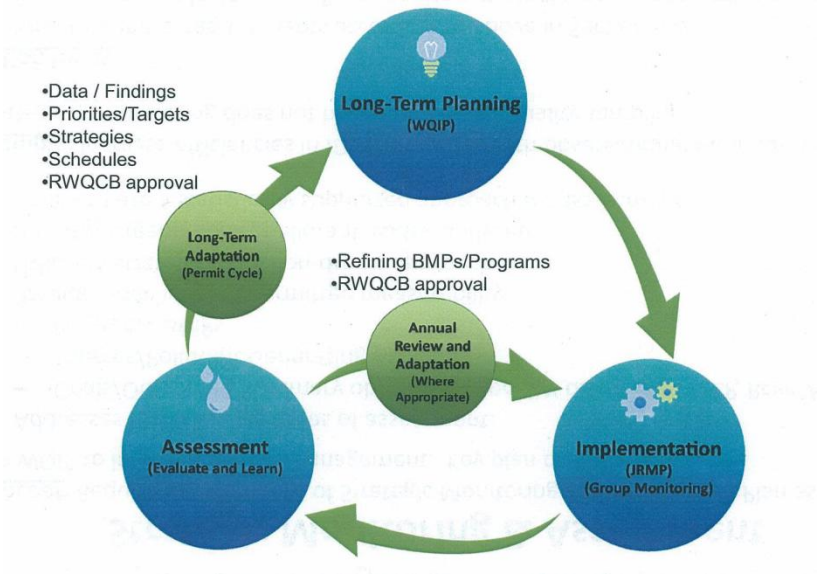

Jon Van Rhyn (County of San Diego) described the differences between program modification and adaptive management. Program modification happens every now and then and is unpredictable. Adaptive management is more defined; it is question-driven. Adaptive management uses questions to direct program modifications; therefore, the questions being asked need to be understood at the beginning of the adaptive management process.

Wayne Chiu (RWQCB) asked the stakeholders how they learn best, where they learn best, and how does the RWQCB put that into the permit. Jon Van Rhyn (County of San Diego) explained that looking back to learn works well only if the plan is well thought out in the beginning. Jon emphasized beginning with a truly robust and comprehensive planning process is important.

Todd Snyder (County of San Diego) referenced slide 10 of the San Diego Copermittees' handout, suggesting development of a Strategic Monitoring and Assessment Plan as part of the Water Quality Improvement Plan to inform adaptive management. This is expected to be discussed in more detail at the next focused meeting; however, Todd recommended the RWQCB provide an opportunity for the San Diego Copermittees to walk through the Strategic Monitoring and Assessment Plan to provide an adequate description before opening up the discussion to questions and answers.

Ziad Mazboudi (City of San Juan Capistrano) provided an example of how the City learned to adjust its program with regard to over irrigation. The City worked with water districts, educated the public, and provided rebates for smart timers instead of attempting to write enforcement tickets for each violation of over irrigation. This was a change in tactic that resulted in the same goal being achieved.

VII. Other Topics

There were some topics raised during the focused meeting that were not within the scope of the meeting but should be discussed at more appropriate times. These included:

- CalGreen / Hydromodification Dedicated Meeting
- Legal Issues
- Aliso Creek / specific areas of geography
- Ninth Circuit Court Decision
- BET and Other Technologies
- Regional BMP Funding and Implementation
- Review time for permit
- Monitoring Presentation by San Diego County Copermittees

VIII. Audience Comments

Comment: Cid Tesoro (County of San Diego), in reference to the proposed meeting, workshop, or symposium focused on hydromodification, recommended also including the full Land Development portion of the permit.

Question: Khosro Aminpour (City of Chula Vista) asked how anti-backsliding works in the realm of adaptive management; will the anti-backsliding policy prevent Copermittees from eliminating inefficient program elements?

Response: David Barker (RWQCB) explained that the anti-backsliding provisions are addressed in the NPDES permit regulations and are usually used in the context of preventing backsliding (relaxation) of numeric effluent limitations. David indicated that RWQCB staff are not prepared to conclude during these focused meetings whether any specific permit requirement is, or is not, subject to the anti-backsliding policy. Therefore, all issues should be open for discussion and we should not let anti-backsliding considerations take issues off the table at this point. Legal determinations will be made at a later date. It is a complicated regulation, but it would not prevent programmatic changes. Cindy Lin (US EPA) concurred.

IX. Meeting Adjourned

San Diego RWQCB
Permit Reissuance Focused Meeting

July 11, 2012

WQIP and JRMP Approval Process

Discharge Prohibitions

- Change "prohibit non-storm water discharges from MS4" to "effectively prohibit …"

Iterative Process

- Include reference to A.4. in sections A.1, A.2, and A.3 to define compliance through the iterative process. Explicit language is needed in light of 9th Circuit Court's finding of the separate enforceability of these provisions.

WQIP and JRMP Approval Process

Concept: The intent of the Permit is for dischargers to submit WQIP and JRMP updates for approval. Compliance is achieved through the submittal, implementation, and update of approved plans. Jurisdictional accountability comes from review and approval of jurisdictional commitments.

Examples:

- If there are 6 dischargers in one WMA, and 5 dischargers' commitments are approved when the WQIP is submitted, any re-submittals need to focus on individual dischargers, not the entire watershed.
- There appears to be no approval process for the JRMP update in year 1 of the permit.
- There is no timeline for approval of annual updates in years 2, 3, 4, 5.
- From previous workshops, "Numeric Targets" are not enforceable.

Action Items:

1. Insert language clarifying identification of individual jurisdictional commitments in WQIP, and insert language clarifying RWQCB approval of individual jurisdictional commitments.
2. Add language to include RWQCB approval timeline for JRMP updates in year 1.
3. Add language in II.F. stating there is a specific (e.g., 90-day) RWQCB approval timeline for annual updates in years 2, 3, 4, 5.
4. Add language to permit, not fact sheet, about non-enforceability of Numeric Targets

WQIP and JRMP Approval Process

Concept: WQBELs in TMDLs are currently expressed as either:

a) Achievement of receiving water limitations, or

b) Achievement of a receiving water limitation applied at the MS4 outfall, and applied as a concentration instead of a load.

Action Item: Add other means of demonstrating compliance with WQBELs, for example:

- Load-based compliance with Waste Load Allocations
- Implementation of EO-approved TMDL compliance plan
- Compliance with exceedance limitations expressed as 'days' or 'frequency' (Bacteria TMDL for Beaches & Creeks)
- Other means of compliance identified in future TMDL language

Adaptive Management Areas of Permit

Concept: The intent of the Permit is to allow for adaptation of Permit programs, strategies, and procedures to enable Copermittees to more effectively and efficiently achieve their goals. Modifications need not be additive. Modifications must be reasonably expected to result in equal or greater overall effectiveness. Modifications can include adjustments to level of effort or methods either geographically, across permit components, or within permit components.

Examples:

- Geographic / Level of Effort Adjustment: Refer to Slides #6 and #7
- Within Permit Component / Level of Effort Adjustment: Modifying IDDE procedures in Section II.E.2.d. (less water quality sampling, more observations)
- Within Permit Component / Method Adjustment: Modifying inspection procedures in Section II.E.5.: Refer to Slide #8
- Across Permit Component / Level of Effort Adjustment: Reducing inspection frequencies in Section II.E.5., and increasing education activities in Section II.E.7.

Action Item: To make clear what is eligible for adaptation, insert language in Section II.B.5. (Adaptive Management Process) clarifying what sections of the Permit "shall be considered, as appropriate," by each Copermittee for adaptation.

Adaptive Management Areas of Permit: Residential Example

Concept: Permit intent is to allow for adaptation of:

- Residential inventory content
- Tools used to address Residential land use as source: O+E, IC/ID complaint response, inspections, street sweeping, MS4 cleaning
- Any other tools needed, providing that residential land use is a source of a WQIP priority

Example: If a Copermittee is in Watersheds 1 and 2 in the figure (slide 7), and residential land use is only a priority in Watershed 1, the Copermittee could conduct IC/ID complaint response in Watershed 2, and conduct any combination of other tools in Watershed 1 to address the priority.

Action Item: Clarify language, where appropriate, to allow modifications to inventories and control strategies with supporting rationale and justification.

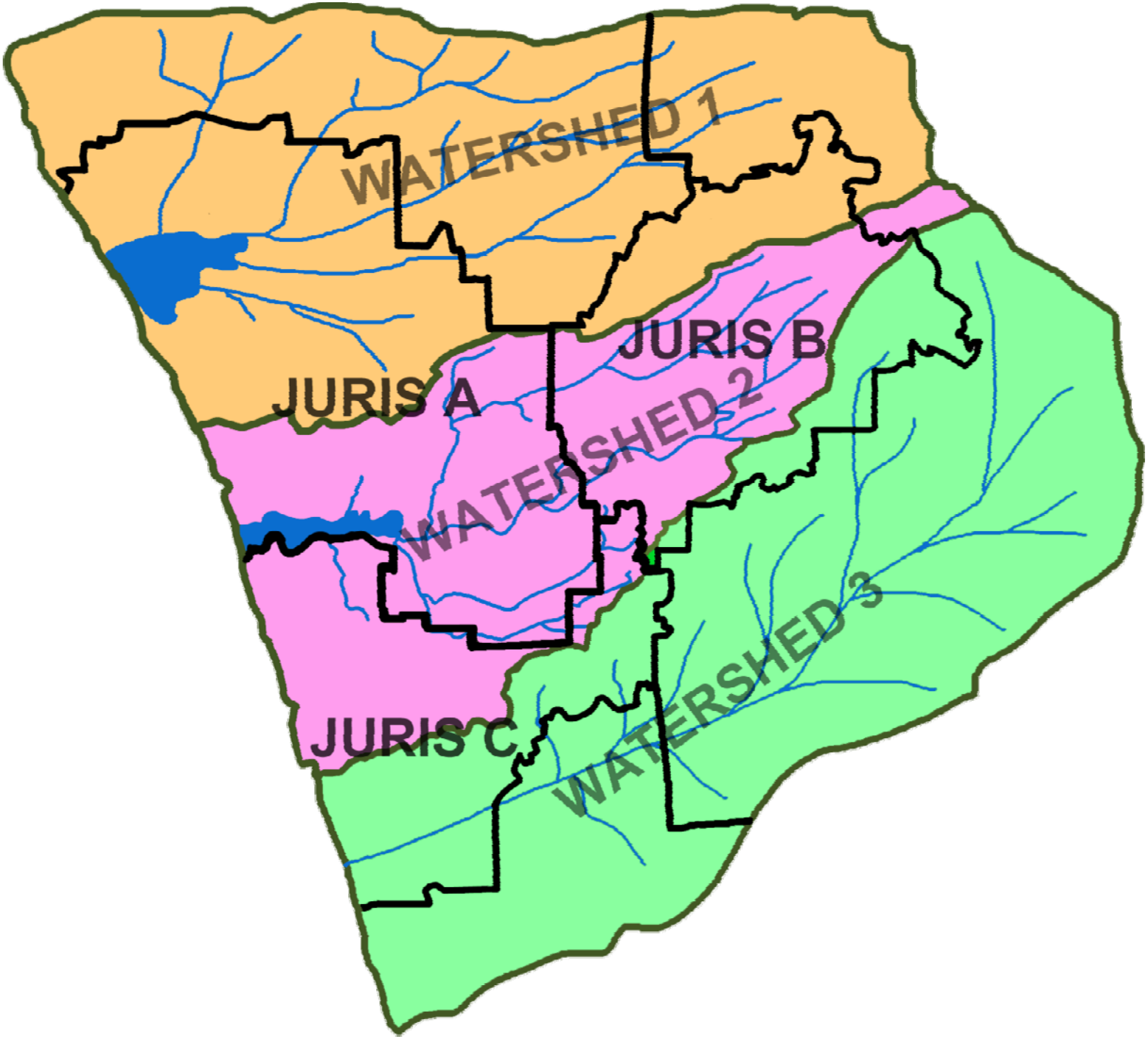
WATERSHED 1
JURIS A
JURIS B
WATERSHED 2
JURIS C
WATERSHED 3

Adaptive Management Areas of Permit: Inspections

Concept: Permit intent is to allow for adaptation of Provision E requirements to allow modifications to inspection methodology as a result of adaptive management

Example: Use of multiple inspection methods to effectively and efficiently verify implementation of BMPs

- "Traditional" Inspections (internal, single business, some external)
- Property-Based Inspections (external-focused on PGAs, internal if necessary, multiple-businesses on one property)
- Patrols or complaint based inspections

Action Item: Clarify language, where appropriate, to allow modifications to inspection methods and requirements with supporting rationale and justification

Adaptive Management Areas of Permit: Long-Term vs. Annual Processes

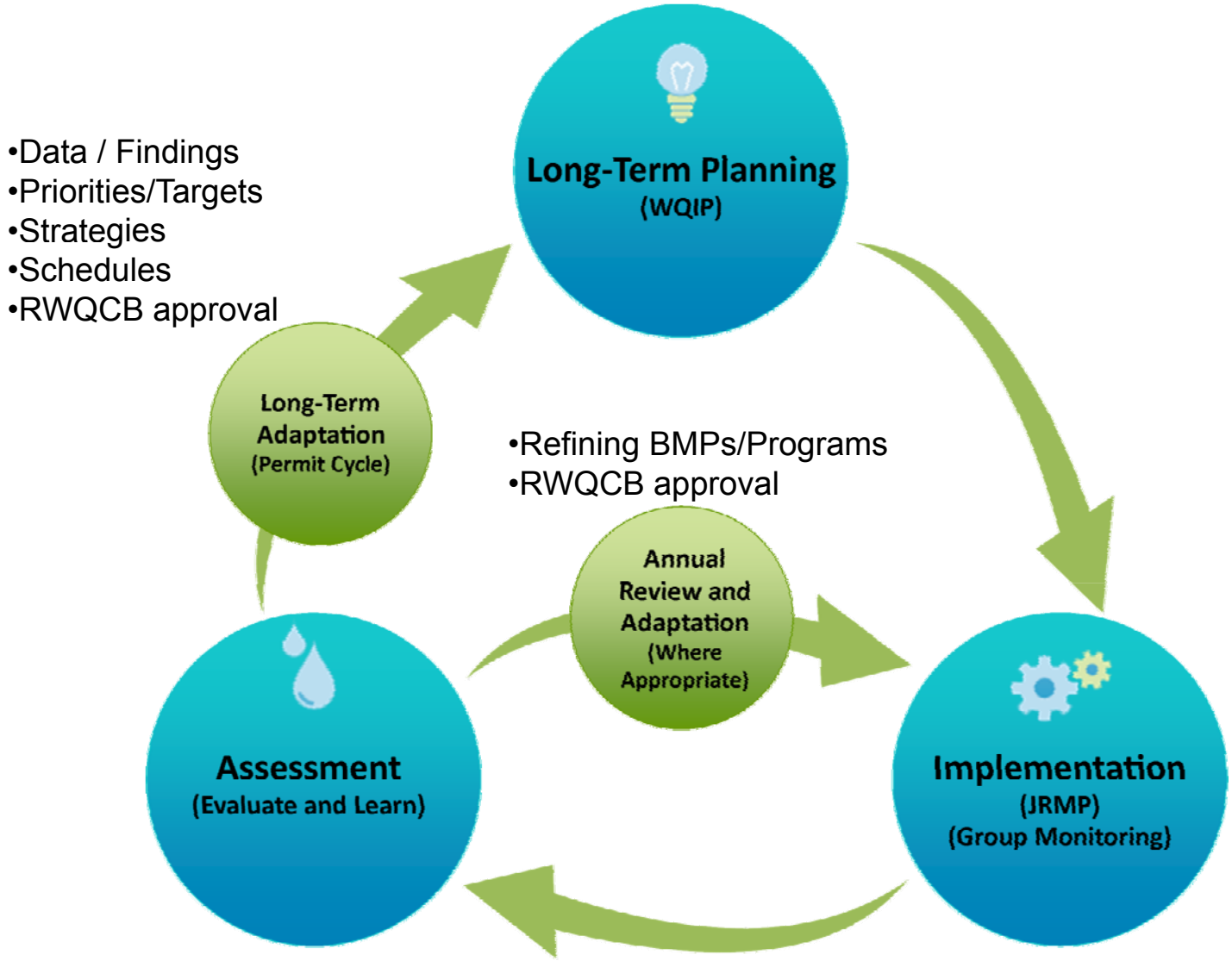

Adaptive Management Areas of Permit: Strategic Monitoring & Assessment

Concept: Require development of Strategic Monitoring and Assessment Plan as part of the WQIP to inform adaptive management. Key plan characteristics:

- Addresses the following areas of assessment:
  - Goals/Outcomes/3 primary objectives (Non-SW discharges, MEP, Rcvg Wtrs)
  - Sources/Pollutant Generating Activities
  - Programs/BMPs
- Provides individual Copermittee measurability
- Utilizes a strategic, question-driven approach
- Prioritizes (geographic, pollutant, water body, etc.)
- Ability to use a statistically supported approach for assessment

Example: Increase efficiencies in IDDE Programs with observational methods (or other strategies); monitoring does not have to be water quality sampling

Action Items:

- Structure initial requirements according to above in Section II.D.
- Adjust language in Section II.B. to require a strategic monitoring and assessment plan as a part of the WQIPs.

From: lyris@swrcb18.waterboards.ca.gov
To: Chiu, Wayne@Waterboards
Subject: July 25, 2012 Focused Meeting Regional MS4 Permit
Date: Friday, July 20, 2012 5:10:57 PM
Attachments: Final FOCUSED MEETING JULY 25 AGENDA.pdf
20120711MeetingNotes.pdf

The San Diego Water Board is scheduled to conduct its third Focused Meeting on July 25, 2012 at the City of Carlsbad Faraday Center. During this Focused Meeting discussions will cover Monitoring and Assessment provisions of the Administrative Draft Regional MS4 Permit with an intent to receive Stakeholder input on the Topic Discussion Questions attached to the Focused Meeting Agenda (See Email Attachment).

Topic specific presentations will be made by stakeholders during the morning portion of this meeting. Those who wish to make a presentation should contact a member of the MS4 Permit Team with a request and an idea of how much time their presentation will take.

Meeting minutes from the July 11, 2012 Focused Meeting on Assessment and Planning are also attached to this email.

Laurie Walsh P.E.
San Diego Water Board
858-467-2970
lwalsh@waterboards.ca.gov

You are currently subscribed to reg9_sandiegoco_ms4permit as: wchiu@waterboards.ca.gov.
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(It may be necessary to cut and paste the above URL if the line is broken)
or send a blank email to leave-365453-508208.cee2a373662e566393e62f0af18d11cf@swrcb18.waterboards.cagov

California Regional Water Quality Control Board, San Diego Region
Regional MS4 Permit Focused Meeting

Meeting Notes

Date	Location	Agenda Topics
7/11/2012 Start time: 9:30 AM End time: 3:10 PM	City of Escondido 201 North Broadway Escondido, CA 92025 Mitchell Conference Room	• Meeting Recap & Feedback • Focused Meeting Intent • Water Quality Improvement Plan Priority Setting & Approval Process • JRMP Relationship with Water Quality Improvement Plan • Adaptive Management Areas of Permit • Other Topics • Audience Comments

I. Introductions

Table participants introduced themselves. Lewis Michaelson (Facilitator) ensured the appropriate representatives were at the table, per the June 20, 2012, San Diego Regional Water Quality Control Board (SD RWQCB) Notice.

San Diego County Copermittees (5): Drew Kleis (City of San Diego), Jon Van Rhyn (County of San Diego), Mikhail Ogawa (City of Del Mar), Todd Snyder (County of San Diego), Elaine Lukey (City of Carlsbad)

Orange County Copermittees (5): Ziad Mazboudi (City of San Juan Capistrano), Joe Ames (City of Mission Viejo), Grant Sharp (Orange County Flood Control District), Ryan Baron (County of Orange), Chris Crompton (County of Orange), Nancy Palmer* (City of Laguna Niguel) **Indicates representatives rotated during the meeting.*

Environmental Community (3): Colin Kelly (Orange County Coastkeeper), Jill Witkowski (San Diego Coastkeeper), Roger Butow (Clean Water Now! Coalition), Thom Spanos* (San Diego Coastkeeper) **Indicates representatives rotated during the meeting.*

Development/Business Community (3): Thom Fuller (San Diego Business Industry Association), Dennis Bowling (American Public Works Association), Bryn Evans (Industrial Environmental Association), Wayne Rosenbaum* (BIA), Mike McSweeney* (BIA) **Indicates representatives rotated during the meeting.*

U.S. Environmental Protection Agency (US EPA) (1): Cindy Lin

San Diego Water Board Permit Team: David Barker, Wayne Chiu, Laurie Walsh, Eric Becker

It was noted that Riverside County MS4 Copermittees were invited to the focused meeting but were unable to attend.

II. Meeting Recap & Feedback

Lewis Michaelson (Facilitator) reflected on the effectiveness of the June 27 Focused Meeting. It seemed that much of the meeting consisted of stakeholders asking questions of the Regional Water Quality Control Board (RWQCB). Today's meeting should consist more of the opposite; questions from the RWQCB and input from the stakeholders.

As requested at the June 27 meeting, a number of stakeholders provided suggestions on topics for today's meeting. Those suggestions were incorporated into the agenda. Lewis reviewed the agenda for today's meeting.

III. Focused Meeting Intent

David Barker (RWQCB) provided information on the intent of the focused meetings. He is the San Diego Water Board Chief of the Surface Water Basins Branch, which encompasses the NPDES wastewater and stormwater programs, including municipal, construction, and industrial stormwater programs. The team that developed the MS4 administrative draft permit is within his Branch. David is here to observe the meetings and assist staff in framing issues for discussion. He is also here as a representative of executive management, including Executive Officer David Gibson, and will do his best to respond to broad policy issues and the Board's process of bringing the permit to adoption.

Although the specific causes of water quality impairments within the San Diego Region are not all known, it is known that most water quality impairments occur downstream of, or within, urbanized settings, and are therefore directly affected by dry weather flows and urban runoff. Thus, there is a continuing need for comprehensive, innovative, and effective stormwater regulation. Creative and non-traditional approaches are needed to address these challenges.

With these challenges in mind, the RWQCB has put considerable thought and effort into proposing the administrative draft permit, which provides an adaptive management pathway for Copermittees to address water quality issues in an iterative process. Under this process, water quality improvement objectives will be regularly prioritized and assessed.

Unlike current prescriptive permits, this administrative draft permit puts the Copermittees in the driver's seat, allowing deployment of resources to achieve goals that will have the greatest water quality improvements.

The RWQCB would really like to hear thoughts from the stakeholders about what should be in the draft permit. The administrative draft permit was released April 9, 2012. By the time written comments are due in September, it will have been available for public review and comment for more than five months. To communicate detailed ideas on specific permit language, the RWQCB would appreciate that detailed language be submitted as written comments. The RWQCB values the stakeholders' thoughts and insights on permit language and will closely consider all submissions.

During this extended review and comment period on the administrative draft permit, the RWQCB has allocated four days for focused meetings to meet with interested stakeholders and listen to ideas on how to improve the administrative draft permit. The schedule for the focused meetings was selected in order to maintain momentum for finalizing the final draft of the permit later this fall. The RWQCB does not anticipate scheduling additional focused meetings prior to release of the final draft permit, other than perhaps a special session on the hydromodification requirements as suggested at the June 27 focused meeting. With recognition that four focused meetings is not enough time for exhaustive, detailed review of the full administrative draft permit, the focused meetings are structured to discuss key issues at a conceptual level. Stakeholders can be most influential on shaping the next iteration of this permit by providing quality input and feedback on the key issues at the conceptual level. The focused meetings are a golden opportunity to have productive discussions in a fair and impartial setting.

David reminded the stakeholders that while these focused meetings may not allow for detailed discussions on all issues of concern, all stakeholders will have an opportunity to review and provide detailed comments on any aspect of the draft permit again later this fall.

Several stakeholders (Roger Butow, Clean Water Now! Coalition; Todd Snyder, San Diego Copermittees; Ziad Mazboudi, City of San Juan Capistrano) strongly support a stand alone hydromodification meeting prior to the written comment deadline. Ziad Mazboudi (City of San Juan Capistrano) is working with Tory Walker and others to hold a symposium with field experts and would want the hydromodification meeting to be held after the symposium. The RWQCB will have a game plan for a hydromodification meeting ready to roll out by the next focused meeting.

Roger Butow (Clean Water Now! Coalition) asked if the legal issues over the legitimacy of the consolidated permit have been addressed by RWQCB counsel. David Barker (RWQCB) stated the RWQCB's official position is that they do have the legal authority to issue this regional general permit; RWQCB counsel is expected to confirm that authority. David mentioned there is a parallel legal track of meetings underway where RWQCB counsel is working with attorneys of the Copermittees. Any legal opinion issued will be open for public review and scrutiny.

IV. Water Quality Improvement Plan Priority Setting & Approval Process

Laurie Walsh (RWQCB) explained that in pre-drafts of the permit the Water Quality Improvement Plan was originally called a Water Quality Management Plan. The title of the plan was changed to "Improvement" instead of "Management" because the goal of the plan is water quality improvement.

The Water Quality Improvement Plan is in the beginning of the permit because of its high importance to the permit. The Water Quality Improvement Plan sets the road map through which the Copermittees will achieve improved water quality. It gives the Copermittees complete control to set priorities with rationale, set schedules, set targets, etc. From meeting with stakeholders, the RWQCB understands that there are not enough

resources to do everything all at once; the Water Quality Improvement Plans are the Copermittees' opportunity to set priorities.

The approval process for the Water Quality Improvement Plans is outlined in the administrative draft permit. The RWQCB is looking for input on any impediments to developing and implementing the Water Quality Improvement Plans, specifically within the timeframe identified in the administrative draft permit.

San Diego Coastkeeper would be open to a staggered submittal of Water Quality Improvement Plans for the nine watersheds so that public review is not all within the same 30-day period.

Jill Witkowski (San Diego Coastkeeper) suggested a phased review period for the Water Quality Improvement Plans where the first phase is review of the priorities and the second phase is review of the full Water Quality Improvement Plan. This may assist in keeping prioritization consistent across watershed management areas. Ziad Mazboudi (City of San Juan Capistrano) expressed concern that a separate review of the priorities is leaning toward micro-managing. Jon Van Rhyn (County of San Diego) said it is an interesting concept; however, the more the process is extended, the more the Copermittees would have to confront the realities of the time needed to budget, which could affect how fast programs move forward. Jon admitted there may need to be a multi-year planning process upfront where the priorities are laid out at the highest level and made open to feedback before proceeding with details of the Water Quality Improvement Plan. Drew Kleis (City of San Diego) agreed with the concept of getting iterative feedback in the process of developing the Water Quality Improvement Plans to ensure development of the plan stays on track.

Jill Witkowski (San Diego Coastkeeper) pointed out there is good direction in the permit on how to assess receiving water conditions, but there is not good guidance on where the bar should be set; it is not clear if the Copermittees will be aiming low or aiming high in their plans. Ziad Mazboudi (City of San Juan Capistrano) explained that the bar could be set high, but the reality of reaching that level may be driven by available resources. Drew Kleis (City of San Diego) acknowledged that Total Maximum Daily Loads (TMDLs) and other regulations will be major factors in determining priorities. There also may not be high priorities in every watershed; there may be tradeoffs that a certain watershed is not as high as another because of TMDLs or other regulations. By allowing that prioritization, the net benefit of a jurisdiction's efforts can be maximized. The frank reality is that prioritization will be driven by regulations and there will be issues that are medium or low priorities. Eric Becker (RWQCB) explained that the permit was purposefully set up so there could be differences across watersheds. Todd Snyder (County of San Diego) concurred that the intent is there will be different prioritizations across different watersheds.

Jill Witkowski (SD Coastkeeper) raised the concern that in watersheds with TMDLs, the only priority might be the TMDL although there are other issues within the watershed. Eric Becker (RWQCB) clarified that the TMDL might be the top priority and efforts to satisfy the TMDL may not allow for other priorities at that time. Other priorities are still on the list, but resources may not be allocated to them until the TMDL is satisfied. Jill Witkowski (SD

Coastkeeper) is concerned that areas on the cusp of becoming TMDLs and ASBSs may not receive attention needed to prevent them from becoming TMDLs and ASBSs.

Mikhail Ogawa (City of Del Mar) explained that aiming high and capturing as many pollutants as possible is an iterative process within the plan development. For example, bacteria may be the highest priority pollutant because of a bacteria TMDL in the watershed; however, as the plan is developed it may be found that additional pollutants can be targeted at the same time using the same methods as those for bacteria. At that point, the priorities may be adjusted to reflect those findings. Therefore, having a phased approach to approving the priorities and then the Water Quality Improvement Plans may not be efficient. Jill Witkowski (SD Coastkeeper) conceded Mikhail's point about priorities changing during plan development and reiterated that it is still important to the environmental community to have sufficient information about how and why priorities are set.

Elaine Lukey (City of Carlsbad) explained that the Copermittees are not starting from scratch in creating watershed priorities. The Copermittees have many years of experience looking at 303(d) listings, impairments, etc., and already have good programs in place to address watershed priorities. The San Diego Copermittees have had Watershed Urban Runoff Management Plans (WURMPs) for 10 years, and there are priorities in those existing WURMPs. The priorities may change based on a TMDL or other regulations; however, looking at the WURMPs is a good place to start to understand the current watershed priorities.

Wayne Chiu (RWQCB) asked stakeholders to provide suggestions as to how to put priority setting guidelines in the permit without limiting the Copermittees' ability to have flexibility in setting priorities and prevent Copermittees from setting the bar too low. Jill Witkowski (SD Coastkeeper) suggested having a tiered approach to priority setting: the baseline tier would be TMDLs, the next tier might be mid-range priorities, and the next tier might be long-range priorities. Jon Van Rhyn (County of San Diego) responded that there are two program elements defined in the permit that are implemented concurrently: the Water Quality Improvement Plans and the Jurisdictional Urban Runoff Management Plans (JRMPs). The Water Quality Improvement Plans are about establishing priorities and following an adaptive management strategy. The JRMPs have baseline requirements and are about establishing an extensive set of activities. The Water Quality Improvement Plans are not entirely independent of the rest of the permit, including the JRMPs.

Drew Kleis (City of San Diego) referred the group to slide 2 of a handout the San Diego Copermittees prepared for this meeting. The San Diego Copermittees would like to have a reference to permit section A.4 in sections A.1, A.2, and A.3 so that compliance with discharge prohibitions, receiving water limitations, and effluent limitations is clearly defined as implementation of the iterative process. They believe explicit language is needed in light of the 9th Circuit Court's finding of the separate enforceability of these provisions. Drew asked Cindy Lin (US EPA) if there is a possibility of revising Provision A to define compliance through the iterative process. Cindy replied that this is still an NPDES permit and there needs to be clarity regarding compliance points. There is, however, a lot of creative

language in other permits within California, so it is not out of the toolbox to have creative language in this permit.

Drew Kleis (City of San Diego) explained that the Copermittees are not looking to walk away from responsibility, but it is easier to budget for a plan if the plan is the compliance pathway. Jill Witkowski (SD Coastkeeper) asked how linking section A.4 to sections A.1-A.3 accomplishes that. Drew explained that at some point a City Manager or politician will question why certain actions or plans are being done. By linking the iterative process clearly to compliance, Copermittees' staff will be able to defend those questions.

Elaine Lukey (City of Carlsbad) referred the group to slide 3 of the San Diego Copermittees' handout. This slide contains suggestions of what would work for the Copermittees regarding permit language for determining compliance:

1. Insert language clarifying identification of individual jurisdictional commitments in the Water Quality Improvement Plans, and insert language clarifying RWQCB approval of individual jurisdictional commitments.
2. Add language to include RWQCB approval timeline for JRMP updates in year 1.
3. Add language in II.F. stating there is a specific (e.g., 90-day) RWQCB approval timeline for annual updates in years 2, 3, 4, 5.
4. Add language to permit, not fact sheet, about non-enforceability of Numeric Targets.

Todd Snyder (County of San Diego) followed that this ties back into the issue of Section A and why it is important that the permit clearly outline the points of compliance for the Water Quality Improvement Plans that Wayne Chiu (RWQCB) lined out at the June 27 MS4 Focused Meeting (1. Submit Water Quality Improvement Plan; 2. Include all required elements in the plan; 3. Implement the plan; and, 4. Assess the plan). Implementation of the Board-approved Water Quality Improvement Plan should constitute compliance. The approval process is critical to that.

Wayne Chiu (RWQCB) responded that the permit writing team does understand the over-arching concern and tried as much as possible to incorporate that concept into the permit language. The RWQCB will consider any recommendation put forth for revised permit language.

Joe Ames (City of Mission Viejo) asked for clarification about whether a goal under a certain priority could be a research project. Laurie Walsh (RWQCB) clarified that the goals are the water quality standards; numeric targets are interim goals to reach the water quality standards; a research project can be a strategy to reach the numeric targets and water quality goals. Cindy Lin (US EPA) concurred that under the Water Quality Improvement Plans there are priorities, under those priorities there are goals (i.e., water quality standards, waste allocations, etc.), under those goals are monitoring plans or targets to use to achieve the water quality objectives or criteria, and then there are the actions or controls implemented to reach those targets. Mikhail Ogawa (City of Del Mar) followed up that as adaptive management is a learning process, there is inherently an expectation that some of

the actions or controls implemented may not work as effectively or efficiently as planned. However, a failed strategy, action, or control does not imply that the Copermittees are not attempting to reach their priorities; it is part of the adaptive management process.

Chris Crompton (County of Orange) is uncomfortable with the idea of this permit trying to replace TMDLs, as the RWQCB has stated before that CLRPs could be modified slightly and become the Water Quality Improvement Plans. This permit is a municipal stormwater permit. It does not incorporate all the stakeholders that a TMDL process does. In addition to bringing in parties besides municipalities, the TMDL process also allows for longer timeframes than under this permit. This MS4 permit aims to fix issues that can be controlled by the jurisdictions; there are significant issues and sources that the jurisdictions cannot control. Eric Becker (RWQCB) asked for suggestions on changing language in the permit to cover TMDLs. Todd Snyder (County of San Diego) referenced slide 4 of the San Diego Copermittees' handout. The concept is that the WQBELs used to interpret TMDLs in the draft permit are expressed as either (a) achievement of receiving water limitations or (b) achievement of a receiving water limitation applied at the MS4 outfall and applied as a concentration instead of a load. The San Diego Copermittees would like to add other means of demonstrating compliance with WQBELs. For example, load-based compliance with Waste Load Allocations, implementation of EO-approved TMDL compliance plan, compliance with exceedance limitations expressed as "days" or "frequency," and/or other means of compliance identified in future TMDL language. These other means of demonstrating compliance with WQBELs acknowledge that MS4s are part of the TMDL solution but not the entire picture.

Cindy Lin (US EPA) provided an example from a Los Angeles TMDL (Dominguez Channel Greater Los Angeles Long Beach Harbor TMDL) where they are trying to reduce the distance between TMDLs and permit language. The TMDL offers four different ways of demonstrating compliance, thereby providing clarity in the expectations. Sometimes it does not make sense to try to meet the water quality standard level.

Wayne Chiu (RWQCB) asked Cindy Lin (US EPA) if that meant that language can be placed within this permit that states the Copermittees would be in compliance with discharge limits and receiving water limits if they have a numeric set of criteria that are met as part of the iterative process. Cindy responded that the compliance point must always be defined. It is the details of how the water quality standard is met. Different numeric metrics can be provided as long as they show that the water quality standard is met.

Wayne Chiu (RWQCB) acknowledged that everyone is highly concerned about the 9th Circuit Court Decision and the RWQCB has been struggling with how to make the language provide some level of assurance that there would be no requirement of enforcement or threat of third party lawsuits if the first two requirements are not met as long as they are implementing a Water Quality Improvement Plan with the full intent of meeting those requirements in the future. The 9th Circuit Court Decision, however, says those provisions are separate and enforceable. Wayne asked for the EPA's position on this. Is the EPA saying that there is some alternative language that could be placed in the permit that the EPA

would accept as being in compliance with discharge prohibitions and receiving water limitations but not necessarily through actual receiving water quality data?

Cindy Lin (US EPA) responded that the 9th Circuit Court Decision is a legal issue on which she has been directed not to comment. Regarding alternative language, Cindy explained that EPA Region IX has been strong and consistent that Copermittees either meet compliance through WQBELs or through quantitative measures. "Quantitative measures" are purposely not defined to provide some interpretation in how to meet compliance.

Wayne Rosenbaum (SD BIA) recommended looking at other, recent permits regarding compliance language and, also, building into Provision A some enforcement structure.

The Environmental and Development Communities (Colin, Wayne R) believe the solution will not be a safe harbor solution, nor will it be something where Copermittees should put up walls to protect themselves from potential litigation. They would prefer not to spend money on litigation unless critically important; they would prefer to help Copermittees implement or assess effective programs and be more involved in the creation of those programs. The permit will not provide complete security from litigation; however, dealing responsibly with the Environmental and Development Communities will reduce liability.

Ryan Baron (County of Orange) acknowledged the RWQCB's multiple requests for stakeholders to submit language, but questioned if there is a statewide effort going on to suggest model language to the State Water Resources Control Board (SWRCB) and asked how difficult it is to change language provided by the EPA for the permit. Wayne Chiu (RWQCB) explained that the EPA has the final say on the permit language. Cindy Lin (US EPA) concurred, explaining that when the permit is presented to the EPA, they can approve it, reject it with recommendations for re-submittal, or decide to issue their own NPDES permit.

Chris Crompton (County of Orange) suggested that the CASQA conversations with the SWRCB may be the solution to this effort as they are working on language for section A and alternate ways of dealing with the 9th Circuit Court Decision.

V. JRMP Relationship with Water Quality Improvement Plan

Laurie Walsh (RWQCB) explained that one objective of the RWQCB is to work closer with the Copermittees, as they have tried to do with this permit process. The permit team met with various stakeholders to talk about things to improve in the stormwater program and to get feedback on key issues. The permit team then went back and wrote the administrative draft permit, trying to address all the key issues the stakeholders had identified, including flexibility to put resources where best suited. The RWQCB is now looking for action items similar to the handout provided by the San Diego Copermittees. Laurie led off with topic discussion question #5 from the June 20, 2012, San Diego Regional Water Quality Control Board (SD RWQCB) Notice: "How can the proposed provisions of the administrative draft permit be modified to support a Copermittee's ability to plan and/or procure resources for its jurisdictional runoff management program?"

Jill Witkowski (SD Coastkeeper) said one of the things unclear with how Water Quality Improvement Plans work together with JRMPs is how the priority setting at the watershed level, with numeric targets and strategies, gets implemented at each jurisdiction to achieve the targets. It is unclear who is responsible for making sure goals in the Water Quality Improvement Plans actually happen and everyone participates in the improvement together.

Jon Van Rhyn (County of San Diego) responded that the big issue has been to maintain separation of group versus individual responsibilities. The general understanding is there may be some things committed to in a group setting, but in the end there will still be multiple Copermittees in a watershed that will have their own stand alone plans to follow through and implement.

Ziad Mazboudi (City of San Juan Capistrano) said that every Copermittee will make sure they are working under the umbrella of the Water Quality Improvement Plans; however, there may be a jurisdiction where a particular pollutant is not an issue. In that case, the jurisdiction would document it, present it, and move to the next prioritized pollutant in the plan. The ultimate enforcement will have to be from the RWQCB.

Elaine Lukey (City of Carlsbad) directed everyone to slide 7 of the San Diego Copermittees' handout.. For illustrative purposes, the graphic is provided below.

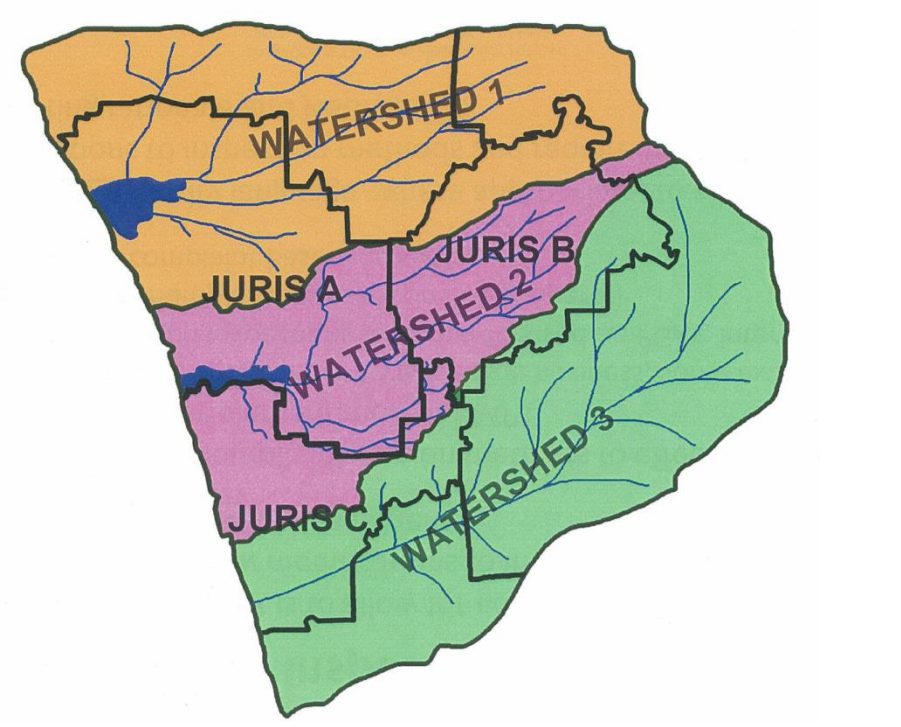

The colored areas are the watersheds; the black lines are the jurisdictional boundaries. The blue lines are receiving waters.

Elaine Lukey (City of Carlsbad) provided an example where Watershed 2 (pink) has bacteria as the top priority but the portion of Jurisdiction C that is in Watershed 2 doesn't have any identified sources of bacteria at the watershed scale. In that case, Jurisdiction C

could address their priority in Watershed 3 (green), doing more intense work in Watershed 3 (green) than in Watershed 2 (pink).

Mikhail Ogawa (City of Del Mar) provided another example where Watershed 2 may have bacteria as a group priority, but Jurisdiction C may decide with rationale and justification that they will focus on nutrients because receiving water in Watershed 2 in Jurisdiction C is impaired for nutrients. The San Diego Copermittees are hoping the RWQCB will look at these not only as individual watersheds, but also look across watersheds and across jurisdictions to get the entire picture.

Wayne Chiu (RWQCB) acknowledged that a very important aspect of this permit is RWQCB oversight. The RWQCB is ultimately responsible for making sure Copermittees are implementing the plans, but they also have to take into consideration that priorities may force them to focus on one watershed over another one as each Copermittee has different circumstances and different priorities because of watershed areas. This permit requires a lot of involvement by RWQCB staff to understand those intricate details. The streamlined reporting in this permit means the RWQCB staff is looking at fewer plans but with more details.

Nancy Palmer (City of Laguna Niguel) shared that South Orange County has been using some of its Integrated Regional Water Management (IRWM) money to develop regional action projects. To do so, they had to find contracting entities under the IRWM that crossed the boundaries; e.g., the Municipal Water District of Orange County is administering a grant for smart landscaping improvements. All the cities in South Orange County have a piece of that pie, but it is administered through a different agency by a grant opportunity. This is an example of an inter-jurisdictional project that is being managed by an identified entity. There are, however, certain projects that become orphans because they are inter-jurisdictional, highly complex, difficult to move forward, or extremely expensive. In the current administrative draft of the permit, there are requirements that regional BMPs are acceptable so long as the BMP is built during the first phase of the project. That does not typically work. It is, however, common in the community development field that for community parks a certain amount of park in lieu fees are collected during the development process and when a certain percentage of buildout is reached, the park is then built using those fees. Nancy suggests those clauses in the administrative draft permit be re-thought.

Colin Kelly (OC Coastkeeper) countered Nancy's argument stating that there have been severe deficiencies with programs that allow BMPs to be developed toward the end of large projects. Especially with the bad economy, some developments have ended up with no BMPs or orphaned BMPs. Colin acknowledged, however, that there are development differences across the jurisdictions and watersheds; some jurisdictions still have high demand for new development so those developments are completed, while other jurisdictions have several developments that have been halted due to low demand and the economy.

Laurie Walsh (RWQCB) informed the group that this topic will be discussed at a future focused meeting and again encouraged stakeholders to submit permit language suggestions.

Jill Witkowski (SD Coastkeeper) asked for more information on how to review the Water Quality Improvement Plans together with the JRMPs. The public needs adequate time to review the reports altogether to check for orphan priorities. Then there needs to be time and a process to resolve conflicts between jurisdictions. Laurie Walsh (RWQCB) said they are interested in hearing more ideas on timing for the public vetting process. Wayne Chiu (RWQCB) explained that orphaned priorities, conflicts between jurisdictions, and other issues would come to light with the audits of the jurisdictions' programs.

Wayne Chiu (RWQCB) explained that they tried to incorporate into the permit a concept of individual jurisdictional accountability as much as possible. There is the Water Quality Improvement Plan that ties jurisdictions together; however, each jurisdiction will be reviewed based on its own merits and own implementation of its portion of achieving the objectives of the Water Quality Improvement Plan. This will require RWQCB staff to look at programs on an individual and watershed scale.

Drew Kleis (City of San Diego) said the Copermittees are very focused on having individual measurability and responsibility. The numeric targets may be set for each Copermittee and that becomes their piece of the pie in addressing implementation of the Water Quality Improvement Plans. Subchapters in and attachments to the Water Quality Improvement Plans will clearly state what each jurisdiction's commitments are. It will be critical to look across watersheds to understand jurisdictional commitments.

Grant Sharp (County of Orange), as someone who helps put together a JRMP for a Copermittee subject to multiple MS4 permits, is highly interested in how the JRMP relates to the Water Quality Improvement Plan. Grant shared that the County of Orange is subject to two separate Phase I MS4 Permits, but the County does not prepare a separate JRMP for each permit. The County prepares one JRMP that covers both permits. The JRMP should document everything being done within the jurisdictional boundaries; it should be a clearinghouse for data; it should be a document that states who, what, and how things are going to be done from the priorities within the Water Quality Improvement Plans. The priorities of the Water Quality Improvement Plans do not need to be reiterated in the JRMPs, just referenced so that the JRMP does not have to be revised every time the WQIP is revised.

Wayne Chiu (RWQCB) explained that the JRMPs establish the programs and lay out who is responsible for doing what within the jurisdiction or each component within the permit. This administrative draft permit has removed some specifics of how often, what frequency of inspections are required to allow discretion by the Copermittee in terms of inspections and enforcement. All actions must still work towards meeting the three basic requirements/objectives of the permit. The RWQCB wants to see outcomes from the Copermittees' actions, whether they are successes or failures. If they are failure, then Copermittees are expected to figure out why their actions failed and revise their plans.

Todd Snyder (County of San Diego) agreed that it is important to see the JRMP to understand how things are being prioritized for jurisdictions in multiple watersheds. This is especially significant to the discussion of phasing plan submittal. To understand commitments in Water Quality Improvement Plans, one needs to understand commitments

at jurisdictional levels (JRMPs). It is unclear how a phased plan submittal process for public review would accommodate this issue.

Chris Crompton (County of Orange) questioned why Section B and Section F are separated in the administrative draft permit. The draft permit seems to have conflicting language about whether the plans are expected to be revised annually or only once every three years. He recommended aligning the JRMP and Water Quality Improvement Plan sections, keeping Sections B, F, and E (TMDLs) closer together either as sequential sections or a combined section.

Jon Van Rhyn (County of San Diego) believes that structurally one of the hardest issues to address in this permit is the annual reporting. Copermittees have to document watershed and jurisdictional commitments, then generate annual reports. Jon does not believe the administrative draft permit fully anticipates all the issues implied in getting through these multiple plans and reports. The San Diego Copermittees, Orange County Copermittees, and SD Coastkeeper volunteered to develop suggested language to address these issues.

Jon Van Rhyn (County of San Diego) appreciated that the RWQCB has taken steps toward streamlined reporting; however, when reporting is too streamlined, it makes it difficult to maintain transparency. In addition, in the administrative draft permit, it appears that JRMP annual reports continue until watershed reports start (Attachment D), but it is unclear as to what happens with JRMP reports after that.

Wayne Chiu (RWQCB) acknowledged Jon's comments and said perhaps having reporting components in one section would be more helpful. With regard to streamlined reporting, the administrative draft permit does focus more on reports on the watershed level than the jurisdictional level. The RWQCB plans to review the jurisdictional level more through audits and working closer with Copermittees. The RWQCB understands that the transparency allowed through streamlined reporting is not fully fleshed out. Wayne continued that the concept behind the regional clearinghouse was to provide documentation and thus transparency to the public. The regional clearinghouse at this time is primarily focused on monitoring data, not inspection or activity data, but that is an area where the RWQCB is open to suggestions. Jon Van Rhyn (County of San Diego) suggested working with the environmental and development communities to develop ways to include things in the clearinghouse that show transparency and robust programs.

Jill Witkowski (SD Coastkeeper) admitted the two-page jurisdictional annual report is a bit terrifying because very little information is provide compared to previous reports. The two-page format does not reflect the work being done. Jill would prefer to see a dashboard-type setup that shows progress bars toward achieving goals; something that is a meaningful summary that still touts the work being done.

Chris Crompton (County of Orange) is also concerned with such a short report as Copermittees ultimately have to defend their programs through audits. Having a thicker report with more information greatly assists with collecting adequate data for such audits.

Wayne Chiu (RWQCB) and Eric Becker (RWQCB) acknowledged the stakeholders' concerns. They explained the Copermittees would still need to maintain the data to support their reports. The RWQCB is open to making the jurisdictional reports a two-page minimum,

allowing the Copermittees to provide additional pages for sufficient information to annually describe their programs and efforts.

VI. Adaptive Management Areas of Permit

Laurie Walsh (RWQCB) stated the administrative draft permit includes some areas for adaptive management. The RWQCB would like to see if those sections are well-received by the stakeholders or if there are other areas to add adaptive management within the permit.

Thom Spanos (SD Coastkeeper) voiced Coastkeeper's support for adaptive management. He specifically highlighted the adaptive management in the JRMP Section of the administrative draft permit where it states that Copermittees are to look at all available data. Thom asked of the Copermittees what SD Coastkeeper and other NGOs could do to make their data useful to the Copermittees.

Drew Kleis (City of San Diego) replied that the Water Quality Improvement Plans and JRMPs first need to be developed so that the Copermittees understand the questions or issues they are to address with the monitoring data. For the data to be useful, they will need to answer a question or issue identified in the Water Quality improvement Plans or JRMPs. Jon Van Rhyn (County of San Diego) noted that the San Diego Copermittees have used SD Coastkeeper's and other NGO's monitoring data in the past. Elaine Lukey (City of Carlsbad) noted that the data need to be strategic, fit into the Water Quality Improvement Plan, be collected in a manner that follows standard protocol, and analyzed in a certified laboratory. Elaine also noted that the Copermittees' stormwater hotlines are always open to receiving notice from NGOs and the public of any observed pollutant generating activities (PGAs).

Regarding the adaptive management areas of the permit, Mikhail Ogawa (City of Del Mar) referred to slide 5 of the San Diego Copermittees' handout. For the San Diego Copermittees, it is unclear in the administrative draft permit what is or is not up for adaptive management. The San Diego Copermittees provided examples of adaptive management based on their understanding of the administrative draft permit, including geographic adjustments, level of effort adjustments within a permit component, method adjustments within a permit component, and level of effort adjustments across permit components. San Diego Copermittees suggested inserting language in Section II.B.5 to clarify what sections of the permit "shall be considered, as appropriate," by each Copermittee for adaptation.

Wayne Chiu (RWQCB) clarified that everything within the Water Quality Improvement Plans is up for adaptation. How the jurisdictional programs are implemented can be adapted through what is discovered in implementing the Water Quality Improvement Plans. For example, the numeric action levels for non-stormwater are based on the water quality objectives. While there is a set of numeric action levels that must be included, that does not mean that all those numeric action levels must be used during implementation of the plan; resources, including monitoring data analysis, can be prioritized on specific pollutants with numeric action levels. Other examples include the LID and hydromodification requirements. The requirements must be in the permit even though meeting those requirements onsite may be a challenge. The performance standards should be used to drive the way the

programs are implemented; such that the programs achieve the goals of those standards through alternate methods (e.g., offsite projects, regional BMP projects, etc.).

Bryn Evans (Industrial Environmental Association) supports the described level of adaptation for the Copermittees. The required monitoring and inspections for industrial sites through other NPDES permits may come into play with adaptive management.

Mike McSweeney (BIA) expressed frustration with the time constraints of the focused meetings and written comment period. The BIA is feeling time-pressured to digest what has been proposed, talk it through with other stakeholders, and provide quality feedback.

David Barker (RWQCB) explained that the focused meetings are a vetting process for the administrative draft permit. There have been four day-long meetings scheduled and dedicated to discussing key issues, along with a five-month schedule for receiving written comments on the administrative draft. After the administrative draft process, there will be another review period for the draft permit, including public hearings and the opportunity for submitting more written comments.

Colin Kelly (OC Coastkeeper) feels there is ample time provided in this permit development process. Jill Witkowski (SD Coastkeeper) concurred with Colin. Elaine Lukey (City of Carlsbad) shared appreciation for the process and the time given in development of this permit.

Jill Witkowski (SD Coastkeeper) referenced Section B.5.a.1.(h) (page 20) of the administrative draft permit where it says public comment will be solicited for the Water Quality Improvement Plans and asked how that will look and at what point public participation will be invited. She also asked how that will dove-tail with the annual reports, as the permit language is vague on the issue. Jill encouraged early, informed public participation for the best results.

Jon Van Rhyn (County of San Diego) admitted it is unknown at this point how the public participation process will work; however, it will be set up during the planning process; therefore, it is critical that the public is part of the development of the plan. Jill Witkowski (SD Coastkeeper) agreed and would appreciate public involvement early in the process.

Elaine Lukey (City of Carlsbad) stated that some areas of the permit dictate that Copermittees must do X, Y, and Z. She suggested adding the language “for the priorities that fit with the watershed” to those required activities.

Chris Crompton (County of Orange) shared in his experience that changes and adaptation are inherently a slow-moving process. Wayne Chiu (RWQCB) explained that the RWQCB is not expecting adaptation every six months or every year. Some issues may not yield significant results even on the 5-year basis. Chris Crompton (County of Orange) agreed that there should be minor course corrections on an annual basis. Todd Snyder (County of San Diego) referred to the San Diego Copermittees’ handout (see graphic below), explaining the mid-course corrections will be the smaller loop and will be minor changes; the overall or big-picture questions and adaptations will be the outer loop on a 5-year or longer term.

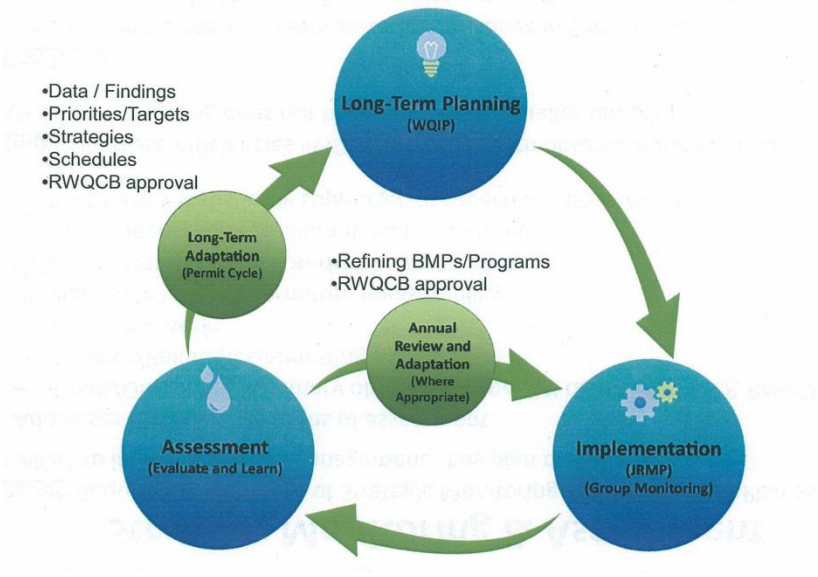

Jon Van Rhyn (County of San Diego) described the differences between program modification and adaptive management. Program modification happens every now and then and is unpredictable. Adaptive management is more defined; it is question-driven. Adaptive management uses questions to direct program modifications; therefore, the questions being asked need to be understood at the beginning of the adaptive management process.

Wayne Chiu (RWQCB) asked the stakeholders how they learn best, where they learn best, and how does the RWQCB put that into the permit. Jon Van Rhyn (County of San Diego) explained that looking back to learn works well only if the plan is well thought out in the beginning. Jon emphasized beginning with a truly robust and comprehensive planning process is important.

Todd Snyder (County of San Diego) referenced slide 10 of the San Diego Copermittees' handout, suggesting development of a Strategic Monitoring and Assessment Plan as part of the Water Quality Improvement Plan to inform adaptive management. This is expected to be discussed in more detail at the next focused meeting; however, Todd recommended the RWQCB provide an opportunity for the San Diego Copermittees to walk through the Strategic Monitoring and Assessment Plan to provide an adequate description before opening up the discussion to questions and answers.

Ziad Mazboudi (City of San Juan Capistrano) provided an example of how the City learned to adjust its program with regard to over irrigation. The City worked with water districts, educated the public, and provided rebates for smart timers instead of attempting to write enforcement tickets for each violation of over irrigation. This was a change in tactic that resulted in the same goal being achieved.

VII. Other Topics

There were some topics raised during the focused meeting that were not within the scope of the meeting but should be discussed at more appropriate times. These included:

- CalGreen / Hydromodification Dedicated Meeting
- Legal Issues
- Aliso Creek / specific areas of geography
- Ninth Circuit Court Decision
- BET and Other Technologies
- Regional BMP Funding and Implementation
- Review time for permit
- Monitoring Presentation by San Diego County Copermittees

VIII. Audience Comments

Comment: Cid Tesoro (County of San Diego), in reference to the proposed meeting, workshop, or symposium focused on hydromodification, recommended also including the full Land Development portion of the permit.

Question: Khosro Aminpour (City of Chula Vista) asked how anti-backsliding works in the realm of adaptive management; will the anti-backsliding policy prevent Copermittees from eliminating inefficient program elements?

Response: David Barker (RWQCB) explained that the anti-backsliding provisions are addressed in the NPDES permit regulations and are usually used in the context of preventing backsliding (relaxation) of numeric effluent limitations. David indicated that RWQCB staff are not prepared to conclude during these focused meetings whether any specific permit requirement is, or is not, subject to the anti-backsliding policy. Therefore, all issues should be open for discussion and we should not let anti-backsliding considerations take issues off the table at this point. Legal determinations will be made at a later date. It is a complicated regulation, but it would not prevent programmatic changes. Cindy Lin (US EPA) concurred.

IX. Meeting Adjourned

San Diego RWQCB
Permit Reissuance Focused Meeting

July 11, 2012

WQIP and JRMP Approval Process

Discharge Prohibitions

- Change "prohibit non-storm water discharges from MS4" to "effectively prohibit …"

Iterative Process

- Include reference to A.4. in sections A.1, A.2, and A.3 to define compliance through the iterative process. Explicit language is needed in light of 9th Circuit Court's finding of the separate enforceability of these provisions.

WQIP and JRMP Approval Process

Concept: The intent of the Permit is for dischargers to submit WQIP and JRMP updates for approval. Compliance is achieved through the submittal, implementation, and update of approved plans. Jurisdictional accountability comes from review and approval of jurisdictional commitments.

Examples:

- If there are 6 dischargers in one WMA, and 5 dischargers' commitments are approved when the WQIP is submitted, any re-submittals need to focus on individual dischargers, not the entire watershed.
- There appears to be no approval process for the JRMP update in year 1 of the permit.
- There is no timeline for approval of annual updates in years 2, 3, 4, 5.
- From previous workshops, "Numeric Targets" are not enforceable.

Action Items:

1. Insert language clarifying identification of individual jurisdictional commitments in WQIP, and insert language clarifying RWQCB approval of individual jurisdictional commitments.
2. Add language to include RWQCB approval timeline for JRMP updates in year 1.
3. Add language in II.F. stating there is a specific (e.g., 90-day) RWQCB approval timeline for annual updates in years 2, 3, 4, 5.
4. Add language to permit, not fact sheet, about non-enforceability of Numeric Targets

WQIP and JRMP Approval Process

Concept: WQBELs in TMDLs are currently expressed as either:

a) Achievement of receiving water limitations, or

b) Achievement of a receiving water limitation applied at the MS4 outfall, and applied as a concentration instead of a load.

Action Item: Add other means of demonstrating compliance with WQBELs, for example:

- Load-based compliance with Waste Load Allocations
- Implementation of EO-approved TMDL compliance plan
- Compliance with exceedance limitations expressed as 'days' or 'frequency' (Bacteria TMDL for Beaches & Creeks)
- Other means of compliance identified in future TMDL language

Adaptive Management Areas of Permit

Concept: The intent of the Permit is to allow for adaptation of Permit programs, strategies, and procedures to enable Copermittees to more effectively and efficiently achieve their goals. Modifications need not be additive. Modifications must be reasonably expected to result in equal or greater overall effectiveness. Modifications can include adjustments to level of effort or methods either geographically, across permit components, or within permit components.

Examples:

- Geographic / Level of Effort Adjustment: Refer to Slides #6 and #7
- Within Permit Component / Level of Effort Adjustment: Modifying IDDE procedures in Section II.E.2.d. (less water quality sampling, more observations)
- Within Permit Component / Method Adjustment: Modifying inspection procedures in Section II.E.5.: Refer to Slide #8
- Across Permit Component / Level of Effort Adjustment: Reducing inspection frequencies in Section II.E.5., and increasing education activities in Section II.E.7.

Action Item: To make clear what is eligible for adaptation, insert language in Section II.B.5. (Adaptive Management Process) clarifying what sections of the Permit "shall be considered, as appropriate," by each Copermittee for adaptation.

Adaptive Management Areas of Permit: Residential Example

Concept: Permit intent is to allow for adaptation of:

- Residential inventory content
- Tools used to address Residential land use as source: O+E, IC/ID complaint response, inspections, street sweeping, MS4 cleaning
- Any other tools needed, providing that residential land use is a source of a WQIP priority

Example: If a Copermittee is in Watersheds 1 and 2 in the figure (slide 7), and residential land use is only a priority in Watershed 1, the Copermittee could conduct IC/ID complaint response in Watershed 2, and conduct any combination of other tools in Watershed 1 to address the priority.

Action Item: Clarify language, where appropriate, to allow modifications to inventories and control strategies with supporting rationale and justification.

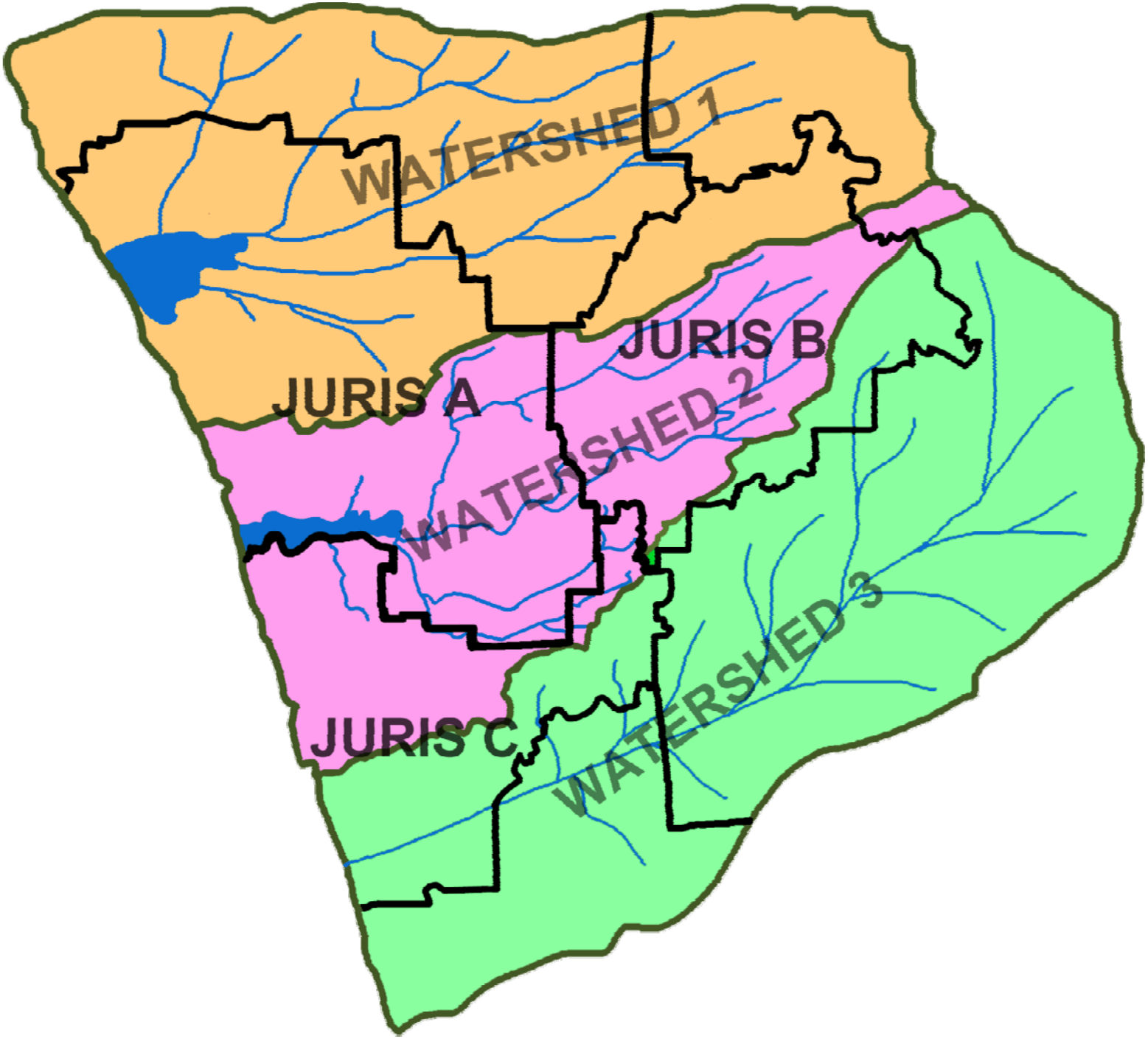
WATERSHED 1
JURIS A
JURIS B
WATERSHED 2
JURIS C
WATERSHED 3

Adaptive Management Areas of Permit: Inspections

Concept: Permit intent is to allow for adaptation of Provision E requirements to allow modifications to inspection methodology as a result of adaptive management

Example: Use of multiple inspection methods to effectively and efficiently verify implementation of BMPs

- "Traditional" Inspections (internal, single business, some external)
- Property-Based Inspections (external-focused on PGAs, internal if necessary, multiple-businesses on one property)
- Patrols or complaint based inspections

Action Item: Clarify language, where appropriate, to allow modifications to inspection methods and requirements with supporting rationale and justification

Adaptive Management Areas of Permit: Long-Term vs. Annual Processes

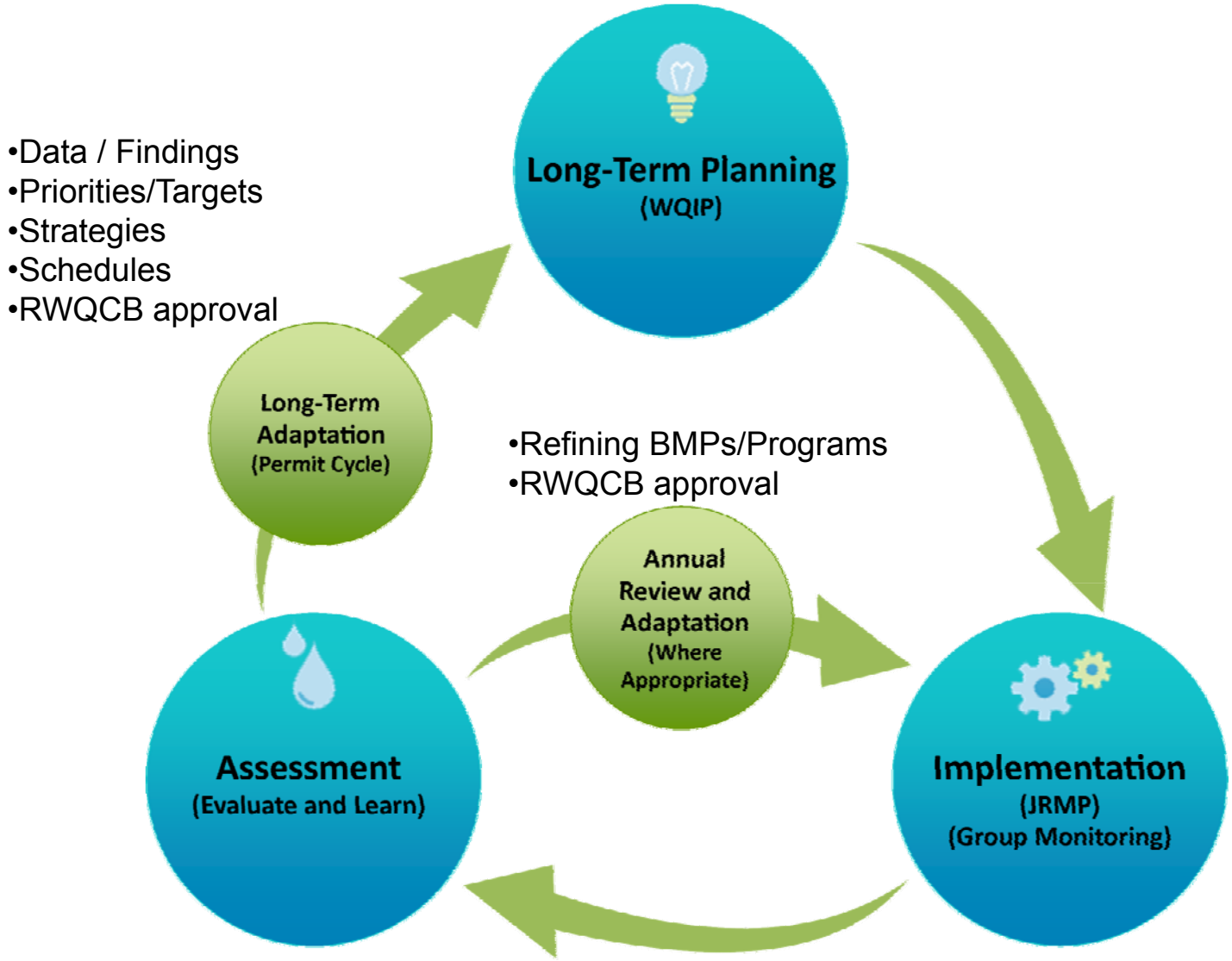

Adaptive Management Areas of Permit: Strategic Monitoring & Assessment

Concept: Require development of Strategic Monitoring and Assessment Plan as part of the WQIP to inform adaptive management. Key plan characteristics:

- Addresses the following areas of assessment:
  - Goals/Outcomes/3 primary objectives (Non-SW discharges, MEP, Rcvg Wtrs)
  - Sources/Pollutant Generating Activities
  - Programs/BMPs
- Provides individual Copermittee measurability
- Utilizes a strategic, question-driven approach
- Prioritizes (geographic, pollutant, water body, etc.)
- Ability to use a statistically supported approach for assessment

Example: Increase efficiencies in IDDE Programs with observational methods (or other strategies); monitoring does not have to be water quality sampling

Action Items:

- Structure initial requirements according to above in Section II.D.
- Adjust language in Section II.B. to require a strategic monitoring and assessment plan as a part of the WQIPs.

FOCUSED MEETING AGENDA

Administrative Draft of
Tentative Order No. R9-2012-0011, NPDES No. CAS0109266
Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region

Wednesday, July 25, 2012
9:30 a.m. - 3:30 p.m.

9:30 a.m. - 9:40 a.m.	Introductions, Table Participants
9:40 a.m. - 9:50 a.m.	Meeting Recap & Feedback, Lewis Michaelson, Katz & Associates
9:50 a.m. - 10:00 a.m.	Focused Meeting Highlights, David Barker, San Diego Water Board
10:00 a.m. - 10:10 a.m.	Monitoring Requirements Intro, Eric Becker, San Diego Water Board
10:10 a.m. - 11:30 a.m.	Stakeholder Monitoring Presentations, Table Participants
11:30 a.m. - 12:30 p.m.	Lunch
12:30 p.m. - 1:30 p.m.	Discussion on Monitoring Proposals Related to Permit Requirements, Table Participants
1:30 p.m. - 1:45 p.m.	Break
1:45 p.m. - 3:00 p.m.	Discussion on Monitoring Proposals Related to Permit Requirements, Table Participants
3:00 p.m. - 3:30 p.m.	Parking Lot Discussion Comments & Questions All

ELECTRONIC MAIL LIST SUBSCRIPTION

The San Diego Water Board has established an electronic mail list specifically for information and notices on the development of a Regional MS4 Storm Water Permit. The San Diego Water Board will use the email list to notify interested persons of upcoming important events and the availability of on-line documents. Persons interested in receiving future notices and information on this specific project can subscribe to one (1) of the electronic mail lists titled "Orange County MS4 Permit, " Riverside County MS4 Permit, or "San Diego MS4 Permit ", located on the San Diego Water Board website at:

http://www.waterboards.ca.gov/resources/email_subscriptions/reg9_subscribe.shtml

Meeting Date	Topic Discussion Questions	Draft Permit Provisions
June 27, 2012 July 11, 2012	**ASSESSMENT/PLANNING** 1. In what ways can the proposed provisions of the administrative draft permit be modified to better assess if the Copermittees' jurisdictional runoff management programs are effectively prohibiting non-storm water discharges to their MS4s? 2. In what ways can the proposed provisions of the administrative draft permit be modified to better assess if the Copermittees' jurisdictional runoff management programs are reducing pollutants in storm water to the maximum extent practicable (MEP)? 3. In what ways can the proposed provisions of the administrative draft permit be modified to better assess that improvements are being achieved in the physical chemical, and biological conditions of receiving waters as a result of implementing the Copermittees' Water Quality Improvement Plans? 4. How can adaptive management or the "iterative process" be incorporated into the proposed provisions of the administrative draft permit better? 5. How can the proposed provisions of the administrative draft permit be modified to support a Copermittee's ability to plan and/or procure resources for its jurisdictional runoff management program? 6. How can the proposed provisions of the administrative draft permit be modified to reduce or eliminate any conflicts with other requirements (e.g. TMDLs, ASBS) or programs (e.g. flood management, vector control, water supply, recycled water, groundwater recharge)?	II.A. Prohibitions and Limitations (includes WQBELs for TMDLs in Attachment E) II.B. Water Quality Improvement Plans II.C. Action Levels II.D.4.a. MS4 Discharges Assessments II.D.4.b. Receiving Waters Assessments II.D.4.c. Water Quality Improvement Assessments II.F.1. Water Quality Improvement Plans II.F.2.c. Water Quality Improvement Plan Updates II.F.3. Progress Reporting II.F.4. Regional Clearinghouse
July 25, 2012	**ASSESSMENT/MONITORING** 1. In what ways can the proposed provisions of the administrative draft permit be changed to improve how the Copermittees collect data to assess whether their jurisdictional runoff management programs are effectively prohibiting non-storm water discharges to their MS4s? 2. In what ways can the proposed provisions of the administrative draft permit be changed to improve how the Copermittees collect data to assess whether their jurisdictional runoff management programs are reducing pollutants in storm water to the MEP? 3. In what ways can the proposed provisions in the administrative draft permit be changed to improve how the Copermittees collect data to assess whether improvements to the physical, chemical, and biological conditions of receiving waters are being achieved as a result of implementing their Water Quality Improvement Plans?	II.D.1. Jurisdictional Monitoring Requirements II.D.2. Watershed Monitoring Requirements II.D.3. Regional Special Studies II.D.4.a. MS4 Discharges Assessments II.D.4.b. Receiving Waters Assessments II.D.4.c. Water Quality Improvement Assessments II.F.3. Progress Reporting II.F.4. Regional Clearinghouse

Meeting Date	Topic Discussion Questions	Draft Permit Provisions
August 22, 2012	**PLANNING/IMPLEMENTATION** 1. How can adaptive management or the "iterative process" be incorporated into the proposed provisions of the administrative draft permit better? 2. How can the proposed provisions of the administrative draft permit be modified to support a Copermittee's ability to plan and/or procure resources for its jurisdictional runoff management program? 3. How can the proposed provisions of the administrative draft permit be modified to reduce or eliminate any conflicts with other requirements (e.g. TMDLs, ASBS) or programs (e.g. flood management, vector control, water supply, recycled water, groundwater recharge)? 4. How can the proposed provisions of the administrative draft permit be modified to support a Copermittee's ability to implement and enforce its jurisdictional runoff management program to effectively prohibit non-storm water discharges to and from its MS4, and reduce pollutants in storm water discharges from its MS4 to the MEP? 5. How can the proposed provisions of the administrative draft permit be modified to promote retrofitting of existing development and/or implementing projects that can restore or rehabilitate receiving waters as good tools to use as pollution control strategies? 6. How can the proposed provisions of the administrative draft permit be modified to allow the Copermittees to better focus their resources on improving water quality?	II.B. Water Quality Improvement Plans II.E. Jurisdictional Runoff Management Programs II.F.1. Water Quality Improvement Plans II.F.2.a. JRMP Document Updates II.F.2.b. BMP Design Manual Updates II.F.2.c. Water Quality Improvement Plan Updates II.F.3.b. Annual Reports II.F.4. Regional Clearinghouse

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http://www.waterboards.ca.gov/resources/email_subscriptions/reg9_subscribe.shtml

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FOCUSED MEETING, Administrative Draft Tentative Order No. R9-2012-0011

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San Diego RWQCB
Permit Reissuance Focused Meeting

July 25, 2012

Adaptive Management Areas of Permit: Monitoring & Assessment Program (MAP)

Concept: Develop MAP as part of each Water Quality Improvement Plan to provide information needed to answer management questions & support effective adaptive management

MAP Elements:

- Receiving Water Conditions
- MS4 Discharges – Non-stormwater & stormwater
- Sources/Pollutant Generating Activities
- BMP Studies/Program Assessments

Example: Increase efficiencies in IDDE Programs with observational methods (or other strategies); monitoring includes activities beyond water quality sampling

Action Items:

- Structure initial requirements according to above in Section II.D.
- Coordinate Prov. II.D requirements with Section II.B. language requiring a strategic monitoring & assessment program as a part of the WQIPs.

Adaptive Management Areas of Permit: Long-Term vs. Annual Processes

- Data / Findings
- Priorities/Targets
- Strategies
- Schedules
- RWQCB approval

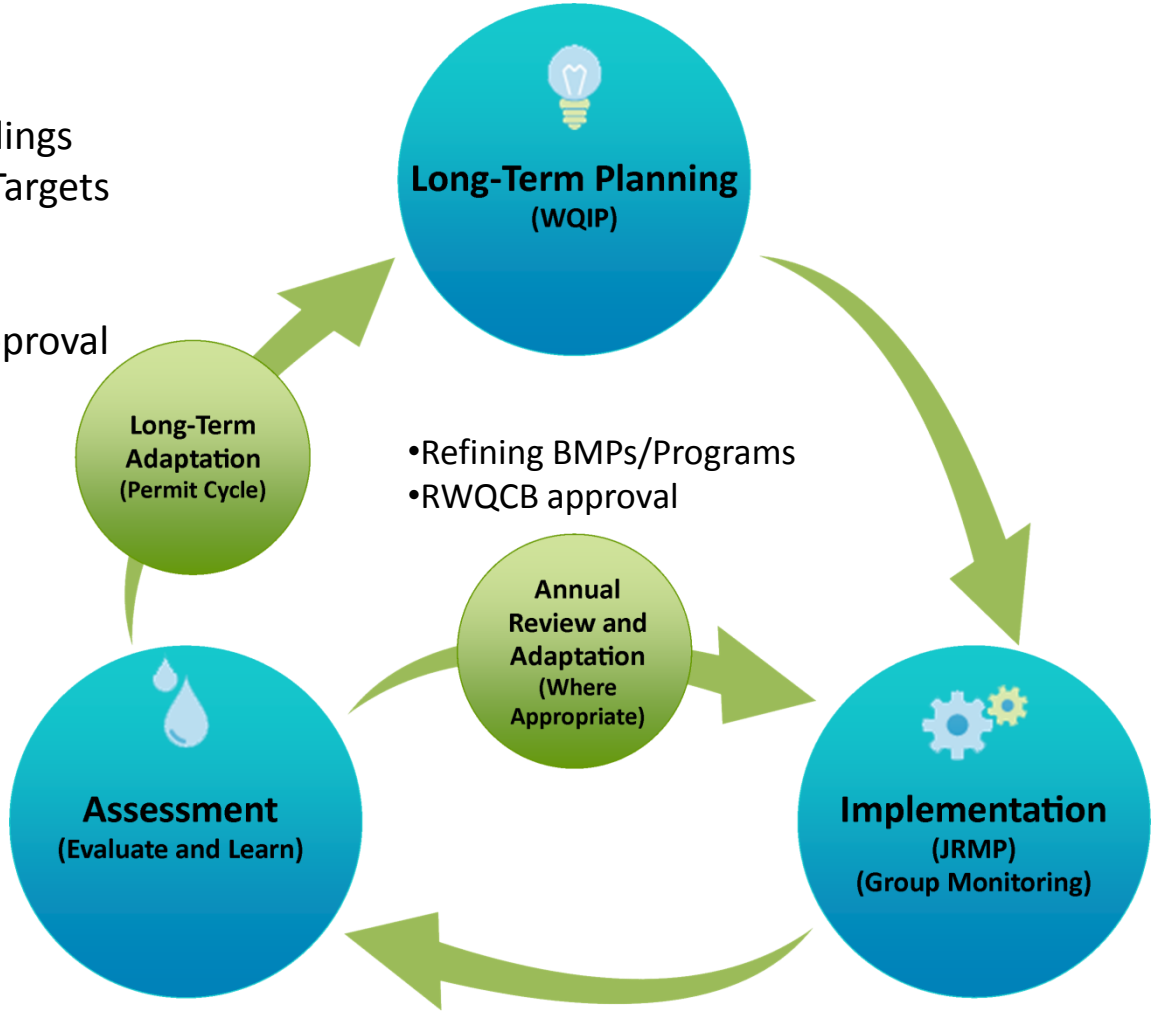

Implementation

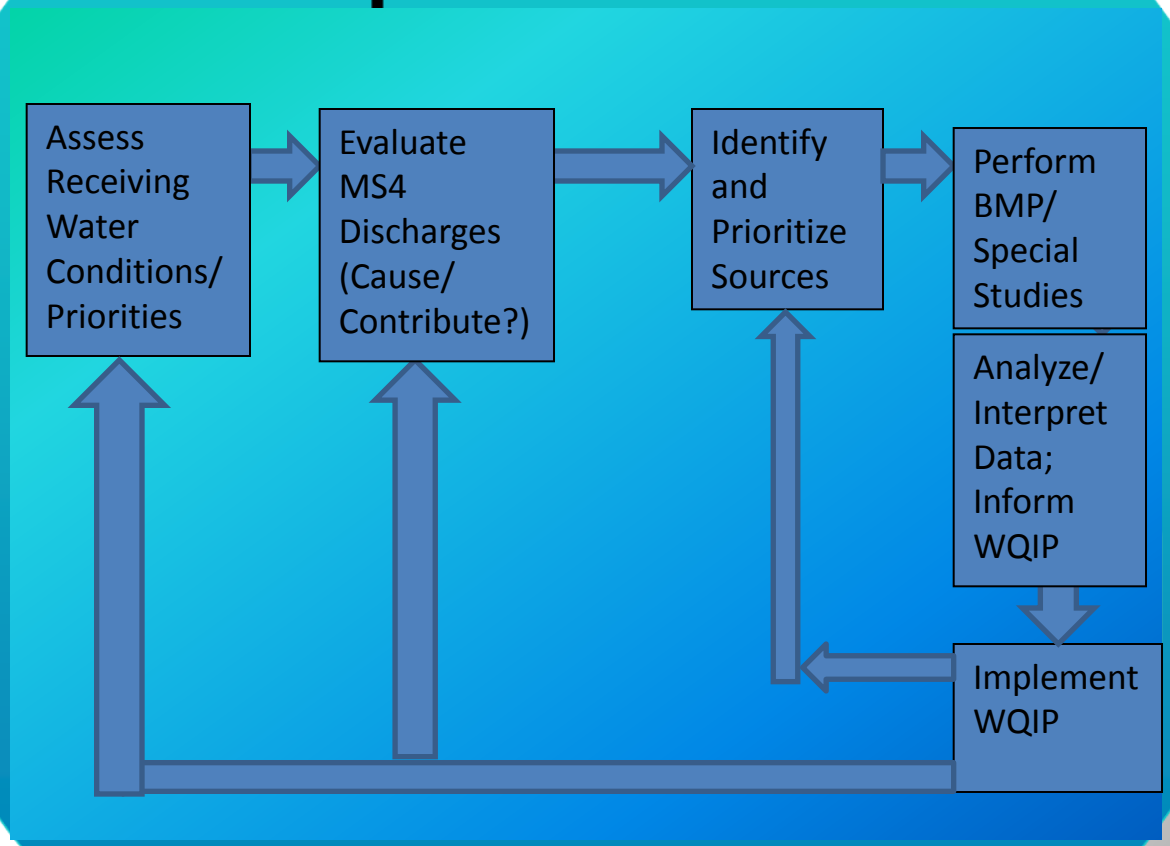

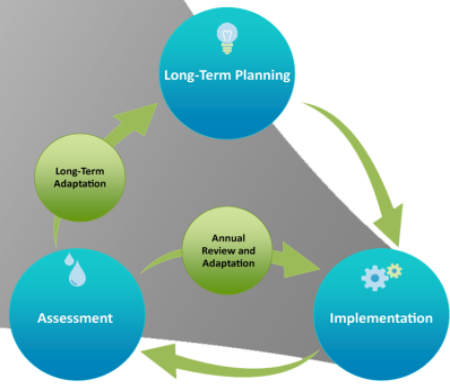

Alternate Provision II.D Rationale

- More effective & efficient use of resources to maximize benefit
- Support **Adaptive Management** needs
- **Question-Driven** Monitoring Approach Design based on Assessment Questions
- Based on 15-20 years of **experience**
- **Monitoring = more than water sampling**
- Ultimately support **WQIP priorities** (strategic, prioritized monitoring approach)

Purpose & Phasing of Alternate Provision II.D

Purpose:

Provide program managers with needed information to support effective adaptive management

Phasing:

- **Pre WQIP (transitional period)** – Proposed Alternate to Provision II.D
- **Post WQIP** – Develop Monitoring & Assessment Program (MAP) to support WQIP priorities

Scientific Basis of Question-Driven Approach

- A Framework for Monitoring & Assessment in the San Diego Region (SDRWQCB, 2012)
- Southern California Stormwater Monitoring Coalition's Model Monitoring Program (SMC, 2004)
- SWAMP Assessment Framework (SWAMP, 2010)
- Elements of a State Water Monitoring and Assessment Program (EPA, 2003)

Key Proposed Changes

- Jurisdictional Non-stormwater Monitoring **(D.1.a)** - Instead of extensive MS4 outfall chemical testing, reduce persistent flows that threaten receiving water quality & eliminate IC/IDs.
- Jurisdictional Stormwater Monitoring **(D.1.b)** - Instead of extensive MS4 outfall chemical monitoring, monitor homogeneous land uses as input to model.
- Jurisdictional Boundary Monitoring **(D.1.a(2))** - Insufficient technical power to differentiate small changes in upstream & downstream water quality due to the inherent variability of water quality data; Determine receiving water monitoring in MAP.
- Bacteria TMDL Monitoring **(Att. E)** – Instead of extensive prescriptive monitoring, rely on monitoring plans prepared as part of the current implementation planning process due to RWQCB October 2012.

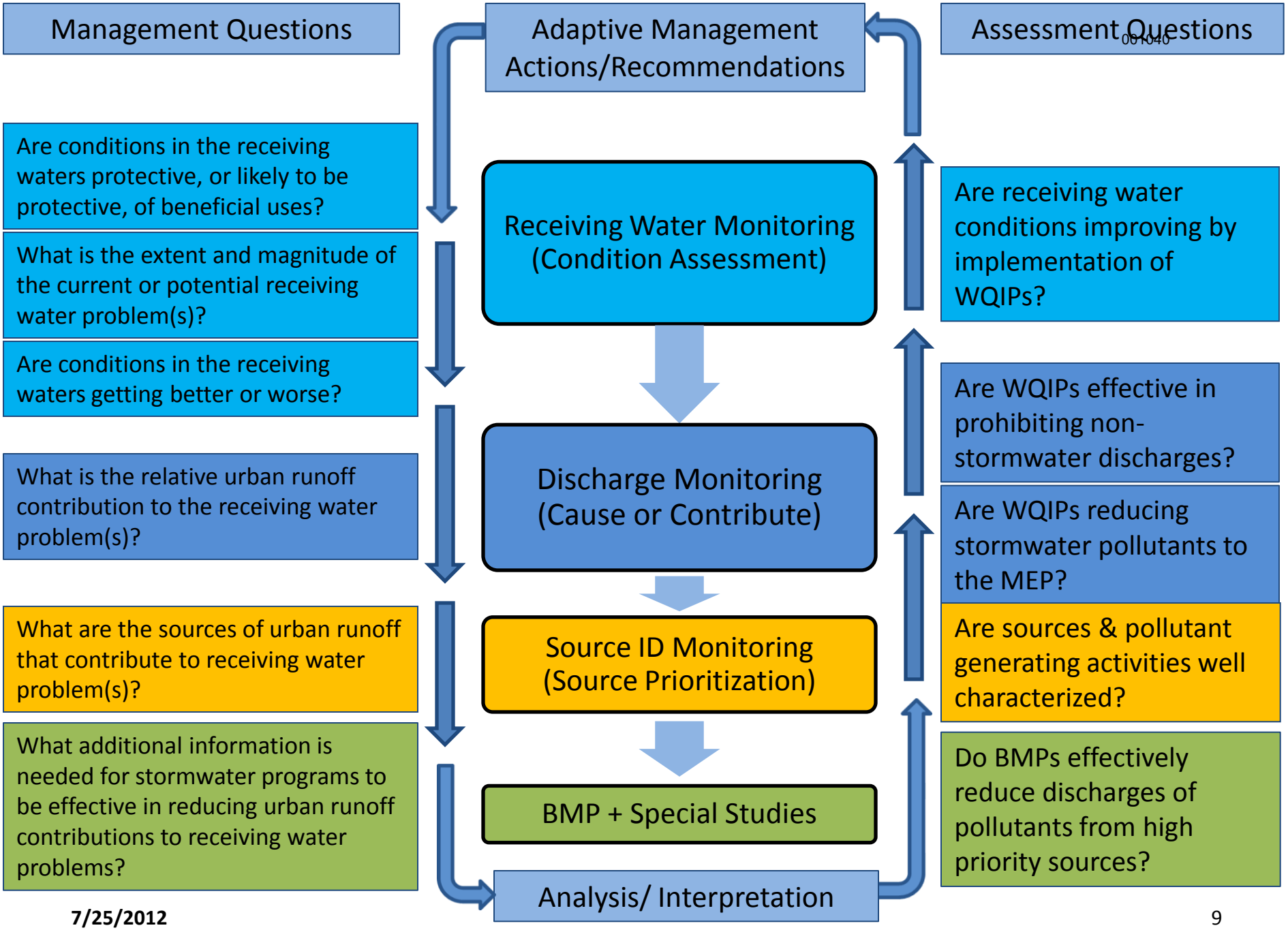
Management Questions
Adaptive Management Actions/Recommendations
Assessment Questions
Are conditions in the receiving waters protective, or likely to be protective, of beneficial uses?
What is the extent and magnitude of the current or potential receiving water problem(s)?
Are conditions in the receiving waters getting better or worse?
What is the relative urban runoff contribution to the receiving water problem(s)?
What are the sources of urban runoff that contribute to receiving water problem(s)?
What additional information is needed for stormwater programs to be effective in reducing urban runoff contributions to receiving water problems?
Receiving Water Monitoring (Condition Assessment)
Discharge Monitoring (Cause or Contribute)
Source ID Monitoring (Source Prioritization)
BMP + Special Studies
Analysis/ Interpretation
Are receiving water conditions improving by implementation of WQIPs?
Are WQIPs effective in prohibiting non-stormwater discharges?
Are WQIPs reducing stormwater pollutants to the MEP?
Are sources & pollutant generating activities well characterized?
Do BMPs effectively reduce discharges of pollutants from high priority sources?

Receiving Water

Management Questions	Adaptive Management Actions/Recommendations	Assessment Questions
Are conditions in the receiving waters protective, or likely to be protective, of beneficial uses?	**Receiving Water Monitoring (Condition Assessment)**	**Are receiving water conditions improving by implementation of WQIPs?**
What is the extent and magnitude of the current or potential receiving water problem(s)?		
Are conditions in the receiving waters getting better or worse?		
What is the relative urban runoff contribution to the receiving water problem(s)?	Discharge Monitoring (Cause or Contribute)	Are WQIPs effective in prohibiting non-stormwater discharges?
		Are WQIPs reducing stormwater pollutants to the MEP?
What are the sources of urban runoff that contribute to receiving water problem(s)?	Source ID Monitoring (Source Prioritization)	Are sources and pollutant generating activities well characterized?
What additional information is needed for stormwater programs to be effective in reducing urban runoff contributions to receiving water problems?	BMP + Special Studies	Do BMPs effectively reduce discharges of pollutants from high priority sources?
	Analysis/ Interpretation	

Receiving Water Monitoring

Assessment Question

Are the physical, chemical, and biological conditions of receiving waters being improved by the WQIPs?

Management Questions

Are conditions in receiving waters protective, or likely to be protective, of beneficial uses?

What is the extent and magnitude of the current or potential receiving water problems?

Are conditions in receiving waters getting better or worse?

Specific Questions

What are the status & trends in enclosed bays harbors estuaries and lagoons?

What are the status & trends in coastal waters?

What is the progress in achieving & complying with adopted TMDL targets?

Specific Activities

SMC Regional Monitoring

Southern California Bight Regional Monitoring

Sediment Quality Monitoring

HMP Monitoring

ASBS Monitoring

TMDL Monitoring

San Diego Regional Reference Stream Study

Pre WQIP: 5 WMA mass loading stations every other year

Pre WQIP: 1 temporary Watershed Station per WMA annually

Post WQIP (example): Receiving Water Monitoring to be based on watershed priorities, TMDL, & 303d listings

Alternate Provision II.D: Receiving Waters Element

Purpose	Assess Conditions of Receiving Waters, Extent/Magnitude, Trends
Methods	• Stormwater Monitoring Coalition (creeks) • Bight (estuaries, coastal waters) • Sediment Quality Monitoring (estuaries) • TMDL Monitoring (creeks/beaches) • Areas of Special Biological Significance • Mass Loading Stations • Temporary Watershed Stations • Third Party Data
Rationale & Benefits	• Broad Spatial and Temporal Coverage • Integrates existing programs • Preserves long -term trend assessments • Supports assessment-driven, adaptive management approach

Discharge Monitoring

Management Questions	Adaptive Management Actions/Recommendations	Assessment Questions
Are conditions in the receiving waters protective, or likely to be protective, of beneficial uses?	Receiving Water Monitoring (Condition Assessment)	Are receiving water conditions improving by implementation of WQIPs?
What is the extent and magnitude of the current or potential receiving water problem(s)?		
Are conditions in the receiving waters getting better or worse?		
What is the relative urban runoff contribution to the receiving water problem(s)?	**Discharge Monitoring (Cause or Contribute)**	**Are WQIPs effective in prohibiting non-stormwater discharges?**
		Are WQIPs reducing stormwater pollutants to the MEP?
What are the sources of urban runoff that contribute to receiving water problem(s)?	Source ID Monitoring (Source Prioritization)	Are sources and pollutant generating activities well characterized?
What additional information is needed for stormwater programs to be effective in reducing urban runoff contributions to receiving water problems?	BMP + Special Studies	Do BMPs effectively reduce discharges of pollutants from high priority sources?
	Analysis/ Interpretation	

Non-Stormwater Discharge Monitoring

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Assessment Question

Are jurisdictional runoff management programs effectively prohibiting non-storm water discharges to their MS4s?

Management Questions

What is the relative urban runoff contribution to receiving water problem(s)?

What are the sources of urban runoff that contribute to receiving water problems(s)?

Specific Questions

Are the numbers of ICIDs identified &/or eliminated increasing or decreasing?

Do discharge concentrations at outfalls meet applicable permit action levels?

Which discharges should be investigated as potential IC/IDs?

Which non-storm water discharges are transient?

Which MS4 outfalls exhibit persistent dry weather flows?

Which MS4 outfalls impact receiving water quality during dry weather?

Specific Activities

Pre/Post WQIP: Conduct visual Inspections of prioritized major outfalls annually

Compile a prioritized list of major outfalls with persistent dry weather discharges to receiving waters

Identify& map one major outfall to monitor in each urbanized HSA twice annually (approximately 70)

Pre-WQIP: Semi-annual field measurements & lab analyses

Post-WQIP (example): Semi-annual analyses of watershed priorities based on TMDL, 303(d), & NAL constituents

Evaluate data, rank outfalls by potential threat to receiving water quality, & produce prioritized list of outfalls for follow-up

Alternate Provision II.D: Discharge Element – Non-Stormwater

Purpose	Address effective prohibition of non-stormwater discharges
Methods	**Transient Flow Programs (IDDE)** • Source identification: existing development inspections • MS4 system programs: patrols, complaint response, MS4 cleaning • Outfall program: visual inspections for transient flows & prioritization, investigations **Persistent Flow Programs** • Current MS4 outfall program to completion • Prioritized monitoring at one outfall per urbanized HSA (NALs)
Rationale & Benefits	• Broad spatial & temporal coverage • Supports assessment-driven, adaptive management approach • Distinction between persistent & transient flows focuses resources on eliminating &/or controlling high priority threats to receiving waters quality • Utilizing other elements of the stormwater programs (inspections, complaint calls) & third party information will efficiently & effectively assist jurisdictions in eliminating non-storm water discharges

Management Questions	Adaptive Management Actions/Recommendations	Assessment Questions
Are conditions in the receiving waters protective, or likely to be protective, of beneficial uses?	Receiving Water Monitoring (Condition Assessment)	Are receiving water conditions improving by implementation of WQIPs?
What is the extent and magnitude of the current or potential receiving water problem(s)?		
Are conditions in the receiving waters getting better or worse?		
What is the relative urban runoff contribution to the receiving water problem(s)?	**Discharge Monitoring (Cause or Contribute)**	Are WQIPs effective in prohibiting non-stormwater discharges?
		Are WQIPs reducing stormwater pollutants to the MEP?
What are the sources of urban runoff that contribute to receiving water problem(s)?	Source ID Monitoring (Source Prioritization)	Are sources and pollutant generating activities well characterized?
What additional information is needed for stormwater programs to be effective in reducing urban runoff contributions to receiving water problems?	BMP + Special Studies	Do BMPs effectively reduce discharges of pollutants from high priority sources?
	Analysis/ Interpretation	

Storm Water Discharge Monitoring

Assessment Question

Are jurisdictional runoff management programs reducing pollutants in storm water to the MEP?

Management Questions

What is the relative urban runoff contribution to receiving water problem(s)?

What are the sources of urban runoff that contribute to receiving water problem(s)?

Specific Questions

Do discharge concentrations & loads from MS4 outfalls meet applicable permit action levels?

How do representative MS4 outfall discharge concentrations, loads, & flows change over time?

Which MS4 outfalls impact receiving water quality during wet weather?

Specific Activities

Pre-WQIP: perform storm water discharge monitoring during two wet weather events annually:

(a) Complete the MS4 outfall monitoring program

(b) Narrative descriptions & field measurements

(c) three monitoring stations at representative major outfalls per WMA

Post-WQIP (example): perform storm water discharge monitoring based on representative outfalls

(a) Develop & implement a monitoring frequency appropriate to characterize pollutant discharges from outfalls in each WMA

(b) analyze parameters identified as watershed priorities, TMDLs, SALs, 303d

Alternate Provision II.D: Discharge Element – Stormwater

Purpose	Address stormwater pollutant reduction to the MEP
Methods	• Complete the current MS4 outfall program • Monitoring at three major outfalls per WMA per year to facilitate modeling based on land use characteristics • Utilize Stormwater Action Levels for prioritization
Rationale & Benefits	• Broad spatial & temporal coverage • Supports assessment-driven, adaptive management approach • Flexibility in site selection will focus resources on the highest watershed priorities, whether it be for representative drainage area data or homogeneous land-use based data.

Source/Stressor Identification

Management Questions	Adaptive Management Actions/Recommendations	Assessment Questions
Are conditions in the receiving waters protective, or likely to be protective, of beneficial uses?	Receiving Water Monitoring (Condition Assessment)	Are receiving water conditions improving by implementation of WQIPs?
What is the extent and magnitude of the current or potential receiving water problem(s)?		
Are conditions in the receiving waters getting better or worse?		
What is the relative urban runoff contribution to the receiving water problem(s)?	Discharge Monitoring (Cause or Contribute)	Are WQIPs effective in prohibiting non-stormwater discharges?
		Are WQIPs reducing stormwater pollutants to the MEP?
What are the sources of urban runoff that contribute to receiving water problem(s)?	**Source ID Monitoring (Source Prioritization)**	**Are sources and pollutant generating activities well characterized?**
What additional information is needed for stormwater programs to be effective in reducing urban runoff contributions to receiving water problems?	BMP + Special Studies	Do BMPs effectively reduce discharges of pollutants from high priority sources?
	Analysis/ Interpretation	

Source/Stressor Identification Monitoring

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Assessment Question

Are sources & pollutant generating activities well characterized?

Management Question

What are the sources of urban runoff that contribute to receiving water problems?

Specific Questions

What are the land use sources contributing to the receiving water problems identified in the WQIP?

What are the relative loadings of sources contributing to the receiving water problems identified in the WQIP?

What are the specific pollutant generating activities (PGAs) contributing to the receiving water problems?

Specific Activities

Constituent-specific source ID

Conduct source/stressor identification studies to address program management needs related to watershed priorities.

Step 1: Compile known information on priority constituent(s).

Step 2: Identify data gaps based on information compiled in Step 1

Step 3: Based on information compiled in Step 1, develop a source inventory & a prioritization scheme within the watershed for potential follow-up action

Step 4: Develop a prioritized list of sources for the priority constituent(s) & deliver to the staff responsible for implementing WQIPs

Pre-WQIP: Continue source identification studies pertaining to compliance with TMDLs & development of the CLRP as applicable

Post-WQIP (example): Conduct PGA investigations for nutrients as part of the MAP for watersheds where WQIPs identified nutrients as a high priority.

Alternate Provision II.D Source/Stressor Identification Element

Purpose	Identify & Prioritize Pollutant Sources & Pollutant Generating Activities (PGAs)
Methods	• Pollutant-Specific Source Inventories • Source/PGA Studies • Prioritization of Sources for Follow-up
Rationale & Benefits	• Responsive to Program Management needs • Provides programs with information to verify, quantify, & prioritize sources • Provides links between sources, activities & effects on runoff quantity & quality

BMPs & Special Studies

Management Questions	Adaptive Management Actions/Recommendations	Assessment Questions
Are conditions in the receiving waters protective, or likely to be protective, of beneficial uses?	Receiving Water Monitoring (Condition Assessment)	Are receiving water conditions improving by implementation of WQIPs?
What is the extent and magnitude of the current or potential receiving water problem(s)?		
Are conditions in the receiving waters getting better or worse?		
What is the relative urban runoff contribution to the receiving water problem(s)?	Discharge Monitoring (Cause or Contribute)	Are WQIPs effective in prohibiting non-stormwater discharges?
		Are WQIPs reducing stormwater pollutants to the MEP?
What are the sources of urban runoff that contribute to receiving water problem(s)?	Source ID Monitoring (Source Prioritization)	Are sources and pollutant generating activities well characterized?
What additional information is needed for stormwater programs to be effective in reducing urban runoff contributions to receiving water problems?	**BMP + Special Studies**	**Do BMPs effectively reduce discharges of pollutants from high priority sources?**
	Analysis/ Interpretation	

Special Studies – BMP, Programmatic, & Water Quality

Assessment Question

Do BMPs effectively reduce discharges of pollutants from high priority sources?

Management Question

Are stormwater program BMPs effective in reducing urban runoff contributions to receiving water problems?

Are pollutant sources being effectively addressed to reduce urban runoff contributions to receiving water problems?

Specific Questions

Specific questions developed to address information needs identified in Source/Stressor Identification studies.

Example: Are sources from outside of the MS4 (e.g., natural sources) contributing to receiving water problems?

Specific Activities

Examples of Special Studies

- Assess background concentrations of contaminants in San Diego reference streams
- Evaluate the effectiveness of enhancing outreach & education (i.e., residential BMP rebate programs, over-irrigation enforcement, rainwater harvesting, turf conversion)
- Evaluate the effectiveness of catch basin inlet cleaning
- Evaluate the effectiveness of residential & commercial area patrolling (commercial patrolling may include inspections)
- Evaluate the effectiveness of targeted aggressive street sweeping
- Evaluate the effectiveness of watershed-based inspections

Alternate Provision II.D BMPs & Special Studies

Purpose	• Support effective adaptive management • Assess BMP effectiveness • Perform scientific investigations to address data gaps
Methods	• Pilot BMP Studies • Source ID Special Studies • Water Quality Studies
Rationale & Benefits	• Answers questions related to program & BMP effectiveness • Addresses data gaps to allow more effective program implementation • Provides scientifically valid information related to regulatory principles

Developing Monitoring & Assessment Programs (MAPs) for Each WQIP

STRATEGIC MONITORING APPROACH:

1. Establish stormwater management priorities specific for each WMA ("Watershed Priorities") as part of WQIP development.
2. Compile existing monitoring data & assess available information for receiving waters, MS4 discharges, & sources or stressors within the watershed.
3. Identify regulatory & non-regulatory drivers that apply to water quality monitoring within the watershed, & list all associated monitoring responsibilities assigned to the Copermittees.
4. Evaluate the watershed priorities in context of available monitoring data & existing monitoring responsibilities, & develop specific management questions for each priority issue.
5. Establish metrics & identify assessments that should be performed to supply information needed to address the management questions.
6. Identify elements of a watershed-based monitoring program needed to address the watershed management questions & perform the necessary assessments.
7. Develop detailed monitoring plan to address the identified monitoring needs, coordinated with other ongoing monitoring in the watershed.

Proposed Provision II.D Development of MAP Components

- HYPOTHETICAL WATERSHED EXAMPLE

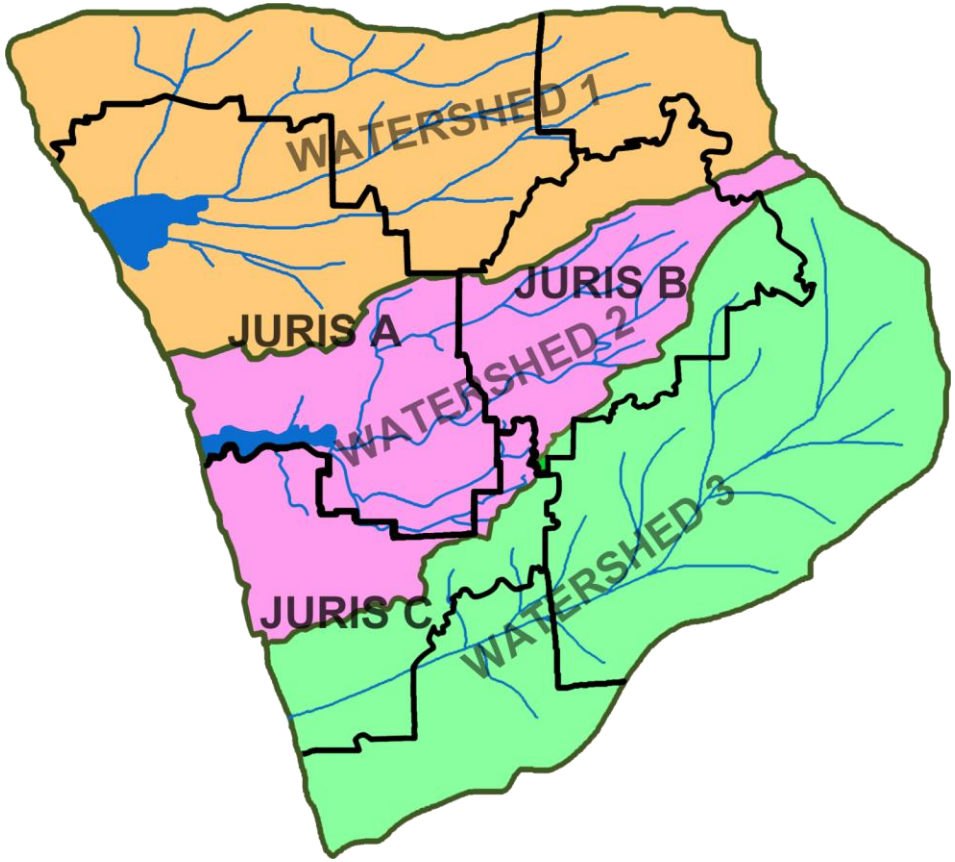

Proposed Provision II.D
WQIP/MAP - Stormwater Discharge Example

- Example WQIP priorities
  - TMDLs: bacteria
  - 303(d) Listings: copper & nutrients
- Likely Assessment question:
  - Are jurisdictional runoff management programs reducing pollutants in storm water to the maximum extent practical?
- Management question:
  - What are the sources of urban runoff that contribute to receiving water problem(s)?

WQIP MAP Example: Stormwater Discharge Monitoring

- Develop Specific questions using available information:
  - MS4s are known sources of bacteria & copper
  - MS4s are less well known as sources of nutrients
  - Loadings from land uses are not well quantified to support planning of wet weather management actions or evaluate their effectiveness
- Specific question
  - *What are the representative MS4 outfall discharge concentrations, loads, & flows?*

WQIP MAP Example: Stormwater Discharge Monitoring

- Approach to answer specific question is to support model development/ calibration/ validation
- Number of sites based on appropriate land use characterization for modeling
  - Characterize individual land uses (i.e., residential) or refine categories of land uses (i.e., SFR & HDR)
- Frequency = 2 storms/year (composite)
- Constituents = bacteria, copper, nutrients, & special study needs
- Duration = at least one adaptive management planning cycle to allow for:
  - Minimum data requirement for adequate characterization
  - Data usability to update management actions for WQIP

Next Steps

- Alternate Provision II.D will be provided
- Technical Memo with Support/Rationale for Alternate Provision II.D

QUESTIONS?

California Regional Water Quality Control Board, San Diego Region
Regional MS4 Permit Focused Meeting

Meeting Notes

Date	Location	Agenda Topics
7/25/2012 Start time: 9:30 AM End time: 2:50 PM	City of Carlsbad Faraday Center 1635 Faraday Ave, Rm 173 Carlsbad, CA 92008	• Focused Meeting Highlights • Monitoring Requirements Introduction • Stakeholder Monitoring Presentation • Discussion on Monitoring Proposals Related to Permit Requirements • Parking Lot Discussion • Other Topics / Audience Comments

I. Introductions

Table participants introduced themselves. Lewis Michaelson (Facilitator) ensured the appropriate representatives were at the table, per the June 20, 2012, San Diego Regional Water Quality Control Board (SD RWQCB) Notice.

San Diego County Copermittees (5): Jo Ann Weber (County of San Diego), Andre Sonksen (City of San Diego), Paul Hartman (City of Vista), Karen Holman (Unified Port of San Diego), Alison Witheridge (City of Oceanside), Mikhail Ogawa* (City of Del Mar), Drew Kleis* (City of San Diego) **Indicates representatives rotated during the meeting.*

Orange County Copermittees (5): Grant Sharp (Orange County Flood Control District), Mary Anne Skorpanich (County of Orange), Ted Von Bitner (County of Orange), Richard Boon (County of Orange), Devin Slaven (City of Lake Forest, Lisa Zawaski* (City of Dana Point) **Indicates representatives rotated during the meeting.*

Riverside County Copermittees (3): Claudio Padres (Riverside County Flood Control District), Bob Collacott (Riverside County Flood Control District), Mike Shetler (County of Riverside)

Environmental Community (3): Colin Kelly (Orange County Coastkeeper), Jill Witkowski (San Diego Coastkeeper), Roger Butow (Clean Water Now! Coalition), Thom Spanos* (San Diego Coastkeeper) **Indicates representatives rotated during the meeting.*

Development/Business Community (3): Bryn Evans (Industrial Environmental Association), Wayne Rosenbaum (BIA), Mike McSweeney (BIA), Mark Grey* (BIA) **Indicates representatives rotated during the meeting.*

U.S. Environmental Protection Agency (US EPA) (1): John Kemmerer

San Diego Water Board Permit Team: David Barker, Wayne Chiu, Laurie Walsh, Eric Becker

II. Focused Meeting Highlights

David Barker (RWQCB) announced that there will be an additional meeting on the topic of hydromodification. The County of Orange has taken the lead on organizing the event, which will run in the same manner as the other focused meetings. Details will be sent out once they are available. A tentative decision has been made to have the meeting the last week of August.

David Barker (RWQCB) provided brief remarks on some of the points raised in the past focused meetings that are resonating with the RWQCB staff.

1. Monitoring doesn't have to be water quality sampling. Water quality data are not the only assessment tool that can be used. There were requests that monitoring programs should include field observations as monitoring data, especially for non-stormwater discharges.
2. Adding language to the permit, not just the fact sheet, about the non-enforceability of action levels.
3. Adaptive management in the permit should be flexible enough for the Copermittees to learn without fear of being out of compliance with the permit.
4. Including more specific public participation requirements for development of Water Quality Improvement Plans, and for development of priorities for the Water Quality Improvement Plans.
5. Clarifying Board approval process for all plan submittals, reports, and updates.
6. Making it clearer in the permit what is eligible for adaptive management practices and clarifying the points of compliance in the permit.
7. Consideration of other means of demonstrating compliance with TMDL requirements that are consistent with the assumptions and requirements of the TMDL. The Board does see some flexibility in how waste load allocations are incorporated into the permit.
8. Examining the proposal to change the permit language from "prohibit" to "effectively prohibit" non-stormwater discharges.

David Barker (RWQCB) did caveat that this is not a complete list, and the omission of any points does not mean the Board is ignoring the issue or has made a final decision on the issue.

III. Monitoring Requirements Introduction

Eric Becker (RWQCB) explained how RWQCB staff developed the monitoring provision in the administrative draft permit, almost starting from scratch. The Board looked at what is truly required in federal regulations of the monitoring program and included that in the

monitoring provisions. The Board also listened to feedback from the Copermittees from meetings, as well as recommendations from the Report of Waste Discharge (ROWD). It was a conscious change to include monitoring as a provision within the permit instead of as an attachment. The main goals of the monitoring program are to ensure non-stormwater discharges are eliminated, pollutants in storm water discharges are reduced to the maximum extent practicable (MEP), and that water quality limits are met in the receiving waters. The Board also wants to increase jurisdictional accountability, make sure that monitoring is used as a feedback loop to adapt programs, and identify illicit discharge sources within the MS4, including those outside of the control of the Copermittees. RWQCB staff expects significant changes to this Provision.

IV. Stakeholder Monitoring Presentation

All stakeholders were provided the opportunity in advance to formally present materials at the focused meeting. The San Diego County Copermittees took advantage of the opportunity.

Jo Ann Weber (County of San Diego) stated that we all share a common goal of protecting beneficial uses in waterways. The purpose today is to build on the considerable level of effort already done and provide insights as to what works and what doesn't work. The program as written in Provision D does not support adaptive management. The San Diego County Copermittees have developed a new approach using specific questions provided by RWQCB staff.

The approach proposed by the San Diego County Copermittees is to require development of a Monitoring and Assessment Program (MAP) as part of each Water Quality Improvement Plan to provide information needed to answer management questions and support effective adaptive management. To do so, the San Diego County Copermittees propose to coordinate Provision II.D requirements with Provision II.B language. The goal is to answer the three big assessment questions as efficiently as possible.

Adaptive management has three phases: long-term planning, implementation, and assessment. To provide useful feedback, the MAP is proposed to be developed during the long-term planning process during the first twelve months after permit adoption. Monitoring needs to be coordinated with the other programmatic elements to provide the most useful information.

The San Diego County Copermittees see monitoring fitting in with overall program management. It fits in with the other implementation elements; it is not an element outside the program. To illustrate this, see the following figure.

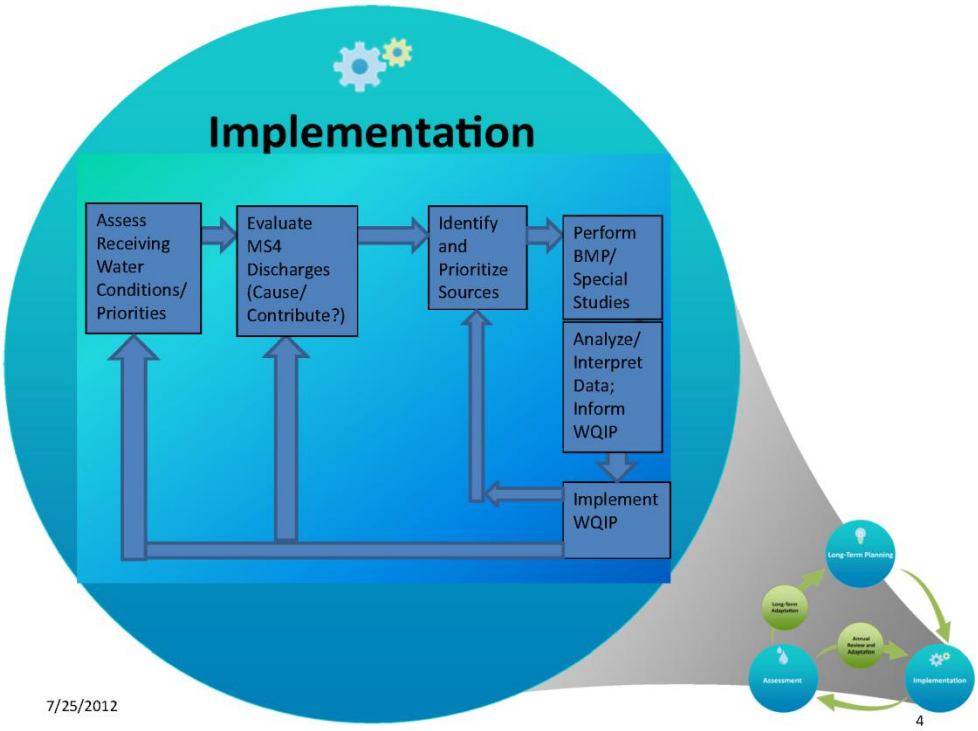

The four overall components of the monitoring program (assess receiving water conditions/priorities; evaluate MS4 discharges; identify and prioritize sources; perform BMP/Special Studies) are shown across the top of the above diagram. The loop across the bottom of the diagram is the adaptive management, or feedback, process.

The San Diego County Copermittees have been monitoring receiving waters for close to 20 years now and have a high level of understanding of the problems in many of the receiving waters. In the 2007 San Diego Permit, the San Diego County Copermittees began to incorporate MS4 stormwater conveyance monitoring to determine how MS4s were impacting the receiving waters. The San Diego County Copermittees are now looking to move this information forward by placing more focus on identifying and prioritizing sources. In earlier permits, a lot of time has been spent in the first box on the left. The focus now should be taking resources and moving forward in the process.

The San Diego County Copermittees believe that this is the nexus to effective implementation because it fits into adaptive management and can guide and utilize other programmatic implementation efforts to improve water quality. For example, if nutrients and bacteria are priority problems, then sources of each must be considered separately. Different strategies for implementation will be necessary to target each audience. Pilot BMPs and other special studies will provide specific information to improve and target implementation activities. These studies may involve more than just water sampling. The loop at the bottom of the diagram represents the adaptive management process.

The San Diego County Copermittees recognize that watersheds are at different levels of understanding with respect to each of the four components. Those with TMDLs have a more mature program. The goal of the MAPs will be to strategically tailor the balance of

monitoring to the prioritized needs of the specific watershed management area. The result will be efficient, coordinated monitoring with an enhanced watershed and TMDL focus.

Provision D in the administrative draft permit has a lot of focus on the first two boxes, but does not allow Copermittees to shift effort to the third and fourth boxes. The San Diego County Copermittees would like that flexibility. The Copermittees want to coordinate the monitoring in Provision D with the assessment plan required in Provision B. To do so, the San Diego County Copermittees propose an Alternate Provision II.D to maximize the benefits of the programs overall. The concept is to use an informed design strategy that tailors a question-driven approach, starting with general questions that lead to more specific questions. The Copermittees would not be starting from scratch; rather, they would be building on the last 20 years of monitoring strategies. Also, as monitoring is not just water sampling, the Copermittees want to incorporate alternate monitoring methods better than has been done in the past. Ultimately, this will support watershed priorities and allow Copermittees to focus water resources on high priorities within each watershed.

The San Diego County Copermittees are proposing alternate language for Provision D that will better provide program managers with needed information to support effective adaptive management. The proposal includes having monitoring within the overall planning process of the Water Quality Improvement Plan. To accomplish this, the San Diego County Copermittees propose a phased approach with pre- and post- Water Quality Improvement Plan phases. The MAP would be developed as part of the Water Quality Improvement Plan. With this approach, the first and second year monitoring requirements would be set forth in the permit as part of a transitional monitoring program. The monitoring requirements would be re-assessed and adjusted as necessary to support the highest priorities in each watershed.

If the permit is adopted in spring 2013, then the current Order No. R9- 2007-0001 monitoring would continue until September 30, 2013 to accommodate the resource commitments for the current fiscal year. The transitional (pre-WQIP) monitoring program would run from October 1, 2013 to September 30, 2015 to accommodate the public review, RWQCB review, and lead time necessary for budgeting. The MAP as part of the Water Quality Improvement Plan (post-WQIP phase) would be implemented from October 1, 2015 forward.

The scientific basis of the San Diego Copermittees' proposed Alternate Provision II.D is an informed, question-driven approach. This approach is strongly endorsed at local, regional, state, and federal levels. At the June 2012 RWQCB meeting, RWQCB staff presented a similar approach that was well-received by the Board. The process proposed by the San Diego County Copermittees aligns well with the condition assessment process proposed by RWQCB Staff with an emphasis on setting priorities. All of these documents (A Framework for Monitoring & Assessment in the San Diego Region (SDRWQCB, 2012), Southern California Stormwater Monitoring Coalition's Model Monitoring Program (SMC, 2004), SWAMP Assessment Framework (SWMP, 2010), Elements of a State Water Monitoring and Assessment Program (EPA, 2003)) stress the importance of basing monitoring on clear questions that support explicit decisions ensuring that data are

gathered only when there is a validated framework in place. These documents follow an earlier National Research Council report on monitoring, which emphasized the importance of building on clear conceptual models and questions that are linked to management needs.

Jo Ann Weber (County of San Diego) stated that today she will summarize key technical issues that support Alternate Provision II.D. Detailed explanation will be provided in a separate memorandum to the RWQCB, including specific permit language revisions.

One key proposed change includes jurisdictional non-stormwater monitoring in Section II.D.1.a. Instead of extensive MS4 outfall testing, the San Diego County Copermittees propose to conduct a targeted program to reduce persistent flows that impact receiving water quality, thus allowing resources to focus on actions to ultimately improve water quality. The San Diego County Copermittees also propose a broad program to eliminate transient illicit discharges/illicit connections (ID/IC) getting the spatial coverage by using visual surveys and appropriate follow up criteria.

In addition, for the jurisdictional stormwater monitoring, instead of extensive MS4 outfall monitoring, the Copermittees propose monitoring homogeneous land uses as input to a model. This wet weather runoff modeling would better inform the planning process by prioritizing drainages for implementation efforts. Representative typical mixed-use sites could be used as a cross-check for model results. Selection of representative outfalls with homogeneous land use types may be coordinated and shared among Copermittees to provide the most efficient representation and characterization of major land use categories. Modeling currently being done as part of the bacteria TMDL implementation plan efforts may be built upon.

The San Diego County Copermittees recognize that the RWQCB wants to see jurisdictional accountability. Jurisdictional accountability should focus on completion of the iterative process and would be supported by data collected at prioritized targeted MS4 outfalls. The San Diego County Copermittees feel that the administrative draft permit's jurisdictional boundary monitoring does not support their goals. In the past, data have shown that jurisdictional boundary monitoring has little value, due to a combination of typically high variability of the concentrations of constituents in receiving waters and discharges, and a relatively small percentage of discharge flows and pollutant loading in the receiving waters. This combination of high variability and relatively small impacts or differences requires extremely high numbers of samples to detect significant differences and would be unlikely to result in any programmatic changes or improvements to water quality.

In addition, instead of the extensive compliance monitoring proposed to comply with the Bacteria TMDL in Attachment E, Copermittees have already developed monitoring programs to comply with Bacteria TMDL requirements that are due October 2012. The current language in Attachment E would replace the monitoring planning effort just completed.

Andre Sonksen (City of San Diego) continued that the workgroup has spent significant time and effort developing their proposed approach. One key point is that this is an ordered process that leads to solving specific water quality problems. This process can be applied at

any level – watershed, jurisdictional, or pollutant level. There are three different components to this: management questions (on the left), monitoring components (in the center), and assessment components (on the right). All three components are essential for this to work.

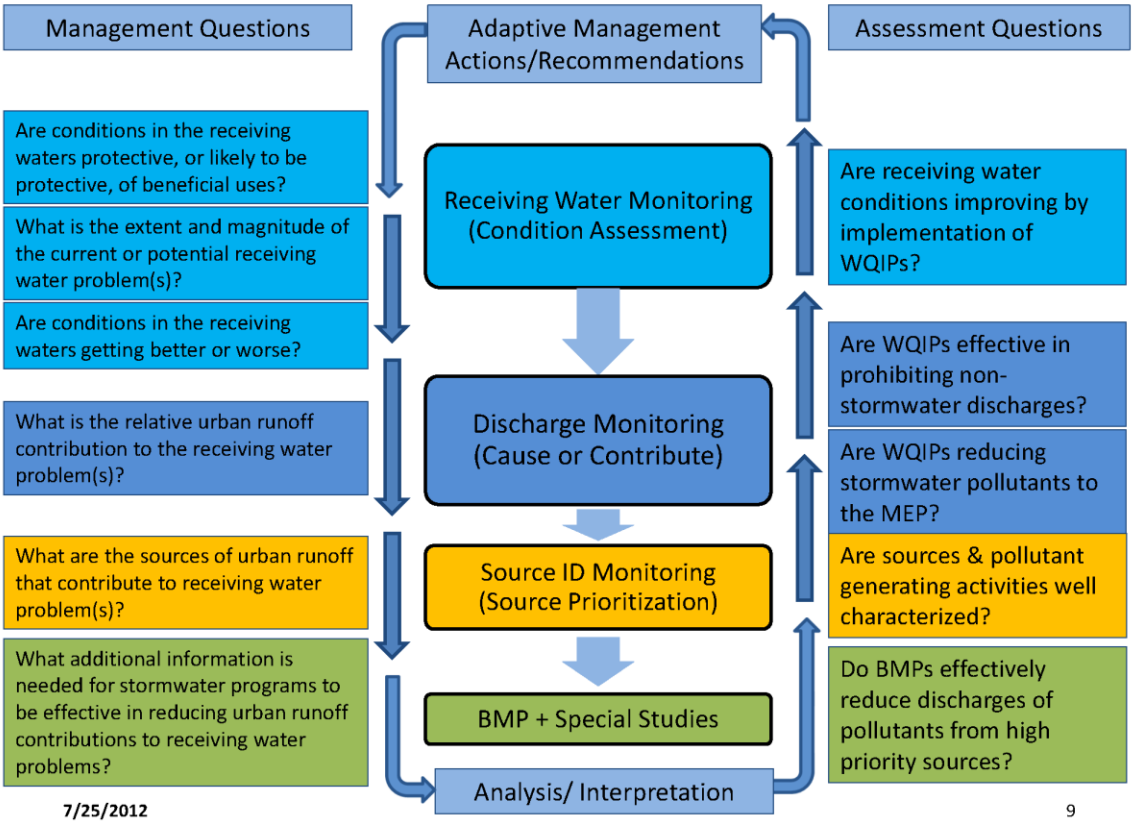

The administrative draft permit focuses on the top four management questions, the receiving water and discharge monitoring, and assessment. There are two more levels needed: source identification and special studies/BMPs. The top three (blue) deal with receiving waters. The next one (darker blue) is discharge monitoring. Yellow is source identification and pollutant-generating activity (PGA) monitoring and identification. The bottom (green) is special studies.

The process starts at the top and moves down. When starting at the top in receiving waters, information is collected that feeds down into discharge monitoring, which feeds into source identification, which then feeds into BMPs. These have to work together. Collecting information at a lower level without collecting information at higher levels will not work. The top question needs to be answered first, or else significant time and effort might be spent looking at something that is not a problem.

The assessment train works in reverse, going back up the process: start with data collected through special studies/BMPs, analyze if the BMPs were effective or if the special

study gives information for feedback into source identification or prioritization, and so on, up the ladder.

The Copermittees have spent a significant amount of time developing how each of these different components are outlined, how they work from top to bottom, left to right, and this is a very well thought out, organized, and methodical process to collect information with direct impacts on how to implement programs.

Andre provided Chollas Creek as an example. In Chollas Creek, the Copermittees have been doing a significant effort for the past 20 years that has culminated into TMDLs for bacteria and metals. Extensive receiving water information has already been collected, the Copermittees already have information at the MS4 discharge level, and there have been special studies completed in Chollas Creek. Looking at the proposed flowchart, some of the questions have already been answered in Chollas Creek. Special studies and BMPs are the next phase for Chollas Creek. Other watersheds don't have the plethora of data that Chollas Creek does, so they would start towards the top of the flowchart.

Claudio Padres (Riverside County Flood Control District) asked if the intent is that this process would be integrally part of the Water Quality Improvement Plan and if the types of monitoring being described would be focused on the high priority issues identified in the Water Quality Improvement Plan or if it would be discharge monitoring everywhere. Andre replied that the MAP would be integrally part of the Water Quality Improvement Plan. This is a methodology for implementing monitoring and how monitoring should be used to inform program planning, program implementation, and adaptive management. For watersheds that have developed high priorities already, the process would be used to tailor the monitoring to get at the issues that are further down in the monitoring tree.

Paul Hartman (City of Vista) stated that the point of the monitoring programs is to allow Copermittees to focus resources on strategic areas identified in the Water Quality Improvement Plan. The way monitoring is laid out in the current administrative draft permit is too prescriptive. Ultimately, the focus needs to be further down in the above diagram, focusing on source identification and special studies.

Claudio Padres (Riverside County Flood Control District) stated that if the intent of the permit is to allow the Copermittees to focus their resources on those high priority issues, then one way to do that is to allow them to focus their monitoring resources, and staffing and time and money, and not spread resources too thin trying to assess everything everywhere.

Colin Kelly (OC Coastkeeper) asked how far the San Diego County Copermittees reached out to Riverside and Orange County about these general ideas. Claudio Padres (Riverside County Flood Control District) responded that the San Diego County Copermittees have been reaching out to Riverside. Unfortunately, due to deliverables under the current Riverside MS4 permit, the County of Riverside has not been able to be involved; however, he has heard a lot of good points and is so far in support of the San Diego County Copermittees presentation today. Richard Boon (County of Orange) stated that Jo Ann Weber has been studiously involving Orange County in conference calls with the group that

developed this approach. Orange County certainly endorses and supports the question-driven approach.

Colin Kelly (OC Coastkeeper) asked if the RWQCB anticipates each program doing every step in this process or if findings can be shared across the jurisdictions, such that if the City of San Diego has done an air deposition study, can those results be taken and used by Orange County so they aren't all doing the same special studies.

David Barker (RWQCB) replied that one reason they are pushing the regional permit is to allow collaborative use of studies.

Mary Anne Skorpanich (County of Orange) shared that she sees this approach very much fitting in with some of their own thoughts that these Water Quality Improvement Plans should take a much more central role in the permit overall. She is completely in concurrence with the overall monitoring required by the permit being linked to the Water Quality Improvement Plan.

Jo Ann Weber (County of San Diego) stepped through the pre-Water Quality Improvement Plan (transitional) monitoring and examples of post-Water Quality Improvement Plan monitoring proposed in Alternate Provision II.D, beginning with receiving waters. The San Diego County Copermittees recognize their responsibilities and commitment to maintaining a level of effort of monitoring during the pre-Water Quality Improvement Plan or transitional phase similar to the current 2007 permit, but adapted to provide more useful information to support Program Managers' needs.

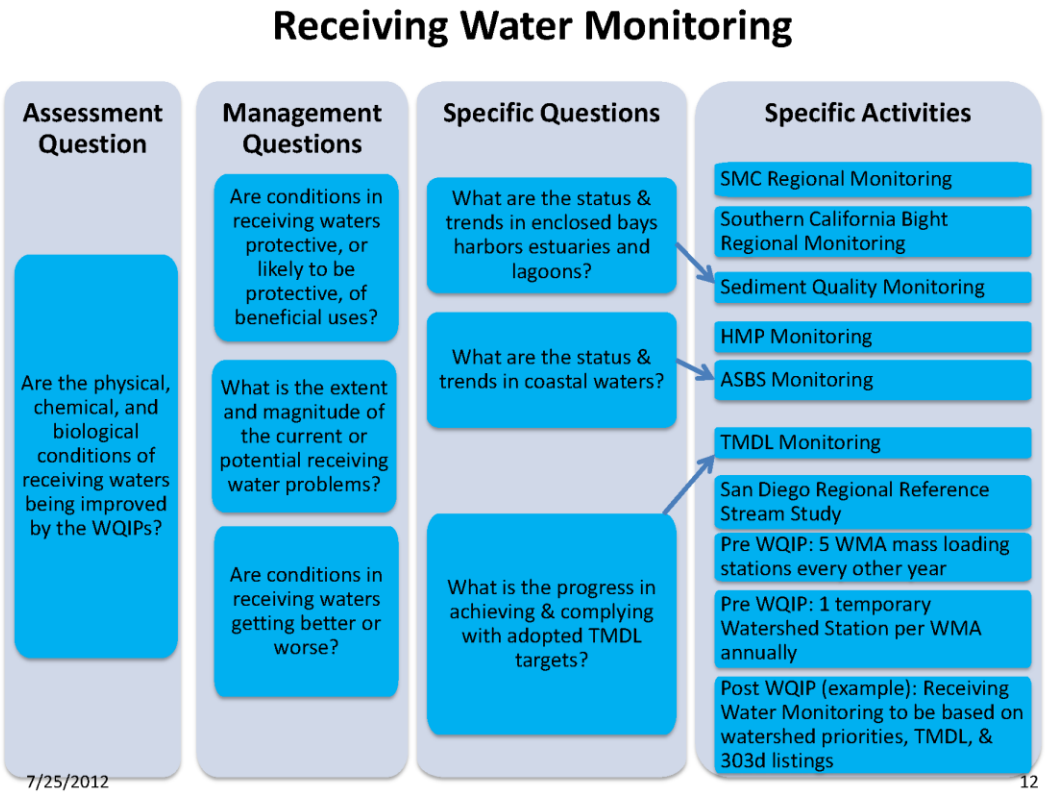

The above diagram illustrates the use of the question-driven approach in designing activities for receiving water monitoring. The process goes from left to right. The Assessment Questions (left side) are from the current Provision II.D ("Are there improvements in the receiving waters conditions?"). The second column lists the appropriate broad Stormwater Monitoring Coalition (SMC) questions that can be summarized as a status question, an extent and magnitude question, and a long-term trend question. These management questions provide context for the more specific, technical questions (third column) and associated monitoring activities (fourth column). Monitoring results from any given activity may only partially contribute to answers for the "big picture" management questions. The specific questions (third column) are examples of detailed study questions that could be used to design the monitoring program. When study questions are answered by specific activities, then the next prioritized study question can begin as part of the adaptive process.

The purpose of the monitoring is to assess trends of receiving waters and magnitude, highlighting rationale and benefits of specific activities. Copermittees are committed to continuing many of the receiving water monitoring programs and balancing sampling needs so that long-term receiving water trends will continue to be addressed. This process supports the question-driven adaptive management approach.

Paul Hartman (City of Vista) presented the Jurisdictional Non-stormwater Discharge Component of the Alternate Provision II.D.

Non-Stormwater Discharge Monitoring

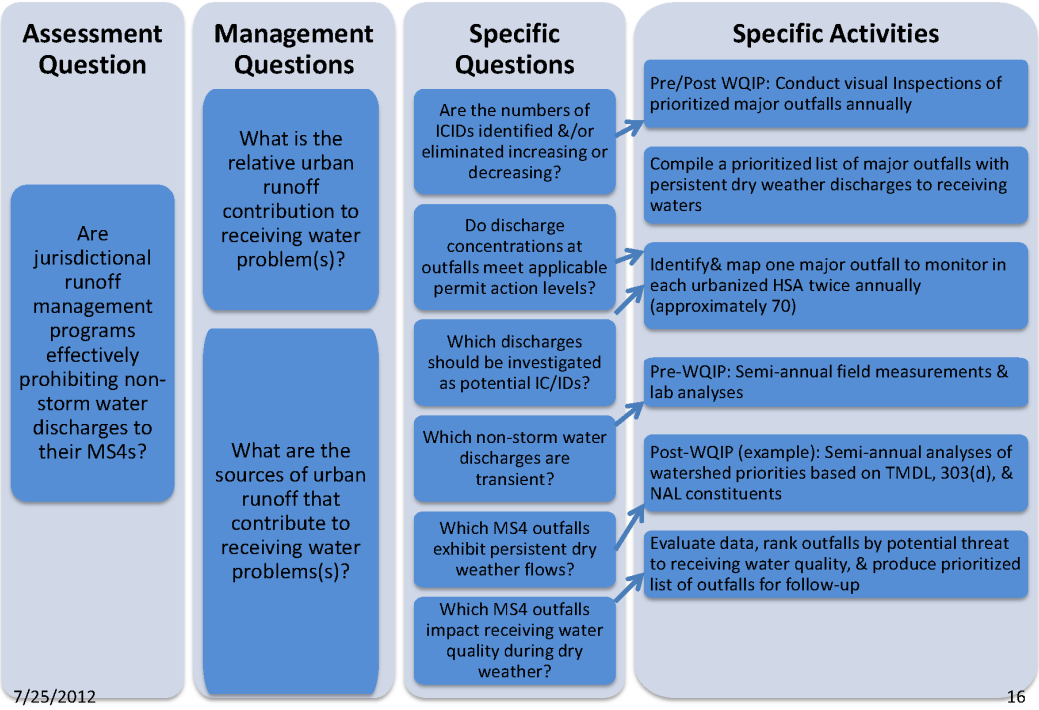

The primary assessment question on the left side is: Are jurisdictional runoff management programs effectively prohibiting non-stormwater discharges to their MS4s? To answer this overall question, the focus is on answering the management questions (second column). From these two management questions, specific monitoring questions have been developed to drive the design of the program. Examples of specific monitoring questions are provided above in the third column. These questions have led to the development of two distinct programs to address non-stormwater discharges during dry weather: one program targeting transient discharges focusing on IDDE; another program targeting persistent flows, designed to strategically prioritize and address outfalls with continuous non-stormwater discharges.

The transient flow program is rooted in a three-pronged approach designed to provide broad spatial and increase temporal coverage. The focus is on sources, the MS4 itself, and the MS4 outfalls discharging to receiving waters. This program would be implemented during both the pre-Water Quality Improvement Plan (transitional) and post-Water Quality Improvement Plan phases. The idea is that the main sources of non-stormwater discharges are addressed via programs such as Industrial, Commercial, and Municipal inspections. Based on analysis of recent data, this program appears effective in preventing discharge impacts. The second part of the transient flow program is to provide coverage of the MS4 system throughout the year, via jurisdictional programs such as complaint response, MS4 cleaning, and staff/citizen reporting of illicit discharges. The third part of the transient flow program consists of visual monitoring at major MS4 outfalls. This would require the updating of inventories and periodic surveys of major outfalls, looking for flow indicative of illicit discharges.

The persistent flow program is based on historical data gathered via existing dry weather programs, MS4 outfall programs, GIS information, and data from the visual observations program discussed previously to identify and prioritize major outfalls that exhibit persistent flows. The current MS4 outfall program will continue to its completion. Once identified and prioritized, one major outfall per hydrologic sub area would be selected for monitoring two times per year. This means approximately 70 outfalls would be under investigation throughout San Diego County at any time. As pollutants are reduced and non-stormwater flows are eliminated, the operation would continue through the prioritized list of outfalls. Comparison to numeric action limits would be used to prioritize outfalls within the Water Quality Improvement Plans.

By implementing the non-stormwater discharge program in two parts (transient and persistent), the Copermittees will be able to best utilize resources to eliminate and control the highest priority threats to receiving water quality.

Jo Ann Weber (County of San Diego) spoke to the stormwater discharge monitoring program.

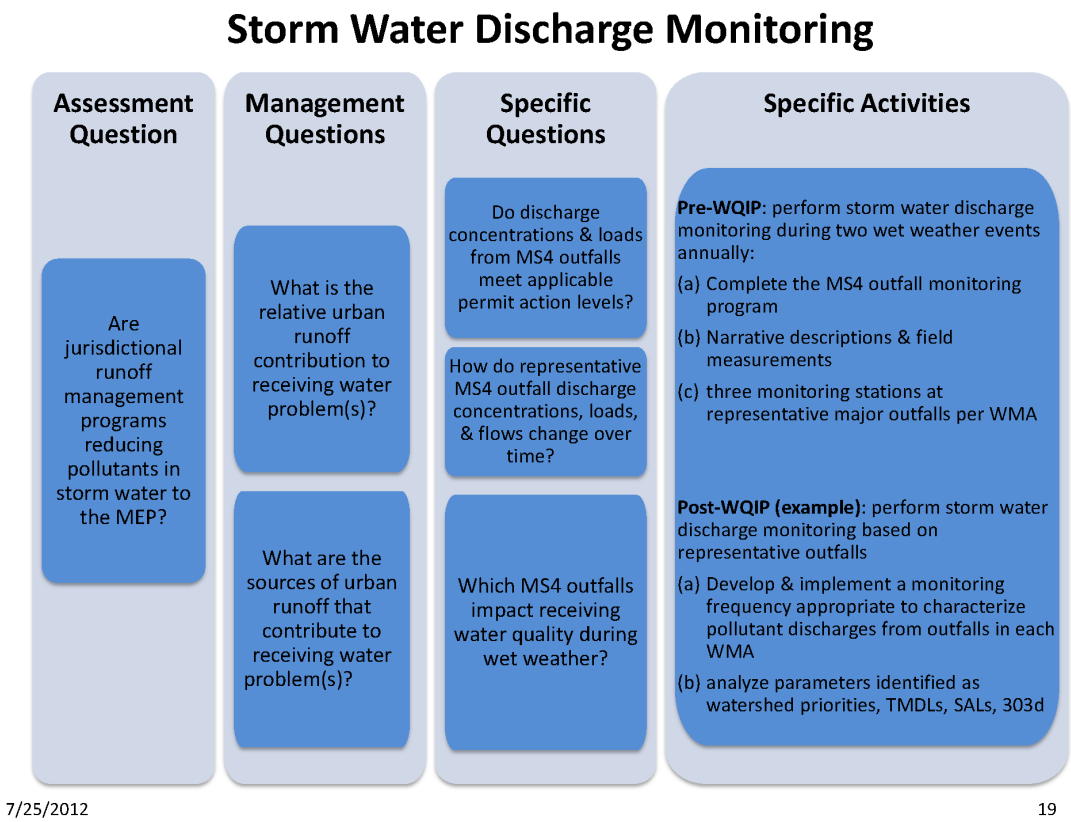

The overall assessment question from the administrative draft permit is if runoff management programs are reducing pollutants to the MEP (first column). The same two over-arching questions are: what is the relative contribution and, if significant, then what are the sources (second column)?

Using the specific questions to guide design, the pre-Water Quality Improvement Plan (transitional) monitoring program commits to completing the current outfall monitoring program (fourth column). In addition, the outfall monitoring in the pre-Water Quality Improvement Plan (transitional) phase would consist of at least three monitoring stations at representative major outfalls per watershed management area. Selection of representative outfalls may be coordinated and shared among Copermittees to provide the most efficient representation and characterization of major land uses. This will allow for more efficient and informed characterization of the MS4 discharges. This effort builds on the rainfall runoff models that use land use coefficients to estimate runoff loads. Sophisticated models developed as part of the implementation plans for the regional bacteria TMDL can be used to inform where additional data for local homogeneous land uses is needed. This proposed MS4 program will be more resource-intensive than the current MS4 program and demonstrates the Copermittees' commitment to gather useful data to target implementation activities.

The post-Water Quality Improvement Plan phase program continues a commitment to perform monitoring of outfalls to characterize pollutants from the MS4s; however, the

design of the program will evolve depending on the specific questions and needs of the watershed management area.

Benefits of this approach are multifold, including broad spatial and temporal coverage; support for assessment-driven, adaptive management approach; and, flexibility in site selection allowing jurisdictions to focus resources on the highest watershed priorities.

JoAnn Weber (County of San Diego) spoke to source/stressor identification (yellow layer). To provide the necessary feedback to improve program implementation, Copermittees have increased emphasis on the Source Identification and BMP/Special Studies, adding the assessment question: "Are sources and pollutants well characterized?" The Copermittees recognize that an increased understanding of sources allows implementation efforts to be focused.

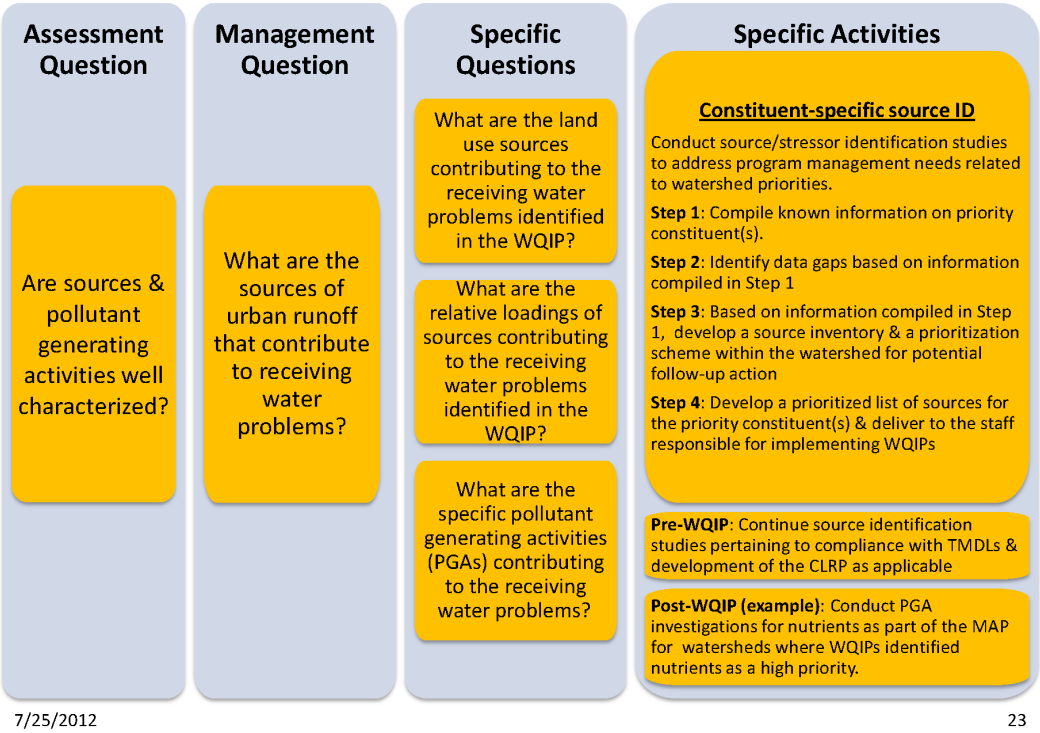

The principle role of identification is to identify and prioritize pollutant generating activities (PGAs) and source categories. PGAs can result in release of pollutants. Once PGAs are identified and prioritized, then behavioral changes and education can take place. Identification of high priority sources is an important step in support of the Water Quality Implementation Plan process, to help inform the development of effective pollutant control strategies for particular priority constituents on a watershed-specific basis.

The key benefits of the source/stressor identification studies are to provide program management with information to verify, quantify, and prioritize sources and provide links between sources, activities, and effects of runoff.

Andre Sonksen (City of San Diego) spoke to Special Studies/BMPs (green layer).

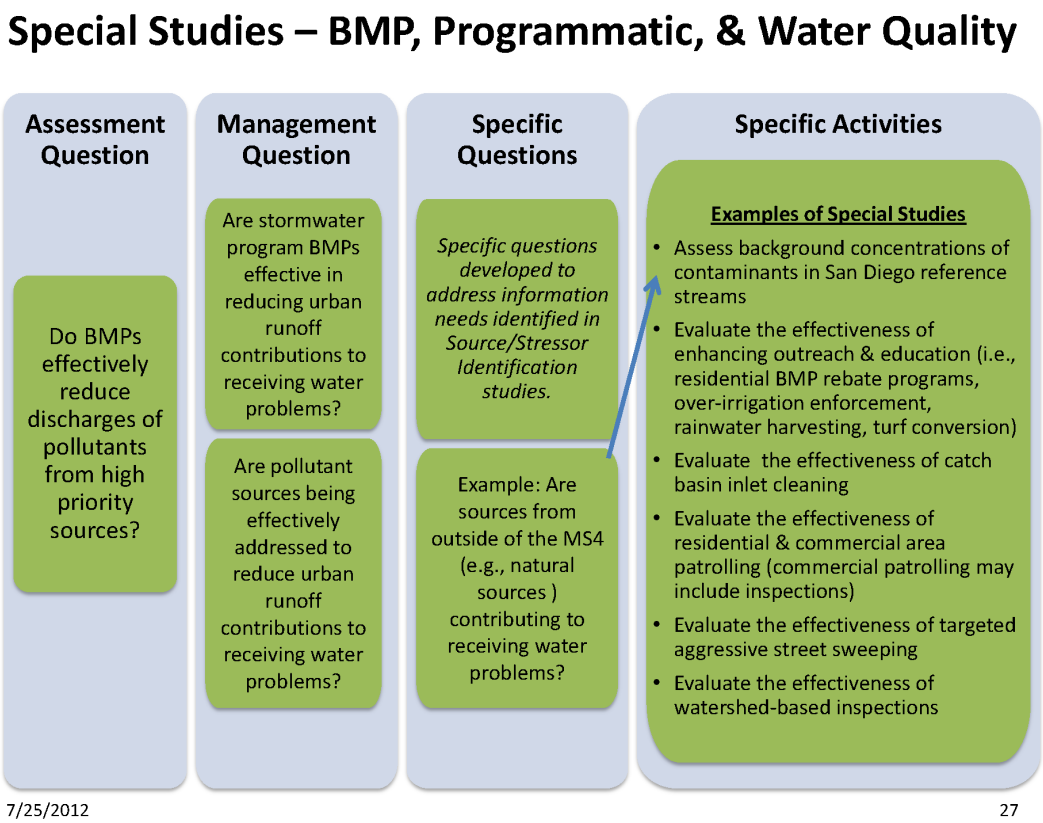

The BMP special studies program follows the same general format seen for receiving waters, etc. Assessment questions are from the administrative draft permit, management questions were developed similar to scope and language as that in the SMC, then specific questions are developed based on specific information needed or desired (third column).

The City of San Diego has used this process to evaluate one of the BMPs in the current permit: street sweeping. As an example, the management question was “Can street sweeping effectiveness be improved?” The City then conducted a pilot study in four phases; each phase had its own specific question. The question for the first phase was “Is there an optimum sweeping frequency? How often do you need to sweep streets to get the maximum benefit?” The question for phase two was “Is there a sweeper type that is better than the others? (vacuum vs. mechanical sweepers).” Phase three asked “How much pollutant removal does sweeping the median in streets add?” Finally, phase four asked “Is there an optimum sweeper speed?” Each phase of the study built upon the results of the previous phases. As a result of the study, the City implemented changes to their street sweeping program.

The purpose of special studies/BMPs is to support effective adaptive management, assess BMP effectiveness, and perform scientific investigations to address data gaps. The methods are very focused (pilot BMP studies, source identification special studies, water quality studies). The benefits are that this all feeds into adaptive management and how to improve programs to improve water quality.

Roger Butow (Clean Water Now! Coalition) asked who creates the questions for this question-driven approach and how much input or influence do watchdog NGOs have over the questions, as the questions are the beginning of the entire flow chart.

Karen Holman (Unified Port of San Diego) responded that the Copermittees started with RWQCB assessment questions from the original permit and SMC questions, especially in the blue areas of the below diagram.

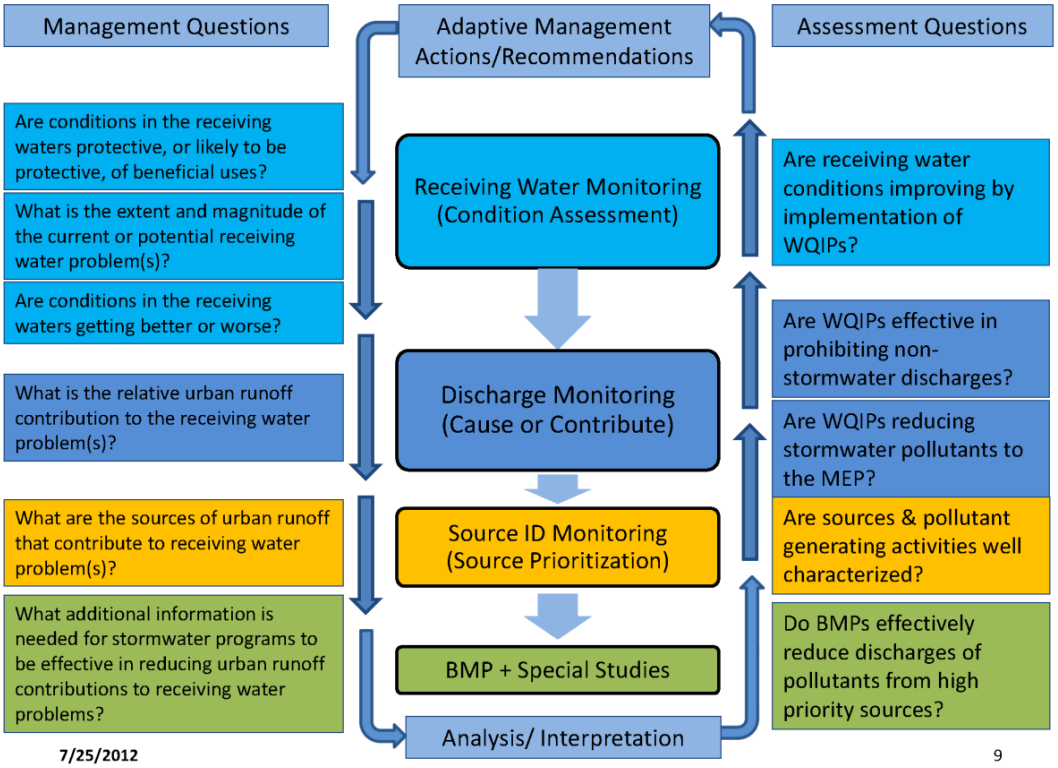

Karen continued that the next two levels (yellow and green) are where adaptive management starts, and that is where the Copermittees are focusing on making the nexus between monitoring and the rest of the permit programs. For these areas, the questions are being developed by the Copermittees based on needs. Questions could be driven by priorities in the Water Quality Improvement Plans; other focused questions could be on whether BMPs are working as expected. Karen hypothesized that NGO involvement could begin there, with the more focused questions that are aligning with Water Quality Improvement Plan priorities.

Jill Wittkowski (SD Coastkeeper) shared that the questions look to be along the right lines. If this is done hand-in-hand with the Water Quality Improvement Plan process, it

makes sense that the public participation process for the Water Quality Improvement Plan would result in a collaborative public process for developing some of the monitoring questions.

Jo Ann Weber (County of San Diego) provided an example of how a MAP might be developed in an example watershed. The slide below lists the steps for the strategic monitoring approach.

Developing Monitoring & Assessment Programs (MAPs) for Each WQIP

STRATEGIC MONITORING APPROACH:

1. Establish stormwater management priorities specific for each WMA ("Watershed Priorities") as part of WQIP development.
2. Compile existing monitoring data & assess available information for receiving waters, MS4 discharges, & sources or stressors within the watershed.
3. Identify regulatory & non-regulatory drivers that apply to water quality monitoring within the watershed, & list all associated monitoring responsibilities assigned to the Copermittees.
4. Evaluate the watershed priorities in context of available monitoring data & existing monitoring responsibilities, & develop specific management questions for each priority issue.
5. Establish metrics & identify assessments that should be performed to supply information needed to address the management questions.
6. Identify elements of a watershed-based monitoring program needed to address the watershed management questions & perform the necessary assessments.
7. Develop detailed monitoring plan to address the identified monitoring needs, coordinated with other ongoing monitoring in the watershed.

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For a sample watershed, assume priorities are TMDL for bacteria and 303(d) listing for copper and nutrients. A likely assessment question would be "Are jurisdictional runoff management programs reducing pollutants in storm water to the maximum extent practicable?" A likely management question would be "What are the sources of urban runoff that contribute to receiving water problems?" Following the previously presented flowchart, the next step would be to develop specific questions using available information. For bacteria and copper, MS4s are known sources; however, MS4s are less well known sources of nutrients. In this watershed example, loadings from land uses are not well quantified to support planning of wet weather management actions or evaluate their effectiveness. A specific question in this case would be "What are the representative MS4 outfall discharge concentrations, loads and flows?" The approach to answering the specific question is to support model development, calibration, and validation. Stormwater discharges should then be monitored at a determined number of sites based on appropriate land use characterization for modeling, at a determined frequency (e.g., 2 storms per year), for specific constituents (e.g., bacteria, copper, nutrients, and any other special study

needs), and for a specific duration (e.g., at least one adaptive management planning cycle to allow for data usability).

To include the San Diego County Copermittees' proposal in the draft permit, the next steps are to provide the RWQCB with Alternate Provision II.D and a technical memorandum with support and rationale for the alternate provision.

In closing, Jo Ann Weber (County of San Diego) stated that the purpose of monitoring is to provide information to program managers to inform implementation of the stormwater programs. A thorough and thoughtful planning process using a question-driven approach provides the roadmap for success. The San Diego County Copermittees have metaphorically traveled the freeways and will now venture onto the roads less traveled, including conducting source identification studies, BMP studies, and targeted special studies. The Copermittees admit they may meet dead ends along the way and through the adaptive planning process will be adjusting the strategic route. The Copermittees look forward to partnering with all stakeholders in the challenging journey ahead.

Roger Butow (Clean Water Now! Coalition) asked how and under what circumstances would the monitoring look at contaminants of emerging concern and take into account any recalibration of trigger levels or metrics. Claudio Padres (Riverside County Flood Control District) responded that there would still be a component of receiving water monitoring to detect emerging issues. The idea would be to assess each issue as it arises, annually go back and review data and review priorities. For example, if perchlorate became an issue, that would get on the priority list and would be set in order as far as doing specific programs to target that particular constituent. It would be addressed in the context of the Water Quality Improvement Plan and its priorities.

Paul Hartman (City of Vista) agreed that it is a matter of striking a balance in the monitoring program: some parts will be monitoring for a broad suite of constituents over the long term; other parts will drill down to activities and BMPs effective at preventing pollutants of concern. The monitoring program will keep a broad approach but will not be monitoring everything everywhere.

Mike Shetler (County of Riverside) shared that Riverside County actually developed a demonstration on flood control district property where they are evaluating different BMPs that could be used in the field. He encouraged Roger Butow to visit the demonstration project.

Jill Wittkowski (SD Coastkeeper) stated that having this presentation in so much detail shows the benefit of the workgroups that the San Diego County Copermittees have. It does not look like these workgroups will be going forward with the new permit. Jill believes it would be valuable to the overall process to continue these workgroups with the next permit.

Jill Wittkowski (SD Coastkeeper) mentioned that the purpose of monitoring that has been repeated a few times is to make the programs better. Another purpose is to keep the pulse of the waterways; to know if the waterways are healthy or not.

Jill Wittkowski (SD Coastkeeper) asked what parts of the administrative draft permit are prohibiting the San Diego County Copermittees' proposed process.

Paul Hartman (City of Vista) replied that there are certain portions of the permit that are focused prescriptively on receiving water and MS4 monitoring. A specific example is the current dry weather program which appears to look for more broad spatial coverage, increasing sampling sites to a ¼-mile grid system (from 40 sites to more than 380 sites for Vista) while also going from quarterly to monthly monitoring. The San Diego County Copermittees are looking for flexibility to dial back those requirements and focus resources through adaptive management monitoring to get valuable feedback.

Claudio Padres (Riverside County Flood Control District) stated that he sees the difference from a high level of what is currently in the administrative draft permit versus the adaptive management strategies presented by the San Diego County Copermittees is the difference between monitoring for monitoring's sake versus strategic monitoring. The current administrative draft permit is a broad brush to do everything everywhere, not the focused approach presented by the San Diego County Copermittees.

Mike McSweeney (BIA) appreciated the approach presented by the San Diego County Copermittees and appreciated that he could understand the thought process from looking at the flowchart. Mike agreed that sampling should not be done so infrequently that if something bad happens it is not caught. He complimented the Copermittees on developing a smart way to address what the RWQCB is looking for. He agrees with Paul Hartman (City of Vista) that the grid pattern seems to be sampling for the sake of sampling, not smart or strategic sampling.

Roger Butow (Clean Water Now! Coalition) asked RWQCB staff if the language "economic feasibility" and "technological possibility" will no longer be used as metrics in the permit.

Wayne Chiu (RWQCB) replied that those terms are not used in this permit. Everything in the permit is a technical possibility and is feasible. The question of whether it is cost effective is part of the equation as well. What the RWQCB has proposed here are the minimum federal requirements, but those are put in as a starting point to basically provide the Copermittees an understanding of what can be in a permit. Those terms are not being used anymore.

Richard Boon (County of Orange) spoke on the definition of MEP as it is a crux issue for this process. The State of California did define MEP in 1993 and used the language "public acceptance," "cost," and "technical feasibility." Until State Board Counsel withdraws that memorandum, Orange County would very much expect to see those discussions in this permit. With respect to monitoring, it would mean that the resources available for monitoring are finite; therefore, Copermittees must be careful with how they allocate resources to monitoring because every dollar spent on monitoring is a dollar not spent on implementation of BMPs.

David Barker (RWQCB) replied that in the administrative draft permit, the State's definition of MEP is listed as part of the definition of MEP; therefore, what Richard has stated is fully consistent with how the administrative draft permit is defining MEP.

Bryn Evans (IEA) stated that the IEA has comments on the permit with regard to permitted non-stormwater discharges, such as groundwater dewatering, that have their

own permits. These activities can be mapped and utilized in the other elements of stormwater programs, including third party data. This would allow Copermittees to cost efficiently understand where those permitted non-stormwater discharges are currently and then focus on non-stormwater discharges that do not have authorization.

Grant Sharp (Orange County Flood Control District) mentioned that Monday was the Phase II Small MS4 permit comment deadline. That permit will target small communities and non-traditional Copermittees, such as school districts, state beaches, state parks, etc. One of the interesting things is the requirement for these non-traditional Copermittees to begin to do water quality monitoring to develop IDDE programs. In addition, the draft Phase II permit also has action levels in it for non-stormwater discharges and when compared to the Phase I MS4 permit, they are very different. With the action levels in the Phase II permit, one of the conceivable situations is one of the new non-traditional Copermittees will be doing their own IDDE monitoring and determine they don't have a problem because findings are below their discharge action levels, but the findings could be above the Phase I MS4 non-stormwater discharge action levels. This results in double investigations with different standards. Grant suggested partnering with the Phase II Copermittees to reduce the chance of double investigations.

Jill Wittkowski (SD Coastkeeper) stated that the modeling makes her nervous. The value of any model is based on the validity of the data being used to create the model. If a bad model is used, then bad decisions may be made based on the bad model. She would like to see the modeling concept developed further so that modeling will be robust and give good information to make good decisions.

Andre Sonksen (City of San Diego) explained that the problem with the current models for the San Diego region is that most of the data for the models are not from the San Diego region. Moving forward, the Copermittees would collect region-specific information that would go into current models or refine models to make them applicable to the appropriate region.

V. Discussion on Monitoring Proposals Related to Permit Requirements

Jill Wittkowski (SD Coastkeeper) stated that Coastkeeper is not the only environmental group involved and interested in this permit. Coastkeeper understands that Copermittees are concerned about the cost and breadth of dry weather monitoring; however, some of the environmental groups do not think that cost should be an issue. It should not be the case that Copermittees are required to comply unless it is too expensive. Dry weather monitoring should be kept in the permit. Jill recognized that Copermittees seem worried about the ¼-mile grid system. An alternative view is that this is a dry weather blitz for the first year and maybe it does make sense for the first year to do a blitz and acquire a broad view of the health of our waters throughout the watersheds. Another possibility may be a tradeoff of dry weather monitoring in exchange for the Copermittees agreeing to the inclusion of numeric effluent limitations in the permit.

Jill Wittkowski (SD Coastkeeper) raised the issue of third party data; the permit allows use of third party data but it is not clear how and when that happens. Coastkeeper would like to see in the permit specific requirements for being able to use the third party data, such as requiring use of that data so long as Quality Control training is done. There is a perception that Copermittees only use the data that looks good for them. The permit should require all data to be used. Coastkeeper would also like to see a useful database where all of the data from the region comes together, including Copermittee data and third party data. The database should be accessible by the public and perhaps show green, yellow, and red as an overview of water health. If people knew better that there are serious problems in waterways, then they may support water quality improvement efforts more and there might not be huge budget struggles.

Jill Wittkoswki (SD Coastkeeper) stated that she heard earlier today there are some places for which the Copermittees do not have a lot of data. If they don't have data, Jill questioned how they are setting priorities.

Jill Wittkowski (SD Coastkeeper) acknowledged that commercial, industrial, and municipal inspections are doing a good job looking at non-stormwater discharges. The big question now is residential sources and what should be done about them. Jill would like to see a commitment from Copermittees to crack down on this issue; to really have a plan for residential sources and be willing to take a stand on it. Jill has seen in watershed reports that there is a problem. She also questioned that if non-stormwater discharges are supposed to be prohibited, then why are there numeric limits for the discharges and why should money be spent on analyzing the discharges rather than locating the sources.

Jill Wittkowski (SD Coastkeeper) recognized the discussion earlier about pollutant-generating activities (PGAs) and using studies to determine which PGAs need to be cracked down on. This information should already be known. Coastkeeper did an audit in the Agua Hedionda Watershed, identified a nutrients problem, and determined it was probably coming from nurseries. They did not see any big problems when doing inspections, but also have not seen any follow up or alternate plans. Coastkeeper would like to see work continued and followed up on.

Jill Wittkowski (SD Coastkeeper) had a general question about having one monitoring station per HSA. She would like to understand how that was chosen, as some areas it may be that more than one would be appropriate.

Colin Kelly (OC Coastkeeper) stated that some issues that Coastkeeper is concerned about were first discussed about an hour ago with the Clean Water Now! Coalition. Colin would like to know what the County believes that this modification might do to impact the prioritization of different waterbodies as constituents of emerging concern (CECs).

Colin wants to make sure that waterbodies not on the priority list are not ignored. Minimum monitoring should be required on the non-priority waterbodies to get a baseline. Colin clarified that he is not specifically asking for Copermittees to test for CECs, but he would like to know the minimum requirements.

Colin Kelly (OC Coastkeeper), regarding the use of historical data, would like to know what is considered to be historical data. There has been a significant adjustment in

technology and lower detection limits between now and the 1970s and 1980s. If there is a ten year term, Colin would like to know at what point will historical data not be useful, or what data can be used by third parties. Colin does not think money should be wasted in duplicative efforts between citizen water monitoring and Copermittee water monitoring. Third parties should be able to provide data to the Copermittees. Colin continued that with the use of historical data, there has been significant land development in Southern California. If there is a certain area that has data from the 1990s but has been developed since then with changed hydrology, then that may be a higher priority.

Thom Spanos (SD Coastkeeper) recognized that there are much more stringent requirements for monitoring during the first year of this permit, but after that it seems to allow much flexibility and the prioritization that the Copermittees desire. Thom asked Copermittees to take a step back and look from the broader perspective; it is not too much to ask that once in every five years Copermittees go back and make sure they are not missing anything. Thom continued that Coastkeeper does understand that costs can be significant, but the Clean Water Act is supposed to be a technology-forcing statute. If they are not made a requirement, then there will be no development in these fields. Copermittees should find ways to make this a more efficient process, into which adaptive management does feed. Coastkeeper does not want Copermittees held responsible for something that is not their fault. If action levels in Phase II permits are higher than Phase I permits, then this is the perfect opportunity for the RWQCB to implement more stringent requirements within their region. Thom hopes that everyone is keeping in mind not just the short term costs, but also the other factors involved.

Roger Butow (Clean Water Now! Coalition) thanked Coastkeeper for their comments on contaminants of emerging concern and that increased science does give a better ability to detect lower limits.

Roger Butow (Clean Water Now! Coalition) mentioned Aliso Creek as an example of sampling where sampling was done week 1 on Monday at 9 am, week 2 on a different day of the week at noon, etc., which resulted in a better window of sampling. He would like to see that type of sampling written into the permit itself, as well as integrating sampling by non-governmental organizations (NGOs). Roger agreed that sampling must take place in a manner that maximizes funds and maximizes the database being developed. Sampling the same time, the same day of the week at one site does not give a general concept of fluctuations and the ability to lead to source tracking.

Ted Von Bitner (County of Orange) stated that the RWQCB's goal is to answer basic questions: what is the condition of the watershed, are beneficial uses being protected, and how are those conditions changing over time? Each permit cycle, the Copermittees have changed their monitoring program. Losing that continuity causes the data set to become less valuable.

Ted von Bitner (County of Orange) continued that one of the primary principles of the NPDES Program in general has been that while you can judge the quality of your discharge by sampling at a specific point, you cannot judge the health of the watershed, which is the mission objective of the RWQCB. Orange County has started on that effort by coming up

with new programs, new monitoring designs that are designed to answer that question. Orange County has the Stormwater Monitoring Coalition's Regional Watershed Monitoring Program which gives a holistic view of the watersheds in general. That approach has also been used by the San Diego RWQCB for the San Diego River Integrated Regional Program, and they are now starting on a coastal program. There seems to be a common approach there that should be adapted for this permit. Following what Coastkeeper said and in context of the approach that San Diego provided, there are some basic questions that need to be answered first about the MS4: What is the condition of the MS4? What needs to be worried about? The Copermittees also need to answer basic questions like: What are the frequency and magnitude of PGAs? Who are the priority pollutant dischargers? The Copermittees cannot answer those questions at this point because they have tried in the past with programs, but each time the permit changes, the Copermittees lose their ability to answer those key questions. The Copermittees would hope to follow what has been proposed and bring back to their previous program. Thinking about the MS4 program, it should be an overall design, recognizing how much of the MS4 creates an impact on receiving waters. It should also be a comprehensive program where everyone comes together, including Phase II dischargers and the Industrial General Permit dischargers. With identical submittal dates, it is difficult to incorporate their program findings with the Copermittees' reports. There is no mechanism to incorporate that data. At same time, Ted does not get a sense from the administrative draft permit of when the RWQCB and Copermittees stop and meet; when does the adaptive management process kick in.

Karen Holman (Unified Port of San Diego) acknowledged that attendees are asking a lot of questions, and that is encouraging because that is why the San Diego County Copermittees developed this question-driven strategy. There are two types of questions: management questions and assessment questions. Looking at the diagram, it is structured in a way that makes sense, asking bigger general questions first, then moving down toward source identification and BMPs.

This approach envisions more time and effort spent on the yellow and green areas, then moving up to answer the larger questions. Going up the ladder focuses more on the assessment questions. At the end of this long phase, the Copermittees should be able to answer the receiving water questions. Adaptive management kicks in throughout the entire process, but especially in the yellow and green areas.

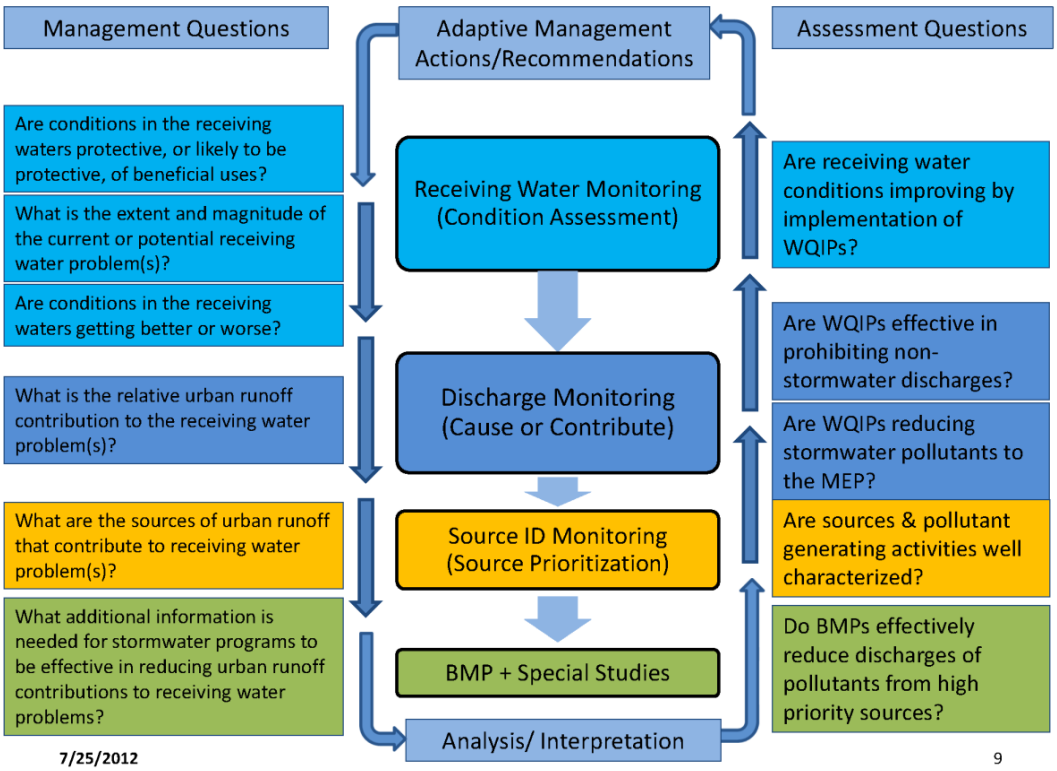

Alison Witheridge (City of Oceanside) shared that as a monitoring person for the last 5-10 years, she wants to believe that monitoring is the answer; that monitoring will indicate if water quality gets better or worse each year; however, she is disappointed each year when the data are analyzed that the variability in water quality data does not allow for indicating changes year after year or even in decades; the amount of data does not seem to help identify or eliminate sources. More data does not always mean more knowledge. That is why the San Diego County Copermittees are proposing a heavier visual observation program instead of straight water quality data collection. As a public employee, Alison needs to spend public funds in a responsible, efficient, and effective manner. For the City of Oceanside alone, it would cost 2 million dollars the first year to implement dry weather monitoring per the current administrative draft permit.

Jo Ann Weber (County of San Diego) continued that for Copermittees in San Diego it is a ten-fold increase in costs the first year with 94 percent for MS4 dry and wet weather monitoring, but at least 70 to 80 percent of that just for dry weather monitoring. In subsequent years, although it does decrease, it is still three to four times what is spent now. The Copermittees want to use their money where they get the greatest value for it. The quarter-mile grid was in the early programs in the mid-1990s and was a guidance document, somewhere to begin. Looking at the current permit writer's guide, it is perfectly reasonable to build on historical record instead of using such a prescriptive grid.

Jo Ann Weber (County of San Diego) is open to discussion on what threshold of monitoring is sufficient, considering visual observations as a key factor to get there. It is

hard to go through an entire MS4 system on an annual or biannual basis for larger jurisdictions, but the County would be okay with prioritizing efforts.

Claudio Padres (Riverside County Flood Control District) stated that regarding cost, his perspective is that everyone can toss around numbers all day, and really what it is not about is not spending money on monitoring; the Copermittees are not trying to avoid monitoring. The Copermittees have to answer to their constituents that they are using their money in an effective way; it needs to be effective monitoring.

Regarding the issue of "cherry-picking" of data, Claudio called attention to the fact that all MS4 permits require the MS4 Copermittees to report all collected data under penalty of perjury.

Claudio Padres (Riverside County Flood Control District) stated that monitoring does not solve problems by itself. Entire city budgets could be spent analyzing the situation without having solved a single problem. The Copermittees need to focus on the type of monitoring needed to take action on high priority issues. Monitoring is an easy way to steal large portions of budgets. The monitoring needs to be taken with an appropriate baseline to assess emerging conditions, taken into the Water Quality Improvement Plan process, and then engaged at the right level to locate sources and measure effectiveness.

Mike McSweeney (BIA) stated that it needs to be realized where our State is financially. It needs to be how smart work is done; not how much money is spent but how the money is spent. Copermittees are trying to figure out the best way to spend money. We all want the same outcome; therefore, there needs to be a sort of triage for priorities. The system should be focused on the outcome and what the best, most efficient way to reach that outcome is.

Andre Sonksen (City of San Diego) explained that when coming up with the proposed monitoring plan and proposing how to implement the program, the workgroup looked at dry weather monitoring program data for the last two years and found it was less than two percent effective in eliminating illicit discharges. The Copermittees do not anticipate that a shotgun approach during the initial year of the new permit would be any more effective than past programs. In developing the proposed process presented today by the San Diego County Copermittees, the workgroup looked at almost twenty years of data from their programs and other related water quality programs not only in San Diego but throughout the country and how to have real, effective changes in water quality.

Colin Kelly (OC Coastkeeper) acknowledged that everyone seems to be broke, and he is not hearing that prioritization is the wrong way to go. He does not, however, want this to be a program where the pause button is hit, causing the Copermittees to not know what is going on with non-priority issues for the next five years. Colin would like to know if there is a floor, and what it is. Focusing all jurisdictional resources on a small portion of a watershed and ignoring everything else is a concern.

Karen Holman (Unified Port of San Diego) agreed with Colin; the intent is not to look at one area in a Water Quality Improvement Plan and ignore the rest. She volunteered the best way to explain the proposed program in more detail may be to meet with Coastkeeper and explain the intent and potential details of the program.

Paul Hartman (City of Vista) stated that one way the Copermittees are looking to address that is through long-term monitoring at existing mass loading stations for a large suite of constituents, including monitoring for contaminants of emerging concern. Also proposed are temporary watershed assessment stations to cover water bodies where information is needed on those outfalls.

Karen Holman (Unified Port of San Diego) responded to Jill Wittkowski's earlier comment about why characterize non-stormwater discharges if they are prohibited. The San Diego County Copermittees are now proposing to look at the transient flows and eliminate transient flows by using observations or other monitoring efforts instead of analytical characterization of the flows. In areas with perpetual flow with sources that cannot be identified easily, those flows would be put into the prioritization program and steps would be taken in the yellow and green areas.

Paul Hartman (City of Vista) responded to Jill Wittkowski's earlier comment about one monitoring station per hydrologic subarea for persistent flows. That provides a broad look at the region, amounting to approximately 70 sites throughout San Diego. The idea came up when working through the Lagoon Investigative Order with SCWRRP, where it was noted that generally one to two outfalls contribute 80 to 90% of the pollutants found in a watershed. As the Copermittees can't monitor everywhere all time, they are trying to use resources effectively and this approach is practical from a staff perspective.

Wayne Chiu (RWQCB) expressed gratitude to the San Diego County Copermittees for providing their proposal as an alternative to what is currently in the administrative draft permit. Throughout this process the RWQCB has asked for recommendations, ideas, etc., and the San Diego County Copermittees have stepped up to the plate. Wayne continued that there are a lot of elements in what he heard today on which all can agree and buy into. The devil will be in the details, and there are a couple aspects where the Board may have its own thoughts. Generally, the approach is sound. In terms of considerations of cost and working smarter, the Board is in favor of that. What is currently in the administrative draft permit is quite onerous, and the Board was not expecting it to make it through to the final draft. The Board hoped to stimulate thinking among Copermittees and send the message that they want to see things done differently, with an increased effort toward eliminating non-stormwater discharges. This permit focuses on elimination first, analysis second for non-stormwater discharges. Stormwater discharges will be a much longer effort.

In terms of historical data, all data collected at any time can be useful. Whether or not it is comparable at all times is a different question. All data can provide historical context and show changes; therefore, any data collected can be used to inform the programs. Wayne agrees that monitoring does not solve problems, but it does indicate if a problem is being solved. Monitoring is needed to identify problems and then to indicate if progress is being made toward solving those problems.

This process is part of the iterative and adaptive management process the RWQCB is trying to incorporate into the permit. Monitoring is an integral part of this; that is why it is the central portion of the permit.

Wayne Chiu (RWQCB) continued that there are two major aspects of the monitoring that the RWQCB would like to make sure are still in the monitoring program: (1) the concept of individual jurisdictional accountability and responsibility and (2) identification of non-Phase I MS4 sources. Wayne is not sure that there is anything with what has been proposed that would inform RWQCB Staff as to what improvements are being shown or demonstrated within a receiving water within a Copermittee's jurisdiction. Wayne would also like to see non-Phase I MS4 sources identified through data. If the monitoring data being collected by non-Phase I MS4 sources are not enough to inform, then the RWQCB has the ability to compel additional information from those dischargers. With a common goal and common understanding through this permit, Wayne believes resources can be jointly used to address the problem.

Karen Holman (Unified Port of San Diego) stated that jurisdictional accountability needs to be in the programs because that is how budget is allocated by City managers. As the Copermittees have been presenting their proposal and talking in depth, it is understood that jurisdictional accountability is a key point for the RWQCB. One of the things the Copermittees are looking at is to see jurisdictional accountability in the green and yellow areas (BMP/Special Studies and Source ID Monitoring). Jurisdictional accountability may not be evident in receiving waters because problems may originate elsewhere.

Paul Hartman (City of Vista) stated that he heard several times in the first focused meetings that the RWQCB is looking for accountability via the iterative process and implementation but that assessment and adaptation of the Copermittees' programs would be more focused on improving the programs. The yellow and green processes are one of the ways to do that. Accountability of items in the blue areas is going to take years to see change unless the RWQCB is only looking at the elimination of non-stormwater flows.

Wayne Chiu (RWQCB) recognized that it will take a long time to see changes in stormwater. The Board expects to see changes in non-stormwater quicker if efforts are placed in the correct places. The Board also still expects monitoring to be done to establish the long-term stormwater trend.

Paul Hartman (City of Vista) stated that one of the places where the Copermittees experience discomfort is where the assessment question is what are the monthly flows and pollutant loads from all outfalls in a jurisdiction.

Wayne Chiu (RWQCB) responded that a lot of the requirements in the monitoring and assessment sections stem from 40 CFR stormwater regulations. There is one assessment requirement in the 40 CFR regulations concerning pollutant loads. That is where the pollutant loading assessment requirement came from. The RWQCB believes that is valuable information, whether it is obtained through modeling, statistics, or empirical data. The RWQCB wants a record of flows and pollutant loads coming out of each Copermittee's MS4; that record can be used to track how improvements are being achieved over time. The RWQCB does not expect everything to happen within a year or 10 years; however, they still need those records to see the trend.

Wayne Chiu (RWQCB) continued, speaking of assessment, when looking at the monitoring requirements, all the monitoring requirements in the administrative draft permit

were shaped and formed around assessment requirements, including what is coming out of the MS4 (non-stormwater and stormwater; what pollutants; how much). The receiving water is something that the RWQCB does not think needs to be monitored every year, but some monitoring data are still needed to establish trends over time. It could take decades to see the trend, but a record is needed to see it. The Copermittees should be using the monitoring data from this administrative draft permit and from the last 20 years to improve their programs.

Richard Boon (County of Orange) shared an approach to dry weather monitoring that had been in a prior permit: a hybrid dry weather reconnaissance program. It included monthly monitoring at over 60 stations across South Orange County. The program was designed to clearly identify aberrant anthropogenic sources (IDIC). It gave really good spatial coverage, directed resources very effectively, and created and established jurisdictional accountability. Richard would be happy to do a presentation on the merits of this approach. He spoke with US EPA headquarters' staff last Friday because they are trying to get the merits of this approach into national rulemaking expected next summer. The dry weather reconnaissance program has dry weather action levels that force the investigation of non-fecal sources of bacteria to identify conditions or pursue elevated bacteria levels that may be the consequence of vegetative decay, or pursue metal concentrations that are most likely from natural shallow groundwater sources. The dry weather reconnaissance program talks about adaptive management, prioritization, accountability, and focusing resources on the issues of real concern. Throughout this process and commentary on the draft permit, Orange County will be advocating for the statistical dry weather reconnaissance approach.

Claudio Padres (Riverside County Flood Control District) recognized that all information has value to the RWQCB. The Copermittees should be looking and focusing on data that have value as they relate to the high priority issues. Claudio asked if it was the intent of the RWQCB staff with the administrative draft permit to have the monitoring requirements be consistent with tailoring to high priority issues or if the intent to was to have monitoring requirements implemented irrespective of priorities.

Wayne Chiu (RWQCB) responded that the Board is trying to build in the ability for the Copermittees to use the monitoring data to inform their priorities. First year monitoring would take a look and make sure priorities are correct. Subsequent years of monitoring would primarily analyze the highest priority pollutants; however, there is a need to go back to make sure priorities are correct.

Claudio Padres (Riverside County Flood Control District) pointed out that one year of monitoring data (i.e., the first year monitoring mentioned previously) is not sufficient to establish priorities. Copermittees must also use historical data to create valid priorities. With that in mind, Claudio is unsure of the benefit of the blitz of first year monitoring currently in the administrative draft permit. Wayne Chiu (RWQCB) responded that RWQCB staff is open to revising that portion of the administrative draft permit.

Ted Von Bitner (County of Orange) reiterated Richard Boon's point about the hybrid dry weather reconnaissance program. It allows Copermittees to draw statistical inferences on a region-wide basis about overall conditions and priorities. Using the numeric approach, it

tells Copermittees what the background levels are across a large-scale region. From there, Copermittees can determine what the region's floor is. As sites are fixed and removed, the average begins to lower on a region-wide basis. With this method, the Copermittees have a robust physical model through which a more cost-effective, smaller-scale monitoring program can be developed that provides an increased power of analysis. Ted would prefer the permit to come back to this type of monitoring. Ted clarified that this monitoring would fit into the blue areas of the San Diego County Copermittees' diagram. Mary Anne Skorpanich (County of Orange) voiced concern that the Copermittees still need to pay attention to the top level (blue level) of the San Diego County Copermittees' diagram. Those top level questions are important to understanding the conditions in the receiving waters and protecting beneficial uses.

Jill Wittkowski (SD Coastkeeper) acknowledged that the regional clearinghouse is a great idea. If done well, it could be huge resource, and she would love to see it housed on the Regional Board's website. She believes there also needs to be public input into the process of creating the regional clearinghouse.

Jill Wittkowski (SD Coastkeeper) recognized the main point of the permit is that pollution has to be controlled to the MEP; however, it is very frustrating that even in the San Diego region people are doing inconsistent practices across the region. Jill would like to see a BMP clearinghouse or other mechanism that gives everyone access to the information gained from the special studies in the yellow and green areas of the diagram. Once jurisdictions have access to the information, they must use it unless they can prove they can't.

Alison Witheridge (City of Oceanside) replied that it goes back to prioritization and adaptive management. Not every watershed or jurisdiction will operate the same way. Jill Wittkowski (SD Coastkeeper) disagreed. All jurisdictions should be operating to the standard of MEP; therefore, BMPs should be implemented the same across jurisdictions. Laurie Walsh (RWQCB) clarified that if something is determined to be MEP, then it is upon the jurisdiction to enforce that on all their sites, and on the RWQCB to enforce that on the jurisdictions.

Andre Sonksen (City of San Diego) explained that monitoring is meant to be one small component of the iterative process of the overall stormwater management program. The street sweeping study is a perfect example. Instead of the general SMC questions, the street sweeping pilot program had specific questions and that is where the monitoring kicked in. Andre reiterated that Copermittees would be using the entire chart as one large process, not ignoring portions of the flowchart. He further stated that monitoring does nothing unless the correct questions are answered, followed by changes to programs based on the monitoring results.

VI. Parking Lot Discussion

The group re-visited off-topic items from the previous focused meeting.

- CalGreen/Hydromodification Dedicated Meeting: There will be a dedicated hydromodification meeting. Richard Boon (County of Orange) is taking the lead. CalGreen will not be included in the meeting.
- Legal Issues: Copermittees' counsels are attempting to proceed with a parallel track of meetings with Regional Board Counsel; however, Regional Board Counsel does not see a purpose to meeting at this time and does need more time to respond to the letter from the County of Orange. This will be updated at the next focus meeting.
- Aliso Creek / specific areas of geography / BET and Other Technologies: This topic has to do with to what degree does the new permit structure speak to or promote emerging technologies. This should be covered in a future focused meeting.
- Ninth Circuit Court Decision – The administrative draft permit has two central provisions dealing with compliance: one is compliance with water quality standards, and one is compliance with water quality standards being obtained through the iterative process. The RWQCB is discussing this internally; however, they have had no conversations with legal counsel yet, although it is a legal issue. David Barker (RWQCB) recognized that this is one of the high priority issues that have been raised and will put some thought into how to address it at the next meeting.
- Regional BMP Funding and Implementation: There is concern that the permit as currently written does not encourage regional BMPs although regional BMPs have great promise for improving water quality. This will be covered in the next focused meeting.
- Review time for permit: The deadline for written comments on the administrative draft permit is September 14. In light of the newly added meeting on hydromodification, scheduled for the last week in August, Mike McSweeney (BIA) asked for an extension on the written comment period. Jill Wittkowski (SD Coastkeeper) disagreed that one topic should push the process out additional weeks. RWQCB staff stated there will be no change to the written comment deadline.
- Monitoring Presentation by San Diego County Copermittees: This was provided at today's focused meeting.

VII. Other Topics / Audience Comments

Comment: Claudio Padres (Riverside County Flood Control District) stated that it would be helpful to know the RWQCB's vision for adaptive management to better provide comments on the administrative draft permit.

Response: David Barker (RWQCB) will address this at the beginning of the next focused meeting.

Comment: Colin Kelly (OC Coastkeeper) stated that the handout from the San Diego County Copermittees was useful; however, some advance notice would be helpful in having valuable discussion. Colin asked for distribution ahead of time for the next focused meeting, if possible.

Response: Materials for future meetings will be distributed ahead of time when possible.

Comment: Mo Lahsaie (City of Oceanside) stated that Federal regulation does not take economics into consideration but Porter Cologne does. Since 2008, with the economy going down, the budget in Oceanside is getting leaner every year, not staying the same.

Comment: Richard Gardner (Capistrano Beach) identified himself as an advocate of water quality, stating that he wished the discussion could have gone into more detail on monitoring, including the constituents (nutrients, dissolved oxygen, toxicity). There are narrative ways to look at toxicity and ways of changing water quality without going after numeric standards or TMDLs. Richard further stated that the health of the riverine system needs to be evaluated. In other areas, regulators should be open minded to looking at different criteria for monitoring in different areas. He does not feel this is covered in the permit. Furthermore, treatment plants, sterilization of water, permits that allow that to continue without monitoring requirements; those should be interim as they could impact the way to deal with FEID. This is also not in the permit now and needs to be dealt with.

Comment: Rosanna Lacarra (City of Coronado) shared that in 2001 the City of Coronado had great results with IC/ID. They yielded good results and were able to eliminate transient and persistent discharges. Now the focus should be on revamping the program to re-strategize and continue efforts under the proposed permit.

Comment: Mikhail Ogawa (City of Del Mar) requested that existing development be the first topic at the next focused meeting.

Comment: Karen Holman (Unified Port of San Diego) stated that this process has been a real asset to all those around the table, allowing for communication and valuable discussion prior to formal issuance of the permit. Karen appreciates the open process and correspondence throughout the process with the RWQCB and other stakeholders.

VIII. Meeting Adjourned

From: lyris@swrcb18.waterboards.ca.gov
To: Chiu, Wayne@Waterboards
Subject: Regional MS4 Permit Focused Meeting - July 25 Meeting Notes
Date: Monday, August 13, 2012 8:49:10 AM
Attachments: 2012-0725_MeetingNotes.pdf

Regional MS4 Permit Stakeholders,

Attached are the Regional MS4 Permit Meeting Minutes from the July 25, 2012 Focused Meeting. The San Diego Regional Permit Team will be forwarding the agenda for the next Focused Meeting scheduled on August 22, 2012 by Friday.

Laurie Walsh P.E.
San Diego Water Board
858-467-2970
lwalsh@waterboards.ca.gov

You are currently subscribed to reg9_sandiegoco_ms4permit as: wchiu@waterboards.ca.gov.
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(It may be necessary to cut and paste the above URL if the line is broken)
or send a blank email to leave-374116-508208.cee2a373662e566393e62f0af18d11cf@swrcb18.waterboards.ca.gov

California Regional Water Quality Control Board, San Diego Region
Regional MS4 Permit Focused Meeting

Meeting Notes

Date	Location	Agenda Topics
7/25/2012 Start time: 9:30 AM End time: 2:50 PM	City of Carlsbad Faraday Center 1635 Faraday Ave, Rm 173 Carlsbad, CA 92008	• Focused Meeting Highlights • Monitoring Requirements Introduction • Stakeholder Monitoring Presentation • Discussion on Monitoring Proposals Related to Permit Requirements • Parking Lot Discussion • Other Topics / Audience Comments

I. Introductions

Table participants introduced themselves. Lewis Michaelson (Facilitator) ensured the appropriate representatives were at the table, per the June 20, 2012, San Diego Regional Water Quality Control Board (SD RWQCB) Notice.

San Diego County Copermittees (5): Jo Ann Weber (County of San Diego), Andre Sonksen (City of San Diego), Paul Hartman (City of Vista), Karen Holman (Unified Port of San Diego), Alison Witheridge (City of Oceanside), Mikhail Ogawa* (City of Del Mar), Drew Kleis* (City of San Diego) **Indicates representatives rotated during the meeting.*

Orange County Copermittees (5): Grant Sharp (Orange County Flood Control District), Mary Anne Skorpanich (County of Orange), Ted Von Bitner (County of Orange), Richard Boon (County of Orange), Devin Slaven (City of Lake Forest, Lisa Zawaski* (City of Dana Point) **Indicates representatives rotated during the meeting.*

Riverside County Copermittees (3): Claudio Padres (Riverside County Flood Control District), Bob Collacott (Riverside County Flood Control District), Mike Shetler (County of Riverside)

Environmental Community (3): Colin Kelly (Orange County Coastkeeper), Jill Witkowski (San Diego Coastkeeper), Roger Butow (Clean Water Now! Coalition), Thom Spanos* (San Diego Coastkeeper) **Indicates representatives rotated during the meeting.*

Development/Business Community (3): Bryn Evans (Industrial Environmental Association), Wayne Rosenbaum (BIA), Mike McSweeney (BIA), Mark Grey* (BIA) **Indicates representatives rotated during the meeting.*

U.S. Environmental Protection Agency (US EPA) (1): John Kemmerer

San Diego Water Board Permit Team: David Barker, Wayne Chiu, Laurie Walsh, Eric Becker

II. Focused Meeting Highlights

David Barker (RWQCB) announced that there will be an additional meeting on the topic of hydromodification. The County of Orange has taken the lead on organizing the event, which will run in the same manner as the other focused meetings. Details will be sent out once they are available. A tentative decision has been made to have the meeting the last week of August.

David Barker (RWQCB) provided brief remarks on some of the points raised in the past focused meetings that are resonating with the RWQCB staff.

1. Monitoring doesn't have to be water quality sampling. Water quality data are not the only assessment tool that can be used. There were requests that monitoring programs should include field observations as monitoring data, especially for non-stormwater discharges.
2. Adding language to the permit, not just the fact sheet, about the non-enforceability of action levels.
3. Adaptive management in the permit should be flexible enough for the Copermittees to learn without fear of being out of compliance with the permit.
4. Including more specific public participation requirements for development of Water Quality Improvement Plans, and for development of priorities for the Water Quality Improvement Plans.
5. Clarifying Board approval process for all plan submittals, reports, and updates.
6. Making it clearer in the permit what is eligible for adaptive management practices and clarifying the points of compliance in the permit.
7. Consideration of other means of demonstrating compliance with TMDL requirements that are consistent with the assumptions and requirements of the TMDL. The Board does see some flexibility in how waste load allocations are incorporated into the permit.
8. Examining the proposal to change the permit language from "prohibit" to "effectively prohibit" non-stormwater discharges.

David Barker (RWQCB) did caveat that this is not a complete list, and the omission of any points does not mean the Board is ignoring the issue or has made a final decision on the issue.

III. Monitoring Requirements Introduction

Eric Becker (RWQCB) explained how RWQCB staff developed the monitoring provision in the administrative draft permit, almost starting from scratch. The Board looked at what is truly required in federal regulations of the monitoring program and included that in the

monitoring provisions. The Board also listened to feedback from the Copermittees from meetings, as well as recommendations from the Report of Waste Discharge (ROWD). It was a conscious change to include monitoring as a provision within the permit instead of as an attachment. The main goals of the monitoring program are to ensure non-stormwater discharges are eliminated, pollutants in storm water discharges are reduced to the maximum extent practicable (MEP), and that water quality limits are met in the receiving waters. The Board also wants to increase jurisdictional accountability, make sure that monitoring is used as a feedback loop to adapt programs, and identify illicit discharge sources within the MS4, including those outside of the control of the Copermittees. RWQCB staff expects significant changes to this Provision.

IV. Stakeholder Monitoring Presentation

All stakeholders were provided the opportunity in advance to formally present materials at the focused meeting. The San Diego County Copermittees took advantage of the opportunity.

Jo Ann Weber (County of San Diego) stated that we all share a common goal of protecting beneficial uses in waterways. The purpose today is to build on the considerable level of effort already done and provide insights as to what works and what doesn't work. The program as written in Provision D does not support adaptive management. The San Diego County Copermittees have developed a new approach using specific questions provided by RWQCB staff.

The approach proposed by the San Diego County Copermittees is to require development of a Monitoring and Assessment Program (MAP) as part of each Water Quality Improvement Plan to provide information needed to answer management questions and support effective adaptive management. To do so, the San Diego County Copermittees propose to coordinate Provision II.D requirements with Provision II.B language. The goal is to answer the three big assessment questions as efficiently as possible.

Adaptive management has three phases: long-term planning, implementation, and assessment. To provide useful feedback, the MAP is proposed to be developed during the long-term planning process during the first twelve months after permit adoption. Monitoring needs to be coordinated with the other programmatic elements to provide the most useful information.

The San Diego County Copermittees see monitoring fitting in with overall program management. It fits in with the other implementation elements; it is not an element outside the program. To illustrate this, see the following figure.

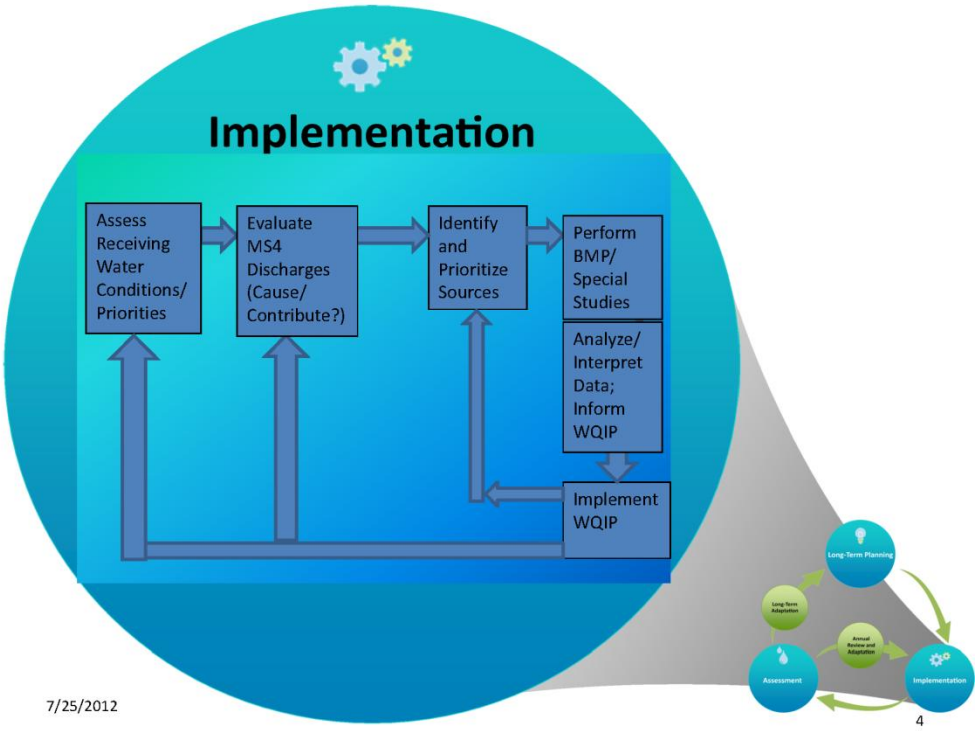

The four overall components of the monitoring program (assess receiving water conditions/priorities; evaluate MS4 discharges; identify and prioritize sources; perform BMP/Special Studies) are shown across the top of the above diagram. The loop across the bottom of the diagram is the adaptive management, or feedback, process.

The San Diego County Copermittees have been monitoring receiving waters for close to 20 years now and have a high level of understanding of the problems in many of the receiving waters. In the 2007 San Diego Permit, the San Diego County Copermittees began to incorporate MS4 stormwater conveyance monitoring to determine how MS4s were impacting the receiving waters. The San Diego County Copermittees are now looking to move this information forward by placing more focus on identifying and prioritizing sources. In earlier permits, a lot of time has been spent in the first box on the left. The focus now should be taking resources and moving forward in the process.

The San Diego County Copermittees believe that this is the nexus to effective implementation because it fits into adaptive management and can guide and utilize other programmatic implementation efforts to improve water quality. For example, if nutrients and bacteria are priority problems, then sources of each must be considered separately. Different strategies for implementation will be necessary to target each audience. Pilot BMPs and other special studies will provide specific information to improve and target implementation activities. These studies may involve more than just water sampling. The loop at the bottom of the diagram represents the adaptive management process.

The San Diego County Copermittees recognize that watersheds are at different levels of understanding with respect to each of the four components. Those with TMDLs have a more mature program. The goal of the MAPs will be to strategically tailor the balance of

monitoring to the prioritized needs of the specific watershed management area. The result will be efficient, coordinated monitoring with an enhanced watershed and TMDL focus.

Provision D in the administrative draft permit has a lot of focus on the first two boxes, but does not allow Copermittees to shift effort to the third and fourth boxes. The San Diego County Copermittees would like that flexibility. The Copermittees want to coordinate the monitoring in Provision D with the assessment plan required in Provision B. To do so, the San Diego County Copermittees propose an Alternate Provision II.D to maximize the benefits of the programs overall. The concept is to use an informed design strategy that tailors a question-driven approach, starting with general questions that lead to more specific questions. The Copermittees would not be starting from scratch; rather, they would be building on the last 20 years of monitoring strategies. Also, as monitoring is not just water sampling, the Copermittees want to incorporate alternate monitoring methods better than has been done in the past. Ultimately, this will support watershed priorities and allow Copermittees to focus water resources on high priorities within each watershed.

The San Diego County Copermittees are proposing alternate language for Provision D that will better provide program managers with needed information to support effective adaptive management. The proposal includes having monitoring within the overall planning process of the Water Quality Improvement Plan. To accomplish this, the San Diego County Copermittees propose a phased approach with pre- and post- Water Quality Improvement Plan phases. The MAP would be developed as part of the Water Quality Improvement Plan. With this approach, the first and second year monitoring requirements would be set forth in the permit as part of a transitional monitoring program. The monitoring requirements would be re-assessed and adjusted as necessary to support the highest priorities in each watershed.

If the permit is adopted in spring 2013, then the current Order No. R9- 2007-0001 monitoring would continue until September 30, 2013 to accommodate the resource commitments for the current fiscal year. The transitional (pre-WQIP) monitoring program would run from October 1, 2013 to September 30, 2015 to accommodate the public review, RWQCB review, and lead time necessary for budgeting. The MAP as part of the Water Quality Improvement Plan (post-WQIP phase) would be implemented from October 1, 2015 forward.

The scientific basis of the San Diego Copermittees' proposed Alternate Provision II.D is an informed, question-driven approach. This approach is strongly endorsed at local, regional, state, and federal levels. At the June 2012 RWQCB meeting, RWQCB staff presented a similar approach that was well-received by the Board. The process proposed by the San Diego County Copermittees aligns well with the condition assessment process proposed by RWQCB Staff with an emphasis on setting priorities. All of these documents (A Framework for Monitoring & Assessment in the San Diego Region (SDRWQCB, 2012), Southern California Stormwater Monitoring Coalition's Model Monitoring Program (SMC, 2004), SWAMP Assessment Framework (SWMP, 2010), Elements of a State Water Monitoring and Assessment Program (EPA, 2003)) stress the importance of basing monitoring on clear questions that support explicit decisions ensuring that data are

gathered only when there is a validated framework in place. These documents follow an earlier National Research Council report on monitoring, which emphasized the importance of building on clear conceptual models and questions that are linked to management needs.

Jo Ann Weber (County of San Diego) stated that today she will summarize key technical issues that support Alternate Provision II.D. Detailed explanation will be provided in a separate memorandum to the RWQCB, including specific permit language revisions.

One key proposed change includes jurisdictional non-stormwater monitoring in Section II.D.1.a. Instead of extensive MS4 outfall testing, the San Diego County Copermittees propose to conduct a targeted program to reduce persistent flows that impact receiving water quality, thus allowing resources to focus on actions to ultimately improve water quality. The San Diego County Copermittees also propose a broad program to eliminate transient illicit discharges/illicit connections (ID/IC) getting the spatial coverage by using visual surveys and appropriate follow up criteria.

In addition, for the jurisdictional stormwater monitoring, instead of extensive MS4 outfall monitoring, the Copermittees propose monitoring homogeneous land uses as input to a model. This wet weather runoff modeling would better inform the planning process by prioritizing drainages for implementation efforts. Representative typical mixed-use sites could be used as a cross-check for model results. Selection of representative outfalls with homogeneous land use types may be coordinated and shared among Copermittees to provide the most efficient representation and characterization of major land use categories. Modeling currently being done as part of the bacteria TMDL implementation plan efforts may be built upon.

The San Diego County Copermittees recognize that the RWQCB wants to see jurisdictional accountability. Jurisdictional accountability should focus on completion of the iterative process and would be supported by data collected at prioritized targeted MS4 outfalls. The San Diego County Copermittees feel that the administrative draft permit's jurisdictional boundary monitoring does not support their goals. In the past, data have shown that jurisdictional boundary monitoring has little value, due to a combination of typically high variability of the concentrations of constituents in receiving waters and discharges, and a relatively small percentage of discharge flows and pollutant loading in the receiving waters. This combination of high variability and relatively small impacts or differences requires extremely high numbers of samples to detect significant differences and would be unlikely to result in any programmatic changes or improvements to water quality.

In addition, instead of the extensive compliance monitoring proposed to comply with the Bacteria TMDL in Attachment E, Copermittees have already developed monitoring programs to comply with Bacteria TMDL requirements that are due October 2012. The current language in Attachment E would replace the monitoring planning effort just completed.

Andre Sonksen (City of San Diego) continued that the workgroup has spent significant time and effort developing their proposed approach. One key point is that this is an ordered process that leads to solving specific water quality problems. This process can be applied at

any level – watershed, jurisdictional, or pollutant level. There are three different components to this: management questions (on the left), monitoring components (in the center), and assessment components (on the right). All three components are essential for this to work.

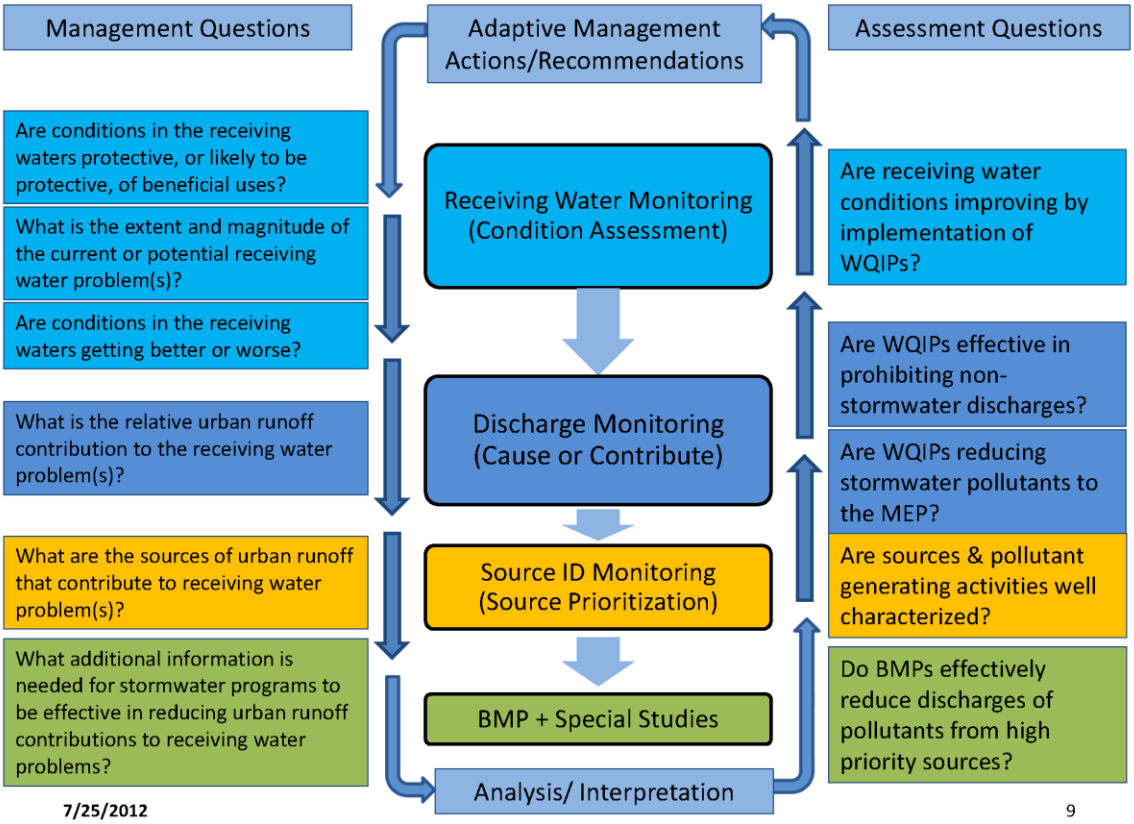

The administrative draft permit focuses on the top four management questions, the receiving water and discharge monitoring, and assessment. There are two more levels needed: source identification and special studies/BMPs. The top three (blue) deal with receiving waters. The next one (darker blue) is discharge monitoring. Yellow is source identification and pollutant-generating activity (PGA) monitoring and identification. The bottom (green) is special studies.

The process starts at the top and moves down. When starting at the top in receiving waters, information is collected that feeds down into discharge monitoring, which feeds into source identification, which then feeds into BMPs. These have to work together. Collecting information at a lower level without collecting information at higher levels will not work. The top question needs to be answered first, or else significant time and effort might be spent looking at something that is not a problem.

The assessment train works in reverse, going back up the process: start with data collected through special studies/BMPs, analyze if the BMPs were effective or if the special

study gives information for feedback into source identification or prioritization, and so on, up the ladder.

The Copermittees have spent a significant amount of time developing how each of these different components are outlined, how they work from top to bottom, left to right, and this is a very well thought out, organized, and methodical process to collect information with direct impacts on how to implement programs.

Andre provided Chollas Creek as an example. In Chollas Creek, the Copermittees have been doing a significant effort for the past 20 years that has culminated into TMDLs for bacteria and metals. Extensive receiving water information has already been collected, the Copermittees already have information at the MS4 discharge level, and there have been special studies completed in Chollas Creek. Looking at the proposed flowchart, some of the questions have already been answered in Chollas Creek. Special studies and BMPs are the next phase for Chollas Creek. Other watersheds don't have the plethora of data that Chollas Creek does, so they would start towards the top of the flowchart.

Claudio Padres (Riverside County Flood Control District) asked if the intent is that this process would be integrally part of the Water Quality Improvement Plan and if the types of monitoring being described would be focused on the high priority issues identified in the Water Quality Improvement Plan or if it would be discharge monitoring everywhere. Andre replied that the MAP would be integrally part of the Water Quality Improvement Plan. This is a methodology for implementing monitoring and how monitoring should be used to inform program planning, program implementation, and adaptive management. For watersheds that have developed high priorities already, the process would be used to tailor the monitoring to get at the issues that are further down in the monitoring tree.

Paul Hartman (City of Vista) stated that the point of the monitoring programs is to allow Copermittees to focus resources on strategic areas identified in the Water Quality Improvement Plan. The way monitoring is laid out in the current administrative draft permit is too prescriptive. Ultimately, the focus needs to be further down in the above diagram, focusing on source identification and special studies.

Claudio Padres (Riverside County Flood Control District) stated that if the intent of the permit is to allow the Copermittees to focus their resources on those high priority issues, then one way to do that is to allow them to focus their monitoring resources, and staffing and time and money, and not spread resources too thin trying to assess everything everywhere.

Colin Kelly (OC Coastkeeper) asked how far the San Diego County Copermittees reached out to Riverside and Orange County about these general ideas. Claudio Padres (Riverside County Flood Control District) responded that the San Diego County Copermittees have been reaching out to Riverside. Unfortunately, due to deliverables under the current Riverside MS4 permit, the County of Riverside has not been able to be involved; however, he has heard a lot of good points and is so far in support of the San Diego County Copermittees presentation today. Richard Boon (County of Orange) stated that Jo Ann Weber has been studiously involving Orange County in conference calls with the group that

developed this approach. Orange County certainly endorses and supports the question-driven approach.

Colin Kelly (OC Coastkeeper) asked if the RWQCB anticipates each program doing every step in this process or if findings can be shared across the jurisdictions, such that if the City of San Diego has done an air deposition study, can those results be taken and used by Orange County so they aren't all doing the same special studies.

David Barker (RWQCB) replied that one reason they are pushing the regional permit is to allow collaborative use of studies.

Mary Anne Skorpanich (County of Orange) shared that she sees this approach very much fitting in with some of their own thoughts that these Water Quality Improvement Plans should take a much more central role in the permit overall. She is completely in concurrence with the overall monitoring required by the permit being linked to the Water Quality Improvement Plan.

Jo Ann Weber (County of San Diego) stepped through the pre-Water Quality Improvement Plan (transitional) monitoring and examples of post-Water Quality Improvement Plan monitoring proposed in Alternate Provision II.D, beginning with receiving waters. The San Diego County Copermittees recognize their responsibilities and commitment to maintaining a level of effort of monitoring during the pre-Water Quality Improvement Plan or transitional phase similar to the current 2007 permit, but adapted to provide more useful information to support Program Managers' needs.

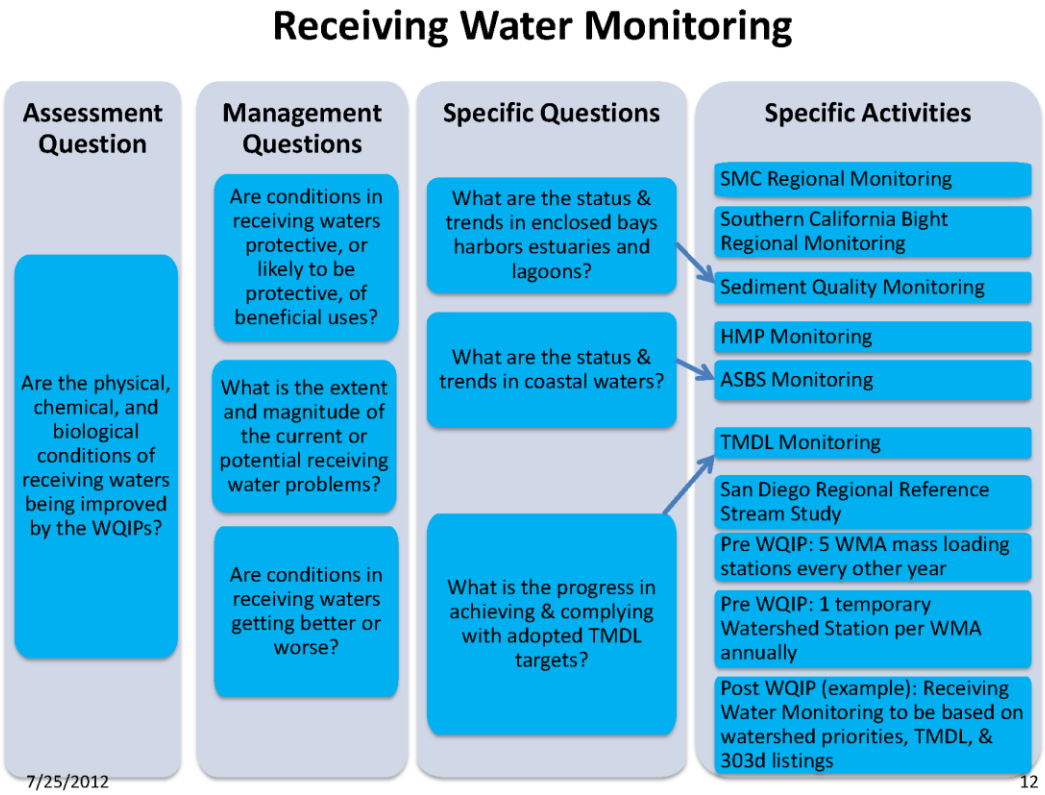

The above diagram illustrates the use of the question-driven approach in designing activities for receiving water monitoring. The process goes from left to right. The Assessment Questions (left side) are from the current Provision II.D ("Are there improvements in the receiving waters conditions?"). The second column lists the appropriate broad Stormwater Monitoring Coalition (SMC) questions that can be summarized as a status question, an extent and magnitude question, and a long-term trend question. These management questions provide context for the more specific, technical questions (third column) and associated monitoring activities (fourth column). Monitoring results from any given activity may only partially contribute to answers for the "big picture" management questions. The specific questions (third column) are examples of detailed study questions that could be used to design the monitoring program. When study questions are answered by specific activities, then the next prioritized study question can begin as part of the adaptive process.

The purpose of the monitoring is to assess trends of receiving waters and magnitude, highlighting rationale and benefits of specific activities. Copermittees are committed to continuing many of the receiving water monitoring programs and balancing sampling needs so that long-term receiving water trends will continue to be addressed. This process supports the question-driven adaptive management approach.

Paul Hartman (City of Vista) presented the Jurisdictional Non-stormwater Discharge Component of the Alternate Provision II.D.

Non-Stormwater Discharge Monitoring

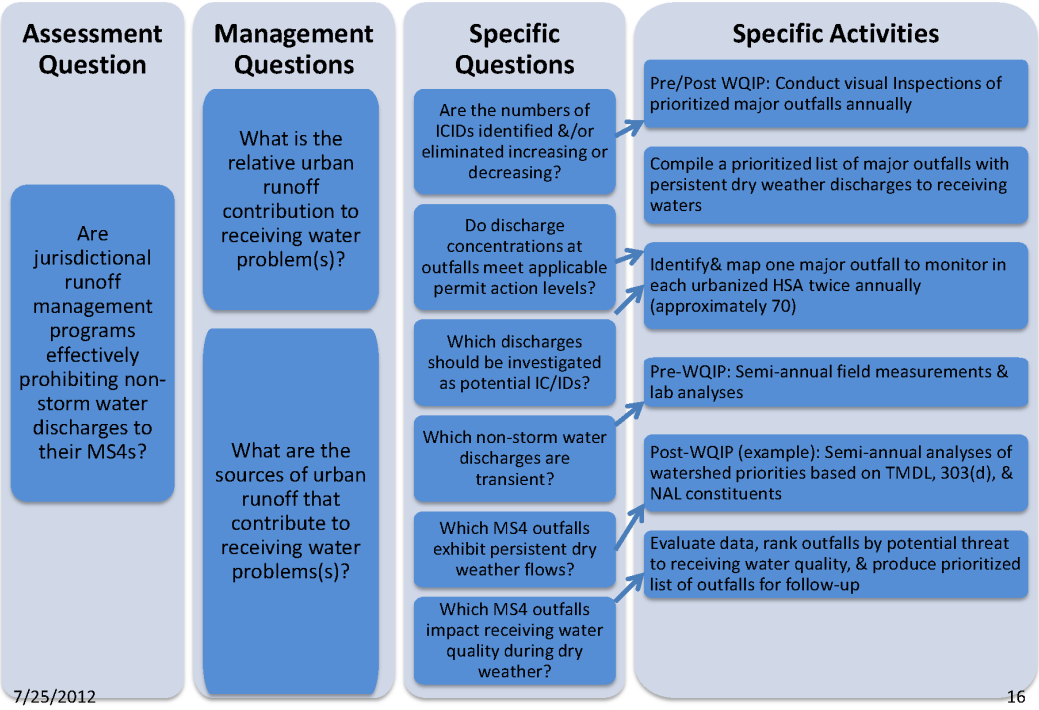

The primary assessment question on the left side is: Are jurisdictional runoff management programs effectively prohibiting non-stormwater discharges to their MS4s? To answer this overall question, the focus is on answering the management questions (second column). From these two management questions, specific monitoring questions have been developed to drive the design of the program. Examples of specific monitoring questions are provided above in the third column. These questions have led to the development of two distinct programs to address non-stormwater discharges during dry weather: one program targeting transient discharges focusing on IDDE; another program targeting persistent flows, designed to strategically prioritize and address outfalls with continuous non-stormwater discharges.

The transient flow program is rooted in a three-pronged approach designed to provide broad spatial and increase temporal coverage. The focus is on sources, the MS4 itself, and the MS4 outfalls discharging to receiving waters. This program would be implemented during both the pre-Water Quality Improvement Plan (transitional) and post-Water Quality Improvement Plan phases. The idea is that the main sources of non-stormwater discharges are addressed via programs such as Industrial, Commercial, and Municipal inspections. Based on analysis of recent data, this program appears effective in preventing discharge impacts. The second part of the transient flow program is to provide coverage of the MS4 system throughout the year, via jurisdictional programs such as complaint response, MS4 cleaning, and staff/citizen reporting of illicit discharges. The third part of the transient flow program consists of visual monitoring at major MS4 outfalls. This would require the updating of inventories and periodic surveys of major outfalls, looking for flow indicative of illicit discharges.

The persistent flow program is based on historical data gathered via existing dry weather programs, MS4 outfall programs, GIS information, and data from the visual observations program discussed previously to identify and prioritize major outfalls that exhibit persistent flows. The current MS4 outfall program will continue to its completion. Once identified and prioritized, one major outfall per hydrologic sub area would be selected for monitoring two times per year. This means approximately 70 outfalls would be under investigation throughout San Diego County at any time. As pollutants are reduced and non-stormwater flows are eliminated, the operation would continue through the prioritized list of outfalls. Comparison to numeric action limits would be used to prioritize outfalls within the Water Quality Improvement Plans.

By implementing the non-stormwater discharge program in two parts (transient and persistent), the Copermittees will be able to best utilize resources to eliminate and control the highest priority threats to receiving water quality.

Jo Ann Weber (County of San Diego) spoke to the stormwater discharge monitoring program.

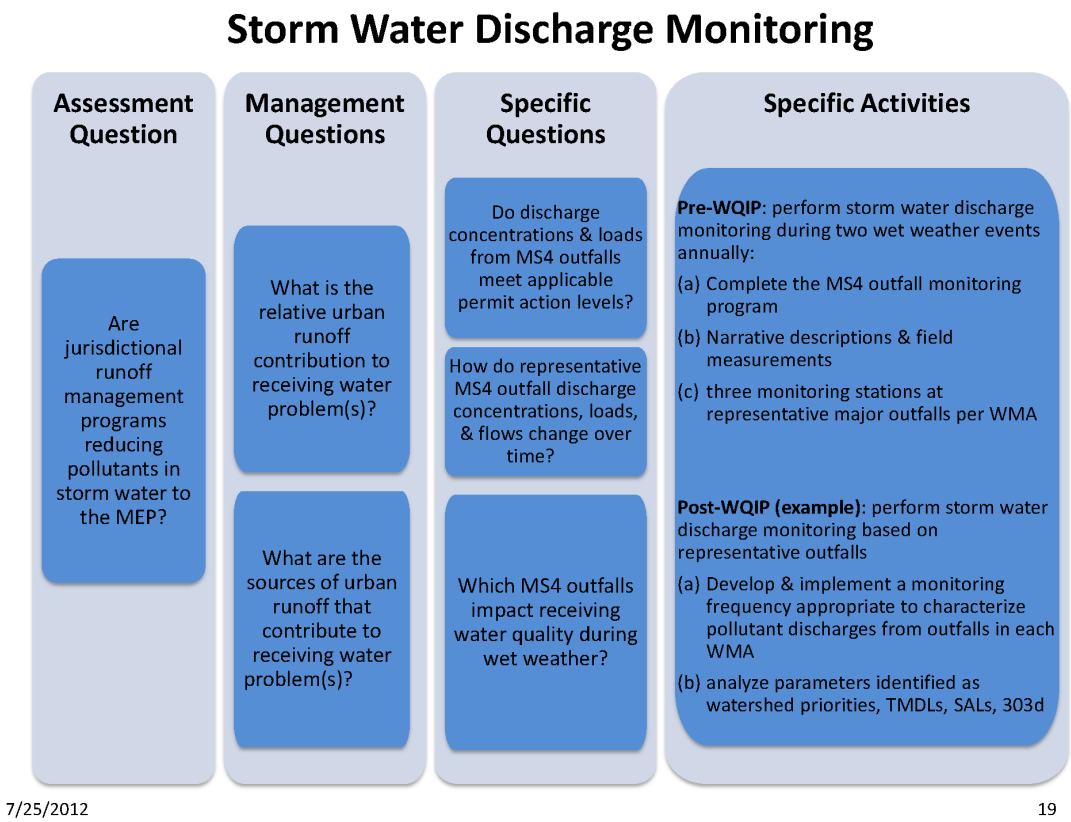

The overall assessment question from the administrative draft permit is if runoff management programs are reducing pollutants to the MEP (first column). The same two over-arching questions are: what is the relative contribution and, if significant, then what are the sources (second column)?

Using the specific questions to guide design, the pre-Water Quality Improvement Plan (transitional) monitoring program commits to completing the current outfall monitoring program (fourth column). In addition, the outfall monitoring in the pre-Water Quality Improvement Plan (transitional) phase would consist of at least three monitoring stations at representative major outfalls per watershed management area. Selection of representative outfalls may be coordinated and shared among Copermittees to provide the most efficient representation and characterization of major land uses. This will allow for more efficient and informed characterization of the MS4 discharges. This effort builds on the rainfall runoff models that use land use coefficients to estimate runoff loads. Sophisticated models developed as part of the implementation plans for the regional bacteria TMDL can be used to inform where additional data for local homogeneous land uses is needed. This proposed MS4 program will be more resource-intensive than the current MS4 program and demonstrates the Copermittees' commitment to gather useful data to target implementation activities.

The post-Water Quality Improvement Plan phase program continues a commitment to perform monitoring of outfalls to characterize pollutants from the MS4s; however, the

design of the program will evolve depending on the specific questions and needs of the watershed management area.

Benefits of this approach are multifold, including broad spatial and temporal coverage; support for assessment-driven, adaptive management approach; and, flexibility in site selection allowing jurisdictions to focus resources on the highest watershed priorities.

JoAnn Weber (County of San Diego) spoke to source/stressor identification (yellow layer). To provide the necessary feedback to improve program implementation, Copermittees have increased emphasis on the Source Identification and BMP/Special Studies, adding the assessment question: "Are sources and pollutants well characterized?" The Copermittees recognize that an increased understanding of sources allows implementation efforts to be focused.

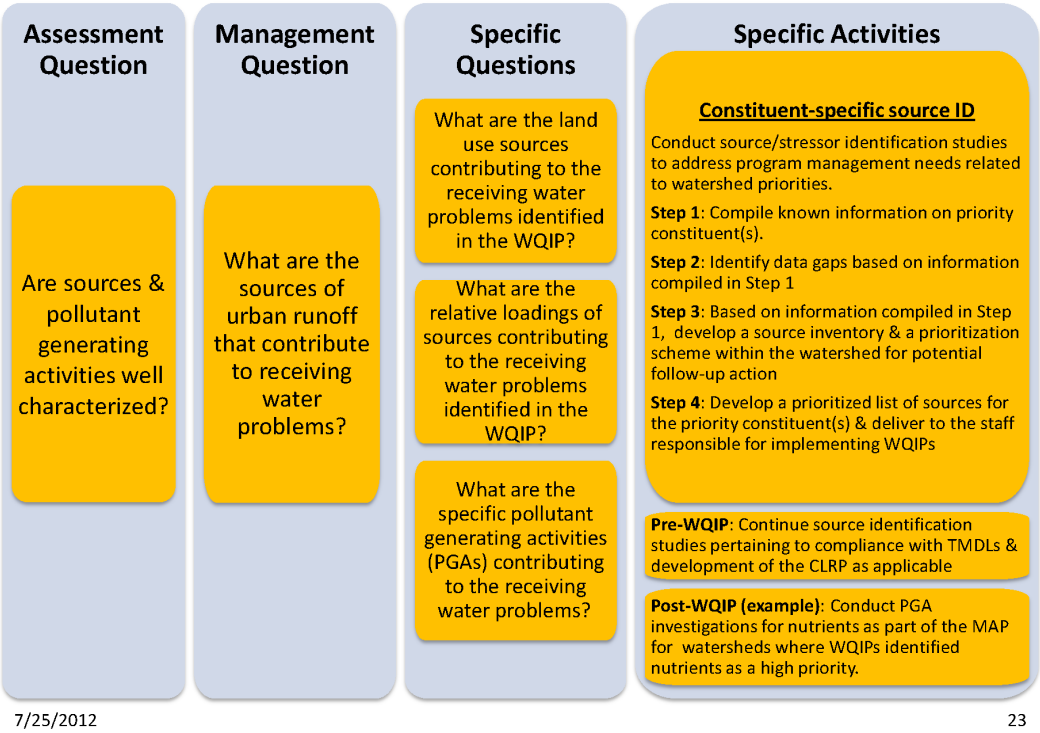

The principle role of identification is to identify and prioritize pollutant generating activities (PGAs) and source categories. PGAs can result in release of pollutants. Once PGAs are identified and prioritized, then behavioral changes and education can take place. Identification of high priority sources is an important step in support of the Water Quality Implementation Plan process, to help inform the development of effective pollutant control strategies for particular priority constituents on a watershed-specific basis.

The key benefits of the source/stressor identification studies are to provide program management with information to verify, quantify, and prioritize sources and provide links between sources, activities, and effects of runoff.

Andre Sonksen (City of San Diego) spoke to Special Studies/BMPs (green layer).

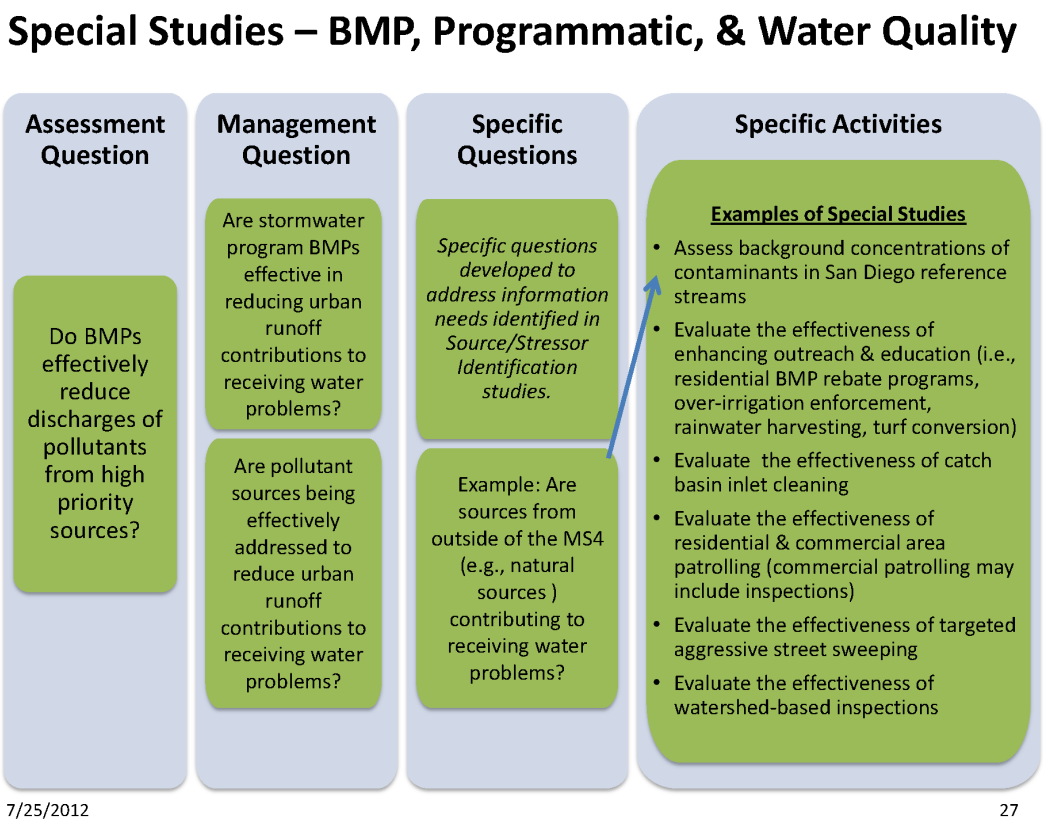

The BMP special studies program follows the same general format seen for receiving waters, etc. Assessment questions are from the administrative draft permit, management questions were developed similar to scope and language as that in the SMC, then specific questions are developed based on specific information needed or desired (third column).

The City of San Diego has used this process to evaluate one of the BMPs in the current permit: street sweeping. As an example, the management question was “Can street sweeping effectiveness be improved?” The City then conducted a pilot study in four phases; each phase had its own specific question. The question for the first phase was “Is there an optimum sweeping frequency? How often do you need to sweep streets to get the maximum benefit?” The question for phase two was “Is there a sweeper type that is better than the others? (vacuum vs. mechanical sweepers).” Phase three asked “How much pollutant removal does sweeping the median in streets add?” Finally, phase four asked “Is there an optimum sweeper speed?” Each phase of the study built upon the results of the previous phases. As a result of the study, the City implemented changes to their street sweeping program.

The purpose of special studies/BMPs is to support effective adaptive management, assess BMP effectiveness, and perform scientific investigations to address data gaps. The methods are very focused (pilot BMP studies, source identification special studies, water quality studies). The benefits are that this all feeds into adaptive management and how to improve programs to improve water quality.

Roger Butow (Clean Water Now! Coalition) asked who creates the questions for this question-driven approach and how much input or influence do watchdog NGOs have over the questions, as the questions are the beginning of the entire flow chart.

Karen Holman (Unified Port of San Diego) responded that the Copermittees started with RWQCB assessment questions from the original permit and SMC questions, especially in the blue areas of the below diagram.

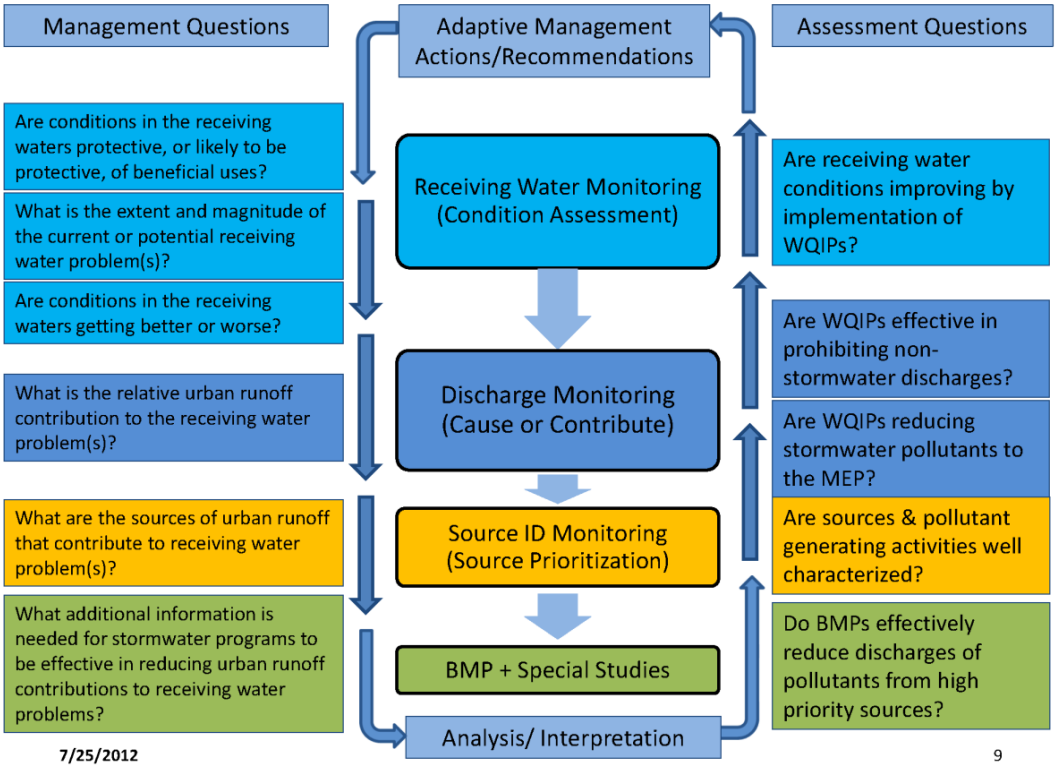

Karen continued that the next two levels (yellow and green) are where adaptive management starts, and that is where the Copermittees are focusing on making the nexus between monitoring and the rest of the permit programs. For these areas, the questions are being developed by the Copermittees based on needs. Questions could be driven by priorities in the Water Quality Improvement Plans; other focused questions could be on whether BMPs are working as expected. Karen hypothesized that NGO involvement could begin there, with the more focused questions that are aligning with Water Quality Improvement Plan priorities.

Jill Wittkowski (SD Coastkeeper) shared that the questions look to be along the right lines. If this is done hand-in-hand with the Water Quality Improvement Plan process, it

makes sense that the public participation process for the Water Quality Improvement Plan would result in a collaborative public process for developing some of the monitoring questions.

Jo Ann Weber (County of San Diego) provided an example of how a MAP might be developed in an example watershed. The slide below lists the steps for the strategic monitoring approach.

Developing Monitoring & Assessment Programs (MAPs) for Each WQIP

STRATEGIC MONITORING APPROACH:

1. Establish stormwater management priorities specific for each WMA ("Watershed Priorities") as part of WQIP development.
2. Compile existing monitoring data & assess available information for receiving waters, MS4 discharges, & sources or stressors within the watershed.
3. Identify regulatory & non-regulatory drivers that apply to water quality monitoring within the watershed, & list all associated monitoring responsibilities assigned to the Copermittees.
4. Evaluate the watershed priorities in context of available monitoring data & existing monitoring responsibilities, & develop specific management questions for each priority issue.
5. Establish metrics & identify assessments that should be performed to supply information needed to address the management questions.
6. Identify elements of a watershed-based monitoring program needed to address the watershed management questions & perform the necessary assessments.
7. Develop detailed monitoring plan to address the identified monitoring needs, coordinated with other ongoing monitoring in the watershed.

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For a sample watershed, assume priorities are TMDL for bacteria and 303(d) listing for copper and nutrients. A likely assessment question would be "Are jurisdictional runoff management programs reducing pollutants in storm water to the maximum extent practicable?" A likely management question would be "What are the sources of urban runoff that contribute to receiving water problems?" Following the previously presented flowchart, the next step would be to develop specific questions using available information. For bacteria and copper, MS4s are known sources; however, MS4s are less well known sources of nutrients. In this watershed example, loadings from land uses are not well quantified to support planning of wet weather management actions or evaluate their effectiveness. A specific question in this case would be "What are the representative MS4 outfall discharge concentrations, loads and flows?" The approach to answering the specific question is to support model development, calibration, and validation. Stormwater discharges should then be monitored at a determined number of sites based on appropriate land use characterization for modeling, at a determined frequency (e.g., 2 storms per year), for specific constituents (e.g., bacteria, copper, nutrients, and any other special study

needs), and for a specific duration (e.g., at least one adaptive management planning cycle to allow for data usability).

To include the San Diego County Copermittees' proposal in the draft permit, the next steps are to provide the RWQCB with Alternate Provision II.D and a technical memorandum with support and rationale for the alternate provision.

In closing, Jo Ann Weber (County of San Diego) stated that the purpose of monitoring is to provide information to program managers to inform implementation of the stormwater programs. A thorough and thoughtful planning process using a question-driven approach provides the roadmap for success. The San Diego County Copermittees have metaphorically traveled the freeways and will now venture onto the roads less traveled, including conducting source identification studies, BMP studies, and targeted special studies. The Copermittees admit they may meet dead ends along the way and through the adaptive planning process will be adjusting the strategic route. The Copermittees look forward to partnering with all stakeholders in the challenging journey ahead.

Roger Butow (Clean Water Now! Coalition) asked how and under what circumstances would the monitoring look at contaminants of emerging concern and take into account any recalibration of trigger levels or metrics. Claudio Padres (Riverside County Flood Control District) responded that there would still be a component of receiving water monitoring to detect emerging issues. The idea would be to assess each issue as it arises, annually go back and review data and review priorities. For example, if perchlorate became an issue, that would get on the priority list and would be set in order as far as doing specific programs to target that particular constituent. It would be addressed in the context of the Water Quality Improvement Plan and its priorities.

Paul Hartman (City of Vista) agreed that it is a matter of striking a balance in the monitoring program: some parts will be monitoring for a broad suite of constituents over the long term; other parts will drill down to activities and BMPs effective at preventing pollutants of concern. The monitoring program will keep a broad approach but will not be monitoring everything everywhere.

Mike Shetler (County of Riverside) shared that Riverside County actually developed a demonstration on flood control district property where they are evaluating different BMPs that could be used in the field. He encouraged Roger Butow to visit the demonstration project.

Jill Wittkowski (SD Coastkeeper) stated that having this presentation in so much detail shows the benefit of the workgroups that the San Diego County Copermittees have. It does not look like these workgroups will be going forward with the new permit. Jill believes it would be valuable to the overall process to continue these workgroups with the next permit.

Jill Wittkowski (SD Coastkeeper) mentioned that the purpose of monitoring that has been repeated a few times is to make the programs better. Another purpose is to keep the pulse of the waterways; to know if the waterways are healthy or not.

Jill Wittkowski (SD Coastkeeper) asked what parts of the administrative draft permit are prohibiting the San Diego County Copermittees' proposed process.

Paul Hartman (City of Vista) replied that there are certain portions of the permit that are focused prescriptively on receiving water and MS4 monitoring. A specific example is the current dry weather program which appears to look for more broad spatial coverage, increasing sampling sites to a ¼-mile grid system (from 40 sites to more than 380 sites for Vista) while also going from quarterly to monthly monitoring. The San Diego County Copermittees are looking for flexibility to dial back those requirements and focus resources through adaptive management monitoring to get valuable feedback.

Claudio Padres (Riverside County Flood Control District) stated that he sees the difference from a high level of what is currently in the administrative draft permit versus the adaptive management strategies presented by the San Diego County Copermittees is the difference between monitoring for monitoring's sake versus strategic monitoring. The current administrative draft permit is a broad brush to do everything everywhere, not the focused approach presented by the San Diego County Copermittees.

Mike McSweeney (BIA) appreciated the approach presented by the San Diego County Copermittees and appreciated that he could understand the thought process from looking at the flowchart. Mike agreed that sampling should not be done so infrequently that if something bad happens it is not caught. He complimented the Copermittees on developing a smart way to address what the RWQCB is looking for. He agrees with Paul Hartman (City of Vista) that the grid pattern seems to be sampling for the sake of sampling, not smart or strategic sampling.

Roger Butow (Clean Water Now! Coalition) asked RWQCB staff if the language "economic feasibility" and "technological possibility" will no longer be used as metrics in the permit.

Wayne Chiu (RWQCB) replied that those terms are not used in this permit. Everything in the permit is a technical possibility and is feasible. The question of whether it is cost effective is part of the equation as well. What the RWQCB has proposed here are the minimum federal requirements, but those are put in as a starting point to basically provide the Copermittees an understanding of what can be in a permit. Those terms are not being used anymore.

Richard Boon (County of Orange) spoke on the definition of MEP as it is a crux issue for this process. The State of California did define MEP in 1993 and used the language "public acceptance," "cost," and "technical feasibility." Until State Board Counsel withdraws that memorandum, Orange County would very much expect to see those discussions in this permit. With respect to monitoring, it would mean that the resources available for monitoring are finite; therefore, Copermittees must be careful with how they allocate resources to monitoring because every dollar spent on monitoring is a dollar not spent on implementation of BMPs.

David Barker (RWQCB) replied that in the administrative draft permit, the State's definition of MEP is listed as part of the definition of MEP; therefore, what Richard has stated is fully consistent with how the administrative draft permit is defining MEP.

Bryn Evans (IEA) stated that the IEA has comments on the permit with regard to permitted non-stormwater discharges, such as groundwater dewatering, that have their

own permits. These activities can be mapped and utilized in the other elements of stormwater programs, including third party data. This would allow Copermittees to cost efficiently understand where those permitted non-stormwater discharges are currently and then focus on non-stormwater discharges that do not have authorization.

Grant Sharp (Orange County Flood Control District) mentioned that Monday was the Phase II Small MS4 permit comment deadline. That permit will target small communities and non-traditional Copermittees, such as school districts, state beaches, state parks, etc. One of the interesting things is the requirement for these non-traditional Copermittees to begin to do water quality monitoring to develop IDDE programs. In addition, the draft Phase II permit also has action levels in it for non-stormwater discharges and when compared to the Phase I MS4 permit, they are very different. With the action levels in the Phase II permit, one of the conceivable situations is one of the new non-traditional Copermittees will be doing their own IDDE monitoring and determine they don't have a problem because findings are below their discharge action levels, but the findings could be above the Phase I MS4 non-stormwater discharge action levels. This results in double investigations with different standards. Grant suggested partnering with the Phase II Copermittees to reduce the chance of double investigations.

Jill Wittkowski (SD Coastkeeper) stated that the modeling makes her nervous. The value of any model is based on the validity of the data being used to create the model. If a bad model is used, then bad decisions may be made based on the bad model. She would like to see the modeling concept developed further so that modeling will be robust and give good information to make good decisions.

Andre Sonksen (City of San Diego) explained that the problem with the current models for the San Diego region is that most of the data for the models are not from the San Diego region. Moving forward, the Copermittees would collect region-specific information that would go into current models or refine models to make them applicable to the appropriate region.

V. Discussion on Monitoring Proposals Related to Permit Requirements

Jill Wittkowski (SD Coastkeeper) stated that Coastkeeper is not the only environmental group involved and interested in this permit. Coastkeeper understands that Copermittees are concerned about the cost and breadth of dry weather monitoring; however, some of the environmental groups do not think that cost should be an issue. It should not be the case that Copermittees are required to comply unless it is too expensive. Dry weather monitoring should be kept in the permit. Jill recognized that Copermittees seem worried about the ¼-mile grid system. An alternative view is that this is a dry weather blitz for the first year and maybe it does make sense for the first year to do a blitz and acquire a broad view of the health of our waters throughout the watersheds. Another possibility may be a tradeoff of dry weather monitoring in exchange for the Copermittees agreeing to the inclusion of numeric effluent limitations in the permit.

Jill Wittkowski (SD Coastkeeper) raised the issue of third party data; the permit allows use of third party data but it is not clear how and when that happens. Coastkeeper would like to see in the permit specific requirements for being able to use the third party data, such as requiring use of that data so long as Quality Control training is done. There is a perception that Copermittees only use the data that looks good for them. The permit should require all data to be used. Coastkeeper would also like to see a useful database where all of the data from the region comes together, including Copermittee data and third party data. The database should be accessible by the public and perhaps show green, yellow, and red as an overview of water health. If people knew better that there are serious problems in waterways, then they may support water quality improvement efforts more and there might not be huge budget struggles.

Jill Wittkoswki (SD Coastkeeper) stated that she heard earlier today there are some places for which the Copermittees do not have a lot of data. If they don't have data, Jill questioned how they are setting priorities.

Jill Wittkowski (SD Coastkeeper) acknowledged that commercial, industrial, and municipal inspections are doing a good job looking at non-stormwater discharges. The big question now is residential sources and what should be done about them. Jill would like to see a commitment from Copermittees to crack down on this issue; to really have a plan for residential sources and be willing to take a stand on it. Jill has seen in watershed reports that there is a problem. She also questioned that if non-stormwater discharges are supposed to be prohibited, then why are there numeric limits for the discharges and why should money be spent on analyzing the discharges rather than locating the sources.

Jill Wittkowski (SD Coastkeeper) recognized the discussion earlier about pollutant-generating activities (PGAs) and using studies to determine which PGAs need to be cracked down on. This information should already be known. Coastkeeper did an audit in the Agua Hedionda Watershed, identified a nutrients problem, and determined it was probably coming from nurseries. They did not see any big problems when doing inspections, but also have not seen any follow up or alternate plans. Coastkeeper would like to see work continued and followed up on.

Jill Wittkowski (SD Coastkeeper) had a general question about having one monitoring station per HSA. She would like to understand how that was chosen, as some areas it may be that more than one would be appropriate.

Colin Kelly (OC Coastkeeper) stated that some issues that Coastkeeper is concerned about were first discussed about an hour ago with the Clean Water Now! Coalition. Colin would like to know what the County believes that this modification might do to impact the prioritization of different waterbodies as constituents of emerging concern (CECs).

Colin wants to make sure that waterbodies not on the priority list are not ignored. Minimum monitoring should be required on the non-priority waterbodies to get a baseline. Colin clarified that he is not specifically asking for Copermittees to test for CECs, but he would like to know the minimum requirements.

Colin Kelly (OC Coastkeeper), regarding the use of historical data, would like to know what is considered to be historical data. There has been a significant adjustment in

technology and lower detection limits between now and the 1970s and 1980s. If there is a ten year term, Colin would like to know at what point will historical data not be useful, or what data can be used by third parties. Colin does not think money should be wasted in duplicative efforts between citizen water monitoring and Copermittee water monitoring. Third parties should be able to provide data to the Copermittees. Colin continued that with the use of historical data, there has been significant land development in Southern California. If there is a certain area that has data from the 1990s but has been developed since then with changed hydrology, then that may be a higher priority.

Thom Spanos (SD Coastkeeper) recognized that there are much more stringent requirements for monitoring during the first year of this permit, but after that it seems to allow much flexibility and the prioritization that the Copermittees desire. Thom asked Copermittees to take a step back and look from the broader perspective; it is not too much to ask that once in every five years Copermittees go back and make sure they are not missing anything. Thom continued that Coastkeeper does understand that costs can be significant, but the Clean Water Act is supposed to be a technology-forcing statute. If they are not made a requirement, then there will be no development in these fields. Copermittees should find ways to make this a more efficient process, into which adaptive management does feed. Coastkeeper does not want Copermittees held responsible for something that is not their fault. If action levels in Phase II permits are higher than Phase I permits, then this is the perfect opportunity for the RWQCB to implement more stringent requirements within their region. Thom hopes that everyone is keeping in mind not just the short term costs, but also the other factors involved.

Roger Butow (Clean Water Now! Coalition) thanked Coastkeeper for their comments on contaminants of emerging concern and that increased science does give a better ability to detect lower limits.

Roger Butow (Clean Water Now! Coalition) mentioned Aliso Creek as an example of sampling where sampling was done week 1 on Monday at 9 am, week 2 on a different day of the week at noon, etc., which resulted in a better window of sampling. He would like to see that type of sampling written into the permit itself, as well as integrating sampling by non-governmental organizations (NGOs). Roger agreed that sampling must take place in a manner that maximizes funds and maximizes the database being developed. Sampling the same time, the same day of the week at one site does not give a general concept of fluctuations and the ability to lead to source tracking.

Ted Von Bitner (County of Orange) stated that the RWQCB's goal is to answer basic questions: what is the condition of the watershed, are beneficial uses being protected, and how are those conditions changing over time? Each permit cycle, the Copermittees have changed their monitoring program. Losing that continuity causes the data set to become less valuable.

Ted von Bitner (County of Orange) continued that one of the primary principles of the NPDES Program in general has been that while you can judge the quality of your discharge by sampling at a specific point, you cannot judge the health of the watershed, which is the mission objective of the RWQCB. Orange County has started on that effort by coming up

with new programs, new monitoring designs that are designed to answer that question. Orange County has the Stormwater Monitoring Coalition's Regional Watershed Monitoring Program which gives a holistic view of the watersheds in general. That approach has also been used by the San Diego RWQCB for the San Diego River Integrated Regional Program, and they are now starting on a coastal program. There seems to be a common approach there that should be adapted for this permit. Following what Coastkeeper said and in context of the approach that San Diego provided, there are some basic questions that need to be answered first about the MS4: What is the condition of the MS4? What needs to be worried about? The Copermittees also need to answer basic questions like: What are the frequency and magnitude of PGAs? Who are the priority pollutant dischargers? The Copermittees cannot answer those questions at this point because they have tried in the past with programs, but each time the permit changes, the Copermittees lose their ability to answer those key questions. The Copermittees would hope to follow what has been proposed and bring back to their previous program. Thinking about the MS4 program, it should be an overall design, recognizing how much of the MS4 creates an impact on receiving waters. It should also be a comprehensive program where everyone comes together, including Phase II dischargers and the Industrial General Permit dischargers. With identical submittal dates, it is difficult to incorporate their program findings with the Copermittees' reports. There is no mechanism to incorporate that data. At same time, Ted does not get a sense from the administrative draft permit of when the RWQCB and Copermittees stop and meet; when does the adaptive management process kick in.

Karen Holman (Unified Port of San Diego) acknowledged that attendees are asking a lot of questions, and that is encouraging because that is why the San Diego County Copermittees developed this question-driven strategy. There are two types of questions: management questions and assessment questions. Looking at the diagram, it is structured in a way that makes sense, asking bigger general questions first, then moving down toward source identification and BMPs.

This approach envisions more time and effort spent on the yellow and green areas, then moving up to answer the larger questions. Going up the ladder focuses more on the assessment questions. At the end of this long phase, the Copermittees should be able to answer the receiving water questions. Adaptive management kicks in throughout the entire process, but especially in the yellow and green areas.

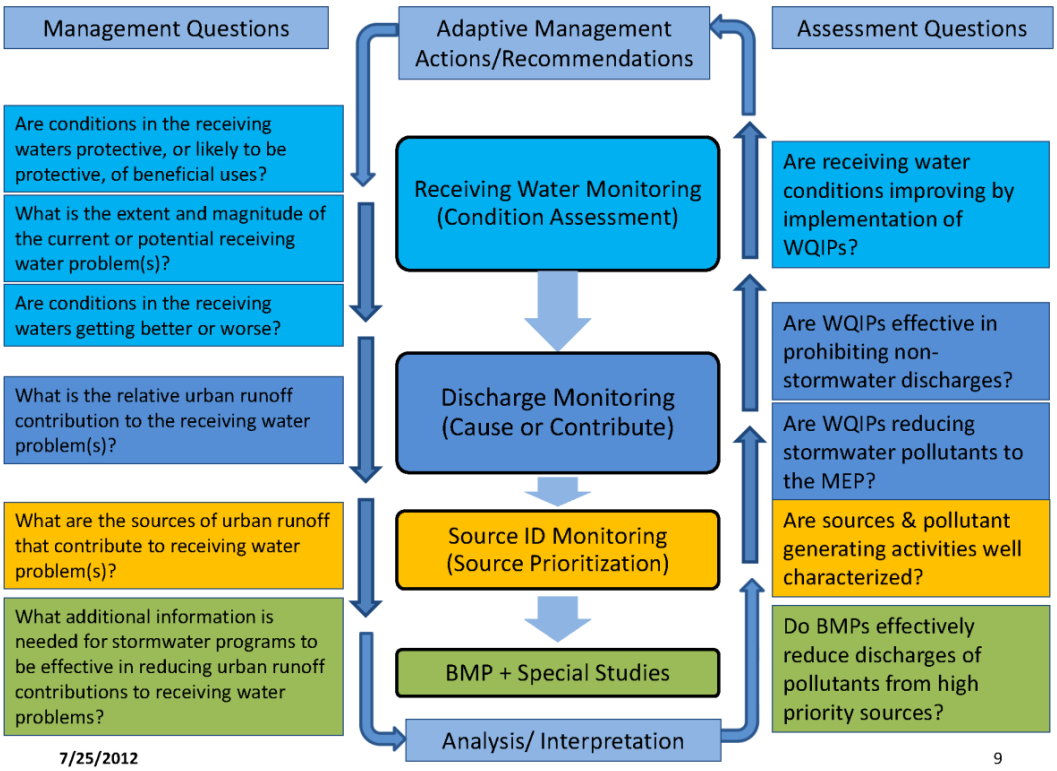

Alison Witheridge (City of Oceanside) shared that as a monitoring person for the last 5-10 years, she wants to believe that monitoring is the answer; that monitoring will indicate if water quality gets better or worse each year; however, she is disappointed each year when the data are analyzed that the variability in water quality data does not allow for indicating changes year after year or even in decades; the amount of data does not seem to help identify or eliminate sources. More data does not always mean more knowledge. That is why the San Diego County Copermittees are proposing a heavier visual observation program instead of straight water quality data collection. As a public employee, Alison needs to spend public funds in a responsible, efficient, and effective manner. For the City of Oceanside alone, it would cost 2 million dollars the first year to implement dry weather monitoring per the current administrative draft permit.

Jo Ann Weber (County of San Diego) continued that for Copermittees in San Diego it is a ten-fold increase in costs the first year with 94 percent for MS4 dry and wet weather monitoring, but at least 70 to 80 percent of that just for dry weather monitoring. In subsequent years, although it does decrease, it is still three to four times what is spent now. The Copermittees want to use their money where they get the greatest value for it. The quarter-mile grid was in the early programs in the mid-1990s and was a guidance document, somewhere to begin. Looking at the current permit writer's guide, it is perfectly reasonable to build on historical record instead of using such a prescriptive grid.

Jo Ann Weber (County of San Diego) is open to discussion on what threshold of monitoring is sufficient, considering visual observations as a key factor to get there. It is

hard to go through an entire MS4 system on an annual or biannual basis for larger jurisdictions, but the County would be okay with prioritizing efforts.

Claudio Padres (Riverside County Flood Control District) stated that regarding cost, his perspective is that everyone can toss around numbers all day, and really what it is not about is not spending money on monitoring; the Copermittees are not trying to avoid monitoring. The Copermittees have to answer to their constituents that they are using their money in an effective way; it needs to be effective monitoring.

Regarding the issue of "cherry-picking" of data, Claudio called attention to the fact that all MS4 permits require the MS4 Copermittees to report all collected data under penalty of perjury.

Claudio Padres (Riverside County Flood Control District) stated that monitoring does not solve problems by itself. Entire city budgets could be spent analyzing the situation without having solved a single problem. The Copermittees need to focus on the type of monitoring needed to take action on high priority issues. Monitoring is an easy way to steal large portions of budgets. The monitoring needs to be taken with an appropriate baseline to assess emerging conditions, taken into the Water Quality Improvement Plan process, and then engaged at the right level to locate sources and measure effectiveness.

Mike McSweeney (BIA) stated that it needs to be realized where our State is financially. It needs to be how smart work is done; not how much money is spent but how the money is spent. Copermittees are trying to figure out the best way to spend money. We all want the same outcome; therefore, there needs to be a sort of triage for priorities. The system should be focused on the outcome and what the best, most efficient way to reach that outcome is.

Andre Sonksen (City of San Diego) explained that when coming up with the proposed monitoring plan and proposing how to implement the program, the workgroup looked at dry weather monitoring program data for the last two years and found it was less than two percent effective in eliminating illicit discharges. The Copermittees do not anticipate that a shotgun approach during the initial year of the new permit would be any more effective than past programs. In developing the proposed process presented today by the San Diego County Copermittees, the workgroup looked at almost twenty years of data from their programs and other related water quality programs not only in San Diego but throughout the country and how to have real, effective changes in water quality.

Colin Kelly (OC Coastkeeper) acknowledged that everyone seems to be broke, and he is not hearing that prioritization is the wrong way to go. He does not, however, want this to be a program where the pause button is hit, causing the Copermittees to not know what is going on with non-priority issues for the next five years. Colin would like to know if there is a floor, and what it is. Focusing all jurisdictional resources on a small portion of a watershed and ignoring everything else is a concern.

Karen Holman (Unified Port of San Diego) agreed with Colin; the intent is not to look at one area in a Water Quality Improvement Plan and ignore the rest. She volunteered the best way to explain the proposed program in more detail may be to meet with Coastkeeper and explain the intent and potential details of the program.

Paul Hartman (City of Vista) stated that one way the Copermittees are looking to address that is through long-term monitoring at existing mass loading stations for a large suite of constituents, including monitoring for contaminants of emerging concern. Also proposed are temporary watershed assessment stations to cover water bodies where information is needed on those outfalls.

Karen Holman (Unified Port of San Diego) responded to Jill Wittkowski's earlier comment about why characterize non-stormwater discharges if they are prohibited. The San Diego County Copermittees are now proposing to look at the transient flows and eliminate transient flows by using observations or other monitoring efforts instead of analytical characterization of the flows. In areas with perpetual flow with sources that cannot be identified easily, those flows would be put into the prioritization program and steps would be taken in the yellow and green areas.

Paul Hartman (City of Vista) responded to Jill Wittkowski's earlier comment about one monitoring station per hydrologic subarea for persistent flows. That provides a broad look at the region, amounting to approximately 70 sites throughout San Diego. The idea came up when working through the Lagoon Investigative Order with SCWRRP, where it was noted that generally one to two outfalls contribute 80 to 90% of the pollutants found in a watershed. As the Copermittees can't monitor everywhere all time, they are trying to use resources effectively and this approach is practical from a staff perspective.

Wayne Chiu (RWQCB) expressed gratitude to the San Diego County Copermittees for providing their proposal as an alternative to what is currently in the administrative draft permit. Throughout this process the RWQCB has asked for recommendations, ideas, etc., and the San Diego County Copermittees have stepped up to the plate. Wayne continued that there are a lot of elements in what he heard today on which all can agree and buy into. The devil will be in the details, and there are a couple aspects where the Board may have its own thoughts. Generally, the approach is sound. In terms of considerations of cost and working smarter, the Board is in favor of that. What is currently in the administrative draft permit is quite onerous, and the Board was not expecting it to make it through to the final draft. The Board hoped to stimulate thinking among Copermittees and send the message that they want to see things done differently, with an increased effort toward eliminating non-stormwater discharges. This permit focuses on elimination first, analysis second for non-stormwater discharges. Stormwater discharges will be a much longer effort.

In terms of historical data, all data collected at any time can be useful. Whether or not it is comparable at all times is a different question. All data can provide historical context and show changes; therefore, any data collected can be used to inform the programs. Wayne agrees that monitoring does not solve problems, but it does indicate if a problem is being solved. Monitoring is needed to identify problems and then to indicate if progress is being made toward solving those problems.

This process is part of the iterative and adaptive management process the RWQCB is trying to incorporate into the permit. Monitoring is an integral part of this; that is why it is the central portion of the permit.

Wayne Chiu (RWQCB) continued that there are two major aspects of the monitoring that the RWQCB would like to make sure are still in the monitoring program: (1) the concept of individual jurisdictional accountability and responsibility and (2) identification of non-Phase I MS4 sources. Wayne is not sure that there is anything with what has been proposed that would inform RWQCB Staff as to what improvements are being shown or demonstrated within a receiving water within a Copermittee's jurisdiction. Wayne would also like to see non-Phase I MS4 sources identified through data. If the monitoring data being collected by non-Phase I MS4 sources are not enough to inform, then the RWQCB has the ability to compel additional information from those dischargers. With a common goal and common understanding through this permit, Wayne believes resources can be jointly used to address the problem.

Karen Holman (Unified Port of San Diego) stated that jurisdictional accountability needs to be in the programs because that is how budget is allocated by City managers. As the Copermittees have been presenting their proposal and talking in depth, it is understood that jurisdictional accountability is a key point for the RWQCB. One of the things the Copermittees are looking at is to see jurisdictional accountability in the green and yellow areas (BMP/Special Studies and Source ID Monitoring). Jurisdictional accountability may not be evident in receiving waters because problems may originate elsewhere.

Paul Hartman (City of Vista) stated that he heard several times in the first focused meetings that the RWQCB is looking for accountability via the iterative process and implementation but that assessment and adaptation of the Copermittees' programs would be more focused on improving the programs. The yellow and green processes are one of the ways to do that. Accountability of items in the blue areas is going to take years to see change unless the RWQCB is only looking at the elimination of non-stormwater flows.

Wayne Chiu (RWQCB) recognized that it will take a long time to see changes in stormwater. The Board expects to see changes in non-stormwater quicker if efforts are placed in the correct places. The Board also still expects monitoring to be done to establish the long-term stormwater trend.

Paul Hartman (City of Vista) stated that one of the places where the Copermittees experience discomfort is where the assessment question is what are the monthly flows and pollutant loads from all outfalls in a jurisdiction.

Wayne Chiu (RWQCB) responded that a lot of the requirements in the monitoring and assessment sections stem from 40 CFR stormwater regulations. There is one assessment requirement in the 40 CFR regulations concerning pollutant loads. That is where the pollutant loading assessment requirement came from. The RWQCB believes that is valuable information, whether it is obtained through modeling, statistics, or empirical data. The RWQCB wants a record of flows and pollutant loads coming out of each Copermittee's MS4; that record can be used to track how improvements are being achieved over time. The RWQCB does not expect everything to happen within a year or 10 years; however, they still need those records to see the trend.

Wayne Chiu (RWQCB) continued, speaking of assessment, when looking at the monitoring requirements, all the monitoring requirements in the administrative draft permit

were shaped and formed around assessment requirements, including what is coming out of the MS4 (non-stormwater and stormwater; what pollutants; how much). The receiving water is something that the RWQCB does not think needs to be monitored every year, but some monitoring data are still needed to establish trends over time. It could take decades to see the trend, but a record is needed to see it. The Copermittees should be using the monitoring data from this administrative draft permit and from the last 20 years to improve their programs.

Richard Boon (County of Orange) shared an approach to dry weather monitoring that had been in a prior permit: a hybrid dry weather reconnaissance program. It included monthly monitoring at over 60 stations across South Orange County. The program was designed to clearly identify aberrant anthropogenic sources (IDIC). It gave really good spatial coverage, directed resources very effectively, and created and established jurisdictional accountability. Richard would be happy to do a presentation on the merits of this approach. He spoke with US EPA headquarters' staff last Friday because they are trying to get the merits of this approach into national rulemaking expected next summer. The dry weather reconnaissance program has dry weather action levels that force the investigation of non-fecal sources of bacteria to identify conditions or pursue elevated bacteria levels that may be the consequence of vegetative decay, or pursue metal concentrations that are most likely from natural shallow groundwater sources. The dry weather reconnaissance program talks about adaptive management, prioritization, accountability, and focusing resources on the issues of real concern. Throughout this process and commentary on the draft permit, Orange County will be advocating for the statistical dry weather reconnaissance approach.

Claudio Padres (Riverside County Flood Control District) recognized that all information has value to the RWQCB. The Copermittees should be looking and focusing on data that have value as they relate to the high priority issues. Claudio asked if it was the intent of the RWQCB staff with the administrative draft permit to have the monitoring requirements be consistent with tailoring to high priority issues or if the intent to was to have monitoring requirements implemented irrespective of priorities.

Wayne Chiu (RWQCB) responded that the Board is trying to build in the ability for the Copermittees to use the monitoring data to inform their priorities. First year monitoring would take a look and make sure priorities are correct. Subsequent years of monitoring would primarily analyze the highest priority pollutants; however, there is a need to go back to make sure priorities are correct.

Claudio Padres (Riverside County Flood Control District) pointed out that one year of monitoring data (i.e., the first year monitoring mentioned previously) is not sufficient to establish priorities. Copermittees must also use historical data to create valid priorities. With that in mind, Claudio is unsure of the benefit of the blitz of first year monitoring currently in the administrative draft permit. Wayne Chiu (RWQCB) responded that RWQCB staff is open to revising that portion of the administrative draft permit.

Ted Von Bitner (County of Orange) reiterated Richard Boon's point about the hybrid dry weather reconnaissance program. It allows Copermittees to draw statistical inferences on a region-wide basis about overall conditions and priorities. Using the numeric approach, it

tells Copermittees what the background levels are across a large-scale region. From there, Copermittees can determine what the region's floor is. As sites are fixed and removed, the average begins to lower on a region-wide basis. With this method, the Copermittees have a robust physical model through which a more cost-effective, smaller-scale monitoring program can be developed that provides an increased power of analysis. Ted would prefer the permit to come back to this type of monitoring. Ted clarified that this monitoring would fit into the blue areas of the San Diego County Copermittees' diagram. Mary Anne Skorpanich (County of Orange) voiced concern that the Copermittees still need to pay attention to the top level (blue level) of the San Diego County Copermittees' diagram. Those top level questions are important to understanding the conditions in the receiving waters and protecting beneficial uses.

Jill Wittkowski (SD Coastkeeper) acknowledged that the regional clearinghouse is a great idea. If done well, it could be huge resource, and she would love to see it housed on the Regional Board's website. She believes there also needs to be public input into the process of creating the regional clearinghouse.

Jill Wittkowski (SD Coastkeeper) recognized the main point of the permit is that pollution has to be controlled to the MEP; however, it is very frustrating that even in the San Diego region people are doing inconsistent practices across the region. Jill would like to see a BMP clearinghouse or other mechanism that gives everyone access to the information gained from the special studies in the yellow and green areas of the diagram. Once jurisdictions have access to the information, they must use it unless they can prove they can't.

Alison Witheridge (City of Oceanside) replied that it goes back to prioritization and adaptive management. Not every watershed or jurisdiction will operate the same way. Jill Wittkowski (SD Coastkeeper) disagreed. All jurisdictions should be operating to the standard of MEP; therefore, BMPs should be implemented the same across jurisdictions. Laurie Walsh (RWQCB) clarified that if something is determined to be MEP, then it is upon the jurisdiction to enforce that on all their sites, and on the RWQCB to enforce that on the jurisdictions.

Andre Sonksen (City of San Diego) explained that monitoring is meant to be one small component of the iterative process of the overall stormwater management program. The street sweeping study is a perfect example. Instead of the general SMC questions, the street sweeping pilot program had specific questions and that is where the monitoring kicked in. Andre reiterated that Copermittees would be using the entire chart as one large process, not ignoring portions of the flowchart. He further stated that monitoring does nothing unless the correct questions are answered, followed by changes to programs based on the monitoring results.

VI. Parking Lot Discussion

The group re-visited off-topic items from the previous focused meeting.

- CalGreen/Hydromodification Dedicated Meeting: There will be a dedicated hydromodification meeting. Richard Boon (County of Orange) is taking the lead. CalGreen will not be included in the meeting.
- Legal Issues: Copermittees' counsels are attempting to proceed with a parallel track of meetings with Regional Board Counsel; however, Regional Board Counsel does not see a purpose to meeting at this time and does need more time to respond to the letter from the County of Orange. This will be updated at the next focus meeting.
- Aliso Creek / specific areas of geography / BET and Other Technologies: This topic has to do with to what degree does the new permit structure speak to or promote emerging technologies. This should be covered in a future focused meeting.
- Ninth Circuit Court Decision – The administrative draft permit has two central provisions dealing with compliance: one is compliance with water quality standards, and one is compliance with water quality standards being obtained through the iterative process. The RWQCB is discussing this internally; however, they have had no conversations with legal counsel yet, although it is a legal issue. David Barker (RWQCB) recognized that this is one of the high priority issues that have been raised and will put some thought into how to address it at the next meeting.
- Regional BMP Funding and Implementation: There is concern that the permit as currently written does not encourage regional BMPs although regional BMPs have great promise for improving water quality. This will be covered in the next focused meeting.
- Review time for permit: The deadline for written comments on the administrative draft permit is September 14. In light of the newly added meeting on hydromodification, scheduled for the last week in August, Mike McSweeney (BIA) asked for an extension on the written comment period. Jill Wittkowski (SD Coastkeeper) disagreed that one topic should push the process out additional weeks. RWQCB staff stated there will be no change to the written comment deadline.
- Monitoring Presentation by San Diego County Copermittees: This was provided at today's focused meeting.

VII. Other Topics / Audience Comments

Comment: Claudio Padres (Riverside County Flood Control District) stated that it would be helpful to know the RWQCB's vision for adaptive management to better provide comments on the administrative draft permit.

Response: David Barker (RWQCB) will address this at the beginning of the next focused meeting.

Comment: Colin Kelly (OC Coastkeeper) stated that the handout from the San Diego County Copermittees was useful; however, some advance notice would be helpful in having valuable discussion. Colin asked for distribution ahead of time for the next focused meeting, if possible.

Response: Materials for future meetings will be distributed ahead of time when possible.

Comment: Mo Lahsaie (City of Oceanside) stated that Federal regulation does not take economics into consideration but Porter Cologne does. Since 2008, with the economy going down, the budget in Oceanside is getting leaner every year, not staying the same.

Comment: Richard Gardner (Capistrano Beach) identified himself as an advocate of water quality, stating that he wished the discussion could have gone into more detail on monitoring, including the constituents (nutrients, dissolved oxygen, toxicity). There are narrative ways to look at toxicity and ways of changing water quality without going after numeric standards or TMDLs. Richard further stated that the health of the riverine system needs to be evaluated. In other areas, regulators should be open minded to looking at different criteria for monitoring in different areas. He does not feel this is covered in the permit. Furthermore, treatment plants, sterilization of water, permits that allow that to continue without monitoring requirements; those should be interim as they could impact the way to deal with FEID. This is also not in the permit now and needs to be dealt with.

Comment: Rosanna Lacarra (City of Coronado) shared that in 2001 the City of Coronado had great results with IC/ID. They yielded good results and were able to eliminate transient and persistent discharges. Now the focus should be on revamping the program to re-strategize and continue efforts under the proposed permit.

Comment: Mikhail Ogawa (City of Del Mar) requested that existing development be the first topic at the next focused meeting.

Comment: Karen Holman (Unified Port of San Diego) stated that this process has been a real asset to all those around the table, allowing for communication and valuable discussion prior to formal issuance of the permit. Karen appreciates the open process and correspondence throughout the process with the RWQCB and other stakeholders.

VIII. Meeting Adjourned

San Diego RWQCB
Permit Reissuance Focused Meeting

July 25, 2012

Adaptive Management Areas of Permit: Monitoring & Assessment Program (MAP)

001129

Concept: Develop MAP as part of each Water Quality Improvement Plan to provide information needed to answer management questions & support effective adaptive management

MAP Elements:

- Receiving Water Conditions
- MS4 Discharges – Non-stormwater & stormwater
- Sources/Pollutant Generating Activities
- BMP Studies/Program Assessments

Example: Increase efficiencies in IDDE Programs with observational methods (or other strategies); monitoring includes activities beyond water quality sampling

Action Items:

- Structure initial requirements according to above in Section II.D.
- Coordinate Prov. II.D requirements with Section II.B. language requiring a strategic monitoring & assessment program as a part of the WQIPs.

Adaptive Management Areas of Permit: Long-Term vs. Annual Processes

- Data / Findings
- Priorities/Targets
- Strategies
- Schedules
- RWQCB approval

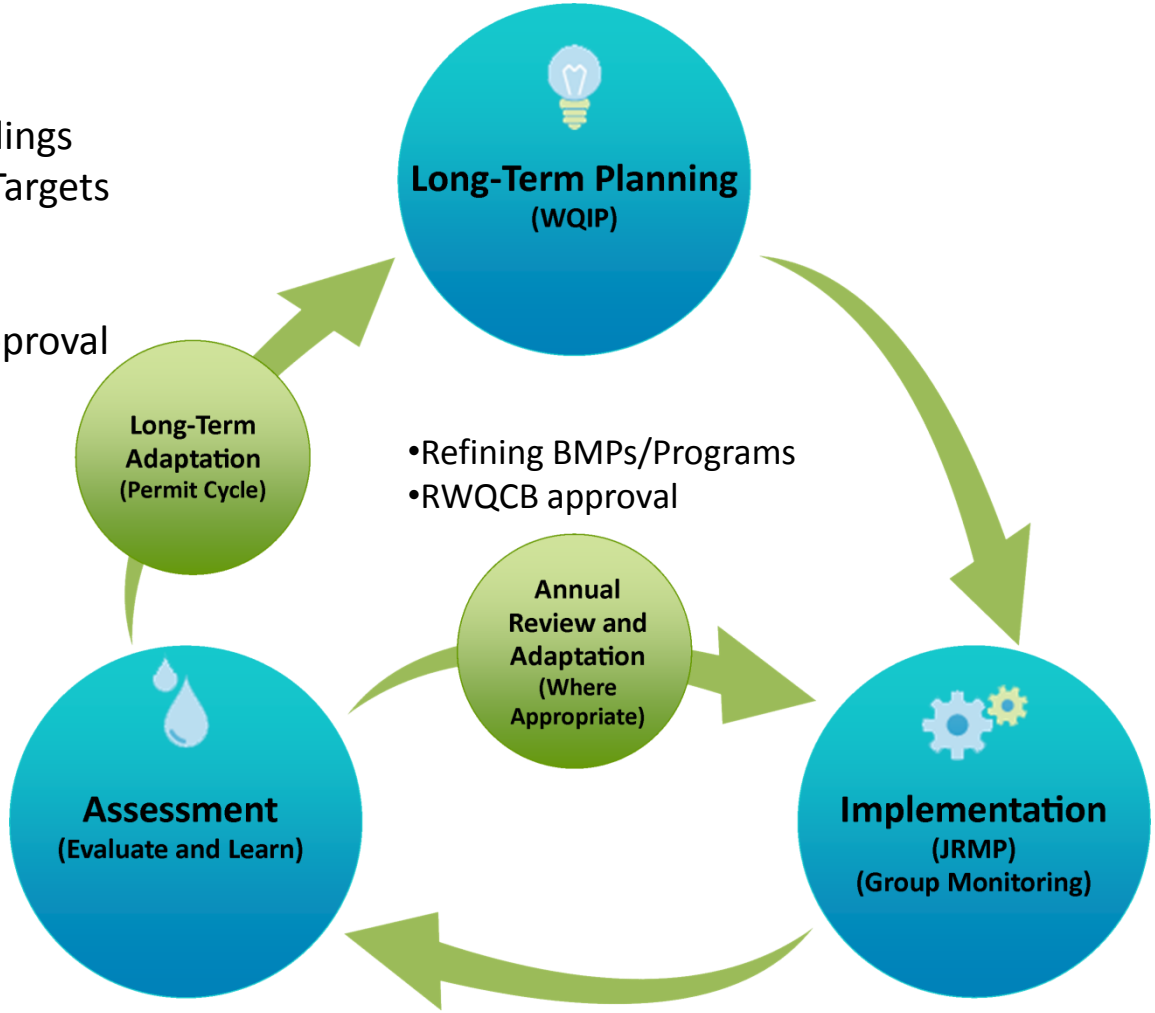

- Refining BMPs/Programs
- RWQCB approval

Implementation

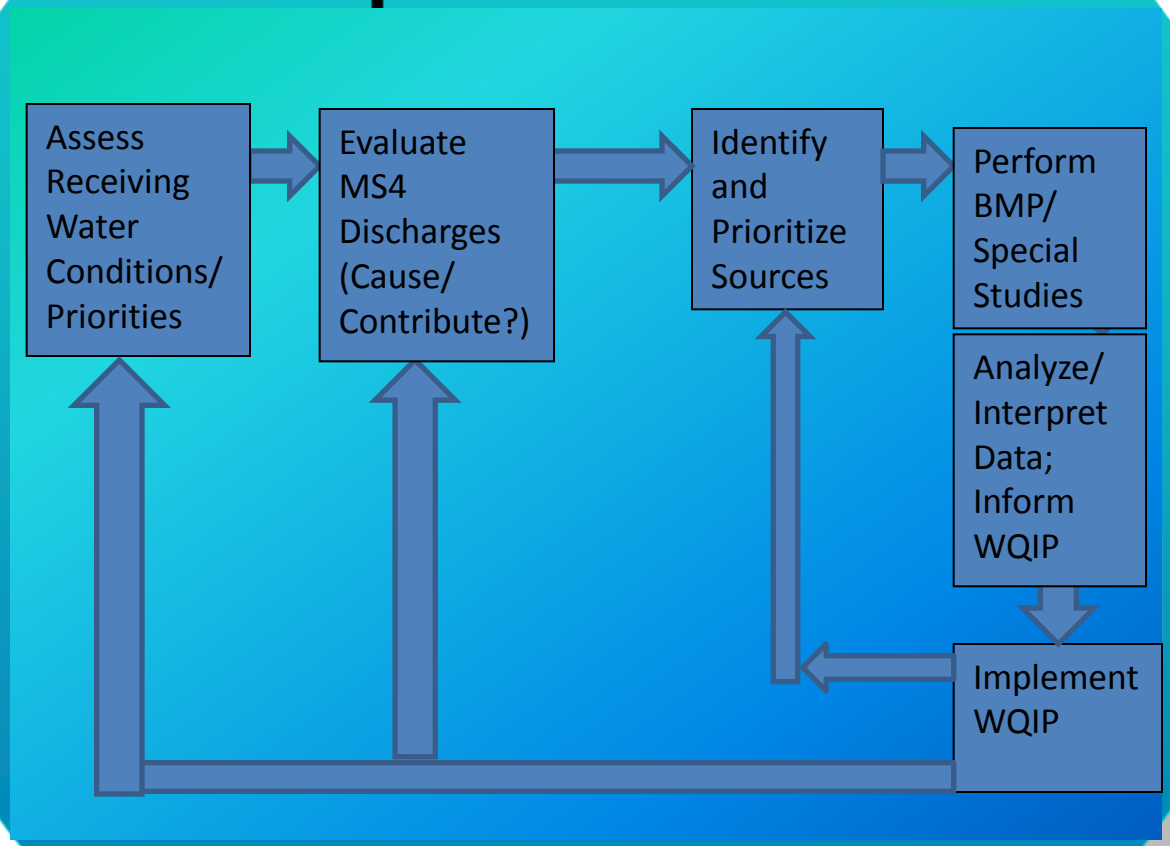

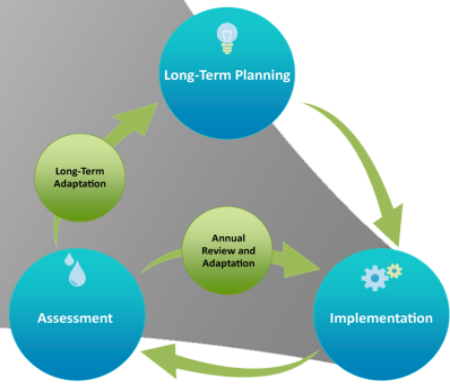

Alternate Provision II.D Rationale

- More effective & efficient use of resources to maximize benefit
- Support **Adaptive Management** needs
- **Question-Driven** Monitoring Approach Design based on Assessment Questions
- Based on 15-20 years of **experience**
- **Monitoring = more than water sampling**
- Ultimately support **WQIP priorities** (strategic, prioritized monitoring approach)

Purpose & Phasing of Alternate Provision II.D

Purpose:

Provide program managers with needed information to support effective adaptive management

Phasing:

- **Pre WQIP (transitional period)** – Proposed Alternate to Provision II.D
- **Post WQIP** – Develop Monitoring & Assessment Program (MAP) to support WQIP priorities

Scientific Basis of Question-Driven Approach

- A Framework for Monitoring & Assessment in the San Diego Region (SDRWQCB, 2012)
- Southern California Stormwater Monitoring Coalition's Model Monitoring Program (SMC, 2004)
- SWAMP Assessment Framework (SWAMP, 2010)
- Elements of a State Water Monitoring and Assessment Program (EPA, 2003)

Key Proposed Changes

- Jurisdictional Non-stormwater Monitoring **(D.1.a)** - Instead of extensive MS4 outfall chemical testing, reduce persistent flows that threaten receiving water quality & eliminate IC/IDs.
- Jurisdictional Stormwater Monitoring **(D.1.b)** - Instead of extensive MS4 outfall chemical monitoring, monitor homogeneous land uses as input to model.
- Jurisdictional Boundary Monitoring **(D.1.a(2))** - Insufficient technical power to differentiate small changes in upstream & downstream water quality due to the inherent variability of water quality data; Determine receiving water monitoring in MAP.
- Bacteria TMDL Monitoring **(Att. E)** – Instead of extensive prescriptive monitoring, rely on monitoring plans prepared as part of the current implementation planning process due to RWQCB October 2012.

Management Questions	Adaptive Management Actions/Recommendations	Assessment Questions
Are conditions in the receiving waters protective, or likely to be protective, of beneficial uses?	Receiving Water Monitoring (Condition Assessment)	Are receiving water conditions improving by implementation of WQIPs?
What is the extent and magnitude of the current or potential receiving water problem(s)?		
Are conditions in the receiving waters getting better or worse?		
What is the relative urban runoff contribution to the receiving water problem(s)?	Discharge Monitoring (Cause or Contribute)	Are WQIPs effective in prohibiting non-stormwater discharges?
		Are WQIPs reducing stormwater pollutants to the MEP?
What are the sources of urban runoff that contribute to receiving water problem(s)?	Source ID Monitoring (Source Prioritization)	Are sources & pollutant generating activities well characterized?
What additional information is needed for stormwater programs to be effective in reducing urban runoff contributions to receiving water problems?	BMP + Special Studies	Do BMPs effectively reduce discharges of pollutants from high priority sources?
	Analysis/ Interpretation	

Receiving Water

Management Questions	Adaptive Management Actions/Recommendations	Assessment Questions
Are conditions in the receiving waters protective, or likely to be protective, of beneficial uses?	**Receiving Water Monitoring (Condition Assessment)**	**Are receiving water conditions improving by implementation of WQIPs?**
What is the extent and magnitude of the current or potential receiving water problem(s)?		
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What is the relative urban runoff contribution to the receiving water problem(s)?	Discharge Monitoring (Cause or Contribute)	Are WQIPs effective in prohibiting non-stormwater discharges?
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	Analysis/ Interpretation	

Receiving Water Monitoring

Assessment Question

Are the physical, chemical, and biological conditions of receiving waters being improved by the WQIPs?

Management Questions

Are conditions in receiving waters protective, or likely to be protective, of beneficial uses?

What is the extent and magnitude of the current or potential receiving water problems?

Are conditions in receiving waters getting better or worse?

Specific Questions

What are the status & trends in enclosed bays harbors estuaries and lagoons?

What are the status & trends in coastal waters?

What is the progress in achieving & complying with adopted TMDL targets?

Specific Activities

SMC Regional Monitoring

Southern California Bight Regional Monitoring

Sediment Quality Monitoring

HMP Monitoring

ASBS Monitoring

TMDL Monitoring

San Diego Regional Reference Stream Study

Pre WQIP: 5 WMA mass loading stations every other year

Pre WQIP: 1 temporary Watershed Station per WMA annually

Post WQIP (example): Receiving Water Monitoring to be based on watershed priorities, TMDL, & 303d listings

Alternate Provision II.D: Receiving Waters Element

Purpose	Assess Conditions of Receiving Waters, Extent/Magnitude, Trends
Methods	• Stormwater Monitoring Coalition (creeks) • Bight (estuaries, coastal waters) • Sediment Quality Monitoring (estuaries) • TMDL Monitoring (creeks/beaches) • Areas of Special Biological Significance • Mass Loading Stations • Temporary Watershed Stations • Third Party Data
Rationale & Benefits	• Broad Spatial and Temporal Coverage • Integrates existing programs • Preserves long -term trend assessments • Supports assessment-driven, adaptive management approach

Discharge Monitoring

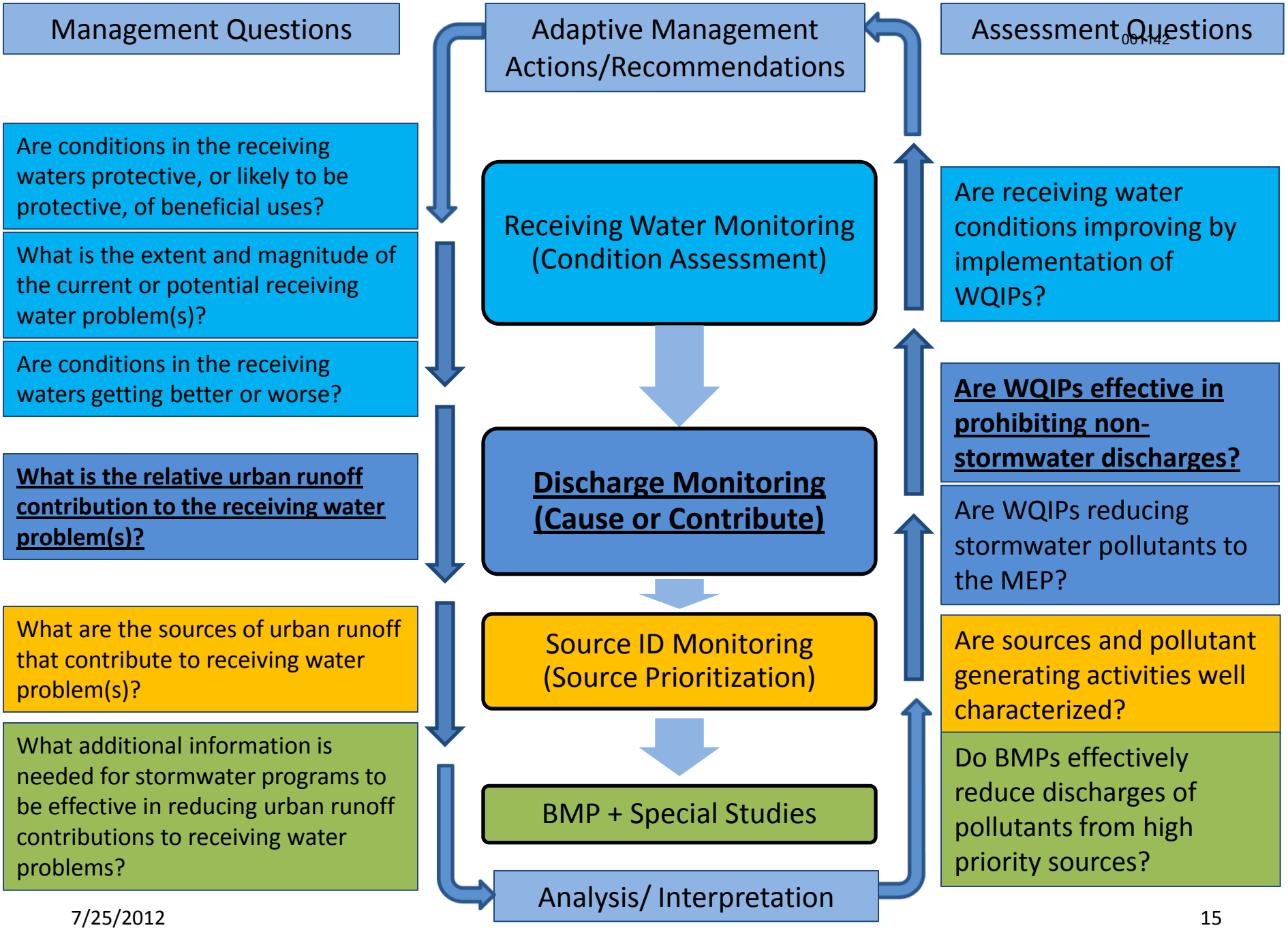
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Receiving Water Monitoring (Condition Assessment)
Discharge Monitoring (Cause or Contribute)
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BMP + Special Studies
Analysis/ Interpretation
Are receiving water conditions improving by implementation of WQIPs?
Are WQIPs effective in prohibiting non-stormwater discharges?
Are WQIPs reducing stormwater pollutants to the MEP?
Are sources and pollutant generating activities well characterized?
Do BMPs effectively reduce discharges of pollutants from high priority sources?

Non-Stormwater Discharge Monitoring

001143

Assessment Question

Are jurisdictional runoff management programs effectively prohibiting non-storm water discharges to their MS4s?

Management Questions

What is the relative urban runoff contribution to receiving water problem(s)?

What are the sources of urban runoff that contribute to receiving water problems(s)?

Specific Questions

Are the numbers of ICIDs identified &/or eliminated increasing or decreasing?

Do discharge concentrations at outfalls meet applicable permit action levels?

Which discharges should be investigated as potential IC/IDs?

Which non-storm water discharges are transient?

Which MS4 outfalls exhibit persistent dry weather flows?

Which MS4 outfalls impact receiving water quality during dry weather?

Specific Activities

Pre/Post WQIP: Conduct visual Inspections of prioritized major outfalls annually

Compile a prioritized list of major outfalls with persistent dry weather discharges to receiving waters

Identify& map one major outfall to monitor in each urbanized HSA twice annually (approximately 70)

Pre-WQIP: Semi-annual field measurements & lab analyses

Post-WQIP (example): Semi-annual analyses of watershed priorities based on TMDL, 303(d), & NAL constituents

Evaluate data, rank outfalls by potential threat to receiving water quality, & produce prioritized list of outfalls for follow-up

Alternate Provision II.D: Discharge Element – Non-Stormwater

Purpose	Address effective prohibition of non-stormwater discharges
Methods	**Transient Flow Programs (IDDE)** • Source identification: existing development inspections • MS4 system programs: patrols, complaint response, MS4 cleaning • Outfall program: visual inspections for transient flows & prioritization, investigations **Persistent Flow Programs** • Current MS4 outfall program to completion • Prioritized monitoring at one outfall per urbanized HSA (NALs)
Rationale & Benefits	• Broad spatial & temporal coverage • Supports assessment-driven, adaptive management approach • Distinction between persistent & transient flows focuses resources on eliminating &/or controlling high priority threats to receiving waters quality • Utilizing other elements of the stormwater programs (inspections, complaint calls) & third party information will efficiently & effectively assist jurisdictions in eliminating non-storm water discharges

Management Questions	Adaptive Management Actions/Recommendations	Assessment Questions
Are conditions in the receiving waters protective, or likely to be protective, of beneficial uses?	Receiving Water Monitoring (Condition Assessment)	Are receiving water conditions improving by implementation of WQIPs?
What is the extent and magnitude of the current or potential receiving water problem(s)?		
Are conditions in the receiving waters getting better or worse?		
What is the relative urban runoff contribution to the receiving water problem(s)?	**Discharge Monitoring (Cause or Contribute)**	Are WQIPs effective in prohibiting non-stormwater discharges?
		Are WQIPs reducing stormwater pollutants to the MEP?
What are the sources of urban runoff that contribute to receiving water problem(s)?	Source ID Monitoring (Source Prioritization)	Are sources and pollutant generating activities well characterized?
What additional information is needed for stormwater programs to be effective in reducing urban runoff contributions to receiving water problems?	BMP + Special Studies	Do BMPs effectively reduce discharges of pollutants from high priority sources?
	Analysis/ Interpretation	

Storm Water Discharge Monitoring

Assessment Question

Are jurisdictional runoff management programs reducing pollutants in storm water to the MEP?

Management Questions

What is the relative urban runoff contribution to receiving water problem(s)?

What are the sources of urban runoff that contribute to receiving water problem(s)?

Specific Questions

Do discharge concentrations & loads from MS4 outfalls meet applicable permit action levels?

How do representative MS4 outfall discharge concentrations, loads, & flows change over time?

Which MS4 outfalls impact receiving water quality during wet weather?

Specific Activities

Pre-WQIP: perform storm water discharge monitoring during two wet weather events annually:

(a) Complete the MS4 outfall monitoring program

(b) Narrative descriptions & field measurements

(c) three monitoring stations at representative major outfalls per WMA

Post-WQIP (example): perform storm water discharge monitoring based on representative outfalls

(a) Develop & implement a monitoring frequency appropriate to characterize pollutant discharges from outfalls in each WMA

(b) analyze parameters identified as watershed priorities, TMDLs, SALs, 303d

Alternate Provision II.D: Discharge Element – Stormwater

Purpose	Address stormwater pollutant reduction to the MEP
Methods	• Complete the current MS4 outfall program • Monitoring at three major outfalls per WMA per year to facilitate modeling based on land use characteristics • Utilize Stormwater Action Levels for prioritization
Rationale & Benefits	• Broad spatial & temporal coverage • Supports assessment-driven, adaptive management approach • Flexibility in site selection will focus resources on the highest watershed priorities, whether it be for representative drainage area data or homogeneous land-use based data.

Source/Stressor Identification

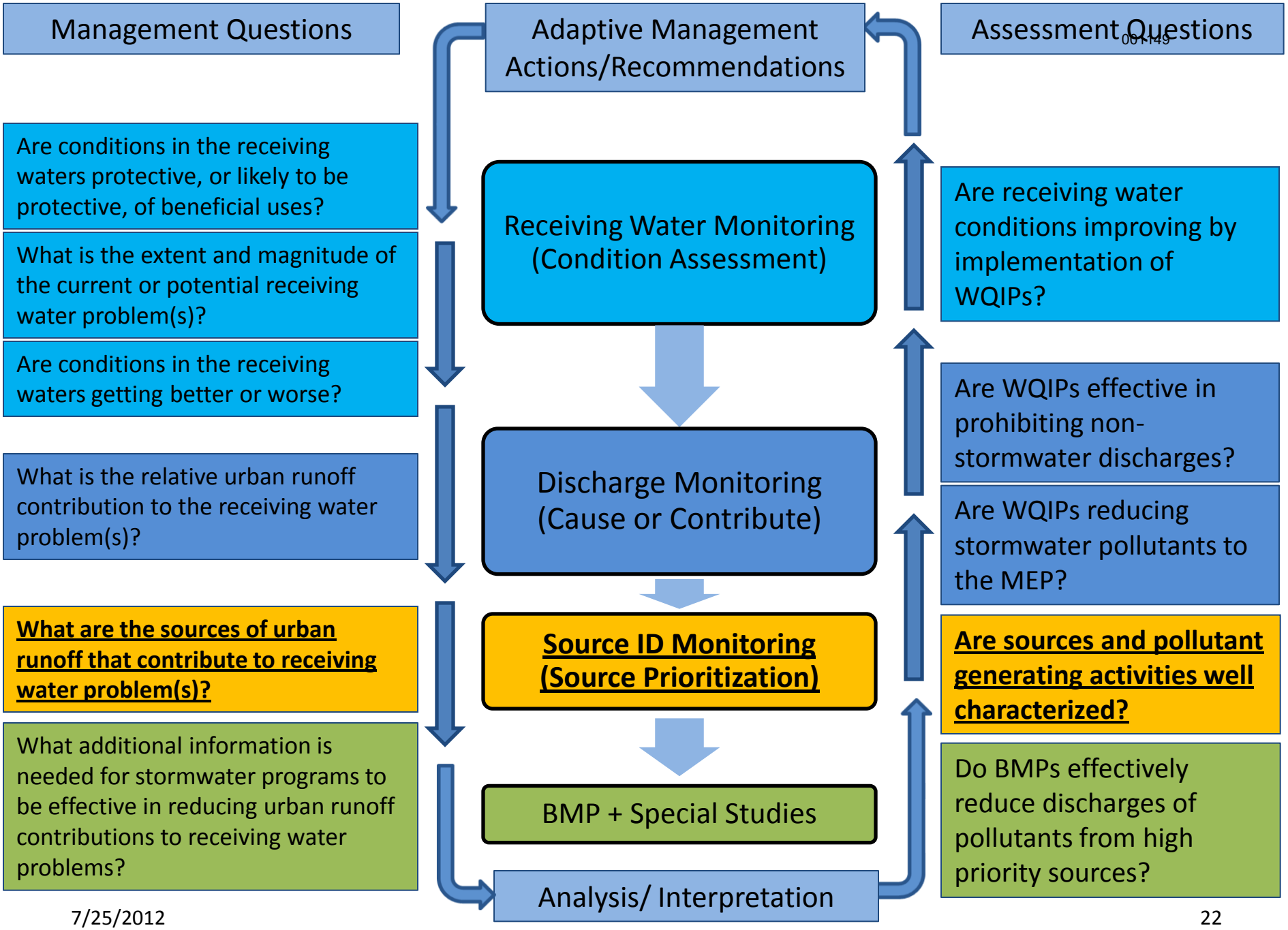
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Do BMPs effectively reduce discharges of pollutants from high priority sources?
Analysis/ Interpretation

Source/Stressor Identification Monitoring

001150

Assessment Question

Are sources & pollutant generating activities well characterized?

Management Question

What are the sources of urban runoff that contribute to receiving water problems?

Specific Questions

What are the land use sources contributing to the receiving water problems identified in the WQIP?

What are the relative loadings of sources contributing to the receiving water problems identified in the WQIP?

What are the specific pollutant generating activities (PGAs) contributing to the receiving water problems?

Specific Activities

Constituent-specific source ID

Conduct source/stressor identification studies to address program management needs related to watershed priorities.

Step 1: Compile known information on priority constituent(s).

Step 2: Identify data gaps based on information compiled in Step 1

Step 3: Based on information compiled in Step 1, develop a source inventory & a prioritization scheme within the watershed for potential follow-up action

Step 4: Develop a prioritized list of sources for the priority constituent(s) & deliver to the staff responsible for implementing WQIPs

Pre-WQIP: Continue source identification studies pertaining to compliance with TMDLs & development of the CLRP as applicable

Post-WQIP (example): Conduct PGA investigations for nutrients as part of the MAP for watersheds where WQIPs identified nutrients as a high priority.

Alternate Provision II.D Source/Stressor Identification Element

Purpose	Identify & Prioritize Pollutant Sources & Pollutant Generating Activities (PGAs)
Methods	• Pollutant-Specific Source Inventories • Source/PGA Studies • Prioritization of Sources for Follow-up
Rationale & Benefits	• Responsive to Program Management needs • Provides programs with information to verify, quantify, & prioritize sources • Provides links between sources, activities & effects on runoff quantity & quality

BMPs & Special Studies

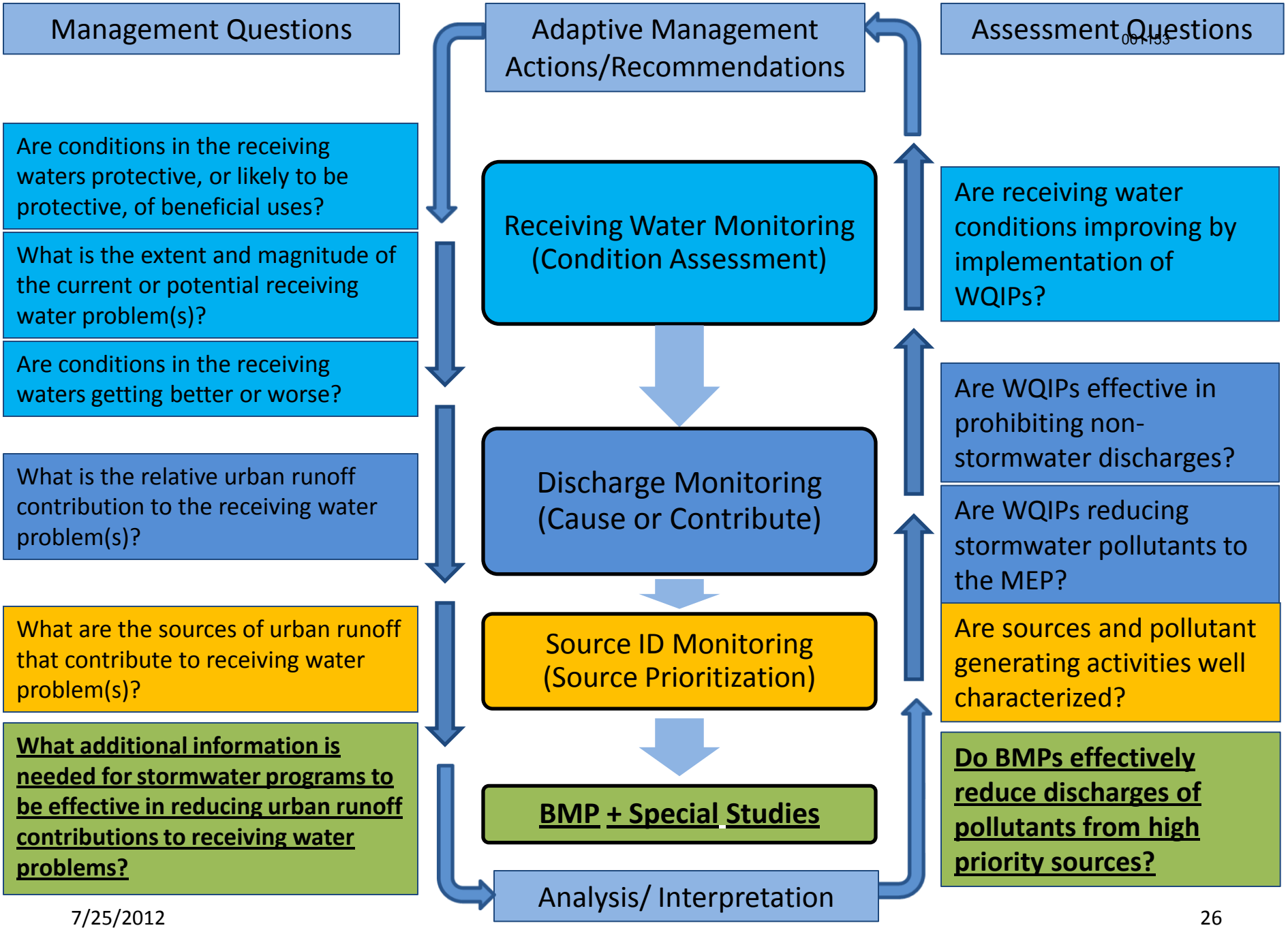
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Are sources and pollutant generating activities well characterized?
What additional information is needed for stormwater programs to be effective in reducing urban runoff contributions to receiving water problems?
BMP + Special Studies
Do BMPs effectively reduce discharges of pollutants from high priority sources?
Analysis/ Interpretation

Special Studies – BMP, Programmatic, & Water Quality

Assessment Question

Do BMPs effectively reduce discharges of pollutants from high priority sources?

Management Question

Are stormwater program BMPs effective in reducing urban runoff contributions to receiving water problems?

Are pollutant sources being effectively addressed to reduce urban runoff contributions to receiving water problems?

Specific Questions

Specific questions developed to address information needs identified in Source/Stressor Identification studies.

Example: Are sources from outside of the MS4 (e.g., natural sources) contributing to receiving water problems?

Specific Activities

Examples of Special Studies

- Assess background concentrations of contaminants in San Diego reference streams
- Evaluate the effectiveness of enhancing outreach & education (i.e., residential BMP rebate programs, over-irrigation enforcement, rainwater harvesting, turf conversion)
- Evaluate the effectiveness of catch basin inlet cleaning
- Evaluate the effectiveness of residential & commercial area patrolling (commercial patrolling may include inspections)
- Evaluate the effectiveness of targeted aggressive street sweeping
- Evaluate the effectiveness of watershed-based inspections

Alternate Provision II.D BMPs & Special Studies

Purpose	• Support effective adaptive management • Assess BMP effectiveness • Perform scientific investigations to address data gaps
Methods	• Pilot BMP Studies • Source ID Special Studies • Water Quality Studies
Rationale & Benefits	• Answers questions related to program & BMP effectiveness • Addresses data gaps to allow more effective program implementation • Provides scientifically valid information related to regulatory principles

Developing Monitoring & Assessment Programs (MAPs) for Each WQIP

STRATEGIC MONITORING APPROACH:

1. Establish stormwater management priorities specific for each WMA ("Watershed Priorities") as part of WQIP development.
2. Compile existing monitoring data & assess available information for receiving waters, MS4 discharges, & sources or stressors within the watershed.
3. Identify regulatory & non-regulatory drivers that apply to water quality monitoring within the watershed, & list all associated monitoring responsibilities assigned to the Copermittees.
4. Evaluate the watershed priorities in context of available monitoring data & existing monitoring responsibilities, & develop specific management questions for each priority issue.
5. Establish metrics & identify assessments that should be performed to supply information needed to address the management questions.
6. Identify elements of a watershed-based monitoring program needed to address the watershed management questions & perform the necessary assessments.
7. Develop detailed monitoring plan to address the identified monitoring needs, coordinated with other ongoing monitoring in the watershed.

Proposed Provision II.D Development of MAP Components

- HYPOTHETICAL WATERSHED EXAMPLE

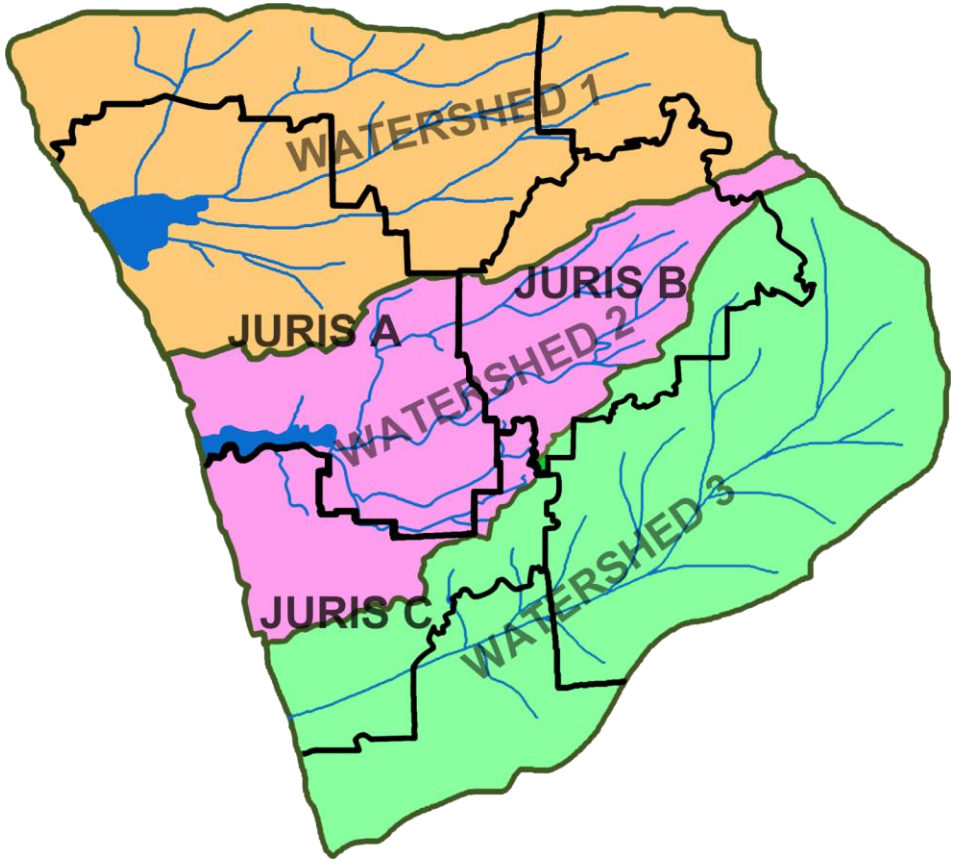

Proposed Provision II.D
WQIP/MAP - Stormwater Discharge Example

- Example WQIP priorities
  - TMDLs: bacteria
  - 303(d) Listings: copper & nutrients
- Likely Assessment question:
  - Are jurisdictional runoff management programs reducing pollutants in storm water to the maximum extent practical?
- Management question:
  - What are the sources of urban runoff that contribute to receiving water problem(s)?

WQIP MAP Example: Stormwater Discharge Monitoring

- Develop Specific questions using available information:
  - MS4s are known sources of bacteria & copper
  - MS4s are less well known as sources of nutrients
  - Loadings from land uses are not well quantified to support planning of wet weather management actions or evaluate their effectiveness
- Specific question
  - *What are the representative MS4 outfall discharge concentrations, loads, & flows?*

WQIP MAP Example: Stormwater Discharge Monitoring

- Approach to answer specific question is to support model development/ calibration/ validation
- Number of sites based on appropriate land use characterization for modeling
  - Characterize individual land uses (i.e., residential) or refine categories of land uses (i.e., SFR & HDR)
- Frequency = 2 storms/year (composite)
- Constituents = bacteria, copper, nutrients, & special study needs
- Duration = at least one adaptive management planning cycle to allow for:
  - Minimum data requirement for adequate characterization
  - Data usability to update management actions for WQIP

Next Steps

- Alternate Provision II.D will be provided
- Technical Memo with Support/Rationale for Alternate Provision II.D

QUESTIONS?

From: lyris@swrcb18.waterboards.ca.gov
To: Chiu, Wayne@Waterboards
Subject: Regional MS4 Permit August 22, 2012 Focused Meeting Agenda
Date: Friday, August 17, 2012 11:58:54 AM
Attachments: Final Focused Meeting August 22 Agenda.pdf

Regional MS4 Stakeholders,

Attached is the agenda for the August 22, 2012 Focused Meeting held at the City of Vista Civic Center. A map is attached for your convenience.

See you all there,

Regional MS4 Permit Team Member
Laurie Walsh P.E.
San Diego Water Board
858-467-2970
lwalsh@waterboards.ca.gov

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(It may be necessary to cut and paste the above URL if the line is broken)
or send a blank email to leave-375629-508208.cee2a373662e566393e62f0af18d11cf@swrcb18.waterboards.ca.gov

FOCUSED MEETING AGENDA

Administrative Draft of
Tentative Order No. R9-2012-0011, NPDES No. CAS0109266
Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region

Wednesday, August 22, 2012
9:30 a.m. - 3:30 p.m.

9:30 a.m. - 9:40 a.m.	Introductions, Table Participants
9:40 a.m. - 9:50 a.m.	Meeting Recap & Feedback, Lewis Michaelson, Katz & Associates
9:50 a.m. - 10:00 a.m.	Focused Meeting Highlights, David Barker, San Diego Water Board
10:00 a.m. - 11:30 a.m.	Watershed and Jurisdictional Planning, Table Participants
11:30 a.m. - 12:30 p.m.	Lunch
12:30 p.m. - 1:30 p.m.	Jurisdictional Implementation, Table Participants
1:30 p.m. - 1:45 p.m.	Break
1:45 p.m. - 3:00 p.m.	Design and Performance Standards, and Alternative Compliance, Table Participants
3:00 p.m. - 3:30 p.m.	Comments & Questions All

CITY OF VISTA - COMMUNITY ROOM
200 CIVIC CENTER DR
VISTA, CA 92084

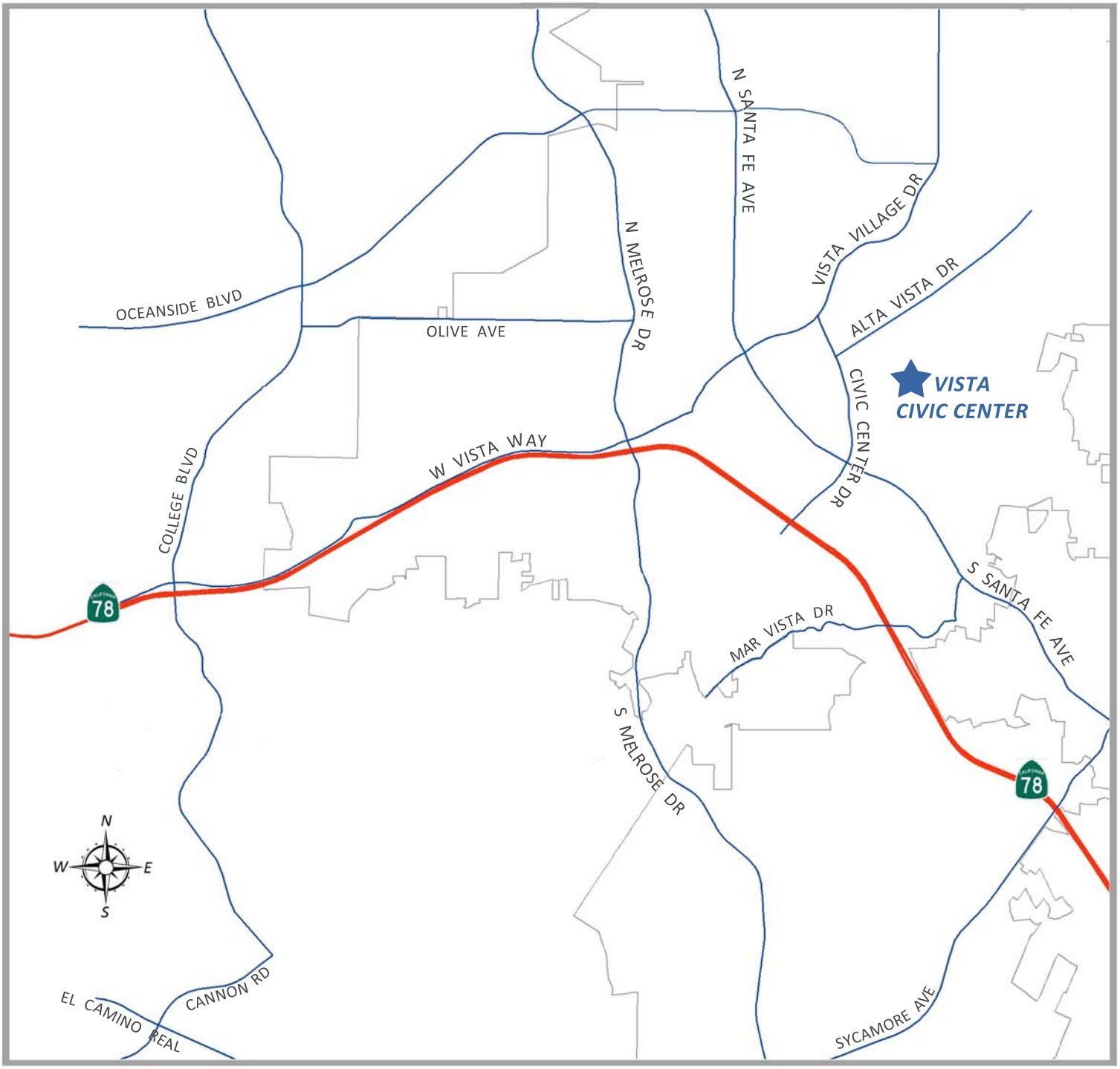

DIRECTIONS

TAKE INTERSTATE 15 TO SR-78 WEST OR TAKE INTERSTATE 5 TO SR-78 EAST
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The entrance to the Community Room is on the upper level - you can access from the staircase by parking lot.

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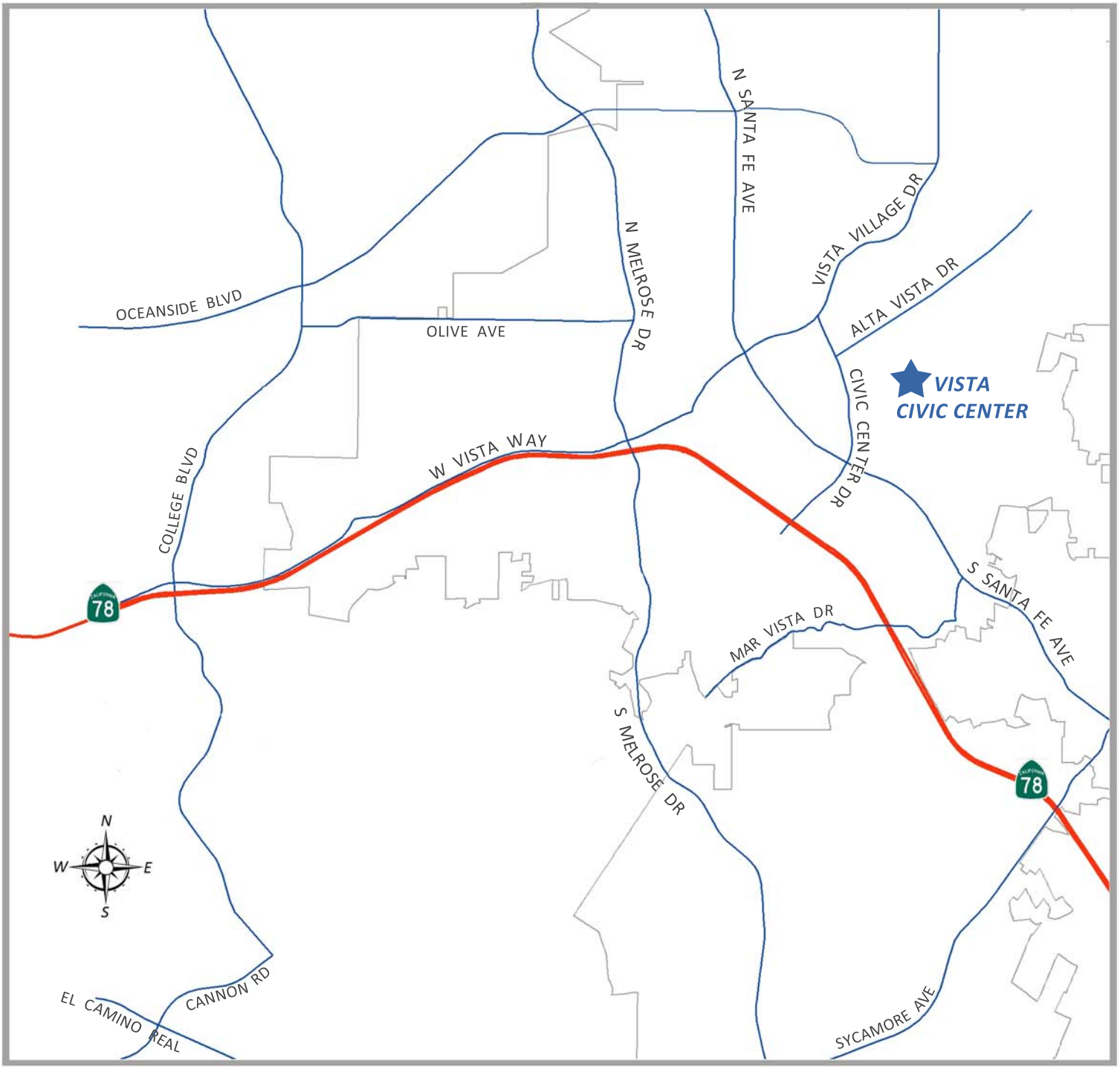

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SIGN IN SHEET, August 22, 2012
FOCUSED MEETING, Administrative Draft Tentative Order No. R9-2012-0011

INITIALS	NAME	AGENCY/AFFILIATION	TELEPHONE	EMAIL ADDRESS
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AV	Allison Vosskuhler	Port of San Diego	(619) 686-6434	avosskuhler@portofsandiego.org
	Amanda Archenhold	AMEC	(858) 514-6468	amanda.archenhold@amec.com
AM	Annie Martin	SD County Regional Airport Authority	(619) 400-2793	amartin@san.org
	Armand Ruby	Armand Ruby Consulting	(831) 477-1214	armand@armandrubyconsultanting.com
	Arsalam Dadkhah	DMax Engineering	(858) 586-6600	arsalam@dmaxime.com
	Bavid Rentrew	Weston Solutions	(760) 795-6903	dave.rentrew@wastonsolutions.com
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BW	Billy Walker	City of Oceanside	(760) 435-5164	bwalker@ci.oceanside.ca.us
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San Diego Regional Water Quality Control Board MS4 Permit Reissuance Focus Meeting: Planning & Implementation

August 22, 2012

Adaptive Management

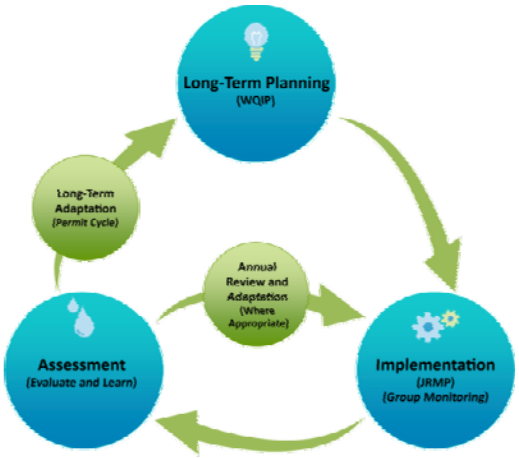

<u>Overarching Goals:</u>

- Jurisdictional Flexibility
  - Proposing programs that make the most sense.
- Watershed Adaptability
  - Modifying programs in response to what we have learned.

Inventory Priorities

Discussion Point	Recommendation
1: Recognition of watershed priorities within jurisdictional requirements (§II.E.5.a(12), §II.E.5.d(1), §II.E.5.d(3))	1: Programs should emphasize watershed priorities (WQIP) and establish jurisdictional baselines (JRMP)
2: Broad definition of sources "may potentially generate a pollutant load" (§II.E.5.a)	2: Modify language to focus resources on highest priorities (watershed and jurisdictional)
3: Scope of inventory requirements (MTS, Phase II MS4s, Mobile Home Parks) (§II.E.5.a)	3: Limit to facilities that Copermittees have the authority to regulate
4: Residential sources are fundamentally different from Industrial, Commercial, and Municipal (§II.E.5.a, §II.E.5.d)	4: Separate inventory and prioritize residential areas by Residential Management Areas (RMA); see slide 5

Industrial, Commercial, and Municipal (ICM) Inspections

Discussion Point	Recommendation
1: Inspections are required at all inventoried facilities over the permit term (§II.E.5.d(1)(a))	1a: Annual inspection obligation should be set at a level equivalent to 20% of entire ICM inventory (# of inspections) 1b: Where appropriate, a source may include multiple facilities 1c: Multiple inspections at a single source, including follow-ups, should each count toward total obligation (20%)
2: Specificity of inspection tracking and records requirements (§II.E.5.d(3))	2: Introductory paragraph to section 3 sets a reasonable standard for documentation
3: Re-inspection within six months of change in property ownership or change in PGA (§II.E.5.d(1)(a))	3: Copermittees are unable to determine when ownership changes occur; strike requirement

Residential Program

Discussion Point	Recommendation
1: The permit proposes more emphasis on residential sources (§II.E.5.a, §II.E.5.d)	1: Specify residential as a separate subsection
2: Residential Management Areas (RMAs)	2: Define residential area assessments in JRMPs and reflect watershed priorities to enable adaptive management
3: Residential areas are treated as ICM facilities (§II.E.5.a, §II.E.5.d)	3: Copermittees determine appropriate approaches to managing RMAs: • Inventory priority and scale • Planning and assessment methods • Variety of assessment outcomes
4: Insufficient linkage with IDDE approach (§II.E.5.d)	4: Primary focus on program improvement and adaptation; follow up on identified IDDEs as appropriate

Enforcement Response Plans (ERPs)

Discussion Point	Recommendation
1: Prescriptive requirements may not support the development of effective ERPs (§II.E.6)	1: ERP should differentiate between construction and existing development requirements.
2: Enforcement response 10 working-day goal for compliance is not achievable (§II.E.6.c)	2: Existing municipal ordinances and code enforcement are already established; increase to 30 calendar-days for consistency
3: Application of high level enforcement lacks Copermittee discretion (§II.E.6.a(1), §II.E.6.b(1), (§II.E.6.c(1))	3a: Evaluate threat to water quality when considering the potential applicability of high level enforcement 3b: Use discretion in applying high level enforcement

Public Education/Outreach and Public Participation

Discussion Point	Recommendation
1: Development of jurisdictional education and outreach programs that are based on watershed priorities (§II.E.7)	1: Address pollutants and behaviors prioritized by watershed and jurisdictions
2: Evaluation and assessment are not explicit (§II.E.7)	2: Integrate evaluation and assessment language to support adaptive management
3: Specific target audiences are identified (§II.E.7.a(3))	3: Allow Copermittees the ability to identify target audiences based on high risk activities and priorities

BMP Implementation and Maintenance

Discussion Point	Recommendation
1: "Enhancement" of BMPs outside of the strategic planning process is unlikely to be effective (§II.E.5.c(3))	1: Let the strategic planning process, with public review, direct efforts toward WQIP priorities; delete the requirement for "enhanced"
2: Copermittees may not have authority over sanitary sewer agencies (§II.E.5.c(4)(c))	2: Jurisdictions should be encouraged, not required, to keep themselves informed
3: Requirement to evaluate stream channel geomorphology related to unpaved road maintenance (§II.E.5.c(4)(b))	3: Infeasible to conduct during regular maintenance inspections; exceeds the scope of regular road maintenance activities; strike requirement
4: Retrofits and channel rehabilitation are standalone BMP requirements (§II.E.5.b)	4: Provide as subsections under BMP Implementation and Maintenance; see slides 9 and 10

Retrofit

Discussion Point	Recommendation
1: Scope of inventory required to be reviewed for retrofit strategy is inclusive of all potential sources (§II.E.5.b(2))	1: Retrofit strategy and updates should be based upon WQIP priorities, and should reflect authority to implement and where resources are available
2: Retrofit is not defined (Attachment C)	2: Retrofit needs a clear definition to include on-site BMPs, infrastructure improvements, and off-site BMPs (i.e. regional)
3: Prioritization criteria are limited (§II.E.5.b(2))	3: Prioritize potential locations based on relative benefit to water quality, feasibility, cost effectiveness, and community acceptance

Channel Rehabilitation and Improvement

Discussion Point	Recommendation
1: Channel rehabilitation and improvement requirements are beyond the scope of an MS4 Permit (§II.E.5.b)	1: Revise language to encourage, rather than require, Copermittees to consider during WQIP strategy development and as part of the adaptive management process
2: Prioritization criteria are limited (§II.E.5.b(2))	2: Potential location prioritization may be based on relative benefit to water quality, feasibility, cost effectiveness, and community acceptance

San Diego RWQCB
Permit Reissuance Focused Meeting

August 22, 2012

San Diego Copermittees

Land Development

Alternative Compliance

Proposed Concept:

- Allow more discretion to the Copermittees in exercising alternative compliance options.

Rationale:

- Establishing a mitigation program will take significant time. Copermittee's may not have resources to identify applicable mitigation projects when they are needed.
- Developer's need the ability to maintain control of any mitigation measures necessary for their project.

Solution:

- Revise Section E.3.c. (4), p69, to allow the Copermittees to exercise alternative compliance ***as an optional program***, at their own discretion when onsite compliance is infeasible[1].
- Revise Section E.3.c.(4) to state that it is ***the sole responsibility of the project proponent to*** execute offsite mitigation project.

[1] *Copermittees are open to waiving proof of infeasibility in unique circumstances where the proposed offsite mitigation results in equal or greater overall water quality benefit.*

Alternative Compliance

Proposed Concept:

- Eliminate specific mitigation project timing requirement and replace with assurance requirements.

Rationale:

- Prior to occupancy requirement is not a practical requirement, this will prevent alternative compliance from occurring. The intent is that the off-site mitigation is a long term strategic planning effort for a higher water quality result.

Solution:

- Replace second sentence in Section II.E.3.(4)(c)(iii) with "...Each development's share of offsite mitigation project funding must be secured prior to the first occupancy. Mitigation projects will be programmed and reported on in the Copermittees WQIP."

Alternative Compliance

Proposed Concept:

- Restructure alternative Compliance requirements to help achieve other permit requirements and to better align with highest water quality priorities identified in the WQIP.

Rationale:

- Alternative compliance is another tool in the toolbox to achieve overall water quality objectives. It should synchronize with other elements of our programs.

Solution:

- Enhance permit language to indicate that Retrofit and Channel Rehabilitation as identified in the WQIP can also be utilized for offsite mitigation.

Adaptive Management

Proposed Concept

- Incorporate Adaptive Management concept as part of the Development Planning section. Allow adaptation be applied to:
  - Site specific or region specific requirements (e.g. match site specific preproject retention of 85th% storm).
  - Adaptive performance standards with technical justification and scientific data/studies.
  - Adaptive priority development project standards
    - Where projects are shown to be a significant/insignificant source of pollutants.

Rationale:

- Some of the permit's proposed performance standards and priority development projects categories do not have known *scientific* justification.

Solutions

- Ensure the permit allows adaptive management of the Development Planning Section II.E.3.

Priority Development Categories

Proposed Concept:

- Exclude Single Family Residential (SFR), that is not part of larger development, from PDP categories to direct resources to higher priorities.

Rationale:

- There are opportunities to implement excellent LID BMPs on low density residential projects without PDP classification.
- Direct resources away from unnecessary PDP paperwork toward higher priorities to achieve more substantial water quality improvements.
- SFR does not have the same impact to water quality as industrial & commercial development, therefore it should have a different threshold.
- Potential pollutants generated from SFR should be addressed by effective source control and better site design.

Solution:

- Include SFR, that is not part of larger development or a proposed subdivision, in the PDP Exemptions, Section II.E.b.(3).
- Allow Copermittees to develop "suite of BMPs" in the BMP Design Manual to meet a minimum performance standard for SFR.

Retention Requirements

Permit Concept:

- Current standard**: Infiltrate, treat or detain** the 85th% storm volume.
- Admin. Draft standard : **Retain** 85th% storm volume.
- Pollutant load reduction resulting from retention is greater than detention.

Considerations:

- Runoff is an important water source to creeks and rivers in our semi-arid climate. 85th% storm: 1/2”- 1”. 80% of raindays in last 30 yrs. had rainfall totals less than ½”.
- Retention of 85th% storm volume is not scientifically justified as beneficial for overall watershed health.
- Retaining more than pre-project volume could result in loss of downstream vegetation and subsequent channel erosion.
- EPA[1] recommends retaining pre-project volume and SCCWRP[2] recommends a water balance approach to mimic natural hydrology.

Proposed Solution

- Retain the pre-project 85th% retention volume to mimic natural hydrology, where soil conditions permit.

[1] *EPA Municipal Permit Improvement Guide, Chapter 5, Page 54*

[2] *SCCWRP Hydromodification Assessment and Management in CA*.

Retention Requirements

Permit Concept:

- Admin Draft standard : **Retain** 85th% storm on site, or mitigate offsite if infeasible.
- Pollutant load reduction resulting from retention is greater than detention.

Considerations:

- Projects need to be given a means to comply onsite even where soil conditions are poor.
- Requiring retention could result in geotechnical hazards in some areas.
- Mitigation sites may not be readily available for all development sites.

Proposed Solution:

- Three tiered compliance standard:
  1. Retain pre-project 85th% volume onsite to mimic natural hydrology, where conditions permit.
  2. Where retention is infeasible[1], design LID/BMPs to achieve pollutant load reduction greater than or equal to the retention standard (in 1 above).
  3. Where standards 1 & 2 cannot be met, provide onsite treatment and offsite mitigation (for retention and/or HMP) that provides an overall water quality benefit within the Watershed Management Area.

[1] *Copermittees are open to waiving proof of infeasibility in unique circumstances where the proposed offsite mitigation results in equal or greater overall water quality benefit.*

HMP- Predevelopment Baseline

Proposed Concept

- Require redevelopment projects to mitigate for the project's impacts. Use pre-project condition as a baseline for HMP design.

Rationale:

- Improve overall watershed water quality by promoting redevelopment and infill development on already degraded, highly impervious lands.
- Benefits of redevelopment include: reduced imperviousness, protection of undeveloped areas, improved water quality treatment, reduced commute miles, removal of blight, smart growth, etc.

Solutions

- Require projects to match pre-project flow rates and durations by preserving the pre-project baseline for HMP. Revise Section II.E.3.b.(3) accordingly.

GEOCON

GEOTECHNICAL CONSIDERATIONS FOR STORM WATER

GEOCON

Technical Infeasibility

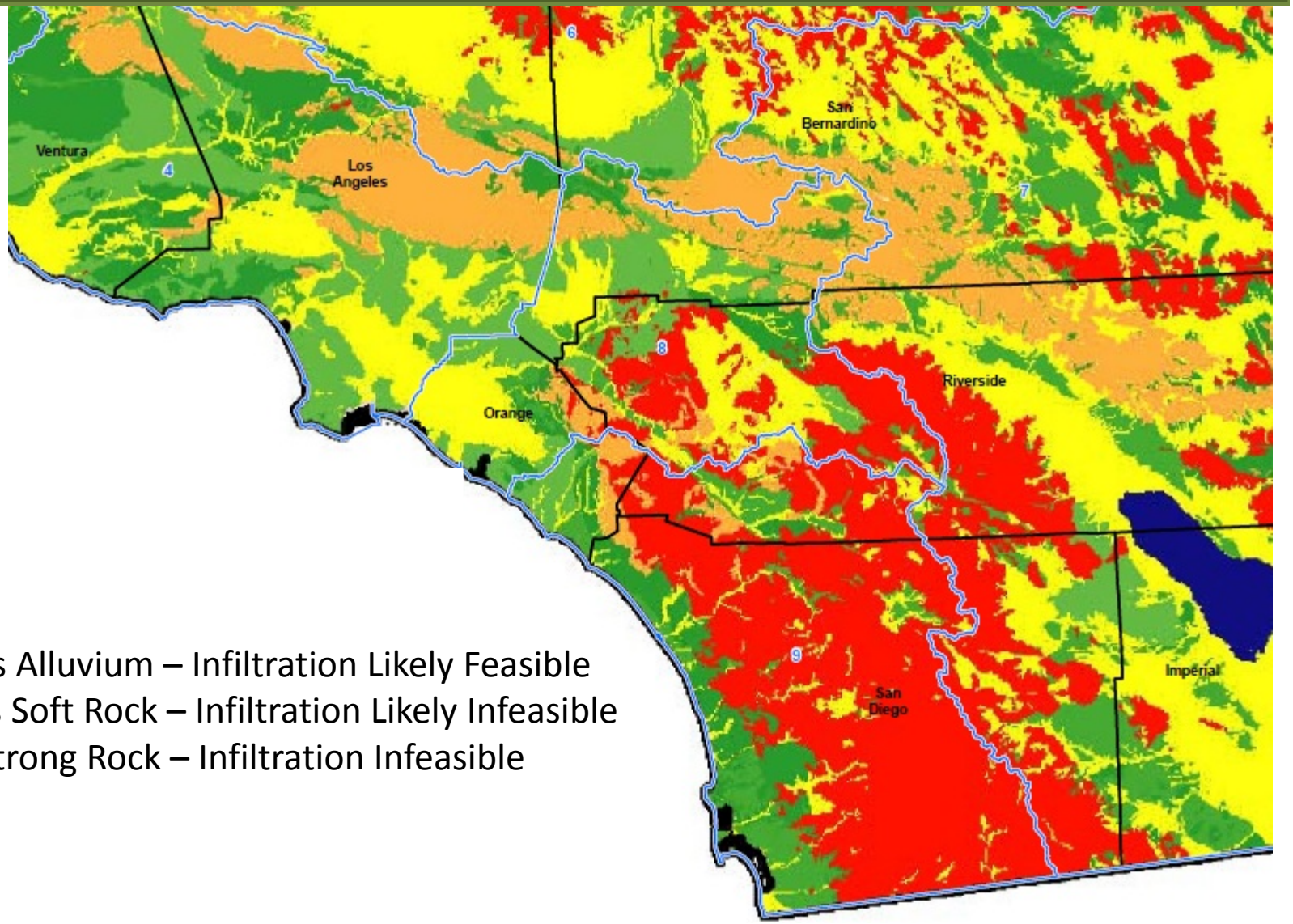

Yellow Indicates Alluvium – Infiltration Likely Feasible
Green Indicates Soft Rock – Infiltration Likely Infeasible
Red Indicates Strong Rock – Infiltration Infeasible

GEOCON

Technical Infeasibility

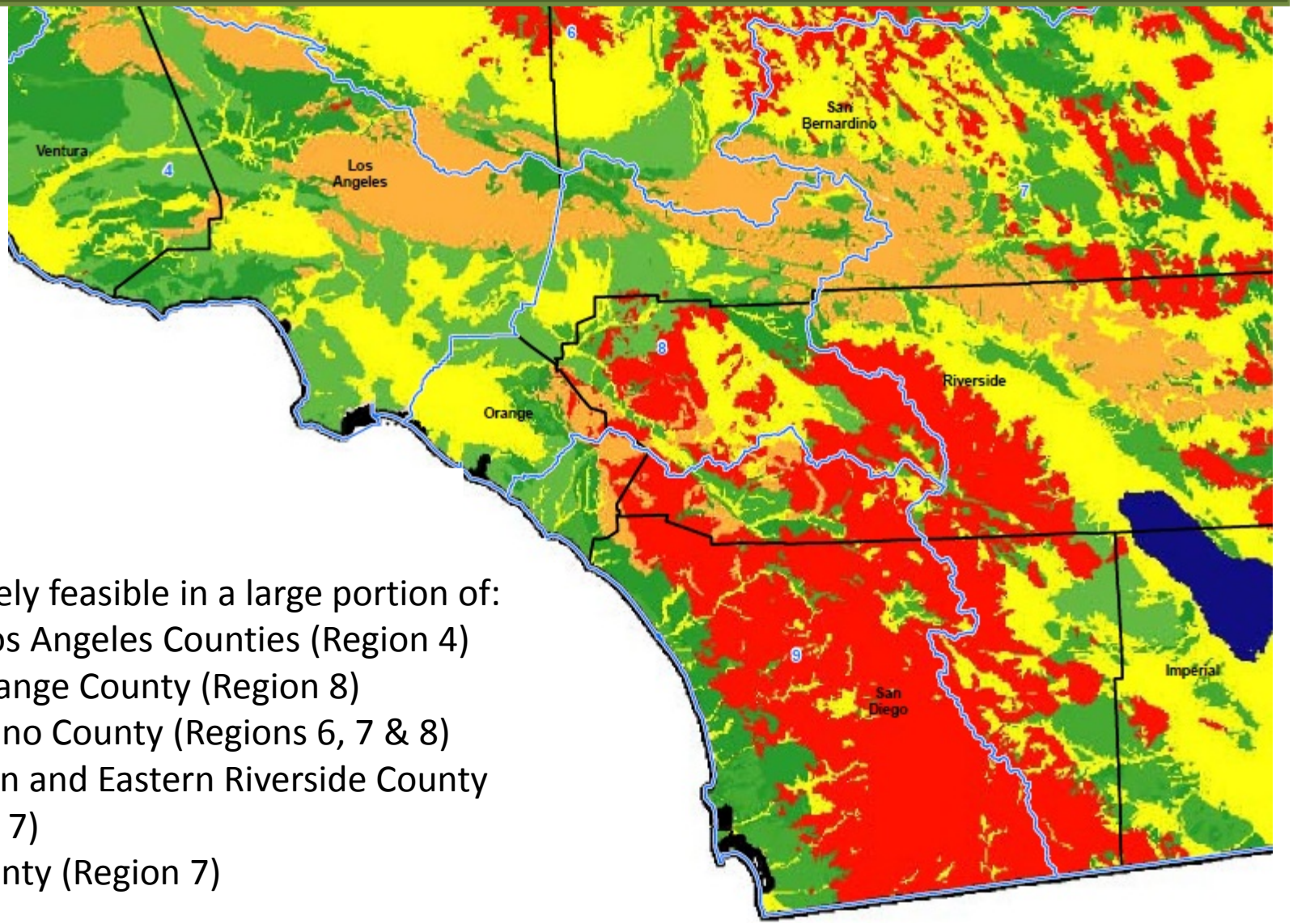

Infiltration is likely feasible in a large portion of:

- Ventura & Los Angeles Counties (Region 4)
- Northern Orange County (Region 8)
- San Bernardino County (Regions 6, 7 & 8)
- Northwestern and Eastern Riverside County (Regions 8 & 7)
- Imperial County (Region 7)

GEOCON

Technical Infeasibility

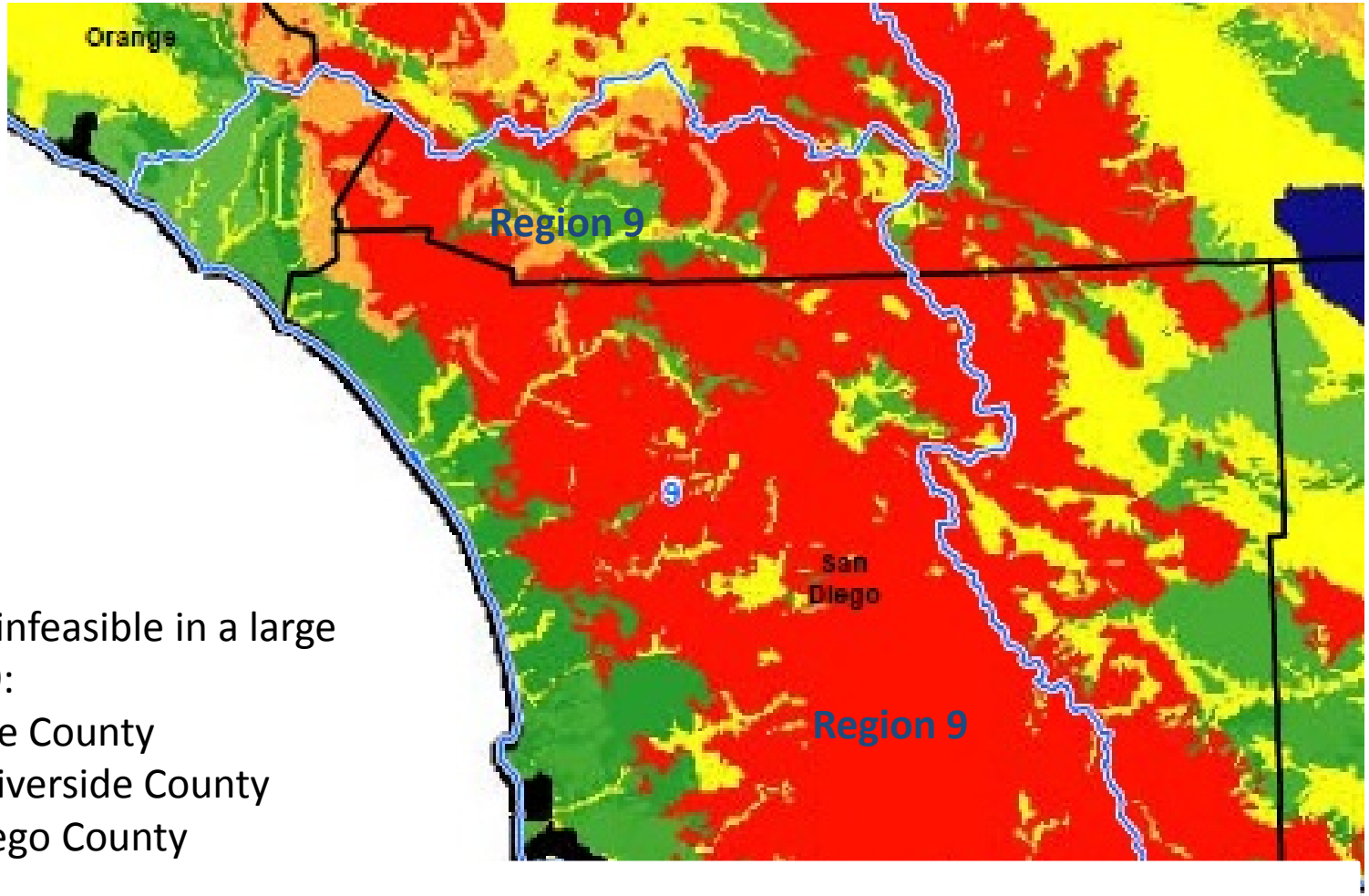

Infiltration is likely infeasible in a large portion of Region 9:

- Southern Orange County
- Southwestern Riverside County
- Western San Diego County

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Technical Infeasibility

Geotechnical conditions that could be affected from required infiltration are:

- Slope stability
- Expansive soil
- Compressible soil
- Seepage
- Loss of pavement and foundation subgrade support

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Technical Infeasibility

Slope Stability

GEOCON

Technical Infeasibility

Slope Stability

GEOCON

Technical Infeasibility

Expansive Soil

GEOCON

Technical Infeasibility

Expansive Soil

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Seepage

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Seepage

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Technical Infeasibility

Loss of Support

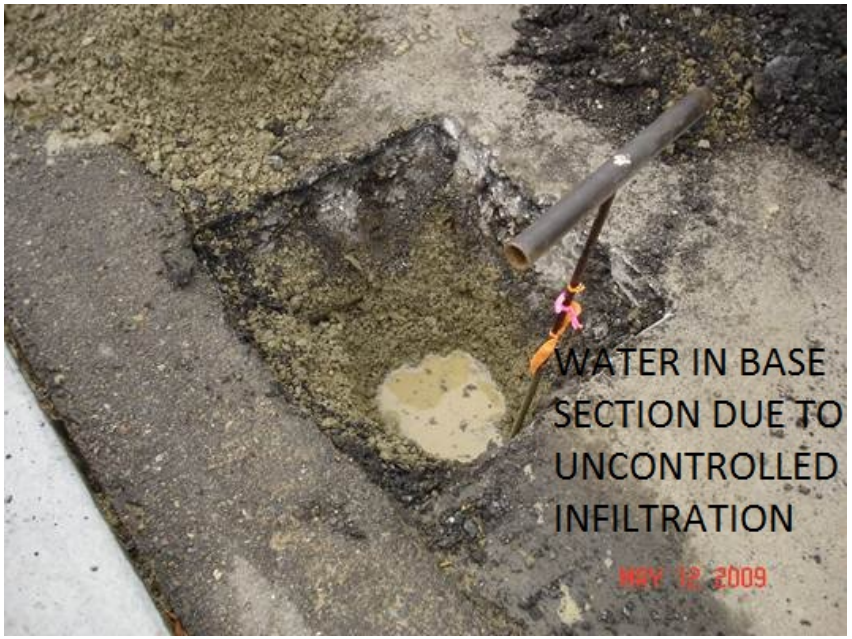

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Increased Liability

About 95 percent of lawsuits that are geotechnically based involve water. The issues include:

- Expansion due to water infiltration that lift flatwork and lightweight structures (i.e. homes) that can cause racking of doors and windows and cracking,
- Retaining wall issues including efflorescence (mineral deposits and staining) on the face of the wall, settlement of backfill soil, and rotational failure,
- Settlement,
- Mold growth,
- Slope stability failure,
- Seepage, and
- Pavement subgrade failure

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Illicit Connections

Illicit discharges are non-storm water discharges without an MS4 or NPDES permit.

We recommend non-storm water discharges be allowed provided the discharges are essential for emergency response purposes, structural stability, slope stability, or naturally occurring and include:

- Foundation and footing drains,
- Water from crawl spaces or basement pumps,
- Hillside/canyon dewatering, and
- Naturally occurring seepage.

Groundwater should also be defined as water that occurs beneath the water table in soil and in geologic formations that are fully saturated as evaluated by the geotechnical consultant/geologist.

The 85th Percentile Event and Runoff Generation in Natural Conditions

Luis A. Parra, PhD, PE, CPSWQ, ToR, D.WRE.
Tory R. Walker Engineering , Inc.
SDSU Professor, Hydrology and Hydraulics

Tory R. Walker, PE, CFM, LEED GA
Tory R. Walker Engineering, Inc.

Purpose

- Discuss runoff generation from a relatively large (85th Percentile) storm event
  - Improve the Draft Permit language to incorporate natural runoff scenarios
  - Maintain naturally occurring runoff, which provides beneficial uses to receiving waters

85th Percentile Runoff

- The 85th Percentile, 24-hour duration event represents the daily record of precipitation exceeded only 15% of the time.
- In San Diego Lindbergh Airport, (1948 –2005, or 57 years) there have been 2,334 rainy days (average* of 40.9 per year).
- An 85th percentile daily event occurs six times a year, on average*.
- A County-wide map has already been prepared (in the SDCHM) to show the 85th Percentile, 24-hr depth in different locations in San Diego County. Other Southern California Counties have prepared similar maps.

* Wide variability (skew)

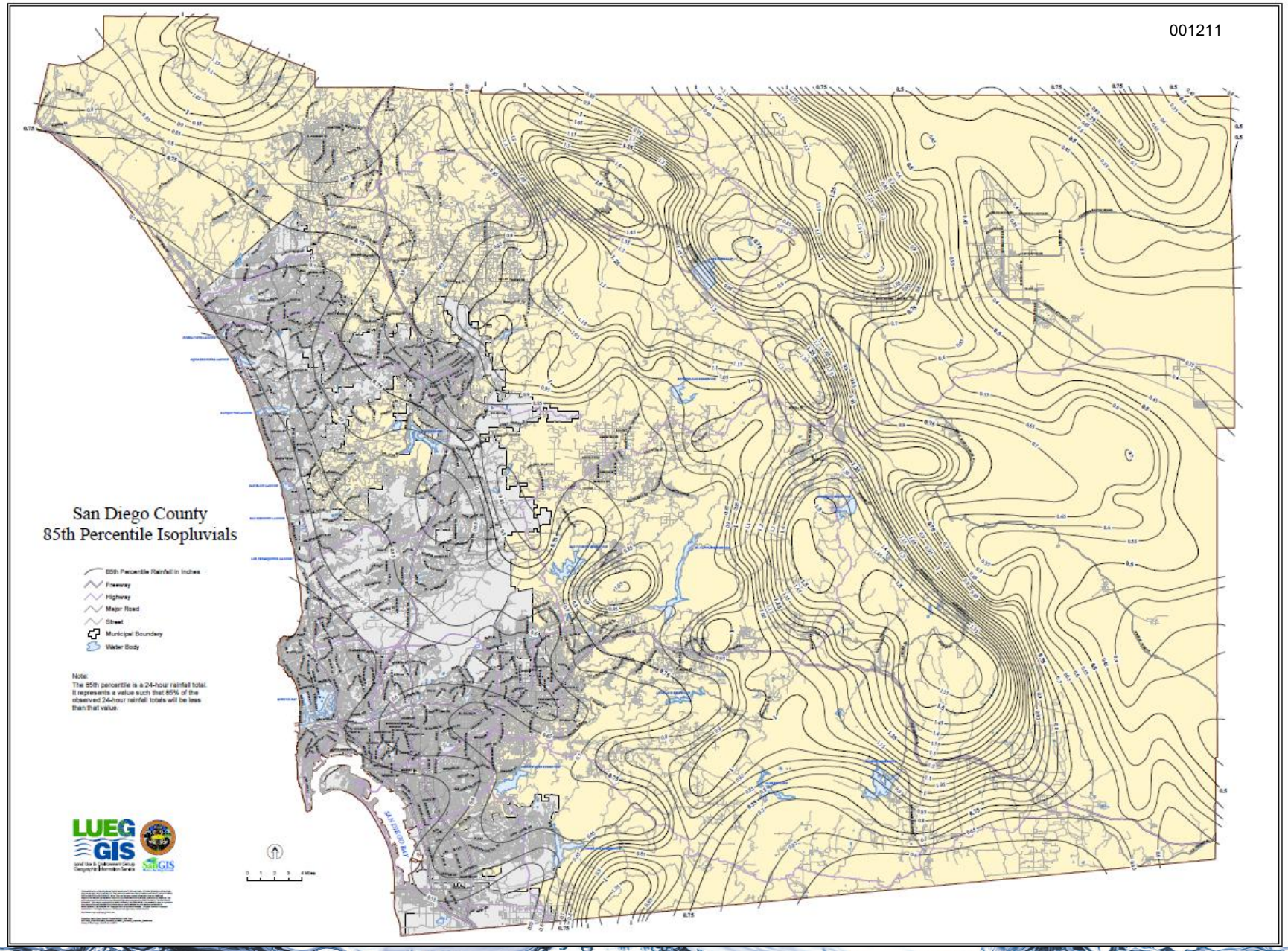
San Diego County
85th Percentile Isopluvials
85th Percentile Rainfall in Inches
Freeway
Highway
Major Road
Street
Municipal Boundary
Water Body
Note:
The 85th percentile is a 24-hour rainfall total. It represents a value such that 85% of the observed 24-hour rainfall totals will be less than that value.
LUEG GIS
Land Use & Environment Group Geographic Information Service
SanGIS
SAN DIEGO BAY

85th Percentile 24-hr Rainfall Isohyetal Map

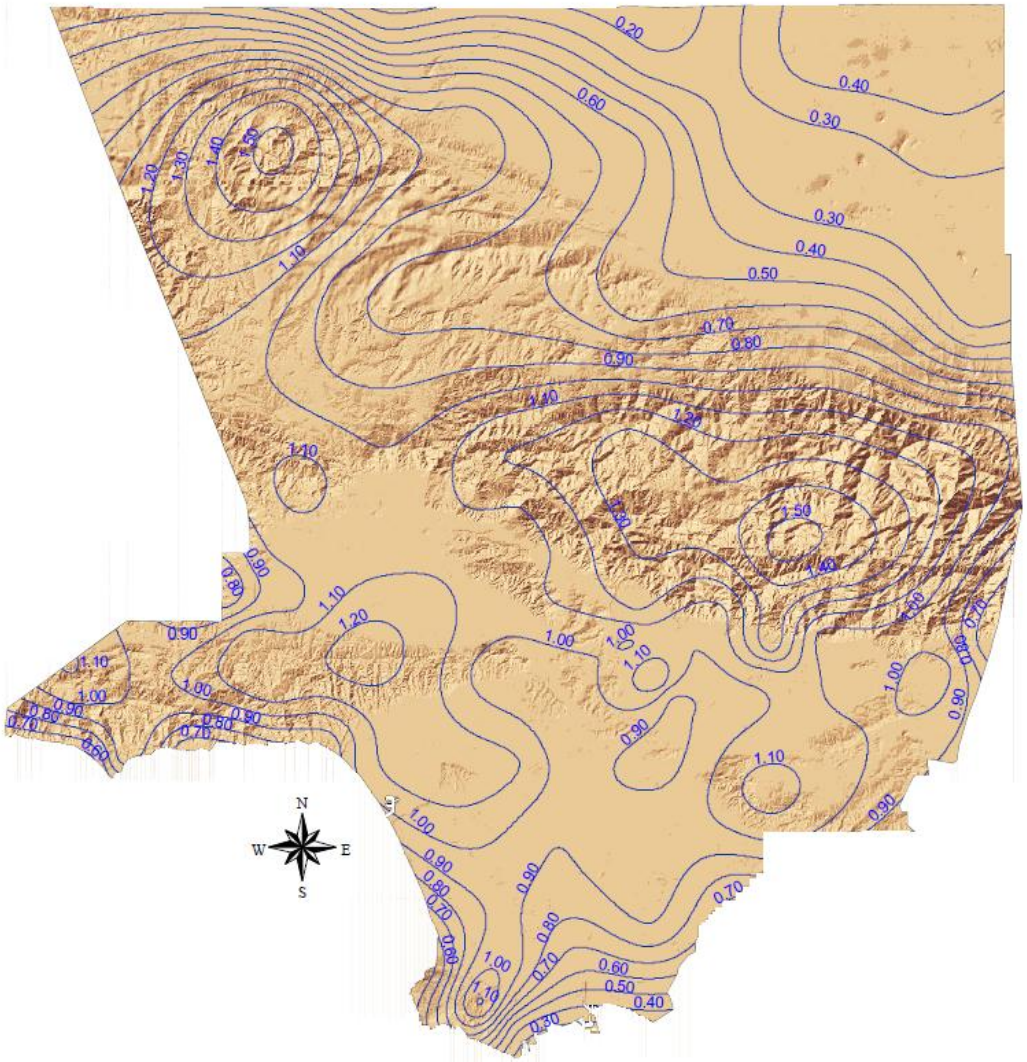

Los Angeles County

Runoff from the 85th Percentile Event

- As the depth of precipitation for the 85th percentile event varies , so does the capacity of the soils to absorb it.
- Runoff depends on many factors: precipitation depth and patterns; soil type; vegetation type and amount; and Antecedent Moisture Conditions (degree of saturation of the soil prior to the rain event).
- In the San Diego Region, the 85th percentile event generates some runoff most of the time:
  - -Impervious Soils (Type D) are most common in the region
  - -Natural vegetation is poor or fair in many areas
- Curve Number values (CN) can be used to estimate natural and post-development runoff volumes

Runoff from the 85th Percentile Event

- Removal of naturally occurring flows generated by storms similar to the 85th percentile for those environments where such flow does occur may have negative impacts to existing habitats:
  - Excessive retention can alter the natural water balance.
- Retention of ALL storms equal to or smaller than the 85th percentile will remove naturally occurring runoff that provides several beneficial uses within the receiving waters
- *The intent of the permit is to retain the seasonal first flush only (and not all flows). Such intent should therefore be evident in the language.*

Runoff for Different P_{85} Values

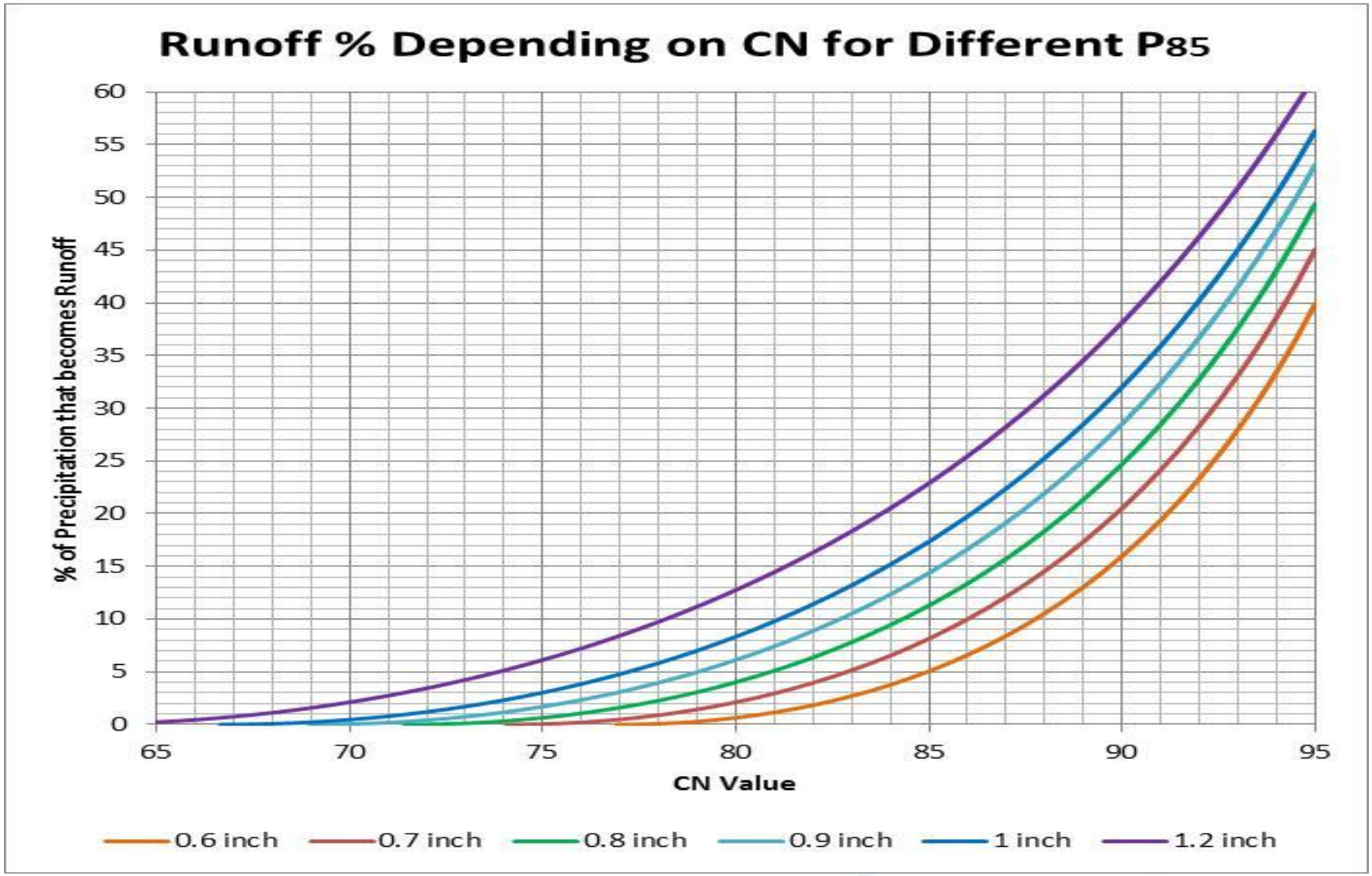

Rainfall Distribution

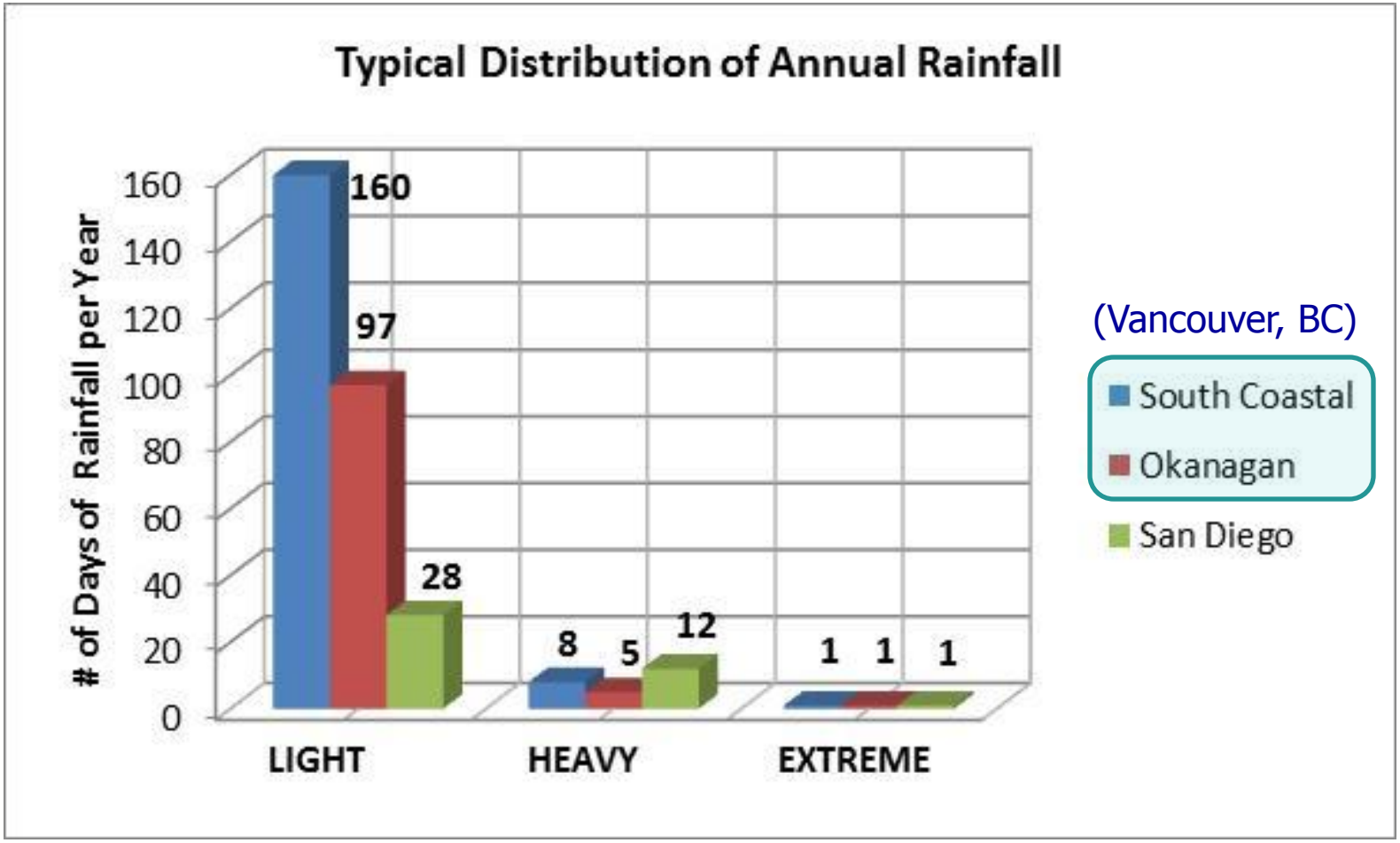

Rainfall Distribution

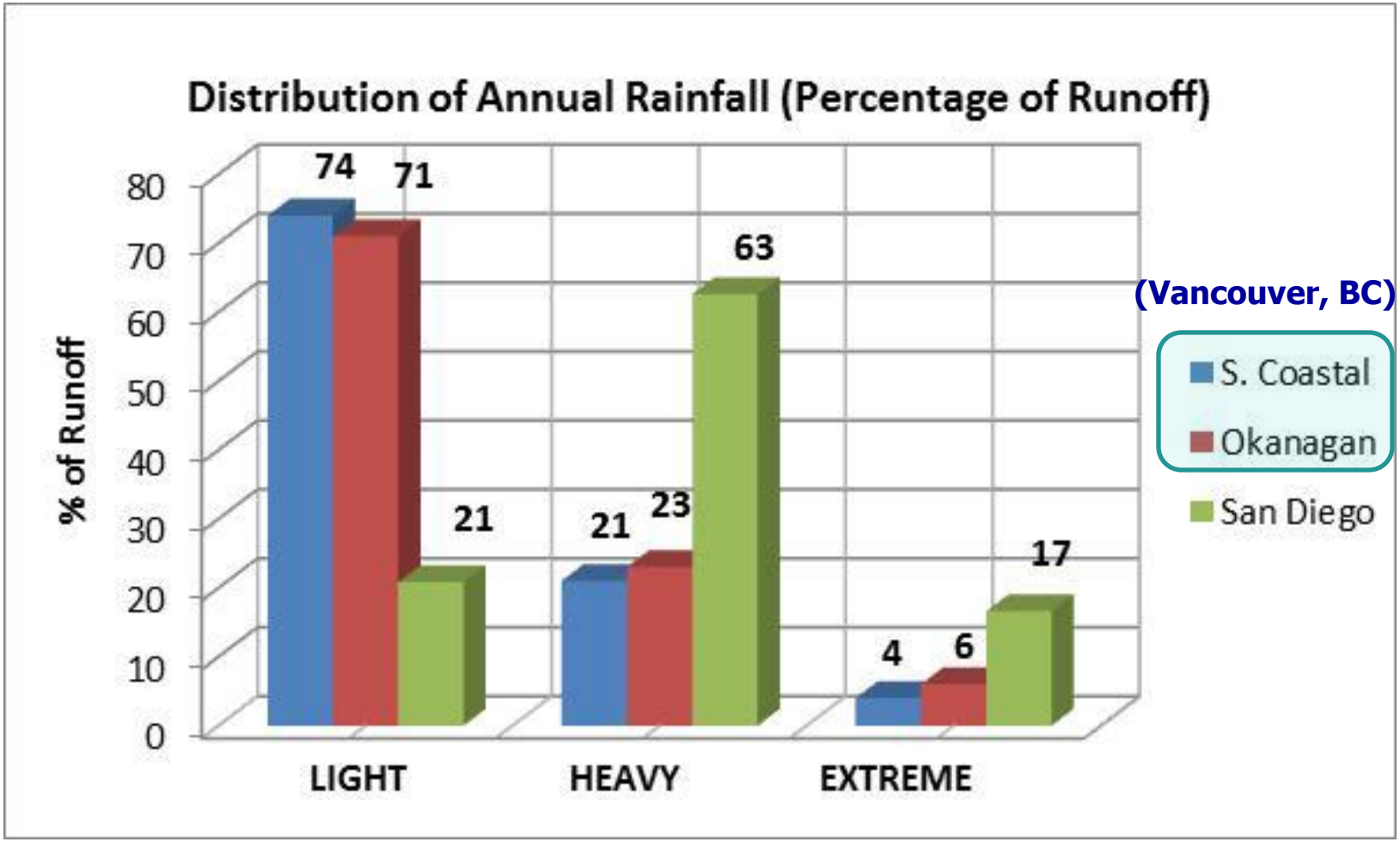

A Better Way to Manage 85th Percentile Runoff

- The Draft Permit says:

  Priority Development Projects must retain the volume equivalent to runoff produced from a 24-hour 85th percentile storm event ("design capture volume");

- To preserve natural condition runoff, we propose:

  Priority Development Projects must retain the volume equivalent to the runoff volume produced from a 24-hour 85th percentile storm event[15] in post-development conditions less the runoff volume produced from the same 24-hour 85th percentile storm event in natural conditions ("design capture volume");

Lane's Stream Balance Relationship

Lane's classic description of channel stability states that dynamic equilibrium exists between stream power and the discharge of bed-material sediment (Lane, 1955 as cited in Chang, 1998):

$$Q_s d \propto Q_w S$$

where Q_s is the sediment discharge, d is the median sediment size, Q is the discharge and S is the bed slope.

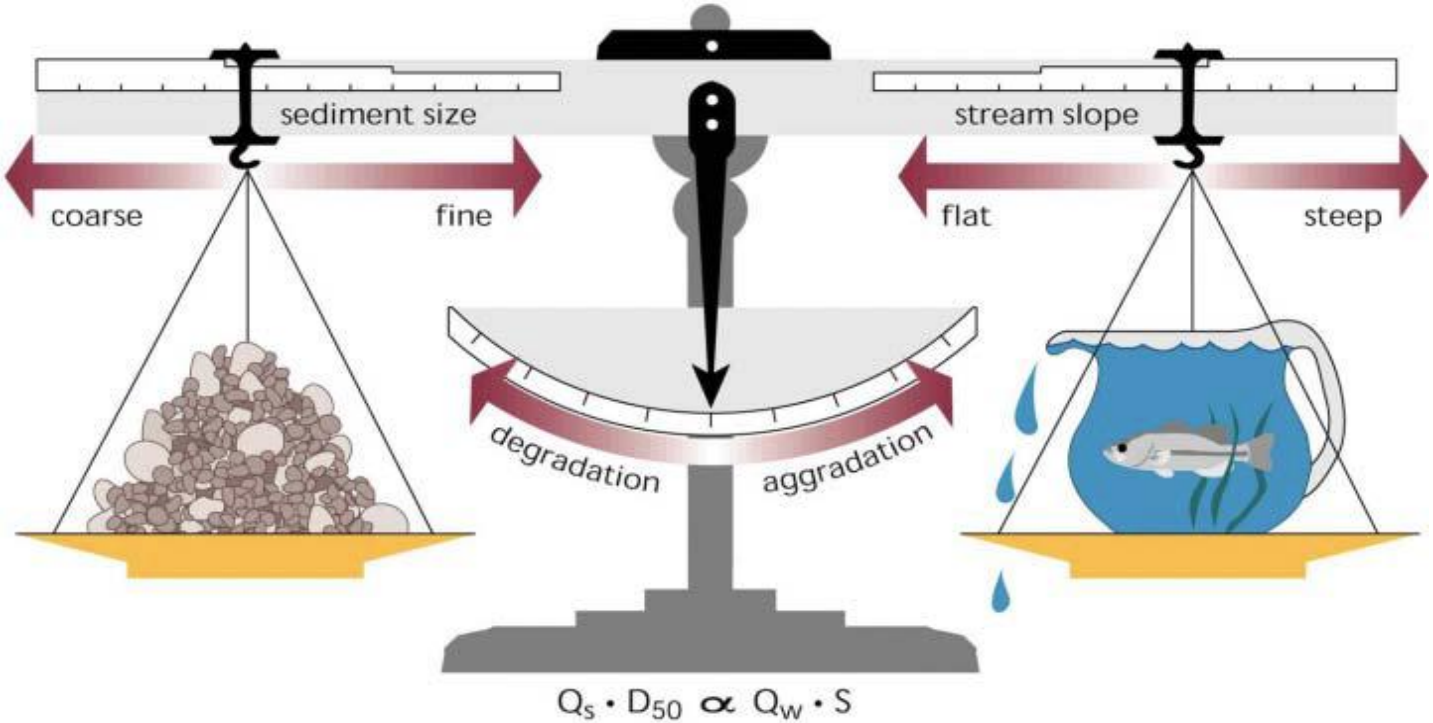

ILLICIT DISCHARGE DETECTION & ELIMINATION – NON-STORM WATER DISCHARGES

Foundation Drains, Footing Drains, and Other Subsurface Drainage Systems

- **Source of the Proposed Regulation**

  The direction and language of the Administrative Draft proceeds from 40 CFR 122.26(d)(2)(iv)(B & B1), but with ***a difference for the following subcategory of non-storm water discharges***:

  a. Uncontaminated pumped ground water;

  b. Discharges from foundation drains;

  c. Water from crawl space pumps; and

  d. Water from footing drains.

ILLICIT DISCHARGE DETECTION & ELIMINATION – NON-STORM WATER DISCHARGES

Foundation Drains, Footing Drains, and Other Subsurface Drainage Systems

- 40 CFR says:

  "the following category of non-storm water discharges or flows shall be addressed where such discharges are ***identified by the municipality as sources of pollutants to waters of the United States***:"

  the Administrative Draft (E.2.a(1)) would require that:

  "Discharges of non-storm water to the MS4 from the following categories ***must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. (CAG919001 or CAG919002)***."

ILLICIT DISCHARGE DETECTION & ELIMINATION – NON-STORM WATER DISCHARGES

Foundation Drains, Footing Drains, and Other Subsurface Drainage Systems

- **Concern #1: the Term "Groundwater"**
  - "Groundwater" here is an undefined term and seems to describe any underground water that could enter the MS4 through this subcategory of drains.
  - "Groundwater" should be properly defined as water that occurs beneath the water table in soil and geologic formations that are fully saturated, as defined by the geotechnical engineer or engineering geologist.

ILLICIT DISCHARGE DETECTION & ELIMINATION – NON-STORM WATER DISCHARGES

Foundation Drains, Footing Drains, and Other Subsurface Drainage Systems

- **Concern #2: Misconception about the Drains**
  - This broad use of "Groundwater" may have led to a misconception of the purpose and function of this subcategory of drains:
  - The designer doesn't include these drains because a fully saturated soil condition exists or is expected to exist on the site. Instead, the designer uses these drains to avoid overdesigning for saturated conditions. Many such drains never yield any water to the MS4.
  - These drains are provided for in state and local building codes and ordinances to protect public health, safety & welfare in case a fully saturated soil condition should develop.
  - If a fully saturated soil condition exists or is expected to exist, the foundations, footings, and other subsurface drainage systems would likely be designed differently.

ILLICIT DISCHARGE DETECTION & ELIMINATION – NON-STORM WATER DISCHARGES

Foundation Drains, Footing Drains, and Other Subsurface Drainage Systems

- **Concern #3: Coverage under NPDES Permits**
  - The NPDES Permits process is not structured to address "theoretical" discharges.
  - At the time of drain design & approval, metrics such as flow rates, pollutant loads, and types of pollutants cannot be known.
  - At the time of drain design such discharges cannot be "***identified by the municipality as sources of pollutants to waters of the United States***".
  - With the Administrative Draft, the Copermittees and the Building Community are in a difficult position – the Copermittees can't approve categorical illicit discharges and the Builders can't get coverage under an NPDES Permit for discharges that don't exist.

ILLICIT DISCHARGE DETECTION & ELIMINATION – NON-STORM WATER DISCHARGES

Foundation Drains, Footing Drains, and Other Subsurface Drainage Systems

- **Concept Revision**
  - Address these potential non-storm water discharges per 40 CFR and as in Administrative Draft E.2.a(3):

"Discharges of non-storm water to the MS4 from the following categories (*include foundation drains, footing drains, and other Subsurface Drainage Systems*) must be addressed by the Copermittees as illicit discharges only if the Copermittees or the San Diego Water Board identifies the discharge as a source of pollutants to receiving waters based on test results:"

Restoration projects for alternative compliance

Restoration projects (onsite and offsite) can provide more benefit to the receiving waters than conventional LID and HMP BMP's

The Administrative Draft permit requires a technical infeasibility analysis for any alternative compliance.

Restoration projects for alternative compliance should be encouraged by the permit. If they enhance the beneficial uses within the watershed, and provide the same or better level of water quality protection, they should not require proof of infeasibility.

The permit should include an “off ramp” that would eliminate the need for a technical infeasibility analysis for restoration projects.

Planning and Land Development Program Element Suggestions: BIA/SC-CICWQ

Permit Issue	Interpretation and Concerns	Suggested Approach
Flow-thru biofiltration does not meet onsite retention standard	A zero discharge standard is established; it is scientifically and technically unsupported; limits LID BMPs in toolbox	Use established LID BMP selection hierarchy that includes biofiltration as an option when other retention BMPs are infeasible
Use of flow-thru biofiltration must be accompanied by mitigation of SWQDv	Biofiltration and bioretention BMPs are established LID practices; requiring accompanying mitigation of SWQDv that has already been biofiltered penalizes use of effective LID controls	Remove this provision; no other permit requires accompanying mitigation for volume that has already been managed in biofilters

Planning and Land Development Program Element Suggestions: BIA/SC-CICWQ

Permit Issue	Interpretation and Concerns	Suggested Approach
Sub-regional and regional LID approaches and watershed planning using LID practices within watershed planning are absent or minimized	Draft permit minimizes any type of regional approach Draft permit doesn't allow co-permittees to incorporate watershed and sub-watershed scale LID and hydromodification control BMPs into a JURMP	Provide co-equal approach to onsite compliance when benefit to groundwater replenishment is established Allow compliance when watershed master plans include LID BMPs implemented at appropriate scale
Hydromodification exemptions for other hardening techniques and urban area have been removed	Requirement is unduly restrictive and requires controls when they are not needed and will have no effect	Substitute "concrete lined" with "hardened"; recognize urban area exemption >70% per HMP

Comparison of New and Re-development Low Impact Development Performance Criteria in Southern California MS4 Permits

Permit Criteria	Southern California Phase I MS4 Permit Comparison—Low Impact Development BMP Permit Criteria							
	Administrative Draft San Diego Regional Permit SDRWQCB Tentative Order	**Adopted South Riverside County Permit SDRWQCB 11/10/2010**	**Adopted Ventura County Permit LARWQCB 7/8/2010**	**Adopted Western Riverside County Permit SARWQCB 1/29/2010**	**Adopted San Bernardino County Permit SARWQCB 1/29/2010**	**Adopted South Orange County Permit SDRWQCB 12/16/2009**	**Adopted North Orange County Permit SARWQCB 6/3/2009**	**Adopted San Diego County Permit SDRWQCB 1/24/2007**
LID Sizing Criteria	1. Size and design BMPs to retain the volume equivalent to runoff produced by the 85th percentile storm event 2. If onsite retention is technically infeasible, flow-thru LID BMPs must be implemented to treat remaining SWQDv not retained onsite 3. Mitigate portion of SWQDv pollutant load not retained onsite	1. Size and design BMPs to ensure onsite retention, without runoff, the 24-hour 85th percentile storm event 2. If #1 infeasible, treat excess surface discharge with biofiltration; increase sizing for biotreatment BMPs by 0.75 times the design storm volume remaining 3. Treat excess surface discharge not retained or biofiltered using treatment controls	1. 5% EIA, with finding of infeasibility allowance to use biofiltration for 1.5X remaining design volume; disconnection is defined as full retention of the water quality volume (85th percentile event) 2. Treat directly connected impervious and pervious areas	1. Retain and treat WQ volume (85th percentile event) 2. Treat excess surface discharge from water quality design storm per WQMP	1. Retain and treat WQ volume (85th percentile event) 2. Treat excess surface discharge from water quality design storm per WQMP	1. Fully retain onsite water quality volume (85th percentile event) without any runoff 2. If #1 infeasible, treat excess surface discharge with biofiltration; increase sizing for biotreatment BMPs by 0.75 times the design storm volume remaining 3. If #2 infeasible to biofilter or biotreat, use conventional BMPs and mitigate volume reduction offsite	1. Retain water quality volume (85th percentile event) or biotreat with a showing of infeasibility to retain the entire volume 2. Treat excess surface discharge from water quality design storm per WQMP	1. Size all treatment systems for 85th percentile event 2. Treat excess surface discharge
LID BMP Selection Priority/Allowable LID BMPs to meet On-site Retention Standard	1. Infiltration 2. Harvest and Use 3. Evapotranspiration 4. Flow-thru LID treatment control BMPs; project applicants must perform mitigation for portion of the pollutant load in the SWQDv that is not retained onsite	1. Site design (conserve natural areas, etc) 2. Infiltration 3. Other LID BMPs sized at 0.75 x portion of design capture volume not retained onsite. 4. Treatment control measures	1. Infiltration 2. Harvest and Use 3. Evapotranspiration 4. Bioretention/ biofiltration 1.5 times remaining design volume	1. Site design (conserve natural areas) 2. Infiltration 3. Harvest and Use 4. Evapotranspiration 5. Bioretention / biofiltration	1. Site design (conserve natural areas) 2. Infiltration 3. Harvest and Use 4. Evapotranspiration 5. Bioretention / biofiltration	1. Infiltration 2. Harvest and Use 3. Evapotranspiration 4. Bioretention / biofiltration	1. Site design (conserve natural areas, etc) 2. Infiltration 3. Harvest and Use 4. Evapotranspiration 5. Bioretention/ Biofiltration	1. Site design (conserve natural areas) 2. Drain portion of impervious area to pervious areas (landscaping) 3. Low traffic areas and appropriate soils, use permeable materials 4. Treatment control measures
LID Technical Infeasibility and Mitigation Process	1. Demonstrate retention LID BMPs implemented to maximum extent technically feasible given project site conditions 2. Perform mitigation with net result the same level of water quality protection as would have been	1. LID waiver program 2. Mitigate pollutant load estimated from each project participating in program 3. Water quality credit option 4. In-lieu fee option	1. Submit hydrologic and/or design analysis showing project meets various criteria 2. Make up volume retention requirement offsite either directly or via in-lieu fee 3. All feasible measures to reduce	1. Submit hydrologic and/or design analysis showing project meets various criteria 2. Create watershed based infiltration map to target stormwater infiltration and storage 3. Create urban runoff fund to fund watershed and sub-	1. Submit hydrologic and/or design analysis showing project meets various criteria 2. Create watershed based infiltration map to target stormwater infiltration and storage 3. Create urban runoff fund to fund watershed and sub-watershed	1. Offsite "waiver" (mitigation) programs to be developed 2. In-lieu fees 3. Water quality credit system	1. Submit hydrologic and/or design analysis showing project meets various criteria 2. Create watershed based infiltration map to target stormwater infiltration and storage 3. Create urban runoff fund to fund watershed and sub-watershed	1. No requirement 2. Model SUSMP to include criteria for LID BMP applicability and feasibility

Permit Criteria	Southern California Phase I MS4 Permit Comparison—Low Impact Development BMP Permit Criteria							
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LID Technical Infeasibility and Mitigation Process	achieved with full implementation of LID BMPs onsite 3. For SWQDv not retained on-site, require either: i) implement an offsite mitigation project; or ii) provide sufficient funding for a public or private offsite mitigation project via a mitigation fund: a. <u>Project Locations:</u> preferably within same hydrologic subarea or within the same hydrologic unit if infeasibility demonstrated b. <u>Project Type:</u> retrofit, stream habitat restoration, green streets, or regional BMPs upstream of receiving waters c. <u>Project Timing</u>: regional projects completed at time of occupancy of first project d. <u>Mitigation Fund</u>: fund pollution credit or mitigation fund allowed		EIA <30% 4. Projects achieving <30% EIA, mitigation or payment in lieu equivalent to stormwater not managed onsite 5. Projects >30% EIA, mitigation or payment in lieu equivalent to stormwater not managed onsite multiplied by 1.5 6. Offsite mitigation must be in same sub-watershed 7. Offsite mitigation must be completed in 4 yrs	watershed scale LID projects 4. Create watershed LID water quality credit system	scale LID projects 4. Create watershed LID water quality credit system		scale LID projects 4. Create watershed LID water quality credit system	

National Comparison of New and Redevelopment Low Impact Development Performance Criteria

Permit Criteria	West Virginia Small MS4 Permit Effective: 7/22/2009	Georgia Phase II MS4 Permit Effective: 1/3/2012	Washington DC Phase I MS4 Permit Effective: 10/7/2011	Philadelphia, Pennsylvania Phase I MS4 Permit Effective: 1/1/2006	Portland, Oregon Phase I MS4 Permit Effective: 1/22/2011
LID Sizing Criteria	1. Keep and manage on site the first one inch of rainfall from a 24-hour storm preceded by 48 hours of no measureable precipitation.	1. Capture and treat the runoff volume resulting from the first 1.2 inches of rainfall from a site.	1. On-site retention of 1.2" of stormwater from a 24-hour storm with a 72-hour antecedent dry period for all development greater than or equal to 5,000 square feet.	1. Manage water quality volume of 1-inch of rainfall over directly connected impervious area. 2. Sizing differs for areas of separate or combined sewers.	1. Infiltrate the 10-year, 24-hour storm event. 2. Three sizing methodologies allowed: Simplified, Presumptive, and Performance 3. Capture and treat 80% of average annual runoff volume
LID BMP Selection Priority/Allowable LID BMPs to meet Onsite Retention Standard	1. Runoff volume reduction achieved thru: canopy interception, soil amendments, evaporation, rainfall harvesting, engineered infiltration, extended filtration, and evapotranspiration. 2. In addition to practices listed in #1 above, use: dry swales, bioretention, rain tanks and cisterns, soil amendments, roof top disconnections, permeable pavement, porous concrete, permeable pavers, reforestation, grass channels, and green roofs for volume reduction.	1. Determine feasibility to include green infrastructure practices, such as infiltration, reuse, and evapotranspiration.	1. Achieved through evapotranspiration, infiltration, and/or stormwater harvesting. 2. Green landscaping incentives program required to encourage use of planters, permeable paving, green roofs, vegetated walls, preservation of existing trees, and layering of vegetation. 3. Every major renovation/rehabilitation project for District owned properties will include on-site stormwater retention measures, such as green roofs, and stormwater harvest/reuse, to meet the retention performance standard.	1. Infiltrate water quality volume (WQV) unless infeasible 2. If infeasible to infiltrate WQV, remaining volume treated by an approved stormwater management practice for volume reduction: planter boxes, biofiltration/bioretention, swales, constructed wetlands, ponds and wet basins, rain barrels and cisterns and green roofs 3. Use rooftop disconnection, pavement disconnection, maximize tree canopy cover, install green roofs, or install porous pavement to reduce directly connected impervious area and WQV to be managed	1. Infiltration and discharge hierarchy of practices subject to 4 categories covering onsite infiltration and offsite discharge. 2. Implement ecoroofs, pervious pavement, or street trees to reduce impervious area (aka hydrologic source controls) 3. Implement total infiltration (>2.0 in/hr), partial infiltration (2.0 to 0.5 in/hr) , or flow-through stormwater management facilities (<0.5 in/hr) depending upon in situ soil infiltration rate.
LID Technical Infeasibility and Mitigation Process	1. If onsite retention is infeasible using practices listed in **LID BMP Selection Priority**, use two alternatives: i) Off-site mitigation, or ii) Payment in-lieu 2. Volume reduction credits available for certain development types, (eg. brownfield redevelopment)	1. Submit determination of infeasibility with associated set of proposed plans. 2. Develop policy or other regulatory mechanism to address post-construction runoff from new development and redevelopment projects to the extent allowable under state and local law.	1. If onsite mitigation is infeasible, two alternatives are considered: i) Off-site mitigation, or ii) Fee-in-lieu 2. Any allowance for adjustments in the retention standard shall be defined in the Permittee's regulations.	1. LID BMP waiver process	1. Applicant may fulfill all or portion of storm water quality volume by compensating the City for future development of offsite facilities per square foot of unmanaged impervious surface

Comments on Tentative Order No. R9-2012-0011

Laura Coley Eisenberg, VP – Open Space & Resource Management, Rancho Mission Viejo

August 22, 2012

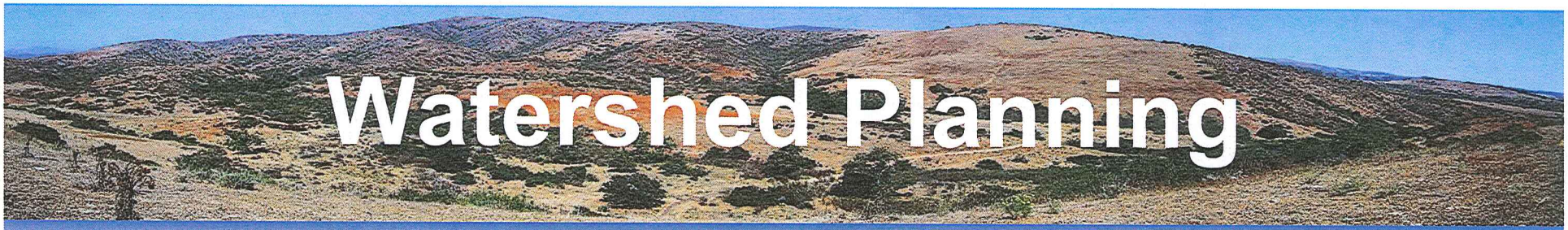

Watershed Planning

- **Contrary to the existing South Orange County Permit, the Tentative Order does not recognize the watershed planning that has occurred in Orange County to date:**
  - San Juan Creek and western San Mateo Watershed have been addressed in:
    - General Plan Amendment/Zone Change (GPA/ZC)
    - Special Area Management Plan (SAMP)
    - Habitat Conservation Plan (HCP)
      - Programmatic WQMP addressing specific conditions found in different sub-watersheds and coordinated with the Southern Subregion Habitat Reserve Management Program

Watershed Planning

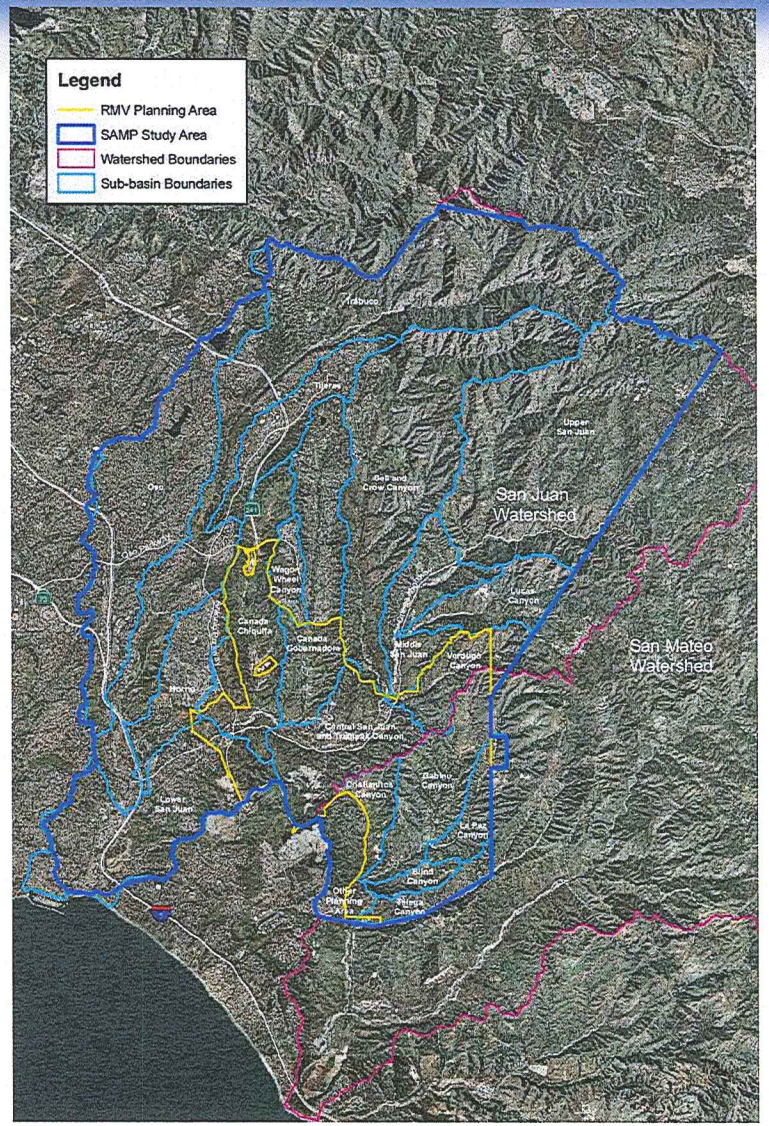

Site Design BMPs Applied at the Watershed Scale

- **The Tentative Order needs to recognize LID Site Design BMPs applied at the broader sub-watershed and watershed scale.**
- **For example;**
  - Terrains/Geomorphology Principle
  - Buffer Tenet

SAMP Terrains/Geomorphology Principle

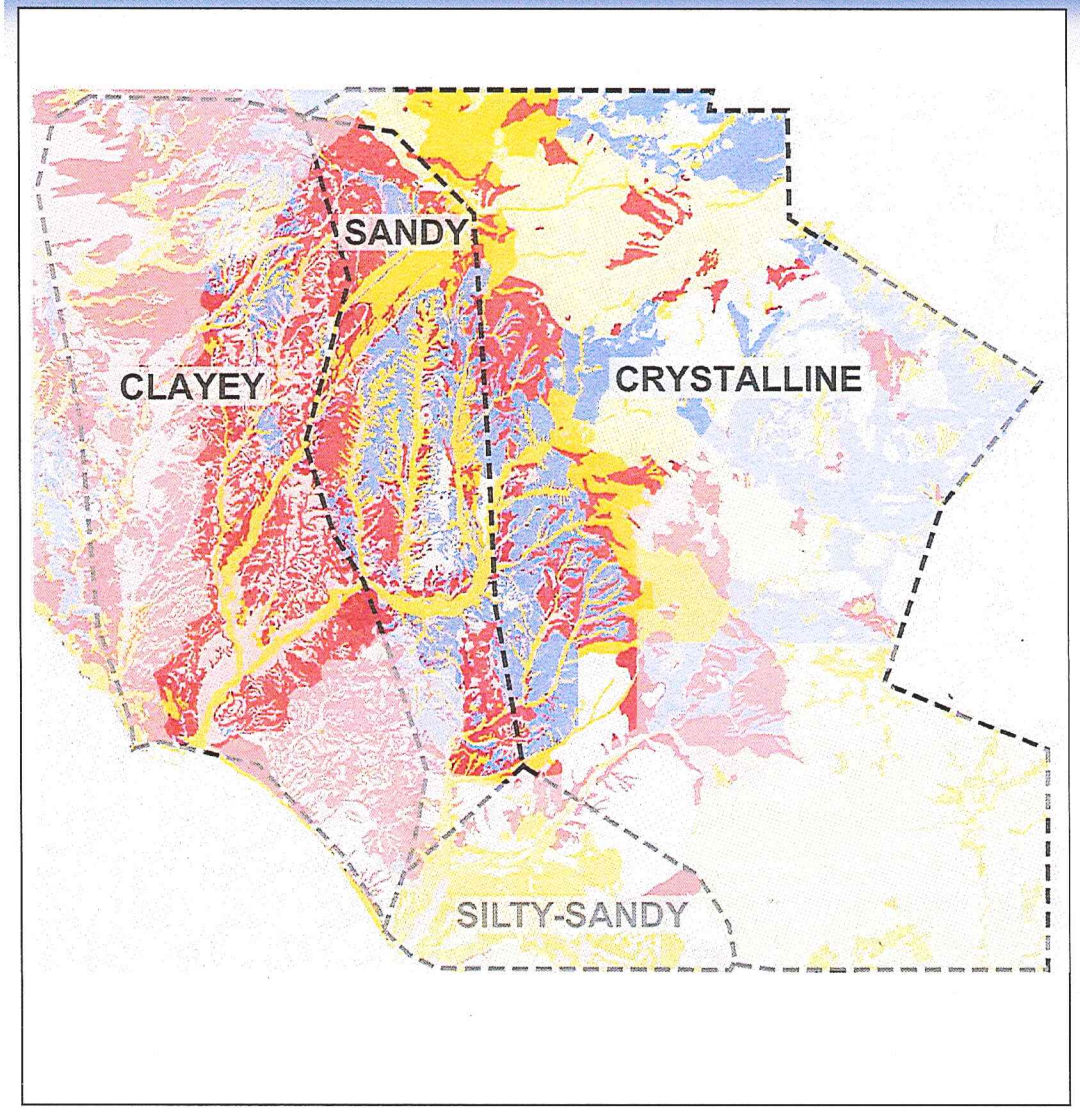

- **Principle: Recognize and account for the hydrologic response of different terrains at the sub-basin and watershed scale.**

- Rocky or Unclassified
- Erodable Sand
- Alluvial
- Less Erodable Upland Sand
- Erodable Clay
- Less Erodable Clay, Mid to Low Slope
- Less Erodable Clay, High Slope
- Erodable Silt, Low Slope
- Erodable Silt, High Slope

Site Design BMPs Applied at the Watershed Scale – Terrains/Geomorphology

- **Application of the Terrains/Geomorphology Principle at the watershed scale resulted in concentration of development in clay/silt terrains while protecting sandy, high infiltrating terrains. This resulted in the following water quality benefits:**
  - maximizing infiltration over the watershed,
  - minimizing the pre and post project change in runoff; and
  - protecting sources of coarse sediment important for stream course functions, aquatic habitat and beach sand replenishment.

SAMP Buffer Tenet

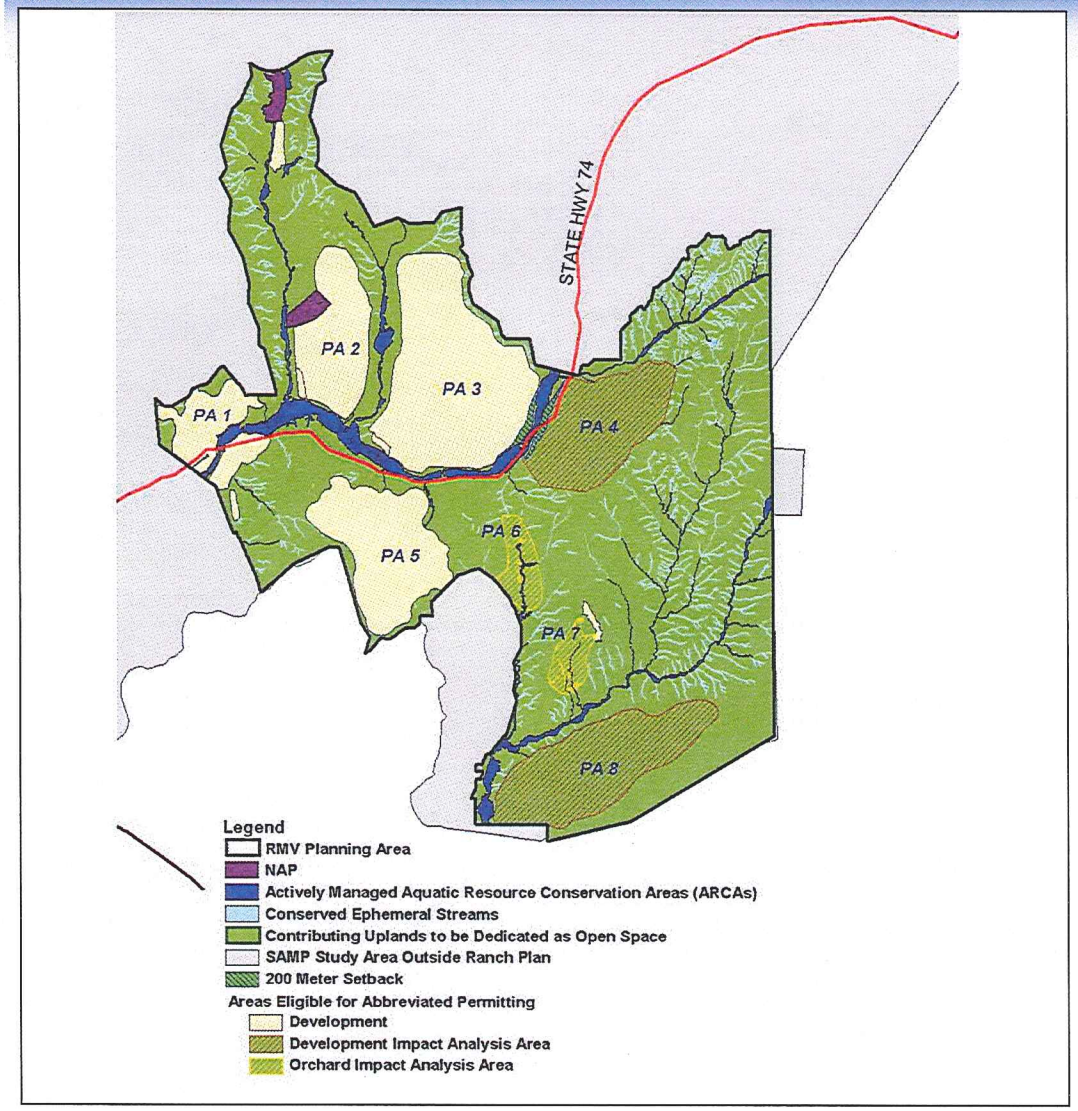

- Tenet: Maintain adequate buffer for the protected riparian corridors

Site Design BMPs Applied at the Watershed Scale - Buffers

- Application of the Buffers Tenet at the watershed scale has resulted in protection of all mainstem creeks on RMV and protection of over 1,650 acres of riparian habitats within the RMV portion of the Southern Subregion Habitat Reserve.

Recommended Changes to Tentative Order

- The Tentative Order should provide for the ability of the co-permittee to incorporate the SAMP and/or HCP and its associated watershed and sub-watershed scale LID site design BMP's and hydromodification control BMP's into a JRMP and apply such standards to Priority Project review.
- The Tentative Order should incorporate the large development project language from the current South Orange County Permit.

Currently Adopted South County Permit Language

- Where a development project, greater than 100 acres in total acres in total project size or smaller than 100 acres in size yet part of larger common plan of development that is over 100 acres, has been prepared using watershed and/or sub-watershed based water quality, hydrologic, and fluvial geomorphic planning principles that implement regional LID BMPs in accordance with the sizing and location criteria of this Order and acceptable to the Regional Board, such standards shall govern review of projects with respect to Section F.1 of this Order and shall be deemed to satisfy this Order's requirements for LID site design, buffer zone, infiltration and hydromodification control standards.
- Regional BMPs must clearly exhibit that they will not result in net impact from pollutant loadings over and above the impact caused by capture and retention of the design storm. Regional BMPs may be used provided that the BMPs capture and retain the defined Section F.1.d(6)(a)(i) and that such controls are located upstream of receiving waters. Any volume that is not retained by the LID BMPs, up to the design capture volume, must be treated using LID bioinfiltration. Any volume up to and including the design capture volume, not retained by LID BMPs not treated by LID bioinfiltration must be treated using conventional treatment control BMPs in accordance with Section F.1.d.(6) and participation in the LID substitution program in Section F.1.d.(8).

California Regional Water Quality Control Board, San Diego Region
Regional MS4 Permit Focused Meeting

Meeting Notes

Date	Location	Agenda Topics
8/22/2012 Start time: 9:30 AM End time: 3:30 PM	City of Vista Community Room 200 Civic Center Drive Vista, CA 92084	• Announcements from Regional Board Staff • Watershed and Jurisdictional Planning and Implementation • Ground Rules for Effective Focused Meetings • Audience Input • Jurisdictional Implementation • Design and Performance Standards, and Alternative Compliance • Other Topics/Audience Comments • Next Steps

I. Introductions

Table participants introduced themselves. Lewis Michaelson (Facilitator) ensured the appropriate representatives were at the table, per the June 20, 2012, San Diego Regional Water Quality Control Board (SD RWQCB) Notice.

San Diego County Copermittees (5): Jon Van Rhyn (County of San Diego), Stephanie Bauer (Port of San Diego), Erik Steenblock (City of Encinitas), Helen Davis (City of Santee), Ruth Kolb (City of San Diego), Sumer Hasenin* (City of San Diego), Jennifer Nichols Kearns* (City of San Diego), Christine Sloan* (County of San Diego), Julie Precopio* (City of Santee), Joe Kuhn* (City of La Mesa), Billy Walker* (City of Oceanside) **Indicates representatives rotated during the meeting.*

Orange County Copermittees (5): Grant Sharp (Orange County Flood Control District), Chris Crompton (County of Orange), Ziad Mazboudi (City of San Juan Capistrano), Nancy Palmer (City of Laguna Niguel), Daniel Apt (County of Orange)

Riverside County Copermittees (3): Claudio Padres (Riverside County Flood Control District), Bob Collacott (Riverside County Flood Control District), Aldo Licitra (City of Temecula)

Environmental Community (3): Colin Kelly (Orange County Coastkeeper), Jill Witkowski (San Diego Coastkeeper), Mike Beanan (South Laguna Civic Association and Laguna Bluebelt), Michael Hazzard* (Clean Water Now! Coalition), Penny Elia* (Sierra Club) **Indicates representatives rotated during the meeting.*

Development/Business Community (3): Dennis Bowling (APWA), Ed Othmer (Industrial Environmental Association), Tory Walker (BIA), Wayne Rosenbaum* (BIA), Mike McSweeney* (BIA), Mark Grey* (BIA), Shawn Weeden* (Geocon), Laura Coley Eisenberg* (Rancho Mission Viejo) **Indicates representatives rotated during the meeting.*

U.S. Environmental Protection Agency (US EPA) (1): Cindy Lin

San Diego Water Board Permit Team: David Barker, Wayne Chiu, Laurie Walsh, Eric Becker

II. Announcements from Regional Water Quality Control Board Staff

David Barker (RWQCB) announced that the date for the hydromodification meeting has been set for August 30, 2012, and will be held at 202 C Street in San Diego. A notice has been sent out, and another notice should be sent out tomorrow. Regional Water Quality Control Board Staff will be attending.

David Barker (RWQCB) informed the group that the RWQCB Counsel expects to respond by September 5 to the letter from Orange County regarding the legal authority of the RWQCB to adopt a regional MS4 permit and concerns about the viability of the Reports of Waste Discharge for Riverside and Orange Counties.

David Barker (RWQCB) also provided an update on the potential meetings between RWQCB Counsel and Copermittee Counsel. The RWQCB Counsel did request a list of issues for discussion prior to setting up a meeting with 5 or 6 attorneys representing the Copermittees. In mid-August, the Copermittees' Counsel advised RWQCB Counsel that they have delayed submitting the summarized list due to pressing demands of assisting with focused meeting concerns. As this process grows to a close and the administrative draft tentative order is finalized, the Copermittees' Counsel has advised that they will submit their written list of issues and anticipate meetings with RWQCB Counsel during public review of the finalized draft permit.

Eric Becker (RWQCB) provided brief remarks on some of the points raised at the last focused meeting that are resonating with the RWQCB staff.

1. Visual observations can be used as part of the monitoring; monitoring is not limited to water quality sampling.
2. Prioritization of and eliminating non-stormwater discharges based on transitional versus persistent non-stormwater flows.
3. Including source identification, BMP effectiveness, and special studies in the monitoring program to better integrate the monitoring assessment requirements with and to better support the adaptive management approach of the Water Quality Improvement Plans
4. Using a combination of modeling, statistical, and empirical data instead of just empirical data to inform the adaptive management process of the Water Quality Improvement Plans.

5. Putting in requirements that do some kind of monitoring pre-Water Quality Improvement Plan to have a better product once a Water Quality Improvement Plan is developed.

III. Watershed and Jurisdictional Planning and Implementation

Wayne Chiu (RWQCB) explained that today's overarching topic is planning and implementation. Key to that is having a plan in place to be implemented. The first topic is the watershed planning and how that works with the jurisdictional planning. Starting with the Water Quality Improvement Plan, the key component of the Water Quality Improvement Plan is the strategy section. Within that section is where the Copermittees would lay out the strategies they would implement in a watershed management area within their jurisdiction to improve the quality of their receiving waters and discharges. Within that section is laid out structural and non-structural BMPs, but also introduced is a concept that is trying to get at the existing problems and implement strategies to address existing problems (e.g., retrofitting in areas of existing development, implementing stream or habitat rehabilitation or restoration type projects to restore the chemical, physical, and biological integrity of receiving waters), outlining what jurisdictional program elements might be implemented to achieve increased quality of waters within our region. That would lay the foundation, then the jurisdictional programs would tie into those strategies and for each Copermittee they would customize those strategies for their jurisdictions depending on the primary sources, stressors, or issues that they've identified as areas to address within the jurisdiction.

At this point, the RWQCB is trying to figure out how to best integrate those elements together, but also have the adaptive management component closely tied to the programs and plans so that modifications can be made to a Water Quality Improvement Plan and jurisdictional programs in a much more fluid way if possible. The RWQCB is looking for feedback and more discussion.

In the planning area, in terms of strategies, the RWQCB would like to maintain the retrofitting of existing development and doing rehabilitation of streams and habitats as much as possible. The RWQCB believes the biggest problems that are to be faced in the watersheds already exist; therefore, the Copermittees need to start trying to address existing areas rather than focusing all or most efforts on new or redevelopment projects.

Ziad Mazboudi (City of San Juan Capistrano) asked how habitat restoration links back to water quality improvement and how to evaluate for water quality benefits.

Wayne Chiu (RWQCB) responded that the RWQCB is primarily looking at restoring and maintaining the physical, chemical, and biological integrity of the nations' waters, per the Clean Water Act, which essentially boils down to water quality standards. Generally, there are beneficial uses within each receiving water, some are supported and some are impaired. The RWQCB is looking to restore the impairments to support a beneficial use.

Jon Van Rhyn (County of San Diego) spoke to the relationship between the Water Quality Improvement Plans and the jurisdictional programs. The San Diego Copermittees

would like to see somewhere in the permit language in both Provision B and Provision E references back and forth clarifying the relationship with the elements. The goal is to provide jurisdictional flexibility and watershed adaptability in reaching the goals of the Water Quality Improvement Plans. Furthermore, Provision E needs to clarify that if a particular minimum must be met (e.g., inspection frequencies) that the application of that minimum is on a jurisdictional basis and the discretion lies with the Copermittees across the watersheds; not such that each minimum must be met across each watershed. It should be clarified that Copermittees would have that discretion.

Jon Van Rhyn (County of San Diego) also spoke to how programs are modified over time, as is intended with adaptive management. The permit needs language to clarify that if there are minimums, there would be the opportunity to modify those minimums with justification. There should be a mechanism to make a proposal to the RWQCB for review by the RWQCB and public to be considered for an adaptation away from what is currently a specific minimum under Provision E. That mechanism does not currently exist in the administrative draft permit.

Laurie Walsh (RWQCB) acknowledged the recommendation to include language for adaptation below prescribed minimums, but expressed concern about determining compliance, and asked for NGO input on the issue.

Jill Witkowski (SD Coastkeeper) expressed understanding at the jurisdictions' desires for as much flexibility as possible, but also expressed concern at determining compliance when minimums can be changed. With some jurisdictions, such as the County of San Diego, in multiple watersheds, there should be a backstop to ensure that no watershed is orphaned due to priorities or focuses in other watersheds. Jill does like the idea that if there is any sort of modification that it would be done with justification and thereby providing transparency. The NGOs are reasonable and want to get clean water with the least amount of money spent; however, it is unnerving when decisions are made without justification. A suggested backstop to the process may be requiring RWQCB, NGO, and other stakeholder input and review on any proposed modifications below minimum requirements to ensure no watersheds are being orphaned and to ensure that the modifications are still proceeding toward improving water quality.

Erik Steenblock (City of Encinitas) stated that the Water Quality Improvement Plan dynamic is something that all will review and have the opportunity to weigh in on, including NGOs, regulators, and other stakeholders. It also needs to be recognized that while jurisdictions are seeking this flexibility, they still have hotlines, complaint responses, monitoring, IDDE programs, and other programs that will continue to inform the jurisdictions on all watersheds.

Colin Kelly (OC Coastkeeper) echoed Jill's concerns about reducing minimum requirements, especially with respect to sampling. Orange County and Inland Empire Coastkeeper do not want to be stuck with sampling results from 2012 when it is 2014 or 2015. Just because areas are clean or acceptable now does not mean that they will be clean or acceptable in the future. Those areas still need to be monitored. That being said,

Coastkeeper is not against flexibility, and may be willing to look into it when discussing it in more details.

Mike Beanan (South Laguna Civic Association and Laguna Bluebelt) encouraged Copermittees to partner early with NGOs when developing ideas; this would promote transparency, and NGOs have access to resources that could help advance these modifications. Mike would also like to see any modifications to plans actually be done to change efforts to significantly above the minimum, not just meet the bare minimum required by the permit. He also encouraged Copermittees to expand their awareness to the whole watershed, not just the portion of the watershed within their jurisdiction.

Wayne Chiu (RWQCB) acknowledged the NGOs concern about orphaned watersheds and explained that is why the RWQCB has been stressing jurisdictional accountability and trying to incorporate that into the Water Quality Improvement Plans and monitoring, which should translate through implementation of the jurisdictional programs. The Water Quality Improvement Plans should be robust enough and include enough information for an environmental group or a regulator to look at the plan and then look at what is being implemented and determine if that is sufficient, if that is trying to improve things, or if there is still potential for improvement of the Water Quality Improvement Plan, which would then in turn improve the jurisdictional programs. This is where it is incumbent upon the NGOs and the regulators to become more familiar with what the jurisdictions are actually doing within their programs. This is an area where there currently is a lot to be desired as, now, regulators are essentially responding to problems rather than trying to support more proactive solutions by the jurisdictions. NGOs can also lend their support to the jurisdictions in many ways; however, the jurisdictions need to be open to that support.

Jill Witkowski (SD Coastkeeper) stated that, from a practical standpoint, Coastkeeper would like to see a clear explanation of jurisdictional activities cross-referenced by page number to the Water Quality Improvement Plans so that if there are changes in a Jurisdictional Runoff Management Plan, then it cross references back to the Water Quality Improvement Plan and there is a clear connection between the two plans.

Erik Steenblock (City of Encinitas) agreed with Jill's recommendation and stated that the Copermittees will be submitting language to that intent. The Copermittees would also like to have language in the existing development sections that clearly point back to the Water Quality Improvement Plans.

Bob Collacott (Riverside) questioned RWQCB staff, particularly management (David Barker), regarding retrofit and stream rehabilitation comments. RWQCB Staff has described this as a high priority. Bob questioned if that is management's perspective as well. Bob expects a lot of thought into this and a clear expectation as to how Copermittees are to comply with these requirements. For example, how are the projects to be funded and how will permit compliance be measured?

David Barker (RWQCB) took note of Bob's questions and deferred the response to RWQCB Staff. Wayne Chiu (RWQCB) explained that the requirements in the permit as they are now is that strategies within a Water Quality Improvement Plan include retrofit where it is necessary to improve water quality and stream rehabilitation where it is necessary to

restore habitats to support water quality. It is incumbent upon the jurisdiction to find those opportunities and figure out if it is necessary. If a jurisdiction determines retrofitting is not viable, then that would be reflected within the Water Quality Improvement Plan. The Water Quality Improvement Plan would then go through public and agency review; however, the idea is that existing development is causing a lot of problems and retrofitting at some level would be feasible. Wayne explained that retrofitting may need a better definition in the permit, as it does not necessarily mean large capital improvement projects to meet the 85th percentile LID retention and hydromodification requirements. Retrofitting could include simple things, such as disconnecting downspouts to connect them to pervious areas, using rain barrels, re-grading areas to include shallower slopes, converting impervious surfaces to pervious surfaces, etc. Retrofitting would include anything that would slow runoff and capture pollutants before getting discharged into receiving waters. Based on this definition, there are plenty of areas within existing development that are viable for retrofitting. Wayne acknowledged that feasibility and funding are part of the question. Wayne continued that there are several areas of the administrative draft permit that mention retrofit and channel rehabilitation and those parts actually fit together. In terms of compliance, compliance is identifying those projects and implementing those projects at some point in the future, according to the Water Quality Improvement Plan. The RWQCB wants Water Quality Improvement Plans to evolve over time and ultimately produce a sustainably configured watershed management area where development can occur in a sustainable way that will still support water quality and meet all the requirements of the Clean Water Act.

Helen Davies (City of Santee) explained that the San Diego County Copermittees have spent a lot of time discussing retrofit and channel rehabilitation and believe that retrofit and channel rehabilitation should be counted as one of the tools when developing a water quality improvement strategy. Helen referred to slides 9 and 10 of the handout prepared by the San Diego County Copermittees. She further explained that retrofit should be focused in those areas where a need has been identified and it should be consistent with the Water Quality Improvement Plan. The San Diego County Copermittees do recommend that retrofit be separated from channel rehabilitation. Putting a structure on an MS4 or adding a rain barrel to a property (retrofit) is much easier than channel rehabilitation. Channel rehabilitation requires a long time and investment in different permits and pulling together of finances. Both, however, should be informed by the Water Quality Improvement Plan and the strategies in it.

Mike Hazzard (Clean Water Now! Coalition) reminded the stakeholders that when talking about channel improvement and water quality improvement, the endangered species in these areas also need to be kept in mind. The endangered species need to be re-established in the creeks that have been degraded.

Wayne Chiu (RWQCB) agreed with Mike Hazzard; there are a lot of streams within the San Diego region that have been severely degraded or channelized and are no longer able to support native species. Wayne explained that is why channel/stream and habitat rehabilitation are in the Water Quality Improvement Plans and existing development requirements. The goal is to restore those degraded areas.

Wayne Chiu (RWQCB) stated that in terms of planning, the RWQCB is trying to provide a way to look at things in a more holistic way in a watershed. Traditionally, earlier permits have been focused on program implementation and the individual programs and each of those program elements have become siloed within the implementation of these permits so that the elements are not coordinated with each other. Development planning is not looking at what existing development or construction or IDDE is doing; every program seems to be an independent program and somehow all are working together but not actually coordinating. The Water Quality Improvement Plan is to provide that coordination among programs and among Copermittees within a watershed management area. That plan, with specific goals, targets, and schedules is to focus everybody's efforts in a certain direction. When talking about having a Water Quality Improvement Plan on a watershed scale, the RWQCB is trying to get everyone to look at things on a watershed scale; to see how each piece fits into improving that watershed. The RWQCB is trying to get feedback and understand how to better define and require this in the permit. The RWQCB is trying to understand stakeholders' needs for planning. The RWQCB also understands that these plans are very powerful tools for Copermittees as stormwater managers to request resources and funding for these programs. The RWQCB is also trying to provide a better tool that allows Copermittees to rationalize to the decision makers the needs for these programs and elements that need to be implemented to improve water quality. The RWQCB needs a better understanding of how to provide a better tool for the Copermittees.

Erik Steenblock (City of Encinitas) responded that is exactly what the Copermittees are trying to provide. In the existing development section of the administrative draft permit, the Copermittees perceive some constraints to the strategic planning process. Erik referred to slide 3 of the handout prepared by the San Diego Copermittees and explained that one area that needs to be refined more is the broad definition of sources when talking about existing development. In the current administrative draft, a source is something that generates a pollutant load. To help support the strategic process, that definition needs to be more constrained to allow Copermittees to define sources and create better inventories and priorities. Erik referred to slide 3 (shown on the next page) for more detailed discussion points and recommendations.

Inventory Priorities

Discussion Point	Recommendation
1: Recognition of watershed priorities within jurisdictional requirements (§II.E.5.a(12), §II.E.5.d(1), §II.E.5.d(3))	1: Programs should emphasize watershed priorities (WQIP) and establish jurisdictional baselines (JRMP)
2: Broad definition of sources "may potentially generate a pollutant load" (§II.E.5.a)	2: Modify language to focus resources on highest priorities (watershed and jurisdictional)
3: Scope of inventory requirements (MTS, Phase II MS4s, Mobile Home Parks) (§II.E.5.a)	3: Limit to facilities that Copermittees have the authority to regulate
4: Residential sources are fundamentally different from Industrial, Commercial, and Municipal (§II.E.5.a, §II.E.5.d)	4: Separate inventory and prioritize residential areas by Residential Management Areas (RMA); see slide 5

Existing Development 3

Colin Kelly (OC Coastkeeper) questioned that the broad definition of sources as anything that may potentially generate a pollutant load needs to be refined to a more restrictive definition. Some of the issues in the Inland Empire and in Riverside are areas that have specifically high phosphorus levels coming from residential communities. Coastkeeper understands the source: fertilization and over-watering of lawns at the same time each year. Coastkeeper also understands that while it may not be a high priority in a specific watershed, it can reasonably anticipate that municipalities could send door hangers or do other education outreach to deal with a pollutant that might not be classified as high priority. By having the broader definition, it might actually be more inclusive of the types of water quality and impairments that are seen on the ground.

Colin Kelly (OC Coastkeeper) agreed with the fourth discussion point (residential sources fundamentally different from industrial, commercial, and municipal sources). Colin asked how the Copermittees would envision creating a separate inventory and how creating a different inventory would be cost effective.

Ruth Kolb (City of San Diego) stated that the San Diego County Copermittees see residential as specifically separate from industrial, commercial, and municipal facilities. The San Diego County Copermittees believe residential sources should have its own subsection because the people being dealt with are drastically different than a business. Residences do

not have mandatory training or reprimands for not doing the correct thing. They definitely need a separate subsection. One of the things the San Diego County Copermittees would like to develop are Residential Management Areas. The Residential Management Areas could be defined by drainage area, by homeowners' association, by communities, etc. The definition of the Residential Management Areas would depend on the municipality and what the priorities are within the Water Quality Improvement Plan. The Water Quality Improvement Plan, going through the public review process, would set out priorities. The Jurisdictional Runoff Management Plan would set out the specific plan of how to address Residential Management Areas within that specific watershed management area. There may be different approaches in different areas. Education is a major component of this and needs to be included in this because it has been found to be one of the most effective ways of reaching out to the general public. These Residential Management Areas would compose the residential inventory, instead of individual residences. It is not the best use of resources to investigate individual residences; it is, however, an efficient use of resources to investigate Residential Management Areas. The recommendation would be to have a higher required inspection amount of Residential Management Areas than the 20% required for industrial, commercial, and municipal sources. The San Diego County Copermittees would also like flexibility to have scalability since HOAs and communities may vary in size between jurisdictions. This would give the jurisdiction the ability to set their own programs based on their own needs. Door hangers may be appropriate in January or February before fertilizing. Code enforcement may be more necessary or more effective at other times or in different areas. The jurisdictions would be able to determine the most appropriate actions based on their unique Residential Management Areas needs. The jurisdictions, of course, would have to follow the priorities and requirements set forth in the Water Quality Improvement Plans, approved through the public process. Having a residential inventory with Residential Management Areas is a new concept since permits in the past have only required inspections of complaints.

Helen Davies (City of Santee) also raised the specific permit requirement to inspect facilities (residences) within 6 months of change of ownership. This requirement appears to be written for industrial, commercial, and municipal properties, not residential. She further stressed the point that it would be more efficient to do Residential Management Areas than to try to manage or inventory residential sources on a parcel by parcel basis.

Jill Witkowski (SD Coastkeeper) agreed that Residential Management Areas are a good idea. This would lead to neighborhood patrols and neighborhood-based programs tailored to the neighborhoods. She also agreed that the six month inspection requirement makes sense for industrial, commercial, and municipal sources, but not residential; however, for residential it could be a six month inspection requirement when there is a change of leadership for the HOA. Building in Residential Management Areas into the permit gives great opportunity for San Diego Coastkeeper to partner on special studies on a neighborhood scale. For residential areas, education is a big component to begin with. They would like to see more aggressive education and outreach, followed by a grace period for improvement, and then followed by inspections and enforcement.

Jill Witkowski (SD Coastkeeper) also addressed the San Diego County Copermittees' recommendation #2 on slide 3 (modify language to focus resources on highest priorities (watershed and jurisdictional)). She echoed Colin Kelly's concerns that focusing on the highest priorities could be a problem. Jurisdictions and watersheds have incentives to not pick many priorities, but that doesn't mean there aren't problems to be fixed. Jill agrees there should be a better definition. Coastkeeper has gotten feedback from jurisdictions that the jurisdictions choose what goes in inventories in different ways. The source definition tends to be some place between the broad definition it is now and specific language such that there is more consistent language and inventories across jurisdictions.

Laurie Walsh (RWQCB) agreed that residential should be separate from industrial, commercial, and municipal. When creating the existing development section, the RWQCB took sections of the permit and combined them; the six month inspection requirement is for industrial, commercial, and municipal facilities, not residential.

Nancy Palmer (City of Laguna Niguel) informed the stakeholders that cities don't know when a property is sold; it is not something that is normally reported to the city. The cities may know when someone comes in for a permit to change something, but not when a property is sold. Nancy suggested that language be changed such that inspection is required a specific amount of time after something is changed by permit application.

Laurie Walsh (RWQCB) stated that the current language reads change in ownership "or a change in pollutant discharge" in that section.

Mike Beanan (South Laguna Civic Association and Laguna Bluebelt) expressed that he likes the notion of paradigm shift and encouraged everyone to keep in the back of their mind the coastal receiving waters. This whole process seems to be disconnected from the ocean. Mike suggested that plume maps may help inland cities get more feedback and response to water quality improvement strategies. Plumes create algae blooms, red tides, and impact the kelp floors. Mike also stated there is beneficial reuse for some of this water, so it may be an opportunity to track the amount of water saving to cost factors and inform communities. That might be a motivating factor for changes in behavior.

Penny Alias (Sierra Club), in reference to discussion point 3 of slide 3 prepared by the San Diego County Copermittees, asked the Copermittees whether or not they had the authority to regulate mobile home parks.

Helen Davies (City of Santee) responded that the City of Santee has direct experience in trying to regulate mobile home parks and has case law that states the City has limited authority.

Wayne Chiu (RWQCB) explained that this MS4 permit can only have the authority to regulate the municipalities covered under the permit and the municipalities are required to have the legal authority to implement the requirements of the permit. Wayne is unsure of the case law that Helen referenced. If a jurisdiction has something within their jurisdiction and they have the legal authority to regulate that entity, parcel, etc., then they need to use their legal authority to stop discharges into their MS4. What is coming out of the mobile home park should fall within their legal authority.

Helen Davies (City of Santee) suggested that the more problematic areas that the jurisdictions do not have authority over should be regulated under Phase II permits.

Ziad Mazboudi (City of San Juan Capistrano) related the mobile home park issue to the issue of Caltrans dumping into the MS4. That is a State issue, not a city controllable issue. Other institutes are outside the City's jurisdiction but are under separate MS4 Phase II permits. Maybe the RWQCB should be enforcing Phase II more. With regard to mobile home parks, Ziad explained that the City of San Juan Capistrano does not review the mobile home parks, as that is the State's role, but if they are discharging into the MS4, the City does educate and work with them.

Chris Crompton (Orange County) affirmed that the Office of the State Architect does retain responsibility for mobile home parks as they are pre-manufactured homes, also hospitals and other facilities. Perhaps those being covered by Phase II permits would be appropriate. This issue has been raised before. This Phase I MS4 permit in itself is very siloed. Essentially, the retrofitting and the TMDL section need to be closer linked. The TMDL is the State's prioritization program. The TMDL program deals with these other kind of discharges that are not Phase I MS4s. Right now the permit is broken into separate areas.

Jon Van Rhyn (County of San Diego) revisited the source definition issue. Currently, the definition at the beginning of Provision E basically says that Copermittees have to inventory all existing development that may potentially generate a pollutant load to the MS4. He is concerned with how literal that can be interpreted. The San Diego County Copermittees do not have specific language recommendations yet, but would like to see some recognition that there is a determination of significance in what is and is not brought in. The San Diego County Copermittees are not after compartmentalizing sources into only those that are reflective of a Water Quality Improvement Plan or Water Quality Improvement Plan priorities. The San Diego County Copermittees recognize that the inventory requirements are based on requirements that need to be broader than the priorities laid out in the Water Quality Improvement Plans; however, they do not want to bring in new priorities based on new definitions.

Jon Van Rhyn (County of San Diego) revisited the change in ownership issue. The County of San Diego does not issue business licenses, they do not have individual stormwater permits for facilities, they do not have a process to inform the County that a facility has changed ownership or practices unless they inspect the facility and discover the changes.

Nancy Palmer (City of Laguna Niguel) informed the stakeholders that most of the cities in South Orange County also don't issue business licenses. If anyone makes a change to a building, they would get a building permit and that may notify the cities of a change.

Ed Othmer (IEA) stated that many times an industry may change within the boundary line of the business itself and those changes are captured through amendments and updates to SWPPPs. Having the jurisdictions inspect every 6 months because of changes in process or activities would not be productive of anybody's time.

Jill Witkowski (SD Coastkeeper) expressed a little alarm at the discussion of not knowing when businesses change, and she would think that would lead to wanting to include more areas in the inventories. She suggested the possibility of listing things like strip malls as one

item in an inventory instead of each individual store and suggested that inspection wouldn't be checking individual business but would be checking the strip mall as a whole. That would be one way of having more flexibility in what goes into the inventory but being broader in covering businesses. Jill suggested keeping the more rigorous inspections on industrial sections.

Claudio Padres (County of Riverside) observed that the discussion started out talking about planning, but keeps drifting to implementation because everyone seems to be saying the same things about the planning side. There are problems with the way the current administrative draft permit is tying the Copermittees' hands to do real planning to address identified water quality problems. It really is a paradigm shift where in the past it was the Jurisdictional Runoff Management Plans with prescriptive requirements; and some of that is still left in this administrative draft permit, where it needs to be changed to provide flexibility to do planning so that in turn Copermittees can move towards compliance based on that plan instead of widget counting.

Mike Hazzard (Clean Water Now! Coalition) shared that in South Orange County, on Aliso Creek, there has been a 13225 directive in place for over a decade. When the directive was issued, a monitoring plan was put together for the top of Aliso Creek where there is one outfall pipe. It was monitored 24/7 which tied directly into the water flow being monitored through the 13225 directive. Flow from that outfall pipe still exists. No residential monitoring has been put into place as far as abating the water quality as it enters the MS4. This is an easy thing to do, it's cost effective, and once the discharge is eliminated, monitoring can move down to the next pipe. This is something that should be enforced.

Erik Steenblock (City of Encinitas) agreed with Jill Witkowski's suggestion of listing things like strip malls as one item in an inventory instead of each individual store. This would allow jurisdictions to cast a broader net and Copermittees' programs would be much more efficient. The San Diego County Copermittees also recommend the annual inspection requirement for industrial, commercial, and municipal facilities to be set to a level equivalent to 20 percent of the entire industrial, commercial and municipal (ICM) inventory. This sets a floor when it comes to these obligations, letting the RWQCB measure the level of effort being put towards the ICM inspections. This also assumes that one facility would be identified as a single source, instead of each pollutant-generating activity within the facility being identified as a source. Erik explained that in practice, a lot of problems being identified are found outside, whether it be through a comprehensive inspection or a visual drive-by inspection. All of these inspections would point back to the Water Quality Improvement Plans. The San Diego County Copermittees have proposed a floor of 20 percent for industrial, commercial, and municipal facilities and separating residential sources from industrial, commercial, and municipal facilities. They have not proposed that the 20 percent obligation be applied to residential sources.

Ruth Kolb (City of San Diego) shared that the City has had success handling strip malls as one entity instead of separate, individual stores. The City has been able to work with the management company of the strip mall to ensure areas are maintained properly, especially

since common areas (e.g., common use dumpsters) are not under the authority of any particular tenant of the facility.

Ruth Kolb (City of San Diego) also commented, in reference to the Aliso Creek outfall, that in her experience it can't be assumed that residential areas are the source of non-storm water discharges even if they are the only existing development in a watershed area. The outfall may be receiving groundwater discharges; it can't be assumed that non-storm water discharges come only from existing development activities.

Mike Hazzard (Clean Water Now! Coalition) acknowledged Ruth's comment and responded that there are ways of determining residential runoff versus groundwater sources. Clean Water Now! Coalition has been pushing for that sampling to be done for a decade, and it has still not happened.

Colin Kelly (OC Coastkeeper) asked the San Diego County Copermittees how inspecting once every five years is different than inspecting 20 percent of the inventory annually.

Jon Van Rhyn (County of San Diego) replied that the current administrative draft permit requires inspection of every identified source within the permit cycle. By going back to 20 percent each year, it gives the Copermittees the discretion to apply inspections where the priorities are, rather than inspecting everything everywhere.

Colin Kelly (OC Coastkeeper) explained that Coastkeeper does get nervous hearing that certain facilities would never be inspected. It is hard to say what is going on at a facility if the Copermittees have never inspected it. This change in requirement would potentially be a problem for Coastkeeper to accept. Coastkeeper does like increased monitoring for those sources that need follow up or are high problems, but it is less reasonable to say that certain sources would not be inspected during the permit cycle.

Jon Van Rhyn (County of San Diego) acknowledged Coastkeeper's concerns. He explained that the other stakeholders would have to trust that the Copermittees' program is going to be directed at the places where there is the greatest number of problems. When the San Diego County Copermittees' proposed 20 percent, they were looking at the current highly inclusive definition of sources. The San Diego County Copermittees are not in agreement to inspect every source within the permit cycle, but are open to a different proposed baseline. Perhaps inspect sources based on priority levels but have other ways, such as education, to reach those sources that are not the highest priorities.

Colin Kelly (OC Coastkeeper) recommended at least one inspection of each source during the permit cycle, and then prioritization of resource allocation based on previous inspections. Coastkeeper believes a minimum of one inspection in five years is completely reasonable.

Ziad Mazboudi (City of San Juan Capistrano) commented that it is interesting to hear this discussion regarding inspection frequencies. On one hand, if a source looks fine on the outside, the San Diego County Copermittees are saying there is no need to inspect. On the other hand, Coastkeeper is saying that one inspection every five years is reasonable and may uncover problems not visual on the outside.

Helen Davies (City of Santee) suggested that Coastkeeper and the San Diego County Copermittees may be in agreement of sorts. Colin mentioned previous experience. Helen

shared that the Copermittees have been inspecting for ten years now, such that the Copermittees do know where the high priority problems are, which businesses need to be inspected more frequently, and where there tends to be turn over. When developing the Water Quality Improvement Plan, the Copermittees can justify why certain areas are being prioritized for inspection. Helen also shared that there are other program components that inform the Copermittees where there are problems, such as complaints. There are a number of ways to address this issue.

Chris Crompton (County of Orange) agreed with Helen Davies. Chris shared that they have spent ten to twenty years doing inspections. The adaptive program depends upon this information that has been collected from past inspections. The Copermittees do not need to inspect everything all the time.

Jill Witkowski (SD Coastkeeper) respectfully disagreed that the Copermittees would already know where the problems are. The Copermittees cannot know where the problems are five years from now, especially not being able to know when facilities change in ownership or activities. Coastkeeper is not asking for intensive inspections on all sources within the five-year permit cycle; a simple drive-by inspection may suffice for most sources. There is some common ground to be reached.

Colin Kelly (OC Coastkeeper) agreed with Jill that Copermittees cannot know if there are problems unless they do inspections. Colin shared that Coastkeeper is in the middle of reviewing MS4 compliance for Orange County and the Inland Empire and has found that different municipalities have different inspection reports, the photographs from the inspections are horrible, and no corrective actions were taken by the cities. Colin would like to believe that Copermittees know where the problems are, but he has seen no evidence to prove or verify those statements.

Ziad Mazboudi (City of San Juan Capistrano) explained that the City of San Juan Capistrano trains its staff in various departments (e.g., inspectors, code enforcement) to look for stormwater violations as they are conducting their normal duties. They perform drive-by inspections every day, and if they see something, they report it. Ziad stated that these drive-bys are different than a minimum inspection; however, if City staff sees problems, they are flagged and the problem is investigated. The City staff can't be everywhere all the time, but when they see a problem, they do go after it.

Grant Sharp (Orange County Flood Control District) stated that when he read the existing development section of the current administrative draft permit, he did not envision a plan so much as he envisioned a geodatabase of layer upon layer of data that starts with parcel data. He is hoping this permit will allow Copermittees the flexibility to create a water quality model based on all the data and then have the ability to calibrate the model with water quality data collected from the requirements of this permit. With the anticipated revisions to the Industrial General Stormwater Permit, the monitoring under that permit is going to change dramatically. Grant would hope to have flexibility to incorporate data from that effort into the Copermittees' model. Grant also mentioned that a structural BMP analysis tool has been developed and Orange County is on the cusp of having that for the entire County. Grant would hope to have the flexibility to use all that data, calibrate it with

other monitoring data from other sources and use that to prioritize where resources are focused. Grant pointed out that one thing not in this list are the post-construction BMPs. There is overlap because the Copermittees are required to implement post-construction BMPs. These are going to overlap with industrial, commercial, and municipal sources. Perhaps the focus should be on the performance of the post-construction BMPs and not what the site is doing. If the RWQCB staff has a different opinion on this section of the permit and how to provide the flexibility to use everything at the Copermittees' disposal, Grant would like to hear it.

Wayne Chiu (RWQCB) stated that everything Grant was trying to infer is exactly what the RWQCB wanted. Everything within the jurisdictional programs is intended to provide data to inform the Water Quality Improvement Plan, to then inform the jurisdictional programs on where they should be focusing their resources. The existing development section is the foundation of data to develop the Water Quality Improvement Plans. All Copermittees have inventories now and a set of inspection records and ideas of problem areas now; all that should be informing the Water Quality Improvement Plan and, as more data are collected, as the program is implemented, as inspection frequencies are tested in different areas, all that also informs the jurisdictional and watershed programs. That is the flexibility that the RWQCB is trying to incorporate. They are trying to get the Copermittees to have the best possible plan going forward and for the plan to become better over time.

Claudio Padres (County of Riverside) completely agrees with Grant in bringing in different sources of information to inform the jurisdictional and watershed programs. He also believes the points made by Jill and Colin are valid in that the Copermittees cannot know if there is a problem unless they do an inspection at some time. Taking it back to the larger picture of the Water Quality Improvement Plans, there is monitoring required under the Water Quality Improvement Plans. If certain areas are not inspected, then Copermittees can look at the monitoring data, assess the data through the Water Quality Improvement Plans, and determine how to deal with any new areas that are appearing with problems. There are checks and balances built into this administrative draft permit to identify new problem areas without having to extend resources in inappropriate areas.

Colin Kelly (OC Coastkeeper) acknowledged Claudio's points and, if the permit retained the level of monitoring that is in the current administrative draft, then it would address issues with inspections. When Copermittees talk about eliminating mandatory inspections at the same time as reducing monitoring, it is unclear how the Copermittees would be able to identify a sudden hot spot or a spike. It is the lack of information that is worrisome with both monitoring and inspections. If the Copermittees could shed light on the amount of inspections able to be done per inspector per day, that might help. Colin does not see that it is something so cost prohibitive that there should be a fundamental shift in government oversight.

Nancy Palmer (City of Laguna Niguel) shared that she is hearing inherent tension in trying to seek an appropriate balance between the priorities, the receiving waters to make sure nothing else is coming up, and resource checking. There is also a concern for orphaned areas. In particular, some of the stream restoration projects end up being orphaned because

they are not prioritized in other places and ownership or jurisdiction of these projects floats around. Nancy suggested the possibility of flexibility of watershed Copermittees collectively to, on a temporary basis, reallocate resources to something that is urgent to try to get some of those things done. Due to limited resources, there would have to be a tradeoff perhaps from the 20 percent inspections or monitoring or other resources to move those resources into stream rehabilitation. She is curious to hear feedback.

Mike Hazzard (Clean Water Now! Coalition) mentioned the endangered species found in many creeks. That it is important to establish natural fauna in the creeks and increase the benthic communities.

David Barker (RWQCB) asked Orange County and Riverside County if the San Diego County Copermittees' suggestion of a 20 percent inspection level would be roughly equivalent to each facility once every five years for Orange County and Riverside County.

Grant Sharp (Orange County Flood Control District) responded that he believes the answer would be yes. He clarified, however, that Orange County has had a residential program since 2003 and would not be looking at inventorying each family home as a separate facility; the permit allows inventory of areas, not houses, so Orange County would also look at using Residential Management Areas.

IV. Ground Rules for Effective Focused Meetings

As this is the last focused meeting, Lewis Michaelson (Facilitator) reviewed the ground rules for effective focused meetings: be concise, focus on new input, listen to understand, one person speaks at a time, and all perspectives are valued.

V. Audience Input

Comment: Mo Lahsaie (City of Oceanside) shared that in the City of Oceanside, as Homeowners' Associations are almost always managed by a company or business, the City looks at HOA areas as a commercial business area instead of a residential source.

Comment: Rudy Maldonado (Riverside County) shared that for the County, in the unincorporated areas, they also do not require business licenses. Owners must come in for a permit for a change in use or a building permit. There is no other mechanism to know of a change in use for all buildings.

Comment: Penny Elia (Sierra Club) re-stated Nancy Palmer's inquiry earlier of taking funds and working with other entities and other Copermittees to accomplish a project; if doing so could be traded off for the 20 percent inspection requirement every five years. She asked for more feedback on that topic.

VI. Jurisdictional Implementation

Jennifer Nichols Kearns (City of San Diego) referred the stakeholders to slide 7 of the handout prepared by the San Diego County Copermittees, entitled "Public Education/Outreach and Public Participation." The San Diego County Copermittees would like the ability to customize the development of their jurisdictional programs but would like

to tie them back into the Water Quality Improvement Plan and Water Quality Improvement Plan highest priorities. That does not mean that situations would be ignored if they were not on the list of priorities. For example, in the case of a spike in phosphorus, then the jurisdiction would find a way to address the spike even if phosphorus was not a high priority; addressing it may be through enforcement, education, or another method. In addition, education is specifically under the jurisdictional program requirements section of the administrative draft permit, where it should also be tied back into the Water Quality Improvement Plan section. Furthermore, evaluation and assessment are not explicitly discussed in Section E.7. The San Diego County Copermittees would like that added. It is currently in the larger portion of adaptive management strategy in the administrative draft permit, but it is not explicitly in the education section. As the Copermittees currently implement education and outreach, those programs would not be as successful as they are without evaluation and assessment. Evaluation and assessment allows Copermittees to look at their education and outreach program to see the level of effort versus effectiveness. The San Diego County Copermittees would like to be able to apply adaptive management to education and outreach. Finally, the administrative draft permit currently identifies only one target audience specifically in the education section – construction site operators. The Copermittees would like to focus jurisdictional and watershed resources on the target audiences that pose the highest threat. The San Diego County Copermittees would like the ability to write that into the Water Quality Improvement Plans that subsequently inform the Jurisdictional Runoff Management Plans. The San Diego County Copermittees fully plan on making sure that the residential section of the Water Quality Improvement Plans includes a heavy education and outreach component as they would like to continue their current effective efforts.

Jill Witkowski (SD Coastkeeper) agreed that education should be integrated throughout the permit and that assessment is important, too. On evaluation and assessment, Jill shared that Coastkeeper has seen reports that indicated the Copermittees handed out X number of calendars and therefore people are educated. Coastkeeper would like more behind the analysis, including a focus on analyzing that beliefs and attitudes are changed.

Wayne Chiu (RWQCB) stated that sharing resources and working cross-jurisdictionally is not a concept that the RWQCB opposes; however, the RWQCB would like to figure out how to allow that type of progressive thinking and use of those resources to be part of the requirements of this permit. It has been a cornerstone of the focused meeting discussions: how to be flexible but prescriptive, allow for forward thinking yet be clear on determining compliance. The RWQCB would like to see these concepts integrated into the permit, but it is unclear how to do that at this point.

Wayne Chiu (RWQCB) admitted that education is a little sparse in the current administrative draft permit. He explained that much of what is in the administrative draft permit was based on what is required by federal regulations. Construction sites are specifically called out in the federal regulations. Public education about toxic substances is also specifically called out in the federal regulations. There is nothing in the federal regulations regarding specific target audiences. The RWQCB can add target audiences if

desired by the stakeholders. The RWQCB is trying to find a balance of meeting requirements of the federal regulations, giving flexibility to Copermittees to implement programs as effectively as possible, but still have a reasonable set of measurements to determine compliance. Wayne acknowledged that all of the information and discussion at these focused meetings and other smaller meetings throughout this process have been informative and helpful. Ultimately, the RWQCB will have to make a decision when writing the draft permit language, but it will be fully informed by what the RWQCB receives as recommendations.

Ziad Mazboudi (City of San Juan Capistrano) raised the issue of Green Streets. In conversations with Cindy Lin (US EPA), the US EPA is promoting the implementation of Green Streets, but it seems that the San Diego RWQCB is against Green Streets. Ziad stated that Green Streets is something that provides a good solution for some of their projects; it is being promoted at the national level by the US EPA, yet not being approved by the San Diego RWQCB.

Daniel Apt (Orange County) explained that the model WQMP and parts of the HMP that were submitted to the RWQCB had a Green Streets approach for roadway projects. That was met with some denial from the RWQCB with regard to the Green Streets approach.

Eric Becker (RWQCB) clarified that the San Diego RWQCB is not against Green Streets; however, the design requirements for SSMP projects must also be met. If a Green Street approach is taken that also meets the design requirements for SSMP projects, then the RWQCB would approve the approach.

Ziad Mazboudi (City of San Juan Capistrano) expressed delight in hearing that the San Diego RWQCB is not outright against Green Streets and understands that SSMP requirements need to be met even when a Green Street approach is being proposed.

Ruth Kolb (City of San Diego) expressed the difficulty in utilizing the Green Streets approach in the City of San Diego as the streets in the City are utility corridors. To implement a Green Street is going to be difficult because of utilities in place, so for San Diego it is something that has to be considered on a case-by-case basis with the soil types and utility corridors.

Jill Witkowski (SD Coastkeeper) brought up the topic of Enforcement Response Plans. Coastkeeper likes this section because it reflects comments that have been made to the RWQCB based on an extensive review of inspection reports throughout San Diego. Coastkeeper's review of inspection reports noted that inspections are done vastly different across jurisdictions and even within jurisdictions based upon which inspector completed the inspection. The review of inspection reports also discovered inconsistencies within jurisdictions regarding follow up inspections. Coastkeeper gave feedback to the RWQCB that there should be ground rules with inspections and follow-ups need to be ensured when there are problems. At the same time, Coastkeeper has heard from Copermittees that forcing application of high level enforcement does not leave jurisdictions the discretion to use the most effective methods to correct issues on an individual basis. Coastkeeper understands those concerns and explained that is why there is discretion for defining high level enforcement. There need to be some standards that all Copermittees' inspectors are

required to do. Coastkeeper likes the basis of what is currently in the administrative draft permit.

Jon Van Rhyn (County of San Diego) responded that the issue of a Copermittee not using enforcement or not following through on enforcement is an issue for the RWQCB and may not be able to be fixed no matter what the permit language states. The San Diego County Copermittees have three main discussion points with regard to Enforcement Response Plans (see slide 6 of the handout prepared by the San Diego Copermittees). The San Diego Copermittees believe the way Enforcement Response Plans are currently laid out in the administrative draft permit is overly structured and overly complicated. Basic requirements can be laid out as to what plans the Copermittees would rely on and reference, and which would need new development of plans. For example, construction and existing development are combined in the current administrative draft permit. Typically, those two categories would not fall under the same Enforcement Response Plan.

Jon Van Rhyn (County of San Diego) continued that the current administrative draft permit calls for enforcement response within 10 working days for compliance or else rationale must be added to the database if more time is needed. An enforcement response of 10 working days does not correspond to typical compliance timeframes as they currently exist. Typical compliance schedules at this time are 30 days (20 working days). The San Diego County Copermittees suggest aligning enforcement response times with the current standard of 30 days instead of 10 working days.

Ruth Kolb (City of San Diego) shared that several years ago the City worked with the attorney's office regarding what problems would be addressed and what type of fines can be issued, based on all environmental issues, not just storm water. The City has enforcement programs in place that may go a little bit beyond what is considered within the water quality realm, and that needs to be considered. There are requirements related to code enforcement already in place that implement the 30-day response time. The San Diego County Copermittees are asking that the permit be consistent with the existing requirements of the municipalities.

Jon Van Rhyn (County of San Diego) raised the issue of high level enforcement. As currently written in the administrative draft permit, it eliminates Copermittee discretion in its implementation. Jon clarified that the Copermittees are not unwilling to commit to use of high enforcement tools when warranted; however, looking at the language currently in the administrative draft permit, if sediment is a high priority issue, then every time an enforcement issue is related to sediment, regardless of other factors, then the Copermittees must automatically implement high level enforcement. The San Diego County Copermittees want to use some discretion in implementing high level enforcement, as starting with high level enforcement may not be applicable to specific situations.

Mike Beanan (South Laguna Civic Association and Laguna Bluebelt) stated that enforcement can shift resources and attention. Once the offending MS4 storm drains are identified, enforcement allows Copermittees to move forward because they are under that enforcement order. Mike admitted that sometimes it is difficult for jurisdictions to enforce because it results in acrimonious neighborhoods and citizens. Sometimes it is better for the

RWQCB to issue enforcement actions as they are an outside agency. Mike explained that without enforcement actions, it is hard for cities to shift resources.

Stephanie Bauer (Port of San Diego) brought up the topic BMP implementation and maintenance, referring the stakeholders to slide 8 of the handout prepared by the San Diego County Copermittees. Once the Copermittees, with public input, have gotten through the prioritization process and identified the areas for focus, the next step is to use BMPs, as appropriate, to address issues. The current administrative draft permit language mentions "enhancement" of BMPs; however, BMPs are already required to be implemented to the MEP. The San Diego County Copermittees would like the word "enhanced" to be removed from the permit language.

Stephanie Bauer (Port of San Diego) also informed the stakeholders that Copermittees may not have authority over sanitary sewer agencies. The administrative draft permit requires jurisdictions to include information from sanitary sewer agencies; however, the sanitary sewer agencies may not release the required information. The San Diego County Copermittees would prefer permit language to encourage, not require, jurisdictions to keep themselves informed with sanitary sewer information.

Stephanie Bauer (Port of San Diego) questioned the linkage between unpaved road maintenance and evaluation of stream channel geomorphology. The general consensus among the San Diego County Copermittees is that it is infeasible to conduct an evaluation of stream channel geomorphology during regular maintenance inspections of unpaved roads. The San Diego County Copermittees request that requirement to be stricken from the permit.

Stephanie Bauer (Port of San Diego) also addressed retrofits and channel rehabilitation requirements, requesting that they be treated as tools in the BMP toolbox instead of separate permit requirements. They should be provided as subsections under BMP Implementation and Maintenance, allowing the Copermittees to determine if they are feasible or if they are the best mechanism for accomplishing the goals of the Water Quality Improvement Plans.

Wayne Chiu (RWQCB) explained that a lot of what is in the BMP Implementation and Maintenance section stems from what is in the federal regulations (40 CFR 122.26(d)(2)(iv)), which calls out a lot of specific BMP requirements for specific types of existing development facilities, including the sanitary sewer requirement. The RWQCB understands that BMPs should already be implemented to the MEP; therefore, they understand the concern with the term "enhancement." The RWQCB also understands that MEP is constantly evolving, so things should be consistently improving and BMPs should be evolving to become better. As additional BMPs are developed or realized, then those should be implemented.

David Barker (RWQCB) clarified that in Wayne's response, his reference to federal regulations was not a legal statement; he was simply providing insight as to where the RWQCB drew the substance for writing the requirement. It may take an attorney to analyze if that was correct or not, but Wayne was simply providing the reference for the permit language.

Cindy Lin (US EPA) agreed that citing the source for permit language is not a legal issue, simply a point of reference. She stated that under this permit, the permit writers must consider what the CFR is requiring, but there is flexibility with some of those requirements as long as the framework is kept in mind.

Wayne Chiu (RWQCB) responded to the linkage between unpaved road maintenance and the evaluation of stream channel geomorphology. In the last ten years, the RWQCB has responded to several complaints related to unpaved roads. Unpaved roads discharge a lot of sediment when not properly maintained or compacted. Unpaved roads tend to be along or through waterways, which contributes to a change in geomorphology. Unpaved roads are a large source of sediment in areas, especially when crossing through a receiving water. The RWQCB also understands that evaluation of stream channel geomorphology may be above what regular maintenance or an inspection may do. Part of the concept the RWQCB is trying to incorporate is to look at existing problems, determine what is causing existing problems, and fix the problems through alternative methods. Rather than focusing on inspections and BMP implementation, the better course may be to retrofit and figure out how to restore and rehabilitate some of the channels already impacted and degraded. Right now the toolbox, with inspections and existing BMPs and enforcement, is limited and can only go so far. This permit is trying to push the MEP line a little bit further and move things farther along to make tangible improvements in the quality of discharges from MS4s and the quality of receiving waters.

Nancy Palmer (City of Laguna Niguel) suggested that the issue of channel geomorphology on unpaved roads should be shifted over as something in the Water Quality Improvement Plans as a retrofit strategy, as opposed to something tacked on to an Operation and Maintenance section.

Colin Kelly (OC Coastkeeper) asked the County of San Diego, regarding authority over sanitary sewer agencies, for clarification that the County's issue is with the last sentence of Section II.E.5.c.(4)(c); that the County does not have an issue in implementing controls to prevent infiltration or seepage from sanitary sewers into the MS4.

Jon Van Rhyn (County of San Diego) concurred.

VII. Design and Performance Standards, and Alternative Compliance

Eric Becker (RWQCB) introduced the ideas and goals intended by the RWQCB for this section of the administrative draft permit. First, the RWQCB wants a consistent set of requirements throughout all three counties and pulled most of the design standards from the Orange County and Riverside County permits. Second, the RWQCB wants to provide more flexibility in how to meet those requirements, including offsite mitigation opportunities. The RWQCB is interested in the stakeholders' take and suggestions on this alternative language.

Shawn Weeden (Geocon, BIA) provided some educational material on infiltration, retention, soil types, and potential damages. He provided soil type maps of Ventura, Los Angeles, Orange, Riverside, and San Diego Counties. Yellow indicates where infiltration is

likely feasible, green is likely infeasible, and red is infeasible. As shown on the maps, a lot of area within San Diego County is infeasible for infiltration.

Shawn Weeden (Geocon, BIA) also highlighted geotechnical conditions that could be affected from required infiltration, including slope stability, expansive soil, compressible soil, seepage, and loss of pavement and foundation subgrade support. From a geotechnical standpoint, it is not only infiltration that can affect geotechnical conditions, but it is also retention. When geotechnical conditions are affected by infiltration or retention, it is the geotechnical engineers that are brought forth for litigation. Simple actions, such as unhooking roof drains and letting them flow into landscaped areas, can cause the loss of foundation support, separation between tilt up panels, racking in doors and windows, dry wall cracks, etc. As a geotechnical engineer, Shawn simply wanted to explain that there are a lot of feasibility issues within Region 9.

Shawn Weeden (Geocon, BIA) continued that from a design standpoint, there are other ways to retain, including retention basins, pervious pavement, pervious concrete, but most of the time within design and implementation it is using liners or specialized devices. Shawn would prefer flow-through BMPs because of the soil types and issues seen in the past.

Wayne Chiu (RWQCB) stated that he was under the impression that this type of discussion and scenarios would be covered during the upcoming Hydromodification Meeting. The RWQCB was hoping today to talk about how those design requirements and performance standards within the permit would be utilized; how the alternative compliance section would fit in with that; and, how those alternatives could be utilized by Copermittees to achieve some of their goals and targets set up within the Water Quality Improvement Plans. The RWQCB recognizes that infiltration is not going to work on every site. That is why it needs to be figured out how to have these standards in the permit and how to fit alternative compliance in with the design. When a designer is developing a plan and figuring out infiltration or retention design, they can include infiltration, evapotranspiration, stormwater harvesting, retention basins, etc. When they can't meet the design standard through one or a combination of those methods, that's where the designer would look at alternatives and determine where else to go to try to meet the requirements.

Tory Walker (BIA and Vista Chamber of Commerce) addressed the 85th percentile runoff generation. Several slides in the handout prepared by the BIA cover what is an 85th percentile storm event, and what it means in terms of comparing natural conditions to post-development conditions. The development community would like to improve the administrative draft permit to incorporate natural runoff scenarios. The point would be to maintain naturally occurring runoff which does provide beneficial uses to receiving waters, as opposed to retaining 100 percent of the post-development 85th percentile runoff. The BIA has done a comparison using Lindbergh Field as an example, with 57 years of monitoring data, to get a good sense of what the 85th percentile storm is. In addition, isopluvial maps have been developed to show the 85th percentile, 24-hour depth for San Diego County and other counties. Runoff depends on many factors and is not a simple issue, but it can be addressed in terms of existing hydrologic methodologies. Specifically, when looking at soils and slopes and vegetation and some of those parameters, there are developed curve

numbers that can be used to estimate natural and post-development runoff volumes. The development community believes there is a better way to manage the 85th percentile runoff. The development community would propose language in the permit that instead of capturing 100 percent of the 85th percentile volume, the requirement would be a difference between an estimated pre-developed and post-developed condition so that you are maintaining, preserving natural condition runoff.

Julie Precopio (City of Santee) stated that the San Diego County Copermittees have been talking about the same kind of concepts and also have concerns about the strict retention of the 85th percentile storm volume. It is understood that the intent is pollutant load reduction, which is a good goal. The San Diego County Copermittees have concerns, however, about runoff to creeks and creek improvement projects, knowing that retaining the 85th percentile storm means that 85% of the average annual volume of runoff would not reach the creeks in the same way it would in the natural condition. Julie referenced slide LD 7 of the handout prepared by the San Diego County Copermittees. The San Diego County Copermittees are recommending permit language be changed such that projects would retain the pre-project 85th percentile retention volume to mimic natural hydrology.

Julie Precopio (City of Santee) addressed Shawn Weeden's comments regarding the retention requirement not being feasible in many areas and the requirement of retention potentially resulting in geotechnical hazards. The San Diego County Copermittees feel that the current administrative draft permit, which requires retention onsite or mitigation offsite, if infeasible, relies too heavily on the mitigation program. Projects should have the ability to meet the permit requirements onsite. In order to do that, the San Diego County Copermittees are proposing a three-tiered compliance standard, similar to what has been in other permits. The first tier would be to retain the pre-project 85th percentile volume onsite to mimic natural hydrology, where conditions permit. The second tier would be, where retention is infeasible, design LID/BMPs to achieve pollutant load reduction greater than or equal to the retention standard of the first tier (with a notation that the Copermittees are open to waiving proof of infeasibility in unique circumstances where the proposed offsite mitigation results in equal or greater overall water quality benefit). The third tier would be, where the first and second tier standards cannot be met, provide onsite treatment and offsite mitigation (for retention and/or HMP) that provides an overall water quality benefit within the Watershed Management Area.

Daniel Apt (Orange County) responded to the proposal from the San Diego County Copermittees, expressing specific concern with removing the biofiltration step that is in the Santa Margarita and South Orange County permits and the essential effect that might have on development and on the watershed. The biofiltration step is in the Santa Margarita and South Orange County permits for sites with bad soils. Harvesting and reuse of water is not feasible for many Southern California sites. Infiltration is the primary way people are meeting the retention requirements. If they cannot meet requirements through infiltration, then they move on to biofiltration. By removing the biofiltration step, it will cause development to focus on sites with good soils, and effectively degrade the overall quality of the watershed.

Sumer Hasenin (City of San Diego), in response to Daniel Apt, stated that the second tier of the San Diego County Copermittees' proposal could include bioretention or biofiltration.

Daniel Alt (Orange County), with that clarification, agreed with the proposal from the San Diego County Copermittees, as it mimics more of an LID approach.

Colin Kelly (OC Coastkeeper) agreed that the LID priority should be to capture water onsite and implement a variety of LID principles. Colin asked for clarification on the notation to the second tier as it would seem to be a fast-track to offsite treatment although onsite treatment is preferred.

Julie Precopio (City of Santee) agreed that onsite treatment is generally the direction to head; however, there could be an opportunity to restore a creek downstream of a development. If that developer were willing to come in and restore that creek, that would be seen as such a benefit that the developer may not need to meet the HMP requirements because the issue with HMP has been addressed by restoring the channel while also providing a benefit to the overall water quality health. There may be an opportunity to implement a greater project.

Colin Kelly (OC Coastkeeper) expressed interest in exploring that. Orange County and Inland Empire Coastkeeper have explored that internally before and considered it, but have some long term problems with it. For instance, if the developer is allowed to otherwise avoid responsibilities, then without proper maintenance of the creek in the long term, water quality could degrade again and the benefits would not be as strong as if LID had been done properly on the development site. Under larger regional LID programs, Coastkeeper has concerns about funding of those mechanisms. If developers pay into funds, then the LID programs might not be implemented until sufficient funds are available, if ever.

Mark Grey (BIA and CICWQ) stated that he personally represents six large trade organizations composed of the people who install and build these controls. He distributed a two-page handout with planning and land development program element suggestions developed by the BIA and CICWQ. The BIA and CICWQ share the concern about biofiltration being recognized in the LID BMP selection hierarchy when other retention BMPs are infeasible. An associated concern is that under the current administrative draft permit, if a developer goes through the onsite retention hierarchy and cannot manage 100% of the design volume, installation of a biofilter would not aide in reaching that retention design volume and the developer would still have to mitigate the difference in volume even if pollutant removal is accomplished through use of biofiltration. Mark has reviewed all the Southern California permits and that provision does not appear in any of the other permits. The BIA and CICWQ would like to see flow-through controls maximized to the extent feasible before moving to traditional controls.

Mark Grey (BIA and CICWQ) continued discussion regarding sub-regional and regional approaches, adding a perspective from the Los Angeles County Permit which is currently being reviewed by the Los Angeles RWQCB. Based on conversations that Mark has had with several NGOs, when there is a regional project that exists that can demonstrate that the stormwater can be beneficially reused for groundwater augmentation that those projects are recognized as co-equal and a project proponent would not have to go through the LID

feasibility engineering hierarchy. That sub-regional or regional project has to be available and has to demonstrate regional groundwater capture and supply improvement. Lastly, the administrative draft permit doesn't allow watershed and sub watershed scale LID and hydromodification controls to be included in the JRMP. The analog would be what is currently in the South Orange County permit. The BIA and CICWQ would hope the permit would allow consideration of LID tools on a subregional or regional scale as part of a master planning process.

Mark Grey (BIA and CICWQ) concluded with the proposal from the BIA and CICWQ to substitute "concrete-lined" with "hardened" and recognize the urban area exemption in the permit.

Wayne Chiu (RWQCB) asked for clarification from the stakeholders as to their interpretation of retention and the design standard for retention, to determine if the RWQCB's intent is being understood.

Sumer Hasenin (City of San Diego) responded that the San Diego County Copermittees' understanding of the retention requirement is the retention of the 85th percentile storm of the first flush, and not necessarily the consecutive storms. At the same time, the BMPs are to be sized to retain or infiltrate additional storms after an extended dry period.

Wayne Chiu (RWQCB) stated that Sumer's interpretation was correct and asked if the other stakeholders understand or on board with that concept.

Mike Beanan (South Laguna Civic Association and Laguna Bluebelt) cautioned against shifting baselines when talking about the 85th percentile storm. He stated that these areas have suffered from 300 years of grazing and over-grazing. The area should naturally look heavily forested. When calculating the retention percentages, Mike would recommend going back to what the original natural processes were, not the natural processes as they are today. Thoughts are always about restoring the creek, but when creeks are used as mitigations they tend to be flooded out and that excess water moves down to the coast and blows out the beach sand berms and adds nutrient loads to the coastal receiving waters. The region is a semi-arid area. Stakeholders need to think further downstream, to the beach, to the ocean plume, and consider how programs will affect the coastal waters.

Mike Beanan (South Laguna Civic Association and Laguna Bluebelt) also shared that many of the problems being seen in Orange County with residential developments are self-induced. The developers scrape off the top soil, exposing clay soil, then build their projects on top of the clay soil. One solution may be to infiltrate below the clay soil using shallow wells or other methods.

Jill Witkowski (SD Coastkeeper) would like to make clear that in determining the BMPs to be implemented to reach the required retention amount, project proponents should implement the top listed BMPs as much as possible and then move down to the lower BMPs in the hierarchy. Coastkeeper also has concerns about allowing developers to do a creek restoration instead of complying with hydromodification requirements; that may be setting up the restored creek for immediate degradation from the development not implementing hydromodification. The environmental groups also have concerns of allowing this because it has not been done before. Jill suggested implementing this option as a pilot test and then

moving from there. In addition, Coastkeeper is not acceptable to the County's notation exception (waiving proof of infeasibility in unique circumstances where the proposed offsite mitigation results in equal or greater overall water quality benefit). Coastkeeper would be acceptable if the notation exception was allowed in unique circumstances where the proposed offsite mitigation results only in greater overall water quality benefit.

Claudio Padres (County of Riverside) acknowledged that regional systems are difficult to implement and make work, and ongoing maintenance is an important issue; however, the Flood Control Water Conservation District often looks for multiple benefits. Where those opportunities arise or could be created, then putting water into a subregional basin could do a lot more to benefit groundwater supply. If there is a regional opportunity nearby that might be a better option than retaining water onsite where groundwater infiltration may not be accomplished.

Claudio Padres (County of Riverside) also discussed what is and is not retention. He shared that a lot of biofiltration BMPs that may have a discharge also do a significant amount of volume reduction. Not reaching the 100% retention level, but ASCE has indicated 40 up to 80 percent retention through biofiltration BMPs. The Flood Control Water Conservation District has built these BMPs at headquarters to do water quality and volume monitoring to validate those results in Southern California.

Tory Walker (BIA) encouraged Jill Witkowski and Mike Beanan to attend the HMP workshop on August 30, where a lot of concerns will be addressed. He encouraged everyone with an interest in infiltration and regional solutions to make it a high priority to attend the HMP workshop.

Sumer Hasenin (City of San Diego) referred the stakeholders to LD 2 of the handout prepared by the San Diego County Copermittees, which addresses alternative compliance. The San Diego County Copermittees are pleased to see alternative compliance in the permit but would like more discretion given to the Copermittees in exercising alternative compliance options. The first preference would be for projects to comply through onsite BMP implementation, which is why the San Diego County Copermittees proposed the three-tiered approach to the retention requirements. Sumer indicated that the notation would be the exception, not the norm. If mitigation projects are implemented, it will be the jurisdictions' responsibility to establish, maintain, and manage mitigation programs. The San Diego County Copermittees believe that establishing a mitigation program will take significant time and some Copermittees may not have the resources available to identify applicable mitigation projects when they are needed. The San Diego County Copermittees are concerned because no one has done this before and it is a challenge. As a result, the San Diego County Copermittees have some proposed revisions to the permit to strengthen the language in the permit to make the mitigation program more of an optional program at the discretion of the Copermittees.

Sumer Hasenin (City of San Diego) moved on to LD 3 of the handout prepared by the San Diego County Copermittees, which addresses timing of the offsite mitigation program. In the current administrative draft permit, the offsite mitigation program must be ready and implemented prior to first occupancy. The San Diego County Copermittees would like this

requirement more relaxed so that it is more practical. They have suggested language to replace the second sentence in Section II.E.3.(4)(c()(iii) to say that each development's share of the offsite mitigation project must be secured prior to the first occupancy. If the municipality is choosing to let that offsite mitigation project happen, then there are ways of securing funding by bonds from the developer or applicant.

Sumer Hasenin (City of San Diego) continued on to LD 4 of the handout prepared by the San Diego County Copermittees. The San Diego County Copermittees would like retrofit and channel rehabilitation to align better so that Copermittees are encouraged to use projects identified in the Water Quality Improvement Plans as retrofit opportunities. The Copermittees would like to be able to select from these projects for offsite mitigation in the future. Sumer believes that there may be permit language already covering this, but it is not strong enough.

Dennis Bowling (APWA) explained that the way the administrative draft permit is currently set up, it discourages alternative compliance. Projects must go through the infeasibility analysis before looking at offsite mitigation as alternative compliance. Dennis would suggest removing that section and leaving it up to the Copermittees to use discretion in allowing alternative compliance. Dennis commented that many times, when looking at one of these offsite projects, it turns out to be a more economical project; more can be done for clean water within a system for less money. Dennis would prefer the permit be set up to encourage alternative compliance, at the discretion of the Copermittees, instead of requiring an in-depth infeasibility analysis first. This would allow the development community to look at restoration problems up front as equal or better if they are expected to provide better results for the watershed.

Cindy Lin (US EPA) commented on technical infeasibility, stating that it is the US EPA's strong position that projects must demonstrate infeasibility onsite first because the project is making an impact on that site. Projects must demonstrate infeasibility onsite before moving on to offsite mitigation or implementing regional projects.

Dennis Bowling (APWA) explained that he was thinking of something different. For example, there is a project that drains into a prismatic channel and, therefore, is not required to meet hydromodification requirements, but there is a highly degraded portion of the receiving water downstream. It would make more sense to fix that degraded portion than to do hydromodification in the development. Overall it would be better for the watershed. The APWA would want the opportunity to fix the larger problems. By requiring projects to concentrate only onsite, those larger problems may never get fixed.

Claudio Padres (County of Riverside) mentioned that silos in the permit were discussed earlier. That may be what is happening here. The permit requires projects to fix the site. The mission of the RWQCB and EPA is to fix problems in receiving waters and restore beneficial uses. The Water Quality Improvement Plans in this permit are designed to bring all the stakeholders together in a watershed and have a consensus-based approach to what is the best way to meet that end. If it is the consensus through a Water Quality Improvement Plan that the best way to address the receiving water problems is to implement a rehabilitation effort in the receiving waters, then that project should be implemented. There are a lot of

regulatory requirements, permitting, funding, etc. to be considered. One way to help overcome that funding hurdle would be if development projects could help fund that effort as an alternative compliance path. The current administrative draft permit would not allow that because instead of those developers putting funds into that effort, they would have to implement BMPs onsite even if it would not as quickly or efficiently address that watershed's priorities according to a consensus of the stakeholders.

Cindy Lin (US EPA) re-stated that technical infeasibility must first be demonstrated onsite, and then offsite measures can be taken.

Lewis Michaelson (Facilitator) posed the question of what if it is technically feasible to implement BMPs onsite but it is not the most beneficial use of resources.

Cindy Lin (US EPA) responded that the general position is still that infeasibility must be shown onsite first before moving to offsite projects. Projects may implement some BMPs onsite but not reach the full requirements, and then offsite mitigation may also be implemented.

Claudio Padres (County of Riverside) stated that the administrative draft permit as currently written has LID requirements that are general for all projects. There are also specific sizing requirements for LID BMPs to mitigate a certain volume of water above those general LID requirements. Claudio suggested that if a site implements the general LID requirements onsite but it is then more beneficial to the watershed to implement a different mitigation project instead of the costly structural onsite measures, then that is where resources should be directed.

Wayne Chiu (RWQCB) explained that the RWQCB has been wrestling with this issue. The technical infeasibility portion is in the administrative draft permit because of precedent in other permits and the EPA's position on several permits. The RWQCB has, however, in discussion with other parties, recognized that maybe technical infeasibility is not the way to go. It may be better to specify technical feasibility with the most benefit. That may involve doing some onsite treatment, retention, etc., in addition to something offsite, such as a retrofit or rehabilitation project. The overall net benefit of the combined effort would meet the LID retention and hydromodification requirements, and maintain some sort of sustainable configuration within the watershed. The RWQCB would like input from the environmental community on this topic.

Laurie Walsh (RWQCB) noted that she picked up clearly on Jill Witkowski's earlier suggestion about the offsite mitigation resulting in greater, not simply equal, overall water quality benefit and she appreciated the suggestion.

Chris Crompton (Orange County) shared that the poster child example in Orange County is the issue of regional infiltration for water supply purposes. There are a number of areas where water supply could benefit if managed by a professional regional organization as opposed to a diffused system of LID BMPs not being managed at the same level. Chris explained that the North Orange County permit does include the ability to look at those issues by the Copermittees preparing a watershed plan; therefore, in terms of precedent, EPA and environmental groups did weigh in on that permit process and approved that approach. When regional opportunities trumped site-specific issues, then the Copermittees

could implement the regional efforts within the context of the watershed plan; there is precedent.

Jill Witkowski (SD Coastkeeper) agrees with the US EPA position that infeasibility should be proven first as projects should aim to correct issues as close as possible to the impact. Jill understands Dennis Bowling's point about not having a hydromodification impact in a concrete channel; however, if a receiving water has become a concrete channel, then we have failed that water quality segment. The goal should be to remove the concrete channel and return it to a streambed.

Dennis Bowling (APWA) clarified that the channel to which he was referring was not concrete, but a natural, stable channel.

Daniel Apt (Orange County) explained that there is a mandate for flood control; therefore, some of these concrete channels have to be there. If there is a concrete channel, it does not mean it's a failure; not everything can be restored.

Jill Witkowski (SD Coastkeeper) addressed the issue of having phasing and having developers put funds in for their share of offsite mitigation. Coastkeeper understands the concern of not getting everything paid for upfront, but is not in agreement that collecting each developer's share would get the project fully funded in the end. Jill suggested having a timeline to the implementation, such as 6 months from the start of the project.

Colin Kelly (OC Coastkeeper) also agrees with the US EPA position that infeasibility should be proved first, supporting the existing prioritization of LID with infiltration at the start. Colin shared that with North Orange County, there were unreliable soil maps when compared to soil sampling results. He understands that South Orange County and San Diego County are significantly different with soil types and believes that would be a benefit to proponents of development projects because it should be easier to prove infeasibility for infiltration.

Colin Kelly (OC Coastkeeper) addressed Chris Crompton's mention of the North Orange County permit, stating that he participated in that as well and it is too early to tell if the regional BMP and water retention programs are a success or not. Coastkeeper is concerned that proponents of projects will not choose to do what is the best option for the watershed; they will elect to satisfy the minimum requirements at the best price.

Chris Crompton (Orange County) responded to Colin's concerns, stating that the North Orange County Permit provides a process and sets a fairly high bar for what is required to allow a regional program instead of a site-specific program. It has not been implemented, but it does provide an off-ramp to move from site specific issues to looking at regional benefit issues. Chris believes it is something that cannot be punted past this permit. It may be less value to implement BMPs onsite than to do a regional program, and the permit should investigate this.

Claudio Padres (Riverside County) acknowledged Colin's concerns that developers should not be choosing whether to implement controls onsite or to implement a regional program and agreed. It would be done in the context of the Water Quality Improvement Plans, put together by Copermittees and stakeholders and approved by the RWQCB. It's an approved watershed plan that would identify these regional projects.

Claudio Padres (Riverside County) expressed concern regarding the concept of waiving proof of infeasibility only where the proposed offsite mitigation results in greater overall water quality benefit. He questioned whether this is then requiring project proponents to mitigate more than their impact.

Claudio Padres (Riverside County) stated that he is hearing throughout the focused meetings that the NGO community really wants improvements in the receiving waters; however, if the consensus of the group was that in a certain circumstance doing actual improvements in receiving waters was the best solution, he is hearing the NGO community say they would rather have funds be spent on onsite improvements. It appears like a conflict between the NGO community's ultimate purpose and project handling.

Mike McSweeney (BIA) explained that what he thinks the regulators, NGO community, and even the Copermittees have a hard time understanding is that there is a cost to the process of proving infeasibility. The development community is frustrated to see resources spent on a process that should be spent on fixing the problem. Instead of addressing only new development, house by house or building by building, the development community would support addressing region-wide issues. Mike explained that the development community has been drilled for the last 50 years to keep water away from the building to prevent future damage. If infiltration works, the development community would love to do it. Unfortunately, when looking at the soil availability, it can be inferred that the options to infiltrate are not that great. Instead of spending a lot of time and money hiring consultants to tell developers what they already know, projects should be allowed to move forward with common knowledge. It does not make sense to do things that have little or no benefit when there are other things that can be done to fix these problems.

Colin Kelly (OC Coastkeeper) responded that Mike McSweeney (BIA) is pretty close to making a reasonable argument that infiltration is not effectively feasible in San Diego. It sounds simple then to go through the process to prove that it is infeasible and then move on to the next LID principle. In many instances, LID options are cost effective and will cost less to do LID than alternative or in lieu programs.

Tory Walker (BIA) shared that in his experience as an engineer in San Diego, Southern California, and the Pacific Northwest, that one of the reasons the rainfall charts were included in the handout that the BIA prepared for the meeting is to make two points. One, is that technical infeasibility with regard to soil type can be discussed. The other is to understand that this region is unique. He is hoping that the HMP workshop will also bring out some of those things. One of the things that he has experienced is the difference in precipitation patterns and what that means in terms of second tier LID. There are a number of studies with regard to rainfall distribution and amounts. For example, if a subdivision of 100 lots is built and rain barrels are put on all homes, it can be expected that 5% will love it, 20% will learn to live with it, leaving 75% where those rain barrels will disappear or become sources of other issues that arise when they are not properly maintained. The problem is that in this region the rainfall comes all at once and the rainwater is not going to be used at that time. There is no problem with rain barrels if someone wants to use them, but human behavior is a concern. Consultants do not like telling developers they are going to lose lots

to implement BMPs. With alternative compliance, developers could possibly not lose lots but participate in a program downstream.

Christine Sloan (County of San Diego) referred to slide LD 5 of the handout that the San Diego County Copermittees prepared for the meeting. Christine stated that most can agree that the efforts being done need to be based on scientific data and have demonstrable results. One of the things the San Diego County Copermittees would like to see put more specifically into this section is allowing for adaptive management so that when they have scientific data and demonstrable results they are able to adapt their programs such that these efforts can be done in a way that is responsible to the watershed and water quality health.

Colin Kelly (OC Coastkeeper) referred to slide 7 of the handout prepared by the BIA for the meeting, titled "Runoff from the 85th Percentile Event." The slide states that the intent of the permit is to retain the seasonal first flush only (and not all flows). Colin stated that was not his interpretation of the administrative draft permit. For Coastkeeper, the permit would require retention of about a 5-year storm event for the first qualifying storm and each storm after that.

Wayne Chiu (RWQCB) somewhat agreed in that the BMP volume is designed to capture the 85th percentile amount, then empty over time, and provide capacity to capture subsequent volume from subsequent storms.

Sumer Hasenin (City of San Diego) clarified that a 5-year storm volume is different than an 85th percentile volume.

Wayne Chiu (RWQCB) agreed that the 85th percentile would be, based on the record of storm events of over a certain time, that 85% of those would be less than or equal to that volume and then everything above would be above the 85th percentile and that volume would be allowed to run off.

Sumer Hasenin (City of San Diego) agreed with Wayne's interpretation, further adding that the 85th percentile is closer to a 2-year storm than a 5-year storm and can be determined from precipitation maps for San Diego.

Grant Sharp (Orange County) revisited the topic of Green Streets. Street improvement projects represent a unique set of challenges. When the stakeholder approach was used for the Region 8 permit, they developed a regional water quality management plan for North Orange County that allowed street improvement projects to follow the US EPA Green Streets program, allowing municipalities to meet the unique issues of street improvement projects with LID requirements to the MEP. Street improvements recently finished in North Orange County with biofiltration and pervious pavement has raised the awareness of the community, and the community is happy with the project. The project has improved water quality and reduced the volume of runoff. With HMP as the driving standard, street improvement projects will likely require underground structures to meet the HMP standards, thereby removing the option to do nice LID features at street level and create higher levels of awareness. With HMP as the driving standard, it eliminates the flexibility for streets where there are utilities underground. There are unique constraints with right-of-way and other features that aren't applicable to other land development requirements. In

the North Orange County permit, Ventura County permit, and draft Los Angeles County permit, the standard is to follow the US EPA manual to the MEP.

Eric Becker (RWQCB) responded that the design standard for this region is that all Priority Development Projects (PDPs) must meet the SUSMP requirements. As written, there is not an alternative to follow the US EPA Green Streets manual to the MEP instead of meeting SUSMP requirements.

Wayne Chiu (RWQCB) clarified Grant's example that he is talking about taking a street, which is large enough to meet the PDP requirements, restructuring it to meet the US EPA Green Streets guidance manual, but it would not meet HMP requirements and may not meet retention requirements. Wayne asked what would happen if there was another Capital Improvement Project (CIP) that could not meet LID or HMP requirements, would retrofitting a street with Green Street features be used as alternative compliance for the other CIP site.

Grant Sharp (Orange County) responded that would be a good possible option, so long as the retrofit does not also become a PDP.

Wayne Chiu (RWQCB) stated that the RWQCB would like to retrofit streets to become Green Streets.

Grant Sharp (Orange County) explained that retrofit of streets to become Green Streets is constrained by the 5,000 square foot threshold for PDPs.

Billy Walker (City of Oceanside) revisited the existing development discussion, specifically in regard to residential projects being separated from industrial, commercial, and municipal projects. The San Diego County Copermittees would like to propose an exclusion from the PDP category for single-family residences (SFR) that are not part of a larger development. A SFR that is not part of a larger development does not have the same impact on water quality as an industrial, commercial, or municipal development. Because of this, the SFR that is not part of a larger development should have a different threshold. The underlying issue is that Copermittees have limited resources and, along with types of inspections and tracking and so on, the Copermittees would like to be able to direct their limited resources to higher priorities, away from unnecessary paperwork, and toward looking to develop those things that lead to more substantial water quality improvement. The solution would be to include SFR that is not part of a larger development as an exemption in the permit and then allow the Copermittees to develop a suite of BMPs that would address 85th percentile retention, treatment, and HMP requirements; thereby simplifying and streamlining the permit process for the applicant.

Ziad Mazboudi (City of San Juan Capistrano) stated that this proposal would be supported by Orange County, and it would allow for efficient use of resources.

Wayne Chiu (RWQCB) acknowledged the concerns about dealing with SFRs with an individual landowner that is not part of a larger development and having them go through the PDP process and maintain a set of BMPs. Where the RWQCB is uncomfortable, however, is where these projects would be creating fairly significant amounts of impervious surfaces and having multiple projects of those types within a watershed management area where there would be a cumulative impact. The RWQCB understands if there were some minimum

requirements that would meet the 85th percentile LID retention and hydromodification requirements that must be implemented to remove them from the PDP classification, and the RWQCB would be okay with that. There are a set of PDP exemptions in the administrative draft permit. If additional exemptions are included in there with a set of requirements that would give assurance that water quality would be protected, then the RWQCB could agree to a separate track for those types of developments. The RWQCB may have additional concerns, but is not completely opposed to it.

Billy Walker (City of Oceanside) responded that the intent is to derive in the BMP Design Manual a set of BMPs that would address all of those concerns. It would be organized in such a fashion that an applicant coming in for a SFR would be able to go through this suite of BMPs and, based upon percent impervious and soil type and so on, they could take these BMPs and, similar to the BMP Calculator, run through a simple spreadsheet and come up with a set of BMPs that would address retention and HMP requirements. The San Diego County Copermittees would like the latitude to have that written into the permit and then be able to address it in the BMP Design Manual.

Tory Walker (BIA) agreed that working on SFRs that are not part of larger developments can be frustrating because of convoluted rules and complex sites. The proposal from the San Diego County Copermittees is not a free pass from HMP requirements. When discussing HMP requirements three years ago, there was a concern about liability in trying to develop an HMP pond maintained by a private owner. In doing BMPs to the MEP on a SFR, keeping it simple for a homeowner is very critical.

Christine Sloan (County of San Diego) explained that in some cases, these SFRs are doing redevelopment, so it would nicely fit into retrofit and have benefits to water quality.

Chris Crompton (Orange County) stated that there are some special issues associated in the land development area with very large planned communities. In South Orange County they have one of the largest communities with Rancho Mission Viejo. There is concern with the way such developments area portrayed in the permit and how the permit applies to something that is being served by an existing Environmental Impact Report (EIR), in this case an EIR from 2004. How the large development project is moving forward with all its plans and processes is something that is very important to the County and the developer.

Laura Coley Eisenberg (Rancho Mission Viejo) represents a cattle ranching and development company located in South Orange County, bordering San Diego County. They have been working for about 20 years developing a comprehensive land use and open space plan for Rancho Mission Viejo. This comprehensive plan has been memorialized in several documents, including a Habitat Conservation Plan through U.S. Fish and Wildlife Service, a Special Area Management Plan with the U.S. Army Corps of Engineers, in addition to a Development Agreement, General Plan Amendment, and Zoning Change with the County of Orange. During the permit negotiations for the current South Orange County Permit, her company spent a lot of time with the RWQCB and Orange County to include language in the permit that recognized that the land use and development plan for Rancho Mission Viejo has been developed using a series of watershed and sub-watershed planning principles specifically developed for the property. A significant amount of time and money was spent

investigating the property to understand the soil types, endangered species, coastal sage scrub, etc., and a conceptual Water Quality Management Plan was incorporated into the EIR, which was certified in 2004. Her company is disappointed to see in the administrative draft permit that the language from the current South Orange County Permit was excluded. Rancho Mission Viejo would like to have the currently adopted South Orange County permit language, as shown on the last slide on page 5 of the handout that Rancho Mission Viejo prepared for the meeting, replicated in this permit.

Sumer Hasenin (City of San Diego) referred the stakeholders to slide LD9 of the handout prepared by the San Diego County Copermittees for this meeting, which relates to the HMP and the naturally occurring requirement in the permit. The administrative draft permit requires projects to mitigate for pre-project flow rates and conditions to match the naturally occurring conditions. The San Diego County Copermittees have discussed this issue with RWQCB staff offline and understand that RWQCB staff has indicated this is beyond their control in terms of changing this requirement. The San Diego County Copermittees still propose that redevelopment projects should be required to mitigate for pre-project flow rates and conditions to match the pre-project conditions, instead of naturally occurring conditions. This is a significant issue of compliance with the HMP, and the San Diego County Copermittees are hoping to continue dialogue with the RWQCB on the technical requirements of this provision in the permit.

VIII. Other Topics / Audience Comments

Comment: Rosanna Lacarra (City of Coronado) shared that the majority of redevelopment in Coronado occurs on single family lots, and the City of Coronado has been requiring a set of LID treatment BMPs with the last permit cycle based on the model SUSMP. Raising the bar to a PDP level for SFRs would preclude a lot of current BMPs being implemented or raise the bar so high that it would pose a big challenge. The City of Coronado would support consideration of alternatives to SFR being in PDP and would continue to implement BMPs but not to the level of PDP.

IX. Next Steps

This marks the end of the focused meetings. There will be a workshop at the RWQCB office on Wednesday, September 5, where the RWQCB will present in which areas of the permit they anticipate making changes. RWQCB staff has been meeting offline with various groups and will continue to do so through the end of the comment period on September 14. The last day to provide comments is Friday, September 14.

X. Meeting Adjourned

From: lyris@swrcb18.waterboards.ca.gov
To: Chiu, Wayne@Waterboards
Subject: Hydromod Meeting
Date: Monday, August 13, 2012 8:32:55 AM

Greetings Regional MS4 Permit Stakeholders,

At the request of several stakeholders participating in the Focused Meetings for the Administrative Draft Regional MS4 Permit, the San Diego Water Board agreed to attend a meeting, in addition to but separate from the Focused Meetings, that will provide information about issues related to hydromodification management.

The meeting was organized and arranged by the Copermittees. Members of the San Diego Water Board Regional Permit Team will attend the meeting as an interested party.

The following information about the meeting was provided to the Regional Permit Team to be distributed via the Lyris lists maintained by the San Diego Water Board for the Orange County MS4 Permit, Riverside County MS4 Permit, and the San Diego County MS4 Permit. To attend the meeting, please see the information provided below:

Laurie Walsh P.E.
San Diego Water Board
858-467-2970
lwalsh@waterboards.ca.gov

HYDROMODIFICATION MANAGEMENT MEETING

The meeting described below is being convened to specifically address stakeholder comments and concerns raised regarding the issue of hydromodification management.

Meeting Goal and Objectives

The goal of the meeting will be to provide the storm water program managers, non-governmental environmental organizations, the development/business community and the San Diego Water Board with a greater understanding of the practice of hydromodification management. The primary objective of the meeting is to consider the following questions:

- Where should hydromodification requirements be applied?
- What are key decision factors in applicability?

Meeting Structure

The meeting will comprise of a series of brief presentations followed by an expert panel discussion of the aforementioned questions in the context of the San Diego River watershed.

The presenters and panel will include:

- Chris Bowles, PhD, PE, CBEC
- Derek Booth, PhD, PG, PE Stillwater Sciences
- Eric Stein, PhD, Southern California Coastal Water Research Project
- Eric Berntsen, PH, CPESC, CPSWQ, State Water Resources Control Board

The meeting and panel discussion will be facilitated by Matt Yeager, D.Env, CPSWQ, QSD/QSP, Yeager Environmental Associates.

Meeting Schedule and Location

The meeting will be held on August 30, 2012, and will begin at 10:00 am and end at 3:30 pm.

The meeting will be held at:

San Diego Concourse
Copper Room
202 C Street
San Diego, CA 92101
(please see attachment for map and directions)

Parking is available at the Concourse Parkade Structure
$2/20 mins OR $18/day max
Cash or Check only

Contacts for Additional Information

Matt A. Yeager, D.Env, CPSWQ, QSD/QSP
Yeager Environmental Associates
(909) 659-8038; matt@yeagerenvironmental.com

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To unsubscribe click here: http://swrcb18.waterboards.ca.gov/u?id=508208.cee2a373662e566393e62f0af18d11cf&n=T&l=reg9_sandiegoco_ms4permit&o=374102
(It may be necessary to cut and paste the above URL if the line is broken)
or send a blank email to leave-374102-508208.cee2a373662e566393e62f0af18d11cf@swrcb18.waterboards.ca.gov

From: lyris@swrcb18.waterboards.ca.gov
To: Chiu, Wayne@Waterboards
Subject: August 10, 2012 Hydromodification Management Meeting
Date: Thursday, August 23, 2012 2:15:48 PM
Attachments: HMP Mgt Mtg flyer and map_8-30-12.pdf

Greetings Regional MS4 Permit Stakeholders,

At the request of several stakeholders participating in the Focused Meetings for the Administrative Draft Regional MS4 Permit, the San Diego Water Board agreed to attend a meeting, in addition to but separate from the Focused Meetings, that will provide information about issues related to hydromodification management.

The meeting was organized and arranged by the Copermittees. Members of the San Diego Water Board Regional Permit Team will attend the meeting as an interested party.

The following information about the meeting was provided to the Regional Permit Team to be distributed via the Lyris lists maintained by the San Diego Water Board for the Orange County MS4 Permit, Riverside County MS4 Permit, and the San Diego County MS4 Permit.

To attend the meeting, please see the information provided below and attached. Please note that RSVPs are requested for this meeting. **Please RSVP** at the following link: https://docs.google.com/spreadsheet/viewform?formkey=dHJaVWxEQkwtcEt3VGNsQlJHQXRFR2c6MQ#gid=0)

Laurie Walsh, PE
San Diego Water Board
Lwalsh@waterboards.ca.gov
858-467-2970

You are currently subscribed to reg9_sandiegoco_ms4permit as: wchiu@waterboards.ca.gov.

To unsubscribe click here: http://swrcb18.waterboards.ca.gov/u?id=508208.cee2a373662e566393e62f0af18d11cf&n=T&l=reg9_sandiegoco_ms4permit&o=377699

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or send a blank email to leave-377699-508208.cee2a373662e566393e62f0af18d11cf@swrcb18.waterboards.ca.gov

HYDROMODIFICATION MANAGEMENT MEETING
AUGUST 30, 2012
10:00 AM – 3:30 PM
SAN DIEGO, CA

The San Diego Water Board is developing a Regional Municipal Separate Storm Sewer System (MS4) Storm Water Permit that will cover municipal copermitees in San Diego County, Southern Orange County, and Southern Riverside County (Tentative Order No R9-2012-0011).

This hydromodification management meeting is being convened to specifically address stakeholder comments and concerns raised regarding the issue of hydromodification management.

Meeting Goal and Objectives

The goal of the meeting will be to provide the Regional Board Permit team, Copermittee storm water program managers, non-governmental environmental organizations, and the development/business community with a greater understanding of the practice of hydromodification management in the urban watershed. Although there are several areas of concern regarding the implementation of hydromodification requirements, the primary objective of the meeting is to consider and provide direction regarding the following questions:

<u>Key Questions</u>

1. *What are key decision factors in applicability of hydromodification management requirements?*
2. *Where in the watershed, and using what criteria, should hydromodification management requirements be applied?*

<u>Second Tier Topics</u>

3. *Constraints and incentives (in lieu, hydromod trading/credits)*
4. *Prioritization*

Meeting Structure

The meeting will comprise a series of brief presentations followed by an expert panel discussion of the aforementioned questions in the context of the San Diego River watershed.

The presenters and panel will include:

- Chris Bowles, PhD, PE, CBEC
- Derek Booth, UCSB, Bren School of Environmental Science and Management
- Eric Stein, PhD, Southern California Coastal Water Research Project
- Eric Berntsen, PH, CPESC, CPSWQ, State Water Resources Control Board
- Flood Control Expert – To Be Announced

The meeting and panel discussion will be facilitated by Matt Yeager, D.Env, CPSWQ, QSD/QSP, Yeager Environmental Associates.

Meeting Schedule and Location

August 30, 2012, from 10:00 a.m. to 3:30 p.m.
(registration begins at 9:30; meeting begins at 10:00)

San Diego Concourse
Copper Room
202 C Street
San Diego, CA 92101

Lunch will be provided—a donation of $10 will be appreciated

Please RSVP at the following link:

Hydromod Registration Form*

(if you receive a hard copy of this flyer or if the link does not work, please enter the following address into your web browser: https://docs.google.com/spreadsheet/viewform?formkey=dHJaVWxEQkwtcEt3VGNsQlJHQXRFR2c6MQ#gid=0)

In order to secure copies of material provided to attendees and have lunch ordered for you, please RSVP no later than 10:00 a.m. on Wednesday, August 29, 2012.

Parking is available at the Concourse Parkade Structure
$2/20 mins OR $18/day max
Cash or Check only

Contacts for Additional Information

Matt A. Yeager, D.Env, CPSWQ, QSD/QSP
Yeager Environmental Associates
(909) 659-8038; matt@yeagerenvironmental.com

SAN DIEGO CONCOURSE

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202 C Street MS57C, San Diego Ca. 92101 / 619-236-7029 / 619-236-7016

Driving Directions to the San Diego Concourse

South on Interstate 5

- 5 south to Front St./Civic Center off ramp
- Take left fork on off ramp to 2nd Ave.
- Turn right onto 2nd Ave.
- Travel 3 blocks to where 2nd Ave. intersects A St.
- Enter Concourse Parkade structure

North on Interstate 5

- 5 north to 6th Ave off ramp
- Turn left onto 6th Ave.
- Turn right onto Ash St.
- Turn left on 2nd Ave., travel one block to where 2nd Ave. intersects A St.
- Enter Concourse Parkade structure

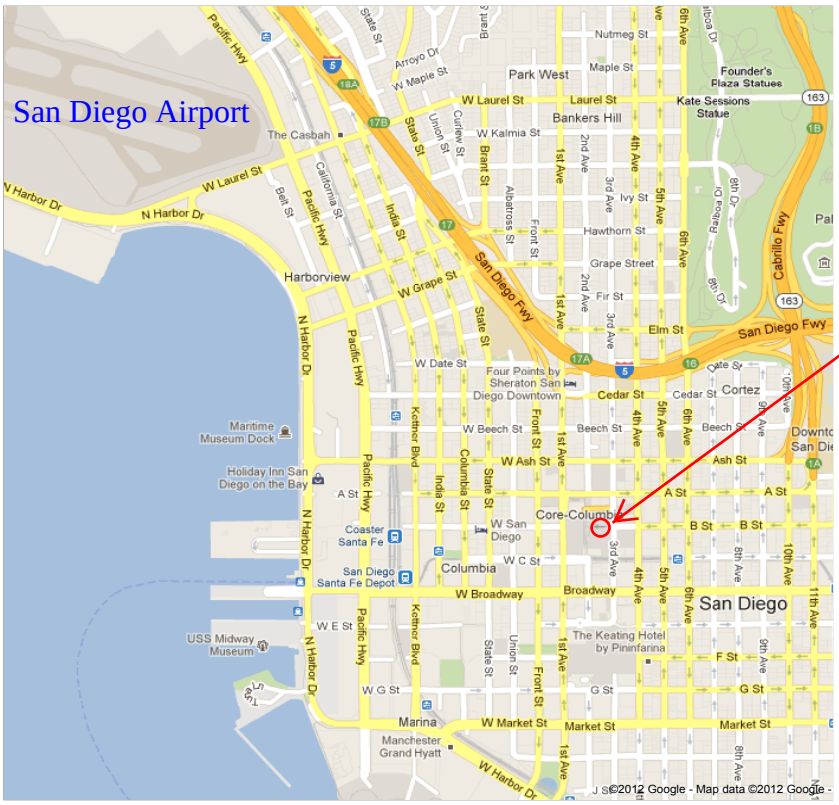

South on Interstate 15

- 15 south to 163 south
- 163 becomes 10th Ave.
- Right on B St.
- Right on 3rd Ave.
- Concourse Parkade entrance is first driveway on left.

West on 94 Freeway

- 94 west into Downtown
- 94 becomes F St.
- Right on 5th Ave.
- Left on B St.
- Right on 3rd Ave.
- Concourse Parkade entrance is first driveway on left.

Second Level

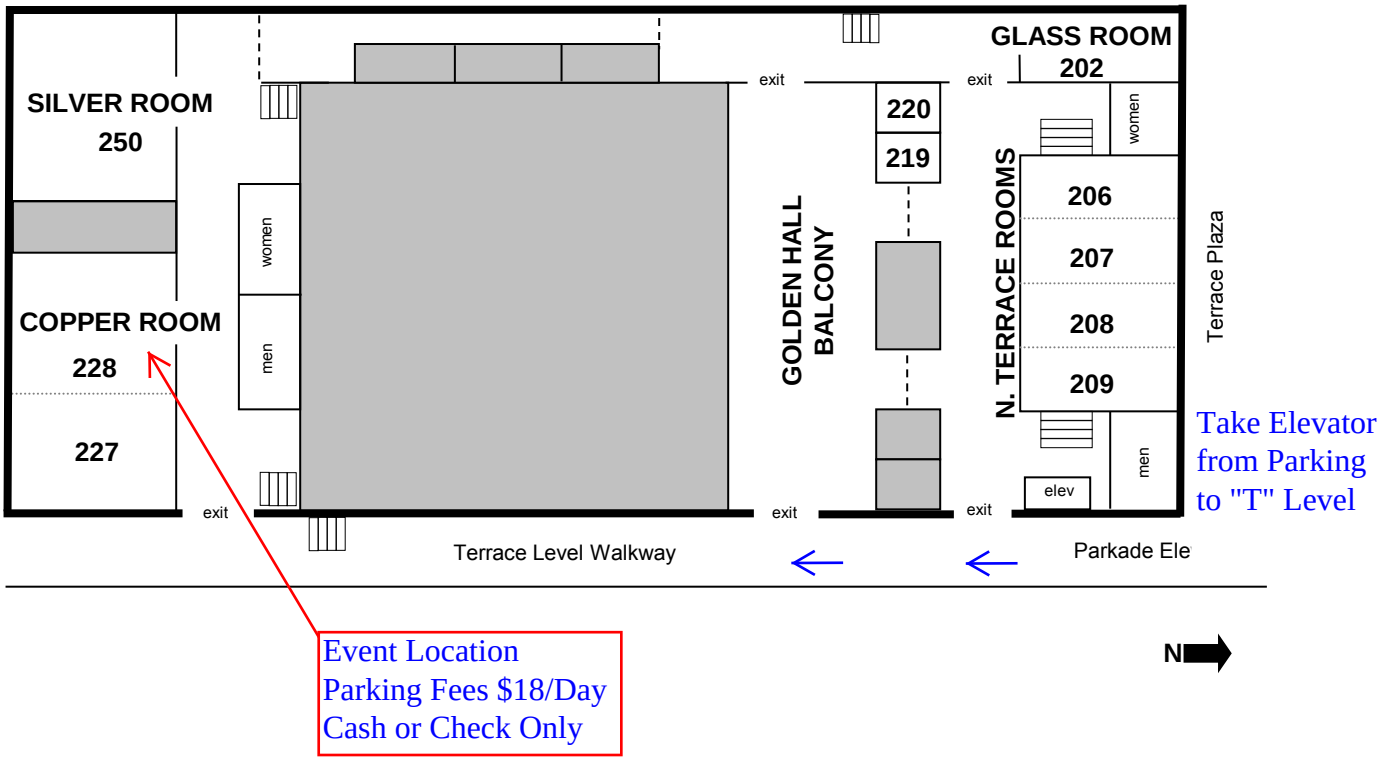

San Diego Region Hydromodification Management Meeting Agenda

August 30, 2012

10:00 am – 3:30 pm

Location: **San Diego Concourse**
Copper Room
202 C Street
San Diego, CA 92101

1. Introduction (Matt Yeager) **10:00 – 10:15**

a. Context/Objectives of Workshop

b. Summary of Workshop Content/Format

1. Fears/misperceptions
2. Broaden the perspective—What ***CAN*** we do?
3. End of day/take away points

c. Introduce Speakers/Panel Members

1. **Eric Stein**, PhD, Southern California Coastal Water Research Project
2. **Eric Berntsen**, PH, CPESC, CPSWQ, State Water Resources Control Board
3. **Iraj Nasseri**, PhD, PE, PH, Water Resources Division, Los Angeles County Flood Control District
4. **Chris Bowles**, PhD, PE, CBEC
5. **Derek Booth**, PhD, PG, PE, UCSB, Bren School of Environmental Science and Management

2. Hydromodification Presentations (so Cal focus) **10:15 – 12:15**

a. Hydromodification 201—HM management in southern California: (Eric Stein)

b. Hydromod regulations in California(Eric Berntsen)

c. Hydromodification and Flood Control--mandates, constraints, and opportunities (Iraj Nasseri)

d. Hydromod regulation and rehabilitation approaches (Chris Bowles)

e. Hydromod prevention controls /management approaches (Derek Booth)

3. Lunch **12:15 – 1:00**

4. Facilitated Panel Discussion **1:00 – 3:00**

a. Discussion with Panel 1:00-2:00

b. Discussion with Workshop Attendees and Panel 2:00-3:00

1. Case studies for discussion (soCal)

A. Dense urban site, redevelopment, all improved drainage

B. Suburban, new development, natural channel or sensitive habitat

2. Discussion questions

Key Questions :

A. What are key decision factors in applicability of HM requirements?

(HM requirements apply everywhere, but specific requirements for a site or catchment should be commensurate with Beneficial Uses, technical feasibility, and cost—one size does not fit all)

B. Where in the watershed, and using what criteria, should hydromod requirements be applied?

(Can we identify specific factors and a process of evaluation that are essential for selecting the type of hydromod management action or approach that is most likely to reduce adverse HM impacts?)

Second Tier Questions:

C. Constraints and incentives (in lieu, hydromod trading/credits)

D. Prioritization of sites and/or areas within watersheds

5. Workshop summary review **3:00 – 3:20**

a. Regulatory/implementation issues

b. Key prioritized workshop recommendations

6. Conclusions/next steps **3:20 – 3:30**

Managing Hydromodification: The Next Generation

Eric Stein

S. Ca. Coastal Water Research Project

“Traditional” Perspective

"Traditional" Management Approaches

- Management triggers based on impervious cover
- Focus on LID and flow-duration control (e.g. 10% Q2)
- Exemptions where hydromodification requirements don't apply

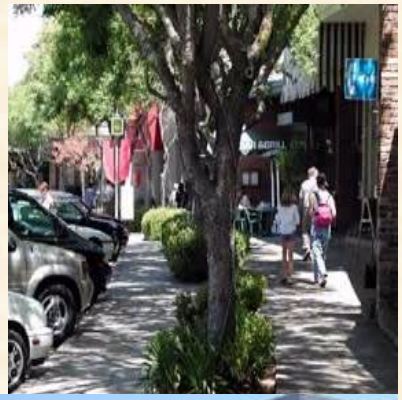

Borrego Canyon – 15% Impervious cover

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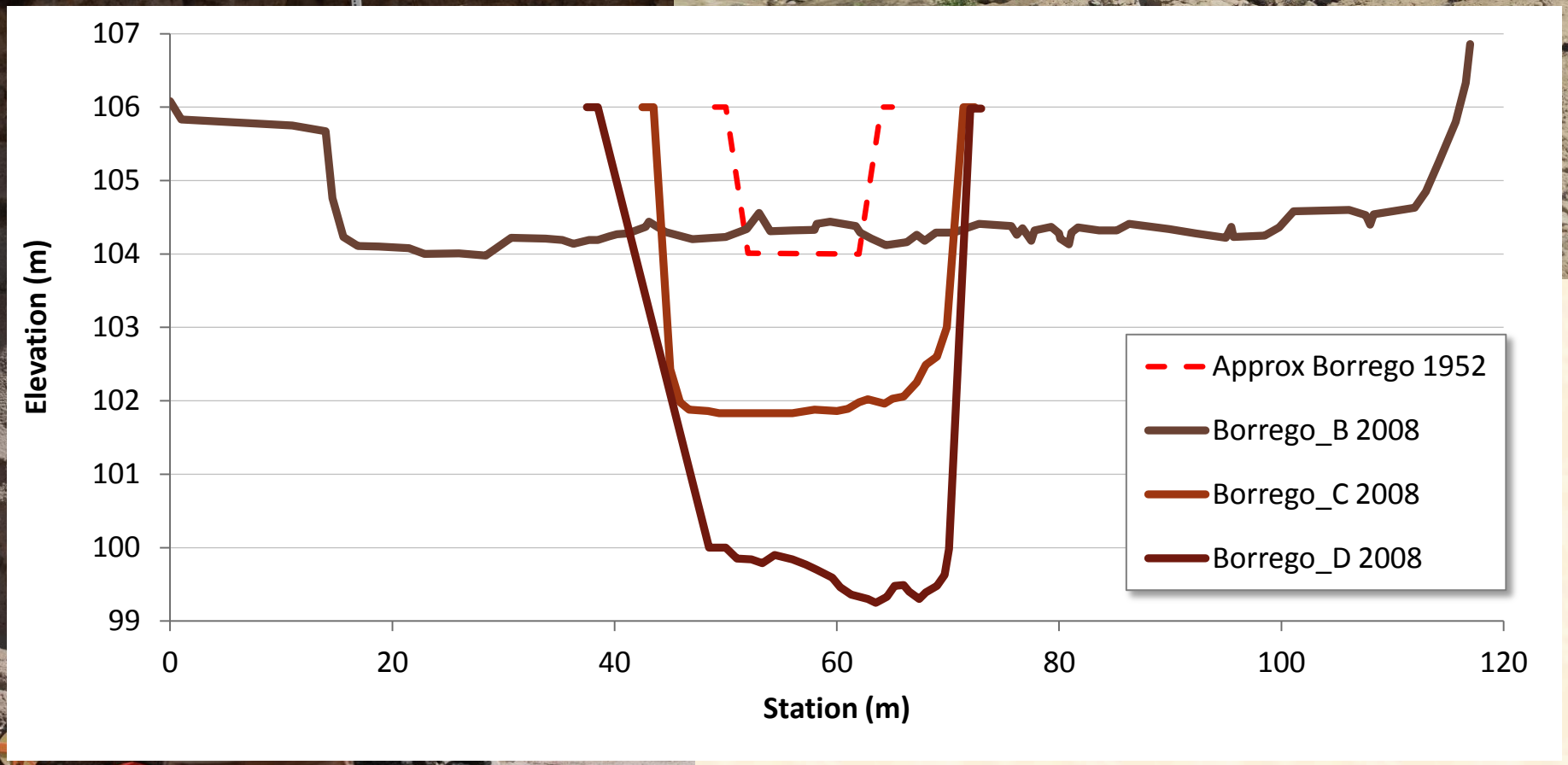
107
106
105
104
103
102
101
100
99
Elevation (m)
0
20
40
60
80
100
120
Station (m)
Approx Borrego 1952
Borrego_B 2008
Borrego_C 2008
Borrego_D 2008

Acton Canyon – 2-3% Impervious cover

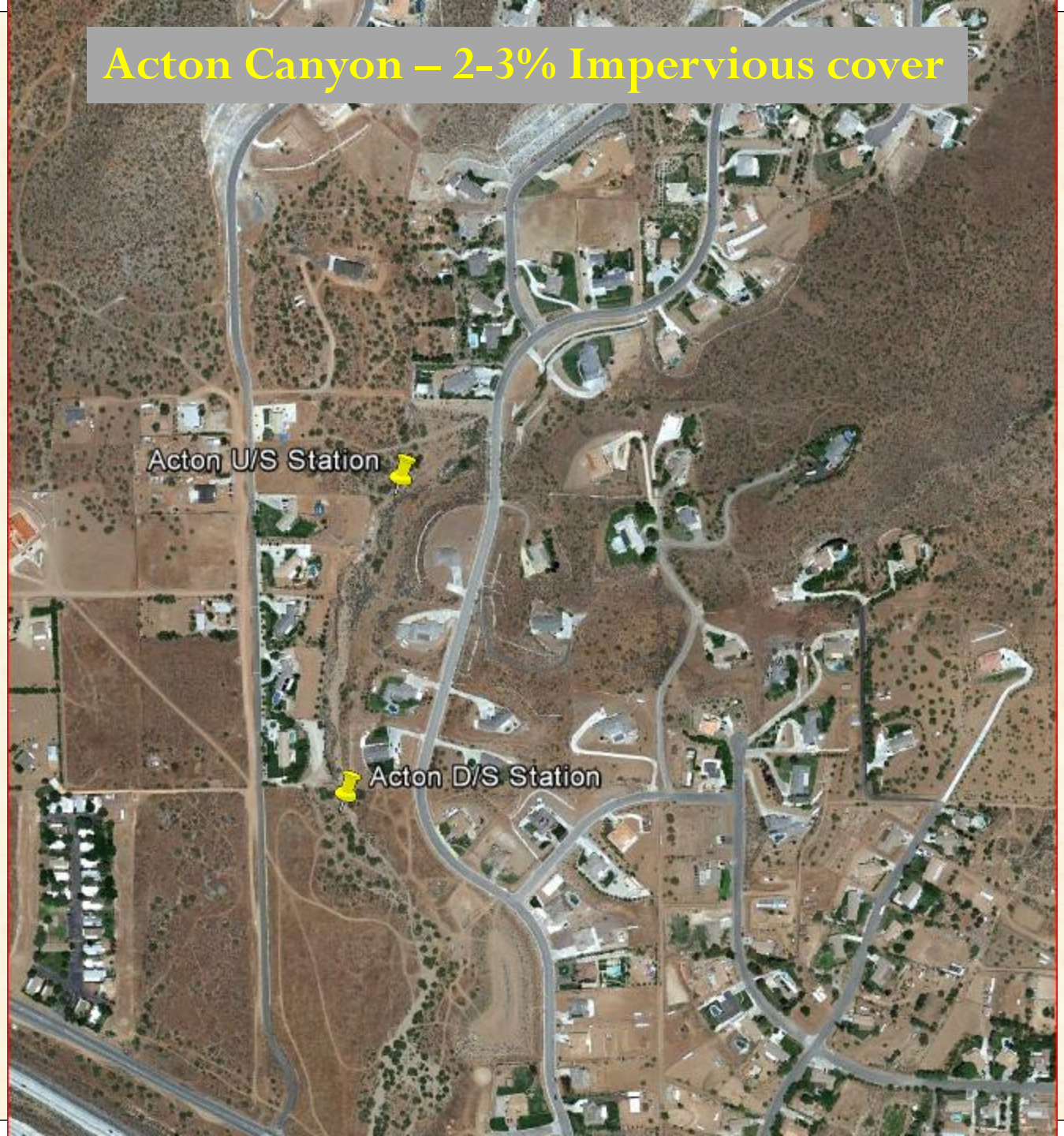

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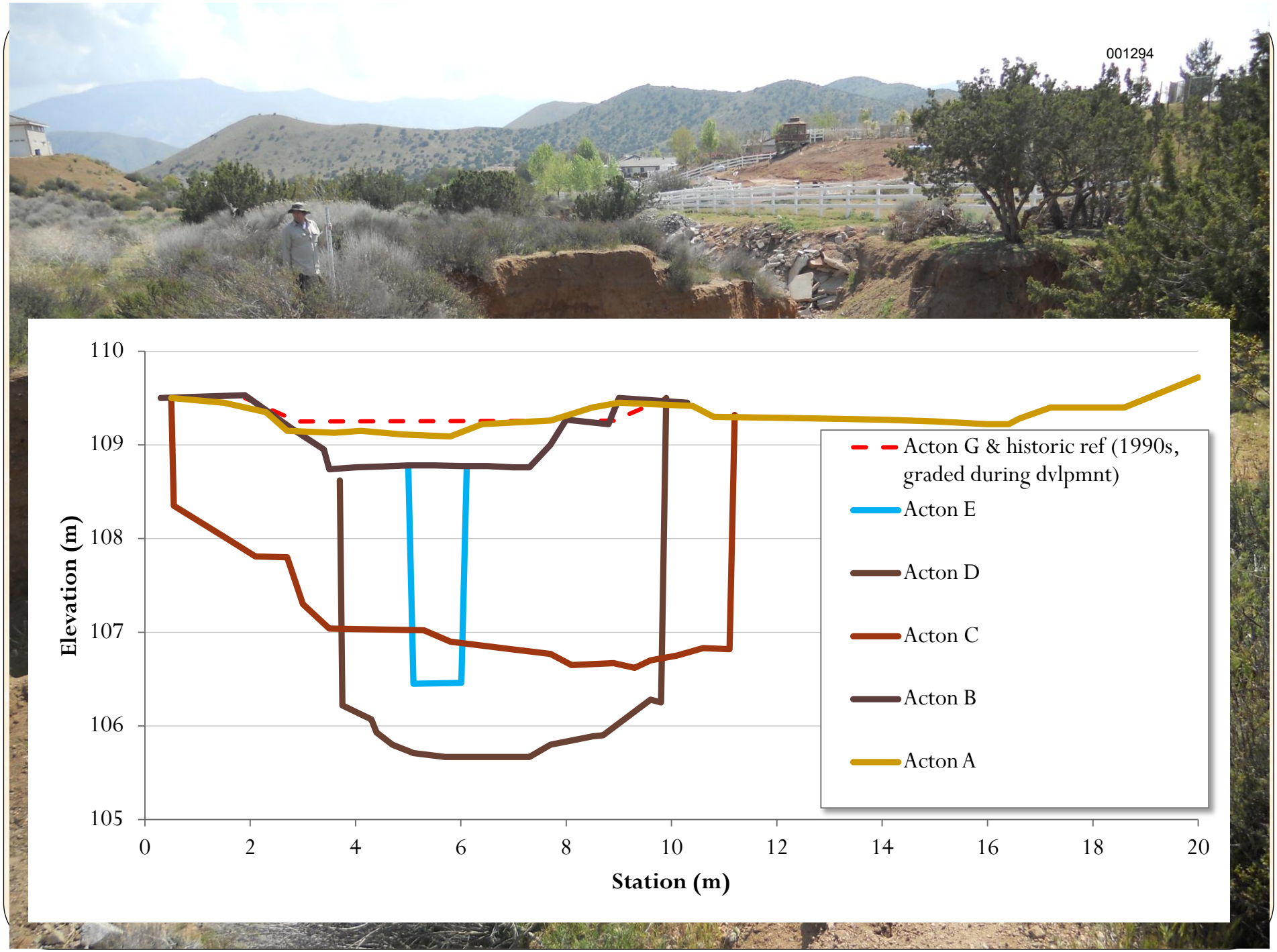
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110
109
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Elevation (m)
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2
4
6
8
10
12
14
16
18
20
Station (m)
Acton G & historic ref (1990s, graded during dvlpmnt)
Acton E
Acton D
Acton C
Acton B
Acton A

Is this the best approach?

"Evolved" Perspective

- ***Hydromodification = Alteration of watershed structure and processes***

~~"Do I need to apply hydromodification management"~~

How and Where should I apply hydromodification management

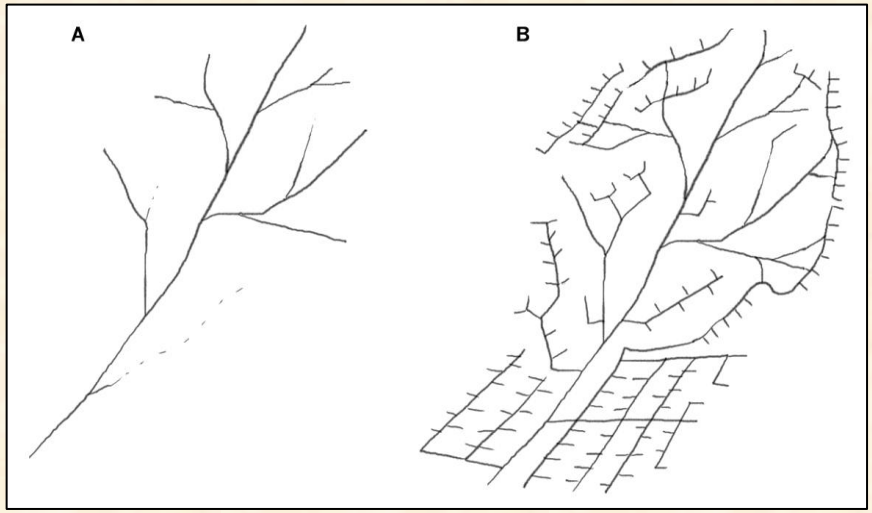

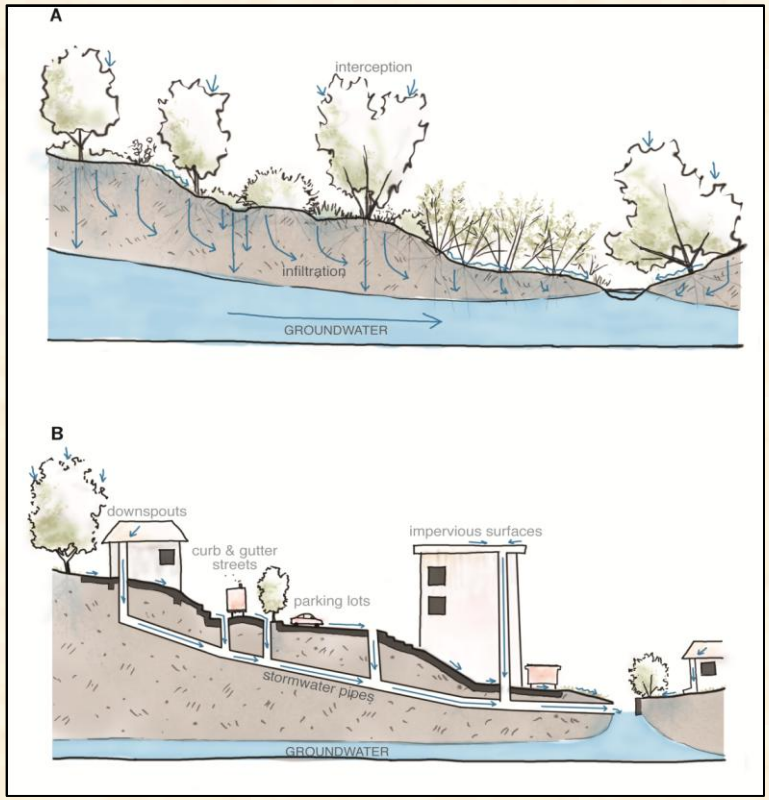

What Does this All Mean?

- It's not just about streams, its about protecting the watershed
- Relying solely on site-based flow control will not be effective at addressing all hydromodification effects
- Hydromodification management should evolve from narrowly-scoped, project-based actions to solutions within an integrated watershed strategy
- Hydromodification control measures cannot be driven solely by new development and redevelopment
  - Legacy effects must be remedied
- Success should be evaluated through systematic monitoring using physical and biological endpoints
  - Monitoring results should feed back to affect future management decisions

Framework for Hydromodification Management

Technical guidance on ***assessment*** of hydromodification impacts, development of strategies and approaches to ***management*** of hydromodification effects, and ***monitoring*** the effect of management actions.

SCCWRP Technical Report #667
http://www.sccwrp.org/Documents/TechnicalReports.aspx

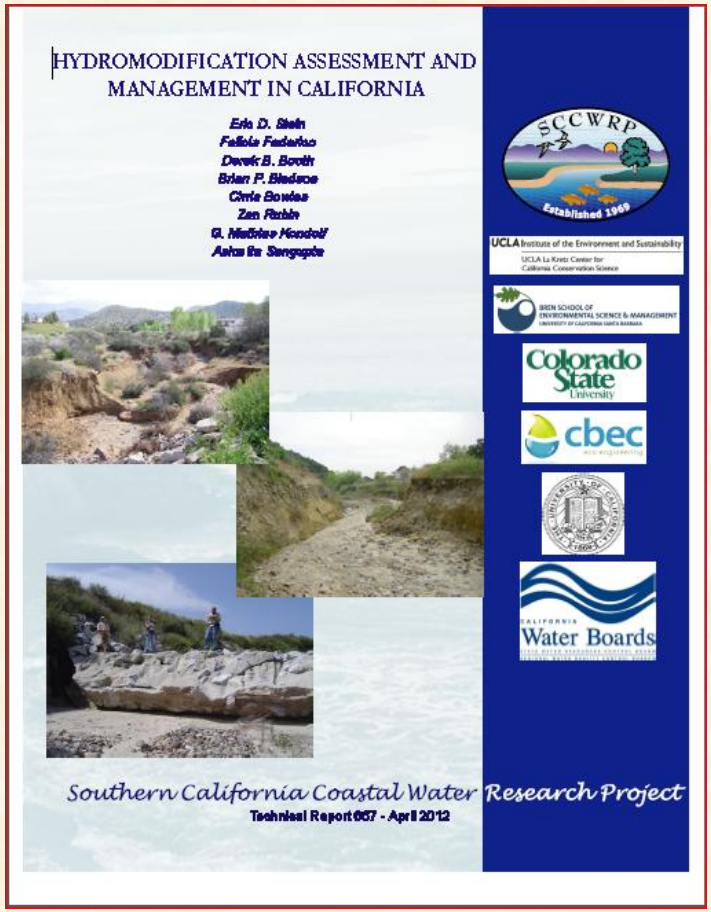

- Where in the watershed is the project?
- What type of stream/water body is the project discharging into?
  - What are the anticipated effects?
- What are the management goals for the receiving waterbody?
- What are the upstream and downstream opportunities?
  - Available land/resources
  - Greatest potential effect

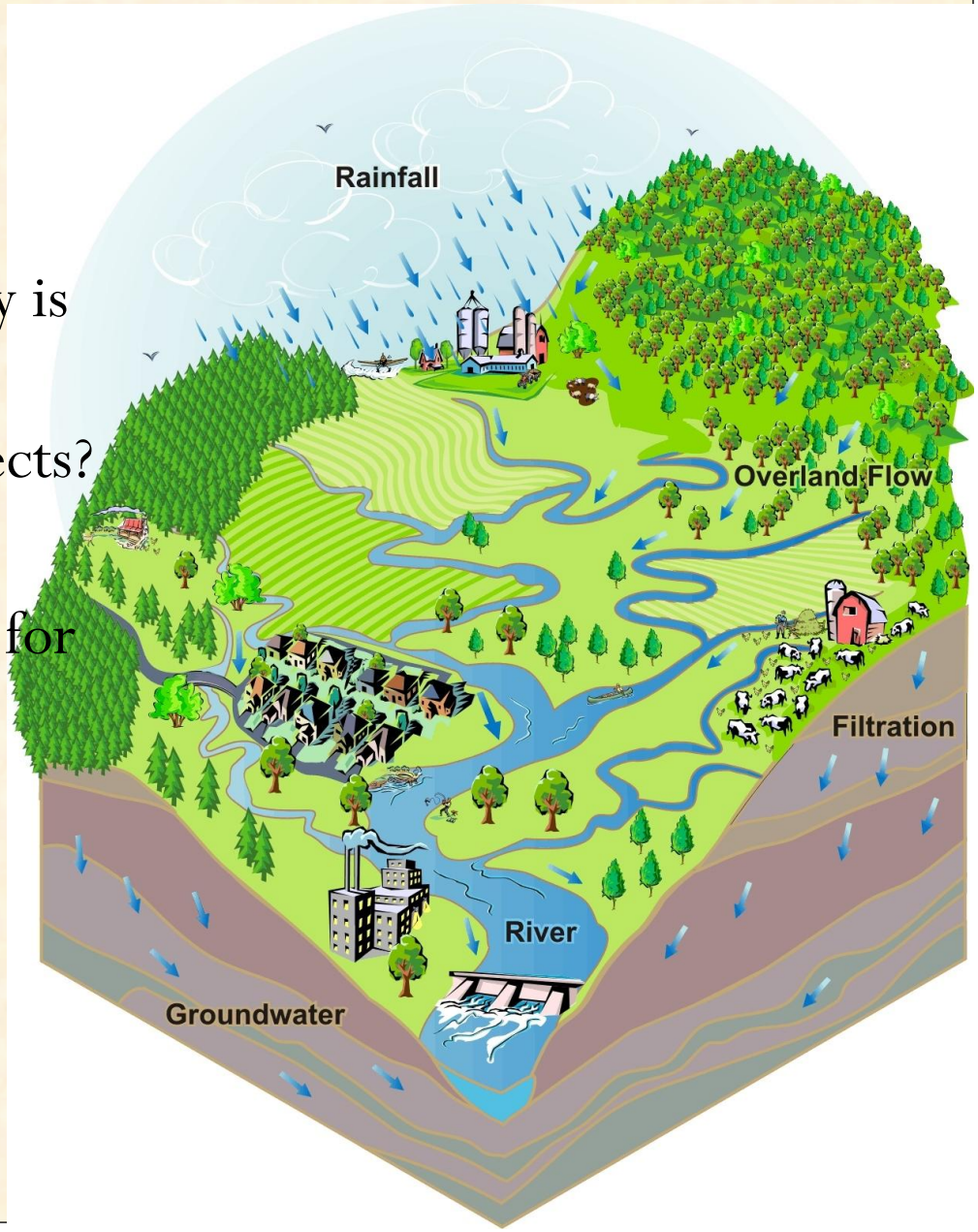

Multi pronged strategy

- Planning
  - Avoid course sediment yield areas
  - Upland restoration
  - Protect infiltration areas
- Site-based mitigation
  - LID
  - On-site basins
  - Regional basin (flow + sediment)
- Floodplain management
  - Buffers and setbacks
  - In-channel rehabilitation
  - Regional restoration

Watershed-based Mitigation

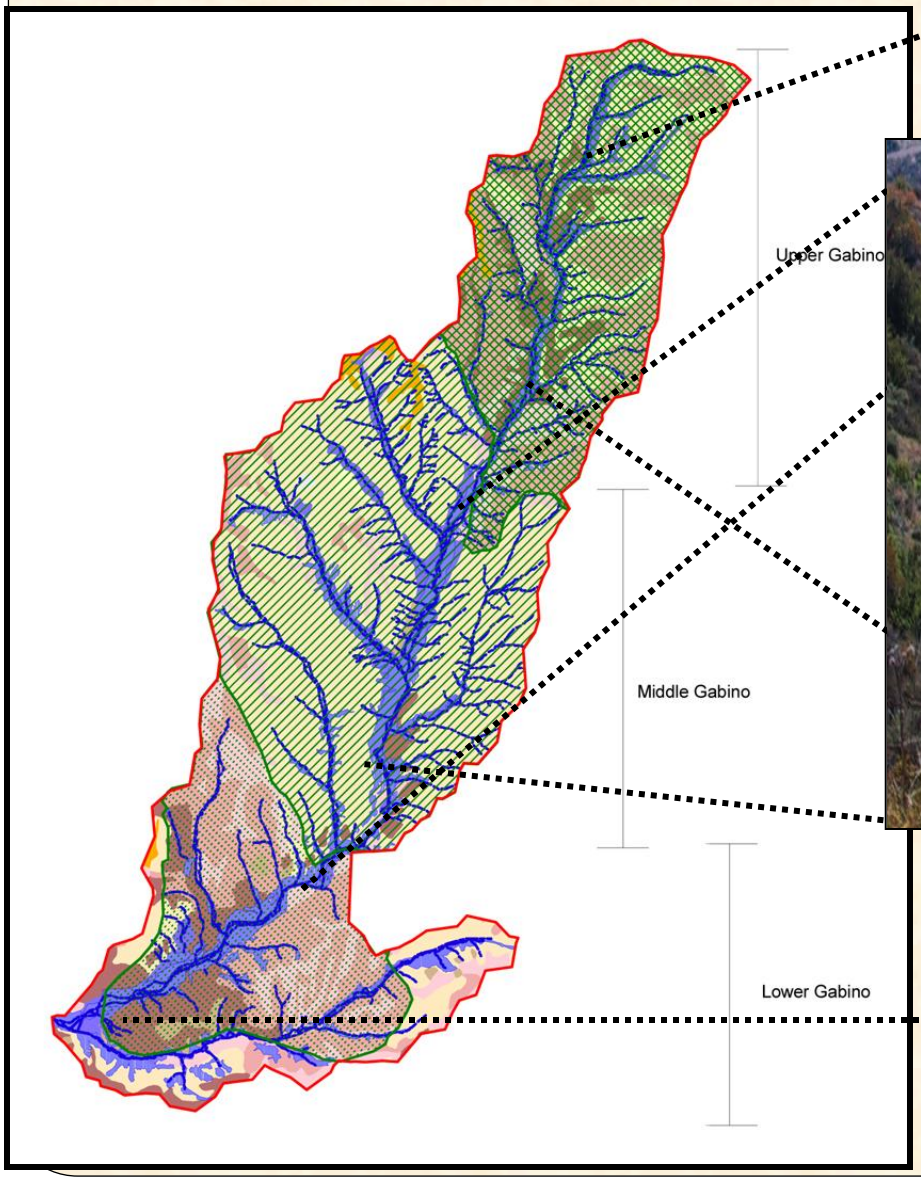

Floodplain Restoration & Protection

Hydromodification

Toxicity

Bioobjectives

Wetland Policy

Nutrient Criteria

Water Quality

Sensitive Species

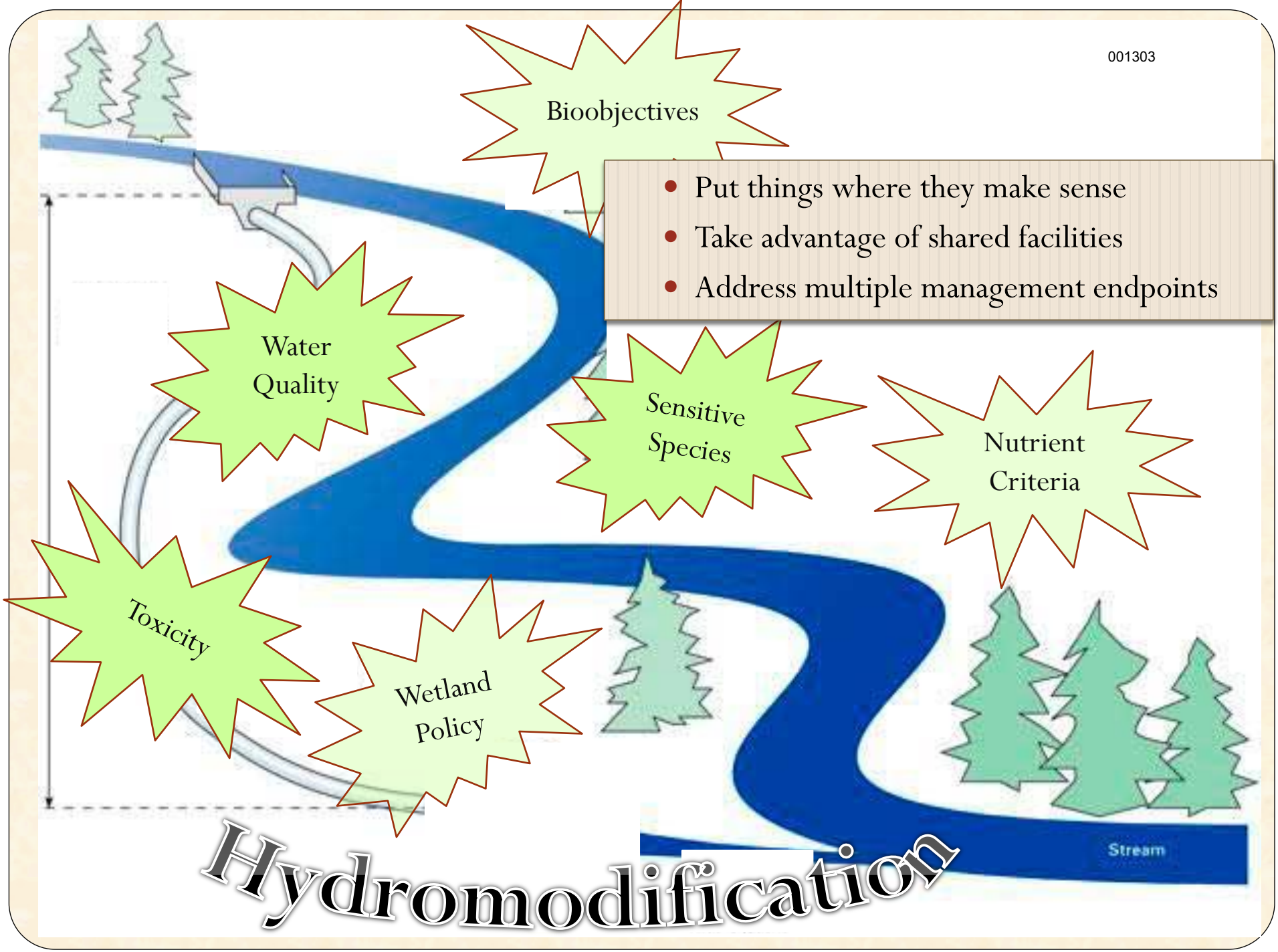

- Put things where they make sense
- Take advantage of shared facilities
- Address multiple management endpoints

Hydromodification

Need for Monitoring

Severe lack of data on hydromodification responses

- **Performance**
  - How do specific BMPs or facilities function relative to their designs?
- **Effectiveness**
  - How well do specific management actions or suites of actions protect the condition or beneficial use of receiving waters?
- **Characterization**
  - What is the condition of target areas relative to specific benchmarks (e.g. standards, reference condition, ambient)?
- **Trends**
  - Are conditions improving or declining over time?

Monitoring should be question driven & adaptive with clear feedback to management action.

Monitoring with Multiple Assessment Endpoints

- Pressure
  - What is affecting the condition?

- State
  - What is the condition?

- Response
  - What is the status of a management or valued endpoint?

Establish Sentinel Sites

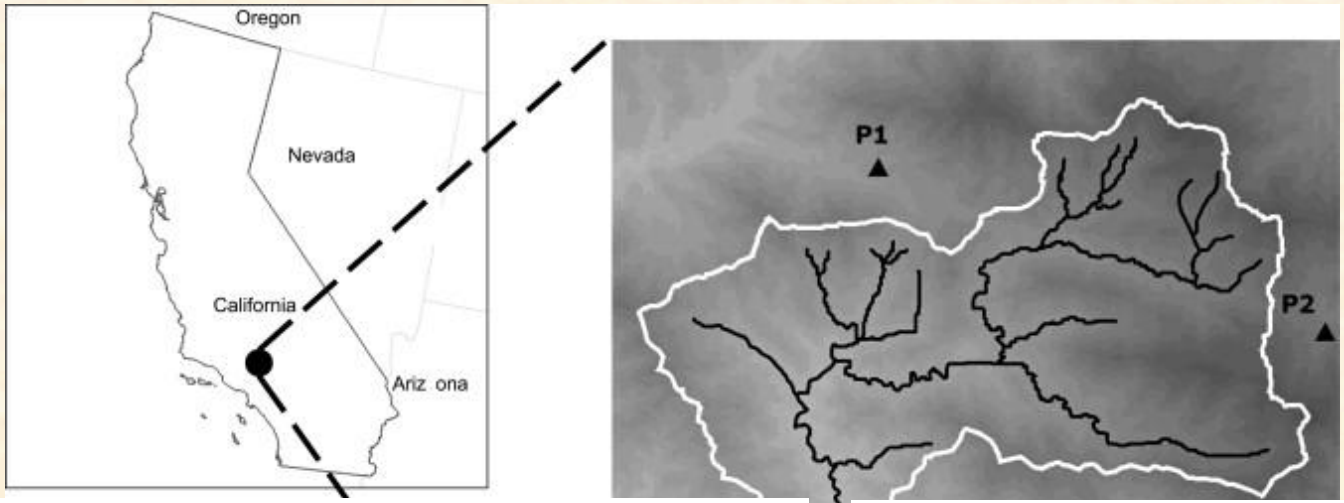

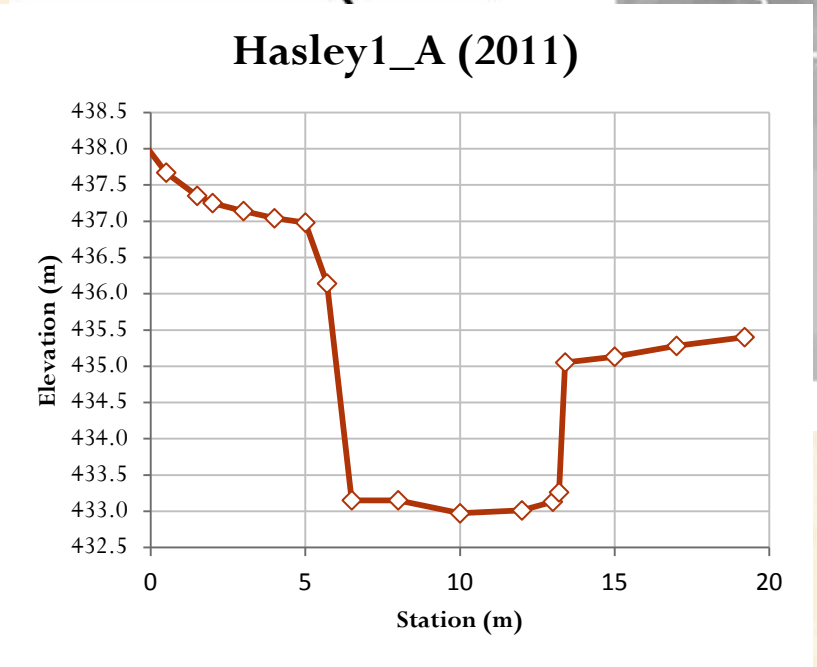

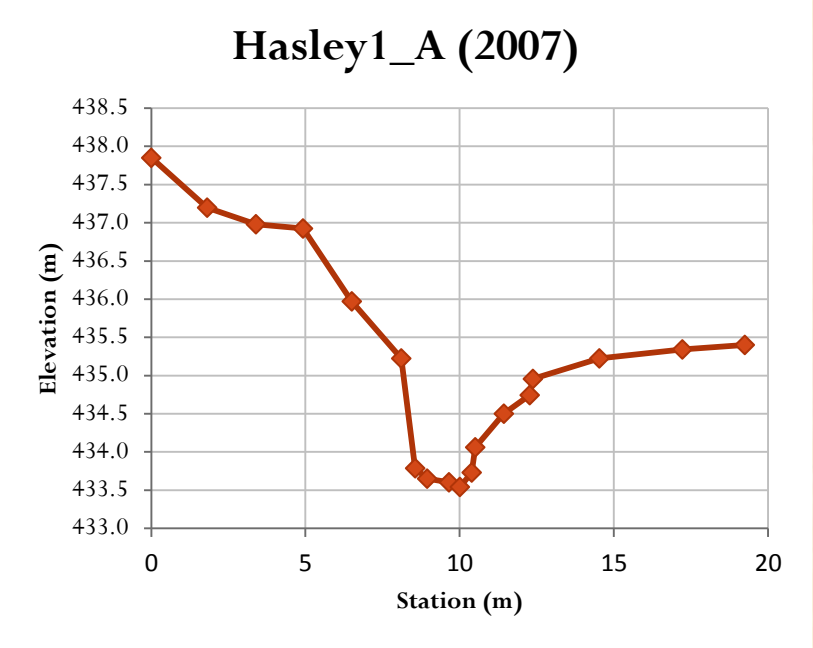

Summary of the Next Generation

- Uses watershed analysis as the foundation for all management actions
- Establishes management endpoints for stream reaches and upland areas based on watershed scale analysis
- Site-based control measures determined in the context of the watershed analysis / management endpoints
- Includes off-site compensatory mitigation measures
- Integrates hydromodification management across multiple programs
- Multi-faceted monitoring program that evaluates and informs adaptive hydromodification management

THANK YOU

Eric Stein
S. Ca. Coastal Water Research Project
erics@sccwrp.org 714-755-3233

Hydromodification Regulations in California

San Diego Hydromodification Workshop
August 30, 2012

eric berntsen
stormwater program/SWRCB

Our Mission and Framework

- "Our mission is to preserve and enhance the quality of California's water resources, and ensure their proper allocation and efficient use for the benefit of present and future generations."
- ***Q: Why are we so focused on discharges?***
- ***A: The legal framework (Clean Water Act) drives us to be discharge-oriented.***

The Clean Water Act

- Passed in 1972, it set goals for all "waters of the United States" to:
  - be free of all discharges causing pollution; and
  - be "fishable, swimmable," meaning they support these use
- Is similar/analogous to our CA Water Code

Beneficial Uses Used to Protect California Water Resources

- **AGR** – Agricultural Supply
- **FLD** – Flood Peak Attenuation/Flood Water Storage
- **FRSH** – Freshwater Replenishment
- **GWR** – Groundwater Recharge
- **MAR** – Marine Habitat
- **MUN** – Municipal and Domestic Supply
- **RARE** – Preservation of Rare and Endangered Species
- **REC-1** – Water Contact Recreation
- **REC-2** – Non-Water Contact Recreation
- **SHELL** – Shellfish Harvesting
- **SPAWN** – Fish Spawning
- **WARM** – Warm Freshwater Habitat
- **WILD** – Wildlife Habitat
- **WQE** – Water Quality Enhancement

Sources of Impairment (USEPA 2006)

	Rivers and Streams	Lakes, Ponds, and Reservoirs	Estuaries
Sources[b]	Agriculture (48%)[a]	Agriculture (41%)	Municipal Point Sources (37%)
	Hydrologic Modification (20%)[c]	**Hydrologic Modification (18%)**	Urban Runoff/Storm Sewers (32%)
	Habitat Modification (14%)[d]	Urban Runoff/Storm Sewers (18%)	Industrial Discharges (26%)
	Urban Runoff /Storm Sewers (13%)	Nonpoint Sources (14%)	Atmospheric Deposition (23%)
	Forestry (10%)	Atmospheric Deposition (13%)	Agriculture (18%)
	Municipal Point Sources (10%)	Municipal Point Sources (12%)	**Hydrologic Modification (14%)**
	Resource Extraction (10%)	Land Disposal (10%)	Resource Extraction (12%)

Sources of Impairment – Urban Stormwater (me 2012)

Year	Acres_Impaired	Miles_of_Streams /Rivers_Impaired
1992	239,423.00	633.00
1994	254,197.00	739.00
1996	262,457.00	1,351.00
1998	521,249.00	1,426.66
2002	781,780.33	3,845.33
2006	806,817.83	4,582.79
2010	871,144.77	5,037.70

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Native Soil

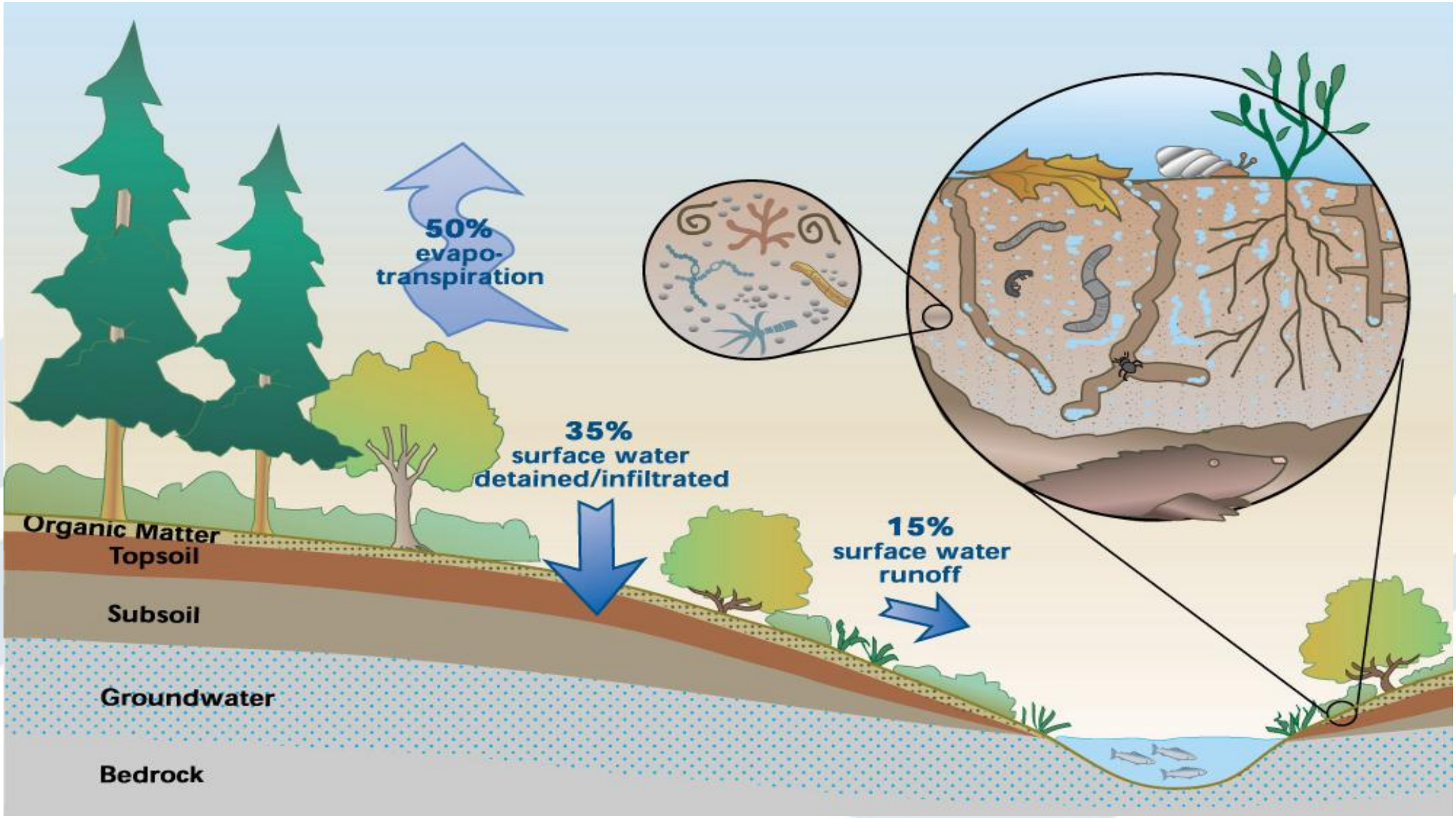

From King County

Disturbed Soil

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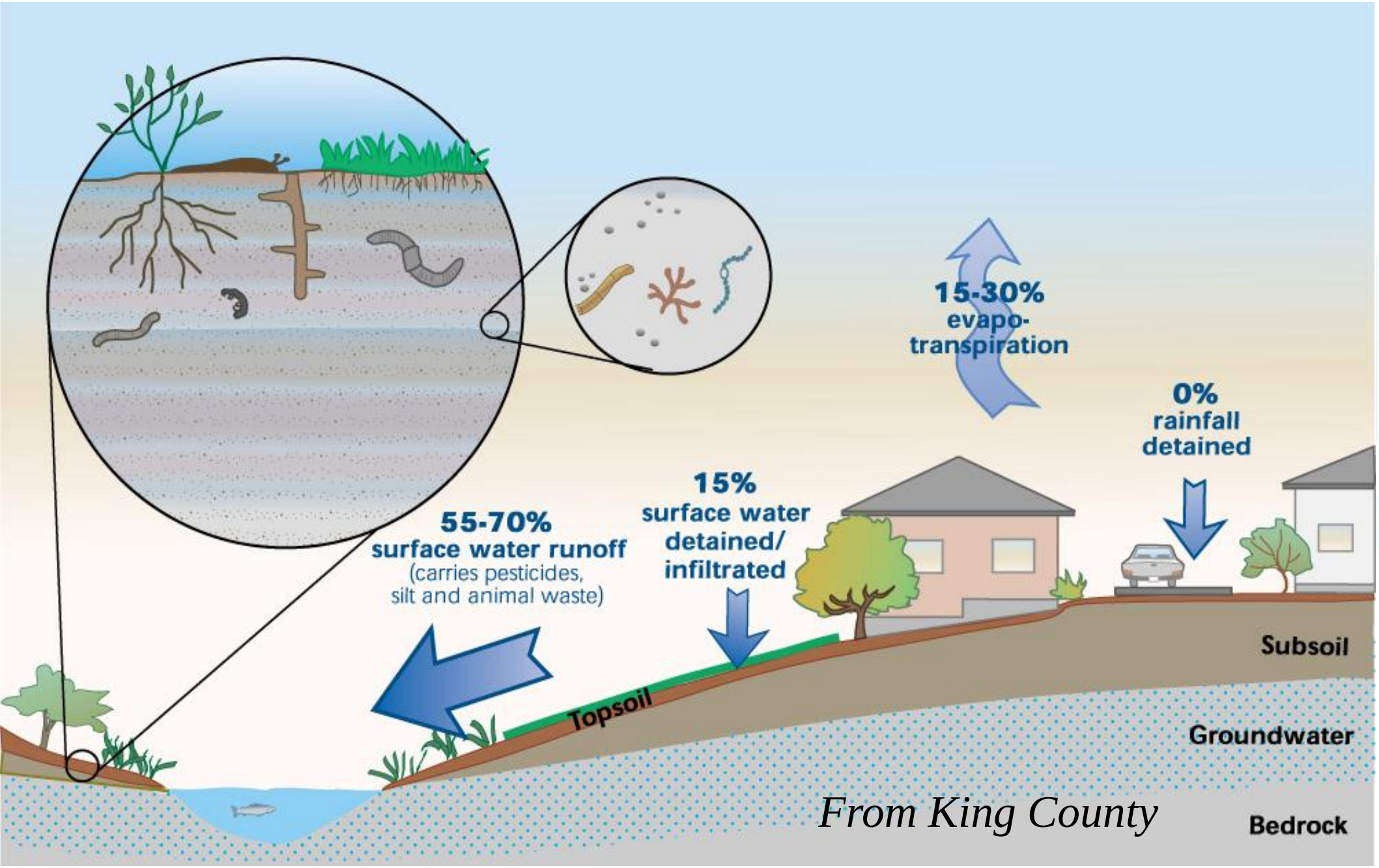

From King County

Storm + Dry weather runoff… It adds up!

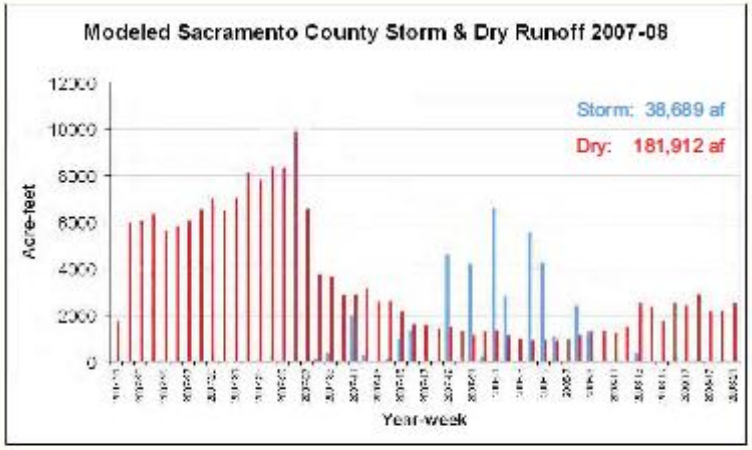

Dry Weather Runoff: 181,912 af

- Is approximately equivalent to:
  - Pyramid Lake (SoCal)… 171,000 af
  - Lake Matthews …… 182,000 af
  - New Spicer …… 189,000 af
  - Pardee …… 198,000 af
- …Or about half of:
  - Hetch Hetchy …… 360,000 af
  - Lake Sonoma …… 381,000 af

1 af = 1 family per year

Final Report. Evaluating Best Management Practices Effectiveness to Reduce Volumes of Runoff and Improve the Quality of Runoff From Urban Environments. Agreement Number: 04-231-550-3

346

Oki 2009

CWA – Permits

- Section 402 – Point Sources
  - The National Pollutant Discharge Elimination System (NPDES) – applies to all point sources of pollutants
  - Stormwater outfalls are considered "point sources" and these regulations apply to:
    - Industrial Sources (including Construction Activities)
    - Municipal Sources (large and small communities)

Stormwater Permit Coverage for Southern California

001320

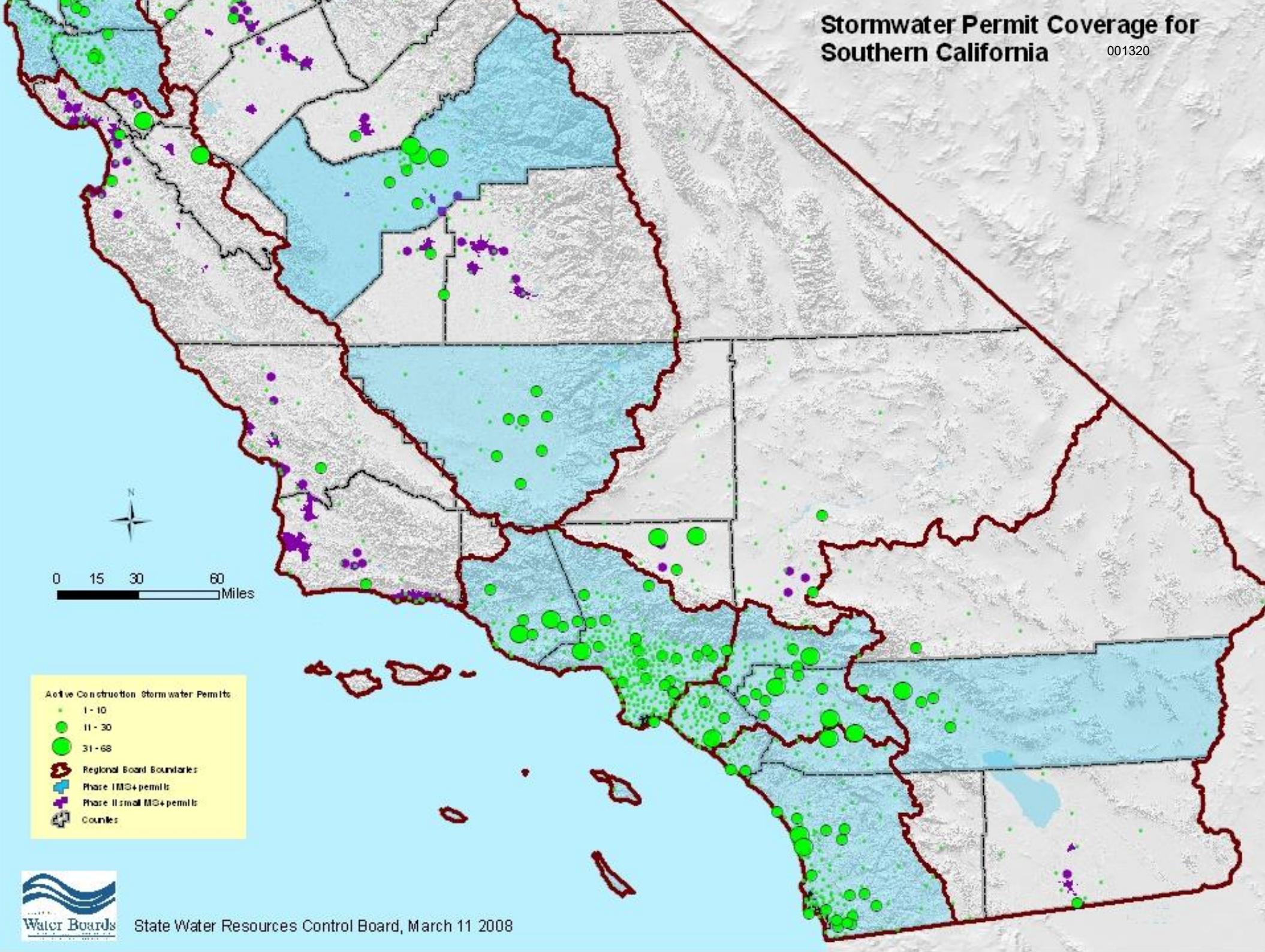

Water Boards

State Water Resources Control Board, March 11 2008

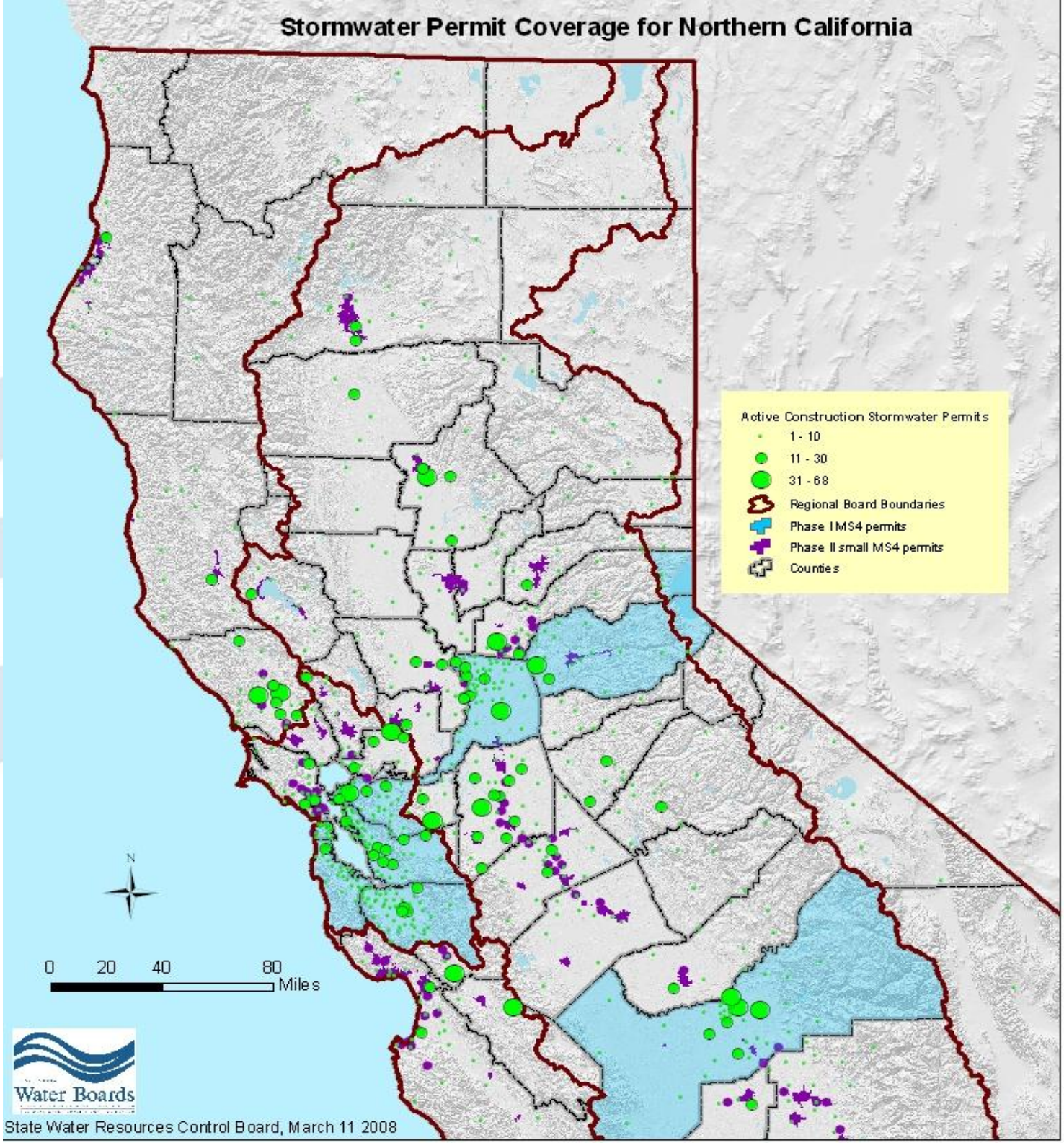
Stormwater Permit Coverage for Northern California
Active Construction Stormwater Permits
1 - 10
11 - 30
31 - 68
Regional Board Boundaries
Phase I MS4 permits
Phase II small MS4 permits
Counties
N
0 20 40 80
Miles
Water Boards
State Water Resources Control Board, March 11 2008

•CWA – Dredge and Fill Discharges

- Section 404/401 – regulate the direct discharges of dredge and fill material to US Waters
- US Army Corps issues 404 permit, which triggers the State's "401 Certification" (that the project complies with our standards)
- "401 Certifications" are one-time compliance tools that apply to many new developments in California, due in part to our abundance of ephemeral and intermittent streams

CWA – Total Maximum Daily Loads (TMDLs)

- If the beneficial uses are impaired, the State must adopt a TMDL that allocates pollutants to all the sources in a watershed
- TMDLs take a long time to develop and adopt

CWA – TMDLs

- They are watershed-based, but they are also pollutant (or impairment cause) specific, so they may or may not lead communities towards more sustainable approaches to Water Resource planning
- It's a Regulatory "Backstop"!

What can the Water Boards do to help implement/enforce the CWA?

- Appropriately designate, development and enforce appropriate Beneficial Uses.
- Develop effective criteria for protecting uses from pollutants and/or habitat disturbance associated with urbanization impacts.
- Get serious about identifying and protecting watershed processes (i.e., watershed protection).

Reason for Analysis

- HMP Permit requires flow control based on a low flow threshold that corresponds with critical shear stress
- *"Do field observations confirm that the HMP appropriately defines the flow rate that initiates movement of channel bed or bank materials?"*
- Three different low flow thresholds based on channel susceptibility (Bledsoe et al., 2010; Brown and Caldwell, 2011)
  - 0.1Q2 for HIGH susceptibility
  - 0.3Q2 for MEDIUM susceptibility
  - 0.5Q2 for LOW susceptibility

Low Flow Thresholds (thanks Brian Haines)

County	Low Flow Threshold or Peak Flow	How developed?
Santa Clara County	0.1Q2	Limited regional field studies and un-calibrated modeling
Alameda, Contra Costa and San Mateo	0.1Q2	Based on Santa Clara precedent
Fairfield-Suisun	0.2Q2	Limited regional field studies and un-calibrated modeling
LA County (interim)	Match Q2	Not developed yet
San Bernardino	Match Q1, Q2, Q5	Not developed yet
Ventura	Qcrit	Not developed yet
San Diego	**0.1-0.5Q2**	**Sensitivity analysis based on modeling different channel types**
South Orange	0.1Q2 (default)	Based on Bay Area precedent?
Sacramento	0.25Q2, 0.45Q2	Soil tests, shear
Santa Ana (Riverside)	Variable	Shear ratio

Analytical Approach

- STEP 1: Define the 2-year discharge
  - No gauge data = need to estimate
  - Phase 1 - regional regression equations
  - Phase 2 - continuous simulation modeling
- STEP 2: Develop transport rating curves
  - Site specific analysis, flow and sediment
  - Compare <u>measured</u> threshold to estimated 2-year discharge
  - How do observed transport thresholds compare with the range of flow thresholds in the HMP? Do we need to adapt or modify in future?

State Water Board's Watershed Management Initiative (1996)

"water quality and ecosystem problems are best prioritized, addressed, and solved at the local watershed level rather than at the individual discharger, waterbody, or state agency level……"

Watershed Approach (CA Urban Water Conservation Council)

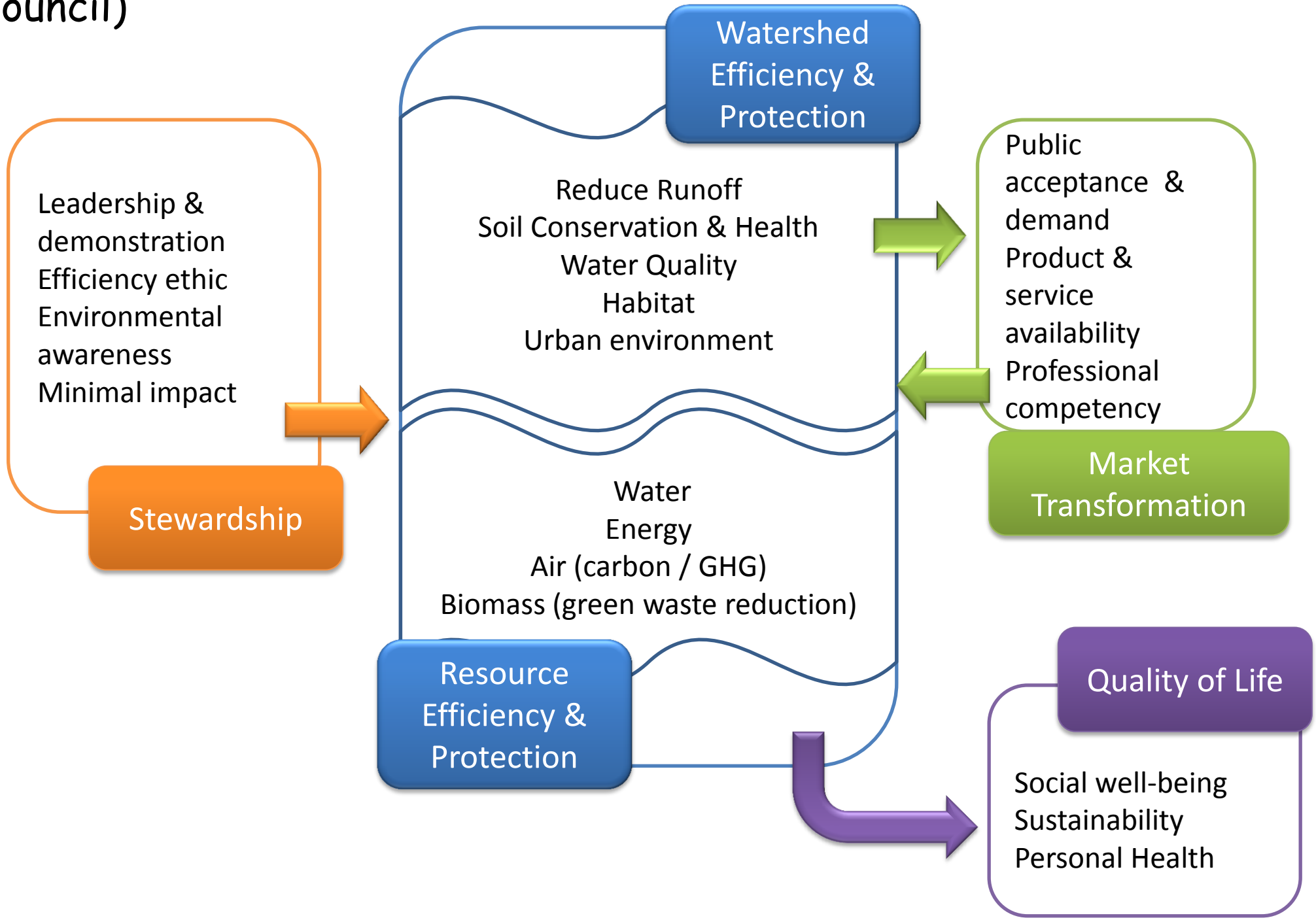

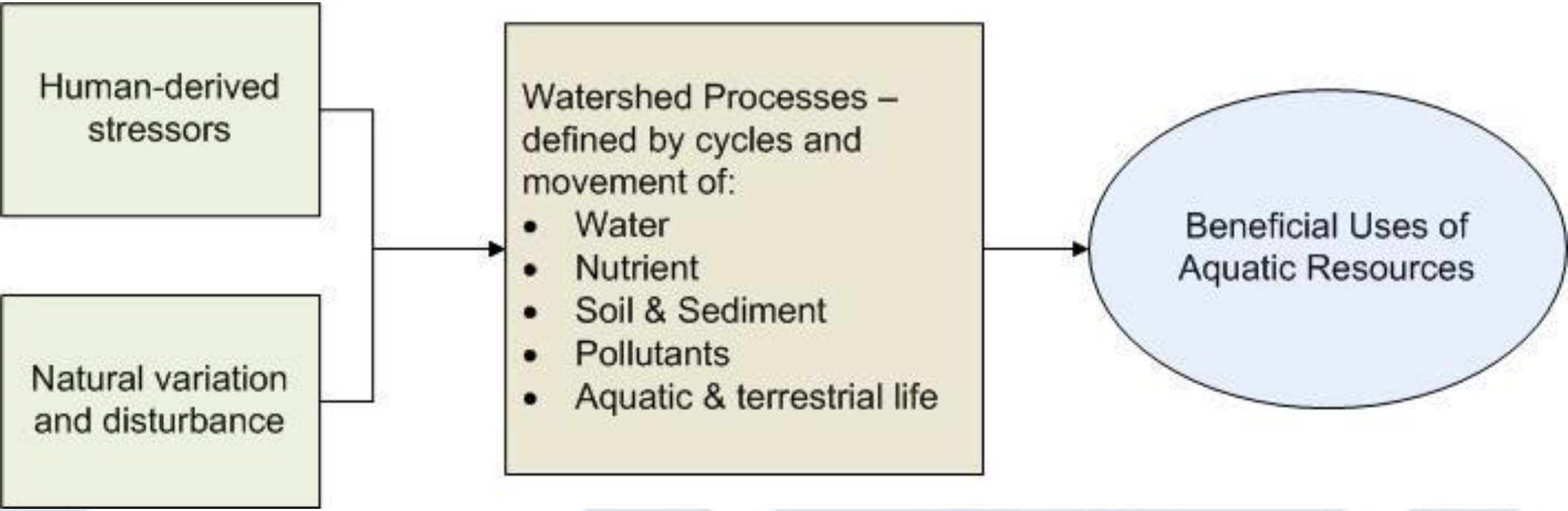
Human-derived stressors
Natural variation and disturbance
Watershed Processes – defined by cycles and movement of:
• Water
• Nutrient
• Soil & Sediment
• Pollutants
• Aquatic & terrestrial life
Beneficial Uses of Aquatic Resources

Watershed Management Zones for Colusa and Yolo County

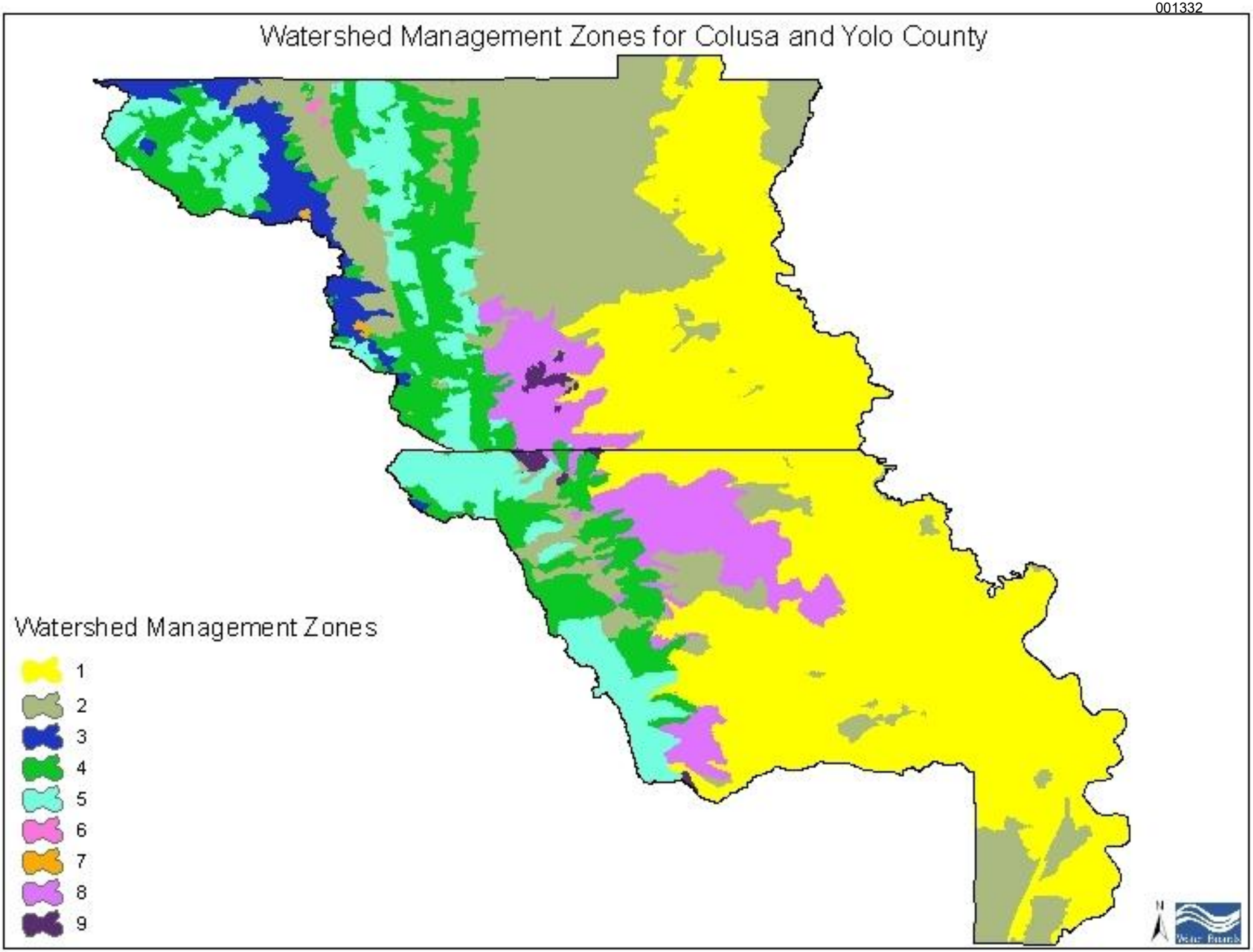

Implementation Measures to protect Watershed Processes

- Vegetation and Soil Enhancement
- Riparian Buffers/Setbacks
- Low Impact Development

Lawn is the largest irrigated "crop" in the US

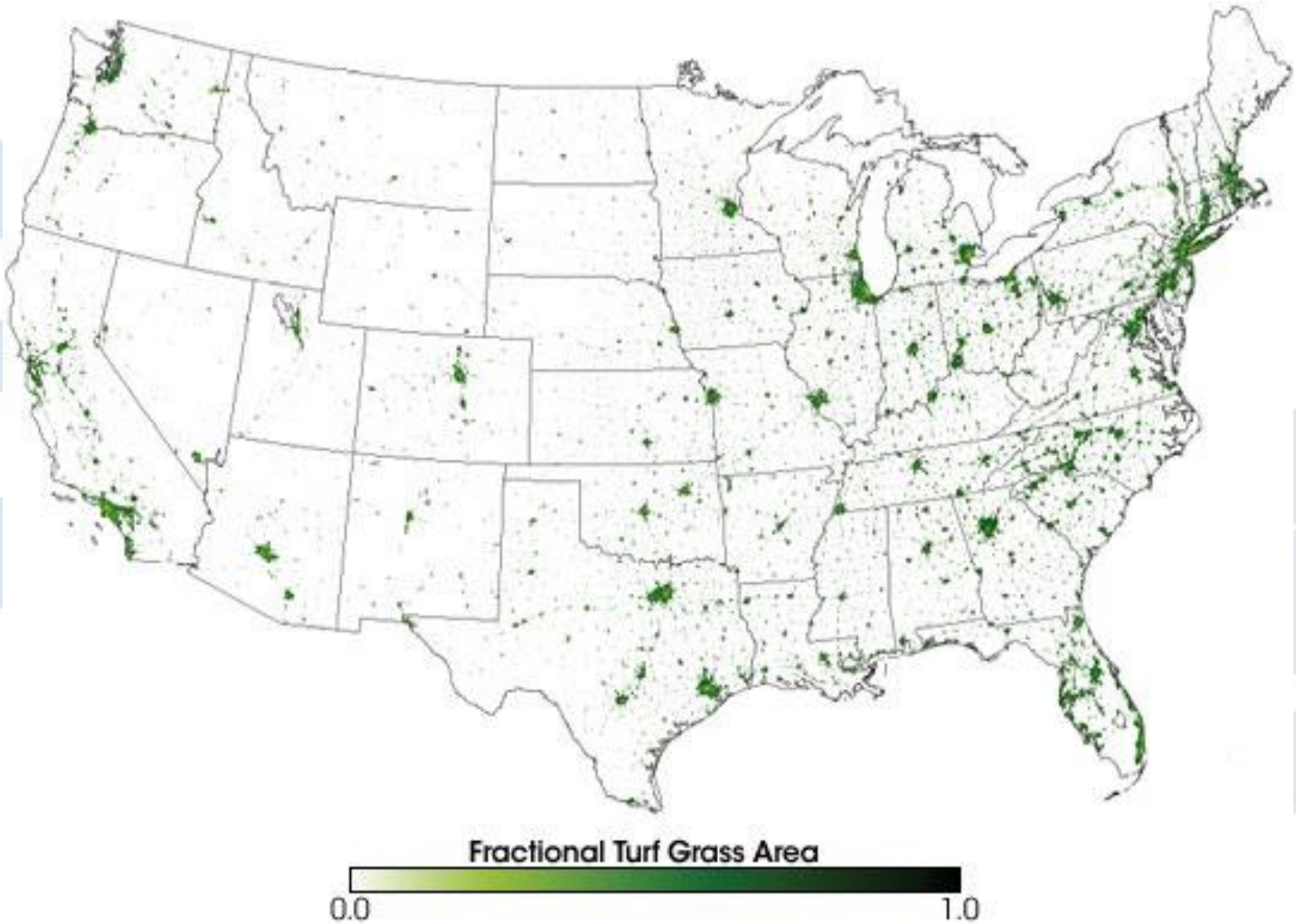

From NOAA

We tend to overwater our landscapes

- Stresses plants-makes them more prone to disease/infestations

- We usually break out the heavy artillery (herbicides/pesticides)

DEADLY HOTSPOTS

Death comes to us all in the end but how you'll go is anyone's guess.
We've gathered the global evidence to discover where you're most likely to die of what.
Think of it as a commemoration of mortality, in true Mexican Day of the Dead style.

All figures from 21st century sources, majority of data for 2008, including World Health Organisation, Nation Master, UN and others. Very low absolute figures (2 or fewer deaths per country per year) were disregarded. Heart disease covers all cardiovascular diseases and stroke. *No-one has been killed by a meteor yet, but Antarctica has 15 times more strikes than anywhere else (so if you're going to be killed by an interstellar projectile...)

iib studio

OPEN SPACE

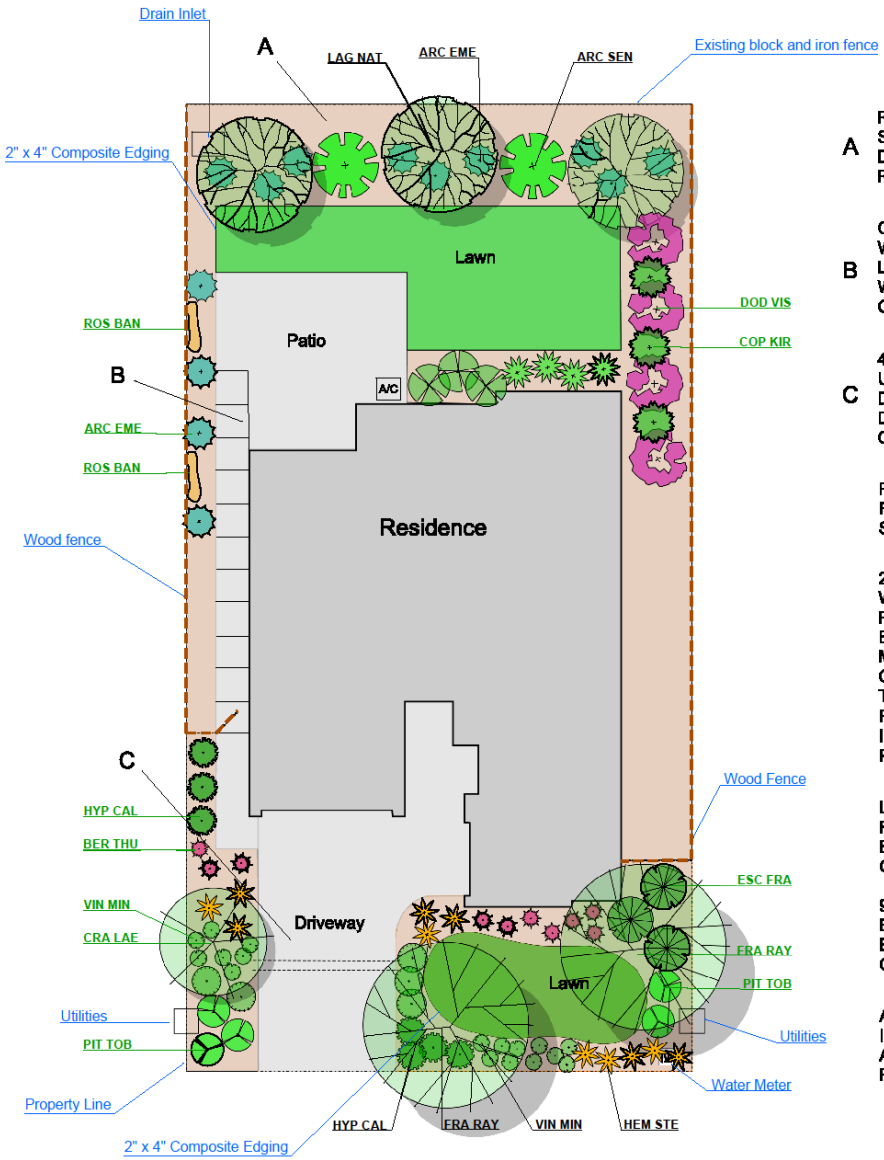

NOTES

A REFER TO GRADING PLAN STORMWATER MANAGEMENT DRAINAGE SWALE: RIVERBED MIX COBBLE

B CONCRETE STEPS/ WALKWAY WITH 4' X 4' LANDINGS. PATIO AND WALKWAY NON-PERVIOUS CONCRETE

C 4" SLEEVE CONDUIT UNDER DRIVEWAY. LOCATION DETERMINED ON SITE. DRIVEWAY NON-PERVIOUS CONCRETE

REFER TO PLANT LIST FOR QUANTITIES AND SIZES

2 TO 3" ORGANIC BROWN WALK-ON MULCH IN ALL PLANTING AREAS TO COVER EXPOSED SOIL SURFACES. MULCH NOT TO BE IN CONTACT WITH BASES OF TREES OR OTHER PLANTS REFER TO PLANTING INSTRUCTIONS FOR PROPER INSTALLATION

LAWNS: 90% / 10% TALL FESCUE / BLUEGRASS (DELTA BLUEGRASS). INSTALL PER GROWER'S INSTRUCTIONS.
OR
95% / 5% MUSTANG FESCUE BLEND / BRONCO KENTUCKY BLUEGRASS WITH 2" X 4" COMPOSITE EDGING

AMEND SOIL IN ALL PLANTING AREAS / BEDS PER SOIL ANALYSIS AND RECOMMENDATIONS

SHEET: 1 of 2	SCALE: 1/8" = 1 ft. 0 in.	DRAWN BY: Cheryl Buckwalter CHECKED BY: CB	JOB NUMBER: 1 DATE: June 27, 2010	REVISION: Rev. 3	**PROJECT:** Riata - Lot 23 - Lefevre Drive Empire Ranch Village 35 Folsom, CA

SHEET DESCRIPTION:
Conceptual Landscape Plan
For:
Elliott Homes

Landscape Liaisons
P.O. Box 218
Cool, CA 95614

MetroList®
001338

001339

001341

001342
Eric Berntsen
916-341-5911
eberntsen@waterboards.ca.gov

Flood Mitigation and Water Conservation

Flood Control District
County of Los Angeles

By
Iraj Nasseri, P.E., Ph.D

Mission of Flood Control District

1. Control of Excess Water:

- *Storm Drains*
- *Flood Control Channels*
- *Detention Basins*
- *Debris Basins*
- *Dams and Reservoirs*
- *Pump Stations*

2. Water Conservation (Quantity and Quality):

- *Groundwater Recharge Basins*
- *Reservoirs – Rubber Dams*
- *Control of Seawater Intrusion*
- *Capture and Treatment of Storm Runoff Pollutants*
- *.Mitigate Hydromodification Impacts*

Major Facilities Control and Conservation of Flood Waters

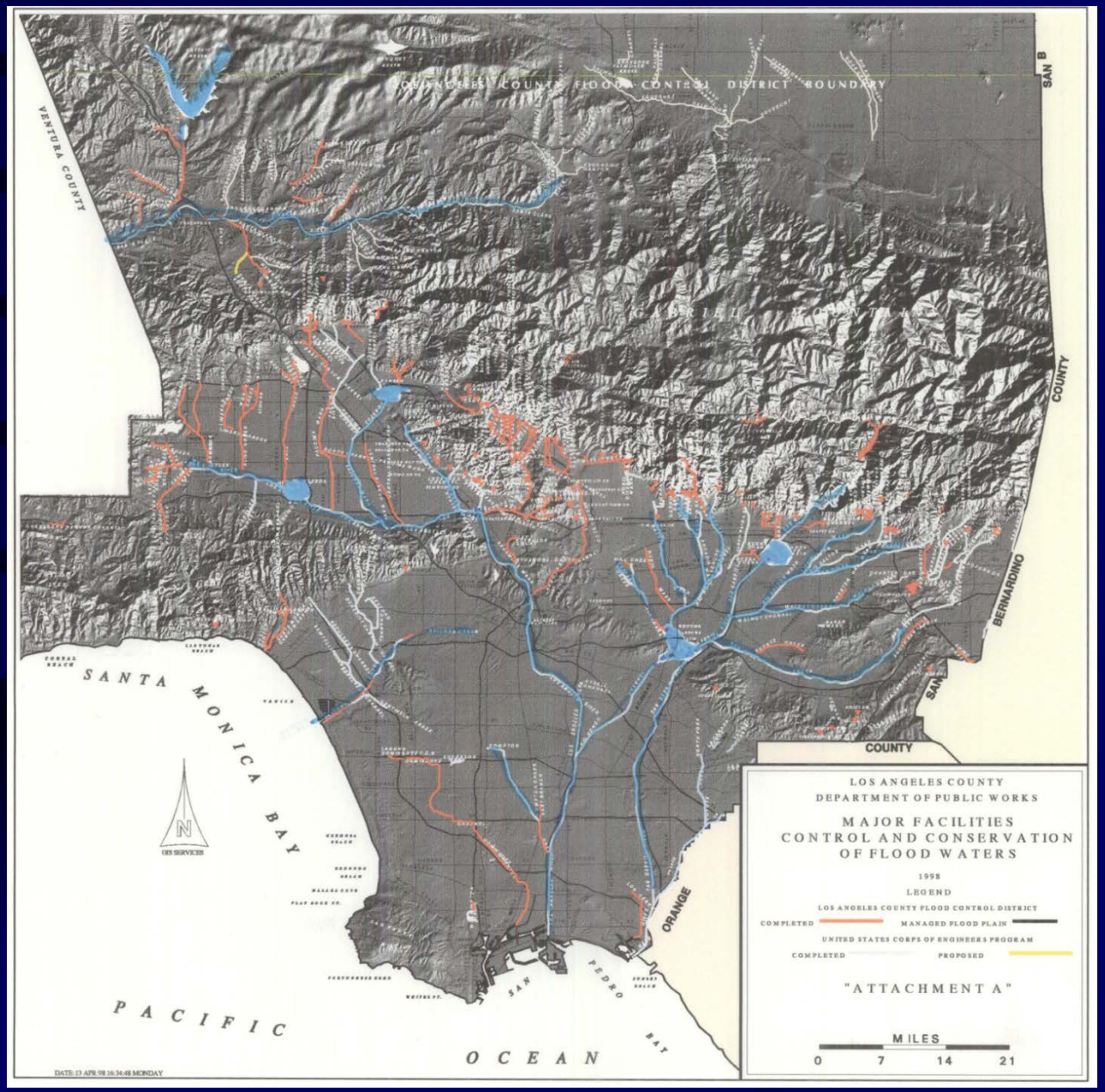

Major Watersheds in LA County

Los Angeles County Pictures

Coastal Area

Los Angeles County Pictures

Coastal Wetland

Los Angeles County Pictures

Desert Area Near Lancaster

Los Angeles County Pictures

001350

Antelope Valley

Los Angeles County Rivers and Channels

Malibu Creek

Los Angeles County Rivers and Channels

Bouquet Canyon

Los Angeles County Rivers and Channels

Upper Portion of San Gabriel River

Los Angeles County Rivers and Channels

Santa Clara River Downstream of Magic Mountain Parkway

Hydrologic Data Collection

Hydrologic Data Collection

001356

A rain gage is used to measure the amount of rainfall at a point of observation.

An outflow recorder is used to measure the amount of surface runoff at a point of observation.

The accurate measurement of rainfall and runoff is the essential foundation for quantitative hydrologic analyses.

Hydrologic Data Collection

001357

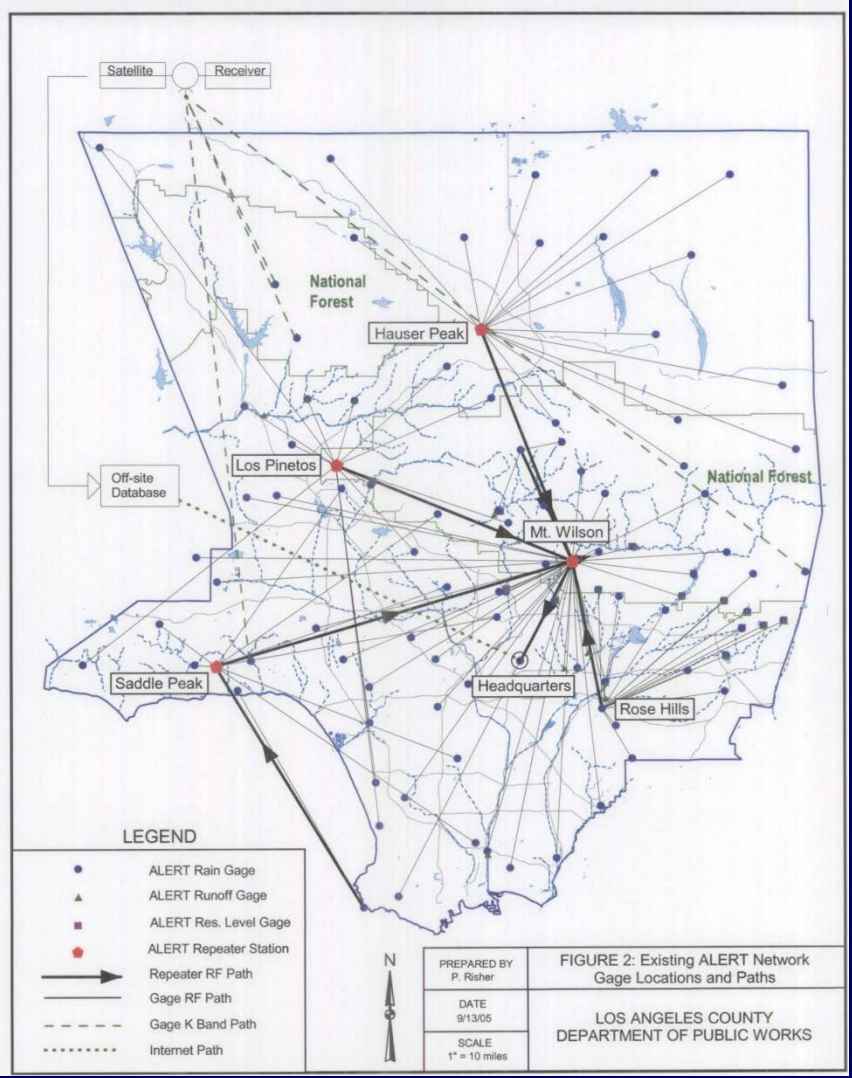

LA County ALERT Network: Gage Locations and Paths

Hydrologic Data Collection

001358

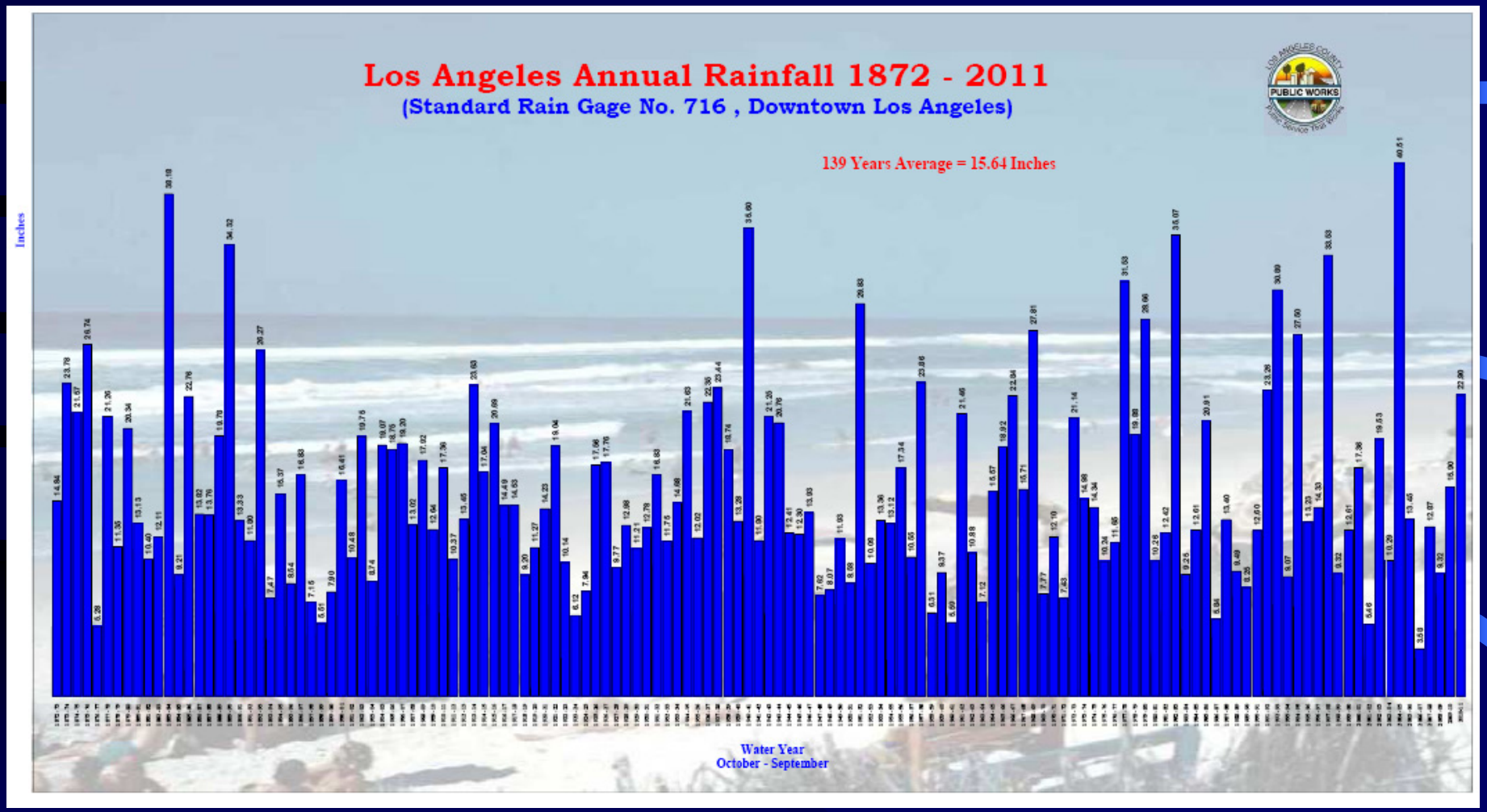

Los Angeles Annual Rainfall 1872-2011

Hydrologic Data Collection

001359

Industrial/Commercial

Residental

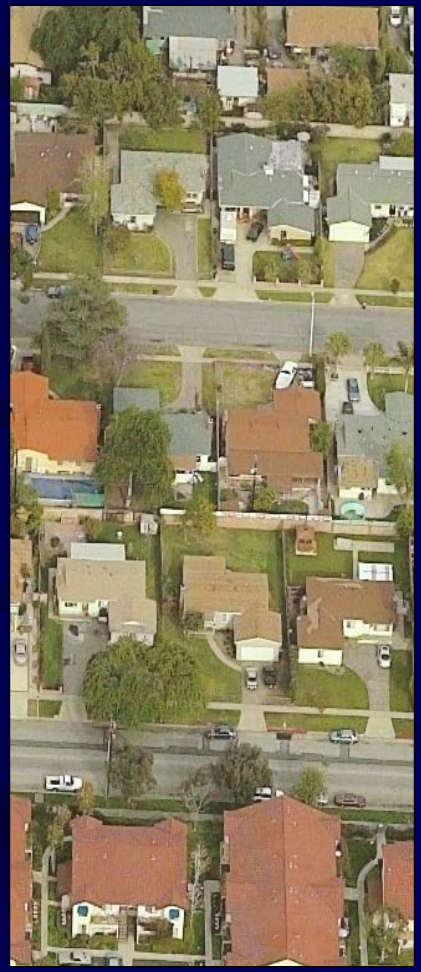

Rural

Different Types of Land Use

Hydrologic Data Collection

001360

Street Flow After 1938 Storm

Hydrologic Data Collection

001361

Appian Way in Long Beach After 1938 Storm

Hydrologic Data Collection

001362

Flooded Sump at Intersection of San Fernando Road and Tuxford Street
After January 2005 Storms

Control of Debris Flows

Control of Debris Flows

Williams Fire of 2002 in the San Gabriel Mountains, Viewed from Santa Fe Dam

Control of Debris Flows

001365

Downstream of Hook Canyon in Glendora After 1969 Storms

Control of Debris Flows

001366

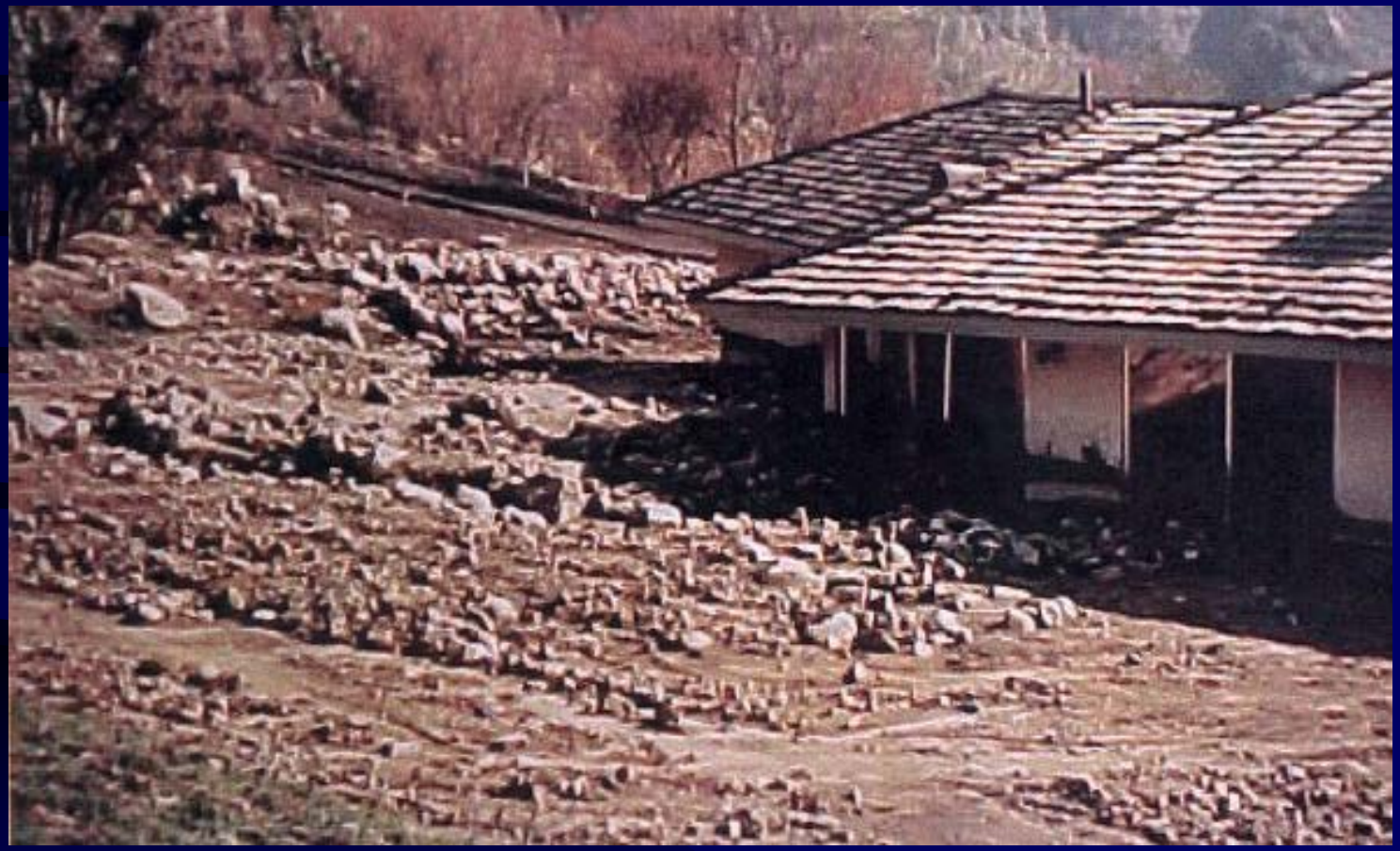

Glencoe Heights After 1969 Storms

Control of Debris Flows

001367

Buena Vista Debris Basin

Dams and Reservoirs

Dams and Reservoirs

001369

Big Dalton Dam and Reservoir

Dams and Reservoirs

001370

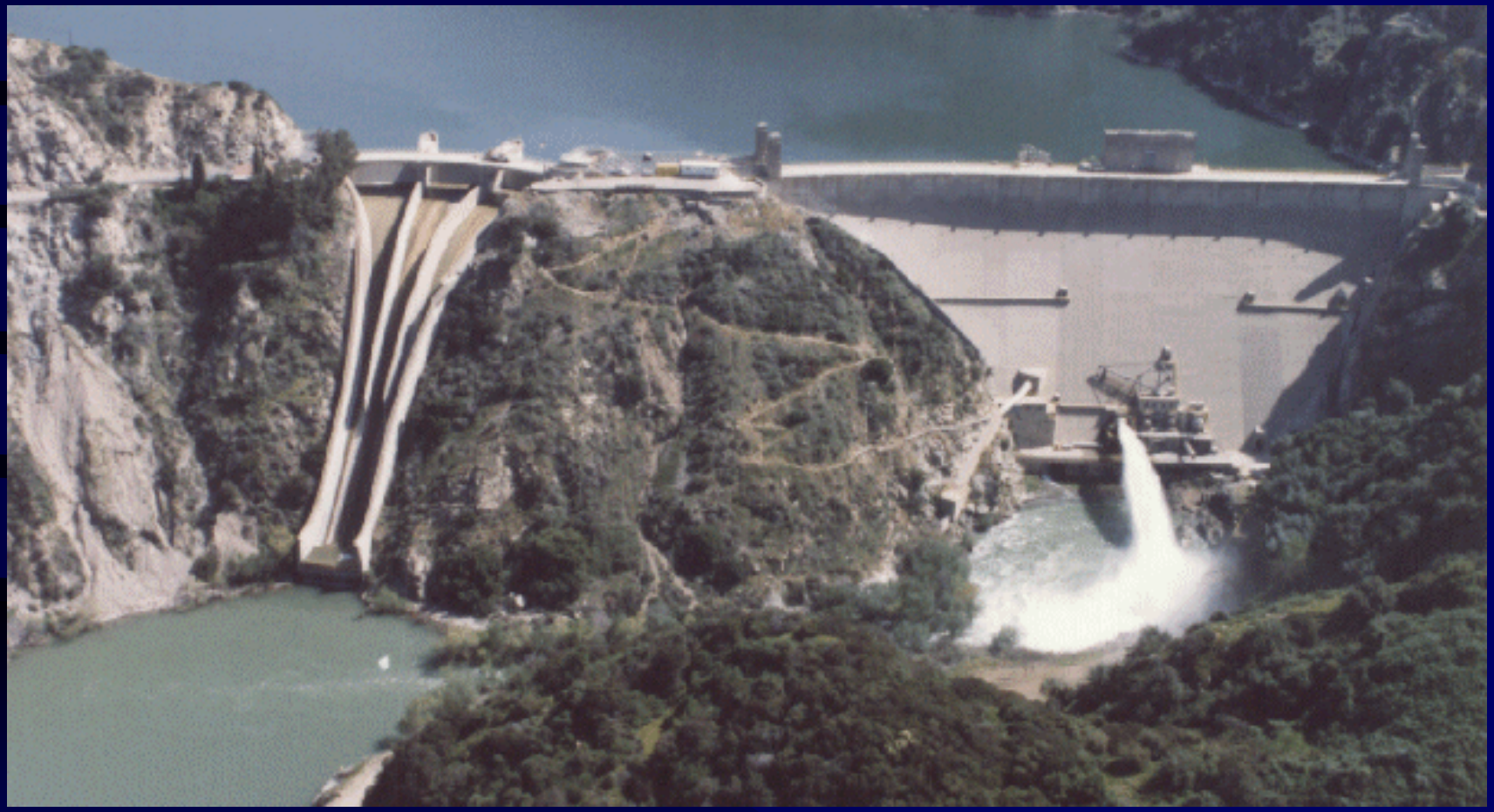

Morris Dam

Dams and Reservoirs

001371

San Gabriel Reservoir

Dams and Reservoirs

001372

Rubber Dam Located in the Lower Portion of the San Gabriel River

Water Conservation (Quantity and Quality)

Water Conservation (Quantity and Quality)

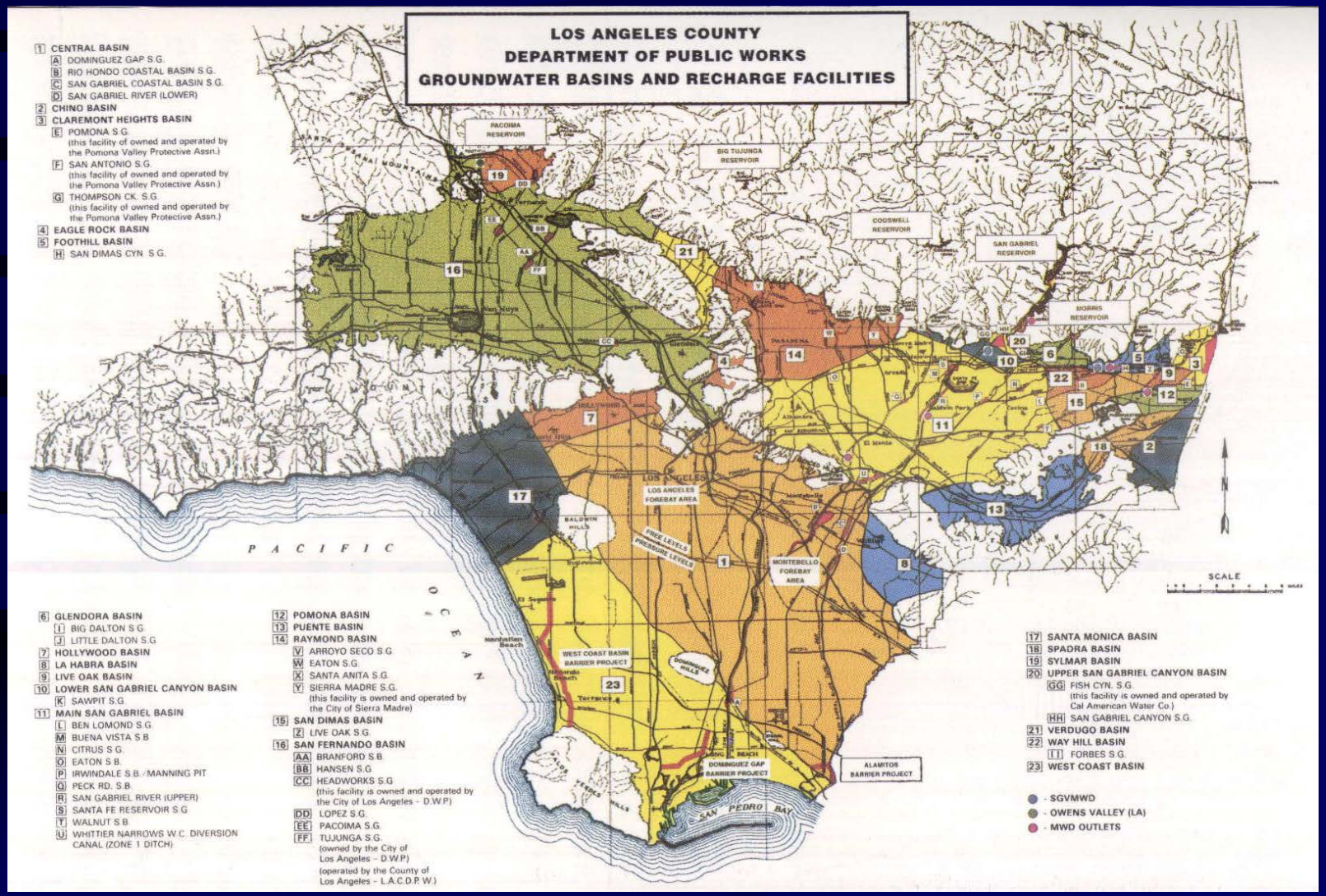

Map of Groundwater Basins and Recharge Facilities in LA County

Water Conservation (Quantity and Quality)

Major Aqueducts in California

Water Conservation (Quantity and Quality)

Arroyo Seco Spreading Grounds in Pasadena

Water Conservation (Quantity and Quality)

Seawater Barriers

PURPOSE:

Seawater Barriers protect a significant portion of the area's drinking water supply by essentially forcing out ocean water which constantly attempts to migrate into existing aquifers. Treated reclaimed and imported water is injected deep into geologic formations.

LADPW – Water Resources Division operates and maintains 3 Seawater Barriers along the California coastline:

1) Alamitos Barrier

2) West Coast Basin Barrier

3) Dominguez Gap Barrier

Water Conservation (Quantity and Quality)

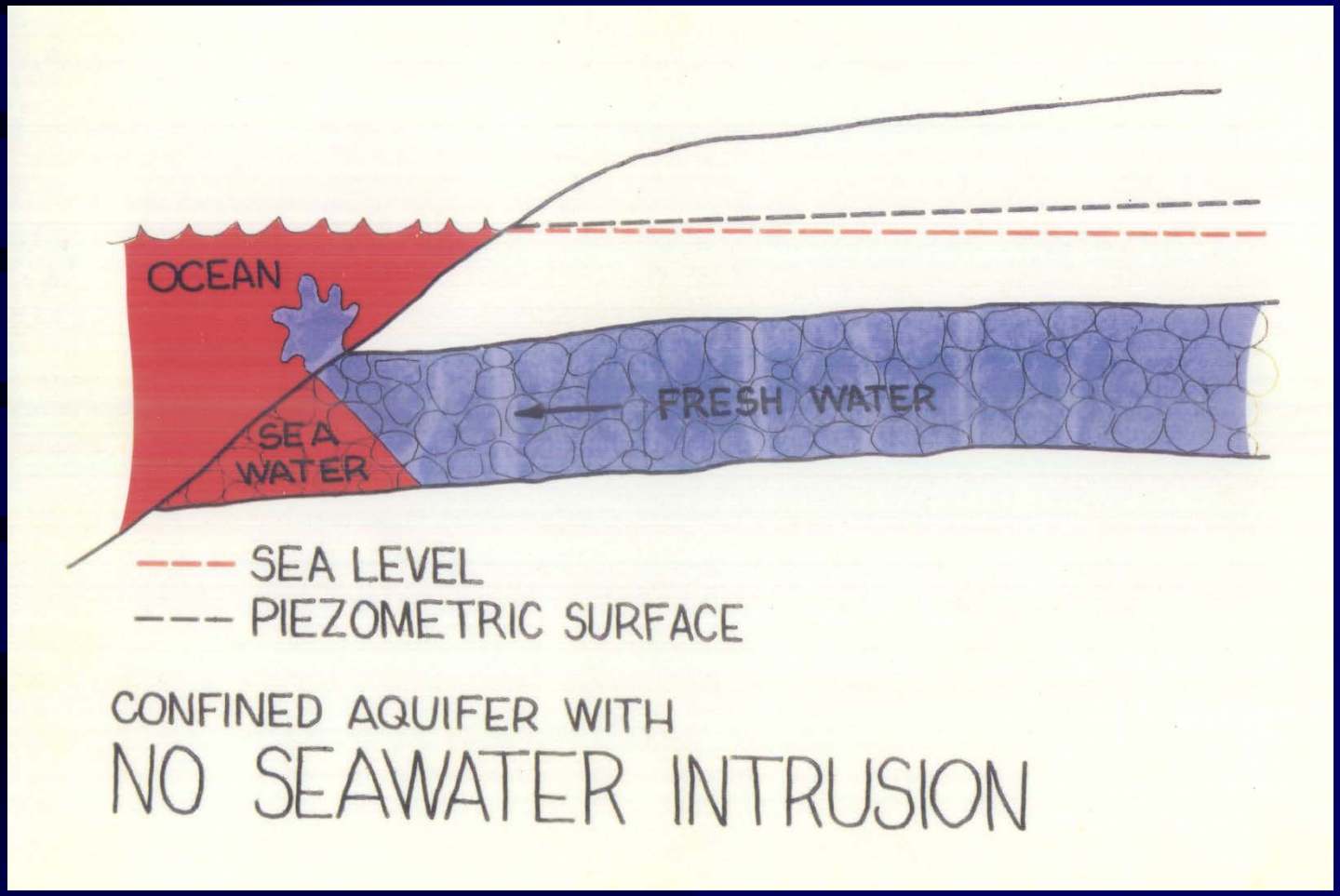

Confined Aquifer with no Seawater Intrusion

Water Conservation (Quantity and Quality)

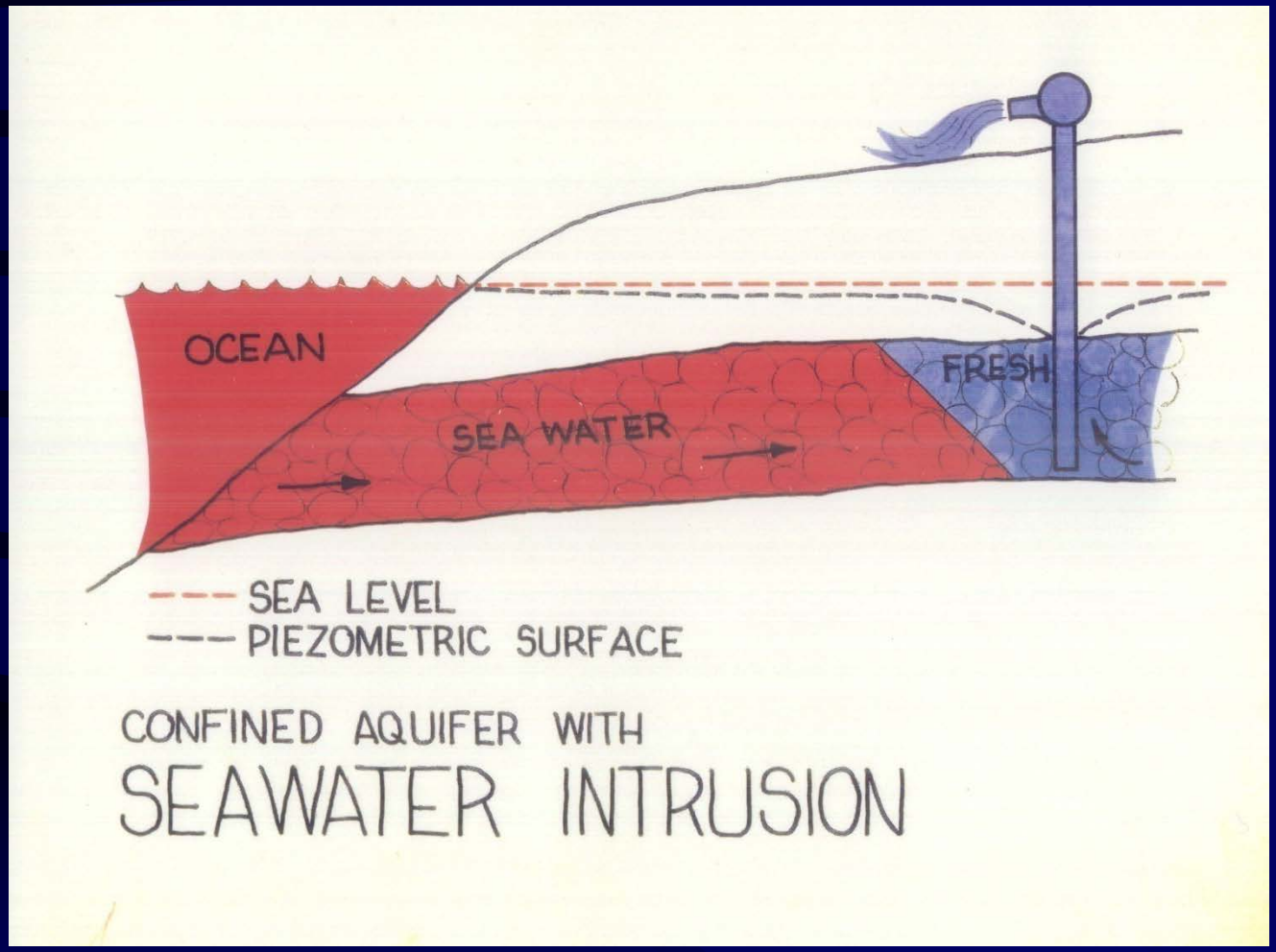

Confined Aquifer with Seawater Intrusion

Water Conservation (Quantity and Quality)

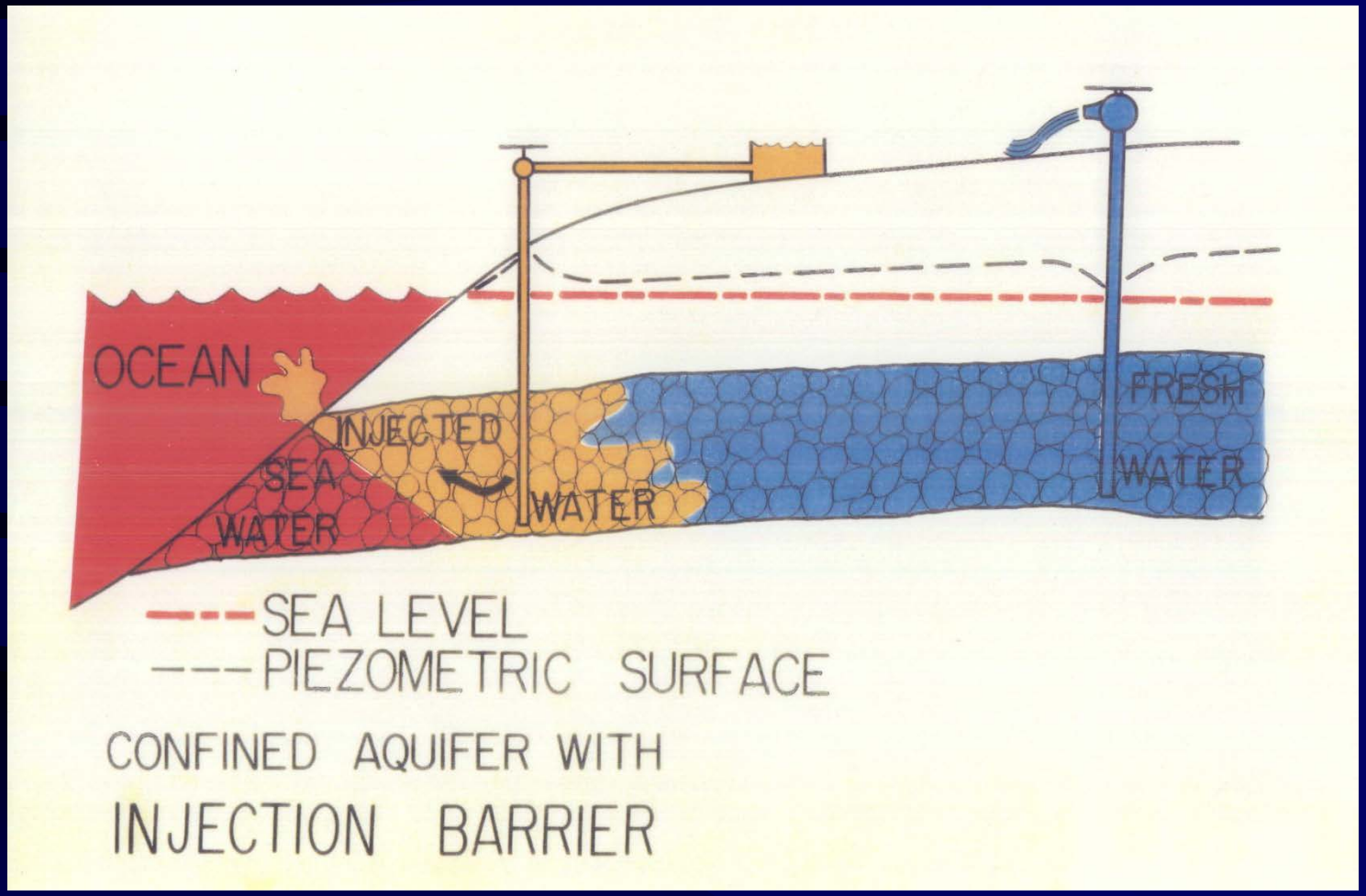

Confined Aquifer with Injection Barrier

Water Conservation (Quantity and Quality)

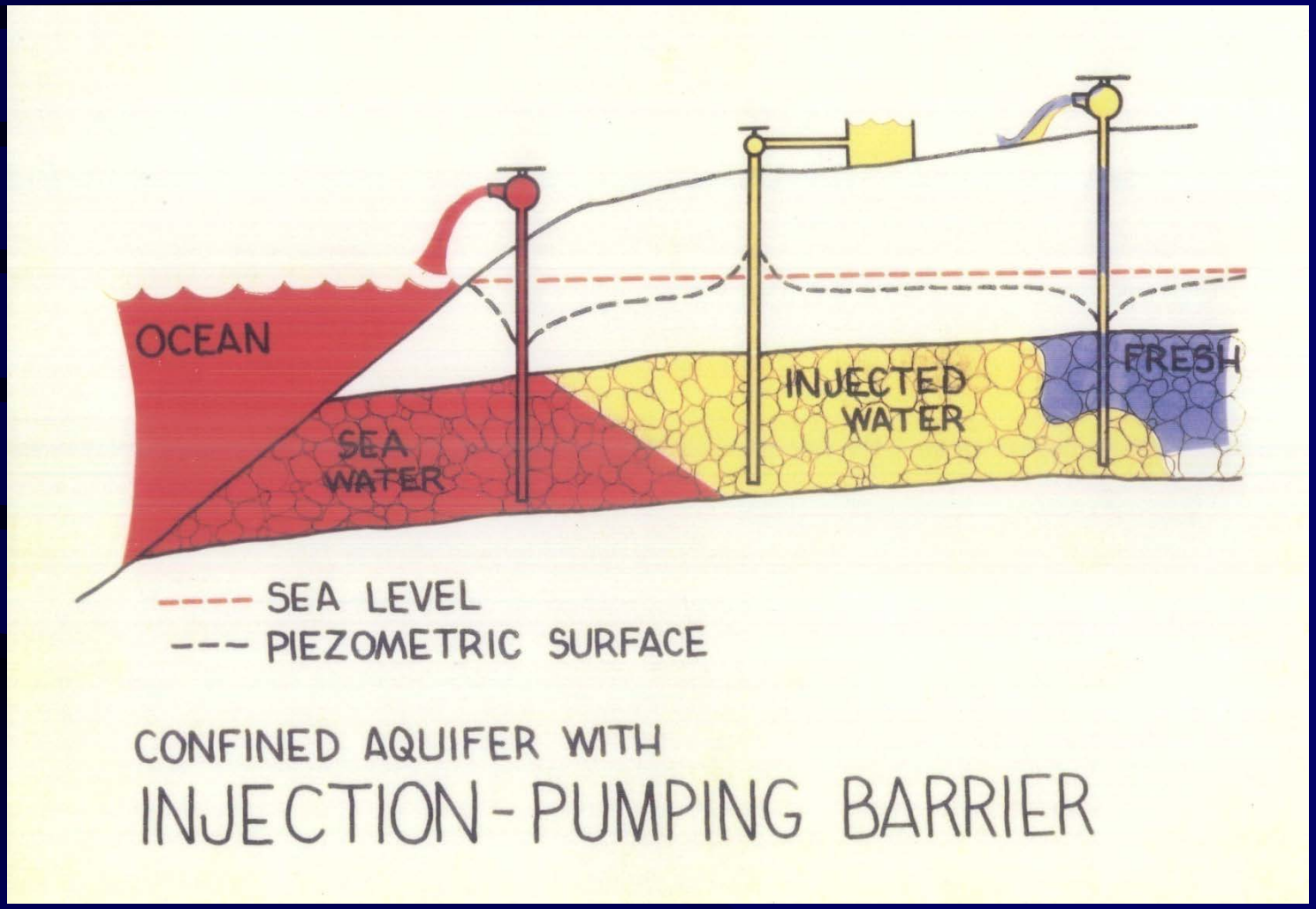

Confined Aquifer with Injection-Pumping Barrier

Los Angeles River Annual Runoff Volume (Ac-Ft) 1955 -2007

(Station F319, L.A. River below Wardlow Rd.)

52 Year Average = 234,390 AF

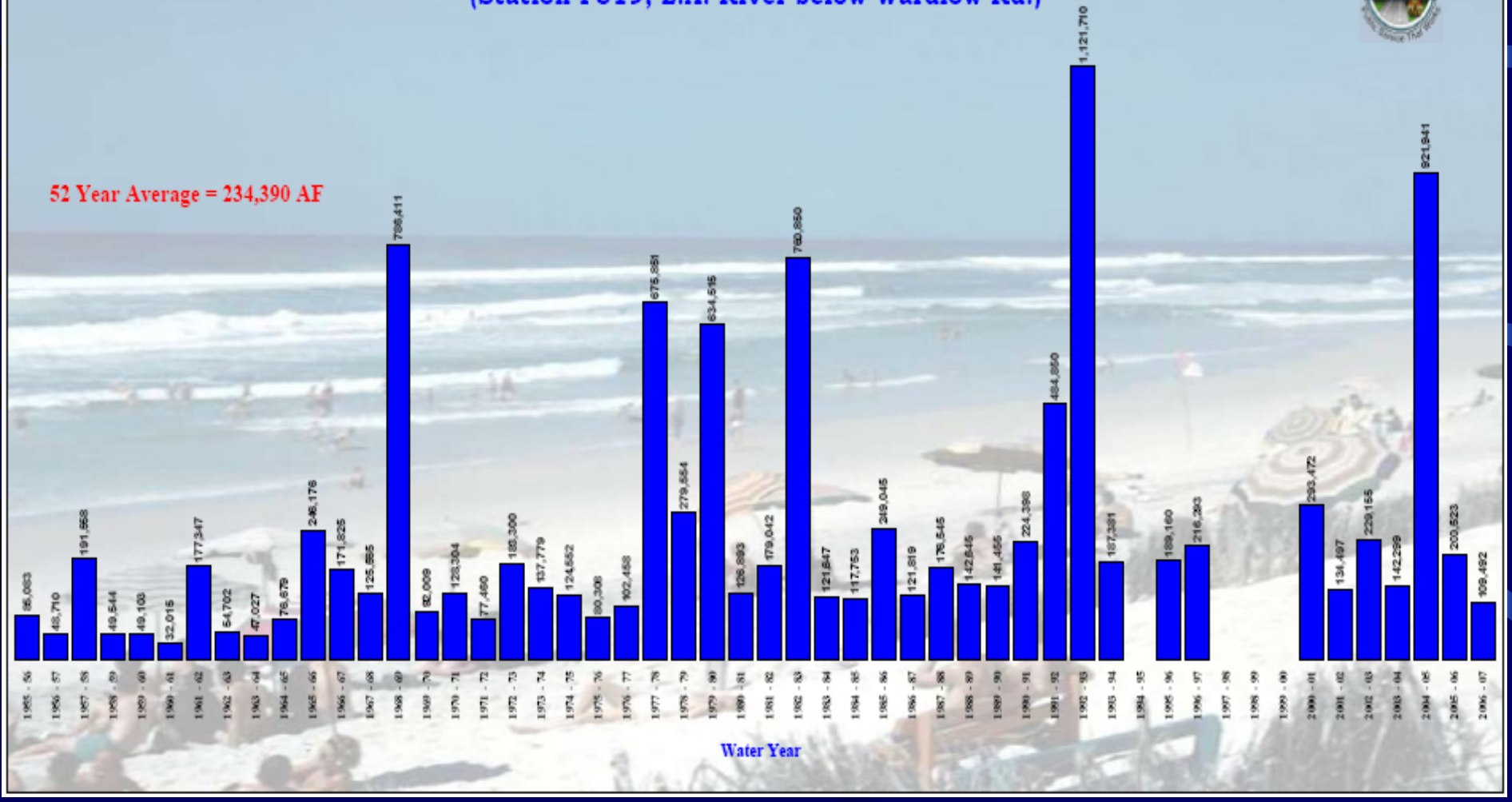

San Gabriel River Annual Runoff Volume (Ac-Ft) 1931 -2007

(Stations F42 & F42B, San Gabriel River Above Spring St.)

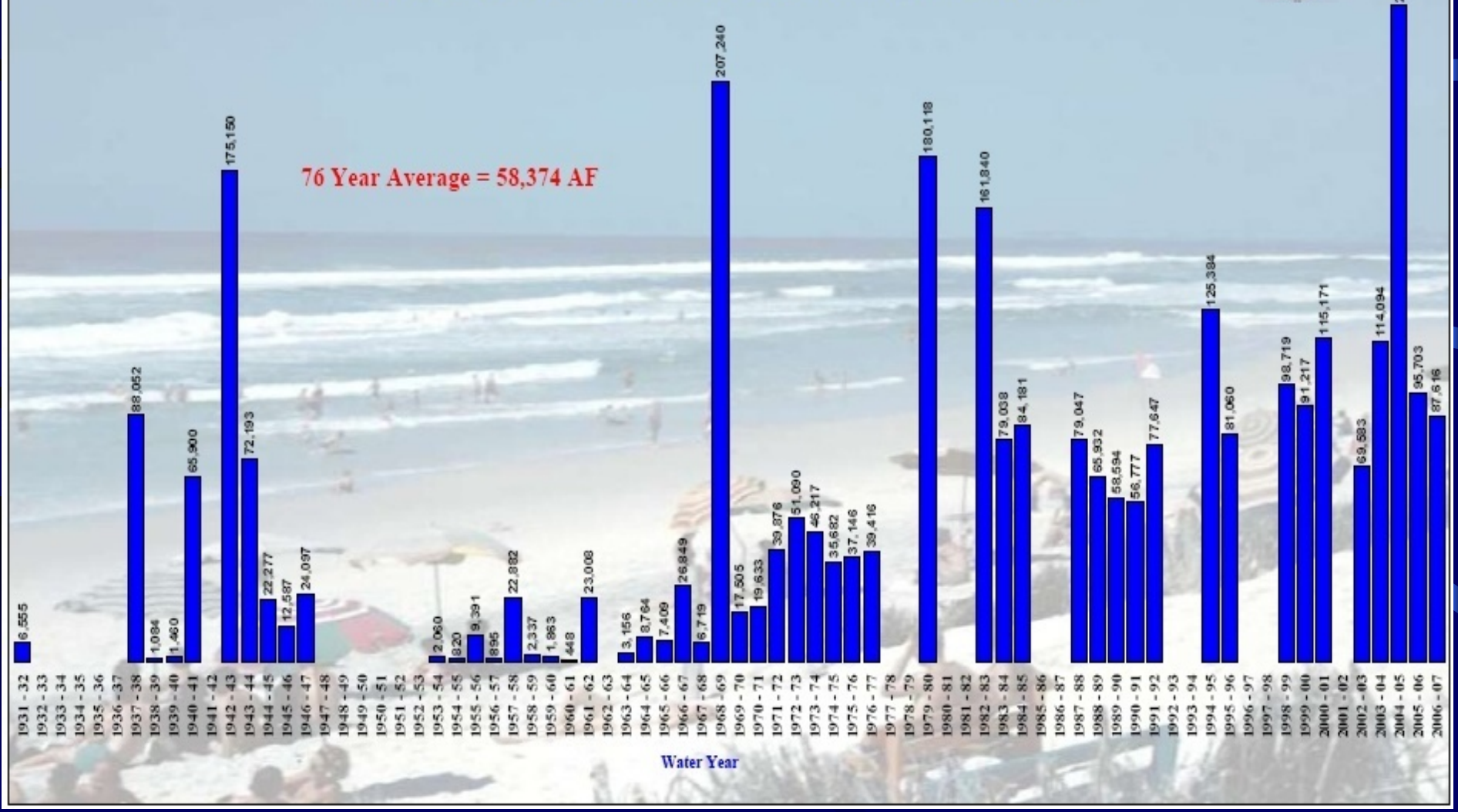

Ballona Creek Annual Runoff Volume (Ac-Ft) 1931-2007

(Stations F38, F38B, & F38C, Ballona Creek Above Sawtelle Blvd.)

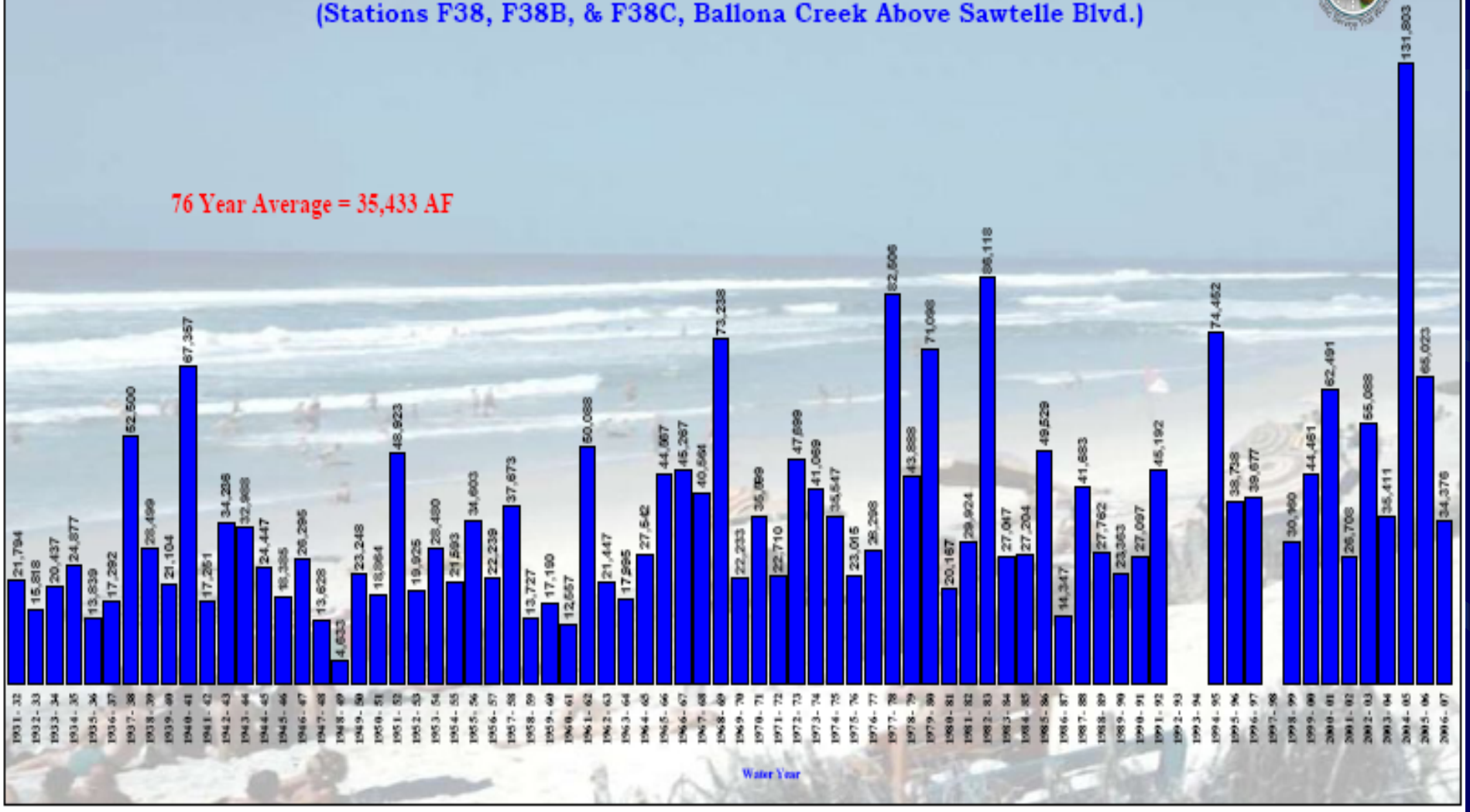

Malibu Creek Annual Runoff Volume (Ac-Ft) 1931-2007

(Station F130, Malibu Creek below Cold Creek)

76 Year Average = 19,543 AF

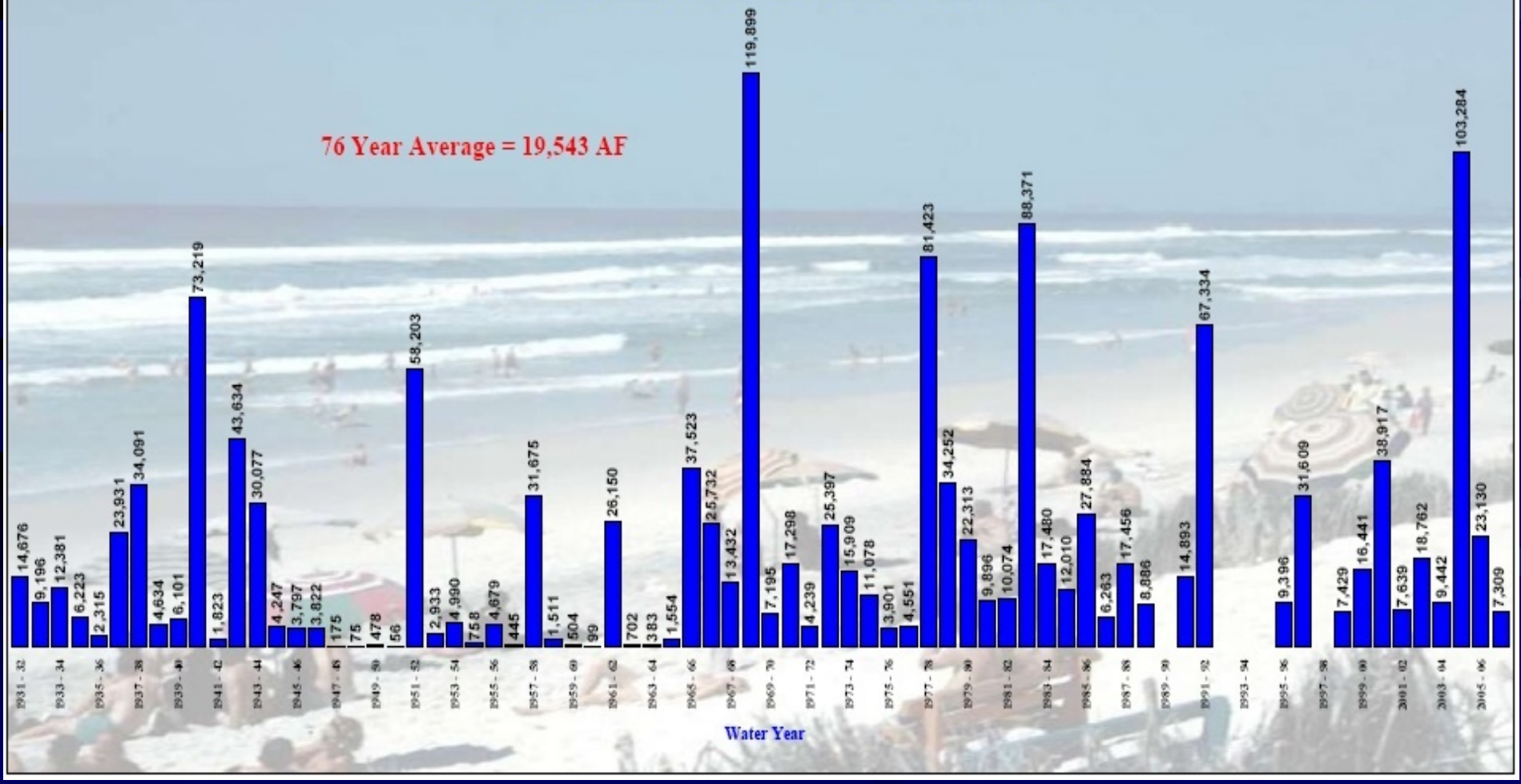

LONG TERM STORAGE POTENTIAL OF SURFACE WATER IN LOS ANGELES COUNTY

LOS ANGELES RIVER	234,390 AC-FT/YR
SAN GABRIEL RIVER	58,374 AC-FT/YR
BALLONA CREEK	35,433 AC-FT/YR
MALIBU CREEK	19,543 AC-FT/YR
TOTAL	347,740 AC-FT/YR

LONG TERM STORAGE POTENTIAL FOR CONJUNCTIVE USE IN LOS ANGELES COUNTY

SAN FERNANDO VALLEY BASINS	150,000 AC-FT
RAYMOND BASIN	144,000 AC-FT
SAN GABRIEL BASIN	400,000 AC-FT
COASTAL BASIN	1,089,000 AC-FT
TOTAL	1,783,000 AC-FT

Hydrologic Cycle

001387

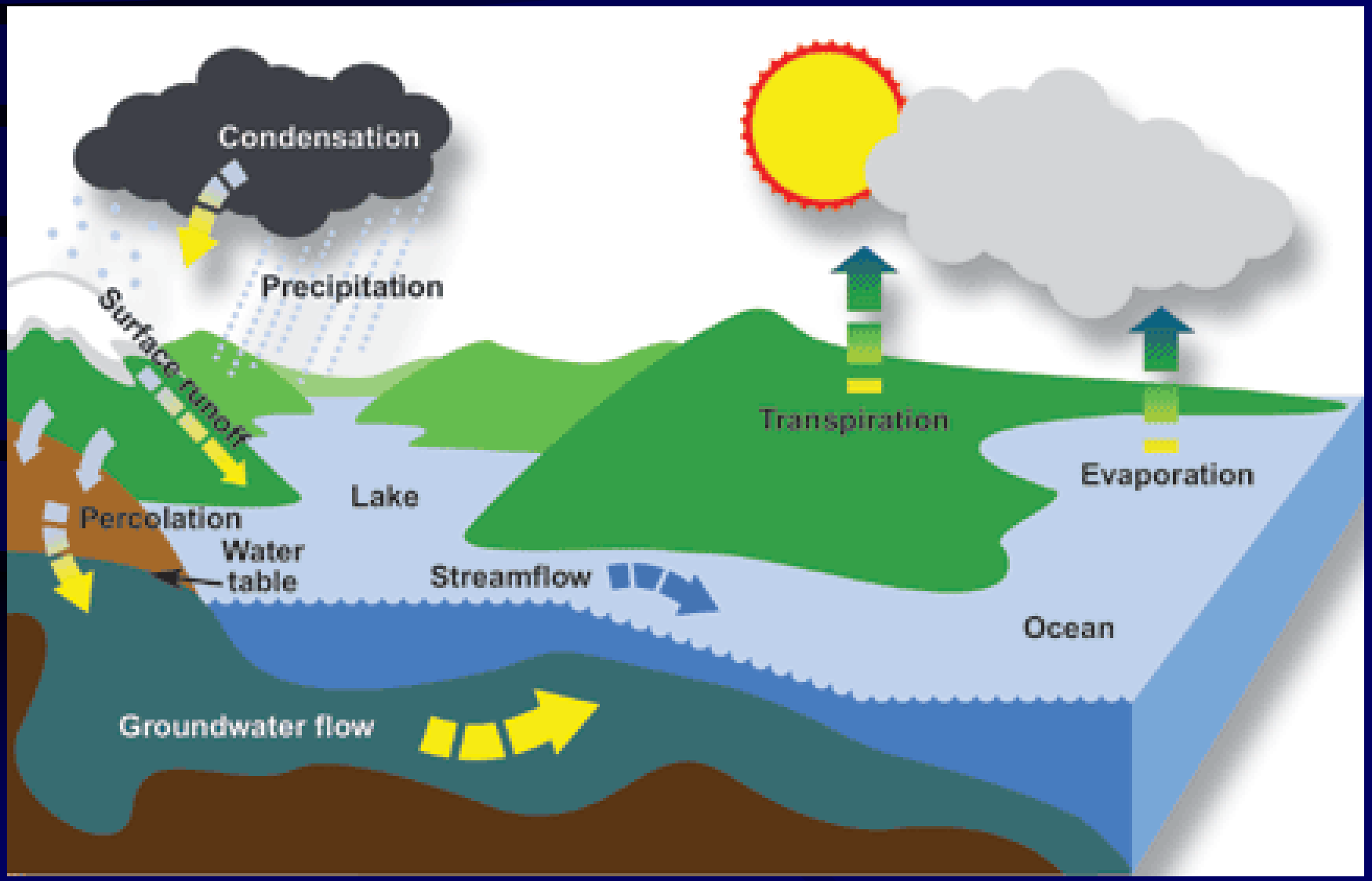

Hydromodification Regulation and Rehabilitation Approaches

Chris Bowles, Ph.D., P.E.
Eco Engineer, cbec, inc.

San Diego Region
Hydromodification Workshop

August 30, 2012

Overview

- Hydromodification regulation
- Rehabilitation approaches
  - Stream preparation
  - Mitigation banking
  - In-lieu programs
- Identification and Prioritization of opportunities, design tools
- Changing paradigms – case study

Hydromodification Regulation

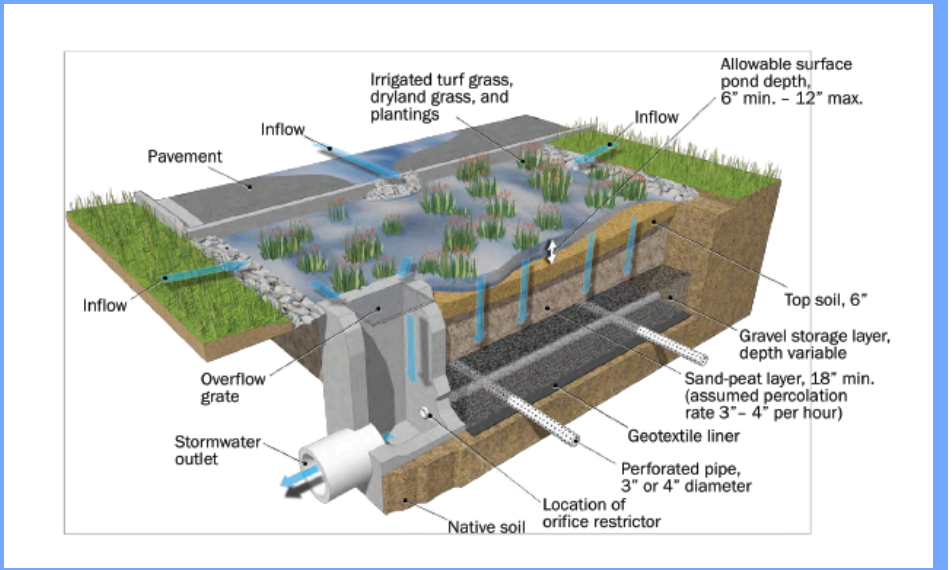

- Source control
  - LID, IMPs, BMPs
- End of pipe
  - Flow duration control basins
- Instream rehabilitation

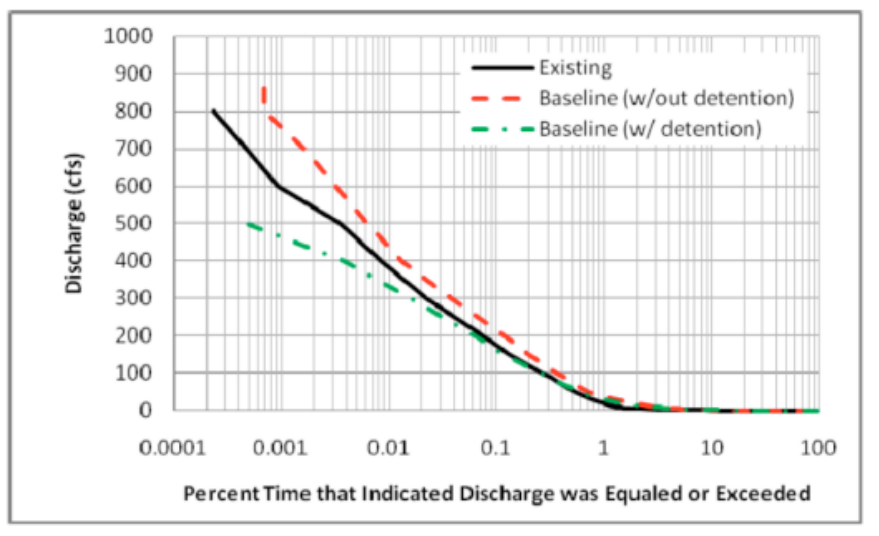

Instream Rehabilitation

- Stream preparation
  - "Preparing the stream for what it is about to receive"
- Mitigation banking
- In-lieu programs

Actions appropriate for degree of degradation

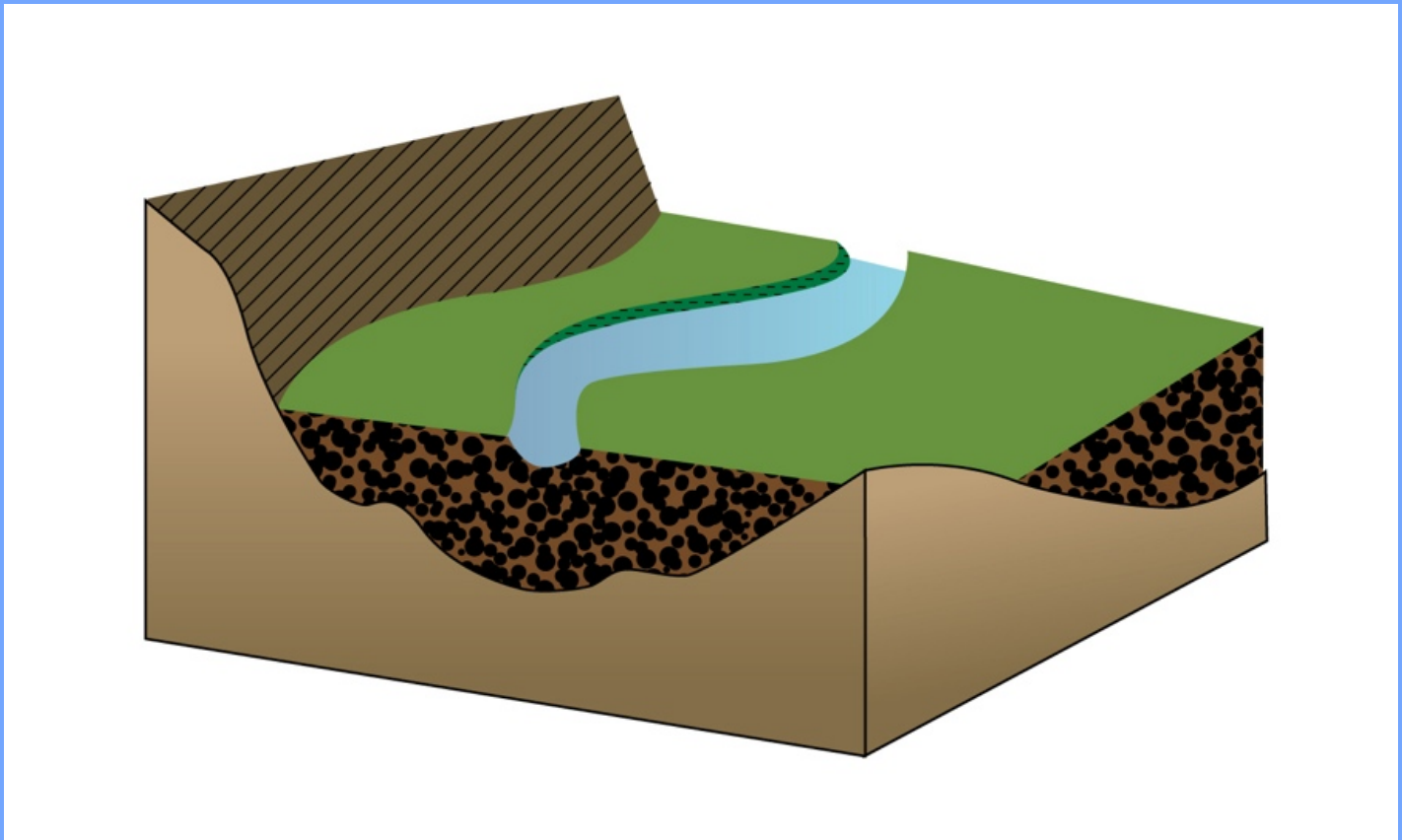

PROTECT

- Manage runoff
- Provide riparian buffer to stream

Actions appropriate for degree of degradation

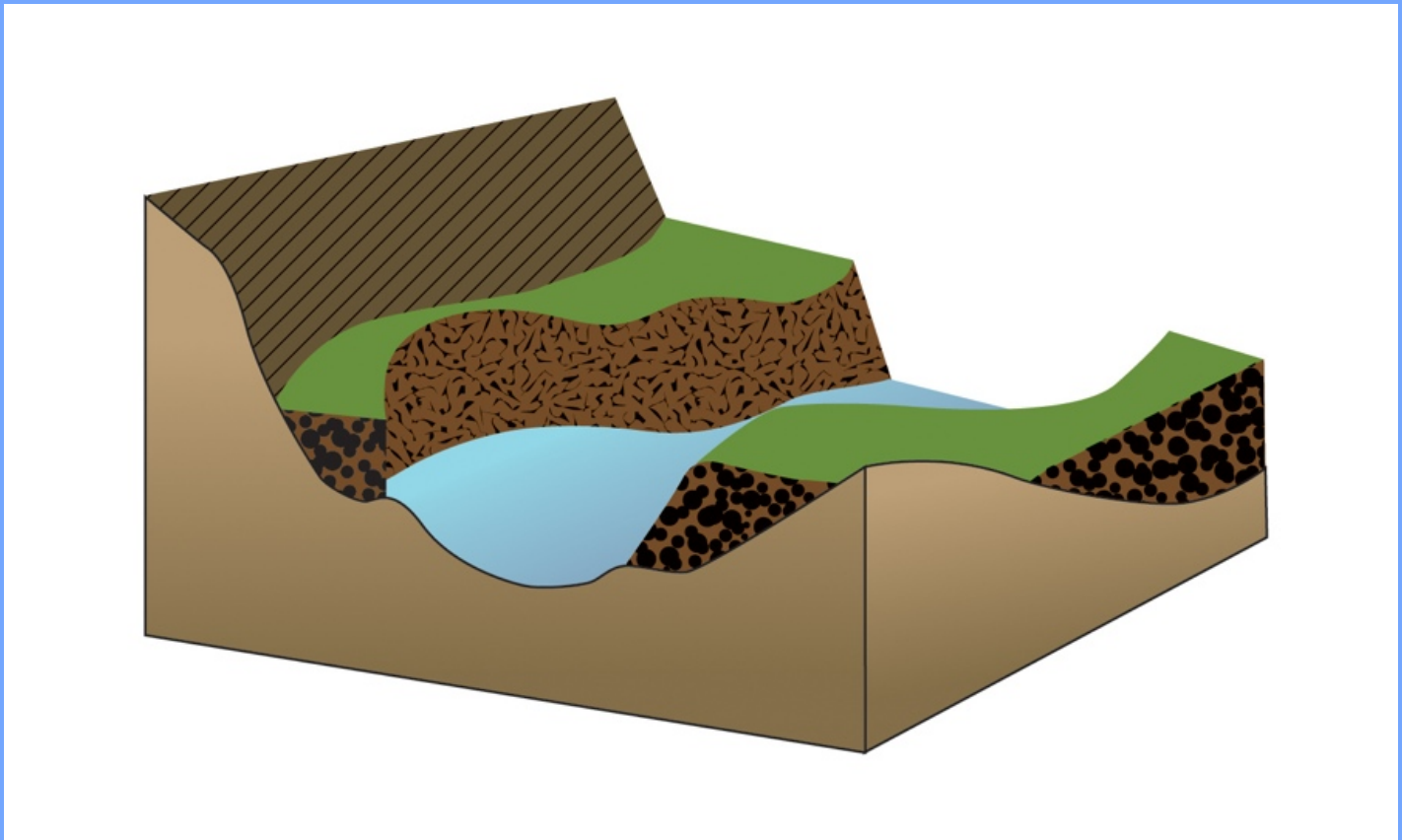

RESTORE/REHABILITATE

- **Stabilize**
- **Recontour**

Actions appropriate for degree of degradation

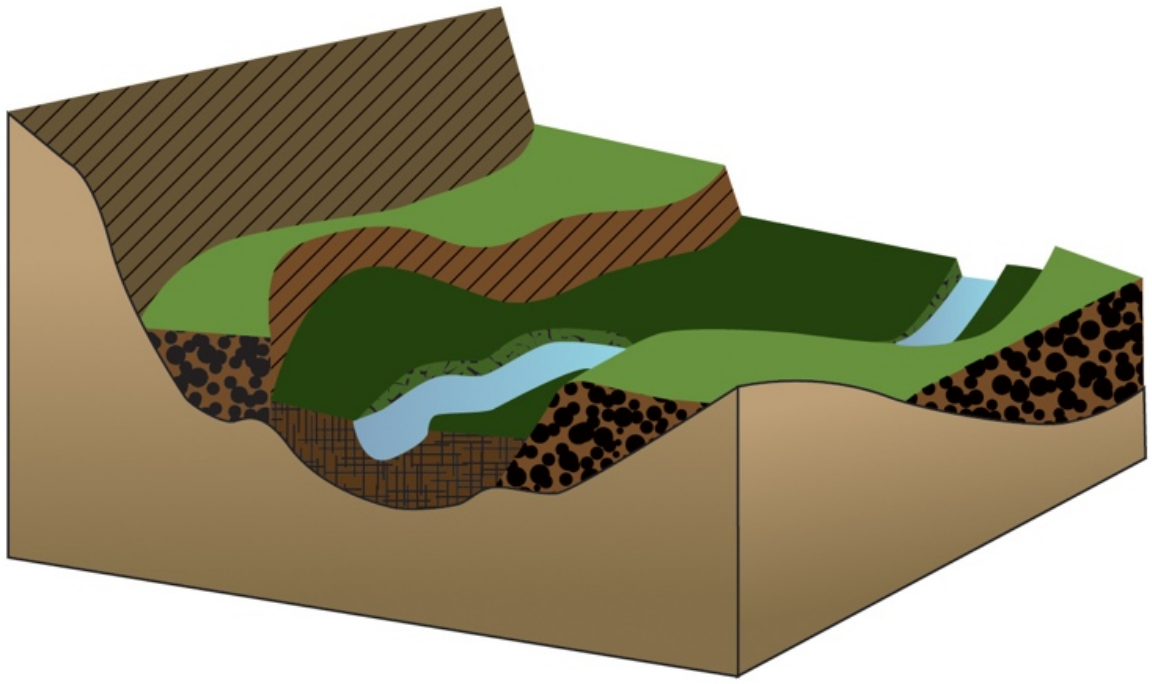

MANAGE FOR NEW CONDITION

- Alternate stream type

Why should we use multi-objective creek corridors?

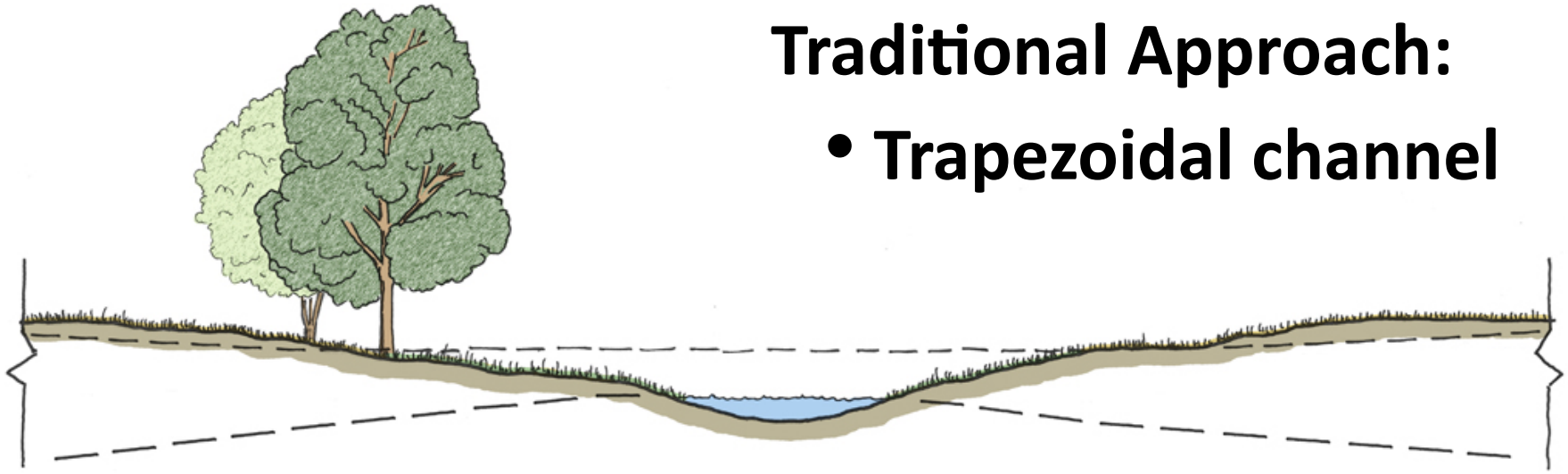

Traditional Approach:

- Trapezoidal channel

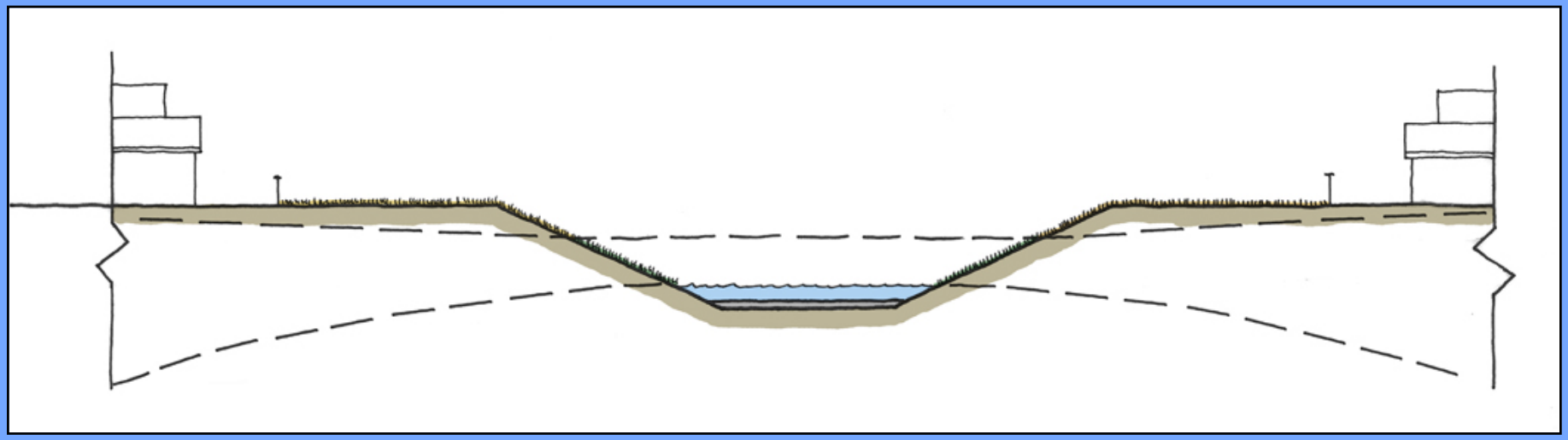

Why should we use multi-objective creek corridors?

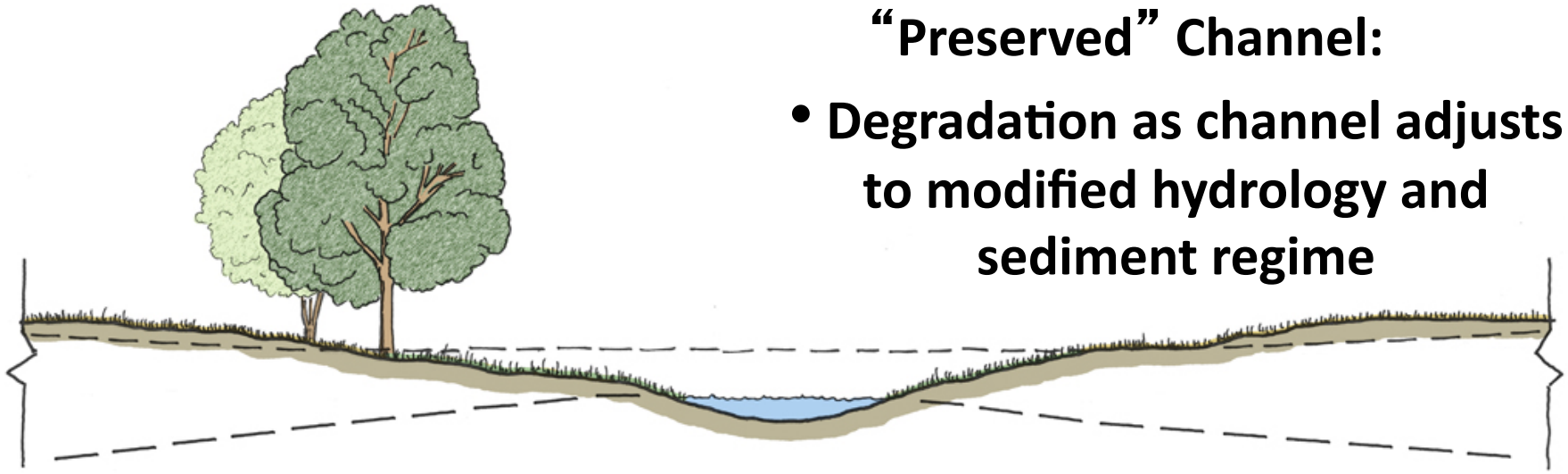

"Preserved" Channel:

- Degradation as channel adjusts to modified hydrology and sediment regime

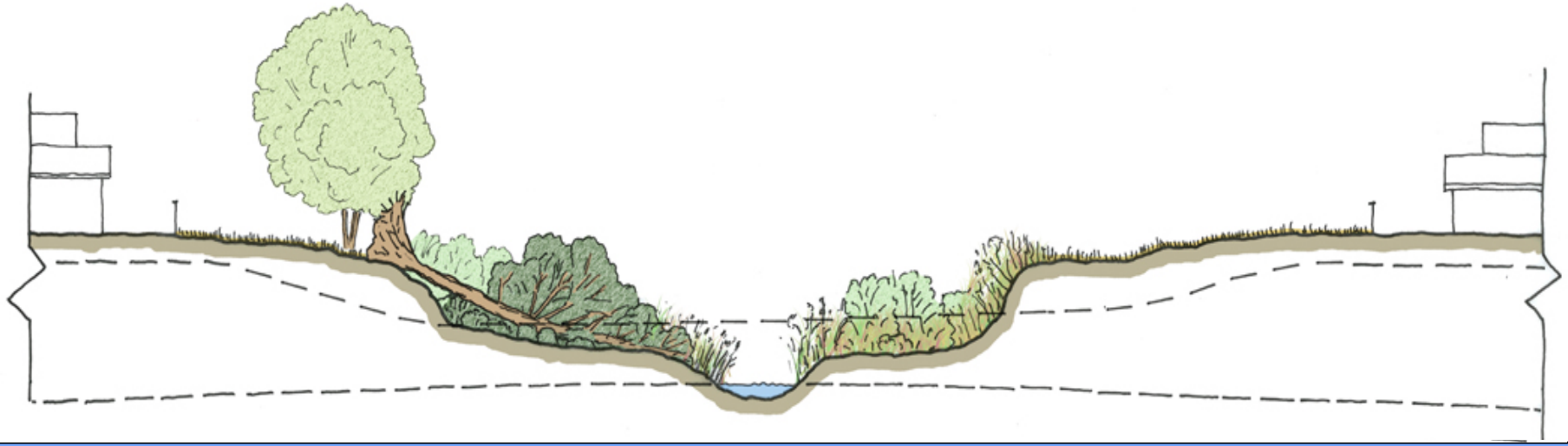

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Why should we use multi-objective creek corridors?

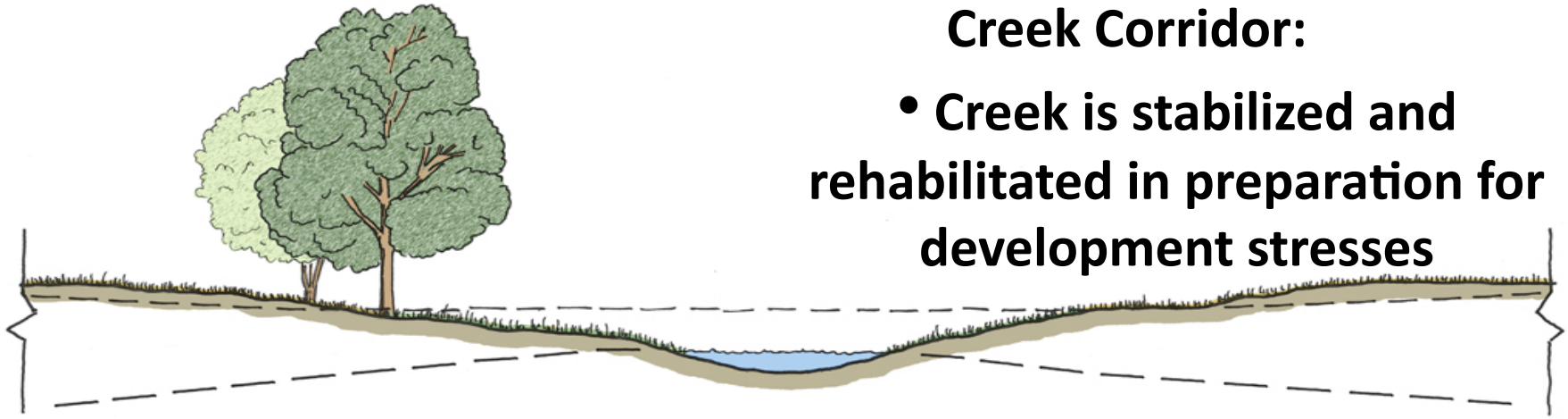

Creek Corridor:

- **Creek is stabilized and rehabilitated in preparation for development stresses**

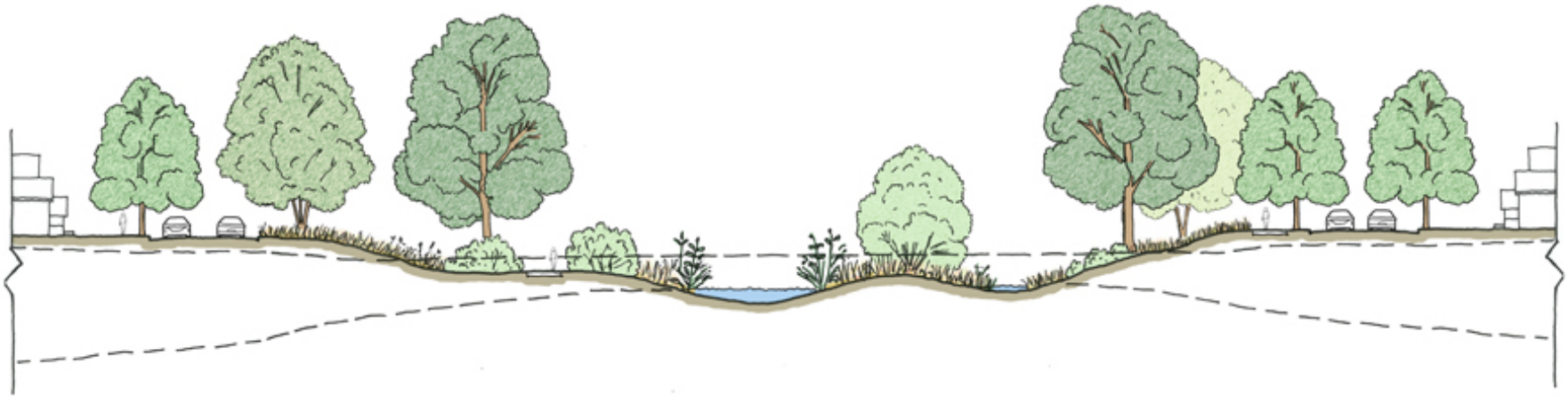

What does "multi-objective creek corridors" mean?

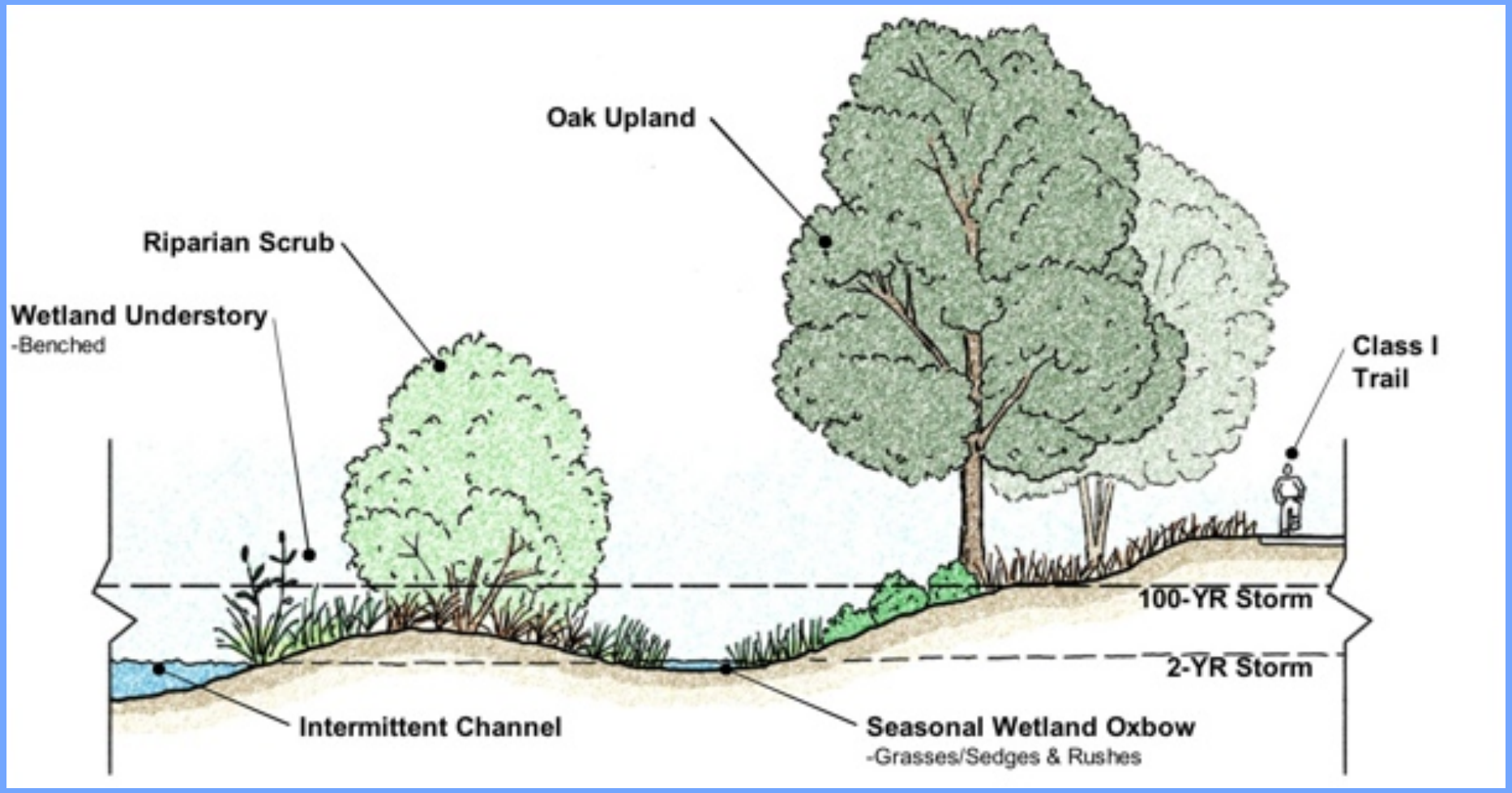

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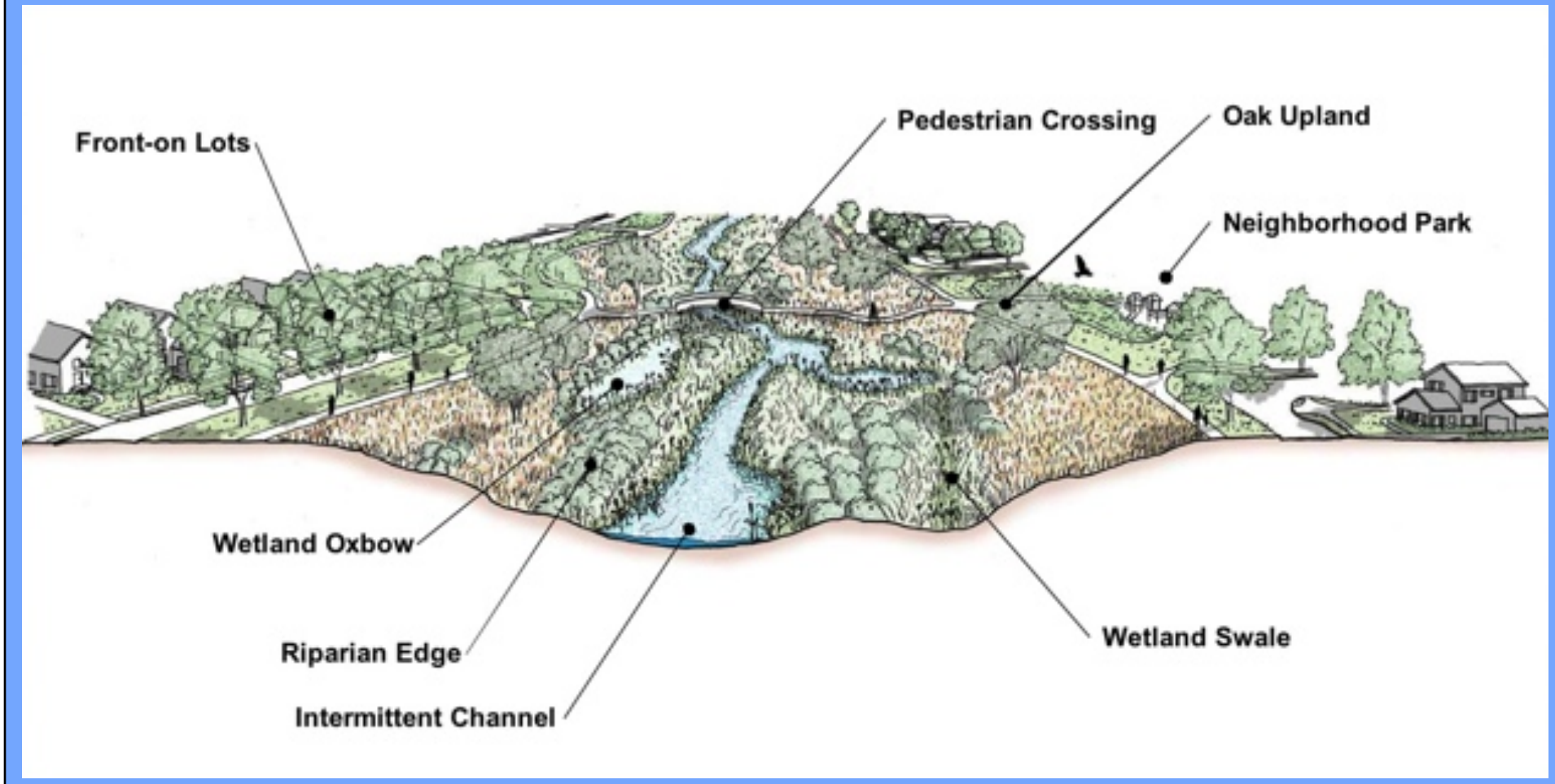

Instream Rehabilitation

In-stream approaches focus on managing stream corridors to protect stability and, if necessary, modify stream channels to accept an altered flow regime. In cases where development is proposed in an already degraded watershed it may be beneficial to focus on rehabilitating the stream channel with an altered flow regime in mind rather than retrofitting the watershed or only controlling a percentage of the runoff. In addition, in some cases where a master-planned watershed development plan is being implemented it may be more feasible to design a new channel to be stable under the proposed watershed land use rather than to construct distributed on-site facilities.

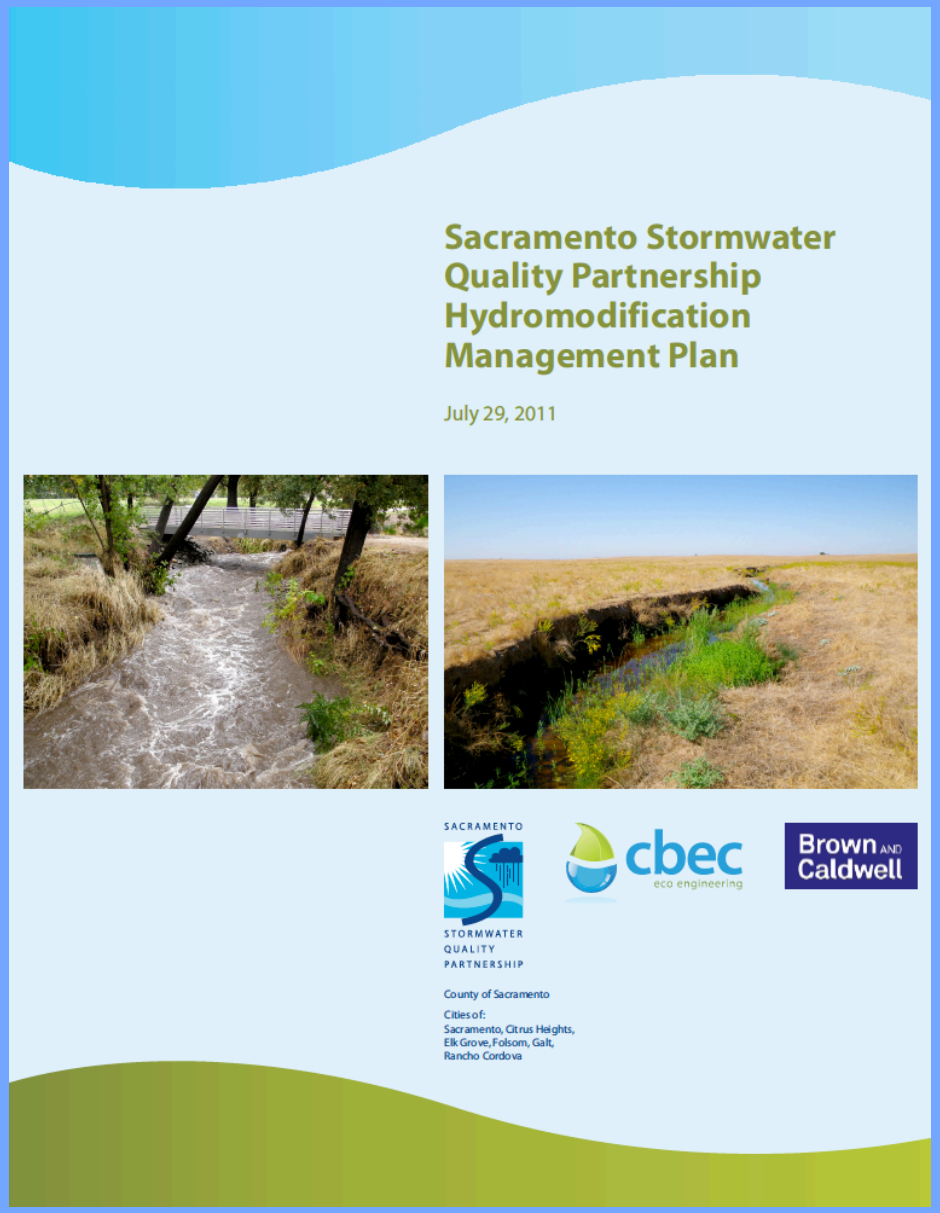

Instream Rehabilitation

United States Department of Agriculture

Natural Resources Conservation Service

Part 654 Stream Restoration Design National Engineering Handbook

Chapter 8 Threshold Channel Design

654.0804 Allowable shear stress approach

The allowable shear approach (sometimes referred to as the tractive stress approach) is typically used with channels that are lined with rock, gravel, or cobbles. Limiting forces for soil bioengineering and manufactured protective linings can also be expressed as allowable shear, as well.

To design a threshold channel using the allowable shear stress approach, the average applied grain bed shear stress is compared to the allowable shear stress for the boundary material. The applied grain bed shear stress can be calculated from the hydraulic parameters determined for the design channel and the characteristics of the channel boundary material. The hydraulic parameters are calculated using the same methods as in the allowable velocity approach. For noncohesive soils, the average allowable shear stress can be calculated using a critical shear stress approach and then adding a factor of safety or by using an empirical equation with a factor of safety included. For cohesive particles, the electrochemical bonds related primarily to clay mineralogy, are the most significant sediment properties that determine allowable shear stress. Although some empirical data are available, laboratory tests to determine allowable shear stress for a specific cohesive soil are preferred.

(a) Calculate applied shear stress

The first step in applying this approach is to calculate the hydraulics of the study reach. The total average shear stress on the boundary can be approximated from equation 8–1, using any consistent units of measurement:

$$\tau_o = \gamma RS \qquad \text{(eq. 8–1)}$$

where:

τ_o = total bed shear stress (lb/ft^2 or N/m^2)
γ = specific weight of water (lb/ft^3 or N/m^3)
R = hydraulic radius (ft or m)
S = energy slope, dimensionless

In wide channels where the width is more than 10 times the depth, R is generally taken to be equal to the depth. Spatial and temporal variation may result in a higher or lower point value for shear stress. The equation approximates average bed shear stress.

The shear stress can also be expressed as a function of the velocity and the ratio of hydraulic radius and boundary roughness. Keulegan (1938) presented such a formula.

$$\tau = \frac{\rho V^2}{\left(\frac{1}{\kappa}\ln\frac{R}{k_s} + 6.25\right)^2} \qquad \text{(eq. 8–2)}$$

where:

V = depth-averaged velocity, ft/s or m/s
ρ = density of water, lb-s^2/ft^4(slugs/ft^3) or kg/m^2
κ = von Karman's constant (usually taken to be 0.4)
k_s = roughness height, ft or m

Actual shear stress values should be calculated for the banks, as well as for the bed of a trapezoidal earth channel. Maximum stresses occur near the center of the bed and at a point on the bank about a third up from the bottom. The designer should note that computer programs such as HEC–RAS may only provide average boundary shear stress in the output. For most trapezoidal sections and depths of flow, bed stress values are somewhat higher than bank stress. Figures 8–5 and 8–6 provide actual shear stress values for the bed and sides of straight trapezoidal channels in coarse grained soil materials.

Grain shear stress

The total applied bed shear stress may be divided into that acting on the grains and that acting on the bedforms. Entrainment and sediment transport are a function only of the grain shear stress; therefore, the grain shear stress is the segment of interest for threshold design. Einstein (1950) determined that the grain shear stress could best be determined by separating total bed shear stress into a grain component and a form component, which are additive. The equation for total bed shear stress is:

$$\tau_o = \tau' + \tau'' = \gamma RS \qquad \text{(eq. 8–3)}$$

where:

τ' = grain shear stress (shear resulting from size of the material on the bed)
τ'' = form shear stress (shear resulting from bed irregularities due to bedforms)

Mitigation Banking/In Lieu Programs

- Stream rehabilitation should be assessed in terms of:
  - Physical Integrity
  - Chemical Integrity
  - Biological Integrity
- Policy Adjustments and Opportunities:
  - Emphasize change rather than endpoints
  - Different metric for different projects, released over time for metrics met
  - Allow flexibility in location: emphasize relative location rather than absolute location
  - Allow flexibility for large or unique projects
  - Flexibility in process: emphasize results not process

JOURNAL OF THE AMERICAN WATER RESOURCES ASSOCIATION

AMERICAN WATER RESOURCES ASSOCIATION

COMPENSATORY MITIGATION FOR STREAMS UNDER THE CLEAN WATER ACT: REASSESSING SCIENCE AND REDIRECTING POLICY[1]

Martin W. Doyle and F. Douglas Shields[2]

ABSTRACT: Current stream restoration science is not adequate to assume high rates of success in recovering ecosystem functional integrity. The physical scale of most stream restoration projects is insufficient because watershed land use controls ambient water quality and hydrology, and land use surrounding many restoration projects at the time of their construction, or in the future, do not provide sufficient conditions for functional integrity recovery. Reach scale channel restoration or modification has limited benefits within the broader landscape context. Physical habitat variables are often the basis for indicating success, but are now increasingly seen as poor surrogates for actual biological function; the assumption "if you build it they will come" lacks support of empirical studies. If stream restoration is to play a continued role in compensatory mitigation under the United States Clean Water Act, then significant policy changes are needed to adapt to the limitations of restoration science and the social environment under which most projects are constructed. When used for compensatory mitigation, stream restoration should be held to effectiveness standards for actual and measurable physical, chemical, or biological functional improvement. To achieve improved mitigation results, greater flexibility may be required for the location and funding of restoration projects, the size of projects, and the restoration process itself.

(KEY TERMS: environmental regulations; stream restoration; aquatic ecology; rivers/streams; water policy.)

Doyle, Martin W. and F. Douglas Shields, 2012. Compensatory Mitigation for Streams Under the Clean Water Act: Reassessing Science and Redirecting Policy. *Journal of the American Water Resources Association* (JAWRA) 1-16. DOI: 10.1111/j.1752-1688.2011.00631.x

INTRODUCTION

The overarching goal of the United States (U.S.) Clean Water Act is to sustain and restore the physical, chemical, and biological integrity of the nation's waters. Under Section 404 of the Clean Water Act, permitted impacts to "aquatic resources" must be mitigated. The term "aquatic resources" includes both streams and wetlands, but although the science, policy, and economics of wetland mitigation have received considerable attention (NRC, 2001), stream mitigation has not (Lave *et al.*, 2008).

Mitigation under the Clean Water Act was regulated for years by a series of guidance documents, but in 2008, the "Rule for Mitigation of Impacts to Aquatic Resources" was finalized jointly by the U.S. Army Corps of Engineers (Corps) and the Environmental Protection Agency (EPA). This rule now governs mitigation (33 CFR Parts 325 and 332, "Compensatory Mitigation for Losses of Aquatic Resources," April 10, 2008; §332.5 and §332.6) and is hereafter referred to as the "2008 Rule." Mitigation prioritizes avoiding and minimizing impacts, and allows "compensatory mitigation," or the preservation, enhancement, or restoration of a site in order to

[1]Paper No. JAWRA-11-0029-P of the *Journal of the American Water Resources Association* (JAWRA). Received March 1, 2011; accepted October 26, 2011. © 2012 American Water Resources Association. **Discussions are open until six months from print publication.**

[2]Respectively, Professor (Doyle), Nicholas School of the Environment, Duke University, Durham, North Carolina 27708; and Research Hydraulic Engineer (Shields), USDA – ARS National Sedimentation Laboratory, Oxford, Mississippi 38655 (E-Mail/Doyle: martin.doyle@duke.edu).

Mitigation Banking/In Lieu Programs

- Economic Instruments
  - Incentivizing monitoring via economic discounts
  - Restoration portfolios
  - Restoration trust funds for long-term adaptive management approaches

Tools – Fluvial Audit

Legend

- Sediment storage zone
- Sediment supply zone
- Survey reaches

N

0 1 2 km

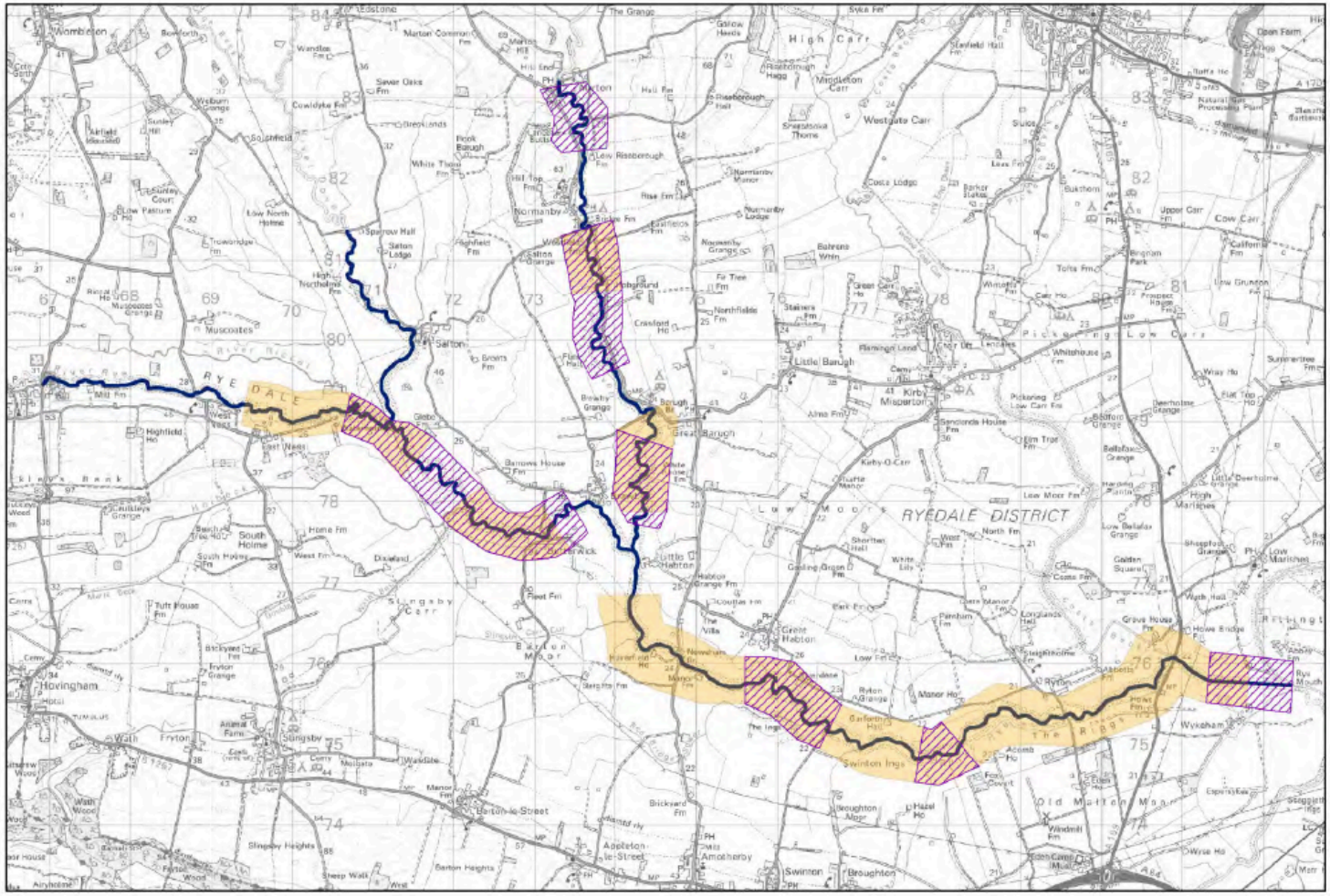

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Tools – Fluvial Audit

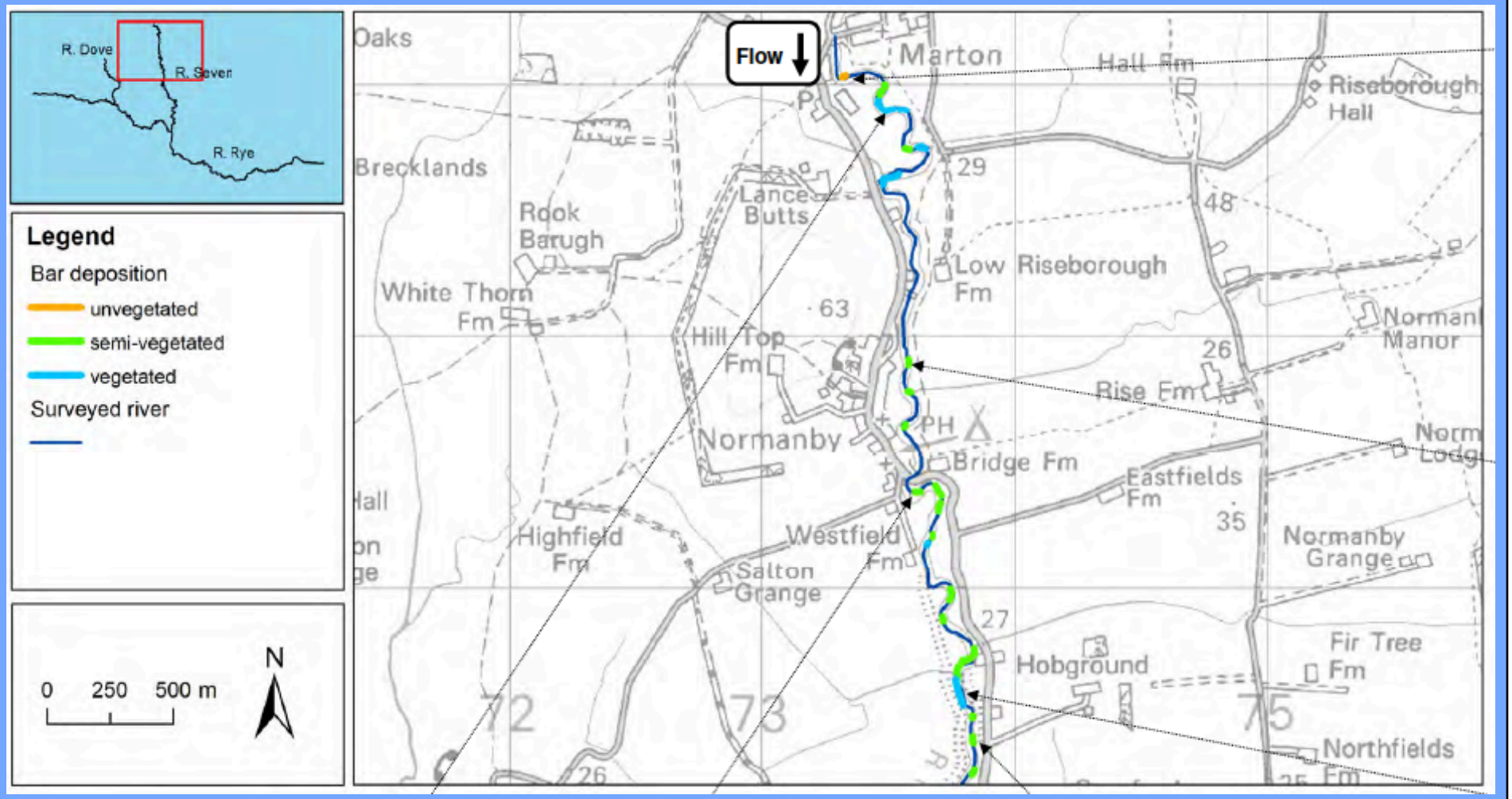

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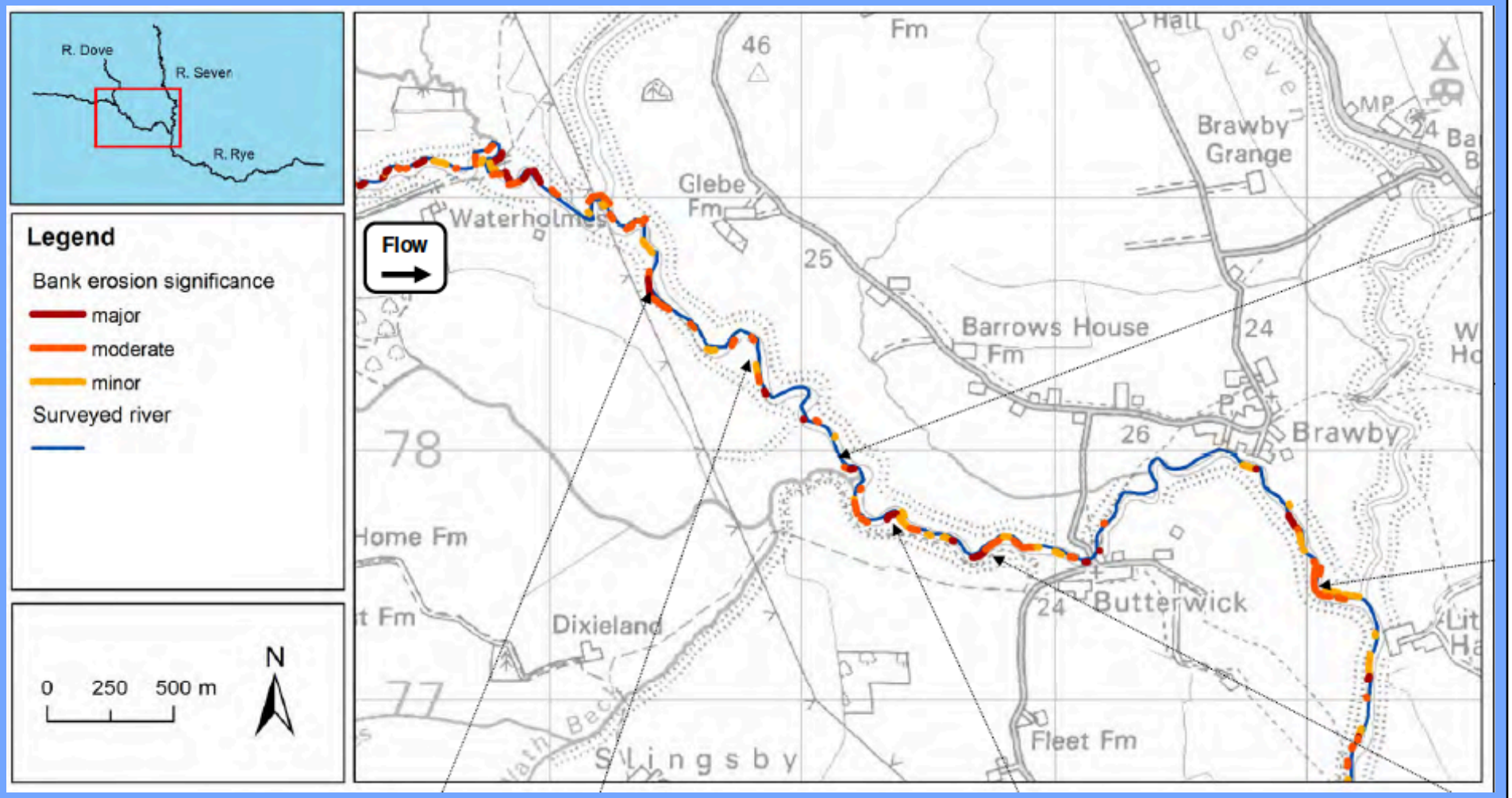

Key findings: Bank erosion rates

Bank erosion as % total bank length for the seven sections of the Rivers Rye, Seven and Dove

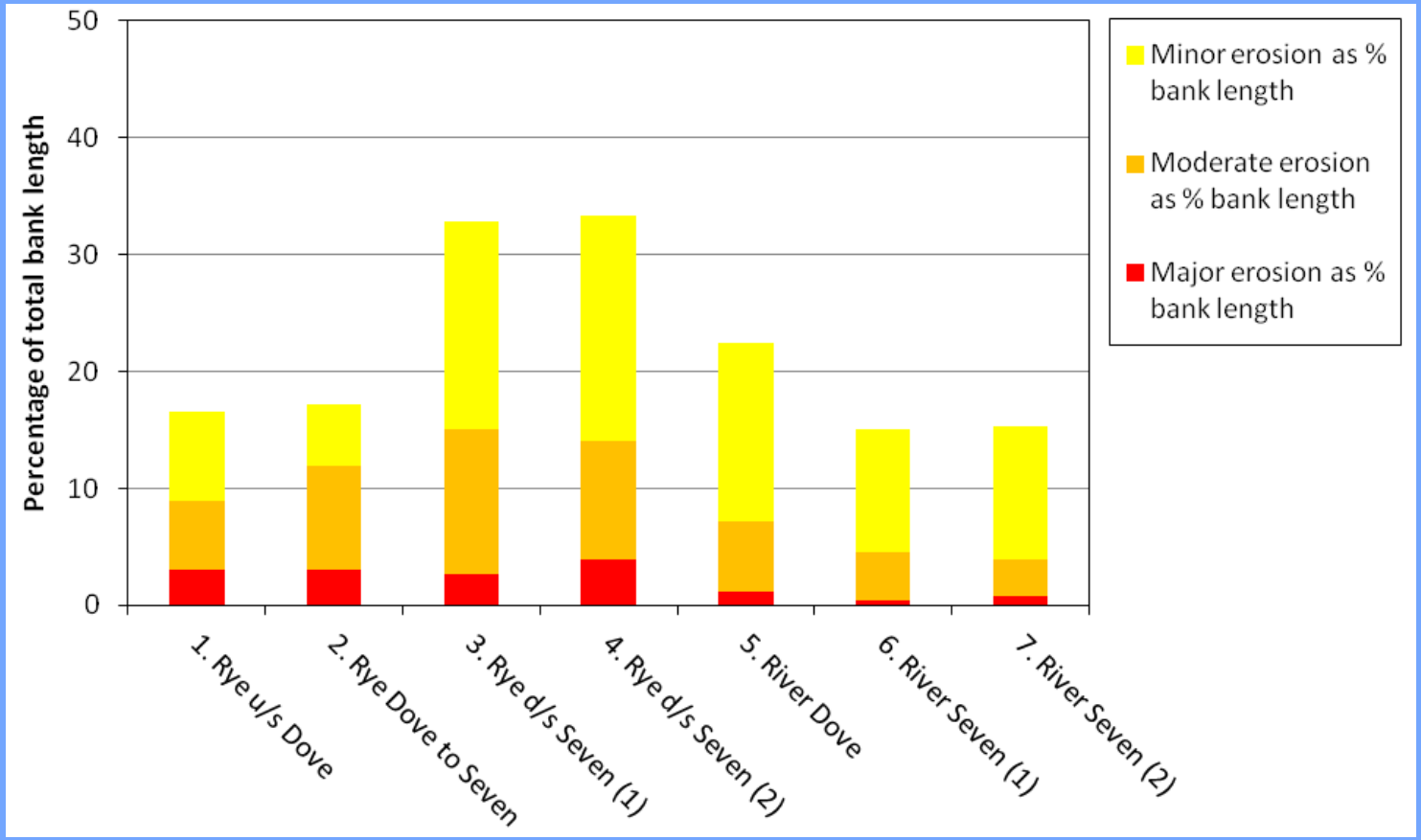

- Between 15% and 33% of banks eroding in each river section
- Highest erosion rates - Rye downstream of Seven confluence

Tools – Fluvial Audit

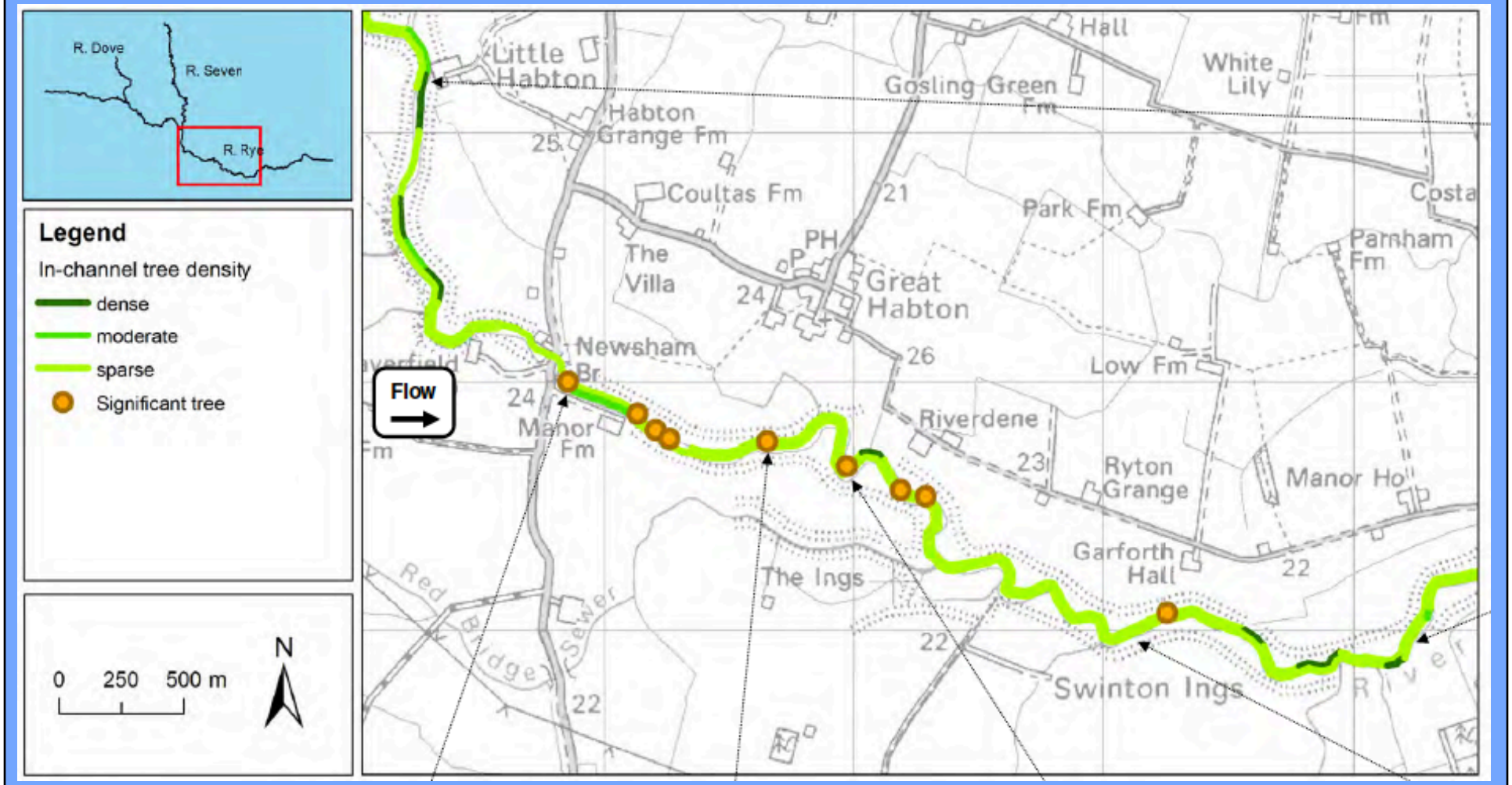

Tools – Fluvial Audit

Legend

Embankment erosion potential

- very low
- low
- moderate
- high
- observed erosion
- Embankments

N

0 1 2 km

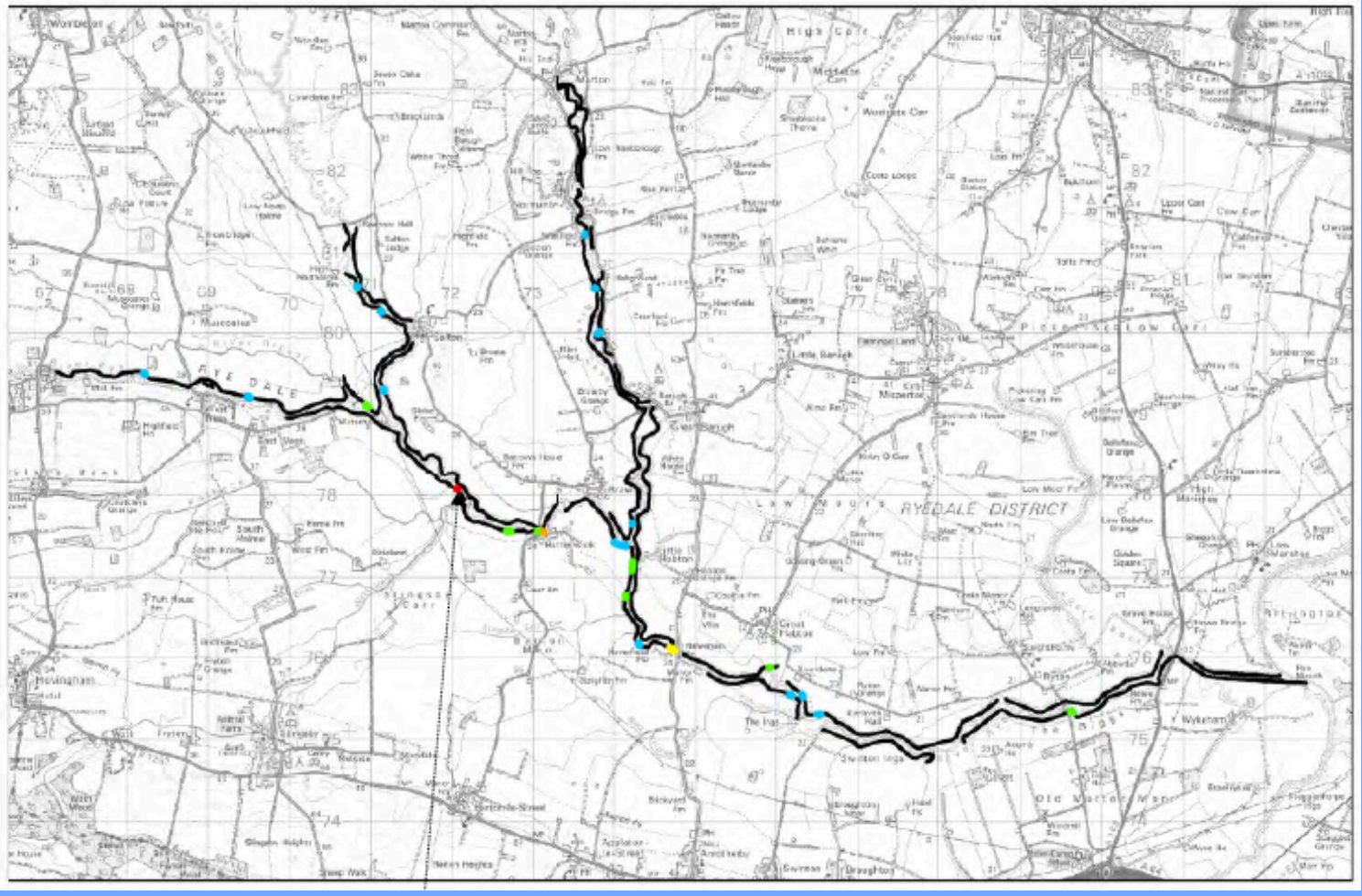

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Tools – Rose and San Clemente Creeks

- Develop Modeling Tools for Watershed Scale Analysis
- Model Existing Conditions
- Formulate Restoration Alternatives Using Hydrodynamic Model
- Test and Refine Proposed Alternatives Using Hydrodynamic Model
- Examine Affects of Proposed Projects on Watershed Hydrodynamics

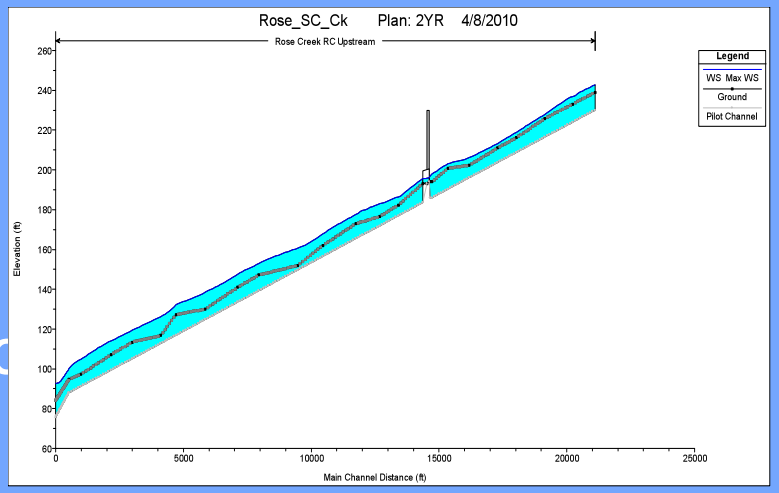

Bathymetric / Topographic Data Collection

- Transect Locations
  - 64 Survey Cross sections
  - 500 to 1000 foot spacing
  - Rose Creek and San Clement Creek (I-805 to Mission Bay)

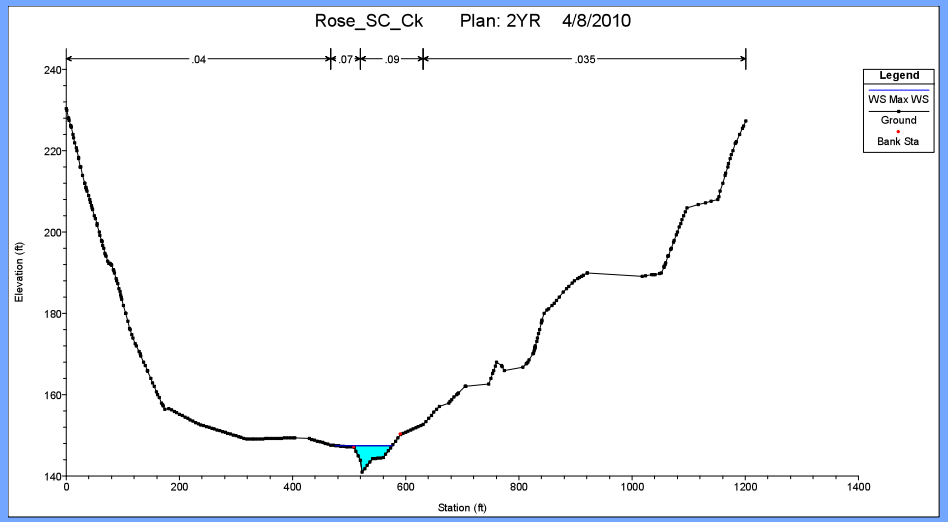

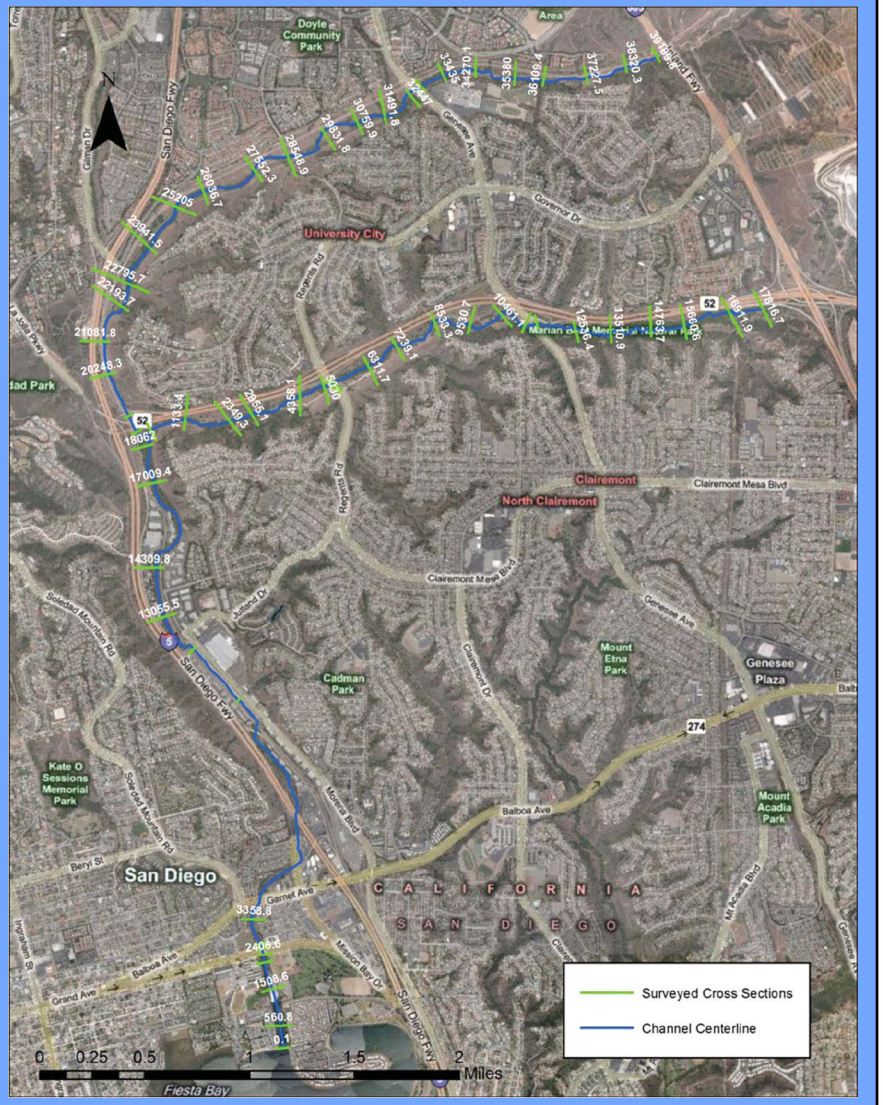

Hydrodynamic Model Development

- HEC-GeoRAS 1D Hydrodynamic Model
- Model Boundary Conditions
  - 100 and 50 year unsteady flow events
  - 2, 5, 10 & 25 year unsteady flow events (HSFP)
- Hydraulic Roughness (Manning's)
  - Estimated in the field per vegetation type along each surveyed cross section
  - Calibrated using measured stage and discharge data

Tools – Fluvial Audit

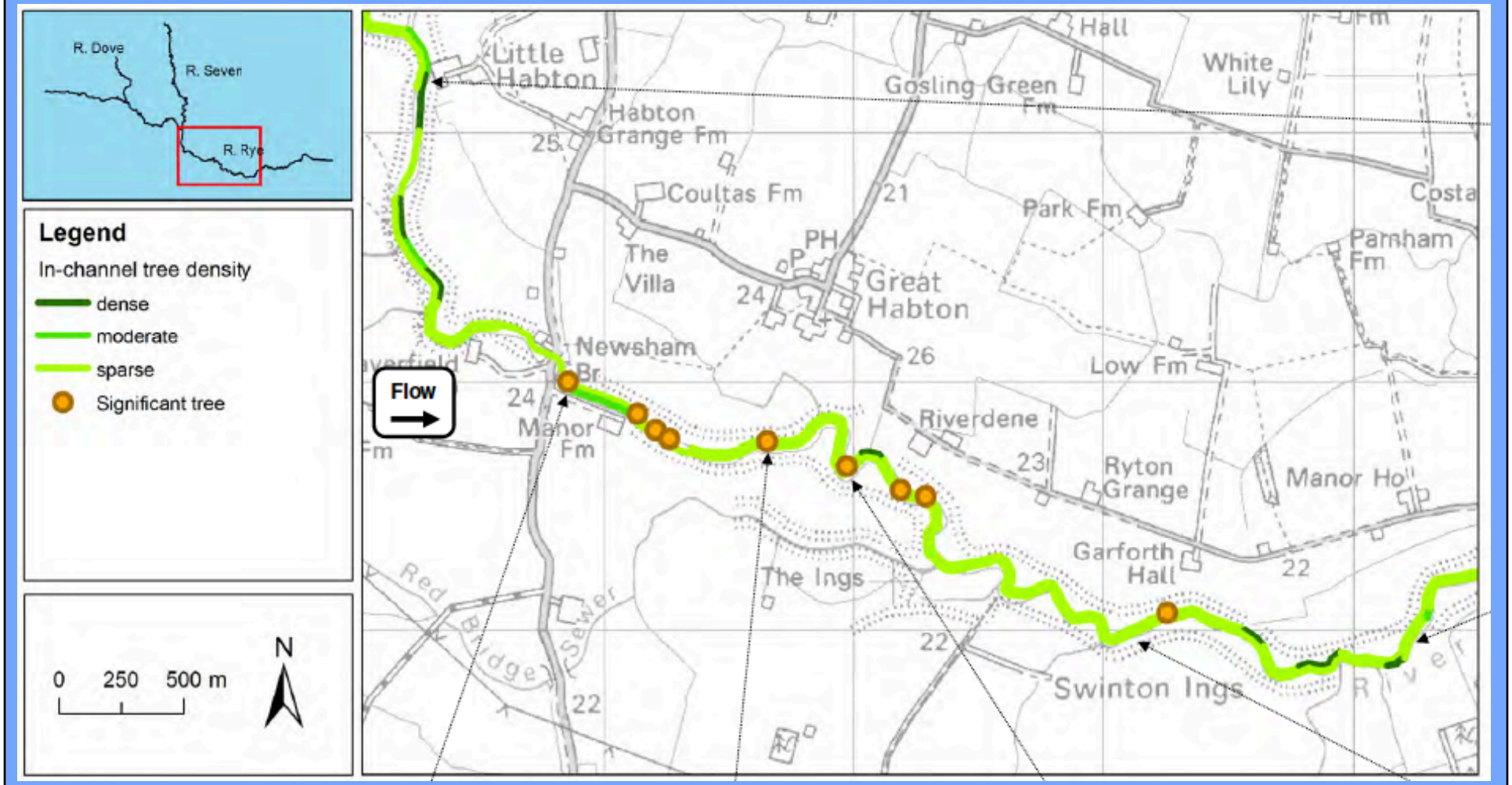

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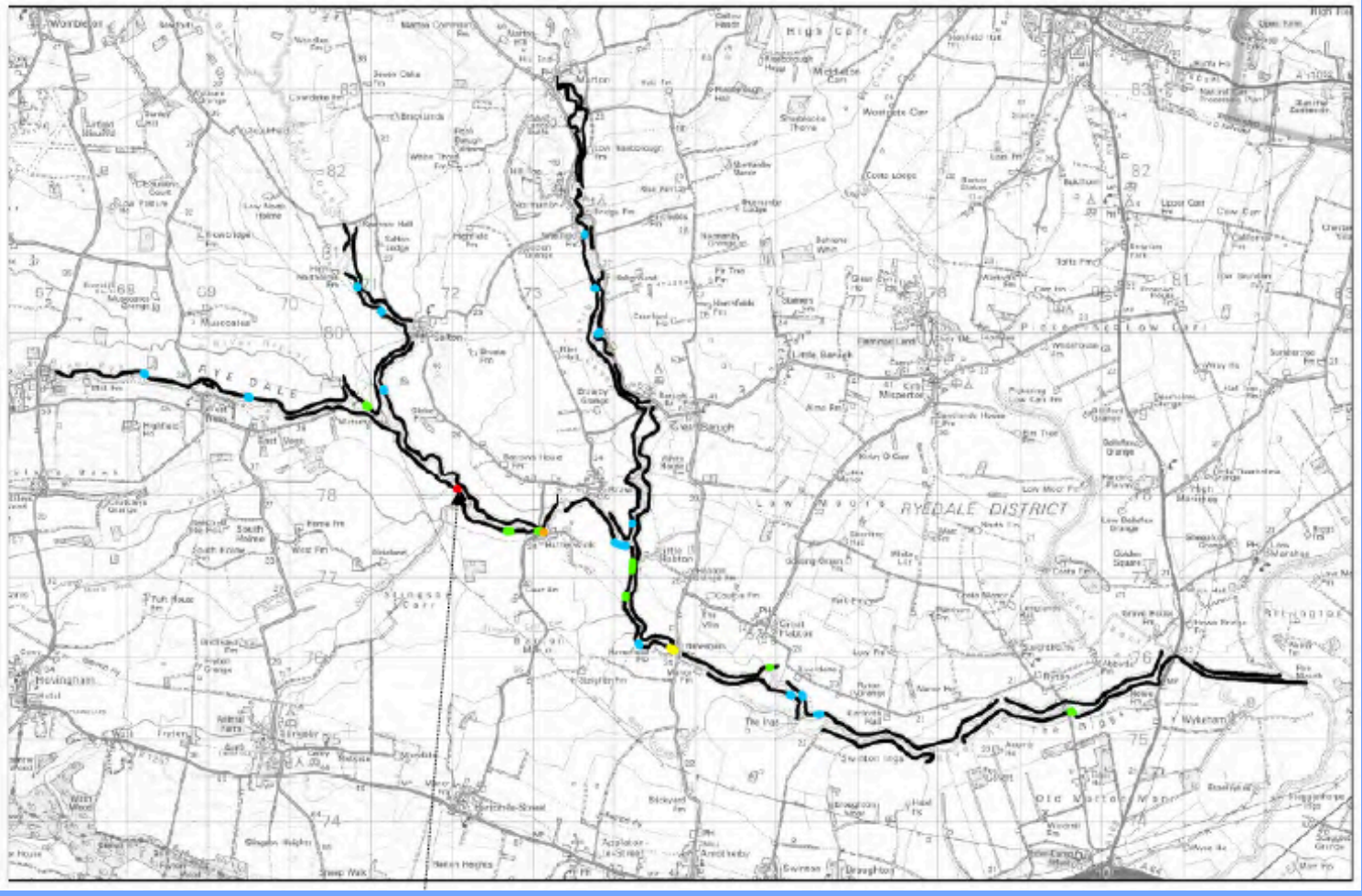

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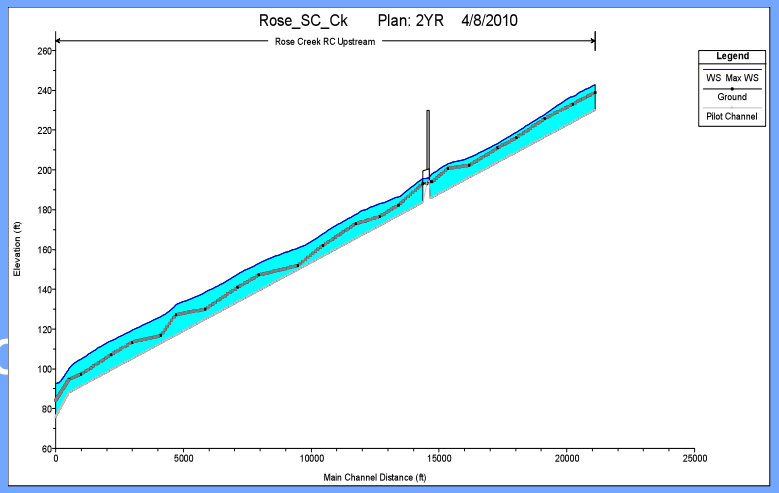

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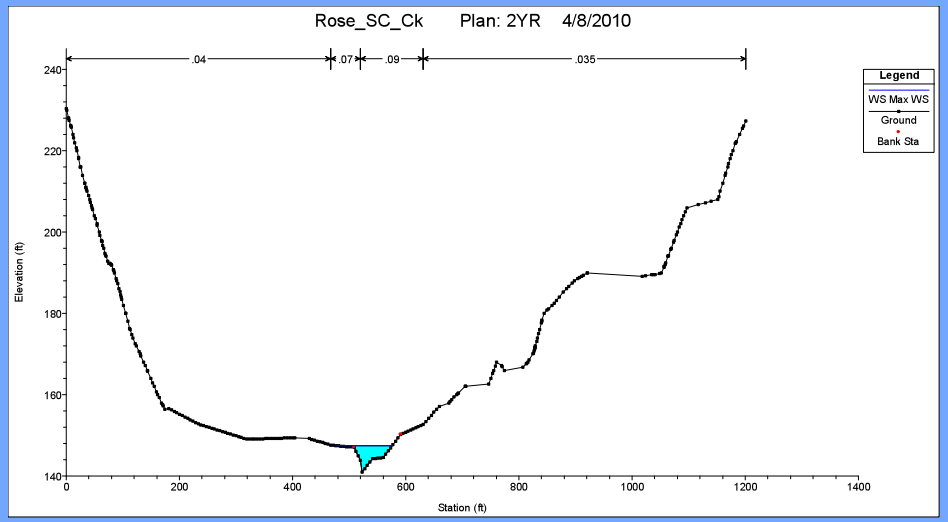

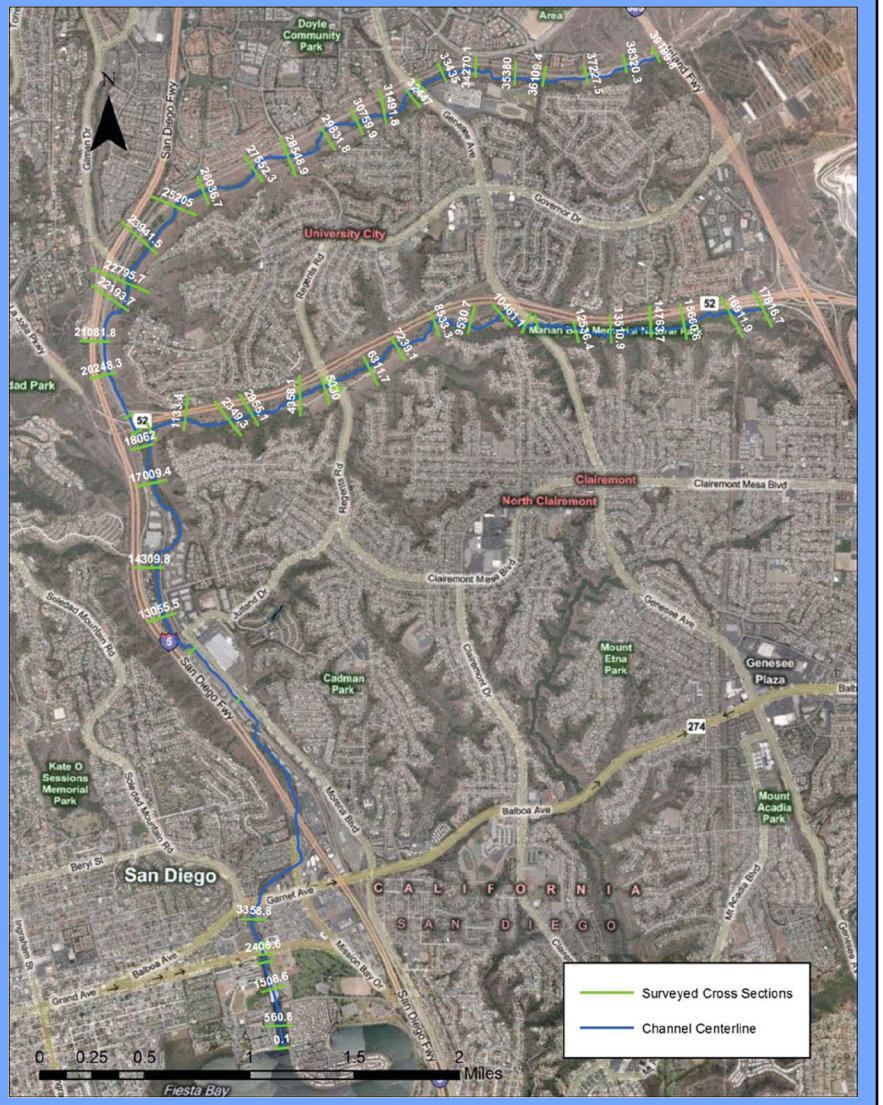

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  - Estimated in the field per vegetation type along each surveyed cross section
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Landscape Stratification, Watershed Processes, and Hydromodification Control—

A new approach from the Central Coast

Derek B. Booth, PhD PG PE
U C S B , Bren School of Env. Science & Mgmt. (Professor)
STILLWATER SCIENCES (Senior Geologist)

Dominic Roques, PG
REGION 3 WQ CONTROL BOARD

Darla Inglis, PhD
U C DAVIS, Center for Land Use and Natural Resources

Chad Helmle, PE
TETRATECH (Water Resource Engineer)

PRESENTATION OVERVIEW

1. STATEMENT OF THE PROBLEM:
   Stormwater mitigation typically (i) has only limited and narrowly defined objectives, and (2) is applied uniformly across a diverse landscape.

2. ALTERNATIVE APPROACH:
   Identify ***key watershed processes*** as they actually occur across the landscape; and recognize that the goal of mitigation must be to protect those processes in order to maintain sustainable downstream receiving-water quality.

3. Implementing this approach is straightforward and achievable now.

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For Sacramento County:

Provision 15.c of the "Planning and New Development Program" section in the permit establishes the following requirements for the HMP:

"The HMP shall require controls to manage the increases in the magnitude (e.g., flow control), frequency, volume and duration of runoff from development projects in order to protect receiving waters from increased potential for erosion and other adverse impacts with consideration towards maintaining (or reproducing) the pre-development hydrology. The HMP shall address, but not be limited to, the following:

"The HPM shall require controls to manage the increases in the magnitude (e.g., flow control), frequency, volume and duration of runoff from development projects in order to protect receiving waters from increased potential for erosion and other adverse impacts...."

For Sacramento County:

Background Information (Continued)

In addition, the permit specifies that the HMP requirements will not be applicable to projects discharging to creeks that have a low erosion potential. These include:

(a) Discharges into creeks that are concrete-lined or significantly armored;
(b)Underground storm drain systems discharging directly to the rivers;
(c) Construction of infill projects in highly developed watersheds, where the potential for single-project and/or cumulative impacts is minimal; and
(d) Projects that do not create an increase in impervious surfaces over pre-project conditions.

ISSUES:

- "Stream-centric"
- Focus is on avoiding channel erosion (by any/all means available, but particularly by controlling runoff)

But…where's the stream?

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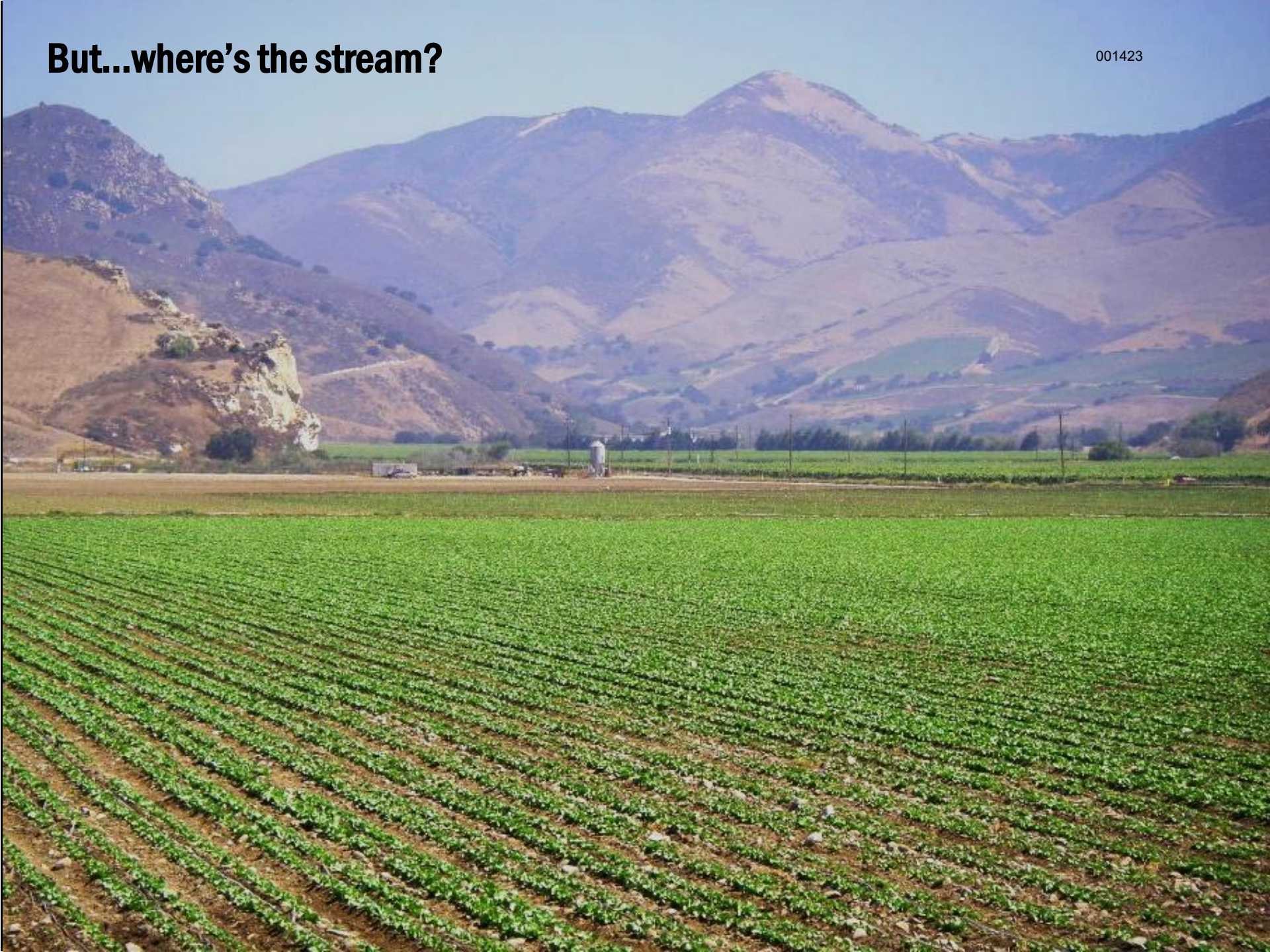

Where's the runoff?

001424

Control for erosion?—here, YES. But...

...here?

Here?

001427

Or, here???

What if the primary receiving water is not even visible (GW aquifer)?

...or if erosion is not the only impact of development?

IN SUMMARY (Part 1):

1. Not every part of a landscape produces “runoff.”
2. Not every part of a landscape drains to an erosion-susceptible stream (or to a stream, at all).
3. Regulations that do not recognize these differences will not achieve meaningful mitigation across (real) watersheds.

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Central Coast
Regional Water Quality Control Board

001433

Overview

The Central Coast Region includes all of Santa Cruz, San Benito, Monterey, San Luis Obispo and Santa Barbara counties and small portions of several other counties. Prime agricultural lands dominate the bottomlands of many watersheds, and upper watersheds are in rugged national forest lands. The area ranges climatically from the extremely wet Santa Cruz Mountains to the very arid Carrizo Plain. Important marine resources have been afforded protection through two National Marine Sanctuary programs and the Morro Bay National Estuary Program. The region's population has increased considerably in recent years to approximately 1.4 million.

Water Facts

Healthy Watersheds—a vision for the future

The guiding vision for the Central Coast Water Board is one of Healthy Watersheds. Healthy Watersheds are sustainable; they support healthy, diverse aquatic habitat, have healthy riparian areas and corridors to maintain healthy habitat, and have near-natural levels of sediment transport. Surface waters meet water quality objectives, sediments are low in pollutants, and groundwater is near natural levels in quantity and quality. All combine to support human and ecosystem health.

Central Coast Water Board

For more information, visit:

Central Coast Water Board: http://www.waterboards.ca.gov/centralcoast/

Central Coast LID Initiative: http://www.centralcoastlidi.org/Central_Coast_LIDI/Home.html

To achieve healthy watersheds—must first identify the "key watershed processes" that support them :

- Overland flow, rilling & gullying
- Infiltration and groundwater recharge
- Interflow (i.e., shallow groundwater flow)
- Evapotranspiration
- Delivery of sediment to waterbodies
- Delivery of organic matter to waterbodies
- Chemical/biological transformations

How are these processes recognized and mapped on the landscape?

<u>To recognize</u>? Just go and look!

<u>To map</u>? In an *undisturbed* landscape, they are best determined by a site's GEOLOGY and SLOPE.

But—what about…

- <u>Land use</u>?—not for undisturbed conditions.
- <u>Soils</u>?—useful for site design, but duplicative with geology (and not useful for processes).
- <u>Precipitation</u>?—also relevant, but for primarly for design.

What do these landscapes look like in the field?

001436

Are they *really* different???

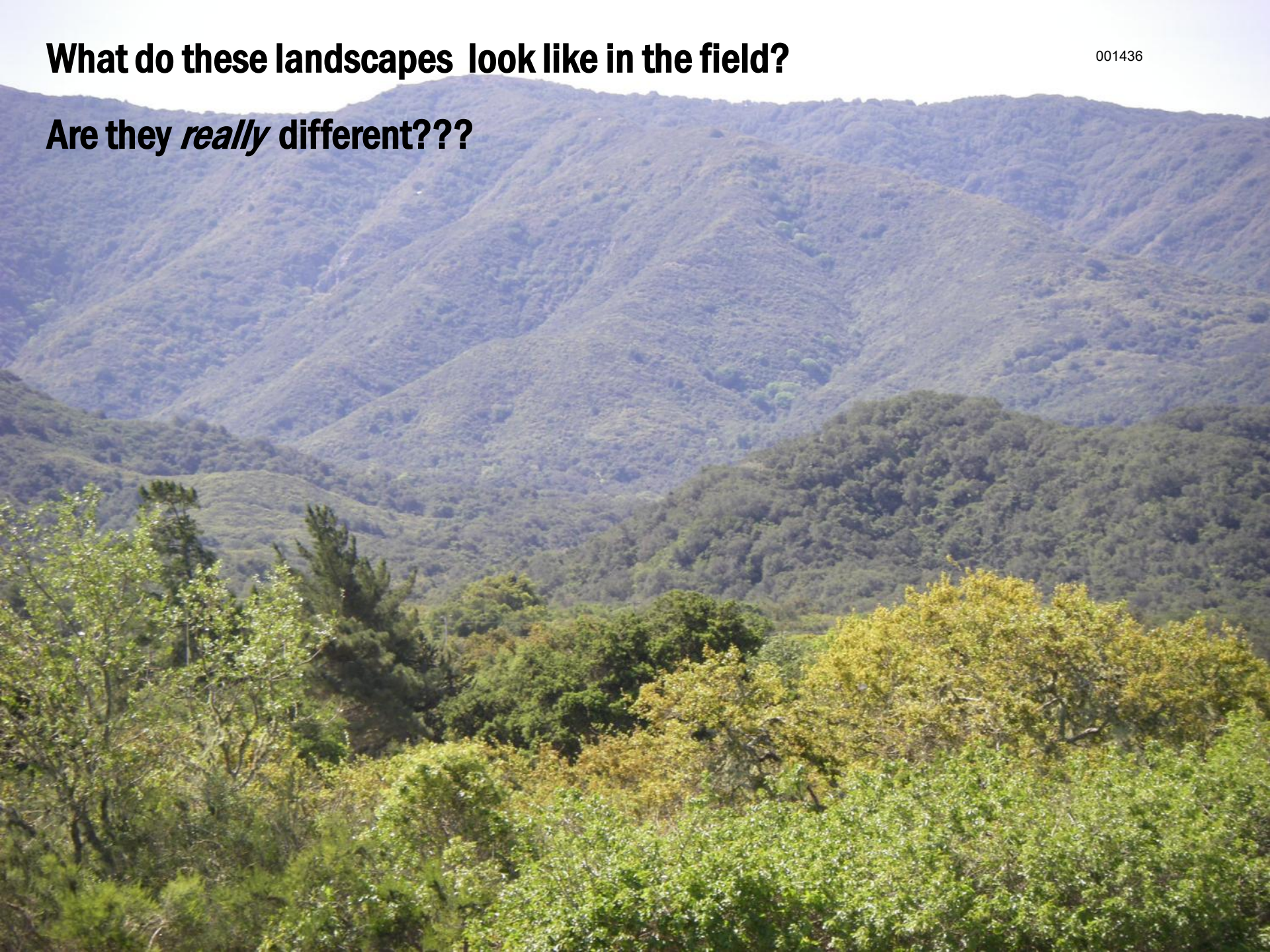

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IN SUMMARY (Part 2):

1. Key watershed processes can be inferred from observation.

2. The spatial distribution of those processes correlates well (but not perfectly!) with the interplay of underlying geology and slope.

3. Other factors may be useful in design and at finer scales of discrimination, but they do not alter the fundamental patterns and relationships of watershed processes.

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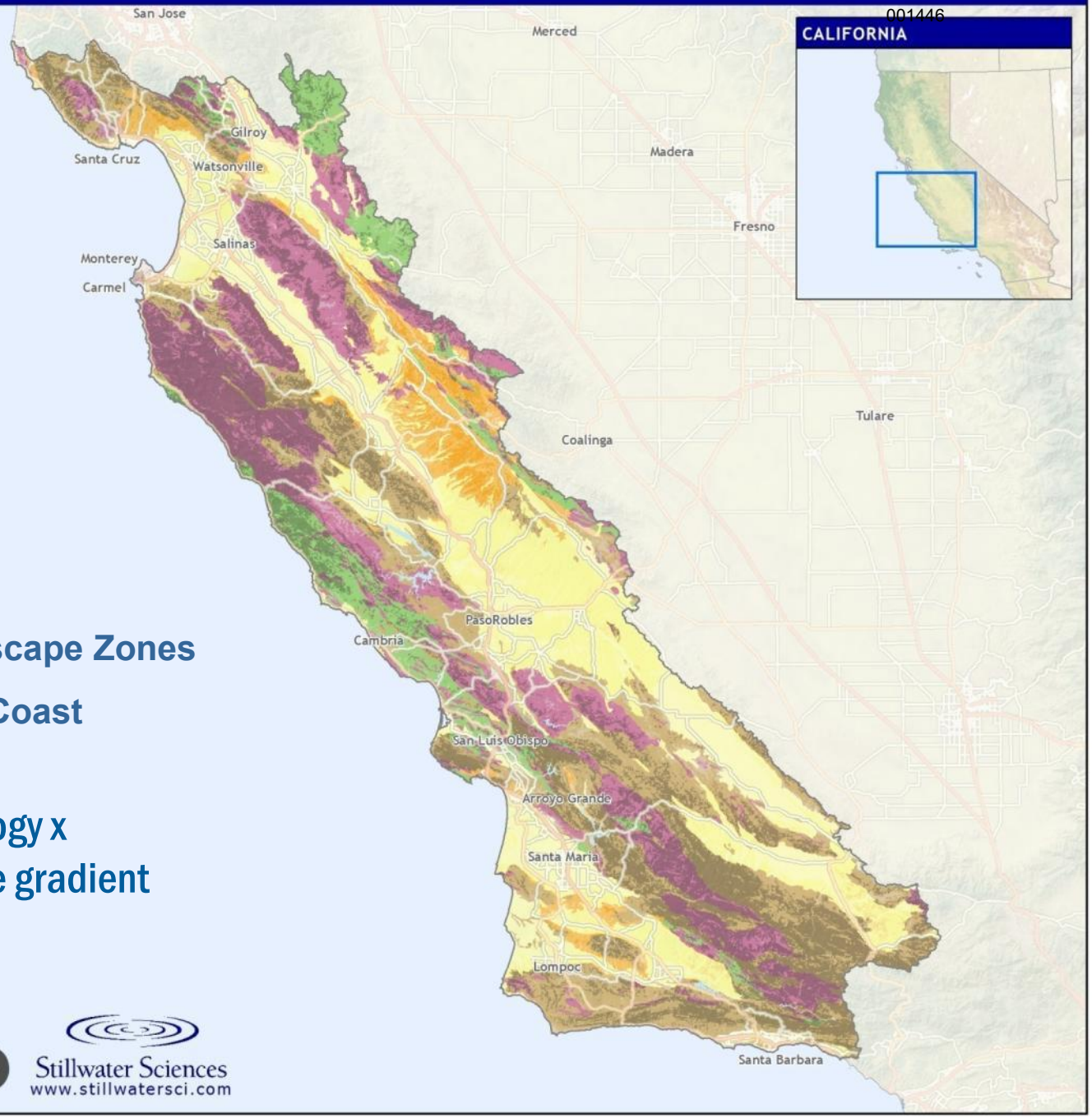

Map of Physical Landscape Zones of the Central Coast

= 5 categories of geology x
3 classes of hillslope gradient

0 12.5 25 50 Miles
0 25 50 100 Kilometers

Stillwater Sciences
www.stillwatersci.com

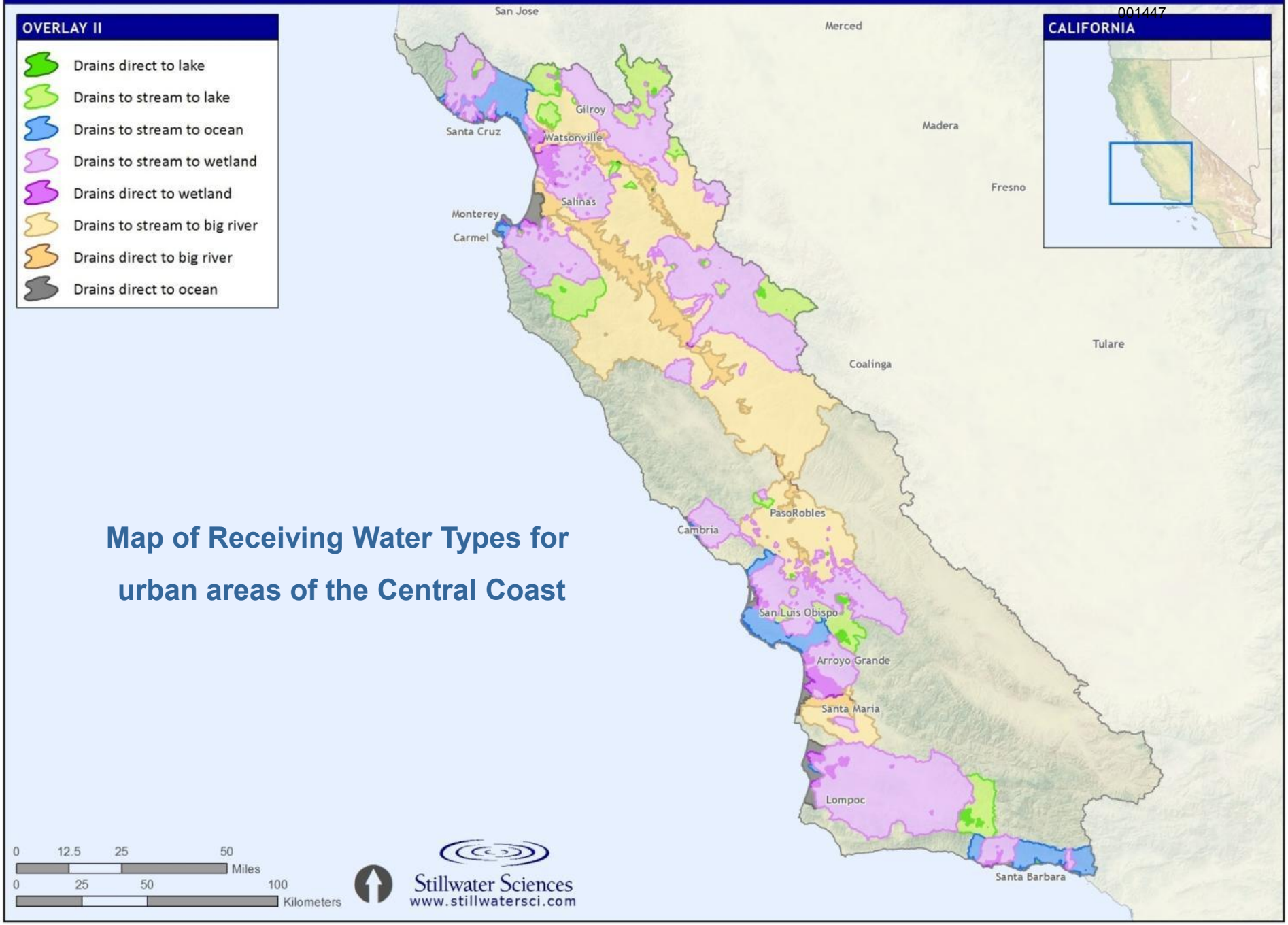

Map of Receiving Water Types for urban areas of the Central Coast

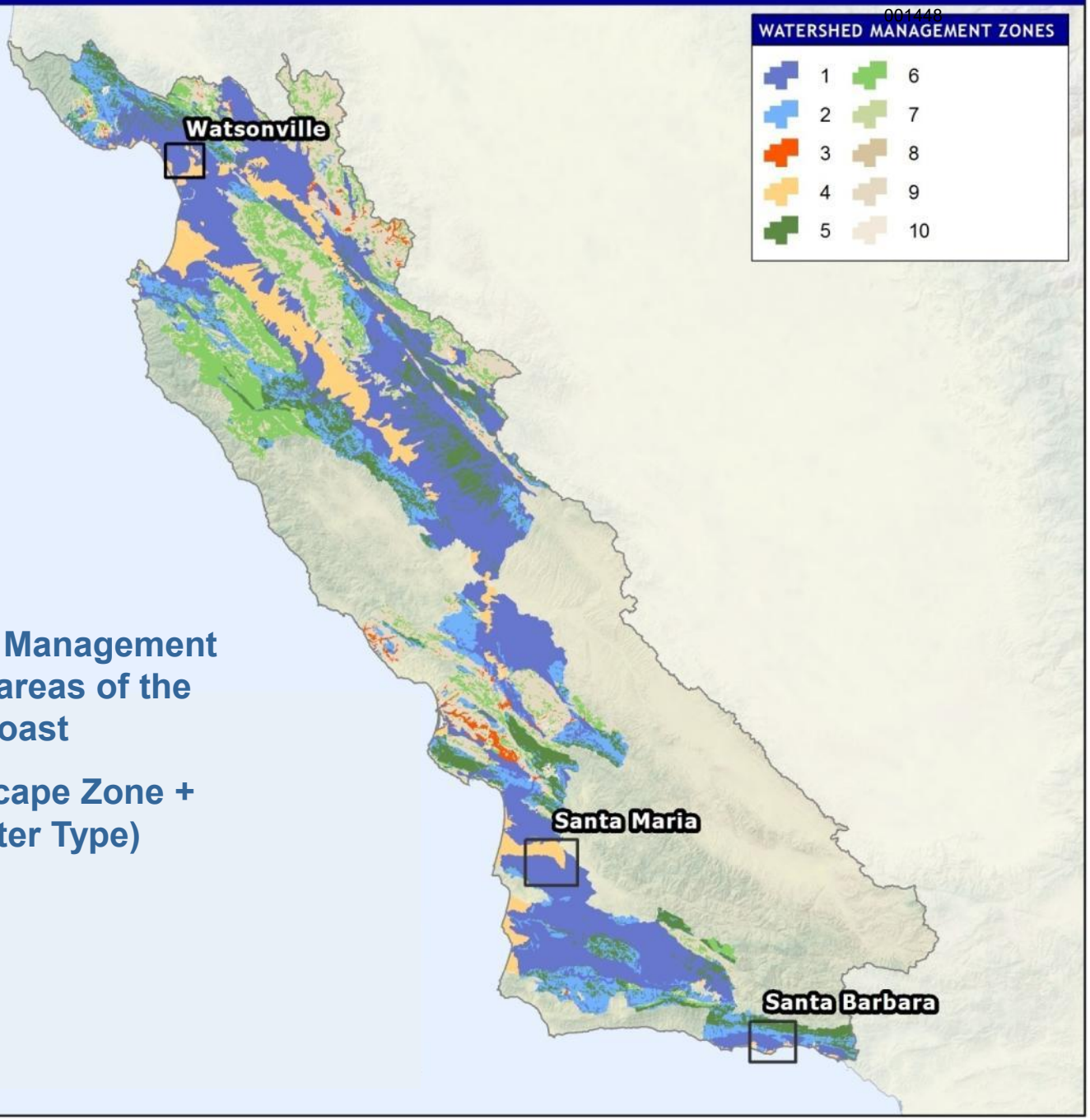

Map of Watershed Management Zones for urban areas of the Central Coast

(Physical Landscape Zone + Receiving Water Type)

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0 12.5 25 50 Miles

0 25 50 100 Kilometers

Table of Watershed Management Zones (1-10)

001449

PHYSICAL LANDSCAPE ZONE	DIRECT RECEIVING WATER					
	Stream	Wetland	Lake	Lake, w/GW basin	Large rivers & marine nearshore	Rivers & marine, w/GW basin
Franciscan mélange 0-10%	3	3	4	4	4	4
Franciscan mélange 10-40%	9	9	10	10	10	10
Franciscan mélange >40%	6	9	10	10	7	7
Pre-Quaternary crystalline 0-10%	3	3	4	4	4	4
Pre-Quaternary crystalline 10-40%	9	9	10	10	10	10
Pre-Quaternary crystalline >40%	6	9	10	10	7	7
Quaternary deposits 0-10%	1	1	4	4*	4	4*
Quaternary deposits 10-40%	1	1	4	4*	4	4*
Quaternary deposits >40%	5	8	10	10*	7	7*
Late Tertiary sediments 0-10%	1	1	4	4*	4	4*
Late Tertiary sediments 10-40%	1	1	4	4*	4	4*
Late Tertiary sediments >40%	5	8	10	10*	7	7*
Early to Mid-Tertiary sed. 0-10%	1	1	4	4*	4	4*
Early to Mid-Tertiary sed. 10-40%	2	2	10	10*	10	10*
Early to Mid-Tertiary sed. >40%	5	8	10	10*	7	7*

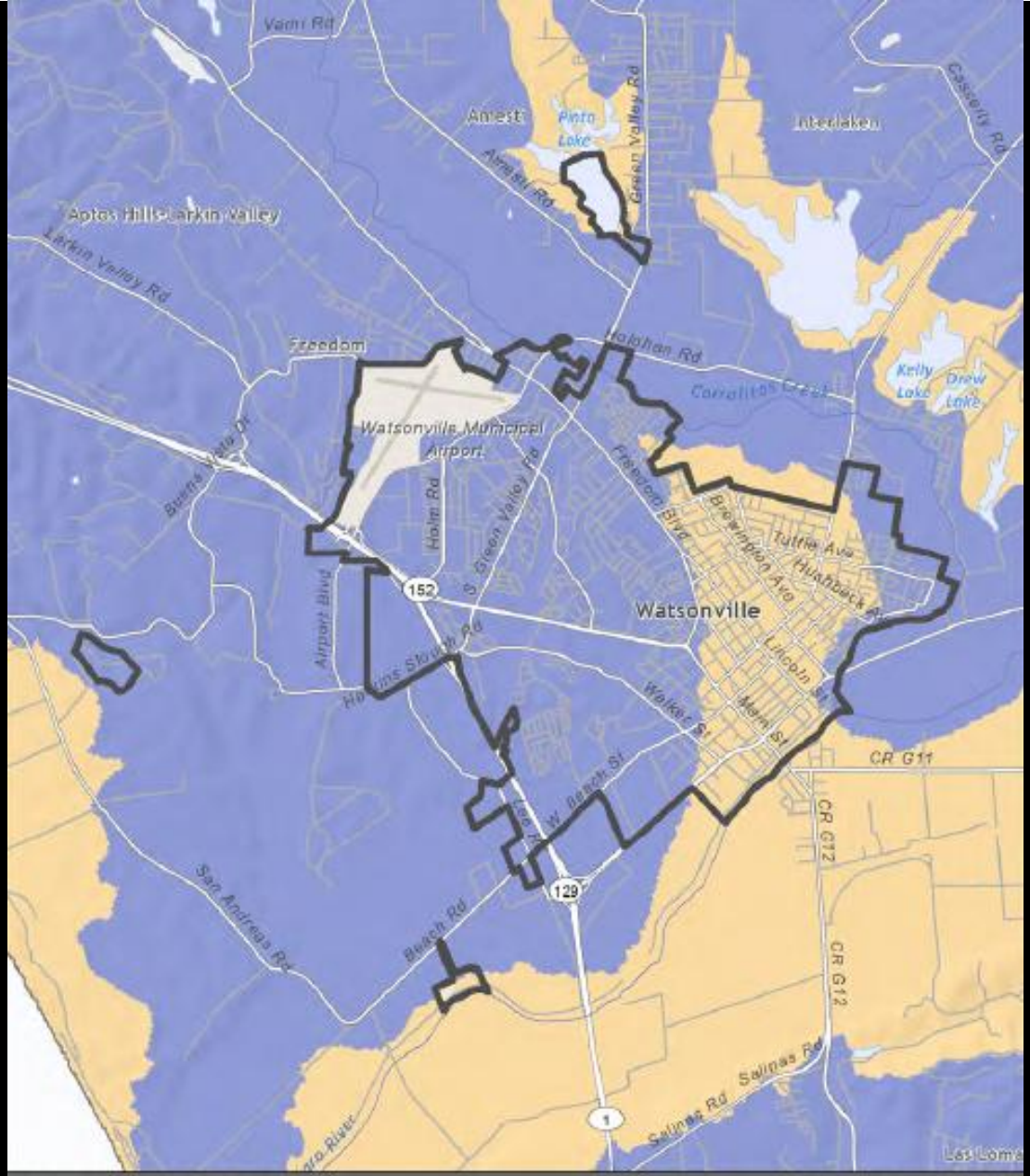

CENTRAL COAST JOINT EFFORT **Watsonville, California**

Watershed management zones

1 2 3 4 5 6 7 8 9 10

Urban area boundary

Data sources
Watershed management zones: Stillwater Sciences, 2012
Base data: ESRI 2010

0 0.25 0.5 1 Miles
0 0.5 1 2 km

N

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Associating WMZ's with Stormwater Control Practices

001451

Preserve/maintain ● ◕ ◑ ◔ ○ No benefit

WMZ #1 (OF, GW; also IF, ET) Management Strategy	Example Criteria	Watershed Processes: Overland flow	Infiltration and groundwater recharge	Interflow	Evapotranspiration	Delivery of sediment to waterbodies	Delivery of organic matter to waterbodies	Chemical/biological transformations
Flow Control	San Diego County – Hydromodification Plan	○	◕	◕	◑	○	○	◕
	Section 438 of EISA – Retain 95th Percentile Event	◕	◕	◕	◕	○	○	◕
	State of New Jersey – Groundwater Recharge	◑	●	●	◑	○	○	◑
Water Quality Treatment	City of Santa Monica – Urban Runoff Mitigation Plan	◑	◕	◕	◕	○	○	◕
Land Preservation	King County, Washington – Requirements for Sensitive Watersheds	◕	◕	◕	◕	◕	◕	◑
	State of Delaware – Final Draft Stormwater Regulations to Minimize Effective Impervious Area	◕	◕	◕	◕	○	○	◕

WMZ 1 = low to mid-gradient, infiltrative sedimentary deposits; drains to stream or wetland

Associating WMZ's with Stormwater Control Practices

Preserve/maintain ● ◕ ◑ ◔ ○ No benefit

WMZ #5 (DS / GW, IF, ET) Management Strategy	Example Criteria	Watershed Processes: Overland flow	Infiltration and groundwater recharge	Interflow	Evapotranspiration	Delivery of sediment to waterbodies	Delivery of organic matter to waterbodies	Chemical/biological transformations
Flow Control	San Diego County – Hydromodification Plan	○	◕	◕	◑	○	○	◕
	Section 438 of EISA – Retain 95th Percentile Event	◕	◕	◕	◕	○	○	◕
	State of New Jersey – Groundwater Recharge	◑	●	●	◑	○	○	◑
Water Quality Treatment	City of Santa Monica – Urban Runoff Mitigation Plan	◑	◕	◕	◕	○	○	◕
Preserve Delivery of Sediment and Organics	Santa Cruz – City-wide Creeks and Wetlands Management Plan (Variable Width)	◔	◑	◔	◔	◕	◕	◔
Land Preservation	King County, Washington – Requirements for Sensitive Watersheds	◕	◕	◕	◕	◕	◕	◑
	State of Delaware – Final Draft Stormwater Regulations to Minimize Effective Impervious Area	◕	◕	◕	◕	○	○	◕

WMZ 5 = steep infiltrative sedimentary deposits; drains to stream

IN SUMMARY (Part 3):

1. "Watershed Management Zones" = the combination of [geology + slope] and [receiving-water type].
2. WMZ's are easily mapped in GIS, at a level of detail determined by the scale of the underlying data.
3. Effective stormwater control strategies can be associated with each WMZ. But....
4. It's not entirely "simple"—implementation also needs to provide easy off-ramps for small projects.

SUMMARY

1. "Stable stream channels" is a overly narrow, unworthy goal for hydromodification control in the 21st century.
2. Watersheds and receiving waters are not everywhere the same; for hydromodification, one size does NOT fit all.
3. Coarse-scale but robust discrimination of key watershed processes can be (i) identified in theory, (ii) confirmed by observation, and (iii) mapped in GIS.
4. Effective stormwater control measures can (and should) be tailored to the site-specific watershed processes needing protection.

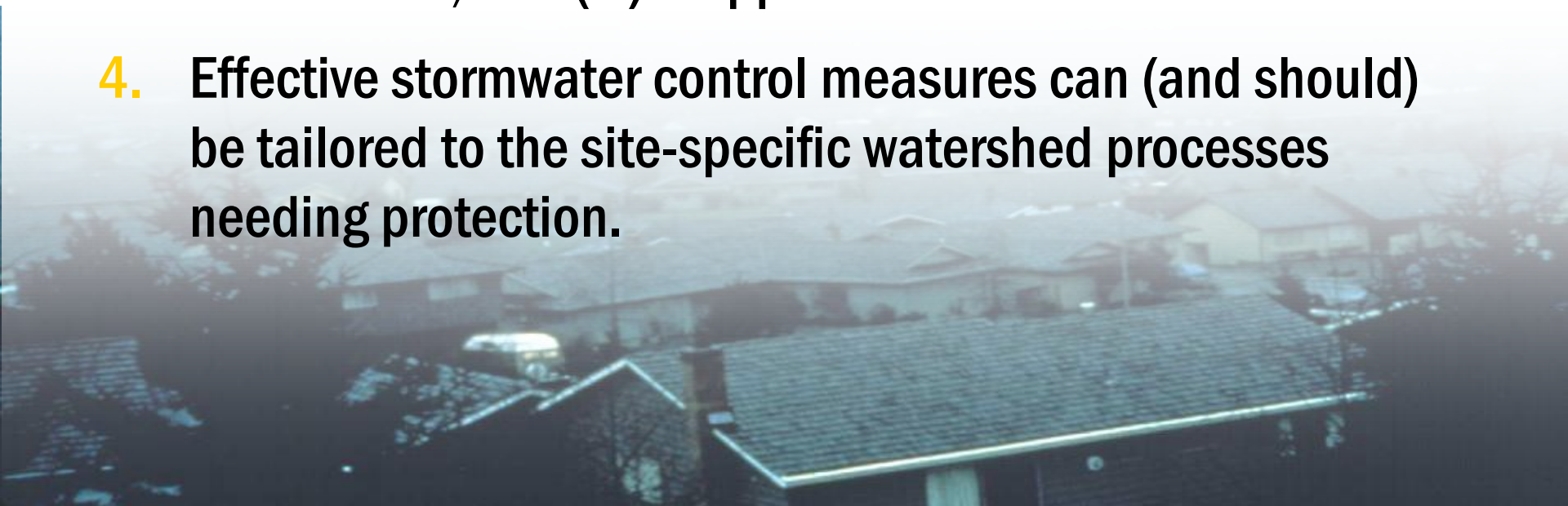

This is not a desired outcome…

001455

...but neither is this.
001456

Central Coast
Water Board
BREN SCHOOL OF
ENVIRONMENTAL SCIENCE
& MANAGEMENT
University of California, Santa Barbara
CENTER FOR WATER
& LAND USE
Stillwater Sciences

Hydromodification Panel Recommendations to the California Water Quality Control Board, San Diego Region

Recommended Hydromodification Management Approaches and Tools for the Regional Municipal Storm Water Permit

October 10, 2012

Hydromodification Management Workshop Recommendations

San Diego Region Hydromodification Management Meeting

August 30, 2012

San Diego Concourse, Copper Room, 202 C Street, San Diego CA

Hydromodification Management

The Draft San Diego Regional MS4 Permit (Regional MS4 Permit) defines hydromodification as:

> ”The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, interflow and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.”

This report and recommendations focus on management approaches and tools to reduce the impacts of hydromodification.

MS4 Permit Context

The San Diego Regional Water Quality Control Board (SDRWQCB) has issued Municipal Separate Storm Sewer System (MS4) Permits under the National Pollutant Discharge Elimination System (NPDES) Phase-I regulations since 1990 to San Diego County, and portions of Orange County and Riverside County. MS4 Permits are required to be renewed every 5 years—to date the San Diego Countywide MS4 Permit was renewed in 2001, and in 2007. The Regional MS4 Permit currently under review will be the fourth-term permit for San Diego Region Countywide Permittees. However, the SDRWQCB intends that the Regional MS4 Permit will apply to all Phase-I Permittees under the jurisdiction of the SDRWQCB, rather than having three separate MS4 Permits for the three counties. Therefore, the Orange and Riverside County Permittees are closely following and participating in the development of the Regional MS4 Permit.

The Regional MS4 Permit would require the Permittees to condition priority development projects (PDPs) (defined in Sections 3.b.1 and .2) under Section E: Jurisdictional Runoff Management Programs. In addition to Low Impact Development (LID) or conventional Best Management Practices (BMPs) to address pollutants in runoff, PDPs must ensure that downstream drainage conveyances will not be adversely impacted by hydromodification, including increases in runoff volume, flow rate, or flow duration. Specifically, PDPs must, with few exceptions, be constructed to match post-development flows to pre-development flows within 10%.

The current San Diego Countywide MS4 Permit required the development of a Hydromodification Management Plan (HMP), which was approved by the SDRWQCB in December 2009. This HMP is currently being implemented and includes "exemptions" that eliminate hydromodification management requirements for a project that 1) discharged to exempt receiving waters such as the Pacific Ocean, or 2) discharged to hardened conveyance systems that extend to exempt systems, or discharged to highly urbanized watersheds (greater than 70 percent imperviousness).

Orange County's 2009 MS4 permit also required the development of a HMP, which was submitted in draft form to the SDRWQCB in December 2011. The Orange County HMP (OC HMP) was based on the framework of the 2009 San Diego HMP and included hydromodification management requirement exemptions for PDPs under certain conditions. These exemptions include projects that discharge to underground stormdrain systems, projects discharging to exempt receiving waters, discharges to engineered channels with specific attributes (including the capacity to convey a 10-year frequency storm event), projects defined as "infill" projects, and projects that discharge to large river reaches. The OC HMP included maps and analysis to help identify these exempt areas.

Within this context, this Workshop was convened to inform the development of hydromodification management approaches, especially given requirements currently under consideration for the draft San Diego Regional MS4 permit. The workshop centered on a panel of five stormwater and hydromodification management experts, who provided presentations during the first half of the workshop and responded to questions in the latter half. They assumed that the audience had basic background knowledge of hydromodification, causes and impacts, so the meeting focused directly on the applicability of hydromodification management requirements in developed areas with well-established flood control systems--especially as applied in the climate of southern California. The audience and panelists were encouraged to think carefully of existing fears and misperceptions, such as the likelihood of removing large flood-control systems in the foreseeable future, and the concern that hydromodification regulations would be similar everywhere (a one-size- fits-all approach). The participants were also encouraged to identify a short list of the highest priority recommendations for consideration as the Regional Permit is developed.

The expert panel was asked to address two specific questions from the MS4 Permittees (as described in the Meeting announcement and agenda) with an understanding that there would be numerous additional questions that might also be relevant. Two examples of these second-tier questions were also provided. These questions were:

Key Questions

A. What are key decision factors in applicability of hydromodification management requirements?
(HM requirements apply everywhere, but specific requirements for a site or catchment should be commensurate with Beneficial Uses, technical feasibility, and cost—one size does not fit all)

B. Where in the watershed, and using what criteria, should hydromodification management requirements be applied?

(Can we identify specific factors and a process of evaluation that are essential for selecting the type of hydromodification management action or approach that is most likely to reduce adverse hydromodification impacts*?)*

Second-Tier Questions:
C. What constraints and incentives (in lieu, hydromodification management trading/credits) are applicable to hydromodification management approaches?

D. How do we prioritize sites and/or areas within watersheds for application of hydromodification management requirements?

The Workshop consisted of five presentations in the morning by the members of the Panel. Their general areas of focus were as follows:

- **Managing Hydromodification: the Next Generation (Eric Stein**, PhD, Southern California Coastal Water Research Project
- **Hydromod' regulations in California (Eric Berntsen** PH, CPESC, CPSWQ, State Water Resources Control Board**)**
- **Hydromodification and Flood Control--mandates, constraints, and opportunities (Iraj Nasseri,** PhD, PE, PH, Water Resources Division, Los Angeles County Flood Control District**)**
- **Hydromodification regulation and rehabilitation approaches (Chris Bowles,** PhD, PE, cbec, inc., eco engineering**)**
- **Landscape Stratification, Watershed Processes, and Hydromodification Control— A new approach from the Central Coast (Derek Booth,** PhD, PG, PE, UC Santa Barbara, Bren School of Environmental Science and Management)

Panel Recommendations

1. Manage stream channels and hydromodification management within a holistic watershed management framework. The panel's key, overarching recommendation was that hydromodification impacts are best addressed by initially identifying and prioritizing opportunities and constraints at the watershed scale. Site-by-site evaluations, typically conducted only as required for local development project permitting--and in the absence of an overall watershed framework--will never provide an adequate basis for successful mitigation of hydromodifcation impacts. The results of a watershed-scale assessment can be used to establish goals and expected conditions for specific areas of the watershed, and they can be a precursor for both an off-site in-lieu and hydromodification management credit and mitigation program. It must be recognized that the level of watershed functionality is the primary control for stream conditions. A simple starting point is to map geology and slope in the watershed, which can be used to infer the primary watershed processes that determine downstream physical, chemical, and biological conditions. More detailed characterization of receiving waters, using stream (or fluvial) audits, field and desktop reconnaissance, and additional watershed attributes such as habitat types and land use, can be included, if available. All relevant data can then be synthesized and analyzed within a GIS or geodatabase to develop "management zones" that can identify the critical elements of the watershed and its key processes that require protection. Present land use can be evaluated and future land use conditioned to protect and enhance watershed processes, and in turn, stream system integrity.

To the extent data are available, such analyses should consider all watershed attributes—physical, chemical, biological, past and future land use, and the applicability of management practices that can address multiple stressors. Consider whether specific tools such as peak flow control, flow and flow duration control, or erosion potential determinations could be useful, or essential, to management of particular watershed areas. Continuous simulation rainfall-runoff models have been developed for several watersheds in southern California. Such models are expensive to develop and maintain, but, if available, can greatly refine the response of the watershed under various rainfall and land use scenarios.

Watershed processes are better understood when evaluated over appropriate timelines—hydromodification impacts and control practices will span decades. Therefore, emphasize change rather than endpoints, and require hydromodification management monitoring to support adaptive management that allows for revised management approaches given new information. Viable HMPs will translate the watershed assessment and appropriate tools into specific management actions that can be applied at project sites.

2. Project-specific metrics should be used in developing hydromodification management requirements. Each site has unique geology and slope that can be heterogeneous at various scales, and some sites may be severely impacted while others are impacted very little. However, it is also important to evaluate projects and watersheds at various scales to ensure a comprehensive understanding of the existing condition, and, to the extent possible, predicted future condition. Individual subwatersheds may share geology and slope attributes, but have very different land uses, for example, which should lead to different management strategies, different metrics of success, and different monitoring plans.

The timescale of analysis is also critical as watersheds and drainage systems change naturally over long time frames and the full extent of a stressor may not be evident within a 5-year MS4 permit term. An effective HMP will recognize these uncertainties, yet provide implementation guidance on the best understood approaches for specific areas of the watershed, and include a mechanism to review the effectiveness of management actions.

3. Revise Regional MS4 Permit language to reduce constraints on and increase the feasibility of off-site hydromodification management in-lieu, credit, and/or mitigation programs. In some cases, the best benefit for the watershed may be to implement mitigation actions off-site, but, wherever possible, within the same watershed as the potential impact. Allowing and incentivizing in-stream rehabilitation projects, which have been adequately characterized, will provide habitat benefits such as greenbelts and connectivity, and can be part of a larger effort to improve watershed functions and values. In developed areas, the only effective solution to hydromodification impacts over a 10-20 year time frame may be to stabilize the stream with structural means and increase habitat functionality over time. Infill projects often have existing conveyance structures with limited connection opportunities and a smaller footprint to incorporate requisite LID BMPs. These projects should also be eligible for off-site mitigation funding support, where appropriate, within a multi-benefit watershed framework, perhaps similar to the approach used in the Corps/EPA Compensatory Mitigation Rule[1].

[1] Department of the Army, Corps of Engineers 33 CFR Parts 325 and 332; and US Environmental Protection Agency 40 CFR Part 230 Compensatory Mitigation for Losses of Aquatic Resources; Final Rule. Federal Register / Vol. 73, No. 70 / Thursday, April 10, 2008, p 19594.

Most MS4 Permits in California, including the Regional MS4 Permit, have provisions to allow for "alternative compliance," such as in-lieu off-site, or hydromodification management and/or water quality credit programs. However, few, if any such programs have been implemented under the MS4 regulations here. The Regional MS4 Permit requires that off-site mitigation must be in the same hydrologic unit if at all possible, the mitigation project must be completed before occupancy permits are to be approved, and funding contributions made to an off-site project require the mitigation project be complete before occupancy permits are allowed. These requirements are very difficult to sequence as needed, and other regulatory agencies can have permitting timelines and requirements that destabilize the process. When developing an off-site credit or in-lieu mitigation approach, results should be emphasized rather than the process. Consider an incremental pay-in and monitoring approach, which may show that a result has been achieved earlier than expected, leaving committed funds for other projects[2].

4. Regional Boards should lead the development of implementation processes for MS4 permit requirements that involve other permitting processes and multiple agencies with jurisdiction over project conditioning or permitting. In California, development project requirements within MS4 permits have become a primary vehicle to ensure projects are conditioned for potential water quality and HM impacts at the project level; and they are also the current regulatory backstop to coordinate and ensure multiple other "non-MS4" project requirements are fulfilled before they can break ground. However, for optimal project design and implementation it is essential that, at the earliest possible stage, the development review and permitting process be coordinated with other involved agencies, including: the Regional Boards' 401 Water Quality Certification Program, the U.S. Army Corps of Engineers Section 404 dredge and fill permits, the U.S. Fish and Wildlife Service, the U.S. Forest Service, the California Department of Fish and Game, and Caltrans, among others. Coordinated permitting and permit scheduling would help support a viable HM off-site, in-lieu, credit, and/or mitigation program.

5. The question of whether (or not) to allow hydromodification management exemptions under certain conditions cannot be adequately addressed from the technical perspective alone, and requires guidance and input from local and/or regional stakeholders. Hydromodification management exemptions for specific stream reaches, or for ranges of stream conditions (such as engineered and hardened channels) may be appropriate; however, such exemptions do not account for other watershed scale effects of hydromodification (e.g. coastal erosion). From a strictly technical perspective, some potential HM-exempt reaches or areas can be identified in the watershed inventory. The watershed inventory and evaluation can also identify any potential in-lieu or off-site mitigation project areas that might have a viable nexus to the identified hydromodification management-exempt areas.

Whereas increased runoff from projects in "hydromodification management-exempt" areas may do little or no apparent harm to the channel that directly receives the discharge, the channel is typically part of a larger system that has been ecologically degraded by anthropogenic stressors, such as urban development and the need for flood protection. Watershed assessment and project planning require scientific and technical support to be

[2]Doyle and Shields, 2012. Compensatory mitigation for streams under the clean water act: Reassessing science and redirecting policy. Journal of the American Water Resources Association, 48(3).

effective in minimizing or reversing environmental impacts over various timescales. However, whether to impose expensive structural hydromodification management requirements on projects that redevelop aging urban areas with existing hardened runoff conveyance systems, or require such a project to pay into an off-site hydromodification management mitigation project or in-lieu fund are not technical questions—they are societal value judgments. Such determinations should be made through the multi-jurisdictional land-development hierarchy that establishes the environmental controls on land development. MS4 permits should incentivize planning and projects that improve watershed attributes and functioning over time, but they also need to recognize the need to integrate technical understanding with policy-level guidance to achieve this goal.

6. Monitoring must be an essential implementation requirement to understand the effectiveness of implemented BMPs or lack thereof. Strategic and judicious hydromodification management monitoring should be an essential component of the Watershed Management or Improvement Plan. Given our current systems and level of understanding, it may be more valuable to prove that a system worked (or did not work), even if conducting such an evaluation process potentially sacrifices some mitigation resources. However, HMP monitoring requires a much longer period of record (typically 10 years or more—well beyond MS4 permit terms) to establish baseline conditions or to discern incremental impacts from developing a single project or a portion of a watershed. Therefore, HMP monitoring must incorporate longer timelines and less frequent reporting than other monitoring program elements.

We, the expert speakers and panelists, support the 6 recommendations as presented above:

Eric Berntsen	**Derek Booth**	**Christopher Bowles**
Iraj Nasseri	**Eric Stein**	

Respectfully submitted on behalf of the workshop attendees.

Matt A. Yeager

Yeager Environmental Associates

From: lyris@swrcb18.waterboards.ca.gov
To: Chiu, Wayne@Waterboards
Subject: Regional MS4 Permit Focused Meeting - July 25 Meeting Notes
Date: Monday, August 13, 2012 8:49:10 AM
Attachments: 2012-0725_MeetingNotes.pdf

Regional MS4 Permit Stakeholders,

Attached are the Regional MS4 Permit Meeting Minutes from the July 25, 2012 Focused Meeting. The San Diego Regional Permit Team will be forwarding the agenda for the next Focused Meeting scheduled on August 22, 2012 by Friday.

Laurie Walsh P.E.
San Diego Water Board
858-467-2970
lwalsh@waterboards.ca.gov

You are currently subscribed to reg9_sandiegoco_ms4permit as: wchiu@waterboards.ca.gov.
To unsubscribe click here: http://swrcb18.waterboards.ca.gov/u?id=508208.cee2a373662e566393e62f0af18d11cf&n=T&l=reg9_sandiegoco_ms4permit&o=374116
(It may be necessary to cut and paste the above URL if the line is broken)
or send a blank email to leave-374116-508208.cee2a373662e566393e62f0af18d11cf@swrcb18.waterboards.ca.gov

California Regional Water Quality Control Board, San Diego Region
Regional MS4 Permit Focused Meeting

Meeting Notes

Date	Location	Agenda Topics
7/25/2012 Start time: 9:30 AM End time: 2:50 PM	City of Carlsbad Faraday Center 1635 Faraday Ave, Rm 173 Carlsbad, CA 92008	• Focused Meeting Highlights • Monitoring Requirements Introduction • Stakeholder Monitoring Presentation • Discussion on Monitoring Proposals Related to Permit Requirements • Parking Lot Discussion • Other Topics / Audience Comments

I. Introductions

Table participants introduced themselves. Lewis Michaelson (Facilitator) ensured the appropriate representatives were at the table, per the June 20, 2012, San Diego Regional Water Quality Control Board (SD RWQCB) Notice.

San Diego County Copermittees (5): Jo Ann Weber (County of San Diego), Andre Sonksen (City of San Diego), Paul Hartman (City of Vista), Karen Holman (Unified Port of San Diego), Alison Witheridge (City of Oceanside), Mikhail Ogawa* (City of Del Mar), Drew Kleis* (City of San Diego) **Indicates representatives rotated during the meeting.*

Orange County Copermittees (5): Grant Sharp (Orange County Flood Control District), Mary Anne Skorpanich (County of Orange), Ted Von Bitner (County of Orange), Richard Boon (County of Orange), Devin Slaven (City of Lake Forest, Lisa Zawaski* (City of Dana Point) **Indicates representatives rotated during the meeting.*

Riverside County Copermittees (3): Claudio Padres (Riverside County Flood Control District), Bob Collacott (Riverside County Flood Control District), Mike Shetler (County of Riverside)

Environmental Community (3): Colin Kelly (Orange County Coastkeeper), Jill Witkowski (San Diego Coastkeeper), Roger Butow (Clean Water Now! Coalition), Thom Spanos* (San Diego Coastkeeper) **Indicates representatives rotated during the meeting.*

Development/Business Community (3): Bryn Evans (Industrial Environmental Association), Wayne Rosenbaum (BIA), Mike McSweeney (BIA), Mark Grey* (BIA) **Indicates representatives rotated during the meeting.*

U.S. Environmental Protection Agency (US EPA) (1): John Kemmerer

San Diego Water Board Permit Team: David Barker, Wayne Chiu, Laurie Walsh, Eric Becker

II. Focused Meeting Highlights

David Barker (RWQCB) announced that there will be an additional meeting on the topic of hydromodification. The County of Orange has taken the lead on organizing the event, which will run in the same manner as the other focused meetings. Details will be sent out once they are available. A tentative decision has been made to have the meeting the last week of August.

David Barker (RWQCB) provided brief remarks on some of the points raised in the past focused meetings that are resonating with the RWQCB staff.

1. Monitoring doesn't have to be water quality sampling. Water quality data are not the only assessment tool that can be used. There were requests that monitoring programs should include field observations as monitoring data, especially for non-stormwater discharges.
2. Adding language to the permit, not just the fact sheet, about the non-enforceability of action levels.
3. Adaptive management in the permit should be flexible enough for the Copermittees to learn without fear of being out of compliance with the permit.
4. Including more specific public participation requirements for development of Water Quality Improvement Plans, and for development of priorities for the Water Quality Improvement Plans.
5. Clarifying Board approval process for all plan submittals, reports, and updates.
6. Making it clearer in the permit what is eligible for adaptive management practices and clarifying the points of compliance in the permit.
7. Consideration of other means of demonstrating compliance with TMDL requirements that are consistent with the assumptions and requirements of the TMDL. The Board does see some flexibility in how waste load allocations are incorporated into the permit.
8. Examining the proposal to change the permit language from "prohibit" to "effectively prohibit" non-stormwater discharges.

David Barker (RWQCB) did caveat that this is not a complete list, and the omission of any points does not mean the Board is ignoring the issue or has made a final decision on the issue.

III. Monitoring Requirements Introduction

Eric Becker (RWQCB) explained how RWQCB staff developed the monitoring provision in the administrative draft permit, almost starting from scratch. The Board looked at what is truly required in federal regulations of the monitoring program and included that in the

monitoring provisions. The Board also listened to feedback from the Copermittees from meetings, as well as recommendations from the Report of Waste Discharge (ROWD). It was a conscious change to include monitoring as a provision within the permit instead of as an attachment. The main goals of the monitoring program are to ensure non-stormwater discharges are eliminated, pollutants in storm water discharges are reduced to the maximum extent practicable (MEP), and that water quality limits are met in the receiving waters. The Board also wants to increase jurisdictional accountability, make sure that monitoring is used as a feedback loop to adapt programs, and identify illicit discharge sources within the MS4, including those outside of the control of the Copermittees. RWQCB staff expects significant changes to this Provision.

IV. Stakeholder Monitoring Presentation

All stakeholders were provided the opportunity in advance to formally present materials at the focused meeting. The San Diego County Copermittees took advantage of the opportunity.

Jo Ann Weber (County of San Diego) stated that we all share a common goal of protecting beneficial uses in waterways. The purpose today is to build on the considerable level of effort already done and provide insights as to what works and what doesn't work. The program as written in Provision D does not support adaptive management. The San Diego County Copermittees have developed a new approach using specific questions provided by RWQCB staff.

The approach proposed by the San Diego County Copermittees is to require development of a Monitoring and Assessment Program (MAP) as part of each Water Quality Improvement Plan to provide information needed to answer management questions and support effective adaptive management. To do so, the San Diego County Copermittees propose to coordinate Provision II.D requirements with Provision II.B language. The goal is to answer the three big assessment questions as efficiently as possible.

Adaptive management has three phases: long-term planning, implementation, and assessment. To provide useful feedback, the MAP is proposed to be developed during the long-term planning process during the first twelve months after permit adoption. Monitoring needs to be coordinated with the other programmatic elements to provide the most useful information.

The San Diego County Copermittees see monitoring fitting in with overall program management. It fits in with the other implementation elements; it is not an element outside the program. To illustrate this, see the following figure.

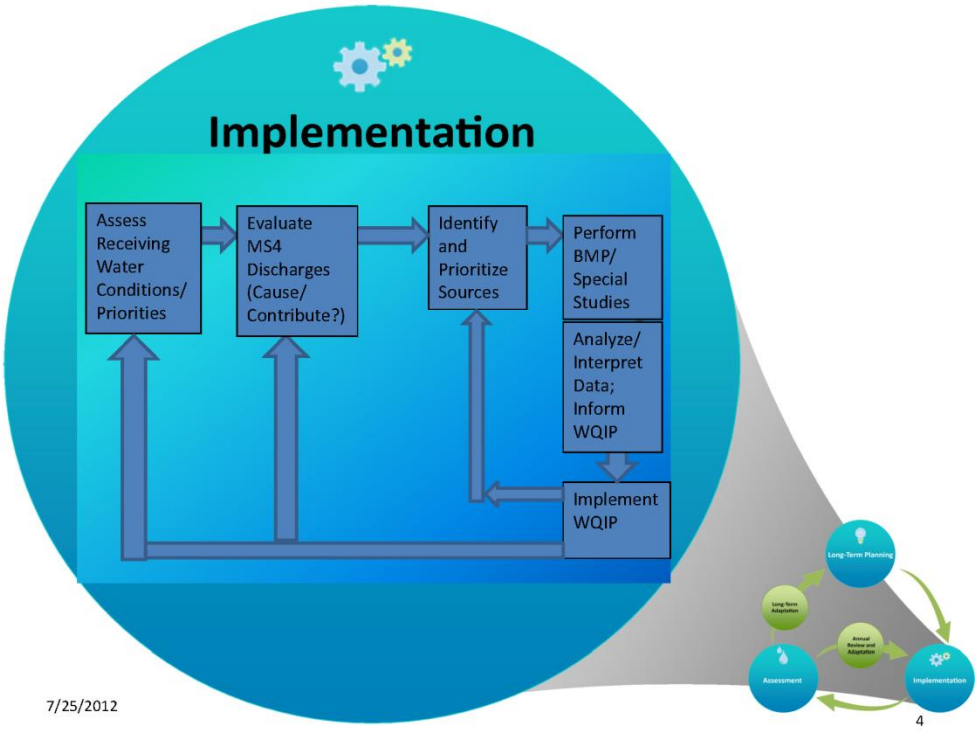

The four overall components of the monitoring program (assess receiving water conditions/priorities; evaluate MS4 discharges; identify and prioritize sources; perform BMP/Special Studies) are shown across the top of the above diagram. The loop across the bottom of the diagram is the adaptive management, or feedback, process.

The San Diego County Copermittees have been monitoring receiving waters for close to 20 years now and have a high level of understanding of the problems in many of the receiving waters. In the 2007 San Diego Permit, the San Diego County Copermittees began to incorporate MS4 stormwater conveyance monitoring to determine how MS4s were impacting the receiving waters. The San Diego County Copermittees are now looking to move this information forward by placing more focus on identifying and prioritizing sources. In earlier permits, a lot of time has been spent in the first box on the left. The focus now should be taking resources and moving forward in the process.

The San Diego County Copermittees believe that this is the nexus to effective implementation because it fits into adaptive management and can guide and utilize other programmatic implementation efforts to improve water quality. For example, if nutrients and bacteria are priority problems, then sources of each must be considered separately. Different strategies for implementation will be necessary to target each audience. Pilot BMPs and other special studies will provide specific information to improve and target implementation activities. These studies may involve more than just water sampling. The loop at the bottom of the diagram represents the adaptive management process.

The San Diego County Copermittees recognize that watersheds are at different levels of understanding with respect to each of the four components. Those with TMDLs have a more mature program. The goal of the MAPs will be to strategically tailor the balance of

monitoring to the prioritized needs of the specific watershed management area. The result will be efficient, coordinated monitoring with an enhanced watershed and TMDL focus.

Provision D in the administrative draft permit has a lot of focus on the first two boxes, but does not allow Copermittees to shift effort to the third and fourth boxes. The San Diego County Copermittees would like that flexibility. The Copermittees want to coordinate the monitoring in Provision D with the assessment plan required in Provision B. To do so, the San Diego County Copermittees propose an Alternate Provision II.D to maximize the benefits of the programs overall. The concept is to use an informed design strategy that tailors a question-driven approach, starting with general questions that lead to more specific questions. The Copermittees would not be starting from scratch; rather, they would be building on the last 20 years of monitoring strategies. Also, as monitoring is not just water sampling, the Copermittees want to incorporate alternate monitoring methods better than has been done in the past. Ultimately, this will support watershed priorities and allow Copermittees to focus water resources on high priorities within each watershed.

The San Diego County Copermittees are proposing alternate language for Provision D that will better provide program managers with needed information to support effective adaptive management. The proposal includes having monitoring within the overall planning process of the Water Quality Improvement Plan. To accomplish this, the San Diego County Copermittees propose a phased approach with pre- and post- Water Quality Improvement Plan phases. The MAP would be developed as part of the Water Quality Improvement Plan. With this approach, the first and second year monitoring requirements would be set forth in the permit as part of a transitional monitoring program. The monitoring requirements would be re-assessed and adjusted as necessary to support the highest priorities in each watershed.

If the permit is adopted in spring 2013, then the current Order No. R9- 2007-0001 monitoring would continue until September 30, 2013 to accommodate the resource commitments for the current fiscal year. The transitional (pre-WQIP) monitoring program would run from October 1, 2013 to September 30, 2015 to accommodate the public review, RWQCB review, and lead time necessary for budgeting. The MAP as part of the Water Quality Improvement Plan (post-WQIP phase) would be implemented from October 1, 2015 forward.

The scientific basis of the San Diego Copermittees' proposed Alternate Provision II.D is an informed, question-driven approach. This approach is strongly endorsed at local, regional, state, and federal levels. At the June 2012 RWQCB meeting, RWQCB staff presented a similar approach that was well-received by the Board. The process proposed by the San Diego County Copermittees aligns well with the condition assessment process proposed by RWQCB Staff with an emphasis on setting priorities. All of these documents (A Framework for Monitoring & Assessment in the San Diego Region (SDRWQCB, 2012), Southern California Stormwater Monitoring Coalition's Model Monitoring Program (SMC, 2004), SWAMP Assessment Framework (SWMP, 2010), Elements of a State Water Monitoring and Assessment Program (EPA, 2003)) stress the importance of basing monitoring on clear questions that support explicit decisions ensuring that data are

gathered only when there is a validated framework in place. These documents follow an earlier National Research Council report on monitoring, which emphasized the importance of building on clear conceptual models and questions that are linked to management needs.

Jo Ann Weber (County of San Diego) stated that today she will summarize key technical issues that support Alternate Provision II.D. Detailed explanation will be provided in a separate memorandum to the RWQCB, including specific permit language revisions.

One key proposed change includes jurisdictional non-stormwater monitoring in Section II.D.1.a. Instead of extensive MS4 outfall testing, the San Diego County Copermittees propose to conduct a targeted program to reduce persistent flows that impact receiving water quality, thus allowing resources to focus on actions to ultimately improve water quality. The San Diego County Copermittees also propose a broad program to eliminate transient illicit discharges/illicit connections (ID/IC) getting the spatial coverage by using visual surveys and appropriate follow up criteria.

In addition, for the jurisdictional stormwater monitoring, instead of extensive MS4 outfall monitoring, the Copermittees propose monitoring homogeneous land uses as input to a model. This wet weather runoff modeling would better inform the planning process by prioritizing drainages for implementation efforts. Representative typical mixed-use sites could be used as a cross-check for model results. Selection of representative outfalls with homogeneous land use types may be coordinated and shared among Copermittees to provide the most efficient representation and characterization of major land use categories. Modeling currently being done as part of the bacteria TMDL implementation plan efforts may be built upon.

The San Diego County Copermittees recognize that the RWQCB wants to see jurisdictional accountability. Jurisdictional accountability should focus on completion of the iterative process and would be supported by data collected at prioritized targeted MS4 outfalls. The San Diego County Copermittees feel that the administrative draft permit's jurisdictional boundary monitoring does not support their goals. In the past, data have shown that jurisdictional boundary monitoring has little value, due to a combination of typically high variability of the concentrations of constituents in receiving waters and discharges, and a relatively small percentage of discharge flows and pollutant loading in the receiving waters. This combination of high variability and relatively small impacts or differences requires extremely high numbers of samples to detect significant differences and would be unlikely to result in any programmatic changes or improvements to water quality.

In addition, instead of the extensive compliance monitoring proposed to comply with the Bacteria TMDL in Attachment E, Copermittees have already developed monitoring programs to comply with Bacteria TMDL requirements that are due October 2012. The current language in Attachment E would replace the monitoring planning effort just completed.

Andre Sonksen (City of San Diego) continued that the workgroup has spent significant time and effort developing their proposed approach. One key point is that this is an ordered process that leads to solving specific water quality problems. This process can be applied at

any level – watershed, jurisdictional, or pollutant level. There are three different components to this: management questions (on the left), monitoring components (in the center), and assessment components (on the right). All three components are essential for this to work.

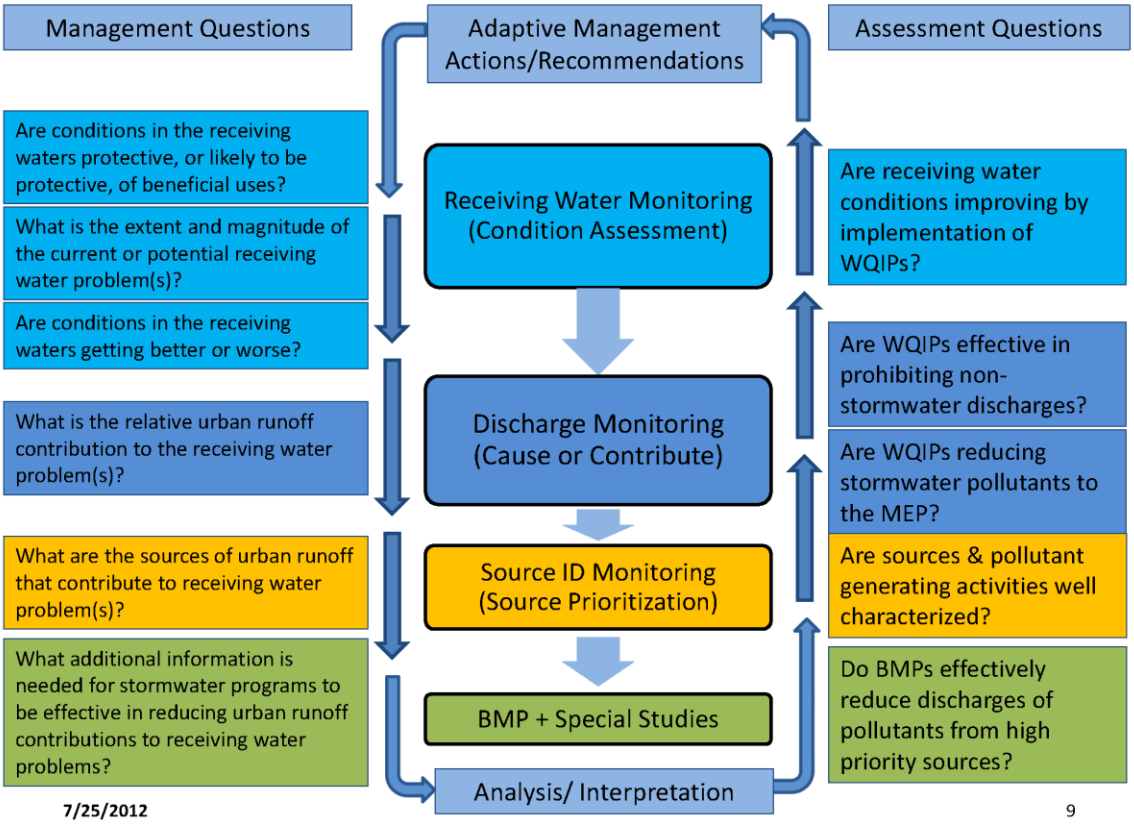

The administrative draft permit focuses on the top four management questions, the receiving water and discharge monitoring, and assessment. There are two more levels needed: source identification and special studies/BMPs. The top three (blue) deal with receiving waters. The next one (darker blue) is discharge monitoring. Yellow is source identification and pollutant-generating activity (PGA) monitoring and identification. The bottom (green) is special studies.

The process starts at the top and moves down. When starting at the top in receiving waters, information is collected that feeds down into discharge monitoring, which feeds into source identification, which then feeds into BMPs. These have to work together. Collecting information at a lower level without collecting information at higher levels will not work. The top question needs to be answered first, or else significant time and effort might be spent looking at something that is not a problem.

The assessment train works in reverse, going back up the process: start with data collected through special studies/BMPs, analyze if the BMPs were effective or if the special

study gives information for feedback into source identification or prioritization, and so on, up the ladder.

The Copermittees have spent a significant amount of time developing how each of these different components are outlined, how they work from top to bottom, left to right, and this is a very well thought out, organized, and methodical process to collect information with direct impacts on how to implement programs.

Andre provided Chollas Creek as an example. In Chollas Creek, the Copermittees have been doing a significant effort for the past 20 years that has culminated into TMDLs for bacteria and metals. Extensive receiving water information has already been collected, the Copermittees already have information at the MS4 discharge level, and there have been special studies completed in Chollas Creek. Looking at the proposed flowchart, some of the questions have already been answered in Chollas Creek. Special studies and BMPs are the next phase for Chollas Creek. Other watersheds don't have the plethora of data that Chollas Creek does, so they would start towards the top of the flowchart.

Claudio Padres (Riverside County Flood Control District) asked if the intent is that this process would be integrally part of the Water Quality Improvement Plan and if the types of monitoring being described would be focused on the high priority issues identified in the Water Quality Improvement Plan or if it would be discharge monitoring everywhere. Andre replied that the MAP would be integrally part of the Water Quality Improvement Plan. This is a methodology for implementing monitoring and how monitoring should be used to inform program planning, program implementation, and adaptive management. For watersheds that have developed high priorities already, the process would be used to tailor the monitoring to get at the issues that are further down in the monitoring tree.

Paul Hartman (City of Vista) stated that the point of the monitoring programs is to allow Copermittees to focus resources on strategic areas identified in the Water Quality Improvement Plan. The way monitoring is laid out in the current administrative draft permit is too prescriptive. Ultimately, the focus needs to be further down in the above diagram, focusing on source identification and special studies.

Claudio Padres (Riverside County Flood Control District) stated that if the intent of the permit is to allow the Copermittees to focus their resources on those high priority issues, then one way to do that is to allow them to focus their monitoring resources, and staffing and time and money, and not spread resources too thin trying to assess everything everywhere.

Colin Kelly (OC Coastkeeper) asked how far the San Diego County Copermittees reached out to Riverside and Orange County about these general ideas. Claudio Padres (Riverside County Flood Control District) responded that the San Diego County Copermittees have been reaching out to Riverside. Unfortunately, due to deliverables under the current Riverside MS4 permit, the County of Riverside has not been able to be involved; however, he has heard a lot of good points and is so far in support of the San Diego County Copermittees presentation today. Richard Boon (County of Orange) stated that Jo Ann Weber has been studiously involving Orange County in conference calls with the group that

developed this approach. Orange County certainly endorses and supports the question-driven approach.

Colin Kelly (OC Coastkeeper) asked if the RWQCB anticipates each program doing every step in this process or if findings can be shared across the jurisdictions, such that if the City of San Diego has done an air deposition study, can those results be taken and used by Orange County so they aren't all doing the same special studies.

David Barker (RWQCB) replied that one reason they are pushing the regional permit is to allow collaborative use of studies.

Mary Anne Skorpanich (County of Orange) shared that she sees this approach very much fitting in with some of their own thoughts that these Water Quality Improvement Plans should take a much more central role in the permit overall. She is completely in concurrence with the overall monitoring required by the permit being linked to the Water Quality Improvement Plan.

Jo Ann Weber (County of San Diego) stepped through the pre-Water Quality Improvement Plan (transitional) monitoring and examples of post-Water Quality Improvement Plan monitoring proposed in Alternate Provision II.D, beginning with receiving waters. The San Diego County Copermittees recognize their responsibilities and commitment to maintaining a level of effort of monitoring during the pre-Water Quality Improvement Plan or transitional phase similar to the current 2007 permit, but adapted to provide more useful information to support Program Managers' needs.

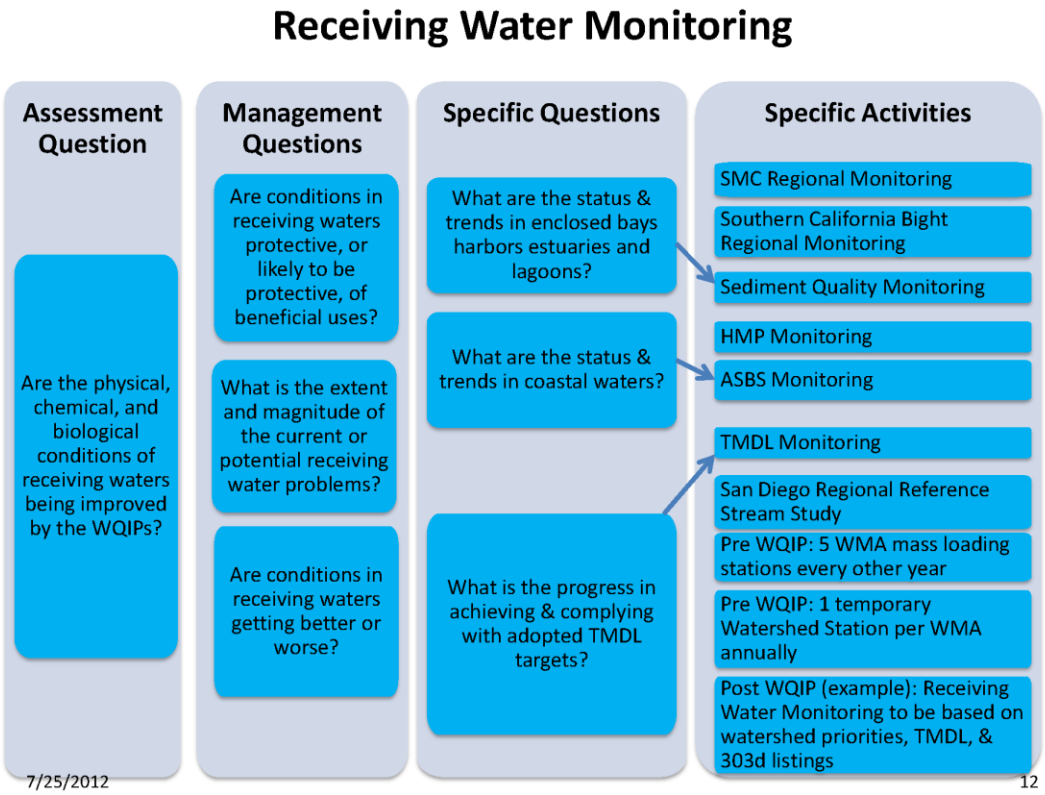

The above diagram illustrates the use of the question-driven approach in designing activities for receiving water monitoring. The process goes from left to right. The Assessment Questions (left side) are from the current Provision II.D ("Are there improvements in the receiving waters conditions?"). The second column lists the appropriate broad Stormwater Monitoring Coalition (SMC) questions that can be summarized as a status question, an extent and magnitude question, and a long-term trend question. These management questions provide context for the more specific, technical questions (third column) and associated monitoring activities (fourth column). Monitoring results from any given activity may only partially contribute to answers for the "big picture" management questions. The specific questions (third column) are examples of detailed study questions that could be used to design the monitoring program. When study questions are answered by specific activities, then the next prioritized study question can begin as part of the adaptive process.

The purpose of the monitoring is to assess trends of receiving waters and magnitude, highlighting rationale and benefits of specific activities. Copermittees are committed to continuing many of the receiving water monitoring programs and balancing sampling needs so that long-term receiving water trends will continue to be addressed. This process supports the question-driven adaptive management approach.

Paul Hartman (City of Vista) presented the Jurisdictional Non-stormwater Discharge Component of the Alternate Provision II.D.

Non-Stormwater Discharge Monitoring

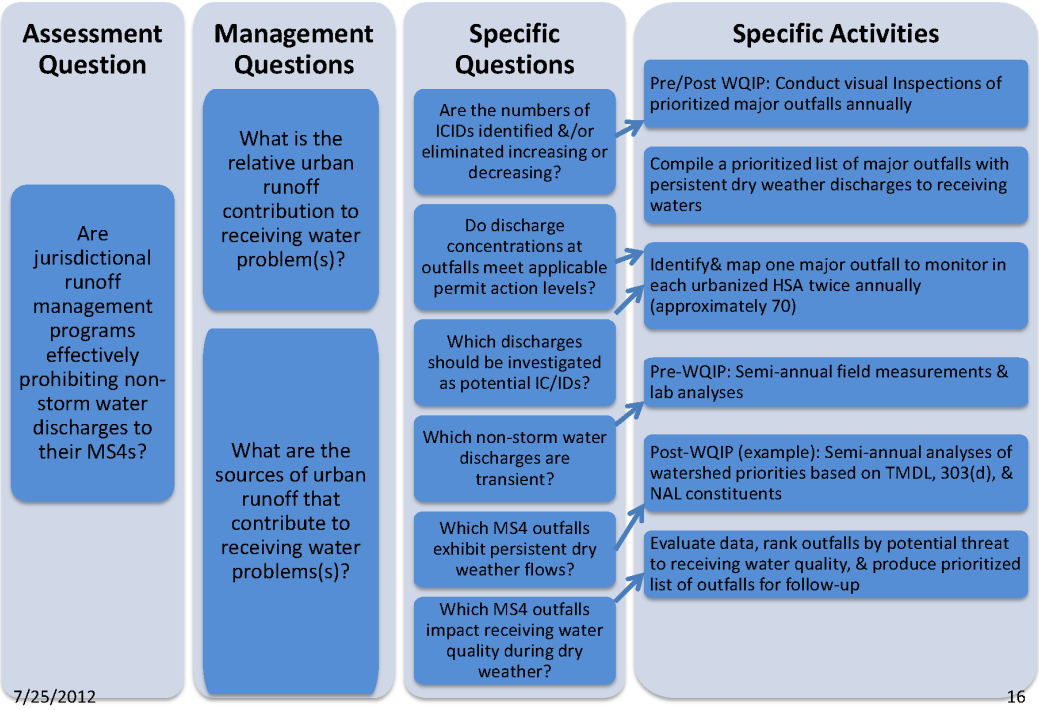

The primary assessment question on the left side is: Are jurisdictional runoff management programs effectively prohibiting non-stormwater discharges to their MS4s? To answer this overall question, the focus is on answering the management questions (second column). From these two management questions, specific monitoring questions have been developed to drive the design of the program. Examples of specific monitoring questions are provided above in the third column. These questions have led to the development of two distinct programs to address non-stormwater discharges during dry weather: one program targeting transient discharges focusing on IDDE; another program targeting persistent flows, designed to strategically prioritize and address outfalls with continuous non-stormwater discharges.

The transient flow program is rooted in a three-pronged approach designed to provide broad spatial and increase temporal coverage. The focus is on sources, the MS4 itself, and the MS4 outfalls discharging to receiving waters. This program would be implemented during both the pre-Water Quality Improvement Plan (transitional) and post-Water Quality Improvement Plan phases. The idea is that the main sources of non-stormwater discharges are addressed via programs such as Industrial, Commercial, and Municipal inspections. Based on analysis of recent data, this program appears effective in preventing discharge impacts. The second part of the transient flow program is to provide coverage of the MS4 system throughout the year, via jurisdictional programs such as complaint response, MS4 cleaning, and staff/citizen reporting of illicit discharges. The third part of the transient flow program consists of visual monitoring at major MS4 outfalls. This would require the updating of inventories and periodic surveys of major outfalls, looking for flow indicative of illicit discharges.

The persistent flow program is based on historical data gathered via existing dry weather programs, MS4 outfall programs, GIS information, and data from the visual observations program discussed previously to identify and prioritize major outfalls that exhibit persistent flows. The current MS4 outfall program will continue to its completion. Once identified and prioritized, one major outfall per hydrologic sub area would be selected for monitoring two times per year. This means approximately 70 outfalls would be under investigation throughout San Diego County at any time. As pollutants are reduced and non-stormwater flows are eliminated, the operation would continue through the prioritized list of outfalls. Comparison to numeric action limits would be used to prioritize outfalls within the Water Quality Improvement Plans.

By implementing the non-stormwater discharge program in two parts (transient and persistent), the Copermittees will be able to best utilize resources to eliminate and control the highest priority threats to receiving water quality.

Jo Ann Weber (County of San Diego) spoke to the stormwater discharge monitoring program.

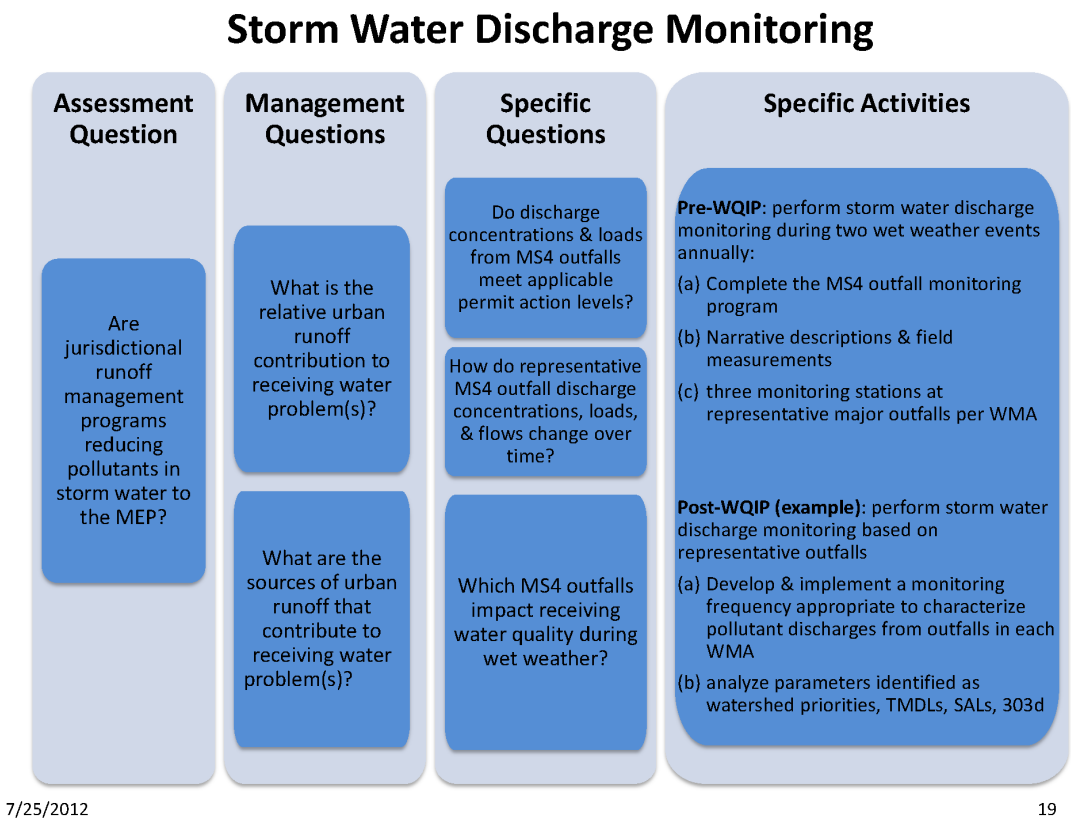

The overall assessment question from the administrative draft permit is if runoff management programs are reducing pollutants to the MEP (first column). The same two over-arching questions are: what is the relative contribution and, if significant, then what are the sources (second column)?

Using the specific questions to guide design, the pre-Water Quality Improvement Plan (transitional) monitoring program commits to completing the current outfall monitoring program (fourth column). In addition, the outfall monitoring in the pre-Water Quality Improvement Plan (transitional) phase would consist of at least three monitoring stations at representative major outfalls per watershed management area. Selection of representative outfalls may be coordinated and shared among Copermittees to provide the most efficient representation and characterization of major land uses. This will allow for more efficient and informed characterization of the MS4 discharges. This effort builds on the rainfall runoff models that use land use coefficients to estimate runoff loads. Sophisticated models developed as part of the implementation plans for the regional bacteria TMDL can be used to inform where additional data for local homogeneous land uses is needed. This proposed MS4 program will be more resource-intensive than the current MS4 program and demonstrates the Copermittees' commitment to gather useful data to target implementation activities.

The post-Water Quality Improvement Plan phase program continues a commitment to perform monitoring of outfalls to characterize pollutants from the MS4s; however, the

design of the program will evolve depending on the specific questions and needs of the watershed management area.

Benefits of this approach are multifold, including broad spatial and temporal coverage; support for assessment-driven, adaptive management approach; and, flexibility in site selection allowing jurisdictions to focus resources on the highest watershed priorities.

JoAnn Weber (County of San Diego) spoke to source/stressor identification (yellow layer). To provide the necessary feedback to improve program implementation, Copermittees have increased emphasis on the Source Identification and BMP/Special Studies, adding the assessment question: "Are sources and pollutants well characterized?" The Copermittees recognize that an increased understanding of sources allows implementation efforts to be focused.

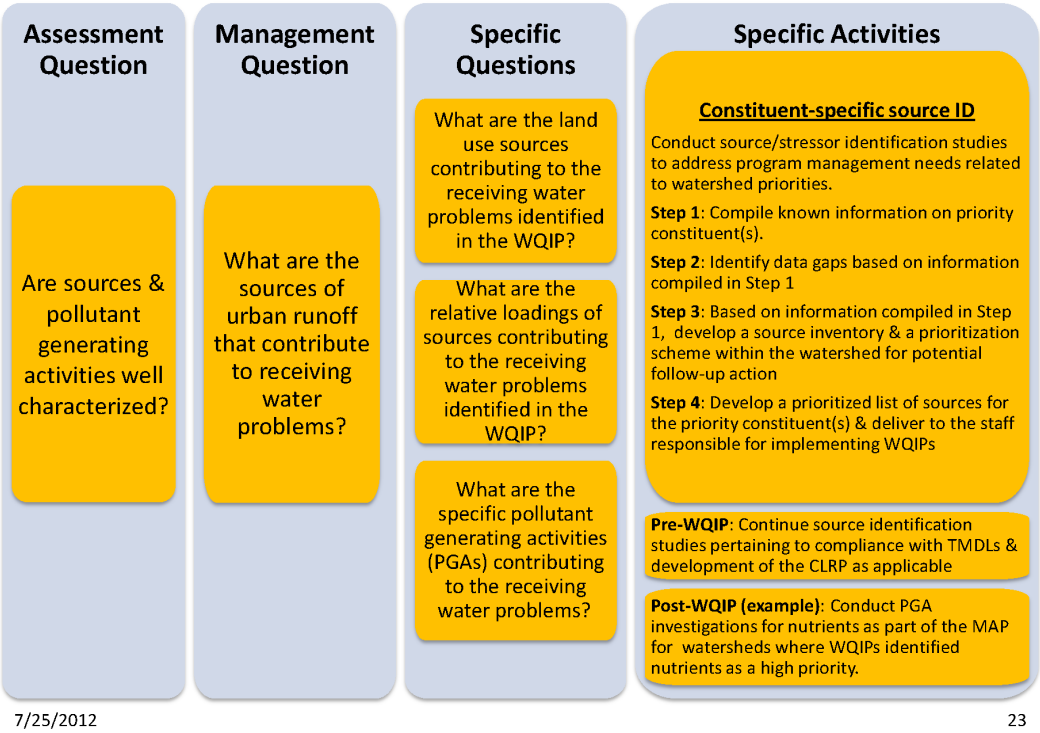

The principle role of identification is to identify and prioritize pollutant generating activities (PGAs) and source categories. PGAs can result in release of pollutants. Once PGAs are identified and prioritized, then behavioral changes and education can take place. Identification of high priority sources is an important step in support of the Water Quality Implementation Plan process, to help inform the development of effective pollutant control strategies for particular priority constituents on a watershed-specific basis.

The key benefits of the source/stressor identification studies are to provide program management with information to verify, quantify, and prioritize sources and provide links between sources, activities, and effects of runoff.

Andre Sonksen (City of San Diego) spoke to Special Studies/BMPs (green layer).

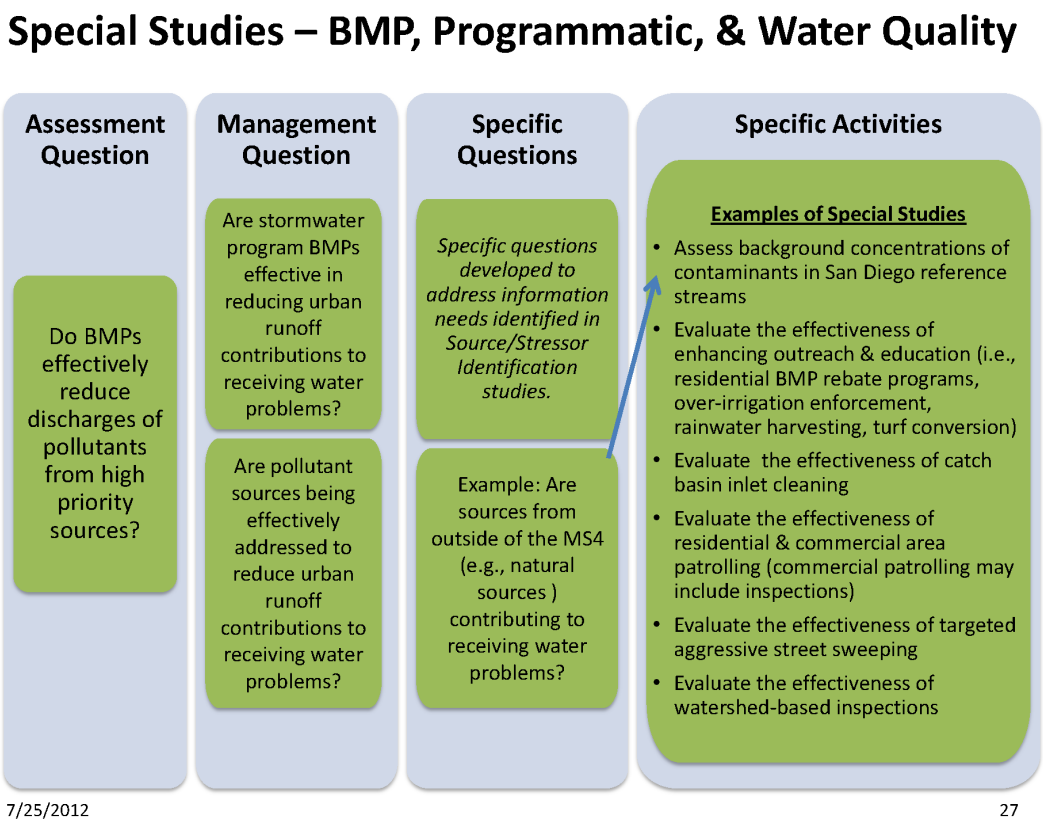

The BMP special studies program follows the same general format seen for receiving waters, etc. Assessment questions are from the administrative draft permit, management questions were developed similar to scope and language as that in the SMC, then specific questions are developed based on specific information needed or desired (third column).

The City of San Diego has used this process to evaluate one of the BMPs in the current permit: street sweeping. As an example, the management question was “Can street sweeping effectiveness be improved?” The City then conducted a pilot study in four phases; each phase had its own specific question. The question for the first phase was “Is there an optimum sweeping frequency? How often do you need to sweep streets to get the maximum benefit?” The question for phase two was “Is there a sweeper type that is better than the others? (vacuum vs. mechanical sweepers).” Phase three asked “How much pollutant removal does sweeping the median in streets add?” Finally, phase four asked “Is there an optimum sweeper speed?” Each phase of the study built upon the results of the previous phases. As a result of the study, the City implemented changes to their street sweeping program.

The purpose of special studies/BMPs is to support effective adaptive management, assess BMP effectiveness, and perform scientific investigations to address data gaps. The methods are very focused (pilot BMP studies, source identification special studies, water quality studies). The benefits are that this all feeds into adaptive management and how to improve programs to improve water quality.

Roger Butow (Clean Water Now! Coalition) asked who creates the questions for this question-driven approach and how much input or influence do watchdog NGOs have over the questions, as the questions are the beginning of the entire flow chart.

Karen Holman (Unified Port of San Diego) responded that the Copermittees started with RWQCB assessment questions from the original permit and SMC questions, especially in the blue areas of the below diagram.

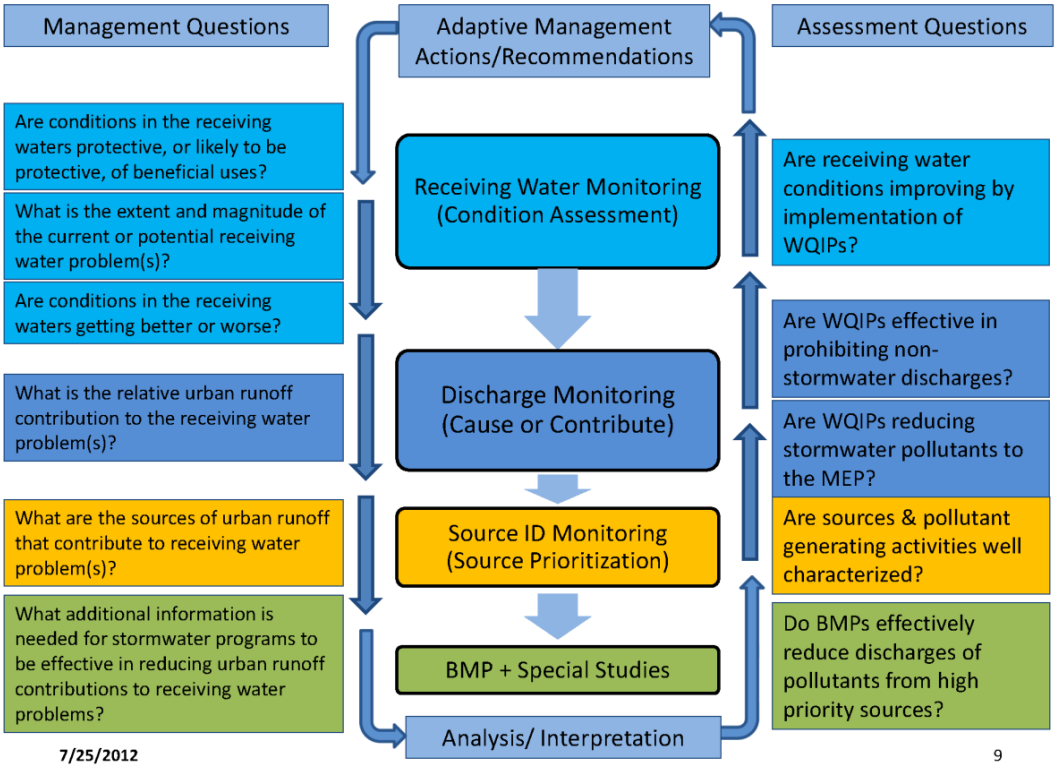

Karen continued that the next two levels (yellow and green) are where adaptive management starts, and that is where the Copermittees are focusing on making the nexus between monitoring and the rest of the permit programs. For these areas, the questions are being developed by the Copermittees based on needs. Questions could be driven by priorities in the Water Quality Improvement Plans; other focused questions could be on whether BMPs are working as expected. Karen hypothesized that NGO involvement could begin there, with the more focused questions that are aligning with Water Quality Improvement Plan priorities.

Jill Wittkowski (SD Coastkeeper) shared that the questions look to be along the right lines. If this is done hand-in-hand with the Water Quality Improvement Plan process, it

makes sense that the public participation process for the Water Quality Improvement Plan would result in a collaborative public process for developing some of the monitoring questions.

Jo Ann Weber (County of San Diego) provided an example of how a MAP might be developed in an example watershed. The slide below lists the steps for the strategic monitoring approach.

Developing Monitoring & Assessment Programs (MAPs) for Each WQIP

STRATEGIC MONITORING APPROACH:

1. Establish stormwater management priorities specific for each WMA ("Watershed Priorities") as part of WQIP development.
2. Compile existing monitoring data & assess available information for receiving waters, MS4 discharges, & sources or stressors within the watershed.
3. Identify regulatory & non-regulatory drivers that apply to water quality monitoring within the watershed, & list all associated monitoring responsibilities assigned to the Copermittees.
4. Evaluate the watershed priorities in context of available monitoring data & existing monitoring responsibilities, & develop specific management questions for each priority issue.
5. Establish metrics & identify assessments that should be performed to supply information needed to address the management questions.
6. Identify elements of a watershed-based monitoring program needed to address the watershed management questions & perform the necessary assessments.
7. Develop detailed monitoring plan to address the identified monitoring needs, coordinated with other ongoing monitoring in the watershed.

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For a sample watershed, assume priorities are TMDL for bacteria and 303(d) listing for copper and nutrients. A likely assessment question would be "Are jurisdictional runoff management programs reducing pollutants in storm water to the maximum extent practicable?" A likely management question would be "What are the sources of urban runoff that contribute to receiving water problems?" Following the previously presented flowchart, the next step would be to develop specific questions using available information. For bacteria and copper, MS4s are known sources; however, MS4s are less well known sources of nutrients. In this watershed example, loadings from land uses are not well quantified to support planning of wet weather management actions or evaluate their effectiveness. A specific question in this case would be "What are the representative MS4 outfall discharge concentrations, loads and flows?" The approach to answering the specific question is to support model development, calibration, and validation. Stormwater discharges should then be monitored at a determined number of sites based on appropriate land use characterization for modeling, at a determined frequency (e.g., 2 storms per year), for specific constituents (e.g., bacteria, copper, nutrients, and any other special study

needs), and for a specific duration (e.g., at least one adaptive management planning cycle to allow for data usability).

To include the San Diego County Copermittees' proposal in the draft permit, the next steps are to provide the RWQCB with Alternate Provision II.D and a technical memorandum with support and rationale for the alternate provision.

In closing, Jo Ann Weber (County of San Diego) stated that the purpose of monitoring is to provide information to program managers to inform implementation of the stormwater programs. A thorough and thoughtful planning process using a question-driven approach provides the roadmap for success. The San Diego County Copermittees have metaphorically traveled the freeways and will now venture onto the roads less traveled, including conducting source identification studies, BMP studies, and targeted special studies. The Copermittees admit they may meet dead ends along the way and through the adaptive planning process will be adjusting the strategic route. The Copermittees look forward to partnering with all stakeholders in the challenging journey ahead.

Roger Butow (Clean Water Now! Coalition) asked how and under what circumstances would the monitoring look at contaminants of emerging concern and take into account any recalibration of trigger levels or metrics. Claudio Padres (Riverside County Flood Control District) responded that there would still be a component of receiving water monitoring to detect emerging issues. The idea would be to assess each issue as it arises, annually go back and review data and review priorities. For example, if perchlorate became an issue, that would get on the priority list and would be set in order as far as doing specific programs to target that particular constituent. It would be addressed in the context of the Water Quality Improvement Plan and its priorities.

Paul Hartman (City of Vista) agreed that it is a matter of striking a balance in the monitoring program: some parts will be monitoring for a broad suite of constituents over the long term; other parts will drill down to activities and BMPs effective at preventing pollutants of concern. The monitoring program will keep a broad approach but will not be monitoring everything everywhere.

Mike Shetler (County of Riverside) shared that Riverside County actually developed a demonstration on flood control district property where they are evaluating different BMPs that could be used in the field. He encouraged Roger Butow to visit the demonstration project.

Jill Wittkowski (SD Coastkeeper) stated that having this presentation in so much detail shows the benefit of the workgroups that the San Diego County Copermittees have. It does not look like these workgroups will be going forward with the new permit. Jill believes it would be valuable to the overall process to continue these workgroups with the next permit.

Jill Wittkowski (SD Coastkeeper) mentioned that the purpose of monitoring that has been repeated a few times is to make the programs better. Another purpose is to keep the pulse of the waterways; to know if the waterways are healthy or not.

Jill Wittkowski (SD Coastkeeper) asked what parts of the administrative draft permit are prohibiting the San Diego County Copermittees' proposed process.

Paul Hartman (City of Vista) replied that there are certain portions of the permit that are focused prescriptively on receiving water and MS4 monitoring. A specific example is the current dry weather program which appears to look for more broad spatial coverage, increasing sampling sites to a ¼-mile grid system (from 40 sites to more than 380 sites for Vista) while also going from quarterly to monthly monitoring. The San Diego County Copermittees are looking for flexibility to dial back those requirements and focus resources through adaptive management monitoring to get valuable feedback.

Claudio Padres (Riverside County Flood Control District) stated that he sees the difference from a high level of what is currently in the administrative draft permit versus the adaptive management strategies presented by the San Diego County Copermittees is the difference between monitoring for monitoring's sake versus strategic monitoring. The current administrative draft permit is a broad brush to do everything everywhere, not the focused approach presented by the San Diego County Copermittees.

Mike McSweeney (BIA) appreciated the approach presented by the San Diego County Copermittees and appreciated that he could understand the thought process from looking at the flowchart. Mike agreed that sampling should not be done so infrequently that if something bad happens it is not caught. He complimented the Copermittees on developing a smart way to address what the RWQCB is looking for. He agrees with Paul Hartman (City of Vista) that the grid pattern seems to be sampling for the sake of sampling, not smart or strategic sampling.

Roger Butow (Clean Water Now! Coalition) asked RWQCB staff if the language "economic feasibility" and "technological possibility" will no longer be used as metrics in the permit.

Wayne Chiu (RWQCB) replied that those terms are not used in this permit. Everything in the permit is a technical possibility and is feasible. The question of whether it is cost effective is part of the equation as well. What the RWQCB has proposed here are the minimum federal requirements, but those are put in as a starting point to basically provide the Copermittees an understanding of what can be in a permit. Those terms are not being used anymore.

Richard Boon (County of Orange) spoke on the definition of MEP as it is a crux issue for this process. The State of California did define MEP in 1993 and used the language "public acceptance," "cost," and "technical feasibility." Until State Board Counsel withdraws that memorandum, Orange County would very much expect to see those discussions in this permit. With respect to monitoring, it would mean that the resources available for monitoring are finite; therefore, Copermittees must be careful with how they allocate resources to monitoring because every dollar spent on monitoring is a dollar not spent on implementation of BMPs.

David Barker (RWQCB) replied that in the administrative draft permit, the State's definition of MEP is listed as part of the definition of MEP; therefore, what Richard has stated is fully consistent with how the administrative draft permit is defining MEP.

Bryn Evans (IEA) stated that the IEA has comments on the permit with regard to permitted non-stormwater discharges, such as groundwater dewatering, that have their

own permits. These activities can be mapped and utilized in the other elements of stormwater programs, including third party data. This would allow Copermittees to cost efficiently understand where those permitted non-stormwater discharges are currently and then focus on non-stormwater discharges that do not have authorization.

Grant Sharp (Orange County Flood Control District) mentioned that Monday was the Phase II Small MS4 permit comment deadline. That permit will target small communities and non-traditional Copermittees, such as school districts, state beaches, state parks, etc. One of the interesting things is the requirement for these non-traditional Copermittees to begin to do water quality monitoring to develop IDDE programs. In addition, the draft Phase II permit also has action levels in it for non-stormwater discharges and when compared to the Phase I MS4 permit, they are very different. With the action levels in the Phase II permit, one of the conceivable situations is one of the new non-traditional Copermittees will be doing their own IDDE monitoring and determine they don't have a problem because findings are below their discharge action levels, but the findings could be above the Phase I MS4 non-stormwater discharge action levels. This results in double investigations with different standards. Grant suggested partnering with the Phase II Copermittees to reduce the chance of double investigations.

Jill Wittkowski (SD Coastkeeper) stated that the modeling makes her nervous. The value of any model is based on the validity of the data being used to create the model. If a bad model is used, then bad decisions may be made based on the bad model. She would like to see the modeling concept developed further so that modeling will be robust and give good information to make good decisions.

Andre Sonksen (City of San Diego) explained that the problem with the current models for the San Diego region is that most of the data for the models are not from the San Diego region. Moving forward, the Copermittees would collect region-specific information that would go into current models or refine models to make them applicable to the appropriate region.

V. Discussion on Monitoring Proposals Related to Permit Requirements

Jill Wittkowski (SD Coastkeeper) stated that Coastkeeper is not the only environmental group involved and interested in this permit. Coastkeeper understands that Copermittees are concerned about the cost and breadth of dry weather monitoring; however, some of the environmental groups do not think that cost should be an issue. It should not be the case that Copermittees are required to comply unless it is too expensive. Dry weather monitoring should be kept in the permit. Jill recognized that Copermittees seem worried about the ¼-mile grid system. An alternative view is that this is a dry weather blitz for the first year and maybe it does make sense for the first year to do a blitz and acquire a broad view of the health of our waters throughout the watersheds. Another possibility may be a tradeoff of dry weather monitoring in exchange for the Copermittees agreeing to the inclusion of numeric effluent limitations in the permit.

Jill Wittkowski (SD Coastkeeper) raised the issue of third party data; the permit allows use of third party data but it is not clear how and when that happens. Coastkeeper would like to see in the permit specific requirements for being able to use the third party data, such as requiring use of that data so long as Quality Control training is done. There is a perception that Copermittees only use the data that looks good for them. The permit should require all data to be used. Coastkeeper would also like to see a useful database where all of the data from the region comes together, including Copermittee data and third party data. The database should be accessible by the public and perhaps show green, yellow, and red as an overview of water health. If people knew better that there are serious problems in waterways, then they may support water quality improvement efforts more and there might not be huge budget struggles.

Jill Wittkoswki (SD Coastkeeper) stated that she heard earlier today there are some places for which the Copermittees do not have a lot of data. If they don't have data, Jill questioned how they are setting priorities.

Jill Wittkowski (SD Coastkeeper) acknowledged that commercial, industrial, and municipal inspections are doing a good job looking at non-stormwater discharges. The big question now is residential sources and what should be done about them. Jill would like to see a commitment from Copermittees to crack down on this issue; to really have a plan for residential sources and be willing to take a stand on it. Jill has seen in watershed reports that there is a problem. She also questioned that if non-stormwater discharges are supposed to be prohibited, then why are there numeric limits for the discharges and why should money be spent on analyzing the discharges rather than locating the sources.

Jill Wittkowski (SD Coastkeeper) recognized the discussion earlier about pollutant-generating activities (PGAs) and using studies to determine which PGAs need to be cracked down on. This information should already be known. Coastkeeper did an audit in the Agua Hedionda Watershed, identified a nutrients problem, and determined it was probably coming from nurseries. They did not see any big problems when doing inspections, but also have not seen any follow up or alternate plans. Coastkeeper would like to see work continued and followed up on.

Jill Wittkowski (SD Coastkeeper) had a general question about having one monitoring station per HSA. She would like to understand how that was chosen, as some areas it may be that more than one would be appropriate.

Colin Kelly (OC Coastkeeper) stated that some issues that Coastkeeper is concerned about were first discussed about an hour ago with the Clean Water Now! Coalition. Colin would like to know what the County believes that this modification might do to impact the prioritization of different waterbodies as constituents of emerging concern (CECs).

Colin wants to make sure that waterbodies not on the priority list are not ignored. Minimum monitoring should be required on the non-priority waterbodies to get a baseline. Colin clarified that he is not specifically asking for Copermittees to test for CECs, but he would like to know the minimum requirements.

Colin Kelly (OC Coastkeeper), regarding the use of historical data, would like to know what is considered to be historical data. There has been a significant adjustment in

technology and lower detection limits between now and the 1970s and 1980s. If there is a ten year term, Colin would like to know at what point will historical data not be useful, or what data can be used by third parties. Colin does not think money should be wasted in duplicative efforts between citizen water monitoring and Copermittee water monitoring. Third parties should be able to provide data to the Copermittees. Colin continued that with the use of historical data, there has been significant land development in Southern California. If there is a certain area that has data from the 1990s but has been developed since then with changed hydrology, then that may be a higher priority.

Thom Spanos (SD Coastkeeper) recognized that there are much more stringent requirements for monitoring during the first year of this permit, but after that it seems to allow much flexibility and the prioritization that the Copermittees desire. Thom asked Copermittees to take a step back and look from the broader perspective; it is not too much to ask that once in every five years Copermittees go back and make sure they are not missing anything. Thom continued that Coastkeeper does understand that costs can be significant, but the Clean Water Act is supposed to be a technology-forcing statute. If they are not made a requirement, then there will be no development in these fields. Copermittees should find ways to make this a more efficient process, into which adaptive management does feed. Coastkeeper does not want Copermittees held responsible for something that is not their fault. If action levels in Phase II permits are higher than Phase I permits, then this is the perfect opportunity for the RWQCB to implement more stringent requirements within their region. Thom hopes that everyone is keeping in mind not just the short term costs, but also the other factors involved.

Roger Butow (Clean Water Now! Coalition) thanked Coastkeeper for their comments on contaminants of emerging concern and that increased science does give a better ability to detect lower limits.

Roger Butow (Clean Water Now! Coalition) mentioned Aliso Creek as an example of sampling where sampling was done week 1 on Monday at 9 am, week 2 on a different day of the week at noon, etc., which resulted in a better window of sampling. He would like to see that type of sampling written into the permit itself, as well as integrating sampling by non-governmental organizations (NGOs). Roger agreed that sampling must take place in a manner that maximizes funds and maximizes the database being developed. Sampling the same time, the same day of the week at one site does not give a general concept of fluctuations and the ability to lead to source tracking.

Ted Von Bitner (County of Orange) stated that the RWQCB's goal is to answer basic questions: what is the condition of the watershed, are beneficial uses being protected, and how are those conditions changing over time? Each permit cycle, the Copermittees have changed their monitoring program. Losing that continuity causes the data set to become less valuable.

Ted von Bitner (County of Orange) continued that one of the primary principles of the NPDES Program in general has been that while you can judge the quality of your discharge by sampling at a specific point, you cannot judge the health of the watershed, which is the mission objective of the RWQCB. Orange County has started on that effort by coming up

with new programs, new monitoring designs that are designed to answer that question. Orange County has the Stormwater Monitoring Coalition's Regional Watershed Monitoring Program which gives a holistic view of the watersheds in general. That approach has also been used by the San Diego RWQCB for the San Diego River Integrated Regional Program, and they are now starting on a coastal program. There seems to be a common approach there that should be adapted for this permit. Following what Coastkeeper said and in context of the approach that San Diego provided, there are some basic questions that need to be answered first about the MS4: What is the condition of the MS4? What needs to be worried about? The Copermittees also need to answer basic questions like: What are the frequency and magnitude of PGAs? Who are the priority pollutant dischargers? The Copermittees cannot answer those questions at this point because they have tried in the past with programs, but each time the permit changes, the Copermittees lose their ability to answer those key questions. The Copermittees would hope to follow what has been proposed and bring back to their previous program. Thinking about the MS4 program, it should be an overall design, recognizing how much of the MS4 creates an impact on receiving waters. It should also be a comprehensive program where everyone comes together, including Phase II dischargers and the Industrial General Permit dischargers. With identical submittal dates, it is difficult to incorporate their program findings with the Copermittees' reports. There is no mechanism to incorporate that data. At same time, Ted does not get a sense from the administrative draft permit of when the RWQCB and Copermittees stop and meet; when does the adaptive management process kick in.

Karen Holman (Unified Port of San Diego) acknowledged that attendees are asking a lot of questions, and that is encouraging because that is why the San Diego County Copermittees developed this question-driven strategy. There are two types of questions: management questions and assessment questions. Looking at the diagram, it is structured in a way that makes sense, asking bigger general questions first, then moving down toward source identification and BMPs.

This approach envisions more time and effort spent on the yellow and green areas, then moving up to answer the larger questions. Going up the ladder focuses more on the assessment questions. At the end of this long phase, the Copermittees should be able to answer the receiving water questions. Adaptive management kicks in throughout the entire process, but especially in the yellow and green areas.

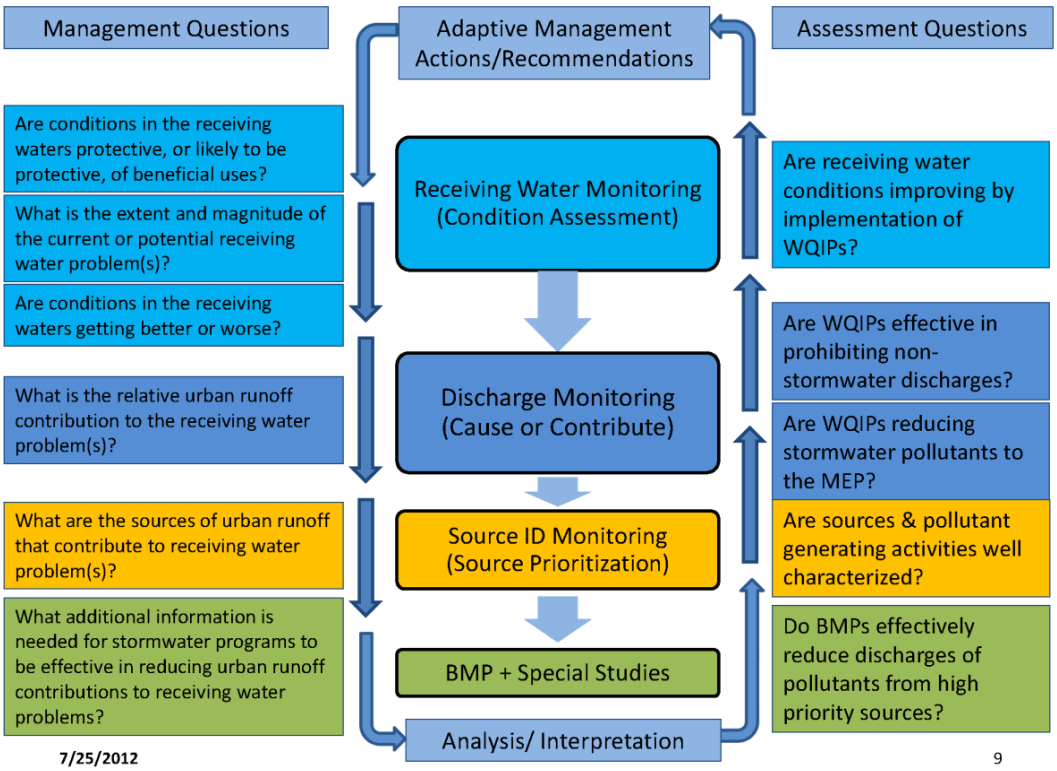

Alison Witheridge (City of Oceanside) shared that as a monitoring person for the last 5-10 years, she wants to believe that monitoring is the answer; that monitoring will indicate if water quality gets better or worse each year; however, she is disappointed each year when the data are analyzed that the variability in water quality data does not allow for indicating changes year after year or even in decades; the amount of data does not seem to help identify or eliminate sources. More data does not always mean more knowledge. That is why the San Diego County Copermittees are proposing a heavier visual observation program instead of straight water quality data collection. As a public employee, Alison needs to spend public funds in a responsible, efficient, and effective manner. For the City of Oceanside alone, it would cost 2 million dollars the first year to implement dry weather monitoring per the current administrative draft permit.

Jo Ann Weber (County of San Diego) continued that for Copermittees in San Diego it is a ten-fold increase in costs the first year with 94 percent for MS4 dry and wet weather monitoring, but at least 70 to 80 percent of that just for dry weather monitoring. In subsequent years, although it does decrease, it is still three to four times what is spent now. The Copermittees want to use their money where they get the greatest value for it. The quarter-mile grid was in the early programs in the mid-1990s and was a guidance document, somewhere to begin. Looking at the current permit writer's guide, it is perfectly reasonable to build on historical record instead of using such a prescriptive grid.

Jo Ann Weber (County of San Diego) is open to discussion on what threshold of monitoring is sufficient, considering visual observations as a key factor to get there. It is

hard to go through an entire MS4 system on an annual or biannual basis for larger jurisdictions, but the County would be okay with prioritizing efforts.

Claudio Padres (Riverside County Flood Control District) stated that regarding cost, his perspective is that everyone can toss around numbers all day, and really what it is not about is not spending money on monitoring; the Copermittees are not trying to avoid monitoring. The Copermittees have to answer to their constituents that they are using their money in an effective way; it needs to be effective monitoring.

Regarding the issue of "cherry-picking" of data, Claudio called attention to the fact that all MS4 permits require the MS4 Copermittees to report all collected data under penalty of perjury.

Claudio Padres (Riverside County Flood Control District) stated that monitoring does not solve problems by itself. Entire city budgets could be spent analyzing the situation without having solved a single problem. The Copermittees need to focus on the type of monitoring needed to take action on high priority issues. Monitoring is an easy way to steal large portions of budgets. The monitoring needs to be taken with an appropriate baseline to assess emerging conditions, taken into the Water Quality Improvement Plan process, and then engaged at the right level to locate sources and measure effectiveness.

Mike McSweeney (BIA) stated that it needs to be realized where our State is financially. It needs to be how smart work is done; not how much money is spent but how the money is spent. Copermittees are trying to figure out the best way to spend money. We all want the same outcome; therefore, there needs to be a sort of triage for priorities. The system should be focused on the outcome and what the best, most efficient way to reach that outcome is.

Andre Sonksen (City of San Diego) explained that when coming up with the proposed monitoring plan and proposing how to implement the program, the workgroup looked at dry weather monitoring program data for the last two years and found it was less than two percent effective in eliminating illicit discharges. The Copermittees do not anticipate that a shotgun approach during the initial year of the new permit would be any more effective than past programs. In developing the proposed process presented today by the San Diego County Copermittees, the workgroup looked at almost twenty years of data from their programs and other related water quality programs not only in San Diego but throughout the country and how to have real, effective changes in water quality.

Colin Kelly (OC Coastkeeper) acknowledged that everyone seems to be broke, and he is not hearing that prioritization is the wrong way to go. He does not, however, want this to be a program where the pause button is hit, causing the Copermittees to not know what is going on with non-priority issues for the next five years. Colin would like to know if there is a floor, and what it is. Focusing all jurisdictional resources on a small portion of a watershed and ignoring everything else is a concern.

Karen Holman (Unified Port of San Diego) agreed with Colin; the intent is not to look at one area in a Water Quality Improvement Plan and ignore the rest. She volunteered the best way to explain the proposed program in more detail may be to meet with Coastkeeper and explain the intent and potential details of the program.

Paul Hartman (City of Vista) stated that one way the Copermittees are looking to address that is through long-term monitoring at existing mass loading stations for a large suite of constituents, including monitoring for contaminants of emerging concern. Also proposed are temporary watershed assessment stations to cover water bodies where information is needed on those outfalls.

Karen Holman (Unified Port of San Diego) responded to Jill Wittkowski's earlier comment about why characterize non-stormwater discharges if they are prohibited. The San Diego County Copermittees are now proposing to look at the transient flows and eliminate transient flows by using observations or other monitoring efforts instead of analytical characterization of the flows. In areas with perpetual flow with sources that cannot be identified easily, those flows would be put into the prioritization program and steps would be taken in the yellow and green areas.

Paul Hartman (City of Vista) responded to Jill Wittkowski's earlier comment about one monitoring station per hydrologic subarea for persistent flows. That provides a broad look at the region, amounting to approximately 70 sites throughout San Diego. The idea came up when working through the Lagoon Investigative Order with SCWRRP, where it was noted that generally one to two outfalls contribute 80 to 90% of the pollutants found in a watershed. As the Copermittees can't monitor everywhere all time, they are trying to use resources effectively and this approach is practical from a staff perspective.

Wayne Chiu (RWQCB) expressed gratitude to the San Diego County Copermittees for providing their proposal as an alternative to what is currently in the administrative draft permit. Throughout this process the RWQCB has asked for recommendations, ideas, etc., and the San Diego County Copermittees have stepped up to the plate. Wayne continued that there are a lot of elements in what he heard today on which all can agree and buy into. The devil will be in the details, and there are a couple aspects where the Board may have its own thoughts. Generally, the approach is sound. In terms of considerations of cost and working smarter, the Board is in favor of that. What is currently in the administrative draft permit is quite onerous, and the Board was not expecting it to make it through to the final draft. The Board hoped to stimulate thinking among Copermittees and send the message that they want to see things done differently, with an increased effort toward eliminating non-stormwater discharges. This permit focuses on elimination first, analysis second for non-stormwater discharges. Stormwater discharges will be a much longer effort.

In terms of historical data, all data collected at any time can be useful. Whether or not it is comparable at all times is a different question. All data can provide historical context and show changes; therefore, any data collected can be used to inform the programs. Wayne agrees that monitoring does not solve problems, but it does indicate if a problem is being solved. Monitoring is needed to identify problems and then to indicate if progress is being made toward solving those problems.

This process is part of the iterative and adaptive management process the RWQCB is trying to incorporate into the permit. Monitoring is an integral part of this; that is why it is the central portion of the permit.

Wayne Chiu (RWQCB) continued that there are two major aspects of the monitoring that the RWQCB would like to make sure are still in the monitoring program: (1) the concept of individual jurisdictional accountability and responsibility and (2) identification of non-Phase I MS4 sources. Wayne is not sure that there is anything with what has been proposed that would inform RWQCB Staff as to what improvements are being shown or demonstrated within a receiving water within a Copermittee's jurisdiction. Wayne would also like to see non-Phase I MS4 sources identified through data. If the monitoring data being collected by non-Phase I MS4 sources are not enough to inform, then the RWQCB has the ability to compel additional information from those dischargers. With a common goal and common understanding through this permit, Wayne believes resources can be jointly used to address the problem.

Karen Holman (Unified Port of San Diego) stated that jurisdictional accountability needs to be in the programs because that is how budget is allocated by City managers. As the Copermittees have been presenting their proposal and talking in depth, it is understood that jurisdictional accountability is a key point for the RWQCB. One of the things the Copermittees are looking at is to see jurisdictional accountability in the green and yellow areas (BMP/Special Studies and Source ID Monitoring). Jurisdictional accountability may not be evident in receiving waters because problems may originate elsewhere.

Paul Hartman (City of Vista) stated that he heard several times in the first focused meetings that the RWQCB is looking for accountability via the iterative process and implementation but that assessment and adaptation of the Copermittees' programs would be more focused on improving the programs. The yellow and green processes are one of the ways to do that. Accountability of items in the blue areas is going to take years to see change unless the RWQCB is only looking at the elimination of non-stormwater flows.

Wayne Chiu (RWQCB) recognized that it will take a long time to see changes in stormwater. The Board expects to see changes in non-stormwater quicker if efforts are placed in the correct places. The Board also still expects monitoring to be done to establish the long-term stormwater trend.

Paul Hartman (City of Vista) stated that one of the places where the Copermittees experience discomfort is where the assessment question is what are the monthly flows and pollutant loads from all outfalls in a jurisdiction.

Wayne Chiu (RWQCB) responded that a lot of the requirements in the monitoring and assessment sections stem from 40 CFR stormwater regulations. There is one assessment requirement in the 40 CFR regulations concerning pollutant loads. That is where the pollutant loading assessment requirement came from. The RWQCB believes that is valuable information, whether it is obtained through modeling, statistics, or empirical data. The RWQCB wants a record of flows and pollutant loads coming out of each Copermittee's MS4; that record can be used to track how improvements are being achieved over time. The RWQCB does not expect everything to happen within a year or 10 years; however, they still need those records to see the trend.

Wayne Chiu (RWQCB) continued, speaking of assessment, when looking at the monitoring requirements, all the monitoring requirements in the administrative draft permit

were shaped and formed around assessment requirements, including what is coming out of the MS4 (non-stormwater and stormwater; what pollutants; how much). The receiving water is something that the RWQCB does not think needs to be monitored every year, but some monitoring data are still needed to establish trends over time. It could take decades to see the trend, but a record is needed to see it. The Copermittees should be using the monitoring data from this administrative draft permit and from the last 20 years to improve their programs.

Richard Boon (County of Orange) shared an approach to dry weather monitoring that had been in a prior permit: a hybrid dry weather reconnaissance program. It included monthly monitoring at over 60 stations across South Orange County. The program was designed to clearly identify aberrant anthropogenic sources (IDIC). It gave really good spatial coverage, directed resources very effectively, and created and established jurisdictional accountability. Richard would be happy to do a presentation on the merits of this approach. He spoke with US EPA headquarters' staff last Friday because they are trying to get the merits of this approach into national rulemaking expected next summer. The dry weather reconnaissance program has dry weather action levels that force the investigation of non-fecal sources of bacteria to identify conditions or pursue elevated bacteria levels that may be the consequence of vegetative decay, or pursue metal concentrations that are most likely from natural shallow groundwater sources. The dry weather reconnaissance program talks about adaptive management, prioritization, accountability, and focusing resources on the issues of real concern. Throughout this process and commentary on the draft permit, Orange County will be advocating for the statistical dry weather reconnaissance approach.

Claudio Padres (Riverside County Flood Control District) recognized that all information has value to the RWQCB. The Copermittees should be looking and focusing on data that have value as they relate to the high priority issues. Claudio asked if it was the intent of the RWQCB staff with the administrative draft permit to have the monitoring requirements be consistent with tailoring to high priority issues or if the intent to was to have monitoring requirements implemented irrespective of priorities.

Wayne Chiu (RWQCB) responded that the Board is trying to build in the ability for the Copermittees to use the monitoring data to inform their priorities. First year monitoring would take a look and make sure priorities are correct. Subsequent years of monitoring would primarily analyze the highest priority pollutants; however, there is a need to go back to make sure priorities are correct.

Claudio Padres (Riverside County Flood Control District) pointed out that one year of monitoring data (i.e., the first year monitoring mentioned previously) is not sufficient to establish priorities. Copermittees must also use historical data to create valid priorities. With that in mind, Claudio is unsure of the benefit of the blitz of first year monitoring currently in the administrative draft permit. Wayne Chiu (RWQCB) responded that RWQCB staff is open to revising that portion of the administrative draft permit.

Ted Von Bitner (County of Orange) reiterated Richard Boon's point about the hybrid dry weather reconnaissance program. It allows Copermittees to draw statistical inferences on a region-wide basis about overall conditions and priorities. Using the numeric approach, it

tells Copermittees what the background levels are across a large-scale region. From there, Copermittees can determine what the region's floor is. As sites are fixed and removed, the average begins to lower on a region-wide basis. With this method, the Copermittees have a robust physical model through which a more cost-effective, smaller-scale monitoring program can be developed that provides an increased power of analysis. Ted would prefer the permit to come back to this type of monitoring. Ted clarified that this monitoring would fit into the blue areas of the San Diego County Copermittees' diagram. Mary Anne Skorpanich (County of Orange) voiced concern that the Copermittees still need to pay attention to the top level (blue level) of the San Diego County Copermittees' diagram. Those top level questions are important to understanding the conditions in the receiving waters and protecting beneficial uses.

Jill Wittkowski (SD Coastkeeper) acknowledged that the regional clearinghouse is a great idea. If done well, it could be huge resource, and she would love to see it housed on the Regional Board's website. She believes there also needs to be public input into the process of creating the regional clearinghouse.

Jill Wittkowski (SD Coastkeeper) recognized the main point of the permit is that pollution has to be controlled to the MEP; however, it is very frustrating that even in the San Diego region people are doing inconsistent practices across the region. Jill would like to see a BMP clearinghouse or other mechanism that gives everyone access to the information gained from the special studies in the yellow and green areas of the diagram. Once jurisdictions have access to the information, they must use it unless they can prove they can't.

Alison Witheridge (City of Oceanside) replied that it goes back to prioritization and adaptive management. Not every watershed or jurisdiction will operate the same way. Jill Wittkowski (SD Coastkeeper) disagreed. All jurisdictions should be operating to the standard of MEP; therefore, BMPs should be implemented the same across jurisdictions. Laurie Walsh (RWQCB) clarified that if something is determined to be MEP, then it is upon the jurisdiction to enforce that on all their sites, and on the RWQCB to enforce that on the jurisdictions.

Andre Sonksen (City of San Diego) explained that monitoring is meant to be one small component of the iterative process of the overall stormwater management program. The street sweeping study is a perfect example. Instead of the general SMC questions, the street sweeping pilot program had specific questions and that is where the monitoring kicked in. Andre reiterated that Copermittees would be using the entire chart as one large process, not ignoring portions of the flowchart. He further stated that monitoring does nothing unless the correct questions are answered, followed by changes to programs based on the monitoring results.

VI. Parking Lot Discussion

The group re-visited off-topic items from the previous focused meeting.

- CalGreen/Hydromodification Dedicated Meeting: There will be a dedicated hydromodification meeting. Richard Boon (County of Orange) is taking the lead. CalGreen will not be included in the meeting.
- Legal Issues: Copermittees' counsels are attempting to proceed with a parallel track of meetings with Regional Board Counsel; however, Regional Board Counsel does not see a purpose to meeting at this time and does need more time to respond to the letter from the County of Orange. This will be updated at the next focus meeting.
- Aliso Creek / specific areas of geography / BET and Other Technologies: This topic has to do with to what degree does the new permit structure speak to or promote emerging technologies. This should be covered in a future focused meeting.
- Ninth Circuit Court Decision – The administrative draft permit has two central provisions dealing with compliance: one is compliance with water quality standards, and one is compliance with water quality standards being obtained through the iterative process. The RWQCB is discussing this internally; however, they have had no conversations with legal counsel yet, although it is a legal issue. David Barker (RWQCB) recognized that this is one of the high priority issues that have been raised and will put some thought into how to address it at the next meeting.
- Regional BMP Funding and Implementation: There is concern that the permit as currently written does not encourage regional BMPs although regional BMPs have great promise for improving water quality. This will be covered in the next focused meeting.
- Review time for permit: The deadline for written comments on the administrative draft permit is September 14. In light of the newly added meeting on hydromodification, scheduled for the last week in August, Mike McSweeney (BIA) asked for an extension on the written comment period. Jill Wittkowski (SD Coastkeeper) disagreed that one topic should push the process out additional weeks. RWQCB staff stated there will be no change to the written comment deadline.
- Monitoring Presentation by San Diego County Copermittees: This was provided at today's focused meeting.

VII. Other Topics / Audience Comments

Comment: Claudio Padres (Riverside County Flood Control District) stated that it would be helpful to know the RWQCB's vision for adaptive management to better provide comments on the administrative draft permit.

Response: David Barker (RWQCB) will address this at the beginning of the next focused meeting.

Comment: Colin Kelly (OC Coastkeeper) stated that the handout from the San Diego County Copermittees was useful; however, some advance notice would be helpful in having valuable discussion. Colin asked for distribution ahead of time for the next focused meeting, if possible.

Response: Materials for future meetings will be distributed ahead of time when possible.

Comment: Mo Lahsaie (City of Oceanside) stated that Federal regulation does not take economics into consideration but Porter Cologne does. Since 2008, with the economy going down, the budget in Oceanside is getting leaner every year, not staying the same.

Comment: Richard Gardner (Capistrano Beach) identified himself as an advocate of water quality, stating that he wished the discussion could have gone into more detail on monitoring, including the constituents (nutrients, dissolved oxygen, toxicity). There are narrative ways to look at toxicity and ways of changing water quality without going after numeric standards or TMDLs. Richard further stated that the health of the riverine system needs to be evaluated. In other areas, regulators should be open minded to looking at different criteria for monitoring in different areas. He does not feel this is covered in the permit. Furthermore, treatment plants, sterilization of water, permits that allow that to continue without monitoring requirements; those should be interim as they could impact the way to deal with FEID. This is also not in the permit now and needs to be dealt with.

Comment: Rosanna Lacarra (City of Coronado) shared that in 2001 the City of Coronado had great results with IC/ID. They yielded good results and were able to eliminate transient and persistent discharges. Now the focus should be on revamping the program to re-strategize and continue efforts under the proposed permit.

Comment: Mikhail Ogawa (City of Del Mar) requested that existing development be the first topic at the next focused meeting.

Comment: Karen Holman (Unified Port of San Diego) stated that this process has been a real asset to all those around the table, allowing for communication and valuable discussion prior to formal issuance of the permit. Karen appreciates the open process and correspondence throughout the process with the RWQCB and other stakeholders.

VIII. Meeting Adjourned

San Diego RWQCB
Permit Reissuance Focused Meeting

July 25, 2012

Adaptive Management Areas of Permit: Monitoring & Assessment Program (MAP)

Concept: Develop MAP as part of each Water Quality Improvement Plan to provide information needed to answer management questions & support effective adaptive management

MAP Elements:

- Receiving Water Conditions
- MS4 Discharges – Non-stormwater & stormwater
- Sources/Pollutant Generating Activities
- BMP Studies/Program Assessments

Example: Increase efficiencies in IDDE Programs with observational methods (or other strategies); monitoring includes activities beyond water quality sampling

Action Items:

- Structure initial requirements according to above in Section II.D.
- Coordinate Prov. II.D requirements with Section II.B. language requiring a strategic monitoring & assessment program as a part of the WQIPs.

Adaptive Management Areas of Permit: Long-Term vs. Annual Processes

- Data / Findings
- Priorities/Targets
- Strategies
- Schedules
- RWQCB approval

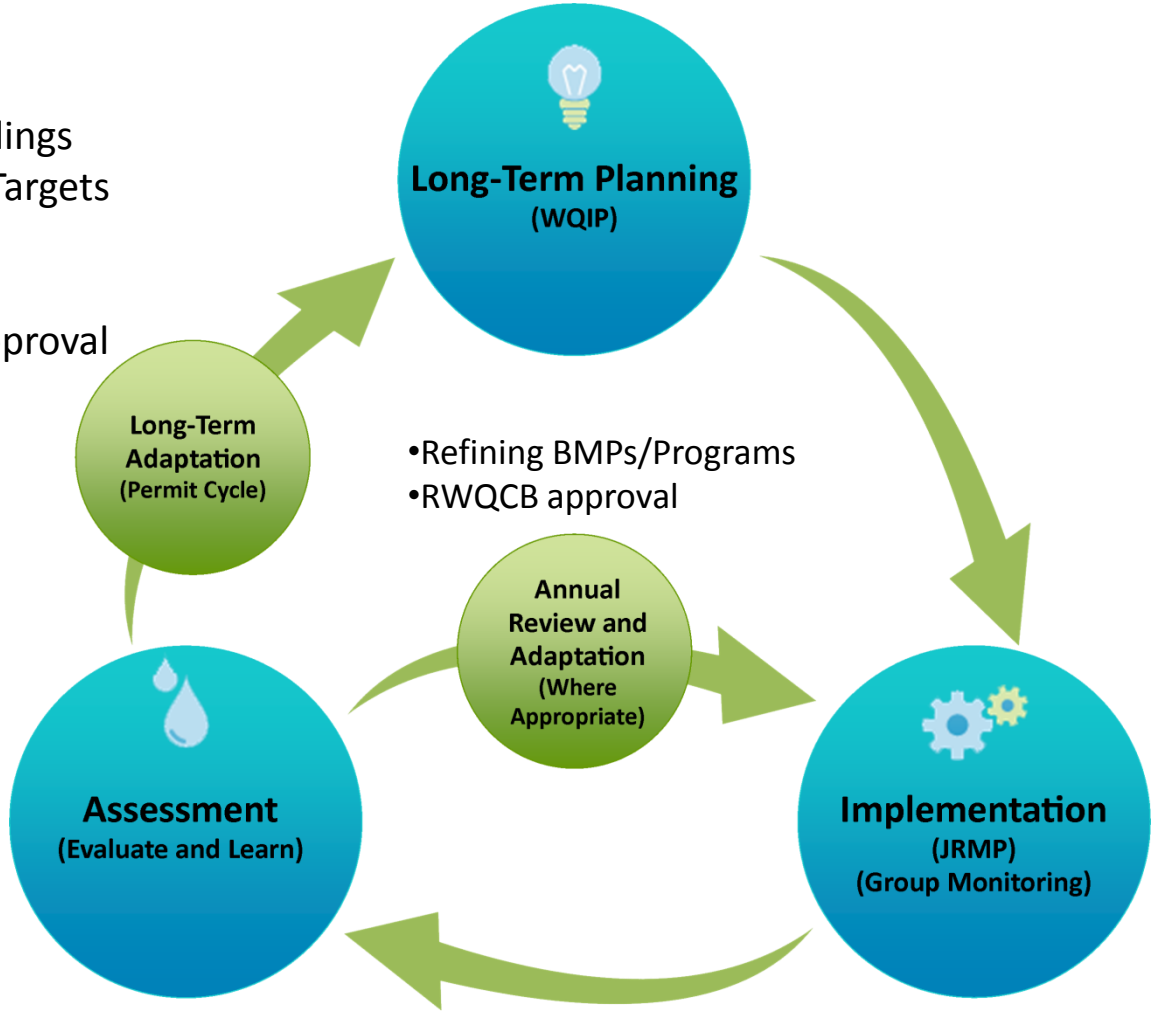

Implementation

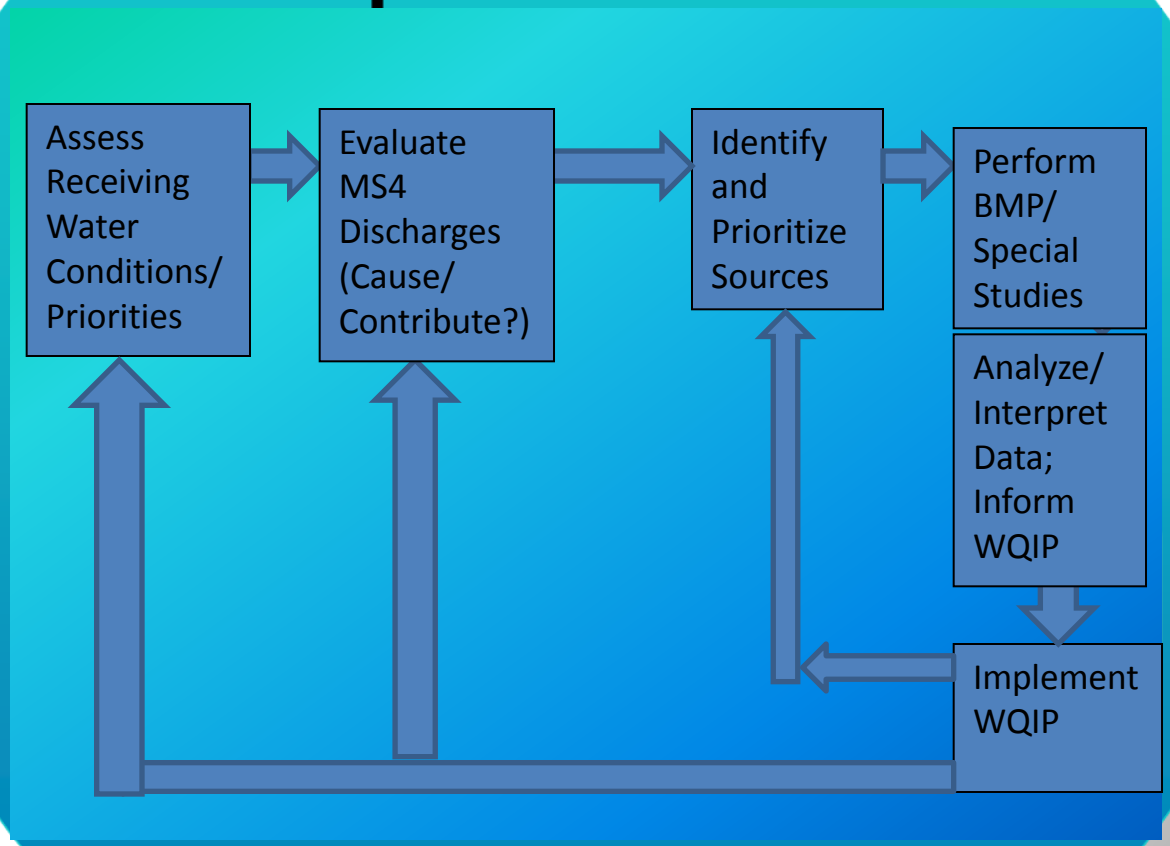

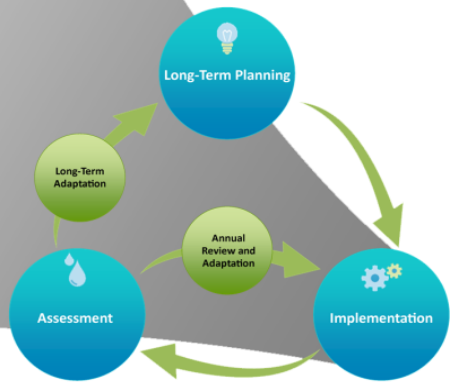

Alternate Provision II.D Rationale

- More effective & efficient use of resources to maximize benefit
- Support **Adaptive Management** needs
- **Question-Driven** Monitoring Approach Design based on Assessment Questions
- Based on 15-20 years of **experience**
- **Monitoring = more than water sampling**
- Ultimately support **WQIP priorities** (strategic, prioritized monitoring approach)

Purpose & Phasing of Alternate Provision II.D

Purpose:

Provide program managers with needed information to support effective adaptive management

Phasing:

- **Pre WQIP (transitional period)** – Proposed Alternate to Provision II.D
- **Post WQIP** – Develop Monitoring & Assessment Program (MAP) to support WQIP priorities

Scientific Basis of Question-Driven Approach

- A Framework for Monitoring & Assessment in the San Diego Region (SDRWQCB, 2012)
- Southern California Stormwater Monitoring Coalition's Model Monitoring Program (SMC, 2004)
- SWAMP Assessment Framework (SWAMP, 2010)
- Elements of a State Water Monitoring and Assessment Program (EPA, 2003)

Key Proposed Changes

- Jurisdictional Non-stormwater Monitoring **(D.1.a)** - Instead of extensive MS4 outfall chemical testing, reduce persistent flows that threaten receiving water quality & eliminate IC/IDs.
- Jurisdictional Stormwater Monitoring **(D.1.b)** - Instead of extensive MS4 outfall chemical monitoring, monitor homogeneous land uses as input to model.
- Jurisdictional Boundary Monitoring **(D.1.a(2))** - Insufficient technical power to differentiate small changes in upstream & downstream water quality due to the inherent variability of water quality data; Determine receiving water monitoring in MAP.
- Bacteria TMDL Monitoring **(Att. E)** – Instead of extensive prescriptive monitoring, rely on monitoring plans prepared as part of the current implementation planning process due to RWQCB October 2012.

Management Questions

- Are conditions in the receiving waters protective, or likely to be protective, of beneficial uses?
- What is the extent and magnitude of the current or potential receiving water problem(s)?
- Are conditions in the receiving waters getting better or worse?
- What is the relative urban runoff contribution to the receiving water problem(s)?
- What are the sources of urban runoff that contribute to receiving water problem(s)?
- What additional information is needed for stormwater programs to be effective in reducing urban runoff contributions to receiving water problems?

Adaptive Management Actions/Recommendations

- Receiving Water Monitoring (Condition Assessment)
- Discharge Monitoring (Cause or Contribute)
- Source ID Monitoring (Source Prioritization)
- BMP + Special Studies
- Analysis/ Interpretation

Assessment Questions

- Are receiving water conditions improving by implementation of WQIPs?
- Are WQIPs effective in prohibiting non-stormwater discharges?
- Are WQIPs reducing stormwater pollutants to the MEP?
- Are sources & pollutant generating activities well characterized?
- Do BMPs effectively reduce discharges of pollutants from high priority sources?

Receiving Water

Management Questions	Adaptive Management Actions/Recommendations	Assessment Questions
Are conditions in the receiving waters protective, or likely to be protective, of beneficial uses?	**Receiving Water Monitoring (Condition Assessment)**	**Are receiving water conditions improving by implementation of WQIPs?**
What is the extent and magnitude of the current or potential receiving water problem(s)?		
Are conditions in the receiving waters getting better or worse?		
What is the relative urban runoff contribution to the receiving water problem(s)?	Discharge Monitoring (Cause or Contribute)	Are WQIPs effective in prohibiting non-stormwater discharges?
		Are WQIPs reducing stormwater pollutants to the MEP?
What are the sources of urban runoff that contribute to receiving water problem(s)?	Source ID Monitoring (Source Prioritization)	Are sources and pollutant generating activities well characterized?
What additional information is needed for stormwater programs to be effective in reducing urban runoff contributions to receiving water problems?	BMP + Special Studies	Do BMPs effectively reduce discharges of pollutants from high priority sources?
	Analysis/ Interpretation	

Receiving Water Monitoring

Assessment Question

Are the physical, chemical, and biological conditions of receiving waters being improved by the WQIPs?

Management Questions

Are conditions in receiving waters protective, or likely to be protective, of beneficial uses?

What is the extent and magnitude of the current or potential receiving water problems?

Are conditions in receiving waters getting better or worse?

Specific Questions

What are the status & trends in enclosed bays harbors estuaries and lagoons?

What are the status & trends in coastal waters?

What is the progress in achieving & complying with adopted TMDL targets?

Specific Activities

SMC Regional Monitoring

Southern California Bight Regional Monitoring

Sediment Quality Monitoring

HMP Monitoring

ASBS Monitoring

TMDL Monitoring

San Diego Regional Reference Stream Study

Pre WQIP: 5 WMA mass loading stations every other year

Pre WQIP: 1 temporary Watershed Station per WMA annually

Post WQIP (example): Receiving Water Monitoring to be based on watershed priorities, TMDL, & 303d listings

Alternate Provision II.D: Receiving Waters Element

Purpose	Assess Conditions of Receiving Waters, Extent/Magnitude, Trends
Methods	• Stormwater Monitoring Coalition (creeks) • Bight (estuaries, coastal waters) • Sediment Quality Monitoring (estuaries) • TMDL Monitoring (creeks/beaches) • Areas of Special Biological Significance • Mass Loading Stations • Temporary Watershed Stations • Third Party Data
Rationale & Benefits	• Broad Spatial and Temporal Coverage • Integrates existing programs • Preserves long -term trend assessments • Supports assessment-driven, adaptive management approach

Discharge Monitoring

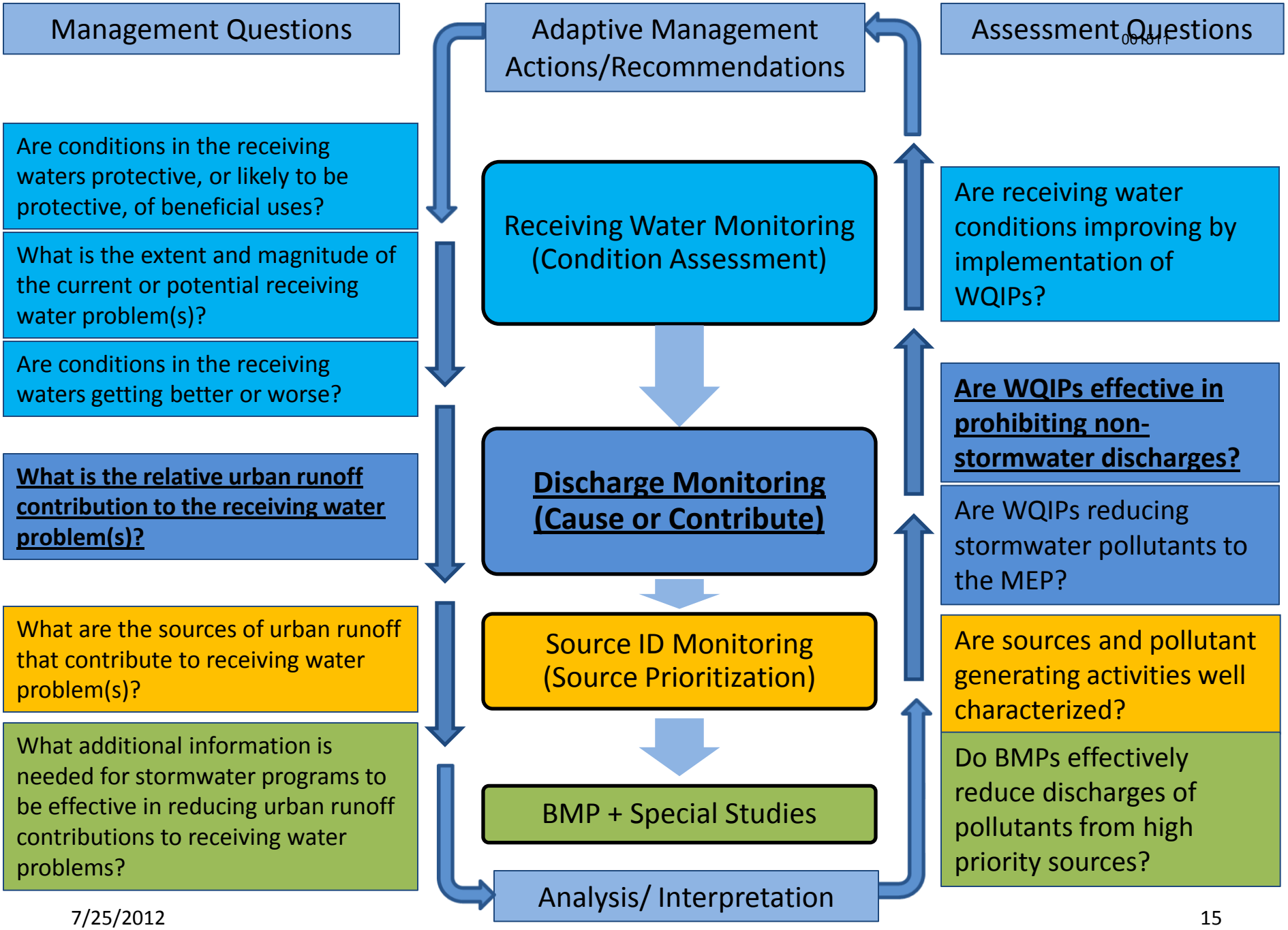
Management Questions
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Assessment Questions
Are conditions in the receiving waters protective, or likely to be protective, of beneficial uses?
What is the extent and magnitude of the current or potential receiving water problem(s)?
Are conditions in the receiving waters getting better or worse?
What is the relative urban runoff contribution to the receiving water problem(s)?
What are the sources of urban runoff that contribute to receiving water problem(s)?
What additional information is needed for stormwater programs to be effective in reducing urban runoff contributions to receiving water problems?
Receiving Water Monitoring (Condition Assessment)
Discharge Monitoring (Cause or Contribute)
Source ID Monitoring (Source Prioritization)
BMP + Special Studies
Analysis/ Interpretation
Are receiving water conditions improving by implementation of WQIPs?
Are WQIPs effective in prohibiting non-stormwater discharges?
Are WQIPs reducing stormwater pollutants to the MEP?
Are sources and pollutant generating activities well characterized?
Do BMPs effectively reduce discharges of pollutants from high priority sources?

Non-Stormwater Discharge Monitoring

001512

Assessment Question

Are jurisdictional runoff management programs effectively prohibiting non-storm water discharges to their MS4s?

Management Questions

What is the relative urban runoff contribution to receiving water problem(s)?

What are the sources of urban runoff that contribute to receiving water problems(s)?

Specific Questions

Are the numbers of ICIDs identified &/or eliminated increasing or decreasing?

Do discharge concentrations at outfalls meet applicable permit action levels?

Which discharges should be investigated as potential IC/IDs?

Which non-storm water discharges are transient?

Which MS4 outfalls exhibit persistent dry weather flows?

Which MS4 outfalls impact receiving water quality during dry weather?

Specific Activities

Pre/Post WQIP: Conduct visual Inspections of prioritized major outfalls annually

Compile a prioritized list of major outfalls with persistent dry weather discharges to receiving waters

Identify& map one major outfall to monitor in each urbanized HSA twice annually (approximately 70)

Pre-WQIP: Semi-annual field measurements & lab analyses

Post-WQIP (example): Semi-annual analyses of watershed priorities based on TMDL, 303(d), & NAL constituents

Evaluate data, rank outfalls by potential threat to receiving water quality, & produce prioritized list of outfalls for follow-up

Alternate Provision II.D: Discharge Element – Non-Stormwater

Purpose	Address effective prohibition of non-stormwater discharges
Methods	**Transient Flow Programs (IDDE)** • Source identification: existing development inspections • MS4 system programs: patrols, complaint response, MS4 cleaning • Outfall program: visual inspections for transient flows & prioritization, investigations **Persistent Flow Programs** • Current MS4 outfall program to completion • Prioritized monitoring at one outfall per urbanized HSA (NALs)
Rationale & Benefits	• Broad spatial & temporal coverage • Supports assessment-driven, adaptive management approach • Distinction between persistent & transient flows focuses resources on eliminating &/or controlling high priority threats to receiving waters quality • Utilizing other elements of the stormwater programs (inspections, complaint calls) & third party information will efficiently & effectively assist jurisdictions in eliminating non-storm water discharges

Management Questions	Adaptive Management Actions/Recommendations	Assessment Questions
Are conditions in the receiving waters protective, or likely to be protective, of beneficial uses?	Receiving Water Monitoring (Condition Assessment)	Are receiving water conditions improving by implementation of WQIPs?
What is the extent and magnitude of the current or potential receiving water problem(s)?		
Are conditions in the receiving waters getting better or worse?		
What is the relative urban runoff contribution to the receiving water problem(s)?	**Discharge Monitoring (Cause or Contribute)**	Are WQIPs effective in prohibiting non-stormwater discharges?
		Are WQIPs reducing stormwater pollutants to the MEP?
What are the sources of urban runoff that contribute to receiving water problem(s)?	Source ID Monitoring (Source Prioritization)	Are sources and pollutant generating activities well characterized?
What additional information is needed for stormwater programs to be effective in reducing urban runoff contributions to receiving water problems?	BMP + Special Studies	Do BMPs effectively reduce discharges of pollutants from high priority sources?
	Analysis/ Interpretation	

Storm Water Discharge Monitoring

Assessment Question

Are jurisdictional runoff management programs reducing pollutants in storm water to the MEP?

Management Questions

What is the relative urban runoff contribution to receiving water problem(s)?

What are the sources of urban runoff that contribute to receiving water problem(s)?

Specific Questions

Do discharge concentrations & loads from MS4 outfalls meet applicable permit action levels?

How do representative MS4 outfall discharge concentrations, loads, & flows change over time?

Which MS4 outfalls impact receiving water quality during wet weather?

Specific Activities

Pre-WQIP: perform storm water discharge monitoring during two wet weather events annually:

(a) Complete the MS4 outfall monitoring program

(b) Narrative descriptions & field measurements

(c) three monitoring stations at representative major outfalls per WMA

Post-WQIP (example): perform storm water discharge monitoring based on representative outfalls

(a) Develop & implement a monitoring frequency appropriate to characterize pollutant discharges from outfalls in each WMA

(b) analyze parameters identified as watershed priorities, TMDLs, SALs, 303d

Alternate Provision II.D: Discharge Element – Stormwater

Purpose	Address stormwater pollutant reduction to the MEP
Methods	• Complete the current MS4 outfall program • Monitoring at three major outfalls per WMA per year to facilitate modeling based on land use characteristics • Utilize Stormwater Action Levels for prioritization
Rationale & Benefits	• Broad spatial & temporal coverage • Supports assessment-driven, adaptive management approach • Flexibility in site selection will focus resources on the highest watershed priorities, whether it be for representative drainage area data or homogeneous land-use based data.

Source/Stressor Identification

Management Questions	Adaptive Management Actions/Recommendations	Assessment Questions
Are conditions in the receiving waters protective, or likely to be protective, of beneficial uses?	Receiving Water Monitoring (Condition Assessment)	Are receiving water conditions improving by implementation of WQIPs?
What is the extent and magnitude of the current or potential receiving water problem(s)?		
Are conditions in the receiving waters getting better or worse?		
What is the relative urban runoff contribution to the receiving water problem(s)?	Discharge Monitoring (Cause or Contribute)	Are WQIPs effective in prohibiting non-stormwater discharges?
		Are WQIPs reducing stormwater pollutants to the MEP?
What are the sources of urban runoff that contribute to receiving water problem(s)?	**Source ID Monitoring (Source Prioritization)**	**Are sources and pollutant generating activities well characterized?**
What additional information is needed for stormwater programs to be effective in reducing urban runoff contributions to receiving water problems?	BMP + Special Studies	Do BMPs effectively reduce discharges of pollutants from high priority sources?
	Analysis/ Interpretation	

Source/Stressor Identification Monitoring

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Assessment Question

Are sources & pollutant generating activities well characterized?

Management Question

What are the sources of urban runoff that contribute to receiving water problems?

Specific Questions

What are the land use sources contributing to the receiving water problems identified in the WQIP?

What are the relative loadings of sources contributing to the receiving water problems identified in the WQIP?

What are the specific pollutant generating activities (PGAs) contributing to the receiving water problems?

Specific Activities

Constituent-specific source ID

Conduct source/stressor identification studies to address program management needs related to watershed priorities.

Step 1: Compile known information on priority constituent(s).

Step 2: Identify data gaps based on information compiled in Step 1

Step 3: Based on information compiled in Step 1, develop a source inventory & a prioritization scheme within the watershed for potential follow-up action

Step 4: Develop a prioritized list of sources for the priority constituent(s) & deliver to the staff responsible for implementing WQIPs

Pre-WQIP: Continue source identification studies pertaining to compliance with TMDLs & development of the CLRP as applicable

Post-WQIP (example): Conduct PGA investigations for nutrients as part of the MAP for watersheds where WQIPs identified nutrients as a high priority.

Alternate Provision II.D Source/Stressor Identification Element

Purpose	Identify & Prioritize Pollutant Sources & Pollutant Generating Activities (PGAs)
Methods	• Pollutant-Specific Source Inventories • Source/PGA Studies • Prioritization of Sources for Follow-up
Rationale & Benefits	• Responsive to Program Management needs • Provides programs with information to verify, quantify, & prioritize sources • Provides links between sources, activities & effects on runoff quantity & quality

BMPs & Special Studies

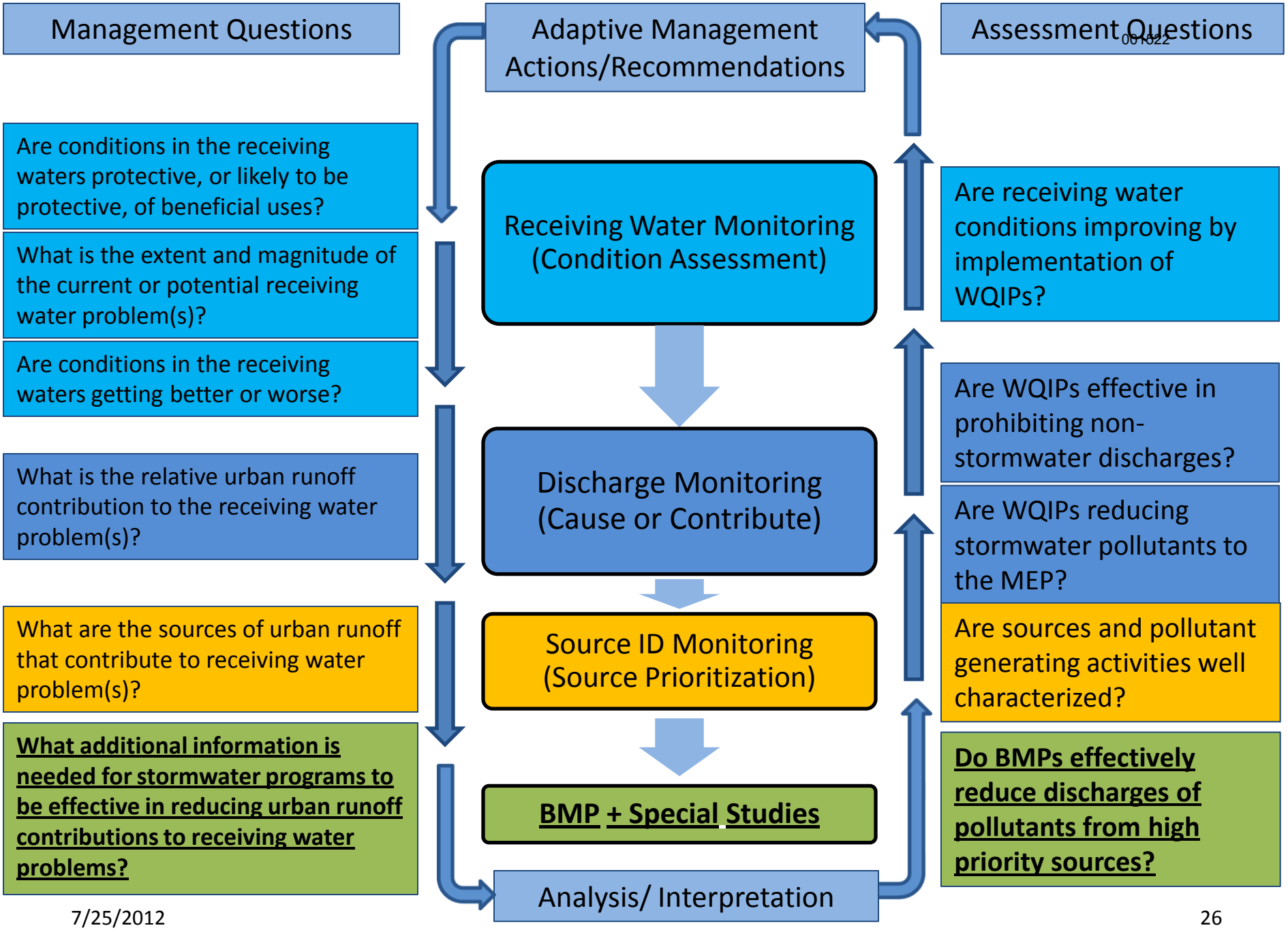
Management Questions
Adaptive Management Actions/Recommendations
Assessment Questions
Are conditions in the receiving waters protective, or likely to be protective, of beneficial uses?
What is the extent and magnitude of the current or potential receiving water problem(s)?
Are conditions in the receiving waters getting better or worse?
Receiving Water Monitoring (Condition Assessment)
Are receiving water conditions improving by implementation of WQIPs?
What is the relative urban runoff contribution to the receiving water problem(s)?
Discharge Monitoring (Cause or Contribute)
Are WQIPs effective in prohibiting non-stormwater discharges?
Are WQIPs reducing stormwater pollutants to the MEP?
What are the sources of urban runoff that contribute to receiving water problem(s)?
Source ID Monitoring (Source Prioritization)
Are sources and pollutant generating activities well characterized?
What additional information is needed for stormwater programs to be effective in reducing urban runoff contributions to receiving water problems?
BMP + Special Studies
Do BMPs effectively reduce discharges of pollutants from high priority sources?
Analysis/ Interpretation

Special Studies – BMP, Programmatic, & Water Quality

Assessment Question

Do BMPs effectively reduce discharges of pollutants from high priority sources?

Management Question

Are stormwater program BMPs effective in reducing urban runoff contributions to receiving water problems?

Are pollutant sources being effectively addressed to reduce urban runoff contributions to receiving water problems?

Specific Questions

Specific questions developed to address information needs identified in Source/Stressor Identification studies.

Example: Are sources from outside of the MS4 (e.g., natural sources) contributing to receiving water problems?

Specific Activities

Examples of Special Studies

- Assess background concentrations of contaminants in San Diego reference streams
- Evaluate the effectiveness of enhancing outreach & education (i.e., residential BMP rebate programs, over-irrigation enforcement, rainwater harvesting, turf conversion)
- Evaluate the effectiveness of catch basin inlet cleaning
- Evaluate the effectiveness of residential & commercial area patrolling (commercial patrolling may include inspections)
- Evaluate the effectiveness of targeted aggressive street sweeping
- Evaluate the effectiveness of watershed-based inspections

Alternate Provision II.D BMPs & Special Studies

Purpose	• Support effective adaptive management • Assess BMP effectiveness • Perform scientific investigations to address data gaps
Methods	• Pilot BMP Studies • Source ID Special Studies • Water Quality Studies
Rationale & Benefits	• Answers questions related to program & BMP effectiveness • Addresses data gaps to allow more effective program implementation • Provides scientifically valid information related to regulatory principles

Developing Monitoring & Assessment Programs (MAPs) for Each WQIP

STRATEGIC MONITORING APPROACH:

1. Establish stormwater management priorities specific for each WMA ("Watershed Priorities") as part of WQIP development.
2. Compile existing monitoring data & assess available information for receiving waters, MS4 discharges, & sources or stressors within the watershed.
3. Identify regulatory & non-regulatory drivers that apply to water quality monitoring within the watershed, & list all associated monitoring responsibilities assigned to the Copermittees.
4. Evaluate the watershed priorities in context of available monitoring data & existing monitoring responsibilities, & develop specific management questions for each priority issue.
5. Establish metrics & identify assessments that should be performed to supply information needed to address the management questions.
6. Identify elements of a watershed-based monitoring program needed to address the watershed management questions & perform the necessary assessments.
7. Develop detailed monitoring plan to address the identified monitoring needs, coordinated with other ongoing monitoring in the watershed.

Proposed Provision II.D Development of MAP Components

- HYPOTHETICAL WATERSHED EXAMPLE

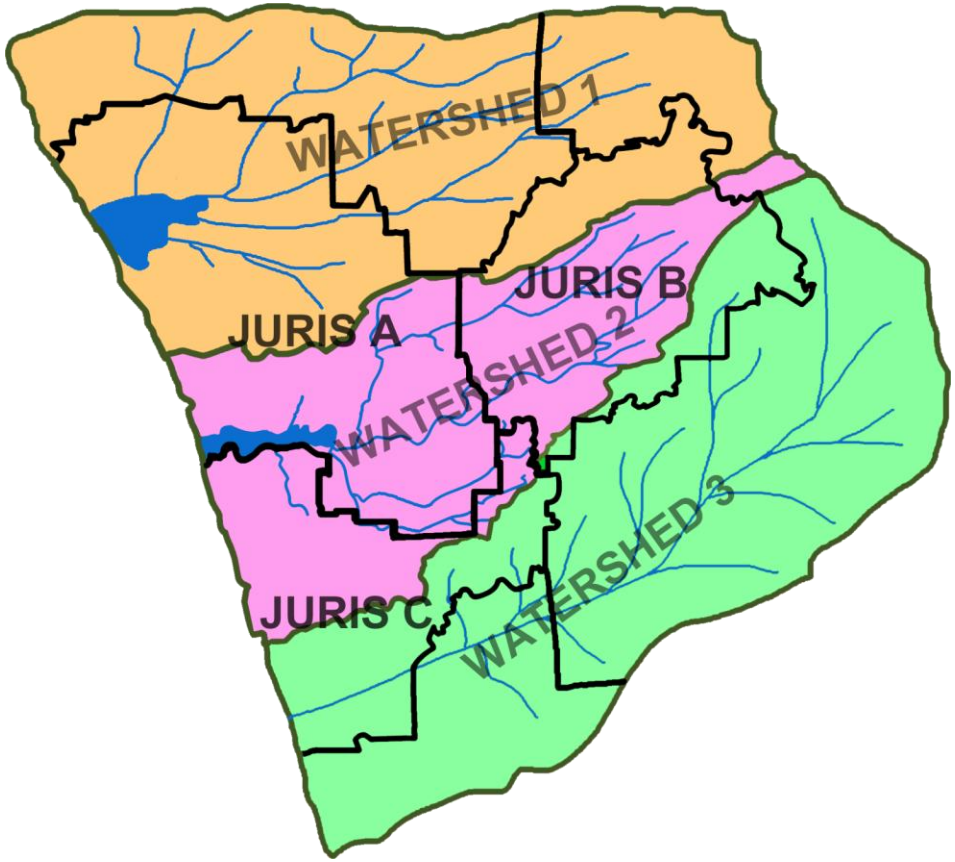

Proposed Provision II.D
WQIP/MAP - Stormwater Discharge Example

- Example WQIP priorities
  - TMDLs: bacteria
  - 303(d) Listings: copper & nutrients
- Likely Assessment question:
  - Are jurisdictional runoff management programs reducing pollutants in storm water to the maximum extent practical?
- Management question:
  - What are the sources of urban runoff that contribute to receiving water problem(s)?

WQIP MAP Example: Stormwater Discharge Monitoring

- Develop Specific questions using available information:
  - MS4s are known sources of bacteria & copper
  - MS4s are less well known as sources of nutrients
  - Loadings from land uses are not well quantified to support planning of wet weather management actions or evaluate their effectiveness
- Specific question
  - *What are the representative MS4 outfall discharge concentrations, loads, & flows?*

WQIP MAP Example: Stormwater Discharge Monitoring

- Approach to answer specific question is to support model development/ calibration/ validation
- Number of sites based on appropriate land use characterization for modeling
  - Characterize individual land uses (i.e., residential) or refine categories of land uses (i.e., SFR & HDR)
- Frequency = 2 storms/year (composite)
- Constituents = bacteria, copper, nutrients, & special study needs
- Duration = at least one adaptive management planning cycle to allow for:
  - Minimum data requirement for adequate characterization
  - Data usability to update management actions for WQIP

Next Steps

- Alternate Provision II.D will be provided
- Technical Memo with Support/Rationale for Alternate Provision II.D

QUESTIONS?

FOCUSED MEETING WRAP UP WORKSHOP AGENDA

Administrative Draft of Tentative Order No. R9-2012-0011, NPDES No. CAS0109266 Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region

Wednesday, September 5, 2012
San Diego Regional Board Office
9:30 a.m. - 11:30 a.m.

1. Opening Remarks - David Barker
2. Focused Meeting Outcomes – Laurie Walsh
3. Regional MS4 Permit Tentative Order and Adoption - Eric Becker
4. Comments and Questions - All

ELECTRONIC MAIL LIST SUBSCRIPTION

The San Diego Water Board has established an electronic mail list specifically for information and notices on the development of a Regional MS4 Storm Water Permit. The San Diego Water Board will use the email list to notify interested persons of upcoming important events and the availability of on-line documents. Persons interested in receiving future notices and information on this specific project can subscribe to one (1) of the electronic mail lists titled “Orange County MS4 Permit, “ Riverside County MS4 Permit, or “San Diego MS4 Permit ”, located on the San Diego Water Board website at:

http://www.waterboards.ca.gov/resources/email_subscriptions/reg9_subscribe.shtml

FOCUSED MEETINGS WRAP UP
PUBLIC WORKSHOP
Administrative Draft Tentative Order No. R9-2012-0011
September 5, 2012

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California Regional Water Quality Control Board
San Diego Region

Planned Changes to the Administrative Draft Regional MS4 Permit

September 5, 2012

Concept Summaries

1. **Public Review / Transparency –** Better integrate early public input during the development of priorities and strategies for the Water Quality Improvement Plan.

   Notes:

2. **Adaptive Management Approach –** Clarify where a requirement is subject to adaptation and how adaptive management works between the Water Quality Improvement Plan and the Jurisdictional Program elements.

   Notes:

3. **Prohibition Provision A –** Prohibition language for non-storm water discharges will be consistent with the Clean Water Act.

   Notes:

4. **NALs and SALs –** Tools to be used to set priorities and assess progress. Clarify that NALs and SALs are to be used as measures of progress towards addressing the Water Quality Improvement Plan priorities. NALs and SALs are NOT triggers for immediate action and NOT enforceable effluent limitations.

   Notes:

5. **Monitoring –** Revamp the monitoring requirements currently in the Administrative Draft.

   Notes:

6. **LID/Hydromod Design Requirements –** Increase clarity on using alternatives for compliance with onsite retention and hydromodification management requirements.

   Notes:

7. **Existing Development Requirements –** Increase flexibility to implement inspections based on priorities outlined in the Water Quality Improvement Plan.

   Notes:

8. **Timing of Deliverables –** Create efficiencies wherever possible between preparation, public review, submittal, and implementation of required deliverables.

   Notes:

Unified Port
of San Diego

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September 11, 2012

Ms. Laurie Walsh
Mr. Wayne Chiu
San Diego Regional Water Quality Control Board
9174 Sky Park Ct., Suite 100
San Diego, CA 92123-4340

Submitted via email: lwalsh@waterboards.ca.gov and wchiu@waterboards.ca.gov

Subject: Comments on Tentative Order No. R9-2012-0011, Administrative Draft of Permit Requirements for Discharges from the Municipal Separate Storm Sewer System in the San Diego Region

Dear Ms. Walsh and Mr. Chiu,

The Port of San Diego (Port) respectfully submits this comment letter to supplement the San Diego County Municipal Copermitees (Copermitees) comments on the Administrative Draft of Permit Requirements for Discharges from the Municipal Separate Storm Sewer System (MS4) in the San Diego Region.

The Port greatly appreciates the efforts of the San Diego Regional Water Quality Control Board (Regional Board) to consider this new approach to permit reissuance by seeking early stakeholder input on an administrative draft of a new MS4 permit prior to issuing the technical draft for formal review. Moreover, we found the workshops to be extremely productive and your team to be open to receiving input and considering permit changes. We feel this process has provided an effective, efficient mechanism to engage stakeholders and receive varying perspectives in an open transparent manner. We fully believe that this process will result in an MS4 permit that Copermittees can support and implement, and which will ultimately achieve improvements in water quality.

The Port is committed to developing an effective and efficient permit. We recognized at the start of the review process that we wanted to fully utilize the opportunity to review the Administrative Draft and have open discussion with the Regional Board and other stakeholders through focus meetings. To that point, the Port devoted at least 500 staff hours over the past five months towards reviewing and developing feedback to the Administrative Draft both internally and with the other Copermittees. The Port also participated on the panel for two of the focus meetings. Through the process, the Port has gained an understanding of the Regional Board's intent of the Administrative Draft and the Board's limitations. We trust that you have heard our concerns and input, and that the ideas and comments the Copermittees have provided will be reflected in the permit. Furthermore, we were encouraged by the feedback received at the September 5, 2012 focus meeting whereby the Regional Board listed concepts of the

Administrative Draft that they planned to change. It is our understanding the list was not exhaustive.

The Port understands that the Copermittees will collectively, through the County of San Diego, submit a red-line strikeout document recommending substantial changes to the permit language. The changes help to clarify permit compliance points, provide a more efficient monitoring program to support the end goal of improving water quality, and are aligned with the Copermittee vision of incorporating adaptive management into the Permit. The Port fully supports the Copermittee recommendations as, in our opinion, the modifications clearly meet the overall objective of the Clean Water Act to restore and maintain the physical, chemical, and biological integrity of receiving waters and provide a well-designed approach that will improve water quality. We strongly encourage you to consider the proposal.

The Port also has general and specific comments on the Administrative Draft as outlined below:

- Modifications to the Receiving Water Limitations in Provision A are required to ensure the implementation of the iterative process. The Port supports revisions to the receiving water limitations language that aligns with the State Board's policy that compliance with water quality standards is "to be achieved over time, through an iterative approach requiring improved BMPs". It is our understanding that a workshop will be held at the state level to discuss the receiving water limitations language in MS4 permits. The Port strongly recommends that language developed as part of the statewide process be incorporated into the permit.

- Although the Regional Board has confirmed verbally that implementation of a Regional Board-approved Water Quality Improvement Plan (WQIP) constitutes compliance with the permit, the Administrative Draft does not reflect that idea. The Port requests that this compliance point be clearly stated.

- As proposed in the Administrative Draft, the monitoring program is very prescriptive and will not allow for efficient or best use of Copermittee resources or for adaptive management. The Copermittees are proposing an alternate monitoring program, and we understand from the discussions at the workshops that the Regional Board is open to considering the Copermittees' proposed program. While we strongly encourage you to incorporate the Copermittee proposed program in its entirety, we recognize that there may be some changes. As such, we want to emphasize the following points in regards to developing the permit's monitoring requirements:

    - Monitoring is only one part in implementing an effective program; it must be coordinated with the other programmatic implementation efforts to provide the most useful information. To be most effective, a monitoring and assessment program should be tailored to the needs of each

Watershed Management Area (WMA). As such, it will need to be part of the WQIPs and developed in alignment with the other programmatic elements.

- The Copermittees' proposed monitoring program shifts the focus of the monitoring efforts from receiving waters to MS4 outfalls. This places a greater reliance on outfall data, prioritizing sources and conducting special studies to determine how to best implement solutions that lead to water quality improvements. This paradigm shift is based on the fact that the Copermittees have a solid understanding of the large-scale receiving water problems and need to now focus on understanding sources so that pollutant load reductions can occur. The Port supports this approach, as we feel this provides the most reasonable means to identify programmatic adjustments that will improve water quality.

- The Port encourages the use of a question-driven monitoring approach. This approach is widely supported by local, state and federal regulatory agencies. It is based on a logical hierarchy in which overall management objectives help define clear management questions. Additional specific questions and assessment frameworks can help to develop appropriate monitoring designs so that meaningful data are collected. This ensures that data and resources are aligned to focus on high priority issues and solutions that can be effective.

- Jurisdictional accountability is best achieved by requiring Copermittees to participate in the WQIPs and conducting monitoring within their portion of the WMA to evaluate whether their programmatic activities are reducing pollutant loads; boundary monitoring does not accomplish this purpose. Jurisdictional boundary monitoring, similar to what is being proposed in the Administrative Draft, has been found to be relatively ineffective in estimating water quality impacts and loading from MS4 discharges. Several factors lead to this finding, 1) typically there is high variability of the constituent concentrations in receiving waters and discharges, 2) there are relatively small percentages of MS4 discharged pollutant loads in the receiving waters, 3) MS4 flows are highly variable and 4) discharges to the MS4 are highly variable. As such, the inability to detect significant differences would be unlikely to support any programmatic changes or guide improvements to water quality.

- A two-part monitoring approach to address transient and persistent non-stormwater discharges is recommended. Rather than implement an extensive MS4 outfall chemical field screening and analysis for all outfall discharges, the Copermittees propose a screening program to appropriately identify and prioritize persistent flows that impact receiving water quality. Coupled with this, a broad, visual-based monitoring program is being proposed to find and eliminate transient discharges. The Port

believes that an approach of this type is cost effective and may actually lead to the elimination of a greater number of transient discharges, while at the same time providing a better understanding of those persistent outfalls that are contributing to receiving water problems.

- While Copermittees may be able to identify sources outside of their MS4, the requirement to reduce/eliminate such discharges is outside the Copermittees control. Requirements to monitor non-stormwater discharges from sources outside of a Copermittee's jurisdictional authority should be removed.

- One element of the WQIP is the numeric targets. It was understood from the discussions at the focus meetings that those numeric targets are to be goals, but are not enforceable. The Port requests that this point is clearly specified in the permit language.

- As written, numeric action levels (NALs) and stormwater action levels (SALs) are triggers for immediate follow-up action. However, during the focus meetings, the Regional Board staff clarified that the NALs/SALs were intended to be used as a mechanism to measure progress and set priorities, and were not intended to be used for determining compliance. The Port requests that this point is clearly specified in the permit language.

- As proposed in the Administrative Draft, Priority Development Projects are to implement BMPs to retain the volume of runoff equivalent to the design capture volume. Due to the Port's location at the headwaters of San Diego Bay, a high groundwater table and existing soils with low infiltration rates, retention is not technically feasible on Port tidelands. The Port is at the bottom of the watershed so consequently retained runoff must be stored for a longer period of time after the peak of a storm. Large underground storage tanks to store the runoff would be infeasible because most tanks would have significant design constraints due to the high groundwater table, flat topography, and high receiving water elevation, making gravity flow drainage systems nearly impossible. Above ground storage tanks would be infeasible because most of Port tidelands are built-out and there is limited room for these facilities. Also, above ground storage tanks pose a vector hazard and a visual nuisance.

  Similarly, the proposed offsite mitigation option discussed in the Administrative Draft also is not feasible within the Port's jurisdiction. Furthermore, mitigation outside of the Port's jurisdiction is also not feasible because the Port would not have the authority to enforce the implementation and maintenance of BMPs outside of its jurisdiction. The Port requests that the retention requirement is removed from the permit.

On behalf of the Port, I wanted to thank you for providing us the opportunity to engage with you and the other stakeholders through the public workshops, and the ability to submit comments on the administrative draft. Please contact Allison Vosskuhler at (619) 686-6434 or avosskuhler@portofsandiego.org if you have any questions or would like additional clarification on the information provided.

Sincerely,

Randa Coniglio

Randa Coniglio,
Executive Vice President, Operations
San Diego Unified Port District

cc: Paul Fanfera
Bill McMinn
Karen Holman
Allison Vosskuhler

DM#541697

Walsh, Laurie@Waterboards

From: Julie Day <JDay@brownandwinters.com>
Sent: Friday, September 14, 2012 3:17 PM
To: Walsh, Laurie@Waterboards; Chiu, Wayne@Waterboards
Cc: bmcminn@portofsandiego.org; Bill Brown
Subject: Comments on Administrative Draft of Permit Requirements for Discharges from Municipal Separate Storm Sewer System, San Diego Region (TO No. R9--2012-2011)
Attachments: 2012-9-14_comments to water board_MS4.pdf

<<2012-9-14_comments to water board_MS4.pdf>> Dear Ms. Walsh and Mr. Chiu:

Attached are the San Diego Unified Port District's comments regarding the subject referenced above. Thank you.

Julie Day
Legal Assistant
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2012-9-14_comments to water board_MS4

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September 14, 2012

VIA EMAIL
lwalsh@waterboards.ca.gov
wchiu@waterboards.ca.gov

Laurie Walsh
Wayne Chiu
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Re: Comments on the Administrative Draft of Permit Requirements for Discharges from the Municipal Separate Storm Sewer System in the San Diego Region (Tentative Order No. R9-2012-0011)

Dear Ms. Walsh and Mr. Chiu:

The San Diego Unified Port District (Port) submits the following comments supplementing other comments by the Port to the Administrative Draft of Permit Requirements for Discharges from the Municipal Separate Storm Sewer System (MS4) in the San Diego Region (the Permit). We note at the outset that the Port supports the objectives of the Permit. We wish simply to address one point regarding the current draft Permit. The Permit should clarify that each Copermittee is responsible only for discharges from that portion of the MS4 which it owns and operates, not for discharges from all MS4 facilities within that Copermittee's jurisdictional boundaries.

The Clean Water Act upon which the MS4 permit is grounded defines "copermittee" as "a permittee to an NPDES permit that is only responsible for permit conditions relating to the discharge *for which it is operator*." (40 Code of Federal Regulations §122.6(b)(1) [emphasis added].) The Regional Board's recent September 7, 2012, letter addressing its authority states that "[t]he federal regulations make it clear that Copermittees need only comply with permit conditions relating to discharges from the MS4s ***for which they are operators***." (Emphasis added, citing 40 CFR Part 122.26(a)(3)(vi).) The Port is unaware of any legal authority that equates operation with jurisdictional location. Nor is such an interpretation consistent with the

common and plain meaning of the word "operate." "Operate" strongly connotes the performance of a function or exertion of physical control or power over the object being operated.

This is a potentially significant distinction for the Port. The Port's jurisdiction overlaps with the jurisdiction of a number of Copermittees. Due to this fact, a significant amount of the MS4 facilities within the Port's geographic jurisdiction are not operated by the Port, but are instead owned and/or operated by others under easements or other forms of ownership and operation. Accordingly, the Permit should include language affirming the intent of the CWA on this point.

This distinction is also not a hypothetical concern, as the Regional Board has previously construed the Port's responsibility for MS4 facilities more broadly than the plain language of the CWA allows. The Port would propose the following clarifying language, which could be placed in the cover for the Permit, just ahead of Table 2 and just following the sentence added by the Copermittees in their proposed redline version of the Permit referencing 40 CFR §122.21(a)(vi):

"The location of an MS4 facility within any Copermittee's jurisdiction boundaries does not, of itself, make the Copermittee an owner or operator of that MS4 facility."

We emphasize that the Port strongly supports the objectives of the Permit. We welcome the opportunity to respond to any questions the Regional Board may have with respect to our comments. Please contact the undersigned or Bill Brown at (760) 633-4485 if you have any questions or would like any clarification of the Port's position.

Very truly yours,

Scott E. Patterson

SEP/jd
cc: William D. McMinn, Esq.

CITY OF CHULA VISTA

Public Works Department

September 12, 2012
File # 0780-85-KY181
Via: Email and Regular Mail

California Regional Water Quality Control Board
San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340
Attention: Laurie Walsh

SUBJECT: COMMENTS ON THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) ORDER NO. R9-2012-0011 ADMINISTRATIVE DRAFT PERMIT FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS OF THE SAN DIEGO REGION

The City of Chula Vista appreciates the opportunity to provide comments on the Draft Order No. R9-2012-0011 (NPDES General Permit No. CAS0109266). City staff has carefully reviewed the Administrative Draft Order, and has specific comments that are presented in Attachment A to this letter. In addition, the City supports the comments and proposed revisions to the draft Administrative Order submitted by the County of San Diego on behalf of the San Diego Copermittees.

We trust that the San Diego Regional Board will give full consideration to our comments and recommendations in order to facilitate continued compliance, and increase effectiveness of the MS4 Permit for the San Diego Region.

Should you have any questions or if you need further information, please call me at (619) 397-6111. Thank you.

K. Aminpour

KHOSRO AMINPOUR
SENIOR CIVIL ENGINEER

Attachment

C: Richard Hopkins, Director of Public Works
William Valle, Assistant Director of Public Works Engineering
Silvester Evetovich, Principal Civil Engineer

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PROVISION II.B – WATER QUALITY IMPROVEMENT PLANS		
Comment No.	**Page No.**	**Comment**
1	19-20	II.B.4 – As Monitoring and Assessment (Provision II.D) is an integral component of WQIP development, Permit language should be revised to show that these two aspects are linked. As Copermittees establish and/or update priority water quality problems within their respective WMA(s), the Monitoring and Assessment plans should be modified to be consistent with these priorities.
PROVISION II.C – ACTION LEVELS		
2	22-25	II.C.1 and II.C.2 – The Permit requires Copermittees to incorporate NALs and SALs into their WQIPs, and Tables C-1 through C-5 include specific limits for which the Copermittees are to use to direct efforts for addressing MS4 discharges to receiving waters. However, Provision II.B requires that Copermittees develop WQIPs that focus on the highest water quality priorities in a watershed. The constituents as listed in Tables C-1 through C-5 may not be the highest watershed priorities for a particular WMA, which may lead to resources being used to address pollutants that are not the highest priority. More flexibility is needed in this provision for the Copermittees to develop NALs and SALs that address the highest priority pollutants in their respective WMA(s).
PROVISION II.D – MONITORING AND ASSESSMENT REQUIREMENTS		
3	26-52	Overall – The Monitoring and Assessment Program should follow a question-driven approach, allow Copermittees to make efficient use of resources for monitoring, incorporate past monitoring data into assessment, and utilize other region-wide monitoring programs.
4	26-52	Overall – Copermittees should only be responsible for discharges within their own jurisdictions.
5	41	II.D.2.b.(6) – Dry weather HMP monitoring should be conducted along with the Copermittees' existing HMP Monitoring Program and not as duplicate efforts or added requirements.
PROVISION II.E – JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS		
6	54	II.E.2.a – 40 CFR 122.26.(d).(2).(iv).(B).(1) provides municipalities with discretion to determine if certain non-storm water discharges are sources of pollutants to waters of the United States and should be addressed. Such discharges include water line flushing, landscape irrigation, discharges from potable water sources, lawn watering, individual residential car washing, dechlorinated swimming pool discharges, etc. The Administrative Draft Permit exceeds federal regulations in requiring the Copermittees to categorically address all discharges by eliminating Copermittee discretion.

PROVISION II.E (continued)		
Comment No.	**Page No.**	**Comment**
7	57	II.E.2.b.(1) – The entire MS4 and all the locations required to be identified on the MS4 map cannot be shown on a single map of practical size. It is recommended that the MS4 map should only show the MS4. Detailed locations should be available in GIS or other mapping system and be made available to the Regional Board upon request.
8	61	II.E.3.a – Change "all development projects" to "all non-exempt development projects." An exempt-projects category should be created to include projects such as tenant improvements, traffic signals, utility work, road resurfacing, and projects similar to those exempted under the definition of Redevelopment (Attachment "C").
9	61	II.E.3.a.(1)(c) – By definition, all MS4s are waters of the state. Permanent BMPs require to be connected to drainage systems by conveyance systems that are also considered MS4s. Therefore, permanent BMPs inevitably are located within waters of the state. Please consider deleting "or waters of the state" per Order No. R9-2007-0001.
10	62	II.E.3.a.(3)(c) – After "Conservation of natural areas within the project footprint including existing trees, other vegetation, and soils" add "to the maximum extent practicable."
11	64	II.E.3.b.(1)(b) – In the second line of this Provision, change "or" to "and" so the sentence will read, "…impervious surfaces on an already developed site, **and** the redevelopment project is a…"
12	66	II.E.3.b.(3)(a) – Directing runoff from sidewalks to landscaped areas may result in localized flooding, standing water, degradation/damage to sidewalks, and excessive infiltration into electrical and other utility trenches. It is recommended to provide categorical exemption for sidewalks from SUSMP requirements, similar to Order No. R9-2007-0001.
13	66	II.E.3.b.(3)(c) – After "Impervious trails" add "or maintenance access roads."
14	66	II.E.3.c.(1) – This Provision is redundant since Provision II.E.3.a.(2) is applicable to all projects per Provision II.E.3.a.
15	66	II.E.3.(c)(2) – The requirement to retain and treat pollutants <u>onsite</u> eliminates the option of regional shared treatment and hydromodification control BMPs which are allowed under Provision II.E.3.a.(1)(b) on Page 61. It is recommended to delete "onsite."
16	67	II.E.3.(c)(2)(a) – This provision is redundant since Provision II.E.3.a.(3) is applicable to all projects per Provision II.E.3.a.

PROVISION II.E (continued)		
Comment No.	**Page No.**	**Comment**
17	67	II.E.3.c.(2)(b) – Examples of LID BMPs that retain runoff should be provided. Retention facilities typically include retention basins, rain barrels, or underground vaults. Can these facilities be considered LID BMPs? What should be done with the retained water in situations where soils are impermeable and there is a lack of demand for irrigation water during the rainy season?
18	67	II.E.3.c.(2)(c) – In the last paragraph, mitigation is required for the portion of the pollutant load that is not retained onsite. Guidelines should be provided to calculate pollutant loads to be mitigated and sizing of mitigation if retrofitting projects or stream and/or habitat restoration are to be used, as provided in Provision II.E.3.c.(4)(c)(ii) on Page 71.
19	67	II.E.3.(c)(2)(d) – Sizing and pollutant removal efficiency criteria have been established for <u>onsite</u> treatment control BMPs. Do these criteria also apply to <u>offsite</u> treatment control BMPs?
20	68	II.E.3.c.(3) – Compliance with hydromodification control requirements on small projects is often infeasible and inefficient. It is recommended to adopt a lower threshold of one acre of impervious area (addition or replacement) for hydromodification control compliance, in line with the San Francisco Bay Area NPDES Municipal Permit.
21	68	II.E.3.c.(3) – Considering that the San Diego HMP has many layers of conservative assumptions, comparing developed condition runoff rates with naturally occurring conditions will add another conservative layer, which may make hydromodification control BMPs infeasible for many projects or may adversely affect the integrity of downstream channels and habitat. This is particularly true for many redevelopment and infill projects.
22	68	II.E.3.c.(3)(a)(ii) – The intent of this Provision is not clear. If it is because of possible future rehabilitation of the channel to its natural condition, then the exemption in Provision II.E.3.c.(3)(d)(ii) on Page 69 should not be allowed by the same reasoning.
23	68	II.E.3.c.(3)(a)(iii) – Monitoring data from Provision II.D.2.b.(6) will not provide necessary information to re-define the range of flows causing erosion.
24	68	II.E.3.c.(3)(b) – The Permit should provide guidelines to calculate sediment loss and the methods by which sediment loss can be compensated.

PROVISION II.E (continued)		
Comment No.	**Page No.**	**Comment**
25	69	II.E.3.c.(3)(d) – The Copermittees have spent over $1M and about four years to develop the Final HMP. The current HMP includes a monitoring plan that extends for five years. Data from the monitoring plan will determine if assumptions and criteria used in the Final HMP are appropriate or not. It is not reasonable to make any changes (including exemptions) to the HMP until monitoring data are available.
26	69	II.E.3.c.(4)(a)(iii) – The Permit requires project applicants to perform mitigation with a net result of at least the same level of water quality protection. The Permit should explain how the same level of water quality protection can be assessed if retrofitting projects or stream or habitat restoration is used as mitigation.
27	71	II.E.3.c.(4).(c)(iii) – It is hardly ever possible to synchronize mitigation projects with development projects. The requirement to complete mitigation prior to occupancy eliminates this option as a practical option.
28	71	II.E.3.c.(4)(c)(iv) – Pollutant credit system has not been explained in the Permit. This mechanism should be described in the context of this permit.
29	71	II.E.3.d – The update to the Design Manual should not include an update of the Final HMP for reasons discussed in Comment No. 25.
30	73	II.E.3.c.(2)(a) – Implementation of local SUSMPs in San Diego County started on 12/12/2002. Inventories of Priority Development Projects prior to that date are not available.
31	75	II.E.4.a.(1) and (3) – This Provision will create duplication of effort and overlap of responsibilities. The State Water Resources Control Board administers the Construction General Permit and has the authority to approve SWPPPs. While the Copermittees review SWPPPs during their construction site inspections, they enforce their own local storm water and grading ordinances. Further, SWPPPs are dynamic documents that reflect daily changes to construction activities on each site. Construction methods, site layout, and daily activities are planned by contractors. Prior to approval of construction or grading permits, such information is not generally available.
32	75	II.E.4.a.(4) – This requirement is already included in other environmental regulations and its inclusion in the Permit is redundant.

PROVISION II.E (continued)		
Comment No.	**Page No.**	**Comment**
33	79	II.E.5.a – The permit should provide the option for the Copermittees to use more than one data management system (inventory) to track the required information. For example, a GIS system can be used to identify and track the names and locations of existing facilities, while another system such as a business license database or a specially developed industrial/commercial database can provide the SIC codes, WDID No. etc.
34	79	II.E.5.a – The term "all its existing development" is too general and should not be used for identifying, tracking, inspections, implementation of BMPs, etc. A more selective term should be used for the purpose of this section.
35	79	II.E.5.a.(1), E.5.a.(2), E.5.a.(8), E.5.a.(9), E.5.a.(10), E.5.a.(11), E.5.a.(12) – Activities are not developments and should not be included in this section. Many of the requirements in Provision E.5 do not apply to activities. Such requirements include developing an inventory which includes names, locations, hydrologic sub-areas, SIC Codes, NOIs, WDID Nos., etc. It may be more appropriate to describe requirements for activities under a separate provision.
36	79	II.E.5.a.(8) – Pollutants generated and potentially generated by existing facilities, areas, and/or activities can only be identified for typical land uses and not individual facilities or areas.
37	83	II.E.5.d – Inspections of all parcels, streets, open spaces, drainage systems, sewage collections systems, etc. are neither feasible nor practicable. The permit should be more specific about the existing developments requiring inspections.
38	83	II.E.5.d.(1)(a) – Changes in property ownership or pollutant generating activities are not reported to the Copermittees in real time. They are generally identified during annual inspections.
39	86	II.E.6.a.(4) – This provision requires the Copermittees to determine if each identified non-storm water discharge is in exceedance of NALs developed pursuant to Provision C.1. For this purpose, the Copermittees would have to sample and test each and every non-storm water discharge, obtain laboratory results, and report to the San Diego Water Board within three business days. Clarification is needed regarding the intent of this requirement, since having qualified persons available for taking samples at multiple locations throughout the day and obtaining laboratory results within three business days are impossible tasks.

CITY OF DANA POINT

DEPARTMENT OF PUBLIC WORKS

September 13, 2012

San Diego Regional Water Quality Control Board
9174 Sky Park Court,
Suite 100,
San Diego, CA 92123-4340
Attn: Laurie Walsh, submitted via e-mail at lwalsh@waterboards.ca.gov

Subject: Comment letter – Regional Municipal Separate Storm Sewer System (MS4) Storm Water NPDES Permit, Tentative Order No. R9-2012-0011

Dear Ms. Walsh and Regional Permit Team:

The City of Dana Point very much appreciated the opportunity to participate in the stakeholder focus meetings to help draft an effective, implementable, and practical MS4 Permit for our region (Regional Permit). The City enjoyed its participation in these meetings, meeting the San Diego Regional Water Quality Control Board (SDRWQCB) team and hearing your ideas and intent for the next iteration of the MS4 Permit while discussing some of the broad concepts and issues.

The City agrees that the Water Quality Improvement Plan (WQIP) and adaptive management approach are an improvement over the current permit and will help Copermittees to progress in their continuing efforts to manage runoff and improve water quality. The focus meeting process and transparency also infused some vigor and enthusiasm into the regulatory atmosphere. We look forward to the continued dialogue and closer working relationship with your staff so that we can work cooperatively to achieve our common goals in an efficient and effective manner.

The City worked with our Principal Permittee, the County of Orange, to develop the redline/strike out version and general comments that will be submitted on behalf of the Orange County Copermittees by the County of Orange, and support the suggestions contained therein.

It is understood that the intent of the comments submitted at this juncture are to address broad topics based on the SDRWQCB's guidance that we received during the focus workshops. Not withstanding the recognition of the benefits and the progress

that has been made of this collaborative approach to draft the Regional Permit, there is concern that the Fact Sheet has not been made available during this process. In addition, the Report of Waste Discharge (ROWD), which represents the opportunity of the Copermittees to consider and apply experiential knowledge, appears largely irrelevant

by the regional permit approach to date. Therefore, it is not the intent of this submittal to provide lengthy legal and extremely detailed technical comments and the City reserves its right to comment independently or cooperatively on any specific issue(s) when the revised final complete Draft Tentative Order is released for public comment in the future.

In addition to the suggestions provided by the County of Orange, the City of Dana Point would like to emphasize the following:

1. Please strongly consider the receiving water language (as provided in the County redline / strikeout version) that supports meaningful programs, supports the historical interpretation of State Board Policy and supports an adaptive management strategy. The recent Ninth Circuit NRDC/L.A. decision has put the Copermittees into a difficult situation.

   We believe that if the Copermittees are better able to adaptively manage their programs to focus their resources on those Best Management Practice (BMP) strategies and monitoring efforts that are identified in the approved Water Quality Improvement Plan (WQIP) as being most effective to address the watersheds priorities, overall progress to improving water quality will be improved.

   Local government certainly recognizes the importance of attaining water quality standards. At the same time, however, it was recognized by your staff in Finding 19, that immediately realizing this goal at the moment of permit adoption is not possible at all times. Indeed, this reality is reflected by the many TMDLs across the State that specifically recognize that current water quality standards cannot be immediately attained and can only be addressed by regulation that supports implementation of an adaptive program over a period of time.

   We also hope that the adaptive management approach will allow for flexibility to re-focus resources for special studies and/or technology improvements where it makes sense. We have a phenomenal resource base of scientists in our local regional that we can tap into; however we need the flexibility to re-allocate or refocus resources to get some of this work done. We have been successful at removing some of our beaches from bacteria 303(d) listing and a clear imperative to address our efforts in the San Juan Creek watershed at the beach with the greatest population use, Doheny State Park Beach.

   The City of Dana Point recognizes the need to continue to make significant progress toward attainment of water quality standards. However, we also believe that no regulatory benefit accrues from the Regional Board establishing permit provisions that result in the potential of immediate non-compliance for

Copermittees. For these reasons, the City of Dana Point requests Receiving Water Limitations language, as supported by the California Stormwater Quality Association (CASQA), and as provided in the redline/ strikeout version provided by the County of Orange be incorporated in the permit. We strongly support this language because it will enable regulated entities to focus and prioritize their resources on critical water quality issues and achieve environmental outcomes that are meaningful to the communities we serve. Importantly, it will also help ensure that good faith compliance is not the subject of significant legal liability and lawsuits.

2. Additionally, and as an alternate, the City of Dana Point strongly supports the revisions shown via track changes in **Attachment A** to this letter, for Section A of the Draft Permit regarding adaptive management.

3. Regarding monitoring, please consider a less prescriptive, flexible, question-driven monitoring and assessment program that can be adapted to provide meaningful answers to our programs. We feel that the monitoring should focus on the watershed and constituents of concern. Our previous dry weather monitoring program was effective and functional and provided a diagnostic tool to support the ID/IC program requirements.

   Although perhaps ideal in an ideal world, it is not practical to take samples every quarter mile. Even a one time effort would be prohibitively expensive and lead to a plethora of unanswerable queries. We have an existing and effective process to investigate exceedances and are learning more each year as technology is advanced. The City has installed numerous Best Management Practices (BMPs), such as diversions and treatment systems, to address runoff pollution at nearly every outlet to the ocean in priority areas in order to make improvements in the short term, while we continue to address long term goals and solutions.

4. Please also strongly consider the need for reasonable, feasible and meaningful hydromodification and development requirements, based on science, practice and experience. We ask for the flexibility to be able to allow for biofiltration and regional, offsite mitigation options that will work effectively in the real world. There was consensus at the workshops that a much larger benefit may be achieved with regional programming in certain circumstances. We hope that the Hydromodification Workshop that was held on August 30 in San Diego provided some additional insight as to the challenges and unknowns that exist at this time. We hope to be able to work together to craft effective requirements, based on what is known so as to avoid going in the wrong direction, requiring large investments without correlated benefits.

We respectfully ask that the Board staff understand that we believe the implementation of this permit does in fact include some unfunded mandates. To state in the Findings that "the local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this order" is misleading given the provisions of California Proposition 218. The voters have the authority. Please acknowledge this by referring to Proposition 218.

Thank you for your time, effort and investment in this stakeholder process to develop the next iteration of the MS4 Permit in our Region. If you have any questions regarding the above, please do not hesitate to contact Lisa Zawaski at 949-248-3584.

Respectfully,

Brad Fowler, P.E.
Director of Public Works & Engineering Services
City of Dana Point

cc: C. Crompton, R. Boon, County of Orange
Lisa Zawaski, City of Dana Point
Orange County Copermittees

Attachment A: Suggested Changes to Section A

ATTACHMENT A

SUGGESTED CHANGES TO SECTION A

II. PROVISIONS

THEREFORE, IT IS HEREBY ORDERED that the Copermittees, in order to meet the provisions contained in division 7 of the CWC and regulations adopted thereunder, and the provisions of the CWA and regulations adopted thereunder, must each comply with the following:

A. PROHIBITIONS AND LIMITATIONS

The purpose of this provision is to describe the conditions under which~~ storm water and~~ non-storm water discharges into ~~and from~~the MS4s are to be effectively prohibited or limited, and to describe how pollutants in discharges from the MS4, whether from storm-water or non-storm water, are to be reduced to the maximum extent practicable (MEP). The goal of this provision is to address the impacts of MS4 discharges so that such discharges do not impair water quality and designated beneficial uses of waters of the state. This goal will be accomplished through implementation of control measures that effectively prohibit non-storm water discharges into the Copermittees' MS4s, and reduce pollutants in ~~storm water~~all discharges from the Copermittees' MS4s to the MEP. The process for ~~determination of~~determining compliance with the Discharge Prohibitions (A.1), Receiving Water Limitations (A.2), and Effluent Limitations (A.~~3~~3, including effluent limitations derived from the TMDL requirements - Attachment E) is defined in Provision A.4.

1. Discharge Prohibitions

a. Except as ~~provided for in Provisions A.1.e or A.4,~~otherwise permitted herein, discharges from MS4s in a manner causing~~, or threatening to cause,~~ a condition of pollution, contamination, or nuisance in waters of the state are prohibited.

b. Non-storm water discharges into MS4s are effectively prohibited, unless such discharges are either authorized by a separate NPDES permit, or the discharge is a category of non-storm water discharges or flows that must be addressed pursuant to Provisions E.2.a.(1)-(5) of this Order.

c. Discharges from MS4s are subject to all ~~waste discharge prohibitions in the Basin Plan, included in Attachment A to this Order.~~applicable waste discharge prohibitions in the Basin Plan.

d. Storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 applicable to these discharges, included in Attachment A to this Order. All other discharges from MS4s to ASBS are prohibited, unless authorized by a ~~subsequent Order~~separate order.

e. ~~For discharges associated with water body pollutant combinations addressed in a TMDL~~

~~in Attachment E of this Order, the affected Copermittees shall achieve compliance as outlined in Attachment E (Total Maximum Daily Load Provisions).~~

2. Receiving Water Limitations

a. Discharges from MS4s must not ~~have a reasonable potential to~~ cause or contribute to the violation of water quality standards in any receiving waters, including but not limited to all applicable provisions contained in the list below ~~including any modifications, unless the Regional Board determines~~, to the extent they remain in effect and are operative, unless such discharges are being addressed by the Copermittee(s) through the ~~process~~processes set forth in this Order (including Provision A.4 below and Attachment E – the TMDL Provisions):

(1) The San Diego Water Board's Basin Plan, including beneficial uses, water quality objectives, and implementation plans;

(2) State Water Board plans for water quality control including the following:

(a) Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries (Thermal Plan), and

(b) The Ocean Plan, including beneficial uses, water quality objectives, and implementation plans;

(3) State Water Board policies for water and sediment quality control including the following:

(a) Water Quality Control Policy for the Enclosed Bays and Estuaries of California,

(b) Sediment Quality Control Plan which includes the following narrative objectives for bays and estuaries:

(i) Pollutants in sediments shall not be present in quantities that, alone or in combination, are toxic to benthic communities, and

(ii) Pollutants shall not be present in sediments at levels that will bioaccumulate in aquatic life to levels that are harmful to human health,

(c) The Statement of Policy with Respect to Maintaining High Quality of Waters in California (State Water Board Resolution No. 68-16).

(4) Priority pollutant criteria promulgated by the USEPA through the following:

(a) National Toxics Rule (NTR)[1] (promulgated on December 22, 1992 and amended on May

[1] 40 CFR 131.36

4, 1995), and

(b) California Toxics Rule (CTR)[2,3]

~~**b.** For Receiving Water Limitations associated with a waterbody pollutant combination addressed in a TMDL in Attachment E of this Order, the Copermittees shall achieve compliance as outlined in Attachment E (Total Maximum Daily Load Provisions).~~

3. Effluent Limitations

a. Technology and Water Quality Based Effluent Limitations (including Effluent Limitations based on TMDLs).
Each Copermittee shall reduce pollutants in ~~stormwater~~ discharges from the MS4 to the maximum extent practicable (MEP[4]).

~~**b.** Water Quality Based Effluent Limitations (WQBELs)This Order establishes WQBELs consistent with the assumptions and requirements of all available TMDL waste load allocations assigned to discharges from the respective MS4s. Each Copermittee shall comply with applicable WQBELs as established for the TMDLs in Attachment E to this Order, pursuant to the applicable TMDL compliance schedules.~~ It is understood that compliance with this requirement will be achieved through the use of MEP-compliant best management practices (BMPs) or other controls that are consistent with the MEP standard.

4. Compliance with Discharge Prohibitions, Receiving Water Limitations, and Effluent Limitations

a. Each Copermittee must comply with the discharge prohibitions (A.1), receiving water limitations (A.2), and effluent limitations (A.~~3~~3, including effluent limitations developed based on TMDLs) of this Order through timely implementation of strategies, control measures and other actions as specified in Provisions B and E, and Attachment E (TMDLs) of this Order~~, including any modifications~~. The Water Quality Improvement Plans described in Provision B shall be designed to achieve compliance to the MEP standard with the discharge prohibitions, receiving water limitations, and all effluent limitations. If the ~~Regional Board~~Executive Officer approves ~~the~~a Water Quality Improvement ~~Plans~~Plan and subsequent updates as described in Provision B and F.1, and ~~the Regional Board Executive Officer determines they are~~ the plan is being implemented in a timely and good faith manner ~~that provides reasonable assurance of attaining the prohibitions and limitations~~

[2] 65 Federal Register 31682-31719 (May 18, 2000), adding Section 131.38 to 40 CFR

[3] If a water quality objective and a CTR criterion are in effect for the same priority pollutant, the more stringent of the two applies, unless a previous regulatory action (i.e., TMDL) has specified otherwise.

[4] This requirement does not apply to MS4 discharges which receive subsequent treatment to reduce pollutants in ~~storm water~~ discharges to the MEP prior to entering receiving waters (e.g., low flow diversions to the sanitary sewer). Runoff treatment must occur prior to the discharge of runoff into receiving waters per Finding ~~8.~~**Error! Reference source not found.**

~~described above through acceptance of the annual reports required by Provision F.3.b, such determination constitutes~~, such implementation of the plan shall constitute compliance with Provisions A.1, A.2, and A.3.

~~1. Except as provided in Parts A.4.3, A,4,4, and A.4.5 below, discharges from the MS4 for which a Permittee is responsible shall not have reasonable potential to cause or contribute to an exceedance of any applicable water quality standard.~~

~~2. Except as provided in Parts A.4.3, A,4,4, and A.4.5, discharges from the MS4 of storm water, or non-storm water, for which a Permittee is responsible, shall not cause a condition of nuisance.~~

.

~~3.~~ b. In instances where discharges from the MS4 for which the permittee is responsible ~~(1)~~, causes or contributes to an exceedance of any applicable water quality standard or effluent limitation, or causes a condition of nuisance in the receiving water; ~~(2) the receiving water is not subject to an approved TMDL that is in effect for the constituent(s) involved; and (3)~~and the ~~constituent~~pollutant(s) associated with the discharge is otherwise not specifically addressed by a provision of this Order (such as specific scheduled actions in a Water Quality Improvement Plan), the Permittee shall comply with the following iterative procedure:

~~a.~~ 1. Submit a report to the ~~State or Regional Water Board (as applicable)~~Executive Officer that:

i. Summarizes and evaluates water quality data associated with the pollutant of concern in the context of the applicable water quality ~~objectives~~objective, discharge prohibition or effluent limitation including the magnitude and frequency of the exceedances.

ii. Includes a work plan to identify the sources of the constituents of concern (including those not associated with the MS4 such that non-MS4s sources can be pursued).

iii. Describes the strategy and schedule for implementing ~~best management practices (BMPs)~~MEP-compliant BMPs and other MEP-compliant controls (including those that are currently being implemented) that will address the Permittee's sources of constituents that are causing or contributing to the exceedances of any applicable water quality standard, discharge prohibition or effluent limitation, or causing a condition of nuisance, and are reflective of the severity of the exceedances. The strategy shall demonstrate that the selection of BMPs will address the Permittee's sources of constituents and include a mechanism for tracking BMP implementation. The strategy shall provide for future refinement pending the results of the source identification work plan noted ~~in A.4.3. ii~~ above.

iv. Outlines, if necessary, additional monitoring to evaluate improvement in water quality and, if appropriate, special studies that will be undertaken to support future management decisions.

v. Includes a methodology(ies) that will assess the effectiveness of the BMPs to address the exceedances.

vi. This report may be submitted in conjunction with the Annual Report unless the ~~State or Regional Water Board~~Executive Officer directs an earlier submittal.

~~b.~~ 2. Submit any modifications to the report that are required by the ~~State of Regional Water Board~~Executive Officer and that are consistent with the MEP standard within 60 days of notification from the Executive Officer. The report is deemed approved within 60 days of its submission if no response is received from the ~~State or Regional Water Board~~Executive Officer.

~~c.~~ 3. Implement the actions specified in the report in accordance with the acceptance or approval of the Executive Officer, including the implementation schedule ~~and any modifications to this Order~~.

.

~~d. As long as the Permittee has complied~~c. Compliance with the procedure set forth above for the subject pollutant or pollutants shall constitute compliance with the applicable discharge prohibition, receiving water limitation or effluent limitation (including the applicable TMDL) in issue, and ~~is implementing the actions,~~ the Permittee does not have to repeat the same procedure for continuing or recurring exceedances ~~of the same receiving water limitations unless directed by the State Water Board or the Regional Water Board to develop additional BMPs.~~

~~4. For Receiving Water Limitations associated with waterbody-pollutant combinations addressed in an adopted TMDL that is in effect and that has been incorporated in this Order, the Permittees shall achieve compliance as outlined in Attachment E (Total Maximum Daily Load Provisions) of this Order. For Receiving Water Limitations associated with waterbody-pollutant combinations on the CWA 303(d) list, which are not otherwise addressed by an applicable pollutant-specific provision of this Order, the Permittees shall achieve compliance as outlined in Part A.4.3 of this Order.~~

~~5. If a Permittee is found to have discharges from its MS4 causing or contributing to an exceedance of any applicable water quality standard or causing a condition of nuisance in the receiving water, the Permittee shall be deemed in compliance with Parts A.4.1 and A.4.2 above, unless it fails to implement the requirements provided in Parts A.4.3 and A.4.4 or as otherwise covered by a provision of this order specifically addressing the constituent in question, as applicable.~~

2.

The information developed pursuant to A.~~4.3~~4.b must be incorporated into the Water Quality Improvement Plans and/or the jurisdictional runoff management programs, as needed.

Walsh, Laurie@Waterboards

From: Cheryl Filar <Cfilar@ci.escondido.ca.us>
Sent: Thursday, September 13, 2012 5:20 PM
To: Walsh, Laurie@Waterboards
Cc: Christopher W. McKinney; Cynthia Mallett (CMallett@ci.oceanside.ca.us); Cheryl Filar; Jeff Warner
Subject: City of Escondido Comments on Tentative Order No. R9-2012-0011
Attachments: SLRExcusionRequest.pdf; slrmap.pdf; SLRemailsupport.pdf

Laurie,

Please find enclosed the City of Escondido's comments (and two attachments) on the proposed 2012 Administrative Draft Municipal Separate Storm Sewer (MS4) Permit.

Thank you for considering our comments.

Cheryl Filar
Environmental Programs Manager
City of Escondido
Utilities Department
201 N Broadway
Escondido, CA 92025

760-839-6315
760-291-7254 (cell)

760-839-4668 (Stormwater Hotline)

ESCONDIDO
City of Choice

Christopher W. McKinney
Director of Utilities
201 N. Broadway, Escondido, CA 92025
Phone: 760-839-4662 Fax: 760-839-4651

September 13, 2012

Ms. Laurie Walsh
California Regional Water Quality Control Board
San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Re: CITY OF ESCONDIDO COPERMITTEE COMMENT SUBMITTAL ON THE ADMINISTRATIVE DRAFT MUNICIPAL SEPARATE STORM SEWER (MS4) PERMIT (TENTATIVE ORDER NO. R9-2012-0011)

Dear Ms. Walsh:

Thank you for the opportunity to comment on the Administrative Draft Municipal Separate Storm Sewer (MS4) Permit that is proposed to cover portions of San Diego County, Orange County, and Riverside County (Tentative Order No. R9-2012-0011). Although the City generally concurs with those comments that are provided as part of the San Diego Copermittees' submission, we do have a particular comment and request to make regarding our inclusion in the San Luis Rey (SLR) Watershed as part of the proposed 2012 draft permit.

During the 2007 draft permit issuance process, the City successfully applied for a waiver from participation/inclusion in the San Luis Rey (SLR) Watershed based on our minimal geographic representation in it. Escondido's 2008 JURMP submittal includes the following language that documents the approved rationale for our non-membership in the SLR Watershed:

1.4.1 <u>San Luis Rey Watershed</u>

Approximately 53 acres of the City are located within the San Luis Rey Watershed, which is associated with Daley Ranch, an open-space preserve that will remain undeveloped in perpetuity. This area occupies only 0.014 percent of the San Luis Rey Watershed and is far removed from any tributary that would convey runoff into San Luis Rey River. Because of this extremely low runoff contribution to the San Luis Rey Watershed, the City of Escondido is not included as a member agency in the management of this watershed. Therefore, for the purposes of assessing and controlling potential pollutants in runoff within watershed areas, the City focuses on the Carlsbad and San Dieguito River watersheds, which make up the majority of the City's jurisdiction.

The attached map provides a visual depiction of our continuing minimal and undeveloped footprint in the SLR Watershed. In addition, I have attached an email from

the City of Oceanside, the lead for the SLR Watershed, which supports Escondido's continued exclusion.

The City of Escondido appreciates your consideration of this matter and looks forward to working with the Regional Board to further improve water quality in our region.

Sincerely,

Cheryl Filar
Environmental Programs Manager

cc: Christopher W. McKinney, Director of Utilities
Cynthia Mallett, Environmental Specialist, City of Oceanside

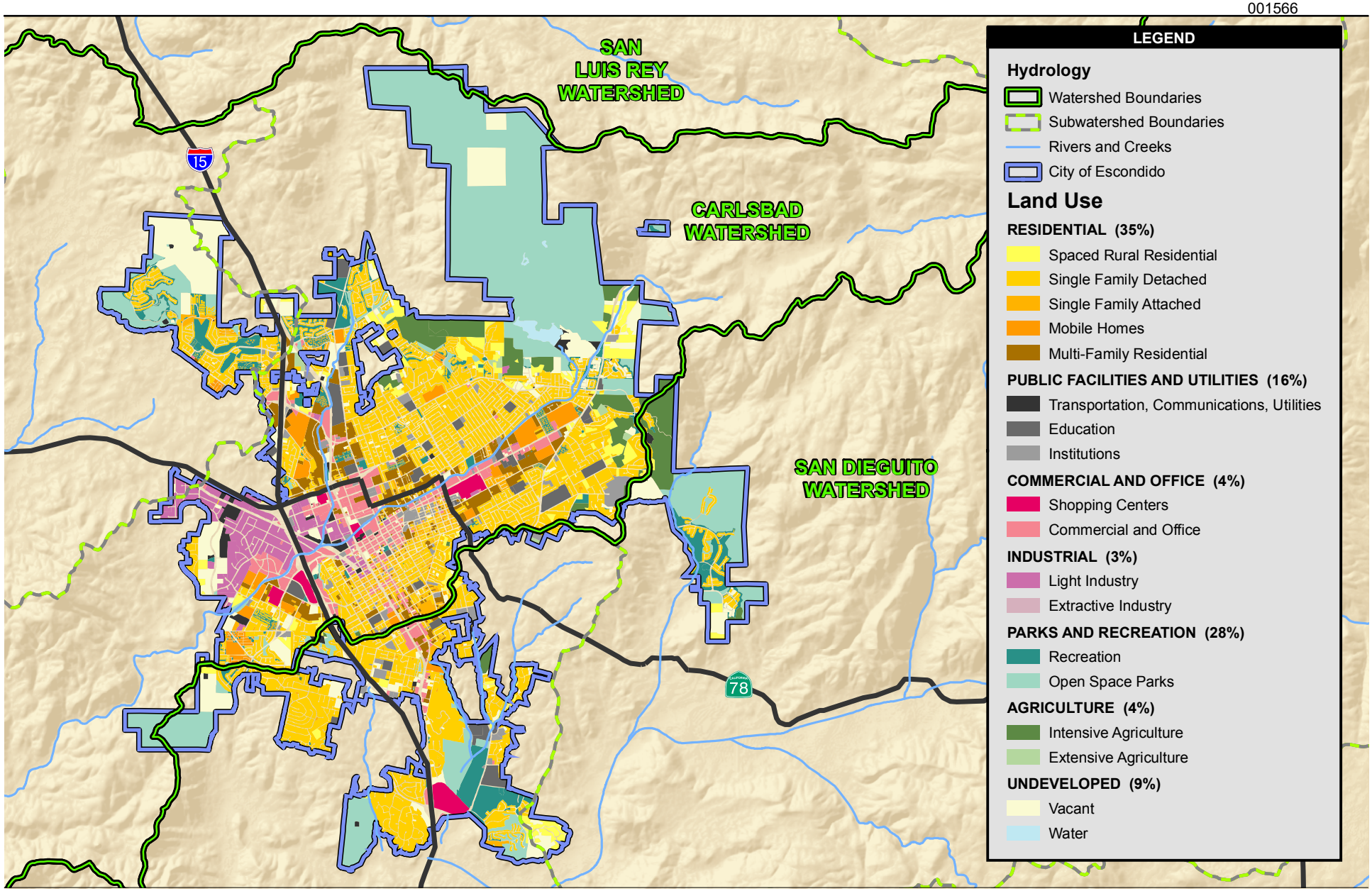

Source: USGS 2000; SANDAG 2010; California Interagency Watershed Mapping Committee 2004; City of Escondido 2009

1.8 0.9 0 1.8 Miles

Scale: 1 = 114,000; 1 inch = 1.8 miles

Figure 1-2
Land Use Designations

Path: P:\2011\11280146.01_Esc_JURMP\06GIS\6.3_Layout\Reports\AR_2010-2011\fig 1-2_LandUseDesignations.mxd, 9/27/2011, augellop

Cheryl Filar

From: Cynthia Mallett <CMallett@ci.oceanside.ca.us>
Sent: Wednesday, September 12, 2012 3:12 PM
To: Cheryl Filar
Cc: Paul Hartman (phartman@cityofvista.com); Scott Norris (scott.norris@sdcounty.ca.gov); Mo Lahsaiezadeh; Alison Witheridge
Subject: Exclude Escondido from SLR Watershed

Hi Cheryl,

I received your email regarding exclusion from the SLR Watershed in the draft administrative Stormwater Permit. I discussed this internally with Oceanside staff and we are fine with the exclusion. The City of Vista and the County of San Diego are fine with this exclusion as well. Also, in the San Diego County Copermittee comments to the RWQCB on the Draft Administrative Permit, Escondido is not included in table B-1 for the San Luis Rey Watershed Management Area.

Let me know if you have any questions.

Thank you,

Cynthia Mallett
Environmental Specialist
Oceanside Clean Water Program
760-435-5807
Urban Runoff Hotline
760-435-5800

CALIFORNIA
NATIONAL CITY
1887
INCORPORATED

Via email: lwalsh@waterboards.ca.gov

September 13, 2012

Laurie Walsh, P.E.
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123

Re: Comments on Administrative Draft MS4 NPDES Permit

Dear Ms. Walsh:

The City of National City (City) appreciates the opportunity to comment on the San Diego Regional Water Quality Control Board (Regional Board) Regional Municipal Separate Storm Sewer (MS4) Storm Water NPDES Permit (Tentative Order No. R9-2012-0011, hereafter "Administrative Draft"). In particular, the City would like to thank the Regional Board for the opportunity to participate in open focused meetings along with other stakeholders. These meetings have been helpful in helping the various stakeholders to better understand each others' positions, and, we believe, to reach consensus on some, although not all, issues.

City representatives have been actively involved in San Diego County Copermittee preparations for the focused meetings and in the process of developing a set of written comments on the Administrative Draft. The City is in general agreement with the Copermittee group comments that are being submitted to the Regional Board and therefore, for the sake of simplicity, is not submitting a separate group of comments at this time. We look forward to continuing to work with you and the rest of the staff at the Regional Board as this permit reissuance process goes forward.

Sincerely,

Stephen Manganiello
City Engineer

Walsh, Laurie@Waterboards

From: Peck Pool Services <bill@peckpool.com>
Sent: Thursday, September 13, 2012 2:18 AM
To: Walsh, Laurie@Waterboards
Cc: joe.sunpools@yahoo.com
Subject: NPDES Draft Permit (Order #R9-2012-0011) comment on a proposed additional rule

The purpose of this letter is to comment on a possible proposed rule addition to the NPDES Draft Permit (Order #R-9-2012-0011). On page 56 (4) (c) this document addresses "Dechlorinated swimming pool discharges". It has come to my attention that a "non-profit coastal group" is planning to propose an additional rule to require residents to use the services of an onsite reverse osmosis filtering company rather than drain their pool into either the MS4 or sanitary sewer. While water conservation is commendable, the scope and purpose of the NPDES is not water conservation but rather the elimination of pollutants entering the MS4. Therefore this proposed rule does not belong in this Permit. In addition, it should be noted that most swimming pool water in the Region covered by this Permit was on its way to the ocean when it was diverted for use in swimming pools, and when discharged (in compliance with the Permit) it finishes this journey. Therefore the water itself is not creating a burden upon the receiving waters (the Pacific Ocean).

If any clarification of this comment is needed please feel free to e-mail me or call me at 858-735-2565.

Respectfully submitted,

Bill Peck, owner, Wm. Peck Pool Services, San Diego, CA

Walsh, Laurie@Waterboards

From: Uhley, Jason <JUHLEY@rcflood.org>
Sent: Thursday, September 13, 2012 6:30 PM
To: Walsh, Laurie@Waterboards
Cc: robert_collacott@urscorp.com; Padres, Claudio
Subject: Riverside County MS4 Permittee Comments regarding Regional MS4 Permit
Attachments: sep 13 Riv Co Regional Permit Comments.pdf

Laurie,

Please find enclosed a copy of our comments regarding the Regional Permit. An original wet-signed version will follow in the mail.

Please let me know if you have any questions or comments.

Regards,

Jason Uhley
Chief of Watershed Protection
Riverside County Flood Control and Water Conservation District
1995 Market Street
Riverside, CA 92501
951.955.1273

September 14, 2012

Ms. Laurie Walsh
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, California 92123-4340

Dear Ms. Walsh:

Re: Administrative Draft Order R9-2012-0011, NPDES No. CAS 0109266 and Waste Discharge Requirements for MS4s Draining the Watersheds within the San Diego Region

The Riverside County Flood Control and Water Conservation District (District) is submitting this comment letter on the above listed Administrative Draft Order, on behalf of the Riverside County MS4 Permittees within the San Diego Region (Riverside County Permittees) which includes the District, the County of Riverside and the Cities of Murrieta, Temecula and Wildomar. Administrative Draft Order R9-2012-0011 (Administrative Draft) was drafted by Board staff to cover Phase I municipal separate storm sewer system (MS4) permittees in San Diego County, Southern Orange County, and the portion of southwestern Riverside County referred to as the Santa Margarita Region. Although the Administrative Draft will initially only apply to the San Diego County MS4 permittees, Provision F.5.a mandates that it will apply to the Riverside County Permittees on expiration of their existing Santa Margarita Region MS4 permit in 2015, unless early enrollment is granted prior to Provision F.6. Since the Administrative Draft purports to cover the activities of the Riverside County Permittees, this letter, developed in consultation with the Riverside County Permittees, reflects those Permittees' most critical concerns. The Board's careful consideration of these critical concerns will be appreciated.

In the workshop on the Administrative Draft Order on April 22nd Regional Board staff identified the following desired outcomes of the Administrative Draft:

- Improving the quality of water discharged from the MS4
- Restoring or enhancing beneficial uses and receiving water quality

It was further identified by Board staff that to be able to meet those goals, the proposed regional MS4 permit needed to be 1) Strategic, 2) Adaptive, and 3) Synergistic.

While the Riverside Copermittees still have questions regarding the legal authority to issue this regional MS4 permit to Copermittees within the three counties, the Copermittees agree that being able to adapt and direct resources toward specific water quality priorities in a given watershed, rather than all-potential problems simultaneously, is more likely to result in actual / meaningful improvements in water quality. However, to be able to achieve those improvements the MS4 Permit must be written to allow the Copermittees to truly and fully adaptively manage their programs to focus their resources on those BMP strategies and monitoring efforts that are identified as being most effective, consistent with the MEP standard, at addressing the watershed's priorities.

Unfortunately, the prescriptive provisions and the receiving water limitations presented in the Administrative Draft are not supportive of achieving those outcomes, as it currently does not allow the Copermittees to be strategic with the use of their resources, nor to adapt their programs to focus on the highest priority water quality needs of the watershed. This comment letter identifies the fundamental issues which, if resolved, will address these limitations and facilitate the desired improvements. Among other issues, there needs to be a greater emphasis on the ***integration*** of the Monitoring, Water Quality Improvement Plans, and Jurisdictional Runoff Management Plans, which may require key elements of the Administrative Draft and, in particular, the proposed monitoring and jurisdictional requirements, to be simplified to provide the needed flexibility for effective implementation of an integrated adaptive management approach.

1 BACKGROUND

The Riverside County Permittees were issued an extensive and prescriptive MS4 Permit in November 2010 (2010 MS4 Permit) which greatly expanded monitoring obligations, required special studies, jurisdictional runoff management program, and watershed workplan requirements. Development and implementation of the 2010 MS4 Permit compliance requirements has been unduly expensive relative to the size, resources, and known beneficial use impairments in the Santa Margarita Region, and the demonstrated benefits of the mandated compliance requirements. These requirements have left other important societal needs unfulfilled by the Riverside County Permittees during a period of unprecedented and continuing economic distress. The Riverside County Permittees are still in the process of developing and implementing these requirements which is a concern given the different approach proposed in the Administrative Draft.

While the Riverside County Permittees have long sought a more flexible, adaptive, and outcome-oriented MS4 permit, the extraordinarily prescriptive compliance and monitoring mandates in the 2010 MS4 Permit have significantly limited the Riverside County Permittees' ability to participate in the focused meetings and to provide detailed comments on the Administrative Draft.

The Riverside County Permittees appreciate that Board staff were have been seeking MS4 permittee input during the focused meetings on the Administrative Draft. Unfortunately, the Riverside County Permittees were effectively precluded from participation in the first two focused meetings, due to the need to meet compliance deadlines set forth in the 2010 MS4 Permit issued by the San Diego Water Board just 18 months earlier. The Riverside County Permittees notified the Regional Board staff of these requirements both verbally and in written correspondence on multiple instances prior to the first focused meeting and stated that, without relief from the 2010 MS4 Permit requirements, the Riverside County Permittees could not attend the first two focused meetings. Nonetheless, Regional Board staff decided to proceed with those first two meetings without participation of the Riverside County Permittees, due to self-imposed goals for the adoption of this regional MS4 permit. Our ability to fully prepare for and participate in the second two focused meetings, and additionally to provide these written comments, continues to be constrained by the demands of developing and rolling out of additional compliance documents mandated in the 2010 MS4 Permit.

However, as the public noticing documents indicated, these comments on the Administrative Draft are considered to be informal and will not be responded to by staff. However, in an apparent contradiction, Regional Board staff has made other comments at focused meetings suggesting that a significant proportion of changes to the proposed regional MS4 permit will be made in response to comments on the Administrative Draft, and that proportionally fewer changes are expected based on (not yet submitted) comments on the (not yet drafted) Tentative Order. Under the Clean Water Act and California law, all interested persons, including the Riverside County Permittees, must be provided the full opportunity to review and comment upon the

Tentative Order, which will represent the actual proposed regional MS4 permit. To not give full consideration to address and respond to all comments on the Tentative Order, including the projected MS4 Permittees in the Santa Margarita Region, would be an abuse of discretion by the Regional Board. Not only should Regional Board staff provide full consideration of all comments on the Tentative Order, but Regional Board staff should have no pre-established expectation or limitation on the amount or scale of changes that will be considered as appropriate on the Tentative Order.

Further, due to the public policy significance of the shift to a regional permitting approach, a series of workshops in front of the Regional Board Members should, and are requested to be scheduled following release of the Tentative Order. Conducting such workshops for the Regional Board Members is critical to allow them to be fully informed of, and hear first-hand the issues from a variety of perspectives, before being asked by Regional Board staff to adopt a regional MS4 permit.

While the Riverside County Permittees appreciate this opportunity to comment on the Administrative Draft, we anticipate providing additional, and perhaps more significant, comments on the Tentative Order. As noted above, our opportunity to review, evaluate, participate in focused meetings on, and develop comments on the Administrative Draft has been significantly constrained by mandates to comply with the 2010 MS4 Permit. Moreover, the Riverside County Permittees reserve the right to make additional or different comments on the Tentative Order from those made on the Administrative Draft, including potentially on similar sections of the permits, as well as to submit redline comments and other exhibits. The provision of comments on the Administrative Draft does not, in any way, preempt the ability of the Riverside County Permittees to collectively or individually make comments on the Tentative Order, and any such comments should be fully considered at that time as part of the formal proceedings.

2 GENERAL COMMENTS

2.1 Authority to Require Regional Permit

Letters were sent by the Orange County and Riverside County Counsels' Offices to the State Water Board's Office of Chief Counsel in May, requesting the views of that office on the legal authority of the Regional Board to issue a single regional MS4 permit covering these three counties, across a number of separate watersheds, with no interconnected MS4, and for which no Report of Waste Discharge (ROWD) had been issued. The Office of Chief Counsel only provided a response to these letters a few days ago, several months after the original letters were sent. While we have reviewed their response, we believe that the response may not have fully considered the entirety of the Clean Water Act regulations regarding jurisdictions that can be regulated on a single permit. The Riverside County Permittees plan to address the Office of Chief Counsel letter separately.

While the Riverside County Permittees continue to reserve the right to contest inclusion in any regional MS4 permit, and wish to state that the submission of comments or participation in focused meetings regarding the Administrative Draft represents no waiver of such reservation, the Riverside County Permittees concur that they may voluntarily agree to enter into such a regional MS4 permit. While the participation of the Riverside County Permittees in focused meetings and workshops should not be construed as any agreement to voluntarily enter into a regional MS4 permit, they remain open to the concept of such a regional MS4 permit, depending on its terms.

2.2 Increase Flexibility to Account for Local Conditions

The Santa Margarita Region has distinctly different hydrology, soils, topography, climate, and water quality concerns than those found in Orange and San Diego Counties. These differences are significant and warrant MS4 permit provisions that are sufficiently flexible to account for them. In addition, the Riverside County Permittees are making significant resource and staff investments in developing and implementing compliance programs for the 2010 MS4 Permit, and are concerned that the inclusion of highly prescriptive requirements in the Administrative Draft, may unnecessarily conflict with the programs developed. If the Regional Board intends to adopt a tri-county regional MS4 permit, these factors must not be ignored or dismissed by Regional Board staff in the development of the Tentative Order, and need to be addressed by giving full consideration to, and not dismissing, each of the comments provided by the Riverside County Permittees.

2.3 Adaptive Management

The Riverside County Permittees are supportive of the adaptive management approach verbally advocated by the Regional Board staff; however the adaptive management approach proposed in the Administrative Draft will require modification to be feasible.

The Administrative Draft does not currently allow true/full adaptive management, and as such will not enable the MS4 Permittees to focus and prioritize their efforts and resources toward obtaining those improvements. The Administrative Draft also proposes an extraordinarily expansive monitoring data collection exercise that is not justified by water quality needs and potential benefits, and certainly not by the coniditons found in the Santa Margarita Region. This absence of flexibility and mandated commitment of resources to implement the monitoring program would severely restrict the ability of the Riverside County Permittee's flexibility to redirect resources to address priority water quality concerns.

Recommendation

Effective implementation of an adaptive management approach requires broad compliance and budgetary flexibility to allow the Riverside County Permittees to focus their resources on those BMP strategies and monitoring efforts that are identified in the approved WQIP as being most effective, consistent with the MEP standard, to address the watersheds priorities. A figure entitled "Example Process for Integrated Adaptive Management Process" which illustrates the adaptive management process supported by the Riverside County Permittees is attached to this letter.

The Riverside County Permittees have attached a figure entitled "Example Process for Integrated Adaptive Management Process" wich illustrates the type of adaptive management process supported by the Permittees. Following is a narrative summary of the attached figure. Although Orange and San Diego Counties may be including similar figures in their comments, differences underscore the need to collaborate in the development of an effective adaptive management approach, including development of functional definitions of "adaptive management" and "iterative approach" as related to the implementation of compliance programs:

- WQIP:

The WQIP should be the primary driver for decisions regarding what programs should be implemented, and the relative scale and resources dedicated to those programs. To provide structure, predictability, and enforceability to that decision process, the WQIP should empower the MS4 Permittees to:

- Identify the highest water quality priorities that are affected by discharges from the MS4;
- Develop jurisdictional and regional BMP strategies, and identify monitoring and assessment efforts, which will be most effective at addressing the watershed's highest water quality priorities affected by discharges from the MS4;
- Develop an assessment system, including monitoring, to measure progress, and identify and control pollutant sources, etc;
- The Water Quality Improvement Plan (and the BMP strategies and Monitoring and Assessment Plans (MAP) therein), should be adaptively managed every five years (addressed in the ROWD), and as/if needed in between; and
- Each MS4 Copermittee should then be held accountable to implement its respective responsibilities as laid-out and scheduled within the WQIP, thereby constituting compliance with the proposed regional MS4 permit.

- *JRMP and Monitoring:*
  - There should not be an expectation (or requirement) that the JRMP and/or the Monitoring programs are separately adaptively managed outside the WQIP process. These plans/programs should be iteratively managed on an ongoing, as-needed basis, provided that WQIP commitments are met. For example, if the WQIP specifies a target for inspections of a particular existing development management area of every three months, a Copermittee should be able to change its internal inspection processes, inspection forms, etc. at any time, provided that the inspections still occur every three months. As illustrated in the attached figure, maintenance of baseline programs (e.g., IC/ID, public education, and others) will continue to be included. However, those baseline programs will be evaluated and revised to tailor to the specific needs of each watershed area and will likely result in changes from the programs described in the existing MS4 permits.
  - The JRMP and monitoring program requirements should be described in the regional MS4 permit as a "menu" of options, recognizing that the WQIP – which will be publically vetted and approved by the Regional Board - will specify those jurisdictional and regional activities that will be implemented to address that watershed's priorities, the appropriate frequencies, performance standards and other compliance elements. This Permit language must recognize that not all compliance requirements specified in the Administrative Draft may be required to appropriately manage high water quality priorities; otherwise if everything is still required all the time, the Copermittees' will NOT be able to focus their resources, and the desired outcomes will likely not be achieved.

2.4 Legal Authority

First, the Legal Authority Establishment and Enforcement provisions, E.1, must be modified to reflect the requirements of law. First, the requirement to address illicit discharges as written is much broader than the requirements of the federal regulations, which require MS4 permittees only to "effectively prohibit through ordinance, order or similar means, illicit discharges to the municipal separate sewer." 40 CFR § 122.26(d)(2)(i)()B). The permit should reflect this language, and should not include any goals or requirements to 'eliminate' or 'prevent' illegal discharges.

Second, the requirement to control discharges from industrial and construction activity should not include the responsibility to control sites covered by general stormwater permits, as that responsibility is that of the Regional Board and fees for the inspection of those facilities are already collected by the State.

Third, the regulations do not require interagency agreements between non-MS4 dischargers and third parties such as Native American tribes, Caltrans or the federal government, but only among MS4 permittees. The Regional Board has authority and responsibility under the Porter Cologne Water Quality Act to regulate discharges from other non-MS4 sources, and that responsibility cannot be transferred to the MS4 permittees. The MS4 copermittees can certainly work cooperatively with such third parties on a voluntary basis.

2.5 "Ensuring" Compliance

Provision E.4.d of the Administrative Draft requires MS4 permittees to conduct inspections of construction sites to "ensure" compliance with various requirements. Such terminology can be read as a requirement to 'guarantee' compliance. The MS4 permittees are not required under federal law to "ensure" (or guarantee) the compliance of third parties, and cannot in fact do so. These provisions should be modified to require that the MS4 permittees "confirm" that requirements are being met, and to conduct enforcement within their jurisdictional authority, where necessary, to prompt the party to come into compliance.

Additionally, the use of the term "ensure" can be found in other provisions in the Administrative Draft, and the Riverside County Permittees object to those usages as well. In particular, we note that the term is used in Provision E.3.e. (Priority Development Project BMP Impact and Oversight), E.4.a. (Construction Management Project Approval Process), E.5.d. (Existing Development inspections) and in the definition of Jurisdictional Runoff Management Program in the Glossary, which requires that JRMPs "ensure" that pollutants in MS4 discharges are reduced to the MEP. In all these cases, and elsewhere in the Administrative Draft where there is a requirement to "ensure" or otherwise guarantee compliance, the Riverside County Permittees request alternative language, such as "confirm," which reflects the iterative process of compliance, one which reflects the real world impossibility of 'ensuring' compliance.

2.6 Fiscal Analysis

Provision E.8.A. requires that "Each Copermittee must secure the resources necessary to meet all the requirements of this Order." This requirement is objectionable on several grounds. First, it exceeds the requirements of federal law or regulation. The MS4 regulations require *only* that MS4 permittees submit a "fiscal analysis" of the resources required to accomplish MS4 permit program activities, including a description of the sources of funds. 40 CFR § 122.26(d)(2)(vi). Second, this requirement ignores the real world limitations facing MS4 permittees in attempting to find funding to conduct the programs required under MS4 permits and ignores the economic conditions faced by the Riverside County Permittees. Third, neither the Clean Water Act nor the Porter-Cologne Water Quality Act give the Regional Board budget authority over municipalities or flood control districts. Thus, there is no legal authority for this provision. It should be deleted and replaced with language reflecting the requirements of the MS4 regulations, which are cited above.

2.7 Purpose of Clean Water Act

Throughout the Administrative Draft, it is stated that that the goal of various provisions of the Administrative Draft is to protect, preserve, enhance or restore water quality or designated beneficial uses of waters of the state. It is true that the Clean Water Act has as its basic goal to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters." 33 U.S.C. § 1251(a) Congress, however, translated that goal for MS4 operators (which does not call for "enhancement" of those waters) in the provisions of Section 402(p)(3)(B), which require that MS4 operators "effectively prohibit" non-stormwater discharges into the MS4s and to "require controls to reduce the discharge of pollutants to the

maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants." 33 U.S.C. § 1342()(3)(B) Thus, the two Congressional requirements for MS4 operators in the Clean Water Act for MS4 Permits are (1) effective prohibition of non-stormwater discharges into the MS4 and (2) the control of pollutants discharged from the MS4, of whatever source, to the maximum extent practicable ("MEP").

Accordingly, Congress' intent was not to place the entire burden of achieving the goals of the Clean Water Act in a watershed upon owners/operators of the MS4, nor that the attainment of water quality standards or beneficial uses should be expressed as the 'goal' of an NPDES MS4 permit. The USEPA, the State Board and the Regional Boards regulate many other potentially significant sources of pollutants, including from industrial dischargers, publicly owned treatment works, federal and tribal sources and agricultural runoff, sources that are beyond the control of the MS4 owners/operators. It is through the combined and proper regulation – by the USEPA, State and Regional Boards, of each of those sources that the goals of the overall Clean Water Act can be met.

[Additionally, while the Water Board has the authority, under the Porter-Cologne Water Quality Act, to adopt requirements in a waste discharge requirement, that adoption requires the Regional Board to follow the requirements of state law, including those set forth in Water Code § 13263(a), and, without limitation, the requirements of Water Code § 13241. The Administrative Draft does not set forth that such requirements have been complied with, as was required by both state law and the California Supreme Court in *City of Burbank v. State Water Resources Control Board* (2005) 35 Cal. 4th 613, 625.]

2.8 Attempted Transfer of Regional Board Responsibilities

Under the Porter-Cologne Water Quality Act, the Legislature delegated primary responsibility for managing waters of the state to the Regional Boards. This includes developing and implementing multi-discharger watershed management approaches if/where necessary, including directly regulating all sources of pollutants in a watershed. Although MS4 dischargers are only one of those potential sources of pollutants, in several sections the Administrative Draft inappropriately attempts to transfer the entire responsibility and burden of watershed planning and attainment or restoration of beneficial uses to the MS4 Permittees, in the form of MS4 permit requirements and, to that extent, is thus inconsistent with this legislative mandate. These responsibilities include proposed requirements for the MS4 Permittees to singlehandedly take the lead in developing watershed plans, conducting receiving water monitoring; conducting special studies, controlling and regulating non-MS4 pollutant sources, and implementing retrofit and stream rehabilitation projects, each with the goal of restoring or rehabilitating beneficial uses in receiving waters. However, in adopting the Porter-Cologne Water Quality Act, the Legislature determined that the Regional Boards, not the MS4 Permittees (i.e., general purpose governments and flood control districts), are the most appropriate entities to implement such efforts. The Riverside County Permittees have demonstrated their commitment to *participate in* watershed management planning and to implement compliance programs that are focused obn addressing the watershed's highest water quality priorities specifically related to MS4 discharges to the extent of their authorities. However, the Riverside Copermittees are not willing to usurp what is otherwise the responsibility of the Regional Board, and to unilaterally pay for activities, such as previously mentioned, that which should be accomplished via the combined resources and proper regulation of all sources, including non-MS4 sources.

The Administrative Draft also attempts to assign all responsibility and liability for funding programs for improving receiving water quality and attaining water quality objectives in receiving waters on the MS4 dischargers. Development and implementation of water quality improvement plans, receiving water monitoring, and monitoring of non-MS4 sources of pollutants must be supported by all of the entities responsible for these pollutant sources. These other sources include Phase II facilities, sites permitted under the General Construction and Industrial Stormwater Permits, federal and state facilities (including Caltrans), agricultural sources, POTWs, purveyors of reclaimed water, and NPDES and waste discharge requirement dischargers otherwise authorized by the Regional Board. The requirement in the Administrative Draft for the MS4 permittees to fully fund the development and implementation of watershed improvement plans would constitute an attempted transfer of local public resources to support the activities of these other public and private entities. If the Regional Board's desired objective is to implement a watershed approach rather than a discharger-based approach, the Regional Board must require all dischargers and sources in the watershed to participate in jointly funding the watershed planning efforts.

Recommendation

If the Regional Board endeavors to accomplish the broader goals of the Clean Water Act, the proper means would be to focus existing Regional Board staff and resources on proper proactive regulation and permitting of all source categories, and bringing those sources together to implement the desired watershed and Basin Planning. All requirements or implications that any element of the MS4 permittees' programs should to singlehandedly take on or lead those responsibilities, or meet those broader Clean Water Act goals, must be removed in the Tentative Order.

In assigning responsibility for basin planning to the Regional Boards, the Legislature authorized the Regional Boards to issue permits and other mandates and to require funding of compliance requirements. The Riverside County Permittees request that the Regional Board retain its legislatively-mandated leadership role in basin planning and require that all sources of pollutants participate in funding monitoring, planning, compliance and other water quality management activities and that requirements which focus that effort only on MS4 permittees be removed from the Tentative Order. The approach described in the federal regulations for development and implementation of Total Maximum Daily loads is a possible model of such an inclusive process.

2.9 Update of Basin Plan

For outcome-based permitting to be successful, the desired outcomes must be achievable by the discharging entity and take into account the background conditions in the watershed (see previous comments about setting desired goals or outcomes at the broader Clean Water Act goals). The Basin Plan should be updated prior to adoption of a regional permit to identify realistic water quality standards which take into account data reflecting local conditions, not just a literature search.

Recommendation

The Riverside County Permittees support a comprehensive evaluation of the Basin Plan for the Santa Margarita River watershed to determine if water quality standards need adjustment to properly reflect localconditions. With the move to outcome based permitting, such an update is necessary to ensure that limited local resources are focused on solving real environmental problems. Such an update should be led by and adequately funded by the Regional Board with participation by the MS4 permittees and other dischargers and sources in the watershed.

2.10 Use of "including but not limited to" Language

Throughout the Administrative Draft, the wording "including but not limited to" is used to define various requirements. This language is impermissibly vague and ambiguous, and potentially leaves the MS4 permittees open to liability for permit violations due to their alleged failure to guess at additional requirements. The MS4 permittees must have certainty in the requirements of the MS4 Permit so that they can plan their compliance activities. The MS4 Permittees cannot be forced to guess at what additional, unstated requirements may be in the minds of Regional Board staff or citizen plaintiffs. The terms of the MS4 Permit are read like a contract. *Northwest Environmental Advocates v. City of Portland,* 56 F.3d 979, 982 (9th Cir. 1995). A provision requiring a MS4 permittee to perform "including but not limited to" certain identified tasks leaves the MS4 permittee with no certainty that performance of the identified tasks is enough for compliance. This basic uncertainty renders the MS4 permit vague and unenforceable and subject to abuse.

This or similar language can be found in the Administrative Draft at the following places:

A.2.a; B.2.a.6; B.2.c.4; B.5.a.1; B.5.b.1; E.3.c.4.(b); E.3.d.1; E.3.f.4.(a)(4); E.5.c.4.(a); F.3.b.1.(d); Attachment B, General Provision 2.g.2; Attachment B, General Provision j.1; Glossary, definition of "construction site."

The Riverside County Permittees object wherever this or similar language is found in the Administrative Draft, whether or not identified above.

Recommendation

The proposed MS4 permit can require that minimum steps be followed; if such steps are followed; however, the permittee is in compliance, though the permittee could voluntarily elect to follow additional steps

3 SPECIFIC CONCERNS

The following comments represent specific high level concerns that the Riverside Copermittees have identified at this time. It does not represent a comprehensive set of comments on all issues with the Administrative Draft.

3.1 Findings

The Riverside County Permittees have two separate sets of comments on the Findings set forth in the Administrative Draft. The first addresses the failure of the draft to include findings on important aspects of California law as well as the physical setting of the Santa Margarita Region. The second addresses issues raised by specific Findings that were included in the Administrative Draft.

3.1.1 Needed Additional Findings

The Administrative Draft fails to fully address the context and conditions under which the proposed regional MS4 permit requirements are to be applied. A more complete explanation of this background is necessary to ensure that the provisions ultimately included in the Tentative Order are credible and appropriate, and legally required, and that the provisions (which should stem from the Findings) are written in context of the broader issues that affect MS4. The Riverside County Permittees request that the Regional Board work with the MS4 permittees to expand the Findings, including the addition of findings to address the following:

- California Water Law – This body of law requires that downstream entities must accept runoff from upgradient properties. Owners and operators of MS4s are not exempt from this legal mandate, even if that runoff contains pollutants. A Finding which describes this mandate is fundamental to properly frame the role of the MS4 permittees, the difficulties in managing runoff from the MS4, and in turn provide the context for the requirements proposed within the MS4 permit.
- Porter-Cologne Water Quality Act – This legislation establishes the State Water Resources Control Board and the Regional Water Quality Control Boards, not the MS4 permittees, are the primary governmental entities responsible for adequately regulating sources of pollutants to meet beneficial uses in receiving waters in California. Please see discussion above.
- Flooding – Many areas that would be under the jurisdiction of a proposed regional MS4 Permit are subject to periodic catastrophic flooding resulting from natural conditions. This flooding exists even in the absence of development. Such flooding has and will result in loss of life, widespread property damage, and exposes runoff to significant amounts of pollutants from industrial, commercial, residential and agricultural land uses, thus damaging watercourses, habitat and the beneficial uses therein. Further, flooding can mobilize significant volumes of pollutants that can have significant and permanent detrimental effects. MS4 systems are designed and constructed to mitigate these impacts. A Finding describing these conditions is necessary to provide a context for the role of drainage system improvements in the management of flood waters and receiving water quality.
- Flood Control District Acts – The Legislature adopted separate acts to establish Flood Control Districts in Orange, Riverside, and San Diego Counties. In these Acts, the Legislature has determined that protection of life and property from the effects of flooding through the implementation of flood control improvements is a priority, and has assigned those Districts with the sole responsibility for the identification of necessary flood hazard mitigation efforts, and the construction and maintenance of those improvements that are necessary to manage and contain flood waters to prevent such negative impacts. These improvements are not only critical to the protection of life and property, but they represent fundamental water quality BMPs inasmuch as they reduce the widespread exposure of runoff to pollutants. Additionally, the Flood Control Districts, while being owners and operators of MS4s, have no authorities or powers beyond those granted by the Legislature in their Acts. The Legislature did not provide the districts authority to control the quality of runoff received by their MS4 facilities. Additionally, the Districts lack authority to govern land use activities since they are not municipal entities. Findings describing the legislative priority for flood control and the limitations on the governing power of the Flood Control Districts are necessary to provide context for the role of flood control improvements relative to water quality priorities and to provide context for the appropriate role of the Flood Control Districts as MS4 permittees.
- Limits of Permittee Legal Authority - The MS4 permittees lack the authority to regulate many of the categories of sources of pollutants that may impact surface receiving waters. For example, the Permittees lack authority to regulate pollutants discharged from federal and state lands and facilities, tribal lands, special districts, utilities, agriculture, and railroads. The Federal Insecticide, Fungicide, and Rodentcide Act (FIFRA) precludes local regulation of pesticides. In some instances, the Regional Board has authority to regulate these sources. A Finding(s) describing these limitations is necessary to provide context for properly assigning responsibilities to the MS4 permittees.

3.1.2 Findings 3, 4 and 16

Findings 3 and 4 of the Administrative Draft erroneously state that the Clean Water Act requires controls to reduce the discharge of pollutants "in storm water" to the MEP. Finding 16 states that non-storm water discharges from the MS4 are "not considered storm water discharges and therefore are not subject to the MEP standard, arguing that the MEP standard "is explicitly for 'Municipal . . . Stormwater Discharges" from the MS4s.

In fact, the plain language of the Clean Water Act is silent as to the nature of the waters discharged from MS4s which must be controlled to the MEP standard. See 33 U.S.C. § 1342(p)(3)(B)(iii). While the heading of 33 U.S.C. § 1342(p) refers to "Municipal and industrial stormwater discharges," this is not dispositive, as 33 U.S.C. § 1342(p)(3)(B)(ii) in fact refers specifically to "non-stormwater" discharges. Also, USEPA, in the preamble to the final stormwater regulations, made it clear that "MEP control measures" would be implemented to address not only pollutants in "storm water" but also from "non-storm water discharges."
As the preamble states:

> "Permittees are required to develop management programs for four types of pollutant sources which discharge to large and medium municipal storm sewer systems. Discharges from [such systems] are usually expected to be composed primarily of: (1) Runoff from commercial and residential areas; (2) storm water runoff from industrial areas; (3) runoff from construction sites; and (4) non-storm water discharges. Part 2 of the permit application has been designed to allow [permittees] the opportunity to propose MEP control measures for each of these components of the discharge."
> 55 Fed. Reg. at 48052. (emphasis supplied)

This language sets forth USEPA's understanding of the plain language of the Clean Water Act: "pollutants" must be controlled to the MEP from the MS4 "discharge," not merely pollutants in stormwater.

3.1.3 Finding 27

This finding purports to find that the regional MS4 permit proposed in the Administrative Draft does not constitute an unfunded state mandate. The Riverside County Permittees take issue with the subsections set forth in this finding. More importantly, the finding is without legal effect because exclusive jurisdiction as to whether a state mandate exists lies with the Commission on State Mandates. Government Code §§ 17751 and 17552; *Lucia Mar Unified School District v. Honig* (1988) 44 Cal.3d 830, 837; *Hayes v. Commission on State Mandates* (1992) 11 Cal.App.4th 1546, 1596-97. The finding of an agency that has no jurisdiction to make that finding is entitled to no weight. This finding should be deleted.

3.1.4 Finding 29

The Riverside County Permittees believe that the receiving water limitation language set forth in the Administrative Draft renders compliance with the regional MS4 permit proposed in the Administrative Draft impossible, since exceedances of water quality standards may occur routinely through no fault of the MS4 Permittees. Please see discussion regarding Provision A, below. Moreover, this same language, as recently interpreted by the United States Court of Appeals for the Ninth Circuit in *Natural Resources Defense Council v. County of Los Angeles*, 673 F.3d 880 (9th Cir. 2011), *cert. granted*, ___ U.S. ___ (2012), renders any "iterative process" to comply with water quality standards or other requirements superfluous, since the Ninth Circuit ruled that the prohibitions against discharges that exceed water quality standards or create condition of nuisance must be read, and enforced, separately

from the iterative process otherwise set forth in the MS4 permit. 673 F.3d at 892. The Riverside County Permittees view the exposure to third party litigation from the Receiving Waters Limitations language, highlighted by the *NRDC* case, to be one of the most significant detriments to the otherwise collaborative effort to design a regional MS4 permit that utilizes an iterative approach to achieve long term water quality improvement.

3.2 Provision A, Prohibitions and Limitations

As noted above, the requirements set forth in Provision A are of great concern to the Riverside County Permittees, especially in light of the recent *NRDC* decision by the Ninth Circuit. The Riverside County Permittees note that the State Water Board has proposed a workshop scheduled for November 20, 2012, in which the concerns of stakeholders regarding the current Receiving Water Limitations language (which is reflected in the Administrative Draft) and how it has been interpreted by the Ninth Circuit, will be addressed. Additionally, the Riverside County Permittees have reviewed comments submitted by South Orange County permittees on Provision A and believe that this approach may have merit.

The Riverside County Permittees generally support an approach to compliance that utilizes Water Quality Improvement Plans (WQIP). Additionally, the Riverside County Permittees have reviewed comments submitted by South Orange County permittees on Provision A and believe that this approach has merit in addressing the problems raised by the *NRDC* decision. However, the Permittees wish to note a concern that the basic benefit of the WQIP aproach, its prioritization of resources and effort to address the greatest threats to water quality, not be lost if the MS4 Permittees must develop 'additional BMP strategies' and 'schedules for implementation' for every exceedance of a water quality standard or other receiving water limitation that is not identified as a high priority for the watershed.

Recommendation

The Riverside County Permittees request that the Regional Board revise Provision A in a manner that ensures that a true iterative process be employed with respect to the Receiving Water Limitations language and further request that no Tentative Order version of Provision A be released until after the State Water Board has considered this issue.

In the absence of a revised precedential order from the State Water Board, the Riverside County Permittees further request that the Regional Board consider the alternative language being submitted by stakeholders on the Administrative Draft intended to address the loss of the iterative process originally set forth in State Board Order Nos. 99-05 and 2001-0015. *In particular*, to facilitate successful implementation of an Adaptive Management process, Provision A should not require that every exceedance to become a 'de-facto' high priority water quality concern outside of the WQIP prioritization process.

3.2.1 Provision A, Introduction (page 9)

The Riverside County Permittees have the following comments on this paragraph. First, the provision sets forth a goal that includes the enhancement and restoration of water quality and designated beneficial uses. Please see comments above regarding how Congress determined to implement the goals of the Clean Water Act through permits for MS4 dischargers. Second, the provision states that the MS4 permit will implement control measures that effectively prohibit non-storm water discharges "into and from the Copermittees' MS4." The Clean Water Act requires only the effective prohibition of non-stormwater discharges *into* the MS4. 33 U.S.C. § 1342(p)(3)(B)(ii). Third, the provision notes the pollutants "in

storm water discharges" from the MS4 must be controlled to the MEP. As discussed above, the Clean Water Act does not differentiate between storm water and non-stormwater discharges from the MS4. Moreover, as noted above, these provisions do not acknowledge the fact that California water law requires that upstream runoff must be accepted, without exception as to the quality of the runoff. To manage the quality of MS4 discharges, the MS4 Permittees will necessarily rely on the proactive efforts to control discharges and sources not under their control.

3.2.2 Provision A.1.a (page 9)

The Riverside County Permittees have two comments. First, the provision prohibits "discharges into MS4s." Such discharges are not the responsibility of the MS4 operators but rather third party dischargers, and thus are beyond the scope of the MS4 permit. Second, the provision prohibiting discharges which are "threatening to cause" a condition of pollution, etc. is unenforceable, because it prohibits an action that, with respect to MS4 operators, is beyond their control. Also, there is no authority for such provisions in waste discharge requirements.

3.2.3 Provision A.1.b (page 9)

This provision in the Administrative Draft attempts to prohibit non-stormwater discharges "from" MS4s." As noted above, such discharges are subject to the MEP standard, not the "effective prohibition" standard. The "effective prohibition" standard in the Clean Water Act refers only to discharges of non-stormwater "into" MS4s. Also, the Clean Water Act requires that discharges of non-stormwater *into* the MS4 must be "effectively prohibited," so the word "effectively" should be added to this subsection.

3.2.4 Provision A.1.c (page 9)

This provision in the Administrative Draft requires the MS4 permittees to comply with the Basin Plan prohibitions listed in Attachment A. This list is over-inclusive, as it contains many requirements that are inapplicable to either any MS4 discharger, or to the Riverside County Permittees in particular. The Riverside County Permittees request that this provision be amended to read as follows: "Discharges from MS4s are subject to all applicable waste discharge prohibitions in the Basin Plan."

3.2.5 Provision A.2.a (pages 9-10)

The Riverside County Permittees have three comments on this provision of the Administrative Draft. First, as noted above, this provision and Provisions A.1. and A.3 should be subject to an iterative process described in A.4. The language employed in Provision A.2.a. as well as elsewhere in Provision A (in subsections A.1 and A.3.) has been interpreted to impose strict liability on MS4 Permittees for any exceedance of a water quality standard. *NRDC*, 673 F.3d at 892. Second, the provision uses the "including but not limited to" language discussed previously. Third, the Riverside County Permittees are concerned that the plans, policies, etc. set forth in Provision A.2.a.(1)-(4) may not all qualify as "water quality standards" or be applicable to the MS4 permittees. These subsections should be deleted, and replaced with a reference to "Water Quality Standards," which is a defined term in the Administrative Draft. Otherwise, the MS4 permit would become over inclusive with respect to what is considered a water quality standard. Such standards must be established in accordance with federal and state law. If this process has not been followed for a particular requirement, it is not a "water quality standard."

3.2.6 Provision A.2.c (page 10)

The Riverside County Permittees believe that this requirement should simply reflect that, for Receiving Water Limitations associated with a water body/pollutant combination addressed in a TMDL in

Attachment E, the MS4 Permittees must achieve compliance as outlined in Attachment E (Total Maximum Daily Load Provisions).

3.2.7 Provision A.3.a (page 11)

As discussed above, this provision erroneously states that pollutants "in storm water discharges" from MS4s must be reduced to the MEP. This MEP requirement applies to all discharges from MS4s as discussed above.

3.2.8 Provision A.3.b (page 11)

This provision should also provide that compliance with a TMDL constitutes compliance with those pollutants/water bodies subject to a TMDL.

3.2.9 Provision A.4.a (pages 11-12)

The Riverside County Permittees support an approach whereby compliance with Provisions A.1 through A.3 are achieved through a truly iterative approach, one which reflects the intent of the precedential State Water Board Order Nos. 99-05 and 2001-015. The Riverside County Permittees note again that the State Water Board is planning a workshop on November 20 to discuss Receiving Water Limitations language, and request that the Regional Board hold in abeyance *any* Tentative Order language on Provision A until that workshop has been held and any revisions to Receiving Water Limitations language are adopted by the State Water Board.

3.2.10 Provision A.4.b (page 12)

This provision proposed in the Administrative Draft, which requires the repeating of the procedure set forth in Provision A.4.a. unless directed not to do so by the Regional Board, does not reflect the language of State Water Board Order No. 99-05, which does not require such repetitions. This provision should reflect either the provisions reflected in precedential decisions of the State Water Board or potential new Receiving Water Limitations language to be adopted by the State Water Board in response to the *NRDC* decision.

3.2.11 Provision A.4.c (page 12)

This provision should be deleted. It affords the Regional Board untrammeled discretion to enforce the proposed MS4 permit, making any iterative process absolutely without meaning, and potentially further reinforcing the Ninth-Circuit Court of Appeals decision. While the Regional Board plainly retains its jurisdiction to enforce the MS4 permit, but the MS4 Permittees must be given the ability to address the requirements of Provision A through a true iterative process.

3.3 Provision B, Water Quality Improvement Plans

3.3.1 Provision B, introductory paragraph (page 13)

This paragraph states that the "goal" of the Water Quality Improvement Plan ("WQIP") "is to attain the reasonable protection, preservation, enhancement, and restoration of water quality and designated beneficial uses of water of the state." Such a goal is not a requirement for NPDES MS4 permittees, who are required under the Clean Water Act, again, to effectively prohibit non-stormwater discharges into the MS4 and to apply controls to the MEP to address discharges from the MS4. Please see the general comments above.

3.3.2 Provision B.2.d (page 17)

This provision requires that numeric targets and schedules must be used to measure progress towards "an ultimate outcome of protections, preservation, enhancement, and restoration of receiving water beneficial uses." As discussed above, meeting the broader goals of the Clean Water Act cannot be singlehandedly assigned to a single discharger group, in this case the MS4 permittees. The goals of an MS4 Permit are clearly established in the Clean Water Act; see comments above.

3.3.3 Provision B.3 (page 18)

The introductory paragraph again refers to the requirement to prevent or eliminate non-stormwater discharges "from the MS4" and reducing pollutants in "storm water discharges" to the MEP. As noted above, the Clean Water Act requires effective prohibition of discharges "into" the MS4, and does not distinguish between stormwater and non-stormwater in discharges from the MS4 subject to the MEP standard.

3.4 Retrofitting and Channel Rehabilitation

In Section II.E.5.b the Administrative Draft proposes to require the MS4 permittees to develop and implement a program to retrofit areas of existing development to reduce the discharge of pollutants in stormwater from the MS4 to the MEP and to restore impaired beneficial uses of streams within their jurisdictions. During the Focused Meeting on the Administrative Draft in Vista on August 22, Regional Board staff stated that all MS4 permittees would be expected to identify and implement retrofit and restoration projects.

The Riverside County Permittees have the following comments regarding these proposed requirements:

- These requirements not only go beyond the Clean Water Act requirements established in 33 U.S.C. § 1342(p)(3), they also could compromise public safety and flood control efforts, as described below.
- Flood control channels are generally not part of the MS4 but rather navigable waters of the United States. The Clean Water Act does not require "rehabilitation" of such navigable waters.
- As described in our comments on "Findings" above, the State Legislature has mandated that the Flood Control Districts, including the Riverside County Flood Control and Water Conservation District, implement measures necessary to protect lives and property from flooding. Achieving this protection may require the construction and maintenance of engineered channels. A requirement to "restore" or even rehabilitate such streams can conflict with these requirements, and must be removed. While there may be cases where rehabilitation can occur, it is up to the Flood Control Districts to determine when that is feasible consistent with their legislative mandate for protection of lives and property from flooding. It is inappropriate for the Regional Board to set policy within an MS4 permit that presumes and/or requires such restoration or rehabilitation to occur.
- The MS4 Permittees cannot be unilaterally held responsible for restoring receiving waters as has been discussed previously.
- Retrofitting and channel rehabilitation projects can only be considered warranted and responsible use of public funds where the WQIP has identified both that such projects are necessary and that funding is realistically available and, moreover, that the project will not interfere with an MS4 permittee's ability to meet other societal needs including the protection of public safety. Retrofit and channel rehabilitation projects should only be considered a 'tool in the toolbox' – not a mandated compliance requirement.

- "Rehabilitation" of flood control improvements should only be considered where such projects are determined to be consistent with Army Corps of Engineers mandates for navigable waters and flood protection applicable to such improvements. Such flood control channels are most likely navigable waters of the United States, and not MS4.

3.5 Monitoring

Provision D of the Administrative Draft proposes a 22-page detailed, prescriptive and expensive monitoring-centered approach that is extremely broad and excessive relative to the data needed to manage water quality in the Santa Margarita Region. The proposed monitoring provisions should be revised to provide for identification of monitoring programs that are specific to the needs of each hydrologic unit. Specifically, monitoring should have three purposes:

- Inform receiving water priorities in the WQIP (and future updates thereto)
- Help identify pollutant sources to those receiving water priorities
- Help assess the effectiveness of the BMP strategies

These purposes are part of the Monitoring Action Plan ('MAP' - part of the WQIP) – so the WQIP (not the permit itself) should define specifics of the 'where', 'when', 'how often', and 'for what' that needs to be monitored. The monitoring provisions in the proposed regional MS4 permit should be limited to broadly establishing the monitoring elements that need to be considered in developing the MAP, but leave the specifics to the WQIP.

3.6 Non-Stormwater

As previously stated, the Clean Water Act only requires the 'Copermitees' to 'effectively prohibit' Non-Stormwater discharges 'into' the MS4. It is not practical to presume, nor to require, that Non-Stormwater discharges need to be 'eliminated' everywhere. Proactive source IDs and elimination of pure non-stormwater, should ONLY be done if/when/where the WQIP dictates that is an appropriate strategy to address the watershed's highest priorities, or where there is an obvious pollutant (illegal) discharge. For example, if a non-stormwater discharge infiltrates and does not reach perennial surface waters, these discharges have little opportunity to affect the beneficial uses of the perennial surface waters. Redirecting resources to conduct source IDs and enforcement for such a discharge reduces the Copermittees' ability to implement efforts that are important to the watershed's priorities, and further diminishes the overall credibility of the MS4 permit programs. It would be better to allow the Copermittees to focus such efforts on discharges that are known or believed to be affecting those identified watershed priorities. In that case, during enforcement, the Copermittees can better explain to dischargers why a discharge needs to be eliminated.

4 CONCLUSION

The Riverside County Permittees are supportive of an MS4 Permitting approach that reduces compliance costs and provides for a more focused, flexible, and adaptive approach to addressing priority water quality concerns. Based on the markedly different climatic, hydrologic, and water quality conditions between the Santa Margarita Region and Southern Orange and San Diego Counties, a less prescriptive management approach that relies on a more robust and integrated adaptive management program is needed to cost-effectively address the priority water quality concerns in our watershed.

The Riverside County Permittees strongly support working with the Regional Board staff, the San Diego and South Orange County MS4 permittees and other interested parties in developing a more cost-effective integrated adaptive management approach to addressing high priority water quality concerns. The Riverside County Permittees request that the Regional Board staff continue to work with the MS4 Permittees in all three counties, prior to the release of a Tentative Order, to address the concerns of the three counties, including those discussed in this letter.

Very truly yours,

JASON E. UHLEY
Chief of Watershed Protection Division

CP:BC:cw
P8/

Example Process for Integrated Adaptive Management Process

* This presents an example scenario. Based on the strategy, various JRMP elements may become prioritized.

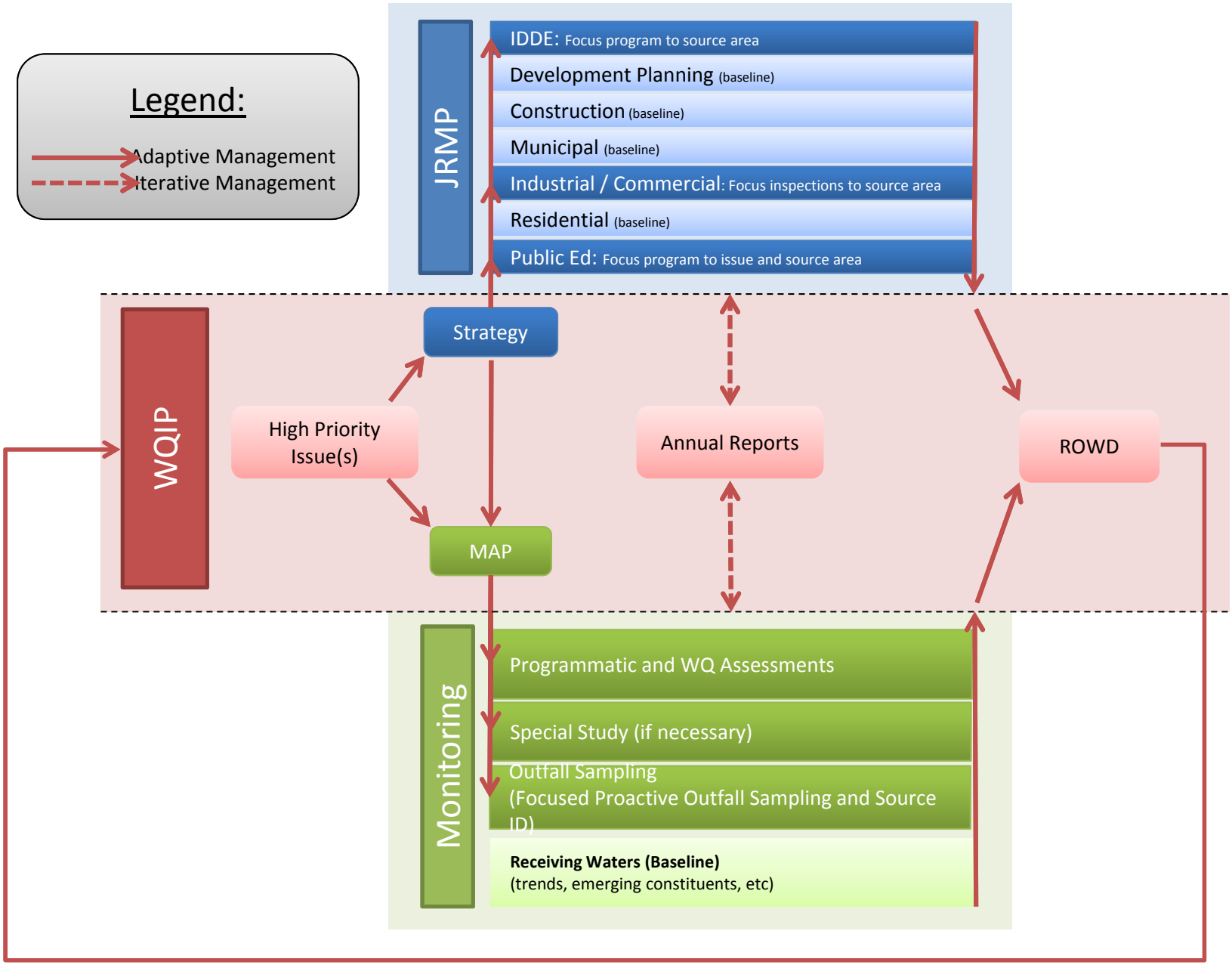

Walsh, Laurie@Waterboards

From: Mark Grey <mgrey@biasc.org>
Sent: Friday, September 14, 2012 9:46 AM
To: Walsh, Laurie@Waterboards
Subject: BIA/SC-CICWQ Comment Letter Package
Attachments: Attachment 2. EPA Bioretention Brownfields.pdf; Attachment 1. EPA Bioretention Applications.pdf; Attachment 3. BIASC_CICWQ SD Regional MS4 Permit Redline.pdf; BIASC_CICWQ SD Regional MS4 Permit Comment Letter.pdf

Hi Laurie, attached to this email is our comment letter package.

I would hope that you and Wayne and Eric may have a few minutes to meet with us over the next month or so and discuss your thoughts on all the comments you received and where you/we are heading moving forward prior to the release of the next Permit draft.

I would be happy to discuss the issues at hand at any point. Regards,

Mark Grey, Ph.D.
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Construction Industry Coalition on Water Quality
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September 14, 2012
Ms. Laurie Walsh, Senior Engineer
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, Ca 92123-4340

Re: ADMINISTRATIVE DRAFT REGIONAL MUNICIPAL SEPARATE STORM SEWER SYSTEM (Tentative Order No. R9-2012-0011)

Dear: Ms. Walsh

On behalf of the Building Industry Association of Southern California, Inc. (BIA/SC) and the Construction Industry Coalition on Water Quality (CICWQ) and the members of both, we appreciate the opportunity to provide comments on the Administrative Draft of the San Diego County Regional MS4 Permit (Administrative Draft Permit). We submit these comments in addition to and in support of comments made by our affiliate in San Diego County, the Building Industry Association of San Diego and its coalition partners, and comments submitted by Rancho Mission Viejo.

BIA/SC is a nonprofit trade association representing nearly 1,000 member companies, which together have nearly 100,000 employees. BIA/SC's members have, for decades, built the majority of the homes in Ventura, Los Angeles, Orange, Riverside, and San Bernardino Counties in southern California. CICWQ is a water quality coalition comprised of representatives from five industry trade associations (in addition to BIA/SC) involved in the development of public and private building, infrastructure and roads throughout California (Associated General Contractors, Engineering Contractors Association, Southern California Contractors Association, Engineering and General Contractors Association, and United Contractors). All of the above trade associations and their members and the union labor work force are affected by the post-construction runoff control requirements proposed in the Draft Permit, and this letter and supporting attachments are intended to provide the San Diego Regional Board staff with constructive suggestions for improvement.

We appreciate the Regional Board's release of the Administrative Draft Permit in April 2012, and the extensive stakeholder involvement process that ensued over the summer of 2012. The comments provided here are intended to further meet the permit's underlying objective of protecting and improving water quality within the watersheds administered by the San Diego Regional Board. Our comments, supporting attachments, and suggested redline permit language

modifications reflect years of working not only on MS4 permits issued by the San Diego Board, but other MS4 permits administered by the Los Angeles, Santa Ana, and San Francisco Bay Regional Water Quality Control Boards.

We have four primary concerns with the Administrative Draft Permit content and the following discussion summarizes those concerns and provides the technical basis for those concerns including supporting attachments:

1. **Administrative Draft Permit Provision E. 3.c.(2)(c) establishes a zero discharge standard for biofiltration-type LID BMPs that are designed with an outlet/underdrain. This type of LID BMP cannot meet the on-site design capture volume standard as it is written. Such a zero discharge standard is scientifically and technically unsound and unsupported.**

Biofiltration is an established LID BMP for use in attempting to mimic pre-development hydrology. The US EPA, in multiple guidance documents produced since 2006, have recognized the use of biofiltration-type systems such as curb contained biofilters, bioswales, rain gardens, and using landscape areas for impervious area disconnection as essential LID BMP elements to include in land development projects, a few of which are cited below. The inclusion of biofiltration BMPs in US EPA's menu is a reflection of the practical limitations to retention of stormwater – retention practices are not universally feasible or desirable. When appropriately selected and designed, biofiltration BMPs achieve high levels of pollutant removal, which may exceed pollutant removal achieved in retention BMPs, particularly in cases where retention BMPs are inappropriately applied.

The retention requirement is contrary to EPA's definition of LID because it disfavors development strategies designed to appropriately "filter" runoff, such as bioretention cells or other vegetated LID BMPs. There are five principal EPA documents regarding LID; and four of them identify the appropriate roles of biotreatment-type BMP, such as detention (i.e., slow down, treat through vegetation, and then release across property lines), filtration, and surface release of stormwater.

In a compilation of case studies by EPA, most of 17 exemplary projects included biotreatment elements, such as bioretention, swales, and wetlands. *See* U.S. EPA 841-F-07-006. Each of two case studies described in another EPA document (s*ee* Attachment 1 at pp. 1-2, EPA 841-B-00-005) included the use of underdrains, and the example in one of the two specifically fed into the MS4 system at issue. Another EPA document updated in January 2009 refers to the many practices used to adhere to LID principles of promoting a watershed's hydrologic and ecological functions, such as bioretention facilities and rain gardens. *See* Attachment 2 at p. 2, EPA-560-F-07-231 (describing "an under-drain system to release treated stormwater off site," permitting planted areas to "safely allow filtration and evapotranspiration of stormwater");

http://www.epa.gov/owow/nps/lid/ (fact sheet describing under-drains used to release treated stormwater off site and permitting planted areas to safely allow filtration of stormwater). Thus, EPA's literature and guidance clearly recognize the important and even necessary role that biofiltration/biotreatment approaches play in real-world implementation of LID principles.

The National Research Council, in their 2008 Report to Congress titled "Urban Stormwater Management in the United States" cite the use of biofiltration and bioretention systems in improving water quality and in attempting to mimic predevelopment hydrology at many different site contexts and locations across the United States. The 2008 NRC report contains and cites numerous examples of using biofiltration type systems to reduce runoff volume and pollutant loads. The 2008 NRC Report clearly recognizes the role that biofiltration systems play in the LID BMP feasibility and selection process, and in achieving runoff management goals. The report states "In some situations ARCD (Aquatic Resources Conservation Design) practices will not be feasible, at least not entirely, and the SCMs [stormwater control measures] conventionally used now and in the recent past (e.g., retention/detention basins, biofiltration without soil enhancement, and sand filters) should be integrated into the overall system to realize the highest management potential." Note that the NRC report definition of ARCD includes both retention and biofiltration elements.

From a management perspective, a review of 4th Term Phase I MS4 permits within California (San Francisco Bay Area, Sacramento Area, North and South Orange County, Western and Southern Riverside County, and San Bernardino County) shows that the use of biofiltration to meet water quality volume and flow control performance standards is clearly allowed (See matrices submitted by BIA/SC_CICWQ at the August 22, 2012 Stakeholder Meeting and provided to the Regional Board by Mark Grey on August 24, 2012). These Regional Boards in California recognize that biofilter-type LID BMPs are an integral component of applying site design principles which seek to mimic pre-development hydrology. Furthermore, these permits implement a clear LID BMP feasibility and selection process, one that first requires examination of on-site retention systems (infiltration, harvest and use, and evapotranspiration), before moving to the evaluation and potential selection of bioinfiltration (some infiltration achieved) and biofiltration systems. This feasibility evaluation hierarchy, which is clearly explained in the South Orange County and South Riverside County MS4 permits adopted by the San Diego Regional Board in 2009 and 2010, respectively, must be preserved and included in the next version of the Administrative Draft Permit.

In summary, the zero discharge standard established by the Administrative Draft Permit significantly narrows the definition of LID, which is contrary to US EPA guidance, the 2008 NRC Report, and the standards established in recently-adopted Permits by the San Diego Regional Board and other Regional Boards. In essence, the proposed provisions would establish a standard that (i) will be impracticable in a relatively large proportion of sites, and (ii) has not

been demonstrated to be necessary to protect receiving water quality. We provide in Attachment 3 suggested permit language to address the continued use of biofiltration.

2. **A mitigation requirement is established when using flow-thru biofiltration-type LID BMPs to manage that portion of the SWQDv that is not retained on-site. This requirement is inconsistent with all other adopted Phase I MS4 permits in California and nationally. Biofiltration and bioretention BMPs are established LID practices; requiring accompanying mitigation of SWQDv that has already been biofiltered penalizes and dis-incentivizes use of these controls.**

Equally problematic, because it does not allow biofiltration type LID BMPs to meet the on-site storm water quality design volume (SWQDv) standard, is the current requirement in Administrative Draft Permit Provision E. 3.c.(2)(c) to "perform mitigation for the portion of the pollutant load that is not retained on-site." In other words, the draft provisions would require that, if a project proponent cannot retain 100 percent of the SWQDv on-site, and must therefore use biofiltration LID BMPs (with a treated discharge), then the use and installation of these systems will trigger an off-site mitigation or in-lieu fee program participation requirement. This provision in the Administrative Draft Permit is technically unjustified, disfavors the use of all types of recognized biofiltration LID BMPs, and could theoretically require a project proponent to not only pay for the installation and O&M of a biofiltration LID BMP, but also require mitigation or fee payment for that portion of runoff managed by it.

Biofiltration BMPs including natural treatment systems such as those that are part of the Irvine Ranch Water District's Natural Treatment System in Orange County (a regional example) can remove vast quantities of pollutant load, and provide other benefits such as habitat, flood control, and aesthetic, recreational and educational value. To relegate multi-benefit biofiltration or biotreatment BMPs applied at a site scale to a status inferior to on-site retention BMPs is not justified on a water quality basis, and is poor public policy, essentially depriving the region of an extremely important and effective approach to managing water quality.

While we agree that project proponents should be required to retain stormwater where technically and economically feasible, there are numerous conditions beyond a project's control that make retention infeasible, undesirable and/or ineffective. For example, in achieving a zero discharge standard, it is necessary to either maintain pre-project ET (which is generally impracticable) or increase the volume of stormwater that is infiltrated (which is the common result). Over-infiltrating rainwater can have adverse consequences such as altering the natural flow regime of the receiving waters such that riparian habitat changes, mobilizing pre-existing contamination in shallow groundwater, increasing inflow and infiltration to sanitary sewers, causing damage from rising groundwater, and other potential effects. By discouraging the use of biofiltration LID BMPs where there are more appropriate than retention, the Administrative

Draft Permit irresponsibly encourages the use of retention where it may have adverse consequences.

Retention BMPs are not necessarily more effective than biofiltration BMPs as the Administrative Draft Permit implies, especially considering the back-to-back-to-back nature of storm systems that arrive in southern California during winter months and deliver the majority of total rainfall volume. The Administrative Draft Permit establishes a SWQDv that must be retained, but does not specify the time over which this volume must be drawn down (i.e., drained) in order to have capacity for the volume from subsequent storms. The rate at which the SWQDv can be drained is a function of the infiltration rates of soils and the demand for harvested water. Where soils are not sufficiently permeable and/or where harvested water demands are moderate to low, the drawdown time of retention BMPs can be in the range of several days to several weeks.

In comparison, biofiltration BMPs are designed with engineered soils that can generally drain the SWQDv much more quickly, on the order of several hours. In cases where retention opportunities are limited, this results in a higher level of capture and treatment by biofiltration BMPs than retention BMPs, which can more than offset the lower "treatment efficiency" afforded by biofiltration compared to full retention. For example, based on rigorous technical analysis contained in the Orange County Technical Guidance Document (Figure III.2, Page III-11), a hypothetical biofiltration BMP draining in 12 hours would achieve approximately 25 percent greater treatment of average annual stormwater runoff volume than an equivalently sized retention BMP that drains in 72 hours and approximately 60 percent greater treatment than a retention BMP that drains in 10 days.

Because drawdown time is an important factor in (i) assessing BMP effectiveness and (ii) evaluating the site-specific determination of whether retention or biofiltration are preferable, we strongly recommend (in addition to allowing the use of biofiltration or biotreatment systems to meet the retention standard) including a secondary performance metric of managing 80 percent of annual runoff volume using continuous simulation modeling. This provides a means of accounting for the performance of strictly on-site retention BMPs versus the addition of biofiltration or biotreatment BMPs which can be designed to manage a greater volume of average annual runoff volume than retention BMPs of the same size. The total amount of water captured and treated and associated pollutant load reduction should be a primary deciding factor in whether retention or biofiltration BMPs are selected for a given project. As written, the Administrative Draft Permit strongly discourages an entire group of effective practices which have the potential to provide better protection of water quality, when compared to retention, in a wide range of cases. Attachment 3 provides suggestions for permit language which corrects these deficiencies.

3. Hydromodification control measures should allow use of the EP method to meet in stream standards; recognize multiple types of channel hardening when evaluating applications for hydromodification control exemptions

In Attachment 3, we also make suggestions for improving the consistency of hydromodification control standards with those identified and allowed in the South Orange County MS4 permit. Specifically, we recommend providing for an in-stream hydromodification control performance standard using the erosion potential (EP) approach and recognizing that there are a number of different types of channel hardening that have been used for armoring in stream systems besides concrete.

The Administrative Draft Permit provides an "on-site" option for addressing hydromodification through flow duration control. This is an important element of the hydromodification control standard. However the Administrative Draft Permit is incomplete without an option to assess and demonstrate hydromodification control through in-stream metrics. In many cases, significant development within a watershed has already caused hydromodification impacts. Requiring project-by-project flow duration control for each new project may not address the existing issue as effectively as a regionally-coordinated approach that combines upland control with in-stream remedies. Including the EP standard enables the development of more comprehensive approaches that include both upland controls and stream modifications (i.e., restoration). This option is critical for more effectively and efficiently protecting the region's aquatic resources.

Additionally, the Administrative Draft Permit includes an unnecessarily narrow definition of hardened channels that includes only those channels lined with concrete. Other forms of artificial hardening may be comparably resistant to hydromodification impacts, such as channels that are lined with rip rap, armored with soil cement, or armored with other practices. While the Permittees or the project proponent should be responsible for demonstrating that a specific channel material is sufficiently stable, the narrow definition currently provided by the Administrative Draft Permit does not allow the use of sound engineering judgment and does not allow for use of innovative materials.

Finally, the Administrative Draft Permit should explicitly recognize the findings of hydromodification management plans (HMPs) that have been previously approved by this Board. The South Orange County HMP and the San Diego County HMPs were both the products of rigorous technical analysis based on the state of the practice, which were reviewed in detail by Board Staff. The findings of these efforts must not be jeopardized under the new terms of the Administrative Draft Permit. Specifically, findings regarding exempt water bodies must be appreciated and upheld, and they should be explicitly recognized in the Administrative Draft Permit per our suggested redline.

4. **The Permit must preserve important provisions for watershed level design and implementation of LID BMPs.**

The proposed development project criteria and requirements in the Administrative Draft Permit do not include the language in the current South Orange County Permit that provides for Alternative Compliance for Watershed-Based Planning (See page 40-41 of the 2009 Permit). We ask that the Regional Board continue to recognize the protections to water quality and enhancements to water bodies which are achieved through watershed-based projects such as the Rancho Mission Viejo Ranch Plan, as it has in the current South County MS4 permit, and define Watershed Planning as an alternative and co-equal approach to the project-specific requirements. Attachment 3 to this submittal contains suggested redline language for addition to the Administrative Draft Permit.

Concluding Remarks:

BIA/SC and CICWQ have been active participants and contributors to the creation of improved MS4 permits across southern California. We continue to believe that rational, *implementable*, and *effective* permit requirements are critical to achieving great progress concerning water quality and our environment. We hope that these comments are received in the manner in which they are intended – to continue the discussion of how we can create a workable permit that improves water quality to the maximum extent practicable. We remain committed to a positive dialog with the Board and its staff – one that will result in an informed, balanced and effective permit.

If you have any questions or want to discuss the content of our comment letter, please feel free to contact me at (951) 781-7310, ext. 213, (909) 525-0623, cell phone, or mgrey@biasc.org.

Sincerely,

Mark Grey, Ph.D.
Director of Environmental Affairs and Technical Director
Building Industry Association of Southern California and
Construction Industry Coalition on Water Quality

United States
Environmental Protection Agency

Office of Water (4203)
Washington, DC 20460

EPA-841-B-00-005A
October 2000

Bioretention Applications

Inglewood Demonstration Project, Largo, Maryland
Florida Aquarium, Tampa, Florida

Key Concepts:

- Retrofits
- Structural Controls
- Source Controls

LOW-IMPACT DEVELOPMENT CENTER

Project Benefits:

- Retrofit Opportunity
- Pollutant Removal
- Volume Reduction
- Cost-Effectiveness

Introduction

Two case studies demonstrate the potential to use integrated management plans (IMPs) in the design of new parking facilities and as retrofits for existing parking facilities. The Inglewood study in Largo, Maryland, compared the pollutant removal efficiency of a bioretention cell in a laboratory setting to that of a comparable facility constructed in a parking lot. The Florida Aquarium study in Tampa, Florida, included monitoring of several storm events for volume and water quality control.

Inglewood Project Area

The project area is an existing 5-acre outdoor parking area located in a highly urbanized office park adjacent to Interstate 95. Runoff from adjacent areas does not flow across the lot. The slope of the parking area is approximately 3 percent. Parking stalls are aligned at 90-degree angles, and there are approximately 30 cars in each row of an aisle. At the end of each aisle are planting areas surrounded by curbs and gutters. Curb drainage inlets have been placed in some of the islands to intercept and collect runoff as sheet flow, which is piped to a downstream regional stormwater management facility.

Inglewood Project Description

The Inglewood project consisted of a laboratory segment and a field segment. The laboratory segment involved construction of a planter box filled with a typical bioretention facility soil mixture (50 percent construction sand, 20 to 30 percent topsoil, and 20 to 30 percent compost). This facility is approximately half the size in volume of the Inglewood facility. The box was planted with representative plants and mulched. A synthetic stormwater mixture was applied and the pollutant removal efficiency, temperature, and runoff volume rate were measured. The pollutant mix included metals (copper, lead, and zinc), phosphorus, organic nitrogen, and nitrate.

A landscaped island measuring approximately 38 feet by 12 feet was chosen as the retrofit area. The island contains a curb inlet that drains into the municipal storm drain system. Almost the entire drainage area is impervious. A 4-foot slot was cut into the curb immediately before the inlet. The landscaped island was then excavated to a depth of 4 feet. An underdrain was installed and tied into the bottom of the existing inlet to completely drain the planting soil to avoid oversaturation. The underdrain was covered with 8 inches of 1- to 2-inch gravel and backfilled with typical bioretention soil mix. The backfill extended to a depth of about 12 inches below the top of the curb, which allows for a ponding depth of approximately 6 inches of water in the island

Figure 1. Bioretention landscaping at the Inglewood demonstration project site.

Table 1. Summary of bioretention pollutant removal results for the Inglewood demonstration project.

Pollutant	Input mean ± standard deviation	Output mean ± standard deviation	Output range	Output percent removal mean ± standard deviation
Cu dissolved (μg/L)	120 ± 27	63 ± 6.5	55–75	48 ± 12
Cu total (μg/L)	120 ± 27	69 ± 9.4	55–85	43 ± 11
Pb dissolved (μg/L)	54 ± 9.4	11 ± 6	6.7–25	79 ± 26
Pb total (μg/L)	54 ± 9.4	16 ± 7	6.7–26	70 ± 23
Zn dissolved (mg/L)	1.1 ± 0.021	0.24 ± 0.44	0.11–0.56	78 ± 29
Zn total (mg/L)	1.1 ± 0.021	0.39 ± 0.44	0.12–1.4	64 ± 42
Ca (mg/L)	44 ± 6.4	32 ± 6.1	24–41	27 ± 14
Cl^- (mg/L)	5.1 ± 0.48	162 ± 80	74–228	3,000[a]
Na (mg/L)	3.1	359 ± 170	68–497	11,000[a]
P (mg/L)	0.83	0.11 ± 0.017	0.10–0.13	87 ± 2
TKN (mg/L as N)	6.9 ± 0.81	2.3 ± 0.64	1.7–3.0	67 ± 9
NO_3^- (mg/L as N)	1.3 ± 0.05	1.1 ± 0.15	0.94–1.2	15 ± 12

[a]Shows percent production.

before a backwater is created at the curb opening. Subsequently the area was planted and covered with 3 inches of shredded hardwood mulch. Figure 1 shows the bioretention area after vegetation was established.

The stormwater mixture was applied to a 50-square-foot area in the field facility at a rate of 1.6 inches per hour for 6 hours. The removal rates for several pollutants are shown in Table 1. In addition to pollutant removal, the runoff temperature was lowered approximately 12 °C as the runoff was processed and filtered through the soil mixture. Most of the pollutant removal process occurred in the mulch layer.

A similar field investigation was conducted on an 8-year-old facility, and the metals removal rate was much higher (Davis et al., 1998). This effect might be attributed to slower flow rates through the soil, which has higher clay content, as well as greater pollutant uptake by vegetation.

Inglewood Project Summary and Benefits

This study showed the feasibility of retrofitting an existing parking facility and demonstrated the consistency of laboratory and field pollutant removal performance. The retrofit cost approximately $4,500 to construct and treats approximately one-half acre of impervious surface. The bioretention retrofit was a more cost-effective way to filter pollutants than many proprietary devices designed to treat the same volume of runoff. These proprietary devices could cost $15,000 to $20,000, would be more expensive to maintain, and would not significantly decrease runoff volume or temperature. Also, bioretention areas offer the ancillary benefit of aesthetic enhancement. It is interesting to note that a drought occurred after the installation of the plants, and although many of the other plants in the parking lot died or experienced severe drought stress, the plants in the bioretention facility survived because of the retained water supply.

Florida Aquarium Project Area

The Florida Aquarium site is an 11.5-acre, asphalt and concrete parking area that serves approximately 700,000 visitors per year. Runoff was controlled using the following IMPs:

- End-of-island bioretention cells
- Bioretention swales located around the parking perimeter
- Permeable paving
- Bioretention strips between parking stalls
- A small pond to supplement storage and pollutant removal

Figure 2 is an illustration of the site that details the type and location of runoff controls.

Florida Aquarium Project Description

A total of 30 storm events were monitored for one year at the Florida Aquarium site during 1998-1999. The Southwest Florida Water Management

District measured rainfall and flow from eight of the subcatchments in the parking area and collected water quality samples on a flow-weighted basis. Comparisons between pavement areas controlled by IMPs and uncontrolled asphalt areas were made for peak runoff rate, runoff volume, runoff coefficients, and water quality. Sediment cores from swales also were collected and analyzed.

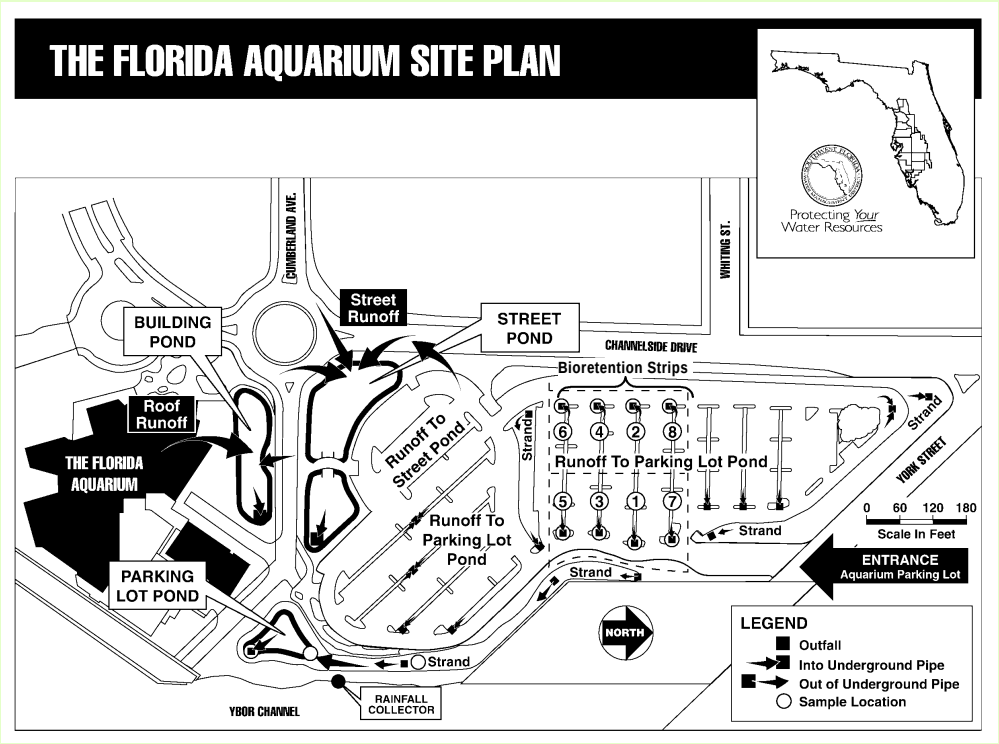

Figure 2. Layout of the Florida Aquarium site with IMPs. The eight basins outlined with dotted lines were evaluated in this part of the study.

Florida Aquarium Project Summary and Benefits

The parking areas controlled by IMPs showed a significant reduction in runoff volume and peak runoff rate. Table 2 shows pollutant load reductions for three pavement types; reduction is compared to pollutant loads in runoff from a basin without a swale. Much of the pollutant reduction is attributed to the reduced runoff in basins with swales. Because the swales are only the first element in the treatment train, even better removal efficiencies should be seen when data are analyzed for the entire system.

Table 2. Load efficiency of pollutants expressed as percent reduction for three types of pavement at the Florida Aquarium site.

Constituents	Percent pollutant reduction[a]		
	Asphalt w/swale	Cement w/swale	Porous w/swale
Ammonia	45	73	85
Nitrate	44	41	66
Total Nitrogen	9	16	42
Orthophosphorus	-180	-180	-74
Total Phosphorus	-94	-62	3
Suspended Solids	46	78	91
Copper	23	72	81
Iron	52	84	92
Lead	59	78	85
Manganese	40	68	92
Zinc	46	62	75

[a]The basins with swales were compared to a basin without a swale to determine the amount of reduction in pollutant loads possible using these small alterations. Notice that the efficiencies for phosphorus are negative, indicating an increase in phosphorus load in the basins with a swale.

References

Davis, A., M. Shokouhian, H. Sharma, and C. Minami, 1998. *Optimization of Bioretention Design for Water Quality and Hydrologic Characteristics*. Report 01-04-31032. Final report to Prince George's County, Maryland.

Rushton, B. 1999. *Low Impact Parking Lot Design Reduces Runoff and Pollutant Loads: Annual Report #1*. Southwest Florida Watershed Management District, Brooksville, Florida.

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Design Principles

for Stormwater Management on Compacted, Contaminated Soils in Dense Urban Areas

EPA's Brownfields Program is designed to empower states, communities, and other stakeholders in economic redevelopment to work together in a timely manner to prevent, assess, safely clean up, and sustainably reuse brownfields. A brownfield is a property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. EPA's Brownfields Program provides financial and technical assistance for brownfield revitalization, including grants for environmental assessment, cleanup, and job training.

What is Green Infrastructure?

Most development and redevelopment practices cover large areas of the ground with impervious surfaces such as roads, driveways, sidewalks, and new buildings themselves, which then prevent rainwater from soaking into the ground. These hard surfaces increase the speed and amount of stormwater that runs into nearby waterways, carrying pollutants and sediment each time it rains.

Green infrastructure seeks to reduce or divert stormwater from the sewer system and direct it to areas where it can be infiltrated, reused or evapotranspirated. Soil and vegetation are used instead of, or in conjunction with, traditional drains, gutters, pipes and centralized treatment areas. In many new and redevelopment projects, green infrastructure is implemented to manage and mitigate the polluted runoff created by precipitation that falls on rooftops, streets, sidewalks, parking lots and other impervious surfaces.

How can Green Infrastructure be Applied to Brownfield Sites?

Preparing brownfields for redevelopment often requires capping of contaminated soils, creating even larger impervious surfaces. The challenge for managing stormwater on brownfield sites is allowing this capping while mitigating the impervious surface conditions that can negatively impact local waterways.

Unlike many conventional developments, impervious footprints on brownfields cannot always be minimized through site designs that incorporate more porous surfaces to allow for infiltration. Direct infiltration on a brownfield site may introduce additional pollutant loads to groundwater and nearby surface waters. However, green infrastructure practices exist that can retain, treat and then release stormwater without it ever coming in contact with contaminated soils.

A bioswale in Wilmington, Delaware, designed to absorb and retain stormwater runoff.

The University of Michigan's School of Natural Resources and Environment developed design guidelines that use low impact development techniques on contaminated sites. Using a former industrial site in Flint, Michigan, called Chevy in the Hole, graduate students considered and refined methods to prevent residual contamination from moving with stormwater.

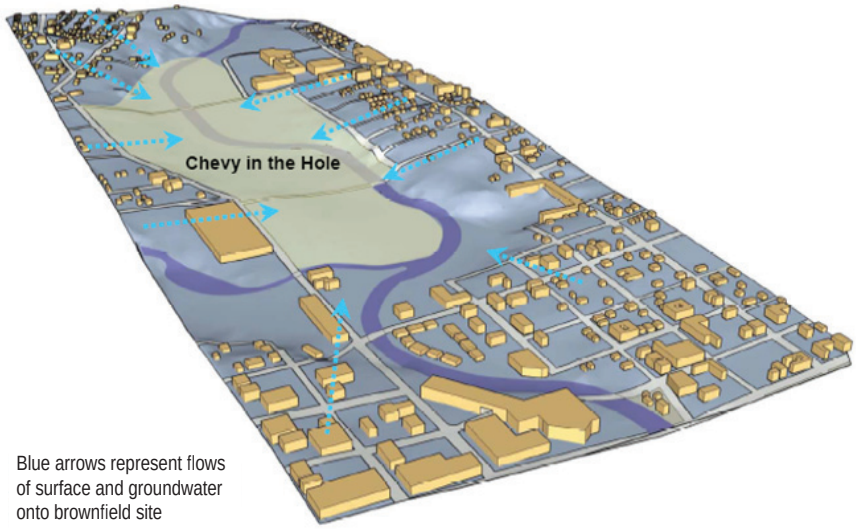

Blue arrows represent flows of surface and groundwater onto brownfield site

Design Considerations

A key component of using green infrastructure for brownfield sites is treatment and storage of stormwater, rather than complete infiltration. Most brownfields that have residual contamination need caps, so vegetated areas need to be located above caps and fitted with underdrain systems to remove overflow stormwater.

Development and redevelopment projects should start with keeping existing trees onsite, minimizing compaction of earth that inhibits water infiltration, and planting trees and other vegetation in areas where none exists. Retaining existing tree cover and vegetated areas helps infiltrate and evapotranspirate stormwater runoff while intercepting large amounts of rainfall that would otherwise enter waterways as runoff.

Buildings and other impervious surfaces can be strategically located to act as caps over areas with known contamination. Areas with fill caps can include soils and vegetation above the cap in the form of swales or rain gardens. If fitted with an under-drain system to release treated stormwater off site, these planted areas can safely allow filtration and evapotranspiration of stormwater. Additional features like impermeable liners or gravel filter blankets can be coupled with modified low impact development (LID) practices that safely filter stormwater without exposing the water to contaminated soils.

Green roofs are an ideal way to reduce the runoff from building roofs by encouraging evapotranspiration of rainwater. Another option for brownfield sites is the capture and reuse of stormwater for non-potable uses; this can include runoff storage in rain barrels for irrigation of green roofs or landscaped areas, or in cisterns that store rainwater for toilet flushing and other uses.

Site location within the watershed is very important. In particular, projects in groundwater recharge areas should avoid low impact development practices that promote infiltration, and use techniques that directly discharge treated stormwater instead. Furthermore, new and redeveloped sites near brownfields should use green infrastructure practices to prevent additional runoff from flowing onto potentially contaminated areas.

Overall, when developing a stormwater management plan on a brownfield, surrounding sites must be considered. *(Source: Flint Futures: Alternative Futures for Brownfield Redevelopment in Flint, Michigan.)*

The Matthew Henson Conservation Center in Washington, DC, utilizes a green roof.

General Principles for Using Green Infrastructure on Brownfield Sites

Guideline #1: Differentiate between groups of contaminants as a way to better minimize risks.

Guideline #2: Keep non-contaminated stormwater separate from contaminated soils and water to prevent leaching and spreading of contaminants.

Guideline #3: Prevent soil erosion using vegetation, such as existing trees, and structural practices like swales or sediment basins.

Guideline #4: Include measures that minimize runoff on all new development within and adjacent to a brownfield. These measures include green roofs, green walls, large trees, and rainwater cisterns.

Definitions

Bioswales are open channels with a dense cover of vegetation where runoff is directed or retained to evapotranspirate and filter.

Evapotranspiration is the return of water to the atmosphere either through evaporation or by plants.

Green Infrastructure and ***Low Impact Development (LID)*** both refer to systems and practices that use or mimic natural processes to infiltrate, evapotranspirate or reuse stormwater or runoff on the site where it is generated.

Green roofs can be used to effectively reduce or eliminate runoff from small and medium sized storms. A soil mixture is placed over a waterproof membrane and drainage system and then planted with water absorbent and drought tolerant plants. Most systems also have root barriers. These roofs soak up stormwater and release it back into the atmosphere through evaporation and plant respiration, while draining excess runoff.

Rain gardens serve the same purpose as stormwater planters and are appropriate where there is more area to plant vegetation. Sizing is dependent on the area of impervious surfaces draining to the rain garden, but they can be designed to only treat a portion of the runoff so they can be placed in most situations.

Stormwater harvest and reuse. Rainwater harvested in cisterns, rain barrels, or other devices may be used to reduce potable water used for landscape irrigation, fire suppression, toilet and urinal flushing, and custodial uses. Storage and reuse techniques range from small-scale systems (e.g., rain barrels) to underground cisterns that may hold large volumes of water.

Stormwater planters. Downspouts can be directed into stormwater planters. These planters are used to temporarily detain, filter and evapotranspirate stormwater using plant uptake.

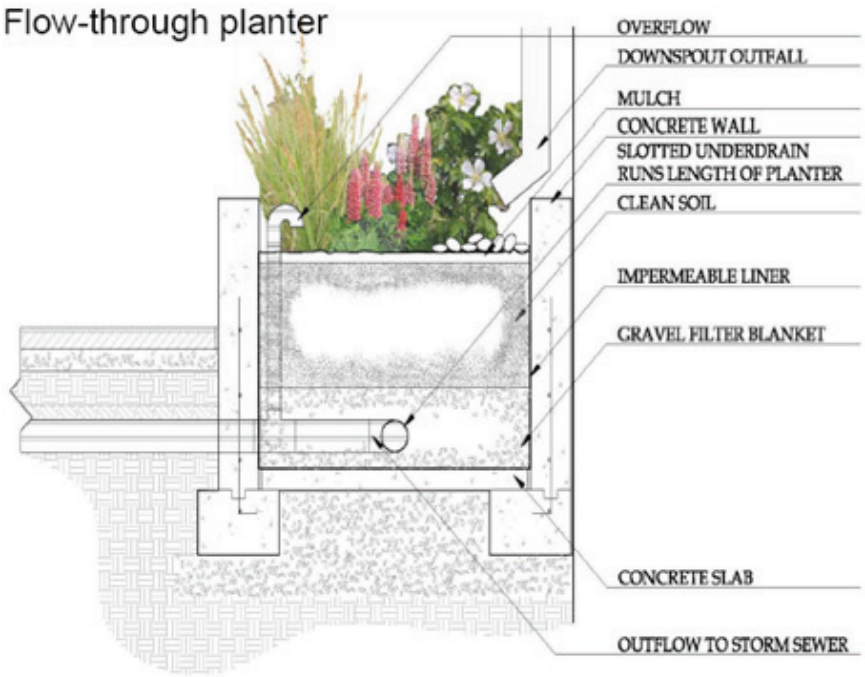

Additional Resources

The Emeryville, California *Stormwater Guidelines for Green, Dense Redevelopment* provides guidance on using vegetative stormwater treatment measures for this dense, brownfield-laden city: www.ci.emeryville.ca.us/planning/stormwater.html.

EPA's *Green Infrastructure Web site* (www.epa.gov/npdes/greeninfrastructure) provides definitions, case studies and performance data for various practices that might be applicable to brownfield sites.

The Low Impact Development Center is dedicated to research, development, and training for water resource and natural resource protection issues. The Center focuses specifically on furthering the advancement of Low Impact Development technology: www.lowimpactdevelopment.org.

Green Roofs for Healthy Cities collects and publishes technical information on green roof products and services: www.greenroofs.org.

The Center for Watershed Protection's Better Site Design Tools provide links to various better site design resources and publications: www.cwp.org/PublicationStore/bsd.htm.

American Rivers' *Catching the Rain: A Great Lakes Resource Guide for Natural Stormwater Management* describes a variety of low impact development strategies that can be implemented in a wide range of built environments. Available at: www.americanrivers.org/site/DocServer/CatchingTheRain.pdf?docID=163

NRDC's *Rooftops to Rivers: Green Strategies for Controlling Stormwater and Combined Sewer Overflows* is a policy guide for decision makers looking to implement green strategies in their own area, including nine case studies of cities that have successfully used green techniques to create a healthier urban environment. Available at: www.nrdc.org/water/pollution/rooftops/contents.asp

Portland's (Oregon) *Trees for Green Streets: An Illustrated Guide* is a guidebook that helps communities select street trees that reduce stormwater runoff from streets and improve water quality. Available at: www.metro-region.org/article.cfm?articleID=263

Seattle's *pilot Street Edge Alternatives Project (SEA Streets)* is designed to provide drainage that more closely mimics the natural landscape prior to development than traditional piped systems. Good information can be found at: www.seattle.gov/util/About_SPU/Drainage_&_Sewer_System/Natural_Drainage_Systems/Street_Edge_Alternatives/index.asp

EPA's *Protecting Water Resources with Higher-Density Development* report helps communities better understand the impacts of higher and lower density development on water resources. The findings indicate that low-density development may not always be the preferred strategy for protecting water resources. Available at: www.epa.gov/dced/water_density.htm.

Portland Metro's (Oregon) *Green Streets: Innovative Solutions for Stormwater and Stream Crossings* is a handbook that describes stormwater management strategies and includes detailed illustrations of "green" street designs that allow infiltration and limit stormwater runoff. Available at www.metro-region.org/article.cfm?articleID=262

EPA's *Protecting Water Resources with Smart Growth* is a report intended for audiences already familiar with smart growth concepts who seek specific ideas on how techniques for smarter growth can be used to protect water resources. The report describes 75 policies that communities can use to grow in the way that they want while protecting their water quality. Available at: www.epa.gov/dced/water_resource.htm

EPA's *Using Smart Growth Techniques as Stormwater Best Management Practices* reviews nine common smart growth techniques and examines how they can be used to prevent or manage stormwater runoff. Available at: www.epa.gov/dced/stormwater.htm

EPA's *Brownfields Program Website* (www.epa.gov/brownfields) provides information on and resources for assessing, cleaning up and redeveloping brownfields, including grant funding opportunities.

3. Development Planning

Each Copermittee must use their land use/planning authorities to implement a development planning program that includes, at a minimum, the following requirements.

a. Permanent BMP Requirements for All Development Projects

Each Copermittee must prescribe the following BMP requirements during the planning process (i.e. prior to project approval and issuance of grading or building permits) for all pollutant-generating[14] development projects (regardless of project type or size), where local permits are issued~~, including unpaved roads and flood management projects:~~

(1) General Requirements

(a) All BMPs must be located so as to remove pollutants from runoff prior to its discharge to any receiving waters~~, and as close to the source as possible~~;

(b) Multiple development projects may use shared permanent BMPs as long as construction of any shared BMP is completed prior to the use or occupation of any development project from which the BMP will receive runoff; and

(c) Permanent BMPs must not be constructed within a waters of the U.S. or waters of the state except those that have obtained a CWA Section 401 Water Quality Certification or Waste Discharge Requirement as applicable.

(2) Source Control BMP Requirements

The following source control BMPs must be implemented at all development projects where applicable and feasible:

(a) Prevention of illicit discharges into the MS4;

(b) Storm drain system stenciling or signage;

(c) Properly designed outdoor material storage areas;

(d) Properly designed outdoor work areas;

(e) Properly designed trash storage areas; ~~and~~

~~(f) Any additional BMPs necessary to minimize pollutant generation at each project.~~

[14] Pollutant generating development projects are those projects that generate pollutants at levels greater than natural background levels.

(3) Low Impact Development (LID) BMP Requirements

The following LID BMPs must be implemented at all pollutant generating development projects where applicable and feasible:

(a) Maintenance or restoration of natural storage reservoirs and drainage corridors (including topographic depressions, areas of permeable soils, natural swales, and ephemeral and intermittent streams);[14][15]

(b) Buffer zones for natural water bodies (where buffer zones are technically infeasible, require project applicant to include other buffers such as trees, access restrictions, etc.);

(c) Conservation of natural areas within the project footprint including existing trees, other vegetation, and soils;

(d) Construction of streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided public safety is not compromised;

(e) Minimization of the impervious footprint of the project;

(f) Minimization of soil compaction to landscaped areas;

(g) Disconnection of impervious surfaces through distributed pervious areas;

(h) Landscaped or other pervious areas designed and constructed to effectively receive and infiltrate, retain and/or treat runoff from impervious areas, prior to discharge to the MS4;

(i) Small collection strategies located at, or as close as possible to, the source (i.e. the point where storm water initially meets the ground) to minimize the transport of runoff and pollutants to receiving waters;

(j) Use of permeable materials for projects with low traffic areas and appropriate soil conditions;

(k) Landscaping with native or drought tolerant species; and

(l) Harvesting and using precipitation.

~~14~~ 15 Development projects proposing to dredge or fill materials in waters of the U.S. must obtain a CWA Section 401 Water Quality Certification. Projects proposing to dredge or fill waters of the State must obtain Waste Discharge Requirements.

(4) Long-Term Permanent BMP Maintenance

Each Copermittee must require the project applicant to submit proof of the mechanism under which ongoing long-term maintenance of all permanent BMPs will be conducted.

(5) Infiltration and Groundwater Protection

(a) Infiltration and treatment control BMPs ~~designed to primarily function as large, centralized infiltration devices (such as large infiltration trenches and infiltration basins)~~ must not cause or contribute to an exceedance of an applicable groundwater quality objective. At a minimum, such infiltration and treatment control BMPs must be in conformance with the design criteria listed below, unless the development project applicant demonstrates to the Copermittee that one or more of the specific design criteria listed below are not necessary to protect groundwater quality. The ~~The design criteria listed below do not apply to small infiltration systems dispersed throughout a development project.~~Permittees may establish different design criteria than those listed below for different BMP types based on the inherent degree of risk to groundwater quality (for example, dry wells versus bioretention).

(i) Runoff must undergo pretreatment such as sedimentation or filtration prior to infiltration;

(ii) Pollution prevention and source control BMPs must be implemented at a level appropriate to protect groundwater quality at sites where infiltration treatment control BMPs are to be used;

(iii) Infiltration treatment control BMPs must be adequately maintained to remove pollutants in storm water to the MEP;

(iv) The vertical distance from the base of any infiltration treatment control BMP to the seasonal high groundwater mark must be at least 10 feet. Where groundwater basins do not support beneficial uses, this vertical distance criteria may be reduced, provided groundwater quality is maintained;

(v) The soil through which infiltration is to occur must have physical and chemical characteristics (e.g., appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses, unless first treated or filtered to remove pollutants prior to infiltration;

(vi) Infiltration treatment control BMPs must not be used for areas of industrial or light industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee, unless first treated or filtered to remove pollutants prior to infiltration; and

(vii) Infiltration treatment control BMPs must be located a minimum of 100 feet horizontally from any water supply wells.

(b) The Copermittees may collectively or individually develop alternative mandatory design criteria to that listed above for infiltration and treatment control BMPs which are designed to primarily function as centralized infiltration devices. Before implementing the alternative design criteria in the development planning process the Copermitee(s) must:

(i) Notify the San Diego Water Board of the intent to implement the alternative design criteria submitted; and

(ii) Comply with any conditions set by the San Diego Water Board.

b. PRIORITY DEVELOPMENT PROJECTS

(1) Definition of Priority Development Project

Priority Development Projects include the following:

(a) All new development projects that fall under the Priority Development Project categories listed under Provision E.3.b.(2). Where a new development project feature, such as a parking lot, falls into a Priority Development Project category, the entire project footprint is subject to Priority Development Project requirements; and

(b) Those redevelopment projects that create, add, or replace at least 5,000 square feet of impervious surfaces on an already developed site, or the redevelopment project is a Priority Development Project

category listed under Provision E.3.b.(2). Where redevelopment results in an increase of less than fifty percent of the impervious surfaces of a previously existing development, and the existing development was not subject to Priority Development Project requirements, the performance and sizing requirements discussed in Provisions E.3.c.(2) and E.3.c.(3) apply only to the addition or replacement, and not to the entire development. Where redevelopment results in an increase of more than fifty percent of the impervious surfaces of a previously existing development, the performance and sizing requirements apply to the entire development.

(2) Priority Development Project Categories

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This category includes commercial, industrial, residential, mixed-use, and public development projects on public or private land which fall under the planning and building authority of the Copermittee.

(b) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

(c) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812), where the land area for development is 5,000 square feet or more.

(d) Hillside development projects. This category includes any development which creates 5,000 square feet or more of impervious surface which is located in an area with known erosive soil conditions, where the development will grade on any natural slope that is twenty-five percent or greater.

(e) Environmentally sensitive areas (ESAs). This category includes any development located within, directly adjacent to, or discharging directly to an ESA, which either creates 2,500 square feet of impervious surface on a proposed project site or increases the area of imperviousness of a proposed project site to 10 percent or more of its naturally occurring condition. “Directly adjacent to” means situated within 200 feet of the ESA. “Discharging directly to” means outflow from a drainage conveyance system that collects runoff

from the subject development or redevelopment site and terminates at or in receiving waters within the ESA.

(f) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce that has 5,000 square feet or more of impervious surface.

(g) Streets, roads, highways, freeways, and residential driveways. This category is defined as any paved impervious surface that is 5,000 square feet or more used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

(h) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

(i) Large development projects. This category includes any post-construction pollutant-generating new development projects that result in the disturbance of one acre or more of land.

(3) Priority Development Project Exemptions

Each Copermittee has the discretion to exempt the following projects from being defined as Priority Development Projects:

(a) Sidewalks constructed as part of new streets or roads and designed to direct storm water runoff to adjacent vegetated areas;

(b) Bicycle lanes that are constructed as part of new streets or roads but are not hydraulically connected to the new streets or roads and designed to direct storm water runoff to adjacent vegetated areas;

(c) Impervious trails constructed and designed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas;

(d) Sidewalks, bicycle lanes, or trails constructed with permeable surfaces.

c. PRIORITY DEVELOPMENT PROJECT PERMANENT BMP PERFORMANCE AND SIZING REQUIREMENTS

In addition to the BMP requirements listed for all pollutant generating development projects under Provision E.3.a, Priority Development Projects

must also implement permanent BMPs that conform to performance and sizing requirements.

(1) Source Control BMP Requirements

Each Copermittee must require each Priority Development Project to implement applicable source control BMPs listed under Provision E.3.a.(2).

(2) Retention and Treatment Control BMP Requirements

Each Copermittee must require each Priority Development Project to implement BMPs to retain and treat pollutants onsite in the following order:

(a) Each Priority Development Project must be required to implement LID BMPs as described in Provision E.3.a.(3);

(b) Each Priority Development Project must be required to implement LID BMPs that are sized and designed to retain the volume equivalent to runoff produced from a 24-hour 85th percentile storm ~~event~~[15] event[16] ("design capture volume").~~;~~

(c) If onsite retention using LID BMPs is technically infeasible per Provision E.3.c.(4), flow-thru LID ~~and/or conventional~~ treatment control BMPs, such as bioretention with an underdrain, must be implemented to treat the portion of the design capture volume that is not retained onsite. Flow-thru LID treatment control BMPs that are sized for the portion of the design capture volume that is not retained onsite may be used if full onsite retention is technically infeasible. Flow-thru LID treatment control BMPs must be designed for an appropriate surface loading rate to prevent erosion, scour and channeling within the BMP. ~~Additionally, project applicants must perform mitigation for the portion of the pollutant load in the design capture volume that is not retained onsite, as described in Provision E.3.c.(4)(c).~~

(d) If it is shown to be technically infeasible per Provision E.3.c.(4) to retain and/or treat with flow-thru LID treatment control BMPs sized for the portion of the design capture volume that is not retained onsite, then the project must implement conventional treatment control BMPs in accordance with Provision E.3.c.(2)(d) below and must participate in the alternative compliance program in Provision E.3.c.(4)(c).

(~~d~~e) All onsite treatment control BMPs must:

(i) Be correctly sized and designed so as to remove pollutants from storm water to the MEP;

(ii) Be sized to comply with the following numeric sizing criteria:

[a] Volume-based treatment control BMPs must be designed to treat the remaining portion of the design capture volume that was not retained and/or treated with flow-thru LID treatment control BMPs sized for the portion of the design capture volume that is not retained onsite~~retained or onsite~~; or

[b] Flow-based treatment control BMPs must be designed to ~~mitigate (filter or~~ treat~~)~~ either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event; or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two, or 3) an alternative design rate that is demonstrated to result in the treatment of a volume of stormwater equivalent to that achieved under c.(2)(e)(ii)[a].

(iii) Be ranked with high or medium pollutant removal efficiency for the project's most significant pollutants of concern. Treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

[15] This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals.

(3) Hydromodification Management BMP Requirements

Each Copermittee must require each Priority Development Project to implement hydromodification management BMPs so that:

(a) ~~(a)~~ Post-project runoff flow rates and durations do not exceed pre-development (naturally occurring) runoff flow rates and durations by more than 10 percent (for the range of flows that result in increased potential for erosion or degraded channel conditions downstream of Priority Development Projects).

OR

The erosion potential ratio is maintained to within 10 percent of the target value from the project discharge point to a downstream receiving water that is exempt from the hydromodification management BMP requirements per Provision E.3.c.(3)(d). Erosion potential is the ratio of total long-term sediment transport capacity or channel work in the proposed condition versus the pre-development (naturally occurring) condition.

(i) In evaluating the range of flows that results in increased potential for erosion of natural (non-hardened) channels, the lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks.

~~(ii) For artificially hardened channels, analysis to identify the lower boundary must use characteristics of a natural stream segment similar to that found in the watershed. The lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or erodes the toe of the channel banks.~~

(ii~~i~~) The Copermittees may use monitoring results pursuant to Provision D.2.b.(6) to re-define the range of flows resulting in increased potential for erosion or degraded channel conditions, as warranted by the data.

(b) ~~(b)~~ Post-project conditions ~~runoff flow rates and durations~~ must ~~compensate~~ manage for the loss of bed sediment supply due to the development project, ~~should~~ if significant loss of sediment supply occurs as a result of the development project.

~~(a)~~(c) If hydromodification management BMPs are technically infeasible per Provision E.3.c.(4), project applicants must perform mitigation for the portion of the runoff volume that is not controlled and will cause or contribute to increased potential for erosion of receiving

waters downstream of the Priority Development Project, as described in Provision E.3.c.(4)(c).

~~(b)~~(d) Exemptions

Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP requirements where the project:

(i) Discharges storm water runoff into underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, ~~or~~ the Pacific Ocean, or exempt river reaches identified in Hydromodification Management Plans (HMPs) approved by the San Diego Water Board;

(ii) Discharges storm water runoff into conveyance channels whose bed and bank are ~~concrete lined~~artificially hardened all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, ~~or~~ the Pacific Ocean; ~~or~~or exempt river reaches identified in HMPs approved by the San Diego Water Board; or

(iii) Discharges storm water runoff into other areas identified by the San Diego Water Board as exempt from the requirements of Provisions E.3.c.(3)(a)-(c)~~.~~, ~~S~~such areas include those identified in HMPs approved by the San Diego Water Board.

(4) Alternative Compliance for Technical Infeasibility

At the discretion of each Copermittee, alternative compliance may be allowed for certain Priority Development Projects to comply with Provisions E.3.c.(2) and E.3.c.(3), subject to the following requirements:

(a) Applicability

Priority Development Projects may be allowed alternative compliance if:

(i) The Copermittee reviews and approves site-specific hydrologic and/or design analysis performed by a registered professional engineer, geologist, architect, or landscape architect;

(ii) The project applicant demonstrates, and the Copermittee determines and documents, that retention LID, flow-through LID treatment control BMPs, and/or hydromodification management BMPs per Provisions E.3.c.(2) and E.3.c.(3) were incorporated into the project

design to the maximum extent technically feasible given the project site conditions;

(iii) The project applicant is required to perform mitigation described in Provision E.3.c.(4)(c) with a net result of at least the same level of water quality protection as would have been achieved if the Priority Development Project had fully implemented the retention LID, flow-through LID treatment control BMPs, and hydromodification management BMP requirements under Provisions E.3.c.(2) and E.3.c.(3) onsite.

(b) Criteria For Technical Infeasibility

Each Copermittee must develop, or develop in collaboration with the other Copermittees, criteria to determine technical infeasibility for fully implementing the retention LID and hydromodification management BMP requirements under Provisions E.3.c.(2) and E.3.c.(3) and include these requirements in the Permanent BMP Sizing Criteria Design Manual pursuant to Provision E.3.d. Technical infeasibility may result from conditions including, but not limited to:

(i) Locations that cannot meet the infiltration and groundwater protection requirements in Provision E.3.a.(5) due to the presence of shallow bedrock, contaminated soils, near surface groundwater, underground facilities, or utilities;

(ii) Brownfield development sites or other locations where pollutant mobilization is a documented concern;

(iii) The design of the site precludes the use of soil amendments, plantings of vegetation, or other designs that can be used to infiltrate and evapotranspirate runoff;

(iv) Soils cannot be sufficiently amended to provide for the requisite infiltration rates;

(v) Locations with geotechnical hazards;

(vi) Insufficient onsite and/or offsite demand for storm water use;

(vii) Modifications to an existing building to manage storm water are not feasible due to structural or plumbing constraints; and

(viii) Smart growth and infill or redevelopment locations where the density and/or nature of the project would create significant

difficulty for compliance with Provisions E.3.c.(2) and E.3.c.(3) onsite.

(c) Mitigation

Priority Development Projects that meet the Copermittee's technical infeasibility criteria developed pursuant to Provision E.3.c.(4)(b) must be required to mitigate for the increased flow rates, increased flow durations, and/or increased pollutant loads expected to be discharged from the site. For the pollutant load in the volume of storm water not retained onsite with retention LID BMPs treated with flow-thru LID treatment control BMPs sized for the portion of the design capture volume that is not retained onsite, ~~, tre~~ or increased potential erosion of downstream receiving waters not fully controlled onsite with hydromodification management BMPs, the Copermittee must require the project applicant to either 1) implement an offsite mitigation project, and/or 2) provide sufficient funding for a public or private offsite mitigation project via a mitigation fund.

(i) *Mitigation Project Locations*

Offsite mitigation projects must be implemented within the same hydrologic unit as the Priority Development Project, and preferably within the same hydrologic subarea. Mitigation projects outside of the hydrologic subarea but within the same hydrologic unit may be approved provided that the project applicant demonstrates that mitigation projects within the same hydrologic subarea are infeasible and that the mitigation project will address similar potential impacts expected from the Priority Development Project.

(ii) *Mitigation Project Types*

Offsite mitigation projects must include, where applicable and feasible, retrofitting opportunities and stream and/or habitat rehabilitation or restoration opportunities identified in the Water Quality Improvement Plans, identified pursuant to Provision B.3.a. Other offsite mitigation projects may include green streets or infrastructure projects, or regional BMPs upstream of receiving waters. In-stream rehabilitation or restoration measures to protect or prevent adverse physical changes to creek bed and banks must not include the use of non-naturally occurring hardscape material such as concrete, riprap, or gabions. Project applicants seeking to utilize these alternative compliance provisions may propose other offsite mitigation projects, which the Copermittees may approve if they meet the requirements of Provision E.3.c.(4)(a).

(iii) *Mitigation Project Timing*

The Copermittee and/or project applicant must develop a schedule for the completion of offsite mitigation projects, including milestone dates to identify, fund, design, and construct the projects. Offsite mitigation projects must be completed upon the granting of occupancy for the first project that contributed funds toward the offsite mitigation project, unless a longer period is authorized by the San Diego Water Board.

(iv) *Mitigation Fund*

A Copermittee may choose to implement additional mitigation programs (e.g., pollutant credit system, mitigation fund) as a means for developing and implementing offsite mitigation projects, provided the projects conform to the requirements for project locations, types, and timing described above.

(5) Alternative Compliance for Watershed-Based Planning

Where a development project, greater than 100 acres in total project size or smaller than 100 acres in size yet part of a larger common plan of development that is over 100 acres, has been prepared using watershed and/or sub-watershed based water quality, hydrologic, and fluvial geomorphologic planning principles that implement regional LID BMPs in accordance with the sizing and location criteria of this Order and acceptable to the Regional Board, such standards shall govern review of projects with respect to Provision E.3. of this Order and shall be deemed to satisfy this Order's requirements for LID site design, buffer zone, infiltration and groundwater protection standards, source control, treatment control, and hydromodification control standards. Regional BMPs must clearly exhibit that they will not result in a net impact from pollutant loadings over and above the impact caused by capture and retention of the design storm. Regional BMPs may be used provided that the BMPs capture and retain the volume of runoff produced from the 24-hour 85th percentile storm event as defined in Provision E.3.c. and that such controls are located upstream of receiving waters. Any volume that is not retained by the LID BMPs, up to the design capture volume, must be treated using LID biofiltration sized for the design capture volume that has not been retained. Where regional LID implementation has been shown to be technically infeasible (per Provision E.3.c.(4)(b)) any volume up to and including the design capture volume, not retained by LID BMPs, nor treated by LID biofiltration, must be treated using conventional treatment control BMPs in accordance with Provision E.3.c.(2)(d) and participation in the mitigation program in Provision E.3.c.(4)(c).

Walsh, Laurie@Waterboards

From: Mike McSweeney <MMcSweeney@biasandiego.org>
Sent: Friday, September 14, 2012 2:02 PM
To: Walsh, Laurie@Waterboards
Cc: Matt Adams; Borre Winckel; Rosenbaum, Wayne
Subject: BIA Comment Letter
Attachments: Stormwater-RWQCB comment letter-Final draft.pdf

Laurie:

Attached is the BIA's Coalition comment letter regarding the Administrative Draft MS4 permit. I will also be hand delivering one to you in a few minutes.

Enjoy your weekend,

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BUILDING INDUSTRY ASSOCIATION OF SAN DIEGO COUNTY
BUILDING INDUSTRY ASSOCIATION OF SOUTHERN CALIFORNIA
ASSOCIATED GENERAL CONTRACTORS, SAN DIEGO
SAN DIEGO REGIONAL CHAMBER OF COMMERCE
BUILDING OWNERS AND MANAGERS ASSOCIATION
SAN DIEGO ASSOCIATION OF REALTORS
ASSOCIATED BUILDERS AND CONTRACTORS
BUSINESS LEADERSHIP ALLIANCE
NAIOP

September 12, 2012

VIA E-MAIL AND HAND DELIVERY

Ms. Laurie Walsh
WRC Engineer
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Re: REVISED ADMINISTRATIVE DRAFT REGIONAL MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) (Tentative Order No. R9-2012-0011)

Dear Ms. Walsh:

The following trade and professional associations, for the purposes of this communication known as, the regulated community, are responding as a Coalition. Spearheaded by the Building Industry Association of San Diego County (BIASD), Business Leadership Alliance (BLA), Associated General Contractors, San Diego (AGC), NAIOP (National Association of Industrial & Office Properties), Associated Builders & Contractors (ABC), the San Diego Regional Chamber of Commerce, the San Diego Association of Realtors® (SDAR), and the Building Owners & Managers Association (BOMA) and the members thereof, we appreciate the opportunity to provide comments on the Administrative Draft of the San Diego County Regional MS4 Permit (Administrative Draft Permit). We submit these comments in addition to and in support of comments made by our affiliate the Building Industry Association of Southern California and its coalition partners. This Coalition employs over 200,000 San Diegans and generates in excess of $ 3 billion dollars of economic activity in the San Diego region.

Alternative Methodologies to Address Water Quality and Hydromodification Concerns

The Coalition supports stream and habitat restoration/rehabilitation as an essential part of hydromodification control, and recommends that alternative compliance presented in the Administrative Draft permit Section E.3.c.(4)(c), Mitigation, should be encouraged. Hydromodification management is an issue that is larger than the individual discharger and needs to be addressed at the local watershed level. Within a watershed, a combination of conventional on-site controls for some projects and alternative compliance for other projects is appropriate.

In some cases, restoration/rehabilitation projects can provide more benefit to the receiving waters than conventional on-site low impact development (LID) and hydromodification management practices. For example, new developments in watersheds that are already experiencing hydromodification from existing development could potentially provide a greater benefit to the receiving water by directing funds to alternative compliance mitigation projects in the stream rather than conventional BMPs on the project site. Within already developed watersheds, the benefit of conventional on-site BMPs may be measurable when compared to the hydromodification effect of existing development.

The Coalition recommends that alternative compliance should be an option accorded equal status with conventional on-site low impact development and hydromodification management practices, and that the permit should provide a simple path or "off-ramp" to alternative compliance. The permit Sections discussed below should be modified to simplify the path to alternative compliance, which would encourage project applicants to pursue this path.

Section E.3.c.(4)(a)(i) of the Administrative Draft permit requires a site-specific and/or design analysis performed by a registered professional engineer, geologist, architect, or landscape architect be provided by the project applicant in order for a Copermittee to approve alternative compliance. The analysis would be required to prove technical infeasibility of retention LID and hydromodification management BMPs. If stream and habitat restoration/rehabilitation projects enhance the beneficial uses within the watershed and provide the same or better level of water quality protection, they should not require proof of infeasibility of on-site retention LID and hydromodification management BMPs.

Section E.3.c.(4)(a)(ii) of the Administrative Draft permit requires a project applicant to demonstrate that retention LID and/or hydromodification management BMPs per Provisions E.3.c.(2) and E.3.c.(3) were incorporated into the project design to the maximum extent technically feasible given the project site conditions. Section E.3.c.(2)(c) requires the project must implement flow-thru LID BMPs for the portion of the design capture volume of runoff that is not retained on-site. Altogether this means the project must implement a mix of conventional retention LID BMPs and flow-thru LID BMPs in addition to alternative compliance. In some cases the benefit of conventional BMPs may be unmeasurable in the context of a watershed that is already experiencing hydromodification, and it would be more beneficial to direct all funds toward stream restoration/rehabilitation (alternative compliance). If stream and habitat restoration/rehabilitation projects enhance the beneficial uses within the watershed and provide the same or better level of water quality protection, projects should not be required to provide a mix of conventional retention LID BMPs and flow-thru LID BMPs in addition to alternative compliance.

The following are recommended changes to the language of the Administrative Draft permit. In addition to the suggested revisions below, the permit should clarify when and how the Regional

Water Quality Control Board will be involved in the review and approval of alternative compliance projects.

PROPOSED CHANGES TO PRIORITY DEVELOPMENT PROJECT PERMANENT BMP PERFORMANCE AND SIZING REQUIREMENTS

Section E.3.c.(2)

In addition to the BMP requirements listed for all development projects under Provision E.3.a, Priority Development Projects must also implement permanent BMPs that conform to performance and sizing requirements.

> (2) Retention and Treatment Control BMP Requirements Each Copermittee must require each Priority Development Project to implement BMPs to retain and treat pollutants onsite in the following order or provide alternative compliance pursuant to Provision E.3.c.(4):

Section E.3.c.(4)(a)

(a) Applicability

> Priority Development Projects may be allowed alternative compliance if:
>
> > (i) ~~The Copermittee reviews and approves site-specific hydrologic and/or design analysis performed by a registered professional engineer, geologist, architect, or landscape architect;~~ The project applicant is required to perform mitigation described in Provision E.3.c.(4)(c) with a net result of at least the same level of water quality protection as would have been achieved if the Priority Development Project had fully implemented the retention LID and hydromodification management BMP requirements under Provisions E.3.c.(2) and E.3.c.(3) onsite; or ~~;~~
> >
> > (ii) The project applicant demonstrates, and the Copermittee determines and documents, that retention LID and/or hydromodification management BMPs per Provisions E.3.c.(2) and E.3.c.(3) were incorporated into the project design to the maximum extent technically feasible given the project site conditions~~;~~ and the project applicant is required to perform mitigation described in Provision E.3.c.(4)(c) for the balance of the project design capture volume that is not retained on-site.
> >
> > (iii) ~~The project applicant is required to perform mitigation described in Provision E.3.c.(4)(c) with a net result of at least the same level of water quality protection as would have been achieved if the Priority Development Project had fully implemented the retention LID and hydromodification management BMP requirements under Provisions E.3.c.(2) and E.3.c.(3) onsite.~~

Illicit Discharge Detection and Elimination

The Coalition is concerned about the unanticipated consequences associated with the Permit's definition of "illicit discharges" and the application of that definition to discharges of ground water through subsurface drains. The permit defines an "illicit discharge" as "Any discharge to the MS4 that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from firefighting activities [40 CFR 122.26(b)(2)]." The permit goes on to define a non-storm water discharge as "All discharges to and from a MS4 that do not originate from precipitation events (i.e., all discharges from a MS4 other than storm water). Non-storm water includes illicit discharges and NPDES permitted discharges." Finally, the permit presumes that any flow in a storm drain that occurs seventy two hours after a rain event is a non-storm water flow and thus an illicit flow in violation of the permit and the clean water act. For the reasons described below, this interpretation is neither enforceable nor technically feasible.

The proposed permit requires development and redevelopment projects to retain the 85th percentile storm event on the project site and either use or infiltrate that water. [Citation] The available area where soil is conducive to infiltration within the County of San Diego is extremely limited. These available areas include soil adjacent to river or stream beds, coastal sandy deposits, and valleys (e.g. along San Luis Rey River, beaches, and Mission Valley) and are a small fraction of the County area. Therefore, the parameters in the permit cannot be met on most projects. About 90 percent of the area of San Diego County belonging to Region 9 is likely deemed unfeasible for infiltration (soils Type C and D, see California Geological Survey - Preliminary Surface Geological Materials Map attached hereto).

Normally, these areas where infiltration can be performed are protected for environmental purposes (i.e. canyon drainages where the existing vegetation protects animal and waterway environments) However, in those areas where the native soils are permeable and development or redevelopment are permitted, building ordinances and design specifications require compacted fill at grade for higher density projects. The compacted fill has a reduced void structure and therefore does not facilitate water infiltration. Thus, this infiltration requirement as written pits the goal of minimizing urban sprawl though high density development with an attempt to infiltrate precipitation.

Because of the soil conditions in the geographic area regulated by this permit, much of the infiltrated water does not reach ground water aquifers but rather becomes perched water which tends to collect around subsurface utility lines, foundations and other structures. Unless the perched water can be allowed to escape there is a high probability of damage to critical infrastructure such as roads, utilities necessary to protect the health, safety and welfare of the community.

The Permit offers the alternative of retention and use of water on site. As discussed at the Permit workshops, this alternative is both impractical and likely in violation of California law. First, because of the unique rain patterns in Southern California the scale of any retention structures would be enormous and costly well beyond any benefit to water quality particularly as applied to critical infrastructure projects such as roads and airports. Second, assuming that it is technically

feasible to capture the runoff, doing so is likely to contravene other state laws and policies such as protection of wetland habitats[1], and previously granted water rights.[2]

The permit impermissibly assumes that any water flowing in a storm drain seventy two hours after an arbitrary 0.1 inch storm event is non-storm water. First, the natural drainage from even an undeveloped site can take more than seventy two hours in many cases. As a matter of fact, a simple review of USGS precipitation and runoff records in a natural watershed in the area, such a San Mateo Creek, proves without a doubt that wet periods may take more than a month to fully drain natural runoff especially in wet years even for relatively small watersheds. Second, natural precipitation which is infiltrated on site is likely to emerge as perched water and enter the storm drain system day, weeks or months after was originally infiltrated. Third, hydromodification BMPs may take much more than 72 hours to drain, especially for those BMPs were a significant volume of detention occurs under amended soil and the drainage is constrained by a very small orifice. Thus, the seventy two hour definition after a 0.1 inch storm event lacks any scientific bases and is, therefore, both arbitrary and capricious.

For the reasons stated above, the Coalition recommends that the Permit language be modified as follows:

ILLICIT DISCHARGE DETECTION AND ELIMINATION -- NON-STORM WATER DISCHARGES

Section 2.a.1

(1) Discharges of non-storm water to the MS4 from the following categories must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG919001 (Order No. R9-2007-0034, or subsequent order) for discharges to San Diego Bay, or NPDES Permit No. CAG919002 (Order No. R9-2008-0002, or subsequent order) for discharges to surface waters other than San Diego Bay:

(a) Uncontaminated pumped ground water;

~~(b) Discharges from foundation drains;~~

~~(c) Water from crawl space pumps; and~~

~~(d) Water from footing drains.~~

---

[1] By capturing all events smaller or equal than the 85th percentile rain event, the runoff volumes are likely to be less than they were in the predevelopment condition, thereby drying up streams and valuable wetland habitat. The use of a universally accepted rainfall-runoff methodology such as the NRCS Method proves that events smaller than the 85th percentile rainfall event may generate a significant percentage of their volume as a runoff, depending on the soil type, antecedent conditions and vegetation type.

[2] If the amount of water being retained on site exceeds the amount of water retained in pre development condition, the additional water being retained will likely violate the prior appropriation rights and pueblo rights of others.

(2) Discharges of non-storm water from water line flushing and water main breaks to the MS4 must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG 679001 (Order No. R9-2010-0003, or subsequent order). This includes water line flushing and water main break discharges from water purveyors issued a water supply permit by the California Department of Public Health or federal military installations. Discharges from recycled or reclaimed water lines to the MS4 must be addressed as illicit discharges, unless the discharges have coverage under a separate NPDES permit.

(3) Discharges of non-storm water to the MS4 from the following categories must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a source of pollutants to receiving waters:

(a) Diverted stream flows;

(b) Rising ground waters;

(c) Uncontaminated ground water infiltration to MS4s;

(d) Springs;

(e) Flows from riparian habitats and wetlands; ~~and~~

(f) Discharges from potable water sources~~.~~;

(g) Foundation and footing drains

(h) Water from crawl space or basement pumps

(i) Hillside/canyon drains

Add to Appendix C – Definitions:

Groundwater – water that occurs beneath the water table in soil and geologic formation that are fully saturated as evaluated by a licensed geotechnical consultant or geologist.

BMP Performance and Sizing Requirements

The Coalition is concerned about the unintended consequences associated with the Permit's definition of LID implementation. We propose a more detailed and clear definition of the volume required for LID, as runoff should not be reduced below the expected runoff produced by the 24 hour – 85th percentile storm in natural conditions (nor the runoff produced by smaller storms in those cases where they indeed generate runoff). In natural conditions, runoff is not only a function of the precipitation event (the main variable) but also a function of the soil type, the natural vegetation type, and the Antecedent Moisture Condition (AMC) before the storm event (degree of saturation of the soil at the beginning of the storm). The current definition also lacks clarity in terms of the intent of the infiltration/retention LID: it is not clear if the volume retained is associated with the first storms of the season, or if it is associated with all storms smaller or equal than the 24 hour – 85th percentile storm event.

In San Diego County, many times the 24 hour - 85th percentile precipitation event (P_{85}) generates runoff in natural conditions, as impervious soils (Type D) are predominant in the County, and poor or fair natural vegetation is common in many areas. The Coalition has prepared a figure that illustrates the percentage of runoff as a function of the Curve Number value (a well-known parameter for hydrologists and engineers to determine runoff via NRCS (SCS) method, which is a function of soil type, vegetation, and AMC), for different values of P_{85}. It is clear that runoff as a percentage of the precipitation can be as small as 0% or as large as 60% depending on the conditions of the natural terrain and the size of P_{85}.

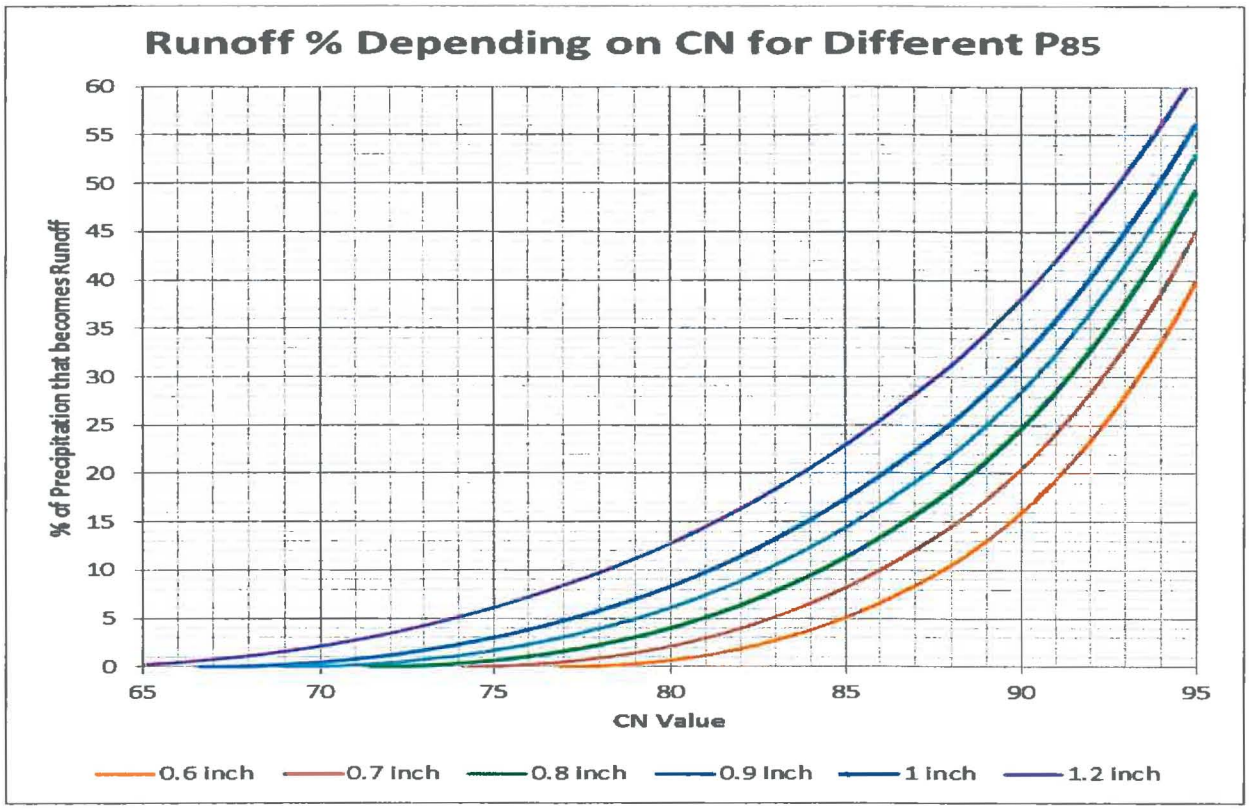

Removal of naturally occurring flows generated by storms similar to the 24 hour – 85th percentile storm for those natural environments where such flows do occur may have negative impacts to existing habitats, as excessive retention may alter the natural water balance. Additionally, excessive retention in soils that have a naturally limited capacity for infiltration increases the risks of failure on vital infrastructure due to lateral water migration.

Also, the intent of the permit to retain the seasonal first flush only (and not all runoff from all events smaller or equal than the 24 hour – 85th percentile event) is not clear in the current language. It is clear in the technical literature (see for example CALTRANS CTSW-RT-05-73-02.6) that first flush treatment has a justification based on the fact that most of the time, in Southern California, treating the first storm of the season may remove built up contamination. Additionally, the first 20% - 40% of the storm volume may remove 50% - 70% of the total contaminant load (excluding sediments and trash). Finally, first flush treatment is justified by the theory of diminishing returns, because

BMPs have a better efficiency removing higher loads, and the cost of treatment is more dependent on the volume of water than on the concentration of contaminants.

For the reasons stated above, the Coalition recommends that the Permit language be modified as follows:

Section E.3.c.(2)(b)

Each Priority Development Project must be required to implement LID BMPs that are sized and designed to retain the volume equivalent to the runoff volume produced from a 24-hour 85th percentile storm event produced in natural conditions. 15 ("design capture volume");

Footnote 15~~: This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals.~~ Runoff volumes must be calculated using the NRCS Method applying average AMC-II conditions, natural NRCS soil types, and the corresponding natural vegetation that exist or existed prior to development; a different hydrologic method could be approved by the Copermittees. LID is not intended to retain the runoff of all events that generate a runoff volume equal to or smaller than the runoff produced by the 24 hour - 85th percentile storm event; rather to retain the first flush up to the 85th percentile runoff difference. The 85th percentile runoff in natural conditions could be 0 or larger depending on the original natural vegetation and soil type. The time needed to use the totality of volume retained must be compatible with current regulations and water usage in the area. Proper vector control will be required in the retention facility if usage and infiltration of the retained water is expected to exceed 96 hours.

Sediment Supply Requirements

The requirement to address sediment balance is briefly mentioned in the new permit in the form of compensation of the potential sediment supply loss due to the proposal of a priority project. The sediment balance within a watershed (or the establishment of new sediment equilibrium as a consequence of many years of development in multiple watersheds) is an extremely complex issue. The Coalition is therefore very concerned about the lack of direction regarding this issue, the myriad of factors affecting a highly variable phenomena and the possibility of wasting valuable resources preparing a useless Sediment Management Plan for Priority Projects. Such plans lack direction, proper design equations, and basic understanding of the sediment transport phenomena in Mediterranean climates.

Sediment yield and sediment transport are functions of the geology of the terrain, the topography of the watershed and the slope of the main channels, the grain size distribution of the sediments existing in the network of channels, the vegetation, the annual precipitation and its distribution, the state of the vegetation prior to the rainfall (burned, dry, stable), the geometry of the main creeks

and channels, the Antecedent Moisture Condition of the soil, the equilibrium conditions of slopes and of the sediments already in the network of channels in terms of stability, the existence of reservoirs or dams and the frequency and duration of their discharges in extreme events, and many other factors.

Trying to accommodate such complex factors into a one-size-fits-all solution is a recipe for disaster. Also, trying to deal with the sediment problem in a typical pre-formatted Sediment Management Plan is not only impractical, but also ineffective and resource-consuming. Sediment transport analysis made in the Tijuana River with 73 years of daily runoff data has proven, for example, that more than 70% of the sediment transport occurs less than 0.15% of the time; sediment analysis in the Santa Clara watershed has generated very similar results, with the added complication of hyperpycnal flow transport (flows with density higher than the salt water due to high sediment content), generating significant geomorphological changes in the watershed.

In addition to the complexity of the problem, many proposed solutions (such as the use of the Lane Relationship) denote the lack of understanding of sediment transport theory, as the Lane Relationship is not a quantitative equation that can be used for design, but a qualitative relation that only can be used for the purposes of discussion about the main factors affecting sediment equilibrium.

An added difficulty is related to the compensation process. It is evident that, even if sediment supply loss can be proven for a given project, adding artificial sediments to a natural creek triggers so many permits and environmental and water quality constraints, that such an alternative is infeasible. Even if the sediment addition is allowed, it is not clear what amount, size distribution, and time-variable sediment injection is required to mimic a naturally variable sediment production and transport condition that is not clearly measured nor understood.

For the above stated reason, the Coalition recommends that the permit language be modified as follows:

Section E.3.C(3)(b)

First option:

Eliminate the language until a more comprehensive and reasonable approach is developed to deal with restoration/rehabilitation projects and measurement of loss of sediment supply:

(~~b) Post-project runoff flow rates and durations must compensate for the loss of sediment supply due to the development project, should loss of sediment supply occur as a result of the development project.~~

Second option:

Incorporate rehabilitation/restoration projects and/or protection of clearly identifiable sediment producing areas as the only feasible alternative to deal with sediment supply:

(b) Post-project runoff flow rates and durations must compensate for the loss of sediment supply due to the development project, should loss of sediment supply occur as a result of the development project. Redevelopment projects that increase pervious areas from pre-development conditions are not subject to such compensation. Compensation should be tied to restoration/rehabilitation projects for downstream creeks and/or funding for protection of identified sediment-supply areas in the watershed.

Thank you for consideration of the Coalition's comments on the Administrative Draft of the Permit. We look forward to working with the Regional Quality Control Board and its staff on improving the final draft with a goal toward achieving improved water quality in harmony with the Regional Board's Basin Plan.

Very truly yours,

Borre Winckel
President & CEO of the BIASD
On behalf of the Coalition

Walsh, Laurie@Waterboards

From: Laurie Madigan <lmadigan@pointcpartners.com>
Sent: Friday, September 14, 2012 12:58 PM
To: Walsh, Laurie@Waterboards
Subject: MS4 Permit letter to Board
Attachments: Gibson.MS4Letter.9.14.12.pdf

Ms. Walsh -

Please accept the attached letter from the San Diego Business Leadership Alliance (BLA) expressing our concern regarding and comments to the currently-proposed MS4 stormwater permit. Thank you for the opportunity to comment and please let me know by response to this email that you recieved out letter.

Yours,

Laurie Madigan
Executive Director
Business Leadership Alliance
lmadigan@sdbla.org

Business Leadership
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Strengthening the voice of business

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BLA Member Organizations
Asian Business Association
Associated Builders & Contractors
Associated General Contractors
BIOCOM
Building Industry Association of San Diego
Building Owners & Managers Association
California Apartment Association, SD Chapter
California Restaurant Association, SD Chapter
CleanTECH San Diego
CommNexus
CanaMexa
CONNECT
Downtown San Diego Partnership
Engineering & General Contractors Association
Filipino American Chamber of Commerce
Hospital Association of San Diego & Imperial Co's
Klein Leadership Foundation
NAIOP San Diego
NextGen
San Diego Association of Realtors
San Diego County Apartment Association
San Diego East County Chamber of Commerce
San Diego East County EDC
San Diego North Chamber of Commerce
San Diego Port Tenants Association
San Diego Regional Chamber of Commerce
San Diego Regional EDC
San Diego Software Industry Council
San Diego Sports Innovators
San Diego Venture Group
Strategic Roundtable
Tech America
Tijuana EDC
Union of Pan Asian Communities
Urban League of San Diego County

Ex Officio
Junior Achievement
LEAD San Diego
San Diego County Taxpayers Association
San Diego Workforce Partnership
Urban Land Institute, San Diego / Tijuana

September 14, 2012

David Gibson
Executive Director
San Diego Regional Water Quality Control Board
9174 Sky Park Ct., Suite 100
San Diego, CA 92123-4340

Dear Mr. Gibson

The purpose of this communication is to add the voices of our member organizations in opposition to the Draft Administrative MS 4 permit released on April 9th of this year. Our organization includes over forty business organizations throughout the San Diego region, including Chambers of Commerce, Economic Development Corporations and trade organizations that range from CleanTech to the Hospital Association of San Diego and Imperial Counties. Our member organizations in turn represent over 17,000 businesses that provide jobs to San Diego County residents.

On August 4, 2012, our member organizations voted unanimously to support the BIA's coalition comment letter advocating a regional, watershed-based approach to improving stormwater water quality. Our member organizations fully support efforts to reduce pollution to our watershed, beaches and bays, but we believe in a realistic, regional approach rather than a property-by-property approach. The lot-by-lot approach proposed in the draft administrative permit is cumbersome, unrealistic to implement, costly to local business, and will take more than a lifetime to achieve actual positive results.

The BLA supports the BIA coalition comment letter and the solutions presented there. We believe this regional approach is the most wide-reaching, direct and cost effective solution to a problem that has been years in the making, yet minimizes the negative effects that a proscriptive permit will cause to employers and local governments in the region. Please consider incorporating the comments provided by the BIA and supported by the Business Leadership Alliance when revising your Administrative Draft MS4 permit.

Working collaboratively, we can achieve better water quality faster with more reasonable financial impacts to our communities.

Sincerely,

Laurie Madigan

Laurie Madigan
Executive Director

Walsh, Laurie@Waterboards

From: Cindy Cekander <Cindy.Cekander@bbklaw.com>
Sent: Friday, September 14, 2012 3:41 PM
To: Walsh, Laurie@Waterboards
Cc: Devin E. Slaven (dslaven@ci.lake-forest.ca.us); 'Julie Procopio'; 'myahya@cityofalisoviejo.com'; Shawn Hagerty; Andre Monette
Subject: Comments on Administrative Draft San Diego Regional MS4 Permit
Attachments: Comments Adm Draft SD Regional MS4 Permits.PDF

Please find attached the above referenced comment letter. Thank you.

CINDY CEKANDER
LEGAL SECRETARY
BEST BEST & KRIEGER LLP
655 WEST BROADWAY, 15TH FLOOR
SAN DIEGO, CA 92101
(619) 525-1342 (DIRECT)
(619) 233-6118 (FAX)
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SECRETARY TO:
SHAWN HAGERTY | DELMAR WILLIAMS | BROOKE MILLER| WENDY CONNOR

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shawn.hagerty@bbklaw.com
File No. 55136.00511

September 14, 2012

Via E-Mail [lwalsh@waterboards.ca.gov]

David Gibson
Executive Officer
San Diego Regional Water Quality Control Board
Sky Park Court
San Diego CA

Re: Comments on Administrative Draft San Diego Regional MS4 Permit

Dear Mr. Gibson,

The purpose of this letter is to submit limited legal comments[1] on the Administrative Draft Permit ("Draft Permit") issued by the San Diego Regional Water Quality Control Board ("Regional Board") on April 9, 2012. I am submitting these comments on behalf of the Cities of Aliso Viejo, Lake Forest, and Santee. Each City may ultimately be regulated under the Draft Permit, if adopted, and each City therefore has a significant interest in the Draft Permit's development. My limited legal comments on the Draft Permit follow.

I. THE RECEIVING WATER LIMITATIONS PROVISIONS IN THE DRAFT PERMIT NEED TO BE REVISED.

The current language in the Draft Permit (Provision A) might be interpreted to require strict compliance with the water quality standards established by the San Diego Basin Plan and with other receiving water limitations established by other specified documents. The State Board has determined that its mandatory receiving water limitations language "does not require strict compliance with water quality standards." Rather, it is State Board policy that compliance with water quality standards is "to be achieved over time, through an iterative approach requiring improved BMPs." (State Water Board Order WQ 2001-15.) Because, as discussed below, the current language in the Draft Permit has been interpreted by the Ninth Circuit in a manner that is not consistent with State Board policy, it must be revised.

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[1] The Draft Permit raises many other legal issues not addressed in this letter. Additional legal comments will be submitted if and when the Draft Permit is reissued for public review as a Tentative Order. We believe that a meeting with legal counsel for the Regional Board would be beneficial to address the limited issues expressed in this letter as well as the broader legal issues raised by the Draft Permit.

State Board policy is, and has been, that water quality standards are to be achieved over time through the iterative process. In State Board Order WQ 2001-15, *In the Matter of the Petitions of Building Industry Assoc. of San Diego County and Western States Petroleum Assoc.* (2001), the State Board explained, in the context of its review of the 2001 San Diego MS4 Permit, that:

> In reviewing the language in this permit, and that in Board Order WQ 99-05, we point out that our language, similar to U.S. EPA's permit language discussed in the *Browner* case, does not require strict compliance with water quality standards. Our language requires that storm water management plans be designed to achieve compliance with water quality standards. Compliance is to be achieved over time, through an iterative approach requiring improved BMPs.
>
> (*Id.*, at 7.)

The State Board's explanation that water quality standards were to be achieved over time through the iterative process was set forth in response to BIA's claim that the Ninth Circuit's decision in *Defenders of Wildlife v. Browner* rendered requirements in the San Diego County MS4 Permit unnecessary and contrary to the MEP standard. While retaining the requirement that the San Diego permit prohibit discharges that cause or contribute to violations of water quality standards, the State Board made clear that compliance with this requirement was to be achieved through the iterative process, and that the water quality standards themselves were not hard compliance targets. The State Board thus established a "middle ground" position where MS4 permits had to require compliance with water quality standards but where compliance was to be achieved over time in recognition of the unique nature of stormwater discharges. As the State Board explained:

> We are concerned, however, with the language in Discharge Prohibition A.2, which is challenged by BIA. This discharge prohibition is similar to the Receiving Water Limitation, prohibiting discharges that cause or contribute to exceedance of water quality objectives. The difficulty with this language, however, is that it is not modified by the iterative process. To clarify that this prohibition also must be complied with through the iterative process, Receiving Water Limitation C.2 must state that it is also applicable to Discharge Prohibition A.2. The permit, in Discharge Prohibition A.5, also incorporates a list of Basin Plan prohibitions, one of which also prohibits discharges that are not in

> compliance with water quality objectives. (See, Attachment A, prohibition 5.) Language clarifying that the iterative approach applies to that prohibition is also necessary.
>
> (*Id.*, at 8-9.)

The State Board's position on the receiving water limitations language has thus been consistent and clear: water quality standards are to be achieved over time through the iterative process.

Unfortunately, the Ninth Circuit Court of Appeals, in *NRDC v County of Los Angeles*, 673 F.3d 880 (9th Cir., 2011), interpreted the State Board's mandatory language in a manner inconsistent with State Board policy. The Ninth Circuit held that the State Board's mandatory language requires strict compliance with water quality standards and that such compliance was not modified by the iterative process. Because the language in the Draft Permit is modeled after the State Board's language, it must be revised in light of the Ninth Circuit's decision to align the language with the State Board's policy.

Several interested parties have submitted suggestions on how to revise the Draft Permit's language. These submittals include sample language prepared by the City of San Diego, the City of Dana Point, and the California Stormwater Quality Association ("CASQA"). The purpose of this letter is not to advocate for one of these suggested revisions over the others but to bring to the Regional Board's attention the importance of revising the existing requirements, and to remind the Regional Board that *existing* State Board policy is to allow municipal dischargers to attain compliance through the iterative process. The Regional Board should also consider delaying the reissuance of the Draft Permit until after the State Board completes its review of this issue. As the Regional Board is likely aware, the State Board will be holding a workshop on this issue on November 20th of this year.

II. "EFFECTIVELY PROHIBIT" DOES NOT REQUIRE AN ABSOLUTE PREVENTION OF DISCHARGES INTO THE MS4.

The Draft Permit misapplies the provision contained in 33 U.S.C. § 1342(p)(3)(B)(ii) that MS4 permits "include a requirement to effectively prohibit non-stormwater discharges into the storm sewers" and needs to be revised. Section 1342(p)(B)(ii) is simple and straightforward. It requires that the Draft Permit include a single requirement that the dischargers shall effectively prohibit dischargers into their MS4. Compliance with this requirement can be attained through an ordinance, regulation or policy of the discharger that effectively prohibits discharges to the MS4. It is *not* an absolute prohibition such that the dischargers are in violation of their permit if any unauthorized discharge into their system occurs.

This issue was also addressed by the State Board in Order No. WQ-2001-15, *In the Matter of the Petitions of Building Industry Assoc. of San Diego County and Western States Petroleum Assoc.* (2001). The State Board clarified that discharges into the MS4 are allowed, and are to be controlled through the use of BMPs and other control techniques. The State Board held:

> An NPDES permit is properly issued for "discharge of a pollutant" to waters of the United States. (Clean Water Act § 402(a).) The Clean Water Act defines "discharge of a pollutant" as an "addition" of a pollutant to waters of the United States from a point source. (Clean Water Act section 502(12).) Section 402(p)(3)(B) authorizes the issuance of permits for discharges "from municipal storm sewers."
>
> We find that the permit language is overly broad because it applies the MEP standard not only to discharges "from" MS4s, but also to discharges "into" MS4s. . . [T]he specific language in this prohibition too broadly restricts all discharges "into" an MS4, and does not allow flexibility to use regional solutions, where they could be applied in a manner that fully protects receiving waters. It is important to emphasize that dischargers into MS4s continue to be required to implement a full range of BMPs, including source control. In particular, dischargers subject to industrial and construction permits must comply with all conditions in those permits prior to discharging storm water into MS4s.
>
> (*Id.*, at 9-10.)

The State Board's decision in the *BIA* matter makes clear that the Clean Water Act does not include a blanket prohibition on discharges of non-stormwater into the MS4. Of course, source control and illicit discharge detection play a vital role in an effective MS4 program. However, to the extent the Draft Permit would hold the dischargers liable in the event that any discharge into the MS4 occurs, the Draft Permit exceeds the requirements of the Clean Water Act.

To avoid this outcome, the text of Section II.A of the Draft Permit needs to be revised to remove prohibitions on discharges into the MS4. These references need to be replaced with a requirement and acknowledgement that non-exempt, non-stormwater discharges into the MS4 are to be effectively prohibited by the dischargers, meaning that the dischargers must adopt ordinances and implement programs to control such discharges.

III. THE CLEAN WATER ACT'S GOALS ARE NOT AN INDEPENDENT SOURCE OF AUTHORITY TO REGULATE MS4 DISCHARGES

Section 101 of the Clean Water Act (33 U.S.C. § 1251) states the goals and the national policy of the Clean Water Act. Section 1251 states:

> The objective of this Act is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. In order to achieve this objective it is hereby declared that, consistent with the provisions of his Act
>
> (1) it is the national goal that the discharge of pollutants into the navigable waters be eliminated by 1985;
>
> (2) it is the national goal that wherever attainable, an interim goal of water quality which provides for the protection and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water be achieved by July 1, 1983;

These goals are a cornerstone of the Clean Water Act. They play a key role in the development of water quality standards across the United States. They are not, however, an independently enforceable requirement that may be imposed upon municipal dischargers in their NPDES permits. To the contrary, compliance with the Clean Water Act, and its stated goals, is to be attained through compliance with the permitting and water quality planning programs contained in the Act itself. For MS4 permits, the program is set forth in Section 402(p)(3)(B)(i)-(iii). This portion of the Act, and not the overarching goals of the Act, provides the regulatory structure in which the Regional Board must operate.

The Courts have made it very clear that the goals of the Act are not an independent source of regulatory authority. For example, in *National Wildlife Federation v. Gorsuch* (D.C. Cir. 1982) 693 F.2d 156, the Court held that the general goals of the Act did not trump express provisions of the Act or provide separate regulatory authority. The Court noted that "[c]aution is always advisable in relying on a general declaration of purpose to alter the apparent meaning of a specific provision." The Court further noted that "it is one thing for Congress to announce a grand goal, and quite another for it to mandate full implementation of that goal. Read as a whole, the Clean Water Act shows not only Congress' determined effort to clean up our polluted lakes and rivers but also its practical recognition of the economic, technological, and political limits on total elimination of all pollution from all sources."

That the goals of the Act do not provide an independent basis for regulation applies with even greater force in the context of MS4 permits. As the Ninth Circuit expressly held in the *Browner* decision (discussed more fully below), the MEP standard applicable to MS4 permits is a "lesser standard" than the standard applicable to other NPDES dischargers. It is thus particularly important to apply the standard adopted by Congress for MS4 discharges, and not to augment that standard by reference to the goals of the Act.

Despite this legal authority, the Draft Permit seeks to directly apply these goals to the dischargers through, among other things, the discharge prohibitions and water quality improvement plan requirements. These aspects of the Draft Permit would require the dischargers to seek restoration opportunities as a matter of permit compliance. Regional Board staff has stated that these requirements are necessary to meet the goals set forth in Section 1251. Nowhere does the Clean Water Act impose the policy statements of Section 1251 directly onto MS4 dischargers.

The NPDES program is a technology based program designed to limit the discharge of pollutants into the waters of the United States. (*Defenders of Wildlife v. Browner* 191 F.3d 1159, 1163 (9th Cir. 1999).) The relevant standard that must be applied to MS4 discharges is the maximum extent practicable standard set forth in 33 U.S.C. § 1342(p). (*Id.*, at 1166-67.) Moreover, the Clean Water Act "unambiguously" does not require MS4 discharges to comply strictly with water quality standards or other more stringent limitations that apply to other NPDES dischargers. (*Id.*, at 1164.) This would include the stated goals set forth at Section 1251, or the water quality standards adopted to achieve those goals. (*Id.*)

For these reasons, the Draft Permit's reliance on the goals of the Clean Water Act as a source of authority to impose restoration or other requirements not required by Section 402(p)(3)(B) on the Co-permittees is misplaced and needs to be revised consistent with the MEP standard. Ultimate achievement of the goals of the Act is a shared value. However, the manner in which those goals are to be achieved has been established by Congress through the MS4 program.

CONCLUSION

We appreciate the opportunity to submit these limited legal comments on the Draft Permit and would be happy to work with the Regional Board and its legal counsel on resolving these and other legal issues. If you have any questions on these comments, please do not hesitate to contact me.

Very truly yours,

Shawn Hagerty
of BEST BEST & KRIEGER LLP

cc: Mr. Devin E. Slaven (via e-mail)
Mr. Moy Yahya (via e-mail)
Ms. Julie Procopio (via e-mail)

Walsh, Laurie@Waterboards

From: Godby, Kim <kgodby@coronado.ca.us>
Sent: Friday, September 14, 2012 4:18 PM
To: Walsh, Laurie@Waterboards
Cc: Little, Matt; Lyon, Cecilia; Herrera, Maria; 'Rosanna Lacarra'
Subject: City of Coronado Comments on Administrative Draft, Tentative Order No. R9-2012-0011
Attachments: Coronado Comments on Administrative Draft, Tentative Order No. R9-2012-0011.pdf

Ms. Walsh,

Please find attached Coronado's comment letter. Do not hesitate to contact me.

Respectfully,

Kim Godby
Services Supervsior
City of Coronado
619-522-7380

CITY OF CORONADO

101 "B" Avenue
CORONADO, CALIFORNIA 92118-1510

DEPARTMENT OF PUBLIC SERVICES
(619) 522-7380

September 14, 2012

Laurie Walsh, PE
San Diego Regional Water Quality Control Board
9174 Sky Park Court
San Diego, CA 92123

SUBJECT: Comments on Administrative Draft, Tentative Order No. R9-2012-0011

Dear Ms. Walsh:

The City of Coronado (City) appreciates the opportunity the San Diego Regional Water Quality Control Board (Regional Board) has provided to the City and the Copermittees to provide initial comments on the Administrative Draft of Tentative Order No. R9-2012-0011, NPDES No. CAS0109266 for Discharges from the Municipal Separate Storm Sewer Systems (MS4s).

City representatives participated in the expanded public involvement efforts lead by the Regional Board through the focused meetings held between June and September 2012. We found the meetings to be very productive and informative, and an excellent approach that promises to result in an improved permit for the San Diego region. We encourage Regional Board staff to continue the dialogue with Copermittees and stakeholders during the next phase of Permit preparation so that we may provide clarification of permit language or explanations of the recommended changes, as necessary.

The County of San Diego, as the Principal Copermittee for the San Diego Copermittees, has submitted a comment document on behalf of the 21 Copermittees in San Diego County. The comment submittal represents a consensus opinion of the San Diego Copermittees and includes comments prepared by the City. The City may provide additional comments in the future when the proposed requirements are presented in the next draft of the permit and public comment period. The City's goal is to recommend language that best addresses any potential differences in the implementation strategies for the City and its unique population, land use, location, and characteristics.

The City's key areas of concern in the Administrative Draft of the permit are listed below.

1. **Adaptive Management.** The City supports the San Diego Copermittees comments and recommendations for adaptive management strategies as submitted by the County of San Diego. In addition, we respectfully recommend that the Regional Board take into consideration the overall approach to the requirements in the permit to clearly identify and consider the distinction between mandatory provisions and requirements, and procedural

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and program management requirements imposed on the Copermittees. For example, the permit should direct Copermittees to develop, implement and manage an existing development management program (as part of their jurisdictional runoff management program or JRMP) that addresses the commercial and industrial sectors. The permit should refrain from listing the specific programmatic requirements to be included in the JRMP, such as, types and frequency of inspections, documentation entries (inspection date, time, weather conditions, etc.). The permit should target the highest level requirements and goals within each provision or program, and allow the Copermittees to define the details of program implementation and operational procedures as part of the development of the JRMP. This example is typical of the current prescriptiveness of the permit requirements associated with the JRMP (Permit Section II.E).

We believe that long-term adaptive management will only be possible if the day-to-day operational procedures are set forth in JRMP, as the programmatic document, that demonstrates compliance with the permit requirements. Otherwise, adaptive management may be stifled by the prescriptiveness of the program implementation requirements and operational procedures, and not allow Copermittees the needed flexibility and responsiveness required to adapt programs to changing water quality and other conditions.

2. **Development Planning.** Numerous modifications to the Administrative Draft have been proposed by the San Diego Copermittees. The City has specific concerns with the following new proposed program requirements: (1) single-family residential redevelopment, and (2) alternative compliance program options.

   a. **Single-family residential redevelopment.** The City is mainly residential land use and experiences numerous redevelopment projects of single-family residences per year. The exclusion of single-family residential properties from the priority development project category will allow for these properties to be improved compared to existing conditions by meeting specific requirements to be defined in the BMP Design Manual without the prohibitive and stringent retention and treatment control BMPs that are known to have existing infeasibility conditions of shallow groundwater levels and other physical constraints. We strongly support the San Diego Copermittees recommendation to exempt single-family residential projects from the priority project category. This will support single-family residential development without the need for costly, extensive engineering and technical documentation of infeasibility for this category.

   b. **Alternative compliance program options.** The City's redevelopment of commercial properties may be severely limited, to the possible detriment of water quality, if land-locked commercial properties are limited in their redevelopment options as a result of stringent priority development project on-site retention, treatment control BMP and off-site mitigation requirements currently presented in the Administrative Draft. We encourage the Regional Board to consider the proposed language that allows alternative compliance program options and to weigh the benefits of redevelopment that includes minimum treatment BMPs compared with very stringent, costly on-site retention and treatment BMPs designed to a specified design capture volume, and/or off-site mitigation that limit redevelopment of properties that currently have no treatment BMPs. Costly,

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comprehensive infeasibility evaluations and documentation should be exempt for redevelopment projects in areas already known for having shallow groundwater and other conditions as long as established minimum LID and treatment BMPs to the MEP are implemented per the BMP Design Manual.

The City looks forward to the next phase of collaborative effort with the Regional Board in the permit reissuance process.

Please feel free to contact me at 619.522.7380 if you have any questions.

Respectfully submitted,

Kim Godby
Services Supervisor
City of Coronado

cc Matt Little, Director of Public Services
Cecilia Lyon, Management Analyst
Maria Herrera, Management Assistant
Rosanna Lacarra, LaRoc Environmental

Walsh, Laurie@Waterboards

From: Mikhail Ogawa <mikhail@mogawaeng.com>
Sent: Friday, September 14, 2012 12:25 PM
To: Walsh, Laurie@Waterboards
Subject: Administrative Draft Tentative Order R9-2012-0011
Attachments: 120914 DM Admin Draft Letter.pdf

Hi Laurie,

Please find attached a letter regarding the Admin Draft.

Thanks for the good discussions – I really look forward to seeing the tentative order and more discussions.

Have a great weekend!

Mikhail

City of Del Mar

001643

September 14, 2012

Ms. Laurie Walsh
WRC Engineer C
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, California 92123

SUBJECT: ADMINISTRATIVE DRAFT MUNICIPAL SEPARATE STORM SEWER PERMIT TENTATIVE ORDER NO. R9-2012-0011

Dear Ms. Walsh:

Thank you for the opportunity to engage in the focused meeting process regarding the Administrative Draft Tentative Order R9-2012-0011. The process has allowed stakeholders to participate in shaping the Public Draft Tentative Order by providing ideas and concepts that support an MS4 Permit that moves us towards our goal – improved water quality and receiving water conditions.

The City of Del Mar has participated in the development of the San Diego County Regional Copermittees comment process. Those comments, including an electronic version of recommended changes (e.g., redline/strikeouts), are to be submitted under separate cover by the County of San Diego on behalf of the San Diego County Regional Copermittees.

The City of Del Mar looks forward to reviewing the Public Draft Tentative Order upon its release and continuing our dialog with Regional Water Quality Control Board staff during the next phases of the permit reissuance process. If you have any questions, please contact me at (619) 994-7074.

Sincerely,

Mikhail Ogawa, P.E.
City of Del Mar
Clean Water Manager

Walsh, Laurie@Waterboards

From: Cynthia Mallett <CMallett@ci.oceanside.ca.us>
Sent: Friday, September 14, 2012 4:08 PM
To: Walsh, Laurie@Waterboards
Cc: Mo Lahsaiezadeh; Scott Smith
Subject: Oceanside Comments on Draft MS4 Admin Permit
Attachments: Oceanside Comments on 2012 Draft MS4 Administrative Permit.pdf

Dear Laurie Walsh,

Please find attached the City of Oceanside's comments on the proposed 2012 Administrative Draft Municipal Separate Storm Sewer (MS4) Permit.

Thank you for considering our comments.

Sincerely,

Cynthia Mallett
Environmental Specialist
Oceanside Clean Water Program
760-435-5807
Urban Runoff Hotline
760-435-5800

CITY OF OCEANSIDE
WATER UTILITIES DEPARTMENT

September 14, 2012

Ms. Laurie Walsh
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Dear Ms. Walsh,

CITY OF OCEANSIDE COPERMITTEE COMMENT SUBMITTAL ON THE ADMINISTRATIVE DRAFT MUNICIPAL SEPARATE STORM SEWER (MS4) PERMIT (TENTATIVE ORDER NO. R9-2012-0011)

Dear Ms. Walsh,

Thank you for the opportunity to comment on the Administrative Draft Municipal Separate Storm Sewer (MS4) Permit. As participants in the Project Planning Subcommittee, Monitoring and Land Development Workgroups, and focused meetings, the City of Oceanside – Clean Water Program staff have been able to work closely with the San Diego Copermittees, the Regional Water Quality Control Board (Regional Board) staff, and other stakeholders to create a revised Administrative Draft MS4 permit which is sustainable in terms of meeting the "triple bottom line" of integrating the economic, environmental, and social needs in our communities. As a Copermittee the City of Oceanside submits the attached comments for your consideration.

We appreciate the opportunity to participate in the focused meetings and acknowledge the verbal consensus that has been reached on many permit concepts between the San Diego Copermittees and the Regional Board. The County of San Diego, as the lead Copermittee, has submitted Copermittee comments and the City of Oceanside supports these comments, except as follows:

1. Inclusion of Single-Family Development (SFD) in the Priority Development Project (PDP) with Commercial and Industrial uses with a 10,000 square foot impervious area threshold (Section E.3.b.(2)(a)).

   The inclusion of SFD in the same PDP category with Commercial and Industrial development, and the application of a 10,000 square foot impervious area threshold, is not consistent with the separate Residential category and incremental reduction in impervious area cited in preceding the San Diego County MS4 Permits (Orders No. 2001-01 and R9-2007-0001). The two preceding San Diego County MS4 Permits cite SFD PDP as a subdivision of 10 or more units.

To be consistent with the "watershed approach" to regulation, the City of Oceanside submits that the San Diego County watersheds continue the separate categorization of SFD and the PDP be defined as residential development of five (5) or more parcels or condominiums, consistent with a final map. This approach represents a compromise that reflects the incremental reduction in SFD PDP contained in previous San Diego County MS4 Permits.

Implementation of a lower impervious area threshold may reduce land development and redevelopment activities, and negatively affect funding sources that subsidize storm water programs.

2. Onsite retention of the 85th percentile volume (Section E.3.c.(2)(b)).

   Retention of 85th percentile volume has the potential to negatively affect habitat located in and adjacent to receiving waters by creating reduced runoff conditions that mimic a drought state. A review of historic rainfall data indicates that more than two-thirds of annual rainfall events do not meet the 85th percentile volume. The requirement to capture low-flow runoff has the potential to negatively affect habitat quality and may reduce the size of sensitive habitats.

3. Application of the "Naturally occurring pre-development condition" to Hydromodification Management Plan (HMP) calculations (Section E.3.c.(3)(a)).

   The proposed naturally occurring condition requirement will remove the incentive to redevelop existing sites by significantly increasing development costs. The application of the "naturally occurring pre-development condition" to HMP calculations is not consistent with the goals of the HMP, does not foster improvements in water quality, and conflicts with the recently implemented five (5) year HMP monitoring plan. Whereas, redevelopment of existing sites promotes improved water quality by decreasing pre-project impervious area, requires the implementation of Low Impact Development (LID) practices, and necessitates the installation of HMP facilities. Without redevelopment of existing projects, receiving waters will remain subject to unmitigated discharges.

   The adoption of a naturally occurring pre-development condition may cause a reduction in the redevelopment of existing sites and negatively affect funding sources that subsidize storm water programs.

The Administrative Draft MS4 Permit indicates the "San Diego Water Board recognizes that the degradation of water quality and impacts to beneficial uses of the waters in the San Diego Region [have] occurred over several decades" and "further recognizes that a decade or more may be necessary to realize demonstrable improvement to the quality

of waters in the Region." The Permit "includes a long term planning and implementation approach that will require more than a single permit term to complete."

The City of Oceanside supports the long term planning and implementation approach to improving water quality. Support of this approach is reflected in the proposed changes to the Administrative Draft MS4 Permit. The proposed changes discussed in this correspondence continue to represent a reduction in possible impacts due to development, as compared to previous Permits, and provides incentive to foster improvement in water quality through the redevelopment of existing unmitigated sites.

The City of Oceanside – Clean Water Program extends its gratitude to the Regional Board for providing a forum for open discussion as part of the permit reissuance process. We respectfully submit these comments for your consideration. Please contact me if you have questions.

Sincerely,

M. A. Lahsaiezadeh

Mo Lahsaie, Ph.D., REHS, Environmental Officer
Water Utilities Department

cc: Scott O. Smith, PE, PLS, City Engineer, Development Services Department
Billy Walker CPSWQ, QSD, Env. Asst, Development Services Department

THE CITY OF SAN DIEGO

SAN DIEGO REGIONAL
WATER QUALITY
CONTROL BOARD

2012 SEP 14 P 1:39

September 14, 2012

Mr. David Gibson
Executive Officer
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123

Subject: Administrative Draft Tentative Order No. R9-2012-0011

Dear Mr. Gibson:

Thank you for the opportunity to comment on the Regional Water Quality Control Board's Administrative Draft San Diego County Municipal Storm Water Permit (Tentative Order No. R9-2012-0011, hereinafter referred to as "Draft Permit"), released April 9, 2012. The City of San Diego (City) is committed to protecting and improving water quality in the San Diego Region. The Draft Permit represents a significant opportunity for the City to more efficiently achieve our storm water quality goals by facilitating a paradigm shift from prescriptive requirements to outcome-based goals that allow for innovation through adaptive management. Regional Board staff, including David Barker, Eric Becker, Wayne Chiu, Laurie Walsh, and Christina Arias should be commended for their efforts in meeting with the City and other Copermittees to better understand our opportunities and constraints. We are hopeful that together we are helping to improve the Draft Permit.

Attached to this letter are the City's requested changes to the Draft Permit with supporting rationale (see Attachments 1 and 2). Key recommendations in the City's comment table are summarized below.

- *Direct Regional Board staff to work with the Copermittees to update the Receiving Water Limitations language.* A key area of input requested by your staff during the review process is how the Draft Permit can be written so that jurisdictions can more clearly articulate their funding needs. The City believes the primary way is to ensure that compliance is clearly defined through implementation requirements. However, the "cause or contribute" language in Provision A has been judicially interpreted to prohibit any discharge from an MS4 outfall which exceeds a receiving water standard. Copermittees now face immediate and substantial liability if there is a single exceedance, irrespective of the City's efforts adhering to the Draft Permit's implementation requirements. This lack of a clear compliance pathway will make

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funding our compliance implementation programs and meeting our shared storm water quality goals more difficult. Specifically, required implementation activities would have to compete for limited funding with the need to respond to every exceedance, in order to avoid liability. To facilitate continued discussions with your staff, the Copermittees have proposed a redline of Provision A that remedies this problem and achieves the stated intent of Regional Board staff to support adaptive management and priority setting based on water quality needs. In addition, the City recommends incorporating any updated language that is developed as a result of the State Board's Receiving Water Limitations Language workshop scheduled for November 20, 2012.

- *Revise the land development requirements to provide more opportunities to comply on-site.* The City recommends an approach that encourages applicants to comply on-site, rather than offering off-site mitigation as the first compliance option. For example, the City supports encouraging implementation of Low Impact Development practices on development sites by providing alternative design standards that are reasonable and achievable on-site (see proposed revisions to Section II.E.3).

- *Replace the monitoring requirements in the Draft Permit with the strategic monitoring approach developed collectively by the Copermittees.* The Copermittees' approach will more efficiently and effectively address critical questions necessary to adaptively manage the City's programs and realize our storm water quality goals.

We appreciate this opportunity to share our comments and look forward to continued discussions in finding ways to improve and protect water quality. If you have any questions please contact Drew Kleis, Program Manager at (858) 541-4329.

Sincerely,

Kris McFadden
Deputy Director

KM:dk

Attachments: 1. City of San Diego comment table
2. City of San Diego proposed changes to Draft Permit

Permit Section	Permit Page (Original)	Section Title	Reason for Proposed Changes/Comments	Proposed Changes
Cover Page	1-2	Cover Page	The Copermittees request clarification that waste discharge requirements are for their respective jurisdictions, in order to limit the entire permit to within each Copermittee's jurisdictional boundaries and preempt any such clauses that would extend requirements beyond the Copermittee's jurisdiction.	**As shown in the attached revised Permit, revise the cover page as follows:** "The San Diego County Copermittees in Table 1a are subject to waste discharge requirements <u>within their respective jurisdictions</u> set forth in this Order" This change is also requested for other sections of the Permit, including Provision A. Add the same language for Orange and Riverside County Copermittees. **Also make this change to the cover page:** This Order provides permit coverage for the Copermittee discharges described in Table 2. <u>"Copermittees need only comply with permit conditions relating to discharges from the municipal separate storm sewers for which they are operators." 40 CFR §122.26(a)(3)(vi).</u>
General Comment	Multiple	Multiple	The term "prohibit" is broader than Clean Water Act requirements, and should be changed to "effectively prohibit." CWA section 402(p) (3) (B) (ii) reads as follows: (B) Municipal Discharge – Permits for discharges from municipal storm sewers – (ii) shall include a requirement to <u>effectively prohibit</u> non-stormwater discharges into the storm sewer; (<u>Emphasis</u> added)	**Revise language throughout the Permit to read as follows:** Change "prohibit" to "effectively prohibit."

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			The provision does not provide any reference to exemptions. Rather the section may be read that a permit shall "effectively prohibit non-stormwater discharges" but may exempt certain discharges that are not significant sources of pollutants from the prohibition. The section does not require a full prohibition but rather an effective prohibition. The operative word is "effective". The more precise and correct finding/provision should note that non-stormwater discharges are effectively prohibited (per 402 (p) (3) (B) (ii)). However discharges that are not significant sources of pollutants are exempted from the prohibition. In a practical sense the use of word "effective" provides flexibility to assess the impacts of relatively benign discharges such as landscape irrigation, air condition condensate, individual car washing, and non-emergency fire fighting flows or non-anthropogenic sources before instituting a prohibition.	
General Comment	Multiple	Multiple	Jurisdictional boundaries only partially define the geographic extent of areas where Copermittees can control, reduce, or prohibit stormwater pollutants. The other component that must be incorporated into the Permit language is ownership/operation. There can be multiple MS4s within a municipal boundary (e.g., Phase 2 MS4s), and some MS4 areas are neither owned nor operated by Copermittees, preventing them from controlling pollutants or flows. The	**Clarify/Make distinction between different MS4 classifications:** Throughout the Permit replace "MS4s" with "MS4s owned and operated by the Copermittee".

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			Permit should clarify that Permit requirements apply to MS4s owned and operated by the Copermittees. Other MS4 permits in California, including the Los Angeles County MS4 permit, include the "owned and operated" distinction.	
I. FINDINGS				
8	2	Jurisdiction	40 CFR 131.10(a) is applicable to waters of the U.S. for beneficial use designations. Application to waters of the state, which the Regional Board has asserted includes the MS4, beyond beneficial use designations is too broad of an interpretation. It could mean that, for example, storm drain inlet drainage inserts are no longer allowed as they would be a TCBMP in a waters of the state. This finding also conflicts with other Provisions requiring TCBMPs.	**As shown in the attached revised Permit, revise the sentence as follows**: Treatment control best management practices (BMPs) must not be constructed in waters of the U.S.
9	2	Discharge Characteristics and Runoff Management	Discharges may contain waste or pollutants, but it should not be presumed that they necessarily always contain waste or pollutants.	**As shown in the attached revised Permit, revise the section to:** "Discharges from the MS4s <u>may</u> contain waste, as defined in the CWC, and pollutants that adversely affect the quality of the waters of the state. A discharge from an MS4 is a "discharge of pollutants from a point source" into waters of the U.S. as defined in the CWA. Storm water and non-storm water discharges from the MS4s <u>may</u> contain pollutants that cause or threaten to cause a violation of surface water quality standards, as outlined in the Basin Plan."
11	3	Discharge Characteristics and Runoff Management	This finding does not apply to developed area that is subject to SUSMP or HMP requirements. These requirements are specifically designed to reduce loads.	**As shown in the attached revised Permit, revise the section to:** "Therefore, runoff leaving a developed area <u>not subject to SUSMP or HMP requirements</u> contains greater pollutant loads and is significantly greater in runoff volume velocity, and peak flow rate than pre-development runoff from the same area."
II. PROVISIONS				
A. Prohibitions and Limitations				

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A	9	Prohibitions and Limitations	The goals of Provision A are multiple, and the Copermittees appreciate the Regional Board's mission to "protect, preserve, enhance, and restore" water quality. For NPDES compliance purposes, however, a concise goal statement that is more central to MS4 permitting is requested. This goal statement provides context to several requested revisions to subsequent provisions. This goal statement is consistent with the intent of the permit program established by Section 402(p)(3)(B) of the Clean Water Act.	**As shown in the attached revised Permit, revise the second sentence of the introductory paragraph of Provision A to:** "The goal of this provision is to ~~protect, preserve, enhance, and restore the~~ address the impacts of MS4 discharges so that such discharges do not impair water quality and designated beneficial uses of waters of the U.S."
A	9	Prohibitions and Limitations	The proposed Prohibitions and Limitation provisions may be construed as stand-alone provisions that could expose the Copermittees to state and federal enforcement actions, as well as to third party actions under the federal Clean Water Act's citizen suit provisions. Consistent with the recent 9th Circuit Court of Appeal decision, each provision of the permit could be read separately so if provision A.2.a states that "the MS4 must not cause or contribute to a violations of a water quality standard" then that is the stand-alone provision, and the accompanying language found in A.4 (Compliance with Discharge Prohibitions) regarding compliance may be considered irrelevant. As such, a clear linkage between the compliance provisions and the prohibitions, receiving water limitations, and effluent limitations must be	**As shown in the attached revised Permit, insert the following sentence at the end of the introductory paragraph of Provision A:** "The process for determination of compliance with the Discharge Prohibitions (A.1), Receiving Water Limitations (A.2), and Effluent Limitations (A.3) is defined in Provision A.4." In this manner, Provisions A.1, A.2, and A.3 are clearly linked to A.4, as opposed to being standalone provisions.

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			established.	
A.1.a (and throughout)	9	Prohibitions and Limitations	Discharge prohibitions in this section should be limited to discharges from MS4s owned and operated by a Copermittee into waters of the U.S.	"Discharges ~~into and~~ from MS4s owned and operated by a Copermittee "
A.1.a (and throughout)	9	Prohibitions and Limitations	Provision A.1.a prohibits certain discharges into waters of the state. NPDES permits under the authority of the Clean Water Act regulate discharges into navigable (surface) waters. Expanding the scope of the Discharge Prohibitions to waters of the state would expand the scope of the Permit to protect groundwater. While the Board has legal authority to protect groundwater under Porter-Cologne, this exceeds federal requirements and would represent an unfunded mandate. Other MS4 permits in California, including the Los Angeles County MS4 permit, protect "waters of the United States." Also, see comment A.1.a.	Throughout the Permit, change "waters of the state" to "waters of the United States", where applicable (and throughout the Administrative Draft). The change for Provision A.1.a is as follows:
A.1.a	9	Prohibitions and Limitations	The Discharge Prohibitions do not establish a sufficient linkage with approved compliance schedules for TMDLs that have been incorporated into the Basin Plan. TMDLs adopted within the region include a schedule to provide MS4 Permittees the time necessary to develop and implement a plan to achieve water quality standards in impaired waters. The compliance schedules for effective TMDLs have been incorporated into Attachment E and language is included in the RWLs provisions (A.2.c.) and the Effluent	**As shown in the attached revised Permit:** "…in receiving waters of the United States ~~state~~ are effectively prohibited, unless the Copermittee is addressing the discharges through Provision A.1.e or A.4 through the process set forth in Provision A.4."

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			Limitations provisions (A.3.b.) pointing to the TMDL compliance schedules. However, by not including similar language within Discharge Prohibitions, these provisions could result in violations of the permit even though the implementation compliance dates have not yet passed. Without modification, the Discharge Prohibitions *conflict* with TMDL compliance schedules. Language should be included to clarify that in instances where a TMDL is in place, or a TMDL is being developed, the permittees shall achieve compliance with these provisions as outlined in Attachment E (Specific Provisions for Total Maximum Daily Loads).	
A.1.c	9	Prohibitions and Limitations	See comment A.1.a	Add the following: "…included in Attachment A to this Order, unless the Copermittee is addressing the discharges through Provision A.1.e or A.4 through the process set forth in Provision A.4."
A.1.d	9	Discharge Prohibitions	The first sentence seems to conflict with the remainder of the paragraph and may create a conflict with the State Water Board's policy if not clarified. The revised language clarifies authorized and unauthorized discharges to the ASBS and limits the jurisdiction. Furthermore, this Discharge Prohibition covers MS4 impacts on ASBS, and thus the Receiving Water Limitation is unnecessary and conflicting.	**As shown in the attached revised Permit, revise A.1.d as follows:** "~~Discharges from MS4s to ASBS are prohibited.~~ Stormwater discharges–from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 applicable to these discharges, included in Attachment A to this Order. All other discharges from MS4s to ASBS are prohibited, unless authorized by a subsequent order." In addition, A.2.c should be deleted.
	9		See comment A.1.a	**Add new part 1.e as follows:** "For discharges associated with

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A.1.e (new)		Prohibitions and Limitations		water body pollutant combinations addressed in a TMDL in Attachment E of this Order, the affected Copermittees shall achieve compliance as outlined in Attachment E (Total Maximum Daily Load Provisions).
A.2.a	9-10	Receiving Water Limitations	The receiving water limitations language contained in Provision A raises significant legal and policy issues that require further discussion and revision. The receiving water limitations language in Provision A generally follows the language required by the State Board's precedential Order WQ 99-05. In the State Board's precedential Order WQ 2001-15, the State Board determined that the mandatory receiving water limitations language found in Order 99-05 "does not require strict compliance with water quality standards." Instead, the State Board concluded that compliance with water quality standards is "to be achieved over time, through an iterative approach requiring improved BMPs." Despite this policy statement from the State Board, in 2011, the 9th Circuit interpreted the State Board's mandatory language in a manner that requires strict and immediate compliance with water quality standards. The State Board has recently scheduled a workshop for November 20 to address the receiving water limitations language. The San Diego Co-Permittees support revisions to the receiving water limitations language that align the language with the State Board's policy that compliance with water quality standards is "to be achieved over time, through an iterative approach	**To provide a more direct tie in between Provision A.2.a, TMDL compliance schedules and A.4.a. the following language is proposed, as shown in the attached revised Permit**. Provision A.2.a should be revised to make clear that compliance with the Receiving Water Limitations is determined by compliance with the iterative process. The City of San Diego has proposed redline language, however, at this time in anticipation of the State Board's forthcoming November workshop on this important issue, which will presumably inform the development of state-wide language, the City of San Diego requests the Regional Board staff coordinate with the City and the Copermittees to develop updated RWL language.. The proposed language provided in the strikeout version of Provision A.1.a provides an example of an approach for addressing this issue in Provision A.2.a.

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			requiring improved BMPs." The redlines submitted with these comments are not designed to address all the issues raised by this conflict. Instead, the redlines address, for this draft permit, how compliance with water quality standards will be achieved for water bodies covered by an adopted TMDL or covered in the WQIPs. The City of San Diego will participate in the State Board process regarding the larger issues involving the receiving water limitations language, and encourage the Regional Board to do so as well. Without modification to the RWLs, they conflict with TMDL compliance schedules. Language should be included to clarify that in instances where a TMDL is in place, or a TMDL is being developed, the permittees shall achieve compliance with these provisions as outlined in Attachment E (Specific Provisions for Total Maximum Daily Loads). Without the requested change, the RWLs put the municipalities in immediate and ongoing non-compliance with the permit, as opposed to incorporating TMDL implementation schedules.	
A.2.a.3.b	10	Receiving Water Limitations	The Sediment Quality Control Plan applies specifically to bays and estuaries and only and subtidal surficial sediments that have been deposited or emplaced seaward of the intertidal zone. Many Copermittees do not discharge to the intertidal zone. Text must	**As shown in the attached revised Permit, revise A.2.a.3.b as follows**: "Sediment Quality Control Plan which includes the following narrative objectives <u>for bays and estuaries:"</u>

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			be revised to clarify that this does not apply to inland MS4 discharges.	
A.2.a.4.b.	10	Receiving Water Limitations	Footnote to A.2.a.4.b requires Copermittees to not cause or contribute to the more stringent of a water quality objective or a CTR criterion. Instances may exist where it has been determined that one or the other is more appropriate given site specific conditions or analysis (i.e., a TMDL has been established).	**As shown in the attached revised Permit, attach the following to the end of footnote 3 regarding the California Toxics Rule**: "unless a previous regulatory action (i.e., TMDL) has specified otherwise."
A.2.b	10	Receiving Water Limitations	See Comment A.2.a	**As shown in the attached revised Permit, add the following as A.2.b**: "For receiving water limitations associated with a water body pollutant combination addressed in a TMDL in Attachment E of this Order, the Copermittees shall achieve compliance as outlined in Attachment E (Total Maximum Daily Load Provisions)."
A.3	11	Effluent Limitations	Two types of effluent limitations, technology-based and water-quality based, are described in A.3, which should be reflected in the Permit.	**As shown in the attached revised Permit, add subsections (a) for Technology-based and (b) and Water Quality-based Effluent Limitations, respectively.**
A.3	11	Effluent Limitations	Similar to the WQBELs, the technology-based effluent limits should be linked to Provision A.4 as described in the comment A.3 below.	**As shown in the attached revised Permit, please add the following language to the end of the sentence that ends with "must be reduced to the MEP":** "reduced to the MEP~~.~~, through timely implementation of control measures and other actions as specified in Provisions B and E as described in Provision A.4."
A.3	11	Effluent Limitations	The effluent limitations and compliance with limitations should be more accurately linked to Attachment E; currently the language reads in a manner that is stand-alone from Attachment E. Instead, the language should reference Attachment E	**As shown in the attached revised Permit, revised the WQBEL language in A.3(b) as follows to better reflect the role of Attachment E:** "For a water body-pollutant combination addressed in a TMDL in Attachment E of this Order, ~~Pollutants~~ pollutants in discharges from MS4s must be reduced to comply with ~~any~~ effluent

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			and the compliance determination language the Copermittees propose for inclusion therein. The language should say "as described in" Attachment E rather than "in." In addition, compliance with effluent limitations should be linked to Provision A.4 as described in the next comment.	limitations expressed as WQBELs required to meet the WLAs established for ~~the~~ those TMDLs as described in Provision A.4 and Attachment E to this Order, pursuant to the applicable TMDL compliance schedules."
A.4	11	Compliance with Discharge Prohibitions and Receiving Water Limitations	The intent of Provision A.4 is to determine compliance with A.1, A.2, and A.3 through the Water Quality Improvement Plan(s). As such, the title should reference all three Provisions. References should also be added in the introductory paragraph for clear linkage with the applicable Provisions (A.1, A.2, A.3, B, and F.1).	Change Provision A.4 title to : "Compliance with Discharge Prohibitions, Receiving Water Limitations, and Effluent Limitations" Modify language as follows: "Each Copermittee must comply with the discharge prohibitions (A.1), ~~and~~ receiving water limitations (A.2), and effluent limitations (A.3) of this Order through timely implementation of strategies, control measures, and other actions as specified in Provisions B and E of this Order, including any modifications. The Water Quality Improvement Plans described in Provision B shall be designed to achieve compliance with the discharge prohibitions, receiving water limitations, and effluent limitations. Copermittees shall be considered in compliance with A.1, A.2, and A.3 unless the Regional Board has denied approval of a Water Quality Improvement Plan or subsequent update as described in Provisions B and F.1."
A.4.a.1	11	Compliance with Discharge Prohibitions and Receiving Water Limitations	Provision A.4 describes the iterative process for MS4s to respond to exceedances of water quality standards that persist. However, the language in A.4 appears too broad and suggests the Copermittees should revise their WQIPs even in cases when (1) TMDL pollutant WLAs are exceeded but the TMDL compliance date has not yet occurred and (2) non-TMDL pollutant RWLs are exceeded and the pollutant is a	**As shown in the attached revised Permit, modify language as follows:** **"**For pollutants that are not in the process of being addressed via specific, scheduled actions in the Water Quality Improvement Plan, u ~~U~~pon determination by either the Copermittees or the San Diego Water Board that discharges from the MS4 are causing or contributing to an exceedance of an applicable water quality standard…"

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			WQIP priority but the BMP implementation schedule described in the WQIP has not yet been exhausted. In these two cases, the water quality standards exceedances are "expected" and no WQIP update is needed; instead the Copermittees should simply complete the implementation of actions identified in the WQIP.	**Insert a new A.4.a.(2) as follows:** "For pollutants in the process of being addressed via a specific, scheduled program in a Water Quality Improvement Plan, the Copermittee(s) shall continue to implement that program as described in the Water Quality Improvement Plan approved by the Regional Board."
A.4.a.1	11	Compliance with Discharge Prohibitions and Receiving Water Limitations	Provision A.4.a.1 states that in the case of persistent water quality standard exceedances, Copermittees shall update their WQIPs in their Annual Reports, "unless the San Diego Water Board directs an earlier submittal." This provision should also consider the scenario where a TMDL is in the process of being developed. In this case, the Copermittees should update their numeric targets/goals to reflect the TMDL WLAs. However, until the TMDL is adopted, the Copermittees have no TMDL WLAs on which to base their numeric goals.	**As shown in the attached revised Permit, add an exception to Provision A.4.a.(1) to acknowledge forthcoming TMDLs, as follows:** "…the Copermittees must submit the following updates to the Water Quality Improvement Plan required under Provision B as part of the Annual Report required under Provision F.3.b, or Water Quality Plan Update Provision B.5.a, unless the San Diego Water Board either: 1) directs an earlier submittal; or 2) allows for the adoption of a forthcoming TMDL to establish wasteload allocations that will form the basis of revisions to the Water Quality Improvement Plan:"
A.4.a.1.b	11	Compliance with Discharge Prohibitions and Receiving Water Limitations	Language clarification.	**As shown in the attached revised Permit, revise wording, as follows:** "~~Additional w~~ Water quality improvement strategies (e.g., BMPs, retrofitting projects, stream and/or habitat rehabilitation, restoration projects, etc.)"
A.4.a.1.e and A.4.a.1.f	12	Compliance with Discharge Prohibitions and Receiving Water Limitations	Copermittees need more than 30 days to update and implement their plans. The San Diego Water Board should also provide a timeline for providing comments and requesting modifications. The timeline should be reasonable and consistent with the Copermittee implementation timeline. Most importantly, the revision process should be identical to the modification and submission	**As shown in the attached revised Permit, revise section A.4.A.2., as follows:** Strike the current language in sub-bullet (e) and replace it, as follows: (e) "As described in Provision B.6, Copermittees must submit requested modifications to the Water Quality Improvement Plan either in the Annual Report required pursuant to Provision F.3.b,

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			process described in Provision B.	or as part of the Report of Waste Discharge (ROWD) required pursuant to Provision F.5.b." Replace the language in sub-bullet (f) with language that is identical to the language in Provision B, as follows: (f) "As described in Provision B.6, upon ~~Within 30 days of the~~ San Diego Water Board determination that the update to the Water Quality Improvement Plan meets the requirements of this Order, the Copermittees must submit requested modifications to the jurisdictional runoff management programs either in the Annual Report or Report of Waste Discharge (ROWD) required pursuant to Provision F.5.b." Strike the remaining language in (f).
A.4.b	12	Compliance with Discharge Prohibitions and Receiving Water Limitations	Provision A.4.b notes that should water quality exceedances continue to occur even after the MS4 has engaged in the "iterative" process and is implementing enhanced water quality improvement strategies, the MS4 must still redo the "iterative" process unless the Regional Board decides otherwise. This approach is not consistent with other stormwater permits (e.g., the recent Caltrans permit) in which the Copermittee does not have to reinstitute the iterative process unless directed to do so by the Regional Board. This distinction is important, as the WQIP process will be underway throughout the course of the Permit, and being required to "re-iterate" when a process is already underway to address exceedances is unreasonable.	**To match the language in Order 99-05, as shown in the attached Revised, replace A.4.b with the following language:** "So long as the Copermittees have complied with the procedures set forth above and are implementing the Water Quality Improvement Plan(s) approved by the Regional Board, the Copermittees do not have to repeat the same procedure for continuing or recurring exceedances of the same discharge prohibitions, effluent limitations, and receiving water limitations unless directed to by the San Diego Water Board. "
A.4.c	12	Compliance with Discharge Prohibition and	The Copermittees envision WQIPs as the foundation for a BMP-based compliance	**Remove Section A.4.c.**

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		Receiving Water Limitations	approach for the Discharge Prohibitions and RWLs. However, the language in the Provision A does not clearly link compliance with the iterative process set forth in the WQIPs. In essence, the language suggests that even if Copermittees expend significant resources to develop and fully implement WQIPs that are progressing towards attainment of water quality standards, they may still be found to be out of compliance for single exceedances. The iterative process is a fundamental aspect of MS4 programs, as envisioned by State Water Board Order 99-05 and later reconfirmed in Order WQ 2001-15 (BIA Order), and is the mechanism by which MS4 Permittees should <u>demonstrate</u> compliance (i.e., implementation of the iterative process equals compliance). The WQIPs now provide a mechanism to "raise the bar" with regards to the detail and quantitative analyses used to identify pollutant sources, implement BMPs to address those sources, and increase the number or size of BMPs until water quality standards are attained. However, as Provision A.4 is written, the envisioned strategic compliance process falls short, and the WQIPs are simply documents that do not appear to have a meaningful linkage to MS4 compliance. An unintended but potentially significant consequence of this compliance uncertainty is that Copermittees will be faced with	

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			increased difficulty successfully securing program funding because even substantial increases in funding would not eliminate the potential for non-compliance.	
B. Water Quality Improvement Plans				
B	13	Water Quality Improvement Plans	Similar to comments regarding the goal statement in Provision A, the Copermittees request a revision to the WQIP goal statement. A concise goal statement that is more central to MS4 permitting is requested. This goal statement provides context to several requested revisions to subsequent provisions.	**As shown in the attached revised Permit, revise the second sentence of the first paragraph of Provision B as follows:** "The goal of the Water Quality Improvement Plan is to 1) effectively prohibit non-storm water discharges into the MS4s, 2) reduce pollutants in storm water discharges from the MS4s to the MEP, and 3) support the attainment and reasonable protection, preservation, and enhancement ~~and restoration~~ of water quality and designated beneficial uses of waters of the state."
B	13	Water Quality Improvement Plans	Similarly, the Copermittees request revisions to the required/critical elements of the WQIPs. These elements reflect several requested revisions to the WQIP process (e.g., B.2), described below.	**As shown in the attached revised Permit, revise the second paragraph of Provision B as follows:** The Copermittees must develop Water Quality Improvement Plans for each Watershed Management Area that 1) prioritize water quality ~~issues~~conditions resulting from the Copermittee's MS4 discharges to and from the MS4s within each Watershed Management Area, 2) identify MS4 pollutant sources and other stressors associated with ~~those~~the water quality priorities, 3) define numeric ~~targets~~goals and schedules to ~~achieve improvement of~~address water quality priorities, 4) describe water quality improvement strategies to achieve numeric ~~targets~~goals, and 5) develop and execute a coordinated monitoring and assessment program to facilitate adaptive management of the Water Quality Improvement Plans and ~~determine progress towards achieving improved water quality~~those goals.
B	13	Water Quality	The Copermittees envision the WQIPs as the foundation for a BMP-based compliance	**As shown in the attached revised Permit, insert the following into the first paragraph of Provision B:**

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		Improvement Plans	approach for the Discharge Prohibitions and RWLs. However, language needs to be added to Provision B to provide a clear linkage between Provision A and B. Note that Provision A.2 is excluded to acknowledge the State's November workshop regarding Receiving Water Limitations. However, it seems logical that RWLs would be included, and we request that Regional Board staff coordinate with the Copermittees to develop updated RWL language.	Therefore, implementation of the WQIPs also provides the basis for complying with Provisions A.1 and A.3, as described in Provision A.4.
B	13	Water Quality Improvement Plans	It is unclear whether the 12-month timeline identified in the third paragraph of Provision B applies to the development of the WQIP or the implementation of the BMPs identified in the WQIP. It would appear that the provision requires that the MS4s must *implement* all the requirements (including BMPs) of Provision B within 12 months of permit adoption.	**As shown in the attached revised Permit, revise the last introductory paragraph of Provision B, as follows:** The Copermittees must submit Water Quality Improvement Plans for public review and Regional Board Executive Officer review and approval per the schedule outline in Provision B.
B	13	Water Quality Improvement Plans	The development of a WQIP will require at a minimum of 18 months and BMP implementation will likely be staggered over a certain time frame. Once the permit is adopted, Copermittees will begin the planning process. However, Copermittees must have at least one full fiscal year budgeting cycle within which to seek additional funding to implement the WQIP from our governing bodies (i.e., City councils and County supervisors). Thus the more reasonable time schedule is to require	**See the proposed changes to the last paragraph of the opening section of Provision B in the attached revised Permit.** Also see the new Section B.6, which combines the submittal, modification, and implementation requirements. 1. The complete WQIPs and corresponding jurisdiction measures are submitted within 18 months. (B.6.a) 2. WQIP implementation is initiated at the beginning of the next fiscal year. (B.6.a) 3. JRMPs are modified in accordance with WQIP

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			the development of the WQIP within 18 months and the implementations of the BMPs to occur consistent with the final approved WQIP.	modifications (B.6.b)
B.1	13-14	Watershed Management Areas	Several changes to Table B-1 are requested. The Copermittees request addition of a tenth WMA, for Mission Bay which is entirely in the jurisdiction of the City of San Diego. Furthermore, the City of Poway is not a responsible Copermittee for San Diego River. City of Escondido is not a responsible Copermittee for San Luis Rey River. Finally, the waterbody Loma Alta Slough should be listed under the Carlsbad WMA. Peñasquitos WMA includes Miramar Reservoir HA and Poway HA.	**Make the following changes to Table B-1, per the attached revised Permit:** 1. Add a WMA for Mission Bay which includes Scripps HA, Miramar HA, and Tecolote HA. 2. Remove Peñasquitos HA and Mission Bay HA from Peñasquitos WMA and insert Miramar Reservoir HA and Poway HA. 3. Remove City of Poway from San Diego River 4. Remove City of Escondido from San Luis Rey River. 5. Add the waterbody "Loma Alta Slough" to the Carlsbad WMA.
B.2	15-18	Identification of Water Quality Priorities	The Copermittees have fully embraced the concept of WQIPs and appreciate the Regional Board's approach to identifying priorities, setting goals, and developing a strategy and schedule to meet those goals. The Copermittees have identified an alternative to Provision B.2, which follows the general approach proposed by the Regional Board but increases focus on addressing MS4 impacts.	The following changes are requested, as detailed in the attached revised Permit section B and further described in subsequent comments: 1. Revisions are proposed to section B.2.a to refine the purpose and add considerations for assessing receiving water conditions. 2. A new section B.2.b is proposed to provide a linkage between receiving water conditions and corresponding impacts from the MS4s (versus other sources). 3. Section B.2.c is expanded to describe the considerations when identifying priority receiving water conditions. 4. Section B.2.d is refined to focus on MS4 impacts and pollutant generating activities. 5. Section B.2.e is refined to elucidate the meaning of numeric goals and their implication for MS4 compliance. 6. The schedule component of B.2.e is moved to a new section B.6 to improve organization of WQIP concepts.

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B.2.a	15-16	Assessment of Receiving Water Conditions	The assessment of receiving water conditions is a critical first step to WQIP development. Changes to purpose of this step are proposed, to focus on water quality issues related to MS4s. Further, data quality and relevance are critical to this assessment, and requirement to consider "all available data" should be refined to address accessibility and quality control issues. Finally, whether a receiving water condition can be achieved and maintained should be assessed.	**As shown in the attached revised Permit, the following changes/revisions were made in Permit section B.2.a:** **Revise the opening paragraph**: "The Copermittees must consider the following, at a minimum, to support the identification of water quality priorities based on the impacts of MS4 discharges on receiving water beneficial uses:" **Under part (7):** replace "All available data" with "Available, relevant, and appropriately collected…data meeting appropriate QA/QC standards" **Insert a new part (10):** "The potential for long-term achievement and maintenance of beneficial use attainment in the Watershed Management Area."
Language Addition B.2.b	Not in original 16	Assessment of MS4 Discharge Quality and Impacts	For WQIP development, it is critical to differentiate between receiving water conditions and MS4 discharges and impacts. Many receiving water conditions are not driven by MS4 impacts, and Copermittees can have the greatest effect on receiving water quality by focusing on reduction of pollutants discharged by their MS4s.	**As shown in the attached revised Permit, add a new section B.2.b titled "Assessment of MS4 Discharge Quality and Impacts", as follows:** "To support the identification of priorities based on the impacts of MS4 discharges on receiving water beneficial uses, the Copermittees must review appropriately collected MS4 discharge quality data and consider the extent to which MS4s cause or contribute to the adverse impacts to receiving water beneficial uses identified in B.2.a. Considerations include: (1) Locations of the Copermittees' MS4 discharges with respect to receiving waters; (2) MS4 discharge quality results relevant to impacts in receiving waters and action levels, including the temporal and geographic variation of the results: (3) The requirements of Provisions A.1 and A.3.; and (4) Whether MS4 discharge quality is sufficiently well known or other information is available to assess whether MS4 discharges are causing or contributing to specific receiving water

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				conditions, or whether additional data need to be collected through the Monitoring and Assessment Program developed as part of the Water Quality Improvement Plan."
B.2.b	16-17	Identify Priority Pollutants and Receiving Water Conditions	We appreciate the Regional Board's approach to identifying priorities for receiving water conditions. Our proposed revisions to the Permit add several elements that should be included by Copermittees when identifying priority receiving water conditions. Following the Regional Board's approach, "priorities" are also differentiated from "highest priorities." Note the proposed revision to the title of the section, which better reflects the envisioned effort/outcome.	Move B.2.b down to B.2.c. **As shown in the attached revised Permit, make two changes:** **#1: Revise the last paragraph of B.2.c as follows:** The Copermittees must identify the highest water quality priorities to be addressed by the Water Quality Improvement Plan, <u>and describe the reasoning for selecting a subset of receiving water conditions as the highest priority(ies).</u> **#2: Rename section to "Identification of Priority Receiving Water Conditions" and add the following to the end of the Section B.2., as follows:** The Water Quality Improvement Plans shall describe the following for the highest priority receiving water condition(s): (1) The beneficial use(s) and pollutant(s) associated with the priority receiving water condition(s); (2) The geographic extent of the priority receiving water condition(s)within the WMA, if known; (3) The Copermittees with MS4s that contribute discharges to the priority water receiving condition(s); (4) The temporal extent of the priority receiving condition(s) (i.e., dry weather and/or wet weather); and (5) Whether receiving waters have been monitored sufficiently to adequately characterize the priority receiving condition(s), including a consideration of spatial and temporal variation"
B.2.c	16-17	Pollutant Source and/or Stressor	The success of WQIPs will hinge on the ability of MS4s to identify and abate	**As shown in the attached revised Permit, rename section to**

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		Identification	sources of pollutants within the MS4s. The pollutant source identification process proposed by the Regional Board is too broad and inhibits the Copermittees from focusing on the sources they are most able to control. In addition, some pollutants are poorly understood and need to be further investigated to allow for design of pollutant control strategies [new sub-bullet d.(4).(5)]. The proposed revisions to the Source ID section are intended to effectively focus the WQIP prioritization process.	**"MS4 Pollutant Source Identification" and revise the section, as follows:** See the changes proposed in the attached revised Permit, which focuses the Source ID section on MS4 sources and impacts. **The new section B.2.d follows:** "The Copermittees must identify <u>and prioritize</u> known and suspected storm water and non-storm water pollutant sources within the MS4 associated with the highest priority receiving water conditions identified under B.2.c. The identification of known and suspected sources of the highest water quality priorities as identified for Provision B.2.c shall consider the following : (1) Land uses and their potential contribution to the highest priority receiving water conditions; (2) Pollutant generating facilities, areas, and/or activities within the Watershed Management Area;: (3) Locations of the Copermittees' MS4s outfalls. (4) Review of available data, including: (a) Findings from the Copermittees' illicit discharge detection and elimination programs, (b) Findings from the Copermittees' MS4 outfall monitoring, (c) Other available, relevant, and appropriately-collected data, information, or studies related to pollutant sources and pollutant-generating activities that contribute to the highest priority receiving water conditions identified in Provision B.2. (5) Whether MS4 sources are sufficiently well known to design an effective, directed control strategy, or whether additional source/stressor identification needs to be conducted through the Monitoring and Assessment Program developed as part of the Water

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				Quality Improvement Plan to identify and prioritize sources/stressors within the watershed."
B.2.d	17-18	Numeric Targets and Schedules	We appreciate the Board staff efforts to allow the MS4s to prioritize their water quality issues and to develop a plan to address these issues. However, the terminology in Provision B.2.d regarding interim and final targets are terms used in TMDL program and their use here confuses the issue. In fact, Provision 2.d (3)(e) clearly ties the numeric "targets" with a TMDL. The WQIP should identify interim and final numeric "goals" to keep the distinction clear between a TMDL and a WQIP. It is entirely possible that the interim goal may in fact be the same as an interim TMDL target but not necessarily.	**Replace "numeric target" with "numeric goal" throughout Provision B.**
B.2.e	17-18	Numeric Targets and Schedules Numeric Goals (Title Revision)	It will be critical to quantify the expected outcomes of WQIP implementation efforts, and numeric goals serve to elucidate those expected outcomes. Based on the proposed revisions to the WQIP goals and elements, revisions to the description of the purpose of numeric goals are also proposed. Furthermore the notation of "target" implies a compliance effluent limit and thereby subject to enforcement action, versus goals set by the Copermittees that do not trigger any enforcement action by themselves.	**As shown in attached revised Permit, revise section B.2.e.(1)-(2), as follows:** The Copermittees must develop and incorporate interim and final numeric goals into the Water Quality Improvement Plans. Numeric goals and schedules are intended to support Water Quality Improvement Plan development and to measure progress towards addressing the highest priority receiving water conditions identified under B.2.b. Numeric goals are not enforceable compliance standards, effluent limitations, or receiving water limitations. When establishing numeric goals and corresponding schedules, the Copermittees must consider the following: (1) Final numeric goals must be based on measureable criteria or indicators, to be achieved in the receiving waters and/or MS4 discharges for the highest priority receiving water conditions which will be capable of demonstrating progress toward the achievement of the

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				restoration and/or protection of water quality standards in receiving waters; and (2) Interim numeric goals must be based on measureable criteria or indicators that can demonstrate incremental progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges. **Footnote 7:** "Interim and final numeric goals may take a variety of forms such as TMDL targets, TMDL wasteload allocations, TMDL based WQBELs incorporated in Attachment E of this Order, action levels, pollutant concentration, load reductions, number of impaired water bodies delisted from the List of Water Quality Impaired Segments, Index of Biotic Integrity (IBI) scores, or other appropriate metrics. Interim and final numeric goals are not necessarily limited to one criterion or indicator, but may include multiple criteria and/or indicators. To the extent that a goal is not based on an enforceable regulatory mechanism (i.e., TMDL, WLA), WQIP goals and schedules may be revised through the iterative process. Numeric goals are not subject to enforcement or non-compliance actions under this Order."
B.3	18-19	Water Quality Improvement Strategies and Schedules	The current version of B.3 requires that the MS4s have <u>all</u> of the following water quality improvement strategies in their WQIP (sub-bullets B.3.a.1 through B.3.a.4): structural and non-structural BMPs, retrofit projects, stream and/or habitat rehabilitation, and other water quality improvements associated with eliminating non-stormwater discharges to the MS4s. This may be an appropriate menu of actions to choose from, but pending the water quality issues and the watershed, the WQIP strategies may include all or only one of the	**As shown in the revised Permit, revise section B.3, as follows:** See the changes proposed in the attached revised Permit section B.3. Sub-bullets B.3.a.1 through a.4 are revised and condensed into two sub-bullets, one for JRMP activities and one for other structural and non-structural BMPs. The two sub-bullets (1) and (2) compose the universe of BMPs that would be implemented by the Copermittees to meet the WQIP numeric goals. **a. WATER QUALITY IMPROVEMENT STRATEGIES** The water quality improvement strategies must prioritize, based on their likely effectiveness and efficiency, and

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			strategies listed.	implement measures, as appropriate, to effectively prohibit non-storm water discharges into its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, and achieve the interim and final numeric goals in accordance with the schedules in Provision B.2.e. Measures include: (1) Copermittee-selected activities identified in Provision E ,either as described in the jurisdictional runoff management programs or as modified with justification, that will address priority receiving water conditions; and (2) Additional structural and/or non-structural BMPs, as selected by the Copermittee, that are designed to achieve the interim and final numeric goals identified in Provision B.2.e.
B.3.b	19	Implementation Schedules	The requirement that "Final dates for achieving final numeric targets must not extend more than 10 years..." may be broadly misinterpreted as currently written with major implications. Based on conversations with Regional Board staff, it is understood that goals can take a number of forms and the "10 year" requirement is not intended as a requirement to attain all Basin Plan water quality standards within 10 years. However, to ensure this requirement is not misinterpreted by third parties, language should be added to make this clarification.	**As shown in the attached revised Permit, add a footnote to sub-bullet (5), as follows:** "Achievement of final numeric goals within 10 years represents progress towards attainment of water quality standards, but is not a requirement to fully attain all applicable water quality standards or all priority receiving water conditions within 10 years."
B.4	19-20	Water Quality Improvement	Monitoring and assessment will be a critical component of the WQIP process. The vision for WQIP monitoring and assessment is	As shown in the attached revised Permit revise section B.4, as follows:

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		Monitoring and Assessment	reflected in the proposed revised language for Permit section B.4. A major aspect of this vision is that monitoring requirements in Provision D will be fully integrated into the WQIPs and modified as the WQIPs evolve. The proposed language clarifies the Copermittee's vision for purpose and components of WQIP monitoring and assessment. The requested linkage with Provision D is highlighted through the proposed revision.	The Copermittees in each Watershed Management Area must develop an integrated Water Quality Improvement Plan Monitoring and Assessment Program that assesses: 1) progress toward achieving the numeric goals and schedules, 2) progress toward addressing the highest priority receiving water conditions for each Watershed Management Area, and 3) each Copermittee's overall efforts implementing the requirements of Provision B[10]. The water quality improvement monitoring and assessment program must include the monitoring and assessment requirements of Provision D, which may be modified for consistency with the priority receiving water conditions of each Watershed Management Area and associated Copermittees. For Watershed Management Areas with applicable TMDLs, the water quality monitoring and assessment program must incorporate the specific monitoring and assessment requirements of Attachment E. For Watershed Management Areas with any ASBS, the water quality monitoring and assessment program must also incorporate the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-001**2** (see Attachment A).
B.5	20-21	Adaptive Management Process	The WQIPs provide an opportunity to synchronize water quality improvement strategies (e.g, TMDL implementation) and jurisdictional runoff management programs. The Adaptive Management section B.5 proposed by the Regional Board has two components: WQIP adaptive management and JRMP adaptive management. With the proposed expanded scope of the WQIPs proposed by the Copermittees, the two components of the adaptive management process are not WQIP and JRMP, instead the components are (1)	**As shown in the attached revised Permit revise section B.5, as follows:** The Copermittees in each Watershed Management Area must implement the iterative process, adapting the Water Quality Improvement Plan, jurisdictional runoff management programs and monitoring and assessment programs, as necessary, to become more effective and meet the requirements of Provisions A, and shall consider the following: **a. PRIORITY RECEIVING WATER CONDITIONS AND NUMERIC GOALS** The priority receiving water conditions and numeric goals, developed pursuant to B.2.c. and B.2.e respectively, shall guide jurisdictional implementation efforts for the duration of this Order. Recommendations

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			Priority Receiving Water Conditions and Numeric Goals and (2) Water Quality Improvement Strategies and Schedules. The proposed revisions to section B.5 reflect the Copermittee's vision for WQIP implementation. Most of the components of the adaptive management process proposed by the Regional Board (sub-bullets B.5.a.1.a thru h and B.5.b.1.a thru e) are included. The proposed language adds clarification on the purpose of the adaptive management process and re-organizes into two alternative management categories: (1) Priority Receiving Water Conditions and Numeric Goals and (2) Water Quality Improvement Strategies and Schedules. Note that these two management categories are adapted on different timelines: • Priority Receiving Water Conditions and Numeric Goals would be adapted, at a minimum, on a frequency that corresponds to Permit cycles (every 5 years). In this manner the ROWD for future permits is supported by the WQIP process. It is <u>not</u> expected that priority receiving water conditions and numeric goals would vary on a shorter frequency, and thus resources for adaptive management should be focused on the strategies/BMPs used to *achieve* the	for changes to priority receiving water conditions and numeric goals shall be provided in the Report of Waste Discharge and shall consider the following: (1) Achieving the outcome of improved water quality in MS4 discharges and receiving waters through implementation of the water quality improvement strategies identified in the Water Quality Improvement Plan; (2) Progress toward achieving interim and final numeric goals in receiving waters and/or MS4 discharges for the highest water quality priorities in the Watershed Management Area (3) New scientific information or new or updated policies or regulations that affect identified numeric goals including revised water quality objectives or TMDLs; (4) Spatial and temporal accuracy of monitoring data collected to inform prioritization of water quality problems and implementation measures to address the highest priority receiving water conditions; (5) Availability of new information and data from sources other than the jurisdictional runoff management programs within the Watershed Management Area that informs the effectiveness of the actions implemented by the Copermittees; (6) The factors listed in Provision B.2.a.(1)-(10); (7) San Diego Water Board recommendations; and

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			numeric goals. • Water Quality Improvement Strategies and Schedules would be adapted annually, allowing modification to the JRMP elements, structural BMPs, and non-structural BMPs for achieving numeric goals. Finally, to improve organization, it is proposed that the requirements regarding WQIP and JRMP modification and submittals (sub-bullets B.5.a.2 thru 3 and B.5.b.2 thru 3) be moved to a new section B.6.	(8) Recommendations for modifications solicited through a public participation process. **b. WATER QUALITY IMPROVEMENT STRATEGIES AND SCHEDULES** The water quality improvement strategies and schedules required pursuant to B.3and B.4 shall be adapted as new information becomes available to inform more effective and efficient means of achieving the numeric goals established in B.2.e. Copermittees shall consider adaptation to jurisdictional programs and monitoring and assessment strategies and schedules at least annually considering the following when applicable: (1) Changes to priority receiving water conditions and numeric goals based on recommendations from B.5.a.; (2) Measurable or demonstrable reductions of non-storm water discharges to each Copermittee's MS4; (3) Measurable or demonstrable reductions of pollutants in storm water discharges from each Copermittee's MS4 to the MEP; (4) Information on the MS4 sources and/or pollutant-generating activities determined to be most significantly contributing to priority receiving water conditions; (5) Efficiency in implementing the Water Quality Improvement Plan; (6) San Diego Water Board recommendations; and

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				(7) Recommendations for modifications solicited through a public participation process.
B.6	21	Water Quality Improvement Plan Implementation	The development of a WQIP will require at a minimum of 18 months and BMP implementation will likely be staggered over a certain time frame. Once the permit is adopted, Copermittees will begin the planning process. However, Copermittees must have at least one full fiscal year budgeting cycle within which to seek additional funding to implement the WQIP from our governing bodies (i.e., City councils and County supervisors). Thus the more reasonable time schedule is to require the development of the WQIP within 18 months and the implementations of the BMPs to occur consistent with the final approved WQIP. Furthermore, adaptive management submittals (i.e., WQIP, JRMP and monitoring modifications) and modifications should be specified under Provision F. In this manner, submittal requirements will be organized and easier for Permittees to follow. As such, the submittal requirements that were previously described under section B.5.a.2 thru 3 and section B.5.b.2 thru 3 were modified and moved to Provision F.	**As shown in the attached revised Permit revise section B.6, as follows:** **6. Water Quality Improvement Plan Submittal, Implementation, and Modifications** Requirements for Water Quality Improvement Plan submittals and modifications are described in Provision F. Requirements for corresponding modifications to the jurisdictional runoff management programs and monitoring and assessment program are also described in Provision F. Copermittees must commence with implementation of the Water Quality Improvement Plan no later than the fiscal year (July 1) following San Diego Water Board approval of the Water Quality Improvement Plan.
C. Action Levels				
C. (Intro)	22	Action Levels	The Draft Order in Provision B states that	**As shown in the attached revised Permit, revise introductory**

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			the goal of the WQIP is to identify the highest water quality priorities within a watershed and implement strategies to achieve improvements in the quality of discharge and receiving waters. Furthermore in Provision B.2.d the Permittees are required to develop and use *interim and final numeric targets/goals* to measure progress towards the protection/enhancement of the receiving waters and beneficial uses. The choice of the target/goals of the watershed may be biological, chemical, or physical based and may include multiple criteria and/or indicators. The permit should provide a clear linkage between Provision B and Provision C and state that the WQIP should guide the customization of the NALs/SALs to meet the highest water quality priorities in a given watershed and that NALs/SALs will be used to assist Copermittees in reaching the goals specified in the WQIP. The introduction to Provision C indicates that the *action levels* (NALs and/or SALs) will be incorporated into the WQIPs (B.2.d) and used to: a) Measure progress towards the protection/ enhancement of the receiving waters and beneficial uses (B.4) ; b) Direct and focus the JRMP implementation efforts for addressing MS4 discharges (D.4.a); and	**paragraphs of section C, as follows:** "The purpose of this provision is for the Copermittees to incorporate numeric non-storm water and storm water action levels in the Water Quality Improvement Plans. The action levels shall be used to guide the following program planning efforts and measure progress towards attaining the reasonable protection, preservation, and enhancement of water quality and designated beneficial uses of waters of the state: 1) Support development and prioritization of water quality improvement strategies through the Water Quality Improvement Plans. Discharge data above action levels can be evaluated using a statistical approach considering the frequency, magnitude, and loading of discharges to the receiving waters to support development of actions and prioritization of their implementation. 2) Assist in the effective prohibition of non-stormwater discharges from the MS4 pursuant to Provision E.2. 3) Support the detection and elimination of illicit discharges to the MS4 pursuant to Provision E.2. These goals will be accomplished through monitoring and assessing the quality of the MS4 discharges prior to and during the implementation of the Water Quality Improvement Plans. Exceedances of action levels are not subject to enforcement or non-compliance actions under this Order. "

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			c) Detect and eliminate non-stormwater and illicit discharges to the MS4 (E.2) Although action levels will be used for several different purposes, the action levels defined in Provision C.1 and C. 2 are chemically based and may be in conflict with the selected watershed metrics. As an example, if the watershed metric is improved IBI scores for a water body, then NALs and SALs associated with water chemistry are unlikely to be the best metric to evaluate progress towards improving IBI scores or for assessing our implementation efforts. Thus, the chemically based NALs/SALs may direct resources away from the watershed priorities. Since Provision C indicates that there are three different purposes for the action levels, the permit should recognize that the action levels for each permit provision (B.4, D.4.a, and/or E.2) may be based on different constituents, metrics, and/or may be different values. As a result, the permit should establish the purposes of the action levels and then allow the Copermittees to establish the numeric action levels. For our purpose we would submit that the action levels should be developed to support program planning and measure progress towards attaining the protection of the beneficial uses.	
C. (Intro)	22	Action Levels	The development of action levels, including	**As shown in the attached revised Permit, revise concluding**

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			the timeline should be clearly linked to the Water Quality Improvement Plans. A timeline that is separate and different from the development of the Water Quality Improvement Plans is not necessary. Previously developed action levels should serve as interim action levels until the Water Quality Improvement Plans are completed.	**paragraph of section C, as follows:** Action levels will be developed and incorporated into the Water Quality Improvement Plans (Provision B) including the Illicit Discharge Detection and Elimination (IDDE) Program (Provision E.2). Depending upon the goals/objectives for the use of the action levels and the priority receiving water conditions, the constituents and values at which they are set may differ between watersheds. Copermittees may develop Watershed Management Area specific numeric action levels for non-storm water and storm water MS4 discharges using an approach approved by the Regional Board or use the default non-stormwater and stormwater action levels prescribed within C.1 and C.2 below, respectively. The Copermittees will submit action levels as part of their Water Quality Improvement Plan(s). The action levels established as part of R9-2007-0001 will serve as the interim action levels until the Water Quality Improvement Plans are completed and approved.
C.1	22-24	Non-Stormwater Action Levels	Referencing the CTR as a "source" is misleading. It is unclear why the Board is excluding the conversion factor from the CMC and CCC Metals Criteria equations from the CTR to generate total recoverable metals criteria. Table notes need to be updated to explain how NALs were derived. It should be made clear that the MDALs and AMALs were calculated using State Implementation Standard (SIP) procedures.	Add appropriate references to the State Implementation Standard procedures and provide a narrative explanation for reasoning and application in the fact sheet, when provided.
C.1	22-24	Non-Stormwater Action Levels	Provision C.1.b of the permit requires that additional NALs must be incorporated into the Permit for any constituents causing or contributing to conditions associated with the highest non-stormwater related water quality priorities. However the provision	The permit should provide a clear linkage between Provision B and Provision C and allow the WQIP to guide the customization of the NALs based on the watershed needs. Furthermore the permit should identify past and current dry weather monitoring as a basis for the development of NALs that are watershed specific.

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			does not identify other options for the development of NALs. The Copermittees believe it necessary to have the flexibility to develop NALs that are relevant to their watershed issues.	
C.2	25	Storm Water Action Levels	Provision C.2.b requires that additional SALs must be incorporated into the Permit for any constituents causing or contributing to conditions associated with the highest non-stormwater related water quality priorities. The development of SALs may be based on one of 3 options: 1) water quality standards; 2) site specific conditions; and 3) numeric WQBELs. As noted previously the Copermittees believe that it is critical that flexibility be provided in the development and implementation of the SALs to allow the Copermittees to address their highest water quality issue(s). Consequently the Copermittees support other options for developing SALs.	Other options that should be included for the development of the SALs in the Permit are the approaches identified in the California Storm Water Panel in its report, "The Feasibility of Numerical Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities" (June 2006). As previously noted, if the Copermittees do not establish action levels to support the WQIP then the Copermittees must use the SALs identified in Provision C.
D. Monitoring and Assessment Requirements				
D	26-52	Monitoring and Assessment Requirements	Current provisions are overly prescriptive and constrain the efficient or best use of Copermittee resources or for adaptive management. Significant efforts have been invested by the State and Regional Boards as well as Copermittees to develop a structured, question-driven monitoring approach. These efforts provide for the development of an effective and appropriate alternative to address the monitoring needs of the permit, which include an evaluation of the effective prohibition of non-stormwater discharges, attainment of MEP, evaluation of impacts to and improvements	Remove current Provision D and replace with the Provision D attached.

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			in receiving waters, and collection of data to support management of stormwater programs.	
D.1.a	26	Jurisdictional Non-Stormwater Monitoring	The Copermittees' past monitoring results illustrate that chemical water quality monitoring data for dry weather inter-MS4 flows is not effective for eliminating dry weather discharges. The approach outlined in the Administrative Draft Tentative Order would generate a great deal of water quality data for dry weather flows and identify some IC/IDs. However, since the purpose of the program is to eliminate dry weather flows and IC/ID flows entirely, there is little value to collecting extensive dry weather water quality data for MS4 sites. Very little of the water quality data collected would support assessment of the stated program management objective to effectively prohibit non-storm water discharges to the MS4s. Consequently, this extremely resource intensive approach will be relatively inefficient in eliminating the MS4 flows and IC/IDs with any potential to adversely impact receiving waters. *See the Dry Weather Outfall Monitoring and Discussion of IDDE Program Efficiency and Effectiveness Sections of the Alternative Provision D Supporting Documentation for additional details.*	*If Provision D is not replaced, modify language to allow greater flexibility in monitoring to eliminate IC/IDs based on Copermittees' experience and understanding of how to effectively address non-stormwater discharges.*
D.1.a.1.a.	26	Jurisdictional Monitoring Requirements	Guideline ii is worded (i.e., must be selected) to require a station in each cell; however, guideline vi appears to provide some off ramps to this requirement and guideline vii sets an upper limit on the	If Provision D is not replaced, the following language should be revised: (ii) At least one non-storm water MS4 station must be selected in each cell containing a segment of the Copermittee's MS4, subject

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			number of stations even if the number of cells is greater than 500.	to the provisions in guidelines vi and vii, which must ….
D.1.a.1.a.	26	Jurisdictional Monitoring Requirements	Guideline ii requires sampling through manholes if outfalls are not available in a grid cell. Such confined space sampling can be very expensive because of additional safety requirements for the crew and the need to coordinate with police regarding traffic impacts. It can also be more hazardous for crews because they are climbing in and out of manholes in the middle of the street.	If Provision D is not replaced, the following language should be revised: (ii) [c] Other point of access (e.g., manhole) if absolutely necessary to investigate contributions from upstream sources based on downstream data from an outfall
D.1.a.1.a.	26	Jurisdictional Monitoring Requirements	Guideline ii potentially contradicts guideline iii; areas defined in iii may not exist in each cell.	If Provision D is not replaced, the following language should be revised: (iii) Where applicable, each non-storm water MS4 monitoring station ….
D.1.a.1.a.	26	Jurisdictional Monitoring Requirements	Guideline vi lists factors such as safety and traffic to consider in the location of each monitoring station. However, it does not say that these factors could result a decision to not monitor in a cell if, for example, the only potential access point was a manhole in the middle of a major arterial.	If Provision D is not replaced, the following language should be revised: vi) The following factors should be considered in determining the location and feasibility of sampling of each non-storm water…
D.1.a.1.c.i.a.3.A	29	Jurisdictional Monitoring Requirements	It is not clear if the total number of stations is 5 or if 5 stations in each of the three land use types is required, for a total of 15 stations.	If Provision D is not replaced, the following language should be revised: Add clarification that only 5 stations are required.
D.1.a.2	32	Dry Weather Ambient Receiving Water Monitoring Program	TO Provision D does not take advantage of the current state of knowledge of receiving water conditions and does not integrate the many existing receiving water monitoring efforts. The proposed monitoring would result in a significant and unnecessary duplication of monitoring efforts by the Copermittees in receiving waters.	*If Provision D is not replaced, modify language to allow greater flexibility and coordination of monitoring to achieve program objectives considering existing receiving water programs that may already meet the goals of Provision D.*

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			Copermittees propose to integrate the numerous receiving waters programs at the WMA level. *See the Receiving Water Monitoring Section of the Alternative Provision D Supporting Documentation for additional details.*	
D.1.a.2	32	Dry Weather Jurisdictional Receiving Water Boundary Monitoring	Jurisdictional receiving water dry weather boundary monitoring proposed in the TO does not support the three key monitoring goals. Monitoring conducted by the Copermittees' and others have shown jurisdictional boundary monitoring of the type proposed in the TO to be ineffective in estimating water quality impacts and loading from MS4 discharges (particularly from one jurisdiction to the next). This is due to a combination of factors, including high variability of the constituent concentrations in receiving waters and discharges, typically small percentages of MS4 discharge flows and pollutant loads in the receiving waters, and uncertainty of the source of flow changes within jurisdictional boundaries. The combination of high variability and relatively small impacts or differences requires high numbers of samples to detect significant and programmatically relevant differences and would be unlikely to support programmatic changes or guide improvements to water quality. *See the Discussion of Jurisdictional Boundary Monitoring of the Alternative Provision D Supporting Documentation for*	*If Provision D is not replaced, remove the jurisdictional receiving water boundary monitoring.*

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			additional details.	
D.1.a.2	32	Jurisdictional Monitoring Requirements	It would be useful to call for the monitoring program to adhere to the design recommendations in the SWAMP Assessment Framework, which calls for structured, question-driven monitoring.	If Provision D is not replaced, the following language should be revised: "…within and through its jurisdiction. The design of the receiving water monitoring program should follow the guidance on structured question-driven monitoring outlined in the SWAMP Assessment Framework. In addition, the design should be comparable with, to the extent practicable, regional scale monitoring designs and approaches being developed for the San Diego River watershed and coastal estuaries in the San Diego Region. Any available monitoring …"
D.1.a.2.a.	32	Jurisdictional Monitoring Requirements	Add an emphasis on improving comparability of data and coordination of sampling.	If Provision D is not replaced, the following language should be revised: "…may be utilized as a dry weather ambient receiving water monitoring station, with an emphasis on improving coordination among sampling efforts and the comparability of monitoring data."
D.1.a.2.a.ii and iii	32	Jurisdictional Monitoring Requirements	It is not clear what question(s) this requirement is meant to address and it seems arbitrary. Recommend deleting unless question(s) can be stated explicitly.	If Provision D is not replaced, Delete or modify to clarify monitoring question(s).
D.1.b	34-38	Jurisdictional Monitoring Requirements	Proposed monitoring of five MS4 outfalls in every jurisdiction is greatly in excess of the monitoring needed to characterize similar land uses and drainages. Monitoring of representative sites for homogeneous land uses or mixed-use land uses can be coordinated and the results shared among jurisdictions. *See the Wet Weather Outfall Monitoring section of the Alternative Provision D Supporting Documentation for additional details.*	*If Provision D is not replaced, modify language to allow greater flexibility and coordination of monitoring (i.e., site selection, frequency, and parameters) to achieve program objectives while focusing resources on receiving water priorities and supporting development and implementation of management actions.*

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D.1.b.1.a.iii	35	Jurisdictional Monitoring Requirements	It is not clear if the total number of stations is 5 or if 5 stations in each of the three land use types is required, for a total of 15 stations	If Provision D is not replaced, Add clarification that only 5 stations are required.
D.2	38-42	Watershed Monitoring Requirements	Section D.2 of the Tentative Order requires more reference watershed monitoring stations (one for each WMA) than are needed to assess receiving water conditions and establish reference conditions for the region. The Copermittees propose to use the results of the San Diego Region Stream Reference Study in lieu of this requirement. Regional reference sites that are based on similar geology and watershed size will provide an appropriate measure of the expected receiving water conditions achievable in Copermittees' jurisdictions as a result of the future implementation of their WQIPs. *See the Receiving Water Monitoring Section of the Alternative Provision D Supporting Documentation for additional details.*	*If Provision D is not replaced, modify language to allow for the use of the San Diego Region Stream Reference Study results to meet the reference watershed requirements.*
D.2	38-42	Watershed Monitoring Requirements	Monitoring proposed for MLS sites is more frequent than required to answer relevant management questions about trends in receiving water conditions. Wet weather monitoring at MLS sites can be reduced to once every five years, based on the statistical simulations conducted for development of the ROWD (2011 and included in Attachment 2-1). *See the Receiving Water Monitoring Section of the Alternative Provision D Supporting Documentation for additional details.*	*If Provision D is not replaced, reduce wet weather monitoring frequency at MLS sites to once every five years.*

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D.2.a	38	Watershed Monitoring Requirements	There is no additional value to continuing the TWAS monitoring in its current form because the constituent concentrations and patterns are generally similar at the TWAS and MLS (and especially within a watershed), (See Attachment 2-1 from the ROWD (2011)). Additional focused receiving water monitoring to address information needs should be evaluated and addressed by Copermittee Program Managers in the WQIP Monitoring and Assessment Plans. *See the Receiving Water Monitoring Section of the Alternative Provision D Supporting Documentation for additional details.*	*If Provision D is not replaced, modify language to allow greater flexibility and coordination of monitoring to achieve program objectives consistent with the determination of receiving water priorities through the WQIP development process.*
D.2.a	38	Watershed Monitoring Requirements	The distinction between these stations and those called for in D.1.a.2 is not clear, partly because the channel types have not been more completely defined but also because no monitoring questions have been stated. There could be overlap between these two types of stations, especially because the receiving water stations are to be located in natural or undisturbed areas.	If Provision D is not replaced, Clarify the distinction between receiving water and watershed stations. Define management / monitoring questions that follow the SWAMP Assessment Framework guidance.
D.2.a.1	38	Watershed Monitoring Requirements	It is not clear how the data from the mass loading stations will be used; as there is no monitoring question or link to a management issue or decision.	If Provision D is not replaced, Define management / monitoring questions that follow the SWAMP Assessment Framework guidance. Show how the mass loading data will be used. Delete these stations if the value of the data cannot be demonstrated.
D.2.a.4	38	Watershed Monitoring Requirements	A single reference station is not very useful and has all sorts of statistical problems if used in isolation. It would be better to use regional reference data, where available.	If Provision D is not replaced, use the San Diego Stream Reference Study for Reference Stations.
D.2.a.5	38	Watershed	The rationale for this station is not clear.	If Provision D is not replaced,

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		Monitoring Requirements	There is no management / monitoring question or link to a management issue or decisions. In addition, there is no readily obvious scientific reason why a midpoint station would be useful.	Delete this requirement.
D.2.e and D.3	45-46	WMA Special Studies and Regional Special Studies	Reduce the number of Special Studies from 3 to 2 per WMA in consideration of the planning period required to develop the Monitoring and Assessment Plan required as part of the WQIP. *See the Source/Stressor ID and Special Studies section of the Alternative Provision D Supporting Documentation for additional details.*	Reduce the number of Special Studies from 3 to 2 per WMA.
D.4.b and D.4.c	51-52	Assessment Requirements	See comment A.4. Language should be added to limit Copermittees responsibilities to within their jurisdiction.	*If Provision D is not replaced, the following language should be revised:* "The Copermittees, within their respective jurisdictions of ~~in~~ each Watershed Management Area, must…"
E. Jurisdictional Runoff Management Programs				
E	53-89	Jurisdictional Runoff Management Programs	Minor grammatical correction in the first sentence.	"The purpose of this provision is for each Copermittee to implement a program to control the contribution of pollutants to and the discharges from the MS4 within its jurisdiction."
E	53-89	Jurisdictional Runoff Management Programs	As stated in the second introductory paragraph in Provision E "The jurisdictional runoff management programs implemented by each Copermittee must be consistent with the Water Quality Improvement Plan for the applicable Watershed Management Area required by Provision B." Additionally, as stated in the introduction to the WQIP (Provision B) "The purpose of this provision is to develop Water Quality Improvement Plans that guide the Copermittees' jurisdictional runoff	Include language into the introductory paragraph that clearly indicates that the JRMP requirements contained in Provision E may be modified to allow for implementation of the JRMP consistent with the WQIP if appropriate justification is provided. In addition, add the following: "**Modification of Jurisdictional Runoff Management Program Requirements** Modifications shall be considered and where selected, proposed according to the process in Provision B.5. Proposed modifications may increase, decrease, and/or replace minimum requirements

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			management program implementation efforts…" However, the provisions do not clearly allow for the appropriate modification of the JRMP requirements (increases, decreases, and/or replacement of activities) contained in the permit.	identified in Provision E."
E and Attachment C	Throughout	Jurisdictional Runoff Management Programs	Clarification.	Refer to Permanent BMPs as Structural BMPs and add a definition for structural BMPs into Attachment C.
E	Throughout	Jurisdictional Runoff Management Programs	Clarification for consistency.	Change "~~Permanent BMP Sizing Criteria Design Manual"~~ to "BMP Design Manual" and make reference to the current design requirements under R9-2007-0001.
E.1.a.2	53	Legal Authority Establishment and Enforcement	Sites regulated under the Construction and Industrial General Permits are regulated elsewhere and through alternative means. Clarification is necessary for sites that are not regulated under the respective General Permits.	"Control the contribution of pollutants in discharges of runoff associated with industrial and construction activity to its MS4 and control the quality of runoff from industrial and construction sites that do not~~, including industrial and construction sites which~~ have coverage under the statewide General Permit for Discharges of Storm Water Associated with Industrial Activities (Industrial General Permit) or General Permit for Discharges of Storm Water Associated with Construction Activities (Construction General Permit)~~, as well as to those sites which do not~~; "
E.1.a.4 and E.1.a.5	53-54	Legal Authority Establishment and Enforcement	The Copermittees do not have jurisdiction to control MS4 discharges outside of their respective MS4s and the Regional Board does not have the authority to require interagency agreements to grant such jurisdiction, particularly for those agencies not subject to the Order (Caltrans, Native American Tribes, Military installations, etc.)	Remove, reword, and/or combine the two subsections as follows : ~~"Control through interagency agreements among Copermittees the contribution of pollutants from one portion MS4 to another portion of the MS4;"~~ and ~~"Control through interagency agreements with other owners of the MS4 such as Caltrans, the U.S. federal government, or sovereign Native American Tribes, where possible, the contribution of pollutants from one portion of the MS4 to another portion of the MS4;"~~ "Coordinate, as possible, with other agencies to minimize the contribution of pollutant discharges from the Copermittee's

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				portion of the MS4 to portions of the MS4 under another agency's jurisdiction and from other agency's portions of the MS4 to the portion of the MS4 under the Copermittee's jurisdiction"
E.2.a	54-57	Illicit Discharge Detection and Elimination	The addition of "to the extent allowable by law", as referenced from the Phase II Regulations, limits Copermittees responsibility to those that they have the legal authority to implement. Copermittees cannot implement programs outside of what they have legal authority to do. In addition, some non-storm water discharges are authorized under the permit unless the Copermittee or San Diego Water Board determines they are a source of pollutants in receiving waters. Language should be provided to account for subsection E.2.a.(3).	"To the extent allowable by law, ~~E~~each Copermittee must address all non-storm water discharges as illicit discharges, where the likelihood exists that they are a source of pollutants to waters of the U.S."
E.2.a.1	55	Illicit Discharge Detection and Elimination	Uncontaminated pumped groundwater is the only category under this section that is required to be permitted under an NPDES Permit. It should be added to the initial paragraph and the remainder of the bullets should be added to E.2.a.(3), as they are impractical to be permitted and are currently not required to be permitted.	"Discharges of non-storm water to the MS4 from uncontaminated pumped groundwater ~~the following categories~~ must be addressed as illicit discharges where there is evidence that suggests that they are the source of pollutants to waters of the U.S., unless the discharge has coverage under NPDES Permit No. CAG919001 (Order No. R9-2007-0034, or subsequent order) for discharges to San Diego Bay, or NPDES Permit No. CAG919002 (Order No. R9-2008-0002, or subsequent order) for discharges to surface waters other than San Diego Bay: ~~(a) Uncontaminated pumped ground water;~~ ~~(b) Discharges from foundation drains;~~ ~~(c) Water from crawl space pumps; and~~ ~~(d) Water from footing drains."~~
E.2.a.2	55	Illicit Discharge Detection and	Limit to within the Copermittee's jurisdiction per prior comments and reword	Discharges of non-storm water from water line flushing and water main breaks to the MS4 must be addressed as illicit discharges

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		Elimination	the applicable permitting portion to allow flexibility for any subsequent NPDES permits that may be issued.	unless the discharge has coverage under a valid NPDES Permit, ~~No. CAG 679001 (~~Order No. R9-2010-0003, or a subsequent order~~)~~. This includes water line flushing and water main break discharges from water purveyors under the Copermittee's jurisdiction that has been issued a water supply permit by the California Department of Public Health or federal military installations.
E.2.a.3	55	Illicit Discharge Detection and Elimination	Non-storm water sources should be limited to anthropogenic sources within the Copermittees jurisdiction to enable to Copermittees to address those sources in which they have control over. Also, see comment E.2.a.1.	Limit the source of pollutants in receiving waters to anthropogenic sources identified as an illicit discharge within the Copermittees jurisdiction and add discharges from foundation drains, water from crawl space pumps, and water from footing drains.
E.2.a.4	56	Illicit Discharge Detection and Elimination	See comment E.2.a.	Add "or similar means where there is evidence that those discharges are a source of pollutants to waters of the U.S."
E.2.a.4.a	56	Illicit Discharge Detection and Elimination	Individual buildings may require substantial structural modifications to redirect air conditioning condensation to landscaped areas. Redirection should be encouraged instead of required.	"The discharge of air conditioning condensation ~~must~~ should be directed to landscaped areas or other pervious surfaces where feasible;"
E.2.a.4.b	56	Illicit Discharge Detection and Elimination	Complete removal of residential car washing activities is unrealistic and resources would be better used to educate the public. Public outreach has proven to be also effective in minimizing water and detergent use and encouraging the use of commercial facilities.	"~~(i)~~ The discharge of wash water must be encouraged through public outreach and education (i) to be directed to landscaped areas or other pervious surfaces where feasible, and (ii) to m~~M~~inimize the use of water for vehicle washing, use as little washing detergent and other vehicle wash products as possible, wash vehicles at commercial wash facilities, and implement other practices or behaviors that will prevent the discharge of pollutants associated with individual residential vehicle washing from entering the MS4; and"
E.2.a.4.c.ii	56	Illicit Discharge Detection and Elimination	Clarify. Discharges of saline water to the MS4 cannot be directed out of the MS4 once the discharge has occurred. Allow saline discharges to salt water receiving waters.	"The discharge of saline swimming pool water ~~to the MS4~~ must be directed to the sanitary sewer, landscaped areas, or other pervious surfaces that can accommodate the volume of water or to the MS4 if the MS4 discharges to a saltwater receiving water."

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E.2.a.5.a.1	56	Illicit Discharge Detection and Elimination	Building fire suppression system maintenance discharges should not be considered an illicit discharge if BMPs are implemented to prevent discharge of pollutants to the MS4.	Add "where BMPs are implemented."
E.2.a.5.b	57	Illicit Discharge Detection and Elimination	Emergency firefighting discharges are exempted in the Clean Water Act. BMPs should be encouraged, not required to be implemented, particularly in emergency situations that may result in the destruction of life and property.	"Each Copermittee ~~must~~ should develop"
E.2.b.1.d	57	Illicit Discharge Detection and Elimination	MS4 and Private Outfalls should be clearly defined. The Clean Water Act definition of MS4 Outfalls limits outfalls to "major outfalls", limiting the responsibility of Copermittees' mapping of outfalls to "major outfalls" and clarifying the definition of what constitutes a "private outfall".	"All known locations of MS4 outfalls as defined by 40 CFR §122.26(b)(5-6) and private outfalls, as defined by 40 CFR 122.26(b)(9), that discharge runoff collected from areas within the Copermittee's jurisdiction,"
E.2.b.1.e	58	Illicit Discharge Detection and Elimination	Clause is redundant and confusing.	~~(i.e., receiving water segments that are both a receiving water and part of the MS4),~~
E.2.b.2	58	Illicit Discharge Detection and Elimination	Clarification is necessary to limit employee responsibilities to within the terms of their employment.	"Each Copermittee must use Copermittee personnel and contractors to assist in identifying and reporting illicit discharges and connections, if observed during the course of their daily employment activities;"
E.2.b.4	58	Illicit Discharge Detection and Elimination	The addition of language is necessary to limit Copermittees responsibility to standards that may reasonably be met.	"Each Copermittee must implement practices and procedures (including a notification mechanism) to prevent, respond to, contain, and clean up any spills that may discharge into the MS4 within their jurisdiction from any source. The Copermittee must coordinate with spill response teams to prevent to the extent possible entry of spills into the MS4, and prevent contamination of waters of the U.S. ~~surface water, ground water, and soil~~."
E.2.b.5	58	Illicit Discharge Detection and	Clarification is needed for circumstances where the source of an illicit connection	Add language to clarify responsibility: (5) Copermittees are responsible for control of discharges to their

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		Elimination: Prevent and Detect	and/or discharge is from another MS4. Add language to E.2.b(5) and move current E.2.b(5) to E.2.b(6).	MS4. In the event that the source of an illicit discharge or connection is from another MS4, the Copermittee shall notify and, if necessary coordinate, with the upstream MS4 to implement and/or enforce corrective actions. Move current E.2.b(5) to E.2.b(6).
E.2.c	58	Illicit Discharge Detection and Elimination: Field Screening and Monitoring	Visual observations should be acknowledged as a way to detect non-storm water and illicit discharges and connections.	Add "Visual Observations" to the provision header and acknowledge within the text.
E.2.d	58-61	Investigate and Eliminate Illicit Discharges and Connections	See the comments above for C.1. NALs should guide JRMP implementation and management actions through the iterative process set forth in the WQIP and may trigger follow up investigations, but may trigger other alternative actions. Actions taken based on NAL exceedances should be defined in the WQIP and/or JRMP based on the most effective actions to reach their watershed-based goals.	Clarify language to state that NAL exceedances during IDDE monitoring/investigations may trigger action levels, including but not limited to follow-up investigations based on the highest watershed priorities set forth and the iterative process provided in the WQIP. In addition, limit E.2.d.1.d to exclude identified natural sources.
E.2.d.2 and E.2.d.3	59 – 61	Illicit Discharge Detection and Elimination: Investigate and Eliminate	Sections 2 and 3 outline the procedures that Copermittees must have in place. Not all language under these headers speak to procedures. Additionally, some overlap exists between these two sections.	Edits were made to ensure that requirements addressed the development of procedures. Additional edits made for clarity and to reduce overlap between sections. See the strikeout document of the admin draft for specifics.
E.2.d.2	59	Illicit Discharge Detection and Elimination	TCBMPs may be part of the MS4 and specifically designed to receive and contain pollutants. The language, as written, is inconsistent with the TCBMP requirements prescribed in Provision E.3.a of the proposed permit. Limiting language should also be added for discharges to receiving waters within the jurisdiction of the Copermittee.	"Each Copermittee must implement procedures to investigate and inspect portions of its MS4 that, based on reports or notifications, field screening and monitoring, or other appropriate information, indicate a reasonable potential of ~~receiving, containing, or~~ discharging pollutants to receiving waters within the Copermittees jurisdiction due to illicit discharges, illicit connections, or other sources of non-storm water."
E.2.d.4	61	Illicit Discharge Detection and	Language used in the current Orange County Permit (Provision R9-2009-0002)	Use Orange County permit language instead: If the Copermittee suspects the source of the non-storm water

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		Elimination	provides clearer language regarding follow through.	discharge as natural in origin (i.e. non-anthropogenically influenced) and in conveyance into the MS4, then the Copermittee must ~~collect the data and evidence necessary to demonstrate to the San Diego Water Board that it is natural in origin; and~~ document the rationale for why the discharge does not need further investigation. This documentation shall be included in the Annual Report.
E.3	61	Permanent BMP Requirements for All Development Projects	No jurisdictional limitations are provided in this section. As a result, language in the subsections may be interpreted as expanding Copermittee requirements outside their MS4 jurisdiction. In addition how the Copermittees implement their program should be a decision left to the Copermittees.	Reword to "Each Copermittee, within their respective jurisdictions, must ~~use their land use/planning authorities to~~ implement a development planning program…"
E.3.a	61	Permanent BMP Requirements for All Development Projects	Added language to clarify that not all the prescribed BMPs in Section E.3.a. are applied to every project. These BMPs are applied as practical and feasible and as applicable based on the sites condition and nature of development.	"Each Copermittee, as practical and feasible, must prescribe the following BMP requirements during the planning process (i.e. prior to project approval and issuance of grading or building permits) for all development projects (regardless of project type or size), where local permits are issued, including unpaved roads and flood management projects, except emergency projects implemented for the protection of persons and property:
E.3.a.2	62	Permanent BMP Requirements for All Development Projects	Source control BMP requirements apply to all projects and should be located in one place in the Provision. Language regarding source control BMPs from E.3.c should be moved here. A definition of "properly designed" should also be provided in Attachment C.	Add "Each Copermittee must require each Priority Development Project to implement applicable source control BMPs." A definition of properly designed has been added to Attachment C.
E.3.a.5.a.vi	64	Permanent BMP Requirements for All Development Projects	Treatment for infiltration BMPs should only be required if significant pollutant levels are present.	"Infiltration treatment control BMPs must not be used for areas of industrial or light industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee, unless runoff does not exceed Basin Plan water quality standards or runoff is first treated or filtered to remove pollutants prior to infiltration; and"

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E.3.b.1.b and E.3.b.1.c	64-65	Definition of Priority Development Project	Since SUSMP requirements have been in effect since 2001, will start seeing some redevelopment projects that were subject to previous SUSMPS. Therefore, the 50% rule for redevelopment projects should apply only to projects that were not subject to any previous SUSMP requirements.	Where redevelopment results in an increase of more than fifty percent of the impervious surfaces of a previously existing development and was not subject to previous Priority Project Development requirements, the performance and sizing requirements apply to the entire development. Add the following: (c) Projects where redevelopment results in an increase of more than fifty percent of impervious surfaces of a previously existing development, and the existing development *was* subject to previous Priority Project Development Requirements, only the altered portion of development is subject to the new Priority Development Project requirements.
E.3.b.2	65-66	Priority Development Project Categories	The definition of a direct discharge has been established to mean that the project is releasing flows directly into the receiving water. If the project drains into an MS4 connection which serves existing developed areas before discharging to receiving water, this is not a direct discharge. Added language for clarification	Add language to E.3.b.2.e to clarify that applicable discharges to an ESA are "not commingled with flows"
E.3.b.2.g	66	Priority Development Project	This requirement was present in the prior permit; however, the residential driveways clause was added under the proposed permit. Including residential driveways as a PDP will require unnecessary, burdensome PDP process without proportional water quality benefits. Residential driveways experience low daily traffic trips compared to highways and roads.	"Streets, roads, highways, and freeways, ~~and residential driveways~~. This category is defined as any paved impervious surface that is 5,000 square feet or more used for the transportation of automobiles, trucks, motorcycles, and other vehicles."
E.3.b.3.c and E.3.b.3.d	66	Priority Development Project	An exemption for Priority Development Projects should be provided for driveways constructed with permeable surfaces.	Add driveways to (c) and (d). Add parking lots to (d).
E.3.b.3.e	66	Priority	This exemption allows small individual	Add language as follows:

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		Development Project Categories	residential projects to apply minimum BMPs that meet a minimum performance standards without going through the burdensome PDP review and approval process including; preparation of a full PDP study, and maintenance, verifications, and inspection of permanent treatment control BMPs. Under the current proposed language, single family residence as small as 5,000sf may be subject to PDP requirements, and is lumped in with industrial and commercial development; The potential pollutants generated by small residential are not as significant as industrial or commercial and can be effectively reduced by effective source control and minimum permanent BMPs.	(e) Single-family residential projects that are not part of a larger development or proposed subdivision and implement BMPs that meet minimum performance standards, as outlined in the BMP Design Manual.
E.3.b.3.f	66	Priority Development Project Exemption	This exemption provides an alternative design standard for smaller roadway projects. Existing roads may provide a great retrofit opportunity, but have many challenges due to physical constraints. Existing roads are considered utility corridors, in addition to being adjacent to buildings and structures which makes it physically impossible to fit BMPs that meet PDP sizing criteria. Therefore, Green Street concept is a design alternative.	Add language as follows: (f) Any paved impervious surface that is 5,000 square feet or more used for the transportation of automobiles, trucks, motorcycles, and other vehicles~~.~~ that follows the USEPA guidance regarding Managing Wet Weather with Green Infrastructure: Green Streets[1] to the MEP. 1:http://water.epa.gov/infrastructure/greeninfrastructure/index.cfm
E.3.c.1	66	Source Control BMP Requirements	See comment E.3.a.2	Remove Section and move language to Provision E.3.a.2.
E.3.c.2	66-67	Retention and Treatment Control BMP Requirement	A second tier standard is proposed for sites where on site retention is not feasible due to adverse soils or other conditions. The proposed language allows projects to provide pollutant removal equal to the	See Redlines to Section E.3.c (1) , page 86 of City of SD version

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			retention standard by capturing and treating a larger volume. Since equal pollutant removal is to be achieved, offsite mitigation should not be required if the second tier standard is met. This also provides flexibility to achieve retention of the design capture volume utilizing different design alternatives such as bioretention or biofiltration.	
E.3.c.2.b	67	Priority Development Project	Proposed language requires retention of the differential runoff volume to mimic natural hydrology. The main principle of LID is to mimic natural hydrology.	"Each Priority Development Project must be required to implement LID BMPs that are sized and designed to retain the difference in volume ~~equivalent to~~ between the runoff volume produced in the post-project condition as compared to the pre-project condition resulting from a 24-hour 85th percentile storm event ("design capture volume"). A footnote should also be provided clarifying that the "Design capture volume is a single event based volume available after an extended dry period".
E.3.c.3	68	Hydromodification Management BMP Requirements	The Regional Board adopted the San Diego Hydromodification Management Plan (HMP) in July 2010. Significant work, technical analysis and input have gone into the development of the HMP and these requirements have been in effect for only 16 months. Rather than providing separate criteria, the permit should acknowledge implementation of the Regional Board approved HMP as a sufficient mechanism for meeting hydromodification requirements.	Add the following: "Each Copermittee must require each Priority Development Project disturbing greater than one acre to implement hydromodification management BMPs, as described in the Copermittees current HMP, as applicable."
E.3.c.3	68	Hydromodification Management BMP Requirements	The requirement to match naturally occurring pre-development runoff conditions holds redevelopment to a higher standard than new development and mandates redevelopment projects to mitigate beyond site's impact. Redevelopment is widely accepted as	Add the following: "Post-project runoff flow rates and durations do not exceed pre-development ~~(naturally occurring)~~ runoff flow rates and durations by more than 10 percent (for the range of flows that result in increased potential for erosion or degraded channel conditions downstream of Priority Development Projects)."

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			benefiting water quality along with providing other environmental benefits. Redevelopment should be incentivized to ensure an overall improvement of water quality by proposing HMP requirements that are reasonable and achievable on site.	
E.3.c.3	68	Hydromodification Management BMP Requirements	Flexibility is needed since available research and study has not determined the most appropriate methods for sediment supply compensation. Reworded the paragraph to allow assessment, preservation and compensation at a regional level rather than project level.	Add the following: "Projects shall preserve, where feasible, or provide compensation for significant losses of sediment supply anticipated as a result of development."
E.3.c.4	69	Alternative Compliance for Technical Infeasibility: Mitigation	The proposed language allows the alternative compliance program to be optional and gives copermittees the discretion to exercise the program if it is determined to be beneficial and practical for the municipality. The City wants to ensure that the offsite mitigation does not end up in the permit where it becomes expectation that the City manages offsite mitigation for private developments. There are many factors to be taking into consideration in administering a mitigation program including: overhead cost to manage such a program, availability of land, long term maintenance responsibilities & cost, variability and lack of accurate cost estimate of BMPs construction & maintenance cost.	Add "Alternative compliance is an optional program for the Copermittees to utilize if it is determined to provide an equal or greater benefit than onsite compliance. Where alternative compliance is allowed, it is the sole responsibility of the project applicant to execute the alternative compliance and comply with the following requirements: ~~subject to the following requirements:~~"
E.3.c.4.c	70	Alternative Compliance for Technical Infeasibility: Mitigation	This section was revised to reflect the proposed revisions to the Retention requirements.	Modify language as follows: and/or ~~increased pollutant loads~~ water quality equivalence expected to be discharged from the site. The Project applicant must perform offsite mitigation for: [a] The portion of the pollutant load in the design capture volume that is not retained or equally treated onsite,

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				and/or [b] The portion of the increased potential erosion of downstream receiving waters not fully controlled with hydromodification management BMPs onsite. ~~For the pollutant load in the volume of storm water not retained onsite with retention LID BMPs, or increased potential erosion of downstream receiving waters not fully controlled onsite with hydromodification management BMPs, the Copermittee must require the project applicant to either 1) implement an offsite mitigation project, and/or 2) provide sufficient funding for a public or private offsite mitigation project via a mitigation fund.~~
E.3.c.4.c.iii	71	Mitigation Project Timing	The requirement that offsite mitigation projects "be completed upon the granting of occupancy for the first project that contributes funds towards the offsite mitigation project…" is not feasible. Due to the length of time it takes to acquire all of the necessary permits, this timeline is not realistic for regional facilities and will serve as a deterrent to their construction as an alternative compliance mechanism. Additionally, it may take several years for a Copermittee to accumulate the funds necessary for the design, construction and permitting of a regional facility.	Modify as follows: Offsite mitigation funding ~~projects~~ must be secured by the applicant and verified by the Copermittee prior to granting construction permits or recording of maps,whichever comes first, for each ~~completed upon the granting of occupancy for the first project that contributed funds toward the offsite mitigation project, unless a longer period is authorized by the San Diego Water Board.~~
E.3.e.2.a	73	Priority Development Project BMP Implementation and Oversight	Removal of the term "continuously" is suggested so ensure Copermittees do not have to allocate resources for incessant updates to the database. Language should also be added to clarify that, although the database will be watershed-based, each	"Each Copermittee must develop and ~~continuously~~ regularly maintain a watershed-based database to track and inventory all Priority Development Projects and associated structural ~~permanent~~ BMPs within their jurisdiction. Inventories must be accurate and complete beginning from January 2002 for the San Diego County Copermittees, February 2003 for the Orange

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			Copermittee is responsible only for inventory under their jurisdiction.	County Copermittees, and July 2005 for the Riverside County Copermittees. The database must include, at a minimum, the following information:"
E.4	75	Construction Management	Storm Water Pollution Prevention Plan (SWPPP) is a State General Construction Permit term, and should not be used within the MS4 permit so that there is no confusion. Replace with Pollution Control Plan.	Replaced SWPPP with Pollution Control Plan
E.4	75	Construction Management	The language has been updated so that the Copermittee can define which construction projects will be inventoried within its jurisdictional program. Not all jurisdictions apply permits the same way, therefore each needs the ability to address their processes in regards to construction projects. This will eliminate projects in the inventory that are issued local building or construction permits but have no ground disturbance, e.g. plumbing, electrical, mechanical, decks, patios, etc.	Add the following: a. "Construction Program Management Each copermittee must define in the Jurisdictional Runoff Management Plan the following: (1) Define construction sites to be inventoried, such as sites that involve any ground disturbance or soil disturbing activities. (2) Define a process for ensuring adequate construction BMP implementation for non-inventoried sites. Non-inventoried sites involve minor construction activities that are not anticipated to create storm water pollution such as interior improvements, plumbing, electrical and mechanical work. "
E.5	79-85	Existing Development Management	After years of implementation of existing development programs, the Copermittees have the knowledge and experience to implement programs consistent with the goals of the Order and the adaptive management process required under the Order. In order to accomplish this goal, the Copermittees have reorganized and provided a concise existing development section as an alternative to the current	Replace the current provision E.5 with the proposed Provison E.5 located in the strikeout version provided.

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			provision E.	
E.5.a	79	Existing Development Management	Adding the term "reasonable potential to discharge" allows flexibility for the Copermittees to determine priorities. Practically all existing properties have the potential to generate pollutant loads and the inspection program will be ineffective and impractical to implement as written. The focus needs to be on significant pollutant load discharges so inspections and enforcement can actually succeed in receiving water pollutant load reductions versus spending an exhaustive amount of time and money inspecting sites that discharge no pollutant loads, but have the potential to generate minimal loads.	*If the current Provision E.5 is not replaced, modify as follows:* "Each Copermittee must maintain an updated watershed-based inventory of all its existing development that has the reasonable potential to ~~may potentially~~ ~~generate~~ discharge a pollutant load to and from the MS4".
E.5.a.1.c	79	Existing Development Management	The SIC Code system was replaced by the NAICS Code system in 1997. As a result, the use of the SIC Code system is being phased out.	*If the current Provision E.5 is not replaced, modify as follows:* c) SIC Code or NAICS Code, if applicable;
E.5.a.4, E.5.a.7	79	Existing Development Management	Mobile home parks are outside the jurisdiction of Copermittees. Also, minor grammatical corrections.	*If the current Provision E.5 is not replaced, modify as follows:* "(4) Identification ~~if a business is a~~ of mobile businesses; " "(7) ~~Identification if an area is a~~ Common Interest Areas (CIAs) / Home Owner Associations (HOAs)~~, or~~ and ~~mobile home parks~~; "
E.5.a.13	80	Existing Development Management	The continual requirement for map updating is excessive. Regularly updated maps should be sufficient for up-to-date information without requiring Copermittees to expend excessive resources.	*If the current Provision E.5 is not replaced, modify as follows:* "A ~~continually~~ regularly updated map showing the location of inventoried existing development, watershed boundaries, water bodies, and pollutants generated at the inventoried existing development."
E.5.b	80	Retrofitting and Channel	This is a new requirement, as compared to the prior permit, which only requires an	*If the current Provision E.5 is not replaced, modify as follows:*

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		Rehabilitation in Areas of Existing Development	evaluation of channels that may be retrofitted. In many instances, channel rehabilitation may not be feasible and other options for improving discharge water quality would need to be considered. Language should be clarified to indicate retrofit and channel rehabilitation are options the Copermittees have at their disposal, but are not necessarily obligatory.	Remove this Provision entirely or include it as an option for compliance as stated below: "…and rehabilitate~~–~~channels and/or receiving waters to restore impaired beneficial uses of streams within its jurisdiction, as feasible."
E.5.b.3	80	Existing Development Management	The proposed permit requires the Copermittees to "encourage" landowner retrofit to private property through the "Copermittee's use of subsidies, penalties, or other incentives." Copermittees will face serious enforcement (and possibly legal) issues if they attempt to penalize private landowners for failing to expend their own time, effort, and money retrofitting properties that landowners had no intention of altering in the first place. In addition, water quality, feasibility, cost effectiveness, and community acceptance should be considered when a strategy is developed for retrofit and/or channel rehabilitation.	*If the current Provision E.5 is not replaced, modify as follows:* Each Copermittee must implement retrofit and channel rehabilitation projects, as feasible, that address the highest water quality priorities identified in the Water Quality Improvement Plan pursuant to Provision B.3.a. Ranking may also take into account water quality, project feasibility cost effectiveness, and community acceptance. The Copermittee ~~must~~ should encourage private landowners to implement retrofit designs, at minimum, through the use of public education and outreach. ~~and channel rehabilitation projects whenever practical. Private landowners should be encouraged through the Copermittee's use of subsidies, penalties, or other incentives.~~
E.5.b.5	81	Existing Development Management	See comments for Provision E.5.b.	*If the current Provision E.5 is not replaced, modify as follows:* "Where retrofitting and channel rehabilitation within specific areas of existing development under the Copermittees jurisdiction are determined to be infeasible to restore and protect receiving waters from the highest water quality priorities identified in the Water Quality Improvement Plan, each Copermittee ~~must~~ may identify, develop, and implement regional retrofitting and channel rehabilitation projects..."
E.5.b.7	81	Existing	Resource re-allocation will assist in	*If the current Provision E.5 is not replaced, modify as follows:*

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		Development Management	neutralizing costs for any channel rehabilitation/retrofit projects undertaken by the Copermittees and will have a more significant likelihood of improving water quality than monitoring. Add.	(7) Upon Regional Board approval and in lieu of monitoring during any given year, the Copermittees may reallocate resources originally authorized for water quality monitoring for retrofit and/or rehabilitation project(s), for a maximum of two nonconsecutive years during the permit term.
E.5.c.1	81	Existing Development Management	Required use of pollution prevention methods will be extremely difficult to enforce, particularly if residential land uses are included.	*If the current Provision E.5 is not replaced, modify as follows:* Each Copermittee must ~~require~~ promote the use of pollution prevention methods by the inventoried existing development through public outreach.
E.5.c.2	81	Existing Development Management	See comment E.5.a.	*If the current Provision E.5 is not replaced, modify as follows:* "Each Copermittee must designate a minimum set of BMPs required for all inventoried existing development with the reasonable potential to discharge pollutant loads to their MS4, including special event venues ~~that have the potential to generate pollutants~~."
E.5.c.3	81	Existing Development Management	See comment E.5.a.	*If the current Provision E.5 is not replaced, modify as follows:* Each Copermittee must implement, or require the implementation of, designated BMPs at inventoried existing development that have the reasonable potential to ~~generate~~ discharge pollutant~~s~~ loads from their MS4.
E.5.c.4	82	Existing Development Management	See comment E.5.a.	*If the current Provision E.5 is not replaced, modify as follows:* Each Copermittee must operate and maintain, or require the operation and maintenance of designated BMPs at all inventoried existing development that have been identified by the Copermittee as having the reasonable potential to discharge pollutant loads to their MS4.
E.5.c.4.b	82	Existing Development Management	Clarification is necessary that Copermittees are only responsible for the work conducted within their jurisdiction and under their	*If the current Provision E.5 is not replaced, modify as follows:* "Each Copermittee must implement procedures during the

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			authority.	operation and maintenance of public streets, unpaved roads, paved roads, and paved highways and freeways, conducted under their authority and within their jurisdiction, that will reduce the contribution of storm water pollutants to the MEP and effectively prohibit the discharge of non-storm water pollutants from the MS4 to receiving water bodies. During maintenance of unpaved roads, each Copermittee must examine the feasibility of replacing existing culverts or designing new culverts/bridge crossings to maintain natural stream geomorphology.
E.5.c.5	82	Existing Development Management	See comment E.5.a.	*If the current Provision E.5 is not replaced, modify as follows:* "Each Copermittee must implement procedures, or require the implementation of procedures, to reduce the contribution of pollutants in storm water to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from inventoried existing development ~~into and from the MS4s.~~ identified by the Copermittee as having the reasonable potential to discharge pollutant loads into or from their MS4."
E.5.d	83	Existing Development Management	See comment E.5.a.	*If the current Provision E.5 is not replaced, modify as follows:* "Each Copermittee must conduct inspections of inventoried existing development that have been identified by the Copermittee as having the reasonable potential to discharge pollutant loads from their MS4 to ensure compliance with applicable local ordinances and permits, and the requirements of this Order."
E.5.d.1	83	Existing Development Management	See comment E.5.a.	*If the current Provision E.5 is not replaced, modify as follows:* "Each Copermittee must establish appropriate inspection frequencies for inventoried existing development based on the priorities set forth in the Water Quality Improvement Plan, and the potential for discharging pollutants via storm water and non-storm water runoff. At a minimum, inventoried existing development that has been identified by the Copermittee as having the reasonable potential to discharge pollutant loads to and from their MS4 must be inspected once ~~every five years~~ during

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				the permit term. Inventoried existing development must also be inspected within six months of any change in property ownership or ~~change~~ increase in pollutant generating activity..”
E.5.d.2.d through E.5.d.2.f	83-84	Existing Development Management	The addition of “if present” is necessary for clarification.	*If the current Provision E.5 is not replaced, modify as follows:* “(d)Visual observations of actual non-storm water discharges, if present; (e)Visual observations of actual or potential discharge of pollutants, if present; (f)Visual observations of actual or potential illicit connections, if present; and…”
E.5.e	85	Existing Development Management	Limiting language should be included for the Copermittee’s jurisdiction. The existing development inventory and enforcement should be limited to development with the reasonable potential to discharge pollutants.	*If the current Provision E.5 is not replaced, modify as follows:* “Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried existing development identified by the Copermittee as having the reasonable potential to discharge pollutant loads from the MS4 within their jurisdiction, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.”
E.6	85	Enforcement Response Plans	Enforcement response plans are already codified in Copermittees’ municipal codes. This section increases requirements for enforcement response and should be made more concise.	Recommend replacement of Enforcement Response Plan Provision with Copermittee streamlined provision, contained in the strikeout provided.
E.6.b.5	87	Enforcement Response Plans	Two weeks compliance is an extremely short time period for maintenance of TCBMPs and reasonable only if the next rain event is within that two week period. One month is much more reasonable and realistic for confirmation of TCBMP maintenance and is consistent with Copermittee implementation experience and	*If the current Provision E.6 is not replaced, modify as follows:* “For violations of permanent BMP maintenance requirements, all violations must be corrected in a timely manner with the goal of correcting them before the next rain event but no longer than than ~~10 business~~ 30 calendar days after the violations are discovered. If more than ~~10 business~~ 30 calendar days are required for compliance, a rationale must be recorded in the electronic

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			existing ordinances.	database or equivalent tabular system used to track permanent BMP inspections. "
E.6.c.2	87-88	Enforcement Response Plans	Criminal penalties should be limited to intentional or criminally negligent acts.	*If the current Provision E.6 is not replaced, modify as follows:* The enforcement process must include, at a minimum, appropriate sanctions to compel compliance, such as: (a) Verbal and written notices of violation; (b) Cleanup requirements; (c) Fines; (d) Bonding requirements; (e) Administrative and criminal (if intentional or criminally negligent) penalties; (f) Liens; (g) Stop work orders; and (h) Permit and occupancy denials.
E.6.c.4	88	Enforcement Response Plans	See comment E.6.b.5.	*If the current Provision E.6 is not replaced, modify as follows:* Change 10 business days to 30 calendar days.
E.6.d.1	88	Enforcement Response Plans	San Diego Water Board notice should be consistent with 40 CFR §122.41(l)(6) and the State of California Construction General Permit. Generally, the requirements should be 24 hour verbal notice and five day written notification. Also, email should suffice as written notice.	"Each Copermittee must notify the San Diego Water Board in writing within ~~48 hours~~ 5 calendar days of issuing ~~high level~~ escalated enforcement (as defined in the Copermittee's Enforcement Response Plan) to a construction site that poses a significant threat to water quality as a result of violations or other non-compliance with its permits and applicable local ordinances, and the requirements of this Order. Written notification may be provided electronically in email form."
E.7.b.	89	Public Education and Participation	Public participation activities are more closely related to education and outreach, and are inherently different from intergovernmental coordination. Therefore public participation should be included with outreach activities. Move from E.7.b. to E.7.a.	"Each Copermittee must implement a public education and participation program, as appropriate, to promote and encourage the development of programs, management practices, control techniques and systems, design and engineering methods, and behaviors that reduce the discharge of pollutants in storm water to the MEP, prevent controllable non-storm water discharges from entering the MS4, and protect water quality standards in receiving

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				waters. The public education program must include~~, at minimum,~~ the following:"
E.7.a.(1)	89	Public Education and Participation	There is specific emphasis on pesticides, herbicides and fertilizers. The rationale for the specificity of these topics is unclear. Given the emphasis on showing changes in water quality, education efforts should be focused on activities that address the pollutants of concern and behaviors that are tied to water quality issues. Therefore, each Copermittee, by jurisdiction and watershed, should identify, determine and prioritize the activities that address priorities consistent with Provision B.	Educational activities, public information activities, and other appropriate outreach activities intended to reduce pollutants ~~associated with the application of pesticides, herbicides and fertilizer in storm water discharges~~ of concern from the MS4 to the MEP. Activities shall be determined and prioritized by Copermittees by jurisdiction and/or watershed (Section 5.c.(5) to address the highest threats to water quality, such as pesticides, herbicides and fertilizers, used oil, toxic waste, etc.;
E.7.a (2)	89	Public Education and Participation	There is specific emphasis on used oil and toxic material disposal. The rationale for the specificity in education topics is unclear. As stated above, Copermittees should be able to target education efforts on the pollutants and behaviors most commonly linked to the water quality issues within their respective jurisdictions and watersheds. Thus, this section is incorporated in the changes proposed above and would become part of E.7.a.1.	Move section E.7.a(2) into E.7.a(1).
E.7.a(3)	89	Public Education and Participation	There is specific emphasis on construction site operators as a target audience, with "other target audiences as determined by the Copermittee(s)". The rationale for this is unclear. Per the justification above, each Copermittee should be able to determine target audiences in accordance with high risk activities and high priority pollutants within their jurisdiction and watershed(s). Once re-worded, this paragraph then becomes E.7.a (2), because the first two	"Appropriate education and training measures ~~for construction site operators and other~~ specific target audiences, as determined and prioritized by the Copermittees by jurisdiction and watershed, based on high risk behaviors and pollutants of concern, such as construction site operators, residents, underserved target audiences and school-aged children."

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			paragraphs have been combined per the comments above. .	
E.7.b	89	Public Education and Participation	Inclusion of evaluation and assessment for education and outreach activities is a critical tool for adaptive management and should be addressed. Use of assessment is heavily cited in the development of the overall Water Quality Improvement Plan strategy. In addition, the purpose of intergovernmental coordination on respective JRMPs is unclear. Append to allow for watershed and regional collaboration of education and outreach activities based on effectiveness as determined by the Copermittees. Remove requirement for intergovernmental collaboration on jurisdictional runoff management programs. Add E.7.b as evaluation and assessment and move the current E.7.b to E.7.c.	Include the following language as E.7.a(3): b. "Each Copermittee shall incorporate a mechanism for evaluation and assessment of educational and other outreach activities, as needed, to identify progress and incorporate modifications necessary to increase the effectiveness of the public education program." c. "Each Copermittee may determine, where appropriate and effective, mechanisms for intergovernmental coordination on education and outreach activities. ~~must incorporate a mechanism for public participation and where necessary intergovernmental coordination in updating, developing, and implementing its jurisdictional runoff management program.~~
F. Reporting				
F.1 and F.2	90	Reporting	Changes for consistency with Provision B.6.	Change timeframe from 12 to 18 months.
F.1	90	Reporting	Minor changes incorporated for consistency with Provision B.	Incorporate timeline consistent with Provision B.
F.2.a	90	Reporting	Additional language is necessary to clarify that modification of program elements of the jurisdictional runoff management program will include rationale for any changes to program elements prescribed in Provision E.	Add "Jurisdictional Runoff Management Program document updates that modify program elements from the requirements of Provision E must provide rationale for the modifications within the update documents." Add similar language for the BMP design manual and the Water Quality Improvement updates.
F.2.b	90	Reporting	See F.2.a.	See F.2.a.
F.2.c	91	Reporting	See F.2.a.	See F.2.a.
F.3.b	91	Reporting	Clarification.	"…The first Annual Report must be prepared for the reporting period beginning July 1 after adoption of the permit, and upon

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				San Diego Water Board determination that ~~the date the San Diego Water Board determines that~~…"
F.3.b.	91-92	Reporting	The San Diego Water Board should provide flexibility to allow updates to the Jurisdictional Runoff Management Program Annual Report Form (Attachment D).	Clarify "(Attachment D or approved revision" throughout the Provision.
F.3.b.1 (a through c)	91	Reporting	Monitoring data should be discussed under proposed modifications of the WQIP.	Move a through c under (iii) in original document (now iv).
F.3.b.1.d	92	Reporting	See F.2.a.	Add: (iii) "Proposed modifications to water quality improvement or jurisdictional strategies with associated rationale for such modifications,"
F.3.b.2	92	Reporting	Each Copermittee must submit the report form for each WMA in which they have jurisdiction. Language has been clarified.	Add: "Each Copermittee's Annual Report form must summarize the jurisdictional activities in the WMAs in which the Copermittee has jurisdiction."
F.4	93	Reporting	The Copermittees require language clarification that the regional clearinghouse may be maintained by another agency.	Add a footnote: "The Copermittee may elect to develop and maintain the clearinghouse(s) provided by other Copermittees or agencies."
F.5	93	Reporting	See F.4.	Add similar language from F.4.
G. Principal Watershed Copermittee Responsibilities				
G	96	Principal Watershed Copermittee Responsibilities	Coordinating and developing, with the other Copermittees, the requirements of Provisions F.3.c, F.4, and F.5.b of this Order.	Remove requirement that Principal Copermittee can only be Principal Copermittee for 2 watersheds. Clarify that all Copermittees have some level of commitment, not just the Principal Watershed Copermittee.
H. Modification of Programs				
H	97	Modification of Programs	Modifications of programs are allowed under the WQIP as part of the iterative process and adaptive management. Language should be added to that effect or there may be annual amendments to the Order.	"Proposed modifications outside of the WQIP process that are not minor require amendment of this Order in accordance with this Order's rules, policies, and procedures."
I. Standard Permit Provisions and General Provisions				
			N/A	None.
Attachment A. Discharge Prohibitions				
Attachment A,	A-1	Attachment B to	The Resolution has been adopted as 2012-	Reference adopted SWRCB Resolution 2012-0012.

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2		State Water Board Resolution 2012-001X	0012 and should be updated accordingly throughout the document. Order should be incorporated by reference instead duplication.	
Attachment B. Standard Permit Provisions and General Provisions				
Attachment B	B1-B5	Standard Permit Provisions and General Provisions	This attachment incorporates the standard NPDES permit provisions as identified in 40 CFR 122.41. Although correctly transposed from the regulations the provisions are obviously developed for a traditional point source permit (i.e. wastewater permit). As such there are a number of standard provision that pose challenges to the Copermittees to comply with. Clarification is requested on a number of the provisions.	See specific changes noted below.
Attachment B, 1.m	B-7	Bypass	This provision requires the Copermittees to notify the Regional Board whenever an anticipated or unanticipated bypass will occur. Given the nature of storm events and the fact that stormwater treatment BMPs include bypass provisions to protect the BMP integrity it would appear that the Copermittees should notify the Regional Board anytime a storm is predicted to ensure compliance with the provision (whether anticipated or unanticipated). This provision was crafted for typical wastewater discharges and has little relevance to stormwater.	Delete this provision.
Attachment C. Acronyms, Abbreviations and Definitions				
Attachment C	C1-C10	Definitions	Definitions need to be added for: properly designed, BMP Design Manual, Public Education, Outreach, and Participation channel rehabilitation and improvement, and retrofit. As currently written, the permit authorizes subjective broad authority and	Suggested definitions are provided in the strikeout.

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			deference to the Regional Board in interpretation of the definitions, if not included. Minor clarifications and grammatical corrections are also included.	
Attachment C	C-6	Definitions – MS4	The addition of CWA language to the definition of MS4 limits Copermittees' responsibilities to within their jurisdiction and strengthens support that Copermittees are not responsible for discharges in MS4s that they do not operate.	Add "Copermittees need only comply with permit conditions relating to discharges from the municipal separate storm sewers for which they are operators." 40 CFR §122.21(a)(vi).
Attachment C	C-7	Definitions – Pre-Development Runoff Conditions	The definition for Pre-Development Runoff Conditions should be the exact language codified in the Federal Register at 64 FR §68761.	**Replace the definition as follows:** **Pre-Development Runoff Conditions** – "Runoff conditions that exist onsite immediately before the planned development activities occur. Pre-development is not intended to be interpreted as that period before any human-induced land disturbance activity has occurred." 64 FR §68761.
Attachment C	C-7	Definitions – Public Education, Outreach, and Participation	Neither Public Education and Outreach, nor Public Participation are mentioned in the definitions section of Attachment C. Please add definitions for these non-structural BMPs.	**Add "Public Education, Outreach and Participation –** Programs to educate residents, businesses and visitors about the importance of water quality and water quality programs so that they will support local efforts and understand their role in protecting receiving waters. The Education and Outreach Program will increase knowledge and awareness, improve attitudes toward storm pollution prevention, and provide a foundation for changing behaviors that contribute to storm water pollution."
Attachment C	C-10	Definitions – Waters of the state	Current permit language, citing the California Water Code, presupposes that all portions of the MS4 are considered waters covered by the definition of waters of the state, "Any water, surface or underground, including saline waters within the boundaries of the State [CWC Provision 13050 (e)]." This language should be	**"Waters of the State** - Any water, surface or underground, including saline waters within the boundaries of the State [CWC Provision 13050 (e)]. The definition of the Waters of the State is broader than that for the Waters of the United States in that all water in the State is considered to be a Waters of the State ~~regardless of circumstance or condition~~. Under this definition, portions of a MS4 may be ~~is always~~ considered to be a Waters of the State. However, man-made portions of the MS4 constructed

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			limited based on the intent of the definition (natural water sources) and should not include dry man-made structures that collect runoff for the sole purpose of flow volume/velocity and/or pollutant reduction.	for the sole purpose of flow and/or pollutant reduction will not be considered Waters of the State."
Attachment D. Jurisdictional Runoff Management Program Annual Report Form				
			N/A	None.
Attachment E. Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2012-0011				
Attachment E	E-1 to E-30	Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2012-0011	Most requirements are outlined already in the TMDLs and the redundancy of this Attachment is unnecessary. In fact, Attachment E *adds* many TMDL requirements not provided in the TMDL Resolutions, circumventing the TMDL public process. Implementation will be inconsistent with previously adopted resolutions and CLRPs and MPs already drafted, submitted, approved, and/or implemented. A summary of inconsistencies between the TMDLs and Attachment E, where the City of San Diego is listed as a responsible party, are provided as an attachment to this table.	On page E-1, reword to clarify that TMDL implementation must be incorporated into the WQIP and Monitoring sections by the Copermittees and reference the Resolution Numbers in the TMDL list and add recommended compliance language per comments below. Address all inconsistencies with the TMDL Resolutions (provided as attachment).
Attachment E	E-1	Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2012-0011	The Rainbow Creek TMDL for Total Nitrogen and Phosphorous does not include Wasteload Allocations for the County of San Diego Copermittees. The TMDL only contains Load Allocations. Load allocations should not be implemented through an NPDES permit. It is inappropriate to simply "re-name" the Load Allocations as Wasteload Allocations.	Strike the following TMDL from Attachment E in its entirety: Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed
Attachment E	E-1 to E-30	Specific Provisions for	State and federal law do not require the use	See recommended changes in the attached revised Permit to the

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		Total Maximum Daily Loads Applicable to Order No. R9-2012-0011	of numeric effluent limitations for MS4 permittees, but rather encourage flexible implementation of best management practices through an iterative process. Specifically, the choice to include either management practices or numeric limitations in MS4 permits is within the regulatory agency's discretion, and on the question of whether MS4 permits must contain numeric effluent limitations, the court upheld EPA's use of iterative BMPs in place of numeric effluent limitations for storm water discharges. (See *Defenders of Wildlife v. Browner*, 191 F.3d 1159, 1166-1167 (9th Cir. 1999)[1] Given the challenges with meeting the numeric WQBELs (even with the implementation of a comprehensive suite of BMPs) and the flexibility allowed by State and federal regulations and guidance, a BMP-based WQBEL approach should be allowed for complying with TMDLs. Removing the numeric WQBELs is not proposed. Rather, inclusion of a WQIP-based "compliance path" is recommended. The WQIPs can and should be used as the basis for establishing WQBELs expressed as BMPs. The WQIPs can satisfy the necessary elements of BMP-based WQBELs. For example, the WQIPs would meet the requirements described in the 2010 EPA memo (which updated key aspects of	following: • Provision A.4.c • Provision A.4.d • Provision B (first paragraph) • Provision B.3 Additionally, within the requirements for each individual TMDL in Attachment E, include language similar to the following,: Compliance may be demonstrated via any one of the following methods: 1. There is no discharge from the MS4, or 2. Applicable effluent limitations are met, or 3. Receiving waters meet the applicable receiving water limitations or water quality objective, or 4. Loading from the MS4 is such that it does not cause water quality objective exceedances, or 5. For Copermittee(s) that are implementing a Regional Board-approved WQIP, WQBELs will be implemented as BMPs and compliance will be based upon implementing all provisions of the WQIP in accordance with the approved milestones and schedule.

[1] See also California Regional Water Quality Control Board San Diego Region - Fact Sheet / Technical Report For Order No. R9-2010-0016 / NPDES NO. CAS0108766.

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			the 2002 memorandum) regarding federal expectations for incorporation of TMDLs WLAs into NPDES stormwater permits as BMP-based WQBELs.	
Attachment E	E-1 to E-30	Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2012-0011	The findings of California's Stormwater Blue Ribbon Panel, which was convened specifically to examine the feasibility of incorporating numeric effluent limits in stormwater permits, ultimately concluded that numeric limits were generally infeasible across all three stormwater activities (municipal, industrial, and construction), with a few exceptions (*The Feasibility of Numeric Effluent Limits Applicable to Discharges of Stormwater Associated with Municipal, Industrial and Construction Activities, June 19, 2006*). Additionally, state law and policy does not require the use of numeric effluent limitations in MS4 permits. In 2009, the State Water Board affirmed this approach in a precedential order, stating: [i]t is our intent that federally mandated TMDLs be given substantive effect. Doing so can improve the efficacy of California's NPDES storm water permits. This is not to say that a wasteload allocation will result in numeric effluent limitations for municipal storm water dischargers. Whether a future municipal storm water permit requirement appropriately implements a storm water wasteload	See recommended changes in the attached revised Permit to the following: • Provision A.4.c • Provision A.4.d • Provision B (first paragraph) • Provision B.3 Additionally, within the requirements for each individual TMDL in Attachment E, include language similar to the following,: Compliance may be demonstrated via any one of the following methods: 1. There is no discharge from the MS4, or 2. Applicable effluent limitations are met, or 3. Receiving waters meet the applicable receiving water limitations or water quality objective, or 4. Loading from the MS4 is such that it does not cause water quality objective exceedances, or 5. For Copermittee(s) that are implementing a Regional Board-approved WQIP, WQBELs will be implemented as BMPs and compliance will be based upon implementing all provisions of the WQIP in accordance with the approved milestones and schedule.

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			allocation will need to be decided on the regional water quality control board's findings *supporting either the numeric or non-numeric* effluent limitations contained in the permit. (Order WQ 2009-0008, In the Matter of the Petition of County of Los Angeles and Los Angeles County Flood Control District, at p. 10 (emphasis added).)	
Attachment E. Part 1.b, 2.b, 3.b, 4.b, 5.b, and 6.b	E-2, E-4, E-6, E-9, E-13, and E-19	Water Quality Based Effluent Limitations	Federal regulations (40 CFR 122.44(d)(1)(vii)(B)) require inclusion of effluent limits that are "consistent with the assumptions and requirements of any available wasteload allocation for the discharge prepared by the State and approved by EPA." Attachment E outlines the requirements of effective TMDLs and appears to incorporate numeric receiving water limitations (RWL) <u>and</u> effluent limitations, where the effluent limitations are set equal to the TMDL Waste Load Allocations (WLAs) and the RWLs are set equal to the TMDL numeric targets. This approach results in a situation where the Copermittees are in double jeopardy. Copermittees should not be put in double jeopardy by being required to meet both RWLs and effluent limitations. Rather, attainment of either RWLs **<u>or</u>** effluent limitations should represent compliance with the permit and the requirements of the TMDL.	See recommended changes in the attached revised Permit. Additional language should be added to the WQBELs sections for all TMDLs in Attachment E to clearly define compliance with WQBELs via any of the following methods: - There is no discharge from the MS4, **OR** - Applicable effluent limitations are met, **OR** - Receiving waters meet the applicable receiving water limitations or water quality objective, **OR** - Loading from the MS4 is such that it does not cause water quality objective exceedances, **OR** - For Copermittee(s) that are implementing a Regional Board-approved WQIP, WQBELs will be implemented as BMPs and compliance will be based upon implementing all provisions of the WQIP in accordance with the approved milestones and schedule.
Attachment E	E-1 to E-30	Multiple	Attachment E specifies outfall monitoring	Modify the Specific Monitoring and Assessment Requirements

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			requirements for several TMDLs, "in accordance with the requirements of Provisions D.1, D.4.a.(1)(b), and D.4.a.(3)(b) of this Order." Adding outfall monitoring to the TMDL provisions is inappropriate and unnecessary. Attachment E should focus on integrating the monitoring requirements *specified in the TMDL Basin Plan Amendments.* The monitoring requirements for TMDLs were developed through a public comment process and adopted by the Regional Board, and are the only monitoring requirements that should be specified in Attachment E. Furthermore, there is no reason to re-state the requirements from Provision D, which makes it likely that Attachment E and Provision D will have inconsistencies. Provision D requirements should only be listed in Provision D.	for the following TMDLs: 1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed 2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin 3. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek 4. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay Specifically, for each of these TMDLs, the sub-bullet under section (d) regarding effluent monitoring should be stricken and replaced with the following: "The Responsible Copermittees must implement the monitoring and assessment requirements issued under Order No. XXXX. The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.", where "XXXX" reflects the order numbers for each TMDL, shown in the attached revised Permit on Page E-1. For the Chollas Creek Metals and Diazinon TMDLs, the XXX refers to the order number for the issued Investigation Orders. For the Project I Bacteria TMDL, specific changes to the monitoring requirements are requested to reflect those specified in the TMDL Basin Plan Amendment, as described below.
Attachment E. Part 4.b.	E-10	Water Quality Based Effluent Limitations	The TMDL for Dissolved Copper, Lead, and Zinc in Chollas Creek states that "If all copper, lead, and zinc concentrations in urban runoff to Chollas Creek meet their respective TMDL concentrations, the	If WQBELs are to be expressed as numeric effluent limits consistent with the WLAs, then mass-based WQBELs should be included as a mechanism for demonstrating compliance to allow for options to demonstrate load-based pollutant reductions. As described above, the mass-based WQBELs should only be included with an "or" statement (not an "and" statement).

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			loading capacity of the creek should not be exceeded" (Section 8). The TMDL further states that "because this WLA is concentration-based it will apply to each land use and each sub-watershed at all times and will not be specific to any land use or sub-watershed (Section 8.1)." Requiring all land uses and sub-watersheds to meet effluent limits consistent with RWLs is not a cost-effective or practicable approach to BMP strategy development. Volume reduction strategies such as Low Impact Development and Green Infrastructure should be a viable compliance path for the San Diego region. The WQBELs should include the mass-load based WLAs to consider the pollutant loads reduced, which will be impacted by both pollutant concentration reductions *and* stormwater volume reductions. Alternatives for load-based approaches should be included as effluent limitations, which will correspond to targets for meaningful CLRP and WQIP development.	The recommended Compliance Determination language in the attached revised Permit addresses this issue.
Attachment E. Part 6.a	E-19	Applicability	Since adoption of the Project I Bacteria TMDL, the Copermittees have submitted data analysis to the Regional Board to demonstrate that 303(d) listings for San Marcos HA, San Dieguito River HA, and Los Penasquitos HA were incorrectly applied to REC beneficial uses. The Regional Board has concurred with the findings for each HA and stated that these HAs are "not subject to further action under Resolution No. R9-2010-0001." Similar	In Table 6.0, the San Dieguito River WMA and Carlsbad WMAs should be deleted. The Los Penasquitos WMA should be re-named to the Mission Bay WMA and Torrey Pines State Beach at Del Mar should be removed. The recommended language in the attached revised Permit addresses this issue by also adding the following to Specific Provision 6.a.(5): "Subsequent to TMDL adoption, it has been established by the Regional Board that the following water bodies are not subject

<table>
<tr><th>Permit Section</th><th>Permit Page (Original)</th><th>Section Title</th><th>Reason for Proposed Changes/Comments</th><th>Proposed Changes</th></tr>
<tr><td></td><td></td><td></td><td>responses are expected for the other HAs.</td><td>to further action under Resolution No. R9-2010-001, and therefore are not subject to Bacteria TMDL requirements described herein and are not included in Table 6.0:
<table>
<tr><th>Watershed Management Area</th><th>Water Body</th><th>Segment or Area</th></tr>
<tr><td>Carlsbad</td><td>Pacific Ocean Shoreline</td><td>at Moonlight State Beach</td></tr>
<tr><td>San Dieguito River</td><td>Pacific Ocean Shoreline</td><td>at San Dieguito Lagoon mouth</td></tr>
<tr><td>Peñasquitos</td><td>Pacific Ocean Shoreline</td><td>Torrey Pines State Beach at Del Mar (Anderson Canyon)</td></tr>
</table></td></tr>
<tr><td>Attachment E. Part 6.b</td><td>E-19</td><td>Receiving Water Limitations</td><td>The Basin Plan Amendment for the Project I Bacteria TMDL contains Receiving Water Limitations. These Receiving Water Limitations should be incorporated directly into the Permit. However, Attachment E contains Receiving Water Limitations that do <u>not</u> match those from the TMDL. The Regional Board should not revise or translate the RWLs from the TMDL, they should be incorporated directly. The RWLs incorporated into Attachment E have several discrepancies with the RWLs in the TMDL, including application of single sample targets to the dry weather RWLs and application of total coliform RWLs for inland waters.</td><td>Replace entirely the RWLs in the Permit with those from the TMDL.

The attached revised Permit incorporates RWLs for beaches (Table 6.1) and RWLs for Creeks (Table 6.2). Note these RWLs were pasted directly from the Basin Plan Amendment (Attachment A, page 52).</td></tr>
<tr><td>Attachment E. Part 6.b</td><td>E-19 and E-20</td><td>Water Quality Based Effluent</td><td>Attachment E specifies WQBELs for dry weather flows as both receiving water and</td><td>It is recommended that the single sample maximum not be used for dry weather WQBELs. At a minimum, an acceptable dry</td></tr>
</table>

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		Limitations	effluent limitations for the Project I Bacteria TMDL, in terms of zero allowable exceedances of the single sample maximum and the 30-day geometric mean. However, the dry weather component of the TMDL only considered the 30-day geometric mean, and did not consider the single sample maximum within its calculation. Incorporating single sample effluent limitations into the Permit goes beyond the TMDL requirements. In addition, if the TMDL had included single sample limits, there would have been a corresponding allowable exceedance frequency, just as for wet weather. The 22% allowable exceedance rate for wet weather was based on a reference beach within the Los Angeles Region, and although not used in the technical approach for the San Diego Beaches and Creeks TMDL, the reference beach also exhibits exceedances during dry weather, which is incorporated into beach TMDLs in the Los Angeles region.	weather exceedance frequency should be assumed and applied. Specific Provision 6.b.(2) of the attached revised Permit addresses this issue by (1) incorporating the RWLs directly from the TMDL, and (2) linking the receiving water limitations and effluent limitations.
Attachment E. Part 6.b	E-20	Water Quality Based Effluent Limitations	The Project I Bacteria TMDL applies mass-load based TMDLs to point sources. Many of the BMPs used for achieving pollutant reductions, such as structural BMPs and green infrastructure, emphasize infiltration and associated volume reduction as the primary mechanism for reducing urban runoff. A significant investment could be made to implement structural BMPs to reduce urban runoff to meet the mass-load based WLAs assigned in the TMDL. These reductions could result in meeting the mass-	If WQBELs are to be expressed as numeric effluent limits consistent with the WLAs, the mass based WLAs for both dry and wet weather presented in the TMDL should be included as a mechanism for demonstrating compliance to 1) be consistent with the assumptions of the WLAs and 2) allow for options to demonstrate load based pollutant reductions. The attached revised Permit addresses this issue by incorporating the mass-based wasteload allocations into Section 6.b.(2).

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			based WLA and have a positive impact on receiving waters by significantly reducing urban loads to receiving waters. However, even the small amount of flows remaining could exceed the numeric effluent limitations currently in the Permit, but not cause or contribute to WQO exceedances. In this manner, a violation of the numeric WQBELs would result in zero credit for the millions invested and penalty for discharges that did not negatively impact attainment of WQ standards. Volume reduction strategies such as Low Impact Development and Green Infrastructure should be a viable compliance path for the San Diego region. The WQBELs should include the mass-load based WLAs to consider the pollutant loads reduced, which will be impacted by both pollutant concentration reductions *and* stormwater volume reductions.	
Attachment E. Part 6.b	E-20	Water Quality Based Effluent Limitations	The reference conditions and associated allowable exceedance frequencies for WQBELs addressing Project I Bacteria TMDL were based on a marine reference beach within Los Angeles, and are not necessarily applicable to fresh water flows in the San Diego Region. The Los Angeles reference beach was influenced by salt water (increasing bacterial die-off) and mixing/dilution from wave action that likely resulted in lower exceedances of REC-1 objectives than would be found in a freshwater stream. Freshwater TMDLs in the Los Angeles region now incorporate	The permit should include language that allows for update of the allowable exceedance frequencies as these results become available. The attached revised Permit addresses this issue by added the following paragraph to Specific Provision 6.b.(1).(a): "The allowable exceedance frequencies in Table 6.1 and Table 6.2 can be updated by the Regional Board Executive Officer if sufficient data is provided regarding reference systems in the San Diego Region."

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			freshwater reference systems (instead of a marine reference system), and the marine beach exceedance rates have been updated through a recent TMDL reopener for Santa Monica Bay. In addition, a reference study is currently underway for the San Diego Region.	
Attachment E. Part 6.c	E-21	Compliance Schedule	Total coliform WQOs do not apply to inland waters.	As shown in the attached revised Permit, add a footnote to Table 6.3 as follows: "Total coliform receiving water limitations apply only to segments of areas of Pacific Ocean Shoreline listed in Table 6.0."
Attachment E. Part 6.c	E-21	Compliance Schedule	The CLRPs to be submitted by Copermitees will propose interim compliance dates, as allowed by the Project I Bacteria TMDL, generally 7 and 10 years, respectively, to meet the 50% reduction milestone for dry and wet weather. The CLRPs submitted by Copermittees may not all propose the same interim compliance dates and the Permit should acknowledge the flexibility allowed by the TMDL (see page 68 of Attachment A of the Basin Plan Amendment). In fact, this scheduling flexibility was a primary "incentive" for Copermitees to develop CLRPs instead of BLRPs.	The interim compliance dates should not be specified in the Permit. Instead, the Permit should reference the submitted and Regional Board-approved CLRPs. This approach will avoid conflict between the TMDL, Permit, and CLRPs. The attached revised Permit addresses this issue by revising the opening of Section 6.c.(2): "The Responsible Copermittees must comply with the following interim WQBELs by the interim compliance dates submitted in the Regional Board-approved CLRPs and supported by Order No. R9-2010-0001:" Table 6.5 should be deleted from Attachment E to allow the CLRPs the scheduling flexibility provided in the TMDL adopted by the Regional Board.
Attachment E. Part 6.c	E-21 thru E-27	Compliance Schedule	Similar to the flexibility allowed for scheduling, the TMDL allows CLRPs flexibility in expressing and achieving TMDL milestones/interim requirements. Furthermore, the wet weather interim compliance dates are well-beyond the term of this Permit, and should be not included in	Delete Table 6.4 because (1) the CLRPs have flexibility to express interim milestones and (2) the wet weather interim requirements do not apply until 2022, well beyond the term of this Permit.

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			Attachment E.	
Attachment E. Part 6.c	E-27	Compliance Schedule	The Copermittees request an acknowledgement of the TMDL reopener scheduled for April 2016 which falls within the term of this Permit.	Add a part (3) to Specific Provision 6.c: "(3) <u>Submittals to Support TMDL Basin Plan Amendment</u> The Responsible Copermittees are encouraged to submit data to support the TMDL reopener scheduled for April 2016 including but not limited to data related to reference watershed monitoring and beneficial use usage frequency."
Attachment E. Part 6.d (new section added to revised)	E-27	Compliance Determination	The BPA for the Project I Bacteria TMDL contains specific language regarding MS4 compliance determination in the case that receiving water limitations are not attained. This language should be added directly to the Permit.	As shown in the attached revised Permit, add the following language to Section 6 of Attachment E, which is *pasted directly* from the BPA: "The municipal MS4s may demonstrate that their discharges are not causing the exceedances in the receiving waters by providing data from their discharge points to the receiving waters, by providing data collected at jurisdictional boundaries, and/or by using other methods accepted by the San Diego Water Board. Otherwise, at the end of the wet weather TMDL compliance schedule, the municipal Phase I MS4s will be held responsible and considered out of compliance unless other information or evidence indicates another controllable or uncontrollable source is responsible for the exceedances in the receiving waters. If controllable sources other than discharges from the municipal Phase I MS4s are identified before or after the end of the wet weather TMDL Compliance Schedules as causing the exceedances, those controllable sources will be responsible for reducing their bacteria loads and/or demonstrating that discharges from those sources are not causing the exceedances. If controllable sources other than the Phase I MS4s are identified as causing the exceedances, and the Phase I MS4s have demonstrated they are not causing or contributing to the exceedances, the Phase I MS4s will not be considered out of compliance. The San Diego Water Board shall implement additional actions (e.g., issue enforcement actions, amend existing NPDES requirements or conditional waivers), as needed, to bring all those controllable sources into

Permit Section	Permit Page (Original)	Section Title	Reason for Proposed Changes/Comments	Proposed Changes
				compliance with the wet weather TMDLs."
Attachment E. Part 6.d	E-27	Specific Monitoring and Assessment Requirements	As described above, the CLRPs envisioned in the Project I Bacteria TMDL include flexibility to develop certain components based on watershed-specific issues and conditions. Each CLRP submitted by the Copermittees will include a monitoring and assessment component. It is important to allow the CLRP process to drive the monitoring programs.	As shown in the attached revised Permit, include the following at the beginning of the Monitoring and Assessment section: "The BLRPs and CLRPs to be submitted by the Copermittees and approved by the Regional Board Executive Officer contain monitoring programs. Implementation of those Regional Board-approved monitoring programs constitutes compliance with the Monitoring Station and Monitoring Procedure requirements, described below."
Attachment E. Part 6.d	E-27	Specific Monitoring and Assessment Requirements	The Project I Bacteria TMDL included specific beach monitoring requirements, which were subject to a public comment process and adopted by the Regional Board. Attachment E adds many additional components to these requirements, which undermines the TMDL adoption and public commenting process. Instead of re-interpreting and adding onto the TMDL monitoring requirements in the Basin Plan Amendment, the Permit should adopt those requirements directly (BPA Attachment A, page 50-51).	As shown in the attached revised Permit, the beach monitoring requirement should be incorporated directly from the TMDL. The following language/requirement for beaches is *pasted directly* from the TMDL: "(1) Monitoring and Assessment Requirements for Beaches (a) Monitoring Stations For beaches addressed by these TMDLs, monitoring locations should consist of, at a minimum, the same locations used to collect data required under MS4 NPDES monitoring requirements and beach monitoring for Health and Safety Code section 115880.75 If exceedances of the receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations and/or other source identification methods must also be used to demonstrate that the bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters. (b) Monitoring Procedures (i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly.

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				(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations at least once within the first 24 hours of the end of a storm event that occurs during the rainy season (i.e., October 1 through April 30). (iii) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria."
Attachment E. Part 6.d	E-27	Specific Monitoring and Assessment Requirements	Similarly, the creek monitoring requirements should reflect the TMDL that was approved and subject to public comment (BPA Attachment A, page 50-51). Note that total coliform should not be a requirement for creek monitoring, as creeks are not subject to total coliform WQOs, RWLs, or WLAs.	As shown in the attached revised Permit, the creek monitoring requirement should be incorporated directly from the TMDL. The following language/requirement for creeks is *pasted directly* from the TMDL: "Monitoring and Assessment Requirements for Creeks and Creek Mouths (a) Monitoring Stations For creeks addressed by these TMDLs, monitoring locations should consist of, at a minimum, a location at or near the mouth of the creek (e.g., Mass Loading Station or Mass Emission Station) and one or more locations upstream of the mouth (e.g., Watershed Assessment Stations). If exceedances of the receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations and/or other source identification methods must also be used to demonstrate that the bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters. (b) Monitoring Procedures (i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. (ii) The Responsible Copermittees must collect wet weather

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				monitoring samples from the receiving water monitoring stations within the first 24 hours of the end of a storm event that occurs during the rainy season (i.e., October 1 through April 30) (iii) Samples collected from receiving water monitoring stations must be analyzed for fecal coliform and *Enterococcus* indicator bacteria."

ADMINISTRATIVE DRAFT MS4 PERMIT INCONSISTENCIES WITH TMDL REQUIREMENTS

Section (Att. E)	Sub-Section	Admin. Draft MS4 Permit Summary	Inconsistency/Issue
1	B(3)(a) Best Management Practices	The Responsible Copermittees must implement BMPs capable of achieving the WQBELs under Specific Provision 1.b	Issue with "must implement BMPs" BMPs are not mentioned in Resolution R9-2002-0123. Copermittees are required to: 1.Enforce existing local ordinances and adopt new legal authority as needed. 2) implement a "Diazinon Toxicity Control Plan", and 3) conduct a focused Public Outreach/Education Program. However, the TMDL technical report suggests but does not require the use of BMPs. "Proposed implementation measures to meet the TMDL include implementation of best management practices (BMPs) and public outreach by the dischargers. Dischargers are responsible for taking measures, such as implementing BMPs, to reduce and manage their input of diazinon.", per the San Diego Water Board Basin Plan Amendment and Technical Report for Resolution No. R9-2002-0123. Additionally, the Regional Water Board cannot dictate the method of implementation.
1	D(b).	"The responsible Copermittees must monitor the effluent of the MS4 outfalls for diazinon within the Chollas Creek Watershed, and calculate or estimate the monthly and annual diazinon loads"	Monitoring requirements are incorrect. Compliance monitoring includes flow-weighted composite sampling at the receiving water. Also, the TMDL is a concentration based TMDL; therefore, load calculations are not required and inappropriate. The Numeric Targets and WLAs are all defined in terms of concentrations.
2	B(3). Best Management Practices	"The responsible copermittee must implement BMPs…"	In resolution R9-2005-0019 there is no mention of BMPs. In the technical TMDL report there is also no requirement of BMP implementation, though pollution prevention practices and source control BMPs "can be developed and implemented". Additionally, the Regional Water Board cannot dictate the method of implementation. Discharger strategies to reduce copper leading to SIYB are discussed, however, they are more applicable to boating. MS4 discharger mitigation is not discussed.
2	c. Compliance Schedule	The Responsible Copermittee was required to achieve its WLA upon the effective date of the TMDL, December 2, 2005.	Compliance schedule is incorrect. The compliance deadline is 2022. Attachment A to resolution No. R9-2005-0019 states that "copper load and wasteload reductions are required over a 17-year staged compliance schedule period."

Section (Att. E)	Sub-Section	Admin. Draft MS4 Permit Summary	Inconsistency/Issue
2	d. Specific Monitoring and Assessment Requirements	The Responsible Copermittee must monitor the effluent of its MS4 outfalls for dissolved copper, and calculate the monthly and annual dissolved copper loads"	There are no specific monitoring requirements other than to monitor SIYB waters (receiving waters).
4	b. (3)a.	The Responsible Copermittee must implement BMPs capable of achieving the WQBELs under Specific Provision 4.b for Chollas Creek.	Issue with must implement BMPs. Mitigation and consideration of alternative projects (i.e. CEQA requirements) "should" be incorporated; however, BMPs are not specifically called out in the TMDL beyond any relevance to restoration projects that would fall under CEQA. Additionally, the Regional Water Board cannot dictate the method of implementation. (Order No. R9-2007-0043).
4	d. Specific Monitoring and Assessment Requirements.	RPs "must monitor the effluent of the MS4 outfalls discharging to Chollas Creek for dissolved copper, lead, and zinc or estimate the monthly and annual dissolved copper, lead, and zinc loads"	Outfall monitoring is not required in the TMDL. Flow-weighted composite sampling for 3 storms at the receiving water is required. No monthly or annual loads are required in the concentration based TMDL which is based on the hardness-dependent CTR water quality criteria for dissolved metals. However, "Storm water samples shall be collected using a flow-weighted composite sampling strategy during the wet-weather season in a manner identical to the current municipal storm water-monitoring program" so what the "current permit" says is what is required. (Order No. R9-2007-0043, Order No. R9-2004-0277.
6	Table 6.0	South Orange County Watershed Management Area (WMA) – Pacific Shoreline related to Laguna Beach includes 5 of 6 segments are listed	Segment Laguna Beach @ Laguna Avenue is not listed in the MS4 Permit (and is included in the TMDL on the List of Impaired Segments).
6	Table 6.0	South Orange County WMA – Pacific Shoreline related to San Clemente	Responsible Party Dana Point is not listed in MS4 Permit (as listed in the TMDL)
6	Table 6.0	Carlsbad WMA RPs include Cities of Oceanside, Solana Beach, and Vista.	These 3 cities are not located within the Moonlight HA. RPs <u>did not</u> include Cities of Oceanside, Solana Beach, and Vista in the TMDL.
6	Table 6.0	Peñasquitos WMA (Miramar Reservoir HA) includes Los Peñasquitos Watershed, Scripps, and Tecolote.	The City of San Diego would not agree with merging all three listings into one WMA. Peñasquitos WMA is appropriate for the Pacific Shoreline Listing at Torrey Pines State Beach; however, not for Scripps and Tecolote. Mission WMA is appropriate for both the Scripps and Tecolote listings. In the TMDL: Miramar HA is listed for the Pacific Shoreline Listing at Torrey Pines State Beach. Scripps HA is listed for Pacific Shoreline Listing at La Jolla and PB segments. Tecolote HA is listed for Tecolote Creek.

Section (Att. E)	Sub-Section	Admin. Draft MS4 Permit Summary	Inconsistency/Issue
6	Table 6.0	San Diego River WMA for Forrester Creek Responsible Parties include City of La Mesa	The TMDL does not list the City of La Mesa as a RP.
6	B. (1) Receiving Water Limitations (RWL) Table 6.1	Note 1: Only the single sample maximum (SSM) is required to be achieved during wet weather.	To focus on the SSM and not be required to address the 30-day geomean for wet weather. Note C of both Tables on p. A52 of the TMDL "Receiving Water Limitations for Beaches and Creeks" states that the 30-day geomean must also be met.
6	Limitations (RWL) Table 6.1	Note 2: Both the SSM and Geomeans are required to be achieved during dry weather.	Adding SSM to the required WQBELs goes beyond the TMDL. The SSM should not be used for a dry weather WQBEL. Note E of both Tables on p. A52 of the TMDL "Receiving Water Limitations for Beaches and Creeks" states that the 30-day geomean must be met. The SSM is not a dry weather numeric target.
6	B. (2) Effluent Limitations	The Permit assigned RWLs to the MS4 discharges. Is not conditional upon causing or contributing to an exceedance in the RW.	Beyond the TMDL requirements, which requires compliance based on the receiving water and follow up based on exceedances in the receiving water. The TMDL allows the RPs the flexibility to design their follow-up program, which is also consistent with the WQIP.
6	B. (3) BMPs	This section does not acknowledge the timeline discrepancy between the WQIP and CLRP and the exhaustive resources that have been expended to date.	The CLRPs are in progress – resources and funding have been committed by the RPs to develop CLRPs. The City will incorporate the CLRPs into the WQIPs. The CLRPs address 3 (b) and (c) (Appendix P of Technical Report), and include a Monitoring Plan and QAPP designed to meet the compliance requirements of the TMDL.
6	C. Compliance Schedule (2) Interim Compliance dates	(2) Interim Compliance dates are provided based on the priorities listed in the TMDL for each listed segment. These do not reflect the CLRP process and remove the flexibility meant to encourage a CLRP approach.	Interim Dry Weather WQBELs provided for City WMAs San Dieguito, Peñasquitos/Miramar, Scripps, and Tecolote are set at year 5, rather than year 7. It should be year 7 to allow for the CLRP process per the TMDL. TMDL allows RPs to propose an alternative compliance schedule when developing a CLRP (pA68-69). The schedule is to be included in the CLRP due October 2012. If the Regional Board doesn't accept the proposed schedule a default CLRP schedule was provided on p A68 (pA69). This allows 7 years to comply with an interim 50% reduction for Dry Weather.
6	C. (1) and (2)	Interim and Final Compliance Dates	Permit is inconsistent in selecting/applying them per the TMDL. (See prior two comments)

Section (Att. E)	Sub-Section	Admin. Draft MS4 Permit Summary	Inconsistency/Issue
6	D. Monitoring and Assessment Requirements (1) Beaches (a) Monitoring Stations	Does not specify AB411 monitoring locations for beach listings.	Inconsistent with the TMDL. AB411 locations provide a possible cost-savings by overlapping with the existing program and a benefit to assessment since there is a historical data set. The TMDL states monitoring locations "…should consist of, at a minimum, the same locations used to collect data required under the MS4 NPDES monitoring requirements and beach monitoring for AB411 monitoring." (pA50). CLRP monitoring has already been designed to monitor at the AB411 locations. Stakeholders agreed to monitor AB411 locations for regional consistency and allow for comparison between watersheds.
6	D. (1) (a) Monitoring Stations	Requires coastal outfall monitoring during wet and dry weather simultaneous to receiving water monitoring. Requires analysis of all 3 analytes regardless of exceedances in the receiving water.	(1) Beyond the requirements of the TMDL. While the TMDL is ambiguous as to whether outfall monitoring is required prior to the end of the compliance period, it states "If at the end of the wet TMDL Compliance schedule the receiving waters exceed the SSM more than the allowable exceedance frequency, all controllable sources are responsible for demonstrating their discharges into the RW are not causing the exceedances or they will be considered out of compliance. (p. A54)." (3) Requires costly, routine monitoring on an annual basis, instead of follow up/source identification based on receiving water monitoring. (4) Follow up monitoring should be based on the exceedance frequency of the receiving water numeric targets. The CLRP monitoring plans design follow up monitoring to address receiving water exceedance frequency of the numeric targets after interim milestone of 50% reduction. This approach allows the RPs to implement BMPs and assess water quality improvements prior to the interim milestones. Focus on BMP implementation and compliance monitoring. Limit the cost of follow up monitoring and source tracking.
6	D. (1) (b) Monitoring Procedures	Must monitor each storm event.	This is a costly requirement and not feasible to execute. The TMDL, as written, has contradictory language regarding the number of wet events. The CLRP monitoring approach identifies a set number of monitoring events to be sampled that should be sufficient to characterize the quality of wet weather discharges. The CLRP monitoring approach should be followed, when submitted.

Section (Att. E)	Sub-Section	Admin. Draft MS4 Permit Summary	Inconsistency/Issue
	D. (1) (b) Monitoring Procedures	Does not specify minimum frequency for dry weather monitoring.	Not consistent with TMDL. Doesn't include a reference to the TMDL. Provides inconsistent guidance to the RPs regarding when to monitor per the Permit versus TMDL requirements. "The method and number of samples needed for calculating the 30-day geomean should be consistent with the number of samples required by the Ocean Plan for beaches and Basin Plan for Creeks (TMDL pA53)." Beaches will utilize data collected under the AB411 program, as specified in the CLRP.
6	D. Monitoring and Assessment Requirements (2) Creeks and Creek Mouths (a) Monitoring Stations	Additional outfall stations and jurisdictional monitoring stations. Two Jurisdictional monitoring sites per City.	Increase monitoring requirements. Removes flexibility for RPs to develop follow up monitoring and special studies based on watershed priorities and available resources. The TMDL, as written, requires monitoring one receiving monitoring location at the mouth and one upstream. It does not require outfall or jurisdictional monitoring, giving RPs the flexibility to design their follow up monitoring and source id studies.
6	D. (2) (b) Monitoring Procedures	Must monitor each storm event.	This is a costly requirement and not feasible to execute although the TMDL has contradictory language regarding the number of wet events. The CLRP monitoring approach identifies a set number of monitoring events to be sampled that should be sufficient to characterize the quality of wet weather discharges.
6	D. (2) (b) Monitoring Procedures	Inconsistent in the level of details provided for outfall and jurisdictional monitoring than provided in D. Monitoring and Assessment Requirements (1) Beaches (a) Monitoring Stations.	Monitoring procedures only apply to receiving water monitoring locations. Does not provide analytes or event frequency requirements for outfall or jurisdictional monitoring.
	D.(2) (c) Assessment and Reporting	Assess interim and final receiving whether WQBELs have been achieved. Requires additional outfall monitoring if the receiving water WQBELs have not been achieved.	This is overly prescriptive monitoring requirements to try and identify sources each year of compliance monitoring. Need to add language to clarify that this assessment is not required until after the interim and final compliance dates. Follow up monitoring and source id studies should not be required until after the interim and final compliance dates. The TMDL requires the Copermittees to "demonstrate progress until the exceedance frequencies ultimately are achieved at the end of the TMDL Compliance Schedule (pA55)." Follow up and Source Id approach should be flexible and adaptive to allow the RPs to implement BMPs and assess water quality improvements prior to the interim milestones, as specified in the CLRP. Focus on BMP implementation and compliance monitoring. Limit the cost of follow up monitoring and source tracking. CLRPs will provide an annual summary of monitoring data and findings.

Section (Att. E)	Sub-Section	Admin. Draft MS4 Permit Summary	Inconsistency/Issue
6	D.(1) and (2) (c) Assessment and Reporting	Inconsistent requirements between the two permit sections.	Section D.(1)c does not require reporting of outfall data or additional sites to address RW exceedances as required in Section D(2)c.

ADMINISTRATIVE DRAFT

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD SAN DIEGO REGION

TENTATIVE
ORDER NO. R9-2012-0011
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The San Diego County Copermittees in Table 1a are subject to waste discharge requirements within their respective jurisdictions set forth in this Order.

Table 1a. San Diego County Copermittees

City of Carlsbad	City of Oceanside
City of Chula Vista	City of Poway
City of Coronado	City of San Diego
City of Del Mar	City of San Marcos
City of El Cajon	City of Santee
City of Encinitas	City of Solana Beach
City of Escondido	City of Vista
City of Imperial Beach	County of San Diego
City of La Mesa	San Diego County Regional Airport Authority
City of Lemon Grove	Unified Port District of San Diego
City of National City	

The Orange County Copermittees in Table 1b are subject to waste discharge requirements within their respective jurisdictions set forth in this Order upon expiration of Order No. R9-2009-0002, NPDES No. CAS0108740 on December 16, 2014.

Table 1b. Orange County Copermittees

City of Aliso Viejo	City of Ranch Santa Margarita
City of Dana Point	City of San Clemente
City of Laguna Beach	City of San Juan Capistrano
City of Laguna Hills	City of Laguna Woods
City of Laguna Niguel	County of Orange
City of Lake Forest	Orange County Flood Control District
City of Mission Viejo	

ADMINISTRATIVE DRAFT

The Riverside County Copermittees in Table 1c are subject to waste discharge requirements within their respective jurisdictions set forth in this Order upon expiration of Order No. R9-2010-0016, NPDES No. CAS0108766 on November 10, 2015.

Table 1c. Riverside County Copermittees

City of Murrieta	County of Riverside
City of Temecula	Riverside County Flood Control and Water Conservation District
City of Wildomar	

The Orange County Copermittees and Riverside County Copermittees may enroll under this Order at a date earlier than the expiration date of their current Orders subject to the conditions described in Provision F.6 of this Order and the Copermittees in the respective county receive a Notice of Enrollment (NOE) from the San Diego Water Board.

The term Copermittee in this Order refers to any San Diego County, Orange County, or Riverside County Copermittee enrolled under this Order, unless specified otherwise.

This Order provides permit coverage for the Copermittee discharges described in Table 2. "Co-permittees need only comply with permit conditions relating to discharges from the municipal separate storm sewers for which they are operators." 40 CFR §122.26(a)(3)(vi).

Table 2. Discharge Locations and Receiving Waters

Discharge Points	Locations throughout San Diego Region
Discharge Description	Municipal Separate Storm Sewer System (MS4) Discharges
Receiving Waters	Waters of the U.S.: Inland Surface Waters, Enclosed Bays and Estuaries, and Coastal Ocean Waters of the San Diego Region

Table 3. Administrative Information

This Order was adopted by the San Diego Water Board on:	**Month Day, 2012**
This Order will become effective on:	**Month Day, 2012**
This Order will expire on:	**Month Day, 2017**
The Copermittees must file a Report of Waste Discharge (ROWD) in accordance with Title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than 180 days in advance of the Order expiration date.	

I, David W. Gibson, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on Month Day, 2012.

TENTATIVE

David W. Gibson
Executive Officer

ADMINISTRATIVE DRAFT

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I. FINDINGS

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), finds that:

JURISDICTION

1. **MS4 Ownership or Operation.** Each of the Copermittees owns or operates an MS4, through which it discharges storm water and non-storm water into waters of the U.S. within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the U.S.

2. **Legal and Regulatory Authority.** This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]) adopted by the United States Environmental Protection Agency (USEPA), and chapter 5.5, division 7 of the California Water Code (CWC) (commencing with section 13370). This Order serves as an NPDES permit for discharges from MS4s to surface waters. This Order also serves as waste discharge requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

3. **CWA Technology Based Standards and Prohibitions.** Pursuant to CWA section 402(p)(3)(B), NPDES permits for storm water discharges from MS4s must include requirements to effectively prohibit non-storm water discharges into MS4s, and require controls to reduce the discharge of pollutants in storm water to the maximum extent practicable (MEP).

4. **CWA NPDES Permit Conditions.** Pursuant to CWA section 402(a)(2), NPDES permits must prescribe conditions to assure compliance with CWA section 402(p)(3)(B) and 40 CFR 122.26(d)(2)(iv)(B). This Order prescribes conditions to assure compliance with the CWA requirements for owners and operators of MS4s to effectively prohibit non-storm water discharges in to the MS4s, and require controls to reduce the discharge of pollutants in storm water from the MS4s to the MEP.

5. **CWA and CWC Monitoring Requirements.** Pursuant to 40 CFR 122.48, NPDES permits must specify requirements for recording and reporting monitoring results. In addition, CWC sections 13267 and 13383 authorize the San Diego Water Board to require technical and monitoring reports. This Order establishes monitoring and reporting requirements to implement federal and State requirements.

6. **Total Maximum Daily Loads.** CWA section 303(d)(1)(A) requires that "[e]ach state shall identify those waters within its boundaries for which the effluent limitations…are not stringent enough to implement any water quality standard applicable to such waters." The CWA also requires states to establish a priority ranking of impaired water bodies known as Water Quality Limited Segments and to establish Total Maximum Daily Loads (TMDLs) for such waters. This priority list of impaired water bodies is called the Clean Water Act Section 303(d) List of Water Quality Limited Segments, commonly referred to as the 303(d) List. The CWA requires the 303(d) List to be updated every two years. Requirements of this Order implement the TMDLs adopted by the San Diego Water Board and approved by USEPA.

7. **Non-Storm Water Discharges.** Pursuant to CWA section 402(p)(3)(B)(ii), this Order requires each Copermittee to effectively prohibit discharges of non-storm water into its MS4. Nevertheless, non-storm water discharges into and from the MS4s continue to be reported to the San Diego Water Board by the Copermittees and other persons. Monitoring conducted by the Copermittees, as well as the 303(d) List, have identified dry weather, non-storm water discharges from the MS4s as a source of pollutants causing or contributing to receiving water quality impairments in the San Diego Region. The federal regulations [40 CFR 122.26(d)(2)(iv)(B)] require the Copermittees to have a program to prevent all types of non-storm water discharges, or illicit discharges, from entering the MS4. The federal regulations, however, allow for specific categories of non-storm water discharges or flows to be addressed as illicit discharges only where such discharges are identified as sources of pollutants to waters of the U.S.

8. **In-Stream Treatment Systems.** Pursuant to federal regulations [40 CFR 131.10(a)], in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S. Authorizing the construction of a runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to accepting waste assimilation as an appropriate use for that water body. Runoff treatment must occur prior to the discharge of runoff into receiving waters. Treatment control best management practices (BMPs) must not be constructed in waters of the U.S. ~~or state.~~ Construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body.

DISCHARGE CHARACTERISTICS AND RUNOFF MANAGEMENT

9. **Point Source Discharges of Pollutants.** Discharges from the MS4s may contain waste, as defined in the CWC, and pollutants that adversely affect the quality of the waters of the state. A discharge from an MS4 is a "discharge of pollutants from a point source" into waters of the U.S. as defined in the CWA. Storm water and non-storm water discharges from the MS4s may contain pollutants that cause or threaten to cause a violation of surface water quality standards, as outlined in the Basin Plan. Storm water and non-storm water discharges from the MS4s are subject to the

conditions and requirements established in the Basin Plan for point source discharges.

10. **Potential Beneficial Use Impairment.** The discharge of pollutants and/or increased flows from MS4s may cause or threaten to cause the concentration of pollutants to exceed applicable receiving water quality objectives and impair or threaten to impair designated beneficial uses resulting in a condition of pollution, contamination, or nuisance.

11. **Pollutants Generated by Land Development.** Land development has created and continues to create new sources of non-storm water discharges and pollutants in storm water discharges as human population density increases. This brings higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash. Pollutants from these sources are dumped or washed off the surface by non-storm water or storm water flows into and from the MS4s. When development converts natural vegetated pervious ground cover to impervious surfaces such as paved highways, streets, rooftops, and parking lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving a developed area not subject to SUSMP or HMP requirements contains greater pollutant loads and is significantly greater in runoff volume, velocity, and peak flow rate than pre-development runoff from the same area.

12. **Runoff Discharges to Receiving Waters.** The MS4s discharge runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within the eleven hydrologic units comprising the San Diego Region. Numerous receiving water bodies and water body segments have been designated as impaired by the San Diego Water Board pursuant to CWA section 303(d).

13. **Pollutants in Runoff.** The most common pollutants in runoff discharged from the MS4s include total suspended solids, sediment, pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., cadmium, copper, lead, and zinc), petroleum products and polynuclear aromatic hydrocarbons, synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus), oxygen-demanding substances (decaying vegetation, animal waste), detergents, and trash.

14. **Human Health and Aquatic Life Impairment.** Pollutants in runoff discharges from the MS4s can threaten and adversely affect human health and aquatic organisms. Adverse responses of organisms to chemicals or physical agents in runoff range from physiological responses such as impaired reproduction or growth anomalies to mortality. Increased volume, velocity, rate, and duration of storm water runoff greatly accelerate the erosion of downstream natural channels. This alters stream channels and habitats and can adversely affect aquatic and terrestrial organisms.

15. **Water Quality Effects.** The Copermittees' water quality monitoring data submitted to date documents persistent exceedances of Basin Plan water quality objectives for runoff-related pollutants at various watershed monitoring stations. Persistent toxicity

has also been observed at several watershed monitoring stations. In addition, bioassessment data indicate that the majority of the monitored receiving waters have Poor to Very Poor Index of Biotic Integrity (IBI) ratings. These findings indicate that runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in the San Diego Region. Non-storm water discharges from the MS4s have been shown to contribute significant levels of pollutants and flow in arid, developed Southern California watersheds, and contribute significantly to exceedances of applicable receiving water quality objectives.

16. **Non-Storm Water Discharges.** ~~Non-storm water discharges from the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard from CWA 402(p)(3)(B)(iii), which is explicitly for "Municipal … *Stormwater Discharges* (emphasis added)" from the MS4s.~~ Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s must be effectively prohibited.

17. **Best Management Practices.** Pollutants can be effectively reduced in runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Pollution prevention is the reduction or elimination of pollutant generation at its source and is the best "first line of defense". Source control BMPs (both structural and non-structural) minimize the contact between pollutants and runoff, therefore keeping pollutants onsite and out of receiving waters. Treatment control BMPs remove pollutants that have been mobilized by storm water or non-storm water flows.

18. **BMP Implementation.** Runoff needs to be addressed during the three major phases of development (planning, construction, and use) in order to reduce the discharge of storm water pollutants to the MEP, effectively prohibit non-storm water discharges, and protect receiving waters. Development which is not guided by water quality planning policies and principles can result in increased pollutant load discharges, flow rates, and flow durations which can negatively affect receiving water beneficial uses. Construction sites without adequate BMP implementation result in sediment runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. Existing development can generate substantial pollutant loads which are discharged in runoff to receiving waters.

19. **Long Term Planning and Implementation.** Federal regulations require municipal storm water permits to expire 5 years from adoption, after which the permit must be renewed and reissued. The San Diego Water Board recognizes that the degradation of water quality and impacts to beneficial uses of the waters in the San Diego Region occurred over several decades. The San Diego Water Board further recognizes that a decade or more may be necessary to realize demonstrable improvement to the quality of waters in the Region. This Order includes a long term planning and implementation approach that will require more than a single permit term to complete.

WATER QUALITY STANDARDS

20. **Basin Plan.** The San Diego Water Board adopted a Water Quality Control Plan for the San Diego Basin (Basin Plan) on September 8, 1994 that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for receiving waters addressed through the plan. The Basin Plan was subsequently approved by the State Water Resources Control Board (State Water Board) on December 13, 1994. Subsequent revisions to the Basin Plan have also been adopted by the San Diego Water Board and approved by the State Water Board. Requirements of this Order implement the Basin Plan.

    The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Process Supply (PROC), Industrial Service Supply (IND), Ground Water Recharge (GWR), Contact Water Recreation (REC1), Non-contact Water Recreation (REC2), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Freshwater Replenishment (FRSH), Hydropower Generation (POW), and Preservation of Biological Habitats of Special Significance (BIOL). The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region: Navigation (NAV), Commercial and Sport Fishing (COMM), Estuarine Habitat (EST), Marine Habitat (MAR), Aquaculture (AQUA), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN), and Shellfish Harvesting (SHELL).

21. **Ocean Plan.** The State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, and 2005. The State Water Board adopted the latest amendment on April 21, 2005 and it became effective on February 14, 2006. The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean. Requirements of this Order implement the Ocean Plan.

    The Ocean Plan identifies the following beneficial uses of ocean waters of the state to be protected: Industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture; preservation and enhancement of designated Areas of Special Biological Significance; rare and endangered species; marine habitat; fish spawning and shellfish harvesting

22. **Sediment Quality Control Plan**. On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret

the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

23. **National Toxics Rule and California Toxics Rule.** USEPA adopted the NTR on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the National toxics Rule (NTR) applied in California. On May 18, 2000, USEPA adopted the California Toxics Rule (CTR). The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants

24. **Antidegradation Policy.** This Order is in conformance with the federal Antidegradation Policy described in 40 CFR 131.12, and State Water Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality Waters in California*. Federal regulations at 40 CFR 131.12 require that the State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The San Diego Water Board's Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies.

CONSIDERATIONS UNDER FEDERAL LAW

25. **Coastal Zone Act Reauthorization Amendments.** Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states with approved coastal zone management programs to address non-point pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point pollution: agriculture, silviculture, urban, marinas, and hydromodification. This Order addresses the management measures required for the urban category, with the exception of septic systems. The runoff management programs developed pursuant to this Order fulfill the need for coastal cities to develop a runoff non-point source plan identified in the Non-Point Source Program Strategy and Implementation Plan. The San Diego Water Board addresses septic systems through the administration of other programs.

26. **Endangered Species Act.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 USCA sections 1531 to 1544). This Order requires compliance with receiving water limits, and other requirements to protect the beneficial uses of waters of the State. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

CONSIDERATIONS UNDER STATE LAW

27. **Unfunded Mandates.** This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following:

    a. This Order implements federally mandated requirements under CWA section 402. (33 USC 1342(p)(3)(B).)

    b. The local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental and new dischargers who are issued NPDES permits for storm water and non-storm water discharges.

    c. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order.

    d. The Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC 1311(a)) and in lieu of numeric restrictions on their MS4 discharges (i.e. effluent limitations).

    e. The local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under State law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

    f. The provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards. (33 USC 1313(d).) Once the USEPA or a state develops a TMDL, federal law requires that permits must contain effluent limitations consistent with the assumptions and requirements of any applicable wasteload allocation. (40 CFR 122.44(d)(1)(vii)(B).)

28. **California Environmental Quality Act.** The issuance of WDRs and an NPDES permit for the discharge of runoff from MS4s to waters of the U.S. is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 et seq.) in accordance with CWC section 13389.

STATE WATER BOARD DECISIONS

29. **Compliance with Prohibitions and Limitations.** The receiving water limitation language specified in this Order is consistent with language recommended by the USEPA and established in State Water Board Order WQ-99-05, *Own Motion Review of the Petition of Environmental Health Coalition to Review Waste Discharge Requirements Order No. 96-03, NPDES Permit No. CAS0108740*, adopted by the State Water Board on June 17, 1999. The receiving water limitation language in this Order requires compliance with water quality standards, which for storm water discharges is to be achieved through an iterative approach requiring the

implementation of improved and better-tailored BMPs over time. Implementation of the iterative approach to comply with receiving water limitations based on applicable water quality standards is necessary to ensure that storm water discharges from the MS4 ultimately will not cause or contribute to violations of water quality standards and the creation of conditions of pollution, contamination, or nuisance.

30. **Special Conditions for Areas of Special Biological Significance.** On March 20, 2012, the State Water Board approved Resolution No. 2012-0012~~X~~ approving an exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges. The Resolution requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBSs. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject terms and conditions of the Resolution. The Special Protections contained in Attachment B to the Resolution applicable to these discharges are hereby incorporated in this Order as if fully set forth herein.

ADMINISTRATIVE FINDINGS

31. **Executive Officer Delegation of Authority.** The San Diego Water Board by prior resolution has delegated all matters that may legally be delegated to its Executive Officer to act on its behalf pursuant to CWC section 13223. Therefore, the Executive Officer is authorized to act on the San Diego Water Board's behalf on any matter within this Order unless such delegation is unlawful under CWC section 13223 or this Order explicitly states otherwise.

32. **Standard Provisions.** Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR 122.42, are provided in Attachment B to this Order.

33. **Fact Sheet.** The Fact Sheet for this Order contains background information, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of this Order. The Fact Sheet is hereby incorporated into this Order and constitutes part of the Findings of this Order.

34. **Public Notice.** The San Diego Water Board notified the Copermittees, and interested agencies and persons of its intent to prescribe WDRs for MS4 discharges of pollutants to waters of the U.S. and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet.

35. **Public Hearing.** The San Diego Water Board held a public hearing on Month Day, 2012 and heard and considered all comments pertaining to the terms and conditions of this Order. Details of the public hearing are provided in the Fact Sheet.

II. PROVISIONS

THEREFORE, IT IS HEREBY ORDERED that the Copermittees, in order to meet the provisions contained in division 7 of the CWC and regulations adopted thereunder, and the provisions of the CWA and regulations adopted thereunder, must each comply with the following:

A. PROHIBITIONS AND LIMITATIONS

The purpose of this provision is to describe the conditions under which storm water and non-storm water discharges into and from MS4s are prohibited or limited. The goal of this provision is to ~~protect, preserve, enhance, and restore~~ address the impacts of MS4 discharges so that such discharges do not impair water quality and designated beneficial uses of waters of the U.S. This goal will be accomplished through implementation of control measures that effectively prohibit non-storm water discharges into and from the Copermittees' MS4s, and reduce pollutants in storm water discharges from the Copermittees' MS4s to the MEP. The process for determination of compliance with the Discharge Prohibitions (A.1), Receiving Water Limitations (A.2), and Effluent Limitations (A.3) is defined in Provision A.4.

1. Discharge Prohibitions

a. Discharges ~~into and~~ from MS4s owned and operated by a Copermittee in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the ~~state~~ U.S. are effectively prohibited, unless the Copermittee is addressing the discharges through Provision A.1.e or A.4 through the process set forth in Provision A.4.

b. Non-storm water discharges into ~~and from~~ MS4s are effectively prohibited, unless such discharges are either authorized by a separate NPDES permit, or the discharge is a category of non-storm water discharges or flows that must be addressed pursuant to Provisions E.2.a.(1)-(5) of this Order.

c. Discharges from MS4s are subject to all waste discharge prohibitions in the Basin Plan, included in Attachment A to this Order, unless the Copermittee is addressing the discharges through Provision A.1.e or A.4 through the process set forth in Provision A.4.

d. ~~Discharges from MS4s to ASBS are prohibited.~~ Storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-001**2**~~X~~ applicable to these discharges, included in Attachment A to this Order. All other discharges from MS4s to ASBS are prohibited, unless authorized by a subsequent order.

e. For discharges associated with water body pollutant combinations addressed in a TMDL in Attachment E of this Order, the affected Copermittees shall achieve compliance as outlined in Attachment E (Total Maximum Daily Load Provisions).

2. Receiving Water Limitations

a. Discharges from MS4s owned and operated by a Copermittee must not cause or contribute to the violation of water quality standards in any receiving waters, including ~~but not limited to~~ all applicable provisions contained in the list below including any modifications, unless the Copermittee is addressing the discharges through Provision A.2.b or A.4 through the process set forth in Provision A.4:

(1) The San Diego Water Board's Basin Plan, including beneficial uses, water quality objectives, and implementation plans;

(2) State Water Board plans for water quality control including the following:

(a) Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries (Thermal Plan), and

(b) The Ocean Plan, including beneficial uses, water quality objectives, and implementation plans;

(3) State Water Board policies for water and sediment quality control including the following:

(a) Water Quality Control Policy for the Enclosed Bays and Estuaries of California,

(b) Sediment Quality Control Plan which includes the following narrative objectives for bays and estuaries:

(i) Pollutants in sediments shall not be present in quantities that, alone or in combination, are toxic to benthic communities, and

(ii) Pollutants shall not be present in sediments at levels that will bioaccumulate in aquatic life to levels that are harmful to human health,

(c) The Statement of Policy with Respect to Maintaining High Quality of Waters in California (State Water Board Resolution No. 68-16).:

(4) Priority pollutant criteria promulgated by the USEPA through the following:

(a) National Toxics Rule (NTR)[1] (promulgated on December 22, 1992 and amended on May 4, 1995), and

(b) California Toxics Rule (CTR)[2,3]

~~a. Discharges from MS4s composed of storm water runoff must not alter natural ocean water quality in an ASBS.~~

~~b. Discharges from MS4s must not cause or contribute to the violation of any receiving water limitations expressed as water quality based effluent limitations (WQBELs) required to meet the WLAs established for the TMDLs in to this Order, pursuant to the applicable TMDL compliance schedules.~~

b. For receiving water limitations associated with a water body pollutant combination addressed in a TMDL in Attachment E of this Order, the Copermittees shall achieve compliance as outlined in Attachment E (Total Maximum Daily Load Provisions).

3. Effluent Limitations

a. Technology Based Effluent Limits
Pollutants in storm water discharges from MS4s must be reduced to the MEP~~.~~[4], through timely implementation of control measures and other actions as specified in Provisions B and E as described in Provision A.4.

b. Water Quality Based Effluent Limits
For a water body-pollutant combination addressed in a TMDL in Attachment E of this Order, ~~P~~pollutants in discharges from MS4s must be reduced to comply with ~~any~~ effluent limitations expressed as WQBELs required to meet the WLAs established for those TMDLs as described in Provision A.4 and Attachment E to this Order, pursuant to the applicable TMDL compliance schedules.

4. Compliance with Discharge Prohibitions, ~~and~~ Receiving Water Limitations, and Effluent Limitations

Each Copermittee must comply with the discharge prohibitions (A.1), ~~and~~ receiving water limitations (A.2), and effluent limitations (A.3) of this Order through timely

[1] 40 CFR 131.36
[2] 65 Federal Register 31682-31719 (May 18, 2000), adding Section 131.38 to 40 CFR
[3] If a water quality objective and a CTR criterion are in effect for the same priority pollutant, the more stringent of the two applies, unless a previous regulatory action (i.e., TMDL) has specified otherwise.
[4] This does not apply to MS4 discharges which receive subsequent treatment to reduce pollutants in storm water discharges to the MEP prior to entering receiving waters (e.g., low flow diversions to the sanitary sewer). Runoff treatment must occur prior to the discharge of runoff into receiving waters per Finding 8.

implementation of strategies, control measures, and other actions as specified in Provisions B and E of this Order, including any modifications. The Water Quality Improvement Plans described in Provision B shall be designed to achieve compliance with the discharge prohibitions, receiving water limitations, and effluent limitations. Copermittees shall be considered in compliance with A.1, A.2, and A.3 unless the Regional Board has denied approval of a Water Quality Improvement Plan or subsequent update as described in Provisions B and F.1.

a. If exceedance(s) of water quality standards persist in receiving waters notwithstanding implementation of this Order, the Copermittees must comply with the following procedures:

(1) For pollutants that are not in the process of being addressed via specific scheduled actions in a Water Quality Improvement Plan, ~~U~~upon a determination by either the Copermittees or the San Diego Water Board that discharges from the MS4 are causing or contributing to an exceedance of an applicable water quality standard, the Copermittees must submit the following updates to the Water Quality Improvement Plan required under Provision B as part of the Annual Report required under Provision F.3.b~~,~~ or Water Quality Improvement Plan update Provision B.5.a, unless the San Diego Water Board either: 1) directs an earlier submittal; or 2) allows for the adoption of a forthcoming TMDL to establish wasteload allocations that will form the basis of revisions to the Water Quality Improvement Plan:

(a) The water quality improvement strategies being implemented that are effective and will continue to be implemented;

(b) ~~Additional w~~Water quality improvement strategies (~~i.~~e.g. BMPs, retrofitting projects, stream and/or habitat rehabilitation, ~~or~~ restoration projects, etc.) that will be implemented to reduce or eliminate any pollutants or conditions that are causing or contributing to the exceedance of water quality standards;

(c) Updates to the schedule for implementation of the existing and additional water quality improvement strategies; and

(d) Updates, when necessary, to the schedule for achieving compliance with the discharge prohibitions and receiving water limitations of this Order;

(e) As described in Provision B.6, Copermittees must submit requested modifications to the Water Quality Improvement Plan either in the Annual Report required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge (ROWD) required pursuant to Provision F.5.b~~The San Diego Water Board may require the incorporation of additional modifications to the Water Quality Improvement Plan required under Provision B. The applicable Copermittees must submit any modifications~~

~~to the update to the Water Quality Improvement Plan within 30 days of notification that additional modifications are required by the San Diego Water Board, or as otherwise directed~~;

(f) As described in Provision B.6, upon ~~Within 30 days of the~~ San Diego Water Board determination that the update to the Water Quality Improvement Plan meets the requirements of this Order, ~~-~~the Copermittees must submit requested modifications to the jurisdictional runoff management programs either in the Annual Report required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge (ROWD) required pursuant to Provision F.5.b.~~revise the jurisdictional runoff management program documents to incorporate the updated water quality improvement strategies that have been and will be implemented, the implementation schedule, and any additional monitoring required~~; and

(g) The Copermittees must implement the revised jurisdictional runoff management programs and updated jurisdictional monitoring and assessment component of the Water Quality Improvement Plan.

(2) For pollutants in the process of being addressed via a specific, scheduled program in a Water Quality Improvement Plan, the Copermittee(s) shall continue to implement that program as described in the Water Quality Improvement Plan approved by the Regional Board;

b. So long as the Copermittees have complied with the procedures set forth above and are implementing the Water Quality Improvement Plan(s) approved by the Regional Board, the Copermittees ~~must~~ do not have to repeat the same procedure ~~set forth above to comply with~~ for continuing or recurring exceedances of the same discharge prohibitions, effluent limitations, and receiving water limitations ~~of this Order for continuing or recurring exceedances of the same water quality standard(s) following implementation of scheduled actions~~ unless directed to ~~do otherwise~~ by the San Diego Water Board.

~~**a.** Nothing in Provisions A.4. and A.4. prevents the San Diego Water Board from enforcing any provision of this Order while the applicable Copermittees prepare and implement the above update to the Water Quality Improvement Plan and jurisdictional runoff management programs.~~

B. WATER QUALITY IMPROVEMENT PLANS

The purpose of this provision is to develop Water Quality Improvement Plans that guide the Copermittees' jurisdictional runoff management program implementation efforts towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plan is to 1) effectively prohibit non-storm water discharges into the MS4s, 2) reduce pollutants in storm water discharges from the MS4s to the MEP, and 3) support attainment and ~~the~~ reasonable protection, preservation~~,~~ and enhancement~~, and restoration~~ of water quality and designated beneficial uses of waters of the state. Therefore, implementation of the WQIPs also provides the basis for complying with Provisions A.1 and A.3, as described in Provision A.4. This goal will be accomplished through an adaptive planning and management process that identifies the highest water quality priorities within a watershed and implements strategies, control measures, and BMPs to achieve improvements in the quality of discharges from the MS4s and receiving waters.

The Copermittees must develop Water Quality Improvement Plans for each Watershed Management Area that 1) prioritize water quality ~~issues~~conditions resulting from the Copermittee's MS4 discharges ~~to and from the MS4s with~~in each Watershed Management Area, 2) identify MS4 pollutant sources ~~and other stressors~~ associated with ~~those~~the water quality priorities, 3) define numeric ~~targets~~goals and schedules to ~~achieve improvement of~~address water quality priorities, 4) describe water quality improvement strategies to achieve numeric ~~targets~~goals, and 5) develop and execute a coordinated monitoring and assessment program to facilitate adaptive management of the Water Quality Improvement Plans and determine progress towards achieving improved water quality in MS4 discharges and receiving waters ~~improved water quality.~~

The Copermittees must ~~implement all~~submit Water Quality Improvement Plans for public review and Regional Board Executive Officer review and approval per the ~~requirements of~~ schedule outline in Provision ~~no later than 12 months after the adoption of this Order, or in accordance with Provision F.5~~B.~~6 of this Order.~~

1. Watershed Management Areas

The Copermittees must develop Water Quality Improvement Plans for each of the Watershed Management Areas in Table B-1. A total of ~~nine~~ten Water Quality Improvement Plans must be developed for the San Diego Region.

Table B-1. Watershed Management Areas (continued)

Watershed Management Area	Hydrologic Unit(s)	Major Surface Water Bodies	Responsible Copermittees
South Orange County	San Juan (901.00)	Aliso Creek San Juan Creek San Mateo Creek Pacific Ocean	- City of Aliso Viejo[1] - City of Dana Point[1] - City of Laguna Beach[1] - City of Laguna Hills[1] - City of Laguna Niguel[1] - City of Laguna Woods[1] - City of Lake Forest[1] - City of Mission Viejo[1] - City of Rancho Santa Margarita[1] - City of San Clemente[1] - City of San Juan Capistrano[1] - County of Orange[1] - Orange County Flood Control District[1]
Santa Margarita River	Santa Margarita (902.00)	Murrieta Creek Temecula Creek Santa Margarita River Santa Margarita Lagoon Pacific Ocean	- City of Murrieta[2] - City of Temecula[2] - City of Wildomar[2] - County of Riverside[2] - County of San Diego[3] - Riverside County Flood Control and Water Conservation District[2]
San Luis Rey River	San Luis Rey (903.00)	San Luis Rey River San Luis Rey Estuary Pacific Ocean	~~- City of Escondido~~ - City of Oceanside - City of Vista - County of San Diego
Carlsbad	Carlsbad (904.00)	Loma Alta Slough Buena Vista Lagoon Agua Hedionda Lagoon Batiquitos Lagoon San Elijo Lagoon Pacific Ocean	- City of Carlsbad - City of Encinitas - City of Escondido - City of Oceanside - City of San Marcos - City of Solana Beach - City of Vista - County of San Diego
San Dieguito River	San Dieguito (905.00)	San Dieguito River San Dieguito Lagoon Pacific Ocean	- City of Del Mar - City of Escondido - City of Poway - City of San Diego - City of Solana Beach - County of San Diego
Penasquitos	~~Penasquitos~~ Reservoir HA (906.~~00~~10) Poway HA (906.20) Miramar HA (906.40)	Los Penasquitos Lagoon ~~Mission Bay~~ Pacific Ocean	- City of Del Mar - City of Poway - City of San Diego - County of San Diego
Mission Bay	Scripps HA (906.30) Miramar HA (906.40) Tecolote HA (906.50)	Mission Bay Pacific Ocean	-City of San Diego
San Diego River	San Diego (907.00)	San Diego River Pacific Ocean	- City of El Cajon - City of La Mesa ~~- City of Poway~~ - City of San Diego - City of Santee - County of San Diego

Table B-1. Watershed Management Areas (continued)

Watershed Management Area	Hydrologic Unit(s)	Major Surface Water Bodies	Responsible Copermittees
San Diego Bay	Pueblo San Diego (908.00) Sweetwater (909.00) Otay (910.00)	Sweetwater River Otay River San Diego Bay Pacific Ocean	- City of Chula Vista - City of Coronado - City of Imperial Beach - City of La Mesa - City of Lemon Grove - City of National City - City of San Diego - County of San Diego - San Diego County Regional Airport Authority - Unified Port of San Diego
Tijuana River	Tijuana (911.00)	Tijuana River Tijuana Estuary Pacific Ocean	- City of Imperial Beach - City of San Diego - County of San Diego

Notes:
1. The Orange County Copermittees will be enrolled under this Order upon expiration of Order No. R9-2009-0002, or earlier if the Orange County Copermittees meet the conditions in Provision F.6.
2. The Riverside County Copermittees will be enrolled under this Order upon expiration of Order No. R9-2010-0016, or earlier if the Riverside County Copermittees meet the conditions in Provision F.6.
3. The County of San Diego will not be required to implement the requirements of Provision B for the Santa Margarita River Watershed Management Area until the Riverside County Copermittees are enrolled under this Order. Until then, the County of San Diego is responsible for implementing and complying with the requirements of Provisions D.1, D.4.a.(1)&(3), E, F.2.a-b, F.3.b, and F.4 for the areas of the Santa Margarita River Watershed Management Area within its jurisdiction.

2. Identification of Water Quality Priorities

The Copermittees must identify the water quality priorities within each Watershed Management Area that will be addressed by the Water Quality Improvement Plan. Where appropriate, Watershed Management Areas may be separated into subwatersheds to focus water quality prioritization and jurisdictional ~~runoff management program~~ implementation efforts by receiving water.

a. Assessment of Receiving Water Conditions

The Copermittees must ~~review pollutant sources, discharges, and receiving water conditions and assess~~consider the following, at a minimum, to ~~determine~~support the ~~degree~~identification of ~~adverse~~water quality priorities based on the impacts ~~to~~of MS4 discharges on receiving water beneficial uses:

(1) Receiving waters listed as impaired on the CWA Section 303(d) List of Water Quality Limited Segments (303(d) List);

(2) TMDLs adopted and under development by the San Diego Water Board;

(3) The requirements of Provision A.2;

~~(3)~~(4) Receiving waters recognized as sensitive or highly valued by the Copermittees, including estuaries designated under the National Estuary Program under CWA section 320, wetlands defined by the State or U.S. Fish and Wildlife Service's National Wetlands Inventory as wetlands, and receiving

waters identified as ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012~~X~~ (Attachment A);

~~(4)~~(5) Water quality standards established in the Basin Plan;

~~(5)~~(6) Known historical versus current physical, chemical, and biological water quality conditions;

~~(6)~~(7) ~~All available~~ Available, relevant, and appropriately collected physical, chemical, and biological receiving water monitoring data meeting appropriate QA/QC standards, including~~, but not limited to,~~ data describing:

(a) Chemical constituents;

(b) Water quality parameters (i.e. pH, temperature, conductivity, etc.);

(c) Toxicity Identification Evaluations for both receiving water column and sediment;

(d) Trash impacts;

(e) Bioassessments; and

(f) Physical habitat.

~~(7)~~(8) Available evidence of erosional impacts in receiving waters due to accelerated flows (i.e. hydromodification); ~~and~~

~~(8)~~(9) Available evidence of adverse impacts to the chemical, physical, and biological integrity of receiving waters~~.~~; and

(10) The potential for long-term achievement and maintenance of beneficial use attainment in the Watershed Management Area.

b. ASSESSMENT OF MS4 DISCHARGE QUALITY AND IMPACTS

To support the identification of priorities based on the impacts of MS4 discharges on receiving water beneficial uses, the Copermittees must review appropriately collected MS4 discharge quality data and consider the extent to which MS4s cause or contribute to the adverse impacts to receiving water beneficial uses identified in B.2.a. Considerations include:

(1) Locations of the Copermittees' MS4 discharges with respect to receiving waters;

(2) MS4 discharge quality results relevant to impacts in receiving waters and action levels, including the temporal and geographic variation of the results:

(3) The requirements of Provisions A.1 and A.3.; and

(4) Whether MS4 discharge quality is sufficiently well known or other information is available to assess whether MS4 discharges are causing or contributing to specific receiving water conditions, or whether additional data need to be collected through the Monitoring and Assessment Program developed as part of the Water Quality Improvement Plan.

c. IDENTIFICATION OF ~~IDENTIFY~~PRIORITY ~~POLLUTANTS AND~~ RECEIVING WATER CONDITIONS

The Copermittees must use the information gathered in Provision B.2.a~~.~~ and B.2.b. to develop a list of water quality priorities as pollutants and/or receiving water conditions that are the highest threat to receiving water quality or that most adversely affect the physical, chemical, and biological integrity of receiving waters. The Copermittees must identify the highest water quality priorities to be addressed by the Water Quality Improvement Plan, and describe the reasoning for selecting a subset of receiving water conditions as the highest priority(ies)~~.~~ The Water Quality Improvement Plans shall describe the following for the highest priority receiving water condition:

(1) The beneficial use(s) and pollutant(s) associated with the priority receiving water condition(s);

(2) The geographic extent of the priority receiving water condition(s)within the WMA, if known;

(3) The Copermittees with MS4s that contribute discharges to the priority water receiving condition(s);

(4) The temporal extent of the priority receiving condition(s) (i.e., dry weather and/or wet weather); and

(5) Whether receiving waters have been monitored sufficiently to adequately characterize the priority receiving condition(s), including a consideration of spatial and temporal variation.

d. MS4 POLLUTANT SOURCE ~~AND/OR STRESSOR~~ IDENTIFICATION

The Copermittees must identify and prioritize known and suspected storm water and non-storm water pollutant sources ~~and any other stressors causing or contributing to~~within the MS4 associated with the highest priority receiving water conditions identified under B.2.c~~quality priorities.~~ . The identification of known

and suspected sources of the highest water quality priorities as identified for Provision B.2.c ~~must~~ shall consider the following :

(1) Land uses and their potential contribution to the highest priority receiving water conditions;

(2) Pollutant generating facilities ~~or~~, areas, and/or activities within the Watershed Management Area~~, including:~~;

~~Each Copermittee's inventory of construction, municipal, commercial, industrial, and residential facilities, areas, and/or activities,~~

~~Publicly owned parks and/or recreational areas,~~

~~Open space areas,~~

~~All currently operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste, and~~

~~Areas not within the Copermittees' jurisdictions (e.g., tribal lands, state lands, federal lands) that may be pollutant sources related to the highest water quality priorities within the Watershed Management Area;~~

Locations of the Copermittees' MS4s~~, including the following:~~

(3) ~~All MS4~~ outfalls ~~that discharge to receiving waters, and~~ .

~~Locations of major structural controls for storm water and non-storm water (e.g., retention basins, detention basins, major infiltration devices, etc.);~~

~~Other known and suspected sources of non-storm water or pollutants in storm water discharges to receiving waters within the Watershed Management Area, including the following:~~

~~Other MS4 outfalls (e.g., Phase II Municipal and Caltrans),~~

~~Other NPDES permitted discharges,~~

~~Any other discharges that may be considered point sources (e.g., private outfalls), and~~

~~Any other discharges that may be considered non-point sources (e.g., agriculture, wildlife or other natural sources);~~

(4) Review of available data, including ~~but not limited to~~:

(i) Findings from the Copermittees' illicit discharge detection and elimination programs,

(ii) Findings from the Copermittees' MS4 outfall monitoring,

~~(iii) Findings from the Copermittees' receiving water monitoring,~~
~~(iv)~~
~~(v) Findings from the Copermittees' MS4 discharges and receiving water assessments, and~~
~~(vi)~~
~~(vii)~~(iii) ~~Any other~~Other available, relevant, and appropriately-collected data, information, or studies related to pollutant sources and ~~conditions~~ pollutant-generating activities that contribute to the highest priority receiving water ~~quality priorities as~~conditions identified ~~for~~ in Provision B.2.c~~c~~.

(5) Whether MS4 sources are sufficiently well known to design an effective, efficient[5], directed control strategy, or whether additional source/stressor identification needs to be conducted through the Monitoring and Assessment Program developed as part of the Water Quality Improvement Plan to identify and prioritize sources/stressors within the watershed.

e. NUMERIC ~~TARGETS AND SCHEDULES~~GOALS

The Copermittees must develop and incorporate interim and final numeric ~~targets[6] and schedules~~ goals[6~~7~~] into the Water Quality Improvement Plans. Numeric ~~targets~~goals and schedules ~~must be used~~are intended to support Water Quality Improvement Plan development and to measure progress towards addressing the highest priority receiving water conditions identified under B.2.c~~water quality priorities and an ultimate outcome of protections, preservation, enhancement, and restoration of~~. Numeric goals are not enforceable compliance standards, effluent limitations, or receiving water ~~beneficial uses.~~ limitations. When ~~developing~~establishing numeric ~~targets~~goals and corresponding schedules, the Copermittees must consider the following:

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[5] Copermittees are encouraged to use a sustainability analysis, or Triple Bottom Line analysis, that considers environmental, social and economic factors when estimating the potential efficiency of control strategies.

~~[6] Interim and final numeric targets may take a variety of forms such as pollutant concentration, load reductions, number of impaired water bodies delisted from the List of Water Quality Impaired Segments, Index of Biotic Integrity (IBI) scores, or other appropriate metrics. Interim and final numeric targets are not necessarily limited to one criterion or indicator, but may include multiple criteria and/or indicators.~~

[6] Interim and final numeric goals may take a variety of forms such as TMDL targets, TMDL wasteload allocations, TMDL based WQBELs incorporated in Attachment E of this Order, action levels, pollutant concentration, load reductions, number of impaired water bodies delisted from the List of Water Quality Impaired Segments, Index of Biotic Integrity (IBI) scores, or other appropriate metrics. Interim and final numeric goals are not necessarily limited to one criterion or indicator, but may include multiple criteria and/or indicators. To the extent that a goal is not based on an enforceable regulatory mechanism (i.e., TMDL, WLA), WQIP goals and schedules may be revised through the iterative process. Numeric goals are not subject to enforcement or non-compliance actions under this Order.

PROVISION B: WATER QUALITY IMPROVEMENT PLANS

(1) Final numeric ~~targets~~goals must be based on measureable criteria or indicators, to be achieved in the receiving waters and/or MS4 discharges for the highest priority receiving water ~~quality priorities~~conditions which will ~~result in~~be capable of demonstrating progress toward the achievement of the restoration and/or protection of water quality standards in receiving waters; and

(2) Interim numeric ~~targets~~goals must be based on measureable criteria or indicators that can demonstrate incremental progress toward achieving the final numeric ~~targets~~goals in the receiving waters and/or MS4 discharges~~;~~. ~~and~~

(3) Schedules must be adequate for measuring progress toward achieving the interim and final numeric ~~targets~~ goals required for Provisions B.2.d. ~~and B.2.d..~~ Schedules must incorporate the following:

(i) Interim dates for achieving the interim numeric goals~~targets~~,

(ii) Compliance schedules for any applicable TMDLs in Attachment E to this Order,

(iii) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-001**2**~~X~~ (see Attachment A),

(iv) Achievement of the final numeric goals ~~targets~~ in the receiving waters and/or MS4 discharges for the highest water quality priorities must be as soon as possible, and

~~(iv)~~(v) Final dates for achieving the final numeric goals ~~targets~~ must not extend more than 10 years beyond the date this Order is adopted, unless the schedule includes an applicable TMDL in Attachment E to this Order[7~~8~~].

3. Water Quality Improvement Strategies and Schedules

The Copermittees must develop specific water quality improvement strategies to address the highest ~~water quality~~ priority~~ies~~ receiving water conditions identified within a Watershed Management Area. The water quality improvement strategies must address the highest water quality priorities by preventing or eliminating non-storm water discharges to and from the MS4, reducing pollutants in storm water discharges from the MS4 to the MEP, and restoring and/or

[7] Achievement of final numeric goals within 10 years represents progress towards attainment of water quality standards, but is not a requirement to fully attain all applicable water quality standards or all priority receiving water conditions within 10 years.

protecting the water quality standards of receiving waters.

a. WATER QUALITY IMPROVEMENT STRATEGIES

The Copermittees must prioritize water quality improvement strategies, ~~must prioritize~~based on their likely effectiveness and efficiency, and implement ~~the following~~ measures, as appropriate, to effectively prohibit non-storm water discharges into its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, and achieve the interim and final numeric ~~targets~~goals in accordance with the schedules ~~required for~~in Provision B.2~~.~~.e. Measures include:

(1) Copermittee-selected activities identified in Provision E ,either as described in the jurisdictional runoff management programs or as modified with justification, that will address priority receiving water conditions; and

~~(2)~~ Additional ~~S~~structural and/or non-structural BMPs (to include public outreach and participation programs), as selected by the Copermittee, that are designed to achieve the interim and final numeric goals identified in Provision B.2.e.~~targets in the receiving waters and/or MS4 discharges;~~

~~Retrofitting projects for areas of existing development known or suspected to contribute to the highest water quality priorities, and where retrofitting will contribute to reducing or eliminating non-storm water discharges to the MS4 and/or reducing pollutants in storm water discharges from the MS4 to the MEP;~~

~~(3)~~(2) ~~Stream and/or habitat rehabilitation or restoration projects where stream and/or habitat rehabilitation or restoration are necessary for, or will contribute to demonstrable improvements in the physical, chemical, and biological receiving water conditions and restoration and/or protection of water quality standards in receiving waters; and~~

~~Other water quality improvement strategies that will result in preventing or eliminating non-storm water discharges to and from the MS4, reducing pollutants in storm water discharges from the MS4 to the MEP, and restoring and/or protecting the water quality standards of receiving waters.~~

b. IMPLEMENTATION SCHEDULES

~~(1)~~ The Copermittees must develop schedules for implementing the water quality improvement strategies identified under Provision B.3.a~~a~~~~a~~ to achieve the interim and final numeric ~~targets~~goals identified in ~~the receiving waters and/or MS4 discharges for the highest water quality priorities~~B.2.e in the Watershed Management Area. Schedules must be developed for both the water quality improvement strategies implemented by each Copermittee within its jurisdiction and for strategies that ~~will be implemented by multiple Copermittees~~ Copermittees' choose to implement on a collaborative basis~~.~~

~~(2)~~(1) .

Formatte

~~(3)~~(2) The Copermittees must incorporate the implementation compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-001~~X~~2 (see Attachment A).

4. Water Quality Improvement Monitoring and Assessment

The Copermittees in each Watershed Management Area must develop an integrated ~~program to assess the~~Water Quality Improvement Plan Monitoring and Assessment Program that assesses: 1) progress toward achieving the numeric ~~targets~~goals and schedules, ~~and~~2) ~~the~~ progress toward addressing the highest priority receiving water ~~quality priorities~~conditions for each Watershed Management Area, and 3) each Copermittee's overall efforts implementing the requirements of Provision B. The water quality improvement monitoring and assessment program must include the monitoring and assessment requirements of Provision D~~.~~, which may be modified for consistency with the priority receiving water conditions of each Watershed Management Area and associated Copermittees. For Watershed Management Areas with applicable TMDLs, the water quality monitoring and assessment program must incorporate the specific monitoring and assessment requirements of Attachment E. For Watershed Management Areas with any ASBS, the water quality monitoring and assessment program must also incorporate the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-001**2**~~**X**~~ (see Attachment A).

5. Iterative and Adaptive Management Process

~~**a. WATER QUALITY IMPROVEMENT PLAN ADAPTIVE MANAGEMENT PROCESS**~~

The Copermittees in each Watershed Management Area must implement the iterative process, ~~at least once every 3 years,~~ adapting the Water Quality Improvement Plan, jurisdictional runoff management programs and monitoring and assessment programs, as necessary, to become more effective~~, based on, but not limited to~~ and meet the requirements of Provisions A, and shall consider the following~~ considerations~~:

a. PRIORITY RECEIVING WATER CONDITIONS AND NUMERIC GOALS

The priority receiving water conditions and numeric goals, developed pursuant to B.2.c. and B.2.e respectively, shall guide jurisdictional implementation efforts for the duration of this Order. Recommendations for changes to priority receiving water conditions and numeric goals shall be provided in the Report of Waste Discharge and shall consider the following:

(1) Achieving the outcome of improved water quality in MS4 discharges and receiving waters through implementation of the water quality improvement strategies identified in the Water Quality Improvement Plan;

(2) Progress toward achieving interim and final numeric ~~targets~~goals in receiving waters and/or MS4 discharges for the highest water quality priorities in the Watershed Management Area~~,~~

~~Appropriateness of the highest water quality priorities identified for the Watershed Management Area;~~

~~Progress toward achieving outcomes according to established schedules;~~

(3) New scientific information or new or updated policies or regulations that affect identified numeric goals including revised water quality objectives or TMDLs;

~~(3)~~(4) Spatial and temporal accuracy of monitoring data collected to inform prioritization of water quality problems and implementation measures to address the highest priority receiving water ~~quality problems~~conditions;

~~(4)~~(5) Availability of new information and data from sources other than the jurisdictional runoff management programs within the Watershed Management Area that informs the effectiveness of the actions implemented by the Copermittees;

(6) The factors listed in Provision B.2.a.(1)-(10);

~~(5)~~(7) San Diego Water Board recommendations; and

~~(6)~~(8) Recommendations for modifications ~~to the Water Quality Improvement Plan~~ solicited through a public participation process.

b. ~~BASED ON THE RESULTS OF THE ITERATIVE PROCESS~~ WATER QUALITY IMPROVEMENT STRATEGIES AND SCHEDULES

~~(1)~~ The water quality improvement strategies and schedules required pursuant to ~~Provision B.5.a., the~~Provisions B.3 and B.4 shall be adapted as new information becomes available to inform more effective and efficient means of achieving the numeric goals established in Provision B.2.e. Copermittees ~~must report any modifications necessary~~shall consider adaptation to ~~improve the effectiveness of the Water Quality Improvement Plan in the Annual Report required pursuant to Provision , or as part of the Report of Waste Discharge (ROWD) required pursuant to Provision F.5..~~

~~(2) The Copermittees must implement any modifications to the Water Quality Improvement Plan in accordance with the schedules developed pursuant to Provisions B.2. and B.3., unless directed otherwise by the San Diego Water Board.~~

~~**b. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ADAPTIVE MANAGEMENT PROCESS**~~

~~Each Copermittee in the Watershed Management Area must implement the iterative process,~~jurisdictional runoff management programs and monitoring and assessment strategies and schedules at least annually~~, adapting its jurisdictional runoff management program to become more effective, based on, but not limited to~~ considering the following:

(1) Changes to priority receiving water conditions and numeric goals based on recommendations from B.5.a.;

(2) Measurable or demonstrable reductions of non-storm water discharges to ~~and from~~ each Copermittee's MS4;

(3) Measurable or demonstrable reductions of pollutants in storm water discharges from each Copermittee's MS4 to the MEP;

(4) Information on the MS4 sources and/or pollutant-generating activities determined to be most significantly contributing to priority receiving water conditions;

~~(4)~~(5) Efficiency in implementing the Water Quality Improvement Plan;

~~(5)~~(6) San Diego Water Board recommendations; and

~~(6)~~(7) Recommendations for modifications ~~to each Copermittee's jurisdictional runoff management program~~ solicited through a public participation process~~.~~.

6. Water Quality Improvement Plan Submittal, Implementation, and Modifications

Requirements for Water Quality Improvement Plan submittals and modifications are described in Provision F. Requirements for corresponding modifications to the jurisdictional runoff management programs and monitoring and assessment program are also described in Provision F.

~~The~~ Copermittees must commence with implementation of the Water Quality Improvement Plan no later than ~~180 days after submission, unless otherwise directed in writing by the San Diego Water Board.~~ the fiscal year (July 1) following San Diego Water Board approval of the Water Quality Improvement Plan.

~~(1) modifications necessary to improve the effectiveness its jurisdictional runoff management program document in the Annual Report required pursuant to Provision , or as part of the ROWD required pursuant to Provision F.5..~~

~~Each Copermittee must implement any modifications to its jurisdictional runoff management program in accordance with the schedules developed pursuant to~~

~~Provisions B.2. and B.3., unless directed otherwise by the San Diego Water Board.~~

~~5. Water Quality Improvement Plan Implementation~~

~~Copermittees must commence with implementation of the Water Quality Improvement Plan no later than 180 days after submission, unless otherwise directed in writing by the San Diego Water Board.~~

C. ACTION LEVELS

The purpose of this provision is for the Copermittees to incorporate numeric non-storm water and storm water action levels in the Water Quality Improvement Plans. The action levels ~~will~~shall be used to guide the following program planning efforts and measure progress towards attaining the reasonable protection, preservation, and enhancement~~, and restoration~~ of water quality and designated beneficial uses of waters of the state~~. This goal will be accomplished through monitoring and assessing the quality of the MS4 discharges during the implementation of the Water Quality Improvement Plans.~~:

1. ~~The Copermittees must incorporate numeric action levels in the~~ Support development and prioritization of water quality improvement strategies through the Water Quality Improvement Plans ~~to direct and focus~~. Discharge data above action levels can be evaluated using a statistical approach considering the ~~Copermittees' jurisdictional runoff management program implementation efforts for addressing MS4~~ frequency, magnitude, and loading of discharges to the receiving waters~~. The numeric action levels will be used as part of the MS4~~ to support development of actions and prioritization of their implementation.

2. Assist in the effective prohibition of non-stormwater discharges ~~assessments required under~~ from the MS4 pursuant to Provision ~~, and each Copermittee's program to detect and eliminate non-storm water~~ E.2.

3. Support the detection and elimination of illicit discharges to the MS4 ~~required under~~pursuant to Provision ~~. Numeric~~E.2.

These goals will be accomplished through monitoring and assessing the quality of the MS4 discharges prior to and during the implementation of the Water Quality Improvement Plans. Exceedances of action levels are not subject to enforcement or non-compliance actions under this Order.

Action levels will be developed and incorporated into the Water Quality Improvement Plans (Provision B) including the Illicit Discharge Detection and Elimination (IDDE) Program (Provision E.2). Depending upon the goals/objectives for the use of the action levels ~~must be developed~~ and the priority receiving water conditions, the constituents and values at which they are set may differ between watersheds. Copermittees may develop Watershed Management Area specific numeric action levels for non-storm water and storm water MS4 discharges~~,~~ using an approach approved by the Regional Board or use the default non-stormwater and stormwater action levels prescribed within C.1 and C.2 below, respectively. The Copermittees will submit action levels as part of their Water Quality Improvement Plan(s). The action levels established as ~~follows:~~part of R9-2007-0001 will serve as the interim action levels until the Water Quality Improvement Plans are completed and approved.

1. Non-Storm Water Action Levels

a. The following non-storm water action levels (NALs) must be incorporated ~~in the Water Quality Improvement Plan~~:

(1) Non-Storm Water Discharges from MS4s to Ocean Surf Zone

Table C-1. Non-Storm Water Action Levels for Discharges from MS4s to Ocean Surf Zone

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Total Coliform	MPN/100 ml	1,000	-	10,000/1,000[1]	OP
Fecal Coliform	MPN/100 ml	200[2]	-	400	OP
Enterococci	MPN/100 ml	35	-	104[3]	OP

Abbreviations/Acronyms
AMAL – average monthly action level
MDAL – maximum daily action level
OP – Ocean Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Total coliform density ~~shall not exceed~~NAL is 1,000 MPN/100 ml when the fecal/total coliform ratio exceeds 0.1
2. Fecal coliform density ~~may not exceed~~ NAL is 200 MPN per 100 ml during any 30 day period
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas"

~~(3)~~

~~(4)~~(2) Non-Storm Water Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Table C-2. Non-Storm Water Action Levels for Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Turbidity	NTU	75	-	225	OP
pH	Units	Within limit of 6.0 to 9.0 at all times			OP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	35	-	104[3]	BP
Priority Pollutants	ug/L	See Table C-3			

Abbreviations/Acronyms:

AMAL – average monthly action level
OP – Ocean Plan water quality objective
NTU – Nephelometric Turbidity Units
ug/L – micrograms per liter
MDAL – maximum daily action level
BP – Basin Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:

1. Based on a minimum of not less than five samples for any 30-day period
2. ~~No~~NAL is reached if ~~-~~more than 10 percent of total samples ~~may~~ exceed 400 MPN per 100 ml during any 30 day period
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas" and is not applicable to waterbodies that are not designated REC-1.

Table C-3. Non-Storm Water Action Levels for Priority Pollutants

Parameter	Units	Freshwater (CTR)		Saltwater (CTR)	
		MDAL	AMAL	MDAL	AMAL
Cadmium	ug/L	**	**	16	8
Copper	ug/L	*	*	5.8	2.9
Chromium III	ug/L	**	**	-	-
Chromium VI	ug/L	16	8.1	83	41
Lead	ug/L	*	*	14	2.9
Nickel	ug/L	**	**	14	6.8
Silver	ug/L	*	*	2.2	1.1
Zinc	ug/L	*	*	95	47

Abbreviations/Acronyms:
CTR – California Toxic Rule
AMAL – average monthly action level
ug/L – micrograms per liter
MDAL – maximum daily action level

Notes:
* Action levels developed on a case-by-case basis (see below)
** Action levels developed on a case-by-case basis (see below), but calculated criteria are not to exceed Maximum Contaminant Levels (MCLs) under the California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64431

The Cadmium, Copper, Chromium (III), Lead, Nickel, Silver and Zinc NALs for MS4 discharges to freshwater receiving waters will be developed on a case-by-case basis because the freshwater criteria are based on site-specific water quality data (receiving water hardness). For these priority pollutants, the following equations (40 CFR 131.38.b.2) will be required:

Cadmium (Total Recoverable) = exp(0.7852[ln(hardness)] -2.715)
Chromium III (Total Recoverable) = exp(0.8190[ln(hardness)] + .6848)
Copper (Total Recoverable) = exp(0.8545[ln(hardness)] - 1.702)
Lead (Total Recoverable) = exp(1.273[ln(hardness)] - 4.705)
Nickel (Total Recoverable) = exp(.8460[ln(hardness)] + 0.0584)
Silver (Total Recoverable) = exp(1.72[ln(hardness)] - 6.52)
Zinc (Total Recoverable) = exp(0.8473[ln(hardness)] + 0.884)

~~(5)~~(3) Non-Storm Water Discharges from MS4s to Inland Surface Waters

Table C-4. Non-Storm Water Action Levels for Discharges from MS4s to Inland Surface Waters

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Dissolved Oxygen	mg/L	Not less than 5.0 in WARM waters and not less than 6.0 in COLD waters			BP
Turbidity	NTU	-	20	See MDAL	BP
pH	Units	Within limit of 6.5 to 8.5 at all times			BP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	33	-	61[3]	BP
Total Nitrogen	mg/L	-	1.0	See MDAL	BP
Total Phosphorus	mg/L	-	0.1	See MDAL	BP
MBAS	mg/L	-	0.5	See MDAL	BP
Iron	mg/L	-	0.3	See MDAL	BP
Manganese	mg/L	-	0.05	See MDAL	BP
Priority Pollutants	ug/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
BP – Basin Plan water quality objective
COLD – cold freshwater habitat beneficial use
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
MDAL – maximum daily action level
WARM – warm freshwater habitat beneficial use
MBAS – Methylene Blue Active Substances
MPN/100 ml – most probable number per 100 milliliters
ug/L – micrograms per liter

Notes:
1. Based on a minimum of not less than five samples for any 30-day period
2. ~~No~~NAL is reached if more than 10 percent of total samples ~~may~~ exceed 400 MPN per 100 ml during any 30 day period
3. This value has been set to the Basin Plan water quality objective for freshwater "designated beach areas" and is not applicable to waterbodies that are not designated REC-1.

b. If not identified in Provision C.1.a, NALs must be identified and incorporated in the Water Quality Improvement Plan for any pollutants or waste constituents causing or contributing, or threatening to cause or contribute to a condition of pollution or nuisance in waters of the ~~state~~ U.S. associated with the highest water quality priorities related to non-storm water discharges from the MS4s. NALs must be based on:

(1) Applicable water quality standards which may be dependent upon site-specific or receiving water-specific conditions or assumptions to be identified by the Copermittees; or

(2) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. Dry weather monitoring and assessment data from MS4 outfalls collected in accordance with Provision D.1 may be used to develop or revise NALs based upon watershed-specific data. Revision of NALs is subject to Regional Board EO approval.

~~3.~~

~~4.~~2. Storm Water Action Levels

a. The following storm water action levels (SALs) for discharges of storm water from the MS4 must be incorporated~~ in the Water Quality Improvement Plan:~~:

Table C-5. Storm Water Action Levels for Discharges from MS4s to Receiving Waters

Parameter	Units	Action Level
Turbidity	NTU	126
Nitrate & Nitrite (Total)	mg/L	2.6
Phosphorus (Total P)	mg/L	1.46
Cadmium (Total Cd)*	µg/L	3.0
Copper (Total Cu)*	µg/L	127
Lead (Total Pb)*	µg/L	250
Zinc (Total Zn)*	µg/L	976

Abbreviations/Acronyms:
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
ug/L – micrograms per liter

Notes:
* The sampling must include a measure of receiving water hardness at each MS4 outfall. If a total metal concentration exceeds the corresponding metals SAL in Table C-5, that concentration must be compared to the California Toxics Rule criteria and the USEPA 1-hour maximum concentration for the detected level of receiving water hardness associated with that sample. If it is determined that the sample's total metal concentration for that specific metal exceeds that SAL, but does not exceed the applicable USEPA 1-hour maximum concentration criterion for the measured level of hardness, then the sample result will not be considered ~~as an excursion~~ above the SAL for that measurement.

b. If not identified in Provision C.2.a, SALs must be identified and incorporated in the Water Quality Improvement Plan for pollutants or waste constituents causing or contributing, or threatening to cause or contribute to a condition of pollution or nuisance in waters of the state associated with the highest water quality priorities related to storm water discharges from the MS4s. SALs must be based on:

(1) Federal and State water quality guidance and/or water quality standards; ~~and~~or

(2) Site-specific or receiving water-specific conditions; or

(3) One of the approaches recommended by the California Water Board's Storm Water Panel in its report, "The Feasibility of Numerical Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities" (June 2006).

~~(3)~~(4) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. Wet weather monitoring and assessment data from MS4 outfalls collected in accordance with Provision D.1.b may be used to develop or revise SALs based upon watershed-specific data. Revision of SALs is subject to San Diego Water Board approval.

PROVISION C: ACTION LEVELS

D. MONITORING AND ASSESSMENT REQUIREMENTS

[*Note: This entire section has been replaced with a proposed alternative version of provision D.*]

Water quality monitoring and assessment shall be question-driven and designed to support adaptive storm water management and the iterative process outlined in Provision B. The monitoring and assessment activities shall be based on a logical hierarchy in which overall management goals help define clear management questions, which are addressed by specific monitoring activities designed to produce data targeted to defined assessment needs. The monitoring and assessment activities shall follow relevant and applicable guidance provided in the SWAMP Assessment Framework (Bernstein, 2010[8]), A Framework for Monitoring and Assessment in the San Diego Region (SDRWQCB, 2011[9]), and the Southern California Stormwater Monitoring Coalition's (SMC) Model Monitoring Program (SMC, 2004[10]).

The monitoring and assessment shall be designed in two phases. A transitional program shall be implemented beginning the first day of October in the year following permit adoption, and continue until the first day of October following commencement of Water Quality Improvement Plan implementation, pursuant to Provision B. The transitional ("pre-WQIP") program shall build on the experience gained implementing water quality monitoring programs under previous Orders and shall address the SMC questions as described below. The second ("post-WQIP") phase of the Monitoring and Assessment Program shall address the watershed priorities identified in the Water Quality Improvement Plans as developed for each watershed pursuant to Provision B. This phase of monitoring shall begin with implementation of the approved WQIPs. The transitional (pre-WQIP) phase of monitoring and assessment applies only to the San Diego County Copermittees; the Orange County and Riverside County permittees affected by this regional permit are expected to participate during the post-WQIP phase, after officially enrolling under the regional permit.

As a starting point, the Monitoring and Assessment Program shall be designed to address the overarching management questions developed by the SMC:

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[8] Bernstein, Brock, 2010. "SWAMP Assessment Framework." Prepared for the Surface Water Ambient Monitoring Program (SWAMP). December, 2010). http://www.swrcb.ca.gov/water_issues/programs/swamp/docs/reports/app_c_assess_frmwrk.pdf.

[9] SDRWQCB, 2011. "A Framework for Monitoring and Assessment in the San Diego Region." California Regional Water Quality Control Board, San Diego Region, Staff Report, Working Draft. May 2012. Prepared by Lilian Busse and Bruce Posthumus. http://www.waterboards.ca.gov/sandiego/board_info/agendas/2012/Jun/item9/eosr0612MonitoringFramework.SD1.pdf

[10] SMC, 2004. "Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California." A report from the Stormwater Monitoring Coalition's Model Monitoring Technical Committee. August 2004. Technical Report #419. http://www.lmtf.org/FoLM/Poliact/EColi/419_smc_mm.pdf

1. Are conditions in receiving waters protective, or likely to be protective, of beneficial uses? This question will be addressed by comparing indicator values to the relevant benchmarks or objectives and/or to background conditions.

2. What is the extent and magnitude of the current or potential receiving water problems? This question will be addressed by mapping the spatial extent and/or temporal persistence of problems, the severity of impacts, and/or the degree to which benchmarks are exceeded.
3. What is the relative urban runoff contribution to the receiving water problem(s)? This question will be addressed by comparing concentrations and loads of priority constituents to those from other sources, including background.

4. What are the sources of urban runoff that contribute to receiving water problem(s)? This question will be addressed by characterizing and prioritizing discharges and using targeted source identification protocols to track the origin of specific constituents.

5. Are conditions in receiving waters getting better or worse? This question will be addressed by time series analyses of individual indicators and/or of aggregate or cumulative indices of condition.

Given that substantial work has already been accomplished and other work is ongoing to address the questions related to receiving water condition assessment (questions 1, 2, 5), the Copermittees shall focus their efforts principally on questions 3 and 4. All five questions need not be addressed simultaneously to the same degree. As watershed problems are identified, effort should shift to diagnosis (questions 4 and 5) until the problems have been addressed, at which point effort may shift back to broader assessment (questions 1 and 2) in search of other problems to address.

During the transitional (pre-WQIP) period, where feasible the Copermittees shall develop more specific monitoring questions to guide the design of specific monitoring activities and address specific assessment needs. The information so generated will be used to guide management actions, based on the results of the monitoring data assessments.

As part of each WQIP, the Copermittees shall develop a water quality Monitoring and Assessment Program (Monitoring and Assessment Program) for each Watershed Management Area (WMA), as provided in Table B-1. Using the overarching SMC management questions as guidance, each Monitoring and Assessment Program shall include specific monitoring questions appropriate to address the assessment needs of each specific WMA. The monitoring activities shall be designed to generate data needed to address priority issues identified in the WQIPs, and the resulting monitoring data and assessments shall be supplied to program planners to help inform management actions. If a WMA has an approved Comprehensive Load Reduction Plan (CLRP), the CLRP shall be incorporated into the WQIP.

Each Copermittee covered by this permit shall participate in development and implementation of the Monitoring and Assessment Program for each WMA in which they have jurisdiction. The Copermittees shall consider the needs of regional monitoring and assessment activities in the development of each Monitoring and Assessment Program and make allowances as needed for regional coordination.

1. Receiving Waters Monitoring

Until approval and implementation of the WQIPs, the Copermittees shall perform receiving water monitoring to address management questions and specific questions, as specified in Provisions D.1.a-D.1.g below:

a. SMC Regional Monitoring

Management Questions: Are conditions in receiving waters protective, or likely to be protective, of beneficial uses? What is the extent and magnitude of the current or potential receiving water problems?

The Copermittees shall participate in the SMC Regional Monitoring Program through its planned completion. The SMC monitoring program seeks to coordinate and leverage existing monitoring efforts to produce regional estimates of condition, improve data comparability and quality assurance, and maximize data availability, while conserving monitoring expenditures. The primary goal of this program is to implement an ongoing, large scale regional monitoring program for southern California's coastal streams and rivers. A comprehensive program was designed by the SMC, in which each participating group assesses its local watersheds and then contributes their portion to the overall regional assessment. The SMC Regional Monitoring Program involves a probabilistic design for characterization of coastal watersheds using bioassessment metrics and related analyses, including, but may not be limited to: physical habitat characterization, Southern California Index of Biological Integrity scoring, macroinvertebrate and algal taxonomy, algal biomass, water chemistry, and toxicity. The study incorporates both reference and non-reference streams and may identify additional biological and/or chemical stressors affecting stream health, such as channel alteration and presence of invasive species.

b. Southern California Bight Regional Monitoring

Management Questions: Are conditions in receiving waters protective, or likely to be protective, of beneficial uses? What is the extent and magnitude of the current or potential receiving water problems?

The Copermittees shall participate in the Southern California Bight Regional Monitoring program as a trade-off with other routine monitoring requirements. The Bight program involves detailed characterization of coastal and offshore receiving waters, as well as targeted special studies. The Bight regional

monitoring effort is designed to build upon the data collected during the previous Bight regional programs, to assess the extent of contamination in the Southern California Bight. Receiving water samples are collected in or near coastal areas, bays, estuaries, offshore islands, and open water/deep ocean within the Bight. Water quality and sediment samples may be collected to provide data for model input, to assess long-term trends, and to answer management questions developed by the diverse group of stakeholders in the Southern California Bight Region as part of the program. In addition, special studies such as potential new technology implementation (i.e. bioanalytical screening and/or genetic coding) may be conducted as part of the Bight Regional Monitoring.

c. SEDIMENT QUALITY MONITORING

Management Questions: Are conditions in receiving waters protective, or likely to be protective, of beneficial uses? What is the extent and magnitude of the current or potential receiving water problems?

Specific Question: What is the condition of sediments in enclosed bays and estuaries with respect to the statewide sediment quality objectives?

Copermittees shall perform monitoring of bay and lagoon sediments, as applicable, under the Copermittees' responsibility to conform to the requirements of the Statewide Sediment Quality Objectives regulatory program, per State Water Resources Control Board Resolution No. 2008-0070 – Adoption of a Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality.

d. HYDROMODIFICATION MANAGEMENT PLAN (HMP) MONITORING

Management Questions: Are conditions in receiving waters protective, or likely to be protective, of beneficial uses? What is the extent and magnitude of the current or potential receiving water problems?

The Copermittees shall perform receiving water monitoring as required per their Hydromodification Management Plan Monitoring Plans, as approved by the California Regional Water Quality Control Board, San Diego Region.

e. TMDL MONITORING

Management Questions: Are conditions in receiving waters protective, or likely to be protective, of beneficial uses? Are conditions in receiving waters getting better or worse?

Specific question: What is the progress in achieving and complying with adopted TMDL targets?

The Copermittees shall conduct receiving water monitoring to address monitoring requirements associated with TMDLs as specified below.

(1) The Copermittees shall perform water quality monitoring as required per the Implementation Plans or approved CLRPs of effective TMDLs, including compliance monitoring for the following TMDLs:

(a) TMDL for Diazinon in Chollas Creek Watershed Resolution No. R9-2002-0123; Effective as of September 11, 2003.

(b) TMDLs for Dissolved Copper in Shelter Island Yacht Basin Resolution No. R9-2005-0019; Effective as of December 2, 2005.

(c) TMDLs for Dissolved Copper, Lead, and Zinc in Chollas Creek Resolution No. R9-2007-0043; Effective as of October 22, 2008.

(d) TMDLs for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay Resolution No. R9-2008-0027; Effective as of September 15, 2009.

(e) Revised TMDLs for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek) Resolution No. R9-2010-0001; Effective as of April 4, 2011.

(2) TMDL monitoring shall be coordinated and/or integrated with monitoring specified in an approved CLRP or equivalent implementation plan.

f. ASBS Special Protections Monitoring

Management Questions: Are conditions in receiving waters protective, or likely to be protective, of beneficial uses? Are conditions in receiving waters getting better or worse?

The Copermittees responsible for discharges to Areas of Special Biological Significance (ASBS) as regulated per the Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges, State Water Resources Control Board Resolution No. 2012-0012, shall perform receiving water monitoring as required, per the adopted ASBS Special Protections.

g. San Diego Regional Reference Stream Study

Management Question: Are conditions in receiving waters protective, or likely to be protective, of beneficial uses? What is the extent and magnitude of the current or potential receiving water problems?

Specific Question: What are the concentrations/loads of bacteria, nutrients, and metals in reference streams in Southern California?

The Copermittees shall participate in reference stream receiving water monitoring and data analysis under the San Diego Regional Reference Stream Study as a Regional Study. The San Diego Regional Reference Stream Study is intended to characterize background concentrations of bacteria, nutrients, and metals in natural streams within the jurisdiction of the San Diego Water Board (Region 9). Samples shall be collected during wet and dry weather at sites considered representative of natural conditions (a contributing drainage area at least 95 percent undeveloped) and that vary in regards to hydrology, catchment size, and geology. The results of the study may be used to assist determination of scientifically-based reference stream numeric goals for indicator bacteria, nutrients, and metals.

h. LONG-TERM RECEIVING WATER MONITORING, POST-WQIP ADOPTION

(1) Management Question: Are conditions in receiving waters getting better or worse?

(2) Following adoption of the WQIPs, the Copermittees shall conduct long-term receiving water monitoring to be performed in each WMA during WQIP implementation, for assessment of long-term trends, as specified below:

(3) The Copermittees in each Watershed Management Area shall select one long-term receiving water station from among the existing mass loading stations (MLS) and temporary watershed assessment stations (TWAS) to be representative of receiving water quality within the WMA.

(4) During the permit term, the Copermittees shall perform monitoring during three wet weather events and three dry weather events at each of the long-term stations selected by the Copermittees and approved by the San Diego Water Board.

(5) <u>Dry Weather Receiving Water Monitoring</u>

During the permit term, the Copermittees shall perform monitoring during three dry weather events, at minimum, at each of the long-term stations. One event must be conducted during the dry season (May 1-September 30) and one event must be conducted during a dry weather period during the wet season (October 1 –April 30), after the first wet weather event of the season, with an antecedent dry period of at least 72 hours following any storm event producing measurable rainfall of greater than 0.1 inch.

(a) For each dry weather receiving water monitoring event, the Copermittees must record field observations consistent with Table D-1 at each monitoring station.

Table D-1. Field Observations for Dry Weather Ambient Receiving Water Monitoring Stations

Field Observations
• Station identification and location. • Presence of flow, or pooled or ponded water. • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate), - Flow characteristics (i.e. presence of floatables, surface scum, or sheens, odor, color), • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, or sheens, odor, color). • Station description (i.e. deposits or stains, vegetation condition, structural condition, observable biology). • Presence and assessment of trash in and around station.

(b) If flow is present during the dry weather watershed monitoring event, and conditions allow the collection of the data, the Copermittee must monitor and record the parameters in Table D-2.

Table D-2. Field Monitoring Parameters for Receiving Water and Persistent MS4 Monitoring Stations

Parameters
• pH • Temperature • Specific conductivity • Dissolved oxygen • Turbidity

(c) Samples must be collected and analyzed as follows:

(i) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, indicator bacteria, and toxicity. Analytes that are field measured do not need to be analyzed by a laboratory.

(ii) For all other constituents, composite samples shall be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques: time-weighted composites composed of 24 discrete hourly samples, or flow-weighted composites collected over a typical 24 hour period. Only one analysis of the composite of aliquots is required.

(d) Samples shall be collected for analysis of the following parameters: TMDL or CLRP constituents in watersheds where the Copermittees are responsible parties in an adopted TMDL Implementation Plan, constituents listed as a cause of impairment on a CWA Section 303(d) listing for the receiving water body reach to which the outfall discharges, applicable NAL constituents, and constituents identified by the Copermittees as the watershed priorities in their respective WQIPs, as well as the constituents listed in Table D-3.

Table D-3. Analytical Monitoring Constituents for Receiving Water Monitoring Stations

Conventionals, Nutrients, Hydrocarbons	Metals (Total and Dissolved)	Pesticides	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity[1] • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus[1] • Orthophosphate • Nitrite[1,2] • Nitrate[1,2] • Total Kjeldahl Nitrogen • Ammonia	• Arsenic • Cadmium[1] • Chromium • Copper[1] • Iron • Lead[1] • Mercury • Nickel • Selenium • Thallium • Zinc[1]	• Organo-phosphate pesticides • Pyrethroid pesticides	•Total Coliform • Fecal Coliform[3] •*Enterococcus*

Notes:
1. Constituent with a storm water action level (SAL) specified under Provision C.2.
2. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
3. *E. Coli* may be substituted for Fecal Coliform.

(e) Dry Weather Receiving Water Toxicity Monitoring:

For each dry weather monitoring event, grab or composite samples from each monitoring station must be collected and analyzed for toxicity in accordance with Table D-4.

Table D-4. Toxicity Testing for Receiving Water Monitoring Stations

Freshwater Organism	Test Approach per Event	EPA Protocol[1]
Pimephales promelas (fathead minnow)	Wet: 1 acute Dry: 1 acute and chronic	EPA-821-R-02-012
Hyalella azteca	Wet: 1 acute Dry: 1 acute and chronic	EPA-821-R-02-012
Psuedokirchneriella subcapitata (formerly *Selenastrum capricornutum*, unicellular algae)	Wet: 1 acute Dry: 1 acute and chronic	EPA-821-R-02-013

Notes:
1. EPA protocols shall be utilized for toxicity testing unless alternate toxicity testing protocols have been approved by the San Diego Regional Water Quality Control Board. Chronic toxicity testing will also be conducted at dry weather mass loading stations unless the channel flows are diverted year-round during dry weather conditions to the sanitary sewer for treatment

(f) Receiving Water Bioassessment Monitoring:

Copermittees shall perform Bioassessment monitoring once during the permit term in accordance with the SMC Model Monitoring Program "Triad" assessment approach (SMC, 2004). Copermittees shall conduct sampling, analysis, and reporting of specified in-stream biological and habitat data according to the protocols specified in the SCCWRP Tech Report No. 539, or subsequent protocols, if developed, that have been widely-accepted as an appropriate alternative for Southern California receiving waters. Bioassessment monitoring may be conducted in conjunction with SMC Regional Monitoring and/or other dry weather receiving water monitoring. A physical assessment shall be conducted that will include details of the channel condition including channel dimensions, hydrologic and geomorphic conditions, and presence and condition of vegetation and habitat.

(6) Wet Weather Receiving Water Monitoring

During the permit term, Copermittees shall perform monitoring during three wet weather events at each of the long-term receiving water monitoring stations. Each monitoring station must be monitored during the wet season beginning October 1 and ending April 30.

(a) For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each monitoring station:

(i) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event;

(ii) The flow rates and volumes measured or estimated. Data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board;

(iii) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(iv) Presence and assessment of trash in and around station.

(b) For each wet weather receiving water monitoring event, the parameters in Table D-2 must be monitored and recorded in the field.

(c) Samples must be collected and analyzed as follows:

(i) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, indicator bacteria, and toxicity. Analytes that are field measured do not need to be analyzed by a laboratory.

(ii) For all other constituents, composite samples shall be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques: time-weighted composites composed of 24 discrete hourly samples, or flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter. Only one analysis of the composite of aliquots is required.

(iii) Copermittees should implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods.

(d) Samples shall be collected for analysis of the following parameters: TMDL or CLRP constituents in watersheds where the Copermittees are responsible parties in an adopted TMDL Implementation Plan, constituents listed as a cause of impairment on a CWA Section 303(d) listing for the receiving water body reach to which the outfall discharges,

applicable SAL constituents, and constituents identified by the Copermittees as the watershed priorities in their respective WQIPs, as well as the constituents listed in Table D-3.

(e) Wet Weather Receiving Water Toxicity Monitoring

Grab samples or composites from each monitoring station must be collected and analyzed for toxicity in accordance with Table D-4.

i. OTHER RECEIVING WATER MONITORING, POST-WQIP ADOPTION

After adoption of the WQIPs, the Copermittees shall conduct monitoring based on the approved WQIPs, in addition to long-term receiving water monitoring as described in Provision D.1.h, to include constituents identified by the Copermittees as the watershed priorities in their respective WQIPs. Nothing in this Provision is intended to prevent Copermittee collection of additional receiving water data, as necessary, to support and implement respective WQIPs. This monitoring shall include, at minimum, integration of the following receiving water requirements within the WQIPs, as appropriate for specific watersheds:

(1) Participation in SMC Regional Monitoring Program, where applicable

(2) Sediment Quality Monitoring in applicable estuaries

(3) Hydromodification Management Plan (HMP) Monitoring as applicable

(4) TMDL Monitoring where implementation plans have been approved and are under implementation, and

(5) ASBS Special Protections Monitoring, where applicable.

j. RECEIVING WATER MONITORING REPORTING

The Copermittees shall report on the progress of the receiving water monitoring and the results or findings of such monitoring, when completed, in the Annual Report pursuant to Provision F.3.b.

2. MS4 Outfall Discharge Monitoring

Discharge monitoring shall involve both Non-Storm Water (Dry Weather) and Storm Water (Wet Weather) components. The Copermittees shall perform monitoring, as necessary, to identify non-storm water discharges and illegal connections/illicit discharges (IC/IDs) pursuant to Provision E.2 of this Order. To accomplish this, the monitoring may include a variety of water quality and other monitoring techniques, including visual and other observations. Copermittees shall investigate dry weather flows and prioritize outfalls with observed flows for follow-up action as detailed below.

a. STORM WATER OUTFALL INVENTORY

Management Questions: What is the relative urban runoff contribution to receiving water problem(s)? What are the sources of urban runoff that contribute to receiving water problem(s)?

(1) Each Copermittee shall identify all major outfalls, as defined by 40 CFR §122.26(b)(5-6), that discharge directly to named receiving waters within its jurisdiction, and geo-locate those outfalls on a map of the MS4 pursuant to Provision E.2.b of this Order. This information shall be compiled in a storm water outfall inventory, which also shall include applicable information including HSA, jurisdiction, outlet size, and approximate drainage area. Only MS4 outfalls with safe access and for which access is gained without disturbing critical habitat will be considered in the number of eligible major MS4 outfalls.

b. NON-STORM WATER TRANSIENT FLOW (DRY WEATHER) MONITORING, IDDE INVESTIGATION

Management Questions: What is the relative urban runoff contribution to receiving water problem(s)? What are the sources of urban runoff that contribute to receiving water problem(s)?

Specific Questions: Which non-storm water discharges are transient and which are persistent? Which discharges should be investigated as potential IDDEs? Which outfalls exhibit persistent dry weather flows?

The Copermittees shall perform non-storm transient flow discharge monitoring to address the above management and specific questions as follows:

(1) Each Copermittee shall prioritize the major MS4 outfalls within its jurisdiction from the list of major outfalls developed pursuant to Provision D.a., based on criteria and rationale that include potential threat to water quality.

(2) Copermittees with less than 125 major MS4 outfalls that discharge to a

receiving water shall visually inspect 80% of the outfalls twice per year during dry weather.

(3) Copermittees with 125 or more but less than 250 major MS4 outfalls that discharge to a receiving water shall visually inspect a prioritized list of major MS4 outfalls that discharge to a receiving water annually. The total number of inspections per Copermittees with 125 or more but less than 250 major MS4s will be a minimum of the total number of all major MS4 outfalls locations once with annual visual inspections Where possible, inspections will be conducted year round. Major MS4 outfalls shall be prioritized based on threat to water quality and will consider factors such as:

(a) Assessment of connectivity of the discharge to a flowing receiving water

(b) Reported exceedances in water quality data

(c) Surrounding land use

(d) Presence of watershed priority constituents, TMDLs & CWA 303(d) list of impaired water bodies

(e) Flow rate

(4) Copermittees with 250 or more major MS4 outfalls that discharge to a receiving water shall visually inspect a prioritized list of major MS4 outfalls that discharge to a receiving water annually. The total number of inspections per Copermittees with 250 or greater major MS4s will be a minimum of 250 to a maximum of 500 locations with annual visual inspections. Where possible, inspections will be conducted year round. Major MS4 outfalls shall be prioritized based on threat to water quality and will consider factors such as:

(a) Assessment of connectivity of the discharge to a flowing receiving water

(b) Reported exceedances in water quality data

(c) Surrounding land use

(d) Presence of watershed priority constituents, TMDLs & CWA 303(d) list of impaired water bodies

(e) Flow rate

(5) Obvious illicit discharges (i.e., unusual color, unusual odor, or high flow) shall be investigated immediately pursuant to Provision E.2.

(6) An antecedent dry period of at least 72 hours following any storm event producing measurable rainfall of greater than 0.1 inch is required prior to conducting dry weather visual inspections.

(7) During a visual inspection, field personnel shall note visual and other observations, including those provided in Table D-5 of this Order.

(a) During a visual inspection, an inspection form will be filled out documenting observations in conformance with table D-5.

(b) Inspections of major outfalls conducted pursuant to Provision E of this order, including but not limited to complaint follow-ups, may be accounted for as the visual inspection for the major outfall under this Provision.

Table D-5. Field Observations for Non-Storm Water MS4 Monitoring Stations

Field Observations
• Station identification and location. • Presence of flow, or pooled or ponded water from the outfall. • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate), - Flow characteristics (i.e. presence of floatables, surface scum, or sheens, odor, color), - Flow source(s) suspected or identified from non-storm water source investigation, and - Flow source(s) eliminated during non-storm water source identification. • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, or sheens, odor, color), and - Known or suspected source(s) of pooled or ponded water. • Station description (i.e. deposits or stains, vegetation condition, structural condition, observable biology). • Presence and assessment of trash in and around station. • Evidence or signs of illicit connections or illegal dumping.

(8) Evidence of obvious illegal discharges, such as obvious odor, discoloration, or floating foam or scum, shall be followed up immediately.

~~(7)~~(9) The field observations shall be evaluated together with existing information available from prior inspections and prior monitoring results to determine whether the non-storm water (dry weather) discharge flow is likely to be transient or persistent[11].

[11] Persistent flow, as modified from the SMC Model Monitoring Program definition of persistent WQO exceedance, is defined as "the presence of flow, pooled, or ponded water more than 72 hours after a measureable rainfall event of

(a) If the flow is deemed to be transient, observations shall be used to conduct IDDE investigations where warranted pursuant to Provision E.2.

(b) If the nature and source of the observed flow is already known, this shall be noted on the field log, including whether the observed flow results from a non-storm water discharge conditionally allowed per Provision E.2.a.

(10) Where the non-storm water (dry weather) discharge flow is deemed to be persistent in Provision D.2.a.(8), the outfall shall be referred to the characterization and prioritization process described in Provision D.2.c. .

(11) The framework developed in the transitional monitoring program shall be used as a basis to design a continuing IDDE monitoring program as part of the Monitoring and Assessment Program in each WQIP.

c. Non-Storm Water Persistent Flow (Dry Weather) Outfall Monitoring

Management Questions: What is the relative urban runoff contribution to receiving water problem(s)? What are the sources of urban runoff that contribute to receiving water problem(s)?

Specific Questions: Which outfalls exhibit persistent dry weather flows? Do discharge concentrations at MS4 outfalls meet applicable permit action levels? Which MS4 outfalls impact receiving water quality during dry weather?

The Copermittees shall perform non-storm water persistent flow discharge monitoring to address the above-listed management and specific questions as follows:

(1) Based upon the results of the investigation conducted pursuant to Provision D.2.b., each Copermittee shall add to the storm water outfall inventory compiled pursuant to Provision D.2.a., a classification of whether the outfall produces persistent discharge flow, transient flow, or no dry weather flow. The inventory shall provide notations on the basis for that classification; the classification may be based on historical data and/or contemporary observations, including information generated per Provision D.2.b..

0.1 inch of precipitation during three consecutive monitoring and/or inspection events". All other flow is considered transient.

(2) The Copermittees shall prioritize the outfalls identified as having persistent dry weather in the stormwater outfall inventory, pursuant to Provision D.2.c.(1). Historical data may be used to assist prioritization, where available. The prioritization shall be prepared based on criteria to be developed by the Copermittees, and a brief rationale for the prioritization shall be provided to accompany the map.

(3) Based on the prioritization of major outfalls developed under Provision D.2.c.(2), the Copermittees shall identify, at minimum, a number of major outfalls to monitor within each watershed management area equivalent to the number of urbanized HSAs within the WMA. The selected outfalls shall be listed by urbanized HSA and indicated on the map prepared pursuant to Provision D.2.a.

(4) The Copermittees shall monitor each major outfall identified in Provision D.2.c.(3) two times annually under dry weather conditions until one of the following occurs, at which point the outfall may be removed from the list:

(a) Flows are reduced to near-zero for three consecutive visits, or

(b) The source(s) of flows are determined to be derived from a non-storm water discharge source conditionally allowed per Provision E.2.a, or

(c) The source of the discharge is determined to be covered by a separate NPDES permit.

(d) The Copermittees shall document any such removal of sites from the outfall monitoring list in their annual report. Outfalls so removed must be replaced with then next highest prioritized MS4 outfall in the WMA per Provision D.2.c.(3), unless there are no remaining qualifying outfalls within the urbanized HSAs of the WMA.

(e) Where these criteria are not met but the threat to water quality is reduced, the outfall may be prioritized accordingly for continued follow up activity.

(5) During each semi-annual visit, the Copermittee must record field observations consistent with Table D-5 at each non-storm water MS4 monitoring station within its jurisdiction.

(6) Prior to WQIP approval, each semi-annual visit in which measurable flow is present from an outfall listed under Provision D.2.c.(3) must include the following:

(a) Grab samples shall be collected for analysis for the constituents listed in Table D-6, unless the Copermittee has historical data that can demonstrate or provide justification that the analysis of the constituent is not necessary.

Table D-6. Analytical Monitoring Constituents for Non-Storm Water MS4 Monitoring Stations

Conventionals, Nutrients, Hydrocarbons	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Total Phosphorus • Ortho-phosphate • Nitrite[1] • Nitrate[1] • Total Kjeldahl Nitrogen • Ammonia as N • Chlorine	• Cadmium • Copper • Lead • Zinc	•Total Coliform • Fecal Coliform[2] •*Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(b) Field measurements shall be collected for the parameters listed in Table D-2.

(c) If the Copermittee identifies and eliminates the source of non-storm water discharge, analysis of the sample is not required.

(7) As part of the WQIP, Copermittees must develop a program to characterize the persistent non-storm water discharges and pollutant loads from the Copermittee's major MS4 outfalls. As part of the development of the Monitoring and Assessment Program for each WMA, the number and selection of outfalls shall be re-evaluated and determined anew for each WMA, along with the appropriate monitoring frequency and methods.

(8) After WQIP approval, each visit in which measurable flow is present from an outfall listed under Provision D.2.c.(3), as modified by approved changes pursuant to Provision D.2.c.(7) must include the following:

a. Samples shall be collected for analysis of the following parameters:

(i) Constituents identified by the Copermittees as highest watershed priorities,

(ii) TMDL constituents in watersheds where the Copermittees are responsible parties in an effective TMDL Implementation Plan for the receiving water body reach to which the outfall discharges,

(iii) Constituents listed as a cause of impairment on a CWA Section 303(d) listing for the receiving water body reach to which the outfall discharges, and

(iv) Applicable NAL constituents.

b. Field measurements shall be collected for the parameters listed in Table D-2.

(9) Annually, the Copermittees shall evaluate the data produced by the persistent flow outfall monitoring and inspections, rank the outfalls according to potential threat to receiving water quality, and produce a prioritized list of major outfalls for follow-up action. The prioritized list shall be used to update the WQIP, with the goal of reducing flows and/or loads in order of the ranked priority list through targeted programmatic actions and source investigations.

d. STORM WATER (WET WEATHER) OUTFALL MONITORING

Management Questions: What is the relative urban runoff contribution to receiving water problem(s)? What are the sources of urban runoff that contribute to receiving water problem(s)?

Specific Questions: Which MS4 outfalls impact receiving water quality during wet weather? Do discharge concentrations at MS4 outfalls meet applicable permit action levels? How do representative MS4 outlet discharge concentrations, loads, and flows change over time?

The Copermittees shall perform storm water discharge monitoring to address the above-listed management and specific questions as follows:

(1) Prior to adoption of the WQIPs, the San Diego Copermittees shall continue the MS4 outfall monitoring program implemented under Order No. R9-2007-0001 per RWQCB approved plan through its planned completion to continue to obtain data from a representative cross-section of discharges.

(2) Prior to adoption of the WQIPs, the San Diego Copermittees shall perform storm water discharge monitoring based on representative outfalls to address the above-listed management questions as follows:

(a) The Copermittees shall select, at minimum, three monitoring stations at representative major MS4 outfalls with homogenous land use types and/or typical mixed-use drainage areas per WMA from the map developed pursuant to Provision D.2.a. Historical data may be used to assist site selection, where available. These outfalls shall be geo-located on a map showing the urban hydrologic sub-areas (HSAs), land use drainage areas, and jurisdictional boundaries within the permitted area.

(b) Each selected monitoring station must be monitored twice during the wet season, beginning October 1 and ending April 30.

(c) For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each monitoring station:

(i) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event;

(ii) The flow rates and volumes measured or estimated. Data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board;

(d) For each wet weather monitoring event, the parameters in Table D-2 must be monitored and recorded in the field. Samples shall be collected for analysis of parameters listed in Table D-7, according to the following methods:

(i) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, and indicator bacteria. Analytes that are field measured do not need to be analyzed by a laboratory.

(ii) For all other constituents, composite samples shall be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

[a] Through use of automated equipment to collect time-weighted composites composed of 24 discrete hourly samples, or flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter. Only one analysis of the composite of aliquots is required.

[b] If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours. Only one analysis of the composite of aliquots is required.

(iii) Copermittees should implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods.

Table D-7. Analytical Monitoring Constituents for Wet Weather MS4 Outfall Monitoring Stations

Conventionals, Nutrients, Hydrocarbons	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity[1] • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus[1] • Orthophosphate • Nitrite[1,2] • Nitrate[1,2] • Total Kjeldahl Nitrogen • Ammonia	• Arsenic • Cadmium[1] • Chromium • Copper[1] • Iron • Lead[1] • • Nickel • Selenium • Thallium • Zinc[1]	•Total Coliform • Fecal Coliform[3] •*Enterococcus*

Notes:
1. Constituent with a storm water action level (SAL) specified under Provision C.2.
2. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
3. *E. Coli* may be substituted for Fecal Coliform.

(3) After adoption of the WQIPs, the Copermittees shall perform storm water discharge monitoring based on representative major MS4 outfalls to address the above-listed management questions, and according to the needs for outfall monitoring as defined in the monitoring and assessment sections of the WQIPs. Samples shall be collected for analysis of parameters identified by the Copermittees as watershed priorities in the WQIP. Copermittees shall consider constituents based on factors including, but not limited to:

(a) Constituents identified as the highest water quality priorities.

(b) TMDL constituents in watersheds where the Copermittees are responsible parties in an effective TMDL Implementation Plan for the receiving water body reach to which the outfall discharges,

(c) Constituents listed as a cause of impairment on a CWA Section 303(d) listing for the receiving water body reach to which the outfall discharges, and

(d) Applicable SAL constituents.

e. MS4 OUTFALL DISCHARGE MONITORING REPORTING

The Copermittees shall report on the progress of the MS4 outfall monitoring and the results or findings of such monitoring, when completed, in the Annual Report pursuant to Provision F.3.b.

3. Source/Stressor Identification

Management Question: What are the sources of urban runoff that contribute to receiving water problem(s)?

The Copermittees shall perform Source/Stressor Identification studies as needed to investigate sources of pollutants or stressors in cases where MS4 discharges are deemed to be causing or contributing to receiving water priorities, based on monitoring performed under Provisions D.1 and D.2. The results of the Stressor/Source Identification studies may be shared regionally among the Copermittees to provide information useful in improving adaptive management of urban runoff through implementation of the WQIPs.

The principal role of Source/Stressor Identification is to identify and prioritize pollutant generating activities and source categories. Identification of high-priority sources is an important step in support of the WQIP process, to help inform the development of effective pollutant reduction strategies for particular priority constituents on a watershed-specific basis.

Source identification shall be conducted on a constituent-specific basis. The source identification efforts shall focus on constituents identified as watershed priorities, and include prioritization of sources based on magnitude, controllability, and other factors. The constituent-specific source identification process shall include, at a minimum, the following steps:

- Step 1: Compile known information on the specific priority constituent. This information includes data on potential sources and movement of a particular constituent within the urban watershed. Data generated by the Copermittees and others, as well as information available from a literature research on the priority constituent shall be compiled and analyzed as appropriate.

- Step 2: Based on the compiled information generated on the priority constituent, identify data gaps, if any. Targeted studies may be planned where appropriate to fill identified data gaps; such studies would be performed as Special Studies per

Provision D.4. For example, targeted studies may be performed to quantify the relative loading of a priority constituent from a particular pollutant generating activity, or to improve understanding of the fate of a constituent in the environment.

- Step 3: Based on the information compiled, develop an inventory of sources and consider how to prioritize them within the watershed for potential follow-up action. Examples of prioritization criteria for sources include relative magnitude in discharges, geographical distribution (i.e., regional or localized), frequency of occurrence in discharges, human health risk, and controllability.

- Step 4: Develop a prioritized list of sources for the priority constituent and deliver to the Copermittee staff responsible for implementing WQIPs.

Prior to adoption of the WQIPs, the San Diego Copermittees shall continue source identification studies pertaining to compliance with TMDLs and the development of the CLRP implemented under Order No. R9-2007-0001.

Following adoption of the WQIPs, the Copermittees shall conduct source/stressor identification studies as necessary to support the WQIP watershed priorities and strategies. The plans for source/stressor ID studies must be submitted as part of the Monitoring and Assessment Programs included as part of the WQIPs required pursuant to Provision B of this Order.

The Copermittees shall report on the progress of the source/stressor ID studies and the results or findings of such studies, when completed, in the Annual Report pursuant to Provision F.3.b.

4. Special Studies

The Copermittees shall conduct Special Studies to address information needs as identified for receiving waters per monitoring performed pursuant to Provision D.1, for MS4 outfall discharges per monitoring performed pursuant to Provision D.2, and in Source/Stressor Identification studies per Provision D.3; to provide information on BMP effectiveness; and otherwise as needed to support implementation or evaluation of the WQIP strategies for the identified highest water quality priorities.

Within the permit term, two Special Studies shall be conducted within each Watershed Management Area, to address specific questions developed for each Watershed Management Area, and two regional special studies shall be conducted to answer regional questions.

a. The monitoring plans for the special studies must be submitted as part of the Monitoring and Assessment Programs included as part of the Water Quality Improvement Plans required pursuant to Provision B. The special studies must, at a minimum, be in conformance with the following criteria:

(1) The special studies must be related to water quality priorities identified by the Copermittees within the Watershed Management Area or San Diego Region, and the monitoring plans for the special studies must address specific watershed or regional questions;

(2) The special studies must be implemented within specific Watershed Management Areas or regionally within the San Diego Region;

(3) The special studies must include some form of participation by all Copermittees within the Watershed Management Area or San Diego Region, as applicable;

(4) One of the two required special studies within each Watershed Management Area may be replaced by a regional special study pursuant to D.4.a. (1) through D.4.a.(3); and

(5) A special study done pursuant to D.4.a. (1) through D.4.a.(4) that is started prior to the submittal of the WQIP, but is completed during the permit term, shall meet the requirements of a special study for a Watershed Management Area or San Diego Region, as applicable.

b. The Copermittees shall report on the progress of the special studies and the results or findings of such studies, when completed, in the Annual Report pursuant to Provision F.3.b.

Examples of special studies include:

- Enhance outreach & education by expanding residential BMP rebate programs (irrigation, rainwater harvesting and turf conversion) to multi-family housing
- Enhance outreach & education by increasing enforcement of over-irrigation regulation
- Conduct Catch Basin Inlet Cleaning Study assessment
- Implement Residential & Commercial Area Patrolling
- Implement Targeted Aggressive Street Sweeping Study
- Develop Watershed Urban Runoff Management Program Inspection Program (separate from commercial/industrial inspections, targets all businesses in specific areas)
- Conduct an investigation to improve the understanding of the linkage between groundwater and surface water hydrology and potential impacts to receiving water beneficial uses
- Conduct targeted field investigations to provide additional spatial or temporal information on the highest priority constituents or activities to inform or improve the efficiency of implementation efforts in the WMA.

The Regional Reference Stream Study is an example of a regional special study.

5. Assessment Requirements

The Copermittees must report the progress and findings of the following assessments, when available and as applicable to each WMA, as part of the Annual Report for each WMA, as required pursuant to Provision F. Assessments that occur only once per permit term, or are based on monitoring that occurs only once per permit term, shall be reported as part of the applicable Annual Report, or included within the Copermittees' Report of Waste Discharge, prior to commencement of the subsequent permit term.

a. Receiving Water Monitoring

The Copermittees shall perform analysis and assessments of data and information produced per Provision D.1, addressing for each Receiving Water Monitoring element the management and specific questions as shown in Provision D.1 and below. The analysis and assessments shall relate the monitoring data compiled for each component to the conditions of affected receiving waters and status of relevant receiving water beneficial uses.

(1) SMC Regional Monitoring

Management Questions: Are conditions in receiving waters protective, or likely to be protective, of beneficial uses? What is the extent and magnitude of the current or potential receiving water problems?

The Copermittees shall incorporate results of the SMC Regional Monitoring Program, when available, into the analysis and assessments conducted as part of WQIP planning and implementation. The SMC Program is designed to provide a representative sampling of receiving water quality in coastal rivers and streams in the region's watersheds, based on a probabilistic design for characterization of coastal watersheds, using bioassessment metrics and related analyses. The analysis and assessments of the data shall relate the SMC monitoring data to the condition of receiving waters and status of receiving water beneficial uses.

(2) Bight Regional Monitoring

Management Questions: Are conditions in receiving waters protective, or likely to be protective, of beneficial uses? What is the extent and magnitude of the current or potential receiving water problems?

The Copermittees shall incorporate results of the Bight Regional Monitoring Program, when available, into the analysis and assessments conducted as part of WQIP planning and implementation. The Bight regional monitoring effort involves detailed characterization of coastal and offshore receiving waters, as well as targeted special studies. The analysis and assessments of the data shall relate the Bight monitoring data to the condition of receiving waters and status of receiving water beneficial uses.

(3) Sediment Quality

Management Questions: Are conditions in receiving waters protective, or likely to be protective, of beneficial uses? What is the extent and magnitude of the current or potential receiving water problems?

Specific Question: What is the condition of sediments in enclosed bays and estuaries with respect to the statewide sediment quality objectives?

The Copermittees shall incorporate results of the sediment quality monitoring of bay and estuarine sediments, when available, into the analysis and assessments conducted as part of WQIP planning and implementation. The analysis and assessments of the data shall relate sediment quality data to the condition of receiving waters and status of receiving water beneficial uses.

The analysis of sediment quality data also shall conform to the requirements of the Statewide Sediment Quality Objectives regulatory program, per State Water Resources Control Board Resolution No. 2008-0070 – Adoption of a Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality. The Copermittees shall include the results of this analysis, when available and as applicable to each WMA, in the Annual Report pursuant to Provision F.3.b.

(4) Hydromodification Management Plan (HMP) Monitoring

Management Questions: Are conditions in receiving waters protective, or likely to be protective, of beneficial uses? What is the extent and magnitude of the current or potential receiving water problems?

The Copermittees shall incorporate results of the receiving water monitoring required per their Hydromodification Management Monitoring Plans, as approved by the California Regional Water Quality Control Board, San Diego Region, when available, into the analysis and assessments conducted as part of WQIP planning and implementation. The analysis and assessments of the data shall relate HMP monitoring data to the condition of receiving waters and status of receiving water beneficial uses. The Copermittees shall include the results of this analysis, when available and as applicable to each WMA, in the Annual Report pursuant to Provision F.3.b.

(5) TMDL Monitoring

Management Questions: Are conditions in receiving waters protective, or likely to be protective, of beneficial uses? Are conditions in receiving waters getting better or worse?

Specific question: What is the progress in achieving and complying with adopted TMDL targets?

The Copermittees shall incorporate results of TMDL monitoring, when available, into the analysis and assessments conducted as part of WQIP planning and implementation. The analysis and assessments of the TMDL monitoring data shall be integrated with other receiving water data in assessments of the condition of receiving waters and status of receiving water beneficial uses.

The Copermittees shall annually evaluate receiving water data produced per Provision D.1.e. to determine whether TMDL targets are being met, for applicable receiving waters as specified in adopted TMDLs and include the results of this evaluation, when available and as applicable to each WMA, in the Annual Report pursuant to Provision F.3.b.

The analysis of TMDL monitoring data also shall conform to the requirements of the adopted TMDLs and associated Implementation Plans, to demonstrate compliance with the applicable terms of adopted TMDLs and Implementation Plans.

(6) ASBS Special Protections Monitoring

Management Questions: Are conditions in receiving waters protective, or likely to be protective, of beneficial uses? Are conditions in receiving waters getting better or worse?

The Copermittees responsible for discharges to Areas of Special Biological Significance (ASBS) as regulated per the Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges, State Water Resources Control Board Resolution No. 2012-0012, shall incorporate results of ASBS monitoring, when available, into the analysis and assessments conducted as part of WQIP planning and implementation. The analysis and assessments of the ASBS monitoring data shall be integrated with other receiving water data in assessments of the condition of receiving waters and status of receiving water beneficial uses.

The Copermittees for whom ASBS monitoring is required under the terms of the adopted ASBS Special Protections shall evaluate the data as required per State Water Resources Control Board Resolution No. 2012-0012, and include the results of this evaluation, when available and as applicable to each WMA, in the Annual Report pursuant to Provision F.3.b.

(7) Long-Term Receiving Water Monitoring

Management Question: Are conditions in receiving waters getting better or worse?

The Copermittees shall incorporate the results of the Long-Term Receiving Water Monitoring into the analysis and assessments conducted as part of the adaptive management process. The analysis and assessments of the Long-Term monitoring data shall be integrated with other receiving water data in assessments of the condition of receiving waters and status of receiving water beneficial uses.

The Copermittees shall evaluate the data produced by the receiving water monitoring pursuant to Provision D.1.g, and incorporate new receiving water data into time series plots for each long-term monitoring constituent, for each WMA. Once per permit term the Copermittee shall perform statistical trends analysis on the cumulative long-term receiving water data set.

(8) Integrated Receiving Water Assessment

Management Questions: Are conditions in receiving waters protective, or likely to be protective, of beneficial uses? What is the extent and magnitude of the current or potential receiving water problems? Are conditions in receiving waters getting better or worse?

Once during the permit term, for each watershed management area, the Copermittees shall integrate the analyses and assessments of the results of the SMC Regional Monitoring Program, Bight Regional Monitoring Program, Sediment Quality monitoring, HMP Monitoring, TMDL monitoring, ASBS monitoring, and Long-term receiving water monitoring, as performed per Provisions D.5.a.(1)-D.5.a.(7), as well as other data as available and applicable, to assess the condition of receiving waters and status of receiving water beneficial uses, and identify data or information gaps. The integrated assessment shall include, as appropriate to address any identified data gaps, recommendations for additional monitoring as may be required to adequately characterize conditions in receiving waters, or where special studies may be needed to address specific information needs.

b. MS4 Outfall Discharge Monitoring

The Copermittees shall perform analysis and assessments of data and information produced per Provision D.2, addressing the management and specific questions as shown in Provision D.2 and below. The Copermittees shall include the results of this analysis, when available and as applicable to each WMA, in the Annual Report pursuant to Provision F.3.b.

(1) Transient Non-Storm Water (Dry Weather) Monitoring, IC/ID Investigation

Management Questions: What is the relative urban runoff contribution to receiving water problem(s)? What are the sources of urban runoff that contribute to receiving water problem(s)?

Specific Questions: Which non-storm water discharges are transient and which are persistent? Which discharges should be investigated as potential IC/IDs? Which outfalls exhibit persistent dry weather flows?

(a) Where the presence of non-storm water (dry weather) flow is noted from an outfall during a visual inspection, field personnel shall note visual and other observations (including approximate/estimated flow rate, changes in flow rate during inspection, changes in flow rate over previous inspections, color, presence of foam or sheen, and odor) on a field log. Inspectors also shall note where there is evidence of past flow and record pertinent observations at all sites visited.

(b) The field observations shall be evaluated together with existing information available from prior inspections and prior monitoring results to determine whether the non-storm water (dry weather) discharge flow is likely to be transient or persistent. If the flow is deemed to be transient as indicated by pooled or ponded water or other evidence of recent flow, and there is evidence of an illicit discharge such as obvious odor, discoloration, foam or scum, the observations shall be used to conduct IC/ID investigations pursuant to Provision E.2. If the nature and source of the observed flow is already known, this shall be noted on the field log, including whether the observed flow results from a non-storm water discharge conditionally allowed per Provision E.2.a.

(c) Where the non-storm water (dry weather) discharge flow is deemed to be persistent in Provision D.2.b.(9), the outfall shall be referred to the characterization and prioritization process described in Provision D.2.c.

(2) Persistent Non-Storm Water (Dry Weather) Outfall Monitoring

Management Questions: What is the relative urban runoff contribution to receiving water problem(s)? What are the sources of urban runoff that contribute to receiving water problem(s)?

Specific Questions: Which outfalls exhibit persistent dry weather flows? Do discharge concentrations at MS4 outfalls meet applicable permit action levels? Which MS4 outfalls impact receiving water quality during dry weather?

(a) Identification and Prioritization of Outfalls with Persistent Flow

Annually, the Copermittees shall evaluate the data produced by the dry weather outfall monitoring pursuant to Provision D.2.c., rank the outfalls according to potential threat to receiving water quality, and produce a prioritized list of outfalls for follow-up action. The Copermittees must analyze the non-storm water monitoring data collected pursuant to Provision D.2.c.

and consider NAL exceedances in prioritizing outfalls. The prioritized list shall be provided in the Annual Report for each WMA pursuant to Provision F.3.b. The prioritized list shall be used to update the WQIPs with the goal of reducing flows/ loads in order of the ranked priority list, through targeted programmatic actions and source investigations.

(b) Evaluate Potential Impacts to Receiving Waters from Persistent Non-Storm Water Outfall Flows

Annually, the Copermittees shall evaluate the data produced by the dry weather outfall monitoring pursuant to Provision D.2.c., and compare the outfall monitoring data to relevant receiving water quality data, to identify outfalls that may cause or contribute to receiving water quality problems.

(c) Calculate Loadings to Receiving Waters from Persistent Non-Storm Water Outfall Flows

Annually, the Copermittees shall estimate discharge loadings from the data produced by the dry weather outfall monitoring pursuant to Provision D.2.c., and rank the monitored outfalls in order from highest to lowest loading, to identify outfalls that may cause or contribute to receiving water quality problems. As part of this annual estimation, the Copermittees shall identify areas where program implementation is thought to have resulted in reductions or elimination of loads from MS4 outfalls.

(d) The Copermittees in each Watershed Management Area must review the non-storm water flow and pollutant load analyses required pursuant to Provision D.4.b.(2)(d) on an annual basis to:

(i) Identify the pollutant load reductions that are thought to be attributable to water quality management actions within the high priority outfall drainage areas

(ii) Assess the effectiveness of the water quality improvement strategies being implemented within the Watershed Management Area toward reducing or eliminating non-storm water discharges and pollutant loads discharging from the MS4 to receiving waters; and

(iii) Identify modifications necessary to increase the effectiveness of the water quality improvement strategies toward reducing or eliminating non-storm water discharges and pollutant loads discharging from the MS4 to receiving waters.

(3) Storm Water (Wet Weather) Outfall Monitoring

Management Questions: What is the relative urban runoff contribution to receiving water problem(s)? What are the sources of urban runoff that contribute to receiving water problem(s)?

Specific Questions: Do discharge concentrations at MS4 outfalls meet applicable permit action levels? Which MS4 outfalls impact receiving water quality during wet weather? How do representative MS4 outlet discharge concentrations, loads, and flows change over time?

(a) Comparisons of Wet Weather Outfall Quality to Storm Water Action Levels

The Copermittees shall analyze the storm water monitoring data collected pursuant to Provision D.2.c and consider SAL exceedances in prioritizing outfalls for further investigation, and assessing progress towards addressing WQIP priorities.

(b) Evaluate Potential Impacts to Receiving Waters

Annually, the Copermittees shall evaluate the data produced by the wet weather outfall monitoring pursuant to Provision D.2.c, and compare the outfall monitoring data to relevant receiving water quality data, to identify outfalls that may cause or contribute to receiving water quality problems. As part of this annual estimation, the Copermittees shall identify areas where program implementation is thought to have resulted in reductions or elimination of loads from MS4 outfalls.

(c) Calculate Loadings to Receiving Waters from Storm Water Outfall Flows

Annually, the Copermittees shall estimate discharge loadings from the data produced by the wet weather outfall monitoring pursuant to Provision D.2.c.

(d) The Copermittees in each Watershed Management Area must review the storm water flow and pollutant load analyses required pursuant to Provision D.4.b.(3)(e) on an annual basis to:

(i) Identify the pollutant load reductions that are thought to be attributable to water quality management actions within the monitored outfall drainage areas

(ii) Assess the effectiveness of the water quality improvement strategies being implemented within the Watershed Management Area toward reducing storm water pollutant loads discharging from the MS4 to receiving waters; and

(iii) Identify modifications necessary to increase the effectiveness of the water quality improvement strategies toward reducing storm water pollutant loads discharging from the MS4 to receiving waters.

(e) Characterization of Trends Over Time

The Copermittees shall evaluate the data produced by the wet weather outfall

monitoring pursuant to Provision D.2.c, and incorporate new outfall monitoring data into time series plots for each long-term monitoring constituent, for each WMA. Once per permit term the Copermittee shall perform statistical trends analysis on the cumulative long-term MS4 outfall water quality data set.

c. Source Identification

Management Question: What are the sources of urban runoff that contribute to receiving water problem(s)?

The principal role of Source/Stressor Identification is to identify and prioritize pollutant generating activities and source categories. Identification of high-priority sources is an important step in support of the WQIP process, to help inform the development of effective pollutant reduction strategies for particular priority constituents on a watershed-specific basis.

Source identification shall be conducted on a constituent-specific basis. The source identification efforts shall focus on constituents identified as watershed priorities, and include prioritization of sources based on magnitude, controllability, and other factors.

Following WQIP approval and implementation, source identification studies shall be used to improve WQIP effectiveness. For each Watershed Management Area, the Copermittees shall perform the investigation pursuant to Provision D.3, as necessary to address identified watershed priorities, including production of a prioritized list of sources or potential sources that warrant additional investigation and/or development of control strategies through the WQIPs.

Annually, the Copermittees shall evaluate the results and findings produced by the source/stressor identification studies conducted pursuant to Provision D.3, and inform Copermittee staff responsible for WQIP implementation of the relative magnitudes and/or priority rankings of identified sources. The Copermittees shall include the results of this analysis, when available and as applicable to each WMA, in the Annual Report pursuant to Provision F.3.b.

d. SPECIAL STUDIES

Following WQIP approval and implementation, special studies shall be identified to fill data gaps and provide targeted information to improve WQIP effectiveness. Upon completion of each Special Study conducted pursuant to Provision D.4, the Copermittees shall evaluate the study results and apply the results to the implementation of WQIPs within each Watershed Management Area as applicable.

Annually, the Copermittees shall evaluate the results and findings produced by the special studies conducted pursuant to Provision D.4, and assess their relevance to the Copermittees' efforts to better characterize WMAs and receiving water conditions, to understand urban runoff pollutant sources, and to control and limit the discharges of pollutants from MS4 outfalls to the maximum extent practicable. The Copermittees shall include the results of this analysis, when available and as applicable to each WMA, in the Annual Report pursuant to Provision F.3.b.

e. INTEGRATED EVALUATION OF WATER QUALITY IMPROVEMENT STRATEGIES

Once during the permit term, for each watershed management area, the Copermittees shall integrate the analyses and results of the monitoring performed pursuant to Provisions D.1-D.4, and the results of the assessments performed pursuant to Provision D.5.a.-D.5.d, as well as other data as available and applicable, to assess: 1) progress towards achieving the numeric goals and schedules established per the approved WQIPs, 2) progress toward addressing the highest priority receiving water conditions established for each Watershed Management Area, and 3) water quality improvements that are thought to be attributable to the Copermittees' implementation of the requirements of Provision B. For Watershed Management Areas with applicable TMDLs, the integrated evaluation must incorporate the specific monitoring and assessment requirements of Attachment E. For Watershed Management Areas with any ASBS, the water quality monitoring and assessment program must also incorporate the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012. The integrated evaluation shall include the following:

(1) The conditions of receiving waters and status of receiving water beneficial uses,

(2) The extent to which MS4 discharges cause or contribute to receiving water problems during both dry weather and wet weather,

(3) The estimated reductions in loadings from MS4 discharges attributable to the Copermittees' stormwater management activities, for both dry and wet weather,

(4) The principal identified sources of pollutants that are responsible for constituents in MS4 discharges that cause or contribute to receiving water problems,

(5) The results of the cumulative special studies and their application to improvement of the WQIPs for the Watershed Management Areas,

(6) Progress toward achieving the interim and final numeric targets for restoring impacted beneficial uses in receiving waters with adopted TMDL Implementation Plans;

(7) Any identified data or information gaps, along with recommendations for additional monitoring, special studies, or other investigations to address the data and information needs.

E. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS

The purpose of this provision is for each Copermittee to implement a program to control the ~~contribution~~discharge of pollutants to and ~~the discharges~~ from ~~the MS4 with~~ its respective MS4 to receiving waters within its jurisdiction. The goals of this ~~provision~~ program ~~is~~ are to: 1) effectively prohibit non-storm water discharges into the MS4s, 2) reduce pollutants in storm water discharges from the MS4s to the MEP, and 3) ~~to reduce the discharge of pollutants in storm water to the MEP and effectively prohibit non-storm water discharges to provide~~ support the attainment and the reasonable protection, preservation,~~,~~ and enhancement~~, and restoration of~~ water quality and designated beneficial uses of waters of the ~~state~~U.S**.** The~~i~~se goals will be accomplished through compliance with the jurisdictional runoff management program requirements of this Provision, and as modified or supplemented per Provision B (Water Quality Improvement Plans).

Each Copermittee must implement all the requirements of Provision E no later than ~~12~~ 18 months after the adoption of this Order, or in accordance with Provision F.5.a. Each Copermittee must update its jurisdictional runoff management program document, in accordance with Provision F.2.a, to include all the requirements of Provision E. The jurisdictional runoff management programs implemented by each Copermittee must be consistent with the Water Quality Improvement Plan for the applicable Watershed Management Area required by Provision B. Until the Copermittee has updated its jurisdictional runoff management program document with the requirements of Provision E, the Copermittee must continue implementing its current jurisdictional runoff management program.

Modification of Jurisdictional Runoff Management Program Requirements

Modifications shall be considered and where selected, proposed according to the process in Provision B.5. Proposed modifications may increase, decrease, and/or replace minimum requirements identified in Provision E.

1. Legal Authority Establishment and Enforcement

a. Each Copermittee must establish, maintain, and enforce adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 through statute, ordinance, permit, contract, order, or similar means to the extent allowable by law. This legal authority must ~~, at a minimum,~~ authorize the Copermittee to:

(1) Effectively ~~P~~prohibit and eliminate all illicit discharges and illicit connections to its MS4;

(2) Control the contribution of pollutants in discharges of runoff associated with industrial and construction activity to its MS4 and control the quality of runoff from industrial and construction sites, including industrial and construction

sites ~~which~~that do not have coverage under the statewide General Permit for Discharges of Storm Water Associated with Industrial Activities (Industrial General Permit) or General Permit for Discharges of Storm Water Associated with Construction Activities (Construction General Permit~~), as well as to those sites which do not;~~);

(3) Control the discharge of spills, dumping, or disposal of materials other than storm water into its MS4;

~~(4) Control through interagency agreements among Copermittees~~Coordinate, as possible, with other agencies to minimize the contribution of ~~pollutants~~pollutant discharges from ~~one portion MS4 to another portion of~~ the ~~MS4;~~

~~(5)~~

~~(6)~~(4) ~~Control through interagency agreements with other owners of the MS4 such as Caltrans, the U.S. federal government, or sovereign Native American Tribes, where possible, the contribution of pollutants from one~~Copermittee's portion of the MS4 to ~~another portion of~~ portions of the MS4 under another agency's jurisdiction and from the other agency's portions of the MS4 to the ~~MS4~~portion of the MS4 under the Copermittee's jurisdiction;

~~(7)~~(5) Require compliance with conditions in its statutes, ordinances, permits, contracts, orders, or similar means to hold dischargers to its MS4 accountable for their contributions of pollutants and flows;

~~(8)~~(6) Require the use of BMPs to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

~~(9)~~(7) Require documentation on the effectiveness of BMPs implemented to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

~~(10)~~(8) Utilize enforcement mechanisms to require compliance with its statutes, ordinances, permits, contracts, orders, or similar means; and

~~(11)~~(9) Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with its statutes, ordinances, permits, contracts, orders, or similar means and with the requirements of this Order, including the prohibition of illicit discharges and connections to its MS4; the Copermittee must also have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from industrial facilities, including construction sites, discharging into its MS4.

b. With the first Annual Report required by Provision F.3.b, each Copermittee must submit a statement certified by its Principal Executive Officer, Ranking Elected

Official, or Duly Authorized Representative that the Copermittee has taken the necessary steps to obtain and maintain full legal authority within its jurisdiction to implement and enforce each of the requirements contained in this Order.

2. Illicit Discharge Detection and Elimination

Each Copermittee must implement a program to actively detect and eliminate illicit discharges and improper disposal into the MS4, or otherwise require the discharger to apply for and obtain a separate NPDES permit. The illicit discharge detection and elimination program must include, at a minimum, the following requirements:

a. Non-Storm Water Discharges

To the extent allowable by law, ~~E~~each Copermittee must address all non-storm water discharges as illicit discharges~~,~~ where the likelihood exists that they are a source of pollutants to waters of the U.S., unless a non-storm water discharge is either identified as a discharge authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to the following requirements:

(1) Discharges of non-storm water to the MS4 from uncontaminated pumped groundwater ~~the following categories~~ must be addressed as illicit discharges where there is evidence that suggests that they are the source of pollutants to waters of the U.S., unless the discharge has coverage under NPDES Permit No. CAG919001 (Order No. R9-2007-0034, or subsequent order) for discharges to San Diego Bay, or NPDES Permit No. CAG919002 (Order No. R9-2008-0002, or subsequent order) for discharges to surface waters other than San Diego Bay:

~~(a) Uncontaminated pumped ground water;~~

~~(b) Discharges from foundation drains;~~

~~(c) Water from crawl space pumps; and~~

~~(d) Water from footing drains.~~

(2) Discharges of non-storm water from water line flushing and water main breaks to the MS4 must be addressed as illicit discharges unless the discharge has coverage under a valid NPDES Permit ~~No. CAG 679001 (~~, Order No. R9-2010-0003, or a subsequent order~~).~~. This includes water line flushing and water main break discharges from water purveyors under the Copermittee's jurisdiction that has been issued a water supply permit by the California Department of Public Health or federal military installations. Discharges from recycled or reclaimed water lines to the MS4 must be addressed as illicit discharges, unless the discharges have coverage under a separate NPDES permit.

(3) Discharges of non-storm water to the MS4 from the following categories must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a anthropogenic source of pollutants to receiving waters within the Copermittee's jurisdiction:

(a) Discharges from foundation drains;

(b) Water from crawl space pumps;

(c) Water from footing drains.

(d) Diverted stream flows;

(e) Rising ground waters;

(f) Uncontaminated ground water infiltration to MS4s;

(g) Springs;

(h) Flows from riparian habitats and wetlands; and

(i) Discharges from potable water sources.

(4) Discharges of non-storm water to the MS4 from the following categories must be controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means where there is evidence that those discharges are a source of pollutants to waters of the~~.~~ U.S. Discharges of non-storm water to the MS4 from the following categories not controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means must be addressed by the Copermittee as illicit discharges.

(a) Air conditioning condensation

The discharge of air conditioning condensation ~~must~~ should be directed to landscaped areas or other pervious surfaces where feasible;

(b) Individual residential vehicle washing

The discharge of wash water must be ~~directed to landscaped areas or other pervious surfaces where feasible, and~~encouraged through public outreach and education:

(i) To be directed to landscaped areas or other pervious surfaces where feasible, and

(ii) To ~~M~~minimize the use of water for vehicle washing, use as little washing detergent and other vehicle wash products as possible, wash vehicles at commercial wash facilities, and implement other practices or behaviors that will prevent the discharge of pollutants associated with individual residential vehicle washing from entering the MS4; and

(c) Dechlorinated swimming pool discharges

(i) Eliminate residual chlorine, algaecide, filter backwash, or other pollutants from swimming pools prior to discharging to the MS4, and

(ii) The discharge of saline swimming pool water ~~to the MS4~~ must be directed to the sanitary sewer, landscaped areas, ~~or~~ other pervious surfaces that can accommodate the volume of water, or to the MS4 if the MS4 discharges to a saltwater receiving water.

~~(4)~~(5) Firefighting discharges to the MS4 must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a significant source of pollutants to receiving waters. Firefighting discharges to the MS4 not identified as a significant source of pollutants to receiving waters, must be addressed, at a minimum, as follows:

(a) Non-emergency firefighting discharges

(i) Building fire suppression system maintenance discharges (e.g. sprinkler line flushing) to the MS4 must be addressed as illicit discharges where BMPs are not implemented.

(ii) Non-emergency firefighting discharges (i.e., discharges from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems) must be addressed by a program, to be developed and implemented by the Copermittee, to reduce or eliminate pollutants in such discharges from entering the MS4.

(b) Emergency firefighting discharges

Each Copermittee ~~must~~ should develop and encourage implementation of BMPs to reduce or eliminate pollutants in emergency firefighting discharges to the MS4s and receiving waters within its jurisdiction. During emergency situations, priority of efforts should be directed toward life, property, and the environment (in descending order). BMPs ~~should~~ shall not interfere with immediate emergency response operations or impact public health and safety.

~~(5)~~(6) If the Copermittee or San Diego Water Board identifies any category of non-storm water discharges listed under Provisions E.2.a.(1)-(4) as a source of pollutants to receiving waters, the category must be prohibited through ordinance, order, or similar means and addressed as an illicit discharge.

b. Prevent and Detect Illicit Discharges And Connections

Each Copermittee must include the following measures within its program to prevent and detect illicit discharges to the MS4:

(1) Each Copermittee must maintain an updated map of its entire MS4 and the corresponding drainage areas. The accuracy of the MS4 map must be confirmed during non-storm water MS4 monitoring events. The MS4 map must be included as part of the jurisdictional runoff management program document. Any geographic information system (GIS) layers or files used by the Copermittee to maintain the MS4 map must be made available to the San Diego Water Board upon request. The MS4 map must identify the following:

(a) All segments of the MS4 owned, operated, and maintained by the Copermittee,

(b) All known locations of inlets that discharge and/or collect runoff into the Copermittee's MS4,

(c) All known locations of connections with other MS4s not owned or operated by the Copermittee (e.g. Caltrans MS4s),

(d) All known locations of MS4 outfalls as defined by 40 CFR §122.26(B)(5-6) and private outfalls as defined by 40 CFR §122.26(B)(9) that discharge runoff collected from areas within the Copermittee's jurisdiction,

(e) All segments of receiving waters within the Copermittee's jurisdiction that receive and convey runoff discharged from the Copermittee's MS4 outfalls ~~(i.e., receiving water segments that are both a receiving water and part of the MS4)~~, and

(f) Locations of the non-storm water MS4 monitoring stations, identified pursuant to Provision D.1.a.(1)(a), within its jurisdiction;

(2) Each Copermittee must use Copermittee personnel and contractors to assist in identifying and reporting illicit discharges and connections, if observed, during the course of their daily employment activities;

(3) Each Copermittee must promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges to or from the MS4. Each Copermittee must facilitate public reporting through development and operation of a public hotline. Public hotlines can be Copermittee-specific or shared by the Copermittees. All public hotlines must be capable of receiving reports in both English and Spanish 24 hours per day and seven days per week;

(4) Each Copermittee must implement practices and procedures (including a notification mechanism) to prevent, respond to, contain, and clean up any spills that may discharge into the MS4 within their jurisdiction from any source. The Copermittee must coordinate with spill response teams to prevent to the extent possible entry of spills into the MS4, and prevent contamination ~~of surface water, ground water, and soil~~waters of the ~~-~~U.S. The Copermittee must coordinate spill prevention, containment, and response activities throughout all appropriate Copermittee departments, programs, and agencies; ~~and~~

~~(4)~~(5) Copermittees are responsible for control of discharges to their MS4. In the event that the source of an illicit discharge or connection is from another MS4, the Copermittee shall notify and, if necessary coordinate, with the upstream MS4 to implement and/or enforce corrective actions; and

~~(5)~~(6) Each Copermittee must implement practices and procedures to prevent and limit infiltration of seepage from sanitary sewers (including private laterals and failing septic systems) to the MS4.

c. Visual Observations, Field Screening, And/or Monitoring

Each Copermittee must conduct visual observations, field screening and/or monitoring of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4 in accordance with the jurisdictional non-storm water MS4 monitoring program requirements in Provision D.1.a.(1).

d. Investigate and Eliminate Illicit Discharges And Connections

Each Copermittee must include the following measures within its program to investigate and eliminate illicit discharges to the MS4:

(1) Each Copermittee must prioritize and determine when follow-up investigations will be performed in response to visual observations and/or water quality monitoring data collected during an investigation of a detected non-storm water or illicit discharge to or from the MS4. The criteria for follow-up investigations must include the following:

(a) Pollutants identified as causing or contributing to the highest water quality priorities identified in the Water Quality Improvement Plan;

(b) Pollutants identified as causing or contributing, or threatening to cause or contribute to impairments in water bodies on the 303(d) List and/or in environmentally sensitive areas (ESAs), located within its jurisdiction;

(c) Pollutants identified from sources or land uses known to exist within the area, drainage basin, or watershed that discharges to the portion of the MS4 within its jurisdiction included in the investigation; and

(d) Pollutants identified as causing or contributing to and exceedance of an NAL[12][13] where the source has not been identified as natural described in Provision C.1; and

(e) Pollutants identified as a threat to human health or the environment.

(2) Each Copermittee must implement procedures to investigate and inspect portions of its MS4 that~~,~~ based on reports or notifications, visual observations, field screening ~~and~~, monitoring, or other appropriate information, indicate a reasonable potential of ~~receiving, containing, or~~ discharging pollutants to receiving waters within the Copermittees jurisdiction due to illicit discharges, illicit connections, or other sources of non-storm water. ~~The procedures must include the following:~~

(a) The Copermittee may develop criteria to assess the validity of, and prioritize the response to, each report or notification received. Each Copermittee must respond to each report or notification (e.g., public hotline reports, staff or contractor reports and notifications, etc.) of an incident in a timely manner. ~~The Copermittee may develop criteria to assess the validity of, and prioritize the response to, each report or notification received;~~

(b) ~~Each Copermittee must immediately investigate and seek~~Procedures should address field investigations to identify sources or potential sources for the discharge, unless the source or potential source has

[12] NAL exceedances discovered during the course of IDDE monitoring and/or investigations may trigger action levels, including but not limited to, follow-up investigations based on the highest watershed priorities set forth and the iterative process provided in the WQIP.

already been identified during previous investigations. The criteria established in Provision E.d.(2)(a) shall be used to prioritize response based on highest watershed priorities as established for the iterative process and determined in the Water Quality Improvement Plan, including:

(i) Obvious illicit discharges must be immediately investigated to identify the source(s) of discharges of non-storm water where flows are observed in and from the MS4 during the field screening and monitoring required pursuant to Provision D.1.a.(1);

(i) The investigation must include field investigations to identify sources or potential sources for the discharge, unless the source or potential source has already been identified during previous investigations;

(ii) The investigation may include field investigations, reviewing Copermittee inventories, and other land use data to identify potential sources of the discharge; and

Procedures should address tracking of illicit discharges and connections.

(i)

(b) Each Copermittee must investigate and seek to identify the source(s) of non-storm water discharges from the MS4 where there is evidence of non-storm water having been discharged into or from the MS4 (e.g., pooled water). The investigation may include field investigations, reviewing Copermittee inventories, and other land use data to identify potential sources of the discharge; and

(3) Each Copermittee must maintain records and a database of the investigations, including the following information:

(a) Location of incident, including hydrologic subarea, portion of MS4 receiving the non-storm water or illicit discharge, and point of discharge or potential discharge from MS4 to receiving water,

(b) Source of information initiating the investigation (e.g., public hotline reports, staff or contractor reports and notifications, monitoring data, etc.),

(c) Date the information used to initiate the investigation was received,

(d) Date the investigation was initiated,

(e) Dates of follow-up investigations,

(i) Identified or suspected source of the illicit discharge or

connection, if determined,

(f) Known or suspected related incidents, if any,

(g) Result of the investigation, and

(h) If a source cannot be identified and the investigation is not continued, a rationale for why a discharge does not pose a threat to water quality and/or does not require additional investigation.

(4) Each Copermittee must initiate the implementation of procedures, in a timely manner, to eliminate all detected and identified illicit discharges and connections within its jurisdiction. The procedures must include the following:

~~Each Copermittee must enforce its~~

(a) Procedures outlined by the Copermittee should address legal authority, as required under Provision E.1, to ~~eliminate~~enforce the elimination of illicit discharges and connections to ~~its~~the MS4. If the Copermittee identifies the source as a controllable source of non-storm water or illicit discharge or connection, the Copermittee must implement its Enforcement Response Plan pursuant to Provision E.6 and enforce its legal authority ~~to prohibit~~to effectively prohibit and eliminate illicit discharges and connections to its MS4~~;~~. Responses to discharges may include:

(i) If the Copermittee identifies the source of the discharge as a category of non-storm water discharges in Provision E.2.a, and the discharge ~~to or from the MS4 is~~ in exceedance of NALs developed ~~under Provision ,~~in the Water Quality Implementation Plan, then the Copermittees must determine if this is an isolated incident or set of circumstances, or if the category of discharge must be addressed through the prohibition of that category of discharge as an illicit discharge pursuant to Provision E.2.a.(6);

(ii) If the Copermittee suspects the source of the non-storm water discharge as natural in origin (i.e. non-anthropogenically influenced) and in conveyance into the MS4, then the Copermittee must ~~collect the data and evidence necessary to demonstrate to the San Diego Water Board that it is natural in origin; and~~document the rationale for why the discharge does not need further investigation. This documentation shall be included in the Annual Report.

(iii) If the Copermittee is unable to identify and document the source of a recurring non-storm water discharge to or from the MS4, then the Copermittee must address the discharge as an illicit discharge and update its jurisdictional runoff management program to

address the common and suspected sources of the non-storm water discharge within its jurisdiction in accordance with the Copermittee's priorities.

(5) Each Copermittee must submit a summary of the non-storm water discharges and illicit discharges and connections investigated and eliminated within its jurisdiction with each Annual Report required under Provision F.3.b of this Order.

3. Development Planning

Each Copermittee ~~must use~~, within ~~their land use/planning authorities to~~ its respective jurisdiction, must implement a development planning program that includes, at a minimum, the following requirements.

a. Permanent BMP Requirements for All Development Projects

Each Copermittee ~~-~~, as practical and feasible, must prescribe ~~the following~~ BMP requirements during the planning process (i.e. prior to project approval and issuance of grading or building permits) for all development projects ~~(regardless of project type or size),~~ where local permits are issued, including unpaved roads and flood management projects, except emergency projects implemented for the protection of persons and property:

(1) General Requirements

(a) All BMPs must be located so as to remove pollutants from runoff prior to its discharge to any receiving waters, and as close to the source as possible;

(b) Multiple development projects may use shared permanent BMPs as long as construction of any shared BMP is completed prior to the use or occupation of any development project from which the BMP will receive runoff; and

(c) Permanent BMPs must not be constructed within ~~a~~ waters of the U.S. ~~or waters of the state.~~

(2) Source Control BMP Requirements

Each Copermittee must require each Priority Development Project to implement applicable source control BMPs. The following source control BMPs must be implemented at all development projects where applicable and feasible:

(a) Prevention of illicit discharges into the MS4;

(b) Storm drain system stenciling or signage;

(c) Properly designed outdoor material storage areas;

(d) Properly designed outdoor work areas;

(e) Properly designed trash storage areas; and

(f) Any additional BMPs necessary to minimize pollutant generation at each project.

(3) Low Impact Development (LID) BMP Requirements

The following LID BMPs must be implemented at all development projects where applicable and feasible:

(a) Maintenance or restoration of natural storage reservoirs and drainage corridors (including topographic depressions, areas of permeable soils, natural swales, and ephemeral and intermittent streams),[13]

(b) Buffer zones for natural water bodies (where buffer zones are technically infeasible, require project applicant to include other buffers such as trees, access restrictions, etc.);

(c) Conservation of natural areas within the project footprint including existing trees, other vegetation, and soils;

(d) Construction of streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided public safety is not compromised;

(e) Minimization of the impervious footprint of the project;

(f) Minimization of soil compaction to landscaped areas;

(g) Disconnection of impervious surfaces through distributed pervious areas;

(h) Landscaped or other pervious areas designed and constructed to effectively receive and infiltrate, retain and/or treat runoff from impervious areas, prior to discharge to the MS4;

(i) Small collection strategies located at, or as close as possible to, the source (i.e. the point where storm water initially meets the ground) to minimize the transport of runoff and pollutants to receiving waters;

[13] Development projects proposing to dredge or fill materials in waters of the U.S. must obtain a CWA Section 401 Water Quality Certification. Projects proposing to dredge or fill waters of the State must obtain Waste Discharge Requirements.

(j) Use of permeable materials for projects with low traffic areas and appropriate soil conditions;

(k) Landscaping with native or drought tolerant species; and

(l) Harvesting and using precipitation.

~~Long-Term Permanent BMP Maintenance~~

~~Each Copermittee must require the project applicant to submit proof of the mechanism under which ongoing long-term maintenance of all permanent BMPs will be conducted.~~

~~Infiltration and Groundwater Protection~~

~~(a) Infiltration and treatment control BMPs designed to primarily function as large, centralized infiltration devices (such as large infiltration trenches and infiltration basins) must not cause or contribute to an exceedance of an applicable groundwater quality objective. At a minimum, such infiltration and treatment control BMPs must be in conformance with the design criteria listed below, unless the development project applicant demonstrates to the Copermittee that one or more of the specific design criteria listed below are not necessary to protect groundwater quality. The design criteria listed below do not apply to small infiltration systems dispersed throughout a development project.~~

~~(i) Runoff must undergo pretreatment such as sedimentation or filtration prior to infiltration;~~

~~(ii) Pollution prevention and source control BMPs must be implemented at a level appropriate to protect groundwater quality at sites where infiltration treatment control BMPs are to be used;~~

~~(iii) Infiltration treatment control BMPs must be adequately maintained to remove pollutants in storm water to the MEP;~~

~~(iv) The vertical distance from the base of any infiltration treatment control BMP to the seasonal high groundwater mark must be at least 10 feet. Where groundwater basins do not support beneficial uses, this vertical distance criteria may be reduced, provided groundwater quality is maintained;~~

~~(v) The soil through which infiltration is to occur must have physical and chemical characteristics (e.g., appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses;~~

~~(vi) Infiltration treatment control BMPs must not be used for areas of industrial or light industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee,~~

~~unless first treated or filtered to remove pollutants prior to infiltration; and~~

~~(vii) Infiltration treatment control BMPs must be located a minimum of 100 feet horizontally from any water supply wells.~~

~~(b) The Copermittees may collectively or individually develop alternative mandatory design criteria to that listed above for infiltration and treatment control BMPs which are designed to primarily function as centralized infiltration devices. Before implementing the alternative design criteria in the development planning process the Copermitee(s) must:~~

~~(i) Notify the San Diego Water Board of the intent to implement the alternative design criteria submitted; and~~

~~(ii) Comply with any conditions set by the San Diego Water Board.~~

b. Priority Development Projects

(1) Definition of Priority Development Project

Priority Development Projects include the following:

(a) All new development projects that fall under the Priority Development Project categories listed under Provision E.3.b.(2). Where a new development project feature, such as a parking lot, falls into a Priority Development Project category, the entire project footprint is subject to Priority Development Project requirements; and

(b) Those redevelopment projects that create, add, or replace at least 5,000 square feet of impervious surfaces on an already developed site, ~~or~~ and the redevelopment project is a Priority Development Project category listed under Provision E.3.b.(2). Where redevelopment results in an increase of less than fifty percent of the impervious surfaces of a previously existing development, and the existing development was not subject to Priority Development Project requirements, the performance and sizing requirements discussed in Provisions E.3.c.(2) and E.3.c.(3) apply only to the addition or replacement, and not to the entire development. Where redevelopment results in an increase of more than fifty percent of the impervious surfaces of a previously existing development and was not subject to previous Priority Project Development requirements, the performance and sizing requirements apply to the entire development.

(c) Projects where redevelopment results in an increase of more than fifty percent of impervious surfaces of a previously existing development, and the existing development was subject to previous Priority Project

Development requirements, only the altered portion of development is subject to the Priority Development Project requirements in this Order.

(2) Priority Development Project Categories

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This category includes commercial, industrial, residential, mixed-use, and public development projects on public or private land which fall under the planning and building authority of the Copermittee.

(b) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

(c) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812), where the land area for development is 5,000 square feet or more~~.~~ of impervious surface.

(d) Hillside development projects. This category includes any development which creates 5,000 square feet or more of impervious surface which is located in an area with known erosive soil conditions, where the development will grade on any natural slope that is twenty-five percent or greater.

(e) Environmentally sensitive areas (ESAs). This category includes any development located within, directly adjacent to, or discharging directly to an ESA, which either creates 2,500 square feet of impervious surface on a proposed project site or increases the area of imperviousness of a proposed project site to 10 percent or more of its naturally occurring condition. "Directly adjacent to" means situated within 200 feet of the ESA. "Discharging directly to" means outflow from a drainage conveyance system that collects runoff from the subject development or redevelopment site ~~and~~ which terminates at or in receiving waters within the ESA and is not comingled with flows from adjacent lands.

(f) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce that has 5,000 square feet or more of impervious surface.

(g) Streets, roads, highways, and freeways~~, and residential driveways~~. This category is defined as any paved impervious surface that is 5,000 square feet or more used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

(h) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more of impervious surface or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

(i) Large development projects. This category includes any post-construction pollutant-generating new development projects that result in the disturbance of one acre or more of land.

(3) Priority Development Project Exemptions

Each Copermittee has the discretion to exempt the following projects from being defined as Priority Development Projects:

(a) Sidewalks constructed as part of new streets or roads and designed to direct storm water runoff to adjacent vegetated areas;

(b) Bicycle lanes that are constructed as part of new streets or roads but are not hydraulically connected to the new streets or roads and designed to direct storm water runoff to adjacent vegetated areas;

(c) Impervious trails and driveways constructed and designed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas;

(d) Sidewalks, bicycle lanes, driveways, parking lots, or trails constructed with permeable surfaces.

(e) Single-family residential projects that are not part of a larger development or proposed subdivision and implement BMPs that meet minimum performance standards, as outlined in the BMP Design Manual.[15]

(f) Any paved impervious surface that is 5,000 square feet or more used for the transportation of automobiles, trucks, motorcycles, and other vehicles that follows the USEPA guidance regarding Management Wet Weather with Green Infrastructure: Green Streets[16] to the MEP.

[15] The BMP Design Manual was formerly known as the Standard Urban Storm Water Mitigation Plan under Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016.
[16] http://water.epa.gov/infrastructure/greeninfrastructure/index.cfm

c. Priority Development Project ~~Permanent~~ Structural BMP Performance and Sizing Requirements

In addition to the BMP requirements listed for all development projects under Provision E.3.a, Priority Development Projects must also implement ~~permanent~~ structural BMPs that conform to performance and sizing requirements.
~~(1) Source Control BMP Requirements~~

~~Each Copermittee must require each Priority Development Project to implement applicable source control BMPs listed under Provision E.3.a.(2).~~

(1) Retention and Treatment Control BMP Requirements

Each Copermittee must require each Priority Development Project to implement BMPs to retain and treat pollutants onsite in the following order:

(a) Each Priority Development Project must be required to implement LID BMPs as described in Provision E.3.a.(3); and~~.~~

(b) Each Priority Development Project must be required to implement LID BMPs that are sized and designed to retain the difference in volume ~~equivalent to~~between the runoff volume produced in the post-development condition as compared to the pre-development runoff condition resulting from a 24-hour 85th percentile storm event[17] ("design capture volume"[18]), or

(c) If onsite retention of the design capture volume using LID BMPs is technically infeasible per Provision E.3.c.(4), flow-thru LID and/or conventional treatment control BMPs must be implemented to provide equal pollutant removal for ~~treat~~ the portion of the design capture volume that is not retained onsite. Flow-thru LID treatment control BMPs must be designed for an appropriate surface loading rate to prevent erosion, scour and channeling within the BMP; or~~.~~

~~(c)~~(d) If retention and/or equivalent pollutant removal of the design capture volume to meet E.3.c.(2)(a) or E.3.c.(2)(b) are infeasible

[17] This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals.
[18] Design capture volume is a single event based volume occurring after an extended dry period.

onsite~~Additionally~~, project applicants must perform mitigation for the portion of the pollutant load in the design capture volume that is not retained or equally treated onsite, as described in Provision E.3.c.(5~~4~~)c.

~~(d)~~(e) All onsite treatment control BMPs must:

(i) Be correctly sized and designed so as to remove pollutants from storm water to the MEP;

(ii) Be sized to comply with the following numeric sizing criteria:

[a] Volume-based treatment control BMPs must be designed to mitigate (infiltrate, filter, or treat) the remaining portion of the design capture volume that was not retained onsite; or

[b] Flow-based treatment control BMPs must be designed to mitigate (filter or treat) either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event; or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two.

(iii) Be ranked with high or medium pollutant removal efficiency for the project's most significant pollutants of concern. Treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

(2) Hydromodification Management BMP Requirements

Each Copermittee must require each Priority Development ~~Project~~Project disturbing greater than one acre to implement hydromodification management BMPs, ~~so that:~~as described in the Copermittees current HMP, as applicable.

(a) Post-project runoff flow rates and durations do not exceed pre-development ~~(naturally occurring)~~ runoff flow rates and durations by more than 10 percent (for the range of flows that result in increased potential for erosion or degraded channel conditions downstream of Priority Development Projects).

(i) In evaluating the range of flows that results in increased potential for erosion of natural (non-hardened) channels, the lower boundary must correspond with the critical channel flow that

produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks.

(ii) For artificially hardened channels, analysis to identify the lower boundary must use characteristics of a natural stream segment similar to that found in the watershed. The lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or erodes the toe of the channel banks.

~~(i)~~(iii) The Copermittees may use monitoring results pursuant to Provision D.5.a.(4) to re-define the range of flows resulting in increased potential for erosion or degraded channel conditions, as warranted by the data.

(b) Projects shall preserve (where feasible) or provide compensation for significant losses of sediment supply anticipated as a result of development. ~~Post-project runoff flow rates and durations must compensate for the loss of sediment supply due to the development project, should loss of sediment supply occur as a result of the development project.~~

(c) If hydromodification management BMPs are technically infeasible per Provision E.3.c.(5~~4~~), project applicants must perform mitigation for the portion of the runoff volume that is not controlled and will cause or contribute to increased potential for erosion of receiving waters downstream of the Priority Development Project, as described in Provision E.3.c.(5~~4~~)c.

(d) Exemptions

Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP requirements where the project:

(i) Discharges storm water runoff into underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;

(ii) Discharges storm water runoff into conveyance channels whose bed and bank are stabilized (e.g. concrete lined, an engineered interlocking paver, gabion system etc…) all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; or

(iii) Discharges storm water runoff into other areas identified by the San Diego Water Board as exempt from the requirements of Provisions E.3.c.(3) .

(3) Long-Term Structural BMP Maintenance

Each Copermittee must require the project applicant to submit proof of the mechanism under which ongoing long-term maintenance of all structural BMPs will be conducted.

(4) Infiltration and Groundwater Protection

(a) Infiltration and treatment control BMPs designed to primarily function as large, centralized infiltration devices (such as large infiltration trenches and infiltration basins) must not cause or contribute to an exceedance of an applicable groundwater quality objective. At a minimum, such infiltration and treatment control BMPs must be in conformance with the design criteria listed below, unless the development project applicant demonstrates to the Copermittee that one or more of the specific design criteria listed below are not necessary to protect groundwater quality. The design criteria listed below do not apply to small infiltration systems dispersed throughout a development project.

(i) Runoff must undergo pretreatment such as sedimentation or filtration prior to infiltration;

(ii) Pollution prevention and source control BMPs must be implemented at a level appropriate to protect groundwater quality at sites where infiltration treatment control BMPs are to be used;

(iii) Infiltration treatment control BMPs must be adequately maintained to remove pollutants in storm water to the MEP;

(iv) The vertical distance from the base of any infiltration treatment control BMP to the seasonal high groundwater mark must be at least 10 feet. Where groundwater basins do not support beneficial uses, this vertical distance criteria may be reduced, provided groundwater quality is maintained;

(v) The soil through which infiltration is to occur must have physical and chemical characteristics (e.g., appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses;

(vi) Infiltration treatment control BMPs must not be used for areas of industrial or light industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee, unless runoff does not exceed Basin Plan water quality standards or runoff is first treated or filtered to remove pollutants prior to infiltration; and

(vii) Infiltration treatment control BMPs must be located a minimum of 100 feet horizontally from any water supply wells.

(b) The Copermittees may collectively or individually develop alternative mandatory design criteria to that listed above for infiltration and treatment control BMPs which are designed to primarily function as centralized infiltration devices. Before implementing the alternative design criteria in the development planning process the Copermittee(s) must:

(i) Notify the San Diego Water Board of the intent to implement the alternative design criteria submitted; and

(ii) Comply with any conditions set by the San Diego Water Board.

(5) Alternative Compliance for Technical Infeasibility

At the discretion of each Copermittee, alternative compliance may be allowed for certain Priority Development Projects to comply with Provisions E.3.c.(~~2~~1) and E.3.c.(2~~3~~)~~,~~. Alternative compliance is an optional program for the Copermittees to utilize if it is determined to provide an equal or greater benefit than onsite compliance. Where alternative compliance is allowed, it is the sole responsibility of the project applicant to execute the alternative compliance and comply with the following requirements:
~~subject to the following requirements:~~

a. Applicability

Priority Development Projects may be allowed alternative compliance if:

(i) The Copermittee reviews and ~~approves~~ accepts site-specific hydrologic and/or design analysis performed by a registered professional engineer, geologist, architect, or landscape architect;

(ii) The project applicant demonstrates, and the Copermittee determines and documents, that ~~retention LID and/or hydromodification management~~ BMPs per Provisions E.3.c.(1~~2~~) and E.3.c.(2~~3~~) were incorporated into the project design to the maximum extent technically feasible given the project site conditions;

(iii) The project applicant is required to perform mitigation described in Provision E.3.c.(5~~4~~)c~~ce~~ with a net result of at least the same level of water quality protection as would have been achieved if the Priority Development Project had fully implemented the ~~retention LID and hydromodification management~~ BMP requirements under Provisions E.3.c.(1~~2~~) and E.3.c.(2~~3~~) onsite.

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b. Criteria For Technical Infeasibility

Each Copermittee must develop, or develop in collaboration with the other Copermittees, criteria to determine technical infeasibility for fully implementing the ~~retention LID and hydromodification management~~ BMP requirements under Provisions E.3.c.(1~~2~~) and E.3.c.(2~~3~~) and include these requirements in the ~~Permanent~~ BMP ~~Sizing Criteria~~ Design Manual pursuant to Provision E.3.d. Technical infeasibility may result from conditions including, but not limited to:

(i) Locations that cannot meet the infiltration and groundwater protection requirements in Provision E.3.c~~a~~.(4~~5~~) due to the presence

of shallow bedrock, contaminated soils, near surface groundwater, underground facilities, or utilities;

(ii) Brownfield development sites or other locations where pollutant mobilization is a documented concern;

(iii) The design of the site precludes the use of soil amendments, plantings of vegetation, or other designs that can be used to infiltrate and evapotranspirate runoff;

(iv) Soils cannot be sufficiently amended to provide for the requisite infiltration rates;

(v) Locations with geotechnical hazards;

(vi) Insufficient onsite and/or offsite demand for storm water use;

(vii) Modifications to an existing building to manage storm water are not feasible due to structural or plumbing constraints;

~~(vii)~~(viii) HMP flow rate requirements that result in BMP orifice sizes too small for efficient maintenance; and

~~(viii)~~(ix) Smart growth and infill or redevelopment locations where the density and/or nature of the project would create significant difficulty for compliance with Provisions E.3.c.(2) and E.3.c.(3) onsite.

c. Mitigation

Priority Development Projects that meet the Copermittee's technical infeasibility criteria developed pursuant to Provision E.3.c.(5~~4~~)b must be required to mitigate for the increased flow rates, increased flow durations, and/or ~~increased pollutant loads~~water quality equivalence expected to be discharged from the site.

(i) The Project applicant must perform offsite mitigation for:

[a] The portion of the pollutant load in the design capture volume that is not retained or equally treated onsite, and/or

[b] The portion of the increased potential erosion of downstream receiving waters not fully controlled with hydromodification management BMPs onsite.

~~For the pollutant load in the volume of storm water not retained onsite with retention LID BMPs, or increased potential erosion of downstream receiving waters not fully controlled onsite with hydromodification management BMPs, the Copermittee must require the project applicant to either 1) implement an offsite mitigation project, and/or 2) provide sufficient funding for a public or private offsite mitigation project via a mitigation fund.~~

~~(i)~~(ii) Mitigation Project Locations

Offsite mitigation projects must be implemented within the same ~~hydrologic unit~~Watershed Management Area as the Priority Development Project, and preferably within the same hydrologic

subarea. Mitigation projects outside of the hydrologic subarea but within the same ~~hydrologic unit~~Watershed Management Area may be approved provided that the project applicant demonstrates that mitigation projects within the same hydrologic subarea are infeasible and that the mitigation project will address similar potential impacts expected from the Priority Development Project.

~~(ii)~~(iii) Mitigation Project Types

Offsite mitigation projects ~~must~~ may include, where applicable and feasible, retrofitting opportunities and stream and/or habitat rehabilitation or restoration opportunities identified in the Water Quality Improvement Plans, identified pursuant to Provision B.3.. Other offsite mitigation projects may include green streets or infrastructure projects, groundwater recharge projects, or regional BMPs upstream of receiving waters. Mitigation credit will not be given to portions of in stream mitigation projects using impervious~~In-stream rehabilitation or restoration measures to protect or prevent adverse physical changes to creek bed and banks must not include the use of non-naturally occurring~~ hardscape materials such as concrete~~, riprap, or gabions~~. Project applicants seeking to utilize these alternative compliance provisions may propose other offsite mitigation projects, which the Copermittees may approve if they meet the requirements of Provision E.3.c.(4).

~~(iii)~~(iv) Mitigation Project Timing

The Copermittee and/or project applicant must develop a schedule for the completion of offsite mitigation projects, including milestone dates to identify, fund, design, and construct the projects. Offsite mitigation funding ~~projects~~ must be secured by the applicant and verified by the Copermittee prior to granting construction permits or recording of maps,whichever comes first. ~~completed upon the granting of occupancy for the first project that contributed funds toward the offsite mitigation project, unless a longer period is authorized by the San Diego Water Board.~~.

~~(iv)~~(v) Mitigation Fund

A Copermittee may choose to implement additional mitigation programs (e.g., pollutant credit system, mitigation fund) as a means for developing and implementing offsite mitigation projects, provided the projects conform to the requirements for project locations, types, and timing described above.

d. Update ~~Permanent~~ BMP ~~Sizing Criteria~~ Design Manual

Each Copermittee must update its ~~Permanent BMP Sizing Criteria Design Manual (~~BMP Design Manual~~)~~[19] pursuant to Provision F.2.b or Provision F.5.a. Until the Copermittee has updated its BMP Design Manual with the requirements of Provision E.3.c, the Copermittee must continue implementing its current BMP Design Manual. Unless directed otherwise by the San Diego Water Board, the Copermittee must implement the BMP Design Manual within 180 days of completing the update. The update of the BMP Design Manual must include the following:

(1) Updated procedures to determine the nature and extent of storm water requirements applicable to a potential development or redevelopment project. These procedures must inform project applicants of the storm water management requirements applicable to their project including, but not limited to, general requirements for all development projects, LID and conventional BMP design procedures and requirements, hydromodification management requirements, requirements specific to phased projects, and procedures specific to private developments and public improvement projects;

(2) Updated procedures to identify pollutants and conditions of concern for selecting the most appropriate ~~permanent~~ structural BMPs that consider, at a minimum, the following:

(a) Receiving water quality (including pollutants for which receiving waters are listed as impaired under CWA section 303(d));

(b) Priority pollutants or receiving water conditions contributing to the highest water quality priorities identified in the Water Quality Improvement Plan;

(c) Land use type of the project and pollutants associated with that land use type; and

(d) Pollutants expected to be present onsite.

(3) Updated procedures for designing ~~permanent~~ structural BMPs, including any updated performance and sizing requirements to be consistent with the requirements of Provision E.3.c for all BMPs listed in the BMP Design Manual;

(4) Long-term maintenance criteria for each BMP listed in the BMP Design Manual; and

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~~[19] The Permanent BMP Sizing Criteria Design Manual was formerly known as the Standard Storm Water Mitigation Plan under Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016.~~

(5) Criteria and mitigation requirements, in accordance with the requirements under Provision E.3.c.(4), if the Copermittee elects to allow alternative compliance for technical infeasibility within its jurisdiction.

e. Priority Development Project BMP Implementation and Oversight

Each Copermittee must implement a program to ensure structural ~~permanent~~ BMPs on all Priority Development Projects are designed, constructed, and maintained to remove pollutants in storm water to the MEP.

(1) Structural~~Permanent~~ BMP Approval and Verification Process

(a) Each Copermittee must ensure that for all Priority Development Project applications that have not received prior lawful approval by the Copermittee by 18~~2~~ months after the adoption of this Order, or pursuant to Provision F.5.a~~aa~~, the requirements of Provision E.3 are implemented. For project applications that have received prior lawful approval by 18~~2~~ months after the adoption of this Order, or pursuant to Provision F.5.a~~aa~~, the Copermittee may allow previous land development requirements to apply.

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(b) Each Copermittee must identify the roles and responsibilities of various municipal departments in implementing the structural~~permanent~~ BMP requirements, including each stage of a project from application review and approval through BMP maintenance and inspections.

(c) Each Copermittee must ensure that appropriate easements and ownerships are properly recorded in public records and the information is conveyed to all appropriate parties when there is a change in project or site ownership.

(d) Each Copermittee must ensure that prior to occupancy and/or intended use of any portion of the Priority Development Project, each ~~permanent~~ structural BMP must be inspected to verify that they have been constructed and are operating in compliance with all of its specifications, plans, permits, ordinances, and the requirements of this Order.

(2) Priority Development Project Inventory and Prioritization

(a) Each Copermittee must develop and ~~continuously~~regularly maintain a watershed-based database to track and inventory all Priority Development Projects and associated structural~~permanent~~ BMPs within their jurisdiction. Inventories must be accurate and complete beginning from January 2002 for the San Diego County Copermittees, February 2003 for the Orange County Copermittees, and July 2005 for the Riverside County

Copermittees, where data is available. The database must include, at a minimum, the following information:

(i) Priority Development Project location (address and hydrologic subarea);

(ii) Descriptions of structural BMP type(s);

(iii) Date(s) of construction;

(iv) Party responsible for ~~permanent~~ structural BMP maintenance;

(v) Dates and findings of ~~permanent~~ structural BMP maintenance verifications; and

(vi) Corrective actions and/or resolutions.

(b) Each Copermittee must prioritize the Priority Development Projects with ~~permanent~~ structural BMPs within its jurisdiction. The designation of Priority Development Projects as high priority must consider the following:

(i) The highest water quality priorities identified in the Water Quality Improvement Plan;

(ii) Receiving water quality;

(iii) Number and sizes of ~~permanent~~ structural BMPs;

(iv) Recommended maintenance frequency of ~~permanent~~ structural BMPs;

(v) Likelihood of operation and maintenance issues of structural ~~permanent~~ BMPs;

(vi) Land use and expected pollutants generated; and

(vii) Compliance record.

(3) Structural ~~Permanent~~ BMP Maintenance Verifications and Inspections

Each Copermittee is required to verify that structural ~~permanent~~ BMPs on each Priority Development Project are adequately maintained, and continue to operate effectively to remove pollutants in storm water to the MEP through inspections, self-certifications, surveys, or other equally effective approaches.

(a) All (100 percent) of the structural ~~permanent~~ BMPs at Priority Development Projects that are designated as high priority must be inspected directly by the Copermittee annually prior to each rainy season;

(b) For verifications performed through a means other than direct Copermittee inspection, adequate documentation must be required by

the Copermittee to provide assurance that the required maintenance of structural ~~permanent~~ BMPs at each Priority Development Project has been completed; and

(c) Appropriate follow-up measures (including re-inspections, enforcement, etc.) must be conducted to ensure that structural ~~permanent~~ BMPs at each Priority Development Project continue to reduce pollutants in storm water to the MEP as originally designed.

f. Development Project Enforcement

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all development projects, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

4. Construction Management

Each Copermittee must implement a construction management program that includes~~, at a minimum,~~ the following requirements:

a. Construction Program Management

Each Copermittee must define in the Jurisdictional Runoff Management Plan the following:

(1) Define construction sites to be inventoried, such as sites that involve any ground disturbance or soil disturbing activities; and

(2) Define a process for ensuring adequate construction BMP implementation for non-inventoried sites. Non-inventoried sites involve minor construction activities that are not anticipated to create storm water pollution such as interior improvements, plumbing, electrical, and mechanical work.

~~a.~~**b.** Project Approval Process

Prior to ~~approval and~~ issuance of any local permit that allows commencement of construction~~, grading, or building permits~~ activities for any inventoried construction site, ~~a project~~ each Copermittee must:

(1) Require a ~~project~~site-specific ~~storm water pollution prevention plan (SWPPP)~~Pollution Control Plan, or equivalent construction BMP or erosion control plan, to be submitted by the project applicant ~~for~~ to the Copermittee~~'s approval~~;

(2) ~~Ensure~~ Confirm the Pollution Control Plan~~SWPPP~~, or equivalent construction BMP or erosion control plan, complies with the local grading ordinance, other applicable local ordinances, and the requirements of this Order; and

(3) ~~Ensure~~ Confirm the Pollution Control Plan~~SWPPP~~, or equivalent construction BMP or erosion control plan, includes seasonally appropriate and effective BMPs and management measures described in Provision E.4.c, as applicable to the project.

~~(1) Verify that the project applicant has obtained coverage under applicable permits, including, but not limited to the Construction General Permit, Clean Water Act Section 401 Water Quality Certification and Section 404 Permit, and California Department of Fish and Game Streambed Alteration Agreement.~~

c. Construction Site Inventory and Tracking

(1) Each Copermittee must maintain, and update at least monthly, a watershed-based inventory of all applicable construction sites ~~requiring construction, grading, or building permits~~ within its jurisdiction. The inventory must include:

(a) Relevant contact information for each site (e.g., name, address, phone, and email for the owner and contractor);

(b) The basic site information including location (address and hydrologic subarea), Waste Discharge Identification (WDID) number (if applicable), size of the site, and approximate area of disturbance;

(c) Whether or not the site is considered a high threat to water quality, as defined in Provision E.4.b.(2) below;

~~(a) The project start and anticipated completion dates;~~

(d) Current construction phase;

(e) The required inspection frequency, as defined in the Copermittee's jurisdictional runoff management program document;

(f) The date the Copermittee ~~approved~~ accepted the project-specific Pollution Control Plan~~SWPPP~~, or equivalent construction BMP or erosion control plan; and

(g) Whether or not there are ongoing enforcement actions administered to the site.

(2) Each Copermittee must identify all construction sites within its jurisdiction that represent a high threat to downstream surface water quality. At a minimum, high threat to water quality sites must include:

(a) Sites located within a hydrologic subarea where sediment is known o suspected to contribute to the highest water quality priorities identified in the Water Quality Improvement Plan;

(b) Sites located within the same hydrologic subarea and tributary to a CWA section 303(d) water body segment impaired for sediment;

(c) Sites located within, directly adjacent to, or discharging directly to a receiving water within an ESA; and

(d) Other sites determined by the Copermittees or the San Diego Water Board as a high threat to water quality.

d. Construction Site BMP and Management Measure Implementation

Each Copermittee must implement, or require the implementation of effective BMPs to reduce discharges of pollutants in storm water from construction sites to the MEP, and prevent non-storm water discharges into the MS4. These BMPs must be site specific, seasonally appropriate, and construction phase appropriate. BMPs and management measures must be implemented at each construction site year round. Dry season BMP implementation must plan for and address unseasonal rain events that may occur during the dry season (May 1 through September 30). Copermittees must implement, or require the implementation of, BMPs and management measures in the following categories:

(1) Project Planning;

(2) Good Site Management "Housekeeping", including waste management;

(3) Non-storm Water Management;

(4) Erosion Control;

(5) Sediment Control;

(6) Run-on and Run-off Control; and

(7) Active/Passive Sediment Treatment Systems, where applicable.

e. Construction Site Inspections

Each Copermittee must conduct construction site inspections to ~~ensure~~ confirm compliance with its permits and applicable local ordinances, and the requirements of this Order. Priority for site inspections must consider threat to water quality pursuant to Provision E.4.b as well as the nature of the construction activity, topography, and the characteristics of soils and receiving water quality.

(1) Inspection Frequency

(a) Each Copermittee must conduct inspections at all inventoried sites, including high threat to water quality sites, at an appropriate frequency for each phase of construction to ~~ensure~~ confirm the site reduces the discharge of pollutants in storm water from construction sites to the MEP, and prevents non-storm water discharges from entering the MS4.

(b) Each Copermittee must establish appropriate inspection frequencies for high threat to water quality sites, and all other sites, for each phase of construction. Inspection frequencies appropriate for addressing the highest water quality priorities identified in the Water Quality Improvement Plan, and for complying with the requirements of this Order must be identified in each Copermittee's jurisdictional runoff management program document.

(c) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e., re-inspection, enforcement) necessary to ~~ensure~~ confirm site compliance with its permits and applicable local ordinances, and the requirements of this Order.

(2) Inspection Content

Inspections of construction sites by the Copermittee must include, at a minimum:

(a) Verification of coverage under the Construction General Permit (Notice of Intent (NOI) and/or WDID number) during initial inspections, when applicable;

(b) Assessment of compliance with its permits and applicable local ordinances related to pollution prevention, including the implementation and maintenance of applicable BMPs;

(c) Assessment of BMP adequacy and effectiveness;

(d) Visual observations of actual non-storm water discharges;

(e) Visual observations of actual or potential discharge of sediment and/or construction related materials from the site;

(f) Visual observations of actual or potential illicit connections; and

(g) If any violations are found and BMP enhancements are needed, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried construction sites. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Site name, location (address and hydrologic subarea), and WDID number (if applicable);

(b) Inspection date;

(c) Weather conditions during inspection;

~~(a) Approximate amount of rainfall since last inspection;~~

(d) Description and photo documentation of problems observed with BMPs and indication of need for BMP addition/repair/replacement and any scheduled re-inspection, and date of re-inspection;

(e) Descriptions of any other specific inspection comments which must, at a minimum, include rationales for longer compliance time~~.~~;

(f) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(g) Resolution of problems noted and date problems fixed.

f. Construction Site Enforcement

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried construction sites, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

5. Existing Development Management

[Note: This section is provided as an alternative to the original language. As such, line-out strike-out is not provided.]

Each Copermittee must implement an existing development management program that includes the following requirements:

a. Industrial, Commercial, and Municipal Sources

(1) Source Identification and Prioritization

Each Copermittee must identify sources and maintain an updated watershed-based inventory of its existing industrial, commercial, and municipal development that has the reasonable potential to discharge a pollutant load to and from the MS4. The use of an automated database system, such as GIS, is highly recommended. The inventory must, at a minimum, include:

(a) Name, location (address and hydrological subarea) of each source;

(b) A designation of the source as municipal, commercial, or industrial;

(c) SIC Code or NAICS Code, if applicable;

(d) Industrial General Permit NOI and/or WDID number, if applicable;

(e) Identification of pollutants generated or potentially generated by the source;

(f) Whether the source is adjacent to an ESA;

(g) Whether the source is tributary to and within the same hydrologic subarea as a CWA section 303(d) water body segment and generates or potentially generates pollutants for which the water body segment is impaired; and

(h) Whether the source contributes or potentially contributes to the highest water quality priorities identified in the Water Quality Improvement Plan;

(2) BMP Implementation and Maintenance

Each Copermittee must designate a minimum set of BMPs required for all inventoried existing development with the reasonable potential to discharge pollutant loads from their MS4, including special event venues. The designated minimum BMPs must be specific to facility types and pollutant-generating activities, as appropriate.

(a) Pollution Prevention

Each Copermittee must promote the use of pollution prevention methods, where appropriate.

(b) BMP Operation and Maintenance

(i) Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at sources within its jurisdiction.

Each Copermittee must implement a schedule of operation and maintenance activities for its MS4 and related structures (including but not limited to catch basins, storm drain inlets, detention basins, etc.), and verify proper operation of all its municipal structural treatment controls. Operations and maintenance activities may include:

[a] Inspections of MS4 and related structures;

[b] Cleaning of MS4 and related structures; and

[c] Proper disposal of materials removed from cleaning of MS4 and related structures.

(ii) Each Copermittee must implement a schedule of operation and maintenance activities for public: streets, unpaved roads, paved roads, and paved highways and freeways within its jurisdiction.

(iii) Each Copermittee must implement controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers. Copermittees that operate both a municipal sanitary sewer system and a MS4 must implement controls and measures to prevent and eliminate seeping sewage from infiltrating the MS4. Copermittees that do not operate both a municipal sanitary sewer system and a MS4 are encouraged to coordinate with sewering agencies to keep themselves informed of relevant and appropriate maintenance activities and capital projects in their jurisdiction.

(c) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must implement procedures, or require the implementation of procedures, as appropriate, to reduce discharges of pollutants associated with the application, storage, and disposal of pesticides, herbicides and fertilizers at sources within its jurisdiction.

(3) Measures to Address Highest Water Quality Priorities

Each Copermittee must conduct or require measures as necessary to address sources or areas that discharge pollutants identified as contributing to the highest water quality priorities in the Water Quality Improvement Plan. These measures must be identified as applicable in each WQIP strategy, and may include any of the following:

(a) Copermittee Program Activities

Each Copermittee may make modifications to its program activities (e.g. increased or focused education, inspections, etc.) to address sources that discharge pollutants identified as contributing to the highest water quality priorities in the Water Quality Improvement Plan.

(b) Additional Control Measures

Each Copermittee may require additional pollution prevention measures and control measures at sources that discharge pollutants identified as contributing to the highest water quality priorities in the Water Quality Improvement Plan, including consideration of retrofit and channel rehabilitation and improvement opportunities, as identified in Provision 5.a.2.(c)

(c) Retrofit

Each Copermittee must develop a strategy to facilitate the implementation of retrofit projects. Existing development in high priority areas should be assessed for inclusion in the retrofit plan. Retrofit plans should focus on

pollutants and areas identified as high priority within the Water Quality Improvement Plans, with the highest priority projects included in the Water Quality Improvement Plans.

(i) Retrofit projects may be prioritized based on their relative benefit to water quality, feasibility, cost effectiveness, and community acceptance.
(ii) Retrofit projects in the highest priority areas should be included in the review for the Water Quality Improvement Plan to provide additional pollutant removal from storm water discharges.

(d) Channel Rehabilitation and Improvement

Each Copermittee must develop a strategy to facilitate the implementation of channel rehabilitation and improvement projects. Existing channels in high priority areas should be assessed for inclusion in the channel rehabilitation and improvement plan. Channel rehabilitation and improvement plans should focus on pollutants and areas identified as high priority within the Water Quality Improvement Plans.

(i) Channel rehabilitation and improvement projects may be selected to address hydromodification, restore wetland and riparian habitat, or to address other water quality issues prioritized in the Water Quality Improvement Plan.

(ii) Channel rehabilitation and improvement projects may be prioritized based on their relative benefit to water quality, feasibility, cost effectiveness, and community acceptance.

(iii) Channel rehabilitation and improvement projects in the highest priority areas should be included in the review for the Water Quality Improvement Plan to provide additional pollutant removal from storm water discharges.

(4) Inspection Requirements:

(a) Inspection Frequency

(i) Each Copermittee must establish appropriate inspection frequencies for inventoried industrial, commercial, and municipal sources based on the potential for discharging pollutants via storm water and non-storm water discharges, and should reflect the priorities set forth in the Water Quality Improvement Plan.

(ii) Each Copermittee must conduct inspections annually with a level of effort equivalent to 20% of their industrial, commercial, and

municipal inventory combined[18]. If facilities require multiple inspections during any given year, those additional inspections may count towards this total.

(iii) Inventoried existing development must be inspected, as needed, in response to valid public complaints and findings from the Copermittee's municipal and contract staff inspections.

(iv) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e. education and outreach, re-inspection, enforcement) as necessary to confirm compliance in accordance with its enforcement response plan pursuant to Provision E.6.

(b) Inspection Content

Inspections of industrial, commercial, and municipal facilities by the Copermittee may include the following:

(i) Industrial, commercial, and municipal facilities name and location (address and hydrologic subarea);

(ii) Inspection and re-inspection date(s);

(iii) Assessment of compliance with its applicable local ordinances and permits related to non-storm water and storm water discharges and runoff;

(iv) Assessment of BMPs implementation;

(v) Verification of coverage under the Industrial General Permit (NOI and/or WDID number), when applicable;

(vi) Visual observations of actual non-storm water discharges, if present;

(vii) Visual observations of actual or potential discharge of pollutants, if present; and

(viii) Visual observations of actual or potential illicit connections, if present.

[18] Excludes linear facilities (MS4 and roads).

(c) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried industrial, commercial, and municipal facilities. The Copermittee must maintain all inspection records in an electronic database or tabular format, either in paper or electronic inspection records files, which must be made available to the San Diego Water Board upon request.

Inspection records must include the information necessary to effectively manage and implement the industrial, commercial, and municipal facilities inspection program, as described in each Copermittee's jurisdictional runoff management plan

b. Residential Sources

(1) Source Identification and Prioritization:

An inventory of residential sources within each Copermittees jurisdiction must be developed as follows:

(a) Designation of Residential Management Areas

Each Copermittee must divide areas of residential development into Residential Management Areas. Residential Management Areas may be designated by one or more of the following: Hydrologic Sub Area, land use (e.g. single family, multi family, rural, Common Interest Areas, ~~or~~ Home Owner Associations), and/or residential target audiences, and/or other accepted methods to be included in each Copermittee-approved jurisdictional runoff management plan.

(b) Prioritization of Residential Management Areas

Copermittees must prioritize Residential Management Areas for the purposes of ~~prioritizing and~~ directing their residential programs. Prioritization must consider whether the Residential Management Area contributes or potentially contributes to the highest water quality priorities identified in the Water Quality Improvement Plan, and consideration of other program information or information from other relevant programs:

(c) A regularly updated map must be developed showing the locations of the highest priority inventoried Residential Management Areas, watershed boundaries, and water bodies at or near them.

(2) BMP Implementation and Maintenance

(a) Designate BMPs

Each Copermittee must designate and ~~require~~ encourage the implementation of a minimum set of BMPs for all residential sources or residential target audiences with the reasonable potential to discharge significant pollutant loads from their MS4.The designated minimum BMPs must be source-specific, and must address each of the following as appropriate.

(i) Pollution Prevention

Each Copermittee must promote the use of pollution prevention methods, where appropriate.

(ii) BMP Operation and Maintenance

Each Copermittee must designate ~~operate~~ and ~~maintain, or~~ require the operation and maintenance of designated BMPs for residential sources within its jurisdiction.

(iii) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must designate ~~require~~ and encourage, as appropriate, the implementation of practices to reduce discharges of pollutants associated with the application, storage, and disposal of pesticides, herbicides and fertilizers at residential sources within its jurisdiction.

(3) Measures to Address Highest Water Quality Priorities

Each Copermittee must designate ~~conduct~~ or require measures as necessary to address residential sources or residential target audiences ~~areas~~ that discharge pollutants identified as contributing to the highest water quality priorities in the Water Quality Improvement Plan. These measures must be identified as applicable in each WQIP strategy, and may include any of the following:

(a) Copermittee Program Activities

Each Copermittee may make modifications to its program activities (e.g. increased or focused education, inspections, etc.) to address residential sources that discharge pollutants identified as contributing to the highest water quality priorities in the Water Quality Improvement Plan.

(b) Additional Control Measures

Each Copermittee may require additional pollution prevention and control measures at sources that discharge pollutants identified as contributing to

the highest water quality priorities in the Water Quality Improvement Plan.

(c) Retrofit

Each Copermittee must encourage through education or other means the implementation of retrofit projects at residential sources or areas.

(4) Residential Management Area Oversight:

(a) Residential Area Assessment

Each Copermittee must conduct representative evaluations (e.g. visual observations, water use analysis, and other historical data) of its high priority ~~prioritized~~ Residential Management Areas as defined in the Water Quality Improvement Plan to update implementation strategies. Each Copermittee must develop a program to facilitate oversight and assessment in residential areas. Oversight may include complaint investigation, IDDE Activities, follow-up on monitoring obdervations, visual observations, outreach and education, water use analysis, or other methods deemed necessary to facilitate BMP implementation. Each Copermittee should conduct assessment of its oversight activities in prioritized residential areas to inform any updates to the WQIP.

~~Residential Program Update~~

~~Within two years, each Copermittee must develop and submit for Regional Board approval an updated residential program strategy based on assessment findings. Until Copermittees implement an updated residential program, they must continue performing their existing programs.~~

(b) Follow up Actions

Each Copermittee must prioritize ~~and implement~~ its follow up actions and enforcement (e.g. education and outreach, re-assessment~~, enforcement~~) in accordance with its Enforcement Response Plan pursuant to Provision E.6.

(c) ~~Assessment Tracking and~~ Record-keeping~~s~~

~~Assessment r~~Records must be ~~tracked and~~ sufficiently detailed in order to determine compliance with the requirements of this Order and any progress made toward the modification of residential management strategies, or addressing the highest water quality priorities identified in the Water Quality Improvement Plan.

~~1) The following municipal facilities:~~

~~(a) Flood management and flood control devices and structures,~~

~~(b) Operating or closed municipal landfills,~~

~~(c) Publicly owned treatment works (including water and wastewater treatment plants) and sanitary sewer collection systems,~~

~~(d) Corporate yards, including maintenance and storage yards for materials, waste, equipment, and vehicles,~~

~~(e) Hazardous waste collection facilities, and~~

~~(f) Other treatment, storage or disposal facilities for municipal waste;~~

~~2) Identification if a business is a mobile business;~~

~~3) SIC Code, if applicable;~~

~~4) Industrial General Permit NOI and/or WDID number, if applicable;~~

~~5) Identification if an area is a Common Interest Area (CIA) / Home Owner Association (HOA), or mobile home park;~~

~~6) Identification of pollutants generated and potentially generated by the facility, area, and/or activity;~~

~~7) Status of facility, area, and/or activity as active or inactive;~~

~~8) Whether the facility, area, and/or activity is adjacent to an ESA;~~

~~9) Whether the facility, area, and/or activity is tributary to and within the same hydrologic subarea as a CWA section 303(d) water body segment and generates pollutants for which the water body segment is impaired;~~

~~10) Whether the facility, area, and/or activity contributes or potentially contributes to the highest water quality priorities identified in the Water Quality Improvement Plan; and~~

~~11) A continually updated map showing the location of inventoried existing development, watershed boundaries, water bodies, and pollutants generated at the inventoried existing development.~~
~~Retrofitting and Channel Rehabilitation in Areas of Existing Development~~

~~Each Copermittee must develop and implement a program to retrofit areas of existing development to reduce the discharge of pollutants in storm water from the MS4 to the MEP and effectively prohibit non-storm water discharges into its MS4, and rehabilitate channels to restore impaired beneficial uses of streams within its jurisdiction.~~

~~(1) Each Copermittee must identify areas of existing development as candidates for retrofitting, and channels in areas of existing development as candidates for rehabilitation within its jurisdiction. Areas of existing development must be selected based on a likelihood that retrofitting and channel rehabilitation will address the highest water quality priorities identified in the Water Quality Improvement Plan prepared pursuant to Provision B.~~

~~(2) Each Copermittee must evaluate and rank the areas of existing development identified pursuant to Provisions E.5.a and E.5.b.(1) for retrofitting and channel rehabilitation. The evaluation must include an assessment of those areas where pollutant removal from storm water and effective prohibition of non-storm water discharges through retrofitting existing development will provide the most benefit to water quality. The evaluation must also include an assessment of the channels within its jurisdiction where channel rehabilitation will improve beneficial uses of streams within the Copermittee's jurisdiction. Data collected during the implementation of the Water Quality Improvement Plan must be used to inform each area assessment and rank determination.~~

~~(3) Each Copermittee must implement retrofit and channel rehabilitation projects that address the highest water quality priorities identified in the Water Quality Improvement Plan pursuant to Provision B.3.a. The Copermittee must encourage private landowners to implement retrofit and channel rehabilitation projects whenever practical. Private landowners should be~~

~~encouraged through the Copermittee's use of subsidies, penalties, or other incentives.~~

~~(4) Each Copermittee must evaluate the flood management and flood control devices and structures in its inventory to determine if it is feasible to retrofit the device or structure, to provide additional pollutant removal from storm water. A Copermittee must consider the highest water quality priorities identified in their Water Quality Improvement Plan as part of each assessment.~~

~~(5) Where retrofitting and channel rehabilitation within specific areas of existing development are determined to be infeasible to restore and protect receiving waters from the highest water quality priorities identified in the Water Quality Improvement Plan, each Copermittee must identify, develop, and implement regional retrofitting and channel rehabilitation projects (i.e. projects that can receive and/or treat storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment) adjacent to and/or downstream of the areas of existing development. The Copermittees may collaborate and cooperate with each other to develop regional retrofitting and channel rehabilitation projects. The Copermittees are also encouraged to partner with existing efforts in other Watershed Management Areas, and the Integrated Regional Water Management (IRWM) Groups in San Diego County, South Orange County, and Southwest Riverside County.~~

~~Existing Development BMP Implementation and Maintenance~~

~~**1)** Pollution Prevention~~

~~Each Copermittee must require the use of pollution prevention methods by the inventoried existing development.~~

~~**2)** Designate BMPs~~

~~Each Copermittee must designate a minimum set of BMPs required for all inventoried existing development, including special event venues, that have the potential to generate pollutants. The designated minimum BMPs must be specific to facility types and pollutant-generating activities, as appropriate.~~

~~**3)** BMP Implementation~~

~~Each Copermittee must implement, or require the implementation of, designated BMPs at inventoried existing development that have the potential to generate pollutants. A Copermittee must require additional pollution prevention measures and enhanced BMPs at inventoried existing development that discharges pollutants identified as contributing to the highest water quality priorities in the Water Quality Improvement Plan.~~

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~~**4)** BMP Operation and Maintenance~~

~~Each Copermittee must operate and maintain, or require the operation and maintenance of designated BMPs at all inventoried existing development.~~

~~(b) Each Copermittee must implement a schedule of operation and maintenance activities for its MS4 and related structures (including but not limited to catch basins, storm drain inlets, detention basins, etc.), and verify proper operation of all its municipal structural treatment controls designed to reduce pollutants (including floatables) in storm water discharges to or from its MS4s and related drainage structures.~~

~~(c) Each Copermittee must implement procedures during the operation and maintenance of public streets, unpaved roads, paved roads, and paved highways and freeways that will reduce the contribution of storm water pollutants to the MEP and effectively prohibit non-storm water pollutants from the MS4 to receiving water bodies. During maintenance of unpaved roads, each Copermittee must examine the feasibility of replacing existing culverts or designing new culverts/bridge crossings to maintain natural stream geomorphology.~~

~~(d) Each Copermittee must implement controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers. Copermittees that operate both a municipal sanitary sewer system and a MS4 must implement controls and measures to prevent and eliminate seeping sewage from infiltrating the MS4. Copermittees that do not operate both a municipal sanitary sewer system and a MS4 must keep themselves informed of relevant and appropriate maintenance activities and sanitary sewage projects in their jurisdiction that may cause or contribute to seepage of sewage into the MS4.~~

~~**5)** Pesticides, Herbicides, and Fertilizers BMPs~~

~~Each Copermittee must implement procedures, or require the implementation of procedures, to reduce the contribution of pollutants in storm water to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from inventoried existing development into and from the MS4s. The Copermittee must require additional pollution prevention measures and enhanced BMPs at inventoried existing development that discharges pesticides, herbicides, or fertilizers identified as contributing to the highest water quality priorities in the Water Quality Improvement Plan. Such BMPs must include, as appropriate educational activities, permits, certifications and other measures for applicators and distributors.~~

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~~Existing Development Inspections~~

~~Each Copermittee must conduct inspections of inventoried existing development to ensure compliance with applicable local ordinances and permits, and the requirements of this Order.~~

~~(1) Inspection Frequency~~

~~(a) Each Copermittee must establish appropriate inspection frequencies for inventoried existing development based on the priorities set forth in the Water Quality Improvement Plan, and the potential for discharging pollutants via storm water and non-storm water runoff. At a minimum, inventoried existing development must be inspected once every five years. Inventoried existing development must also be inspected within six months of any change in property ownership or change in pollutant generating activity. The frequency of inspection at inventoried existing development must be appropriate to ensure that applied BMPs are sufficient to reduce the discharge of pollutants in storm water from the MS4 to the MEP and effectively prohibit non-storm water discharges to the MS4.~~

~~(b) Inventoried existing development must be inspected, as needed, in response to valid public complaints and findings from the Copermittee's municipal and contract staff inspections.~~

~~(c) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e. re-inspection, enforcement) necessary to ensure compliance with its applicable local ordinances and permits, the most current jurisdictional runoff management program document, the Water Quality Improvement Plan, and the requirements of this Order.~~

~~(2) Inspection Content~~

~~Inspections of existing development by the Copermittee must include, at a minimum:~~

~~(a) Assessment of compliance with its applicable local ordinances and permits related to non-storm water and storm water discharges and runoff;~~

~~(b) Assessment of the implementation, maintenance and effectiveness of the designated minimum and/or enhanced BMPs;~~

~~(c) Verification of coverage under the Industrial General Permit (NOI and/or WDID number), when applicable;~~

~~(d) Visual observations of actual non-storm water discharges;~~

~~(e) Visual observations of actual or potential discharge of pollutants;~~

~~(f) Visual observations of actual or potential illicit connections; and~~

~~(g) If any violations are found and BMP enhancements are needed, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.~~

~~(3) Inspection Tracking and Records~~

~~Each Copermittee must track all inspections and re-inspections at all inventoried existing development. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must be sufficiently detailed in order to determine compliance with the~~

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~~requirements of this Order and any progress made towards addressing the highest water quality priorities identified in the Water Quality Improvement Plan. Inspection records must include, at a minimum:~~

~~(a) Existing development name and location (address and hydrologic subarea);~~

~~(b) Inspection and re-inspection date(s);~~

~~(c) Weather conditions during inspection;~~

~~(d) Description and photo documentation of problems observed with BMPs and indication of need for BMP addition/repair/replacement and any scheduled re-inspection, and date of re-inspection;~~

~~(e) Description of actions to reduce pollutants in storm water runoff to the MEP and actions to effectively prohibit non-storm discharges into the MS4 at the inventoried existing development;~~

~~(f) Photo documentation of observed actions or BMPs to reduce pollutants in storm water runoff to the MEP and actions to effectively prohibit non-storm discharges into the storm drain;~~

~~(g) If the facility, area, and/or activity has been designated or identified as a contributor to the highest water quality priorities identified in the Water Quality Improvement Plan, then the inspection report must include a description of any specific or additional actions taken to reduce or eliminate the contribution of the facility, area, and/or activity to the highest water quality priorities;~~

~~(h) Descriptions of any other specific inspection comments which must, at a minimum, include rationales for longer compliance time;~~

~~(i) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and~~

~~(j) Resolution of problems noted and date problems fixed.~~

c. Existing Development Enforcement

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried existing development identified by the Copermittee as having the reasonable potential to discharge pollutant loads from the MS4 within their jurisdiction, ~~as necessary, to achieve compliance with the requirements of this Order,~~ in accordance with its Enforcement Response Plan pursuant to Provision E.6.

6. Enforcement Response Plans

Each Copermittee must develop and implement an Enforcement Response Plan as part of its jurisdictional runoff management program document. The Enforcement Response Plan must ~~include the protocols for progressively stricter responses, including timeframes allowed for corrections of problems, and for~~

~~various field violation scenarios~~describe the applicable protocols and options for enforcing compliance with the provisions of this Order. The Enforcement Response Plan must include ~~, at a minimum,~~ the following ~~requirements~~:

a. ENFORCEMENT RESPONSE PLAN COMPONENTS

The Enforcement Response Plans shall include the following individual components:

(1) The Illicit Discharge Detection and Elimination Enforcement Components provided in Provision E.2;

(2) The Development Planning Enforcement Component provided in Provision E.3;

(3) The Construction Management Enforcement Component provided in Provision E.4; and

(4) The Existing Development Management Enforcement Component provided in Provision E.5.

Existing enforcement plans or procedures may be used to partially or wholly satisfy the requirements of any Enforcement Response Plan component.

b. ENFORCEMENT APPROACHES AND OPTIONS

Each Enforcement Response Plan component must describe the Copermittee's approach to correcting noncompliance with its permits, applicable local ordinances, and this Order. It must describe protocols for progressively stricter responses, including, as applicable, timeframes allowed to bring areas or facilities into compliance. The enforcement process must include appropriate sanctions to compel compliance, such as:

(1) Verbal and written notices of violation;

(2) Cleanup requirements;

(3) Fines

(4) Bonding requirements;

(5) Administrative and criminal (if intentional or criminally negligent) penalties;

(6) Liens;

(7) Stop work orders; and

(8) Permit and occupancy denials.

c. CORRECTION OF VIOLATIONS

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(1) Violations must be corrected in a timely manner with the goal of correcting them within 30 calendar days after the violations are discovered, and prior to the next predicted rain event, when possible.

(2) If more than 30 calendar days are required for compliance, then a rationale must be recorded in the applicable electronic database or tabular system used to track compliance.

d. ESCALATED ENFORCEMENT PRIORITIES

(1) Each Enforcement Response Plan must include a definition of "escalated enforcement priorities". Escalated enforcement priorities shall be defined to include any enforcement scenario where a violation or other non-compliance is determined to constitute a significant contribution to any of the highest water quality priorities identified in the Water Quality Improvement Plan. Escalated enforcement priorities may be defined differently for development planning; construction sites; commercial, industrial, and municipal sources; and residential management areas.

(2) Where a violation involving a pollutant or stressor that has been identified as a highest water quality priority is not determined to represent an escalated enforcement priority, a rationale must be recorded in the applicable electronic database or tabular system used to track compliance.

(3) Escalated enforcement actions must continue to increase in severity, as necessary, to compel compliance as soon as possible.

~~**a. Illicit Discharge Detection and Elimination Enforcement Component**~~

~~The Enforcement Response Plan must describe required enforcement actions to eliminate non-storm water discharges and illicit discharges or connections to the Copermittee's MS4.~~

~~(1) The Enforcement Response Plan must include a definition of "high level enforcement" for non-storm water discharges and illicit discharges or connections. "High level enforcement" for non-storm water discharges and illicit discharges or connections may be defined differently for construction sites, municipal, commercial, industrial, and residential areas of existing development.~~

~~(2) Non-storm water discharges and illicit discharges or connections must be addressed with an escalating series of enforcement actions as follows:~~

~~(a) If the non-storm water discharge and illicit discharge or connection is a source of pollutants contributing to the highest water quality priorities identified in the Water Quality Improvement Plan, then high level enforcement actions must be immediately issued, and subsequent high~~

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~~level enforcement actions must continue to escalate, as necessary, to compel the elimination of the discharge or connection as soon as possible; or~~

~~(b) If the non-storm water discharge and illicit discharge or connection is not a source of pollutants contributing to the highest water quality priorities identified in the Water Quality Improvement Plan, then escalating enforcement actions must be issued, and enforcement actions must result in the elimination of the discharge or connection as quickly as the Copermittee's available resources allow.~~

~~(3) If the Copermittee identifies the source, and the source is a controllable non-storm water discharge (i.e. anthropogenically influenced) or a controllable illicit discharge or connection, then the Copermittee must implement the following:~~

~~(a) Immediately enforce its legal authority to eliminate controllable sources of non-storm water and illicit discharges or connections upon identifying the source; and~~

~~(b) For controllable sources of non-storm water discharges and illicit discharges or connections that cannot be eliminated immediately upon identification, the discharge or connection must be eliminated in a timely manner with the goal of eliminating the discharge or connection within 10 business days after the source is identified. If more than 10 business days are required to eliminate the discharge or connection, a rationale must be recorded in the electronic database or equivalent tabular system used to track the investigations of non-storm water and illicit discharges and connections.~~

~~(4) If the Copermittee identifies the source as a non-storm water discharge to or from the MS4 that is in exceedance of NALs developed pursuant to Provision C.1, and in violation or threatened violation of an existing separate NPDES permit (e.g. the groundwater dewatering NPDES permit), then the Copermittee must report, within three business days, the findings to the San Diego Water Board including all pertinent information regarding the discharger and discharge characteristics.~~

~~**b.** Development Projects Enforcement Component~~

~~The Enforcement Response Plan must describe required enforcement actions to compel compliance with the Copermittee's BMP Design Manual requirements for development projects.~~

~~(1) The Enforcement Response Plan must include a definition of "high level enforcement" for development projects.~~

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~~(2) The enforcement process must include appropriate sanctions to compel compliance with requirements of the Copermittee's BMP Design Manual or this Order. Sanctions must include, at a minimum, the following tools or their equivalent:~~

~~(a) Non-monetary penalties;~~

~~(b) Fines;~~

~~(c) Bonding requirements;~~

~~(d) Administrative and criminal penalties;~~

~~(e) Liens; and~~

~~(f) Permit or occupancy denials.~~

~~(3) Occupancy must be denied until a development project is in full compliance with the Copermittee's BMP Design Manual requirements. Documentation of full compliance with the Copermittee's BMP Design Manual requirements must be recorded in the electronic database or equivalent tabular system used to track development projects.~~

~~(4) Violations or other non-compliance that contribute or potentially contribute to the highest water quality priorities identified in the Water Quality Improvement Plan must be issued high level enforcement actions. High level enforcement actions must continue to escalate, as necessary, to compel compliance as soon as possible.~~

~~(5) For violations of permanent BMP maintenance requirements, all violations must be corrected in a timely manner with the goal of correcting them before the next rain event but no longer than 10 business days after the violations are discovered. If more than 10 business days are required for compliance, a rationale must be recorded in the electronic database or equivalent tabular system used to track permanent BMP inspections.~~

~~**a.** Construction / Existing Development Enforcement Component~~

~~The Enforcement Response Plan must describe required enforcement actions to compel compliance with its permits and applicable local ordinances, and the requirements of this Order, at construction sites and areas of existing development.~~

~~(1) The Enforcement Response Plan must include a definition of "high level enforcement" for construction sites and areas of existing development. "High level enforcement" may be defined differently for construction sites, municipal,~~

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~~commercial, industrial, and residential areas of existing development.~~

~~(2) The enforcement process must include, at a minimum, appropriate sanctions to compel compliance, such as:~~

~~(a) Verbal and written notices of violation;~~

~~(b) Cleanup requirements;~~

~~(c) Fines;~~

~~(d) Bonding requirements;~~

~~(e) Administrative and criminal penalties;~~

~~(f) Liens;~~

~~(g) Stop work orders; and~~

~~(h) Permit and occupancy denials.~~

~~(3) Violations or other non-compliance that contribute or potentially contribute to the highest water quality priorities identified in the Water Quality Improvement Plan must be issued high level enforcement actions. High level enforcement actions must continue to escalate, as necessary, to compel compliance as soon as possible.~~

~~(4) All violations must be corrected in a timely manner with the goal of correcting them before the next rain event but no longer than 10 business days after the violations are discovered. If more than 10 business days are required for compliance, then a rationale must be recorded in the electronic database or equivalent tabular system used to track construction site and existing development inspections.~~

e. REPORTING OF NON-COMPLIANT SITES

(1) Each Copermittee must notify the San Diego Water Board verbally within 24 hours and in writing within ~~48 hours~~ 5 calendar days of issuing ~~high level~~escalated enforcement (as defined in the Copermittee's Enforcement Response Plan) to a construction site that poses a significant threat to water quality as a result of violations or other non-compliance with its permits and applicable local ordinances, and the requirements of this Order. Written notification may be provided electronically in email form.

(2) Each Copermittee must notify the San Diego Water Board of non-filers under the Industrial General Permit and Construction General Permit by email to Nonfilers_R9@waterboards.ca.gov.

~~6.~~7. Public Education and Participation

a. Each Copermittee must implement a public education and participation program, as appropriate, to promote and encourage the development of programs, management practices, control techniques and systems, design and engineering methods, and behaviors that reduce the discharge of pollutants in storm water to the MEP, prevent controllable non-storm water discharges from entering the MS4, and protect water quality standards in receiving waters. The public education program must include ~~, at a minimum,~~ the following:

(1) Educational activities, public information activities, and other appropriate outreach activities intended to reduce pollutants ~~associated with the application of pesticides, herbicides and fertilizer in storm water discharges to and~~of concern from its MS4 to the MEP. Activities shall be determined and prioritized by Copermittees by jurisdiction and/or watershed (Section 5.c.(5) to address the highest threats to water quality (e.g. pesticides, herbicides and fertilizers, used oil, toxic waste, etc.);

~~(1) Educational activities, public information activities, and other appropriate outreach activities to facilitate the proper management and disposal of used oil and toxic materials; and~~

(2) Appropriate education and training measures for ~~construction site operators and other~~ specific target audiences, as determined and prioritized by the Copermittee(s) by jurisdiction and watershed, based on high risk behaviors and pollutants of concern, such as construction site operators, residents, underserved target audiences and school-aged children.

b. ~~.~~Each Copermittee shall incorporate a mechanism for evaluation and assessment of educational and other outreach activities, as needed, to identify progress and incorporate modifications necessary to increase the effectiveness of the public education program.

c. Each Copermittee may determine, where appropriate and effective, mechanisms for intergovernmental coordination on education and outreach activities.~~must incorporate a mechanism for public participation and where necessary intergovernmental coordination in updating, developing, and implementing its jurisdictional runoff management program.~~

~~7.~~8. Fiscal Analysis

a. Each Copermittee must secure the resources necessary to meet all the requirements of this Order.

b. Each Copermittee must conduct an annual fiscal analysis of their jurisdictional runoff management programs in their entirety. The fiscal analysis must include the following:

(1) Identification of the various categories of expenditures necessary to implement the requirements of this Order, including a description of the specific items to be accounted for in each category of expenditures;
~~(1) The capital and operation and maintenance expenditures necessary to implement the requirements of this Order;~~

(2) The staff resources needed and allocated to meet the requirements of this Order, including any development, implementation, and enforcement activities required;

(3) The fiscal analysis must provide estimated expenditures for Provisions E.8.b.(1) and E.8.b.(2) for each Copermittee's jurisdictional runoff management program budget for the current reporting period.~~during the reporting period, the preceding reporting period, and the next reporting period; and~~

(4) The source(s) of funds that are proposed to meet the necessary expenditures described in Provisions E.8.b.(1) and E.8.b.(2), including legal restrictions on the use of such funds.

c. Each Copermittee must submit a summary of the annual fiscal analysis with each Annual Report required pursuant to Provision F.3.b.

d. Each Copermittee must provide the documentation used to develop the summary of the annual fiscal analysis upon request by the San Diego Water Board.

F. REPORTING

The purpose of this provision is to determine and document compliance with the requirements set forth in this Order. The goal of this provision is to communicate to the San Diego Water Board and the people of the State of California the implementation status of each jurisdictional runoff management program and compliance with the requirements of this Order. This goal is to be accomplished through the submittal of specific deliverables to the San Diego Water Board by the Copermittees.

1. Water Quality Improvement Plans

The Copermittees for each Watershed Management Area must develop and submit a complete Water Quality Improvement Plan in accordance with the requirements of Provision B, no later than ~~12~~ 18 months after the adoption of this Order for a 30 day public review and comment period. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of 30 days. Based on the comments received, the San Diego Water Board will determine whether to hold a public hearing or to limit public input to submittal of written comments. If no hearing is held the San Diego Water Board will notify the Copermittees that the Water Quality Improvement Plan has been accepted as complete following its review and determination that the Water Quality Improvement Plan meets the requirements of this Order Water Quality Improvement Plans are deemed approved if no response is provided to the Copermittees within 2 months of the submittal date. Water Quality Improvement Plans must be made available on the Regional Clearinghouse required pursuant to Provision F.4.

a. WATER QUALITY IMPROVEMENT PLAN SUBMITTAL AND IMPLEMENTATION

Copermittees must submit requested modifications to the Water Quality Improvement Plan either in the Annual Report required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge (ROWD) required pursuant to Provision F.5.b. Once approved by the San Diego Water Board Executive Officer, the Copermittees must implement any modifications to the Water Quality Improvement Plan in accordance with the schedules developed pursuant to Provisions B.2 and B.3.b. Requests for modification are deemed approved if no response is provided to the requesting Copermittee(s) within 2 months of the request date.

b. CORRESPONDING MODIFICATIONS TO JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS AND MONITORING AND ASSESSMENT PROGRAMS

Copermittees must submit requested modifications to the jurisdictional runoff management programs and monitoring and assessment programs either in the Annual Report required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge (ROWD) required pursuant to Provision F.5.b. Once approved by the San Diego Water Board Executive Officer, the Copermittees must implement any modifications to the Water Quality Improvement Plan in

accordance with the schedules developed pursuant to Provisions B.3.b. Requests for modification are deemed approved if no response is provided to the requesting Copermittee(s) within 2 months of the request date.

2. Updates

a. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATES

Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E. The update must be completed no later than ~~12~~18 months after the adoption of this Order. Updated jurisdictional runoff management program documents must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Subsequent updates may be submitted as part of the Annual Reports, and updated jurisdictional runoff management program documents must be made available on the Regional Clearinghouse.

Jurisdictional Runoff Management Program document updates that modify program elements from the requirements of Provision E must provide rationale for the modifications within the update documents.

b. ~~PERMANENT~~ BMP ~~SIZING CRITERIA~~ DESIGN MANUAL UPDATES

Each Copermittee must update its BMP Design Manual to incorporate the requirements of Provision E.3.d. The update must be completed no later than 18~~12~~ months after the adoption of this Order. Updated BMP Design Manuals must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Subsequent updates may be submitted as part of the Annual Reports. Updated BMP Design Manuals must be made available on the Regional Clearinghouse.

BMP Design Manual updates that modify program elements from the requirements of Provision E must provide rationale for the modifications within the update documents.

c. WATER QUALITY IMPROVEMENT PLAN UPDATES

The Copermittees for each Watershed Management Area must submit updates to the Water Quality Improvement Plan as part of the Annual Reports. Updated Water Quality Improvement Plans must be made available on the Regional Clearinghouse required pursuant to Provision F.4.

Water Quality Improvement Plan updates that modify program elements from the requirements of Provision E must provide rationale for the modifications within the update documents.

~~5.~~3. Progress Reporting

a. Progress Report Presentations

The Copermittees for each Watershed Management Area must appear before the San Diego Water Board, as requested by the San Diego Water Board, to provide progress reports on the implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs.

b. Annual Reports

(1) The Copermittees for each Watershed Management Area must submit an Annual Report for each reporting period, which begins July 1 and ends June ~~-~~30 in the following year, no later than ~~October~~ January 31 of the following year~~the end of the reporting period~~. This is to accommodate the monitoring year from October 1, to September 30 of the subsequent year. The first Annual Report must be prepared for the reporting period beginning ~~from~~July 1 after adoption of the ~~date the~~permit, and upon San Diego Water Board ~~determines~~determination that the Water Quality Improvement Plan meets the requirements of this Order to June 30 in the following year. Annual Reports must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Each Annual Report must include the following:

(a) The progress of implementing the Water Quality Improvement Plan including, but not limited to:

:

(i) The progress toward achieving the interim and final numeric ~~targets~~goals for the highest water quality priorities for the Watershed Management Area,

(ii) The water quality improvement strategies that were implemented and/or no longer implemented by each of the Copermittees during the reporting period and previous reporting periods, and are planned to be implemented during the next reporting period,

(iii) Proposed modifications to water quality improvement or jurisdictional strategies with associated rationale for such modifications,

(iv) Previously proposed modifications or updates incorporated into the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document and implemented by the Copermittees in the Watershed Management Area,

[a] The monitoring data collected pursuant to Provision D,

summarized and presented in tabular and graphical form;

[b] Progress of the special studies required pursuant to Provision D, and the results or findings when a special study, or each phase of a special study, is completed;

[c] The findings from the assessments required pursuant to Provision D; and

~~[a] and~~

(v) Proposed modifications or updates to the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document;

(b) A completed Jurisdictional Runoff Management Program Annual Report Form (Attachment D or approved revision) for each Copermittee in the Watershed Management Area, certified by a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative.

(2) Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (Attachment D or approved revision) no later than October 31 of each year until the first Annual Report is required to be submitted. Each Copermittee's Annual Report form must summarize the jurisdictional activities in the WMAs in which the Copermittee has jurisdiction.

(3) Each Copermittee must provide any data or documentation utilized in developing the Annual Report upon request by the San Diego Water Board. Any monitoring data utilized in developing the Annual Report must be uploaded to the California Environmental Data Exchange Network (CEDEN).[19] Any monitoring and assessment data utilized in developing the Annual Report must be provided on the Regional Clearinghouse required pursuant to Provision F.4.

C. Regional Monitoring and Assessment Report

(1) The Copermittees must submit a Regional Monitoring and Assessment Report no later than 180 days in advance of the expiration date of this Order. The Regional Monitoring and Assessment Report may be submitted as part of the ROWD required pursuant to Provision F.5.b. The Copermittees must review the jurisdictional and watershed monitoring data, data analyses, and assessments required pursuant to Provision D.4, to assess the following:

[19] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

Copermittee Draft Draft

(a) The beneficial uses of the receiving waters within the San Diego Region that are protected or must be restored;

(b) The progress toward restoring impacted beneficial uses in the receiving waters within the San Diego Region; and

~~(c)~~ The Copermittees for each Watershed Management Area must submit an Annual ~~The jurisdictional and watershed monitoring data collected pursuant to Provisions D.1 and D.2, summarized and presented in tabular and graphical form;~~

~~(d)~~

~~(e) Progress of the special studies required pursuant to Provisions D.2 and D.3, and the results or findings when a special study, or each phase of a special study, is completed;~~

~~(f)~~

~~(g) The findings from the assessments required pursuant to Provision D.4;~~

~~(h)~~

~~(i)~~(c) The progress of implementing the Water Quality Improvement Plan, including, but not limited to, the following

(d) Pollutants or conditions of emerging concern that may impact beneficial uses in the receiving waters within the San Diego Region.

(2) The Regional Monitoring and Assessment Report must include recommendations for improving the implementation and assessment of the Water Quality Improvement Plans and jurisdictional runoff management programs.

(3) Each Copermittee must provide any data or documentation utilized in developing the Regional Monitoring and Assessment Report upon request by the San Diego Water Board. Any monitoring and assessment data utilized in developing the Regional Monitoring and Assessment Report must be provided on the Regional Clearinghouse required pursuant to Provision F.4.

4. Regional Clearinghouse

The Copermittees[20]23 must develop, update, and maintain an internet-based Regional Clearinghouse that can be used to store, disseminate, and share the Copermittees' Water Quality Improvement Plans, Annual Reports, jurisdictional runoff management program documents, monitoring data, special studies, and any other data or information generated by the Copermittees during the implementation

[20] The Copermittee may elect to develop and maintain the clearinghouse(s) provided by other Copermittees or agencies.

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of this Order. Monitoring data collected pursuant to Provision D must be uploaded to CEDEN,[21] with links to the uploaded data available on the Regional Clearinghouse. The Regional Clearinghouse may be linked to other internet-based data portals and databases where the original documents and data are stored. The Regional Clearinghouse must be available and accessible to members of the public. The Regional Clearinghouse must be developed and made available to the public no later than 18~~2~~ months after the adoption of this Order.

5. Report of Waste Discharge

a. The Orange County Copermittees and the Riverside County Copermittees, are required to submit a complete ROWD pursuant to the requirements of their current Orders and are enrolled under this Order upon expiration of their current Orders. Upon expiration of their current Orders, the Copermittees in each county must comply with the requirements of this Order by July 1 after enrollment under this Order, unless early enrollment is granted pursuant to Provision F.6 of this Order. The current Orders for the Orange County Copermittees and Riverside County Copermittees are rescinded upon their expiration date except for enforcement purposes.

b. The Copermittees must submit to the San Diego Water Board a complete ROWD as an application for the re-issuance of this NPDES permit. The ROWD must be submitted no later than 180 days in advance of the expiration date of this Order. The Copermittee may elect to develop and submit the in conjunction with or provided by another Copermittee. The ROWD must contain the following minimum information:

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[21] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

(1) Names and addresses of the Copermittees;

(2) Names and titles of the primary contacts of the Copermittees;

(3) Proposed changes to the Copermittees' Water Quality Improvement Plans and the supporting justification;

(4) Proposed changes to the Copermittees' jurisdictional runoff management programs and the supporting justification;

(5) Any other information necessary for the re-issuance of this Order; and

(6) Any other information required by federal regulations for NPDES permit reissuance.

6. Application for Early Enrollment

a. The Orange County Copermittees, collectively, or Riverside County Copermittees, collectively, may apply for early enrollment under this Order by submitting a Report of Waste Discharge Form 200 for each individual Copermittee in the respective county, with a written request for early enrollment under this Order that certifies the following conditions have been met:

(1) A Water Quality Improvement Plan has been developed in accordance with the requirements of Provision B, which can and will be implemented immediately upon enrollment under this Order;

(2) Each Copermittee in the county has updated its jurisdictional runoff management program document to incorporate the requirements of Provision E, which can and will be implemented immediately upon enrollment under this Order; and

(3) Each Copermittee in the county has updated its BMP Design Manual to incorporate the requirements of Provision E.3.d, which can and will be implemented immediately upon enrollment under this Order.

b. The San Diego Water Board will review the application for early enrollment and associated documents for completeness. A Notice of Enrollment (NOE) under this Order will be issued to the Copermittees in the respective county by the San Diego Water Board upon completion of the early enrollment application requirements. The effective enrollment date will be specified in the NOE and the Copermittees in the respective county are authorized to have MS4 discharges pursuant to the requirements of this Order starting on the date specified in the NOE. The existing Order for that county is rescinded upon the effective enrollment date specified in the NOE except for enforcement purposes.

7. Reporting Provisions

Each Copermittee must comply with all the reporting and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

G. PRINCIPAL WATERSHED COPERMITTEE RESPONSIBILITIES

1. The Copermittees within each Watershed Management Area must designate a Principal Watershed Copermittee and notify the San Diego Water Board of the name of the Principal Watershed Copermittee. ~~An individual Copermittee should not be designated a Principal Watershed Copermittee for more than two Watershed Management Areas.~~ The notification may be submitted with the Water Quality Improvement Plan required pursuant to Provision F.1 of this Order.

2. The Principal Watershed Copermittee is responsible for, at a minimum, the following:

a. Serving as liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues, and when necessary and appropriate, representing the Copermittees in the Watershed Management Area before the San Diego Water Board.

b. Facilitating the development of the Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order

c. Coordinating the submittal of the deliverables required by Provisions F.1, F.2, F.3.a, and F.3.b of this Order.

d. Coordinating and developing, with the other ~~Principal Watershed~~ Copermittees, the requirements of Provisions F.3.c, F.4, and F.5.~~bbb~~ of this Order.

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H. MODIFICATION OF PROGRAMS

1. Modifications of the Order may be initiated by the San Diego Water Board or by the Copermittees. Requests by Copermittees must be made to the San Diego Water Board.

2. Minor modifications to the Order may be made by the San Diego Water Board where the proposed modification complies with all the prohibitions and limitations, and other requirements of this Order.

3. Proposed modifications outside of the WQIP process that are not minor require amendment of this Order in accordance with this Order's rules, policies, and procedures.

I. STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

Each Copermittee must comply with all the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

ADMINISTRATIVE DRAFT

ATTACHMENT A

DISCHARGE PROHIBITIONS

1. Basin Plan Waste Discharge Prohibitions

California Water Code Section 13243 provides that a Regional Water Board, in a water quality control plan, may specify certain conditions or areas where the discharge of waste or certain types of waste is not permitted. The following waste discharge prohibitions in the Water Quality Control Plan for the San Diego Basin (Basin Plan) are applicable to any person, as defined by Section 13050(c) of the California Water Code, who is a citizen, domiciliary, or political agency or entity of California whose activities in California could affect the quality of waters of the state within the boundaries of the San Diego Region.

1. The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in California Water Code Section 13050, is prohibited.

2. The discharge of waste to land, except as authorized by waste discharge requirements or the terms described in California Water Code Section 13264 is prohibited.

3. The discharge of pollutants or dredged or fill material to waters of the United States except as authorized by a National Pollutant Discharge Elimination System (NPDES) permit or a dredged or fill material permit (subject to the exemption described in California Water Code Section 13376) is prohibited.

4. Discharges of recycled water to lakes or reservoirs used for municipal water supply or to inland surface water tributaries thereto are prohibited, unless this San Diego Water Board issues a NPDES permit authorizing such a discharge; the proposed discharge has been approved by the State Department of Health Services (DHS) and the operating agency of the impacted reservoir; and the discharger has an approved fail-safe long-term disposal alternative.

5. The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the San Diego Water Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

6. The discharge of waste in a manner causing flow, ponding, or surfacing on lands not owned or under the control of the discharger is prohibited, unless the discharge is authorized by the San Diego Water Board.

7. The dumping, deposition, or discharge of waste directly into waters of the state, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the San Diego Water Board.

8. Any discharge to a storm water conveyance system that is not composed entirely of "*storm water*" is prohibited unless authorized by the San Diego Water Board. [The federal regulations, 40 CFR 122.26(b)(13), define storm water as storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from fire fighting activities.] [§122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

9. The unauthorized discharge of treated or untreated sewage to waters of the state or to a storm water conveyance system is prohibited.

10. The discharge of industrial wastes to conventional septic tank/subsurface disposal systems, except as authorized by the terms described in California Water Code Section 13264, is prohibited.

11. The discharge of radioactive wastes amenable to alternative methods of disposal into the waters of the state is prohibited.

12. The discharge of any radiological, chemical, or biological warfare agent into waters of the state is prohibited.

13. The discharge of waste into a natural or excavated site below historic water levels is prohibited unless the discharge is authorized by the San Diego Water Board.

14. The discharge of sand, silt, clay, or other earthen materials from any activity, including land grading and construction, in quantities which cause deleterious bottom deposits, turbidity or discoloration in waters of the state or which unreasonably affect, or threaten to affect, beneficial uses of such waters is prohibited.

15. The discharge of treated or untreated sewage from vessels to Mission Bay, Oceanside Harbor, Dana Point Harbor, or other small boat harbors is prohibited.

16. The discharge of untreated sewage from vessels to San Diego Bay is prohibited.

17. The discharge of treated sewage from vessels to portions of San Diego Bay that are less than 30 feet deep at mean lower low water (MLLW) is prohibited.

18. The discharge of treated sewage from vessels, which do not have a properly functioning ~~US~~ U.S. Coast Guard certified Type I or Type II marine sanitation device, to portions of San Diego Bay that are greater than 30 feet deep at mean lower low water (MLLW) is prohibited.

2. Attachment B to State Water Board Resolution 2012-0012~~X~~

Copermittees that discharge into Areas of Special Biological Significance must comply with State Water Board Resolution No. 2012-0012.

~~**Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges**~~

~~I. PROVISIONS FOR POINT SOURCE DISCHARGES OF STORM WATER AND NONPOINT SOURCE WASTE DISCHARGES~~

~~The following terms, prohibitions, and special conditions (hereafter collectively referred to as special conditions) are established as limitations on point source storm water and nonpoint source discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in Areas of Special Biological Significance (ASBS), as required for State Water Quality Protection Areas pursuant to California Public Resources Code Sections 36700(f) and 36710(f). These Special Protections are adopted by the State Water Board as part of the California Ocean Plan (Ocean Plan) General Exception.~~

~~The special conditions are organized by category of discharge. The State Water Resources Control Board (State Water Board) and Regional Water Quality Control Boards (Regional Water Boards) will determine categories and the means of regulation for those categories [e.g., Point Source Storm Water National Pollutant Discharge Elimination System (NPDES) or Nonpoint Source].~~

~~**A. PERMITTED POINT SOURCE DISCHARGES OF STORM WATER**~~

~~1. General Provisions for Permitted Point Source Discharges of Storm Water~~

~~a. Existing storm water discharges into an ASBS are allowed only under the following conditions:~~

~~(1) The discharges are authorized by an NPDES permit issued by the State Water Board or Regional Water Board;~~

~~(2) The discharges comply with all of the applicable terms, prohibitions, and special conditions contained in these Special Protections; and~~

~~(3) The discharges:~~

~~(i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;~~

~~(ii) Are designed to prevent soil erosion;~~

~~(iii) Occur only during wet weather;~~

~~(iv) Are composed of only storm water runoff.~~

~~b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.~~

c. The discharge of trash is prohibited.

d. Only discharges from existing storm water outfalls are allowed. Any proposed or new storm water runoff discharge shall be routed to existing storm water discharge outfalls and shall not result in any new contribution of waste to an ASBS (i.e., no additional pollutant loading). "Existing storm water outfalls" are those that were constructed or under construction prior to January 1, 2005. "New contribution of waste" is defined as any addition of waste beyond what would have occurred as of January 1, 2005. A change to an existing storm water outfall, in terms of re-location or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges are prohibited except as provided below:

(1) The term "non-storm water discharges" means any waste discharges from a municipal separate storm sewer system (MS4) or other NPDES permitted storm drain system to an ASBS that are not composed entirely of storm water.

(2) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability or occur naturally:

(i) Discharges associated with emergency fire fighting operations.

(ii) Foundation and footing drains.

(iii) Water from crawl space or basement pumps.

(iv) Hillside dewatering.

(v) Naturally occurring groundwater seepage via a storm drain.

(vi) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

2. Compliance Plans for Inclusion in Storm Water Management Plans (SWMP) and Storm Water Pollution Prevention Plans (SWPPP).

The discharger shall specifically address the prohibition of non-storm water runoff and the requirement to maintain natural water quality for storm water discharges to an ASBS in an ASBS Compliance Plan to be included in its SWMP or a SWPPP, as appropriate to permit type. If a statewide permit includes a SWMP, then the discharger shall prepare a stand-alone compliance plan for ASBS discharges . The ASBS Compliance Plan is subject to approval by the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (for permits issued by Regional Water Boards).

a. The Compliance Plan shall include a map of surface drainage of storm water runoff, showing areas of sheet runoff, prioritize discharges, and describe any structural Best

~~Management Practices (BMPs) already employed and/or BMPs to be employed in the future. Priority discharges are those that pose the greatest water quality threat and which are identified to require installation of structural BMPs. The map shall also show the storm water conveyances in relation to other features such as service areas, sewage conveyances and treatment facilities, landslides, areas prone to erosion, and waste and hazardous material storage areas, if applicable. The SWMP or SWPPP shall also include a procedure for updating the map and plan when changes are made to the storm water conveyance facilities.~~

~~b. The ASBS Compliance Plan shall describe the measures by which all non-authorized non-storm water runoff (e.g., dry weather flows) has been eliminated, how these measures will be maintained over time, and how these measures are monitored and documented.~~

~~c. For Municipal Separate Storm Sewer System (MS4s), the ASBS Compliance Plan shall require minimum inspection frequencies as follows:~~

~~(1) The minimum inspection frequency for construction sites shall be weekly during rainy season;~~

~~(2) The minimum inspection frequency for industrial facilities shall be monthly during the rainy season;~~

~~(3) The minimum inspection frequency for commercial facilities (e.g., restaurants) shall be twice during the rainy season; and~~

~~(4) Storm water outfall drains equal to or greater than 18 inches (457 mm) in diameter or width shall be inspected once prior to the beginning of the rainy season and once during the rainy season and maintained to remove trash and other anthropogenic debris.~~

~~d. The ASBS Compliance Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff, that are necessary to comply with these special conditions, will be achieved through BMPs. Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that such installation would pose a threat to health or safety. BMPs to control storm water runoff discharges (at the end-of-pipe) during a design storm shall be designed to achieve on average the following target levels:~~

~~(1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or~~

~~(2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges. The baseline for the reduction is the effective date of the Exception. The baseline for these determinations is the effective date of the Exception, and the reductions must be achieved and documented within four (4) years of the effective date.~~

~~e. The ASBS Compliance Plan shall address erosion control and the prevention of anthropogenic sedimentation in ASBS. The natural habitat conditions in the ASBS shall not be altered as a result of anthropogenic sedimentation.~~

~~f. The ASBS Compliance Plan shall describe the non-structural BMPs currently employed and planned in the future (including those for construction activities), and include an implementation schedule. The ASBS Compliance Plan shall include non-structural BMPs that address public education and outreach. Education and outreach efforts must adequately inform the public that direct discharges of pollutants from private property not entering an MS4 are prohibited. The ASBS Compliance Plan shall also describe the structural BMPs, including any low impact development (LID) measures, currently employed and planned for higher threat discharges and include an implementation schedule. To control storm water runoff discharges (at the end-of-pipe) during a design storm, permittees must first consider using LID practices to infiltrate, use, or evapotranspirate storm water runoff on-site.~~

~~g. The BMPs and implementation schedule shall be designed to ensure that natural water quality conditions in the receiving water are achieved and maintained by either reducing flows from impervious surfaces or reducing pollutant loading, or some combination thereof.~~

~~h. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and Regional Water Board within 30 days of receiving the results.~~

~~(1) The report shall identify the constituents in storm water runoff that alter natural ocean water quality and the sources of these constituents.~~

~~(2) The report shall describe BMPs that are currently being implemented, BMPs that are identified in the SWMP or SWPPP for future implementation, and any additional BMPs that may be added to the SWMP or SWPPP to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the BMPs.~~

~~(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits), the discharger shall revise its ASBS Compliance Plan to incorporate any new or modified BMPs that have been or will be implemented, the implementation schedule, and any additional monitoring required.~~

~~(4) As long as the discharger has complied with the procedures described above and is implementing the revised SWMP or SWPPP, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural ocean water quality conditions due to the same constituent.~~

~~(5) Compliance with this section does not excuse violations of any term, prohibition, or condition contained in these Special Protections.~~

~~3. Compliance Schedule~~

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within one year from the effective date of the Exception, the discharger shall submit a written ASBS Compliance Plan to the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that describes its strategy to comply with these special conditions, including the requirement to maintain natural water quality in the affected ASBS. The ASBS Compliance Plan shall include a time schedule to implement appropriate non-structural and structural controls (implementation schedule) to comply with these special conditions for inclusion in the discharger's SWMP or SWPPP, as appropriate to permit type.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these special conditions shall be implemented.

d. Within four (4) years of the effective date of the Exception, any structural controls identified in the ASBS Compliance Plan that are necessary to comply with these special conditions shall be operational.

e. Within four (4) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water, pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data, and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

(1) for municipalities, a demonstration of significant hardship to discharger ratepayers, by showing the relationship of storm water fees to annual household income for

residents within the discharger's jurisdictional area, and the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or

(2) for other governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process.

B. NONPOINT SOURCE DISCHARGES

[NOT INCLUDED]
[PROVISIONS FOR NONPOINT SOURCE DISCHARGES NOT APPLICABLE]

II. ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES

[NOT INCLUDED]
[ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES NOT APPLICABLE]

III. ADDITIONAL REQUIREMENTS – WATERFRONT AND MARINE OPERATIONS

[NOT INCLUDED]
[ADDITIONAL REQUIREMENTS FOR WATERFRONT AND MARINE OPERATIONS NOT APPLICABLE]

IV. MONITORING REQUIREMENTS

Monitoring is mandatory for all dischargers to assure compliance with the Ocean Plan. Monitoring requirements include both: (A) core discharge monitoring, and (B) ocean receiving water monitoring. The State and Regional Water Boards must approve sampling site locations and any adjustments to the monitoring programs. All ocean receiving water and reference area monitoring must be comparable with the Water Boards' Surface Water Ambient Monitoring Program (SWAMP).

Safety concerns: Sample locations and sampling periods must be determined considering safety issues. Sampling may be postponed upon notification to the State and Regional Water Boards if hazardous conditions prevail.

Analytical Chemistry Methods: All constituents must be analyzed using the lowest minimum detection limits comparable to the Ocean Plan water quality objectives. For metal analysis, all samples, including storm water effluent, reference samples, and ocean receiving water samples, must be analyzed by the approved analytical method with the lowest minimum detection limits (currently Inductively Coupled Plasma/Mass Spectrometry) described in the Ocean Plan.

A. CORE DISCHARGE MONITORING PROGRAM

1. General sampling requirements for timing and storm size:

~~Runoff must be collected during a storm event that is greater than 0.1 inch and generates runoff, and at least 72 hours from the previously measurable storm event. Runoff samples shall be collected when post-storm receiving water is sampled, and analyzed for the same constituents as receiving water and reference site samples (see section IV B) as described below.~~

~~2. Runoff flow measurements~~

~~a. For municipal/industrial storm water outfalls in existence as of December 31, 2007, 18 inches (457mm) or greater in diameter/width (including multiple outfall pipes in combination having a width of 18 inches, runoff flows must be measured or calculated, using a method acceptable to and approved by the State and Regional Water Boards.~~
~~b. This will be reported annually for each precipitation season to the State and Regional Water Boards.~~

~~3. Runoff samples – storm events~~

~~a. For outfalls equal to or greater than 18 inches (0.46m) in diameter or width:~~

~~(1) samples of storm water runoff shall be analyzed during the same storm as receiving water samples for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination, ; and~~

~~(2) samples of storm water runoff shall be analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS~~

~~(3) If an applicant has no outfall greater than 36 inches, then storm water runoff from the applicant's largest outfall shall be further analyzed during the same storm as receiving water samples for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates).~~

~~b. For outfalls equal to or greater than 36 inches (0.91m) in diameter or width:~~

~~(1) samples of storm water runoff shall be analyzed during the same storm as receiving water samples for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and~~

~~(2) samples of storm water runoff shall be further analyzed during the same storm as receiving water samples for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates) and~~

~~(3) samples of storm water runoff shall be analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.~~

c. For an applicant not participating in a regional monitoring program [see below in Section IV (B)] in addition to (a.) and (b.) above, a minimum of the two largest outfalls or 20 percent of the larger outfalls, whichever is greater, shall be sampled (flow weighted composite samples) at least three times annually during wet weather (storm event) and analyzed for all Ocean Plan Table A constituents, Table B constituents for marine aquatic life protection (except for toxicity, only chronic toxicity for three species shall be required), DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, and Ocean Plan indicator bacteria. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one (the largest) such discharge shall be sampled annually in each Region.

4. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may reduce or suspend core monitoring once the storm runoff is fully characterized. This determination may be made at any point after the discharge is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

B. OCEAN RECEIVING WATER AND REFERENCE AREA MONITORING PROGRAM

In addition to performing the Core Discharge Monitoring Program in Section II.A above, all applicants having authorized discharges must perform ocean receiving water monitoring. In order to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS, dischargers may choose either (1) an individual monitoring program, or (2) participation in a regional integrated monitoring program.

1. Individual Monitoring Program: The requirements listed below are for those dischargers who elect to perform an individual monitoring program to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within the affected ASBS. In addition to Core Discharge Monitoring, the following additional monitoring requirements shall be met:

   a. Three times annually, during wet weather (storm events), the receiving water at the point of discharge from the outfalls described in section (IV)(A)(3)(c) above shall be sampled and analyzed for Ocean Plan Table A constituents, Table B constituents for marine aquatic life, DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, salinity, chronic toxicity (three species), and Ocean Plan indicator bacteria.

      The sample location for the ocean receiving water shall be in the surf zone at the point of discharges; this must be at the same location where storm water runoff is sampled. Receiving water shall be sampled at approximately the same time prior to (pre-storm) and during (or immediately after) the same storm (post storm). Reference water quality shall also be sampled and analyzed for the same constituents pre-storm and post-storm, during the same storms when receiving water is sampled. Reference stations will be determined by the State Water Board's Division of Water Quality and the applicable Regional Water Board(s).

   b. Sediment sampling shall occur at least three times during every five (5) year period. The subtidal sediment (sand or finer, if present) at the discharge shall be sampled and analyzed for Ocean Plan Table B constituents for marine aquatic life, DDT, PCBs, PAHs,

pyrethroids, and OP pesticides. For sediment toxicity testing, only an acute toxicity test using the amphipod Eohaustorius estuarius must be performed.

c. A quantitative survey of intertidal benthic marine life shall be performed at the discharge and at a reference site. The survey shall be performed at least once every five (5) year period. The survey design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The results of the survey shall be completed and submitted to the State Water Board and Regional Water Board at least six months prior to the end of the permit cycle.

d. Once during each five (5) year period, a bioaccumulation study shall be conducted to determine the concentrations of metals and synthetic organic pollutants at representative discharge sites and at representative reference sites. The study design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The bioaccumulation study may include California mussels (Mytilus californianus) and/or sand crabs (Emerita analoga or Blepharipoda occidentalis). Based on the study results, the Regional Water Board and the State Water Board's Division of Water Quality, may adjust the study design in subsequent permits, or add or modify additional test organisms (such as shore crabs or fish), or modify the study design appropriate for the area and best available sensitive measures of contaminant exposure.

e. Marine Debris: Representative quantitative observations for trash by type and source shall be performed along the coast of the ASBS within the influence of the discharger's outfalls. The design, including locations and frequency, of the marine debris observations is subject to approval by the Regional Water Board and State Water Board's Division of Water Quality.

f. The monitoring requirements of the Individual Monitoring Program in this section are minimum requirements. After a minimum of one (1) year of continuous water quality monitoring of the discharges and ocean receiving waters, the Executive Director of the State Water Board (statewide permits) or Executive officer of the Regional Water Board (Regional Water Board permits) may require additional monitoring, or adjust, reduce or suspend receiving water and reference station monitoring. This determination may be made at any point after the discharge and receiving water is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

2. Regional Integrated Monitoring Program: Dischargers may elect to participate in a regional integrated monitoring program, in lieu of an individual monitoring program, to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS. This regional approach shall characterize natural water quality, pre- and post-storm, in ocean reference areas near the mouths of identified open space watersheds and the effects of the discharges on natural water quality (physical, chemical, and toxicity) in the ASBS receiving waters, and should include benthic marine aquatic life and bioaccumulation components. The design of the ASBS stratum of a regional integrated monitoring program may deviate from the otherwise prescribed individual monitoring approach (in Section IV.B.1) if approved by the State Water Board's Division of Water Quality and the Regional Water Boards.

a. Ocean reference areas shall be located at the drainages of flowing watersheds with minimal development (in no instance more than 10% development), and shall not be located in CWA Section 303(d) listed waterbodies or have tributaries that are 303(d)

~~listed. Reference areas shall be free of wastewater discharges and anthropogenic non-storm water runoff. A minimum of low threat storm runoff discharges (e.g. stream highway overpasses and campgrounds) may be allowed on a case-by-case basis. Reference areas shall be located in the same region as the ASBS receiving water monitoring occurs. The reference areas for each Region are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean reference water samples must be collected from each station, each from a separate storm. A minimum of one reference location shall be sampled for each ASBS receiving water site sampled per responsible party. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.~~

~~b. ASBS ocean receiving water must be sampled in the surf zone at the location where the runoff makes contact with ocean water (i.e. at "point zero"). Ocean receiving water stations must be representative of worst-case discharge conditions (i.e. co-located at a large drain greater than 36 inches, or if drains greater than 36 inches are not present in the ASBS then the largest drain greater than18 inches.) Ocean receiving water stations are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean receiving water samples must be collected during each storm season from each station, each from a separate storm. A minimum of one receiving water location shall be sampled in each ASBS per responsible party in that ASBS. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.~~

~~c. Reference and receiving water sampling shall commence during the first full storm season following the adoption of these special conditions, and post-storm samples shall be collected when annual storm water runoff is sampled. Sampling shall occur in a minimum of two storm seasons. For those ASBS dischargers that have already participated in the Southern California Bight 2008 ASBS regional monitoring effort, sampling may be limited to only one storm season.~~

~~d. Receiving water and reference samples shall be analyzed for the same constituents as storm water runoff samples. At a minimum, constituents to be sampled and analyzed in reference and discharge receiving waters must include oil and grease, total suspended solids, Ocean Plan Table B metals for protection of marine life, Ocean Plan PAHs, pyrethroids, OP pesticides, ammonia, nitrate, phosphates, and critical life stage chronic toxicity for three species. In addition, within the range of the southern sea otter, indicator bacteria or some other measure of fecal contamination shall be analyzed.~~

~~3. Waterfront and Marine Operations: In addition to the above requirements for ocean receiving water monitoring, additional monitoring must be performed for marinas and boat launch and pier facilities:~~

~~a. For all marina or mooring field operators, in mooring fields with 10 or more occupied moorings, the ocean receiving water must be sampled for Ocean Plan indicator bacteria, residual chlorine, copper, zinc, grease and oil, methylene blue active substances (MBAS), and ammonia nitrogen.~~

~~(1) For mooring field operators opting for an individual monitoring program (Section IV.B.1 above), this sampling must occur weekly (on the weekend) from May through October.~~

~~(2) For mooring field operators opting to participate in a regional integrated monitoring program (Section IV.B.2 above), this sampling must occur monthly from May through October on a high use weekend in each month. The Water Boards may allow a reduction in the frequency of sampling, through the regional monitoring program, after the first year of monitoring.~~

~~b. For all mooring field operators, the subtidal sediment (sand or finer, if present) within mooring fields and below piers shall be sampled and analyzed for Ocean Plan Table B metals (for marine aquatic life beneficial use), acute toxicity, PAHs, and tributyltin. For sediment toxicity testing, only an acute toxicity test using the amphipod Eohaustorius estuarius must be performed. This sampling shall occur at least three times during a five (5) year period. For mooring field operators opting to participate in a regional integrated monitoring program, the Water Boards may allow a reduction in the frequency of sampling after the first sampling effort's results are assessed.~~

ADMINISTRATIVE DRAFT

ATTACHMENT B

STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

1. Standard Permit Provisions

Code of Federal Regulations Title 40 Section 122.41 (40 CFR 122.41) includes conditions, or provisions, that apply to all National Pollutant Discharge Elimination System (NPDES) permits. Additional provisions applicable to NPDES permits are in 40 CFR 122.42. All applicable provisions in 40 CFR 122.41 and 40 CFR 122.42 must be incorporated into this Order and NPDES permit. The applicable 40 CFR 122.41 and 40 CFR 122.42 provisions are as follows:

a. DUTY TO COMPLY [40 CFR 122.41(a)]

The Copermittee must comply with all of the provisions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

(1) The Copermittee must comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement. [40 CFR 122.41(a)(1)]

(2) The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to a civil penalty not to exceed $25,000 per day for each violation. The CWA provides that any person who *negligently* violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than 2 years, or both. Any person who *knowingly* violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both. Any person who knowingly violates Section 301, 302, 303, 306, 307, 308, 318 or 405 of the CWA, or any

permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, and who knows at that time that he thereby places another person in imminent danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.
[40 CFR 122.41(a)(2)]

(3) Any person may be assessed an administrative penalty by the San Diego Regional Water Quality Control Board (San Diego Water Board), State Water Resources Control Board (State Water Board), or United States Environmental Protection Agency (USEPA) for violating Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.
[40 CFR 122.41(a)(3)]

b. DUTY TO REAPPLY [40 CFR 122.41(B)]

If a Copermittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Copermittee must apply for and obtain a new permit.

c. NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE [40 CFR 122.41(C)]

It shall not be a defense for a Copermittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

d. DUTY TO MITIGATE [40 CFR 122.41(D)]

The Copermittee must take all reasonable steps to minimize or prevent any discharge or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

e. PROPER OPERATION AND MAINTENANCE [40 CFR 122.41(E)]

The Copermittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Copermittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and

appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by a Copermittee only when the operation is necessary to achieve compliance with the conditions of this permit.

f. PERMIT ACTIONS [40 CFR 122.41(F)]

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Copermittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

g. PROPERTY RIGHTS [40 CFR 122.41(G)]

This permit does not convey any property rights of any sort, or any exclusive privilege.

h. DUTY TO PROVIDE INFORMATION [40 CFR 122.41(H)]

The Copermittee must furnish to the San Diego Water Board, State Water Board, or USEPA within a reasonable time, any information which the San Diego Water Board, State Water Board, or USPEA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Copermittee must also furnish to the San Diego Water Board, State Water Board, or USPEA upon request, copies of records required to be kept by this permit.

i. INSPECTION AND ENTRY [40 CFR 122.41(I)]

The Copermittee must allow the San Diego Water Board, State Water Board, USEPA, and/or their authorized representative (including an authorized contractor acting as their representative), upon presentation of credentials and other documents as may be required by law, to:

(1) Enter upon the Copermittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit; [40 CFR 122.41(i)(1)]

(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit; [40 CFR 122.41(i)(2)]

(3) Inspect and photograph at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; [40 CFR 122.41(i)(3)] and

(4) Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location. [40 CFR 122.41(i)(4)]

j. MONITORING AND RECORDS [40 CFR 122.41(J)]

(1) Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity. [40 CFR 122.41(j)(1)]

(2) Except for records of monitoring information required by this permit related to the Copermittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five (5) years (or longer as required by 40 CFR Part 503), the Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time. [40 CFR 122.41(j)(2)]

(3) Records for monitoring information must include: [40 CFR 122.41(j)(3)]

(a) The date, exact place, and time of sampling or measurements; [40 CFR 122.41(j)(3)(i)]
(b) The individual(s) who performed the sampling or measurements; [40 CFR 122.41(j)(3)(ii)]
(c) The date(s) analyses were performed; [40 CFR 122.41(j)(3)(iii)]
(d) The individual(s) who performed the analyses; [40 CFR 122.41(j)(3)(iv)]
(e) The analytical techniques or methods used; [40 CFR 122.41(j)(3)(v)] and
(f) The results of such analyses. [40 CFR 122.41(j)(3)(vi)]

(4) Monitoring must be conducted according to test procedures under 40 CFR Part 136 unless another method is required under 40 CFR Subchapters N or O.
[40 CFR 122.41(j)(4)]

In the case of pollutants for which there are no approved methods under 40 CFR Part 136 or otherwise required under 40 CFR Subchapters N and O, monitoring must be conducted according to a test procedure specified in the permit for such pollutants. [40 CFR 122.44(i)(1)(iv)]

(5) The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. [40 CFR 122.41(j)(5)]

k. SIGNATORY REQUIREMENT [40 CFR 122.41(K)]

(1) All applications, reports, or information submitted to the San Diego Water Board, State Water Board, or USEPA must be signed and certified. (See 40 CFR 122.22) [40 CFR 122.41(k)(1)]

(a) *For a municipality, State, Federal, or other public agency.* [All applications must be signed] [b]y either a principal executive officer or ranking elected official. [40 CFR 122.22(a)(3)]

(b) All reports required by permits, and other information requested by the San Diego Water Board, State Water Board, or USEPA must be signed by a person described in paragraph (a) of this section, or by a duly authorized representative of that person. A person is a duly authorized representative only if: [40 CFR 122.22(b)]

(i) The authorization is made in writing by a person described in paragraph (a) of this section; [40 CFR 122.22(b)(1)]
(ii) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company, (A duly authorized representative may thus be either a named individual or any individual occupying a named position.)
[40 CFR 122.22(b)(2)] and,
(iii) The written authorization is submitted to the San Diego Water Board and State Water Board. [40 CFR 122.22(b)(3)]

(c) *Changes to authorization.* If an authorization under paragraph (b) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (b) of this section must be submitted to the San Diego Water Board prior to or together with any reports, information, or applications to be signed by an authorized representative. [40 CFR 122.22(c)]

(d) *Certification.* Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." [40 CFR 122.22(d)]

(2) The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both. [40 CFR 122.41(k)(2)]

I. REPORTING REQUIREMENTS [40 CFR 122.41(L)]

(1) *Planned changes.* The Copermittee must give notice to the San Diego Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when: [40 CFR 122.41(l)(1)]

(a) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b);
[40 CFR 122.41(l)(1)(i)] or

(b) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1).
[40 CFR 122.41(l)(1)(ii)]

(c) The alteration or addition results in a significant change in the Copermittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. [40 CFR 122.41(l)(1)(iii)]

(2) Anticipated noncompliance. The Copermittee must give advance notice to the San Diego Water Board or State Water Board of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.
[40 CFR 122.41(l)(2)]

(3) *Transfers*. This permit is not transferable to any person except after notice to the San Diego Water Board. The San Diego Water Board may require modification or revocation and reissuance of the permit to change the name of the Copermittee and incorporate such other requirements as may be necessary under the CWA.
[40 CFR 122.41(l)(3)]

(4) Monitoring reports. Monitoring results must be reported at the intervals specified elsewhere in this permit. [40 CFR 122.41(l)(4)]

(a) Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the San Diego Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices. [40 CFR 122.41(l)(4)(i)]

(b) If the Copermittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or another method required for an industry-specific waste stream under 40 CFR Subchapters N or O, the results of this monitoring must be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the San Diego Water Board or State Water Board. [40 CFR 122.41(l)(4)(ii)]

(c) Calculations for all limitations which require averaging of measurements must utilize an arithmetic mean unless otherwise specified in the permit. [40 CFR 122.41(l)(4)(iii)]

(5) *Compliance schedules*. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date. [40 CFR 122.41(l)(5)]

(6) Twenty-four hour reporting.

(a) The Copermittee must report any noncompliance that may endanger health or the environment. Any information must be provided orally within 24 hours from the time the Copermittee becomes aware of the circumstances. A written submission must also be provided within five (5) days of the time the Copermittee becomes aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6)(i)]

(b) The following must be included as information which must be reported within 24 hours under this paragraph: [40 CFR 122.41(l)(6)(ii)]

(i) Any unanticipated bypass that exceeds any effluent limitation in the permit (See 40 CFR 122.41(g)). [40 CFR 122.41(l)(6)(ii)(A)]
(ii) Any upset which exceeds any effluent limitation in the permit. [40 CFR 122.41(l)(6)(ii)(B)] and,
(iii) Violation of a maximum daily discharge limitation for any of the pollutants listed by the San Diego Water Board in the permit to be reported within 24

hours. (See 40 CFR 122.44(g))
[40 CFR 122.41(l)(6)(ii)(C)]

(c) The San Diego Water Board may waive the above-required written report on a case-by-case basis if the oral report has been received within 24 hours. [40 CFR 122.41(l)(6)(iii)]

(7) *Other noncompliance.* The Copermittee must report all instances of noncompliance not reported in accordance with the standard provisions required under 40 CFR 122.41(l)(4), (5), and (6), at the time monitoring reports are submitted. The reports must contain the information listed in the standard provisions required under 40 CFR 122.41(l)(6). [40 CFR 122.41(l)(7))]

(8) *Other information.* When the Copermittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the San Diego Water Board, State Water Board, or USEPA, the Copermittee must promptly submit such facts or information.
[40 CFR 122.41(l)(8)]

~~**a. BYPASS** [40 CFR 122.41(m)]~~

~~(1) *Definitions.*~~

~~(a) "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. [40 CFR 122.41(m)(1)(i)] or~~

~~(b) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.~~
~~[40 CFR 122.41(m)(1)(ii)]~~

~~(2) *Bypass not exceeding limitations*. The Copermittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the standard provisions required under 40 CFR 122.41(m)(3) and (4).~~
~~[40 CFR 122.41(m)(2)]~~

~~(3) *Notice.*~~

~~(a) *Anticipated bypass*. If the Copermittee knows in advance of the need for a bypass, it must submit a notice, if possible at least ten days before the date of the bypass. [40 CFR 122.41(m)(3)(i)] or~~

~~(b) *Unanticipated bypass*. The Copermittee must submit notice of an unanticipated bypass in accordance with the standard provisions required under 40 CFR 122.41(l)(6) (24-hour notice).~~
~~[40 CFR 122.41(m)(3)(ii)]~~

~~(4) *Prohibition of Bypass.*~~

~~(a) Bypass is prohibited, and the San Diego Water Board may take enforcement action against a Copermittee for bypass, unless:~~
~~[40 CFR 122.41(m)(4)(i)]~~

~~(i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; [40 CFR 122.41(m)(4)(i)(A)]~~
~~(ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance;~~
~~[40 CFR 122.41(m)(4)(i)(B)] and,~~
~~(iii) The Copermittee submitted notice in accordance with the standard provisions required under 40 CFR 122.41(m)(3).~~
~~[40 CFR 122.41(m)(4)(i)(C)]~~

~~(b) The San Diego Water Board may approve an anticipated bypass, after considering its adverse effects, if the San Diego Water Board determines that it will meet the three conditions listed above.~~
~~[40 CFR 122.41(m)(4)(ii)]~~

m. UPSET [40 CFR 122.41(N)]

(1) *Definition.* "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Copermittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. [40 CFR 122.41(n)(1)]

(2) *Effect of an upset*. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the standard provisions required under 40 CFR 122.41(n)(3) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. [40 CFR 122.41(n)(2)]

(3) *Conditions necessary for a demonstration of upset*. A Copermittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:
[40 CFR 122.41(n)(3)]

(a) An upset occurred and that the Copermittee can identify the cause(s) of the upset; [40 CFR 122.41(n)(3)(i)]
(b) The permitted facility was at the time being properly operated; [40 CFR 122.41(n)(3)(ii)] and
(c) The Copermittee submitted notice of the upset in accordance with the standard provisions required under 40 CFR 122.41(l)(6)(ii)(B) (24-hour notice). [40 CFR 122.41(n)(3)(iii)]
(d) The Copermittee complied with any remedial measures pursuant to the standard provisions required under 40 CFR 122.41(d). [40 CFR 122.41(n)(3)(iii)]

(4) *Burden of proof*. In any enforcement proceeding, the Copermittee seeking to establish the occurrence of an upset has the burden of proof. [40 CFR 122.41(n)(4)]

n. STANDARD PERMIT PROVISIONS FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS [40 CFR 122.42(c)]

The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the San Diego Water Board or State Water Board under 40 CFR 122.26(a)(1)(v) must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report must include:

(1) The status of implementing the components of the storm water management program that are established as permit conditions; [40 CFR 122.42(c)(1)]

(2) Proposed changes to the storm water management programs that are established as permit conditions. Such proposed changes must be consistent with 40 CFR 122.26(d)(2)(iii); [40 CFR 122.42(c)(2)] and

(3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under 40 CFR 122.26(d)(2)(iv) and (v); [40 CFR 122.42(c)(3)]

(4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; [40 CFR 122.42(c)(4)]

(5) Annual expenditures and budget for year following each annual report; [40 CFR 122.42(c)(5)]

(6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; [40 CFR 122.42(c)(6)]

(7) Identification of water quality improvements or degradation. [40 CFR 122.42(c)(7)]

o. STANDARD PERMIT PROVISIONS FOR STORM WATER DISCHARGES [40 CFR 122.42(D)]

The initial permits for discharges composed entirely of storm water issued pursuant to 40 CFR 122.26(e)(7) must require compliance with the conditions of the permit as expeditiously as practicable, but in no event later than three years after the date of issuance of the permit.

2. General Provisions

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. The general provisions applicable to this Order and NPDES permit are as follows:

a. DISCHARGE OF WASTE IS A PRIVILEGE

No discharge of waste into the waters of the State, whether or not such discharge is made pursuant to waste discharge requirements, shall create a vested right to continue such discharge. All discharges of waste into waters of the State are privileges, not rights. [CWC Section 13263(g)]

b. DURATION OF ORDER AND NPDES PERMIT

(1) *Effective date*. This Order and NPDES permit becomes effective on the date of its adoption provided the USEPA has no objection. If the USEPA objects to its issuance, this Order shall not become effective until such objection is withdrawn. This Order supersedes Order No. R9-2007-0001 upon the effective date of this Order, and supercedes Order Nos. R9-2009-0002 and R9-2010-0016 upon their expiration.

(2) *Expiration*. This Order and NPDES permit expires five years after adoption. [40 CFR 122.46(a)]

(3) *Continuation of expired order*. After this Order and NPDES permit expires, the terms and conditions of this Order and NPDES permit are automatically continued pending issuance of a new permit if all requirements of the federal NPDES regulations on the continuation of expired permits (40 CFR 122.6) are complied with.

c. AVAILABILITY

A copy of this Order must be kept at a readily accessible location and must be available to on-site personnel at all times.

d. CONFIDENTIALITY OF INFORMATION

Except as provided for in 40 CFR 122.7, no information or documents submitted in accordance with or in application for this Order will be considered confidential, and all such information and documents shall be available for review by the public at the San Diego Water Board office.

Claims of confidentiality for the following information will be denied: [40 CFR 122.7(b)]

(1) The name and address of any permit applicant or Copermittee; [40 CFR 122.7(b)(1)] and

(2) Permit applications and attachments, permits, and effluent data. [40 CFR 122.7(b)(2)]

e. EFFLUENT LIMITATIONS

(1) *Interim effluent limitations*. The Copermittee must comply with any interim effluent limitations as established by addendum, enforcement action, or revised waste discharge requirements which have been, or may be, adopted by the San Diego Water Board.

(2) *Other effluent limitations and standards*. If any applicable toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant and that standard or prohibition is more stringent than any limitation on the pollutant in the permit, the San Diego Water Board shall institute proceedings under these regulations to modify or revoke and reissue the permit to conform to the toxic effluent standard or prohibition. [40 CFR 122.44(b)(1)]

f. DUTY TO MINIMIZE OR CORRECT ADVERSE IMPACTS

The Copermittee must take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this Order, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the noncompliance.

g. PERMIT ACTIONS

The filing of a request by the Copermittee for modification, revocation and reissuance, or termination of this Order, or a notification of planned change in or anticipated noncompliance with this Order does not stay any condition of this Order. (See 40 CFR 122.41(f)) In addition, the following provisions apply to this Order:

(1) Upon application by any affected person, or on its own motion, the San Diego Water Board may review and revise the requirements in this Order. All requirements must be reviewed periodically. [CWC Section 13263(e)]

(2) This Order may be terminated or modified for cause, including, but not limited to, all of the following: [CWC Section 13381]

(a) Violation of any condition contained in the requirements of this Order. [CWC Section 13381(a)]

(b) Obtaining the requirements in this Order by misrepresentation, or failure to disclose fully all relevant facts. [CWC Section 13381(b)]

(c) A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge. [CWC Section 13381(c)]

(3) When this Order is transferred to a new owner or operator, such requirements as may be necessary under the CWC may be incorporated into this Order.

h. NPDES Permitted Non-Storm Water Discharges

The San Diego Water Board has, in prior years, issued a limited number of individual NPDES permits for non-storm water discharges to MS4s. The San Diego Water Board or State Water Board may in the future, upon prior notice to the Copermittee(s), issue an NPDES permit for any non-storm water discharge (or class of non-storm water discharges) to an MS4.

i. Monitoring

In addition to the standard provisions required under 40 CFR 122.41(j) and (l)(4), the following general monitoring provisions apply to this Order:

(1) Where procedures are not otherwise specified in Order, sampling, analysis and quality assurance/quality control must be conducted in accordance with the Quality Assurance Management Plan (QAMP) for the State of California's Surface Water Ambient Monitoring Program (SWAMP), adopted by the State Water Resources Control Board (State Water Board).

(2) Pursuant to 40 CFR 122.41(j)(2) and CWC Section 13383(a), each Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five (5) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time.

(3) All chemical, bacteriological, and toxicity analyses must be conducted at a laboratory certified for such analyses by the California Department of Public Health or a laboratory approved by the San Diego Water Board.

(4) For priority toxic pollutants that are identified in the California Toxics Rule (CTR) (65 Fed. Reg. 31682), the Copermittees must instruct their laboratories to establish

calibration standards that are equivalent to or lower than the Minimum Levels (MLs) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP). If a Copermittee can demonstrate that a particular ML is not attainable, in accordance with procedures set forth in 40 CFR Part 136, the lowest quantifiable concentration of the lowest calibration standard analyzed by a specific analytical procedure (assuming that all the method specified sample weights, volumes, and processing steps have been followed) may be used instead of the ML listed in Appendix 4 of the SIP. The Copermittee must submit documentation from the laboratory to the San Diego Water Board for approval prior to raising the ML for any priority toxic pollutant.

j. ENFORCEMENT

(1) The San Diego Water Board is authorized to enforce the terms of this Order under several provisions of the CWC, including, but not limited to, CWC Sections 13385, 13386, and 13387.

(2) Nothing in this Order shall be construed to protect the Copermittee from its liabilities under federal, state, or local laws.

(3) The CWC provides for civil and criminal penalties comparable to, and in some cases greater than, those provided for under the CWA.

(4) Except as provided in the standard conditions required under 40 CFR 122.41(m) and (n), nothing in this Order shall be construed to relieve the Copermittee from civil or criminal penalties for noncompliance.

(5) Nothing in this Order shall be construed to preclude the institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties to which the Copermittee is or may be subject to under Section 311 of the CWA.

(6) Nothing in this Order shall be construed to preclude institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authoring preserved by Section 510 of the CWA.

k. SEVERABILITY

The provisions of this Order are severable, and if any provision of this Order, or the application of any provisions of this Order to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this Order shall not be affected thereby.

l. APPLICATIONS

Any application submitted by a Copermittee for reissuance or modification of this Order must satisfy all applicable requirements specified in federal regulations as well as any additional requirements for submittal of a Report of Waste Discharge specified in the CWC and the California Code of Regulations.

m. IMPLEMENTATION

All plans, reports and subsequent amendments submitted in compliance with this Order must be implemented immediately (or as otherwise specified). All submittals by Copermittees must be adequate to implement the requirements of this Order.

n. REPORT SUBMITTALS

(1) All report submittals must include an executive summary, introduction, conclusion, recommendations, and signed certified statement.

(2) Each Copermittee must submit a signed certified statement covering its responsibilities for each applicable submittal.

(3) The Principal Watershed Copermittee(s) must submit a signed certified statement covering its responsibilities for each applicable submittal and the sections of the submittals for which it is responsible.

(4) Unless otherwise directed, the Copermittees must submit one hard copy and one electronic copy of each report required under this Order to the San Diego Water Board, and one electronic copy to the USEPA.

(5) The Copermittees must submit reports and provide notifications as required by this Order to the following:

EXECUTIVE OFFICER
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
9174 SKY PARK COURT, SUITE 100
SAN DIEGO CA 92123-4340
Telephone: (858) 467-2952 Fax: (858) 571-6972

EUGENE BROMLEY
US ENVIRONMENTAL PROTECTION AGENCY
REGION IX
PERMITS ISSUANCE SECTION (W-5-1)
75 HAWTHORNE STREET
SAN FRANCISCO CA 94105

ADMINISTRATIVE DRAFT

ATTACHMENT C

ACRONYMS AND ABBREVIATIONS

1. Acronyms and Abbreviations

AMAL	Average Monthly Action Level
ASBS	Area(s) of Special Biological Significance
BMP	Best Management Practice
~~BMP Design Manual~~	~~Permanent BMP Sizing Criteria Design Manual~~
Basin Plan	Water Quality Control Plan for the San Diego Basin
CEQA	California Environmental Quality Act
CCR	California Code of Regulations
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWC	California Water Code
CZARA	Coastal Zone Act Reauthorization Amendments of 1990
ERP	Enforcement Response Plan
ESAs	Environmentally Sensitive Areas
GIS	Geographic Information System
IBI	Index of Biotic Integrity
LID	Low Impact Development
MDAL	Maximum Daily Action Level
MEP	Maximum Extent Practicable
ML	Minimum Level
MS4	Municipal Separate Storm Sewer System
NAL	Non-Storm Water Action Level
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
ROWD	Report of Waste Discharge (application for NPDES reissuance)
SAL	Storm Water Action Level
San Diego Water Board	California Regional Water Quality Control Board, San Diego Region
SIC	Standard Industrial Classification Code
State Water Board	State Water Resources Control Board
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
Waters of the U.S.	Waters of the United States
WDID	Waste Discharge Identification Number

WLA	Waste Load Allocation
WQBEL	Water Quality Based Effluent Limitation

DEFINITIONS

2. Definitions

Active/Passive Sediment Treatment - Using mechanical, electrical or chemical means to flocculate or coagulate suspended sediment for removal from runoff from construction sites prior to discharge.

Anthropogenic Litter – Trash generated from human activities, not including sediment.

Average Monthly Action Level – The highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month or the geometric mean for bacteria, as applicable.~~.~~

Beneficial Uses - The uses of water necessary for the survival or well being of man, plants, and wildlife. These uses of water serve to promote tangible and intangible economic, social, and environmental goals. "Beneficial Uses" of the waters of the State that may be protected include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. Existing beneficial uses are uses that were attained in the surface or ground water on or after November 28, 1975; and potential beneficial uses are uses that would probably develop in future years through the implementation of various control measures. "Beneficial Uses" are equivalent to "Designated Uses" under federal law. [California Water Code Section 13050(f)].

Best Management Practices (BMPs) - Defined in 40 CFR 122.2 as schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. ~~-~~In the case of municipal ~~storm water~~discharge permits, BMPs may be used in place of numeric effluent limits.

Bioassessment - The use of biological community information to evaluate the biological integrity of a water body and its watershed. With respect to aquatic ecosystems, bioassessment is the collection and analysis of samples of the benthic macroinvertebrate community together with physical/habitat quality measurements associated with the sampling site and the watershed to evaluate the biological condition (i.e. biotic integrity) of a water body.

Biocriteria - Under the CWA, numerical values or narrative expressions that define a desired biological condition for a water body that are legally enforceable. The USEPA defines biocriteria as: "numerical values or narrative expressions that describe the reference biological integrity of aquatic communities inhabiting waters of a given designated aquatic life use… (that)…describe the characteristics of water body segments least impaired by human activities."

Biofiltration - Practices that use vegetation and amended soils to detain and treat runoff from impervious areas. Treatment is through filtration, infiltration, adsorption, ion exchange, and biological uptake of pollutants.

Biological Integrity - Defined in Karr J.R. and D.R. Dudley. 1981. Ecological perspective on water quality goals. *Environmental Management* 5:55-68 as: "A balanced, integrated, adaptive

community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitat of the region." Also referred to as ecosystem health.

BMP Design Manual – A plan developed to eliminate, reduce, or mitigate the impacts of runoff from development projects, including Priority Development Projects.

Channel Rehabilitation and Improvement –Remedial measures or activities for the purpose of improving or restoring the environmental health of streams, channels or river systems. Techniques may vary from in-stream restoration techniques to off-line stormwater management practices installed in the system corridor or upland areas. Rehabilitation techniques may include, but are not limited to the following: riparian zone restoration, constructed wetlands, bank stabilization, channel modifications, and daylighting of drainage systems. Effectiveness may be measured in various manners, including: assessments of habitat, reduced streambank erosion, and restoration of water and sediment transport balance.

Clean Water Act Section 303(d) Water Body - An impaired water body in which water quality does not meet applicable water quality standards and/or is not expected to meet water quality standards, even after the application of technology based pollution controls required by the CWA. The discharge of runoff to these water bodies by the Copermittees is significant because these discharges can cause or contribute to violations of applicable water quality standards.

Construction Site – Any project, including projects requiring coverage under the Construction General Permit, that involves soil disturbing activities greater than 10,000 square feet including, but not limited to, clearing, grading, disturbances to ground such as stockpiling, and excavation. This does not include minor construction activities such as interior remodeling, plumbing, electrical, or mechanical work.

Contamination - As defined in the Porter-Cologne Water Quality Control Act, contamination is "an impairment of the quality of waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste whether or not waters of the State are affected."

Copermittee – An incorporated city within the County of Orange, County of Riverside, or County of San Diego in the San Diego Region (Region 9), the County of Orange, the County of Riverside, the County of San Diego, the Orange County Flood Control District, the Riverside County Water Conservation and Flood Control District, the San Diego Regional Airport Authority, or the Unified Port District of San Diego.

Copermittees – All of the individual Copermittees, collectively.

Critical Channel Flow (Qc) – The channel flow that produces the critical shear stress that initiates bed movement or that erodes the toe of channel banks. When measuring Qc, it should be based on the weakest boundary material – either bed or bank.

Daily Discharge – Defined as either: (1) the total mass of the constituent discharged over the calendar day or any 24 hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g. concentration.)

The Daily Discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day, or other 24 hour period other than a day), or by the arithmetic mean of analytical results from one or more grab samples taken over the course of a day.

Development Projects - Construction, rehabilitation, redevelopment, or reconstruction of any public or private projects involving land disturbance activities. ~~residential project, industrial, commercial, or any other projects.~~

Dry Season – ~~The period of time from~~ May 1 to September 30. ~~when rainfall is not expected to occur the San Diego.~~

Dry Weather – Weather is considered dry if the preceding 72 hours has been without measurable precipitation (>0.1 inch).

Enclosed Bays – Enclosed bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost bay works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays do not include inland surface waters or ocean waters.

Erosion – When land is diminished or worn away due to wind, water, or glacial ice. Often the eroded debris (silt or sediment) becomes a pollutant via storm water runoff. Erosion occurs naturally but can be intensified by land clearing activities such as farming, development, road building, and timber harvesting.

Environmentally Sensitive Areas (ESAs) - Areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; areas designated as preserves or their equivalent under the Natural Communities Conservation Program within the Cities and County of Orange; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.

Estuaries – Waters, including coastal lagoons, located at the mouth of streams that serve as areas of mixing fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and ocean water. Estuaries do not include inland surface waters or ocean waters.

Existing Development – Any area that has been developed and exists for municipal, commercial, industrial, or residential purposes, uses, or activities. May include areas that are not actively used for its originally developed purpose, but may be re-purposed or redeveloped for another use or activity.

Flow Duration – The long-term period of time that flows occur above a threshold that causes significant sediment transport and may cause excessive erosion damage to creeks and streams (not a single storm event duration). The simplest way to visualize this is to consider a histogram of pre- and post-project flows using long-term records of hourly data. To maintain pre-

development flow duration means that the total number of hours (counts) within each range of flows in a flow-duration histogram cannot increase between the pre- and post-development condition. Flow duration within the range of geomorphologically significant flows is important for managing erosion.

Grading - The cutting and/or filling of the land surface to a desired slope or elevation.

Hazardous Material – Any substance that poses a threat to human health or the environment due to its toxicity, corrosiveness, ignitability, explosive nature or chemical reactivity. These also include materials named by the USEPA in 40 CFR 116 to be reported if a designated quantity of the material is spilled into the waters of the U.S. or emitted into the environment.

Hazardous Waste - Hazardous waste is defined as "any waste which, under Section 600 of Title 22 of this code, is required to be managed according to Chapter 30 of Division 4.5 of Title 22 of this code" [CCR Title 22, Division 4.5, Chapter 11, Article 1].

Household Hazardous Waste – Paints, cleaning products, and other wastes generated during home improvement or maintenance activities.

Hydromodification – The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, interflow and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

Illicit Connection – Any connection to the MS4 that conveys an illicit discharge.

Illicit Discharge - Any discharge to the MS4 that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from fire fighting activities [40 CFR 122.26(b)(2)].

Inactive Areas – Areas of construction activity that are not active and those that have been active and are not scheduled to be re-disturbed for at least 14 days.

Infiltration – Water other than wastewater that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow [40 CFR 35.2005(20)].

Inland Surface Waters – Includes all surface waters of the ~~State~~ U.S. that do not include the ocean, enclosed bays, or estuaries.

Jurisdictional Runoff Management Program Document – A written description of the specific jurisdictional runoff management measures and programs that each Copermittee will implement to comply with this Order and ensure that storm water pollutant discharges in runoff are reduced to the MEP and do not cause or contribute to a violation of water quality standards.

Low Impact Development (LID) – A storm water management and land development strategy that emphasizes conservation and the use of on-site natural features integrated with

engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions.

Low Impact Development Best Management Practices (LID BMPs) – LID BMPs include schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States through storm water management and land development strategies that emphasize conservation ~~s~~and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions. LID BMPs include retention practices that do not allow runoff, such as infiltration, rain water harvesting and reuse, and evapotranspiration. LID BMPs also include flow-through practices such as biofiltration that may have some discharge of storm water following pollutant reduction.

Major Outfall – As defined in the Code of Federal Regulations, a major outfall is a MS4 outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (i.e. discharge from a single conveyance other than a circular pipe which is associated with a drainage area of more than 50 acres); or, for MS4s that receive storm water from lands zoned for industrial activity (based on comprehensive zoning plans or equivalent), a MS4 outfall that discharges from a single pipe with an inside diameter of 12 inches or more or from its equivalent (i.e. discharge from other than a circular pipe associated with a drainage area of 2 acres or more).

Maximum Daily Action Level (MDAL) –The highest allowable daily discharge of a pollutant, over a calendar day (or 24 hour period). For pollutants with action levels expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with action levels expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

Maximum Extent Practicable (MEP) – The technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) for storm water that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) in combination with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than BAT. A definition for MEP is not provided either in the statute or in the regulations. Instead the definition of MEP is dynamic and will be defined by the following process over time: municipalities propose their definition of MEP by way of their runoff management programs. Their total collective and individual activities conducted pursuant to the runoff management programs becomes their proposal for MEP as it applies both to their overall effort, as well as to specific activities (e.g., MEP for street sweeping, or MEP for MS4 maintenance). In the absence of a proposal acceptable to the San Diego Water Board, the San Diego Water Board defines MEP.

In a memo dated February 11, 1993, entitled "Definition of Maximum Extent Practicable," Elizabeth Jennings, Senior Staff Counsel, SWRCB addressed the achievement of the MEP standard as follows:

> "*To achieve the MEP standard, municipalities must employ whatever Best Management Practices (BMPs) are technically feasible (i.e., are likely to be effective) and are not cost prohibitive. The major emphasis is on technical feasibility. Reducing pollutants to the MEP means choosing effective BMPs, and rejecting applicable BMPs only where other effective*

BMPs will serve the same purpose, or the BMPs would not be technically feasible, or the cost would be prohibitive. In selecting BMPs to achieve the MEP standard, the following factors may be useful to consider:

a. Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?
b. Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?
c. Public Acceptance: Does the BMP have public support?
d. Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?
e. Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc.?

The final determination regarding whether a municipality has reduced pollutants to the maximum extent practicable can only be made by the Regional or State Water Boards, and not by the municipal discharger. If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit derived, it would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs that would address a pollutant source, or to pick a BMP based solely on cost, which would be clearly less effective. In selecting BMPs the municipality must make a serious attempt to comply and practical solutions may not be lightly rejected. In any case, the burden would be on the municipal discharger to show compliance with its permit. After selecting a menu of BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented."

Monitoring Year – The monitoring year begins annually on October 1st and ends on September 30th.

Municipal Separate Storm Sewer System (MS4) – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designated or used for collecting or conveying storm water; (iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.26. "Co-permittees need only comply with permit conditions relating to discharges from the municipal separate storm sewers for which they are operators." 40 CFR §122.26(a)(3)(vi).

National Pollutant Discharge Elimination System (NPDES) - The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the CWA.

Non-Storm Water - All discharges to and from a MS4 that do not originate from precipitation events (i.e., all discharges from a MS4 other than storm water). Non-storm water includes illicit discharges and NPDES permitted discharges.

Nuisance - As defined in the Porter-Cologne Water Quality Control Act, a nuisance is "anything which meets all of the following requirements: 1) Is injurious to health, or is indecent, or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. 2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. 3) Occurs during~~,~~ or as a result of~~,~~ the treatment or disposal of wastes."

Ocean Waters – the territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the State Board's California Ocean Plan.

Order – Unless otherwise specified, refers to this Order, Order No. R9-2012-0011 (NPDES No. CAS0109266).
~~**Permanent BMP Sizing Criteria Design Manual** – A plan developed to eliminate, reduce, or mitigate the impacts of runoff from development projects, including Priority Development Projects.~~
Person - A person is defined as an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof [40 CFR 122.2].

Point Source - Any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, landfill leachate collection systems, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

Pollutant - Any agent that may cause or contribute to the degradation of water quality such that a condition of pollution or contamination is created or aggravated.

Pollution - As defined in the Porter-Cologne Water Quality Control Act, pollution is "the alteration of the quality of the waters of the State by waste, to a degree that unreasonably affects the either of the following: 1) The waters for beneficial uses; or 2) Facilities that serve these beneficial uses." Pollution may include contamination.

Pollution Prevention - Pollution prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control BMPs, treatment control BMPs, or disposal.

Permanent BMPs - A subset of BMPs including structural and non-structural controls which detain, retain, filter, remove, or educate to prevent the release of pollutants to surface waters from development projects in perpetuity, after construction of a project is completed.

Pre-Development Runoff Conditions ~~**(Discharge Rates, Durations, Etc.)**~~ – "Runoff conditions that exist~~ed~~ onsite immediately before the ~~existing development was constructed, or exists onsite before~~ planned development activities occur. Pre-development is not intended to be interpreted as that period before any human-induced land disturbance activity has occurred." 64 FR 68761.~~This definition includes natural watershed hydrology before any human induced~~

~~land alterations.~~

Priority Development Projects - New development and redevelopment projects defined under Provision E.3.b of Order No. R9-2012-0011.

Properly Designed – Designed in accordance with the Copermittee's BMP Design Manual and/or any appropriate design requirements set forth by the Copermittee and based on widely accepted design criteria.

Public Education, Outreach and Participation – Programs to educate residents, businesses and visitors about the importance of water quality and water quality programs so that they will support local efforts and understand their role in protecting receiving waters. The Education and Outreach Program will increase knowledge and awareness, improve attitudes toward storm pollution prevention, and provide a foundation for changing behaviors that contribute to storm water pollution.

Rainy Season (aka Wet Season) – ~~The period of time from~~ October 1 to April 30. ~~when the San Diego Region experiences the most rainfall.~~

Receiving Waters – Waters of the ~~United States~~U.S.

Receiving Water Limitations - Waste discharge requirements issued by the San Diego Water Board typically include both: (1) "Effluent Limitations" (or "Discharge Limitations") that specify the technology-based or water-quality-based effluent limitations; and (2) "Receiving Water Limitations" that specify the water quality objectives in the Basin Plan as well as any other limitations necessary to attain those objectives. In summary, the "Receiving Water Limitations" provision is the provision used to implement the requirement of CWA section 301(b)(1)(C) that NPDES permits must include any more stringent limitations necessary to meet water quality standards.

Redevelopment - The creation, addition, and or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include trenching and resurfacing associated with utility work; parking lots; resurfacing existing roadways; cutting and reconfiguring of surface parking lots; new sidewalk construction, pedestrian ramps, or bike lane on existing roads; and routine replacement of damaged pavement, such as pothole repair.

Retain –Keep or hold in a particular place, condition, or position without discharge to surface waters.

Retrofit – Retrofit is defined as a stormwater management practice (usually structural) put into place after development has occurred in watersheds where practices previously did not exist or are ineffective. The purpose of retrofits is to improve water quality, protect downstream channels, reduce flooding, or meet other specific objectives. Some examples of retrofits include, but are not limited to the following: green roofs, downspout and impervious cover disconnection, permeable pavement, bioretention, rain barrels, rain gardens, vacant lot stabilization, trash area enclosures, additional trash and waste disposal containers.

Runoff - All flows in a storm water conveyance system that consists of the following components: (1) storm water (wet weather flows) and (2) non-storm water including dry weather flows.

San Diego Water Board – As used in this document the term "San Diego Water Board" is synonymous with the term "Regional Board" as defined in Water Code section 13050(b) and is intended to refer to the California Regional Water Quality Control Board for the San Diego Region as specified in Water Code Section 13200.

Sediment - Soil, sand, and minerals washed from land into water. Sediment resulting from anthropogenic sources (i.e. human induced land disturbance activities) is considered a pollutant. This Order regulates only the discharges of sediment from anthropogenic sources and does not regulate naturally occurring sources of sediment. Sediment can destroy fish-nesting areas, clog animal habitats, and cloud waters so that sunlight does not reach aquatic plants.

Shared Treatment Control BMP - BMPs used by multiple developments to infiltrate, filter, or treat the required volume or flow prior to discharge to a receiving water. This could include, for example, a treatment BMP at the end of an enclosed storm drain that collects runoff from several commercial developments.

Source Control BMP – Land use or site planning practices, or structural or nonstructural measures that aim to prevent runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between pollutants and runoff.

State Water Quality Protection Area – A nonterrestrial marine or estuarine area designated to protect marine species or biological communities from an undesirable alteration in natural water quality, including, but not limited to, areas of special biological significance that have been designated by the State Water Board through its water quality control planning process. Areas of special biological significance are a subset of State Water Quality Protection Areas, and require special protection as determined by the State Water Resources Control Board pursuant to the California Ocean Plan adopted and reviewed pursuant to Article 4 (commencing with Section 13160) of Chapter 3 of Division 7 of the California Water Code and pursuant to the Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California (California Thermal Plan) adopted by the State Water Board.

Storm Water – Per 40 CFR 122.26(b)(13), means storm water runoff, snowmelt runoff and surface runoff and drainage. ~~Surface runoff and drainage pertains to runoff and drainage resulting from precipitation events.~~

Structural BMP – Any structural control which detains, retains, or filters, to reduce the release of pollutants to surface waters from development projects (e.g. treatment control BMPs) which remains after construction.

Total Maximum Daily Load (TMDL) - The maximum amount of a pollutant that can be discharged into a water body from all sources (point and non-point) and still maintain water quality standards. Under CWA section 303(d), TMDLs must be developed for all water bodies that do not meet water quality standards after application of technology-based controls.

Toxicity - Adverse responses of organisms to chemicals or physical agents ranging from

mortality to physiological responses such as impaired reproduction or growth anomalies). The water quality objectives for toxicity provided in the Basin Plan, state in part…"All waters shall be free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life….The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge".

Treatment Control BMP – Any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media absorption or any other physical, biological, or chemical process.

Unpaved Road – Any long, narrow stretch without pavement used for traveling by motor passenger vehicles between two or more points. Unpaved roads are generally constructed of dirt, gravel, aggregate or macadam and may be improved or unimproved.

Waste - As defined in CWC Section 13050(d), "waste includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal."

Article 2 of CCR Title 23, Chapter 15 (Chapter 15) contains a waste classification system that applies to solid and semi-solid waste, which cannot be discharged directly or indirectly to water of the state and which therefore must be discharged to land for treatment, storage, or disposal in accordance with Chapter 15. There are four classifications of waste (listed in order of highest to lowest threat to water quality): hazardous waste, designated waste, non-hazardous solid waste, and inert waste.

Water Quality Objective - Numerical or narrative limits on constituents or characteristics of water designated to protect designated beneficial uses of the water. [California Water Code Section 13050 (h)]. California's water quality objectives are established by the State and Regional Water Boards in the Water Quality Control Plans. Numeric or narrative limits for pollutants or characteristics of water designed to protect the beneficial uses of the water. In other words, a water quality objective is the maximum concentration of a pollutant that can exist in a receiving water and still generally ensure that the beneficial uses of the receiving water remain protected (i.e., not impaired). Since water quality objectives are designed specifically to protect the beneficial uses, when the objectives are violated the beneficial uses are, by definition, no longer protected and become impaired. This is a fundamental concept under the Porter Cologne Act. Equally fundamental is Porter Cologne's definition of pollution. A condition of pollution exists when the water quality needed to support designated beneficial uses has become unreasonably affected or impaired; in other words, when the water quality objectives have been violated. These underlying definitions (regarding beneficial use protection) are the reason why all waste discharge requirements implementing the federal NPDES regulations require compliance with water quality objectives. (Water quality objectives are also called water quality criteria in the CWA.)

Water Quality Standards - Water quality standards, as defined in Clean Water Act section 303(c) consist of the beneficial uses (e.g., swimming, fishing, municipal drinking water supply, etc.,) of a water body and criteria (referred to as water quality objectives in the California Water Code) necessary to protect those uses. Under the Water Code, the water boards establish beneficial uses and water quality objectives in water quality control or basin plans. Together with an anti-degradation policy, these beneficial uses and water quality objectives serve as water

quality standards under the Clean Water Act. In Clean Water Act parlance, state beneficial uses are called "designated uses" and state water quality objectives are called "criteria." Throughout this Order, the relevant term is used depending on the statutory scheme.

Waters of the State - Any water, surface or underground, including saline waters within the boundaries of the State [CWC section 13050 (e)]. The definition of the Waters of the State is broader than that for the Waters of the United States in that all water in the State is considered to be a Waters of the State~~ regardless of circumstances or condition.~~. Under this definition, portions of a MS4 ~~is always~~may be considered to be a Waters of the State. However, man-made portions of the MS4 constructed for the sole purpose of flow and/or pollutant reduction are not considered waters of the state.

Waters of the United States - As defined in the 40 CFR 122.2, the Waters of the U.S. are defined as: "(a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate "wetlands;" (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters otherwise defined as waters of the United States under this definition: (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial seas; and (g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA."

Watershed - That geographical area which drains to a specified point on a water course, usually a confluence of streams or rivers (also known as drainage area, catchment, or river basin).

Wet Season (aka Rainy Season) – The period of time from October 1 to April 30 when the San Diego Region experiences the most rainfall.

Wet Weather – Weather is considered wet if there is a storm event of 0.1 inches and greater and the following 72 hours, unless defined in another regulatory mechanism such as a TMDL.

ATTACHMENT D

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

FY _____

I. COPERMITTEE INFORMATION

Copermittee Name:

Copermittee Primary Contact Name:

Copermittee Primary Contact Information:
Address:
City: County: State: Zip:
Telephone: Fax: Email:

II. LEGAL AUTHORITY

Has the Copermittee established adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 that complies with Order No. R9-2012-0011?	YES NO	☐ ☐
A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority?	YES NO	☐ ☐

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

Was an update of the jurisdictional runoff management program document required or recommended by the San Diego Water Board?	YES NO	☐ ☐
If YES to the question above, did the Copermittee update its jurisdictional runoff management program document and make it available on the Regional Clearinghouse?	YES NO	☐ ☐

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

Has the Copermittee implemented a program to actively detect and eliminate illicit discharges and connections to its MS4 that complies with Order No. R9-2012-0011?	YES NO	☐ ☐

Number of non-storm water discharges reported by the public	
Number of non-storm water discharges detected by Copermittee staff or contractors	
Number of non-storm water discharges investigated by the Copermittee	
Number of sources of non-storm water discharges identified	
Number of non-storm water discharges eliminated	
Number of sources of illicit discharges or connections identified	
Number of illicit discharges or connections eliminated	
Number of enforcement actions issued	
Number of high level enforcement actions issued	

V. DEVELOPMENT PLANNING PROGRAM

Has the Copermittee implemented a development planning program that complies with Order No. R9-2012-0011?	YES NO	☐ ☐
Was an update to the ~~Permanent~~ BMP ~~Sizing Criteria~~ Design Manual required or recommended by the San Diego Water Board?	YES NO	☐ ☐
If YES to the question above, did the Copermittee update its ~~Permanent~~ BMP ~~Sizing Criteria~~ Design Manual and make it available on the Regional Clearinghouse?	YES NO	☐ ☐

Number of proposed development projects in review	
Number of Priority Development Projects in review	
Number of Priority Development Projects approved	
Number of approved Priority Development Projects exempt from any BMP requirements	
Number of approved Priority Development Projects requiring mitigation	
Number of Priority Development Projects granted occupancy	

Number of completed Priority Development Projects in inventory	
Number of high priority Priority Development Project ~~permanent~~ structural BMP inspections	
Number of Priority Development Project ~~permanent~~ structural BMP violations	
Number of enforcement actions issued	

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
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Number of high level enforcement actions issued	

FY _____

VI. CONSTRUCTION MANAGEMENT PROGRAM

Has the Copermittee implemented a construction management program that complies with Order No. R9-2012-0011?	YES ☐ NO ☐
Number of construction sites in inventory	
Number of active construction sites in inventory	
Number of inactive construction sites in inventory	
Number of construction sites closed/completed during reporting period	
Number of construction site inspections	
Number of construction site violations	
Number of enforcement actions issued	
Number of high level enforcement actions issued	

VII EXISTING DEVELOPMENT MANAGEMENT PROGRAM

Has the Copermittee implemented an existing development management program that complies with Order No. R9-2012-0011?	YES ☐ NO ☐

	Municipal	Commercial	Industrial	Residential
Number of existing developments in inventory				
Number of existing development inspections				
Number of follow-up inspections				
Number of existing development violations				
Number of enforcement actions issued				
Number of high level enforcement actions issued				

VIII PUBLIC EDUCATION AND PARTICIPATION

Has the Copermittee implemented a public education program that complies with Order No. R9-2012-0011?	YES ☐ NO ☐
Has the Copermittee implemented a mechanism for public participation and where necessary intergovernmental coordination that complies with Order No. R9-2012-0011?	YES ☐ NO ☐

IX. FISCAL ANALYSIS

Has the Copermittee attached to this form a summary of its fiscal analysis that complies with Order No. R9-2012-0011?	YES ☐ NO ☐

X. CERTIFICATION

I [☐ Principal Executive Officer ☐ Ranking Elected Official ☐ Duly Authorized Representative] certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature	Date
Print Name	Title
Telephone Number	Email

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ADMINISTRATIVE DRAFT

ATTACHMENT E

SPECIFIC PROVISIONS FOR TOTAL MAXIMUM DAILY LOADS APPLICABLE TO ORDER NO. R9-2012-0011

These provisions implement Total Maximum Daily Loads (TMDLs), adopted by the San Diego Water Board and approved by USEPA under Clean Water Act section 303(c), which are applicable to discharges regulated under this Order. The provisions and schedules for implementation of the TMDLs described below must be incorporated into the Water Quality Improvement Plans and monitoring requirements, required pursuant to Provision-s B and D of this Order, respectively, for the specified Watershed Management Areas.

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed~~Total Maximum Daily Load for Diazinon in Chollas Creek Watershed~~~~Total Maximum Daily Load for Diazinon in Chollas Creek Watershed~~ Resolution No. R9-2002-0123
2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin Resolution No. R9-2005-0019
3. ~~Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed~~
4. ~~.~~3. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek Resolution No. R9-2007-0043
5. ~~.~~4. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay Resolution No. R9-2008-0027
6. ~~.~~5. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek) Resolution No. R9-2010-0001

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2002-0123

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	August 14, 2002
State Water Board Approval Date:	July 16, 2003
Office of Administrative Law Approval Date:	September 11, 2003
US EPA Approval Date:	November 3, 2003

(3) TMDL Effective Date: September 11, 2003

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, Unified Port District of San Diego

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for Chollas Creek consist of the following:

(1) Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedule under Specific Provision 1.~~II~~c:

Table 1.1
Receiving Water Limitations as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Diazinon	Acute	0.08 µg/L	1 hour
	Chronic	0.05 µg/L	4 days

(2) Effluent Limitations

Discharges from the MS4s must not contain concentrations that exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 1.~~II~~c:

Table 1.2
Effluent Limitations as Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation	Averaging Period
Diazinon	Acute	0.072 µg/L	1 hour
	Chronic	0.045 µg/L	4 days

(3) Best Management Practices

~~The following~~ BMPs for Chollas Creek ~~must~~may be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area and implemented by the Responsible Copermittees:

~~(a) The Responsible Copermittees must implement BMPs capable of achieving the WQBELs under Specific Provision 1. for Chollas Creek.~~
~~(b) Responsible Copermittees must implement the Diazinon Toxicity Control Plan and Diazinon Public Outreach/Education Program as described in the report titled, *Technical Report for Total Maximum Daily Load for Diazinon in Chollas Creek Watershed, San Diego County*, dated August 14, 2002, including subsequent modifications, in order to achieve the WQBELs under Specific Provision 1..~~

~~(c)~~(a) The Responsible Copermittees should coordinate ~~the~~any implemented BMPs to address this TMDL with Caltrans ~~wherever and whenever~~ , as possible.

c. Compliance Schedule

The Responsible Copermittees were required to achieve their WLA by December 31, 2010. The Responsible Copermittees must be in compliance with the WQBELs under Specific Provision 1.b~~kk~~.

d. Compliance Determination

Compliance with WQBELs or WLAs may be demonstrated via any one of the following methods:

(1) There is no discharge from the MS4, or

(2) Applicable effluent limitations are met, or

(3) Receiving waters meet the applicable receiving water limitations or water quality objective, or

(4) Loading from the MS4 is such that it does not cause water quality objective exceedances, or

(5) Implementation of a Water Quality Improvement Plan determined by the Regional Board Executive Officer to comply with Provision A as described in Provision A.4.

e. Specific Monitoring and Assessment Requirements

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

~~The Responsible Copermittees must monitor the effluent of the MS4 outfalls for diazinon within the Chollas Creek watershed, and calculate or estimate the monthly and annual diazinon loads, in accordance with the requirements of Provisions , , and of this Order. The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision of this Order.~~

2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0019

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	September 22, 2005
Office of Administrative Law Approval Date:	December 2, 2005
US EPA Approval Date:	February 8, 2006

(3) TMDL Effective Date: December 2, 2005

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Shelter Island Yacht Basin

(6) Responsible Copermittees: City of San Diego, San Diego Unified Port District

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for Shelter Island Shoreline Park consist of the following:

(1) Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedule under Specific Provision 2.c~~qq~~:

Table 2.1
Receiving Water Limitations as Concentrations in Shelter Island Yacht Basin

Constituent	Exposure Duration	Effluent Limitation	Averaging Period
Dissolved Copper	Acute	4.8 µg/L	1 hour
	Chronic	3.1 µg/L	4 days

(2) Effluent Limitations

Discharges from the MS4s must not contain pollutant loads that exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 2.~~qq~~c:

Table 2.2
Effluent Limitations as Annual Loads in MS4 Discharges to Shelter Island Yacht Basin

Constituent	Effluent Limitation
Dissolved Copper	30 kg/yr

(3) Best Management Practices

The Responsible Copermittees ~~must~~may implement BMPs ~~capable of achieving~~to support the achievement of WQBELs under Specific Provision 2.~~pp~~ bfor Shelter Island Yacht Basin

c. COMPLIANCE SCHEDULE

The Responsible Copermittees ~~was~~ are required to achieve ~~its~~ respective WLAs ~~upon the effective date of the TMDL,~~by December 2, ~~2005~~2022. The Responsible Copermittees must be in compliance with the WQBELs under Specific Provision 2.b~~pp~~.

d. COMPLIANCE DETERMINATION

Compliance with WQBELs or WLAs may be demonstrated via any one of the following methods:

(1) There is no discharge from the MS4, or

(2) Applicable effluent limitations are met, or

(3) Receiving waters meet the applicable receiving water limitations or water quality objective, or

(4) Loading from the MS4 is such that it does not cause water quality objective exceedances, or

(5) Implementation of a Water Quality Improvement Plan determined by the Regional Board Executive Officer to comply with Provision A as described in Provision A.4.

~~d.~~e. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittees must ~~monitor~~implement the ~~effluent of its MS4 outfalls for dissolved copper, and calculate or estimate the monthly and annual dissolved copper loads, in accordance with the~~ monitoring and assessment requirements ~~of Provisions , , and of this~~ issued under Order~~.~~ No. R9-2005-0019. The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

4. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed
5.
6. Applicability
7.
8. TMDL Basin Plan Amendment: Resolution No. R9-2005-0036
9.
10. TMDL Adoption and Approval Dates:
11.
12. San Diego Water Board Adoption Date: February 9, 2005
13. State Water Board Approval Date: November 16, 2005
14. Office of Administrative Law Approval Date: February 1, 2006
15. US EPA Approval Date: March 22, 2006
16.
17. TMDL Effective Date: February 1, 2006
18.
19. Watershed Management Area: Santa Margarita River
20.
21. Water Body: Rainbow Creek
22.
23. Responsible Copermittee: County of San Diego
24.
25. Water Quality Based Effluent Limitations
26.
27. The WQBELs for Rainbow Creek consist of the following
28.
29. Receiving Water Limitations
30.
31. Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedule under Specific Provision 3.c.(1):
32.
33. Table 3.1
34. Receiving Water Limitations as
35. Concentrations in Rainbow Creek

36. Constituent	37. Receiving Water 38. Limitation
39. Nitrate (as N)	40. 10 mg/L
41. Total Nitrogen	42. 1 mg/L
43. Total Phosphorus	44. 0.1 mg/L

45.

~~47.~~
~~48. Effluent Limitations~~
~~49.~~
~~50. Discharges from the MS4s must not contain concentrations that exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 3.c.(1):~~
~~51.~~
~~52. Table 3.2~~
~~53. Effluent Limitations as Concentrations in~~
~~54. MS4 Discharges to Rainbow Creek~~

~~55. Constituent~~	~~56. Effluent 57. Limitation~~
~~58. Nitrate (as N)~~	~~59. 10 mg/L~~
~~60. Total Nitrogen~~	~~61. 1 mg/L~~
~~62. Total Phosphorus~~	~~63. 0.1 mg/L~~

~~64.~~
~~65. Pollutant loads from given land uses discharging to and from the MS4s must not exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 3.c.(1):~~
~~66.~~
~~67. Table 3.3~~
~~68. Effluent Limitations as Annual Loads in~~
~~69. MS4 Discharges to Rainbow Creek~~

~~70. Land Use~~	~~71. Total N~~	~~72. Total P~~
~~73. Commercial nurseries~~	~~74. 116 kg/yr~~	~~75. 3 kg/yr~~
~~76. Park~~	~~77. 3 kg/yr~~	~~78. 0.1 kg/yr~~
~~79. Residential areas~~	~~80. 149 kg/yr~~	~~81. 12 kg/yr~~
~~82. Urban areas~~	~~83. 27 kg/yr~~	~~84. 6 kg/yr~~

~~85.~~
~~86. Interim effluent limitations expressed as pollutant loads are given in the compliance schedule under Specific Provision 3.0.~~
~~87.~~
~~88. Best Management Practices~~
~~89.~~
~~90. The Responsible Copermittee must implement BMPs capable of achieving the WQBELs under Specific Provision 3.b for Rainbow Creek.~~
~~91.~~

~~**92. The Responsible Copermittee should coordinate the BMPs to address this TMDL with Caltrans and other sources wherever and whenever possible.**~~

~~**93.**~~

~~95. Compliance Schedule~~
~~96.~~
~~97. WLA Compliance Date~~
~~98.~~
~~99. The Responsible Copermittee is required to achieve its WLAs, thus must be in compliance with the WQBELs under Specific Provision 3.b, by December 31, 2021.~~
~~100.~~
~~101. Interim Compliance Requirements~~
~~102.~~
~~103. Table 3.4~~
~~104. Interim Effluent Limitations as Annual Loads in~~
~~105. MS4 Discharges from Specific Land Uses to Rainbow Creek~~

~~106.~~	~~107. Total N~~ ~~108. Interim Effluent Limitations~~ ~~109. (kg/yr)~~			~~110. Total P~~ ~~111. Interim Effluent Limitations~~ ~~112. (kg/yr)~~		
~~113.~~	~~114. Interim Compliance Date~~			~~115. Interim Compliance Date~~		
~~116. Land Use~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~
~~123. Commercial nurseries~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~
~~130. Park~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~
~~137. Residential areas~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~
~~144. Urban areas~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~

~~Specific Monitoring and Assessment Requirements~~

~~**The Responsible Copermittee must implement the Sampling and Analysis Plan for Rainbow Creek Nutrient Reduction TMDL Implementation Water Quality Monitoring, dated January 2010. The results of any monitoring conducted during the reporting period, and assessment of whether the interim and final WQBELs have been achieved must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.**~~

3. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2007-0043

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2007
State Water Board Approval Date:	July 15, 2008
Office of Administrative Law Approval Date:	October 22, 2008
US EPA Approval Date:	December 18, 2008

(3) TMDL Effective Date: October 22, 2008

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District ~~of San Diego~~

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for Chollas Creek consist of the following:

(1) Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedule under Specific Provision 4.c.(1):

Table 3.1
Receiving Water Limitations as Concentrations in Chollas Creek

Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$(0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$(0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$(0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$(0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER.

(2) Effluent Limitations

Discharges from the MS4s must not contain pollutant loads that exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 4.c.(1):

Table 3.2
Effluent Limitations as Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER.

(3) Best Management Practices

(a) The Responsible Copermittee ~~must~~may implement BMPs ~~capable of achieving~~to support the achievement of WQBELs under Specific Provision 4.c~~uu~~ for Chollas Creek.

(b) The Responsible Copermittees should coordinate the BMPs to address this TMDL with Caltrans and the U.S. Navy ~~wherever and whenever~~, as possible.

c. COMPLIANCE SCHEDULE

(1) WLA Compliance Date

The Responsible Copermittee is required to achieve the WLA, thus must be in compliance with the WQBELs under Specific Provision 4.b~~uu~~, by October 22, 2028.

(2) Interim Compliance Requirements

The Responsible Copermittee must comply with the following interim WQBELs by the interim compliance date:

Table 3.1
Interim Effluent Limitations as Concentrations in MS4 Discharges to Chollas Creek

Interim Compliance Date	Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
October 22, 2018	Dissolved Copper	Acute	1.2 x 90% x (0.96) x $e^{[0.9422 \times \ln(\text{hardness}) - 1.700]}$ x WER*	1 hour
		Chronic	1.2 x 90% x (0.96) x $e^{[0.8545 \times \ln(\text{hardness}) - 1.702]}$ x WER*	4 days
	Dissolved Lead	Acute	1.2 x 90% x [1.46203 – 0.145712 x ln(hardness)] x $e^{[1.273 \times \ln(\text{hardness}) - 1.460]}$ x WER*	1 hour
		Chronic	1.2 x 90% x [1.46203 – 0.145712 x ln(hardness)] x $e^{[1.273 \times \ln(\text{hardness}) - 4.705]}$ x WER*	4 days
	Dissolved Zinc	Acute	1.2 x 90% x (0.978) x $e^{[0.8473 \times \ln(\text{hardness}) + 0.884]}$ x WER*	1 hour
		Chronic	1.2 x 90% x (0.986) x $e^{[0.8473 \times \ln(\text{hardness}) + 0.884]}$ x WER*	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER.

d. COMPLIANCE DETERMINATION

Compliance with WQBELs or WLAs may be demonstrated via any one of the following methods:

(1) There is no discharge from the MS4, or

(2) Applicable effluent limitations are met, or

(3) Receiving waters meet the applicable receiving water limitations or water quality objective, or

(4) Loading from the MS4 is such that it does not cause water quality objective exceedances, or

(5) Implementation of a Water Quality Improvement Plan determined by the Regional Board Executive Officer to comply with Provision A as described in Provision A.4.

e. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*, when it is amended to include monitoring requirements for the Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must ~~monitor~~implement the ~~effluent of the MS4 outfalls discharging to Chollas Creek for dissolved copper, lead, and zinc, and calculate or estimate the monthly and annual dissolved copper, lead, and zinc loads, in accordance with the~~ monitoring and assessment requirements ~~of Provisions , , and of~~ issued under Order No. R9-2007-0043, as consistent with this Order~~.~~.. The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

4. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2008-0027

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 11, 2008
State Water Board Approval Date:	June 16, 2009
Office of Administrative Law Approval Date:	September 15, 2009
US EPA Approval Date:	October 26, 2009

(3) TMDL Effective Date: September 15, 2009

(4) Watershed Management Areas: See Table 5.0

(5) Water Bodies: See Table 5.0

(6) Responsible Copermittees: See Table 5.0

Table 4.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County	Dana Point Harbor	Baby Beach	-City of Dana Point -County of Orange
San Diego Bay	San Diego Bay	Shelter Island Shoreline Park	-Unified Port of San Diego

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Receiving Water Limitations

(a) Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedules under Specific Provisions 5.c.(1)(a) and 5.c.(2):

Table 4.1
Receiving Water Limitations as Bacteria Densities in the Water Body

	Receiving Water Limitations	
Constituent	**Single Sample Maximum[1,2]**	**30-Day Geometric Mean[2]**
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.

(b) If the above receiving water limitations are not met in the receiving water, the Responsible Copermittees must demonstrate that the discharges from the MS4s are not causing or contributing to the violation of receiving water limitations. The Copermittee must provide data that demonstrate the discharges from the MS4s are meeting the effluent limitations under Specific Provision 5.b.(2).

(2) Effluent Limitations

Discharges from the MS4s must not contain densities that exceed the following effluent limitations by the end of the compliance schedules under Specific Provisions 5.c.(1)(a) and 5.c.(2) to demonstrate the discharge is not causing or contributing to a violation of receiving water quality standards:

Table 4.2
Effluent Limitations as Bacteria Densities in MS4 Discharges to the Water Body

	Effluent Limitations	
Constituent	**Single Sample Maximum[1,2]**	**30-Day Geometric Mean[2]**
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.

Interim effluent limitations expressed as pollutant loads are given in the compliance schedule under Specific Provision 5.c.

(3) Best Management Practices

(a) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 5.0 fulfill the Bacteria Load Reduction Plan (BLRP) requirements in Resolution No. R9-2008-0027.

(b) The Responsible Copermittee must implement BMPs capable of achieving the WQBELs under Specific Provision 5.0 for the segments or areas of the water bodies listed in Table 5.0

c. COMPLIANCE SCHEDULE

(1) Baby Beach in Dana Point Harbor

(a) WLA Compliance Dates

The Responsible Copermittees for MS4 discharges to Baby Beach are required to achieve the WLA, thus must be in compliance with the WQBELs under Specific Provision 5.0, according to the following compliance schedule:

Table 4.3
Compliance Schedule Dates to Achieve Baby Beach WLAs

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform	September 15, 2014	September 15, 2009
Fecal Coliform		September 15, 2009
Enterococcus		September 15, 2019

(b) Interim Compliance Requirements

The Responsible Copermittees for MS4 discharges to Baby Beach must comply with the following interim WQBELs by the interim compliance date:

Table 4.4
Interim Effluent Limitations as Loads in MS4 Discharges to Baby Beach

Constituent	Interim Compliance Date	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	5.32×10^9 MPN/day	NA*
Fecal Coliform	September 15, 2012	0.59×10^9 MPN/day	NA*
Enterococcus	September 15, 2012	0.42×10^9 MPN/day	NA**
	September 15, 2016	NA*	207×10^9 MPN/30days

Notes:
* The WQBELs under Specific Provision 5.b must already be achieved by the given interim compliance date.
** There is no corresponding interim WQBEL for the given interim compliance date.

(2) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park is required to achieve the WLA, thus must be in compliance with the WQBELs under Specific Provision 5.0, by December 31, 2012.

d. COMPLIANCE DETERMINATION

Compliance with WQBELs or WLAs may be demonstrated via any one of the following methods:

(1) There is no discharge from the MS4, or

(2) Applicable effluent limitations are met, or

(3) Receiving waters meet the applicable receiving water limitations or water quality objective, or

(4) Loading from the MS4 is such that it does not cause water quality objective exceedances, or

(5) Implementation of a Water Quality Improvement Plan determined by the Regional Board Executive Officer to comply with Provision A as described in Provision A.4.

~~d.~~e. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) Monitoring Stations and Procedures

The Responsible Copermittees must implement the monitoring requirements issued under Order No. R9-2008-0027.

~~(a) designate the MS4 outfalls within their jurisdiction discharging to the segments or areas of the water bodies listed in Table 5.0 as high priority non-storm water MS4 monitoring stations, in accordance with the requirements of Provision D.1.~~

~~(b)~~

~~(c) The Responsible Copermittees must establish at least one monitoring station within the receiving water body.~~

~~(2) Monitoring Procedures~~

~~(a) The Responsible Copermittees must monitor the effluent of the designated MS4 outfalls within their jurisdiction discharging during dry weather conditions to the segments or areas of the water bodies listed in Table 5.0 in accordance with the dry weather jurisdictional monitoring requirements of Provision D.1.a.(1)(b). Samples required to be submitted to a laboratory for analysis must include analysis for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.~~

~~(b) The Responsible Copermittees must monitor, within the first 24 hours of each storm event,[25] the effluent of the designated MS4 outfalls within their~~

~~[25] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].~~

~~jurisdiction discharging to the segments or areas of the water bodies listed in Table 5.0 in accordance with the wet weather jurisdictional monitoring requirements of Provision D.1.b.(1)(b) of this Order. Samples required to be submitted to a laboratory for analysis must include analysis for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.~~

~~(c) The Responsible Copermittees must collect samples from the monitoring stations within the receiving water body for each dry weather and wet weather MS4 outfall monitoring event. Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.~~

~~(3)~~(2) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs have been achieved.

(b) The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

5. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2010-0001

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date: February 10, 2010
State Water Board Approval Date: December 14, 2010
Office of Administrative Law Approval Date: April 4, 2011
US EPA Approval Date: June 22, 2011

(3) TMDL Effective Date: April 4, 2011

(4) Watershed Management Areas: See Table 6.0

(5) Water Bodies: See Table 6.0

The water bodies identified in Table 6.0 are subject to the requirements of this Attachment E, except those water bodies listed in Table 6.0 that have been delisted from the 303(d) list for REC-1 bacteria impairments. These delisted water bodies are not subject to the requirements of this Attachment E so long as monitoring data continues to support compliance with water quality standards.

(6) Responsible Copermittees: See Table 6.0

Table 5.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	-City of Laguna Beach -County of Orange -Orange County Flood Control District
		at Heisler Park - North	
	Pacific Ocean Shoreline	at Main Laguna Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Woods -County of Orange -Orange County Flood Control District
		Laguna Beach at Ocean Avenue	
		Laguna Beach at Cleo Street	
		Arch Cove at Bluebird Canyon Road	
		Laguna Beach at Dumond Drive	

Table 5.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County (cont'd)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Hills -City of Laguna Niguel -City of Laguna Woods -City of Lake Forest -City of Mission Viejo -County of Orange -Orange County Flood Control District
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	
	Aliso Creek Mouth	at mouth	
	Pacific Ocean Shoreline	Aliso Beach at West Street	-City of Dana Point -City of Laguna Beach -City of Laguna Niguel -County of Orange -Orange County Flood Control District
		Aliso Beach at Table Rock Drive	
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)	
		at Salt Creek (large outlet)	
		Salt Creek Beach at Salt Creek service road	
		Salt Creek Beach at Strand Road	
	Pacific Ocean Shoreline	at San Juan Creek	-City of Dana Point -City of Laguna Hills -City of Laguna Niguel -City of Mission Viejo -City of Rancho Santa Margarita -City of San Juan Capistrano -County of Orange -Orange County Flood Control District
	San Juan Creek	lower 1 mile	
	San Juan Creek Mouth	at mouth	

Table 5.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I- Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County (cont'd)	Pacific Ocean Shoreline	at Poche Beach	- City of Dana Point -City of San Clemente -County of Orange -Orange County Flood Control District
		Ole Hanson Beach Club Beach at Pico Drain	
		San Clemente City Beach at El Portal Street Stairs	
		San Clemente City Beach at Mariposa Street	
		San Clemente City Beach at Linda Lane	
		San Clemente City Beach at South Linda Lane	
		San Clemente City Beach at Lifeguard Headquarters	
		under San Clemente Municipal Pier	
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	
		San Clemente State Beach at Riviera Beach	
		Can Clemente State Beach at Cypress Shores	
San Luis Rey River	Pacific Ocean Shoreline	at San Luis Rey River mouth	-City of Oceanside -City of Vista -County of San Diego
Carlsbad	Pacific Ocean Shoreline	at Moonlight State Beach	-City of Carlsbad -City of Encinitas -City of Escondido -City of Oceanside -City of San Marcos -City of Solana Beach -City of Vista -County of San Diego
San Dieguito River	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	-City of Del Mar -City of Escondido -City of Poway -City of San Diego -City of Solana Beach -County of San Diego
Penasquitos (Miramar Reservior HA)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	-City of Del Mar -City of Poway -City of San Diego -County of San Diego
Mission Bay	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	-City of San Diego
		La Jolla Shores Beach at Caminito del Oro	

Table 5.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I- Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
		La Jolla Shores Beach at Vallecitos	
Mission Bay (cont'd)	Pacific Ocean Shoreline	La Jolla Shores Beach at Avenida de la Playa	-City of San Diego
		at Casa Beach, Children's Pool	
		South Casa Beach at Coast Boulevard	
		Whispering Sands Beach at Ravina Street	
		Windansea Beach at Vista de la Playa	
		Windansea Beach at Bonair Street	
		Windansea Beach at Playa del Norte	
		Windansea Beach at Palomar Avenue	
		at Tourmaline Surf Park	
		Pacific Beach at Grand Avenue	
	Tecolote Creek	Entire reach and tributaries	-City of San Diego
San Diego River	Forrester Creek	lower 1 mile	City of El Cajon ~~-City of La Mesa~~ -City of Santee -County of San Diego
	San Diego River	lower 6 miles	-City of El Cajon -City of La Mesa -City of San Diego -City of Santee -County of San Diego
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	
San Diego Bay	Chollas Creek	lower 1.2 miles	-City of La Mesa -City of Lemon Grove -City of San Diego -County of San Diego -San Diego Unified Port District

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for segments or areas of the water bodies listed in Table 6.0 consist of the following:

~~(1) Receiving Water Limitations~~

~~(a) Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedules under Specific Provision 6.c.(1):~~

~~**Table 6.1**~~
~~*Receiving Water Limitations as Bacteria Densities and Allowable Exceedance Frequencies in the Water Body*~~

	~~Receiving Water Limitations~~			
~~Constituent~~	~~Single Sample Maximum[1,2] (MPN/100mL)~~	~~Single Sample Maximum Allowable Exceedance Frequency[3]~~	~~30-Day Geometric Mean[2] (MPN/100mL)~~	~~30-Day Geometric Mean Allowable Exceedance Frequency~~
~~Total Coliform~~	~~10,000~~	~~22% / 0%~~	~~1,000~~	~~0%~~
~~Fecal Coliform~~	~~400~~	~~22% / 0%~~	~~200~~	~~0%~~
~~*Enterococcus*~~	~~104[4] / 61[5]~~	~~22% / 0%~~	~~35[4] / 33[5]~~	~~0%~~

~~Notes:~~
~~1. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.~~
~~2. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.~~
~~3. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. The 0% single sample maximum allowable exceedance frequency applies to dry weather days.~~
~~4. This *Enterococcus* receiving water limitation applies to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.~~
~~5. This *Enterococcus* receiving water limitations applies to segments or areas of creeks or creek mouths listed in Table 6.0.~~

~~Interim receiving water limitations expressed as allowable exceedance frequencies are given in the compliance schedule under Specific Provision 6.fff.~~

~~(b) If the above receiving water limitations are not met in the receiving water, the Responsible Copermittees must demonstrate that the discharges from the MS4s are not causing or contributing to the violation of receiving water limitations. The Copermittee must provide data that demonstrate the discharges from the MS4s are meeting the effluent limitations under Specific Provision 6.b..~~

~~(2)~~(1) Effluent Limitations

Discharges from the MS4s must not ~~contain densities that exceed the following effluent limitations by the end of the compliance schedules under Specific Provision 6.c. to demonstrate the discharge is not causing~~cause or ~~contributing~~contribute to a violation of receiving water ~~quality standards~~limitations. The mass-based waste load allocations presented in Resolution No. R9-2010-0001 can be used to demonstrate that loading from the MS4 is such that it does not cause water quality objective exceedances, as described in bullet (4) under Specific Provision 6.d. ~~:~~

~~**Table 6.2**~~
~~*Effluent Limitations as Bacteria Densities and Allowable Exceedance Frequencies in MS4 Discharges to the Water Body*~~

	~~Effluent Limitations~~			
~~Constituent~~	~~Single Sample Maximum[1,2] (MPN/100mL)~~	~~Single Sample Maximum Allowable Exceedance Frequency[3]~~	~~30-Day Geometric Mean[2] (MPN/100mL)~~	~~30-Day Geometric Mean Allowable Exceedance Frequency~~
~~Total Coliform~~	~~10,000~~	~~22% / 0%~~	~~1,000~~	~~0%~~
~~Fecal Coliform~~	~~400~~	~~22% / 0%~~	~~200~~	~~0%~~
~~*Enterococcus*~~	~~104[4] / 61[5]~~	~~22% / 0%~~	~~35[4] / 33[5]~~	~~0%~~

~~Notes:~~
~~1. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.~~
~~2. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.~~
~~3. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. The 0% single sample maximum allowable exceedance frequency applies to dry weather days~~
~~4. This *Enterococcus* effluent limitation applies to MS4 discharges to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.~~
~~5. This *Enterococcus* effluent limitation applies to MS4 discharges to segments or areas of creeks or creek mouths listed in Table 6.0.~~

~~Interim effluent limitations expressed as allowable exceedance frequencies are given in the compliance schedule under Specific Provision 6.c.~~

~~(3)~~(2) Best Management Practices

(a) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 6.0 ~~fulfill~~will incorporate the Comprehensive Load Reduction ~~Plan~~Plans (CLRP) ~~requirements in~~drafted pursuant to Resolution No. R9-2010-0001.

(b) The Responsible Copermittee ~~must~~may implement BMPs ~~capable of achieving~~to support the achievement of WQBELs under Specific Provision 6.~~cee~~ b for the segments or areas of the water bodies listed in Table 6.0.

(c) The Responsible Copermittees ~~should coordinate~~may implement BMPs to support the ~~BMPs~~achievement of ~~to address~~ this TMDL with Caltrans and owners/operators of small MS4s ~~wherever and whenever~~, as possible.

c. Compliance Schedule

(1) WLA Compliance Dates

The Responsible Copermittees for MS4 discharges to a segment or area of the water bodies listed in Table 6.0 are required to achieve the WLA, thus must be in compliance with the WQBELs under Specific Provision 6.0, according to the following compliance schedule:

Table 5.2
Compliance Schedule Dates to Achieve Indicator Bacteria WLAs

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform[1]	April 4, 2021	April 4, 2031
Fecal Coliform		
Enterococcus		

1 - Total coliform receiving water limitations apply only to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.

(2) Interim Compliance Requirements

The Responsible Copermittees must comply with the ~~following~~ interim WQBELs by the interim compliance dates~~:~~ provided as part of the CLRP and supported by Order No. R9-2010-0001.

(a) Interim Dry Weather WQBELs

Interim dry weather WQBELS are expressed as receiving water limitations. The Responsible Copermittee must calculate the "existing" exceedance frequencies of the 30-day geometric mean water quality objectives for each of the indicator bacteria by analyzing the monitoring data collected between January 1, 2002 and April 4, 2011. "Existing" exceedance frequencies may be calculated by segment or area of a water body, or by water body, and/or by Watershed Management Area listed in Table 6.0. Separate "existing" exceedance frequencies must be calculated for beaches and creeks/creek mouths.

The Responsible Copermittees must achieve a 50 percent reduction in the "existing" exceedance frequency of the 30-day geometric mean WQBELs for the segments or areas of the water bodies listed in Table 6.0 ~~by the interim compliance dates for achieving the interim dry weather WQBELs given in Table 6.5~~. A 50 percent reduction in the "existing" exceedance frequency is equivalent to half of the "existing" exceedance frequency of the 30-day geometric mean WQBELs.

(3) Submittals to Support TMDL Basin Plan Amendment

The Responsible Copermittees are encouraged to submit data to support the TMDL reopener scheduled for April 2016 including but not limited to data related to reference watershed monitoring and beneficial use usage frequency.

~~The "existing" exceedance frequencies and the interim dry weather allowable exceedance frequencies (i.e. interim dry weather WQBELs) calculated by the Responsible Copermittees must be included in the Water Quality Improvement Plans for the applicable Watershed Management Areas.~~

~~Interim Wet Weather WQBELs~~

~~The Responsible Copermittees must achieve the interim wet weather WQBELs in Table~~

~~6.4, expressed as interim allowable exceedance frequencies, by the interim compliance dates for achieving the interim wet weather WQBELs given in Table 6.5.~~

~~Table 6.4~~
~~Interim Wet Weather WQBELs Expressed as~~
~~Interim Wet Weather Allowable Exceedance Frequencies~~

~~Watershed Management Area~~	~~Water Body~~	~~Segment or Area~~	~~Interim Wet Weather Allowable Exceedance Frequencies~~		
			~~Total Coliform~~	~~Fecal Coliform~~	~~Enterococcus~~
~~South Orange County~~	~~Pacific Ocean Shoreline~~	~~Cameo Cove at Irvine Cove Drive – Riviera Way~~	~~38%~~	~~37%~~	~~39%~~
		~~at Heisler Park - North~~			
	~~Pacific Ocean Shoreline~~	~~at Main Laguna Beach~~			
		~~Laguna Beach at Ocean Avenue~~			
		~~Laguna Beach at Cleo Street~~			
		~~Arch Cove at Bluebird Canyon Road~~			
		~~Laguna Beach at Dumond Drive~~			
	~~Pacific Ocean Shoreline~~	~~Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach~~	~~41%~~	~~41%~~	~~42%~~
	~~Aliso Creek~~	~~Entire reach (7.2 miles) and associated tributaries:~~ ~~- Aliso Hills Channel~~ ~~- English Canyon Creek~~ ~~- Dairy Fork Creek~~ ~~- Sulfur Creek~~ ~~- Wood Canyon Creek~~	~~41%~~	~~41%~~	~~42%~~
	~~Aliso Creek Mouth~~	~~at mouth~~	~~41%~~	~~41%~~	~~42%~~

	~~Pacific Ocean Shoreline~~	~~Aliso Beach at West Street~~	~~36%~~	~~36%~~	~~36%~~
		~~Aliso Beach at Table Rock Drive~~			
		~~100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)~~			
		~~at Salt Creek (large outlet)~~			
		~~Salt Creek Beach at Salt Creek service road~~			
		~~Salt Creek Beach at Strand Road~~			

~~Table 6.4 (Cont'd)~~
~~Interim Wet Weather WQBELs Expressed as~~
~~Interim Wet Weather Allowable Exceedance Frequencies~~

~~Watershed Management Area~~	~~Water Body~~	~~Segment or Area~~	~~Interim Wet Weather Allowable Exceedance Frequencies~~		
			~~Total Coliform~~	~~Fecal Coliform~~	~~Enterococcus~~
~~South Orange County (cont'd)~~	~~Pacific Ocean Shoreline~~	~~at San Juan Creek~~	~~44%~~	~~44%~~	~~48%~~
	~~San Juan Creek~~	~~lower 1 mile~~	~~44%~~	~~44%~~	~~47%~~
	~~San Juan Creek Mouth~~	~~at mouth~~	~~44%~~	~~44%~~	~~47%~~
	~~Pacific Ocean Shoreline~~	~~at Poche Beach~~	~~35%~~	~~35%~~	~~36%~~
		~~Ole Hanson Beach Club Beach at Pico Drain~~			
		~~San Clemente City Beach at El Portal Street Stairs~~			
		~~San Clemente City Beach at Mariposa Street~~			
		~~San Clemente City Beach at Linda Lane~~			
		~~San Clemente City Beach at South Linda Lane~~			
		~~San Clemente City Beach at Lifeguard Headquarters~~			
		~~under San Clemente Municipal Pier~~			
		~~San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)~~			

		~~San Clemente State Beach at Riviera Beach~~			
		~~Can Clemente State Beach at Cypress Shores~~			
~~San Luis Rey River~~	~~Pacific Ocean Shoreline~~	~~at San Luis Rey River mouth~~	~~45%~~	~~44%~~	~~47%~~
~~Carlsbad~~	~~Pacific Ocean Shoreline~~	~~at Moonlight State Beach~~	~~40%~~	~~40%~~	~~41%~~
~~San Dieguito River~~	~~Pacific Ocean Shoreline~~	~~at San Dieguito Lagoon mouth~~	~~33%~~	~~33%~~	~~36%~~

~~Table 6.4 (Cont'd)~~
~~Interim Wet Weather WQBELs Expressed as~~
~~Interim Wet Weather Allowable Exceedance Frequencies~~

~~Watershed Management Area~~	~~Water Body~~	~~Segment or Area~~	~~Interim Wet Weather Allowable Exceedance Frequencies~~ ~~Total Coliform~~	~~Fecal Coliform~~	~~Enterococcus~~
~~Penasquitos~~	~~Pacific Ocean Shoreline~~	~~Torrey Pines State Beach at Del Mar (Anderson Canyon)~~	~~26%~~	~~26%~~	~~26%~~
	~~Pacific Ocean Shoreline~~	~~La Jolla Shores Beach at El Paseo Grande~~	~~37%~~	~~37%~~	~~37%~~
		~~La Jolla Shores Beach at Caminito del Oro~~			
		~~La Jolla Shores Beach at Vallecitos~~			
		~~La Jolla Shores Beach at Avenida de la Playa~~			
		~~at Casa Beach, Children's Pool~~			
		~~South Casa Beach at Coast Boulevard~~			
		~~Whispering Sands Beach at Ravina Street~~			
		~~Windansea Beach at Vista de la Playa~~			
		~~Windansea Beach at Bonair Street~~			
		~~Windansea Beach at Playa del Norte~~			
		~~Windansea Beach at Palomar Avenue~~			
		~~at Tourmaline Surf Park~~			
		~~Pacific Beach at Grand Avenue~~			

	~~Tecolote Creek~~	~~Entire reach and tributaries~~	~~49%~~	~~49%~~	~~51%~~
~~San Diego River~~	~~Forrester Creek~~	~~lower 1 mile~~	~~46%~~	~~43%~~	~~49%~~
	~~San Diego River~~	~~lower 6 miles~~	~~46%~~	~~43%~~	~~49%~~
	~~Pacific Ocean Shoreline~~	~~at San Diego River mouth at Dog Beach~~	~~46%~~	~~43%~~	~~51%~~
~~San Diego Bay~~	~~Chollas Creek~~	~~lower 1.2 miles~~	~~41%~~	~~41%~~	~~43%~~

~~Interim WQBEL Compliance Dates~~

~~The Responsible Copermittees must achieve the interim WQBELs under Specific Provisions 6.c.(2) and 6.c.(2) by the interim compliance dates given in Table 6.5.~~

~~Table 6.5~~
~~Interim Compliance Dates to Achieve Interim WQBELs~~

~~Watershed Management Area~~	~~Water Body~~	~~Segment or Area~~	~~Interim Compliance Dates~~ ~~Interim Dry Weather WQBELs~~	~~Interim Wet Weather WQBELs~~
~~South Orange County~~	~~Pacific Ocean Shoreline~~	~~Cameo Cove at Irvine Cove Drive – Riviera Way~~	~~April 4, 2016~~	~~April 4, 2021~~
		~~at Heisler Park – North~~		
	~~Pacific Ocean Shoreline~~	~~at Main Laguna Beach~~	~~April 4, 2016~~	~~April 4, 2021~~
		~~Laguna Beach at Ocean Avenue~~		
		~~Laguna Beach at Cleo Street~~		
		~~Arch Cove at Bluebird Canyon Road~~		
		~~Laguna Beach at Dumond Drive~~		
	~~Pacific Ocean Shoreline~~	~~Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach~~	~~April 4, 2016~~	~~April 4, 2021~~
	~~Aliso Creek~~	~~Entire reach (7.2 miles) and associated tributaries:~~ ~~- Aliso Hills Channel~~ ~~- English Canyon Creek~~ ~~- Dairy Fork Creek~~ ~~- Sulfur Creek~~ ~~- Wood~~	~~April 4, 2018~~	~~April 4, 2021~~

		~~Canyon Creek~~		
	~~Aliso Creek Mouth~~	~~at mouth~~	~~April 4, 2018~~	~~April 4, 2021~~
	~~Pacific Ocean Shoreline~~	~~Aliso Beach at West Street~~	~~April 4, 2016~~	~~April 4, 2021~~
		~~Aliso Beach at Table Rock Drive~~		
		~~100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)~~		
		~~at Salt Creek (large outlet)~~		
		~~Salt Creek Beach at Salt Creek service road~~	~~April 4, 2017~~	~~April 4, 2021~~
		~~Salt Creek Beach at Strand Road~~	~~April 4, 2017~~	~~April 4, 2021~~

~~Table 6.5 (Cont'd)~~
~~Interim Compliance Dates to Achieve Interim WQBELs~~

~~Watershed Management Area~~	~~Water Body~~	~~Segment or Area~~	~~Interim Compliance Dates~~ ~~Interim Dry Weather WQBELs~~	~~Interim Wet Weather WQBELs~~
~~South Orange County (cont'd)~~	~~Pacific Ocean Shoreline~~	~~at San Juan Creek~~	~~April 4, 2016~~	~~April 4, 2021~~
	~~San Juan Creek~~	~~lower 1 mile~~	~~April 4, 2018~~	~~April 4, 2021~~
	~~San Juan Creek Mouth~~	~~at mouth~~	~~April 4, 2016~~	~~April 4, 2021~~
	~~Pacific Ocean Shoreline~~	~~at Poche Beach~~	~~April 4, 2016~~	~~April 4, 2021~~
		~~Ole Hanson Beach Club Beach at Pico Drain~~	~~April 4, 2016~~	~~April 4, 2021~~
		~~San Clemente City Beach at El Portal Street Stairs~~	~~April 4, 2017~~	~~April 4, 2021~~
		~~San Clemente City Beach at Mariposa Street~~		
		~~San Clemente City Beach at Linda Lane~~	~~April 4, 2016~~	~~April 4, 2021~~
		~~San Clemente City Beach at South Linda Lane~~	~~April 4, 2018~~	~~April 4, 2021~~
		~~San Clemente City Beach at Lifeguard Headquarters~~	~~April 4, 2017~~	~~April 4, 2021~~
		~~under San Clemente Municipal Pier~~		
		~~San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)~~	~~April 4, 2018~~	~~April 4, 2021~~

		~~San Clemente State Beach at Riviera Beach~~	~~April 4, 2016~~	~~April 4, 2021~~
		~~Can Clemente State Beach at Cypress Shores~~	~~April 4, 2017~~	~~April 4, 2021~~
~~San Luis Rey River~~	~~Pacific Ocean Shoreline~~	~~at San Luis Rey River mouth~~	~~April 4, 2017~~	~~April 4, 2021~~
~~Carlsbad~~	~~Pacific Ocean Shoreline~~	~~at Moonlight State Beach~~	~~April 4, 2016~~	~~April 4, 2021~~
~~San Dieguito River~~	~~Pacific Ocean Shoreline~~	~~at San Dieguito Lagoon mouth~~	~~April 4, 2016~~	~~April 4, 2021~~

~~Table 6.5 (Cont'd)~~
~~Interim Compliance Dates to Achieve Interim WQBELs~~

~~Watershed Management Area~~	~~Water Body~~	~~Segment or Area~~	~~Interim Compliance Dates~~ ~~Interim Dry Weather WQBELs~~	~~Interim Wet Weather WQBELs~~
~~Penasquitos~~	~~Pacific Ocean Shoreline~~	~~Torrey Pines State Beach at Del Mar (Anderson Canyon)~~	~~April 4, 2016~~	~~April 4, 2021~~
	~~Pacific Ocean Shoreline~~	~~La Jolla Shores Beach at El Paseo Grande~~		
		~~La Jolla Shores Beach at Caminito del Oro~~		
		~~La Jolla Shores Beach at Vallecitos~~		
		~~La Jolla Shores Beach at Avenida de la Playa~~		
		~~at Casa Beach, Children's Pool~~		
		~~South Casa Beach at Coast Boulevard~~		
		~~Whispering Sands Beach at Ravina Street~~		
		~~Windansea Beach at Vista de la Playa~~		
		~~Windansea Beach at Bonair Street~~		
		~~Windansea Beach at Playa del Norte~~		
		~~Windansea Beach at Palomar Avenue~~		
		~~at Tourmaline Surf Park~~		
		~~Pacific Beach at Grand Avenue~~		
	~~Tecolote Creek~~	~~Entire reach and tributaries~~		

~~San Diego River~~	~~Forrester Creek~~	~~lower 1 mile~~	~~April 4, 2018~~	~~April 4, 2021~~
	~~San Diego River~~	~~lower 6 miles~~		
	~~Pacific Ocean Shoreline~~	~~at San Diego River mouth at Dog Beach~~		
~~San Diego Bay~~	~~Chollas Creek~~	~~lower 1.2 miles~~	~~April 4, 2018~~	~~April 4, 2021~~

a. COMPLIANCE DETERMINATION

Compliance with WQBELs or WLAs may be demonstrated via any one of the following methods:

(1) There is no discharge from the MS4, or

(2) Applicable effluent limitations are met, or

(3) Receiving waters meet the applicable receiving water limitations or water quality objective, or

(4) Loading from the MS4 is such that it does not cause water quality objective exceedances, or

(5) Implementation of a Water Quality Improvement Plan determined by the Regional Board Executive Officer to comply with Provision A as described in Provision A.4.

The Phase I MS4s may demonstrate that their discharges are not causing the exceedances in the receiving waters by providing data from their discharge points to the receiving waters, by providing data collected at jurisdictional boundaries, and/or by using other methods accepted by the San Diego Water Board. Otherwise, at the end of the dry weather TMDL compliance schedule, the municipal Phase I MS4s will be held responsible and considered out of compliance unless other information or evidence indicates another controllable or uncontrollable source is responsible for the exceedances in the receiving waters. If controllable sources other than discharges from the municipal Phase I MS4s are identified before or after the end of the dry weather TMDL Compliance Schedule as causing the exceedances, those controllable sources will be responsible for reducing their bacteria loads and/or demonstrating that discharges from those sources are not causing the exceedances. The San Diego Water Board shall implement additional actions (e.g., issue enforcement actions, amend existing NPDES requirements or conditional waivers), as needed, to bring all controllable sources into compliance with the dry weather TMDLs.

e. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

The Bacteria Load Reduction Plans (BLRPs) and CLRPs to be submitted by the Copermittees and approved by the Regional Board Executive Officer contain

monitoring programs. Implementation of those Regional Board-approved monitoring programs constitutes compliance with the Monitoring Station and Monitoring Procedure requirements, described below.

(1) Monitoring and Assessment Requirements for Beaches

(a) Monitoring Stations

~~(i) The Responsible Copermittees must designate the MS4 outfalls within their jurisdiction discharging to the Pacific Ocean Shoreline segments or areas listed in Table 6.0 as high priority non-storm water MS4 monitoring stations, in accordance with the requirements of Provision of this Order.~~

~~(ii) For the Pacific Ocean Shoreline segments or areas listed in Table 6.0 with MS4 outfalls, the Responsible Copermittees must establish at least one monitoring station within the receiving water.~~

For beaches addressed by these TMDLs, monitoring locations should consist of, at a minimum, the same locations used to collect data required under MS4 NPDES monitoring requirements and beach monitoring for Health and Safety Code section 115880.[75] If exceedances of the receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations and/or other source identification methods must also be used to demonstrate that the bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations at least once within the first 24 hours of the end of a storm event[26] that occurs during the rainy season (i.e., October 1 through April 30).

~~(i) The Responsible Copermittees must monitor, within the first 24 hours of each storm event,[27] the effluent of the designated MS4 outfalls within their jurisdiction discharging to the Pacific Ocean Shoreline segments or areas listed in Table 6.0 in accordance with the wet weather jurisdictional monitoring requirements of Provision of this Order. Samples required to be submitted to a laboratory for analysis must include analysis for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.~~

~~(ii)~~(iii) ~~The Responsible Copermittees must collect samples from the monitoring stations within the receiving water body for each dry weather and wet weather MS4 outfall monitoring event.~~ Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs for the Pacific Ocean Shoreline segments or areas listed in Table 6.0 have been achieved.

[26] Commonly referred to as AB 411 monitoring

~~(i)~~(ii) The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

[26] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

~~[27] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].~~

(2) Monitoring and Assessment Requirements for Creeks and Creek Mouths

(a) Monitoring Stations

~~(i) The Responsible Copermittees must establish at least one receiving water monitoring station at or near the mouth of the creeks listed in Table 6.0.~~

~~(ii)~~

~~(iii) The Responsible Copermittees must establish at least one receiving water monitoring station upstream of the station established for Specific Provision 6.d.(2)(a). At least one monitoring station must be established for each Responsible Copermittee at the most downstream location within its jurisdiction, and one monitoring station at the most upstream location within its jurisdiction.~~

~~(iv) The Responsible Copermittees must identify the MS4 outfalls discharging to the segments or areas of the creeks and creek mouths listed in Table 6.0. The Responsible Copermittees must identify the MS4 outfalls that are monitored in accordance with the dry weather jurisdictional monitoring requirements of Provision of this Order and the wet weather jurisdictional monitoring requirements of Provision of this Order.~~

For creeks addressed by these TMDLs, monitoring locations should consist of, at a minimum, a location at or near the mouth of the creek (e.g., Mass Loading Station or Mass Emission Station) and one or more locations upstream of the mouth (e.g., Watershed Assessment Stations). If exceedances of the receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations and/or other source identification methods must also be used to demonstrate that the bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations ~~at least monthly.~~ according to the WQIP.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations within the first 24 hours of the end of a storm event[28] that occurs during the rainy season (i.e., October 1 through April 30).

(iii) Samples collected from receiving water monitoring stations must be analyzed for ~~total coliform,~~ fecal coliform~~,~~ and *Enterococcus* indicator bacteria.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the receiving water monitoring data to assess whether the interim and final receiving water WQBELs for the creeks and creek mouths listed in Table 6.0 have been achieved.

~~(ii) If the receiving water WQBELs for the creeks and creek mouths listed in Table 6.0 have not been achieved, the Responsible Copermittees must review the MS4 outfall monitoring data to assess whether the interim and final effluent WQBELs have been achieved.~~

~~(iii) The Responsible Copermittee must identify and incorporate additional MS4 outfall and receiving water monitoring stations and/or adjust monitoring frequencies to identify sources causing exceedances of the receiving water WQBELs.~~

(ii) The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

[28] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

Walsh, Laurie@Waterboards

From: Helen Davies <HDavies@ci.santee.ca.us>
Sent: Friday, September 14, 2012 3:32 PM
To: Walsh, Laurie@Waterboards; Gibson, David@Waterboards
Subject: City of Santee Comment on Draft Regional Municipal Permit R9-2012-0011
Attachments: Scanned from a Xerox multifunction device001.pdf

Dave and Laurie,

Please see attached a comment letter from our Deputy City Manager Pedro Orso Delgado.

Regards,

Helen

CITY OF SANTEE

MAYOR
Randy Voepel

CITY COUNCIL
Jack E. Dale
Rob McNelis
John W. Minto
John Ryan

CITY MANAGER
Keith Till

September 14, 2012

Mr. David Gibson
Executive Officer
Regional Water Quality Control Board San Diego Region
9174 Sky Park Court, Suite 100
San Diego, Ca 92123

SUBJECT: DRAFT REGIONAL MUNICIPAL PERMIT

Dear ~~Mr. Gibson~~, Dave

I am writing to express the City of Santee's general support for the revised comments being submitted on behalf of the San Diego County Copermittees. We have been actively participating in the development of these comments; the focused meetings; and associated discussions with RWQCB staff and stakeholders.

We appreciate the opportunity to constructively participate in the development of this permit and hope that the RWQCB will continue the discussion with us as the administrative draft is developed.

We commend your leadership in enabling this process to occur.

Pedro Orso Delgado, P.E.
Deputy City Manager/Director of Development Services

Walsh, Laurie@Waterboards

From: Paul Hartman <phartman@ci.vista.ca.us>
Sent: Friday, September 14, 2012 4:21 PM
To: Walsh, Laurie@Waterboards
Subject: City of Vista comments
Attachments: City of Vista Comment Letter ADTO R9-2012-0011.pdf

Hi Laurie,

Attached please find the City of Vista's comment letter addressing the Administrative Draft Tentative Order. Please confirm your receipt.

Thank you! Have a great weekend!

Paul Hartman
Stormwater Program Manager
200 Civic Center Drive
Vista, CA 92084
(760) 726-1340 x1373

CITY OF VISTA
CALIFORNIA

September 14, 2012

Regional Water Quality Control Board
Attention: Ms. Laurie Walsh
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Subject: **City of Vista Comments regarding the Administrative Draft of the Tentative Order No. R9-2012-0011, the NPDES Permit for Municipal Separate Storm Sewer Systems (MS4) Draining the Watersheds within the San Diego Region**

Dear Ms. Walsh:

The City of Vista appreciates the efforts that the Regional Water Board staff has undertaken to involve the stakeholders in the development of the new permit. The release of the administrative draft to the stakeholders is a positive step that fosters early and collaborative input and will provide for an improved Tentative Order when released. The focused meetings were successful in bringing together the various stakeholders and provided for fruitful discussions of the permit requirements that allowed for the expression of many points of view. Thank you for these efforts.

The City of Vista participated in the development of the comments submitted by the County of San Diego on behalf of the 21 Copermittees in San Diego County. We support the comments and look forward to their inclusion in the revised Tentative Order. Additionally, we respectfully submit the following comments for your consideration. Due to staffing limitations and time constraints, these comments were unable to be put forward for consideration in the Copermittee comments.

1. E.4.b.(2) - Construction Site Inventory and Tracking: This section addresses minimums in determining construction sites that are a high threat to water quality. The requirement to "identify all construction sites within its jurisdiction that represent a high threat to downstream surface water quality" is acceptable practice. However, the following requirements to include all sites within areas of the watershed that have water bodies that are impacted by sediment does not allow for prioritization of construction sites. **The statement "At a minimum, high threat to water quality sites must include:" should be changed to read "At a minimum, prioritization of construction sites must consider:"**

   Through many discussions with Regional Board Staff, the City understands that the concept of prioritization and adaptation is supported and will be incorporated throughout the permit. The City would appreciate the latitude to prioritize construction sites appropriately. In the past, prioritization has been accomplished taking many factors into account including site size, erosion potential, location related to an Environmentally Sensitive Area, sediment impaired waterbodies, etc. When

determining the threat to water quality of a construction site, the overall potential for the discharge of sediment is the critical consideration with respect to determining priority. The watershed and receiving water problems should be a factor in this determination, but should not automatically deem construction sites a high priority, regardless of other factors.

As written, it is likely that small sites, with limited ground disturbance and a low threat to water quality, will be deemed high priority due to their location within the jurisdiction. This may result in a misdirection of resources to provide frequent inspections at these sites with relatively little benefit to water quality.

2. Attachment C: **The definition of Monitoring Year should be changed to October 1 through September 30** to align with hydrologic patterns. This modification will allow for reporting of a full wet season followed by the subsequent dry season. This definition is consistent with the proposed Provision D submitted by the San Diego County Copermittees. Defining the monitoring year as written (July 1 – June 30) breaks up the dry season which will present challenges and inconsistencies in data interpretation and reporting.

We understand the need to balance the collaborative process in the development of the permit with the regulatory oversight incumbent on the Regional Water Quality Control Board. Thank you for the opportunities provided thus far for the Copermittees to add their experience and insights to the process. We look forward to further discussions on the concepts put forward as we all work towards a permit that will efficiently and effectively lead to improvements in water quality in the San Diego Region.

Sincerely,

Paul Hartman
Water Quality Protection Program Manager

Walsh, Laurie@Waterboards

From: Suppes, Christy <Christy.Suppes@ocpw.ocgov.com>
Sent: Friday, September 14, 2012 3:58 PM
To: Walsh, Laurie@Waterboards
Cc: Gibson, David@Waterboards; Felix, Tony@Waterboards; Crompton, Chris; Skorpanich, Mary Anne; Boon, Richard; Onuma, Kevin; 'jon.vanrhyn@sdcounty.ca.gov'; 'Padres, Claudio'; 'syhasenin@sandiego.gov'; Ruano, Betty; bfowler@danapoint.org; Crompton, Chris; Chris Macon - Laguna Woods; Suppes, Christy; Devin Slaven - Lake Forest; E. (Max) Maximous - Rancho Santa Margarita; Fortuna, James; Gin, Vincent; Sharp, Grant; Humza Javed - Laguna Hills; Jean Jambon - Laguna Niguel; Voss, Jenna; Shook, Jennifer; Joe Ames - Mission Viejo; jwhitman@cityofalisoviejo.com; Jonathan Orduna - Laguna Niguel; krosenfield@ci.laguna-hills.ca.us; Leslie Keane - Laguna Woods; Lisa Zawaski - Dana Point; Luis Estevez - Lake Forest; Skorpanich, Mary Anne; Mary Vondrak - San Clemente; Mike Phillips - Laguna Beach; Moy Yahya - Aliso Viejo; Nancy Palmer - Laguna Niguel; Nasser Abbaszadeh - San Juan Capistrano; Nguyen, Duc; Peter Meier - Lake Forest; Rae Beimer - Rancho Santa Margarita; Boon, Richard; Richard Schlesinger - Mission Viejo; Tom Bonigut - San Clemente; Tracy Ingebrigtsen - Laguna Beach; Yi, Greg; Ziad Mazboudi - San Juan Capistrano
Subject: County of Orange Comments on Administrative Draft Order No. R9-2012-0111
Attachments: OC Comment Letter - Draft Administrative Order R9-2012-011.pdf; OC Attachment A - Summary Table of Comments.pdf; OC Attachment B.1 - Draft Tentative Order Redline Comments.docx; OC Attachment B.2 - Enforcement Response Plan Alternative.docx; OC Attachment B.3 - Existing Development Management Alternative.docx; OC Attachment C - Monitoring Principles.pdf; OC Attachment D - Proposed Regional Permit Structure.pdf

Good afternoon,

Please find attached comments from the County of Orange on the *Administrative Draft Order No. R9-2012-0011 NPDES No. CAS0109266 National Pollutant Discharge Eliminations System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region.*

Thank you,

Christy Suppes
OC Watershed Program - Stormwater External
2301 N. Glassell St., Orange, CA 92865
(714) 955-0673 tel / (714) 955-0639 fax
christy.suppes@ocpw.ocgov.com
www.ocwatersheds.com

Please note my working hours are 7:30 AM - 5:00 PM, Monday - Thursday, and 7:30 AM - 4:00 PM every other Friday.
For the month of September, I will be in the office on the following Friday(s): 14th and 28th.

ORANGE COUNTY
OC PublicWorks
Our Community. Our Commitment.

Ignacio G. Ochoa, P.E., Interim Director
300 N. Flower Street
Santa Ana, CA

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September 14, 2012

By E-Mail and U.S. Mail

Laurie Walsh
California Regional Water Quality Control Board, San Diego region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4353

Subject: County of Orange Comments on the Administrative Draft of Tentative Order No. R9-2012-0011, NPDES No. CAS0109266

Dear Ms. Walsh:

We are in receipt of April 9, 2012, *Administrative Draft Order No. R9-2012-0011 NPDES No. CAS0109266 National Pollutant Discharge Eliminations System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds Within the San Diego Region*. The County of Orange, as Principal Permittee of the Orange County Stormwater Program, welcomes the opportunity to provide comments on the Draft Administrative Order that has been prepared, distributed, and discussed by your staff. The south Orange County Permittees (Permittees) were involved in the development of these comments and the cities of Aliso Viejo, Dana Point and Mission Viejo have directed that they be recognized as concurring entities on this letter. We also support the comments of the Permittees in Riverside and San Diego Counties (except where noted in the attachments), who have identified many of the same issues with the Administrative Draft Order.

Since April 9, the Permittees have participated with Board staff in an initial public workshop (April 25), four "focused meetings" (June 27, July 11, July 25 and August 22), a hydromodification workshop (August 30), and a final public workshop (September 5). There have also been two separate Orange County-specific meetings. We recognize the significant efforts of your staff to engage the Permittees and key stakeholders in the initial development of this regional permit in a collaborative manner. While you are already aware of our concerns regarding the scheduling and appropriateness of this effort (see prior correspondence dated May 10, 2012, May 17, 2012 and July 3, 2012, which are incorporated by reference), this approach nonetheless represents a notable departure from prior permit renewal processes. It is hoped that this initial consultative effort is a harbinger for meaningful compromise on issues of concern to the Permittees.

In starting to conceive of a fifth term permit, the Permittees share an understanding that MS4 permitting needs to be informed by the following guiding principles:

1. The ability of the Permittees to direct resources toward specific water quality priorities in a given watershed, rather than all potential problems simultaneously, is more likely to result in actual / meaningful improvements in water quality.

2. The Permittees must be able to truly and fully adaptively manage their programs to focus their resources on those BMP strategies and monitoring efforts that are identified in the approved Water Quality Improvement Plan (WQIP) as being most effective, consistent with the MEP standard, to address each watershed's priorities.

3. The regional permit through the Water Quality Improvement plan (WQIP) should enable the Permittees to specify the jurisdictional and regional BMP strategies and the monitoring efforts that will be implemented to address the watershed's highest priorities, monitor and measure progress, identify and control pollutant sources, etc.

4. Once the WQIP is approved by the Regional Board, each Permittee's implementation of their respective responsibilities as laid out and scheduled within the WQIP, should alone constitute compliance with the regional permit.

5. The Jurisdictional Runoff Management Program (JRMP) is a procedural document that describes how each Permittee will accomplish their WQIP responsibilities.

6. The WQIP (and the BMP strategies and Monitoring and Assessment Plans (MAP) therein), should be updated at least every five years based upon the Report of Waste Discharge (ROWD), and as needed in between. Attachment D shows a conceptual representation of how we see the elements of the Draft Administrative Order working together cohesively, which would suggest structural change is needed to the organization of the Order.

7. The JRMP and monitoring program requirements should be written in the regional permit as a "default menu of options," recognizing that the WQIP – which will be publically vetted and approved by the Regional Board – will specify those jurisdictional and regional activities that will be implemented to address the watershed's priorities, the appropriate frequencies, performance standards, and other compliance elements.

We look forward to continuing to meet with Regional Board staff to discuss the development of the Permittees' next permit based upon these principles. In the meantime, we have summarized our overarching concerns with the Draft Administrative Order as general comments in this letter and provide additional comments and concerns in the following attachments:

- Attachment A presents a tabulation on our technical concerns.
- Attachment B presents a redline/strikeout version of the Draft Order.
- Attachment C presents a set of principles regarding monitoring.

- Attachment D presents a conceptual representation of how we see the elements of the Draft Administrative Order working together cohesively.

General Comments

I. MS4 Permitting

In 2009, your staff committed in the last permit renewal to look at consistency with the State's other MS4 permits, notably those being promulgated by the Santa Ana and Los Angeles Regional Boards. This commitment represented recognition of the Little Hoover Commission's highlighting of the lack of consistency in MS4 permits as a critical area of concern and consideration of the regulated communities and USEPA's interest in seeing greater permitting consistency. Nonetheless, while Regional Board staff has stated that the Draft Administrative Order is meant to be a modest incremental update of the current south Orange County permit, it nevertheless escalates the regulatory requirements in many key areas, creates greater variance with the north Orange County permit, and appears to represent a singular rather than statewide vision of the future of MS4 permitting.

To the extent that the Draft Administrative Order may ease the regulatory burden for your staff, there will be a commensurate increase in burden for the local governments that are dealing with multiple Regional Board jurisdictions if permitting in California continues to be defined by divergent rather than convergent approaches. It is therefore necessary for us to seek revisions to the Draft Administrative Order and an enrollment schedule supportive of a more cogent alignment of our countywide program. This consistency is important to the credibility of our respective efforts to manage urban runoff and is vital to sustaining the obvious cost effectiveness of a coordinated countywide program in Orange County with promising synergies in other regions at a time of widespread economic distress for many communities.

It should also be noted that the Draft Administrative Order provides no consideration at all for the five Permittees whose jurisdictional area is regulated under separate permits from the Santa Ana and San Diego Regional Boards.

II. Planning

Since 1993, the Drainage Area Management Plan (DAMP) has provided policy and programmatic guidance to each Permittee in the development of its DAMP/Local Implementation Plan that describes how stormwater management actions will be implemented on a jurisdictional basis (equivalent to the JRMP). It also includes Watershed Workplans (previously Watershed Action Plans) for each of the south Orange County watersheds. Concurrently, the annual progress report has developed into a systematic assessment of program effectiveness at jurisdictional, watershed, and countywide levels of resolution, using California Stormwater Quality Association program effectiveness assessment guidance and a comprehensive environmental quality dataset.

In 2009, it appeared that the DAMP was in danger of being dismissed as inconsequential "procedural correspondence." Consequently, the renewed importance of effective adaptive

management to be described in a policy and program guidance document, i.e., the Water Quality Improvement Plan (WQIP), is welcomed by the Permittees. The attached redline/strikeout version of the Draft Administrative Order provides a number of suggested revisions related to this provision intended to more fully develop this planning process both as a robust basis for compliance and as a basis for ensuring meaningful water quality outcomes. However, the revisions do not address the separation of the planning and reporting processes that is a consequence of the current structure of the Draft Administrative Order. The Permittees believe that such structural adjustments need to be made in Draft Administrative Order to realize the full potential of the WQIP-JRMP alignment and planning and reporting process. See again attached Attachment D.

III. New Requirements for Land Development

The history of MS4 permitting has largely been defined by a focus on land development. In 2009, MS4 programs on a statewide basis started to transition requirements for land development from "treat and release" runoff management to onsite retention, a new emphasis on Low Impact Development (LID), and hydromodification. In 2012, while there is perhaps recognition of an emerging paradigm that the future management of urban landscapes should be based upon the principal of seeking to restore of natural hydrologic processes, there is absolutely no clear consensus on how and where this approach should be effected.

The attached comments are intended to shift the land development program toward an approach based upon nationally accepted LID principles, recognize the uncertainties and need for greater flexibility in hydromodification requirements, and offer a mitigative approach to urban land development that will produce meaningful environmental outcomes. Our revisions would recognize biofiltration as a LID BMP; ensure that the significantly more challenging requirements related to hydromodification are not imposed for discharges to channels that are engineered, concrete lined, significantly hardened, and/or are regularly maintained as part of a regional flood control program; and incorporate USEPA green street guidance to provide greater flexibility for land-constrained street, road, and highway projects consistent with other adopted MS4 permits in the State.

IV. Monitoring

The Permittees consider it axiomatic that the purpose of environmental monitoring is to inform and support decisions regarding the management, protection, and improvement of Orange County's surface water resources. During the focused meetings your staff explicitly encouraged submittal of alternate monitoring proposals that might better support the WQIP management approach. We have been party to the San Diego Permittees' efforts to define an alternative monitoring approach in response to this request and, indeed, concur with many elements of their proposal. However, we do not believe that this proposal represents a model for the permit that would be appropriate for Orange County. Instead, we believe that the WQIP management approach would be best served by permit requirements for monitoring that establish the principles and review criteria for a monitoring program that is reviewed and approved as an integral component of the WQIP. These principles should substitute for the Draft

Administrative Order's prescription in this area. Our recommendation regarding these principles is provided in Attachment C.

V. Technical Justification

To the extent that the Draft Administrative Order seeks to prescribe any requirements that escalate the future compliance obligations beyond the Permittees' current MS4 Permit, such requirements need to be supported by a rigorous technical justification. The Permittees are concerned that the Fact Sheet, which is the document for establishing the technical rationale for the regulations, has not been made available and appears to be on a schedule to follow rather precede the Tentative Order. At the same time the Report of Waste Discharge (ROWD), which represents the opportunity of the Permittees to consider and apply experiential knowledge is being made largely irrelevant by the regional permit approach. The Permittees believe that the integrity and credibility of the MS4 permitting process risks being compromised by the sidelining of the Fact Sheet and ROWD documents. These potentially significant shortcomings would be addressed by your staff releasing a Fact Sheet for review and comment in advance of the release of the Tentative Order and a re-crafting of the enrollment process to re-establish the role of the ROWD.

VI. Compliance

In responding to your staff's requests for comments on the Draft Administrative Order, the focus has been on providing technical comments intended to assist development of a MS4 permit that will support the Orange County Stormwater Program's continued progress toward our mutual goals based upon a robust and achievable basis for maintaining compliance centered on the WQIP. However, establishing the WQIP as the fundamental basis of compliance has tremendous legal significance. The Permittees believe that the Ninth Circuit Court of Appeals decision in the case of Natural Resources Defense Council vs. Los Angeles County Flood Control District will create an unavoidable situation of non-compliance unless the Receiving Water Limitations language is revised. The importance of making the revisions as shown in Attachment B cannot be overstated and its focus as a State Board workshop in November highlights this.

Thank you for your attention to our comments. Please contact me directly if you have any questions. For technical questions, please contact Chris Crompton at (714) 955-0630 or Richard Boon at (714) 955-0670.

Sincerely,

Mary Anne Skorpanich, Manager
OC Watersheds

Attachments: A – Technical Concerns
B – Redline Version of the Draft Administrative Order

C – Monitoring Principles
D – Proposed Regional Permit Structure

Cc: David Gibson, San Diego Regional Board
Tony Felix, San Diego Regional Board
South Orange County Permittees
Orange County Technical Advisory Committee
Kevin Onuma, Orange County Flood Control District
County of San Diego
Riverside County Flood Control and Water Conservation District
City of San Diego

ORANGE COUNTY PERMITTEES

ATTACHMENT A

SUMMARY TABLE OF COMMENTS

	COUNTY OF ORANGE COMMENTS ON TENTATIVE ORDER NO. R9-2012-0011				
Comment #	**Permit Section**	**Permit Page[1]**	**Section Title**	**Reason for Proposed Changes/Comments**	**Proposed Changes**
1	General Comments	N/A	Throughout	The term "prohibit" is broader than the Clean Water Act requirements, and should be changed to "effectively prohibit." CWA section 402(p) (3) (B) (ii) reads as follows: (B) Municipal Discharge – Permits for discharges from municipal storm sewers – (ii) shall include a requirement to effectively prohibit non-stormwater discharges into the storm sewer; (Emphasis added) The permit shall "effectively prohibit non-stormwater discharges" but may exempt certain discharges that are not significant sources of pollutants from the prohibition. The section does not require a full prohibition but rather an effective prohibition. The operative word is "effective", which recognizes the constraints of owning and operating a stormwater drainage system, which includes hundreds of miles of open channel. The finding/provision should note that non-stormwater discharges are effectively prohibited (per 402(p)(3)(B)(ii)). In addition, discharges that are not significant sources of pollutants are exempted from the prohibition. In a practical sense, the use of word "effective" also provides flexibility to assess the impacts of relatively benign discharges such as landscape irrigation, air condition condensate, individual car washing, and non-emergency fire-fighting flows or non-anthropogenic sources before instituting a prohibition.	**Revise language throughout the Permit to read as follows:** Change "prohibit" to "effectively prohibit."
2	General	N/A	Throughout	Language similar to that which is deleted in the	**Revise language throughout the Permit to read**

[1] Refers to the page numbers of the original Administrative Draft issued by the Regional Board on April 9, 2012

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	Comments			proposed changes is in several sections of the Admin Draft. This language provides an overly broad interpretation of the stormwater regulations.	**as follows:** "The goal of this provision is to address the impacts of MS4 discharges so that such discharges do not impair~~protect, preserve, enhance, and restore the~~ water quality and designated beneficial uses of waters of the state."
3	General Comments	1-2	Cover Pages	The Copermittees request clarification that waste discharge requirements are for their respective jurisdictions, in order to limit the entire permit to within each Copermittee's jurisdictional boundaries and preempt any such clauses that would extend requirements beyond the Copermittee's jurisdiction.	**As shown in the attached revised Permit, revise the cover page as follows:** "The San Diego County Copermittees in Table 1a are subject to waste discharge requirements within their respective jurisdictions as set forth in this Order" This change is also requested for other sections of the Permit, including Provision A. Add the same language for Orange and Riverside County Copermittees.
4	General Comments	N/A	Throughout	Jurisdictional boundaries only partially define the geographic extent of areas where Copermittees can control, reduce, or prohibit stormwater pollutants. The other component that must be incorporated into the Permit language is ownership/operation. There can be multiple MS4s within a municipal boundary (e.g., Phase 2 MS4s), and some MS4 areas are neither owned nor operated by Copermittees, preventing them from controlling pollutants or flows. The Permit should clarify that Permit requirements apply to MS4s owned and operated by the Copermittees. Other MS4 permits in California, including the Los Angeles County MS4 permit, include the "owned and operated" distinction.	**Clarify/Make distinction between different MS4 classifications:** Throughout the Permit replace "MS4s" with "MS4s owned and operated by the Copermittee".

	COUNTY OF ORANGE COMMENTS ON TENTATIVE ORDER NO. R9-2012-0011				
Comment #	**Permit Section**	**Permit Page[1]**	**Section Title**	**Reason for Proposed Changes/Comments**	**Proposed Changes**
I. FINDINGS					
5		1	Finding 4	Minor edit change	**As shown in the attached revised Permit, revise the language as follows:** Delete space from "in to" to "into".
6		2	Finding 7	The interpretation of the Federal regulations is overly broad. The suggested deletion narrows the applicability of this Finding.	**As shown in the attached revised Permit, revise the language as follows:** The federal regulations [40 CFR 122.26(d)(2)(iv)(B)] require the Copermittees to have a program to effectively prohibit~~preventall types of non-stormwater discharges, or~~ illicit discharges, from entering the MS4.
7		2	Finding 9	Discharges may contain waste or pollutants, but it should not be presumed that they necessarily always contain waste or pollutants.	**As shown in the attached revised Permit, revise the language as follows:** "Discharges from the MS4s may contain waste, as defined in the CWC, and pollutants that adversely affect the quality of the waters of the state. A discharge from an MS4 is a "discharge of pollutants from a point source" into waters of the U.S. as defined in the CWA. Storm water and non-storm water discharges from the MS4s may contain pollutants that cause or threaten to cause a violation of surface water quality standards, as outlined in the Basin Plan."
8		4	Finding 16	Although the Permittees do not agree with the Regional Board's Finding that the MEP technology-based standard does not apply to non-stormwater discharges, the Permittees are, at a minimum, recommending the proposed change to the existing language.	**As shown in the attached revised Permit, revise the language as follows:** "Non-storm water discharges ~~from~~into the MS4s are not considered storm water discharges and therefore are not subject to the MEP…"

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9		8	Finding 33	The Copermittees reserve the right to submit additional comments on the Fact Sheet and/or on Provisions of the Tentative Order based on the information that is provided in the Fact Sheet when it is made available for review. To date the Fact Sheet has not been provided to the Copermittees for review.	N/A
II. PROVISIONS					
A. Prohibitions and Limitations					
10	A	9	Prohibitions and Limitations	The proposed Prohibitions and Limitation provisions may be construed as standalone provisions that could expose the Copermittees to state and federal enforcement actions, as well as to third party actions under the federal Clean Water Act's citizen suit provisions. Consistent with the recent 9th Circuit Court of Appeal decision, each provision of the permit could be read separately so if provision A.2.a states that "the MS4 must not cause or contribute to a violations of a water quality standard" then that is the stand-alone provision, and the accompanying language found in A.4 (Compliance with Discharge Prohibitions) regarding compliance may be considered irrelevant. As such, a clear linkage between the compliance provisions and the prohibitions, receiving water limitations, and effluent limitations must be established.	**As shown in the attached revised Permit, insert the following sentence at the end of the introductory paragraph of Provision A:** "The process for determining compliance with the Discharge Prohibitions (A.1), Receiving Water Limitations (A.2), and Effluent Limitations (A.3, including effluent limitations derived from the TMDL requirements – Attachment E) is defined in Provision A.4." In this manner, Provisions A.1, A.2, and A.3 are clearly linked to A.4, as opposed to being standalone provisions.
11	A.1.a	9	Discharge Prohibitions	The Discharge Prohibitions do not establish a sufficient linkage with approved compliance schedules for TMDLs that have been incorporated into the Basin Plan. TMDLs adopted within the region include a schedule to provide MS4 Permittees the time necessary to develop and implement a plan to achieve water quality standards in impaired waters. The compliance schedules for effective TMDLs have been incorporated into Attachment E and language is included in the RWLs provisions (A.2.c.) and the Effluent Limitations	**As shown in the attached revised Permit:** **Revise 1.a. as follows:** "Except as otherwise permitted herein, ~~D~~ discharges ~~into and~~ fromMS4s, owned and operated by a Copermittee, in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in ~~receiving~~ waters of the state are prohibited."

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				provisions (A.3.b.) pointing to the TMDL compliance schedules.	
12	A.1.d	9	Discharge Prohibitions	The first sentence seems to conflict with the remainder of the paragraph and may create a conflict with the State Water Board's policy if not clarified. The revised language clarifies authorized and unauthorized discharges to the ASBS and limits the jurisdiction.	**As shown in the attached revised Permit, revise the language as follows:** "~~Discharges from MS4s to ASBS are prohibited unless specifically authorized.~~ Stormwater dischargesfrom the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012applicable to these discharges, included in Attachment A to this Order. All other discharges from MS4s to ASBS are prohibited, unless authorized by a subsequent order."
13	A.2.a, A.2.c	9-10	Receiving Water Limitations	Without modification to the RWLs, they conflict with TMDL compliance schedules. Language should be included to clarify that in instances where a TMDL iseffective, the Copermittees shall achieve compliance with these provisions as outlined in Attachment E (Specific Provisions for Total Maximum Daily Loads). Without the requested change, the RWLs put the municipalities in immediate and ongoing non-compliance with the permit, as opposed to incorporating TMDL implementation schedules.	**To provide a more direct tie in between Provision A.2.a, TMDL compliance schedules, and A.4 the following language is proposed, as shown in the attached revised Permit**. **Revise A.2.a by adding the following onto the end of the provision:** "…the list below to the extent they remain in effect and are operative, unless such discharges are being addressed by the Copermittee(s) through the processes set forth in this Order (including Provision A.4 below and Attachment E, the TMDL Provisions):." **As shown in the attached revised Permit, delete 2.c.**

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14	A.2.a.3.b	10	Receiving Water Limitations	The Sediment Quality Control Plan applies specifically to bays and estuaries and only subtidal surficial sediments that have been deposited or emplaced seaward of the intertidal zone. Many Copermittees do not discharge to the intertidal zone. Text should be revised to clarify that this does not apply to inland MS4 discharges.	**As shown in the attached revised Permit, revise A.2.a.3.b as follows**: "Sediment Quality Control Plan which includes the following narrative objectives for bays and estuaries:"
15	A.2.a.4.b. Footnote 3	10	Receiving Water Limitations	Footnote to A.2.a.4.b requires Copermittees to not cause or contribute to the more stringent of a water quality objective or a CTR criterion. Instances may exist where it has been determined that one or the other is more appropriate given site specific conditions or analysis (i.e., a TMDL has been established).	**As shown in the attached revised Permit, attach the following to the end of footnote 3**: "unless a previous regulatory action (i.e., TMDL) has specified otherwise."
16	A.3	10	Effluent Limitations	Two types of effluent limitations, technology-based and water quality-based, are described in A.3, which should be reflected in the Permit.	**As shown in the attached revised Permit, revise subsections (a) and (b) for Technology-based and Water Quality-based Effluent Limitations, respectively.** **a.** Technology and Water Quality Based Effluent Limitations (including Effluent Limitations based on TMDLs). Each Copermittee shall reduce pollutants in discharges from the MS4 to the maximum extent practicable (MEP[2]). **b.** It is understood that compliance with this requirement will be achieved through the use of MEP-compliance best management practices (BMPs) or other controls that are

[2] This does not apply to MS4 discharges which receive subsequent treatment to reduce pollutants in storm water discharges to the MEP prior to entering receiving waters (e.g., low flow diversions to the sanitary sewer).Runoff treatment must occur prior to the discharge of runoff into receiving waters per Finding **Error! Reference source not found.**.

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					consistent with the MEP standard.
17	A.3	10	Effluent Limitations	The water quality-based effluent limitations and compliance with the limitations should be linked to Attachment E; currently the language reads in a manner that is standalone from Attachment E. Instead, the language should reference Attachment E and the compliance determination language the Copermittees propose for inclusion therein.	**As shown in the attached revised Permit, revised the WQBEL language in A.3 as follows to better reflect the role of Attachment E:** "This Order establishes WQBELs consistent with the assumptions and requirements of all available TMDL waste load allocations assigned to discharges from the respective MS4s. Each Copermittee shall comply with applicable WQBELs as set forth in Attachment E to this Order, pursuant to the applicable TMDL compliance schedules."
18	A.4	11	Compliance with Discharge Prohibitions and Receiving Water Limitations	Language in Provision A.4 should be consistent with the CASQA proposed receiving water limitation language (also attached).	**As shown in the attached revised Permit, please modify A.4**.
19	A.4	12	Compliance with Discharge Prohibition and Receiving Water Limitations Compliance with Discharge Prohibitions, Receiving Water Limitations, and Effluent Limitations (Title Revision)	The Copermittees envision WQIPs as the foundation for a BMP-based compliance approach for the Discharge Prohibitions and RWLs. However, the language in the Provision A.4 describes the WQIPs as a document trail rather than a compliance mechanism. In essence, the language suggests that Copermittees shall expend significant resources to develop and implement WQIPs, but taking the actions in the WQIPs has no effect on the Regional Board's compliance determination. The iterative process is a fundamental aspect of MS4 programs, as envisioned by State Water Board Order 99-05 and later reconfirmed in Order WQ 2001-15 (BIA Order), and is the mechanism by which MS4 Permittees should <u>demonstrate</u> compliance. The WQIPs	**As shown in the attached revised Permit, modify the opening paragraph to A.4 to reflect the 99-05 order, using the WQIP in place of the SWMP, as follows:** 1. Change the title of the section and first sentence in A.4 to also include effluent limitations (A.3) 2. Add the following language to the end of the paragraph: "The Water Quality Improvement Plans described in Provision B shall be designed to achieve compliance to the MEP standard with the discharge prohibitions, receiving water limitations, and all effluent limitations. If the Executive Officer

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				now provide a mechanism to provide the detail and quantitative analyses used to identify pollutant sources and implement BMPs to address those sources.	approves a Water Quality Improvement Plan and subsequent updates as described in Provision B and F.1, and the plan is being implemented in a timely and good faith manner, such implementation of the plan shall constitute compliance with Provisions A.1, A.2, and A.3."
20	A.4	11	Compliance with Discharge Prohibition and Receiving Water Limitations	The WQIPs are intended to focus on water quality priorities. Pollutants addressed by existing TMDLs or are exceeding frequently such that a TMDL may be warranted are clearly high priority. However, pollutants that intermittently exceed a WQO or exceed once during a permit term appear to result in violations of the RWL provisions and will require Copermittees to expend resources in line with pollutants that have been identified as a priority. Provision A.4 describes the iterative process for MS4s to respond to exceedances of water quality standards that persist. However, the language in A.4 appears too broad and suggests the Copermittees should revise their WQIPs even in cases when (1) TMDL pollutant WLAs are exceeded but the TMDL compliance date has not yet occurred and (2) non-TMDL pollutant RWLs are exceeded and the pollutant is a WQIP priority but the BMP implementation schedule described in the WQIP has not yet been exhausted. In these two cases, the water quality standards exceedances are "expected" and no WQIP update is needed; instead the Copermittees should simply complete the implementation of actions identified in the WQIP.	**As shown in the attached revised Permit, revise the language as follows:** Revise the approach to determining compliance with the RWL provisions such that the primary focus of WQIPs is on priorities rather than random and infrequent exceedances of WQO. See also the language added to the introduction to Provision B. "The Water Quality Improvement Plans described in Provision B shall be designed to achieve compliance to the MEP standard with the discharge prohibitions, receiving water limitations, and all effluent limitations."
B. Water Quality Improvement Plans					
21	B	13	Water Quality Improvement	Although Board staff have indicated that the WQIPs, once developed and approved, will functionally replace the CLRPs and BLRPs, the permit does not formally	**As shown in the attached revised Permit, revise the language as follows and add footnote 5:**

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			Plans	recognize this. This footnote would clarify that this is the case.	"Once developed and approved, the Water Quality Improvement Plan and corresponding Jurisdictional Runoff Management Plans will functionally replace the Load Reduction Plans."
22	B	13	Water Quality Improvement Plans	The Copermittes request a revision to the WQIP goal statement. A concise goal statement that is more central to MS4 permitting is requested. This goal statement provides context to several requested revisions to subsequent provisions.	**As shown in the attached revised Permit, revise the second sentence of the first paragraph of Provision B as follows:** "The goal of the Water Quality Improvement Plan is to 1) effectively prohibit non-storm water discharges into the MS4s, 2) reduce pollutants in storm water discharges from the MS4s to the MEP, and 3) attain the reasonable protection, ~~preservation, andenhancement and restoration~~ of water quality and designated beneficial uses of waters of the state."
23	B	13	Water Quality Improvement Plans	The County envisions the WQIPs as the foundation for a BMP-based compliance approach for the Discharge Prohibitions and RWLs. However, language is needs to be added to Provision B to provide a clear linkage between Provision A and B.	**As shown in the attached revised Permit, insert the following in the first paragraph of Provision B, after the second sentence:** "Therefore, implementation of the WQIPs also provides the basis for complying with Provisions II.A.1, II.A.2, and II.A.3, as described in Provision II.A.4."
24	B	13	Water Quality Improvement Plans	Additional language should be added to clarify that Provision E requirements may be modified for consistency with Water Quality Improvements Plans.	**As shown in the attached revised Permit, insert the following at the end of the first paragraph of Provision B:** "As such, the requirements outlined in Provision E may be modified for consistency with the Water Quality Improvement Plan for the applicable Watershed Management Area, if appropriate justification is provided."

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					Insert the following language at the beginning of the second paragraph: "Development of the Water Quality Improvement Plans allows permittees to customize the requirements in Provision E to address the highest watershed priorities."
25	B	13	Water Quality Improvement Plans	Similarly, the Copermittees request revisions to the required/critical elements of the WQIPs. These elements reflect several requested revisions to the WQIP process (e.g., B.2), described below.	**As shown in the attached revised Permit, revise the second paragraph of Provision B as follows:** The Copermittees must develop Water Quality Improvement Plans for each Watershed Management Area that 1) prioritize water quality ~~issues~~ conditions resulting from the Copermittee's MS4 discharges ~~to and from the MS4s with~~in each Watershed Management Area, 2) identify MS4 pollutant sources ~~and other stressors~~ associated with ~~those~~the water quality priorities, 3) define numeric ~~targets~~goals and schedules to ~~achieve improvement of~~address water quality priorities, 4) describe water quality improvement strategies to achieve numeric ~~targets~~goals, and 5) develop and execute a coordinated monitoring and assessment program to facilitate adaptive management of the Water Quality Improvement Plansand determine progress towards achieving ~~improved water quality~~those goals.
26	B	13	Water Quality Improvement Plans	It is unclear whether the 12-month timeline identified in the third paragraph of Provision B applies to the development of the WQIP or the implementation of the BMPs identified in the WQIP. It would appear that the	**As shown in the attached revised Permit, revise the last introductory paragraph of Provision B, as follows:** "The Copermittees must submit Water Quality

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				provision requires that the MS4s must *implement* all the requirements (including BMPs) of Provision B within 12 months of permit adoption.	Improvement Plans for public review and Regional Board Executive Officer review and approval per the schedule outline in Provision II.B.0. "
27	B	13	Water Quality Improvement Plans	The development of a WQIP will require at a minimum of 18 months and BMP implementation will likely be staggered over a certain time frame. Once the permit is adopted, Copermittees will begin the planning process. However, Copermittees must have at least one full fiscal year budgeting cycle within which to seek additional funding to implement the WQIP from our governing bodies (i.e., City councils and County supervisors). Thus the more reasonable time schedule is to require the development of the WQIP within 18 months and the implementations of the BMPs to occur consistent with the final approved WQIP.	**See the proposed changes to the last paragraph of the opening section of Provision B in the attached revised Permit.** A staggered approach to WQIP development is proposed, as detailed in a proposed section B.6. This staggered approach ensures rapid progress on WQIP development while providing a feasible WQIP submittal and initiation schedule: 1. The WQIP priorities and numeric goals are presented to the Regional Board within 6 months of the adopted Order. (B.6.a) 2. The complete WQIPs and corresponding jurisdiction measures are submitted 12 months later. (B.6.b) 3. WQIP implementation is initiated at the beginning of the next fiscal year. (B.6.b)
28	B.1	13-14	Watershed Management Areas	Several changes to Table B-1 are requested. The Copermittees request addition of a tenth WMA, for Mission Bay which is entirely in the jurisdiction of the City of San Diego. Furthermore, the City of Poway is not a responsible Copermittee for San Diego River. City of Escondido is not a responsible Copermittee for San Luis Rey River. Finally, the waterbody Loma Alta Slough should be listed under the Carlsbad WMA. Penasquitos WMA includes Miramar Reservoir HA and Poway HA.	**Make the following changes to Table B-1, per the attached revised Permit:** 1. Add a WMA for Mission Bay which includes Scripps HA, Miramar HA, and Tecolote HA. 2. Remove Penasquitos HA and Mission Bay HA from Penasquitos WMA and insert Miramar Reservoir HA and Poway HA. 3. Remove City of Poway from San Diego River 4. Remove City of Escondido from San Luis Rey River.

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					5. Add the waterbody "Loma Alta Slough" to the Carlsbad WMA.
29	B.2	15-18	Identification of Water Quality Priorities	The Copermittees have fully embraced the concept of WQIPs and appreciate the Regional Board's approach to identifying priorities, setting goals, and developing a strategy and schedule to meet those goals. The Copermittees have identified an alternative to Provision B.2, which follows the general approach proposed by the Regional Board but increases focus on addressing MS4 impacts.	The following changes are requested, as detailed in the attached revised Permit section B and further described in subsequent comments: 1. Revisions are proposed to section B.2.a to refine the purpose and add considerations for assessing receiving water conditions. 2. A new section B.2.b is proposed to provide a linkage between receiving water conditions and corresponding impacts from the MS4s (versus other sources). 3. Section B.2.c is expanded to describe the considerations when identifying priority receiving water conditions. 4. Section B.2.d is refined to focus on MS4 impacts and pollutant generating activities. 5. Section B.2.e is refined to elucidate the meaning of numeric goals and their implication for MS4 compliance. 6. The schedule component of B.2.e is moved to a new section B.6 to improve organization of WQIP concepts.
30	B.2.a	15-16	Assessment of Receiving Water Conditions	The assessment of receiving water conditions is a critical first step to WQIP development. Changes to purpose of this step are proposed, to focus on water quality issues related to MS4s. Further, data quality and relevance are critical to this assessment, and requirement to consider "all available data" should be refined to address accessibility and quality control issues. Finally, whether a receiving water condition can be achieved and maintained should be assessed.	**As shown in the attached revised Permit, the following changes/revisions were made in Permit section B.2.a:** **Revise the opening paragraph**: "The Copermittees must consider the following, at a minimum, to support the identification of water quality priorities based on the impacts of MS4 discharges on receiving water beneficial uses:"

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					Under part (7): replace "All available data" with "Available, relevant, and appropriately collected…data meeting appropriate QA/QC standards" **Insert a new part (10):** "The potential for long-term achievement and maintenance of beneficial use attainment in the Watershed Management Area."
31	*Language Addition* B.2.b	Not in original (Add at: 17-18)	Assessment of MS4 Discharge Quality and Impacts	For WQIP development, it is critical to differentiate between receiving water conditions and MS4 discharges and impacts. Many receiving water conditions are not driven by MS4 impacts, and Copermittees can have the greatest effect on receiving water quality by focusing on reduction of pollutants discharged by their MS4s.	**As shown in the attached revised Permit, add a new section B.2.b titled "Assessment of MS4 Discharge Quality and Impacts", as follows:** "To support the identification of priorities based on the impacts of MS4 discharges on receiving water beneficial uses, the Copermittees must review appropriately collected MS4 discharge quality data and consider the extent to which MS4s cause or contribute to the adverse impacts to receiving water beneficial uses identified in II.B.2.a. Considerations include: (1) Locations of the Copermittees' MS4 discharges with respect to receiving waters; (2) MS4 discharge quality results relevant to impacts in receiving waters and action levels, including the temporal and geographic variation of the results: (3) The requirements of Provisions II.A.1 and II.A.3.; and (4) Whether MS4 discharge quality is sufficiently well known or other information is available to assess whether MS4 discharges are causing or contributing to specific receiving water

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					conditions, or whether additional data need to be collected through the Monitoring and Assessment Program developed as part of the Water Quality Improvement Plan."
32	B.2.b	16	Identify Priority Pollutants and Receiving Water Conditions Identification of Priority Receiving Water Conditions (Title Revision)	We appreciate the Regional Board's approach to identifying priorities for receiving water conditions. Our proposed revisions to the Permit add several elements that should be included by Copermittees when identifying priority receiving water conditions. Following the Regional Board's approach, "priorities" are also differentiated from "highest priorities" (see new sub-bullet 6). Note the proposed revision to the title of the section, which better reflects the envisioned effort/outcome.	**As shown in the attached revised Permit, rename section to "Identification of Priority Receiving Water Conditions" and add the following to the end of the Section B.2., as follows:** "The Water Quality Improvement Plans shall describe the following for each priority receiving water condition: (1) The beneficial use(s) and pollutant(s) associated with the priority receiving water condition(s); (2) The geographic extent of the priority receiving water condition(s)within the WMA, if known; (3) The Copermittees with MS4s that contribute discharges to the priority water receiving condition(s); (4) The temporal extent of the priority receiving condition(s) (i.e., dry weather and/or wet weather); (5) Whether receiving waters have been monitored sufficiently to adequately characterize the priority receiving condition(s), including a consideration of spatial and temporal variation; and (6) The reasoning for selecting specific receiving water conditions as a priority and a subset of priorities as the highest priorities."
33	B.2.c	16-	Pollutant Source	The success of WQIPs will hinge on the ability of	

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		17	and/or Stressor Identification MS4 Pollutant Source Identification (Title Revision)	MS4s to identify and abate sources of pollutants within the MS4s. The pollutant source identification process proposed by the Regional Board is too broad and inhibits the Copermittees from focusing on the sources they are most able to control. In addition, some pollutants are poorly understood and need to be further investigated to allow for design of pollutant control strategies [new sub-bullet d.(4).(5)]. The proposed revisions to the Source ID section are intended to effectively focus the WQIP prioritization process.	**As shown in the attached revised Permit, rename section to "MS4 Pollutant Source Identification" and revise the section, as follows:** See the changes proposed in the attached revised Permit, which focuses the Source ID section on MS4 sources and impacts. **The new section B.2.d follows:** "The Copermittees must identify <u>and prioritize</u> known and suspected storm water and non-storm water pollutant sources within the MS4 associated with the highest priority receiving water conditions identified under II.B.2.c. The identification of known and suspected sources of the highest water quality priorities as identified for Provision B.2.c shall consider the following : (1) Land uses and their potential contribution to the highest priority receiving water conditions; (2) Pollutant generating facilities, areas, and/or activities within the Watershed Management Area;: (3) Locations of the Copermittees' MS4s outfalls. (4) Review of available data, including: (a) Findings from the Copermittees' illicit discharge detection and elimination programs, (b) Findings from the Copermittees' MS4 outfall monitoring,

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					(c) Other available, relevant, and appropriately-collected data, information, or studies related to pollutant sources and pollutant-generating activities that contribute to the highest priority receiving water conditions identified in Provision II.B.2. (5) Whether MS4 sources are sufficiently well known to design an effective, directed control strategy, or whether additional source/stressor identification needs to be conducted through the Monitoring and Assessment Program developed as part of the Water Quality Improvement Plan to identify and prioritize sources/stressors within the watershed."
34	B.2.d	17-18	Numeric Targets and Schedules Numeric Goals (Title Revision)	We appreciate the Board staff efforts to allow the MS4s to prioritize their water quality issues and to develop a plan to address these issues. However, the terminology in Provision B.2.d regarding interim and final targets are terms used in TMDL program and their use here confuses the issue. In fact, Provision 2.d (3)(e) clearly ties the numeric "targets" with a TMDL. The WQIP should identify interim and final numeric "goals" to keep the distinction clear between a TMDL and a WQIP. It is entirely possible that the interim goal may in fact be the same as an interim TMDL target but not necessarily.	**Replace "numeric target" with "numeric goal" throughout Provision B.**
35	B.2.d	17-18	Numeric Targets and Schedules	It will be critical to quantify the expected outcomes of WQIP implementation efforts, and numeric goals serve	**As shown in attached revised Permit, revise section B.2.d, as follows:**

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			Numeric Goals (Title Revision)	to elucidate those expected outcomes. Based on the proposed revisions to the WQIP goals and elements, revisions to the description of the purpose of numeric goals are also proposed. Furthermore the notation of "target" implies a compliance effluent limit and thereby subject to enforcement action, versus goals set by the Copermittees that do not trigger any enforcement action by themselves.	The Copermittees must develop and incorporate interim and final numeric[6] goals goals[7] into the Water Quality Improvement Plans. Numeric goals and schedules are intended to support Water Quality Improvement Plan development and to measure progress towards addressing the highest priority receiving water conditions identified under II.B.2.**Error! Reference source not found.**. Numeric goals themselves are not enforceable compliance standards, effluent limitations, or receiving water limitations. When establishing numeric goals and corresponding schedules, the Copermittees must consider the following: (1) Final numeric goals must be based on measureable criteria or indicators, to be achieved in the receiving waters and/or MS4 discharges for the highest priority receiving water conditions which will be capable of demonstrating progress toward the achievement of the restoration and/or protection of water quality standards in receiving waters; and (2) Interim numeric goals must be based on measureable criteria or indicators that can demonstrate incremental progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges. **Footnote 7:** "Interim and final numeric goals may take a variety of forms such as TMDL targets, TMDL wasteload allocations, TMDL based

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					WQBELs incorporated in Attachment E of this Order, action levels, pollutant concentration, load reductions, number of impaired water bodies delisted from the List of Water Quality Impaired Segments, Index of Biotic Integrity (IBI) scores, or other appropriate metrics. Interim and final numeric goals are not necessarily limited to one criterion or indicator, but may include multiple criteria and/or indicators. To the extent that a goal is not based on an enforceable regulatory mechanism (i.e., TMDL, WLA), WQIP goals and schedules may be revised through the iterative process. Numeric goals are not subject to enforcement or non-compliance actions under this Order."
36	B.2.d.3	17-18	Numeric Targets and Schedules Implementation Schedules (Title Revision)	The schedule for achieving a numeric goal is tied to *implementation* not the goals itself. Therefore, it is recommended that part B.2.3 be moved to the section that describes WQIP implementation schedule requirements.	**As shown in the revised Permit, sub-bullet (3), which is the schedule component of B.2.e, should be moved to section B.3.b to improve organization of WQIP concepts.**
37	B.3	18-19	Water Quality Improvement Strategies and Schedules	The current version of B.3 requires that the MS4s have <u>all</u> of the following water quality improvement strategies in their WQIP (sub-bullets B.3.a.1 through B.3.a.4): structural and non-structural BMPs, retrofit projects, stream and/or habitat rehabilitation, and other water quality improvements associated with eliminating non-stormwater discharges to the MS4s. This may be an appropriate menu of actions to choose from, but pending the water quality issues and the watershed, the WQIP strategies may include all or only one of the strategies listed.	**As shown in the revised Permit, revise section B.3, as follows:** See the changes proposed in the attached revised Permit section B.3. Sub-bullets B.3.a.1 through a.4 are revised and condensed into two sub-bullets, one for JRMP activities and one for other structural and non-structural BMPs. These two sub-bullets compose the universe of BMPs that would be implemented by the Copermittees to meet the WQIP numeric goals:

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					(1) Copermittee-selected activities identified in Provision E ,either as described in the jurisdictional runoff management programs or as modified with justification, that will address the highest priority receiving water conditions; and (2) Additional Copermittee-selected structural and/or non-structural BMPs that are designed to achieve the interim and final numeric goals. **a. WATER QUALITY IMPROVEMENT STRATEGIES** The water quality improvement strategies must prioritize, based on their likely effectiveness and efficiency, and implement measures, as appropriate, to effectively prohibit non-storm water discharges into its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, and achieve the interim and final numeric goals in accordance with the schedules in Provision II.B.2.e. Measures shall include: (1) Activities identified in Provision E either as described or as modified, with justification, at the discretion of each Copermittee[3]; and (2) Structural and/or non-structural BMPs that are designed to achieve the interim

[3] Activities considered for modification shall include those required in Provisions II.D and II.E with the exception of II.E.3.c.(2)(b), II.E.3.c.(2)(d) and II.E.3.c.(3).

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					and final numeric goals identified in Provision II.B.2.e.
38	B.3.b	19	Implementation Schedules	Implementation of the WQIPs should form the basis of Permit compliance. As commented above, the schedule bullets from the Numeric Targets section should be moved to the Implementation Schedule section. Furthermore, the requirement that "Final dates for achieving final numeric targets must not extend more than 10 years..." is one of the most disconcerting requirements in the Permit. Based on conversations with Regional Board staff, it is understood that goals can take a number of forms and the "10 year" requirement is not intended as a requirement to attain all Basin Plan water quality standards within 10 years. However, to ensure this requirement is not mis-interpreted by third parties, language should be added to make this clarification.	**As shown in the attached revised Permit, add a footnote to sub-bullet (5), as follows:** "Achievement of final numeric goals within 10 years represents progress towards attainment of water quality standards, but is not a requirement to fully attain all applicable water quality standards or all priority receiving water conditions within 10 years."
39	B.4	19-20	Water Quality Improvement Monitoring and Assessment	Monitoring and assessment will be a critical component of the WQIP process. The vision for WQIP monitoring and assessment is reflected in the proposed revised language for Permit section B.4. A major aspect of this vision is that monitoring requirements in Provision D will be fully integrated into the WQIPs and modified as the WQIPs evolve. The proposed language clarifies the Copermittee's vision for purpose and components of WQIP monitoring and assessment. The requested linkage with Provision D is highlighted through the proposed revision.	As shown in the attached revised Permit revise section B.4, as follows: The Copermittees in each Watershed Management Area must develop an integrated Water Quality Improvement Plan Monitoring and Assessment Program that assesses: 1) progress toward achieving the numeric goals and schedules, 2) progress toward addressing the highest priority receiving water conditions for each Watershed Management Area, and 3) each Copermittee's overall efforts implementing the requirements of Provision B. The water quality improvement monitoring and assessment program must include the monitoring and assessment requirements of

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					Provision D, which may be modified for consistency with the priority receiving water conditions of each Watershed Management Area and associated Copermittees. For Watershed Management Areas with applicable TMDLs, the water quality monitoring and assessment program must incorporate the specific monitoring and assessment requirements of Attachment E. For Watershed Management Areas with any ASBS, the water quality monitoring and assessment program must also incorporate the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-001**2** (see Attachment A).
40	B.5	20-21	Adaptive Management Process	The WQIPs provide an opportunity to integrate water quality improvement strategies (e.g, TMDL implementation) and jurisdictional runoff management programs. The Copermittees have embraced the concept of WQIPs and propose to revise the Permit to fully integrate JRMPs into the WQIP process. The Adaptive Management section B.5 proposed by the Regional Board has two components: WQIP adaptive management and JRMP adaptive management. With the proposed expanded scope of the WQIPs proposed by the Copermittees, the two components of the adaptive management process are not WQIP and JRMP, instead the components are (1) Priority Receiving Water Conditions and Numeric Goals and (2) Water Quality Improvement Strategies and Schedules. The proposed revisions to section B.5 reflect the Copermittee's vision for WQIP implementation.	**As shown in the attached revised Permit revise section B.5, as follows:** The Copermittees in each Watershed Management Area must implement the iterative process, adapting the Water Quality Improvement Plan to become more effective and meet the requirements of Provisions II.A, and shall consider the following: **a. PRIORITY RECEIVING WATER CONDITIONS AND NUMERIC GOALS** The priority receiving water conditions and numeric goals, developed pursuant to II.B.2.c. and II.B.2.e respectively, shall guide jurisdictional implementation efforts for the duration of this Order. Recommendations for changes to priority receiving water conditions and numeric goals shall be provided in the Report of Waste Discharge and shall consider the following:

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				Most of the components of the adaptive management process proposed by the Regional Board (sub-bullets B.5.a.1.a thru h and B.5.b.1.a thru e) are included. The proposed language adds clarification on the purpose of the adaptive management process and re-organizes into two alternative management categories: (1) Priority Receiving Water Conditions and Numeric Goals and (2) Water Quality Improvement Strategies and Schedules. Note that these two management categories are adapted on different timelines: • Priority Receiving Water Conditions and Numeric Goals would be adapted, at a minimum, on a frequency that corresponds to Permit cycles (every 5 years). In this manner the ROWD for future permits is supported by the WQIP process. It is <u>not</u> expected that priority receiving water conditions and numeric goals would vary on a shorter frequency, and thus resources for adaptive management should be focused on the strategies/BMPs used to *achieve* the numeric goals. • Water Quality Improvement Strategies and Schedules would be adapted annually, allowing modification to the JRMP elements, structural BMPs, and non-structural BMPs for achieving numeric goals. Finally, to improve organization, it is proposed that the requirements regarding WQIP and JRMP modification and submittals (sub-bullets B.5.a.2 thru 3 and B.5.b.2 thru 3) be moved to a new section B.6.	(1) Achieving the outcome of improved water quality in MS4 discharges and receiving waters through implementation of the water quality improvement strategies identified in the Water Quality Improvement Plan; (2) Progress toward achieving interim and final numeric goals in receiving waters and/or MS4 discharges for the highest water quality priorities in the Watershed Management Area (3) New scientific information or new or updated policies or regulations that affect identified numeric goals including revised water quality objectives or TMDLs; (4) Spatial and temporal accuracy of monitoring data collected to inform prioritization of water quality problems and implementation measures to address the highest priority receiving water conditions; (5) Availability of new information and data from sources other than the jurisdictional runoff management programs within the Watershed Management Area that

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					informs the effectiveness of the actions implemented by the Copermittees; (6) The factors listed in Provision II.B.2.a.(1)-(10); (7) San Diego Water Board recommendations; and Recommendations for modifications solicited through a public participation process. **b. WATER QUALITY IMPROVEMENT STRATEGIES AND SCHEDULES** The water quality improvement strategies and schedules required pursuant to II.B.3 shall be adapted as new information becomes available to inform more effective and efficient means of achieving the numeric goals established in II.B.2.e. Copermittees shall consider adaptation to ~~b. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ADAPTIVE MANAGEMENT PROCESS~~ jurisdictional programs and monitoring and assessment strategies and schedules at least annually considering the following: (1) Changes to priority receiving water conditions and numeric goals based on recommendations from II.B.5.a.;

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					(2) Measurable or demonstrable reductions of non-storm water discharges to each Copermittee's MS4; (3) Measurable or demonstrable reductions of pollutants in storm water discharges from each Copermittee's MS4 to the MEP; (4) Information on the MS4 sources and/or pollutant-generating activities determined to be most significantly contributing to priority receiving water conditions; (5) Efficiency in implementing the Water Quality Improvement Plan; (6) San Diego Water Board recommendations; and (7) Recommendations for modifications solicited through a public participation process.
41	B.6	21	Water Quality Improvement Plan Implementation	The WQIP development and implementation process has several components and requirements for submittals to the Regional Board. As described in the first comments for Provision B, a staggered WQIP submittal schedule is proposed to extend the timeline to 18 months while still ensuring rapid progress on WQIP development. This proposal is described in the	**6. Water Quality Improvement Plan Submittal, Implementation, and Modifications** **a. PRIORITY RECEIVING WATER CONDITIONS, MS4 SOURCES, AND NUMERIC GOALS**

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				proposed language for the new Section B.6. Furthermore, requirements for submittals to the Regional Board following modifications due to adaptive management would also fall under section B.6. A staggered approach to WQIP development is proposed, as detailed in a proposed section B.6. This staggered approach ensures rapid progress on WQIP development while providing a feasible WQIP submittal and initiation schedule: 1. The WQIP priorities and numeric goals are presented to the Regional Board within 6 months of the adopted Order. (B.6.a) 2. The complete WQIPs and corresponding jurisdiction measures are submitted 12 months later. (B.6.b) 3. WQIP implementation is initiated at the beginning of the next fiscal year. (B.6.b) Furthermore, adaptive management submittals (i.e., WQIP modifications) are combined and described under Section B.6.c and B.6.d (these requirements were previously described under section B.5.a.2 thru 3 and section B.5.b.2 thru 3.	The Copermittees in each Watershed Management Area must submit the proposed priority receiving water conditions, MS4 sources, and numeric goals required in Provisions II.B.2.c-e. for San Diego Water Board Executive Officer review and approval no later than 6 months following adoption of this Order. Priority receiving water conditions, MS4 sources, and numeric goals are deemed approved if no response is provided to the Copermittees within 2 months of the submittal date. **a. WATER QUALITY IMPROVEMENT PLANS** Copermittees shall commence development of the remaining portions of the Water Quality Improvement Plans upon approval of the priority receiving water conditions, MS4 sources, and numeric goals by the San Diego Water Board Executive Officer in II.B.6.a. Copermittees must submit complete Water Quality Improvement Plans for San Diego Water Board review and approval no later than 18 months following adoption of this Order. Copermittees must commence with implementation of the Water Quality Improvement Plan no later than the fiscal year (July 1) following San Diego Water Board approval. Water Quality

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					Improvement Plans are deemed approved if no response is provided to the Copermittees within 6 months of the submittal date. **b. WATER QUALITY IMPROVEMENT PLAN MODIFICATIONS** Copermittees must submit requested modifications to the Water Quality Improvement Plan either in the Annual Report required pursuant to Provision II.F.3.b, or as part of the Report of Waste Discharge (ROWD) required pursuant to Provision II.F.5 .b. Once approved by the San Diego Water Board Executive Officer, the Copermittees must implement any modifications to the Water Quality Improvement Plan in accordance with the schedules developed pursuant to Provisions II.B.2 and II.B.3.b. Requests for modification are deemed approved if no response is provided to the requesting Copermittee(s) within 3 months of the request date.
C. Action Levels					
42	C. (Intro)	22	Action Levels	The Draft Order in Provision B states that the goal of the WQIP is to identify the highest water quality priorities within a watershed and implement strategies to achieve improvements in the quality of discharge and receiving waters. Furthermore in Provision B.2.d the Permittees are required to develop and use *interim and final numeric targets/goals* to measure progress towards the protection/enhancement of the receiving	**As shown in the attached revised Permit, revise introductory paragraphs of section C, as follows:** "The purpose of this provision is for the Copermittees to incorporate numeric non-storm water and storm water action levels in the Water Quality Improvement Plans and numeric non-

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				waters and beneficial uses. The choice of the target/goals of the watershed may be biological, chemical, or physical based and may include multiple criteria and/or indicators. The permit should provide a clear linkage between Provision B and Provision C and state that the WQIP should guide the customization of the NALs/SALs to meet the highest water quality priorities in a given watershed and that NALs/SALs will be used to assist Copermittees in reaching the goals specified in the WQIP. The introduction to Provision C indicates that the *action levels* (NALs and/or SALs) will be incorporated into the WQIPs (B.2.d) and used to: a) Measure progress towards the protection/ enhancement of the receiving waters and beneficial uses (B.4) ; b) Direct and focus the JRMP implementation efforts for addressing MS4 discharges (D.4.a); and c) Detect and eliminate non-stormwater and illicit discharges to the MS4 (E.2) Although action levels will be used for several different purposes, the action levels defined in Provision C.1 and C. 2 are chemically based and may be in conflict with the selected watershed metrics. As an example, if the watershed metric is improved IBI scores for a water body, then NALs and SALs associated with water chemistry are unlikely to be the best metric to evaluate progress towards improving IBI scores or for assessing our implementation efforts. Thus, the chemically based NALs/SALs may direct resources away from the watershed priorities. Since Provision C indicates that there are three different	stormwater action levels into the IDDE Program. The action levels shall be used to guide the following program planning efforts and measure progress towards attaining the reasonable protection, preservation, and enhancement of water quality and designated beneficial uses of waters of the state: 1) Support development and prioritization of water quality improvement strategies through the Water Quality Improvement Plans. Discharge data above action levels can be evaluated using a statistical approach considering the frequency, magnitude, and loading of discharges to the receiving waters to support development of actions and prioritization of their implementation. 2) Assist in the effective prohibition of non-stormwater discharges from the MS4 pursuant to Provision E.2. 3) Support the detection and elimination of illicit discharges to the MS4 pursuant to Provision E.2. These goals will be accomplished through monitoring and assessing the quality of the MS4 discharges prior to and during the implementation of the Water Quality Improvement Plans and as a part of the IDDE Program. Exceedances of action levels are not subject to enforcement or non-compliance actions under this Order. ”

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				purposes for the action levels, the permit should recognize that the action levels for each permit provision (B.4, D.4.a, and/or E.2) may be based on different constituents, metrics, and/or may be different values. As a result, the permit should establish the purposes of the action levels and then allow the Copermittees to establish the numeric action levels. For our purpose we would submit that the action levels should be developed to support program planning and measure progress towards attaining the protection of the beneficial uses.	
43	C. (Intro)	22	Action Levels	The development of action levels, including the timeline should be clearly linked to the Water Quality Improvement Plans. A timeline that is separate and different from the development of the Water Quality Improvement Plans is not necessary. Previously developed action levels should serve as interim action levels until the Water Quality Improvement Plans are completed.	**As shown in the attached revised Permit, revise concluding paragraph of section C, as follows:** Action levels will be developed and incorporated into the Water Quality Improvement Plans (Provision B) including the Illicit Discharge Detection and Elimination (IDDE) Program (Provision E.2). Depending upon the goals/objectives for the use of the action levels and the priority receiving water conditions, the constituents and values at which they are set may differ between watersheds. Copermittees may develop Watershed Management Area specific numeric action levels for non-storm water and storm water MS4 discharges using an approach approved by the Regional Board or use the default non-stormwater and stormwater action levels prescribed within C.1 and C.2 below, respectively. The Copermittees will submit action levels as part of their Water Quality Improvement Plan(s). The action levels currently established will serve as the interim action levels until revised action levels are

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					completed and approved.
44	C. (Intro)	22	Action Levels	The introduction to Provision C indicates that numeric action levels must be *developed* for non-stormwater and stormwater MS4 discharges….. Although the permit states that NALs/SALs must be *developed*, the permit then mandates which constituents must have NALs/SALs and what the values of the action levels are. As stated above, the Permit should include an approach that allows the Permittees the opportunity to *develop* the NALs/SALs.	**As shown in the attached revised Permit, add the following to the introduction to C.1, as follows:** The following non-storm water action levels (NALs) must be incorporated in the Water Quality Improvement Plan and IDDE program if the Permittees have not developed their own NALs using an approach approved by the Regional Board EO:
45	C.1		Non-Stormwater Action Levels	Referencingthe CTR as a "source" is misleading. It is unclear why the Board is excluding the conversion factor from the CMC and CCC Metals Criteria equations from the CTR to generate total recoverable metals criteria. Table notes need to be updated to explain how NALs were derived. It should be made clear that the MDALs and AMALs were calculated using State Implementation Standard (SIP) procedures.	Add appropriate references to the State Implementation Standard procedures and provide a narrative explanation for reasoning and application in the fact sheet, when provided.
46	C.1	22-24	Non-Stormwater Action Levels	Provision C.1.b of the permit requires that additional NALs must be incorporated into the Permit for any constituents causing or contributing to conditions associated with the highest non-stormwater related water quality priorities. In Provision C.1.a the Permit mandates the NALs that must be incorporated into the WQIP. This provision results in the potential for NALs to be incorporated into the WQIP that may have no direct	The permit should provide a clear linkage between Provision B and Provision C and state allow the WQIP to guide the customization of the NALs based on the watershed needs. As a result, the Permit should provide two approaches for the NALs: 1. Permittees develop the NALs based on the highest water quality priorities; or 2. Permittees use the default NALs and

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				linkage to the highest water quality priorities. Flexibility should be added to the permit language to allow Copermittees to implement NALs based on the watershed's highest priorities and for those NALs to be included, as appropriate, in the WQIP. Otherwise Copermittees may be required to expend time and resources on numeric metrics not associated with the highest priorities in a given watershed instead of addressing the highest priorities.	approach identified in Provision C (both provision C.1.a and C.1.b) **The following is recommended language to support this approach.** C.1.c. Dry weather monitoring and assessment data from MS4 outfalls collected in accordance with Provision D.1.a may be used to develop or revise NALs based upon watershed-specific data. Revision of NALs is subject to Regional Board approval.
47	C.2	25	Storm Water Action Levels	Provision C.2.b requires that additional SALs must be incorporated into the Permit for any constituents causing or contributing to conditions associated with the highest non-stormwater related water quality priorities. The development of SALs may be based on one of 3 options: 1) water quality standards; 2) site specific conditions; and 3) numeric WQBELs. As noted previously the Copermittees believe that it is critical that flexibility be provided in the development and implementation of the SALs to allow the Copermittees to address their highest water quality issue(s). Consequently the Copermittees support other options for developing SALs.	Other options that should be included for the development of the SALs in the Permit are the approaches identified in the California Storm Water Panel in its report, "The Feasibility of Numerical Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities" (June 2006). As previously noted, if the Copermittees do not establish action levels to support the WQIP then the Copermittees must use the SALs identified in Provision C.
D. Monitoring and Assessment Requirements [See attached Monitoring Principles**]**					
E. Jurisdictional Runoff Management Programs					
48	E	53	Jurisdictional Runoff Management Programs	Modifications/clarifications to the first sentence.	**As shown in the attached revised Permit, revise the language, as follows:** "The purpose of this provision is for each Copermittee to implement a program to control the discharge~~contribution~~ of pollutants into and ~~the discharges~~ from theirrespective MS4sto receiving

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					waterswithin its jurisdiction and to focus and prioritize those implementation actions based on the highest water quality priorities identified within the associated Water Quality Improvement Plan."
49	E	53	Jurisdictional Runoff Management Programs	As stated in the second introductory paragraph in Provision E "The jurisdictional runoff management programs implemented by each Copermittee must be consistent with the Water Quality Improvement Plan for the applicable Watershed Management Area required by Provision B." Additionally, as stated in the introduction to the WQIP (Section B) "The purpose of this provision is to develop Water Quality Improvement Plans that guide the Copermittees' jurisdictional runoff management program implementation efforts…" However, the provisions do not clearly allow for the appropriate modification of the JRMP requirements contained in the permit. Given this, it is unclear that the Copermittees would be able to implement a JRMP consistent with the WQIP unless the WQIP was designed to implement the JRMP in the exact manner as required by the current provisions in Provision E.	Include language into the introductory paragraph that clearly indicates that the JRMP requirements contained in Provision E may be modified to allow for implementation of the JRMP consistent with the WQIP if appropriate justification is provided. **Add the following language:** "As such, the requirements of the jurisdictional runoff management programs as outlined below may be modified and prioritized as appropriate for consistency with the highest water quality priorities identified in the Water Quality Improvement Plan for the applicable Watershed Management Area if appropriate justification is provided."
50	E & Attachment C	Throughout	Jurisdictional Runoff Management Programs	Clarification.	Refer to Permanent BMPs as Structural BMPs and add a definition for structural BMPs into Attachment C.
51	E	Throughout	Jurisdictional Runoff Management Programs	Clarification for consistency.	Change "~~Permanent BMP Sizing Criteria Design Manual"~~ to"BMP Design Manual" and make reference to the current design requirements under R9-2007-0001.
52	E.1.a.2	53	Legal Authority Establishment and Enforcement	Sites regulated under the Construction and Industrial General Permits are regulated elsewhere and through alternative means. Clarification is necessary for sites that are not regulated under the respective General Permits.	**As shown in the attached revised Permit, revise the language, as follows:** "Control the contribution of pollutants in discharges of runoff associated with industrial and construction activity into its MS4 and control the

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					quality of runoff from industrial and construction sites~~ including industrial and construction sites whichhave coverage under the statewide General Permit for Discharges of Storm Water Associated with Industrial Activities (Industrial General Permit) or General Permit for Discharges of Storm Water Associated with Construction Activities (Construction General Permit), as well as to those sites which do not~~;" **And add the footnote:** "The Permittees will only be responsible for administering and enforcing the codes and ordinances applicable to their jurisdictions (i.e.; a municipality is not responsible for administering and/or enforcing a permit issued by the State of California)."
53	E.1.a.4 and E.1.a.5	53-54	Legal Authority Establishment and Enforcement	The Copermittees do not have jurisdiction to control MS4 discharges outside of their respective MS4s and the Regional Board does not have the authority to require interagency agreements to grant such jurisdiction, particularly for those agencies not subject to the Order (Caltrans, Native American Tribes, Military installations, etc.)	**As shown in the attached revised Permit, revise the language, as follows:** "~~Control through interagency agreements among Copermittees the contribution of pollutants from one portion MS4 to another portion of the MS4;~~" and "~~Control through interagency agreements with other owners of the MS4 such as Caltrans, the U.S. federal government, or sovereign Native American Tribes, where possible, the contribution of pollutants from one portion of the MS4 to another portion of the MS4;~~" (4) The permittees are encouraged to enter into interagency agreements with owners of other MS4 systems, such as Caltrans, school and college districts, universities, Department of Defense, Native American Tribes, etc., to control the

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					contribution of pollutants from one portion of the MS4s to another portion.
54	E.1.a.7&8	54	Legal Authority Establishment and Enforcement	Copermittees must have the legal authority to control contribution of pollutants in discharges of runoff to its MS4 – mandating the legal authority to require BMPs is not necessary. Additionally, it is not realistic to require homeowners or other private responsible parties to ensure effectiveness of structural BMPs.	Delete E.1.a.7 and E.1.a.8
55	E.1.a.10	54	Legal Authority Establishment And Enforcement	Incorporate language from existing Orange County permit that acknowledges that legal authority will be included in ordinances to the extent permitted by the constitution.	**As shown in the attached revised Permit, revise the language, as follows:** "The Copermittee's ordinance must include adequate legal authority, to the extent permitted by California and Federal Law and subject to the limitations on municipal action under the constitutions of California and the United States,"
56	E.2.a	54	Illicit Discharge Detection and Elimination	Some non-storm water discharges are authorized under the permit unless the Copermittee or San Diego Water Board determines they are a source of pollutants in receiving waters. Language should be provided to account for subsection E.2.a.(3).	**As shown in the attached revised Permit, revise the language, as follows:** "Each Copermittee must address all non-storm water discharges as illicit discharges, where the likelihood exists that they are a source of pollutants to waters of the state."
57	E.2.a.2	55	Illicit Discharge Detection and Elimination	There is no basis for addressing potable water as an illicit discharge to the MS4 unless pollutants are discharged as a result of the water line flushing or a water main break.	**As shown in the attached revised Permit, revise the language, as follows:** "Discharges of non-storm water from water line flushing and water main breaks to the MS4 must be addressed as illicit discharges unless the discharge has coverage under a valid NPDES Permit,. This includes water line flushing and water main break discharges from water purveyors under the Copermittee's jurisdiction that has been issued a water supply permit by the California Department of Public Health or federal military installations. Discharges from recycled or reclaimed water lines to the MS4 must be addressed as illicit discharges, unless the discharges have coverage under a

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					separate NPDES permit.
58	E.2.a.1	55	Illicit Discharge Detection and Elimination	There is no technical basis or water quality concern that justifies the classification of uncontaminated pumped ground water, discharges from foundation drains, water from crawl space pumps, water from footing drains, water line flushing and water main breaks as illicit discharges. These discharges have little to no contribution to water quality pollution. Addressing these non-stormwater discharges as illicit discharges is not a good use of Copermittee resources and they should be added back to the list of allowable non-stormwater discharges.	Add the following back to the list of allowable non-stormwater discharges: • Uncontaminated pumped ground water • Discharges from foundation drains • Water from crawl space pumps • Water line flushing • Water main breaks
59	E.2.a.2	55	Illicit Discharge Detection and Elimination	The provision states: "Discharges from recycled or reclaimed water lines to the MS4 must be addressed as illicit discharges, unless the discharges have coverage under a separate NPDES permit." What does this mean for Cities where a separate Water District has a separate Permit for recycled water lines? Are cities primarily responsible for "addressing the illicit discharge," or is the Water District responsible for enforcing its permit? Does this discussion apply to on-site irrigation lines?	Please clarify.
60	E.2.a.4	56	Illicit Discharge Detection and Elimination	See comment E.2.a.	**As shown in the attached revised Permit, revise the language, as follows:** "or similar means<u>where there is evidence that those discharges are a source of pollutants to waters of the state</u>"
61	E.2.a.4.a	56	Illicit Discharge Detection and Elimination	Individual buildings may require substantial structural modifications to redirect air conditioning condensation to landscaped areas. Redirection should be encouraged instead of required.	**As shown in the attached revised Permit, revise the language, as follows:** "The discharge of air conditioning condensation ~~must~~ <u>should</u> be directed to landscaped areas or other pervious surfaces where feasible;"

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62	E.2.a.4.b	56	Illicit Discharge Detection and Elimination	Complete removal of residential car washing activities is unrealistic and resources would be better used to educate the public. Public outreach has proven to be also effective in minimizing water and detergent use and encouraging the use of commercial facilities.	**As shown in the attached revised Permit, revise the language, as follows:** "(b) Individual residential vehicle washing – Residents should be encouraged, through public outreach and education, to implement the following when washing their vehicles: (i) Direct the discharge of wash ~~water must be directed~~ to landscaped areas or other pervious surfaces where feasible, and (ii) Minimize the use of water for vehicle washing, use as little washing detergent and other vehicle wash products as possible, wash vehicles at commercial wash facilities, and implement other practices or behaviors that will prevent the discharge of pollutants associated with individual residential vehicle washing from entering the MS4; and"
63	E.2.a.4.c.ii	56	Illicit Discharge Detection and Elimination	Clarify. Discharges of saline water to the MS4 cannot be directed out of the MS4 once the discharge has occurred. Allow saline discharges to salt water receiving waters.	**As shown in the attached revised Permit, revise the language, as follows:** "The discharge of saline swimming pool water ~~to the MS4~~ must be directed to the sanitary sewer (with approval from the sanitary sewer agency), landscaped areas, or other pervious surfaces that can accommodate the volume of water or to the MS4 if the MS4 discharges to a saltwater receiving water."
64	E.2.a.5.b	56-57	Illicit Discharge Detection and Elimination	Priorities for emergency procedures such as firefighting are public health and safety. The paragraph on Emergency Fire Fighting discharges should reflect the language included in the County's current permit. In addition, the language for the non-emergency fire fighting activities should be streamlined.	**As shown in the attached revised Permit, revise the language, as follows:** (1) "Firefighting discharges to the MS4 must be addressed by the Copermittees ~~as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a significant source of pollutants to receiving~~

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					~~waters. Firefighting discharges to the MS4 not identified as a significant source of pollutants to receiving waters, must be addressed, at a minimum,~~ as follows:" **Delete language in E.2.a.5.b and replace with:** (a) "Emergency fire fighting flows (i.e., flows necessary for the protection of life or property) do not require BMPs and need not be prohibited. As part of the Jurisdictional Runoff Management Plan (JRMP), each Copermittee must develop and implement a program to address pollutants from non-emergency fire fighting flows (i.e., flows from controlled or practice blazes and maintenance activities) identified by the Copermittee to be significant sources of pollutants to waters of the United States."
65	E.2.b.1.e	58	Illicit Discharge Detection and Elimination	Clause is redundant and confusing.	**As shown in the attached revised Permit, revise the language, as follows:** ~~(i.e., receiving water segments that are both a receiving water and part of the MS4),~~
66	E.2.b.2	58	Illicit Discharge Detection and Elimination	Clarification is necessary to limit employee responsibilities to within the terms of their employment.	**As shown in the attached revised Permit, revise the language, as follows:** "~~Each Copermittee must use~~ Copermittee personnel and contractors should~~to~~ assist in identifying and reporting illicit discharges and connections, if observed during the course of their daily employment activities;"
67	E.2.b.4	58	Illicit Discharge Detection and Elimination	The addition of language is necessary to limit Copermittees responsibility to standards that may reasonably be met.	**As shown in the attached revised Permit, revise the language, as follows:** "Each Copermittee must implement practices and procedures (including a notification mechanism) to prevent, respond to, contain, and clean up any spills

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					that may discharge into the MS4 within their jurisdiction from any source. The Copermittee must coordinate with spill response teams to prevent to the extent possible entry of spills into the MS4, and prevent contamination of surface water, ground water, and soil."
68	E.2.c	58	Illicit Discharge Detection and Elimination: Field Screening and Monitoring	Visual observations should be acknowledged as a way to detect non-storm water and illicit discharges and connections.	Add "Visual Observations" to the provision header and acknowledge within the text.
69	E.2.d.2 & E.2.d.3	59 – 61	Illicit Discharge Detection and Elimination: Investigate and Eliminate	Sections 2 and 3 outline the procedures that Copermittees must have in place. Not all language under these headers speak to procedures. Additionally, some overlap exists between these two sections.	Edit were made to ensure that requirements addressed the development of procedures. Additional edits made for clarity and to reduce overlap between sections. See the strikeout document of the admin draft for specifics.
70	E.2.d.2	59	Illicit Discharge Detection and Elimination	Language should be added for discharges to receiving waters within the jurisdiction of the Copermittee.	**As shown in the attached revised Permit, revise the language, as follows:** "Each Copermittee must implement procedures to investigate and inspect portions of its MS4 that, based on reports or notifications, visual observations, field screening and monitoring, or other appropriate information, indicate a reasonable potential of ~~receiving, containing, or~~ discharging pollutants to receiving waters within the Copermittees jurisdiction due to illicit discharges or illicit connections, ~~or other sources of non-storm water~~."
71	E.2.d.2.b & c	60	Illicit Discharge Detection and Elimination	Provision E.2.d.2 states that the Copermittee must implement procedures and develop criteria for responding to and addressing incidents. Providing additional specificity in (b) and (c) is unnecessary and contradicts previous statements that Copermittees develop their own criteria. Delete b and c.	**Delete the following:** ~~(b) Each Copermittee must immediately investigate and seek to identify the source(s) of discharges of non-storm water where flows are observed in and from the MS4 during the field screening and monitoring required pursuant to Provision D.1.a.(1). The investigation must include field~~

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					~~investigations to identify sources or potential sources for the discharge, unless the source or potential source has already been identified during previous investigations;~~ ~~(c) Each Copermittee must investigate and seek to identify the source(s) of non-storm water discharges from the MS4 where there is evidence of non-storm water having been discharged into or from the MS4 (e.g., pooled water). The investigation may include field investigations, reviewing Copermittee inventories, and other land use data to identify potential sources of the discharge; and~~
72	E.2.d.4	61	Illicit Discharge Detection and Elimination	Language used in the current Orange County Permit (Provision R9-2009-0002) provides clearer language regarding follow through.	**Use Orange County permit language instead:** If the Copermittee suspects the source of the non-storm water discharge as natural in origin (i.e. non-anthropogenically influenced) and in conveyance into the MS4, then the Copermittee must ~~collect the data and evidence necessary to demonstrate to the San Diego Water Board that it is natural in origin; and~~document the rationale for why the discharge does not need further investigation. This documentation shall be included in the Annual Report.
73	E.3	61	Permanent BMP Requirements for All Development Projects	No jurisdictional limitations are provided in this section. As a result, language in the subsections may be interpreted as expanding Copermittee requirements outside their MS4 jurisdiction. In addition how the Copermittees implement their program should be a decision left to the Copermittees.	**As shown in the attached revised Permit, revise the language, as follows:** "Each Copermittee, within their respective jurisdictions, must ~~use their land use/planning authorities to~~ implement a development planning program…"
74	E.3.	61-74	Development Planning	Permanent BMPs. This nomenclature can be confusing. "Treatment controls and structural LID BMPs" is more apt language than "permanent" to the type of BMPs in these provisions.	**As shown in the attached revised Permit, revise the language, as follows:** Change "permanent" to "Treatment controls and

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					structural LID BMPs" throuought the section.
75	E.3.a	61	Permanent BMP Requirements for All Development Projects	Requiring specific types of BMPs (i.e. LID) does not allow for Copermittees to implement adaptive management practices based on the best available technology for the soil and climate types of specific developments. This is an increase in BMP requirements to all development (including redevelopment) projects as compared to the prior permit and will require additional TCBMP inspections and maintenance. It will also impact the Copermittee's ability to maintain their infrastructure due to additional requirements, costs, and time associated with implementation. An exception should also be added for the protection of persons and property, particularly as it applies to BMPs not being implemented in waters of the U.S. or state. This language is consistent with Cal. Water Code §13269(c)(1-2). Flood control projects are intended for the protection of public safety and property and are mandated by the Orange County Flood Control Act of 1927. Requiring flood control projects to implement BMPs which are intended for traditional types of development projects is inappropriate and in most cases infeasible. Furthermore requiring flood control projects to implement BMPs may cause flood control projects to be infeasible which in many cases will increase the risk of flooding. If flooding does occur in these areas it would increase the risk of pollutants discharging into receiving waters from the flooded areas.	**As shown in the attached revised Permit, revise the language, as follows:** "Each Copermittee, as practical and feasible, must prescribe the following BMP requirements during the planning process (i.e. prior to project approval and issuance of grading or building permits) for all development projects (regardless of project type or size), where local permits are issued, including unpaved roads, ~~and flood management projects~~, except emergency projects implemented for the protection of persons and property:"
76	E.3.a.3	62	Permanent BMP Requirements for All Development Projects	Specified LID BMPs should be implemented consistent with technical guidance developed by the Copermittees.	**As shown in the attached revised Permit, revise the language, as follows:** Add the following foot note to this section: "Implementation of LID BMPs shall be consistent with technical guidance developed by the Copermittees."

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77	E.3.a.5	63	Infiltration and Groundwater Protection	Infiltration BMPs must not have a reasonable potential to cause an exceedance of an applicable groundwater quality objective as identifying that it has caused an exceedance would be difficult.	**As shown in the attached revised Permit, revise the language, as follows:** "Infiltration and treatment control BMPs designed to primarily function as large, centralized infiltration devices (such as large infiltration trenches and infiltration basins) must not <u>have reasonable potential</u> to cause or contribute to an exceedance of an applicable groundwater quality objective."
78	E.3.b.1.a	64	Definition of Priority Development Project	The entire project footprint should not be required to adhere to the new development requirements as only project features that qualify as PDP projects should be subject to the PDP requirements. Other non-PDP land uses have not been identified as PDPs for a reason as they are not a significant source of pollutants. If they were a source of pollutants then they would be categorized as a PDP. Identification of PDP types has focused in the past on those land uses that are a significant source of pollutants, and so requiring non-PDP land uses to meet PDP requirements has no technical basis since they are not a significant source of pollutants there will be no significant reduction in pollutants through the implementation of PDP requirements. Furthermore this non-PDP land uses also do not represent an increase in the volume of runoff as they do not contain large amounts of impervious surfaces as if they did then they we trigger the impervious area thresholds of the PDP categories. Therefore requiring non-PDP land uses to meet PDP requirements has no technical basis since they are also not a significant source of increases of volume of runoff and therefore there will be no significant reduction in the volume of runoff through the implementation of PDP requirements.	Delete the section from the permit.

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79	E.3.b.1.b	64	Definition of Priority Development Project	Limit to requirements not subject to prior PDP requirements as these projects already have water quality treatment and the new requirements should not apply to areas that already have water quality treatment.	**As shown in the attached revised Permit, revise the language, as follows:** "Where redevelopment results in an increase of more than fifty percent of the impervious surfaces of a previously existing development and was not subject to previous Priority Project Development requirements, the performance and sizing requirements apply to the entire development."
80	E.3.b.1.c	64-65	Definition of Priority Development Project	Clarify that regardless of the 50% threshold, portions of the site that were subject to and meet previous Priority Development Project requirements are not subject to the new requirements. Proposed language has been modified from Ventura County NPDES MS4 Permit (Order No. 00-108).	**As shown in the attached revised Permit, revise the language, as follows:** Add the following: "(c) Projects where redevelopment results in an increase of more than fifty percent of impervious surfaces of a previously existing development, and the existing development *was* subject to previous Priority Project Development Requirements, only the altered portion is subject to the new Priority Development Project requirements. "
81	E.3.b.2	65	Priority Development Project Categories	This provision establishes the scope of development projects subject to the post-construction controls. Sometimes the criterion is based on impervious area and other times it is based on surface area. Also, this is an increase in requirements from the prior permit, which was limited to much larger development projects.	In the interest of consistency, revise the criterion so that impervious area is the mechanism for determining applicability as it is an accurate surrogate for establishing project eligibility.
82	E.3.b.2.g	66	Priority Development Project Categories	This requires PDP requirements for development and redevelopment of streets, roads, highways, freeways, and residential driveways over 5,000 square feet. This requirement was present in the prior permit; however, the residential driveways requirement was added under the proposed permit and will require additional Copermittee effort for treatment control and structural LID BMP inventory, inspections, and maintenance	**As shown in the attached revised Permit, revise the language, as follows:** "Streets, roads, highways, and freeways~~, and residential driveways~~. This category is defined as any paved impervious surface that is 5,000 square feet or more used for the transportation of automobiles, trucks, motorcycles, and other internal

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				verification and may have potential enforcement issues. Residential driveways should be removed from this Provision unless the Regional Board can provide a sound scientific basis for inclusion. Additionally vehicles should be defined as internal combustion vehicles as internal combustion vehicles are the source of pollutants this section is developed for.	combustionvehicles."
83	E.3.b.2.i	66	Priority Development Project Categories	The term pollutant-generating is ambiguous and needs to be defined.	**As shown in the attached revised Permit, revise the language, as follows:** Include footnote with a definition of "pollutant generating"
84	E.3.b.3.d	66	Priority Development Project Categories	An exemption for Priority Development Projects should be provided for driveways and parking lots constructed with permeable surfaces.	**As shown in the attached revised Permit, revise the language, as follows:** "Sidewalks, bicycle lanes, driveways, parking lots, or trails constructed with permeable surfaces."
85	E.3.b.3.e	66	Priority Development Project Categories	Single family residential projects should not be subject to PDP requirements as the PDP requirements would put an undue burden on single family residences where it has not been shown that they are significant source of pollutants.	**As shown in the attached revised Permit, revise the language, as follows:** Single-family residential projects that are not part of a larger development or proposed subdivision
86	E.3.b.3.f	66	Priority Development Project Categories	The Ventura County NPDES MS4 Permit, the Santa Ana Region permits for Orange County, San Bernardino County, and Riverside County, and the Greater Los Angeles MS4 Permit Staff Working Proposal provide that streets, roads, and highways, and freeways follow USEPA guidance regarding Managing Wet Weather with Green Infrastructure: Green Streets to the maximum extent practicable.	**As shown in the attached revised Permit, revise the language, as follows:** "(e) Any paved impervious surface that is 5,000 square feet or more used for the transportation of automobiles, trucks, motorcycles, and other vehicles that follows the USEPA guidance regarding Managing Wet Weather with Green Infrastructure: Green Streets[1] to the MEP." 1:http://water.epa.gov/infrastructure/greeninfrastructure/index.cfm

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87	E.3.b.3.g	66	Definition of Priority Development Project	This provision establishes an exemption for emergency public safety projects where a delay due to a SSMP would compromise public safety, public health and/or the environment. Permittees need an exemption where if public health or safety or environmental protection is threatened the project can proceed without a SSMP.	**As shown in the attached revised Permit, revise the language, as follows:** "(d) Emergency public safety projects in any of the Priority Development Categories may be excluded if the delay caused due to the requirement for a SSMP compromises public safety, public health and/or environmental protection."
88	E.3.c.2	66 – 68	Priority Development Project Permanent BMP Performance and Sizing Criteria	The permit should allow offsite regional groundwater replenishment as an option that is coequal with onsite retention. This promotes groundwater infiltration at a regional scale where it can have watershed-wide benefits. As currently written in the Administrative Draft, a project applicant must prove technical infeasibility before pursuing alternative compliance. This will limit the need for alternative compliance. Copermittees may not be willing to take on the risk of investing in regional groundwater replenishment projects if the permit requirements do not foster a need for such projects. Allowing onsite retention and offsite regional groundwater replenishment as coequal options provides for a higher number of project applicants paying into a fund to construct regional facilities.	**As shown in the attached revised Permit, revise the language, as follows:** Allow offsite regional groundwater replenishment as an option coequal with onsite retention. Suggest adding the following language: "(a) Each Priority Development Project must be required to implement LID BMPs as described in Provision E.3.a.(3) or offsite regional groundwater replenishment if the following conditions apply:; (i) The volume of stormwater runoff used to replenish groundwater must be equal to or greater than the design capture volume; (ii) Pollutant reduction is provided through treatment of the design capture volume at the project site."
89	E.3.c.2.b	67	Priority Development Project BMP Implementation and Oversight	Retention should not be limited to requiring retention for the 85th percentile storm but also allow, as an option, the matching of the volumes between the pre and post-project conditions. The former will result in lesser flows necessary for downstream habitats and may be less desirable in some circumstances.	**As shown in the attached revised Permit, revise the language, as follows:** "Each Priority Development Project must be required to implement LID BMPs that are sized and designed to retain the volume equivalent to runoff produced from a 24-hour 85th percentile storm event or to retain the difference in the volume

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					between the runoff volume produced in the post-project condition as compared to the pre-project condition resulting from a 24-hour 85th percentile storm event ("design capture volume").
90	E.3.c.2.c	67	Priority Development Project BMP Implementation and Oversight	This provision removes the BMP hierarchy recently adopted in both the South Orange County Permit (R9-2009-0002) and the Santa Margarita Region Permit (R9-2010-0016): retention, then biofiltration, and then conventional BMPs including offsite mitigation with no technical justification. Biofiltration provided an option for those sites where in their natural condition soils are not suitable for infiltration, and where harvesting and use is not feasible. By removing the biofiltration step from the hierarchy the existing soils of the site are no longer considered in the implementation of BMPs for the site. In the above mentioned permits, soils of a site can be factored into BMP implementation as when infiltration is not feasible due to poor soilsbiofiltration is a viable option. This provision in the Administrative Draft removes the biofiltration option and additionally requires offsite mitigation for those siteswith natural site conditions that prevent full retention from occurring onsite. This in effect punishes sites that have poor soils, which is a factor beyond the control of the site. Furthermore this provision as currently written will result in development being implemented in areas of well draining soils so that the retention standard can be met through infiltration. This result is antithetical to one of the primary LID site design techniques, which is to concentrate development and impervious surfaces on poor draining soils to help maintain the natural hydrology. The result of this provision will be that development will be located on well draining	**As shown in the attached revised Permit, revise the language, as follows:** "(c) If onsite retention of the design capture volume using LID BMPs is technically infeasible per Provision E.3.c.(4)flow-thru LID ~~and/or conventional treatment control~~ BMPs must be implemented to treat the portion of the design capture volume that is not retained onsite. Flow-thru LID treatment control BMPs must be designed for an appropriate surface loading rate to prevent erosion, scour and channeling within the BMP. (d) If retention and/or equivalent pollutant removal of the design capture volume to meet E.3.c.(2)(a) or E.3.c.(2)(b) are infeasible onsite~~Additionally~~ project applicants must perform mitigation for the portion of the pollutant load in the design capture volume that is not retained onsite, as described in Provision E.3.c.(4)**Error! Reference source not found.**.."

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				soilswhere meeting retention through infiltration is feasible, which could have a disastrous impact on the overall health of a watershed as land with good draining soils will be targeted for development vs being preserved in the watershed.	
91	E.3.c.(3)	68	Hydromodification Management BMP Requirements	The Regional Board adopted the San Diego Hydromodification Management Plan (HMP) in July 2010. Significant work, technical analysis and input have gone into the development of the HMP and these requirements have been in effect for only 16 months. Rather than providing separate criteria, the permit should acknowledge implementation of the Regional Board approved HMP as a sufficient mechanism for meeting hydromodification requirements. The Orange County MS4 permit states only guidelines/criteria regarding hydromodification and refer to the HMP for detailed requirements. Similarly significant work and technical analysis and input have gone into the development of the South Orange County HMP, which would essentially become obsolete shortly after approval and beginning of implementation. The Regional Board has provided no technical justification for the new hydromodification provisions. The HMPs for San Diego and South Orange County are based on sound science and should be allowed time to understand if they are adequate for mitigating hydromodification impacts. The administrative draft proposes to lower project applicability thresholds substantially in some categories. For example, commercial and industrial projects will be lowered from one acre to 10,000 sqftor	**As shown in the attached revised Permit, revise the language, as follows:** "Each Copermittee must require each Priority Development Projects greater than one acre to implement hydromodification management BMPs as described in the Copermittees' current HMP, as applicable ~~so that~~." Delete sections E.3.c.3(a)(i) and (ii).

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				more of impervious surfaces. Imposing hydromodification requirements on these lower thresholds will be unduly burdensome to smaller projects.	
92	E.3.c.(3)(c)	68	Hydromodification Management BMP Requirements	Per the Hydromodification Management Workshop provided by the Copermittees on August 30, 2012 the expert panel identified that onsite controls are not one size fits all and in some cases it maybe more beneficial to provide stream restoration instead of onsite controls. Regional Board Staff acknowledged at the September 5, 2012 workshop that onsite controls may not be applicable in all cases. Changes to the language in this section provide an opportunity for PDPs to implement stream restoration projects or offsite mitigation or contribute to an established mitigation fund if it is identified that stream restoration or offsite mitigation would be more beneficial to watershed health	**As shown in the attached revised Permit, revise the language, as follows:** "If hydromodification management BMPs are technically infeasible per Provision E.3.c.(4)orit is identified that stream rehabilitation projects or regional mitigation projects are preferable for restoration of watershed functions, project applicants must perform mitigation for the portion of the runoff volume that is not controlled and has a reasonable potential to cause or contribute to increased potential for erosion of receiving waters downstream of the Priority Development Project, as described in Provision E.3.c.(4)**Error! Reference source not found.**or contribute to an established mitigation fund per Provision (3)(d)(v)."
93	E.3.c.(3)(d) New Section	69	Hydromodification Management BMP Requirements	This section provides an option for Copermittees to develop an Offsite Hydromodification Mitigation program to implement a watershed based approach to hydormodification. This language provides the basis and key elements to the development of this program.	**As shown in the attached revised Permit, revise the language, as follows:** Add the following text: (d) Offsite Hydromodification Mitigation Program Each Copermittee, in collaboration with the other Copermittees may develop and implement a watershed based approach to hydromodification management that may include the following: (i) Analysis to identify current

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					land uses and proposed future development and changes in land use. (ii) Development of watershed hydromodification management objectives. (iii) Development of criteria to identify when stream rehabilitation or regional mitigation projects are preferable to onsite hydromodification controls for PDPs, in order to restore watershed functions and processes,. (iv) Identification of opportunities for stream rehabilitation and mitigation projects to restore watershed functions and processes (v) Development of a mitigation fund and program for implementation of stream rehabilitation and mitigation projects
94	E.3.c.3.d.ii	69	Hydromodification Management BMP Requirements – Exemptions	Section F.1.h.(3) provides discretion to the Copermittees to identify hydromodification requirements that are not required. Hydromodification requirements are not appropriate for channels that are designed to accept increased flows from upstream	**As shown in the attached revised Permit, revise the language, as follows:** "(ii) Discharges storm water runoff into conveyance channels <u>that are engineered for the</u>

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				development, as the potential for erosion, if any, is minimal. A waiver for projects that discharge to concrete-lined or engineered channels should be included. Studies have shown that hydromodification is caused by the smaller storms up to the 10 year event. Based on these studies those engineered channels designed to convey the 10-year ultimate build out condition will therefore not experience hydromodification impacts. These channels were installed for the purpose of flood control and protection of public safety and property as historically flooding occurred where there is now development. These channels cannot be removed as they serve the important and mandated service of flood control. It is also unrealistic to think that development can be removed from the floodplain so that these flood control channels could be removed and returned to a natural state. Since removal of these channels is infeasible restoration of these channels to a natural state is also infeasible. Since there is no potential for restoration to a natural state and because these channels are designed to be flood control channels they should be allowed to convey the storm events they are designed for. Since there is no potential for removal of these channels there is no environmental benefit to requiring onsite mitigation of hydromodification when these channels are designed and engineered to accept these flows.	capacity to convey the 10-year ultimate build out condition flow and are regularly maintained to ensure flow capacity ~~whose bed and bank are concrete lined~~ all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;"
95	E.3.c.3.d.iii	69	Hydromodification Management BMP Requirements – Exemptions	Studies have shown that cumulative watershed impacts are minimal in stream reaches of large depositional rivers. Analysis in the San Diego HMP demonstrated that the effects of cumulative watershed impacts are minimal in those reaches which the drainage area exceeds 100 square miles and with a 100-year design flow in excess of 20,000 cfs. An exemption for those reaches that meet these criteria should be included in	**As shown in the attached revised Permit, revise the language, as follows:** " (iv) Discharges to large rivers where large rivers are defined as reaches for which the contributing drainage area exceeds 100 square miles and with a 100-year design flow in excess of 20,000 cfs;"

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				the exemption provisions of the permit.	
96	E.3.c.3.d.iv	69	Hydromodification Management BMP Requirements – Exemptions	Infill redevelopment projects offer an opportunity for improvement in water quality. Due to the usual tight constraints and limited footprint of infill development projects implementing onsite hydromodification controls is often infeasible. In many cases projects will not be able to meet the hydromodification criteria and so will choose "greenfield" developments where meeting hydromodification criteria are more feasible. To encourage infill development over "urban sprawl" and "greenfield" development, a hydromodification exemption should be provided for infill development projects. This will also provide the benefit of improving water quality as the water quality/LID requirements will still be required to be met. Overtime infill redevelopment projects will address the significant issue of improving water quality from existing development. Without this exemption redevelopment for infill projects will likely not occur as implementing onsite hydromodification will just be too expensive for these types of projects and so the benefits meeting the water quality/LID requirements will not be realized at these sites. Criteria for what projects qualify for the infill development exemption shall be developed by each of the Permittees as part of updates to their HMPs.	**As shown in the attached revised Permit, revise the language, as follows:** " (v) Discharges from infill redevelopment projects that meet criteria to be established in the Permittees' HMPs; or"
97	E.3.c.3.d.v	69	Hydromodification Management BMP Requirements – Exemptions	Flood control projects are intended for the protection of public safety and property and are mandated by the Orange County Flood Control Act of 1927. Requiring flood control projects to implement hydromodification controls intended for traditional types of development projects is inappropriate and in most cases infeasible. Furthermore requiring flood control projects to implement hydromodification controls may cause flood control projects to be infeasible which may increase the risk of flooding. If flooding does occur in these areas it	**As shown in the attached revised Permit, revise the language, as follows:** "(vi) In-stream flood control and restoration projects."

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				would increase the risk of pollutants discharging into receiving waters from the flooded areas. In-stream restoration projects are designed to restore beneficial use of streams and channels. These projects also serve as a potential option for restoring impacts from hydromodification. It is counterproductive to require mitigation of a restoration project.	
98	E.3.c.4.a.iv	69	Alternative Compliance for Technical Infeasibility	Add additional language to encourage strategically important regional BMP projects	**As shown in the attached revised Permit, revise the language, as follows:** "(iv) The project applicant is required to perform mitigation described in Provision E.3.c.(4)(c) and has the option or ability to contribute to a regionally important mitigation project/program as defined in the Water Quality Improvement Plan that would address strategic high-priority water quality protection and/or more-direct restoration of beneficial uses in receiving waters than if achieved if the Priority Development Project had fully implemented the retention LID and hydromodification management BMP requirements under Provisions E.3.c.(2) and E.3.c.(3) onsite."
99	E.3.c.4.b.i.	70	Alternative Compliance for Technical Infeasibility: Criteria	Contaminated groundwater at a project development site should also be included as reason for technical infeasibility.	**As shown in the attached revised Permit, revise the language, as follows:** "(i) Locations that cannot meet the infiltration and groundwater protection requirements in Provision E.3.a.(5)due to the presence of shallow bedrock, contaminated soils, contaminated groundwater, near surface groundwater, underground facilities, or utilities;"
100	E.3.c.4.c	70	Alternative Compliance for	The permit should clearly provide Copermittees' with the option to develop an alternative compliance	**As shown in the attached revised Permit, revise the language, as follows:**

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			Technical Infeasibility: Mitigation	program that fits their specific program needs.	"Priority Development Projects that meet the Copermittee's technical infeasibility criteria developed pursuant to Provision E.3.c.(4)**Error! Reference source not found.** must be required to mitigate for the increased flow rates, increased flow durations, and/or increased pollutant loads expected to be discharged from the site. ~~Forpollutant load in the volume of storm water~~Copermittees may establish an offsite mitigation program that requires the developer to mitigate for the water quality equivalencenot retained onsite with retention LID BMPs, or increased potential erosion of downstream receiving waters not fully controlled onsite with hydromodification management BMPs, the Copermittee must require the project applicant to either 1) implement an offsite mitigation project, and/or 2) provide sufficient funding for a public or private offsite mitigation project via a mitigation fund."
101	E.3.c.4.c.ii	71	Mitigation Project Types	Groundwater recharge projects are a viable offsite mitigation project as they promote and integrated water resources approach and should be listed as an option for offsite mitigation. In-stream rehabilitation projects need the flexibility to incorporate a variety of materials to be effective at restoring beneficial uses and stream function. Limiting the types of materials that can be used will prevent many project from being implemented. Regional Board staff will have an opportunity to review the materials used in all stream restoration projects through the 401 certification.	**As shown in the attached revised Permit, revise the language, as follows:** "Offsite mitigation projects ~~must~~may include, where applicable and feasible, retrofitting opportunities and stream and/or habitat rehabilitation or restoration opportunities identified in the Water Quality Improvement Plans, identified pursuant to Provision B.3.a. Other offsite mitigation projects may include green streets or infrastructure projects, groundwater recharge projects, or regional BMPs upstream of receiving waters. ~~In stream rehabilitation or restoration measures to protect~~

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					~~or prevent adverse physical changes to creek bed and banks must not include the use of nonnaturally occurring hardscape material such as concrete, riprap, or gabions.~~ Project applicants seeking to utilize these alternative compliance provisions may propose other offsite mitigation projects, which the Copermittees may approve if they meet the requirements of Provision E.3.c.(4)**Error! Reference source not found.**.
102	E.3.c.4.c.iii	71	Mitigation Project Timing	Offsite mitigation projects being implemented by a PDP should be completed upon completion of the PDP project, however the Copermitees should be provided the opportunity to develop a timing scheme if they choose to develop a Copermittee offsite mitigation program.	**As shown in the attached revised Permit, revise the language, as follows:** "The Copermittee and/or project applicant must develop a schedule for the completion of offsite mitigation projects, including milestone dates to identify, fund, design, and construct the projects. PDP implemented~~O~~offsite mitigation projects must be completed upon ~~the granting of occupancy for the first project that contributed funds~~completion of thePDP, unless a longer period is authorized by the San Diego Water Board. The timing of mitigation projects associated with a Copermittee offsite mitigation program will be developed by the Copermittees as part of developing their offsite mitigation program."
103	E.3.e.2.a	73	Priority Development Project BMP Implementation and Oversight	Removal of the term "continuously" is suggested so ensure Copermittees do not have to allocate resources for incessant updates to the database. Language should also be added to clarify that, although the database will be watershed-based, each Copermittee is responsible only for inventory under their jurisdiction.	**As shown in the attached revised Permit, revise the language, as follows:** "Each Copermittee must develop and ~~continuously~~regularly maintain a watershed-based

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					database to track and inventory all Priority Development Projects and associated ~~permanent~~ treatment control and structural LIDBMPs within their jurisdiction…"
104	E.4	75	Construction Management	The current language does not provide clarity on when the construction management program is applicable or what the Copermittees responsibilities are under the program.	Revise section to clarify Copermittees responsibilities and applicability of the program.
105	E.4.a.	75	Construction Management	Include the word "sediment" in this section as construction stormwater management requires an effective combination of erosion and sediment controls. Remove the word "equivalent" as this term is ambiguous as there is no set standard for SWPPPs and so equivalency is undefined.	Revise the section include the word "sediment" in the sections that identify erosion control plans and remove the word "equivalent" related to erosion and sediment control plans.
106	E.4.a.4	75	Project Approval Process	Copermittees are required to verify that the project applicant has obtained coverage under applicable permits. The US ACOE requires all other permits to be in place prior to issuing the 404 permit. It is not possible to have the 404 permit prior to issuing a grading or building permit. The requirement from the 4th Term permit was to verify coverage under the Construction General Permit.	**As shown in the attached revised Permit, revise the language, as follows:** "Verify that the project applicant has obtained coverage under ~~applicable permits, including, but not limited to~~ the Construction General Permit.~~, Clean Water Act Section 401 Water Qaulity Certification and Section 404 Permit, and California Department of Fish and Game Streambed Alteration Agreement.~~
107	E.4.b.(1)	75	Construction Management	The current language requires monthly update of construction sites. Quarterly update of the inventory is more appropriate to track construction sites as this is a significant burden on the Copermittees. These sites are tracked through SMARTS already and more frequent tracking is not necessary.	**As shown in the attached revised Permit, revise the language, as follows:** "(1) Each Copermittee must maintain, and update at least ~~monthly~~quarterly, a watershed-based inventory of all construction sites requiring construction, grading, or building permits within its jurisdiction."
108	E.5	79	Existing Development	After years of implementation of existing development programs, the Copermittees have the knowledge and	Replace the current provision E.5 with the proposed Provison E.5 provided in the attachment.

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			Management	experience to implement programs consistent with the goals of the Order and the adaptive management process required under the Order. In order to accomplish this goal, the Copermittees have reorganized and provided a concise existing development section as an alternative to the current provision E.	
109	E.5	79	Existing Development Management	Provision E.5.a mixes types of facilities, areas, and activities that should be included in the inventory and the information that should be included within the database regarding each type of facility, area, and activity.	If the current provision E.5 is not replaced with the proposed provision E.5, then the reorganization of this provision is recommended. Specific edits for this section are provided below.
110	E.5.a	79	Existing Development Management	Regulation of residential sites, while not entirely new, will increase cost, responsibility, and liability as currently presented due to the magnitude of increased regulatory requirements. There will be significant enforcement issues, particularly with the residential portion. Adding the term "reasonable potential to discharge" allows flexibility for the Copermittees to determine priorities. Practically all existing properties have the potential to generate pollutant loads and the inspection program will be ineffective and impractical to implement as written. The focus needs to be on significant pollutant load discharges so inspections and enforcement can actually succeed in receiving water pollutant load reductions versus spending an exhaustive amount of time and money inspecting sites that discharge no pollutant loads, but have the potential to generate minimal loads.	**If the current Provision E.5 is not replaced, modify as follows**: "Each Copermittee must maintain an updated watershed-based inventory and/or map of its existing development that has the reasonable potential to ~~may potentiallygenerate~~discharge a pollutant load into ~~and from~~ the MS4."
111	E.5.a.4, E.5.a.7	79	Existing Development Management	Minor grammatical corrections.	**If the current Provision E.5 is not replaced, modify as follows**: "(4) Identification ~~if a business is a~~ of mobile businesses;

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					(7) ~~Identification if an area is a~~ Common Interest Areas (CIAs) / Home Owner Associations (HOAs), ~~or~~and mobile home parks;"
112	E.5.a.13	80	Existing Development Management	The continual requirement for map updating is excessive. Regularly updated maps should be sufficient for up-to-date information without requiring Copermittees to expend excessive resources. Expand to highlight what has already been accomplished by permittees.	**If the current Provision E.5 is not replaced, modify as follows**: "A ~~continually~~regularly updated map showing the location of inventoried existing development, watershed boundaries, water bodies, and retrofits implemented~~and pollutants generated~~ at the inventoried existing development and/or rehabilitations implemented at channels and/or receiving waters."
113	E.5.b	80	Retrofitting and Channel Rehabilitation in Areas of Existing Development	This is a new requirement, as compared to the prior permit, which only requires an evaluation of channels that may be retrofitted. Requiring Municipalities to take responsibility for entire stream channels and rehabilitate them to restore impaired beneficial uses of streams is beyond the responsibility that MS4 operators have over MS4 discharges. MS4 operators are not the sole discharger to/cause of impaired channels. Additionally in many instances the channels are flood control facilities which may be required to sustain the existing surrounding development. In many instances, channel rehabilitation of channels may not be feasible and other options for improving discharge water quality would need to be considered.	Remove this Provision entirely or include it as an option for compliance as stated below: "…and rehabilitatechannels and/or receiving waters to restore impaired beneficial uses of streams, as feasible."
114	E.5.b.1	80	Retrofitting and Channel Rehabilitation in Areas of Existing Development	Minor modifications to language to better encompass creek restoration projects.	**As shown in the attached revised Permit, revise the language, as follows:** "Each Copermittee must identify areas of existing development as candidates for retrofitting, and channels and/or receiving waters ~~in areas of~~

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					~~existing development~~ as candidates for rehabilitationwithin its jurisdiction, as feasible. Areas of existing development must be selected based on a likelihood that retrofitting and channel rehabilitation will address the highest water quality priorities identified in the Water Quality Improvement Plan prepared pursuant to Provision B.”
115	E.5.b.2	80	Retrofitting and Channel Rehabilitation in Areas of Existing Development	Minor modifications to language to acknowledge that benefits of creek restoration may occur immediately downstream.	**As shown in the attached revised Permit, revise the language, as follows:** “The evaluation must also include an assessment of the channels and/or receiving waters within its jurisdiction where ~~channel~~ rehabilitation will improve beneficial uses of streams within or immediately downstream of the Copermittee’s jurisdiction.”
116	E.5.b.3	80	Retrofitting and Channel Rehabilitation in Areas of Existing Development	The proposed permit requires the Copermittees to “encourage” landowner retrofit to private property through the “Copermittee’s use of subsidies, penalties, or other incentives.” Copermittees will face serious enforcement (and possibly legal) issues if they attempt to penalize private landowners for failing to expend their own time, effort, and money retrofitting properties that landowners had no intention of altering in the first place. As this is a first time requirement to implement channel restoration projects, the logical first step in retrofitting is to identify projects and prioritize them for implementation based on the highest benefit to water quality and beneficial uses.	**As shown in the attached revised Permit, revise the language, as follows:** “Each Copermittee must ~~implement~~prioritize for implementation retrofit and channel rehabilitation projects, as feasible, that address the highest water quality priorities identified in the Water Quality Improvement Plan pursuant to Provision B.3.a. Ranking may also take into account project feasibility and cost effectiveness. The Copermittee ~~must~~ should encourage private landowners to implement retrofit designs, at minimum, through the use of public education and outreach. ~~and channel rehabilitation projects whenever practical. Private landowners should be encouraged through the Copermittee’s use of subsidies, penalties, or other incentives.~~”

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117	E.5.b.4	81	Retrofitting and Channel Rehabilitation in Areas of Existing Development	Evaluation of flood control facilities for retrofit for water quality should occur as a part of maintenance for these facilities.	**As shown in the attached revised Permit, revise the language, as follows:** "Each Copermittee must evaluate the flood management and flood control devices and structures in its inventory to determine if it is feasible to retrofit the device or structure, to provide additional pollutant removal from storm water. A Copermittee must consider the highest water quality priorities identified in their Water Quality Improvement Plan as part of each assessment. Evaluation of facilities may occur as a part of routine maintenance of these facilities."
118	E.5.b.5	81	Retrofitting and Channel Rehabilitation in Areas of Existing Development	See comments for Provision E.5.b. and E.5.b.3.	**As shown in the attached revised Permit, revise the language, as follows:** "Where retrofitting and channel rehabilitation within specific areas of existing development under the Copermittees jurisdiction are determined to be infeasible to restore and protect receiving waters from the highest water quality priorities identified in the Water Quality Improvement Plan, each Copermittee ~~must~~may identify, develop, and ~~implement~~prioritize for implementation regional retrofitting and channel rehabilitation…"
119	E.5.b.6	81	Existing Development Management	This provision gives the Copermittees flexibility in reallocating resources with the approval of the Regional Board Executive Officer to implement retrofit or rehabilitation projects.	**As shown in the attached revised Permit, revise the language, as follows:** Add the following: "Upon Regional Board Executive Officer approval the Copermittees may reallocate resources in the WQIPs for retrofit and rehabilitation project(s).
120	E.5.c.1	81	Existing Development	Required use of pollution prevention methods will be extremely difficult to enforce, particularly if residential	**If the current Provision E.5 is not replaced, modify as follows**:

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			Management	land uses are included.	"Each Copermittee must ~~require~~ promote the use of pollution prevention methods by the inventoried existing development through public outreach."
121	E.5.c.2	81	Existing Development Management	See comment E.5.a.	**If the current Provision E.5 is not replaced, modify as follows**: "Each Copermittee must designate a minimum set of BMPs required for all inventoried existing development with the reasonable potential to discharge pollutant loads to their MS4, including special event venues~~, that have the potential to generate pollutants~~."
122	E.5.c.3	81	Existing Development Management	See comment E.5.a.	**If the current Provision E.5 is not replaced, modify as follows**: "Each Copermittee must implement, or require the implementation of, designated BMPs at inventoried existing development that have the reasonable potential to ~~generate~~discharge pollutant~~s~~ loadsfrom their MS4."
123	E.5.c.4	82	Existing Development Management	See comment E.5.a.	**If the current Provision E.5 is not replaced, modify as follows**: "Each Copermittee must operate and maintain, or require the operation and maintenance of designated BMPs at all inventoried existing development that have been identified by the Copermittee as having the reasonable potential to discharge pollutant loads to their MS4."
124	E.5.c.4.b	82	Existing Development Management	Clarification is necessary that Copermittees are only responsible for the work conducted within their jurisdiction and under their authority.	**If the current Provision E.5 is not replaced, modify as follows**: "Each Copermittee must implement procedures during the operation and maintenance of public streets, unpaved roads, paved roads, and paved highways and freeways, conducted under their authority and within their jurisdiction, that will reduce the contribution of storm water pollutants to

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					the MEP and effectively prohibit the discharge of non-storm water pollutants from the MS4 to receiving water bodies..."
125	E.5.c.5	82	Existing Development Management	See comment E.5.a.	**If the current Provision E.5 is not replaced, modify as follows**: "…associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from inventoried existing development ~~into and from the MS4s.~~ identified by the Copermittee as having the reasonable potential to discharge pollutant loads into or from their MS4."
126	E.5.d	83	Existing Development Management	See comment E.5.a. In addition to the comment under E.5.a, the proposed language will also limit the number of inspections required.	**If the current Provision E.5 is not replaced, modify as follows**: "Each Copermittee must conduct inspections of inventoried existing development that have been identified by the Copermittee as having the reasonable potential to discharge pollutant loads from their MS4 to ensure compliance with applicable local ordinances and permits, and the requirements of this Order."
127	E.5.d.1	83	Existing Development Management	See comment E.5.a. Proposed language will also limit the number of inspections required and allow effective self-certifications and third party inspections to be utilized. Additional language added to clarify expectation of land use change. Inspections due to changes in property ownership are not realistic as it is not possible for a municipality to track and be aware of all property ownership changes.	**If the current Provision E.5 is not replaced, modify as follows**: "…At a minimum, inventoried existing municipal, industrial, commercial, and residential-association development ~~that has been~~ identified by the Copermittee as having the reasonable potential to discharge pollutant loads to and from their MS4 must be inspected once ~~every five years~~during the permit term. Effective self-certification or third-party inspection programs may be utilized for this purpose. Inventoried existing development must also be inspected within 12~~six~~ months ~~of any change in property ownership~~ after any redevelopment or land use~~or change~~change associated with a potential increase in pollutant

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					generating activity…"
128	E.5.d.2.d through E.5.d.2.f	83-84	Existing Development Management	The addition of "if present" is necessary for clarification.	**If the current Provision E.5 is not replaced, modify as follows**: "(d)Visual observations of actual non-storm water discharges, if present; (e)Visual observations of actual or potential discharge of pollutants, if present; (f)Visual observations of actual or potential illicit connections, if present; and…"
129	E.5d.3.f	84	Existing Development Inspection Records	Photo documentation should not include a requirement to obtain and keep photographic records of active compliance. Photo documentation should be limited to cases of non-compliance in the interest of file space, size, and information management.	**If the current Provision E.5 is not replaced, modify as follows**: Delete the following: "~~Photo documentation of observed actions or BMPs to reduce pollutants in stormwater runoff to the MEP and actions to effectively prohibit non-storm discharges into the storm drain.~~"
130	E.5.d.3.e and g	84	Existing Development Inspection Records	It is unnecessary to formally describe all of the activities and actions being conducted at each site that assist in reducing pollutants and non-stormwater discharges. It is more efficient and effective to focus on those items that need to be improved or added in order to ensure that the site is being managed correctly. This is standard protocol for inspection programs. Per the language within Provision B and the intro to Provision E, the JRMPs will already be focused on those sources and activities that have a reasonable potential to contribute the pollutants of concern that are of the highest priority within the WQIPs. Therefore this paragraph is unnecessary. Combine these three paragraphs to simplify and better convey requirement.	**If the current Provision E.5 is not replaced, modify as follows**: Delete the following ~~Description of actions to reduce pollutants in storm water runoff to the MEP and actions to effectively prohibit non-storm discharges into the MS4 at the inventoried existing development~~ ~~If the facility, area, and/or activity has been designated or identified as a contributor to the highest water quality priorities identified in the Water Quality Improvement Plan, then the inspection report must include a description of any specific or additional actions taken to reduce or eliminate the contribution of the facility, area, and/or activity to the highest water quality priorities;~~

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					and replace with the following: "Verification of compliance with designated BMPs, as applicable."
131	E.5.e	85	Existing Development Management	Limiting language should be included for the Copermittee's jurisdiction. The existing development inventory and enforcement should be limited to development with the reasonable potential to discharge pollutants, avoiding inventory, inspection, and enforcement of every developed property within their jurisdiction. Time and money will be better spent focusing on development that may actually contribute to pollutant loads in the MS4.	**If the current Provision E.5 is not replaced, modify as follows**: "Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried existing development identified by the Copermittee as having the reasonable potential to discharge pollutant loads from the MS4 within their jurisdiction, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6."
132	E.6	87	Enforcement Response Plans	Enforcement response plans are already codified in Copermittees' municipal codes. This section increases requirements for enforcement response and should be made more concise.	Recommend replacement of Enforcement Response Plan Provision with Copermittee streamlined provision, contained in the attachment provided.
133	E.6	85	Existing Development Management	Acknowledge and allow existing and equivalent enforcement plans such as Orange County's Enforcement Consistency Guide to meet intent of provision.	**If the current Provision E.6 is not replaced, modify as follows**: "The Enforcement Response Plan must include the protocols for progressively stricter responses, including timeframes allowed for corrections of problems, and for various field violation scenarios. Copermittees may continue to utilize and implement established, equivalent guidelines and procedures for enforcement ."
134	E.6.a.2.a	85	Existing Development Management	Enforcement may not be feasible "immediately."	**If the current Provision E.6 is not replaced, modify as follows**: "…the Water Quality Improvement Plan, then ~~high level~~ enforcement actions must beginat a high level ~~immediately issued,~~ and subsequent high level…"
135	E.6.b.3.a	86	Existing	Permit should acknowledge the responsibilities of other	**If the current Provision E.6 is not replaced,**

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			Development Management	entities and encourage coordination (e.g., Caltrans, water districts).	**modify as follows**: "(a) Immediately enforce its legal authority, or notify the entity with applicable legal authority, to eliminate controllable sources of non-storm water and illicit discharges or connections upon identifying the source; and"
136	E.6.b.5	87	Enforcement Response Plans	Two weeks compliance is an extremely short time period for maintenance of BMPs and reasonable only if the next rain event is within that two week period. One month is much more reasonable and realistic for confirmation of BMP maintenance.	**If the current Provision E.6 is not replaced, modify as follows**: "For violations of permanent BMP maintenance requirements, all violations must be corrected in a timely manner with the goal of correcting them before the next rain event but no longer than 30 ~~10~~calendar~~business~~ days after the violations are discovered. If more than ~~10~~30calendar~~business~~ days are required for compliance, a rationale must be recorded in the electronic database or equivalent tabular system used to track permanent BMP inspections."
137	E.6.c.2	87-88	Enforcement Response Plans	Criminal penalties should be limited to intentional or negligent acts.	**If the current Provision E.6 is not replaced, modify as follows**: The enforcement process must include, at a minimum, appropriate sanctions to compel compliance, such as: (a) Verbal and written notices of violation; (b) Cleanup requirements; (c) Fines; (d) Bonding requirements; (e) Administrative and criminal (if intentional or negligent) penalties; (f) Liens;

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					(g) Stop work orders; and (h) Permit and occupancy denials.
138	E.6.c.4	88	Enforcement Response Plans	See comment E.6.b.5.	Change 10 business days to 30 calendar days.
139	E.6.d.1	88	Enforcement Response Plans	Use consistent terminology	**If the current Provision E.6 is not replaced, modify as follows**: "…(as defined in the Copermittee's Enforcement Response Plan) to a construction site that significantly impacts~~poses a significant threat to~~ water quality as a result of violations or other…"
140	E.7	88	Public Education and Participation	Language was provided in this section to identify that the Permittees will develop the public education program based on the highest water quality issues of concern identified within the WQIPs.	See corresponding edits within Provision E.7
141	E.8	89	Fiscal Analysis	Unclear why the fiscal analysis has expanded beyond what is required in Orange County's current permit.	See corresponding edits within Provision E.8
F. Reporting					
142	F.1 & F.2	90	Reporting	Changes for consistency with Provision II.B.6.	**As shown in the attached revised Permit, revise the language, as follows:** Change timeframe from 12 to 18 months.
143	F.1	90	Reporting	Minor changes incorporated for consistency with Provision II.B.	**As shown in the attached revised Permit, revise the language, as follows:** Incorporate timeline consistent with Provision B.
144	F.1	90	Reporting	All references to "Regional Clearinghouse" deleted and replaced with reference to Provision F.4. See comment re: F.4 below.	**As shown in the attached revised Permit, revise the language, as follows:** "Water Quality Improvement Plans must be made available as~~on the Regional Clearinghouse~~ required pursuant to Provision F.4."
145	F.2.a	90	Reporting	Additional language is necessary to clarify that modification of program elements of the jurisdictional runoff management program will include rationale for any changes to program elements prescribed in Provision E.	**As shown in the attached revised Permit, revise the language, as follows:** Add "Jurisdictional Runoff Management Program document updates that modify program elements from the requirements of Provision E must provide

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					rationale for the modifications within the update documents." Add similar language for the BMP design manual and the Water Quality Improvement updates.
146	F.2.b	90	Reporting	See F.2.a.	See F.2.a.
147	F.2.c	90	Reporting	See F.2.a.	See F.2.a.
148	F.3.b	91	Reporting	Clarification as to a date when the annual reporting period will begin under the permit is necessary.	**As shown in the attached revised Permit, revise the language, as follows:** "…The first Annual Report must be prepared for the reporting period beginning July 1 after adoption of the permit, and upon San Diego Water Board Determination that~~the date the San Diego Water Board determines that~~…"
149	F.3.b.1.e and F.3.b.2	92	Reporting	Unclear how form will improve upon existing reporting processes. Form seems to restrict reporting and require the compilation of cumbersome and uninformative numbers such as "number of existing developments in residential inventory." Permittees should be allowed to continue current reporting formats. Either delete the form or make optional.	Delete the following language: "~~(a) A completed Jurisdictional Runoff Management Program Annual Report Form (Attachment D) for each Copermittee in the Watershed Management Area, certified by a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative~~." "~~(2) Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (Attachment D) no later than October 31 of each year until the first Annual Report is required to be submitted~~."
150	F.4	93	Reporting	The Copermittees require language clarification that the regional clearinghouse may be maintained by another agency.	**As shown in the attached revised Permit, revise the language, as follows:** Add a footnote: "The Copermittee may elect to develop and maintain the clearinghouse(s) provided by other Copermittees or agencies."
151	F.4	93	Reporting	Delete all references to a Regional Clearinghouse. Copermittees have been and will continue to make key	**As shown in the attached revised Permit, revise the language, as follows:**

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				documents and information related to permit compliance available to the public. Copermittees should not be required to invest time and resources into a potentially expensive and time consuming clearinghouse that would require coordination amongst all permittees. The benefit of a clearinghouse does not appear to outweigh the resources necessary to make it possible.	Delete all references throughout permit to "Regional Clearinghouse" and replace with reference to comply with Provision F4. Additionally, modify language as follows: "4.~~**Regional Clearinghouse**~~**Mechanism for Data and Information Sharing** The Copermittees must identify and implement a mechanism to ~~develop, update, and maintain an internet-based Regional Clearinghouse that can be used to~~ store, disseminate, and share the Copermittees' Water Quality Improvement Plans, Annual Reports, jurisdictional runoff management program documents, monitoring data, special studies, and ~~any~~ other pertinent data or information generated by the Copermittees during the implementation of this Order. Monitoring data collected pursuant to Provision D must be uploaded to CEDEN, ~~with links to the uploaded data available on the Regional Clearinghouse. The Regional Clearinghouse may be linked to other internet-based data portals and databases where the original documents and data are stored. The Regional Clearinghouse~~Copermittees must make this information ~~be~~ available and accessible to members of the public. The ~~Regional Clearinghouse~~ mechanism for sharing Copermittee data and information must be developed and made available to the public no later than 12 months after the adoption of this Order."
152	F.5	93	Reporting	See F.4.	Add similar language from F.4.
G. Principal Watershed Copermittee Responsibilities					
153	G	96	Principal Watershed	Coordinating and developing, with the other Copermittees, the requirements of Provisions F.3.c, F.4,	Remove requirement that Principal Copermittee can only be Principal Copermittee for 2 watersheds.

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			Copermittee Responsibilities	and F.5.b of this Order.	Clarify that all Copermittees have some level of commitment, not just the Principal Watershed Copermittee.
H. Modification of Programs					
154	H	97	Modification of Programs	Modifications of programs are allowed under the WQIP as part of the iterative process and adaptive management. Language should be added to that effect or there may be annual amendments to the Order.	"Proposed modifications <u>outside of the WQIP process</u> that are not minor require amendment of this Order in accordance with this Order's rules, policies, and procedures."
I. Standard Permit Provisions and General Provisions					
				N/A	None.
Attachment A. Discharge Prohibitions					
155	Attachment A, 2	A-2	Attachment B to State Water Board Resolution 2012-001X	The Resolution has been adopted as 2012-0012 and should be updated accordingly throughout the document. Order should be incorporated by reference instead duplication.	Reference adopted SWRCB Resolution 2012-0012.
Attachment B. Standard Permit Provisions and General Provisions					
156	Attachment B	B1-B5	Standard Permit Provisions and General Provisions	This attachment incorporates the standard NPDES permit provisions as identified in 40 CFR 122.41. Although correctly transposed from the regulations the provisions are obviously developed for a traditional point source permit (i.e. wastewater permit). As such there are a number of standard provision that pose challenges to the Copermittees to comply with. Clarification is requested on a number of the provisions.	See specific changes noted below.
157	Attachment B, 1.m	B-7	Bypass	This provision requires the Copermittees to notify the Regional Board whenever an anticipated or unanticipated bypass will occur. Given the nature of storm events and the fact that stormwater treatment BMPs include bypass provisions to protect the BMP integrity it would appear that the Copermittees should notify the Regional Board anytime a storm is predicted	Delete this provision.

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				to ensure compliance with the provision (whether anticipated or unanticipated). This provision was crafted for typical wastewater discharges and has little relevance to stormwater.	
Attachment C. Acronyms, Abbreviations and Definitions					
158	Attachment C	C1-C10	Definitions	Definitions need to be added for: properly designed, rehabilitation, and retrofit. As currently written, the permit authorizes subjective broad authority and deference to the Regional Board in interpretation of the definitions, if not included. Minor clarifications and grammatical corrections are also included.	Suggested definitions are provided in the strikeout.
159	Attachment C	C-4	Definitions - Infiltration	The current definition only makes reference to infiltration of water into the sewer system. This definition should also include a traditional definition of infiltration.	**As shown in the attached revised Permit, revise the language, as follows:** Add: In the context of low impact development, infiltration may also be defined as the percolation of water into the ground. Infiltration is often expressed as a rate (inches per hour), which is determined through an infiltration test.
160	Attachment C	C-6	Definitions – MS4	The addition of CWA language to the definition of MS4 limits Copermittees' responsibilities to within their jurisdiction and strengthens support that Copermittees are not responsible for discharges in MS4s that they do not operate.	**As shown in the attached revised Permit, revise the language, as follows:** Add: "Co-permittees need only comply with permit conditions relating to discharges from the municipal separate storm sewers for which they are operators." 40 CFR §122.21(a)(vi).
161	Attachment C	C-10	Definitions – Waters of the state	Current permit language, citing the California Water Code, presupposes that all portions of the MS4 are considered waters covered by the definition of waters of the state, "Any water, surface or underground, including saline waters within the boundaries of the State [CWC Provision 13050 (e)]." This language	**"Waters of the State** - Any water, surface or underground, including saline waters within the boundaries of the State [CWC Provision 13050 (e)]. The definition of the Waters of the State is broader than that for the Waters of the United States in that all water in the State is considered to

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				should be limited based on the intent of the definition (natural water sources) and should not include dry man-made structures that collect runoff for the sole purpose of flow volume/velocity and/or pollutant reduction.	be a Waters of the State~~ regardless of circumstance or condition~~. Under this definition, portions of a MS4 may be~~is always~~ considered to be a Waters of the State. However, man-made portions of the MS4 constructed for the sole purpose of flow and/or pollutant reduction will not be considered Waters of the State."
162	Attachment C	C-11	Definitions – Wet Weather	Grammatical edits –words appear to be missing from the definition	Edit as follows: **"Wet Weather –** Weather is considered wet if there is a storm event of 0.1 inches and greater and ~~the following~~preceded by 72 hours of dry weather."
Attachment D. Jurisdictional Runoff Management Program Annual Report Form					
163	Attachment D			See previous comments in F.3.b	Delete form or make optional.
Attachment E. Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2012-0011					
164	Attachment E	E-1 to E-30	Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2012-0011	Most requirements are outlined already in the TMDLs and the redundancy of this Attachment is unnecessary. In fact, Attachment E *adds* many TMDL requirements not provided in the TMDL Resolutions, circumventing the TMDL public process. Implementation will be inconsistent with previously adopted resolutions and CLRPs and MPs already drafted, submitted, approved, and/or implemented.	On page E-1, reword to clarify that TMDL implementation must be incorporated into the WQIP and Monitoring sections by the Copermittees and reference the Resolution Numbers in the TMDL list and add recommended compliance language per comments below.
165	Attachment E	E-1	Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2012-0011	The Rainbow Creek TMDL for Total Nitrogen and Phosphorous does not include Wasteload Allocations for the County of San Diego Copermittees. The TMDL only contains Load Allocations. Load allocations should not be implemented through an NPDES permit. It is in appropriate to simply "re-name" the Load Allocations as Wasteload Allocations.	Strike the following TMDL from Attachment E in its entirety: Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed
166	Attachment	E-1	Specific		

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	E	to E-30	Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2012-0011	State and federal law do not require the use of numeric effluent limitations for MS4 permittees, but rather encourage flexible implementation of best management practices through an iterative process. Specifically, the choice to include either management practices or numeric limitations in MS4 permits is within the regulatory agency's discretion, and on the question of whether MS4 permits must contain numeric effluent limitations, the court upheld EPA's use of iterative BMPs in place of numeric effluent limitations for storm water discharges. (See *Defenders of Wildlife v. Browner*, 191 F.3d 1159, 1166-1167 (9th Cir. 1999)[4] Given the challenges with meeting the numeric WQBELs (even with the implementation of a comprehensive suite of BMPs) and the flexibility allowed by State and federal regulations and guidance, a BMP-based WQBEL approach should be allowed for complying with TMDLs. Removing the numeric WQBELs is not proposed. Rather, inclusion of a WQIP-based "compliance path" is recommended. The WQIPs can and should be used as the basis for establishing WQBELs expressed as BMPs. The WQIPs can satisfy the necessary elements of BMP-based WQBELs. For example, the WQIPs would meet the requirements described in the 2010 EPA memo (which updated key aspects of the 2002 memorandum) regarding federal expectations for incorporation of TMDLs WLAs into NPDES stormwater permits as BMP-based WQBELs.	See recommended changes in the attached revised Permit to the following: • Provision A.4.c • Provision A.4.d • Provision B (first paragraph) • Provision B.3 Additionally, within the requirements for each individual TMDL in Attachment E, include language similar to the following: Compliance may be demonstrated via any one of the following methods: 1. There is no discharge from the MS4, or 2. Applicable effluent limitations are met, or 3. Receiving waters meet the applicable receiving water limitations or water quality objective, or 4. Loading from the MS4 is such that it does not cause water quality objective exceedances, or 5. For Permittee(s) that are implementing a Regional Board-approved WQIP, WQBELs will be implemented as BMPs and compliance will be based upon implementing all provisions of the WQIP in accordance with the approved milestones and schedule.

[4] See also California Regional Water Quality Control Board San Diego Region - Fact Sheet / Technical Report For Order No. R9-2010-0016 / NPDES NO. CAS0108766.

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167	Attachment E	E-1 to E-30	Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2012-0011	The findings of California's Stormwater Blue Ribbon Panel, which was convened specifically to examine the feasibility of incorporating numeric effluent limits in stormwater permits, ultimately concluded that numeric limits were generally infeasible across all three stormwater activities (municipal, industrial, and construction), with a few exceptions (*The Feasibility of Numeric Effluent Limits Applicable to Discharges of Stormwater Associated with Municipal, Industrial and Construction Activities, June 19, 2006*). Additionally, state law and policy does not require the use of numeric effluent limitations in MS4 permits. In 2009, the State Water Board affirmed this approach in a precedential order, stating: [i]t is our intent that federally mandated TMDLs be given substantive effect. Doing so can improve the efficacy of California's NPDES storm water permits. This is not to say that a wasteload allocation will result in numeric effluent limitations for municipal storm water dischargers. Whether a future municipal storm water permit requirement appropriately implements a storm water wasteload allocation will need to be decided on the regional water quality control board's findings *supporting either the numeric or non-numeric* effluent limitations contained in the permit. (Order WQ 2009-0008, In the Matter of the Petition of County of Los Angeles and Los Angeles County Flood Control District, at p. 10 (emphasis added).)	See recommended changes in the attached revised Permit to the following: • Provision A.4.c • Provision A.4.d • Provision B (first paragraph) • Provision B.3 Additionally, within the requirements for each individual TMDL in Attachment E, include language similar to the following,: Compliance may be demonstrated via any one of the following methods: 1. There is no discharge from the MS4, or 2. Applicable effluent limitations are met, or 3. Receiving waters meet the applicable receiving water limitations or water quality objective, or 4. Loading from the MS4 is such that it does not cause water quality objective exceedances, or 5. For Permittee(s) that are implementing a Regional Board-approved WQIP, WQBELs will be implemented as BMPs and compliance will be based upon implementing all provisions of the WQIP in accordance with the approved milestones and schedule.

	COUNTY OF ORANGE COMMENTS ON TENTATIVE ORDER NO. R9-2012-0011				
Comment #	**Permit Section**	**Permit Page[1]**	**Section Title**	**Reason for Proposed Changes/Comments**	**Proposed Changes**
168	Attachment E. Part 1.b, 2.b, 3.b, 4.b, 5.b, and 6.b	E-2, E-4, E-6, E-9, E-13, and E-19	Water Quality Based Effluent Limitations	Federal regulations (40 CFR 122.44(d)(1)(vii)(B)) require inclusion of effluent limits that are "consistent with the assumptions and requirements of any available wasteload allocation for the discharge prepared by the State and approved by EPA." Attachment E outlines the requirements of effective TMDLs and appears to incorporate numeric receiving water limitations (RWL) <u>and</u> effluent limitations, where the effluent limitations are set equal to the TMDL Waste Load Allocations (WLAs) and the RWLs are set equal to the TMDL numeric targets. This approach results in a situation where the Copermittees are in double jeopardy. Copermittees should not be put in double jeopardy by being required to meet both RWLs and effluent limitations. Rather, attainment of either RWLs **<u>or</u>** effluent limitations should represent compliance with the permit and the requirements of the TMDL.	See recommended changes in the attached revised Permit. Additional language should be added to the WQBELs sections for all TMDLs in Attachment E to clearly define compliance with WQBELs via any of the following methods: - There is no discharge from the MS4, **OR** - Applicable effluent limitations are met, **OR** - Receiving waters meet the applicable receiving water limitations or water quality objective, **OR** - Loading from the MS4 is such that it does not cause water quality objective exceedances, **OR** - For Permittee(s) that are implementing a Regional Board-approved WQIP, WQBELs will be implemented as BMPs and compliance will be based upon implementing all provisions of the WQIP in accordance with the approved milestones and schedule.
169	Attachment E	E-1 to E-30	Multiple	Attachment E specifies outfall monitoring requirements for several TMDLs, "in accordance with the requirements of Provisions D.1, D.4.a.(1)(b), and D.4.a.(3)(b) of this Order." Adding outfall monitoring to the TMDL provisions is inappropriate and unnecessary. Attachment E should focus on integrating the monitoring requirements *specified in the TMDL Basin Plan Amendments.* The monitoring requirements for TMDLs were developed through a public comment	Modify the Specific Monitoring and Assessment Requirements for the following TMDLs: 1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed 2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin 3. Total Maximum Daily Loads for Dissolved

	COUNTY OF ORANGE COMMENTS ON TENTATIVE ORDER NO. R9-2012-0011				
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				process and adopted by the Regional Board, and are the only monitoring requirements that should be specified in Attachment E. Furthermore, there is no reason to re-state the requirements from Provision D, which makes it likely that Attachment E and Provision D will have inconsistencies. Provision D requirements should only be listed in Provision D.	Copper, Lead, and Zinc in Chollas Creek 4. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay Specifically, for each of these TMDLs, the sub-bullet under section (d) regarding effluent monitoring should be stricken and replaced with the following: "The Responsible Copermittees must implement the monitoring and assessment requirements issued under Order No. XXXX. The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.", where "XXXX" reflects the order numbers for each TMDL, shown in the attached revised Permit on Page E-1. For the Chollas Creek Metals and Diazinon TMDLs, the XXX refers to the order number for the issued Investigation Orders. For the Project I Bacteria TMDL, specific changes to the monitoring requirements are requested to reflect those specified in the TMDL Basin Plan Amendment, as described below.
170	Attachment E. Part 4.b.	E-10	Water Quality Based Effluent Limitations	The TMDL for Dissolved Copper, Lead, and Zinc in Chollas Creek states that "If all copper, lead, and zinc concentrations in urban runoff to Chollas Creek meet their respective TMDL concentrations, the loading capacity of the creek should not be exceeded" (Section	If WQBELs are to be expressed as numeric effluent limits consistent with the WLAs, then mass-based WQBELs should be included as a mechanism for demonstrating compliance to allow for options to demonstrate load-based pollutant reductions. As described above, the mass-based WQBELs

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				8). The TMDL further states that "because this WLA is concentration-based it will apply to each land use and each sub-watershed at all times and will not be specific to any land use or sub-watershed (Section 8.1). Requiring all land uses and sub-watersheds to meet effluent limits consistent with RWLs is not a cost-effective or practicable approach to BMP strategy development. Volume reduction strategies such as Low Impact Development and Green Infrastructure should be a viable compliance path for the San Diego region. The WQBELs should include the mass-load based WLAs to consider the pollutant loads reduced, which will be impacted by both pollutant concentration reductions *and* stormwater volume reductions. Alternatives for load-based approaches should be included as effluent limitations, which will correspond to targets for meaningful CLRP and WQIP development.	should only be included with an "or" statement (not an "and" statement). The recommended Compliance Determination language in the attached revised Permit addresses this issue.
171	Attachment E. Part 5.b (1) and (2)		Effluent Limits	The effluent limits listed within the permit apply the water quality objectives end of pipe for the MS4 dischargers. The permit language should be consistent with the TMDL and state what the load allocations are that are assigned to the dischargers.	**As shown in the attached revised Permit, revise the language, as follows:** Delete the following from 5.b (1)(b): "The Copermittee must provide data that demonstrate the discharges from the MS4s are meeting the effluent limitations under Specific Provision 5.b.**Error! Reference source not found.**" Delete section 5.b.(2) "Effluent Limits" and replace with the following: "For both (a) and (b) above, if the REC-1 water quality objectives cannot be met in the receiving waters, and if the natural and

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					background sources appear to be the sole source of the continued impairment, the natural sources exclusion approach (NSEA) may be applied. The Municipal Dischargers are responsible for collection of the data to support the application of the NSEA to recalculate the TMDL." www.waterboards.ca.gov/sandiego/water_issues/programs/basin_plan/docs/update082812/Chpt_7_2012.pdf, Page 7-56
172	Attachment E. Part 5.c		Compliance Schedule	The waste load reduction milestones should be consistent with the milestones included in the current Order R9-2009-0002 (page 78).	**As shown in the attached revised Permit, revise the language, as follows:** Revise 5.c.(1) to include the waste load reduction compliance dates.
173	Attachment E. Part 6.a	E-19	Applicability	Since adoption of the Project I Bacteria TMDL, the Copermittees have submitted data to the Regional Board to demonstrate that 303(d) listings for San Marcos HA, San Dieguito River HA, and Los Penasquitos HA were incorrectly applied to REC beneficial uses. The Regional Board has responded and agreed, indicating "that Los Penasquitos has posted data to the Regional Board to demonstrate that 303(d) listings for San Marcos HA, Pacific Ocean Shoreline at Los Penasquitos River Mouth is not subject to further action under Resolution No. R9-2010-0001." Similar responses are expected for the other HAs.	In Table 6.0, the San Dieguito River WMA and Carlsbad WMAs should be deleted. The Los Penasquitos WMA should be re-named to the Mission Bay WMA and Torrey Pines State Beach at Del Mar should be removed. The recommended language in the attached revised Permit addresses this issue by also adding the following to Specific Provision 6.a.(5): "Subsequent to TMDL adoption, it has been established by the Regional Board that the following water bodies are not

<table>
<tr><th></th><th colspan="5">COUNTY OF ORANGE COMMENTS ON TENTATIVE ORDER NO. R9-2012-0011</th></tr>
<tr><th>Comment #</th><th>Permit Section</th><th>Permit Page[1]</th><th>Section Title</th><th>Reason for Proposed Changes/Comments</th><th>Proposed Changes</th></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td>subject to further action under Resolution No. R9-2010-001, and therefore are not subject to Bacteria TMDL requirements described herein and are not included in Table 6.0:
<table>
<tr><th>Watershed Management Area</th><th>Water Body</th><th>Segment or Area</th></tr>
<tr><td>Carlsbad</td><td>Pacific Ocean Shoreline</td><td>at Moonlight State Beach</td></tr>
<tr><td>San Dieguito River</td><td>Pacific Ocean Shoreline</td><td>at San Dieguito Lagoon mouth</td></tr>
<tr><td>Penasquitos</td><td>Pacific Ocean Shoreline</td><td>Torrey Pines State Beach at Del Mar (Anderson Canyon)</td></tr>
</table></td></tr>
<tr><td>174</td><td>Attachment E. Part 6.a</td><td>E-19</td><td>Applicability</td><td>Since adoption of the Project I Bacteria TMDL, the Copermittees have submitted data to the Regional Board to demonstrate that 303(d) listings were incorrectly applied to REC beneficial uses. The permit should include language to recognize that additional water body areas or segment may not be subject to further action under Resolution No. R9-2010-001.</td><td>As shown in the attached revised Permit, revise the language, as follows:

Add the following language:
“The TMDLs that have been developed for the Pacific Ocean shorelines are applicable to all the beaches located on the shorelines of the hydrologic subareas (HSAs), hydrologic areas (HAs), and hydrologic units (HUs) listed above. Beginning with the 2008 303(d) List, specific beach segments of the Pacific Ocean shoreline are listed individually. Specific beach segments from some of the Pacific Ocean shorelines listed in the above table have been delisted from the 2008 303(d) list that was approved by the San Diego Board on December 16, 2009, and therefore are not subject to</td></tr>
</table>

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					any further action as long as monitoring data continues to support compliance with water quality standards." www.waterboards.ca.gov/sandiego/water_issues/programs/basin_plan/docs/update082812/Chpt_7_2012.pdf, Page 7-60
175	Attachment E. Part 6.b	E-19	Receiving Water Limitations	The Basin Plan Amendment for the Project I Bacteria TMDL contains Receiving Water Limitations. These Receiving Water Limitations should be incorporated directly into the Permit. However, Attachment E contains Receiving Water Limitations that do not match those from the TMDL. The Regional Board should not revise or translate the RWLs from the TMDL, they should be incorporated directly. The RWLs incorporated into Attachment E have several discrepancies with the RWLs in the TMDL, including application of single sample targets to the dry weather RWLs and application of total coliform RWLs for inland waters.	Replace entirely the RWLs in the Permit with those from the TMDL. The attached revised Permit incorporates RWLs for beaches (Table 6.1) and RWLs for Creeks (Table 6.2). Note these RWLs were *pasted directly* from the Basin Plan Amendment (Attachment A, page 52).
176	Attachment E. Part 6.b	E-19 and E-20	Water Quality Based Effluent Limitations	Attachment E specifies WQBELs for dry weather flows as both receiving water and effluent limitations for the Project I Bacteria TMDL, in terms of zero allowable exceedances of the single sample maximum and the 30-day geometric mean. However, the dry weather component of the TMDL only considered the 30-day geometric mean, and did not consider the single sample maximum within its calculation. Incorporating single sample effluent limitations into the Permit goes beyond the TMDL requirements. In addition, if the TMDL had included single sample limits, there would have been a corresponding allowable exceedance frequency, just as	It is recommended that the single sample maximum not be used for dry weather WQBELs. At a minimum, an acceptable dry weather exceedance frequency should be assumed and applied. Specific Provision 6.b.(2) of the attached revised Permit addresses this issue by (1) incorporating the RWLs directly from the TMDL, and (2) linking the receiving water limitations and effluent limitations.

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Comment #	**Permit Section**	**Permit Page[1]**	**Section Title**	**Reason for Proposed Changes/Comments**	**Proposed Changes**
				for wet weather. The 22% allowable exceedance rate for wet weather was based on a reference beach within the Los Angeles Region, and although not used in the technical approach for the San Diego Beaches and Creeks TMDL, the reference beach also exhibits exceedances during dry weather, which is incorporated into beach TMDLs in the Los Angeles region.	
177	Attachment E. Part 6.b	E-20	Water Quality Based Effluent Limitations	The Project I Bacteria TMDL applies mass-load based TMDLs to point sources. Many of the BMPs used for achieving pollutant reductions, such as structural BMPs and green infrastructure, emphasize infiltration and associated volume reduction as the primary mechanism for reducing urban runoff. A significant investment could be made to implement structural BMPs to reduce urban runoff to meet the mass-load based WLAs assigned in the TMDL. These reductions could result in meeting the mass-based WLA and have a positive impact on receiving waters by significantly reducing urban loads to receiving waters. However, even the small amount of flows remaining could exceed the numeric effluent limitations currently in the Permit, but <u>not</u> cause or contribute to WQO exceedances. In this manner, a violation of the numeric WQBELs would result in zero credit for the millions invested and penalty for discharges that did <u>not</u> negatively impact attainment of WQ standards. Volume reduction strategies such as Low Impact Development and Green Infrastructure should be a viable compliance path for the San Diego region. The WQBELs should include the mass-load based WLAs to consider the pollutant loads reduced, which will be impacted by both pollutant concentration reductions *and* stormwater volume reductions.	If WQBELs are to be expressed as numeric effluent limits consistent with the WLAs, the mass based WLAs for both dry and wet weather presented in the TMDL should be included as a mechanism for demonstrating compliance to 1) be consistent with the assumptions of the WLAs and 2) allow for options to demonstrate load based pollutant reductions. The attached revised Permit addresses this issue by incorporating the mass-based wasteload allocations into Section 6.b.(2).

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178	Attachment E. Part 6.b	E-20	Water Quality Based Effluent Limitations	The reference conditions and associated allowable exceedance frequencies for WQBELs addressing Project I Bacteria TMDL were based on a marine reference beach within Los Angeles, and are not necessarily applicable to fresh water flows in the San Diego Region. The Los Angeles reference beach was influenced by salt water (increasing bacterial die-off) and mixing/dilution from wave action that likely resulted in lower exceedances of REC-1 objectives than would be found in a freshwater stream. Freshwater TMDLs in the Los Angeles region now incorporate freshwater reference systems (instead of a marine reference system), and the marine beach exceedance rates have been updated through a recent TMDL reopener for Santa Monica Bay. In addition, a reference study is currently underway for the San Diego Region.	The permit should include language that allows for update of the allowable exceedance frequencies as these results become available. The attached revised Permit addresses this issue by added the following paragraph to Specific Provision 6.b.(1).(a): "The allowable exceedance frequencies in Table 6.1 and Table 6.2 can be updated by the Regional Board Executive Officer if sufficient data is provided regarding reference systems in the San Diego Region."
179	Attachment E. Part 6.c	E-20	Compliance Schedule	Total coliform WQOs do not apply to inland waters.	As shown in the attached revised Permit, add a footnote to Table 6.3 as follows: "Total coliform receiving water limitations apply only to segments of areas of Pacific Ocean Shoreline listed in Table 6.0."
180	Attachment E. Part 6.c	E-27	Compliance Schedule	The CLRPs to be submitted by Copermitees will propose interim compliance dates, as allowed by the Project I Bacteria TMDL, generally 7 and 10 years, respectively, to meet the 50% reduction milestone for dry and wet weather. The CLRPs submitted by Copermittees may not all propose the same interim compliance dates and the Permit should acknowledge the flexibility allowed by the TMDL (see page 68 of Attachment A of the Basin Plan Amendment). In fact, this scheduling flexibility was a primary "incentive" for Copermitees to develop CLRPs instead of BLRPs.	The interim compliance dates should not be specified in the Permit. Instead, the Permit should reference the submitted and Regional Board-approved CLRPs. This approach will avoid conflict between the TMDL, Permit, and CLRPs. The attached revised Permit addresses this issue by revising the opening of Section 6.c.(2): "The Responsible Copermittees must comply with

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					the following interim WQBELs by the interim compliance dates <u>submitted in the Regional Board-approved CLRPs and supported by Order No. R9-2010-0001</u>:" Table 6.5 should be deleted from Attachment E to allow the CLRPs the scheduling flexibility provided in the TMDL adopted by the Regional Board.
181	Attachment E. Part 6.c	E-21 thru E-27	Compliance Schedule	Similar to the flexibility allowed for scheduling, the TMDL allows CLRPs flexibility in expressing and achieving TMDL milestones/interim requirements. Furthermore, the wet weather interim compliance dates are well-beyond the term of this Permit, and should be not included in Attachment E.	Delete Table 6.4 because (1) the CLRPs have flexibility to express interim milestones and (2) the wet weather interim requirements do not apply until 2022, well beyond the term of this Permit.
182	Attachment E. Part 6.c	E-27	Compliance Schedule	The Copermittees request an acknowledgement of the TMDL reopener scheduled for April 2016 which falls within the term of this Permit.	Add a part (3) to Specific Provision 6.c: "(3) <u>Submittals to Support TMDL Basin Plan Amendment</u> The Responsible Copermittees are encouraged to submit data to support the TMDL reopener scheduled for April 2016 including but not limited to data related to reference watershed monitoring and beneficial use usage frequency."
183	Attachment E. Part 6.d (new section added to revised)	E-27	Compliance Determination	The BPA for the Project I Bacteria TMDL contains specific language regarding MS4 compliance determination in the case that receiving water limitations are not attained. This language should be added directly to the Permit.	As shown in the attached revised Permit, add the following language to Section 6 of Attachment E, which is *pasted directly* from the BPA: "The municipal MS4s may demonstrate that their discharges are not causing the exceedances in the receiving waters by providing data from their discharge points to the receiving waters, by providing data collected at jurisdictional

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					boundaries, and/or by using other methods accepted by the San Diego Water Board. Otherwise, at the end of the wet weather TMDL compliance schedule, the municipal Phase I MS4s will be held responsible and considered out of compliance unless other information or evidence indicates another controllable or uncontrollable source is responsible for the exceedances in the receiving waters. If controllable sources other than discharges from the municipal Phase I MS4s are identified before or after the end of the wet weather TMDL Compliance Schedules as causing the exceedances, those controllable sources will be responsible for reducing their bacteria loads and/or demonstrating that discharges from those sources are not causing the exceedances. If controllable sources other than the Phase I MS4s are identified as causing the exceedances, and the Phase I MS4s have demonstrated they are not causing or contributing to the exceedances, the Phase I MS4s will not be considered out of compliance. The San Diego Water Board shall implement additional actions (e.g., issue enforcement actions, amend existing NPDES requirements or conditional waivers), as needed, to bring all those controllable sources into compliance with the wet weather TMDLs."
184	Attachment E. Part 6.d	E-27	Specific Monitoring and Assessment Requirements	As described above, the CLRPs envisioned in the Project I Bacteria TMDL include flexibility to develop certain components based on watershed-specific issues and conditions. Each CLRP submitted by the Copermittees will include a monitoring and assessment component. It is important to allow the CLRP process to drive the monitoring programs.	As shown in the attached revised Permit, include the following at the beginning of the Monitoring and Assessment section: "The BLRPs and CLRPs to be submitted by the Copermittees and approved by the Regional Board

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					Executive Officer contain monitoring programs. Implementation of those Regional Board-approved monitoring programs constitutes compliance with the Monitoring Station and Monitoring Procedure requirements, described below."
185	Attachment E. Part 6.d	E-27	Specific Monitoring and Assessment Requirements	The Project I Bacteria TMDL included specific beach monitoring requirements, which were subject to a public comment process and adopted by the Regional Board. Attachment E adds many additional components to these requirements, which undermines the TMDL adoption and public commenting process. Instead of re-interpreting and adding onto the TMDL monitoring requirements in the Basin Plan Amendment, the Permit should adopt those requirements directly (BPA Attachment A, page 50-51).	As shown in the attached revised Permit, the beach monitoring requirement should be incorporated directly from the TMDL. The following language/requirement for beaches is *pasted directly* from the TMDL: "(1) Monitoring and Assessment Requirements for Beaches (a) Monitoring Stations For beaches addressed by these TMDLs, monitoring locations should consist of, at a minimum, the same locations used to collect data required under MS4 NPDES monitoring requirements and beach monitoring for Health and Safety Code section 115880.75 If exceedances of the receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations and/or other source identification methods must also be used to demonstrate that the bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters. (b) Monitoring Procedures

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					(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. (ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations at least once within the first 24 hours of the end of a storm event that occurs during the rainy season (i.e., October 1 through April 30). (iii) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria."
186	Attachment E. Part 6.d	E-27	Specific Monitoring and Assessment Requirements	Similarly, the creek monitoring requirements should reflect the TMDL that was approved and subject to public comment (BPA Attachment A, page 50-51). Note that total coliform should not be a requirement for creek monitoring, as creeks are not subject to total coliform WQOs, RWLs, or WLAs.	As shown in the attached revised Permit, the creek monitoring requirement should be incorporated directly from the TMDL. The following language/requirement for creeks is *pasted directly* from the TMDL: "Monitoring and Assessment Requirements for Creeks and Creek Mouths (a) Monitoring Stations For creeks addressed by these TMDLs, monitoring locations should consist of, at a minimum, a location at or near the mouth of the creek (e.g., Mass Loading Station or Mass Emission Station) and one or more locations upstream of the mouth (e.g., Watershed Assessment Stations). If exceedances of the receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations and/or other source

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					identification methods must also be used to demonstrate that the bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters. (b) Monitoring Procedures (i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. (ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations within the first 24 hours of the end of a storm event that occurs during the rainy season (i.e., October 1 through April 30) (iii) Samples collected from receiving water monitoring stations must be analyzed for fecal coliform and *Enterococcus* indicator bacteria."

ADMINISTRATIVE DRAFT

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

TENTATIVE
ORDER NO. R9-2012-0011
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The San Diego County Copermittees in Table 1a are subject to waste discharge requirements within their respective jurisdictions as set forth in this Order.

Table 1a. San Diego County Copermittees

City of Carlsbad	City of Oceanside
City of Chula Vista	City of Poway
City of Coronado	City of San Diego
City of Del Mar	City of San Marcos
City of El Cajon	City of Santee
City of Encinitas	City of Solana Beach
City of Escondido	City of Vista
City of Imperial Beach	County of San Diego
City of La Mesa	San Diego County Regional Airport Authority
City of Lemon Grove	Unified Port District of San Diego
City of National City	

The Orange County Copermittees in Table 1b are subject to waste discharge requirements within their respective jurisdictions as set forth in this Order upon expiration of Order No. R9-2009-0002, NPDES No. CAS0108740 on December 16, 2014.

Table 1b. Orange County Copermittees

City of Aliso Viejo	City of Ranch Santa Margarita
City of Dana Point	City of San Clemente
City of Laguna Beach	City of San Juan Capistrano
City of Laguna Hills	City of Laguna Woods
City of Laguna Niguel	County of Orange
City of Lake Forest	Orange County Flood Control District
City of Mission Viejo	

ADMINISTRATIVE DRAFT

The Riverside County Copermittees in Table 1c are subject to waste discharge requirements within their respective jurisdictions as set forth in this Order upon expiration of Order No. R9-2010-0016, NPDES No. CAS0108766 on November 10, 2015.

Table 1c. Riverside County Copermittees

City of Murrieta	County of Riverside
City of Temecula	Riverside County Flood Control and Water Conservation District
City of Wildomar	

The Orange County Copermittees and Riverside County Copermittees may enroll under this Order at a date earlier than the expiration date of their current Orders subject to the conditions described in Provision F.6 of this Order and the Copermittees in the respective county receive a Notice of Enrollment (NOE) from the San Diego Water Board.

The term Copermittee in this Order refers to any San Diego County, Orange County, or Riverside County Copermittee enrolled under this Order, unless specified otherwise.

This Order provides permit coverage for the Copermittee discharges described in Table 2.

Table 2. Discharge Locations and Receiving Waters

Discharge Points	Locations throughout San Diego Region
Discharge Description	Municipal Separate Storm Sewer System (MS4) Discharges
Receiving Waters	Inland Surface Waters, Enclosed Bays and Estuaries, and Coastal Ocean Waters of the San Diego Region

Table 3. Administrative Information

This Order was adopted by the San Diego Water Board on:	**Month Day, 2012**
This Order will become effective on:	**Month Day, 2012**
This Order will expire on:	**Month Day, 2017**
The Copermittees must file a Report of Waste Discharge (ROWD) in accordance with Title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than 180 days in advance of the Order expiration date.	

I, David W. Gibson, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on Month Day, 2012.

TENTATIVE

David W. Gibson
Executive Officer

ADMINISTRATIVE DRAFT

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ADMINISTRATIVE DRAFT

I. FINDINGS

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), finds that:

JURISDICTION

1. **MS4 Ownership or Operation.** Each of the Copermittees owns or operates an MS4, through which it discharges storm water and non-storm water into waters of the U.S. within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the U.S.

2. **Legal and Regulatory Authority.** This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]) adopted by the United States Environmental Protection Agency (USEPA), and chapter 5.5, division 7 of the California Water Code (CWC) (commencing with section 13370). This Order serves as an NPDES permit for discharges from MS4s to surface waters. This Order also serves as waste discharge requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

3. **CWA Technology Based Standards and Prohibitions.** Pursuant to CWA section 402(p)(3)(B), NPDES permits for storm water discharges from MS4s must include requirements to effectively prohibit non-storm water discharges into MS4s, and require controls to reduce the discharge of pollutants in storm water to the maximum extent practicable (MEP).

4. **CWA NPDES Permit Conditions.** Pursuant to CWA section 402(a)(2), NPDES permits must prescribe conditions to assure compliance with CWA section 402(p)(3)(B) and 40 CFR 122.26(d)(2)(iv)(B). This Order prescribes conditions to assure compliance with the CWA requirements for owners and operators of MS4s to effectively prohibit non-storm water discharges in-to the MS4s, and require controls to reduce the discharge of pollutants in storm water from the MS4s to the MEP.

5. **CWA and CWC Monitoring Requirements.** Pursuant to 40 CFR 122.48, NPDES permits must specify requirements for recording and reporting monitoring results. In addition, CWC sections 13267 and 13383 authorize the San Diego Water Board to require technical and monitoring reports. This Order establishes monitoring and reporting requirements to implement federal and State requirements.

6. **Total Maximum Daily Loads.** CWA section 303(d)(1)(A) requires that "[e]ach state shall identify those waters within its boundaries for which the effluent limitations…are not stringent enough to implement any water quality standard applicable to such waters." The CWA also requires states to establish a priority ranking of impaired water bodies known as Water Quality Limited Segments and to establish Total Maximum Daily Loads (TMDLs) for such waters. This priority list of impaired water bodies is called the Clean Water Act Section 303(d) List of Water Quality Limited Segments, commonly referred to as the 303(d) List. The CWA requires the 303(d) List to be updated every two years. Requirements of this Order implement the TMDLs adopted by the San Diego Water Board and approved by USEPA.

7. **Non-Storm Water Discharges.** Pursuant to CWA section 402(p)(3)(B)(ii), this Order requires each Copermittee to effectively prohibit discharges of non-storm water into its MS4. Nevertheless, non-storm water discharges into and from the MS4s continue to be reported to the San Diego Water Board by the Copermittees and other persons. Monitoring conducted by the Copermittees, as well as the 303(d) List, have identified dry weather, non-storm water discharges from the MS4s as a source of pollutants causing or contributing to receiving water quality impairments in the San Diego Region. The federal regulations [40 CFR 122.26(d)(2)(iv)(B)] require the Copermittees to have a program to ~~prevent~~ effectively prohibit ~~all types of non-storm water discharges, or~~ illicit discharges, from entering the MS4. The federal regulations, however, allow for specific categories of non-storm water discharges ~~or flows~~ to be addressed as illicit discharges only where such discharges are identified as sources of pollutants to waters of the U.S.

8. **In-Stream Treatment Systems.** Pursuant to federal regulations [40 CFR 131.10(a)], in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S. Authorizing the construction of a runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to accepting waste assimilation as an appropriate use for that water body. Runoff treatment must occur prior to the discharge of runoff into receiving waters. Treatment control best management practices (BMPs) must not be constructed in waters of the U.S. or state. Construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body.

DISCHARGE CHARACTERISTICS AND RUNOFF MANAGEMENT

9. **Point Source Discharges of Pollutants.** Discharges from the MS4s may contain waste, as defined in the CWC, and pollutants that adversely affect the quality of the waters of the state. A discharge from an MS4 is a "discharge of pollutants from a point source" into waters of the U.S. as defined in the CWA. Storm water and non-storm water discharges from the MS4s may contain pollutants that cause or threaten to cause a violation of surface water quality standards, as outlined in the Basin Plan. Storm water and non-storm water discharges from the MS4s are subject to the conditions and requirements established in the Basin Plan for point source

discharges.

10. **Potential Beneficial Use Impairment.** The discharge of pollutants and/or increased flows from MS4s may cause or threaten to cause the concentration of pollutants to exceed applicable receiving water quality objectives and impair or threaten to impair designated beneficial uses resulting in a condition of pollution, contamination, or nuisance.

11. **Pollutants Generated by Land Development.** Land development has created and continues to create new sources of non-storm water discharges and pollutants in storm water discharges as human population density increases. This brings higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash. Pollutants from these sources are dumped or washed off the surface by non-storm water or storm water flows into and from the MS4s. When development converts natural vegetated pervious ground cover to impervious surfaces such as paved highways, streets, rooftops, and parking lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving a developed area contains greater pollutant loads and is significantly greater in runoff volume, velocity, and peak flow rate than pre-development runoff from the same area.

12. **Runoff Discharges to Receiving Waters.** The MS4s discharge runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within the eleven hydrologic units comprising the San Diego Region. Numerous receiving water bodies and water body segments have been designated as impaired by the San Diego Water Board pursuant to CWA section 303(d).

13. **Pollutants in Runoff.** The most common pollutants in runoff discharged from the MS4s include total suspended solids, sediment, pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., cadmium, copper, lead, and zinc), petroleum products and polynuclear aromatic hydrocarbons, synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus), oxygen-demanding substances (decaying vegetation, animal waste), detergents, and trash.

14. **Human Health and Aquatic Life Impairment.** Pollutants in runoff discharges from the MS4s can threaten and adversely affect human health and aquatic organisms. Adverse responses of organisms to chemicals or physical agents in runoff range from physiological responses such as impaired reproduction or growth anomalies to mortality. Increased volume, velocity, rate, and duration of storm water runoff greatly accelerate the erosion of downstream natural channels. This alters stream channels and habitats and can adversely affect aquatic and terrestrial organisms.

15. **Water Quality Effects.** The Copermittees' water quality monitoring data submitted to date documents persistent exceedances of Basin Plan water quality objectives for runoff-related pollutants at various watershed monitoring stations. Persistent toxicity has also been observed at several watershed monitoring stations. In addition,

bioassessment data indicate that the majority of the monitored receiving waters have Poor to Very Poor Index of Biotic Integrity (IBI) ratings. These findings indicate that runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in the San Diego Region. Non-storm water discharges from the MS4s have been shown to contribute significant levels of pollutants and flow in arid, developed Southern California watersheds, and contribute significantly to exceedances of applicable receiving water quality objectives.

16. **Non-Storm Water Discharges.** Non-storm water discharges ~~from~~ into the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard from CWA 402(p)(3)(B)(iii), which is explicitly for "Municipal … *Stormwater Discharges* (emphasis added)" from the MS4s. Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s must be effectively prohibited.

17. **Best Management Practices.** Pollutants can be effectively reduced in runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Pollution prevention is the reduction or elimination of pollutant generation at its source and is the best "first line of defense". Source control BMPs (both structural and non-structural) minimize the contact between pollutants and runoff, therefore keeping pollutants onsite and out of receiving waters. Treatment control BMPs remove pollutants that have been mobilized by storm water or non-storm water flows.

18. **BMP Implementation.** Runoff needs to be addressed during the three major phases of development (planning, construction, and use) in order to reduce the discharge of storm water pollutants to the MEP, effectively prohibit non-storm water discharges, and protect receiving waters. Development which is not guided by water quality planning policies and principles can result in increased pollutant load discharges, flow rates, and flow durations which can negatively affect receiving water beneficial uses. Construction sites without adequate BMP implementation result in sediment runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. Existing development can generate substantial pollutant loads which are discharged in runoff to receiving waters.

19. **Long Term Planning and Implementation.** Federal regulations require municipal storm water permits to expire 5 years from adoption, after which the permit must be renewed and reissued. The San Diego Water Board recognizes that the degradation of water quality and impacts to beneficial uses of the waters in the San Diego Region occurred over several decades. The San Diego Water Board further recognizes that a decade or more may be necessary to realize demonstrable improvement to the quality of waters in the Region. This Order includes a long term planning and implementation approach that will require more than a single permit term to complete.

WATER QUALITY STANDARDS

20. **Basin Plan.** The San Diego Water Board adopted a Water Quality Control Plan for the San Diego Basin (Basin Plan) on September 8, 1994 that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for receiving waters addressed through the plan. The Basin Plan was subsequently approved by the State Water Resources Control Board (State Water Board) on December 13, 1994. Subsequent revisions to the Basin Plan have also been adopted by the San Diego Water Board and approved by the State Water Board. Requirements of this Order implement the Basin Plan.

    The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Process Supply (PROC), Industrial Service Supply (IND), Ground Water Recharge (GWR), Contact Water Recreation (REC1), Non-contact Water Recreation (REC2), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Freshwater Replenishment (FRSH), Hydropower Generation (POW), and Preservation of Biological Habitats of Special Significance (BIOL). The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region: Navigation (NAV), Commercial and Sport Fishing (COMM), Estuarine Habitat (EST), Marine Habitat (MAR), Aquaculture (AQUA), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN), and Shellfish Harvesting (SHELL).

21. **Ocean Plan.** The State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, and 2005. The State Water Board adopted the latest amendment on April 21, 2005 and it became effective on February 14, 2006. The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean. Requirements of this Order implement the Ocean Plan.

    The Ocean Plan identifies the following beneficial uses of ocean waters of the state to be protected: Industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture; preservation and enhancement of designated Areas of Special Biological Significance; rare and endangered species; marine habitat; fish spawning and shellfish harvesting

22. **Sediment Quality Control Plan**. On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret

the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

23. **National Toxics Rule and California Toxics Rule.** USEPA adopted the NTR on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the National toxics Rule (NTR) applied in California. On May 18, 2000, USEPA adopted the California Toxics Rule (CTR). The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants

24. **Antidegradation Policy.** This Order is in conformance with the federal Antidegradation Policy described in 40 CFR 131.12, and State Water Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality Waters in California*. Federal regulations at 40 CFR 131.12 require that the State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The San Diego Water Board's Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies.

CONSIDERATIONS UNDER FEDERAL LAW

25. **Coastal Zone Act Reauthorization Amendments.** Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states with approved coastal zone management programs to address non-point pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point pollution: agriculture, silviculture, urban, marinas, and hydromodification. This Order addresses the management measures required for the urban category, with the exception of septic systems. The runoff management programs developed pursuant to this Order fulfill the need for coastal cities to develop a runoff non-point source plan identified in the Non-Point Source Program Strategy and Implementation Plan. The San Diego Water Board addresses septic systems through the administration of other programs.

26. **Endangered Species Act.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 USCA sections 1531 to 1544). This Order requires compliance with receiving water limits, and other requirements to protect the beneficial uses of waters of the State. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

CONSIDERATIONS UNDER STATE LAW

27. Unfunded Mandates. This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following:

a. This Order implements federally mandated requirements under CWA section 402. (33 USC 1342(p)(3)(B).)

b. The local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental and new dischargers who are issued NPDES permits for storm water and non-storm water discharges.

c. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order.

d. The Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC 1311(a)) and in lieu of numeric restrictions on their MS4 discharges (i.e. effluent limitations).

e. The local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under State law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

f. The provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards. (33 USC 1313(d).) Once the USEPA or a state develops a TMDL, federal law requires that permits must contain effluent limitations consistent with the assumptions and requirements of any applicable wasteload allocation. (40 CFR 122.44(d)(1)(vii)(B).)

28. California Environmental Quality Act. The issuance of WDRs and an NPDES permit for the discharge of runoff from MS4s to waters of the U.S. is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 et seq.) in accordance with CWC section 13389.

STATE WATER BOARD DECISIONS

29. Compliance with Prohibitions and Limitations. The receiving water limitation language specified in this Order is consistent with language recommended by the USEPA and established in State Water Board Order WQ-99-05, *Own Motion Review of the Petition of Environmental Health Coalition to Review Waste Discharge Requirements Order No. 96-03, NPDES Permit No. CAS0108740*, adopted by the State Water Board on June 17, 1999. The receiving water limitation language in this Order requires compliance with water quality standards, which for storm water discharges is to be achieved through an iterative approach requiring the

implementation of improved and better-tailored BMPs over time. Implementation of the iterative approach to comply with receiving water limitations based on applicable water quality standards is necessary to ensure that storm water discharges from the MS4 ultimately will not cause or contribute to violations of water quality standards and the creation of conditions of pollution, contamination, or nuisance.

30. **Special Conditions for Areas of Special Biological Significance.** On March 20, 2012, the State Water Board approved Resolution No. 2012-~~001X~~ 0012 approving an exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges. The Resolution requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBSs. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject terms and conditions of the Resolution. The Special Protections contained in Attachment B to the Resolution applicable to these discharges are hereby incorporated in this Order as if fully set forth herein.

ADMINISTRATIVE FINDINGS

31. **Executive Officer Delegation of Authority.** The San Diego Water Board by prior resolution has delegated all matters that may legally be delegated to its Executive Officer to act on its behalf pursuant to CWC section 13223. Therefore, the Executive Officer is authorized to act on the San Diego Water Board's behalf on any matter within this Order unless such delegation is unlawful under CWC section 13223 or this Order explicitly states otherwise.

32. **Standard Provisions.** Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR 122.42, are provided in Attachment B to this Order.

33. **Fact Sheet.** The Fact Sheet for this Order contains background information, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of this Order. The Fact Sheet is hereby incorporated into this Order and constitutes part of the Findings of this Order.

34. **Public Notice.** The San Diego Water Board notified the Copermittees, and interested agencies and persons of its intent to prescribe WDRs for MS4 discharges of pollutants to waters of the U.S. and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet.

35. **Public Hearing.** The San Diego Water Board held a public hearing on Month Day, 2012 and heard and considered all comments pertaining to the terms and conditions of this Order. Details of the public hearing are provided in the Fact Sheet.

II. PROVISIONS

THEREFORE, IT IS HEREBY ORDERED that the Copermittees, in order to meet the provisions contained in division 7 of the CWC and regulations adopted thereunder, and the provisions of the CWA and regulations adopted thereunder, must each comply with the following:

A. PROHIBITIONS AND LIMITATIONS

The purpose of this provision is to describe the conditions under which ~~storm water and~~ non-storm water discharges into ~~and from~~ the MS4s are to be effectively prohibited or limited, and to describe how pollutants in discharges from the MS4, whether from stormwater or non-stormwater, are to be reduced to the maximum extent practicable (MEP). The goal of this provision is to address the impacts of MS4 discharges so that such discharges do not impair~~protect, preserve, enhance, and restore the~~ water quality and designated beneficial uses of waters of the state. This goal will be accomplished through implementation of control measures that effectively prohibit non-storm water discharges into ~~and from~~ the Copermittees' MS4s, and reduce pollutants in ~~storm water~~all discharges from the Copermittees' MS4s to the MEP. The process for determining compliance with the Discharge Prohibitions (A.1), Receiving Water Limitations (A.2), and Effluent Limitations (A.3, including effluent limitations derived from the TMDL requirements – Attachment E) is defined in Provision A.4.

1. Discharge Prohibitions

a. Except as otherwise permitted herein, ~~Discharges~~ discharges ~~into and~~ from MS4s~~s~~ owned and operated by a Copermittee, in a manner causing~~, or threatening to cause,~~ a condition of pollution, contamination, or nuisance in ~~receiving~~ waters of the state are prohibited.

b. Non-storm water discharges into ~~and from~~ MS4s are effectively prohibited, unless such discharges are either authorized by a separate NPDES permit, or the discharge is a category of non-storm water discharges or flows that must be addressed pursuant to Provisions E.2.a.(1)-(5) of this Order.

c. Discharges from MS4s are subject to all waste discharge prohibitions in the Basin Plan, included in Attachment A to this Order.

d. ~~Discharges from MS4s to ASBS are prohibited.~~ Storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-~~001X~~ 0012 applicable to these discharges, included in Attachment A to this Order. All other discharges from MS4s to ASBS are prohibited, unless authorized by a separate Order.

2. Receiving Water Limitations

a. Discharges from MS4s owned and operated by a Copermittee must not cause or contribute to the violation of water quality standards in any receiving waters, including but not limited to all applicable provisions contained in the list below to the extent they remain in effect and are operative, unless such discharges are being addressed by the Copermittee(s) through the processes set forth in this Order (including Provision A.4 below and Attachment E, the TMDL Provisions):

(1) The San Diego Water Board's Basin Plan, including beneficial uses, water quality objectives, and implementation plans;

(2) State Water Board plans for water quality control including the following:

(a) Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries (Thermal Plan), and

(b) The Ocean Plan, including beneficial uses, water quality objectives, and implementation plans;

(3) State Water Board policies for water and sediment quality control including the following:

(a) Water Quality Control Policy for the Enclosed Bays and Estuaries of California,

(b) Sediment Quality Control Plan which includes the following narrative objectives for bays and estuaries:

(i) Pollutants in sediments shall not be present in quantities that, alone or in combination, are toxic to benthic communities, and

(ii) Pollutants shall not be present in sediments at levels that will bioaccumulate in aquatic life to levels that are harmful to human health,

(c) The Statement of Policy with Respect to Maintaining High Quality of Waters in California (State Water Board Resolution No. 68-16).

(4) Priority pollutant criteria promulgated by the USEPA through the following:

(a) National Toxics Rule (NTR)[1] (promulgated on December 22, 1992 and amended on May 4, 1995), and

[1] 40 CFR 131.36

(b) California Toxics Rule (CTR)[2,3]

~~Discharges from MS4s composed of storm water runoff must not alter natural ocean water quality in an ASBS.~~

~~Discharges from MS4s must not cause or contribute to the violation of any receiving water limitations expressed as water quality based effluent limitations (WQBELs) required to meet the WLAs established for the TMDLs in Attachment E to this Order, pursuant to the applicable TMDL compliance schedules.~~

3. Effluent Limitations

a. Technology and Water Quality Based Effluent Limitations (including Effluent Limitations based on TMDLs).
Each Copermittee shall reduce pollutants in discharges from the MS4 to the maximum extent practicable (~~Pollutants in storm water discharges from MS4s must be reduced to the~~ MEP[4]).

~~a.~~ It is understood that compliance with this requirement will be achieved through the use of MEP-compliance best management practices (BMPs) or other controls that are consistent with the MEP standard.

b. ~~Pollutants in discharges from MS4s must be reduced to comply with any effluent limitations expressed as WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order, pursuant to the applicable TMDL compliance schedules.~~

4. Compliance with Discharge Prohibitions, ~~and~~ Receiving Water Limitations, and Effluent Limitations

a. Each Copermittee must comply with the discharge prohibitions (A.1), ~~and~~ receiving water limitations (A.2), and effluent limitations (A.3, including effluent limitations developed based on TMDLs) of this Order through timely implementation of ~~control~~ strategies, control measures and other actions as specified in Provisions B, ~~and~~ E, and Attachment E (TMDLs) of this Order. The Water Quality Improvement Plans described in Provision B shall be designed to achieve compliance to the MEP standard with the discharge prohibitions, receiving water limitations, and all effluent limitations. If the Executive Officer approves a Water Quality Improvement Plan and subsequent updates as described in Provision B and F.1, and the plan is being implemented in a timely and good faith manner, such

Comment [A1]: It is recommended that this section be replaced with the language similar to what CASQA provided to the State Board. Although this language has been slightly modified, it is consistent with the CASQA language.

[2] 65 Federal Register 31682-31719 (May 18, 2000), adding Section 131.38 to 40 CFR
[3] If a water quality objective and a CTR criterion are in effect for the same priority pollutant, the more stringent of the two applies, unless a previous regulatory action (i.e., TMDL) has specified otherwise.
[4] This requirement does not apply to MS4 discharges which receive subsequent treatment to reduce pollutants in ~~storm water~~ discharges to the MEP prior to entering receiving waters (e.g., low flow diversions to the sanitary sewer). Runoff treatment must occur prior to the discharge of runoff into receiving waters per Finding 8.

implementation of the plan shall constitute compliance with Provisions A.1, A.2, and A.3.

b. In instances where discharges from the MS4 for which the permittee is responsible, causes or contributes to an exceedance of any applicable water quality standard or effluent limitation, or causes a condition of nuisance in the receiving water; and the pollutant(s) associated with the discharge is otherwise not specifically addressed by a provision of this Order (such as specific scheduled actions in a Water Quality Improvement Plan), the Permittee shall comply with the following iterative procedure:

1. Submit a report to the Executive Officer that:
   i. Summarizes and evaluates water quality data associated with the pollutant of concern in the context of the applicable water quality objective, discharge prohibition, or effluent limitation including the magnitude and frequency of the exceedances.
   ii. Includes a work plan to identify the sources of the constituents of concern (including those not associated with the MS4 such that non-MS4s sources can be pursued).
   iii. Describes the strategy and schedule for implementing MEP-compliant BMPs and other MEP-compliant controls (including those that are currently being implemented) that will address the Permittee's sources of constituents that are causing or contributing to the exceedances of any applicable water quality standard, discharge prohibition, or effluent limitation, or causing a condition of nuisance, and are reflective of the severity of the exceedances. The strategy shall demonstrate that the selection of BMPs will address the Permittee's sources of constituents and include a mechanism for tracking BMP implementation. The strategy shall provide for future refinement pending the results of the source identification work plan noted above.
   iv. Outlines, if necessary, additional monitoring to evaluate improvement in water quality and, if appropriate, special studies that will be undertaken to support future management decisions.
   v. Includes a methodology(ies) that will assess the effectiveness of the BMPs to address the exceedances.
   vi. This report may be submitted in conjunction with the Annual Report unless the Executive Officer directs an earlier submittal.

2. Submit any modifications to the report that are required by the Executive Officer and that are consistent with the MEP standard within 60 days of notification from the Executive Officer. The report is deemed approved within 60 days of its submission if no response is received from the Executive Officer.

3. Implement the actions specified in the report in accordance with the acceptance or approval of the Executive Officer, including the implementation schedule.

c. Compliance with the procedure set forth above for the subject pollutant or pollutants shall constitute compliance with the applicable discharge prohibition, receiving water limitation or effluent limitation (including the applicable TMDL) in issue, and the Permittee does not have to repeat the same procedure for continuing or recurring exceedances.

The information developed pursuant to A.4.b must be incorporated into the Water Quality Improvement Plans and/or the jurisdictional runoff management programs, as needed.

~~**a.** If exceedance(s) of water quality standards persist in receiving waters notwithstanding implementation of this Order, the Copermittees must comply with the following procedures:~~

~~(1) Upon a determination by either the Copermittees or the San Diego Water Board that discharges from the MS4 are causing or contributing to an exceedance of an applicable water quality standard, the Copermittees must submit the following updates to the Water Quality Improvement Plan required under Provision B as part of the Annual Report required under Provision F.3.b, unless the San Diego Water Board directs an earlier submittal:~~

~~(a) The water quality improvement strategies being implemented that are effective and will continue to be implemented;~~

~~(b) Additional water quality improvement strategies (i.e. BMPs, retrofitting projects, stream and/or habitat rehabilitation or restoration projects) that will be implemented to reduce or eliminate any pollutants or conditions that are causing or contributing to the exceedance of water quality standards;~~

~~(c) Updates to the schedule for implementation of the existing and additional water quality improvement strategies; and~~

~~(d) Updates, when necessary, to the schedule for achieving compliance with the discharge prohibitions and receiving water limitations of this Order;~~

~~(2) The San Diego Water Board may require the incorporation of additional modifications to the Water Quality Improvement Plan required under Provision B. The applicable Copermittees must submit any modifications to the update to the Water Quality Improvement Plan within 30 days of~~

~~notification that additional modifications are required by the San Diego Water Board, or as otherwise directed;~~

~~(3) Within 30 days of the San Diego Water Board determination that the update to the Water Quality Improvement Plan meets the requirements of this Order, the Copermittees must revise the jurisdictional runoff management program documents to incorporate the updated water quality improvement strategies that have been and will be implemented, the implementation schedule, and any additional monitoring required; and~~

~~(4) The Copermittees must implement the revised jurisdictional runoff management programs and updated jurisdictional monitoring and assessment component of the Water Quality Improvement Plan.~~

B. WATER QUALITY IMPROVEMENT PLANS[5]

The purpose of this provision is to develop Water Quality Improvement Plans that guide the Copermittees' jurisdictional ~~runoff management program~~ implementation efforts (Provision E) towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plan is to 1) effectively prohibit non-stormwater discharges into the MS4s, 2) reduce pollutants in stormwater discharges from the MS4s to the MEP, and 3) attain the reasonable protection~~, preservation, enhancement, and restoration~~ of water quality and designated beneficial uses of waters of the state. Therefore, implementation of the WQIPs also provides the basis for complying with Provisions II.A.1, II.A.2, II.A.3, as described in Provision II.A.4. This goal will be accomplished through an adaptive planning and management process that identifies the highest water quality priorities within a watershed and implements customized strategies, control measures, and BMPs to achieve improvements in the quality of discharges from the MS4s and receiving waters. As such, the requirements outlined in Provision E may be modified for consistency with the Water Quality Improvement Plan for the applicable Watershed Management Area, if appropriate justification is provided.

Development of the Water Quality Improvement Plans allows permittees to customize the requirements in Provision E to address the highest watershed priorities. The Copermittees must develop Water Quality Improvement Plans for each Watershed Management Area that 1) prioritize water quality ~~issues~~ conditions resulting from the Copermittee's MS4 discharges ~~to and from the MS4s with~~in each Watershed Management Area, 2) identify MS4 pollutant sources ~~and other stressors~~ associated with th~~os~~e water quality priorities, 3) define numeric ~~targets~~goals and schedules to ~~achieve~~ address ~~improvement of~~ water quality priorities, 4) describe water quality improvement strategies to achieve numeric ~~targets~~goals, and 5) develop and execute a coordinated monitoring and assessment program to facilitate adaptive management of the WQIPs and determine progress towards achieving ~~improved water quality~~those goals.

The Copermittees must submit WQIPs for public review and Regional Board Executive Officer review and approval per the schedule outline in Provision II.B.6.~~implement all the requirements of Provisions B.1 through B.4 no later than 12 18 months after the adoption of this Order, or in accordance with Provision F.5.a~~ of this Order.

1. Watershed Management Areas

The Copermittees must develop Water Quality Improvement Plans for each of the Watershed Management Areas in Table B-1. A total of ~~nine~~ ten Water Quality Improvement Plans must be developed for the San Diego Region.

Table B-1. Watershed Management Areas

[5] Once developed and approved, the Water Quality Improvement Plan and corresponding Jurisdictional Runoff Management Plans will functionally replace Load Reduction Plans.

Watershed Management Area	Hydrologic Unit(s)	Major Surface Water Bodies	Responsible Copermittees
South Orange County	San Juan (901.00)	Aliso Creek San Juan Creek San Mateo Creek Pacific Ocean	- City of Aliso Viejo[1] - City of Dana Point[1] - City of Laguna Beach[1] - City of Laguna Hills[1] - City of Laguna Niguel[1] - City of Laguna Woods[1] - City of Lake Forest[1] - City of Mission Viejo[1] - City of Rancho Santa Margarita[1] - City of San Clemente[1] - City of San Juan Capistrano[1] - County of Orange[1] - Orange County Flood Control District[1]
Santa Margarita River	Santa Margarita (902.00)	Murrieta Creek Temecula Creek Santa Margarita River Santa Margarita Lagoon Pacific Ocean	- City of Murrieta[2] - City of Temecula[2] - City of Wildomar[2] - County of Riverside[2] - County of San Diego[3] - Riverside County Flood Control and Water Conservation District[2]
San Luis Rey River	San Luis Rey (903.00)	San Luis Rey River San Luis Rey Estuary Pacific Ocean	- ~~City of Escondido~~ - City of Oceanside - City of Vista - County of San Diego
Carlsbad	Carlsbad (904.00)	Loma Alta Slough Buena Vista Lagoon Agua Hedionda Lagoon Batiquitos Lagoon San Elijo Lagoon Pacific Ocean	- City of Carlsbad - City of Encinitas - City of Escondido - City of Oceanside - City of San Marcos - City of Solana Beach - City of Vista - County of San Diego
San Dieguito River	San Dieguito (905.00)	San Dieguito River San Dieguito Lagoon Pacific Ocean	- City of Del Mar - City of Escondido - City of Poway - City of San Diego - City of Solana Beach - County of San Diego
Penasquitos	~~Penasquitos (906.00)~~Reservoir HA (906.10) Poway HA (906.20) Miramar HA (906.40)	Los Penasquitos Lagoon ~~Mission Bay~~ Pacific Ocean	- City of Del Mar - City of Poway - City of San Diego - County of San Diego
Mission Bay	Scripps HA (906.30) Miramar HA (906.40) Tecolote HA (906.50)	Mission Bay Pacific Ocean	- City of San Diego
San Diego River	San Diego (907.00)	San Diego River Pacific Ocean	- City of El Cajon - City of La Mesa - ~~City of Poway~~ - City of San Diego - City of Santee - County of San Diego

Table B-1. Watershed Management Areas

Watershed Management Area	Hydrologic Unit(s)	Major Surface Water Bodies	Responsible Copermittees
San Diego Bay	Pueblo San Diego (908.00) Sweetwater (909.00) Otay (910.00)	Sweetwater River Otay River San Diego Bay Pacific Ocean	- City of Chula Vista - City of Coronado - City of Imperial Beach - City of La Mesa - City of Lemon Grove - City of National City - City of San Diego - County of San Diego - San Diego County Regional Airport Authority - Unified Port of San Diego
Tijuana River	Tijuana (911.00)	Tijuana River Tijuana Estuary Pacific Ocean	- City of Imperial Beach - City of San Diego - County of San Diego

Notes:
1. The Orange County Copermittees will be enrolled under this Order upon expiration of Order No. R9-2009-0002, or earlier if the Orange County Copermittees meet the conditions in Provision F.6.
2. The Riverside County Copermittees will be enrolled under this Order upon expiration of Order No. R9-2010-0016, or earlier if the Riverside County Copermittees meet the conditions in Provision F.6.
3. The County of San Diego will not be required to implement the requirements of Provision B for the Santa Margarita River Watershed Management Area until the Riverside County Copermittees are enrolled under this Order. Until then, the County of San Diego is responsible for implementing and complying with the requirements of Provisions D.1, D.4.a.(1)&(3), E, F.2.a-b, F.3.b, and F.4 for the areas of the Santa Margarita River Watershed Management Area within its jurisdiction.

2. Identification of Water Quality Priorities

The Copermittees must identify the water quality priorities within each Watershed Management Area that will be addressed by the Water Quality Improvement Plan. Where appropriate, Watershed Management Areas may be separated into subwatersheds to focus water quality prioritization and jurisdictional ~~runoff management program~~ implementation efforts by receiving water.

a. Assessment of Receiving Water Conditions

The Copermittees must consider ~~review pollutant sources, discharges, and receiving water conditions and assess~~ the following, at a minimum, to support ~~determine~~ the identification ~~degree~~ of water quality priorities based on the ~~adverse~~ impacts of MS4 discharges on ~~to~~ receiving water beneficial uses:

(1) Receiving waters listed as impaired on the CWA Section 303(d) List of Water Quality Limited Segments (303(d) List);

(2) TMDLs adopted and under development by the San Diego Water Board;

~~(2)~~(3) The requirements of Provision II.A.2;

~~(3)~~(4) Receiving waters recognized as sensitive or highly valued by the Copermittees, including estuaries designated under the National Estuary Program under CWA section 320, wetlands defined by the State or U.S. Fish and Wildlife Service's National Wetlands Inventory as wetlands, and receiving

waters identified as ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-~~001X~~ 0012 (Attachment A);

~~(4)~~(5) Water quality standards established in the Basin Plan;

~~(5)~~(6) Known historical versus current physical, chemical, and biological water quality conditions;

~~(6)~~(7) A~~All a~~vailable, relevant, and appropriately collected physical, chemical, and biological receiving water monitoring data meeting appropriate QA/QC standards~~,~~ including ~~, but not limited to,~~ data describing:

(a) Chemical constituents;

(b) Water quality parameters (i.e. pH, temperature, conductivity, etc.);

(c) Toxicity Identification Evaluations for both receiving water column and sediment;

(d) Trash impacts;

(e) Bioassessments; and

(f) Physical habitat.

~~(7)~~(8) Available evidence of erosional impacts in receiving waters due to accelerated flows (i.e. hydromodification); ~~and~~

(9) Available evidence of adverse impacts to the chemical, physical, and biological integrity of receiving waters~~.~~; and

~~(8)~~(10) The potential for long-term achievement and maintenance of beneficial use attainment in the Watershed Management Area.

b. ASSESSMENT OF MS4 DISCHARGE QUALITY AND IMPACTS

To support the identification of priorities based on the impacts of MS4 discharges on receiving water beneficial uses, the Copermittees must review appropriately collected MS4 discharge quality data and consider the extent to which MS4s cause or contribute to the adverse impacts to receiving water beneficial uses identified in II.B.2.a. Considerations include:

(1) Locations of the Copermittees' MS4 discharges with respect to receiving waters;

(2) MS4 discharge quality results relevant to impacts in receiving waters and action levels, including the temporal and geographic variation of the results:

(3) The requirements of Provisions II.A.1 and II.A.3.; and

(4) Whether MS4 discharge quality is sufficiently well known or other information is available to assess whether MS4 discharges are causing or contributing to specific receiving water conditions, or whether additional data need to be collected through the Monitoring and Assessment Program developed as part of the Water Quality Improvement Plan.

~~b.~~c. IDENTIFICATION OF ~~Y~~ PRIORITY ~~POLLUTANTS AND~~ RECEIVING WATER CONDITIONS

The Copermittees must use the information gathered in Provision B.2.a. and B.2.b to develop a list of water quality priorities as pollutants and/or receiving water conditions that are the highest threat to water quality or that most adversely affect the physical, chemical, and biological integrity of receiving waters. The Copermittees must identify the highest water quality priorities to be addressed by the Water Quality Improvement Plan. The WQIPs shall describe the following for each priority receiving water condition:

(1) The beneficial use(s) and pollutant(s) associated with the priority receiving water condition(s);

(2) The geographic extent of the priority receiving water condition(s)within the WMA, if known;

(3) The Copermittees with MS4s that contribute discharges to the priority water receiving condition(s);

(4) The temporal extent of the priority receiving condition(s) (i.e., dry weather and/or wet weather);

(5) Whether receiving waters have been monitored sufficiently to adequately characterize the priority receiving condition(s), including a consideration of spatial and temporal variation; and

(6) The reasoning for selecting specific receiving water conditions as a priority and a subset of priorities as the highest priorities.

~~c.~~d. MS4 POLLUTANT SOURCE ~~AND/OR STRESSOR~~ IDENTIFICATION

The Copermittees must identify and prioritize known and suspected storm water and non-storm water pollutant sources within the MS4 associated with ~~and any other stressors causing or contributing to~~ the highest priority receiving water conditions identified under II.B.2.c. ~~quality priorities.~~ The identification of known and suspected sources of the highest water quality priorities as identified for

Provision B.2.c~~b~~ shall~~must~~ consider the following:

(1) Land uses and their potential contribution to the highest priority receiving water conditions;

~~(1)~~(2) Pollutant generating facilities~~ or~~, areas, and/or activities within the Watershed Management Area~~, including:~~;:

~~(2) Each Copermittee's inventory of construction, municipal, commercial, industrial, and residential facilities, areas, and/or activities,~~
~~(3)~~
~~(4) Publicly owned parks and/or recreational areas,~~
~~(5)~~
~~(6) Open space areas,~~
~~(7)~~
~~(8) All currently operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste, and~~
~~(9)~~
~~(10) Areas not within the Copermittees' jurisdictions (e.g., tribal lands, state lands, federal lands) that may be pollutant sources related to the highest water quality priorities within the Watershed Management Area;~~
~~(11)~~
~~(12)~~ Locations of the Copermittees' MS4s~~, including the following:~~
~~(13)~~
~~(14)~~(3) ~~All MS4~~ outfalls~~ that discharge to receiving waters, and~~ .

~~(15) Locations of major structural controls for storm water and non-storm water (e.g., retention basins, detention basins, major infiltration devices, etc.);~~
~~(16)~~
~~(17) Other known and suspected sources of non-storm water or pollutants in storm water discharges to receiving waters within the Watershed Management Area, including the following:~~
~~(18)~~
~~(19) Other MS4 outfalls (e.g., Phase II Municipal and Caltrans),~~
~~(20)~~
~~(21) Other NPDES permitted discharges,~~
~~(22)~~
~~(23) Any other discharges that may be considered point sources (e.g., private outfalls), and~~
~~(24)~~
~~(25) Any other discharges that may be considered non-point sources (e.g., agriculture, wildlife or other natural sources);~~
~~(26)~~
~~(27)~~(4) Review of available data, including~~ but not limited to~~:

(a) Findings from the Copermittees' illicit discharge detection and elimination programs,

(b) Findings from the Copermittees' MS4 outfall monitoring,

~~(c) Findings from the Copermittees' receiving water monitoring,~~
~~(d)~~
~~(e) Findings from the Copermittees' MS4 discharges and receiving water assessments, and~~
~~(f)~~
~~(g)~~(c) ~~Any other~~Other available, relevant, and appropriately-collected data, information, or studies related to pollutant sources and ~~conditions~~ pollutant-generating activities that contribute to the highest priority receiving water ~~quality priorities as~~conditions identified ~~for~~ in Provision II.B.2.b.

~~(28)~~(5) Whether MS4 sources are sufficiently well known to design an effective, directed control strategy, or whether additional source/stressor identification needs to be conducted through the Monitoring and Assessment Program developed as part of the Water Quality Improvement Plan to identify and prioritize sources/stressors within the watershed.

~~d.~~e. **NUMERIC ~~TARGETS~~ GOALS ~~AND SCHEDULES~~**

The Copermittees must develop and incorporate interim and final numeric ~~targets[6] and schedules~~ goals[7] into the Water Quality Improvement Plans. Numeric ~~targets~~goals and schedules ~~must be used~~are intended to support Water Quality Improvement Plan development and to measure progress towards addressing the highest priority receiving water conditions identified under II.B.2.b~~water quality priorities and an ultimate outcome of protections, preservation, enhancement, and restoration of~~. Numeric goals themselves are not enforceable compliance standards, effluent limitations, or receiving water ~~beneficial uses.~~ limitations. When ~~developing~~establishing numeric ~~targets~~goals and corresponding schedules, the Copermittees must consider the following:

~~[6] Interim and final numeric targets may take a variety of forms such as pollutant concentration, load reductions, number of impaired water bodies delisted from the List of Water Quality Impaired Segments, Index of Biotic Integrity (IBI) scores, or other appropriate metrics. Interim and final numeric targets are not necessarily limited to one criterion or indicator, but may include multiple criteria and/or indicators.~~
[7] Interim and final numeric goals may take a variety of forms such as TMDL targets, TMDL wasteload allocations, TMDL based WQBELs incorporated in Attachment E of this Order, action levels, pollutant concentration, load reductions, number of impaired water bodies delisted from the List of Water Quality Impaired Segments, Index of Biotic Integrity (IBI) scores, or other appropriate metrics. Interim and final numeric goals are not necessarily limited to one criterion or indicator, but may include multiple criteria and/or indicators. To the extent that a goal is not based on an enforceable regulatory mechanism (i.e., TMDL, WLA), WQIP goals and schedules may be revised through the iterative process. Numeric goals are not subject to enforcement or non-compliance actions under this Order.

(1) Final numeric ~~targets~~goals must be based on measureable criteria or indicators, to be achieved in the receiving waters and/or MS4 discharges for the highest priority receiving water ~~quality priorities~~conditions which will ~~result in~~be capable of demonstrating progress toward the achievement of the restoration and/or protection of water quality standards in receiving waters; and

(2) Interim numeric ~~targets~~goals must be based on measureable criteria or indicators that can demonstrate incremental progress toward achieving the final numeric ~~targets~~goals in the receiving waters and/or MS4 discharges~~;~~. ~~and~~

~~(3) Schedules must be adequate for measuring progress toward achieving the interim and final numeric targets required for Provisions B.2.d. and B.2.d.. Schedules must incorporate the following:~~

3. Water Quality Improvement Strategies and Schedules

The Copermittees must develop specific water quality improvement strategies to address the highest ~~water quality~~ priority~~ies~~ receiving water conditions identified within a Watershed Management Area. The water quality improvement strategies must address the highest water quality priorities by preventing or eliminating non-storm water discharges to and from the MS4, reducing pollutants in storm water discharges from the MS4 to the MEP, and restoring and/or protecting the water quality standards of receiving waters.

a. WATER QUALITY IMPROVEMENT STRATEGIES

The water quality improvement strategies must prioritize, based on their likely effectiveness and efficiency, and implement ~~the following~~ measures, as appropriate, to effectively prohibit non-storm water discharges into its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, and achieve the interim and final numeric ~~targets~~goals in accordance with the schedules ~~required for~~in Provision II.B.2~~.~~.e. Measures include:

(1) Activities identified in Provision E ,either as described in the jurisdictional runoff management programs or as modified with justification, that will address priority receiving water conditions; and

~~(1)~~ Additional ~~S~~structural and/or non-structural BMPs that are designed to achieve the interim and final numeric goals identified in Provision II.B.2.e.~~targets in the receiving waters and/or MS4 discharges;~~
~~(2)~~

~~(3) Retrofitting projects for areas of existing development known or suspected to contribute to the highest water quality priorities, and where retrofitting will contribute to reducing or eliminating non-storm water discharges to the MS4 and/or reducing pollutants in storm water discharges from the MS4 to the MEP;~~

~~(4)~~

~~(5)~~(2) ~~Stream and/or habitat rehabilitation or restoration projects where stream and/or habitat rehabilitation or restoration are necessary for, or will contribute to demonstrable improvements in the physical, chemical, and biological receiving water conditions and restoration and/or protection of water quality standards in receiving waters; and~~

~~Other water quality improvement strategies that will result in preventing or eliminating non-storm water discharges to and from the MS4, reducing pollutants in storm water discharges from the MS4 to the MEP, and restoring and/or protecting the water quality standards of receiving waters.~~

b. IMPLEMENTATION SCHEDULES

The Copermittees must develop schedules for implementing the water quality improvement strategies identified under Provision II.B.3.a to achieve the interim and final numeric ~~targets~~goals identified in ~~the receiving waters and/or MS4 discharges for the highest water quality priorities~~B.2.e in the Watershed Management Area. Schedules must be developed for both the water quality improvement strategies implemented by each Copermittee within its jurisdiction and for strategies that ~~will be implemented by multiple Copermittees~~ Copermittees' choose to implement on a collaborative basis. Schedules must incorporate the following:

(a) Interim dates for achieving the interim numeric ~~targets~~goals;

(b) Compliance schedules for any applicable TMDLs in Attachment E to this Order;

(c) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-001**2**~~X~~ (see Attachment A);

(d) Achievement of the final numeric goals~~targets~~ in the receiving waters and/or MS4 discharges for the highest water quality priorities must be as soon as possible, and

(e) Final dates for achieving the final numeric ~~targets~~ goals must not extend more than 10 years beyond the date this Order is adopted, unless the schedule includes an applicable TMDL in Attachment E to this Order[8]

[8] Achievement of final numeric goals within 10 years represents progress towards attainment of water quality standards, but is not a requirement to fully attain all applicable water quality standards or all priority receiving water conditions within 10 years.

4. Water Quality Improvement Monitoring and Assessment

The Copermittees in each Watershed Management Area must develop an integrated ~~program to assess the~~Water Quality Improvement Plan Monitoring and Assessment Program that assesses: 1) progress toward achieving the numeric ~~targets~~goals and schedules, ~~and~~2) ~~the~~ progress toward addressing the highest priority receiving water ~~quality priorities~~conditions for each Watershed Management Area, and 3) each Copermittee's overall efforts implementing the requirements of Provision B. The water quality improvement monitoring and assessment program must include the monitoring and assessment requirements of Provision D~~.~~, which may be modified for consistency with the priority receiving water conditions of each Watershed Management Area and associated Copermittees. For Watershed Management Areas with applicable TMDLs, the water quality monitoring and assessment program must incorporate the specific monitoring and assessment requirements of Attachment E. For Watershed Management Areas with any ASBS, the water quality monitoring and assessment program must also incorporate the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-001**2**~~X~~ (see Attachment A).

5. Adaptive Management Process

~~**1. WATER QUALITY IMPROVEMENT PLAN ADAPTIVE MANAGEMENT PROCESS**~~

The Copermittees in each Watershed Management Area must implement the iterative process, ~~at least once every 3 years,~~ adapting the Water Quality Improvement Plan to become more effective~~, based on, but not limited to~~ and meet the requirements of Provisions II.A, and shall consider the following~~ considerations~~:

a. PRIORITY RECEIVING WATER CONDITIONS AND NUMERIC GOALS

The priority receiving water conditions and numeric goals, developed pursuant to II.B.2.c. and II.B.2.e respectively, shall guide jurisdictional implementation efforts for the duration of this Order. Recommendations for changes to priority receiving water conditions and numeric goals shall be provided in the Report of Waste Discharge and shall consider the following:

(1) Achieving the outcome of improved water quality in MS4 discharges and receiving waters through implementation of the water quality improvement strategies identified in the Water Quality Improvement Plan;

(2) Progress toward achieving interim and final numeric ~~targets~~goals in receiving waters and/or MS4 discharges for the highest water quality priorities in the Watershed Management Area~~,~~

~~(3) Appropriateness of the highest water quality priorities identified for the Watershed Management Area;~~

~~(4)~~

~~(5) Progress toward achieving outcomes according to established schedules;~~

~~(6)~~
(3) New scientific information or new or updated policies or regulations that affect identified numeric goals including revised water quality objectives or TMDLs;

~~(7)~~(4) Spatial and temporal accuracy of monitoring data collected to inform prioritization of water quality problems and implementation measures to address the highest priority receiving water ~~quality problems~~conditions;

~~(8)~~(5) Availability of new information and data from sources other than the jurisdictional runoff management programs within the Watershed Management Area that informs the effectiveness of the actions implemented by the Copermittees;

(6) The factors listed in Provision II.B.2.a.(1)-(10);

~~(9)~~(7) San Diego Water Board recommendations; and

~~(10)~~(8) Recommendations for modifications ~~to the Water Quality Improvement Plan~~ solicited through a public participation process.

b. ~~Based on the results of the iterative process~~ **WATER QUALITY IMPROVEMENT STRATEGIES AND SCHEDULES**

~~(11)~~ The water quality improvement strategies and schedules required pursuant to ~~Provision B.5.a., the~~II.B.3 shall be adapted as new information becomes available to inform more effective and efficient means of achieving the numeric goals established in II.B.2.e. Copermittees ~~must report any modifications necessary~~shall consider adaptation to ~~improve the effectiveness of the Water Quality Improvement Plan in the Annual Report required pursuant to Provision , or as part of the Report of Waste Discharge (ROWD) required pursuant to Provision F.5..~~

~~(12) The Copermittees must implement any modifications to the Water Quality Improvement Plan in accordance with the schedules developed pursuant to Provisions B.2. and B.3., unless directed otherwise by the San Diego Water Board.~~

~~**2. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ADAPTIVE MANAGEMENT PROCESS**~~

~~Each Copermittee in the Watershed Management Area must implement the iterative process.~~jurisdictional runoff management programs and monitoring and assessment strategies and schedules at least annually~~, adapting its jurisdictional runoff management program to become more effective, based on, but not limited to~~ considering the following:

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(1) Changes to priority receiving water conditions and numeric goals based on recommendations from II.B.5.a.;

~~(1)~~(2) Measurable or demonstrable reductions of non-storm water discharges to ~~and from~~ each Copermittee's MS4;

~~(2)~~(3) Measurable or demonstrable reductions of pollutants in storm water discharges from each Copermittee's MS4 to the MEP;

(4) Information on the MS4 sources and/or pollutant-generating activities determined to be most significantly contributing to priority receiving water conditions;

~~(3)~~(5) Efficiency in implementing the Water Quality Improvement Plan;

~~(4)~~(6) San Diego Water Board recommendations; and

~~(5)~~(7) Recommendations for modifications ~~to each Copermittee's jurisdictional runoff management program~~ solicited through a public participation process~~.~~.

6. Water Quality Improvement Plan Submittal, Implementation, and Modifications

a. PRIORITY RECEIVING WATER CONDITIONS, MS4 SOURCES, AND NUMERIC GOALS

The ~~Based on~~Copermittees in each Watershed Management Area must submit the ~~results of the iterative process~~proposed priority receiving water conditions, MS4 sources, and numeric goals required ~~pursuant~~in Provisions II.B.2.c-e. for San Diego Water Board Executive Officer review and approval no later than 6 months following adoption of this Order. Priority receiving water conditions, MS4 sources, and numeric goals are deemed approved if no response is provided to the Copermittees within 2 months of the submittal date.

b. WATER QUALITY IMPROVEMENT PLANS

Copermittees shall commence development of the remaining portions of the Water Quality Improvement Plans upon approval of the priority receiving water conditions, MS4 sources, and numeric goals by the San Diego Water Board Executive Officer in II.B.6.a, and must submit complete Water Quality Improvement Plans for San Diego Water Board review and approval no later than 12 months thereafter. Water Quality Improvement Plans are deemed approved if no response is provided to the Copermittees within 2 months of the submittal date. Copermittees must commence with implementation of the Water Quality Improvement Plan no later than ~~180 days after submission, unless otherwise directed in writing by the San Diego Water Board.~~ the fiscal year (July 1) following San Diego Water Board approval of the Water Quality

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Improvement Plan.

c. WATER QUALITY IMPROVEMENT PLAN MODIFICATIONS

(a) Copermittees must submit requested modifications necessary to improve the effectiveness its jurisdictional runoff management program documentthe Water Quality Improvement Plan either in the Annual Report required pursuant to Provision II.F.3.b, or as part of the Report of Waste Discharge (ROWD) required pursuant to Provision II.F.5..

Each Copermittee.b. Once approved by the San Diego Water Board Executive Officer, the Copermittees must implement any modifications to its jurisdictional runoff management programthe Water Quality Improvement Plan in accordance with the schedules developed pursuant to Provisions B.2. and B.3., unless directed otherwise by the San Diego Water BoardII.B.2 and II.B.3.b. Requests for modification are deemed approved if no response is provided to the requesting Copermittee(s) within 2 months of the request date.

d. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM MODIFICATIONS

Copermittees must submit requested modifications to the jurisdictional runoff management programs either in the Annual Report required pursuant to Provision II.F.3.b, or as part of the Report of Waste Discharge (ROWD) required pursuant to Provision II.F.5.b. Once approved by the San Diego Water Board Executive Officer, the Copermittees must implement any modifications to the Water Quality Improvement Plan in accordance with the schedules developed pursuant to Provisions II.B.3.b. Requests for modification are deemed approved if no response is provided to the requesting Copermittee(s) within 2 months of the request date.

6. Water Quality Improvement Plan Implementation

Copermittees must commence with implementation of the Water Quality Improvement Plan no later than 180 days after submission, unless otherwise directed in writing by the San Diego Water Board.

Internal Draft

C. ACTION LEVELS

The purpose of this provision is for the Copermittees to incorporate numeric non-storm water and storm water action levels in the Water Quality Improvement Plans and numeric non-storm water action levels in the IDDE Program. The action levels ~~will~~shall be used to guide the following program planning efforts and measure progress towards ~~attaining~~ the reasonable protection~~, preservation,~~ and ~~enhancement, and restoration~~ of water quality and designated beneficial uses of waters of the state~~. This goal will be accomplished through monitoring and assessing the quality of the MS4 discharges during the implementation of the Water Quality Improvement Plans.~~:

1) ~~The Copermittees must incorporate numeric action levels in the~~ Support development and prioritization of water quality improvement strategies through the Water Quality Improvement Plans ~~to direct and focus~~. Discharge data above action levels can be evaluated using a statistical approach considering the ~~Copermittees' jurisdictional runoff management program implementation efforts for addressing MS4~~ frequency, magnitude, and loading of discharges to the receiving waters~~. The numeric action levels will be used as part of the MS4~~ to support development of actions and prioritization of their implementation.
2) Assist in the effective prohibition of non-stormwater discharges ~~assessments required under~~ from the MS4 pursuant to Provision ~~, and each Copermittee's program to detect and eliminate non-storm water~~ E.2.
3) Support the detection and elimination of illicit discharges to the MS4 ~~required under~~pursuant to Provision ~~. Numeric~~E.2.

These goals will be accomplished through monitoring and assessing the quality of the MS4 discharges prior to and during the implementation of the Water Quality Improvement Plans and as a part of the IDDE program. Exceedances of action levels are not subject to enforcement or non-compliance actions under this Order.

Action levels will be developed and incorporated into the Water Quality Improvement Plans (Provision B) and~~including~~ the Illicit Discharge Detection and Elimination (IDDE) Program (Provision E.2). Depending upon the goals/objectives for the use of the action levels ~~must be developed~~ and the priority receiving water conditions, the constituents and values at which they are set may differ between watersheds. Copermittees may develop Watershed Management Area specific numeric action levels for non-storm water and storm water MS4 discharges using an approach approved by the Regional Board or use the default non-stormwater and stormwater action levels prescribed within C.1 and C.2 below, respectively. The Copermittees will submit action levels as part of their Water Quality Improvement Plan(s). The action levels currently established ~~as follows:part of R9-2007-0001~~ will serve as the interim action levels until ~~the Water Quality Improvement Plans~~revised action levels are completed and approved.

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PROVISION C: ACTION LEVELS
C.1. Non-Storm Water Action Levels

1. Non-Storm Water Action Levels

The following non-storm water action levels (NALs) must be incorporated in the Water Quality Improvement Plan and IDDE program if the Permittees have not developed their own NALs using an approach approved by the Regional Board EO:

a. The following non-storm water action levels (NALs) must be incorporated ~~in the Water Quality Improvement Plan~~:

(1) Non-Storm Water Discharges from MS4s to Ocean Surf Zone

Table C-1. Non-Storm Water Action Levels for Discharges from MS4s to Ocean Surf Zone

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Total Coliform	MPN/100 ml	1,000	-	10,000/1,000[1]	OP
Fecal Coliform	MPN/100 ml	200[2]	-	400	OP
Enterococci	MPN/100 ml	35	-	104[3]	OP

Abbreviations/Acronyms

AMAL – average monthly action level
MDAL – maximum daily action level
OP – Ocean Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:

1. Total coliform density ~~shall not exceed~~NAL is 1,000 MPN/100 ml when the fecal/total coliform ratio exceeds 0.1
2. Fecal coliform density ~~may not exceed~~NAL is 200 MPN per 100 ml during any 30 day period
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas"

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(2) Non-Storm Water Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Table C-2. Non-Storm Water Action Levels for Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Turbidity	NTU	75	-	225	OP
pH	Units	Within limit of 6.0 to 9.0 at all times			OP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	35	-	104[3]	BP
Priority Pollutants	ug/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
OP – Ocean Plan water quality objective
NTU – Nephelometric Turbidity Units
ug/L – micrograms per liter
MDAL – maximum daily action level
BP – Basin Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Based on a minimum of not less than five samples for any 30-day period
2. NAL is reached if n~~N~~o more than 10 percent of total samples may exceed 400 MPN per 100 ml during any 30 day period
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas" and is not applicable to waterbodies that are not designated REC-1

Table C-3. Non-Storm Water Action Levels for Priority Pollutants

Parameter	Units	Freshwater (CTR)		Saltwater (CTR)	
		MDAL	AMAL	MDAL	AMAL
Cadmium	ug/L	**	**	16	8
Copper	ug/L	*	*	5.8	2.9
Chromium III	ug/L	**	**	-	-
Chromium VI	ug/L	16	8.1	83	41
Lead	ug/L	*	*	14	2.9
Nickel	ug/L	**	**	14	6.8
Silver	ug/L	*	*	2.2	1.1
Zinc	ug/L	*	*	95	47

Abbreviations/Acronyms:
CTR – California Toxic Rule
AMAL – average monthly action level
ug/L – micrograms per liter
MDAL – maximum daily action level

Notes:
* Action levels developed on a case-by-case basis (see below)
** Action levels developed on a case-by-case basis (see below), but calculated criteria are not to exceed Maximum Contaminant Levels (MCLs) under the California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64431

The Cadmium, Copper, Chromium (III), Lead, Nickel, Silver and Zinc NALs for MS4 discharges to freshwater receiving waters will be developed on a case-by-case basis because the freshwater criteria are based on site-specific water quality data (receiving water hardness). For these priority pollutants, the following equations (40 CFR 131.38.b.2) will be required:

Cadmium (Total Recoverable) = exp(0.7852[ln(hardness)] -2.715)
Chromium III (Total Recoverable) = exp(0.8190[ln(hardness)] + .6848)
Copper (Total Recoverable) = exp(0.8545[ln(hardness)] - 1.702)
Lead (Total Recoverable) = exp(1.273[ln(hardness)] - 4.705)
Nickel (Total Recoverable) = exp(.8460[ln(hardness)] + 0.0584)
Silver (Total Recoverable) = exp(1.72[ln(hardness)] - 6.52)
Zinc (Total Recoverable) = exp(0.8473[ln(hardness)] + 0.884)

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(3) Non-Storm Water Discharges from MS4s to Inland Surface Waters

Table C-4. Non-Storm Water Action Levels for Discharges from MS4s to Inland Surface Waters

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Dissolved Oxygen	mg/L	Not less than 5.0 in WARM waters and not less than 6.0 in COLD waters			BP
Turbidity	NTU	-	20	See MDAL	BP
pH	Units	Within limit of 6.5 to 8.5 at all times			BP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	33	-	61[3]	BP
Total Nitrogen	mg/L	-	1.0	See MDAL	BP
Total Phosphorus	mg/L	-	0.1	See MDAL	BP
MBAS	mg/L	-	0.5	See MDAL	BP
Iron	mg/L	-	0.3	See MDAL	BP
Manganese	mg/L	-	0.05	See MDAL	BP
Priority Pollutants	ug/L	See Table C-3			

Abbreviations/Acronyms:

AMAL – average monthly action level
BP – Basin Plan water quality objective
COLD – cold freshwater habitat beneficial use
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
MDAL – maximum daily action level
WARM – warm freshwater habitat beneficial use
MBAS – Methylene Blue Active Substances
MPN/100 ml – most probable number per 100 milliliters
ug/L – micrograms per liter

Notes:

1. Based on a minimum of not less than five samples for any 30-day period
2. NAL is reached if n~~N~~o more than 10 percent of total samples may exceed 400 MPN per 100 ml during any 30 day period
3. This value has been set to the Basin Plan water quality objective for freshwater "designated beach areas" and is not applicable to waterbodies that are nor designated REC-1.

b. If not identified in Provision C.1.a, NALs must be identified and incorporated in the Water Quality Improvement ~~Plan~~ Plan and/or IDDE program for any pollutants or waste constituents that cause~~ing~~ or contribute~~ing~~, or are threatening to cause or contribute to a condition of pollution or nuisance in waters of the state associated with the highest water quality priorities related to non-storm water discharges from the MS4s. NALs must be based on:

(1) Applicable water quality standards which may be dependent upon site-specific or receiving water-specific conditions or assumptions to be identified by the Copermittees; or

(2) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. Dry weather monitoring and assessment data from MS4 outfalls collected in accordance with Provision D.1.a may be used to develop or revise NALs based upon watershed-specific data. Revision of NALs is subject to Regional Board EO approval.

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2. Storm Water Action Levels

The following storm water action levels (SALs) must be incorporated in the Water Quality Improvement Plan if the Permittees have not developed their own SALs using an approach approved by the Regional Board EO:

a. The following storm water action levels (SALs) for discharges of storm water from the MS4 must be incorporated ~~in the Water Quality Improvement Plan~~:

Table C-5. Storm Water Action Levels for Discharges from MS4s to Receiving Waters

Parameter	Units	Action Level
Turbidity	NTU	126
Nitrate & Nitrite (Total)	mg/L	2.6
Phosphorus (Total P)	mg/L	1.46
Cadmium (Total Cd)*	µg/L	3.0
Copper (Total Cu)*	µg/L	127
Lead (Total Pb)*	µg/L	250
Zinc (Total Zn)*	µg/L	976

Abbreviations/Acronyms:
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
ug/L – micrograms per liter

Notes:
* The sampling must include a measure of receiving water hardness at each MS4 outfall. If a total metal concentration exceeds the corresponding metals SAL in Table C-5, that concentration must be compared to the California Toxics Rule criteria and the USEPA 1-hour maximum concentration for the detected level of receiving water hardness associated with that sample. If it is determined that the sample's total metal concentration for that specific metal exceeds that SAL, but does not exceed the applicable USEPA 1-hour maximum concentration criterion for the measured level of hardness, then the sample result will not be considered ~~as an excursion~~ above the SAL for that measurement.

b. If not identified in Provision C.2.a, SALs must be identified and incorporated in the Water Quality Improvement Plan for pollutants or waste constituents that causes~~ing~~ or contributes~~ing~~, or are threatening to cause or contribute to a condition of pollution or nuisance in waters of the state associated with the highest water quality priorities related to storm water discharges from the MS4s. SALs must be based on:

(1) Federal and State water quality guidance and/or water quality standards; ~~and~~or

(2) Site-specific or receiving water-specific conditions; or

~~(2)~~(3) One of the approaches recommended by the California Water Board's Storm Water Panel in its report, "The Feasibility of Numerical Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities" (June 2006); or

~~(3)~~(4) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

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c. Wet weather monitoring and assessment data from MS4 outfalls collected in accordance with Provision D.1.b may be used to develop or revise SALs based upon watershed-specific data. Revision of SALs is subject to ~~San Diego Water~~Regional Board EO approval.

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D. MONITORING AND ASSESSMENT REQUIREMENTS

Comment [A2]: The Orange County Copermittees are working on revised monitoring language with the San Diego County Copermittees. While the OC Copermittees do not have specific language that can be offered at this time, the Monitoring Principles that we would like to see incorporated as a part of the monitoring program are included as an attachment.

The purpose of this provision is for the Copermittees to monitor and assess the chemical, physical, and biological impact on receiving waters caused by discharges from the Copermittees' MS4s under wet weather and dry weather conditions. The goal of this provision is to inform the Copermittees about the nexus between the health of receiving waters and the water quality condition of the discharges from their MS4s. This goal will be accomplished through implementing and complying with the monitoring and assessment requirements of this Order.

The Copermittees must implement the following minimum monitoring and assessment requirements:

1. Jurisdictional Monitoring Requirements

~~b.~~a. DRY WEATHER JURISDICTIONAL MONITORING [D.1.a]

For dry weather days,[9] each Copermittee must implement the following minimum monitoring requirements within its jurisdiction:

(1) Non-Storm Water MS4 Monitoring Program [D.1.a.(1)]

Each Copermittee must develop and conduct a program to monitor and characterize non-storm water flows and pollutant loads during dry weather conditions within its jurisdiction. The non-storm water MS4 monitoring program must be utilized to detect and eliminate non-storm water discharges and illicit discharges and connections to the Copermittee's MS4. Any available monitoring data not collected specifically to meet these requirements may be utilized by the Copermittee. The non-storm water MS4 monitoring program must meet the following minimum requirements:

(a) Non-Storm Water MS4 Monitoring Stations [D.1.a.(1)(a)]

Each Copermittee must identify the non-storm water MS4 monitoring stations within its jurisdiction that will be screened and monitored during dry weather days to identify non-storm water discharges and illicit discharges and connections to the MS4. Non-storm water MS4 monitoring stations must be selected in accordance with the following guidelines and criteria:

(i) A grid system consisting of perpendicular north-south and east-west lines spaced ¼ mile apart must be overlayed on a map of the Copermittee's MS4. All cells that contain a segment of the Copermittee's MS4 must be identified;

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[9] Dry weather day is defined as any day with less than 0.1 inches of rain observed on each of the previous 3 days.

(ii) At least one non-storm water MS4 monitoring station must be selected in each cell containing a segment of the Copermittee's MS4, which must consist of one of the following:

[a] A major outfall,
[b] Other outfall point, or
[c] Other point of access (e.g., manhole);

(iii) Each non-storm water MS4 monitoring station should be located downstream of any areas that are known or suspected to be sources of non-storm water discharges and/or illicit discharges or connections to the MS4;

(iv) Each non-storm water MS4 monitoring station must be located to the degree practicable at the farthest outfall, manhole, or other accessible location downstream in the MS4, within each cell;

(v) In addition to the non-storm water MS4 monitoring stations identified in accordance with Provisions D.1.a.(1)(a)(i)-(iv) above, each Copermittee must identify stations that will be screened and monitored during dry weather days to identify non-storm water discharges from sources not directly under the jurisdiction of the Copermittee.[10] These stations must be selected in accordance with the following guidelines and criteria:

[a] Stations should be located at or prior to the point of discharge into the Copermittee's MS4, but may be located downstream of the source as long as the station remains appropriate for characterizing the discharge from the source not within the authority of the Copermittee to control,
[b] Any non-storm water MS4 monitoring station identified in accordance with Provisions D.1.a.(1)(a)(i)-(iv) and located at the point of discharge or directly downstream of a known or suspected source of non-storm water discharges not within the authority of the Copermittee to control may also be utilized as a station to monitor the source not within the authority of the Copermittee to control;

(vi) The following factors should be considered in determining the location of each non-storm water MS4 monitoring station:

[a] Safety of personnel and accessibility of the location,
[b] Total area draining to the location,
[c] Population density of the area draining to the location,
[d] Traffic density,
[e] Age of the structures or buildings in the area,

[10] Sources not directly under the jurisdiction of and subject to regulation by the Copermittee may include lands or areas under the jurisdiction of other Copermittees, owners or operators of federal and state lands or facilities, tribal lands, special districts, etc.

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[f] History of the area,
[g] Land use types draining to the location,
[h] Hydrological conditions, and
[i] Recommendations from the San Diego Water Board; and

(vii) No more than 500 non-storm water MS4 monitoring stations need to be selected by each Copermittee within its jurisdiction for any given year.

(b) Non-Storm Water MS4 Station Prioritization [D.1.a.(1)(b)]

Based on the first year of non-storm water field observations collected consistent with the Provision D.1.a.(1)(c)(i), each Copermittee must identify the high priority non-storm water MS4 monitoring stations. The non-storm water MS4 monitoring stations that meet the following criteria must be identified as high priority:

(i) The Copermittee has not identified and eliminated the source of the non-storm water discharges; or

(ii) The Copermittee has not been able to eliminate the source of an identified illicit discharge, and

(iii) The non-storm water discharges and/or illicit discharges are known or suspected to contribute and/or contain pollutants that cause or contribute, or threaten to cause or contribute to a condition of pollution or nuisance associated with the highest water quality priorities related to discharges from the MS4s.

(iv) The Copermittee may also designate any non-storm water MS4 monitoring stations that do not meet the criteria above as high priority.

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(c) Non-Storm Water Monitoring Procedures [D.1.a.(1)(c)]

Each Copermittee must monitor the non-storm water MS4 monitoring stations within its jurisdiction as follows:

(i) *Non-Storm Water Field Observations* [D.1.a.(1)(c)(i)]

[a] Monitoring events for each non-storm water MS4 monitoring station must be scheduled as follows:
[1] During the first year of enrollment under this Order, the Copermittee must record field observations consistent with Table D-1 at each non-storm water MS4 monitoring station within its jurisdiction at least one time per month;

Table D-1. Field Observations for Non-Storm Water MS4 Monitoring Stations

Field Observations
• Station identification and location. • Presence of flow, or pooled or ponded water. • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate), - Flow characteristics (i.e. presence of floatables, surface scum, or sheens, odor, color), - Flow source(s) suspected or identified from non-storm water source investigation, and - Flow source(s) eliminated during non-storm water source identification. • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, or sheens, odor, color), and - Known or suspected source(s) of pooled or ponded water. • Station description (i.e. deposits or stains, vegetation condition, structural condition, observable biology). • Presence and assessment of trash in and around station. • Evidence or signs of illicit connections or illegal dumping.

[2] For any stations monitoring sources not within the authority of the Copermittee to control where flows are observed during the first year of enrollment under this Order, the Copermittee must develop a field screening and monitoring schedule that can characterize the monthly non-storm water discharges and pollutant loads from the sources in or discharging to the Copermittee's MS4;

[3] High priority non-storm water MS4 monitoring stations must be monitored in accordance with the following:

A. Each Copermittee must designate at least 5 high priority non-storm water MS4 monitoring stations that are representative of non-storm water discharges from areas consisting primarily of residential, commercial, and industrial land uses present within and directly under the Copermittee's jurisdiction. Where there are less than 5 non-storm water MS4 monitoring stations within a Copermittee's jurisdiction, all stations must be designated as high priority, and

B. Each Copermittee must develop a monitoring schedule that can characterize the monthly non-storm water discharges and pollutant loads in or discharging from the high priority non-storm water MS4 monitoring stations;

[4] At least 10 percent of the non-storm water MS4 monitoring stations not identified as high priority must be screened and monitored each month. In addition, each non-storm water MS4 monitoring station must be screened and monitored at least once per year. If non-storm water flows are observed at

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any non-storm water MS4 monitoring stations not identified as high priority, then they must become high priority pursuant to Provision D.1.a.(1)(b).

[b] For each monitoring events required above, the narrative descriptions and observations in Table D-1 must be recorded at each non-storm water MS4 monitoring station.

(ii) *Non-Storm Water Field Monitoring* [D.1.a.(1)(c)(ii)]

If flows, or pooled or ponded water are present during the field observations required under Provision D.1.a.(1)(c)(i), the Copermittee must monitor and record the parameters in Table D-2:

Table D-2. Field Monitoring Parameters for Non-Storm Water MS4 Monitoring Stations

Parameters
• pH • Temperature • Specific conductivity • Dissolved oxygen • Turbidity • Total chlorine • Total copper* • Total phenol • Detergents (or surfactants)* • Total hardness* • Reactive phosphorus* • Nitrate* • Ammonia as nitrogen*

* Field measurement not required if flow is observed and collection of a sample for analysis is required.

(iii) *Non-Storm Water Analytical Monitoring* [D.1.a.(1)(c)(iii)]

If flows are present during the field observations required under Provision D.1.a.(1)(c)(i), samples must be collected and analyzed as follows:

[a] If the Copermittee identifies and eliminates the source of non-storm water discharge, analysis of the sample is not required, but encouraged;

[b] During the first year of enrollment under this Order, samples must be collected if flows are observed at non-storm water MS4 monitoring stations. Samples must be analyzed for the following constituents, unless the Copermittee has historical data that can demonstrate or provide justification that the analysis of the constituent is not necessary:

[1] Any pollutants identified as the highest priority for the Watershed Management Area in the Water Quality Improvement Plan,

[2] Any pollutants or constituents that the Copermittee has identified as a potential concern to receiving waters requiring additional data collection,

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[3] Constituents listed in Table D-3;

Table D-3. Analytical Monitoring Constituents for Non-Storm Water MS4 Monitoring Stations

Conventionals, Nutrients, Hydrocarbons	Pesticides	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Total Phosphorus • Dissolved Phosphorus • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia • Oil and Grease	• Diazinon • Chlorpyrifos • Pyrethroids	• Cadmium • Copper • Lead • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

[c] **After** the first year of enrollment under this Order, samples must be collected from all high priority non-storm water MS4 monitoring stations for analysis at least two times per year. Samples must be collected at least once during the dry season (May-September) and at least once after the first storm event of the wet season (October-April). Samples must be analyzed for the following constituents:

[1] Any pollutants identified as the highest priority for the Watershed Management Area in the Water Quality Improvement Plan,

[2] Any pollutants or constituents that the Copermittee has identified as a potential concern to receiving waters requiring additional data collection, and

[3] Constituents listed in Table D-3 must be analyzed at least once per year;

[d] Samples must be collected from all non-storm water MS4 monitoring stations not identified as high priority for analysis if flows are observed during required field screening and monitoring events. Samples must be analyzed for the following constituents, unless the Copermittee has historical data that can demonstrate or provide justification that the analysis of the constituent is not necessary:

[1] Any pollutants identified as the highest priority for the Watershed Management Area in the Water Quality Improvement Plan,

[2] Any pollutants or constituents that the Copermittee has identified as a potential concern to receiving waters requiring additional data collection, and

[3] Constituents listed in Table D-3.

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(2) Dry Weather Ambient Receiving Water Monitoring Program [D.1.a.(2)]

Each Copermittee must develop and conduct a program to monitor and characterize the ambient conditions of the receiving waters utilized for conveying non-storm water within and through its jurisdiction. Any available monitoring data not collected specifically to meet these requirements may be utilized by the Copermittee. The dry weather ambient receiving water monitoring program must meet the following minimum requirements:

(a) Dry Weather Ambient Receiving Water Monitoring Stations [D.1.a.(2)(a)]

Each Copermittee must identify the dry weather ambient receiving water monitoring stations that will be screened and monitored. Any location in a receiving water that is already monitored by the Copermittee or another entity may also be utilized as a dry weather ambient receiving water monitoring station. The monitoring stations must be selected in accordance with the following criteria:

(i) The following factors should be considered in determining the location of each dry weather ambient receiving water monitoring station:

[a] Permission to cross private property and public land,
[b] Safety of personnel and accessibility of the location,
[c] Location can complement or supplement historical ambient receiving water data,
[d] Location should not be in close proximity to any MS4 outfalls or other point source discharges to the receiving water,
[e] Natural or relatively unaltered areas in receiving waters are preferred, and
[f] Recommendations from the San Diego Water Board;

(ii) Locate at least one monitoring station in the lowest part of the Watershed Management Area near the boundary of its jurisdiction;

(iii) Locate at least one monitoring station located in the uppermost part of the Watershed Management Area near the boundary of its jurisdiction; and

(iv) The monitoring stations identified in Provisions D.1.a.(2)(a)(ii) and D.1.a.(2)(a)(iii) must be hydraulically connected.

(b) Dry Weather Ambient Receiving Water Monitoring Procedures [D.1.a.(2)(b)]

Each Copermittee must monitor the dry weather ambient receiving water monitoring stations as follows:

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(i) *Dry Weather Ambient Receiving Water Field Observations* [D.1.a.(2)(b)(i)]

Monitoring events for each monitoring station must be scheduled as follows:

[a] During the first year of enrollment under this Order, the Copermittee must record field observations consistent with Table D-4 at each dry weather ambient receiving water monitoring station at least one time per month; and

Table D-4. Field Observations for Dry Weather Ambient Receiving Water Monitoring Stations

Field Observations
• Station identification and location. • Presence of flow, or pooled or ponded water. • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate), - Flow characteristics (i.e. presence of floatables, surface scum, or sheens, odor, color), • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, or sheens, odor, color),. • Station description (i.e. deposits or stains, vegetation condition, structural condition, observable biology). • Presence and assessment of trash in and around station.

[b] For any monitoring stations where flows are observed during the first year of enrollment under this Order, the Copermittee must develop a field screening and monitoring schedule that can characterize the monthly flows and pollutant loads in the receiving water.

(ii) *Dry Weather Ambient Receiving Water Field Monitoring* [D.1.a.(2)(b)(ii)]

If flow, or pooled or ponded water is present during the field observations required under Provision D.1.a.(2)(b)(i), the Copermittee must monitor and record the parameters in Table D-2.

(iii) *Dry Weather Ambient Receiving Water Analytical Monitoring* [D.1.a.(2)(b)(iii)]

If flows are present during the field observations required under Provision D.1.a.(2)(b)(i), samples of the ambient receiving water flows must be collected and analyzed as follows:

[a] During the first year of enrollment under this Order, samples must be collected for each observation of flow in the ambient receiving water monitoring stations for analysis. Samples must be analyzed for the following constituents:

[1] Any pollutants identified as the highest priority for the Watershed Management Area in the Water Quality Improvement Plan,

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[2] Any non-storm water pollutants or constituents that the Copermittee has identified as a potential concern to receiving waters requiring additional data collection, and
[3] Constituents listed in Table D-3; and

[b] **After** the first year of enrollment under this Order, samples of flows observed at ambient receiving water monitoring stations must be collected for analysis at least two times during the remaining term of this Order. Samples must be collected at least once during the dry season (May-September) and at least once after the first storm event of the wet season (October-April). Samples must be analyzed for the following constituents:
[1] Any pollutants identified as the highest priority for the Watershed Management Area in the Water Quality Improvement Plan,
[2] Any pollutants or constituents that the Copermittee has identified as a potential concern to receiving waters requiring additional data collection,
[3] Constituents listed in Table D-3 must be analyzed at least once per year.

~~c.~~b. **WET WEATHER JURISDICTIONAL MONITORING** [D.1.b]

For wet weather days,[11] each Copermittee must implement the following minimum monitoring requirements within its jurisdiction:

(1) Storm Water MS4 Outfall Monitoring Program [D.1.b.(1)]

Each Copermittee must develop and conduct a program to monitor and characterize the storm water flows and pollutant loads from the MS4 outfalls within its jurisdiction during wet weather days. Any available monitoring data not collected specifically to meet these requirements may be utilized by the Copermittee. The monitoring program must meet the following minimum requirements:

(a) Storm Water MS4 Outfall Monitoring Stations [D.1.b.(1)(a)]

Each Copermittee must identify the wet weather MS4 outfall monitoring stations within its jurisdiction that will be monitored and sampled during wet weather days. Any non-storm water MS4 monitoring station identified under Provision D.1.a.(1)(a) may also be utilized as a storm water MS4 outfall monitoring station. Monitoring stations must be selected in accordance with the following guidelines and criteria:

(i) The following factors should be considered in determining the location of each wet weather MS4 outfall monitoring station:

[11] Wet weather day defined as any day with 0.1 inches of rain or greater and the following 3 days.

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[a] Safety of personnel and accessibility of the location,
[b] Total area draining to the location,
[c] Population density of the area draining to the location,
[d] Traffic density,
[e] Age of the structures or buildings in the area,
[f] History of the area,
[g] Land use types draining to the location,
[h] Hydrological conditions, and
[i] Recommendations from the San Diego Water Board.

(ii) Each wet weather MS4 outfall monitoring station must consist of one of the following:

[a] A major outfall, or
[b] Other outfall point, or
[c] Other point of access (e.g., manhole), only as an alternate location if safety during wet weather discharge sampling at available outfall locations discharging to receiving waters is a significant concern and limits accessibility;

(iii) Each Copermittee must designate at least 5 monitoring stations that are representative of storm water flows from areas consisting primarily of residential, commercial, and industrial land uses present within the Copermittee's jurisdiction. Where there are less than 5 MS4 outfalls within a Copermittee's jurisdiction, all MS4 outfalls must be designated as wet weather MS4 outfall monitoring stations.

(iv) Any monitoring station that does not have any SAL exceedances for 3 successive years may be replaced with a different monitoring station.

(b) Storm Water MS4 Outfall Monitoring Procedures [D.1.b.(1)(b)]

Each Copermittee must develop monitoring procedures to be consistent with the following criteria:

(i) A narrative description must be provided of the station identification and location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event which generated the sampled discharge and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event;

(ii) Flow rates and volumes for each monitoring station must be measured or estimated during each monitoring event in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), sections 3.2.1 or 3.2.2, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board;

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(iii) Each Copermittee must develop and implement a monitoring frequency during the wet season to characterize pollutant discharges from the MS4 outfalls within its jurisdiction. At a minimum, storm water samples must be collected from two storm events occurring at least one month apart for each monitoring station. Samples must be collected as follows:

[a] Grab samples may be collected only for pH, temperature, specific conductivity, dissolved oxygen, hardness, oil and grease, and indicator bacteria,

[b] For all other constituents, one of the following methods must be used to collect the samples:

[1] A 24-hour composite sample, using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours. Results of the analyses of individual grab samples may be averaged to obtain the daily average,

[2] A flow-weighted composite sample for either the entire discharge or for the first 3 hours of the discharge. The flow-weighted composite sample for the storm water discharge may be taken with a continuous sampler or as a combination of a minimum of three sample aliquots taken in each hour of discharge for the entire discharge or for the first three hours of the discharge, with each aliquot being separated by a minimum period of fifteen minutes. Only one analysis of the composite of aliquots is required, or

[3] A minimum of one grab sample may be collected for storm water discharges from holding ponds or other impoundments with a retention period greater than 24 hours;

(iv) Storm water MS4 outfall monitoring stations must be monitored and sampled during the first wet weather event of the wet season. Samples must be analyzed for the following constituents:

[a] Any pollutants contributing to the highest water quality priorities for the Watershed Management Area as identified in the Water Quality Improvement Plan,

[b] Any non-storm water pollutants or constituents that the Copermittee has identified as a potential concern to receiving waters requiring additional data collection, and

[c] Constituents listed in Table D-5.

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Table D-5. Analytical Monitoring Constituents for Wet Weather MS4 Outfall Monitoring Stations

Conventionals, Nutrients, Hydrocarbons	Pesticides	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity[1] • Total Hardness • pH • Specific Conductivity • Temperature • Dissolved Oxygen • Biological Oxygen Demand, 5-day • Chemical Oxygen Demand • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus[1] • Dissolved Phosphorus • Nitrite[1,2] • Nitrate[1,2] • Total Kjeldhal Nitrogen • Ammonia • Oil and Grease	• Diazinon • Chlorpyrifos • Pyrethroids	• Arsenic • Cadmium[1] • Chromium • Copper[1] • Iron • Lead[1] • Manganese • Mercury • Nickel • Selenium • Silver • Thallium • Zinc[1]	• Total Coliform • Fecal Coliform[3] • *Enterococcus*

Notes:
1. Constituent with a storm water action level (SAL) specified under Provision C.2.
2. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
3. *E. Coli* may be substituted for Fecal Coliform.

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(v) Samples collected after the first wet weather monitoring event and during the remaining period of the wet season must be analyzed for the following constituents:

[a] Any pollutants contributing to the highest water quality priorities for the Watershed Management Area as identified in the Water Quality Improvement Plan.

[b] Any pollutants or constituents that the Copermittee has identified as a potential concern to receiving waters requiring additional data collection.

(2) Storm Water Pollutant Source Identification Monitoring Program [D.1.b.(2)]

Each Copermittee must develop and conduct a program within its jurisdiction to identify the sources of pollutants in storm water discharged from the Copermittee's MS4 during wet weather conditions. Any available monitoring data not collected specifically to meet these requirements may be utilized by the Copermittee. The storm water pollutant source identification monitoring

program must include focused monitoring which moves upstream into each MS4 outfall drainage area as necessary to identify sources of the highest water quality priorities in the receiving waters. The wet weather source identification monitoring program must begin no later than the wet season following the date the San Diego Water Board determines that the Water Quality Improvement Plan meets the requirements of this Order.

2. Watershed Monitoring Requirements

a. WATERSHED MONITORING STATIONS [D.2.a]

The Copermittees must identify watershed monitoring stations within the Watershed Management Area. The watershed monitoring stations must be selected in accordance with the following criteria:

(1) All mass loading stations (MLSs) previously established by the Copermittees in each Watershed Management Area must continue to be utilized as watershed monitoring stations;

(2) All temporary watershed assessment stations (TWASs), bioassessment stations, and stream assessment stations previously established by the Copermittees must be considered for continued use as watershed monitoring stations;

(3) Any dry weather ambient receiving water monitoring station identified pursuant to Provision D.1.a.(2)(a) may be considered for use as a watershed monitoring station;

(4) At least one reference watershed monitoring station must be selected for each Watershed Management Area; and

(5) At least one watershed monitoring station located between and hydrologically connected to each MLS and each reference station must be selected for each Watershed Management Area.

b. DRY WEATHER WATERSHED MONITORING [D.2.b]

The Copermittees must develop and conduct a program to monitor the condition of the receiving waters in each Watershed Management Area during dry weather conditions. Any available monitoring data not collected specifically to meet these requirements may be utilized by the Copermittees. For dry weather days, the Copermittees must develop and/or update its written dry weather watershed monitoring procedures to be consistent with the following criteria:

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(1) Dry Weather Watershed Field Observations [D.2.b.(1)]

For each dry weather watershed monitoring event, the Copermittee must record field observations consistent with Table D-4 at each monitoring station. Dry weather watershed monitoring is required at least every two years for each monitoring station. At least two dry weather watershed monitoring events must be scheduled for each watershed monitoring station per monitoring year. One monitoring event is required during the dry season (May-September) and one monitoring event is required on a dry weather day during the wet season (October-April), after the first storm event.

(2) Dry Weather Watershed Field Monitoring [D.2.b.(2)]

If flow, or pooled or ponded water is present during the dry weather watershed monitoring event required pursuant to Provision D.2.b.(1), and conditions allow the collection of the data, the Copermittee must monitor and record the parameters in Table D-2.

(3) Dry Weather Watershed Analytical Monitoring [D.2.b.(3)]

Samples from each monitoring station must be collected for analysis at least every two years. At least two dry weather watershed analytical monitoring events must be scheduled for each watershed monitoring station per monitoring year. Samples must be collected once during the dry season (May-September) and once on a dry weather day during the wet season (October-April), after the first storm event. Analytical monitoring samples must be collected and analyzed as follows:

(a) Grab samples may be collected only for pH, temperature, specific conductivity, dissolved oxygen, hardness, oil and grease, and indicator bacteria;

(b) For all other constituents, time-weighted composites composed of 24 discrete hourly samples must be collected; and

(c) Analysis for the following constituents is required:

(i) Any other pollutants contributing to the highest water quality priorities for the Watershed Management Area as identified in the Water Quality Improvement Plan,

(ii) Any pollutants that the Copermittee has identified as a potential concern to receiving waters requiring additional data collection, and

(iii) Constituents listed in Table D-5.

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(4) Dry Weather Watershed Toxicity Monitoring [D.2.b.(4)]

Samples from each monitoring station must be collected for toxicity testing at least every two years. At least two dry weather watershed toxicity monitoring events must be scheduled for each watershed monitoring station per monitoring year. Samples must be collected once during the dry season (May-September) and once on a dry weather day during the wet season (October-April), after the first storm event. Toxicity testing must be conducted in accordance with the following table:

Table D-6. Toxicity Testing for Dry Weather Watershed Monitoring Station Flows

Dry Weather Watershed Monitoring Station	Freshwater Organisms	Estuarine and Marine Organisms
Mass Loading Stations[1]	3 acute[2] 3 chronic[2]	1 chronic[3]
Others Stations	3 acute[2] 3 chronic[2]	None

Notes:
1. Dry weather toxicity testing at a mass loading station may be omitted if the channel flows are diverted year-round during dry weather conditions to the sanitary sewer for treatment.
2. The presence of acute toxicity must be determined in accordance with USEPA protocol EPA-821-R-02-012. The presence of chronic toxicity must be determined in accordance with USEPA protocol EPA-821-R-02-013. Toxicity testing must include the use of *Pimephales promelas* (fathead minnow), *Hyalella azteca*, and *Psuedokirchneriella subcapitata* (formerly *Selenastrum capricornutum*, unicellular algae).
3. The presence of chronic marine toxicity must be determined in accordance with USEPA guidance EPA 600/R95/136, except for chronic mysid tests which must be conducted in accordance with USEPA protocol EPA-821-R-02-014. *Americamysis bahia* may be used as a marine test organism if *Holmesimysis costata* cannot be reasonably obtained. The use of, and justification for, *A. bahia* must be clearly reported in the Annual Report.

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(5) Dry Weather Watershed Bioassessment Monitoring [D.2.b.(5)]

Bioassessment monitoring for each monitoring station is required at least every two years. Bioassessment monitoring is required to be conducted in May or June for each watershed monitoring station, and must be conducted as follows:

(a) The following bioassessment samples and measurements must be collected:

(i) Macroinvertebrate samples must be collected in accordance with the "Reachwide Benthos (Multihabitat) Procedure" in the most current Surface Water Ambient Monitoring Program (SWAMP) Bioassessment Standard Operating Procedures (SOP), and amendments, as applicable;[12]

[12] Ode, P.R.. 2007. Standard operating procedures for collecting macroinvertebrate samples and associated physical and chemical data for ambient bioassessments in California. California State Water Resources Control Board Surface Water Ambient Monitoring Program (SWAMP) Bioassessment SOP 001. http://www.swrcb.ca.gov/water_issues/programs/swamp/tools.shtml#monitoring

(ii) The "Full" suite of physical habitat characterization measurements must be collected in accordance with the most current SWAMP Bioassessment SOP, and as summarized in the SWAMP Stream Habitat Characterization Form – Full Version;[13] and

(iii) Freshwater algae samples must be collected in accordance with the SWAMP Standard Operating Procedures for Collecting Algae Samples.[14] Analysis of samples must include algal taxonomic composition (diatoms and soft algae) and algal biomass.

(b) The bioassessment samples, measurements, and appropriate water chemistry data must be used to calculate the following:

(i) An Index of Biotic Integrity (IBI) for macroinvertebrates for each monitoring station where bioassessment monitoring was conducted, based on the most current calculation method;[15] and

(ii) An IBI for algae for each monitoring station where bioassessment monitoring was conducted, when a calculation method is developed.[16]

(6) Dry Weather Watershed Hydromodification Monitoring [D.2.b.(6)]

In addition to the hydromodification monitoring conducted as part of the Copermittees' Hydromodification Management Plans, for any year dry weather watershed monitoring is required, hydromodification monitoring is required to be conducted at least once during the dry weather season (May-September) for each monitoring station. The following hydromodification monitoring observations and measurements must be collected within an appropriate domain of analysis for the monitoring station:

(a) Channel conditions, including:

(i) Channel dimensions,

(ii) Hydrologic and geomorphic conditions, and

(iii) Presence and condition of vegetation and habitat;

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[13] Available at: http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/reports/fieldforms_fullversion052908.pdf

[14] Fetscher et al. 2009. Standard Operating Procedures for Collecting Stream Algae Samples and Associated Physical Habitat and Chemical Data for Ambient Bioassessments in California.

[15] The most current calculation method at the time the Order was adopted is outlined in "A Quantitative Tool for Assessing the Integrity of Southern California Coastal Streams" (Ode, et al. 2005. Environmental Management. Vol. 35, No. 1, pp. 1-13). If an updated or new calculation method is developed, either both (i.e. current and updated/new) methods must be used, or historical IBIs must be recalculated with the updated or new calculation method.

[16] When a calculation method is developed, IBIs must be calculated for all available and appropriate historical data.

(b) Location of discharge points;

(c) Habitat integrity;

(d) Photo documentation of existing erosion and habitat impacts, with location (i.e. latitude and longitude coordinates) where photos were taken;

(e) Measurement or estimate of dimensions of any existing channel bed or bank eroded areas, including length, width, and depth of any incisions; and

(f) Known or suspected cause(s) of existing downstream erosion or habitat impact, including flow, soil, slope, and vegetation conditions, as well as upstream land uses and contributing new and existing development.

(7) Dry Weather Watershed Sediment Quality Monitoring [D.2.b.(7)]

Sediment monitoring must be performed by the Copermittees to assess compliance with sediment quality receiving water limits applicable to MS4 discharges to enclosed bays and estuaries. The monitoring may be performed either by individual or multiple Copermittees to assess compliance with receiving water limits, or through participation in a water body monitoring coalition. The Copermittees must identify sediment sampling stations that are spatially representative of the sediment within the water body segment or region of interest. Sediment quality monitoring must be conducted at least once every two years between June and September. Sediment quality monitoring must be conducted in conformance with the monitoring requirements set forth in the State Water Board Sediment Quality Control Plan.

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c. WET WEATHER WATERSHED MONITORING [D.2.c]

The Copermittees in each Watershed Management Area must develop and conduct a program to monitor the condition in receiving waters and characterize storm water flows during wet weather days of the wet season. Any available monitoring data not collected specifically for this Order that meet the monitoring requirements may be utilized by the Copermittee. For wet weather days, the Copermittees must develop and/or update its written wet weather watershed monitoring procedures to be consistent with the following criteria:

(1) Wet Weather Watershed Field Observations [D.2.c.(1)]

Wet weather watershed monitoring events are required at least once every two years for each dry weather watershed monitoring station. Each monitoring station must be monitored during at least two wet weather events

in any period (July 1 to June 30) that monitoring is required, including the first wet weather event of the wet season beginning October 1 and ending April 30, and at least one wet weather event after February 1. For each wet weather watershed monitoring event, the following narrative descriptions and observations must be recorded at each monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event;

(b) The flow rates and volumes measured or estimated. Data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board;

(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(d) Presence and assessment of trash in and around station.

(2) Wet Weather Watershed Field Monitoring [D.2.c.(2)]

For each wet weather watershed monitoring event, the parameters in Table D-2 must be monitored and recorded.

(3) Wet Weather Watershed Analytical Monitoring [D.2.c.(3)]

Samples from each wet weather watershed monitoring station must be collected for analysis at least two times during the term of this Order, at least once for the first wet weather event of the wet season, and at least once for a wet weather event after February 1. Wet weather samples must be collected and analyzed as follows:

(a) Grab samples may be collected only for pH, temperature, specific conductivity, dissolved oxygen, hardness, oil and grease, and indicator bacteria;

(b) For all other constituents, one of the following methods must be used to collect the samples:

(i) A 24-hour composite sample, using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours. Results of the analyses of individual grab samples may be averaged to obtain the daily average, or

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(ii) A flow-weighted composite sample for either the entire discharge or for the first 3 hours of the discharge. The flow-weighted composite sample for the storm water discharge may be taken with a continuous sampler or as a combination of a minimum of three sample aliquots taken in each hour of discharge for the entire discharge or for the first three hours of the discharge, with each aliquot being separated by a minimum period of fifteen minutes. Only one analysis of the composite of aliquots is required; and

(c) Analysis for the following constituents is required:

(i) Any other pollutants contributing to the highest water quality priorities for the Watershed Management Area as identified in the Water Quality Improvement Plan,

(ii) Any water pollutants or constituents that the Copermittee has identified as a potential concern to receiving waters requiring additional data collection, and

(iii) Constituents listed in Table D-5.

(4) Wet Weather Watershed Toxicity Monitoring [D.2.c.(4)]

Samples from each wet weather watershed monitoring station must be collected for toxicity testing at least two times during the term of this Order, at least once for the first wet weather event of the wet season, and at least once for a wet weather event after February 1. Toxicity testing must be conducted in accordance with the following table:

Table D-7. Toxicity Testing for Wet Weather Watershed Monitoring Station Flows

Wet Weather Watershed Monitoring Station	Freshwater Organisms	Estuarine and Marine Organisms
Mass Loading Stations	3 acute[1]	1 acute[2] 2 chronic[2]
Others Stations	None	None

Notes:
1. The presence of acute toxicity must be determined in accordance with USEPA protocol EPA-821-R-02-012. Toxicity testing must include the use of *Pimephales promelas* (fathead minnow), *Hyalella azteca*, and *Psuedokirchneriella subcapitata* (formerly *Selenastrum capricornutum*, unicellular algae).
2. The presence of acute toxicity must be determined in accordance with USEPA protocol EPA-821-R-02-012. The presence of chronic marine toxicity must be determined in accordance with USEPA guidance EPA 600/R95/136, except for chronic mysid tests which must be conducted in accordance with USEPA protocol EPA-821-R-02-014. *Americamysis bahia* may be used as a marine test organism if *Holmesimysis costata* cannot be reasonably obtained. The use of, and justification for, *A. bahia* must be clearly reported in the Annual Report.

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d. ALTERNATIVE WATERSHED MONITORING REQUIREMENTS [D.2.d]

In lieu of implementing the watershed monitoring requirements under Provisions D.2.a-c, the San Diego Water Board may direct the Copermittees to participate with other regulated entities, other interested parties, and the San Diego Water Board in the development, refinement, implementation, and coordination of regional monitoring and assessment programs to determine the status and trends of water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams.

e. WATERSHED MANAGEMENT AREA SPECIAL STUDIES [D.2.e]

(1) Within the term of this Order, the Copermittees must implement at least three special studies in each Watershed Management Area. The Copermittees are to determine which special studies will be developed and implemented in the Watershed Management Area. The monitoring plans for the Watershed Management Area special studies must be submitted with the Water Quality Improvement Plan required pursuant to Provision F.1. The Watershed Management Area special studies must, at a minimum, be in conformance with the following criteria:

(a) The special studies must be related to the highest water quality priorities identified by the Copermittees within the Watershed Management Area;

(b) The special studies must be implemented within the Watershed Management Area;

(c) The special studies must require some form of participation by all Copermittees within the Watershed Management Area; and

(d) One of the three required special studies may be implemented as part of a regional special study required pursuant to Provision D.3.

(2) The Copermittees must report the progress and findings of the Watershed Management Area Special Studies as part of the Annual Report for each Watershed Management Area, as required pursuant to Provision F.3.b.

3. Regional Special Studies

Within the term of this Order, the Copermittees must develop and implement at least two regional special studies for the San Diego Region. The Copermittees must determine which regional special studies will be developed and implemented. The regional special studies must be identified in the Water Quality Improvement Plans required pursuant to Provision F.1. The regional special studies must, at a minimum, be in conformance with the following criteria:

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a. The special studies must be related to a water quality priority issue or potential water quality concern identified by the Copermittees for the entire San Diego Region;

b. The special studies must be implemented within the San Diego Region; and

c. The special studies must require some form of participation by all Copermittees enrolled under this Order.

4. Assessment Requirements

Each Copermittee must evaluate the data collected pursuant to Provisions D.1, D.2 and D.3 to identify causes of exceedances of action levels developed pursuant to Provision C, assess the quality of the discharges into and from the MS4s, and assess the quality of receiving waters. Each Copermittee must also assess the progress of the water quality improvement strategies required pursuant to Provision B.3 in restoring and protecting beneficial uses of receiving waters. Assessments must be performed as described in the following provisions:

a. MS4 DISCHARGES ASSESSMENTS [D.4.a]

(1) Jurisdictional Non-Storm Water Discharges Reduction Assessment [D.4.a.(1)]

(a) Non-Storm Water Action Levels [D.4.a.(1)(a)]

Each Copermittee must analyze the jurisdictional non-storm water monitoring data collected pursuant to Provision D.1.a and identify causes of NAL exceedances. The analysis must include, but not be limited to, all of the following considerations:

(i) For non-storm water discharges from the Copermittee's MS4 outfalls to receiving waters within the Copermittee's jurisdiction causing exceedances of NALs, the Copermittee must analyze its municipal, commercial, industrial, and residential inventories and activities, and other land use data, and identify sources or potential sources that may have caused or contributed to the NAL exceedances;

(ii) Each Copermittee must provide non-storm water monitoring and analytical data to demonstrate that NAL exceedances were caused by pollutants which are not anthropogenic in origin; and

(iii) Each Copermittee must provide non-storm water monitoring and analytical data to demonstrate that NAL exceedances were caused by pollutants which originate from sources or potential sources not within the authority of the Copermittee to control (e.g. Phase II dischargers or Caltrans).

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(b) Calculate Jurisdictional Non-Storm Water Discharges and Pollutant Loads [D.4.a.(1)(b)]

Each Copermittee must analyze the jurisdictional non-storm water monitoring data collected pursuant to Provision D.1.a to calculate non-storm water discharges and pollutant loads from the MS4s and receiving waters in each jurisdiction. These calculations must be updated annually in the Annual Report required per Provision F.3.b. Each Copermittee must calculate:

(i) Monthly non-storm water discharges and pollutant loads from each known or potential source not within the authority of the Copermittee to control to an MS4 or receiving waters within the Copermittee's jurisdiction;

(ii) Monthly non-storm water discharges and pollutant loads from the Copermittee's MS4 outfalls to receiving waters within the Copermittee's jurisdiction, with an estimate of the percent contribution from each land use type within the drainage basin for each MS4 outfall;

(iii) Monthly non-storm water flows and pollutant loads in receiving waters at the downstream boundary of the Copermittee's jurisdiction; and

(iv) Monthly non-storm water flows and pollutant loads in receiving waters from areas or facilities subject to the Copermittee's legal authority that are discharged from the Copermittee's MS4 to downstream receiving waters.

(c) Review Progress and Evaluate Jurisdictional Actions [D.4.a.(1)(c)]

Each Copermittee must review the NAL exceedances, discharge and flow analyses, and pollutant load analyses required pursuant to Provisions D.4.a.(1)(a) and D.4.a.(1)(b) on an annual basis to:

(i) Identify reductions and progress in achieving reductions in non-storm water and illicit discharges and connections from different land uses and/or drainage areas to its MS4;

(ii) Assess the effectiveness of current actions being implemented by the Copermittee toward the reduction or elimination of non-storm water discharges from the MS4 within its jurisdiction; and

(iii) Identify modifications necessary to increase the effectiveness of the jurisdictional runoff management program toward reducing or eliminating non-storm water discharges to and from the MS4 within its jurisdiction.

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(2) Watershed Management Area Non-Storm Water Assessment [D.4.a.(2)]

(a) Calculate Watershed Non-Storm Water Flows and Pollutant Loads [D.4.a.(2)(a)]

The Copermittees must analyze the jurisdictional non-storm water and watershed monitoring data collected per Provisions D.1.a and D.2.b to calculate non-storm water flows and pollutant loads in receiving waters for each Watershed Management Area. These calculations must be updated annually in the Annual Report required per Provision F.3.b. The Copermittees must develop or utilize appropriate methods or models to calculate:

(i) Monthly non-storm water runoff flows and pollutant loads at each watershed monitoring station from different land uses and drainage basins;

(ii) Monthly non-storm water flows and pollutant loads at each watershed monitoring station from all the Copermittees' MS4 outfalls to receiving waters, with an estimate of the percent contribution from different land uses; and

(iii) Monthly non-storm water flows and pollutant loads at each watershed monitoring station, with an estimate of the percent contribution from both areas or facilities subject to the Copermittees' legal authority and areas or facilities not subject to the Copermittees' legal authority.

(b) Evaluate Water Quality Improvement Strategies [D.4.a.(2)(b)]

The Copermittees in each Watershed Management Area must review the non-storm water flow and pollutant load analyses required pursuant to Provision D.4.a.(2)(a) on an annual basis to:

(i) Assess the effectiveness of the water quality improvement strategies being implemented within the Watershed Management Area toward reducing or eliminating non-storm water discharges and pollutant loads from entering and discharging from the MS4 to receiving waters; and

(ii) Identify modifications necessary to increase the effectiveness of the water quality improvement strategies toward reducing or eliminating non-storm water discharges and pollutant loads from entering and discharging from the MS4 to receiving waters.

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(3) Jurisdictional Storm Water Pollutant Discharges Reduction Assessment [D.4.a.(3)]

(a) Storm Water Action Levels [D.4.a.(3)(a)]

(i) For storm water discharges from the Copermittee's storm water MS4 outfall monitoring stations with analytical monitoring data indicating exceedances of SALs, the Copermittee must analyze its municipal, commercial, industrial, and residential inventories and activities, and other land use data and identify sources or potential sources that may have caused or contributed to the SAL exceedances;

(ii) Each Copermittee must provide storm water monitoring and analytical data to demonstrate that SAL exceedances were caused by the constituents in storm water discharges from the MS4 which are not anthropogenic in origin; and

(iii) Each Copermittee must provide storm water monitoring and analytical data to demonstrate that SAL exceedances were caused by the constituents in storm water discharges from the MS4 which originate from sources or potential sources not within the authority of the Copermittee to control.

(b) Calculate Jurisdictional Storm Water Discharges and Pollutant Loads [D.4.a.(3)(b)]

Each Copermittee must analyze the jurisdictional storm water monitoring data collected pursuant to Provision D.1.b to calculate storm water discharges and pollutant loads from the MS4s in each jurisdiction. These calculations must be updated annually in the Annual Report required per Provision F.3.b. Each Copermittee must calculate or estimate:

(i) The monthly mean rainfall estimates (or summary of weather bureau data) and the monthly average number of storm events;

(ii) The average storm water runoff coefficient for each land use type within the Copermittee's jurisdiction;

(iii) The volume of storm water discharged from each of the Copermittee's MS4 outfalls to receiving waters within its jurisdiction for each storm event;

(iv) The pollutant loads from each of the Copermittee's MS4 outfalls to receiving waters within its jurisdiction for each storm event; and

(v) The percent contribution of pollutant loads from each land use type within the drainage basin to storm water discharges for each MS4 outfall within its jurisdiction, for each storm event.

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(c) Review Progress and Evaluate Jurisdictional Actions [D.4.a.(3)(c)]

Each Copermittee must review the SAL exceedances, discharge analyses, and pollutant load analyses required pursuant to Provisions D.4.a.(3)(a) and D.4.a.(3)(b) on an annual basis to:

(i) Identify reductions and progress in achieving reductions in pollutant concentrations and/or pollutant loads from different land uses and/or drainage areas discharging from its MS4;

(ii) Assess the effectiveness of current actions being implemented by the Copermittee toward the reduction of pollutants in storm water discharges from the MS4 within its jurisdiction to the MEP; and

(iii) Identify modifications necessary to increase the effectiveness of the jurisdictional runoff management program toward reducing pollutants in storm water discharges from the MS4 within its jurisdiction to the MEP.

(4) Watershed Management Area Storm Water Assessment [D.4.a.(4)]

(a) Calculate Watershed Storm Water Flows and Pollutant Loads [D.4.a.(4)(a)]

The Copermittees must analyze the jurisdictional storm water and watershed monitoring data collected per Provisions D.1.b and D.2.c to calculate storm water flows and pollutant loads in receiving waters for each Watershed Management Area. These calculations must be updated annually in the Annual Report required per Provision F.3.b. The Copermittees must develop or utilize appropriate methods or models to calculate:

(i) Storm water runoff flows and pollutant loads at each watershed monitoring station from different land uses and drainage basins;

(ii) Storm water flows and pollutant loads at each watershed monitoring station from all the Copermittees' MS4 outfalls, with an estimate of the percent contribution from different land uses; and

(iii) Storm water pollutant loads in receiving waters at each watershed monitoring station, with an estimate of the percent contribution from both areas or facilities subject to the Copermittees' legal authority and areas or facilities not within the authority of the Copermittees to control.

(b) Evaluate Water Quality Improvement Strategies [D.4.a.(4)(b)]

The Copermittees in each Watershed Management Area must review the storm water flow and pollutant load analyses required pursuant to Provision D.4.a.(4)(a) on an annual basis to:

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(i) Assess the effectiveness of the water quality improvement strategies being implemented in each Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to the MEP; and

(ii) Identify modifications necessary to increase the effectiveness of the water quality improvement strategies toward reducing pollutants in storm water discharges from the MS4s to the MEP.

b. RECEIVING WATERS ASSESSMENTS [D.4.b]

The Copermittees must annually perform assessments of receiving waters based on data collected pursuant to Provision D.2 and any appropriate receiving water monitoring data available from other sources. The receiving waters assessments must analyze the status and trends of water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under dry weather and wet weather conditions. For each of the three types of receiving waters, the Copermittees in each Watershed Management Area must:

(1) Identify the most critical beneficial uses that must be protected or restored to ensure overall health of the receiving water;

(2) Determine whether or not those critical beneficial uses are being protected or must be restored; and

(3) Identify short-term and/or long-term improvements or degradation of those critical beneficial uses.

c. WATER QUALITY IMPROVEMENT ASSESSMENTS [D.4.c]

The Copermittees in each Watershed Management Area must review the numeric ~~targets~~goals in the Water Quality Improvement Plan, the data collected pursuant to Provisions D.1 and D.2, and the findings from the assessments required pursuant to Provisions D.4.a and D.4.b to assess the following:

(1) Beneficial uses of the receiving waters that are protected or must be restored;

(2) Appropriateness of final dry weather and wet weather numeric ~~targets~~goals for the highest water quality priorities that will restore the impacted beneficial uses in the receiving waters;

(3) Non-storm water and storm water pollutant load reductions, or other improvements to receiving water or water quality conditions, that are necessary to attain the final numeric ~~targets~~goals for restoring impacted beneficial uses in the receiving waters;

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(4) Non-storm water and storm water pollutant load reductions necessary for the Copermittees to demonstrate that non-storm water and storm water discharges from their MS4s are not causing or contributing to exceedances of water quality objectives or impacts to beneficial uses in receiving waters;

(5) Non-storm water and storm water pollutant loads from their MS4s and/or receiving water flows that may be attributed to sources or potential sources not within the authority of the Copermittee to control and other non-anthropogenic sources identified by the Copermittees;

(6) Progress of the water quality improvement strategies toward attaining non-storm water and storm water pollutant load reductions or improvements to water quality conditions; and

(7) Progress toward achieving the interim and final numeric ~~targets~~goals for restoring impacted beneficial uses in the receiving waters.

5. Monitoring Provisions

Each Copermittee must comply with all the monitoring, reporting, and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

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E. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS

The purpose of this provision is for each Copermittee to implement a program to control the ~~contribution~~ discharge of pollutants into ~~and the discharges~~and from their respective MS4s to receiving waters within its jurisdiction and to focus and prioritize those implementation actions based on the highest water quality priorities identified within the associated Water Quality Improvement Plan.

The goals of this program are: 1) to effectively prohibit non-stormwater discharges into the MS4s, 2) to reduce pollutants in stormwater discharges from the MS4s to the MEP, and 3) to address impacts of ~~provision is to reduce the discharge of pollutants from~~in ~~storm water to the MEP and effectively prohibit non-storm water discharges~~ into ~~the~~ MS4 discharges ~~provide the reasonable protection, preservation, enhancement, and restoration of water quality and designated beneficial uses of waters of the state~~so that such discharges do not impair water quality and designated beneficial uses of waters of the state**.** These goals will be accomplished through compliance with the jurisdictional runoff management program requirements of this Provision, and as modified or supplemented per Provision B (Water Quality Improvement Plans).

Each Copermittee must implement ~~all~~ the requirements of Provision E no later than 18~~2~~ months after the adoption of this Order, or in accordance with Provision F.5.a. Each Copermittee must update its jurisdictional runoff management program document, in accordance with Provision F.2.a, to include ~~all~~ the requirements of Provision E. The jurisdictional runoff management programs implemented by each Copermittee must be consistent with the Water Quality Improvement Plan for the applicable Watershed Management Area required by Provision B. As such, the requirements of the jurisdictional runoff management programs as outlined below may be modified and prioritized as appropriate for consistency with the highest water quality priorities identified in the Water Quality Improvement Plan for the applicable Watershed Management Area if appropriate justification is provided. Until the Copermittee has updated its jurisdictional runoff management program document with the requirements of Provision E, the Copermittee must continue implementing its current jurisdictional runoff management program.

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1. Modification of Jurisdictional Runoff Management Program Requirements

The requirements of this section apply to each Copermittee on a jurisdiction-wide basis. Copermittees that are in multiple WMAs may implement any activity or requirement at a level different than a specified minimum within any individual WMA so long as the requirement (as specified below) is met for the jurisdiction as a whole and compliance with all other applicable permit directives is maintained jurisdictionally and within each WMA.

Upon approval of the Executive Officer, specific minimum requirements may be modified or waived as follows:

a. Modifications within a WMA

Specific requirements may be reduced or waived for a WMA or a jurisdictional portion of a WMA only where the following conditions have been met:

i. The proposed change must be approved as a part of the approval of a Water Quality Improvement Plan or any update to it;

ii. Activities or requirements that can be reasonably demonstrated to provide an equivalent or higher level of water quality protection must be substituted for those being reduced or waived;

iii. Approved modifications will apply only to the portion of the WMA applicable to the Copermittee or Copermittees for which an approval has been granted; and

iv. Where a requirement has been reduced or waived within any WMA or portion of it, the requirement shall continue to apply to the remainder of the WMA, and to all remaining areas within the jurisdiction of the respective Copermittee(s) for which the modification has been granted.

b. Modifications within a Jurisdiction (Jurisdiction-Wide)

Specific requirements may be reduced or waived on a jurisdictional basis only where the following conditions have been met:

i. The Copermittee's proposed JRMP modifications must be submitted to the San Diego Water Board within 3 months of approval of the Water Quality Improvement Plan. The San Diego Water Board will issue a public notice and solicit public comments on the JRMP modification for a minimum of 30 days. Based on the comments received, the San Diego Water Board will determine whether to hold a public hearing or to limit public input to submittal of written comments. If no hearing is held the San Diego Water Board will notify the Copermittee that the JRMP modification has been approved following its review and determination that it meets the requirements of this Order;

ii. On RWQCB approval, the Copermittee's JRMP must be amended per Section II.F.2.a. to incorporate the modification(s);

iii. Activities or requirements that can be reasonably demonstrated to provide an equivalent or higher level of water quality protection must be substituted for those being reduced or waived; and

iv. Applicable portions of any WQIP to which an approved modification applies must be modified to reference or incorporate it, and the updated WQIP made available on the Regional Clearinghouse pursuant to Provision F.4.

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1. Legal Authority Establishment and Enforcement

a. Each Copermittee must establish, maintain, and enforce adequate legal authority within its jurisdiction to control pollutant discharges into ~~and from~~ its MS4 through statute, ordinance, permit, contract, order, or similar means. This legal authority must, at a minimum, authorize the Copermittee to:

(1) Effectively p~~P~~rohibit and eliminate ~~all~~ illicit discharges and illicit connections into its MS4;

(2) Control the contribution of pollutants in discharges of runoff associated with industrial and construction activity into its MS4 and control the quality of runoff from industrial and construction sites[17]., ~~including industrial and construction sites which that do not have coverage under the statewide General Permit for Discharges of Storm Water Associated with Industrial Activities (Industrial General Permit) or General Permit for Discharges of Storm Water Associated with Construction Activities (Construction General Permit), as well as to those sites which do not;~~

(3) Control the discharge of spills, dumping, or disposal of materials other than storm water into its MS4;

(4) The permittees are encouraged to enter into interagency agreements with owners of other MS4 systems, such as Caltrans, school and college districts, universities, Department of Defense, Native American Tribes, etc., to control the contribution of pollutants from one portion of the MS4s to another portion. ~~;~~

~~(3) Control through interagency agreements among Copermittees the contribution of pollutants from one portion MS4 to another portion of the MS4;~~

~~(4) Control through interagency agreements with other owners of the MS4 such as Caltrans, the U.S. federal government, or sovereign Native American Tribes, where possible, the contribution of pollutants from one portion of the MS4 to another portion of the MS4;~~

(5) Require compliance with conditions in its statutes, ordinances, permits, contracts, orders, or similar means to hold dischargers to its MS4 accountable for their contributions of pollutants and flows;

[17] The Permittees will only be responsible for administering and enforcing the codes and ordinances applicable to their jurisdictions (i.e.; a municipality is not responsible for administering and/or enforcing a permit issued by the State of California).

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(6) Require the use of BMPs to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

~~(6) Require documentation on the effectiveness of BMPs implemented to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;~~

~~(7)~~

~~(8)~~(7) Utilize enforcement mechanisms to require compliance with its statutes, ordinances, permits, contracts, orders, or similar means; and

~~(9)~~(8) Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with its statutes, ordinances, permits, contracts, orders, or similar means and with the requirements of this Order, including the effective prohibition of illicit discharges and connections to its MS4. The Copermittee's ordinance must include adequate legal authority, to the extent permitted by California and Federal Law and subject to the limitations on municipal action under the constitutions of California and the United States, ~~the Copermittee must also have authority~~ to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from industrial facilities, including construction sites, discharging into its MS4.

b. With the first Annual Report required by Provision F.3.b, each Copermittee must submit a statement certified by its Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative that the Copermittee has taken the necessary steps to obtain and maintain full legal authority within its jurisdiction to implement and enforce each of the requirements contained in this Order.

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2. Illicit Discharge Detection and Elimination

Each Copermittee must implement a program to actively detect and eliminate illicit discharges and improper disposal into the MS4, or otherwise require the discharger to apply for and obtain a separate NPDES permit. The illicit discharge detection and elimination program must include, at a minimum, the following requirements:

a. NON-STORM WATER DISCHARGES

Each Copermittee must address ~~all~~ non-storm water discharges as illicit discharges, where the likelihood exists that they are a source of pollutants to the waters of the state, unless ~~a non-storm water~~the discharge is either identified as a discharge authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to the following requirements:

~~(1) Discharges of non-storm water to the MS4 from the following categories must~~

~~be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG919001 (Order No. R9-2007-0034, or subsequent order) for discharges to San Diego Bay, or NPDES Permit No. CAG919002 (Order No. R9-2008-0002, or subsequent order) for discharges to surface waters other than San Diego Bay:~~

~~(a) Uncontaminated pumped ground water;~~

~~(b) Discharges from foundation drains;~~

~~(c) Water from crawl space pumps; and~~

~~(d) Water from footing drains.~~

~~(2)~~(1) Discharges of non-storm water from water line flushing and water main breaks to the MS4 must be addressed as illicit discharges unless the discharge has coverage under a valid NPDES Permit ~~No. CAG 679001 (Order No. R9-2010-0003, or subsequent order)~~. This includes water line flushing and water main break discharges from water purveyors under the Copermittee's jurisdiction that has been issued a water supply permit by the California Department of Public Health or federal military installations. Discharges from recycled or reclaimed water lines to the MS4 must be addressed as illicit discharges, unless the discharges have coverage under a separate NPDES permit.

~~(3)~~(2) Discharges of non-storm water to the MS4 from the following categories must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a source of pollutants to receiving waters within the Copermittee's jurisdiction:

(a) Diverted stream flows;

(b) Rising ground waters;

(c) Uncontaminated ground water infiltration to MS4s;

(d) Uncontaminated pumped ground water;

~~(c)~~(e) Discharges from foundation drains;

(f) Springs;

(g) Water from crawl space pumps;

~~(d)~~(h) Water from footing drains;

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~~(e)~~(i) Flows from riparian habitats and wetlands; and

~~(f)~~(j) Discharges from potable water sources.

~~(4)~~(3) Discharges of non-storm water into the MS4 from the following categories must be controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means where there is evidence that those discharges are a source of pollutants to waters of the state. Discharges of non-storm water into the MS4 from the following categories not controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means must be addressed by the Copermittee as illicit discharges.

(a) Air conditioning condensation

The discharge of air conditioning condensation ~~must~~ should be directed to landscaped areas or other pervious surfaces where feasible;

(b) Individual residential vehicle washing – Residents should be encouraged, through public outreach and education, to implement the following when washing their vehicles:

(i) Direct t~~T~~he discharge of wash water ~~must be directed~~ to landscaped areas or other pervious surfaces where feasible, and

(ii) Minimize the use of water for vehicle washing, use as little washing detergent and other vehicle wash products as possible, wash vehicles at commercial wash facilities, and implement other practices or behaviors that will prevent the discharge of pollutants associated with individual residential vehicle washing from entering the MS4; and

(c) Dechlorinated swimming pool discharges

(i) Eliminate residual chlorine, algaecide, filter backwash, or other pollutants from swimming pools prior to discharging to the MS4, and

(ii) The discharge of saline swimming pool water ~~to the MS4~~ must be directed to the sanitary sewer (with approval from the sanitary sewer agency) landscaped areas, ~~or~~ other pervious surfaces that can accommodate the volume of water, or to the MS4 if the MS4 discharges to a saltwater receiving water.

~~(5)~~(4) Firefighting discharges to the MS4 must be addressed by the Copermittees ~~as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a significant source of pollutants to receiving waters. Firefighting discharges to the MS4 not identified as a~~

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~~significant source of pollutants to receiving waters, must be addressed, at a minimum,~~ as follows:

(a) Non-emergency firefighting discharges

(i) Building fire suppression system maintenance discharges (e.g. sprinkler line flushing) to the MS4 must be addressed as illicit discharges.

(ii) Non-emergency firefighting discharges (i.e., discharges from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems) must be addressed by a program, to be developed and implemented by the Copermittee in conjunction with the local Fire Authority/District, to reduce or eliminate pollutants in such discharges from entering the MS4.

~~(b) Emergency firefighting discharges~~

~~(b)~~

(b) ~~Each Copermittee must develop and encourage implementation of BMPs to reduce or eliminate pollutants in emergency firefighting discharges to the MS4s and receiving waters within its jurisdiction. During emergency situations, priority of efforts should be directed toward life, property, and the environment (in descending order). BMPs should not interfere with immediate emergency response operations or impact public health and safety.~~ Emergency fire fighting flows (i.e., flows necessary for the protection of life or property) do not require BMPs and need not be prohibited. As part of the Jurisdictional Runoff Management Plan (JRMP), each Copermittee must develop and implement a program to address pollutants from non-emergency fire fighting flows (i.e., flows from controlled or practice blazes and maintenance activities) identified by the Copermittee to be significant sources of pollutants to waters of the United States.

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~~(6)~~(5) If the Copermittee or San Diego Water Board identifies any category of non-storm water discharges listed under Provisions E.2.a.(1)-(4) as a source of pollutants to receiving waters, the category must be prohibited through ordinance, order, or similar means and addressed as an illicit discharge.

b. PREVENT AND DETECT ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to prevent and detect illicit discharges to the MS4:

(1) Each Copermittee must maintain an updated map of its entire MS4 and the corresponding drainage areas. The accuracy of the MS4 map must be confirmed during non-storm water MS4 monitoring events. The MS4 map

must be included as part of the jurisdictional runoff management program document. Any geographic information system (GIS) layers or files used by the Copermittee to maintain the MS4 map must be made available to the San Diego Water Board upon request. The MS4 map must identify the following:

(a) All segments of the MS4 owned, operated, and maintained by the Copermittee,

(b) All known locations of inlets that discharge and/or collect runoff into the Copermittee's MS4,

(c) All known locations of connections with other MS4s not owned or operated by the Copermittee (e.g. Caltrans MS4s),

(d) All known locations of MS4 outfalls that discharge runoff collected from areas within the Copermittee's jurisdiction,

(e) All segments of receiving waters within the Copermittee's jurisdiction that receive and convey runoff discharged from the Copermittee's MS4 outfalls ~~(i.e., receiving water segments that are both a receiving water and part of the MS4)~~, and

(f) Locations of the non-storm water MS4 monitoring stations, identified pursuant to Provision D.1.a.(1)(a), within its jurisdiction.~~;~~

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(2) ~~Each Copermittee must use~~ Copermittee personnel and contractors should~~to~~ assist in identifying and reporting illicit discharges and connections~~,~~ if observed during the course of their daily employment activities;

(3) Each Copermittee must promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges into ~~or from~~ the MS4. Each Copermittee must facilitate public reporting through development and operation of a public hotline. Public hotlines can be Copermittee-specific or shared by the Copermittees. All public hotlines must be capable of receiving reports in both English and Spanish 24 hours per day and seven days per week;

(4) Each Copermittee must implement practices and procedures (including a notification mechanism) to prevent, respond to, contain, and clean up any spills that may discharge into the MS4 within their jurisdiction from any source. The Copermittee must coordinate with spill response teams to prevent to the extent possible entry of spills into the MS4, and prevent contamination of surface water, ground water, and soil. The Copermittee must coordinate spill prevention, containment, and response activities throughout all appropriate Copermittee departments, programs, and agencies; and

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~~(4)~~(5) Each Copermittee must implement practices and procedures to prevent and limit infiltration of seepage from sanitary sewers (including private laterals and failing septic systems) to the MS4.

c. VISUAL OBSERVATIONS, FIELD SCREENING AND/OR MONITORING

Each Copermittee must conduct visual observations, field screening and/or monitoring of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4 in accordance with the jurisdictional non-storm water MS4 monitoring program requirements in Provision D.1.a.(1).

d. INVESTIGATE AND ELIMINATE ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to investigate and eliminate illicit discharges to the MS4:

(1) Each Copermittee must prioritize and determine when follow-up investigations will be performed in response to visual observations and/or water quality monitoring data collected during an investigation of a detected non-storm water or illicit discharge into ~~or from~~ the MS4. The criteria for follow-up investigations must include the following:

(a) Pollutants identified as causing or contributing to the highest water quality priorities identified in the Water Quality Improvement Plan;

(b) Pollutants identified as causing or contributing, or are threatening to cause or contribute to impairments in water bodies on the 303(d) List and/or in environmentally sensitive areas (ESAs), located within its jurisdiction;

(c) Pollutants identified from sources or land uses known to exist within the area, drainage basin, or watershed that discharges to the portion of the MS4 within its jurisdiction included in the investigation; and

(d) Pollutants identified as causing or contributing to and exceedance of an NAL described in Provision C.1; and

(e) Pollutants identified as an immediate and significant threat to human health or the environment.

(2) Each Copermittee must implement procedures to investigate and inspect portions of its MS4 that, based on reports, ~~or~~ notifications, visual observations, field screening, monitoring, or other appropriate information, indicate a reasonable potential of ~~receiving, containing, or~~ discharging pollutants to receiving waters within the Copermittees jurisdiction due to illicit discharges or~~,~~ illicit connections~~, or other sources of non-storm water~~. The

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procedures must include the following:

(a) The Copermittee may develop criteria to assess the validity of, and prioritize the response to, each report or notification received. Each Copermittee must respond to each report or notification (e.g., public hotline reports, staff or contractor reports and notifications, etc.) of an incident in a timely manner. ~~The Copermittee may develop criteria to assess the validity of, and prioritize the response to, each report or notification received;~~

~~(b) Each Copermittee must immediately investigate and seek to identify the source(s) of discharges of non-storm water where flows are observed in and from the MS4 during the field screening and monitoring required pursuant to Provision D.1.a.(1). The investigation must include field investigations to identify sources or potential sources for the discharge, unless the source or potential source has already been identified during previous investigations;~~

~~(c) Each Copermittee must investigate and seek to identify the source(s) of non-storm water discharges from the MS4 where there is evidence of non-storm water having been discharged into or from the MS4 (e.g., pooled water). The investigation may include field investigations, reviewing Copermittee inventories, and other land use data to identify potential sources of the discharge; and~~

~~(d)~~(b) Procedures should address field investigations to identify sources or potential sources for the discharge, unless the source or potential source has already been identified during previous investigations.

(i) Obvious illicit discharges must be immediately investigated to identify the source(s) of discharges of non-storm water where flows are observed in and from the MS4 during the field screening and monitoring required pursuant to Provision D.1.a.(1);~~.~~

(ii) The investigation must include field investigations to identify sources or potential sources for the discharge, unless the source or potential source has already been identified during previous investigations;

(iii) The investigation may include field investigations, reviewing Copermittee inventories, and other land use data to identify potential sources of the discharge; and

~~(i)~~(iv) Procedures should address tracking of illicit discharges and connections.

(3) Each Copermittee must maintain records and a database of the

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investigations, including the following information:

(i) Location of incident, including hydrologic subarea, portion of MS4 receiving the non-storm water or illicit discharge, and point of discharge or potential discharge from MS4 to receiving water,

(ii) Source of information initiating the investigation (e.g., public hotline reports, staff or contractor reports and notifications, monitoring data, etc.),

(iii) Date the information used to initiate the investigation was received,

(iv) Date the investigation was initiated,

(v) Dates of follow-up investigations,

(vi) Identified or suspected source of the illicit discharge or connection, if determined,

(vii) Known or suspected related incidents, if any,

(viii) Result of the investigation, and

(ix) If a source cannot be identified and the investigation is not continued, a rationale for why a discharge does not pose a threat to water quality and/or does not require additional investigation.

(4) Each Copermittee must initiate the implementation of procedures, in a timely manner, to detect, control, and/or eliminate all detected and identified illicit discharges and connections within its jurisdiction. The procedures must include the following:

(a) Procedures should address ~~Each Copermittee must enforce its~~ legal authority, as required under Provision E.1, to eliminate illicit discharges and connections to the~~its~~ MS4. If the Copermittee identifies the source as a controllable ~~source of non-storm water or~~ illicit discharge or connection, the Copermittee must implement its Enforcement Response Plan pursuant to Provision E.6 and enforce its legal authority to effectively prohibit and eliminate illicit discharges and connections to its MS4~~;~~. Responses to discharges may include:

(i) If the Copermittee identifies the source of the discharge as a category of non-storm water discharges in Provision E.2.a, and the discharge ~~to or from the MS4~~ is in exceedance of NALs developed ~~under Provision C.1~~in the Water Quality Implementation Plan, then the Copermittees must determine if this is an isolated incident or set of circumstances, or if the category of discharge must be addressed through the prohibition of that category of discharge as an illicit discharge pursuant to Provision E.2.a.(5);

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(ii) If the Copermittee suspects the source of the non-storm water discharge as natural in origin (i.e. non-anthropogenically influenced) and in conveyance into the MS4, then the Copermittee must ~~collect the data and evidence necessary to demonstrate to the San Diego Water Board that it is natural in origin; and~~document the rationale for why the discharge does not need further investigation. This documentation shall be included in the Annual Report.

(iii) If the Copermittee is unable to identify ~~and document~~ the source of a recurring, documented ~~non-storm water~~illicit discharge into ~~or from~~ the MS4, then the Copermittee must ~~address the discharge as an illicit discharge and~~ update its jurisdictional runoff management program to address the common and suspected sources of the non-storm water discharge within its jurisdiction in accordance with the Copermittee's priorities.

(5) Each Copermittee must submit a summary of the ~~non-storm water discharges and~~ illicit discharges and connections investigated and eliminated within its jurisdiction with each Annual Report required under Provision F.3.b of this Order.

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3. Development Planning

Each Copermittee within their respective jurisdictions, must ~~use their land use/planning authorities to~~ implement a development planning program that includes, at a minimum, the following requirements.

a. ~~Permanent~~ BMP Requirements for All Development Projects

Each Copermittee, as practical and feasible, must prescribe ~~the following~~ BMP requirements during the planning process (i.e. prior to project approval and issuance of grading or building permits) for all development projects ~~(regardless of project type or size)~~, where local permits are issued, including unpaved roads ~~and flood management projects~~, except emergency projects implemented for the protection of persons and property.

(1) General Requirements

(a) All BMPs must be located so as to remove pollutants from runoff prior to its discharge to any receiving waters, and as close to the source as possible;

(b) Multiple development projects may use shared ~~permanent~~ treatment control or structural LID BMPs as long as construction of any shared BMP is completed prior to the use or occupation of any development project from which the BMP will receive runoff; and

(c) Treatment control and structural LID~~Permanent~~ BMPs must not be constructed within a waters of the U.S. or waters of the state.

(2) Source Control BMP Requirements

The following source control BMPs must be implemented at all development projects where applicable and feasible:

(a) Prevention of illicit discharges into the MS4;

(b) Storm drain system stenciling or signage;

(c) Properly designed outdoor material storage areas;

(d) Properly designed outdoor work areas;

(e) Properly designed trash storage areas; and

(f) Any additional BMPs necessary to minimize pollutant generation at each project.

(3) Low Impact Development (LID) BMP Requirements

The following LID BMPs must be implemented at all development projects where applicable and feasible[18]:

(a) Maintenance or restoration of natural storage reservoirs and drainage corridors (including topographic depressions, areas of permeable soils, natural swales, and ephemeral and intermittent streams);[19]

(b) Buffer zones for natural water bodies (where buffer zones are technically infeasible, require project applicant to include other buffers such as trees, access restrictions, etc.);

(c) Conservation of natural areas within the project footprint including existing trees, other vegetation, and soils;

(d) Construction of streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided public safety is not compromised;

(e) Minimization of the impervious footprint of the project;

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[18] Implementation of LID BMPs shall be consistent with technical guidance developed by the Copermittees.

[19] Development projects proposing to dredge or fill materials in waters of the U.S. must obtain a CWA Section 401 Water Quality Certification. Projects proposing to dredge or fill waters of the State must obtain Waste Discharge Requirements.

(f) Minimization of soil compaction to landscaped areas;

(g) Disconnection of impervious surfaces through distributed pervious areas;

(h) Landscaped or other pervious areas designed and constructed to effectively receive and infiltrate, retain and/or treat runoff from impervious areas, prior to discharge to the MS4;

(i) Small collection strategies located at, or as close as possible to, the source (i.e. the point where storm water initially meets the ground) to minimize the transport of runoff and pollutants to receiving waters;

(j) Use of permeable materials for projects with low traffic areas and appropriate soil conditions;

(k) Landscaping with native or drought tolerant species; and

(l) Harvesting and using precipitation.

(4) Long-Term Treatment Control/Structural LID~~Permanent~~ BMP Maintenance

Each Copermittee must require the project applicant to submit proof of the mechanism under which ongoing long-term maintenance of all treatment control and structural LID~~permanent~~ BMPs will be conducted.

(5) Infiltration and Groundwater Protection

(a) Infiltration and treatment control BMPs designed to primarily function as large, centralized infiltration devices (such as large infiltration trenches and infiltration basins) must not cause or contribute to an exceedance of an applicable groundwater quality objective. At a minimum, such infiltration and treatment control BMPs must be in conformance with the design criteria listed below, unless the development project applicant demonstrates to the Copermittee that one or more of the specific design criteria listed below are not necessary to protect groundwater quality. The design criteria listed below do not apply to small infiltration systems dispersed throughout a development project.

(i) Runoff must undergo pretreatment such as sedimentation or filtration prior to infiltration;

(ii) Pollution prevention and source control BMPs must be implemented at a level appropriate to protect groundwater quality at sites where infiltration treatment control BMPs are to be used;

(iii) Infiltration treatment control BMPs must be adequately maintained to remove pollutants in storm water to the MEP;

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(iv) The vertical distance from the base of any infiltration treatment control BMP to the seasonal high groundwater mark must be at least 10 feet. Where groundwater basins do not support beneficial uses, this vertical distance criteria may be reduced, provided groundwater quality is maintained;

(v) The soil through which infiltration is to occur must have physical and chemical characteristics (e.g., appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses;

(vi) Infiltration treatment control BMPs must not be used for areas of industrial or light industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee, unless first treated or filtered to remove pollutants prior to infiltration; and

(vii) Infiltration treatment control BMPs must be located a minimum of 100 feet horizontally from any water supply wells.

(b) The Copermittees may collectively or individually develop alternative mandatory design criteria to that listed above for infiltration and treatment control BMPs which are designed to primarily function as centralized infiltration devices. Before implementing the alternative design criteria in the development planning process the Copermitee(s) must:

(i) Notify the San Diego Water Board of the intent to implement the alternative design criteria submitted; and

(ii) Comply with any conditions set by the San Diego Water Board.

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b. PRIORITY DEVELOPMENT PROJECTS

(1) Definition of Priority Development Project

Priority Development Projects include the following:

(a) ~~All new development projects that fall under the Priority Development Project categories listed under Provision E.3.b.(2). Where a new development project feature, such as a parking lot, falls into a Priority Development Project category, the entire project footprint is subject to Priority Development Project requirements; and~~

(b) Those redevelopment projects that create, add, or replace at least 5,000 square feet of impervious surfaces on an already developed site, ~~or~~ and the redevelopment project is a Priority Development Project category listed under Provision E.3.b.(2). Where redevelopment results in an

increase of less than fifty percent of the impervious surfaces of a previously existing development, and the existing development was not subject to Priority Development Project requirements, the performance and sizing requirements discussed in Provisions E.3.c.(2) and E.3.c.(3) apply only to the addition or replacement, and not to the entire development. Where redevelopment results in an increase of more than fifty percent of the impervious surfaces of a previously existing development and was not subject to previous Priority Project Development requirements, the performance and sizing requirements apply to the entire development.

(c) Projects where redevelopment results in an increase of more than fifty percent of impervious surfaces of a previously existing development, and the existing development was subject to previous Priority Project Development requirements, only the altered portion is subject to the new Priority Development Project requirements.

(2) Priority Development Project Categories

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This category includes commercial, industrial, residential, mixed-use, and public development projects on public or private land which fall under the planning and building authority of the Copermittee.

(b) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

(c) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812), where the land area for development is 5,000 square feet or more of impervious surface.

(d) Hillside development projects. This category includes any development which creates 5,000 square feet or more of impervious surface which is located in an area with known erosive soil conditions, where the development will grade on any natural slope that is twenty-five percent or greater.

(e) Environmentally sensitive areas (ESAs). This category includes any development located within, directly adjacent to, or discharging directly to an ESA, which either creates 2,500 square feet of impervious surface on a proposed project site or increases the area of imperviousness of a

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proposed project site to 10 percent or more of its naturally occurring condition. “Directly adjacent to” means situated within 200 feet of the ESA. “Discharging directly to” means outflow from a drainage conveyance system that collects runoff from the subject development or redevelopment site and terminates at or in receiving waters within the ESA.

(f) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce that has 5,000 square feet or more of impervious surface.

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(g) Streets, roads, highways, and freeways~~, and residential driveways~~. This category is defined as any paved impervious surface that is 5,000 square feet or more used for the transportation of automobiles, trucks, motorcycles, and other internal combustion vehicles.

(h) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more of impervious surface or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

(i) Large development projects. This category includes any post-construction pollutant-generating new development projects that result in the disturbance of one acre or more of land.

(3) Priority Development Project Exemptions

Each Copermittee has the discretion to exempt the following projects from being defined as Priority Development Projects:

(a) Sidewalks constructed as part of new streets or roads and designed to direct storm water runoff to adjacent vegetated areas;

(b) Bicycle lanes that are constructed as part of new streets or roads but are not hydraulically connected to the new streets or roads and designed to direct storm water runoff to adjacent vegetated areas;

(c) Impervious trails constructed and designed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas;

(d) Sidewalks, bicycle lanes, ~~or~~ trails, driveways, or parking lots constructed with permeable surfaces.

(e) Single-family residential projects that are not part of a larger development or proposed subdivision.

(f) Any paved impervious surface that is 5,000 square feet or more used for the transportation of automobiles, trucks, motorcycles, and other vehicles that follows the USEPA guidance regarding Management Wet Weather with Green Infrastructure: Green Streets[20] to the MEP.

~~(d)~~(g) Emergency public safety projects in any of the Priority Development Categories may be excluded if the delay caused due to the requirement for a SSMP compromises public safety, public health and/or environmental protection.

[20] http://water.epa.gov/infrastructure/greeninfrastructure/index.cfm

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c. Priority Development Project ~~Permanent~~ BMP Performance and Sizing Requirements

In addition to the BMP requirements listed for all development projects under Provision E.3.a, Priority Development Projects must also implement ~~permanent~~ BMPs that conform to performance and sizing requirements.

(1) Source Control BMP Requirements

Each Copermittee must require each Priority Development Project to implement applicable source control BMPs listed under Provision E.3.a.(2).

(2) Retention and Treatment Control BMP Requirements

Each Copermittee must require each Priority Development Project to implement BMPs to retain and treat pollutants onsite in the following order:

(a) Each Priority Development Project must be required to implement LID BMPs as described in Provision E.3.a.(3) or offsite regional groundwater replenishment if the following conditions apply:~~;~~

(i) The volume of stormwater runoff used to replenish groundwater must be equal to or greater than the design capture volume;

(ii) Pollutant reduction is provided through treatment of the design capture volume at the project site.

~~(a)~~(b) Each Priority Development Project must be required to implement LID BMPs that are sized and designed to retain the volume equivalent to runoff produced from a 24-hour 85th percentile storm event[21] or to retain the difference in the volume between the runoff volume produced in the post-project condition as compared to the pre-project condition resulting from a 24-hour 85th percentile storm event ("design capture volume");

[21] This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of runoff for the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals.

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(c) If onsite retention of the design capture volume using LID BMPs is technically infeasible per Provision E.3.c.(4) flow-thru LID ~~and/or conventional treatment control~~ BMPs must be implemented to treat the portion of the design capture volume that is not retained onsite. Flow-thru LID treatment control BMPs must be designed for an appropriate surface loading rate to prevent erosion, scour and channeling within the BMP.

~~(b)~~(d) If retention and/or equivalent pollutant removal of the design capture volume to meet E.3.c.(2)(a) or E.3.c.(2)(b) are infeasible onsite ~~Additionally,~~ project applicants must perform mitigation for the portion of the pollutant load in the design capture volume that is not retained onsite, as described in Provision E.3.c.(4)(c).

~~(c)~~(e) All onsite treatment control BMPs must:

(i) Be correctly sized and designed so as to remove pollutants from storm water to the MEP;

(ii) Be sized to comply with the following numeric sizing criteria:

[a] Volume-based treatment control BMPs must be designed to mitigate (infiltrate, filter, or treat) the remaining portion of the design capture volume that was not retained onsite; or

[b] Flow-based treatment control BMPs must be designed to mitigate (filter or treat) either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event; or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two.

(iii) Be ranked with high or medium pollutant removal efficiency for the project's most significant pollutants of concern. Treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

(3) Hydromodification Management ~~BMP Requirements~~

Each Copermittee must require each Priority Development Projects greater than one acre to implement hydromodification management BMPs as described in the Copermittees' current HMP, as applicable. ~~so that:~~

(a) Post-project runoff flow rates and durations do not exceed pre-project

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~~development (naturally occurring)~~ runoff flow rates and durations by more than 10 percent (for the range of flows that result in increased potential for erosion or degraded channel conditions downstream of Priority Development Projects).

~~(i) In evaluating the range of flows that results in increased potential for erosion of natural (non-hardened) channels, the lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks.~~

~~(ii) For artificially hardened channels, analysis to identify the lower boundary must use characteristics of a natural stream segment similar to that found in the watershed. The lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or erodes the toe of the channel banks.~~

~~(iii)~~(i) The Copermittees may use monitoring results pursuant to Provision D.2.b.(6) to re-define the range of flows resulting in increased potential for erosion or degraded channel conditions, as warranted by the data.

(b) Post-project runoff flow rates and durations must compensate for the loss of sediment supply due to the development project, should loss of sediment supply occur as a result of the development project.

(c) If hydromodification management BMPs are technically infeasible per Provision E.3.c.(4) or it is identified that stream rehabilitation projects or regional mitigation projects are preferable for restoration of watershed functions, project applicants must perform mitigation for the portion of the runoff volume that is not controlled and will cause or contribute to increased potential for erosion of receiving waters downstream of the Priority Development Project, as described in Provision E.3.c.(4)(c) or contribute to an established mitigation fund per Provision (3)(d)(v).

(d) Offsite Hydromodification Mitigation Program

Each Copermittee, in collaboration with the other Copermittees may develop and implement a watershed based approach to hydromodification management that may include the following:

(i) Analysis to identify current land uses and proposed future development and changes in land use.

(ii) Development of watershed hydromodification management objectives.

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(iii) Development of criteria to identify when stream rehabilitation or regional mitigation projects are preferable to onsite hydromodification controls for PDPs, in order to restore watershed functions and processes,.

(iv) Identification of opportunities for stream rehabilitation and mitigation projects to restore watershed functions and processes

(v) Development of a mitigation fund and program for implementation of stream rehabilitation and mitigation projects

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~~(c)~~(e) Exemptions

Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP requirements where the project:

(i) Discharges storm water runoff into underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;

(ii) Discharges storm water runoff into conveyance channels that are engineered for the capacity to convey the 10-year ultimate build out condition flow and are regularly maintained to ensure flow capacity ~~whose bed and bank are concrete lined~~ all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;

(iii) Discharges to large rivers where large rivers are defined as reaches for which the contributing drainage area exceeds 100 square miles and with a 100-year design flow in excess of 20,000 cfs;

(iv) Discharges from infill redevelopment projects that meet criteria to be established in the Permittees' HMPs; or

(v) In-stream flood control and restoration projects.

(vi) Discharges storm water runoff into other areas identified by the San Diego Water Board as exempt from the requirements of Provisions E.3.c.(3)(a)-(c).

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(4) Alternative Compliance for Technical Infeasibility

At the discretion of each Copermittee, alternative compliance may be allowed for certain Priority Development Projects to comply with Provisions E.3.c.(2) and E.3.c.(3), subject to the following requirements:

(a) Applicability

Priority Development Projects may be allowed alternative compliance if:

(i) The Copermittee reviews and approves site-specific hydrologic and/or design analysis performed by a registered professional engineer, geologist, architect, or landscape architect;

(ii) The project applicant demonstrates, and the Copermittee determines and documents, that retention LID and/or hydromodification

management BMPs per Provisions E.3.c.(2) and E.3.c.(3) were incorporated into the project design to the maximum extent technically feasible given the project site conditions;

(iii) The project applicant is required to perform mitigation described in Provision E.3.c.(4)(c) with a net result of at least the same level of water quality protection as would have been achieved if the Priority Development Project had fully implemented the retention LID and hydromodification management BMP requirements under Provisions E.3.c.(2) and E.3.c.(3) onsite; or.

(iv) The project applicant is required to perform mitigation described in Provision E.3.c.(4)(c) and has the option or ability to contribute to a regionally important mitigation project/program as defined in the Water Quality Improvement Plan that would address strategic high-priority water quality protection and/or more-direct restoration of beneficial uses in receiving waters than if achieved if the Priority Development Project had fully implemented the retention LID and hydromodification management BMP requirements under Provisions E.3.c.(2) and E.3.c.(3) onsite.

(b) Criteria For Technical Infeasibility

Each Copermittee must develop, or develop in collaboration with the other Copermittees, criteria to determine technical infeasibility for fully implementing the retention LID and hydromodification management BMP requirements under Provisions E.3.c.(2) and E.3.c.(3) and include these requirements in the Treatment control/structural LID~~Permanent~~ BMP Sizing Criteria Design Manual pursuant to Provision E.3.d. Technical infeasibility may result from conditions including, but not limited to:

(i) Locations that cannot meet the infiltration and groundwater protection requirements in Provision E.3.a.(5) due to the presence of shallow bedrock, contaminated soils, contaminated groundwater, near surface groundwater, underground facilities, or utilities;

(ii) Brownfield development sites or other locations where pollutant mobilization is a documented concern;

(iii) The design of the site precludes the use of soil amendments, plantings of vegetation, or other designs that can be used to infiltrate and evapotranspirate runoff;

(iv) Soils cannot be sufficiently amended to provide for the requisite infiltration rates;

(v) Locations with geotechnical hazards;

(vi) Insufficient onsite and/or offsite demand for storm water use;

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(vii) Modifications to an existing building to manage storm water are not feasible due to structural or plumbing constraints; and

(viii) Smart growth and infill or redevelopment locations where the density and/or nature of the project would create significant difficulty for compliance with Provisions E.3.c.(2) and E.3.c.(3) onsite.

(c) Mitigation

Priority Development Projects that meet the Copermittee's technical infeasibility criteria developed pursuant to Provision E.3.c.(4)(b) must be required to mitigate for the increased flow rates, increased flow durations, and/or increased pollutant loads expected to be discharged from the site. ~~For the pollutant load in the volume of storm water~~ Copermittees may establish an offsite mitigation program that requires the developer to mitigate for the water quality equivalence not retained onsite with retention LID BMPs, or increased potential erosion of downstream receiving waters not fully controlled onsite with hydromodification management BMPs, the Copermittee must require the project applicant to either 1) implement an offsite mitigation project, and/or 2) provide sufficient funding for a public or private offsite mitigation project via a mitigation fund.

(i) *Mitigation Project Locations*

Offsite mitigation projects must be implemented within the same hydrologic unit as the Priority Development Project, and preferably within the same hydrologic subarea. Mitigation projects outside of the hydrologic subarea but within the same hydrologic unit may be approved provided that the project applicant demonstrates that mitigation projects within the same hydrologic subarea are infeasible and that the mitigation project will address similar potential impacts expected from the Priority Development Project.

(ii) *Mitigation Project Types*

Offsite mitigation projects ~~must~~ may include, where applicable and feasible, retrofitting opportunities and stream and/or habitat rehabilitation or restoration opportunities identified in the Water Quality Improvement Plans, identified pursuant to Provision B.3.a. Other offsite mitigation projects may include green streets or infrastructure projects, groundwater recharge projects, or regional BMPs upstream of receiving waters. ~~In-stream rehabilitation or restoration measures to protect or prevent adverse physical changes to creek bed and banks must not include the use of non-naturally occurring hardscape material such as concrete, riprap, or gabions.~~ Project applicants seeking to utilize these alternative compliance provisions may propose other offsite mitigation projects, which the Copermittees may approve if they meet the requirements of Provision

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E.3.c.(4)(a).

(iii) *Mitigation Project Timing*

The Copermittee and/or project applicant must develop a schedule for the completion of offsite mitigation projects, including milestone dates to identify, fund, design, and construct the projects. PDP implemented o~~O~~ffsite mitigation projects must be completed upon ~~the granting of occupancy for the first project that contributed funds~~completion of the PDP, ~~toward the offsite mitigation project,~~ unless a longer period is authorized by the San Diego Water Board. The timing of mitigation projects associated with a Copermittee offsite mitigation program will be developed by the Copermittees as part of developing ~~-~~their offsite mitigation program.

(iv) *Mitigation Fund*

A Copermittee may choose to implement additional mitigation programs (e.g., pollutant credit system, mitigation fund) as a means for developing and implementing offsite mitigation projects, provided the projects conform to the requirements for project locations, types, and timing described above.

d. UPDATE ~~PERMANENT~~ TREATMENT CONTROL/STRUCTURAL LID~~STRUCTURAL~~ BMP SIZING CRITERIA DESIGN MANUAL (BMP DESIGN MANUAL)

Each Copermittee must update its ~~Permanent~~ Treatment Control/Structural LID BMP Sizing Criteria Design Manual (BMP Design Manual)[22] pursuant to Provision F.2.b or Provision F.5.a. Until the Copermittee has updated its BMP Design Manual with the requirements of Provision E.3.c, the Copermittee must continue implementing its current BMP Design Manual. Unless directed otherwise by the San Diego Water Board, the Copermittee must implement the BMP Design Manual within 180 days of completing the update. The update of the BMP Design Manual must include the following:

(1) Updated procedures to determine the nature and extent of storm water requirements applicable to a potential development or redevelopment project. These procedures must inform project applicants of the storm water management requirements applicable to their project including, but not limited to, general requirements for all development projects, LID and conventional BMP design procedures and requirements, hydromodification management requirements, requirements specific to phased projects, and procedures specific to private developments and public improvement projects;

(2) Updated procedures to identify pollutants and conditions of concern for selecting the most appropriate ~~permanent~~ treatment control or structural LID

[22] The Permanent BMP Sizing Criteria Design Manual was formerly known as the Standard Storm Water Mitigation Plan under Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016.

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BMPs that consider, at a minimum, the following:

(a) Receiving water quality (including pollutants for which receiving waters are listed as impaired under CWA section 303(d));

(b) Priority pollutants or receiving water conditions contributing to the highest water quality priorities identified in the Water Quality Improvement Plan;

(c) Land use type of the project and pollutants associated with that land use type; and

(d) Pollutants expected to be present onsite.

(3) Updated procedures for designing ~~permanent~~ treatment control or structural LID BMPs, including any updated performance and sizing requirements to be consistent with the requirements of Provision E.3.c for all BMPs listed in the BMP Design Manual;

(4) Long-term maintenance criteria for each BMP listed in the BMP Design Manual; and

(5) Criteria and mitigation requirements, in accordance with the requirements under Provision E.3.c.(4), if the Copermittee elects to allow alternative compliance for technical infeasibility within its jurisdiction.

e. PRIORITY DEVELOPMENT PROJECT BMP IMPLEMENTATION AND OVERSIGHT

Each Copermittee must implement a program to ensure ~~permanent~~ treatment control or structural LID BMPs on all Priority Development Projects are designed, constructed, and maintained to remove pollutants in storm water to the MEP.

(1) ~~Permanent~~ Treatment Control/Structural LID BMP Approval and Verification Process

(a) Each Copermittee must ensure that for all Priority Development Project applications that have not received prior lawful approval by the Copermittee by 12 months after the adoption of this Order, or pursuant to Provision F.5.a, the requirements of Provision E.3 are implemented. For project applications that have received prior lawful approval by 12 months after the adoption of this Order, or pursuant to Provision F.5.a, the Copermittee may allow previous land development requirements to apply.

(b) Each Copermittee must identify the roles and responsibilities of various municipal departments in implementing the ~~permanent~~ treatment control/structural LID BMP requirements, including each stage of a project from application review and approval through BMP maintenance and

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inspections.

(c) Each Copermittee must ensure that appropriate easements and ownerships are properly recorded in public records and the information is conveyed to all appropriate parties when there is a change in project or site ownership.

(d) Each Copermittee must ensure that prior to occupancy and/or intended use of any portion of the Priority Development Project, each ~~permanent~~ treatment control or structural LID BMP must be inspected to verify that they have been constructed and are operating in compliance with all of its specifications, plans, permits, ordinances, and the requirements of this Order.

(2) Priority Development Project Inventory and Prioritization

(a) Each Copermittee must develop and regularly ~~continuously~~ maintain a watershed-based database to track and inventory all Priority Development Projects and associated ~~permanent~~ treatment control and structural LID BMPs within their jurisdiction. Inventories must be accurate and complete beginning from January 2002 for the San Diego County Copermittees, February 2003 for the Orange County Copermittees, and July 2005 for the Riverside County Copermittees. The database must include, at a minimum, the following information:

(i) Priority Development Project location (address and hydrologic subarea);

(ii) Descriptions of BMP type(s);

(iii) Date(s) of construction;

(iv) Party responsible for treatment control/structural LID~~permanent~~ BMP maintenance;

(v) Dates and findings of treatment control/structural LID~~permanent~~ BMP maintenance verifications; and

(vi) Corrective actions and/or resolutions.

(b) Each Copermittee must prioritize the Priority Development Projects with treatment control/structural LID~~permanent~~ BMPs within its jurisdiction. The designation of Priority Development Projects as high priority must consider the following:

(i) The highest water quality priorities identified in the Water Quality Improvement Plan;

(ii) Receiving water quality;

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(iii) Number and sizes of treatment control/structural LID~~permanent~~ BMPs;

(iv) Recommended maintenance frequency of treatment control/structural LID~~permanent~~ BMPs;

(v) Likelihood of operation and maintenance issues of treatment control/structural LID~~permanent~~ BMPs;

(vi) Land use and expected pollutants generated; and

(vii) Compliance record.

(3) Treatment Control Structural LID ~~Permanent~~ BMP Maintenance Verifications and Inspections

Each Copermittee is required to verify that treatment control and structural LID ~~permanent~~ BMPs on each Priority Development Project are adequately maintained, and continue to operate effectively to remove pollutants in storm water to the MEP through inspections, self-certifications, surveys, or other equally effective approaches.

(a) All (100 percent) of the ~~permanent~~ treatment control and structural LID BMPs at Priority Development Projects that are designated as high priority must be inspected directly by the Copermittee annually prior to each rainy season;

(b) For verifications performed through a means other than direct Copermittee inspection, adequate documentation must be required by the Copermittee to provide assurance that the required maintenance of ~~permanent~~ treatment control and structural LID BMPs at each Priority Development Project has been completed; and

(c) Appropriate follow-up measures (including re-inspections, enforcement, etc.) must be conducted to ensure that ~~permanent~~ treatment control and structural LID BMPs at each Priority Development Project continue to reduce pollutants in storm water to the MEP as originally designed.

f. DEVELOPMENT PROJECT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all development projects, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

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4. Construction Management

Each Copermittee must implement a construction management program within their jurisdiction that includes, at a minimum, the following requirements:

a. Project Approval Process

Prior to approval and issuance of any construction, grading, or building permits for a project each Copermittee must:

(1) Require a project-specific storm water pollution prevention plan (SWPPP), or ~~equivalent~~ construction BMP or erosion and sediment control plan, to be submitted by the project applicant for the Copermittee's approval;

(2) Ensure the SWPPP, or ~~equivalent~~ construction BMP or erosion and sediment control plan, complies with the local grading ordinance, other applicable local ordinances, and the requirements of this Order;

(3) Ensure the SWPPP, or ~~equivalent~~ construction BMP or erosion and sediment control plan, includes seasonally appropriate and effective BMPs and management measures described in Provision E.4.c, as applicable to the project; and

~~(4)~~ Verify that the project applicant has obtained coverage under ~~applicable permits, including, but not limited to~~ the Construction General Permit.~~, Clean Water Act Section 401 Water Quality Certification and Section 404 Permit, and California Department of Fish and Game Streambed Alteration Agreement.~~

~~(5)~~(4)

b. Construction Site Inventory and Tracking

(1) Each Copermittee must maintain, and update at least ~~monthly~~quarterly, a watershed-based inventory of all construction sites requiring construction, grading, or building permits within its jurisdiction. The inventory must include:

(a) Relevant contact information for each site (e.g., name, address, phone, and email for the owner and contractor);

(b) The basic site information including location (address and hydrologic

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subarea), Waste Discharge Identification (WDID) number (if applicable), size of the site, and approximate area of disturbance;

(c) Whether or not the site is considered a high threat to water quality, as defined in Provision E.4.b.(2) below;

(d) The project start and anticipated completion dates;

(e) Current construction phase;

(f) The required inspection frequency, as defined in the Copermittee's jurisdictional runoff management program document;

(g) The date the Copermittee approved the project-specific SWPPP, or equivalent construction BMP or erosion and sediment control plan; and

(h) Whether or not there are ongoing enforcement actions administered to the site.

(2) Each Copermittee must identify all construction sites within its jurisdiction that represent a high threat to downstream surface water quality. At a minimum, high threat to water quality sites must include:

(a) Sites located within a hydrologic subarea where sediment is known or suspected to contribute to the highest water quality priorities identified in the Water Quality Improvement Plan;

(b) Sites located within the same hydrologic subarea and tributary to a CWA section 303(d) water body segment impaired for sediment;

(c) Sites located within, directly adjacent to, or discharging directly to a receiving water within an ESA; and

(d) Other sites determined by the Copermittees or the San Diego Water Board as a high threat to water quality.

c. CONSTRUCTION SITE BMP AND MANAGEMENT MEASURE IMPLEMENTATION

Each Copermittee must implement, or require the implementation of effective

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BMPs to reduce discharges of pollutants in storm water from construction sites to the MEP, and prevent non-storm water discharges into the MS4. These BMPs must be site specific, seasonally appropriate, and construction phase appropriate. BMPs and management measures must be implemented at each construction site year round. Dry season BMP implementation must plan for and address unseasonal rain events that may occur during the dry season (May 1 through September 30). Copermittees must implement, or require the implementation of, BMPs and management measures in the following categories:

(1) Project Planning;

(2) Good Site Management "Housekeeping", including waste management;

(3) Non-storm Water Management;

(4) Erosion Control;

(5) Sediment Control;

(6) Run-on and Run-off Control; and

(7) Active/Passive Sediment Treatment Systems, where applicable.

d. CONSTRUCTION SITE INSPECTIONS

Each Copermittee must conduct construction site inspections to ensure compliance with its permits and applicable local ordinances, and the requirements of this Order. Priority for site inspections must consider threat to water quality pursuant to Provision E.4.b as well as the nature of the construction activity, topography, and the characteristics of soils and receiving water quality.

(1) Inspection Frequency

(a) Each Copermittee must conduct inspections at all inventoried sites, including high threat to water quality sites, at an appropriate frequency for each phase of construction to ensure the site reduces the discharge of pollutants in storm water from construction sites to the MEP, and prevents non-storm water discharges from entering the MS4.

(b) Each Copermittee must establish appropriate inspection frequencies for

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high threat to water quality sites, and all other sites, for each phase of construction. Inspection frequencies appropriate for addressing the highest water quality priorities identified in the Water Quality Improvement Plan, and for complying with the requirements of this Order must be identified in each Copermittee's jurisdictional runoff management program document.

(c) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e., re-inspection, enforcement) necessary to ensure site compliance with its permits and applicable local ordinances, and the requirements of this Order.

(2) Inspection Content

Inspections of construction sites by the Copermittee must include, at a minimum:

(a) Verification of coverage under the Construction General Permit (Notice of Intent (NOI) and/or WDID number) during initial inspections, when applicable;

(b) Assessment of compliance with its permits and applicable local ordinances related to pollution prevention, including the implementation and maintenance of applicable BMPs;

(c) Assessment of BMP adequacy and effectiveness;

(d) Visual observations of actual non-storm water discharges;

(e) Visual observations of actual or potential discharge of sediment and/or construction related materials from the site;

(f) Visual observations of actual or potential illicit connections; and

(g) If any violations are found and BMP enhancements are needed, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

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Each Copermittee must track all inspections and re-inspections at all inventoried construction sites. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Site name, location (address and hydrologic subarea), and WDID number (if applicable);

(b) Inspection date;

(c) Weather conditions during inspection;

(d) Approximate amount of rainfall since last inspection;

(e) Description and photo documentation of problems observed with BMPs and indication of need for BMP addition/repair/replacement and any scheduled re-inspection, and date of re-inspection;

(f) Descriptions of any other specific inspection comments which must, at a minimum, include rationales for longer compliance time~~.~~;

(g) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(h) Resolution of problems noted and date problems fixed.

e. CONSTRUCTION SITE ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried construction sites, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

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5. Existing Development Management

Comment [A3]: The OC Copermittees are offering alternative language for this section – see attachment for Existing Development. In lieu of the alternative language – the proposed revisions are provided below.

Each Copermittee must implement an existing development management program that includes, at a minimum, the following requirements:

a. EXISTING DEVELOPMENT INVENTORY AND TRACKING

Each Copermittee must maintain an updated watershed-based inventory and/or map of ~~all~~ its existing development that has the reasonable potential to discharge ~~may potentially generate~~ a pollutant load into ~~and from~~ the MS4. The map should be ~~A continually~~ regularly updated and identify ~~map showing~~ the locations of inventoried existing development categories listed below, the watershed management area boundaries, the water bodies, and the significant, regional retrofits implemented ~~and pollutants generated~~ at the inventoried existing

development and/or significant, regional rehabilitations implemented at channels and/or receiving waters. The use of an automated database system, such as GIS, is highly recommended.

The inventory must, at a minimum, include the following types of facilities:

(1) The following municipal facilities:

(a) Flood management projects and flood control devices ~~and structures~~,

(b) Operating or closed municipal landfills,

(c) Publicly owned treatment works (including water and wastewater treatment plants) and sanitary sewer collection systems,

(d) Corporate yards, including maintenance and storage yards for materials, waste, equipment, and vehicles,

(e) Hazardous waste collection facilities, ~~and~~

(f) ~~Other treatment, storage or disposal facilities for municipal waste~~Solid waste transfer facilities; and

~~(f)~~(g) Land application sites;

(2) Identification of ~~if a business is a~~ mobile businesses;

(3) ~~Identification if an area is a~~ Common Interest Areas (CIAs) / Home Owner Associations (HOAs), and~~or~~ mobile home parks;

The inventory must, at a minimum, include the following information for each of the facilities, as applicable:

(1) Name, location (address and/or hydrological subarea) of each facility, area, and/or activity;

(2) A description of the facility, area, and/or activity, including classification as municipal, commercial, industrial, or residential;

(3) SIC and/or NAICS Code~~, if applicable~~;

(4) Industrial General Permit ~~NOI and/or~~ WDID number~~, if applicable~~;

(5) Identification of pollutants generated and/or potentially generated by the facility, area, and/or activity;

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(6) Status of facility, area, and/or activity as active or inactive;

(7) Whether the facility, area, and/or activity is adjacent to an ESA;

(8) Whether the facility, area, and/or activity is tributary to and within the same hydrologic subarea as a CWA section 303(d) water body segment and generates pollutants for which the water body segment is impaired;

~~(4) Whether the facility, area, and/or activity contributes or potentially contributes to the highest water quality priorities identified in the Water Quality Improvement Plan; and~~

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b. Retrofitting and Channel Rehabilitation in Areas of Existing Development

Each Copermittee must develop and implement a program to retrofit areas of existing development to reduce the discharge of pollutants in storm water from the MS4 to the MEP and effectively prohibit non-storm water discharges into its MS4, and rehabilitate channels and/or receiving waters to restore impaired beneficial uses of streams within its jurisdiction, as feasible.

(1) Each Copermittee must identify areas of existing development as candidates for retrofitting, and channels and/or receiving waters ~~in areas of existing development~~ as candidates for rehabilitation within its jurisdiction, as feasible. Areas of existing development must be selected based on a likelihood that retrofitting and channel rehabilitation will address the highest water quality priorities identified in the Water Quality Improvement Plan prepared pursuant to Provision B.

(2) Each Copermittee must evaluate and rank the areas of existing development identified pursuant to Provisions E.5.a and E.5.b.(1) for retrofitting and channel rehabilitation. The evaluation must include an assessment of those areas where pollutant removal from storm water and effective prohibition of non-storm water discharges through retrofitting existing development will provide the most benefit to water quality. The evaluation must also include an assessment of the channels and/or receiving waters within its jurisdiction where ~~channel~~ rehabilitation will improve beneficial uses of streams within or immediately downstream of the Copermittee's jurisdiction. Data collected during the implementation of the Water Quality Improvement Plan must be used to inform each area assessment and rank determination.

(3) Each Copermittee must ~~implement~~ prioritize for implementation retrofit and channel rehabilitation projects that address the highest water quality priorities identified in the Water Quality Improvement Plan pursuant to Provision B.3.a. The Copermittee ~~must~~ should encourage private landowners to implement retrofit designs, at a minimum through the use of public education and outreach~~and channel rehabilitation projects whenever practical. Private~~

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~~landowners should be encouraged through the Copermittee's use of subsidies, penalties, or other incentives~~.

(4) Each Copermittee must evaluate the flood management and flood control devices and structures in its inventory to determine if it is feasible to retrofit the device or structure, to provide additional pollutant removal from storm water. A Copermittee must consider the highest water quality priorities identified in their Water Quality Improvement Plan as part of each assessment. Evaluation of facilities can occur as a part of routine maintenance of these facilities.

(5) Where retrofitting and channel rehabilitation within specific areas of existing development under the Copermittees jurisdiction are determined to be infeasible to restore and protect receiving waters from the highest water quality priorities identified in the Water Quality Improvement Plan, each Copermittee may~~ust~~ identify, develop, and prioritize for implementation regional retrofitting and channel rehabilitation projects (i.e. projects that can receive and/or treat storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment) adjacent to and/or downstream of the areas of existing development. The Copermittees may collaborate and cooperate with each other to develop regional retrofitting and channel rehabilitation projects. The Copermittees are also encouraged to partner with existing efforts in other Watershed Management Areas, and the Integrated Regional Water Management (IRWM) Groups in San Diego County, South Orange County, and Southwest Riverside County.

(6) Upon Regional Board Executive Officer approval the Copermittees may reallocate resources in the WQIPs for retrofit and rehabilitation project(s).

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c. Existing Development BMP Implementation and Maintenance

(1) Pollution Prevention

Each Copermittee must ~~require~~ promote the use of pollution prevention methods by the inventoried existing development through public outreach.

(2) Designate BMPs

Each Copermittee must designate a minimum set of BMPs required for all inventoried existing development with the reasonable potential to discharge pollutant loads from their MS4, including special event venues~~, that have the potential to generate pollutants~~. The designated minimum BMPs must be specific to facility types and pollutant-generating activities, as appropriate.

(3) BMP Implementation

Each Copermittee must implement, or require the implementation of, designated BMPs at inventoried existing development that have the reasonable potential to ~~generate~~ discharge pollutants loads into~~from~~ the~~ir~~ MS4s. A Copermittee must require additional pollution prevention measures and enhanced BMPs at inventoried existing development that discharges pollutants identified as contributing to the highest water quality priorities in the Water Quality Improvement Plan.

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(4) BMP Operation and Maintenance

Each Copermittee must operate and maintain, or require the operation and maintenance of designated BMPs at all inventoried existing development that have been identified by the Copermittee as having the reasonable potential to discharge pollutant loads into~~from~~ the~~ir~~ MS4.

(a) Each Copermittee must implement a schedule of operation and maintenance activities for its MS4 and related structures (including but not limited to catch basins, storm drain inlets, detention basins, etc.), and verify proper operation of all its municipal structural treatment controls designed to reduce pollutants (including floatables) in storm water discharges to or from its MS4s and related drainage structures.

(b) Each Copermittee must implement procedures during the operation and maintenance of public streets, unpaved roads, paved roads, and paved highways and freeways, conducted under their authority and within their jurisdiction, that will reduce the contribution of storm water pollutants to the MEP and effectively prohibit the discharge of non-storm water pollutants from the MS4 to receiving water bodies. During maintenance of unpaved roads, each Copermittee must examine the feasibility of replacing existing culverts or designing new culverts/bridge crossings to maintain natural stream geomorphology.

(c) Each Copermittee must implement controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers. Copermittees that operate both a municipal sanitary sewer system and a MS4 must implement controls and measures to prevent and eliminate seeping sewage from infiltrating the MS4. Copermittees that do not operate both a municipal sanitary sewer system and a MS4 must keep themselves informed of relevant and appropriate maintenance activities and sanitary sewage projects in their jurisdiction that may cause or contribute to seepage of sewage into the MS4.

(5) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must implement procedures, or require the implementation of procedures, to reduce the contribution of pollutants in storm water to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from inventoried existing development~~ into and from the MS4s.~~ identified by the Copermittee as having the reasonable potential to discharge pollutant loads into ~~or from their~~ the MS4.~~-~~ The Copermittee must require additional pollution prevention measures and enhanced BMPs at inventoried existing development that discharges pesticides, herbicides, or fertilizers identified as contributing to the highest water quality priorities in the Water Quality Improvement Plan. Such BMPs must include, as appropriate educational

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activities, permits, certifications and other measures for applicators and distributors.

d. EXISTING DEVELOPMENT INSPECTIONS

Each Copermittee must conduct inspections of inventoried existing development that have been identified by the Copermittee as having the reasonable potential to discharge pollutant loads ~~from their~~into the MS4 to ensure compliance with applicable local ordinances and permits, and the requirements of this Order.

(1) Inspection Frequency

(a) Each Copermittee must establish appropriate inspection frequencies for inventoried existing development based on the priorities set forth in the Water Quality Improvement Plan, and the potential for discharging pollutants via storm water and non-storm water discharge~~runoff~~. At a minimum, inventoried existing municipal, industrial, commercial, and residential-association development ~~that has been~~ identified by the Copermittee as having the reasonable potential to discharge pollutant loads from their MS4 must be inspected once during the permit term~~every five years~~. Effective self-certification or third-party inspection programs may be utilized for this purpose. Inventoried existing development must also be inspected within ~~six~~ twelve months ~~of any change in property ownership or~~ after any redevelopment or land use change associated with a potential ~~change~~ increase in pollutant generating activity. The frequency of inspection at inventoried existing development must be appropriate to ensure that applied BMPs are sufficient to reduce the discharge of pollutants in storm water from the MS4 to the MEP and effectively prohibit non-storm water discharges to the MS4.

(b) Inventoried existing development must be inspected, as needed, in response to valid public complaints and findings from the Copermittee's municipal and contract staff inspections.

(c) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e. re-inspection, enforcement) necessary to ensure compliance with its applicable local ordinances and permits, the most current jurisdictional runoff management program document, the Water Quality Improvement Plan, and the requirements of this Order.

(2) Inspection Content

Inspections of existing development by the Copermittee must include, at a minimum:

(a) Assessment of compliance with its applicable local ordinances and

permits related to non-storm water and storm water discharges and runoff;

(b) Assessment of the implementation, maintenance and effectiveness of the designated minimum and/or enhanced BMPs;

(c) Verification of coverage under the Industrial General Permit (NOI and/or WDID number), when applicable;

(d) Visual observations of actual non-storm water discharges, if present;

(e) Visual observations of actual or potential discharge of pollutants, if present;

(f) Visual observations of actual or potential illicit connections if present; and

(g) If any violations are found and BMP enhancements are needed, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried existing development. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must be sufficiently detailed in order to determine compliance with the requirements of this Order and any progress made towards addressing the highest water quality priorities identified in the Water Quality Improvement Plan. Inspection records must include, at a minimum:

(a) Existing development name and location (address and hydrologic subarea);

(b) Inspection and re-inspection date(s);

(c) Weather conditions during inspection;

(d) Description and photo documentation of problems observed with BMPs and indication of need for BMP addition/repair/replacement and any scheduled re-inspection, and date of re-inspection;

(e) Verification of compliance with designated BMPs, as applicable~~Description of actions to reduce pollutants in storm water runoff to the MEP and actions to effectively prohibit non-storm discharges into the MS4 at the inventoried existing development~~;

~~(f) Photo documentation of observed actions or BMPs to reduce pollutants in storm water runoff to the MEP and actions to effectively prohibit non-storm~~

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~~discharges into the storm drain;~~

~~If the facility, area, and/or activity has been designated or identified as a contributor to the highest water quality priorities identified in the Water Quality Improvement Plan, then the inspection report must include a description of any specific or additional actions taken to reduce or eliminate the contribution of the facility, area, and/or activity to the highest water quality priorities;~~

~~(g)~~(f) Descriptions of any other specific inspection comments which must, at a minimum, include rationales for longer compliance time;

~~(h)~~(g) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

~~(i)~~(h) Resolution of problems noted and date problems fixed.

e. EXISTING DEVELOPMENT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried existing development identified by the Copermittees as having the reasonable potential to discharge pollutant loads from the MS4 within their jurisdiction, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

6. Enforcement Response Plans

Comment [A4]: The OC Copermittees are offering alternative language for this section – see attachment for Enforcement Response Plans
In lieu of the alternative language – the proposed revisions are provided below.

Each Copermittee must develop and implement an Enforcement Response Plan as part of its jurisdictional runoff management program document. The Enforcement Response Plan must include the protocols for progressively stricter responses, including timeframes allowed for corrections of problems, and for various field violation scenarios. Copermittees may continue to utilize and implement established, equivalent guidelines and procedures for enforcement . The Enforcement Response Plan must include, at a minimum, the following requirements:

a. ILLICIT DISCHARGE DETECTION AND ELIMINATION ENFORCEMENT COMPONENT

The Enforcement Response Plan must describe required enforcement actions to eliminate non-storm water discharges and illicit discharges or connections to the Copermittee's MS4.

(1) The Enforcement Response Plan must include a definition of "high level enforcement" for non-storm water discharges and illicit discharges or connections. "High level enforcement" for non-storm water discharges and illicit discharges or connections may be defined differently for construction

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sites, municipal, commercial, industrial, and residential areas of existing development.

(2) Non-storm water discharges and illicit discharges or connections must be addressed with an escalating series of enforcement actions as follows:

(a) If the non-storm water discharge or~~and~~ illicit discharge or connection is a source of pollutants contributing to the highest water quality priorities identified in the Water Quality Improvement Plan, then ~~high level~~ enforcement actions must begin at a high level ~~immediately issued~~, and subsequent high level enforcement actions must continue to escalate, as necessary, to compel the elimination of the discharge or connection as soon as possible; or

(b) If the non-storm water discharge and illicit discharge or connection is not a source of pollutants contributing to the highest water quality priorities identified in the Water Quality Improvement Plan, then escalating enforcement actions must be issued, and enforcement actions must result in the elimination of the discharge or connection as quickly as the Copermittee's available resources allow.

(3) If the Copermittee identifies the source, and the source is a controllable non-storm water discharge (i.e. anthropogenically influenced) or a controllable illicit discharge or connection, then the Copermittee must implement the following:

(a) Immediately enforce its legal authority, or notify the entity with applicable legal authority, to eliminate controllable sources of non-storm water and illicit discharges or connections upon identifying the source; and

(b) For controllable sources of non-storm water discharges and illicit discharges or connections that cannot be eliminated immediately upon identification, the discharge or connection must be eliminated in a timely manner with the goal of eliminating the discharge or connection within 10 business days after the source is identified. If more than 10 business days are required to eliminate the discharge or connection, a rationale must be recorded in the electronic database or equivalent tabular system used to track the investigations of non-storm water and illicit discharges and connections.

(4) If the Copermittee identifies the source as a non-storm water discharge to or from the MS4 that is in exceedance of NALs developed pursuant to Provision C.1, and in violation or threatened violation of an existing separate NPDES permit (e.g. the groundwater dewatering NPDES permit), then the Copermittee must report, within three business days, the findings to the San Diego Water Board including all pertinent information regarding the

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discharger and discharge characteristics.

b. DEVELOPMENT PROJECTS ENFORCEMENT COMPONENT

The Enforcement Response Plan must describe required enforcement actions to compel compliance with the Copermittee's BMP Design Manual requirements for development projects.

(1) The Enforcement Response Plan must include a definition of "high level enforcement" for development projects.

(2) The enforcement process must include appropriate sanctions to compel compliance with requirements of the Copermittee's BMP Design Manual or this Order. Sanctions must include, at a minimum, the following tools or their equivalent:

(a) Non-monetary penalties;

(b) Fines;

(c) Bonding requirements;

(d) Administrative and criminal penalties;

(e) Liens; and

(f) Permit or occupancy denials.

(3) Occupancy must be denied until a development project is in full compliance with the Copermittee's BMP Design Manual requirements. Documentation of full compliance with the Copermittee's BMP Design Manual requirements must be recorded in the electronic database or equivalent tabular system used to track development projects.

(4) Violations or other non-compliance that contribute or potentially contribute to the highest water quality priorities identified in the Water Quality Improvement Plan must be issued high level enforcement actions. High level enforcement actions must continue to escalate, as necessary, to compel compliance as soon as possible.

(5) For violations of ~~permanent~~ treatment control and structural LID BMP maintenance requirements, all violations must be corrected in a timely manner with the goal of correcting them before the next rain event but no longer than 3~~1~~0 ~~business~~ calendar days after the violations are discovered. If more than 3~~1~~0 ~~business~~ calendar days are required for compliance, a rationale must be recorded in the electronic database or equivalent tabular system used to track treatment control and structural LID ~~permanent~~ BMP

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inspections.

c. Construction / Existing Development Enforcement Component

The Enforcement Response Plan must describe required enforcement actions to compel compliance with its permits and applicable local ordinances, and the requirements of this Order, at construction sites and areas of existing development.

(1) The Enforcement Response Plan must include a definition of "high level enforcement" for construction sites and areas of existing development. "High level enforcement" may be defined differently for construction sites, municipal, commercial, industrial, and residential areas of existing development.

(2) The enforcement process must include, at a minimum, appropriate sanctions to compel compliance, such as:

(a) Verbal and written notices of violation;

(b) Cleanup requirements;

(c) Fines;

(d) Bonding requirements;

(e) Administrative and criminal (if intentional or negligent) penalties;

(f) Liens;

(g) Stop work orders; and

(h) Permit and occupancy denials.

(3) Violations or other non-compliance that contribute or potentially contribute to the highest water quality priorities identified in the Water Quality Improvement Plan must be issued high level enforcement actions. High level enforcement actions must continue to escalate, as necessary, to compel compliance as soon as possible.

(4) All violations must be corrected in a timely manner with the goal of correcting them before the next rain event but no longer than 3~~1~~0 ~~business~~ calendar days after the violations are discovered. If more than 3~~1~~0 calendar~~business~~ days are required for compliance, then a rationale must be recorded in the electronic database or equivalent tabular system used to track construction site and existing development inspections.

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d. REPORTING OF NON-COMPLIANT SITES

(1) Each Copermittee must notify the San Diego Water Board in writing within 48 hours of issuing high level enforcement (as defined in the Copermittee's Enforcement Response Plan) to a construction site that significantly impacts ~~poses a significant threat to~~ water quality as a result of violations or other non-compliance with its permits and applicable local ordinances, and the requirements of this Order. Written notification may be provided electronically in email form.

(2) Each Copermittee must notify the San Diego Water Board of non-filers under the Industrial General Permit and Construction General Permit by email to Nonfilers_R9@waterboards.ca.gov.

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7. Public Education and Participation

a. Each Copermittee must implement a public education and participation program, as appropriate, to promote and encourage the development of programs, management practices, control techniques and systems, design and engineering methods, and behaviors that reduce the discharge of pollutants in storm water to the MEP, prevent controllable non-storm water discharges from entering the MS4, and protect water quality standards in receiving waters. The public education program must include, at a minimum, the following:

(1) Educational activities, public information activities, and other appropriate outreach activities intended to reduce the pollutants of concern associated with ~~the application of pesticides, herbicides and fertilizer in~~ storm water discharges ~~to and~~ from its MS4 to the MEP. Activities shall be determined and prioritized by the Copermittees by jurisdiction and/or watershed to address the highest water quality issues of concern identified within the corresponding WQIP(s);

~~(2) Educational activities, public information activities, and other appropriate outreach activities to facilitate the proper management and disposal of used oil and toxic materials; and~~

~~(3)~~(2) Appropriate education and training measures for specific ~~construction site operators and other~~ target audiences, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed to address the highest water quality issues of concern identified within the corresponding WQIP(s).

b. Each Copermittee must incorporate a mechanism for public participation and where necessary intergovernmental coordination in updating, developing, and implementing its jurisdictional runoff management program.

8. Fiscal Analysis

a. Each Copermittee must secure the resources necessary to meet all the requirements of this Order.

b. Each Copermittee must conduct an annual fiscal analysis of their jurisdictional runoff management programs. ~~following:~~

The Copermittees must identify the various categories of expenditures necessary to implement the requirements of this Order, including a description of the specific items to be accounted for in each category of expenditures. For each category of expenditures, the fiscal analysis must include the following:

(1) The capital and operation and maintenance expenditures necessary to implement the requirements of this Order;
~~(2) The staff resources needed and allocated to meet the requirements of this~~

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~~Order, including any development, implementation, and enforcement activities required;~~

~~(3)~~(2) The estimated expenditures ~~for Provisions E.8.b.(1) and E.8.b.(1)(2)~~ during the reporting period~~, the preceding reporting period,~~ and the next reporting period; and

~~(4)~~(3) The source(s) of funds that are proposed to meet the necessary expenditures ~~described in Provisions E.8.b.(1) and E.8.b.(1)(2),~~ including legal restrictions on the use of such funds.

c. Each Copermittee must submit a summary of the annual fiscal analysis with each Annual Report required pursuant to Provision F.3.b.

d. Each Copermittee must provide the documentation used to develop the summary of the annual fiscal analysis upon request by the San Diego Water Board.

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F. REPORTING

The purpose of this provision is to determine and document compliance with the requirements set forth in this Order. The goal of this provision is to communicate to the San Diego Water Board and the people of the State of California the implementation status of each jurisdictional runoff management program and compliance with the requirements of this Order. This goal is to be accomplished through the submittal of specific deliverables to the San Diego Water Board by the Copermittees.

1. Water Quality Improvement Plans

The Copermittees for each Watershed Management Area must develop and submit a complete Water Quality Improvement Plan in accordance with the requirements of Provision B, no later than 18~~2~~ months after the adoption of, or enrollment under this Order for a 30 day public review and comment period. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of 30 days. Based on the comments received, the San Diego Water Board will determine whether to hold a public hearing or to limit public input to submittal of written comments. If no hearing is held the San Diego Water Board will notify the Copermittees that the Water Quality Improvement Plan has been accepted as complete following its review and determination that the Water Quality Improvement Plan meets the requirements of this Order. The San Diego Water Board shall notify the Copermittees within six (6) months of the submittal date. Water Quality Improvement Plans must be made available as~~on the Regional Clearinghouse~~ required pursuant to Provision F.4.

2. Updates

a. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATES

Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E. The update must be completed no later than 18~~2~~ months after the adoption of, or enrollment under, this Order. Updated jurisdictional runoff management program documents must be made available as ~~on the Regional Clearinghouse~~ required pursuant to Provision F.4. Subsequent updates may be submitted as part of the Annual Reports, and updated jurisdictional runoff management program documents must be made available ~~on the Regional Clearinghouse~~as required pursuant to Provision F.4.

Jurisdictional Runoff Management Program document updates that modify program elements from the requirements of Provision E must provide rationale for the modifications within the update documents.

b. ~~PERMANENT~~ TREATMENT CONTROL/STRUCTURAL LID BMP SIZING CRITERIA DESIGN MANUAL UPDATES

Each Copermittee must update its BMP Design Manual to incorporate the

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requirements of Provision E.3.d, as needed. The update must be completed no later than 18~~2~~ months after the adoption of, or enrollment under, this Order. Updated BMP Design Manuals must be made available as ~~on the Regional Clearinghouse~~ required pursuant to Provision F.4. Subsequent updates may be submitted as part of the Annual Reports. Updated BMP Design Manuals must be made available as required pursuant to Provision F.4~~on the Regional Clearinghouse~~.

BMP Design Manual updates that modify program elements from the requirements of Provision E must provide rationale for the modifications within the update documents.

c. WATER QUALITY IMPROVEMENT PLAN UPDATES

The Copermittees for each Watershed Management Area must submit updates to the Water Quality Improvement Plan as part of the Annual Reports. Updated Water Quality Improvement Plans must be made available as ~~on the Regional Clearinghouse~~ required pursuant to Provision F.4.

Water Quality Improvement Plan updates that modify program elements from the requirements of Provision E must provide rationale for the modifications within the update documents.

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3. Progress Reporting

a. PROGRESS REPORT PRESENTATIONS

The Copermittees for each Watershed Management Area must appear before the San Diego Water Board, as requested by the San Diego Water Board, to provide progress reports on the implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs.

b. ANNUAL REPORTS

(1) The Copermittees for each Watershed Management Area must submit an Annual Report for each reporting period, which begins July 1 and ends June 30 in the following year, no later than October 31 following the end of the reporting period. The first Annual Report must be prepared for the reporting period beginning July 1 after adoption of the permit, and upon San Diego Water Board's determination that ~~from the date the San Diego Water Board determines that~~ the Water Quality Improvement Plan meets the requirements of this Order to June 30 in the following year. Annual Reports must be made available ~~on the Regional Clearinghouse~~as required pursuant to Provision F.4. Each Annual Report must include the following:

(a) The jurisdictional and watershed monitoring data collected pursuant to Provisions D.1 and D.2, summarized and presented in tabular and

graphical form;

(b) Progress of the special studies required pursuant to Provisions D.2 and D.3, and the results or findings when a special study, or each phase of a special study, is completed;

(c) The findings from the assessments required pursuant to Provision D.4;

(d) The progress of implementing the Water Quality Improvement Plan, including, but not limited to, the following:

(i) The progress toward achieving the interim and final numeric ~~targets~~goals for the highest water quality priorities for the Watershed Management Area,

(ii) The water quality improvement strategies that were implemented and/or no longer implemented by each of the Copermittees during the reporting period and previous reporting periods, and are planned to be implemented during the next reporting period,

(iii) Previously proposed modifications or updates incorporated into the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document and implemented by the Copermittees in the Watershed Management Area, and

(iv) Proposed modifications or updates to the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document;

(e) A completed Jurisdictional Runoff Management Program Annual Report Form (Attachment D) for each Copermittee in the Watershed Management Area, certified by a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative.

(2) Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (Attachment D) no later than October 31 of each year until the first Annual Report is required to be submitted.

(3) Each Copermittee must provide any data or documentation utilized in developing the Annual Report upon request by the San Diego Water Board. Any monitoring data utilized in developing the Annual Report must be uploaded to the California Environmental Data Exchange Network

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(CEDEN).[23] Any monitoring and assessment data utilized in developing the Annual Report must be provided as ~~on the Regional Clearinghouse~~ required pursuant to Provision F.4.

c. Regional Monitoring and Assessment Report

(1) The Copermittees must submit a Regional Monitoring and Assessment Report no later than 180 days in advance of the expiration date of this Order. The Regional Monitoring and Assessment Report may be submitted as part of the ROWD required pursuant to Provision F.5.b. The Copermittees must review the jurisdictional and watershed monitoring data, data analyses, and assessments required pursuant to Provision D.4, to assess the following:

(a) The beneficial uses of the receiving waters within the San Diego Region that are protected or must be restored;

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[23] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

(b) The progress toward restoring impacted beneficial uses in the receiving waters within the San Diego Region; and

(c) Pollutants or conditions of emerging concern that may impact beneficial uses in the receiving waters within the San Diego Region.

(2) The Regional Monitoring and Assessment Report must include recommendations for improving the implementation and assessment of the Water Quality Improvement Plans and jurisdictional runoff management programs, where feasible.

(3) Each Copermittee must provide any data or documentation utilized in developing the Regional Monitoring and Assessment Report upon request by the San Diego Water Board. Any monitoring and assessment data utilized in developing the Regional Monitoring and Assessment Report must be provided as ~~on the Regional Clearinghouse~~ required pursuant to Provision F.4.

4. ~~Regional Clearinghouse~~ Mechanism for Data and Information Sharing[24]

The Copermittees must identify and implement a mechanism to ~~develop, update, and maintain an internet-based Regional Clearinghouse that can be used to~~ store, disseminate, and share the Copermittees' Water Quality Improvement Plans, Annual Reports, jurisdictional runoff management program documents, monitoring data, special studies, and ~~any~~ other pertinent data or information generated by the Copermittees during the implementation of this Order. Monitoring data collected pursuant to Provision D must be uploaded to CEDEN~~,~~[25] ~~with links to the uploaded data available on the Regional Clearinghouse~~. ~~The Regional Clearinghouse may be linked to other internet-based data portals and databases where the original documents and data are stored.~~ ~~The Regional Clearinghouse~~Copermittees must make this information~~be~~ available and accessible to members of the public. The ~~Regional Clearinghouse~~mechanism for sharing Copermittee data and information must be developed and made available to the public no later than 18~~2~~ months after the adoption of this Order.

5. Report of Waste Discharge

a. The Orange County Copermittees and the Riverside County Copermittees, are required to submit a complete ROWD pursuant to the requirements of their

[24] The Copermittees may elect to develop and maintain the clearinghouse(s) provided by other Copermittees or agencies.

[25] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

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current Orders and are enrolled under this Order upon expiration of their current Orders. Upon expiration of their current Orders, the Copermittees in each county must comply with the requirements of this Order by July 1 after enrollment under this Order, unless early enrollment is granted pursuant to Provision F.6 of this Order. The current Orders for the Orange County Copermittees and Riverside County Copermittees are rescinded upon their expiration date except for enforcement purposes.

b. The Copermittees must submit to the San Diego Water Board a complete ROWD as an application for the re-issuance of this NPDES permit. The ROWD must be submitted no later than 180 days in advance of the expiration date of this Order. The Copermittees may elect to develop and submit the ROWD individually or collaboratively. The ROWD must contain the following minimum information:

(1) Names and addresses of the Copermittees;

(2) Names and titles of the primary contacts of the Copermittees;

(3) Proposed changes to the Copermittees' Water Quality Improvement Plans and the supporting justification;

(4) Proposed changes to the Copermittees' jurisdictional runoff management programs and the supporting justification;

(5) Any other information necessary for the re-issuance of this Order; and

(6) Any other information required by federal regulations for NPDES permit reissuance.

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6. Application for Early Enrollment

a. The Orange County Copermittees, collectively, or Riverside County Copermittees, collectively, may apply for early enrollment under this Order by submitting a Report of Waste Discharge Form 200 for each individual Copermittee in the respective county, with a written request for early enrollment under this Order that certifies the following conditions have been met:

(1) A Water Quality Improvement Plan has been developed in accordance with the requirements of Provision B, which can and will be implemented immediately upon enrollment under this Order;

(2) Each Copermittee in the county has updated its jurisdictional runoff management program document to incorporate the requirements of Provision E, which can and will be implemented immediately upon enrollment under this Order; and

(3) Each Copermittee in the county has updated its BMP Design Manual to incorporate the requirements of Provision E.3.d, which can and will be implemented immediately upon enrollment under this Order.

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b. The San Diego Water Board will review the application for early enrollment and associated documents for completeness. A Notice of Enrollment (NOE) under this Order will be issued to the Copermittees in the respective county by the San Diego Water Board upon completion of the early enrollment application requirements. The effective enrollment date will be specified in the NOE and the Copermittees in the respective county are authorized to have MS4 discharges pursuant to the requirements of this Order starting on the date specified in the NOE. The existing Order for that county is rescinded upon the effective enrollment date specified in the NOE except for enforcement purposes.

7. Reporting Provisions

Each Copermittee must comply with all the reporting and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

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G. PRINCIPAL WATERSHED COPERMITTEE RESPONSIBILITIES

1. The Copermittees within each Watershed Management Area must designate a Principal Watershed Copermittee and notify the San Diego Water Board of the name of the Principal Watershed Copermittee. ~~An individual Copermittee should not be designated a Principal Watershed Copermittee for more than two Watershed Management Areas.~~ The notification may be submitted with the Water Quality Improvement Plan required pursuant to Provision F.1 of this Order.

2. The Principal Watershed Copermittee is responsible for, at a minimum, the following:

a. Serving as liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues, and when necessary and appropriate, representing the Copermittees in the Watershed Management Area before the San Diego Water Board.

b. Facilitating the development of the Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order

c. Coordinating the submittal of the deliverables required by Provisions F.1, F.2, F.3.a, and F.3.b of this Order.

d. Coordinating and developing, with the other ~~Principal Watershed~~ Copermittees, the requirements of Provisions F.3.c, F.4, and F.5.b of this Order.

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H. MODIFICATION OF PROGRAMS

1. Modifications of the Order may be initiated by the San Diego Water Board or by the Copermittees. Requests by Copermittees must be made to the San Diego Water Board.

2. Minor modifications to the Order may be made by the San Diego Water Board where the proposed modification complies with all the prohibitions and limitations, and other requirements of this Order.

3. Proposed modifications outside of the WQIP process that are not minor require amendment of this Order in accordance with this Order's rules, policies, and procedures.

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I. STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

Each Copermittee must comply with all the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

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ADMINISTRATIVE DRAFT

ATTACHMENT A

DISCHARGE PROHIBITIONS

1. Basin Plan Waste Discharge Prohibitions

California Water Code Section 13243 provides that a Regional Water Board, in a water quality control plan, may specify certain conditions or areas where the discharge of waste or certain types of waste is not permitted. The following waste discharge prohibitions in the Water Quality Control Plan for the San Diego Basin (Basin Plan) are applicable to any person, as defined by Section 13050(c) of the California Water Code, who is a citizen, domiciliary, or political agency or entity of California whose activities in California could affect the quality of waters of the state within the boundaries of the San Diego Region.

1. The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in California Water Code Section 13050, is prohibited.

2. The discharge of waste to land, except as authorized by waste discharge requirements or the terms described in California Water Code Section 13264 is prohibited.

3. The discharge of pollutants or dredged or fill material to waters of the United States except as authorized by a National Pollutant Discharge Elimination System (NPDES) permit or a dredged or fill material permit (subject to the exemption described in California Water Code Section 13376) is prohibited.

4. Discharges of recycled water to lakes or reservoirs used for municipal water supply or to inland surface water tributaries thereto are prohibited, unless this San Diego Water Board issues a NPDES permit authorizing such a discharge; the proposed discharge has been approved by the State Department of Health Services (DHS) and the operating agency of the impacted reservoir; and the discharger has an approved fail-safe long-term disposal alternative.

5. The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the San Diego Water Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

6. The discharge of waste in a manner causing flow, ponding, or surfacing on lands not owned or under the control of the discharger is prohibited, unless the discharge is authorized by the San Diego Water Board.

7. The dumping, deposition, or discharge of waste directly into waters of the state, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the San Diego Water Board.

8. Any discharge to a storm water conveyance system that is not composed entirely of "*storm water*" is prohibited unless authorized by the San Diego Water Board. [The federal regulations, 40 CFR 122.26(b)(13), define storm water as storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from fire fighting activities.] [§122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

9. The unauthorized discharge of treated or untreated sewage to waters of the state or to a storm water conveyance system is prohibited.

10. The discharge of industrial wastes to conventional septic tank/subsurface disposal systems, except as authorized by the terms described in California Water Code Section 13264, is prohibited.

11. The discharge of radioactive wastes amenable to alternative methods of disposal into the waters of the state is prohibited.

12. The discharge of any radiological, chemical, or biological warfare agent into waters of the state is prohibited.

13. The discharge of waste into a natural or excavated site below historic water levels is prohibited unless the discharge is authorized by the San Diego Water Board.

14. The discharge of sand, silt, clay, or other earthen materials from any activity, including land grading and construction, in quantities which cause deleterious bottom deposits, turbidity or discoloration in waters of the state or which unreasonably affect, or threaten to affect, beneficial uses of such waters is prohibited.

15. The discharge of treated or untreated sewage from vessels to Mission Bay, Oceanside Harbor, Dana Point Harbor, or other small boat harbors is prohibited.

16. The discharge of untreated sewage from vessels to San Diego Bay is prohibited.

17. The discharge of treated sewage from vessels to portions of San Diego Bay that are less than 30 feet deep at mean lower low water (MLLW) is prohibited.

18. The discharge of treated sewage from vessels, which do not have a properly functioning US Coast Guard certified Type I or Type II marine sanitation device, to portions of San Diego Bay that are greater than 30 feet deep at mean lower low water (MLLW) is prohibited.

2. Attachment B to State Water Board Resolution 2012-~~001X~~ 0012

Copermittees that discharge into Areas of Special Biological Significance must comply with State Water Board Resolution No. 2012-0012.

~~**Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges**~~

~~I. PROVISIONS FOR POINT SOURCE DISCHARGES OF STORM WATER AND NONPOINT SOURCE WASTE DISCHARGES~~

~~The following terms, prohibitions, and special conditions (hereafter collectively referred to as special conditions) are established as limitations on point source storm water and nonpoint source discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in Areas of Special Biological Significance (ASBS), as required for State Water Quality Protection Areas pursuant to California Public Resources Code Sections 36700(f) and 36710(f). These Special Protections are adopted by the State Water Board as part of the California Ocean Plan (Ocean Plan) General Exception.~~

~~The special conditions are organized by category of discharge. The State Water Resources Control Board (State Water Board) and Regional Water Quality Control Boards (Regional Water Boards) will determine categories and the means of regulation for those categories [e.g., Point Source Storm Water National Pollutant Discharge Elimination System (NPDES) or Nonpoint Source].~~

~~**A. PERMITTED POINT SOURCE DISCHARGES OF STORM WATER**~~

~~1. General Provisions for Permitted Point Source Discharges of Storm Water~~

~~a. Existing storm water discharges into an ASBS are allowed only under the following conditions:~~

~~(1) The discharges are authorized by an NPDES permit issued by the State Water Board or Regional Water Board;~~

~~(2) The discharges comply with all of the applicable terms, prohibitions, and special conditions contained in these Special Protections; and~~

~~(3) The discharges:~~

~~(i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;~~

~~(ii) Are designed to prevent soil erosion;~~

~~(iii) Occur only during wet weather;~~

~~(iv) Are composed of only storm water runoff.~~

~~b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.~~

c. The discharge of trash is prohibited. Minimize the discharge of trash to the maximum extent practicable over the course of the permit term.

d. Only discharges from existing storm water outfalls are allowed. Any proposed or new storm water runoff discharge shall be routed to existing storm water discharge outfalls and shall not result in any new contribution of waste to an ASBS (i.e., no additional pollutant loading). "Existing storm water outfalls" are those that were constructed or under construction prior to January 1, 2005. "New contribution of waste" is defined as any addition of waste beyond what would have occurred as of January 1, 2005. A change to an existing storm water outfall, in terms of re-location or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges are prohibited except as provided below:

(1) The term "non-storm water discharges" means any waste discharges from a municipal separate storm sewer system (MS4) or other NPDES permitted storm drain system to an ASBS that are not composed entirely of storm water.

(2) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability or occur naturally:

(i) Discharges associated with emergency fire fighting operations.

(ii) Foundation and footing drains.

(iii) Water from crawl space or basement pumps.

(iv) Hillside dewatering.

(v) Naturally occurring groundwater seepage via a storm drain.

(vi) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.
Rising ground waters.
Springs.
Flows from riparian habitats and wetlands.
Discharges from potable water sources.
Uncontaminated pumped groundwater.
Water line flushing.
Water main breaks.

(3) Authorized non-storm water discharges shall not have a reasonable potential to cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

2. Compliance Plans for Inclusion in Storm Water Management Plans (SWMP) and Storm Water Pollution Prevention Plans (SWPPP).

~~The discharger shall specifically address the prohibition of non-storm water runoff and the goal of~~requirement to ~~maintaining~~ natural water quality for storm water discharges to an ASBS in an ASBS Compliance Plan to be included in its SWMP or a SWPPP, as appropriate to permit type. If a statewide permit includes a SWMP, then the discharger shall prepare a stand-alone compliance plan for ASBS discharges . The ASBS Compliance Plan is subject to approval by the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (for permits issued by Regional Water Boards).

a. The Compliance Plan shall include a map of surface drainage of storm water runoff, showing areas of sheet runoff, prioritize discharges, and describe any structural Best Management Practices (BMPs) already employed and/or BMPs to be employed in the future. Priority discharges are those that pose the greatest water quality threat and which are identified to require installation of structural, non-structural, and/or source BMPs, as feasible. The map shall also show the storm water conveyances in relation to other features such as service areas, sewage conveyances and treatment facilities, landslides, areas prone to erosion, and waste and hazardous material storage areas, if applicable. The SWMP or SWPPP shall also include a procedure for updating the map and plan when changes are made to the storm water conveyance facilities.

b. The ASBS Compliance Plan shall describe the measures by which all non-authorized non-storm water runoff (e.g., dry weather flows) has been reduced and/or preventedeliminated, how these measures will be maintained over time, and how these measures are monitored and documented.

c. For Municipal Separate Storm Sewer System (MS4s), the ASBS Compliance Plan shall require minimum inspection frequencies as follows:

(1) The minimum inspection frequency for construction sites shall be weekly during rainy season;

(2) The minimum inspection frequency for industrial facilities shall be monthly during the rainy season;

(3) The minimum inspection frequency for commercial facilities (e.g., restaurants) shall be twice during the rainy season; and

(4) Storm water outfall drains equal to or greater than 18 inches (457 mm) in diameter or width shall be inspected once prior to the beginning of the rainy season and once during the rainy season and maintained to remove trash and other anthropogenic debris.

d. The ASBS Compliance Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff, that are necessary to comply with these special conditions, will be achieved through BMPs. Structural, non-structural, and/or source control BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that such installation would pose a threat to health or safety. BMPs to control storm water runoff discharges (at the end-of-pipe) during a design storm shall be

~~designed to the maximum extent practicable. achieve on average the following target levels:~~

~~(1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or~~

~~(2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges. The baseline for the reduction is the effective date of the Exception. The baseline for these determinations is the effective date of the Exception, and the reductions must be achieved and documented within four (4) years of the effective date.~~

~~e. The ASBS Compliance Plan shall address erosion control and the prevention of anthropogenic sedimentation in ASBS. The natural habitat conditions in the ASBS shall not be altered as a result of anthropogenic sedimentation.~~

~~f. The ASBS Compliance Plan shall describe the non-structural BMPs currently employed and planned in the future (including those for construction activities), and include an implementation schedule. The ASBS Compliance Plan shall include non structural BMPs that address public education and outreach. Education and outreach efforts must adequately inform the public that direct discharges of pollutants from private property not entering an MS4 are prohibited. The ASBS Compliance Plan shall also describe the structural BMPs, including any low impact development (LID) measures, currently employed and planned for higher threat discharges and include an implementation schedule. To control storm water runoff discharges (at the end-of-pipe) during a design storm, permittees must first consider using LID practices to infiltrate, use, or evapotranspirate storm water runoff on-site.~~

~~g. The BMPs and implementation schedule shall be designed to ensure with the goal that natural water quality conditions in the receiving water are achieved and maintained by either reducing flows from impervious surfaces or reducing pollutant loading, or some combination thereof.~~

~~h. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and Regional Water Board within 30 days of receiving the results.~~

~~(1) The report shall identify the constituents in storm water runoff that alter natural ocean water quality and the sources of these constituents.~~

~~(2) The report shall describe BMPs that are currently being implemented, BMPs that are identified in the SWMP or SWPPP for future implementation, and any additional BMPs that may be added to the SWMP or SWPPP to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the BMPs.~~

~~(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits), the discharger shall revise its ASBS Compliance Plan to incorporate any new or modified BMPs that have been or will be implemented, the implementation schedule, and any additional monitoring required.~~

(4) As long as the discharger has complied with the procedures described above and is implementing the revised SWMP or SWPPP, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural ocean water quality conditions due to the same constituent.

(5) Compliance with this section does not excuse violations of any term, prohibition, or condition contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all Discharger shall obtain the legal authority necessary to prevent and eliminate non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within one year from the effective date of the Exception, the discharger shall submit a written ASBS Compliance Plan to the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that describes its strategy to comply with these special conditions, including the requirement goal to maintain natural water quality in the affected ASBS. The ASBS Compliance Plan shall include a time schedule to implement appropriate non-structural and structural controls (implementation schedule) to comply with these special conditions for inclusion in the discharger's SWMP or SWPPP, as appropriate to permit type.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these special conditions shall be implemented.

d. Within four (4) years of the effective date of the Exception, any structural controls identified in the ASBS Compliance Plan that are necessary to comply with these special conditions shall be operational.

e. Within four (4) years of the effective date of the Exception, all dischargers must implement non-structural and/or structural BMPs to assist in meeting the goal comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water, pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data, and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to

~~this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.~~

~~The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:~~

~~(1) for municipalities, a demonstration of significant hardship to discharger ratepayers, by showing the relationship of storm water fees to annual household income for residents within the discharger's jurisdictional area, and the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or~~
~~(2) for other governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process.~~

~~**B. NONPOINT SOURCE DISCHARGES**~~

~~*[NOT INCLUDED]*~~
~~*[PROVISIONS FOR NONPOINT SOURCE DISCHARGES NOT APPLICABLE]*~~

~~II. ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES~~

~~*[NOT INCLUDED]*~~
~~*[ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES NOT APPLICABLE]*~~

~~III. ADDITIONAL REQUIREMENTS – WATERFRONT AND MARINE OPERATIONS~~

~~*[NOT INCLUDED]*~~
~~*[ADDITIONAL REQUIREMENTS FOR WATERFRONT AND MARINE OPERATIONS NOT APPLICABLE]*~~

~~IV. MONITORING REQUIREMENTS~~

~~Monitoring is mandatory for all dischargers to assure compliance with the Ocean Plan. Monitoring requirements include both: (A) core discharge monitoring, and (B) ocean receiving water monitoring. The State and Regional Water Boards must approve sampling site locations and any adjustments to the monitoring programs. All ocean receiving water and reference area monitoring must be comparable with the Water Boards' Surface Water Ambient Monitoring Program (SWAMP).~~

~~Safety concerns: Sample locations and sampling periods must be determined considering safety issues. Sampling may be postponed upon notification to the State and Regional Water Boards if hazardous conditions prevail.~~

~~Analytical Chemistry Methods: All constituents must be analyzed using the lowest minimum detection limits comparable to the Ocean Plan water quality objectives. For metal analysis, all samples, including storm water effluent, reference samples, and ocean receiving water samples, must be analyzed by the approved analytical method with the lowest minimum detection limits (currently Inductively Coupled Plasma/Mass Spectrometry) described in the Ocean Plan.~~

~~**A. CORE DISCHARGE MONITORING PROGRAM**~~

~~1. General sampling requirements for timing and storm size:~~

~~Runoff must be collected during a storm event that is greater than 0.1 inch and generates runoff, and at least 72 hours from the previously measurable storm event. Runoff samples shall be collected when post storm receiving water is sampled, and analyzed for the same constituents as receiving water and reference site samples (see section IV B) as described below.~~

~~2. Runoff flow measurements~~

~~a. For municipal/industrial storm water outfalls in existence as of December 31, 2007, 18 inches (457mm) or greater in diameter/width (including multiple outfall pipes in combination having a width of 18 inches, runoff flows must be measured or calculated, using a method acceptable to and approved by the State and Regional Water Boards.~~
~~b. This will be reported annually for each precipitation season to the State and Regional Water Boards.~~

~~3. Runoff samples – storm events~~

~~a. For outfalls equal to or greater than 18 inches (0.46m) in diameter or width:~~

~~(1) samples of storm water runoff shall be analyzed during the same storm as receiving water samples for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination, ; and~~

~~(2) samples of storm water runoff shall be analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS~~

~~(3) If an applicant has no outfall greater than 36 inches, then storm water runoff from the applicant's largest outfall shall be further analyzed during the same storm as receiving water samples for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates).~~

~~b. For outfalls equal to or greater than 36 inches (0.91m) in diameter or width:~~

~~(1) samples of storm water runoff shall be analyzed during the same storm as receiving water samples for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and~~

~~(2) samples of storm water runoff shall be further analyzed during the same storm as receiving water samples for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates) and~~

~~(3) samples of storm water runoff shall be analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.~~

~~c. For an applicant not participating in a regional monitoring program [see below in Section IV (B)] in addition to (a.) and (b.) above, a minimum of the two largest outfalls or 20 percent of the larger outfalls, whichever is greater, shall be sampled (flow weighted composite samples) at least three times annually during wet weather (storm event) and analyzed for all Ocean Plan Table A constituents, Table B constituents for marine aquatic life protection (except for toxicity, only chronic toxicity for three species shall be required), DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, and Ocean Plan indicator bacteria. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one (the largest) such discharge shall be sampled annually in each Region.~~

~~4. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may reduce or suspend core monitoring once the storm runoff is fully characterized. This determination may be made at any point after the discharge is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.~~

~~**B. OCEAN RECEIVING WATER AND REFERENCE AREA MONITORING PROGRAM**~~

~~In addition to performing the Core Discharge Monitoring Program in Section II.A above, all applicants having authorized discharges must perform ocean receiving water monitoring. In order to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS, dischargers may choose either (1) an individual monitoring program, or (2) participation in a regional integrated monitoring program.~~

~~1. Individual Monitoring Program: The requirements listed below are for those dischargers who elect to perform an individual monitoring program to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within the affected ASBS. In addition to Core Discharge Monitoring, the following additional monitoring requirements shall be met:~~

~~a. Three times annually, during wet weather (storm events), the receiving water at the point of discharge from the outfalls described in section (IV)(A)(3)(c) above shall be sampled and analyzed for Ocean Plan Table A constituents, Table B constituents for marine~~

~~aquatic life, DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, salinity, chronic toxicity (three species), and Ocean Plan indicator bacteria.~~

~~The sample location for the ocean receiving water shall be in the surf zone at the point of discharges; this must be at the same location where storm water runoff is sampled. Receiving water shall be sampled at approximately the same time prior to (pre-storm) and during (or immediately after) the same storm (post storm). Reference water quality shall also be sampled and analyzed for the same constituents pre-storm and post-storm, during the same storms when receiving water is sampled. Reference stations will be determined by the State Water Board's Division of Water Quality and the applicable Regional Water Board(s).~~

~~b. Sediment sampling shall occur at least three times during every five (5) year period. The subtidal sediment (sand or finer, if present) at the discharge shall be sampled and analyzed for Ocean Plan Table B constituents for marine aquatic life, DDT, PCBs, PAHs, pyrethroids, and OP pesticides. For sediment toxicity testing, only an acute toxicity test using the amphipod Eohaustorius estuarius must be performed.~~

~~c. A quantitative survey of intertidal benthic marine life shall be performed at the discharge and at a reference site. The survey shall be performed at least once every five (5) year period. The survey design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The results of the survey shall be completed and submitted to the State Water Board and Regional Water Board at least six months prior to the end of the permit cycle.~~

~~d. Once during each five (5) year period, a bioaccumulation study shall be conducted to determine the concentrations of metals and synthetic organic pollutants at representative discharge sites and at representative reference sites. The study design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The bioaccumulation study may include California mussels (Mytilus californianus) and/or sand crabs (Emerita analoga or Blepharipoda occidentalis). Based on the study results, the Regional Water Board and the State Water Board's Division of Water Quality, may adjust the study design in subsequent permits, or add or modify additional test organisms (such as shore crabs or fish), or modify the study design appropriate for the area and best available sensitive measures of contaminant exposure.~~

~~e. Marine Debris: Representative quantitative observations for trash by type and source shall be performed along the coast of the ASBS within the influence of the discharger's outfalls. The design, including locations and frequency, of the marine debris observations is subject to approval by the Regional Water Board and State Water Board's Division of Water Quality.~~

~~f. The monitoring requirements of the Individual Monitoring Program in this section are minimum requirements. After a minimum of one (1) year of continuous water quality monitoring of the discharges and ocean receiving waters, the Executive Director of the State Water Board (statewide permits) or Executive officer of the Regional Water Board (Regional Water Board permits) may require additional monitoring, or adjust, reduce or suspend receiving water and reference station monitoring. This determination may be made at any point after the discharge and receiving water is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.~~

2. ~~Regional Integrated Monitoring Program: Dischargers may elect to participate in a regional integrated monitoring program, in lieu of an individual monitoring program, to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS. This regional approach shall characterize natural water quality, pre- and post-storm, in ocean reference areas near the mouths of identified open space watersheds and the effects of the discharges on natural water quality (physical, chemical, and toxicity) in the ASBS receiving waters, and should include benthic marine aquatic life and bioaccumulation components. The design of the ASBS stratum of a regional integrated monitoring program may deviate from the otherwise prescribed individual monitoring approach (in Section IV.B.1) if approved by the State Water Board's Division of Water Quality and the Regional Water Boards.~~

   a. ~~Ocean reference areas shall be located at the drainages of flowing watersheds with minimal development (in no instance more than 10% development), and shall not be located in CWA Section 303(d) listed waterbodies or have tributaries that are 303(d) listed. Reference areas shall be free of wastewater discharges and anthropogenic non-storm water runoff. A minimum of low threat storm runoff discharges (e.g. stream highway overpasses and campgrounds) may be allowed on a case-by-case basis. Reference areas shall be located in the same region as the ASBS receiving water monitoring occurs. The reference areas for each Region are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean reference water samples must be collected from each station, each from a separate storm. A minimum of one reference location shall be sampled for each ASBS receiving water site sampled per responsible party. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.~~

   b. ~~ASBS ocean receiving water must be sampled in the surf zone at the location where the runoff makes contact with ocean water (i.e. at "point zero"). Ocean receiving water stations must be representative of worst case discharge conditions (i.e. co-located at a large drain greater than 36 inches, or if drains greater than 36 inches are not present in the ASBS then the largest drain greater than18 inches.) Ocean receiving water stations are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean receiving water samples must be collected during each storm season from each station, each from a separate storm. A minimum of one receiving water location shall be sampled in each ASBS per responsible party in that ASBS. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.~~

   c. ~~Reference and receiving water sampling shall commence during the first full storm season following the adoption of these special conditions, and post-storm samples shall be collected when annual storm water runoff is sampled. Sampling shall occur in a minimum of two storm seasons. For those ASBS dischargers that have already participated in the Southern California Bight 2008 ASBS regional monitoring effort, sampling may be limited to only one storm season.~~

   d. ~~Receiving water and reference samples shall be analyzed for the same constituents as storm water runoff samples. At a minimum, constituents to be sampled and analyzed in~~

~~reference and discharge receiving waters must include oil and grease, total suspended solids, Ocean Plan Table B metals for protection of marine life, Ocean Plan PAHs, pyrethroids, OP pesticides, ammonia, nitrate, phosphates, and critical life stage chronic toxicity for three species. In addition, within the range of the southern sea otter, indicator bacteria or some other measure of fecal contamination shall be analyzed.~~

~~3. Waterfront and Marine Operations: In addition to the above requirements for ocean receiving water monitoring, additional monitoring must be performed for marinas and boat launch and pier facilities:~~

~~a. For all marina or mooring field operators, in mooring fields with 10 or more occupied moorings, the ocean receiving water must be sampled for Ocean Plan indicator bacteria, residual chlorine, copper, zinc, grease and oil, methylene blue active substances (MBAS), and ammonia nitrogen.~~

~~(1) For mooring field operators opting for an individual monitoring program (Section IV.B.1 above), this sampling must occur weekly (on the weekend) from May through October.~~

~~(2) For mooring field operators opting to participate in a regional integrated monitoring program (Section IV.B.2 above), this sampling must occur monthly from May through October on a high use weekend in each month. The Water Boards may allow a reduction in the frequency of sampling, through the regional monitoring program, after the first year of monitoring.~~

~~b. For all mooring field operators, the subtidal sediment (sand or finer, if present) within mooring fields and below piers shall be sampled and analyzed for Ocean Plan Table B metals (for marine aquatic life beneficial use), acute toxicity, PAHs, and tributyltin. For sediment toxicity testing, only an acute toxicity test using the amphipod Eohaustorius estuarius must be performed. This sampling shall occur at least three times during a five (5) year period. For mooring field operators opting to participate in a regional integrated monitoring program, the Water Boards may allow a reduction in the frequency of sampling after the first sampling effort's results are assessed.~~

ADMINISTRATIVE DRAFT

ATTACHMENT B

STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

1. Standard Permit Provisions

Code of Federal Regulations Title 40 Section 122.41 (40 CFR 122.41) includes conditions, or provisions, that apply to all National Pollutant Discharge Elimination System (NPDES) permits. Additional provisions applicable to NPDES permits are in 40 CFR 122.42. All applicable provisions in 40 CFR 122.41 and 40 CFR 122.42 must be incorporated into this Order and NPDES permit. The applicable 40 CFR 122.41 and 40 CFR 122.42 provisions are as follows:

a. DUTY TO COMPLY [40 CFR 122.41(a)]

The Copermittee must comply with all of the provisions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

(1) The Copermittee must comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement. [40 CFR 122.41(a)(1)]

(2) The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to a civil penalty not to exceed $25,000 per day for each violation. The CWA provides that any person who *negligently* violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than 2 years, or both. Any person who *knowingly* violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both. Any person who knowingly violates Section 301, 302, 303, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, and who knows at that time that he thereby places another person in imminent danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of

not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.
[40 CFR 122.41(a)(2)]

(3) Any person may be assessed an administrative penalty by the San Diego Regional Water Quality Control Board (San Diego Water Board), State Water Resources Control Board (State Water Board), or United States Environmental Protection Agency (USEPA) for violating Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.
[40 CFR 122.41(a)(3)]

b. DUTY TO REAPPLY [40 CFR 122.41(b)]

If a Copermittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Copermittee must apply for and obtain a new permit.

c. NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE [40 CFR 122.41(c)]

It shall not be a defense for a Copermittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

d. DUTY TO MITIGATE [40 CFR 122.41(d)]

The Copermittee must take all reasonable steps to minimize or prevent any discharge or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

e. PROPER OPERATION AND MAINTENANCE [40 CFR 122.41(e)]

The Copermittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Copermittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by a Copermittee only when the operation is necessary to achieve compliance with the conditions of this permit.

f. PERMIT ACTIONS [40 CFR 122.41(f)]

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Copermittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

g. PROPERTY RIGHTS [40 CFR 122.41(g)]

This permit does not convey any property rights of any sort, or any exclusive privilege.

h. DUTY TO PROVIDE INFORMATION [40 CFR 122.41(h)]

The Copermittee must furnish to the San Diego Water Board, State Water Board, or USEPA within a reasonable time, any information which the San Diego Water Board, State Water Board, or USPEA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Copermittee must also furnish to the San Diego Water Board, State Water Board, or USPEA upon request, copies of records required to be kept by this permit.

i. INSPECTION AND ENTRY [40 CFR 122.41(i)]

The Copermittee must allow the San Diego Water Board, State Water Board, USEPA, and/or their authorized representative (including an authorized contractor acting as their representative), upon presentation of credentials and other documents as may be required by law, to:

(1) Enter upon the Copermittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit; [40 CFR 122.41(i)(1)]

(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit; [40 CFR 122.41(i)(2)]

(3) Inspect and photograph at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; [40 CFR 122.41(i)(3)] and

(4) Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location. [40 CFR 122.41(i)(4)]

j. MONITORING AND RECORDS [40 CFR 122.41(j)]

(1) Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity. [40 CFR 122.41(j)(1)]

(2) Except for records of monitoring information required by this permit related to the Copermittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five (5) years (or longer as required by 40 CFR Part 503), the

Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time. [40 CFR 122.41(j)(2)]

(3) Records for monitoring information must include: [40 CFR 122.41(j)(3)]

(a) The date, exact place, and time of sampling or measurements; [40 CFR 122.41(j)(3)(i)]
(b) The individual(s) who performed the sampling or measurements; [40 CFR 122.41(j)(3)(ii)]
(c) The date(s) analyses were performed; [40 CFR 122.41(j)(3)(iii)]
(d) The individual(s) who performed the analyses; [40 CFR 122.41(j)(3)(iv)]
(e) The analytical techniques or methods used; [40 CFR 122.41(j)(3)(v)] and
(f) The results of such analyses. [40 CFR 122.41(j)(3)(vi)]

(4) Monitoring must be conducted according to test procedures under 40 CFR Part 136 unless another method is required under 40 CFR Subchapters N or O. [40 CFR 122.41(j)(4)]

In the case of pollutants for which there are no approved methods under 40 CFR Part 136 or otherwise required under 40 CFR Subchapters N and O, monitoring must be conducted according to a test procedure specified in the permit for such pollutants. [40 CFR 122.44(i)(1)(iv)]

(5) The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. [40 CFR 122.41(j)(5)]

k. SIGNATORY REQUIREMENT [40 CFR 122.41(k)]

(1) All applications, reports, or information submitted to the San Diego Water Board, State Water Board, or USEPA must be signed and certified. (See 40 CFR 122.22) [40 CFR 122.41(k)(1)]

(a) *For a municipality, State, Federal, or other public agency.* [All applications must be signed] [b]y either a principal executive officer or ranking elected official. [40 CFR 122.22(a)(3)]

(b) All reports required by permits, and other information requested by the San Diego Water Board, State Water Board, or USEPA must be signed by a person described in paragraph (a) of this section, or by a duly authorized representative of that person. A person is a duly authorized representative only if: [40 CFR 122.22(b)]

(i) The authorization is made in writing by a person described in paragraph (a) of this section; [40 CFR 122.22(b)(1)]

(ii) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company, (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) [40 CFR 122.22(b)(2)] and,

(iii) The written authorization is submitted to the San Diego Water Board and State Water Board. [40 CFR 122.22(b)(3)]

(c) *Changes to authorization.* If an authorization under paragraph (b) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (b) of this section must be submitted to the San Diego Water Board prior to or together with any reports, information, or applications to be signed by an authorized representative. [40 CFR 122.22(c)]

(d) *Certification.* Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." [40 CFR 122.22(d)]

(2) The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both. [40 CFR 122.41(k)(2)]

I. REPORTING REQUIREMENTS [40 CFR 122.41(l)]

(1) *Planned changes.* The Copermittee must give notice to the San Diego Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when: [40 CFR 122.41(l)(1)]

(a) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); [40 CFR 122.41(l)(1)(i)] or

(b) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which

are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1). [40 CFR 122.41(l)(1)(ii)]

(c) The alteration or addition results in a significant change in the Copermittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. [40 CFR 122.41(l)(1)(iii)]

(2) *Anticipated noncompliance*. The Copermittee must give advance notice to the San Diego Water Board or State Water Board of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements. [40 CFR 122.41(l)(2)]

(3) *Transfers*. This permit is not transferable to any person except after notice to the San Diego Water Board. The San Diego Water Board may require modification or revocation and reissuance of the permit to change the name of the Copermittee and incorporate such other requirements as may be necessary under the CWA. [40 CFR 122.41(l)(3)]

(4) *Monitoring reports.* Monitoring results must be reported at the intervals specified elsewhere in this permit. [40 CFR 122.41(l)(4)]

(a) Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the San Diego Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices. [40 CFR 122.41(l)(4)(i)]

(b) If the Copermittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or another method required for an industry-specific waste stream under 40 CFR Subchapters N or O, the results of this monitoring must be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the San Diego Water Board or State Water Board. [40 CFR 122.41(l)(4)(ii)]

(c) Calculations for all limitations which require averaging of measurements must utilize an arithmetic mean unless otherwise specified in the permit. [40 CFR 122.41(l)(4)(iii)]

(5) *Compliance schedules*. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date. [40 CFR 122.41(l)(5)]

(6) *Twenty-four hour reporting.*

(a) The Copermittee must report any noncompliance that may endanger health or the environment. Any information must be provided orally within 24 hours from

the time the Copermittee becomes aware of the circumstances. A written submission must also be provided within five (5) days of the time the Copermittee becomes aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6)(i)]

(b) The following must be included as information which must be reported within 24 hours under this paragraph: [40 CFR 122.41(l)(6)(ii)]

(i) Any unanticipated bypass that exceeds any effluent limitation in the permit (See 40 CFR 122.41(g)). [40 CFR 122.41(l)(6)(ii)(A)]

(ii) Any upset which exceeds any effluent limitation in the permit. [40 CFR 122.41(l)(6)(ii)(B)] and,

(iii) Violation of a maximum daily discharge limitation for any of the pollutants listed by the San Diego Water Board in the permit to be reported within 24 hours. (See 40 CFR 122.44(g)) [40 CFR 122.41(l)(6)(ii)(C)]

(c) The San Diego Water Board may waive the above-required written report on a case-by-case basis if the oral report has been received within 24 hours. [40 CFR 122.41(l)(6)(iii)]

(7) *Other noncompliance.* The Copermittee must report all instances of noncompliance not reported in accordance with the standard provisions required under 40 CFR 122.41(l)(4), (5), and (6), at the time monitoring reports are submitted. The reports must contain the information listed in the standard provisions required under 40 CFR 122.41(l)(6). [40 CFR 122.41(l)(7))]

(8) *Other information.* When the Copermittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the San Diego Water Board, State Water Board, or USEPA, the Copermittee must promptly submit such facts or information. [40 CFR 122.41(l)(8)]

~~**m. BYPASS** [40 CFR 122.41(m)]~~

~~(1) *Definitions.*~~

~~(a) "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. [40 CFR 122.41(m)(1)(i)] or~~

~~(b) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production. [40 CFR 122.41(m)(1)(ii)]~~

~~(2) *Bypass not exceeding limitations*. The Copermittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the standard provisions required under 40 CFR 122.41(m)(3) and (4). [40 CFR 122.41(m)(2)]~~

~~(3) *Notice*.~~

~~(a) *Anticipated bypass*. If the Copermittee knows in advance of the need for a bypass, it must submit a notice, if possible at least ten days before the date of the bypass. [40 CFR 122.41(m)(3)(i)] or~~

~~(b) *Unanticipated bypass*. The Copermittee must submit notice of an unanticipated bypass in accordance with the standard provisions required under 40 CFR 122.41(l)(6) (24 hour notice). [40 CFR 122.41(m)(3)(ii)]~~

~~(4) *Prohibition of Bypass*.~~

~~(a) Bypass is prohibited, and the San Diego Water Board may take enforcement action against a Copermittee for bypass, unless: [40 CFR 122.41(m)(4)(i)]~~

~~(i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; [40 CFR 122.41(m)(4)(i)(A)]~~

~~(ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; [40 CFR 122.41(m)(4)(i)(B)] and,~~

~~(iii) The Copermittee submitted notice in accordance with the standard provisions required under 40 CFR 122.41(m)(3). [40 CFR 122.41(m)(4)(i)(C)]~~

~~(b) The San Diego Water Board may approve an anticipated bypass, after considering its adverse effects, if the San Diego Water Board determines that it will meet the three conditions listed above. [40 CFR 122.41(m)(4)(ii)]~~

~~n.~~**m. UPSET** [40 CFR 122.41(n)]

(1) *Definition.* "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Copermittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. [40 CFR 122.41(n)(1)]

(2) *Effect of an upset*. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the standard provisions required under 40 CFR 122.41(n)(3) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. [40 CFR 122.41(n)(2)]

(3) *Conditions necessary for a demonstration of upset*. A Copermittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that: [40 CFR 122.41(n)(3)]

(a) An upset occurred and that the Copermittee can identify the cause(s) of the upset; [40 CFR 122.41(n)(3)(i)]
(b) The permitted facility was at the time being properly operated; [40 CFR 122.41(n)(3)(ii)] and
(c) The Copermittee submitted notice of the upset in accordance with the standard provisions required under 40 CFR 122.41(l)(6)(ii)(B) (24-hour notice). [40 CFR 122.41(n)(3)(iii)]
(d) The Copermittee complied with any remedial measures pursuant to the standard provisions required under 40 CFR 122.41(d). [40 CFR 122.41(n)(3)(iii)]

(4) *Burden of proof*. In any enforcement proceeding, the Copermittee seeking to establish the occurrence of an upset has the burden of proof. [40 CFR 122.41(n)(4)]

~~o.~~n. **STANDARD PERMIT PROVISIONS FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS**
[40 CFR 122.42(c)]

The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the San Diego Water Board or State Water Board under 40 CFR 122.26(a)(1)(v) must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report must include:

(1) The status of implementing the components of the storm water management program that are established as permit conditions; [40 CFR 122.42(c)(1)]

(2) Proposed changes to the storm water management programs that are established as permit conditions. Such proposed changes must be consistent with 40 CFR 122.26(d)(2)(iii); [40 CFR 122.42(c)(2)] and

(3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under 40 CFR 122.26(d)(2)(iv) and (v); [40 CFR 122.42(c)(3)]

(4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; [40 CFR 122.42(c)(4)]

(5) Annual expenditures and budget for year following each annual report;

[40 CFR 122.42(c)(5)]

(6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; [40 CFR 122.42(c)(6)]

(7) Identification of water quality improvements or degradation. [40 CFR 122.42(c)(7)]

~~p.~~o. **STANDARD PERMIT PROVISIONS FOR STORM WATER DISCHARGES** [40 CFR 122.42(d)]

The initial permits for discharges composed entirely of storm water issued pursuant to 40 CFR 122.26(e)(7) must require compliance with the conditions of the permit as expeditiously as practicable, but in no event later than three years after the date of issuance of the permit.

2. General Provisions

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. The general provisions applicable to this Order and NPDES permit are as follows:

a. DISCHARGE OF WASTE IS A PRIVILEGE

No discharge of waste into the waters of the State, whether or not such discharge is made pursuant to waste discharge requirements, shall create a vested right to continue such discharge. All discharges of waste into waters of the State are privileges, not rights. [CWC Section 13263(g)]

b. DURATION OF ORDER AND NPDES PERMIT

(1) *Effective date*. This Order and NPDES permit becomes effective on the date of its adoption provided the USEPA has no objection. If the USEPA objects to its issuance, this Order shall not become effective until such objection is withdrawn. This Order supersedes Order No. R9-2007-0001 upon the effective date of this Order, and supercedes Order Nos. R9-2009-0002 and R9-2010-0016 upon their expiration.

(2) *Expiration*. This Order and NPDES permit expires five years after adoption. [40 CFR 122.46(a)]

(3) *Continuation of expired order*. After this Order and NPDES permit expires, the terms and conditions of this Order and NPDES permit are automatically continued pending issuance of a new permit if all requirements of the federal NPDES regulations on the continuation of expired permits (40 CFR 122.6) are complied with.

c. AVAILABILITY

A copy of this Order must be kept at a readily accessible location and must be available to on-site personnel at all times.

ATTACHMENT B: STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS
2. General Provisions

d. CONFIDENTIALITY OF INFORMATION

Except as provided for in 40 CFR 122.7, no information or documents submitted in accordance with or in application for this Order will be considered confidential, and all such information and documents shall be available for review by the public at the San Diego Water Board office.

Claims of confidentiality for the following information will be denied: [40 CFR 122.7(b)]

(1) The name and address of any permit applicant or Copermittee; [40 CFR 122.7(b)(1)] and

(2) Permit applications and attachments, permits, and effluent data. [40 CFR 122.7(b)(2)]

e. EFFLUENT LIMITATIONS

(1) *Interim effluent limitations*. The Copermittee must comply with any interim effluent limitations as established by addendum, enforcement action, or revised waste discharge requirements which have been, or may be, adopted by the San Diego Water Board.

(2) *Other effluent limitations and standards*. If any applicable toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant and that standard or prohibition is more stringent than any limitation on the pollutant in the permit, the San Diego Water Board shall institute proceedings under these regulations to modify or revoke and reissue the permit to conform to the toxic effluent standard or prohibition. [40 CFR 122.44(b)(1)]

f. DUTY TO MINIMIZE OR CORRECT ADVERSE IMPACTS

The Copermittee must take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this Order, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the noncompliance.

g. PERMIT ACTIONS

The filing of a request by the Copermittee for modification, revocation and reissuance, or termination of this Order, or a notification of planned change in or anticipated noncompliance with this Order does not stay any condition of this Order. (See 40 CFR 122.41(f)) In addition, the following provisions apply to this Order:

(1) Upon application by any affected person, or on its own motion, the San Diego Water Board may review and revise the requirements in this Order. All requirements must be reviewed periodically. [CWC Section 13263(e)]

(2) This Order may be terminated or modified for cause, including, but not limited to, all of the following: [CWC Section 13381]

(a) Violation of any condition contained in the requirements of this Order. [CWC Section 13381(a)]

(b) Obtaining the requirements in this Order by misrepresentation, or failure to disclose fully all relevant facts. [CWC Section 13381(b)]

(c) A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge. [CWC Section 13381(c)]

(3) When this Order is transferred to a new owner or operator, such requirements as may be necessary under the CWC may be incorporated into this Order.

h. NPDES PERMITTED NON-STORM WATER DISCHARGES

The San Diego Water Board has, in prior years, issued a limited number of individual NPDES permits for non-storm water discharges to MS4s. The San Diego Water Board or State Water Board may in the future, upon prior notice to the Copermittee(s), issue an NPDES permit for any non-storm water discharge (or class of non-storm water discharges) to an MS4.

i. MONITORING

In addition to the standard provisions required under 40 CFR 122.41(j) and (l)(4), the following general monitoring provisions apply to this Order:

(1) Where procedures are not otherwise specified in Order, sampling, analysis and quality assurance/quality control must be conducted in accordance with the Quality Assurance Management Plan (QAMP) for the State of California's Surface Water Ambient Monitoring Program (SWAMP), adopted by the State Water Resources Control Board (State Water Board).

(2) Pursuant to 40 CFR 122.41(j)(2) and CWC Section 13383(a), each Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five (5) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time.

(3) All chemical, bacteriological, and toxicity analyses must be conducted at a laboratory certified for such analyses by the California Department of Public Health or a laboratory approved by the San Diego Water Board.

(4) For priority toxic pollutants that are identified in the California Toxics Rule (CTR) (65 Fed. Reg. 31682), the Copermittees must instruct their laboratories to establish calibration standards that are equivalent to or lower than the Minimum Levels (MLs) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP). If a Copermittee can demonstrate that a particular ML is not attainable, in accordance

with procedures set forth in 40 CFR Part 136, the lowest quantifiable concentration of the lowest calibration standard analyzed by a specific analytical procedure (assuming that all the method specified sample weights, volumes, and processing steps have been followed) may be used instead of the ML listed in Appendix 4 of the SIP. The Copermittee must submit documentation from the laboratory to the San Diego Water Board for approval prior to raising the ML for any priority toxic pollutant.

j. ENFORCEMENT

(1) The San Diego Water Board is authorized to enforce the terms of this Order under several provisions of the CWC, including, but not limited to, CWC Sections 13385, 13386, and 13387.

(2) Nothing in this Order shall be construed to protect the Copermittee from its liabilities under federal, state, or local laws.

(3) The CWC provides for civil and criminal penalties comparable to, and in some cases greater than, those provided for under the CWA.

(4) Except as provided in the standard conditions required under 40 CFR 122.41(m) and (n), nothing in this Order shall be construed to relieve the Copermittee from civil or criminal penalties for noncompliance.

(5) Nothing in this Order shall be construed to preclude the institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties to which the Copermittee is or may be subject to under Section 311 of the CWA.

(6) Nothing in this Order shall be construed to preclude institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authoring preserved by Section 510 of the CWA.

k. SEVERABILITY

The provisions of this Order are severable, and if any provision of this Order, or the application of any provisions of this Order to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this Order shall not be affected thereby.

l. APPLICATIONS

Any application submitted by a Copermittee for reissuance or modification of this Order must satisfy all applicable requirements specified in federal regulations as well as any additional requirements for submittal of a Report of Waste Discharge specified in the CWC and the California Code of Regulations.

m. IMPLEMENTATION

All plans, reports and subsequent amendments submitted in compliance with this Order must be implemented immediately (or as otherwise specified). All submittals by Copermittees must be adequate to implement the requirements of this Order.

n. REPORT SUBMITTALS

(1) All report submittals must include an executive summary, introduction, conclusion, recommendations, and signed certified statement.

(2) Each Copermittee must submit a signed certified statement covering its responsibilities for each applicable submittal.

(3) The Principal Watershed Copermittee(s) must submit a signed certified statement covering its responsibilities for each applicable submittal and the sections of the submittals for which it is responsible.

(4) Unless otherwise directed, the Copermittees must submit one hard copy and one electronic copy of each report required under this Order to the San Diego Water Board, and one electronic copy to the USEPA.

(5) The Copermittees must submit reports and provide notifications as required by this Order to the following:

EXECUTIVE OFFICER
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
9174 SKY PARK COURT, SUITE 100
SAN DIEGO CA 92123-4340
Telephone: (858) 467-2952 Fax: (858) 571-6972

EUGENE BROMLEY
US ENVIRONMENTAL PROTECTION AGENCY
REGION IX
PERMITS ISSUANCE SECTION (W-5-1)
75 HAWTHORNE STREET
SAN FRANCISCO CA 94105

ADMINISTRATIVE DRAFT

ATTACHMENT C

ACRONYMS AND ABBREVIATIONS

AMAL	Average Monthly Action Level
ASBS	Area(s) of Special Biological Significance
BMP	Best Management Practice
~~BMP Design Manual~~	~~Permanent BMP Sizing Criteria Design Manual~~
Basin Plan	Water Quality Control Plan for the San Diego Basin
CEQA	California Environmental Quality Act
CCR	California Code of Regulations
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWC	California Water Code
CZARA	Coastal Zone Act Reauthorization Amendments of 1990
ERP	Enforcement Response Plan
ESAs	Environmentally Sensitive Areas
GIS	Geographic Information System
IBI	Index of Biotic Integrity
LID	Low Impact Development
MDAL	Maximum Daily Action Level
MEP	Maximum Extent Practicable
ML	Minimum Level
MS4	Municipal Separate Storm Sewer System
NAL	Non-Storm Water Action Level
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
ROWD	Report of Waste Discharge (application for NPDES reissuance)
SAL	Storm Water Action Level
San Diego Water Board	California Regional Water Quality Control Board, San Diego Region
SIC	Standard Industrial Classification Code
State Water Board	State Water Resources Control Board
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
WDID	Waste Discharge Identification Number
WLA	Waste Load Allocation

WQBEL Water Quality Based Effluent Limitation

DEFINITIONS

Active/Passive Sediment Treatment - Using mechanical, electrical or chemical means to flocculate or coagulate suspended sediment for removal from runoff from construction sites prior to discharge.

Anthropogenic Litter – Trash generated from human activities, not including sediment.

Average Monthly Action Level – The highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month or the geometric mean for bacteria, as applicable.

Beneficial Uses - The uses of water necessary for the survival or well being of man, plants, and wildlife. These uses of water serve to promote tangible and intangible economic, social, and environmental goals. "Beneficial Uses" of the waters of the State that may be protected include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. Existing beneficial uses are uses that were attained in the surface or ground water on or after November 28, 1975; and potential beneficial uses are uses that would probably develop in future years through the implementation of various control measures. "Beneficial Uses" are equivalent to "Designated Uses" under federal law. [California Water Code Section 13050(f)].

Best Management Practices (BMPs) - Defined in 40 CFR 122.2 as schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. In the case of municipal ~~storm water~~discharge permits, BMPs may be used in place of numeric effluent limits.

Bioassessment - The use of biological community information to evaluate the biological integrity of a water body and its watershed. With respect to aquatic ecosystems, bioassessment is the collection and analysis of samples of the benthic macroinvertebrate community together with physical/habitat quality measurements associated with the sampling site and the watershed to evaluate the biological condition (i.e. biotic integrity) of a water body.

Biocriteria - Under the CWA, numerical values or narrative expressions that define a desired biological condition for a water body that are legally enforceable. The USEPA defines biocriteria as: "numerical values or narrative expressions that describe the reference biological integrity of aquatic communities inhabiting waters of a given designated aquatic life use… (that)…describe the characteristics of water body segments least impaired by human activities."

Biofiltration - Practices that use vegetation and amended soils to detain and treat runoff from impervious areas. Treatment is through filtration, infiltration, adsorption, ion exchange, and biological uptake of pollutants.

Biological Integrity - Defined in Karr J.R. and D.R. Dudley. 1981. Ecological perspective on water quality goals. *Environmental Management* 5:55-68 as: "A balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization

comparable to that of natural habitat of the region." Also referred to as ecosystem health.

BMP Design Manual – A plan developed to eliminate, reduce, or mitigate the impacts of runoff from development projects, including Priority Development Projects.

Channel Rehabilitation and Improvement –Remedial measures or activities for the purpose of improving or restoring the environmental health of streams, channels or river systems. Techniques may vary from in-stream restoration techniques to off-line stormwater management practices installed in the system corridor or upland areas. Rehabilitation techniques may include, but are not limited to the following: riparian zone restoration, constructed wetlands, bank stabilization, channel modifications, and daylighting of drainage systems. Effectiveness may be measured in various manners, including: assessments of habitat, reduced streambank erosion, and restoration of water and sediment transport balance.

Clean Water Act Section 303(d) Water Body - An impaired water body in which water quality does not meet applicable water quality standards and/or is not expected to meet water quality standards, even after the application of technology based pollution controls required by the CWA. The discharge of runoff to these water bodies by the Copermittees is significant because these discharges can cause or contribute to violations of applicable water quality standards.

Construction Site – Any project, including projects requiring coverage under the Construction General Permit, that involves soil disturbing activities including, but not limited to, clearing, grading, disturbances to ground such as stockpiling, and excavation.

Contamination - As defined in the Porter-Cologne Water Quality Control Act, contamination is "an impairment of the quality of waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste whether or not waters of the State are affected."

Copermittee – An incorporated city within the County of Orange, County of Riverside, or County of San Diego in the San Diego Region (Region 9), the County of Orange, the County of Riverside, the County of San Diego, the Orange County Flood Control District, the Riverside County Water Conservation and Flood Control District, the San Diego Regional Airport Authority, or the Unified Port District of San Diego.

Copermittees – All of the individual Copermittees, collectively.

Critical Channel Flow (Qc) – The channel flow that produces the critical shear stress that initiates bed movement or that erodes the toe of channel banks. When measuring Qc, it should be based on the weakest boundary material – either bed or bank.

Daily Discharge – Defined as either: (1) the total mass of the constituent discharged over the calendar day or any 24 hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g. concentration.)

The Daily Discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day, or other 24 hour period other than a day), or by the arithmetic mean of analytical results from one or more grab samples taken over the course of a

day.

Development Projects - Construction, rehabilitation, redevelopment, or reconstruction of any public or private ~~residential project, industrial, commercial, or any other~~ projects involving land disturbance activities.

Dry Season – The period of time from May 1 to September 30 ~~when rainfall is not expected to occur the San Diego~~.

Dry Weather – Weather is considered dry if the preceding 72 hours has been without measurable precipitation (> 0.1 inch).

Enclosed Bays – Enclosed bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost bay works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays do not include inland surface waters or ocean waters.

Erosion – When land is diminished or worn away due to wind, water, or glacial ice. Often the eroded debris (silt or sediment) becomes a pollutant via storm water runoff. Erosion occurs naturally but can be intensified by land clearing activities such as farming, development, road building, and timber harvesting.

Environmentally Sensitive Areas (ESAs) - Areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; areas designated as preserves or their equivalent under the Natural Communities Conservation Program within the Cities and County of Orange; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.

Estuaries – Waters, including coastal lagoons, located at the mouth of streams that serve as areas of mixing fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and ocean water. Estuaries do not include inland surface waters or ocean waters.

Existing Development – Any area that has been developed and exists for municipal, commercial, industrial, or residential purposes, uses, or activities. May include areas that are not actively used for its originally developed purpose, but may be re-purposed or redeveloped for another use or activity.

Flow Duration – The long-term period of time that flows occur above a threshold that causes significant sediment transport and may cause excessive erosion damage to creeks and streams (not a single storm event duration). The simplest way to visualize this is to consider a histogram of pre- and post-project flows using long-term records of hourly data. To maintain pre-development flow duration means that the total number of hours (counts) within each range of flows in a flow-duration histogram cannot increase between the pre- and post-development condition. Flow duration within the range of geomorphologically significant flows is important for

managing erosion.

Grading - The cutting and/or filling of the land surface to a desired slope or elevation.

Hazardous Material – Any substance that poses a threat to human health or the environment due to its toxicity, corrosiveness, ignitability, explosive nature or chemical reactivity. These also include materials named by the USEPA in 40 CFR 116 to be reported if a designated quantity of the material is spilled into the waters of the U.S. or emitted into the environment.

Hazardous Waste - Hazardous waste is defined as "any waste which, under Section 600 of Title 22 of this code, is required to be managed according to Chapter 30 of Division 4.5 of Title 22 of this code" [CCR Title 22, Division 4.5, Chapter 11, Article 1].

Household Hazardous Waste – Paints, cleaning products, and other wastes generated during home improvement or maintenance activities.

Hydromodification – The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, interflow and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

Illicit Connection – Any connection to the MS4 that conveys an illicit discharge.

Illicit Discharge - Any discharge to the MS4 that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from fire fighting activities [40 CFR 122.26(b)(2)].

Inactive Areas – Areas of construction activity that are not active and those that have been active and are not scheduled to be re-disturbed for at least 14 days.

Infiltration – Water other than wastewater that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow [40 CFR 35.2005(20)]. In the context of low impact development, infiltration may also be defined as the percolation of water into the ground. Infiltration is often expressed as a rate (inches per hour), which is determined through an infiltration test.

Inland Surface Waters – Includes all surface waters of the ~~State~~ U.S. that do not include the ocean, enclosed bays, or estuaries.

Jurisdictional Runoff Management Program Document – A written description of the specific jurisdictional runoff management measures and programs that each Copermittee will implement to comply with this Order and ensure that storm water pollutant discharges in runoff are reduced to the MEP and do not cause or contribute to a violation of water quality standards.

Low Impact Development (LID) – A storm water management and land development strategy that emphasizes conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic

functions.

Low Impact Development Best Management Practices (LID BMPs) – LID BMPs include schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States through storm water management and land development strategies that emphasize conservation ~~s~~and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions. LID BMPs include retention practices that do not allow runoff, such as infiltration, rain water harvesting and reuse, and evapotranspiration. LID BMPs also include flow-through practices such as biofiltration that may have some discharge of storm water following pollutant reduction.

Major Outfall – As defined in the Code of Federal Regulations, a major outfall is a MS4 outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (i.e. discharge from a single conveyance other than a circular pipe which is associated with a drainage area of more than 50 acres); or, for MS4s that receive storm water from lands zoned for industrial activity (based on comprehensive zoning plans or equivalent), a MS4 outfall that discharges from a single pipe with an inside diameter of 12 inches or more or from its equivalent (i.e. discharge from other than a circular pipe associated with a drainage area of 2 acres or more).

Maximum Daily Action Level (MDAL) –The highest allowable daily discharge of a pollutant, over a calendar day (or 24 hour period). For pollutants with action levels expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with action levels expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

Maximum Extent Practicable (MEP) – The technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) for storm water that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) in combination with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than BAT. A definition for MEP is not provided either in the statute or in the regulations. Instead the definition of MEP is dynamic and will be defined by the following process over time: municipalities propose their definition of MEP by way of their runoff management programs. Their total collective and individual activities conducted pursuant to the runoff management programs becomes their proposal for MEP as it applies both to their overall effort, as well as to specific activities (e.g., MEP for street sweeping, or MEP for MS4 maintenance). In the absence of a proposal acceptable to the San Diego Water Board, the San Diego Water Board defines MEP.

In a memo dated February 11, 1993, entitled "Definition of Maximum Extent Practicable," Elizabeth Jennings, Senior Staff Counsel, SWRCB addressed the achievement of the MEP standard as follows:

> "*To achieve the MEP standard, municipalities must employ whatever Best Management Practices (BMPs) are technically feasible (i.e., are likely to be effective) and are not cost prohibitive. The major emphasis is on technical feasibility. Reducing pollutants to the MEP means choosing effective BMPs, and rejecting applicable BMPs only where other effective*

BMPs will serve the same purpose, or the BMPs would not be technically feasible, or the cost would be prohibitive. In selecting BMPs to achieve the MEP standard, the following factors may be useful to consider:

a. Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?
b. Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?
c. Public Acceptance: Does the BMP have public support?
d. Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?
e. Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc.?

The final determination regarding whether a municipality has reduced pollutants to the maximum extent practicable can only be made by the Regional or State Water Boards, and not by the municipal discharger. If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit derived, it would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs that would address a pollutant source, or to pick a BMP based solely on cost, which would be clearly less effective. In selecting BMPs the municipality must make a serious attempt to comply and practical solutions may not be lightly rejected. In any case, the burden would be on the municipal discharger to show compliance with its permit. After selecting a menu of BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented."

Monitoring Year – The monitoring year begins annually on July 1st and ends on June 30th.

Municipal Separate Storm Sewer System (MS4) – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designated or used for collecting or conveying storm water; (iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.26. Co-permittees need only comply with permit conditions relating to discharges from the municipal separate storm sewers for which they are operators." 40 CFR §122.21(a)(vi).

National Pollutant Discharge Elimination System (NPDES) - The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the CWA.

Non-Storm Water - All discharges to and from a MS4 that do not originate from precipitation

events (i.e., all discharges from a MS4 other than storm water). Non-storm water includes illicit discharges and NPDES permitted discharges.

Nuisance - As defined in the Porter-Cologne Water Quality Control Act, a nuisance is "anything which meets all of the following requirements: 1) Is injurious to health, or is indecent, or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. 2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. 3) Occurs during~~,~~ or as a result of~~,~~ the treatment or disposal of wastes."

Ocean Waters – the territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the State Board's California Ocean Plan.

Order – Unless otherwise specified, refers to this Order, Order No. R9-2012-0011 (NPDES No. CAS0109266)

~~**Permanent BMP Sizing Criteria Design Manual** – A plan developed to eliminate, reduce, or mitigate the impacts of runoff from development projects, including Priority Development Projects.~~

Person - A person is defined as an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof [40 CFR 122.2].

Point Source - Any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, landfill leachate collection systems, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

Pollutant - Any agent that may cause or contribute to the degradation of water quality such that a condition of pollution or contamination is created or aggravated.

Pollution - As defined in the Porter-Cologne Water Quality Control Act, pollution is "the alteration of the quality of the waters of the State by waste, to a degree that unreasonably affects the either of the following: 1) The waters for beneficial uses; or 2) Facilities that serve these beneficial uses." Pollution may include contamination.

Pollution Prevention - Pollution prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control BMPs, treatment control BMPs, or disposal.

Permanent BMPs - A subset of BMPs including structural and non-structural controls which detain, retain, filter, remove, or educate to prevent the release of pollutants to surface waters from development projects in perpetuity, after construction of a project is completed.

Pre-Development Runoff Conditions (Discharge Rates, Durations, Etc.) – Runoff conditions that existed onsite before the existing development was constructed, or exists onsite before planned development activities occur. ~~This definition includes natural watershed hydrology before any human induced land alterations.~~

Priority Development Projects - New development and redevelopment projects defined under Provision E.3.b of Order No. R9-2012-0011.

Properly Designed – Designed in accordance with the Copermittee's BMP design manual and/or any appropriate design requirements set forth by the Copermittee and based on widely accepted design criteria.

Rainy Season (aka Wet Season) – The period of time from October 1 to April 30 ~~when the San Diego Region experiences the most rainfall~~.

Receiving Waters – Waters of the United States.

Receiving Water Limitations - Waste discharge requirements issued by the San Diego Water Board typically include both: (1) "Effluent Limitations" (or "Discharge Limitations") that specify the technology-based or water-quality-based effluent limitations; and (2) "Receiving Water Limitations" that specify the water quality objectives in the Basin Plan as well as any other limitations necessary to attain those objectives. In summary, the "Receiving Water Limitations" provision is the provision used to implement the requirement of CWA section 301(b)(1)(C) that NPDES permits must include any more stringent limitations necessary to meet water quality standards.

Redevelopment - The creation, addition, and or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include trenching and resurfacing associated with utility work; parking lots; resurfacing existing roadways; cutting and reconfiguring of surface parking lots; new sidewalk construction, pedestrian ramps, or bike lane on existing roads; and routine replacement of damaged pavement, such as pothole repair.

Retain –Keep or hold in a particular place, condition, or position without discharge to surface waters.

Retrofit – Retrofit is defined as a stormwater management practice (usually structural) put into place after development has occurred in watersheds where practices previously did not exist or are ineffective. The purpose of retrofits is to improve water quality, protect downstream channels, reduce flooding, or meet other specific objectives. Some examples of retrofits include, but are not limited to the following: green roofs, downspout and impervious cover disconnection, permeable pavement, bioretention, rain barrels, rain gardens, vacant lot stabilization, trash area enclosures, additional trash and waste disposal containers.

Runoff - All flows in a storm water conveyance system that consists of the following components: (1) storm water (wet weather flows) and (2) non-storm water including dry weather flows.

San Diego Water Board – As used in this document the term "San Diego Water Board" is synonymous with the term "Regional Board" as defined in Water Code section 13050(b) and is intended to refer to the California Regional Water Quality Control Board for the San Diego

Region as specified in Water Code Section 13200.

Sediment - Soil, sand, and minerals washed from land into water. Sediment resulting from anthropogenic sources (i.e. human induced land disturbance activities) is considered a pollutant. This Order regulates only the discharges of sediment from anthropogenic sources and does not regulate naturally occurring sources of sediment. Sediment can destroy fish-nesting areas, clog animal habitats, and cloud waters so that sunlight does not reach aquatic plants.

Shared Treatment Control BMP - BMPs used by multiple developments to infiltrate, filter, or treat the required volume or flow prior to discharge to a receiving water. This could include, for example, a treatment BMP at the end of an enclosed storm drain that collects runoff from several commercial developments.

Source Control BMP – Land use or site planning practices, or structural or nonstructural measures that aim to prevent runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between pollutants and runoff.

State Water Quality Protection Area – A nonterrestrial marine or estuarine area designated to protect marine species or biological communities from an undesirable alteration in natural water quality, including, but not limited to, areas of special biological significance that have been designated by the State Water Board through its water quality control planning process. Areas of special biological significance are a subset of State Water Quality Protection Areas, and require special protection as determined by the State Water Resources Control Board pursuant to the California Ocean Plan adopted and reviewed pursuant to Article 4 (commencing with Section 13160) of Chapter 3 of Division 7 of the California Water Code and pursuant to the Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California (California Thermal Plan) adopted by the State Water Board.

Storm Water – Per 40 CFR 122.26(b)(13), means storm water runoff, snowmelt runoff and surface runoff and drainage. ~~Surface runoff and drainage pertains to runoff and drainage resulting from precipitation events.~~

Structural BMP – Any structural control which detains, retains, or filters, to reduce the release of pollutants to surface waters from development projects (e.g. treatment control BMPs) which remains after construction.

Total Maximum Daily Load (TMDL) - The maximum amount of a pollutant that can be discharged into a water body from all sources (point and non-point) and still maintain water quality standards. Under CWA section 303(d), TMDLs must be developed for all water bodies that do not meet water quality standards after application of technology-based controls.

Toxicity - Adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies). The water quality objectives for toxicity provided in the Basin Plan, state in part…"All waters shall be free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life….The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge".

Treatment Control BMP – Any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media absorption or any other physical, biological, or chemical process.

Unpaved Road – Any long, narrow stretch without pavement used for traveling by motor passenger vehicles between two or more points. Unpaved roads are generally constructed of dirt, gravel, aggregate or macadam and may be improved or unimproved.

Waste - As defined in CWC Section 13050(d), "waste includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal."

Article 2 of CCR Title 23, Chapter 15 (Chapter 15) contains a waste classification system that applies to solid and semi-solid waste, which cannot be discharged directly or indirectly to water of the state and which therefore must be discharged to land for treatment, storage, or disposal in accordance with Chapter 15. There are four classifications of waste (listed in order of highest to lowest threat to water quality): hazardous waste, designated waste, non-hazardous solid waste, and inert waste.

Water Quality Objective - Numerical or narrative limits on constituents or characteristics of water designated to protect designated beneficial uses of the water. [California Water Code Section 13050 (h)]. California's water quality objectives are established by the State and Regional Water Boards in the Water Quality Control Plans. Numeric or narrative limits for pollutants or characteristics of water designed to protect the beneficial uses of the water. In other words, a water quality objective is the maximum concentration of a pollutant that can exist in a receiving water and still generally ensure that the beneficial uses of the receiving water remain protected (i.e., not impaired). Since water quality objectives are designed specifically to protect the beneficial uses, when the objectives are violated the beneficial uses are, by definition, no longer protected and become impaired. This is a fundamental concept under the Porter Cologne Act. Equally fundamental is Porter Cologne's definition of pollution. A condition of pollution exists when the water quality needed to support designated beneficial uses has become unreasonably affected or impaired; in other words, when the water quality objectives have been violated. These underlying definitions (regarding beneficial use protection) are the reason why all waste discharge requirements implementing the federal NPDES regulations require compliance with water quality objectives. (Water quality objectives are also called water quality criteria in the CWA.)

Water Quality Standards - Water quality standards, as defined in Clean Water Act section 303(c) consist of the beneficial uses (e.g., swimming, fishing, municipal drinking water supply, etc.,) of a water body and criteria (referred to as water quality objectives in the California Water Code) necessary to protect those uses. Under the Water Code, the water boards establish beneficial uses and water quality objectives in water quality control or basin plans. Together with an anti-degradation policy, these beneficial uses and water quality objectives serve as water quality standards under the Clean Water Act. In Clean Water Act parlance, state beneficial uses are called "designated uses" and state water quality objectives are called "criteria." Throughout this Order, the relevant term is used depending on the statutory scheme.

Waters of the State - Any water, surface or underground, including saline waters within the boundaries of the State [CWC section 13050 (e)]. The definition of the Waters of the State is

broader than that for the Waters of the United States in that all water in the State is considered to be a Waters of the State ~~regardless of circumstances or condition~~. Under this definition, a portions of the MS4 may ~~is always considered~~be considered to be a Waters of the State. However, man-made portions of the MS4 constructed for the sole purpose flow and/or pollutant reduction are not considered waters of the state.

Waters of the United States - As defined in the 40 CFR 122.2, the Waters of the U.S. are defined as: "(a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate "wetlands;" (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters otherwise defined as waters of the United States under this definition: (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial seas; and (g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA."

Watershed - That geographical area which drains to a specified point on a water course, usually a confluence of streams or rivers (also known as drainage area, catchment, or river basin).

Wet Season (aka Rainy Season) – The period of time from October 1 to April 30 when the San Diego Region experiences the most rainfall.

Wet Weather – Weather is considered wet if there is a storm event of 0.1 inches and greater and ~~the following~~ preceded by 72 hours of dry weather, unless defined in another manner within another regulatory mechanism such as a TMDL.

ATTACHMENT D

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM

Internal Draft

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM
FY _____

I. COPERMITTEE INFORMATION			
Copermittee Name:			
Copermittee Primary Contact Name:			
Copermittee Primary Contact Information: Address: City:	County:	State:	Zip:
Telephone:	Fax:	Email:	

II. LEGAL AUTHORITY		
Has the Copermittee established adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 that complies with Order No. R9-2012-0011?	YES NO	☐ ☐
A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority?	YES NO	☐ ☐

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE		
Was an update of the jurisdictional runoff management program document required or recommended by the San Diego Water Board?	YES NO	☐ ☐
If YES to the question above, did the Copermittee update its jurisdictional runoff management program document and make it available on the Regional Clearinghouse?	YES NO	☐ ☐

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM		
Has the Copermittee implemented a program to actively detect and eliminate illicit discharges and connections to its MS4 that complies with Order No. R9-2012-0011?	YES NO	☐ ☐

Number of non-storm water discharges reported by the public	
Number of non-storm water discharges detected by Copermittee staff or contractors	
Number of non-storm water discharges investigated by the Copermittee	
Number of sources of non-storm water discharges identified	
Number of non-storm water discharges eliminated	
Number of sources of illicit discharges or connections identified	
Number of illicit discharges or connections eliminated	
Number of enforcement actions issued	
Number of high level enforcement actions issued	

V. DEVELOPMENT PLANNING PROGRAM		
Has the Copermittee implemented a development planning program that complies with Order No. R9-2012-0011?	YES NO	☐ ☐
Was an update to the ~~Permanent~~ BMP ~~Sizing Criteria~~ Design Manual required or recommended by the San Diego Water Board?	YES NO	☐ ☐
If YES to the question above, did the Copermittee update its ~~Permanent~~ BMP ~~Sizing Criteria~~ Design Manual and make it available on the Regional Clearinghouse?	YES NO	☐ ☐

Number of proposed development projects in review	
Number of Priority Development Projects in review	
Number of Priority Development Projects approved	
Number of approved Priority Development Projects exempt from any BMP requirements	
Number of approved Priority Development Projects requiring mitigation	
Number of Priority Development Projects granted occupancy	
Number of completed Priority Development Projects in inventory	
Number of high priority Priority Development Project ~~permanent~~ structural BMP inspections	
Number of Priority Development Project ~~permanent~~ structural BMP violations	
Number of enforcement actions issued	

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM

Number of high level enforcement actions issued	

FY _____

VI. CONSTRUCTION MANAGEMENT PROGRAM

Has the Copermittee implemented a construction management program that complies with Order No. R9-2012-0011?	YES	☐
	NO	☐

Number of construction sites in inventory	
Number of active construction sites in inventory	
Number of inactive construction sites in inventory	
Number of construction sites closed/completed during reporting period	
Number of construction site inspections	
Number of construction site violations	
Number of enforcement actions issued	
Number of high level enforcement actions issued	

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

Has the Copermittee implemented an existing development management program that complies with Order No. R9-2012-0011?	YES	☐
	NO	☐

	Municipal	Commercial	Industrial	Residential
Number of existing developments in inventory				
Number of existing development inspections				
Number of follow-up inspections				
Number of existing development violations				
Number of enforcement actions issued				
Number of high level enforcement actions issued				

VIII. PUBLIC EDUCATION AND PARTICIPATION

Has the Copermittee implemented a public education program that complies with Order No. R9-2012-0011?	YES	☐
	NO	☐
Has the Copermittee implemented a mechanism for public participation and where necessary intergovernmental coordination that complies with Order No. R9-2012-0011?	YES	☐
	NO	☐

IX. FISCAL ANALYSIS

Has the Copermittee attached to this form a summary of its fiscal analysis that complies with Order No. R9-2012-0011?	YES	☐
	NO	☐

X. CERTIFICATION

I [☐ Principal Executive Officer ☐ Ranking Elected Official ☐ Duly Authorized Representative] certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature	Date
Print Name	Title
Telephone Number	Email

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM

ADMINISTRATIVE DRAFT

ATTACHMENT E

SPECIFIC PROVISIONS FOR TOTAL MAXIMUM DAILY LOADS APPLICABLE TO ORDER NO. R9-2012-0011

These provisions implement Total Maximum Daily Loads (TMDLs), adopted by the San Diego Water Board and approved by USEPA under Clean Water Act section 303(c), which are applicable to discharges regulated under this Order. The provisions and schedules for implementation of the TMDLs described below must be incorporated into the Water Quality Improvement Plans and monitoring requirements, required pursuant to Provisions B and D of this Order, respectively, for the specified Watershed Management Areas.

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed Resolution No. R9-2002-0123
2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin Resolution No. R9-2005-0019
3. ~~Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed Resolution No. R9-2005-0036~~
4. ~~4.~~3. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek Resolution No. R9-2007-0043
5. ~~5.~~4. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay Resolution No. R9-2008-0027
6. ~~6.~~5. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek) Resolution No. R9-2010-0001

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2002-0123

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	August 14, 2002
State Water Board Approval Date:	July 16, 2003
Office of Administrative Law Approval Date:	September 11, 2003
US EPA Approval Date:	November 3, 2003

(3) TMDL Effective Date: September 11, 2003

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, Unified Port District of San Diego

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for Chollas Creek consist of the following:

(1) Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedule under Specific Provision 1.c:

Table 1.1
Receiving Water Limitations as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Diazinon	Acute	0.08 µg/L	1 hour
	Chronic	0.05 µg/L	4 days

(2) Effluent Limitations

Discharges from the MS4s must not contain concentrations that exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 1.c:

Table 1.2
Effluent Limitations as Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation	Averaging Period
Diazinon	Acute	0.072 µg/L	1 hour
	Chronic	0.045 µg/L	4 days

(3) Best Management Practices

~~The following~~BMPs for Chollas Creek may~~must~~ be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area and implemented by the Responsible Copermittees:

~~(a) The Responsible Copermittees must implement BMPs capable of achieving the WQBELs under Specific Provision 1.b for Chollas Creek.~~

~~(b) The Responsible Copermittees must implement the Diazinon Toxicity Control Plan and Diazinon Public Outreach/Education Program as described in the report titled, *Technical Report for Total Maximum Daily Load for Diazinon in Chollas Creek Watershed, San Diego County*, dated August 14, 2002, including subsequent modifications, in order to achieve the WQBELs under Specific Provision 1.b.~~

~~(c)~~(a) The Responsible Copermittees should coordinate any implemented~~the~~ BMPs to address this TMDL with Caltrans ~~wherever and whenever~~as possible.

c. COMPLIANCE SCHEDULE

The Responsible Copermittees were required to achieve their WLA by December 31, 2010. The Responsible Copermittees must be in compliance with the WQBELs under Specific Provision 1.b.

d. COMPLIANCE DETERMINATION

Compliance with WQBELs or WLAs may be demonstrated via any one of the following methods:

(1) There is no discharge from the MS4, or
(2) Applicable effluent limitations are met, or
(3) Receiving waters meet the applicable receiving water limitations or water quality objective, or
(4) Loading from the MS4 is such that it does not cause water quality objective exceedances, or
(5) Implementation of a Water Quality Improvement Plan determined by the Regional Board Executive Officer to comply with Provision II.A as described in Provision II.A.4.

~~d.~~e. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(a) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*. The monitoring reports

required under Investigation Order No. R9-2004-0277 must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

~~(b) The Responsible Copermittees must monitor the effluent of the MS4 outfalls for diazinon within the Chollas Creek watershed, and calculate or estimate the monthly and annual diazinon loads, in accordance with the requirements of Provisions D.1, D.4.a.(1)(b), and D.4.a.(3)(b) of this Order. The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.~~

2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0019

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	September 22, 2005
Office of Administrative Law Approval Date:	December 2, 2005
US EPA Approval Date:	February 8, 2006

(3) TMDL Effective Date: December 2, 2005

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Shelter Island Yacht Basin

(6) Responsible Copermittees: City of San Diego, San Diego Unified Port District

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for Shelter Island Shoreline Park consist of the following:

(1) Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedule under Specific Provision 2.c:

Table 2.1
Receiving Water Limitations as Concentrations in Shelter Island Yacht Basin

Constituent	Exposure Duration	Effluent Limitation	Averaging Period
Dissolved Copper	Acute	4.8 µg/L	1 hour
	Chronic	3.1 µg/L	4 days

(2) Effluent Limitations

Discharges from the MS4s must not contain pollutant loads that exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 2.c:

Table 2.2
Effluent Limitations as Annual Loads in MS4 Discharges to Shelter Island Yacht Basin

Constituent	Effluent Limitation
Dissolved Copper	30 kg/yr

(3) Best Management Practices

The Responsible Copermittees mayust implement BMPs to support the achievement of capable of achieving the WQBELs under Specific Provision 2.b for Shelter Island Yacht Basin

c. COMPLIANCE SCHEDULE

The Responsible Copermittees are was required to achieve the respective its WLAs upon the effective date of the TMDL, December 2, 2005by December 2, 2022. The Responsible Copermittees must be in compliance with the WQBELs under Specific Provision 2.b.

d. COMPLIANCE DETERMINATION

Compliance with WQBELs or WLAs may be demonstrated via any one of the following methods:

(6) There is no discharge from the MS4, or
(7) Applicable effluent limitations are met, or
(8) Receiving waters meet the applicable receiving water limitations or water quality objective, or
(9) Loading from the MS4 is such that it does not cause water quality objective exceedances, or
(10) Implementation of a Water Quality Improvement Plan determined by the Regional Board Executive Officer to comply with Provision II.A as described in Provision II.A.4.

d.e. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

The Responsible Copermittees must implement the monitoring and assessment requirements issued under Order No. R9-2005-0019. monitor the effluent of its MS4 outfalls for dissolved copper, and calculate or estimate the monthly and annual dissolved copper loads, in accordance with the requirements of Provisions D.1, D.4.a.(1)(b), and D.4.a.(3)(b) of this Order. The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed

a. Applicability

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0036

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date: February 9, 2005
State Water Board Approval Date: November 16, 2005
Office of Administrative Law Approval Date: February 1, 2006
US EPA Approval Date: March 22, 2006

(3) TMDL Effective Date: February 1, 2006

(4) Watershed Management Area: Santa Margarita River

(5) Water Body: Rainbow Creek

(6) Responsible Copermittee: County of San Diego

b. Water Quality Based Effluent Limitations

The WQBELs for Rainbow Creek consist of the following

(1) Receiving Water Limitations

Discharges from the MS4s must not have a reasonable potential to cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedule under Specific Provision 3.c.(1):

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Table 3.1
Receiving Water Limitations as Concentrations in Rainbow Creek

Constituent	Receiving Water Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

~~(2) Effluent Limitations~~

~~(a) Discharges from the MS4s must not contain concentrations that exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 3.c.(1):~~

~~**Table 3.2**~~
~~*Effluent Limitations as Concentrations in MS4 Discharges to Rainbow Creek*~~

~~Constituent~~	~~Effluent Limitation~~
~~Nitrate (as N)~~	~~10 mg/L~~
~~Total Nitrogen~~	~~1 mg/L~~
~~Total Phosphorus~~	~~0.1 mg/L~~

~~(b) Pollutant loads from given land uses discharging to and from the MS4s must not exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 3.c.(1):~~

~~**Table 3.3**~~
~~*Effluent Limitations as Annual Loads in MS4 Discharges to Rainbow Creek*~~

~~Land Use~~	~~Total N~~	~~Total P~~
~~Commercial nurseries~~	~~116 kg/yr~~	~~3 kg/yr~~
~~Park~~	~~3 kg/yr~~	~~0.1 kg/yr~~
~~Residential areas~~	~~149 kg/yr~~	~~12 kg/yr~~
~~Urban areas~~	~~27 kg/yr~~	~~6 kg/yr~~

~~Interim effluent limitations expressed as pollutant loads are given in the compliance schedule under Specific Provision 3.0.~~

~~(3) Best Management Practices~~

~~(a) The Responsible Copermittee must implement BMPs capable of achieving the WQBELs under Specific Provision 3.b for Rainbow Creek.~~

~~(b) The Responsible Copermittee should coordinate the BMPs to address this TMDL with Caltrans and other sources wherever and whenever possible.~~

~~c. COMPLIANCE SCHEDULE~~

~~(1) WLA Compliance Date~~

~~The Responsible Copermittee is required to achieve its WLAs, thus must be in compliance with the WQBELs under Specific Provision 3.b, by December 31, 2021.~~

~~(2) Interim Compliance Requirements~~

~~**Table 3.4**~~
~~*Interim Effluent Limitations as Annual Loads in MS4 Discharges from Specific Land Uses to Rainbow Creek*~~

	~~Total N Interim Effluent Limitations (kg/yr)~~			~~Total P Interim Effluent Limitations (kg/yr)~~		
	~~Interim Compliance Date~~			~~Interim Compliance Date~~		
~~Land Use~~	~~2009~~	~~2013~~	~~2017~~	~~2009~~	~~2013~~	~~2017~~
~~Commercial nurseries~~	~~399~~	~~299~~	~~196~~	~~20~~	~~16~~	~~10~~
~~Park~~	~~5~~	~~3~~	~~3~~	~~0.15~~	~~0.10~~	~~0.10~~
~~Residential areas~~	~~507~~	~~390~~	~~260~~	~~99~~	~~74~~	~~47~~
~~Urban areas~~	~~40~~	~~27~~	~~27~~	~~9~~	~~6~~	~~6~~

~~COMPLIANCE DETERMINATION~~

~~Compliance may be demonstrated via any one of the following methods:~~

- ~~There is no discharge from the MS4, or~~
- ~~Applicable effluent limitations are met, or~~
- ~~Receiving waters meet the applicable receiving water limitations or water quality objective, or~~
- ~~Loading from the MS4 is such that it does not cause water quality objective exceedances, or~~
- ~~For Permittee(s) that are implementing a Regional Board-approved WQIP, WQBELs will be implemented as BMPs and compliance will be based upon implementing all provisions of the WQIP in accordance with the approved milestones and schedule.~~

~~d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS~~

~~The Responsible Copermittee must implement the Sampling and Analysis Plan for Rainbow Creek Nutrient Reduction TMDL Implementation Water Quality Monitoring, dated January 2010. The results of any monitoring conducted during the reporting period, and assessment of whether the interim and final WQBELs have been achieved must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.~~

~~4.~~3. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2007-0043

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date: June 13, 2007
State Water Board Approval Date: July 15, 2008
Office of Administrative Law Approval Date: October 22, 2008
US EPA Approval Date: December 18, 2008

(3) TMDL Effective Date: October 22, 2008

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District ~~of San Diego~~

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELsfor Chollas Creek consist of the following:

(1) Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedule under Specific Provision 4.c.(1):

Table 4.1
Receiving Water Limitations as Concentrations in Chollas Creek

Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$(0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$(0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$(0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$(0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

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Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER.

(2) Effluent Limitations

Discharges from the MS4s must not contain pollutant loads that exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 4.c.(1):

Table 4.2
Effluent Limitations as Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER.

(3) Best Management Practices

(a) The Responsible Copermittees may ~~must~~ implement BMPs to support the achievement of ~~capable of achieving the~~ WQBELs under Specific Provision 4.b for Chollas Creek.

(b) The Responsible Copermittees should coordinate the BMPs to address this TMDL with Caltrans and the U.S. Navy ~~wherever and whenever~~as possible.

c. Compliance Schedule

(1) WLA Compliance Date

The Responsible Copermittee is required to achieve the WLA, thus must be in compliance with the WQBELs under Specific Provision 4.b, by October 22, 2028.

(2) Interim Compliance Requirements

The Responsible Copermittee must comply with the following interim WQBELs by the interim compliance date:

Table 4.3
Interim Effluent Limitations as Concentrations in MS4 Discharges to Chollas Creek

Interim Compliance Date	Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
October 22, 2018	Dissolved Copper	Acute	1.2 x 90% x (0.96) x $e^{[0.9422 \times \ln(\text{hardness}) - 1.700]}$ x WER*	1 hour
		Chronic	1.2 x 90% x (0.96) x $e^{[0.8545 \times \ln(\text{hardness}) - 1.702]}$ x WER*	4 days
	Dissolved Lead	Acute	1.2 x 90% x [1.46203 – 0.145712 x ln(hardness)] x $e^{[1.273 \times \ln(\text{hardness}) - 1.460]}$ x WER*	1 hour
		Chronic	1.2 x 90% x [1.46203 – 0.145712 x ln(hardness)] x $e^{[1.273 \times \ln(\text{hardness}) - 4.705]}$ x WER*	4 days
	Dissolved Zinc	Acute	1.2 x 90% x (0.978) x $e^{[0.8473 \times \ln(\text{hardness}) + 0.884]}$ x WER*	1 hour
		Chronic	1.2 x 90% x (0.986) x $e^{[0.8473 \times \ln(\text{hardness}) + 0.884]}$ x WER*	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER.

d. COMPLIANCE DETERMINATION

Compliance with WQBELs or WLAs may be demonstrated via any one of the following methods:

(1) There is no discharge from the MS4, or
(2) Applicable effluent limitations are met, or
(3) Receiving waters meet the applicable receiving water limitations or water quality objective, or
(4) Loading from the MS4 is such that it does not cause water quality objective exceedances, or
(5) Implementation of a Water Quality Improvement Plan determined by the Regional Board Executive Officer to comply with Provision II.A as described in Provision II.A.4.

~~d.~~e. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(a) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*, when it is amended to include monitoring requirements for the Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek. The monitoring reports required

under Investigation Order No. R9-2004-0277 must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

(b) The Responsible Copermittees must ~~monitor the effluent of the MS4 outfalls discharging to Chollas Creek for dissolved copper, lead, and zinc, and calculate or estimate the monthly and annual dissolved copper, lead, and zinc loads, in accordance with the requirements of Provisions D.1, D.4.a.(1)(b), and D.4.a.(3)(b) of this Order~~implement the monitoring and assessment requirements issued under Order No. R9-2007-0043, as consistent with this Order. The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

~~5.~~4. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2008-0027

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 11, 2008
State Water Board Approval Date:	June 16, 2009
Office of Administrative Law Approval Date:	September 15, 2009
US EPA Approval Date:	October 26, 2009

(3) TMDL Effective Date: September 15, 2009

(4) Watershed Management Areas: See Table 5.0

(5) Water Bodies: See Table 5.0

(6) Responsible Copermittees: See Table 5.0

Table 5.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County	Dana Point Harbor	Baby Beach	-City of Dana Point -County of Orange
San Diego Bay	San Diego Bay	Shelter Island Shoreline Park	-Unified Port of San Diego

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Receiving Water Limitations

(a) Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedules under Specific Provisions 5.c.(1)(a) and 5.c.(2):

Table 5.1
Receiving Water Limitations as Bacteria Densities in the Water Body

Constituent	Receiving Water Limitations	
	Single Sample Maximum[1,2]	30-Day Geometric Mean[2]
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.

(b) If the above receiving water limitations are not met in the receiving water, the Responsible Copermittees must demonstrate that the discharges from the MS4s are not causing or contributing to the violation of receiving water limitations. ~~The Copermittee must provide data that demonstrate the discharges from the MS4s are meeting the effluent limitations under Specific Provision 5.b.(2)~~.

For both (a) and (b) above, if the REC-1 water quality objectives cannot be met in the receiving waters, and if the natural and background sources appear to be the sole source of the continued impairment, the natural sources exclusion approach (NSEA) may be applied. The Municipal Dischargers are responsible for collection of the data to support the application of the NSEA to recalculate the TMDL.

~~(2) Effluent Limitations~~

~~Discharges from the MS4s must not contain densities that exceed the following effluent limitations by the end of the compliance schedules under Specific Provisions 5.c.(1)(a) and 5.c.(2) to demonstrate the discharge is not causing or contributing to a violation of receiving water quality standards:~~

~~**Table 5.2**~~
~~*Effluent Limitations as Bacteria Densities in MS4 Discharges to the Water Body*~~

~~Constituent~~	~~Effluent Limitations~~	
	~~Single Sample Maximum[1,2]~~	~~30-Day Geometric Mean[2]~~
~~Total Coliform~~	~~10,000 MPN/100mL~~	~~1,000 MPN/100mL~~
~~Fecal Coliform~~	~~400 MPN/100mL~~	~~200 MPN/100mL~~
~~*Enterococcus*~~	~~104 MPN/100mL~~	~~35 MPN/100mL~~

~~Notes:~~
~~1. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.~~
~~2. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.~~

~~Interim effluent limitations expressed as pollutant loads are given in the compliance schedule under Specific Provision 5.c.~~

~~(3)~~(2) Best Management Practices

(a) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 5.0 fulfill the Bacteria Load Reduction Plan (BLRP) requirements in Resolution No. R9-2008-0027.

(b) The Responsible Copermittee must implement BMPs capable of achieving the WQBELs under Specific Provision 5.0 for the segments or areas of the water bodies listed in Table 5.0

c. COMPLIANCE SCHEDULE

(1) Baby Beach in Dana Point Harbor

(a) ~~WLA~~ Waste Load Reduction Compliance Dates

The Responsible Copermittees for MS4 discharges to Baby Beach shall implement BMPs capable of achieving the following Waste Load Reduction Milestones.~~are required to achieve the WLA, thus must be in compliance with the WQBELs under Specific Provision 5.0, according to the following compliance schedule:~~

Table 5.3

TMDL Waste Load Reduction Milestones

Action	Dry Weather	Wet Weather
Meet 50% wasteload reductions	December 2012*	December, 2016*
Meet 100% wasteload reductions	December, 2014*	December, 2019*

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~~*Compliance Schedule Dates to Achieve Baby Beach WLAs*~~

~~Constituent~~	~~Dry Weather WLA Compliance Date~~	~~Wet Weather WLA Compliance Date~~
~~Total Coliform~~	~~September 15, 2014~~	~~September 15, 2009~~
~~Fecal Coliform~~		~~September 15, 2009~~
~~*Enterococcus*~~		~~September 15, 2019~~

~~(b) Interim Compliance Requirements~~

~~The Responsible Copermittees for MS4 discharges to Baby Beach must comply with the following interim WQBELs by the interim compliance date:~~

~~**Table 5.4**~~

~~*Interim Effluent Limitations as Loads in MS4 Discharges to Baby Beach*~~

~~Constituent~~	~~Interim Compliance Date~~	~~Dry Weather Interim Effluent Limitation~~	~~Wet Weather Interim Effluent Limitation~~
~~Total Coliform~~	~~September 15, 2012~~	~~$5.32x10^9$ MPN/day~~	~~NA*~~
~~Fecal Coliform~~	~~September 15, 2012~~	~~$0.59x10^9$ MPN/day~~	~~NA*~~
~~*Enterococcus*~~	~~September 15, 2012~~	~~$0.42x10^9$ MPN/day~~	~~NA**~~
	~~September 15, 2016~~	~~NA*~~	~~$207x10^9$ MPN/30days~~

~~Notes:~~

~~* The WQBELs under Specific Provision 5.b must already be achieved by the given interim compliance date.~~

~~** There is no corresponding interim WQBEL for the given interim compliance date.~~

(2) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park is required to achieve the WLA, thus must be in compliance with the WQBELs under Specific Provision 5.0, by December 31, 2012.

d. COMPLIANCE DETERMINATION

Compliance with WQBELs or WLAs may be demonstrated via any one of the following methods:

(1) There is no discharge from the MS4, or
(2) Applicable effluent limitations are met, or
(3) Receiving waters meet the applicable receiving water limitations or water quality objective, or
(4) Loading from the MS4 is such that it does not cause water quality objective

exceedances, or

(5) Demonstration of elimination of controllable sources of indicator bacteria loading and application of Natural Source Exclusion Approach (NSEA), if applicable, or

(6) Implementation of a Water Quality Improvement Plan determined by the Regional Board Executive Officer to comply with Provision II.A as described in Provision II.A.4.

~~d.~~e. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) Monitoring Stations and Procedures

~~(a)~~ The Responsible Copermittees must implement the monitoring requirements issued under Order No. R9-2008-0027. ~~designate the MS4 outfalls within their jurisdiction discharging to the segments or areas of the water bodies listed in Table 5.0 as high priority non-storm water MS4 monitoring stations, in accordance with the requirements of Provision D.1.~~

~~(b) The Responsible Copermittees must establish at least one monitoring station within the receiving water body.~~

~~(2) Monitoring Procedures~~

~~(a) The Responsible Copermittees must monitor the effluent of the designated MS4 outfalls within their jurisdiction discharging during dry weather conditions to the segments or areas of the water bodies listed in Table 5.0 in accordance with the dry weather jurisdictional monitoring requirements of Provision D.1.a.(1)(b). Samples required to be submitted to a laboratory for analysis must include analysis for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.~~

~~(b) The Responsible Copermittees must monitor, within the first 24 hours of each storm event,[26] the effluent of the designated MS4 outfalls within their jurisdiction discharging to the segments or areas of the water bodies listed in Table 5.0 in accordance with the wet weather jurisdictional monitoring requirements of Provision D.1.b.(1)(b) of this Order. Samples required to be submitted to a laboratory for analysis must include analysis for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.~~

~~(c) The Responsible Copermittees must collect samples from the monitoring stations within the receiving water body for each dry weather and wet~~

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[26] ~~Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].~~

~~weather MS4 outfall monitoring event. Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.~~

~~(d)~~(a)

~~(3)~~(2) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs have been achieved.

(b) The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

~~6.~~5. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2010-0001

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 10, 2010
State Water Board Approval Date:	December 14, 2010
Office of Administrative Law Approval Date:	April 4, 2011
US EPA Approval Date:	June 22, 2011

(3) TMDL Effective Date: April 4, 2011

(4) Watershed Management Areas: See Table 6.0

(5) Water Bodies: See Table 6.0

Subsequent to TMDL adoption, the Regional Board determined that the following water bodies are not subject to further action under Resolution No. R9-2010-001, and therefore are not subject to Bacteria TMDL requirements described herein and are not included in Table 6.0:

Watershed Management Area	Water Body	Segment or Area
Carlsbad	Pacific Ocean Shoreline	at Moonlight State Beach
San Dieguito River	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth
Penasquitos	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)

~~(5)~~(6) Responsible Copermittees: See Table 6.0

Table 6.0

Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	-City of Laguna Beach -County of Orange -Orange County Flood Control District
		at Heisler Park - North	
	Pacific Ocean Shoreline	at Main Laguna Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Woods -County of Orange -Orange County Flood Control District
		Laguna Beach at Ocean Avenue	
		Laguna Beach at Cleo Street	
		Arch Cove at Bluebird Canyon Road	
		Laguna Beach at Dumond Drive	
	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Hills -City of Laguna Niguel -City of Laguna Woods -City of Lake Forest -City of Mission Viejo -County of Orange -Orange County Flood Control District
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	
	Aliso Creek Mouth	at mouth	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County (cont'd)	Pacific Ocean Shoreline	Aliso Beach at West Street	-City of Dana Point -City of Laguna Beach -City of Laguna Niguel -County of Orange -Orange County Flood Control District
		Aliso Beach at Table Rock Drive	
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)	
		at Salt Creek (large outlet)	
		Salt Creek Beach at Salt Creek service road	
		Salt Creek Beach at Strand Road	
	Pacific Ocean Shoreline	at San Juan Creek	-City of Dana Point -City of Laguna Hills -City of Laguna Niguel -City of Mission Viejo -City of Rancho Santa Margarita -City of San Juan Capistrano -County of Orange -Orange County Flood Control District
	San Juan Creek	lower 1 mile	
	San Juan Creek Mouth	at mouth	
	Pacific Ocean Shoreline	at Poche Beach	- City of Dana Point -City of San Clemente -County of Orange -Orange County Flood Control District
		Ole Hanson Beach Club Beach at Pico Drain	
		San Clemente City Beach at El Portal Street Stairs	
		San Clemente City Beach at Mariposa Street	
		San Clemente City Beach at Linda Lane	
		San Clemente City Beach at South Linda Lane	
		San Clemente City Beach at Lifeguard Headquarters	
		under San Clemente Municipal Pier	
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	
		San Clemente State Beach at Riviera Beach	
		Can Clemente State Beach at Cypress Shores	
San Luis Rey River	Pacific Ocean Shoreline	at San Luis Rey River mouth	-City of Oceanside -City of Vista -County of San Diego

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
Carlsbad	Pacific Ocean Shoreline	at Moonlight State Beach	-City of Carlsbad -City of Encinitas -City of Escondido ~~-City of Oceanside~~ -City of San Marcos ~~-City of Solana Beach~~ ~~-City of Vista~~ -County of San Diego
San Dieguito River	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	-City of Del Mar -City of Escondido -City of Poway -City of San Diego -City of Solana Beach -County of San Diego
Penasquitos	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	-City of Del Mar -City of Poway -City of San Diego -County of San Diego
Mission	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	-City of San Diego
		La Jolla Shores Beach at Caminito del Oro	
		La Jolla Shores Beach at Vallecitos	
		La Jolla Shores Beach at Avenida de la Playa	
		at Casa Beach, Children's Pool	
		South Casa Beach at Coast Boulevard	
		Whispering Sands Beach at Ravina Street	
		Windansea Beach at Vista de la Playa	
		Windansea Beach at Bonair Street	
		Windansea Beach at Playa del Norte	
		Windansea Beach at Palomar Avenue	
		at Tourmaline Surf Park	
		Pacific Beach at Grand Avenue	
	Tecolote Creek	Entire reach and tributaries	-City of San Diego

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I- Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
San Diego River	Forrester Creek	lower 1 mile	-City of El Cajon ~~-City of La Mesa~~ -City of Santee -County of San Diego
	San Diego River	lower 6 miles	-City of El Cajon -City of La Mesa -City of San Diego -City of Santee -County of San Diego
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	
San Diego Bay	Chollas Creek	lower 1.2 miles	-City of La Mesa -City of Lemon Grove -City of San Diego -County of San Diego - San Diego Unified Port District

The TMDLs that have been developed for the Pacific Ocean shorelines are applicable to all the beaches located on the shorelines of the hydrologic subareas (HSAs), hydrologic areas (HAs), and hydrologic units (HUs) listed above. Beginning with the 2008 303(d) List, specific beach segments of the Pacific Ocean shoreline are listed individually. Specific beach segments from some of the Pacific Ocean shorelines listed in the above table have been delisted from the 2008 303(d) list that was approved by the San Diego Board on December 16, 2009, and therefore are not subject to any further action as long as monitoring data continues to support compliance with water quality standards.

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for segments or areas of the water bodies listed in Table 6.0 consist of the following:

(1) Receiving Water Limitations

(a) Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedules under Specific Provision 6.c.(1):

Table 6.1
Receiving Water Limitations for Beaches as Bacteria Densities and Allowable Exceedance Frequencies in the Water Body

Indicator Bacteria	Wet Weather Days [a]		Dry Weather Days [b]	
	Wet Weather Numeric Objective [c] (MPN/100mL)	Wet Weather Allowable Exceedance [d] Frequency	Dry Weather Numeric Objective [e] (MPN/100mL)	Dry Weather Allowable Exceedance Frequency
Fecal Coliform	400	22%	200	0%
Total Coliform	10,000	22%	1,000	0%
Enterococcus	104	22%	35	0%

a. Wet weather days defined as days with rainfall events of 0.2 inches or greater and the following 72 hours.
b. Dry weather days defined as days with less than 0.2 inch of rainfall observed on each of the previous 3 days.
c. Wet weather numeric objectives based on the single sample maximum water quality objectives in the California Ocean Plan (2005). Compliance with the wet weather TMDLs in the receiving water is based on the frequency that the wet weather days in any given year exceed the wet weather numeric objective, but 30-day geometric mean must also be met.
d. The wet weather allowable exceedance frequency is set at 22%. In the calculation of the wet weather TMDLs, the San Diego Regional Board chose to apply the 22 percent allowable exceedance frequency as determined for Leo Carillo Beach in Los Angeles County. At the time the wet weather watershed model was developed, the 22 percent exceedance frequency from Los Angeles County was the only reference beach exceedance frequency available. The 22 percent allowable exceedance frequency used to calculate the wet weather TMDLs is justified because the San Diego Region watersheds' exceedance frequencies will likely be close to the value calculated for Leo Carillo Beach, and is consistent with the exceedance frequency that was applied by the Los Angeles Regional Board.
e. Dry weather numeric objectives based on the 30-day geometric mean water quality objectives in the California Ocean Plan (2005). Compliance with the dry weather TMDLs in the receiving water is based on the frequency that the dry weather days in any given year exceed the dry weather numeric objective.

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Table 6.2 *Receiving Water Limitations for Creeks as Bacteria Densities and Allowable Exceedance Frequencies in the Water Body*

Indicator Bacteria	Wet Weather Days [a]		Dry Weather Days [b]	
	Wet Weather Numeric Objective [c] (MPN/100mL)	Wet Weather Allowable Exceedance [d] Frequency	Dry Weather Numeric Objective [e] (MPN/100mL)	Dry Weather Allowable Exceedance Frequency
Fecal Coliform	400	22%	200	0%
Enterococcus	61 (104) [f]	22%	33	0%

a. Wet weather days defined as days with rainfall events of 0.2 inches or greater and the following 72 hours.
b. Dry weather days defined as days with less than 0.2 inch of rainfall observed on each of the previous 3 days.
c. Wet weather numeric objectives based on the single sample maximum (or equivalent) water quality objectives in the Water Quality Control Plan for the San Diego Basin (1994). Compliance with the wet weather TMDLs in the receiving water is based on the frequency that the wet weather days in any given year exceed the wet weather numeric objective, but 30-day geometric mean must also be met.
d. The wet weather allowable exceedance frequency is set at 22%. In the calculation of the wet weather TMDLs, the San Diego Regional Board chose to apply the 22 percent allowable exceedance frequency as determined for Leo Carillo Beach in Los Angeles County. At the time the wet weather watershed model was developed, the 22 percent exceedance frequency from Los Angeles County was the only reference beach exceedance frequency available. The 22 percent allowable exceedance frequency used to calculate the wet weather TMDLs is justified because the San Diego Region watersheds' exceedance frequencies will likely be close to the value calculated for Leo Carillo Beach, and is consistent with the exceedance frequency that was applied by the Los Angeles Regional Board.
e. Dry weather numeric objectives based on the 30-day geometric mean (or equivalent) water quality objectives in Water Quality Control Plan for the San Diego Basin (1994). Compliance with the dry weather TMDLs in the receiving water is based on the frequency that the dry weather days in any given year exceed the dry weather numeric objective.
f. A wet weather numeric objective for *Enterococcus* of 104 MPN/100mL may be applied as a receiving water limitation for creeks, instead of 61 MPN/100mL, if one or more of the creeks addressed by these TMDLs (San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek, San Diego River, and/or Cholas Creek) is designated with a "moderately to lightly used area" or less frequent usage frequency in the Basin Plan. Otherwise, the wet weather numeric objective of 61 MPN/100mL for Enterococcus will be used to assess compliance with the wet weather allowable exceedance frequency.

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~~Constituent~~	~~Receiving Water Limitations~~			
	~~Single Sample Maximum[2,2] (MPN/100mL)~~	~~Single Sample Maximum Allowable Exceedance Frequency[3]~~	~~30-Day Geometric Mean[2] (MPN/100mL)~~	~~30-Day Geometric Mean Allowable Exceedance Frequency~~
~~Total Coliform~~	~~10,000~~	~~22% / 0%~~	~~1,000~~	~~0%~~

~~Fecal Coliform~~	~~400~~	~~22% / 0%~~	~~200~~	~~0%~~
~~*Enterococcus*~~	~~104[4] / 61[5]~~	~~22% / 0%~~	~~35[4] / 33[5]~~	~~0%~~

~~Notes:~~
~~1. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.~~
~~2. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.~~
~~3. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. The 0% single sample maximum allowable exceedance frequency applies to dry weather days.~~
~~4. This *Enterococcus* receiving water limitation applies to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.~~
~~5. This *Enterococcus* receiving water limitations applies to segments or areas of creeks or creek mouths listed in Table 6.0.~~

Interim receiving water limitations expressed as allowable receiving water exceedance frequencies are ~~given~~ presented in ~~the compliance schedule under~~ Specific Provision 6.c (2).

The allowable exceedance frequencies in Table 6.1 and Table 6.2 can be updated by the Regional Board Executive Officer if sufficient data is provided regarding reference systems in the San Diego Region.

(b) If the above receiving water limitations are not met in the receiving water, the Responsible Copermittees must demonstrate that the discharges from the MS4s are not causing or contributing to the violation of receiving water limitations. ~~The Copermittee may incorporate follow-up investigations and monitoring into the WQIP, as consistent with Provisions D and E.2 of this Order. must provide data that demonstrate the discharges from the MS4s are meeting the effluent limitations under Specific Provision 6.b.(2).~~

(2) Effluent Limitations

Discharges from the MS4s must not cause or contribute ~~contain densities that exceed the following effluent limitations by the end of the compliance schedules under Specific Provision 6.c.(1) to demonstrate the discharge is not causing or contributing~~ to a violation of receiving water ~~quality standards~~limitations. The mass-based waste load allocations presented in Resolution No. R9-2010-0001 can be used to demonstrate that loading from the MS4 is such that it does not cause water quality objective exceedances, as described in bullet (4) under Specific Provision 6.d.

~~**Table 6.2**~~
~~*Effluent Limitations as Bacteria Densities and Allowable Exceedance Frequencies in MS4 Discharges to the Water Body*~~

	~~Effluent Limitations~~			
~~Constituent~~	~~Single Sample Maximum[1,2] (MPN/100mL)~~	~~Single Sample Maximum Allowable Exceedance Frequency[3]~~	~~30-Day Geometric Mean[2] (MPN/100mL)~~	~~30-Day Geometric Mean Allowable Exceedance Frequency~~
~~Total Coliform~~	~~10,000~~	~~22% / 0%~~	~~1,000~~	~~0%~~
~~Fecal Coliform~~	~~400~~	~~22% / 0%~~	~~200~~	~~0%~~
~~*Enterococcus*~~	~~104[4] / 61[5]~~	~~22% / 0%~~	~~35[4] / 33[5]~~	~~0%~~

~~Notes:~~

~~1. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.~~
~~2. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.~~
~~3. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. The 0% single sample maximum allowable exceedance frequency applies to dry weather days~~
~~4. This *Enterococcus* effluent limitation applies to MS4 discharges to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.~~
~~5. This *Enterococcus* effluent limitation applies to MS4 discharges to segments or areas of creeks or creek mouths listed in Table 6.0.~~

~~Interim effluent limitations expressed as allowable exceedance frequencies are given in the compliance schedule under Specific Provision 6.c.~~

(3) Best Management Practices

(a) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 6.0 that continue to have 303(d) listings for RED-1 indicator bacteria will incorporate ~~fulfill the Comprehensive~~ Load Reduction Plans ~~(CLRPs)~~ drafted pursuant to ~~requirements in~~ Resolution No. R9-2010-0001.

(b) The Responsible Copermittee ~~must~~ may implement BMPs to support the achievement of ~~capable of achieving the~~ WQBELs under Specific Provision 6.b for the segments or areas of the water bodies listed in Table 6.0.

(c) The Responsible Copermittees may implement ~~should coordinate the~~ BMPs to support the achievement of ~~address~~ this TMDL with Caltrans and owners/operators of small MS4s ~~wherever and whenever~~as possible.

c. COMPLIANCE SCHEDULE

(1) ~~WLA~~ Waste Load Reduction Compliance Dates

The Responsible Copermittees for MS4 discharges to a segment or area of the water bodies listed in Table 6.0 are required to achieve the ~~WLA~~Waste Load Reductions, thus must be in compliance with the WQBELs under Specific Provision 6.b, according to the following compliance schedule:

Table 6.3
Compliance Schedule Dates to Achieve Indicator Bacteria ~~WLAs~~Waste Load Reductions

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform	April 4, 2021	April 4, 2031
Fecal Coliform		
Enterococcus		

1 - Total coliform receiving water limitations apply only to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.

(2) Interim Compliance Requirements

The Responsible Copermittees must comply with the following interim WQBELs by the interim compliance dates supported by Order No. R9-2010-0001.

(a) Interim Dry Weather WQBELs

The Responsible Copermittees must comply with dry weather interim WQBELs demonstrating 50% exceedance frequency reductions by the interim compliance dates presented in Table 6.5. Data from year(s) between 1996-2002 (as available) may be used to characterize the "existing" dry weather exceedances frequency as the baseline from which interim reductions in exceedances frequency must be measured.

~~Interim dry weather WQBELS are expressed as receiving water limitations. The Responsible Copermittee must calculate the "existing" exceedance frequencies of the 30-day geometric mean water quality objectives for each of the indicator bacteria by analyzing the monitoring data collected between January 1, 2002 and April 4, 2011.~~ "Existing" exceedance frequencies may be calculated by segment or area of a water body, or by water body, and/or by Watershed Management Area listed in Table 6.0. Separate "existing" exceedance frequencies must be calculated for beaches and creeks/creek mouths, where applicable.

The Responsible Copermittees must achieve a 50 percent reduction in each~~the~~ "existing" exceedance frequency, or otherwise demonstrate 50% reduction progress toward the final allowable exceedances frequency or compliance metric, by the interim compliance dates for dry weather givenin Table 6.5. Metric(s) expressing the 50 percent reduction in ~~of the 30-day geometric mean WQBELs for the segments or areas of the water bodies listed in Table 6.0 by the interim compliance dates for achieving the interim dry weather WQBELs given in Table 6.5. A 50 percent reduction in the "existing" exceedance frequency is equivalent to half of the "existing" exceedance frequency of the 30-day geometric mean WQBELs~~dry weather exceedances frequency (i.e. interim dry weather WQBLs, which may be expressed as receiving water limitations) calculated by the Responsible Copermittees must be included in the Water Quality Improvement Plans for the applicable Watershed Management Areas.
~~The "existing" exceedance frequencies and the interim dry weather allowable exceedance frequencies (i.e. interim dry weather WQBELs) calculated by the Responsible Copermittees must be included in the Water Quality Improvement Plans for the applicable Watershed Management Areas.~~

(b) Interim Wet Weather WQBELs

The Responsible Copermittees must achieve the interim allowable wet weather exceedances frequencies identified in ~~WQBELs in~~ Table 6.4, or otherwise demonstrate 50% progress towards the final wet weather compliance metric, ~~expressed as interim allowable exceedance frequencies,~~ by the interim compliance dates for achieving the interim wet weather WQBELs given in Table 6.5, unless an alternative interim

compliance schedule is identified in the applicable LRP.

Table 6.4
Interim Wet Weather WQBELs Expressed as
Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	38%	37%	39%
		at Heisler Park - North			
	Pacific Ocean Shoreline	at Main Laguna Beach			
		Laguna Beach at Ocean Avenue			
		Laguna Beach at Cleo Street			
		Arch Cove at Bluebird Canyon Road			
		Laguna Beach at Dumond Drive			
	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	41%	41%	42%
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	41%	41%	42%
	Aliso Creek Mouth	at mouth	41%	41%	42%
	Pacific Ocean Shoreline	Aliso Beach at West Street	36%	36%	36%
		Aliso Beach at Table Rock Drive			
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)			
		at Salt Creek (large outlet)			
		Salt Creek Beach at Salt Creek service road			
		Salt Creek Beach at Strand Road			

Table 6.4 (Cont'd)
Interim Wet Weather WQBELs Expressed as
Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County (cont'd)	Pacific Ocean Shoreline	at San Juan Creek	44%	44%	48%
	San Juan Creek	lower 1 mile	44%	44%	47%
	San Juan Creek Mouth	at mouth	44%	44%	47%
	Pacific Ocean Shoreline	at Poche Beach	35%	35%	36%
		Ole Hanson Beach Club Beach at Pico Drain			
		San Clemente City Beach at El Portal Street Stairs			
		San Clemente City Beach at Mariposa Street			
		San Clemente City Beach at Linda Lane			
		San Clemente City Beach at South Linda Lane			
		San Clemente City Beach at Lifeguard Headquarters			
		under San Clemente Municipal Pier			
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)			
		San Clemente State Beach at Riviera Beach			
		Can Clemente State Beach at Cypress Shores			
San Luis Rey River	Pacific Ocean Shoreline	at San Luis Rey River mouth	45%	44%	47%
Carlsbad	Pacific Ocean Shoreline	at Moonlight State Beach	40%	40%	41%
San Dieguito River	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	33%	33%	36%

Table 6.4 (Cont'd)
Interim Wet Weather WQBELs Expressed as
Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
Penasquitos	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	26%	26%	26%
	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	37%	37%	37%
		La Jolla Shores Beach at Caminito del Oro			
		La Jolla Shores Beach at Vallecitos			
		La Jolla Shores Beach at Avenida de la Playa			
		at Casa Beach, Children's Pool			
		South Casa Beach at Coast Boulevard			
		Whispering Sands Beach at Ravina Street			
		Windansea Beach at Vista de la Playa			
		Windansea Beach at Bonair Street			
		Windansea Beach at Playa del Norte			
		Windansea Beach at Palomar Avenue			
		at Tourmaline Surf Park			
		Pacific Beach at Grand Avenue			
	Tecolote Creek	Entire reach and tributaries	49%	49%	51%
San Diego River	Forrester Creek	lower 1 mile	46%	43%	49%
	San Diego River	lower 6 miles	46%	43%	49%
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	46%	43%	51%
San Diego Bay	Chollas Creek	lower 1.2 miles	41%	41%	43%

(c) Interim WQBEL Compliance Dates

The Responsible Copermittees must achieve the interim WQBELs under Specific Provisions 6.c.(2)(a) and 6.c.(2)(b) by the interim compliance dates given in Table 6.5, unless an alternative interim compliance schedule is identified in the applicable LRP.

Table 6.5
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs
South Orange County	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	April 4, 2016	April 4, 2021
		at Heisler Park - North		
	Pacific Ocean Shoreline	at Main Laguna Beach	April 4, 2016	April 4, 2021
		Laguna Beach at Ocean Avenue		
		Laguna Beach at Cleo Street		
		Arch Cove at Bluebird Canyon Road		
		Laguna Beach at Dumond Drive		
	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	April 4, 2016	April 4, 2021
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	April 4, 2018	April 4, 2021
	Aliso Creek Mouth	at mouth	April 4, 2018	April 4, 2021
	Pacific Ocean Shoreline	Aliso Beach at West Street	April 4, 2016	April 4, 2021
		Aliso Beach at Table Rock Drive		
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)		
		at Salt Creek (large outlet)		
		Salt Creek Beach at Salt Creek service road	April 4, 2017	April 4, 2021
		Salt Creek Beach at Strand Road	April 4, 2017	April 4, 2021

Table 6.5 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs
South Orange County (cont'd)	Pacific Ocean Shoreline	at San Juan Creek	April 4, 2016	April 4, 2021
	San Juan Creek	lower 1 mile	April 4, 2018	April 4, 2021
	San Juan Creek Mouth	at mouth	April 4, 2016	April 4, 2021
	Pacific Ocean Shoreline	at Poche Beach	April 4, 2016	April 4, 2021
		Ole Hanson Beach Club Beach at Pico Drain	April 4, 2016	April 4, 2021
		San Clemente City Beach at El Portal Street Stairs	April 4, 2017	April 4, 2021
		San Clemente City Beach at Mariposa Street		
		San Clemente City Beach at Linda Lane	April 4, 2016	April 4, 2021
		San Clemente City Beach at South Linda Lane	April 4, 2018	April 4, 2021
		San Clemente City Beach at Lifeguard Headquarters	April 4, 2017	April 4, 2021
		under San Clemente Municipal Pier		
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	April 4, 2018	April 4, 2021
		San Clemente State Beach at Riviera Beach	April 4, 2016	April 4, 2021
		Can Clemente State Beach at Cypress Shores	April 4, 2017	April 4, 2021
San Luis Rey River	Pacific Ocean Shoreline	at San Luis Rey River mouth	April 4, 2017	April 4, 2021
Carlsbad	Pacific Ocean Shoreline	at Moonlight State Beach	April 4, 2016	April 4, 2021
San Dieguito River	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	April 4, 2016	April 4, 2021

Table 6.5 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs
Penasquitos	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	April 4, 2016	April 4, 2021
	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande		
		La Jolla Shores Beach at Caminito del Oro		
		La Jolla Shores Beach at Vallecitos		
		La Jolla Shores Beach at Avenida de la Playa		
		at Casa Beach, Children's Pool		
		South Casa Beach at Coast Boulevard		
		Whispering Sands Beach at Ravina Street		
		Windansea Beach at Vista de la Playa		
		Windansea Beach at Bonair Street		
		Windansea Beach at Playa del Norte		
		Windansea Beach at Palomar Avenue		
		at Tourmaline Surf Park		
		Pacific Beach at Grand Avenue		
	Tecolote Creek	Entire reach and tributaries		
San Diego River	Forrester Creek	lower 1 mile	April 4, 2018	April 4, 2021
	San Diego River	lower 6 miles		
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach		
San Diego Bay	Chollas Creek	lower 1.2 miles	April 4, 2018	April 4, 2021

(1) Submittals to Support TMDL Basin Plan Amendment

The Responsible Copermittees are encouraged to submit data to support the TMDL reopener scheduled for April 2016 including but not limited to data related to reference watershed monitoring and beneficial use usage frequency.

For the watersheds where there are no longer any impairments listed on the 2008 303(d) List, the Phase I MS4s and Caltrans are not required to submit a load reduction plan as part of the TMDL.

d. COMPLIANCE DETERMINATION

Compliance with WQBELs or WLAs may be demonstrated via any one of the following methods:

(1) There is no discharge from the MS4, or
(2) Applicable effluent limitations are met, or
(3) Receiving waters meet the applicable receiving water limitations or water quality objective, or
(4) Loading from the MS4 is such that it does not cause water quality objective exceedances, or
(5) Demonstration of elimination of controllable sources of indicator bacteria loading and application of Natural Source Exclusion Approach (NSEA), if applicable, or
(6) Implementation of a Water Quality Improvement Plan determined by the Regional Board Executive Officer to comply with Provision II.A as described in Provision II.A.4.

The Phase I MS4s may demonstrate that their discharges are not causing the exceedances in the receiving waters by providing data from their discharge points to the receiving waters, by providing data collected at jurisdictional boundaries, and/or by using other methods accepted by the San Diego Water Board. Otherwise, at the end of the dry weather TMDL compliance schedule, the municipal Phase I MS4s will be held responsible and considered out of compliance unless other information or evidence indicates another controllable or uncontrollable source is responsible for the exceedances in the receiving waters. If controllable sources other than discharges from the municipal Phase I MS4s are identified before or after the end of the dry weather TMDL Compliance Schedule as causing the exceedances, those controllable sources will be responsible for reducing their bacteria loads and/or demonstrating that discharges from those sources are not causing the exceedances. The San Diego Water Board shall implement additional actions (e.g., issue enforcement actions, amend existing NPDES requirements or conditional waivers), as needed, to bring all controllable sources into compliance with the dry weather TMDLs.

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~~d.~~e. **SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS**

The Bacteria Load Reduction Plans (BLRPs) and/or CLRPs to be submitted by the Copermittees and approved by the Regional Board Executive Officer contain monitoring programs. Implementation of those Regional Board-approved monitoring programs constitutes compliance with the Monitoring Station and Monitoring Procedure requirements, described below.

(1) Monitoring and Assessment Requirements for Beaches

(a) Monitoring Stations

For beaches addressed by these TMDLs, monitoring locations should consist of, at a minimum, the same locations used to collect data required under MS4 NPDES monitoring requirements and beach monitoring for Health and Safety Code section 115880.[75] If exceedances of the receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations and/or other source identification methods must also be used to demonstrate that the bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

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~~(i) The Responsible Copermittees may~~must ~~designate the MS4 outfalls within their jurisdiction discharging to the Pacific Ocean Shoreline segments or areas listed in Table 6.0 as high priority non-storm water MS4 monitoring stations, in accordance with the requirements of Provision D.1 of this Order. Monitoring stations may be selected based on stations utilized under other monitoring programs. Outfalls may be monitored for follow up source identification, at minimum, as consistent with this Order.~~

~~(ii) For the Pacific Ocean Shoreline segments or areas listed in Table 6.0 with MS4 outfalls, the Responsible Copermittees must establish at least one monitoring station within the receiving water. Monitoring stations may be selected based on stations utilized under other monitoring programs.~~

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly.

The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations for an adequate number of storm events that occur during the rainy season (i.e., October 1 through April 20) to represent wet weather conditions. At least one sample must be collected within the first 24 hours of the end of a storm event[27].

~~(i) The Responsible Copermittees must monitor receiving waters the effluent of the designated MS4 outfalls within their jurisdiction discharging during dry weather to the Pacific Ocean Shoreline segments or areasas listed in Table 6.0 in accordance with the dry weather jurisdictional monitoring set forth in the WQIP.requirements of Provision D.1.a.(1)(b) of this Order. Samples required to be submitted to a laboratory for analysis must include analysis for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.~~

~~(ii) The Responsible Copermittees must monitor, within the first 24 hours of each monitored storm event,[28] the receiving water effluent of the designated MS4 outfalls within their jurisdiction as discharging to the Pacific Ocean Shoreline segments or areas listed in Table 6.0 in accordance with the wet weather jurisdictional monitoring requirements of Provision D.1.b.(1)(b) of this Order. Samples required to be submitted to a laboratory for analysis must include analysis for total coliform, fecal coliform, and *Enterococcus* indicator bacteriamonitoring requirements set forth in the WQIP.~~

~~(iii)~~(ii) ~~The Responsible Copermittees must collect samples from the~~

[27] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

~~[28] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].~~

~~monitoring stations within the receiving water body for each dry weather and wet weather MS4 outfall monitoring event monitored.~~ Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs for the Pacific Ocean Shoreline segments or areas listed in Table 6.0 have been achieved.

[12] Commonly referred to as AB 411 monitoring

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~~(i)~~(ii) The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

(2) Monitoring and Assessment Requirements for Creeks and Creek Mouths

(a) Monitoring Stations

For creeks addressed by these TMDLs, monitoring locations should consist of, at a minimum, a location at or near the mouth of the creek (e.g., Mass Loading Station or Mass Emission Station) and one or more locations upstream of the mouth (e.g., Watershed Assessment Stations). If exceedances of the receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations and/or other source identification methods must also be used to demonstrate that the bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

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~~(i) The Responsible Copermittees must establish at least one receiving water monitoring station at or near the mouth of the creeks listed in Table 6.0. Monitoring stations may be selected based on stations utilized under other monitoring programs. Outfalls may be monitored for follow-up source identification, at minimum, as consistent with this Order.~~

~~(ii) The Responsible Copermittees must establish at least one receiving water monitoring station upstream of the station established for Specific Provision 6.d.(2)(a)(i). At least one monitoring station must be established for each Responsible Copermittee at the most downstream location within its jurisdiction, and one monitoring station at the most upstream location within its jurisdiction.~~

~~(iii) The Responsible Copermittees may must identify the MS4 outfalls discharging to the segments or areas of the creeks and creek mouths listed in Table 6.0. The Responsible Copermittees must may identify the MS4 outfalls that are monitored in accordance with the dry weather jurisdictional monitoring requirements of Provision D.1.a.(1)(b) of this Order and the wet weather jurisdictional monitoring requirements of Provision D.1.b.(1)(a) of this Orderunder other monitoring programs and in accordance with the WQIP.~~

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations ~~at least monthly~~according to the WQIP.

(i) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations for an adequate number of storm events that occur during the rainy season (i.e., October 1 through April 20) to represent wet weather conditions. At least one sample must be collected within the first 24 hours of the end of a storm event[29].
~~each storm event monitored, according to the WQIP.~~[30]

(ii) Samples collected from receiving water monitoring stations must be analyzed for ~~total coliform,~~ fecal coliform, and *Enterococcus* indicator bacteria.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the receiving water monitoring data to assess whether the interim and final receiving water WQBELs for the creeks and creek mouths listed in Table 6.0 have been achieved.

~~(ii) If the receiving water WQBELs for the creeks and creek mouths listed in Table 6.0 have not been achieved, the Responsible Copermittees must review the MS4 outfall monitoring data to assess whether the interim and final effluent WQBELs have been achievedfollow the process set forth in the WQIP.~~

[29] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

~~[30] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].~~

~~(iii) If receiving water WQBELs for the creeks and creek mouths listed in Table 6.0 have not been achieved, tThe Responsible Copermittee must identify and incorporate additional MS4 outfall and receiving water monitoring stations and/or adjust monitoring frequencies to identify sources causing exceedances of the receiving water WQBELs.actions to be implemented in the WQIP.~~

~~(iv)~~(ii) The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

6. Enforcement Response Plans [Alternative to Provision E.6]

Each Copermittee must develop and implement an Enforcement Response Plan as part of its jurisdictional runoff management program document. The Enforcement Response Plan must describe the applicable protocols and options for enforcing compliance with the provisions of this Order. The Copermittees may continue to utilize and implement established, equivalent guidelines and procedures for enforcement.

The Enforcement Response Plan must include the following:

a. Enforcement Response Plan Components
The Enforcement Response Plans shall include the following individual components:

i. The Illicit Discharge Detection and Elimination Enforcement Components provided in Provision E.2.
ii. The Development Projects Enforcement Component provided in provision E.3.

Existing enforcement plans or procedures may be used to partially or wholly satisfy the requirements of any Enforcement Response Plan component.

a. Enforcement Approaches and Options
Each Enforcement Response Plan component must describe the Copermittee's approach to correcting noncompliance with its permits, applicable local ordinances, and this Order. It must describe protocols for progressively stricter responses, including, as applicable, timeframes allowed to bring areas or facilities into compliance. The enforcement process must include appropriate sanctions to compel compliance, such as:

1) Verbal and written notices of violation;
2) Cleanup requirements;
3) Fines
4) Bonding requirements;
5) Administrative and criminal penalties;
6) Liens;
7) Stop work orders; and
8) Permit and occupancy denials.

c. **CORRECTION OF VIOLATIONS**

1) Violations must be corrected in a timely manner with the goal of correcting them within 30 calendar days after the violations are discovered and prior to the next predicted rain event, when possible.
2) If more than 30 calendar days are required for compliance, then a

Internal Draft

rationale must be recorded in the applicable electronic database or tabular system used to track compliance.

d. **ESCALATED ENFORCEMENT PRIORITIES**

1) Each Enforcement Response Plan must include a definition of "escalated enforcement priorities". Escalated enforcement priorities shall be defined to include any enforcement scenario where a violation or other non-compliance is determined to constitute a significant contribution to any of the highest water quality priorities identified in the Water Quality Improvement Plan. Escalated enforcement priorities may be defined differently for development planning; construction sites; commercial, industrial, and municipal sources; and residential management areas.

2) Where a violation involving a pollutant or stressor that has been identified as a highest water quality priority is not determined to represent an escalated enforcement priority, a rationale must be recorded in the applicable electronic database or tabular system used to track compliance.

3) High level enforcement actions must continue to escalate, as necessary, to compel compliance as soon as possible.

e. Reporting of Non-Compliant Sites

(1) Each Copermittee must notify the San Diego Water Board in writing within 48 hours of issuing escalated enforcement (as defined in the Copermittee's Enforcement Response Plan) to a construction site that poses a significant threat to water quality as a result of violations or other non-compliance with its permits and applicable local ordinances, and the requirements of this Order. Written notification may be provided electronically in email form.

(2) Each Copermittee must notify the San Diego Water Board of non-filers under the Industrial General Permit and Construction General Permit by email to Nonfilers_R9@waterboards.ca.gov.

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5. Existing Development Management [Alternative to Provision E.5]

Each Copermittee must implement an existing development management program that includes the following requirements:

a. Industrial, Commercial, and Municipal Sources

(1) Source Identification and Prioritization

Each Copermittee must identify known sources and maintain an updated watershed-based inventory of its existing industrial, commercial, and municipal development that has the reasonable potential to discharge a pollutant load to and from the MS4. The use of an automated database system, such as GIS, is highly recommended. The inventory must, at a minimum, include:

(a) Name, location (address and/or hydrological subarea) of each source;

(b) A designation of the source as municipal, commercial, or industrial;

(c) SIC Code or NAICS Code, if applicable;

(d) Industrial General Permit NOI and/or WDID number, if applicable;

(e) Identification of pollutants generated or potentially generated by the source;

(f) Whether the source is adjacent to an ESA;

(g) Whether the source is tributary to and within the same hydrologic subarea as a CWA section 303(d) water body segment and generates or potentially generates pollutants for which the water body segment is impaired; and

(h) Whether the source contributes or potentially contributes to the highest water quality priorities identified in the Water Quality Improvement Plan;

(2) BMP Implementation and Maintenance

Each Copermittee must designate a minimum set of BMPs required for all inventoried existing development with the reasonable potential to discharge pollutant loads from their MS4, including special event venues. The designated minimum BMPs must be specific to facility types and pollutant-generating activities, as appropriate.

(a) Pollution Prevention

Each Copermittee must promote the use of pollution prevention methods, where appropriate.

(b) BMP Operation and Maintenance

(i) Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at sources within its jurisdiction.

(ii) Each Copermittee must implement a schedule of operation and maintenance activities for its MS4 and related structures (including but not limited to catch basins, storm drain inlets, detention basins, etc.), and verify proper operation of all its municipal structural treatment controls. Operations and maintenance activities may include:

[a] Inspections of MS4 and related structures;

[b] Cleaning of MS4 and related structures; and

[c] Proper disposal of materials removed from cleaning of MS4 and related structures.

(iii) Each Copermittee must implement a schedule of operation and maintenance activities for public: streets, unpaved roads, paved roads, and paved highways and freeways within its jurisdiction.

(iv) Each Copermittee must implement controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers. Copermittees that operate both a municipal sanitary sewer system and a MS4 must implement controls and measures to prevent and eliminate seeping sewage from infiltrating the MS4. Copermittees that do not operate both a municipal sanitary sewer system and a MS4 are encouraged to coordinate with sewering agencies to keep themselves informed of relevant and appropriate maintenance activities and capital projects in their jurisdiction.

(c) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must implement procedures, or require the implementation of procedures, as appropriate, to reduce discharges of pollutants associated with the application, storage, and disposal of pesticides, herbicides and fertilizers at sources within its jurisdiction.

(3) Measures to Address Highest Water Quality Priorities

Each Copermittee must conduct or require measures as necessary to address sources or areas that discharge pollutants identified as contributing to the highest water quality priorities in the Water Quality Improvement Plan. These measures must be identified as applicable in each WQIP strategy, and may include any of the following:

(a) Copermittee Program Activities

Each Copermittee may make modifications to its program activities (e.g. increased or focused education, inspections, etc.) to address sources that discharge pollutants identified as contributing to the highest water quality priorities in the Water Quality Improvement Plan.

(b) Additional Control Measures

Each Copermittee may require additional pollution prevention measures and control measures at sources that discharge pollutants identified as contributing to the highest water quality priorities in the Water Quality Improvement Plan, including consideration of retrofit and channel rehabilitation and improvement opportunities, as identified in Provision 5.a.2.(c)

(c) Retrofit

Each Copermittee must develop a strategy to facilitate the implementation of retrofit projects. Existing development in high priority areas should be assessed for inclusion in the retrofit plan. Retrofit plans should focus on pollutants and areas identified as high priority within the Water Quality Improvement Plans, with the highest priority projects included in the Water Quality Improvement Plans.

(i) Retrofit projects may be prioritized based on their relative benefit to water quality, feasibility, cost effectiveness, and community acceptance.

(ii) Retrofit projects in the highest priority areas should be included in the review for the Water Quality Improvement Plan to provide additional pollutant removal from storm water discharges.

(d) Channel Rehabilitation and Improvement

Each Copermittee must develop a strategy to facilitate the implementation of channel rehabilitation and improvement projects within their jurisdiction. Existing channels in high priority areas should be assessed for inclusion in the channel rehabilitation and improvement plan. Channel rehabilitation and

improvement plans should focus on pollutants and areas identified as high priority within the Water Quality Improvement Plans.

(i) Channel rehabilitation and improvement projects may be selected to address hydromodification, restore wetland and riparian habitat, or to address other water quality issues prioritized in the Water Quality Improvement Plan.

(ii) Channel rehabilitation and improvement projects may be prioritized based on their relative benefit to water quality, feasibility, cost effectiveness, and community acceptance.

(iii) Channel rehabilitation and improvement projects in the highest priority areas should be included in the review for the Water Quality Improvement Plan to provide additional pollutant removal from storm water discharges.

(4) Inspection Requirements:

(a) Inspection Frequency

(i) Each Copermittee must establish appropriate inspection frequencies for inventoried industrial, commercial, and municipal sources based on the potential for discharging pollutants via storm water and non-storm water discharges, and should reflect the priorities set forth in the Water Quality Improvement Plan.

(ii) Each Copermittee must conduct inspections annually with a level of effort equivalent to 20% of their industrial, commercial, and municipal inventory combined[12]. If facilities require multiple inspections during any given year, those additional inspections may count towards this total.

(iii) Inventoried existing development must be inspected, as needed, in response to valid public complaints and findings from the Copermittee's municipal and contract staff inspections.

(iv) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e. education and outreach, re-inspection,

[1] Excludes linear facilities (MS4 and roads).

enforcement) as necessary to confirm compliance in accordance with its enforcement response plan pursuant to Provision E.6.

(b) Inspection Content

Inspections of industrial, commercial, and municipal facilities by the Copermittee may include the following:

(i) Industrial, commercial, and municipal facilities name and location (address and hydrologic subarea);

(ii) Inspection and re-inspection date(s);

(iii) Assessment of compliance with its applicable local ordinances and permits related to non-storm water and storm water discharges and runoff;

(iv) Assessment of BMPs implementation;

(v) Verification of coverage under the Industrial General Permit (NOI and/or WDID number), when applicable;

(vi)

(vii) Visual observations of actual non-storm water discharges, if present;

(viii) Visual observations of actual or potential discharge of pollutants, if present; and

(ix) Visual observations of actual or potential illicit connections, if present.

(c) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried industrial, commercial, and municipal facilities. The Copermittee must maintain all inspection records in an electronic database or tabular format, either in paper or electronic inspection records files, which must be made available to the San Diego Water Board upon request.

Inspection records must include the information necessary to effectively manage and implement the industrial, commercial, and municipal facilities inspection program, as described in each Copermittee's jurisdictional runoff management plan

b. Residential Sources

(1) Source Identification and Prioritization:

An inventory of residential sources within each Copermittees jurisdiction must be developed as follows:

(a) Designation of Residential Management Areas

Each Copermittee must divide areas of residential development into Residential Management Areas. Residential Management Areas may be designated by one or more of the following: Hydrologic Sub Area, land use (e.g. single family, multi family, rural, Common Interest Areas, or Home Owner Associations), or other accepted methods to be included in each Copermittee-approved jurisdictional runoff management plan.

(b) Prioritization of Residential Management Areas

Copermittees must prioritize Residential Management Areas for the purposes of prioritizing and directing their residential programs. Prioritization must consider whether the Residential Management Area contributes or potentially contributes to the highest water quality priorities identified in the Water Quality Improvement Plan, and consideration of other program information or information from other relevant programs:

(c) A regularly updated map must be developed showing the locations of inventoried Residential Management Areas, watershed boundaries, and water bodies at or near them.

(2) BMP Implementation and Maintenance

(a) Designate BMPs

Each Copermittee must designate and require the implementation of a minimum set of BMPs for all residential sources or target audiences with the reasonable potential to discharge significant pollutant loads from their MS4.The designated minimum BMPs must be source-specific, and must address each of the following as appropriate.

(i) Pollution Prevention

Each Copermittee must promote the use of pollution prevention

methods, where appropriate.

(ii) BMP Operation and Maintenance

Each Copermittee must operate and maintain, or require the operation and maintenance of designated BMPs for sources within its jurisdiction.

(iii) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must require and encourage, as appropriate, the implementation of practices to reduce discharges of pollutants associated with the application, storage, and disposal of pesticides, herbicides and fertilizers at residential sources within its jurisdiction.

(3) Measures to Address Highest Water Quality Priorities

Each Copermittee must conduct or require measures as necessary to address sources or areas that discharge pollutants identified as contributing to the highest water quality priorities in the Water Quality Improvement Plan. These measures must be identified as applicable in each WQIP strategy, and may include any of the following:

(a) Copermittee Program Activities

Each Copermittee may make modifications to its program activities (e.g. increased or focused education, inspections, etc.) to address sources that discharge pollutants identified as contributing to the highest water quality priorities in the Water Quality Improvement Plan.

(b) Additional Control Measures

Each Copermittee may require additional pollution prevention and control measures at sources that discharge pollutants identified as contributing to the highest water quality priorities in the Water Quality Improvement Plan.

(c) Retrofit

Each Copermittee must encourage through education or other means the implementation of retrofit projects at residential sources or areas.

(4) Residential Management Area Oversight:

(a) Residential Area Assessment

Each Copermittee must conduct representative evaluations (e.g. visual observations, surveys, water use analysis, if available, and other data) of its prioritized RMAs to update implementation strategies.

(b) Residential Program Update

Within two years, each Copermittee must develop and submit for Regional Board approval an updated residential program strategy based on assessment findings. Until Copermittees implement an updated residential program, they must continue performing their existing programs.

(c) Follow up Actions

Each Copermittee must prioritize and implement its follow up actions (e.g. education and outreach, re-assessment, enforcement) in accordance with its Enforcement Response Plan pursuant to Provision E.6.

(d) Assessment Tracking and Records

Assessment records must be tracked and sufficiently detailed in order to determine compliance with the requirements of this Order and any progress made toward the modification of residential management strategies, or addressing the highest water quality priorities identified in the Water Quality Improvement Plan.

c. Existing Development Enforcement
Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried existing development identified by the Copermittee as having the reasonable potential to discharge pollutant loads from the MS4 within their jurisdiction, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

ORANGE COUNTY PERMITTEES

ATTACHMENT C

MONITORING PRINCIPLES

Orange County Monitoring Principles

The Permittees from San Diego County have developed an alternative monitoring program from the one identified in the Draft Administrative Order. While we agree in many cases with the alternative approach, the Orange County Permittees do not believe that this proposal represents a model for the permit that would be appropriate for Orange County, and think any monitoring program should reflect the following principles:

1. Support the question-driven monitoring and assessment program using the SMC model stormwater monitoring program as guidance. The WQIP should be the vehicle for establishing the monitoring program to support the watershed priorities. As such the proposed monitoring program should include:
    a. Wet Weather and Dry Weather Monitoring
    b. Receiving Water and Outfall Monitoring
    c. Supplemental Monitoring as appropriate
    d. Scope and schedule for monitoring
2. Monitoring should focus on the watershed and constituents of concern. Therefore initial monitoring should focus on the receiving water condition to identify the critical water quality issues (both dry and wet weather) and from there move to outfall monitoring to better support the stormwater program to address the critical water quality issues.
3. Monitoring should provide the opportunity to measure the overall watershed condition while being supported by a focused and complimentary outfall monitoring program that evaluates the sources and stressors affecting watershed condition. The assessment and feedback approach using a question driven framework would follow this general framework:
    a. Provide a comprehensive regional assessment of receiving waters in years 1 of the permit term (assessment).
    b. Conduct intensive outfall monitoring within each watershed or hydrologic subarea on an annual basis or rotating basis in the intervening years (sources and stressors).
    c. Conduct a comprehensive re-assessment of receiving water conditions in year 5 of the permit term to measure progress in addressing outfall discharges (feedback).
4. Dry weather monitoring should have the following objectives:
    a. As a diagnostic tool to support the Illegal Discharge / Illicit Connection (ID/IC) program
        i. Develop action levels that reflect a probabilistic and targeted sampling program.
        ii. Conduct investigation to identify the discharge.
    b. As an assessment tool to effectively prohibit non-stormwater discharges.
        i. Develop action levels that reflect protection of beneficial uses and watershed water quality issues.
        ii. Conduct investigation to identify the source(s).
5. Wet weather monitoring should have the following objectives:
    a. Assess the long term changes in the receiving water
        i. Conduct comprehensive monitoring at Mass Load Stations (MLS) every five years
    b. Assess the impacts of stormwater discharges on the receiving water
        i. Conduct outfall monitoring on an annual basis.

Although we have not provided specific comments on the monitoring provision of the Draft Adminstrative Order our assessment of the future Tentative Order will be based on these principles.

Walsh, Laurie@Waterboards

From: Suppes, Christy <Christy.Suppes@ocpw.ocgov.com>
Sent: Monday, September 17, 2012 4:08 PM
To: Walsh, Laurie@Waterboards
Cc: Gibson, David@Waterboards; Felix, Tony@Waterboards; Crompton, Chris; Skorpanich, Mary Anne; Boon, Richard; Onuma, Kevin; 'jon.vanrhyn@sdcounty.ca.gov'; 'Padres, Claudio'; 'syhasenin@sandiego.gov'; Ruano, Betty; bfowler@danapoint.org; Crompton, Chris; 'Chris Macon - Laguna Woods'; Suppes, Christy; 'Devin Slaven - Lake Forest'; 'E. (Max) Maximous - Rancho Santa Margarita'; Fortuna, James; Gin, Vincent; Sharp, Grant; 'Humza Javed - Laguna Hills'; 'Jean Jambon - Laguna Niguel'; Voss, Jenna; Shook, Jennifer; 'Joe Ames - Mission Viejo'; jwhitman@cityofalisoviejo.com; 'Jonathan Orduna - Laguna Niguel'; krosenfield@ci.laguna-hills.ca.us; 'Leslie Keane - Laguna Woods'; 'Lisa Zawaski - Dana Point'; 'Luis Estevez - Lake Forest'; Skorpanich, Mary Anne; 'Mary Vondrak - San Clemente'; 'Mike Phillips - Laguna Beach'; 'Moy Yahya - Aliso Viejo'; 'Nancy Palmer - Laguna Niguel'; 'Nasser Abbaszadeh - San Juan Capistrano'; Nguyen, Duc; 'Peter Meier - Lake Forest'; 'Rae Beimer - Rancho Santa Margarita'; Boon, Richard; 'Richard Schlesinger - Mission Viejo'; 'Tom Bonigut - San Clemente'; 'Tracy Ingebrigtsen - Laguna Beach'; Yi, Greg; 'Ziad Mazboudi - San Juan Capistrano'
Subject: County of Orange Comments Addendum - Administrative Draft Order No. R9-2012-0111
Attachments: OC Comment Addendum - Draft Admin Order R9-2012-0011.pdf; OC Comment - Attachment A-Addendum.pdf

ORANGE COUNTY
OC PublicWorks
Our Community. Our Commitment.

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September 17, 2012

By E-Mail and U.S. Mail

Laurie Walsh
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4353

Subject: County of Orange Comment Submittal on the Administrative Draft Municipal Separate Storm Sewer (MS4) Permit (Tentative Order No. R9-2012-0011)

Dear Ms. Walsh:

On September 14, the County provided you with comments on the subject Permit. Since that time, the County has been provided with the comment letter prepared by Rancho Mission Viejo. This comment letter requests inclusion of language from current Order No. R9-2009-0002, specifically, *Provision F.1.d.(11) Where a development project……*

The County supports the inclusion of this provision in the future Tentative Order. Attached is an Addendum modifying our comments to include a provision that would continue the current alternative compliance option for watershed-based planning approaches for land development.

Christy Suppes
OC Watershed Program - Stormwater External
2301 N. Glassell St., Orange, CA 92865
(714) 955-0673 tel / (714) 955-0639 fax
christy.suppes@ocpw.ocgov.com
www.ocwatersheds.com

Please note my working hours are 7:30 AM - 5:00 PM, Monday - Thursday, and 7:30 AM - 4:00 PM every other Friday.
For the month of September, I will be in the office on the following Friday(s): 14th and 28th.

ORANGE COUNTY PERMITTEES

A – ADDENDUM

REDLINE/STRIKEOUT DRAFT PERMIT AND COMMENT TABLE

	COUNTY OF ORANGE COMMENTS ON TENTATIVE ORDER NO. R9-2012-0011				
Comment #	**Permit Section**	**Permit Page[1]**	**Section Title**	**Reason for Proposed Changes/Comments**	**Proposed Changes**
102a	E.3.c.5	71	Alternative Compliance for Watershed-Based Planning	Inclusion of new section "E.3.c.5 Alternative Compliance for Watershed-Based Planning" is needed to maintain continuity with same provision in R9-2009-0002 F.1.d(11)	**As shown in the attached revised Permit, include additional language, as follows:** (5) Alternative Compliance for Watershed-Based Planning Where a development project, greater than 100 acres in total project size or smaller than 100 acres in size yet part of a larger common plan of development that is over 100 acres, has been prepared using watershed and/or sub-watershed based water quality, hydrologic, and fluvial geomorphologic planning principles that implement regional LID BMPs in accordance with the sizing and location criteria of this Order and acceptable to the Regional Board, such standards shall govern review of projects with respect to Provision E.3 of this Order and shall be deemed to satisfy this Order's requirements for LID site design, buffer zone, infiltration and groundwater protection standards, source control, treatment control, and hydromodification control standards. Regional BMPs must clearly exhibit that they will not result in a net impact from pollutant loadings over and above the impact caused by capture and retention of the design storm. Regional BMPs may be used provided that the BMPs capture and retain the volume of runoff produced from the 24-hour 85th percentile storm event as defined in Provision E.3.c. and

[1] Refers to the page numbers of the original Administrative Draft issued by the Regional Board on April 9, 2012

	COUNTY OF ORANGE COMMENTS ON TENTATIVE ORDER NO. R9-2012-0011				
Comment #	**Permit Section**	**Permit Page[1]**	**Section Title**	**Reason for Proposed Changes/Comments**	**Proposed Changes**
					that such controls are located upstream of receiving waters. Any volume that is not retained by the LID BMPs, up to the design capture volume, must be treated using LID biofiltration sized for the design capture volume that has not been retained. Where regional LID implementation has been shown to be technically infeasible (per Section E.3.c.(4)(b)) any volume up to and including the design capture volume, not retained by LID BMPs, not treated by LID biolfiltration, must be treated using conventional treatment control BMPs in accordance with Section E.3.c.(2)(d) and participation in the mitigation program in Section D.3.c.(4)(c).

for the completion of offsite mitigation projects, including milestone dates to identify, fund, design, and construct the projects. PDP implemented offsite mitigation projects must be completed upon completion of the PDP, unless a longer period is authorized by the San Diego Water Board. The timing of mitigation projects associated with a Copermittee offsite mitigation program will be developed by the Copermittees as part of developing their offsite mitigation program.

(iv) *Mitigation Fund*

A Copermittee may choose to implement additional mitigation programs (e.g., pollutant credit system, mitigation fund) as a means for developing and implementing offsite mitigation projects, provided the projects conform to the requirements for project locations, types, and timing described above.

(5) Alternative Compliance for Watershed-Based Planning

Where a development project, greater than 100 acres in total project size or smaller than 100 acres in size yet part of a larger common plan of development that is over 100 acres, has been prepared using watershed and/or sub-watershed based water quality, hydrologic, and fluvial geomorphologic planning principles that implement regional LID BMPs in accordance with the sizing and location criteria of this Order and acceptable to the Regional Board, such standards shall govern review of projects with respect to Provision E.3 of this Order and shall be deemed to satisfy this Order's requirements for LID site design, buffer zone, infiltration and groundwater protection standards, source control, treatment control and hydromodification control standards. Regional BMPs must clearly exhibit that they will not result in a net impact from pollutant loadings over and above the impact caused by capture and retention of the design storm. Regional BMPs may be used provided that the BMPs capture and retain the volume of runoff produced from the 24-hour 85th percentile storm event as defined in Provision E.3.c. and that such controls are located upstream of receiving waters. Any volume that is not retained by the LID BMPs, up to the design capture volume, must be treated using LID biofilitration sized for the design capture volume that has not been retained. Where regional LID implementation has been shown to be technically infeasible (per Section E.3.c.(4)(b)) any volume up to and including the design capture volume, not retained by LID BMPs, nor treated by LID biofiltration, must be treated using conventional treatment control BMPs in accordance with Section E.3.c.(2)(d) and participation in the mitigation program in Section E.3.c.(4)(c).

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ORANGE COUNTY
OC Public Works
Our Community. Our Commitment.

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300 N. Flower Street
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Fax: (714) 967-0896

September 17, 2012

By E-Mail and U.S. Mail

Laurie Walsh
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4353

Subject: County of Orange Comment Submittal on the Administrative Draft Municipal Separate Storm Sewer (MS4) Permit (Tentative Order No. R9-2012-0011)

Dear Ms. Walsh:

On September 14, the County provided you with comments on the subject Permit. Since that time, the County has been provided with the comment letter prepared by Rancho Mission Viejo. This comment letter requests inclusion of language from current Order No. R9-2009-0002, specifically, *Provision F.1.d.(11) Where a development project……*

The County supports the inclusion of this provision in the future Tentative Order. Attached is an Addendum modifying our comments to include a provision that would continue the current alternative compliance option for watershed-based planning approaches for land development.

Please contact me directly if you have any questions. For technical questions, please contact Chris Crompton at (714) 955-0630 or Richard Boon at (714) 955-0670.

Sincerely,

Richard Boon for
Mary Anne Skorpanich, Manager
OC Watersheds

Attachments: A – Addendum: Redline/Strikeout Draft Permit and Comment Table

Cc: David Gibson, San Diego Regional Board
Tony Felix, San Diego Regional Board
South Orange County Permittees
Orange County Technical Advisory Committee
Kevin Onuma, Orange County Flood Control District

Walsh, Laurie@Waterboards

From: McPherson, Sheri <Sheri.McPherson@sdcounty.ca.gov>
Sent: Friday, September 14, 2012 2:59 PM
To: Walsh, Laurie@Waterboards; Chiu, Wayne@Waterboards; Becker, Eric@Waterboards; Barker, David@Waterboards
Cc: Tesoro, Cid; Brownyard, Teresa; Snyder, Todd
Subject: County of San Diego Comments on Administrative Draft Permit (R9-2012-0011)
Attachments: 09-14-12 County comment letter to RB admin draft.pdf

Laurie,

Please find attached the County of San Diego's comment letter on the Administrative Draft MS4 Permit (R9-2012-0011).

Please let me know if you have questions.

Thank you,

Sheri

Sheri McPherson
County of San Diego
Watershed Protection Program
(858) 495-5285
sheri.mcpherson@sdcounty.ca.gov

****As of August 10, 2012 our offices will be relocated to 5510 Overland Avenue, Suite 410, San Diego, CA 92123. All email addresses, phone numbers and fax numbers will remain the same.**

County of San Diego

RICHARD E. CROMPTON
DIRECTOR

DEPARTMENT OF PUBLIC WORKS

5510 OVERLAND AVE, SUITE 410
SAN DIEGO, CALIFORNIA 92123-1295

(858) 694-2212 FAX: (858) 694-3597
Web Site: www.sdcounty.ca.gov/dpw/

September 14, 2012

Ms. Laurie Walsh
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

SUBJECT: COUNTY OF SAN DIEGO COMMENT SUBMITTAL ON THE ADMINISTRATIVE DRAFT MUNICIPAL SEPARATE STORM SEWER (MS4) PERMIT (TENTATIVE ORDER NO. R9-2012-0011)

Dear Ms. Walsh,

Thank you for the opportunity to comment on *Tentative Order No. R9-2012-0011 -- National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Administrative Draft Permit).

The comments provided herein are offered by the County of San Diego in addition to those that the County has submitted separately on behalf of the 21 Copermittees subject to Order 2007-0001. While the Copermittee comments represent a general consensus developed since the release of the Administrative Draft Permit in April 2012, we believe that additional input is needed to reflect the unique perspective of the County as Regional Principal Permittee and as a large jurisdiction covering portions of eight watershed management areas.

Below we have identified several additional issues for Regional Board consideration. We believe in particular that the first three issues warrant additional discussion, and we are anxious to continue dialoguing with Regional Board staff, representatives of the Orange and Riverside permit regions, and other parties as appropriate. We would also like to emphasize that the comment letters submitted by both of these counties provide

suggested principles that we agree are both useful and appropriate as a basis for much of this discussion.

1. Relationship of WQIP and JRMP Requirements.

The relationship of Water Quality Improvement Plan (WQIP) and Jurisdictional Runoff Management Plan (JRMP) requirements must be clarified. In spite of the extensive discussion that has already occurred on this issue, there appears to be a considerable variety of opinions on the specific content to be addressed in each plan, how these plans are related, and how each supports compliance with applicable permit performance standards. We suggest that the following questions be considered as a basis for continued discussion:

- What is the required content, relationship, and phasing of all submittals under the permit?
- Must a WQIP contain all jurisdictional commitments within a WMA or only those related to the highest priority water quality issues?
- Is the JRMP intended to be a procedural document generally describing Copermittee programs? Or should it contain specific watershed and/or jurisdictional commitments?
- Will implementation of a publicly vetted and Regional Board-approved WQIP constitute compliance with the permit?
- What specific content should be contained in WQIP Annual Reports? Are these reports sufficient to describe jurisdictional compliance as a whole?
- What are appropriate timeframes for reporting various data, information, and results?

2. Adaptive Management Provisions.

Adaptive management provisions of the Administrative Draft Permit should be fleshed out to ensure that they support meaningful program improvement over time. In particular, the County believes that a clear distinction should be made between normal iterative management processes (i.e., ongoing adjustments to programs and plans in response to experience obtained during routine implementation) and adaptive management (a structured process of identifying and addressing specific knowledge gaps with an aim toward resolving them over time). We believe that the two processes are fundamentally different in their aims, and with respect to the planning and resource commitments needed to sustain them. The best permit will be one that recognizes these distinctions, and that ensures the proper application of both processes. We suggest that the following questions be considered as a basis for continued discussion:

- Where are iterative and adaptive management processes most needed?
- Where do Copermittees have the discretion to make modifications? Where are approvals needed?
- Are there specific permit provisions that can or cannot be modified?
- Are there standards, criteria, other conditions that must be met to allow modification?
- Where approvals are needed for modifications, what is the process for obtaining them? What is the role of public review in this process?

Adaptive management provisions in the Administrative Draft Permit are currently consolidated under Section II.B.5. The Copermittees have suggested the addition of clarifying text in the introduction to Section II.E, as well as other specific edits throughout Section II.B. The County supports these changes, but additionally proposes that a separate section be established in the permit to consolidate, clarify, and emphasize iterative and adaptive management provisions.

3. Offsite Mitigation Programs.

Section II.E.3 of the Administrative Draft Permit requires the imposition of onsite retention and HMP controls for Priority Development Projects (PDPs). During discussions, Copermittees and industry representatives have emphasized the impracticability of meeting the proposed retention standard for all PDP sites. As an alternative that would provide greater flexibility in achieving compliance onsite, the Copermittees have proposed that a second tier of LID treatment options be added to the permit. The County strongly supports this proposal. However, even assuming acceptance of this proposed modification it's likely that PDPs will in some instances be unable to meet all applicable standards onsite. Therefore, we view the development of a mitigation program as an eventual necessity. Given this, it's critical that any limitations or constraints on the development or application of such programs be fully vetted prior to permit adoption. In particular, the County remains concerned that the mitigation project timing requirements contained in the Administrative Draft Permit would make regional controls infeasible in some cases or impose unrealistic and unacceptable liabilities on Copermittees for their completion and performance. Likewise, the use of mitigation funds, either internal or private, must be further explored to better understand their potential role. The required use of mitigation programs is new to this permit, and it's pragmatic to approach their imposition with caution. Unless the potential difficulties associated with such an undertaking are met up front, it's possible that the County will have little incentive to actively pursue them.

4. Attachment E, Total Maximum Daily Load for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed.

The Rainbow Creek TMDL for Total Nitrogen and Phosphorous assigns a Load Allocation (LA) to the County MS4. The Administrative Draft Permit incorporates this Load Allocation as Wasteload Allocation (WLA). We are aware of no legal basis for such a change, and therefore believe it was made in error. We request that the Regional Board strike the Rainbow Creek TMDL from Attachment E of the Administrative Draft Permit.

5. Provision E.2.A, Non-Storm Water Discharge of Irrigation Runoff.

Section B.2 of Order R9-2007-0001 requires that discharges from irrigation water, lawn watering, and landscape irrigation be prohibited only where they have been identified as a significant source of pollutants to waters of the U.S. Section E.2.a of the Administrative Draft Permit categorically defines each of these discharge types as illicit discharges. Since an accompanying Technical Report has not been provided with the Administrative Draft Permit, the County is unaware of any rationale for the removal of these exemptions. We request that this rationale be provided as part of the public record. If not, we respectfully request that irrigation water, lawn watering, and landscape irrigation be added to Section E.2.a.(3) of the Administrative Draft Permit. If sufficient rationale is provided for their removal, we alternatively request that they be added to Section E.2.a.(4) since their control through statute, ordinance, permit, contract, order, or similar means would seem to constitute an appropriate management response.

Again, thank you for the opportunity to participate in the development of a new for the San Diego Region. We look forward to continued discussion of the issues raised above. Please contact Jon Van Rhyn (858) 495-5133 if you have any questions.

Sincerely,

CID TESORO, LUEG Program Manager
Watershed Protection Program,
Department of Public Works
County of San Diego

Walsh, Laurie@Waterboards

From: Jill Witkowski <jill@sdcoastkeeper.org>
Sent: Friday, September 14, 2012 4:35 PM
To: Walsh, Laurie@Waterboards
Cc: Chiu, Wayne@Waterboards; Becker, Eric@Waterboards; Barker, David@Waterboards; Colin Kelly
Subject: Comments on Administrative Draft MS4 Permit--San Diego Region
Attachments: 2012-0406 Tentative Order--Enviro Redline.docx; 9-14-12 Enviro Group MS4 comments FINAL.pdf

Dear Ms. Walsh:

Attached please find comments on the administrative draft of the San Diego Regional Municipal Separate Storm Sewer System permit, Tentative Order No. R9-2012-0011, submitted by San Diego Coastkeeper, Orange County Coastkeeper, Inland Empire Waterkeeper, Surfrider Foundation—San Diego Chapter, Surfrider Foundation—South Orange County Chapter, Environmental Health Coalition, Preserve Wild Santee, Friends of Rose Canyon, Coastal Environmental Rights Foundation, Laguna Bluebelt Coalition, South Laguna Civic Association, and Save Hobo Aliso.

Also attached, for your reference, is a redline document incorporating some of the suggestions mentioned in the attached comment letter. Please let me know if you have difficulty opening any other attachments.

Thank you,
Jill

Jill Witkowski
Waterkeeper
San Diego Coastkeeper®

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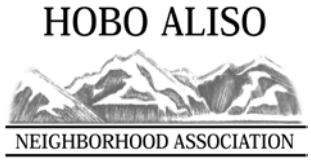

September 14, 2012

Via e-mail to lwalsh@waterboards.ca.gov
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

RE: Comments from Environmental Groups on Tentative Order Number: R9-2012-0011

Dear Ms. Walsh:

San Diego Coastkeeper, Orange County Coastkeeper, Inland Empire Waterkeeper, Surfrider Foundation—San Diego Chapter, Surfrider Foundation—South Orange County Chapter, Environmental Health Coalition, Preserve Wild Santee, Friends of Rose Canyon, Coastal Environmental Rights Foundation, Laguna Bluebelt Coalition, South Laguna Civic Association, and Save Hobo Aliso (the "Environmental Groups") respectfully submit the following comments on the administrative draft of the San Diego Regional Municipal Separate Storm Sewer System permit, Tentative Order No. R9-2012-0011 ("Administrative Draft Permit").

EXECUTIVE SUMMARY

The Environmental Groups appreciate the opportunity to provide exhaustive comments on the pre-public notice draft of the San Diego Region's municipal stormwater permit. The focused meeting approach has provided the Environmental Groups an opportunity to work collaboratively with Regional Board staff, Copermittees, and other stakeholder groups. While the Administrative Draft

Permit is step in the right direction, there are several areas of concern remaining. Moreover, these concerns are not necessarily the same throughout the region. The priority issues list below is meant to assist the Regional Board staff in identifying the highest priority issues for environmentalists in each county.

SAN DIEGO COUNTY PRIORITY ISSUES:

1. The adaptive management process should not provide a safe harbor for enforcement action where discharges from the MS4 cause or contribute to violation of receiving water standards. (§ II.)
2. The Permit should demand water quality improvements within the permit term. (§II.)
3. The public should be included in developing Water Quality Improvement Plans and adaptive management. (§ V.B.)
4. Each Copermittee should be accountable for meeting watershed goals. (§V.F. at 14)
5. The Permit should require aggressive action to effectively prohibit non-stormwater discharges, particularly from overwatering, car washing, and swimming pool discharges. (§ III.)
6. The Permit should encourage collaboration between Copermittees and stakeholders. (§§ V.B, VI.C, VI.J.)

ORANGE COUNTY PRIORITY ISSUES:

1. The Permit should promote regular inspections of inventoried existing development to ensure compliance with applicable local ordinances and permits. (§ L.)
2. The Administrative Draft Permit fails to property incorporate adopted Total Maximum Daily Loads. (§ IV.)
3. The adaptive management process should not provide a safe harbor for enforcement action where discharges from the MS4 cause or contribute to violation of receiving water standards. (§ II.)

RIVERSIDE COUNTY PRORITIY ISSUES:

1. The Administrative Draft Permit fails to property incorporate adopted Total Maximum Daily Loads. (§ IV.)
2. The Regional Clearinghouse could become an important tool to increase transparency. (§ X.C.)

BACKGROUND

Southern California's unique, breathtaking beaches are one of the area's main attractions, with tourism contributing to approximately 75% of California's ocean-related jobs. The San Diego tourism industry is the third largest industry in the county, and is critical to the region's economy supporting businesses and jobs.[1] Hosting more than 31 million visitors each year, the industry employs over 160,000 San Diegans directly and indirectly and generates an economic impact of over $17 billion new dollars generated for the regional economy and hundreds of millions in statute and local taxes each year.[2]

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[1] *See* http://www.sandiego.org/industry-research.aspx.
[2] *See* http://www.sandiego.org/industry-research.aspx.

Southern California's ocean-based tourism economy hinges on people being able to access the water. But polluted runoff keeps people out of the water and off the beaches for at least 72 hours after a rain event. Even in dry weather, recreational beach users are told to avoid runoff discharge locations by at least 75 feet. People ignoring these warnings often get sick. To safeguard our region's tourism economy and keep people healthy, the San Diego Regional Water Quality Control Board ("Regional Board") must adopt stringent requirements in this permit.

The current draft permit is unique in California in that it abandons the county-by-county permitting process and proposes a regional MS4 permit covering three counties. That being said, the draft permit undoubtedly addresses pollution and runoff concerns more progressively than any previous permit to date keeping in mind that it should implement the goals of the Clean Water Act to "restore and maintain the chemical, physical and biological integrity of the nation's waters" by "eliminating the discharges of pollutants by 1985, and to enhance water quality nationally to a 'fishable/swimmable' level by 1983." (33 U.S.C. § 1251(a)(1-2)(2012).

We have failed to achieve the Clean Water Act's goals in the San Diego Region. To achieve the Clean Water Act's goals, we must recognize the effects storm water runoff has on our shores and waterways. Twenty seven years after we should have eliminated pollutant discharges, beaches are still being closed after rainfalls because the water is too contaminated for us to safely swim. This is simply unacceptable. In a community that relies on tourism, in a time of economic hardship, in an area growing exponentially, the San Diego region must re-evaluate our its interests and implement measures strong enough to protect what is arguably our single greatest asset.

COMMENTS

I. An Expanded Regional MS4 Permit is both Legal and Appropriate.

A. The Regional Board Has Legal Authority to Issue a Regional Permit.

The Regional Board has the legal authority to issue an expanded region-wide permit.[3] The legislature directed regional boards to "coordinate their respective activities so as to achieve a unified and effective water quality control program."[4] In order to achieve this, the Regional Board has the authority to "formulate and adopt water quality control plans for all areas within the region."[5] Most importantly, the statutory language assumes Regional Boards may enact plans which include multiple counties; "regional boards shall not adopt any water quality control plan unless a public hearing is first held…in the affected county or ***counties***."[6] The Regional Board has the statutory authority to use a regional permit instead of county specific permits.

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[3] *See* Cal. Water Code §§ 13000, 13001, 13140, 13240, 13370, 13377.
[4] Cal. Water Code § 13001.
[5] Cal. Water Code § 13040.
[6] *See* Cal. Water Code § 13244 (emphasis added).

B. The Regional Board Should Issue a Regional Permit.

The Regional Board has taken an important step in bringing together the permits for all three of the counties under the jurisdiction of Region 9. Having all of Region 9 governed by one MS4 permit promotes efficiency and consistency, allowing Regional Board staff the opportunity to focus on compliance and enforcement issues. As staff would have more time to work with Copermittees on specific compliance issues, the region would likely benefit with improved water quality. Further, uniform requirements across all of Region 9 will clarify expectations regarding work plans and budget allocations, and encourage watershed-based cooperation to address water quality problems.

II. THE ADMINISTRATIVE DRAFT PERMIT PROTECTS RECEIVING WATERS.

The Administrative Draft Permit includes receiving water limitations that prohibit discharges from the MS4s from causing or contributing to water quality standard violations.[7] This prohibition is appropriate to achieve Clean Water Act mandates.

While the Administrative Draft Permit directs the Copermittees to strive to improve water quality through the adaptive management process, engaging in adaptive management does not provide Copermittees a "safe harbor" from enforcement action for water quality violations.[8] This approach is appropriate and complies with the Clean Water Act.[9]

However, the Administrative Draft Permit fails to aggressively seek water quality improvements. Indeed, the Administrative Draft Permit suggests that, because water quality degradation in the San Diego region occurred over several decades, "a decade or more may be necessary to realize demonstrable improvement to the quality of waters in the Region."[10]

Our region deserves better. Just because it may be difficult to see water quality improvements does not mean that we cannot and should not demand aggressive action to see water quality improvements for at least some pollutants in some portions of our watersheds. Region 9 had 274 water body segments on the 2008 303(d) list for some type of pollution—156 of these requiring a TMDL. If you count the impairment per pollutant for each water body, the number of listed segments skyrockets from 274 to 1570.[11]

The Permit should not bow to Copermittee pessimism that measurable water quality improvements will take decades to achieve. Instead, the Permit should demand that we significant water quality improvement within the permit term.

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[7] *See* Tentative Order No. R9-2012-0011 §II.A.2 at 9.
[8] *See* Tentative Order No. R9-2012-0011 § II.A.4.(c) at 12.
[9] The Clean Water Act regulations specify that permit-holders have a duty to "comply with all conditions of th[e] permit. Any permit noncompliance constitutes a violation of the Clean Water Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application." 40 C.F.R. § 122.41(a).
[10] *See* Tentative Order No. R9-2012-0011 § I. at 4.
[11] *See* http://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/TMDLs/303dlist.shtml.

III. THE ADMINISTRATIVE DRAFT PERMIT'S TOUGH STANCE ON NON-STORMWATER DISCHARGES IS APPROPRIATE.

A. The Administrative Draft Permit Properly Tightened Non-Storm Water Exemptions.

The Administrative Draft Permit takes an important step by ratcheting down exemptions for non-storm water discharges. The Clean Water Act requires that municipal stormwater permits "shall include a requirement to effectively prohibit non-stormwater discharges into the storm sewers."[12] The Administrative Draft Permit fulfills this requirement by prohibiting non-stormwater discharges into the MS4 unless they are "authorized by a separate NPDES permit" or the discharge falls within a category of non-stormwater discharges that must be addressed under the permit's illicit discharge detection and elimination provisions.[13] This wording meets the Clean Water Act requirements of "effectively prohibiting" non-stormwater discharges while providing clarity regarding how a Copermittee can meet the "effectively prohibit" standard.[14]

This more specific language is necessary because the Copermittees have done a poor job "effectively prohibiting" non-stormwater discharges under the current permit language.[15] Non-stormwater discharges are rampant throughout the region and municipalities have failed to take reasonable steps to effectively prohibit non-stormwater discharges. The Administrative Draft Permit's language prohibiting non-stormwater discharges except in limited situations emphasizes the importance of eliminating non-stormwater discharges and forces the Copermittees to take real action to effectively prohibit non-stormwater discharges. The Environmental Groups urge the Regional Board to leave the Administrative Draft Permit language prohibiting non-stormwater discharges

B. The Administrative Draft Permit Properly Prohibits Non-Stormwater Discharges that are Easily Preventable or Likely to be A Significant Source of Pollutants to Receiving Waters.

The Administrative Draft Permit properly prohibits discharges of pumped ground water, discharges from fountain drains, water from crawl space pumps, and water from footing drains.[16] Likewise, the Administrative Draft Permit properly prohibits water line flushing and water main breaks.[17] While the Administrative Draft Permit does not specifically address landscape irrigation, it has removed the non-stormwater exemption included in the current MS4 permit. These prohibitions are appropriate because they are discharges that can be controlled relatively easily and are likely to be significant sources of pollutants. These provisions therefore meet the Clean Water Act requirements that municipalities effectively prohibit non-stormwater discharges.

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[12] 33 U.S.C. § 1342(p)(3)(B)(ii).
[13] *See* Tentative Order No. R9-2012-0011 § II.A.1(b) at 9.
[14] 33 U.S.C. § 1342(p)(3)(B)(ii).
[15] 33 U.S.C. § 1342(p)(3)(B)(ii).
[16] *See* Tentative Order No. R9-2012-0011 § II.E.2(a)(1) at 56.
[17] *See* Tentative Order No. R9-2012-0011 § II.E.2(a)(2) at 56.

C. The Permit Should Not Allow Non-Stormwater Discharges into San Diego Bay.

The Administrative Draft Permit carves out an exception when it prohibits discharges of pumped ground water, discharges from fountain drains, water from crawl space pumps, and water from footing drains.[18] The Administrative Draft Permit prohibits these non-stormwater discharges, except if those discharges drain to San Diego Bay.[19] The Regional Board has failed to justify why San Diego Bay does not deserve the same protection provided to other surface waters in San Diego, Orange, and Riverside Counties. The Clean Water Act requires the MS4 permit to "effectively prohibit" non-stormwater discharges and does not carve out or sacrifice certain water bodies.[20] The Permit should remove the carve-out allowing pumped groundwater, discharges from foundation drains, water from crawl spaces and water from footing drains to flow unrestricted to San Diego Bay.

D. In Order to Effectively Prohibit Non-Stormwater Discharges, the Copermittees' Legal Authority Must Authorize the Copermittees to Control the Contribution of Pollutants in Discharges of Runoff from Residential and Commercial Properties.

The Administrative Draft Permit requires that Copermittees must establish, maintain, and enforce adequate legal authority to "control the contribution of pollutants in discharges of runoff associated with industrial and construction activity to its MS4…."[21] Residential and commercial properties are also likely causing or contributing to water quality problems throughout the region. Therefore, the Copermittees must likewise establish legal authority to address those problems. Without legal authority to address pollution problems stemming from residential and commercial properties, Copermittees will never be able to address the full range of pollution sources within its jurisdiction.

E. The Permit Should Take a More Aggressive Stance on Vehicle Washing.

The Administrative Draft Permit addresses individual residential vehicle washing as a non-stormwater discharges that "must be controlled… through statute, ordinance, permit, contract, order or similar means."[22] But these "requirements" provide so much flexibility that they are meaningless. To address vehicle washing as a non-stormwater discharge that Copermittees must "effectively prohibit," the Permit must take a more aggressive stance on vehicle washing.

1. <u>The Permit should prohibit wash water from vehicle washing from leaving the residential property.</u>

The Administrative Draft Permit states that wash water from residential vehicle washing must be "directed to landscaped areas or other pervious surfaces where feasible" and that residents should "minimize the use of water for vehicle washing, use as little detergent… as possible, wash vehicles at

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[18] *See* Tentative Order No. R9-2012-0011 § II.E.2.a.(2) at 54.
[19] *See id.*
[20] 33 U.S.C. § 1342(p)(3)(B)(ii).
[21] *See* Tentative Order R9-2012-0011 § II.E.1.a.(2) at 54.
[22] *See* Tentative Order R9-2012-0011 § II.E.2.a.(4) at 57.

commercial facilities, and implement other practices of behaviors" to prevent pollutants from residential car washing from entering the stormdrain.[23]

To effectively address residential vehicle washing as a source of non-stormwater discharges, which Copermittees must "effectively prohibit," the Permit should tighten requirements related to residential vehicle washing. The Permit should "effectively prohibit" non-stormwater discharges from residential vehicle washing by prohibiting residents from allowing wash water to leave their property.

2. <u>The Permit should prohibit fundraising or group car washes unless water is directed to landscaped areas or other pervious surfaces.</u>

The Administrative Draft Permit fails to address fundraising or group car washes as a source of non-stormwater discharges. Because of the volume of cars washed within a short time period and the fact that car washes are often held at gas stations or drugstores on a highly-trafficked corner—places with lots of pavement, sources of trash, oil and gas, and a nearby stormdrain—these car washes are sources of problematic non-stormwater discharges. The Permit should require Copermittees to prohibit fundraising or group car washes unless water is directed to landscaped areas or other pervious surfaces.

F. The Permit Should Require All Dechlorinated Swimming Pool Discharges be Directed to the Sanitary Sewer, Landscaped Areas, or Other Pervious Surfaces.

The Administrative Draft Permit allows residents to dump dechlorinated swimming pool discharges to storm drains.[24] This requirement should apply to all pool discharges because of the threat to water quality from extremely large discharges entering storm drains. Unless the discharges directly enter the storm drain, they will gather significant amounts of pollutants along roads, sidewalks, and other impervious surfaces before entering the storm drain. Therefore, the Permit should require all discharges of dechlorinated pool water be directed to the sanitary sewer, landscaped areas, or other pervious surfaces that can handle the volume of water.

G. The Permit Should Require that Exempted Sources of Non-Storm Water be Reduced Whenever Feasible.

The Permit should require that Copermittees take steps to reduce exempted sources of non-storm water when feasible. Even if the exempted category of non-storm waters poses little threat of containing contaminants on its own, all non-storm waters gather additional pollutants as they travel along impervious surfaces to storm drains. Without such a requirement, Copermittees are free to rely on exemptions and do nothing about discharges even when they can be easily prevented. For example, San Diego Coastkeeper recently reported a leaking pipe to the City of San Diego that had been identified by a resident living nearby. In response to the complaint, the City of San Diego reported that, because the pipe was leaking potable water, the discharge was not illegal. The City

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[23] *See id.*
[24] *See* Tentative Order R9-2012-0011 § II.E.2.a.(4)(c) at 57.

failed to identify whether it was possible to fix the leak, instead it took the easy route and relied on an exemption in the current Stormwater permit.

This flies in the face of the Clean Water Act, which requires that all non-storm water discharges be effectively prohibited.[25] The Regional Board should include language to compel Copermittees to reduce or eliminate ***all*** non-stormwater discharges, where possible. There is no acceptable reason that easily preventable non-storm water discharges should be allowed to go unattended.

H. The Permit Should Require Copermittees to Maintain a Hotline and Online Pollution Reporting System as Part of Their Illicit Discharge Detection and Elimination Programs.

The Administrative Draft Permit recognizes that public hotline reports can provide valuable information to help Copermittees identify and eliminate illicit discharges.[26] However, the Administrative Draft Permit fails to require Copermittees to maintain telephone and online reporting hotlines. By not explicitly requiring methods for the public to formally contact the Copermittees to report illicit discharges and pollution problems, the Administrative Draft Permit invites Copermittees to eliminate this portion of their jurisdictional program.

Instead, the Permit should require that each Copermittee must maintain a telephone hotline to accept stormwater complaints from the public. The Permit should also require Copermittees to maintain an email address (not just an online form) to allow e-mail reporting of stormwater complaints. As part of these requirements, Copermittees should be required to make this information available prominently on the Copermittee's webpage, and all the contacts should be listed on one page of the regional clearinghouse.

1. <u>The Permit should require Copermittees to provide follow up information to those who request it.</u>

Further, the Permit should require Copermittees to respond with follow-up or complaint resolution information to any person using the telephone or e-mail complaint reporting system. San Diego Coastkeeper often passes on to local jurisdictions pollution reports that the organization receives from individuals wishing to remain anonymous. San Diego Coastkeeper always asks for follow-up after the complaint has been investigated, and while some jurisdictions are good about providing the information, others are inconsistent or resistant. Providing the public and interested environmental groups with information about the resolution of pollution complaints, when requested, is important to foster public buy-in to the stormwater program and to encourage citizens to report pollution problems when they see them.

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[25] *See* 33 U.S.C. § 1342.
[26] *See* Tentative Order R9-2012-0011 at § II.E.2.d.(2)(a) at 60.

2. The Permit should require the Copermittees to make their hotline response databases publicly available.

The Permit should require that the Copermittees make their hotline response databases publicly available on the Regional Clearinghouse. This will increase transparency regarding Copermittee response to hotline complaints. It will also help environmental groups and stakeholders to work with Copermittees to educate the public so that hotline calls and reports become more effective.

IV. THE ADMINISTRATIVE DRAFT PERMIT FAILS TO PROPERLY INCORPORATE ADOPTED TOTAL MAXIMUM DAILY LOADS.

A. The Permit Must Include Mass Limits In Order to Comply with the Total Maximum Daily Loads That Include Mass Limits.

The Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay (adopted June 11, 2008) and the Total Maximum Daily Loads for Indicator Bacteria, Project I—Twenty Beaches and Creeks in the San Diego Region (adopted February 10, 2010) include both effluent limitations and wasteload allocations. However, the Administrative Draft Permit excludes the wasteload allocations. Not only are wasteload allocations a requirement of a valid Total Maximum Daily Load (TMDL),[27] but a large amount of time and effort went into developing the wasteload allocations to limit the total amount of bacteria loading into local waters. Weight-based wasteload allocations included in the TMDLs must be included in the Permit.

B. The Administrative Draft Permit Properly Prohibits Exceedances for Diazinon in Chollas Creek and Dissolved Copper in the Shelter Island Yacht Basin.

The Administrative Draft Permit properly removed allowable exceedances from the Diazinon TMDL in Chollas Creek and the Dissolved Copper TMDL in the Shelter Island Yacht Basin.[28] It is proper for the Regional Board to prohibit exceedances for Diazinon in Chollas Creek and Dissolved Copper in Shelter Island Yacht Basin because this will result in better water quality for Chollas Creek and San Diego Bay.

C. The Administrative Draft Permit Should Reflect the Correct Limit for Total Nitrogen in Rainbow Creek.

The TMDL for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed states that as of 2009, Total Nitrogen load allocation for Commercial Nurseries is 390 kg/yr. However, the Administrative Draft Permit states the total Nitrogen load allocation for Commercial Nurseries is 399 kg/yr.[29] The Permit must reflect the 390 kg/yr value in the Rainbow Creek Watershed Nitrogen and Phosphorus TMDL.

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[27] *See* 40 C.F.R. 130.2(i).
[28] *See* Tentative Order R9-2012-0011 Attachment E at E-2 and E-4.
[29] *See* Tentative Order R9-2012-0011 Attachment E, Table 3.4 at E-8.

D. The Administrative Draft Permit Improperly Calculates the Limit for Total Coliform at Baby Beach in Dana Point Harbor.

The dry weather interim effluent limitation for Total Coliform is incorrect.[30] According to the TMDL for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay, the City of Dana Point and the County of Orange must achieve a 50% reduction of indicator bacteria at Baby Beach by the 3rd year after approval, which is 2012. The dry weather municipal MS4 existing wasteload for Total Coliform at the time the TMDL was completed was 9.0 billion MPN/day. The wasteload allocation outlined by the TMDL is 0.86 billion MPN/day. Therefore, a 50% reduction means the City of Dana Point and the County of Orange must meet an interim allocation by 2012 of 4.93 billion MPN/day. However, the Administrative Draft Permit lists this interim limitation as 5.32 billion MPN/day. To comply with the TMDL, the Permit must reflect the TMDL's requirement, which is 4.93 billion MPN/day by 2012.[31]

E. The Permit Should List Previous Wet Weather Interim Effluent Limits to Maintain Compliance.

The Administrative Draft Permit does not list numeric values for wet weather interim effluent limitations to be reached by 2012 for any TMDL that includes them. Even if the Copermittees have already complied with the interim limits, the Permit should include these values to maintain compliance with the loading limits.

V. WATER QUALITY IMPROVEMENT PLANS HAVE THE POTENTIAL TO ENCOURAGE COPERMITTEES WITHIN A WATERSHED TO WORK TOGETHER TO IMPROVE WATER QUALITY.

The Water Quality Improvement Plans are the focal point of the Administrative Draft Permit. Their goal, to "guide Copermittees' jurisdictional runoff management program implementation efforts towards achieving the outcome of improved water quality in MS4 discharges and receiving waters," is proper. This approach recognizes that watersheds span multiple jurisdictions and that water quality will not improve unless all jurisdictions in a watershed work together. However, the Water Quality Improvement Plan process has room for improvement.

A. The Water Quality Improvement Plans Should Best Protect, Preserve, Enhance, and Restore Waters of the State.

The Administrative Draft Permit states that the goal of the Water Quality Improvement Plans is "to attain ***reasonable*** protection, preservation, enhancement, and restoration of water quality and

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[30] *See* Tentative Order No. R9-2012-0011 at Attachment E, Table 5.4 at E-14.

[31] Calculation:
9.0 billion MPD/day – 0.86 billion MPD/day = 8.14 (Total to be reduced)
8.14 billion MPD/day / 2 = 4.07 billion MPD/day (50% of reduction)
9.0 billion MPD/day – 4.07 billion MPD/day = 4.93 billion MPD/day (2012 Interim Target)

designated beneficial uses of waters of the state."[32] "Reasonable" protection, preservation, and restoration of our waters is not enough. The State Water Board's mission is to "preserve, enhance, and restore the quality of California's water resources."[33] The Regional Board's mission is to "develop and enforce water quality objectives and implementations plans that will ***best protect*** the state's waters…."[34]

To properly reflect the goals of the Water Quality Improvement Plans and to bring them in line with the State Water Board's and the Regional Board's mission, the goal of the Water Quality Improvement Plans should be "to ***best*** protect, preserve, enhance, and restore water quality and designated beneficial uses of waters of the state."[35]

B. The Public Should Be Included in Developing Water Quality Improvement Plans.

The Administrative Draft Permit relegates public participation in Water Quality Improvement Plans to a lone 30 day public review and comment period after the Copermittees have spent an entire year developing Water Quality Improvement Plans.[36] Not only is there only one 30-day public review period, but it is likely that each of the nine Water Quality Improvement Plans will be subject to concurrent public review periods. For organizations like San Diego Coastkeeper and Orange County Coastkeeper that would review Water Quality Improvement Plans for multiple watersheds, concurrent 30-day review periods for all 9 plans will preclude meaningful participation or comments.

1. <u>The Permit should encourage Copermittees to involve stakeholders throughout the Water Quality Improvement Plan development process.</u>

Too often Copermittees and environmental groups view each other as adversaries instead of potential partners and resources. But environmental groups and other stakeholders have key information, data, knowledge, and resources that can assist Copermittees in developing a robust Water Quality Improvement Plan. The Permit should encourage Copermittees to identify key stakeholders in each watershed and involve those stakeholders either formally or informally throughout the Water Quality Improvement Plan development process. Involving key stakeholders early and often as Water Quality Improvement Plans are developed will ensure that Copermittees hear and address stakeholder concerns and suggestions early in the process and avoid a situation where completed plans would need to be completely revised in response to comments received after Water Quality Improvement Plans are completed.

2. <u>The Permit should include more public review and comment points and stagger the review periods.</u>

To ensure meaningful public participation in the Water Quality Improvement Plan development

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[32] Tentative Order No. R9-2012-0011§ II.B. at 13 (emphasis added).
[33] State Water Board Website http://www.waterboards.ca.gov/about_us/water_boards_structure/mission.shtml
34State Water Board Website (emphasis added)
http://www.waterboards.ca.gov/about_us/water_boards_structure/mission.shtml.
35 Tentative Order No. R9-2012-0011 § II.B. at 13 (emphasis added).
36 *See* Tentative Order No. R9-2012-0011 § II.F.1 at 91.

process, the Permit should include additional public review periods and stagger the final review of Water Quality Improvement Plans so not all 9 plans are reviewable concurrently. Formal public review and comment periods should be incorporated at each major decision step in the Water Quality Improvement Plan process. To allow the watershed groups maximum flexibility, the Permit could require watershed groups to submit a public involvement plan setting a schedule for public review of each main component of the plan as it is developed. This approach could also facilitate a staggering of Water Quality Improvement Plan review periods.

3. The Permit should include language explicitly involving the public in setting water quality priorities.

Water quality priorities are the foundation of Water Quality Improvement Plans. Because the entire Water Quality Improvement Plan will be based on the watershed's water quality priorities, the public must be actively involved in identifying priority pollutants or receiving water conditions within each watershed.

To facilitate public participation in identifying a watershed's priority pollutants, the Permit should:

- Specify that "all available physical, chemical, and biological receiving water monitoring data" includes data collected by third parties.

- Mandate that watershed groups make a "call for data" and allow interested third parties 30 days to submit data to the watershed groups for consideration.

- Require watershed groups to submit a preliminary priority pollutant list for Regional Board and public review and comment, along with a case for support identifying data and information relied on to select the priority pollutants or receiving water conditions. This review and comment period should be held prior to identifying pollutant sources, developing numeric targets and schedules, or selecting water quality improvement strategies.

4. The Permit should involve the public in identifying pollutant sources and stressors.

Environmental Groups and other key stakeholders often have specific information regarding pollutant sources within a watershed. Groups like San Diego Coastkeeper and Orange County Coastkeeper frequently receive calls from concerned citizens about facilities, neighborhoods, or activities that may be generating pollutants. These groups and others also have the capacity to reach out to their members and volunteers to specifically solicit information about potential pollutant sources.

To facilitate public participation in identifying pollutant sources, the Draft Permit should:

- Specify that "review of available data" includes complaints received through stormwater hotlines or reported by citizens or environmental groups.

- Mandate that watershed groups make a "call for data" and allow interested third parties 90 days to submit pollutant source data to the watershed groups for consideration.

- Emphasize that pollutant source identification is an ongoing process and does not only occur during the development of the Water Quality Improvement Plan.

- Specifically allow that Copermittees or stakeholder groups may perform special studies to further refine pollutant source identification, and that such information will be considered during the adaptive management process.

- Require watershed groups to submit a preliminary pollutant source list for Regional Board and public review and comment, along with a case for support identifying data and information relied on to select the priority pollutants or receiving water conditions. This review and comment period should be held prior to developing numeric targets and schedules, or selecting water quality improvement strategies.

5. <u>The Permit must require hearings for proposed Water Quality Improvement Plans.</u>

California law requires the Regional Board hold a public hearing before adopting any water quality control plan.[37] Water Quality Improvement Plans qualify as "water quality control plans" and therefore are subject to public hearing requirements.[38] The criteria to be considered a "water quality control plan" subject to a public hearing are that the plan: *(1)* is created for a specific area or region; *(2)* protects the beneficial uses of waters; *(3)* sets limits to protect beneficial uses; *(4)* includes an implementation program designed to meet water quality objectives.[39] The Water Quality Improvement Plans meet all the criteria of a water quality control plan.[40] Therefore, the permit must require, not merely allow, public hearings for Water Quality Improvement Plans.[41]

C. The Permit Should Specify the Regional Board Staff's Role in Developing Water Quality Improvement Plans.

Just as involving key stakeholders early and often as Water Quality Improvement Plans are developed will avoid the potential for having to start from scratch on the plans, Regional Board staff participation throughout the Water Quality Improvement Plan process is imperative. The Draft Permit should reflect when and how the Regional Board staff intends to be involved in Water Quality Improvement Plan development. At a minimum, the Regional Board should receive monthly updates from watershed groups and should provide formal review of water quality priorities, pollutant sources identified, numeric targets and schedules, strategies and schedules, and monitoring and assessment plans as they are developed.

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[37] *See* Cal. Water Code § 13244.
[38] *See* Cal. Water Code § 13050(j).
[39] *See id.*
[40] *See* Tentative Order No. R9-2012-0011 §§ II. B.1., B.2(a) & (d), B.3 at 13-18.
[41] *See* Tentative Order No. R9-2012-0011 § II. F.1.

D. Copermittees Should Implement Water Quality Improvement Plans as Soon as the Plans are Approved.

The Administrative Draft Permit contains inconsistent deadline requirements for Water Quality Improvement Plans. Administrative Draft Permit requires Copermittees "to implement" all the requirements in Provision B, related to the Water Quality Improvement Plans, within one year of the permit's adoption.[42] But the Administrative Draft Permit also allows Copermittees 180 days after submission "to commence with implementation of the Water Quality Improvement Plan."[43] Copermittees should begin implementing Water Quality Improvement Plans as soon as they are approved.

E. The Permit Should Require Interim and Final Numeric Targets and Schedules Based on Applicable Water Quality Standards.

The Administrative Draft Permit states that Copermittees must develop and incorporate interim and final numeric targets into their Water Quality Improvement Plans.[44] The permit should direct Copermittees that final targets must be compliance with applicable water quality standards. Interim targets should reflect incremental, yet demonstrable, progress towards improving water quality. Interim targets will allow the Copermittees, the Regional Board, and the public to fully assess Copermittees' progress towards compliance with final targets.

F. Each Copermittee Should Be Held Accountable For Achieving Watershed Numeric Targets.

During the focused meeting process, some Copermittees indicated that they intended to focus jurisdictional program efforts on one watershed and effectively ignore water quality priorities in other watersheds that are also within its jurisdiction. While this approach may be consistent with jurisdictions focusing resources where they can have the most impact, it also presents the potential that watershed priorities will be "orphaned" or that one jurisdiction will carry the primary or sole burden of implementing water quality improvement strategies within the watershed.

In order to help identify this problem, the Water Quality Improvement Plan schedules for implementing water quality improvement strategies must indicate which jurisdiction(s) is responsible for each strategy and cross-reference the section and page in the jurisdictional plan where each Copermittee commits to implementing the strategy.[45]

To avoid this potential problem and ensure that each jurisdiction remains actively involved in ensuring that each watershed within its jurisdiction achieves its interim and numeric targets, the Permit should reflect that each jurisdiction will be held accountable for achieving the watershed numeric targets.[46] Further, the Permit should specify that the Regional Board will reject any Water

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[42] *See* Tentative Order No. R9-2012-0011 § II.B. at 13.
[43] Tentative Order No. R9-2012-0011 § II.B.6 at 21 and § F.1 at 91.
[44] *See* Tentative Order No. R9-2012-0011 § II.B.2.d at 17.
[45] *See* Tentative Order No. R9-2012-0011 § II.B.3.b(1) at 19.
[46] *See* Tentative Order No. R9-2012-0011 § II.B.2.d at 18.

Quality Improvement Plan including orphaned priorities.[47]

These proposed changes are consistent with the Administrative Draft Permit's special study requirements. The Administrative Draft Permit requires Copermittees to implement at least three special studies within each Watershed Management Area, and the special studies require some form of participation by all Copermittees within the Watershed Management Area.[48] This requirement demonstrates the Regional Board's commitment to avoiding "orphaned" water quality priorities or having the primary responsibility for watershed strategy implementation fall to only Copermittee.

G. The Adaptive Management Process Should Include a Formal Public Participation Process.

The Administrative Draft Permit recognizes that public participation is an important element in the adaptive management process.[49] However, the Administrative Draft Permit fails to detail how and when the Copermittees are to solicit recommendations for modifications to the Water Quality Improvement Plans or Jurisdictional Runoff Management Plans as part of a public participation process.

For Water Quality Improvement Plans, the permit should include a process during which the Copermittees in each Watershed Management Area prepare a progress report, akin to a Report of Waste Discharge, that details the water quality improvement strategies completed or in progress, along with water quality data (from the Copermittees and third parties) and an assessment of progress towards interim and final numeric targets. Before revising the Water Quality Improvement Plan, the Copermittees must solicit comments from the Regional Board and public. The revised Water Quality Improvement Plan should be subject to public comment and a public hearing.

The Administrative Draft requires Copermittees to create a means "for public participation…in updating, developing, and implementing [their] jurisdictional runoff management program."[50] Part of the adaptive management process for Jurisdictional Runoff Management Programs requires Copermittees to take into account recommendations they receive.[51] To involve the public in the adaptive management process for jurisdictional runoff management programs, the Permit should require each Copermittee to solicit public comment on its initial findings and proposed changes before changes to the jurisdictional runoff management program is finalized.

H. The Adaptive Management Process for Water Quality Improvement Plans Should Occur More Frequently Than Every Three Years.

The Administrative Draft Permit currently requires Copermittees to implement the iterative process at least once every three years.[52] The Copermittees should be required to implement the iterative

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[47] *See* Tentative Order No. R9-2012-0011 § II.F.1 at 91.
[48] *See* Tentative Order No. R9-2012-0011 § II.D.2.e. at 46.
[49] *See* Tentative Order No. R9-2012-0011 § II.B.5.a.(h) at 20.
[50] *See* Tentative Order No. R9-2012-0011 § II.E.7(b) at 90.
[51] *See* Tentative Order No. R9-2012-0011 § II.B.5(b)(1)(e) at 21.
[52] *See* Tentative Order No. R9-2012-0011 § II.B.5.a.(1) at 20.

process at least every two years. More frequent adaptive management encourages the Copermittees to modify programs to address new information as it becomes available. It also compels the Copermittees to develop an adaptive management process that is nimble and can quickly incorporate change as needed.

Further, the proposed three year requirement will effectively cause the Copermittees to engage in one long and one short adaptive management process within a permit cycle instead of two equally spaced processes.

The sample calendar below illustrates the challenge with the current schedule:

Activity	**Frequency/Timing**	**Hypothetical Date**
Permit issued		January 1, 2013
Water Quality Improvement Plan Submitted	Within 12 months of permit issuance ***§ B***	December 31, 2013
Public process	30 days after submittal ***§F.1.***	January 2-31, 2014
Water Quality Improvement Plan Implemented	Within 180 days after submittal ***§B.6.***	May 30, 2014
Adaptive Management	At least once every three years ***§B.5.a.***	May 30, 2017
Report of Waste Discharge including proposed changes to Water Quality Improvement Plans	180 days before permit expires ***§F.5.b.***	May 30, 2018
Permit Expires	5 years from issuance	December 31, 2018

I. Interim Numeric Targets Should Align With the Adaptive Management Process Schedule.

The Administrative Draft Permit requires watershed groups to set final and interim numeric targets and schedules.[53] While the Administrative Draft Permit provides some guidance that "interim numeric targets must be based on measurable criteria or indicators that can demonstrate incremental progress toward achieving the final numeric targets," there is no guidance regarding the scheduling of the interim numeric targets. The Permit should specify that the interim numeric targets should be set on the same schedule as the adaptive management process. This will provide the Copermittees with concrete goals to evaluate during the adaptive management process and require the Copermittees to collect sufficient data to evaluate progress to those goals by the time the adaptive management process occurs.

[53] *See* Tentative Order No. R9-2012-0011 § II.B.2.d. at 17-18.

VI. ACTION LEVELS ARE ONLY SUFFICIENT IF THE REGIONAL BOARD DETERMINES NUMERIC EFFLUENT LIMITS ARE INFEASIBLE.

A. The Clean Water Act Requires the Regional Board to Assess Whether Numeric Effluent Limits are Feasible.

The Clean Water Act, its regulations, and case law all require that NPDES permits contain numeric effluent limitations when feasible. The Regional Board has failed to assess whether any numeric effluent limitations are feasible for this permit. Numeric effluent limitations are not *de facto* infeasible in stormwater permits, nor are they limited to end-of-pipe limits.

Numeric effluent limitations can be expressed as: *(1)* pollutant reduction levels for parameters that are applied system-wide rather than to individual discharge locations; *(2)* requirements to meet performance standards for specific pollutant parameters or *(3)* in-stream targets for specific pollutant parameters.[54]

The Regional Board must make a good faith effort to assess the feasibility of including numeric effluent limits within this permit in order to comply with the Clean Water Act's technology-forcing provisions.

B. Non-Storm Water Numeric Action Levels Should Be Numeric Effluent Limits.

The Clean Water Act requires that all municipal stormwater permits "effectively prohibit" no-stormwater discharges.[55] Yet the Administrative Draft Permit includes detailed "Non-Storm Water Action Levels" to set water-quality based goals for non-stormwater discharges.[56] Because Copermittees are responsible for "effectively prohibiting" non-stormwater discharges within their jurisdictions, mere "action levels" for non-stormwater discharges are inappropriate. These levels should be included as enforceable numeric effluent limits. By allowing non-stormwater discharges that fall within the numeric effluent limits and do not cause or contribute to a violation of water quality standards, the permit would provide an effective mechanism to determine whether or not Copermittees are effectively prohibiting non-stormwater discharges within their jurisdiction. Further, these numeric effluent limits are feasible because the Clean Water Act recognizes that non-stormwater discharges should be eliminated.

VII. MONITORING AND ASSESSMENT REQUIREMENTS MUST ENSURE THAT COPERMITTEES IDENTIFY PROGRESS TOWARDS WATERSHED GOALS AND TRACK THE HEALTH OF THE WATERSHEDS.

The Administrative Draft Permit sets out a comprehensive system of monitoring and assessment procedures that will ensure Copermittees are able to detect and eliminate illicit discharges and connections. The Regional Board must recognize the importance of extensive monitoring in

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[54] *See* Environmental Protection Agency, *Establishing Total Maximum Daily Load Wasteload Allocations for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs*, November 22, 2002.
[55] *See* 33 U.S.C. § 1342; Clean Water Act § 402(p)(3)(B)(ii).
[56] *See* Tentative Order No. R9-2012-0011 § II.C.1. at 22-24.

making continued progress towards clean waters in the San Diego Region. If the Permit does not include enough monitoring, the watersheds in Region 9 will be in danger of increased pollutant discharges that Copermittees will not be able to detect.

A. The Permit Must Include Sufficient General Monitoring Requirements to Detect Changing Conditions Within Watersheds.

During the focused meeting process, some Copermittees proposed drastically reducing the amount of monitoring required in the Administrative Draft Permit. One Copermittee representative even likened routine watershed monitoring to a colonoscopy.

The permit must continue to require the Copermittees to not just monitor areas with known pollution problems, but also to track areas currently meeting water quality standards to ensure that they do not become impaired or impacted. Environmental Groups seek to avoid a monitoring program that fails to provide relevant information to the public and regulators as to actual water quality impairments.

Copermittees should be encouraged to partner with local environmental groups to assist in monitoring areas to track general trends of watershed health. Many local groups already sample water quality and would be interested in partnering with Copermittees and watershed groups to ensure that baseline water quality data for the whole watershed is collected. For example, San Diego Coastkeeper has a state-certified water quality laboratory and has been using volunteers to collect water quality data and assess the health of our watersheds for years.

B. The Permit Should Allow Visual Observations to Be Included within Copermittees' Inspection Programs.

The Administrative Draft Permit does not explicitly allow Copermittees to create an inspection program that relies on visual observations. While visual observations alone should not comprise the Copermittees' entire inspection program, the Permit should allow Copermittees to include visual inspections as a key component of inspection programs.

Further, to assist Copermittees in completing visual inspections, particularly in residential areas or shopping centers, the Permit should explicitly allow Copermittees to use information gathered from volunteer monitoring or patrol programs. Such programs could be operated by the Copermittees or environmental groups and would be subject to a training program to ensure volunteers are able to spot potential violations and avoid trespassing or confronting property owners.

C. The Permit Should Specify that Copermittees Must Accept Quality-Controlled Data Received from Third Parties.

The Administrative Draft Permit and the Regional Board staff have indicated that Copermittees should use third party water quality monitoring data to assist in assessing our watersheds and the

Copermittees' progress towards achieving water quality standards.[57] However, some Copermittees are reluctant to use data collected by third parties. One Copermittee articulated its distaste for third party-collected data by saying that third party data is not as rigorous as data collected by the Copermittees and therefore trying to compare third party data to Copermittee data is "like comparing apples and oranges."

The Permit should specify that Copermittees must use third party data that meets particular criteria. These criteria should require third parties to maintain and make available for review the following information: *(1)* a quality assurance project plan; *(2)* a list of methods used; and *(3)* standard operating procedures.

Additionally, the Administrative Draft Permit's "Assessment Requirements" should specify that Copermittees must evaluate not just "the data collected pursuant to Provisions D.1, D.2, and D.3" to identify causes of exceedances, but must also solicit and evaluate third party data that meets that permit criteria to identify causes of water quality problems.

D. If the Permit Allows Copermittees to Use Modeling to Determine Water Quality Conditions, the Permit Must Include Safeguards to Ensure Reliable Modeling Results.

The Administrative Draft Permit does not contemplate Copermittees using modeling as a tool to monitor and assess water quality. During the focused meeting process, the Copermittees have asked to use modeling to assess water quality, and the Regional Board staff appeared receptive to the idea.

Modeling can be an important predictive tool, or it can be meaningless garbage. The quality of the modeling hinges on the quality and quantity of the data on which the model is based, along with the skill of the modeler. To ensure that any water quality modeling completed in conjunction with the permit produces robust results, the permit must include stringent safeguards. These safeguards must include: *(1)* requiring the input data to include recent (no older than five years) water quality information from within the watershed, *(2)* requiring Copermittees to use an experienced and qualified water quality modeling professional to complete the model, *(3)* requiring Regional Board oversight to assess whether the monitoring results are in line with common-sense predictions of water quality, and (4) quality control hindcasting in certain segments to validate the model for use in subsequent years.

E. The Monitoring and Assessment Requirements Should Begin Immediately Upon Enrollment Under the Order.

The Administrative Draft Permit 's monitoring and assessment requirements appear to go into effect immediately upon adoption, but it does not say so explicitly. This could create confusion amongst Copermittees because other provisions of the Administrative Draft Permit state specific time frames for implementation.[58] The Regional Board should explicitly say in the Permit that Provision D's requirements go into effect immediately upon enrollment to avoid ambiguity.

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[57] *See* Tentative Order No. R9-2012-0011 § II.B.2 at 15.
[58] *See* Tentative Order R9-2012-0011 at §§ II.B, B.5, B.6, C, E, F.1, and F.3.

F. The Permit Should Not Allow Historical Data to Excuse Copermittees from Analyzing Non-Stormwater Discharges.

The Clean Water Act requires that Copermittees effectively prohibit non-stormwater discharges. Therefore, it is inappropriate for the permit to allow Copermittees to skip analyzing non-stormwater discharges that it fails to eliminate.[59] The Copermittees must analyze all non-stormwater discharges and demonstrate that those discharges comply with the non-stormwater numeric effluent limits.

If the Permit allows Copermittees to avoid analyzing constituents if historical data indicates analysis is not needed, the Permit should limit "historical data" to that collected within the past ten years. Technology has increased by leaps and bounds in recent years (i.e. minimum detection limits,) and more accurately detects pollutants.

G. The Permit Must Clarify the Dry Weather Watershed Monitoring Frequency Requirements.

Several sections of the Dry Weather Watershed Monitoring section have seemingly contradictory timing requirements. The Administrative Draft Permit states:

> Dry weather watershed monitoring is required at least every two years for each monitoring station. At least two dry weather watershed monitoring events must be scheduled for each watershed monitoring station per monitoring year. One monitoring event is required during the dry season (May-September) and one monitoring event is required on a dry weather day during the wet season (October-April), after the first storm event. *See* Tentative Order No. R9-2012-0011 at D.2(b)(3).

This language is unclear and implies that monitoring must occur at least once every two years but also twice per year. Similar language can be found in sections D.2(b)(4), and (5), as well as parts (1) and (4) from section D.2.c. The Permit must resolve these seemingly contradictory statements to ensure the Copermittees are able to fully understand and meet their requirements.

H. To Detect Illicit Flows, the Permit Should Require Copermittees to Install a Network of Flow Meters.

Many Copermittees have taken issue with the Administrative Draft Permit's dry weather monitoring requirements. The Copermittees argue that the proposed program is cumbersome, costly, and would not result in identifying illicit flows.

To replace the dry weather monitoring scheme in the Administrative Draft Permit with an approach that will identify illicit flows, the Permit should require Copermittees to install a network of flow meters. The flow meters could constantly monitor flows and alert Copermittees when flow peaks.

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[59] *See* Tentative Order R9-2012-0011 § II.D.1.a(1)(c)(iii) at 30.

This will more accurately allow Copermittees to identify illicit dry weather flows than the dry weather monitoring program as currently proposed.

I. The Permit Should Require Additional Information for Claims that Non-Stormwater Discharges Originate Outside a Copermittee's Jurisdiction.

The Administrative Draft Permit currently requires Copermittees to screen discharges entering their systems and to identify those discharges from sources outside the control of the Copermittee.[60] The Permit should require Copermittees to explain from what jurisdiction the discharge is entering their system and the evidence supporting that conclusion. This will increase accountability and transparency in the Permit by making sure those responsible for violations are easily identified.

J. The Permit Should Allow Third Party Participations in Special Studies.

The Administrative Draft Permit requires Copermittees to implement at least three special studies within each Watershed Management Area and at least two regional special studies for the San Diego Region.[61] These studies are important to ensure that the Copermittees work together to identify sources of high priority pollutants and assess the efficiency of various best management practices within a watershed to achieve watershed goals. The Administrative Draft Permit's approach properly requires each Copermittee within a watershed to participate in each of the watershed's special studies. However, the Permit should also specifically allow Copermittees to partner with environmental groups or other third parties to complete regional special studies.

For example, Copermittees within the Peñasquitos watershed group might partner with San Diego Coastkeeper to complete a pilot project combining GPS-based water quality data and volunteer patrols to track pollution up a watershed to identify a pollution problem's source. Or perhaps Copermittees within the Carlsbad watershed might work with the Building Industry Alliance and the Escondido Creek Watershed Conservancy to create a pilot Escondido Creek restoration project and assess the feasibility of using such restoration as a regional mitigation project for development within the Carlsbad watershed.

By encouraging the Copermittees to partner with third parties to complete special studies, the Permit could foster watershed-based collaboration and leverage efficiencies and additional resources that third parties bring to the table.

K. The Permit Should Designate County of San Diego as the Lead Copermittee for San Diego County.

The current San Diego Regional MS4 permit designates the County of San Diego as the lead copermittee. This process has ensured that the Copermittees coordinate their reporting, monitoring, assessment, and programs. It has also led to regular public meetings where the San Diego Copermittees meet and discuss the permit, compliance and reporting. These meetings provided Regional Board staff, environmental groups, consultants, and other interested parties and

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[60] *See* Tentative Order R9-2012-0011 § II.D.4.a(1)(a)(iii) at 46.
[61] *See* Tentative Order R9-2012-0011 §§ II.D.2.e, D.3 at 46.

opportunity and venue to connect with all the San Diego Copermittees at the same time. This regional coordination was also a great asset to the focused meeting process, with the San Diego Copermittees bringing organized and coordinated suggestions for improving the permit.

As the region moves forward with a new permit, the Copermittees, Regional Board staff, and interested parties could greatly benefit from continued coordination and regular public meetings among the Copermittees. Further, the Administrative Draft Permit requires Copermittees to develop two special studies for the entire San Diego Region "related to a water quality priority issue or potential water quality concern identified by the Copermittees for the entire San Diego Region."[62] It will be difficult, if not impossible, for the San Diego Copermittees to identify water quality priority issues for the entire region without collaboration. That collaboration should involve the public, particularly when identifying water quality priority issues for the entire region. Therefore, the permit should require continued Copermittee collaboration for the San Diego Copermittees that includes meetings open to the public.

VIII. THE PERMIT'S DEVELOPMENT PLANNING PROVISIONS MUST AGGRESSIVELY PROMOTE PRACTICES TO ELIMINATE DEVELOPMENT AS A POLLUTANT SOURCE CAUSING OR CONTRIBUTING TO WATER QUALITY PROBLEMS.

Low Impact Development ("LID") is an acknowledged and proven Best Management Practice ("BMP") for effective storm water management for new and significant redevelopment projects. LID BMPs are often less expensive to install, require less maintenance and provide ecosystem benefits that conventional stormwater controls cannot offer. For example, a recent analysis of the economics of LID found the benefits to include reduced flooding, improved water quality, increased ground water recharge, reduced public expenditures on stormwater infrastructure, reduced energy use, improved air quality, and enhanced aesthetics and property value.[63]

The report goes on to describe American Forests' CITYgreen model as it applies to San Diego. The model calculates the volume of stormwater absorbed by San Diego's existing tree canopy and estimates the amount of cost-avoided in stormwater management this canopy allows. The study concludes that San Diego would have to expend $0.16 billion to expand their existing stormwater infrastructure to treat the amount the cities trees already manage. Studies and analyzes like these help explain the myriad benefits of LID as a system the Copermittees can use to effectively manage stormwater while also ensuring the wise expenditure of funds.

The Administrative Draft Permit fails to underscore the key role LID plays in achieving the region's water quality goals. Other nearby MS4 permits contain language reflecting that recent studies have found LID best management practices to be effective storm water management tools that minimize adverse impacts on storm water runoff quality and quantity resulting from urban developments.[64] The Permit should include this language in order to clarify and reinforce that LID BMPs are

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[62] *See* Tentative Order R9-2012-0011 at § II.D.3 at 46.
[63] MacMullen, Ed, The Economics of Low-Impact Development: A Literature Review, ECONorthwest 19 (November 2007).
[64] *See* Orange County Permit, Order No. R8-2009-0033 at L.61.

preferred over any other non-LID method.

A. The Permit Should Stress Low-Impact Development Best Management Practices as the Preferred Best Management Practices for Use in Water Quality Improvement Strategies.

The Administrative Draft Permit requires Copermittees to develop water quality improvement strategies that prioritize measures that can be taken to reduce pollutants.[65] Rather than giving Copermittees the ability to equally prioritize structural and non-structural Best Management Practices, the Permit should clearly state that LID BMPs are the preferred method and should receive the highest priority. The Administrative Draft Permit fails to mention of LID in the Water Quality Improvement Strategies section. At the very least, the Water Quality Improvement Strategies section should reference section II.E.3(a)(3) where LID definitions and examples are given. The Permit should include a chart which prioritizes LID, similar to the structure of the North Orange County permit.

B. The Permit Should Prioritize Various Low-Impact Development Best Management Practices and Include Examples of these Best Management Practices.

The Administrative Draft Permit fails to incorporate an LID BMP prioritization regime similar to existing MS4 permits in Orange and Riverside counties.[66] Although the Administrative Draft Permit defines LID BMPs to include retention practices such as "infiltration, rainwater harvesting and reuse, evapotranspiration" and flow-through practices such as biofiltration. However, it leaves much of the judgment as to which LID BMPs would be utilized onsite to the proponent of the project.[67]

The Orange County MS4 permit adopted by the Santa Ana Regional Board prioritized LID principles by first instituting preventative measures (mostly non-structural measures, e.g., preservation of natural features to a level consistent with MEP; reducing impervious areas, etc.) and second, requiring mitigation. Mitigation is generally structural measures, such as infiltration, harvest and reuse, and biotreatment. However, even the LID BMPs required under the mitigation section were prioritized. If a party could not satisfy permit requirements to the MEP by utilizing preventative measures, then the party would be required to determine whether it was feasible to infiltrate, harvest and re-use and bio-filter/bio-retain, in that order. In so doing, the Regional Board provided guidance and certainty to those engaged in new or significant redevelopment rather than a mechanism that requires LID BMPs without stating a clear preference. As such, the Administrative Draft Permit should be modified to include a prioritization of LID BMPs.

C. The Permit Should De-Emphasize Biofiltration as a Low-Impact Development Best Management Practice.

The Administrative Draft Permit's definitions section lists biofiltration as a flow-through LID BMP

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[65] *See* Tentative Order No. R9-2012-0011 at § II.B.3. at18.
[66] *See* Orange County Permit, Order No. R8-2009-0033 at XII.C.4
[67] *See* Tentative Order R9-2012-0011 at Attachment C "Definitions."

that may have discharge storm water following pollutant reduction.[68] The Permit should de-emphasize biofiltration and other flow-through practices as LID BMPs because retention Best Management Practices are environmentally preferable due to their ability to prevent discharges. Including "biofiltration" in the definition of LID BMP, without including a LID BMP prioritization schedule, may create unnecessary reliance on "biofiltration" methods when other LID options would be preferable.

D. The Permit Should Require Biofiltration to Reach Equivalent Water Quality Standards as Other Best Management Practices.

The Administrative Draft Permit includes "biofiltration" as an available Low Impact Development Best Management Practice without requiring verifiable standards that effective biofiltration BMPs must satisfy. Without standards, developers are free to include biofiltration systems that do not guarantee onsite retention of pollutants. Additionally, the permit contains no oversight of any proposed biofiltration device to guarantee that it is properly sized and designed. While the Administrative Draft Permit requires that flow-through treatment control BMPs must "be ranked with high or medium pollutant removal efficiency for the project's most significant pollutants of concern," the Administrative Draft Permit fails to specify what those efficiency rates are or how they are to be calculated.[69]

Structural, proprietary, and/or engineered biofiltration devices should be permitted where appropriate. However, the Permit should hold those biofiltration devices to equivalent water quality standards and require proper monitoring to prove their initial and continued effectiveness as pollution control devices. For example, the Permit should require a four to five year post-construction monitoring regimen with at least annual reporting that includes data on wet and dry seasons to analyze biofiltration effectiveness for major developments.

E. The Permit Must Have More Stringent Post-Development Hydromodification Requirements for Flow Rates and Durations to be Consistent with the Riverside County Hydromodification Requirements, to Maintain Progress in Managing Development Storm Water Runoff, and to Comply with Anti-Backsliding Requirements.

The Administrative Draft Permit requires Copermittees to achieve post-development flow rates and durations that "do not exceed pre-development (naturally occurring) runoff flow rates and durations by more than 10 percent."[70]

However, Riverside County's MS4 permit does not allow 10% leeway for hydromodification post-development flow rates and durations. Instead, the Riverside County permit requires that "estimated post-project runoff discharge rates and durations must not exceed pre-development discharge rates and durations."[71] The Riverside County permit justified its hydromodification

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[68] *See* Tentative Order R9-2012-0011 at Attachment C "Definitions."
[69] *See* Tentative Order R9-2012-0011 § II.D.3.c.(2)(d)(iii) at 67.
[70] Tentative Order R9-2012-0011 § II.E.3(c)(3)(a).
[71] *See* Order R9-2010-0016 at F.1.h.

requirement, stating:

> The increased volume, velocity, frequency and discharge duration of storm water runoff from developed areas has the potential to greatly accelerate downstream erosion, impair stream habitat in natural drainages, and negatively impact beneficial uses.[72]

In light of this statement, and no such finding to the contrary in the Administrative Draft Permit , the Regional Board should not allow a 10% increase in flow rates or duration post-development.

The Permit cannot allow priority development projects to exceed naturally occurring runoff flow rates by 10 percent. The 10 percent exception would introduce inconsistent requirements within the Region and constitute illegal backsliding from Riverside County's MS4 permit. The Riverside County permit is currently the most recently enacted MS4 permit in Region 9 and represents the MEP standard that must be applied to the Permit.

More importantly, easing Riverside County's hydromodification requirements in favor of a 10 percent exception violates the Clean Water Act's anti-backsliding provisions. By allowing Riverside County to comply with a less stringent standard in a subsequent permit, the new Permit violates provisions enacted to ensure that permit standards continue to get increasingly more stringent instead of bowing to political pressure to ease standards.

F. The Permit Should Not Include Likelihood of Increased Erosion as a Criterion for Hydromodification Because Erosion is Not the Only Purpose of Hydromodification Requirements.

The Administrative Draft Permit currently allows Copermittees to achieve post-development flow rate and duration that is 10% above "the range of flows that result in increased potential for erosion or degraded channel conditions."[73] But erosion is not the only purpose of hydromodification requirements. As the Riverside County permit recognized, increased flow volume and duration can lead to erosion, as well as "impair stream habitat in natural drainages, and negatively impact beneficial uses."[74]

Developers should not be excused from complying with hydromodification requirements merely because the immediate channel into which a developments discharges would be entering are likely to erode. If the Permit provides an exception for developments that discharge into concrete channels or other channels not subject to erosion, the Regional Board will send the message that it has no interest in possibly reclaiming those creeks as natural drainages. Further, the exception fails to recognize that while the immediate receiving water may not be easily eroded, the discharges may impact downstream channels and habitat.

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[72] Order R9-2010-0016 at Findings D.2(g).
[73] *See* Tentative Order R9-2012-0011 § II.E.3(c)(3)(a).
[74] *See* Order R9-2010-0016 at Findings D.2(g).

G. The Permit Must Include Priority Development Requirements for Restaurants that are Less than 5000 Square Feet to be Consistent with Previous Permits.

The Riverside, Orange County and San Diego MS4 permits require restaurants where land development is less than 5,000 square feet to meet all SSMP requirements except for structural treatment BMP, numeric sizing criteria requirements and hydromodification requirement.[75] The Administrative Draft Permit fails to include this MEP provision. The Permit should include this language to be consistent with other MS4 permits and to make certain that all restaurant development projects are properly covered under the Permit.

H. The Permit Should Include a Water Quality Credit System.

The Administrative Draft Permit does not include any provisions or requirements for a water quality credit system. The only mention of a credit system is an example of a mitigation fund that Copermittees may implement as part of a mitigation plan under alternative compliance.[76] The Permit should include a requirement for water quality credits similar to what has been adopted in the Orange County permit: a "credit system clearly exhibits that it will not allow PDPs to result in a new impact from pollutant loadings over and above the impact cause by projects meeting LID requirements."[77] Including this language in the Permit will ensure water quality credits will be allocated to specific projects that actually offer a water quality benefit and will clarify the requirements of a water quality credit system.

I. The Permit Should Define "Infeasible" or Require Developers to Examine the Range of Feasible Projects and Select the Projects with the Greatest Water Quality Benefits.

The Administrative Draft Permit uses the term "feasible" and "infeasible" throughout the permit. For example, the Administrative Draft Permit requires LID BMPs to be implemented at all development projects where applicable and feasible.[78] The Administrative Draft Permit also allows Priority Development Projects to pursue "alternative compliance" with hydromodification requirements where fully implementation of hydromodification projects is "technically infeasible." The Administrative Draft Permit does not define "feasible" and specifically tasks Copermittees with defining "technical infeasibility."[79]

Allowing Copermittees to develop their own criteria as to what is "technically infeasible" runs the risk of Copermittees bowing to political pressure from building industry lobbyists and incorporating economic factors into the infeasibility standard. To ensure a robust and consistent standard of "technical infeasibility," the Regional Board should define a standard and explicitly direct that "technical infeasibility" cannot consider financial or economic factors.

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[75] *See, e.g.*, Riverside Permit, F.1(d)(2)(c); Orange County Permit, F.1(d)(2)(c); San Diego Permit, D.1(d)(2)(e).
[76] *See* Tentative Order R9-2012-0011 § II.E.3(c)(4)(c)(iv).
[77] *See* Order No. R9-2009-0002 at F.1(d)(7)(g).
[78] *See* Tentative Order R9-2012-0011 § II.E.3(a)(3).
[79] *See* Tentative Order R9-2012-0011 § II.E.3(c)(4)(b).

Further, the development community has consistently articulated engineers' and geotechnical experts' concerns that forcing infiltration could compromise the structural integrity of development projects and expose developers to liability. While the Environmental Groups recognize the development community's concerns, the answer is not to eliminate hydromodification requirements in San Diego County. Instead, the answer is for the Regional Board to articulate, in conjunction with Copermittees, Environmental Groups, the development community, and the green building community, a fair definition of technical infeasibility that maximizes environmental protection and public safety.

J. The Permit Could Incorporate Hydromodification Requirements to Prioritize On-site Measures while Recognizing Hydromodification's Watershed Impacts.

As an alternative to the current hydromodification scheme, the Permit could adopt an approach to hydromodification that would both prioritize on-site infiltration measures while recognizing that hydromodification "disrupts… natural watershed hydrologic processes."[80]

Some Copermittees and the development community have been urging the Regional Board staff to allow developers to proceed directly to regional mitigation projects instead of on-site measures, where the regional mitigation projects would have at least the same water quality benefits. While regional mitigation projects may have great benefits for the watershed, they should only be allowed in limited circumstances and with certain safeguards in place. First, the regional mitigation project should have ***greater*** water quality benefits than full-implementation of on-site infiltration. Second, the mitigation projects must have safeguards to ensure there is sufficient funding to complete the project before any individual developer is off the hook for on-site mitigation. This is important to avoid the situation where a developer "pays in" a few thousand dollars to a multi-million dollar restoration project, but not enough funds are ultimately raised and the project viability is compromised—and hence, the development has never mitigated its impact.

To avoid this, there should be a time-limit on restoration projects, perhaps through a "Kickstarter" approach. Under this approach, there is a limited amount of time for investors to pledge money for a project. If the monetary goal is raised, the project goes forward and all investors contribute their money. If the project raises insufficient funds, the investors keep their money and must find another project to serve as their mitigation. This approach could also allow Copermittees to pledge money toward the project and then operate the project as a quasi-mitigation bank for developments within the watershed. Another alternative would be for Copermittees to pre-identify and fund regional mitigation opportunities themselves, and then hold these assets in a mitigation bank for sale to developers of future projects.

Also, the Permit could include a requirement to focus not on what is "infeasible," but what is feasible. This approach could foster creativity and get developers, Copermittees, and environmental groups working together on projects to benefit the entire watershed.

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[80] *See* Tentative Order R9-2012-0011 at Attachment C-4.

K. The Permit Should Require the Incorporation of USEPA Green Street Implementation for New or Significant Re-Development throughout the Region.

The Environmental Groups encourages the Regional Board to modify the Permit's Priority Development Program to require the adoption of USEPA Green Streets. As written, the Administrative Draft Permit's Jurisdictional Runoff Management Program Priority Development Project Section states that streets, roads, highways, freeways, and residential driveways with an impervious area greater than 5,000 square feet and is used for transportation purposes is a priority area.[81] The north Orange County MS4 permit adopted by the Santa Ana Regional Board explicitly incorporates USEPA guidance, "Managing Wet Weather with Green Infrastructure: Green Streets."[82] This USEPA guidance is required to be implemented to the MEP.[83]

L. The Permit Should Promote Regular Inspections of Inventoried Existing Development to Ensure Compliance with Applicable Local Ordinances and Permits.

The Administrative Draft Permit establishes a five-year minimum inspection cycle for inventoried existing development along with a requirement of an inspection within six months of any change in property ownership.[84] Copermittees have argued for a weakening of those minimum requirements and indicated a system that would allow for a focusing of resources on those facilities which may be of a higher priority.

The Environmental Groups do not oppose the focusing of scarce resources towards higher priority pollutants or areas, so long as each facility in a Copermittee's jurisdiction is inspected at least once during this Permit term. State Water Resources Control Board audits and private consultants have concluded that industrial and commercial inspections are a necessary component of stormwater permitting. A 2006 Tetra Tech report assessing California's Industrial Storm Water Program contained a central finding stating that "*compliance improves with field inspector presence.*"[85] The report goes onto state, "[r]egulatory presence (1) shows the facility representatives that the [regulator] takes the program seriously and (2) keeps stormwater compliance in the minds of facility representatives."[86]

The proven benefit of a robust inspection program and the relatively modest requirement that each facility is inspected no less than once every five years is not a regulatory burden on the Copermittees. Therefore, the Environmental Groups oppose any material modification to lessen inspection frequency.

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[81] *See* Tentative Order No. R9-2012-0011 at § II.E.3.b.(2)(g).
[82] *See* Order No. R8-2009-0030, as amended by Order No. R8-2010-0062, § XII.B.2.h.
[83] *See id.*
[84] *See* Tentative Order No. R9-2012-0011 at § II.E.5.d.(1)(a).
[85] Assessment Report on Tetra Tech's Support of California's Industrial Stormwater Program, 22 (July 12, 2006).
[86] *Id.*

M. The Permit Should Promote Retrofitting Existing Development as a Primary Strategy to Achieve Water Quality Improvement.

The Administrative Draft Permit appropriately requires each Copermittee to develop a program to retrofit existing development.[87] However, the retrofit sections could be improved by avoiding "orphan" areas and including environmental groups and other stakeholders in retrofit program.

1. Identifying "high priority" areas for implementation runs the risk of abandoning other areas.

Identifying areas that will address high priority water quality concerns seems like a reasonable start. However, as in other sections of the Permit, and consistent with our comments in this letter,[88] we have concerns that this will leave other areas as "orphans" and not result in comprehensive adoption of rebates and other incentives, nor an equitable distribution of the requirements and the resulting benefits to all affected jurisdictions.

2. Environmental groups and other stakeholders should be actively involved in retrofit implementation.

Much like our comments on including environmental organizations and citizen monitoring,[89] we strongly recommend additional language in the Permit to encourage partnerships with non-governmental organizations working on pollution prevention programs for existing development. In other areas of the State, as well as locally, this type of cooperative effort between government and non-government results in reduced costs and increased benefits.

IX. THE ADMINISTRATIVE DRAFT PERMIT'S ENFORCEMENT APPROACH IS APPROPRIATE.

A. The Permit Must Include Enforcement Response Plans to Ensure Improved Water Quality in the Region.

The Administrative Draft Permit's substantive enforcement requirements assist Copermittees to hold accountable dischargers who contribute to water quality standards violations. These enforcement requirements outlined in are appropriate should be retained as-is in the Permit.[90] Strong enforcement provisions are appropriate to encourage Copermittees, industrial and construction dischargers, and the development community to find better and more cost-effective BMPs and alternative methods for achieving water quality standards. The Permit should further strengthen these requirements to address facilities which could fall through the cracks under the Administrative Draft Permit's language.

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[87] *See: See* Tentative Order No. R9-2010-0016 at § II.E. (b)
[88] See eg, Section IV B (5) (F) of this letter.
[89] See eg, Section IV B (1), (2) and (3) of this letter.
[90] *See* Tentative Order No. R9-2010-0016 at § II.E.6

B. The Permit Must Maintain Escalating Enforcement Actions to Ensure Violators of Water Quality Standards Stop Unauthorized Practices.

Increasing enforcement action, like the provisions in E.6, help deter dischargers from compromising water quality.[91] The Permit should retain these requirements; however in our experience Copermittees are too lenient on repeat offenders. Failure to appropriately "ratchet up" enforcement should be considered a failure to comply with these provisions of the Permit.

C. The Permit Should Include Reporting Requirements for Sites Which are Repeatedly Subject to Low Level Enforcement.

The Administrative Draft Permit requires Copermittees to notify the Regional Board after issuing any "high level enforcement action" to a construction site, but there is no similar requirement for sites that receive multiple low level enforcement actions.[92] The Regional Board should be aware of repeat violators not associated with the highest water quality priorities. The Permit should require Copermittees to notify the Regional Board of such dischargers.

D. The Permit Should Require Board Notification for All Violators Subject to High Level Enforcement Actions, Not Only Construction Sites.

The Administrative Draft Permit requires Copermittees to inform the Regional Board after issuing any "high level enforcement action" to a construction site.[93] There is no reason this requirement should only apply to construction sites. The Regional Board should be notified of any discharger subject to high level enforcement. The Regional Board should remove the word "construction" from Provision E.6(d)(1) to correct this issue and include all sites.

E. The Permit Should Require Copermittees to Automatically Notify the Regional Board of Non-Compliant Sites Threatening the Highest Water Quality Priorities Because These Violations are Already Significant.

The Administrative Draft Permit requires Copermittees to report to the Regional Board issuance of a high level enforcement action to a site that poses a "significant threat to water quality."[94] When the site threatens the highest water quality priorities, violations requiring the issuance of high level enforcement actions are already significant because Copermittees have identified these waters as their highest water quality priorities. Therefore, the Regional Board should require Copermittees to automatically notify the Regional Board of any high level enforcement action issued that affects the highest water quality priorities.

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[91] *See* Tentative Order No. R9-2010-0016 at E.6(a)(2)-(3), (b)(4), and (c)(3).
[92] *See* Tentative Order No. R9-2010-0016 at E.6(d).
[93] *See* Tentative Order No. R9-2010-0016 at E.6(d)(1).
[94] *See* Tentative Order No. R9-2010-0016 at E.6(d)(1).

F. The Permit Must Preserve the Enforcement Requirements for Violations of Highest Water Quality Priorities.

It is proper for the permit to require Copermittees to automatically start enforcement at high level for any violation that threatens or potentially threatens the highest water quality priorities.[95]

G. The Permit Should Modify Reporting Requirements for Continued Exceedances of Water Quality Standards to Encourage Copermittees to Take Initiative in Finding Exceedances.

The Administrative Draft Permit currently requires Copermittees to submit updates on their Water Quality Improvement Plans when either the Copermittee or the Regional Board determines that discharges from the facility are causing or contributing to an exceedance.[96] The Permit could facilitate better practices by the Copermittees if this requirement were changed to reward the efforts of Copermittees that seek out troublesome discharges on their own.

X. THE PERMIT'S REPORTING PROVISIONS MUST BE STRENGTHENED TO ENSURE MEANINGFUL PUBLIC PARTICIPATION.

A. The Permit Must Require More Detailed Annual Reporting than Proposed in the Administrative Draft Permit.

The Administrative Draft Permit modifies the existing reporting standards for Copermittees' and significantly reduced the volume of data that must be disclosed to a double-sided, single page form.[97] For many of the Copermittees' actions, the form only requires the disclosure of the number of times an action occurred (e.g. number of non-storm water discharges eliminated), without any details regarding the discharges or what actions were taken to fix them.

The Regional Board, Copermittees and the Environmental Groups agree that valuable and scarce resources should not be spent on the completion and submission of reports that do not provide value equal to the amount of time spent in preparing the reports. However, Annual Reports provide a mechanism to public agencies to reflect on their performance over the past twelve months and a shortened report may negatively impact the ability of these agencies to fully calculate the effectiveness of their programs. The Environmental Groups encourage the Regional Board to revise the Annual Report requirements to include a more robust analysis of the Copermittees' programs. This modification may allow Copermittees to incorporate cross-references to other documents to avoid additional costs of Annual Report preparation.

B. The Permit Should Require Copermittees to Submit Water Quality Data to CEDEN.

The Administrative Draft Permit requires Copermittees to submit their water quality monitoring data to the California Environmental Data Exchange Network (CEDEN). This requirement is

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[95] *See* Tentative Order No. R9-2012-0011 at E.6(a)(2)(a) and (c)(3).
[96] *See* Tentative Order R9-2012-0011 § II.A.4(a)(1).
[97] *See* Tentative Order No. R9-2010-0016 at F.3(b)(2).

important because it ensures that CEDEN will become a comprehensive source of water quality data for the region.

C. The Regional Clearinghouse Could Become an Important Tool To Increase Transparency.

The Administrative Draft Permit requires the Copermittees to develop, update and maintain an internet-based Regional Clearinghouse to serve as a collection point for Water Quality Improvement Plans, Annual Reports, jurisdictional runoff management program document, monitoring data, and any other edata or information generated through this process.[98] The Regional Clearinghouse has the potential to become a powerful tool to increase transparency and facilitate public participation in developing Water Quality Improvement Plans and jurisdictional programs.

However, the Regional Clearinghouse needs to be set up in a way so that reports and data are easy to locate. The allocation of scarce financial resources dedicated towards collecting information and providing it to the public via a system that is difficult to navigate fails to satisfy the purpose of this or any other permit. The San Diego Copermittees' current website, Project Clean Water, is difficult to navigate and tends to obscure information, rather than make it accessible. Furthermore, unless the public has been made aware of the availability of this tool, few should be expected to access it. Therefore, the Regional Clearinghouse should be prominently displayed on Copermittee's water quality websites and the Regional Board should encourage distribution of information relating to this tool as well as how-to recommendations on reducing water usage to residents. Any and all public information should have contact information, including e-mail and phone numbers, for stormwater program managers for each Copermittee.

D. The Regional Clearinghouse Should Include a Database for Mobile Sources, Along with Each Copermittee's Industrial, Commercial, and Municipal Inventories.

The San Diego Copermittees had been developing a mobile sources database to help track mobile sources across jurisdictions. San Diego Coastkeeper was particularly interested in making that information publicly accessible in order to assist jurisdictions in holding mobile sources accountable. Unfortunately, the San Diego Copermittees refused to make the database publicly accessible.

In order to ensure an accurate picture of the potential sources of water quality impairments the Regional Board must provide a comprehensive procedure that allows for concerned members of the public, and the non-profit community that represents them, the ability to assist Copermittees in resolving chronic water quality problems. One of the most effective means of achieving improved water quality are regulations that encourage public involvement in their enforcement.[99] In this instance, the Environmental Groups seek the access to data compiled by public agencies, likely without the financial resources to comprehensively review their data, in order to ensure compliance with this Permit and its stated goal of improved water quality. Therefore, this Permit should require

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[98] *See* Tentative Order No. R9-2012-0011 § II.F.4.

[99] *See* State Water Resources Control Board, Office of Enforcement, Citizen Suit Enforcement under the Federal Clean Water Act: A Snapshot of the California Experience Based on Notices of Intent to Sue March 2009 through June 2010. 7 (May 2011).

the Regional Clearinghouse to include a publicly accessible mobile sources inventory and tracking system as well as each Copermittee's industrial, commercial, and municipal inventories.

E. The Permit Should Require a Best Management Practices Database.

The Clean Water Act requires Copermittees to reduce pollutants in waters discharged to and from the MS4 to the Maximum Extent Practicable ("MEP"). Because the Clean Water Act is a technology-forcing statute, MEP is an ever-evolving standard, forcing better technology and new approaches over time. In order for the Regional Board to assess MEP, the Permit should require the Copermittees to create a publicly accessible BMP database. This will allow Copermittees to share innovative techniques, technology, and practices and help the Regional Board staff and environmental groups to push the Copermittees to "raise the bar" and pursue ever-improving strategies to achieve water quality standards

XI. THE PERMIT MUST ADJUST EARLY ENROLLMENT REQUIREMENTS FOR ORANGE AND RIVERSIDE COUNTIES.

The previous permits from Orange and Riverside counties were not on the same time schedule as the San Diego permit and were not set to expire until 2014 and 2015 respectively. These currently effective permits had requirements for the Copermittees to complete several special studies in addition to the core monitoring requirements. Some of the special studies had implementation dates that have not yet passed.

The Riverside County permit outlines requirements for a Trash and Litter Investigation, and an Agricultural, Federal, and Tribal Input Study which both must be submitted by September 1, 2012, and also an Intermittent and Ephemeral Stream Perennial Conversion Study which must be submitted by April 1, 2013. The current Administrative Draft Permit requires Copermittees to conduct special studies but makes no reference to the past studies that are still pending implementation.

Will these studies no longer be required? Or will this portion of the superseded permits still be in effect? The Permit must adjust the early enrollment requirements for Orange and Riverside counties to ensure these studies are completed even if they undergo early enrollment.

XII. THE PERMIT SHOULD REQUIRE A NARRATIVE FISCAL ANALYSIS.

The Administrative Draft Permit does not require Copermittees to include a narrative description of causes of a 25 percent or greater annual change in any budget line item in the annual reports. The current permits for Riverside and Orange Counties include such a provision.[100] This provision holds Copermittees to a higher standard in their annual analysis while creating accountability to such increases in their budgets. The Permit should include a similar standard.

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[100] *See* Order No. R9-2010-0016 at H.2(b); Order No. R9-2009-0002 at H.2(b).

XIII. THE ENVIRONMENTAL GROUPS REQUEST NOTICE.

The Environmental Groups request notice of any further documentation, decisions, findings or actions taken in regards to this matter.

CONCLUSION

In conclusion, the Environmental Groups appreciate the effort the Regional Board and its staff have put towards developing an MS4 permit for the San Diego Region which effectively and efficiently addresses the environmental concerns of the watershed in a transparent and comprehensive approach. We look forward to a constructive relationship with the Regional Board and hope our comments will assist in the development of a thoughtful and progressive permit.

Respectfully submitted,

Jill Witkowski
San Diego Coastkeeper

Colin Kelly
Orange County Coastkeeper

Garry Brown
Inland Empire Waterkeeper

Penny Elia
Save Hobo Aliso

Michael Beanan
South Laguna Civic Association
Laguna Bluebelt Coalition

Livia Borak
Coastal Environmental Rights Foundation

Julia Chunn-Heer
Surfrider Foundation,
San Diego Chapter

Doug Reese
Surfrider Foundation,
South Orange County Chapter

Nicole Capretz
Environmental Health Coalition

Van Collinsworth
Preserve Wild Santee

Debby Knight
Friends of Rose Canyon

ADMINISTRATIVE DRAFT

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

TENTATIVE
ORDER NO. R9-2012-0011
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The San Diego County Copermittees in Table 1a are subject to waste discharge requirements set forth in this Order.

Table 1a. San Diego County Copermittees

City of Carlsbad	City of Oceanside
City of Chula Vista	City of Poway
City of Coronado	City of San Diego
City of Del Mar	City of San Marcos
City of El Cajon	City of Santee
City of Encinitas	City of Solana Beach
City of Escondido	City of Vista
City of Imperial Beach	County of San Diego
City of La Mesa	San Diego County Regional Airport Authority
City of Lemon Grove	Unified Port District of San Diego
City of National City	

The Orange County Copermittees in Table 1b are subject to waste discharge requirements set forth in this Order upon expiration of Order No. R9-2009-0002, NPDES No. CAS0108740 on December 16, 2014.

Table 1b. Orange County Copermittees

City of Aliso Viejo	City of Ranch Santa Margarita
City of Dana Point	City of San Clemente
City of Laguna Beach	City of San Juan Capistrano
City of Laguna Hills	City of Laguna Woods
City of Laguna Niguel	County of Orange
City of Lake Forest	Orange County Flood Control District
City of Mission Viejo	

The Riverside County Copermittees in Table 1c are subject to waste discharge requirements set forth in this Order upon expiration of Order No. R9-2010-0016, NPDES No. CAS0108766 on November 10, 2015.

Table 1c. Riverside County Copermittees

City of Murrieta	County of Riverside
City of Temecula	Riverside County Flood Control and Water Conservation District
City of Wildomar	

The Orange County Copermittees and Riverside County Copermittees may enroll under this Order at a date earlier than the expiration date of their current Orders subject to the conditions described in Provision F.6 of this Order and the Copermittees in the respective county receive a Notice of Enrollment (NOE) from the San Diego Water Board.

The term Copermittee in this Order refers to any San Diego County, Orange County, or Riverside County Copermittee enrolled under this Order, unless specified otherwise.

This Order provides permit coverage for the Copermittee discharges described in Table 2.

Table 2. Discharge Locations and Receiving Waters

Discharge Points	Locations throughout San Diego Region
Discharge Description	Municipal Separate Storm Sewer System (MS4) Discharges
Receiving Waters	Inland Surface Waters, Enclosed Bays and Estuaries, and Coastal Ocean Waters of the San Diego Region

Table 3. Administrative Information

This Order was adopted by the San Diego Water Board on:	**Month Day, 2012**
This Order will become effective on:	**Month Day, 2012**
This Order will expire on:	**Month Day, 2017**
The Copermittees must file a Report of Waste Discharge (ROWD) in accordance with Title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than 180 days in advance of the Order expiration date.	

I, David W. Gibson, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on Month Day, 2012.

TENTATIVE

David W. Gibson
Executive Officer

ADMINISTRATIVE DRAFT

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ADMINISTRATIVE DRAFT

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ADMINISTRATIVE DRAFT

I. FINDINGS

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), finds that:

JURISDICTION

1. **MS4 Ownership or Operation.** Each of the Copermittees owns or operates an MS4, through which it discharges storm water and non-storm water into waters of the U.S. within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the U.S.

2. **Legal and Regulatory Authority.** This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]) adopted by the United States Environmental Protection Agency (USEPA), and chapter 5.5, division 7 of the California Water Code (CWC) (commencing with section 13370). This Order serves as an NPDES permit for discharges from MS4s to surface waters. This Order also serves as waste discharge requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

3. **CWA Technology Based Standards and Prohibitions.** Pursuant to CWA section 402(p)(3)(B), NPDES permits for storm water discharges from MS4s must include requirements to effectively prohibit non-storm water discharges into MS4s, and require controls to reduce the discharge of pollutants in storm water to the maximum extent practicable (MEP).

4. **CWA NPDES Permit Conditions.** Pursuant to CWA section 402(a)(2), NPDES permits must prescribe conditions to assure compliance with CWA section 402(p)(3)(B) and 40 CFR 122.26(d)(2)(iv)(B). This Order prescribes conditions to assure compliance with the CWA requirements for owners and operators of MS4s to effectively prohibit non-storm water discharges in to the MS4s, and require controls to reduce the discharge of pollutants in storm water from the MS4s to the MEP.

5. **CWA and CWC Monitoring Requirements.** Pursuant to 40 CFR 122.48, NPDES permits must specify requirements for recording and reporting monitoring results. In addition, CWC sections 13267 and 13383 authorize the San Diego Water Board to require technical and monitoring reports. This Order establishes monitoring and reporting requirements to implement federal and State requirements.

6. **Total Maximum Daily Loads.** CWA section 303(d)(1)(A) requires that "[e]ach state shall identify those waters within its boundaries for which the effluent limitations…are not stringent enough to implement any water quality standard applicable to such waters." The CWA also requires states to establish a priority ranking of impaired water bodies known as Water Quality Limited Segments and to establish Total Maximum Daily Loads (TMDLs) for such waters. This priority list of impaired water bodies is called the Clean Water Act Section 303(d) List of Water Quality Limited Segments, commonly referred to as the 303(d) List. The CWA requires the 303(d) List to be updated every two years. Requirements of this Order implement the TMDLs adopted by the San Diego Water Board and approved by USEPA.

7. **Non-Storm Water Discharges.** Pursuant to CWA section 402(p)(3)(B)(ii), this Order requires each Copermittee to effectively prohibit discharges of non-storm water into its MS4. Nevertheless, non-storm water discharges into and from the MS4s continue to be reported to the San Diego Water Board by the Copermittees and other persons. Monitoring conducted by the Copermittees, as well as the 303(d) List, have identified dry weather, non-storm water discharges from the MS4s as a source of pollutants causing or contributing to receiving water quality impairments in the San Diego Region. The federal regulations [40 CFR 122.26(d)(2)(iv)(B)] require the Copermittees to have a program to prevent all types of non-storm water discharges, or illicit discharges, from entering the MS4. The federal regulations, however, allow for specific categories of non-storm water discharges or flows to be addressed as illicit discharges only where such discharges are identified as sources of pollutants to waters of the U.S.

8. **In-Stream Treatment Systems.** Pursuant to federal regulations [40 CFR 131.10(a)], in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S. Authorizing the construction of a runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to accepting waste assimilation as an appropriate use for that water body. Runoff treatment must occur prior to the discharge of runoff into receiving waters. Treatment control best management practices (BMPs) must not be constructed in waters of the U.S. or state. Construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body.

DISCHARGE CHARACTERISTICS AND RUNOFF MANAGEMENT

9. **Point Source Discharges of Pollutants.** Discharges from the MS4s contain waste, as defined in the CWC, and pollutants that adversely affect the quality of the waters of the state. A discharge from an MS4 is a "discharge of pollutants from a point source" into waters of the U.S. as defined in the CWA. Storm water and non-storm water discharges from the MS4s contain pollutants that cause or threaten to cause a violation of surface water quality standards, as outlined in the Basin Plan. Storm water and non-storm water discharges from the MS4s are subject to the conditions and requirements established in the Basin Plan for point source discharges.

10. **Potential Beneficial Use Impairment.** The discharge of pollutants and/or increased flows from MS4s may cause or threaten to cause the concentration of pollutants to exceed applicable receiving water quality objectives and impair or threaten to impair designated beneficial uses resulting in a condition of pollution, contamination, or nuisance.

11. **Pollutants Generated by Land Development.** Land development has created and continues to create new sources of non-storm water discharges and pollutants in storm water discharges as human population density increases. This brings higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash. Pollutants from these sources are dumped or washed off the surface by non-storm water or storm water flows into and from the MS4s. When development converts natural vegetated pervious ground cover to impervious surfaces such as paved highways, streets, rooftops, and parking lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving a developed area contains greater pollutant loads and is significantly greater in runoff volume, velocity, and peak flow rate than pre-development runoff from the same area.

12. **Runoff Discharges to Receiving Waters.** The MS4s discharge runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within the eleven hydrologic units comprising the San Diego Region. Numerous receiving water bodies and water body segments have been designated as impaired by the San Diego Water Board pursuant to CWA section 303(d).

13. **Pollutants in Runoff.** The most common pollutants in runoff discharged from the MS4s include total suspended solids, sediment, pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., cadmium, copper, lead, and zinc), petroleum products and polynuclear aromatic hydrocarbons, synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus), oxygen-demanding substances (decaying vegetation, animal waste), detergents, and trash.

14. **Human Health and Aquatic Life Impairment.** Pollutants in runoff discharges from the MS4s can threaten and adversely affect human health and aquatic organisms. Adverse responses of organisms to chemicals or physical agents in runoff range from physiological responses such as impaired reproduction or growth anomalies to mortality. Increased volume, velocity, rate, and duration of storm water runoff greatly accelerate the erosion of downstream natural channels. This alters stream channels and habitats and can adversely affect aquatic and terrestrial organisms.

15. **Water Quality Effects.** The Copermittees' water quality monitoring data submitted to date documents persistent exceedances of Basin Plan water quality objectives for runoff-related pollutants at various watershed monitoring stations. Persistent toxicity has also been observed at several watershed monitoring stations. In addition, bioassessment data indicate that the majority of the monitored receiving waters have

Poor to Very Poor Index of Biotic Integrity (IBI) ratings. These findings indicate that runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in the San Diego Region. Non-storm water discharges from the MS4s have been shown to contribute significant levels of pollutants and flow in arid, developed Southern California watersheds, and contribute significantly to exceedances of applicable receiving water quality objectives.

16. **Non-Storm Water Discharges.** Non-storm water discharges from the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard from CWA 402(p)(3)(B)(iii), which is explicitly for "Municipal … *Stormwater Discharges* (emphasis added)" from the MS4s. Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s must be effectively prohibited.

17. **Best Management Practices.** Pollutants can be effectively reduced in runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Pollution prevention is the reduction or elimination of pollutant generation at its source and is the best "first line of defense". Source control BMPs (both structural and non-structural) minimize the contact between pollutants and runoff, therefore keeping pollutants onsite and out of receiving waters. Treatment control BMPs remove pollutants that have been mobilized by storm water or non-storm water flows.

18. **BMP Implementation.** Runoff needs to be addressed during the three major phases of development (planning, construction, and use) in order to reduce the discharge of storm water pollutants to the MEP, effectively prohibit non-storm water discharges, and protect receiving waters. Development which is not guided by water quality planning policies and principles can result in increased pollutant load discharges, flow rates, and flow durations which can negatively affect receiving water beneficial uses. Construction sites without adequate BMP implementation result in sediment runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. Existing development can generate substantial pollutant loads which are discharged in runoff to receiving waters.

19. **Long Term Planning and Implementation.** Federal regulations require municipal storm water permits to expire 5 years from adoption, after which the permit must be renewed and reissued. The San Diego Water Board recognizes that the degradation of water quality and impacts to beneficial uses of the waters in the San Diego Region occurred over several decades. The San Diego Water Board ~~further recognizes that a decade or more may be necessary to realize~~ expects to see demonstrable improvement to the quality of waters in the Region once Copermittees are given the flexibility to focus resources on addressing priority issues first. This Order includes a long term planning and implementation approach that will require more than a single permit term to ~~complete.~~achieve comprehensive water quality improvements throughout the Region.

FINDINGS

WATER QUALITY STANDARDS

20. **Basin Plan.** The San Diego Water Board adopted a Water Quality Control Plan for the San Diego Basin (Basin Plan) on September 8, 1994 that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for receiving waters addressed through the plan. The Basin Plan was subsequently approved by the State Water Resources Control Board (State Water Board) on December 13, 1994. Subsequent revisions to the Basin Plan have also been adopted by the San Diego Water Board and approved by the State Water Board. Requirements of this Order implement the Basin Plan.

    The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Process Supply (PROC), Industrial Service Supply (IND), Ground Water Recharge (GWR), Contact Water Recreation (REC1), Non-contact Water Recreation (REC2), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Freshwater Replenishment (FRSH), Hydropower Generation (POW), and Preservation of Biological Habitats of Special Significance (BIOL). The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region: Navigation (NAV), Commercial and Sport Fishing (COMM), Estuarine Habitat (EST), Marine Habitat (MAR), Aquaculture (AQUA), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN), and Shellfish Harvesting (SHELL).

21. **Ocean Plan.** The State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, and 2005. The State Water Board adopted the latest amendment on April 21, 2005 and it became effective on February 14, 2006. The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean. Requirements of this Order implement the Ocean Plan.

    The Ocean Plan identifies the following beneficial uses of ocean waters of the state to be protected: Industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture; preservation and enhancement of designated Areas of Special Biological Significance; rare and endangered species; marine habitat; fish spawning and shellfish harvesting

22. **Sediment Quality Control Plan**. On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret

the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

23. **National Toxics Rule and California Toxics Rule.** USEPA adopted the NTR on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the National toxics Rule (NTR) applied in California. On May 18, 2000, USEPA adopted the California Toxics Rule (CTR). The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants

24. **Antidegradation Policy.** This Order is in conformance with the federal Antidegradation Policy described in 40 CFR 131.12, and State Water Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality Waters in California*. Federal regulations at 40 CFR 131.12 require that the State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The San Diego Water Board's Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies.

CONSIDERATIONS UNDER FEDERAL LAW

25. **Coastal Zone Act Reauthorization Amendments.** Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states with approved coastal zone management programs to address non-point pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point pollution: agriculture, silviculture, urban, marinas, and hydromodification. This Order addresses the management measures required for the urban category, with the exception of septic systems. The runoff management programs developed pursuant to this Order fulfill the need for coastal cities to develop a runoff non-point source plan identified in the Non-Point Source Program Strategy and Implementation Plan. The San Diego Water Board addresses septic systems through the administration of other programs.

26. **Endangered Species Act.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 USCA sections 1531 to 1544). This Order requires compliance with receiving water limits, and other requirements to protect the beneficial uses of waters of the State. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

CONSIDERATIONS UNDER STATE LAW

27. **Unfunded Mandates.** This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following:

    a. This Order implements federally mandated requirements under CWA section 402. (33 USC 1342(p)(3)(B).)

    b. The local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental and new dischargers who are issued NPDES permits for storm water and non-storm water discharges.

    c. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order.

    d. The Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC 1311(a)) and in lieu of numeric restrictions on their MS4 discharges (i.e. effluent limitations).

    e. The local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under State law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

    f. The provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards. (33 USC 1313(d).) Once the USEPA or a state develops a TMDL, federal law requires that permits must contain effluent limitations consistent with the assumptions and requirements of any applicable wasteload allocation. (40 CFR 122.44(d)(1)(vii)(B).)

28. **California Environmental Quality Act.** The issuance of WDRs and an NPDES permit for the discharge of runoff from MS4s to waters of the U.S. is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 et seq.) in accordance with CWC section 13389.

STATE WATER BOARD DECISIONS

29. **Compliance with Prohibitions and Limitations.** The receiving water limitation language specified in this Order is consistent with language recommended by the USEPA and established in State Water Board Order WQ-99-05, *Own Motion Review of the Petition of Environmental Health Coalition to Review Waste Discharge Requirements Order No. 96-03, NPDES Permit No. CAS0108740*, adopted by the State Water Board on June 17, 1999. The receiving water limitation language in this Order requires compliance with water quality standards, which for storm water discharges is to be achieved through an iterative approach requiring the

implementation of improved and better-tailored BMPs over time. Implementation of the iterative approach to comply with receiving water limitations based on applicable water quality standards is necessary to ensure that storm water discharges from the MS4 ultimately will not cause or contribute to violations of water quality standards and the creation of conditions of pollution, contamination, or nuisance.

30. **Special Conditions for Areas of Special Biological Significance.** On March 20, 2012, the State Water Board approved Resolution No. 2012-001**X** approving an exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges. The Resolution requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBSs. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject terms and conditions of the Resolution. The Special Protections contained in Attachment B to the Resolution applicable to these discharges are hereby incorporated in this Order as if fully set forth herein.

ADMINISTRATIVE FINDINGS

31. **Executive Officer Delegation of Authority.** The San Diego Water Board by prior resolution has delegated all matters that may legally be delegated to its Executive Officer to act on its behalf pursuant to CWC section 13223. Therefore, the Executive Officer is authorized to act on the San Diego Water Board's behalf on any matter within this Order unless such delegation is unlawful under CWC section 13223 or this Order explicitly states otherwise.

32. **Standard Provisions.** Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR 122.42, are provided in Attachment B to this Order.

33. **Fact Sheet.** The Fact Sheet for this Order contains background information, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of this Order. The Fact Sheet is hereby incorporated into this Order and constitutes part of the Findings of this Order.

34. **Public Notice.** The San Diego Water Board notified the Copermittees, and interested agencies and persons of its intent to prescribe WDRs for MS4 discharges of pollutants to waters of the U.S. and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet.

35. **Public Hearing.** The San Diego Water Board held a public hearing on Month Day, 2012 and heard and considered all comments pertaining to the terms and conditions of this Order. Details of the public hearing are provided in the Fact Sheet.

II. PROVISIONS

THEREFORE, IT IS HEREBY ORDERED that the Copermittees, in order to meet the provisions contained in division 7 of the CWC and regulations adopted thereunder, and the provisions of the CWA and regulations adopted thereunder, must each comply with the following:

A. PROHIBITIONS AND LIMITATIONS

The purpose of this provision is to describe the conditions under which storm water and non-storm water discharges into and from MS4s are prohibited or limited. The goal of this provision is to protect, preserve, enhance, and restore the water quality and designated beneficial uses of waters of the state. This goal will be accomplished through implementation of control measures that effectively prohibit non-storm water discharges into and from the Copermittees' MS4s, and reduce pollutants in storm water discharges from the Copermittees' MS4s to the MEP.

1. Discharge Prohibitions

a. Discharges into and from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the state are prohibited.

b. Non-storm water discharges into and from MS4s are prohibited, unless such discharges are either authorized by a separate NPDES permit, or the discharge is a category of non-storm water discharges or flows that must be addressed pursuant to Provisions E.2.a.(1)-(5) of this Order.

c. Discharges from MS4s are subject to all waste discharge prohibitions in the Basin Plan, included in Attachment A to this Order.

d. Discharges from MS4s to ASBS are prohibited. Storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-001**X** applicable to these discharges, included in Attachment A to this Order.

2. Receiving Water Limitations

a. Discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters, including but not limited to all applicable provisions contained in:

(1) The San Diego Water Board's Basin Plan, including beneficial uses, water quality objectives, and implementation plans;

(2) State Water Board plans for water quality control including the following:

(a) Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries (Thermal Plan), and

(b) The Ocean Plan, including beneficial uses, water quality objectives, and implementation plans;

(3) State Water Board policies for water and sediment quality control including the following:

(a) Water Quality Control Policy for the Enclosed Bays and Estuaries of California,

(b) Sediment Quality Control Plan which includes the following narrative objectives:

(i) Pollutants in sediments shall not be present in quantities that, alone or in combination, are toxic to benthic communities, and

(ii) Pollutants shall not be present in sediments at levels that will bioaccumulate in aquatic life to levels that are harmful to human health,

(c) The Statement of Policy with Respect to Maintaining High Quality of Waters in California (State Water Board Resolution No. 68-16).

(4) Priority pollutant criteria promulgated by the USEPA through the following:

(a) National Toxics Rule (NTR)[1] (promulgated on December 22, 1992 and amended on May 4, 1995), and

(b) California Toxics Rule (CTR)[2,3]

b. Discharges from MS4s composed of storm water runoff must not alter natural ocean water quality in an ASBS.

c. Discharges from MS4s must not cause or contribute to the violation of any receiving water limitations expressed as water quality based effluent limitations (WQBELs) required to meet the WLAs established for the TMDLs in Attachment E to this Order, pursuant to the applicable TMDL compliance schedules.

[1] 40 CFR 131.36
[2] 65 Federal Register 31682-31719 (May 18, 2000), adding Section 131.38 to 40 CFR
[3] If a water quality objective and a CTR criterion are in effect for the same priority pollutant, the more stringent of the two applies.

3. Effluent Limitations

a. Pollutants in storm water discharges from MS4s must be reduced to the MEP.[4]

b. Pollutants in discharges from MS4s must be reduced to comply with any effluent limitations expressed as WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order, pursuant to the applicable TMDL compliance schedules.

4. Compliance with Discharge Prohibitions and Receiving Water Limitations

Each Copermittee must comply with the discharge prohibitions and receiving water limitations of this Order through timely implementation of control measures and other actions as specified in Provisions B and E of this Order, including any modifications.

a. If exceedance(s) of water quality standards persist in receiving waters notwithstanding implementation of this Order, the Copermittees must comply with the following procedures:

(1) Upon a determination by ~~either~~ the Copermittees ~~or the San Diego Water Board~~ that discharges from the MS4 are causing or contributing to an exceedance of an applicable water quality standard, the Copermittees must submit the following updates to the Water Quality Improvement Plan required under Provision B as part of the Annual Report required under Provision F.3.b, unless the San Diego Water Board directs an earlier submittal:

(a) The water quality improvement strategies being implemented that are effective and will continue to be implemented;

(b) Additional water quality improvement strategies (i.e. BMPs, retrofitting projects, stream and/or habitat rehabilitation or restoration projects) that will be implemented to reduce or eliminate any pollutants or conditions that are causing or contributing to the exceedance of water quality standards;

(c) Updates to the schedule for implementation of the existing and additional water quality improvement strategies; and

(d) Updates, when necessary, to the schedule for achieving compliance with the discharge prohibitions and receiving water limitations of this Order;

[4] This does not apply to MS4 discharges which receive subsequent treatment to reduce pollutants in storm water discharges to the MEP prior to entering receiving waters (e.g., low flow diversions to the sanitary sewer). Runoff treatment must occur prior to the discharge of runoff into receiving waters per Finding 8.

(2) Upon a determination by the San Diego Water Board that discharges from the MS4 are causing or contributing to an exceedance of an applicable water quality standard (that was not identified pursuant to A.4(a)(1)), the Copermittees must submit the updates required under Provision A.4(a)(1)(a)-(d) to the Water Quality Improvement Plan required under Provision B within 30 days, unless the San Diego Water Board directs a later submittal:

(3)

~~(2)~~(4) The San Diego Water Board may require the incorporation of additional modifications to the Water Quality Improvement Plan required under Provision B. The applicable Copermittees must submit any modifications to the update to the Water Quality Improvement Plan within 30 days of notification that additional modifications are required by the San Diego Water Board, or as otherwise directed;

~~(3)~~(5) Within 30 days of the San Diego Water Board determination that the update to the Water Quality Improvement Plan meets the requirements of this Order, the Copermittees must revise the jurisdictional runoff management program documents to incorporate the updated water quality improvement strategies that have been and will be implemented, the implementation schedule, and any additional monitoring required; and

~~(4)~~(6) The Copermittees must implement the revised jurisdictional runoff management programs and updated jurisdictional monitoring and assessment component of the Water Quality Improvement Plan.

b. The Copermittees must repeat the procedure set forth above to comply with discharge prohibitions and receiving water limitations of this Order for continuing or recurring exceedances of the same water quality standard(s) following implementation of scheduled actions unless directed to do otherwise by the San Diego Water Board.

c. Nothing in Provisions A.4.a and A.4.b prevents the San Diego Water Board from enforcing any provision of this Order while the applicable Copermittees prepare and implement the above update to the Water Quality Improvement Plan and jurisdictional runoff management programs.

B. WATER QUALITY IMPROVEMENT PLANS

The purpose of this provision is to develop Water Quality Improvement Plans that guide the Copermittees' jurisdictional runoff management program implementation efforts towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plan is to ~~attain the reasonable~~ best protect~~ion~~, preserv~~eation~~, enhance~~ment~~, and restor~~eation of~~ water quality and designated beneficial uses of waters of the state. This goal will be accomplished through an adaptive planning and management process that identifies the highest water quality priorities within a watershed and implements strategies, control measures, and BMPs to achieve improvements in the quality of discharges from the MS4s and receiving waters.

The Copermittees must develop Water Quality Improvement Plans that 1) prioritize water quality issues resulting from discharges to and from the MS4s within each Watershed Management Area, 2) identify pollutant sources and other stressors associated with those water quality priorities, 3) define numeric targets and schedules to achieve improvement of water quality priorities, 4) describe water quality improvement strategies to achieve numeric targets, and 5) execute a coordinated monitoring and assessment program to determine progress towards achieving improved water quality.

The Copermittees must implement all the requirements of Provision B no later than 12 months after the adoption of this Order, or in accordance with Provision F.5.a of this Order.

1. Watershed Management Areas

The Copermittees must develop Water Quality Improvement Plans for each of the Watershed Management Areas in Table B-1. A total of nine Water Quality Improvement Plans must be developed for the San Diego Region.

Table B-1. Watershed Management Areas

Watershed Management Area	Hydrologic Unit(s)	Major Surface Water Bodies	Responsible Copermittees
South Orange County	San Juan (901.00)	Aliso Creek San Juan Creek San Mateo Creek Pacific Ocean	- City of Aliso Viejo[1] - City of Dana Point[1] - City of Laguna Beach[1] - City of Laguna Hills[1] - City of Laguna Niguel[1] - City of Laguna Woods[1] - City of Lake Forest[1] - City of Mission Viejo[1] - City of Rancho Santa Margarita[1] - City of San Clemente[1] - City of San Juan Capistrano[1] - County of Orange[1] - Orange County Flood Control District[1]

Table B-1. Watershed Management Areas

Watershed Management Area	Hydrologic Unit(s)	Major Surface Water Bodies	Responsible Copermittees
Santa Margarita River	Santa Margarita (902.00)	Murrieta Creek Temecula Creek Santa Margarita River Santa Margarita Lagoon Pacific Ocean	- City of Murrieta[2] - City of Temecula[2] - City of Wildomar[2] - County of Riverside[2] - County of San Diego[3] - Riverside County Flood Control and Water Conservation District[2]
San Luis Rey River	San Luis Rey (903.00)	San Luis Rey River San Luis Rey Estuary Pacific Ocean	- City of Escondido - City of Oceanside - City of Vista - County of San Diego
Carlsbad	Carlsbad (904.00)	Buena Vista Lagoon Agua Hedionda Lagoon Batiquitos Lagoon San Elijo Lagoon Pacific Ocean	- City of Carlsbad - City of Encinitas - City of Escondido - City of Oceanside - City of San Marcos - City of Solana Beach - City of Vista - County of San Diego
San Dieguito River	San Dieguito (905.00)	San Dieguito River San Dieguito Lagoon Pacific Ocean	- City of Del Mar - City of Escondido - City of Poway - City of San Diego - City of Solana Beach - County of San Diego
Penasquitos	Penasquitos (906.00)	Los Penasquitos Lagoon Mission Bay Pacific Ocean	- City of Del Mar - City of Poway - City of San Diego - County of San Diego
San Diego River	San Diego (907.00)	San Diego River Pacific Ocean	- City of El Cajon - City of La Mesa - City of Poway - City of San Diego - City of Santee - County of San Diego
San Diego Bay	Pueblo San Diego (908.00) Sweetwater (909.00) Otay (910.00)	Sweetwater River Otay River San Diego Bay Pacific Ocean	- City of Chula Vista - City of Coronado - City of Imperial Beach - City of La Mesa - City of Lemon Grove - City of National City - City of San Diego - County of San Diego - San Diego County Regional Airport Authority - Unified Port of San Diego
Tijuana River	Tijuana (911.00)	Tijuana River Tijuana Estuary Pacific Ocean	- City of Imperial Beach - City of San Diego - County of San Diego

Notes:
1. The Orange County Copermittees will be enrolled under this Order upon expiration of Order No. R9-2009-0002, or earlier if the Orange County Copermittees meet the conditions in Provision F.6.
2. The Riverside County Copermittees will be enrolled under this Order upon expiration of Order No. R9-2010-0016, or earlier if the Riverside County Copermittees meet the conditions in Provision F.6.
3. The County of San Diego will not be required to implement the requirements of Provision B for the Santa Margarita River Watershed Management Area until the Riverside County Copermittees are enrolled under this Order. Until then, the County of San Diego is responsible for implementing and complying with the requirements of Provisions D.1, D.4.a.(1)&(3), E, F.2.a-b, F.3.b, and F.4 for the areas of the Santa Margarita River Watershed Management Area within its jurisdiction.

2. Identification of Water Quality Priorities

The Copermittees must identify the water quality priorities within each Watershed Management Area that will be addressed by the Water Quality Improvement Plan. Where appropriate, Watershed Management Areas may be separated into subwatersheds to focus water quality prioritization and jurisdictional runoff management program implementation efforts by receiving water.

a. Assessment of Receiving Water Conditions

The Copermittees must review pollutant sources, discharges, and receiving water conditions and assess the following, at a minimum, to determine the degree of adverse impacts to receiving water beneficial uses:

(1) Receiving waters listed as impaired on the CWA Section 303(d) List of Water Quality Limited Segments (303(d) List);

(2) TMDLs adopted and under development by the San Diego Water Board;

(3) Receiving waters recognized as sensitive or highly valued by the Copermittees, including estuaries designated under the National Estuary Program under CWA section 320, wetlands defined by the State or U.S. Fish and Wildlife Service's National Wetlands Inventory as wetlands, and receiving waters identified as ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-001**X** (Attachment A);

(4) Water quality standards established in the Basin Plan;

(5) Known historical versus current physical, chemical, and biological water quality conditions;

(6) All available physical, chemical, and biological receiving water monitoring data, including data produced by third parties. Data to be considered shall ~~including~~include, but is not limited to, data describing:

(a) Chemical constituents;

(b) Water quality parameters (i.e. pH, temperature, conductivity, etc.);

(c) Toxicity Identification Evaluations for both receiving water column and sediment;

(d) Trash impacts;

(e) Bioassessments; and

(f) Physical habitat.

(7) Available evidence of erosional impacts in receiving waters due to accelerated flows (i.e. hydromodification); and

(8) Available evidence of adverse impacts to the chemical, physical, and biological integrity of receiving waters.

To ensure that Copermittees consider all available data when identifying priorities, Copermittees must make a call for data. The call for data must solicit third party water monitoring data and other evidence from the public regarding available evidence of adverse impacts to the chemical, physical, and biological integrity of receiving waters. The Copermittees must allow the public at least 30 days to submit data and information for consideration.

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b. IDENTIFY PRIORITY POLLUTANTS AND RECEIVING WATER CONDITIONS

The Copermittees must use the information gathered in Provision B.2.a. to develop a list of water quality priorities as pollutants and/or receiving water conditions that are the highest threat to water quality or that most adversely affect the physical, chemical, and biological integrity of receiving waters. The Copermittees must identify the highest water quality priorities to be addressed by the Water Quality Improvement Plan.

After developing the list of water quality priorities, the Copermittees must submit the proposed list, along with data supporting the list, to the Regional Board for a 30 day review and comment period for the public and Regional Board staff.

c. POLLUTANT SOURCE AND/OR STRESSOR IDENTIFICATION

The Copermittees must identify known and suspected storm water and non-storm water pollutant sources and any other stressors causing or contributing to the highest water quality priorities. The identification of known and suspected sources of the highest water quality priorities as identified for Provision B.2.b must consider the following:

(1) Pollutant generating facilities or areas within the Watershed Management Area, including:

(a) Each Copermittee's inventory of construction, municipal, commercial, industrial, and residential facilities, areas, and/or activities,

(b) Publicly owned parks and/or recreational areas,

(c) Open space areas,

(d) All currently operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste, and

(e) Areas not within the Copermittees' jurisdictions (e.g., tribal lands, state lands, federal lands) that may be pollutant sources related to the highest water quality priorities within the Watershed Management Area;

(2) Locations of the Copermittees' MS4s, including the following:

(a) All MS4 outfalls that discharge to receiving waters, and

(b) Locations of major structural controls for storm water and non-storm water (e.g., retention basins, detention basins, major infiltration devices, etc.);

(3) Other known and suspected sources of non-storm water or pollutants in storm water discharges to receiving waters within the Watershed Management Area, including the following:

(a) Other MS4 outfalls (e.g., Phase II Municipal and Caltrans),

(b) Other NPDES permitted discharges,

(c) Any other discharges that may be considered point sources (e.g., private outfalls), and

(d) Any other discharges that may be considered non-point sources (e.g., agriculture, wildlife or other natural sources);

(4) Review of available data, including but not limited to:

(a) Findings from the Copermittees' illicit discharge detection and elimination programs,

(b) Findings from the Copermittees' MS4 outfall monitoring,

(c) Findings from the Copermittees' receiving water monitoring,

(d) Findings from the Copermittees' MS4 discharges and receiving water assessments, and

(e) Any other available data, information, or studies related to pollutant sources and conditions that contribute to the highest water quality priorities as identified for Provision B.2.b.

To ensure that Copermittees consider all available information when identifying pollutant sources and stressors, Copermittees must make a call for information. The call for data must solicit information from the public regarding known and suspected sources. The Copermittees must allow the public at least 90 days to submit data and information for

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consideration.

After developing the list of pollutant sources, the Copermittees must submit the proposed list, along with data supporting it, to the Regional Board for a 30 day review and comment period for the public and Regional Board staff.

~~(e)~~

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d. NUMERIC TARGETS AND SCHEDULES

The Copermittees must develop and incorporate interim and final numeric targets[5] and schedules into the Water Quality Improvement Plans. Numeric targets and schedules must be used to measure progress towards addressing the highest water quality priorities and an ultimate outcome of protections, preservation, enhancement, and restoration of receiving water beneficial uses. When developing numeric targets and corresponding schedules, the Copermittees must consider the following:

[5] Interim and final numeric targets may take a variety of forms such as pollutant concentration, load reductions, number of impaired water bodies delisted from the List of Water Quality Impaired Segments, Index of Biotic Integrity (IBI) scores, or other appropriate metrics. Interim and final numeric targets are not necessarily limited to one criterion or indicator, but may include multiple criteria and/or indicators. The final goals must be linked to applicable water quality criteria.

(1) Final numeric targets must be based on measureable criteria or indicators, to be achieved in the receiving waters and/or MS4 discharges for the highest water quality priorities which will result in the restoration and/or protection of water quality standards in receiving waters;

(2) Interim numeric targets must be based on measureable criteria or indicators that can demonstrate incremental progress toward achieving the final numeric targets in the receiving waters and/or MS4 discharges; and

(3) Schedules must be adequate for measuring progress toward achieving the interim and final numeric targets required for Provisions B.2.d.(1) and B.2.d.(2). Schedules must incorporate the following:

(a) Interim dates for achieving the interim numeric targets,

(b) Compliance schedules for any applicable TMDLs in Attachment E to this Order,

(c) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-001**X** (see Attachment A),

(d) Achievement of the final numeric targets in the receiving waters and/or MS4 discharges for the highest water quality priorities must be as soon as possible, and

(e) Final dates for achieving the final numeric targets must not extend more than 10 years beyond the date this Order is adopted, unless the schedule includes an applicable TMDL in Attachment E to this Order.

After developing the numeric targets, the Copermittees must submit the proposed list to the Regional Board for a 30 day review and comment period for the public and Regional Board staff.

Each Copermittee will be jointly and severally responsible for achieving the numeric targets.

~~(e)~~

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3. Water Quality Improvement Strategies and Schedules

The Copermittees must develop specific water quality improvement strategies to address the highest water quality priorities identified within a Watershed Management Area. The water quality improvement strategies must address the highest water quality priorities by preventing or eliminating non-storm water discharges to and from the MS4, reducing pollutants in storm water discharges from the MS4 to the MEP, and restoring and/or protecting the water quality standards of

receiving waters.

a. WATER QUALITY IMPROVEMENT STRATEGIES

The water quality improvement strategies must prioritize and implement the following measures to achieve the interim and final numeric targets in accordance with the schedules required for Provision B.2.c:

(1) Structural and/or non-structural BMPs that are designed to achieve the interim and final numeric targets in the receiving waters and/or MS4 discharges;

(2) Retrofitting projects for areas of existing development known or suspected to contribute to the highest water quality priorities, and where retrofitting will contribute to reducing or eliminating non-storm water discharges to the MS4 and/or reducing pollutants in storm water discharges from the MS4 to the MEP;

(3) Stream and/or habitat rehabilitation or restoration projects where stream and/or habitat rehabilitation or restoration are necessary for, or will contribute to demonstrable improvements in the physical, chemical, and biological receiving water conditions and restoration and/or protection of water quality standards in receiving waters; and

(4) Other water quality improvement strategies that will result in preventing or eliminating non-storm water discharges to and from the MS4, reducing pollutants in storm water discharges from the MS4 to the MEP, and restoring and/or protecting the water quality standards of receiving waters.

b. IMPLEMENTATION SCHEDULES

(1) The Copermittees must develop schedules for implementing the water quality improvement strategies identified under Provision B.3.a to achieve the interim and final numeric targets in the receiving waters and/or MS4 discharges for the highest water quality priorities in the Watershed Management Area. Schedules must be developed for both the water quality improvement strategies implemented by each Copermittee within its jurisdiction and for strategies that will be implemented by multiple Copermittees on a collaborative basis.

(2) The Copermittees must incorporate the implementation compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-001**X** (see Attachment A).

After developing the strategies and schedules, the Copermittees must submit the proposed list to the Regional Board for a 30 day review and comment period for

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the public and Regional Board staff.

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4. Water Quality Improvement Monitoring and Assessment

The Copermittees in each Watershed Management Area must develop an integrated program to assess the progress toward achieving the numeric targets and schedules, and the progress toward addressing the highest water quality priorities for each Watershed Management Area. The water quality improvement monitoring and assessment program must include the monitoring and assessment requirements of Provision D. For Watershed Management Areas with applicable TMDLs, the water quality monitoring and assessment program must incorporate the specific monitoring and assessment requirements of Attachment E. For Watershed Management Areas with any ASBS, the water quality monitoring and assessment program must also incorporate the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-001**X** (see Attachment A).

5. Adaptive Management Process

a. WATER QUALITY IMPROVEMENT PLAN ADAPTIVE MANAGEMENT PROCESS

(1) The Copermittees in each Watershed Management Area must implement the iterative process, at least once every 2~~3~~ years, adapting the Water Quality Improvement Plan to become more effective, based on, but not limited to the following considerations:

(a) Achieving the outcome of improved water quality in MS4 discharges and receiving waters through implementation of the water quality improvement strategies identified in the Water Quality Improvement Plan;

(b) Progress toward achieving interim and final numeric targets in receiving waters and/or MS4 discharges for the highest water quality priorities in the Watershed Management Area,

(c) Appropriateness of the highest water quality priorities identified for the Watershed Management Area;

(d) Progress toward achieving outcomes according to established schedules;

(e) Spatial and temporal accuracy of monitoring data collected to inform prioritization of water quality problems and implementation measures to address the highest water quality problems;

(f) Availability of new information and data from sources other than the jurisdictional runoff management programs within the Watershed Management Area that informs the effectiveness of the actions

implemented by the Copermittees;

(g) San Diego Water Board recommendations; and

(h) Recommendations for modifications to the Water Quality Improvement Plan solicited through a public participation process.

(2) Based on the results of the iterative process required pursuant to Provision B.5.a.(1), the Copermittees must report any modifications necessary to improve the effectiveness of the Water Quality Improvement Plan in the Annual Report required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge (ROWD) required pursuant to Provision F.5.b.

(3) The Copermittees must implement any modifications to the Water Quality Improvement Plan in accordance with the schedules developed pursuant to Provisions B.2.d and B.3.b, unless directed otherwise by the San Diego Water Board.

b. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ADAPTIVE MANAGEMENT PROCESS

(1) Each Copermittee in the Watershed Management Area must implement the iterative process, at least annually, adapting its jurisdictional runoff management program to become more effective, based on, but not limited to the following:

(a) Measurable or demonstrable reductions of non-storm water discharges to and from each Copermittee's MS4;

(b) Measurable or demonstrable reductions of pollutants in storm water discharges from each Copermittee's MS4 to the MEP;

(c) Efficiency in implementing the Water Quality Improvement Plan;

(d) San Diego Water Board recommendations; and

(e) Recommendations for modifications to each Copermittee's jurisdictional runoff management program solicited through a public participation process.

(2) Based on the results of the iterative process required pursuant to Provision B.5.b.(1), each Copermittee must report any modifications necessary to improve the effectiveness its jurisdictional runoff management program document in the Annual Report required pursuant to Provision F.3.b, or as part of the ROWD required pursuant to Provision F.5.b.

(3) Each Copermittee must implement any modifications to its jurisdictional runoff

management program in accordance with the schedules developed pursuant to Provisions B.2.d and B.3.b, unless directed otherwise by the San Diego Water Board.

6. Water Quality Improvement Plan Implementation

The Copermittees must commence with implementation of the Water Quality Improvement Plan ~~no later than 180 days~~immediately after approval by ~~after submission, unless otherwise directed in writing by~~ the San Diego Water Board after a public hearing.

C. ACTION LEVELS

The purpose of this provision is for the Copermittees to incorporate numeric non-storm water and storm water action levels in the Water Quality Improvement Plans. The action levels will be used to measure progress towards ~~attaining the reasonable~~best ~~protection~~protecting, ~~preservation~~preservating, enhanc~~emen~~ing~~t~~, and restoring ~~ation of~~ water quality and designated beneficial uses of waters of the state. This goal will be accomplished through monitoring and assessing the quality of the MS4 discharges during the implementation of the Water Quality Improvement Plans.

The Copermittees must incorporate numeric action levels in the Water Quality Improvement Plans to direct and focus the Copermittees' jurisdictional runoff management program implementation efforts for addressing MS4 discharges to receiving waters. The numeric action levels will be used as part of the MS4 discharges assessments required under Provision D.4.a, and each Copermittee's program to detect and eliminate non-storm water and illicit discharges to the MS4 required under Provision E.2. Numeric action levels must be developed for non-storm water and storm water MS4 discharges, as follows:

1. Non-Storm Water Action Levels

a. The following non-storm water action levels (NALs) must be incorporated in the Water Quality Improvement Plan:

(1) Non-Storm Water Discharges from MS4s to Ocean Surf Zone

Table C-1. Non-Storm Water Action Levels for Discharges from MS4s to Ocean Surf Zone

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Total Coliform	MPN/100 ml	1,000	-	10,000/1,000[1]	OP
Fecal Coliform	MPN/100 ml	200[2]	-	400	OP
Enterococci	MPN/100 ml	35	-	104[3]	OP

Abbreviations/Acronyms
AMAL – average monthly action level
MDAL – maximum daily action level
OP – Ocean Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Total coliform density shall not exceed 1,000 MPN/100 ml when the fecal/total coliform ratio exceeds 0.1
2. Fecal coliform density may not exceed 200 MPN per 100 ml during any 30 day period
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas"

(2) Non-Storm Water Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Table C-2. Non-Storm Water Action Levels for Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Turbidity	NTU	75	-	225	OP
pH	Units	Within limit of 6.0 to 9.0 at all times			OP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	35	-	104[3]	BP
Priority Pollutants	ug/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
OP – Ocean Plan water quality objective
NTU – Nephelometric Turbidity Units
ug/L – micrograms per liter
MDAL – maximum daily action level
BP – Basin Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Based on a minimum of not less than five samples for any 30-day period
2. No more than 10 percent of total samples may exceed 400 MPN per 100 ml during any 30 day period
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas"

Table C-3. Non-Storm Water Action Levels for Priority Pollutants

Parameter	Units	Freshwater (CTR)		Saltwater (CTR)	
		MDAL	AMAL	MDAL	AMAL
Cadmium	ug/L	**	**	16	8
Copper	ug/L	*	*	5.8	2.9
Chromium III	ug/L	**	**	-	-
Chromium VI	ug/L	16	8.1	83	41
Lead	ug/L	*	*	14	2.9
Nickel	ug/L	**	**	14	6.8
Silver	ug/L	*	*	2.2	1.1
Zinc	ug/L	*	*	95	47

Abbreviations/Acronyms:
CTR – California Toxic Rule
AMAL – average monthly action level
ug/L – micrograms per liter
MDAL – maximum daily action level

Notes:
* Action levels developed on a case-by-case basis (see below)
** Action levels developed on a case-by-case basis (see below), but calculated criteria are not to exceed Maximum Contaminant Levels (MCLs) under the California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64431

The Cadmium, Copper, Chromium (III), Lead, Nickel, Silver and Zinc NALs for MS4 discharges to freshwater receiving waters will be developed on a case-by-case basis because the freshwater criteria are based on site-specific water quality data (receiving water hardness). For these priority pollutants, the following equations (40 CFR 131.38.b.2) will be required:

Cadmium (Total Recoverable) = exp(0.7852[ln(hardness)] -2.715)
Chromium III (Total Recoverable) = exp(0.8190[ln(hardness)] + .6848)
Copper (Total Recoverable) = exp(0.8545[ln(hardness)] - 1.702)
Lead (Total Recoverable) = exp(1.273[ln(hardness)] - 4.705)
Nickel (Total Recoverable) = exp(.8460[ln(hardness)] + 0.0584)
Silver (Total Recoverable) = exp(1.72[ln(hardness)] - 6.52)
Zinc (Total Recoverable) = exp(0.8473[ln(hardness)] + 0.884)

(3) Non-Storm Water Discharges from MS4s to Inland Surface Waters

Table C-4. Non-Storm Water Action Levels for Discharges from MS4s to Inland Surface Waters

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Dissolved Oxygen	mg/L	Not less than 5.0 in WARM waters and not less than 6.0 in COLD waters			BP
Turbidity	NTU	-	20	See MDAL	BP
pH	Units	Within limit of 6.5 to 8.5 at all times			BP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	33	-	61[3]	BP
Total Nitrogen	mg/L	-	1.0	See MDAL	BP
Total Phosphorus	mg/L	-	0.1	See MDAL	BP
MBAS	mg/L	-	0.5	See MDAL	BP
Iron	mg/L	-	0.3	See MDAL	BP
Manganese	mg/L	-	0.05	See MDAL	BP
Priority Pollutants	ug/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
BP – Basin Plan water quality objective
COLD – cold freshwater habitat beneficial use
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
MDAL – maximum daily action level
WARM – warm freshwater habitat beneficial use
MBAS – Methylene Blue Active Substances
MPN/100 ml – most probable number per 100 milliliters
ug/L – micrograms per liter

Notes:
1. Based on a minimum of not less than five samples for any 30-day period
2. No more than 10 percent of total samples may exceed 400 MPN per 100 ml during any 30 day period
3. This value has been set to the Basin Plan water quality objective for freshwater "designated beach areas"

b. If not identified in Provision C.1.a, NALs must be identified and incorporated in the Water Quality Improvement Plan for any pollutants or waste constituents causing or contributing, or threatening to cause or contribute to a condition of pollution or nuisance in waters of the state associated with the highest water quality priorities related to non-storm water discharges from the MS4s. NALs must be based on:

(1) Applicable water quality standards which may be dependent upon site-specific or receiving water-specific conditions or assumptions to be identified by the Copermittees; or

(2) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

2. Storm Water Action Levels

a. The following storm water action levels (SALs) for discharges of storm water from the MS4 must be incorporated in the Water Quality Improvement Plan:

Table C-5. Storm Water Action Levels for Discharges from MS4s to Receiving Waters

Parameter	Units	Action Level
Turbidity	NTU	126
Nitrate & Nitrite (Total)	mg/L	2.6
Phosphorus (Total P)	mg/L	1.46
Cadmium (Total Cd)*	µg/L	3.0
Copper (Total Cu)*	µg/L	127
Lead (Total Pb)*	µg/L	250
Zinc (Total Zn)*	µg/L	976

Abbreviations/Acronyms:
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
ug/L – micrograms per liter

Notes:
* The sampling must include a measure of receiving water hardness at each MS4 outfall. If a total metal concentration exceeds the corresponding metals SAL in Table C-5, that concentration must be compared to the California Toxics Rule criteria and the USEPA 1-hour maximum concentration for the detected level of receiving water hardness associated with that sample. If it is determined that the sample's total metal concentration for that specific metal exceeds that SAL, but does not exceed the applicable USEPA 1-hour maximum concentration criterion for the measured level of hardness, then the sample result will not be considered as an excursion above the SAL for that measurement.

b. If not identified in Provision C.2.a, SALs must be identified and incorporated in the Water Quality Improvement Plan for pollutants or waste constituents causing or contributing, or threatening to cause or contribute to a condition of pollution or nuisance in waters of the state associated with the highest water quality priorities related to storm water discharges from the MS4s. SALs must be based on:

(1) Federal and State water quality guidance and/or water quality standards; and

(2) Site-specific or receiving water-specific conditions; or

(3) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. Wet weather monitoring and assessment data from MS4 outfalls collected in accordance with Provision D.1.b may be used to develop or revise SALs based upon watershed-specific data. Revision of SALs is subject to San Diego Water Board approval.

D. MONITORING AND ASSESSMENT REQUIREMENTS

The purpose of this provision is for the Copermittees to monitor and assess the chemical, physical, and biological impact on receiving waters caused by discharges from the Copermittees' MS4s under wet weather and dry weather conditions. The goal of this provision is to inform the Copermittees about the nexus between the health of receiving waters and the water quality condition of the discharges from their MS4s. This goal will be accomplished through implementing and complying with the monitoring and assessment requirements of this Order.

The Copermittees must implement the following minimum monitoring and assessment requirements:

1. Jurisdictional Monitoring Requirements

a. DRY WEATHER JURISDICTIONAL MONITORING [D.1.a]

For dry weather days,[6] each Copermittee must implement the following minimum monitoring requirements within its jurisdiction:

(1) Non-Storm Water MS4 Monitoring Program [D.1.a.(1)]

Each Copermittee must develop and conduct a program to monitor and characterize non-storm water flows and pollutant loads during dry weather conditions within its jurisdiction. The non-storm water MS4 monitoring program must be utilized to detect and eliminate non-storm water discharges and illicit discharges and connections to the Copermittee's MS4. Any available monitoring data not collected specifically to meet these requirements may be utilized by the Copermittee. The non-storm water MS4 monitoring program must meet the following minimum requirements:

(a) Non-Storm Water MS4 Monitoring Stations [D.1.a.(1)(a)]

Each Copermittee must identify the non-storm water MS4 monitoring stations within its jurisdiction that will be screened and monitored during dry weather days to identify non-storm water discharges and illicit discharges and connections to the MS4. Non-storm water MS4 monitoring stations must be selected in accordance with the following guidelines and criteria:

(i) A grid system consisting of perpendicular north-south and east-west lines spaced ¼ mile apart must be overlayed on a map of the Copermittee's MS4. All cells that contain a segment of the Copermittee's MS4 must be identified;

[6] Dry weather day is defined as any day with less than 0.1 inches of rain observed on each of the previous 3 days.

(ii) At least one non-storm water MS4 monitoring station must be selected in each cell containing a segment of the Copermittee's MS4, which must consist of one of the following:

[a] A major outfall,
[b] Other outfall point, or
[c] Other point of access (e.g., manhole);

(iii) Each non-storm water MS4 monitoring station should be located downstream of any areas that are known or suspected to be sources of non-storm water discharges and/or illicit discharges or connections to the MS4;

(iv) Each non-storm water MS4 monitoring station must be located to the degree practicable at the farthest outfall, manhole, or other accessible location downstream in the MS4, within each cell;

(v) In addition to the non-storm water MS4 monitoring stations identified in accordance with Provisions D.1.a.(1)(a)(i)-(iv) above, each Copermittee must identify stations that will be screened and monitored during dry weather days to identify non-storm water discharges from sources not directly under the jurisdiction of the Copermittee.[7] These stations must be selected in accordance with the following guidelines and criteria:

[a] Stations should be located at or prior to the point of discharge into the Copermittee's MS4, but may be located downstream of the source as long as the station remains appropriate for characterizing the discharge from the source not within the authority of the Copermittee to control,
[b] Any non-storm water MS4 monitoring station identified in accordance with Provisions D.1.a.(1)(a)(i)-(iv) and located at the point of discharge or directly downstream of a known or suspected source of non-storm water discharges not within the authority of the Copermittee to control may also be utilized as a station to monitor the source not within the authority of the Copermittee to control;

(vi) The following factors should be considered in determining the location of each non-storm water MS4 monitoring station:

[a] Safety of personnel and accessibility of the location,
[b] Total area draining to the location,
[c] Population density of the area draining to the location,
[d] Traffic density,
[e] Age of the structures or buildings in the area,

[7] Sources not directly under the jurisdiction of and subject to regulation by the Copermittee may include lands or areas under the jurisdiction of other Copermittees, owners or operators of federal and state lands or facilities, tribal lands, special districts, etc.

[f] History of the area,
[g] Land use types draining to the location,
[h] Hydrological conditions, and
[i] Recommendations from the San Diego Water Board; and

(vii) No more than 500 non-storm water MS4 monitoring stations need to be selected by each Copermittee within its jurisdiction for any given year.

(b) Non-Storm Water MS4 Station Prioritization [D.1.a.(1)(b)]

Based on the first year of non-storm water field observations collected consistent with the Provision D.1.a.(1)(c)(i), each Copermittee must identify the high priority non-storm water MS4 monitoring stations. The non-storm water MS4 monitoring stations that meet the following criteria must be identified as high priority:

(i) The Copermittee has not identified and eliminated the source of the non-storm water discharges; or

(ii) The Copermittee has not been able to eliminate the source of an identified illicit discharge, and

(iii) The non-storm water discharges and/or illicit discharges are known or suspected to contribute and/or contain pollutants that cause or contribute, or threaten to cause or contribute to a condition of pollution or nuisance associated with the highest water quality priorities related to discharges from the MS4s.

(iv) The Copermittee may also designate any non-storm water MS4 monitoring stations that do not meet the criteria above as high priority.

(c) Non-Storm Water Monitoring Procedures [D.1.a.(1)(c)]

Each Copermittee must monitor the non-storm water MS4 monitoring stations within its jurisdiction as follows:

(i) *Non-Storm Water Field Observations* [D.1.a.(1)(c)(i)]

[a] Monitoring events for each non-storm water MS4 monitoring station must be scheduled as follows:
[1] During the first year of enrollment under this Order, the Copermittee must record field observations consistent with Table D-1 at each non-storm water MS4 monitoring station within its jurisdiction at least one time per month;

Table D-1. Field Observations for Non-Storm Water MS4 Monitoring Stations

Field Observations
• Station identification and location. • Presence of flow, or pooled or ponded water. • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate), - Flow characteristics (i.e. presence of floatables, surface scum, or sheens, odor, color), - Flow source(s) suspected or identified from non-storm water source investigation, and - Flow source(s) eliminated during non-storm water source identification. • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, or sheens, odor, color), and - Known or suspected source(s) of pooled or ponded water. • Station description (i.e. deposits or stains, vegetation condition, structural condition, observable biology). • Presence and assessment of trash in and around station. • Evidence or signs of illicit connections or illegal dumping.

[2] For any stations monitoring sources not within the authority of the Copermittee to control where flows are observed during the first year of enrollment under this Order, the Copermittee must develop a field screening and monitoring schedule that can characterize the monthly non-storm water discharges and pollutant loads from the sources in or discharging to the Copermittee's MS4;

[3] High priority non-storm water MS4 monitoring stations must be monitored in accordance with the following:

A. Each Copermittee must designate at least 5 high priority non-storm water MS4 monitoring stations that are representative of non-storm water discharges from areas consisting primarily of residential, commercial, and industrial land uses present within and directly under the Copermittee's jurisdiction. Where there are less than 5 non-storm water MS4 monitoring stations within a Copermittee's jurisdiction, all stations must be designated as high priority, and

B. Each Copermittee must develop a monitoring schedule that can characterize the monthly non-storm water discharges and pollutant loads in or discharging from the high priority non-storm water MS4 monitoring stations;

[4] At least 10 percent of the non-storm water MS4 monitoring stations not identified as high priority must be screened and monitored each month. In addition, each non-storm water MS4 monitoring station must be screened and monitored at least once per year. If non-storm water flows are observed at

any non-storm water MS4 monitoring stations not identified as high priority, then they must become high priority pursuant to Provision D.1.a.(1)(b).

[b] For each monitoring events required above, the narrative descriptions and observations in Table D-1 must be recorded at each non-storm water MS4 monitoring station.

(ii) *Non-Storm Water Field Monitoring* [D.1.a.(1)(c)(ii)]

If flows, or pooled or ponded water are present during the field observations required under Provision D.1.a.(1)(c)(i), the Copermittee must monitor and record the parameters in Table D-2:

Table D-2. Field Monitoring Parameters for Non-Storm Water MS4 Monitoring Stations

Parameters
• pH • Temperature • Specific conductivity • Dissolved oxygen • Turbidity • Total chlorine • Total copper* • Total phenol • Detergents (or surfactants)* • Total hardness* • Reactive phosphorus* • Nitrate* • Ammonia as nitrogen*

* Field measurement not required if flow is observed and collection of a sample for analysis is required.

(iii) *Non-Storm Water Analytical Monitoring* [D.1.a.(1)(c)(iii)]

If flows are present during the field observations required under Provision D.1.a.(1)(c)(i), samples must be collected and analyzed as follows:

[a] If the Copermittee identifies and eliminates the source of non-storm water discharge, analysis of the sample is not required, but encouraged;

[b] During the first year of enrollment under this Order, samples must be collected if flows are observed at non-storm water MS4 monitoring stations. Samples must be analyzed for the following constituents~~, unless the Copermittee has historical data that can demonstrate or provide justification that the analysis of the constituent is not necessary~~:

[1] Any pollutants identified as the highest priority for the Watershed Management Area in the Water Quality Improvement Plan,

[2] Any pollutants or constituents that the Copermittee has identified as a potential concern to receiving waters requiring additional data collection,

[3] Constituents listed in Table D-3;

Table D-3. Analytical Monitoring Constituents for Non-Storm Water MS4 Monitoring Stations

Conventionals, Nutrients, Hydrocarbons	Pesticides	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Total Phosphorus • Dissolved Phosphorus • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia • Oil and Grease	• Diazinon • Chlorpyrifos • Pyrethroids	• Cadmium • Copper • Lead • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

[c] **After** the first year of enrollment under this Order, samples must be collected from all high priority non-storm water MS4 monitoring stations for analysis at least two times per year. Samples must be collected at least once during the dry season (May-September) and at least once after the first storm event of the wet season (October-April). Samples must be analyzed for the following constituents:

[1] Any pollutants identified as the highest priority for the Watershed Management Area in the Water Quality Improvement Plan,

[2] Any pollutants or constituents that the Copermittee has identified as a potential concern to receiving waters requiring additional data collection, and

[3] Constituents listed in Table D-3 must be analyzed at least once per year;

[d] Samples must be collected from all non-storm water MS4 monitoring stations not identified as high priority for analysis if flows are observed during required field screening and monitoring events. Samples must be analyzed for the following constituents, unless the Copermittee has historical data that can demonstrate or provide justification that the analysis of the constituent is not necessary:

[1] Any pollutants identified as the highest priority for the Watershed Management Area in the Water Quality Improvement Plan,

[2] Any pollutants or constituents that the Copermittee has identified as a potential concern to receiving waters requiring additional data collection, and

[3] Constituents listed in Table D-3.

(2) Dry Weather Ambient Receiving Water Monitoring Program [D.1.a.(2)]

Each Copermittee must develop and conduct a program to monitor and characterize the ambient conditions of the receiving waters utilized for conveying non-storm water within and through its jurisdiction. Any available monitoring data not collected specifically to meet these requirements may be utilized by the Copermittee. The dry weather ambient receiving water monitoring program must meet the following minimum requirements:

(a) Dry Weather Ambient Receiving Water Monitoring Stations [D.1.a.(2)(a)]

Each Copermittee must identify the dry weather ambient receiving water monitoring stations that will be screened and monitored. Any location in a receiving water that is already monitored by the Copermittee or another entity may also be utilized as a dry weather ambient receiving water monitoring station. The monitoring stations must be selected in accordance with the following criteria:

(i) The following factors should be considered in determining the location of each dry weather ambient receiving water monitoring station:

[a] Permission to cross private property and public land,
[b] Safety of personnel and accessibility of the location,
[c] Location can complement or supplement historical ambient receiving water data,
[d] Location should not be in close proximity to any MS4 outfalls or other point source discharges to the receiving water,
[e] Natural or relatively unaltered areas in receiving waters are preferred, and
[f] Recommendations from the San Diego Water Board;

(ii) Locate at least one monitoring station in the lowest part of the Watershed Management Area near the boundary of its jurisdiction;

(iii) Locate at least one monitoring station located in the uppermost part of the Watershed Management Area near the boundary of its jurisdiction; and

(iv) The monitoring stations identified in Provisions D.1.a.(2)(a)(ii) and D.1.a.(2)(a)(iii) must be hydraulically connected.

(b) Dry Weather Ambient Receiving Water Monitoring Procedures [D.1.a.(2)(b)]

Each Copermittee must monitor the dry weather ambient receiving water monitoring stations as follows:

(i) *Dry Weather Ambient Receiving Water Field Observations* [D.1.a.(2)(b)(i)]

Monitoring events for each monitoring station must be scheduled as follows:

[a] During the first year of enrollment under this Order, the Copermittee must record field observations consistent with Table D-4 at each dry weather ambient receiving water monitoring station at least one time per month; and

Table D-4. Field Observations for Dry Weather Ambient Receiving Water Monitoring Stations

Field Observations
• Station identification and location. • Presence of flow, or pooled or ponded water. • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate), - Flow characteristics (i.e. presence of floatables, surface scum, or sheens, odor, color), • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, or sheens, odor, color),. • Station description (i.e. deposits or stains, vegetation condition, structural condition, observable biology). • Presence and assessment of trash in and around station.

[b] For any monitoring stations where flows are observed during the first year of enrollment under this Order, the Copermittee must develop a field screening and monitoring schedule that can characterize the monthly flows and pollutant loads in the receiving water.

(ii) *Dry Weather Ambient Receiving Water Field Monitoring* [D.1.a.(2)(b)(ii)]

If flow, or pooled or ponded water is present during the field observations required under Provision D.1.a.(2)(b)(i), the Copermittee must monitor and record the parameters in Table D-2.

(iii) *Dry Weather Ambient Receiving Water Analytical Monitoring* [D.1.a.(2)(b)(iii)]

If flows are present during the field observations required under Provision D.1.a.(2)(b)(i), samples of the ambient receiving water flows must be collected and analyzed as follows:

[a] During the first year of enrollment under this Order, samples must be collected for each observation of flow in the ambient receiving water monitoring stations for analysis. Samples must be analyzed for the following constituents:

[1] Any pollutants identified as the highest priority for the Watershed Management Area in the Water Quality Improvement Plan,

[2] Any non-storm water pollutants or constituents that the Copermittee has identified as a potential concern to receiving waters requiring additional data collection, and
[3] Constituents listed in Table D-3; and

[b] **After** the first year of enrollment under this Order, samples of flows observed at ambient receiving water monitoring stations must be collected for analysis at least two times during the remaining term of this Order. Samples must be collected at least once during the dry season (May-September) and at least once after the first storm event of the wet season (October-April). Samples must be analyzed for the following constituents:
[1] Any pollutants identified as the highest priority for the Watershed Management Area in the Water Quality Improvement Plan,
[2] Any pollutants or constituents that the Copermittee has identified as a potential concern to receiving waters requiring additional data collection,
[3] Constituents listed in Table D-3 must be analyzed at least once per year.

b. WET WEATHER JURISDICTIONAL MONITORING [D.1.b]

For wet weather days,[8] each Copermittee must implement the following minimum monitoring requirements within its jurisdiction:

(1) Storm Water MS4 Outfall Monitoring Program [D.1.b.(1)]

Each Copermittee must develop and conduct a program to monitor and characterize the storm water flows and pollutant loads from the MS4 outfalls within its jurisdiction during wet weather days. Any available monitoring data not collected specifically to meet these requirements may be utilized by the Copermittee. The monitoring program must meet the following minimum requirements:

(a) Storm Water MS4 Outfall Monitoring Stations [D.1.b.(1)(a)]

Each Copermittee must identify the wet weather MS4 outfall monitoring stations within its jurisdiction that will be monitored and sampled during wet weather days. Any non-storm water MS4 monitoring station identified under Provision D.1.a.(1)(a) may also be utilized as a storm water MS4 outfall monitoring station. Monitoring stations must be selected in accordance with the following guidelines and criteria:

(i) The following factors should be considered in determining the location of each wet weather MS4 outfall monitoring station:

[8] Wet weather day defined as any day with 0.1 inches of rain or greater and the following 3 days.

[a] Safety of personnel and accessibility of the location,
[b] Total area draining to the location,
[c] Population density of the area draining to the location,
[d] Traffic density,
[e] Age of the structures or buildings in the area,
[f] History of the area,
[g] Land use types draining to the location,
[h] Hydrological conditions, and
[i] Recommendations from the San Diego Water Board.

(ii) Each wet weather MS4 outfall monitoring station must consist of one of the following:

[a] A major outfall, or
[b] Other outfall point, or
[c] Other point of access (e.g., manhole), only as an alternate location if safety during wet weather discharge sampling at available outfall locations discharging to receiving waters is a significant concern and limits accessibility;

(iii) Each Copermittee must designate at least 5 monitoring stations that are representative of storm water flows from areas consisting primarily of residential, commercial, and industrial land uses present within the Copermittee's jurisdiction. Where there are less than 5 MS4 outfalls within a Copermittee's jurisdiction, all MS4 outfalls must be designated as wet weather MS4 outfall monitoring stations.

(iv) Any monitoring station that does not have any SAL exceedances for 3 successive years may be replaced with a different monitoring station.

(b) Storm Water MS4 Outfall Monitoring Procedures [D.1.b.(1)(b)]

Each Copermittee must develop monitoring procedures to be consistent with the following criteria:

(i) A narrative description must be provided of the station identification and location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event which generated the sampled discharge and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event;

(ii) Flow rates and volumes for each monitoring station must be measured or estimated during each monitoring event in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), sections 3.2.1 or 3.2.2, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board;

(iii) Each Copermittee must develop and implement a monitoring frequency during the wet season to characterize pollutant discharges from the MS4 outfalls within its jurisdiction. At a minimum, storm water samples must be collected from two storm events occurring at least one month apart for each monitoring station. Samples must be collected as follows:

[a] Grab samples may be collected only for pH, temperature, specific conductivity, dissolved oxygen, hardness, oil and grease, and indicator bacteria,

[b] For all other constituents, one of the following methods must be used to collect the samples:

[1] A 24-hour composite sample, using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours. Results of the analyses of individual grab samples may be averaged to obtain the daily average,

[2] A flow-weighted composite sample for either the entire discharge or for the first 3 hours of the discharge. The flow-weighted composite sample for the storm water discharge may be taken with a continuous sampler or as a combination of a minimum of three sample aliquots taken in each hour of discharge for the entire discharge or for the first three hours of the discharge, with each aliquot being separated by a minimum period of fifteen minutes. Only one analysis of the composite of aliquots is required, or

[3] A minimum of one grab sample may be collected for storm water discharges from holding ponds or other impoundments with a retention period greater than 24 hours;

(iv) Storm water MS4 outfall monitoring stations must be monitored and sampled during the first wet weather event of the wet season. Samples must be analyzed for the following constituents:

[a] Any pollutants contributing to the highest water quality priorities for the Watershed Management Area as identified in the Water Quality Improvement Plan,

[b] Any non-storm water pollutants or constituents that the Copermittee has identified as a potential concern to receiving waters requiring additional data collection, and

[c] Constituents listed in Table D-5.

Table D-5. Analytical Monitoring Constituents for Wet Weather MS4 Outfall Monitoring Stations

Conventionals, Nutrients, Hydrocarbons	Pesticides	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity[1] • Total Hardness • pH • Specific Conductivity • Temperature • Dissolved Oxygen • Biological Oxygen Demand, 5-day • Chemical Oxygen Demand • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus[1] • Dissolved Phosphorus • Nitrite[1,2] • Nitrate[1,2] • Total Kjeldhal Nitrogen • Ammonia • Oil and Grease	• Diazinon • Chlorpyrifos • Pyrethroids	• Arsenic • Cadmium[1] • Chromium • Copper[1] • Iron • Lead[1] • Manganese • Mercury • Nickel • Selenium • Silver • Thallium • Zinc[1]	• Total Coliform • Fecal Coliform[3] • *Enterococcus*

Notes:
1. Constituent with a storm water action level (SAL) specified under Provision C.2.
2. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
3. *E. Coli* may be substituted for Fecal Coliform.

(v) Samples collected after the first wet weather monitoring event and during the remaining period of the wet season must be analyzed for the following constituents:

[a] Any pollutants contributing to the highest water quality priorities for the Watershed Management Area as identified in the Water Quality Improvement Plan.

[b] Any pollutants or constituents that the Copermittee has identified as a potential concern to receiving waters requiring additional data collection.

(2) Storm Water Pollutant Source Identification Monitoring Program [D.1.b.(2)]

Each Copermittee must develop and conduct a program within its jurisdiction to identify the sources of pollutants in storm water discharged from the Copermittee's MS4 during wet weather conditions. Any available monitoring data not collected specifically to meet these requirements may be utilized by the Copermittee. The storm water pollutant source identification monitoring

program must include focused monitoring which moves upstream into each MS4 outfall drainage area as necessary to identify sources of the highest water quality priorities in the receiving waters. The wet weather source identification monitoring program must begin no later than the wet season following the date the San Diego Water Board determines that the Water Quality Improvement Plan meets the requirements of this Order.

2. Watershed Monitoring Requirements

a. WATERSHED MONITORING STATIONS [D.2.a]

The Copermittees must identify watershed monitoring stations within the Watershed Management Area. The watershed monitoring stations must be selected in accordance with the following criteria:

(1) All mass loading stations (MLSs) previously established by the Copermittees in each Watershed Management Area must continue to be utilized as watershed monitoring stations;

(2) All temporary watershed assessment stations (TWASs), bioassessment stations, and stream assessment stations previously established by the Copermittees must be considered for continued use as watershed monitoring stations;

(3) Any dry weather ambient receiving water monitoring station identified pursuant to Provision D.1.a.(2)(a) may be considered for use as a watershed monitoring station;

(4) At least one reference watershed monitoring station must be selected for each Watershed Management Area; and

(5) At least one watershed monitoring station located between and hydrologically connected to each MLS and each reference station must be selected for each Watershed Management Area.

b. DRY WEATHER WATERSHED MONITORING [D.2.b]

The Copermittees must develop and conduct a program to monitor the condition of the receiving waters in each Watershed Management Area during dry weather conditions. Any available monitoring data not collected specifically to meet these requirements may be utilized by the Copermittees. For dry weather days, the Copermittees must develop and/or update its written dry weather watershed monitoring procedures to be consistent with the following criteria:

(1) Dry Weather Watershed Field Observations [D.2.b.(1)]

For each dry weather watershed monitoring event, the Copermittee must record field observations consistent with Table D-4 at each monitoring station. Dry weather watershed monitoring is required at least every two years for each monitoring station. At least two dry weather watershed monitoring events must be scheduled for each watershed monitoring station per monitoring year. One monitoring event is required during the dry season (May-September) and one monitoring event is required on a dry weather day during the wet season (October-April), after the first storm event.

(2) Dry Weather Watershed Field Monitoring [D.2.b.(2)]

If flow, or pooled or ponded water is present during the dry weather watershed monitoring event required pursuant to Provision D.2.b.(1), and conditions allow the collection of the data, the Copermittee must monitor and record the parameters in Table D-2.

(3) Dry Weather Watershed Analytical Monitoring [D.2.b.(3)]

Samples from each monitoring station must be collected for analysis at least every two years. At least two dry weather watershed analytical monitoring events must be scheduled for each watershed monitoring station per monitoring year. Samples must be collected once during the dry season (May-September) and once on a dry weather day during the wet season (October-April), after the first storm event. Analytical monitoring samples must be collected and analyzed as follows:

(a) Grab samples may be collected only for pH, temperature, specific conductivity, dissolved oxygen, hardness, oil and grease, and indicator bacteria;

(b) For all other constituents, time-weighted composites composed of 24 discrete hourly samples must be collected; and

(c) Analysis for the following constituents is required:

(i) Any other pollutants contributing to the highest water quality priorities for the Watershed Management Area as identified in the Water Quality Improvement Plan,

(ii) Any pollutants that the Copermittee has identified as a potential concern to receiving waters requiring additional data collection, and

(iii) Constituents listed in Table D-5.

(4) Dry Weather Watershed Toxicity Monitoring [D.2.b.(4)]

Samples from each monitoring station must be collected for toxicity testing at least every two years. At least two dry weather watershed toxicity monitoring events must be scheduled for each watershed monitoring station per monitoring year. Samples must be collected once during the dry season (May-September) and once on a dry weather day during the wet season (October-April), after the first storm event. Toxicity testing must be conducted in accordance with the following table:

Table D-6. Toxicity Testing for Dry Weather Watershed Monitoring Station Flows

Dry Weather Watershed Monitoring Station	Freshwater Organisms	Estuarine and Marine Organisms
Mass Loading Stations[1]	3 acute[2] 3 chronic[2]	1 chronic[3]
Others Stations	3 acute[2] 3 chronic[2]	None

Notes:
1. Dry weather toxicity testing at a mass loading station may be omitted if the channel flows are diverted year-round during dry weather conditions to the sanitary sewer for treatment.
2. The presence of acute toxicity must be determined in accordance with USEPA protocol EPA-821-R-02-012. The presence of chronic toxicity must be determined in accordance with USEPA protocol EPA-821-R-02-013. Toxicity testing must include the use of *Pimephales promelas* (fathead minnow), *Hyalella azteca*, and *Psuedokirchneriella subcapitata* (formerly *Selenastrum capricornutum*, unicellular algae).
3. The presence of chronic marine toxicity must be determined in accordance with USEPA guidance EPA 600/R95/136, except for chronic mysid tests which must be conducted in accordance with USEPA protocol EPA-821-R-02-014. *Americamysis bahia* may be used as a marine test organism if *Holmesimysis costata* cannot be reasonably obtained. The use of, and justification for, *A. bahia* must be clearly reported in the Annual Report.

(5) Dry Weather Watershed Bioassessment Monitoring [D.2.b.(5)]

Bioassessment monitoring for each monitoring station is required at least every two years. Bioassessment monitoring is required to be conducted in May or June for each watershed monitoring station, and must be conducted as follows:

(a) The following bioassessment samples and measurements must be collected:

(i) Macroinvertebrate samples must be collected in accordance with the "Reachwide Benthos (Multihabitat) Procedure" in the most current Surface Water Ambient Monitoring Program (SWAMP) Bioassessment Standard Operating Procedures (SOP), and amendments, as applicable;[9]

[9] Ode, P.R.. 2007. Standard operating procedures for collecting macroinvertebrate samples and associated physical and chemical data for ambient bioassessments in California. California State Water Resources Control Board Surface Water Ambient Monitoring Program (SWAMP) Bioassessment SOP 001. http://www.swrcb.ca.gov/water_issues/programs/swamp/tools.shtml#monitoring

(ii) The "Full" suite of physical habitat characterization measurements must be collected in accordance with the most current SWAMP Bioassessment SOP, and as summarized in the SWAMP Stream Habitat Characterization Form – Full Version;[10] and

(iii) Freshwater algae samples must be collected in accordance with the SWAMP Standard Operating Procedures for Collecting Algae Samples.[11] Analysis of samples must include algal taxonomic composition (diatoms and soft algae) and algal biomass.

(b) The bioassessment samples, measurements, and appropriate water chemistry data must be used to calculate the following:

(i) An Index of Biotic Integrity (IBI) for macroinvertebrates for each monitoring station where bioassessment monitoring was conducted, based on the most current calculation method;[12] and

(ii) An IBI for algae for each monitoring station where bioassessment monitoring was conducted, when a calculation method is developed.[13]

(6) Dry Weather Watershed Hydromodification Monitoring [D.2.b.(6)]

In addition to the hydromodification monitoring conducted as part of the Copermittees' Hydromodification Management Plans, for any year dry weather watershed monitoring is required, hydromodification monitoring is required to be conducted at least once during the dry weather season (May-September) for each monitoring station. The following hydromodification monitoring observations and measurements must be collected within an appropriate domain of analysis for the monitoring station:

(a) Channel conditions, including:

(i) Channel dimensions,

(ii) Hydrologic and geomorphic conditions, and

(iii) Presence and condition of vegetation and habitat;

[10] Available at: http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/reports/fieldforms_fullversion052908.pdf

[11] Fetscher et al. 2009. Standard Operating Procedures for Collecting Stream Algae Samples and Associated Physical Habitat and Chemical Data for Ambient Bioassessments in California.

[12] The most current calculation method at the time the Order was adopted is outlined in "A Quantitative Tool for Assessing the Integrity of Southern California Coastal Streams" (Ode, et al. 2005. Environmental Management. Vol. 35, No. 1, pp. 1-13). If an updated or new calculation method is developed, either both (i.e. current and updated/new) methods must be used, or historical IBIs must be recalculated with the updated or new calculation method.

[13] When a calculation method is developed, IBIs must be calculated for all available and appropriate historical data.

(b) Location of discharge points;

(c) Habitat integrity;

(d) Photo documentation of existing erosion and habitat impacts, with location (i.e. latitude and longitude coordinates) where photos were taken;

(e) Measurement or estimate of dimensions of any existing channel bed or bank eroded areas, including length, width, and depth of any incisions; and

(f) Known or suspected cause(s) of existing downstream erosion or habitat impact, including flow, soil, slope, and vegetation conditions, as well as upstream land uses and contributing new and existing development.

(7) Dry Weather Watershed Sediment Quality Monitoring [D.2.b.(7)]

Sediment monitoring must be performed by the Copermittees to assess compliance with sediment quality receiving water limits applicable to MS4 discharges to enclosed bays and estuaries. The monitoring may be performed either by individual or multiple Copermittees to assess compliance with receiving water limits, or through participation in a water body monitoring coalition. The Copermittees must identify sediment sampling stations that are spatially representative of the sediment within the water body segment or region of interest. Sediment quality monitoring must be conducted at least once every two years between June and September. Sediment quality monitoring must be conducted in conformance with the monitoring requirements set forth in the State Water Board Sediment Quality Control Plan.

c. WET WEATHER WATERSHED MONITORING [D.2.c]

The Copermittees in each Watershed Management Area must develop and conduct a program to monitor the condition in receiving waters and characterize storm water flows during wet weather days of the wet season. Any available monitoring data not collected specifically for this Order that meet the monitoring requirements may be utilized by the Copermittee. For wet weather days, the Copermittees must develop and/or update its written wet weather watershed monitoring procedures to be consistent with the following criteria:

(1) Wet Weather Watershed Field Observations [D.2.c.(1)]

Wet weather watershed monitoring events are required at least once every two years for each dry weather watershed monitoring station. Each monitoring station must be monitored during at least two wet weather events

in any period (July 1 to June 30) that monitoring is required, including the first wet weather event of the wet season beginning October 1 and ending April 30, and at least one wet weather event after February 1. For each wet weather watershed monitoring event, the following narrative descriptions and observations must be recorded at each monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event;

(b) The flow rates and volumes measured or estimated. Data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board;

(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(d) Presence and assessment of trash in and around station.

(2) Wet Weather Watershed Field Monitoring [D.2.c.(2)]

For each wet weather watershed monitoring event, the parameters in Table D-2 must be monitored and recorded.

(3) Wet Weather Watershed Analytical Monitoring [D.2.c.(3)]

Samples from each wet weather watershed monitoring station must be collected for analysis at least two times during the term of this Order, at least once for the first wet weather event of the wet season, and at least once for a wet weather event after February 1. Wet weather samples must be collected and analyzed as follows:

(a) Grab samples may be collected only for pH, temperature, specific conductivity, dissolved oxygen, hardness, oil and grease, and indicator bacteria;

(b) For all other constituents, one of the following methods must be used to collect the samples:

(i) A 24-hour composite sample, using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours. Results of the analyses of individual grab samples may be averaged to obtain the daily average, or

(ii) A flow-weighted composite sample for either the entire discharge or for the first 3 hours of the discharge. The flow-weighted composite sample for the storm water discharge may be taken with a continuous sampler or as a combination of a minimum of three sample aliquots taken in each hour of discharge for the entire discharge or for the first three hours of the discharge, with each aliquot being separated by a minimum period of fifteen minutes. Only one analysis of the composite of aliquots is required; and

(c) Analysis for the following constituents is required:

(i) Any other pollutants contributing to the highest water quality priorities for the Watershed Management Area as identified in the Water Quality Improvement Plan,

(ii) Any water pollutants or constituents that the Copermittee has identified as a potential concern to receiving waters requiring additional data collection, and

(iii) Constituents listed in Table D-5.

(4) Wet Weather Watershed Toxicity Monitoring [D.2.c.(4)]

Samples from each wet weather watershed monitoring station must be collected for toxicity testing at least two times during the term of this Order, at least once for the first wet weather event of the wet season, and at least once for a wet weather event after February 1. Toxicity testing must be conducted in accordance with the following table:

Table D-7. Toxicity Testing for Wet Weather Watershed Monitoring Station Flows

Wet Weather Watershed Monitoring Station	Freshwater Organisms	Estuarine and Marine Organisms
Mass Loading Stations	3 acute[1]	1 acute[2] 2 chronic[2]
Others Stations	None	None

Notes:
1. The presence of acute toxicity must be determined in accordance with USEPA protocol EPA-821-R-02-012. Toxicity testing must include the use of *Pimephales promelas* (fathead minnow), *Hyalella azteca*, and *Psuedokirchneriella subcapitata* (formerly *Selenastrum capricornutum*, unicellular algae).
2. The presence of acute toxicity must be determined in accordance with USEPA protocol EPA-821-R-02-012. The presence of chronic marine toxicity must be determined in accordance with USEPA guidance EPA 600/R95/136, except for chronic mysid tests which must be conducted in accordance with USEPA protocol EPA-821-R-02-014. *Americamysis bahia* may be used as a marine test organism if *Holmesimysis costata* cannot be reasonably obtained. The use of, and justification for, *A. bahia* must be clearly reported in the Annual Report.

d. ALTERNATIVE WATERSHED MONITORING REQUIREMENTS [D.2.d]

In lieu of implementing the watershed monitoring requirements under Provisions D.2.a-c, the San Diego Water Board may direct the Copermittees to participate with other regulated entities, other interested parties, and the San Diego Water Board in the development, refinement, implementation, and coordination of regional monitoring and assessment programs to determine the status and trends of water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams.

e. WATERSHED MANAGEMENT AREA SPECIAL STUDIES [D.2.e]

(1) Within the term of this Order, the Copermittees must implement at least three special studies in each Watershed Management Area. The Copermittees are to determine which special studies will be developed and implemented in the Watershed Management Area. The monitoring plans for the Watershed Management Area special studies must be submitted with the Water Quality Improvement Plan required pursuant to Provision F.1. The Watershed Management Area special studies must, at a minimum, be in conformance with the following criteria:

(a) The special studies must be related to the highest water quality priorities identified by the Copermittees within the Watershed Management Area;

(b) The special studies must be implemented within the Watershed Management Area;

(c) The special studies must require some form of participation by all Copermittees within the Watershed Management Area; ~~and~~

(d) One of the three required special studies may be implemented as part of a regional special study required pursuant to Provision D.3; and

~~(d)~~(e) The special studies shall include partnerships and cooperation with interested stakeholder groups whenever feasible.

(2) The Copermittees must report the progress and findings of the Watershed Management Area Special Studies as part of the Annual Report for each Watershed Management Area, as required pursuant to Provision F.3.b.

3. Regional Special Studies

Within the term of this Order, the Copermittees must develop and implement at least two regional special studies for the San Diego Region. The Copermittees must determine which regional special studies will be developed and implemented. The regional special studies must be identified in the Water Quality Improvement Plans required pursuant to Provision F.1. The regional special studies must, at a

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minimum, be in conformance with the following criteria:

a. The special studies must be related to a water quality priority issue or potential water quality concern identified by the Copermittees for the entire San Diego Region;

b. The special studies must be implemented within the San Diego Region; ~~and~~

c. The special studies must require some form of participation by all Copermittees enrolled under this Order;

d. The special studies shall include partnerships and cooperation with interested stakeholder groups whenever feasible;

~~c.~~**e.** The County of San Diego shall be the lead Copermittee for the regional special studies.

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4. Assessment Requirements

Each Copermittee must evaluate the data collected pursuant to Provisions D.1, D.2 and D.3 to identify causes of exceedances of action levels developed pursuant to Provision C, assess the quality of the discharges into and from the MS4s, and assess the quality of receiving waters. Each Copermittee must also assess the progress of the water quality improvement strategies required pursuant to Provision B.3 in restoring and protecting beneficial uses of receiving waters. Assessments must be performed as described in the following provisions:

a. MS4 Discharges Assessments [D.4.a]

(1) Jurisdictional Non-Storm Water Discharges Reduction Assessment [D.4.a.(1)]

(a) Non-Storm Water Action Levels [D.4.a.(1)(a)]

Each Copermittee must analyze the jurisdictional non-storm water monitoring data collected pursuant to Provision D.1.a and identify causes of NAL exceedances. The analysis must include, but not be limited to, all of the following considerations:

(i) For non-storm water discharges from the Copermittee's MS4 outfalls to receiving waters within the Copermittee's jurisdiction causing exceedances of NALs, the Copermittee must analyze its municipal, commercial, industrial, and residential inventories and activities, and other land use data, and identify sources or potential sources that may have caused or contributed to the NAL exceedances;

(ii) Each Copermittee must provide non-storm water monitoring and analytical data to demonstrate that NAL exceedances were caused by pollutants which are not anthropogenic in origin; and

(iii) Each Copermittee must provide non-storm water monitoring and analytical data to demonstrate that NAL exceedances were caused by pollutants which originate from sources or potential sources not within the authority of the Copermittee to control (e.g. Phase II dischargers or Caltrans).

(b) Calculate Jurisdictional Non-Storm Water Discharges and Pollutant Loads [D.4.a.(1)(b)]

Each Copermittee must analyze the jurisdictional non-storm water monitoring data collected pursuant to Provision D.1.a to calculate non-storm water discharges and pollutant loads from the MS4s and receiving waters in each jurisdiction. These calculations must be updated annually in the Annual Report required per Provision F.3.b. Each Copermittee must calculate:

(i) Monthly non-storm water discharges and pollutant loads from each known or potential source not within the authority of the Copermittee to control to an MS4 or receiving waters within the Copermittee's jurisdiction;

(ii) Monthly non-storm water discharges and pollutant loads from the Copermittee's MS4 outfalls to receiving waters within the Copermittee's jurisdiction, with an estimate of the percent contribution from each land use type within the drainage basin for each MS4 outfall;

(iii) Monthly non-storm water flows and pollutant loads in receiving waters at the downstream boundary of the Copermittee's jurisdiction; and

(iv) Monthly non-storm water flows and pollutant loads in receiving waters from areas or facilities subject to the Copermittee's legal authority that are discharged from the Copermittee's MS4 to downstream receiving waters.

(c) Review Progress and Evaluate Jurisdictional Actions [D.4.a.(1)(c)]

Each Copermittee must review the NAL exceedances, discharge and flow analyses, and pollutant load analyses required pursuant to Provisions D.4.a.(1)(a) and D.4.a.(1)(b) on an annual basis to:

(i) Identify reductions and progress in achieving reductions in non-storm water and illicit discharges and connections from different land uses and/or drainage areas to its MS4;

(ii) Assess the effectiveness of current actions being implemented by the Copermittee toward the reduction or elimination of non-storm water discharges from the MS4 within its jurisdiction; and

(iii) Identify modifications necessary to increase the effectiveness of the jurisdictional runoff management program toward reducing or eliminating non-storm water discharges to and from the MS4 within its jurisdiction.

(2) Watershed Management Area Non-Storm Water Assessment [D.4.a.(2)]

(a) Calculate Watershed Non-Storm Water Flows and Pollutant Loads [D.4.a.(2)(a)]

The Copermittees must analyze the jurisdictional non-storm water and watershed monitoring data collected per Provisions D.1.a and D.2.b to calculate non-storm water flows and pollutant loads in receiving waters for each Watershed Management Area. These calculations must be updated annually in the Annual Report required per Provision F.3.b. The Copermittees must develop or utilize appropriate methods or models to calculate:

(i) Monthly non-storm water runoff flows and pollutant loads at each watershed monitoring station from different land uses and drainage basins;

(ii) Monthly non-storm water flows and pollutant loads at each watershed monitoring station from all the Copermittees' MS4 outfalls to receiving waters, with an estimate of the percent contribution from different land uses; and

(iii) Monthly non-storm water flows and pollutant loads at each watershed monitoring station, with an estimate of the percent contribution from both areas or facilities subject to the Copermittees' legal authority and areas or facilities not subject to the Copermittees' legal authority.

(b) Evaluate Water Quality Improvement Strategies [D.4.a.(2)(b)]

The Copermittees in each Watershed Management Area must review the non-storm water flow and pollutant load analyses required pursuant to Provision D.4.a.(2)(a) on an annual basis to:

(i) Assess the effectiveness of the water quality improvement strategies being implemented within the Watershed Management Area toward reducing or eliminating non-storm water discharges and pollutant loads from entering and discharging from the MS4 to receiving waters; and

(ii) Identify modifications necessary to increase the effectiveness of the water quality improvement strategies toward reducing or eliminating non-storm water discharges and pollutant loads from entering and discharging from the MS4 to receiving waters.

PROVISION D: MONITORING AND ASSESSMENT REQUIREMENTS
D.4. Assessment Requirements

(3) Jurisdictional Storm Water Pollutant Discharges Reduction Assessment [D.4.a.(3)]

(a) Storm Water Action Levels [D.4.a.(3)(a)]

(i) For storm water discharges from the Copermittee's storm water MS4 outfall monitoring stations with analytical monitoring data indicating exceedances of SALs, the Copermittee must analyze its municipal, commercial, industrial, and residential inventories and activities, and other land use data and identify sources or potential sources that may have caused or contributed to the SAL exceedances;

(ii) Each Copermittee must provide storm water monitoring and analytical data to demonstrate that SAL exceedances were caused by the constituents in storm water discharges from the MS4 which are not anthropogenic in origin; and

(iii) Each Copermittee must provide storm water monitoring and analytical data to demonstrate that SAL exceedances were caused by the constituents in storm water discharges from the MS4 which originate from sources or potential sources not within the authority of the Copermittee to control.

(b) Calculate Jurisdictional Storm Water Discharges and Pollutant Loads [D.4.a.(3)(b)]

Each Copermittee must analyze the jurisdictional storm water monitoring data collected pursuant to Provision D.1.b to calculate storm water discharges and pollutant loads from the MS4s in each jurisdiction. These calculations must be updated annually in the Annual Report required per Provision F.3.b. Each Copermittee must calculate or estimate:

(i) The monthly mean rainfall estimates (or summary of weather bureau data) and the monthly average number of storm events;

(ii) The average storm water runoff coefficient for each land use type within the Copermittee's jurisdiction;

(iii) The volume of storm water discharged from each of the Copermittee's MS4 outfalls to receiving waters within its jurisdiction for each storm event;

(iv) The pollutant loads from each of the Copermittee's MS4 outfalls to receiving waters within its jurisdiction for each storm event; and

(v) The percent contribution of pollutant loads from each land use type within the drainage basin to storm water discharges for each MS4 outfall within its jurisdiction, for each storm event.

(c) Review Progress and Evaluate Jurisdictional Actions [D.4.a.(3)(c)]

Each Copermittee must review the SAL exceedances, discharge analyses, and pollutant load analyses required pursuant to Provisions D.4.a.(3)(a) and D.4.a.(3)(b) on an annual basis to:

(i) Identify reductions and progress in achieving reductions in pollutant concentrations and/or pollutant loads from different land uses and/or drainage areas discharging from its MS4;

(ii) Assess the effectiveness of current actions being implemented by the Copermittee toward the reduction of pollutants in storm water discharges from the MS4 within its jurisdiction to the MEP; and

(iii) Identify modifications necessary to increase the effectiveness of the jurisdictional runoff management program toward reducing pollutants in storm water discharges from the MS4 within its jurisdiction to the MEP.

(4) Watershed Management Area Storm Water Assessment [D.4.a.(4)]

(a) Calculate Watershed Storm Water Flows and Pollutant Loads [D.4.a.(4)(a)]

The Copermittees must analyze the jurisdictional storm water and watershed monitoring data collected per Provisions D.1.b and D.2.c to calculate storm water flows and pollutant loads in receiving waters for each Watershed Management Area. These calculations must be updated annually in the Annual Report required per Provision F.3.b. The Copermittees must develop or utilize appropriate methods or models to calculate:

(i) Storm water runoff flows and pollutant loads at each watershed monitoring station from different land uses and drainage basins;

(ii) Storm water flows and pollutant loads at each watershed monitoring station from all the Copermittees' MS4 outfalls, with an estimate of the percent contribution from different land uses; and

(iii) Storm water pollutant loads in receiving waters at each watershed monitoring station, with an estimate of the percent contribution from both areas or facilities subject to the Copermittees' legal authority and areas or facilities not within the authority of the Copermittees to control.

(b) Evaluate Water Quality Improvement Strategies [D.4.a.(4)(b)]

The Copermittees in each Watershed Management Area must review the storm water flow and pollutant load analyses required pursuant to Provision D.4.a.(4)(a) on an annual basis to:

(i) Assess the effectiveness of the water quality improvement strategies being implemented in each Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to the MEP; and

(ii) Identify modifications necessary to increase the effectiveness of the water quality improvement strategies toward reducing pollutants in storm water discharges from the MS4s to the MEP.

b. RECEIVING WATERS ASSESSMENTS [D.4.b]

The Copermittees must annually perform assessments of receiving waters based on data collected pursuant to Provision D.2 and any appropriate receiving water monitoring data available from other sources. The receiving waters assessments must analyze the status and trends of water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under dry weather and wet weather conditions. For each of the three types of receiving waters, the Copermittees in each Watershed Management Area must:

(1) Identify the most critical beneficial uses that must be protected or restored to ensure overall health of the receiving water;

(2) Determine whether or not those critical beneficial uses are being protected or must be restored; and

(3) Identify short-term and/or long-term improvements or degradation of those critical beneficial uses.

c. WATER QUALITY IMPROVEMENT ASSESSMENTS [D.4.c]

The Copermittees in each Watershed Management Area must review the numeric targets in the Water Quality Improvement Plan, the data collected pursuant to Provisions D.1 and D.2, and the findings from the assessments required pursuant to Provisions D.4.a and D.4.b to assess the following:

(1) Beneficial uses of the receiving waters that are protected or must be restored;

(2) Appropriateness of final dry weather and wet weather numeric targets for the highest water quality priorities that will restore the impacted beneficial uses in the receiving waters;

(3) Non-storm water and storm water pollutant load reductions, or other improvements to receiving water or water quality conditions, that are necessary to attain the final numeric targets for restoring impacted beneficial uses in the receiving waters;

(4) Non-storm water and storm water pollutant load reductions necessary for the Copermittees to demonstrate that non-storm water and storm water discharges from their MS4s are not causing or contributing to exceedances of water quality objectives or impacts to beneficial uses in receiving waters;

(5) Non-storm water and storm water pollutant loads from their MS4s and/or receiving water flows that may be attributed to sources or potential sources not within the authority of the Copermittee to control and other non-anthropogenic sources identified by the Copermittees;

(6) Progress of the water quality improvement strategies toward attaining non-storm water and storm water pollutant load reductions or improvements to water quality conditions; and

(7) Progress toward achieving the interim and final numeric targets for restoring impacted beneficial uses in the receiving waters.

5. Monitoring Provisions

Each Copermittee must comply with all the monitoring, reporting, and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

E. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS

The purpose of this provision is for each Copermittee to implement a program to control the contribution of pollutants to and the discharges from the MS4 with its jurisdiction. The goal of this provision is to reduce the discharge of pollutants in storm water to the MEP and effectively prohibit non-storm water discharges to provide the reasonable protection, preservation, enhancement, and restoration of water quality and designated beneficial uses of waters of the state**.** This goal will be accomplished through compliance with the jurisdictional runoff management program requirements.

Each Copermittee must implement all the requirements of Provision E no later than 12 months after the adoption of this Order, or in accordance with Provision F.5.a. Each Copermittee must update its jurisdictional runoff management program document, in accordance with Provision F.2.a, to include all the requirements of Provision E. The jurisdictional runoff management programs implemented by each Copermittee must be consistent with the Water Quality Improvement Plan for the applicable Watershed Management Area required by Provision B. Until the Copermittee has updated its jurisdictional runoff management program document with the requirements of Provision E, the Copermittee must continue implementing its current jurisdictional runoff management program.

1. Legal Authority Establishment and Enforcement

a. Each Copermittee must establish, maintain, and enforce adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 through statute, ordinance, permit, contract, order, or similar means. This legal authority must, at a minimum, authorize the Copermittee to:

(1) Prohibit and eliminate all illicit discharges and illicit connections to its MS4;

(2) Control the contribution of pollutants in discharges of runoff associated with industrial and construction activity to its MS4 and control the quality of runoff from industrial and construction sites, including industrial and construction sites which have coverage under the statewide General Permit for Discharges of Storm Water Associated with Industrial Activities (Industrial General Permit) or General Permit for Discharges of Storm Water Associated with Construction Activities (Construction General Permit), as well as to those sites which do not;

(3) Control the contribution of pollutants in discharges of runoff associated with commercial and residential activity to its MS4 and control the quality of runoff from commercial and residential sites.

~~(3)~~(4) Control the discharge of spills, dumping, or disposal of materials other than storm water into its MS4;

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~~(4)~~(5) Control through interagency agreements among Copermittees the contribution of pollutants from one portion MS4 to another portion of the MS4;

~~(5)~~(6) Control through interagency agreements with other owners of the MS4 such as Caltrans, the U.S. federal government, or sovereign Native American Tribes, where possible, the contribution of pollutants from one portion of the MS4 to another portion of the MS4;

~~(6)~~(7) Require compliance with conditions in its statutes, ordinances, permits, contracts, orders, or similar means to hold dischargers to its MS4 accountable for their contributions of pollutants and flows;

~~(7)~~(8) Require the use of BMPs to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

~~(8)~~(9) Require documentation on the effectiveness of BMPs implemented to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

~~(9)~~(10) Utilize enforcement mechanisms to require compliance with its statutes, ordinances, permits, contracts, orders, or similar means; and

~~(10)~~(11) Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with its statutes, ordinances, permits, contracts, orders, or similar means and with the requirements of this Order, including the prohibition of illicit discharges and connections to its MS4; the Copermittee must also have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from industrial facilities, including construction sites, discharging into its MS4.

b. With the first Annual Report required by Provision F.3.b, each Copermittee must submit a statement certified by its Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative that the Copermittee has taken the necessary steps to obtain and maintain full legal authority within its jurisdiction to implement and enforce each of the requirements contained in this Order.

2. Illicit Discharge Detection and Elimination

Each Copermittee must implement a program to actively detect and eliminate illicit discharges and improper disposal into the MS4, or otherwise require the discharger to apply for and obtain a separate NPDES permit. The illicit discharge detection and elimination program must include, at a minimum, the following requirements:

a. NON-STORM WATER DISCHARGES

Each Copermittee must address all non-storm water discharges as illicit discharges, unless a non-storm water discharge is either identified as a discharge authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to the following requirements:

(1) Discharges of non-storm water to the MS4 from the following categories must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG919001 (Order No. R9-2007-0034, or subsequent order) for discharges to San Diego Bay, or NPDES Permit No. CAG919002 (Order No. R9-2008-0002, or subsequent order) for discharges to surface waters ~~other than San Diego Bay~~:

(a) Uncontaminated pumped ground water;

(b) Discharges from foundation drains;

(c) Water from crawl space pumps; and

(d) Water from footing drains.

(2) Discharges of non-storm water from water line flushing and water main breaks to the MS4 must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG 679001 (Order No. R9-2010-0003, or subsequent order). This includes water line flushing and water main break discharges from water purveyors issued a water supply permit by the California Department of Public Health or federal military installations. Discharges from recycled or reclaimed water lines to the MS4 must be addressed as illicit discharges, unless the discharges have coverage under a separate NPDES permit.

(3) Discharges of non-storm water to the MS4 from the following categories must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a source of pollutants to receiving waters:

(a) Diverted stream flows;

(b) Rising ground waters;

(c) Uncontaminated ground water infiltration to MS4s;

(d) Springs;

(e) Flows from riparian habitats and wetlands; and

(f) Discharges from potable water sources.

(4) Discharges of non-storm water to the MS4 from the following categories must be controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means. Discharges of non-storm water to the MS4 from the following categories not controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means must be addressed by the Copermittee as illicit discharges.

(a) Air conditioning condensation

The discharge of air conditioning condensation must be directed to landscaped areas or other pervious surfaces where feasible;

(b) Individual residential vehicle washing and group or fundraising car washes:

(i) The discharge of wash water must be directed to landscaped areas or other pervious surfaces ~~where feasible~~so that no wash water leaves the property and enters the MS4, and

(ii) ~~Minimize the use of water for vehicle washing, use as little washing detergent and other vehicle wash products as possible,~~ wash vehicles at commercial wash facilities if it is infeasible to direct wash water to landscaped areas or other pervious surfaces so that no wash water leaves the residential property~~, and implement other practices or behaviors that will prevent the discharge of pollutants associated with individual residential vehicle washing from entering the MS4~~; and

(c) Dechlorinated swimming pool discharges

(i) Eliminate residual chlorine, algaecide, filter backwash, or other pollutants from swimming pools prior to discharging to the sanitary sewer, ~~the MS4~~landscaped areas, or other pervious surfaces that can accommodate the volume of water, and

(ii) The discharge of saline swimming pool water to the MS4 must be directed to the sanitary sewer, landscaped areas, or other pervious surfaces that can accommodate the volume of water.

(5) Firefighting discharges to the MS4 must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a significant source of pollutants to receiving waters. Firefighting discharges to the MS4 not identified as a significant source of pollutants to receiving waters, must be addressed, at a minimum, as follows:

(a) Non-emergency firefighting discharges

(i) Building fire suppression system maintenance discharges (e.g. sprinkler line flushing) to the MS4 must be addressed as illicit discharges.

(ii) Non-emergency firefighting discharges (i.e., discharges from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems) must be addressed by a program, to be developed and implemented by the Copermittee, to reduce or eliminate pollutants in such discharges from entering the MS4.

(b) Emergency firefighting discharges

Each Copermittee must develop and encourage implementation of BMPs to reduce or eliminate pollutants in emergency firefighting discharges to the MS4s and receiving waters within its jurisdiction. During emergency situations, priority of efforts should be directed toward life, property, and the environment (in descending order). BMPs should not interfere with immediate emergency response operations or impact public health and safety.

(6) All non-stormwater discharges must be reduced, where feasible, whether or not they are otherwise exempted under Provisions E.2.a (1)- (5).

(7) If the Copermittee or San Diego Water Board identifies any category of non-storm water discharges listed under Provisions E.2.a.(1)-(4) as a source of pollutants to receiving waters, the category must be prohibited through ordinance, order, or similar means and addressed as an illicit discharge. ~~(6)~~

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b. PREVENT AND DETECT ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to prevent and detect illicit discharges to the MS4:

(1) Each Copermittee must maintain an updated map of its entire MS4 and the corresponding drainage areas. The accuracy of the MS4 map must be confirmed during non-storm water MS4 monitoring events. The MS4 map must be included as part of the jurisdictional runoff management program document. Any geographic information system (GIS) layers or files used by the Copermittee to maintain the MS4 map must be made available to the San Diego Water Board upon request. The MS4 map must identify the following:

(a) All segments of the MS4 owned, operated, and maintained by the Copermittee,

(b) All known locations of inlets that discharge and/or collect runoff into the

Copermittee's MS4,

(c) All known locations of connections with other MS4s not owned or operated by the Copermittee (e.g. Caltrans MS4s),

(d) All known locations of MS4 outfalls and private outfalls that discharge runoff collected from areas within the Copermittee's jurisdiction,

(e) All segments of receiving waters within the Copermittee's jurisdiction that receive and convey runoff discharged from the Copermittee's MS4 outfalls (i.e., receiving water segments that are both a receiving water and part of the MS4), and

(f) Locations of the non-storm water MS4 monitoring stations, identified pursuant to Provision D.1.a.(1)(a), within its jurisdiction;

(2) Each Copermittee must use Copermittee personnel and contractors to assist in identifying and reporting illicit discharges and connections during their daily activities;

(3) Each Copermittee must promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges to or from the MS4. Each Copermittee must facilitate public reporting through development and operation of a public hotline. Public hotlines can be Copermittee-specific or shared by the Copermittees. All public hotlines must be capable of receiving reports in both English and Spanish 24 hours per day and seven days per week;

(a) Each Copermittee must designate an e-mail address for receiving e-mail pollution reports. The e-mail address must be prominently displayed on the Regional Clearinghouse and on the Copermittee's webpage.

(b) Each Copermittee must provide follow-up information regarding any public report submitted when the reporting individual specifically requests for follow-up information.

~~(3)~~(c) All Copermittees must make their hotline reporting database information available at least monthly on the regional clearinghouse. Minimum information to be provided shall include date of report, nature of complaint, follow up steps taken, and whether or not the complaint was resolved.

(4) Each Copermittee must implement practices and procedures (including a notification mechanism) to prevent, respond to, contain, and clean up any spills that may discharge into the MS4 from any source. The Copermittee must coordinate with spill response teams to prevent entry of spills into the MS4, and prevent contamination of surface water, ground water, and soil. The Copermittee must coordinate spill prevention, containment, and response activities throughout all appropriate Copermittee departments, programs, and

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agencies; and

(5) Each Copermittee must implement practices and procedures to prevent and limit infiltration of seepage from sanitary sewers (including private laterals and failing septic systems) to the MS4.

c. FIELD SCREENING AND MONITORING

Each Copermittee must conduct field screening and monitoring of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4 in accordance with the jurisdictional non-storm water MS4 monitoring program requirements in Provision D.1.a.(1).

In lieu of field screening and monitoring, Copermittees may elect to install a network of flow meters to detect illicit flows.

d. INVESTIGATE AND ELIMINATE ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to investigate and eliminate illicit discharges to the MS4:

(1) Each Copermittee must prioritize and determine when follow-up investigations will be performed in response to water quality monitoring data collected during an investigation of a detected non-storm water or illicit discharge to or from the MS4. The criteria for follow-up investigations must include the following:

(a) Pollutants identified as causing or contributing to the highest water quality priorities identified in the Water Quality Improvement Plan;

(b) Pollutants identified as causing or contributing, or threatening to cause or contribute to impairments in water bodies on the 303(d) List and/or in environmentally sensitive areas (ESAs), located within its jurisdiction;

(c) Pollutants identified from sources or land uses known to exist within the area, drainage basin, or watershed that discharges to the portion of the MS4 within its jurisdiction included in the investigation;

(d) Pollutants identified as causing or contributing to and exceedance of an NAL described in Provision C.1; and

(e) Pollutants identified as a threat to human health or the environment.

(2) Each Copermittee must implement procedures to investigate and inspect portions of its MS4 that, based on reports or notifications, field screening and monitoring, or other appropriate information, indicate a reasonable potential of receiving, containing, or discharging pollutants due to illicit discharges, illicit connections, or other sources of non-storm water. The procedures must include the following:

(a) Each Copermittee must respond to each report or notification (e.g., public hotline reports, staff or contractor reports and notifications, etc.) of an incident in a timely manner. The Copermittee may develop criteria to assess the validity of, and prioritize the response to, each report or notification received;

(b) Each Copermittee must immediately investigate and seek to identify the source(s) of discharges of non-storm water where flows are observed in and from the MS4 during the field screening and monitoring required pursuant to Provision D.1.a.(1). The investigation must include field investigations to identify sources or potential sources for the discharge, unless the source or potential source has already been identified during previous investigations;

(c) Each Copermittee must investigate and seek to identify the source(s) of non-storm water discharges from the MS4 where there is evidence of non-storm water having been discharged into or from the MS4 (e.g., pooled

water). The investigation may include field investigations, reviewing Copermittee inventories, and other land use data to identify potential sources of the discharge; and

(d) Each Copermittee must maintain records and a database of the investigations, including the following information:

(i) Location of incident, including hydrologic subarea, portion of MS4 receiving the non-storm water or illicit discharge, and point of discharge or potential discharge from MS4 to receiving water,

(ii) Source of information initiating the investigation (e.g., public hotline reports, staff or contractor reports and notifications, monitoring data, etc.),

(iii) Date the information used to initiate the investigation was received,

(iv) Date the investigation was initiated,

(v) Dates of follow-up investigations,

(vi) Identified or suspected source of the illicit discharge or connection, if determined,

(vii) Known or suspected related incidents, if any,

(viii) Result of the investigation, and

(ix) If a source cannot be identified and the investigation is not continued, a rationale for why a discharge does not pose a threat to water quality and/or does not require additional investigation.

(3) Each Copermittee must initiate the implementation of procedures, in a timely manner, to eliminate all detected and identified illicit discharges and connections within its jurisdiction. The procedures must include the following:

(a) Each Copermittee must enforce its legal authority, as required under Provision E.1, to eliminate illicit discharges and connections to its MS4. If the Copermittee identifies the source as a controllable source of non-storm water or illicit discharge or connection, the Copermittee must implement its Enforcement Response Plan pursuant to Provision E.6 and enforce its legal authority to prohibit and eliminate illicit discharges and connections to its MS4;

(b) If the Copermittee identifies the source of the discharge as a category of non-storm water discharges in Provision E.2.a, and the discharge to or from the MS4 is in exceedance of NALs developed under Provision C.1, then the Copermittees must determine if this is an isolated incident or set of circumstances, or if the category of discharge must be addressed through the prohibition of that category of discharge as an illicit discharge pursuant to Provision E.2.a.(6);

(c) If the Copermittee suspects the source of the non-storm water discharge as natural in origin (i.e. non-anthropogenically influenced) and in conveyance into the MS4, then the Copermittee must collect the data and evidence necessary to demonstrate to the San Diego Water Board that it is natural in origin; and

(d) If the Copermittee is unable to identify and document the source of a recurring non-storm water discharge to or from the MS4, then the Copermittee must address the discharge as an illicit discharge and update its jurisdictional runoff management program to address the common and suspected sources of the non-storm water discharge within its jurisdiction in accordance with the Copermittee's priorities.

(4) Each Copermittee must submit a summary of the non-storm water discharges and illicit discharges and connections investigated and eliminated within its jurisdiction with each Annual Report required under Provision F.3.b of this Order.

3. Development Planning

Each Copermittee must use their land use/planning authorities to implement a development planning program that includes, at a minimum, the following requirements.

a. PERMANENT BMP REQUIREMENTS FOR ALL DEVELOPMENT PROJECTS

Each Copermittee must prescribe the following BMP requirements during the planning process (i.e. prior to project approval and issuance of grading or building permits) for all development projects (regardless of project type or size), where local permits are issued, including unpaved roads and flood management projects:

(1) General Requirements

(a) All BMPs must be located so as to remove pollutants from runoff prior to its discharge to any receiving waters, and as close to the source as possible;

(b) Multiple development projects may use shared permanent BMPs as long as construction of any shared BMP is completed prior to the use or occupation of any development project from which the BMP will receive runoff; and

(c) Permanent BMPs must not be constructed within a waters of the U.S. or waters of the state.

(2) Source Control BMP Requirements

The following source control BMPs must be implemented at all development projects where applicable and feasible:

(a) Prevention of illicit discharges into the MS4;

(b) Storm drain system stenciling or signage;

(c) Properly designed outdoor material storage areas;

(d) Properly designed outdoor work areas;

(e) Properly designed trash storage areas; and

(f) Any additional BMPs necessary to minimize pollutant generation at each project.

(3) Low Impact Development (LID) BMP Requirements

The following LID BMPs must be implemented at all development projects where applicable and feasible:

(a) Maintenance or restoration of natural storage reservoirs and drainage corridors (including topographic depressions, areas of permeable soils, natural swales, and ephemeral and intermittent streams);[14]

(b) Buffer zones for natural water bodies (where buffer zones are technically infeasible, require project applicant to include other buffers such as trees, access restrictions, etc.);

(c) Conservation of natural areas within the project footprint including existing trees, other vegetation, and soils;

(d) Construction of streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided public safety is not compromised;

(e) Minimization of the impervious footprint of the project;

(f) Minimization of soil compaction to landscaped areas;

(g) Disconnection of impervious surfaces through distributed pervious areas;

[14] Development projects proposing to dredge or fill materials in waters of the U.S. must obtain a CWA Section 401 Water Quality Certification. Projects proposing to dredge or fill waters of the State must obtain Waste Discharge Requirements.

(h) Landscaped or other pervious areas designed and constructed to effectively receive and infiltrate, retain and/or treat runoff from impervious areas, prior to discharge to the MS4;

(i) Small collection strategies located at, or as close as possible to, the source (i.e. the point where storm water initially meets the ground) to minimize the transport of runoff and pollutants to receiving waters;

(j) Use of permeable materials for projects with low traffic areas and appropriate soil conditions;

(k) Landscaping with native or drought tolerant species; and

(l) Harvesting and using precipitation.

(4) Long-Term Permanent BMP Maintenance

Each Copermittee must require the project applicant to submit proof of the mechanism under which ongoing long-term maintenance of all permanent BMPs will be conducted.

(5) Infiltration and Groundwater Protection

(a) Infiltration and treatment control BMPs designed to primarily function as large, centralized infiltration devices (such as large infiltration trenches and infiltration basins) must not cause or contribute to an exceedance of an applicable groundwater quality objective. At a minimum, such infiltration and treatment control BMPs must be in conformance with the design criteria listed below, unless the development project applicant demonstrates to the Copermittee that one or more of the specific design criteria listed below are not necessary to protect groundwater quality. The design criteria listed below do not apply to small infiltration systems dispersed throughout a development project.

(i) Runoff must undergo pretreatment such as sedimentation or filtration prior to infiltration;

(ii) Pollution prevention and source control BMPs must be implemented at a level appropriate to protect groundwater quality at sites where infiltration treatment control BMPs are to be used;

(iii) Infiltration treatment control BMPs must be adequately maintained to remove pollutants in storm water to the MEP;

(iv) The vertical distance from the base of any infiltration treatment control BMP to the seasonal high groundwater mark must be at least 10 feet. Where groundwater basins do not support beneficial uses, this vertical distance criteria may be reduced, provided groundwater quality is maintained;

(v) The soil through which infiltration is to occur must have physical and chemical characteristics (e.g., appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses;

(vi) Infiltration treatment control BMPs must not be used for areas of industrial or light industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee, unless first treated or filtered to remove pollutants prior to infiltration; and

(vii) Infiltration treatment control BMPs must be located a minimum of 100 feet horizontally from any water supply wells.

(b) The Copermittees may collectively or individually develop alternative mandatory design criteria to that listed above for infiltration and treatment control BMPs which are designed to primarily function as centralized infiltration devices. Before implementing the alternative design criteria in the development planning process the Copermitee(s) must:

(i) Notify the San Diego Water Board of the intent to implement the alternative design criteria submitted; and

(ii) Comply with any conditions set by the San Diego Water Board.

b. PRIORITY DEVELOPMENT PROJECTS

(1) Definition of Priority Development Project

Priority Development Projects include the following:

(a) All new development projects that fall under the Priority Development Project categories listed under Provision E.3.b.(2). Where a new development project feature, such as a parking lot, falls into a Priority Development Project category, the entire project footprint is subject to Priority Development Project requirements; and

(b) Those redevelopment projects that create, add, or replace at least 5,000 square feet of impervious surfaces on an already developed site, or the redevelopment project is a Priority Development Project category listed under Provision E.3.b.(2). Where redevelopment results in an increase of less than fifty percent of the impervious surfaces of a previously existing development, and the existing development was not subject to Priority Development Project requirements, the performance and sizing requirements discussed in Provisions E.3.c.(2) and E.3.c.(3) apply only to the addition or replacement, and not to the entire development. Where

redevelopment results in an increase of more than fifty percent of the impervious surfaces of a previously existing development, the performance and sizing requirements apply to the entire development.

(2) Priority Development Project Categories

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This category includes commercial, industrial, residential, mixed-use, and public development projects on public or private land which fall under the planning and building authority of the Copermittee.

(b) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

(c) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812), where the land area for development is 5,000 square feet or more.

(d) Hillside development projects. This category includes any development which creates 5,000 square feet or more of impervious surface which is located in an area with known erosive soil conditions, where the development will grade on any natural slope that is twenty-five percent or greater.

(e) Environmentally sensitive areas (ESAs). This category includes any development located within, directly adjacent to, or discharging directly to an ESA, which either creates 2,500 square feet of impervious surface on a proposed project site or increases the area of imperviousness of a proposed project site to 10 percent or more of its naturally occurring condition. “Directly adjacent to” means situated within 200 feet of the ESA. “Discharging directly to” means outflow from a drainage conveyance system that collects runoff from the subject development or redevelopment site and terminates at or in receiving waters within the ESA.

(f) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce that has 5,000 square feet or more of impervious surface.

(g) Streets, roads, highways, freeways, and residential driveways. This category is defined as any paved impervious surface that is 5,000 square feet or more used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

(h) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

(i) Large development projects. This category includes any post-construction pollutant-generating new development projects that result in the disturbance of one acre or more of land.

(3) Priority Development Project Exemptions

Each Copermittee has the discretion to exempt the following projects from being defined as Priority Development Projects:

(a) Sidewalks constructed as part of new streets or roads and designed to direct storm water runoff to adjacent vegetated areas;

(b) Bicycle lanes that are constructed as part of new streets or roads but are not hydraulically connected to the new streets or roads and designed to direct storm water runoff to adjacent vegetated areas;

(c) Impervious trails constructed and designed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas;

(d) Sidewalks, bicycle lanes, or trails constructed with permeable surfaces.

c. PRIORITY DEVELOPMENT PROJECT PERMANENT BMP PERFORMANCE AND SIZING REQUIREMENTS

In addition to the BMP requirements listed for all development projects under Provision E.3.a, Priority Development Projects must also implement permanent BMPs that conform to performance and sizing requirements.

(1) Source Control BMP Requirements

Each Copermittee must require each Priority Development Project to implement applicable source control BMPs listed under Provision E.3.a.(2).

(2) Retention and Treatment Control BMP Requirements

Each Copermittee must require each Priority Development Project to implement BMPs to retain and treat pollutants onsite in the following order:

(a) Each Priority Development Project must be required to implement LID BMPs as described in Provision E.3.a.(3);

(b) Each Priority Development Project must be required to implement LID BMPs that are sized and designed to retain the volume equivalent to runoff produced from a 24-hour 85th percentile storm event[15] ("design capture volume");

(c) If onsite retention using LID BMPs is technically infeasible per Provision E.3.c.(4), flow-thru LID and/or conventional treatment control BMPs must be implemented to treat the portion of the design capture volume that is not retained onsite. Flow-thru LID treatment control BMPs must be designed for an appropriate surface loading rate to prevent erosion, scour and channeling within the BMP. Additionally, project applicants must perform mitigation for the portion of the pollutant load in the design capture volume that is not retained onsite, as described in Provision E.3.c.(4)(c).

(d) All onsite treatment control BMPs must:

(i) Be correctly sized and designed so as to remove pollutants from storm water to the MEP;

(ii) Be sized to comply with the following numeric sizing criteria:

[a] Volume-based treatment control BMPs must be designed to mitigate (infiltrate, filter, or treat) the remaining portion of the design capture volume that was not retained onsite; or

[b] Flow-based treatment control BMPs must be designed to mitigate (filter or treat) either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event; or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two.

(iii) Be ranked with high or medium pollutant removal efficiency for the project's most significant pollutants of concern. Treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted

[15] This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals.

which exhibits that implementation of treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

(3) Hydromodification Management BMP Requirements

Each Copermittee must require each Priority Development Project to implement hydromodification management BMPs so that:

(a) Post-project runoff flow rates and durations do not exceed pre-development (naturally occurring) runoff flow rates and durations ~~by more than 10 percent~~ (for the range of flows that result in increased potential for erosion ~~or~~, degraded channel conditions, impaired stream habitat, or negatively impacted beneficial uses downstream of Priority Development Projects).

~~(i) In evaluating the range of flows that results in increased potential for erosion of natural (non-hardened) channels, the lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks.~~

~~(ii) For artificially hardened channels, analysis to identify the lower boundary must use characteristics of a natural stream segment similar to that found in the watershed. The lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or erodes the toe of the channel banks.~~

~~(iii) The Copermittees may use monitoring results pursuant to Provision D.2.b.(6) to re-define the range of flows resulting in increased potential for erosion or degraded channel conditions, as warranted by the data.~~

(b) Post-project runoff flow rates and durations must compensate for the loss of sediment supply due to the development project, should loss of sediment supply occur as a result of the development project.

(c) If hydromodification management BMPs are technically infeasible per Provision E.3.c.(4), project applicants must perform mitigation for the portion of the runoff volume that is not controlled and will cause or contribute to increased potential for erosion of receiving waters downstream of the Priority Development Project, as described in Provision E.3.c.(4)(c).

(d) Exemptions

Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP requirements where the project:

(i) Discharges storm water runoff into underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;

(ii) Discharges storm water runoff into conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; or

(iii) Discharges storm water runoff into other areas identified by the San Diego Water Board as exempt from the requirements of Provisions E.3.c.(3)(a)-(c).

(4) Alternative Compliance for Technical Infeasibility

At the discretion of each Copermittee, alternative compliance may be allowed for certain Priority Development Projects to comply with Provisions E.3.c.(2) and E.3.c.(3), subject to the following requirements:

(a) Applicability

Priority Development Projects may be allowed alternative compliance if:

(i) The Copermittee reviews and approves site-specific hydrologic and/or design analysis performed by a registered professional engineer, geologist, architect, or landscape architect;

(ii) The project applicant demonstrates, and the Copermittee determines and documents, that retention LID and/or hydromodification management BMPs per Provisions E.3.c.(2) and E.3.c.(3) were incorporated into the project design to the maximum extent technically feasible given the project site conditions;

(iii) The project applicant is required to perform mitigation described in Provision E.3.c.(4)(c) with a net result of at least the same level of water quality protection as would have been achieved if the Priority Development Project had fully implemented the retention LID and hydromodification management BMP requirements under Provisions E.3.c.(2) and E.3.c.(3) onsite.

(b) Criteria For Technical Infeasibility

Each Copermittee must develop, or develop in collaboration with the other Copermittees, criteria to determine technical infeasibility for fully

implementing the retention LID and hydromodification management BMP requirements under Provisions E.3.c.(2) and E.3.c.(3) and include these requirements in the Permanent BMP Sizing Criteria Design Manual pursuant to Provision E.3.d. Technical infeasibility may result from conditions including, but not limited to:

(i) Locations that cannot meet the infiltration and groundwater protection requirements in Provision E.3.a.(5) due to the presence of shallow bedrock, contaminated soils, near surface groundwater, underground facilities, or utilities;

(ii) Brownfield development sites or other locations where pollutant mobilization is a documented concern;

(iii) The design of the site precludes the use of soil amendments, plantings of vegetation, or other designs that can be used to infiltrate and evapotranspirate runoff;

(iv) Soils cannot be sufficiently amended to provide for the requisite infiltration rates;

(v) Locations with geotechnical hazards;

(vi) Insufficient onsite and/or offsite demand for storm water use;

(vii) Modifications to an existing building to manage storm water are not feasible due to structural or plumbing constraints; and

(viii) Smart growth and infill or redevelopment locations where the density and/or nature of the project would create significant difficulty for compliance with Provisions E.3.c.(2) and E.3.c.(3) onsite.

(c) Mitigation

Priority Development Projects that meet the Copermittee's technical infeasibility criteria developed pursuant to Provision E.3.c.(4)(b) must be required to mitigate for the increased flow rates, increased flow durations, and/or increased pollutant loads expected to be discharged from the site. For the pollutant load in the volume of storm water not retained onsite with retention LID BMPs, or increased potential erosion of downstream receiving waters not fully controlled onsite with hydromodification management BMPs, the Copermittee must require the project applicant to either 1) implement an offsite mitigation project, and/or 2) provide sufficient funding for a public or private offsite mitigation project via a mitigation fund.

(i) *Mitigation Project Locations*

Offsite mitigation projects must be implemented within the same hydrologic unit as the Priority Development Project, and preferably within the same hydrologic subarea. Mitigation projects outside of

the hydrologic subarea but within the same hydrologic unit may be approved provided that the project applicant demonstrates that mitigation projects within the same hydrologic subarea are infeasible and that the mitigation project will address similar potential impacts expected from the Priority Development Project.

(ii) *Mitigation Project Types*

Offsite mitigation projects must include, where applicable and feasible, retrofitting opportunities and stream and/or habitat rehabilitation or restoration opportunities identified in the Water Quality Improvement Plans, identified pursuant to Provision B.3.a. Other offsite mitigation projects may include green streets or infrastructure projects, or regional BMPs upstream of receiving waters. In-stream rehabilitation or restoration measures to protect or prevent adverse physical changes to creek bed and banks must not include the use of non-naturally occurring hardscape material such as concrete, riprap, or gabions. Project applicants seeking to utilize these alternative compliance provisions may propose other offsite mitigation projects, which the Copermittees may approve if they meet the requirements of Provision E.3.c.(4)(a).

(iii) *Mitigation Project Timing*

The Copermittee and/or project applicant must develop a schedule for the completion of offsite mitigation projects, including milestone dates to identify, fund, design, and construct the projects. Offsite mitigation projects must be completed upon the granting of occupancy for the first project that contributed funds toward the offsite mitigation project, unless a longer period is authorized by the San Diego Water Board.

(iv) *Mitigation Fund*

A Copermittee may choose to implement additional mitigation programs (e.g., pollutant credit system, mitigation fund) as a means for developing and implementing offsite mitigation projects, provided the projects conform to the requirements for project locations, types, and timing described above.

d. UPDATE PERMANENT BMP SIZING CRITERIA DESIGN MANUAL (BMP DESIGN MANUAL)

Each Copermittee must update its Permanent BMP Sizing Criteria Design Manual (BMP Design Manual)[16] pursuant to Provision F.2.b or Provision F.5.a. Until the Copermittee has updated its BMP Design Manual with the requirements of Provision E.3.c, the Copermittee must continue implementing its current BMP Design Manual. Unless directed otherwise by the San Diego Water Board, the

[16] The Permanent BMP Sizing Criteria Design Manual was formerly known as the Standard Storm Water Mitigation Plan under Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016.

Copermittee must implement the BMP Design Manual within 180 days of completing the update. The update of the BMP Design Manual must include the following:

(1) Updated procedures to determine the nature and extent of storm water requirements applicable to a potential development or redevelopment project. These procedures must inform project applicants of the storm water management requirements applicable to their project including, but not limited to, general requirements for all development projects, LID and conventional BMP design procedures and requirements, hydromodification management requirements, requirements specific to phased projects, and procedures specific to private developments and public improvement projects;

(2) Updated procedures to identify pollutants and conditions of concern for selecting the most appropriate permanent BMPs that consider, at a minimum, the following:

(a) Receiving water quality (including pollutants for which receiving waters are listed as impaired under CWA section 303(d));

(b) Priority pollutants or receiving water conditions contributing to the highest water quality priorities identified in the Water Quality Improvement Plan;

(c) Land use type of the project and pollutants associated with that land use type; and

(d) Pollutants expected to be present onsite.

(3) Updated procedures for designing permanent BMPs, including any updated performance and sizing requirements to be consistent with the requirements of Provision E.3.c for all BMPs listed in the BMP Design Manual;

(4) Long-term maintenance criteria for each BMP listed in the BMP Design Manual; and

(5) Criteria and mitigation requirements, in accordance with the requirements under Provision E.3.c.(4), if the Copermittee elects to allow alternative compliance for technical infeasibility within its jurisdiction.

e. PRIORITY DEVELOPMENT PROJECT BMP IMPLEMENTATION AND OVERSIGHT

Each Copermittee must implement a program to ensure permanent BMPs on all Priority Development Projects are designed, constructed, and maintained to remove pollutants in storm water to the MEP.

(1) Permanent BMP Approval and Verification Process

(a) Each Copermittee must ensure that for all Priority Development Project applications that have not received prior lawful approval by the Copermittee by 12 months after the adoption of this Order, or pursuant to Provision F.5.a, the requirements of Provision E.3 are implemented. For project applications that have received prior lawful approval by 12 months after the adoption of this Order, or pursuant to Provision F.5.a, the Copermittee may allow previous land development requirements to apply.

(b) Each Copermittee must identify the roles and responsibilities of various municipal departments in implementing the permanent BMP requirements, including each stage of a project from application review and approval through BMP maintenance and inspections.

(c) Each Copermittee must ensure that appropriate easements and ownerships are properly recorded in public records and the information is conveyed to all appropriate parties when there is a change in project or site ownership.

(d) Each Copermittee must ensure that prior to occupancy and/or intended use of any portion of the Priority Development Project, each permanent BMP must be inspected to verify that they have been constructed and are operating in compliance with all of its specifications, plans, permits, ordinances, and the requirements of this Order.

(2) Priority Development Project Inventory and Prioritization

(a) Each Copermittee must develop and continuously maintain a watershed-based database to track and inventory all Priority Development Projects and associated permanent BMPs. Inventories must be accurate and complete beginning from January 2002 for the San Diego County Copermittees, February 2003 for the Orange County Copermittees, and July 2005 for the Riverside County Copermittees. The database must include, at a minimum, the following information:

(i) Priority Development Project location (address and hydrologic subarea);

(ii) Descriptions of BMP type(s);

(iii) Date(s) of construction;

(iv) Party responsible for permanent BMP maintenance;

(v) Dates and findings of permanent BMP maintenance verifications; and

(vi) Corrective actions and/or resolutions.

(b) Each Copermittee must prioritize the Priority Development Projects with permanent BMPs within its jurisdiction. The designation of Priority Development Projects as high priority must consider the following:

(i) The highest water quality priorities identified in the Water Quality Improvement Plan;

(ii) Receiving water quality;

(iii) Number and sizes of permanent BMPs;

(iv) Recommended maintenance frequency of permanent BMPs;

(v) Likelihood of operation and maintenance issues of permanent BMPs;

(vi) Land use and expected pollutants generated; and

(vii) Compliance record.

(3) Permanent BMP Maintenance Verifications and Inspections

Each Copermittee is required to verify that permanent BMPs on each Priority Development Project are adequately maintained, and continue to operate effectively to remove pollutants in storm water to the MEP through inspections, self-certifications, surveys, or other equally effective approaches.

(a) All (100 percent) of the permanent BMPs at Priority Development Projects that are designated as high priority must be inspected directly by the Copermittee annually prior to each rainy season;

(b) For verifications performed through a means other than direct Copermittee inspection, adequate documentation must be required by the Copermittee to provide assurance that the required maintenance of permanent BMPs at each Priority Development Project has been completed; and

(c) Appropriate follow-up measures (including re-inspections, enforcement, etc.) must be conducted to ensure that permanent BMPs at each Priority Development Project continue to reduce pollutants in storm water to the MEP as originally designed.

f. DEVELOPMENT PROJECT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all development projects, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

4. Construction Management

Each Copermittee must implement a construction management program that includes, at a minimum, the following requirements:

a. PROJECT APPROVAL PROCESS

Prior to approval and issuance of any construction, grading, or building permits for a project each Copermittee must:

(1) Require a project-specific storm water pollution prevention plan (SWPPP), or equivalent construction BMP or erosion control plan, to be submitted by the project applicant for the Copermittee's approval;

(2) Ensure the SWPPP, or equivalent construction BMP or erosion control plan, complies with the local grading ordinance, other applicable local ordinances, and the requirements of this Order;

(3) Ensure the SWPPP, or equivalent construction BMP or erosion control plan, includes seasonally appropriate and effective BMPs and management measures described in Provision E.4.c, as applicable to the project; and

(4) Verify that the project applicant has obtained coverage under applicable permits, including, but not limited to the Construction General Permit, Clean Water Act Section 401 Water Quality Certification and Section 404 Permit, and California Department of Fish and Game Streambed Alteration Agreement.

b. CONSTRUCTION SITE INVENTORY AND TRACKING

(1) Each Copermittee must maintain, and update at least monthly, a watershed-based inventory of all construction sites requiring construction, grading, or building permits within its jurisdiction. The inventory must include:

(a) Relevant contact information for each site (e.g., name, address, phone, and email for the owner and contractor);

(b) The basic site information including location (address and hydrologic subarea), Waste Discharge Identification (WDID) number (if applicable), size of the site, and approximate area of disturbance;

(c) Whether or not the site is considered a high threat to water quality, as defined in Provision E.4.b.(2) below;

(d) The project start and anticipated completion dates;

(e) Current construction phase;

(f) The required inspection frequency, as defined in the Copermittee's jurisdictional runoff management program document;

(g) The date the Copermittee approved the project-specific SWPPP, or equivalent construction BMP or erosion control plan; and

(h) Whether or not there are ongoing enforcement actions administered to the site.

(2) Each Copermittee must identify all construction sites within its jurisdiction that represent a high threat to downstream surface water quality. At a minimum, high threat to water quality sites must include:

(a) Sites located within a hydrologic subarea where sediment is known or suspected to contribute to the highest water quality priorities identified in the Water Quality Improvement Plan;

(b) Sites located within the same hydrologic subarea and tributary to a CWA section 303(d) water body segment impaired for sediment;

(c) Sites located within, directly adjacent to, or discharging directly to a receiving water within an ESA; and

(d) Other sites determined by the Copermittees or the San Diego Water Board as a high threat to water quality.

c. CONSTRUCTION SITE BMP AND MANAGEMENT MEASURE IMPLEMENTATION

Each Copermittee must implement, or require the implementation of effective BMPs to reduce discharges of pollutants in storm water from construction sites to the MEP, and prevent non-storm water discharges into the MS4. These BMPs must be site specific, seasonally appropriate, and construction phase appropriate. BMPs and management measures must be implemented at each construction site year round. Dry season BMP implementation must plan for and address unseasonal rain events that may occur during the dry season (May 1 through September 30). Copermittees must implement, or require the implementation of, BMPs and management measures in the following categories:

(1) Project Planning;

(2) Good Site Management "Housekeeping", including waste management;

(3) Non-storm Water Management;

(4) Erosion Control;

(5) Sediment Control;

(6) Run-on and Run-off Control; and

(7) Active/Passive Sediment Treatment Systems, where applicable.

d. CONSTRUCTION SITE INSPECTIONS

Each Copermittee must conduct construction site inspections to ensure compliance with its permits and applicable local ordinances, and the requirements of this Order. Priority for site inspections must consider threat to water quality pursuant to Provision E.4.b as well as the nature of the construction activity, topography, and the characteristics of soils and receiving water quality.

(1) Inspection Frequency

(a) Each Copermittee must conduct inspections at all inventoried sites, including high threat to water quality sites, at an appropriate frequency for each phase of construction to ensure the site reduces the discharge of pollutants in storm water from construction sites to the MEP, and prevents non-storm water discharges from entering the MS4.

(b) Each Copermittee must establish appropriate inspection frequencies for high threat to water quality sites, and all other sites, for each phase of construction. Inspection frequencies appropriate for addressing the highest water quality priorities identified in the Water Quality Improvement Plan, and for complying with the requirements of this Order must be identified in each Copermittee's jurisdictional runoff management program document.

(c) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e., re-inspection, enforcement) necessary to ensure site compliance with its permits and applicable local ordinances, and the requirements of this Order.

(2) Inspection Content

Inspections of construction sites by the Copermittee must include, at a minimum:

(a) Verification of coverage under the Construction General Permit (Notice of Intent (NOI) and/or WDID number) during initial inspections, when applicable;

(b) Assessment of compliance with its permits and applicable local ordinances related to pollution prevention, including the implementation and maintenance of applicable BMPs;

(c) Assessment of BMP adequacy and effectiveness;

(d) Visual observations of actual non-storm water discharges;

(e) Visual observations of actual or potential discharge of sediment and/or construction related materials from the site;

(f) Visual observations of actual or potential illicit connections; and

(g) If any violations are found and BMP enhancements are needed, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried construction sites. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Site name, location (address and hydrologic subarea), and WDID number (if applicable);

(b) Inspection date;

(c) Weather conditions during inspection;

(d) Approximate amount of rainfall since last inspection;

(e) Description and photo documentation of problems observed with BMPs and indication of need for BMP addition/repair/replacement and any scheduled re-inspection, and date of re-inspection;

(f) Descriptions of any other specific inspection comments which must, at a minimum, include rationales for longer compliance time.;

(g) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(h) Resolution of problems noted and date problems fixed.

e. CONSTRUCTION SITE ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried construction sites, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

5. Existing Development Management

Each Copermittee must implement an existing development management program that includes, at a minimum, the following requirements:

a. EXISTING DEVELOPMENT INVENTORY AND TRACKING

Each Copermittee must maintain an updated watershed-based inventory of all its existing development that may potentially generate a pollutant load to and from the MS4. The use of an automated database system, such as GIS, is highly recommended. The inventory must, at a minimum, include:

(1) Name, location (address and hydrological subarea) of each facility, area, and/or activity;

(2) A description of the facility, area, and/or activity, including classification as municipal, commercial, industrial, or residential;

(3) The following municipal facilities:

(a) Flood management and flood control devices and structures,

(b) Operating or closed municipal landfills,

(c) Publicly owned treatment works (including water and wastewater treatment plants) and sanitary sewer collection systems,

(d) Corporate yards, including maintenance and storage yards for materials, waste, equipment, and vehicles,

(e) Hazardous waste collection facilities, and

(f) Other treatment, storage or disposal facilities for municipal waste;

(4) Identification if a business is a mobile business;

(5) SIC Code, if applicable;

(6) Industrial General Permit NOI and/or WDID number, if applicable;

(7) Identification if an area is a Common Interest Area (CIA) / Home Owner Association (HOA), or mobile home park;

(8) Identification of pollutants generated and potentially generated by the facility, area, and/or activity;

(9) Status of facility, area, and/or activity as active or inactive;

(10) Whether the facility, area, and/or activity is adjacent to an ESA;

(11) Whether the facility, area, and/or activity is tributary to and within the same hydrologic subarea as a CWA section 303(d) water body segment and generates pollutants for which the water body segment is impaired;

(12) Whether the facility, area, and/or activity contributes or potentially contributes to the highest water quality priorities identified in the Water Quality Improvement Plan; and

(13) A continually updated map showing the location of inventoried existing development, watershed boundaries, water bodies, and pollutants generated at the inventoried existing development.

b. RETROFITTING AND CHANNEL REHABILITATION IN AREAS OF EXISTING DEVELOPMENT

Each Copermittee must develop and implement a program to retrofit areas of existing development to reduce the discharge of pollutants in storm water from the MS4 to the MEP and effectively prohibit non-storm water discharges into its MS4, and rehabilitate channels to restore impaired beneficial uses of streams within its jurisdiction.

(1) Each Copermittee must identify areas of existing development as candidates for retrofitting, and channels in areas of existing development as candidates for rehabilitation within its jurisdiction. Areas of existing development must be selected based on a likelihood that retrofitting and channel rehabilitation will address the highest water quality priorities identified in the Water Quality Improvement Plan prepared pursuant to Provision B.

(2) Each Copermittee must evaluate and rank the areas of existing development identified pursuant to Provisions E.5.a and E.5.b.(1) for retrofitting and channel rehabilitation. The evaluation must include an assessment of those areas where pollutant removal from storm water and effective prohibition of non-storm water discharges through retrofitting existing development will provide the most benefit to water quality. The evaluation must also include an assessment of the channels within its jurisdiction where channel rehabilitation will improve beneficial uses of streams within the Copermittee's jurisdiction. Data collected during the implementation of the Water Quality Improvement Plan must be used to inform each area assessment and rank determination.

(3) Each Copermittee must implement retrofit and channel rehabilitation projects that address the highest water quality priorities identified in the Water Quality Improvement Plan pursuant to Provision B.3.a. The Copermittee must encourage private landowners to implement retrofit and channel rehabilitation projects whenever practical. Private landowners should be encouraged through the Copermittee's use of subsidies, penalties, or other incentives.

(4) Each Copermittee must evaluate the flood management and flood control devices and structures in its inventory to determine if it is feasible to retrofit the device or structure, to provide additional pollutant removal from storm water. A Copermittee must consider the highest water quality priorities identified in their Water Quality Improvement Plan as part of each assessment.

(5) Where retrofitting and channel rehabilitation within specific areas of existing development are determined to be infeasible to restore and protect receiving waters from the highest water quality priorities identified in the Water Quality Improvement Plan, each Copermittee must identify, develop, and implement regional retrofitting and channel rehabilitation projects (i.e. projects that can receive and/or treat storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment) adjacent to and/or downstream of the areas of existing development. The Copermittees may collaborate and cooperate with each other to develop regional retrofitting and channel rehabilitation projects. The Copermittees are also encouraged to partner with existing efforts in other Watershed Management Areas, and the Integrated Regional Water Management (IRWM) Groups in San Diego County, South Orange County, and Southwest Riverside County.

c. EXISTING DEVELOPMENT BMP IMPLEMENTATION AND MAINTENANCE

(1) Pollution Prevention

Each Copermittee must require the use of pollution prevention methods by the inventoried existing development.

(2) Designate BMPs

Each Copermittee must designate a minimum set of BMPs required for all inventoried existing development, including special event venues, that have the potential to generate pollutants. The designated minimum BMPs must be specific to facility types and pollutant-generating activities, as appropriate.

(3) BMP Implementation

Each Copermittee must implement, or require the implementation of, designated BMPs at inventoried existing development that have the potential to generate pollutants. A Copermittee must require additional pollution prevention measures and enhanced BMPs at inventoried existing development that discharges pollutants identified as contributing to the highest water quality priorities in the Water Quality Improvement Plan.

(4) BMP Operation and Maintenance

Each Copermittee must operate and maintain, or require the operation and maintenance of designated BMPs at all inventoried existing development.

(a) Each Copermittee must implement a schedule of operation and maintenance activities for its MS4 and related structures (including but not limited to catch basins, storm drain inlets, detention basins, etc.), and verify proper operation of all its municipal structural treatment controls designed to reduce pollutants (including floatables) in storm water discharges to or from its MS4s and related drainage structures.

(b) Each Copermittee must implement procedures during the operation and maintenance of public streets, unpaved roads, paved roads, and paved highways and freeways that will reduce the contribution of storm water pollutants to the MEP and effectively prohibit non-storm water pollutants from the MS4 to receiving water bodies. During maintenance of unpaved roads, each Copermittee must examine the feasibility of replacing existing culverts or designing new culverts/bridge crossings to maintain natural stream geomorphology.

(c) Each Copermittee must implement controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers. Copermittees that operate both a municipal sanitary sewer system and a MS4 must implement controls and measures to prevent and eliminate seeping sewage from infiltrating the MS4. Copermittees that do not operate both a municipal sanitary sewer system and a MS4 must keep themselves informed of relevant and appropriate maintenance activities and sanitary sewage projects in their jurisdiction that may cause or contribute to seepage of sewage into the MS4.

(5) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must implement procedures, or require the implementation of procedures, to reduce the contribution of pollutants in storm water to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from inventoried existing development into and from the MS4s. The Copermittee must require additional pollution prevention measures and enhanced BMPs at inventoried existing development that discharges pesticides, herbicides, or fertilizers identified as contributing to the highest water quality priorities in the Water Quality Improvement Plan. Such BMPs must include, as appropriate educational activities, permits, certifications and other measures for applicators and distributors.

d. EXISTING DEVELOPMENT INSPECTIONS

Each Copermittee must conduct inspections of inventoried existing development to ensure compliance with applicable local ordinances and permits, and the requirements of this Order.

(1) Inspection Frequency

(a) Each Copermittee must establish appropriate inspection frequencies for inventoried existing development based on the priorities set forth in the Water Quality Improvement Plan, and the potential for discharging pollutants via storm water and non-storm water runoff. At a minimum, inventoried existing development must be inspected once every five years. Inventoried existing development must also be inspected within six months of any change in property ownership or change in pollutant generating activity. The frequency of inspection at inventoried existing development must be appropriate to ensure that applied BMPs are sufficient to reduce the discharge of pollutants in storm water from the MS4 to the MEP and effectively prohibit non-storm water discharges to the MS4.

(b) Inventoried existing development must be inspected, as needed, in response to valid public complaints and findings from the Copermittee's municipal and contract staff inspections.

(c) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e. re-inspection, enforcement) necessary to ensure compliance with its applicable local ordinances and permits, the most current jurisdictional runoff management program document, the Water Quality Improvement Plan, and the requirements of this Order.

(2) Inspection Content

Inspections of existing development by the Copermittee must include, at a minimum:

(a) Assessment of compliance with its applicable local ordinances and permits related to non-storm water and storm water discharges and runoff;

(b) Assessment of the implementation, maintenance and effectiveness of the designated minimum and/or enhanced BMPs;

(c) Verification of coverage under the Industrial General Permit (NOI and/or WDID number), when applicable;

(d) Visual observations of actual non-storm water discharges;

(e) Visual observations of actual or potential discharge of pollutants;

(f) Visual observations of actual or potential illicit connections; and

(g) If any violations are found and BMP enhancements are needed, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried existing development. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must be sufficiently detailed in order to determine compliance with the requirements of this Order and any progress made towards addressing the highest water quality priorities identified in the Water Quality Improvement Plan. Inspection records must include, at a minimum:

(a) Existing development name and location (address and hydrologic subarea);

(b) Inspection and re-inspection date(s);

(c) Weather conditions during inspection;

(d) Description and photo documentation of problems observed with BMPs and indication of need for BMP addition/repair/replacement and any scheduled re-inspection, and date of re-inspection;

(e) Description of actions to reduce pollutants in storm water runoff to the MEP and actions to effectively prohibit non-storm discharges into the MS4 at the inventoried existing development;

(f) Photo documentation of observed actions or BMPs to reduce pollutants in storm water runoff to the MEP and actions to effectively prohibit non-storm discharges into the storm drain;

(g) If the facility, area, and/or activity has been designated or identified as a contributor to the highest water quality priorities identified in the Water Quality Improvement Plan, then the inspection report must include a description of any specific or additional actions taken to reduce or eliminate the contribution of the facility, area, and/or activity to the highest water quality priorities;

(h) Descriptions of any other specific inspection comments which must, at a minimum, include rationales for longer compliance time;

(i) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(j) Resolution of problems noted and date problems fixed.

e. EXISTING DEVELOPMENT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried existing development, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

6. Enforcement Response Plans

Each Copermittee must develop and implement an Enforcement Response Plan as part of its jurisdictional runoff management program document. The Enforcement Response Plan must include the protocols for progressively stricter responses, including timeframes allowed for corrections of problems, and for various field violation scenarios. The Enforcement Response Plan must include, at a minimum, the following requirements:

a. ILLICIT DISCHARGE DETECTION AND ELIMINATION ENFORCEMENT COMPONENT

The Enforcement Response Plan must describe required enforcement actions to eliminate non-storm water discharges and illicit discharges or connections to the Copermittee's MS4.

(1) The Enforcement Response Plan must include a definition of "high level enforcement" for non-storm water discharges and illicit discharges or connections. "High level enforcement" for non-storm water discharges and illicit discharges or connections may be defined differently for construction sites, municipal, commercial, industrial, and residential areas of existing development.

(2) Non-storm water discharges and illicit discharges or connections must be addressed with an escalating series of enforcement actions as follows:

(a) If the non-storm water discharge and illicit discharge or connection is a source of pollutants contributing to the highest water quality priorities identified in the Water Quality Improvement Plan, then high level enforcement actions must be immediately issued, and subsequent high level enforcement actions must continue to escalate, as necessary, to compel the elimination of the discharge or connection as soon as possible; or

(b) If the non-storm water discharge and illicit discharge or connection is not a source of pollutants contributing to the highest water quality priorities identified in the Water Quality Improvement Plan, then escalating enforcement actions must be issued, and enforcement actions must result in the elimination of the discharge or connection as quickly as the Copermittee's available resources allow.

(3) If the Copermittee identifies the source, and the source is a controllable non-storm water discharge (i.e. anthropogenically influenced) or a controllable illicit discharge or connection, then the Copermittee must implement the following:

(a) Immediately enforce its legal authority to eliminate controllable sources of non-storm water and illicit discharges or connections upon identifying the source; and

(b) For controllable sources of non-storm water discharges and illicit discharges or connections that cannot be eliminated immediately upon identification, the discharge or connection must be eliminated in a timely manner with the goal of eliminating the discharge or connection within 10 business days after the source is identified. If more than 10 business days are required to eliminate the discharge or connection, a rationale must be recorded in the electronic database or equivalent tabular system used to track the investigations of non-storm water and illicit discharges and connections.

(4) If the Copermittee identifies the source as a non-storm water discharge to or from the MS4 that is in exceedance of NALs developed pursuant to Provision C.1, and in violation or threatened violation of an existing separate NPDES permit (e.g. the groundwater dewatering NPDES permit), then the Copermittee must report, within three business days, the findings to the San Diego Water Board including all pertinent information regarding the discharger and discharge characteristics.

b. DEVELOPMENT PROJECTS ENFORCEMENT COMPONENT

The Enforcement Response Plan must describe required enforcement actions to compel compliance with the Copermittee's BMP Design Manual requirements for development projects.

(1) The Enforcement Response Plan must include a definition of "high level enforcement" for development projects.

(2) The enforcement process must include appropriate sanctions to compel compliance with requirements of the Copermittee's BMP Design Manual or this Order. Sanctions must include, at a minimum, the following tools or their equivalent:

(a) Non-monetary penalties;

(b) Fines;

(c) Bonding requirements;

(d) Administrative and criminal penalties;

(e) Liens; and

(f) Permit or occupancy denials.

(3) Occupancy must be denied until a development project is in full compliance with the Copermittee's BMP Design Manual requirements. Documentation of full compliance with the Copermittee's BMP Design Manual requirements must be recorded in the electronic database or equivalent tabular system used to track development projects.

(4) Violations or other non-compliance that contribute or potentially contribute to the highest water quality priorities identified in the Water Quality Improvement Plan must be issued high level enforcement actions. High level enforcement actions must continue to escalate, as necessary, to compel compliance as soon as possible.

(5) For violations of permanent BMP maintenance requirements, all violations must be corrected in a timely manner with the goal of correcting them before the next rain event but no longer than 10 business days after the violations are discovered. If more than 10 business days are required for compliance, a rationale must be recorded in the electronic database or equivalent tabular system used to track permanent BMP inspections.

c. Construction / Existing Development Enforcement Component

The Enforcement Response Plan must describe required enforcement actions to compel compliance with its permits and applicable local ordinances, and the requirements of this Order, at construction sites and areas of existing development.

(1) The Enforcement Response Plan must include a definition of "high level enforcement" for construction sites and areas of existing development. "High level enforcement" may be defined differently for construction sites, municipal, commercial, industrial, and residential areas of existing development.

(2) The enforcement process must include, at a minimum, appropriate sanctions to compel compliance, such as:

(a) Verbal and written notices of violation;

(b) Cleanup requirements;

(c) Fines;

(d) Bonding requirements;

(e) Administrative and criminal penalties;

(f) Liens;

(g) Stop work orders; and

(h) Permit and occupancy denials.

(3) Violations or other non-compliance that contribute or potentially contribute to the highest water quality priorities identified in the Water Quality Improvement Plan must be issued high level enforcement actions. High level enforcement actions must continue to escalate, as necessary, to compel compliance as soon as possible.

(4) All violations must be corrected in a timely manner with the goal of correcting them before the next rain event but no longer than 10 business days after the violations are discovered. If more than 10 business days are required for compliance, then a rationale must be recorded in the electronic database or equivalent tabular system used to track construction site and existing development inspections.

d. REPORTING OF NON-COMPLIANT SITES

(1) Each Copermittee must notify the San Diego Water Board in writing within 48 hours of issuing high level enforcement (as defined in the Copermittee's Enforcement Response Plan) to an ~~construction~~industrial, commercial, construction, or residential ~~-~~site that poses a significant threat to water quality or poses a threat to the Highest Water Quality Prirorites (as identified in the Water Quality Improvement Plan) as a result of violations or other non-compliance with its permits and applicable local ordinances, and the requirements of this Order.

(2) Each Copermittee must notify the San Diego Water Board in writing within 48 hours of issuing low level enforcement (those enforcement actions not defined as high level in the Copermittee's Enforcement Response Plan) to an industrial, commercial, construction, or residential site that has received at least 5 prior low level enforcement actions within the past 2 years.

~~(2)~~(3) Each Copermittee must notify the San Diego Water Board of non-filers

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under the Industrial General Permit and Construction General Permit by email to Nonfilers_R9@waterboards.ca.gov.

7. Public Education and Participation

a. Each Copermittee must implement a public education program, as appropriate, to promote and encourage management practices, control techniques and systems, design and engineering methods, and behaviors that reduce the discharge of pollutants in storm water to the MEP, prevent controllable non-storm water discharges from entering the MS4, and protect water quality standards in receiving waters. The public education program must include, at a minimum, the following:

(1) Educational activities, public information activities, and other appropriate outreach activities to reduce pollutants associated with the application of pesticides, herbicides and fertilizer in storm water discharges to and from its MS4 to the MEP;

(2) Educational activities, public information activities, and other appropriate outreach activities to facilitate the proper management and disposal of used oil and toxic materials; and

(3) Appropriate education and training measures for construction site operators and other target audiences, as determined by the Copermittee(s).

b. Each Copermittee must incorporate a mechanism for public participation and where necessary intergovernmental coordination in updating, developing, and implementing its jurisdictional runoff management program.

8. Fiscal Analysis

a. Each Copermittee must secure the resources necessary to meet all the requirements of this Order.

b. Each Copermittee must conduct an annual fiscal analysis of the following:

(1) The capital and operation and maintenance expenditures necessary to implement the requirements of this Order;

(2) The staff resources needed and allocated to meet the requirements of this Order, including any development, implementation, and enforcement activities required;

(3) The estimated expenditures for Provisions E.8.b.(1) and E.8.b.(2) during the reporting period, the preceding reporting period, and the next reporting period; and

(4) The source of funds that are proposed to meet the necessary expenditures described in Provisions E.8.b.(1) and E.8.b.(2), including legal restrictions on the use of such funds.

c. Each Copermittee must submit a summary of the annual fiscal analysis with each Annual Report required pursuant to Provision F.3.b.

d. Each Copermittee must provide the documentation used to develop the summary of the annual fiscal analysis upon request by the San Diego Water Board.

F. REPORTING

The purpose of this provision is to determine and document compliance with the requirements set forth in this Order. The goal of this provision is to communicate to the San Diego Water Board and the people of the State of California the implementation status of each jurisdictional runoff management program and compliance with the requirements of this Order. This goal is to be accomplished through the submittal of specific deliverables to the San Diego Water Board by the Copermittees.

1. Water Quality Improvement Plans

The Copermittees for each Watershed Management Area must develop and submit a complete Water Quality Improvement Plan in accordance with the requirements of Provision B, no later than 12 months after the adoption of this Order for a 30 day public review and comment period. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of 30 days. Based on the comments received, the San Diego Water Board will determine whether to hold a public hearing or to limit public input to submittal of written comments. If no hearing is held the San Diego Water Board will notify the Copermittees that the Water Quality Improvement Plan has been accepted as complete following its review and determination that the Water Quality Improvement Plan meets the requirements of this Order. Water Quality Improvement Plans must be made available on the Regional Clearinghouse required pursuant to Provision F.4.

2. Updates

a. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATES

Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E. The update must be completed no later than 12 months after the adoption of this Order. Updated jurisdictional runoff management program documents must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Subsequent updates may be submitted as part of the Annual Reports, and updated jurisdictional runoff management program documents must be made available on the Regional Clearinghouse.

b. PERMANENT BMP SIZING CRITERIA DESIGN MANUAL UPDATES

Each Copermittee must update its BMP Design Manual to incorporate the requirements of Provision E.3.d. The update must be completed no later than 12 months after the adoption of this Order. Updated BMP Design Manuals must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Subsequent updates may be submitted as part of the Annual Reports. Updated BMP Design Manuals must be made available on the Regional Clearinghouse.

c. WATER QUALITY IMPROVEMENT PLAN UPDATES

The Copermittees for each Watershed Management Area must submit updates to the Water Quality Improvement Plan as part of the Annual Reports. Updated Water Quality Improvement Plans must be made available on the Regional Clearinghouse required pursuant to Provision F.4.

3. Progress Reporting

a. PROGRESS REPORT PRESENTATIONS

The Copermittees for each Watershed Management Area must appear before the San Diego Water Board, as requested by the San Diego Water Board, to provide progress reports on the implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs.

b. ANNUAL REPORTS

(1) The Copermittees for each Watershed Management Area must submit an Annual Report for each reporting period, which begins July 1 and ends June 30 in the following year, no later than October 31 following the end of the reporting period. The first Annual Report must be prepared for the reporting period beginning from the date the San Diego Water Board determines that the Water Quality Improvement Plan meets the requirements of this Order to June 30 in the following year. Annual Reports must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Each Annual Report must include the following:

(a) The jurisdictional and watershed monitoring data collected pursuant to Provisions D.1 and D.2, summarized and presented in tabular and graphical form;

(b) Progress of the special studies required pursuant to Provisions D.2 and D.3, and the results or findings when a special study, or each phase of a special study, is completed;

(c) The findings from the assessments required pursuant to Provision D.4;

(d) The progress of implementing the Water Quality Improvement Plan, including, but not limited to, the following:

(i) The progress toward achieving the interim and final numeric targets for the highest water quality priorities for the Watershed Management Area,

(ii) The water quality improvement strategies that were implemented and/or no longer implemented by each of the Copermittees during

the reporting period and previous reporting periods, and are planned to be implemented during the next reporting period,

(iii) Previously proposed modifications or updates incorporated into the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document and implemented by the Copermittees in the Watershed Management Area, and

(iv) Proposed modifications or updates to the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document;

(e) A completed Jurisdictional Runoff Management Program Annual Report Form (Attachment D) for each Copermittee in the Watershed Management Area, certified by a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative.

(2) Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (Attachment D) no later than October 31 of each year until the first Annual Report is required to be submitted.

(3) Each Copermittee must provide any data or documentation utilized in developing the Annual Report upon request by the San Diego Water Board. Any monitoring data utilized in developing the Annual Report must be uploaded to the California Environmental Data Exchange Network (CEDEN).[17] Any monitoring and assessment data utilized in developing the Annual Report must be provided on the Regional Clearinghouse required pursuant to Provision F.4.

c. REGIONAL MONITORING AND ASSESSMENT REPORT

(1) The Copermittees must submit a Regional Monitoring and Assessment Report no later than 180 days in advance of the expiration date of this Order. The Regional Monitoring and Assessment Report may be submitted as part of the ROWD required pursuant to Provision F.5.b. The Copermittees must review the jurisdictional and watershed monitoring data, data analyses, and assessments required pursuant to Provision D.4, to assess the following:

(a) The beneficial uses of the receiving waters within the San Diego Region that are protected or must be restored;

[17] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

(b) The progress toward restoring impacted beneficial uses in the receiving waters within the San Diego Region; and

(c) Pollutants or conditions of emerging concern that may impact beneficial uses in the receiving waters within the San Diego Region.

(2) The Regional Monitoring and Assessment Report must include recommendations for improving the implementation and assessment of the Water Quality Improvement Plans and jurisdictional runoff management programs.

(3) Each Copermittee must provide any data or documentation utilized in developing the Regional Monitoring and Assessment Report upon request by the San Diego Water Board. Any monitoring and assessment data utilized in developing the Regional Monitoring and Assessment Report must be provided on the Regional Clearinghouse required pursuant to Provision F.4.

4. Regional Clearinghouse

The Copermittees must develop, update, and maintain an internet-based Regional Clearinghouse that can be used to store, disseminate, and share the Copermittees' Water Quality Improvement Plans, Annual Reports, jurisdictional runoff management program documents, monitoring data, special studies, and any other data or information generated by the Copermittees during the implementation of this Order. Monitoring data collected pursuant to Provision D must be uploaded to CEDEN,[18] with links to the uploaded data available on the Regional Clearinghouse. The Regional Clearinghouse may be linked to other internet-based data portals and databases where the original documents and data are stored. The Regional Clearinghouse must be available and accessible to members of the public. The Regional Clearinghouse must be developed and made available to the public no later than 12 months after the adoption of this Order.

5. Report of Waste Discharge

a. The Orange County Copermittees and the Riverside County Copermittees, are required to submit a complete ROWD pursuant to the requirements of their current Orders and are enrolled under this Order upon expiration of their current Orders. Upon expiration of their current Orders, the Copermittees in each county must comply with the requirements of this Order by July 1 after enrollment under this Order, unless early enrollment is granted pursuant to Provision F.6 of this

[18] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

Order. The current Orders for the Orange County Copermittees and Riverside County Copermittees are rescinded upon their expiration date except for enforcement purposes.

b. The Copermittees must submit to the San Diego Water Board a complete ROWD as an application for the re-issuance of this NPDES permit. The ROWD must be submitted no later than 180 days in advance of the expiration date of this Order. The ROWD must contain the following minimum information:

(1) Names and addresses of the Copermittees;

(2) Names and titles of the primary contacts of the Copermittees;

(3) Proposed changes to the Copermittees' Water Quality Improvement Plans and the supporting justification;

(4) Proposed changes to the Copermittees' jurisdictional runoff management programs and the supporting justification;

(5) Any other information necessary for the re-issuance of this Order; and

(6) Any other information required by federal regulations for NPDES permit reissuance.

6. Application for Early Enrollment

a. The Orange County Copermittees, collectively, or Riverside County Copermittees, collectively, may apply for early enrollment under this Order by submitting a Report of Waste Discharge Form 200 for each individual Copermittee in the respective county, with a written request for early enrollment under this Order that certifies the following conditions have been met:

(1) A Water Quality Improvement Plan has been developed in accordance with the requirements of Provision B, which can and will be implemented immediately upon enrollment under this Order;

(2) Each Copermittee in the county has updated its jurisdictional runoff management program document to incorporate the requirements of Provision E, which can and will be implemented immediately upon enrollment under this Order; and

(3) Each Copermittee in the county has updated its BMP Design Manual to incorporate the requirements of Provision E.3.d, which can and will be implemented immediately upon enrollment under this Order.

b. The San Diego Water Board will review the application for early enrollment and associated documents for completeness. A Notice of Enrollment (NOE) under this Order will be issued to the Copermittees in the respective county by the San Diego Water Board upon completion of the early enrollment application requirements. The effective enrollment date will be specified in the NOE and the Copermittees in the respective county are authorized to have MS4 discharges pursuant to the requirements of this Order starting on the date specified in the NOE. The existing Order for that county is rescinded upon the effective enrollment date specified in the NOE except for enforcement purposes.

7. Reporting Provisions

Each Copermittee must comply with all the reporting and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

G. PRINCIPAL WATERSHED COPERMITTEE RESPONSIBILITIES

1. The Copermittees within each Watershed Management Area must designate a Principal Watershed Copermittee and notify the San Diego Water Board of the name of the Principal Watershed Copermittee. An individual Copermittee should not be designated a Principal Watershed Copermittee for more than two Watershed Management Areas. The notification may be submitted with the Water Quality Improvement Plan required pursuant to Provision F.1 of this Order.

2. The Principal Watershed Copermittee is responsible for, at a minimum, the following:

a. Serving as liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues, and when necessary and appropriate, representing the Copermittees in the Watershed Management Area before the San Diego Water Board.

b. Facilitating the development of the Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order

c. Coordinating the submittal of the deliverables required by Provisions F.1, F.2, F.3.a, and F.3.b of this Order.

d. Coordinating and developing, with the other Principal Watershed Copermittees, the requirements of Provisions F.3.c, F.4, and F.5.b of this Order.

H. MODIFICATION OF PROGRAMS

1. Modifications of the Order may be initiated by the San Diego Water Board or by the Copermittees. Requests by Copermittees must be made to the San Diego Water Board.

2. Minor modifications to the Order may be made by the San Diego Water Board where the proposed modification complies with all the prohibitions and limitations, and other requirements of this Order.

3. Proposed modifications that are not minor require amendment of this Order in accordance with this Order's rules, policies, and procedures.

I. STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

Each Copermittee must comply with all the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

ADMINISTRATIVE DRAFT

ATTACHMENT A

DISCHARGE PROHIBITIONS

1. Basin Plan Waste Discharge Prohibitions

California Water Code Section 13243 provides that a Regional Water Board, in a water quality control plan, may specify certain conditions or areas where the discharge of waste or certain types of waste is not permitted. The following waste discharge prohibitions in the Water Quality Control Plan for the San Diego Basin (Basin Plan) are applicable to any person, as defined by Section 13050(c) of the California Water Code, who is a citizen, domiciliary, or political agency or entity of California whose activities in California could affect the quality of waters of the state within the boundaries of the San Diego Region.

1. The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in California Water Code Section 13050, is prohibited.

2. The discharge of waste to land, except as authorized by waste discharge requirements or the terms described in California Water Code Section 13264 is prohibited.

3. The discharge of pollutants or dredged or fill material to waters of the United States except as authorized by a National Pollutant Discharge Elimination System (NPDES) permit or a dredged or fill material permit (subject to the exemption described in California Water Code Section 13376) is prohibited.

4. Discharges of recycled water to lakes or reservoirs used for municipal water supply or to inland surface water tributaries thereto are prohibited, unless this San Diego Water Board issues a NPDES permit authorizing such a discharge; the proposed discharge has been approved by the State Department of Health Services (DHS) and the operating agency of the impacted reservoir; and the discharger has an approved fail-safe long-term disposal alternative.

5. The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the San Diego Water Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

6. The discharge of waste in a manner causing flow, ponding, or surfacing on lands not owned or under the control of the discharger is prohibited, unless the discharge is authorized by the San Diego Water Board.

7. The dumping, deposition, or discharge of waste directly into waters of the state, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the San Diego Water Board.

8. Any discharge to a storm water conveyance system that is not composed entirely of "*storm water*" is prohibited unless authorized by the San Diego Water Board. [The federal regulations, 40 CFR 122.26(b)(13), define storm water as storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from fire fighting activities.] [§122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

9. The unauthorized discharge of treated or untreated sewage to waters of the state or to a storm water conveyance system is prohibited.

10. The discharge of industrial wastes to conventional septic tank/subsurface disposal systems, except as authorized by the terms described in California Water Code Section 13264, is prohibited.

11. The discharge of radioactive wastes amenable to alternative methods of disposal into the waters of the state is prohibited.

12. The discharge of any radiological, chemical, or biological warfare agent into waters of the state is prohibited.

13. The discharge of waste into a natural or excavated site below historic water levels is prohibited unless the discharge is authorized by the San Diego Water Board.

14. The discharge of sand, silt, clay, or other earthen materials from any activity, including land grading and construction, in quantities which cause deleterious bottom deposits, turbidity or discoloration in waters of the state or which unreasonably affect, or threaten to affect, beneficial uses of such waters is prohibited.

15. The discharge of treated or untreated sewage from vessels to Mission Bay, Oceanside Harbor, Dana Point Harbor, or other small boat harbors is prohibited.

16. The discharge of untreated sewage from vessels to San Diego Bay is prohibited.

17. The discharge of treated sewage from vessels to portions of San Diego Bay that are less than 30 feet deep at mean lower low water (MLLW) is prohibited.

18. The discharge of treated sewage from vessels, which do not have a properly functioning US Coast Guard certified Type I or Type II marine sanitation device, to portions of San Diego Bay that are greater than 30 feet deep at mean lower low water (MLLW) is prohibited.

ADMINISTRATIVE DRAFT

2. Attachment B to State Water Board Resolution 2012-001X

Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges

I. PROVISIONS FOR POINT SOURCE DISCHARGES OF STORM WATER AND NONPOINT SOURCE WASTE DISCHARGES

The following terms, prohibitions, and special conditions (hereafter collectively referred to as special conditions) are established as limitations on point source storm water and nonpoint source discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in Areas of Special Biological Significance (ASBS), as required for State Water Quality Protection Areas pursuant to California Public Resources Code Sections 36700(f) and 36710(f). These Special Protections are adopted by the State Water Board as part of the California Ocean Plan (Ocean Plan) General Exception.

The special conditions are organized by category of discharge. The State Water Resources Control Board (State Water Board) and Regional Water Quality Control Boards (Regional Water Boards) will determine categories and the means of regulation for those categories [e.g., Point Source Storm Water National Pollutant Discharge Elimination System (NPDES) or Nonpoint Source].

A. PERMITTED POINT SOURCE DISCHARGES OF STORM WATER

1. General Provisions for Permitted Point Source Discharges of Storm Water

   a. Existing storm water discharges into an ASBS are allowed only under the following conditions:

      (1) The discharges are authorized by an NPDES permit issued by the State Water Board or Regional Water Board;

      (2) The discharges comply with all of the applicable terms, prohibitions, and special conditions contained in these Special Protections; and

      (3) The discharges:

         (i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

         (ii) Are designed to prevent soil erosion;

         (iii) Occur only during wet weather;

         (iv) Are composed of only storm water runoff.

   b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

   c. The discharge of trash is prohibited.

d. Only discharges from existing storm water outfalls are allowed. Any proposed or new storm water runoff discharge shall be routed to existing storm water discharge outfalls and shall not result in any new contribution of waste to an ASBS (i.e., no additional pollutant loading). “Existing storm water outfalls” are those that were constructed or under construction prior to January 1, 2005. “New contribution of waste” is defined as any addition of waste beyond what would have occurred as of January 1, 2005. A change to an existing storm water outfall, in terms of re-location or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges are prohibited except as provided below:

(1) The term “non-storm water discharges” means any waste discharges from a municipal separate storm sewer system (MS4) or other NPDES permitted storm drain system to an ASBS that are not composed entirely of storm water.

(2) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability or occur naturally:

(i) Discharges associated with emergency fire fighting operations.

(ii) Foundation and footing drains.

(iii) Water from crawl space or basement pumps.

(iv) Hillside dewatering.

(v) Naturally occurring groundwater seepage via a storm drain.

(vi) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

2. Compliance Plans for Inclusion in Storm Water Management Plans (SWMP) and Storm Water Pollution Prevention Plans (SWPPP).

The discharger shall specifically address the prohibition of non-storm water runoff and the requirement to maintain natural water quality for storm water discharges to an ASBS in an ASBS Compliance Plan to be included in its SWMP or a SWPPP, as appropriate to permit type. If a statewide permit includes a SWMP, then the discharger shall prepare a stand-alone compliance plan for ASBS discharges . The ASBS Compliance Plan is subject to approval by the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (for permits issued by Regional Water Boards).

a. The Compliance Plan shall include a map of surface drainage of storm water runoff, showing areas of sheet runoff, prioritize discharges, and describe any structural Best Management Practices (BMPs) already employed and/or BMPs to be employed in the future. Priority discharges are those that pose the greatest water quality threat and which

are identified to require installation of structural BMPs. The map shall also show the storm water conveyances in relation to other features such as service areas, sewage conveyances and treatment facilities, landslides, areas prone to erosion, and waste and hazardous material storage areas, if applicable. The SWMP or SWPPP shall also include a procedure for updating the map and plan when changes are made to the storm water conveyance facilities.

b. The ASBS Compliance Plan shall describe the measures by which all non-authorized non-storm water runoff (e.g., dry weather flows) has been eliminated, how these measures will be maintained over time, and how these measures are monitored and documented.

c. For Municipal Separate Storm Sewer System (MS4s), the ASBS Compliance Plan shall require minimum inspection frequencies as follows:

   (1) The minimum inspection frequency for construction sites shall be weekly during rainy season;

   (2) The minimum inspection frequency for industrial facilities shall be monthly during the rainy season;

   (3) The minimum inspection frequency for commercial facilities (e.g., restaurants) shall be twice during the rainy season; and

   (4) Storm water outfall drains equal to or greater than 18 inches (457 mm) in diameter or width shall be inspected once prior to the beginning of the rainy season and once during the rainy season and maintained to remove trash and other anthropogenic debris.

d. The ASBS Compliance Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff, that are necessary to comply with these special conditions, will be achieved through BMPs. Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that such installation would pose a threat to health or safety. BMPs to control storm water runoff discharges (at the end-of-pipe) during a design storm shall be designed to achieve on average the following target levels:

   (1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

   (2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges. The baseline for the reduction is the effective date of the Exception. The baseline for these determinations is the effective date of the Exception, and the reductions must be achieved and documented within four (4) years of the effective date.

e. The ASBS Compliance Plan shall address erosion control and the prevention of anthropogenic sedimentation in ASBS. The natural habitat conditions in the ASBS shall not be altered as a result of anthropogenic sedimentation.

f. The ASBS Compliance Plan shall describe the non-structural BMPs currently employed and planned in the future (including those for construction activities), and include an implementation schedule. The ASBS Compliance Plan shall include non-structural BMPs that address public education and outreach. Education and outreach efforts must adequately inform the public that direct discharges of pollutants from private property not entering an MS4 are prohibited. The ASBS Compliance Plan shall also describe the structural BMPs, including any low impact development (LID) measures, currently employed and planned for higher threat discharges and include an implementation schedule. To control storm water runoff discharges (at the end-of-pipe) during a design storm, permittees must first consider using LID practices to infiltrate, use, or evapotranspirate storm water runoff on-site.

g. The BMPs and implementation schedule shall be designed to ensure that natural water quality conditions in the receiving water are achieved and maintained by either reducing flows from impervious surfaces or reducing pollutant loading, or some combination thereof.

h. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents in storm water runoff that alter natural ocean water quality and the sources of these constituents.

(2) The report shall describe BMPs that are currently being implemented, BMPs that are identified in the SWMP or SWPPP for future implementation, and any additional BMPs that may be added to the SWMP or SWPPP to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the BMPs.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits), the discharger shall revise its ASBS Compliance Plan to incorporate any new or modified BMPs that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised SWMP or SWPPP, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural ocean water quality conditions due to the same constituent.

(5) Compliance with this section does not excuse violations of any term, prohibition, or condition contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within one year from the effective date of the Exception, the discharger shall submit a written ASBS Compliance Plan to the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that describes its strategy to comply with these special conditions, including the requirement to maintain natural water quality in the affected ASBS. The ASBS Compliance Plan shall include a time schedule to implement appropriate non-structural and structural controls (implementation schedule) to comply with these special conditions for inclusion in the discharger's SWMP or SWPPP, as appropriate to permit type.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these special conditions shall be implemented.

d. Within four (4) years of the effective date of the Exception, any structural controls identified in the ASBS Compliance Plan that are necessary to comply with these special conditions shall be operational.

e. Within four (4) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water, pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data, and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

   If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

   The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

   (1) for municipalities, a demonstration of significant hardship to discharger ratepayers, by showing the relationship of storm water fees to annual household income for residents within the discharger's jurisdictional area, and the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or

(2) for other governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process.

B. NONPOINT SOURCE DISCHARGES

[NOT INCLUDED]
[PROVISIONS FOR NONPOINT SOURCE DISCHARGES NOT APPLICABLE]

II. ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES

[NOT INCLUDED]
[ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES NOT APPLICABLE]

III. ADDITIONAL REQUIREMENTS – WATERFRONT AND MARINE OPERATIONS

[NOT INCLUDED]
[ADDITIONAL REQUIREMENTS FOR WATERFRONT AND MARINE OPERATIONS NOT APPLICABLE]

IV. MONITORING REQUIREMENTS

Monitoring is mandatory for all dischargers to assure compliance with the Ocean Plan. Monitoring requirements include both: (A) core discharge monitoring, and (B) ocean receiving water monitoring. The State and Regional Water Boards must approve sampling site locations and any adjustments to the monitoring programs. All ocean receiving water and reference area monitoring must be comparable with the Water Boards' Surface Water Ambient Monitoring Program (SWAMP).

Safety concerns: Sample locations and sampling periods must be determined considering safety issues. Sampling may be postponed upon notification to the State and Regional Water Boards if hazardous conditions prevail.

Analytical Chemistry Methods: All constituents must be analyzed using the lowest minimum detection limits comparable to the Ocean Plan water quality objectives. For metal analysis, all samples, including storm water effluent, reference samples, and ocean receiving water samples, must be analyzed by the approved analytical method with the lowest minimum detection limits (currently Inductively Coupled Plasma/Mass Spectrometry) described in the Ocean Plan.

A. CORE DISCHARGE MONITORING PROGRAM

1. General sampling requirements for timing and storm size:

   Runoff must be collected during a storm event that is greater than 0.1 inch and generates runoff, and at least 72 hours from the previously measurable storm event. Runoff samples shall be collected when post-storm receiving water is sampled, and analyzed for the same

constituents as receiving water and reference site samples (see section IV B) as described below.

2. Runoff flow measurements

   a. For municipal/industrial storm water outfalls in existence as of December 31, 2007, 18 inches (457mm) or greater in diameter/width (including multiple outfall pipes in combination having a width of 18 inches, runoff flows must be measured or calculated, using a method acceptable to and approved by the State and Regional Water Boards.
   b. This will be reported annually for each precipitation season to the State and Regional Water Boards.

3. Runoff samples – storm events

   a. For outfalls equal to or greater than 18 inches (0.46m) in diameter or width:

      (1) samples of storm water runoff shall be analyzed during the same storm as receiving water samples for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination, ; and

      (2) samples of storm water runoff shall be analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS

      (3) If an applicant has no outfall greater than 36 inches, then storm water runoff from the applicant's largest outfall shall be further analyzed during the same storm as receiving water samples for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates).

   b. For outfalls equal to or greater than 36 inches (0.91m) in diameter or width:

      (1) samples of storm water runoff shall be analyzed during the same storm as receiving water samples for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

      (2) samples of storm water runoff shall be further analyzed during the same storm as receiving water samples for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates) and

      (3) samples of storm water runoff shall be analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

   c. For an applicant not participating in a regional monitoring program [see below in Section IV (B)] in addition to (a.) and (b.) above, a minimum of the two largest outfalls or 20 percent of the larger outfalls, whichever is greater, shall be sampled (flow weighted

composite samples) at least three times annually during wet weather (storm event) and analyzed for all Ocean Plan Table A constituents, Table B constituents for marine aquatic life protection (except for toxicity, only chronic toxicity for three species shall be required), DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, and Ocean Plan indicator bacteria. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one (the largest) such discharge shall be sampled annually in each Region.

4. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may reduce or suspend core monitoring once the storm runoff is fully characterized. This determination may be made at any point after the discharge is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

B. OCEAN RECEIVING WATER AND REFERENCE AREA MONITORING PROGRAM

In addition to performing the Core Discharge Monitoring Program in Section II.A above, all applicants having authorized discharges must perform ocean receiving water monitoring. In order to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS, dischargers may choose either (1) an individual monitoring program, or (2) participation in a regional integrated monitoring program.

1. Individual Monitoring Program: The requirements listed below are for those dischargers who elect to perform an individual monitoring program to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within the affected ASBS. In addition to Core Discharge Monitoring, the following additional monitoring requirements shall be met:

   a. Three times annually, during wet weather (storm events), the receiving water at the point of discharge from the outfalls described in section (IV)(A)(3)(c) above shall be sampled and analyzed for Ocean Plan Table A constituents, Table B constituents for marine aquatic life, DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, salinity, chronic toxicity (three species), and Ocean Plan indicator bacteria.

      The sample location for the ocean receiving water shall be in the surf zone at the point of discharges; this must be at the same location where storm water runoff is sampled. Receiving water shall be sampled at approximately the same time prior to (pre-storm) and during (or immediately after) the same storm (post storm). Reference water quality shall also be sampled and analyzed for the same constituents pre-storm and post-storm, during the same storms when receiving water is sampled. Reference stations will be determined by the State Water Board's Division of Water Quality and the applicable Regional Water Board(s).

   b. Sediment sampling shall occur at least three times during every five (5) year period. The subtidal sediment (sand or finer, if present) at the discharge shall be sampled and analyzed for Ocean Plan Table B constituents for marine aquatic life, DDT, PCBs, PAHs, pyrethroids, and OP pesticides. For sediment toxicity testing, only an acute toxicity test using the amphipod Eohaustorius estuarius must be performed.

c. A quantitative survey of intertidal benthic marine life shall be performed at the discharge and at a reference site. The survey shall be performed at least once every five (5) year period. The survey design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The results of the survey shall be completed and submitted to the State Water Board and Regional Water Board at least six months prior to the end of the permit cycle.

d. Once during each five (5) year period, a bioaccumulation study shall be conducted to determine the concentrations of metals and synthetic organic pollutants at representative discharge sites and at representative reference sites. The study design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The bioaccumulation study may include California mussels (Mytilus californianus) and/or sand crabs (Emerita analoga or Blepharipoda occidentalis). Based on the study results, the Regional Water Board and the State Water Board's Division of Water Quality, may adjust the study design in subsequent permits, or add or modify additional test organisms (such as shore crabs or fish), or modify the study design appropriate for the area and best available sensitive measures of contaminant exposure.

e. Marine Debris: Representative quantitative observations for trash by type and source shall be performed along the coast of the ASBS within the influence of the discharger's outfalls. The design, including locations and frequency, of the marine debris observations is subject to approval by the Regional Water Board and State Water Board's Division of Water Quality.

f. The monitoring requirements of the Individual Monitoring Program in this section are minimum requirements. After a minimum of one (1) year of continuous water quality monitoring of the discharges and ocean receiving waters, the Executive Director of the State Water Board (statewide permits) or Executive officer of the Regional Water Board (Regional Water Board permits) may require additional monitoring, or adjust, reduce or suspend receiving water and reference station monitoring. This determination may be made at any point after the discharge and receiving water is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

2. Regional Integrated Monitoring Program: Dischargers may elect to participate in a regional integrated monitoring program, in lieu of an individual monitoring program, to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS. This regional approach shall characterize natural water quality, pre- and post-storm, in ocean reference areas near the mouths of identified open space watersheds and the effects of the discharges on natural water quality (physical, chemical, and toxicity) in the ASBS receiving waters, and should include benthic marine aquatic life and bioaccumulation components. The design of the ASBS stratum of a regional integrated monitoring program may deviate from the otherwise prescribed individual monitoring approach (in Section IV.B.1) if approved by the State Water Board's Division of Water Quality and the Regional Water Boards.

   a. Ocean reference areas shall be located at the drainages of flowing watersheds with minimal development (in no instance more than 10% development), and shall not be located in CWA Section 303(d) listed waterbodies or have tributaries that are 303(d) listed. Reference areas shall be free of wastewater discharges and anthropogenic non-storm water runoff. A minimum of low threat storm runoff discharges (e.g. stream highway overpasses and campgrounds) may be allowed on a case-by-case basis.

Reference areas shall be located in the same region as the ASBS receiving water monitoring occurs. The reference areas for each Region are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean reference water samples must be collected from each station, each from a separate storm. A minimum of one reference location shall be sampled for each ASBS receiving water site sampled per responsible party. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

b. ASBS ocean receiving water must be sampled in the surf zone at the location where the runoff makes contact with ocean water (i.e. at "point zero"). Ocean receiving water stations must be representative of worst-case discharge conditions (i.e. co-located at a large drain greater than 36 inches, or if drains greater than 36 inches are not present in the ASBS then the largest drain greater than18 inches.) Ocean receiving water stations are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean receiving water samples must be collected during each storm season from each station, each from a separate storm. A minimum of one receiving water location shall be sampled in each ASBS per responsible party in that ASBS. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

c. Reference and receiving water sampling shall commence during the first full storm season following the adoption of these special conditions, and post-storm samples shall be collected when annual storm water runoff is sampled. Sampling shall occur in a minimum of two storm seasons. For those ASBS dischargers that have already participated in the Southern California Bight 2008 ASBS regional monitoring effort, sampling may be limited to only one storm season.

d. Receiving water and reference samples shall be analyzed for the same constituents as storm water runoff samples. At a minimum, constituents to be sampled and analyzed in reference and discharge receiving waters must include oil and grease, total suspended solids, Ocean Plan Table B metals for protection of marine life, Ocean Plan PAHs, pyrethroids, OP pesticides, ammonia, nitrate, phosphates, and critical life stage chronic toxicity for three species. In addition, within the range of the southern sea otter, indicator bacteria or some other measure of fecal contamination shall be analyzed.

3. Waterfront and Marine Operations: In addition to the above requirements for ocean receiving water monitoring, additional monitoring must be performed for marinas and boat launch and pier facilities:

   a. For all marina or mooring field operators, in mooring fields with 10 or more occupied moorings, the ocean receiving water must be sampled for Ocean Plan indicator bacteria, residual chlorine, copper, zinc, grease and oil, methylene blue active substances (MBAS), and ammonia nitrogen.

      (1) For mooring field operators opting for an individual monitoring program (Section IV.B.1 above), this sampling must occur weekly (on the weekend) from May through October.

(2) For mooring field operators opting to participate in a regional integrated monitoring program (Section IV.B.2 above), this sampling must occur monthly from May through October on a high use weekend in each month. The Water Boards may allow a reduction in the frequency of sampling, through the regional monitoring program, after the first year of monitoring.

b. For all mooring field operators, the subtidal sediment (sand or finer, if present) within mooring fields and below piers shall be sampled and analyzed for Ocean Plan Table B metals (for marine aquatic life beneficial use), acute toxicity, PAHs, and tributyltin. For sediment toxicity testing, only an acute toxicity test using the amphipod Eohaustorius estuarius must be performed. This sampling shall occur at least three times during a five (5) year period. For mooring field operators opting to participate in a regional integrated monitoring program, the Water Boards may allow a reduction in the frequency of sampling after the first sampling effort's results are assessed.

ADMINISTRATIVE DRAFT

ATTACHMENT B

STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

1. Standard Permit Provisions

Code of Federal Regulations Title 40 Section 122.41 (40 CFR 122.41) includes conditions, or provisions, that apply to all National Pollutant Discharge Elimination System (NPDES) permits. Additional provisions applicable to NPDES permits are in 40 CFR 122.42. All applicable provisions in 40 CFR 122.41 and 40 CFR 122.42 must be incorporated into this Order and NPDES permit. The applicable 40 CFR 122.41 and 40 CFR 122.42 provisions are as follows:

a. DUTY TO COMPLY [40 CFR 122.41(a)]

The Copermittee must comply with all of the provisions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

(1) The Copermittee must comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement. [40 CFR 122.41(a)(1)]

(2) The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to a civil penalty not to exceed $25,000 per day for each violation. The CWA provides that any person who *negligently* violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than 2 years, or both. Any person who *knowingly* violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both. Any person who knowingly violates Section 301, 302, 303, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, and who knows at that time that he thereby places another person in imminent danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of

not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.
[40 CFR 122.41(a)(2)]

(3) Any person may be assessed an administrative penalty by the San Diego Regional Water Quality Control Board (San Diego Water Board), State Water Resources Control Board (State Water Board), or United States Environmental Protection Agency (USEPA) for violating Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.
[40 CFR 122.41(a)(3)]

b. DUTY TO REAPPLY [40 CFR 122.41(b)]

If a Copermittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Copermittee must apply for and obtain a new permit.

c. NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE [40 CFR 122.41(c)]

It shall not be a defense for a Copermittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

d. DUTY TO MITIGATE [40 CFR 122.41(d)]

The Copermittee must take all reasonable steps to minimize or prevent any discharge or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

e. PROPER OPERATION AND MAINTENANCE [40 CFR 122.41(e)]

The Copermittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Copermittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by a Copermittee only when the operation is necessary to achieve compliance with the conditions of this permit.

f. PERMIT ACTIONS [40 CFR 122.41(f)]

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Copermittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

g. PROPERTY RIGHTS [40 CFR 122.41(g)]

This permit does not convey any property rights of any sort, or any exclusive privilege.

h. DUTY TO PROVIDE INFORMATION [40 CFR 122.41(h)]

The Copermittee must furnish to the San Diego Water Board, State Water Board, or USEPA within a reasonable time, any information which the San Diego Water Board, State Water Board, or USPEA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Copermittee must also furnish to the San Diego Water Board, State Water Board, or USPEA upon request, copies of records required to be kept by this permit.

i. INSPECTION AND ENTRY [40 CFR 122.41(i)]

The Copermittee must allow the San Diego Water Board, State Water Board, USEPA, and/or their authorized representative (including an authorized contractor acting as their representative), upon presentation of credentials and other documents as may be required by law, to:

(1) Enter upon the Copermittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit; [40 CFR 122.41(i)(1)]

(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit; [40 CFR 122.41(i)(2)]

(3) Inspect and photograph at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; [40 CFR 122.41(i)(3)] and

(4) Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location. [40 CFR 122.41(i)(4)]

j. MONITORING AND RECORDS [40 CFR 122.41(j)]

(1) Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity. [40 CFR 122.41(j)(1)]

(2) Except for records of monitoring information required by this permit related to the Copermittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five (5) years (or longer as required by 40 CFR Part 503), the

Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time. [40 CFR 122.41(j)(2)]

(3) Records for monitoring information must include: [40 CFR 122.41(j)(3)]

(a) The date, exact place, and time of sampling or measurements; [40 CFR 122.41(j)(3)(i)]
(b) The individual(s) who performed the sampling or measurements; [40 CFR 122.41(j)(3)(ii)]
(c) The date(s) analyses were performed; [40 CFR 122.41(j)(3)(iii)]
(d) The individual(s) who performed the analyses; [40 CFR 122.41(j)(3)(iv)]
(e) The analytical techniques or methods used; [40 CFR 122.41(j)(3)(v)] and
(f) The results of such analyses. [40 CFR 122.41(j)(3)(vi)]

(4) Monitoring must be conducted according to test procedures under 40 CFR Part 136 unless another method is required under 40 CFR Subchapters N or O. [40 CFR 122.41(j)(4)]

In the case of pollutants for which there are no approved methods under 40 CFR Part 136 or otherwise required under 40 CFR Subchapters N and O, monitoring must be conducted according to a test procedure specified in the permit for such pollutants. [40 CFR 122.44(i)(1)(iv)]

(5) The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. [40 CFR 122.41(j)(5)]

k. SIGNATORY REQUIREMENT [40 CFR 122.41(k)]

(1) All applications, reports, or information submitted to the San Diego Water Board, State Water Board, or USEPA must be signed and certified. (See 40 CFR 122.22) [40 CFR 122.41(k)(1)]

(a) *For a municipality, State, Federal, or other public agency.* [All applications must be signed] [b]y either a principal executive officer or ranking elected official. [40 CFR 122.22(a)(3)]

(b) All reports required by permits, and other information requested by the San Diego Water Board, State Water Board, or USEPA must be signed by a person described in paragraph (a) of this section, or by a duly authorized representative of that person. A person is a duly authorized representative only if: [40 CFR 122.22(b)]

(i) The authorization is made in writing by a person described in paragraph (a) of this section; [40 CFR 122.22(b)(1)]

(ii) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company, (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) [40 CFR 122.22(b)(2)] and,

(iii) The written authorization is submitted to the San Diego Water Board and State Water Board. [40 CFR 122.22(b)(3)]

(c) *Changes to authorization.* If an authorization under paragraph (b) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (b) of this section must be submitted to the San Diego Water Board prior to or together with any reports, information, or applications to be signed by an authorized representative. [40 CFR 122.22(c)]

(d) *Certification.* Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." [40 CFR 122.22(d)]

(2) The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both. [40 CFR 122.41(k)(2)]

I. REPORTING REQUIREMENTS [40 CFR 122.41(l)]

(1) *Planned changes.* The Copermittee must give notice to the San Diego Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when: [40 CFR 122.41(l)(1)]

(a) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); [40 CFR 122.41(l)(1)(i)] or

(b) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which

are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1). [40 CFR 122.41(l)(1)(ii)]

(c) The alteration or addition results in a significant change in the Copermittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. [40 CFR 122.41(l)(1)(iii)]

(2) *Anticipated noncompliance*. The Copermittee must give advance notice to the San Diego Water Board or State Water Board of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements. [40 CFR 122.41(l)(2)]

(3) *Transfers*. This permit is not transferable to any person except after notice to the San Diego Water Board. The San Diego Water Board may require modification or revocation and reissuance of the permit to change the name of the Copermittee and incorporate such other requirements as may be necessary under the CWA. [40 CFR 122.41(l)(3)]

(4) *Monitoring reports.* Monitoring results must be reported at the intervals specified elsewhere in this permit. [40 CFR 122.41(l)(4)]

(a) Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the San Diego Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices. [40 CFR 122.41(l)(4)(i)]

(b) If the Copermittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or another method required for an industry-specific waste stream under 40 CFR Subchapters N or O, the results of this monitoring must be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the San Diego Water Board or State Water Board. [40 CFR 122.41(l)(4)(ii)]

(c) Calculations for all limitations which require averaging of measurements must utilize an arithmetic mean unless otherwise specified in the permit. [40 CFR 122.41(l)(4)(iii)]

(5) *Compliance schedules*. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date. [40 CFR 122.41(l)(5)]

(6) *Twenty-four hour reporting.*

(a) The Copermittee must report any noncompliance that may endanger health or the environment. Any information must be provided orally within 24 hours from

the time the Copermittee becomes aware of the circumstances. A written submission must also be provided within five (5) days of the time the Copermittee becomes aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6)(i)]

(b) The following must be included as information which must be reported within 24 hours under this paragraph: [40 CFR 122.41(l)(6)(ii)]

(i) Any unanticipated bypass that exceeds any effluent limitation in the permit (See 40 CFR 122.41(g)). [40 CFR 122.41(l)(6)(ii)(A)]
(ii) Any upset which exceeds any effluent limitation in the permit. [40 CFR 122.41(l)(6)(ii)(B)] and,
(iii) Violation of a maximum daily discharge limitation for any of the pollutants listed by the San Diego Water Board in the permit to be reported within 24 hours. (See 40 CFR 122.44(g)) [40 CFR 122.41(l)(6)(ii)(C)]

(c) The San Diego Water Board may waive the above-required written report on a case-by-case basis if the oral report has been received within 24 hours. [40 CFR 122.41(l)(6)(iii)]

(7) *Other noncompliance.* The Copermittee must report all instances of noncompliance not reported in accordance with the standard provisions required under 40 CFR 122.41(l)(4), (5), and (6), at the time monitoring reports are submitted. The reports must contain the information listed in the standard provisions required under 40 CFR 122.41(l)(6). [40 CFR 122.41(l)(7))]

(8) *Other information.* When the Copermittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the San Diego Water Board, State Water Board, or USEPA, the Copermittee must promptly submit such facts or information. [40 CFR 122.41(l)(8)]

m. BYPASS [40 CFR 122.41(m)]

(1) *Definitions.*

(a) "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. [40 CFR 122.41(m)(1)(i)] or

(b) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production. [40 CFR 122.41(m)(1)(ii)]

(2) *Bypass not exceeding limitations*. The Copermittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the standard provisions required under 40 CFR 122.41(m)(3) and (4). [40 CFR 122.41(m)(2)]

(3) *Notice.*

(a) *Anticipated bypass*. If the Copermittee knows in advance of the need for a bypass, it must submit a notice, if possible at least ten days before the date of the bypass. [40 CFR 122.41(m)(3)(i)] or

(b) *Unanticipated bypass*. The Copermittee must submit notice of an unanticipated bypass in accordance with the standard provisions required under 40 CFR 122.41(l)(6) (24-hour notice). [40 CFR 122.41(m)(3)(ii)]

(4) *Prohibition of Bypass.*

(a) Bypass is prohibited, and the San Diego Water Board may take enforcement action against a Copermittee for bypass, unless: [40 CFR 122.41(m)(4)(i)]

(i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; [40 CFR 122.41(m)(4)(i)(A)]

(ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; [40 CFR 122.41(m)(4)(i)(B)] and,

(iii) The Copermittee submitted notice in accordance with the standard provisions required under 40 CFR 122.41(m)(3). [40 CFR 122.41(m)(4)(i)(C)]

(b) The San Diego Water Board may approve an anticipated bypass, after considering its adverse effects, if the San Diego Water Board determines that it will meet the three conditions listed above. [40 CFR 122.41(m)(4)(ii)]

n. UPSET [40 CFR 122.41(n)]

(1) *Definition.* "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Copermittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. [40 CFR 122.41(n)(1)]

(2) *Effect of an upset*. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the standard provisions required under 40 CFR 122.41(n)(3) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. [40 CFR 122.41(n)(2)]

(3) *Conditions necessary for a demonstration of upset*. A Copermittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that: [40 CFR 122.41(n)(3)]

(a) An upset occurred and that the Copermittee can identify the cause(s) of the upset; [40 CFR 122.41(n)(3)(i)]
(b) The permitted facility was at the time being properly operated; [40 CFR 122.41(n)(3)(ii)] and
(c) The Copermittee submitted notice of the upset in accordance with the standard provisions required under 40 CFR 122.41(l)(6)(ii)(B) (24-hour notice). [40 CFR 122.41(n)(3)(iii)]
(d) The Copermittee complied with any remedial measures pursuant to the standard provisions required under 40 CFR 122.41(d). [40 CFR 122.41(n)(3)(iii)]

(4) *Burden of proof*. In any enforcement proceeding, the Copermittee seeking to establish the occurrence of an upset has the burden of proof. [40 CFR 122.41(n)(4)]

o. STANDARD PERMIT PROVISIONS FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS [40 CFR 122.42(c)]

The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the San Diego Water Board or State Water Board under 40 CFR 122.26(a)(1)(v) must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report must include:

(1) The status of implementing the components of the storm water management program that are established as permit conditions; [40 CFR 122.42(c)(1)]

(2) Proposed changes to the storm water management programs that are established as permit conditions. Such proposed changes must be consistent with 40 CFR 122.26(d)(2)(iii); [40 CFR 122.42(c)(2)] and

(3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under 40 CFR 122.26(d)(2)(iv) and (v); [40 CFR 122.42(c)(3)]

(4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; [40 CFR 122.42(c)(4)]

(5) Annual expenditures and budget for year following each annual report; [40 CFR 122.42(c)(5)]

(6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; [40 CFR 122.42(c)(6)]

(7) Identification of water quality improvements or degradation. [40 CFR 122.42(c)(7)]

p. STANDARD PERMIT PROVISIONS FOR STORM WATER DISCHARGES [40 CFR 122.42(d)]

The initial permits for discharges composed entirely of storm water issued pursuant to 40 CFR 122.26(e)(7) must require compliance with the conditions of the permit as expeditiously as practicable, but in no event later than three years after the date of issuance of the permit.

2. General Provisions

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. The general provisions applicable to this Order and NPDES permit are as follows:

a. DISCHARGE OF WASTE IS A PRIVILEGE

No discharge of waste into the waters of the State, whether or not such discharge is made pursuant to waste discharge requirements, shall create a vested right to continue such discharge. All discharges of waste into waters of the State are privileges, not rights. [CWC Section 13263(g)]

b. DURATION OF ORDER AND NPDES PERMIT

(1) *Effective date*. This Order and NPDES permit becomes effective on the date of its adoption provided the USEPA has no objection. If the USEPA objects to its issuance, this Order shall not become effective until such objection is withdrawn. This Order supersedes Order No. R9-2007-0001 upon the effective date of this Order, and supercedes Order Nos. R9-2009-0002 and R9-2010-0016 upon their expiration.

(2) *Expiration*. This Order and NPDES permit expires five years after adoption. [40 CFR 122.46(a)]

(3) *Continuation of expired order*. After this Order and NPDES permit expires, the terms and conditions of this Order and NPDES permit are automatically continued pending issuance of a new permit if all requirements of the federal NPDES regulations on the continuation of expired permits (40 CFR 122.6) are complied with.

c. AVAILABILITY

A copy of this Order must be kept at a readily accessible location and must be available to on-site personnel at all times.

d. CONFIDENTIALITY OF INFORMATION

Except as provided for in 40 CFR 122.7, no information or documents submitted in accordance with or in application for this Order will be considered confidential, and all such information and documents shall be available for review by the public at the San Diego Water Board office.

Claims of confidentiality for the following information will be denied: [40 CFR 122.7(b)]

(1) The name and address of any permit applicant or Copermittee; [40 CFR 122.7(b)(1)] and

(2) Permit applications and attachments, permits, and effluent data. [40 CFR 122.7(b)(2)]

e. EFFLUENT LIMITATIONS

(1) *Interim effluent limitations*. The Copermittee must comply with any interim effluent limitations as established by addendum, enforcement action, or revised waste discharge requirements which have been, or may be, adopted by the San Diego Water Board.

(2) *Other effluent limitations and standards*. If any applicable toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant and that standard or prohibition is more stringent than any limitation on the pollutant in the permit, the San Diego Water Board shall institute proceedings under these regulations to modify or revoke and reissue the permit to conform to the toxic effluent standard or prohibition. [40 CFR 122.44(b)(1)]

f. DUTY TO MINIMIZE OR CORRECT ADVERSE IMPACTS

The Copermittee must take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this Order, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the noncompliance.

g. PERMIT ACTIONS

The filing of a request by the Copermittee for modification, revocation and reissuance, or termination of this Order, or a notification of planned change in or anticipated noncompliance with this Order does not stay any condition of this Order. (See 40 CFR 122.41(f)) In addition, the following provisions apply to this Order:

(1) Upon application by any affected person, or on its own motion, the San Diego Water Board may review and revise the requirements in this Order. All requirements must be reviewed periodically. [CWC Section 13263(e)]

(2) This Order may be terminated or modified for cause, including, but not limited to, all of the following: [CWC Section 13381]

(a) Violation of any condition contained in the requirements of this Order. [CWC Section 13381(a)]

(b) Obtaining the requirements in this Order by misrepresentation, or failure to disclose fully all relevant facts. [CWC Section 13381(b)]

(c) A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge. [CWC Section 13381(c)]

(3) When this Order is transferred to a new owner or operator, such requirements as may be necessary under the CWC may be incorporated into this Order.

h. NPDES PERMITTED NON-STORM WATER DISCHARGES

The San Diego Water Board has, in prior years, issued a limited number of individual NPDES permits for non-storm water discharges to MS4s. The San Diego Water Board or State Water Board may in the future, upon prior notice to the Copermittee(s), issue an NPDES permit for any non-storm water discharge (or class of non-storm water discharges) to an MS4.

i. MONITORING

In addition to the standard provisions required under 40 CFR 122.41(j) and (l)(4), the following general monitoring provisions apply to this Order:

(1) Where procedures are not otherwise specified in Order, sampling, analysis and quality assurance/quality control must be conducted in accordance with the Quality Assurance Management Plan (QAMP) for the State of California's Surface Water Ambient Monitoring Program (SWAMP), adopted by the State Water Resources Control Board (State Water Board).

(2) Pursuant to 40 CFR 122.41(j)(2) and CWC Section 13383(a), each Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five (5) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time.

(3) All chemical, bacteriological, and toxicity analyses must be conducted at a laboratory certified for such analyses by the California Department of Public Health or a laboratory approved by the San Diego Water Board.

(4) For priority toxic pollutants that are identified in the California Toxics Rule (CTR) (65 Fed. Reg. 31682), the Copermittees must instruct their laboratories to establish calibration standards that are equivalent to or lower than the Minimum Levels (MLs) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP). If a Copermittee can demonstrate that a particular ML is not attainable, in accordance

with procedures set forth in 40 CFR Part 136, the lowest quantifiable concentration of the lowest calibration standard analyzed by a specific analytical procedure (assuming that all the method specified sample weights, volumes, and processing steps have been followed) may be used instead of the ML listed in Appendix 4 of the SIP. The Copermittee must submit documentation from the laboratory to the San Diego Water Board for approval prior to raising the ML for any priority toxic pollutant.

j. ENFORCEMENT

(1) The San Diego Water Board is authorized to enforce the terms of this Order under several provisions of the CWC, including, but not limited to, CWC Sections 13385, 13386, and 13387.

(2) Nothing in this Order shall be construed to protect the Copermittee from its liabilities under federal, state, or local laws.

(3) The CWC provides for civil and criminal penalties comparable to, and in some cases greater than, those provided for under the CWA.

(4) Except as provided in the standard conditions required under 40 CFR 122.41(m) and (n), nothing in this Order shall be construed to relieve the Copermittee from civil or criminal penalties for noncompliance.

(5) Nothing in this Order shall be construed to preclude the institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties to which the Copermittee is or may be subject to under Section 311 of the CWA.

(6) Nothing in this Order shall be construed to preclude institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authoring preserved by Section 510 of the CWA.

k. SEVERABILITY

The provisions of this Order are severable, and if any provision of this Order, or the application of any provisions of this Order to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this Order shall not be affected thereby.

l. APPLICATIONS

Any application submitted by a Copermittee for reissuance or modification of this Order must satisfy all applicable requirements specified in federal regulations as well as any additional requirements for submittal of a Report of Waste Discharge specified in the CWC and the California Code of Regulations.

m. IMPLEMENTATION

All plans, reports and subsequent amendments submitted in compliance with this Order must be implemented immediately (or as otherwise specified). All submittals by Copermittees must be adequate to implement the requirements of this Order.

n. REPORT SUBMITTALS

(1) All report submittals must include an executive summary, introduction, conclusion, recommendations, and signed certified statement.

(2) Each Copermittee must submit a signed certified statement covering its responsibilities for each applicable submittal.

(3) The Principal Watershed Copermittee(s) must submit a signed certified statement covering its responsibilities for each applicable submittal and the sections of the submittals for which it is responsible.

(4) Unless otherwise directed, the Copermittees must submit one hard copy and one electronic copy of each report required under this Order to the San Diego Water Board, and one electronic copy to the USEPA.

(5) The Copermittees must submit reports and provide notifications as required by this Order to the following:

EXECUTIVE OFFICER
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
9174 SKY PARK COURT, SUITE 100
SAN DIEGO CA 92123-4340
Telephone: (858) 467-2952 Fax: (858) 571-6972

EUGENE BROMLEY
US ENVIRONMENTAL PROTECTION AGENCY
REGION IX
PERMITS ISSUANCE SECTION (W-5-1)
75 HAWTHORNE STREET
SAN FRANCISCO CA 94105

ADMINISTRATIVE DRAFT

ATTACHMENT C

ACRONYMS AND ABBREVIATIONS

AMAL	Average Monthly Action Level
ASBS	Area(s) of Special Biological Significance
BMP	Best Management Practice
BMP Design Manual	Permanent BMP Sizing Criteria Design Manual
Basin Plan	Water Quality Control Plan for the San Diego Basin
CEQA	California Environmental Quality Act
CCR	California Code of Regulations
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWC	California Water Code
CZARA	Coastal Zone Act Reauthorization Amendments of 1990
ERP	Enforcement Response Plan
ESAs	Environmentally Sensitive Areas
GIS	Geographic Information System
IBI	Index of Biotic Integrity
LID	Low Impact Development
MDAL	Maximum Daily Action Level
MEP	Maximum Extent Practicable
ML	Minimum Level
MS4	Municipal Separate Storm Sewer System
NAL	Non-Storm Water Action Level
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
ROWD	Report of Waste Discharge (application for NPDES reissuance)
SAL	Storm Water Action Level
San Diego Water Board	California Regional Water Quality Control Board, San Diego Region
SIC	Standard Industrial Classification Code
State Water Board	State Water Resources Control Board
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
WDID	Waste Discharge Identification Number
WLA	Waste Load Allocation
WQBEL	Water Quality Based Effluent Limitation

ADMINISTRATIVE DRAFT

DEFINITIONS

Active/Passive Sediment Treatment - Using mechanical, electrical or chemical means to flocculate or coagulate suspended sediment for removal from runoff from construction sites prior to discharge.

Anthropogenic Litter – Trash generated from human activities, not including sediment.

Average Monthly Action Level – The highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month.

Beneficial Uses - The uses of water necessary for the survival or well being of man, plants, and wildlife. These uses of water serve to promote tangible and intangible economic, social, and environmental goals. "Beneficial Uses" of the waters of the State that may be protected include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. Existing beneficial uses are uses that were attained in the surface or ground water on or after November 28, 1975; and potential beneficial uses are uses that would probably develop in future years through the implementation of various control measures. "Beneficial Uses" are equivalent to "Designated Uses" under federal law. [California Water Code Section 13050(f)].

Best Management Practices (BMPs) - Defined in 40 CFR 122.2 as schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. In the case of municipal storm water permits, BMPs may be used in place of numeric effluent limits.

Bioassessment - The use of biological community information to evaluate the biological integrity of a water body and its watershed. With respect to aquatic ecosystems, bioassessment is the collection and analysis of samples of the benthic macroinvertebrate community together with physical/habitat quality measurements associated with the sampling site and the watershed to evaluate the biological condition (i.e. biotic integrity) of a water body.

Biocriteria - Under the CWA, numerical values or narrative expressions that define a desired biological condition for a water body that are legally enforceable. The USEPA defines biocriteria as: "numerical values or narrative expressions that describe the reference biological integrity of aquatic communities inhabiting waters of a given designated aquatic life use… (that)…describe the characteristics of water body segments least impaired by human activities."

Biofiltration - Practices that use vegetation and amended soils to detain and treat runoff from impervious areas. Treatment is through filtration, infiltration, adsorption, ion exchange, and biological uptake of pollutants.

Biological Integrity - Defined in Karr J.R. and D.R. Dudley. 1981. Ecological perspective on water quality goals. *Environmental Management* 5:55-68 as: "A balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitat of the region." Also referred to as ecosystem health.

Clean Water Act Section 303(d) Water Body - An impaired water body in which water quality does not meet applicable water quality standards and/or is not expected to meet water quality standards, even after the application of technology based pollution controls required by the CWA. The discharge of runoff to these water bodies by the Copermittees is significant because these discharges can cause or contribute to violations of applicable water quality standards.

Construction Site – Any project, including projects requiring coverage under the Construction General Permit, that involves soil disturbing activities including, but not limited to, clearing, grading, disturbances to ground such as stockpiling, and excavation.

Contamination - As defined in the Porter-Cologne Water Quality Control Act, contamination is "an impairment of the quality of waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste whether or not waters of the State are affected."

Copermittee – An incorporated city within the County of Orange, County of Riverside, or County of San Diego in the San Diego Region, the County of Orange, the County of Riverside, the County of San Diego, the Orange County Flood Control District, the Riverside County Water Conservation and Flood Control District, the San Diego Regional Airport Authority, or the Unified Port District of San Diego.

Copermittees – All of the individual Copermittees, collectively.

Critical Channel Flow (Qc) – The channel flow that produces the critical shear stress that initiates bed movement or that erodes the toe of channel banks. When measuring Qc, it should be based on the weakest boundary material – either bed or bank.

Daily Discharge – Defined as either: (1) the total mass of the constituent discharged over the calendar day or any 24 hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g. concentration.)

The Daily Discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day, or other 24 hour period other than a day), or by the arithmetic mean of analytical results from one or more grab samples taken over the course of a day.

Development Projects - Construction, rehabilitation, redevelopment, or reconstruction of any public or private residential project, industrial, commercial, or any other projects.

Dry Season – The period of time from May 1 to September 30 when rainfall is not expected to occur the San Diego.

Dry Weather – Weather is considered dry if the preceding 72 hours has been without precipitation.

Enclosed Bays – Enclosed bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost bay works is less than 75 percent

of the greatest dimension of the enclosed portion of the bay. Enclosed bays do not include inland surface waters or ocean waters.

Erosion – When land is diminished or worn away due to wind, water, or glacial ice. Often the eroded debris (silt or sediment) becomes a pollutant via storm water runoff. Erosion occurs naturally but can be intensified by land clearing activities such as farming, development, road building, and timber harvesting.

Environmentally Sensitive Areas (ESAs) - Areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; areas designated as preserves or their equivalent under the Natural Communities Conservation Program within the Cities and County of Orange; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.

Estuaries – Waters, including coastal lagoons, located at the mouth of streams that serve as areas of mixing fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and ocean water. Estuaries do not include inland surface waters or ocean waters.

Existing Development – Any area that has been developed and exists for municipal, commercial, industrial, or residential purposes, uses, or activities. May include areas that are not actively used for its originally developed purpose, but may be re-purposed or redeveloped for another use or activity.

Flow Duration – The long-term period of time that flows occur above a threshold that causes significant sediment transport and may cause excessive erosion damage to creeks and streams (not a single storm event duration). The simplest way to visualize this is to consider a histogram of pre- and post-project flows using long-term records of hourly data. To maintain pre-development flow duration means that the total number of hours (counts) within each range of flows in a flow-duration histogram cannot increase between the pre- and post-development condition. Flow duration within the range of geomorphologically significant flows is important for managing erosion.

Grading - The cutting and/or filling of the land surface to a desired slope or elevation.

Hazardous Material – Any substance that poses a threat to human health or the environment due to its toxicity, corrosiveness, ignitability, explosive nature or chemical reactivity. These also include materials named by the USEPA in 40 CFR 116 to be reported if a designated quantity of the material is spilled into the waters of the U.S. or emitted into the environment.

Hazardous Waste - Hazardous waste is defined as “any waste which, under Section 600 of Title 22 of this code, is required to be managed according to Chapter 30 of Division 4.5 of Title 22 of this code” [CCR Title 22, Division 4.5, Chapter 11, Article 1].

Household Hazardous Waste – Paints, cleaning products, and other wastes generated during home improvement or maintenance activities.

Hydromodification – The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, interflow and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

Illicit Connection – Any connection to the MS4 that conveys an illicit discharge.

Illicit Discharge - Any discharge to the MS4 that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from fire fighting activities [40 CFR 122.26(b)(2)].

Inactive Areas – Areas of construction activity that are not active and those that have been active and are not scheduled to be re-disturbed for at least 14 days.

Infiltration – Water other than wastewater that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow [40 CFR 35.2005(20)].

Inland Surface Waters – Includes all surface waters of the State that do not include the ocean, enclosed bays, or estuaries.

Jurisdictional Runoff Management Program Document – A written description of the specific jurisdictional runoff management measures and programs that each Copermittee will implement to comply with this Order and ensure that storm water pollutant discharges in runoff are reduced to the MEP and do not cause or contribute to a violation of water quality standards.

Low Impact Development (LID) – A storm water management and land development strategy that emphasizes conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions.

Low Impact Development Best Management Practices (LID BMPs) – LID BMPs include schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States through storm water management and land development strategies that emphasize conservation sand the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions. LID BMPs include retention practices that do not allow runoff, such as infiltration, rain water harvesting and reuse, and evapotranspiration. LID BMPs also include flow-through practices such as biofiltration that may have some discharge of storm water following pollutant reduction.

Major Outfall – As defined in the Code of Federal Regulations, a major outfall is a MS4 outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (i.e. discharge from a single conveyance other than a circular pipe which is associated with a drainage are of more than 50 acres); or, for MS4s that receive storm water from lands zoned for industrial activity (based on comprehensive zoning plans or equivalent), a MS4 outfall that

discharges from a single pipe with an inside diameter of 12 inches or more or from its equivalent (i.e. discharge from other than a circular pipe associated with a drainage area of 2 acres or more).

Maximum Daily Action Level (MDAL) –The highest allowable daily discharge of a pollutant, over a calendar day (or 24 hour period). For pollutants with action levels expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with action levels expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

Maximum Extent Practicable (MEP) – The technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) for storm water that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) in combination with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than BAT. A definition for MEP is not provided either in the statute or in the regulations. Instead the definition of MEP is dynamic and will be defined by the following process over time: municipalities propose their definition of MEP by way of their runoff management programs. Their total collective and individual activities conducted pursuant to the runoff management programs becomes their proposal for MEP as it applies both to their overall effort, as well as to specific activities (e.g., MEP for street sweeping, or MEP for MS4 maintenance). In the absence of a proposal acceptable to the San Diego Water Board, the San Diego Water Board defines MEP.

In a memo dated February 11, 1993, entitled "Definition of Maximum Extent Practicable," Elizabeth Jennings, Senior Staff Counsel, SWRCB addressed the achievement of the MEP standard as follows:

> "*To achieve the MEP standard, municipalities must employ whatever Best Management Practices (BMPs) are technically feasible (i.e., are likely to be effective) and are not cost prohibitive. The major emphasis is on technical feasibility. Reducing pollutants to the MEP means choosing effective BMPs, and rejecting applicable BMPs only where other effective BMPs will serve the same purpose, or the BMPs would not be technically feasible, or the cost would be prohibitive. In selecting BMPs to achieve the MEP standard, the following factors may be useful to consider:*
>
> a. *Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?*
> b. *Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?*
> c. *Public Acceptance: Does the BMP have public support?*
> d. *Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?*
> e. *Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc.?*
>
> *The final determination regarding whether a municipality has reduced pollutants to the maximum extent practicable can only be made by the Regional or State Water Boards, and not by the municipal discharger. If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those*

where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit derived, it would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs that would address a pollutant source, or to pick a BMP based solely on cost, which would be clearly less effective. In selecting BMPs the municipality must make a serious attempt to comply and practical solutions may not be lightly rejected. In any case, the burden would be on the municipal discharger to show compliance with its permit. After selecting a menu of BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented."

Monitoring Year – The monitoring year begins annually on July 1st and ends on June 30th.

Municipal Separate Storm Sewer System (MS4) – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designated or used for collecting or conveying storm water; (iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.26.

National Pollutant Discharge Elimination System (NPDES) - The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the CWA.

Non-Storm Water - All discharges to and from a MS4 that do not originate from precipitation events (i.e., all discharges from a MS4 other than storm water). Non-storm water includes illicit discharges and NPDES permitted discharges.

Nuisance - As defined in the Porter-Cologne Water Quality Control Act, a nuisance is "anything which meets all of the following requirements: 1) Is injurious to health, or is indecent, or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. 2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. 3) Occurs during, or as a result of, the treatment or disposal of wastes."

Ocean Waters – the territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the State Board's California Ocean Plan.

Order – Unless otherwise specified, refers to this Order, Order No. R9-2012-0011 (NPDES No. CAS0109266)

Permanent BMP Sizing Criteria Design Manual – A plan developed to eliminate, reduce, or mitigate the impacts of runoff from development projects, including Priority Development

Projects.

Person - A person is defined as an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof [40 CFR 122.2].

Point Source - Any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, landfill leachate collection systems, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

Pollutant - Any agent that may cause or contribute to the degradation of water quality such that a condition of pollution or contamination is created or aggravated.

Pollution - As defined in the Porter-Cologne Water Quality Control Act, pollution is "the alteration of the quality of the waters of the State by waste, to a degree that unreasonably affects the either of the following: 1) The waters for beneficial uses; or 2) Facilities that serve these beneficial uses." Pollution may include contamination.

Pollution Prevention - Pollution prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control BMPs, treatment control BMPs, or disposal.

Permanent BMPs - A subset of BMPs including structural and non-structural controls which detain, retain, filter, remove, or educate to prevent the release of pollutants to surface waters from development projects in perpetuity, after construction of a project is completed.

Pre-Development Runoff Conditions (Discharge Rates, Durations, Etc.) – Runoff conditions that existed onsite before the existing development was constructed, or exists onsite before planned development activities occur. This definition includes natural watershed hydrology before any human induced land alterations.

Priority Development Projects - New development and redevelopment projects defined under Provision E.3.b of Order No. R9-2012-0011.

Rainy Season (aka Wet Season) – The period of time from October 1 to April 30 when the San Diego Region experiences the most rainfall.

Receiving Waters – Waters of the United States.

Receiving Water Limitations - Waste discharge requirements issued by the San Diego Water Board typically include both: (1) "Effluent Limitations" (or "Discharge Limitations") that specify the technology-based or water-quality-based effluent limitations; and (2) "Receiving Water Limitations" that specify the water quality objectives in the Basin Plan as well as any other limitations necessary to attain those objectives. In summary, the "Receiving Water Limitations" provision is the provision used to implement the requirement of CWA section 301(b)(1)(C) that NPDES permits must include any more stringent limitations necessary to meet water quality standards.

Redevelopment - The creation, addition, and or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening,

the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include trenching and resurfacing associated with utility work; resurfacing existing roadways; new sidewalk construction, pedestrian ramps, or bike lane on existing roads; and routine replacement of damaged pavement, such as pothole repair.

Retain –Keep or hold in a particular place, condition, or position without discharge to surface waters.

Runoff - All flows in a storm water conveyance system that consists of the following components: (1) storm water (wet weather flows) and (2) non-storm water including dry weather flows.

San Diego Water Board – As used in this document the term "San Diego Water Board" is synonymous with the term "Regional Board" as defined in Water Code section 13050(b) and is intended to refer to the California Regional Water Quality Control Board for the San Diego Region as specified in Water Code Section 13200.

Sediment - Soil, sand, and minerals washed from land into water. Sediment resulting from anthropogenic sources (i.e. human induced land disturbance activities) is considered a pollutant. This Order regulates only the discharges of sediment from anthropogenic sources and does not regulate naturally occurring sources of sediment. Sediment can destroy fish-nesting areas, clog animal habitats, and cloud waters so that sunlight does not reach aquatic plants.

Shared Treatment Control BMP - BMPs used by multiple developments to infiltrate, filter, or treat the required volume or flow prior to discharge to a receiving water. This could include, for example, a treatment BMP at the end of an enclosed storm drain that collects runoff from several commercial developments.

Source Control BMP – Land use or site planning practices, or structural or nonstructural measures that aim to prevent runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between pollutants and runoff.

State Water Quality Protection Area – A nonterrestrial marine or estuarine area designated to protect marine species or biological communities from an undesirable alteration in natural water quality, including, but not limited to, areas of special biological significance that have been designated by the State Water Board through its water quality control planning process. Areas of special biological significance are a subset of State Water Quality Protection Areas, and require special protection as determined by the State Water Resources Control Board pursuant to the California Ocean Plan adopted and reviewed pursuant to Article 4 (commencing with Section 13160) of Chapter 3 of Division 7 of the California Water Code and pursuant to the Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California (California Thermal Plan) adopted by the State Water Board.

Storm Water – Per 40 CFR 122.26(b)(13), means storm water runoff, snowmelt runoff and surface runoff and drainage. Surface runoff and drainage pertains to runoff and drainage resulting from precipitation events.

Total Maximum Daily Load (TMDL) - The maximum amount of a pollutant that can be discharged into a water body from all sources (point and non-point) and still maintain water quality standards. Under CWA section 303(d), TMDLs must be developed for all water bodies that do not meet water quality standards after application of technology-based controls.

Toxicity - Adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies). The water quality objectives for toxicity provided in the Basin Plan, state in part…"All waters shall be free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life….The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge".

Treatment Control BMP – Any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media absorption or any other physical, biological, or chemical process.

Unpaved Road – Any long, narrow stretch without pavement used for traveling by motor passenger vehicles between two or more points. Unpaved roads are generally constructed of dirt, gravel, aggregate or macadam and may be improved or unimproved.

Waste - As defined in CWC Section 13050(d), "waste includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal."

Article 2 of CCR Title 23, Chapter 15 (Chapter 15) contains a waste classification system that applies to solid and semi-solid waste, which cannot be discharged directly or indirectly to water of the state and which therefore must be discharged to land for treatment, storage, or disposal in accordance with Chapter 15. There are four classifications of waste (listed in order of highest to lowest threat to water quality): hazardous waste, designated waste, non-hazardous solid waste, and inert waste.

Water Quality Objective - Numerical or narrative limits on constituents or characteristics of water designated to protect designated beneficial uses of the water. [California Water Code Section 13050 (h)]. California's water quality objectives are established by the State and Regional Water Boards in the Water Quality Control Plans. Numeric or narrative limits for pollutants or characteristics of water designed to protect the beneficial uses of the water. In other words, a water quality objective is the maximum concentration of a pollutant that can exist in a receiving water and still generally ensure that the beneficial uses of the receiving water remain protected (i.e., not impaired). Since water quality objectives are designed specifically to protect the beneficial uses, when the objectives are violated the beneficial uses are, by definition, no longer protected and become impaired. This is a fundamental concept under the Porter Cologne Act. Equally fundamental is Porter Cologne's definition of pollution. A condition of pollution exists when the water quality needed to support designated beneficial uses has become unreasonably affected or impaired; in other words, when the water quality objectives have been violated. These underlying definitions (regarding beneficial use protection) are the reason why all waste discharge requirements implementing the federal NPDES regulations require compliance with water quality objectives. (Water quality objectives are also called water quality criteria in the CWA.)

Water Quality Standards - Water quality standards, as defined in Clean Water Act section 303(c) consist of the beneficial uses (e.g., swimming, fishing, municipal drinking water supply, etc.,) of a water body and criteria (referred to as water quality objectives in the California Water Code) necessary to protect those uses. Under the Water Code, the water boards establish beneficial uses and water quality objectives in water quality control or basin plans. Together with an anti-degradation policy, these beneficial uses and water quality objectives serve as water quality standards under the Clean Water Act. In Clean Water Act parlance, state beneficial uses are called "designated uses" and state water quality objectives are called "criteria." Throughout this Order, the relevant term is used depending on the statutory scheme.

Waters of the State - Any water, surface or underground, including saline waters within the boundaries of the State [CWC section 13050 (e)]. The definition of the Waters of the State is broader than that for the Waters of the United States in that all water in the State is considered to be a Waters of the State regardless of circumstances or condition. Under this definition, a MS4 is always considered to be a Waters of the State.

Waters of the United States - As defined in the 40 CFR 122.2, the Waters of the U.S. are defined as: "(a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate "wetlands;" (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters otherwise defined as waters of the United States under this definition: (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial seas; and (g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA."

Watershed - That geographical area which drains to a specified point on a water course, usually a confluence of streams or rivers (also known as drainage area, catchment, or river basin).

Wet Season (aka Rainy Season) – The period of time from October 1 to April 30 when the San Diego Region experiences the most rainfall.

Wet Weather – Weather is considered wet if there is a storm event of 0.1 inches and greater and the following 72 hours.

ADMINISTRATIVE DRAFT

ATTACHMENT D

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM
FY _____

I. COPERMITTEE INFORMATION			
Copermittee Name:			
Copermittee Primary Contact Name:			
Copermittee Primary Contact Information: Address: City:	County:	State:	Zip:
Telephone:	Fax:	Email:	

II. LEGAL AUTHORITY		
Has the Copermittee established adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 that complies with Order No. R9-2012-0011?	**YES** **NO**	☐ ☐
A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority?	**YES** **NO**	☐ ☐

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE		
Was an update of the jurisdictional runoff management program document required or recommended by the San Diego Water Board?	**YES** **NO**	☐ ☐
If YES to the question above, did the Copermittee update its jurisdictional runoff management program document and make it available on the Regional Clearinghouse?	**YES** **NO**	☐ ☐

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM		
Has the Copermittee implemented a program to actively detect and eliminate illicit discharges and connections to its MS4 that complies with Order No. R9-2012-0011?	**YES** **NO**	☐ ☐

Number of non-storm water discharges reported by the public	
Number of non-storm water discharges detected by Copermittee staff or contractors	
Number of non-storm water discharges investigated by the Copermittee	
Number of sources of non-storm water discharges identified	
Number of non-storm water discharges eliminated	
Number of sources of illicit discharges or connections identified	
Number of illicit discharges or connections eliminated	
Number of enforcement actions issued	
Number of high level enforcement actions issued	

V. DEVELOPMENT PLANNING PROGRAM		
Has the Copermittee implemented a development planning program that complies with Order No. R9-2012-0011?	**YES** **NO**	☐ ☐
Was an update to the Permanent BMP Sizing Criteria Design Manual required or recommended by the San Diego Water Board?	**YES** **NO**	☐ ☐
If YES to the question above, did the Copermittee update its Permanent BMP Sizing Criteria Design Manual and make it available on the Regional Clearinghouse?	**YES** **NO**	☐ ☐

Number of proposed development projects in review	
Number of Priority Development Projects in review	
Number of Priority Development Projects approved	
Number of approved Priority Development Projects exempt from any BMP requirements	
Number of approved Priority Development Projects requiring mitigation	
Number of Priority Development Projects granted occupancy	

Number of completed Priority Development Projects in inventory	
Number of high priority Priority Development Project permanent BMP inspections	
Number of Priority Development Project permanent BMP violations	
Number of enforcement actions issued	
Number of high level enforcement actions issued	

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM
FY _____

VI. CONSTRUCTION MANAGEMENT PROGRAM

Has the Copermittee implemented a construction management program that complies with Order No. R9-2012-0011?	**YES**	☐
	NO	☐

Number of construction sites in inventory	
Number of active construction sites in inventory	
Number of inactive construction sites in inventory	
Number of construction sites closed/completed during reporting period	
Number of construction site inspections	
Number of construction site violations	
Number of enforcement actions issued	
Number of high level enforcement actions issued	

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

Has the Copermittee implemented an existing development management program that complies with Order No. R9-2012-0011?	**YES**	☐
	NO	☐

	Municipal	Commercial	Industrial	Residential
Number of existing developments in inventory				
Number of existing development inspections				
Number of follow-up inspections				
Number of existing development violations				
Number of enforcement actions issued				
Number of high level enforcement actions issued				

VIII. PUBLIC EDUCATION AND PARTICIPATION

Has the Copermittee implemented a public education program that complies with Order No. R9-2012-0011?	**YES**	☐
	NO	☐
Has the Copermittee implemented a mechanism for public participation and where necessary intergovernmental coordination that complies with Order No. R9-2012-0011?	**YES**	☐
	NO	☐

IX. FISCAL ANALYSIS

Has the Copermittee attached to this form a summary of its fiscal analysis that complies with Order No. R9-2012-0011?	**YES**	☐
	NO	☐

X. CERTIFICATION

I [☐ Principal Executive Officer ☐ Ranking Elected Official ☐ Duly Authorized Representative] certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature	Date
Print Name	Title
Telephone Number	Email

ADMINISTRATIVE DRAFT

ATTACHMENT E

SPECIFIC PROVISIONS FOR TOTAL MAXIMUM DAILY LOADS APPLICABLE TO ORDER NO. R9-2012-0011

These provisions implement Total Maximum Daily Loads (TMDLs), adopted by the San Diego Water Board and approved by USEPA under Clean Water Act section 303(c), which are applicable to discharges regulated under this Order. The provisions and schedules for implementation of the TMDLs described below must be incorporated into the Water Quality Improvement Plans, required pursuant to Provision B of this Order, for the specified Watershed Management Areas.

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed
2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin
3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed
4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek
5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay
6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2002-0123

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	August 14, 2002
State Water Board Approval Date:	July 16, 2003
Office of Administrative Law Approval Date:	September 11, 2003
US EPA Approval Date:	November 3, 2003

(3) TMDL Effective Date: September 11, 2003

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, Unified Port District of San Diego

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for Chollas Creek consist of the following:

(1) Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedule under Specific Provision 1.c:

Table 1.1
Receiving Water Limitations as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Diazinon	Acute	0.08 µg/L	1 hour
	Chronic	0.05 µg/L	4 days

(2) Effluent Limitations

Discharges from the MS4s must not contain concentrations that exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 1.c:

Table 1.2
Effluent Limitations as Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation	Averaging Period
Diazinon	Acute	0.072 µg/L	1 hour
	Chronic	0.045 µg/L	4 days

(3) Best Management Practices

The following BMPs for Chollas Creek must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area and implemented by the Responsible Copermittees:

(a) The Responsible Copermittees must implement BMPs capable of achieving the WQBELs under Specific Provision 1.b for Chollas Creek.

(b) The Responsible Copermittees must implement the Diazinon Toxicity Control Plan and Diazinon Public Outreach/Education Program as described in the report titled, *Technical Report for Total Maximum Daily Load for Diazinon in Chollas Creek Watershed, San Diego County*, dated August 14, 2002, including subsequent modifications, in order to achieve the WQBELs under Specific Provision 1.b.

(c) The Responsible Copermittees should coordinate the BMPs to address this TMDL with Caltrans wherever and whenever possible.

c. COMPLIANCE SCHEDULE

The Responsible Copermittees were required to achieve their WLA by December 31, 2010. The Responsible Copermittees must be in compliance with the WQBELs under Specific Provision 1.b.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(a) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

(b) The Responsible Copermittees must monitor the effluent of the MS4 outfalls for diazinon within the Chollas Creek watershed, and calculate or estimate the monthly and annual diazinon loads, in accordance with the requirements of Provisions D.1, D.4.a.(1)(b), and D.4.a.(3)(b) of this Order. The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0019

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	September 22, 2005
Office of Administrative Law Approval Date:	December 2, 2005
US EPA Approval Date:	February 8, 2006

(3) TMDL Effective Date: December 2, 2005

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Shelter Island Yacht Basin

(6) Responsible Copermittee: City of San Diego

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for Shelter Island Shoreline Park consist of the following:

(1) Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedule under Specific Provision 2.c:

Table 2.1
Receiving Water Limitations as Concentrations in Shelter Island Yacht Basin

Constituent	Exposure Duration	Effluent Limitation	Averaging Period
Dissolved Copper	Acute	4.8 µg/L	1 hour
	Chronic	3.1 µg/L	4 days

(2) Effluent Limitations

Discharges from the MS4s must not contain pollutant loads that exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 2.c:

Table 2.2
Effluent Limitations as Annual Loads in MS4 Discharges to Shelter Island Yacht Basin

Constituent	Effluent Limitation
Dissolved Copper	30 kg/yr

(3) Best Management Practices

The Responsible Copermittee must implement BMPs capable of achieving the WQBELs under Specific Provision 2.b for Shelter Island Yacht Basin

c. COMPLIANCE SCHEDULE

The Responsible Copermittee was required to achieve its WLA upon the effective date of the TMDL, December 2, 2005. The Responsible Copermittee must be in compliance with the WQBELs under Specific Provision 2.b.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

The Responsible Copermittee must monitor the effluent of its MS4 outfalls for dissolved copper, and calculate or estimate the monthly and annual dissolved copper loads, in accordance with the requirements of Provisions D.1, D.4.a.(1)(b), and D.4.a.(3)(b) of this Order. The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0036

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	November 16, 2005
Office of Administrative Law Approval Date:	February 1, 2006
US EPA Approval Date:	March 22, 2006

(3) TMDL Effective Date: February 1, 2006

(4) Watershed Management Area: Santa Margarita River

(5) Water Body: Rainbow Creek

(6) Responsible Copermittee: County of San Diego

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for Rainbow Creek consist of the following

(1) Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedule under Specific Provision 3.c.(1):

Table 3.1
Receiving Water Limitations as Concentrations in Rainbow Creek

Constituent	Receiving Water Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(2) Effluent Limitations

(a) Discharges from the MS4s must not contain concentrations that exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 3.c.(1):

Table 3.2
Effluent Limitations as Concentrations in MS4 Discharges to Rainbow Creek

Constituent	Effluent Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(b) Pollutant loads from given land uses discharging to and from the MS4s must not exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 3.c.(1):

Table 3.3
Effluent Limitations as Annual Loads in MS4 Discharges to Rainbow Creek

Land Use	Total N	Total P
Commercial nurseries	116 kg/yr	3 kg/yr
Park	3 kg/yr	0.1 kg/yr
Residential areas	149 kg/yr	12 kg/yr
Urban areas	27 kg/yr	6 kg/yr

Interim effluent limitations expressed as pollutant loads are given in the compliance schedule under Specific Provision 3.0.

(3) Best Management Practices

(a) The Responsible Copermittee must implement BMPs capable of achieving the WQBELs under Specific Provision 3.b for Rainbow Creek.

(b) The Responsible Copermittee should coordinate the BMPs to address this TMDL with Caltrans and other sources wherever and whenever possible.

c. Compliance Schedule

(1) WLA Compliance Date

The Responsible Copermittee is required to achieve its WLAs, thus must be in compliance with the WQBELs under Specific Provision 3.b, by December 31, 2021.

(2) Interim Compliance Requirements

Table 3.4
Interim Effluent Limitations as Annual Loads in MS4 Discharges from Specific Land Uses to Rainbow Creek

	Total N Interim Effluent Limitations (kg/yr)			Total P Interim Effluent Limitations (kg/yr)		
	Interim Compliance Date			Interim Compliance Date		
Land Use	**2009**	**2013**	**2017**	**2009**	**2013**	**2017**
Commercial nurseries	3909	299	196	20	16	10
Park	5	3	3	0.15	0.10	0.10
Residential areas	507	390	260	99	74	47
Urban areas	40	27	27	9	6	6

d. Specific Monitoring and Assessment Requirements

The Responsible Copermittee must implement the Sampling and Analysis Plan for Rainbow Creek Nutrient Reduction TMDL Implementation Water Quality Monitoring, dated January 2010. The results of any monitoring conducted during the reporting period, and assessment of whether the interim and final WQBELs have been achieved must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2007-0043

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2007
State Water Board Approval Date:	July 15, 2008
Office of Administrative Law Approval Date:	October 22, 2008
US EPA Approval Date:	December 18, 2008

(3) TMDL Effective Date: October 22, 2008

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, Unified Port District of San Diego

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELsfor Chollas Creek consist of the following:

(1) Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedule under Specific Provision 4.c.(1):

Table 4.1
Receiving Water Limitations as Concentrations in Chollas Creek

Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$(0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$(0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$(0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$(0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER.

(2) Effluent Limitations

Discharges from the MS4s must not contain pollutant loads that exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 4.c.(1):

Table 4.2
Effluent Limitations as Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER.

(3) Best Management Practices

(a) The Responsible Copermittee must implement BMPs capable of achieving the WQBELs under Specific Provision 4.b for Chollas Creek.

(b) The Responsible Copermittees should coordinate the BMPs to address this TMDL with Caltrans and the U.S. Navy wherever and whenever possible.

c. COMPLIANCE SCHEDULE

(1) WLA Compliance Date

The Responsible Copermittee is required to achieve the WLA, thus must be in compliance with the WQBELs under Specific Provision 4.b, by October 22, 2028.

(2) Interim Compliance Requirements

The Responsible Copermittee must comply with the following interim WQBELs by the interim compliance date:

Table 4.3
Interim Effluent Limitations as Concentrations in MS4 Discharges to Chollas Creek

Interim Compliance Date	Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
October 22, 2018	Dissolved Copper	Acute	1.2 x 90% x (0.96) x $e^{[0.9422 \times \ln(\text{hardness}) - 1.700]}$ x WER*	1 hour
		Chronic	1.2 x 90% x (0.96) x $e^{[0.8545 \times \ln(\text{hardness}) - 1.702]}$ x WER*	4 days
	Dissolved Lead	Acute	1.2 x 90% x [1.46203 – 0.145712 x ln(hardness)] x $e^{[1.273 \times \ln(\text{hardness}) - 1.460]}$ x WER*	1 hour
		Chronic	1.2 x 90% x [1.46203 – 0.145712 x ln(hardness)] x $e^{[1.273 \times \ln(\text{hardness}) - 4.705]}$ x WER*	4 days
	Dissolved Zinc	Acute	1.2 x 90% x (0.978) x $e^{[0.8473 \times \ln(\text{hardness}) + 0.884]}$ x WER*	1 hour
		Chronic	1.2 x 90% x (0.986) x $e^{[0.8473 \times \ln(\text{hardness}) + 0.884]}$ x WER*	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER.

d. Specific Monitoring and Assessment Requirements

(a) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*, when it is amended to include monitoring requirements for the Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

(b) The Responsible Copermittees must monitor the effluent of the MS4 outfalls discharging to Chollas Creek for dissolved copper, lead, and zinc, and calculate or estimate the monthly and annual dissolved copper, lead, and zinc loads, in accordance with the requirements of Provisions D.1, D.4.a.(1)(b), and D.4.a.(3)(b) of this Order. The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2008-0027

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 11, 2008
State Water Board Approval Date:	June 16, 2009
Office of Administrative Law Approval Date:	September 15, 2009
US EPA Approval Date:	October 26, 2009

(3) TMDL Effective Date: September 15, 2009

(4) Watershed Management Areas: See Table 5.0

(5) Water Bodies: See Table 5.0

(6) Responsible Copermittees: See Table 5.0

Table 5.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County	Dana Point Harbor	Baby Beach	-City of Dana Point -County of Orange
San Diego Bay	San Diego Bay	Shelter Island Shoreline Park	-Unified Port of San Diego

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Receiving Water Limitations

(a) Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedules under Specific Provisions 5.c.(1)(a) and 5.c.(2):

Table 5.1
Receiving Water Limitations as Bacteria Densities in the Water Body

	Receiving Water Limitations	
Constituent	**Single Sample Maximum[1,2]**	**30-Day Geometric Mean[2]**
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.

(b) If the above receiving water limitations are not met in the receiving water, the Responsible Copermittees must demonstrate that the discharges from the MS4s are not causing or contributing to the violation of receiving water limitations. The Copermittee must provide data that demonstrate the discharges from the MS4s are meeting the effluent limitations under Specific Provision 5.b.(2).

(2) Effluent Limitations

Discharges from the MS4s must not contain densities that exceed the following effluent limitations by the end of the compliance schedules under Specific Provisions 5.c.(1)(a) and 5.c.(2) to demonstrate the discharge is not causing or contributing to a violation of receiving water quality standards:

Table 5.2
Effluent Limitations as Bacteria Densities in MS4 Discharges to the Water Body

	Effluent Limitations	
Constituent	**Single Sample Maximum[1,2]**	**30-Day Geometric Mean[2]**
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.

Interim effluent limitations expressed as pollutant loads are given in the compliance schedule under Specific Provision 5.c.

(3) Best Management Practices

(a) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 5.0 fulfill the Bacteria Load Reduction Plan (BLRP) requirements in Resolution No. R9-2008-0027.

(b) The Responsible Copermittee must implement BMPs capable of achieving the WQBELs under Specific Provision 5.0 for the segments or areas of the water bodies listed in Table 5.0

c. COMPLIANCE SCHEDULE

(1) Baby Beach in Dana Point Harbor

(a) WLA Compliance Dates

The Responsible Copermittees for MS4 discharges to Baby Beach are required to achieve the WLA, thus must be in compliance with the WQBELs under Specific Provision 5.0, according to the following compliance schedule:

Table 5.3
Compliance Schedule Dates to Achieve Baby Beach WLAs

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform	September 15, 2014	September 15, 2009
Fecal Coliform		September 15, 2009
Enterococcus		September 15, 2019

(b) Interim Compliance Requirements

The Responsible Copermittees for MS4 discharges to Baby Beach must comply with the following interim WQBELs by the interim compliance date:

Table 5.4
Interim Effluent Limitations as Loads in MS4 Discharges to Baby Beach

Constituent	Interim Compliance Date	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	~~45~~.9332x10^9 MPN/day	NA*
Fecal Coliform	September 15, 2012	0.59x10^9 MPN/day	NA*
Enterococcus	September 15, 2012	0.42x10^9 MPN/day	NA**
	September 15, 2016	NA*	207x10^9 MPN/30days

Notes:
* The WQBELs under Specific Provision 5.b must already be achieved by the given interim compliance date.
** There is no corresponding interim WQBEL for the given interim compliance date.

(2) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park is required to achieve the WLA, thus must be in compliance with the WQBELs under Specific Provision 5.0, by December 31, 2012.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) Monitoring Stations

(a) The Responsible Copermittees must designate the MS4 outfalls within their jurisdiction discharging to the segments or areas of the water bodies listed in Table 5.0 as high priority non-storm water MS4 monitoring stations, in accordance with the requirements of Provision D.1.

(b) The Responsible Copermittees must establish at least one monitoring station within the receiving water body.

(2) Monitoring Procedures

(a) The Responsible Copermittees must monitor the effluent of the designated MS4 outfalls within their jurisdiction discharging during dry weather conditions to the segments or areas of the water bodies listed in Table 5.0 in accordance with the dry weather jurisdictional monitoring requirements of Provision D.1.a.(1)(b). Samples required to be submitted to a laboratory for analysis must include analysis for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(b) The Responsible Copermittees must monitor, within the first 24 hours of each storm event,[19] the effluent of the designated MS4 outfalls within their jurisdiction discharging to the segments or areas of the water bodies listed in Table 5.0 in accordance with the wet weather jurisdictional monitoring requirements of Provision D.1.b.(1)(b) of this Order. Samples required to be submitted to a laboratory for analysis must include analysis for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(c) The Responsible Copermittees must collect samples from the monitoring stations within the receiving water body for each dry weather and wet weather MS4 outfall monitoring event. Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs have been achieved.

(b) The monitoring and assessment results must be submitted as part of the

[19] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

Annual Reports required under Provision F.3.b of this Order.

6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2010-0001

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 10, 2010
State Water Board Approval Date:	December 14, 2010
Office of Administrative Law Approval Date:	April 4, 2011
US EPA Approval Date:	June 22, 2011

(3) TMDL Effective Date: April 4, 2011

(4) Watershed Management Areas: See Table 6.0

(5) Water Bodies: See Table 6.0

(6) Responsible Copermittees: See Table 6.0

Table 6.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	-City of Laguna Beach -County of Orange -Orange County Flood Control District
		at Heisler Park - North	
	Pacific Ocean Shoreline	at Main Laguna Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Woods -County of Orange -Orange County Flood Control District
		Laguna Beach at Ocean Avenue	
		Laguna Beach at Cleo Street	
		Arch Cove at Bluebird Canyon Road	
		Laguna Beach at Dumond Drive	
	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Hills -City of Laguna Niguel -City of Laguna Woods -City of Lake Forest -City of Mission Viejo -County of Orange -Orange County Flood Control District
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	
	Aliso Creek Mouth	at mouth	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County (cont'd)	Pacific Ocean Shoreline	Aliso Beach at West Street	-City of Dana Point -City of Laguna Beach -City of Laguna Niguel -County of Orange -Orange County Flood Control District
		Aliso Beach at Table Rock Drive	
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)	
		at Salt Creek (large outlet)	
		Salt Creek Beach at Salt Creek service road	
		Salt Creek Beach at Strand Road	
	Pacific Ocean Shoreline	at San Juan Creek	-City of Dana Point -City of Laguna Hills -City of Laguna Niguel -City of Mission Viejo -City of Rancho Santa Margarita -City of San Juan Capistrano -County of Orange -Orange County Flood Control District
	San Juan Creek	lower 1 mile	
	San Juan Creek Mouth	at mouth	
	Pacific Ocean Shoreline	at Poche Beach	-City of San Clemente -County of Orange -Orange County Flood Control District
		Ole Hanson Beach Club Beach at Pico Drain	
		San Clemente City Beach at El Portal Street Stairs	
		San Clemente City Beach at Mariposa Street	
		San Clemente City Beach at Linda Lane	
		San Clemente City Beach at South Linda Lane	
		San Clemente City Beach at Lifeguard Headquarters	
		under San Clemente Municipal Pier	
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	
		San Clemente State Beach at Riviera Beach	
		Can Clemente State Beach at Cypress Shores	
San Luis Rey River	Pacific Ocean Shoreline	at San Luis Rey River mouth	-City of Oceanside -City of Vista -County of San Diego

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
Carlsbad	Pacific Ocean Shoreline	at Moonlight State Beach	-City of Carlsbad -City of Encinitas -City of Escondido -City of Oceanside -City of San Marcos -City of Solana Beach -City of Vista -County of San Diego
San Dieguito River	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	-City of Del Mar -City of Escondido -City of Poway -City of San Diego -City of Solana Beach -County of San Diego
Penasquitos	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	-City of Del Mar -City of Poway -City of San Diego -County of San Diego
		La Jolla Shores Beach at El Paseo Grande	-City of San Diego
		La Jolla Shores Beach at Caminito del Oro	
		La Jolla Shores Beach at Vallecitos	
		La Jolla Shores Beach at Avenida de la Playa	
		at Casa Beach, Children's Pool	
		South Casa Beach at Coast Boulevard	
		Whispering Sands Beach at Ravina Street	
		Windansea Beach at Vista de la Playa	
		Windansea Beach at Bonair Street	
		Windansea Beach at Playa del Norte	
		Windansea Beach at Palomar Avenue	
		at Tourmaline Surf Park	
		Pacific Beach at Grand Avenue	
	Tecolote Creek	Entire reach and tributaries	-City of San Diego

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I- Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
San Diego River	Forrester Creek	lower 1 mile	-City of El Cajon -City of La Mesa -City of Santee -County of San Diego
	San Diego River	lower 6 miles	-City of El Cajon -City of La Mesa -City of San Diego -City of Santee -County of San Diego
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	
San Diego Bay	Chollas Creek	lower 1.2 miles	-City of La Mesa -City of Lemon Grove -City of San Diego -County of San Diego

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for segments or areas of the water bodies listed in Table 6.0 consist of the following:

(1) Receiving Water Limitations

(a) Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedules under Specific Provision 6.c.(1):

Table 6.1
Receiving Water Limitations as Bacteria Densities and Allowable Exceedance Frequencies in the Water Body

	Receiving Water Limitations			
Constituent	Single Sample Maximum[1,2] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[3]	30-Day Geometric Mean[2] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform	10,000	22% / 0%	1,000	0%
Fecal Coliform	400	22% / 0%	200	0%
Enterococcus	104[4] / 61[5]	22% / 0%	35[4] / 33[5]	0%

Notes:
1. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
3. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. The 0% single sample maximum allowable exceedance frequency applies to dry weather days.
4. This *Enterococcus* receiving water limitation applies to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
5. This *Enterococcus* receiving water limitations applies to segments or areas of creeks or creek mouths listed in Table 6.0.

Interim receiving water limitations expressed as allowable exceedance frequencies are given in the compliance schedule under Specific Provision 6.c.

(b) If the above receiving water limitations are not met in the receiving water, the Responsible Copermittees must demonstrate that the discharges from the MS4s are not causing or contributing to the violation of receiving water limitations. The Copermittee must provide data that demonstrate the discharges from the MS4s are meeting the effluent limitations under Specific Provision 6.b.(2).

(2) Effluent Limitations

Discharges from the MS4s must not contain densities that exceed the following effluent limitations by the end of the compliance schedules under Specific Provision 6.c.(1) to demonstrate the discharge is not causing or contributing to a violation of receiving water quality standards:

Table 6.2
Effluent Limitations as Bacteria Densities and Allowable Exceedance Frequencies in MS4 Discharges to the Water Body

	Effluent Limitations			
Constituent	Single Sample Maximum[1,2] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[3]	30-Day Geometric Mean[2] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform	10,000	22% / 0%	1,000	0%
Fecal Coliform	400	22% / 0%	200	0%
Enterococcus	104[4] / 61[5]	22% / 0%	35[4] / 33[5]	0%

Notes:
1. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.
3. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. The 0% single sample maximum allowable exceedance frequency applies to dry weather days
4. This *Enterococcus* effluent limitation applies to MS4 discharges to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
5. This *Enterococcus* effluent limitation applies to MS4 discharges to segments or areas of creeks or creek mouths listed in Table 6.0.

Interim effluent limitations expressed as allowable exceedance frequencies are given in the compliance schedule under Specific Provision 6.c.

(3) Best Management Practices

(a) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 6.0 fulfill the Comprehensive Load Reduction Plan (CLRP) requirements in Resolution No. R9-2010-0001.

(b) The Responsible Copermittee must implement BMPs capable of achieving the WQBELs under Specific Provision 6.b for the segments or areas of the water bodies listed in Table 6.0.

(c) The Responsible Copermittees should coordinate the BMPs to address this TMDL with Caltrans and owners/operators of small MS4s wherever and whenever possible.

c. COMPLIANCE SCHEDULE

(1) WLA Compliance Dates

The Responsible Copermittees for MS4 discharges to a segment or area of the water bodies listed in Table 6.0 are required to achieve the WLA, thus must be in compliance with the WQBELs under Specific Provision 6.b, according to the following compliance schedule:

Table 6.3
Compliance Schedule Dates to Achieve Indicator Bacteria WLAs

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform	April 4, 2021	April 4, 2031
Fecal Coliform		
Enterococcus		

(2) Interim Compliance Requirements

The Responsible Copermittees must comply with the following interim WQBELs by the interim compliance dates:

(a) Interim Dry Weather WQBELs

The Responsible Copermittee must calculate the "existing" exceedance frequencies of the 30-day geometric mean water quality objectives for each of the indicator bacteria by analyzing the monitoring data collected between January 1, 2002 and April 4, 2011. "Existing" exceedance frequencies may be calculated by segment or area of a water body, or by water body, and/or by Watershed Management Area listed in Table 6.0. Separate "existing" exceedance frequencies must be calculated for beaches and creeks/creek mouths.

The Responsible Copermittees must achieve a 50 percent reduction in the "existing" exceedance frequency of the 30-day geometric mean WQBELs for the segments or areas of the water bodies listed in Table 6.0 by the interim compliance dates for achieving the interim dry weather WQBELs given in Table 6.5. A 50 percent reduction in the "existing" exceedance frequency is equivalent to half of the "existing" exceedance frequency of the 30-day geometric mean WQBELs.

The "existing" exceedance frequencies and the interim dry weather allowable exceedance frequencies (i.e. interim dry weather WQBELs) calculated by the Responsible Copermittees must be included in the Water Quality Improvement Plans for the applicable Watershed Management Areas.

(b) Interim Wet Weather WQBELs

The Responsible Copermittees must achieve the interim wet weather WQBELs in Table 6.4, expressed as interim allowable exceedance frequencies, by the interim compliance dates for achieving the interim wet weather WQBELs given in Table 6.5.

Table 6.4
Interim Wet Weather WQBELs Expressed as
Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	38%	37%	39%
		at Heisler Park - North			
	Pacific Ocean Shoreline	at Main Laguna Beach			
		Laguna Beach at Ocean Avenue			
		Laguna Beach at Cleo Street			
		Arch Cove at Bluebird Canyon Road			
		Laguna Beach at Dumond Drive			
	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	41%	41%	42%
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	41%	41%	42%
	Aliso Creek Mouth	at mouth	41%	41%	42%
	Pacific Ocean Shoreline	Aliso Beach at West Street	36%	36%	36%
		Aliso Beach at Table Rock Drive			
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)			
		at Salt Creek (large outlet)			
		Salt Creek Beach at Salt Creek service road			
		Salt Creek Beach at Strand Road			

Table 6.4 (Cont'd)
Interim Wet Weather WQBELs Expressed as
Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County (cont'd)	Pacific Ocean Shoreline	at San Juan Creek	44%	44%	48%
	San Juan Creek	lower 1 mile	44%	44%	47%
	San Juan Creek Mouth	at mouth	44%	44%	47%
	Pacific Ocean Shoreline	at Poche Beach	35%	35%	36%
		Ole Hanson Beach Club Beach at Pico Drain			
		San Clemente City Beach at El Portal Street Stairs			
		San Clemente City Beach at Mariposa Street			
		San Clemente City Beach at Linda Lane			
		San Clemente City Beach at South Linda Lane			
		San Clemente City Beach at Lifeguard Headquarters			
		under San Clemente Municipal Pier			
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)			
		San Clemente State Beach at Riviera Beach			
		Can Clemente State Beach at Cypress Shores			
San Luis Rey River	Pacific Ocean Shoreline	at San Luis Rey River mouth	45%	44%	47%
Carlsbad	Pacific Ocean Shoreline	at Moonlight State Beach	40%	40%	41%
San Dieguito River	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	33%	33%	36%

Table 6.4 (Cont'd)
Interim Wet Weather WQBELs Expressed as
Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
Penasquitos	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	26%	26%	26%
	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	37%	37%	37%
		La Jolla Shores Beach at Caminito del Oro			
		La Jolla Shores Beach at Vallecitos			
		La Jolla Shores Beach at Avenida de la Playa			
		at Casa Beach, Children's Pool			
		South Casa Beach at Coast Boulevard			
		Whispering Sands Beach at Ravina Street			
		Windansea Beach at Vista de la Playa			
		Windansea Beach at Bonair Street			
		Windansea Beach at Playa del Norte			
		Windansea Beach at Palomar Avenue			
		at Tourmaline Surf Park			
		Pacific Beach at Grand Avenue			
	Tecolote Creek	Entire reach and tributaries	49%	49%	51%
San Diego River	Forrester Creek	lower 1 mile	46%	43%	49%
	San Diego River	lower 6 miles	46%	43%	49%
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	46%	43%	51%
San Diego Bay	Chollas Creek	lower 1.2 miles	41%	41%	43%

(c) Interim WQBEL Compliance Dates

The Responsible Copermittees must achieve the interim WQBELs under Specific Provisions 6.c.(2)(a) and 6.c.(2)(b) by the interim compliance dates given in Table 6.5.

Table 6.5
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs
South Orange County	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	April 4, 2016	April 4, 2021
		at Heisler Park - North		
	Pacific Ocean Shoreline	at Main Laguna Beach	April 4, 2016	April 4, 2021
		Laguna Beach at Ocean Avenue		
		Laguna Beach at Cleo Street		
		Arch Cove at Bluebird Canyon Road		
		Laguna Beach at Dumond Drive		
	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	April 4, 2016	April 4, 2021
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	April 4, 2018	April 4, 2021
	Aliso Creek Mouth	at mouth	April 4, 2018	April 4, 2021
	Pacific Ocean Shoreline	Aliso Beach at West Street	April 4, 2016	April 4, 2021
		Aliso Beach at Table Rock Drive		
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)		
		at Salt Creek (large outlet)		
		Salt Creek Beach at Salt Creek service road	April 4, 2017	April 4, 2021
		Salt Creek Beach at Strand Road	April 4, 2017	April 4, 2021

Table 6.5 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs
South Orange County (cont'd)	Pacific Ocean Shoreline	at San Juan Creek	April 4, 2016	April 4, 2021
	San Juan Creek	lower 1 mile	April 4, 2018	April 4, 2021
	San Juan Creek Mouth	at mouth	April 4, 2016	April 4, 2021
	Pacific Ocean Shoreline	at Poche Beach	April 4, 2016	April 4, 2021
		Ole Hanson Beach Club Beach at Pico Drain	April 4, 2016	April 4, 2021
		San Clemente City Beach at El Portal Street Stairs	April 4, 2017	April 4, 2021
		San Clemente City Beach at Mariposa Street		
		San Clemente City Beach at Linda Lane	April 4, 2016	April 4, 2021
		San Clemente City Beach at South Linda Lane	April 4, 2018	April 4, 2021
		San Clemente City Beach at Lifeguard Headquarters	April 4, 2017	April 4, 2021
		under San Clemente Municipal Pier		
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	April 4, 2018	April 4, 2021
		San Clemente State Beach at Riviera Beach	April 4, 2016	April 4, 2021
		Can Clemente State Beach at Cypress Shores	April 4, 2017	April 4, 2021
San Luis Rey River	Pacific Ocean Shoreline	at San Luis Rey River mouth	April 4, 2017	April 4, 2021
Carlsbad	Pacific Ocean Shoreline	at Moonlight State Beach	April 4, 2016	April 4, 2021
San Dieguito River	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	April 4, 2016	April 4, 2021

Table 6.5 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs
Penasquitos	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	April 4, 2016	April 4, 2021
		La Jolla Shores Beach at El Paseo Grande		
		La Jolla Shores Beach at Caminito del Oro		
		La Jolla Shores Beach at Vallecitos		
		La Jolla Shores Beach at Avenida de la Playa		
		at Casa Beach, Children's Pool		
		South Casa Beach at Coast Boulevard		
		Whispering Sands Beach at Ravina Street		
		Windansea Beach at Vista de la Playa		
		Windansea Beach at Bonair Street		
		Windansea Beach at Playa del Norte		
		Windansea Beach at Palomar Avenue		
		at Tourmaline Surf Park		
		Pacific Beach at Grand Avenue		
	Tecolote Creek	Entire reach and tributaries		
San Diego River	Forrester Creek	lower 1 mile	April 4, 2018	April 4, 2021
	San Diego River	lower 6 miles		
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach		
San Diego Bay	Chollas Creek	lower 1.2 miles	April 4, 2018	April 4, 2021

d. Specific Monitoring and Assessment Requirements

(1) Monitoring and Assessment Requirements for Beaches

(a) Monitoring Stations

(i) The Responsible Copermittees must designate the MS4 outfalls within their jurisdiction discharging to the Pacific Ocean Shoreline segments or areas listed in Table 6.0 as high priority non-storm water MS4 monitoring stations, in accordance with the requirements of Provision D.1 of this Order.

(ii) For the Pacific Ocean Shoreline segments or areas listed in Table 6.0 with MS4 outfalls, the Responsible Copermittees must establish at least one monitoring station within the receiving water.

(b) Monitoring Procedures

(i) The Responsible Copermittees must monitor the effluent of the designated MS4 outfalls within their jurisdiction discharging during dry weather to the Pacific Ocean Shoreline segments or areas listed in Table 6.0 in accordance with the dry weather jurisdictional monitoring requirements of Provision D.1.a.(1)(b) of this Order. Samples required to be submitted to a laboratory for analysis must include analysis for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(ii) The Responsible Copermittees must monitor, within the first 24 hours of each storm event,[20] the effluent of the designated MS4 outfalls within their jurisdiction discharging to the Pacific Ocean Shoreline segments or areas listed in Table 6.0 in accordance with the wet weather jurisdictional monitoring requirements of Provision D.1.b.(1)(b) of this Order. Samples required to be submitted to a laboratory for analysis must include analysis for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(iii) The Responsible Copermittees must collect samples from the monitoring stations within the receiving water body for each dry weather and wet weather MS4 outfall monitoring event. Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs for the Pacific Ocean Shoreline segments or areas listed in Table 6.0 have been achieved.

(ii) The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

[20] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(2) Monitoring and Assessment Requirements for Creeks and Creek Mouths

(a) Monitoring Stations

(i) The Responsible Copermittees must establish at least one receiving water monitoring station at or near the mouth of the creeks listed in Table 6.0.

(ii) The Responsible Copermittees must establish at least one receiving water monitoring station upstream of the station established for Specific Provision 6.d.(2)(a)(i). At least one monitoring station must be established for each Responsible Copermittee at the most downstream location within its jurisdiction, and one monitoring station at the most upstream location within its jurisdiction.

(iii) The Responsible Copermittees must identify the MS4 outfalls discharging to the segments or areas of the creeks and creek mouths listed in Table 6.0. The Responsible Copermittees must identify the MS4 outfalls that are monitored in accordance with the dry weather jurisdictional monitoring requirements of Provision D.1.a.(1)(b) of this Order and the wet weather jurisdictional monitoring requirements of Provision D.1.b.(1)(a) of this Order.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations within the first 24 hours of each storm event.[21]

(iii) Samples collected from receiving water monitoring stations must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the receiving water monitoring data to assess whether the interim and final receiving water WQBELs for the creeks and creek mouths listed in Table 6.0 have been achieved.

[21] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(ii) If the receiving water WQBELs for the creeks and creek mouths listed in Table 6.0 have not been achieved, the Responsible Copermittees must review the MS4 outfall monitoring data to assess whether the interim and final effluent WQBELs have been achieved.

(iii) The Responsible Copermittee must identify and incorporate additional MS4 outfall and receiving water monitoring stations and/or adjust monitoring frequencies to identify sources causing exceedances of the receiving water WQBELs.

(iv) The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

Walsh, Laurie@Waterboards

From: Jack Monger <Jack.Monger@IEA-sd.com>
Sent: Friday, September 14, 2012 4:04 PM
To: Walsh, Laurie@Waterboards
Subject: Comments for Draft MS4 Permit
Attachments: IEA Comments_Regional MS4 Permit_FINAL.docx

Hello Laurie,

Please find our comment letter attached.

Feel free to contact me if you have any questions.

Best regards,

Jack

JACK MONGER
EXECUTIVE DIRECTOR
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**** *** *** *** *** *** *** ****
2012 STATEWIDE ENVIRONMENTAL SUMMIT
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INDUSTRIAL
ENVIRONMENTAL
ASSOCIATION

September12, 2012

VIA E-MAIL AND HAND DELIVERY

Ms. Laurie Walsh
WRC Engineer
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, California 92123-4340

RE: NPDES Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region (Regional MS4 Permit) (Order No. R9-2012-0011)

Dear Ms. Walsh,

Please accept the following comments on behalf of the The Industrial Environmental Association (IEA) with regard to the draft language for the new Regional MS4 Permit.

IEA was formed in 1983 to promote responsible, cost-effective environmental laws and regulations, facilitate environmental compliance among member companies and provide related education activities for the community at large. IEA actively insists on strong environmental compliance efforts among member companies as a matter of written policy. Further, IEA urges reliance on scientific, analytical data to evaluate the regulations necessary to protect the public and the environment. Accordingly, IEA has reviewed the administrative draft Regional MS4 Permit and presents the following comments.

1. **Overall Methodology**- In general, IEA supports a Regional MS4 Permit promoting an adaptive planning and management process that allows implementation of appropriate strategies, control measures, and best management practices (BMPs) to protect and preserve water quality and suitable beneficial uses of waters of the state.

2. **Water Quality Improvement Plan Approach-** IEA recognizes the general intent of the Water Quality Improvement Plans (Section II. B.) is for Copermittees to develop focused watershed-based plans to identify water quality conditions and issues, develop priorities, establish strategies and schedules, and implement adaptive processes to carry out prioritized actions to improve water quality. IEA welcomes the opportunity to participate in the Water Quality Improvement Plan development process and

collaborate with Copermittees to develop targeted and cost-efficient strategies and assessment metrics aimed at water quality improvement.

3. **Monitoring and Assessment**- IEA recognizes a key goal of an effective Monitoring and Assessment framework (Section II. D.) is the collection of precise and useful data to inform stakeholders about water quality conditions in discharges and receiving waters. It is presumed that this data will allow for focused implementation actions and water quality improvement strategies. IEA is concerned that the current monitoring framework, although extensive, may not provide cost-effective informed data to guide future actions. Accordingly, IEA supports stakeholder involvement in developing a more strategic, cost-effective, question-driven monitoring approach. The approach should incorporate short-, medium-, and long-term goals and outline procedures to collect comparable data across watersheds/jurisdictions that allows for future statistical assessments. Short-term goals can include discharge and receiving water characterization to understand current conditions and track progress. Medium-term goals can include planning for Clean Water Act Section 303(d) listings/delistings and best available science-based TMDL development. Long-term goals can include collecting data appropriate for development of site-specific water quality objectives and potential revisions to Basin Plan objectives.

4. **Non-Storm Water Discharges**- IEA recognizes the Regional MS4 Permit intent to reduce transport of pollutants through elimination of non-storm water discharges (Section II. E. 2.). IEA supports the Regional MS4 Permit implementation approach for certain categories of non-storm water discharges. Specifically, the Regional MS4 Permit currently specifies that air conditioner condensation is a non-storm water discharge that must be directed to landscaped areas or other pervious surfaces *where feasible* (emphasis added). IEA members have previously independently evaluated this potential action and have identified potentially significant costs for compliance. A case study in the Los Penasquitos watershed estimated that due to current system configuration, re-routing the condensation line at one building facility would require ~$12,000 investment. For these reasons, it is suggested that these designs are limited to development/re-development, unless otherwise required by the Water Quality Improvement Plans. Also, non-emergency firefighting flows from controlled or practice blazes and fire suppression equipment maintenance activities can be treated with BMPs and in such cases should not be considered an illicit discharge.

   The Regional MS4 Permit appears to use the terms "illicit discharges" and "non-storm water discharges" interchangeably throughout the draft Permit. These terms have different meanings and cannot be used interchangeably. The Regional MS4 Permit definition of illicit discharges excludes discharges subject to NPDES permits and discharges resulting from firefighting activities. Therefore, these non-storm water discharges are not illicit discharges and are authorized discharges to MS4s. However, Finding 7 of the Regional MS4 Permit states: "The federal regulations [40 CFR 122.26(d)(2)(iv)(b)] require the Copermittees to have a program to prevent all types of non-storm water discharges, or illicit discharges, from entering the MS4". This finding incorrectly equates non-storm water discharges and illicit discharges and is inconsistent with federal regulations [40 CFR 122.26(d)(2)(iv)(b)]. Whereas under federal regulation, the Copermittees' program must address illicit discharges (which do not include discharges made pursuant to NPDES permits and discharges resulting from firefighting activities), the Regional MS4 Permit would incorrectly expand this "all types of non-storm water discharges". Further, the Regional MS4 Permit definition of "non-storm water discharges" states: All discharges to and from a MS4 that do not originate from precipitation events (i.e., all discharges from a MS4 other than storm

water). Non-storm water includes illicit discharges and NPDES permitted discharges". Including "NPDES permitted discharges" in the definition of "non-storm water" could lead to the incorrect conclusion that, because the permit states that discharges of non-storm water to MS4s need to be prohibited, NPDES permitted discharges must be prohibited. IEA urges the RWQCB to revise the Regional MS4 Permit to eliminate this confusion and to clarify that discharges made pursuant to NPDES permits and discharges resulting from firefighting activities are not required to be prevented.

Further, the discharges need to be authorized to areas of the MS4 that discharge to ASBS as provided for in the SWRCB ASBS exception. Attachment A Section 2. A. 1. e. (non-storm water discharges to MS4s that discharge to ASBS), is missing the final language adopted into the ASBS exception that allows non-storm water discharges that do not affect natural water quality. The Regional MS4 Permit needs to find that these permitted discharges are authorized.

5. **Development Planning**- IEA supports the implementation of cost-effective methods to: "reduce the discharge of pollutants in storm water to the maximum extent practicable (MEP) and effectively prohibit non-storm water discharges to provide the *reasonable* protection, preservation, enhancement, and restoration of water quality and designated beneficial uses of waters of the state" (emphasis added). IEA supports the business and development community in requesting the Development Planning (Section II. E. 3.) criteria for technical infeasibility and mitigation requirements for projects deemed technically infeasible be carefully examined. Given the poor soil infiltration rates in much of San Diego County, many development projects will likely demonstrate technical infeasibility in implementing cost-effective Low Impact Development (LID) and hydromodification controls. The process currently identified in the Regional MS4 Permit does not provide sufficient detail for consistency among Copermittees in evaluating technical infeasibility conditions and implementation of feasible mitigation alternatives. IEA supports development of a stakeholder-lead Technical Advisory Committee to assist in the revision of Section II. E. 3. to meet multiple objectives for both improved water quality and consideration of site-specific conditions and economic constraints.

   Further, linear underground/overhead projects, as defined in the State Water Resources Control Board (SWRCB) Construction General Permit, are exempt from post-construction BMPs. The Regional MS4 Permit needs to maintain consistency with the Construction General Permit on this issue.

6. **Existing Development Management-Inspections-** In general, IEA recognizes the importance of Copermittee inspection activities at inventoried existing development to ensure compliance with applicable local ordinances and permits and the Regional MS4 Permit. However, the draft Regional MS4 Permit currently states that inventoried existing development must be inspected within six months of any change in property ownership or change in pollutant generating activity [Section II. E. 5.d.(1).(a)]. Through the course of normal business operations, many IEA members make periodic adjustments to industrial processes, materials and handling procedures. Accordingly, in accordance with the state Industrial General Permit and local Copermittee ordinances, the facility Storm Water Pollution Prevention Plan is amended to reflect operations and other changes with potential to impact storm water quality discharging from the site.

   As written, the Regional MS4 Permit requires that Copermittees re-inspect facilities after these relatively minor changes that would potentially be considered a "change in pollutant generating activity". The

potential increase in inspection frequency is an undue burden on both the Copermittees and the inspected facility. Accordingly, IEA recommends that Section II. E. 5.d.(1).(a) be revised to remove the provision that re-inspection be required after changes in pollutant generating activity at an existing development facility.

Thank you for the opportunity to comment regarding the draft language for the MS4 Permit. On behalf of IEA's 61 member companies, I appreciate your consideration.

Sincerely,

Jack Monger
Executive Director

Walsh, Laurie@Waterboards

From: Garrison, Noah <ngarrison@nrdc.org>
Sent: Friday, September 14, 2012 3:19 PM
To: Walsh, Laurie@Waterboards; Chiu, Wayne@Waterboards
Cc: Kheyfets, Anna; Colin Kelly; jill@sdcoastkeeper.org
Subject: NRDC Comment on Draft San Diego Regional MS4 Permit
Attachments: NRDC SD Regional MS4 Comment (9-14-12 FINAL).pdf; EPA - Reducing Stormwater Costs through LID Strategies and Practices.pdf; LA County Mun Stormwater BS 080548.pdf; EPA - 2011 Fact Sheet NPDES MS4 Permit No DC0000221.pdf; State of West Virginia DEP - General NPDES Permit No WV0116025.pdf; Horner Gretz - 12-2011 Investigation of Feasibility and Benefits of LID.pdf; Horner - Investigation of Feasibility and Benefits of LID for Ventura County.pdf; Horner - 2007 Initial Investigation of the Feasibility and Benefits of LID for the SF Bay Area.pdf; Horner - 2007 Supplementary Investigation of the Feasibility and Benefits of LID for the SF Bay Area.pdf; ECONorthwest - Economics of LID-A Literature Review.pdf; American Society of Landscape Architects - Advocacy-Stormwater Overview Webpage.pdf; ECONorthwest - Managing Stormwater in Redevelopment and Greenfield using GI.pdf; BASMAA - 12-1-2010 Model Bioretention Soil Media Specifications-MRP Provision.pdf

Dear Ms. Walsh,

Attached, please find a comment letter from the NRDC on the April 9, 2012 Administrative Draft of the San Diego Region MS4 Permit and supporting documents. Two emails with additional supporting documents will follow this message. Please do not hesitate to contact me with any questions you may have,

Sincerely,

Noah Garrison

Noah Garrison
Project Attorney - Water Program
Natural Resources Defense Council
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September 14, 2012

Via electronic mail

Mr. David Gibson
Executive Officer and Members of the Board
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123
Email: lwalsh@waterboards.ca.gov

Re: Comments on Tentative Order R9-2012-0011, San Diego Region MS4 Permit, April 9, 2012 Draft

Dear Mr. Gibson:

On behalf of the Natural Resources Defense Council ("NRDC"), we are writing with regard to the April 9, 2012, Draft National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds Within the San Diego Region, Draft permit R9-2012-0011, NPDES Permit No. CAS0109266 ("Draft Permit"). We appreciate the opportunity to submit these comments to the San Diego Regional Water Quality Control Board ("Regional Board") on the Draft permit.

I. Stormwater Runoff is a Leading Source of Water Pollution in the San Diego Region

The U.S. Environmental Protection Agency ("U.S. EPA") considers urban runoff to be "one of the most significant reasons that water quality standards are not being met nationwide."[1] As the U.S. EPA has stated:

> Most stormwater runoff is the result of the man-made hydrologic modifications that normally accompany development. The addition of impervious surfaces, soil compaction, and tree and vegetation removal result in alterations to the movement of water through the environment. As interception, evapotranspiration, and infiltration are reduced and precipitation is converted to overland flow, these modifications affect not only the characteristics of the developed site but also the watershed in

[1] U.S. General Accounting Office (June 2001) *Water Quality: Urban Runoff Programs*, Report No. GAO-01-679.

> which the development is located. Stormwater has been identified as one of the leading sources of pollution for all waterbody types in the United States. Furthermore, the impacts of stormwater pollution are not static; they usually increase with more development and urbanization.[2]

In the San Diego Region, the Regional Board has found that:

- Land development has created and continues to create new sources of non-storm water discharges and pollutants in storm water discharges as human population density increases. This brings higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash. Pollutants from these sources are dumped or washed off the surface by non-storm water or storm water flows into and from the MS4s (Draft Permit, at Finding 11);

- [C]ommon pollutants in runoff discharged from the MS4s include total suspended solids, sediment, pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., cadmium, copper, lead, and zinc), petroleum products and polynuclear aromatic hydrocarbons, synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus), oxygen-demanding substances (decaying vegetation, animal waste), detergents, and trash (Draft Permit, at Finding 13); and,

- Copermittees' water quality monitoring data submitted to date documents persistent exceedances of Basin Plan water quality objectives for runoff-related pollutants at various watershed monitoring stations. Persistent toxicity has also been observed at several watershed monitoring stations. In addition, bioassessment data indicate that the majority of the monitored receiving waters have Poor to Very Poor Index of Biotic Integrity (IBI) ratings. These findings indicate that runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in the San Diego Region. (Draft Permit, at Finding 15.)

The Draft Permit establishes requirements critical to addressing this pollution.

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[2] U.S. Environmental Protection Agency (December 2007) *Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices*, at v.

II. Pollutants in Stormwater Must be Reduced to the Maximum Extent Practicable

Consistent with the federal Clean Water Act, a fundamental goal of all municipal stormwater permits is to ensure that discharges from storm sewers do not cause or contribute to a violation of water quality standards. (33 U.S.C. § 1341.) In addition, for MS4s covered under the National Pollutant Discharge Elimination System program, permits for discharges from municipal storm sewers:

> shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants.

(33 U.S.C. § 1342(p)(3)(B)(iii).) The maximum extent practicable ("MEP") standard serves effectively as a floor to performance for regulated parties. This standard does not grant unbridled leeway to Permittees in developing controls to reduce the discharge of pollution. "[W]hat the discharger will do to reduce discharges to the 'maximum extent practicable' . . . crosses the threshold from being an item of procedural correspondence to being a substantive requirement of a regulatory regime." (*Environmental Defense Center, Inc. v. U.S. E.P.A* (9th Cir. 2003) 344 F.3d 832, 853.) The MEP standard "imposes a clear duty on the agency to fulfill the statutory command to the extent that it is feasible or possible." (*Defenders of Wildlife v. Babbitt,* 130 F. Supp. 2d 121, 131 (D.D.C. 2001); *Friends of Boundary Waters Wilderness v. Thomas,* 53 F.3d 881, 885 (8th Cir. 1995) ("feasible" means "physically possible").

As one state hearing board held:

> [MEP] means to the fullest degree technologically feasible for the protection of water quality, except where costs are wholly disproportionate to the potential benefits…. This standard requires more of Permittees than mere compliance with water quality standards or numeric effluent limitations designed to meet such standards…. The term "maximum extent practicable" in the stormwater context implies that the mitigation measures in a stormwater permit must be more than simply adopting standard practices. This definition applies particularly in areas where standard practices are already failing to protect water quality….

(*North Carolina Wildlife Fed. Central Piedmont Group of the NC Sierra Club v. N.C. Division of Water Quality* (N.C.O.A.H. October 13, 2006) 2006 WL 3890348, Conclusions of Law 21-22 (internal citations omitted).) The North Carolina board further found that the permits in question violated the MEP standard both because commenters highlighted measures that would reduce pollution more effectively than the permits' requirements and because other controls, such as infiltration measures, "would [also]

reduce discharges more than the measures contained in the permits." (*Id.* at Conclusions of Law 19.)

Nor is MEP a static requirement—the standard anticipates and in fact requires new and additional controls to be included with each successive permit. As U.S. EPA has explained, NPDES permits, including the MEP standard, will "evolve and mature over time" and must be flexible "to reflect changing conditions." (55 Fed. Reg. 47990, 48052.) "EPA envisions application of the MEP standard as an iterative process. MEP should continually adapt to current conditions and BMP effectiveness and should strive to attain water quality standards. Successive iterations of the mix of BMPs and measurable goals will be driven by the objective of assuring maintenance of water quality standards." (64 Fed. Reg. 68722, 68754.) In other words, successive iterations of permits for a given jurisdiction will necessarily evolve, and contain new, and more stringent requirements for controlling the discharge of pollutants in runoff.

Requiring compliance with MEP is often synonymous with achieving water quality standards and other common permit terms. Nonetheless, permits also require "such other provisions as the Administrator or the State determines appropriate for the control of such pollutants." This language in section 1342(p) has been held by California courts to grant "the EPA (and/or a state approved to issue the NPDES permit) . . . the discretion to impose 'appropriate' water pollution controls in addition to those that come within the definition of 'maximum extent practicable.'" (*Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 883 (citing *Defenders of Wildlife v. Browner* (1999) 191 F.3d 1159, at 1165–1167).) As a result, while the MEP standard represents a statutory floor, rather than limit, for permit requirements, the Regional Board and EPA maintain the authority to impose additional restrictions over and above MEP as they determine appropriate. Both California and EPA maintain that MS4 permits must include provisions to ensure that discharges do not cause or contribute to exceedances of water quality standards.

III. <u>Permit Provisions</u>

A. The Draft Permit's Receiving Water Limitations Appropriately Prohibit Discharges that Cause or Contribute to the Violation of Water Quality Standards.

Consistent with the 2007 San Diego County MS4 Permit and federal authority,[3] the Draft Permit requires that "Discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters." (Draft Permit, at § II.A.2.a.)[4] Multiple California and federal courts have upheld such provisions, including in prior

[3] Order No. R9-2007-0001 ("2007 San Diego Permit").
[4] See, 2007 San Diego Permit, at § A.3; see also, South Orange County MS4 Permit, Order No. R9-2009-0002, at § A.3.

iterations of the San Diego MS4 Permit.[5] As such, the prohibition against discharges that cause or contribute to violations of water quality standards is appropriately incorporated into the Draft Permit's receiving water limitations here. Moreover, any weakening of the receiving water limitations language would constitute a violation of the Clean Water Act's anti-backsliding provisions.[6] The adopted permit must require compliance with water quality standards, without restriction.

B. The Draft Permit's Development Planning Requirements Must Require On-Site Retention of the 85th Percentile Storm

We strongly support that the Draft Permit establishes requirements for new development and redevelopment projects to retain, on-site, the runoff from the 85th percentile, 24-hour rain event.[7] This requirement, resulting in retention of stormwater runoff with no off-site discharge in the vast majority of storms, is consistent with on-site retention requirements of other permits throughout California, as well as in permits and ordinances found in all corners of the United States. Similar or more stringent requirements are included in the following permits:

Ventura County: MS4 permit requires on-site retention of ninety-five percent of rainfall from the 85th percentile storm; off-site mitigation allowed if on-site retention is technically infeasible;[8]

South Orange County: MS4 permit requires on-site retention of the 85th percentile storm, off-site mitigation allowed if on-site retention is technically infeasible;[9]

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[5] *See, e.g.*, *Building Industry Ass'n of San Diego County*, 124 Cal.App.4th at 883; *In re L.A. County Mun. Storm Water Permit Litigation.*, No. BS 080548 at 4-7 (L.A. Super. Ct. Mar. 24, 2005) ("*L.A. County Mun. Stormwater*"); *County of Los Angeles v. Cal. State Water Res. Control Bd.* (2006) 143 Cal.App.4th 985, 989; *Natural Resources Defense Council v. County of Los Angeles* (2011) 673 F.3d 880, 897. The court in *In re L.A. County Mun. Stormwater* noted that, "the Regional Board acted within its authority when it included Parts 2.1 and 2.2 in the Permit without a 'safe harbor,' whether or not compliance therewith requires efforts that exceed the 'MEP' standard." (*In re L.A. County Mun. Stormwater*, at 7.) But regardless of this authority, the Court found that "the terms of the Permit taken, as a whole [including the Permit's receiving water limitations], constitute the Regional Board's definition of MEP." (*Id*. at 7-8.)

[6] 40 C.F.R. 122.44(l)(1) provides that except for a narrow set of enumerated circumstances, "when a permit is renewed or reissued, interim effluent limitations, standards, or conditions must be at least as stringent as the final effluent limitations, standards, or conditions in the previous permit."

[7] We note, however, that the evidence presented below, including reports from Dr. Richard Horner and examples of permits and ordinances from other jurisdictions, would support requirements for projects to retain runoff from up to and including the 95th percentile storm event.

[8] Los Angeles Regional Water Quality Control Board (July 8, 2010) Ventura County Municipal Separate Stormwater National Pollutant Discharge Elimination System (NPDES) Permit; Order No. R4-2009-0057; NPDES Permit No. CAS004002.

[9] San Diego Regional Water Quality Control Board (December 16, 2009) South Orange County MS4 Permit, Order No. R9-2009-0002, NPDES Permit No. CAS0108740.

Washington D.C.: MS4 permit requires retention of the first 1.2 inches of stormwater (which represents the 90th percentile storm) for all new development and redevelopment over 5,000 square feet.[10]

West Virginia: Statewide Phase II MS4 permit requires on-site retention of "the first one inch of rainfall from a 24-hour storm" event unless infeasible;[11] and,

Philadelphia, PA: Infiltrate the first one inch of rainfall from all impervious surfaces; if on-site infiltration is infeasible, the same performance must be achieved off-site.[12]

These jurisdictions have recognized the paramount importance of mandating onsite retention of a certain quantity of stormwater since, in contrast to retention practices, which ensure that 100 percent of the pollutant load in the retained volume of runoff does not reach receiving waters, biofiltration (or other LID flow-through) practices that treat and then discharge runoff through an underdrain result in the release of pollutants to receiving waters. Indeed, in order to achieve equivalent pollutant load reduction benefits to the use of on-site retention, biofiltration practices would have to be 100 percent effective at filtering pollutants from runoff, which they are invariably not. As a result, while biofiltration practices (or conventional flow-through) practices may be appropriate for on-site treatment when coupled with an offsite mitigation requirement in cases of technical infeasibility (discussed further below), they are not a proper substitute for LID practices that retain water on-site.

This conclusion is borne out by data presented in the Draft Ventura County Technical Guidance Manual, which estimates pollutant removal efficiency for total suspended solids to be 54-89 percent, and for total zinc to be 48-96 percent.[13] Biofiltration has additionally been shown to be a particularly ineffective method of pollutant removal for addressing nitrogen or phosphorous, two common contaminants found in stormwater.[14] The Draft Ventura Technical Guidance, for example, indicates that biofiltration achieves

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[10] U. S. EPA (2011) Fact Sheet, National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Permit No. DC0000221 (Government of the District of Columbia).

[11] State of West Virginia Department of Environmental Protection, Division of Water and Waste Management, General National Pollution Discharge Elimination System Water Pollution Control Permit, NPDES Permit No. WV0116025 at 13-14 (June 22, 2009).

[12] City of Philadelphia (Jan. 29, 2008) Stormwater Management Guidance Manual 2.0, at 1.1, available at.

[13] Ventura County Low Impact Development Technical Guidance Manual, July 13, 2011, at D-7.

[14] Lawn irrigation has been identified as a "hot spot" for nutrient contamination in urban watersheds—lawns "contribute greater concentrations of Total N, Total P and dissolved phosphorus than other urban source areas . . . source research suggests that nutrient concentrations in lawn runoff can be as much as four times greater than other urban sources such as streets, rooftops or driveways." Center for Watershed Protection (March 2003) *Impacts of Impervious Cover on Aquatic Systems* at 69; see also H.S. Garn (2002) *Effects of lawn fertilizer on nutrient concentration in runoff from lakeshore lawns, Lauderdale Lakes, Wisconsin*. U.S. Geological Survey Water- Resources Investigations Report 02-4130 (In an investigation of runoff from lawns in Wisconsin, runoff from fertilized lawns contained elevated concentrations of phosphorous and dissolved phosphorous).

pollutant removal efficiency for total nitrogen at between only 21-54 percent,[15] as compared with 100 percent for runoff retained on-site.

The retention requirement in the Draft Permit is additionally supported by recent technical analysis by national stormwater expert Dr. Richard Horner. Dr. Horner's analysis demonstrates that, for five different types of land use development or redevelopment projects in Southern California, the full 85th percentile, or even the full 95th percentile, 24-hour precipitation event could be retained on-site using *only* infiltration practices on sites overlying soils classified as Group C (typically containing 20 to 40 percent clay) under the Natural Resources Conservation Service (NRCS) major soil orders classification scheme.[16] Even for sites overlying Group D soils (typically 40 percent or more clay with substantially restricted water transmissivity) and assuming no infiltration was feasible, greater than 50 percent of the 85th percentile storm could be retained at each development type using only rooftop runoff dispersion or harvest and reuse techniques.[17] Additional retention under these scenarios could be achieved through use of evaporation practices, or, in cases where some infiltration is feasible, use of infiltration BMPs.

Additional analysis by Dr. Horner has amply demonstrated both the viability of, and need for, such a retention standard. A principal reason to adopt such an approach is the superior pollutant load reduction capacity of LID practices that retain runoff on-site, for a variety of climatic scenarios, including for the San Diego region.[18] With particular regard to the feasibility of the type of retention standard proposed by the Draft Permit, Dr. Horner has found that, in nearly all case studies, "all storm water discharges could be eliminated at least under most meteorological conditions by dispersing runoff from impervious surfaces to pervious areas."[19]

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[15] Ventura County Low Impact Development Technical Guidance Manual, July 13, 2011, at D-7. See also, BASMAA (December 1, 2010) *Draft Model Bioretention Soil Media Specifications-MRP Provision C.3.c.iii*, at Annotated Bibliography section 3.0 (noting nutrient removal from synthetic stormwater runoff demonstrated only 55 to 65 percent of total Kjeldahl nitrogen removal and that only 20 percent of nitrate is removed from the runoff).

[16] Dr. Richard Horner and Jocelyn Gretz (November 2011) Investigation of the Feasibility and Benefits of Low-Impact Site Design Practices Applied to Meet Various Potential Stormwater Runoff Regulatory Standards; Natural Resources Conservation Service, Distribution Maps of Dominant Soil Orders (http://soils.usda.gov/technical/classification/orders/, last accessed December 16, 2011).

[17] Id. We note as well that even in areas characterized regionally as underlain by D soils, site specific investigation may establish substantial potential for infiltration of runoff.

[18] Id.; see also, Horner, Richard. Report for Ventura County; Horner, Richard. Initial Investigation for San Francisco Bay Area; Horner, Richard. Supplementary Investigation for San Francisco Bay Area; Horner, Richard. Report for San Diego Region.

[19] Horner, Ventura Report, at 15.

1. LID Is Cost-Effective and Provides Significant Economic Benefits

LID "provides ecosystem services and associated economic benefits that conventional stormwater controls do not."[20] Because traditional stormwater management approaches involve the construction of complex systems of infrastructure, they can entail substantial costs. Since LID attempts to mimic the predevelopment hydrology of a site, emphasizing storage and use, infiltration, and use of a site's existing drainage conditions, "[c]ost savings are typically seen in reduced infrastructure because the total volume of runoff to be managed is minimized."[21] A 2007 U.S. EPA study found that "in the vast majority of cases . . . implementing well-chosen LID practices saves money for developers, property owners, and communities while protecting and restoring water quality."[22] With only "a few exceptions," the EPA study found that "[t]otal capital cost savings ranged from 15 to 80 percent when LID methods were used" instead of conventional stormwater management techniques.[23] The savings identified in documented studies are noteworthy considering they do not reflect the additional economically beneficial attributes LID provides, including reduced costs of municipal infrastructure, reduced costs of municipal stormwater management, and increased value of real estate.[24]

Nor is the EPA study alone in reaching this conclusion. A survey released by the American Society of Landscape Architects in 2011 found that green infrastructure reduced or did not influence project costs 75 percent of the time.[25] A joint project by the University of New Hampshire Stormwater Center and Virginia Commonwealth University found that use of LID provided stormwater management cost savings of 6 percent for residential development and 26 percent for commercial developments as compared with conventional stormwater management.[26] And while the economics of integrating LID into redevelopment projects vary slightly from new development, there is little evidence it typically raises project costs. An analysis of three communities by ECONorthwest found that while complying with stormwater standards, including strict

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[20] ECONorthwest, The Economics of Low-Impact Development: A Literature Review, at iii. (2007) ("ECONorthwest") (Exh. 61).
[21] U.S. EPA Cost Study, at 2; U.S. Department of Housing and Urban Development, The Practice of Low Impact Development, at 33 (2003) (Exh. 62).
[22] U.S. EPA Cost Study, at iii.
[23] *Id.* at iv.
[24] See ECONorthwest, at 5; *Id*. at 15 (disconnecting downspouts to allow for natural infiltration in the Beecher Water District near Flint, Michigan cost the district about $15,000, but decreased the mean volume of sewer flows by 26 percent, and saved the district more than $8,000 per month in stormwater fees); U.S. EPA Cost Study, at 7.
[25] American Society of Landscape Architects (2011) Advocacy: Stormwater Case Studies.
[26] Roseen, R., T. Janeski, J. Houle, M. Simpson, and J. Gunderson (2011) *Forging the Link: Linking the Economic Benefits of Low Impact Development and Community Decisions*. University of New Hampshire Stormwater Center, the Virginia Commonwealth University, and Antioch University New England; see generally, NRDC (2011) Rooftops to Rivers II: Green Strategies for Controlling Stormwater and Combined Sewer Overflows, at 19-30.

runoff volume reduction requirements, is a cost consideration, it is rarely, if ever, a driving factor in decisions to undertake redevelopment projects.[27]

Further, LID can provide substantial benefits for the San Diego region in terms of increased local supply of water and reduced energy usage, in addition to the stormwater runoff and pollution benefits it can provide.[28]

2. The Draft Permit Properly Requires a Determination that it is Technically Infeasible to Retain the Design Storm On-Site.

Although we support the inclusion of strong retention standards for stormwater runoff, and the Draft Permit's requirement to incorporate on-site treatment in addition to performance of offsite mitigation in the event of technical infeasibility for on-site retention, we are concerned by statements of Regional Board staff that they "would like to make a shift away from determining what is infeasible onsite to determining what is feasible onsite. . . ." (Regional MS4 Permit RWQCB Workshop Notes, September 5, 2012, at 4.) Retention of the 85th Percentile Storm event has been established as MEP in California Permits;[29] responsibility is properly placed on the project proponent to establish, given site specific conditions, that this standard cannot be met.

3. The Draft Permit's Mitigation Requirements for Offsite Projects Must Prioritize Projects that Retain Runoff With no Discharge to Receiving Waters.

While we support the Draft Permit's requirement that a Priority Development Project meeting the technical infeasibility criteria for on-site retention must perform on-site treatment of runoff and additionally implement an offsite mitigation project (or provide sufficient funding for an offsite mitigation project), we note that in order to ensure that equivalent pollutant load is reduced as would have been achieved through on-site retention, the Mitigation program should prioritize implementation of offsite projects that retain runoff with no discharge. These may include, as identified in the Draft Permit, retrofitting opportunities, green streets, infrastructure projects, or regional BMPs that

---

[27] ECONorthwest (2011) "Managing Stormwater in Redevelopment and Greenfield Development Projects Using Green Infrastructure: Economic Factors that Influence Developers Decisions,"prepared by S. Reich et al, accessed at http://www.americanrivers.org/assets/pdfs/reports-andpublications/stormwater-green-report.pdf, p. 2.

[28] See, NRDC and University of California at Santa Barbara (2009) A Clear Blue Future: How Greening California Cities Can Address Water Resources and Climate Challenges in the 21st Century; See also, NRDC (2011) Capturing Rainwater from Rooftops: An Efficient Water Resource Management Strategy that Increases Supply and Reduces Pollution; NRDC and University of California at Los Angeles (2012) Looking Up: How Green Roofs and Cool Roofs Can Reduce Energy Use, Address Climate Change, and Protect Water Resources in Southern California.

[29] See, e.g., Ventura County MS4 Permit, Order No. R4-2009-0057; San Francisco Bay Area MS4 Permit, Order No. R2-2009-0074; North Orange County MS4 Permit, Order No. R8-2009-0030; South Orange County MS4 Permit, Order No. R9-2009-0002.

receive runoff from multiple sites. However, as demonstrated above, retention BMPs, including infiltration, harvest and re-use, and evaporation, result in a greater reduction in pollutant load than do projects that treat and discharge runoff to receiving waters, while simultaneously reducing flooding that treat and discharge projects may do little to abate. Further, LID retention projects can be designed to capture water through infiltration or rainwater harvesting to increase local water supplies, a critical concern for the region. As a result, the Draft Permit's Mitigation program should focus on retention of stormwater runoff, and not solely on a range of projects identified as broadly beneficial in Permittee Water Quality Improvement Plans.

IV. Conclusion

We appreciate this opportunity to comment on the Draft Permit. Please feel free to contact us with any questions or concerns you may have.

Sincerely,

Noah Garrison
Project Attorney
Natural Resources Defense Council

Walsh, Laurie@Waterboards

From: Garrison, Noah <ngarrison@nrdc.org>
Sent: Friday, September 14, 2012 3:19 PM
To: Walsh, Laurie@Waterboards; Chiu, Wayne@Waterboards
Cc: Kheyfets, Anna; Colin Kelly; jill@sdcoastkeeper.org
Subject: Additional supporting documents for NRDC comment on Draft San Diego Regional MS4 Permit 1/2
Attachments: NRDC - Clear Blue Future 2009.pdf; NRDC - Capturing Rainwater 2011.pdf; NRDC - Green Roofs 2012.pdf; NRDC - Rooftops to Rivers II 2011 Green Strategies for Controlling Stormwater.pdf

Supporting email 1 of 2.

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Walsh, Laurie@Waterboards

From: Garrison, Noah <ngarrison@nrdc.org>
Sent: Friday, September 14, 2012 3:19 PM
To: Walsh, Laurie@Waterboards; Chiu, Wayne@Waterboards
Cc: Kheyfets, Anna; Colin Kelly; jill@sdcoastkeeper.org
Subject: Additional supporting documents for NRDC comment on Draft San Diego Regional MS4 Permit 2/2
Attachments: Ventura County Low Impact Development Technical Guidance Manual -07-13-2011.pdf

Supporting email 2 of 2.

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Advocacy

STORMWATER OVERVIEW

The Environmental Protection Agency (E.P.A.) recently initiated a national rulemaking to establish a comprehensive program to reduce stormwater runoff from new development and re-development projects, and make other improvements to strengthen its stormwater program. The E.P.A. announced that during this rulemaking process it will evaluate sustainable green infrastructure design techniques that mimic natural processes to evapo-transpire, infiltrate and recharge, and harvest and reuse stormwater.

The EPA asked ASLA to collect case studies on projects that successfully and sustainably manage stormwater. ASLA members responded with 479 case studies from 43 states, the District of Columbia, and Canada. Not only do these projects showcase landscape architecture, they also demonstrate to policymakers the value of promoting green infrastructure policies. Green infrastructure and low-impact development (LID) approaches, which are less costly than traditional grey infrastructure projects, can save communities millions of dollars each year and improve the quality of our nation's water supply.

An analysis of the case studies:

Project type:
Institutional/Education — 21.5%
Open Space/Park — 21.3%
Other — 17.6%
Transportation Corridor/Streetscape — 11.9%
Commercial —8.6%
Single Family Residential — 5.5%
Government Complex — 4.2%
Multifamily Residential — 3.7%
Open Space-Garden/Arboretum —2.9%
Mixed Use — 1.8%
Industrial — 1.1%

Estimated cost of green infrastructure:
$100,000–$500,000 — 29.2%
$1,000,000–$5,000,000 — 22.1%
$500,000–$1,000,000 — 13.2%
$50,000–$100,000 — 12.9%
$10,000–$50,000 — 12.1%
<$5,000,000 — 7.0%
>$10,000 — 3.5%

Green infrastructure type:
Retrofit of existing property — 50.7%
New development — 30.7%
Redevelopment project — 18.6%

How much impervious area was managed?
1 acre to 5 acres — 34.5%
5,000 sq/ft to 1 acre — 31.3%
greater than 5 acres — 24.8%
less than 5,000 sq/ft — 9.5%

Did use of green infrastructure increase costs?
Reduced costs — 44.1%
Did not influence costs — 31.4.7%
Increased costs — 24.5%

Green infrastructure design approaches used:
Bioswale — 62.1%
Rain garden — 53.2%
Bioretention facility — 50.8%
Permeable pavement systems — 47.3%
Curb cuts — 37.9%
Cistern — 21.2%
Downspout removal — 18.1%
Green roof — 16.5%
Rain barrels — 5.7%

EPA | Office of Water

ASLA Water and Stormwater

CAMPAIGN FOR GREEN INFRASTRUCTURE

Partners:
American Rivers
NRDC

ANALYSIS

- Over 300 ASLA members and other practitioners responded with 465 case studies
- Case studies were submitted from 43 states, the District of Columbia, and Canada.
- 55 percent of the projects were designed to meet a local ordinance.
- 88 percent of local regulators were supportive of the green infrastructure projects submitted.
- 68 percent of the projects received local public funding.

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B A S M A A

Alameda Countywide Clean Water Program

Contra Costa Clean Water Program

Fairfield-Suisun Urban Runoff Management Program

Marin County Stormwater Pollution Prevention Program

Napa County Stormwater Pollution Prevention Program

San Mateo Countywide Water Pollution Prevention Program

Santa Clara Valley Urban Runoff Pollution Prevention Program

Sonoma County Water Agency

Vallejo Sanitation and Flood Control District

December 1, 2010

Bruce Wolfe, Executive Officer
California Regional Water Quality Control Board
San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, CA 94612

Subject: Model Bioretention Soil Media Specifications–MRP Provision C.3.c.iii.(3)

Dear Mr. Wolfe:

This letter and attachments are submitted on behalf of all 76 permittees subject to the requirements of the Municipal Regional Stormwater NPDES Permit (MRP).

Provision C.3.c.iii.(3) requires the permittees, collaboratively or individually, to submit a report containing the following information:

- Proposed soil media specifications for biotreatment systems;
- Proposed soil testing methods to verify a long-term infiltration rate of 5-10 inches/hour;
- Relevant literature and field data showing the feasibility of the minimum design specifications;
- Relevant literature, field, and analytical data showing adequate pollutant removal and compliance with the Provision C.3.d hydraulic sizing criteria; and
- Guidance for the permittees to apply the minimum specifications in a consistent and appropriate manner.

The permittees have worked diligently since the MRP was adopted in October 2009 to develop this information. The work has been carried out collaboratively among the permittees and in cooperation with your staff.

In April 2010 the permittees sponsored a roundtable discussion of bioretention soils. The roundtable included members of your staff, consultants, permittee staff, and representatives of the building industry. This diverse group included soil scientists and soils engineers with expertise in soil testing and construction of bioretention facilities. The meeting was facilitated by Sandi Potter of your staff.

Based on that discussion, BASMAA retained WRA, Inc., to develop regional guidance for bioretention soil. WRA was directed to use as a starting point guidance they had previously developed for the Contra Costa Clean Water Program (CCCWP). The CCCWP published its guidance in February 2009 as Appendix B to their *Stormwater C.3 Guidebook*. Contra Costa permittees have overseen construction of many bioretention facilities using this guidance and have had the opportunity to see the facilities perform through at least one full rainy season. The "soil" is a mix of 60-70% sand meeting a size gradation consistent with ASTM C33 for fine aggregate and

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30-40% compost meeting the standards developed by the US Composting Council. The sand and compost are readily available from Bay Area suppliers, and at least two companies currently provide and advertise their own versions of the bioretention "soil" mix. For the regional guidance, WRA has recommended some minor improvements and clarifications to the Contra Costa guidance.

The permittees are pleased to make this guidance available to permittee staff and the land development community. However, we believe the MRP should continue to allow, as it does now, room for experimentation and innovation with bioretention soils, as long as that experimentation and innovation is within the bounds of the minimum requirements needed to achieve effective stormwater treatment.

MRP Provision C.3.c.i.(2)(b)(vi) currently provides that: "Bioretention systems shall be designed to have a surface area no smaller than what is required to accommodate a 5-inch-per-hour stormwater runoff surface loading rate." This existing permit requirement sets the minimum square footage of the bioretention facility. For a facility this size to successfully treat the design runoff flow, the soil media must infiltrate runoff at a rate of at least 5 inches per hour. Thus, the essential characteristic of the bioretention soil is already established within the permit.

Accordingly, we recommend that the Regional Water Board take no action with regard to bioretention soil specifications, as the current MRP language is already adequate to the purpose. However, if the permit is to be amended to explicitly incorporate a bioretention soil objective, we recommend the following:

> "Soils for bioretention facilities must be sufficiently permeable to infiltrate runoff at a minimum rate of 5 inches per hour during the life of the facility, and must provide sufficient retention of moisture and nutrients to support healthy vegetation."

The guidance developed by WRA on behalf of the permittees meets this objective, and the guidance is clearly feasible to implement, but it would be incorrect (and counterproductive) to suggest this guidance is the only means and method by which the objective can be achieved.

Similarly, WRA's report includes proposed testing methods for verification of alternative bioretention soil mixes. Although this information will be useful to permittee staff, some permittees have already indicated a preference for fewer or different tests to estimate the long-term infiltration rate.

WRA's report also includes guidance on soil installation, the use of mulch, water conservation, and other topics of interest to designers and operators of bioretention facilities. This information is outside the scope of permit requirements, but will be useful to permittee staff and land development professionals.

We thank your staff for their helpful and attentive participation in the April roundtable and other discussions leading to this submittal.

We certify under penalty of law that this document was prepared under our direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on our inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of our knowledge and belief, true, accurate, and complete. We are aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

James Scanlin, Alameda Countywide Clean Water Program

Tom Dalziel, Contra Costa Clean Water Program

Kevin Cullen, Fairfield-Suisun Urban Runoff Management Program

Matt Fabry, San Mateo Countywide Water Pollution Prevention Program

Adam Olivieri, Santa Clara Valley Urban Runoff Pollution Prevention Program

Lance Barnett, Vallejo Sanitation and Flood Control District

Attachments:
Technical Memorandum, "Regional Bioretention Soil Guidance and Model Specification," by WRA, Inc.
Technical Memorandum, "Regional Bioretention Installation Guidance," by WRA, Inc.
Annotated Bibliography, "Regional Biotreatment Soil Guidance," by WRA, Inc.

cc: Tom Mumley, Regional Water Board
Shin-Roei Lee, Regional Water Board
Dale Bowyer, Regional Water Board
Sue Ma, Regional Water Board
BASMAA Board of Directors

TECHNICAL MEMORANDUM

Regional Bioretention Soil Guidance & Model Specification
Bay Area Stormwater Management Agencies Association

Prepared For:

Bay Area Stormwater Management Agencies
Association (BASMAA)

Contact:

Megan Stromberg
stromberg@wra-ca.com

Date:

November 12, 2010

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INTRODUCTION

Recently the San Francisco Bay Regional Water Quality Control Board issued the Municipal Regional Stormwater Permit. The Bay Area Stormwater Management Agencies Association (BASMAA) engaged WRA to provide guidance and specification for bioretention soils to assist stormwater agencies at the associated municipalities in meeting the requirements of the permit.

This report provides model soil guidance and specification with the goal of providing a long-term infiltration rate of 5 to 10 inches per hour, providing stormwater treatment and supporting plant health. The guidance and specification is provided such that Permittees can apply the minimum specifications in a consistent and appropriate manner.

This report is organized into two parts. Part 1 provides the justification for recommendations made for the Regional Bioretention Soil Mix Guidance to better meet the requirements of the Municipal Regional Stormwater Permit. Part 2 provides guidance and a draft Model Specification for Bioretention Soil.

PART 1 - JUSTIFICATION

1.0 COMPOST

Compost has been a focus of many bioretention soil mixes because it has been shown to increase water holding capacity and attenuate pollutants from stormwater.

1.1 Compost Particle Size

Fines play an important role in bioretention facilities. Cation exchange capacity (CEC) is known to improve the removal of metals in bioretention soils (Jurries 2003). CEC refers to the quantity of negative charges in soil. The negative charges attract positively charged ions, or cations, hence the name 'cation exchange capacity'. In addition to metals, many essential plant nutrients exist in the soil as cations. The primary factor determining CEC is the clay and organic matter content of the soil. Fines will raise the CEC of a soil and thus the pollutant removal capacity as well as the nutrient availability for plant health.

However, there is mixed information on how fines relate to permeability. In part this is due to the different ways the fine fraction of a soil may be characterized. Some research indicates that hydraulic conductivity of bioretention soil mixes is correlated to percent passing the 200 sieve (0.003"), i.e. fines. Curtis Hinman's bioretention soil mix review and recommendations for Western Washington states that fines passing the 200 sieve should ideally be between 2 and 4 percent to produce a bioretention soil mix with a long-term infiltration rate of between 1 and 12 inches per hour (Hinman 2009). In contrast, Scott Wikstrom of the City of Walnut Creek states that the mineralogy and particle size of the fines is critical to the degree of impact they will have on permeability. Although both silt and clay pass the 200 sieve, his experience is that silt will have minimal impact while highly plastic clay will have a significant effect on permeability. In practice, he has observed that the bioretention soils formulated using Contra Costa County's specification are more likely to easily meet the minimum standard 5 inches per hour than they are to fail (Personal Communication 2010). Current Contra Costa guidance only specifies 0 - 5% passing the 200 sieve size for the fine aggregate and has no specification for compost particle gradation.

A third hypothesis is proposed by Frank Shields of Soil Control Lab. He points to particle size gradation, not particle size distribution, as determining a soil's infiltration rate (Personal

Communication 2010). He has implied that to limit the risk of compost plugging the bioretention soil mix, we should target the correct gradation. Perhaps both size and gradation are important to consider. Screening compost to remove fines effectively creates an 'open graded' compost. 'Open graded' refers to a gradation that contains only a small percentage of aggregate particles in the small range relative to the overall mix. This results in more air voids because there are not enough small particles to fill in the voids between the larger particles. Open graded aggregate is used to create pervious concrete, for example.

Anecdotally, in mixing soils to meet the Contra Costa County performance specification for infiltration rate, Rob Hawkins of LH Voss Landscape Materials in Dublin and Stockton, California has experienced problems when using whole compost that was not screened to remove some fines. His company uses a blend of different compost types to create a custom coarse compost. He provided analytical testing results for his bioretention soil mix conducted from earlier this year. Particle size distribution test results show that his bioretention mix contains over 12% passing the 200 sieve size. Yet, the percolation rate using the 'dirt bong' method developed by Contra Costa County, was between 14 and 72 inches per hour. More recently, his compost blend has been the following blend: 1/3 BFI 'whole compost,' 1/3 Zanker wood fines (screened compost with particle sizes between ¼" to ½") and 1/3 recycled redwood fencing in its bioretention soil mix. He will provide particle size analysis and infiltration rate testing of his new blend as soon as it becomes available in the next few weeks.

Screening whole compost will reduce percentages of fine particles in the compost but this screened 'coarse' compost is only available from some suppliers. Adding to the lack of clear information on this topic, compost is not routinely tested for particle size distribution to below the size 10 sieve (0.079"). Earl Boyd of Lyngso Garden Materials in Redwood City, California stocks 'Verma Green' compost that is a coarser blend than their premium compost. Boyd stated that Verma Green compost has less than 10% passing the 200 sieve (Personal communication 2010). If used with ASTM C33 fine aggregate which has a maximum of 5% passing the 200 sieve, the overall bioretention soil mix would therefore have more than 5% passing the 200 sieve size. However, without comprehensive testing of compost and ASTM C33 blends, we may not have a clear answer about how the permeability relates to fines.

In summary, existing literature suggests that fines in the overall mix should include fines in the range 2 – 4% but even within this range, the permeability will vary from 1 to 12 inches per hour. Scott Wikstrom suggests that fines in the range of 6-12% may produce an acceptable infiltration rate. This hypothesis is confirmed by the analytical testing provided by LH Voss Materials. Compost is widely available with fines in the range of 8 - 12%. Municipalities have observed that previously constructed biofiltration basins are meeting the minimum infiltration rate specification without limiting the fines in compost.

1.2 Nutrient Leaching from Compost

Compost amended soils are generally good or very good at retaining metals, hydrocarbon, organics, and bacteria (Davis 2006, Hinman 2009). Total phosphorous and total nitrogen removal in bioretention is good compared to other stormwater treatment practices; however, phosphate and nitrate reduction is variable in bioretention basins with underdrains (Davis 2006, Chi-hsu 2005, Hunt 2003, Hunt 2006). Until recently, loadings of nitrogen and phosphorous to San Francisco Bay have not been a high-priority regulatory concern; however, the State Water Resources Control Board, supported by USEPA Region IX is implementing an Estuarine Nutrient Numeric Endpoint Project.

Hinman (2009) and Hunt (2006) suggest that the design of bioretention facilities is at the heart of the issue of nutrient export rather than compost or media design.Hinman suggests that depth of media should be 24" to 36" to minimize export of phosphorous (2009). Current specification requires a minimum depth of 18". Recent research by Hunt (2006) also suggests that a laboratory analysis for bio-available phosphorous may correlate with phosphorous export from bioretention areas. Biosolids and manure composts can be higher in bio-available phosphorous than compost derived from yard or plant waste. Accordingly, biosolids or manure compost in bioretention areas are not recommended to reduce the possibility of exporting bio-available phosphorous in effluent.

Hunt's studies (2006) indicate that bioretention designs with underdrains do not reduce nitrate-nitrogen levels sufficiently, as such bioretention facilities are constructed without any zone designed to be saturated and anaerobic. For nitrate-nitrogen to be converted to nitrogen gas, thus enhancing total nitrogen removal, an anaerobic zone is necessary (Hunt 2003, Hunt 2006). An elevated underdrain, allowing for a saturated zone beneath the drain, may improve nitrate removal more consistently than changing the bioretention soil mix.

Because design changes are beyond the scope of this report, we researched ways to minimize nitrate export from bioretention soils. Compost is intermediate between soil organic matter and fertilizers in its release rates of nitrate in the first season of application (Claassen and Young 2010). However, diversity in the types and sources of raw organic solid waste combined with the various processing procedures used to produce composted materials results in different physical and chemical properties in the composted products (Frank Shields, personal communication 2010). It is therefore difficult to generalize nutrient leaching from compost with the variety of sources of composted materials.

However, one recent study by CalTrans has identified some trends in compost and leaching. They propose that organic carbon, phosphorous and metal leaching losses steadily decline as compost ages; but that losses of nitrogen-rich compounds peak with mature compost (4 weeks old) and then decline with curing (except nitrate, which remains at very low levels). In addition, potassium increases with compost age, as does nitrate slightly. (Claassen and Young 2010).

In contrast, Frank Shields of Soil Control Lab states that while compost age and texture may generally relate to nutrient leaching, he hypothesizes that these factors will not always predict leaching potential. He explains that it is possible to estimate nitrate leaching potential by evaluating compost for its stability. He therefore provides some background on how nitrate is released from compost: Young compost that has not been cured contains many different forms of organic matter. Many of these types are readily available to soil organisms (fats, oils, polysaccharides, etc) and some are not (lignin, cellulose, proteins). As organisms consume carbon they must also consume nitrogen. The bio-available forms of carbon are consumed first and nitrogen is not released. As the consumption of carbon slows the compost may then begin to leach nitrates. With cured or aged compost, all the bio-available forms of carbon have already been consumed. Such compost is therefore said to be 'stable.' Stable composts will release nitrogen at a slow and steady rate (Shields, personal communication, 2010). Current specification already requires that compost be stable because this is a basic requirement for certification by the US Composting Council.

Shields further recommends that the Carbon to Nitrogen (C:N) ratio should be evaluated. Some composts are stable but are high in nitrogen (such as those from grass clippings or chicken manure). A C:N ratio below 10:1 can supply nitrogen even if it is stable. Hinman (2009) recommends a C:N ratio of between 20:1 and 25:1 for compost used in bioretention basins.

Soil and Compost Lab states that a compost with a C:N ratio above 20:1 can deplete nitrogen from the soil (Broadmoor 2010). Therefore, a compost with a C:N ratio of between 15:1 and 25:1 may balance the need for nitrogen for plant health with the desire to limit nitrate leaching.

Claassen and Young state that compost only boosts nutrient export temporarily. In the long-term (perhaps three or four years), most plant-based composts appear to develop similar rates of nitrogen release that are generally similar to soil organic matter (Claassen and Young 2010). By specifying compost that is stable, peaks in nitrogen export should be minimized. The specification should therefore balance the need for added nutrients for plants while they are getting established and the need to limit exporting nutrients.

In summary, nutrient export from bioretention soil media appears to be an issue related more to the design of the bioretention areas rather than the media itself. Greater depths of treatment media and anaerobic areas appear to be promising developments in the design of bioretention facilities that could limit nutrient export more predictably than in changing the compost specification.

1.3 Inert Materials in Compost

Current specifications for inert materials in compost range from a maximum of 0.1% by weight in Alameda County to 1% by weight in Contra Costa County. Frank Shields of Soil Control Lab suggests that his visual assessment test is more appropriate because the inert materials are an aesthetic issue (for example, glass, plastics and paper) more than one of function. Dan Cloak, in working with Contra Costa County, comments that he has not encountered problems with trash in bioretention soils (Personal communication 2010). This suggests that the current specifications are already stringent enough to eliminate composts from green waste sources which tend to have high percentage of inert materials.

1.4 Recommendations for Guidance

Particle Size: Fines in compost may cause clogging of the bioretention soil mix. In contrast, fines offer enhanced metals retention, fertility, and water-holding capacity. Current specifications require that the aggregate component to have between 0-5% fines. Contra Costa County has not experienced problems with the infiltration rate of bioretention soils as currently specified but there may be some risk of low infiltration rate if compost with a high percentage of fines is used.

We recommend one of three options:

- No change to the specification OR
- Provide a required particle size gradation for the compost component including a maximum of 10% passing the 200 sieve OR
- Require the overall mix to have between 2% and 5% passing the 200 sieve as recommended in Western Washington.

Nutrient Leaching: Nutrient leaching may be unavoidable without changes to the design of bioretention facilities such as increased media depth and raising the underdrain. However, we identified some guidance to limit leaching of nutrients from compost. We recommend that guidance continue to specify compost certified by the US Composting Council certified to

ensure stability. In addition, we recommend that the C:N ratio of compost be specified between 15:1 and 25:1.

Inert Materials: We recommend specifying a performance level of "no visual impact" from inert materials. Each municipality can interpret the specification as desired to avoid high content of inert materials in compost.

2.0 SOIL ADDITIVES

2.1 Water Retention and Cationic Exchange Capacity in Bioretention Soils

Cation exchange capacity (CEC) is known to improve the removal of metals in bioretention soils (Jurries 2003). CEC refers to the quantity of negative charges in soil existing on the surfaces of clay and organic matter. The negative charges attract positively charges ions, or cations, hence the name 'cation exchange capacity'. In addition to metals, many essential plant nutrients exist in the soil as cations. A high CEC can indicate a more fertile soil. As discussed earlier, the primary factor determining CEC is the clay and organic matter content of the soil.

Water-holding capacity helps to improve plant survival during dry periods and reduce irrigation needs. Water is held in soil in two ways: as a thin coating on the outside of soil particles and in the pore spaces. Soil water in the pore spaces can be divided into two different forms: gravitational water and capillary water. Gravitational water generally moves quickly downward in the soil due to the force of gravity. Capillary water is the most important for plant growth because it is held by soil particles against the force of gravity. Soil texture is related to water-holding capacity with loams and silt loams having the greatest available water for plants. Clays hold water very tightly so less is available to plants and sands hold very little water so even less is available to plants. Composted organic material is the most common soil amendment because it offers improved water holding capacity and supplies nutrients for soil.

2.2 Perlite and Vermiculite Blends

Vermiculite and perlite are both mined materials that are quickly heated to expand the mineral. Recently, perlite and vermiculite have been utilized in stormwater treatment facilities. Perlite improves drainage and wicks water well. Vermiculite has a tremendous water holding capacity but can drown roots when used alone. Perlite dries out quickly between rain events or waterings. Vermiculite and perlite are often used together in horticultural applications because of these complimentary attributes.

Granular perlite is sometimes used as a filter media for stormwater treatment. El Dorado County Department of Transportation is currently researching the effectiveness of perlite filters for stormwater as compared to fine sand filters for areas where infiltration is not feasible (Kooyman and Wigart 2009). Perlite is used in proprietary stormwater treatment systems including Aqua Filter. Preliminary small scale tests with perlite show effectiveness of reducing turbidity in stormwater between 40% and 90% (Kooyman and Wigart 2009). It is unclear if perlite, when included in a soil mix would have the same effectiveness. It seems that it would perform similarly to the sand component of the bioretention soil mix.

Additionally, vermiculite is commonly used to treat waste waters from mining activities to remove waterborne heavy metals. Vermiculite may be attractive for use in watersheds that are known to have a problem with heavy metals. Research is not available regarding the benefits vermiculite offers in reducing heavy metals within watersheds that have lower levels of heavy

metals typical of runoff from urban areas as compared to runoff from areas with contaminated soils or mining areas.

In summary, perlite appears to be equivalent to the sand component in the engineered bioretention soil mix. Vermiculite may improve water-holding capacity of a soil, but without further study it is difficult to prescribe the proper amount to include in the mix. Furthermore, the drawbacks of perlite and vermiculite are that these minerals do not contain nutrients needed for plant growth. Costs may also exceed that of compost.

2.3 Calcined Clay

Eliminating fines from the soil mix is likely to increase the infiltration rate as discussed under Section 1.1. On the other hand fine particles increase the cation exchange capacity of a soil which in turn increases metals retention. Fines also improve fertility and water-holding capacity by slowing the drainage through the media. Further study on the use of calcined clay was therefore suggested during the April 2010 roundtable discussion as a way to ensure that fines are not eliminated from the bioretention soil mix.

Calcined clay is clay that has been heated to drive out volatile materials. It is commonly used in potting soil mixes and as a garden bed amendment. In heavy clay soils and compacted soils, it can improve aeration, as well as water and nutrient holding capacity. Calcined clay has high levels of calcium and sulfur but doesn't have additional nutrient value for plants.

As discussed earlier, the primary factor determining CEC is the clay and organic matter content of the soil. Higher quantities of clay and organic matter beget higher CEC. Calcined clay is sometimes added to sand-based fields to increases CEC. No research exists on the use of calcined clay in bioretention soils. .

2.4 Recommendations for Guidance

Limited research exists on these soil amendments for use in bioretention soil mixes. It is also unclear that they provide greater benefits than compost alone, and they will have an unpredictable effect on the infiltration rate of the bioretention soil mix. Compost is proven to improve water holding capacity, increase CEC, and to support plant health, and has been studied to provide some measure of predictability in infiltration. At this time, the existing research does not warrant adding vermiculite, perlite or calcined clay to the bioretention soil mix.

3.0 NON-FLOATING MULCH MATERIAL

Generally, soft woods like fir and pine trees are less dense than water. Wood chip mulch made from softwoods will float because the specific gravity is less than that of water. Some hardwood trees are very dense and will float less or even sink. Locally, only Mountain mahogany (Cercocarpus betuloides) will sink in water, but not likely to be available commercially (Armstrong 2010). Some oaks and acacias are also very dense and only barely float, but these materials are also unlikely to be commercially available as mulch. The most common material for commercially available wood chip mulch is pine and fir.

Shredded redwood bark mulch does not float because the fibrous strands tend to stick together and to the soil surface. Unfortunately, some fire departments will not allow shredded bark mulches due to the perceived fire hazard.

Some success has been noted in surface mulching with compost. The City of Seattle recommends mulching with compost because it is less likely to float than wood chips. The University of Maine Cooperative extension recommends two types of mulch: Super Humus brand of compost and Erosion Control mulch. Super Humus is commercially available from local soil products suppliers.

In-organic mulches such as pea gravel, are also non-floating. However, they only provide some of the benefits of mulch. Organic mulches add organic matter and nutrients for plant health.

We therefore recommend that the guidance specify applying non-floating mulch, such as compost, or other non-floating mulch as specified by the landscape-architect and approved by the local jurisdiction, as mulch within bioretention basins and wood chips adjacent to basins (above the maximum water line).

4.0 METHODS FOR EVALUATION OF ALTERNATE MIXES

Alternative mixes should be required to meet performance criteria if they do not fulfill the prescriptive 'recipe' for bioretention soil. We recommend that municipalities be discouraged from using alternative mixes because the specifications are fine tuned to produce a bioretention soil that achieves the desired performance in infiltration rate and fertility. However, if it is necessary to include alternative options we recommend that alternate mixes are evaluated for infiltration rate and certified for appropriate fertility.

Infiltration tests should be conducted by a qualified geotechnical soil testing laboratory. Field infiltration rates will differ from permeability rates measured in the laboratory. Variables during construction can have a significant influence on as-constructed and long-term infiltration rates. However, laboratory permeability testing is a relative indicator of the overall drainage performance of a particular aggregate compost mix. As discussed at the April 14, 2010, soil specifications roundtable meeting, the objectives of onsite infiltration testing can be met alternatively by reviewing the soil mix, overseeing installation, and observing the functioning of the facility. The soil should be required to have a percolation rate between 5 and 12 inches per hour to provide adequate drainage but not be too fast draining to support plants.

The following tests are suggested:

- Moisture – density relationships (compaction tests) should be conducted on a minimum of two samples of bioretention soil. We recommend compacting the bioretention soil to 85 to 90 percent of the maximum dry density (ASTM D1557). This level of relative compaction of bioretention soil mixes should be similar to field conditions.

- Constant head permeability – testing in accordance with ASTM D2434 should be conducted with a 6-inch mold and vacuum saturation. Municipalities should require at least two samples be tested.

- Particle size analysis – particle size analysis on the mixed bioretention soil should be provided.

Due to the expense associated with laboratory testing, the suggested testing may discourage developers from using alternative mixes. The above tests cost about $900. If the alternative mix fails, retesting will be required.

Fertility is also an important aspect of the bioretention soil. Rather than specifying performance benchmarks for all the various elements that contribute to soil fertility (pH, salinity, nitrate, ammonium nitrogen, phosphate phosphorous, potassium, calcium, magnesium, sodium, copper, zinc, manganese, iron, sulfate, and boron, etc), we recommend that alternative soil mixes should be certified as appropriate for plants by a qualified soil analysis laboratory or landscape architect. The qualified expert should submit a signed letter certifying that the bioretention soil will support the selected species of plants.

PART 2 – GUIDANCE AND SPECIFICATIONS

The following text is based on the guidance found in Appendix B of Contra Costa County Clean Water Program's Stormwater C.3 Guidebook, 4th Edition. **Bold and underlined text** indicates additions to the specifications.

SOILS FOR BIORETENTION FACILITIES

Soils for bioretention areas must meet two objectives:

- Be sufficiently permeable to infiltrate runoff at a minimum rate of 5" per hour during the life of the facility, and
- Have sufficient moisture retention to support healthy vegetation.

Achieving both objectives with an engineered soil mix requires careful specification of soil gradations and a substantial component of organic material (typically compost).

The San Francisco Regional Water Board has developed specifications for a bioretention soil mix. Local soil products suppliers have expressed interest in developing 'brand-name' mixes that meet these specifications. At their sole discretion, municipal construction inspectors may choose to accept test results and certification for a 'brand-name' mix from a soil supplier. Updated soil and compost test results may be required; tests must be **conducted** within 120 days prior to the delivery date of the bioretention soil to the project site.

Typically, batch-specific test results and certification will be required for projects installing more that 100 cubic yards of bioretention soil.

SOIL SPECIFICATION

Bioretention soils should meet the following criteria.

1. General Requirements
   Bioretention soil shall achieve a long-term, in-place infiltration rate of at least 5 inches per hour. Bioretention soil shall also support vigorous plant growth.

   Bioretention Soil shall be a mixture of fine sand, and compost, measured on a volume basis:

   60%-70% Sand
   30%-40% Compost

1.1. Submittals
The applicant must submit to the municipality for approval:

A. A sample of mixed bioretention soil.

B. Certification from the soil supplier or an accredited laboratory that the Bioretention Soil meets the requirements of this guideline specification.

C. Grain size analysis results of the fine sand component performed in accordance with ASTM D 422, Standard Test Method for Particle Size Analysis of Soils.

D. Quality analysis results for compost performed in accordance with Seal of Testing Assurance (STA) standards, as specified in Section 1.4.

E. Organic content test results of mixed Bioretention Soil. Organic content test shall be performed in accordance with by Testing Methods for the Examination of Compost and Composting (TMECC) 05.07A, “Loss-On-Ignition Organic Matter Method”.

F. Grain size analysis results of compost component performed in accordance with ASTM D 422, Standard Test Method for Particle Size Analysis of Soils.

G. A description of the equipment and methods used to mix the sand and compost to produce Bioretention Soil.

H. Provide the following information about the testing laboratory(ies) name of laboratory(ies) including

1) contact person(s)

2) address(es)

3) phone contact(s)

4) e-mail address(es)

5) qualifications of laboratory(ies), and personnel including date of current certification by STA, ASTM, or approved equal

1.2. Sand for Bioretention Soil

A. General

Sand shall be free of wood, waste, coating such as clay, stone dust, carbonate, etc., or any other deleterious material. All aggregate passing the No. 200 sieve size shall be non-plastic.

B. Sand for Bioretention Soil Texture

Sand for Bioretention Soils shall be analyzed by an accredited lab using #200, #100, #40, #30, #16. #8, #4, and 3/8 inch sieves (ASTM D 422 or as approved by municipality), and meet the following gradation:

Sieve Size	Percent Passing (by weight)	
	Min	*Max*
3/8 inch	100	100
No. 4	90	100
No. 8	70	100
No. 16	40	95
No. 30	15	70
No. 40	5	55
No. 100	0	15
No. 200	0	5

Note: all sands complying with ASTM C33 for fine aggregate comply with the above gradation requirements.

1.3. Composted Material

Compost shall be a well decomposed, stable, weed free organic matter source **derived from waste materials including yard debris, wood wastes or other organic materials not including manure or biosolids** meeting the standards developed by the US Composting Council (USCC). The product shall be certified through the USCC Seal of Testing Assurance (STA) Program (a compost testing and information disclosure program).

A. Compost Quality Analysis

Before delivery of the soil, the supplier shall submit a copy of lab analysis performed by a laboratory that is enrolled in the US Composting Council's Compost Analysis Proficiency (CAP) program and using approved Test Methods for the Evaluation of Composting and Compost (TMECC). The lab report shall verify:

1) Feedstock Materials shall be specified and include one or more of the following: landscape/yard trimmings, grass clippings, food scraps, and agricultural crop residues.

2) Organic Matter Content: 35% - 75% by dry wt.

3) Carbon and Nitrogen Ratio: C:N < 25:1 **and C:N >15:1**

4) Maturity/Stability: shall have a dark brown color and a soil-like odor. Compost exhibiting a sour or putrid smell, containing recognizable grass or leaves, or is hot (120F) upon delivery or rewetting is not acceptable. In addition any one of the following is required to indicate stability:

a. Oxygen Test < 1.3 O2 /unit TS /hr

b. Specific oxy. Test < 1.5 O2 / unit BVS /

c. Respiration test < 8 C / unit VS / day

d. Dewar test < 20 Temp. rise (°C) e.

e. Solvita® > 5 Index value

5) Toxicity: any one of the following measures is sufficient to indicate non-toxicity.

a. NH4- : NO3-N < 3

b. Ammonium < 500 ppm, dry basis

c. Seed Germination > 80 % of control

d. Plant Trials > 80% of control

e. e. Solvita® > 5 Index value

6) Nutrient Content: provide analysis detailing nutrient content including N-P-K, Ca, Na, Mg, S, and B.

a. Total Nitrogen content 0.9% or above preferred.

b. Boron: Total shall be <80 ppm; Soluble shall be <2.5 ppm

7) Salinity: Must be reported; < 6.0 mmhos/cm

8) pH shall be between 6.5 and 8. May vary with plant species.

B. Compost for Bioretention Soil Texture

Compost for Bioretention Soils shall be analyzed by an accredited lab using #200, 1/4 inch, 1/2 inch, and 1 inch sieves (ASTM D 422 or as approved by municipality), and meet the following gradation:

Sieve Size	**Percent Passing (by weight)**	
	Min	***Max***
1 inch	**99**	**100**
1/2 inch	**90**	**100**
1/4 inch	**40**	**90**
No. 200	**2**	**10**

C. Bulk density: shall be between 500 and 1100 dry lbs/cubic yard

D. Moisture Content shall be between 30% - 55% of dry solids.

E. Inerts: compost shall be relatively free of inert ingredients, including glass, plastic and paper, < 1 % by weight or volume.

F. Weed seed/pathogen destruction: provide proof of process to further reduce pathogens (PFRP). For example, turned windrows must reach min. 55C for 15 days with at least 5 turnings during that period.

G. Select Pathogens: Salmonella <3 MPN/4grams of TS, or Coliform Bacteria <10000 MPN/gram.

H. Trace Contaminants Metals (Lead, Mercury, Etc.) Product must meet US EPA, 40 CFR 503 regulations.

I. Compost Testing

The compost supplier will test all compost products within 120 calendar days prior to application. Samples will be taken using the STA sample collection protocol. (The sample collection protocol can be obtained from the U.S. Composting Council, 4250 Veterans Memorial Highway, Suite 275, Holbrook, NY 11741 Phone: 631-737-4931, www.compostingcouncil.org). The sample shall be sent to an independent STA Program approved lab. The compost supplier will pay for the test.

VERIFICATION OF ALTERNATIVE BIORETENTION SOIL MIXES

Bioretention soils not meeting the above criteria may be evaluated on a case by case basis. Alternative bioretention soil must meet the following specification: "Soils for bioretention facilities must be sufficiently permeable to infiltrate runoff at a minimum rate of 5 inches per hour during the life of the facility, and must provide sufficient retention of moisture and nutrients to support healthy vegetation."

The following guidance is offered to assist municipalities with verifying that alternative soil mixes meet the specification:

1. General Requirements

Bioretention soil shall achieve a long-term, in-place infiltration rate of at least 5 inches per hour. Bioretention soil shall also support vigorous plant growth.

1.1. Submittals

The applicant must submit to the municipality for approval:

A. A sample of mixed bioretention soil.

B. Certification from the soil supplier or an accredited laboratory that the Bioretention Soil meets the requirements of this guideline specification.

C. Certification from an accredited geotechnical testing laboratory that the Bioretention Soil has an infiltration rate between 5 and 12 inches per hour as tested according to Section 1.2.

E. Organic content test results of mixed Bioretention Soil. Organic content test shall be performed in accordance with by Testing Methods for the Examination of Compost and Composting (TMECC) 05.07A, "Loss-On-Ignition Organic Matter Method".

F. Grain size analysis results of mixed bioretention soil performed in accordance with ASTM D 422, Standard Test Method for Particle Size Analysis of Soils.

G. A description of the equipment and methods used to mix the sand and compost to produce Bioretention Soil.

H. Provide the following information about the testing laboratory(ies) name of laboratory(ies) including

1) contact person(s)

2) address(es)

3) phone contact(s)

4) e-mail address(es)

5) qualifications of laboratory(ies), and personnel including date of current certification by STA, ASTM, or approved equal

1.2. Bioretention Soil

A. Bioretention Soil Texture

Bioretention Soils shall be analyzed by an accredited lab using #200, and 1/2" inch sieves (ASTM D 422 or as approved by municipality), and meet the following gradation:

Sieve Size	Percent Passing (by weight)	
	Min	*Max*
1/2 inch	97	100
No. 200	2	5

B. Bioretention Soil Permeability testing

Bioretention Soils shall be analyzed by an accredited geotechnical lab for the following tests:

1. Moisture – density relationships (compaction tests) shall be conducted on bioretention soil. Bioretention soil for the permeability test shall be compacted to 85 to 90 percent of the maximum dry density (ASTM D1557).

2. Constant head permeability testing in accordance with ASTM D2434 shall be conducted on a minimum of two samples with a 6-inch mold and vacuum saturation.

MULCH FOR BIORETENTION FACILITIES

Mulch is not required by this guidance but is recommended for the purpose of retaining moisture, preventing erosion and minimizing weed growth. It should be noted that projects subject to the State's Model Water Efficiency Landscaping Ordinance (or comparable local ordinance) will be required to provide at least two inches of mulch. Aged mulch, also called compost mulch, reduces the ability of weeds to establish, keeps soil moist, and replenishes soil nutrients. Aged mulch can be obtained through soil suppliers or directly from commercial recycling yards. Apply 1" to 2" of composted mulch, once a year, preferably in June following weeding.

Compared to green wood chip or bark mulch, aged mulch has somewhat less of a tendency to float into overflow inlets during intense storms. Bark or wood chip mulch may be used on the side slopes of basins above the maximum water line. The project landscape architect may also specify another type of non-floating mulch, subject to approval by the local jurisdiction.

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TECHNICAL MEMORANDUM

Regional Bioretention Installation Guidance
Bay Area Stormwater Management Agencies Association

Prepared For:

Bay Area Stormwater Management Agencies
Association (BASMAA)

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INTRODUCTION

Recently the San Francisco Bay Regional Water Quality Control Board issued the Municipal Regional Stormwater Permit. The Bay Area Stormwater Management Agencies Association (BASMAA) engaged WRA to provide guidance and specification for bioretention soils to assist stormwater agencies at the associated municipalities in meeting the requirements of the permit.

This report provides guidance for the installation of bioretention soils with the goal of preserving the integrity of the soil media to support a long-term infiltration rate of 5 to 10 inches per hour, provide stormwater treatment and support plant health.

INSTALLATION OF BIORETENTION SOILS

The following section provides considerations for proper bioretention soil installation.

Prior to Installing Bioretention Soil:

- Is the contractor familiar with constructing bioretention systems?
- Plan how inspections will be handled as part of the construction process.
- Verify soil meets specification prior to delivering and or placing in the facility.
- Prevent over-compaction of native soils in the area of the basin. Delineate the facility area and keep construction traffic off. Protect soils with fencing, plywood, etc.
- Provide erosion control in the contributing drainage areas of the facility. Stabilize upslope areas.
- Facilities should not be used as sediment control facilities.
- Drainage should be directed away from bioretention facilities until upslope areas are stabilized, if possible. The concentration of fines could prevent post-construction infiltration.
- If drainage is to be allowed through the facility during construction, leave or backfill at least 6” above the final grade. Temporarily cover the underdrain with plastic or fabric. Line or mulch the facility.
- Ideally, bioretention facilities should remain outside the limit of disturbance until construction of the bioretention begins to prevent soil compaction by heavy equipment. Protect bioretention areas with silt fence or construction fencing.
- Verify installation of underdrain is correct prior to placing soil.

Soil Mixing and Placement:

- Do not excavate, place soils, or amend soils during wet or saturated conditions.
- Operate equipment adjacent to (not in) the facility.
- If machinery must operate in the facility, use light weight, low ground-contact pressure equipment.

- It may be necessary to rip or scarify the bottom soils to promote greater infiltration or excavate any sediment that may have built up during construction.
- Consider the time of year and site working area when determining whether to mix bioretention soil on-site or to import pre-mixed soil.
- If mixing bioretention media onsite, use an adjacent impervious area or on plastic sheeting.
- Place soil in 12" lifts with machinery adjacent to the facility. If working within the facility, to avoid over-compacting, place first lifts at far end from entrance and place backwards toward entrance.
- Do not place or work bioretention soil if it is saturated or raining
- Allow bioretention soil lifts to settle naturally, boot pack (walk around to firm) lifts to achieve 85% compaction effort. After all lifts are placed, wait a few days to check for settlement, and add additional media as needed.
- An alternative to boot compaction is to settle bioretention soils by lightly watering until soils are just saturated. Allow soil to dry between lifts. It may take a day or more to dry adequately between lifts. Soil cannot be worked when saturated so this method should be used with caution. Allow for extra time to let soils dry between each lift. After all lifts are placed, wait a few days to check for settlement, and add additional media as needed.
- Verify bioretention soil elevations before applying mulch or installing plants.

Other Considerations:

- Protect adjacent trees.
- Protect adjacent infiltration systems including swales, soils and porous pavement from sediment.

REFERENCES

Buck, Jonathan 2010. "Design of Bioretention Areas at Serramonte Library, Daly City." Alameda Countywide Clean Water Program 2010 New Development Workshop. September 29, 2010.

Hinman, Curtis, 2009. "Bioretention Soil Mixes." LID Technical Workshop – San Francisco. Washington State University Extension. January 18, 2009.

Lancaster, Alice, 2009. "Bioretention: Construction, Inspection and O&M." LID Technical Workshop – San Francisco. Herrera Environmental Consultants. January 18, 2009.

Wikstrom, Scott and Niemuth, Paul, 2010. "The Nitty Gritty on Soils for Successful Stormwater BMPs." Bay-Friendly Landscape Conference. September 17, 2010.

Stenn, H. 2010. Building Soil: Guidelines and Resources for Implementing Soil Quality and Depth BMP T5.13 in WDOE Stormwater Management Manual for Western Washington. Seattle Public Utilities: Seattle. Available at: http://www.buildingsoil.org/tools/Soil_BMP_Manual.pdf

ANNOTATED BIBLIOGRAPHY

Regional Biotreatment Soil Guidance
Bay Area Stormwater Management Agencies Association

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INTRODUCTION

Recently the San Francisco Bay Regional Water Quality Control Board issued the Municipal Regional Stormwater Permit. The Bay Area Stormwater Management Agencies Association (BASMAA) engaged WRA to provide guidance and specification for bioretention soils to assist stormwater agencies at the associated municipalities in meeting the requirements of the permit.

The following bibliography provides a summary of existing literature, field and analytical data prepared in conjunction with the preparation of Regional Bioretention Soil Guidance.

1.0 COMPOST

Claassen, V. and Young, T. 2010. Model Guided Specification for Using Compost to Promote Establishment of Vegetation and Improvement in Stormwater Quality. California Department of Transportation (CalTrans). Available online: http://www.dot.ca.gov/hq/LandArch/research/erosion_control.htm

This study establishes parameters for compost use on slopes based on performance criteria including soil type, climate, slope length and steepness, aspect, and location. The research addresses how compost affects water quality and erosion, and if compost improves the establishment of permanent vegetation cover. Results indicate that in many cases, degraded, nutrient-poor soils can be regenerated with yard waste compost amendment with minimal risk of nutrient loss, especially if the composts are incorporated into the slope surface and covered with a mulch layer. Finer and more aged composts leach nitrogen at slightly higher rates than non-aged composts. However, more aged composts are more likely to retain heavy metals. Surface application of compost decreases nutrient loss.

Faucette, L.B. et. al. 2005. “Evaluation of stormwater from compost and conventional erosion control practices in construction activities.” Soil and Water Conservation Society. November 2005 vol. 60 no. 6 288-297.

The use of surface applied organic amendments has been shown to reduce runoff and erosion, however, with the exception of animal manure, little research has focused on nutrient loss from these amendments. Four types of compost blankets, hydroseed, silt fence, and a bare soil (control) were applied in field test plots. Treatments were seeded with common bermuda grass. A rainfall simulator applied rainfall at an average rate equivalent to a 50 yr^{-1} storm event (7.75 cm hr^{-1}). After three months, the compost generated five times less runoff than hydroseed with silt fence, and after one year, generated 24 percent less runoff. All treatments proved better than the control at reducing solids loss. Materials high in inorganic nitrogen (N) released greater amounts of nitrogen in storm runoff; however, these materials showed reduced N loss over time. Hydroseeding generated significantly higher total phosphorus (P) and dissolved reactive P loads compared to compost in storm runoff during the first storm event.

Stenn, H. 2010. Building Soil: Guidelines and Resources for Implementing Soil Quality and Depth BMP T5.13 in WDOE Stormwater Management Manual for Western Washington. Seattle Public Utilities: Seattle. Available at: http://www.buildingsoil.org/tools/Soil_BMP_Manual.pdf

The guide describes techniques for construction site soil handling, reducing soil compaction, and amending site soils with compost to meet BMP T5.13 “Post Construction Soil Quality and

Depth" in the WA Dept. of Ecology's Stormwater Management Manual for Western Washington. This guide also includes field inspection techniques, WA suppliers of compost and soil testing laboratories, and specification language in APWA and CSI formats.

2.0 SOIL AMENDMENTS

Kooyman, Steve and Wigart, Russ, 2009. Urban Stormwater fine sediment filtration using granular perlite. El Dorado County Department of Transportation.

Perlite can be used as an alternative to fine sand for stormwater filtration to reduce turbidity.

Paul, J. L. et. al. 1971. "Effects of Organic and Inorganic Amendments on the Hydraulic Conductivity of Three Sands Used for Turfgrass Soils" *California Turfgrass Culture*. Volume 21, No. 2. p.9-13. Accessed from University of California Riverside Turf Research Facility: http://ucrturf.ucr.edu/publications/CTC/ctc21_2.pdf

Calcined clay-l (CC-l) : montmorillonite clay is calcined at high temperatures to make porous, mechanically strong particles of mainly very coarse sand-fine gravel texture. Calcined clay-2 (CC-2) : an unspecified mineral is calcined to produce a porous, more or less spherical particle which falls mostly in the textural class of medium sand. Vermiculite (V) : the material was an industrial chemical grade (No. 1) of expanded mineral. While the particle size consisted mainly of very coarse and coarse sand sizes, particles were readily deformed and compressed by compacting forces. In this study, calcined clay acted in the same way as sand. Depending on the gradation of the sand and the particle size of the calcined clay, hydraulic conductivity was either increased or decreased. Vermiculite decreased hydraulic conductivity the most of the amendments studied. In addition, appreciable changes in hydraulic conductivity were not observed until 30-40% of the amendment was added to the sand.

3.0 POLLUTANT REMOVAL

Davis et. al. 2006. "Water Quality Improvement through Bioretention Media: Nitrogen and Phosphorous Removal." *Water Environment Research.* Vol. 78, No. 3: pp.284-293.

High nutrient inputs and eutrophication continue to be one of the highest priority water quality problems. This work provides an in-depth analysis on removal of nutrients from a synthetic stormwater runoff by bioretention. Results have indicated good removal of phosphorus (70 to 85%) and total Kjeldahl nitrogen (55 to 65%). Nitrate reduction was poor (,20%) and, in several cases, nitrate production was noted. Variations in flowrate (intensity) and duration had a moderate affect on nutrient removal. Mass balances demonstrate the importance of water attenuation in the facility in reducing mass nutrient loads. Captured nitrogen can be converted to nitrate between storm events and subsequently washed from the system. Analysis on the fate of nutrients in bioretention suggests that accumulation of phosphorus and nitrogen may be controlled by carefully managing growing and harvesting of vegetation. Water Environ. Res., 78, 284 (2006).

Hsieh, Chi-hsu and Davis, Allen P., 2005. "Evaluation and Optimization of Bioretention Media for Treatment of Urban Storm Water Runoff." *Journal of Environmental Engineering*. November: pp. 1521-1531.

The objective of this study is to provide insight on media characteristics that control bioretention water management behavior. Eighteen bioretention columns and six existing bioretention facilities were evaluated employing synthetic runoff. In columns, the runoff infiltration rate through different media mixtures ranged from 0.28 to 8.15 cm/min at a fixed 15 cm head. For pollutant removals, the results showed excellent removal for oil/grease __96%_. Total lead removal _from 66 to _98%_ decreased when the total suspended solids level in the effluent increased _removed from 29 to _96%_. The removal efficiency of total phosphorus ranged widely _4–99%_, apparently due to preferential flow patterns, and both nitrate and ammonium were moderate to poorly removed, with removals ranging from 1 to 43% and from 2 to 49%, respectively. Two more on-site experiments were conducted during a rainfall event to compare with laboratory investigation. For bioretention design, two media design profiles are proposed; _96% TSS, _96% O/G, _98% lead, _70% TP, _9% nitrate, and _20% ammonium removals are expected with these designs.

Hunt, William F. III, 2003. *Pollutant Removal Evaluation and Hydraulic Characterization for Bioretention Stormwater Treatment Devices.* Pennsylvania State University. Available online: http://www.psparchives.com/publications/our_work/stormwater/lid/bio_docs/bio_docs.htm

Current bioretention designs do not reduce nitrate-nitrogen levels sufficiently, as bioretention is constructed without any zone designed to be saturated. For nitrate-nitrogen to be converted to nitrogen gas, thus enhancing total nitrogen (TN) removal, an anaerobic zone may be necessary. This research determined the effect of an anaerobic layer within bioretention devices on the concentrations and loadings of TN, nitrate-nitrogen (NO3-N), and other nutrient and pollutant species in stormwater runoff including ammonia-nitrogen (NH3-N), total kjeldahl nitrogen (TKN), total phosphorus (TP), ortho-phosphate (Ortho-P), zinc (Zn), iron (Fe), copper (Cu), lead (Pb), and total suspended solids (TSS). Results from the laboratory experiment showed high removal rates for TN (mean efficiencies ranging from 70% to 85%) and NO3-N (over 90%). The presence of an intentional anaerobic zone and the anaerobic zone's thickness did not have a significant impact ($p<0.10$) on the microcosm's nutrient removal abilities. There was a significant impact ($p<0.10$) when comparing hydraulic retention times of 2 and 4 days. The longer retention time had significantly lower TN and NO3-N concentrations.

Hunt, W.F. et al. 2006. "Evaluating Bioretention Hydrology and Nutrient Removal at Three Field Sites in North Carolina." *Journal of Irrigation and Drainage Engineering*. November/December: 600-608.

Three bioretention field sites in North Carolina were examined for pollutant removal abilities and hydrologic performance. The cells varied by fill media type or drainage configuration. The field studies confirmed high annual total nitrogen mass removal rates at two conventionally drained bioretention cells _40% reduction each_. Nitrate-nitrogen mass removal rates varied between 75 and 13%, and calculated annual mass removal of zinc, copper, and lead from one Greensboro cell were 98, 99, and 81%, respectively. All high mass removal rates were due to a substantial decrease in outflow volume. The ratio of volume of water leaving the bioretention cell versus that which entered the cell varied from 0.07 _summer_ to 0.54 _winter_. There was a

significant _p_0.05_ change in the ratio of outflow volume to inflow volume when comparing warm seasons to winter. Cells using a fill soil media with a lower phosphorus index _P-index_, Chapel Hill cell C1 and Greensboro cell G1, had much higher phosphorus removal than Greensboro cell G2, which used a high P-index fill media. Fill media selection is critical for total phosphorus removal, as fill media with a low P-index and relatively high CEC appear to remove phosphorus much more readily.

4.0 BIOFILTER MEDIA DESIGN & SPECIFICATIONS

Burge, K. et. al. 2007. "Finding the Right Bioretention Soil Media" 13th International Conference on Rainwater Cathcment Systems. Available at: http://www.hidro.ufcg.edu.br/twiki/pub/ChuvaNet/13thInternationalConferenceonRainwaterCatchmentSystems/Burge.pdf

This paper describes the soil media characteristics that are critical to the successful functioning of a bioretention system and outlines the methodology behind the development of the Guideline Specifications for Soil Media in Bioretention Systems (FAWB, 2006).

Hinman, Curtis, 2009. Bioretention Soil Mix Review and Recommendations for Western Washington. Puget Sound Partnership. Available online: http://www.psparchives.com/publications/our_work/stormwater/BSMResults-Guidelines%20Final.pdf

The soil mix used in bioretention systems is central for determining flow control and water quality treatment performance. The purpose of this study is to provide bioretention soil mix (BSM) guidelines that: 1) meet performance objectives; 2) include materials readily available in the Puget Sound region; 3) include materials that aggregate and compost suppliers can provide with adequate quality control and consistency; and 4) are affordable. The focus of this study is on the aggregate component of the BSM. Four candidate aggregate samples were collected from various suppliers and locations around Puget Sound. Laboratory analysis was conducted to determine aggregate gradation, as well as the organic matter content, hydraulic conductivity, cation exchange capacity, and available phosphorus of a specified aggregate compost bioretention soil mix. Hydraulic conductivity of bioretention soil mixes is strongly correlated to percent mineral aggregate passing the 200 sieve and that the fines should be less than five and ideally between two and four percent. Organic matter content and associated available phosphorus and nitrogen cycling in these mixes may lead to phosphate and nitrate exported in under-drain effluent. Current research shows variable nitrate and phosphate retention and additional work is needed to study methods to optimize bioretention soil mixes for phosphate and nitrate retention and removal capability.

Jurries, Dennis, 2003. Biofilters (Bioswales, Vegetative Buffers, & Constructed Wetlands) for Storm Water Discharge Pollution Removal. State of Oregon Department of Environmental Quality. Available at: http://www.deq.state.or.us/wq/stormwater/docs/nwr/biofilters.pdf

Compilation of available information on the design and use of biofilters. Clays and organic matter have highest cation exchange capacities. Organic matter has twice the rate of cation exchange capacity as clay.

5.0 HYDRAULIC SIZING CRITERIA

Colwell, S. and Fowler J. 2009. Technical Memorandum re: Updated SPU Bioretention Soil – Modeling Inputs and Water Quality Treatment. Seattle Public Utilities. Available at: http://www.seattle.gov/util/groups/public/@spu/@usm/documents/webcontent/spu02_019972.pdf

This memorandum provides SPU's recommendations and justifications for modeling inputs for the bioretention soil and discusses how it meets Washington State Department of Ecology's (Ecology) requirements for treatment. Infiltration rate is highly variable for designed bioretention soils. A long-term correction factor of infiltration rate is recommended to be 2 for catchment areas containing less than 5000 sf of pollution generating surface or less than 10,000 sf impervious surface.

Herrera Environmental Consultants, 2007 "First Controlled Infiltration Test for High Point Phase I Block-Scale Monitoring Project" Seattle Public Utilities. Courtesy of Tracy Tackett (SPU NDS Program Manager)

Results of field study of infiltration and treatment performance of large-scale bioretention system project in Seattle. Design infiltration rate for the bioretention soil mix was 2" per hour and field tested rate was 4.2" per hour.

Herrera Environmental Consultants, 2007 "Results from Second Controlled Infiltration Test for High Point Phase I Block-Scale Monitoring Project" Seattle Public Utilities. Courtesy of Tracy Tackett (SPU NDS Program Manager)

Results of field study of infiltration and treatment performance of large-scale bioretention system project in Seattle. Design infiltration rate for the bioretention soil mix was 2" per hour and field tested rate was 6.1" per hour. Differences from the first and second test are attributed to rainfall event occurring just prior to test 1.

Mcmullen, Chad, 2007. Technical Memorandum: Bioretention Specification Development. Seattle Public Utilites. Provided courtesy Tracy Tackett of Seattle Public Utilites.

This memorandum provides grain size analysis for hydraulic capacity of several available aggregates in Western Washington. Compaction, organic content and permeability testing was performed on aggregate-compost mixtures. Provides draft bioretention soil specification for SPU.

6.0 BIOFILTER SOIL SPECIFICATIONS

Alameda Countywide Clean Water Program, 2007. "Soil Specifications for Stormwater Treatment Measures," Alameda County.

Alameda's soil specification to help applicants specify soils that will provide suitable growing conditions for appropriate plantings and meet the percolation requirements. Target percolation rate is 5 to 10 inches per hour.

Seattle Public Utilites 2008. "SPU Bioretention Soil Specification" courtesy of Tracy Tackett (SPU NDS Program Manager)

Specification for bioretention soil with infiltration rate of 5 in/hour (to be confirmed with Tracy). Specification geared towards locally available materials to Seattle that can be installed by contractors or homeowners.

7.0 LAB SOIL TEST RESULTS

To be provided with final draft.

8.0 PLANTS

Bornstein, C., Fross, D., and O'Brien, B. 2005. *California Native Plants for the Garden* Cachuma Press: Solvang.

Plant recommendations, plant care, nursery resources.

CalTrans 2001. "Advisory Guide to Plant Species Selection for Erosion Control." Cal Trans, District 5.

Hardcopy format of a geographic information system (GIS) that combines state and district-level climatalogical, geological, topographical, and plant biogeographical data to define ecologically meaningful subdistrict Plant climate Zones. These climate zones form the foundation for rapid access to lists of plant species for revegetation that are both ecologically appropriate for a project site and useful in minimizing erosion, primarily on slopes up to 2:1 H:V.

Harlow, Nora 2004. *Plants and Landscapes for Summer-Dry Climates*. East Bay Municipal Utility District.

Plant recommendations for the Bay Area.

Los Angeles County Public Works 2004. "LA River Masterplan: Landscaping Guidelines and Plant Palettes." County of Los Angeles.

Landscape design guidelines for the LA River corridor. Includes plant list of plants that should never be planted along the river and suggested plant lists, plants by plant communities and info about each plant such as estimated water needs, height, spread, and frequency of occurrence.

San Mateo County 2007. "Appendix B: Plant List and Planting Guidance for Landscape-Based Stormwater Measures" *San Mateo Countywide Water Pollution Prevention Program: C.3 Technical Guidance*. Accessed from: http://www.flowstobay.org/bs_new_development.php

Summary: Guidance for planting techniques and selection of appropriate plant materials for stormwater measures.

SVR Design Company 2006. "High Point Community Site Drainage Technical Standards" Prepared for Seattle Public Utilities. Accessed from: http://www.svrdesign.com/high_pt.html

Suggested plant list for various BMPs.

9.0 BIORETENTION SOILS INSTALLATION

SVR Design Company 2006. "High Point Community Right of Way and Open Space Landscape Maintenance Guidelines" Prepared for Seattle Public Utilities. Accessed from: http://www.svrdesign.com/high_pt.html

Materials recommendations and trouble shooting.

Lancaster, Alice, 2009. "Bioretention: Design and Construction" Presentation at Low Impact Development Workshop. City of San Francisco.

Construction sequencing, prevention of compaction, erosion control, contractor training, and public relations.

Hinman, Curtis, 2009. "Low Impact Development Technical Workshop Series: Bioretention Soil Mixes." Presentation at Low Impact Development Workshop. City of San Francisco.

Construction recommendations specific to installing bioretention soils.

The Economics of Low-Impact Development: A Literature Review

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ECONorthwest specializes in the economic and financial analysis of public policy. ECO has analyzed the economics of resource-management, land-use development, and growth-management issues for municipalities, state and federal agencies, and private clients for more than 30 years.

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EXECUTIVE SUMMARY

Low-impact development (LID) methods can cost less to install, have lower operations and maintenance (O&M) costs, and provide more cost-effective stormwater management and water-quality services than conventional stormwater controls. LID also provides ecosystem services and associated economic benefits that conventional stormwater controls do not.

The available economic research on some of these conclusions is preliminary or limited in scope. For example, most economic studies of LID describe the costs of installing LID, or compare the costs of installing LID with the costs of installing conventional controls. Few reports quantify the economic benefits that LID can provide in addition to managing stormwater. Fewer researchers report results of studies that measure at least some costs *and* at least some benefits of LID vs. conventional controls.

The costs and benefits of LID controls can be site specific and will vary depending on the LID technology (e.g., green roof vs. bioswale), and local biophysical conditions such as topography, soil types, and precipitation. Including developers, engineers, architects and landscape architects early in the design process can help minimize the LID-specific construction costs.

Despite the fact the LID technologies have been promoted and studied since the early 1990s, for many stormwater managers and developers, LID is still a new and emerging technology. As with most new technologies, installation and other costs of LID are highest during the early phases of development and adoption. Over time, as practitioners learn more about the technology, as the number of suppliers of inputs expands, and as regulations adapt to the new technology, costs will likely decline.

Combined sewer overflows (CSO), and the resulting biophysical and economic consequences, are major concerns for municipal stormwater managers. LID can help minimize the number of CSO events and the volume of contaminated flows by managing more stormwater on site and keeping flows out of combined sewer pipes. Some preliminary evidence exists that LID can help control CSO volumes at lower cost than conventional controls.

Many municipalities have zoning and building-inspection standards in place that were adopted many years ago, long before LID was an option. Municipalities with outdated stormwater regulations typically require that builders file variances if they want to use LID controls. This can increase a builder's design and regulatory costs, which delays construction and can increase a builder's financing costs. Updating building regulations to accommodate LID can help reduce the regulatory risk and expense that builders face.

The large majority of the economic studies on LID focus on the costs of including LID in new construction. Replacing curbs, gutters and stormwater pipes with bioswales, pervious pavers and other LID controls can reduce construction costs. Protecting a site's existing drainage patterns can reduce the need for pipe infrastructure and a developer may be able to do away with surface stormwater ponds, which also increases the number of developable lots. Some researchers report that developments that emphasize LID controls and protected natural grass and forest drainage areas cost less to develop and sell for more than traditionally-developed lots with conventional stormwater controls.

Few studies considered the economic outcomes of including LID in urban redevelopment projects. Some evidence exists that LID controls cost more than conventional controls under these conditions, however, these studies excluded O&M costs of the two alternatives and the economic benefits that the LID controls can provide.

I. INTRODUCTION

Conventional stormwater controls collect stormwater from impervious surfaces, including roads, parking lots and rooftops, and transport the flow off site through buried pipes to treatment facilities or directly to receiving bodies of water. This approach efficiently collects and transports stormwater, but also can create high-velocity flows polluted with urban contaminants, including sediment, oil, fertilizers, heavy metals, and pet wastes. Such flows can erode stream banks and natural channels, and deposit pollutants that pose ecosystem and public health risks (Kloss and Calarusse 2006).The resulting ecosystem and public health consequences can create significant economic costs.

A study of the biophysical and public health damages and associated economic costs of stormwater runoff in the Puget Sound estimates these costs at over $1 billion during the next decade (Booth et al. 2006). These costs include flood-related property damage and financial losses, capital costs of new stormwater infrastructure, cleaning up stormwater-polluted water resources, and habitat restoration and protection efforts. The Natural Resources Defense Council (Kloss and Calarusse 2006) describes similar impacts attributed to conventional controls across the U.S.: stormwater sewers collect and discharge untreated stormwater to water bodies, while combined sewer and stormwater systems overflow during heavy rains, discharging both untreated sewage and stormwater into the nation's rivers and lakes. Both contribute to impaired water quality, flooding, habitat degradation, and stream bank erosion. The U.S. Environmental Protection Agency (EPA) estimates the costs of controlling combined sewer overflows (CSO) throughout the U.S. at approximately $56 billion. Developing and implementing stormwater-management programs and urban-runoff controls will cost an additional $11 to $22 billion (Kloss and Calarusse 2006).

In contrast to conventional stormwater controls, low-impact development (LID) techniques emphasize on-site treatment and infiltration of stormwater. The term low-impact development encompasses a variety of stormwater-management techniques. Examples include bioswales, rain gardens, green streets, and pervious pavers (U.S. EPA 2000). The name LID came into use around the late 1990s, however stormwater managers employed LID techniques prior to this. Technicians in Prince George's County, Maryland were some of the first to install what eventually became known as LID techniques in the early 1990s as an alternative to conventional stormwater controls. Soon after, a few communities in the Chesapeake Bay area followed, experimenting with a number of LID demonstration projects. Over time, interest in LID as an alternative or complement to conventional controls grew, and so did the number of LID demonstration projects and case studies across the United States. The EPA reviewed the early literature on LID and described their assessment of this literature in a report released in 2000 (U.S. EPA and Low Impact Development Center 2000). Their review assessed the availability and reliability of data on LID projects and the effectiveness of LID at managing stormwater. While this report focused primarily on the potential stormwater-management benefits of LID, it concluded that LID controls can be more cost effective and have lower maintenance costs than conventional stormwater controls. In December of the following year, the Center for Watershed Protection published one of the earliest studies that focused primarily on the economic aspects of "better site design," which included many LID principles (Center for Watershed Protection 2001).

The amount of information available on the economics of managing stormwater using LID has grown since the publication of these first reports. Most studies describe the costs of installing LID, or compare the costs of installing LID with the costs of installing conventional controls. Other reports focus on the economic benefits that LID can provide in addition to managing stormwater. These benefits include mitigating flooding, improving water-quality, and providing amenity values for properties adjacent to LID, such as green streets. A few—very few—researchers report results of studies that attempt to characterize at least some costs *and* at least some benefits of LID vs. conventional controls in a *single* study. In this report we summarize our review of the literature on the economic costs and benefits of managing stormwater by LID.

This literature review has three objectives. First, to describe briefly, and in plain language, the methods economists use when measuring the costs and benefits of LID and conventional stormwater controls. This information provides the reader with a context for the economic descriptions of costs and benefits that follow. Second, to summarize the literature that identifies and measures the economic costs and benefits of managing stormwater using LID, or that compares costs or benefits, or both, between LID and conventional controls. Third, to organize and present this information in a way that non-economist municipal officials, stormwater managers, ratepayer stakeholders and others can use as they consider and deliberate stormwater-management plans.

This literature review differs from literature reviews that accompany academic studies. Typically, academic literature reviews provide an introduction and a context for an analysis of a specific economic issue, e.g., a new analytical technique that measures economic benefits. In this case, the literature review is a stand-alone document that summarizes information on the broad issue of economic costs and benefits of LID. Academic literature reviews also target academic and professional economists. This literature review targets non-economist readers.

The technical effectiveness of LID stormwater controls is outside the scope of our review. Our analysis assumes that the LID techniques described in the economic studies that we reviewed provide the necessary or expected stormwater controls. As we understand, there is a growing body of literature on LID effectiveness, and we include some of these references in the Appendix to this report. Also, the more general topic of the economic values of ecosystem services, while somewhat related, was outside the scope of our review. Our analysis focused on the values of ecosystem services as affected by LID techniques.

We began our search for relevant literature by developing a list of key words with which to find reports or articles that contained relevant information. After a cursory search of LID literature, we identified LID- and economics-related key words that researchers and practitioners use when describing LID projects and analyses. The list includes words often used synonymously with LID (i.e., source control, natural drainage systems, sustainable stormwater management), or that describe a set of conservation-design strategies that include LID techniques (i.e., green infrastructure and conservation development). We also searched the literature using economics-related terms (i.e., costs, benefits, and savings). Table 1-1 lists the LID- and economics-related search terms we used in our search of the literature.

Using the terms listed in Table 1-1, we searched databases that contained the widest-possible range of sources including academic literature, reports produced by government

agencies and non-profit organizations, news coverage, and articles in the popular press. These databases include information published in peer-reviewed articles, books, reports, conference papers and presentations, and web pages. Table 1-2 lists the databases included in our search.

Table 1-1: Search Terms

LID-Related Search Terms	Economics-Related Search Terms
Low-impact development	Economics
Source control	Benefits, economic benefits
Green infrastructure	Costs, economic costs
Natural drainage systems	Cost comparison
Sustainable stormwater management	Savings
Conservation development	Benefit cost analysis, cost benefit analysis
Alternative stormwater management	Cost effectiveness
Better site design	
Low-impact urban design and development	

Source: ECONorthwest

Table 1-2: Databases

Database	Description
Academic Search Premier	Index of 8,000 academic journals in the social sciences, humanities, and general science, back to 1965.
Article First	Index of 16,000 journal titles in business, humanities, popular culture, science, social science, and technology, back to 1990.
Econlit	American Economic Association's index of economic research, back to 1969.
Environmental Protection Agency (EPA) website	Database of studies, reports, educational material, and newsletters authored or supported by the EPA.
Environmental Valuation Reference Inventory (EVRI)	Database of empirical studies conducted internationally on the economic values of ecosystem services.
Google	Source for non-peer reviewed reports, articles, websites and other publications.
Journal Storage (JSTOR)	Index of over 100 major research journals in a variety of academic disciplines, some back to 1870.
Web of Science	Index of science and social science journals, back to 1975.
WorldCat	Index of bibliographic records of books, journals, manuscripts, etc. archived in university, public and private library catalogs around the world.

Source: ECONorthwest

We reviewed potential sources for relevance. If a source contained LID-related cost or benefit information, we indexed it in our own database, summarized the information on costs or benefits, and reviewed its bibliography for additional sources of information.

This report of our review of the literature is organized as follows. The next two sections provide background information to the discussion of the economic costs and benefits of managing stormwater. This background information provides a context or economic frame-of-reference that will help the reader consider the descriptions of costs and benefits that follow.

In **Section II** we list the range of benefits associated with LID, as identified in the LID literature, along with illustrations of the values of these benefits as reported in the economic literature. We found that many more reports simply list these benefits rather than quantify them.

In **Section III** we describe two of the more common methods of measuring the economic costs and benefits of stormwater controls: the cost-effectiveness and benefit-cost methods. As the names imply, cost-effectiveness studies compare alternatives looking exclusively at the alternatives' costs. This method assumes away benefits or holds them constant across alternatives. A benefit-cost analysis considers the range of costs and benefits for each alternative. The benefit-cost method has greater data demands and can be more expensive than the cost-effectiveness approach—primarily because it adds benefits into the analysis—but it can also yield a more accurate economic picture of the full range of economic consequences of implementing the alternatives.

In **Section IV** we summarize the literature that considers the costs and benefits of LID. The large majority of these studies focus exclusively on the costs of installing LID, or compare the costs of installing LID with the costs of installing conventional controls. Some studies look beyond installation costs to include operations and maintenance costs. Few studies consider both the costs and benefits of LID or compare costs and benefits of LID with conventional controls.[1] When the literature allowed, we described the economic aspects of adopting LID from the perspective of municipal decisionmakers, ratepayer stakeholders, and private developers.

In **Section V** we describe LID from the perspective of property developers. As with other new technologies, adopting LID includes opportunities and risks. We describe the risks and challenges that developers face when they include LID controls in their projects and the successes developers have had adopting LID.

In **Section VI** we discuss areas of future research that would increase our understanding of the economics of LID. For example, limited information exists on the life-cycle costs of LID, the economic benefits of LID beyond stormwater control, and the economic impacts of installing LID in urban-redevelopment settings.

The **Bibliography** lists the references we cite in this report. During our search for information on the economic aspects of LID, we encountered non-economic information that supports the use of LID. We list this information in the **Appendix** to this report.

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[1] We list the reported dollar amounts of costs and benefits without converting to current, 2007-year, dollars because in most cases, the available information prevented such a conversion.

II. Ecosystem Services Provided or Enhanced by Low-Impact Development

Conventional controls and LID techniques both manage stormwater flows. By promoting stormwater management on site using a variety of techniques, LID controls can provide a range of ecosystem services beyond stormwater management. Braden and Johnston (2004), Coffman (2002), and the Natural Resources Defense Council (Lehner et al. 2001) list and describe the kinds of ecosystem services that LID can provide or enhance. Taken together, these researchers describe the following ecosystem services: reduced flooding, improved water quality, increased groundwater recharge, reduced public expenditures on stormwater infrastructure, reduced ambient air temperatures and reduced energy demand, improved air quality, and enhanced aesthetics and property values. We briefly describe each of these services below.

Reduced Flooding

Braden and Johnston (2004) studied the flood-mitigation benefits of managing stormwater on site, including reduced frequency, area, and impact of flooding events. In a follow-up study, Johnston, Braden, and Price (2006) focus on the downstream benefits accrued from flood reduction accomplished by greater upstream on-site retention of stormwater. These benefits include reduce expenditures on bridges, culverts and other water-related infrastructure.

Improved Water Quality

Brown and Schueler (1997), Center for Watershed Protection (1998), U.S. EPA and Low Impact Development Center (2000), and Braden and Johnston (2004) describe the water-quality benefits that LID stormwater controls can provide. These benefits include effectively capturing oil and sediment, animal waste, landscaping chemicals, and other common urban pollutants that typically wash into sewers and receiving water bodies during storm events. Plumb and Seggos (2007) report that LID controls that include vegetation and soil infiltration, e.g., bioswales, can prevent more stormwater pollutants from entering New York City's harbor than conventional controls.

Increased Ground Water Recharge

On-site infiltration of stormwater helps recharge groundwater aquifers. According to a report by American Rivers, the Natural Resources Defense Council, and Smart Growth America (Otto et al. 2002), areas of impervious cover can significantly reduce ground water recharge and associated water supplies. The study found that impervious surfaces in Atlanta reduced groundwater infiltration by up to 132 billion gallons each year—enough water to serve the household needs of up to 3.6 million people per year.

Braden and Johnston (2004) distinguish between two services associated with increased groundwater recharge: the increased volume of water available for withdrawal and consumption, and maintaining a higher water table, which reduces pumping costs and increases well pressure.

Reduced Public Expenditures on Stormwater Infrastructure

The Center for Watershed Protection (1998), Lehner et al. (2001), and U.S. EPA (2005) report that LID techniques, such as bioswales, rain gardens, and permeable surfaces, can help reduce the demand for conventional stormwater controls, such as curb-and-gutter, and pipe-and-pond infrastructure. Braden and Johnston (2004) report that retaining stormwater runoff on site reduces the size requirements for downstream pipes and culverts, and reduces the need to protect stream channels against erosion.

Two recent studies by the Natural Resources Defense Council (Kloss and Calarusse 2006) and Riverkeeper (Plumb and Seggos 2007) report that by managing stormwater on site, LID techniques can help reduce combined sewer overflows. Combined sewer systems transport both sewage and stormwater flows. Depending on the capacity of the pipes and the amount of rainfall, the volume of combined sewer and stormwater flows can exceed the capacity of the pipes when it rains. When this happens, overflows of sewage and stormwater go directly to receiving bodies of water untreated. LID helps to keep stormwater out of the combined system, which reduces CSO events. Thurston (2003) found that decentralized stormwater controls, such as LID, can control CSO events at a lower cost than conventional controls.

Reduced Energy Use

LID techniques, such as green roofs and shade trees incorporated into bioswales and other controls can provide natural temperature regulation, which can help reduce energy demand and costs in urban areas. Plumb and Seggos (2007) estimate that covering a significant amount of the roof area in New York City with green roofs could lower ambient air temperatures in summer by an estimated 1.4 degrees Fahrenheit. The U.S. EPA and Low Impact Development Center (2000) report that the insulation properties of vegetated roof covers can help reduce a building's energy demand, and notes that green roofs in Europe have successfully reduced energy use in buildings.

Improved Air Quality

Trees and vegetation incorporated into LID help improve air quality by sequestering pollutants from the air, including nitrogen dioxide, sulfur dioxide, ozone, carbon monoxide, and particulate matter (American Forests 2000-2006). In a study by Trees New York and Trees New Jersey, Bisco Werner et al. (2001) report similar air-quality benefits of trees and vegetation in urban areas. Plumb and Seggos (2007) cite one study that found that a single tree can remove 0.44 pounds of air pollution per year.

Enhanced Aesthetics and Property Values

Several studies including Lacy (1990), Mohamed (2006), U.S. Department of Defense (2004), and Bisco Werner et al. (2001) report that the natural features and vegetative cover of LID can enhance an area's aesthetics, and increase adjacent property values. The U.S. Department of Defense (2004) highlights how LID can improve the aesthetics of the landscape and increase adjacent property values by providing architectural interest to otherwise open spaces. On commercial sites, Bisco Werner et al. (2001) found that LID on commercial sites provided amenities for people living and working in the area and complemented the site's economic vitality, which improved its competitive advantage over similar establishments for customers and tenants.

III. Economic Framework: Measuring Costs and Benefits of Low-Impact Development

Researchers and practitioners assess the economic aspects of LID using several methodologies. These methodologies range from rough cost evaluations, that compare a subset of costs of LID against the same costs for conventional management techniques, to benefit-cost analyses, that compare a range of costs and benefits of LID to the same for conventional stormwater controls. This section examines the differences in these methodologies.

Most economic evaluations of LID reported in the literature emphasize costs. The overwhelming majority of these studies confined their analyses to measuring installation costs. Evaluators prefer this method perhaps because from a developer's perspective, installation cost is one of the most important considerations when choosing between LID or conventional controls. LID can compare favorably with conventional controls in a side-by-side analysis of installation costs (*see for example* Foss 2005; Conservation Research Institute 2005; U.S. EPA 2005; Zickler 2004), however, focusing on installation costs misses other relevant economic information. For example, such a focus excludes operation and maintenance (O & M) costs, differences in the effectiveness of LID versus conventional systems, and the environmental and economic benefits that LID can provide, but which conventional controls cannot.

Evaluating projects based on installation costs has advantages of costing less than studies that include other economic factors, e.g., O & M costs, taking less time than more extensive analyses, and relying on readily available construction-cost data. The tradeoff for stormwater managers is an incomplete and possibly biased description of economic consequences, especially over the long term.

Some researchers look beyond comparisons of installation costs and evaluate LID and conventional controls using a method know as a life-cycle cost analysis (LCCA) (Powell et al. 2005; Sample et al. 2003; Vesely et al. 2005). This approach considers a comprehensive range of stormwater-management costs including planning and design costs, installation costs, O & M costs, and end-of-life decommissioning costs. An LCCA method requires more data than a comparison of installation costs, and this data, particularly data on lifetime O & M costs, may not exist or is difficult and costly to obtain. The tradeoff for policy makers is more accurate information on the cost implications of alternative stormwater-management options. However, LCCA, like more limited cost comparisons, excludes measures of economic benefits.

Another limitation of cost comparisons is that they ignore differences in effectiveness between LID and conventional controls. For this reason, researchers recommend that LCCA should compare projects that provide the similar levels of services (Powell et al. 2005). Brewer and Fisher (2004), Horner, Lim, and Burges (2004), and Zielinski (2000) found, however, that LID approaches can manage stormwater quantity and quality more effectively than the conventional approaches, either controlling more flow, or filtering more pollutants, or both. In these cases, an LCCA study could conclude that an LID option costs more than the conventional control, without accounting for the fact that the LID option can manage a larger volume of stormwater.

The benefit-cost approach overcomes the limitations of simple cost comparisons or LCCA by considering the full range of costs and benefits of alternative management options. The tradeoff is that the benefit-cost approach requires more data than cost comparison, which increases the time and costs of conducting the economic analysis.

The benefit-cost approach evaluates the net economic benefits of a project, or compares outcomes among projects, by comparing relevant costs with relevant economic benefits (Boardman et al. 2005; Field and Field 2006; Gramlich 1990; Kolstad 2000). Economic researchers in academic, business, and public-policy sectors have for many years conducted benefit-cost analyses in a wide variety of applications. Since at least the middle of the twentieth century, economic evaluations of large-scale public projects included some type of benefit-cost analysis, and since 1981, the federal government required that new programs and regulations include a benefit cost analysis (Freeman 2003). The U.S. Office of Management and Budget (OMB) considers the benefit-cost method the "recommended" technique when conducting formal economic analyses of government programs or projects (U.S. OMB 1992). Over the years, the technique has grown more sophisticated, especially with respect to measuring and incorporating non-market goods and services, such as the values of ecosystem services (Croote 1999).

The economic literature on benefit-cost analysis is voluminous and growing, but the basic process can be broken into four steps (Field and Field 2006).[2]

1. The first step defines the scope of the analysis, including the population that will experience the benefits and costs, and the elements of the project, including location, timing, and characteristics of the work to be done.

2. The second step determines a project's full range of inputs and effects, from the planning and design phase through the end of the project's lifespan.

3. The third step identifies and, where possible, quantifies the costs and benefits resulting from the project's inputs and effects. Where quantification is not possible, qualitatively describe the cost or benefit in as much detail as possible, including degree of uncertainty and expected timing of impacts (long-term or short-term).

4. The final step compares the benefits and costs of the project, either in terms of net benefits (the total benefits minus the total costs) or in terms of a benefit-cost ratio (the amount of benefits produced per unit of cost). If relevant, compare results among alternative projects.

We found few benefit-cost evaluations of LID projects. The large majority of studies estimate installation costs, a few consider additional costs, such as O & M costs, and a handful compared some measures of costs against some measures of benefits. The reported benefit-cost studies of LID include Bachand (2002) and Fine (2002),[3] Devinny

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[2] For a more complete discussion of benefit-cost analysis, see Field and Field (2006), Gramlich (1990) and Harberger and Jenkins (2002).

[3] We reviewed summaries of Bachand (2002) and Fine (2002) because we were unable to acquire copies of the full articles.

et al. (2005), and Doran and Cannon (2006). Data limitations may explain part of the reason for the limited number of benefit-cost analyses of LID. This is especially true for lifetime O & M costs and the economic importance of LID benefits. Sample et al. (2003), Powell et al. (2005), Johnston, Braden, and Price (2006), and Conservation Research Institute (2005), among others, describe the need for more research quantifying the benefits of LID practices.

Another reason may be that economic benefits or lifetime O & M costs have no relevance to a given economic study. For example, property developers pay installation costs of stormwater controls, but not lifetime O & M costs. Nor do they benefit directly from the ecosystem services that LID can enhance or provide. Economic results reported by developers will therefore likely focus exclusively on installation costs of LID or compare installation costs for LID and conventional controls.

Using the benefit-cost approach has challenges that the other analytical methods do not. However, benefit-cost analysis has advantages in that it can provide decisionmakers, ratepayers and other stakeholders with a more complete picture of the economic consequences of stormwater-management alternatives than other analytical methods. This is especially true for costs and benefits of alternatives over the long term. In situations in which time, budget, or other information constraints limit quantifying economic benefits or costs, the next best alternative is identifying the range of costs and benefits, quantifying what can be measured and describing the remaining impacts qualitatively. The federal government takes this approach in that the OMB recommends that when benefits and costs cannot be quantified, agencies should provide qualitative descriptions of the benefits and costs. These qualitative descriptions should include the nature, timing, likelihood, location, and distribution of the unquantified benefits and costs (U.S. OMB 2000).

IV. Costs and Benefits of Low-Impact Development

The large majority of literature that describe economic assessments of LID focus on the costs of installing the technology. Most studies report the costs of building LID stormwater controls, or compare the costs of installing LID to the costs of conventional controls. The organization of this section reflects this emphasis in the literature. We begin by summarizing studies that list the costs of installing various LID techniques. Most of these reports describe the outcomes of case studies of LID installed as new or developing stormwater-management technologies. We then discuss studies that compare the costs of building LID controls with the costs of building conventional controls.

A number of researchers looked beyond installation costs and considered the impacts that operations and maintenance costs can have on economic evaluations of LID. Analysts sometimes refer to these as life-cycle studies because they consider the relevant costs throughout the useful life of a technology. We summarize three studies that took this approach with LID evaluations.

Combined sewer overflows, and the resulting biophysical and economic consequences, are major concerns for municipal stormwater managers. LID can help minimize the number of CSO events and the volume of contaminated flows by managing more stormwater on site and keeping flows out of combined sewer pipes. We summarize five studies that evaluated the costs of managing CSO events using LID.

A relatively small percentage of the economic evaluations of LID reported in the literature include assessments of the economic benefits of the technology. We summarize a number of these reports at the end of this section.

A. Cost of Low-Impact Development

Brown and Schueler (1997) surveyed construction costs for different methods of managing stormwater in urban areas. Their survey emphasized conventional controls but also included a number of LID techniques. At the time of their study, LID techniques were considered “next generation” best-management practices (BMPs). The report lists construction costs for sixty-four BMPs including wet and dry stormwater ponds, bioretention areas, sand filters and infiltration trenches. The authors’ major conclusion is that a BMP’s construction cost increases with the volume of stormwater the BMP stores. The report’s construction costs may be out-of-date, however they provide insights into relative cost differences between LID and other controls listed in the report.

In a more recent study, Tilley (2003) reports construction costs for LID case studies implemented in Puget Sound and Vancouver, B.C. The report describes a range of case studies from small-scale projects implemented by homeowners to large installations completed by universities, developers and municipal governments. The LID techniques studied include rain gardens, permeable pavement and green roofs. The amount of cost information varies by case study. In some cases the report lists per-unit costs to install an LID, e.g., a pervious concrete project cost $1.50 per square foot for materials (excluding labor). Other descriptions report costs generally, but not costs specific to the case study described, e.g., the cost for pervious concrete is typically $6 to $9 per square foot. Some descriptions have no cost information, and others list total construction costs without a detailed breakdown of cost components.

The U.S. Department of Defense (DoD) (2004) developed a manual of design guidelines to incorporate LID into DoD facilities. The manual describes 13 stormwater-management techniques and their most appropriate uses, maintenance issues, and cost information. The list of LID techniques includes bioretention, grassed swales, and permeable pavers. The manual describes costs in some detail but also notes the site-specific nature of construction costs and factors that can influence construction costs for certain LIDs.

Liptan and Brown (1996) describe one of the earliest comparisons of construction costs for LID with that for conventional controls.[4] They focus on two projects in Portland, Oregon, which they refer to as the OMSI and FlexAlloy projects, and the Village Homes development in Davis, California. In all cases, the LID option cost less. The LID design implemented at the OMSI project saved the developer $78,000 in construction costs by reducing manholes, piping, trenching, and catch basins. At the FlexAlloy site, the City of Portland conducted a retrospective study of LID vs. conventional development, after the builder installed conventional controls. The City calculated that the developer could have saved $10,000 by implementing the LID option. The description of the FlexAlloy case study includes a detailed comparison of construction costs for the two options. The Village Homes case study concluded that by using vegetated swales, narrow streets, and a cluster layout of building lots, the developer saved $800 per lot, or $192,000 for the development. The Village Homes description includes no additional details on construction costs for the two options. The report also includes brief descriptions of other LID case studies, some with cost comparisons for LID vs. conventional controls. The authors conclude that involving developers, engineers, architects and landscape architects early in the design of a development that includes LID can help minimizing the LID-specific construction costs.

Hume and Comfort (2004) compared the costs of constructing conventional roads and stormwater controls with the costs of building LID options, such as bioretention cells and pervious pavement. The researchers added complexity to some of their comparisons by paring the same conventional and LID controls, e.g., infiltration trench (conventional) vs. bioretention cell (LID) on a different soil types and with different sources of stormwater runoff (e.g., driveway vs. roof top) to see how this affected construction costs. In some comparisons the LID option cost more than the conventional option, in other cases the results were opposite. These comparisons illustrate the site-specific nature of LID construction costs. Local conditions, e.g., less pervious soils, can influence the costs of LID controls.

In some cases, LID can help lower construction costs by making use of a site's existing or undisturbed drainage conditions in ways that conventional controls cannot. Planners of a 44-acre, 80-lot residential development in Florida took advantage of the site's natural drainage patters to help lower stormwater-management costs (PATH 2005). The site's low-lying areas convey the large majority of stormwater runoff to forested basins. The developer minimized disturbing natural drainage patterns by clustering building sites and connecting sites with narrow roads. Relying on natural infiltration and drainage patterns help the developer save $40,000 in construction costs by avoiding the costs of constructing stormwater ponds.

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[4] In this Section we describe some of the developments associated with costs comparisons reported in the LID literature. The next Section focuses on LID from the perspective of property developers and contractors. In that Section we list results for a larger number of cost comparisons

Comparing construction costs between LID and conventional options, while informative, provides no information on the relationship between the cost and effectiveness. For example, in cases where the LID option costs more to build, it may also control a larger volume of stormwater relative to the conventional option. LID that keeps stormwater out of pipes and treatment facilities help lower operations and maintenance (O & M) costs, and help extend the useful life of the infrastructure, which can reduce future construction costs. The relative importance of construction or O & M costs depends on who pays for them. Builders likely focus exclusively on construction costs, however, cost and effectiveness information would help stormwater managers better evaluate control options and plan for future demands on stormwater infrastructure.

Brewer and Fisher (2004) report the results of four case studies that compared the cost and effectiveness of LID to that of conventional controls. The case studies modeled stormwater costs and conditions on four developments: high- and medium-density residential, an elementary school, and a commercial development. In both residential developments LID controls cost less than conventional controls. LID cost more for the school and commercial development. However, in all four cases, the LID option managed a larger volume of stormwater than the conventional option. We reproduce Brewer and Fisher's results in Table 4-1.

Table 4-1: Comparison of Runoff Controlled and Cost Savings for Conventional and LID Design.

Site Example	Runoff Storage (acre-feet)		LID Net Cost or Savings
	Conventional	LID	
Medium Density Residential	1.3	2.5	$476,406
Elementary School	0.6	1.6	$(48,478)
High Density Residential	0.25	0.45	$25,094
Commercial	0.98	2.9	$(9,772)

Source: Brewer and Fisher 2004

We calculated the economic value of the additional storage provided by the LID designs reported in Brewer and Fisher (2004), using data on the national average of construction costs as reported by American Forests. American Forests' CITYgreen analyses calculate the national-average cost of storing 1 acre-foot of runoff at $87,120.[5] American Forests uses a value of $2.00 per cubic foot of storage, obtained from national estimates of stormwater construction costs. This amount represents the avoided costs of not building stormwater detention ponds. This value may vary, depending on a project's location. In some of its analyses, American Forests uses local estimates of construction costs, which can be lower or higher than the national average. For example, American Forests uses

[5] *See, for example,* American Forests. 2003. *Urban Ecosystem Analysis: San Diego, California*. July. Retrieved August 2, 2007, from http://www.americanforests.org/downloads/rea/AF_SanDiego.pdf, American Forests. 2003. *Urban Ecosystem Analysis: Buffalo-Lackawanna Area, Erie County, New York*. June. Retrieved August 2, 2007, from http://www.americanforests.org/downloads/rea/AF_Buffalo.pdf.

$0.66 per cubic foot of storage in Houston, TX,[6] $5.00 per cubic foot of storage in Washington D.C.,[7] and $6.00 per cubic foot of storage in Portland, OR.[8] Table 4-2 shows the results of our calculation.

Table 4-2: Value of the Difference in Runoff Storage Provided by LID Designs.

Site Example	Runoff Storage (acre-feet)			Runoff Storage Difference (cubic-feet)[a]	Value of Difference in Runoff Storage ($2/cf)
	Conventional	LID	Difference		
Medium Density Residential	1.3	2.5	1.2	52,272	$104,544
Elementary School	0.6	1.6	1	43,560	$87,120
High Density Residential	0.25	0.45	0.2	8,712	$17,424
Commercial	0.98	2.9	1.92	83,635	$167,270

Source: ECONorthwest
Notes: [a] To convert from an acre foot to cubic feet, multiply by 43,560 (the number of cubic feet in an acre-foot).

Based on the results reported in Table 4-1, and taking the perspective of a builder, LID is the higher-cost alternative for the school and commercial development. Including the results from Table 4-2, and taking the perspective of a municipal stormwater manager—that is, considering construction costs and the cost savings associated with reductions in stormwater volume in our example calculation above—the LID option dominates the conventional choice in all four cases. The LID options control a larger volume of stormwater, which helps avoid municipal expenditures on stormwater management.

Doran and Cannon (2006) studied the relationship between construction costs of LID and conventional controls and effectiveness as measured by improvements in water quality. They studied the impacts of incorporating LID into a downtown redevelopment project in Caldwell, Idaho. The analysis modeled construction costs and improvements to water quality as measured by reduced concentrations of sediment and phosphorus in stormwater runoff. The LID techniques used in the project included permeable pavers, bioretention swales, riparian wetlands, and plantings of restored native vegetation. The study evaluated the LID and conventional controls using the cost of a 1-percent reduction in sediment and phosphorus concentrations. Conventional stormwater controls had lower

[6] American Forests. 2000. *Urban Ecosystem Analysis for the Houston Gulf Coast Region*. December. Retrieved August 2, 2007, from http://www.americanforests.org/downloads/rea/AF_Houston.pdf.

[7] American Forests. 2002. *Urban Ecosystem Analysis: The District of Columbia*. February. Retrieved August 2, 2007, from http://www.americanforests.org/downloads/rea/AF_WashingtonDC2.pdf.

[8] American Forests. 2001. *Regional Ecosystem Analysis for the Willamette/Lower Columbia Region of Northwestern Oregon and Southwestern Washington State*. October. Retrieved August 2, 2007, from http://www.americanforests.org/downloads/rea/AF_Portland.pdf.

installation costs, but also had a lesser impact on water quality. Conventional controls cost $8,500 and reduced sediment and phosphorus concentrations by 5 percent, or $1,700 per percent reduction. LID stormwater controls cost more, $20,648, but had a greater impact on water quality, reducing sediment by 32 percent and phosphorus by 30 percent. The authors calculated a cost of $645 per percent reduction for the LID option. The LID option produced a better return on initial investment, as measured by improvements to water quality, than did investments in conventional controls.

As the previous two studies illustrate, comparing LID and conventional controls based on costs may bias the assessment against the most effective management option, and the option that yields the greatest return on investment. LID may cost more to build, but from an investment perspective, it may also control more stormwater and better improve water quality. The studies above considered separately LID effectiveness as measured by volume of stormwater managed and improvements in water quality of stormwater runoff. A more complete and accurate assessment of effectiveness and costs would consider the impacts on both in a single study. That is, compare LID and conventional controls based on costs and effectiveness as measured by volume of stormwater *and* water quality. We found no such studies in the literature.

Looking beyond construction costs to O & M and other costs gives a more complete description of the economic consequences of adopting LID or conventional controls. Sample et al. (2003) promotes evaluating stormwater BMPs using life-cycle-cost (LCC) analysis. LCC analysis includes the initial capital expenditures for construction, planning, etc., and the present value of lifetime O & M costs, and the salvage value at the end of the BMP's useful life. In addition, the authors suggest including the opportunity cost of land in the cost analysis. BMPs that occupy more land area have a higher opportunity cost valued at the next-best use for the land, e.g., residential value.

Vesely et al. (2005) compared the LCC for LID controls in the Glencourt Place residential development in Auckland, New Zealand with LCC results for conventional controls. The LID option had the added benefit of reusing stormwater collected on site as grey water for laundry, flushing toilets and irrigation. The LID option had LCCs that were 4 to 8 percent higher than the conventional option, depending on the discount rate and number of years in the analysis. These results do not account for the value of recycled stormwater. Including the avoided cost associated with water saved by recycling stormwater as household gray water, the LCC for the LID option were 0 to 6 percent higher, again, depending on the discount rate and number of future years in the analysis. The authors conclude that accounting for the value of water saved, the LID option was cost competitive with the conventional approach, as measured by the LCC method.

Data constraints on this study included difficulty estimating current and future maintenance costs and future decommissioning costs. Accounting for the opportunity cost of land also proved challenging give the available data. Data limitations also prevented the authors from considering the economic aspects of environmental externalities associated with the LID and conventional options.

LCC evaluations are an improvement over comparisons of construction costs in that they provide a more comprehensive assessment of relevant costs. On the other hand, LCC analyses require more data and results are sensitive to the discount rate applied to future values and the number of years of the analysis. Powell et al. (2005) underscore these advantages and challenges associated with LCC analysis. They recommend a checklist of

factors to consider when conducting a LCC for LID and conventional controls. The checklist includes *quantitative* assessments of the components of LCC costs including acquisition, construction, O & M, and salvage value. Also included are *qualitative* assessments of the effectiveness of managing stormwater and the benefits attributed to the management option. The authors note that effectively and accurately implementing LCC analyses for LID will require more research into the costs of LID design, construction and O & M. Further research is also need in assessing the monetary benefits of LID controls.

Despite the fact that LID technologies have been promoted and studied since the early 1990s, in many ways, and to many stormwater managers, LID is still a new and emerging technology (Coffman 2002). As with most new technologies, installation and other costs for LID are highest during the early phases of development and adoption. Over time, as practitioners learn more about the technology, as the number of suppliers of inputs increases, and as regulations adapt to the new technology, costs will likely decline.

Foss (2005) describes this relationship between a learning curve and construction costs for greenstreet technology in Seattle. The city spent $850,000 implementing a greenstreet pilot project, known as the "Street Edge Alternative" (SEA) street. The City's street planners expect that based on their experience with the pilot project, building greenstreets in the future will cost substantially less. Foss quotes the manager of the City's surface water program on this point:

> *"You could take $200,000 off the price just from what we didn't know. … The pilot phases that we are currently in are more expensive, but as the project becomes institutionalized, all the costs will come down. Even still, these projects are less expensive than standard projects." (p. 7)*

B. Costs of Managing Combined Sewer Overflows By Low-Impact Development

One of the earliest studies of the economic aspects of managing combined sewer overflows by LID evaluated a project that disconnected downspouts as a means of reducing the number of CSO events and costs (Kaufman and Wurtz 1997). In 1994, the Beecher Water District (BWD) near Flint, Michigan, provided free downspout diversions from home sites to sanitary-sewer pipes for the 6,020 residential customers in their service area. The purpose of the program was to reduce the volume of sewer flows from the BWD to the City of Flint's stormwater facility—and reduce the fees that BWD paid the city to manage these flows—and reduce the number and volume of CSO events in the BWD.

The program was a success on many levels and is an example of a small-scale and inexpensive approach that effectively managed CSO events. Disconnecting downspouts cost the BWD just over $15,000. After the diversions, the mean volume of sewer flows measured across all precipitation events decreased 26 percent. The program saved the BWD over $8,000 per month in reduced fees to the City of Flint's stormwater facility, and in reduced costs of managing CSO events. The program paid for itself in two months. Other benefits included reduced CSO-related customer complaints, improved recharge of groundwater and reduced pollution of the Great Lakes, the receiving waters for CSO from the District.

In another study looking at controlling CSO events on a smaller scale, Thurston et al. (2003) modeled the costs of CSO controls for a small watershed in Cincinnati, Ohio. The modeling exercise was part of a study that evaluated the theoretical considerations of developing a market for tradable stormwater credits as a means of reducing CSO events and costs. One part of the study compared the construction costs of controlling CSO events by building tunnels and storage vaults with the costs of building LID controls on each of the 420 mostly-residential lots in the study area.

They calculated that building the tunnel and vault option would cost between $8.93 to $11.90 per cubic foot of storage capacity. Building LID controls on individual lots would cost $5.40 per cubic foot of capacity. Based on these results the researchers suggest that the costs of managing CSOs by implementing LID throughout the watershed would cost less than building a large centralized tunnel and vault system to store excess flows. They also note, however that their analysis does not include the opportunity cost of land that the LID controls would occupy, and so the cost of the LID option would be higher than they report. Their analysis also excludes O & M costs for both options, as well as the costs of education and outreach to property owners, and managing the construction of a large number of dispersed LID projects as components of the LID option. The project also excludes the economic benefits of the LID option.

Kloss and Calarusse (2006) developed a set of policy guidelines for decisionmakers interested in implement LID controls as a means of reducing CSO events in their jurisdictions. Regarding the costs of LID controls, the authors distinguish between new and retrofit construction projects. In new developments, they conclude, LID typically cost less than conventional stormwater controls. They note, however, that retrofit developments in urban areas that include LID typically cost more than conventional controls. This is especially true for individual, small-scale retrofit projects. The relative costs of LID controls can be reduced when they are incorporated into larger-scale redevelopment projects. The report provides conclusions with limited details on cost information. The report also describes the experiences of nine municipalities across the country that include LID in their policies to control CSO events and related costs.

Montalto et al. (2007) described the relationship between public agencies tasked with controlling CSO events, and private land owners on whose property the large majority of LID controls would be sited. The public agencies benefit from the reduced stormwater flows and CSO events that LID provides. The land owner, however, pays the LID installation and O & M costs, but may see little benefit beyond reduced stormwater fees or increased property values from LID such as greenstreets. These benefits may not outweigh the costs to the land owner, and so they may choose not to install LID controls. Given this disconnect, the authors note the benefits of public policies, incentives and subsidies to promote LID adoptions by private-property owners.

In an effort, in part, to measure the amount of subsidy that may be required, the authors developed a model to assess the cost-effectiveness of mitigating CSO events in urban areas using LID. They applied their model to a case study in the Gowanus Canal area of Brooklyn, NY. The case study compared the costs of installing porous pavement, green roofs, wetland developments and other LID throughout the study area to the costs of installing storage tanks to catch excess stormwater flows. As part of their analysis they collected and report installation and O & M costs for a range of LID techniques.

They conclude that under a range of cost and performance assumptions, LID installed throughout the study area could potentially reduce the number of CSO events and volume at a cost that would be competitive or less than the costs of the conventional storage-tank option. They note that they could improve the performance of their model if more data were available on LID performance, costs and public acceptance.

Plumb and Seggos (2007) studied the impacts of diverting monies currently designated to building storage tanks and other conventional CSO controls for New York City to building LID controls throughout the city. They compared the effectiveness of storage tanks and LID controls based on gallons of stormwater managed per $1,000 invested. We reproduce their results in Table 4-3 below. Except for greenroofs, the LID options control more stormwater per $1,000 invested than the conventional storage-tank option.

Table 4-3: Gallons of Stormwater Managed per $1,000 Invested.

Stormwater Control	Gallons per $1,000 Invested
Conventional Storage Tanks	2,400
Greenstreet	14,800
Street Trees	13,170
Greenroof	810
Rain Barrel	9,000

Source: Plumb and Seggos 2007

They describe their analysis as a simple and preliminary cost comparison and conclude that their results demonstrate that LID controls can be cost competitive with conventional controls, if not more so. The authors recommended further detailed study of the issue. Their analysis focused on the costs of LID vs. conventional controls and did not consider economic benefits of the LID techniques.

C. Economic Benefits of Low-Impact Development

Many reports and articles describe the potential benefits that LID stormwater controls can provide—benefits that conventional controls can not offer.[9] Very few studies, however, quantify these benefits, either in biophysical measures or in dollar amounts. A study by CH2MHill (2001) is a typical example. The analysis compared the costs and benefits of managing stormwater in two residential developments using LID or conventional controls. The cost analysis included detailed information for the LID and conventional controls. In this case, results of the cost analysis were mixed. In one development the LID option cost less to build and in the other development the conventional control cost less. In both cases the LID option had higher maintenance costs but homeowners would benefit from lower stormwater and water fees.

[9] We list a number of these sources in Section II of this report.

The analysis of benefits included much less detailed information. The study lists the benefits that the LID option would provide, benefits that the conventional approach would not. These benefits include reduced auto traffic, increased open space, improved downstream water quality, and increased groundwater recharge. However, the benefits were not quantified in dollar amounts.

In another example, Bachand (2002) studied the costs and benefits of developing wetlands as a stormwater management option. The analysis described the construction and O & M costs associated with the wetlands option, and the benefits including adding new recreational opportunities, increased wildlife habitat and increase property values for near-by homeowners. However, they did not measure the benefits in economic terms. An accompanying study by Fine (2002) quantified some of the recreational benefits that derive from wildlife watching in the wetlands, but left unquantified the benefits of other direct uses of the wetlands, as well as the value of habitat improvements and other non-use benefits.[10]

When researchers cite the needs for further research into LID-related topics, quantifying benefits and measuring their economic importance invariably makes the list. For example, Sample et al. (2003) cites the need for more research into measuring the technical and economic benefits of LID, including benefits to downstream receiving waters. Powell et al. (2005) note the need for more research into monetary measures of the benefits of LID, e.g., the impact that a greenstreet can have on adjacent property values. Vesely et al. (2005) state that future studies should include not only the economic benefits of LID but also the negative economic impacts of conventional controls. Failing to do so will continue biasing management decisions in favor of conventional controls:

> *"Exclusive reliance on profitability and market value will favour [sic] the conventional approach to stormwater management by disregarding both the negative environmental externalities associated with this approach, and the positive environmental externalities associated with the low impact approach." (page 12)*

A number of studies do measure some of the economic benefits of on-site stormwater controls. For example, Braden and Johnson (2004) studied the economic benefits that on-site stormwater management could have on properties downstream. The researchers first estimated the impacts that on-site stormwater controls could have on the frequency and extent of downstream flooding. Using information reported in the literature on the extent to which property markets discount the value of properties in a floodplain, they approximated the economic value of reduced flooding attributed to on-site management of stormwater. They then calculated the value of avoided flood damage as a percentage of property values. They estimate that a marginal reduction in flooding would increase property values 0 to 5 percent for properties in a floodplain, depending on the extent to which the on-site controls reduce stormwater runoff.

They then took a similar approach to valuing improvements in water quality. Based on values reported in the literature, they estimate that the benefits of improved water quality could reach 15 percent of market value for properties that border the water body at issue

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[10] We were unable to obtain a copy of the full report. We base our description on a summary of the analysis.

if water quality improves significantly. The increase is much less for smaller improvements in water quality, for undeveloped properties, and for properties not adjacent to the water body.

They conclude with a best-guess estimate of a 2 to 5 percent increase in property values for properties in a floodplain from on-site management of stormwater. Other benefits that could not be quantified or valued given available information include reduced infrastructure expenditures for culverts, bridges and other drainage infrastructure.

In a follow-up case study, Johnston, Braden, and Price (2006) applied the analytical method developed in the previous study to properties in the one-hundred-year floodplain portion of a watershed in the Chicago area. They estimate the economic benefit of avoided flooding two ways and extend the analysis to approximate reduced municipal expenditures on culverts.

Applying the 0 to 5 percent impact on property values calculated in the previous study to properties in the case study, the researchers estimated an economic benefit of $0 to $7,800 per acre of increased property value attributed to reduced flooding. They also calculated the economic benefit of reduced flooding based on the avoided flood damage to structures and contents for properties in the floodplain. This analytical method included data compiled by the U.S. Army Corps of Engineers on the relationship between flooding and damages to properties in floodplains. This approach yields an economic benefit of avoided flooding of $6,700 to $9,700 per acre for properties in the floodplain.

The researchers approximate that for the case-study portion of the watershed, conservation-design practices such as LID techniques that retain more stormwater on site and reduce flooding could generate $3.3 million in avoided costs for road culverts.

The estimated economic benefit of increased on-site management of stormwater for properties in the case study for both avoided flooding and reduced municipal expenditures on culverts is $380 to $590 per acre.

A series of analyses by American Forests (2000-2006) report the economic benefits of stormwater services provided by trees in various cities and regions throughout the United States. These reports describe results from American Forests' CITYgreen model, which calculates the volume of stormwater absorbed by existing tree canopies and estimates the avoided costs in stormwater management that the trees provide. The model includes city-specific per-unit stormwater-management costs when available. The model substitutes national per-unit costs when city-specific data are not available. In Table 4-4 below we report the results for some of American Forests' city and regional analyses. The dollar amounts represent the costs of expanding stormwater infrastructure to manage the stormwater that existing trees otherwise absorb and transpire.

Table 4-4: Avoided stormwater-construction costs attributed to trees, as measured by the American Forests' CITYgreen model.

Urban Area	Amount that trees save in one-time stormwater-construction costs
Houston, Texas	$1.33 billion
Atlanta, Georgia	$2.36 billion
Vancouver, Washington/ Portland-Eugene, Oregon	$20.2 billion
Washington D.C.	$4.74 billion
New Orleans, Louisiana	$0.74 billion
San Antonio, Texas	$1.35 billion
San Diego, California	$0.16 billion
Puget Sound Metro Area, Washington	$5.90 billion
Detroit, Michigan	$0.38 billion
Chesapeake Bay Region	$1.08 billion

Source: American Forests 2000-2006

The Bisco Werner et al. (2001) analysis of the economic benefits of trees attributed to stormwater management also employed the CITYgreen model. Researchers applied the CITYgreen model to a case study that included the commercial corridor along a major highway through central New Jersey. The analysis modeled the change in tree canopy between 1975 and 1995, and calculated the value of lost stormwater services. During this time, the value of services declined from $1.1 million to $896,000, a 19-percent reduction. If existing trends continue, the expected value in 2015 will be $715,000, a 35-percent reduction relative to the value of services available in 1975. As services supplied by street trees declines, demand on municipal stormwater controls, and associated costs, increase.

The researchers extended their study to include the economic benefits of tree cover attributed to removing air pollutants. This portion of their analysis studied the tree cover at a number of commercial properties in the New York and New Jersey area. In this case the CITYgreen model calculated avoided stormwater-construction costs associated with stormwater services provided by trees on site and, using values reported in the literature, the amounts of air pollutants absorbed by trees, and the per-unit value for each pollutant.

In one case study of a shopping mall, the analysis estimated that the trees currently on the site manage approximately 53,000 cubic feet of stormwater. The CITYgreen model estimated the value of the associated avoided infrastructure costs at just over $33,000. The value of air-pollutant removed is estimated at $1,441 per year. The report lists results for fifteen such case studies.

Wetlands that absorb stormwater runoff can help minimize stormwater-related management and infrastructure costs. Depending on their location and makeup, wetlands

may provide other benefits, such as wildlife habitat and recreational opportunities. Fine (2002)[11] studied the recreational benefits provided by wetlands proposed as part of the Treasure Island redevelopment in San Francisco Bay. The analysis assumes that the wetlands will attract visitors year round, with the winter months providing the best opportunity to view migratory birds. Based on recreational expenditures for similar sites in the San Francisco Bay area, Fine calculates that area visitors will spend $4 to $8 million annually. Other benefits that Fine was unable to quantify and value include fisheries enhancement and water-quality services.

Devinny et al. (2005) developed a first-approximation of a benefit-cost analysis of complying with water-quality requirements throughout Los Angeles County using LID and other stormwater BMPs. They present their analysis as an alternative to the approach described by Gordon et al. (2002), which relies on collecting and treating the county's stormwater using conventional controls. The Devinny et al. approach assumes widespread adoption of LID and other on-site stormwater BMPs.

The Devinny et al. analysis accounts for the fact that the density of existing development will limit the extent to which LID and other BMPs can be retrofitted into developments. As an alternative they propose a combination of LID and BMPs along with directing stormwater to regional wetlands and other infiltration systems. As the density of development increases, so does the size and costs of developing regional wetlands.

This study differs from other benefit-cost analyses of stormwater-management options in that the researchers quantify a range of potential benefits associated with the approach that emphasizes on-site treatment of stormwater. They estimate the cost of their approach at $2.8 billion if disbursed LID and other on-site BMPs sufficiently control stormwater quality. Costs increase to $5.7 to $7.4 billion if regional wetlands and other infiltration systems are needed. This approach costs less than the estimated cost of $44 billion to implement the option that emphasizes conventional controls (California Department of Transportation 2005).

The estimated value of the economic benefits of implementing LID, other on-site BMPs and regional wetlands range from $5.6 to $18 billion. Benefits include the economic aspects of reduced flood control, increased property values adjacent to new greenspaces and wetlands, additional groundwater supplies, improved beach tourism, and reduced sedimentation of area harbors. The conventional approach would provide none of these economic benefits.

[11] We were unable to obtain a copy of the full report. We base our description on a summary of the analysis.

V. Developers' Experiences With Low-Impact Development

Baring regulations that mandate LID controls, developers adopt LID because they help reduce construction costs, increase sales, boost profits, or some combination of the three. These deliberations focus primarily on the extent to which local property markets account for the direct costs and benefits that LID can provide. Typically these deliberations do not include indirect costs and benefits and the potential non-market impacts of LID that may be important to others such as municipal stormwater managers and area residents. These non-market impacts may include reduced downstream flooding, improved water quality and habitat of water bodies that receive stormwater, reduced CSO events, or impacts on the costs of operating municipal-stormwater infrastructure.

In this section we summarize developers' experiences installing LID. As with other new technologies, adopting LID includes opportunities and risks. We begin by describing the risks and challenges that developers face by including LID in their projects. These risks include uncertain construction delays as the developer applies for variances to local zoning codes because the codes do not explicitly recognize LID as an accepted stormwater control.

Next, we describe some of the efforts by municipal governments to reduce the developers' regulatory risk and uncertainty of using LID. Finally, we list some of the successes developers have had adopting LID and the resulting impacts on construction costs, sales, and profits.

A. Challenges Developers Face Using LID

Much of the general public is still unaware of LID attributes, the benefits they can provide, or their O & M costs. As such, they may not understand or appreciate why a developer included LID in a project. This may give developers pause because they supply products that they believe their customers—homebuyers—want and will purchase. Potential buyers may shy away from homes that include an unfamiliar technology.

A general lack of understanding of LID may concern developers in part because including on-site treatment of stormwater will also require on-site management of stormwater facilities, the LID technologies. Homeowners unfamiliar with LID likely will have no understanding of their maintenance requirements (Lewis 2006; England 2002; Foss 2005). For example, a bioswale clogged with sediment may not control stormwater volume or quality, which could negatively reflect on the builder. Another concern has to do with the lack of understanding as to the life-expectancy of LID controls (Lewis 2006). A builder may be concerned that an untimely failure of stormwater controls could negatively affect their reputation.

Similar to the public's general lack of understanding of LID, many builders are also unfamiliar with the technology. A builder may not be able to identify the most effective and least-cost LID technology for a given development from the wide variety of possible LID controls (Foss 2005; Lewis 2006). A related point is that construction costs for LID technologies are site specific. For example, not all soils can support LID technologies that emphasize stormwater infiltration. Assessing a site and designing LID technologies that will function on the site may also increase a builder's design costs (Coffman 2002; Strassler et al. 1999).

A much-mentioned impediment to builders' adoption of LID is building codes that do not account for LID as stormwater controls. Many municipalities have zoning and building-inspection standards in place that were adopted many years ago, long before LID was an option (Coffman 2002; NAHB Research Center Inc. 2003; Foss 2005; Lewis 2006). These standards emphasize conventional stormwater controls that collect stormwater and transport it off site to a receiving body of water or to a treatment facility. Municipalities with outdated stormwater regulations typically require that builders file variances if they want to use LID controls. Filing variances for LID increases design and regulatory costs, which delays construction and can increase a builder's financing costs (Clar 2004; Coffman 2002; Lewis 2006; NAHB Research Center Inc. 2003).

A related constraint in some jurisdictions with outdated regulations is a lack of technical expertise or understanding by regulators regarding LID stormwater controls. In some cases, regulators unfamiliar with LID technology must be convinced of their effectiveness, which also increases a builder's design and regulatory costs (Coffman 2002; NAHB 2003; Lewis 2006).

B. Municipal Actions To Increase LID Adoption On Private Developments

Some jurisdictions help promote LID adoption on private lands and take steps that reduce the regulatory uncertainty and risk that builders face when including LID in private developments. These jurisdictions may have CSO problems, or are trying to extend the useful life of their stormwater infrastructure in the face of increasing population and economic activity. In any case, they recognize the importance of managing as much stormwater on site as possible and keeping it out of the jurisdiction's stormwater pipes.

One way that jurisdictions promote LID adoption on private lands is by updating their zoning codes and building-inspection standards to explicitly address LID stormwater controls (Coffman 2002; NAHB Research Center Inc. 2003; Foss 2005; Lewis 2006). This helps reduce a builder's regulatory risk because it eliminates the need to file variances. Rather than spending time convincing regulators as to the desirable stormwater attributes or effectiveness of LID controls, builders can instead proceed with their development.

Granting density bonuses for developments that install LID stormwater controls is another way jurisdictions encourage the proliferation of LID techniques. In this case, the jurisdiction grants the developer a greater number of individual building lots than would have been allowed if the development relied on conventional stormwater controls (Coffman 2002; NAHB Research Center Inc. 2003). This type of incentive not only reduces a builder's regulatory risk, and associated costs, but also increases the number of lots that can be sold, which can increase the builder's revenue and profits. Jurisdictions also promote LID installation on private lands by reducing development-related fees, such as inspection fees (Coffman 2002; NAHB Research Center Inc. 2003).

C. Benefits To Developers of Including LID Controls in Their Projects

Developers who accept the regulatory uncertainty and other challenges of adopting LID do so with the expectation that controlling stormwater on site can have economic

advantages. These advantages include increasing the number of developable lots and reducing expenditures associated with stormwater infrastructure. Managing stormwater on site using LID controls can mean doing away with stormwater ponds, thus increasing a site's developable area (Coffman 2002; NAHB Research Center Inc. 2003). Selling additional lots can increase a builder's revenues and profits. Replacing curbs, gutters and stormwater pipes with bioswales, pervious pavers and other LID controls reduces construction costs for some developers (Coffman 2002; NAHB Research Center Inc. 2003; Center for Watershed Protection 2001).

An analysis of a development in Prince George's County, Maryland, documented the impacts that controlling stormwater on site with LID can have on the site's buildable area and construction costs. The Somerset Community development installed rain gardens, grass swales along streets, and other LID controls. Substituting LID for conventional controls saved the developer approximately $900,000. Doing away with the site's stormwater ponds gave the developer six additional lots (Foss 2005).

A study of the Pembroke Woods Subdivision in Frederick County, Maryland found similar results (Clar 2004). The developer substituted LID for conventional controls, doing away with curbs, gutters, sidewalks, and eliminated two stormwater ponds. Eliminating the curbs and gutters saved the developer $60,000. Installing narrower streets eliminated impervious area and reduced paving costs by 17 percent. Excluding the stormwater ponds saved $200,000 in construction costs and added two developable lots, valued at $45,000 each. Other economic benefits to the developer include reduced costs of clearing land for development of $160,000, and adding 2.5 additional acres of open space, which reduced the developer's wetland-mitigation requirements.

Conservation subdivisions take a comprehensive approach to stormwater management by combining LID controls with a site design that takes advantage of existing drainage patterns. Narrow streets and clustered building lots make maximum use of natural stormwater controls, thus reducing construction costs (Center for Watershed Protection 2001). A study of ten subdivisions found that conservation subdivisions that emphasized LID and protected natural drainage patterns cost, on average, thirty-six percent less than subdivisions that relied on conventional stormwater controls (Conservation Research Institute 2005).

Researchers note that some conservation subdivisions have an additional benefit in that there's greater demand for lots in these subdivisions compared with the demand for lots in conventional subdivisions. Greater demand for lots means the developer can charge more for the lot and lots may sell faster (Center for Watershed Protection 2001).

A case study of conservation and conventional subdivisions in South Kingstown, Rhode Island quantified the market benefits of conservation developments. The study compared the costs of developing the lots and the market value of the lots (Mohamed 2006). Results show that conservation lots cost less to develop and sell for a higher price. On average, conservation lots cost $7,400 less to produce than lots in conventional subdivisions, and sold for 12 to 16 percent more, per acre, than conventional lots. Lots in the conservation subdivision also sold in approximately half the time as lots in conventional subdivisions.

Another study of cluster developments in New England found that houses in these types of developments appreciate faster than houses in conventional developments (Lacy 1990). Lacy identified developments in Concord and Amherst, Massachusetts that were

characterized by smaller individual lots surrounded by natural open space, limited lot clearing, and narrower streets. He compared these with nearby conventional developments. The Concord cluster development appreciated 26 percent more than conventional developments over an eight-year study period. The Amherst cluster development also yielded a higher rate of return on investment over a 21-year study period, compared to nearby conventional development.

In Tables 5-1 and 5-2 below we summarize the results of studies that compared construction costs using LID vs. conventional stormwater controls for residential and commercial developments (respectively). We included information in the tables if a study described the source of the cost difference, e.g., substituting a bioswale for curbs and gutters saved $Z. We excluded studies that reported a cost difference, but did not describe the details of the cost comparison. We found many studies in the literature that did not provide details of cost comparisons.

We distinguish between study results for built developments from results for proposed or modeled developments. In some cases the studies report total cost savings for a development but not savings per lot in the development. In these cases we calculated the per-lot cost savings. We recognize that the cost savings values reported below are in dollars from different years, and so comparisons of cost savings between examples may not be appropriate. We found insufficient data in most case studies to convert all values to the same-year dollars.

The large majority of studies listed in Tables 5-1 and 5-2 describe LID installed or proposed to be installed in new developments. We found very few studies that measured the economic outcomes of including LID stormwater controls in urban, redevelopment projects. We identified these studies as “retrofits” in the tables.

Table 5-1: Cost savings attributed to installing LID stormwater controls in residential developments.

Location	Description	LID Cost Savings[a]
Meadow on the Hylebos Residential Subdivision Pierce County, WA	9-acre development reduced street width, added swale drainage system, rain gardens, and a sloped bio-terrace to slowly release stormwater to a creek. Stormwater pond reduced by 2/3, compared to conventional plan. (Zickler 2004)	LID cost 9% less than conventional
Somerset Community Residential Subdivision Prince George's Co., MD	80-acre development included rain gardens on each lot and a swale drainage system. Eliminated a stormwater pond and gained six extra lots. (NAHB Research Center Inc. 2003)	$916,382 $4,604 per lot
Pembroke Woods Residential Subdivision Frederick County, MD	43-acre, 70-lot development reduced street width, eliminated sidewalks, curb and gutter, and 2 stormwater ponds, and added swale drainage system, natural buffers, and filter strips. (Clar 2004; Lehner et al. 2001)	$420,000 $6,000 per lot[b]
Madera Community Residential Subdivision Gainesville, FL	44-acre, 80-lot development used natural drainage depressions in forested areas for infiltration instead of new stormwater ponds. (PATH 2005)	$40,000 $500 per lot[b]
Prairie Crossing Residential Subdivision Grayslake, IL	667-acre, 362-lot development clustered houses reducing infrastructure needs, and eliminated the need for a conventional stormwater system by building a natural drainage system using swales, constructed wetlands, and a central lake. (Lehner et al. 2001; Conservation Research Institute 2005)	$1,375,000-$2,700,000 $3,798-$7,458 per lot[b]
SEA Street Retrofit Residential street retrofit Seattle, WA	1-block retrofit narrowed street width, installed swales and rain gardens. (Tilley 2003)	$40,000
Gap Creek Residential Subdivision Sherwood, AK	130-acre, 72-lot development reduced street width, and preserved natural topography and drainage networks. (U.S. EPA 2005; Lehner et al. 2001; NAHB Research Center Inc. 2003)	$200,021 $4,819 per lot
Poplar Street Apartments Residential complex Aberdeen, NC	270-unit apartment complex eliminated curb and gutter stormwater system, replacing it with bioretention areas and swales. (U.S. EPA 2005)	$175,000
Kensington Estates* Residential Subdivision Pierce County, WA	24-acre, 103-lot hypothetical development reduced street width, used porous pavement, vegetated depressions on each lot, reduced stormwater pond size. (CH2MHill 2001; U.S. EPA 2005)	$86,800 $843 per lot[b]
Garden Valley* Residential Subdivision Pierce County, WA	10-acre, 34-lot hypothetical development reduced street width, used porous paving techniques, added swales between lots, and a central infiltration depression. (CH2MHill 2001)	$60,000 $1,765 per lot[b]
Circle C Ranch Residential Subdivision Austin, TX	Development employed filter strips and bioretention strips to slow and filter runoff before it reached a natural stream. (EPA 2005)	$185,000 $1,250 per lot

Location	Description	LID Cost Savings[a]
Woodland Reserve* Residential Development Lexana, KS	Reduced land clearing, reduced impervious surfaces, and added native plantings. (Beezhold 2006)	$118,420
The Trails* Multi-Family Residential Lexana, KS	Reduced land clearing, reduced impervious surfaces, and added native plantings. (Beezhold 2006)	$89,043
Medium Density Residential* Stafford County, VA	45-acre, 108-lot clustered development, reduced curb and gutter, storm sewer, paving, and stormwater pond size. (Center for Watershed Protection 1998b)	$300,547 $2,783 per lot[b]
Low Density Residential* Wicomico County, MD	24-acre, 8-lot development eliminated curb and gutter, reduced paving, storm drain, and reforestation needs. Eliminated stormwater pond and replaced with bioretention and bioswales. (Center for Watershed Protection 1998b)	$17,123 $2,140 per lot[b]

Source: ECONorthwest, with data from listed sources.
Notes: * indicates hypothetical or modeled project, not actually constructed.
[a] Dollar amounts as reported at the time of study.
[b] Per-lot cost savings calculated by ECONorthwest.

Table 5-2: Cost savings attributed to installing LID stormwater controls in commercial developments.

Location	Description	LID Cost Savings[a]
Parking Lot Retrofit Largo, MD	One-half acre of impervious surface. Stormwater directed to central bioretention island. (U.S. EPA 2005)	$10,500-$15,000
Old Farm Shopping Center* Frederick, MD	9.3-acre site redesigned to reduce impervious surfaces, added bioretention islands, filter strips, and infiltration trenches. (Zielinski 2000)	$36,230 $3,986 per acre[b]
270 Corporate Office Park* Germantown, MD	12.8-acre site redesigned to eliminate pipe and pond stormwater system, reduce impervious surface, added bioretention islands, swales, and grid pavers. (Zielinski 2000)	$27,900 $2,180 per acre[b]
OMSI Parking Lot Portland, OR	6-acre parking lot incorporated bioswales into the design, and reduced piping and catch basin infrastructure. (Liptan and Brown 1996)	$78,000 $13,000 per acre[b]
Light Industrial Parking Lot* Portland, OR	2-acre site incorporated bioswales into the design, and reduced piping and catch basin infrastructure. (Liptan and Brown 1996)	$11,247 $5,623 per acre[b]
Point West Shopping Center* Lexana, KS	Reduced curb and gutter, reduced storm sewer and inlets, reduced grading, and reduced land cost used porous pavers, added bioretention cells, and native plantings. (Beezhold 2006)	$168,898
Office Warehouse* Lexana, KS	Reduced impervious surfaces, reduced storm sewer and catch basins, reduced land cost, added bioswales and native plantings. (Beezhold 2006)	$317,483
Retail Shopping Center*	9-acre shopping development reduced parking lot area, added porous pavers, clustered retail spaces, added infiltration trench, bioretention and a sand filter, reduced curb and gutter and stormwater system, and eliminated infiltration basin. (Center for Watershed Protection 1998b)	$36,182 $4,020 per acre[b]
Commercial Office Park*	13-acre development reduced impervious surfaces, reduced stormwater ponds and added bioretention and swales. (Center for Watershed Protection 1998b)	$160,468 $12,344 per acre[b]
Tellabs Corporate Campus Naperville, IL	55-acre site developed into office space minimized site grading and preserved natural topography, eliminated storm sewer pipe and added bioswales. (Conservation Research Institute 2005)	$564,473 $10,263 per acre[b]
Vancouver Island Technology Park Redevelopment Saanich, British Columbia	Constructed wetlands, grassy swales and open channels, rather than piping to control stormwater. Also used amended soils, native plantings, shallow stormwater ponds within forested areas, and permeable surfaces on parking lots. (Tilley 2003)	$530,000

Source: ECONorthwest, with data from listed sources.
Notes: * indicates hypothetical or modeled project, not actually constructed.
[a] Dollar amounts as reported at the time of study.
[b] Per-acre cost savings calculated by ECONorthwest.

VI. DIRECTIONS FOR FUTURE RESEARCH

Despite the increasing use of LID stormwater controls, and the growing number of economic studies of this technique, our literature review found areas for further research. These areas include:

- Additional research that quantifies the costs and benefits of stormwater management. This includes economic research on the lifetime O & M costs for LID and conventional controls, as well as, studies that quantify the economic benefits of LID methods.

- More detailed information on costs associated with LID. Specifically, information on the factors that contribute to cost savings or cost increases of LID relative to conventional controls.

- Economic studies of LID and conventional methods that control for the effectiveness of the techniques regarding managing stormwater volumes and improving water quality. Comparing LID techniques that cost more to install than conventional methods, but control larger amounts of stormwater, is an apples-to-oranges comparison.

- The large majority of economic studies of LID methods apply to new construction. More research is needed on the economic outcomes of including LID methods in urban redevelopment projects.

- Some preliminary evidence exists that LID can help control CSO volumes at a lower cost than conventional controls. Stormwater managers and public-policy decisionmakers would benefit from additional economic research on this topic.

- Economic studies that model theoretical LID and conventional controls, while informative, may be less convincing to some stormwater managers, decisionmakers and ratepayer stakeholders than retrospective studies of installed controls.

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Economic Factors that Influence Developers' Decisions

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ECONorthwest specializes in economics, planning, and finance. Founded in 1974, we're one of the oldest independent economic consulting firms in the Pacific Northwest. We have extensive experience applying rigorous analytical methods to examine the benefits, costs, and other economic effects of environmental and natural resource topics for a diverse array of public and private clients throughout the United States and across the globe.

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I. Introduction and Summary

Low-impact development and green-infrastructure (LID) are viable strategies for managing stormwater, as reflected by the increasing number of jurisdictions that are either encouraging or requiring their use. As the U.S. EPA develops regulations for controlling non-point-source pollution from stormwater runoff, it is considering requiring local jurisdictions to implement stronger stormwater standards.[1] Among the options it is considering is a volume-based standard that will drive the use of LID more broadly nationwide.

There is currently disagreement as to whether strong stormwater standards uniformly applied across development types would have an impact on where and how development occurs. Some regulators and interest groups have raised concerns that widespread, uniform mandates for stronger stormwater controls, including LID, would undercut efforts to reduce sprawl and to direct future development into already-urbanized areas. These concerns arise from a premise that stronger stormwater controls, and LID in particular, are more expensive to integrate into redevelopment than greenfield development because of site constraints, land costs and other regulatory factors. Facing these increased costs, it is argued, developers may focus their resources on greenfield development and reduce their investment in redevelopment projects. This shift could have unintended, adverse consequences for water quality in the long run by increasing the overall amount of impervious areas in a given watershed.

Other interest groups share concerns about the adverse environmental effects of sprawl, but suggest that the data do not support claims of prohibitive cost and diversion of development to greenfields allegedly caused by strong stormwater requirements. These advocates note that the development process is complex and motivated by a range of factors, many which are highly site-specific, and that no one factor drives decisions on the location and type of development. Further, they argue that, the economic benefits of a stormwater standard—particularly if it requires the use of green infrastructure—will provide economic and livability benefits that will actually encourage the redevelopment of existing communities rather than push development to greenfields.

Smart Growth America (SGA), in collaboration with American Rivers, the Center for Neighborhood Technology, River Network, and the Natural Resources Defense Council, asked us to investigate what impact, if any, strong stormwater regulations that require or encourage LID techniques, uniformly applied to greenfield development and redevelopment, would have on developers' decisions about where and how to build. We approached this project by reviewing relevant literature and interviewing jurisdiction staff and individuals in the development community on these topics:

[1] Throughout this report, we refer to "stronger stormwater standards" to mean water-quality and/or volume standards that require developers to manage the majority of stormwater runoff from impervious surface conversion on-site, ideally using infiltration or retention techniques. The three jurisdictions we focus on in this report recently adopted stronger stormwater standards, relative to what they required previously, and relative to the stormwater controls many jurisdictions in the nation currently require. Each set of requirements is slightly different (see Section II, B for a summary), but in general, they are among the strongest in the nation, and are an indication of the level of stormwater control EPA may consider requiring more broadly as it revises the national stormwater regulations.

- the factors that affect development decisions in greenfield and redevelopment contexts, and the significance of stormwater management in these decision-making processes
- the challenges and benefits of implementing stronger stormwater standards in greenfield and redevelopment contexts
- the range of incentives jurisdictions have implemented or considered to facilitate the adoption of LID in greenfield and redevelopment projects

We focused our inquiry on the developers' decision-making process in three jurisdictions that have recently implemented stronger stormwater standards for retention and/or water-quality treatment, and allow or require consideration of LID or Environmentally Sensitive Design (referred to here as LID): Montgomery County, Maryland; Philadelphia, Pennsylvania; and Olympia, Washington. We first reviewed the literature on the topics above and each jurisdiction's efforts to implement stronger stormwater controls. We then interviewed members of the development community and permitting and planning staff in each jurisdiction to focus on specific issues the existing literature does not sufficiently address.

This report presents the information we have collected on these topics. We organize our findings into seven broad conclusions that inform the primary research question. We summarize them below. We elaborate on each with evidence from the literature and interviews in the following sections. Appendix A presents a bibliography, and Appendix B lists the individuals we interviewed and consulted during this project.

1. Developers are successfully incorporating stronger stormwater controls to meet strict volume-reduction and water-quality standards in both redevelopment and greenfield projects.

Our study found that some developers can and do meet stronger stormwater standards in both redevelopment and greenfield projects. Interviewees who had completed developments that met stronger stormwater standards using LID indicated that doing so required creativity and willingness to experiment with new approaches to projects. They emphasized that pursuing these projects was not without challenge, but they will continue developing in places that require strong stormwater controls and LID. Developers pointed to a variety of reasons for this choice: the markets they participate in respond favorably to the new stormwater designs; meeting regulations with green-infrastructure techniques could be more cost effective than conventional controls; and for some, they simply believed it was the right thing to do for the environment. Some developers we interviewed had not yet implemented projects under the stronger stormwater standards. Some were skeptical, based on their own initial experiences or other developers they'd talked to, that they could make a project pencil out using LID controls. A minority of interviewees held this perspective. Although staff at each jurisdiction had encountered this opinion, none had actually observed that developers were choosing to invest in greenfield projects over redevelopment projects because of the new standards. This is consistent with other findings in the literature (Leistra, Weiss, and Helman 2010).

2. Complying with stormwater regulations is one factor among many that influences a project's costs. It is rarely the driving factor.

Stronger stormwater standards can affect the costs of both greenfield and redevelopment projects. These costs are folded into a *pro forma* analysis that developers and lenders use to assess the viability of a project. Developers we interviewed revealed that their decision-making process incorporates a wide range of economic factors, including various construction costs, current and future market conditions, regulatory incentives and disincentives, and uncertainty and risk. While some developers we interviewed indicated that the costs associated with meeting stronger stormwater standards may change the types of projects they will pursue in the future, many developers described the cost of implementing stormwater controls as minor compared to the other economic factors they considered in deciding whether or not to pursue a project. This is especially true in the context of highly-complex redevelopment projects and green-building infill projects. In general, stronger stormwater standards increase the costs of implementing stormwater controls, a trend that many of the developers we interviewed have experienced since at least the 1980s. Some developers pointed out, however, that using LID controls has helped offset some of the increased cost, compared to using conventional controls.

3. The costs of stormwater controls in general, and LID controls in particular, tend to be more variable and site-specific for redevelopment versus greenfield development.

The developers we interviewed were reluctant to make specific predictions about the extent to which stronger stormwater controls influence the cost of projects. They emphasized that stormwater designs are highly site-specific, and one solution may be feasible and cost-effective at one site, but infeasible or cost-prohibitive at another site. The conceptual framework in Section II outlines the different factors we identified in the literature and through the interviews that influence the cost of implementing stronger stormwater standards. They underscore the site-specific nature of stormwater-control costs, and explain why implementing stronger stormwater controls in redevelopment projects tends to be more expensive than in greenfield projects.

4. Developers respond to benefits that influence their bottom line. In some cases, these may help offset increased costs of complying with stronger stormwater regulations.

While stronger stormwater regulations and LID controls can provide a range of environmental and amenity benefits, developers generally only respond to those benefits that affect their bottom line. Developers we interviewed suggested that LID controls that helped them comply with stronger stormwater regulations at lower cost, increased the sale price or rent of a project, reduced the time to sale, or all three, would affect their decisions to use LID. Specific examples of LID controls providing economic benefits to developers include bioswales and other vegetative stormwater controls that improve the appearance and market appeal of a development while also reducing overall landscaping costs, and greenroofs that reduce energy costs and the long-term cost of roof maintenance. Developers noted, however, that market demand for projects that include LID stormwater controls have not yet expanded beyond niche markets. Factors such as unfamiliarity with the technology and uncertainty about how to address

operations and maintenance of LID controls limit broader use of LID by developers and demand from consumers.

5. Cost-effective responses to stronger stormwater standards require a more collaborative approach to addressing stormwater management.

Interviewees who successfully implement stronger stormwater controls using infiltration and volume-reduction practices in redevelopment projects emphasize the importance of considering stormwater management at the earliest stages of development, and of integrating professionals' expertise throughout the project. These principles are consistent with the conclusions of the broader literature on green building, which emphasize the importance of collaboration among professionals throughout the design process to achieve reductions in overall costs. These principles are especially important in the success of redevelopment projects, because these projects tend to require more complex, site-specific, and creative solutions to effectively manage stormwater.

6. Market adjustments are already reducing costs of implementing stronger stormwater standards, for both redevelopment and greenfield development, a trend that is likely to continue.

Market adjustments include changes on the supply side that result in lower costs to implement stronger stormwater standards and changes in demand that result in increased consumer willingness to pay for projects that incorporate stronger stormwater controls. Market adjustments that have the potential to lower costs include more widespread availability of materials (such as porous pavers), better technologies that reduce the time and/or expense of installation (such as modular greenroof systems), and improved design and engineering expertise. Increased regulatory certainty as more developers become familiar with the permitting process and more permitting officials become comfortable with the new regulatory system also will reduce developers' costs of implementing stronger stormwater controls. Market adjustments also have the potential to increase consumers' willingness to pay for projects that integrate some types of stormwater controls—especially those that add amenities, such as rain gardens, and those that reduce building operating costs, such as greenroofs. Willingness to pay may increase as more consumers recognize and demand the environmental benefits LID provides, as LID techniques become more familiar and main-stream, and as time and increased use demonstrate LID's long-term effectiveness across wider geographic regions and climate conditions.

7. Developers are supportive of incentives that offset costs and ease the transition to stronger stormwater standards. Jurisdictions can use them to increase the level of social benefits derived from LID practices.

All three jurisdictions have or have considered implementing incentives to encourage developers to adopt LID controls as a way of complying with stronger stormwater standards. Jurisdictions themselves have an incentive to offer developers incentives, in part, because many of the benefits LID provides accrue to the jurisdiction or the public at large, but don't register in the developers' private accounting of costs and benefits. Enhancing the private benefits developers can receive from LID by passing through some of the public benefits can create a more economically efficient outcome for society.

Incentives come in a variety of different forms, from direct financial payments and subsidies, to efforts to reduce the costs and risks associated with the permitting and review process. Each jurisdiction we focused on has processes in place to help developers navigate the permitting process more efficiently if they propose to implement LID beyond what current regulations require. Developers generally responded favorably to these efforts and said that they took advantage of them. Among the jurisdictions we looked at, Philadelphia has the most developed financial incentive programs, including a fee offset for managing stormwater onsite and a greenroof tax credit. Developers we interviewed who work in Philadelphia indicated they were aware of these incentives and, in some cases, they had taken advantage of them. Many interviewees expressed their support of stormwater credit and off-site mitigation programs to address the reality that on-site stormwater retention may not be physically possible in every project, and may not be economically feasible in some projects.

II. Conceptual Framework and Methodology

We approached this project in two phases: a literature review followed by key-informant interviews. Through the literature review, we developed a conceptual framework to understand the issues developers face with regard to the factors that influence the costs and benefits of implementing increasingly stringent stormwater regulations in redevelopment and greenfield projects. The interviews provided an opportunity to test the framework against developers' practical experiences and collect information not available in the literature.

A. Literature Review

There are many stand-alone studies and reviews of the literature that describe the benefits and costs associated with LID and green infrastructure and compare the costs of LID to conventional development (*see,* e.g., Center for Neighborhood Technology 2010, U.S. EPA 2007, MacMullan and Reich 2007, Gunderson et al. 2011). We drew heavily from our knowledge of these studies to develop our conceptual framework, and cite to them throughout the following section. We did not, however, set out to add another broad literature review of LID economics to the existing body of literature. Instead, we narrowly focused our review of the literature on two specific topics:

1) Studies that describe the differential impact of stronger stormwater regulations on greenfield and redevelopment activities, either quantitatively or qualitatively.

2) Studies that describe the impact of stronger stormwater regulations on developers' decisions to build.

1. Differential Impacts of Stormwater Regulations on Development

Our review found no broad-scale studies that systematically investigated the impacts that stronger stormwater regulations may have on different types of development, specifically greenfield projects and redevelopment projects. The literature contains an ever-growing list of case studies that illustrate developer's experiences integrating LID into different types of projects. Many of these illustrations contain cost information. It is very difficult, however, to draw meaningful conclusions about the relative costs of implementing stormwater controls in greenfield and redevelopment projects from these largely anecdotal illustrations. It is more difficult still to determine potential differential impacts under specific regulatory standards.

We found only one study that directly addressed the differential cost impact between greenfield development and redevelopment (Chesapeake Stormwater Network 2010). This study, which was specific to developments and regulations in the mid-Atlantic region and may have limited applicability in other regions of the country, found that installing LID controls at redevelopment sites with less than 65 percent impervious coverage could be successfully accomplished at little to no extra cost than new development sites. Integrating LID into sites with greater than 65 percent impervious coverage—those in highly urban settings—can be up to 4 times more expensive than new development, however. This conclusion may or may not be relevant beyond the limited cases described in this study. More quantitative research is warranted on this

topic to understand how the cost impacts of stronger stormwater standards may vary across different development types and different markets.

2. Impacts of Stronger Stormwater Regulations on Developers' Decisions

Economists and other researchers have attempted to describe the locational behavior of firms in response to environmental regulation of all types at a regional level for decades. The studies that have emerged illustrate the challenge of finding a definitive answer to this question, given the complexity of the world within which such decisions are made. One analysis summarizes the literature by concluding that the studies have found positive, negative, and no impact, and often produce conflicting, contradictory results (Jeppesen and Folmer 2001). Perhaps because of the methodological and practical challenges inherent in answering such a question, we found no studies that used statistical or quantitative methods to determine how developers have responded to changes in stormwater regulations.

We did, however, find one recent study that used interviews of local permitting officials to inform how stronger stormwater regulations in the District of Columbia might affect developers' decisions about where to build (Leistra, Weiss, and Helman 2010). As part of the study, the researchers attempted to describe how developers responded to similar stormwater regulations in four other jurisdictions: Philadelphia, Chicago, Portland, and Seattle. Through interviews with municipal officials, the study's authors found that the new stormwater requirements have not had, or are not expected to have, discernible effects on development. In Philadelphia, which we also focus on in this study, the study's authors found that, while some developers threatened to pull projects when the regulations went into effect, municipal officials did not actually observe that this occurred. Officials attributed this to other factors influencing developers' decisions more than stormwater costs, and the City's expedited approval process, incentives, and customer service.

B. Conceptual Framework

The results of our focused literature review suggest that few researchers have set out to answer the question we were asked to investigate. There are many ways one might attempt to answer this question. Limited resources, time, and data required us to take a qualitative approach. We focus broadly on describing the economic drivers of developers' decisions, and how stronger stormwater standards may interact with these decisions. Our study does not attempt to quantify the costs developers incur from complying with particular stormwater regulations, to estimate the benefits of stronger stormwater regulations, or to predict the specific effects stronger stormwater regulations will have on particular developments or regional development patterns.

Many factors influence developers' decisions on where and how to build. We developed a conceptual framework to guide our inquiry into developers' decision-making processes and provide insight into this question: *How will stronger stormwater regulations influence how and where developers decide to build, and what impact, if any, are they likely to have on overall development patterns and trends*? Figure 1 illustrates our conceptual framework.

Figure 1. Conceptual Framework

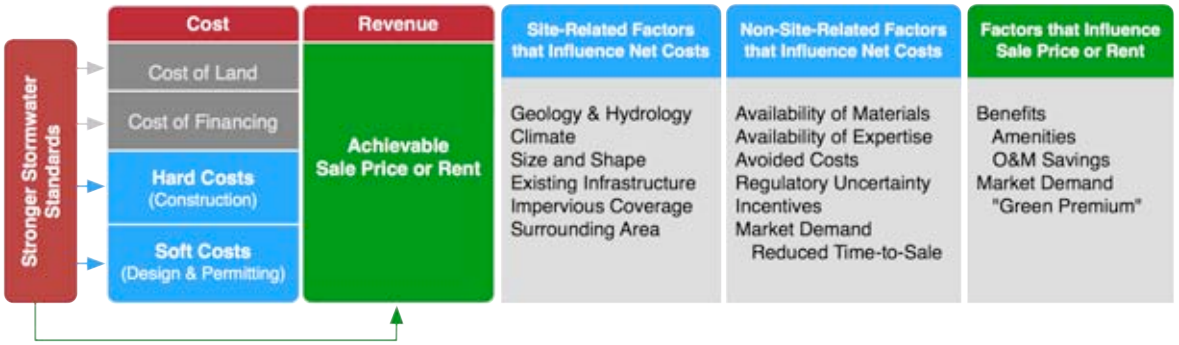

Source: ECONorthwest

When developers embark on a project, they usually develop a financial model, called a *pro forma*, that estimates the project's anticipated financial return. The *pro forma* typically includes four major categories of costs: land, financing, hard costs (e.g., construction), soft costs (e.g., design and permitting) (Nachem 2007). A *pro forma* assumes that all these costs are financed upfront into a stream of debt service that, when compared to achievable sale price or rent, generates a reasonable return on investment. What a developer considers "reasonable" varies depending on their personal preferences and a project's risk and complexity.

The cost categories are shown in the left side of the diagram in Figure 1, the revenue on the right. Stronger stormwater regulations primarily affect two categories of cost most directly: hard costs and soft costs, shown in blue. To a lesser extent, stormwater regulations may also influence the cost of land and financing costs, identified in gray in Figure 1. Depending on how a developer implements stormwater controls, stronger stormwater standards also may affect the achievable sale price or rent, shown in the diagram in green.

The first two subsections, below, describe how stronger stormwater standards might affect the cost and revenue sides of a development *pro forma*. The third and fourth subsections unpack these relationships, and describe how variations in site and non-site related factors might affect the extent to which stronger stormwater standards influence cost and revenue, and ultimately, the developers' decision-making process.

1. Cost-Related Factors in the Developers' Decision-Making Process

Stronger stormwater standards have the potential to influence the costs in the *pro forma* analysis and affect how a project pencils out. The most direct effects are on hard and soft costs, identified in blue in Figure 1. The extent to which stronger stormwater standards affect these costs will depend, in part, on the existing level of stormwater management controls developers are accustomed to factoring into their projects. The effect on cost could be very different if regulations impose a new requirement where none existed before, versus incrementally strengthening retention or water-quality standards or requiring the use of certain best management practices (BMPs), such as LID, over more conventional controls. In the first instance, the direction of the effect likely will be more predictable (positive) and uniform in magnitude across development projects. In the

second instance, depending on the degree of regulatory change and how different developers are already approaching stormwater management, the direction and magnitude of the effect will likely vary considerably, and the overall effect from project to project may be less clear.

Hard Costs. Both conventional and LID stormwater controls have hard costs—in the short-run to install, and in the long-run to maintain. Stormwater controls represent a portion of the total construction costs, and the ratio of stormwater-control costs to other hard costs can vary considerably from project to project. An extensive and growing body of literature exists on the construction cost of conventional stormwater controls (*see,* e.g., Brown and Schueler 1997, Heaney, Sample, and Wright 2002, Narayan and Pitt 2006). There is also a growing body of information on the construction costs of various LID controls (Schueler et al. 2007, WERF 2009), although the costs of LID controls are still less-well understood and documented (Stephenson and Beamer 2008). In general, the costs of LID controls are more dependent on site characteristics than conventional controls, and the variation in costs across LID BMPs for different development types, geographic regions, and climates is not well documented through systematic research (although the body of anecdotal case studies is growing).

Stronger stormwater management regulations (those that require LID and those that do not) may affect hard costs by requiring more extensive stormwater infrastructure to treat higher volumes or greater levels of contamination. The effect of stronger regulations, however, may not always be straightforward: by using LID techniques that provide higher levels of treatment, many developers have been able to minimize conventional infrastructure and actually reduce the overall hard costs associated with stormwater management (U.S. EPA 2007, MacMullan and Reich 2007). In general, the infrastructure to address stormwater (LID or conventional controls) on more constrained sites with higher levels of impervious coverage—typical of redevelopment and retrofit projects—will cost more than unconstrained sites with large amounts of land (Schueler et al. 2007, Chesapeake Stormwater Network 2011). Schueler et al. (2007), for example, found that the cost of implementing stormwater controls in redevelopment projects with high ratios of impervious surface can be 1.5 to 4 times the cost of constructing stormwater controls at new development sites. This research was conducted in the mid-Atlantic region and may not be applicable to other regions, with different climate, hydrology, and geology. Ultimately, it is critical to acknowledge that the effect of stronger stormwater regulations on hard costs depends on a variety of site-specific factors described in more detail in subsection three, below.

Soft Costs. Stormwater systems require engineering expertise to design, and jurisdictions typically require developers to demonstrate a stormwater control plan before they issue a building permit. The literature suggests the design and permitting costs, for LID and conventional controls, range depending on the BMP, but are typically around 25 to 40 percent of a BMP's construction costs (Schueler et al. 2007, Brown and Schueler 1997).

Stronger stormwater management regulations can increase the design and permitting costs by requiring more studies and documentation to obtain permits and more specialized engineering expertise to design new types of controls. Increased uncertainty about how to meet new regulations or how jurisdictions implement new regulations can

increase the time and costs of navigating the regulatory process, which also increases project costs (Braconi 1996, Randolph et al. 2007). More complicated or constrained sites may require more intensive and expensive stormwater design and permitting efforts, which would suggest that soft costs associated with LID or conventional stormwater controls could be higher for redevelopment projects than greenfield projects.

Cost of Land. The value of land is a function of the allowable uses on the property (entitlements), achievable pricing (rents), costs (hard costs like building materials and plumbers, and soft costs like planning and financing), and expected returns (profit). Developers see the market price of the finished project and hard and soft costs as being largely outside of their control. Thus, the developer focuses on the cost he or she can influence most strongly: the cost of property acquisition. In other words, a developer will solve backwards to determine what he or she is willing to pay for property based on the other costs to complete the project. Shifts in variables, such as hard costs, will directly affect the ability to pay for land. Stronger stormwater controls that increase the hard or soft costs of stormwater management may limit or lower what the developer can pay for land. In some cases, developers already own the land. In that situation, the cost of land factors into a developers' decision as an opportunity cost (what the developer could sell the land for if he or she did not want to redevelop it), and the effect of stronger stormwater standards in this calculation is more complicated.

Financing Costs. Lenders provide developers with working capital. They are risk limiters, not profit maximizers. Lending is a low-margin, high-volume business that generally receives fixed returns in the form of upfront fees and interest. These fees and interest factor into the developers' *pro forma.* Financial institutions make credit decisions based on a project's cash flow that will be available to pay debt service. Some lenders are important partners in community development efforts, and will accept a higher risk project without a corresponding increase in interest rates, but in general, riskier projects will cost a developer more as lenders seek to cover the risk in their portfolio. Stronger stormwater management regulations that increase a project's overall cost have the potential to reduce the margin of certainty that a project will pencil out, which would increase the risk from the lender's perspective and lead to higher financing rates.

2. Revenue-Related Factors in the Developers' Decision-Making Process

Developers' decisions are affected not only by factors that influence costs, but also by factors that influence the achievable sale price or rent (the revenue, identified in green in Figure 1)—the benefits to developers. LID stormwater controls can have **market and non-market benefits** that conventional stormwater controls do not (Center for Neighborhood Technology and American Rivers 2010). When considering developers' decision-making processes, however, it is very important to identify when these benefits materialize and to whom. While stormwater controls may produce water-quality benefits in the local watershed, for example, these benefits are unlikely to translate directly into an economic benefit a developer can capitalize into the sale price or rent of the development.[2]

[2] Some studies show that water-quality improvements can positively affect the values of adjacent property (Kirshner and Moore 1989, Leggett and Bockstael 2000).

Other benefits more directly accrue to the building owner or resident and may affect property value. Some consider the amenities that LID controls provide to be visually appealing, and would be willing to pay more to live or work in the environment they create. This demand may positively influence property values (Ward, MacMullan, and Reich 2008). Recent research is demonstrating that neighborhoods built around green streets provide more opportunities for neighbors to interact with each other, providing a positive community environment that many people may be willing to pay more to enjoy this benefit (Dill et al. 2010). Other features associated with LID BMPs, particularly green roofs, can generate benefits for building owners and occupants by reducing heating and cooling costs, and reducing maintenance costs by increasing the lifespan of the roof (David Evans and Associates and ECONorthwest 2008).

In the end, **market demand** and consumer willingness to pay determine the rent or sales price that developers earn on a project. If people aren't willing to pay for the features that LID stormwater controls provide, or don't recognize a difference between LID and conventional stormwater practices, the benefits of stronger stormwater standards that require LID may have little influence over developers' decisions. In some cases, if regulations produce features that consumers perceive as negative, they may actually lower the achievable sales price or rent. In general, however, the demand for green buildings and sustainable stormwater practices has been increasing in response to the rapid growth in the global green building industry, which is the fastest growing sector of the building industry (Jackson et al., 2010). This trend likely means that these factors will play an increasingly important role in developers' decisions.

3. Site-Related Factors that Influence Costs and Benefits

The costs and benefits associated with implementing stormwater management controls are highly site-specific. This is especially true when stronger stormwater management controls require on-site retention and treatment using LID controls. Site characteristics largely determine which types of LID controls may be used, and the wide range of costs across different LID controls may lead to widely-divergent control costs from project to project. Different LID controls also result in different levels of benefits and interactions with market demand. Local differences in public and private experience adapting LID to local conditions can also affect costs and the way benefits are perceived at the site level.

A site's **geology and hydrology** determine how effectively different infiltration techniques will address stormwater management (Langdon 2007). Level sites that infiltrate well may support infiltration techniques with little additional soil amendment or earth movement. Sites that do not infiltrate well or are sloped may require extensive modification to implement infiltration practices effectively, increasing costs, in some cases substantially. Some sites may not support any infiltration, and techniques that don't rely on infiltration, such as collection systems (rain barrels and cisterns) or vegetative systems (greenroofs and tree planters) must be used instead, often (though not always) at increased cost (Schueler et al. 2007 and U.S. Army Corps of Engineers 2009).

A site's **regional and micro-climate** can influence the way both infiltration and retention techniques are designed, with various implications on cost and achievable benefits (*see,* e.g., U.S. EPA 2010). Places with prolonged drought or freeze periods will have the

greatest influence on design considerations. In some cases, cold-weather climates may limit the range of BMPs, or their effectiveness (Roseen et al. 2009). Total precipitation and variation in precipitation throughout the year may influence the design and utility of other BMPs, such as rainwater capture systems and greenroofs (Schroll et al. 2011, Sands 2003).

The overall **size and shape of the site** is important, as sites with large amounts of land—again, more typical of new development projects than redevelopment projects—may benefit from economies of scale (Langdon 2007). The literature suggests that construction costs decrease on a per-unit basis as the overall size of the stormwater control increases (Lampe et al. 2005).

Existing infrastructure and **impervious surface coverage** also affect the costs of implementing stormwater controls (Chesapeake Stormwater Network 2011 and Lukes and Kloss 2008). Existing built infrastructure reduces the land available for stormwater control, and reduces the flexibility to implement a wide range of stormwater-control designs.

4. Non-Site-Related Factors that Influence Costs and Benefits

The site-related factors described above have the potential to directly influence the costs and benefits associated with implementing stronger stormwater standards. There are several other factors unrelated to a given development site that may influence developers' decisions about whether to pursue a project that requires LID stormwater controls. Some of these factors affect the cost side of a developers' equation, while others influence the revenue side and lower a development's net costs.

The **availability of materials and expertise** to implement new or unfamiliar stormwater controls or **regulatory uncertainty** regarding these controls can affect a developers' costs. Developers operating where few engineers with experience implementing LID-type controls are working, for example, may pay more to obtain that expertise. Similarly, some LID techniques require specialized materials that may need to be shipped from other parts of the country, increasing costs beyond what they would be if they were available locally. Regulatory uncertainty is often cited as a big factor affecting the overall cost of implementing stronger stormwater standards. Sites that require more complex stormwater-control strategies may take more time to navigate regulatory reviews. Some LID controls may not be clearly defined or allowed, reducing the range of options engineers have to manage stormwater and potentially increasing costs.

Using LID controls can help **avoid other development costs**, and some jurisdictions offer **regulatory or monitory incentives**, all of which can financially benefit developers. Some LID stormwater controls may cost more than traditional controls, but can help developers avoid other costs that the traditional approaches cannot. The literature provides many examples of avoided costs when LID controls are integrated into a project, including less conveyance infrastructure and fewer curbs and gutters (U.S. EPA 2007). Sometimes jurisdictions offer financial and other **incentives**, such as fee reductions or fast-track permitting that help offset overall project costs and provide a reason for developers to pursue certain stormwater-management techniques even if they add hard costs up front.

C. Interview Site Selection and Methodology

We conducted key-informant interviews with public officials and individuals involved in development. We designed these interviews to better-understand the gaps in the literature about the range of economic factors that influence developers' decisions when faced with complying with stronger stormwater standards.

In conjunction with SGA and its partner organizations, we selected three jurisdictions that have implemented stronger stormwater controls. We used these screening criteria to guide our selection process:

1. The jurisdiction has adopted a strong stormwater regulation (e.g., volume-based, water-quality-based, or explicit LID requirement).
2. Jurisdiction boundaries should include a mix of potential redevelopment and new development opportunities.
3. Regulation should apply similarly to redevelopment and new development.
4. Set of jurisdictions should reflect a diversity of geography.
5. Preference for jurisdictions that haven't received a lot of research attention already.

Our selection process was challenged by the fact that few jurisdictions in the country have actually implemented mandatory LID requirements or stormwater regulations that require significant retention or water-quality treatment on-site. Those that have, have done so only recently. We selected these communities:

Montgomery County, Maryland. Montgomery County enacted its first stormwater management standards nearly forty years ago, and has strengthened them several times to address declining water-quality in the region. In 2010, the County passed a revised stormwater ordinance that maintained the existing volume standards, which require both new development and redevelopment projects to protect water quality for the first inch of stormwater and control volume for the first 2.6 inches of stormwater. The new regulations require greenfield developments to use environmental site design (ESD, which is equivalent to LID) to meet these standards for the first inch of stormwater, and require ESD to the "maximum extent practicable" for redevelopment. County staff is in the process of clarifying what "maximum extent practicable," means for redevelopment projects, and are adjusting local ordinances to remove barriers to implementing LID (Montgomery County Department of Environmental Protection 2011, Biohabitats 2010). After considerable concern from the development community that the proposed regulations would have a significant impact on the cost of projects and discourage redevelopment, the regulations incorporated a provision to allow the County to grant administrative waivers for projects that received approval before the regulations were passed (Montgomery County Department of Permitting Services 2011).

Olympia, Washington. Olympia's stormwater program is one of the oldest in western Washington, and continues to be one of the most stringent. It adopted its most recent regulations in 2009, which apply to both new development and redevelopment (City of Olympia, Washington 2009). The regulations are modeled on the Western Washington Stormwater Manual (Washington Department of Ecology

2005), but go beyond the state-level standards, especially for water-quality treatment. Developments meeting certain minimum size and disturbance criteria must match stormwater discharges to pre-development rates from 50-percent of the 2-year peak flow to the full 50-year peak flow. Water-quality standards also apply, and must be managed using approved on-site treatment BMPs, including LID controls. Although the regulations apply to both new development and redevelopment, in its 2009 revision to the regulations, Olympia added a financial cap for mitigating existing impervious surfaces at redevelopment projects, at 30-percent of the total project costs. The state of Washington is currently considering more broadly requiring LID controls in its next regions of the Western Washington Stormwater Manual, due out in 2012 (Washington Department of Ecology 2010).

Philadelphia, Pennsylvania. Philadelphia adopted revised stormwater regulations in 2006 that apply to both new development and redevelopment. All development projects (new and redevelopment) must control stormwater quality for the first one-inch of runoff from connected impervious surfaces. This provision was adopted to 1) recharge groundwater and increase stream base flows, 2) restore more natural site hydrology, 3) improve water quality, and 4) reduce combined sewer overflows (CSOs) from the city's CSO system. This requirement must be met using infiltration techniques. If infiltration is demonstrated to be infeasible, a waiver may be considered. Philadelphia also has adopted channel protection and flood control standards, which require slow release of the 1-year, 24-hour storm event and require developers to prevent the occurrence of flooding in downstream areas. Redevelopment projects may apply for exemptions from the channel protection and flood control requirements by reducing land disturbance by 20 percent from predevelopment and post-development conditions (Philadelphia Water Department 2011).

Within each jurisdiction, we identified and interviewed the key municipal officials with experience designing and implementing the new stormwater regulations. These interviews helped us clarify the regulatory context within which developers were making decisions. They also helped us understand how the development community, as a whole, is responding to the new regulations.

To capture the range of perspectives from the development community, we interviewed builders, engineers, landscape designers, and architects in each jurisdiction. We identified potential interviewees by contacting trade organizations (e.g., the U.S. Green Building Council, Master Builders Associations), reviewing public documents, searching web-based directories, and soliciting recommendations from the public officials and other interviewees in each jurisdiction.

Appendix B contains a complete list of the individuals we interviewed for this project.

III. Findings and Conclusions

Our review of the literature, described in the previous section, and the interviews we conducted revealed many insights into how developers in different parts of the country respond to stronger stormwater standards. In this section we present the results of our interviews in each jurisdiction together, rather than as three separate case studies, because the themes that emerged were strikingly similar across the jurisdictions. Where interesting differences across jurisdictions stand out, we highlight them. We organize the results of the interviews, with insights from the literature, into seven broad findings.

As we attempted to understand how developers responded to the most recent regulatory changes, we were faced with the reality that economic conditions since 2007 have had an unprecedented effect on all types of development. The three jurisdictions we focused on all adopted stronger stormwater standards between 2006 and 2010—although each had stronger-than-average regulations prior to this. In many places, very little development activity has occurred at all since stronger stormwater regulations were implemented. Many of the projects that have gone forward were grandfathered under previous stormwater regulations. Because of this, the responses we collected in our interviews were often—but not always—based on conjecture or theoretical understanding, rather than actual experience or observation. In all jurisdictions we studied, the market has yet to fully respond to the new regulatory environment. Repeating this study in 2 to 3 years likely would yield an interesting comparison to our results.

1. Developers are successfully incorporating stronger stormwater controls to meet strict volume-reduction and water-quality standards in both greenfield and redevelopment projects.

Our study found that some developers can and do meet stronger stormwater standards in both redevelopment and greenfield projects. Interviewees who had completed developments that met stronger stormwater standards using LID indicated that doing so required creativity and willingness to experiment with new approaches to projects. They emphasized that pursuing these projects was not without challenge, but they will continue developing in places that require strong stormwater controls and LID for a variety of reasons: the markets they participate in respond favorably to the new stormwater designs; meeting regulations with green-infrastructure techniques could be more cost effective than conventional controls; and for some, they simply believed it was the right thing to do for the environment. Some developers we interviewed had not yet implemented projects under the stronger stormwater standards. Some were skeptical, based on their own initial experiences or other developers they'd talked to, that they could make a project pencil out using LID controls. A minority of interviewees held this perspective. Although staff at each jurisdiction had encountered this opinion, none had actually observed that developers were choosing to invest in greenfield projects over redevelopment projects because of the new standards. This is consistent with other findings in the literature (Leistra, Weiss, and Helman 2010).

Several important distinctions about the way developers approached compliance with stronger stormwater standards in redevelopment projects stand out:

- Redevelopment applications of stormwater controls, including LID techniques, are usually more site-specific and custom than greenfield applications, although this depends on the nature of the redevelopment. Redevelopment sites that are taken down to bare soil can often be treated more like greenfield sites. Redevelopment sites with considerable existing impervious cover, or sites that are surrounded by or incorporate existing infrastructure are generally more challenging to accommodate stormwater management than greenfield or less-dense redevelopment sites.
- The three jurisdictions in our study have strong stormwater regulations that govern greenfield and redevelopment projects. Each jurisdiction also has "off-ramps" that permit developers to avoid full compliance with the new regulations if they can demonstrate engineering, site-condition, or financial reasons why they cannot implement the new controls. Off-ramps can include payment in lieu, off-site mitigation, on-site trading, alternative treatment practices, and reduced performance criteria. Staff in Montgomery County are currently developing clear and consistent guidelines for applying off-ramp provisions, such as using LID to the "maximum extent practicable," that may relax standards for some redevelopment projects. In Olympia, permitting officials described taking a pragmatic approach to permitting stormwater controls for some redevelopment projects that contend with complex existing infrastructure (both on-site and off-site) and connections to existing systems. In Philadelphia, permitting officials allow on-site trading for difficult sites, where one part of a site may not meet the standards, but another part exceeds the standards. There are currently no explicit requirements in any of the jurisdictions that mandate the use of specific BMPs, such as green roofs, on redevelopment sites to fully meet infiltration or water-quality targets.

2. Complying with stormwater regulations is one factor among many that influences a project's costs. It is rarely the driving factor.

Stronger stormwater standards can affect the costs of both greenfield and redevelopment projects. These costs are folded into a *pro forma* analysis that developers and lenders use to assess the viability of a project. Our interviews revealed that developers' decision-making process incorporates a wide range of economic factors, including various construction costs, current and future market conditions, regulatory incentives and disincentives, and uncertainty and risk. While some developers we interviewed indicated that the costs associated with meeting stronger stormwater standards may change the types of projects they will pursue in the future, many developers described the cost of implementing stormwater controls as minor compared to the other economic factors they considered in deciding whether or not to pursue a project, especially in the context of highly-complex redevelopment projects and green-building infill projects.

- In general, stronger stormwater standards have increased the costs to implement stormwater controls, a trend that many of the developers we interviewed have experienced since at least the 1980s. Some developers pointed out, however, that using LID controls has helped offset some of the increased cost, compared to using conventional controls.

- Among the interviewees we spoke to, the majority agreed that complying with stormwater regulations has become a larger component of both greenfield and redevelopment projects, in terms of complexity and cost.
- Complying with stormwater regulations is considered a cost of doing business, and most members of the development community we spoke with did not view the cost of managing stormwater as a major deciding factor in whether or not they pursued a particular project.
- Interviewees cited zoning regulations (and related provisions, such as density limitations and height restrictions) and non-stormwater environmental regulations, such as wetlands and critical habitat areas, as the primary regulatory factors guiding a site's development potential and a project's viability. These are usually larger factors in greenfield development than redevelopment.
- Several interviewees in Philadelphia said that labor costs, which they claimed were driven higher by union wages, made many redevelopment projects in the city unviable. Interviewees in Olympia or Montgomery County did not identify labor costs as a major factor.
- Consumer demand and market conditions matter to developers above all other factors. Developers emphasized that they build where the market demands development. If the market is strong for redevelopment projects in urban areas, interviewees said they would continue to meet that demand. Likewise, if people continue to demand the type of housing that new greenfield sites accommodate, developers maintained that they would continue to pursue these projects.
- In deciding between sites that would accommodate similar types of development, developers indicated that the potential stormwater management costs associated with a site could be among the deciding factors. In general, however, developers noted that market demand trumps the costs of stormwater controls. All things being equal, however, where there are substitute sites, higher stormwater costs could dictate project location.
- Redevelopment projects generally fall into one of two categories: those that are more financially risky because they are being built in a market with soft demand and many potential substitutes with fewer site constraints, and those that are less financially risky because they are being driven by high demand and are higher-end, and sometimes green-branded, projects. For the former group, any factor that influences costs—including stricter stormwater regulations—may affect the project's viability. For the latter group, stricter stormwater controls have not been an issue, and may actually be integrated as an amenity or help the project achieve green ratings.

3. The costs of stormwater controls in general, and LID controls in particular, tend to be more variable and site-specific for redevelopment versus greenfield development.

The developers we interviewed were reluctant to make broad generalizations about the extent to which stronger stormwater controls influence the cost of projects. They emphasized that stormwater designs are highly site-specific, and one solution may be feasible and cost-effective at one site, but infeasible or cost-prohibitive at another site.

The diagram presented in Section II outlines the different factors we identified in the literature and through the interviews that influence the cost of implementing stronger stormwater standards. They underscore the site-specific nature of stormwater-control costs, and explain why implementing stronger stormwater controls in redevelopment projects tends to be more expensive than in greenfield projects. This discussion of costs, however, cannot be separated from the discussion of other factors that influence developers' decisions: avoided costs and market and non-market benefits may help offset increases in direct costs, and market demand and other regulatory and non-regulatory factors may support increases in net project costs.

- Developers incorporate stormwater-management costs into *pro forma* analyses of all development projects. The proportion of total development costs attributable to stormwater controls is highly variable, especially in redevelopment projects. Developers we interviewed were unable or unwilling to provide specific "rules of thumb" for either the proportional costs of stormwater relative to overall development costs or the difference in costs to implement stormwater controls between redevelopment and greenfield projects.
- Many developers we interviewed noted that it is not difficult to incorporate LID for equal or less cost than conventional stormwater controls in a greenfield development. When asked the same question about redevelopment or infill development, developers were very reluctant to make broad generalizations. They were quick to note that the additional costs could be insignificant or major, depending on site conditions.
- Implementing stronger stormwater standards are often, though not always, more expensive in redevelopment projects than greenfield projects. Developers identified several reasons for this:

  Soil characteristics: poor, compacted soils require more amendment to support infiltration. Infiltration may not be allowed at all on sites with contaminated soils. Redevelopment sites are more likely to display these challenging soil conditions.

  Impervious coverage: infiltration techniques are cheaper to construct on large sites with extensive pervious area. Redevelopment sites tend to have higher densities than new development, with less land available for infiltration BMPs. In general, the higher the impervious coverage, the more expensive managing stormwater is likely to be.

  Existing infrastructure: redevelopment sites tend to have existing infrastructure that must be considered in designing stormwater controls. In some cases, this may reduce the flexibility engineers have to design cost-effective solutions for managing stormwater, increasing costs.

- Driving the cost differential, in large part, is the more limited range of BMPs available to manage stormwater on constrained, largely impervious sites. Developers indicated that for many urban redevelopment projects, BMPs on the lower end of the cost curve (e.g., rain gardens and managed wetlands) are not possible. Instead, they must rely on BMPs that are perceived as being on the higher end of the cost curve in many cases, such as greenroofs, micro-swales,

water capture and reuse, stormwater planters, and permeable pavement materials (either pavers or pavement).

- Regulatory uncertainty can increase a developers' costs in the planning and design stages of a project. While regulatory uncertainty is not unique to stronger stormwater regulations, the site-specific nature of using green infrastructure to comply with regulations is inherently more varied than conventional approaches to managing stormwater. It is more difficult for regulators to provide black-and-white guidance for complying with the regulations across all potential circumstances. Moreover, the application of regulatory guidance for stormwater management in redevelopment projects may be more uncertain than in greenfield sites because of the greater variability across and unique characteristics of each redevelopment site. This may, in part, contribute to the perception that it costs more to integrate stronger stormwater controls into redevelopment projects. The developers we interviewed identified these ways in which regulatory uncertainty increased their costs, especially for redevelopment projects:

  Multiple plan reviews: All three jurisdictions require stormwater designs to be incorporated into early plan review, before other permits are issued. If changes to the stormwater design are required later—a common situation, especially in redevelopment projects—plans often must be re-reviewed, adding time and cost to the review process. It is important to note that some developers indicated that early plan review requirements actually helped reduce uncertainty and costs in many cases, because they were forced to address and resolve potential stormwater-related issues while there was still flexibility in the design process.

  Inconsistent application of standards and guidance: Inconsistency in how both developers and permitting officials interpret stormwater standards can cause considerable uncertainty that may lead to increased costs. Developers identified two issues that have increased their uncertainty under the stronger stormwater regulations: 1) receiving different signals from officials within the same jurisdiction about how applications of stormwater controls on a given site may be approved and 2) stormwater design applications that are approved for one site may not be approved for a site with similar characteristics at a different location or future time. Without clear, predictable, and consistent guidance, developers spend more time, and thus cost, navigating the permit-review process.

  Overbuilding: Engineers and developers may hedge against a plan rejection by overdesigning or building multiple levels of stormwater controls, which adds unnecessary costs to the project (but, in theory, reduces the costs associated with regulatory review.)

4. Developers respond to benefits that influence their bottom line. In some cases, these may help offset increased costs of complying with stronger stormwater regulations.

While stronger stormwater regulations and LID controls can provide a range of environmental and amenity benefits, developers generally only respond to those

benefits that affect their bottom line. Developers we interviewed suggested that LID controls that helped them comply with stronger stormwater regulations at lower cost, increased the sale price or rent of a project, reduced the time to sale, or all three, would affect their decisions to use LID. Specific examples of LID controls providing economic benefits to developers include bioswales and other vegetative stormwater controls that improved the appearance and market appeal of a development while also reducing overall landscaping costs, and greenroofs that reduced energy costs and long-term cost of roof maintenance for their customers. Developers noted, however, that market demand for projects that include LID stormwater controls have not yet expanded beyond niche markets. Factors such as unfamiliarity with the technology and uncertainty how to address operations and maintenance of LID controls limit broader use of LID by developers and demand from consumers.

- Developers in each jurisdiction recognized that many of their customers respond positively to the landscape amenities LID BMPs provide. Few developers said that the landscape amenities translated directly into increased property values or higher rents, however.
- Developers who observed that LID could increase property values focused narrowly on the green sector of the market, and incorporated many green-building techniques into their residential infill properties. LID is one of the multiple green attributes of these developments, and the relative importance of LID compared to the other green attributes (e.g., high-efficiency windows, low-VOC building materials, etc.) is difficult for developers to identify.
- Several developers, particularly in Montgomery County, MD and Olympia, Washington, said that some of their customers still expect to see the traditional curb-and-gutter, sidewalk design that characterizes conventional stormwater management techniques. They do not respond as favorably to the LID designs characterized by rain gardens, bioswales, narrow streets, and fewer sidewalks.
- Several developers commented that some customers are wary of LID designs that require maintenance, and that bioswales and rain gardens may actually deter some potential customers from buying a property.

5. Cost-effective responses to stronger stormwater standards require a more collaborative approach to addressing stormwater management.

Engineers and developers who successfully implement stronger stormwater controls using infiltration and retention practices emphasize the importance of considering stormwater management at the earliest stages of development, and of integrating professionals' expertise throughout the project. These principles are consistent with the conclusions of the broader literature on green building, which emphasize the importance of integrating professionals throughout the design process to achieve reductions in capital costs (*see,* e.g., Kibert 2008).

- Some professionals and jurisdictions recognize that thinking about stormwater management early in a project's design is critical to successfully and cost-effectively implementing stronger stormwater controls. Jurisdictions encourage this approach by requiring stormwater management plans, or encouraging consultation with permitting officials early in a project's evolution. Considering

stormwater first allows engineers and developers the flexibility to extract cost savings, maximize site efficiencies, and work around more complex features of a site that could lead to increased costs later.

- Interviewees who successfully and cost-effectively implement LID emphasize the value of collaboration among professionals involved in site design, including the engineer, architect, and builder. This approach treats stormwater management as an integral part of project and site design, rather than as an isolated engineering exercise.
- Engineers often lead the design process that includes implementing stormwater controls. Yet, many engineers have not yet acquired the necessary skills and experience to implement LID controls efficiently and cost-effectively. This lack of experience increases the cost of responding to stronger stormwater standards. Developers raised these issues about the lack of skilled engineering expertise:

  Scarcity of expertise. Those engineers that have LID expertise often charge a premium for it, which increases the overall cost of implementing LID, compared to conventional controls.

  Lack of appropriate tools. Many engineers rely on engineering software or other tools that do not easily accommodate LID designs or collaboration with other professionals, e.g., architects, designers, builders, etc.

  Need for education. Some engineering higher-education programs now include LID training as part of their curriculum. As more engineering students learn LID techniques and apply them in their professional careers, the costs associated with these issues will decrease.

6. Market adjustments are already reducing costs of implementing stronger stormwater standards, for both redevelopment and greenfield development, a trend that is likely to continue.

Market adjustments include changes on the supply side that result in lower costs to implement stronger stormwater standards and changes in demand that result in increased consumer willingness to pay for projects that incorporate stronger stormwater controls. Market adjustments that have the potential to lower costs include more widespread availability of materials (such as porous pavers), better technologies that reduce the time and/or expense of installation (such as modular greenroof systems), and improved design and engineering expertise. Increased regulatory certainty as more developers become familiar with the permitting process and as more permitting officials become comfortable with the new regulatory system also will reduce the developers' cost of implementing stronger stormwater controls. Market adjustments also have the potential to increase consumers' willingness to pay for projects that integrate some types of stormwater controls—especially those that add amenities, such as rain gardens and reduce building operating costs, such as greenroofs. Willingness to pay may increase as more consumers recognize and demand the environmental benefits LID provides, as LID techniques become more familiar and main-stream, and as time and increased use demonstrate LID's long-term effectiveness across wider geographic regions and climate conditions.

- Developers and engineers we interviewed reported that new LID materials and technologies are becoming more available, less costly, and more reliable. They indicated that they expect this trend will further reduce costs.
- Some developers in Montgomery County reported that finding engineers and designers who specialize in LID practices and are comfortable with navigating the permit review process is difficult, because this expertise is limited and in high demand. They reported that the professionals with this expertise can charge a premium to work on projects, which developers must factor into their overall costs. This was not identified as a major issue in Olympia or Philadelphia, which suggests that the market may have already responded to the higher demand for those types of services.
- LID is still perceived as a new technology, and consumers don't always fully understand or value the services it provides. As information on LID spreads, demand may increase for developments that incorporate LID—especially those BMPs with enhanced amenities, such as landscaped bioswales, greenroofs, and rainwater catchment. This could lead to higher rents, higher property values, and less time on the market. These demand-side factors can help offset the increased costs that may occur when integrating LID into a project. Anecdotal evidence in Portland and Seattle, where LID techniques have been implemented for over a decade, suggests that property values are enhanced where these techniques are used (Leistra, Weiss, and Helman 2010, Ward, MacMullan, and Reich 2008).
- Demand for the benefits that LID provides can influence whether developers are willing to take on more risk or higher costs to implement LID. Most developers we interviewed reported that demand for the benefits LID provides is limited, and these benefits don't influence their decisions on how to implement stormwater management. With the exception of a developer in Olympia, Washington that specializes in infill residential construction of green homes, the developers we interviewed did not perceive that LID currently offers significant benefits in terms of increased property values or other amenity values. Many recognize, however, that with future market changes, these benefits could become a larger factor in the future.

7. Developers are supportive of incentives that offset costs and ease the transition to stronger stormwater standards. Jurisdictions can use them to increase the level of social benefits derived from LID practices.

All three jurisdictions have or have considered implementing incentives to encourage developers to adopt LID controls as a way of complying with stronger stormwater standards. Jurisdictions themselves have an incentive to offer developers incentives, in part, because many of the benefits LID provides accrue to the jurisdiction or the public at large, but don't register in the developers' private accounting of costs and benefits. Enhancing the private benefits developers can receive from LID by passing through some of the public benefits can create a more economically efficient outcome for society. Incentives come in a variety of different forms, from direct financial payments and subsidies, to efforts to reduce the costs and risks associated with the permitting and review process. Each jurisdiction we focused on has processes in place to help developers navigate the permitting process more efficiently if they propose to

implement LID beyond what current regulations require. Developers generally responded favorably to these efforts and said that they took advantage of them.

- Developers responded favorably to incentives that reduce the uncertainty associated with the permitting, to the extent that these incentives reduce the time (and associated costs) of getting approval to implement LID. Developers identified these techniques that help with the permitting process: streamlined or fast-track permitting, guaranteed permit review times, and access to permitting staff for collaborative problem solving early in the process. All three jurisdictions have fast-track review processes for green development concepts in place. Philadelphia guarantees plan review for redevelopment projects that disconnect 95 percent of impervious area and don't increase the burden on public infrastructure within 5 business days. Developers expressed mixed opinions about how well these fast-track processes actually work in practice.
- Reduced stormwater fees provided many developers with strong incentives to incorporate LID into redevelopment projects. Fees pegged to impervious area coverage tipped the economic equation for at least one developer considering integrating pervious pavement, one of the more common BMPs used in redevelopment. Developers and engineers in Philadelphia indicated that the City's fee reduction program was becoming a useful tool to get buy-in from customers on including BMPs that would quality for the credit.
- Direct subsidies for LID BMPs on the higher end of the cost scale, such as greenroofs and rainwater catchment systems, can encourage developers to integrate LID into redevelopment projects where other BMPs are not technically feasible. These types of incentives are useful transition tools, helping to build a market for materials and expertise that eventually drives costs down and makes these techniques more broadly affordable in the long run.
- Many developers mentioned that a fee-in-lieu or credit-offset program for stormwater would be an effective way for dealing with exceptionally difficult sites where LID is physically impossible or too costly. Such programs may serve a useful role in a LID regulatory scheme, but they would have to be designed carefully to maximize the environmental benefits that are achievable on-site and collect a payment that is sufficient to actually implement controls off-site that can address the remaining stormwater-related effects.
- Philadelphia has a fee-in-lieu program. Permitting officials said that it is rarely used, because the fee is set such that it is usually cheaper for developers to implement stormwater controls on-site. Permitting officials suggested that this fee-in-lieu program is designed as a useful way to force developers to take a harder look at their site when considering the feasibility of implementing stormwater controls.

APPENDIX A: REFERENCES

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APPENDIX B: LIST OF INTERVIEWEES

Montgomery County, Maryland

Rick Brush, Manager, Montgomery County Department of Permitting Services, Water Resource Plan Review

Steve Shofar, Chief, Montgomery County Division of Watershed Management

David Borchardt, P.E., LEED-AP, Tower Companies

Chris Earley, LEED-AP, Greening Urban

Kenneth Michael, NAI Michael Companies, Inc.

Ken Wallace, McCarthy and Associates

Paul Woodburn, Ben Dyer Associates, Inc.

Mike Novy, P.E., Ben Dyer Associates, Inc.

Guy Semmes, Hopkins & Porter Construction, Inc.

Olympia, Washington

Andy Haub, Planning and Engineering Manager, City of Olympia Public Works Department

Tom Hill, Permit and Inspections Manager, City of Olympia Community Planning and Development

Art Castle, Interim Vice President, Building Industry Association of Washington

Sean Comfort, P.E., AHBL

Scott Bergford, Scott Homes

Damon DeRosa, P.E., LeRoy Surveyors & Engineers

Bill Creveling, P.G., LeRoy Surveyors & Engineers

Philadelphia, Pennsylvania

Chris Crockett, Director of Planning and Research, City of Philadelphia Water Department

Christine Marjoram, Stormwater Plan Review Program Manager, City of Philadelphia Water Department

Howard Steinberg, Onion Flats/Plumbob

Michele Adams P.E., Meliora Environmental Design

Bob Rosenthal, Hovnanaian Homes

Thomas May, P.E., LEED-AP, Urban Engineers

Angelo Waters, P.E., LEED-AP, Urban Engineers

FACT SHEET

National Pollutant Discharge Elimination System (NPDES)
Municipal Separate Storm Sewer System (MS4)
Permit No. DC0000221 (Government of the District of Columbia)
Draft Modification #1

NPDES PERMIT NUMBER: DC0000221, Modification #1

FACILITY NAME AND MAILING ADDRESS:

Government of the District of Columbia
The John A. Wilson Building
1350 Pennsylvania Avenue, N.W.
Washington, D.C. 20004

MS4 ADMINISTRATOR NAME AND MAILING ADDRESS:

Director, District Department of the Environment
1200 First Street, N.E., 6th Floor
Washington, D.C. 20002

FACILITY LOCATION:

District of Columbia's Municipal Separate Storm Sewer System (MS4)

RECEIVING WATERS:

Potomac River, Anacostia River, Rock Creek, and Stream Segments Tributary
To Each Such Water Body

INTRODUCTION:

Today's action proposes a limited modification of the District of Columbia Municipal Separate Storm Sewer System (MS4) Permit. On September 30, 2011, the U.S. Environmental Protection Agency (EPA) issued the Phase I National Pollutant Discharge Elimination System (NPDES) permit for the District of Columbia Municipal Separate Storm Sewer System, Permit No. DC0000221. The permit became effective October 7, 2011.

On November 4, 2011, the Friends of the Earth, Anacostia Riverkeeper, Inc., Potomac Riverkeeper Inc., and Natural Resources Defense Council, Inc. (collectively, the Environmental Petitioners) filed a petition requesting the Environmental Appeals Board (EAB) to review the permit (appeal 11-06). On the same day, the District of Columbia Water and Sewer Authority (DC Water) and the Wet Weather Partnership (WWP) also jointly filed a petition requesting the EAB to review the permit (appeal 11-05).

On November 17, 2011, the District Department of the Environment (DDOE) filed a motion with the EAB requesting permission to intervene and file a response to both petitions for review. On February 2, 2012 the EAB granted DDOE's motion.

On December 20, 2011, the EPA provided notification to DDOE of its determination of which permit elements would be stayed pending resolution of the appeals. The stay was limited only to certain provisions. The remainder of the permit remained in effect, and continues to remain in effect.

All parties agreed to attempt to resolve the appeals through Alternative Dispute Resolution (ADR) and on March 8-9, 2012 convened with an EAB judge and a representative of the EAB to agree upon the issues that would be discussed in negotiations. The parties conducted subsequent discussions over the following two months to attempt to reach agreement on relevant issues.

On May 18, 2012, the EPA and the Environmental Petitioners (appeal 11-06) signed a settlement agreement in which the EPA agreed to propose modifications to language in several sections of the permit and to provide certain clarifications in the draft fact sheet for those proposed modifications. The petition for review filed by DC Water and the Wet Weather Partnership (appeal 11-05) was not resolved via ADR; that petition is pending before the EAB.

For additional information on the appeal proceedings the EAB docket is available at: http://yosemite.epa.gov/oa/EAB_Web_Docket.nsf/f22b4b245fab46c6852570e6004df1bd/a4dedd0575d39c4f852579420055a56a!OpenDocument

ACTION TO BE TAKEN:

The EPA is today proposing specific and limited modifications, consistent with the settlement agreement and ADR discussions described above, to the District of Columbia NPDES MS4 Permit No. DC0000221, issued on September 30, 2011. Pursuant to 40 C.F.R. § 122.62 and 40 C.F.R. § 124.19, the EPA is taking comments *only* on the proposed language changes identified in draft Modification #1. The remaining portions of the permit are not open for comment or modification.

The following conventions are used to show proposed changes to the existing permit language: deleted language is indicated in ~~strikethrough~~ font and added language is indicated in <u>underline</u> font.

I. MINOR MODIFICATIONS

References to two section numbers were erroneously cited in the final permit. Pursuant to 40 C.F.R. 122.63(a), those section numbers are being corrected as follows:

1. On page 9, Table 1, the part number for the Retrofit Program will be corrected to 4.1.5.

2. On page 53, within the definition for "TMDL Implementation Plan", the erroneous reference to section 8.1.4 will be replaced with the correct reference to section 4.10.3.

II. PROPOSED MODIFICATIONS

Pursuant to 40 C.F.R. §§ 122.62 and 124.19, the EPA is proposing several modifications to the permit. In general the proposed modifications are intended to serve several purposes:

1) **To provide additional public notice and input on the District's development of its Consolidated TMDL Implementation Plan.** The proposed modifications specifically provide for public participation in the development of the Consolidated Total Maximum Daily Load (TMDL) Implementation Plan (*see* II.E), and also add six (6) months to the schedule for submitting the Plan to the EPA for approval, in order to facilitate public participation and an adequate public notice period for the draft Plan.

The EPA is also taking comment on a provision to require public notification of sanitary sewer overflows to the MS4 (*see* II.C) in section 4.3.1.3 of the permit.

2) **To provide additional clarity and accountability for specific water quality-related outcomes**. The proposed modifications to discharge limitations (*see* II.B), content requirements for the Consolidated TMDL Implementation Plan (*see* II.E), and the specific addition of definitions for the terms “benchmarks” and “milestones” used for TMDL planning (*see* II.G) are to clarify what are to be enforceable permit requirements. The EPA clarifies that final dates for attainment of wasteload allocations (WLAs) must be specified in the Plan and that the EPA will incorporate interim and final milestones for attainment as enforceable permit provisions.

The EPA also clarifies that *all* provisions of this permit are enforceable. The permittee must comply with all conditions of this permit. The EPA intends each provision of the permit to be enforceable. Compliance with any provision of this permit does not relieve the permittee from compliance with any other provision of the permit.

3**) To provide clarity that the Government of the District of Columbia is the sole permittee.** To eliminate any possible confusion about who the "permittee" is, the EPA is proposing modifications of the definition of "permittee" and standardization of language throughout the permit. Specifically, the EPA is proposing to remove a reference to DC Water (*see* II.C), to simplify the definition of permittee (*see* II. G), and to replace the term "District" with "permittee" in many places throughout the permit (*see* II.A).

The EPA recognizes that the Government of the District of Columbia has the institutional policies, regulations and agreements to make internal determinations about which District entities shall implement the various provisions of the permit. The EPA realizes that a number of departments, agencies and authorities of the Government of the District of Columbia will be engaged in carrying out particular responsibilities under the permit. However, the permit does not purport to identify which of these entities are responsible for any particular requirement, as this does not fall within the EPA's purview as the permitting authority. The EPA will continue to work directly with DDOE, the current stormwater administrator.

The following describe the specific proposed modifications:

A. PERMITTEE

To simplify and clarify the definition of "permittee", the EPA is proposing to replace the term "District" with "permittee" in all places in the permit where the term "District" has been used in the context of a mandate to the permittee to carry out a provision. The term "District" or "District of Columbia" continues to be used when the reference is to the specific geographical area.

Consistent with simplification of the definition of "permittee" (*see* II.G) these changes are intended to clarify that there is a single permittee, *i.e.*, the Government of the District of Columbia. As stated in Part 2.3 of the permit, the specific duties and obligations under the permit may ultimately be carried out by particular agencies, departments or authorities with the Government of the District of Columbia. DC law recognizes that implementing the MS4 permit involves a number of agencies, as outlined in the *Comprehensive Stormwater Management Enhancement Amendment Act of 2008*.[1] Section 151(a), which was enacted as part of the 2008 law, established a Stormwater Administration within DDOE, and provides that the Stormwater Administration "shall be responsible for monitoring and coordinating the activities of all District agencies, including the activities of the District of Columbia Water and Sewer Authority . . . which are required to maintain compliance with the Stormwater Permit" (referring to the MS4 permit). Section 151(c) further requires various agencies "and any other District agency identified by the Director" of DDOE to comply "with all requests made by the Director relating to stormwater related requests . . .". Therefore, while the permit stipulates the requirements to be fulfilled, determination of which agency or entity will be charged with bringing those tasks to fruition is governed by the DC statute and not a determination made by the permitting authority.

B. DISCHARGE LIMITATIONS

In Part 1.4 of the permit the EPA proposes to modify the final sentence to read:

> "Compliance with the ~~performance standards and~~ provisions contained in Parts 2 through 8 of this permit, <u>including milestones and final dates for attainment of applicable WLAs</u>, shall constitute adequate progress toward compliance with DCWQS and WLAs for this permit term."

The purpose of the proposed modification is to emphasize the importance of robust and timely progress towards implementation of the applicable wasteload allocations and attainment of water quality standards within defined timeframes.

C. SANITARY SEWAGE SYSTEM MAINTENANCE OVERFLOW AND SPILL PREVENTION RESPONSE

1. Modification to Part 4.3.1

[1] Draft Modification #1 Administrative Record, Document #18 (District of Columbia, *Comprehensive Stormwater Management Enhancement Amendment Act of 2008*, DC Law 16-51; DC Official Code §8.151.01 *et seq.*)

In Part 4.3.1 of the permit the EPA proposes the following modification:

> "The permittee shall ~~coordinate with DC Water to~~ implement an effective response protocol for overflows of the sanitary sewer system into the MS4."

The EPA had not originally included the phrase "coordinate with DC Water to" in the draft permit proposed in April 2010, but added it to the final permit per the request of DC Water in their comments on the proposed permit[2]. The EPA has subsequently concluded that this provided more confusion than clarity, and is now proposing to delete the phrase consistent with the modifications described above (*see* II.A) emphasizing that the Government of the District of Columbia is the permittee, and that the permittee will coordinate implementation of the permit according to its policies and regulations.

2. Public Comment on Part 4.3.1.3

In addition the EPA solicits public comment on the provision in the final permit that the permittee shall provide public notification of sanitary sewer overflows to the MS4. The final permit provided that the permittee would have procedures for:

> "Notifying appropriate sewer, public health agencies and the public within 24 hours when the sanitary sewer overflows to the MS4."

In the draft permit provision, the EPA did not originally include the phrase "and the public." However, in response to comments for more public notification and review generally[3,4,5,6], the EPA included it in the final permit as a logical outgrowth of the draft permit provision. The draft permit included requiring notice to appropriate public health agencies, and the rationale for notifying the public directly is the same: to ensure that people know to stay out of waterways in which untreated domestic sewage has been discharged. Notification of the public directly is also consistent with agency policy and guidance[7,8,9,10,11,12,13,14] on sanitary sewer overflow (SSO)

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[2] Final Permit Administrative Record Document #14 (District of Columbia Water & Sewer Authority, George Hawkins, Comment Letter (June 4, 2010)).
[3] Final Permit Administrative Record Document #3 (Alice Ferguson Foundation, Inc., Tracy Bowen, Comment Letter (June 4, 2010)).
[4] Final Permit Administrative Record Document #5 (Anacostia Watershed Society (50 form letters) (May – June 2010)).
[5] Final Permit Administrative Record Document #8 (Chesapeake Bay Foundation, Lee Epstein, Comment Letter (June 4, 2010)).
[6] Final Permit Administrative Record Document #16 (Friends of Rock Creek's Environment, Beth Mullin, Comment Letter (June 4, 2010)).
[7] Draft Modification #1 Administrative Record, Document #1 (U.S. EPA, *Report to Congress: Impacts and Control of CSOs and SSOs*, August 2004, EPA 833-R-04-001).
[8] Draft Modification #1 Administrative Record, Document #2 (U.S. EPA, *Why Control Sanitary Sewer Overflows?*, fact sheet).
[9] Draft Modification #1 Administrative Record, Document #3 (U.S. EPA, *National Pollutant Discharge Elimination System Permit Requirements for Peak Wet Weather Discharges from Publicly Owned Treatment Works Treatment Plants Serving Separate Sanitary Sewer Collection Systems*, December 2005).
[10] Draft Modification #1 Administrative Record, Document #4 (U.S. EPA, *Guide for Evaluating Capacity, Management, Operation and Maintenance (CMOM) Programs at Sanitary Sewer Collection Systems*, January 2005).

notification. Nonetheless, in order to be sure that the public has an opportunity to comment on this provision, the EPA seeks public comment on the requirement to include notice to the public when sanitary sewers overflow to the MS4. Upon receipt of those public comments, the EPA will decide whether to retain the requirement for public notification of SSOs to the MS4, remove it, or include a variation on this provision in the permit. The EPA emphasizes that, because this is an MS4 permit, this provision includes *only* those SSOs that reach the MS4.

D. PUBLIC INVOLVEMENT AND PARTICIPATION

In Part 4.9.4.1 of the permit the EPA proposes to add the following:

> "The permittee shall continue to create opportunities for the public to participate in the decision making processes involving the implementation of the permittee's SWMP. In particular the permittee shall provide meaningful opportunity for the public to participate in the development of the permittee's Consolidated TMDL Implementation Plan. The permittee shall continue to implement its process for consideration of public comments on their SWMP."

The purpose of this modification is to ensure that all parties with an interest in TMDL implementation have ample opportunity to participate in the planning process. Other modifications are also being proposed to Part 4.10.4 of the permit (*see* II.E) to achieve that purpose.

E. TOTAL MAXIMUM DAILY LOAD (TMDL) WASTELOAD ALLOCATION (WLA) PLANNING AND IMPLEMENTATION

A number of changes to Parts 4.10.3 and 4.10.4 are being proposed, which are summarized here. For the specific modifications to the permit language being proposed, please refer to the proposed modifications document.

1. The EPA is proposing to extend the compliance schedule for development of the Consolidated TMDL Implementation Plan (the Plan) from 24-months to 30-months to allow for adequate public involvement and public notification. The permit requirement to develop the Plan has been stayed due to permit appeal. Under 40 CFR § 124.19(d) the EPA is proposing to withdraw the original permit requirement and replace it with the modified provision. Therefore, the 30-month period would begin with the effective date of the permit modification. (Part 4.10.3)

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[11] Draft Modification #1 Administrative Record, Document #5 (U.S. EPA, *Sanitary Sewer Capacity, Management, Operation and Maintenance Self-Assessment Check-list*, (see Overflow Emergency Response Plan, page 22)).
[12] Draft Modification #1 Administrative Record, Document #6 (American Society of Civil Engineers, *Sanitary Sewer Overflow Solutions, Guidance Manual*, April 2004).
[13] Draft Modification #1 Administrative Record, Document #7 (U.S. EPA, Model NPDES Permit Language for Sanitary Sewer Overflows, August 2007 Draft).
[14] Draft Modification #1 Administrative Record, Document #8 (U.S. EPA, NPDES Permit Requirements for Municipal Sanitary Sewer Collection Systems and SSOs, August 2007 Draft).

2. The EPA is proposing to remove the reference to the 2002 TMDL for Total Suspended Solids in the Upper and Lower Anacostia River from the permit because that TMDL has been superseded by the 2007 TMDL for Sediment/Total Suspended Solids for the Anacostia River Basin. (Part 4.10.3)
3. The EPA is proposing modifications that provide additional clarification that the EPA will take action to incorporate milestones and final WLA attainment dates into the permit as enforceable requirements of the program. (Part 4.10.3)
4. The EPA is proposing modifications that clarify when and how modifications to the Plan must be submitted to the EPA. (Part 4.10.3)
5. The EPA is proposing modifications that clarify what the interim and final elements of the Plan must be, including benchmarks, milestones and final attainment objectives (*also see*, II.G). (Part 4.10.3)
6. The EPA is proposing to add a requirement that the Plan include adequate narrative to ensure that there is clear understanding of the rationale for TMDL implementation schedules and controls. (Part 4.10.3)
7. The EPA is proposing modifications that clarify that all TMDLs with WLAs assigned to the MS4 that are in effect, e.g., haven't been withdrawn, reissued, or the water delisted, must be included in the Plan. (Part 4.10.3)
8. The EPA is proposing modifications that clarify that the most current version of the Plan must be posted on the permittee's website. (Part 4.10.3)
9. The EPA is proposing modifications to the language describing actions the permittee must take should the permittee make insufficient progress toward attaining any WLA. (Part 4.10.4)

In the event the permittee does not submit a Consolidated TMDL Implementation Plan, submits a plan that fails to address one or more applicable TMDLs, or submits a plan that the EPA disapproves, the EPA will initiate action to set the relevant milestones and final dates for attainment by which the permittee will meet applicable WLAs, pursuant to section 4.10.3 of the permit, within 6 months of the failure and finalize those requirements within 2 years of the failure. The EPA will incorporate those elements as enforceable permit provisions.

The EPA believes these modifications would improve the transparency of the process with respect to implementing the various, and to some extent overlapping, TMDLs that apply to the receiving waters in question. Moreover, the clarifications should make it easier for both the permittee and the public to identify the enforceable elements of the permit.

F. DESIGN OF THE REVISED MONITORING PROGRAM

The final permit aligned the schedules for development of the Consolidated TMDL Implementation Plan and the Revised Monitoring Program (Part 5.1.1) because of the importance of tailoring monitoring to support TMDL implementation. Since the EPA is proposing to extend the compliance date for submittal of the Consolidated TMDL Plan to 30 months, the EPA also proposes to extend the compliance date for submittal of the Revised Monitoring Strategy to 30 months to maintain the alignment between the two schedules. Both 30 month schedules would start with the effective date of this permit modification.

G. DEFINITIONS

In conjunction with the changes to 4.10.3 and 4.10.4, the EPA proposes two new definitions to support and clarify the expectations for TMDL planning and implementation:

> "'Benchmark' as used in this permit is a quantifiable goal or target to be used to assess progress toward "milestones" (see separate definition) and WLAs, such as a numeric goal for BMP implementation. If a benchmark is not met, the permittee should take appropriate corrective action to improve progress toward meeting milestones or other objectives. Benchmarks are intended as an adaptive management aid and generally are not considered to be enforceable."

> "'Milestone' as used in this permit is an interim step toward attainment of a WLA that upon incorporation into the permit will become an enforceable limit or requirement to be achieved by a stated date. A milestone should be expressed in numeric terms, i.e. as a volume reduction, pollutant load, specified implementation action or set of actions or other objective metric, when possible and appropriate."

In addition, the EPA proposes to simplify the definition of "permittee" as follows:

> "'Permittee' refers to the Government of the District of Columbia ~~and all subordinate District and independent agencies, such as the District of Columbia Water and Sewer Authority, directly accountable and responsible to the City Council and Mayor as authorized under the Stormwater Permit Compliance Amendment Act of 2000 and any subsequent amendments for administrating, coordinating, implementing, and managing stormwater for MS4 activities within the boundaries of the District of Columbia~~."

As explained above (*see*, II.A), under District of Columbia law, it is the responsibility of DDOE to coordinate implementation of the MS4 permit.

WHERE TO SEND COMMENTS:

Comments on the proposed modifications may be sent via electronic mail or regular mail to:

Ms. Kaitlyn Bendik
U.S. Environmental Protection Agency
Region 3
NPDES Permits Branch, Mailcode 3WP41
1650 Arch Street
Philadelphia, PA 19103-2029
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Comments must be postmarked (if regular mail) or sent (if electronic mail) on or before August 27, 2012.

Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices

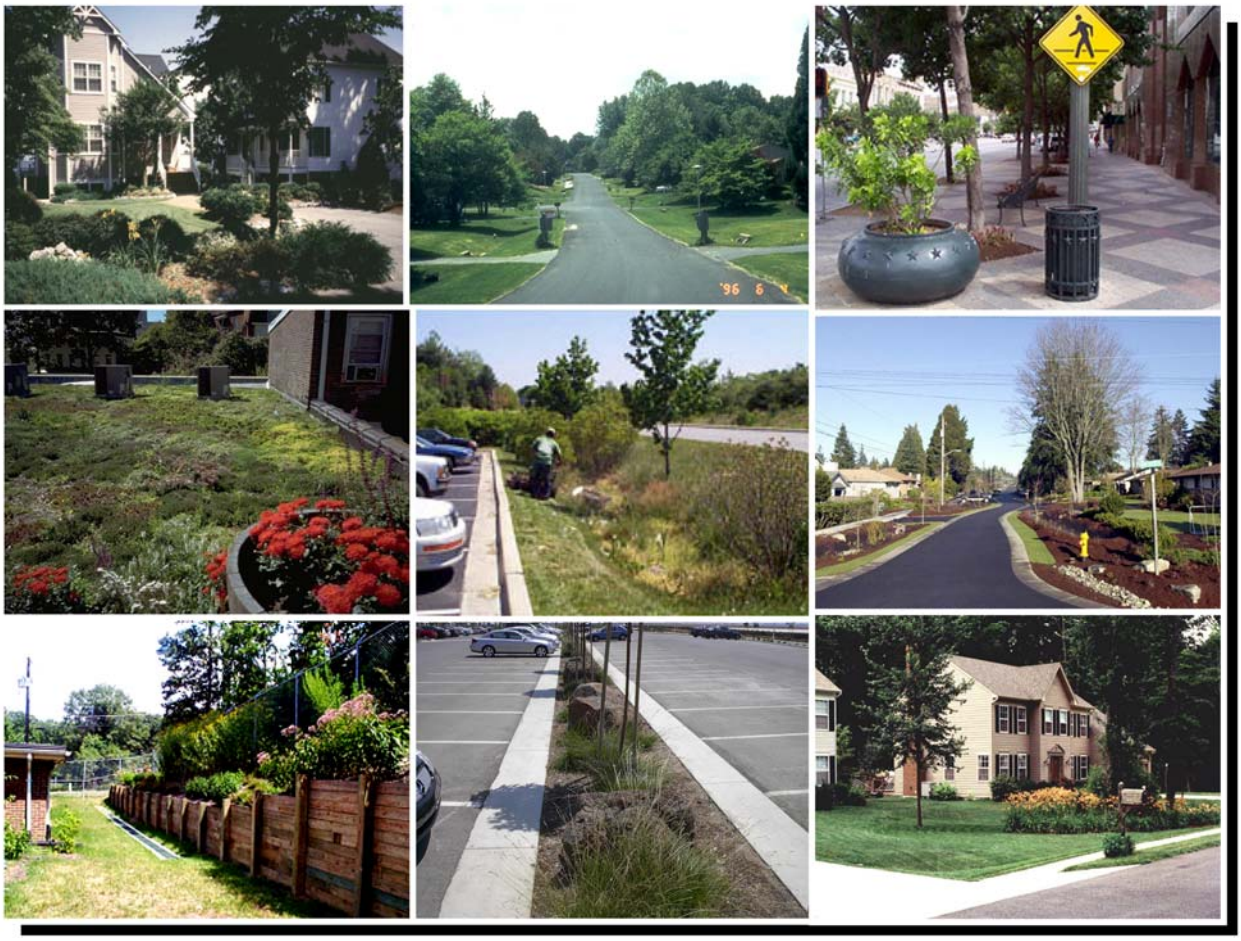

Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices

December 2007

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Nonpoint Source Control Branch (4503T)

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FOREWORD

One of the most exciting new trends in water quality management today is the movement by many cities, counties, states, and private-sector developers toward the increased use of Low Impact Development (LID) to help protect and restore water quality. LID comprises a set of approaches and practices that are designed to reduce runoff of water and pollutants from the site at which they are generated. By means of infiltration, evapotranspiration, and reuse of rainwater, LID techniques manage water and water pollutants at the source and thereby prevent or reduce the impact of development on rivers, streams, lakes, coastal waters, and ground water.

Although the increase in application of these practices is growing rapidly, data regarding both the effectiveness of these practices and their costs remain limited. This document is focused on the latter issue, and the news is good. In the vast majority of cases, the U.S. Environmental Protection Agency (EPA) has found that implementing well-chosen LID practices saves money for developers, property owners, and communities while protecting and restoring water quality.

While this study focuses on the cost reductions and cost savings that are achievable through the use of LID practices, it is also the case that communities can experience many amenities and associated economic benefits that go beyond cost savings. These include enhanced property values, improved habitat, aesthetic amenities, and improved quality of life. This study does not monetize and consider these values in performing the cost calculations, but these economic benefits are real and significant. For that reason, EPA has included a discussion of these economic benefits in this document and provided references for interested readers to learn more about them.

Readers interested in increasing their knowledge about LID and Green Infrastructure, which encompasses LID along with other aspects of green development, should see www.epa.gov/npdes/greeninfrastructure and www.epa.gov/nps/lid. It is EPA's hope that as professionals and citizens continue to become more knowledgeable about the effectiveness and costs of LID, the use of LID practices will continue to increase at a rapid pace.

EXECUTIVE SUMMARY

This report summarizes 17 case studies of developments that include Low Impact Development (LID) practices and concludes that applying LID techniques can reduce project costs and improve environmental performance. In most cases, LID practices were shown to be both fiscally and environmentally beneficial to communities. In a few cases, LID project costs were higher than those for conventional stormwater management practices. However, in the vast majority of cases, significant savings were realized due to reduced costs for site grading and preparation, stormwater infrastructure, site paving, and landscaping. Total capital cost savings ranged from 15 to 80 percent when LID methods were used, with a few exceptions in which LID project costs were higher than conventional stormwater management costs.

EPA has identified several additional areas that will require further study. First, in all cases, there were benefits that this study did not monetize and did not factor into the project's bottom line. These benefits include improved aesthetics, expanded recreational opportunities, increased property values due to the desirability of the lots and their proximity to open space, increased total number of units developed, increased marketing potential, and faster sales. Second, more research is also needed to quantify the environmental benefits that can be achieved through the use of LID techniques and the costs that can be avoided. Examples of environmental benefits include reduced runoff volumes and pollutant loadings to downstream waters, and reduced incidences of combined sewer overflows. Finally, more research is needed to monetize the cost reductions that can be achieved through improved environmental performance, reductions in long-term operation and maintenance costs, and/or reductions in the life cycle costs of replacing or rehabilitating infrastructure.

INTRODUCTION

BACKGROUND

Most stormwater runoff is the result of the man-made hydrologic modifications that normally accompany development. The addition of impervious surfaces, soil compaction, and tree and vegetation removal result in alterations to the movement of water through the environment. As interception, evapotranspiration, and infiltration are reduced and precipitation is converted to overland flow, these modifications affect not only the characteristics of the developed site but also the watershed in which the development is located. Stormwater has been identified as one of the leading sources of pollution for all waterbody types in the United States. Furthermore, the impacts of stormwater pollution are not static; they usually increase with more development and urbanization.

Extensive development in the United States is a relatively recent phenomenon. For the past two decades, the rate of land development across the country has been twice the rate of population growth. Approximately 25 million acres were developed between 1982 and 1997, resulting in a 34 percent increase in the amount of developed land with only a 15 percent increase in population.[1,2] The 25 million acres developed during this 15-year period represent nearly 25 percent of the total amount of developed land in the contiguous states. The U.S. population is expected to increase by 22 percent from 2000 to 2025. If recent development trends continue, an additional 68 million acres of land will be developed during this 25-year period.[3]

Water quality protection strategies are often implemented at three scales: the region or large watershed area, the community or neighborhood, and the site or block. Different stormwater approaches are used at different scales to afford the greatest degree of protection to waterbodies because the influences of pollution are often found at all three scales. For example, decisions about where and how to grow are the first and perhaps most important decisions related to water quality. Growth and development can give a community the resources needed to revitalize a downtown, refurbish a main street, build new schools, and develop vibrant places to live, work, shop, and play. The environmental impacts of development, however, can pose challenges for communities striving to protect their natural resources. Development that uses land efficiently and protects undisturbed natural lands allows a community to grow and still protect its water resources.

Strategies related to these broad growth and development issues are often implemented at the regional or watershed scale. Once municipalities have determined where to grow and where to preserve, various stormwater management techniques are applied at the neighborhood or community level. These measures, such as road width requirements, often transcend specific development sites and can be applied throughout a neighborhood. Finally, site-specific stormwater strategies, such as rain gardens and infiltration areas, are incorporated within a particular development. Of course, some stormwater management strategies can be applied at several scales. For example, opportunities to maximize infiltration can occur at the neighborhood and site levels.

Many smart growth approaches can decrease the overall amount of impervious cover associated with a development's footprint. These approaches include directing development to already degraded land; using narrower roads; designing smaller parking lots; integrating retail, commercial, and residential uses; and designing more compact residential lots. These development approaches, combined with other techniques aimed at reducing the impact of development, can offer communities superior stormwater management.

Stormwater management programs have struggled to provide adequate abatement and treatment of stormwater at the current levels of development. Future development will create even greater challenges for maintaining and improving water quality in the nation's waterbodies. The past few decades of stormwater management have resulted in the current convention of control-and-treatment strategies. They are largely engineered, end-of-pipe practices that have been focused on controlling peak flow rate and suspended solids concentrations. Conventional practices, however, fail to address the widespread and cumulative hydrologic modifications within the watershed that increase stormwater volumes and runoff rates and cause excessive erosion and stream channel degradation. Existing practices also fail to adequately treat for other pollutants of concern, such as nutrients, pathogens, and metals.

LOW IMPACT DEVELOPMENT

Low Impact Development (LID)[4] is a stormwater management strategy that has been adopted in many localities across the country in the past several years. It is a stormwater management approach and set of practices that can be used to reduce runoff and pollutant loadings by managing the runoff as close to its source(s) as possible. A set or system of small-scale practices, linked together on the site, is often used. LID approaches can be used to reduce the impacts of development and redevelopment activities on water resources. In the case of new development, LID is typically used to achieve or pursue the goal of maintaining or closely replicating the predevelopment hydrology of the site. In areas where development has already occurred, LID can be used as a retrofit practice to reduce runoff volumes, pollutant loadings, and the overall impacts of existing development on the affected receiving waters.

In general, implementing integrated LID practices can result in enhanced environmental performance while at the same time reducing development costs when compared to traditional stormwater management approaches. LID techniques promote the use of natural systems, which can effectively remove nutrients, pathogens, and metals from stormwater. Cost savings are typically seen in reduced infrastructure because the total volume of runoff to be managed is minimized through infiltration and evapotranspiration. By working to mimic the natural water cycle, LID practices protect downstream resources from adverse pollutant and hydrologic impacts that can degrade stream channels and harm aquatic life.

It is important to note that typical, real-world LID designs usually incorporate more than one type of practice or technique to provide integrated treatment of runoff from a site. For example, in lieu of a treatment pond serving a new subdivision, planners might incorporate a bioretention area in each yard, disconnect downspouts from driveway surfaces, remove curbs, and install grassed swales in common areas. Integrating small

practices throughout a site instead of using extended detention wet ponds to control runoff from a subdivision is the basis of the LID approach.

When conducting cost analyses of these practices, examples of projects where actual practice-by-practice costs were considered separately were found to be rare because material and labor costs are typically calculated for an entire site rather than for each element within a larger system. Similarly, it is difficult to calculate the economic benefits of individual LID practices on the basis of their effectiveness in reducing runoff volume and rates or in treating pollutants targeted for best management practice (BMP) performance monitoring.

The following is a summary of the different categories of LID practices, including a brief description and examples of each type of practice.

Conservation designs can be used to minimize the generation of runoff by preserving open space. Such designs can reduce the amount of impervious surface, which can cause increased runoff volumes. Open space can also be used to treat the increased runoff from the built environment through infiltration or evapotranspiration. For example, developers can use conservation designs to preserve important features on the site such as wetland and riparian areas, forested tracts, and areas of porous soils. Development plans that outline the smallest site disturbance area can minimize the stripping of topsoil and compaction of subsoil that result from grading and equipment use. By preserving natural areas and not clearing and grading the entire site for housing lots, less total runoff is generated on the development parcel. Such simplistic, nonstructural methods can reduce the need to build large structural runoff controls like retention ponds and stormwater conveyance systems and thereby decrease the overall infrastructure costs of the project. Reducing the total area of impervious surface by limiting road widths, parking area, and sidewalks can also reduce the volume of runoff that must be treated. Residential developments that incorporate conservation design principles also can benefit residents and their quality of life due to increased access and proximity to communal open space, a greater sense of community, and expanded recreational opportunities.

Examples of Conservation Design

- Cluster development
- Open space preservation
- Reduced pavement widths (streets, sidewalks)
- Shared driveways
- Reduced setbacks (shorter driveways)
- Site fingerprinting during construction

Infiltration practices are engineered structures or landscape features designed to capture and infiltrate runoff. They can be used to reduce both the volume of runoff discharged from the site and the infrastructure needed to convey, treat, or control runoff. Infiltration practices can also be used to recharge ground water. This benefit is especially important in areas where maintaining drinking water supplies and stream baseflow is of special concern because of limited precipitation or a high ratio of withdrawal to recharge rates. Infiltration of runoff can also help to maintain stream temperatures because the infiltrated water that moves laterally to replenish stream baseflow typically has a lower temperature than overland flows, which might be subject

Examples of Infiltration Practices

- Infiltration basins and trenches
- Porous pavement
- Disconnected downspouts
- Rain gardens and other vegetated treatment systems

to solar radiation. Another advantage of infiltration practices is that they can be integrated into landscape features in a site-dispersed manner. This feature can result in aesthetic benefits and, in some cases, recreational opportunities; for example, some infiltration areas can be used as playing fields during dry periods.

Runoff storage practices. Impervious surfaces are a central part of the built environment, but runoff from such surfaces can be captured and stored for reuse or gradually infiltrated, evaporated, or used to irrigate plants. Using runoff storage practices has several benefits. They can reduce the volume of runoff discharged to surface waters, lower the peak flow hydrograph to protect streams from the erosive forces of high flows, irrigate landscaping, and provide aesthetic benefits such as landscape islands, tree boxes, and rain gardens. Designers can take advantage of the void space beneath paved areas like parking lots and sidewalks to provide additional storage. For example, underground vaults can be used to store runoff in both urban and rural areas.

Examples of Runoff Storage Practices

- Parking lot, street, and sidewalk storage
- Rain barrels and cisterns
- Depressional storage in landscape islands and in tree, shrub, or turf depressions
- Green roofs

Runoff conveyance practices. Large storm events can make it difficult to retain all the runoff generated on-site by using infiltration and storage practices. In these situations, conveyance systems are typically used to route excess runoff through and off the site. In LID designs, conveyance systems can be used to slow flow velocities, lengthen the runoff time of concentration, and delay peak flows that are discharged off-site. LID conveyance practices can be used as an alternative to curb-and-gutter systems, and from a water quality perspective they have advantages over conventional approaches designed to rapidly convey runoff off-site and alleviate on-site flooding. LID conveyance practices often have rough surfaces, which slow runoff and increase evaporation and settling of solids. They are typically permeable and vegetated, which promotes infiltration, filtration, and some biological uptake of pollutants. LID conveyance practices also can perform functions similar to those of conventional curbs, channels, and gutters. For example, they can be used to reduce flooding around structures by routing runoff to landscaped areas for treatment, infiltration, and evapotranspiration.

Examples of Runoff Conveyance Practices

- Eliminating curbs and gutters
- Creating grassed swales and grass-lined channels
- Roughening surfaces
- Creating long flow paths over landscaped areas
- Installing smaller culverts, pipes, and inlets
- Creating terraces and check dams

Filtration practices are used to treat runoff by filtering it through media that are designed to capture pollutants through the processes of physical filtration of solids and/or cation exchange of dissolved pollutants. Filtration practices offer many of the same benefits as infiltration, such as reductions in the volume of runoff transported off-site, ground water recharge, increased stream baseflow, and reductions in thermal impacts to receiving waters. Filtration practices also have the added advantage of providing increased pollutant removal benefits. Although pollutant build-up and removal may be of concern, pollutants are typically captured in the upper soil horizon and can be removed by replacing the topsoil.

Examples of Filtration Practices

- Bioretention/rain gardens
- Vegetated swales
- Vegetated filter strips/buffers

Low impact landscaping. Selection and distribution of plants must be carefully planned when designing a functional landscape. Aesthetics are a primary concern, but it is also important to consider long-term maintenance goals to reduce inputs of labor, water, and chemicals. Properly preparing soils and selecting species adapted to the microclimates of a site greatly increases the success of plant establishment and growth, thereby stabilizing soils and allowing for biological uptake of pollutants. Dense, healthy plant growth offers such benefits as pest resistance (reducing the need for pesticides) and improved soil infiltration from root growth. Low impact landscaping can thus reduce impervious surfaces, improve infiltration potential, and improve the aesthetic quality of the site.

Examples of Low Impact Landscaping

- Planting native, drought-tolerant plants
- Converting turf areas to shrubs and trees
- Reforestation
- Encouraging longer grass length
- Planting wildflower meadows rather than turf along medians and in open space
- Amending soil to improve infiltration

EVALUATIONS OF BENEFITS AND COSTS

To date, the focus of traditional stormwater management programs has been concentrated largely on structural engineering solutions to manage the hydraulic consequences of the increased runoff that results from development. Because of this emphasis, stormwater management has been considered primarily an engineering endeavor. Economic analyses regarding the selection of solutions that are not entirely based on pipes and ponds have not been a significant factor in management decisions. Where costs have been considered, the focus has been primarily on determining capital costs for conventional infrastructure, as well as operation and maintenance costs in dollars per square foot or dollars per pound of pollutant removed.

Little attention has been given to the benefits that can be achieved through implementing LID practices. For example, communities rarely attempt to quantify and monetize the pollution prevention benefits and avoided treatment costs that might accrue from the use of conservation designs or LID techniques. To be more specific, the benefits of using LID practices to decrease the need for combined sewer overflow (CSO) storage and conveyance systems should be factored into the economic analyses. One of the major factors preventing LID practices from receiving equal consideration in the design or selection process is the difficulty of monetizing the environmental benefits of these practices. Without good data and relative certainty that these alternatives will work and not increase risk or cost, current standards of practice are difficult to change.

This report is an effort to compare the projected or known costs of LID practices with those of conventional development approaches. At this point, monetizing the economic and environmental benefits of LID strategies is much more difficult than monetizing traditional infrastructure costs or changes in property values due to improvements in existing utilities or transportation systems. Systems of practices must be analyzed to determine net performance and monetary benefits based on the capacity of the systems to both treat for pollutants and reduce impacts through pollution prevention. For example, benefits might come in the form of reduced stream channel degradation, avoided stream restoration costs, or reduced drinking water treatment costs.

One of the chief impediments to getting useful economic data to promote more widespread use of LID techniques is the lack of a uniform baseline with which to compare the costs and benefits of LID practices against the costs of conventional stormwater treatment and control. Analyzing benefits is further complicated in cases where the environmental performance of the conservation design or LID system exceeds that of the conventional runoff management system, because such benefits are not easily monetized. The discussion below is intended to provide a general discussion of the range of economic benefits that may be provided by LID practices in a range of appropriate circumstances.

OVERVIEW OF BENEFITS

The following is a brief discussion of some of the actual and assumed benefits of LID practices. Note that environmental and ancillary benefits typically are not measured as part of development projects, nor are they measured as part of pilot or demonstration projects, because they can be difficult to isolate and quantify. Many of the benefits described below are assumed on the basis of limited studies and anecdotal evidence.

The following discussion is organized into three categories: (1) environmental benefits, which include reductions in pollutants, protection of downstream water resources, ground water recharge, reductions in pollutant treatment costs, reductions in the frequency and severity of CSOs, and habitat improvements; (2) land value benefits, which include reductions in downstream flooding and property damage, increases in real estate value, increased parcel lot yield, increased aesthetic value, and improvement of quality of life by providing open space for recreation; and (3) compliance incentives.

Environmental Benefits

Pollution abatement. LID practices can reduce both the volume of runoff and the pollutant loadings discharged into receiving waters. LID practices result in pollutant removal through settling, filtration, adsorption, and biological uptake. Reductions in pollutant loadings to receiving waters, in turn, can improve habitat for aquatic and terrestrial wildlife and enhance recreational uses. Reducing pollutant loadings can also decrease stormwater and drinking water treatment costs by decreasing the need for regional stormwater management systems and expansions in drinking water treatment systems.

Protection of downstream water resources. The use of LID practices can help to prevent or reduce hydrologic impacts on receiving waters, reduce stream channel degradation from erosion and sedimentation, improve water quality, increase water supply, and enhance the recreational and aesthetic value of our natural resources. LID practices can be used to protect water resources that are downstream in the watershed. Other potential benefits include reduced incidence of illness from contact recreation activities such as swimming and wading, more robust and safer seafood supplies, and reduced medical treatment costs.

Ground water recharge. LID practices also can be used to infiltrate runoff to recharge ground water. Growing water shortages nationwide increasingly indicate the need for water resource management strategies designed to integrate stormwater, drinking water, and wastewater programs to maximize benefits and minimize costs. Development pressures typically result in increases in the amount of impervious surface and volume of runoff. Infiltration practices can be used to replenish ground water and increase stream baseflow. Adequate baseflow to streams during dry weather is important because low ground water levels can lead to greater fluctuations in stream depth, flows, and temperatures, all of which can be detrimental to aquatic life.

Water quality improvements/reduced treatment costs. It is almost always less expensive to keep water clean than it is to clean it up. The Trust for Public Land[5] noted Atlanta's tree cover has saved more than $883 million by preventing the need for stormwater retention facilities. A study of 27 water suppliers conducted by the Trust for Public Land and the American Water Works Association[6] found a direct relationship between forest cover in a watershed and water supply treatment costs. In other words, communities with higher percentages of forest cover had lower treatment costs. According to the study, approximately 50 to 55 percent of the variation in treatment costs can be explained by the percentage of forest cover in the source area. The researchers also found that for every 10 percent increase in forest cover in the source area, treatment and chemical costs decreased approximately 20 percent, up to about 60 percent forest cover.

Reduced incidence of CSOs. Many municipalities have problems with CSOs, especially in areas with aging infrastructure. Combined sewer systems discharge sanitary wastewater during storm events. LID techniques, by retaining and infiltrating runoff, reduce the frequency and amount of CSO discharges to receiving waters. Past management efforts typically have been concentrated on hard engineering approaches focused on treating the total volume of sanitary waste together with the runoff that is discharged to the combined system. Recently, communities like Portland (Oregon), Chicago, and Detroit have been experimenting with watershed approaches aimed at reducing the total volume of runoff generated that must be handled by the combined system. LID techniques have been the primary method with which they have experimented to reduce runoff. A Hudson Riverkeeper report concluded, based on a detailed technical analysis, that New York City could reduce its CSO's more cost-effectively with LID practices than with conventional, hard infrastructure CSO storage practices. [7]

Habitat improvements. Innovative stormwater management techniques like LID or conservation design can be used to improve natural resources and wildlife habitat, maintain or increase land value, or avoid expensive mitigation costs.

Land Value and Quality of Life Benefits

Reduced downstream flooding and property damage. LID practices can be used to reduce downstream flooding through the reduction of peak flows and the total amount or volume of runoff. Flood prevention reduces property damage and can reduce the initial capital costs and the operation and maintenance costs of stormwater infrastructure. Strategies designed to manage runoff on-site or as close as possible to its point of generation can reduce erosion and sediment transport as well as reduce flooding and downstream erosion. As a result, the costs for cleanups and streambank restoration can be reduced or avoided altogether. The use of LID techniques also can help protect or restore floodplains, which can be used as park space or wildlife habitat.[8]

Real estate value/property tax revenue. Homeowners and property owners are willing to pay a premium to be located next to or near aesthetically pleasing amenities like water features, open space, and trails. Some stormwater treatment systems can be beneficial to developers because they can serve as a "water" feature or other visual or recreational amenity that can be used to market the property. These designs should be visually attractive and safe for the residents and should be considered an integral part of planning the development. Various LID projects and smart growth studies have shown that people are willing to pay more for clustered homes than conventionally designed subdivisions. Clustered housing with open space appreciated at a higher rate than conventionally designed subdivisions. EPA's *Economic Benefits of Runoff Controls*[9] describes numerous examples where developers and subsequent homeowners have received premiums for proximity to attractive stormwater management practices.

Lot yield. LID practices typically do not require the large, contiguous areas of land that are usually necessary when traditional stormwater controls like ponds are used. In cases where LID practices are incorporated on individual house lots and along roadsides as part of the landscaping, land that would normally be dedicated for a stormwater pond or other large structural control can be developed with additional housing lots.

Aesthetic value. LID techniques are usually attractive features because landscaping is an integral part of the designs. Designs that enhance a property's aesthetics using trees, shrubs, and flowering plants that complement other landscaping features can be selected. The use of these designs may increase property values or result in faster sale of the property due to the perceived value of the "extra" landscaping.

Public spaces/quality of life/public participation. Placing water quality practices on individual lots provides opportunities to involve homeowners in stormwater management and enhances public awareness of water quality issues. An American Lives, Inc., real estate study found that 77.7 percent of potential homeowners rated natural open space as "essential" or "very important" in planned communities.[10]

Compliance Incentives

Regulatory compliance credits. Many states recognize the positive benefits LID techniques offer, such as reduced wetland impacts. As a result, they might offer regulatory compliance credits, streamlined or simpler permit processes, and other incentives similar to those offered for other green practices. For example, in Maryland the volume required for the permanent pool of a wet pond can be reduced if rooftop runoff is infiltrated on-site using LID practices. This procedure allows rooftop area to be subtracted from the total impervious area, thereby reducing the required size of the permanent pool. In addition, a LID project can have less of an environmental impact than a conventional project, thus requiring smaller impact fees.

COST CONSIDERATIONS

Traditional approaches to stormwater management involve conveying runoff off-site to receiving waters, to a combined sewer system, or to a regional facility that treats runoff from multiple sites. These designs typically include hard infrastructure, such as curbs, gutters, and piping. LID-based designs, in contrast, are designed to use natural drainage features or engineered swales and vegetated contours for runoff conveyance and treatment. In terms of costs, LID techniques like conservation design can reduce the amount of materials needed for paving roads and driveways and for installing curbs and gutters. Conservation designs can be used to reduce the total amount of impervious surface, which results in reduced road and driveway lengths and reduced costs. Other LID techniques, such as grassed swales, can be used to infiltrate roadway runoff and eliminate or reduce the need for curbs and gutters, thereby reducing infrastructure costs. Also, by infiltrating or evaporating runoff, LID techniques can reduce the size and cost of flood-control structures. Note that more research is needed to determine the optimal combination of LID techniques and detention practices for flood control.

It must be stated that the use of LID techniques might not always result in lower project costs. The costs might be higher because of the costs of plant material, site preparation, soil amendments, underdrains and connections to municipal stormwater systems, and increased project management.

Another factor to consider when comparing costs between traditional and LID designs is the amount of land required to implement a management practice. Land must be set aside for both traditional stormwater management practices and LID practices, but the former require the use of land *in addition to* individual lots and other community areas, whereas bioretention areas and swales can be incorporated into the landscaping of yards, in rights-

of-way along roadsides, and in or adjacent to parking lots. The land that would have been set aside for ponds or wetlands can in many cases be used for additional housing units, yielding greater profits.

Differences in maintenance requirements should also be considered when comparing costs. According to a 1999 EPA report, maintenance costs for retention basins and constructed wetlands were estimated at 3 to 6 percent of construction costs, whereas maintenance costs for swales and bioretention practices were estimated to be 5 to 7 percent of construction costs.[11] However, much of the maintenance for bioretention areas and swales can be accomplished as part of routine landscape maintenance and does not require specialized equipment. Wetland and pond maintenance, on the other hand, involves heavy equipment to remove accumulated sediment, oils, trash, and vegetation in forebays and open ponds.

Finally, in some circumstances LID practices can offset the costs associated with regulatory requirements for stormwater control. In urban redevelopment projects where land is not likely to be available for large stormwater management practices, developers can employ site-dispersed BMPs in sidewalk areas, in courtyards, on rooftops, in parking lots, and in other small outdoor spaces, thereby avoiding the fees that some municipalities charge when stormwater mitigation requirements cannot otherwise be met. In addition, stormwater utilities often provide credits for installing runoff management practices such as LID practices.[12]

CASE STUDIES

The case studies presented below are not an exhaustive list of LID projects nationwide. These examples were selected on the basis of the quantity and quality of economic data, quantifiable impacts, and types of LID practices used. Economic data are available for many other LID installations, but those installations often cannot be compared with conventional designs because of the unique nature of the design or the pilot status of the project. Table 1 presents a summary of the LID practices employed in each case study.

Table 1. Summary of LID Practices Employed in the Case Studies

Name	LID Techniques							
	Biore-tention	Cluster Building	Reduced Impervious Area	Swales	Permeable Pavement	Vegetated Landscaping	Wetlands	Green Roofs
2nd Avenue SEA Street	✓		✓	✓				
Auburn Hills	✓		✓	✓		✓	✓	
Bellingham Parking Lot Retrofits	✓							
Central Park Commercial Redesigns	✓			✓				
Crown Street	✓		✓	✓				
Gap Creek			✓			✓		
Garden Valley	✓	✓		✓	✓		✓	
Kensington Estates		✓	✓		✓	✓	✓	
Laurel Springs	✓	✓	✓	✓				
Mill Creek		✓	✓	✓				
Poplar Street Apartments	✓			✓			✓	
Portland Downspout Disconnection*			✓					
Prairie Crossing	✓		✓	✓		✓		
Prairie Glen	✓	✓	✓	✓		✓	✓	
Somerset	✓			✓				
Tellabs Corporate Campus	✓			✓		✓	✓	
Toronto Green Roofs								✓

*Although impervious area stays the same, the disconnection program reduces directly connected impervious area.

The case studies contain an analysis of development costs, which are summarized in Table 2. Note that some case study results do not lend themselves well to a traditional vs.

LID cost comparison and therefore are not included in Table 2 (as noted). *Conventional development cost* refers to costs incurred or estimated for a traditional stormwater management approach, whereas *LID cost* refers to costs incurred or estimated for using LID practices. *Cost difference* is the difference between the conventional development cost and the LID cost. *Percent difference* is the cost savings relative to the conventional development cost.

Table 2. Summary of Cost Comparisons Between Conventional and LID Approaches[a]

Project	Conventional Development Cost	LID Cost	Cost Difference[b]	Percent Difference[b]
2nd Avenue SEA Street	$868,803	$651,548	$217,255	25%
Auburn Hills	$2,360,385	$1,598,989	$761,396	32%
Bellingham City Hall	$27,600	$5,600	$22,000	80%
Bellingham Bloedel Donovan Park	$52,800	$12,800	$40,000	76%
Gap Creek	$4,620,600	$3,942,100	$678,500	15%
Garden Valley	$324,400	$260,700	$63,700	20%
Kensington Estates	$765,700	$1,502,900	–$737,200	-96%
Laurel Springs	$1,654,021	$1,149,552	$504,469	30%
Mill Creek[c]	$12,510	$9,099	$3,411	27%
Prairie Glen	$1,004,848	$599,536	$405,312	40%
Somerset	$2,456,843	$1,671,461	$785,382	32%
Tellabs Corporate Campus	$3,162,160	$2,700,650	$461,510	15%

[a] The Central Park Commercial Redesigns, Crown Street, Poplar Street Apartments, Prairie Crossing, Portland Downspout Disconnection, and Toronto Green Roofs study results do not lend themselves to display in the format of this table.
[b] Negative values denote increased cost for the LID design over conventional development costs.
[c] Mill Creek costs are reported on a per-lot basis.

2ND AVENUE SEA STREET, SEATTLE, WASHINGTON

The 2nd Avenue Street Edge Alternative (SEA) Street project was a pilot project undertaken by Seattle Public Utilities to redesign an entire 660-foot block with a number of LID techniques. The goals were to reduce stormwater runoff and to provide a more "livable" community. Throughout the design and construction process, Seattle Public Utilities worked collaboratively with street residents to develop the final street design.[13]

The design reduced imperviousness, included retrofits of bioswales to treat and manage stormwater, and added 100 evergreen trees and 1,100 shrubs.[14] Conventional curbs and gutters were replaced with bioswales in the rights-of-way on both sides of the street, and the street width was reduced from 25 feet to 14 feet. The final constructed design reduced imperviousness by more than 18 percent. An estimate for the final total project cost was $651,548. A significant amount of community outreach was involved, which raised the level of community acceptance. Community input is important for any project, but because this was a pilot study, much more was spent on communication and redesign than what would be spent for a typical project.

The costs for the LID retrofit were compared with the estimated costs of a conventional street retrofit (Table 3). Managing stormwater with LID techniques resulted in a cost savings of 29 percent. Also, the reduction in street width and sidewalks reduced paving costs by 49 percent.

Table 3. Cost Comparison for 2nd Avenue SEA Street [15]

Item	Conventional Development Cost	SEA Street Cost	Cost Savings*	Percent Savings*	Percent of Total Savings*
Site preparation	$65,084	$88,173	–$23,089	–35%	–11%
Stormwater management	$372,988	$264,212	$108,776	29%	50%
Site paving and sidewalks	$287,646	$147,368	$140,278	49%	65%
Landscaping	$78,729	$113,034	–$34,305	–44%	–16%
Misc. (mobilization, etc.)	$64,356	$38,761	$25,595	40%	12%
Total	$868,803	$651,548	$217,255	—	—

* Negative values denote increased cost for the LID design over conventional development costs.

The avoided cost for stormwater infrastructure and reduced cost for site paving accounted for much of the overall cost savings. The nature of the design, which included extensive use of bioswales and vegetation, contributed to the increased cost for site preparation and landscaping. Several other SEA Street projects have been completed or are under way, and cost evaluations are expected to be favorable.

For this site, the environmental performance has been even more significant than the cost savings. Hydrologic monitoring of the project indicates a 99 percent reduction in total potential surface runoff, and runoff has not been recorded at the site since December 2002, a period that included the highest-ever 24-hour recorded rainfall at Seattle-Tacoma Airport.[16] The site is retaining more than the original design estimate of 0.75 inch of rain. A modeling analysis indicates that if a conventional curb-and-gutter system had been installed along 2nd Avenue instead of the SEA Street design, 98 times more stormwater would have been discharged from the site.[17]

Auburn Hills Subdivision, Southwestern Wisconsin

Auburn Hills in southwestern Wisconsin is a residential subdivision developed with conservation design principles. Forty percent of the site is preserved as open space; this open space includes wetlands, green space and natural plantings, and walking trails. The subdivision was designed to include open swales and bioretention for stormwater management. To determine potential savings from using conservation design, the site construction costs were compared with the estimated cost of building the site as a conventional subdivision.[18] Reduced stormwater management costs accounted for approximately 56 percent of the total cost savings. A cost comparison is provided in Table 4. Other savings not shown in Table 4 were realized as a result of reduced sanitary sewer, water distribution, and utility construction costs.

Table 4. Cost Comparison for Auburn Hills Subdivision [19]

Item	Conventional Development Cost	Auburn Hills LID Cost	Cost Savings*	Percent Savings*	Percent of Total Savings*
Site preparation	$699,250	$533,250	$166,000	24%	22%
Stormwater management	$664,276	$241,497	$422,779	64%	56%
Site paving and sidewalks	$771,859	$584,242	$187,617	24%	25%
Landscaping	$225,000	$240,000	–$15,000	-7%	-2%
Total	$2,360,385	$1,598,989	$761,396	—	—

* Negative values denote increased cost for the LID design over conventional development costs.

The clustered design used in the development protected open space and reduced clearing and grading costs. Costs for paving and sidewalks were also decreased because the cluster design reduced street length and width. Stormwater savings were realized primarily through the use of vegetated swales and bioswales. These LID practices provided stormwater conveyance and treatment and also lowered the cost of conventional stormwater infrastructure. The increase in landscaping costs resulted from additional open space present on-site compared to a conventional design, as well as increased street sweeping. Overall, the subdivision's conservation design retained more natural open space for the benefit and use of the homeowners and aided stormwater management by preserving some of the site's natural hydrology.[20]

Bellingham, Washington, Parking Lot Retrofits

The City of Bellingham, Washington, retrofitted two parking lots—one at City Hall and the other at Bloedel Donovan Park—with rain gardens in lieu of installing underground vaults to manage stormwater.[21] At City Hall, 3 parking spaces out of a total of 60 were used for the rain garden installation. The Bloedel Donovan Park retrofit involved converting to a rain garden a 550-square-foot area near a catch basin. Both installations required excavation, geotextile fabric, drain rock, soil amendments, and native plants. Flows were directed to the rain gardens by curbs. An overflow system was installed to accommodate higher flows during heavy rains.

The City compared actual rain garden costs to estimates for conventional underground vaults based on construction costs for similar projects in the area ($12.00 per cubic foot of storage). Rain garden costs included labor, vehicle use/rental, and materials. Table 5 shows that the City Hall rain garden saved the City $22,000, or 80 percent, over the underground vault option; the Bloedel Donovan Park installation saved $40,000, or 76 percent.

Table 5. Cost Comparison for Bellingham's Parking Lot Rain Garden Retrofits[22]

Project	Conventional Vault Cost	Rain Garden Cost	Cost Savings	Percent Savings
City Hall	$27,600	$5,600	$22,000	80%
Bloedel Donovan Park	$52,800	$12,800	$40,000	76%

Central Park Commercial Redesigns, Fredericksburg, VA (A Modeling Study)

The Friends of the Rappahannock undertook a cost analysis involving the redesign of site plans for several stores in a large commercial development in the Fredericksburg, Virginia, area called Central Park.[23,24] Table 6 contains a side-by-side analysis of the cost additions and reductions for each site for scenarios where LID practices (bioretention areas and swales) were incorporated into the existing, traditional site designs. In five of the six examples, the costs for the LID redesigns were higher than those for the original designs, although they never exceeded $10,000, or 10 percent of the project. One example yielded a $5,694 savings. The fact that these projected costs for LID were comparable to the costs for traditional designs convinced the developer to begin incorporating LID practices into future design projects.[25]

Table 6. Site Information and Cost Additions/Reductions Using LID Versus Traditional Designs

Name	Total BMP Area (ft^2)	Total Impervious Area Treated (ft^2)	Percent of Impervious Area Treated	Cost Additions[a]	Cost Reductions[b]	Change in Cost After Redesign
Breezewood Station Alternative 1	4,800	64,165	98.4%	$36,696	$34,785	+ $1,911
Breezewood Station Alternative 2	3,500	38,775	59.5%	$24,449	$21,060	+ $3,389
Olive Garden	1,780	31,900	59.1%	$14,885	$11,065	+ $3,790
Kohl's, Best Buy, & Office Depot	14,400	354,238	56.3%	$89,433	$80,380	+ $9,053
First Virginia Bank	1,310	20,994	97.7%	$6,777	$1,148	+ $5,629
Chick-Fil-A[c]	1,326	28,908	82.2%	$6,846	$12,540	– $5,694

[a] Additional costs for curb, curb blocks, storm piping, inlets, underdrains, soil, mulch, and vegetation as a result of the redesign.
[b] Reduced cost for curb, storm piping, roof drain piping, and inlets as a result of the redesign.
[c] Cost reduction value includes the cost of a Stormceptor unit that is not needed as part of the redesign.

Crown Street, Vancouver, British Columbia

In 1995 the Vancouver City Council adopted a Greenways program that is focused on introducing pedestrian-friendly green space into the City to connect trails, environmental areas, and urban space. As a part of this program, the City has adopted strategies to manage stormwater runoff from roadways. Two initiatives are discussed here.

The Crown Street redevelopment project, completed in 2005, retrofitted a 1,100-foot block of traditional curb-and-gutter street with a naturalized streetscape modeled after the Seattle SEA Street design. Several LID features were incorporated into the design. The total imperviousness of the street was decreased by reducing the street width from 28 feet to 21 feet with one-

way sections of the road narrowed to 10 feet. Roadside swales that use vegetation and structural grass (grass supported by a grid and soil structure that prevents soil compaction and root damage) were installed to collect and treat stormwater through infiltration.[26]

Modeling predicts that the redesigned street will retain 90 percent of the annual rainfall volume on-site; the remaining 10 percent of runoff will be treated by the system of vegetated swales before discharging.[27,28] The City chose to use the LID design because stormwater runoff from Crown Street flows into the last two salmon-bearing creeks in Vancouver.[29] Monitoring until 2010 will assess the quality of stormwater runoff and compare it with both the modeling projections and the runoff from a nearby curb-and-gutter street.

The cost of construction for the Crown Street redevelopment was $707,000. Of this, $311,000 was attributed to the cost of consultant fees and aesthetic design features, which were included in the project because it was the first of its kind in Vancouver. These added costs would not be a part of future projects. Discounting the extra costs, the $396,000 construction cost is 9 percent higher than the estimated $364,000 conventional curb-and-gutter design cost.[30] The City has concluded that retrofitting streets that have an existing conventional stormwater system with naturalized designs will cost marginally more than making curb-and-gutter improvements, but installing naturalized street designs in new developments will be less expensive than installing conventional drainage systems.[31,32]

One goal of Vancouver's Greenways program is to make transportation corridors more pedestrian-friendly. A method used to achieve this goal is to extend curbs at intersections out into the street to lessen the crossing distance and improve the line of sight for pedestrians. When this initiative began, the City relocated stormwater catch basins that would have been enclosed within the extended curb. Now, at certain intersections, the City uses the new space behind the curb to install "infiltration bulges" to collect and infiltrate roadway runoff. The infiltration bulges are constructed of permeable soils and vegetation. (The City of Portland, Oregon, has installed similar systems, which they call "vegetated curb extensions.") The catch basins are left in place, and any stormwater that does not infiltrate into the soil overflows into the storm drain system.[33]

The infiltration bulges have resulted in savings for the City. Because the stormwater infiltration bulges are installed in conjunction with planned roadway improvements, the only additional costs associated with the stormwater project are the costs of a steel curb insert to allow stormwater to enter the bulge and additional soil excavation costs. These additional costs are more than offset by the $2,400 to $4,000 cost that would have been required to relocate the catch basins. To date, the City has installed nine infiltration bulges, three of which are maintained by local volunteers as part of a Green Streets program in which local residents adopt city green space.[34]

GAP CREEK SUBDIVISION, SHERWOOD, ARKANSAS

Gap Creek's original subdivision plan was revised to include LID concepts. The revised design increased open space from the originally planned 1.5 acres to 23.5 acres. Natural drainage areas were preserved and buffered by greenbelts. Traffic-calming circles were used, allowing the developer to reduce street widths from 36 to 27 feet. In addition, trees were kept close to the curb line. These design techniques allowed the development of 17 additional lots.

The lots sold for $3,000 more and cost $4,800 less to develop than comparable conventional lots. A cost comparison is provided in Table 7. For the entire development, the combination of cost savings and lot premiums resulted in an additional profit to the developer of $2.2 million.[35,36]

Table 7. Cost Comparison for Gap Creek Subdivision[37]

Total Cost of Conventional Design	Gap Creek LID Cost	Cost Savings	Percent Savings	Savings per Lot
$4,620,600	$3,942,100	$678,500	15%	$4,800

GARDEN VALLEY, PIERCE COUNTY, WASHINGTON (A MODELING STUDY)

The Garden Valley subdivision is a 9.7-acre site in Pierce County, Washington. A large wetland on the eastern portion of the site and a 100-foot buffer account for 43 percent of the site area. Designers evaluated a scenario in which roadway widths were reduced and conventional stormwater management practices were replaced with swales, bioretention, and soil amendments. The use of these LID elements would have allowed the cost for stormwater management on the site to be reduced by 72 percent. A cost comparison is provided in Table 8.[38] Other costs expected with the LID design were a $900 initial cost for homeowner education with $170 required annually thereafter. Annual maintenance costs for the LID design (not included above) were expected to be $600 more than those for the conventional design, but a $3,000 annual savings in the stormwater utility bill was expected to more than offset higher maintenance costs.

Table 8. Cost Comparison for Garden Valley Subdivision[39]

Item	Conventional Development Cost	Garden Valley LID Cost	Cost Savings*	Percent Savings*
Stormwater management	$214,000	$59,800	$154,200	72%
Site paving	$110,400	$200,900	–$90,500	–82%
Total	$324,400	$260,700	$63,700	—

* Negative values denote increased cost for the LID design over conventional development costs.

The design incorporated the use of narrower roadways coupled with Grasscrete parking along the roadside, which increased the overall site paving costs. However, this added cost was more than offset by the savings realized by employing LID for stormwater management. The LID practices were expected to increase infiltration and reduce stormwater discharge rates, which can improve the health and quality of receiving streams.

Kensington Estates, Pierce County, Washington (A Modeling Study)

A study was undertaken to evaluate the use of LID techniques at the Kensington Estates subdivision, a proposed 24-acre development consisting of single-family homes on 103 lots. The study assumed that conventional stormwater management practices would be replaced entirely by LID techniques, including reduced imperviousness, soil amendments, and bioretention areas. The design dictated that directly connected impervious areas on-site were to be minimized. Three wetlands and an open space tract would treat stormwater discharging from LID installations. Open space buffers were included in the design. The LID proposal also included rooftop rainwater collection systems on each house.[40,41]

The proposed LID design reduced effective impervious area from 30 percent in the conventional design to approximately 7 percent, and it was approximately twice as expensive as the traditional design. A cost comparison is provided in Table 9.

Table 9. Cost Comparison for Kensington Estates Subdivision[42]

Item	Conventional Development Cost	Kensington Estate LID Cost	Additional Cost
Stormwater management	$243,400	$925,400	$ 682,000
Site paving	$522,300	$577,500	$55,200
Total	$765,700	$1,502,900	$737,200

Although the study assumed that roadways in the LID design would be narrower than those in the conventional design, site paving costs increased because the LID design assumed that Grasscrete parking would be included along the roadside to allow infiltration. The use of Grasscrete increased the overall site paving costs.

The avoidance of conventional stormwater infrastructure with the use of LID afforded significant cost savings. The LID measures eliminated the need for a detention pond and made more lots available for development. The significant cost for the rooftop rainwater collection systems was assumed to be offset somewhat by savings on stormwater utility bills.[43]

The study also anticipated that the use of LID would reduce stormwater peak flow discharge rates and soil erosion. Furthermore, greater on-site infiltration increases ground water recharge, resulting in increased natural baseflows in streams and a reduction in dry channels. Proposed clustering of buildings would allow wetlands and open space to be preserved and create a more walkable community. The reduced road widths were anticipated to decrease traffic speeds and accident rates.

Laurel Springs Subdivision, Jackson, Wisconsin

The Laurel Springs subdivision in Jackson, Wisconsin, is a residential subdivision that was developed as a conservation design community. The use of cluster design helped to preserve open space and minimize grading and paving. The use of bioretention and vegetated swales lowered the costs for stormwater management.

The costs of using conservation design to develop the subdivision were compared with the estimated cost of developing the site with conventional practices (Table 10).[44] The total savings realized with conservation design were just over $504,469, or approximately 30 percent of the estimated conventional construction cost. Savings from stormwater management accounted for 60 percent of the total cost savings. Other project savings were realized with reduced sanitary sewer, water distribution, and utility construction costs.

Table 10. Cost Comparison for Laurel Springs Subdivision[45]

Item	Conventional Development Cost	Laurel Springs LID Cost	Cost Savings	Percent Savings	Percent of Total Savings
Site preparation	$441,600	$342,000	$99,600	23%	20%
Stormwater management	$439,956	$136,797	$303,159	69%	60%
Site paving and sidewalks	$607,465	$515,755	$91,710	15%	18%
Landscaping	$165,000	$155,000	$10,000	6%	2%
Total	$1,654,021	$1,149,552	$504,469	—	—

In addition to preserving open space and reducing the overall amount of clearing and grading, the cluster design also reduced street lengths and widths, thereby lowering costs for paving and sidewalks. Vegetated swales and bioswales largely were used to replace conventional stormwater infrastructure and led to significant savings. Each of these factors helped to contribute to a more hydrologically functional site that reduced the total amount of stormwater volume and managed stormwater through natural processes.

MILL CREEK SUBDIVISION, KANE COUNTY, ILLINOIS

The Mill Creek subdivision is a 1,500-acre, mixed-use community built as a conservation design development. Approximately 40 percent of the site is identified as open space; adjacent land use is mostly agricultural. The subdivision was built using cluster development. It uses open swales for stormwater conveyance and treatment, and it has a lower percentage of impervious surface than conventional developments. An economic analysis compared the development cost for 40 acres of Mill Creek with the development costs of 30 acres of a conventional development with similar building density and location.[46]

When compared with the conventional development, the conservation site design techniques used at Mill Creek saved approximately $3,411 per lot. Nearly 70 percent of these savings resulted from reduced costs for stormwater management, and 28 percent of the savings were found in reduced costs for site preparation. A cost comparison is provided in Table 11. Other savings not included in the table were realized with reduced construction costs for sanitary sewers and water distribution.

Table 11. Cost Comparison for Mill Creek Subdivision[47]

Item	Conventional Development Cost per Lot	Mill Creek LID Cost per Lot	Cost Savings per Lot	Percent Savings per Lot	Percent of Total Savings
Site preparation	$2,045	$1,086	$959	47%	28%
Stormwater management	$4,535	$2,204	$2,331	51%	68%
Site paving and sidewalks	$5,930	$5,809	$121	2%	4%
Total	$12,510	$9,099	$3,411	—	—

The use of cluster development and open space preservation on the site decreased site preparation costs. The majority of the cost savings were achieved by avoiding the removal and stockpiling of topsoil. In addition to cost savings from avoided soil disturbance, leaving soils intact also retains the hydrologic function of the soils and aids site stormwater management by reducing runoff volumes and improving water quality. The site's clustered design was also responsible for a decrease in costs for paving and sidewalks because the designers intentionally aimed to decrease total road length and width.

The designers used open swales as the primary means for stormwater conveyance. Coupled with other site techniques to reduce runoff volumes and discharge rates, significant savings in stormwater construction were avoided because of reduced storm sewer installation; sump pump connections; trench backfill; and catch basin, inlet, and cleanout installation.

In addition to the cost savings, the conservation design at Mill Creek had a positive effect on property values: lots adjacent to walking/biking trails include a $3,000 premium, and lots adjacent to or with views of open space include a $10,000 to $17,500 premium. The

600 acres of open space on the site include 127 acres of forest preserve with quality wetlands, 195 acres of public parks, and 15 miles of walking/biking trails.[48]

Poplar Street Apartments, Aberdeen, North Carolina

The use of bioretention, topographical depressions, grass channels, swales, and stormwater basins at the 270-unit Poplar Street Apartment complex improved stormwater treatment and lowered construction costs. The design allowed almost all conventional underground storm drains to be eliminated from the design. The design features created longer flow paths, reduced runoff volume, and filtered pollutants from runoff. According to the U.S. Department of Housing and Urban Development, use of LID techniques resulted in a $175,000 savings (72 percent).[49]

Portland Downspout Disconnection Program, Portland, Oregon

The City of Portland, Oregon, implemented a Downspout Disconnection Program as part of its CSO elimination program. Every year, billions of gallons of stormwater mixed with sewage pour into the Willamette River and Columbia Slough through CSOs. When roof runoff flows into Portland's combined sewer system, it contributes to CSOs. The City has reduced the frequency of CSOs to the Columbia Slough and hopes to eliminate 94 percent of the overflows to the Willamette River by 2011.[50]

The Downspout Disconnection Program gives homeowners, neighborhood associations, and community groups the chance to work as partners with the Bureau of Environmental Services and the Office of Neighborhood Involvement to help reduce CSOs. Residents of selected neighborhoods disconnect their downspouts from the combined sewer system and allow their roof water to drain to gardens and lawns. Residents can do the work themselves and earn $53 per downspout, or they can have community groups and local contractors disconnect for them. Community groups earn $13 for each downspout they disconnect. (Materials are provided by the City.)

More than 44,000 homeowners have disconnected their downspouts, removing more than 1 billion gallons of stormwater per year from the combined sewer system. The City estimates that removing the 1 billion gallons will result in a $250 million reduction in construction costs for an underground pipe to store CSOs by reducing the capacity needed to handle the flows. The City has spent $8.5 million so far to implement this program and will continue to encourage more homeowners and businesses to disconnect their downspouts to achieve additional CSO and water quality benefits.

PRAIRIE CROSSING SUBDIVISION, GRAYSLAKE, ILLINOIS

The Prairie Crossing subdivision is a conservation development on 678 acres, of which 470 acres is open space. The site was developed as a mixed-use community with 362 residential units and 73 acres of commercial property, along with schools, a community center, biking trails, a lakefront beach, and a farm. The site uses bioretention cells and vegetated swales to manage stormwater.[51]

A cost analysis was performed to compare the actual construction costs of Prairie Crossing with the estimated costs of a conventional design on the site with the same layout. Cost savings with conservation design were realized primarily in four areas: stormwater management, curb and gutter installation, site paving, and sidewalk installation. The total savings were estimated to be almost $1.4 million, or nearly $4,000 per lot (Table 12). Savings from stormwater management accounted for approximately 15 percent of the total savings. The cost savings shown are relative to the estimated construction cost for the items in a conventional site design based on local codes and standards.

Table 12. Cost Comparison for Prairie Crossing Subdivision[52]

Item	Cost Savings	Percent Savings
Reduced Road Width	$178,000	13%
Stormwater Management	$210,000	15%
Decreased Sidewalks	$648,000	47%
Reduced Curb and Gutter	$339,000	25%
Total	$1,375,000	—

Reduced costs for sidewalks accounted for nearly half of the total cost savings. This savings is attributed in part to the use of alternative materials rather than concrete for walkways in some locations. In addition, the design and layout of the site, which retained a very high percentage of open space, contributed to the cost savings realized from reducing paving, the length and number of sidewalks, and curbs and gutters. The use of alternative street edges, vegetated swales, and bioretention and the preservation of natural areas all reduced the need for and cost of conventional stormwater infrastructure.[53] Benefits are associated with the mixed-use aspect of the development as well: residents can easily access schools, commercial areas, recreation, and other amenities with minimal travel. Proximity to these resources can reduce traffic congestion and transportation costs. Also, mixed-use developments can foster a greater sense of community and belonging than other types of development. All of these factors tend to improve quality of life.

PRAIRIE GLEN SUBDIVISION, GERMANTOWN, WISCONSIN

The Prairie Glen subdivision is nationally recognized for its conservation design approach. A significant portion of the site (59 percent) was preserved as open space. Wetlands were constructed to manage stormwater runoff, and the open space allowed the reintroduction of native plants and wildlife habitat. The site layout incorporated hiking trails, which were designed to allow the residents to have easy access to natural areas.[54]

To evaluate the cost benefits of Prairie Glen's design, the actual construction costs were compared with the estimated costs of developing the site conventionally. When compared with conventional design, the conservation design at Prairie Glen resulted in a savings of nearly $600,000. Savings for stormwater management accounted for 25 percent of the total savings. Table 13 provides a cost comparison. Other savings not included in the table were realized with reduced sanitary sewer, water distribution, and utility construction costs.

Table 13. Cost Comparison for Prairie Glen Subdivision[55]

Item	Conventional Development Cost	Prairie Glen LID Cost	Cost Savings*	Percent Savings*	Percent of Total Savings*
Site preparation	$277,043	$188,785	$88,258	32%	22%
Stormwater management	$215,158	$114,364	$100,794	47%	25%
Site paving and sidewalks	$462,547	$242,707	$219,840	48%	54%
Landscaping	$50,100	$53,680	–$3,580	–7%	–1%
Total	$1,004,848	$599,536	$405,312	—	—

* Negative values denote increased cost for the LID design over conventional development costs.

The cluster design and preservation of a high percentage of open space resulted in a significant reduction in costs for paving and sidewalks. These reduced costs accounted for 54 percent of the cost savings for the overall site. Reduced costs for soil excavation and stockpiling were also realized. The use of open-channel drainage and bioretention minimized the need for conventional stormwater infrastructure and accounted for the bulk of the savings in stormwater management. Landscaping costs increased due to the added amount of open space on the site.

SOMERSET SUBDIVISION, PRINCE GEORGE'S COUNTY, MARYLAND

The Somerset subdivision, outside Washington, D.C., is an 80-acre site consisting of nearly 200 homes. Approximately half of the development was built using LID techniques; the other half was conventionally built using curb-and-gutter design with detention ponds for stormwater management. Bioretention cells and vegetated swales were used in the LID portion of the site to replace conventional stormwater infrastructure. Sidewalks were also eliminated from the design. To address parking concerns, some compromises were made: because of local transportation department concern that roadside parking would damage the swales, roads were widened by 10 feet.[56] (Note that there are alternative strategies to avoid increasing impervious surface to accommodate parking, such as installing porous pavement parking lanes next to travel lanes.)

Most of the 0.25-acre lots have a 300- to 400-square-foot bioretention cell, also called a rain garden. The cost to install each cell was approximately $500—$150 for excavation and $350 for plants. The total cost of bioretention cell installation in the LID portion of the site was $100,000 (swale construction was an additional cost). The construction cost for the detention pond in the conventionally designed portion of the site was $400,000, excluding curbs, gutters, and sidewalks.[57,58] By eliminating the need for a stormwater pond, six additional lots could be included in the LID design. A comparison of the overall costs for the traditional and LID portions of the site is shown in Table 14.

Table 14. Cost Comparison for Somerset Subdivision

Conventional Development Cost	Somerset LID Cost	Cost Savings	Percent Savings	Savings per Lot
$2,456,843	$1,671,461	$785,382	32%	$4,000

In terms of environmental performance, the LID portion of the subdivision performed better than the conventional portion.[59] A paired watershed study compared the runoff between the two portions of the site, and monitoring indicated that the average annual runoff volume from the LID watershed was approximately 20 percent less than that from the conventional watershed. The number of runoff-producing rain events in the LID watershed also decreased by 20 percent. Concentrations of copper were 36 percent lower; lead, 21 percent lower; and zinc, 37 percent lower in LID watershed runoff than in conventional watershed runoff. The homeowners' response to the bioretention cells was positive; many perceived the management practices as a free landscaped area.

TELLABS CORPORATE CAMPUS, NAPERVILLE, ILLINOIS

The Tellabs corporate campus is a 55-acre site with more than 330,000 square feet of office space. After reviewing preliminary planning materials that compared the costs of conventional and conservation design, the company chose to develop the site with conservation design approaches. Because the planning process included estimating costs for the two development approaches, this particular site provides good information on commercial/industrial use of LID.[60]

Development of the site included preserving trees and some of the site's natural features and topography. For stormwater management, the site uses bioswales, as well as other infiltration techniques, in parking lots and other locations. The use of LID techniques for stormwater management accounted for 14 percent of the total cost savings for the project. A cost comparison is provided in Table 15. Other cost savings not shown in Table 15 were realized with reduced construction contingency costs, although design contingency costs were higher.

Table 15. Cost Comparison for Tellabs Corporate Campus[61]

Item	Conventional Development Cost	Tellabs LID Cost	Cost Savings	Percent Savings	Percent of Total Savings
Site preparation	$2,178,500	$1,966,000	$212,500	10%	46%
Stormwater management	$480,910	$418,000	$62,910	13%	14%
Landscape development	$502,750	$316,650	$186,100	37%	40%
Total	$3,162,160	$2,700,650	$461,510	—	—

Savings in site preparation and landscaping had the greatest impact on costs. Because natural drainage pathways and topography were maintained to the greatest extent possible, grading and earthwork were minimized; 6 fewer acres were disturbed using the conservation design approach. Landscaping at the site maximized natural areas and restored native prairies and wetland areas. The naturalized landscape eliminated the need for irrigation systems and lowered maintenance costs when compared to turf grass, which requires mowing and regular care. In the end, the conservation approach preserved trees and open space and provided a half acre of wetland mitigation. The bioswales used for stormwater management complemented the naturalized areas and allowed the site to function as a whole; engineered stormwater techniques augmented the benefits of the native areas and wetlands.[62]

TORONTO GREEN ROOFS, TORONTO, ONTARIO (A MODELING STUDY)

Toronto is home to more than 100 green roofs. To evaluate the benefits of greatly expanded use of green roofs in the city, a study was conducted using a geographic information system to model the effects of installing green roofs on all flat roofs larger than 3,750 square feet. (The model assumed that each green roof would cover at least 75 percent of the roof area.) If the modeling scenario were implemented, 12,000 acres of green roofs (8 percent of the City's land area) would be installed.[63] The study quantified five primary benefits from introducing the green roofs: (1) reduced stormwater flows into the separate storm sewer system, (2) reduced stormwater flows into the combined sewer system, (3) improved air quality, (4) mitigation of urban heat island effects, and (5) reduced energy consumption.[64]

The study predicted economic benefits of nearly $270 million in municipal capital cost savings and more than $30 million in annual savings. Of the total savings, more than $100 million was attributed to stormwater capital cost savings, $40 million to CSO capital cost savings, and nearly $650,000 to CSO annual cost savings. The cost of installing the green roofs would be largely borne by private building owners and developers; the cost to Toronto would consist of the cost of promoting and overseeing the program and would be minimal. Costs for green roof installations in Canada have averaged $6 to $7 per square foot. The smallest green roof included in the study, at 3,750 square feet, would cost between $22,000 and $27,000. The total cost to install 12,000 acres of green roofs would be $3 billion to $3.7 billion.[65,66] Although the modeled total costs exceed the monetized benefits, the costs would be spread across numerous private entities.

CONCLUSION

The 17 case studies presented in this report show that LID practices can reduce project costs and improve environmental performance. In most cases, the case studies indicate that the use of LID practices can be both fiscally and environmentally beneficial to communities. As with almost all such projects, site-specific factors influence project outcomes, but in general, for projects where open space was preserved and cluster development designs were employed, infrastructure costs were lower. In some cases, initial costs might be higher because of the cost of green roofs, increased site preparation costs, or more expensive landscaping practices and plant species. However, in the vast majority of cases, significant savings were realized during the development and construction phases of the projects due to reduced costs for site grading and preparation, stormwater infrastructure, site paving, and landscaping. Total capital cost savings ranged from 15 to 80 percent when LID methods were used, with a few exceptions in which LID project costs were higher than conventional stormwater management costs.

EPA has identified several additional areas that will require further study. First, in all the cases, there were benefits that this study did not monetize and factor into the project's bottom line. These benefits include improved aesthetics, expanded recreational opportunities, increased property values due to the desirability of the lots and their proximity to open space, increased number of total units developed, the value of increased marketing potential, and faster sales.

Second, more research is also needed to quantify the environmental benefits that can be achieved through the use of LID techniques and the costs that can be avoided by using these practices. For example, substantial downstream benefits can be realized through the reduction of the peak flows, discharge volumes, and pollutant loadings discharged from the site. Downstream benefits also might include reductions in flooding and channel degradation, costs for water quality improvements, costs of habitat restoration, costs of providing CSO abatement, property damage, drinking water treatment costs, costs of maintaining/dredging navigable waterways, and administrative costs for public outreach and involvement.

Finally, additional research is needed monetize the cost reductions that can be achieved through improved environmental performance, reductions in long-term operation and maintenance costs and/or reductions in the life cycle costs of replacing or rehabilitating infrastructure.

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INITIAL INVESTIGATION OF THE FEASIBILITY AND BENEFITS OF LOW-IMPACT SITE DESIGN PRACTICES ("LID") FOR THE SAN FRANCISCO BAY AREA

Richard R. Horner†

ABSTRACT

The Clean Water Act NPDES permit that regulates municipal separate storm sewer systems (MS4s) in the San Francisco Bay Area, California will be reissued in 2007. The draft permit includes general provisions related to low impact development practices (LID) for certain kinds of development and redevelopment projects. Using six representative development project case studies, based on California building records, the author investigated the practicability and relative benefits of LID options for the majority of the region having soils potentially suitable for infiltration either in their natural state or after amendment using well recognized LID techniques. The results showed that (1) LID site design and source control techniques are more effective than conventional best management practices (BMPs) in reducing runoff rates; and (2) in each of the case studies, LID methods would reduce site runoff volume and pollutant loading to zero in typical rainfall scenarios.

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INTRODUCTION

The Assessment in Relation to Municipal Permit Conditions

This purpose of this study is to investigate the relative water quality and water reuse benefits of three levels of storm water treatment best management practices (BMPs): (1) basic "treat-and-release" BMPs (e.g., drain inlet filters, CDS units), (2) commonly used BMPs that expose runoff to soils and vegetation (extended-detention basins and biofiltration swales and filter strips), and (3) low impact development (LID) practices. The factors considered in the investigation are runoff volume, pollutant loading, and the availability of water for infiltration or other reuse. In order to assess the differential impact of storm water reduction approaches on these factors, this study examines six case studies typical of development covered by the proposed Municipal Regional Urban Runoff Phase I NPDES Stormwater Permit (MRP).

This report covers locations in the Bay Area most amenable to soil infiltration of stormwater runoff, those areas having soils in Natural Resources Conservation Service (NRCS) Hydrologic Soil Groups A, B, or C as classified by the Natural Resources Conservation Service (http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx). Depending on site-specific conditions, A and B soils would generally effectively infiltrate water without modification, whereas C soils could require organic amendments according to now standard LID methods. This report does not cover locations with group D soils, which are generally not amenable to infiltration, again depending on the specific conditions on-site. A subsequent report will examine options in these locations, which include other LID techniques (e.g., roof runoff harvesting for irrigation or gray water supply) and state-of-the-art conventional stormwater

management practices. A minority but still substantial fraction of the Bay Area has group D soils (39.3, 68.0, 18.3, and 50.1 percent of the mapped areas of Alameda, Contra Costa, San Mateo, and Santa Clara Counties, respectively). Regarding any mapped soil type, it is important to keep in mind that soils vary considerably within small distances. Characteristics at specific locations can deviate greatly from those of the major mapped unit, making infiltration potential either more or less than may be expected from the mapping.

Low impact development methods reduce storm runoff and its contaminants by decreasing their generation at sources, infiltrating into the soil or evaporating storm flows before they can enter surface receiving waters, and treating flow remaining on the surface through contact with vegetation and soil, or a combination of these strategies. Soil-based LID practices often use soil enhancements such as compost, and thus improve upon the performance of more traditional basins and biofilters. The study encompassed vegetated swales (channels for conveyance at some depth and velocity), vegetated filter strips (surfaces for conveyance in thin sheet flow), and bioretention areas (shallow basins with a range of vegetation types in which runoff infiltrates through soil either to groundwater or a subdrain for eventual surface discharge). Application of these practices in a low impact site design mode requires either determination that existing site soils can support runoff reduction through infiltration or that soils will be amended using accepted LID techniques to attain this objective. Finally, the study further broadened implementation options to include water harvesting (collection and storage for use in, for example, irrigation or gray water systems), roof downspout infiltration trenches, and porous pavements.

The investigation also considered whether typical development patterns and local conditions in the Bay Area would enable LID implementation as required by a new standard proposed for the 2007 Ventura County Municipal Storm Water Permit. This standard requires management of effective impervious area (EIA), limiting it to 5%, as well as other impervious area (what might be termed Not-Connected Impervious Area, NCIA), and pervious areas.

Where treatment control BMPs are required to manage runoff from a site, Volume or Flow Hydraulic Design Bases commonly used in California were assumed to apply. The former basis applies to storage-type BMPs, like ponds, and requires capturing and treating either the runoff volume from the 85th percentile, 24-hour rainfall event for the location or the volume of annual runoff to achieve 80 percent or more volume treatment. The calculations in this analysis used the 85th percentile 24-hour rainfall event basis. The Flow basis applies to flow-through BMPs, like swales, and requires treating the runoff flow rate produced from a rain event equal to at least 0.2 inches per hour intensity (or one of two other approximately equivalent options).

Scope of the Assessment

With respect to each of the six development case studies, three assessments were undertaken: a baseline scenario incorporating no stormwater management controls; a second scenario employing conventional BMPs; and a third development scenario employing LID stormwater management strategies.

To establish a baseline for each case study, annual stormwater runoff volumes were estimated, as well as concentrations and mass loadings of four pollutants: (1) total suspended solids (TSS), (2) total recoverable copper (TCu), (3) total recoverable zinc (TZn), and (4) total phosphorus (TP). These baseline estimates were based on the anticipated land use and cover with no stormwater management efforts.

Two sets of calculations were then conducted using the parameters defined for the six case studies. The first group of calculations estimated the extent to which basic BMPs reduce runoff volumes and pollutant concentrations and loadings, and what impact, if any, such BMPs have on recharge rates or water retention on-site.

The second group of calculations estimated the extent to which commonly used soil-based BMPs and LID site design strategies ameliorate runoff volumes and pollutant concentrations and loadings, and the effect such techniques have on recharge rates. When evaluating LID strategies in the context of the EIA concept employed in the draft Ventura County MS4 permit, it was presumed that EIA would be limited to three percent. It was also assumed that pervious surfaces on a site receiving runoff from other areas on the site would be sized and prepared to manage (through infiltration or storage) the volume directed there in addition to precipitation falling directly on those areas. The assessment of basins, biofiltration, and low impact design practices analyzed the expected infiltration capacity of the case study sites. It also considered related LID techniques and practices, such as source reduction strategies, that could work in concert with infiltration to serve the goals of: (1) preventing increase in annual runoff volume from the pre- to the post-developed state, (2) preventing increase in annual pollutant mass loadings between the two development states, and (3) avoiding exceedances of the Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) criteria for copper and zinc.

The results of this analysis show that:

- A full-range of typical development categories common in the Bay Area, from single family residential to restaurants, housing developments, and commercial uses like office buildings, can feasibly implement standard LID techniques to achieve no stormwater discharge during rain events equal to, and in some cases greater than, design storm conditions. This conclusion is based on an analysis that used actual building records in California and annual rainfall records in two rainfall zones in the Bay Area to show that site conditions support this level of performance. In addition, site conditions typical at a wide range of development projects are more than sufficient to attain compliance with a three percent EIA limit, as is being contemplated in other MS4 re-issuance proceedings in California presently.

- Developments implementing no post-construction BMPs result in storm water runoff volume and pollutant loading that are substantially increased, and recharge rates that are substantially decreased, compared to pre-development conditions.

- Developments implementing basic post-construction treatment BMPs achieve reduced pollutant loading compared to developments with no BMPs, but stormwater runoff volume and recharge rates are similar to developments with no BMPs.

- Developments implementing traditional basins and biofilters, and even more so low impact post-construction BMPs, achieve significant reduction of pollutant loading and runoff volume as well as greatly enhanced recharge rates compared to both developments with no BMPs and developments with basic treatment BMPs.

This report covers the methods employed in the investigation, data sources, and references for both. It then presents the results, discusses their consequences, draws conclusions, and makes recommendations relative to the feasibility of utilizing low-impact development practices in Bay Area developments.

CASE STUDIES

Six case studies were selected to represent a range of urban development types considered to be representative of the Bay Area. These case studies involved: a multi-family residential complex (MFR), a relatively small-scale (23 homes) single-family residential development (Sm-SFR), a restaurant (REST), an office building (OFF), a relatively large (1000 homes) single-family residential development (Lg-SFR), and a single home (SINGLE).[1]

Parking spaces were estimated to be 176 sq ft in area, which corresponds to 8 ft width by 22 ft length dimensions. Code requirements vary by jurisdiction, with the tendency now to drop below the traditional 200 sq ft average. About 180 sq ft is common, but various standards for full- and compact-car spaces, and for the mix of the two, can raise or lower the average.[2] The 176 sq ft size is considered to be a reasonable value for conventional practice.

Roadways and walkways assume a wide variety of patterns. Exclusive of the two SFR cases, simple, square parking lots with roadways around the four sides and square buildings with walkways also around the four sides were assumed. Roadways and walkways were taken to be 20 ft and 6 ft wide, respectively.

Single-family residences were assumed each to have a driveway 20 ft wide and 30 ft long. It was further assumed that each would have a sidewalk along the front of the lot, which was calculated to be 5749 sq ft in area. Assuming a square lot, the front dimension would be 76 ft. A 40-ft walkway was included within the property. Sidewalks and walkways were taken to be 4 ft wide. For each case study the total area for all of these impervious features was subtracted from the total site area to estimate the pervious area, which was assumed to have conventional landscaping cover (grass, small herbaceous decorative plants, bushes, and a few trees).

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[1] Building permit records from the City of San Marcos in San Diego County provided data on total site areas for the first four case studies, including numbers of buildings, building footprint areas (including porch and garage for Sm-SFR), and numbers of parking spaces associated with the development projects. While the building permit records made no reference to features such as roadways, walkways, and landscaping normally associated with development projects, these features were taken into account in the case studies using assumptions described herein. Larger developments and redevelopment were not represented in the sampling of building permits from the San Marcos database. To take these types of projects into account in the subsequent analysis, the Lg-SFR scenario scaled up all land use estimates from the Sm-SFR case in the ratio of 1000:23. The single home case (SINGLE) was derived from Bay Area records obtained at http://www.ppic.org/content/other/706EHEP_web_only_appendix.pdf, which showed 8000 ft^2 as a rough average for a single home lot in the region. As with the other cases, these hypothetical developments were assumed to have roadways, walkways, and landscaping, as described herein.

[2] J. Gibbons, *Parking Lots*, NONPOINT EDUCATION FOR MUNICIPAL OFFICERS, Technical Paper No. 5 (1999) (http://nemo.uconn.edu/tools/publications/tech_papers/tech_paper_5.pdf).

Table 1 summarizes the characteristics of the six case studies. The table also provides the recorded or estimated areas in each land use and cover type.

Table 1. Case Study Characteristics and Land Use and Land Cover Areas

	MFR[a]	Sm-SFR[a]	REST[a]	OFF[a]	Lg-SFR[a]	SINGLE[a]
No. buildings	11	23	1	1	1000	1
Total area (ft^2)	476,982	132,227	33,669	92,612	5,749,000	8,000
Roof area (ft^2)	184,338	34,949	3,220	7,500	1,519,522	2114
No. parking spaces	438	-	33	37	-	-
Parking area (ft^2)	77,088	-	5808	6512	-	-
Access road area (ft^2)	22,212	-	6097	6456	-	-
Walkway area (ft^2)	33,960	10,656	1362	2078	463,289	518
Driveway area (ft^2)	-	13,800	-	-	600,000	835
Landscape area (ft^2)	159,384	72,822	17,182	70,066	3,166,190	4533

[a] MFR—multi-family residential; Sm-SFR—small-scale single-family residential; REST—restaurant; OFF—office building; Lg-SFR—large-scale single-family residential; SINGLE—single-family home

METHODS OF ANALYSIS

Annual Stormwater Runoff Volumes

Annual surface runoff volumes produced were estimated for both pre- and post-development conditions for each case study site. Runoff volume was computed as the product of annual precipitation, contributing drainage area, and a runoff coefficient (ratio of runoff produced to rainfall received). For impervious areas the following equation was used:

$$C = (0.009)\, I + 0.05$$

where I is the impervious percentage. This equation was derived by Schueler (1987) from Nationwide Urban Runoff Program data (U.S. Environmental Protection Agency 1983). With I = 100 percent for fully impervious surfaces, C is 0.95.

The basis for pervious area runoff coefficients was the Natural Resource Conservation Service's (NRCS) Urban Hydrology for Small Watersheds (NRCS 1986, as revised from the original 1975 edition). This model estimates storm event runoff as a function of precipitation and a variable representing land cover and soil, termed the curve number (CN). Larger events are forecast to produce a greater amount of runoff in relation to amount of rainfall because they more fully saturate the soil. Therefore, use of the model to estimate annual runoff requires selecting some event or group of events to represent the year. The 85th percentile, 24-hour rainfall event was used in the analysis here for the relative comparison between pre- and post-development and applied to deriving a runoff coefficient for annual estimates, recognizing that smaller storms would produce less and larger storms more runoff.

A memorandum titled Rainfall Data Analysis and Guidance for Sizing Treatment BMPs (http://www.cccleanwater.org/construction/Publications/CCCWPBasinSizingMemoFINAL_4-20-05.pdf) prepared for the Contra Costa Clean Water Program demonstrated a linear relationship between unit basin storage volume for 80 percent capture (which is related to the 85th

percentile event) and mean annual precipitation. Rainfall for Bay Area 85th percentile, 24-hour events could thus be determined from locations where events have been established in direct proportion to mean annual rainfall.

In order to obtain appropriate regional estimates of annual precipitation, rainfall records were obtained from a number of sites in the four counties, plus the city of Vallejo, covered by the permit.[3] The mean annual range is from 13.73 to 24.30 inches, with quantities close to either 14 or 20 inches predominating. The study was performed for both of these rainfall totals. These figures were used in conjunction with 85th percentile, 24-hour event amounts of 0.75 for Los Angeles and 0.92 for Santa Rosa (http://ci.santa-rosa.ca.us/pworks/other/SW/SRSWManualFinalDraft.pdf), respectively, and mean annual totals of 12 and 31 inches for the respective cities to estimate 85 percentile, 24-hour event quantities of 0.77 and 0.82 inch for the 14 and 20-inch Bay Area rainfall zones, respectively.

Pre- and post-development runoff quantities were computed with selected CN values and the 0.77- and 0.82-inch rainfalls. The CN choices based on tabulated data in NRCS (1986) and professional judgment were 83 before development and 86 after land modification. Estimate runoff amounts were then divided by the rainfall totals to obtain runoff coefficients. The results were about the same for the two rainfall zones at 0.07 and 0.12 before and after development, respectively. Finally, total annual runoff volumes were estimated based on the two average annual precipitation figures.

Stormwater Runoff Pollutant Discharges

Annual pollutant mass discharges were estimated as the product of annual runoff volumes produced by the various land use and cover types and pollutant concentrations typical of those areas. Again, the 0.75-inch precipitation event was used as a basis for volumes. Stormwater pollutant data have typically been measured and reported for general land use types (e.g., single-family residential, commercial). However, an investigation of low impact development practices of the type this study sought to conduct demands data on specific land coverages. The literature offers few data on this basis. Those available and used herein were assembled by a consultant to the City of Seattle for a project in which the author participated. They appear in Attachment A (Herrera Environmental Consultants, Inc. undated).

Pollutant concentrations expected to occur typically in the mixed runoff from the several land use and cover types making up a development were estimated by mass balance; i.e., the concentrations from the different areas of the sites were combined in proportion to their contribution to the total runoff.

The Effect of Conventional Treatment BMPs on Runoff Volume, Pollutant Discharges, and Recharge Rates

The first question in analyzing how BMPs reduce runoff volumes and pollutant discharges was, What BMPs are being employed in Bay Area developments under the permit now in force? These county permits provide regulated entities with a large number of choices and few fixed requirements regarding the selection of stormwater BMPs. (See Contra Costa County NPDES Municipal Stormwater Permit, Order No. 99-058; see also Santa Clara County NPDES Municipal Stormwater Permit, Order No. 01-024, at C.3.a.). Clean Water Program Available options presumably include manufactured BMPs, such as drain inlet inserts (DIIs) and continuous deflective separation (CDS) units. Developments may also select such non-

[3] http://www.census.gov/stab/ccdb/cit7140a.txt, http://www.acwd.org/dms_docs/76d0b026b60d97830492079a48b1cb88.pdf, http://www.ci.berkely.ca.us/aboutberkeley/weather.html, http://www.usbr.gov/dataweb/dams/ca10168.htm, http://www.redwoodcity.org/about/weather.html.

proprietary devices as extended-detention basins (EDBs) and biofiltration swales and filter strips. EDBs hold water for two to three days for solids settlement before releasing whatever does not infiltrate or evaporate. Biofiltration treats runoff through various processes mediated by vegetation and soil. In a swale, runoff flows at some depth in a channel, whereas a filter strip is a broad surface over which water sheet flows. Each of these BMP types was applied to each case study, although it is not clear that these BMPs, in actuality, have been implemented consistently within the Bay Area to date.

The principal basis for the analysis of BMP performance was the California Department of Transportation's (CalTrans, 2004) BMP Retrofit Pilot Program, performed in San Diego and Los Angeles Counties. One important result of the program was that BMPs with a natural surface infiltrate and evaporate (probably, mostly infiltrate) a substantial amount of runoff, even if conditions do not appear to be favorable for an infiltration basin. On average, the EDBs, swales, and filter strips lost 40, 50 and 30 percent, respectively, of the entering flow before the discharge point. DIIs and CDS units do not contact runoff with a natural surface, and therefore do not reduce runoff volume.

The CalTrans program further determined that BMP effluent concentrations were usually a function of the influent concentrations, and equations were developed for the functional relationships in these cases. BMPs generally reduced influent concentrations proportionately more when they were high. In relatively few situations influent concentrations were constant at an "irreducible minimum" level regardless of inflow concentrations.

In analyzing the effects of BMPs on the case study runoff, the first step was to reduce the runoff volumes estimated with no BMPs by the fractions observed to be lost in the pilot study. The next task was estimating the effluent concentrations from the relationships in the CalTrans report. The final step was calculating discharge pollutant loadings as the product of the reduced volumes and predicted effluent concentrations. As before, typical pollutant concentrations in the mixed runoff were established by mass balance.

Estimating Infiltration Capacity of the Case Study Sites

Infiltrating sufficient runoff to maintain pre-development hydrologic characteristics and prevent pollutant transport is the most effective way to protect surface receiving waters. Successfully applying infiltration requires soils and hydrogeological conditions that will pass water sufficiently rapidly to avoid overly-lengthy ponding, while not allowing percolating water to reach ground-water before the soil column captures pollutants.

The study assumed that infiltration would occur in surface facilities and not in below-ground trenches. The use of trenches is certainly possible, and was judged to be an approved BMP by CalTrans after the pilot study. However, the intent of this investigation was to determine the ability of pervious areas to manage the site runoff. This was accomplished by determining the infiltration capability of the pervious areas in their original condition for each development case study, and further assessing the pervious areas' infiltration capabilities if soils were modified according to low impact development practices.

The chief basis for this aspect of the work was an assessment of infiltration capacity and benefits for Los Angeles' San Fernando Valley (Chralowicz et al. 2001). The Chralowicz study posited providing 0.1-0.5 acre for infiltration basins to serve each 5 acres of contributing drainage area. At 2-3 ft deep, it was estimated that such basins could infiltrate 0.90-1.87 acre-ft/year of runoff in San Fernando Valley conditions. Soils there are generally various loam textures with infiltration rates of approximately 0.5-2.0 inches/hour. Loams are also common formations in the portion of the Bay Area covered by this report, those areas with Hydrologic

Soil Groups A, B, and C,[4] thus making the conclusions of the San Fernando Valley study applicable for these purposes. This information was used to estimate how much of each case study site's annual runoff would be infiltratable, and if the pervious portion would provide sufficient area for infiltration. For instance, if sufficient area were available, the infiltration configuration would not have to be in basin form but could be shallower and larger in surface area. This study's analyses assumed the use of bioretention areas rather than traditional infiltration basins.

Volume and Pollutant Source Reduction Strategies

As mentioned above, the essence of low impact development is reducing runoff problems before they can develop, at their sources, or exploiting the infiltration and treatment abilities of soils and vegetation. If a site's existing infiltration and treatment capabilities are inadequate to preserve pre-development hydrology and prevent runoff from causing or contributing to violations of water quality standards, then LID-based source reduction strategies can be implemented, infiltration and treatment capabilities can be upgraded, or both.

Source reduction can be accomplished through various LID techniques. Soil can be upgraded to store runoff until it can infiltrate, evaporate, or transpire from plants through compost addition. Soil amendment, as this practice is known, is a standard LID technique.

Upgraded soils are used in bioretention cells that hold runoff and effect its transfer to the subsurface zone. This standard LID tool can be used where sufficient space is available. This study analyzed whether the six development case study sites would have sufficient space to effectively reduce runoff using bioretention cells, assuming the soils and vegetation could be amended and enhanced where necessary.

Conventional pavements can be converted to porous asphalt or concrete or replaced with concrete or plastic unit pavers or grid systems. For such approaches to be most effective, the soils must be capable of infiltrating the runoff passing through, and may require renovation.

Source reduction can be enhanced by the LID practice of water harvesting, in which water from impervious surfaces is captured and stored for reuse in irrigation or gray water systems. For example, runoff from roofs and parking lots can be harvested, with the former being somewhat easier because of the possibility of avoiding pumping to use the water and fewer pollutants. Harvesting is a standard technique for Leadership in Energy and Environmental Design (LEED) buildings.[5] Many successful systems of this type are in operation, such as the Natural Resources Defense Council office (Santa Monica, CA), the King County Administration Building (Seattle, WA), and two buildings on the Portland State University campus (Portland, OR). This investigation examined how water harvesting could contribute to stormwater management for case study sites where infiltration capacity, available space, or both appeared to be limited.

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[4] http://gis.ca.gov/catalog/BrowseCatalog.epl?id=108, http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx

[5] New Buildings Institute, Inc., *Advanced Buildings* (2005) (http://www.poweryourdesign.com/LEEDGuide.pdf).

RESULTS OF THE ANALYSIS

1. "Base Case" Analysis: Development without Stormwater Controls

Comparison of Pre- and Post-Development Runoff Volumes

Table 2 presents a comparison between the estimated runoff volumes generated by the respective case study sites in the pre- and post-development conditions, assuming implementation of no stormwater controls on the developed sites. On sites dominated by impervious land cover, most of the infiltration that would recharge groundwater in the undeveloped state is expected to be lost to surface runoff after development. This greatly increased surface flow would raise peak flow rates and volumes in receiving water courses, raise flooding risk, and transport pollutants. Only the office building, the plan for which retained substantial pervious area, would lose less than 40 percent of the site's pre-development recharge.

Table 2. Pre- and Post-Development without BMPs: Distribution of Surface Runoff Versus Recharge to Groundwater (annual volume in acre-ft)

Distribution	MFR[a]	Sm-SFR[a]	REST[a]	OFF[a]	Lg-SFR[a]	SINGLE[a]
14 Inches/Year Rainfall:						
Precipitation[b]	12.8	3.54	0.90	2.47	154	0.21
Pre-development runoff[c]	0.89	0.25	0.07	0.17	10	0.02
Pre-development recharge[d]	11.9	3.29	0.83	2.30	144	0.19
Post-development impervious runoff[c]	8.07	1.51	0.42	0.57	66	0.09
Post-development pervious runoff[c]	0.51	0.24	0.06	0.23	10	0.01
Post-development total runoff[c]	8.58	1.75	0.48	0.80	76	0.10
Post-development recharge[d]	4.22	1.79	0.42	1.67	78	0.11
Post-development recharge loss (% of pre-development)	7.68 (65%)	1.50 (46%)	0.41 (49%)	0.65 (27%)	66 (45%)	0.08 (41%)
20 Inches/Year Rainfall:						
Precipitation[b]	18.2	5.06	1.29	3.54	220	0.30
Pre-development runoff[c]	1.28	0.35	0.10	0.24	15	0.03
Pre-development recharge[d]	16.9	4.71	1.19	3.30	205	0.27
Post-development impervious runoff[c]	11.5	2.16	0.60	0.82	94	0.13
Post-development pervious runoff[c]	0.73	0.34	0.08	0.33	15	0.01
Post-development total runoff[c]	12.2	2.50	0.68	1.15	109	0.14
Post-development recharge[d]	6.0	2.56	0.61	2.39	111	0.16
Post-development recharge loss (% of pre-development)	10.9 (65%)	2.15 (46%)	0.58 (49%)	0.91 (27%)	94 (45%)	0.11 (41%)

[a] MFR—multi-family residential; Sm-SFR—small-scale single-family residential; REST—restaurant; OFF—office building; Lg-SFR—large-scale single-family residential; SINGLE—single family home
[b] Volume of precipitation on total project area
[c] Quantity of water discharged from the site on the surface
[d] Quantity of water infiltrating the soil; the difference between precipitation and runoff

Pollutant Concentrations and Loadings

Table 3 presents the pollutant concentrations from the literature and loadings calculated as described for the various land use and cover types represented by the case studies. Landscaped areas are expected to release the highest TSS concentration, although relatively low TSS mass loading because of the low runoff coefficient. The highest copper concentrations and loadings are expected from parking lots. Roofs, especially commercial roofs, top the list for both zinc concentrations and loadings. Landscaping would issue by far the highest phosphorus, although access roads and driveways would contribute the highest mass loadings. With expected concentrations being equal in the two rainfall zones, mass loadings in the 20 inches/year zone would be higher than those in the 14 inches/year zone in the same proportion as the ratio of rainfall quantities.

Table 3. Pollutant Concentrations and Loadings for Case Study Land Use and Cover Types

Land Use	Concentrations				Loadings			
	TSS (mg/L)	TCu (mg/L)	TZn (mg/L)	TP (mg/L)	Lbs. TSS/ acre-year	Lbs. TCu/ acre-year	Lbs. TZn/ acre-year	Lbs. TP/ acre-year
14 Inches/Year Rainfall:								
Residential roof	25	0.013	0.159	0.11	75	0.039	0.477	0.330
Commercial roof	18	0.014	0.281	0.14	54	0.042	0.844	0.420
Access road/driveway	120	0.022	0.118	0.66	360	0.066	0.354	1.981
Parking	75	0.036	0.097	0.14	225	0.108	0.291	0.420
Walkway	25	0.013	0.059	0.11	75	0.039	0.177	0.330
Landscaping	213	0.013	0.059	2.04	81	0.005	0.022	0.774
20 Inches/Year Rainfall:								
Residential roof	25	0.013	0.159	0.11	107	0.056	0.683	0.472
Commercial roof	18	0.014	0.281	0.14	77	0.060	1.207	0.601
Access road/driveway	120	0.022	0.118	0.66	515	0.094	0.507	2.834
Parking	75	0.036	0.097	0.14	322	0.155	0.417	0.601
Walkway	25	0.013	0.059	0.11	107	0.056	0.253	0.472
Landscaping	213	0.013	0.059	2.04	135	0.008	0.037	1.291

The Basin Plan freshwater acute criteria for copper and zinc are 0.013 mg/L and 0.120 mg/L, respectively (http://www.swrcb.ca.gov/rwqcb2/basinplan/web/BP_CH3.html). All developed land uses are expected to discharge copper at or above the criterion, based on the mass balance calculations using concentrations from Table 3. Any surface release from the case study sites would just meet or violate the criterion at the point of discharge, although dilution by the receiving water would lower the concentration below the criterion at some point. Even if copper mass loadings are reduced by BMPs, any surface discharge would equal or exceed the criterion initially, but it would be easier to dilute below that level. In contrast, runoff from land covers other than roofs would not violate the acute zinc criterion. Because of this difference, the evaluation considered whether or not the zinc criterion would be exceeded in each analysis, whereas there was no point in this analysis for copper. There are no equivalent water quality criteria for TSS and TP; hence, their concentrations were not further analyzed in the different scenarios.

Table 4 shows the overall loadings, as well as zinc concentrations, expected to be delivered from the case study developments should they not be fitted with any BMPs. As Table 4 shows, all cases are forecast to exceed the 0.120 mg/L acute zinc criterion. Because of its size, the large residential development dominates the mass loading emissions.

Table 4. Case Study Pollutant Concentration and Loading Estimates without BMPs

	MFR[a]	Sm-SFR[a]	REST[a]	OFF[a]	Lg-SFR[a]	SINGLE[a]
14 Inches/ Year Rainfall:						
TZn (mg/L)	0.127	0.123	0.128	0.133	0.123	0.121
Lbs. TSS/year	1254	328	119	230	14249	20
Lbs. TCu/year	0:44	0.070	0.030	0.043	3.04	0.004
Lbs. TZn/year	2.94	0.576	0.165	0.286	25.04	0.034
Lbs. TP/year	6.24	2.27	0.68	1.69	98.55	0:14
20 Inches/ Year Rainfall:						
TZn (mg/L)	0.127	0.123	0.128	0.133	0.123	0.121
Lbs. TSS/year	1864	501	180	360	21781	30
Lbs. TCu/year	0.63	0.102	0.043	0.063	4.44	0.006
Lbs. TZn/year	4.22	0.833	0.238	0.417	36.2	0.050
Lbs. TP/year	9.60	3.55	1.05	2.71	154	0.22

[a] MFR—multi-family residential; Sm-SFR—small-scale single-family residential; REST—restaurant; OFF—office building; Lg-SFR—large-scale single-family residential; SINGLE—single-family home

2. *"Conventional BMP" Analysis: Effect of Basic Treatment BMPs*

Effect of Basic Treatment BMPs on Post-Development Runoff Volumes

The current set of regional permits allows regulated parties to select from a range of BMPs in order to treat or infiltrate a given quantity of annual rainfall. The administrative draft of the proposed MRP is also non-specific regarding the role of LID in satisfying permit conditions. The range of BMPs includes drain inlet inserts, CDS units, and other manufactured BMPs, detention vaults, and sand filters, all of which isolate runoff from the soil; as well as basins and biofiltration BMPs built in soil and generally having vegetation. Treatment BMPs that do not permit any runoff contact with soils discharge as much stormwater runoff as equivalent sites with no BMPs, and hence yield zero savings in recharge. As mentioned above, the CalTrans (2004) study found that BMPs with a natural surface can reduce runoff by substantial margins (30-50 percent for extended-detention basins and biofiltration).

With such a wide range of BMPs in use, runoff reduction ranging from 0 to 50 percent, and a lack of clearly ascertainable requirements, it is not possible to make a single estimate of how much recharge savings are afforded by maximal implementation of the current permits or the Municipal Regional Permit (MRP), if issued as now proposed. We made the following assumptions regarding implementation of BMPs. Assuming natural-surface BMPs perform at the average of the three types tested by CalTrans (2004), i.e., 40 percent runoff reduction, the estimate can be bounded as shown in Table 5. The table demonstrates that allowing free choice of BMPs without regard to their ability to direct water into the ground forfeits substantial groundwater recharge benefits when hardened-surface BMPs are selected. Use of soil-based conventional BMPs could cut recharge losses from half or more of the full potential to about one-quarter to one-third or less, except with the highly impervious commercial development. This analysis shows the wisdom of draining impervious to pervious surfaces, even if those surfaces are not prepared in any special way. But as subsequent analyses showed, soil amendment can gain considerably greater benefits.

Table 5. Pre- and Post-Development with Conventional BMPs: Distribution of Surface Runoff Versus Recharge to Groundwater (annual volume in acre-ft)

Distribution	MFR[a]	Sm-SFR[a]	REST[a]	OFF[a]	Lg-SFR[a]	SINGLE[a]
14 Inches/Year Rainfall:						
Precipitation[b]	12.8	3.54	0.90	2.47	154	0.21
Pre-development runoff[c]	0.89	0.25	0.07	0.17	10	0.02
Pre-development recharge[d]	11.9	3.29	0.83	2.30	144	0.19
Post-development impervious runoff[e]	4.84-8.07	0.90-1.51	0.25-0.42	0.34-0.57	39-66	0.05-0.09
Post-development pervious runoff[e]	0.30-0.51	0.14-0.24	0.04-0.06	0.13-0.23	6.3-10	0.006-0.01
Post-development total runoff[e]	5.15-8.58	1.05-1.75	0.29-0.48	0.48-0.80	46-76	0.06-0.10
Post-development recharge[d, e]	4.22-7.60	1.79-2.49	0.42-0.62	1.67-2.00	78-108	0.11-0.15
Post-development recharge loss (% of pre-development)[e]	4.29-7.68 (36-65%)	0.80-1.50 (24-46%)	0.80-0.41 (26-49%)	0.30-0.65 (13-27%)	34-66 (24-45%)	0.05-0.08 (24-41%)
20 Inches/Year Rainfall:						
Precipitation[b]	18.2	5.06	1.29	3.54	220	0.30
Pre-development runoff[c]	1.28	0.35	0.10	0.24	15	0.03
Pre-development recharge[d]	16.9	4.71	1.19	3.30	205	0.27
Post-development impervious runoff[e]	6.92-11.5	1.29-2.16	0.35-0.60	0.49-0.82	56-94	0.08-0.13
Post-development pervious runoff[e]	0.44-0.73	0.20-0.34	0.05-0.08	0.19-0.33	9.0-15	0.006-0.01
Post-development total runoff[e]	7.36-12.2	1.50-2.50	0.41-0.68	0.68-1.15	65-109	0.08-0.14
Post-development recharge[d, e]	6.0-10.8	2.56-3.56	0.61-0.88	2.39-2.86	111-155	0.16-0.22
Post-development recharge loss (% of pre-development)[e]	6.1-10.9 (36-65%)	1.14-2.15 (24-46%)	0.31-0.58 (26-49%)	0.44-0.91 (13-27%)	49-94 (24-45%)	0.07-0.11 (24-41%)

[a] MFR—multi-family residential; Sm-SFR—small-scale single-family residential; REST—restaurant; OFF—office building; Lg-SFR—large-scale single-family residential; SINGLE—single-family home. Ranges represent 40 percent runoff volume reduction, with full site coverage by BMPs having a natural surface, to no reduction, with BMPs isolating runoff from soil.
[b] Volume of precipitation on total project area
[c] Quantity of water discharged from the site on the surface
[d] Quantity of water infiltrating the soil; the difference between precipitation and runoff [e] Ranging from the quantity with hardened bed BMPs to the quantity with soil-based BMPs

Effect of Basic Treatment BMPs on Pollutant Discharges

Table 6 presents estimates of zinc effluent concentrations and mass loadings of the various pollutants discharged from four types of conventional treatment BMPs. The loading reduction results show the CDS units always performing below 50 percent reduction for all pollutants analyzed, and most often in the vicinity of 20 percent, with zero copper reduction.

Table 6. Pollutant Concentration and Mass Loading Reduction Estimates with Conventional BMPs

	MFR[a]	Sm-SFR[a]	REST[a]	OFF[a]	Lg-SFR[a]	SINGLE[a]
Effluent Concentrations:						
CDS TZn (mg/L)[a]	0.095	0.095	0.098	0.102	0.095	0.094
EDB TZn (mg/L)[a]	0.085	0.086	0.084	0.084	0.086	0.084
Swale TZn (mg/L)	0.055	0.054	0.055	0.056	0.054	0.053
Filter strip TZn (mg/L)	0.039	0.039	0.039	0.041	0.039	0.038
Mass Loading Reductions—14 Inches/Year Rainfall:						
CDS TSS reduction	15.7%	19.9%	22.0%	24.0%	19.9%	20.2%
CDS TCu reduction	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
CDS TZn reduction	22.7%	22.4%	22.9%	23.1%	22.4%	22.5%
CDS TP reduction	30.6%	41.5%	40.7%	45.9%	41.5%	42.0%
EDB TSS reduction	68.1%	73.7%	79.0%	81.1%	73.7%	74.3%
EDB TCu reduction	61.9%	55.7%	66.2%	63.0%	55.7%	55.8%
EDB TZn reduction	59.7%	59.6%	60.4%	61.9%	59.6%	59.8%
EDB TP reduction	61.9%	69.7%	69.1%	72.9%	69.7%	70.1%
Swale TSS reduction	68.8%	71.1%	73.1%	73.9%	71.1%	71.3%
Swale TCu reduction	72.5%	68.5%	78.2%	73.3%	68.5%	68.5%
Swale TZn reduction	78.4%	78.1%	84.3%	78.8%	78.1%	78.2%
Swale TP reduction	66.3%	70.7%	67.2%	76.2%	70.7%	71.1%
Filter strip TSS reduction	69.9%	75.4%	80.6%	82.6%	75.4%	76.0%
Filter strip TCu reduction	74.4%	69.1%	78.2%	75.4%	69.1%	69.1%
Filter strip TZn reduction	78.3%	77.9%	78.4%	78.7%	77.9%	78.1%
Filter strip TP reduction	48.4%	53.1%	63.7%	59.8%	53.1%	53.5%

Table 6 continued

	MFR[a]	Sm-SFR[a]	REST[a]	OFF[a]	Lg-SFR[a]	SINGLE[a]
Mass Loading Reductions—20 Inches/Year Rainfall:						
CDS TSS reduction	18.8%	25.0%	26.3%	30.5%	25.0%	25.4%
CDS TCu reduction	0.7%	1.9%	1.1%	3.0%	1.9%	2.0%
CDS TZn reduction	23.1%	23.3%	23.6%	24.7%	23.3%	23.4%
CDS TP reduction	35.4%	46.6%	44.8%	51.8%	46.6%	47.1%
EDB TSS reduction	68.8%	74.6%	79.6%	81.6%	74.6%	75.1%
EDB TCu reduction	61.8%	55.6%	66.0%	62.7%	55.6%	55.7%
EDB TZn reduction	59.6%	59.3%	60.2%	61.5%	59.3%	59.6%
EDB TP reduction	63.0%	70.4%	69.7%	73.4%	70.4%	70.7%
Swale TSS reduction	69.1%	71.4%	73.6%	74.1%	71.4%	71.6%
Swale TCu reduction	72.5%	68.4%	77.9%	73.1%	68.4%	68.5%
Swale TZn reduction	78.3%	78.0%	84.1%	78.6%	78.0%	78.1%
Swale TP reduction	67.6%	71.9%	68.2%	77.1%	71.9%	72.3%
Filter strip TSS reduction	70.6%	76.3%	81.2%	83.1%	76.3%	76.8%
Filter strip TCu reduction	74.4%	69.0%	78.0%	75.1%	69.0%	69.1%
Filter strip TZn reduction	78.2%	77.8%	78.3%	78.5%	77.8%	77.9%
Filter strip TP reduction	49.9%	54.6%	66.3%	61.0%	54.6%	55.0%

[a] MFR—multi-family residential; Sm-SFR—small-scale single-family residential; REST—restaurant; OFF—office building; Lg-SFR—large-scale single-family residential; SINGLE—single family home; CDS— continuous deflective separation unit; EDB—extended-detention basin

When treated with extended-detention basins, swales, or filter strips, effluents from each development case study site are expected to fall below the Basin Plan acute zinc criterion. These natural-surface BMPs, if fully implemented and well maintained, are predicted to prevent the pollutant masses generated on the six case study development sites from reaching a receiving water in both rainfall zones, which do not differ appreciably. Only total phosphorus reduction falls below 50 percent for three case studies. Otherwise, mass loading reductions range from about 60 to above 80 percent for the EDB, swale, and filter strip. These data indicate that draining impervious to pervious surfaces, even if those surfaces are not prepared in any special way, pays water quality as well as hydrologic dividends.

3. LID Analysis

(a) Hydrologic Analysis

The LID analysis repeats the analysis above, focusing here on the performance of LID techniques in reducing or eliminating runoff from the six development case studies. In addition to assessing the total runoff that would be expected, the analysis also considered whether LID techniques would be sufficient to attain compliance with a performance standard being

considered by the Los Angeles Regional Water Quality Control Board for Ventura County, California. This standard limits EIA (Effective Impervious Area) to five percent (but our analysis further assumed EIA would be ultimately reduced to three percent). All runoff from NCIA (Not-Connected Impervious Area) was assumed to drain to vegetated surfaces.

One goal of this exercise was to identify methods that reduce runoff production in the first place. It was hypothesized that implementation of source reduction techniques could allow all of the case study sites to infiltrate substantial proportions, or all, of the developed site runoff, advancing the hydromodification mitigation objective of the Draft Permit. When runoff is dispersed into the soil instead of being rapidly collected and conveyed away, it recharges groundwater, supplementing a resource that maintains dry season stream flow and wetlands. An increased water balance can be tapped by humans for potable, irrigation, and process water supply. Additionally, runoff volume reduction would commensurately decrease pollutant mass loadings.

Accordingly, the analysis considered the practicability of more than one scenario. In one option, all roof runoff is harvested and stored for some beneficial use. A second option disperses runoff into the soil via roof downspout infiltration trenches. The former option is probably best suited to cases like large commercial and office buildings, while distribution in the soil would fit best with residences and relatively small commercial developments. The analysis was repeated with the assumptions of harvesting OFF roof runoff for some beneficial use and dispersing roof runoff from the remaining four cases in roof downspout infiltration systems.

Expected Infiltration Capacities of the Case Study Sites

The first inquiry on this subject sought to determine how much of the total annual runoff each property is expected to infiltrate, since infiltration is a basic (although not exclusive) LID technique. Based on the findings of Chralowicz et al. (2001), it was assumed that an infiltration zone of 0.1-0.5 acres in area and 2-3 ft deep would serve a drainage catchment area in the size range 0-5 acres and infiltrate 0.9-1.9 acre-ft/year. The conclusions of Chralowicz et al. (2001) were extrapolated to conservatively assume that 0.5 acre would be required to serve each additional five acres of catchment, and would infiltrate an incremental 1.4 acre-ft/year (the midpoint of the 0.9-1.9 acre-ft/year range). According to these assumptions, the following schedule of estimates applies:

Pervious Area Available for Infiltration	Catchment Served acres	Infiltration Capacity
0.5 acres	0-5 acres	1.4 acre-ft/year
1.0 acres	5-10 acres	2.8 acre-ft/year
1.5 acres	10-15 acres	4.2 acre-ft/year
(Etc.)	...	...

As a formula, infiltration capacity ≈ 2.8 x available pervious area. To apply the formula conservatively, the available area was reduced to the next lower 0.5-acre increment before multiplying by 2.8.

As shown in Table 7, in both rainfall zones all six of the sites have adequate or greater capacity to infiltrate the full annual runoff volume expected from NCIA and pervious areas where EIA is limited to three percent of the total site area. Indeed, five of the six development types have sufficient pervious area to infiltrate *all* runoff, including runoff from EIA areas. These results are based on infiltrating in the native soils with no soil amendment. For any development project at which infiltration-oriented BMPs are considered, it is important that infiltration potential be carefully assessed using site-specific soils and hydrogeologic data. In the event such an investigation reveals a marginal condition (e.g., hydraulic conductivity, spacing to groundwater) for infiltration basins, soils could be enhanced to produce bioretention zones to assist infiltration. Notably, the five case studies with far greater than necessary infiltration capacity would offer substantial flexibility in designing infiltration, allowing ponding at less than 2-3 ft depth.

Table 7. Infiltration and Runoff Volume (With 3 Percent EIA and All NCIA Draining to Pervious Areas)

	MFR[a]	Sm-SFR[a]	REST[a]	OFF[a]	Lg-SFR[a]	SINGLE[a]
14 Inches/Year Rainfall:						
EIA runoff (acre-ft/year)	0.36	0.10	0.03	0.07	4.4	0.01
NCIA + pervious area runoff (acre-ft/year)	**8.20**	**1.64**	**0.45**	**0.73**	**71.3**	**0.08**
Total runoff (acre-ft/year)	8.56	1.74	0.48	0.80	75.7	0.09
Pervious area available for infiltration (acres)	3.66	1.67	0.39	1.61	72.7	0.10
Estimated infiltration capacity (acre-ft/year)[b]	**9.8**	**4.2**	**1.4**	**4.2**	**203**	**0.28**
Infiltration potential[c]	>100%	>100%	>100%	>100%	>100%	>100%
20 Inches/Year Rainfall:						
EIA runoff (acre-ft/year)	0.52	0.14	0.04	0.10	6.2	0.01
NCIA + pervious area runoff (acre-ft/year)	**11.7**	**2.34**	**0.64**	**1.04**	**101.7**	**0.14**
Total runoff (acre-ft/year)	12.2	2.48	0.68	1.14	108.0	0.15
Pervious area available for infiltration (acres)	3.66	1.67	0.39	1.61	72.7	0.10
Estimated infiltration capacity (acre-ft/year)[b]	**9.8**	**4.2**	**1.4**	**4.2**	**203**	**0.28**
Infiltration potential[c]	84%	>100%	>100%	>100%	>100%	>100%

[a] MFR—multi-family residential; Sm-SFR—small-scale single-family residential; REST—restaurant; OFF—office building; Lg-SFR—large-scale single-family residential; SINGLE—single family home;
[b] Based on Chralowicz et al. (2001) according to the schedule described above
[c] Compare runoff production from NCIA + pervious area (**row 3**) with estimated infiltration capacity (**row 6**)

As Table 7 shows, each of the six case study sites have the capacity to infiltrate *all* or substantially all of the runoff produced onsite annually by draining impervious surfaces to pervious areas on native soils or, in some soil regimes, soils amended with organic matter. If these sites were designed as envisioned in this analysis, no runoff discharge is expected in storms as large as, and probably larger than, the design storm event—using infiltration only. Discharge would be anticipated only with exceptionally intense, large, or prolonged rainfall that saturates the ground at a faster rate than water can infiltrate or evaporate. Even runoff from the area assumed to be EIA could be infiltrated in most cases based on the amount of pervious area available in typical development projects. Therefore, this analysis shows that the EIA performance standard being considered for Ventura County, California, or one more stringent, can be met readily in development projects occurring on A, B, and C soils in the San Francisco Bay Area.

Additional Source Reduction Capabilities of the Case Study Sites: Water Harvesting Example

As noted, infiltration is one of a wide variety of LID-based source reduction techniques. Where site conditions such as soil quality or available area limit a site's infiltration capacity, other source LID measures can enhance a site's runoff retention capability. For example, soil amendment, which improves infiltration, is a standard LID technique. Water harvesting is another. Such practices can also be used where infiltration capacity is adequate, but the developer desires greater flexibility for land use on-site. Table 8 shows the added LID implementation flexibility created by subtracting roof runoff by harvesting it or efficiently directing it into the soil through downspout dispersion systems, further demonstrating the feasibility and robust performance of LID options for reducing or eliminating runoff in most expected conditions. Specifically, all development types studied could readily infiltrate and/or retain all expected annual precipitation.

Table 8. Infiltration and Runoff Volume Reduction Analysis Including Roof Runoff Harvesting or Disposal in Infiltration Trenches (Assuming 3 Percent EIA and All NCIA Draining to Pervious Areas)

	MFR[a]	Sm-SFR[a]	REST[a]	OFF[a]	Lg-SFR[a]	SINGLE[a]
14 Inches/Year Rainfall:						
EIA runoff (acre-ft/year)	0.36	0.10	0.03	0.07	4.4	0.01
Roof runoff (acre-ft/year)	4.68	0.89	0.08	0.19	38.5	0.05
Other NCIA + pervious area runoff (acre-ft/year)	**3.52**	**0.75**	**0.37**	**0.54**	**32.7**	**0.04**
Total runoff (acre-ft/year)	8.56	1.74	0.48	0.80	75.6	0.10
Pervious area available for infiltration (acres)	3.66	1.67	0.39	1.61	72.7	0.10
Estimated infiltration capacity (acre-ft/year)[b]	**9.8**	**4.2**	**1.4**	**4.2**	**203**	**0.28**
Infiltration capacity[c]	>100%	>100%	>100%	>100%	>100%	>100%
20 Inches/Year Rainfall:						
EIA runoff (acre-ft/year)	0.52	0.14	0.04	0.10	6.2	0.01
Roof runoff (acre-ft/year)	6.67	1.27	0.12	0.28	55.1	0.08
Other NCIA + pervious area runoff (acre-ft/year)	**5.03**	**1.07**	**0.52**	**0.76**	**46.7**	**0.06**
Total runoff (acre-ft/year)	12.2	2.48	0.68	1.14	108.0	0.15
Pervious area available for infiltration (acres)	3.66	1.67	0.39	1.61	72.7	0.10

Table 8 continued

	MFR[a]	Sm-SFR[a]	REST[a]	OFF[a]	Lg-SFR[a]	SINGLE[a]
Estimated infiltration capacity (acre-ft/year)[b]	**9.8**	**4.2**	**1.4**	**4.2**	**203**	**0.28**
Infiltration capacity[c]	>100%	>100%	>100%	>100%	>100%	>100%

[a] MFR—multi-family residential; Sm-SFR—small-scale single-family residential; REST—restaurant; OFF—office building; Lg-SFR—large-scale single-family residential; SINGLE—single family home;
[b] Based on Chralowicz et al. (2001) according to the schedule described above
[c] Comparison of runoff production from NCIA + pervious area (**row 3**) with estimated infiltration capacity (**row 6**)

Effect of Full LID Approach on Recharge

Table 9 shows the recharge benefits of preventing roofs from generating runoff and infiltrating as much as possible of the runoff from the remainder of the case study sites. The data show that LID methods offer significant benefits relative to the baseline (no stormwater controls) in all cases. These benefits are particularly impressive in developments with relatively high site imperviousness, such as in the MFR case.

Table 9. Comparison of Water Captured Annually (in acre-ft) from Development Sites for Beneficial Use with a Full LID Approach Compared to Development With No BMPs

	MFR[a]	Sm-SFR[a]	REST[a]	OFF[a]	Lg-SFR[a]	SINGLE[a]
14 Inches/Year Rainfall:						
Pre-development recharge[b] (acre-ft)	11.9	3.29	0.83	2.30	144	0.19
No BMPs—						
Post-development recharge[b] (acre-ft)	4.22	1.79	0.42	1.67	78	0.11
Post-development recharge lost (acre-ft)	7.68	1.50	0.41	0.65	66	0.08
Post-development % recharge lost	65%	46%	49%	27%	45%	41%
Full LID approach—						
Post-development runoff capture (acre-ft)[c]	11.9	3.29	0.83	2.30	144	0.19
Post-development recharge lost (acre-ft)	0	0	0	0	0	0
Post-development % recharge lost	0%	0%	0%	0%	0%	0%

Table 9 continued

	MFR[a]	Sm-SFR[a]	REST[a]	OFF[a]	Lg-SFR[a]	SINGLE[a]
20 Inches/Year Rainfall:						
Pre-development recharge[b] (acre-ft)	16.9	4.71	1.19	3.30	205	0.27
No BMPs—						
Post-development recharge[b] (acre-ft)	6.0	2.56	0.61	2.39	111	0.16
Post-development recharge lost (acre-ft)	10.9	2.15	0.58	0.91	94	0.11
Post-development % recharge lost	65%	46%	49%	27%	45%	41%
Full LID approach—						
Post-development runoff capture (acre-ft)[c]	16.9	4.71	1.19	3.30	205	0.27
Post-development recharge lost (acre-ft)	0	0	0	0	0	0
Post-development % recharge lost	0%	0%	0%	0%	0%	0%

[a] MFR—multi-family residential; Sm-SFR—small-scale single-family residential; REST—restaurant; OFF—office building; Lg-SFR—large-scale single-family residential; SINGLE—Single family home
[b] Quantity of water infiltrating the soil; the difference between precipitation and runoff
[c] Water either entirely infiltrated in BMPs and recharged to groundwater or partially harvested from roofs and partially infiltrated in BMPs. EIA was not distinguished from the remainder of the development, because these sites have the potential to capture all runoff.

(b) Water Quality Analysis

It was assumed that any site discharges would be subject to treatment control. For purposes of the analysis, treatment control was assumed to be provided by conventional sand filtration. This choice is appropriate for study purposes for two reasons. First, sand filters can be installed below grade, and land above can be put to other uses. Pervious area should be reserved for receiving NCIA drainage, and using sand filters would not draw land away from that service or other site uses. A second reason for the choice is that sand filter performance data equivalent to the data used in analyzing other conventional BMPs are available from the CalTrans (2004) work. Sand filters may or may not expose water to soil, depending on whether or not they have a hard bed. This analysis assumed a hard bed, meaning that no infiltration would occur and thus there would be no additional recharge in sand filters. Performance would be even better than shown in the analytical results if sand filters were built in earth.

Pollutant Discharge Reduction Through LID Techniques

The preceding analyses demonstrated that in each of the six case studies, *all* stormwater discharges could be eliminated at least under most meteorological conditions by dispersing runoff from impervious surfaces to pervious areas. Therefore, pollutant additions to receiving waters would also be eliminated.

SUMMARY AND CONCLUSIONS

This paper demonstrated that common Bay Area residential and commercial development types subject to the Municipal NPDES Permit are likely, without stormwater management, to reduce groundwater recharge from the pre-development state by approximately half in most cases to a much higher fraction with a large ratio of impervious to pervious area. With no treatment, runoff from these developments is expected to exceed Basin Plan acute copper and zinc criteria at the point of discharge and to deliver large pollutant mass loadings to receiving waters.

Conventional soil-based BMP solutions that promote and are component parts of low impact development approaches, by contrast, regain about 30-50 percent of the recharge lost in development without stormwater management in Bay Area locations having NRCS Hydrologic Soil Groups A, B, and C. It is expected the soil-based BMPs generally would release effluent that meets the acute zinc criterion at the point of discharge, although it would still exceed or just barely meet the copper limit. Excepting phosphorus, it was found that these BMPs would capture and prevent the movement to receiving waters of the majority of the pollutant loadings considered in the analysis.

It was found that by draining all site runoff to pervious areas with A, B, or C soil types, runoff can be eliminated entirely in most development categories. It follows that a three percent Effective Impervious Area standard can be met in typical developments, as well. This result was reached assuming the use of native soils or well recognized soil enhancement techniques (typically, with compost). Draining impervious surfaces onto these soils, in connection with limiting directly connected impervious area to three percent of the site total area, should eliminate storm runoff from some development types and greatly reduce it from more highly impervious types. Adding roof runoff elimination to the LID approach (by harvesting or directing it to downspout infiltration trenches) provides an additional tool, increasing flexibility and confidence that no discharge in most meteorological conditions is a feasible performance expectation. Even in the development scenarios involving the highest relative proportion of impervious surface, losses of rainfall capture for beneficial uses could be reduced from the untreated scenario when draining to pervious areas was supplemented with water harvesting. These results demonstrate the basic soundness of the concept of using LID techniques to reduce stormwater pollution in the Bay Area, and further show that limiting directly connected impervious area and draining the remainder over pervious surfaces, as contemplated by some Regional Water Boards in California, is also feasible.

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ATTACHMENT A

POLLUTANT CONCENTRATIONS FOR URBAN SOURCE AREAS (HERRERA ENVIRONMENTAL CONSULTANTS, INC. UNDATED)

Source Area	Study	Location	Sample Size (n)	TSS (mg/L)	TCu (ug/L)	TPb (ug/L)	TZn (ug/L)	TP (mg/L)	Notes
Roofs									
Residential	Steuer, et al. 1997	MI	12	36	7	25	201	0.06	2
Residential	Bannerman, et al. 1993	WI	~48	27	15	21	149	0.15	3
Residential	Waschbusch, et al. 2000	WI	25	15	n.a.	n.a.	n.a.	0.07	3
Residential	FAR 2003	NY		*19*	*20*	*21*	*312*	*0.11*	4
Residential	Gromaire, et al. 2001	France		*29*	*37*	*493*	*3422*	*n.a.*	5
Representative Residential Roof Values				**25**	**13**	**22**	**159**	**0.11**	
Commercial	Steuer, et al. 1997	MI	12	24	20	48	215	0.09	2
Commercial	Bannerman, et al. 1993	WI	~16	15	9	9	330	0.20	3
Commercial	Waschbusch, et al. 2000	WI	25	18	n.a.	n.a.	n.a.	0.13	3
Representative Commercial Roof Values				**18**	**14**	**26**	**281**	**0.14**	
Parking Areas									
Res. Driveways	Steuer, et al. 1997	MI	12	157	34	52	148	0.35	2
Res. Driveways	Bannerman, et al. 1993	WI	~32	173	17	17	107	1.16	3
Res. Driveways	Waschbusch, et al. 2000	WI	25	34	n.a.	n.a.	n.a.	0.18	3
Driveway	FAR 2003	NY		*173*	*17*		*107*	*0.56*	4
Representative Residential Driveway Values				**120**	**22**	**27**	**118**	**0.66**	
Comm./ Inst. Park. Areas	Pitt, et al. 1995	AL	16	110	116	46	110	n.a.	1
Comm. Park. Areas	Steuer, et al. 1997	MI	12	110	22	40	178	0.2	2
Com. Park. Lot	Bannerman, et al. 1993	WI	5	58	15	22	178	0.19	3
Parking Lot	Waschbusch, et al. 2000	WI	25	51	n.a.	n.a.	n.a.	0.1	3
Parking Lot	Tiefenthaler, et al. 2001	CA	5	36	28	45	293	n.a.	6
Loading Docks	Pitt, et al. 1995	AL	3	40	22	55	55	n.a.	1
Highway Rest Areas	CalTrans 2003	CA	53	*63*	*16*	*8*	*142*	*0.47*	7
Park and Ride Facilities	CalTrans 2003	CA	179	*69*	*17*	*10*	*154*	*0.33*	7
Comm./ Res. Parking	FAR 2003	NY		*27*	*51*	*28*	*139*	*0.15*	4
Representative Parking Area/Lot Values				**75**	**36**	**26**	**97**	**0.14**	

Landscaping/Lawns									
Landscaped Areas	Pitt, et al. 1995	AL	6	33	81	24	230	n.a.	1
Landscaping	FAR 2003	NY		*37*	*94*	*29*	*263*	n.a.	4
Representative Landscaping Values				**33**	**81**	**24**	**230**	**n.a.**	
Lawns - Residential	Steuer, et al. 1997	MI	12	262	n.a.	n.a.	n.a.	2.33	2
Lawns - Residential	Bannerman, et al. 1993	WI	~30	397	13	n.a.	59	2.67	3
Lawns	Waschbusch, et al. 2000	WI	25	59	n.a.	n.a.	n.a.	0.79	3
Lawns	Waschbusch, et al. 2000	WI	25	122	n.a.	n.a.	n.a.	1.61	3
Lawns - Fertilized	USGS 2002	WI	58	n.a.	n.a.	n.a.	n.a.	2.57	3
Lawns - Non-P Fertilized	USGS 2002	WI	38	n.a.	n.a.	n.a.	n.a.	1.89	3
Lawns - Unfertilized	USGS 2002	WI	19	n.a.	n.a.	n.a.	n.a.	1.73	3
Lawns	FAR 2003	NY	3	*602*	*17*	*17*	*50*	*2.1*	4
Representative Lawn Values				**213**	**13**	**n.a.**	**59**	**2.04**	

Notes:

Representative values are weighted means of collected data. Italicized values were omitted from these calculations.

1 - Grab samples from residential, commercial/institutional, and industrial rooftops. Values represent mean of DETECTED concentrations

2 - Flow-weighted composite samples, geometric mean concentrations

3 - Geometric mean concentrations

4 - Citation appears to be erroneous - original source of data is unknown. Not used to calculate representative value

5 - Median concentrations. Not used to calculate representative values due to site location and variation from other values.

6 - Mean concentrations from simulated rainfall study

7 - Mean concentrations. Not used to calculate representative values due to transportation nature of land use.

INVESTIGATION OF THE FEASIBILITY AND BENEFITS OF LOW-IMPACT SITE DESIGN PRACTICES ("LID") FOR VENTURA COUNTY

Richard R. Horner†

ABSTRACT

The Clean Water Act NPDES permit that regulates municipal separate storm sewer systems (MS4s) in Ventura County, California will be reissued in 2007. The draft permit includes provisions for requiring the use of low impact development practices (LID) for certain kinds of development and redevelopment projects. Using six representative development project case studies, the author investigated the practicability and relative benefits of the permit's LID requirements. The results showed that (1) LID site design and source control techniques are more effective than conventional best management practices (BMPs) in reducing runoff rates; (2) Effective Impervious Area (EIA) can practicably be capped at three percent, a standard more protective than that proposed in the draft permit; and (3) in five out of six case studies, LID methods would reduce site runoff volume and pollutant loading to zero in typical rainfall scenarios.

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INTRODUCTION

The Assessment in Relation to Municipal Permit Conditions

This purpose of this study is to investigate the relative water quality and water reuse benefits of three levels of storm water treatment best management practices (BMPs): (1) basic "treat-and-release" BMPs (e.g., drain inlet filters, CDS units), (2) commonly used BMPs that expose runoff to soils and vegetation (extended-detention basins and biofiltration swales and filter strips), and (3) low-impact development (LID) practices. The factors considered in the investigation are runoff volume, pollutant loading, and the availability of water for infiltration or other reuse. In order to assess the differential impact of storm water reduction approaches on these factors, this study examines six case studies typical of development covered by the Ventura County Municipal Separate Storm Sewer System Permit.

Low-impact development methods reduce storm runoff and its contaminants by decreasing their generation at sources, infiltrating into the soil or evaporating storm flows before they can enter surface receiving waters, and treating flow remaining on the surface through contact with vegetation and soil, or a combination of these strategies. Soil-based LID practices often use soil enhancements such as compost, and thus improve upon the performance of more traditional basins and biofilters. For the study's purposes, verification of the practicability and utility of LID practices was based on a modified version of the Planning and Land Development Program (Part 4, section E) in the Draft Ventura County Municipal Separate Storm Sewer System Permit ("Draft Permit"). The Draft Permit requires that Effective Impervious Area (EIA) of certain types of new development and redevelopment projects be limited to five percent of

total development project area. EIA is defined as hardened surface hydrologically connected via sheet flow or a discrete hardened conveyance to a drainage system or receiving water body. (Draft Permit p. 50) The study modified this requirement to three percent, as a way to test both the feasibility of meeting the higher, five percent standard in the draft permit and because as the lower, three percent EIA is essential to protect the Ventura County aquatic environment (see Attachment A).

The Draft Permit further requires minimizing the overall percentage of impervious surfaces in new development and redevelopment projects to support storm water infiltration. The Draft Permit also directs an integrated approach to minimizing and mitigating storm water pollution, using a suite of strategies including source control, LID, and treatment control BMPs. (Draft Permit p. 50) It is noted in this section of the document that impervious surfaces can be rendered "ineffective" if runoff is dispersed through properly designed vegetated swales. In testing the practicability of the draft permit's requirements and a three percent EIA standard, this study broadened this approach to encompass not only vegetated swales (channels for conveyance at some depth and velocity) but also vegetated filter strips (surfaces for conveyance in thin sheet flow) and bioretention areas (shallow basins with a range of vegetation types in which runoff infiltrates through soil either to groundwater or a subdrain for eventual surface discharge). The Draft Permit's stipulation of "properly designed" facilities was interpreted to entail, among other requirements, either determination that existing site soils can support runoff reduction through infiltration or that soils will be amended using accepted LID techniques to attain this objective. Finally, the study further broadened implementation options to include water harvesting (collection and storage for use in, for example, irrigation or gray water systems), roof downspout infiltration trenches, and porous pavements.

The Draft permit was interpreted to require management of EIA, other impervious area (what might be termed Not-Connected Impervious Area, NCIA), and pervious areas as follows:

- Runoff from EIA is subject to treatment control and the Draft Permit's Hydromodification Mitigation Control requirements before discharge.

- NCIA must be drained onto a properly designed vegetated surface or its runoff managed by one of the other options discussed in the preceding paragraph. To the extent NCIA runoff is not eliminated prior to discharge from the site in one of these ways, it is subject to treatment control and the Draft Permit's Hydromodification Mitigation Control requirements before discharge.

- Runoff from pervious areas is subject to treatment control and the Draft Permit's Hydromodification Mitigation Control requirements before discharge. This provision applies to pervious areas that both do and do not receive drainage from NCIA.

Where treatment control BMPs are required to manage runoff from the site, the Draft Permit's Volumetric or Hydrodynamic (Flow Based) Treatment Control design bases were assumed to apply. The former basis applies to storage-type BMPs, like ponds, and requires capturing and treating either the runoff volume from the 85th percentile 24-hour rainfall event for the location, the volume of annual runoff to achieve 80 percent or more volume treatment, or the volume of runoff produced from a 0.75 inch storm event. The calculations in this analysis used the 0.75-inch quantity. The Hydrodynamic basis applies to flow-through BMPs, like swales, and requires treating the runoff flow rate produced from a rain event equal to at least 0.2 inches per hour intensity (or one of two other approximately equivalent options).

Scope of the Assessment

With respect to each of the six development case studies, three assessments were undertaken: a baseline scenario incorporating no storm water management controls; a second scenario employing conventional BMPs; and a third development scenario employing LID storm water management strategies.

To establish a baseline for each case study, annual storm water runoff volumes were estimated, as well as concentrations and mass loadings of four pollutants: (1) total suspended solids (TSS), (2) total recoverable copper (TCu), (3) total recoverable zinc (TZn), and (4) total phosphorus (TP). These baseline estimates were based on the anticipated land use and cover with no storm water management efforts.

Two sets of calculations were then conducted using the parameters defined for the six case studies.

The first group of calculations estimated the extent to which basic BMPs reduce runoff volumes and pollutant concentrations and loadings, and what impact, if any, such BMPs have on recharge rates or water retention on-site.

The second group of calculations estimated the extent to which commonly used soil-based BMPs and LID site design strategies ameliorate runoff volumes and pollutant concentrations and loadings, and the effect such techniques have on recharge rates. When evaluating LID strategies, it was presumed that EIA would be limited to three percent and runoff from EIA, NCIA, and pervious areas would be managed as indicated above. The assessment of basins, biofiltration, and low-impact design practices analyzed the expected infiltration capacity of the case study sites. It also considered related LID techniques and practices, such as source reduction strategies, that could work in concert with infiltration to serve the goals of: (1) preventing increase in annual runoff volume from the pre- to the post-developed state, (2) preventing increase in annual pollutant mass loadings between the two development states, and (3) avoiding exceedances of California Toxics Rule (CTR) acute saltwater criteria for copper and zinc.

The results of this analysis show that:

- Developments implementing no post-construction BMPs result in storm water runoff volume and pollutant loading that are substantially increased, and recharge rates that are substantially decreased, compared to pre-development conditions.

- Developments implementing basic post-construction treatment BMPs achieve reduced pollutant loading compared to developments with no BMPs, but storm water runoff volume and recharge rates are similar to developments with no BMPs.

- Developments implementing traditional basins and biofilters, and even more so low-impact post-construction BMPs, achieve significant reduction of pollutant loading and runoff volume as well as greatly enhanced recharge rates compared to both developments with no BMPs and developments with basic treatment BMPs.

- Typical development categories, ranging from single family residential to large commercial, can feasibly implement low-impact post-construction BMPs designed in compliance with the draft permit's requirements, as modified to include a lower, three percent EIA requirement.

This report covers the methods employed in the investigation, data sources, and references for both. It then presents the results, discusses their consequences, draws conclusions, and makes recommendations relative to the feasibility of utilizing low-impact development practices in Ventura County developments.

CASE STUDIES

Six case studies were selected to represent a range of urban development types considered to be representative of coastal Southern California, including Ventura County. These case studies involved: a multi-family residential complex (MFR), a relatively small-scale (23 homes) single-family residential development (Sm-SFR), a restaurant (REST), an office building (OFF), a relatively large (1000 homes) single-family residential development (Lg-SFR) and a sizeable commercial retail installation (COMM).[1]

Parking spaces were estimated to be 176 sq ft in area, which corresponds to 8 ft width by 22 ft length dimensions. Code requirements vary by jurisdiction, with the tendency now to drop below the traditional 200 sq ft average. About 180 sq ft is common, but various standards for full- and compact-car spaces, and for the mix of the two, can raise or lower the average.[2] The 176 sq ft size is considered to be a reasonable value for conventional practice.

Roadways and walkways assume a wide variety of patterns. Exclusive of the two SFR cases, simple, square parking lots with roadways around the four sides and square buildings with walkways also around the four sides were assumed. Roadways and walkways were taken to be 20 ft and 6 ft wide, respectively.

Single-family residences were assumed each to have a driveway 20 ft wide and 30 ft long. It was further assumed that each would have a sidewalk along the front of the lot, which was calculated to be 5749 sq ft in area. Assuming a square lot, the front dimension would be 76 ft. A 40-ft walkway was included within the property. Sidewalks and walkways were taken to be 4 ft wide.

Exclusive of the COMM case, the total area for all of these impervious features was subtracted from the total site area to estimate the pervious area, which was assumed to have conventional landscaping cover (grass, small herbaceous decorative plants, bushes, and a few trees). For the COMM scenario, the hypothetical total impervious cover was enlarged by 10 percent to represent the landscaping, on the belief that a typical retail commercial establishment would typically be mostly impervious.

Table 1 (page 5) summarizes the characteristics of the six case studies. The table also provides the recorded or estimated areas in each land use and cover type.

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[1] Building permit records from the City of San Marcos in San Diego County provided data on total site areas for the first four case studies, including numbers of buildings, building footprint areas (including porch and garage for Sm-SFR), and numbers of parking spaces associated with the development projects. While the building permit records made no reference to features such as roadways, walkways, and landscaping normally associated with development projects, these features were taken into account in the case studies using assumptions described herein. Larger developments were not represented in the sampling of building permits from the San Marcos database. To take larger development projects into account in the subsequent analysis, the two larger scale case studies were hypothesized. The Lg-SFR scenario scaled up all land use estimates from the Sm-SFR case in the ratio of 1000:23. The hypothetical COMM scenario consisted of a building with a 2-acre footprint and 500 parking spaces. As with the smaller-scale cases, these hypothetical developments were assumed to have roadways, walkways, and landscaping, as described herein.

[2] J. Gibbons, *Parking Lots*, NONPOINT EDUCATION FOR MUNICIPAL OFFICERS, Technical Paper No. 5 (1999) (http://nemo.uconn.edu/tools/publications/tech_papers/tech_paper_5.pdf).

Table 1. Case Study Characteristics and Land Use and Land Cover Areas

	MFR[a]	Sm-SFR[a]	REST[a]	OFF[a]	Lg-SFR[a]	COMM[a]
No. buildings	11	23	1	1	1000	1
Total area (ft^2)	476,982	132,227	33,669	92,612	5,749,000	226,529
Roof area (ft^2)	184,338	34,949	3,220	7,500	1,519,522	87,120
No. parking spaces	438	-	33	37	-	500
Parking area (ft^2)	77,088	-	5808	6512	-	88,000
Access road area (ft^2)	22,212	-	6097	6456	-	23,732
Walkway area (ft^2)	33,960	10,656	1362	2078	463,289	7,084
Driveway area (ft^2)	-	13,800	-	-	600,000	-
Landscape area (ft^2)	159,384	72,822	17,182	70,066	3,166,190	20,594

[a] MFR—multi-family residential; Sm-SFR—small-scale single-family residential;
REST—restaurant; OFF—office building; Lg-SFR—large-scale single-family residential; COMM—retail commercial

METHODS OF ANALYSIS

Annual Storm Water Runoff Volumes

Annual surface runoff volumes produced were estimated for both pre- and post-development conditions for each case study site. Runoff volume was computed as the product of annual precipitation, contributing drainage area, and a runoff coefficient (ratio of runoff produced to rainfall received). For impervious areas the following equation was used:

$$C = (0.009)\, I + 0.05$$

where I is the impervious percentage. This equation was derived by Schueler (1987) from Nationwide Urban Runoff Program data (U.S. Environmental Protection Agency 1983). With I = 100 percent for fully impervious surfaces, C is 0.95.

The basis for pervious area runoff coefficients was the Natural Resource Conservation Service's (NRCS) Urban Hydrology for Small Watersheds (NRCS 1986, as revised from the original 1975 edition). This model estimates storm event runoff as a function of precipitation and a variable representing land cover and soil, termed the curve number (CN). Larger events are forecast to produce a greater amount of runoff in relation to amount of rainfall because they more fully saturate the soil. Therefore, use of the model to estimate annual runoff requires selecting some event or group of events to represent the year. A 0.75-inch rainfall event was used in the analysis here for the relative comparison between pre- and post-development and applied to deriving a runoff coefficient for annual estimates, recognizing that smaller storms would produce less and larger storms more runoff.

To select CN for the pre-development case, an analysis performed in the area of the Cedar Fire in San Diego County was used in which CN was determined before and after the 2003 fire.[3] In the San Diego analysis, CN = 83 was estimated for the pre-existing land cover, which was generally chaparral, a vegetative cover also typical of Ventura County. As indicated below, soils are also similar in Ventura and San Diego Counties, making the parameter selection reasonable for use in both locations. For post-development landscaping, CN = 86 was selected based on tabulated data in NRCS (1986) and professional judgment.

Pre- and post-development runoff quantities were computed with these CN values and the 0.75-inch rainfall, and then divided by the rainfall to obtain runoff coefficients. The results were 0.07

[3] American Forests, *San Diego Urban Ecosystem Analysis After the Cedar Fire* (Feb. 3, 2006) (http://www.ufei.org/files/pubs/SanDiegoUrbanEcosystemAnalysis-PostCedarFire.pdf).

and 0.12, respectively. Finally, total annual runoff volumes were estimated based on an average annual precipitation in the City of Ventura of 14.71 inches.[4]

Storm Water Runoff Pollutant Discharges

Annual pollutant mass discharges were estimated as the product of annual runoff volumes produced by the various land use and cover types and pollutant concentrations typical of those areas. Again, the 0.75-inch precipitation event was used as a basis for volumes. Storm water pollutant data have typically been measured and reported for general land use types (e.g., single-family residential, commercial). However, an investigation of low-impact development practices of the type this study sought to conduct demands data on specific land coverages. The literature offers few data on this basis. Those available and used herein were assembled by a consultant to the City of Seattle for a project in which the author participated. They appear in Attachment B (Herrera Environmental Consultants, Inc. undated).

Pollutant concentrations expected to occur typically in the mixed runoff from the several land use and cover types making up a development were estimated by mass balance; i.e., the concentrations from the different areas of the sites were combined in proportion to their contribution to the total runoff.

The Effect of Conventional Treatment BMPs on Runoff Volume, Pollutant Discharges, and Recharge Rates

The first question in analyzing how BMPs reduce runoff volumes and pollutant discharges was, What BMPs are being employed in Ventura County developments under the permit now in force? This permit is open-ended and provides regulated entities with a large number of choices and few fixed requirements. These options presumably include manufactured BMPs, such as drain inlet inserts (DIIs) and continuous deflective separation (CDS) units. Developments may also select such non-proprietary devices as extended-detention basins (EDBs) and biofiltration swales and filter strips. EDBs hold water for two to three days for solids settlement before releasing whatever does not infiltrate or evaporate. Biofiltration treats runoff through various processes mediated by vegetation and soil. In a swale, runoff flows at some depth in a channel, whereas a filter strip is a broad surface over which water sheet flows. Each of these BMP types was applied to each case study, although it is not clear that these BMPs, in actuality, have been implemented consistently within Ventura County to date.

The principal basis for the analysis of BMP performance was the California Department of Transportation's (CalTrans, 2004) BMP Retrofit Pilot Program, performed in San Diego and Los Angeles Counties. One important result of the program was that BMPs with a natural surface infiltrate and evaporate (probably, mostly infiltrate) a substantial amount of runoff, even if conditions do not appear to be favorable for an infiltration basin. On average, the EDBs, swales, and filter strips lost 40, 50 and 30 percent, respectively, of the entering flow before the discharge point. DIIs and CDS units do not contact runoff with a natural surface, and therefore do not reduce runoff volume.

The CalTrans program further determined that BMP effluent concentrations were usually a function of the influent concentrations, and equations were developed for the functional

[4] Ventura County Watershed Protection District (http://www.vcwatershed.org/fws/specialmedia.htm). The City of Ventura is considered to be representative of most of the developed and developing areas in Ventura County. However, there is some variation around the county, with the maximum precipitation registered at Ojai (annual average 21.32 inches). Ojai is about 15 miles inland and lies at elevation 745 ft at the foot of the Topatopa Mountains, the orographic effect of which influences its meteorology. Ojai's higher rainfall was taken into account in the calculations, and the report notes the few instances where it affected the conclusions.

relationships in these cases. BMPs generally reduced influent concentrations proportionately more when they were high. In relatively few situations influent concentrations were constant at an "irreducible minimum" level regardless of inflow concentrations.

In analyzing the effects of BMPs on the case study runoff, the first step was to reduce the runoff volumes estimated with no BMPs by the fractions observed to be lost in the pilot study. The next task was estimating the effluent concentrations from the relationships in the CalTrans report. The final step was calculating discharge pollutant loadings as the product of the reduced volumes and predicted effluent concentrations. As before, typical pollutant concentrations in the mixed runoff were established by mass balance.

Estimating Infiltration Capacity of the Case Study Sites

Infiltrating sufficient runoff to maintain pre-development hydrologic characteristics and prevent pollutant transport is the most effective way to protect surface receiving waters. Successfully applying infiltration requires soils and hydrogeological conditions that will pass water sufficiently rapidly to avoid overly-lengthy ponding, while not allowing percolating water to reach ground-water before the soil column captures pollutants.

The study assumed that infiltration would occur in surface facilities and not in below-ground trenches. The use of trenches is certainly possible, and was judged to be an approved BMP by CalTrans after the pilot study. However, the intent of this investigation was to determine the ability of pervious areas to manage the site runoff. This was accomplished by determining the infiltration capability of the pervious areas in their original condition for each development case study, and further assessing the pervious areas' infiltration capabilities if soils were modified according to low impact development practices.

The chief basis for this aspect of the work was an assessment of infiltration capacity and benefits for Los Angeles' San Fernando Valley (Chralowicz et al. 2001). The Chralowicz study posited providing 0.1-0.5 acre for infiltration basins to serve each 5 acres of contributing drainage area. At 2-3 ft deep, it was estimated that such basins could infiltrate 0.90-1.87 acre-ft/year of runoff in San Fernando Valley conditions. Soils there are generally various loam textures with infiltration rates of approximately 0.5-2.0 inches/hour. The most prominent soils in Ventura County, at least relatively near the coast, are loams, sandy loams, loamy sands, and silty clay loams, thus making the conclusions of the San Fernando Valley study applicable for these purposes.[5] This information was used to estimate how much of each case study site's annual runoff would be infiltratable, and if the pervious portion would provide sufficient area for infiltration. For instance, if sufficient area were available, the infiltration configuration would not have to be in basin form but could be shallower and larger in surface area. This study's analyses assumed the use of bioretention areas rather than traditional infiltration basins.

Volume and Pollutant Source Reduction Strategies

As mentioned above, the essence of low-impact development is reducing runoff problems before they can develop, at their sources, or exploiting the infiltration and treatment abilities of soils and vegetation. If a site's existing infiltration and treatment capabilities are inadequate to preserve pre-development hydrology and prevent runoff from causing or contributing to violations of water quality standards, then LID-based source reduction strategies can be implemented, infiltration and treatment capabilities can be upgraded, or both.

[5] Cabrillo Port Liquefied Natural Gas Deepwater Port Draft EIS/EIR (Oct. 2004) (http://www.cabrilloport.ene.com/files/eiseir/4.05%20%20-Agriculture%20and%20Soils.pdf).

Source reduction can be accomplished through various LID techniques. Soil can be upgraded to store runoff until it can infiltrate, evaporate, or transpire from plants through compost addition. Soil amendment, as this practice is known, is a standard LID technique.

Upgraded soils are used in bioretention cells that hold runoff and effect its transfer to the subsurface zone. This standard LID tool can be used where sufficient space is available. This study analyzed whether the six development case study sites would have sufficient space to effectively reduce runoff using bioretention cells, assuming the soils and vegetation could be amended and enhanced where necessary.

Conventional pavements can be converted to porous asphalt or concrete or replaced with concrete or plastic unit pavers or grid systems. For such approaches to be most effective, the soils must be capable of infiltrating the runoff passing through, and may require renovation.

Source reduction can be enhanced by the LID practice of water harvesting, in which water from impervious surfaces is captured and stored for reuse in irrigation or gray water systems. For example, runoff from roofs and parking lots can be harvested, with the former being somewhat easier because of the possibility of avoiding pumping to use the water and fewer pollutants. Harvesting is a standard technique for Leadership in Energy and Environmental Design (LEED) buildings.[6] Many successful systems of this type are in operation, such as the Natural Resources Defense Council offices (Santa Monica, CA), the King County Administration Building (Seattle, WA), and two buildings on the Portland State University campus (Portland, OR). This investigation examined how water harvesting could contribute to storm water management for case study sites where infiltration capacity, available space, or both appeared to be limited.

RESULTS OF THE ANALYSIS

1. "Base Case" Analysis: Development without Storm Water Controls

Comparison of Pre- and Post-Development Runoff Volumes

Table 2 (page 9) presents a comparison between the estimated runoff volumes generated by the respective case study sites in the pre- and post-development conditions, assuming implementation of no storm water controls on the developed sites. On sites dominated by impervious land cover, most of the infiltration that would recharge groundwater in the undeveloped state is expected to be lost to surface runoff after development. This greatly increased surface flow would raise peak flow rates and volumes in receiving water courses, raise flooding risk, and transport pollutants. Only the office building, the plan for which retained substantial pervious area, would lose less than half of the site's pre-development recharge.

[6] New Buildings Institute, Inc., *Advanced Buildings* (2005) (http://www.poweryourdesign.com/LEEDGuide.pdf).

Table 2. Pre- and Post-Development without BMPs: Distribution of Surface Runoff Versus Recharge to Groundwater

Annual Volume (acre-ft)	MFR[a]	Sm-SFR[a]	REST[a]	OFF[a]	Lg-SFR[a]	COMM[a]
Precipitation[b]	13.4	3.72	0.95	2.60	162	6.37
Pre-development runoff[c]	0.94	0.26	0.07	0.18	11	0.45
Pre-development recharge[d]	12.5	3.46	0.88	2.42	150	5.92
Post-development impervious runoff[c]	8.48	1.59	0.44	0.60	69	5.50
Post-development pervious runoff[c]	0.54	0.25	0.06	0.24	11	0.07
Post-development total runoff[c]	9.02	1.83	0.50	0.84	80	5.57
Post-development recharge[d]	4.39	1.88	0.45	1.76	82	0.80
Post-development recharge loss (% of pre-development recharge)	8.08 (65%)	1.57 (46%)	0.43 (49%)	0.66 (27%)	68 (45%)	5.12 (86%)

[a] MFR—multi-family residential; Sm-SFR—small-scale single-family residential; REST—restaurant; OFF—office building; Lg-SFR—large-scale single-family residential;
COMM—retail commercial
[b] Volume of precipitation on total project area
[c] Quantity of water discharged from the site on the surface
[d] Quantity of water infiltrating the soil; the difference between precipitation and runoff

Pollutant Concentrations and Loadings

Table 3 presents the pollutant concentrations from the literature and loadings calculated as described for the various land use and cover types represented by the case studies. Landscaped areas are expected to release the highest TSS concentration, although relatively low TSS mass loading because of the low runoff coefficient. The highest copper concentrations and loadings are expected from parking lots. Roofs, especially commercial roofs, top the list for both zinc concentrations and loadings. Landscaping would issue by far the highest phosphorus, although access roads and driveways would contribute the highest mass loadings.

Table 3. Pollutant Concentrations and Loadings for Case Study Land Use and Cover Types

Land Use	Concentrations				Loadings			
	TSS (mg/L)	TCu (mg/L)	TZn (mg/L)	TP (mg/L)	Lbs. TSS/ acre-year	Lbs. TCu/ acre-year	Lbs. TZn/ acre-year	Lbs. TP/ acre-year
Residential roof	25	0.013	0.159	0.11	79	0.041	0.503	0.348
Commercial roof	18	0.014	0.281	0.14	57	0.044	0.889	0.443
Access road/driveway	120	0.022	0.118	0.66	380	0.070	0.373	2.088
Parking	75	0.036	0.097	0.14	237	0.114	0.307	0.443
Walkway	25	0.013	0.059	0.11	79	0.041	0.187	0.348
Landscaping	213	0.013	0.059	2.04	85	0.005	0.024	0.815

The CTR acute criteria for copper and zinc are 0.0048 mg/L and 0.090 mg/L, respectively. Table 3 shows that all developed land uses are expected to discharge copper above the criterion, based on the mass balance calculations using concentrations from Table 3. Any surface release from the case study sites would violate the criterion at the point of discharge, although dilution by the receiving water would lower the concentration below the criterion at some point. Even if copper mass loadings are reduced by BMPs, any surface discharge would exceed the criterion initially, but it would be easier to dilute below that level. In contrast, runoff from some land covers would not violate the acute zinc criterion. Because of this difference, the evaluation considered whether or not the zinc criterion would be exceeded in each analysis, whereas there was no point in this analysis for copper. There are no equivalent water quality

criteria for TSS and TP; hence, their concentrations were not further analyzed in the different scenarios.

Table 4 shows the overall loadings, as well as zinc concentrations, expected to be delivered from the case study developments should they not be fitted with any BMPs. As Table 4 shows, all cases are forecast to exceed the 0.090 mg/L acute zinc criterion, and the retail commercial development does so by a wide margin. Because of its size, the large residential development dominates the mass loading emissions.

Table 4. Case Study Pollutant Concentration and Loading Estimates without BMPs

	MFR[a]	Sm-SFR[a]	REST[a]	OFF[a]	Lg-SFR[a]	COMM[a]
TZn (mg/L)	0.127	0.123	0.128	0.133	0.123	0.175
Lbs. TSS/year	1321	345	125	242	15016	853
Lbs. TCu/year	0.46	0.074	0.032	0.045	3.21	0.37
Lbs. TZn/year	3.09	0.607	0.174	0.301	26.4	2.64
Lbs. TP/year	6.58	2.39	0.72	1.78	104	3.36

[a] MFR—multi-family residential; Sm-SFR—small-scale single-family residential; REST—restaurant; OFF—office building; Lg-SFR—large-scale single-family residential; COMM—retail commercial

2. "Conventional BMP" Analysis: Effect of Basic Treatment BMPs

Effect of Basic Treatment BMPs on Post-Development Runoff Volumes

The current permit allows regulated parties to select from a range of BMPs in order to treat or infiltrate a given quantity of annual rainfall. The range includes drain inlet inserts, CDS units, and other manufactured BMPs, detention vaults, and sand filters, all of which isolate runoff from the soil; as well as basins and biofiltration BMPs built in soil and generally having vegetation. Treatment BMPs that do not permit any runoff contact with soils discharge as much storm water runoff as equivalent sites with no BMPs, and hence yield zero savings in recharge. As mentioned above, the CalTrans (2004) study found that BMPs with a natural surface can reduce runoff by substantial margins (30-50 percent for extended-detention basins and biofiltration).

With such a wide range of BMPs in use, runoff reduction ranging from 0 to 50 percent, and a lack of clearly ascertainable requirements, it is not possible to make a single estimate of how much recharge savings are afforded by maximal implementation of the current permit. We made the following assumptions regarding implementation of BMPs. Assuming natural-surface BMPs perform at the average of the three types tested by CalTrans (2004), i.e., 40 percent runoff reduction, the estimate can be bounded as shown in Table 5 (page 11). The table demonstrates that allowing free choice of BMPs without regard to their ability to direct water into the ground forfeits substantial groundwater recharge benefits when hardened-surface BMPs are selected. Use of soil-based conventional BMPs could cut recharge losses from half or e more of the full potential to about one-quarter to one-third or less, except with the highly impervious commercial development. This analysis shows the wisdom of draining impervious to pervious surfaces, even if those surfaces are not prepared in any special way. But as subsequent analyses showed, soil amendment can gain considerably greater benefits.

Table 5. Pre- and Post-Development with Conventional BMPs: Distribution of Surface Runoff Versus Recharge to Groundwater

Annual Volume (acre-ft)	MFR[a]	Sm-SFR[a]	REST[a]	OFF[a]	Lg-SFR[a]	COMM[a]
Precipitation[b]	13.4	3.72	0.95	2.60	162	6.37
Pre-development runoff[c]	0.94	0.26	0.07	0.18	11	0.45
Pre-development recharge	12.5	3.46	0.88	2.42	150	5.92
Post-development impervious runoff[c, d]	5.09-8.48	0.95-1.59	0.26-0.44	0.36-0.60	41-69	3.30-5.50
Post-development pervious runoff[c, d]	0.32-0.54	0.15-0.25	0.04-0.06	0.14-0.24	6.6-11	0.04-0.07
Post-development total runoff[c, d]	5.41-9.02	1.10-1.83	0.30-0.50	0.50-0.84	48-80	3.34-5.57
Post-development recharge[d, e]	4.39-7.99	1.88-2.62	0.45-0.65	1.76-2.10	82-114	0.80-3.03
Post-development recharge loss (% of pre-development recharge)[d, e]	4.51-8.08 (36-65%)	0.84-1.57 (24-46%)	0.23-0.43 (26-49%)	0.32-0.66 (13-27%)	36-68 (24-45%)	2.89-5.12 (49-86%)

[a] MFR—multi-family residential; Sm-SFR—small-scale single-family residential; REST—restaurant; OFF—office building; Lg-SFR—large-scale single-family residential; COMM—retail commercial. Ranges represent 40 percent runoff volume reduction, with full site coverage by BMPs having a natural surface, to no reduction, with BMPs isolating runoff from soil.
[b] Volume of precipitation on total project area
[c] Quantity of water discharged from the site on the surface
[d] Ranging from the quantity with hardened bed BMPs to the quantity with soil-based BMPs
[e] Quantity of water infiltrating the soil; the difference between precipitation and runoff

Effect of Basic Treatment BMPs on Pollutant Discharges

Table 6 (page 12) presents estimates of zinc effluent concentrations and mass loadings of the various pollutants discharged from four types of conventional treatment BMPs. The manufactured CDS BMPs in this table, which do not expose runoff to soil or vegetation, are not expected to drop any of the concentrations sufficiently to meet the acute zinc criterion at the discharge point. The loading reduction results show the CDS units always performing below 50 percent reduction for all pollutants analyzed, and most often in the vicinity of 20 percent, with zero copper reduction.

When treated with swales or filter strips, effluents from each development case study site are expected to fall below the CTR acute zinc criterion. All but the large commercial site would meet the criterion with EDB treatment. These natural-surface BMPs, if fully implemented and well maintained, are predicted to prevent the majority of the pollutant masses generated on most of the development sites from reaching a receiving water. Only total phosphorus reduction falls below 50 percent for two case studies. Otherwise, mass loading reductions range from about 60 to above 80 percent for the EDB, swale, and filter strip. This data indicates that draining impervious to pervious surfaces, even if those surfaces are not prepared in any special way, pays water quality as well as hydrologic dividends.

Table 6. Pollutant Concentration and Loading Reduction Estimates with Conventional BMPs

	MFR[a]	Sm-SFR[a]	REST[a]	OFF[a]	Lg-SFR[a]	COMM[a]
Effluent Concentrations:						
CDS TZn (mg/L)[a]	0.095	0.095	0.098	0.102	0.095	0.131
EDB TZn (mg/L)[a]	0.085	0.086	0.084	0.084	0.086	0.098
Swale TZn (mg/L)	0.055	0.054	0.055	0.056	0.054	0.068
Filter strip TZn (mg/L)	0.039	0.039	0.039	0.041	0.039	0.048
Loading Reductions:						
CDS TSS loading reduction	15.7%	19.9%	22.0%	24.0%	19.9%	16.9%
CDS TCu loading reduction	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
CDS TZn loading reduction	22.7%	22.4%	22.9%	23.1%	22.4%	25.1%
CDS TP loading reduction	30.6%	41.5%	40.7%	45.9%	41.5%	20.3%
EDB TSS loading reduction	68.1%	73.7%	79.0%	81.1%	73.7%	71.7%
EDB TCu loading reduction	61.9%	55.7%	66.2%	63.0%	55.7%	66.8%
EDB TZn loading reduction	59.7%	59.6%	60.4%	61.9%	59.6%	66.6%
EDB TP loading reduction	61.9%	69.7%	69.1%	72.9%	69.7%	54.5%
Swale TSS loading reduction	68.8%	71.1%	73.1%	73.9%	71.1%	69.4%
Swale TCu loading reduction	72.5%	68.5%	78.2%	73.3%	68.5%	75.8%
Swale TZn loading reduction	78.4%	78.1%	84.3%	78.8%	78.1%	80.7%
Swale TP loading reduction	66.3%	70.7%	67.2%	76.2%	70.7%	55.0%
Filter strip TSS loading reduction	69.9%	75.4%	80.6%	82.6%	75.4%	72.3%
Filter strip TCu loading reduction	74.4%	69.1%	78.2%	75.4%	69.1%	78.7%
Filter strip TZn loading reduction	78.3%	77.9%	78.4%	78.7%	77.9%	80.9%
Filter strip TP loading reduction	48.4%	53.1%	63.7%	59.8%	53.1%	34.6%

[a] MFR—multi-family residential; Sm-SFR—small-scale single-family residential; REST—restaurant; OFF—office building; Lg-SFR—large-scale single-family residential; COMM—retail commercial; CDS— continuous deflective separation unit; EDB—extended-detention basin

3. LID Analysis: Development According to Modified Draft Permit Provisions

(a) Hydrologic Analysis

The LID analysis was first performed according to the Draft Permit provisions under the Planning and Land Development Program (Part 4, section E). In this analysis, however, EIA was limited to three instead of five percent, under the reasoning presented in Attachment A. All runoff from NCIA was assumed to drain to vegetated surfaces, as provided in the Draft Permit.

One goal of this exercise was to identify methods that reduce runoff production in the first place. It was hypothesized that implementation of source reduction techniques could allow all of the case study sites to infiltrate substantial proportions of the developed site runoff, advancing the hydromodification mitigation objective of the Draft Permit. When runoff is dispersed into the soil instead of being rapidly collected and conveyed away, it recharges groundwater, supplementing a resource that maintains dry season stream flow and wetlands. An increased water balance can be tapped by humans for potable, irrigation, and process water supply. Additionally, runoff volume reduction would commensurately decrease pollutant mass loadings.

Accordingly, the analysis considered the practicability of more than one scenario by which the draft permit's terms could be met, as modified to reflect three percent EIA. In one option, all roof runoff is harvested and stored for some beneficial use. A second option disperses runoff into the soil via roof downspout infiltration trenches. The former option is probably best suited to cases like the large commercial and office buildings, while distribution in the soil would fit best with residences and relatively small commercial developments. The analysis was repeated with the assumptions of harvesting OFF and COMM roof runoff for some beneficial use and dispersing roof runoff from the remaining four cases in roof downspout infiltration systems.

Expected Infiltration Capacities of the Case Study Sites

The first inquiry on this subject sought to determine how much of the total annual runoff each property is expected to infiltrate. This assessment tested the feasibility of draining all but three percent of impervious area to pervious land on the sites. Based on the findings of Chralowicz et al. (2001), it was assumed that an infiltration zone of 0.1-0.5 acres in area and 2-3 ft deep would serve a drainage catchment area in the size range 0-5 acres and infiltrate 0.9-1.9 acre-ft/year. The conclusions of Chralowicz et al. (2001) were extrapolated to conservatively assume that 0.5 acre would be required to serve each additional five acres of catchment, and would infiltrate an incremental 1.4 acre-ft/year (the midpoint of the 0.9-1.9 acre-ft/year range). According to these assumptions, the following schedule of estimates applies:

Pervious Area Available for Infiltration	Catchment Served acres	Infiltration Capacity
0.5 acres	0-5 acres	1.4 acre-ft/year
1.0 acres	5-10 acres	2.8 acre-ft/year
1.5 acres	10-15 acres	4.2 acre-ft/year
(Etc.)	...	...

As a formula, infiltration capacity ≈ 2.8 x available pervious area. To apply the formula conservatively, the available area was reduced to the next lower 0.5-acre increment before multiplying by 2.8.

As shown in Table 7, five of the six sites have adequate or greater capacity to infiltrate the full annual runoff volume from NCIA and pervious areas where EIA is limited to three percent of the total site area (four at the higher Ojai rainfall). Indeed, five of the six development types have sufficient pervious area to infiltrate *all* runoff, including runoff from EIA areas. With the most representative rainfall, only the large commercial development, with little available pervious area, falls short of the needed capacity to infiltrate all rainfall, but it still has the capacity to meet the terms of the draft permit, as modified for this analysis. These results are based on infiltrating in the native soils with no soil amendment. For any development project at which infiltration-oriented BMPs are considered, it is important that infiltration potential be carefully assessed using site-specific soils and hydrogeologic data. In the event such an investigation reveals a marginal condition (e.g., hydraulic conductivity, spacing to groundwater) for infiltration basins, soils could be enhanced to produce bioretention zones to assist infiltration. Notably, the four case studies with far greater than necessary infiltration capacity would offer substantial flexibility in designing infiltration, allowing ponding at less than 2-3 ft depth.

Table 7. Infiltration and Runoff Volume With 3 Percent EIA and All NCIA Draining to Pervious Areas

	MFR[a]	Sm-SFR[a]	REST[a]	OFF[a]	Lg-SFR[a]	COMM[a]
EIA runoff (acre-ft/year)	0.38	0.11	0.03	0.07	4.6	0.18
NCIA + pervious area runoff (acre-ft/year)	**8.63**	**1.73**	**0.47**	**0.76**	**75.0**	**5.39**
Total runoff (acre-ft/year)	9.01	1.84	0.50	0.83	79.6	5.57
Pervious area available for infiltration (acres)	3.66	1.67	0.39	1.61	72.7	0.47
Estimated infiltration capacity (acre-ft/year)[b]	**9.8**	**4.2**	**1.4**	**4.2**	**203**	**1.4**
Infiltration capacity [c]	> 100%[d]	> 100%	> 100%	> 100%	> 100%	~26% [d]

[a] MFR—multi-family residential; Sm-SFR—small-scale single-family residential; REST—restaurant; OFF—office building; Lg-SFR—large-scale single-family residential; COMM—retail commercial;
[b] Based on Chralowicz et al. (2001) according to the schedule described above
[c] Compare runoff production from NCIA + pervious area (**row 3**) with estimated infiltration capacity (**row 6**)
[d] At Ojai rainfall levels, capacity would be ~78 percent at the MFR site and ~18 percent at the COMM site.

As Table 7 shows, five of the six case study sites have the capacity to infiltrate *all* runoff produced onsite by draining impervious surfaces to pervious areas. Even runoff from the area assumed to be EIA could be infiltrated in most cases based on the amount of pervious area available in typical development projects. By showing that it is possible under normal site conditions and using native soils to retain *all* runoff in typical developments, these results demonstrate that a three percent EIA requirement, which would not demand that all runoff be retained, is feasible and practicable.

Additional Source Reduction Capabilities of the Case Study Sites: Water Harvesting Example

Infiltration is one of a wide variety of LID-based source reduction techniques. Where site conditions such as soil quality or available area limit a site's infiltration capacity, other source LID measures can enhance a site's runoff retention capability. For example, soil amendment, which improves infiltration, is a standard LID technique. Water harvesting is another. Such practices can also be used where infiltration capacity is adequate, but the developer desires greater flexibility for land use on-site. Table 8 shows the added implementation flexibility created by subtracting roof runoff by harvesting it or efficiently directing it into the soil through downspout dispersion systems, further demonstrating the feasibility of meeting the draft permit's proposed requirements, as modified to include a three percent EIA standard.

Table 8. Infiltration and Runoff Volume Reduction Analysis Including Roof Runoff Harvesting or Disposal in Infiltration Trenches (Assuming 3 Percent EIA and All NCIA Draining to Pervious Areas)

	MFR[a]	Sm-SFR[a]	REST[a]	OFF[a]	Lg-SFR[a]	COMM[a]
EIA runoff (acre-ft/year)	0.38	0.11	0.03	0.07	4.6	0.18
Roof runoff (acre-ft/year)	4.92	0.93	0.09	0.20	41	2.33
Other NCIA + pervious area runoff (acre-ft/year)	**3.71**	**0.79**	**0.39**	**0.56**	**35**	**3.06**
Total runoff (acre-ft/year)	9.01	1.84	0.50	0.83	79.6	5.57
Pervious area available for infiltration (acres)	3.66	1.67	0.39	1.61	72.7	0.47
Estimated infiltration capacity (acre-ft/year)[b]	**9.8**	**4.2**	**1.4**	**4.2**	**203**	**1.4**
Infiltration capacity [c]	> 100%	> 100%	> 100%	> 100%	> 100%	~45% [d]

[a] MFR—multi-family residential; Sm-SFR—small-scale single-family residential; REST—restaurant; OFF—office building; Lg-SFR—large-scale single-family residential; COMM—retail commercial;
[b] Based on Chralowicz et al. (2001) according to the schedule described above
[c] Comparison of runoff production from NCIA + pervious area (**row 3**) with estimated infiltration capacity (**row 6**)
[d] If the higher rainfall at Ojai is assumed, capacity would be ~32 percent of the amount needed for the COMM case.

Effect of Full LID Approach on Recharge

Table 9 (page 15) shows the recharge benefits of preventing roofs from generating runoff and infiltrating as much as possible of the runoff from the remainder of the case study sites. The data show that LID methods offer significant benefits relative to the baseline (no storm water controls) in all cases. These benefits are particularly impressive in developments with relatively high site imperviousness, such as in the MFR and COMM cases. In the latter case the full LID approach (excluding the common and effective practice of soil amendment) would cut loss of the potential water resource represented by recharge and harvesting from 86 to 37 percent.

Table 9. Comparison of Water Captured Annually (in acre-ft) from Development Sites for Beneficial Use With a Full LID Approach Compared to Development With No BMPs

	MFR[a]	Sm-SFR[a]	REST[a]	OFF[a]	Lg-SFR[a]	COMM[a]
Pre-development recharge[b] (acre-ft)	12.5	3.46	0.88	2.42	150	5.92
No BMPs:						
post-development recharge [b] (acre-ft)	4.39	1.88	0.45	1.76	82	0.80
post-development runoff (acre-ft)	8.08	1.57	0.43	0.66	68	5.12
post-development % recharge lost	65%	46%	49%	27%	45%	86%
Full LID approach:						
post-development runoff capture (acre-ft)[c]	12.5	3.46	0.88	2.42	150	3.73
post-development runoff (acre-ft)	0	0	0	0	0	2.19
post-development % recharge lost	0%	0%	0%	0%	0%	37%

[a] MFR—multi-family residential; Sm-SFR—small-scale single-family residential; REST—restaurant; OFF—office building; Lg-SFR—large-scale single-family residential; COMM—retail commercial
[b] Quantity of water infiltrating the soil; the difference between precipitation and runoff
[c] Water either entirely infiltrated in BMPs and recharged to groundwater or partially harvested from roofs and partially infiltrated in BMPs. For the first five case studies, EIA was not distinguished from the remainder of the development, because these sites have the potential to capture all runoff.

(b) Water Quality Analysis

As outlined above, it was assumed that EIA discharges, as well as runoff from all pervious surfaces, are subject to treatment control. For purposes of the analysis, treatment control was assumed to be provided by conventional sand filtration. This choice is appropriate for study purposes for two reasons. First, sand filters can be installed below grade, and land above can be put to other uses. Under the Draft Permit's approach, pervious area should be reserved for receiving NCIA drainage, and using sand filters would not draw land away from that service or other site uses. A second reason for the choice is that sand filter performance data equivalent to the data used in analyzing other conventional BMPs are available from the CalTrans (2004) work. Sand filters may or may not expose water to soil, depending on whether or not they have a hard bed. This analysis assumed a hard bed, meaning that no infiltration would occur and thus there would be no additional recharge in sand filters. Performance would be even better than shown in the analytical results if sand filters were built in earth.

Pollutant Discharge Reduction Through LID Techniques

The preceding analyses demonstrated that each of the six case studies could feasibly comply with the draft permit's requirements, as modified to include a more protective three percent EIA standard. Moreover, for five of the six case studies, *all* storm water discharges could be eliminated at least under most meteorological conditions by dispersing runoff from impervious surfaces to pervious areas. Therefore, pollutant additions to receiving waters would also be eliminated. This demonstrates not only that a lower EIA (three percent) is a feasible and practicable approach to maintaining the natural hydrology of land being developed, as discussed above, but that a lower EIA is a feasible and practicable way to eliminate the discharge of pollutants that could cause or contribute to violations of water quality standards.

While the high proportion of impervious area present on the large commercial site relative to pervious area would not allow eliminating all discharge, harvesting roof water and draining NCIA to properly-prepared pervious area would substantially decrease the volume discharged. Deployment of treatment control BMPs (e.g. sand filter treatment) could cut contaminant discharges from pollutants in the remaining volume of runoff to low levels.

Table 10 presents the pollutant reductions from the untreated case achievable through the complete LID approach described above in comparison to conventional treatments (from Table 6). Assuming EIA still discharges through sand filters, pollutant loadings from the untreated condition are expected to decrease by more than 96 percent for all but the COMM case. In that challenging case loadings would still fall by at least 89 percent for TSS and the metals and by 83 percent for total phosphorus, assuming City of Ventura rainfall levels, and slightly less assuming the higher Ojai rainfall levels. Thus, the Draft Permit's basic premise of disconnecting most impervious area, supplemented by specially managing roof water, is shown by both water quality and hydrologic results to be feasible and to afford broad and significant environmental benefits.

Table 10. Pollutant Loading Reduction Estimates With a Full LID Approach Relative to Conventional BMPs

	MFR[a]	Sm-SFR[a]	REST[a]	OFF[a]	Lg-SFR[a]	COMM[a]
Conventional TSS loading reduction[b]	15.7-69.9%	19.9-75.4%	22.0-80.6%	24.0-82.6%	19.9-75.4%	16.9-72.3%
Conventional TCu loading reduction[b]	0.0-74.4%	0.0-69.1%	0.0-78.2%	0.0-75.4%	0.0-69.1%	0.0-78.7%
Conventional TZn loading reduction[b]	22.7-78.4%	22.4-78.1%	22.9-84.3%	23.1-78.8%	22.4-78.1%	25.1-80.9%
Conventional TP loading reduction[b]	30.6-66.3%	41.5-70.7%	40.7-69.1%	45.9-76.2%	41.5-70.7%	20.3-55.0%
LID TSS loading reduction[c]	99.4%	99.3%	99.5%	99.4%	99.3%	89.0% [d]
LID TCu loading reduction[c]	98.1%	96.7%	98.0%	96.2%	96.7%	90.6% [d]
LID TZn loading reduction[c]	99.1%	98.8%	98.9%	98.3%	98.8%	94.8% [d]
LID TP loading reduction[c]	98.1%	98.6%	98.8%	98.7%	98.6%	83.1%[d]

[a] MFR—multi-family residential; Sm-SFR—small-scale single-family residential; REST—restaurant; OFF—office building; Lg-SFR—large-scale single-family residential; COMM—retail commercial; CDS— continuous deflective separation unit; EDB—extended-detention basin; NCIA—not connected impervious area; EIA—effective (connected) impervious area
[b] Range from Table 6 represented by treatment by CDS unit, EDB, biofiltration swale, or biofiltration strip
[c] Based on directing roof runoff to downspout infiltration trenches (MFR, Sm-SFR, REST, and Lg-SFR) or harvesting it (OFF and COMM), draining other NCIA to pervious areas, and treating EIA with sand filters
[d] If the higher rainfall at Ojai is assumed, reduction estimates for TSS, TCu, TZn, and TP would be 84.0, 86.3, 92.5, and 75.5 percent, respectively.

SUMMARY AND CONCLUSIONS

This paper demonstrated that common Ventura County area residential and commercial development types subject to the Municipal NPDES Permit are likely, without storm water management, to reduce groundwater recharge from the predevelopment state by approximately half in most cases to a much higher fraction with a large ratio of impervious to pervious area. With no treatment, runoff from these developments is expected to exceed CTR acute copper and zinc criteria at the point of discharge and to deliver large pollutant mass loadings to receiving waters.

Conventional soil-based BMP solutions that promote and are component parts of low-impact development approaches, by contrast, regain about 30-50 percent of the recharge lost in development without storm water management, although commercially-manufactured filtration and hydrodynamic BMPs for storm water management give no benefits in this area. It is expected the soil-based BMPs generally would release effluent that meets the acute zinc criterion at the point of discharge, although it would still exceed the copper limit. Excepting phosphorus, it was found that these BMPs would capture and prevent the movement to receiving waters of the majority of the pollutant loadings considered in the analysis.

It was found that a three percent Effective Impervious Area standard can be met in typical developments, and that by draining all site runoff to pervious areas, runoff can be eliminated entirely in most development types. This result was reached assuming the use of native soils. Soil enhancement (typically, with compost) can further advance infiltration. Draining impervious surfaces onto the loam soils typical of Ventura County, in connection with limiting directly connected impervious area to three percent of the site total area, should eliminate storm runoff from some development types and greatly reduce it from more highly impervious types. Adding roof runoff elimination to the LID approach (by harvesting or directing it to downspout infiltration trenches) should eliminate runoff from all but mostly impervious developments. Even in the development scenario involving the highest relative proportion of impervious surface, losses of rainfall capture for beneficial uses could be reduced from more than 85 to less than 40 percent, and pollutant mass loadings would fall by 83-95 percent from the untreated scenario when draining to pervious areas was supplemented with water harvesting. These results demonstrate the basic soundness of the Draft Permit's concept to limit directly connected impervious area and drain the remainder over pervious surfaces.

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ATTACHMENT A

JUSTIFICATION OF PROPOSED EFFECTIVE IMPERVIOUS AREA LIMITATION

Summary

The literature shows that adverse impacts to the physical habitat and biological integrity of receiving waters occur as a result of the conversion of natural areas to impervious cover. These effects are observed at the lowest levels of impervious cover in associated catchments (two to three percent) and are pronounced by the point that impervious cover reaches five percent. To protect biological productivity, physical habitat, and other beneficial uses, effective impervious area should be capped at no more than three percent.

I. Impacts to physical habitat of California receiving waters observed at three percent impervious cover

Stein *et al*.[7] note that while studies from parts of the country with climates more humid than California's indicate that physical degradation of stream channels can initially be detected when watershed impervious cover approaches 10%, biological effects, which may be more difficult to detect, may occur at lower levels (CWP 2003).[8] Recent studies from both northern and southern California indicate that intermittent and ephemeral streams in California are more susceptible to the effects of hydromodification than streams from other regions of the US, with stream degradation being recognized when the associated catchment's impervious cover is as little as 3-5% (Coleman *et al*. 2005).[9] Furthermore, supplemental landscape irrigation in semi-arid regions, like California, can substantially increase the frequency of erosive flows (AQUA TERRA Consultants 2004).[10]

Coleman, *et al*.[3] report that the ephemeral/intermittent streams in southern California (northwestern Los Angeles County through southern Ventura County to central Orange County) appear to be more sensitive to changes in percent impervious cover than streams in other areas. Stream channel response can be represented using an *enlargement curve*, which relates the percent of impervious cover to a change in cross-sectional area. The data for southern California streams forms a relationship very similar in shape to the enlargement curves developed for other North American streams. However, the curve for southern California streams is above the general curve for streams in other climates. This suggests that a specific enlargement ratio is produced at a lower value of impervious surface area in southern California than in other parts of North America. Specifically, the estimated threshold of response is approximately 2-3% impervious cover, as compared to 7-10% for other portions of the U.S. It is important to note that this conclusion applies specifically to streams with a catchment drainage area less than 5 square miles.

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[9] Coleman, D., C. MacRae, and E.D. Stein, (2005) *Effect of Increases in Peak Flows and Imperviousness on the Morphology of Southern California Streams.* Southern California Coastal Water Research Project Technical Report #450, Westminster, CA.

[10] AQUA TERRA Consultants, (2004) *Urbanization and Channel Stability Assessment in the Arroyo Simi Watershed of Ventura County CA*. FINAL REPORT. Prepared for Ventura County Watershed Protection Division, Ventura CA.

This study concludes that disconnecting impervious areas from the drainage network and adjacent impervious areas is a key approach to protecting channel stability. Utilizing this strategy can make it practical to keep the effective impervious cover (*i.e.* the amount hydrologically connected to the stream) equal to or less than the identified threshold of 2-3%.

II. Impacts to biological integrity of receiving waters observed with any conversion from natural to impervious surface

Two separate studies conducted by Horner *et al*.[11,12] in the Puget Sound region (Washington State), Montgomery County, Maryland, and Austin, Texas built a database totaling more than 650 reaches on low-order streams in watersheds ranging from no urbanization and relatively little human influence (the reference state, representing "best attainable" conditions) to highly urban (>60 percent total impervious area, "TIA"). Biological health was assessed according to the benthic index of biotic integrity (B-IBI) and, in Puget Sound, the ratio of young-of-the-year coho salmon (*Oncorhynchus kisutch*), a relatively stress-intolerant fish, to cutthroat trout (*Oncorhynchus clarki*), a more stress-tolerant species. The following discussion summarizes the results and conclusions of these two studies.

There is no single cause for the decline of water resource conditions in urbanizing watersheds. Instead, it is the cumulative effects of multiple stressors that are responsible for degraded aquatic habitat and water quality. Imperviousness, while not a perfect yardstick, appears to be a useful predictor of ecological condition. However, a range of stream conditions can be associated with any given level of imperviousness. In general, only streams that retain a significant proportion of their natural vegetative land-cover <u>and</u> have very low levels of watershed imperviousness appear to retain their natural ecological integrity. It is this change in watershed land-cover that is largely responsible for the shift in hydrologic regime from a sub-surface flow dominated system to one dominated by surface runoff.

While the decline in ecological integrity is relatively continuous and is consistent for all parameters, the impact on physical conditions appears to be more pronounced earlier in the urbanization process than chemical degradation. It is generally acknowledged, based on field research and hydrologic modeling, that it is the shift in hydrologic conditions that is the driving force behind physical changes in urban stream-wetland ecosystems.

Multiple scales of impact operate within urbanizing watersheds: landscape-level impacts, including the loss of natural forest cover and the increase in impervious surface area throughout the watershed; riparian corridor-specific impacts such as encroachment, fragmentation, and loss of native vegetation; and local impacts such as water diversions, exotic vegetation, stream channelization, streambank hardening, culvert installation, and pollution from the widespread use of pesticides and herbicides. All of these stressors contribute to the overall cumulative impact.

The researchers found that there is no clear threshold of urbanization below which there exists a "no-effect" condition. Instead, there appears to be a relatively continuous decline in almost all measures of water quality or ecological integrity. Losses of integrity occur from the lowest levels of TIA and are already pronounced by the point that TIA reaches 5 percent.

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[11] Horner, R. R., C. W. May, (2002) *The Limitations of Mitigation-Based Stormwater Management in the Pacific Northwest and the Potential of a Conservation Strategy based on Low-Impact Development Principles*. (Proceedings of the American Society of Engineers Stormwater Conference, Portland, OR).

[12] Horner, R.R., E. H. Livingston, C. W. May, J. Maxted, (2006) *BMPs, Impervious Cover, and Biological Integrity of Small Streams*. (Proceedings of the Eighth Biennial Stormwater Research and Watershed Management Conference, Tampa, FL).

Similarly, the Alliance for the Chesapeake Bay[13] reports that small-watershed studies by the Maryland Department of Natural Resources Biological Stream Survey have shown that some sensitive species are affected by even low amounts of impervious cover. In one study, no brook trout were observed in any stream whose watershed had more than 2 percent impervious cover, and brook trout were rare in any watershed with more than 0.5 percent impervious cover.

III. Ventura County's watersheds include biologically-significant water bodies

The literature discussed above is relevant to the watersheds of Ventura County, which contain rivers and streams that currently or historically support a variety of beneficial uses that may be impaired by water quality degradation and stream hydromodification as a result of storm water runoff from impervious land cover. Unlike some Southern California watersheds, Ventura County still has many natural stream systems with a high degree of natural functionality.

For instance, the Ventura River watershed in northwestern Ventura County "supports a large number of sensitive aquatic species,"[14] including steelhead trout, a federally-listed endangered species. Although "local populations of steelhead and rainbow trout have nearly been eliminated along the Ventura River" itself, the California Department of Fish and Game has "recognized the potential for the restoration of the estuary and enhancement of steelhead populations in the Ventura River."[15] Steelhead may also be present in tributaries such as San Antonio Creek.[16] Thriving rainbow trout populations exist in tributaries of the Ventura River including Matilija Creek and Coyote Creek.[17] The Ventura River either does or is projected to support the following beneficial uses: warm freshwater habitat; cold freshwater habitat; wildlife habitat; rare, threatened, or endangered species; migration of aquatic organisms; and spawning and reproduction.[18] Furthermore, the Ventura River Estuary also supports commercial fishing, shellfish harvesting, and wetland habitat.[19] The Ventura River receives municipal storm drain discharges from Ojai, San Buenaventura, and unincorporated areas of Ventura County.[20]

The Santa Clara River watershed in northern Ventura County "is the largest river system in southern California that remains in a relatively natural state."[21] Sespe Creek is one of the Santa Clara's largest tributaries, and "supports significant steelhead spawning and rearing habitat."[22] Other creeks in the Santa Clara River watershed that support steelhead are Piru Creek and Santa Paula Creek. Sespe Creek and the Santa Clara River also provide spawning habitat for the Pacific lamprey. Rainbow trout populations exist in tributaries of the Santa Clara River including Sespe Creek.[23] The creeks and the Santa Clara river do or are projected to support the following beneficial uses: warm freshwater habitat; cold freshwater habitat; wildlife habitat; preservation of biological habitats rare, threatened, or endangered species; migration of aquatic organisms; and spawning and reproduction.[24] Los Padres National Forest covers much of the Santa Clara River watershed, but increasing development in floodplain areas has been

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[13] Karl Blankenship, BAY JOURNAL,"It's a hard road ahead for meeting new sprawl goal: States will try to control growth of impervious" (July/August 2004), at http://www.bayjournal.com/article.cfm?article=66.
[14] Los Angeles Region Water Quality Control Plan (1994) p. 1-18 ("Basin Plan").
[15] Basin Plan, p. 1-16; Ventura County Environmental & Energy Resources Division, "Endangered Steelhead Trout in Ventura County: Past, Present, and Future," available at http://www.wasteless.org/Eye_articles/steelhead.htm.
[16] Ventura County Environmental & Energy Resources Division, "Steelhead Spawning in Ventura County," (2005), available at http://www.wasteless.org/Eye_articles/steehead2005.html.
[17] Ventura County Environmental & Energy Resources Division, "Endangered Steelhead Trout in Ventura County: Past, Present, and Future," available at http://www.wasteless.org/Eye_articles/steelhead.htm.
[18] Basin Plan, Table 2-1.
[19] Basin Plan, Table 2-4.
[20] Ventura County Watershed Protection District, *Report of Waste Discharge* (January 2005) at p. 3.
[21] Basin Plan, p. 1-16.
[22] Basin Plan, p. 1-16.
[23] Ventura County Environmental & Energy Resources Division, "Endangered Steelhead Trout in Ventura County: Past, Present, and Future," available at http://www.wasteless.org/Eye_articles/steelhead.htm.
[24] Basin Plan, Table 2-1.

identified as a threat to the river system's water quality.[25] Furthermore, the Santa Clara estuary supports the additional beneficial uses of shellfish harvesting and wetlands habitat.[26] The Santa Clara River receives municipal storm drain discharges from Fillmore, Oxnard, San Buenaventura, Santa Paula, and unincorporated areas of Ventura County.[27]

The Calleguas Creek watershed "empties into Mugu Lagoon, one of southern California's few remaining large wetlands."[28] It supports or is projected to support the following beneficial uses: estuarine habitat; marine habitat; wildlife habitat; preservation of biological habitats; rare, threatened, or endangered species; migration of aquatic organisms; spawning and reproduction; shellfish harvesting; and wetlands habitat.[29] Historically, Calleguas Creek drained largely agricultural areas. But this watershed has been under increasing pressure from sedimentation due to increased surface flow from municipal discharges and urban wastewaters, among other sources.[30] Increasing residential developments on steep slopes has been identified as a substantial contributing factor to the problem of accelerated erosion in the watershed (and sedimentation in the Lagoon). Calleguas Creek receives municipal storm drain discharges from Camarillo, Moorpark, Simi Valley, Thousand Oaks, and unincorporated areas of Ventura County.[31]

Ventura County's coastal streams also support a variety of beneficial uses:[32]

- Little Sycamore Canyon Creek in southern Ventura County (warm freshwater habitat; wildlife habitat; rare, threatened or endangered species; and spawning and reproduction);
- Lake Casitas tributaries (warm freshwater habitat; cold freshwater habitat; wildlife habitat; rare, threatened or endangered species; spawning and reproduction; and wetland habitat);
- Javon Canyon and Padre Juan Canyon (warm freshwater habitat; cold freshwater habitat; wildlife habitat; and spawning and reproduction); and
- Los Sauces Creek in northern Ventura County (warm freshwater habitat; cold freshwater habitat; wildlife habitat; migration of aquatic species; and spawning and reproduction).

IV. Conclusion

In order to protect the biological habitat, physical integrity, and other beneficial uses of the water bodies in Ventura County, effective impervious area should be capped at no more than three percent.

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[25] Basin Plan, pp. 1-16, 1-18.
[26] Basin Plan, Table 2-4.
[27] Ventura County Watershed Protection District, *Report of Waste Discharge* (January 2005) at p. 3.
[28] Basin Plan, p. 1-18.
[29] Basin Plan, Table 2-1.
[30] Basin Plan, pp. 1-16, 1-18.
[31] Ventura County Watershed Protection District, *Report of Waste Discharge* (January 2005) at p. 3.
[32] Basin Plan, Table 2-1.

ATTACHMENT B

POLLUTANT CONCENTRATIONS FOR URBAN SOURCE AREAS (HERRERA ENVIRONMENTAL CONSULTANTS, INC. UNDATED)

Source Area	Study	Location	Sample Size (n)	TSS (mg/L)	TCu (ug/L)	TPb (ug/L)	TZn (ug/L)	TP (mg/L)	Notes
Roofs									
Residential	Steuer, et al. 1997	MI	12	36	7	25	201	0.06	2
Residential	Bannerman, et al. 1993	WI	~48	27	15	21	149	0.15	3
Residential	Waschbusch, et al. 2000	WI	25	15	n.a.	n.a.	n.a.	0.07	3
Residential	FAR 2003	NY		*19*	*20*	*21*	*312*	*0.11*	4
Residential	Gromaire, et al. 2001	France		*29*	*37*	*493*	*3422*	*n.a.*	5
Representative Residential Roof Values				**25**	**13**	**22**	**159**	**0.11**	
Commercial	Steuer, et al. 1997	MI	12	24	20	48	215	0.09	2
Commercial	Bannerman, et al. 1993	WI	~16	15	9	9	330	0.20	3
Commercial	Waschbusch, et al. 2000	WI	25	18	n.a.	n.a.	n.a.	0.13	3
Representative Commercial Roof Values				**18**	**14**	**26**	**281**	**0.14**	
Parking Areas									
Res. Driveways	Steuer, et al. 1997	MI	12	157	34	52	148	0.35	2
Res. Driveways	Bannerman, et al. 1993	WI	~32	173	17	17	107	1.16	3
Res. Driveways	Waschbusch, et al. 2000	WI	25	34	n.a.	n.a.	n.a.	0.18	3
Driveway	FAR 2003	NY		*173*	*17*		*107*	*0.56*	4
Representative Residential Driveway Values				**120**	**22**	**27**	**118**	**0.66**	
Comm./ Inst. Park. Areas	Pitt, et al. 1995	AL	16	110	116	46	110	n.a.	1
Comm. Park. Areas	Steuer, et al. 1997	MI	12	110	22	40	178	0.2	2
Com. Park. Lot	Bannerman, et al. 1993	WI	5	58	15	22	178	0.19	3
Parking Lot	Waschbusch, et al. 2000	WI	25	51	n.a.	n.a.	n.a.	0.1	3
Parking Lot	Tiefenthaler, et al. 2001	CA	5	36	28	45	293	n.a.	6
Loading Docks	Pitt, et al. 1995	AL	3	40	22	55	55	n.a.	1
Highway Rest Areas	CalTrans 2003	CA	53	*63*	*16*	*8*	*142*	*0.47*	7
Park and Ride Facilities	CalTrans 2003	CA	179	*69*	*17*	*10*	*154*	*0.33*	7
Comm./ Res. Parking	FAR 2003	NY		*27*	*51*	*28*	*139*	*0.15*	4
Representative Parking Area/Lot Values				**75**	**36**	**26**	**97**	**0.14**	

Landscaping/Lawns									
Landscaped Areas	Pitt, et al. 1995	AL	6	33	81	24	230	n.a.	1
Landscaping	FAR 2003	NY		*37*	*94*	*29*	*263*	n.a.	4
Representative Landscaping Values				**33**	**81**	**24**	**230**	**n.a.**	
Lawns - Residential	Steuer, et al. 1997	MI	12	262	n.a.	n.a.	n.a.	2.33	2
Lawns - Residential	Bannerman, et al. 1993	WI	~30	397	13	n.a.	59	2.67	3
Lawns	Waschbusch, et al. 2000	WI	25	59	n.a.	n.a.	n.a.	0.79	3
Lawns	Waschbusch, et al. 2000	WI	25	122	n.a.	n.a.	n.a.	1.61	3
Lawns - Fertilized	USGS 2002	WI	58	n.a.	n.a.	n.a.	n.a.	2.57	3
Lawns - Non-P Fertilized	USGS 2002	WI	38	n.a.	n.a.	n.a.	n.a.	1.89	3
Lawns - Unfertilized	USGS 2002	WI	19	n.a.	n.a.	n.a.	n.a.	1.73	3
Lawns	FAR 2003	NY	3	*602*	*17*	*17*	*50*	*2.1*	4
Representative Lawn Values				**213**	**13**	**n.a.**	**59**	**2.04**	

Notes:
Representative values are weighted means of collected data. Italicized values were omitted from these calculations.
1 - Grab samples from residential, commercial/institutional, and industrial rooftops. Values represent mean of DETECTED concentrations
2 - Flow-weighted composite samples, geometric mean concentrations
3 - Geometric mean concentrations
4 - Citation appears to be erroneous - original source of data is unknown. Not used to calculate representative value
5 - Median concentrations. Not used to calculate representative values due to site location and variation from other values.
6 - Mean concentrations from simulated rainfall study
7 - Mean concentrations. Not used to calculate representative values due to transportation nature of land use.

SUPPLEMENTARY INVESTIGATION OF THE FEASIBILITY AND BENEFITS OF LOW-IMPACT SITE DESIGN PRACTICES ("LID") FOR THE SAN FRANCISCO BAY AREA

Richard R. Horner†

ABSTRACT

The Clean Water Act NPDES permit that regulates municipal separate storm sewer systems (MS4s) in the San Francisco Bay Area, California will be reissued in 2007. The draft permit includes general provisions related to low impact development practices (LID) for certain kinds of development and redevelopment projects. Using eight representative development project case studies, based on California building records, the author investigated the practicability and relative benefits of LID options for the portion of the region having soils potentially limiting to infiltration. The principal LID option applicable in this situation is roof runoff harvesting, supplement by dispersion of the roof water in single-home sites. Other site runoff would be treated by conventional stormwater best management practices (BMPs), as specified in the permit. The results showed that effectively managing roof runoff and treating the remainder with conventional BMPS can: (1) reduce annual runoff volumes by almost half to more than 3/4, depending on land use characteristics, with much of the water saved available for a beneficial use; and (2) decrease mass loadings of pollutants to receiving waters by 63 to over 90 percent, depending on pollutant and land use.

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INTRODUCTION

Background

A report titled Initial Investigation of the Feasibility and Benefits of Low-Impact Development Practices ("LID") for the San Francisco Bay Area used six representative development project case studies, based on California building records, to investigate the practicability and relative benefits of LID options for the majority of the region having soils potentially suitable for infiltration either in their natural state or after amendment using well recognized LID techniques. The results demonstrated that: (1) LID site design and source control techniques are more effective than conventional best management practices (BMPs) in reducing runoff rates; and (2) in each of the case studies, LID methods would reduce site runoff volume and pollutant loading to zero in typical rainfall scenarios.

For a broad regional assessment of relatively large scale use of soil-based, infiltrative LID practices, the initial report covered areas having soils in Natural Resources Conservation Service (NRCS) Hydrologic Soil Groups A, B, or C as classified by the Natural Resources Conservation Service (http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx). Depending on site-specific conditions, A and B soils would generally effectively infiltrate water without modification, whereas C soils could require organic amendments according to now standard LID methods. This supplementary report covers locations with group D soils, which are generally not amenable to infiltration, again depending on the specific conditions on-site. A minority but still substantial fraction of the Bay Area has group D soils (39.3, 68.0, 18.3, and 50.1 percent of the mapped areas of Alameda, Contra Costa, San Mateo, and Santa Clara Counties, respectively). Regarding any mapped soil type, it is important to keep in mind that soils vary considerably within small distances. Characteristics at specific locations can deviate greatly from

those of the major mapped unit, making infiltration potential either more or less than may be expected from the mapping. The soil survey data are regarded as appropriate for use in broad-scale assessments such as underlie this and the initial report, but once site-specific implementation begins, it is important to verify site conditions.

General Assessment Methods

The assessment for group D soils reported herein emphasizes the use of LID practices appropriate in areas with relatively restrictive soils to the greatest possible extent, supplemented by conventional stormwater management practices implemented at fully practicable, high levels of effectiveness. The assessment was performed in a manner analogous to the analysis for the other soil groups and as described in the initial report. To recap briefly, with respect to each of several development case studies, three assessments were undertaken: a baseline scenario incorporating no stormwater management controls; a second scenario employing conventional BMPs; and a third development scenario employing LID stormwater management strategies. In each assessment, annual stormwater runoff volumes were estimated, as well as concentrations and mass loadings (the products of concentrations times flow volumes) of four pollutants: (1) total suspended solids (TSS), (2) total recoverable copper (TCu), (3) total recoverable zinc (TZn), and (4) total phosphorus (TP). The results of the second and third assessments were expressed in terms of the extent to which the management practices would reduce pollutant concentrations and loadings and runoff volumes, converting stormwater discharge a potential beneficial use (direct consumption or, in the case of group A, B, C soil areas, groundwater recharge).

Six case studies were selected to represent a range of urban development types considered to be representative of the Bay Area. These case studies involved: a multi-family residential complex (MFR), a relatively small-scale (23 homes) single-family residential development (Sm-SFR), a restaurant (REST), an office building (OFF), a relatively large (1000 homes) single-family residential development (Lg-SFR), and a single home (SINGLE). The land cover types for these various land uses were derived from building permit and other public records from the Bay Area or elsewhere in California.

Adaptation of Methods for Areas with Group D Soils

A key LID technique in a setting with soils relatively restrictive to infiltration is water harvesting, which can be applied at larger scales in commercial and light industrial developments and at smaller residential scales using cisterns or rain barrels. Harvesting has been successful in reducing runoff discharged to the storm drain system and conserving water in applications at all scales. For example, in downtown Seattle the King County Government Center collects enough roof runoff to supply over 60 percent of the toilet flushing and plant irrigation water requirements, saving approximately 1.4 million gallons of potable water per year (http://www.psat.wa.gov/Publications/LID_studies/rooftop_rainwater.htm, http://dnr.metrokc.gov/dnrp/ksc_tour/features/features.htm). A much smaller public building in Seattle, the Carkeek Environmental Learning Center, drains roof runoff into a 3500-gallon cistern to supply toilets (http://www.harvesth2o.com/seattle.shtml). Collecting drainage from individual dwellings for household use is a standard technique around the world, particularly in areas deficient in rainfall and without affordable alternative sources.

An additional general category of LID practices for poorly infiltrating locations, applicable especially at single homes and other relatively small-scale developments, is runoff dispersion for storage in vegetation and soil until evapotranspiration and some infiltration occurs. Section C.3.c of the California Regional Water Quality Control Board San Francisco Bay Region "Administrative Draft" NPDES Municipal Regional Stormwater Permit ("the Permit") requires all single-family home projects that create and/or replace 5,000 square feet or more of impervious surface to implement one or more stormwater lot-scale BMPs from a selection of: (1) diverting roof runoff to vegetated areas; (2) directing paved surface runoff flow to vegetated areas; and/or (3) installing driveways, patios, and walkways with pervious material such as pervious concrete or pavers. Another way of distributing and dissipating roof runoff used successfully in varied soils in the state of Washington is the downspout dispersion system, consisting of a splash block or gravel-filled trench serving to spread roof runoff over a vegetated area (Washington Department of Ecology 2005 [Volume III, Section 3.1.2]).

The basis of the group D soils assessment was harvesting roof runoff to the maximum possible degree, supplemented in smaller-scale developments by runoff dispersion methods. The report asserts that, through these LID BMPs, it is practicable to prevent the entrance of any roof runoff into the municipal storm drain system in any soils setting in the Bay Area. In group D soils, infiltration likely cannot be relied upon to reduce runoff from other portions of developments, such as walkways, driveways, parking lots, access roads, and landscaping. Some water loss would undoubtedly occur, especially through evapotranspiration and at least some infiltration of runoff generated on or directed to landscaping. The analysis presented in this report does not take account of these losses and hence is somewhat conservative in estimating benefits.

As required by the Permit, any runoff not attenuated by harvest, evapotranspiration, or infiltration would be subject to quantity and quality controls. The analysis assumes that extended-detention basins (EDBs) with water residence times up to 72 hours would provide this control. EDBs are one of several general-purpose, conventional stormwater BMPs available for this service, others being wet ponds, constructed wetlands, sand or other media filters, and biofiltration swales and filter strips. The California Department of Transportation (Caltrans, 2004) tested the performance of all of these practices in its BMP Retrofit Pilot Program, conducted in San Diego and Los Angeles Counties. The initial report investigating LID for A, B, and C soils presented estimates of benefits for EDBs, swales, and filter strips, along with continuous deflective separation (CDS) units, a practice that effectively captures only large particulate pollutants. For brevity, this follow-up report focuses on just EDBs as the supplement to LID. In performance, EDBs tend to fall between swales and filter strips for total suspended solids, slightly lower than the other two BMP types for metals, and either between the two or comparable to swales for total phosphorus.

These practices were applied to the same six case studies used in the initial analysis and described in Table 1 of the first report. Two additional case studies were defined for the assessment reported here: a sizeable commercial retail installation (COMM) and an urban redevelopment (REDEV). The hypothetical COMM scenario consists of a building with a 2-acre footprint and 500 parking spaces. Parking spaces were estimated to be 176 sq ft in area, which corresponds to 8 ft width by 22 ft length dimensions. A simple, square parking lot with roadways around the four sides and a square building with walkways also around the four sides were assumed. Roadways and walkways were taken to be 20 ft and 6 ft wide, respectively. The REDEV case was taken from an actual project in Berkeley involving a remodel of an existing structure, built originally as a corner grocery store with apartments above and a large side yard, and the addition of a new building on the same site to create a nine-unit, mixed-use, urban infill project. Table 1 summarizes the characteristics of these two case studies. The table also provides the recorded or estimated areas in each land use and cover type.

Table 1. Characteristics and Land Use and Land Cover Areas of Added Case Studies

	COMM[a]	REDEV[a]
No. buildings	1	1
Total area (ft^2)	226,529	5,451
Roof area (ft^2)	87,120	3,435
No. parking spaces	500	2 uncovered
Parking area (ft^2)	88,000	316 uncovered
Access road area (ft^2)	23,732	-
Walkway area (ft^2)	7,084	350
Driveway area (ft^2)	-	650
Landscape area (ft^2)	20,594	700

[a] COMM—retail commercial; REDEV—commercial/residential infill

The assessment for group D soils employed the same methods as the earlier analysis to estimate annual stormwater runoff volumes and pollutant discharges. Please refer to the initial report for details on those

methods. The Natural Resource Conservation Service (NRCS, 1986) methodology cited in that report was applied to estimate that infiltration in group D soils would be roughly 60 percent of the amount through landscaping or the bed of a conventional BMP in C soils, which were the basis for establishing runoff coefficients in the first analysis. While that initial analysis was performed for both 14- and 20-inch average annual runoff zones, typical of different Bay Area locations, this supplementary work covered only the former condition. This simplification was made in the interest of brevity in this report, given that the first analysis showed almost no difference in conclusions between the two situations.

RESULTS OF THE ANALYSIS

Table 2 provides a comprehensive summary of the results. Rows shaded in gray compare runoff and pollutant discharges with and without treatment by CDS units, which can capture relatively large solids but have no mechanisms for dissolved substances and the finer particles. Having no soil contact and very limited residence time for evaporation, this BMP cannot reduce runoff volume at all. It can achieve some substantial reductions in TSS and TP for land uses relatively high in landscaped area but little removal of metals, especially copper.

The blue-shaded rows show the performance of conventional EDBs. In the group D soils considered in this analysis, they were estimated to reduce annual runoff volumes by 13-23 percent, the higher values for land uses with relatively small impervious footprints (OFF and REST). These BMPs can capture the majority of the long-term mass loading of most pollutants from most land uses in these soils, falling below 50 percent in reducing metals in stormwater flowing from residential developments.

Rows shaded in green present the results of applying LID BMPs appropriate for group D soils, roof runoff harvesting supplemented by dispersion in single-home land uses, plus treating the remaining runoff with EDBs. Comparing annual runoff volumes with and without LID, it can be seen that removing roof runoff from the storm drain system affords very significant benefits in reducing surface discharge and putting much of that water to productive use. Compared to directing all site runoff to EDBs, LID is expected to reduce volume by almost 10 times in the REDEV case, by about five times for the various residential land uses, 3.6 times for the large commercial development, and around twice for the OFF and REST cases. This management strategy can recover over 3/4 of the stormwater that would otherwise go down the drain in the intense redevelopment case, approximately 2/3 for the multi- and single-family residential cases, over half in the COMM development, and almost half in the office and restaurant cases with relatively small roof footprints.

Reduction of volume translates to decreases in pollutant loadings also. The combination of LID and EDB treatment is estimated to raise copper and zinc reductions to about 70 to over 90 percent in all except the developments with relatively low roof proportions (60-65 percent in these cases). TSS predictions come in at a quite consistent 75-82 percent across land uses. Total phosphorus estimates are a similarly consistent 63-71 percent, a bit higher in the highly impervious REDEV case.

Effectively managing roof runoff gives a way out of the dilemma posed by group D soils in the Bay Area. The analysis has demonstrated that harvesting this runoff stream, supplemented by ground dispersion techniques with sufficient space, shows strong promise to reduce the majority of flow inputs to municipal storm drain systems while conserving water. Moreover, this strategy can also stem the majority of solids, copper, zinc, and phosphorus transport to receiving waters.

Table 2. Runoff Volume and Pollutant Loading Reductions with Conventional and Low-Impact Development (LID) Best Management Practices (BMPs) for Eight Land Use Case Studies in Hydrologic Group D Soils

	COMM[a]	OFF[a]	REST[a]	REDEV[a]	MFR[a]	Lg-SFR[a]	Sm-SFR[a]	SINGLE
Total annual runoff with no BMPs (ac-ft)	5.29	0.80	0.47	0.12	8.57	75.66	1.74	0.10
Total annual runoff with CDS units[b] (reduction)	5.29 (0.0%)	0.80 (0.0%)	0.47 (0.0%)	0.12 (0.0%)	8.57 (0.0%)	75.66 (0.0%)	1.74 (0.0%)	0.10 (0.0%)
Total annual runoff with EDBs[b] (reduction)	4.43 (16.3%)	0.63 (21.3%)	0.36 (23.2%)	0.11 (8.1%)	7.48 (12.7%)	65.27 (13.7%)	1.50 (13.7%)	0.09 (13.3%)
Total annual runoff with LID[b] (reduction)	2.22 (58.0%)	0.44 (45.0%)	0.28 (40.4%)	0.03 (78.9%)	2.80 (67.3%)	26.72 (64.8%)	0.61 (64.8%)	0.04 (65.7%)
CDS TSS reduction[b, c]	19.4%	44.8%	33.9%	22.1%	27.1%	37.1%	37.1%	37.7%
CDS TCu reduction[b, c]	0.4%	11.0%	4.2%	0.9%	2.7%	7.3%	7.3%	7.6%
CDS TZn reduction[b, c]	25.3%	29.1%	25.5%	25.5%	24.1%	25.6%	25.6%	25.9%
CDS TP reduction[b, c]	25.9%	63.7%	54.3%	35.7%	46.7%	57.6%	57.6%	58.2%
EDB TSS reduction[b, c]	64.7%	78.1%	74.9%	66.5%	62.8%	70.3%	70.3%	70.9%
EDB TCu reduction[b, c]	57.9%	51.6%	56.4%	53.2%	51.4%	43.5%	43.5%	43.6%
EDB TZn reduction[b, c]	57.6%	49.6%	48.9%	58.1%	48.5%	47.7%	47.7%	48.0%
EDB TP reduction[b, c]	44.4%	67.6%	63.3%	52.8%	56.3%	64.4%	64.4%	64.7%
LID + EDB TSS reduction[b, c, d]	74.6%	80.3%	77.0%	81.5%	79.4%	81.3%	81.3%	81.8%
LID + EDB TCu reduction[b, c, d]	71.9%	60.3%	62.2%	82.3%	73.8%	68.9%	68.9%	69.5%
LID + EDB TZn reduction[b, c, d]	79.7%	65.1%	60.9%	92.3%	78.9%	76.4%	76.4%	77.0%
LID + EDB TP reduction[b, c, d]	63.1%	69.8%	66.0%	75.2%	69.4%	70.8%	70.8%	71.1%

[a] COMM—retail commercial; OFF—office building; REST—restaurant; REDEV—commercial/residential redevelopment; MFR—multi-family residential; Lg-SFR—large-scale single-family residential; Sm-SFR—small-scale single-family residential; SINGLE—single family home
[b] CDS— continuous deflective separation; EDBs—extended-detention basins; reduction—comparison with no BMPs
[c] TSS—total suspended solids; TCu—total recoverable copper; TZn—total recoverable zinc; TP—total phosphorus
[d] LID + EDB—roof runoff harvesting for COMM, OFF, REST, REDEV, AND MFR; harvesting supplemented by dispersion of roof runoff for Lg-SFR, Sm-SFR, and SINGLE; treatment of remaining runoff by EDBs

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INVESTIGATION OF THE FEASIBILITY AND BENEFITS OF LOW-IMPACT SITE DESIGN PRACTICES APPLIED TO MEET VARIOUS POTENTIAL STORMWATER RUNOFF REGULATORY STANDARDS

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Report to

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EXECUTIVE SUMMARY

STUDY DESIGN

A study was performed to investigate the degree to which stormwater management practices, commonly referred to as “low-impact development” methods or “green infrastructure,” can retain urban runoff and meet five possible regulatory standards that could be applied nationally. Retention is defined as preventing the conversion of precipitation to runoff discharging from a development site on the surface, from where it can enter a receiving water. Retaining runoff from impervious and pollutant generating pervious surfaces prevents the introduction of urban runoff pollutants to receiving waters as well as reduces runoff volume to prevent stream channel and habitat damage, flooding, and loss of groundwater recharge. ARCD methods were assessed for their ability to: (1-2) meet standards pertaining to retention of the runoff generated by the 85th and 95th percentile, 24-hour precipitation events; (3) retain 90 percent of the post-development runoff; and (4-5) retain the difference between the post- and pre-development runoff, both with and without a cap at the 85th percentile, 24-hour event. The study assessed five urban land use types (three residential, one retail commercial, and one infill redevelopment), each placed in four climate regions in the continental United States on two regionally common soil types.

Infiltrating bioretention was applied as an initial strategy in the analysis of each case. When the initial strategy could not fully retain post-development runoff, additional methods were applied, involving roof runoff harvesting in the most impervious development cases and roof water dispersion in those with substantial pervious area. Benefits were assessed with respect to reduction of the annual average surface runoff volume from the quantity estimated without any stormwater management practices, the associated maintenance of pre-development groundwater recharge, and water quality improvement achieved through preventing discharge to receiving waters of pollutants generated with developed land uses.

RETENTION AND POLLUTANT REDUCTION CAPABILITIES

The initial strategy of infiltrating bioretention could retain all post-development runoff and pre-existing groundwater recharge, as well as attenuate all pollutant transport, in the three residential land use development types on hydrologic soil group (HSG) B soils, in all cases, in all regions, taking a fraction of the available pervious area to do so. For the more highly impervious commercial retail and redevelopment cases, bioretention would retain about 45 percent of the runoff and pollutants generated and save about 40 percent of the pre-development recharge. Adding roof runoff management measures in these cases would approximately double retention and pollutant reduction for the retail commercial land use and raise it to 100 percent for the redevelopment. Results were generally similar with HSG C soils, although more of the pervious portion of sites was required to equal the retention seen on B soils.

For development on the D soils in all climate regions, use of roof runoff management techniques was estimated to increase runoff retention and pollutant reduction from zero to between about one-third to two-thirds of the post-development runoff generated, depending on the land use case. These strategies would offer little groundwater recharge benefit with this soil condition, but would still have the potential to significantly reduce runoff volume and pollutant loading.

ABILITY TO MEET STANDARDS

The projected ability to meet the five standards identified above was found to vary mostly in relation to soil type (B or C versus D) and the relative imperviousness of development. The ability to meet the five standards varied much less across climate regions. With B and C soils,

the methods considered were projected to meet all five standards in all but 12 of 125 evaluations. With D soils, however, only three standards could be met at all and those only occasionally. However, even on D soils, all cases for Standard 1 (retention of the 85th percentile, 24-hour precipitation event) were able to retain greater than 50 percent of the required runoff volume. Moreover, opportunities to use ARCD practices or site design principles not modeled in this analysis have the potential to further increase runoff retention volume.

Standard 3 (retain 90 percent of the average annual post-development runoff volume) would be the most environmentally protective standard. Meeting or coming as close as possible to meeting, but not exceeding, this standard was estimated to lead to 66-90 percent of total runoff retention and pollutant loading reduction on B and C soils and 37-66 percent runoff retention on D soils. Standard 2 (retain the runoff produced by the 95th percentile, 24-hour precipitation event) would yield equivalent protection on D soils and only slightly less protection with B and C soils. The outcome with this standard would also be more consistent region to region than with the alternative standard 1, based on the 85th instead of the 95th percentile precipitation event. Sites located on B or C soils were able retain the runoff produced by the 85th percentile storm in 24 of 25 cases modeled (in 18 of the 25 cases by using infiltrating bioretention alone), and were able to retain the runoff produced by the 95th percentile storm in 22 of 25 cases modeled.

Standards 4 and 5, based on the differential between pre- and post-development runoff volume, are inconsistent in retaining runoff and reducing pollutants, in that they are relatively protective where pre-development runoff is estimated to be low relative to post-development flow, but result in progressively lower retention and pollutant loading reduction as pre- and post-development volumes converge, such as in several cases on D soils. Standard 5 is especially weak in this regard. The potentially low level of retention and pollutant loading reduction renders these standards based on the change in pre- versus post-development runoff volume poor candidates for national application, at least as formulated in these terms.

In summary, standards 2 and 3 are clearly superior to the other three options from both a volume and pollutant load reduction standpoint. Standard 3 is entirely consistent from place to place in degree of environmental protection, and standard 2 does not deviate much. Analysis of the five development cases on two soil groups in each of four regions demonstrated the two standards are virtually identical in the runoff retention and pollutant loading reduction they would bring about. Of the remaining standards, standard 1 (retantion of the runoff produced by the 85th percentile storm event) remains more consistent across regions and more protective of water quality for development on D soils than either standard 4 or 5, and is preferable to those standards in this regard.

INTRODUCTION

GENERAL STUDY DESCRIPTION

Study Design

This purpose of this study was to investigate the degree to which low-impact development (LID) [1] practices can meet or exceed the requirements of various potential stormwater management facility design standards and to determine the environmental benefits that can be realized by applying these techniques. The investigation was performed by estimating the stormwater retention possible with full application of low-impact options under a range of conditions broadly representative of different regions within the United States and then determining the implications of the findings for achieving various standards and for providing benefits. Retention is defined as preventing the conversion of precipitation to surface runoff from urbanized land uses through infiltration, evapotranspiration, and/or harvesting for some water supply purpose. Retaining runoff from impervious and pollutant generating pervious surfaces prevents the introduction of urban runoff pollutants to receiving waters as well as reduces runoff volume to prevent stream channel and habitat damage, flooding, and loss of groundwater recharge. Benefits were assessed with respect to reduction of the potential developed land surface runoff volume, the associated maintenance of pre-development groundwater recharge, and water quality improvement achieved through preventing discharge to receiving waters of pollutants generated with developed land uses.

The potential regulatory standards investigated were capture and retention of, at minimum:

- Standard 1—The runoff produced by the 85th percentile, 24-hour precipitation event,[2] a standard commonly used in California;
- Standard 2—The runoff produced by the 95th percentile, 24-hour precipitation event, the standard adopted under Section 438 of the Energy Independence and Security Act;
- Standard 3—90 percent of the average annual post-development runoff volume;
- Standard 4—The difference between the post- and pre-development[3] average annual runoff volumes; and
- Standard 5—The difference between the post- and pre-development runoff volumes for all events up to and including the 85th percentile, 24-hour precipitation event.

Conditions broadly representative of the nation were selected by, first, considering the climate regions defined in USEPA's (1983) Nationwide Urban Runoff Project (NURP) report. For full analysis, climate regions 1 (Northeast-Upper Midwest), 3 (Southeast), 5 (South Central), and 6 (Southwest) were chosen as providing a wide range of climatological conditions and geographic distribution. Once the four regions were picked, a metropolitan area and a specific city in each were chosen to serve as typical models of development circumstances in the general area, as

[1] The National Research Council (NRC, 2009) renamed LID, also known as green infrastructure, as aquatic resources conservation design (ARCD), the term used henceforth in this report.

[2] The 85th percentile, 24-hour event represents the precipitation quantity in a 24-hour period not exceeded in 85 percent of all events in an extended record.

[3] In this study the pre-development state is taken as the typical land cover existing before European settlement of an area.

detailed in the Case Studies discussion below. In addition, region 7 (Pacific Northwest) was identified as an additional location to be discussed. This region is the site of a considerable amount of ARCD application in an area somewhat different climatologically than other selected regions, in having persistent winter rainfall totaling annually, in the major urban areas, intermediately among the other regions. Results of research on ARCD conducted in this region are discussed at several points in this report.

Soils and topography were the next considerations in developing broadly representative conditions. U.S. Department of Agriculture websites were the source of general soil characterizations for the study regions and specific soil survey data in and around the representative metropolitan areas. Soils generally represented some range in textural classes and associated hydraulic conductivities. For each region, a soil type predominating among those representing hydraulic conductivities relatively high and low for the region were selected to serve as a basis for the analyses. The effect of slope was also investigated but ultimately found not to affect results substantially.

Five types of urban development were selected to represent breadth in land use: (1) multi-family residential, (2) small-scale single-family residential, (3) large-scale single-family residential, (4) large-scale commercial, and (5) infill redevelopment. Building permit data from each region were consulted to determine typical distributions of site features for each (e.g., land cover by buildings, parking areas, roadways, walkways, driveways, landscaping).

Case studies thus comprised four climate regions, each with two soil conditions and five land use types, for a total of 40 permutations. For each, the ability of the site to accommodate soil- and vegetation-based ARCD practices was investigated. Runoff quantities were estimated and compared to the five potential regulatory standards. Annual mass loading discharges were estimated for four pollutants: total suspended solids (TSS), total recoverable copper (TCu) and zinc (TZn), and total phosphorus (TP). In any case where soil- and vegetation-based ARCD infiltration techniques appeared not to be able to attenuate all runoff, specific roof runoff management strategies were investigated as possible measures to achieve additional retention. Runoff quantities and pollutant discharges were recalculated based on use of these additional practices in place.

This report covers the methods employed in the investigation, data sources, and references for both. It then presents the results, discusses their consequences, draws conclusions, and makes recommendations relative to the feasibility of utilizing low-impact development practices to meet the respective potential regulatory standards.

AQUATIC RESOURCES CONSERVATION DESIGN PRACTICES

General Description

As the stormwater management field developed, it passed through several stages. First, it was thought that the key to success was to match post-development with pre-development peak flow rates, while also reducing a few common pollutants (usually, TSS) by a set percentage. Finding that these efforts generally required large ponds, but that they did not forestall impacts, stormwater managers next deduced that runoff volumes and high discharge durations would also have to decrease. Almost simultaneously, although not necessarily in concert, the idea of low-impact development arose to offer a way to achieve actual avoidance, or at least minimization, of discharge quantity and pollutant increases reaching far above pre-development levels. These methods reduce storm runoff and its contaminants by decreasing their generation

at sources, infiltrating into the soil or evaporating or transpiring[4] storm flows before they can enter surface receiving waters, and treating flow remaining on the surface through contact with vegetation and soil, or a combination of these strategies.

The National Research Council ("NRC") (2009) renamed LID as Aquatic Resources Conservation Design (ARCD) for several reasons. First, this term signifies that the principles and many of the methods apply not only to building on previously undeveloped sites, but also to redeveloping and retrofitting existing development. Second, incorporating aquatic resources conservation in the title is a direct reminder of the central reason for improving stormwater regulation and management. ARCD encompasses the complete range of practices to counteract all negative urban runoff impacts; i.e., the full suite of practices that emphasize and accomplish retention as defined above. These practices aim at decreasing surface runoff peak flow rates, volumes, and elevated flow durations, as well as avoiding or at least minimizing the introduction of pollutants to any surface runoff produced. Reducing the concentration of pollutants, together with runoff volume decrease, cuts the cumulative mass loadings (mass per unit time) of pollutants entering receiving waters over time.

The menu of ARCD practices begins with conserving, as much as possible, existing trees, other vegetation, and soils, as well as natural drainage features (e.g., depressions, dispersed sheet flows, swales). Clustering development to affect less land is a fundamental practice advancing this goal. Conserving natural features would further entail performing construction in such a way that vegetation and soils are not needlessly disturbed and soils are not compacted by heavy equipment. Using less of polluting materials, isolating contaminating materials and activities from contact with rainfall or runoff, and reducing the introduction of irrigation and other non-stormwater flows into storm drain systems are essential. Many ARCD practices fall into the category of minimizing impervious areas through decreasing building footprints and restricting the widths of streets and other pavements to the minimums necessary. Another important category of ARCD practices involves directing runoff from roofs and pavements onto pervious areas as sheet flow, where all or much of the runoff can infiltrate or evaporate in many situations.

Water can be harvested from impervious surfaces, especially roofs, and put to use for irrigation, non-potable indoor water supply. Harvesting is a standard technique for Leadership in Energy and Environmental Design (LEED) buildings (U.S. Green Building Council, 2008). Many successful systems of this type are in operation, with examples such as the Natural Resources Defense Council offices (Santa Monica, CA), the King County Administration Building (Seattle, WA), and two buildings on the Portland State University campus (Portland, OR). Harvesting is feasible at the small scale using rain barrels and at larger scales using larger collection cisterns and piping systems. These small-scale applications have been used throughout the world for centuries and are rapidly spreading in the United States today (See, e.g., Texas Water Development Board, 2005; Georgia Department of Community Affairs, 2009).

If these practices are used but runoff is still produced, ARCD offers an array of techniques to retain it on-site through infiltration and evapotranspiration (ET). The bioretention cell (rain garden) is the workhorse practice in this category, but swales conveying flow slowly, filter strips set up for sheet flows, and other modes are also important. Relatively low traffic areas can be constructed with permeable surfaces such as porous asphalt, open-graded Portland cement concrete, coarse granular materials, concrete or plastic unit pavers, or plastic grid systems to allow for infiltration.

[4] Transpiration refers to vaporization of water from plant tissue, while evaporation applies to vaporization from a liquid (e.g., pool) or solid (e.g., leaf) surface. The terms are often combined to form the compound evapotranspiration (ET).

ARCD practices should be selected and applied as close to sources as possible to stem runoff and pollutant production near the point of potential generation. However, these practices must also work well together and, in many cases, must be supplemented with strategies operating farther downstream. For example, the City of Seattle, in its "natural drainage system" retrofit initiative, built serial bioretention cells flanking relatively flat streets. "Cascades" of vegetated stepped pools created by weirs were installed along more sloping streets. In some cases the cells drain to downstream cascades. The upstream components are highly effective in attenuating most or even all runoff. Flowing at higher velocities on sloped surfaces, the cascades do not perform at such a high level, although under favorable conditions they can still infiltrate or evapotranspire the majority of the incoming runoff (Chapman 2006, Chapman and Horner 2010). Even if not as impressive statistically, cascades can actually decrease storm discharge to streams more than the cells do, because of their generally greater size. Also, the cascades extract pollutants from remnant runoff through mechanisms mediated by vegetation and soils. The success of Seattle's natural drainage systems demonstrates that well designed ARCD practices can mimic natural landscapes hydrologically, and thereby avoid raising discharge quantities.

A watershed-based program emphasizing ARCD practices would convey significant benefits beyond greatly improved stormwater management. ARCD techniques overall would advance water conservation, and infiltrative practices would increase recharge of groundwater resources. ARCD practices can be made attractive and thereby improve neighborhood aesthetics and property values. Retention of more natural vegetation can both save wildlife habitat and provide recreational opportunities. Municipalities could use the program in their general urban improvement initiatives, giving incentives to property owners to contribute to goals in that area while also protecting water resources.

A Catalogue of ARCD Practices

ARCD practices are numerous and expanding as existing configurations are applied in new ways. Table 1 presents a catalogue adapted from USEPA (2007) and NRC (2009). This catalogue contains practices that are not equally applicable in all settings; e.g., nevertheless, each category offers practices applicable in a broad variety of circumstances.

The best strategy for choosing among and implementing these practices is a decentralized, integrated one; i.e., selecting practices that fit together as a system, starting at or near sources and working through the landscape until management objectives are met. This strategy makes maximum possible use of practices in the first three categories, which prevent stormwater quantity and quality problems, and then selects among the remaining classifications in relation to the localized and overall site conditions. Source control and preservation of existing vegetation and soils obviously avoid post-development runoff quantity and pollutant increases from any portion of the site that can be so treated. Among all strategies, these best maintain natural infiltration and ET patterns and yield of materials flowing from the site. This preventive strategy is supplemented by strategies to create as little impervious cover as possible. The remaining practices then contend with the excess runoff and pollutants over pre-development levels generated by the development.

For the practices that infiltrate water, a site's soil characteristics and depth to groundwater can and should be determined through infiltration rate testing and excavation to determine the infiltration capability. Because of the often substantial variability of conditions around a site, these determinations should be made at multiple points. If the natural infiltration rate is low, generally < 0.5 inch/hour (< 1.25 cm/h, Geosyntec 2008), in many situations the soil can be amended, usually with organic compost, to apply an infiltrative practice.

In addition to soil characteristics, the position of the groundwater table is a crucial determinant of whether or not stormwater infiltration should be promoted by applying ground-based ARCD

practices. A seasonal high water table too close to the surface results in rapid saturation of a thin soil column and retarded infiltration. Ponding water longer than 72 hours can permit mosquito growth, damage vegetation, and promote clogging of the facility by microorganism growths and polysaccharide organic materials that form in the reduced-oxygen environment accompanying excessive ponding time (Mitchell and Nevo 1964, Ronner and Wong 1996). Also, storm runoff flow through a short soil column or very rapidly through a coarse-textured soil can convey contaminants to groundwater.

Evidence gathering from available performance data is that evapotranspiration (ET) can be a substantial factor in water retention (discussed below) but may be difficult to quantify at a given site without more research. A conservative approach is to design on the basis of infiltration rate, calculated to include consideration of soil amendments, if any. Together with careful investigation of soils and hydrogeologic conditions, this means of proceeding is very likely to produce facilities that retain at least as much runoff as predicted, and almost certainly more as a result of unquantified ET.

Table 1. A Catalogue of Aquatic Resources Conservation Design Practices (USEPA [2007] and NRC [2009])

Category	Definition	Examples
Source control	Minimizing pollutants or isolating them from contact with rainfall or runoff	• Substituting less for more polluting products • Segregating, covering, containing, and/or enclosing pollutant-generating materials, wastes, and activities • Avoiding or minimizing fertilizer and pesticide applications • Removing animal wastes deposited outdoors • Conserving water to reduce non-stormwater discharges
Conservation site design	Minimizing the generation of runoff by preserving open space and reducing the amount of land disturbance and impervious surface	• Clustering development • Preserving wetlands, riparian areas, forested tracts, and porous soils • Reducing pavement widths (streets, sidewalks, driveways, parking lot aisles) • Reducing building footprints
Conservation construction	Retaining vegetation and avoiding removing topsoil or compacting soil	• Minimizing site clearing • Minimizing site grading • Prohibiting heavy vehicles from driving anywhere unnecessary
Runoff harvesting	Capturing rainwater, generally from roofs, for a beneficial use	• Using storage and distribution systems (rain barrels or cisterns) for irrigation and/or indoor supply for public and private buildings
Natural runoff conveyance practices	Maintaining natural drainage patterns (e.g., depressions, natural swales) as much as possible, and designing drainage paths to increase the time before runoff leaves the site	• Emphasizing sheet instead of concentrated flow • Eliminating curb-and-gutter systems in favor of natural drainage systems • Roughening land surfaces • Creating long flow paths over landscaped areas • When flow must be concentrated, using vegetated channels with flow controls (e.g., check dams)
Practices for temporary runoff storage followed by infiltration and/or evapotranspiration[a]	Use of soil pore space and vegetative tissue to increase the opportunity for runoff to percolate to groundwater or vaporize to the atmosphere	• Bioretention cells (rain garden) • Vegetated swales (channel flow) • Vegetated filter strips (sheet flow) • Planter boxes • Tree pits • Infiltration basins • Infiltration trenches • Roof downspout surface or subsurface dispersal • Permeable pavement • Vegetated (green) roofs
ARCD landscaping[b]	Soil amendment and/or plant selection to increase storage, infiltration, and evapotranspiration	• Organic compost soil amendments • Native, drought-tolerant plantings • Reforestation • Turf conversion to meadow, shrubs, and/or trees

[a] Some of these practices are also conventional stormwater BMPs but are ARCD practices when ARCD landscaping methods are employed as necessary to maximize storage, infiltration, and evapotranspiration. The first five examples can be constructed with an impermeable liner and an underdrain connection to a storm sewer, if full retention is technically infeasible (see further discussion later). Vegetated roofs store and evapotranspire water but offer no infiltration opportunity, unless their discharge is directed to a secondary, ground-based facility.

[b] Selection of landscaping methods depends on the ARCD practice to which it applies and the stormwater management objectives, but amending soils unless they are highly infiltrative and planting several vegetation canopy layers (e.g., herbaceous growth, shrubs, and trees) are generally conducive to increasing storage, infiltration, and evapotranspiration.

Application of ARCD Practices in This Study

The investigation performed for this study first assessed the capacity of each case study site to infiltrate the full average annual post-development storm runoff volume and thereby reduce pollutant releases to zero. The report terms this initial evaluation as the "Basic ARCD Analysis". The means of infiltration was not distinguished at this level of analysis. For example, it was not specified if runoff would be distributed in sheet flow across a pervious area or channeled into a rain garden. As detailed later in the Methods of Analysis section, this analysis was limited to the estimated infiltration capacity of the case study soil type, possibly compost-amended, and the available pervious area.

Critically, there was no attempt to estimate the loss of surface runoff through ET in the Basic ARCD analysis (ET is considered, to address rooftop runoff only, as part of our "Full ARCD analysis," discussed below). In general, the estimated mean annual evapotranspiration in the Southeast is about 70 percent of the precipitation, or roughly 35 inches per year. For large areas of the Southwest, evapotranspiration is virtually equal to 100 percent of the precipitation, which is only about 10 inches per year. The ratio of estimated mean annual evapotranspiration to precipitation is least in the mountains of the Pacific Northwest and New England where evapotranspiration is about 40 percent of the precipitation (Hanson, 1991). By leaving out these substantial losses, generally 40 percent of precipitation or more, the retention estimates in this study can be considered quite conservative.

Additionally, there was no consideration of many ARCD practices in the Table 1 catalogue that could be applied in site-specific design. For example, there were no refinements of the prevailing building standards to reduce street widths or cluster buildings and reduce their footprints. Further, green roofs were not considered in this study, although they are already making a contribution to runoff reduction around the nation and reflect a significant additional opportunity to retain runoff on-site. The U.S. EPA has stated that "a 3.5-4 in. (8 -10 cm) deep green roof can retain 50% or more of the annual precipitation." (U.S. EPA, 2009a). For water quality, we did not assume any source control implementation. Thus, actual site design could take advantage of substantial additional capabilities not considered in this study.

In cases where the practices incorporated in the initial level of analysis (infiltration through bioretention) did not, according to the estimates, fully attenuate post-development pollutant discharges, specific attention was directed at ways of extracting additional water from surface discharge by managing roof runoff. This assessment is called the "Full ARCD Analysis" in the report. The options broadly divide into harvesting water for a purpose such as irrigation and/or non-potable indoor supply, or making special provisions to infiltrate or evapotranspire roof runoff even if soil conditions are limiting. Harvesting applies best to relatively large developments having sufficient demand for the collected water. While single-family residences can harvest water into rain barrels or cisterns for lawn and garden watering, these containers may be small in volume relative to runoff production; and though opportunity exists, no credit was taken for them in this study. However, even in poorly infiltrating soils, options exist to disperse house roof runoff as sheet flow for storage in vegetation and soil until evapotranspiration and some infiltration occurs.

CASE STUDIES

CLIMATE REGIONS

Basis of Selection

The Nationwide Urban Runoff Project divided the nation into nine regions based on differences in volume, intensity, and duration of precipitation and interval between precipitation events (USEPA 1983). For broad representation of the U.S. generally this study chose regions 1 (Northeast-Upper Midwest), 3 (Southeast), 5 (South Central), and 6 (Southwest) for analysis. Table 2 provides the annual precipitation statistics from the NURP compilation.

Table 2. Precipitation Statistics (Means) for Four NURP Regions Selected for Study (USEPA 1983)

Region	Volume (inch)	Intensity (inch/hour)	Duration (hours)	Interval (hours)
1—Northeast-Upper Midwest	0.26	0.051	5.8	73
3—Southeast	0.49	0.102	5.2	89
5—South Central	0.33	0.080	4.0	108
6—Southwest	0.17	0.045	3.6	277

The selected regions represent a volume differential of about a factor of three, intensity variation of approximately two times, and inter-storm interval varying by almost four times. The NURP report shows coefficients of variation (mean/standard deviation) of greater than 1.0 for all of these means, indicating an overall high degree of dispersion.

Figure 1 visually depicts variation in mean annual precipitation across the continental United States. It shows that the selected regions are overall representative of the broadly prevailing range across the nation, particularly its major urban and still urbanizing areas.

Region 7 (Pacific Northwest) was also identified for discussion of research results on ARCD, although not full analysis. It has less intense (mean 0.024 inch/hour) but much more extended (mean 20.0 hours) precipitation compared to any other region in the nation. Mean storm volume ranks with region 3 (mean 0.48 inch); but fewer storms, especially in the summer, yield overall less total annual precipitation in lowland areas holding all urban development in region 7. It was of interest because of the already occurring use of ARCD techniques in a relatively rainy part of the country.

Representative Metropolitan Areas and Cities

Once the regions were identified, a metropolitan area within each area was chosen as a basis for assigning specific precipitation and development characteristics. The areas considered were USEPA-designated Urban Areas: “An urbanized area is a land area comprising one or more places – central place(s) – and the adjacent densely settled surrounding area – urban fringe – that together have a residential population of at least 50,000 and an overall population density of at least 1,000 people per square mile” (USEPA 2007). Stormwater regulations would have the most impact in areas that are being quickly developed, redeveloped, or both. Five of the twenty fastest growing counties in the nation from 2000 to 2009 were near Atlanta, GA and five were in the state of Texas (U.S. Census Bureau 2010). These statistics factored into the decision to focus on records from these regions.

Each selected metropolitan area is generally representative of its region in precipitation and development characteristics. Each is also undergoing relatively active new development and redevelopment, offering candidate locations where a prospective stormwater standard would frequently be applied. These metropolitan areas are: region 1—Boston, MA, region 3—Atlanta, GA, region 5—Austin, TX, and region 6—San Diego, CA

Figure 1. Precipitation of the Conterminous States of the United States, National Atlas of the United States, 2011.

Finally, a city with a high rate of development (and often redevelopment) was picked in each metropolitan area for investigation of building patterns and standards. The intent was to match regional patterns of climate, soils (see discussion on physiographic data, below), and land use and land cover realistically. After substantial investigation, the conclusion was that building standards, how land is used, and the relative allocation of impervious and pervious lands do not vary in any systematic way across the nation and cannot be regionally distinguished. Therefore, the variables of interest came down to precipitation and soils.

Alpharetta, about 30 miles north of Atlanta, represents that metropolitan area. In 1981 it was a small town of approximately 3,000 residents but grew to 51,243 by 2007. During the workday, the city swells to more than 120,000 residents, workers, and visitors. Alpharetta is home to large corporations such as AT&T (3500 employees), Verizon Wireless (3000 employees), and ADP, Inc./National Account Services (2100 employees). Infill redevelopment projects are anticipated in the downtown area (City of Alpharetta, 2011).

Round Rock is a typical developing city located 15 miles to the north of Austin, TX. In 1970 there were only 2,700 residents in this town, while today the population exceeds 100,000. Round Rock is the eighth-fastest growing city in the nation and the location of several large corporate campuses.

The Town of Framingham, 20 miles west of Boston, represents the northeastern climate zone. At nearly 67,000 inhabitants, Framingham is the largest entity designated as a “town” in the Commonwealth of Massachusetts. It is home to three large corporations and overall 2200 businesses providing 45,000 jobs. Differing greatly from the representative communities in

other regions, Framingham was incorporated in 1700 and developed early in the nation's history. Today's activity includes redevelopment of brownfields and downtown revitalization, although some agricultural land still remains within the town limits (Town of Framingham, 2011).

San Marcos, representing the San Diego area and located about 35 miles north of the city, grew from a population of 17,479 in 1980 to 82,743 by 2008. Major institutions in the city include California State University San Marcos and Palomar Community College. At this stage the city is only approximately 72 percent built out, and thus new development continues (City of San Marcos, 2011).

Precipitation Data

Average monthly precipitation data were obtained from the NOAA Hourly Precipitation Data Rainfall Event Statistics[5] for one station with a long-term record in each region: Southeast—Atlanta/Hartsfield International Airport (Station #90451), South Central—Austin/Robert Mueller Municipal Airport (410428), Northeast—Boston/Logan International Airport (190770), and Southwest—San Diego/San Diego International Airport (Lindbergh Field) (47740). Atlanta receives the most precipitation, averaging about 49 inches per year, followed by Boston (47 inches/year), Austin (33 inches/year), and San Diego (10 inches/year). Figure 2 depicts precipitation variations over more than 50 years.

Values for either the 85th and 95th percentile, 24-hour storms were available in a number of state-specific resources, including the Georgia Stormwater Standards Supplement (Center for Watershed Protection 2009) and the Integrated Stormwater Management Program (North Central Texas Council of Governments 2010), as well as national publications such as an USEPA's technical guidance documents (USEPA 2009). However, few references had values for both 85th and 95th percentile storms. Therefore, these values were calculated following the methodology outlined in the USEPA's Technical Guidance on Implementing the Stormwater Runoff Requirements (USEPA 2009, page 30). Daily precipitation and temperature data from the National Climatic Data Center's TD Summary of the Day data set were collected and analyzed for the four stations lover a time period of 60 years, January 1, 1950 to January, 31 2010.

[5] National Climatic Data Center, Hourly Precipitation Data Rainfall Event Statistics (http://cdo.ncdc.noaa.gov/cgi-bin/HPD/HPDStats.pl, last accessed December 15, 2011).

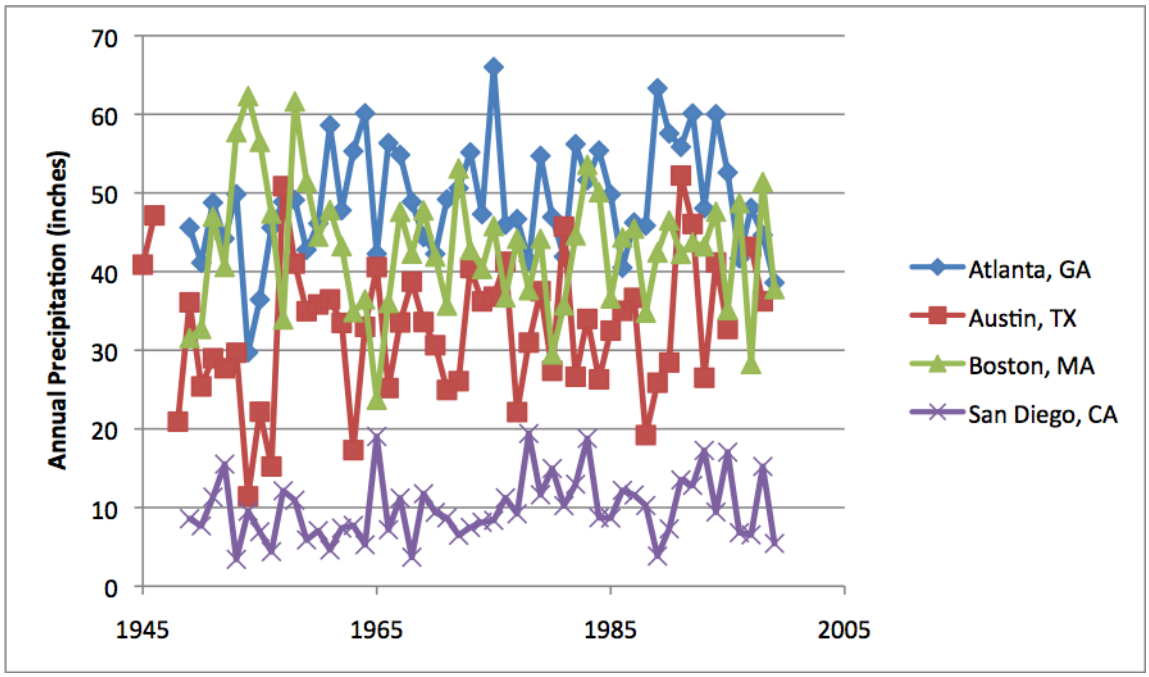

Figure 2. Average Annual Precipitation for Four Climate Regions over the Latter Part of the Twentieth Century (from NOAA Hourly Precipitation Data Rainfall Event Statistics, http://cdo.ncdc.noaa.gov/cgi-bin/HPD/HPDStats.pl)

For snowfall days, snow water equivalent (SWE) was calculated according to the guidelines provided by a National Climate Data Center's (NCDC) document, Estimating the Water Equivalent of Snow, utilizing the reported mean temperature for the day (National Climatic Data Center, accessed December 16, 2011). The NCDC tables calculate that the SWE is at most, about 10 percent of the total snowfall depth. In the methodology for determining the 85th and 95th percentile events, all days with < 0.1 inch precipitation are removed, lowering the impact of snow on the results. Snowfall had no effect in the Southwest region, a very minor effect in the Southeast and South Central, and still a relatively small effect in the Northeast, as follows: San Diego—0 snow days; Atlanta—74 of 4600 total days having ≥ 0.1 inch (1.6 percent), with a contribution ranging 0.01-0.79 inch precipitation; Austin—32 of 2418 days (1.3 percent), contributing 0.01-0.50 inch; and Boston—993 of 4783 days (20.8 percent), contributing 0.01-2.24 inch. Since snow does add to runoff that must be managed in a location like the Northeast, these snow water equivalents were left in the records. Table 3 summarizes precipitation data used in the analyses for the four regions.

Table 3. Precipitation Summary for Study Regions

Region	Average Annual Precipitation (inches)	85th Percentile, 24-Hour Event		95th Percentile, 24-Hour Event	
		Depth (inch)[a]	Fraction Covered[b]	Depth (inch)[a]	Fraction Covered[b]
Southeast	49.02	1.13	0.63	1.79	0.87
South Central	32.67	1.19	0.58	1.99	0.82
Northeast	47.03	1.07	0.81	1.72	0.89
Southwest	9.68	0.76	0.62	1.26	0.83

[a] Calculated from National Climatic Data Center's TD Summary of the Day, for all precipitation days >0.1 inch for period January 1, 1950 – December 31, 2009
[b] Fraction of total annual precipitation covered by event standard

Physiographic Data

General Methods

This section of the report covers the soils, groundwater, and topographic data underlying the analyses. Soil characteristics are largely a product of climate, geology and topography. The characteristics of most interest for this study were those controlling infiltration of surface water and percolation to an aquifer. Although there is variation within each climate region, the major soil orders can be used to identify regional characteristics. The Natural Resources Conservation Service (NRCS) website[6] describing the major soil orders and their locations was the initial source of these data. Maps generated by Miller and White (1998) gave information from the State Soil Geographic Database (STATSGO), including characteristics such as soil texture and hydrologic soil group. These resources were employed to gain a broad view of the soils in each of the four regions.

To extend the scope of the study, soils were investigated in the Upper Midwest, in addition to the Southeast, South Central, Northeast, and Southwest climate regions. Upper Midwest and Northeast soils share general similarities. Both regions also have temperate, seasonal, humid climates. While average annual precipitation is overall somewhat greater in the Northeast compared to the Upper Midwest, the two regions were deemed similar enough physiographically and climatologically to be considered together. This report henceforth groups them as the Northeast – Upper Midwest climate region.

To validate the regional patterns emerging from the general sources, custom "soil resource" reports for four cities were generated using the NRCS Web Soil Survey[7] tool. These reports collected characteristics related to infiltration rates and runoff including soil texture, hydrologic soil group, drainage classification, representative slope, and depth to water table. Using this tool requires selecting an "area of interest". This examination utilized a size of at least 8,000 acres (10,000 acres is the maximum allowed) to insure a representative sample of soil and related conditions.

Hydrologic soil group assignment is a means of generally categorizing soils according to their tendency to admit and transmit water. The hydrologic soil group (HSG) is determined with respect to the water-transmitting soil layer with the lowest saturated hydraulic conductivity and depth to any layer that is more or less water impermeable (such as a fragipan or duripan) or depth to a water table. Box 1 summarizes the characteristics of the four HSGs (NRCS 2007).

The position of the groundwater table is a crucial determinant of whether or not stormwater infiltration should be promoted by applying ground-based ARCD practices. A seasonal high water table too close to the surface results in rapid saturation of a thin soil column and retarded infiltration. Ponding water longer than 72 hours can permit mosquito growth, damage vegetation, and promote clogging of the facility by microorganism growths and polysaccharide organic materials that form in the reduced-oxygen environment accompanying excessive ponding time (Mitchell and Nevo 1964, Ronner and Wong 1996). Also, storm runoff flow through a short soil column or very rapidly through a coarse-textured soil can potentially convey contaminants to groundwater. To avoid entertaining stormwater management strategies threatening development of these problems, data on depth to groundwater was obtained from the U.S. Geological Survey's (USGS) Groundwater-Level Annual Statistics (USGS 2011).

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[6] Natural Resources Conservation Service, Distribution Maps of Dominant Soil Orders (http://soils.usda.gov/technical/classification/orders/, last accessed December 16, 2011).

[7] Natural Resources Conservation Service, 2011, Web Soil Survey (http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm).

Topographic slope influences runoff production by setting incident precipitation in motion downslope, thus producing a horizontal component of velocity vector partially counteracting the tendency to penetrate the soil vertically. This study investigated that importance of that effect by considering two slopes typical of urban development sites. As discussed during the presentation of results, below, this factor did not have a large effect on the analysis.

Box 1. Summary of Hydrologic Soil Groups (NRCS 2007)

Group A—Soils in this group have low runoff potential when thoroughly wet. Water is transmitted freely through the soil. Group A soils typically have less than 10 percent clay and more than 90 percent sand or gravel and have gravel or sand textures. Some soils having loamy sand, sandy loam, loam or silt loam textures may be placed in this group if they are well aggregated, of low bulk density, or contain greater than 35 percent rock fragments. The saturated hydraulic conductivity of all soil layers exceeds 5.67 inches per hour. The depth to any water-impermeable layer is greater than 20 inches. The depth to the water table is greater than 24 inches. Soils deeper than 40 inches to a water-impermeable layer are in group A if the saturated hydraulic conductivity of all soil layers within 40 inches of the surface exceeds 1.42 inch per hour.[a]

Group B—Soils in this group have moderately low runoff potential when thoroughly wet. Water transmission through the soil is unimpeded. Group B soils typically have between 10 percent and 20 percent clay and 50 percent to 90 percent sand and have loamy sand or sandy loam textures. Some soils having loam, silt loam, silt, or sandy clay loam textures may be placed in this group if they are well aggregated, of low bulk density, or contain greater than 35 percent rock fragments. The saturated hydraulic conductivity in the least transmissive layer between the surface and 20 inches ranges from 10.0 1.42 to 5.67 inches per hour. The depth to any water-impermeable layer is greater than 20 inches. The depth to the water table is greater than 24 inches. Soils deeper than 40 inches to a water- impermeable layer or water table are in group B if the saturated hydraulic conductivity of all soil layers within 40 inches of the surface exceeds 0.57 inch per hour but is less than 1.42 inch per hour.

Group C—Soils in this group have moderately high runoff potential when thoroughly wet. Water transmission through the soil is somewhat restricted. Group C soils typically have between 20 percent and 40 percent clay and less than 50 percent sand and have loam, silt loam, sandy clay loam, clay loam, and silty clay loam textures. Some soils having clay, silty clay, or sandy clay textures may be placed in this group if they are well aggregated, of low bulk density, or contain greater than 35 percent rock fragments. The saturated hydraulic conductivity in the least transmissive layer between the surface and 20 inches is between 0.14 and 1.42 inch per hour. The depth to any water-impermeable layer is greater than 20 inches. The depth to the water table is greater than 24 inches. Soils deeper than 40 inches to a restriction or water table are in group C if the saturated hydraulic conductivity of all soil layers within 40 inches of the surface exceeds 0.06 inch per hour but is less than 0.57 inch per hour.

Group D—Soils in this group have high runoff potential when thoroughly wet. Water movement through the soil is restricted or very restricted. Group D soils typically have greater than 40 percent clay, less than 50 percent sand, and have clayey textures. In some areas, they also have high shrink-swell potential. All soils with a depth to a water-impermeable layer less than 20 inches and all soils with a water table within 24 inches of the surface are in this group, although some may have a dual classification if they can be adequately drained. For soils with a water-impermeable layer at a depth between 20 and 40 inches, the saturated hydraulic conductivity in the least transmissive soil layer is less than or equal to 0.14 inch per hour. For soils deeper than 40 inches to a restriction or water table, the saturated hydraulic conductivity of all soil layers within 40 inches of the surface is less than or equal to 0.06 inch per hour.

[a] While Group A soils are present across large areas of the country, our analysis considers only Group B, C, and D soils to provide a conservative assessment of infiltration potential in urban areas, and to account for potential issues such as soil compaction that may occur for lawn and other landscaping in urban and suburban development.

Southeast Climate Region

The major soil order found throughout the southeastern United States is Utisols, sub-order Udults. The humid climate with frequent rainfall gives the soils an udic moisture regime; soils are rarely dry for more than 45 consecutive days. Utisols are highly weathered and are deficient in calcium and other bases. Georgia is known for its red soils, which are the unhydrated iron oxides left in the weathered material. Pre-European contact, these soils supported mixed conifer and deciduous woodlands. Due to its relatively flat topography and warmer temperatures, Florida has primarily Spodosols, Alphisols and Histosols (Soil Survey Staff, NRCS 2011).

This region has a variety of soil textures, ranging from sand and sandy loam throughout Mississippi, Alabama, and Georgia; silty loam soils near the Appalachian Mountains; and some areas with significant organic materials in Florida. The major soil hydrologic groups of the region are varied as well, with C and D soils dominating the Georgia coastline and most of Florida. Group A and B soils are more prevalent in the interior parts of the region, in central Georgia and Alabama (Miller and White 1998).

A NRCS web soil survey was conducted for an area of interest (AOI) centered in Alpharetta, GA. The selected AOI did not have complete soil survey coverage, and findings were compared with another AOI of 8990.5 acres north of the city in Fulton County. In both AOIs, the leading HSG is B (86 percent of AOI), followed by group C (11 percent of AOI). Approximately 97 percent of the AOI has a sandy loam soil texture. The leading drainage classification was well drained (86 percent of AOI), followed by somewhat poorly drained (10 percent of AOI). The selected AOI was moderately steep, with approximately 70 percent of the AOI having slopes between 8 and 12 percent.

Fulton County, Georgia has four wells in the USGS record, three with depth-to-groundwater data. Two wells have only one recorded depth: site 08CC08 had a depth of 2.447 ft in 1986, and site 10DD01 had a depth of 16.131 ft in 1968. Site 10DD02 has been monitored annually from 1977-2010 and has an annual well-depth average in this time period of 6.292 ft.

South Central Climate Region

The major soil order in Texas is Mollisols, sub-order ustolls. These soils span the sub-humid and semiarid climate zones, and are common on the western Great Plains and throughout the Rocky Mountain States. These soils originally supported grasslands and (in mountainous regions) forests, and now are ranched or farmed. Houston black soils are also characteristic of the region and are important in agriculture and urban areas, occurring throughout central Texas. Dry soils in the Order Aridisols, sub-orders Argids and Calcids, are found in west Texas and large portions of New Mexico as well. These soils were formerly sparsely vegetated areas, now used for rangeland or wildlife habitat (Soil Survey Staff, NRCS 2011).

Soil characteristic maps generated by Miller & White (1998) indicate that the majority of soil types in the South Central climate region are diverse: sandy loam and clay dominate eastern Texas, clay soils are prevalent in central parts of the state and loam soils are in western Texas and New Mexico. Most soils tend to be in the C and D hydrologic groups, however B soils are found in bands in New Mexico (Miller & White, 1998).

A web soil survey was conducted for an area of interest of 8267.5 acres centered in Round Rock, TX. The leading HSG is D (68 percent of AOI), followed by group C (22 percent of AOI) and group B (10 percent). Primary soil textures are clay (33 percent), silty clay (27 percent), extremely stony clay (17 percent), and silty clay loam (10 percent). The leading drainage classification is well drained (79 percent of AOI) followed by moderately well drained (21

percent). The selected AOI is relatively flat; approximately 70 percent of the AOI has slopes under 2 percent, and 20 percent has slopes of 3-4 percent.

Travis County, Texas had three wells that were measured in 2003 and recorded by USGS (site YD-58-50-216) and 2004 (sites YD-58-50-216 and YD-58-25-907). Groundwater is very deep in each location, averaging 220 ft below the ground surface.

Northeast – Upper Midwest Climate Region

This climate region has significant variation in dominant soil orders. The Spodsols order, sub-order Orthods, dominates the northern portions (northern Minnesota, Wisconsin, Michigan, Vermont, and Maine) and is generally considered infertile without soil amendments. Inceptisols, sub-order Udepts, are also prevalent in the region, especially in New England states, through the Appalachian Mountains and northeastern Minnesota. Alfisols, sub-order Udalfs, too are prevalent in the region, extending from Minnesota east to New York. These two soils both have an udic moisture regime, and are rarely dry for more than 45 consecutive days due to the year-round precipitation in the area (Soil Survey Staff, NRCS 2011). The state soil of Massachusetts is the Paxton fine sandy loam and also extends into New Hampshire, New York and Vermont. These deep soils were formed in acid subglacial till and are derived from schist, gneiss and granite (NRCS undated).

Based on maps generated by Miller and White (1998), sandy loam and silt loam soils tend to dominate the region, with small areas of clay and silty clay soils. Hydrologic soil group B is most prevalent in the Midwestern states (Minnesota, Wisconsin, Illinois), and Group C is most common in the rest of the region, spanning from Indiana to Maine. The region primarily supported forest ecosystems before development.

A web soil survey was conducted for an area of interest centered in Framingham, MA with an AOI of 8645.6 acres. The region has relatively equal amounts of each HSG: 20 percent of the AOI in Group A, 19 percent in group B, 20 percent in Group C, and 24 percent in Group D. Soil textures represented are fine sandy loam (49 percent), muck (10 percent), loamy sand (9 percent), and moderately decomposed plant material (8 percent). The leading drainage classification is well drained (32 percent of AOI) followed by very poorly drained (16 percent), somewhat excessively drained (12 percent), and moderately well drained (11 percent). Fourteen percent of the AOI has slopes of 1 percent or less, with 18 percent at 2-5 percent, 23 percent at 6-8 percent, and another 23 percent at 8-12 percent slopes.

There are three wells in the USGS record for Middlesex County, MA including 5 years of record for an Acton well averaging 17.75 ft, 6 years for the Wakefield well with an average depth of 6.59 ft, and 11 years at the Wilmington well with an average of 8.09 ft.

Southwest Climate Region

There are multiple soil orders in California due to its variation in climate, topography and geologic history. Entisols occur in the southern parts of the state; sub-order Psamments is a frequently found sandy soil that makes productive rangeland. Order Mollisols, sub-order Xerolls, are freely drained and dry soils found in the Mediterranean climate along the coast of California. Pre-settlement ecosystems supported by these soils include oak savanna, grasslands, and chaparral. Current soils may be used as cropland or rangeland (Soil Survey Staff, NRCS 2011).

A web soil survey was conducted for an 8267.5-acre area of interest centered in San Marcos, CA. The leading HSG is D (58 percent of AOI), followed by group C (26 percent) and group B (14 percent). Soil texture include sandy loam (19 percent), coarse sandy loam (17 percent), silt loam (15 percent), very fine sandy loam (14 percent), loamy fine sand (12 percent), loam (7

percent), and clay (5 percent). The leading drainage classification is well drained (51 percent of AOI), followed by moderately well drained (34 percent). Approximately 10 percent of the AOI has slopes ≤ 5 percent, and 66 percent has slopes of 5-10 percent.

There are no groundwater records for San Diego County available on the USGS website. Data were collected from the California Department of Water Resource Water Data Library[8]. Ten wells west of San Marcos near Escondido were sampled in 1987. The depth to groundwater ranged from 2.0 to 28.1 ft for an average of 11.6 ft.

Summary of Physiographic Characteristics

Due to the large area of land encompassed in each climate region, it is difficult to select one location that is truly "representative" of the entire region. By selecting four cities that are spaced throughout the country with different climate and soil characteristics, however, this study can demonstrate the different potential for ARCD strategies in regions around the nation. Table 4 summarizes the major soils, groundwater, and topographic characteristics for these regions. Figure 3 shows the distributions of hydrologic soil groups in areas of interest investigated in the four metropolitan areas.

Table 4. Summary of Physiographic Data

Characteristic	Southeast	South Central	Northeast – Upper Midwest	Southwest
Main soil types	Sandy loam	Clay, clay loam	Sandy loam, silt loam	Sandy loam, loam
Hydrologic soil group near study site	B (GA, AL, SC)	D (TX)	C (Northeastern states)	D
Other hydrologic soil group in climate region	D (FL)	C (NM)	B (MN, WI, IL, MI)	C
Predominant pre-development land cover	Woods	Semi-arid herbaceous	Woods	Narrow-leaved chaparral
Predominant slopes	70% @ 8-12%	90% < 4%	65% < 12%	76% < 10%

LAND USE CASES

Five cases were selected to represent a range of urban development types considered to be representative of the nation. These cases involved: a multi-family residential complex (MFR), a relatively small-scale (23 homes) single-family residential development (Sm-SFR), a relatively large (1000 homes) single-family residential development (Lg-SFR), a sizeable commercial retail installation (COMM), and an urban redevelopment (REDEV).

Building permit records from the City of San Marcos in San Diego County, California provided data on total site areas for the first three cases, including numbers of buildings, building footprint areas (including porch and garage for Sm-SFR), and numbers of parking spaces associated with the development projects. Information was not as complete for cities in other regions, but what data was available indicated no substantial difference in these site features. Therefore, the San Marcos data were used for all regional case studies. This uniformity had the advantage of placing comparisons completely on the basis of the major variables of interest, climatological and soils characteristics.

[8] http://www.water.ca.gov/waterdatalibrary (last accessed December 16, 2011).

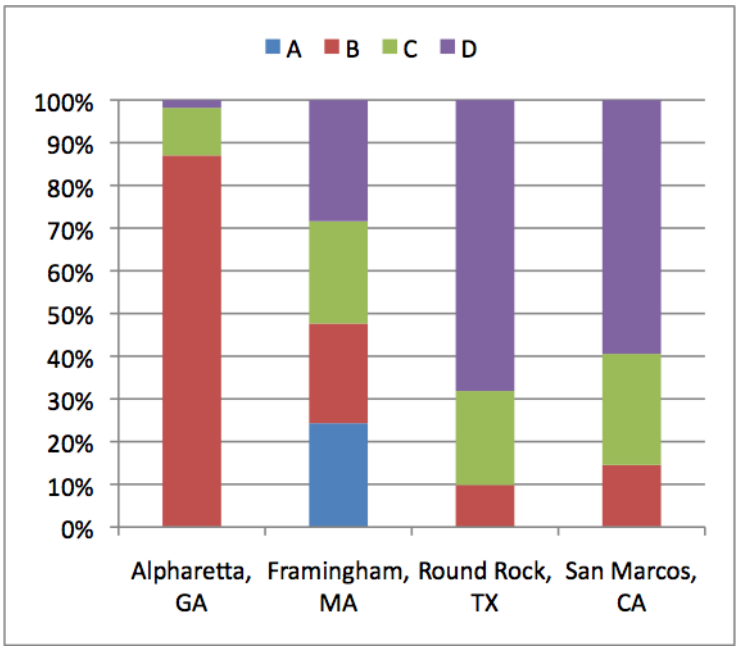

Figure 3. Distribution of Hydrologic Soil Groups in Four Study Cities

The REDEV case was taken from an actual project in Berkeley, California involving conversion of an existing structure, built originally as a corner grocery store, to apartments and addition of a new building to create a nine-unit, mixed-use, urban infill project. Space remained for a large side yard.

Larger developments were not represented in the sampling of building permits from the San Marcos database. To take larger development projects into account in the subsequent analysis, the two larger scale cases were hypothesized. The Lg-SFR scenario scaled up all land use estimates from the Sm-SFR case in the ratio of 1000:23. The hypothetical COMM scenario consisted of a building with a 2-acre footprint and 500 parking spaces. As with the smaller-scale cases, these hypothetical developments were assumed to have roadways, walkways, and landscaping, as described below.

While the building permit records made no reference to features such as roadways, walkways, and landscaping normally associated with development projects, these features were taken into account in the case studies using assumptions described herein. Parking spaces were estimated to be 176 square ft in area, which corresponds to 8 ft width by 22 ft length dimensions. Code requirements vary by jurisdiction, with the tendency now to drop below the traditional 200 square ft average. About 180 square ft is common, but various standards for full- and compact-car spaces, and for the mix of the two, can raise or lower the average (Gibbons, 2009). The 176 square ft size is considered to be a reasonable value for conventional practice.

Roadways and walkways assume a wide variety of patterns. Exclusive of the two SFR cases, simple, square parking lots with roadways around the four sides and square buildings with walkways also around the four sides were assumed. Roadways and walkways were taken to be 20 ft and 6 ft wide, respectively.

Each single-family residences (SFR) was assumed to have a lot area of 5749 square ft,, and a driveway 20 ft wide and 30 ft long. Assuming a square lot, each would have a sidewalk 76 feet by 4 feet wide, and a walkway that is 40 feet by 4 feet. .

Exclusive of the COMM case, the total area for all of these impervious features was subtracted from the total site area to estimate the pervious area, which was assumed to have conventional landscaping cover (grass, small herbaceous decorative plants, bushes, and a few trees). For the COMM scenario, an additional 10 percent was added to the building, parking lot, access road, and walkway area to represent the landscaping, on the belief that a typical retail commercial establishment would be mostly impervious.

Table 5 summarizes the characteristics of the five land use cases. The table also provides the recorded or estimated areas in each land use and cover type.

Table 5. Summary of Cases with Land Use and Land Cover Areas

	MFR[a]	Sm-SFR[a]	Lg-SFR[a]	COMM[a]	REDEV[a]
No. buildings	11	23	1000	1	2
Total area (ft^2)	476,982	132,227	5,749,000	226,529	5,451
Roof area (ft^2)	184,338	34,949	1,519,522	87,120	3,435
No. parking spaces[b]	438	-	-	500	2
Parking area (ft^2)[b]	77,088	-	-	88,000	316
Access road area (ft^2)	22,212	-	-	23,732	-
Walkway area (ft^2)	33,960	10,656	463,289	7,084	350
Driveway area (ft^2)	-	13,800	600,000	-	650
Landscape area (ft^2)	159,384	72,822	3,166,190	20,594	700

[a] MFR—multi-family residential; Sm-SFR—small-scale single-family residential; Lg-SFR—large-scale single-family residential; COMM—retail commercial; REDEV—redevelopment
[b] Uncovered

METHODS OF ANALYSIS

AVERAGE EVENT AND ANNUAL STORMWATER RUNOFF VOLUMES

Calculation Methods

Surface runoff volumes produced were estimated for both pre- and post-development conditions for each case study. The pre-development state was considered to be the predominant land cover for each region prior to European settlement.

For impervious areas, average event and annual runoff volumes were computed as the product of event or average annual precipitation, contributing drainage area, and a runoff coefficient (ratio of runoff produced to precipitation received) according to the familiar Rational Method equation. The runoff coefficient was determined from the equation C = (0.009) I + 0.05, where I is the impervious percentage. This equation was derived by Schueler (1987) from Nationwide Urban Runoff Program data (USEPA 1983). With I = 100 percent for fully impervious surfaces, C is 0.95.

The basis for pervious area runoff coefficients, for both the pre-development state and landscaped areas in developments, was the NRCS's Urban Hydrology for Small Watersheds (NRCS 1986, as revised from the original 1975 edition). This model estimates storm event runoff (R, inch) as a function of precipitation (P, inch) and a variable representing land cover and soil, termed the curve number (CN, dimensionless). CN enters the calculation via a variable S, which is the potential maximum soil moisture retention after runoff begins. The equations for English units of measurement are:

$$R = \frac{(P - 0.2S)^2}{P + 0.8S} \qquad S = \frac{1000}{CN} - 10$$

The runoff equation is valid for P > 0.2S, which represents the initial abstraction, the amount of water retained before runoff begins by vegetative interception and infiltration (NRCS 1986). According to this model, larger events are forecast to produce a greater amount of runoff in relation to amount of precipitation, because they more fully saturate the soil. Therefore, use of the model to estimate annual runoff requires selecting some event or group of events to compute an average runoff coefficient representing the year.

Average pre- and post-development pervious area average runoff coefficients were derived by computing runoff from a series of precipitation events ranging from 0.1 inch up to the 95th percentile, 24-hour event for the respective metropolitan areas, dividing by the associated precipitation, and averaging for all event amounts > 0.2S. Average annual runoff volumes for pervious areas were estimated based on these runoff coefficients and average annual precipitation quantities recorded at the respective gauging locations.

Curve Number Selection

Pre-development curve numbers were determined from existing studies and NRCS (1986) CN tables based on pre-European settlement land cover. Before development, woods predominated in Georgia and Massachusetts. Pre-development Texas had principally arid and semi-arid range with herbaceous cover. Chaparral was the predominant land cover in the San Diego area, however, this land cover type is not listed in the NRCS tables. For that region the selection came from a study by Easterbrook (undated) on curve numbers and associated soil hydrologic groups in an investigation of mainly chaparral lands before and after wildfires in the San Diego area.

Conversion to landscaping typical of development modifies soil and water infiltration characteristics by removing topsoil and even subsoil, compacting the remaining soil, and changing the vegetative cover. For pervious landscaping after development, CN was based on 1/8-acre urban development for all building types.

To demonstrate a range of results, runoff estimates were made for two soils in each region falling in B and C, B and D, or C and D HSGs. The more infiltrative soil was assumed to be in "good" condition and the less permeable one in "poor" condition, differentiations made in the NRCS tables. Table 6 summarizes the curve numbers used in the analyses. The paragraphs following the table detail how the selections were made for each region.

Table 6. Summary of Curve Numbers for Study Regions

	Southeast		South Central		Northeast – Upper Midwest		Southwest	
Hydrologic soil group-condition	B-good	D-poor	C-good	D-poor	B-good	C-poor	C-good	D-poor
Pre-development	55	83	74	93	55	77	77	90
Post-development	85	92	90	93	85	90	91	93

The Georgia Stormwater Manual Supplement recommends that watershed managers select curve numbers proposed by the NRCS based on hydrologic soil groups A through D and hydrologic condition of the site (Center for Watershed Protection 2009). As aforementioned, the pre-European land cover of the southeastern United States was forested. A study by Dyke (2001) in Forsyth and Hall Counties northeast of Atlanta confirmed that, immediately prior to development, approximately 50 percent of urban lands were forested, with 22 percent in agricultural use.

Because the region includes B soils in the interior of Alabama and Georgia, and poorly draining D soils in Florida and along the coasts, it was decided, for the purpose of demonstrating a range of results, to base NRCS Curve number values on B soils in good condition and D soils in poor condition. The corresponding pre- and post-development curve numbers are 55 and 83 and 85 and 92, respectively.

Prior to human development, approximately 80 percent of Texas, mostly in the central part, was covered in short and tall grassland communities; the western 10 percent of the state was desert grassland; and the eastern 10 percent was forested (University of Texas 2000). McLendon (2002) conducted a study on the observed and predicted curve numbers in 107 watersheds in Texas. For rural watersheds the CNs ranged from 48 to 88. The range in Austin was 49-89 and in Dallas 60-90. The Texas Department of Transportation's (2001) Hydraulic Design Manual Section 7 lists values for pre-development curve numbers for arid and semi- arid rangelands. Based on these sources, the respective pre- and post-development CN choices were 74 (C—good soil) and 93 (D—poor soil) and 90 (C—good soil) and 93 (D—poor soil).

Before European development, most of the Northeast – Upper Midwest region was covered in mixed hardwood and coniferous forests. A recent USGS report confirms that most urban development in the region from 1973 to 2000 has converted forestland (47 percent of all changes), followed by farmland (11 percent) (Auch undated). For this study's pre-development curve number, the woods cover type, soil group B in good condition and C soil in poor condition gave corresponding curve numbers of 55 and 77, respectively. Post-development curve numbers for these soil types at 1/8-acre development size were 85 and 90 for the good B and poor C soils, respectively. These post-development curve numbers are similar to a recent study in the Aberjona River watershed, an urban catchment northwest of Boston, where the authors used an overall CN of 89 to represent the more impervious parts of the watershed (Perez-Pedini et al. 2005).

With the lack of NRCS data for chaparral, CN selection for the San Diego area was based on an analysis performed in the area of the 2003 Cedar Fire in San Diego County by Easterbrook (undated). For pre-development C soils in good condition and D soils in poor condition, the choices were 77 and 90, respectively. Post-development curve numbers were selected from Easterbrook's estimation of CN after a high-burn fire; for good C soils CN = 91, and for poor D soils CN = 93.

Effect of Slope on Curve Number

NRCS documents developing the curve number concept and associated methods did not cover the effect of land slope. Independent researchers have given some attention to the question though. Sharpley and Williams (1990) introduced the empirical equation that has been most often used to adjust CN relative to slope:

$$CN_s = 0.333(CN_w - CN)(1 - 2e^{-13.86s}) + CN$$

where CN is the curve number reported in NRCS tables for an average soil moisture condition and assumed slope ≤ 5 percent, CN_s = slope-adjusted CN, CN_w = CN in an initially wet soil condition, and s = slope (ft/ft). Ward and Trimble provided factors to adjust tabulated CN values to obtain CN_w. Carrying through the analysis in this manner demonstrated that results deviated between two assessed slopes (5 and 10 percent) by only around 2-6 percent. This small difference was considered minimal in the context of the approximations and assumptions inherent in the modeling process. While the results presentation gives some additional data on slope effects, full coverage is given only for 5 percent, the topographic basis of the NRCS model and by far the subject of its greatest application.

ESTIMATING INFILTRATION CAPACITY OF THE CASE STUDY SITES

Infiltration Rates

Infiltrating sufficient runoff to maintain pre-development hydrologic characteristics and prevent pollutant transport is the most effective way to protect surface receiving waters. Successfully applying infiltration requires soils and hydrogeological conditions that will pass water sufficiently rapidly to avoid overly-lengthy ponding, while not allowing percolating water to reach groundwater before the soil column captures pollutants.

The study assumed that infiltration would occur in surface facilities and not in below-ground trenches. The use of trenches is certainly possible. However, the intent of this investigation was to determine the ability of pervious areas to manage the site runoff, and their exclusion is consistent with the conservative approach to modeling taken in this analysis. This inquiry was accomplished by evaluating the ability of the predominant soil types identified for each region to provide an infiltration rate of at least 0.5 inch/hour, the rate often regarded in the stormwater management field as the minimum for the use of infiltration practices (e.g., Geosyntec Consultants 2008). The assessment considered soils that either would provide this rate, at a minimum, in their original condition or could be organically amended to augment soil water storage and increase infiltration, while also safeguarding groundwater. Therefore, prevailing groundwater depths were assessed in relation to runoff percolation times generally regarded as safe.

Infiltration rates were based on saturated hydraulic conductivities (obtained from Leij et al. 1996) typical of the basic soil types incorporated in the U.S. Department of Agriculture (USDA, 1987) soil textural triangle. Sand, loamy sand, sandy loam have conductivities well above 0.5 inch/hour. As Table 4 indicates, three of the four regions have a sandy loam as the dominant soil type. For such a soil in the B HSG in these regions, the infiltration rate was taken as 1.74

inch/hour (Leij et al. 1996). Other textures represented that would generally fall in the C group are mostly loam and silt loam. These soil types either have conductivities in excess of 0.5 inch/hour or, in the first author's experience, can be and have been successfully organically amended to produce such a rate and infiltrate accumulated water within 72 hours, and usually less time. The D soils in some study regions, silty clay and clay, were regarded as not amendable to reach 0.5 inch/hour conductivity to host conventional or ARCD-type facilities designed specifically for infiltration. Still, locations with these soils could distribute sheet flow over pervious areas for evapotranspiration and some infiltration at slow rates and could utilize roof downspout surface or subsurface dispersal.

Groundwater Protection Assessment

Avoidance of groundwater contamination was assessed by assuming a hydraulic conductivity generally regarded as the maximum rate for the use of infiltration practices, 2.4 inches/hour (e.g., Geosyntec Consultants 2008), and a minimum spacing to seasonal high groundwater from the bed of an infiltration facility of 4 ft. These conditions would provide a travel time of 20 hours, during which contaminant capture would occur through soil contact. This 20-hour travel time was regarded as a minimum for any soil type. For example, infiltrating on loamy sand with a hydraulic conductivity of 5.7 inches/hour would require minimum spacing from the infiltration surface to groundwater of 10 ft. This consideration did not actually become an issue for analyses in any region in this study, because all predominant soil types have infiltration rates under 2.4 inches/hour and groundwater spacings that exceed 4 ft.

Site Infiltration Capacities

Runoff volumes were estimated for the 85th and 95th percentile, 24-hour events as described previously. Bioretention cell surface area to accommodate these volumes was calculated based on a method in the City of Santa Barbara's Storm Water BMP Guidance Manual (Geosyntec Consultants 2008) (adapted from the Georgia Stormwater Manual (Atlanta Regional Commission, 2001)):

$$A = \frac{(V_{design})(l)}{(t)(k_{design})(d + l)}$$

where:

V_{design} = design volume of runoff to be infiltrated (ft3);

k_{design} = design infiltration rate (in/hr), taken as 0.5 times the typical rate for the soil type naturally or amended as a safety factor;

d = ponding depth (ft), assumed as 0.25 ft for a shallow landscape feature on the recommendation of the Georgia manual;

l = depth of planting media (ft), assumed as 4 ft on the recommendation of the Georgia manual;

t = required drawdown time (hr), taken as 48 hours.

The design variable selections are conservative in applying a safety factor to hydraulic conductivity, using minimum depths for economy and limiting site disruption, and applying a drain time lower than the maximum of 72 hours.

In considering the long-term capacity of a facility designed to infiltrate, the potential for groundwater mounding below or aside the unit is a concern. To avoid this problem a basic analysis was made using a groundwater rise equation from Zomorodi (2005):

$$\text{Rise} = 0.86\,\frac{(K_v)(W)}{(K_h - K_v)}$$

where:

Rise = mounding occurring in a year of use (ft);

K_v = vertical saturated hydraulic conductivity (ft/year);

W = bioretention cell width (ft); and

K_h = horizontal saturated hydraulic conductivity (ft/year).

This equation was solved for K_v for computation of the allowable annual infiltration rate, assuming a rise limited to 1 ft. It was assumed that the bioretention surface area would be broken up to have no more than one basin for each 5 acres of total site area, another measure safeguarding against groundwater mounding. Also assumed was a square cell (i.e., W was computed as the square root of the surface area calculated according to the equation for A above). Horizontal hydraulic conductivites for loams such as represented among the B and C soils in the study regions tend to run in the range of 10 to 1000 meters/year (0.1 to 9 ft/day. A conservative value of 3 ft/day was used in the analysis.

The yearly rate of infiltration from a bioretention cell can be expressed in terms of volume of runoff per unit infiltrating surface area, acre-ft/acre-year, which is equivalent to K_v expressed as ft/year. The K_v value avoiding groundwater monitoring was therefore used to assess maximum annual infiltration capacity by multiplying by the total available pervious surface area. However, the K_v value was capped at a rate found in a study of infiltration capacity and benefits for Los Angeles' San Fernando Valley by Chralowicz et al. (2001). The Los Angeles study posited providing 0.1-0.5 acre for infiltration basins to serve each 5 acres of contributing drainage area. At 2-3 ft deep, it was estimated that such basins could infiltrate 0.90-1.87 acre-ft/year of runoff in San Fernando Valley conditions. Three types of soils predominate in the study area: sandy loams (35 percent of the area), a clay loam (23 percent), and a silty clay loam (29 percent). The balance of 13 percent includes small amounts at both ends of the textural spectrum, a clay and loamy sands. Infiltration rates are in the approximate range of 0.5-2.0 inches/hour, within the span generally regarded as ideal for successful infiltration without threatening groundwater. Computing the ratios of the rate and basin size data of Chralowicz et al. (2001), K_v maximized at approximately 20 acre-ft of runoff/acre infiltration surface-year under the most limiting conditions of soils and basin dimensions. This value was applied in this study if calculated rates were higher, another conservative feature to obtain the most realistic projections of infiltration potential.

In some cases analyzed, the maximum annual infiltration capacity was estimated at greater than post-development runoff volume production. In these instances complete retention would be possible with excess capacity left, and only a fraction of the available pervious area would have to be devoted to bioretention. That fraction was expressed as the ratio of annual runoff production to infiltration capacity.

STORMWATER RUNOFF VOLUME AND POLLUTANT DISCHARGES

Urban Land Use Pollutant Yields

Annual pollutant mass loadings prior to application of any stormwater management practices were estimated as the product of annual runoff volumes produced by the various land use and cover types and pollutant concentrations typical of those areas. General land use types (e.g., single-family residential, commercial) have typically been the basis for measuring and reporting stormwater pollutant data. However, an investigation of ARCD practices of the type of interest in this study demands data on specific land coverages. The literature offers few data on this basis. Those available and used herein were assembled by a consultant to the City of Seattle for a project in which the author participated. They appear in Attachment A (Herrera Environmental Consultants, Inc. undated). Table 7 summarizes the representative values used in the analysis.

Table 7. Pollutant Concentrations in Runoff from Developed Land Uses (after Herrera Environmental Consultants, Inc. undated)

Land Use	Total Suspended Solids (mg/L)	Total Copper (µg/L)	Total Zinc (µg/L)	Total Phosphorus (µg/L)
Residential roof	25	13	159	110
Commercial roof	18	14	281	140
Access road/driveway	120	22	118	660
Parking	75	36	97	140
Walkway	25	13	59	110
Landscaping	213	13	59	2040

Pollutant concentrations expected to occur typically in the mixed runoff from the several land use and cover types making up a development were estimated by mass balance; i.e., the concentrations from the different areas of the sites were combined in proportion to their contribution to the total runoff.

Estimating Retention

The principal interest of this study was to estimate how much of the post-development runoff volume for the various land use cases could be retained by ARCD measures and prevented from discharging from the site on the surface. The analyses initially evaluated the runoff volume that could potentially be infiltrated by using a portion or all of the available pervious area for bioretention facilities. In some instances judicious use of the pervious area could infiltrate the full volume. In other cases use of the pervious area for as much infiltration as possible plus special management of roof runoff would fully attenuate post-development runoff.

Complete retention would, of course, exceed any ordinary regulatory standard intended to govern discharge quantity and quality. To the extent that full retention could not be expected, the study was interested in assessing the degree to which bioretention and roof runoff management could meet the specific potential standards outlined earlier. Performance was estimated in terms of volume retained versus released, the extent to which pre-development groundwater recharge would be preserved, and the pollutant loading reduction accompanying volume retention in comparison to the quantities that would enter receiving waters with no stormwater management actions. These measures expressed in equation form are:

$$\text{Runoff retention (\%)} = \frac{(\text{Volume with no practices} - \text{Volume with ARCD practices})}{\text{Volume with no practices}} \text{x}100$$

(expresses amount of the theoretical maximum post-development runoff prevented from discharging by ARCD)

$$\text{Recharge retention (\%)} = [1 - \frac{(\text{Predevelopment recharge} - \text{Postdevelopment recharge with ARCD})}{\text{Predevelopment recharge}}]\text{x}100$$

Pre-development recharge = Rainfall volume – Predevelopment runoff volume

Post-development recharge = The smaller of rainfall volume or post-development infiltration volume

$$\text{Loading reduction (\%)} = \frac{(\text{Loading with no practices} - \text{Loading with ARCD practices})}{\text{Loading with no practices}} \text{x}100$$

It should be noted that runoff retention and recharge retention express different quantities and are not equal numerically.

When infiltration alone (Basic ARCD) could not accomplish full retention, roof runoff management strategies were selected as appropriate for the land use case (Full ARCD). For the retail commercial development (COMM), roof runoff management was assumed to be accomplished by harvesting, temporarily storing, and applying water to use in the building. To this end, the assumption was made that the commercial development would be able to manage and would have capacity to store and make use of the entire roof runoff volume. While this particular assumption is, on its own, speculative, the commercial development would, as discussed in the section on Application of ARCD Practices, earlier, see a reduction in runoff as a result of evapotranspiration, and would have the option to employ ARCD site design principles to reduce impervious surface area, to install a green roof to retain runoff, or to implement any of a number of other ARCD practices designed to reduce runoff volume and pollutant loading. As a result, the overall analysis of the commercial site remains conservative in its assessment of the potential to retain runoff onsite.

In the three multi-family and single-family residential cases it was assumed that the roof water would be dispersed on or within the pervious area according to accepted and standardized practices. For example, the Washington Department of Ecology's (2005) Stormwater Management Manual for Western Washington provides design criteria for two methods: splash blocks followed by vegetated dispersion areas and gravel-filled trenches. These devices can be used wherever space is sufficient regardless of infiltration rates, as they operate by evapotranspiration and slow infiltration. Even clay can infiltrate at an approximate rate of 0.2 inch/hour or higher (Leij et al. 1996; Pitt, Chen, and Clark 2002). Care was taken to assure that pervious area already allocated to infiltration would not also be counted upon for dispersion. While dispersion was assumed for simplification of the study analyses, in reality a site designer would have the option of using rain barrels, cisterns, and/or green roofs instead of or along with ground dispersion to manage roof water. Analyses for the final case, the redevelopment scenario (REDEV), assumed dispersion and/or small-scale harvesting of roof runoff above whatever level of infiltration could be accomplished given the soil condition.

Additional Analyses When Full Retention Cannot Be Expected

Retaining runoff from impervious and pollutant generating pervious surfaces is the best stormwater management policy, because it prevents the introduction of urban runoff pollutants

to receiving waters as well as serves quantity discharge control requirements. Maintaining pre-development peak flow rates, volumes, and elevated flow durations prevents stream channel and habitat damage, flooding, and loss of groundwater recharge. When conditions were expected to render full retention technically infeasible for the study cases, estimates were made of the volume and pollutant loadings that would be discharged assuming the remaining surface runoff is released to a receiving water with and without treatment. Treatment was assumed to be provided by bioretention discharging either directly on the surface or via an underdrain. While not as environmentally beneficial as retention, such treatment is superior to conventional stormwater management practices like ponds and sand filters. It captures pollutants through a number of mechanisms as contaminants are held for a time in the facility and contact vegetation and soil, such as sedimentation, filtration by plants, and adsorption and ion exchange in soil.

The effectiveness of bioretention in removing pollutants from surface runoff was estimated according to measurements by Chapman and Horner (2010). This study was performed on a linear bioretention device located on a slope and made up of a number of cells separated by weirs (termed a “cascade”). While an estimated 74 percent of all entering runoff infiltrated or evapotranspired before discharging, the flows reaching the end in the larger storms would have less residence time in the facility than in a unit on flat ground percolating water through soil before surface discharge via an underdrain. Therefore, pollutant concentrations exiting such a unit could be less yet. On the other hand, some bioretention facilities bypass the relatively rare higher flows, affording no treatment, while the cascade was designed to convey all runoff, even beyond its water quality design storm flow, and provide some treatment. On balance between the advantage and disadvantage of the facility providing the data, the discharge concentrations are considered to be representative of bioretention.

Chapman and Horner (2010) computed volume-weighted average discharge pollutant concentrations by multiplying concentrations times flow volumes for each monitored storm, summing, and dividing by total volume. The resulting values for the contaminants considered in this study are: total suspended solids (TSS)—30 mg/L, total copper—6.3 µg/L, total zinc—47 µg/L, and total phosphorus—133 µg/L. In a few instances these concentrations are higher than those in Table 7, an expression of the observation sometimes made in stormwater management that treatment cannot reduce concentrations in relatively “clean” flows below certain minimum values. In these situations the concentrations in Table 8 were also used in computing discharge loadings; i.e., no concentration reduction was applied in estimating discharge loadings, although flow volume would still be decreased to the extent infiltration could occur.

RESULTS OF THE ANALYSIS

ASSESSMENT OF MAXIMUM ARCD CAPABILITIES

Runoff Retention and Groundwater Recharge

Basic ARCD

One goal of this exercise was to determine if ARCD practices could eliminate post-development runoff production, and the pollutants it transports, and maintain pre-development groundwater recharge. The first assessment, termed the Basic ARCD analysis in this report, was to estimate if each site's pervious area is sufficient for full infiltration if given to this purpose to the extent necessary without compromising other uses. Accordingly, shallow, unobtrusive bioretention cells (i.e., rain gardens) are envisioned, dispersed through sites at no more than one for each 5 acres. It bears reemphasis that no credit was taken for water loss through evapotranspiration in this assessment, although a substantial, but not necessarily easily quantifiable, amount would undoubtedly occur. Estimates of runoff retention are therefore conservative.

Table 8 presents comparisons, for the Southeast climate region, between estimated annual runoff volumes generated before development and then post-development with and without Basic ARCD stormwater management. The table also gives annual groundwater recharge estimates for these same conditions.

Table 8. Runoff and Groundwater Recharge Volumes with Basic ARCD: Southeast Climate Region[a]

Period	Volume (acre-ft) or Percentage Measure	MFR	Sm-SFR	Lg-SFR	COMM	REDEV
B soil						
Pre-dev.	Runoff	0.046	0.013	0.56	0.022	0.001
	Recharge	44.7	12.4	539	21.2	0.51
Post-dev.	Runoff without stormwater practices	29.5	6.85	298	18.7	0.45
	Runoff retained with Basic ARCD	29.5	6.85	298	8.30	0.21
	Runoff released with Basic ARCD	0	0	0	10.4	0.25
	Runoff retention (%)	100%	100%	100%	44%	45%
	Recharge without stormwater practices	15.3	5.55	241	2.53	0.06
	Recharge with Basic ARCD	44.7	12.4	539	8.30	0.21
	Recharge retention (%)	100%	100	100%	39%	40%
	Pervious area needed (%)[b]	36%	22%	22%	100%	100%
D soil						
Pre-dev.	Runoff	13.5	3.76	163	6.43	0.16
	Recharge	31.2	8.64	376	14.8	0.36
Post-dev.	Runoff without stormwater practices	Full ARCD needed to maximize retention on D soil				
	Runoff retained with Basic ARCD					
	Runoff released with Basic ARCD					
	Runoff retention (%)					
	Recharge without stormwater practices	11.6	4.17	181	2.12	0.05
	Recharge with Basic ARCD	Full ARCD needed to maximize retention on D soil				
	Recharge retention (%)	37%	48%	48%	14%	14%
	Pervious area needed (%)[b]	Full ARCD needed to maximize retention on D soil				

[a] Pre-dev.—pre-development; post-dev.—post-development; ARCD—aquatic resources conservation design; MFR—multi-family residential; Sm-SFR—small-scale single-family residential; Lg-SFR—large-scale single-family residential; COMM—retail commercial; REDEV—infill redevelopment; Basic ARCD—infiltrating bioretention; runoff—quantity of water discharged from the site on the surface; recharge--quantity of water infiltrating the soil

[b] Proportion of the total pervious area on the site required for bioretention to achieve given results

In all cases the majority of the infiltration that would recharge groundwater in the undeveloped state would be lost to surface runoff after development. These losses would approach 90 percent in the most impervious developments. The greatly increased surface flow would raise peak flow rates and volumes in receiving water courses, increase flooding risk, and transport pollutants.

Basic ARCD could retain all post-development runoff and pre-existing groundwater recharge in the three residential cases on the B soils, using from less than one-fourth to just over one-third of the available pervious area for bioretention cells. Taking all available pervious area for the more highly impervious COMM and REDEV cases on B soil, bioretention would retain about 45 percent of the runoff generated and save about 40 percent of the pre-development recharge. To illustrate the relatively small role that slope increase from 5 to 10 percent plays in runoff retention, full retention would still be expected in the three residential cases and for the remaining two cases (COMM and REDEV) would decrease from 44-45 percent only slightly to 40-41 percent (not shown in table).

On the D soil, infiltrating bioretention may not be technically feasible and was not relied upon for retention estimates. Without the use of additional measures in the Full ARCD category, only incidental post-development runoff would be retained; and most pre-development recharge would be lost.

Tables 9-11 are companions to Table 8 for the South Central, Northeast – Upper Midwest, and Southwest climate regions, respectively. Results for the Northeast - Upper Midwest B soil are very close to those for the Southeast B soil, as would be expected given the similar precipitation quantities and soil characteristics. In the three regions having C soils, Basic ARCD can retain all runoff for the MFR, Sm-SFR, and Lg-SFR residential cases. With these soils, except in the Southwest, achieving full retention requires more of the available pervious area than with B soils, up to 69 percent, but is still fully attainable.

The effect of lower rainfall is evident in the South Central and, especially, the Southwest regions. In the latter location, not only the residential cases but also the COMM and REDEV scenarios can achieve full runoff retention with Basic ARCD on the C soil. The residential cases need much smaller percentages of the available pervious area for bioretention than for the same cases on C and even B soils elsewhere. Applying Basic ARCD to the South Central, C soil, REDEV case results in higher runoff retention than for the B soil cases in higher rainfall regions.

The study cases demonstrated two interesting points about groundwater recharge. First, with effective infiltrating bioretention it is possible for post-development annual recharge to exceed the pre-development quantity. This phenomenon is most evident in comparing the two amounts for cases with 100 percent runoff retention on C soils, which in the natural state produce much less recharge in relation to runoff than B soils. The B soils have a recharge-to-runoff ratio of about 500, whereas that ratio is only 4-6 for the C soils studied. One reason for higher post- compared to pre-development recharge is that bioretention is set up to hold water, increasing the time for infiltration to occur, instead of letting it run off. Another is that soils, especially in the C HSG, are often improved by organic amendments to yield both more water storage capacity and higher infiltration rates than the pre-existing soils.

A related point is that the percentage of pre-development recharge retained after development can be higher with C than B soils. This situation can best be seen in cases without full runoff retention, COMM and sometimes REDEV. In terms of recharge, installing bioretention conveys a greater advantage to the C than the B soils, which already have more pore space for water storage and higher infiltration and recharge rates.

Table 9. Runoff and Groundwater Recharge Volumes with Basic ARCD: South Central Climate Region[a]

Period	Volume (acre-ft) or Percentage Measure	MFR	Sm-SFR	Lg-SFR	COMM	REDEV
C soil						
Pre-dev.	Runoff	4.10	1.14	49.4	1.95	0.05
	Recharge	25.7	7.13	310	12.2	0.29
Post-dev.	Runoff without stormwater practices	21.2	5.15	224	12.7	0.31
	Runoff retained with Basic ARCD	21.2	5.15	224	4.33	0.21
	Runoff released with Basic ARCD	0	0	0	8.32	0.10
	Runoff retention (%)	100	100	100	34	67
	Recharge without stormwater practices	8.62	3.11	135	1.51	0.03
	Recharge with Basic ARCD	29.8	8.3	359	4.33	0.21
	Recharge retention (%)	100	100	100	38	70
	Pervious area needed (%)[b]	51	23	30	100	100
D soil						
Pre-dev.	Runoff	18.5	5.14	223	8.80	0.21
	Recharge	11.3	3.13	136	5.36	0.13
Post-dev.	Runoff without stormwater practices	Full ARCD needed to maximize retention on D soil				
	Runoff retained with Basic ARCD					
	Runoff released with Basic ARCD					
	Runoff retention (%)					
	Recharge without stormwater practices	7.23	7.59	112	1.35	0.03
	Recharge with Basic ARCD	Full ARCD needed to maximize retention on D soil				
	Recharge retention (%)	64	83	83	25	24
	Pervious area needed (%)[b]	Full ARCD needed to maximize retention on D soil				

Table 10. Runoff and Groundwater Recharge Volumes with Basic ARCD: Northeast – Upper Midwest Climate Region[a]

Period	Volume (acre-ft) or Percentage Measure	MFR	Sm-SFR	Lg-SFR	COMM	REDEV
B soil						
Pre-dev.	Runoff	0.04	0.01	0.54	0.02	0.001
	Recharge	42.9	11.9	517	20.4	0.49
Post-dev.	Runoff without stormwater practices	28.3	6.68	286	18.0	0.44
	Runoff retained with Basic ARCD	28.3	6.68	286	8.53	0.21
	Runoff released with Basic ARCD	0	0	0	9.43	0.23
	Runoff retention (%)	100	100	100	48	47
	Recharge without stormwater practices	14.6	5.32	231	2.42	0.06
	Recharge with Basic ARCD	42.9	11.9	517	8.53	0.21
	Recharge retention (%)	100	100	100	42	42
	Pervious area needed (%)[b]	34	21	21	100	100
C soil						
Pre-dev.	Runoff	7.87	2.18	94.8	3.74	0.09
	Recharge	35.1	9.72	422	16.6	0.40
Post-dev.	Runoff without stormwater practices	30.5	7.42	323	18.2	0.44
	Runoff retained with Basic ARCD	30.5	7.42	323	4.57	0.21
	Runoff released with Basic ARCD	0	0	0	13.6	0.24
	Runoff retention (%)	100	100	100	25	47
	Recharge without stormwater practices	12.4	4.48	195	2.17	0.05
	Recharge with Basic ARCD	42.9	11.9	517	4.57	0.21
	Recharge retention (%)	100	100	100	27	51
	Pervious area needed (%)[b]	69	31	40	100	100

Table 11. Runoff and Groundwater Recharge Volumes with Basic ARCD: Southwest Climate Region[a]

Period	Volume (acre-ft) or Percentage Measure	MFR	Sm-SFR	Lg-SFR	COMM	REDEV
C soil						
Pre-dev.	Runoff	1.62	0.45	19.5	0.77	0.02
	Recharge	7.22	2.00	87.0	3.43	0.08
Post-dev.	Runoff without stormwater practices	6.41	1.57	68.5	3.77	0.09
	Runoff retained with Basic ARCD	6.41	1.57	68.5	3.77	0.09
	Runoff released with Basic ARCD	0	0	0	0	0
	Runoff retention (%)	100	100	100	100	100
	Recharge without stormwater practices	2.43	0.88	38.1	0.43	0.01
	Recharge with Basic ARCD	8.84	2.45	107	4.20	0.10
	Recharge retention (%)	100	100	100	100	100
	Pervious area needed (%)[b]	12	5	7	69	44
D soil						
Pre-dev.	Runoff	4.47	1.24	53.8	2.12	0.05
	Recharge	4.37	1.21	52.7	2.08	0.05
Post-dev.	Runoff without stormwater practices	Full ARCD needed to maximize retention on D soil				
	Runoff retained with Basic ARCD					
	Runoff released with Basic ARCD					
	Runoff retention (%)					
	Recharge without stormwater practices	2.14	0.77	33.3	0.40	0.01
	Recharge with Basic ARCD	Full ARCD needed to maximize retention on D soil				
	Recharge retention (%)	49	63	63	19	18
	Pervious area needed (%)[b]	Full ARCD needed to maximize retention on D soil				

Full ARCD

Infiltration is one of a wide variety of ARCD-based source reduction techniques. Where site conditions such as soil quality or available area limit a site's infiltration capacity, other ARCD measures can enhance a site's runoff retention capability. Such practices can also be used where infiltration capacity is adequate, but the developer desires greater flexibility for land use on-site. Among those techniques, this study considered special management of roof water in those cases where bioretention could not infiltrate all post-development runoff.

Specifically, water harvesting for supply of irrigation and/or non-potable indoor uses was investigated for the retail commercial development. In residential cases with insufficient capacity for infiltrative bioretention but remaining space not already devoted to infiltration, efficiently directing roof runoff into the soil through downspout dispersion systems was the method of choice. Such cases invariably occurred with HSG D soils. The Full-ARCD scenario applied to the redevelopment case was roof water dispersion, harvesting, or a combination of the two practices. Generally speaking, infiltration consumed all available pervious area in the REDEV cases on B and C soils, making roof runoff harvesting the mechanism to retain more water. With no bioretention facility on D soil, the pervious area would be available for dispersion. Of course, harvesting could be applied instead of or along with dispersion. Again, it was assumed that that the commercial and, as needed, redevelopment sites had capacity to harvest and make use of the full volume of roof runoff generated, however, the analysis remains conservative in terms of the potential for onsite retention as it does not consider the use of ARCD site design principles to reduce impervious surfaces, green roofs, and evaporation/evapotranspration from surfaces other than rooftops.

Table 12 gives Southeast climate region results with the addition of Full ARCD techniques: roof runoff management, consisting of harvesting for reuse in the COMM case, dispersion on or within pervious land for the three residential cases, and a combination of these measures for REDEV. On the B soil runoff retention would approximately double for the retail commercial

land use and reach 100 percent for the redevelopment. Groundwater recharge would not be expected to increase over the Basic ARCD case, though; because harvesting still keeps water out of the soil system.

For development on the D soil, use of roof runoff management techniques was estimated to increase runoff retention from zero to about one-third to two-thirds of the post-development runoff generated, depending on the land use case. Groundwater recharge would not materially benefit, however; because harvest does not contribute to it. Also, no recharge credit was taken for dispersion, since infiltration is restricted and loss by ET would tend to occur before infiltration. Some small amount of recharge would still be likely though. To illustrate further the small role of topography, in this D soil, Full ARCD scenario runoff retention is forecast to decrease by only 1-2 percent at a 10 percent slope compared to a 5 percent slope (not shown in table).

Table 12. Runoff and Groundwater Recharge Volumes with Full ARCD: Southeast Climate Region[a]

Period	Volume (acre-ft) or Percentage Measure	MFR	Sm-SFR	Lg-SFR	COMM	REDEV
B soil						
Pre-dev.	Runoff	0.046	0.013	0.56	0.022	0.001
	Recharge	44.7	12.4	539	21.2	0.51
Post-dev.	Runoff without stormwater practices	Complete retention possible with Basic ARCD			18.7	0.45
	Runoff retained with Full ARCD				16.1	0.45
	Runoff released with Full ARCD				2.66	0
	Runoff retention (%)				86%	100%
	Recharge without stormwater practices				2.53	0.06
	Recharge with Full ARCD				8.30	0.21
	Recharge retention (%)				39%	40%
	Pervious area needed (%)[b]				100%	100%
D soil						
Pre-dev.	Runoff	13.5	3.76	163	6.43	0.16
	Recharge	31.2	8.64	376	14.8	0.36
Post-dev.	Runoff without stormwater practices	33.1	8.23	358	19.1	0.46
	Runoff retained with Full ARCD	16.4	3.11	135	7.76	0.31
	Runoff released with Full ARCD	16.7	5.12	222	11.4	0.16
	Runoff retention (%)	50%	38%	38%	41%	66%
	Recharge without stormwater practices	11.6	4.17	181	2.12	0.05
	Recharge with Full ARCD	11.6	4.17	181	2.12	0.05
	Recharge retention (%)	37.2%	48.3%	48.3%	14.3%	13.6%
	Pervious area needed (%)[b]	100%	100%	100%	100%	100%

[a] Pre-dev.—pre-development; post-dev.—post-development; ARCD—aquatic resources conservation design; MFR—multi-family residential; Sm-SFR—small-scale single-family residential; Lg-SFR—large-scale single-family residential; COMM—retail commercial; REDEV—infill redevelopment; Full ARCD—infiltrating bioretention, roof runoff harvesting, and/or roof runoff dispersion; runoff—quantity of water discharged from the site on the surface; recharge--quantity of water infiltrating the soil
[b] Proportion of the total pervious area on the site required for bioretention to achieve given results

Tables 13-15 give data analogous to Table 12 for the South Central, Northeast – Upper Midwest, and Southwest climate regions, respectively. Results are similar to those reported for the Southeast region. Full ARCD can approximately double runoff retention from the Basic ARCD level for the COMM case and extend runoff retention to 100 percent for the redevelopment on both B and C soils. Once again, application of Full ARCD to the D soil cases increases runoff retention from zero to one-third to two-thirds of the volume produced, depending on land use case.

Table 13. Runoff and Groundwater Recharge Volumes with Full ARCD: South Central Climate Region[a]

Period	Volume (acre-ft) or Percentage Measure	MFR	Sm-SFR	Lg-SFR	COMM	REDEV
C soil						
Pre-dev.	Runoff	4.10	1.14	49.4	1.95	0.05
	Recharge	25.7	7.13	310	12.2	0.29
Post-dev.	Runoff without stormwater practices	Complete retention possible with Basic ARCD			12.7	0.31
	Runoff retained with Full ARCD				9.51	0.31
	Runoff released with Full ARCD				3.15	0
	Runoff retention (%)				75	100
	Recharge without stormwater practices				1.51	0.03
	Recharge with Full ARCD				4.33	0.21
	Recharge retention (%)				35	72
	Pervious area needed (%)[b]				100	100
D soil						
Pre-dev.	Runoff	18.5	5.14	223	8.80	0.21
	Recharge	11.3	3.13	136	5.36	0.13
Post-dev.	Runoff without stormwater practices	22.6	5.68	247	12.8	0.31
	Runoff retained with Full ARCD	11.0	2.08	90.3	5.17	0.20
	Runoff released with Full ARCD	11.6	3.60	157	7.63	0.11
	Runoff retention (%)	49	37	37	40	66
	Recharge without stormwater practices	7.23	2.59	112	1.35	0.03
	Recharge with Full ARCD	7.23	2.59	112	1.35	0.03
	Recharge retention (%)	64	83	83	25	24
	Pervious area needed (%)[b]	100	100	100	100	100

Table 14. Runoff and Groundwater Recharge Volumes with Full ARCD: Northeast – Upper Midwest Climate Region[a]

Period	Volume (acre-ft) or Percentage Measure	MFR	Sm-SFR	Lg-SFR	COMM	REDEV
B soil						
Pre-dev.	Runoff	0.04	0.01	0.54	0.02	0.001
	Recharge	42.9	11.9	51.7	20.4	0.49
Post-dev.	Runoff without stormwater practices	Complete retention possible with Basic ARCD			18.0	0.44
	Runoff retained with Full ARCD				16.0	0.44
	Runoff released with Full ARCD				2.00	0
	Runoff retention (%)				89	100
	Recharge without stormwater practices				2.42	0.06
	Recharge with Full ARCD				8.53	0.21
	Recharge retention (%)				42	43
	Pervious area needed (%)[b]				100	100
C soil						
Pre-dev.	Runoff	7.87	2.18	94.8	3.74	0.09
	Recharge	35.1	9.72	422	16.6	0.40
Post-dev.	Runoff without stormwater practices	Complete retention possible with Basic ARCD			18.2	0.44
	Runoff retained with Full ARCD				12.0	0.44
	Runoff released with Full ARCD				6.19	0
	Runoff retention (%)				66	100
	Recharge without stormwater practices				2.17	0.05
	Recharge with Full ARCD				4.57	0.21
	Recharge retention (%)				28	43
	Pervious area needed (%)[b]				100	100

Table 15. Runoff and Groundwater Recharge Volumes with Full ARCD: Southwest Climate Region[a]

Period	Volume (acre-ft) or Percentage Measure	MFR	Sm-SFR	Lg-SFR	COMM	REDEV
C soil						
Pre-dev.	Runoff	1.62	0.45	19.5	0.77	0.02
	Recharge	7.22	2.00	87.0	3.43	0.08
Post-dev.	Runoff without stormwater practices	Complete retention possible with Basic ARCD				
	Runoff retained with Full ARCD					
	Runoff released with Full ARCD					
	Runoff retention (%)					
	Recharge without *stormwater* practices					
	Recharge with Full ARCD					
	Recharge retention (%)					
	Pervious area needed (%)[b]					
D soil						
Pre-dev.	Runoff	4.47	1.24	53.8	2.12	0.05
	Recharge	4.37	1.21	52.7	2.08	0.05
Post-dev.	Runoff without stormwater practices	6.70	1.68	73.2	3.80	0.09
	Runoff retained with Full ARCD	3.25	0.62	26.8	1.53	0.06
	Runoff released with Full ARCD	3.45	1.07	46.5	2.26	0.03
	Runoff retention (%)	49	37	37	40	66
	Recharge without stormwater practices	2.14	0.77	33.3	0.40	0.01
	Recharge with Full ARCD	2.14	0.77	33.3	0.40	0.01
	Recharge retention (%)	49	63	63	19	18
	Pervious area needed (%)[b]	100	100	100	100	100

Pollutant Loading Reductions

The examination of maximum ARCD capabilities considered the reductions of annual mass loadings of four water pollutants that would accompany runoff retention. Since retention means no surface discharge, these loading reductions are, at a minimum, equal to the percentages of runoff retention. In those cases with less than full runoff retention, there is good reason to expect pollutant loading reductions higher than the percentage of runoff retained. The early runoff ("first flush"), occurring when the soils are least saturated, is more likely to be retained than later runoff. It is frequently observed that the first flush has higher pollutant concentrations than later runoff, particularly in the wash off after relatively extended dry periods.

For the B and D soil and the residential cases on C soils, the reductions were very consistent among regions:

- B and C soils, Basic ARCD, residential cases—100%;
- B soil, Basic ARCD, COMM and REDEV cases—44-45%;
- B soil, Full ARCD, COMM and REDEV cases—86-100%;
- D soil, Full ARCD, SFR and COMM cases—38-41%;
- D soil, Full ARCD, MFR case—50%; and
- D soil, Full ARCD, REDEV case—66%.

For the most highly impervious cases, COMM and REDEV, on C soils reduction was variable and dependent on precipitation. With Basic ARCD the range was from 25 to 100 percent, going from relatively high to low precipitation. Full ARCD is expected to raise the lowest reductions to 100 percent for REDEV and at least 66 percent for COMM.

Therefore, taking the greatest advantage of what ARCD offers could prevent the addition to receiving waters of all or almost all pollutant mass that would otherwise discharge from a range

of urban developments on B and C soils. With D soils, Full ARCD can accomplish loading reductions approaching or somewhat exceeding 50 percent.

ABILITY TO MEET POTENTIAL STANDARDS

General Summary

This section evaluates the ability of the Basic and Full ARCD strategies to meet each of the five potential stormwater management standards enumerated in the beginning of the report. It also examines the extent of pollutant loading reduction if the standards are just met; i.e., if runoff is retained at the minimum needed to meet the standard. It has already been demonstrated that retention of all post-development runoff and full pollutant attenuation is possible in some circumstances. Table 16 summarizes the results for all regions and cases and both ARCD strategies.

Ability to Meet Standards

The projected ability to meet the standards overall varies mostly in relation to soil type (B or C versus D) and the relative imperviousness of development, and much less across climate regions. The one exception to this generality is that implementing Basic ARCD practices on the Southwest region C soil would meet all five standards. This uniformity does not occur elsewhere on either B or C soils, and is apparently primarily a function of the relatively low precipitation in the region.

Setting aside the Southwest region, success in complying with standards is mostly comparable among the various B and C soils, with a small number of instances where a development type meets a standard on B but not on C soil. Basic ARCD methods invariably can meet all standards on B and C soils for the residential development cases (MFR and Sm- and Lg-SFR). Full ARCD practices are forecast to meet all standards for the redevelopment case on B soils but only standards 1 and 5 consistently on C soils. The combination of infiltration and roof runoff management applied to the retail commercial development allows meeting these same two standards on B soils but only the latter on both of the C soils occurring outside the Southwest region. The only standards that cannot be met on B and C soils by the ARCD methods considered are standards 2-4 for the COMM case. Therefore, of the 125 standards assessments, ARCD practices are projected to meet 113 (90.4 percent) with B and C soils.

The ability to meet these standards is much reduced on D soils. Standard 1 can be met occasionally with Full ARCD used in the redevelopment. All cases with Full ARCD comply with standard 4 on this soil where pre-development runoff is estimated to be relatively high, reflecting a low overall requirement for retention volume. Standard 5 can be met with Full ARCD with the exception of one COMM case. Standards 2 and 3 were never estimated to be met in any D soil case. All in all, with this soil 26 of the 75 scenarios (34.7 percent) are expected to meet a standard.

Table 16. Ability to Meet Potential Regulatory Standards with Basic/Full ARCD Practices

Region-Case[a]	Standards Met—Basic ARCD[b]	Standards Met—Full ARCD[b]	Runoff Retention and Pollutant Loading Reduction (%)[b, c]				
			Std. 1	Std. 2	Std. 3	Std. 4	Std. 5
SE(B)-MFR	1, 2, 3, 4, 5		63	87	90	>99	63
Sm-SFR	1, 2, 3, 4, 5		63	87	90	>99	63
Lg-SFR	1, 2, 3, 4, 5		63	87	90	>99	63
COMM		1, 5	63	86	86	86	63
REDEV		1, 2, 3, 4, 5	63	87	90	>99	63
SE(D)-MFR		5	50	50	50	50	37
Sm-SFR		5	38	38	38	38	34
Lg-SFR		5	38	38	38	38	34
COMM			41	41	41	41	41
REDEV		1, 5	63	66	66	66	42
SC(C)-MFR	1, 2, 3, 4, 5		58	82	90	81	47
Sm-SFR	1, 2, 3, 4, 5		58	82	90	78	45
Lg-SFR	1, 2, 3, 4, 5		58	82	90	78	45
COMM		1, 5	58	75	75	75	49
REDEV		1, 2, 3, 4, 5	58	82	90	84	49
SC(D)-MFR		4, 5	49	49	49	18	10
Sm-SFR		4, 5	37	37	37	10	6
Lg-SFR		4, 5	37	37	37	10	6
COMM		4, 5	40	40	40	31	18
REDEV		1, 4, 5	58	66	66	32	18
NM(B)-MFR	1, 2, 3, 4, 5		81	89	90	>99	81
Sm-SFR	1, 2, 3, 4, 5		81	89	90	>99	81
Lg-SFR	1, 2, 3, 4, 5		81	89	90	>99	81
COMM		1, 2, 5	81	89	89	89	81
REDEV		1, 2, 3, 4, 5	81	89	90	>99	81
NM(C)-MFR	1, 2, 3, 4, 5		81	89	90	74	60
Sm-SFR	1, 2, 3, 4, 5		81	89	90	71	57
Lg-SFR	1, 2, 3, 4, 5		81	89	90	71	57
COMM		5	66	66	66	66	64
REDEV		1, 2, 3, 4, 5	81	89	90	80	64
SW(C)-MFR	1, 2, 3, 4, 5		62	83	90	75	46
Sm-SFR	1, 2, 3, 4, 5		62	83	90	72	44
Lg-SFR	1, 2, 3, 4, 5		62	83	90	72	44
COMM	1, 2, 3, 4, 5		62	83	90	80	49
REDEV	1, 2, 3, 4, 5		62	83	90	80	49
SW(D)-MFR		4, 5	49	49	49	33	21
Sm-SFR		4, 5	37	37	37	27	16
Lg-SFR		4, 5	37	37	37	27	16
COMM		5	40	40	40	40	27
REDEV		1, 4, 5	62	66	66	44	28

[a] Region (hydrologic soil group)—land use; regions: SE—Southeast, SC—South-central, NM—Northeast-Upper Midwest, SW—Southwest; land uses: MFR—multi-family residential, Sm-SFR—small single-family residential, Lg-SFR--large single-family residential, COMM—retail commercial, REDEV--redevelopment

[b] Standard (Std.) 1—Retain the runoff produced by the 85th percentile, 24-hour precipitation event
Standard 2—Retain the runoff produced by the 95th percentile, 24-hour precipitation event
Standard 3—Retain 90 percent of the average annual post-development runoff volume
Standard 4—Retain the difference between the post- and pre-development average annual runoff volumes
Standard 5—Retain the difference between the post- and pre-development runoff volumes for all events up to and including the 85th percentile, 24-hour precipitation event

[c] Reduction estimated to result from meeting the standard, to the extent it can be met (fully met if so indicated in preceding columns), without treatment of remaining discharge. Where a standard can be met using Basic or Full ARCD application it is indicated in black, where a standard cannot be met using Basic or Full ARCD it is highlighted red.

Figure 4a. Ability to Meet Potential Regulatory Standards with Basic/Full ARCD Practices for Southeast Climate Region

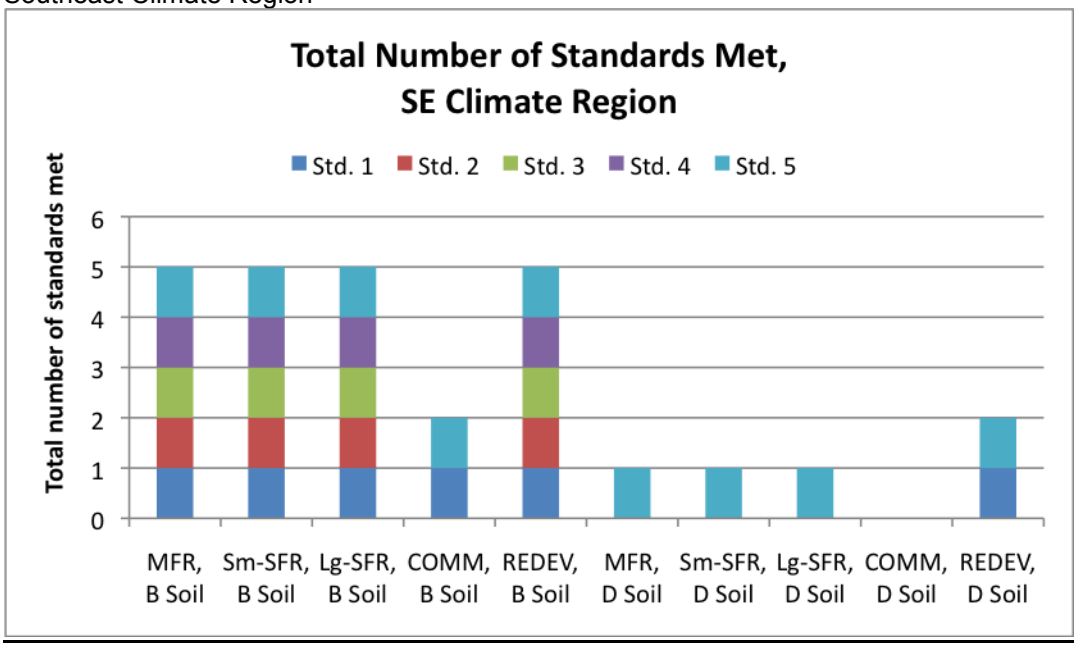

MFR—multi-family residential, Sm-SFR—small single-family residential, Lg-SFR--large single-family residential, COMM—retail commercial, REDEV—redevelopment. Standard (Std.) 1—Retain the runoff produced by the 85th percentile, 24-hour precipitation event; Standard 2—the 95th percentile, 24-hour precipitation event; Standard 3—90 percent of the average annual post-development runoff volume; Standard 4—the difference between the post- and pre-development average annual runoff volumes; and, Standard 5—the difference between the post- and pre-development runoff volumes for all events up to and including the 85th percentile, 24-hour precipitation event

Figure 4b. Ability to Meet Potential Regulatory Standards with Basic/Full ARCD Practices for South Central Climate Region

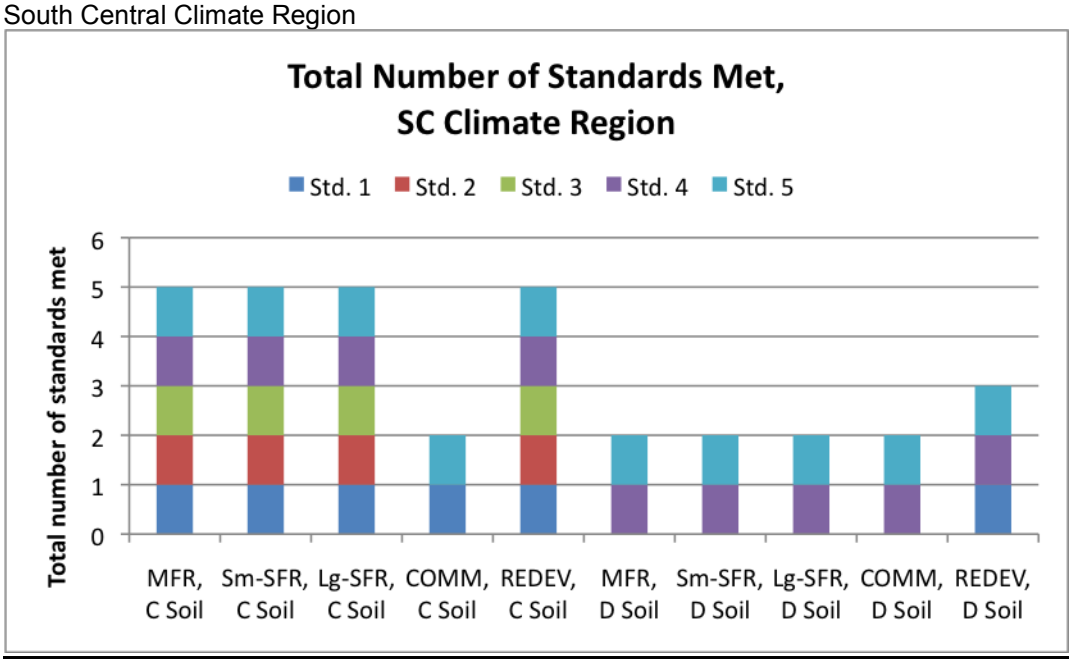

Figure 4c. Ability to Meet Potential Regulatory Standards with Basic/Full ARCD Practices for Northeast-Midwest Climate Region

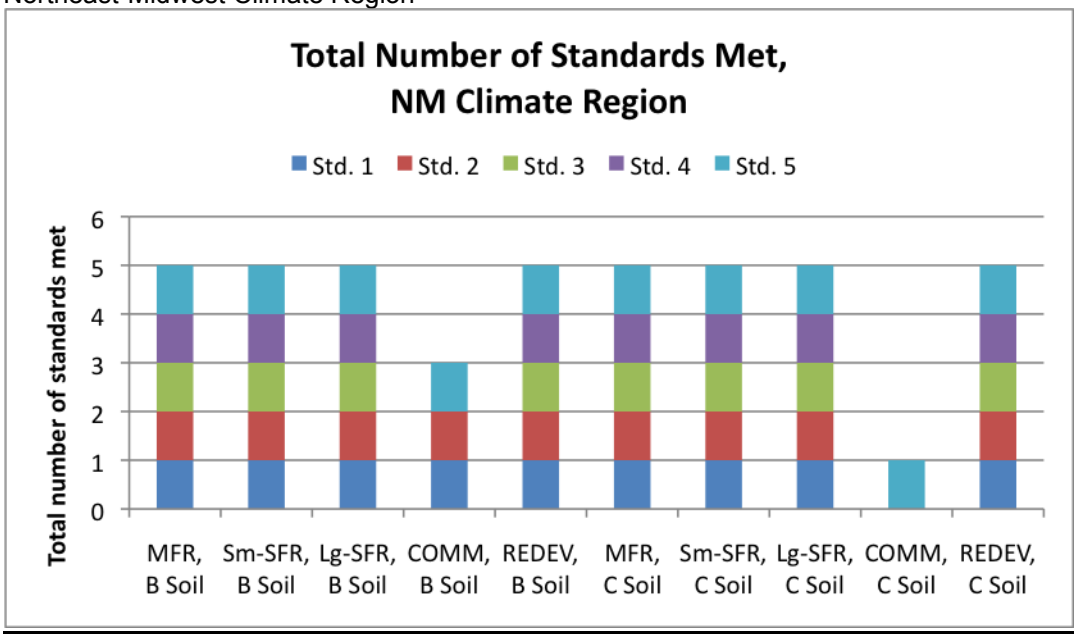

Figure 4d. Ability to Meet Potential Regulatory Standards with Basic/Full ARCD Practices for Southwest Climate Region

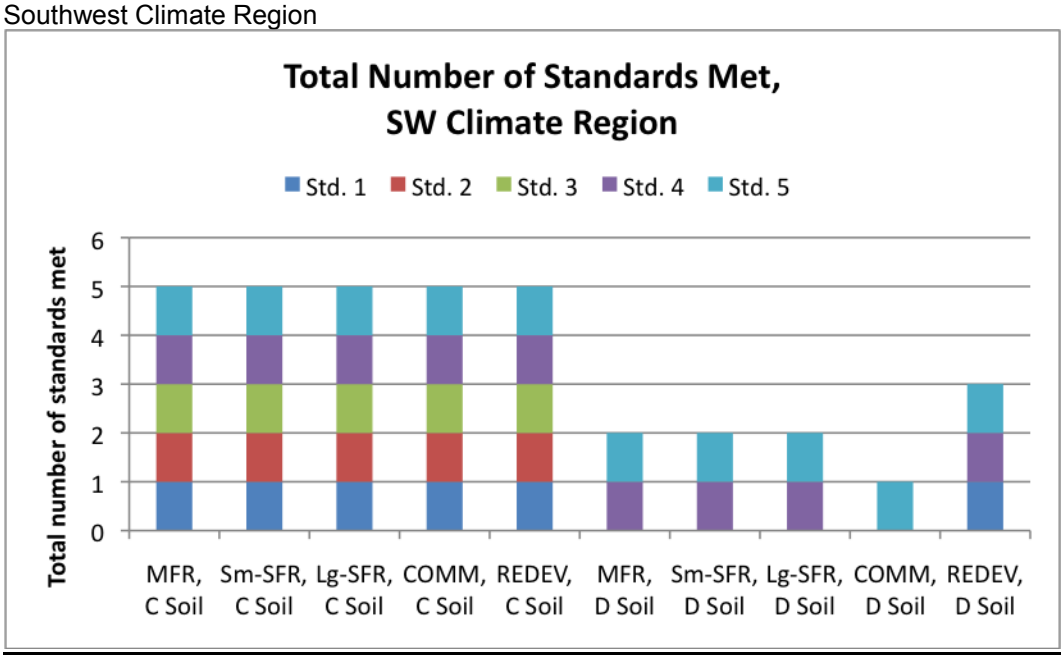

Figure 5a. Percentage of Runoff Retained Relative to Standards 1 (85th Percentile, 24-hour precipitation event) and 2 (95th Percentile event) for Southeast Climate Region

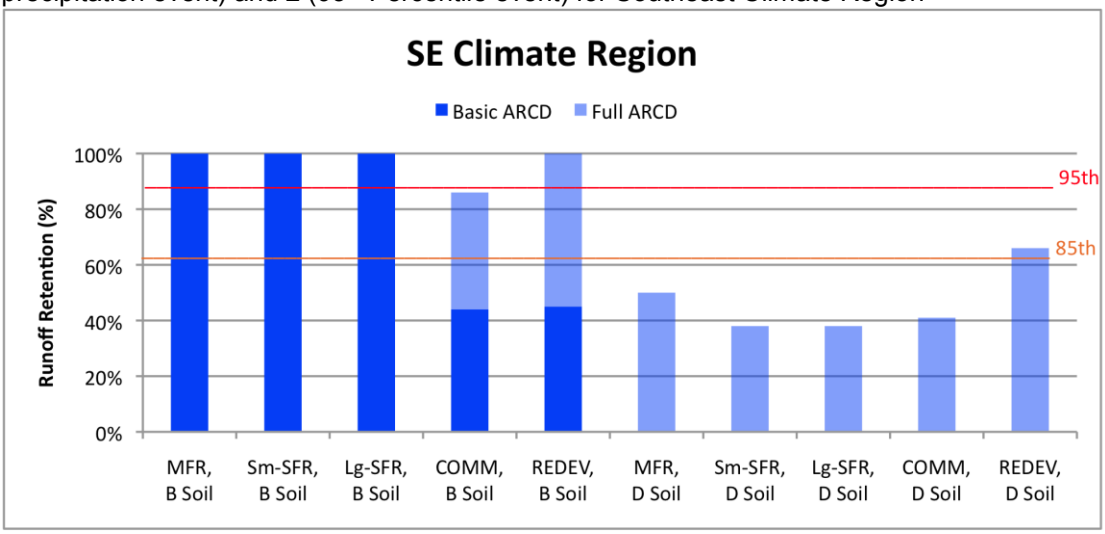

MFR—multi-family residential, Sm-SFR—small single-family residential, Lg-SFR--large single-family residential, COMM—retail commercial, REDEV—redevelopment. Standard (Std.) 1—Retain the runoff produced by the 85th percentile, 24-hour precipitation event; Standard 2—the 95th percentile, 24-hour precipitation event; Standard 3—90 percent of the average annual post-development runoff volume; Standard 4—the difference between the post- and pre-development average annual runoff volumes; and, Standard 5—the difference between the post- and pre-development runoff volumes for all events up to and including the 85th percentile, 24-hour precipitation event

Figures 5a-d show the percentage of runoff that can be retained for each development type, in each region, using either Basic or Full ARCD practices, in comparison with Standard 1 (retention of the 85th percentile, 24-hour precipitation event) and Standard 2 (retention of the 95th percentile, 24 hour event). Even where Standards 1 and 2 cannot be met in full, ARCD practices can still result in substantial compliance, and retention of significant runoff volume.

Figure 5b. Percentage of Runoff Retained Relative to Standards 1 (85th Percentile, 24-hour precipitation event) and 2 (95th Percentile event) for South Central Climate Region

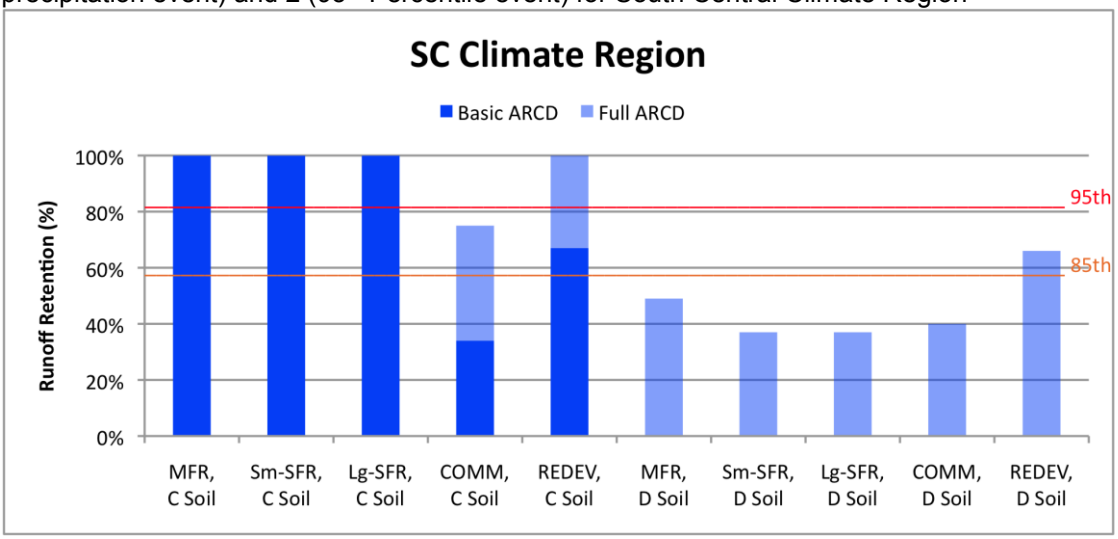

Figure 5c. Percentage of Runoff Retained Relative to Standards 1 (85th Percentile, 24-hour precipitation event) and 2 (95th Percentile event) for Northeast-Midwest Region

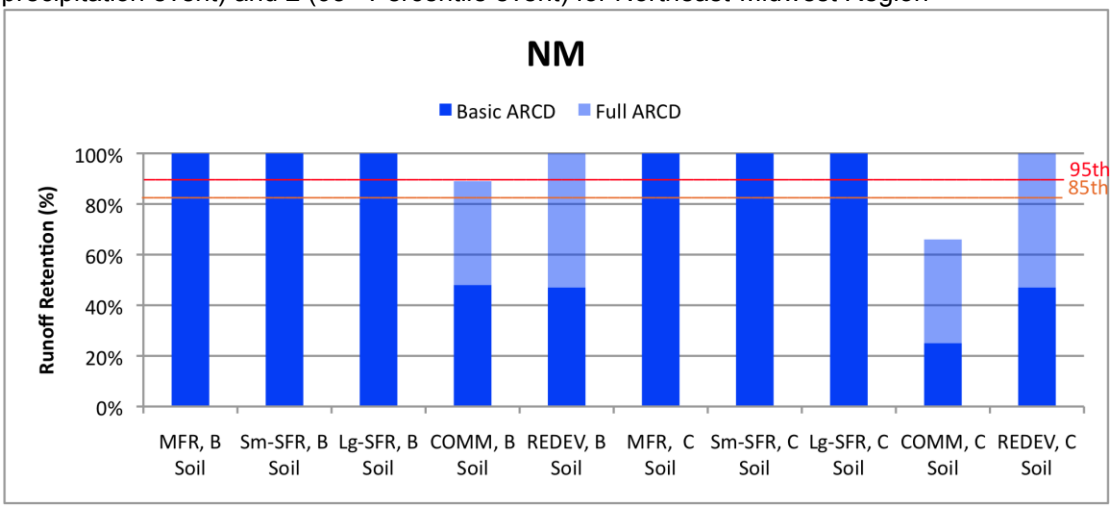

Figure 5d. Percentage of Runoff Retained Relative to Standards 1 (85th Percentile, 24-hour precipitation event) and 2 (95th Percentile event) for Southwest Region

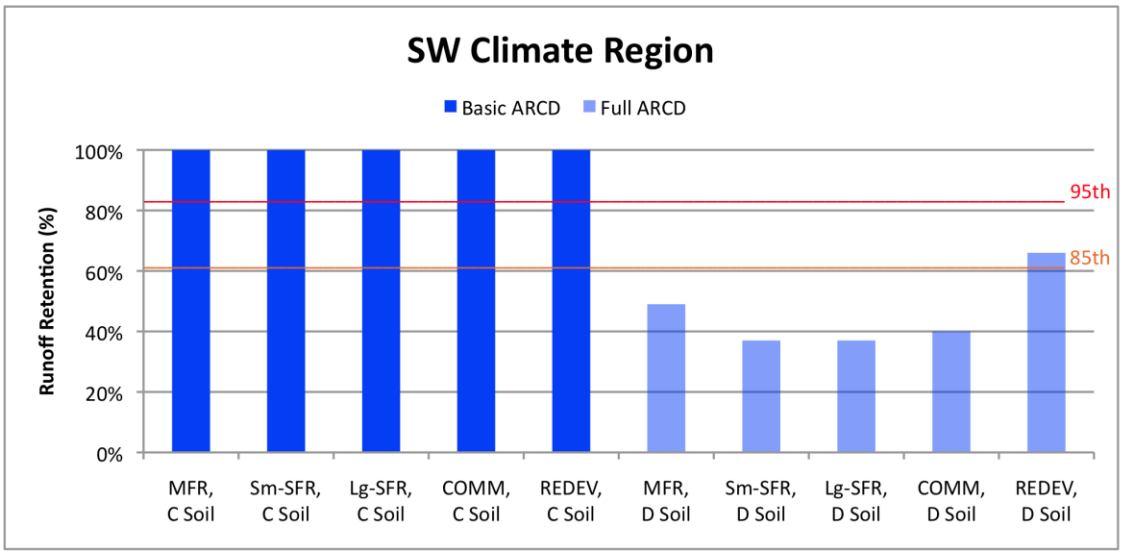

Effectiveness of Standards in Environmental Protection

Standard 3 (retain 90 percent of the average annual post-development runoff volume) would be the most protective standard. Meeting or coming as close as possible to meeting, but not exceeding, this standard is estimated to lead to 66-90 percent runoff retention and pollutant loading reduction on B and C soils and 37-66 percent on D soil. Standard 2 (retain the runoff produced by the 95th percentile, 24-hour precipitation event) would yield only slightly less protection with B and C soils and, with D soil, retention and loading reduction equivalent to standard 3.

Standards 4 and 5, based on the differential between pre- and post-development runoff volume, are highly inconsistent in retaining runoff and reducing pollutants, in that they are relatively protective where pre-development runoff is estimated to be very low relative to post-development flow, but result in progressively lower retention and pollutant loading reduction as pre- and post-development volumes converge, such as in several cases on D soils. Standard 5 is especially weak in this regard. The potentially low level of retention and pollutant loading reduction renders these standards based on the change in pre- versus post-development runoff volume poor candidates for national application, at least as formulated in these terms.

Fully meeting standard 1 (retain the runoff produced by the 85th percentile, 24-hour precipitation event) would yield runoff retention and pollutant mass reduction ranging from 58 to 81 percent, depending on climate region. This level of inconsistency decreases the utility of this standard for widespread use. Standard 2, based on the 95th percentile event, is much better in this respect, with variability in runoff retention and loading reduction across the nation in the much narrower 82-89 percent range. However, standard 1 remains more consistent across regions, and more protective of water quality for development on D soils than either standard 4 or 5, and is preferable to those standards in this regard.

In summary, standards 2 and 3 are clearly superior to the other three options. Standard 3 is entirely consistent from place to place in degree of environmental protection, and standard 2 does not deviate much. Analysis of the five development cases on two soil groups in each of four regions demonstrated the two standards are virtually identical in the runoff retention and pollutant loading reduction they would bring about.

Management or Runoff in Excess of Standards Requirements

All of the analysis reported above assumed that any remaining runoff after the application of ARCD and meeting, or coming as close as possible to meeting a standard, would discharge with no treatment. In fact, additional treatment could further decrease pollutant loadings. Treatment without further runoff retention could be accomplished by many conventional or ARCD methods designed to lower contaminant concentrations. The most effective of the alternatives is probably bioretention discharging non-retained runoff either on the surface or through an underdrain, assumed in the analysis conducted for this study according to the methods cited above. Treatment of all remaining runoff with underdrained bioretention cells where space remains but all infiltration capacity is used can raise the pollutant removals given in Table 16 to the levels in Table 17. These estimates apply to the four pollutants considered, TSS and total copper, zinc, and phosphorus. Space would most likely be available in the three MFR and SFR cases but not the COMM and REDEV scenarios.

While there is substantial variability in these results, they demonstrate that discharging effluent of relatively consistent, high quality can be accomplished with a comprehensive ARCD strategy. This strategy would embrace, first, retaining as much urban runoff as possible and then utilizing treatment based on soil and vegetative media to capture contaminants from the remainder.

Table 17. Estimated Pollutant Loading Reduction Benefits of Bioretention Treatment of Runoff Remaining After ARCD Implemented to Meet or Approach Standards

Range of Table 16 Values (%)	Approximate Pollutant Removal Increase (%)	Total Estimated Pollutant Removal Range (%)
35-45	30-45	65-90
45-55	25-35	70-90
55-65	20-30	75-95
65-75	15->20	80->95
75-85	10->15	85->95
>85	5->10	90->95

SUMMARY AND CONCLUSIONS

STUDY DESIGN

This study was performed to investigate the degree to which low-impact development ARCD practices can meet or exceed the requirements of various potential stormwater management facility design standards and the resulting environmental benefits. The investigation was performed by estimating the stormwater retention possible with full application of ARCD practices to five land use cases in four representative climatic regions in the United States on two prominent soil types in each region. Retention is defined as preventing the conversion of precipitation to surface runoff. Retaining runoff from impervious and pollutant generating pervious surfaces prevents the introduction of urban runoff pollutants to receiving waters as well as reduces runoff volume to prevent stream channel and habitat damage, flooding, and loss of groundwater recharge. Infiltrating bioretention was first applied in the analysis of each case, a strategy termed Basic ARCD. When Basic ARCD could not fully retain post-development runoff, a Full ARCD strategy was added, involving roof runoff harvesting in the most impervious development cases and roof water dispersion in those with substantial pervious area. Benefits were assessed with respect to reduction of the annual average surface runoff volume from the quantity estimated without any stormwater management practices, and associated maintenance of pre-development groundwater recharge and water quality improvement through preventing discharge to receiving waters of pollutants generated with developed land uses.

A number of conservative assumptions were built into the analysis to ensure that the capabilities and benefits of ARCD would not be over-estimated. In summary, these assumptions are:

- No retention credit for evapotranspiration in the Basic ARCD strategy, although generally a substantial amount would occur, and consideration of evapotranspiration only for roof runoff in the Full ARCD strategy;
- Letting aside many available ARCD practices and site design principles that could be employed to reduce the runoff quantity, and the pollutants it transports, by reducing impervious surface area or directing the runoff to bioretention, harvesting, and dispersion facilities;
- The assumption of no infiltration on hydrologic soil group D soils, although some infiltration occurs at finite rates even on clay;
- Application of a safety factor to estimated infiltration rates;
- Minimum bioretention cell depths, so that these facilities would not be disruptive to site design and could be put to other uses;
- Requiring a 48-hour drawdown time for bioretention, instead of the 72-hour maximum;
- An analysis to guard against groundwater mounding under bioretention cells, with conservative assumptions for horizontal and vertical hydraulic conductivity rates; and
- An analysis demonstrating that doubling topographic slope changes results by only a few percent.

CAPABILITIES OF FULL ARCD APPLICATION

Comparison of estimated runoff production in the pre- and post-development states demonstrated that the majority of the infiltration that would recharge groundwater in the undeveloped state would be lost to surface runoff after development with no stormwater management practices. These losses would approach 90 percent in the most impervious developments. These observations apply in in all climate regions and with the full range of soil conditions.

Basic ARCD could retain all post-development runoff and pre-existing groundwater recharge, as well as attenuate all pollutant transport, in the three residential cases on B soils in the two climate regions where these soils were analyzed. Bioretention cells to accomplish this retention would use from less than one-fourth to just over one-third of the available pervious area for infiltration. Taking all available pervious area for the more highly impervious COMM and REDEV cases, bioretention would retain about 45 percent of the runoff and pollutants generated and save about 40 percent of the pre-development recharge. Adding Full ARCD measures in these cases would approximately double retention and pollutant reduction for the retail commercial land use and raise it to 100 percent for the redevelopment. Groundwater recharge would not increase, however, because the additional retention is accomplished by harvesting or dispersion.

In the three regions having C soils, Basic ARCD can again retain all runoff and reduce urban runoff pollutant mass loading to zero for the MFR and Sm-SFR and Lg-SFR residential cases, although generally requiring more of the available pervious area to do so than in B soil cases. The effect of lower rainfall is evident in the South Central and, especially, the Southwest regions. In the latter location, not only the residential cases but also the COMM and REDEV scenarios can achieve full runoff and groundwater recharge retention and pollutant loading attenuation with Basic ARCD on C soil. Full ARCD can approximately double runoff retention and pollutant removal from the Basic ARCD level for the COMM case and extend these measures to 100 percent for the redevelopment.

For development on the D soils in all climate regions, use of roof runoff management techniques was estimated to increase runoff retention and pollutant reduction from zero to between about one-third to two-thirds of the post-development runoff generated, depending on the land use case. These strategies would offer little groundwater recharge benefit with this soil condition, but would still have the potential to significantly reduce runoff volume and pollutant loading.

Therefore, taking the greatest advantage of what ARCD offers is expected to retain the great majority of post-development runoff and pre-development groundwater recharge. This strategy would also prevent the addition to receiving waters of all or almost all pollutant mass that would otherwise discharge from a range of urban developments on B and C soils. With D soils, Full ARCD can accomplish runoff retention and loading reductions approaching or somewhat exceeding 50 percent, and opportunities to use ARCD practices or site design principles not modeled in this analysis can further increase runoff retention volume.

ABILITY TO MEET STANDARDS

ARCD methods were assessed for their ability to meet five potential regulatory standards, the first two pertaining to retention of the 85th and 95th percentile, 24-hour precipitation events, the third to retain 90 percent of the post-development runoff, and the last two to retain the difference between the post- and pre-development runoff, the final standard capped at the 85th percentile, 24-hour event. The projected ability to meet the five standards varies mostly in relation to soil type (B or C versus D) and the relative imperviousness of development, and much less across climate regions, except for the relatively arid Southwest.

The only standards that cannot be fully met on B and C soils by the ARCD methods considered are standards 2-4 for the COMM case. Of the 125 standards assessments, ARCD practices are projected to meet 113 (90.4 percent) with B and C soils. The ability to meet these standards is much reduced on D soils. Only standards 1 (85th percentile, 24-hour precipitation event, and 4 and 5 (related to the difference between the post- and pre-development runoff) can be met occasionally and under limited conditions using Full ARCD methods. However, even on D soils, all cases for Standard 1 were able to retain greater than 50 percent of the required runoff volume.

Standard 3 (retain 90 percent of the average annual post-development runoff volume) would be the most environmentally protective standard. Meeting or coming as close as possible to meeting, but not exceeding, this standard was estimated to lead to 66-90 percent runoff retention and pollutant loading reduction on B and C soils and 37-66 percent on D soil. Standard 2 (retain the runoff produced by the 95th percentile, 24-hour precipitation event) would yield equivalent protection on D soils and only slightly less protection with B and C soils.

Standards 4 and 5, based on the differential between pre- and post-development runoff volume, are very inconsistent in retaining runoff and reducing pollutants. They are highly protective where pre-development runoff is estimated to be very low relative to post-development flow, and then to result in progressively lower retention and loading reduction as pre- and post-development volumes converge. Standard 5 is especially weak in this regard. This inconsistency makes these standards poor candidates for national application, at least as formulated in these terms.

Fully meeting standard 1 (retain the runoff produced by the 85th percentile, 24-hour precipitation event) would yield runoff retention and pollutant mass reduction ranging from 58 to 81 percent, depending on climate region. This level of inconsistency decreases the utility of this standard to some degree. Standard 2, based on the 95th percentile event, is much better in this respect, with variability in runoff retention and loading reduction across the nation in the much narrower 82-89 percent range. However, standard 1 remains more consistent across regions, and more protective of water quality for development on D soils than either standard 4 or 5, and is preferable to those standards in this regard.

In summary, standards 2 and 3 are clearly superior to the other three options. Standard 3 is entirely consistent from place to place in degree of environmental protection, and standard 2 does not deviate much. Analysis of the five development cases on two soil groups in each of four regions demonstrated the two standards are virtually identical in the runoff retention and pollutant loading reduction they would bring about.

All five standards are based on some stipulated runoff retention. Pollutant mass loading reduction is at least equal to the amount of retention that occurs. It is possible to decrease loadings further by treating excess runoff. Analysis showed that subjecting that runoff to bioretention treatment before discharge could reduce loadings of TSS and total copper, zinc, and phosphorus by at least two-thirds and as much as over 95 percent. This conclusion applies to all climate regions and soil types for land use cases where space is available for the additional bioretention cells. The three residential cases are in this group but not the COMM or REDEV cases, where all pervious land would have already been used for retentive or roof water dispersion practices.

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ATTACHMENT A

POLLUTANT CONCENTRATIONS FOR URBAN SOURCE AREAS (HERRERA ENVIRONMENTAL CONSULTANTS, INC. UNDATED)

Source Area	Study	Location	Sample Size (n)	TSS (mg/L)	TCu (µg/L)	TPb (µg/L)	TZn (µg/L)	TP (mg/L)	Notes
Roofs									
Residential	Steuer, et al. 1997	MI	12	36	7	25	201	0.06	2
Residential	Bannerman, et al. 1993	WI	~48	27	15	21	149	0.15	3
Residential	Waschbusch, et al. 2000	WI	25	15	n.a.	n.a.	n.a.	0.07	3
Residential	FAR 2003	NY		*19*	*20*	*21*	*312*	*0.11*	4
Residential	Gromaire, et al. 2001	France		*29*	*37*	*493*	*3422*	*n.a.*	5
Representative Residential Roof Values				**25**	**13**	**22**	**159**	**0.11**	
Commercial	Steuer, et al. 1997	MI	12	24	20	48	215	0.09	2
Commercial	Bannerman, et al. 1993	WI	~16	15	9	9	330	0.20	3
Commercial	Waschbusch, et al. 2000	WI	25	18	n.a.	n.a.	n.a.	0.13	3
Representative Commercial Roof Values				**18**	**14**	**26**	**281**	**0.14**	
Parking Areas									
Res. Driveways	Steuer, et al. 1997	MI	12	157	34	52	148	0.35	2
Res. Driveways	Bannerman, et al. 1993	WI	~32	173	17	17	107	1.16	3
Res. Driveways	Waschbusch, et al. 2000	WI	25	34	n.a.	n.a.	n.a.	0.18	3
Driveway	FAR 2003	NY		*173*	*17*		*107*	*0.56*	4
Representative Residential Driveway Values				**120**	**22**	**27**	**118**	**0.66**	
Comm./ Inst. Park. Areas	Pitt, et al. 1995	AL	16	110	116	46	110	n.a.	1
Comm. Park. Areas	Steuer, et al. 1997	MI	12	110	22	40	178	0.2	2
Com. Park. Lot	Bannerman, et al. 1993	WI	5	58	15	22	178	0.19	3
Parking Lot	Waschbusch, et al. 2000	WI	25	51	n.a.	n.a.	n.a.	0.1	3
Parking Lot	Tiefenthaler, et al. 2001	CA	5	36	28	45	293	n.a.	6
Loading Docks	Pitt, et al. 1995	AL	3	40	22	55	55	n.a.	1
Highway Rest Areas	CalTrans 2003	CA	53	*63*	*16*	*8*	*142*	*0.47*	7

Park and Ride Facilities	CalTrans 2003	CA	179	*69*	*17*	*10*	*154*	*0.33*	7
Comm./ Res. Parking	FAR 2003	NY		*27*	*51*	*28*	*139*	*0.15*	4
Representative Parking Area/Lot Values				**75**	**36**	**26**	**97**	**0.14**	
Landscaping/Lawns									
Landscaped Areas	Pitt, et al. 1995	AL	6	33	81	24	230	n.a.	1
Landscaping	FAR 2003	NY		*37*	*94*	*29*	*263*	n.a.	4
Representative Landscaping Values				**33**	**81**	**24**	**230**	**n.a.**	
Lawns - Residential	Steuer, et al. 1997	MI	12	262	n.a.	n.a.	n.a.	2.33	2
Lawns - Residential	Bannerman, et al. 1993	WI	~30	397	13	n.a.	59	2.67	3
Lawns	Waschbusch, et al. 2000	WI	25	59	n.a.	n.a.	n.a.	0.79	3
Lawns	Waschbusch, et al. 2000	WI	25	122	n.a.	n.a.	n.a.	1.61	3
Lawns - Fertilized	USGS 2002	WI	58	n.a.	n.a.	n.a.	n.a.	2.57	3
Lawns - Non-P Fertilized	USGS 2002	WI	38	n.a.	n.a.	n.a.	n.a.	1.89	3
Lawns - Unfertilized	USGS 2002	WI	19	n.a.	n.a.	n.a.	n.a.	1.73	3
Lawns	FAR 2003	NY	3	*602*	*17*	*17*	*50*	*2.1*	4
Representative Lawn Values				**213**	**13**	**n.a.**	**59**	**2.04**	

Notes:
Representative values are weighted means of collected data. Italicized values were omitted from these calculations.
1 - Grab samples from residential, commercial/institutional, and industrial rooftops. Values represent mean of DETECTED concentrations
2 - Flow-weighted composite samples, geometric mean concentrations
3 - Geometric mean concentrations
4 - Citation appears to be erroneous - original source of data is unknown. Not used to calculate representative value
5 - Median concentrations. Not used to calculate representative values due to site location and variation from other values.
6 - Mean concentrations from simulated rainfall study
7 - Mean concentrations. Not used to calculate representative values due to transportation nature of land use.

FILED
LOS ANGELES SUPERIOR COURT
MAR 24 2005
JOHN A. CLARKE, CLERK
BY E. SABALBURO, DEPUTY

SUPERIOR COURT OF THE STATE OF CALIFORNIA
COUNTY OF LOS ANGELES - CENTRAL CIVIL WEST COURTHOUSE

In Re LOS ANGELES COUNTY MUNICIPAL STORM WATER PERMIT LITIGATION

Lead Case No. **BS 080548**
Related Cases: BS 080753, BS 080758 BS 080791, BS 080792, and 080807
Judge: Hon. Victoria Gerrard Chaney

STATEMENT OF DECISION FROM PHASE I TRIAL ON PETITIONS FOR WRIT OF MANDATE

Statement of Decision from Phase I Trial
Hearing: January 7, 2005
Ruling: March 16, 2005
Department: 324-Central Civil West
Date Actions Filed: January 15 & 17, 2003

On May 19-20, 2004, trial was held on Phase I of this bifurcated action, known as *In the Matter of the Los Angeles County Municipal Stormwater Permit*, which involves five coordinated Petitions for Writ of Mandate filed by Petitioners County of Los Angeles and the Los Angeles County Flood Control District (County Petitioners); Petitioners the Cities of Arcadia, Baldwin Park, Bell Gardens, Bellflower, Cerritos, Claremont, Commerce, Covina, Diamond Bar, Downey, Gardena, Hawaiian Gardens, Irwindale, Lawndale, Montebello, Paramount, Pico Rivera, Pomona, Rosemead, San Gabriel, Santa Fe Springs, Sierra Madre, Signal Hill, South Pasadena, Temple City, Vernon, Walnut, West Covina, Whittier, Building Industry Legal Defense Foundation, and Construction Industry Coalition on Water Quality

(Arcadia Petitioners); Petitioners Cities of Monrovia, Norwalk, Rancho Palos Verdes, Artesia, Beverly Hills, Carson, La Mirada, Westlake Village, Agoura Hills, Hidden Hills, San Fernando, and San Marino (Monrovia Petitioners); Petitioner City of Alhambra (Alhambra); and Petitioners Los Angeles County Economic Development Corporation and the Cities of Industry, Lakewood, Santa Clarita and Torrance (LAEDC Petitioners) against the Regional Water Quality Control Board, Los Angeles Region (Regional Board). The Natural Resources Defense Council, Santa Monica Baykeeper, and Heal the Bay (Intervenors) intervened as Respondents in Intervention in support of the Permit.

After full briefing and oral argument, the Court, the Honorable Victoria Gerrard Chaney presiding, issues the following Statement of Decision on the Phase I issues. All parties were present and represented by counsel. Howard Gest appeared on behalf of the County Petitioners; Rufus C. Young and Amy Morgan appeared for the Alhambra and LAEDC Petitioners; Richard Montevideo and Peter Howell appeared for the Arcadia Petitioners; John J. Harris and Evan J. McGinley appeared for the Monrovia Petitioners; Jennifer Novak and Helen Arens, Deputy Attorneys General appeared for the Regional Board; David Beckman, Anjali Jaiswal and Leslie Mintz appeared for the Intervenors. This Statement of Decision applies only to the Phase I issues presented to this Court. All remaining issues are addressed in the Phase II Statement of Decision.

Phase I of this bifurcated proceeding involved the following issues, as framed in the Joint Statement Regarding Briefing and Hearing Schedule, filed on March 2, 2004:

1. Petitioners' allegations that Part 2 of the Permit ("Receiving Water Limitations") is ambiguous, arbitrary, unsupported by the Record, and contrary to the "good faith" safe harbor intentions of the Respondent and renders compliance with the Permit impossible and impracticable;

2. Petitioners' allegations that the Permit exceeds the Respondent's authority under the federal Clean Water Act and California's Porter-Cologne Water Quality Act by imposing requirements that go beyond the Clean Water Act's "maximum extent

practicable" ("MEP") standard and/or the Porter-Cologne Act's "reasonably achievable" standard;

3. Certain Petitioners' allegations that the Permit unlawfully regulates discharges "into", as opposed to only "from", the municipal separate storm sewer system contrary to the Clean Water Act and without authority under the Porter-Cologne Act;

4. Petitioners' allegations that Respondent acted without authority by adopting Permit terms that unlawfully direct Petitioners to modify their General Plans and/or their CEQA guidelines, and that unlawfully compel Petitioners to review development projects in a manner that is contrary to or different from the process provided for by the California Legislature, with Respondent violating the Separation of Powers doctrine under the California Constitution;

5. Certain Petitioners' allegations that the Permit unlawfully interferes with their land use authority; and

6. Petitioners' allegations that the Permit was adopted in violation of CEQA, as Respondent failed to comply with the environmental review requirements of CEQA. (To what extent was the Respondent required to comply with CEQA in adopting the Permit and did the Respondent so comply.)

Holding

With some caveats, the Court denies the petitions for writ of mandate as they relate to the Phase I issues.

To obtain a writ of mandate under Code of Civil Procedure section 1094.5, Petitioners must prove that Respondent, the Regional Board: 1) proceeded without or in excess of jurisdiction; 2) issued its Permit without first holding a fair hearing; or 3) prejudicially abused its discretion. Abuse of discretion is established if the Respondent: a) has not proceeded in a manner required by law; b) the Permit is not supported by findings; or c) the findings are not supported by the evidence.

Petitioners failed to demonstrate that Respondent exceeded its jurisdiction.

Petitioners do not appear to argue that the Permit was issued without a fair hearing. If this argument were made, 80,000 pages of the administrative record ("the Record") and approximately 50 meetings between Regional Board staff and interested parties would confute the argument.

Neither have Petitioners demonstrated that Respondent failed to proceed in a manner required by law, that the Permit is unsupported by the findings, or that the findings are unsupported by the evidence. Therefore, the Court finds no prejudicial abuse of discretion.

Permit Part 2: Receiving Water Limitations

Petitioners assert several arguments with respect to Part 2 of the Permit, Receiving Waters Limitations. In particular, Petitioners assert that subparts 2.1, 2.2, 2.3, and 2.4 of Part 2 create ambiguity, that Part 2 must include a "safe harbor" provision, and that the Permit, including Part 2, unlawfully exceeds the MEP standard.

The Permit cannot be read in a vacuum. In interpreting the Permit the Court looks to the content of Part 2, other language and provisions in the Permit, other related statutes and regulations, and the technical and specialized nature of NPDES permits together with the expertise of those who implement them. (See *Department of Alcoholic Beverage Control v. Alcoholic Beverage Control Appeals Bd.* (2003) 109 Cal.App.4th 1687, 1696; see also *Northwest Environmental Advocates v. Portland* (9th Cir. 1995) 56 F.3d 979, 982; *United States v. Weitzenhoff* (9th Cir. 1994) 35 F.3d 1275, 1289.)

The terms of the Permit are governed by 33 U.S.C. section 1342, subdivision (p)(3)(B) of the Clean Water Act, which includes the "requirement to effectively prohibit non-stormwater discharges into the storm sewers"; the Maximum Extent Practicable standard[1]; and the separate

[1] See Permit at 57 citing (*In the Matter of the Petitions of the Cities of Bellflower et al.* (Oct. 5, 2000) SWRCB WQ 2000-11 at 20 (R007511); see Memorandum from Elizabeth Miller Jennings, Senior Staff Counsel, SWRCB, *Definition of Maximum Extent Practicable* (Feb. 11, 1993) at 3 (R0028353); 40 C.F.R. §122.26(d)(2)(iv); *NRDC v. Costle* (D.C. Cir. 1977) 568 F.2d 1369, 1375; *NRDC v. U.S. EPA* (9th Cir. 1992) 966 F.2d 1292, 1296, 1308; *Browner* 191 F.3d at

authority of the Regional Board to require "such other provisions" necessary to meet water quality standards. The Permit is governed also by the Porter-Cologne Act section 13263, to the extent it is not inconsistent with federal law; and Part 2 should be interpreted in light of the findings of experts, including the Regional Board,[2] precedential orders,[3] and related Clean Water Act provisions, such as those that provide for the adoption of TMDLs.[4]

Pursuant to these authorities and guides, the Court rejects Petitioners' assertion that the MEP standard is the sole standard that applies to municipal storm water discharges and their related contention that MEP is a substantive upper limit on requirements that can be imposed to meet water quality standards. In *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159 (*Defenders of Wildlife*), the Ninth Circuit noted: "Under that discretionary provision [of Section 402(p)(3)(B)], the EPA has the authority to determine that ensuring strict compliance with state water-quality standards is necessary to control pollutants. The EPA also has the authority to require less than strict compliance with state water-quality standards." (191 F.3d at p. 1166.) The Regional Board, which is authorized to enforce the Clean Water Act pursuant to Water Code

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1168-67 (permitting authority's broad discretion to specify BMPs and determine whether MEP is satisfied).

[2] See, e.g., Long Beach Municipal Stormwater Permit (Los Angeles RWQCB Order 99-060 at 6-7 (R0008599-600); Ventura County Municipal Stormwater Permit (Los Angeles RWQCB Order 00-108) at 9 (R0008753); Caltrans Stormwater Permit (State Board 99-06) at 10-11 (R0003225); Ltr from Alexis Strauss, Acting Director, Division of Water, EPA Region IX (Mar. 17, 1998) at 2 (R0008582); 61 Fed.Reg. 43,761 *EPA Interim Permitting Approach*; Memorandum from Michael A.M. Lauffer, Staff Counsel, SWRCB, *Legal Issues Concerning Renewal of Order 96-054* (Nov. 9, 2001) at 12 (R0007374); Memorandum from Regional Board Staff for Nov. 29, 2001 Meeting at A.9-A.10 (R0006796-97).

[3] See, e.g., *Own Motion Review of the Petition of Environmental Health Coalition* SWRCB WQ 98-01 at 5 (R0001973) amended by *Own Motion Review of the Petition of Environmental Health Coalition* SWRCB WQ 99-05 at 1-2 (R0001965-66) ("as a precedent decision, the following receiving water limitation language shall be included in future municipal storm water permits" without a safe harbor) (R0001965-66); *In the Matter of the Petitions of BIA*, SWRCB WQ 2001-15 at 5-7 (R0007530-32); see also *In the Matter of the Petition of Citizens for a Better Environment, et al.* SWRCB order 91-03 at 36 (R0066466).

[4] See Fact Sheet 14-15 (R0008047-48); 40 C.F.R. § 122.44(a)(1) (TMDL implementation in stormwater management plans), 40 C.F.R. § 130.6(c)(1); Cal. Water Code § 13263.

sections 13370 and 13377, can also require compliance with water quality standards. (See *Building Industry Association of San Diego County v. State Water Resources Control Board* (2004) 124 Cal. App. 4th 866 (*Building Industry Association*) [rejecting the claim that the MEP standard is the exclusive measure that may be applied to municipal storm sewer discharges].)

It seems clear that the Regional Board followed these principles when it established subparts 2.1 and 2.2 as the basic receiving water requirements for Los Angeles area waters and subparts 2.3 and 2.4 as the procedure the Board intends to implement to resolve any violations those requirements. (See *Building Industry Association*, *supra*, 124 Cal.App.4th at p. 890 ["Although the Permit allows the regulatory agencies to enforce the water quality standards during this process, the Water Boards have made clear in this litigation that they envision the ongoing iterative process as the centerpiece to achieving water quality standards."]; see generally *Defenders of Wildlife*, *supra*, 191 F.3d 1159; *NRDC v. Costle* (D.C. Cir. 1977) 568 F.2d 1369, 1375; *NRDC v. U.S. EPA* (9th Cir. 1992) 966 F.2d 1292, 1296, 1308.)

Under this process, the first step to correct water quality violations that occur, even if a permittees' SQMP has been designed to achieve standards and BMPs have been timely implemented, is set forth in subpart 2.3, the "iterative" process. Should that not be sufficient, the parties would move to subpart 2.4, Best Management Practices (BMP) requirements. The process requires cooperation from the Regional Board, State Board and local government entities and impliedly requires that all parties work together in good faith.

This reading is consistent with the requirements of the Clean Water Act generally and section 402 specifically, as well as the Porter-Cologne Act. (See 33 U.S.C. § 1342(p)(3)(B)(iii); 33 U.S.C. §§ 1341(a)(1)-(2), 1342(a)(2), 1342(p)(3)(B)(ii); 40 C.F.R. 122.4(d); Cal. Water Code §§ 13000, 13263(a).) It is also consistent with State Board orders WQ 2001-15 and WQ 99-05 and the Francine Diamond letter, found at Exhibit B to Petitioners' Request for Judicial Notice.

Reading the Receiving Waters Limitations language in this manner, there is no tension between the subparts and no ambiguity.

Petitioners assert that the Regional Board was required under the Porter-Cologne Act and CEQA to consider certain factors when issuing the Permit, including economics, reasonably achievable water quality conditions, potential and environmental impacts, alternatives to the proposed requirements and mitigation measures for any requirements adopted. In a later section of this Statement of Decision and in the Statement of Decision from Phase II of trial the Court rejects these arguments but finds that in any event the Regional Board met any such obligations by considering these factors in addressing the MEP standard. In addition, where applicable, the Total Maximum Daily Load (TMDL) procedures allow for correction of water quality problems in a graded manner over a period of years. The TMDL procedures provide some protection from unreasonable enforcement by the Regional Board.

In sum, the Regional Board acted within its authority when it included Parts 2.1 and 2.2 in the Permit without a "safe harbor," whether or not compliance therewith requires efforts that exceed the "MEP" standard. *(Defenders of Wildlife*, supra, 191 F.3d 1159; *Building Industry Association* 124 Cal. App. 4th at p. 884.) In so concluding, the Court gives deference to State Board order 99-05, a precedential decision under Government Code section 11425.60, and notes the EPA's objection to specific safe harbor language. (See *Own Motion Review of the Petition of Environmental Health Coalition* SWRCB WQ 99-05 at 1-2 (R0001965-66); see also Letter from Alexis Strauss, Acting Director, Division of Water, EPA Region IX (Mar. 17, 1998) at 2 (R0008582).) The Court emphasizes the importance of good faith on the part of all parties in implementing Part 2.

Maximum Extent Practicable Standard

Further, Petitioners assert that the Permit cannot go beyond the maximum extent practicable ("MEP") standard under the Clean Water Act and this Permit is inconsistent with the MEP standard. As noted, even if the Permit did exceed the MEP standard, the Regional Board was within its authority in requiring more stringent standards. However, the Court finds that the administrative record contains significant evidence showing that the terms of the Permit taken, as

a whole, constitute the Regional Board's definition of MEP, including, but not limited to, the challenged Permit provisions. There is significant evidence in the administrative record that the Regional Board looked to both other states and jurisdictions, and conducted its own independent studies regarding various methods for compliance with MEP.[5] This Court specifically finds that the Regional Board conducted considerable research and review to ensure that the best management practices ("BMPs") were available and reasonable.[6] For example, the administrative record contains *The Fundamentals of Urban Runoff Management: Technical and Institutional Issues*, which demonstrated an effective and available method for removing

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[5] See, e.g., Permit at 14 (development and redevelopment activities); Permit at 18 (implementation of all BMPs in SQMP); Final Fact Sheet/Staff Report (Dec. 13, 2001) ("Fact Sheet") at 15-17 (public education and participation) (R0008048-50); Fact Sheet at 19-25 (industrial/commercial program and inspections) (R0008052-58); Fact Sheet at 38-40 (public agency activity) (R0008071-73); Fact Sheet at 40-45 (development and redevelopment activity) (R0008073-78); Long Beach Municipal Stormwater Permit (Los Angeles RWQCB Order 99-060 (R0008599-600); Ventura County Municipal Stormwater Permit (Los Angeles RWQCB Order 00-108) (R0008753); Caltrans Stormwater Permit (State Board 99-06) at 10-11 (R0003225).Comparison of Permit with Orange County and Santa Clara Permit (R0031402); Orange County Permit Proposed Monitoring Program (R0054938); Riverside Permit (R0055287-88); Denver Urban Stormwater Drainage Manual (R0056744-46); San Francisco BMPs (R0057414); Watershed Ordinance for Austin, TX (R0058074); Orange County DAMP (R0058399); San Bernardino Permit (R0061460); Ventura Permit (R0061493); Fresno Permit (R0061511); Sacramento Permit (R0061585); San Francisco Bay Area Permit (R0061636); Santa Cruz Region Permit (R0061652); Sarasota Permit (R0061666); Tulsa Permit (R0061773); Anchorage Permit (R0061805) (New York State Stormwater Management Design Manual (R0009514); Virginia Stormwater Management Manual (R0009529).

[6] See, e.g., Allison, Robin, Effectiveness of Two Storm Water Trash Trapping Systems (R0068962-63); Leecaster, Molly K., Assessment of Efficient Sampling Designs for Urban Stormwater Monitoring (R0022854-60); Radulescu, Dan, Storm Water Quality Task Force BMP Guide for Retail Gasoline Outlets (Nov. 2001) (R0007546-50); Radulescu, Dan, Retail Gasoline Outlets: New Development Design Standards for Mitigation of Storm Water Impacts (Dec. 2001) (R0007598-607); Dallman, Suzanne, Storm Water: Asset not Liability (Dec. 3, 1999) (R0068878-913); Pitt, Robert, Illicit Discharge Detection and Elimination (May 2001) (R0011273); Swamikannu, Xavier, SUSMPs Presentation to the Regional Board (Jan. 26, 2000) (R0068726-40); Othmer, Edward F., Performance Evaluation of Structural BMPs: Drain Inlet Inserts (R0007566-78); Los Angeles County Requirements, Section Three (R0068875-77); Schueler, Thomas, R., Better Site Design: Changing Development Rules to Protect the Environment (1999) (R0068693-95); A Guide to Better Site Planning (R0068868-73); Urban Runoff: New Development Management Measure (R0068713-22); Ferguson, Bruce K., Stormwater Infiltration (R0068914-15); Horner, Richard R., Fundamentals of Urban Runoff Management: Technical and Institutional Issues (Aug. 1994) (R0068930-61); Ltr from NRDC to Regional Board re: SUSMPs (Jan. 14, 2000) (R0068840-61).

pollutants. (Horner, R., *Fundamentals of Urban Runoff Management: Technical and Institutional Issues* (Aug. 1994) (R0068930).) The administrative record also shows that the Regional Board considered State Board order 2000-11, which held that the Standard Urban Stormwater Mitigation Plans ("SUSMPs") "are consistent with MEP and therefore are federally mandated." (*In Re Cities of Bellflower, et al.* (2000) SWRCB Order 2000-11 (R0007506).) Additional challenges to the SUSMPs are rejected in the Statement of Decision from Phase II of trial in deciding Issue 6.

The Court finds that there was no issue of impossibility. The administrative record demonstrates that there are (1) BMPs available to meet the terms of the Permit consistent with the MEP standard, and (2) that those BMPs are reasonable. The administrative record supports the conclusion that the research and review were conducted by the Respondent.[7]

This Court finds based on the administrative record that the Regional Board made considerable findings regarding (1) the positive effects of storm water management and (2) the cost of potential programs and BMPs. (See e.g. Permit at 2-4, 8-10, 12-14; Fact Sheet at 3-7 (R0008036-40).) The Regional Board considered the history of implementation costs, both in prior permits for Petitioners and costs in other states.[8]

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[7] See *supra* notes 7 and 8; see also Addendum (consideration of EPA documents).

[8] See, e.g., Yamaguchi, Marianne, *Comparative Cost of the LA County Storm Water Management Program* (June 10, 1996) (R0031426-30; R0031431-44); Regional Board, Slide Presentation of MS4 Permit (Dec. 13, 2001) (R0007660); SUSMPs, *BMP Cost Estimates* (Nov. 30, 1999) (R0068731-33); Santa Monica Bay Tourism and Recreational Beach Use (1994) (R0031447); Los Angeles 1998 Economic and Demographic Info. (1998) (R0010984-85); Permit Costs, City of Manhattan Beach (June 17, 1996) (R0031445); U.S. EPA, *Economic Benefits of Runoff Controls* (Sept. 1995) (R0010711-12); U.S. EPA, *Data Summary of Urban Stormwater Best Management Practices* (Aug. 1999) (R0010735-36); *Cost and Benefits of Storm Water BMPs* (Sept. 14, 1998) (R0073087-135); U.S. EPA, *Economic Analysis of the Storm Water Phase II Rule* (Aug. 1, 1997) (R0010281-82); U.S. EPA, *Liquid Assets: A Summertime Perspective on the Importance of Clean Water to the Nation's Economy* (May 1996) (R0066961); The Role of Metropolitan Areas in the National Economy (R0011017); *The Benefits of Better Site Design in Commercial Development* (R0011499-508); Billingsley, Janice, *Study Nails Building Costs* (Sept. 4, 2000) (R0010703); U.S. Dept. of Commerce, *Economic Valuation of Natural Resources: A Handbook for Coastal Resource Policymakers* (June 1995)

CEQA Compliance

Several Petitioners assert that the Court should invalidate the action of the Regional Board on the grounds that the Regional Board failed to comply with the California Environmental Quality Act (CEQA), and failed to conduct the necessary environmental review required by CEQA. They acknowledge that in issuing a National Pollutant Discharge Elimination System (NPDES) permit, the Regional Board is exempt from complying with CEQA's requirement to prepare Environmental Impact Reports or negative declarations. (See Wat. Code, § 13389; Cal. Code of Regs., Title 14, § 15263; *Committee for a Progressive Gilroy v. State Water Resources Control Board* (1987) 192 Cal.App.3d 847, 862.) Petitioners allege that the Regional Board was to comply with the "policy" requirements of CEQA, pointing to Public Resources Code sections 21000 and 21001.

The Court rejects the argument that the Regional Board violated CEQA. The Court agrees with the Regional Board that the issuance of the subject Permit was exempt from all aspects of CEQA. The Court acknowledges the State Board's finding that complying with CEQA's "policy" provisions means that in adopting the Permit, the Regional Board should consider any environmental reports or similar documents submitted during the adoption process. (See State Board Orders WQ 75-8 & 84-7, attached to Petitioners' Request for Judicial Notice as Exhibits D & E.) This interpretation of CEQA is consistent with the Legislature's stated intent that the environmental review documents contain the discussion of any adverse environmental impacts, alternatives, mitigation possibilities, etc. (Pub. Resources Code, §§ 21002.1, 21003.1;

(R0042398); Griffin, Adrian, *Economic Issues in Water Quality Regulation* (R0010706-07); U.S. Conference of Mayors, *U.S. Metro Economies: The Engines of America's Growth* (July 2001) (R0010916, R0010918); Washington State Dept. of Transport. and Ecology, *Cost Analysis, Washington Dept. of Ecology Year 2001* (Aug. 30, 2001) (R0010780); Virginia Dept. of Conservation and Recreation, *The Economic Benefits of Protecting Virginia's Streams, Lakes, and Wetlands* (Oct. 2001) (R0010880-85; R0010909-11).

cf. Cal. Code of Regs., title 14, § 15063.) CEQA requires public agencies to generate sufficiently informative documents so that decisions are made with full consideration of the environmental consequences. (*Laurel Heights Improvement Assn. v. Regents of University of California* (1988) 47 Cal.3d 376, 392.) This makes the environmental impact report the "heart" of CEQA, (*Sierra Club v. State Bd. of Forestry* (1994) 7 Cal.4th 1215, 1229 [citation omitted]). Petitioners' arguments cannot be accepted because they would render the Regional Board's exemption from this requirement illusory. Petitioners have not argued that the Regional Board failed to consider existing environmental documents as provided in State Board orders 75-8 and 84-7. The Court finds that the Regional Board had before it and considered the necessary information concerning the environment.

In addition, having found the Permit is consistent with the Clean Water Act with respect to the MEP standard and other Phase I issues, the Court respectfully disagrees with Petitioners' contention that the Permit goes "far beyond" the Clean Water Act's mandates. Also, a finding that the Permit's adoption was not bound by these CEQA reporting requirements is consistent with Congress' intent to streamline environmental regulation. (See 33 U.S.C. § 1371, subd. (c); *Pacific Legal Foundation v. Quarles* (C.D. Cal. 1977) 440 F.Supp 316, 320-21 & fn. 2.) Under the Porter-Cologne Act, a California-issued NPDES permit must be consistent with federal law and intent. (See Wat. Code, §§ 13370, 13372; *Pacific Water Conditioning v. City Council of Riverside* (1977) 73 Cal.App.3d 546, 556.)

The Court therefore finds that in adopting the Permit, the Regional Board did not act in a manner that was contrary to law, outside the scope of its authority or without the support of the weight of evidence in the record with respect to Petitioners' CEQA violation claim.

CEQA Amendment Claim

Turning next to Petitioners' claim that the Permit violates the separation of powers and unlawfully "amends" the CEQA process, the Court finds that Petitioners have not met their burden under section 1094.5. Petitioners' argument rests on the belief that CEQA occupies the field of environmental review. Petitioners present no authority to demonstrate this alleged legislative intent.

Public Resources Code section 21003 demonstrates that the Legislature intended CEQA to be *an* environmental review process, not the *only* one. When more than one review occurs, these should be coordinated as much as possible. The plain language of this statute supports this reading. Given the powers vested in the Regional Board to implement water quality control and coordination under the Porter-Cologne Act, the Regional Board can require additional environmental reviews consistent with this authority and it can specify and require actions to ameliorate the impacts of polluted runoff without offending CEQA. (See, e.g., Pub. Resources Code, § 21174; *Bozung v. Local Agency Formation Com.* (1975) 13 Cal.3d 263, 274.)

The Court also finds that the equitable doctrines of estoppel, laches and waiver apply here. When applying for their 1996 permit, the permittees advised the Regional Board that much of their storm water consideration could be "channeled" through the compliance effort of CEQA. (R0060482.) They proposed coordination with their existing CEQA processes, finding that the CEQA checklist to assess initial studies could also indirectly address potential impacts to storm water, with additions to the form. (R0060482, 0060555, 0060629.) The 1996 permit therefore included a requirement that permittees amend their CEQA review process to include storm water considerations. (R0008514.) Indeed, it imposed a deadline of 1998 to develop CEQA guidelines and 1999 to incorporate them into the permittees' internal procedures. (R008514, R008510.)

Yet none of these Petitioners availed themselves of the right to challenge this provision to the State Board under Porter-Cologne Act section 13320. At argument, Petitioners represented that they complied with the 1996 permit's requirements. In addition, when applying for the subject Permit, they proposed that this provision be added to the Permit. (R0000032.) This conduct is inconsistent with their current position. The equitable doctrines of waiver, laches and estoppel can apply to municipalities. (See, e.g., *City of Los Angeles v. County of Los Angeles* (1937) 9 Cal.2d 624, 628, 630; *Pettitt v. City of Fresno* (1973) 34 Cal.App.3d 813, 820.) The Court is satisfied under these facts that those doctrines apply here to bar Petitioners' claims on this issue.

General Plan Amendment Claim

Along a similar vein, Petitioners argue that the Permit, specifically the sections on new development and redevelopment and General Plans, constitutes land use planning, infringing upon the municipalities' land use authority. The Court respectfully disagrees with the Alhambra and LAEDC Petitioners and follows *California Coastal Commission v. Granite Rock* (1987) 480 U.S. 572 [107 S.Ct. 1419] holding that an environmental regulation is not a land use regulation. The Court finds that these are environmental regulations that do not dictate the manner in which the permittees are to use the land. Instead, while there may be some limitations, this court finds these sections represent environmental regulations, not land use regulations. These regulations are clearly for the greater good. The Permit itself notes that the Regional Board did not intend the Permit to restrict or control local land use decision-making authority, but contemplated that while permittees exercised that authority, they fulfilled Clean Water Act requirements to reduce the discharge of pollutants from new development and redevelopment activities. (Permit, at p. 14.)

In addition, the cases which Petitioners cite regarding land use planning stand for the general proposition that land use planning falls within the authority of local governments and agencies. Yet even then, land use planning must be consistent with general laws. The California Constitution Article 11 section 7 states that a county or city may not enact laws that conflict with general laws. This position is further supported by the case of *City of Los Angeles v. State of California* (1982) 138 Cal.App.3d 526, 532 for matters of statewide concern. The Porter-Cologne Act contains the Legislature's finding that water quality is a matter of statewide concern, requiring a statewide program administered at a regional level. (See, e.g., Wat. Code, § 13000; see also generally *Southern California Edison v. State Water Resources Control Board* (1981) 116 Cal.App.3d 751, 758.) 33 U.S.C. section 1251 has a companion policy statement in the Clean Water Act, where Congress found that water quality is a matter of federal concern.

In this connection, the Court disagrees with the Arcadia Petitioners that the Regional Board cannot act on behalf of the State Board. The Porter-Cologne Act sections 13001 and 13225 clearly authorize a regional board to act on behalf of the State Board. Additionally, it makes more sense to allow a regional board to act on behalf of the State Board because a regional board would be more aware of the specific problems in its area/region of the state as compared to the State Board. If permittees and other interested parties had to deal with one large board, as opposed to larger regional boards, then there would not necessarily be specialists in the particular problems of that region, such as clay soil, mountains or other unique features not occurring in different regions. (*e.g.* Northern California, the farming communities, Central California, and Los Angeles County metropolis are unique.) Allowing regional boards provides greater efficiency by processing the permits more expeditiously by specialists in specific areas.

Porter-Cologne Act section 13001 gives the Water Board primary responsibility to control and coordinate water quality, with a broad grant of authority. However, Porter-Cologne

Act section 13225 empowers the Regional Board with regional duties and obligations to prevent and abate problems and set water policies which deal with water pollution and nuisances. Porter-Cologne Act section 13240 allows for the adoption of plans by the Regional Board, which clearly gives the Regional Board authority to act in this instance, and Porter-Cologne Act section 13002 gives the Regional Board authority over local government entities.

The Court also finds that the equitable doctrines of waiver, laches and estoppel do apply to bar Petitioners' land use allegations. This finding is based on Petitioners' own actions and proposals, as well as the 1996 permit. As early as 1995, the permittees submitted an application for the 1996 permit in which they indicated that their General Plans were the legal "backbone" for the planning process and all development approvals must be consistent with the policies, objectives and principles set forth in the General Plan. They further offered: "Discussion of stormwater issues in the General Plan could greatly enhance the awareness of the issues and encourage full assessment of possible adverse impacts on stormwater quality as the result of new and redevelopment." (R0060556.) The 1996 permit, at section 3(b) included a requirement that each permittee include watershed and storm water management considerations whenever the relevant portions of its General Plan were amended. (R0008514.) None of the parties before the Court today challenged, either administratively or judicially, this requirement in the 1996 permit.

Petitioners argue that they were not required to challenge this provision in the 1996 permit but were entitled to simply tolerate it. However, as with the CEQA arguments, their current position regarding land use are contradicted by the fact that when applying for the current permit, they specifically requested inclusion of this provision. In their proposed permit, they included a requirement similar to the one found in the 1996 permit and virtually identical to the one that the Regional Board eventually included in the challenged Permit. (See R00000032, Permit at p. 41.) Respondent and Intervenors have noted that prior permits and the permittees'

application for a permit serve as the basis for drafting and adopting a subsequent permit. In drafting and adopting the subject Permit, the Regional Board considered and relied upon programs implemented and proposed by the permittees. This series of events and actions satisfy the Court that the equitable doctrines of waiver, estoppel and laches apply.

Discharges "Into" and "From" the Storm Drain System

The Court denies the petitions for writ of mandate with respect to the "into" versus "from" argument. First, Respondent and Intervenors have demonstrated that the Clean Water Act itself uses the words "in" or "into," not just "from." (See, e.g., 33 U.S.C. § 1342(p)(3)(B)(ii); 40 C.F.R. § 122.26(d)(1)(ii), 122.26(d)(1)(v)(B), 122.26(d)(2)(iv)(D), 122(d)(2)(iv)(B); 122.26(d)(1)(v), 122.26(d)(2)(iv)(A)(6), 122.26(d)(2)(iv)(A), 122.26(d)(2)(iv)(A)(2).)

Second, the Clean Water Act section 402(p)(3)(B)(ii) prohibits the discharge of non-stormwater "into" storm sewers. (33 U.S.C. 1342(p)(3)(B)(ii).) The administrative record also contains an admission by Petitioners that "the most effective way of dealing with stormwater runoff is to deal with it at the source before it becomes a problem"—before it goes into the system. (Ltr from Executive Advisory Committee (Aug. 6, 2001) (R0004878).) In addition, State Board 2001-15, discuses the "into" versus "from" issue, stating, "It is important to emphasize that dischargers into MS4s continue to be required to implement a full range of BMPs, including source control." (*In re Building Industry Association of San Diego County, et al.* (2001) SWRCB Order 2001-15 at 10 (R0007535).)

Third, although this Court recognizes that it may not always be possible to prevent something from going into the system, it probably is the cheapest method. If something does not go in, then there is no concern about it coming out the other end. If the contaminant does not enter the system, there is no need to process it at the end of the system. If the system is

overloaded at the final point by flood, for example, there are less toxic materials which could then enter the general water system.

Fourth, the Court does not look at the word "in" in quite as restrictive a manner as the Arcadia and Monrovia Petitioners. The Arcadia and Monrovia Petitioners argued that the word "in" only relates to the point of origin, and that this limits petitioner's ability to set regional controls. However, what constitutes "in" depends on at what point one looks at the storm drain system. Analogizing the storm drain system to a tree, any of the junctures between one little leaf, the first little branch, twig, or a slightly larger branch, could be either from or into a regional control or "from" that and "into" the larger system. The Court finds that the Permit's regulation of what goes "into" the storm drain does not take away from the Petitioners' rights and needs to control the process.

Finally, by regulating discharges into the storm drain system, Petitioners have the opportunity to try to deal with it at the source of the contamination, like the car wash example mentioned by the County Petitioners. It would allow Petitioners to review the car wash's activities and stop the point of the contamination, while still permitting Petitioners to deal with the regions. Petitioners could potentially control an area of five square miles at the source and also operate a larger detention basin or treatment facility, as the Arcadia Petitioners referred to as a regional approach. Regulating discharges "into" the storm drain system does not take away from the regional approach as argued by the Arcadia Petitioners. Thus, this Court resolves this issue in favor of the Regional Board and Intervenors.

IT IS SO ORDERED.

Dated: March ~~16,~~ 24 2005

VICTORIA GERRARD CHANEY
JUDGE OF THE SUPERIOR COURT

Addendum
Examples of Regional Board Consideration of US EPA Documents

US EPA, *Draft Data Summary for the Construction and Development Industry* (Feb. 2001) (R0020445)
US EPA, *Estuarine and Coastal Marine Waters: Bioassessment and Biocriteria Technical Guidance* (Dec. 2000) (R0022664)
US EPA, *National Conference on Tools for Urban Water Resource Management & Protection* – Proceedings, Chicago, IL. Feb. 7-10, 2000 (July 2000) (R0019356)
US EPA, *Storm Water Phase II Compliance Assistance Guide* (March 2000) (R0010593)
US EPA, *Report to Congress on the Phase II Storm Water Regulations* (Oct. 1999) (R0010418)
US EPA, *Storm Water O&M Fact Sheet: Catch Basin Cleaning* (September 1999) (R0022652)
US EPA, *Storm Water Technology Fact Sheet: Sand Filters* (Sept. 1999) (R0022645)
US EPA, *Storm Water Technology Fact Sheet: Water Quality Inlets* (Sept. 1999) (R0022639)
US EPA, *Storm Water Management Fact Sheet: Record Keeping* (Sept. 1999) (R0017615)
US EPA, *Storm Water Management Fact Sheet: Coverings* (Sept. 1999) (R0017612)
US EPA, *Preliminary Data Summary of Urban Storm Water Best Management Practices* (Aug. 1999) (R0017609)
US EPA, *National Conference on Retrofit Opportunities for Water Resource Protection in Urban Environments* – Proceedings, Chicago, IL, Feb. 9-12, 1998 (July 1999) (R0022320)
US EPA, *Guidance on Storm Water Drainage Wells* (Interim Final) (May 1998) (R0022206)
US EPA, *Economic Analysis of the Storm Water Phase II Proposed Rule: Initial Final Draft*, (Aug. 1, 1997) (R0010281)
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Ventura County Technical Guidance Manual for Stormwater Quality Control Measures

Manual Update 2011

Ventura Countywide Stormwater Quality Management Program

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Manual Updates: The 2011 TGM may be periodically updated to correct minor errors and unintentional omissions. Additionally, due to the evolving nature of stormwater quality management, the 2011 TGM may also be updated to incorporate new and innovative control measures. 2011 TGM users should ensure that they are referencing the most current edition by checking www.vcstormwater.org or contacting the local permitting agency.

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1 INTRODUCTION

This *Technical Guidance Manual for Stormwater Quality Measures* (2011 TGM) provides guidance for the implementation of stormwater management control measures in new development and redevelopment projects in the County of Ventura and the incorporated cities therein. These guidelines are intended to improve water quality and mitigate potential water quality impacts. These guidelines have been developed to meet the Planning and Land Development requirements contained in Part 4, Section E of the Los Angeles Regional Water Quality Control Board's (Regional Board) municipal separate storm sewer system (MS4) permit (Order R4-2010-0108) for new development and redevelopment projects.

The Planning and Land Development requirements are not implemented at the discretion of the local permitting agency; they are requirements in Order R4-2010-0108 that must be complied with. The 2011 TGM does not attempt to expand or circumvent these requirements, but rather it provides guidance on how to meet them.

When used in this Manual, the verb "shall" indicates a statement of required, mandatory, or specifically prohibited practice. Statements that are not mandatory, but are recommended practice in typical situations, with allowable deviations if engineering judgment or scientific study indicates them appropriate, are typically stated with the verb "should." In both cases specific options may be provided that are allowable modifications.

1.1 Goals

The 2011 TGM has been prepared by the Ventura Countywide Stormwater Quality Management Program to accomplish the following goals:

- Ensure that new development and redevelopment projects reduce urban runoff pollution to the "maximum extent practicable" (MEP);
- Ensure that the implementation of measures in the 2011 TGM are consistent with Regional Water Quality Control Board Order R4-2010-0108 and other state requirements;
- Provide guidance to developers, design engineers, agency engineers, and planners on the selection and implementation of appropriate stormwater management control measures; and
- Provide maintenance procedures to ensure that the selected stormwater management control measures will be properly maintained to provide effective, long-term pollution control.

1.2 Regulatory Background

In 1972, the Federal Water Pollution Control Act [later referred to as the Clean Water Act (CWA)] was amended to require National Pollutant Discharge Elimination System (NPDES) permits for the discharge of pollutants to waters of the United States from any point source. In 1987, the CWA was amended to require the United States Environmental Protection Agency (USEPA) to establish regulations permitting municipal and industrial stormwater discharges under the NPDES permit program. The USEPA published final regulations regarding stormwater discharges on November 16, 1990. The regulations require that MS4 discharges to surface waters be regulated by a NPDES permit.

The Ventura County Watershed Protection District, County of Ventura, and the cities of Camarillo, Fillmore, Moorpark, Ojai, Oxnard, Port Hueneme, San Buenaventura, Santa Paula, Simi Valley, and Thousand Oaks have joined together to form the Ventura Countywide Stormwater Quality Management Program (Program)and are named as co-permittees under a revised countywide municipal NPDES permit for stormwater discharges issued by the Regional Water Quality Control Board in 2010 (Order R4-2010-0108).

Prior to the issuance of Order R4-2010-0108, stormwater discharges from the Ventura County MS4 were covered under the countywide waste discharge requirements contained in three previous MS4 NPDES Permits (Order 09-0057, Order 00-108, and Order No. 94-082).

Under Order R4-2010-0108, the co-permittees are required to administer, implement, and enforce a Stormwater Quality Management Program (Program) to reduce pollutants in urban runoff to the MEP. The Program emphasizes all aspects of pollution control including, but not limited to, public awareness and participation, source control, regulatory restrictions, water quality monitoring, and treatment control.

For the Program to be successful, it is critical to control urban runoff pollution from new development and redevelopment projects during and after construction. Therefore, the co-permittees implemented the Planning and Land Development Program, one element within the Program, to specifically control post-construction urban runoff pollutants from new development and redevelopment projects. The goal of the Planning and Land Development Program is to minimize runoff pollution typically caused by land development and protect the beneficial uses of receiving waters by limiting effective impervious area (EIA) to no more than 5% of the project area and retaining stormwater on site. This goal can be achieved by employing a sensible combination of Site Design Principles and Techniques, Source Control Measures, Retention Best Management Practices (BMPs), Biofiltration BMPs, and Treatment Control Measures to the level required in Order R4-2010-0108.

“Site Design Principles and Techniques,” “Source Control Measures,” “Retention

BMPs," "Biofiltration BMPs," and "Treatment Control Measures," as used in the 2011 TGM refer to BMPs and features incorporated into the design of a new development or redevelopment project, which prevent and/or reduce pollutants in stormwater runoff from the project. These measures are described below:

1) ***Site Design Principles and Techniques*** are a stormwater management strategy that emphasizes conservation and use of existing site features to reduce the amount of runoff and pollutant loading that is generated from a project site.

2) ***Source Control Measures*** limit the exposure of materials and activities so that potential sources of pollutants are prevented from making contact with stormwater runoff.

3) ***Retention BMPs*** are stormwater BMPs that are designed to retain water onsite, and achieve a greater reduction in surface runoff from a project site than traditional stormwater Treatment Control Measures. The term "Retention BMPs" encompasses infiltration, rainwater harvesting[1], and evapotranspiration BMPs. Retention BMPs are preferred and shall be selected over biofiltration BMPs and Treatment Control Measures where technically feasible to do so.

4) ***Biofiltration BMPs*** are vegetated stormwater BMPs that remove pollutants by filtering stormwater through vegetation and soils.

5) ***Treatment Control Measures*** are engineered BMPs that provide a reduction of pollutant loads and concentrations in stormwater runoff.

Applicable projects (Section 1.4) must reduce Effective Impervious Area (EIA) to less than or equal to five percent (≤5%) of the total project area, unless infeasible. Impervious surfaces are rendered "ineffective" if the design storm volume is fully retained onsite using Retention BMPs. Biofiltration BMPs may be used to achieve the 5% EIA standard if Retention BMPs are technically infeasible (see Section 3.2).

The 2011 TGM contains guidance for the design and implementation of all of these types of stormwater management control measures for new development and redevelopment projects. In addition to the requirements of Order R4-2010-0108, owners and developers of some of the sites in the County may also be subject to the State of California's general permit for stormwater discharge from industrial activities (Industrial General Permit) and general permit for stormwater discharge from construction activities (Construction General Permit). The stormwater management control measures provided in the 2011 TGM may also assist the owner or developer in meeting the requirements of the State's construction and industrial permits. The stormwater management staffs of the governing co-permittee agencies are available to provide assistance regarding all of the State stormwater permit

[1] Rainwater harvesting is a BMP that stores and uses rainwater or stormwater runoff. This is consistent with the use of the term "reuse" contained in Order R4-2010-0108.

requirements.

1.3 Impacts of Land Development

The Cities and County of Ventura have separate stormwater and sanitary sewer conveyance systems. Land development typically creates an increase in impervious surfaces, which increases the amount of runoff and pollutants entering stormwater conveyance systems. Pollutants that enter the conveyance system in stormwater are typically transported directly to receiving waters (i.e. local channels, rivers, and the ocean), and are not treated in a wastewater treatment plant. Pollutants in untreated stormwater runoff from impervious surfaces that drains to streets and enters storm drains directly contribute to water pollution.

Typically, as stormwater runs over impervious surfaces (e.g., rooftops, roadways, and parking lots), it:

- Does not infiltrate or evapotranspire, which increases runoff volumes, velocities, and flow rates;
- Moves more quickly, which increases runoff velocities; and
- Entrains (i.e., accumulates) pollution and sediment, which increases nutrients, bacteria, and other pollutant concentrations in receiving waters (i.e., local channels, rivers, and the ocean).

The impacts of these alterations due to development may include:

- Increased concentrations of nutrients, toxic pollutants, and bacteria in surface receiving waters, including adjacent land and habitat (e.g., beaches) creeks, estuaries, and storm drain outlets.
- Increased flooding due to higher peak flow rates and runoff volumes produced by a storm.
- Decreased wet season groundwater recharge due to a decreased infiltration area.
- Increased dry season groundwater recharge due to outdoor irrigation with potable or reclaimed water.
- Introduction of baseflows in ephemeral streams due to surface discharge of dry weather urban runoff.
- Increased stream and channel bank instability and erosion due to increased runoff volumes, flow durations, and higher stream velocities (“hydromodification impacts”); and

- Increased stream temperature due to loss of riparian vegetation as well as runoff warmed by impervious surfaces, which decreases dissolved oxygen levels and makes streams inhospitable to some aquatic life requiring cooler temperatures for survival.

1.4 Stormwater Management Principles

Stormwater management principles such as Integrated Water Resource Management (IWRM) and Low Impact Development (LID) can be used to help mitigate the impacts of development. These principles are described below.

The emergence of LID falls under the umbrella of the over-arching concept of IWRM. IWRM is a process which promotes the coordinated development and management of water, land, and related resources. IWRM links traditional development topics such as land use, water supply, wastewater treatment/reclamation, flood control/drainage, water quality, and hydromodification management into a cohesive hydrologic system that recognizes their interdependencies and minimizes their potentially negative effects on the environment. An example of IWRM includes recharging groundwater with reclaimed wastewater to support the water supply. Another example is combining stormwater treatment, hydromodification control, and flood control in a single regional infiltration basin that recharges groundwater, incorporates recreation, and provides habitat. Another example is using Smart Growth principles to help reduce the environmental footprint while still accommodating growth.

Generally, the 2011 TGM advises to first design for the largest hydrologic controls (such as matching post development 100-year flows with pre-project 100-year flows for flood mitigation requirements), according to the appropriate City or County drainage requirements (not included in the 2011 TGM). Secondly, the 2011 TGM advises to check if flood mitigation will reduce or satisfy the stormwater management requirements (as set forth in the 2011 TGM). If it does not, then add more controls as necessary. Flood mitigation may provide the necessary sediment and pollution control, thereby reducing maintenance requirements for the stormwater management BMPs. A sequence of hydrologic controls should be considered, such as site design, flood drainage mitigation, and Retention BMPs. Biofiltration BMPs and Treatment Control Measures can be considered where the use of Retention BMPs is technically infeasible. Each of these controls will have an influence on stormwater runoff from the new development or redevelopment project.

Similar to Source Control Measures, which prevent pollutant sources from contacting stormwater runoff, Retention BMPs use techniques to infiltrate, store, use, and evaporate runoff onsite to mimic pre-development hydrology, to the extent feasible. The goal of LID is to increase groundwater recharge, enhance water quality, and prevent degradation of downstream natural drainage channels. This goal may be accomplished with creative site planning and with incorporation of localized, naturally functioning BMPs into the project. Implementation of Retention BMPs will

reduce the size of additional Hydromodification Control Measures that may be required for a new development or redevelopment project, and, in many circumstances, may be used to satisfy all stormwater management requirements.

1.5 Applicability

The following projects and associated triggers, contained in subpart 4.E.II of Order R4-2010-0108, are subject to the requirements and standards laid out in the 2011 TGM.

Note that some of the project triggers are based on *total altered surface area* and others on *impervious surface area*, which is an intentional requirement in the MS4 Permit.

New Development Projects

Development projects subject to conditioning and approval for the design and implementation of post-construction stormwater management control measures, prior to completion of the project(s), are:

1) All development projects equal to 1 acre or greater of disturbed area that adds more than 10,000 square feet of impervious surface area.

2) Industrial parks with 10,000 square feet or more of total altered surface area.

3) Commercial strip malls with 10,000 square feet or more of impervious surface area.

4) Retail gasoline outlets with 5,000 square feet or more of total altered surface area.

5) Restaurants (Standard Industrial Classification (SIC) of 5812) with 5,000 square feet or more of total altered surface area.

6) Parking lots with 5,000 square feet or more of impervious surface area, or with 25 or more parking spaces.

7) Streets, roads, highways, and freeway construction of 10,000 square feet or more of impervious surface area (see Section 2 for specific requirements).

8) Automotive service facilities (Standard Industrial Classification (SIC) of 5013, 5014, 5511, 5541, 7532-7534 and 7536-7539) of 5,000 square feet or more of total altered surface area.

9) Projects located in or directly adjacent to, or discharging directly to an Environmentally Sensitive Area (ESA), where the development will:

    a. Discharge stormwater runoff that is likely to impact a sensitive biological species or habitat; and

b. Create 2,500 square feet or more of impervious surface area.

10) Single-family hillside homes (see Section 2 for specific requirements).

Redevelopment Projects

Redevelopment projects subject to conditioning and approval for the design and implementation of post-construction stormwater management control measures, prior to completion of the project(s), are redevelopment projects in categories 1 through 10 above that meet the threshold identified below:

- Land-disturbing activity that results in the creation or addition or replacement of 5,000 square feet or more of impervious surface area on an already developed site.

Additionally:

1) Projects where redevelopment results in an alteration to more than fifty percent of impervious surfaces of a previously existing development, and the existing development was not subject to the post development stormwater quality control requirements of Board Order 00-108, shall mitigate the entire redevelopment project area.

2) Projects where redevelopment results in an alteration to more than fifty percent of impervious surfaces of a previously existing development, and the existing development was subject to the post development stormwater quality control requirements of Board Order 00-108, must mitigate only the altered portion of the redevelopment project area and not the entire project area.

3) Projects where redevelopment results in an alteration of less than fifty percent of impervious surfaces of a previously existing development must mitigate only the altered portion of the redevelopment project area and not the entire project area.

Land-disturbing activity that results in the creation or addition or replacement of less than 5,000 square feet of impervious surface area on an already developed site, or that results in a decrease in impervious area which was subject to the post-development stormwater quality control requirements of Board Order 00-108, is not subject to mitigation unless so directed by the local permitting agency.

Redevelopment does not include routine maintenance activities that are conducted to maintain the original line and grade, hydraulic capacity, or original purpose of the facility or emergency redevelopment activity required to protect public health and safety. Impervious surface replacement, such as the reconstruction of parking lots and roadways, that does not disturb additional area and maintains the original grade and alignment, is considered a routine maintenance activity. Agencies' flood control, drainage, and wet utilities projects that maintain original line and grade or hydraulic capacity are considered routine maintenance. Redevelopment also does not include the repaving of existing roads to maintain original line and grade.

Existing single-family dwelling and accessory structure projects are exempt from the redevelopment requirements unless the project creates, adds, or replaces 10,000 square feet of impervious surface area.

Effective Date

The new development and redevelopment requirements contained in Part 4, Section E of Board Order R4-2010-0108 (the "Order") shall become effective 90 calendar days after the Regional Water Quality Control Board Executive Officer approves the 2011 TGM (the "Effective Date"). After the Effective Date, all applicable projects, except those identified below, must comply with the new development and redevelopment requirements contained in Part 4, Section E of the Order.

The new development and redevelopment requirements contained in Part 4, Section E of the Order shall not apply to the projects described in paragraphs 1 through 5 below. Projects meeting the criteria listed in paragraphs 1 through 5 below shall instead continue to comply with the performance criteria set forth in the 2002 Technical Guidance Manual for Stormwater Quality Control Measures under Board Order 00-108:

1) Projects or phases of projects where the project's applications have been "deemed complete for processing" (or words of equivalent meaning), including projects with ministerial approval, by the applicable local permitting agency in accordance with the local permitting agency's applicable rules prior to the Effective Date; or

2) Projects that are the subject of an approved Development Agreement and/or an adopted Specific Plan; or an application for a Development Agreement and/or Specific Plan where the application for the Development Agreement and/or Specific Plan has been "deemed complete for processing" (or words of equivalent meaning), by the applicable local permitting agency in accordance with the local permitting agency's applicable rules, and thereafter during the term of such Development Agreement and/or Specific Plan unless earlier cancelled or terminated; or

3) All private projects in which, prior to the Effective Date, the private party has completed public improvements; commenced design, obtained financing, and/or participated in the financing of the public improvements; or which requires the private party to reimburse the local agency for public improvements upon the development of such private project; or

4) Local agency projects for which the governing body or their designee has approved initiation of the project design prior to the Effective Date; or

5) A Tentative Map or Vesting Tentative Map deemed complete or approved by the local permitting agency prior to the Effective Date, and subsequently a Revised Map is submitted, the project would be exempt from the 2011 TGM provisions if the revisions substantially conform to original map design, consistent with

Subdivision Map Act requirements. Changes must also comply with local and state law.

The intent of these guidelines is to ensure that projects for which the applications have been deemed "complete" or the applicants have worked with local permitting agency staff to develop a final, or substantially final, drainage concept and site layout that includes water quality treatment based upon the performance criteria set forth in the 2002 Technical Guidance Manual for Stormwater Quality Control Measures prior to the Effective Date, are not required to redesign their proposed projects for purposes of complying with the new development and redevelopment requirements contained in Part 4, Section E of Board Order R4-2010-0108.

In addition, any project, phase of a project, or individual lot within a larger previously-approved project, where the application for such project has been "deemed complete for processing" (or words of equivalent meaning) that does not have a final or substantially final drainage concept as determined by the local permitting agency or a site layout that includes water quality treatment must comply with the performance standards set forth in the 2011 TGM.

1.6 Organization of the 2011 TGM

The 2011 TGM is divided into seven sections and nine appendices:

Section 1	Introduction
Section 2	Stormwater Management Standards
Section 3	Site Assessment and BMP Selection
Section 4	Site Design Principles & Techniques
Section 5	Source Control Measures
Section 6	Retention BMPs, Biofiltration BMPs, and Treatment Control Measure Design
Section 7	Operation and Maintenance Planning
Appendix A	Glossary of Terms
Appendix B	Maps: Watersheds Delineation, Existing Urban Areas, Environmentally Sensitive Areas, and 85th Percentile Rainfall Depth
Appendix C	Site Soil Type and Infiltration Testing

Appendix D	BMP Performance Guidance
Appendix E	BMP Sizing Worksheets
Appendix F	Flow Splitter Design
Appendix G	Design Criteria Checklists for Stormwater Runoff BMPs
Appendix H	Stormwater Control Measure Access and Maintenance Agreements
Appendix I	Stormwater Control Measure Maintenance Plan Guidelines and Checklists

2 STORMWATER MANAGEMENT STANDARDS

2.1 Introduction

This section outlines the design process to comply with stormwater control requirements. A flowchart is presented in Figure 2-1 to illustrate a step-by-step process for incorporating these stormwater management control measures.

The selection of appropriate stormwater management control measures should be a collaborative effort between the project proponent and the local permitting agency staff. It is recommended that discussions between project planners, engineers, and local permitting agency staff regarding selection of stormwater management control measures occur very early in the design process.

2.2 Step 1: Determine Project Applicability

New development and redevelopment projects meeting the applicability criteria contained in Section 4.E.II of Order R4-2010-0108 [presented in Section 1.5 of the 2011 TGM] must include control measures specified in the 2011 TGM. These projects should be designed to meet the performance criteria described in the steps below.

Separate requirements exist for three types of projects:

- Projects located within a Redevelopment Project Area Master Plan (RPAMP);
- Single Family Hillside Homes; and
- Roadway Projects.

The requirements for these three project types are described in further detail in the substeps below. Projects that are not applicable are still subject to stormwater agency review, especially for flood drainage requirements. Stormwater management control measures may be required by the governing agency for inapplicable projects, depending on the potential discharge of pollutants in stormwater runoff, impairments in receiving water, or other special conditions that would require increased protection.

Step 1a: Determine RPAMP Eligibility

If a project is located within the boundary of a Redevelopment Project Area Master Plan (RPAMP), the stormwater management requirements in the RPAMP take precedence over the control measures and performance criteria specified in this 2011 TGM. A stormwater agency may apply to the Regional Water Quality Control Board for approval of a RPAMP in consideration of exceptional site constraints that inhibit site-by-site or project-by-project implementation of post-construction requirements.

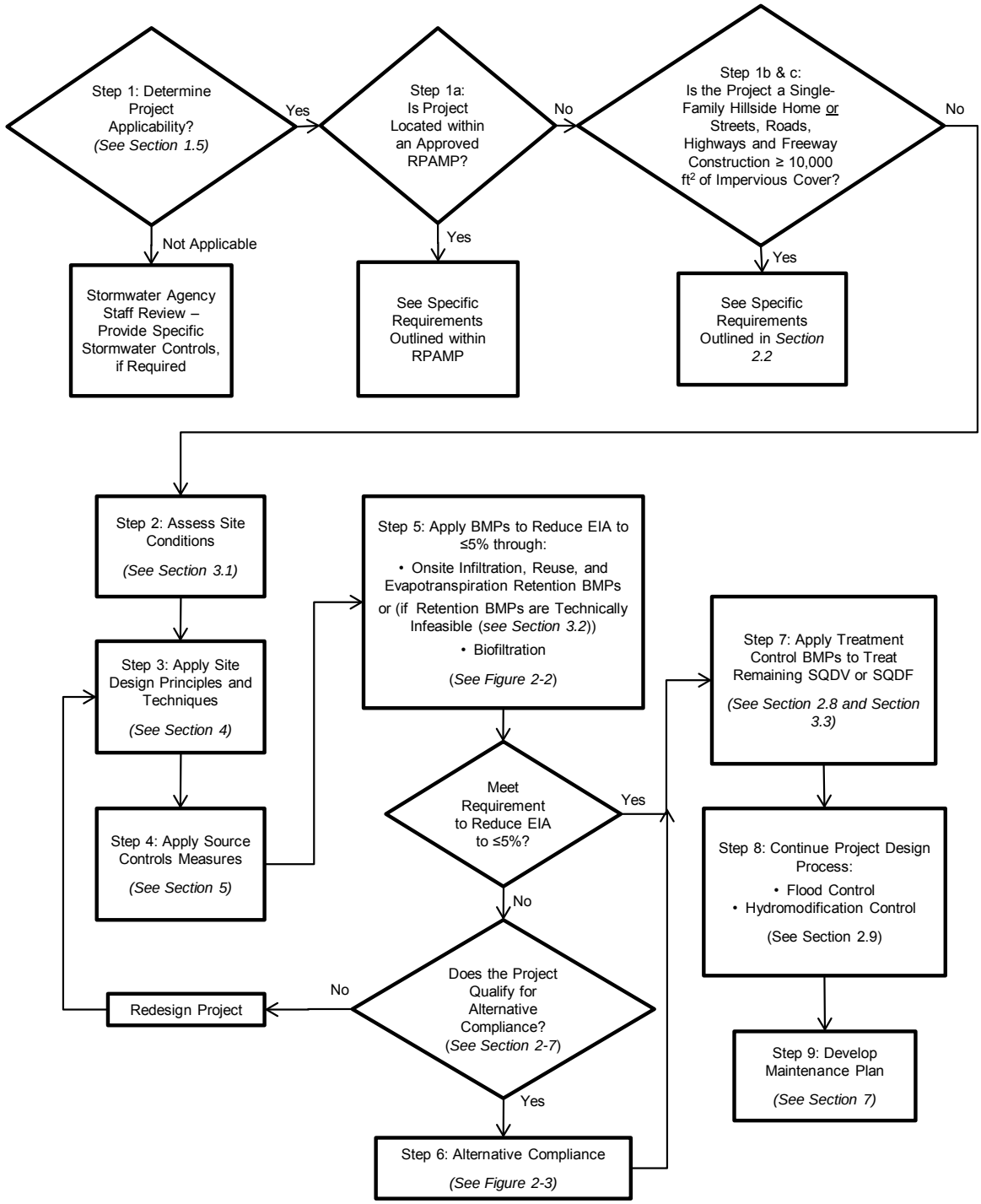

Figure 2-1: Stormwater Management Control Measures Design Decision Flowchart

Step 1b: Single-Family Hillside Homes

Single-family hillside home projects have specific requirements separate from other new development and redevelopment project categories. These requirements only apply to single-family hillside homes that disturb less than 1 acre and that add less than 10,000 square feet of impervious surface area. If the project is equal to 1 acre or greater of disturbed area that adds more than 10,000 square feet of impervious surface area, then project must comply with Steps 2 through 9.

According to Order R4-2010-0108, a hillside is defined as:

> "*Property located in an area with known erosive soil conditions, where the development will result in grading on any slope that is 20% or greater or an area designated by the Municipality under a General Plan or ordinance as a 'hillside area.'*"

The measures presented in this substep comprise the performance standard for single-family hillside home new development and redevelopment projects and apply to the entire lot (additional information on these measures may be found in Section 4 and Section 5).

Conserve Natural Areas

Each project site possesses unique topographic, hydrologic and vegetative features, some of which are more suitable for development than others. Locating development on the least sensitive portion of a site and conserving naturally vegetated areas can minimize environmental impacts in general and stormwater runoff impacts in particular.

The following measures are required and should be included in the lot layout, consistent with applicable General Plan and Local Area Plan policies and if appropriate and feasible with the given site conditions:

1) Concentrate or cluster improvements on the least-sensitive portions of the lot and leave the remaining land in a natural undisturbed state; at a minimum, sensitive portions of the lot should include areas covered under Clean Water Act Section 404 such as riparian areas and wetlands;

2) Limit clearing and grading of native vegetation on the lot to the minimum area needed to build the home, allow access, and provide fire protection; and

3) Maximize trees and other vegetation at the site by planting additional vegetation, clustering tree areas, and promoting the use of native and/or drought-tolerant plants.

Protect Slopes and Channels

Erosion of slopes and channels can be a major source of sediment and associated pollutants such as nutrients, if not properly protected and stabilized.

Slope Protection

Slope protection practices must conform to local permitting agency erosion and sediment control standards and design requirements. The post-construction design criteria described below are intended to enhance and be consistent with these local standards.

1) Slopes must be protected from erosion by safely conveying runoff from the tops of slopes.

2) Slopes must be vegetated by first considering the use of native or drought-tolerant species.

Channel Protection

The following measures should be implemented to provide erosion protection to unlined receiving streams on the lot. Activities and structures must conform to applicable permitting requirements, standards, and specifications of agencies with jurisdiction (i.e., U.S. Army Corps of Engineers, California Department of Fish and Game, or Regional Water Quality Control Board).

1) Use natural drainage systems to the maximum extent practicable, but minimize runoff discharge to the maximum extent practicable.

2) Stabilize permanent channel crossings.

3) Install energy dissipaters, such as rock riprap, at the outlets of storm drains, culverts, conduits or channels that discharge into unlined channels.

Provide Storm Drain System Stenciling and Signage

Storm drain message markers or placards are required at all storm drain inlets within the project boundary. The signs should be placed in clear sight facing anyone approaching the inlet from either side. All storm drain inlet locations must be identified on the development site map.

Some local agencies within the County have approved storm drain message placards for use. Consult local permitting agency stormwater staff to determine specific requirements for placard types and installation methods.

Divert Roof Runoff and Surface Flows to Vegetated Area(s) or Collection System(s), Unless the Diversion Would Result in Slope Instability

Diverted Roof Runoff
City of Santa Barbara

Disconnecting downspouts divert water from roof gutters to (1) vegetated pervious areas of the site in order to allow for infiltration, storage, evapotranspiration (i.e., evaporation and uptake of water by plants), and treatment, or (2) a rainwater collection system (e.g., a rain barrel or a cistern). Disconnected downspouts differ from conventional downspout systems that provide a direct connection of roof runoff to stormwater conveyance systems (storm drains), which quickly collect and convey stormwater away from the site. "Flow spreading" is a technique used to spread runoff from rooftops, sidewalks, patios, and driveways out over a vegetated pervious area, rather than concentrating and conveying the runoff directly to a stormwater conveyance system.

Dispersion methods include splash blocks, gravel-filled trenches, or other methods which serve to spread runoff over vegetated pervious areas. Sheet flow dispersion is the simplest method and can be used for any impervious or pervious surface that is graded so as to avoid concentrating flows. Because flows are already dispersed as they leave the surface, they only need to traverse through a narrow band of adjacent vegetation for the runoff to be effectively attenuated and treated.

The following requirements apply to runoff diversion:

- Vegetated flowpaths for the diverted flows should be at least 25 feet in length, measured from the diversion location to the downstream property line, structure, steep slope, stream, wetland, or impervious surface. The vegetated flowpath must be covered with well-established lawn or pasture, landscaping with well-established groundcover, or native vegetation with natural groundcover. The groundcover should be dense enough to help disperse and infiltrate flows and to prevent erosion.

- If the vegetated flowpath (measured as defined above) is less than 25 feet, a perforated stub-out connection may be used in lieu of downspout dispersion. A perforated stub-out connection is a length of perforated pipe within a gravel-filled trench that is placed between roof downspouts and a stub-out to the local drainage system. A perforated stub-out may also be used where implementation of downspout dispersion might cause erosion or flooding problems, either onsite or on adjacent lots. This provision might be

appropriate, for example, for lots where dispersed flows might pose a potential hazard for lower lying lots or adjacent offsite lots. Location of the connection should be selected to allow a maximum amount of runoff to infiltrate into the ground (ideally a dry location on the site that is relatively well drained). To facilitate maintenance, the perforated pipe portion of the system should not be located under impervious or heavily compacted (e.g., driveways and parking areas) surfaces. The use of a perforated stub-out in lieu of downspout dispersion may be determined by the Local permitting agency.

- In general, if the ground is sloped away from the foundation and there is adequate vegetation and area for effective dispersion, splash blocks will adequately disperse stormwater runoff. If the ground is fairly level, if the structure includes a basement, or if foundation drains are proposed, splash blocks with downspout extensions may be a better choice because the discharge point is moved away from the foundation. Downspout extensions may include piping to a splash block/discharge point a considerable distance from the downspout, as long as the runoff can travel through a well-vegetated area as described above.

- No erosion or flooding of downstream properties may result.

- Runoff discharged towards steep slopes or landslide hazard areas, including perforated stub-out connections, must be evaluated by a geotechnical engineer or qualified geologist. The discharge point may not be placed on or above slopes greater than 20% or above erosion hazard areas without evaluation by a geotechnical engineer or qualified geologist and jurisdiction approval.

- For sites with septic systems, the discharge point must be down gradient of the drainfield primary and reserve areas. This requirement can be waived by the jurisdiction's permit review staff if site topography clearly prohibits flows from intersecting with the drainfield.

Step 1c: Roadway Projects

Roadway projects have specific requirements separate from other new development and redevelopment project categories. The measures presented in this substep comprise the performance standard for street, roadway, highway, and freeway projects. Section 4.E.II of Order R4-2010-0108 requires street, roadway, highway, and freeway projects that construct 10,000 square feet or more of impervious surface area, to incorporate USEPA guidance regarding *Managing Wet Weather with Green Infrastructure: Green Streets* to the maximum extent practicable.

The following requirements apply to the impervious area within the right-of-way associated with public streets, roads, highways, and freeways projects and the streets

that are part of a larger private project. These requirements do not apply to routine maintenance activities that are conducted to maintain original line and grade, hydraulic capacity, original purpose of facility, or emergency redevelopment activity required to protect public health and safety. Impervious surface replacement, such as the reconstruction of parking lots and roadways, which does not disturb additional area and maintains the original grade and alignment, is considered a routine maintenance activity. Agencies' flood control, drainage, and wet utilities projects that maintain original line and grade or hydraulic capacity are considered routine maintenance. Also, the requirements do not apply to the repaving of existing roads to maintain original line and grade.

Minimum requirements for the impervious area within the right-of-way associated with streets, roads, highways, and freeways are as follows:

1) Provide Retention BMPs or Biofiltration BMPs sized to capture and treat the Stormwater Quality Design Volume (SQDV) or the Stormwater Quality design Flow (SQDF) (see Step 7 for guidance on calculating the SQDV and SQDF).

   Additional Treatment Control Measures may be integrated into roadway projects if they are used in a treatment train approach with Retention BMPs or Biofiltration BMPs to address the pollutants of concern (see Section 3.3).

2) Projects should apply the following measures to the maximum extent practicable and as specified in the local permitting agency's codes:

   - Minimize street width to the appropriate minimum width for maintaining traffic flow and public safety;
   - Use porous pavement or pavers for low traffic roadways, on-street parking, shoulders or sidewalks; and
   - Add tree canopy by planting or preserving trees and shrubs.

2.3 Step 2: Assess Site Conditions

The next step is to collect site information that is critical for the selection and implementation of Retention BMPs, Biofiltration BMPs, and Treatment Control Measures. The following information should be documented: topography, soil type and geology, groundwater, geotechnical considerations, offsite drainage, existing utilities, and Environmentally Sensitive Areas. In addition, soil and infiltration testing should be conducted. Detailed guidance on assessing site conditions can be found in Section 3.1.

2.4 Step 3: Apply Site Design Principles and Techniques

The third step is to apply Site Design Principles & Techniques (see Section 4). The implementation of LID requires an integrated approach to site design and

stormwater management. Traditional approaches to stormwater management planning within the site planning process are not likely to achieve the LID performance standard of the MS4 Permit. The use of the site planning techniques presented in Section 4 (Site Design Principles & Techniques) will help generate a more hydrologically functional site, maximize the effectiveness of Retention BMPs, and integrate stormwater management throughout the site.

The following criteria should be considered during the early site planning stages:

- Retention BMPs should be considered as early as possible in the site planning process. Hydrology should be a key principle that is integrated into the initial site assessment planning phases. Where flexibility exists, conceptual drainage plans should attempt to route water to areas suitable for Retention BMPs.
- A multidisciplinary approach at the initial phases of the project is recommended and should include planners, engineers, landscape architects, and architects.
- Individual Retention BMPs should be distributed throughout the project site as feasible and may influence the configuration of roads, buildings and other infrastructure.
- The project must demonstrate disconnection of impervious surface such that the 5% EIA requirement is achieved. If fully meeting the 5% EIA requirement using Retention BMPs is not technically feasible, the project must still utilize Retention BMPs to the maximum extent practicable.
- Flood and hydromodification control should be considered early in the design stages. Even sites with Retention BMPs will still have runoff that occurs during large storm events, but Retention facilities can have flood and hydromodification control benefits. It may be possible to simultaneously address flood and hydromodification control requirements through an integrated water resources management approach.

Perhaps the most important aspect of site planning is allowing sufficient space for Retention BMPs in areas that can physically accept runoff. A simple rule of thumb is to allow 3 to 10 percent of the tributary impervious area (depending on how well the soils drain and then allow for more area with less infiltrative soils) for infiltration BMPs and 3 to 5 percent for biofiltration in preliminary design to achieve the 5% Effective Impermeable Area (EIA) standard.

2.5 Step 4: Apply Source Control Measures

All applicable projects must implement applicable Source Control Measures. Source Control Measures are operational practices that reduce potential pollutants at the

source. They typically do not require maintenance or significant construction. Guidance on Source Control Measures can be found in Section 5.

2.6 Step 5: Apply BMPs to Reduce EIA to ≤5%

According to Order R4-2010-0108, Applicable projects must reduce Effective Impervious Area (EIA) to less than or equal to five percent (≤5%) of the total project area, unless infeasible. Impervious surfaces are rendered "ineffective" if the design storm volume is fully retained onsite using either infiltration, rainwater harvesting, and/or evapotranspiration Retention BMPs. Biofiltration BMPs may be used to achieve the 5% EIA standard if Retention BMPs are technically infeasible (see Section 3.2). This section and Figure 2-2 describe the process for reducing EIA to ≤5%. Refer to Section 2.7 if Retention BMPs and/or Biofiltration BMPs cannot feasibly be used to meet the 5% EIA standard (see Section 3.2).

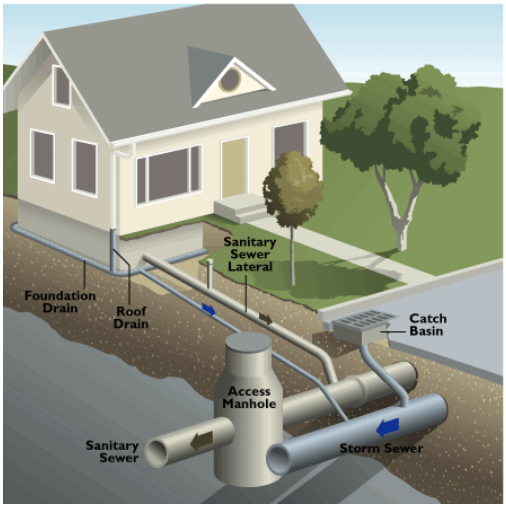

Effective Impervious Area
Victoria, BC Capital Regional District

Step 5a: Calculate Allowable EIA

EIA is defined as impervious area that is hydrologically connected via sheet flow over a hardened conveyance or impervious surface without any intervening medium to mitigate flow volume. Connected impervious areas efficiently transport runoff without allowing infiltration. Often in urban areas, runoff from connected impervious surfaces is immediately directed into a stormwater conveyance system where it is further connected and efficiently transported to an outfall (stormwater conveyance system outlet). For example, in this illustration, the rooftop is directly connected via a roof drain and underground solid drain pipe to the storm drain in the street (Note that the sanitary sewer is separate from the storm sewer). The roadway drains to the storm drain through the catch basin. The roof area and roadway area would be considered EIA.

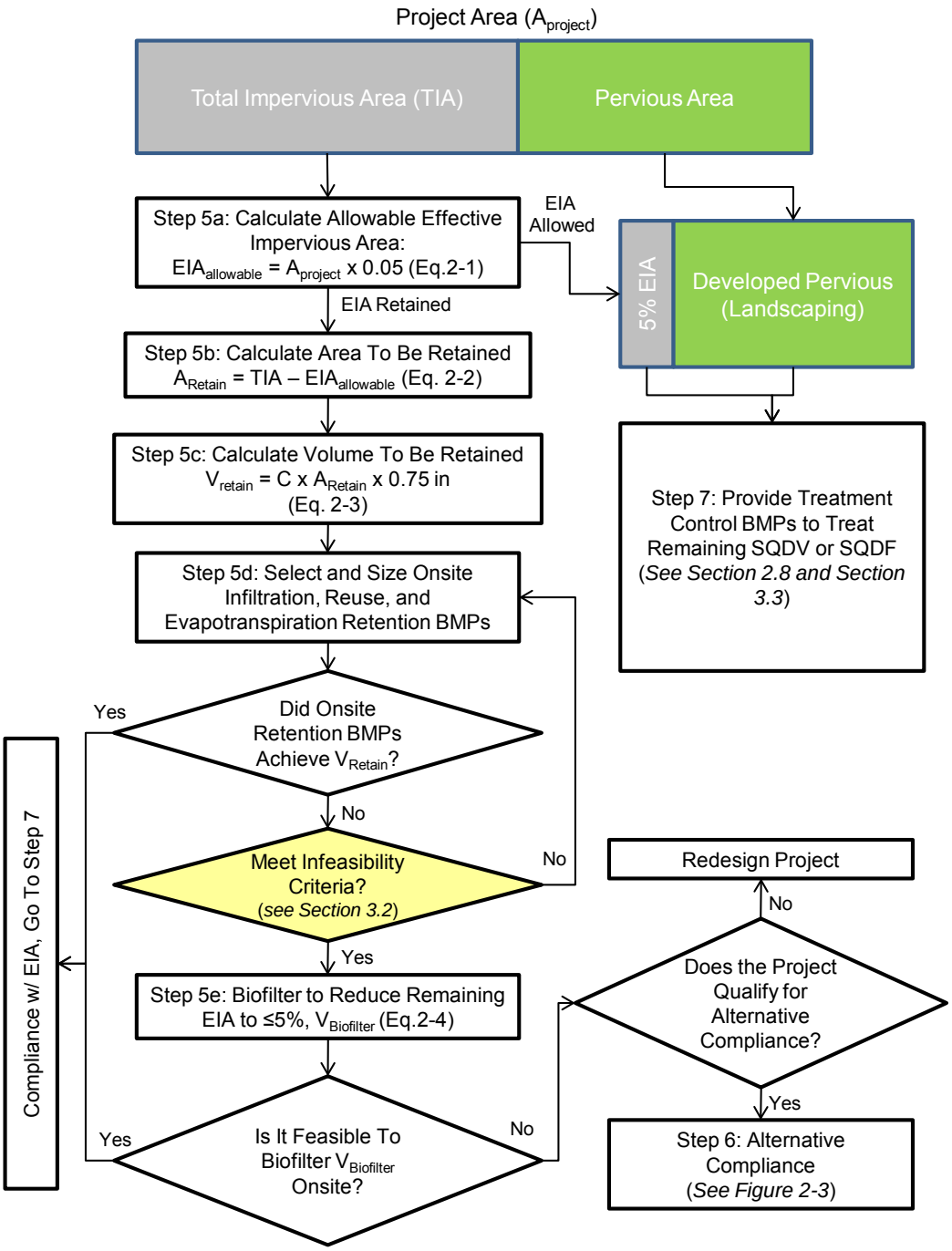

Figure 2-2: Apply BMPs to Reduce EIA to ≤5% Process Flow Chart

> "Impervious surface" is a man-made hard surface area which causes water to run off the surface in greater quantities or at an increased rate of flow from the flow present under natural conditions prior to development. Common impervious surfaces include, but are not limited to, rooftops, walkways, patios, driveways, parking lots or storage areas, concrete or asphalt paving, compacted gravel roads, packed earthen materials, and oiled, macadam or other surfaces which similarly impede the natural infiltration of stormwater. Open, uncovered retention/detention facilities and exposed bedrock shall not be considered as impervious surfaces for purposes of determining EIA retention volume.

The allowable EIA for a project site should be calculated as follows:

$$EIA_{allowable} = (A_{project})*(\%_{allowable}) \qquad \text{(Equation 2-1)}$$

Where:

$EIA_{allowable}$ = the maximum impervious area from which runoff can be treated and discharged offsite [and not retained onsite] (acres)

$A_{project}$ = the total project area (acres).

> "Total project area" (or "gross project area") for new development and redevelopment projects is defined as the disturbed, developed, and undisturbed portions within the project's property (or properties) boundary, at the project scale submitted for first approval. Areas proposed to be permanently dedicated for open space purposes as part of the project are explicitly included in the "total project area." Areas of land precluded from development through a restrictive covenant, conservation easement, or other recorded document for the permanent preservation of open space prior to project submittal shall not be included in the "total project area."

$\%_{allowable}$ = 5 percent

Step 5b: Calculate Impervious Area to be Retained

The impervious area from which runoff must be retained onsite is the total impervious area minus the $EIA_{allowable}$, which should be calculated as follows:

$$A_{Retain} = TIA - EIA_{allowable} = (IMP*A_{project}) - EIA_{allowable} \qquad \text{(Equation 2-2)}$$

Where:

A_{Retain} = the drainage area from which runoff must be retained (acres)

TIA = total impervious area (acres)

$EIA_{allowable}$	=	the maximum impervious area from which runoff can be treated and discharged offsite [and not retained onsite] (acres).
IMP	=	imperviousness of project area (%)/100
$A_{project}$	=	the total project area (acres)

Step 5c: Calculate the Volume to be Retained (SQDV)

All Retention BMPs used to render impervious surfaces "ineffective" should be properly sized to retain the volume of water that results from the water quality design storm. The design storm volume, referred to in the TGM as the Stormwater Quality Design Volume (SQDV) shall be calculated using the following four allowable methodologies:

1) The 85th percentile 24-hour runoff event determined as the maximized capture stormwater volume for the area using a 48 to 72-hour draw down time, from the formula recommended in Urban Runoff Quality Management, WEF Manual of Practice No. 23/ASCE Manual of Practice No. 87, (1998); or

2) The volume of annual runoff based on unit basin storage water quality volume to achieve 80 percent or more volume treatment; or

3) The volume of runoff produced from a 0.75 inch storm event; or

4) Eighty (80) percent of the average annual runoff volume using an appropriate public domain continuous flow model [such as Storm Water Management Model (SWMM) or Hydrologic Engineering Center – Hydrologic Simulation Program – Fortran (HEC-HSPF)], using the local rainfall record and relevant BMP sizing and design data.

Note: Examples used throughout the 2011 TGM use the 0.75 inch storm event (Methodology #3).

EXAMPLE 2-1: EIA CALCULATION

Given: 10 acre total project area, 55% impervious, 25% landscaped, 20% undisturbed, percent allowable EIA = 5%.

$EIA_{allowable} = 10 * 0.05 = 0.5$ acres

$A_{Retain} = (0.55*10) – 0.5 = 5.0$ acres

$A_{treatment} = (0.25*10) + 0.5 = 3.0$ acres

The maximum EIA allowed for the site is 0.5 acres, from which the generated runoff must be treated prior to discharge, in addition to the runoff from the 2.5 acres landscaped area, up to the design storm volume or flow rate. The runoff volume generated from the remaining 5 acre impervious area (A_{Retain}) must be retained onsite via infiltration, rainwater harvesting, and/or evapotranspiration Retention BMPs.

$A_{treatment}$ equals the EIA allowed for the site plus the landscaped area.

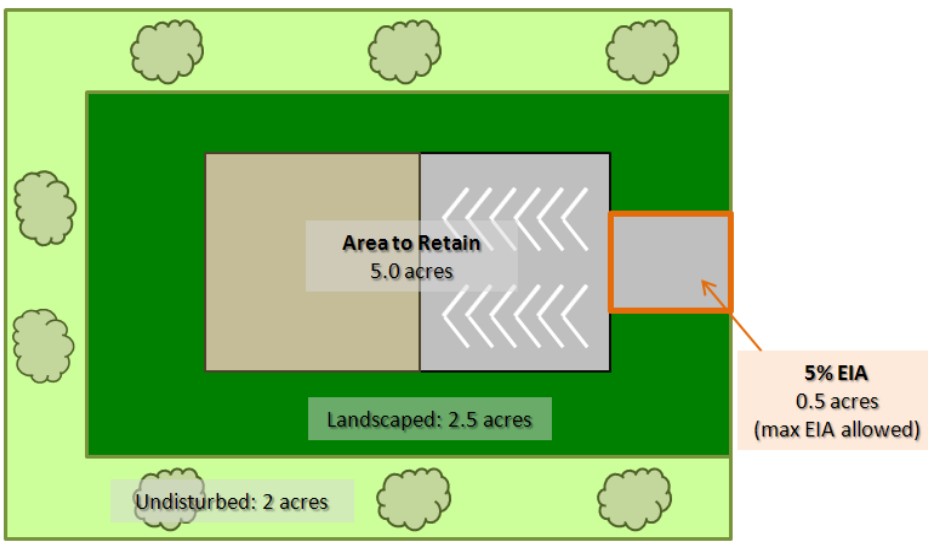

Note: graphic not to scale; for illustration purposes only

The runoff volume that is to be retained onsite should be calculated using Equation 2-3 below:

$$V_{Retain} = C*(0.75/12)*A_{retain} \qquad \text{(Equation 2-3)}$$

Where:

V_{Retain} = the stormwater quality design volume (SQDV) that must be retained onsite (ac-ft)

C	=	runoff coefficient (equals o.95 for impervious surfaces)
0.75	=	the design rainfall depth (in) [based on SQDV sizing method 3]
A_{Retain}	=	the drainage area from which runoff is retained (acres), calculated using Equation 2-2

EXAMPLE 2-2: RETENTION VOLUME CALCULATION

Given: A_{Retain} = 5.0 acres (from Example 2-1); runoff coefficient (C) = 0.95

$$V_{Retain} = 0.95*(0.75/12)*5.0 \text{ acres} = 0.3 \text{ acre-feet}$$

The project must retain at least 0.3 acre-feet of runoff from impervious surfaces using Retention BMPs.

Step 5d: Select and Size Onsite Retention BMPs to Achieve 5% EIA

The next step is to select and size Retention BMPs, based on the site assessment design, and constraints. Section 3-4 provides guidance on the selection of Retention BMPs. The project must demonstrate disconnection of impervious area such that the 5% EIA requirement is achieved.

Step 5e: Select and Size Biofiltration BMPs to Reduce EIA to ≤5%

Retention BMPs shall be used onsite to the maximum extent practicable. Pretreatment BMPs shall be provided for all infiltration BMPs and other Retention BMPs as needed (see Section 6.1).

New development and redevelopment projects that demonstrate technical infeasibility for reducing EIA to ≤5% using Retention BMPs are eligible to use Biofiltration BMPs to achieve the EIA performance standard.

The project applicant shall demonstrate technical infeasibility by submitting a site-specific analysis conducted and endorsed by a registered professional engineer, geologist, architect, and/or landscape architect. Section 3.2 discusses technical feasibility screening criteria. Projects that cannot demonstrate technical infeasibility shall meet the requirement to reduce EIA to ≤5% using Retention BMPs. Otherwise project applicants must examine other options for meeting the requirements, such as redesigning the site.

Volume-based biofiltration BMPs shall be sized to treat 1.5 times the volume not retained using Retention BMPs.

The onsite biofiltered volume ($V_{Biofilter}$), should be calculated as follows:

$$V_{Biofilter} = (V_{Retain} - V_{Achieved}) * 1.5 \qquad \text{(Equation 2-4)}$$

Where:

$V_{Biofilter}$	=	the volume that must be captured and treated in a Biofiltration BMP (ac-ft)
V_{Retain}	=	the stormwater quality design volume (SQDV) that must be retained (ac-ft) (established in Step 5c)
$V_{Achieved}$	=	the volume retained onsite using Retention BMPs (ac-ft)

EXAMPLE 2-3: BIOFILTRATION VOLUME CALCULATION

Given: V_{Retain} = 0.3 ac-ft (from Example 2-2); $V_{Achieved}$ = 0.25 ac-ft

$$V_{Biofilter} = (0.3 - 0.25) * 1.5 = 0.075 \text{ ac-ft}$$

If the project applicant has demonstrated technical infeasibility, the remaining EIA requirement may be met by biofiltering 1.5 times the remaining V_{Retain}. In this case, the Biofiltration BMP must be sized to treat 0.075 ac-ft.

If the project applicant has demonstrated technical infeasibility, the remaining EIA requirement may also be satisfied with flow-based Biofiltration BMPs. Flow-based Biofiltration BMPs shall be sized for the remaining drainage area from which runoff must be retained (A_{Retain}) using the methodology described in Section 2.8, Stormwater Quality Design Flow, with a rainfall intensity that varies with time of concentration for the catchment tributary to the flow-based Biofiltration BMP, according to Table 2-1.

Table 2-1: Flow-Based Biofiltration BMP Design Intensity for 150% Sizing

Time of Concentration, minutes	Design Intensity for 150% Sizing, in/hr
30	0.24
20	0.25
15	0.28
10	0.31
5	0.35

Time of concentration should be determined using the methodology provided in the Ventura County Hydrology Manual.

2.7 Step 6: Alternative Compliance

Certain new development and redevelopment project types are eligible for alternative compliance measures if onsite Retention BMPs and/or Biofiltration BMPs cannot feasibly be used to meet the 5% EIA standard (see Section 3.2). Such projects include:

1) Redevelopment projects (as defined in Section 1.5).

2) Infill projects. Infill projects meet the following conditions:

   a. The project is consistent with applicable general plan designation, and all applicable general plan policies, and applicable zoning designation and regulations;

   b. The proposed development occurs on a project site of no more than five acres substantially surrounded by urban uses;

   c. The project site has no value as habitat for endangered, rare, or threatened species;

   d. Approval of the project would not result in any significant effects relating to traffic, noise, air quality, or water quality; and

   e. The site can be adequately served by all required utilities and public services (modified from State Guidelines § 15332).

3) Smart Growth projects. Smart Growth projects are defined as new development and redevelopment projects that occur within existing urban areas[2] (see maps in Appendix B) designed to achieve the majority of the following principles[3]:

   a. Create a range of housing opportunities and choices;

   b. Create walkable neighborhoods;

   c. Mix land uses;

[2] Existing urban areas and corresponding maps in Appendix B are based on the cities' City Urban Restriction Boundaries (CURB) lines and in the case of the unincorporated County, the Existing Community designation. These boundaries are a growth management tool intended to channel growth and protect agricultural and open-space land. The 2011 TGM utilizes existing urban areas (as defined in Appendix B) to provide parameters around eligibility for alternative compliance in two areas: 1) Smart Growth and 2) low income housing projects.

[3] Adapted from the Smart Growth Network's Smart Growth Principles in cooperation with the U.S. Environmental Protection Agency.

d. Preserve open space, natural beauty, and critical areas;

   i. Farmland preservation may also be considered for projects occurring outside existing urban areas (as defined by the Appendix B maps).

e. Provide a variety of transportation choices;

   i. Includes transit oriented development (development located within an average 2,000 foot walk to a bus or train station).[4]

f. Strengthen and direct development towards existing communities (as defined by Appendix B maps); and

g. Take advantage of compact building design.

The City or County Planning Division in which a project is proposed will ultimately determine whether a project meets these Smart Growth criteria.

4) Pedestrian/bike trail projects:

   ✓ Located along side of a road and

   ✓ Where right-of-way width is inadequate for the implementation of Retention and/or Biofiltration BMPs.

5) Agency flood control, drainage, and wet utilities projects:

   ✓ Located within waterbody and is therefore not increasing functional impervious cover; or

   ✓ Located on top of a narrow flood control feature (such as a levee) and space is unavailable for the implementation of Retention and/or Biofiltration BMPs; or

   ✓ Where the integrity of the flood control feature (such as a dam or levee) may be compromised through Retention and/or Biofiltration BMPs (e.g., infiltration of stormwater is not appropriate in a levee).

6) Historical preservation projects:

   ✓ Where the extent of the designated preservation area restricts the amount of land available for the implementation of Retention BMPs.

[4] Calthorpe, P. (1993), "The next American metropolis: Ecology, community, and the American dream", New York: Princeton Architectural Press.

7) Low income housing projects that occur within existing urban areas (as defined by the maps provided in Appendix B):

   - ✓ Where density requirements restrict the amount of land available for the implementation of Retention BMPs and/or
   - ✓ Where project financing constraints restrict the amount of land available for the implementation of Retention BMPs.

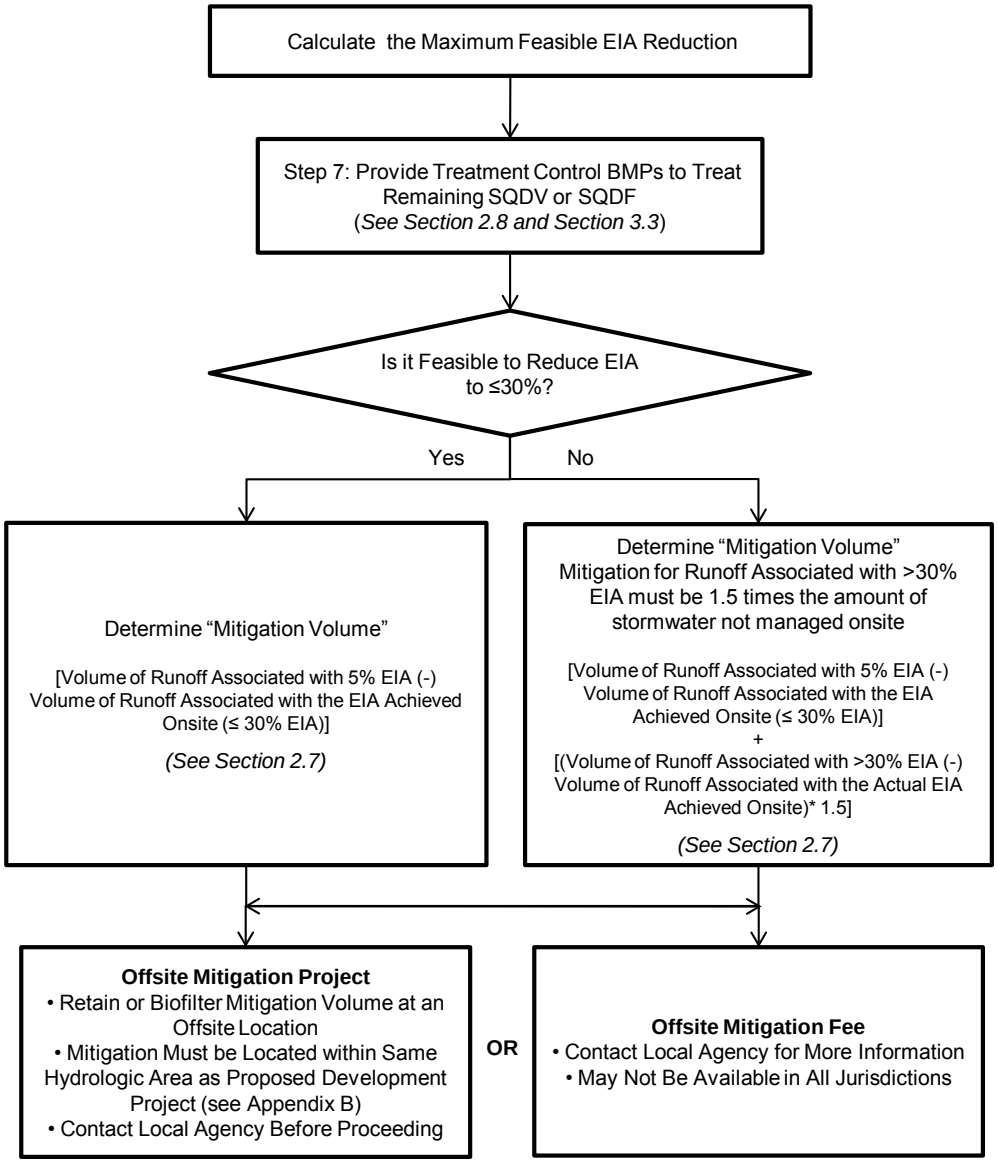

Figure 2-3: Alternative Stormwater Management Control Measures Compliance Decision Flow Chart

Projects in these categories must demonstrate that full compliance with the 5% EIA standard using Retention BMPs and Biofiltration BMPs is infeasible prior to moving to the alternative compliance flowchart (Figure 2-3) and selecting an offsite mitigation alternative. Section 3.2 provides infeasibility criteria.

Stormwater runoff from impervious surfaces and developed pervious surfaces that is not fully retained onsite (up to the SQDV) shall be mitigated using Treatment Control Measures [Chapter 6] selected per the BMP selection process outlined in Section 3.3, in addition to offsite alternative compliance measures.

Alternative compliance may be met through two options:

- Offsite mitigation project; or
- Offsite mitigation fee.

In either case, the Project applicant must contact the local approval agency before proceeding with Alternative Compliance.

Mitigation Volume

Projects requesting alternative compliance must demonstration that EIA has been reduced to the maximum extent practicable. Additionally, the SQDV or SQDF from all directly connected impervious area and the developed pervious project area must be captured and treated within the project site.

Alternative compliance options will be based on the "mitigation volume." The mitigation volume is the difference between the volume of runoff associated with 5% EIA and the volume of runoff associated with the actual EIA achieved onsite less than or equal to 30% (≤30%) EIA. The offsite mitigation requirement for EIA in excess of 30% (>30%) is 1.5 times the amount of stormwater not managed onsite.

Projects Feasible to Reduce EIA to ≤ 30%

1) Determine the volume of runoff that is retained and biofiltered onsite ($V_{Ret/Bio}$), using Equation 2-5 below:

$$V_{Ret/Bio} = (V_{Achieved} + (V_{Biofiltered}/1.5)) \qquad \text{(Equation 2-5)}$$

Where:

$V_{Ret/Bio}$ = the total volume of runoff retained and/or biofiltered onsite using Retention and Biofiltration BMPs

$V_{Achieved}$ = the runoff volume retained onsite using Retention BMPs as calculated in Equation 2-4

$V_{Biofiltered}$ = the runoff volume biofiltered onsite

2) Determine the Mitigation Volume ($V_{Mitigation}$), using Equation 2-6 below:

$$V_{Mitigation} = V_{Retain} - V_{Ret/Bio} \quad \text{(Equation 2-6)}$$

Where:

$V_{Mitigation}$ = the volume of runoff that must be mitigated offsite

V_{Retain} = the SQDV that must be retained onsite per the 5% EIA requirement calculated in Equation 2-3

$V_{Ret/Bio}$ = the total volume of runoff retained and/or biofiltered onsite using Retention and Biofiltration BMPs calculated in Equation 2-5

EXAMPLE 2-4: ≤30% EIA OFFSITE MITIGATION VOLUME CALCULATION

Given: V_{Retain} = 0.3 ac-ft (from Example 2-2); $V_{Retained}$ = 0.25 ac-ft; $V_{Biofiltered}$ = 0.06 ac-ft

1) Calculate volume of runoff retained and biofiltered onsite ($V_{Ret/Bio}$).

$V_{Ret/BioBio}$ = 0.25 + (0.06/1.5) = 0.29 ac-ft [See Equation 2-5]

2) Calculate Mitigation Volume: ($V_{Mitigation}$):

$V_{Mitigation}$ = 0.3– 0.29 = 0.01 acre-feet [See Equation 2-6]

The required offsite mitigation volume is 0.01 ac-ft.

In addition, the SQDV or SQDF from the EIA (0.5 acres) and the developed pervious area (10 acres *25% = 2.5 acres) must be captured and treated in an approved Treatment Control Measure.

SQDV (acre-feet) = C*(0.75/12)*3 acres

OR

SQDF (cfs) = C* 0.20 in/hr * 3 acres

Note: Per Order R4-2010-0108, several options exist to determine the SQDV and SQDF. Examples used throughout the 2011 TGM use the 0.75 inch storm event (SQDV Methodology #3) for the SQDV and 0.2 inches per hour intensity for the SQDF (SQDF Methodology #1). For these examples, the 10-acre project site is assumed to be in a location where the 85th percentile storm event is equal to 0.75 inches.

Projects with EIA > 30%

For the scenario where the effective impervious area of the project is greater than 30% due to infeasibility, the runoff volume associated with the effective impervious area up to 30% must be mitigated offsite at a one-to-one ratio and the runoff volume associated with the effective impervious area greater than 30% must be mitigated off-site at 1.5 times the volume.

1) Determine the area of the impervious portion of the drainage area from which runoff is retained or biofiltered at 30% EIA ($A_{30\%EIA}$), using Equation 2-7 below:

$$A_{30\%EIA} = (IMP*A_{project}) - (30\%*A_{project}) \quad \text{(Equation 2-7)}$$

Where:

$A_{30\%EIA}$	=	the impervious portion of the drainage area from which runoff would have been retained or biofiltered at 30% EIA (acres)
IMP	=	total imperviousness of project area (%)/100
$A_{project}$	=	the total project area (acres)

2) Determine the total volume that would have been retained or biofiltered onsite at 30% EIA ($V_{30\%EIA}$), using Equation 2-8 below:

$$V_{30\%EIA} = C*(0.75/12)*A_{30\%EIA} \qquad \text{(Equation 2-8)}$$

Where:

$V_{30\%EIA}$	=	the stormwater quality design volume (SQDV) retained or biofiltered at 30% EIA (note: for the purposes of this calculation, the biofiltered volume does not include the 1.5 multiplier)
C	=	runoff coefficient [equals o.95 for impervious surfaces]
0.75	=	the design rainfall depth (in) [based on SQDV sizing method 3]
$A_{30\%EIA}$	=	the impervious area from which runoff would have been retained or biofiltered at 30% EIA (acres) [See Equation 2-7]

3) Determine the impervious area from which runoff is actually retained ($A_{ActualEIA}$). This is the total amount of impervious area that drains to properly sized Retention or Biofiltration BMPs.

$$A_{ActualEIA} = (IMP*A_{project}) - (EIA\%*A_{project}) \qquad \text{(Equation 2-9)}$$

Where:

$A_{ActualEIA}$	=	the impervious portion of the drainage area from which runoff is retained or biofiltered using the actual EIA achieved on-site (acres)
IMP	=	total imperviousness of project area (%)/100
$A_{project}$	=	the total project area (acres)
EIA%	=	percent EIA actually achieved on-site

4) Determine the volume that is actually retained onsite ($V_{ActualEIA}$), using Equation 2-10 below:

$$V_{ActualEIA} = C*(0.75/12)*A_{AcutalEIA} \quad \text{(Equation 2-10)}$$

Where:

$V_{AcutalEIA}$ = the stormwater quality design volume (SQDV) that is retained and/or biofiltered onsite C = runoff coefficient [equals o.95 for impervious surfaces]

0.75 = the design rainfall depth (in) [based on SQDV sizing method 3]

$A_{ActualEIA}$ = the area associated with the Actual EIA achieved onsite, (i.e., the area from which runoff is retained or biofiltered (acres) [See # 3 above]

Determine the Mitigation Volume for 30% EIA using Equation 2-11 below:

$$V_{Mitigation30\%} = V_{Retain} - V_{30\%EIA} \quad \text{(Equation 2-11)}$$

Where:

$V_{Mitigation30\%}$ = the mitigation volume for Project site with 30% EIA

V_{Retain} = the SQDV that must be retained onsite per the 5% EIA requirement, calculated using Equation 2-3

$V_{30\%EIA}$ = the runoff that would have been retained and/or biofiltered at 30% EIA (note: for the purposes of this calculation, the biofiltered volume does not include the 1.5 multiplier), calculated using Equation 2-8

Determine the Mitigation Volume for >30% (EIA $V_{Mitigation>30\%}$), using Equation 2-12 below:

$$V_{Mitigation>30\%} = (V_{30\%EIA} - V_{ActualEIA})*1.5 \quad \text{(Equation 2-12)}$$

Where:

$V_{Mitigation>30\%}$ = the mitigation volume for >30% EIA

$V_{30\%EIA}$ = the stormwater quality design volume (SQDV) retained or biofiltered at 30% EIA (note: for the

purposes of this calculation, the biofiltered volume does not include the 1.5 multiplier)

$V_{ActualEIA}$ = the stormwater quality design volume (SQDV) that is actually retained and/or biofiltered onsite, calculated using Equation 2-9

Determine the Total Mitigation Volume ($V_{MitigationTotal}$), using Equation 2-13 below:

$$V_{MitigationTotal} = V_{Mitigation>30\%} + V_{Mitigation30\%} \quad \text{(Equation 2-13)}$$

Where:

$V_{MitigationTotal}$ = the total mitigation volume for 30% EIA

$V_{Mitigation>30\%}$ = the mitigation volume for >30% EIA, calculated using Equation 2-11

$V_{Mitigation30\%}$ = the mitigation volume for 30% EIA calculated using Equation 2-10.

EXAMPLE 2-5: >30% EIA OFFSITE MITIGATION CALCULATION

Given: 40% EIA; 10 acre total project area, 55% impervious, 25% landscaped, 20% undisturbed; runoff coefficient (C) = 0.95; V_{Retain} = 0.3 ac-ft

1) Determine impervious area retained or biofiltered onsite at 30% EIA
   $A_{30\%EIA}$ = ((55/100)*10) – ((30/100)*10) = 2.5 acres [See Equation 2-7]

2) Determine the volume that is retained or biofiltered onsite at 30% EIA
   $V_{30\%EIA}$ = 0.95*(0.75/12)*2.5 = 0.15 ac-ft [See Equation 2-8]

3) Determine the impervious area from which runoff is actually retained
   $A_{ActualEIA}$ = ((55/100)*10) – ((40/100)*10) = 1.5 acres [See Equation 2-9]

4) Determine the volume that is actually retained or biofiltered onsite
   $V_{ActualEIA}$ = 0.95*(0.75/12)*1.5 = 0.09 ac-ft [See Equation 2-10]

5) Determine Mitigation Volume for 30% EIA
   $V_{Mitigation30\%}$ = 0.3 – 0.15 = 0.15 ac-ft [See Equation 2-11]

6) Determine Mitigation Volume for >30%
   $V_{Mitigation>30\%}$ = (0.15-0.09) *1.5 = 0.09 ac-ft [See Equation 2-12]

7) Determine the Total Mitigation Volume
   $V_{MitigationTotal}$ = 0.15 + 0.09 = 0.24 ac-ft [See Equation 2-13]

The required offsite mitigation volume is 0.24 ac-ft

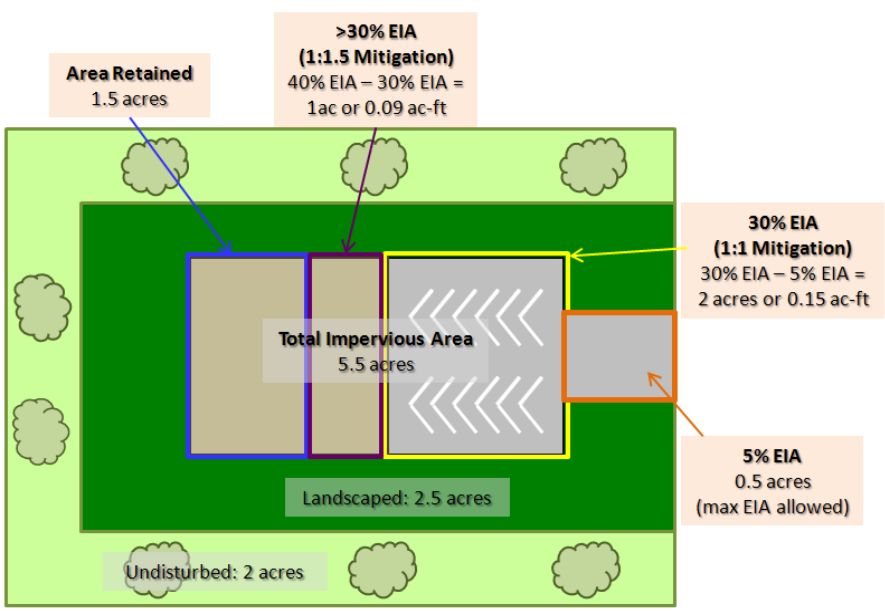

Selecting Offsite Mitigation Projects

Project applicants may identify offsite mitigation projects. Project applicants are responsible for completing offsite mitigation projects that will achieve equivalent volume and pollutant load reduction using Retention and/or Biofiltration BMPs sized for the mitigation volume. Offsite mitigation projects must adhere to the following criteria:

- Offsite mitigation projects must be located within the same hydrologic area (see map in Appendix B)
- Offsite mitigation projects must be completed as soon as possible and at the latest, within 4 years of the certificate of occupancy for the original project.

Examples of Offsite Mitigation Projects

Mitigation projects should target urbanized areas that were developed without stormwater mitigation. All projects must be approved by the local permitting agency and must adhere to the BMP Selection Criteria presented in Section 3.3 of the 2011 TGM. Potential project types may include:

- Convert a convex parking lot landscaped island into a depressed bioretention area designed to retain parking lot runoff.
- Convert a traditionally-paved parking lot into porous pavement.
- Modify an existing detention pond into a retention pond.
- Install bioretention in bump-outs, in parkways, or in roadway medians.
- Install bioretention in sidewalk areas to infiltrate roof, sidewalk, and/or roadway runoff. Sidewalks must be wide enough to permit foot traffic around bioretention area.
- Incorporate infiltration BMPs into landscaped areas that collect runoff from impervious surfaces.
- Regional BMPs.

Offsite Mitigation Fee

In some cases, Alternative Compliance may be achieved through an Offsite Mitigation Fee. A list of offsite mitigation projects available for funding will be identified by the Approval Agencies. Applicants should contact their local Approval Agency for more information. The Offsite Mitigation Fee may not be available in all jurisdictions.

2.8 Step 7: Apply Treatment Control Measures

Stormwater runoff from EIA and developed pervious surfaces shall be mitigated using Retention BMPs, Biofiltration BMPs, or Treatment Control Measures [Chapter 6] selected per the BMP selection process outlined in Section 3.3. Biofiltration BMPs and Treatment Control Measures may be sized to meet the Stormwater Quality Design Volume (SQDV) or the Stormwater Quality Design Flow (SQDF). Treatment Control Measures should be designed in adherence with the guidance provided in Section 6 of the 2011 TGM in order to assure a level of pollutant removal comparable to those listed in Attachment "C" of Order R4-2010-0108 (also provided in Appendix D.1).

Projects that are eligible for Offsite Mitigation must still provide treatment for all impervious surfaces and developed pervious areas using Treatment Control Measures sized to meet the SQDV or SQDF on site. Treatment Control Measures must be selected per the BMP selection process outlined in Section 3.3.

Stormwater Quality Design Volume (SQDV)

Volume-based Treatment Control Measures must be sized to capture and treat the runoff volume from the water quality design storm. The SQDV shall be calculated using the following four allowable methodologies:

1) The 85th percentile 24-hour runoff event determined as the maximized capture stormwater volume for the area using a 48 to 72-hour draw down time, from the formula recommended in Urban Runoff Quality Management, WEF Manual of Practice No. 23/ASCE Manual of Practice No. 87, (1998); or

2) The volume of annual runoff based on unit basin storage water quality volume to achieve 80 percent or more volume treatment; or

3) The volume of runoff produced from a 0.75 inch storm event; or

4) Eighty (80) percent of the average annual runoff volume using an appropriate public domain continuous flow model [such as Storm Water Management Model (SWMM) or Hydrologic Engineering Center – Hydrologic Simulation Program – Fortran (HEC-HSPF)], using the local rainfall record and relevant BMP sizing and design data.

The allowable design storm calculation methodology for Treatment Control Measures, per Order R4-2010-0108, is determined by the total project disturbed land area, as summarized in Table 2-2 below.

Table 2-2: Allowed Design Storm Methodology Based on Project Size

Project Size (Disturbed Land Area[1])	Allowed Design Storm Methodology
Less than 5 acres	(1), (2), (3), or (4)
5 acres - 50 acres	(1), (2), or (4)
More than 50 acres	(4)

[1] "Disturbed Area" means any area that is altered as a result of land disturbance, such as clearing, grading, grubbing, stockpiling or excavation.

Instructions for calculating the SQDV based on method (3), the volume of runoff produced from a 0.75 inch storm event, are provided below. Instructions for calculating the SQDV for methods (1), (2), and (4) are provided in Appendix E. Note that Biofiltration BMPs must be sized to treat 1.5 times the volume not retained using Retention BMPs as indicated in Step 5e.

Calculation Procedure

1) Determine the area from which runoff must be retained or captured and treated ($A_{project}$).

2) Determine the runoff coefficient (C), using Equation 2-13 below:

$$C = 0.95*imp + C_p\,(1\text{-}imp) \qquad \text{(Equation 2-13)}$$

Where:

C	=	runoff coefficient (equals o.95 for impervious surfaces)
imp	=	impervious fraction of watershed
C_p	=	pervious runoff coefficient, determined based on soil type using table below [see Ventura County Hydrology Manual (2006)]:

Table 2-3: Ventura Soil Type Pervious Runoff Coefficients

Ventura Soil Type (Soil Number)	C_p value
1	0.15
2	0.10
3	0.10
4	0.05
5	0.05
6	0
7	0

3) Determine the stormwater runoff design volume (SQDV), using Equation 2-14 below:

$$SQDV = C*(0.75/12)* A_{project} \qquad \text{(Equation 2-14)}$$

Where:

SQDV	=	the stormwater quality design volume (acre-feet)
C	=	runoff coefficient, calculated by Equation 2-13
0.75	=	the design rainfall depth (in) [based on sizing method (3)]Atrib
$A_{project}$	=	drainage area of the tributary catchment (acres)

Stormwater Quality Design Flow (SQDF)

For the purposes of the 2011 TGM, instructions for calculating the SQDF based on method (1), the flow of runoff produced from a rainfall event equal to at least 0.2 inches per hour intensity, are provided below. Instructions for calculating the SQDF for methods (2), and (3) are provided in Appendix E. Note that flow-based Biofiltration BMPs used to achieve 5% EIA must be sized per the design intensity specified in Table 2-1.

Calculation Procedure

1) Determine the drainage area from which the flow-based BMP will be receiving runoff ($A_{project}$).

2) Calculate the runoff coefficient (C), using Equation 2-13.

3) Calculate the SQDF using Equation 2-15 below:

$$SQDF = C*I*A_{project} \quad \text{(Equation 2-15)}$$

Where:

SQDF	=	flow in cubic feet per second (cfs)
C	=	runoff coefficient, calculated by Equation 2-13 above
I	=	average rainfall intensity (inches/hour) for a duration equal to the time of concentration of the watershed [equal to 0.2 in/hr for method (1); see also Table 2-1:]
$A_{project}$	=	drainage area of the tributary catchment (acres)

2.9 Step 8: Continue Project Design Process: Flood Control and Hydromodification Requirements

The project applicant should continue with the design process to address additional requirements including flood control and hydromodification control criteria.

Step 8a: Flood Control Requirements

Applicants shall comply with Ventura County and local approval agency regulations on floodplain and floodway management.

Step 8b: Hydromodification (Flow/Volume/Duration) Control Criteria

Projects meeting the applicability criteria contained in Section 4.E.II of Order R4-2010-0108 (presented in Section 1.5 of the 2011 TGM) are required to implement hydrologic control measures to prevent accelerated erosion and to protect stream habitat in downstream natural drainage systems. Natural drainage systems are defined as unlined or unimproved (not engineered) creeks, streams, rivers and their tributaries.

Exemptions

The following new development and redevelopment projects are exempt from the hydromodification control criteria:

1) Single-family structures, unless such projects disturb one acre or more of land or create, add, or replace 10,000 square feet or more of impervious surface area.

2) All projects that disturb less than one acre.

3) Projects that are replacement, maintenance, or repair of an Agency's existing flood control facility, storm drain, or transportation network.

4) Redevelopment projects in existing urban areas [see maps in Appendix B] that do not increase the effective impervious area or decrease the infiltration capacity of pervious areas compared to the pre-developed condition.

5) Projects that have any increased discharge directly or via a storm drain to a sump, lake, area under tidal influence, into a waterway that has a 100-year peak flow (Q100) of 25,000 cubic feet per second (cfs) or more, or other receiving water that is not susceptible to hydromodification impacts.

6) Projects that discharge directly or via a storm drain into concrete or improved (not natural) channels (e.g., rip rap, sackcrete, etc.), which, in turn, discharge into receiving water that is not susceptible to hydromodification impacts (as in #5 above).

Hydromodification Control Measures

The purpose of Hydromodification Control Measures is to minimize changes in post-development stormwater runoff discharge rates, velocities, and durations by maintaining within a certain tolerance, the project's pre-developed stormwater runoff flow rates and durations.

Hydromodification Control Measures may include onsite, subregional, or regional Hydromodification Control Measures, Retention BMPs, or stream restoration measures. Preference must be given to onsite Retention BMPs and Hydromodification Control Measures. In-stream restoration measures may not adversely affect the beneficial uses of natural drainage systems.

The Southern California Stormwater Monitoring Coalition (SMC) is developing a regional methodology to eliminate or mitigate the adverse impacts of hydromodification as a result of urbanization, including hydromodification assessment and management tools. The Program will develop and implement watershed-specific Hydromodification Control Plans (HCPs) after the completion of the SMC study. Until the completion of the HCPs, the Interim Hydromodification Control Criteria, described below, apply to applicable, non-exempt new development and redevelopment projects.

Interim Hydromodification Control Criteria

1) Projects disturbing less than 50 acres must comply with the Stormwater Management Standards contained in the 2011 TGM (i.e., a combination of Retention BMPs, Biofiltration BMPs, and/or Treatment Control Measures).

2) Projects disturbing 50 acres or greater must develop and implement a Hydromodification Analysis Study (HAS) that demonstrates that post development conditions are expected to approximate the pre-developed erosive

effect of sediment transporting flows in receiving waters. The HAS must lead to the incorporation of project design features intended to approximate, to the extent feasible, an Erosion Potential value of 1, or any alternative value that can be shown to be protective of the natural drainage systems from erosion, incision, and sedimentation that can occur as a result of flow increases from impervious surfaces and damage stream habitat in natural drainage systems. The methodology for calculating Erosion Potential is provided in Appendix E of Order R4-2010-0108. Project proponents must work with their local permitting authority to ensure that the HAS is correctly prepared.

2.10 Step 9: Develop Maintenance Plan

The Ventura Countywide Stormwater Quality Management Program (Program) requires the submittal of a Maintenance Plan and execution of a Maintenance Agreement with the owner/operator of any stormwater control that requires maintenance including Site Design Principles and Techniques (Section 4); Source Control Measures (Section 5; and Retention BMPs, Biofiltration BMPs, and Treatment Control Measures (Section 6). Maintenance Plans must include guidelines for how and when inspection and maintenance should occur for each control. Section 7 and Appendices H and I provide additional information and guidance on compliance with maintenance requirements.

3 SITE ASSESSMENT AND BMP SELECTION

3.1 Assessing Site Conditions and Other Constraints

Assessing a site's potential for implementation of Retention BMPs, Biofiltration BMPs, and Treatment Control Measures requires both the review of existing information and the collection of site-specific measurements. Available information regarding site layout and slope, soil type, geotechnical conditions, and local groundwater conditions should be reviewed as discussed below. In addition, soil and infiltration testing should be conducted to determine if stormwater infiltration is feasible and to determine the appropriate design infiltration rates for infiltration-based treatment BMPs.

Site Conditions

Topography

The site's topography should be assessed to evaluate surface drainage and topographic high and low points, as well as to identify the presence of steep slopes that qualify as Hillside Locations. All of these conditions have an impact on what type of Retention BMPs, Biofiltration BMPs, and Treatment Control Measures will be most beneficial for a given project site. Stormwater infiltration is more effective on level or gently sloping sites. Flows on slopes steeper than 15% may runoff as surface flows, rather than infiltrate into the ground. On hillsides, infiltrated runoff may daylight or resurface a short distance downslope, which could cause slope instability depending on the soil or geologic conditions. See the Geotechnical Considerations section below.

Soil Type and Geology

The site's soil types and geologic conditions should be determined to evaluate the site's ability to infiltrate stormwater and to identify suitable, as well as unsuitable, locations for infiltration-based BMPs (e.g., infiltration basins and trenches, bioretention without an underdrain, permeable pavement, and drywells). Using the Soil Survey completed by the Soil Conservation Service (SCS) (now identified as the Natural Resource Conservation Service [NRCS]) of the U. S. Department of Agriculture in April 1970, soils in Ventura County were grouped into seven hydrologically homogeneous families [see Ventura County Hydrology Manual (2006); also see Appendix B]. Two families were assigned to each of the NRCS Hydrologic Soil Groups A, B, and C; while only one family was considered appropriate for NRCS Hydrologic Soil Group D [for further information, see http://soils.usda.gov/]:

- Group A soils are typically sands, loamy sands, or sandy loams. Group A soils have low runoff potential and high infiltration rates even when thoroughly wetted. They consist chiefly of deep and well to excessively drained sands or

gravels and have a high rate of water transmission. Ventura County soil numbers 6 and 7 are Group A soils.

- Group B soils are typically silty loams or loams. They have a moderate infiltration rate when thoroughly wetted and consist chiefly of moderately deep to deep and moderately well to well drained soils with moderately fine to moderately coarse texture. Ventura County soil numbers 4 and 5 are Group B soils.

- Group C soils are typically sandy clay loams. They have low infiltration rates when thoroughly wetted, consist chiefly of soils with a layer that impedes downward movement of water, and/or have moderately fine to fine soil structure. Ventura County soil numbers 2 and 3 are Group C soils.

- Group D soils are typically clay loams, silty clay loams, sandy clays, silty clays, or clays. They have very low infiltration rates when thoroughly wetted and consist chiefly of clay soils with high swelling potential, permanent high water table, claypan or clay layer at or near the surface, and/or shallow soils over nearly impervious material. Ventura County soil number 1 is a Group D soil.

Infiltration-based BMPs should be feasible in areas mapped with Ventura County Soil Numbers 4 through 7. If site-specific data is available, then soils with infiltration rates of 0.5 in/hr or greater are considered feasible for infiltration. Infiltration-based BMPs should not be designed for sites mapped with Ventura County Soil Numbers 1 through 3 (unless site specific testing is performed and shows an infiltration rate greater than 0.5 in/hr) or with site-specific infiltration rates less than 0.5 in/hr.

Locations where soils are mapped with Ventura Hydrology Manual Soil Number 3, or where a site-specific analyses show that the soils have an infiltration rate of 0.3 to 0.5 inches per hour, and no other infiltration-related infeasibility criteria apply, shall use a Bioinfiltration BMP (or Rainwater Harvesting). Bioinfiltration is an adaption of the Bioretention with an Underdrain BMP in which the underdrain is raised above the gravel storage layer in order to promote infiltration but allow release of biotreated runoff to the storm drain when infiltration capacity is reached.

Early identification of soil types throughout the project footprint can reduce the number of test pit investigations and infiltration tests needed. Early identification reduces the number of potential test sites to locations with those that are most likely to be amenable to infiltration. Guidance for conducting test pit investigations and infiltration tests is provided in Appendix C.

Project applicants should review available geologic or geotechnical reports on local geology to identify relevant features such as depth to bedrock, rock type, lithology, faults, and hydrostratigraphic or confining units. These geologic investigations may also identify shallow water tables and past groundwater issues that are important for BMP design (see below).

Groundwater Considerations

Site groundwater conditions should be considered prior to Retention BMP, Biofiltration BMP, and Treatment Control Measure siting, selection, sizing, and design. The depth to groundwater beneath the project during the wet season may preclude infiltration, since five feet of separation to the seasonal high ground water level and mounded groundwater level is required. Depth to seasonal high groundwater level shall be estimated as the average of the annual minima (i.e., the shallowest recorded measurements in each water year, defined as October 1 through September 30) for all years on record. If groundwater level data are not available or not considered to be representative, seasonal high groundwater depth can be determined by redoximorphic analytical methods combined with temporary groundwater monitoring for November 1 through April 1 at the proposed project site.

In areas with known groundwater pollution, infiltration may need to be avoided, as it could contribute to the movement or dispersion of groundwater contamination. Areas with known groundwater impacts include sites listed by the Los Angeles Regional Water Quality Control Board's Leaking Underground Storage Tanks (LUST) program and Site Cleanup Program (SCP). The California State Water Resources Control Board maintains a database of registered contaminated sites through their 'Geotracker' Program. Registered contaminated sites can be identified in the project vicinity when the site address is typed into the "map cleanup sites" field.

Mobilization of groundwater contaminants may also be of concern where contamination from natural sources is prevalent (e.g., marine sediments, selenium rich groundwater, to the extent that data is available). Infiltration on sites with contaminated soils or groundwater that could be mobilized or exacerbated by infiltration is not allowed, unless a site-specific analysis determines the infiltration would be beneficial. A site-specific analysis may be conducted where groundwater pollutant mobilization is a concern to allow for infiltration-based BMPs.

Research conducted on the effects of stormwater infiltration on groundwater by Pitt et al. (1994) indicate that the potential for contamination due to infiltration is dependent on a number of factors, including the local hydrogeology and the chemical characteristics of the pollutants of concern. Chemical characteristics that influence the potential for groundwater impacts include high mobility (low absorption potential), high solubility fractions, and abundance of pollutants in urban runoff. As a class of constituents, trace metals tend to adsorb onto soil particles and are filtered out by the soils. This has been confirmed by extensive data collected beneath stormwater detention/retention ponds in Fresno (conducted as part of the Nationwide Urban Runoff Program (Brown & Caldwell, 1984)) that showed that trace metals tended to be adsorbed in the upper few feet in the bottom sediments. Bacteria are also filtered out by soils. More mobile and soluble pollutants, such as chloride and nitrate, have a greater potential for impacting groundwater.

Where soils have very high infiltration rates, groundwater quality may be impacted by infiltration BMPs. Prior to the use of infiltration basins and subsurface infiltration BMPs in areas with high infiltration rates, consult with the local

regulatory agencies to identify if unconfined aquifers are located beneath the project to determine the appropriateness of infiltration-based BMPs. In areas underlain by unconfined aquifers with designated beneficial groundwater uses (e.g. drinking water supply), the application of infiltration BMPs should be limited to those that provide significant pretreatment to ensure groundwater is protected from pollutants of concern.

Geotechnical Considerations

Water infiltration can cause geotechnical issues, including: (1) settlement through collapsible soil, (2) expansive soil movement, (3) slope instability, and (4) increased liquefaction hazard. Stormwater infiltration temporarily raises the groundwater level near the infiltration facility, such that the potential geotechnical conditions are likely to be of greatest significance near the infiltration area and decrease with distance. A geotechnical investigation should be performed for the infiltration facility to identify potential geotechnical issues and geological hazards that may result from infiltration.

In general, infiltration-based BMPs must be set back from building foundations or steep slopes. Increased water pressure in soil pores reduces soil strength. Decreased soil strength can make foundations more susceptible to settlement and slopes more susceptible to failure. Recommendations for each site should be determined by a licensed geotechnical engineer based on soils boring data, drainage patterns, and the current requirements for stormwater treatment. Implementing the geotechnical engineer's requirements is essential to prevent damage from increased subsurface water pressure on surrounding properties, public infrastructure, sloped banks, and even mudslides.

Collapsible Soil

Typically, collapsible soil is observed in sediments that are loosely deposited, separated by coatings or particles of clay or carbonate, and subject to saturation. Stormwater infiltration will result in a temporary rise in the groundwater elevation. This rise in groundwater could change the soil structure by dissolving or deteriorating the intergranular contacts between the sand particles, resulting in a sudden collapse, referred to as hydrocollapse. This collapse phenomenon generally occurs during the first saturation episode after deposition of the soil, and repeated cycles of saturation are not likely to result in additional collapse. It is important to evaluate the potential for hydrocollapse during the geotechnical investigation.

The magnitude of hydrocollapse is proportional to the thickness of the soil column where infiltration is occurring. In most instances, the magnitude of hydrocollapse will be small. Regardless, the geotechnical engineer should evaluate the potential effects of hydrocollapse from large infiltration facilities on nearby structures and roadways. Typically, a network of surface settlement monuments is installed around the infiltration site, along adjacent roadways, and in neighboring developments to evaluate if hydrocollapse has occurred. These monuments are typically monitored

prior to infiltrating stormwater, monthly during the first year of operation of the facility, then yearly thereafter for a period of approximately five years.

Expansive Soil

Expansive soil is generally defined as soil or rock material that has a potential for shrinking or swelling under changing moisture conditions. Expansive soils contain clay minerals that expand in volume when water is introduced and shrink when the water is removed or the material is dried. When expansive soil is present near the ground surface, a rise in groundwater from infiltration activities can introduce moisture and cause these soils to swell. Conversely, as the groundwater surface falls after infiltration, these soils will shrink in response to the loss of moisture in the soil structure. The effects of expansive soil movement (swelling and shrinking) will be greatest on near surface structures such as shallow foundations, roadways, and concrete walks. Basements or below-grade parking structures can also be affected as additional loads are applied to the basement walls from the large swelling pressures generated by soil expansion. A geotechnical investigation should identify if expandable materials are present near the proposed infiltration facility, and if they are, evaluate if the infiltration will result in wetting of these materials. See Appendix B, Map B-14 (expansive soil potential map).

Slopes

Slopes near the infiltration facility can be affected by the temporary rise in groundwater. The presence of a water surface near a slope can substantially reduce the stability of the slope from a dry condition. A groundwater mounding analysis should be performed to evaluate the rise in groundwater around the facility. If the computed rise in groundwater approaches nearby slopes, then a separate slope stability evaluation should be performed to evaluate the implications of the temporary groundwater surface. The geotechnical and groundwater mounding evaluations should identify the duration of the elevated groundwater and assign factors of safety consistent with the duration (e.g., temporary or long-term conditions).

Liquefaction

Seismically-induced soil liquefaction is a phenomenon in which saturated granular materials, typically possessing low to medium density, undergo matrix rearrangement, develop high pore water pressure, and lose shear strength due to cyclic ground motions induced by earthquakes. This rearrangement and strength loss is followed by a reduction in bulk volume. Manifestation of soil liquefaction can include loss of bearing capacity for foundations, surface settlements, and tilting in level ground. Soil liquefaction can also result in instabilities and lateral spreading in embankments and areas of sloping ground.

Saturation of the subsurface soils above the existing groundwater table may occur as a result of stormwater infiltration. A groundwater mounding analysis should also

evaluate the duration of mounding, as a lengthy duration or long-term rise in groundwater will need to be considered in the evaluation of liquefaction. If the granular soils are sufficiently dense, it is unlikely that liquefaction will be of concern, regardless of the groundwater mounding. If analyses indicate that the potential for liquefaction may be increased from stormwater infiltration, then the analyses will need to evaluate the liquefaction-induced settlement of structures, lateral spreading, and other surface manifestations. See Appendix B, Map B-14 (liquefaction potential map).

Managing Offsite Drainage

Locations and sources of offsite run-on onto the site should be identified early in the design process. Offsite drainage should be considered when determining appropriate BMPs so that drainage can be managed. Concentrated flows from offsite drainage may cause extensive erosion, if not properly conveyed through or around the project site or otherwise managed. By identifying the locations and sources of offsite drainage, the volume of water running onto the site may be estimated and factored into the siting and sizing of onsite BMPs. Vegetated swales or storm drains may be used to intercept, divert, and convey offsite drainage through or around a site to prevent flooding or erosion that might otherwise occur.

Existing Utilities

Existing utility lines that are onsite will limit the possible locations of certain BMPs. For example, infiltration BMPs should not be located near utility lines where the increased amount of water could damage the utilities. Stormwater should be directed away from existing underground utilities. Project designs that require the relocation of existing utilities should be avoided, if possible.

Environmentally Sensitive Areas

The presence of Environmentally Sensitive Areas (ESAs) may limit the siting of certain BMPs. ESA's are typically delineated by and fall under the regulatory oversight of state or federal agencies such as the U.S. Army Corp of Engineers (USACE), California Department of Fish and Game, U.S. Fish and Wildlife Service, or the California Environmental Protection Agency. BMPs should be selected and sited to avoid adversely affecting an ESA. The Ventura County ESA map (ESA as defined in Order R4-2010-0108) is provided in Appendix B or may be obtained from the local permitting authority.

3.2 Technical Feasibility Screening

To use biofiltration BMPs and alternative compliance measures, the project applicant should demonstrate that compliance with the requirement to reduce EIA to ≤5% using Retention BMPs is technically infeasible by submitting a site-specific hydrologic and/or design analysis conducted and endorsed by a registered professional engineer and/or geologist. Projects seeking to use alternative compliance measures must demonstrate EIA has been reduced to the maximum

extent practicable. Project applicants should contact their local Approval Agency to determine if additional infeasibility criteria apply. Technical infeasibility may result from conditions including the following:

1) Locations where seasonal high groundwater or mounded groundwater beneath an infiltration BMP is within 5 feet of the bottom of the infiltration BMP.

2) Locations on the project site where soils are mapped with Ventura Hydrology Manual Soil Numbers 1-2 or site-specific analyses show that the soils have an infiltration rate less than 0.3 inches per hour. Locations where soils are mapped with Ventura Hydrology Manual Soil Number 3, or where a site-specific analyses show that the soils have an infiltration rate of 0.3 to 0.5 inches per hour, and no other infiltration-related infeasibility criteria apply, shall use a Bioinfiltration BMP or Rainwater Harvesting (if feasible) to achieve the 5% EIA requirement.

3) Locations on the project site within 100 feet of a groundwater well used for drinking water, non-potable wells, drain fields, and springs; locations less than 50 feet away from slopes steeper than 15 percent or an alternative setback established by the geotechnical expert for the project; and locations less than eight feet from building foundations or an alternative setback established by the geotechnical expert for the project.

4) Locations where pollutant mobilization is a documented concern, unless a site-specific analysis determines that infiltration would not be detrimental. Portions of brownfield development sites may be eligible for alternative compliance where pollutant mobilization is a concern.

5) Locations with potential geotechnical hazards established by the geotechnical professional for the project.

6) Projects with high-risk areas such as service/gas stations, truck stops, and heavy industrial sites, unless a site-specific evaluation demonstrates that:

   - Treatment is provided to address pollutants of concern, and/or

   - High risks areas are isolated from stormwater runoff or infiltration areas with little chance of spill migration.

7) Locations where reduction of surface runoff may potentially impair beneficial uses of the receiving water as documented in a site-specific study (e.g., California Environmental Quality Act (CEQA) analysis) or watershed plan.

8) Location where an increase in infiltration over natural conditions could potentially cause impairments to downstream beneficial uses, such as change of seasonality of ephemeral washes, as confirmed through a site-specific study.

9) Green roofs are not required to be considered for all project locations and types; this evapotranspiration BMP is considered optional subject to the approval of the permitting authority.

10) Projects that do not provide sufficient demand for harvested stormwater such that the system provides 80% capture with a 72 hour drawdown time considering all "allowable and reliable demand."

    a. Allowable and reliable demand is defined as the rate of use of harvested water under average wet season conditions (November through March), from sources meeting the following criteria:

        - The use is permitted by building codes and health codes without requiring disinfection and fine filtration.

        - The use is reliable on a seasonal basis, such that the lowest weekly demand on an average annual basis is no less than 2/7th of the wet season average. *Intent: Under worst-case conditions, the demand should still be sufficient to use the entire tank volume within a week.*

        - Where a reliable use is present on the site that is not permitted by building codes and/or health codes, a variance has been sought to allow use without disinfection and fine filtration.

        - The use does not conflict with mandatory use of reclaimed water. It is assumed that uses do not conflict unless water balance calculations are provided to demonstrate the contrary.

        - The estimated use rates are consistent with requirements for low water use landscaping requirements under local and statewide ordinance (including California Assembly Bill 1881).

11) BMPs that are not allowable per current federal, state or local codes are considered infeasible. Local codes will be updated by mid-2012 as required in Order R4-2010-0108 (Provision III.D).

12) The following project types where the density and/or nature of the project would create significant difficulty for compliance with the requirement to reduce EIA to ≤5%:

    a. Redevelopment projects (as defined in Section1.5).

    b. Infill projects that meet the following conditions:

        i. The project is consistent with applicable general plan designation, and all applicable general plan policies, and applicable zoning designation and regulations;

ii. The proposed development occurs on a project site of no more than five acres substantially surrounded by urban uses;

iii. The project site has no value as habitat for endangered, rare, or threatened species;

iv. Approval of the project would not result in any significant effects relating to traffic, noise, air quality, or water quality; and

v. The site can be adequately served by all required utilities and public services (modified from State Guidelines § 15332).

c. Smart Growth projects, which are defined as new development and redevelopment projects that occur within existing urban areas (see maps in Appendix B) designed to achieve the majority of the following principles :

i. Create a range of housing opportunities and choices;

ii. Create walkable neighborhoods;

iii. Mix land uses;

iv. Preserve open space, natural beauty, and critical areas;

1. Farmland preservation may also be considered for projects occurring outside existing urban areas (as defined by the Appendix B maps).

v. Provide a variety of transportation choices;

vi. Includes transit oriented development (development located within an average 2,000 foot walk to a bus or train station).

vii. Strengthen and direct development towards existing communities (as defined by Appendix B maps); and

viii. Take advantage of compact building design.

The City or County Planning Division in which a project is proposed will ultimately determine whether a project meets these Smart Growth criteria.

13) Pedestrian/bike trail projects:

- ✓ Located along side of a road and
- ✓ Where right-of-way width is inadequate for the implementation of Retention and/or Biofiltration BMPs.

14) Agency flood control, drainage, and wet utilities projects:

- ✓ Located within waterbody and is therefore not increasing functional impervious cover; or
- ✓ Located on top of a narrow flood control feature (such as a levee) and space is unavailable for the implementation of Retention and/or Biofiltration BMPs; or
- ✓ Where the integrity of the flood control feature (such as a dam or levee) may be compromised through Retention and/or Biofiltration BMPs (e.g., infiltration of stormwater is not appropriate in a levee).

15) Historical preservation projects:

- ✓ Where the extent of the designated preservation area restricts the amount of land available for the implementation of Retention BMPs.

16) Low income housing projects that occur within existing urban areas (as defined by the maps provided in Appendix B):

- ✓ Where density requirements restrict the amount of land available for the implementation of Retention BMPs and/or
- ✓ Where project financing constraints restrict the amount of land available for the implementation of Retention BMPs.

Determining Maximum Volume Feasibly Infiltrated and/or Biofiltered

Site conditions and constraints may make it infeasible to fully retain stormwater to achieve ≤ 5% EIA using Retention BMPs. In such cases, stormwater runoff must be retained to the maximum extent practicable and then the remaining volume must be multiplied by 1.5 and biofiltered to the maximum extent practicable. If SQDV still remains, it may be addressed in an alternative compliance program. This section provides narrative and numeric criteria for determining the "maximized" volume for Infiltration BMPs and Biofiltration BMPs. The term "maximized" refers to the volume that is determined, on a case-by-case basis, to be consistent with the maximum extent practicable standard.

Criteria for Maximizing Infiltration Volume

Volume can be considered to be maximized in infiltration BMPs when all of the following conditions are met, or when adjustments to the site/BMP plan to meet any one of these criteria results in achievement of the ≤5% EIA performance standard:

1) BMPs are designed to the maximum depth allowed by design standards, but are not required to exceed the depth that infiltrates within 48 hours at the design percolation rate. *Explanation: Deeper BMPs provide more volume per footprint*

area, therefore it is more feasible to retain stormwater in deeper BMPs than shallower BMPs. However, because of the nature of sequential storms in Southern California, the volume provided in excess of that which drains within 48 hours provides significantly diminishing value.

2) All practicable methods are employed to enhance the design percolation rate, including:

   - Use of soil amendments to native soil below infiltration BMPs, and
   - Provision of pretreatment to reduce the allowable factor of safety, and
   - Additional site investigation to reduce uncertainty in infiltration rate and allow the use of a lower factor of safety.

3) Good site practices have been integrated to provide the maximum pervious area feasible for infiltration BMPs, and infiltration BMPs have been configured to make use of this area. Table 3-1 provides recommended percentages of a site, by project type, that should be feasible to dedicate to infiltration BMPs (where technically feasible) within pervious areas. If the project has not provided this portion of the project site for infiltration BMPs (where technically feasible), an attempt should be made to improve site design to provide more pervious area until it is either infeasible to provide more pervious area or EIA is reduced to ≤5%. The minimum percent of parking lot pavement area considered feasible to dedicate to permeable pavement (where technically feasible) is 20%; this does not apply to parking lots that anticipate heavy truck traffic such as truck stops and heavy industrial areas. The criteria provided in Table 3-1 are guidance; each project will be individually evaluated by the local permitting authority to determine if good site practices have been integrated into the project to provide the maximum pervious area feasible for siting infiltration BMPs.

Criteria for Maximizing Biofiltration Volume

Biofiltration BMPs can be used downstream of a Retention BMP that has been "maximized" (e.g., a planter box treating overflow from a cistern) or can be designed to provide both "maximized" retention and "maximized" biofiltration in the same BMP (e.g., a bioretention area with an underdrain, where retention volume is provided in a gravel layer or other subsurface reservoir below the underdrain).

Volume can be considered to be maximized in Biofiltration BMPs when all of the following conditions are met, or when adjustments to the site design and BMP plan to meet any one of these criteria results in achievement of the ≤5% EIA performance standard:

1) Drain time and/or treatment rate of the Biofiltration BMP is consistent with design guidance contained in Section 6 of the 2011 TGM.

2) Good site practices have been integrated to provide the maximum area feasible for Biofiltration BMPs, and BMPs have been configured to make use of this area. Table 3-1 provides recommended percentages of a site that are feasible to be dedicated to Biofiltration BMPs by project type. If the project has not provided these portions of the project site for siting Biofiltration BMPs, an attempt should be made to improve site design to provide more area until it is either infeasible to provide more area or EIA is reduced to ≤5%. The criteria provided in Table 3-1 are guidance; each project will be individually evaluated by the local permitting authority to determine if good site practices have been integrated into the project to provide the maximum pervious area feasible for siting Biofiltration BMPs.

If a Biofiltration BMP also includes a retention component (e.g., storage volume in a swale in amended soil below the surface discharge elevation or storage below the underdrain of a bioretention area), the maximized retention volume is determined as the volume of water that can be infiltrated or evapotranspired within 48 hours after the Biofiltration BMP has emptied. This criterion should be used to establish the depth of the retention layer (i.e., the depth of amended soil below the swale or the size of the storage below underdrains in the bioretention area).

Table 3-1: Recommended Criteria for Percent of Site Feasible to Dedicate to BMPs

Project Type		Percent of Site[1]
New Development	SF/MF Residential < 7 du/ac	10
	SF/MF Residential 7 – 18 du/ac	7
	SF/MF Residential > 18 du/ac	5
	Mixed Use, Commercial, Institutional/Industrial w/ FAR < 1.0	10
	Mixed Use, Commercial, Institutional/Industrial w/ FAR 1.0 – 2.0	7
	Mixed Use, Commercial, Institutional/Industrial w/ FAR > 2.0	5
	Podium (parking under > 75% of project)	3
	Projects with zoning allowing development to lot lines	2
	Transit Oriented Development	5
	Parking	5

Project Type		Percent of Site[1]
Redevelopment	SF/MF Residential < 7 du/ac	5
	SF/MF Residential 7 – 18 du/ac	4
	SF/MF Residential > 18 du/ac	3
	Mixed Use, Commercial, Institutional/Industrial w/ FAR < 1.0	5
	Mixed Use, Commercial, Institutional/Industrial w/ FAR 1.0 – 2.0	4
	Mixed Use, Commercial, Institutional/Industrial w/ FAR > 2.0	3
	Podium (parking under > 75% of project)	2
	Projects with zoning allowing development to lot lines	1
	Transit Oriented Development	3
	Projects in Historic Districts	3

Key: SF = Single Family, MF = Multi Family, du/ac = dwelling units per acre, FAR = Floor Area Ratio = ratio of gross floor area of building to gross lot area.

[1] If subsurface BMPs are used, dedicated area may have other surface land uses which do not structurally impact the subsurface BMP (see INF-6: Proprietary Infiltration).

3.3 Treatment Control Measure Selection Guidance

Treatment Control Measure selection criteria contained in Order R4-2010-0108 include the following:

- Treatment Control Measures shall be selected based on the primary class of pollutants likely to be discharged from the project (e.g., metals from an auto repair shop).
- For projects that discharge to an impaired waterbody and whose discharges contain the pollutant causing impairment, the project shall select Treatment Control Measures from the top three performing BMP categories, or alternative BMPs that are designed to meet or exceed the performance of the highest performing BMP, for the pollutant causing impairment.

Primary Class of Pollutants

Pollutants in stormwater runoff are typically related to land use activities, which means that the proposed project's site uses provide some indication of the pollutants that will be generated in the site's runoff. Table 3-2 identifies pollutants of concern based on typical land use activities that may be present on a project site.

Table 3-2: Land Uses and Associated Pollutants

Class of Pollutant	Potential Land Use and Activities Sources
Sediment (TSS and Turbidity)	Streets, driveways, roads, landscaped areas, construction activities, soil erosion (channels and slopes)
Nutrients	Landscape fertilizers, atmospheric deposition, automobile exhaust, soil erosion, animal waste, detergents
Metals/Metalloids	Automobiles, bridges, atmospheric deposition, industrial areas, soil erosion, metal surfaces, combustion processes
Pesticides	Landscaped areas, roadsides, utility right-of-ways
Organic Materials/ Oxygen Demanding Substances	Landscaped areas, animal wastes, industrial wastes
Oil and Grease/ Organics Associated with Petroleum	Roads, driveways, parking lots, vehicle maintenance areas, gas stations, automobile emissions, restaurants
Bacteria and Viruses	Lawns, roads, leaky sanitary sewer lines, sanitary sewer cross-connections, animal waste (domestic and wild), septic systems, homeless encampments, sediments/biofilms in stormwater conveyance system
Trash and Debris (Gross Solids and Floatables)	Commercial areas, roadways, schools, trash receptacles/storage/disposal

Adapted from US EPA, 1999 (Preliminary Data Summary of Urban Stormwater BMPs)

Impaired Waterbodies

When designated beneficial uses of a particular receiving water body are being compromised by water quality for a specific or multiple pollutants, Section 303(d) of the CWA requires identifying and listing that water body as "impaired".

Table 3-3 below lists the categories of pollutants and specific pollutants that are included on the 2010 303(d) list for Ventura County. Project proponents should consult the most recent 303(d) list to identify whether the project's receiving waterbody is listed as impaired. The most recent 303(d) list is located on the State Water Resources Control Board website (click on water issues/programs/water quality assessment).

Table 3-3: Ventura County 2010 303(d)-listed Water Quality Pollutants

Class of Pollutant	Specific Pollutants		
Sediment (TSS and Turbidity)	Sedimentation/Siltation		
Nutrients	Ammonia Nitrate and Nitrite Nitrate Nitrogen	Organic Enrichment/ Low Dissolved Oxygen	Algae Eutrophic
Metals/Metalloids	Boron Copper Copper, Dissolved	Lead Mercury Nickel	Selenium Zinc
Pesticides	ChemA (tissue) Chlordane Chlordane (tissue & sediment) Chlordane (tissue) Chlorpyrifos Chlorpyrifos (tissue) DDT DDT (sediment) DDT (tissue & sediment)	DDT (tissue) Diazinon Dieldrin Dieldrin (tissue) Organophosphorous Pesticides Toxaphene Toxaphene (tissue & sediment) Toxaphene (tissue)	
Trash and Debris (Gross Solids and Floatables)	Trash and Debris		
Other Organics	PCBs		
Bacteria and Viruses	Coliform Bacteria	Indicator Bacteria	
Salinity	Chloride		
Toxicity	Sediment Toxicity	Toxicity	
Miscellaneous	pH	Scum/Foam - unnatural	Sulfates

Once the classes of pollutants likely to be discharged from the project have been identified for projects that do not discharge to an impaired waterbody, any Treatment Control Measures listed in Table 3-4 that addresses the primary pollutant class may be selected. If more than one pollutant class is identified, then sediment shall be the primary pollutant class.

For projects that discharge to an impaired waterbody and whose discharges contain the pollutant causing impairment, the project shall select Treatment Control Measures from the top three BMPs listed for that class of pollutant in Table 3-4, or alternative BMPs that are designed to meet or exceed the performance of the highest performing Treatment Control Measure, for the pollutant causing impairment. Many receiving water impairments are due to legacy pollutants from past land use activities (e.g., DDT from historical farming or PCBs from historical industrial activities), where the primary sources are contaminated soils and sediment. For these pollutants, site clean-up, erosion and sediment controls during construction, slope

stabilization measures, and placement of impervious surfaces will address the legacy pollutants.

Table 3-4: Treatment Control Measures for Addressing Pollutants of Concern

Class of Pollutant	Recommended BMPs (in Order of Performance)
Sediment	1. Retention BMPs (Infiltration, Rainwater Harvesting, and Evapotranspiration BMPs) 2. Any of the following BMPs(equivalent performance): a. Biofiltration BMPs b. Wet Detention Basin c. Constructed Wetland d. Sand Filter/Cartridge Media Filter 3. Dry Extended Detention Basin
Metals / Metalloids	1. Retention BMPs (Infiltration, Rainwater Harvesting, and Evapotranspiration BMPs) 2. Any of the following BMPs (equivalent performance): a. Constructed Wetland b. Biofiltration BMPs c. Wet Detention Basin d. Sand Filter/Cartridge Media Filter 3. Dry Extended Detention Basin
Nutrients[1]	1. Retention BMPs (Infiltration, Rainwater Harvesting, and Evapotranspiration BMPs) 2. Any of the following BMPs (equivalent performance): a. Bioinfiltration b. Wet Detention Basin c. Constructed Wetland 3. Any of the following BMPs (equivalent performance): a. Biofiltration BMPs 4. Any of the following (equivalent performance): a. Sand Filter/Cartridge Media Filter b. Dry Extended Detention Basin
Pesticides[2]	1. Source controls, erosion controls 2. Retention BMPs (Infiltration, Rainwater Harvesting, and Evapotranspiration BMPs) 3. Any of the following BMPs (equivalent performance): a. Biofiltration BMPs b. Wet Detention Basin c. Constructed Wetland d. Sand Filter/Cartridge Media Filter 4. Dry Extended Detention Basin

Class of Pollutant	Recommended BMPs (in Order of Performance)
Pathogens	1. Retention BMPs (Infiltration, Rainwater Harvesting, and Evapotranspiration BMPs) 2. Any of the following BMPs (equivalent performance): a. Bioretention with Underdrain b. Wet Detention Basins c. Proprietary Biofiltration 3. Sand Filter/Cartridge Media Filter
Trash and Debris	1. Gross Solids Removal BMPs (should be combined with a Retention BMP, Biofiltration BMP, or Treatment Control Measure) 2. Any Retention BMP, Biofiltration BMP, or Treatment Control Measure designed to incorporate a trash capture device (e.g., a trash screen)

[1]Performance is based on removal of nitrogen compounds. For performance of BMPs in removing phosphorous, see sediment pollutant class as they are largely associated with particulates.
[2]Performance data is not available for this pollutant class, but as they are largely associated with particulates, BMP selection should be similar to the sediment pollutant class.

An analysis of Biofiltration BMP and Treatment Control Measure performance from the ASCE International Stormwater BMP Database [1999-2008] is provided in Appendix D. These performance data summaries are occasionally revised. Updated analyses of Biofiltration BMP and Treatment Control Measure performance may be found on the ASCE International Stormwater BMP Database website. The 2011 TGM assumes that BMPs adhering to the design guidance provided in Section 6 will have a level of pollutant removal performance comparable to those listed in Attachment C in Order R4-2010-0108 (also provided in Appendix D.1).

Proprietary BMPs should meet or exceed the performance standards listed in Attachment C in Order R4-2010-0108 and provided in Appendix D.

The data contained in the Stormwater BMP Database indicate that wet detention basins, constructed wetlands, sand filters, and biofilters are among the best performing BMPs for the typical pollutants of concern in urban runoff. This conclusion is consistent with the treatment processes typically provided by these BMP types (e.g., filtration, sedimentation, adsorption, and biological processes).

Wet detention basins (wetponds) and constructed wetlands are attractive solutions both from a treatment process and observed performance perspective. However, these systems require significant base flow to maintain their permanent pools and to avoid creating stagnant conditions and vector concerns. Therefore, these BMPs are often infeasible in locations where water conservation during dry weather is a significant concern. If a regional Treatment Control Measure is desired, infiltration basins and dry extended detention basins may be more feasible in Ventura County. However, these BMPs may need additional treatment train components (e.g., pre- or post-treatment) to adequately address the entire list of pollutants of concern and provide reliable and consistent performance, in addition to significant space

requirements. BMP designs for each pollutant category that incorporate dense vegetation and promote extended contact with or filtration through soils are encouraged, consistent with the BMP selection prioritization requirements in Order R4-2010-0108.

Consideration of Site-Specific Conditions

Ultimately, Retention BMPs, Biofiltration BMPs, and Treatment Control Measures have to be constructed at a physical location and site-specific conditions should be considered during the BMP selection process. Site constraints such as steep slopes, poor draining soils, high ground water tables, unstable or contaminated soils and several other factors can preclude the implementation of certain kinds of Retention BMPs, Biofiltration BMPs, and Treatment Control Measures or design options. Therefore, site-specific conditions must be considered when selecting specific BMPs or Treatment Control Measures to implement. Once candidate BMPs or Treatment Control Measures have been chosen, the selection process should consider the site assessment results for soil characteristics, slopes, groundwater proximity, etc. Table 3-5 below provides general guidance for designers regarding site limitations for the different Retention BMPs, Biofiltration BMPs, and Treatment Control Measures.

Table 3-6 below provides general guidance for designers regarding capital and operation costs for the different Retention BMPs, Biofiltration BMPs, and Treatment Control Measures. BMP costs can also be estimated using the Water Environment Research Foundation (WERF) BMP and LID Whole Life Cost Models. These models are set of spreadsheet tools that help users identify and combine capital costs and ongoing maintenance expenditures in order to estimate whole life costs for stormwater management. The models provide a framework for calculating capital and long-term maintenance costs of individual Retention BMPs, Biofiltration BMPs, and Treatment Control Measures. Models are included for retention ponds, extended detention basins, vegetated swales, permeable pavement, green roofs, large commercial cisterns, and bioretention. Online PDF of user's guide and spreadsheet tools are located here: http://www.werf.org/AM/Template.cfm?Section=Research_Profile&Template=/CustomSource/Research/PublicationProfile.cfm&id=SW2R08.

Table 3-5: BMP Site Suitability Considerations

Important Note to Users: This table should be used to provide general BMP comparisons only and should not replace an evaluation performed by a qualified water quality professional.

BMP	Site Suitability Considerations			
	Tributary Area (Acres) [1]	Site Slope (%)	Depth to Seasonally High or Mounded Groundwater (ft)	Soil Number
Infiltration BMPs: INF-1: Infiltration Basin INF-2: Infiltration Trench INF-3: Bioretention INF-4: Drywell INF-6: Proprietary Infiltration	< 5	< 7[2]	> 5	Not suitable in Soil Numbers 1, 2, and 3 unless percolation testing shows the infiltration rate is greater than 0.5 in/hr
INF-5: Permeable Pavement	< 5	< 5[2,5]	> 2 with underdrains; > 5 without underdrains	Underdrains should be provided for Soil Numbers 1, 2, and 3
ET-1: Green Roof	Equal to roof tributary area	N/A	N/A	N/A
BIO-1: Bioretention with Underdrain	< 5	< 15; planter boxes are generally more suitable for steep slopes[2,3]	> 2 with underdrains; > 5 without underdrains	Underdrains should be provided for Soil Numbers 1, 2, and 3
BIO-2: Planter Box	< 1	< 15[4]	> 2	Any
BIO-3: Vegetated Swale	< 5	< 10 site slope; 0.5 to 6 longitudinal slope of swale [2,3]	> 2 with underdrains; > 5 without underdrains	Any[3]

BMP	Site Suitability Considerations			
	Tributary Area (Acres) [1]	Site Slope (%)	Depth to Seasonally High or Mounded Groundwater (ft)	Soil Number
BIO-4: Vegetated Filter Strip	< 2	< 4 site slope; 2 to 6 longitudinal slope of strip[2]	> 2	Any
BIO-5: Proprietary Biotreatment Devices	The site suitability requirements for specific proprietary devices must be provided by the manufacturer and should be verified by independent sources or assessed by a qualified water quality professional.			
TCM-4: Sand Filter	< 10	< 15[4]	> 2	Any
TCM-5: Cartridge Media Filters	The site suitability requirements for specific proprietary devices must be provided by the manufacturer and should be verified by independent sources or assessed by a qualified water quality professional.			
PT-1: Hydrodynamic Devices	The site suitability requirements for specific proprietary devices must be provided by the manufacturer and should be verified by independent sources or assessed by a qualified water quality professional.			
PT-2: Catch Basin Inserts				

[1] Tributary area is the area of the site draining to the BMP. Tributary areas provided here should be used as a general guideline only. Tributary areas can be larger or smaller as appropriate.

[2] If site slope exceeds that specified or if the system is within 200 ft from the top of a hazardous slope or landslide area (on the uphill side), a geotechnical investigation analysis and report addressing slope stability shall be prepared by a licensed civil engineer. In addition, for swales, if the longitudinal slope exceeds 6%, check dams should be provided.

[3] If system is located within 50 feet of a sensitive steep slope (on the uphill side), within 10 feet from a structure, has a longitudinal slope less than 1.5% (swales), or has poorly drained soils (e.g., silts and clays), underdrains should be incorporated.

[4] If system is fully contained, includes an underdrain system, and overflows to a stormwater conveyance system, then slopes can exceed 15%.

[5] If a gravel base is used for storage of runoff: (1) slopes should be restricted to 0.5% (steeper grades reduce storage capacity) and (2) underdrains should be used if within 50 feet of a sensitive steep slope.

[6] Setbacks apply to systems without underdrains.

Table 3-6: BMP Cost Considerations

BMP Type	Relative Expense[4] (cost/ac-ft[1] or cost/cfs[2])	Construction Costs (per cubic feet)[3,4]	Typical Cost[3]		Annual Maintenance Cost (% of Construction)[3,4]	Notes
			($/BMP)	Application		
Infiltration Trench	Not included	$4- $50	$45,000	5-ac Commercial Site (65% Impervious)	5%-20%	
Infiltration Basin	$	$1.30 - $18	$15,000	5-ac Commercial Site (65% Impervious)	1% -10%	
Bioretention	Not included	$3- $5.30	$60,000	5-ac Commercial Site (65% Impervious)	5%- 7%	Cost of plants varies. Maintenance costs comparable to cost of typical landscaping.
Swale	$$	$0.25-$0.50	$3,500	5-ac Residential Site (35% Impervious)	5%- 7%	
Filter Strip	$$	$0.00- $1.30	$0- $9,000	5-ac Residential Site (35% Impervious)	$350/ acre/ year (about $0.01/square foot/ year)	
Extended Detention Basin	$$$	$0.50- $1.00	Not included		3 to 6%	Costs vary widely. One 0.3 ac-ft basin was recorded to have cost $160,000[5] $3,132 Annual maintenance costs for per Caltrans[5]
Wet Ponds	$$$	$0.50- $1.00	Not included		3 to 6%	$17,000 Annual maintenance costs for one Caltrans pond[5]
Constructed Wetland	$$$$	$0.60 – $1.25	$125,000	50-Acre Residential Site (35% Impervious)	2%	
Sand Filter	$$$$	$3 - $6	$35,000- $70,000	5-Acre Commercial Site (65% Impervious)		

[1] Volume based BMPs
[2] Flow based BMPs
[3] EPA, 1999. Preliminary Data Summary of Urban Storm Water Best Management Practices. Part D, Cost and Benefits Analysis. http://water.epa.gov/scitech/wastetech/guide/stormwater/index.cfm#report
[4] CASQA, 2003. New Development and Redevelopment Handbook
[5] Figures from Caltrans studies cited in CASQA BMP Handbook.

4 SITE DESIGN PRINCIPLES AND TECHNIQUES

4.1 Introduction

The primary objective of the Site Design Principles and Techniques is to reduce the hydrologic and water quality impacts associated with land development. The benefits derived from this approach include**:**

- Reduced size of downstream Treatment Control Measures and conveyance systems;
- Reduced pollutant loading to onsite Treatment Control Measures and receiving streams; and
- Reduced hydraulic impact on receiving streams.

Site Design Principles and Techniques include the following design features and considerations:

- Site planning;
- Protect and restore natural areas;
- Minimize land disturbance;
- Minimize impervious cover;
- Apply Low Impact Development best management practices (LID BMPs) at various scales: and
- Implement Integrated Water Resource Management Practices.

The Site Design Principles and Techniques described in this section are required to be considered for all new development and redevelopment projects subject to conditioning and approval for the design and implementation of post-construction stormwater management control measures (as defined in Section 1.5). They are not required if the project proponent demonstrates to the satisfaction of the City or County that the particular measures are not applicable to the proposed project, or the project site conditions make it infeasible to implement the site design control measure in question. The applicability of specific controls outlined within this section should be confirmed with the local government.

Detailed descriptions and design criteria for each of the Site Design Principles and Techniques are presented in the following section.

4.2 Site Planning

Purpose

LID requires a holistic approach to site design and stormwater management. As such, planners, developers, architects, and engineers should reconsider conventional approaches to stormwater management. The use of site planning techniques presented here will generate a more hydrologically functional site, help to maximize the effectiveness of Retention BMPs, and integrate stormwater management throughout the site.

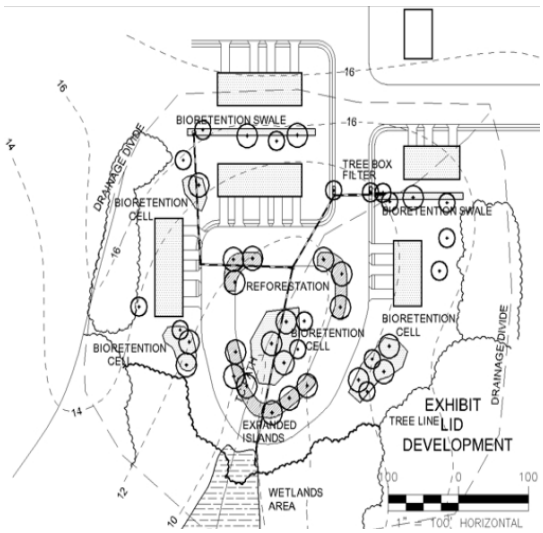

LID BMPs Integrated within Site Planning Process

Low Impact Development Center, Inc.

Design Criteria

The following criteria should be considered during the early site planning stages:

1) Retention BMPs should be considered as early as possible in the site planning process. Hydrology should be an organizing principle that is integrated into the initial site assessment planning phases.

2) Project applicants should anticipate and plan for the space requirements of Retention and Biofiltration BMPs. Table 4-1 provides general rules of thumb for BMP space requirements.

3) Site planning should use a multidisciplinary approach that includes planners, engineers, landscape architects, and architects at the initial phases of the project.

4) Individual Retention BMPs should be distributed throughout the project site and may influence the configuration of roads, buildings, and other infrastructure.

5) The project must demonstrate disconnection of impervious surface such that the 5% EIA requirement is achieved. If fully meeting the 5% EIA requirement using Retention BMPs is not technically feasible, the project must still utilize Retention BMPs to the maximum extent practicable.

6) Consider flood control early in the design stages. Even sites with Retention BMPs will still have runoff that occurs during large storm events. Look for opportunities to simultaneously address flood control requirements and the requirement to reduce EIA to ≤5% presented in Section 2.

7) Consider the use of alternative building materials instead of conventional materials for new construction and renovation. Several studies have indicated that metal used as roofing material, flashing, or gutters can leach metals into the environment. Avoid the use of roofing, gutters, and trim made of copper and galvanized (zinc) roofs, gutters, chain link fences and siding.

8) Consider 2010 Green Building Code requirements during the site planning stages.

Table 4-1: Rule of Thumb Space Requirements for BMPs[5]

BMP Type	% of Contributing Drainage Area
Infiltration	3 to 10
Rainwater Harvesting (Cistern)	0 to 10
Evapotranspiration (Green Roof)	1 to 1 ratio of impervious cover treated
Biofiltration	3 to 5
Dry Extended Detention Basin	1 to 3
Wet Detention Basin	1 to 3
Sand Filters	0 to 5
Cartridge Media Filter	0 to 5

[5] Modified from Schueler, T., D. Hirschman, M. Novotney, and J. Zielinski. 2007. Urban Stormwater Retrofit Practices. Manual 3 in the Urban Subwatershed Restoration Manual Series. Center for Watershed Protection. Ellicott City, MD.

4.3 Protect and Restore Natural Areas

Purpose

Each project site possesses unique topographic, hydrologic and vegetative features, some of which are more suitable for development than others. Sensitive areas that should be protected and/or restored include streams and their buffers, floodplains, wetlands, steep slopes, and high permeability soils. Additionally, slopes can be a major source of sediment and should be properly protected and stabilized.

Stream Buffer

Larry Walker Associates

Locating development on the least sensitive portion of a site and conserving naturally vegetated areas can minimize environmental impacts in general and stormwater runoff impacts in particular.

Design Criteria

If applicable and feasible for the given site conditions, the following site design features or elements are required and should be included in the project site layout, consistent with applicable General Plan and Local Area Plan policies:

1) Identify and cordon off streams and their buffers, floodplains, wetlands, and steep slopes.

2) Reserve areas with high permeability soils for either open space or Infiltration BMPs.

3) Incorporate existing trees into site layout.

4) Identify areas that may be restored or revegetated either during or post-construction.

5) Identify and avoid and/or stabilize areas susceptible to erosion and sediment loss.

6) Concentrate or cluster development on the least-sensitive portions of a site, while leaving the remaining land in a natural undisturbed state.

7) Slopes must be protected from erosion by safely conveying runoff from the tops of slopes.

   - Slopes should be vegetated by first considering use of native or drought-tolerant species.

- Slope protection practices must conform to local permitting agency erosion and sediment control standards and design standards. The design criteria described in this section are intended to enhance and be consistent with these local standards.

8) Limit clearing and grading of native vegetation at the project site to the minimum amount needed to build lots, allow access, and provide fire protection.

9) Maintain existing topography and existing drainage divides to encourage dispersed flow.

10) Maximize trees and other vegetation at each site by planting additional vegetation, clustering tree areas, and promoting the use of native and/or drought-tolerant plants.

11) Promote natural vegetation by using parking lot islands and other landscaped areas. Integrate vegetated BMPs within parking lot islands and landscaped areas.

4.4 Minimize Land Disturbance

Purpose

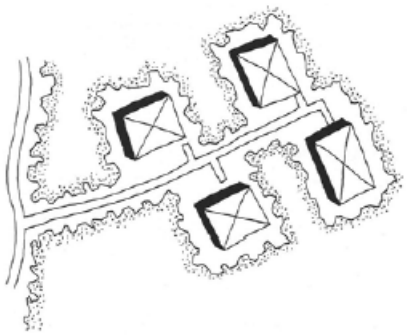

Minimized Clearing and Grading

Greenfield et al., 1991

This control works to protect water quality by preserving some of the natural hydrologic function of the site. By designing a site layout to preserve the natural hydrology and drainageways on the site, it reduces the need for grading the disturbance of vegetation and soils (GSMM, 2001). By siting buildings and impervious surfaces away from steep slopes, drainageways, and floodplains, it limits the amount of grading, clearing and distance and reduces the hydrologic impact. This site design principle has most applicability in greenfield settings, but opportunities may exist in redevelopment and infill projects.

Existing soils may contain organic material and soil biota that are ideal for storing and infiltrating stormwater. Clearing, grading, and heavy equipment can remove and compact existing soils and, therefore, limit their infiltrative capacity. The design criteria presented below are not intended to supersede compaction requirements associated with building codes.

Design Criteria

1) Delineate and flag the development envelope for the site. Delineating and flagging the development envelope includes a clear indication of the development envelope on the site plan and physical demarcation in the field which can be accomplished using temporary orange construction fencing or flagging. The development envelope can be established by identifying the minimum area needed to build lots; allow access and provide fire protection; and protect and buffer sensitive features such as streams, floodplains, steep slopes and wetlands. Concentrate buildings and paved areas on the least permeable soils, with the least intact habitats.

2) Plan clearing and grading to minimize the compaction of infiltrative soils.

3) Restrict equipment access and storage of construction equipment to the development envelope.

4) Restrict storage of construction equipment within the development envelope.

5) Avoid the removal of existing trees and valuable vegetation, as feasible.

6) Consider soil amendments to restore permeability and organic content especially for infill and redevelopment projects to avoid soil disturbance.

4.5 Minimize Impervious Cover

Purpose

The potential for the discharge of pollutants in stormwater runoff from a project site increases as the percentage of impervious area within the project site increases because impervious areas increase the volume and rate of runoff flow. Pollutants deposited on impervious areas tend to be easily mobilized and transported by surface water runoff. Minimizing impervious area through site design is an important means of minimizing stormwater pollutants of concern. In addition to the environmental and aesthetic benefits, a highly pervious site may allow reduction in the size of downstream conveyance and treatment systems, yielding savings in development costs. Reducing impervious area is the most cost effective way of minimizing the effective impervious area (EIA) requirement.

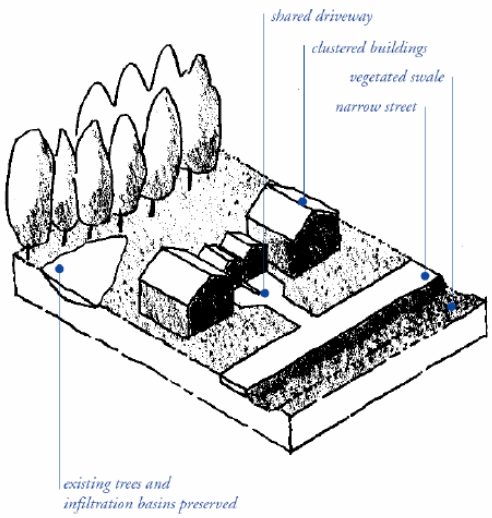

Impervious Cover Minimization

BASMAA, Start at the Source

Design Criteria

Local permitting agency building and fire codes and ordinances determine some aspects of site design. These design strategies are intended to enhance and be consistent with these local codes and ordinances. Minimizing impervious surfaces at every possible opportunity requires integration of many small strategies. Suggested strategies for minimizing impervious surfaces through site design include the following:

1) Use minimum allowable roadway cross sections, driveway lengths, and parking stall widths and lengths.

2) Minimize or eliminate the use of curbs and gutters, and maximize the use of Retention BMPs, where slope and density permit.

3) Use two-track/ribbon alleyways/driveways or shared driveways.

4) Include landscape islands in cul-de-sac streets. Consider alternatives to cul-de-sacs to increase connectivity.

5) Reduce the footprints of building and parking lots. Building footprints may be reduced by building taller.

6) Use permeable pavement to accommodate overflow parking (if overflow parking is needed).

7) Cluster buildings and paved areas to maximize pervious area.

8) Maximize tree preservation or tree planting.

9) Avoid compacting or paving over soils with high infiltration rates (see Minimize Land Disturbance).

10) Use pervious pavement materials where appropriate, such as modular paving blocks, turf blocks, porous concrete and asphalt, brick, and gravel or cobbles.

11) Use grass-lined channels or surface swales to convey runoff instead of paved gutters (see Vegetated Swale in Section 6).

12) Build more compactly in infill and redevelopment site to avoid disturbing natural and agricultural lands. Per capita impacts can be significantly reduced by building more compactly in infill and redevelopment areas.

4.6 Apply LID at Various Scales

Purpose

LID is a decentralized approach to stormwater management that works to mimic the natural hydrology of the site by retaining rainfall onsite. In order to realize the full benefits of water quality protection and runoff volume reduction, LID should be integrated and considered at the regional and watershed scale and the site scale.

Design Criteria

Regional/Watershed

1) Consider Density: Low density development has a greater water resource impact than compact growth on a watershed scale. Higher density development uses less land and produces less impervious cover per capita than low density development (USEPA, 2006). Developments should consider higher densities, but should still adhere to density levels as specified within local zoning requirements.

2) Identify and Preserve Contiguous Open Space: Large contiguous areas of open space can act as a flood control, have an ecological benefit, serve as a buffer for streams and rivers, and provide recreational opportunities (EPA, 2004). Applicants should look for opportunities to link open space preservation with regional open space preservation efforts (such as Save Open Space and Agricultural Resources).

3) Make use of Previously Developed Sites: Redevelopment of existing sites replace impervious cover with impervious cover, reduces the need for greenfield development, and makes use of existing infrastructure.

4) Locate Compact Development within Close Proximity to Mass Transit: This maximizes transportation choices, reduces the number of automobile trips, and lessens the water quality impacts associated with transportation and low-density sprawl.

Site

The following design criteria should be considered at the site level in addition to the principles and techniques discussed earlier in this section (e.g., Minimize Impervious Cover).

1) Maintain and Restore Natural Flowpaths for Runoff: Site buildings and impervious surfaces away from steep slopes, drainageways, and floodplains to reduce the amount of necessary clearing and grading and maintain the pre-development hydrology's time of concentration.

2) Maximize Use of Existing Impervious Cover: Assess and take advantage of opportunities to use existing impervious surfaces at the site level to reduce runoff at a watershed scale.

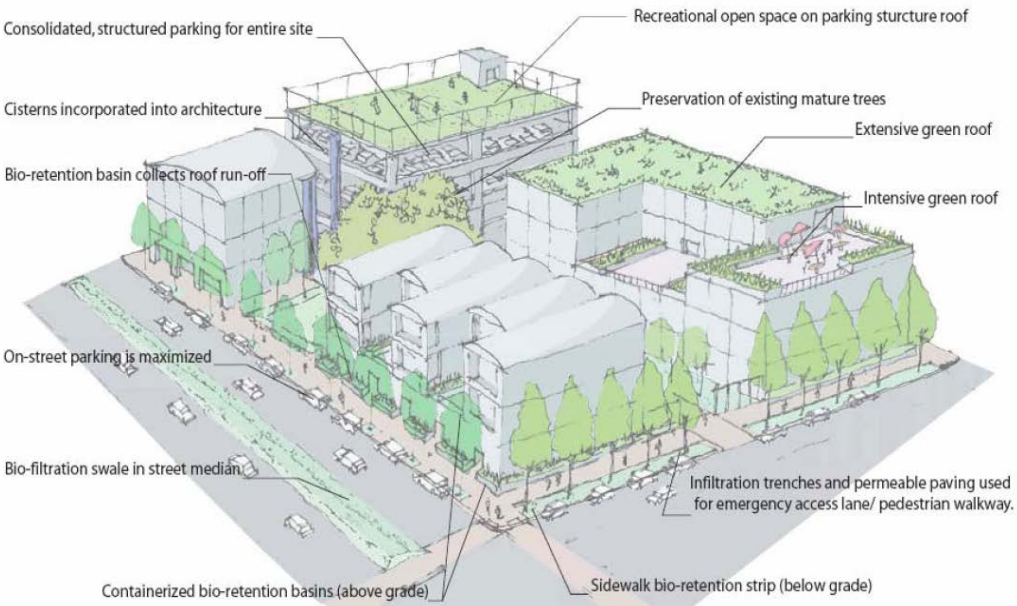

LID BMPs Considered at Various Scales

C. Anderson, Sustainable Urbanism

3) Design Public Spaces and Common Areas to Minimize Stormwater Runoff: Public spaces and common areas can serve as community gathering places but are often composed of impervious cover (e.g., courtyards primarily made up of concrete) (EPA, 2004). Design public spaces and common areas to accommodate both people and stormwater management.

4) Compact Project Design: Compact project design reduces the amount of impervious cover per capita, increases walkability, and decreases water quality impacts associated with transportation. Concentrating development on one portion of the site reduces the amount of lawn, provides more opportunities to preserve open space, and maintains and restores natural flow paths. Additionally, compact design can reduce street and driveway length and as a result, can help to reduce the imperviousness associated with development.

5) Encourage Use of Multiple Modes of Transportation: In addition to density and compact design, additional aspects of site design may encourage the use of multiple modes of transportation:

- Bicycle and pedestrian-friendly streets;
- Well connected sidewalks and streets; and
- Mixed uses that encourage walking.

4.7 Implement Integrated Water Resource Management Practices

Purpose

Integrated Water Resource Management (IWRM) is a process which promotes the coordinated development and management of water, land, and related resources. Order R4-2010-0108 promotes the use of IWRM to help guide the selection of BMPs that conserve water, recharge groundwater, provide recreational opportunities and serve as multiple purpose parks and preserve open space.

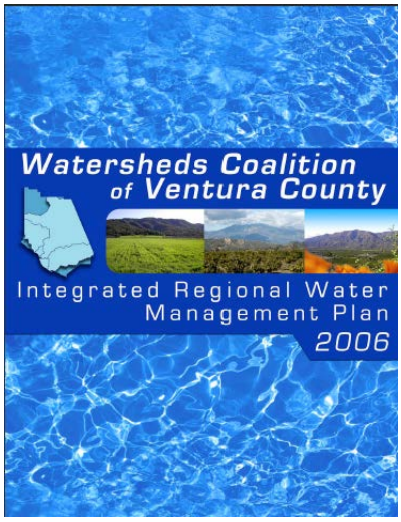

Integrated Regional Water Management Plan

Ventura County

Many of the concepts of IWRM are documented in the County's Integrated Regional Water Management Plan (IRWMP). The IRWMP is the product of an intensive stakeholder process and addresses multiple water resource management goals including improved water supply reliability, water recycling, water conservation, recreation and access, flood control, wetlands enhancement and creation, and environmental and habitat protection (Watershed Coalition of Ventura County, 2006).

Design Criteria

The goals of the 2011 TGM and the new development and redevelopment requirements contained within Order R4-2010-0108, complement the goals of the IRWMP. Development projects should strive to select BMPs that meet the following multiple objectives (Watershed Coalition of Ventura County, 2006):

1) Conserve and Augment Water Supplies: Identify and evaluate the opportunities to recharge groundwater and increase water use efficiency. This can be accomplished through infiltration of stormwater runoff and selection of drought-tolerant landscaping.

2) Protect People, Property and the Environment from Adverse Flooding Impacts: Identify opportunities to utilize BMPs that provide both water quality and water quantity benefits. Provide and maintain setbacks from streams and rivers.

3) Protect and Restore Habitat and Ecosystems in Watersheds: Implement the practices identified in Protect and Restore Natural Areas to integrate habitat and stormwater goals. Landscaping selection for stormwater management practices may also further encourage and attract wildlife.

4) Provide Water-related Recreational, Public Access and Educational Opportunities: Integrate recreation and stormwater management by creating multi-functional BMPs and designing courtyards and open spaces that accommodate both people and stormwater runoff. Consider providing educational signs for BMPs located in public spaces, where appropriate.

5 SOURCE CONTROL MEASURES

5.1 Introduction

Source Control Measures are low-technology practices designed to prevent pollutants from contacting stormwater runoff and prevent discharge of contaminated runoff to the storm drainage system. This section addresses site-specific, structural-type Source Control Measures consisting of specific design features or elements. Non-structural type Source Control Measures; such as good housekeeping and employee training, are not included in the 2011 TGM. The project applicant can consult the California Industrial Best Management Practice Manual for this type of practice (SWQTF, 1993). The governing stormwater agency may require additional Source Control Measures not included in the 2011 TGM for specific pollutants, activities, or land uses.

This section describes control measures for specific types of sites or activities that have been identified as potential significant sources of pollutants in stormwater. Each of the measures specified in this section should be implemented in conjunction with appropriate non-structural Source Control Measures to optimize pollution prevention.

The measures addressed in this section apply to both stormwater and non-stormwater discharges. Non-stormwater discharges are the discharge of any substance, such as process wastewater, to the storm drainage system or water body that is not composed entirely of stormwater. Stormwater that is mixed or commingled with other non-stormwater flows is considered non-stormwater. Discharges of stormwater and non-stormwater to the storm drainage system or a water body may be subject to local, state, or federal permitting prior to discharge. The appropriate agency should be contacted prior to any discharge. Discuss the matter with the stormwater staff if you are uncertain as to which agency should be contacted.

Some of the measures presented in this section require connection to the sanitary sewer system. It is prohibited to connect and discharge to the sanitary sewer system without prior approval or obtaining the required permits. Contact the stormwater staff of the governing agency about obtaining sanitary sewer permits within Ventura County. Discharges of certain types of flows to the sanitary sewer system may be cost prohibitive. The designer is urged to contact the appropriate agency prior to completing site and equipment design of the facility.

5.2 Description

Table 5-1 summarizes site-specific Source Control Measures and associated design features specified for various sites and activities. Fact Sheets are presented in this section for each source control measure. These sheets include design criteria

established by the Approval Agencies to ensure effective implementation of the required Source Control Measures:

Table 5-1: Summary of Site-Specific Source Control Measure Design Features

Site-Specific Source Control Measure [1]	DESIGN FEATURE OR ELEMENT						
	Signs, placards, stencils	Surfacing (compatible, impervious)	Covers, screens	Grading/berming to prevent run-on	Grading/berming to provide secondary containment	Sanitary sewer connection	Emergency Storm Drain Seal
Storm Drain Message and Signage (S-1)	X						
Outdoor Material Storage Area Design (S-2)		X	X	X	X		X
Outdoor Trash Storage and Waste Handling Area Design (S-3)		X	X	X		X	
Outdoor Loading/Unloading Dock Area Design (S-4)		X	X	X	X		
Outdoor Repair/Maintenance Bay Design (S-5)		X	X	X	X		X
Outdoor Vehicle/Equipment/ Accessory Washing Area Design (S-6)		X	X	X	X	X	X
Fueling Area Design (S-7)		X	X	X	X		X
Parking Lot Design [2]							

1 Refer to Fact Sheets in Section 6 for detailed information and design criteria and Appendix E for BMP sizing worksheets

2 Requirements for proper design of parking lots are covered by requirements for General Site Design Principles and Techniques (see Section 4) and Treatment Control Measures (see Section 6).

5.3 Site-Specific Source Control Measures

S-1: Storm Drain Message and Signage

Purpose

Waste materials dumped into storm drain inlets can have severe impacts on receiving and ground waters. Posting notices regarding discharge prohibitions at storm drain inlets can prevent waste dumping. This Fact Sheet contains details on the installation of storm drain messages at storm drain inlets located in new or redeveloped commercial, industrial, and residential sites.

Design Criteria

Storm drain messages have become a popular method of alerting the public to the effects of and the prohibitions against waste disposal into the storm drain system. The signs are typically stenciled or affixed near the storm drain inlet. The message simply informs the public that dumping of wastes into storm drain inlets is prohibited and/or the drain discharges to a receiving water.

Storm drain message markers or placards are required at all storm drain inlets within the boundary of the development project. The marker should be placed in clear sight facing anyone approaching the inlet from either side (see Figure 5-1). All storm drain inlet locations must be identified on the development site map.

Some local agencies within the County have approved storm drain message placards for use. Signs with language and/or graphical icons, which prohibit illegal dumping, should be posted at designated public access points along channels and streams within a project area. Consult local permitting agency stormwater staff to determine specific requirements for placard types and installation methods.

Maintenance Requirements

Legibility of markers and signs should be maintained. If required by the agency with jurisdiction over the project, the owner/operator or homeowner's association shall enter into a Maintenance Agreement with the agency or record a deed restriction upon the property title to maintain the legibility of placards and signs.

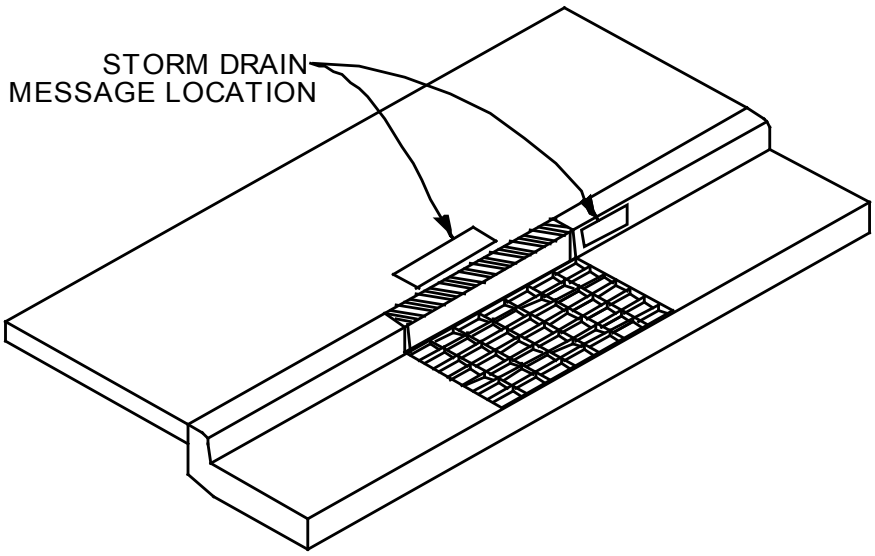

CURB TYPE INLET

NOTES:

1. **STORM DRAIN MESSAGE SHALL BE APPLIED IN SUCH A WAY AS TO PROVIDE A CLEAR, LEGIBLE IMAGE.**
2. **STORM DRAIN MESSAGE SHALL BE PERMANENTLY APPLIED DURING THE CONSTRUCTION OF THE CURB AND GUTTER USING A METHOD APPROVED BY THE LOCAL AGENCY.**

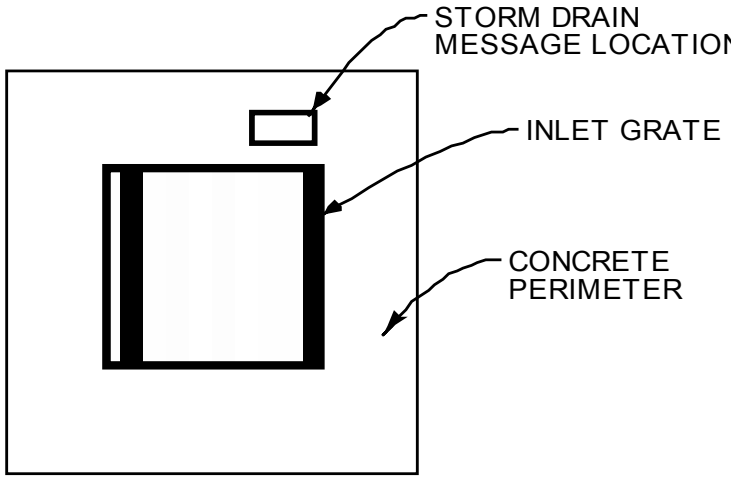

AREA TYPE INLET

Figure 5-1: Storm Drain Message Location

S-2: Outdoor Material Storage Area Design

Purpose

Materials that are stored outdoors could become sources of pollutants in stormwater runoff if not handled or stored properly. Materials could be in the form of raw products, by-products, finished products, and waste products. The type of pollutants associated with the materials will vary depending on the type of commercial or industrial activity.

Some materials are more of a concern than others. Toxic and hazardous materials must be prevented from coming in contact with stormwater. Non-toxic or non-hazardous materials do not have to be prevented from stormwater contact, but cannot be allowed to runoff with the stormwater. These materials may have toxic effects on receiving waters. Accumulated material on an impervious surface could result in significant debris and sediment being discharged with stormwater runoff causing a significant impact on the rivers or streams that receive the runoff.

Materials may be stored in a variety of ways, including bulk piles, containers, shelving, stacking, and tanks. Stormwater contamination may be prevented by eliminating the possibility of stormwater contact with the material storage areas either through diversion, cover, or capture of the stormwater. Control measures may also include minimizing the storage area. Control measures are site-specific and must meet local permitting agency requirements.

Design Criteria

Design requirements for material storage areas are governed by Building and Fire Codes and by current City or County ordinances and zoning requirements. Source Control Measures described in the Fact Sheet are intended to enhance and be consistent with these code and ordinance requirements. The following design features should be incorporated into the design of a material storage area when storing materials outside could contribute significant pollutants to the storm drain.

Table 5-2: Design Criteria for Outdoor Material Storage Area Design

Source Control Design Feature	Design Criteria
Surfacing	• Construct the storage area base with a material impervious to leaks and spills.
Covers	• Install a cover that extends beyond the storage area, or use a manufactured storage shed for small containers.
Grading/Containment	• Minimize the storage area. • Slope the storage area towards a dead-end sump to contain spills. • Grade or berm storage areas to prevent run-on from surrounding areas. • Direct runoff from downspouts/roofs away from storage areas.

Accumulated Stormwater and Non-stormwater

Stormwater and non-stormwater will accumulate in containment areas and sumps with impervious surfaces. Contaminated accumulated water must be disposed of in accordance with applicable laws and cannot be discharged directly to the storm drain or sanitary sewer system without the appropriate permit.

S-3: Outdoor Trash Storage Area Design

Purpose

Stormwater runoff from areas where trash is stored or disposed of can be polluted. In addition, loose trash and debris can be easily transported by water or wind into nearby storm drain inlets, channels, and/or creeks. Waste handling operations may be sources of stormwater pollution and include dumpsters, litter control, and waste piles. This fact sheet contains details on the specific measures required to prevent or reduce pollutants in stormwater runoff associated with trash storage and handling.

Design Criteria

Design requirements for waste handling areas are governed by Building and Fire Codes, and by current local permitting agency ordinances and zoning requirements. The design criteria described in the Fact Sheet are meant to enhance and be consistent with these code and ordinance requirements. Hazardous waste should be handled in accordance with legal requirements established in Title 22, California Code of Regulations.

Wastes from commercial and industrial sites are typically hauled by either public or commercial carriers that may have design or access requirements for waste storage areas. The design criteria listed below are recommendations and are not intended to be in conflict with requirements established by the waste hauler. The waste hauler

should be contacted prior to the design of your site trash collection area to obtain established and accepted guidelines for designing trash collection areas. Conflicts or issues should be discussed with the local permitting agency.

The following trash storage area design controls were developed to enhance the local permitting agency codes and ordinances and should be implemented depending on the type of waste and the type of containment.

Table 5-3: Design Criteria for Outdoor Trash Storage Areas

Source Control Design Feature	Design Criteria
Surfacing	• Construct the storage area base with a material impervious to leaks and spills.
Screens/Covers	• Install a screen or wall around trash storage area to prevent offsite transport of loose trash. • Use lined bins or dumpsters to reduce leaking of liquid wastes. • Use water-proof lids on bins/dumpsters or provide a roof to cover enclosure (local permitting agency discretion) to prevent rainfall from entering containers.
Grading/Contouring	• Berm or grade the waste handling area to prevent run-on of stormwater. • Do not locate storm drains in immediate vicinity of the trash storage area.
Signs	• Post signs on all dumpsters informing users that hazardous materials are not to be disposed of therein.

Maintenance Requirements

The owner/operator must maintain the integrity of structural elements that are subject to damage (e.g. screens, covers and signs). Maintenance Agreements between the local permitting agency and the owner/operator may be required. Some agencies will require maintenance deed restrictions to be recorded of the property title. If required by the local permitting agency, Maintenance Agreements or deed restrictions must be executed by the owner/operator before improvement plans are approved. Refer to Appendix G and H for further guidance regarding Maintenance Plan Agreements.

S-4: Outdoor Loading/Unloading Dock Area Design

Purpose

Materials spilled, leaked, or lost during loading or unloading may collect on impervious surfaces or in the soil and be carried away by runoff or when the area is cleaned. Rainfall may also wash pollutants from machinery used to load or unload materials. Depressed loading docks (truck wells) are contained areas that can accumulate stormwater runoff. Discharge of spills or contaminated stormwater to

the storm drain system is prohibited. This Fact Sheet contains details on specific measures recommended to prevent or reduce pollutants in stormwater runoff from outdoor loading or unloading areas.

Design Criteria

Design requirements for outdoor loading and unloading of materials are governed by Building and Fire Codes, and by current local permitting agency ordinances and zoning requirements. Source Control Measures described in this Fact Sheet are meant to enhance and be consistent with these code and ordinance requirements. Companies may have their own design or access requirements for loading docks. The design criteria listed below are not intended to be in conflict with requirements established by individual companies. Conflicts or issues should be discussed with the local permitting agency.

The following design criteria should be followed when developing construction plans for material loading and unloading areas:

Table 5-4: Design Criteria for Outdoor Loading/ Unloading Areas

Source Control Design Feature	Design Criteria
Surfacing	• Construct floor surfaces with materials that are compatible with materials being handled in the loading/unloading area.
Covers	• Cover loading/unloading areas to a distance of at least 3 feet beyond the loading dock or install a seal or door skirt to be used for all material transfers between the trailer and the building.
Grading/Contouring	• Grade or berm storage the areas to prevent run-on from surrounding areas. • Direct runoff from downspouts/roofs away from loading areas.
Emergency Storm Drain Seal	• Do not locate storm drains in the loading dock area. Direct connections to storm drains from depressed loading docks are prohibited. • Provide means, such as isolation valves, drain plugs, or drain covers, to prevent spills or contaminated stormwater from entering the storm drainage system.

Accumulated Stormwater and Non-stormwater

Stormwater and non-stormwater will accumulate in containment areas and sumps with impervious surfaces, such as depressed loading docks. Contaminated accumulated water must be disposed of in accordance with applicable laws and cannot be discharged directly to the storm drain or sanitary sewer system without the appropriate permit.

S-5: Outdoor Repair/Maintenance Bay Design

Purpose

Activities that can contaminate stormwater include engine repair, service, and parking (i.e. leaking engines or parts). Oil and grease, solvents, car battery acid, coolant and gasoline from the repair/maintenance bays can severely impact stormwater if allowed to come into contact with stormwater runoff. This Fact Sheet contains details on the specific measures required to prevent or reduce pollutants in stormwater runoff from vehicle and equipment maintenance and repair areas.

Design Criteria

Design requirements for vehicle maintenance and repair areas are governed by Building and Fire Codes, and by current local permitting agency ordinances, and zoning requirements. The design criteria described in this Fact Sheet are meant to enhance and be consistent with these code requirements.

The following design criteria are required for vehicle and equipment maintenance, and repair. All wash water, hazardous and toxic wastes must be prevented from entering the storm drainage system.

Source Control Design Feature	Design Criteria
Surfacing	• Construct the vehicle maintenance/repair floor area with Portland cement concrete.
Covers	• Cover or berm areas where vehicle parts with fluids are stored. • Cover or enclose all vehicle maintenance/repair areas.
Grading/ Contouring	• Berm or grade the maintenance/repair area to prevent run-on and runoff of stormwater or runoff of spills. • Direct runoff from downspouts/roofs away from maintenance/repair areas. • Grade the maintenance/repair area to drain to a dead-end sump for collection of all wash water, leaks and spills. Direct connection of maintenance/repair area to storm drain system is prohibited. • Do not locate storm drains in the immediate vicinity of the maintenance/repair area.
Emergency Storm Drain Seal	• Provide means, such as isolation valves, drain plugs, or drain covers, to prevent spills or contaminated stormwater from entering the storm drainage system.

Accumulated Stormwater and Non-stormwater

Stormwater and non-stormwater will accumulate in containment areas and sumps with impervious surfaces. Contaminated accumulated water must be disposed of in accordance with applicable laws and cannot be discharged directly to the storm drain or sanitary sewer system without the appropriate permit.

S-6: Outdoor Vehicle/Equipment/Accessory Washing Area Design

Purpose

Washing vehicles and equipment in areas where wash water flows onto the ground can pollute stormwater. Wash waters are not allowed in the storm drain system. They can contain high concentrations of oil and grease, solvents, phosphates and high suspended solids loads. Sources of washing contamination include outside vehicle/equipment cleaning or wash water discharge to the ground. This Fact Sheet contains details on the specific measures required to prevent or reduce pollutants in stormwater runoff from vehicle and equipment washing areas.

Design Criteria

Design requirements for vehicle maintenance and repair areas are governed by Building and Fire Codes, and by current local permitting agency ordinances, and zoning requirements. The design criteria described in this Fact Sheet are meant to enhance and be consistent with these code requirements.

The following design criteria are required for vehicle and equipment washing areas. All hazardous and toxic wastes must be prevented from entering the storm drain system.

Source Control Design Feature	Design Criteria
Surfacing	• Construct the vehicle/equipment wash area floors with Portland cement concrete.
Covers	• Provide a cover that extends over the entire wash area.
Grading/ Contouring	• Berm or grade the maintenance/repair area to prevent run-on and runoff of stormwater or runoff of spills. • Grade or berm the wash area to contain the wash water within the covered area and direct the wash water to treatment and recycle or pretreatment and proper connection to the sanitary sewer system. Obtain approval from the governing agency before discharging to the sanitary sewer. • Direct runoff from downspouts/roofs away from wash areas. • Do not locate storm drains in the immediate vicinity of the wash area.
Emergency Storm Drain Seal	• Provide means, such as isolation valves, drain plugs, or drain covers, to prevent spills or contaminated stormwater from entering the storm drainage system.

Accumulated Stormwater and Non-stormwater

Stormwater and non-stormwater will accumulate in containment areas and sumps with impervious surfaces. Contaminated accumulated water must be disposed of in accordance with applicable laws and cannot be discharged directly to the storm drain or sanitary sewer system without the appropriate permit.

S-7: Fueling Area Design

Purpose

Spills at vehicle and equipment fueling areas can be a significant source of pollution because fuels contain toxic materials and heavy metals that are not easily removed by stormwater treatment devices. When stormwater mixes with fuel spilled or leaked onto the ground, it becomes polluted by petroleum-based materials that are harmful to humans, fish, and wildlife. This could occur at large industrial sites or at small commercial sites such as gas stations and convenience stores. This Fact Sheet contains details on specific measures required to prevent or reduce pollutants in stormwater runoff from vehicle and equipment fueling areas, including retail gas stations.

Design Criteria

Design requirements for fueling areas are governed by Building and Fire Codes and by current local permitting agency ordinances and zoning requirements. The design requirements described in this Fact Sheet are meant to enhance and be consistent with these code and ordinance requirements.

Source Control Design Feature	Design Criteria
Surfacing	• Fuel dispensing areas must be paved with Portland cement concrete. The fuel dispensing area is defined as extending 6.5 feet from the corner of each fuel dispenser or the length at which the hose and nozzle assemble may be operated plus 1 foot, whichever is less. The paving around the fuel dispensing area may exceed the minimum dimensions of the "fuel dispensing area" stated above. • Use asphalt sealant to protect asphalt paved areas surrounding the fueling area.
Covers	• The fuel dispensing area must be covered [1], and the cover's minimum dimensions must be equal to or greater than the area within the grade break or the fuel dispensing area, as defined above. The cover must not drain onto the fuel dispensing area.
Grading/ Contouring	• The fuel dispensing area should have a 2% to 4% slope to prevent ponding and must be separated from the rest of the site by a grade break that prevents run-on of stormwater to the extent practicable. • Grade the fueling area to drain toward a dead-end sump. • Direct runoff from downspouts/roofs away from fueling areas. • Do not locate storm drains in the immediate vicinity of the fueling area.

Source Control Design Feature	Design Criteria
Emergency Storm Drain Seal	• Provide means, such as isolation valves, drain plugs, or drain covers, to prevent spills or contaminated stormwater from entering the storm drainage system.

1. If fueling large equipment or vehicles that would prohibit the use of covers or roofs, the fueling island should be designed to sufficiently accommodate the larger vehicles and equipment and to prevent run-on and runoff of stormwater. Grade to direct stormwater to a dead-end sump.

Accumulated Stormwater and Non-stormwater

Stormwater and non-stormwater will accumulate in containment areas and sumps with impervious surfaces. Contaminated accumulated water must be disposed of in accordance with applicable laws and cannot be discharged directly to the storm drain or sanitary sewer system without the appropriate permit.

S-8: Proof of Control Measure Maintenance

Purpose

Continued effectiveness of control measures specified in the 2011 TGM depends on diligent ongoing inspection and maintenance. To ensure that such maintenance is provided, the local permitting agency will require both a Maintenance Agreement and a Maintenance Plan from the owner/operator of stormwater control measures.

Maintenance Agreement

Onsite Treatment Control Measures are to be maintained by the owner/operator. Maintenance Agreements between the governing agency and the owner/operator may be required. A Maintenance Agreement with the governing agency must be executed by the owner/operator before occupancy of the project is approved. A sample Maintenance Agreement form is provided in Appendix H.

Maintenance Plan

A post-construction Maintenance Plan shall be prepared and made available at the governing agency's request. The Maintenance Plan should address items such as:

- Operation plan and schedule, including a site map;
- Maintenance and cleaning activities and schedule;
- Equipment and resource requirements necessary to operate and maintain facility; and
- Responsible party for operation and maintenance.

Additional guidelines for Maintenance Plans are provided in Appendix I.

6 STORMWATER BMP DESIGN

6.1 Introduction

Retention BMPs, Biofiltration BMPs, and Treatment Control Measures are required to augment Site Design Principles and Techniques and Source Control Measures to reduce pollution from stormwater discharges to the maximum extent practicable. Retention BMPs are engineered facilities that are designed to retain surface runoff on the project site. Biofiltration BMPs are vegetated stormwater BMPs that remove pollutants by filtering stormwater through vegetation and soils. Treatment Control Measures are engineered BMPs that provide a reduction of pollutant loads and concentrations in stormwater runoff. The type(s) of Retention BMPs and Biofiltration BMPs to be implemented depends on site suitability factors discussed in this chapter. The type of Treatment Control Measure(s) to be implemented at a site depends on a number of factors including: type of pollutants in the stormwater runoff, quantity of stormwater runoff to be treated, project site conditions, receiving water conditions, and state industrial permit requirements, where applicable. Land requirements and costs to design, construct, and maintain Treatment Control Measures vary by type.

Unlike flood control measures that are designed to handle peak flows, stormwater Retention BMPs, Biofiltration BMPs, and Treatment Control Measures are designed to retain or treat the more frequent, lower-flow storm events, or the first flush runoff from larger storm events (typically referred to as the first flush events). Small, frequent storm events represent most of the total average annual rainfall for the area. It's the volume from such small events, referred to as the Stormwater Quality Design Volume (SQDV), that is targeted for retention onsite in Retention BMPs. Biofiltration BMPs and Treatment Control Measures can be sized to capture either the SQDV or the Stormwater Quality Design Flow (SQDF). Calculation methods for the SQDV and the SQDF are presented in Section 2 and Appendix E.

6.2 General Considerations

Retention BMPs, Biofiltration BMPs, and Treatment Control Measures are designed to remove pollutants contained in stormwater runoff. The pollutants of concern, depending on the watershed, may include trash, debris, and sediment; metals such as copper, lead, and zinc; nutrients such as nitrogen and phosphorous; certain bacteria and viruses; mineral salts such as chloride; and organic chemicals such as petroleum hydrocarbons and pesticides. Pollutant removal methods include sedimentation/settling, filtration, plant uptake, ion exchange, adsorption, and microbially-mediated decomposition. Floatable pollutants such as oil, debris, and scum can be removed with separator structures. Retention BMPs, Biofiltration BMPs, and some Treatment Control Measures are also designed to reduce runoff volume, thereby reducing pollutant loading to receiving waters. Retention BMP,

Biofiltration BMPs, and Treatment Control Measure types and common terms used in stormwater treatment are discussed below.

Maintenance Responsibility

Unless otherwise agreed to by the governing stormwater agency, the landowner, site operator, or homeowner's association is responsible for the operation and maintenance of the Retention BMPs, Biofiltration BMPs, and Treatment Control Measures. Failure to properly operate and maintain the measures could result in reduced treatment of stormwater runoff or a concentrated loading of pollutants to the storm drain system. To protect against failure, a Maintenance Plan must be developed and implemented for all Retention BMPs, Biofiltration BMPs, and Treatment Control Measures. Guidelines for maintenance plans are provided in Appendix I of the 2011 TGM. The Plan must be made available at the agency's request. In addition, a maintenance agreement with the governing agency may be required. The example maintenance agreements are included in Appendix H.

In addition to maintenance, the governing agency may require water quality monitoring agreements for any of the Retention BMPs, Biofiltration BMPs, or Treatment Control Measures recommended in the 2011 TGM. Monitoring may be conducted by the site operator, the agency, or both. Monitoring may be required for a period of time to help the agency evaluate the effectiveness of Retention BMPs, Biofiltration BMPs, and Treatment Control Measures in reducing pollutants in stormwater runoff.

Pretreatment

Pretreatment must be provided for filtration and infiltration facilities and other facilities whose function could be adversely affected by sediment or other pollutants. Pretreatment may also be provided for water quality detention basins and other Treatment Control Measures to facilitate the routine removal of sediment, trash, and debris, and to increase the longevity of the downstream BMPs.

Pretreatment may be provided by presettling basins or forebays (small detention basins), vegetated swales, filter strips, and hydrodynamic separators. Source control activities, described in Chapter 5, minimize the introduction of pollutants into stormwater runoff and also help to protect filtration and infiltration facilities. Effort should be made early in the site planning stages to minimize runoff from impervious areas by grading toward landscaped areas, disconnecting downspouts, and using pervious conveyances prior to discharging to the storm drain system. These site design practices can reduce the size and maintenance burden of downstream, end-of-pipe BMPs.

Oil/Water Separation

Oil/water separators remove floating oil from the water surface. There are two general types of separators: American Petroleum Institute (API) separators and

coalescing plate (CP) separators. Both types use physical mechanisms to remove high concentrations of floating and dispersed oil. Oil/water separators are not suitable for the relatively low concentrations of petroleum hydrocarbons present in typical urban runoff, and should only be used in locations where higher concentrations of oil are expected to occur, such as retail fuel facilities, high volume roads, and petroleum-related industrial facilities. Oil/water separators must be located off-line from the primary conveyance system, as they function at low flow conditions and will wash out in high flow conditions. Other oil control devices/facilities that may be used for pretreatment of slightly elevated concentrations of oil (i.e., typical of high use commercial parking lots) include catch basin inserts, hydrodynamic devices, and linear sand filters. Oil control devices/facilities should always be placed upstream of other treatment facilities and as close to the oil source as possible.

Infiltration

Infiltration refers to the use of the filtration, adsorption, and biological decomposition properties of soils to remove pollutants prior to the intentional routing of runoff to the subsurface for groundwater recharge. Infiltration BMPs are a type of Retention BMP and include infiltration basins, infiltration trenches, bioretention without an underdrain, dry wells, permeable pavement, and proprietary infiltration devices. Infiltration can provide multiple benefits including pollutant removal, hydromodification control, groundwater recharge, and flood control. However, conditions that can limit the use of infiltration include soil properties and potential adverse impacts on groundwater quality. A geotechnical investigation must be conducted when evaluating infiltration to determine the suitability of the site soil in adequately addressing groundwater protection. This may include an in-situ percolation test, per the guidance provided in Appendix C, and the determination of minimum depth to groundwater. The minimum separation to seasonal high groundwater or estimated mounded groundwater is five feet. Depth to seasonal high groundwater level shall be estimated as the average of the annual minima (i.e., the shallowest recorded measurements in each water year, defined as October 1 through September 30) for all years on record. If groundwater level data are not available or not considered to be representative, seasonal high groundwater depth can be determined by redoximorphic analytical methods combined with temporary groundwater monitoring for November 1 through April 1 at the proposed project site.

Soils should have sufficient organic content and sorption capacity to remove certain pollutants, but must be coarse enough to infiltrate runoff in a reasonable amount of time (e.g., < 72 hours for above-ground ponded water to prevent vector breeding). Examples of suitable soils are silty and sandy loams. Coarser soils, such as gravelly sands, have limited organic content and high permeability and therefore present a potential risk to groundwater from certain pollutants, especially in areas of shallow groundwater. Prior to the use of infiltration BMPs, consult with the local permitting agency to identify if vulnerable unconfined aquifers are located beneath the project to determine the appropriateness of these BMPs. In an area identified as an unconfined

aquifer, the application of infiltration BMPs should include significant pretreatment to ensure groundwater is protected from pollutants of concern.

Infiltration BMPs should not be placed in high-risk areas such as at or near service/gas stations, truck stops, and heavy industrial sites due to the groundwater contamination risk. Infiltration BMPs may be placed in high-risk areas if a site-specific evaluation demonstrates that sufficient pretreatment is provided to address pollutants of concern, high risks areas are isolated from stormwater runoff, or infiltration areas have little chance of spill migration.

In addition, infiltration BMPs must be sited at least 50 feet away from slopes steeper than 15 percent or an alternative setback established by the geotechnical expert for the project. Adequate spacing (100 feet or more) must be provided between infiltration BMPs and potable wells, non-potable wells, drain fields, and springs. Infiltration BMPs must be setback from building foundations at least eight feet or have an alternative setback established by the geotechnical expert for the project.

Infiltration is not allowed at locations with contaminated soils or groundwater where the pollutants could be mobilized or exacerbated by infiltration, unless a site-specific analysis determines the infiltration would not be detrimental. A site-specific analysis shall be prepared where pollutant mobilization (e.g., naturally-derived groundwater pollutants) is a concern. Projects must consider the potential for mobilization of groundwater contamination from natural sources as a result of stormwater infiltration (e.g., marine sediments, selenium-rich groundwater) to the extent that data is available.

Incidental infiltration that occurs in other types of Biofiltration BMPs and Treatment Control Measures, such as dry extended detention basins, vegetation swales, filter strips, and bioretention areas with underdrains, pose little risk to groundwater quality as treatment is provided in the BMP prior to infiltration.

Biofiltration BMPs

Biofiltration BMPs use vegetation and soils or other filtration media for runoff treatment. As runoff passes through the vegetation and filtration media, the combined effects of filtration, adsorption, and biological uptake remove pollutants. In biofiltration BMPs, pore spaces and organic material in the soils help to retain water in the form of soil moisture and to promote the pollutant adsorption (e.g., dissolved metals and petroleum hydrocarbons) into the soil matrix. Plants use soil moisture, promote the drying of the soil through transpiration, and uptake pollutants in their roots and leaves. Plants with extensive root systems also help to maintain filtration rates. Vegetation also decreases the velocity of flow and allows for particulates to settle.

Treatment Control Measures

Filtration

Various media, such as sand, perlite, zeolite, compost, and activated carbon, can be used in filtration BMPs to effectively remove total suspended solids (TSS) and associated pollutants such as organics (hydrocarbons and pesticides) and particulate metals. Filtration systems can be configured in the form of horizontal beds, trenches, or lastly, cartridge systems in underground vaults or catch basins.

Wetpools

A wetpool is a permanent pool of water incorporated into a wetpond or stormwater wetland BMP. Wetpools provide runoff treatment by allowing settling of particulates (sedimentation) by biological uptake and by vegetative filtration (if vegetation is present). Wetpool BMPs may be single-purpose facilities, providing only runoff treatment, or they may also provide flow control by providing additional detention storage with the use of a multi-stage outlet structure. If combined with detention, the wetpool volume can often be stacked under the detention volume with little further loss of development area.

"On-line" and "Off-line" Facilities

The location and configuration of control facilities can vary depending on the desired function. For example, drop structures or grade control may be located in a drainage channel so as to stabilize a channel for hydromodification control purposes. Such facilities are referred to as "in-stream" controls. Retention BMPs, Biofiltration BMPs, and Treatment Control Measures may not be located in-stream. Retention BMPs, Biofiltration BMPs, and Treatment Control Measures cannot be located in Waters of the US, but rather must be located upland to retain or treat runoff prior to discharge into Waters of the US.

If a Retention BMP, Biofiltration BMP, or Treatment Control Measure facility is designed such that all the runoff passes through the facility, the facility is called an "on-line" system. However, care must be taken to limit the resuspension of previously captured pollutants or damage to BMP performance during high flows. If, on the other hand, the facility only receives flows less than or equal to the stormwater quality design flow (SQDF), the facility is called an "off-line" system. Off-line systems therefore require a flow splitter or equivalent device. Generally treatment performance is better for off-line facilities because a larger percentage of the runoff is treated. Figure 6-1 illustrates the difference between on-line, off-line, and in-stream controls.

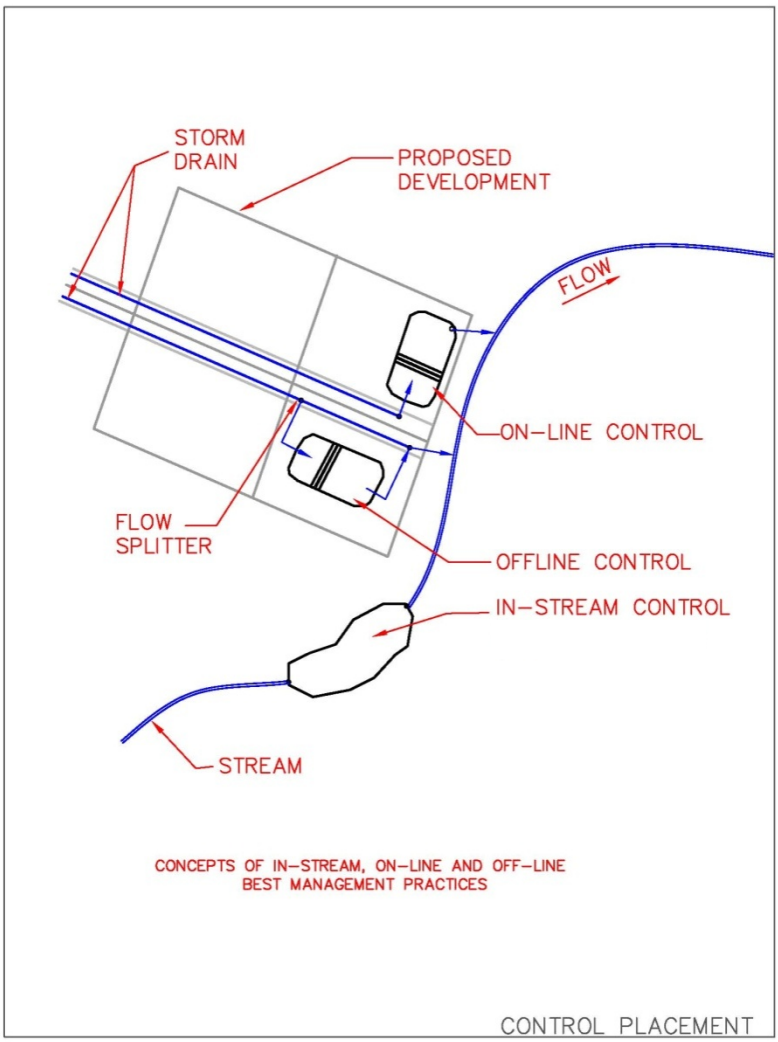

Figure 6-1: Differences between On-line, Off-line, and In-stream Control Measures

6.3 Retention BMP, Biofiltration BMP, and Treatment Control Measure Fact Sheets

This section provides fact sheets with recommended criteria for the design and implementation of Retention BMPs, Biofiltration BMPs, and Treatment Control Measures. The siting, design, and maintenance requirements in the fact sheets are intended to ensure optimal performance of the measures. Alternative designs may be approved by the local permitting authority based on site specific conditions if equivalent pollutant removal performance is provided.

The 2011 TGM also contains calculation worksheets to aid in the design of these BMPs in Appendix E. New BMPs that are equivalent to those included in the 2011 TGM are acceptable based on approval of the local permitting agency.

Fact sheets are provided for the Retention BMPs, Biofiltration BMPs, and Treatment Control Measures listed below:

Retention BMPs

Infiltration BMPs

INF-1: Infiltration Basin
INF-2: Infiltration Trench
INF-3: Bioretention
INF-4: Drywell
INF-5: Permeable Pavement
INF-6: Proprietary Infiltration

Rainwater Harvesting BMPs

RWH-1: Rainwater Harvesting

Evapotranspiration BMPs

ET-1: Green Roof
ET-2: Hydrologic Source Controls

Biofiltration BMPs

BIO-1: Bioretention with Underdrain
BIO-2: Planter Box
BIO-3: Vegetated Swale
BIO-4: Vegetated Filter Strip
BIO-5: Proprietary Biotreatment

Treatment Control Measures

TCM-1: Dry Extended Detention Basin
TCM-2: Wet Detention Basin
TCM-3: Constructed Wetland
TCM-4: Sand Filter (if vegetated, this is considered a Biofiltration BMP)
TCM-5: Cartridge Media Filter

Pretreatment/Gross Solids Removal BMPs

PT-1: Hydrodynamic Device
PT-2: Catch Basin Insert

INF-1: Infiltration Basin

An infiltration basin consists of an earthen basin constructed in naturally pervious soils (Type A or B soils) with a flat bottom and provided with an inlet structure to dissipate energy of incoming flow and an emergency spillway to control excess flows. An optional relief underdrain may be provided to drain the basin if standing water conditions occur. A forebay settling basin or separate Treatment Control Measure must be provided as pretreatment. An infiltration basin functions by retaining the SQDV in the basin and allowing the retained runoff to percolate into the underlying native soils over a specified period of time. The bottoms of infiltration basins are typically vegetated with dry-land grasses or irrigated turf grass. A typical layout of an infiltration basin system is shown in Figure 6-2.

Infiltration Basin in a Fresno, CA Park, Before and After a Rain Event

Photo Credit: Geosyntec Consultants

Application

- Mixed-use and commercial
- Roads and parking lots
- Parks and open spaces
- Single and multi-family residential
- Can integrate with parks

Routine Maintenance

- Removal trash, debris, and sediment at inlet and outlets
- Wet weather inspection to ensure drain time
- Remove weeds
- Inspect for mosquito breeding

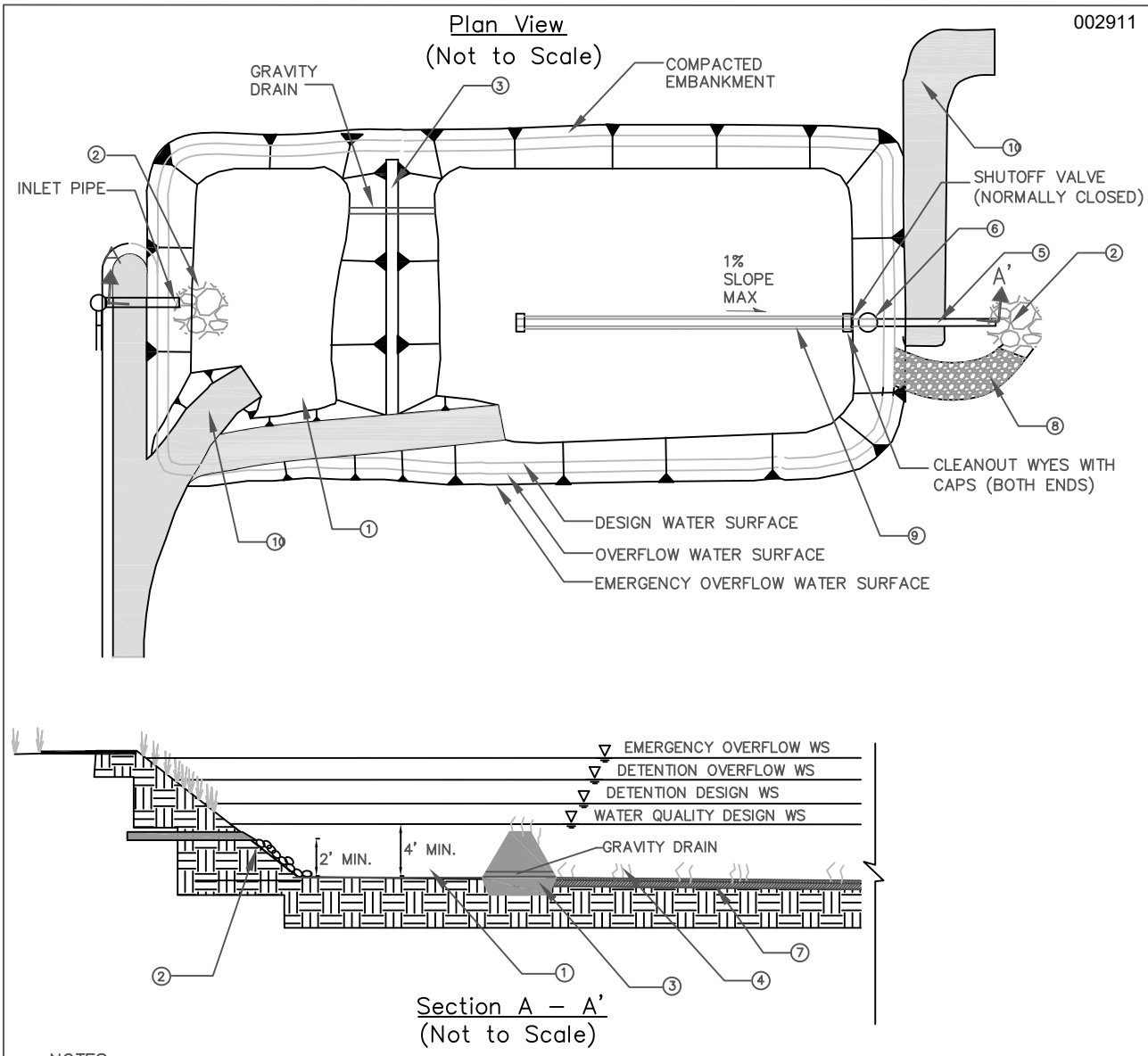

NOTES:

1. UPSTREAM PRETREATMENT SHALL BE PROVIDED. SEDIMENT FOREBAY WITH VOLUME EQUAL TO 25% OF TOTAL INFILTRATION BASIN VOLUME MAY BE USED IN LIEU OF UPSTREAM PRETREATMENT. DEPTH SHALL BE 4' MIN TO 8' MAX PLUS AN ADDITIONAL 1 FOOT MIN SEDIMENT STORAGE DEPTH.
2. RIP RAP APRON OR OTHER ENERGY DISSIPATION.
3. EXTEND EARTHEN BERM ACROSS ENTIRE WIDTH OF THE INFILTRATION BASIN.
4. INFILTRATION BASIN BOTTOM AND SIDE SLOPES SHALL BE PLANTED WITH DROUGHT TOLERANT VEGETATION. DEEP ROOTED VEGETATION PREFERRED FOR BASIN BOTTOM. NO TOPSOIL SHALL BE ADDED TO INFILTRATION BASIN BED.
5. SIZE OUTLET PIPE TO PASS 100–YEAR PEAK FLOW FOR ON–LINE INFILTRATION BASINS AND WATER QUALITY PEAK FLOW FOR OFF–LINE INFILTRATION BASINS.
6. WATER QUALITY OUTLET STRUCTURE. SEE FIGURE 7–2 AND FIGURE 7–3 FOR DETAILS.
7. OVER EXCAVATE BASIN BOTTOM 1 FOOT. RE–PLACE EXCAVATED MATERIAL UNIFORMLY WITHOUT COMPACTION. AMENDING EXCAVATED MATERIAL WITH 2" – 4" OF COARSE SAND IS RECOMMENDED FOR SOILS WITH BORDER LINE INFILTRATION CAPACITY.
8. INSTALL EMERGENCY OVERFLOW SPILLWAY AS NEEDED. SEE FIGURE 2–4 FOR DETAILS
9. INSTALL OPTIONAL 6" MINIMUM DIAMETER PERFORATED PIPE UNDERDRAIN. INSTALL AT 0.5% MINIMUM SLOPE.
10. MAINTENANCE RAMP SHOULD PROVIDE ACCESS TO BOTH THE FIRST CELL AND MAIN BASIN.

Geosyntec consultants

Figure 6-2: Infiltration Basin

Limitations

The following limitations should be considered before choosing to use an infiltration basin:

- Native soil infiltration rate - permeability of soils at the infiltration basin location must be at least 0.5 inches per hour.
- Depth to groundwater, bedrock, or low permeability soil layer – 5 feet vertical separation is required between the bottom of the infiltration basin and the seasonal high groundwater level or mounded groundwater level, bedrock, or other barrier to infiltration to ensure that the facility will completely drain between storms and that infiltrating water will receive adequate treatment though the soils before it reaches the groundwater.
- Slope stability - infiltration BMPs must be sited at least 50 feet away from slopes steeper than 15 percent or an alternative setback established by the geotechnical expert for the project.
- Setbacks - a minimum setback (100 feet or more) must be provided between infiltration BMPs and potable wells, non-potable wells, drain fields, and springs. Infiltration BMPs must be setback at least eight feet from building foundations or have an alternative setback established by the geotechnical expert for the project.
- Groundwater contamination - the application of infiltration BMPs should include significant pretreatment in an area identified as an unconfined aquifer to ensure groundwater is protected for pollutants of concern.
- Contaminated soils or groundwater plumes - infiltration BMPs are not allowed at locations with contaminated soils or groundwater, where the pollutants could be mobilized or exacerbated by infiltration, unless a site-specific analysis determines the infiltration would be beneficial.
- High pollutant land uses - infiltration BMPs should not be placed in high-risk areas such as at or near service/gas stations, truck stops, and heavy industrial sites due to the groundwater contamination risk unless a site-specific evaluation demonstrates that sufficient pretreatment is provided to address pollutants of concern, high risks areas are isolated from stormwater runoff, or infiltration areas have little chance of spill migration.
- High sediment loading rates – infiltration BMPs may clog quickly if sediment loads are high (e.g., unstabilized site) or if flows are not adequately pretreated.

Additional Control Functions

Infiltration basins can be designed for flow control by providing storage capacity in excess of that provided by infiltration and incorporating outlet controls. The additional storage and outlet structure should be provided per the requirements outlined in the Dry Extended Detention Basins section of the 2011 TGM. Note that the selected outlet structure should not be designed to drain the design volume intended for infiltration and should be similar to outlet structures that maintain a permanent pool (see Section 6.10.2 – Wet Retention Basins).

Multi-Use Opportunities

Infiltration basins may be integrated into the design of a park or playfield. Recreational multi-use facilities should be inspected after every storm and may require a greater maintenance frequency than dedicated infiltration basins to ensure aesthetics and public safety are not compromised. Any planned multi-use facility must obtain approval by the affected City and County departments.

Design Criteria

The main challenge associated with infiltration basins is preventing system clogging and subsequent infiltration inhibition. Infiltration basins should be designed according to the requirements listed in Table 6-1 and outlined in the section below. Detailed design procedures and an example are included in Appendix E.

Table 6-1: Infiltration Basin Design Criteria

Design Parameter	Unit	Design Criteria
Stormwater quality design volume (SQDV)	acre-feet	See Section 2.3 and Appendix E for calculating SQDV
Design drawdown time	hr	12 - 72 (See Appendix D, Section D.2)
Bottom basin Elevation	feet	5 feet above seasonally high groundwater table or mounded groundwater
Setbacks	feet	100 feet from wells, fields, and springs; 20 feet downslope of 100 feet upslope of foundations; Geotechnical expert should establish the setback requirement from building foundations that must be ≥ 8 ft.
Pretreatment	-	Sedimentation forebay or any Treatment Control Measure shall be provided as pretreatment for all tributary surfaces other than roofs.

Design Parameter	Unit	Design Criteria
Design percolation rate (P_{design})	in/hr	Measured percolation rate must be corrected based onsite suitability assessment and design related considerations described in this fact sheet.
Facility geometry	-	Forebay (if applicable): 25% of facility volume; flat bottom slope
Freeboard (minimum)	ft	1.0
Inlet/ Outlet erosion control	-	Energy dissipater to reduce velocity
Overflow device	-	Required if system is on-line

Geotechnical Considerations

An extensive geotechnical site investigation must be undertaken early in the site planning process to verify site suitability for the installation of infiltration facilities, due to the potential to contaminate groundwater, cause slope instability, impact surrounding structures, and have insufficient infiltration capacity.. Soil infiltration rates and the water table depth should be evaluated to ensure that conditions are satisfactory for proper operation of an infiltration facility. See Appendix C for guidance on infiltration testing.

The project designer must demonstrate through infiltration testing, soil logs, and the written opinion of a licensed civil engineer that sufficiently permeable soils exist onsite to allow the construction of a properly functioning infiltration facility.

1) Infiltration facilities require a minimum soil infiltration rate of 0.5 inches/hour. Pretreatment is required in all instances.

2) Groundwater separation must be at least 5 feet from the basin bottom to the measured Seasonal High Groundwater Elevation or estimated high groundwater mounding elevation. Groundwater levels measurements must be made during the time when water level is expected to be at a maximum (i.e., toward the end of the wet season).

3) Potential BMP sites with a slope greater than 25% (4:1) should be excluded. A geotechnical analysis and report addressing slope stability are required if located within 50 feet of slopes greater than 15%.

Soil Assessment and Site Geotechnical Investigation Reports

The soil assessment report should:

- State whether the site is suitable for the proposed infiltration basin;

- Recommend a design percolation rate (see "*Step 2: Determine The Design Percolation Rate*" below);
- Identify the seasonally high depth to groundwater table surface elevation;
- Provide a good understanding of how the stormwater runoff will move in the soil (horizontally or vertically) and if there are any geological conditions that could inhibit the movement of water; and
- If a geotechnical investigation and report are required, the report should:
  - Provide a written opinion by a professional civil engineer describing whether the infiltration basin will compromise slope stability; and
  - Identify potential impacts to nearby structural foundations.

Setbacks

1) Infiltration facilities shall be setback a minimum of 100 feet from proposed or existing potable wells, non-potable wells, septic drain fields, and springs.
2) Infiltration BMPs must be sited at least 50 feet away from slopes steeper than 15 percent or an alternative setback established by the geotechnical expert for the project.
3) The geotechnical expert shall establish the setback requirement from building foundations that must be ≥ 8 ft.

Pretreatment

Pretreatment is required for infiltration basins in order to reduce the sediment load entering the facility and maintain the infiltration rate of the facility. Pretreatment refers to design features that provide settling of large particles before runoff reaches a management practice; easing the long-term maintenance burden. Pretreatment is important for most all structural stormwater BMPs, but it is particularly important for infiltration BMPs. To ensure that pretreatment mechanisms are effective, designers should incorporate sediment reduction practices. Sediment reduction BMPs may include vegetated swales, vegetated filter strips, sedimentation basins or forebays, sedimentation manholes and hydrodynamic separation devices. The use of at least two pretreatment devices is highly recommended for infiltration basins.

For design specification of selected pretreatment devices, refer to:

- BIO-3: Vegetated swales
- BIO-4: Vegetated filter strips
- TCM-4: Sand filters

- TCM-5: Cartridge media filters
- PT-1: Hydrodynamic separation device

Sizing Criteria

As with sand filters, infiltration facilities can be sized using one of two methods: a simple sizing method or a routing modeling method. With either method the SQDV volume must be completely infiltrated within 12 to 72 hours (see Appendix D, Section D.2 for a discussion on drawdown time and BMP performance). The simple sizing procedures provided below can be used for either infiltration basins or infiltration trenches (see INF-2: Infiltration Trench). For the routing modeling method, refer to TCM-4 Sand Filters.

Step 1: Calculate the Design Volume

Infiltration facilities shall be sized to capture and infiltrate the SQDV volume (see Section 2 and Appendix E) with a 12 to 72 hour drawdown time (see Appendix D, Section D.2).

Step 2: Determine the Design Percolation Rate

The percolation rate will decline between maintenance cycles as the surface becomes occluded and particulates accumulate in the infiltrative layer. Monitoring of actual facility performance has shown that the full-scale infiltration rate is far lower than the rate measured by small-scale testing. It is important that adequate conservatism is incorporated in the selection of design percolation rates. For infiltration trenches, the design percolation rate discussed here is the percolation rate of the underlying soils and not the percolation rate of the filter media bed (refer to the "Geometry and Sizing" section of INF-2 for the recommended composition of the filter media bed for infiltration trenches).

Considerations for Design Percolation Rate Corrections

Suitability assessment related considerations include (Table 6-2):

- Soil assessment methods – the site assessment extent (e.g., number of borings, test pits, etc.) and the measurement method used to estimate the short-term infiltration rate.
- Predominant soil texture/percent fines – soil texture and the percent fines can greatly influence the potential for clogging.
- Site soil variability – site with spatially heterogeneous soils (vertically or horizontally), as determined from site investigations, are more difficult to estimate average properties resulting in a higher level of uncertainty associated with initial estimates.

- Depth to seasonal high groundwater/impervious layer – groundwater mounding may become an issue during excessively wet conditions where shallow aquifers or shallow clay lenses are present.

Table 6-2: Suitability Assessment Related Considerations for Infiltration Facility Safety Factors

Consideration	High Concern	Medium Concern	Low Concern
Assessment methods	Use of soil survey maps or simple texture analysis to estimate short-term infiltration rates	Direct measurement of ≥ 20 percent of infiltration area with localized infiltration measurement methods (e.g., infiltrometer)	Direct measurement of ≥ 50 percent of infiltration area with localized infiltration measurement methods or Use of extensive test pit infiltration measurement methods
Ventura Hydrology Manual soil number (measured infiltration rate)	3 (f = 0.5 – 0.64)	4 or 5 (f = 0.65 –0.91)	6 or 7 (f = 0.92 or higher)
Site soil variability	Highly variable soils indicated from site assessment or limited soil borings collected during site assessment	Soil borings/test pits indicate moderately homogeneous soils	Multiple soil borings/test pits indicate relatively homogeneous soils
Depth to groundwater/ impervious layer	<10 ft below facility bottom	10-30 ft below facility bottom	>30 below facility bottom

Localized infiltration testing refers to methods such as the double ring infiltrometer test (ASTM D3385-88), which measure infiltration rates over an area less than 10 sq-ft and do not attempt to account for soil heterogeneity. Extensive infiltration testing refers to methods that include excavating a significant portion of the proposed infiltration area, filling the excavation with water, and monitoring drawdown. In all cases, testing should be conducted in the area of the proposed BMP where, based on geotechnical data, soils appear least likely to support infiltration.

Design related considerations include (Table 6-3):

- Size of area tributary to facility – all things being equal, both physical and economic risk factors related to infiltration facilities increase with an increase in the tributary area served. Therefore facilities serving larger tributary areas should use more restrictive adjustment factors.

- Level of pretreatment/expected influent sediment loads – credit should be given for good pretreatment by allowing less restrictive factors to account for the reduced probability of clogging from high sediment loading. Also, facilities designed to capture runoff from relatively clean surfaces such as rooftops are likely to see low sediment loads and therefore should be allowed to apply less restrictive safety factors.

- Redundancy – facilities that consist of multiple subsystems operating in parallel such that parts of the system remains functional when other parts fail and/or bypass, should be rewarded for the built-in redundancy with less restrictive correction and safety factors. For example, if bypass flows would be at least partially treated by another BMP, the risk of discharging untreated runoff in the event of clogging the primary facility is reduced. A bioretention facility that overflows to a landscaped area is another example. Compaction during construction – proper construction oversight is needed during construction to ensure that the bottoms of infiltration facility are not overly compacted. Facilities that do not commit to proper construction practices and oversight should have to use more restrictive correction and safety factors.

Table 6-3: Design Related Considerations for Infiltration Facility Safety Factors

Consideration	High Concern	Medium Concern	Low Concern
Tributary area size	Greater than 10 acres.	Greater than 2 acres but less than 10 acres.	2 acres or less.
Level of pre-treatment/ expected influent sediment loads	Pre-treatment from gross solids removal devices only, such as hydrodynamic separators, racks and screens, AND tributary area includes landscaped areas, steep slopes, high traffic areas, or any other areas expected to produce high sediment, trash, or debris loads.	Good pre-treatment with BMPs that mitigate coarse sediments such as vegetated swales AND influent sediment loads from the tributary area are expected to be relatively low (e.g., low traffic, mild slopes, disconnected impervious areas, etc.).	Excellent pre-treatment with BMPs that mitigate fine sediments such as bioretention or media filtration OR sedimentation or facility only treats runoff from relatively clean surfaces, such as rooftops.
Redundancy of treatment	No redundancy in BMP treatment train.	Medium redundancy, other BMPs available in treatment train to maintain at least 50% of function of facility in event of failure.	High redundancy, multiple components capable of operating independently and in parallel, maintaining at least 90% of facility functionality in event of failure.
Compaction during construction	Construction of facility on a compacted site or elevated probability of unintended/ indirect compaction.	Medium probability of unintended/ indirect compaction.	Heavy equipment actively prohibited from infiltration areas during construction and low probability of unintended/ indirect compaction.

Adjust the measured short-term infiltration rate using a weighted average of several safety factors using the worksheet shown in Table 6-4 below. The design percolation rate would be determined as follows:

- For each consideration shown in Table 6-2 and Table 6-3 above, determine whether the consideration is a high, medium, or low concern.
- For all high concerns, assign a factor value of 3, for medium concerns, assign a factor value of 2, and for low concerns assign a factor value of 1.
- Multiply each of the factors by the corresponding weight to get a product.

- Sum the products within each factor category to obtain a safety factor for each.
- Multiply the two safety factors together to get the final combined safety factor. If the combined safety factor is less than 2, then use 2 as the safety factor.
- Divide the measured short-term infiltration rate by the combined safety factor to obtain the adjusted design percolation rate for use in sizing the infiltration facility.

Table 6-4: Infiltration Facility Safety Factor Determination Worksheet

Factor Category		Factor Description	Assigned Weight (w)	Factor Value (v)	Product (p) p = w x v
A	Suitability Assessment	Soil assessment methods	0.25		
		Predominant soil texture	0.25		
		Site soil variability	0.25		
		Depth to groundwater / impervious layer	0.25		
		Suitability Assessment Safety Factor, $S_A = \Sigma p$			
B	Design	Tributary area size	0.25		
		Level of pre-treatment/ expected sediment loads	0.25		
		Redundancy	0.25		
		Compaction during construction	0.25		
		Design Safety Factor, $S_B = \Sigma p$			
Combined Safety Factor = S_A x S_B					

Note: The minimum combined adjustment factor shall not be less than 2.0 and the maximum combined adjustment factor shall not exceed 9.

Step 3: Calculate the surface area

Determine the size of the required infiltrating surface by assuming the SQDV will fill the available ponding depth plus (for infiltration trenches) the void spaces based on the computed porosity of the filter media (normally about 32%).

1) Determine the maximum depth of runoff that can be infiltrated within the required drain time (d_{max}) as follows:

$$d_{\max} = \frac{P_{design}}{12} t \qquad \text{(Equation 6-1)}$$

Where:

d_{max}	=	the maximum depth of water that can be infiltrated within the required drain time (ft)
P_{design}	=	design percolation rate of underlying soils (in/hr)
t	=	required drain time (hrs)

2) Choose the ponding depth (d_p) and/or trench depth (d_t) such that:

$$d_{\max} \geq d_p \quad \text{For Infiltration Basins} \qquad \text{(Equation 6-2)}$$

$$d_{\max} \geq n_t d_t + d_p \quad \text{For Infiltration Trenches} \qquad \text{(Equation 6-3)}$$

Where:

d_{max}	=	the maximum depth of water that can be infiltrated within the required drain time (ft)
d_p	=	ponding depth (ft)
n_t	=	trench fill aggregate porosity (unitless)
d_t	=	depth of trench fill (ft)

3) Calculate infiltrating surface area (filter bottom area) required:

$$A = \frac{SQDV}{((TP_{design}/12) + d_p)} \quad \text{For Infiltration Basins} \qquad \text{(Equation 6-4)}$$

$$A = \frac{SQDV}{((TP_{design}/12) + n_t d_t + d_p)} \quad \text{For Infiltration Trenches} \qquad \text{(Equation 6-5)}$$

Where:

$SQDV$	=	stormwater quality design volume (ft^3)
n_t	=	trench fill aggregate porosity (unitless)
P_{design}	=	design percolation rate (in/hr)
d_p	=	ponding depth (ft)
d_t	=	depth of trench fill (ft)
T	=	fill time (time to fill to max ponding depth with water) (hrs) [use 2 hours for most designs]

Geometry and Sizing

1) Infiltration basins should be designed and constructed with the flattest bottom slope possible to promote uniform ponding and infiltration across the facility.

2) A sediment forebay is required unless adequate pretreatment is provided in a separate pretreatment unit (e.g., vegetated swale, filter strip, hydrodynamic device) to reduce sediment loads entering the infiltration basin. The sediment forebay, if present, should have a volume equal to 25% of the total infiltration basin volume.

3) The forebay should be designed with a minimum length to width ratio of 2:1 and should completely drain to the main basin through an 8-inch minimum low-flow outlet within 10 minutes.

4) All inlets should enter the sediment forebay. If there are multiple inlets, the length-to-width ratio should be based on the average flowpath length for all inlets.

5) Design embankments to conform to requirements of the State of California Division of Safety of Dams, if the basin dimensions cause it to fall under that agency's jurisdiction.

Drainage

1) The bottom of the infiltration bed should be native soil, over-excavated to at least one foot in depth, and replaced uniformly without compaction. Amending the excavated soil with 2-4 inches (~15-30%) of coarse sand is recommended.

2) The hydraulic conductivity of the subsurface layers should be sufficient to ensure a maximum 72-hr drawdown time. An observation well shall be incorporated to allow observation of drain time.

3) For infiltration basins, an underdrain should be installed within the bottom layer to provide drainage in case of standing water. The underdrain should be operated by opening a valve, which should be closed during normal operation. Cleanouts should be provided for the underdrain. See Sand Filter Section VEG-8 for specifications for underdrains.

Emergency Overflow

1) There should be an overflow route for stormwater flows that overtop the facility or in case the infiltration facility becomes clogged.

2) The overflow channel should be able to safely convey flows from the peak design storm to the downstream stormwater conveyance system or other acceptable discharge point.

3) Spillway and overflow structures should be designed in accordance with applicable standards of the Ventura County Flood Control District or local jurisdiction.

Vegetation

1) A thick mat of drought tolerant grass should be established on the basin floor and side-slopes following construction. Grasses can help prevent erosion and increase evapotranspiration and their roots discourage compaction helping to maintain the surface infiltration rates. Additionally, the active growing vegetation can help break up surface layers that accumulate fine particulates.

2) Grass may need to be irrigated during establishment.

3) For infiltration basins, landscaping of the area surrounding the basin should adhere to the following criteria so as not to hinder maintenance operations:

    a. No trees or shrubs may be planted within 10 feet of inlet or outlet pipes or manmade drainage structures such as spillways, flow spreaders, or earthen embankments. Species with roots that seek water, such as willow or poplar, should not be used within 50 feet of pipes.

    b. Prohibited non-native plant species will not be permitted. For more information on invasive weeds, including biology and control of listed weeds, look at the encycloweedia located at the California Department of Food and Agriculture website or the California Invasive Plant Council website at www.cal-ipc.org.

Maintenance Access

1) Maintenance access road(s) shall be provided to the drainage structures associated with the basin (e.g., inlet, emergency overflow, or bypass structures). Manhole and catch basin lids should be in or at the edge of the access road.

2) An access ramp to the basin bottom is required to facilitate the entry of sediment removal and vegetation maintenance equipment without compaction of the basin bottom and side slopes.

Construction Considerations

To preserve and avoid the loss of infiltration capacity, the following construction guidelines are specified:

1) The entire area draining to the facility should be stabilized before construction begins. If this is impossible, a diversion berm should be placed around the perimeter of the infiltration site to prevent sediment entrance during construction.

2) Infiltration basins should not be hydraulically connected to the stormwater conveyance system until all contributing tributary areas are stabilized as shown on the Contract Plans and to the satisfaction of the Engineer. Infiltration basins should not be used as sediment control facilities.

3) Compaction of the subgrade with heavy equipment should be minimized to the maximum extent possible. If the use of heavy equipment on the base of the facility cannot be avoided, the infiltrative capacity should be restored by tilling or aerating prior to placing the infiltrative bed.

4) The exposed soils should be inspected by a civil engineer after excavation to confirm that soil conditions are suitable.

Operations and Maintenance

Infiltration facility maintenance should include frequent inspections to ensure that surface ponding infiltrates into the subsurface completely within the design infiltration time after a storm (see Appendix I for an infiltration BMP inspection and maintenance checklist).

Maintenance and regular inspections are of primary importance if infiltration BMPs are to continue to function as originally designed. A specific maintenance plan shall be formulated specifically for each facility outlining the schedule and scope of maintenance operations, as well as the data handling and reporting requirements. The following are general maintenance requirements:

1) Regular inspection should determine if the pretreatment sediment removal BMPs require routine maintenance.

2) If water is noticed in the basin more than 72 hours after a major storm the infiltration facility may be clogged. Maintenance activities triggered by a potentially clogged facility include:

    a. Check for debris/sediment accumulation, rake surface, and remove sediment (if any) and evaluate potential sources of sediment and debris (e.g., embankment erosion, channel scour, overhanging trees, etc). If suspected upland sources are outside of the immediate jurisdiction, additional pretreatment operations (e.g., trash racks, vegetated swales, etc.) may be necessary.

    b. For basins, removal of the top layer of native soil may be required to restore infiltrative capacity.

    c. Any debris or algae growth located on top of the infiltration facility should be removed and disposed of properly.

    d. Facilities shall be inspected annually. Trash and debris should be removed as needed, but at least annually prior to the beginning of the wet season.

3) Site vegetation should be maintained as frequently as necessary to maintain the aesthetic appearance of the site, and as follows:

   a. Vegetation, large shrubs, or trees that limit access or interfere with basin operation should be pruned or removed.

   b. Slope areas that have become bare should be revegetated and eroded areas should be regraded prior to being revegetated.

   c. Grass should be mowed to 4" - 9" high and grass clippings should be removed.

   d. Fallen leaves and debris from deciduous plant foliage should be raked and removed.

   e. Invasive vegetation, such as Alligatorweed (Alternanthera philoxeroides), Halogeton (Halogeton glomeratus), Spotted Knapweed (Centaurea maculosa), Giant Reed (Arundo donax), Castor Bean (Ricinus communis), Perennial Pepperweed (Lepidium latifolium), and Yellow Starthistle (Centaurea solstitalis) should be removed and replaced with non-invasive species. Invasive species should never contribute more than 25% of the vegetated area. For more information on invasive weeds, including biology and control of listed weeds, look at the encycloweedia located at the California Department of Food and Agriculture website or the California Invasive Plant Council website at www.cal-ipc.org.

   f. Dead vegetation should be removed if it exceeds 10% of area coverage. Vegetation should be replaced immediately to maintain cover density and control erosion where soils are exposed.

4) For infiltration basins, sediment build-up exceeding 50% of the forebay capacity should be removed. Sediment from the remainder of the basin should be removed when 6 inches of sediment accumulates. Sediments should be tested for toxic substance accumulation in compliance with current disposal requirements if land uses in the catchment include commercial or industrial zones, or if visual or olfactory indications of pollution are noticed. If toxic substances are encountered at concentrations exceeding thresholds of Title 22, Section 66261 of the California Code of Regulations, the sediment should be disposed of in a hazardous waste landfill and the source of the contaminated sediments should be investigated and mitigated to the extent possible.

5) Following sediment removal activities, replanting and/or reseeding of vegetation may be required for reestablishment.

INF-2: Infiltration Trench

Infiltration trenches are long, narrow, gravel-filled trenches, often vegetated, that infiltrate stormwater runoff from small drainage areas. Infiltration trenches may include a shallow depression at the surface, but the majority of runoff is stored in the void space within the gravel and infiltrates through the sides and the bottom of the trench.

Rural Highway Infiltration Trench

http://stormwater.wordpress.com/2007/05/23/infiltration--trenches/

Application

- Open areas adjacent to parking lots, driveways, and buildings
- Roadway medians and shoulders

Routine Maintenance

- Removal trash, debris, and sediment at inlet and outlets
- Wet weather inspection to ensure drain time
- Remove weeds
- Inspect for mosquito breeding

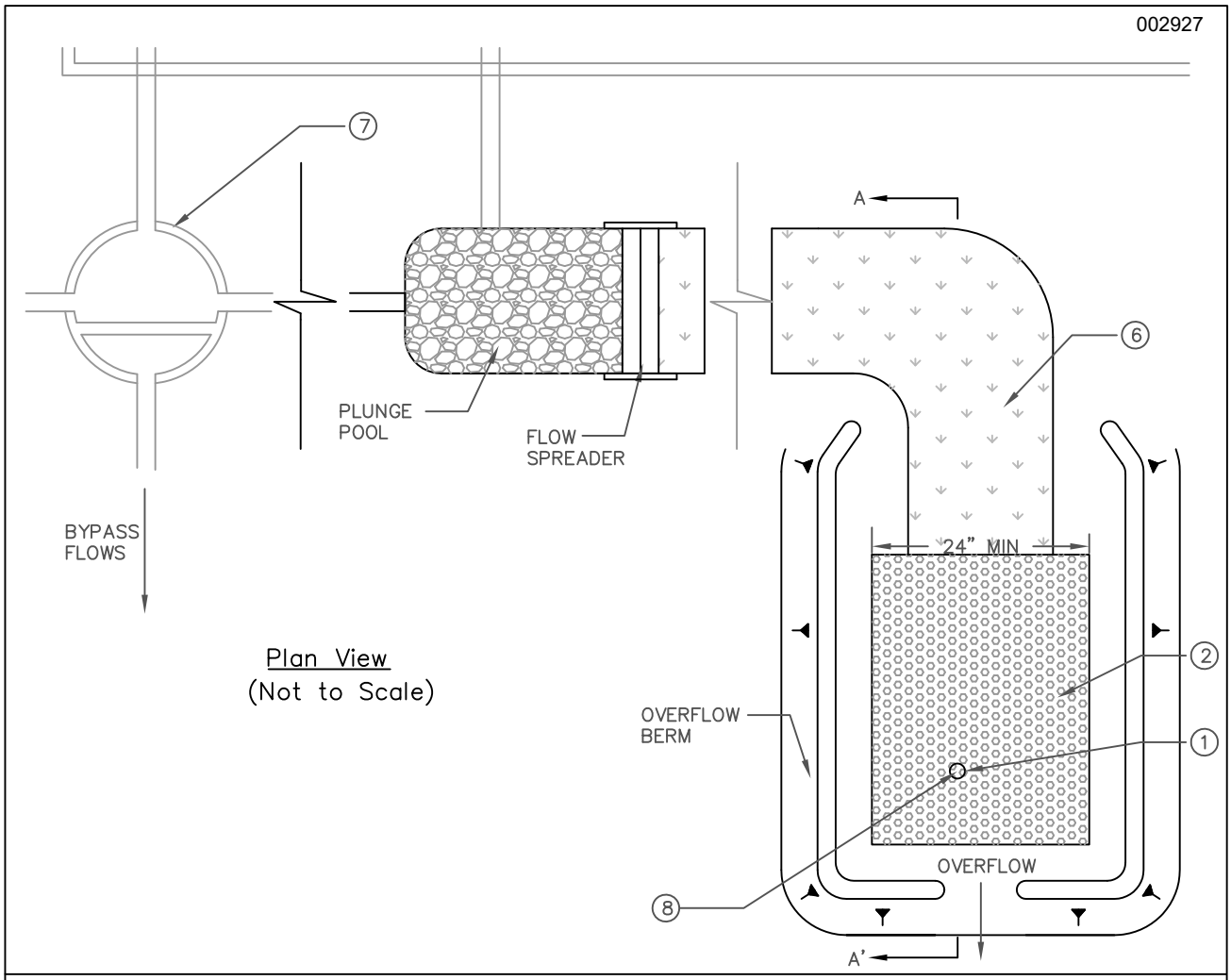

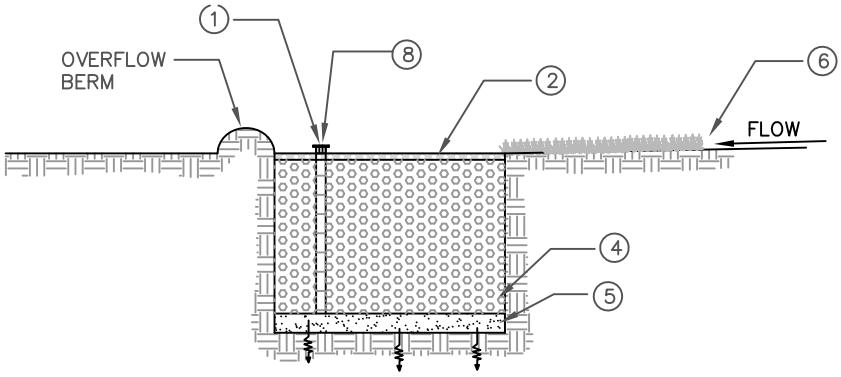

Section A – A'
(Not to Scale)

NOTES:

1. OBSERVATION WELL WITH LOCKABLE ABOVE–GROUND CAP.
2. 2" PEA GRAVEL FILTER LAYER.
3. MINIMUM 10' ABOVE SEASONAL HIGH GROUNDWATER TABLE AND 3' ABOVE BEDROCK.
4. 3' – 5' DEEP TRENCH FILLED WITH 2" – 6" DIAMETER CLEAN STONE WITH 30% – 40% VOIDS.
5. 6" DEEP SAND FILTER LAYER (OR FABRIC EQUIVALENT).
6. RUNOFF FILTERS THROUGH GRASS FILTER STRIP OR VEGETATED SWALE.
7. OPTIONAL FLOW CONTROL DEVICE FOR OFF–LINE CONFIGURATIONS.

Geosyntec consultants

Figure 6-3: Infiltration Trench

Limitations

The following limitations should be considered before choosing to use an infiltration trench:

- Native soil infiltration rate – soil permeability at the infiltration trench location must be at least 0.5 inches per hour.
- Depth to groundwater, bedrock, or low permeability soil layer – 5 feet vertical separation is required between the bottom of the infiltration trench and the seasonal high groundwater level or mounded groundwater level, bedrock, or other barrier to infiltration to ensure that the facility will completely drain between storms and that infiltrating water will receive adequate treatment though the soils before it reaches the groundwater.
- Slope stability - infiltration BMPs must be sited at least 50 feet away from slopes steeper than 15 percent or an alternative setback established by the geotechnical expert for the project.
- Setbacks - a minimum setback (100 feet or more) must be provided between infiltration BMPs and potable wells, non-potable wells, drain fields and springs. Infiltration BMPs must be setback from building foundations at least eight feet or an alternative setback established by the geotechnical expert for the project.
- Groundwater contamination - the application of infiltration BMPs should include significant pretreatment in an area identified as an unconfined aquifer to ensure groundwater is protected for pollutants of concern.
    - Contaminated soils or groundwater plumes - infiltration BMPs are not allowed at locations with contaminated soils or groundwater where the pollutants could be mobilized or exacerbated by infiltration, unless a site-specific analysis determines that infiltration would be beneficial.
- High pollutant land uses - infiltration BMPs should not be placed in high-risk areas such as at or near service/gas stations, truck stops, and heavy industrial sites due to the groundwater contamination risk unless a site-specific evaluation demonstrates that sufficient pretreatment is provided to address pollutants of concern, high risks areas are isolated from stormwater runoff, or infiltration areas have little chance of spill migration.
- High sediment loading rates – infiltration BMPs may clog quickly if sediment loads are high (e.g., unstabilized site) or if flows are not adequately pretreated.

Design Criteria

The main challenge associated with infiltration trenches is preventing system clogging and subsequent infiltration inhibition. Infiltration trenches should be designed according to the requirements listed in Table 6-5 and outlined in the section below. BMP sizing worksheets are presented in Appendix E.

Table 6-5: Infiltration Trench Design Criteria

Design Parameter	Unit	Design Criteria
Stormwater quality design volume (SQDV)	acre-feet	See Section 2 and Appendix E for calculating SQDV.
Design drawdown time	hr	12 – 72, see Appendix D, Section D.2
Trench bottom elevation	feet	5 feet from seasonally high groundwater table
Setbacks	feet	100 feet from wells, fields, springs Geotechnical expert should establish the setback requirement from building foundations that must be ≥ 8 ft Do not locate under tree drip-lines
Pretreatment	-	BIO-3: Vegetated Swale, BIO-4: Filter Strip, proprietary device, or sedimentation forebay, for all surfaces other than roofs
Design percolation rate, (P_{design})	in/hr	Measured percolation rate must be corrected based onsite suitability assessment and design related considerations described in this fact sheet
Maximum depth of facility (d_{max})	feet	8.0; Defined by the design infiltration rate and the design drawdown time (includes ponding depth and depth of media)
Surface area of facility (A)	square feet	Based on depth of ponding (if applicable) and depth of trench media
Facility geometry	-	Minimum 24 inches wide and maximum 5 feet deep; max 3% bottom slope
Filter media diameter	inches	1 – 3 (gravel); prefabricated media may also be used
Trench lining material	-	Geotextile fabric
Overflow device	-	Required if system is on-line

Geotechnical Considerations

An extensive geotechnical site investigation must be undertaken early in the site planning process to verify site suitability for the installation of infiltration facilities due to the potential to contaminate groundwater, cause slope instability, impact surrounding structures, and have insufficient infiltration capacity. Soil infiltration rates and the water table depth should be evaluated to ensure that conditions are satisfactory for proper operation of an infiltration facility. See Appendix C for guidance on infiltration testing.

The project designer must demonstrate through infiltration testing, soil logs, and the written opinion of a licensed civil engineer that sufficiently permeable soils exist onsite to allow the construction of a properly functioning infiltration facility.

1) Infiltration facilities require a minimum soil infiltration rate of 0.5 inches/hour. If infiltration rates exceed 2.4 inches/hour, then the runoff should be fully treated in an upstream BMP prior to infiltration to protect groundwater quality. Pretreatment for coarse sediment removal is required in all instances.

2) Groundwater separation must be at least 5 feet from the trench bottom to the measured season high groundwater elevation or estimated high groundwater mounding elevation. Groundwater level measurements must be made during the time when water level is expected to be at a maximum (i.e., toward the end of the wet season).

3) Sites with a slope greater than 25% (4:1) should be excluded. A geotechnical analysis and report addressing slope stability are required if located on slopes greater than 15%.

Soil Assessment and Site Geotechnical Investigation Reports

The soil assessment report should:

- State whether the site is suitable for the proposed infiltration trench;
- Recommend a design infiltration rate (see the Step 2 of sizing methodology section, “Determine the design percolation rate,” in the Infiltration Basin fact sheet above);
- Identify the seasonally high depth to groundwater table surface elevation.
- Provide a good understanding of how the stormwater runoff will move in the soil (horizontally or vertically) and if there are any geological conditions that could inhibit the movement of water; and
- If a geotechnical investigation and report are required, the report should:
    - Provide a written opinion by a professional civil engineer describing whether the infiltration trench will compromise slope stability; and

- Identify potential impacts to nearby structural foundations.

Setbacks

1) Infiltration facilities shall be setback a minimum of 100 feet from proposed or existing potable wells, non-potable wells, septic drain fields, and springs.

2) Infiltration BMPs must be sited at least 50 feet away from slopes steeper than 15 percent or an alternative setback established by the geotechnical expert for the project.

3) Infiltration BMPs must be setback from building foundations at least eight feet or an alternative setback established by the geotechnical expert for the project.

Pretreatment

Pretreatment is required for infiltration trenches in order to reduce the sediment load entering the facility and maintain the infiltration rate of the facility. Pretreatment refers to design features that provide settling of large particles before runoff reaches a management practice; easing the long-term maintenance burden. Pretreatment is important for most all structural stormwater BMPs, but it is particularly important for infiltration BMPs. To ensure that pretreatment mechanisms are effective, designers should incorporate sediment reduction practices. Sediment reduction BMPs may include vegetated swales, vegetated filter strips, sedimentation basins or forebays, sedimentation manholes and hydrodynamic separation devices.

For design specification of selected pre-treatment devices, refer to:

- VEG-3: Vegetated swales
- VEG-4: Vegetated filter strips
- TCM-4: Sand filters
- TCM-5: Cartridge media filters
- PT-1: Hydrodynamic separation device

Sizing Criteria

See Sizing Criteria section in the INF-1: Infiltration Basin fact sheet.

Geometry and Sizing

1) Infiltration trenches should be at least 2 feet wide and 3 to 5 feet deep.

2) The longitudinal slope of the trench should not exceed 3%.

3) The filter bed media layers should have the following composition and thickness:

a. Top layer – If stormwater runoff enters the top of the trench via sheet flow at the ground surface, then the top 2 inches should be pea gravel with a thin 2 to 4 inch layer of pure sand and 2 inch layer of chocking stone (e.g., #8) to capture sediment before entering the trench. If stormwater runoff enters the trench from an underground pipe, pretreatment prior to entry into the trench is required.

b. Middle layer (3 to 5 feet of washed, 1.5 to 3 inch gravel). Void space should be in the range of 30 percent to 40 percent.

c. Bottom layer (6 inches of clean, washed sand to encourage drainage and prevent compaction of the native soil while the stone aggregate is added).

4) One or more observation wells should be installed, depending on trench length, to check for water level, drawdown time, and evidence of clogging. A typical observation well consists of a slotted PVC well screen, 4 to 6 inches in diameter, capped with a lockable, above-ground lid.

Drainage

1) The bottom of the infiltration bed must be native soil, over-excavated to at least one foot in depth and replaced uniformly without compaction. Amending the excavated soil with 2 to 4 inches (~15% to 30%) of coarse sand is recommended.

2) The hydraulic conductivity of the subsurface layers should be sufficient to ensure the design drawdown time. An observation well should be incorporated to allow observation of drain time.

Emergency Overflow

1) There must be an overflow route for stormwater flows that overtop the facility or in case the infiltration facility becomes clogged.

2) The overflow channel must be able to safely convey flows from the peak design storm to the downstream stormwater conveyance system or other acceptable discharge point.

Vegetation

1) Trees and other large vegetation should be planted away from trenches such that drip lines do not overhang infiltration beds.

Maintenance Access

1) The facility and outlet structures must all be safely accessible during wet and dry weather conditions.

2) An access road along the length of the trench is required, unless the trench is located along an existing road or parking lot that can be safely used for maintenance access.

3) If the infiltration trench becomes plugged and fails, then access is needed to excavate the facility to remove and replace the top layer or the filter bed media, as well as to increase all dimensions of the facility by 2 inches to provide a fresh surface for infiltration. To prevent damage and compaction, access must be able to accommodate a backhoe working at "arms length".

Construction Considerations

To preserve and avoid the loss of infiltration capacity, the following construction guidelines are specified:

1) The entire area draining to the facility must be stabilized before construction begins. If this is impossible, a diversion berm should be placed around the perimeter of the infiltration site to prevent sediment entering during construction.

2) Infiltration trenches should not be hydraulically connected to the stormwater conveyance system until all contributing tributary areas are stabilized as shown on the Contract Plans and to the satisfaction of the Engineer. Infiltration trenches should not be used as sediment control facilities.

3) Compaction of the subgrade with heavy equipment should be minimized to the maximum extent possible. If the use of heavy equipment on the base of the facility cannot be avoided, the infiltrative capacity should be restored by tilling or aerating prior to placing the infiltrative bed.

4) The exposed soils should be inspected by a civil engineer after excavation to confirm that soil conditions are suitable.

Operations and Maintenance

Infiltration facility maintenance should include frequent inspections to ensure that water infiltrates into the subsurface completely within the design drawdown time after a storm.

Maintenance and regular inspections are of primary importance if infiltration trenches are to continue to function as originally designed. A specific maintenance plan shall be developed specific to each facility outlining the schedule and scope of maintenance operations, as well as the documentation and reporting requirements. The following are general maintenance requirements:

1) Regular inspection should determine if the sediment pretreatment structures require preventative maintenance. Inspect a minimum of twice a year, before and after the rainy season, after large storms, or more frequently if needed.

2) If water is noticed in the observation well of the infiltration trench more than 72 hours after a major storm, the infiltration trench may be clogged. Maintenance activities triggered by a potentially clogged facility include:

a. For trenches, assess the condition of the top aggregate layer for sediment buildup and crusting. Remove top layer of pea gravel and replace. If slow draining conditions persist, entire trench may need to be excavated and replaced.

3) Any debris or algae growth located on top of the infiltration facility should be removed and disposed of properly.

4) Inspect a minimum of twice a year, before and after the rainy season, after large storms, or more frequently if needed.

5) Clean when loss of infiltrative capacity is observed. If drawdown time is observed to have increased significantly over the design drawdown time, removal of sediment may be necessary. This is an expensive maintenance activity and the need for it can be minimized through prevention of upstream erosion.

6) Mow as appropriate for vegetative cover species.

7) Monitor health of vegetation and replace as necessary.

8) Control mosquitoes as necessary.

9) Remove litter and debris from trench area as required.

INF-3: Bioretention

Bioretention stormwater treatment facilities are landscaped shallow depressions that capture and filter stormwater runoff. These facilities function as a soil and plant-based filtration device that removes pollutants through a variety of physical, biological, and chemical treatment processes. The facilities normally consist of a ponding area, mulch layer, planting soils, and plantings. An optional gravel layer can be added below the planting soil to provide additional storage volume for infiltration. As stormwater passes down through the planting soil, pollutants are filtered, adsorbed, and biodegraded by the soil and plants. For areas with low permeability native soils or steep slopes, see section INF-7: Bioinfiltration or BIO-1: Bioretention with Underdrain for relevant design specifications.

Bioretention in Parkway and parking lots

Photo Credits: Geosyntec Consultants

Application

- Commercial, residential, mixed use, institutional, and recreational uses
- Parking lot islands, traffic circles
- Road parkways & medians

Preventative Maintenance

- Repair small eroded areas
- Remove trash and debris and rake surface soils
- Remove accumulated fine sediments, dead leaves and trash
- Remove weeds and prune back excess plant growth
- Remove sediment and debris accumulation near inlet and outlet structures
- Periodically observe function under wet weather conditions

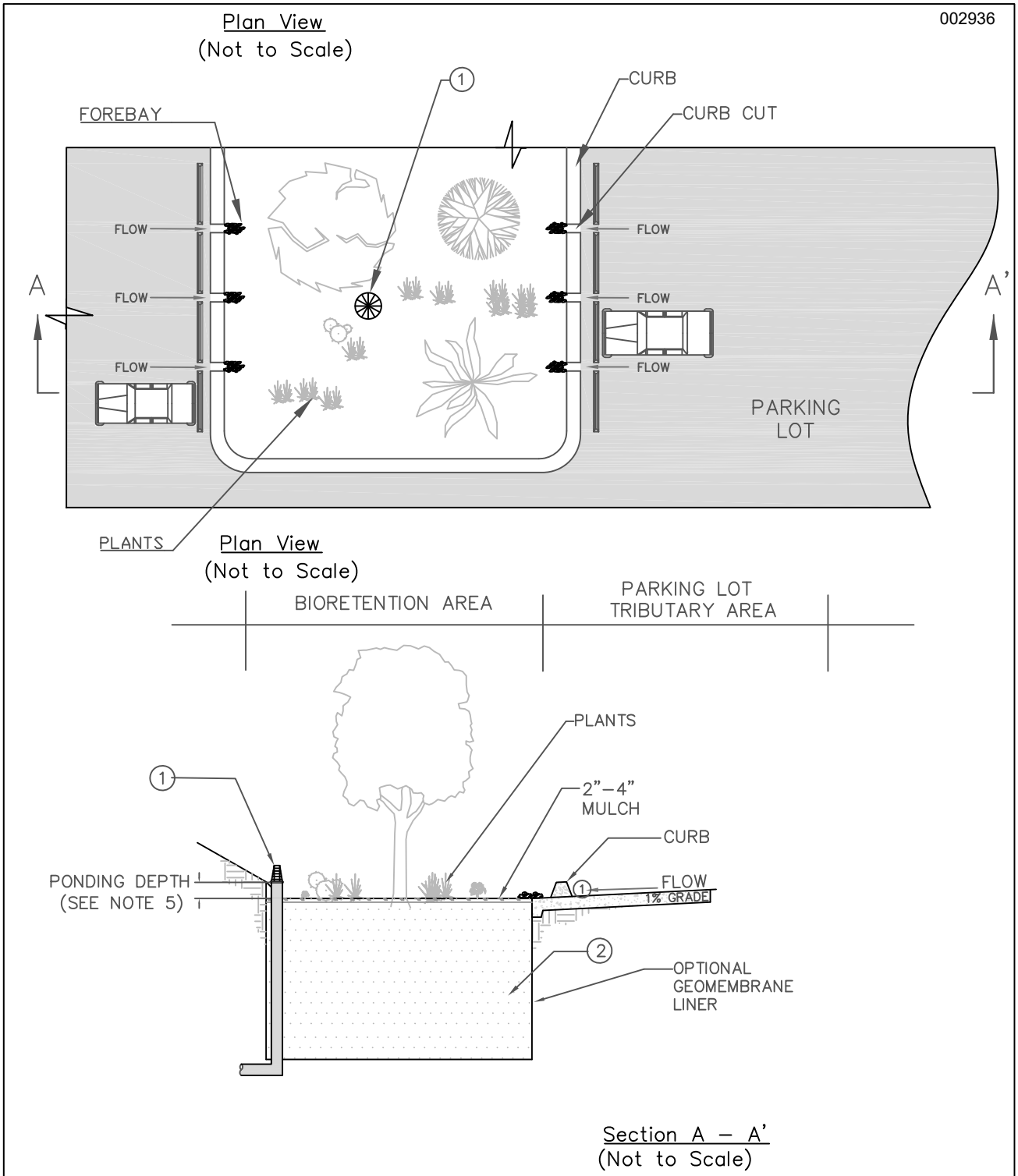

NOTES:

① OVERFLOW DEVICE: VERTICAL RISER OR EQUIVALENT.

② 2' MIN PLANTING MIX; 3' PREFERRED.

③ PONDING DEPTH 18" WITH FENCE; 6" WITHOUT FENCE.

Geosyntec consultants

Figure 6-4: Bioretention

Limitations

The following limitations should be considered before choosing to use bioretention:

1) Native soil infiltration rate - soil permeability at the bioretention location must be at least 0.5 inches per hour.

2) Depth to groundwater, bedrock, or low permeability soil layer – 5 feet vertical separation is required between the bottom of the infiltration trench and the seasonal high groundwater level or mounded groundwater level, bedrock, or other barrier to infiltration to ensure that the facility will completely drain between storms and that infiltrating water will receive adequate treatment though the soils before it reaches the groundwater.

3) Slope stability - infiltration BMPs must be sited at least 50 feet away from slopes steeper than 15 percent or an alternative setback established by the geotechnical expert for the project.

4) Setbacks - a minimum setback (100 feet or more) must be provided between infiltration BMPs and potable wells, non-potable wells, drain fields, and springs. Infiltration BMPs must be setback from building foundations at least eight feet or have an alternative setback established by the geotechnical expert for the project.

5) Groundwater contamination - the application of infiltration BMPs should include significant pretreatment in an area identified as an unconfined aquifer to ensure groundwater is protected for pollutants of concern.

6) Contaminated soils or groundwater plumes - infiltration BMPs are not allowed at locations with contaminated soils or groundwater where the pollutants could be mobilized or exacerbated by infiltration, unless a site-specific analysis determines that infiltration would be beneficial.

7) High pollutant land uses - infiltration BMPs should not be placed in high-risk areas such as at or near service/gas stations, truck stops, and heavy industrial sites due to the groundwater contamination risk unless a site-specific evaluation demonstrates that sufficient pretreatment is provided to address pollutants of concern, high risks areas are isolated from stormwater runoff, or infiltration areas have little chance of spill migration.

8) High sediment loading rates – infiltration BMPs may clog quickly if sediment loads are high (e.g., unstabilized site) or if flows are not adequately pretreated.

9) Vertical relief and proximity to storm drain - site must have adequate relief between the land surface and storm drain to permit vertical percolation through the soil media and collection.

Design Criteria

Bioretention should be designed according to the requirements listed in Table 6-6 and outlined in the section below. BMP sizing worksheets are presented in Appendix E.

Table 6-6: Bioretention Design Criteria

Design Parameter	Unit	Design Criteria
Stormwater quality design volume (SQDV)	acre-feet	See Section 2 and Appendix E for calculating SQDV.
Forebay	-	Forebay should be provided for all tributary surfaces that contain landscaped areas. Forebays should be designed to prevent standing water during dry weather and should be planted with a plant palette that is tolerant of wet conditions.
Maximum drawdown time of water ponded on surface	hours	48
Maximum drawdown time of surface ponding plus subsurface pores	hours	96 (72 preferred)
Maximum ponding depth	inches	18
Minimum thickness of amended soil	feet	2 (3 preferred)
Minimum thickness of stabilized mulch	inches	2 to 3
Planting mix composition	-	60 to 80% fine sand, 20 to 40% compost
Overflow device	-	Required

Sizing Criteria

Bioretention facilities can be sized using one of two methods: a simple sizing method or a routing modeling method. With either method the SQDV volume must be completely infiltrated within 96 hours (including subsurface pore space), and surface ponding must be infiltrated within 48 hours. The simple sizing procedure is provided below. For the routing modeling method, refer to TCM-4 Sand Filters.

Step 1: Calculate the Design Volume

Bioretention facilities shall be sized to capture and infiltrate the SQDV volume (see Section 2.3 and Appendix E).

Step 2: Determine the Design Percolation Rate

The percolation rate through the BMP and to the subsurface will decline between maintenance cycles as the surface becomes occluded and particulates accumulate in the infiltration layer. Monitoring of actual facility performance has shown that the full-scale infiltration rate is far lower than the rate measured by small-scale testing. It is important that adequate conservatism is incorporated in the selection of design percolation rates. For bioretention facilities, the design percolation rate discussed here is the adjusted percolation rate of the underlying soils and not the percolation rate of the filter media bed.

Considerations for Design Percolation Rate Corrections

Suitability assessment-related considerations include (Table 6-7):

- Soil assessment methods – the site assessment extent (e.g., number of borings, test pits, etc.) and the measurement method used to estimate the short-term infiltration rate.
- Predominant soil texture/percent fines – soil texture and the percent of fines can greatly influence the potential for clogging.
- Site soil variability – site with spatially heterogeneous soils (vertically or horizontally) as determined from site investigations are more difficult to estimate average properties, resulting in a higher level of uncertainty associated with initial estimates.
- Depth to seasonal high groundwater/impervious layer – groundwater mounding may become an issue during excessively wet conditions where shallow aquifers or shallow clay lenses are present.

Localized infiltration testing refers to methods such as the double ring infiltrometer test (ASTM D3385-88), which measure infiltration rates over an area less than 10 sq-ft and do not attempt to account for soil heterogeneity. Extensive infiltration testing refers to methods that include excavating a significant portion of the proposed infiltration area, filling the excavation with water, and monitoring drawdown. In all cases, testing should be conducted in the area of the proposed BMP where, based on geotechnical data, soils appear least likely to support infiltration.

Table 6-7: Suitability Assessment Related Considerations for Infiltration Facility Safety Factors

Consideration	High Concern	Medium Concern	Low Concern
Assessment methods	Use of soil survey maps or simple texture analysis to estimate short-term infiltration rates	Direct measurement of ≥ 20 percent of infiltration area with localized infiltration measurement methods (e.g., infiltrometer)	Direct measurement of ≥ 50 percent of infiltration area with localized infiltration measurement methods or Use of extensive test pit infiltration measurement methods
Ventura Hydrology Manual soil number (measured infiltration rate)	3 (f = 0.5 – 0.64)	4 or 5 (f = 0.65 – 0.91)	6 or 7 (f = 0.92 or higher)
Site soil variability	Highly variable soils indicated from site assessment or limited soil borings collected during site assessment	Soil borings/test pits indicate moderately homogeneous soils	Multiple soil borings/test pits indicate relatively homogeneous soils
Depth to groundwater/ impervious layer	<10 ft below facility bottom	10-30 ft below facility bottom	>30 below facility bottom

Design related considerations include:

- Size of area tributary to facility – all things being equal, both physical and economic risk factors related to infiltration facilities increase with an increase in the tributary area served. Therefore facilities serving larger tributary areas should use more restrictive adjustment factors.

- Level of pretreatment/expected influent sediment loads – credit should be given for good pretreatment by allowing less restrictive factors to account for the reduced probability of clogging from high sediment loading. Also, facilities designed to capture runoff from relatively clean surfaces such as rooftops are likely to see low sediment loads and therefore should be allowed to apply less restrictive safety factors.

- Redundancy – facilities that consist of multiple subsystems operating in parallel such that parts of the system remain functional when other parts fail and/or bypass should be rewarded for the built-in redundancy with less restrictive

correction and safety factors. For example, if bypass flows would be at least partially treated in another BMP, the risk of discharging untreated runoff in the event of clogging the primary facility is reduced. A bioretention facility that overflows to a landscaped area is another example.

- Compaction during construction – proper construction oversight is needed during construction to ensure that the bottoms of bioretention facility are not overly compacted. Facilities that do not commit to proper construction practices and oversight should have to use more restrictive correction and safety factors.

Table 6-8: Design Related Considerations for Infiltration Facility Safety Factors

Consideration	High Concern	Medium Concern	Low Concern
Tributary area size	Greater than 10 acres.	Greater than 2 acres but less than 10 acres.	2 acres or less.
Level of pre-treatment/ expected influent sediment loads	Pre-treatment from gross solids removal devices only, such as hydrodynamic separators, racks and screens, AND tributary area includes landscaped areas, steep slopes, high traffic areas, or any other areas expected to produce high sediment, trash, or debris loads.	Good pre-treatment with BMPs that mitigate coarse sediments such as vegetated swales AND influent sediment loads from the tributary area are expected to be relatively low (e.g., low traffic, mild slopes, disconnected impervious areas, etc.).	Excellent pre-treatment with BMPs that mitigate fine sediments such as bioretention or media filtration OR sedimentation or facility only treats runoff from relatively clean surfaces, such as rooftops.
Redundancy of treatment	No redundancy in BMP treatment train.	Medium redundancy, other BMPs available in treatment train to maintain at least 50% of function of facility in event of failure.	High redundancy, multiple components capable of operating independently and in parallel, maintaining at least 90% of facility functionality in event of failure.
Compaction during construction	Construction of facility on a compacted site or elevated probability of unintended/ indirect compaction.	Medium probability of unintended/ indirect compaction.	Heavy equipment actively prohibited from infiltration areas during construction and low probability of unintended/ indirect compaction.

Adjust the measured short-term infiltration rate using a weighted average of several safety factors using the worksheet shown in Table 6-9 below. The design percolation rate would be determined as follows:

- For each consideration shown in Tables 6-7 and 6-8 above, determine whether the consideration is a high, medium, or low concern.
- For all high concerns assign a factor value of 3, for medium concerns assign a factor value of 2, and for low concerns assign a factor value of 1.
- Multiply each of the factors by the corresponding weight to get a product.
- Sum the products within each factor category to obtain a safety factor for each.
- Multiply the two safety factors together to get the final combined safety factor. If the combined safety factor is less than 2, then use 2 as the safety factor.
- Divide the measured short-term infiltration rate by the combined safety factor to obtain the adjusted design percolation rate for use in sizing the infiltration facility.

Table 6-9: Infiltration Facility Safety Factor Determination Worksheet

Factor Category		Factor Description	Assigned Weight (w)	Factor Value (v)	Product (p) p = w x v
A	Suitability Assessment	Soil assessment methods	0.25		
		Predominant soil texture	0.25		
		Site soil variability	0.25		
		Depth to groundwater / impervious layer	0.25		
		Suitability Assessment Safety Factor, $S_A = \Sigma p$			
B	Design	Tributary area size	0.25		
		Level of pre-treatment/ expected sediment loads	0.25		
		Redundancy	0.25		
		Compaction during construction	0.25		
		Design Safety Factor, $S_B = \Sigma p$			
		Combined Safety Factor = S_A x S_B			

Note: The minimum combined adjustment factor shall not be less than 2.0 and the maximum combined adjustment factor shall not exceed 9.

Step 3: Calculate the surface area

Determine the size of the required infiltrating surface by assuming the SQDV will fill the available ponding depth plus the void spaces in the media, based on the computed porosity of the filter media and optional aggregate layer.

1) Determine the maximum depth of surface ponding that can be infiltrated within the required surface drain time (48 hr), (d_{max}), as follows:

$$d_{\max} = \frac{P_{design} \times t_{ponding}}{12\frac{in}{ft}} \qquad \text{(Equation 6-6)}$$

Where:

$t_{ponding}$	=	required drain time of surface ponding (48 hrs)
P_{design}	=	design percolation rate of underlying soils (in/hr) (see Step 2, above)
d_{max}	=	the maximum depth of surface ponding water that can be infiltrated within the required drain time (ft), calculated using Equation 6-6

2) Choose surface ponding depth (d_p) such that:

$$d_p \le d_{\max} \qquad \text{(Equation 6-7)}$$

Where:

d_p	=	selected surface ponding depth (ft)
d_{max}	=	the maximum depth of water that can be infiltrated within the required drain time (ft)

Choose thickness(es) of amended media and optional gravel storage layer and calculate total effective storage depth of the bioretention area ($d_{effective}$), as follows:

$$d_{effective} \le (d_p + n^*_{media} l_{media} + n_{gravel} l_{gravel}) \qquad \text{(Equation 6-8)}$$

Where:

$d_{effective}$	=	total equivalent depth of water stored in bioretention area (ft), including surface ponding and volume available in pore spaces of media and gravel layers
d_p	=	surface ponding depth (ft), chosen using Equation 6-7
n^*_{media}	=	available porosity of amended soil media (ft/ft), approximately 0.25 ft/ft accounting for antecedent moisture conditions. This represents the volume of

available pore space as a fraction of the total soil volume; sometimes has units of (ft^3/ft^3) or described as a percentage.

l_{media} = thickness of amended soil media layer (ft), minimum 2 ft

n_{gravel} = porosity of optional gravel layer (ft/ft), approximately 0.40 ft/ft

l_{gravel} = thickness of optional gravel layer (ft)

3) Check that entire effective depth (surface plus subsurface storage), $d_{effective}$, infiltrates in no greater than 96 hours as follows:

$$t_{total} = \frac{d_{effective}}{P_{design}} \times 12 \frac{in}{ft} \leq 96\ hr \qquad \text{(Equation 6-9)}$$

Where:

$d_{effective}$ = total equivalent depth of water stored in bioretention area (ft), calculated using Equation 6-8

P_{design} = design percolation rate of underlying soils (in/hr) (see Step 2, above)

If $t_{total} > 96$ hrs, then reduce surface ponding depth and/or amended media thickness and/or gravel thickness and return to 1).

If $t_{total} \leq 96$ hrs, then proceed to 5).

4) Calculate required infiltrating surface area, (A_{req}):

$$A_{req} = \frac{SQDV}{d_{effective}} \qquad \text{(Equation 6-10)}$$

Where:

A_{req} = required infiltrating area (ft^2). Should be calculated at the contour corresponding to the mid ponding depth (i.e., $0.5 \times d_p$ from the bottom of the facility).

$SQDV$ = stormwater quality design volume (ft^3)

$d_{effective}$ = total equivalent depth of water stored in bioretention area (ft), calculated using Equation 6-8

5) Calculate total footprint required by including a buffer for side slopes and freeboard; A_{req} is calculated at the contour corresponding to the mid ponding depth (i.e., $0.5 \times d_p$ from the bottom of the facility).

Geometry

1) Bioretention areas shall be sized to capture and treat the stormwater quality design volume (See Section 2 and Appendix E for calculating SQDV) with an 18-inch maximum ponding depth. *The intention is that ponding depth be limited to a depth that will allow for a health vegetation layer.*

2) Minimum planting soil depth should be 2 feet, although 3 feet is preferred. *The intention is that the minimum planting soil depth should provide a beneficial root zone for the chosen plant palette and adequate water storage for the SQDV.*

3) A gravel storage layer below the bioretention soil media to promote infiltration into the native soil is optional.

4) Bioretention should be designed to drain below the planting soil in less than 48 hours and completely drain in less than 96 hours. *The intention is that soils must be allowed to dry out periodically in order to restore hydraulic capacity needed to receive flows from subsequent storms, maintain infiltration rates, maintain adequate soil oxygen levels for healthy soil biota and vegetation, and to provide proper soil conditions for biodegradation and retention of pollutants.*

Flow Entrance and Energy Dissipation

The following types of flow entrance can be used for bioretention cells:

1) Dispersed, low velocity flow across a landscape area. Dispersed flow may not be possible given space limitations or if the facility is controlling roadway or parking lot flows where curbs are mandatory.

2) Dispersed flow across pavement or gravel and past wheel stops for parking areas.

3) Curb cuts for roadside or parking lot areas: curb cuts should include rock or other erosion protection material in the channel entrance to dissipate energy. Flow entrance should drop 2 to 3 inches from curb line and it should provide a settling area and periodic sediment removal of coarse material before flow dissipates to the remainder of the cell.

4) Pipe flow entrance: Piped entrances, such as roof downspouts, should include rock, splash blocks, or other appropriate measures at the entrance to dissipate energy and disperse flows.

Woody plants (trees, shrubs, etc.) can restrict or concentrate flows and can be damaged by erosion around the root ball and should not be placed directly in the entrance flow path.

Overflow

An overflow device is required at the 18-inch ponding depth. The following, or equivalent should be provided:

1) A vertical PVC pipe (SDR 35) to act as an overflow riser.

2) The overflow riser(s) should be 6 inches or greater in diameter, so it can be cleaned without damage to the pipe.

The inlet to the riser should be at the ponding depth (18 inches for fenced bioretention areas and 6 inches for areas that are not fenced), and be capped with a spider cap to exclude floating mulch and debris. Spider caps should be screwed in or glued, i.e., not removable.

Hydraulic Restriction Layers

Infiltration pathways may need to be restricted due to the close proximity of roads, foundations, or other infrastructure. A geomembrane liner, or other equivalent water proofing, may be placed along the vertical walls to reduce lateral flows. This liner should have a minimum thickness of 30 mils.

Planting/Storage Media

1) The planting media placed in the cell should achieve a long-term, in-place infiltration rate of at least 1 inch per hour. Higher infiltration rates are permissible. If the design long-term, in-place infiltration rate of the soil exceeds 12 inches per hour, documentation should be provided to demonstrate that the media will adequately address pollutants of concern at a higher flowrate. Bioretention soil shall also support vigorous plant growth.

2) Planting media should consist of 60 to 80% fine sand and 20 to 40% compost.

3) Sand should be free of wood, waste, coating such as clay, stone dust, carbonate, etc., or any other deleterious material. All aggregate passing the No. 200 sieve size should be non-plastic. Sand for bioretention should be analyzed by an accredited lab using #200, #100, #40, #30, #16, #8, #4, and 3/8 sieves (ASTM D 422 or as approved by the local permitting authority) and meet the following gradation (Note: all sands complying with ASTM C33 for fine aggregate comply with the gradation requirements below):

Sieve Size (ASTM D422)	% Passing (by weight)	
	Minimum	Maximum
3/8 inch	100	100
#4	90	100
#8	70	100
#16	40	95
#30	15	70
#40	5	55
#100	0	15
#200	0	5

Note: the gradation of the sand component of the media is believed to be a major factor in the hydraulic conductivity of the media mix. If the desired hydraulic conductivity of the media cannot be achieved within the specified proportions of sand and compost (#2), then it may be necessary to utilize sand at the coarser end of the range specified in above ("minimum" column).

4) Compost should be a well decomposed, stable, weed free organic matter source derived from waste materials including yard debris, wood wastes, or other organic materials not including manure or biosolids meeting standards developed by the US Composting Council (USCC). The product shall be certified through the USCC Seal of Testing Assurance (STA) Program (a compost testing and information disclosure program). Compost quality should be verified via a lab analysis to be:

- Feedstock materials shall be specified and include one or more of the following: landscape/yard trimmings, grass clippings, food scraps, and agricultural crop residues.
- Organic matter: 35-75% dry weight basis.
- Carbon and Nitrogen Ratio: 15:1 < C:N < 25:1
- Maturity/Stability: shall have dark brown color and a soil-like odor. Compost exhibiting a sour or putrid smell, containing recognizable grass or leaves, or is hot (120 F) upon delivery or rewetting is not acceptable.
- Toxicity: any one of the following measures is sufficient to indicate non-toxicity:
  - NH4:NH3 < 3
  - Ammonium < 500 ppm, dry weight basis
  - Seed Germination > 80% of control
  - Plant trials > 80% of control

- Solvita® > 5 index value

- Nutrient content:
  - Total Nitrogen content 0.9% or above preferred
  - Total Boron should be <80 ppm, soluble boron < 2.5 ppm
- Salinity: < 6.0 mmhos/cm
- pH between 6.5 and 8 (may vary with plant palette)

Compost for bioretention should be analyzed by an accredited lab using #200, ¼ inch, ½ inch, and 1 inch sieves (ASTM D 422 or as approved by the local permitting authority) and meet the following gradation:

Sieve Size (ASTM D422)	% Passing (by weight)	
	Minimum	Maximum
1 inch	99	100
½ inch	90	100
¼ inch	40	90
#200	2	10

Tests should be sufficiently recent to represent the actual material that is anticipated to be delivered to the site. If processes or sources used by the supplier have changed significantly since the most recent testing, new tests should be requested.

Note: the gradation of compost used in bioretention media is believed to play an important role in the saturated hydraulic conductivity of the media. To achieve a higher saturated hydraulic conductivity, it may be necessary to utilize compost at the coarser end of this range ("minimum" column). The percent passing the #200 sieve (fines) is believed to be the most important factor in hydraulic conductivity.

In addition, a coarser compost mix provides more heterogeneity of the bioretention media, which is believed to be advantageous for more rapid development of soil structure needed to support health biological processes. This may be an advantage for plant establishment with lower nutrient and water input.

5) The bioretention area should be covered with 2 to 4 inches (average 3 inches) of mulch at the start and an additional placement of 1 to 2 inches of mulch should be added annually. *The intention is that to help sustain the nutrient levels, suppress weeds, retain moisture, and maintain infiltration capacity*.

Plants

1) Plant materials should be tolerant of summer drought, ponding fluctuations, and saturated soil conditions for 48 to 96 hours.

2) It is recommended that a minimum of three types of tree, shrubs, and/or herbaceous groundcover species be incorporated to protect against facility failure due to disease and insect infestations of a single species.

3) Native plant species and/or hardy cultivars that are not invasive and do not require chemical inputs should be used to the maximum extent practicable.

Operations and Maintenance

Bioretention areas require annual plant, soil, and mulch layer maintenance to ensure optimum infiltration, storage, and pollutant removal capabilities. In general, bioretention maintenance requirements are typical landscape care procedures and include:

1) Watering: Plants should be drought-tolerant. Watering may be required during prolonged dry periods after plants are established.

2) Erosion control: Inspect flow entrances, ponding area, and surface overflow areas periodically, and replace soil, plant material, and/or mulch layer in areas if erosion has occurred (see Appendix I for a bioretention inspection and maintenance checklist). Properly designed facilities with appropriate flow velocities should not have erosion problems, except perhaps in extreme events. If erosion problems occur, the following should be reassessed: (1) flow velocities and gradients within the cell, and (2) flow dissipation and erosion protection strategies in the pretreatment area and flow entrance. If sediment is deposited in the bioretention area, immediately determine the source within the contributing area, stabilize, and remove excess surface deposits.

3) Plant material: Depending on aesthetic requirements, occasional pruning and removing of dead plant material may be necessary. Replace all dead plants and if specific plants have a high mortality rate, assess the cause and, if necessary, replace with more appropriate species. Periodic weeding is necessary until plants are established. The weeding schedule should become less frequent if the appropriate plant species and planting density have been used and, as a result, undesirable plants excluded.

4) Nutrients and pesticides: The soil mix and plants should be selected for optimum fertility, plant establishment, and growth. Nutrient and pesticide inputs should not be required and may degrade the pollutant processing capability of the bioretention area, as well as contribute pollutant loads to receiving waters. By design, bioretention facilities are located in areas where phosphorous and nitrogen levels are often elevated and these should not be limiting nutrients. If in question, have soil analyzed for fertility.

5) Mulch: Replace mulch annually in bioretention facilities where heavy metal deposition is likely (e.g., contributing areas that include industrial and auto dealer/repair parking lots and roads). In residential lots or other areas where metal

deposition is not a concern, replace or add mulch as needed to maintain a 2 to 3 inch depth at least once every two years.

6) Soil: Soil mixes for bioretention facilities are designed to maintain long-term fertility and pollutant processing capability. Estimates from metal attenuation research suggest that metal accumulation should not present an environmental concern for at least 20 years in bioretention systems. Replacing mulch in bioretention facilities where heavy metal deposition is likely provides an additional level of protection for prolonged performance. If in question, have soil analyzed for fertility and pollutant levels.

INF-4: Drywell

A dry well is defined as a bored, drilled, or driven shaft or hole whose depth is greater than its width. A dry well is designed specifically for flood alleviation and stormwater disposal. Drywells are similar to infiltration trenches in their design and function, as they are designed to temporarily store and infiltrate runoff, primarily from rooftops or other impervious areas with low pollutant loading. A dry well may be either a small excavated pit filled with aggregate or a prefabricated storage chamber or pipe segment.

Dry wells can be used to reduce the increased volume of stormwater runoff caused by roofs of buildings. While generally not a significant source of runoff pollution, roofs are one of the most important sources of new or increased runoff volume from land development sites. Dry wells can also be used to indirectly enhance water quality by reducing the amount of SQDV to be treated by the other, downstream stormwater management facilities.

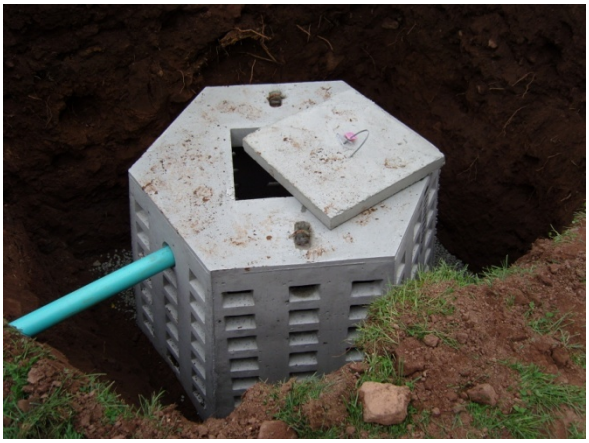

Drywell installation

Photo Credits: 1. K&A Enterprises; 2. Canale Landscaping

Application

- Infiltration of roof runoff

Preventative Maintenance

- Remove trash, debris, and sediment at inlet and outlets
- Wet weather inspection to ensure drain time
- Inspect for mosquito breeding

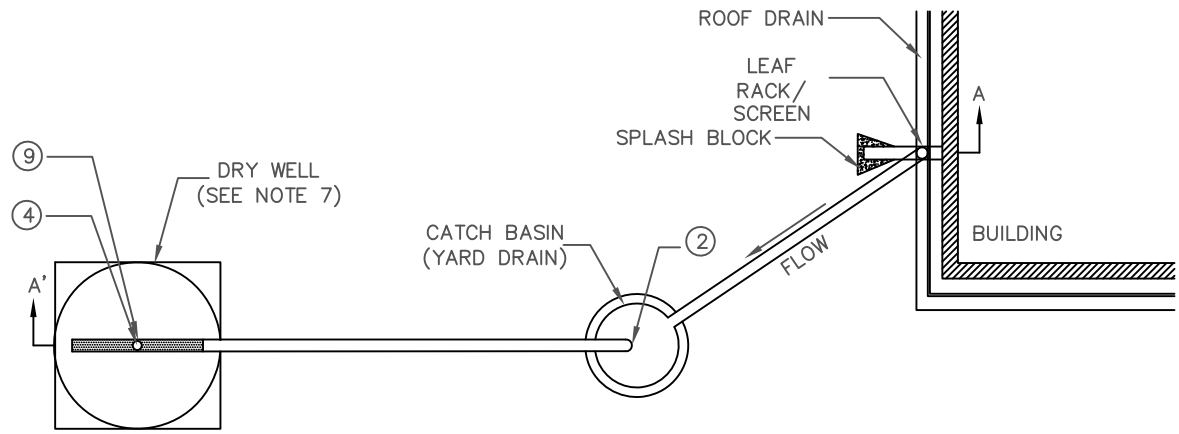

Plan View
(Not to Scale)

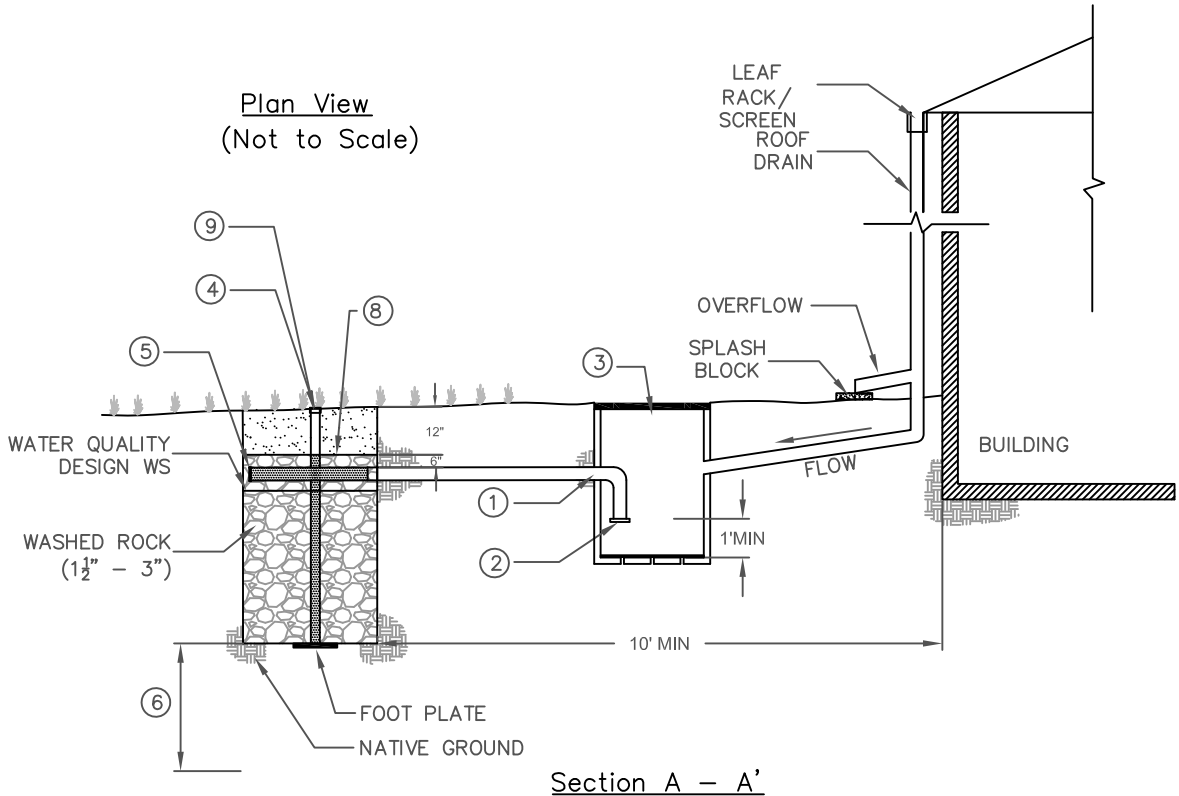

Section A – A'
(Not to Scale)

NOTES:

1. MINIMUM 4" – 6" DIAMETER PVC PIPE. INSTALL AT FLAT SLOPE.
2. INSTALL FINE MESH SCREEN AT INLET TO DRY WELL. SET INLET ELEVATION AT 1' MINIMUM ABOVE CATCH BASIN BOTTOM.
3. CATCH BASIN (YARD DRAIN) INSTALLED WITH A SOLID LID FLUSH WITH GROUND SURFACE.
4. 4–6" VERTICAL PERFORATED PVC INSPECTION WELL WITH SCREW LID (NUT DOWN) FLUSH WITH GROUND SURFACE.
5. CAP END OF 4–6" HORZONTAL PERFORATED PVC DISPERSION PIPE.
6. MINIMUM 10' ABOVE SEASONAL HIGH GROUNDWATER TABLE AND 3' ABOVE BEDROCK.
7. DRY WELL CONFIGURATION MAY VARY (E.G. PRE–FAB MAY BE CIRCULAR).
8. CHOKING STONE LAYER SHALL BE PLACED ON TOP OF THE DRY WELL TO SEPARATE IT FROM THE TOPSOIL AND PREVENT CLOGGING.

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Figure 6-5: Drywell

Limitations

The following limitations shall be considered before choosing to use a dry well:

- Native soil infiltration rate – soil permeability at the infiltration basin location must be at least 0.5 inches per hour.
- Depth to groundwater, bedrock, or low permeability soil layer – 5 feet vertical separation is required between the bottom of the infiltration basin and the seasonal high groundwater level or mounded groundwater level, bedrock, or other barrier to infiltration to ensure that the facility will completely drain between storms and that infiltrating water will receive adequate treatment though the soils before it reaches the groundwater.
- Slope stability - infiltration BMPs must be sited at least 50 feet away from slopes steeper than 15 percent or an alternative setback established by the geotechnical expert for the project.
- Setbacks - a minimum setback (100 feet or more) must be provided between infiltration BMPs and potable wells, non-potable wells, drain fields, and springs. Infiltration BMPs must be setback from building foundations at least eight feet or have an alternative setback established by the geotechnical expert for the project.
- Groundwater contamination - the application of infiltration BMPs should include significant pretreatment in an area identified as an unconfined aquifer, to ensure groundwater is protected from pollutants of concern.
- Contaminated soils or groundwater plumes - infiltration BMPs are not allowed at locations with contaminated soils or groundwater where the pollutants could be mobilized or exacerbated by infiltration, unless a site-specific analysis determines the infiltration would be beneficial.
- High pollutant land uses - infiltration BMPs should not be placed in high-risk areas such as at or near service/gas stations, truck stops, and heavy industrial sites due to groundwater contamination risk unless a site-specific evaluation demonstrates that sufficient pretreatment is provided to address pollutants of concern, high risks areas are isolated from stormwater runoff, or infiltration areas have little chance of spill migration.
- High sediment loading rates – infiltration BMPs may clog quickly if sediment loads are high (e.g., unstabilized site) or if flows are not adequately pretreated.
- Dry wells cannot receive untreated stormwater runoff, except rooftop runoff. Pretreatment of runoff from other surfaces is necessary to prevent premature failure that results from clogging with fine sediment, and to prevent potential groundwater contamination due to nutrients, salts, and hydrocarbons.

- Infiltration structures cannot be used to treat runoff from portions of the site that are not stabilized.
- Rehabilitation of failed dry wells requires complete reconstruction.

Design Criteria

The main challenge associated with drywells, as with infiltration trenches, is the prevention of system clogging and subsequent infiltration inhibition. Drywells should be designed according to the requirements listed in Table 6-10 and outlined in the section below. BMP sizing worksheets are presented in Appendix E.

Table 6-10: Infiltration BMP Design Criteria

Design Parameter	Unit	Design Criteria
Stormwater quality design volume (SQDV)	acre-feet	See Section 2 and Appendix E for calculating SQDV.
Design drawdown time	hour	12
Pretreatment	-	BIO-3: Vegetated Swale, BIO-4: Filter Strip, proprietary device, or equivalent.
Design percolation rate (k_{design})	in/hr	Shall be corrected for testing method, potential for clogging and compaction over time, and facility geometry.
Maximum depth of facility (d_{max})	feet	Defined by the design infiltration rate and the design drawdown time (includes depth of media).
Surface area of facility (A)	ft^2	Based on depth of dry well media.
Facility geometry	-	Geometry varies; max 10 feet deep; flat bottom slope.
Filter media diameter	inches	1.5 – 3 (gravel); prefabricated media may also be used
Overflow device	-	Required if system is on-line

Geotechnical Considerations

An extensive geotechnical site investigation must be undertaken early in the site planning process to verify site suitability for the installation of infiltration facilities, due to the potential to contaminate groundwater, cause slope instability, impact surrounding structures, and have insufficient infiltration capacity. Soil infiltration rates and the water table depth should be evaluated to ensure that conditions are satisfactory for proper operation of an infiltration facility. See Appendix C for guidance on infiltration testing.

The project designer must demonstrate through infiltration testing, soil logs, and the written opinion of a licensed civil engineer that sufficiently permeable soils exist on site to allow the construction of a properly functioning infiltration facility.

1) Infiltration facilities require a minimum soil infiltration rate of 0.5 inches/hour. If infiltration rates exceed 2.4 inches/hour, then the runoff should be fully-treated in an upstream BMP prior to infiltration to protect groundwater quality. Pretreatment for coarse sediment removal is required in all instances.

2) Groundwater separation must be at least 5 feet from the basin bottom to the measured season high groundwater elevation or estimated high groundwater mounding elevation. Measurements of groundwater levels must be made during the time when water level is expected to be at a maximum (i.e., toward the end of the wet season).

3) Sites with a slope greater than 25% (4:1) should be excluded. A geotechnical analysis and report addressing slope stability are required if located on slopes greater than 15%.

Soil Assessment and Site Geotechnical Investigation Reports

The soil assessment report should:

- State whether the site is suitable for the proposed drywell;
- Recommend a design infiltration rate (see the Step 2 of sizing methodology section, "Determine the design percolation rate," in the INF-1: Infiltration Basin fact sheet above);
- Identify the seasonal high depth to groundwater table surface elevation;
- Provide a good understanding of how the stormwater runoff will move in the soil (horizontally or vertically) and if there are any geological conditions that could inhibit the movement of water; and
- If a geotechnical investigation and report are required, the report should:
  - Provide a written opinion by a professional civil engineer describing whether the drywell will compromise slope stability; and
  - Identify potential impacts to nearby structural foundations.

Setbacks

1) Infiltration facilities shall be setback a minimum of 100 feet from proposed or existing potable wells, non-potable wells, septic drain fields, and springs.

2) Infiltration BMPs must be sited at least 50 feet away from slopes steeper than 15 percent or an alternative setback established by the geotechnical expert for the project.

3) Infiltration BMPs must be setback from building foundations at least eight feet or have an alternative setback established by the geotechnical expert for the project.

Pretreatment

- A removable filter with a screened bottom should be installed in the roof leader below the surcharge pipe in order to screen out leaves and other debris.

- Though roofs are generally not a significant source of runoff pollution, they can still be source of particulates and organic matter. Measures such as roof gutter guards, roof leader clean-out with sump, or an intermediate sump box can provide pretreatment for dry wells by minimizing the amount of sediment and other particulates that may enter it.

Sizing Criteria

See Sizing Criteria section in the INF-1: Infiltration Basin fact sheet.

Geometry and Sizing

1) Dry well configurations vary, but generally they have length and width dimensions closer to square than infiltration trenches. Pre-fabricated dry-wells are often circular. The surface area of the dry well must be large enough to infiltrate the storage volume in 12 hours based on the maximum depth allowable (d_{max}).

2) The filter bed media layers are the same as for infiltration trenches unless prefabricated dry wells and/or media are used. The porosity of gravel media systems is generally 30 to 40% and is 80 to 95% for prefabricated media systems.

3) If a dry well receives runoff from an underground pipe (i.e., runoff does not enter the top of the dry well from the ground surface), a fine mesh screen should be installed at the inlet. The inlet elevation should be 18 inches below the ground surface (i.e., below 12 inches of surface soil and 6 inches of dry well media).

4) An observation well should be installed to check for water levels, drawdown time, and evidence of clogging. A typical observation well consists of a slotted PVC well screen, 4 to 6 inches in diameter, capped with a lockable, above-ground lid.

Drainage

1) The bottom of infiltration bed must be native soil, over-excavated to at least one foot in depth and replaced uniformly without compaction. Amending the excavated soil with 2 to 4 inches (~15% to 30%) of coarse sand is recommended.

2) The hydraulic conductivity of the subsurface layers should be sufficient to ensure a maximum 12 hr drawdown time. An observation well should be incorporated to allow observation of drain time.

Emergency Overflow

1) There must be an overflow route for stormwater flows that overtop the facility or in case the infiltration facility becomes clogged.

2) The overflow channel must be able to safely convey flows from the peak design storm to the downstream stormwater conveyance system or other acceptable discharge point.

Vegetation

1) Drywells should be kept free of vegetation.

2) Trees and other large vegetation should be planted away from drywells such that drip lines do not overhang infiltration beds.

Maintenance Access

1) The facility and outlet structures must all be safely accessible during wet and dry weather conditions.

2) Maintenance access is required.

3) If the drywell becomes plugged and fails, then access is needed to excavate the facility to remove and replace the top layer and the filter bed media of the structure. To prevent damage and compaction, access must be able to accommodate a backhoe working at “arms length”.

Construction Considerations

To preserve and avoid the loss of infiltration capacity, the following construction guidelines should be specified:

1) The entire area draining to the facility must be stabilized before construction begins. If this is impossible, a diversion berm should be placed around the perimeter of the infiltration site to prevent sediment entering during construction.

2) Drywells should not be hydraulically connected to the stormwater conveyance system until all contributing tributary areas are stabilized as shown on the Contract Plans and to the satisfaction of the Engineer. Drywells should not be used as sediment control facilities.

3) Compaction of the subgrade with heavy equipment should be minimized to the maximum extent possible. If the use of heavy equipment on the base of the facility

cannot be avoided, the infiltration capacity should be restored by tilling or aerating prior to placing the infiltrative bed.

4) The exposed soils should be inspected by a civil engineer after excavation to confirm that soil conditions are suitable.

Operations and Maintenance

Drywell maintenance should be performed frequently to ensure that water infiltrates into the subsurface completely within the recommended infiltration time (or drain time if a drywell receives runoff from an underground pipe) of 72 hours or less after a storm.

Maintenance and regular inspections are important for the proper function of drywells. A specific maintenance plan shall be developed specifically for each facility outlining the schedule and scope of maintenance operations, documentation, and reporting requirements.

INF-5: Permeable Pavement

Permeable pavements contain small voids that allow water to pass through to a stone base. They come in a variety of forms; they may be a modular paving system (concrete pavers, grass-pave, or gravel-pave) or a poured-in-place solution (porous concrete or permeable asphalt). All permeable pavements with a stone reservoir base treat stormwater and remove sediments and metals to some degree. While conventional pavement result in increased rates and volumes of surface runoff, porous pavements when properly constructed and maintained, allow some of the stormwater to percolate through the pavement and enter the soil below. This facilitates groundwater recharge while providing the structural and functional features needed for the roadway, parking lot, or sidewalk. The paving surface, subgrade, and installation requirements of permeable pavements are more complex than those for conventional asphalt or concrete surfaces. For porous pavements to function properly over an expected life span of 15 to 20 years, they must be properly sited and carefully designed and installed, as well as periodically maintained. Failure to protect paved areas from construction-related sediment loads can result in their premature clogging and failure. Note that the 2011 TGM does not provide specific instructions on how to design and construct pavement.

Permeable pavement applications

Photo Credits: 1. Geosyntec Consultants; 2. EPA Stormwater Manaaement

Application

- Parking lots
- Driveways
- Sidewalks and walkways
- Outdoor athletic courts

Preventative Maintenance

- Trash removal
- Post-rain inspections
- Vacuum sweeping
- Vegetation inspection and removal

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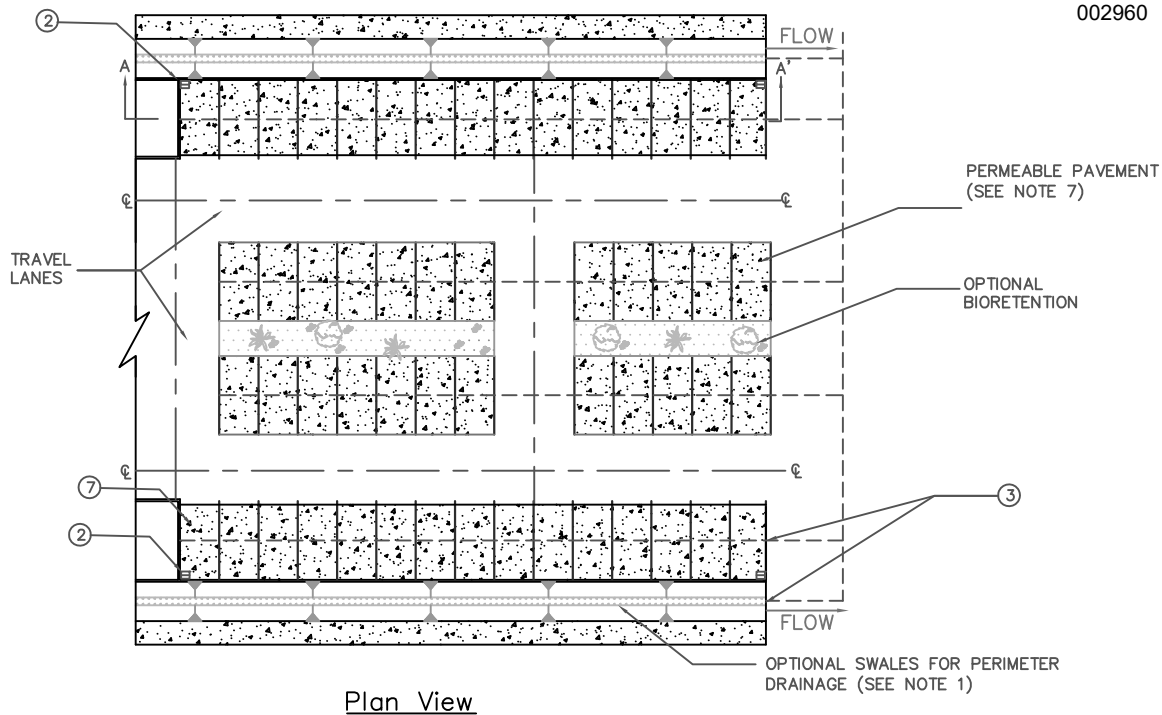

Plan View
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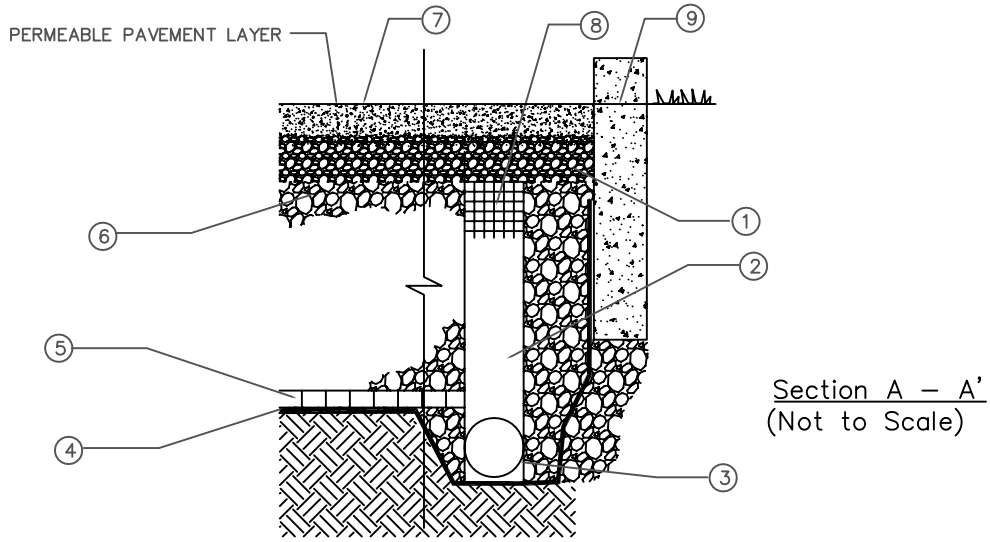

Section A – A'
(Not to Scale)

NOTES:

1. BEDDING COURSE SHALL BE 1½" TO 3" MIN THICKNESS (TYP NO. 8 AGGREGATE).
2. OPTIONAL OVERFLOW PIPE(S) SHALL BE PROVIDED IF OVERFLOWS ARE NOT MANAGED VIA PERIMETER DRAINAGE TO SWALES, BIORETENTION OR STORM WATER CONVEYANCE SYSTEM INLETS.
3. CONNECT OUTFALL PIPES TO DOWNSTREAM STORMWATER CONVEYANCE SYSTEM. OUTFALL PIPES SHALL BE SLOPED TOWARDS COLLECTION SYSTEM.
4. SOIL SUBGRADE SHALL HAVE ZERO SLOPE.
5. INSTALL GEOTEXTILE OR CHOKING LAYER ON BOTTOM & SIDES OF OPEN–GRADED BASE FOR FULL AND PARTIAL INFILTRATION, OR AN IMPERMEABLE LINER FOR NO INFILTRATION.
6. OPEN–GRADED BASE. THICKNESS AND GRADATION VARIES WITH DESIGN. TYP. NO. 57 AGGREGATE OR 4" THICK NO. 57 OVER NO. 2 STONE SUBASE. THICKNESS OF SUB–BASE VARIES WITH DESIGN.
7. PERMEABLE PAVEMENT INFILTRATIVE LAYER
8. OPTIONAL RIGID PLASTIC SCREEN FASTENED OVER OVERFLOW INLETS.
9. CURB/EDGE RESTRAINT WITH CUT–OUTS FOR OVERFLOW DRAINAGE TO PERIMETER BMPS, STORMWATER CONVEYANCE SYSTEM INLETS OR OPTIONAL OVERFLOW PIPES.
10. PARTIAL EXFILTRATION THROUGH THE SOIL. PERFORATED PIPES DRAIN EXCESS RUNOFF THAT CAN NOT BE ABSORBED BY SLOW–DRAINING SOIL.

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Figure 6-6: Permeable Pavement

Limitations

The following describes limitations for the use of permeable pavement.

- Native soil infiltration rate - permeability of soils at the BMP location must be at least 0.5 inches per hour.
- Depth to groundwater, bedrock, or low permeability soil layer – 5 feet vertical separation is required between the bottom of the infiltration trench and the seasonal high groundwater level or mounded groundwater level, bedrock, or other infiltration barrier to ensure that the facility will completely drain between storms and that infiltrating water will receive adequate treatment though the soils before it reaches the groundwater.
- Slope stability - infiltration BMPs must be sited at least 50 feet away from slopes steeper than 15 percent or an alternative setback established by the geotechnical expert for the project.
- Setbacks - a minimum setback (100 feet or more) must be provided between infiltration BMPs and potable wells, non-potable wells, drain fields, and springs. Infiltration BMPs must be setback from building foundations at least eight feet or an alternative setback established by the geotechnical expert for the project.
- Groundwater contamination - the application of infiltration BMPs should include significant pretreatment in an area identified as an unconfined aquifer, to ensure groundwater is protected for pollutants of concern.
- Contaminated soils or groundwater plumes - infiltration BMPs are not allowed at locations with contaminated soils or groundwater where the pollutants could be mobilized or exacerbated by infiltration, unless a site-specific analysis determines the infiltration would be beneficial.
- High pollutant land uses - infiltration BMPs should not be placed in high-risk areas such as at or near a service/gas stations, truck stops, and heavy industrial sites due to the groundwater contamination risk unless a site-specific evaluation demonstrates that sufficient pretreatment is provided to address pollutants of concern, high risks areas are isolated from stormwater runoff, or infiltration areas that have little chance of spill migration.
- High sediment loading rates – infiltration BMPs may clog quickly if sediment loads are high (e.g., unstabilized site) or if flows are not adequately pretreated.
- Permeable pavement cannot receive untreated stormwater runoff from other surfaces. Pretreatment of run-on from other surfaces is necessary to prevent premature failure that results from clogging with fine sediment.

- Permeable pavement cannot be used to treat runoff from portions of the site that are not stabilized.

Design Criteria

Permeable pavement should be designed according to the requirements listed in Table 6-11 and outlined in the section below.

Table 6-11: Permeable Pavements Design Criteria

Design Parameter	Unit	Design Criteria
Stormwater Quality Design Volume (SQDV)	acre-feet	See Section 2 and Appendix E for calculating SQDV.
Pretreatment	-	Runoff from pervious areas should be minimized but, if provided, BIO-3: Vegetated Swale or BIO-4: Filter Strip should be provided for all runoff from offsite sources that are not directly adjacent to the permeable pavement.
Drawdown time of gravel drainage layer	hrs	12 - 72
Porous Pavement Infill		ASTM C-33 sand or equivalent
Minimum depth to bedrock	ft	2 (without underdrains)
Minimum depth to seasonal high water table	ft	2 (with underdrains); 10 (without underdrains)
Infiltration rate of subsoil	in/hr	1.0 (minimum without an underdrain)
Overflow device	-	Required

Geotechnical Considerations

An extensive geotechnical site investigation must be undertaken early in the site planning process to verify site suitability for the installation of infiltration facilities, due to the potential to contaminate groundwater, cause slope instability, impact surrounding structures, and have insufficient infiltration capacity. Soil infiltration rates and the water table depth should be evaluated to ensure that conditions are satisfactory for proper operation of an infiltration facility. See Appendix C for guidance on infiltration testing.

The project designer must demonstrate through infiltration testing, soil logs, and the written opinion of a licensed civil engineer that sufficiently permeable soils exist onsite to allow the construction of a properly functioning infiltration facility.

1) Infiltration facilities require a minimum native soil infiltration rate of 0.5 inches/hour. If infiltration rates exceed 2.4 inches/hour, then the runoff should be fully treated in an upstream BMP prior to infiltration to protect groundwater quality.

Pretreatment for removing coarse sediment present in runoff from the tributary area is required in all instances.

2) Groundwater separation must be at least 5 feet from the basin bottom to the measured season high groundwater elevation or estimated high groundwater mounding elevation. Groundwater levels measurements must be made during the time when the water level is expected to be at a maximum (i.e., toward the end of the wet season).

3) Sites with a slope greater than 25% (4:1) should be excluded. A geotechnical analysis and report addressing slope stability are required if located on slopes greater than 15%.

Soil Assessment and Site Geotechnical Investigation Reports

The soil assessment report should:

- State whether the site is suitable for the proposed permeable pavement;
- Recommend a design infiltration rate (see the Step 2 of sizing methodology section, "Determine the design percolation rate," in the Infiltration Basin fact sheet above);
- Identify the seasonal high depth to groundwater table surface elevation;
- Provide a good understanding of how the stormwater runoff will move in the soil (horizontally or vertically) and if there are any geological conditions that could inhibit the movement of water; and
- If a geotechnical investigation and report are required, the report should:
  - Provide a written opinion by a professional civil engineer describing whether the infiltration trench will compromise slope stability; and
  - Identify potential impacts to nearby structural foundations.

Setbacks

1) Infiltration facilities shall be setback a minimum of 100 feet from proposed or existing potable wells, non-potable wells, septic drain fields, and springs.

2) Infiltration BMPs must be sited at least 50 feet away from slopes steeper than 15 percent or an alternative setback established by the geotechnical expert for the project.

3) Infiltration BMPs must be setback from building foundations at least eight feet or have an alternative setback established by the geotechnical expert for the project.

Pretreatment

1) Depending on how and where permeable pavements will be used, pretreatment of the runoff entering the permeable pavement may be necessary. This is particularly important when the permeable pavement will be accepting run-on from pervious areas or areas that are not completely stabilized. If this is the case, then the run-on should be treated prior to contacting the permeable pavement. Without adequate pretreatment, the life of the permeable pavement may be significantly decreased.

2) If sheet flow is conveyed to the permeable pavement over stabilized grassed areas, the site must be graded in such a way that minimizes erosive conditions.

Sizing Criteria

Permeable pavement must be designed to meet Ventura County codes and/or applicable local permitting authority codes. These sizing criteria are meant to provide guidance for runoff volume storage only.

Step 1: Calculate the Design Volume

Infiltration facilities shall be sized to capture and infiltrate the SQDV volume (see Section 2 and Appendix E) with a 12 to 72 hour drawdown time (see Appendix D, Section D.2).

Step 2: Determine the Design Percolation Rate

The percolation rate will decline between maintenance cycles as the surface becomes occluded and particulates accumulate in the infiltration layer. Monitoring of actual facility performance has shown that the full-scale infiltration rate is far lower than the rate measured by small-scale testing. It is important that adequate conservatism is incorporated in the selection of design percolation rates. For infiltration trenches, the design percolation rate discussed here is the percolation rate of the underlying soils and not the percolation rate of the filter media bed (refer to the "Geometry and Sizing" section of INF-2 for the recommended composition of the filter media bed for infiltration trenches).

Considerations for Design Percolation Rate Corrections

Suitability assessment related considerations include (Table 6-12):

- Soil assessment methods – the site assessment extent (e.g., number of borings, test pits, etc.) and the measurement method used to estimate the short-term infiltration rate.

- Predominant soil texture/percent fines – soil texture and the percent of fines can greatly influence the potential for clogging.

- Site soil variability – site with spatially heterogeneous soils (vertically or horizontally) as determined from site investigations are more difficult to estimate

average properties resulting in a higher level of uncertainty associated with initial estimates.

- Depth to seasonal high groundwater/impervious layer – groundwater mounding may become an issue during excessively wet conditions where shallow aquifers or shallow clay lenses are present.

Table 6-12: Suitability Assessment Related Considerations for Infiltration Facility Safety Factors

Consideration	High Concern	Medium Concern	Low Concern
Assessment methods	Use of soil survey maps or simple texture analysis to estimate short-term infiltration rates	Direct measurement of ≥ 20 percent of infiltration area with localized infiltration measurement methods (e.g., infiltrometer)	Direct measurement of ≥ 50 percent of infiltration area with localized infiltration measurement methods or Use of extensive test pit infiltration measurement methods
Ventura Hydrology Manual soil number (measured infiltration rate)	3 (f = 0.5 – 0.64)	4 or 5 (f = 0.65 – 0.91)	6 or 7 (f = 0.92 or higher)
Site soil variability	Highly variable soils indicated from site assessment or limited soil borings collected during site assessment	Soil borings/test pits indicate moderately homogeneous soils	Multiple soil borings/test pits indicate relatively homogeneous soils
Depth to groundwater/ impervious layer	<10 ft below facility bottom	10-30 ft below facility bottom	>30 below facility bottom

Localized infiltration testing refers to methods such as the double ring infiltrometer test (ASTM D3385-88) which measure infiltration rates over an area less than 10 sq-ft and do not attempt to account for soil heterogeneity. Extensive infiltration testing refers to methods that include excavating a significant portion of the proposed infiltration area, filling the excavation with water, and monitoring drawdown. In all cases, testing should be conducted in the area of the proposed BMP where, based on geotechnical data, soils appear least likely to support infiltration.

Design related considerations include (Table 6-13):

- Size of area tributary to facility – all things being equal, both physical and economic risk factors related to infiltration facilities increase with an increase in the tributary area served. Therefore facilities serving larger tributary areas should use more restrictive adjustment factors.

- Level of pretreatment/expected influent sediment loads – credit should be given for good pretreatment by allowing less restrictive factors to account for the reduced probability of clogging from high sediment loading. Also facilities designed to capture runoff from relatively clean surfaces such as rooftops are likely to see low sediment loads and therefore should be allowed to apply less restrictive safety factors.

- Redundancy – facilities that consist of multiple subsystems operating in parallel such that parts of the system remains functional when other parts fail and/or bypass should be rewarded for the built-in redundancy with less restrictive correction and safety factors. For example, if bypass flows would be at least partially treated in another BMP, the risk of discharging untreated runoff in the event of clogging the primary facility is reduced. A bioretention facility that overflows to a landscaped area is another example.

Compaction during construction – proper construction oversight is needed during construction to ensure that the bottom of the infiltration facility are not overly compacted. Facilities that do not commit to proper construction practices and oversight should have to use more restrictive correction and safety factors.

Table 6-13: Design Related Considerations for Infiltration Facility Safety Factors

Consideration	High Concern	Medium Concern	Low Concern
Tributary area size	Greater than 10 acres.	Greater than 2 acres but less than 10 acres.	2 acres or less.
Level of pre-treatment/ expected influent sediment loads	Pre-treatment from gross solids removal devices only, such as hydrodynamic separators, racks and screens AND tributary area includes landscaped areas, steep slopes, high traffic areas, or any other areas expected to produce high sediment, trash, or debris loads.	Good pre-treatment with BMPs that mitigate coarse sediments such as vegetated swales AND influent sediment loads from the tributary area are expected to be relatively low (e.g., low traffic, mild slopes, disconnected impervious areas, etc.).	Excellent pre-treatment with BMPs that mitigate fine sediments such as bioretention or media filtration OR sedimentation or facility only treats runoff from relatively clean surfaces, such as rooftops.
Redundancy of treatment	No redundancy in BMP treatment train.	Medium redundancy, other BMPs available in treatment train to maintain at least 50% of function of facility in event of failure.	High redundancy, multiple components capable of operating independently and in parallel, maintaining at least 90% of facility functionality in event of failure.
Compaction during construction	Construction of facility on a compacted site or elevated probability of unintended/ indirect compaction.	Medium probability of unintended/ indirect compaction.	Heavy equipment actively prohibited from infiltration areas during construction and low probability of unintended/ indirect compaction.

Adjust the measured short-term infiltration rate using a weighted average of several safety factors, using the worksheet shown in Table 6-14 below. The design percolation rate would be determined as follows:

- For each consideration shown in Table 6-12 and Table 6-13 above, determine whether the consideration is a high, medium, or low concern.
- For all high concerns assign a factor value of 3, for medium concerns assign a factor value of 2, and for low concerns assign a factor value of 1.
- Multiply each of the factors by the corresponding weight to get a product.

- Sum the products within each factor category to obtain a safety factor for each.
- Multiply the two safety factors together to get the final combined safety factor. If the combined safety factor is less than 2, then use 2 as the safety factor.
- Divide the measured short term infiltration rate by the combined safety factor to obtain the adjusted design percolation rate for use in sizing the infiltration facility.

Table 6-14: Infiltration Facility Safety Factor Determination Worksheet

Factor Category		Factor Description	Assigned Weight (w)	Factor Value (v)	Product (p) p = w x v
A	Suitability Assessment	Soil assessment methods	0.25		
		Predominant soil texture	0.25		
		Site soil variability	0.25		
		Depth to groundwater / impervious layer	0.25		
		Suitability Assessment Safety Factor, $S_A = \Sigma p$			
B	Design	Tributary area size	0.25		
		Level of pre-treatment/ expected sediment loads	0.25		
		Redundancy	0.25		
		Compaction during construction	0.25		
		Design Safety Factor, $S_B = \Sigma p$			
Combined Safety Factor = S_A x S_B					

Note: The minimum combined adjustment factor shall not be less than 2.0 and the maximum combined adjustment factor shall not exceed 9.

Step 3: Determine the Gravel Drainage Layer Depth

Permeable pavement (including the base layers) should be designed to drain in less than 72 hours. The basis for this is that soils must be allowed to dry out periodically in order to restore hydraulic capacity to receive flows from subsequent storms, maintain infiltration rates, maintain adequate sub soil oxygen levels for healthy soil biota, and to provide proper soil conditions for biodegradation and retention of pollutants.

1) Calculate the maximum depth of runoff (d_{max}) that can be infiltrated within the drawdown time:

$$d_{\max} = \frac{P_{design} \bullet t}{12} \qquad \text{(Equation 6-11)}$$

Where:

d_{max} = maximum depth that can be infiltrated (ft)

P_{design}	=	design percolation rate of underlying soils (in/hr) (see Step 2, above)
t	=	drawdown time (12-72 hours) (hr)

2) Select the gravel drainage layer depth, (l), such that:

$$d_{\max} \geq n \times l \qquad \text{(Equation 6-12)}$$

Where:

d_{max}	=	maximum depth that can be infiltrated (ft) (see 1) above)
n	=	gravel drainage layer porosity(unitless)(generally about 40% or 0.40 for gravel)
l	=	gravel drainage layer depth (ft)

Step 4: Determine infiltrating surface area

3) Calculate infiltrating surface area for permeable pavement (A):

$$A = \frac{SQDV}{\frac{TP_{design}}{12} + nl} \qquad \text{(Equation 6-13)}$$

Where:

P_{design}	=	design percolation rate of underlying soils (in/hr) (see Step 2, above)
n	=	gravel drainage layer porosity(unitless)[about 40% or 0.40 for gravel]
l	=	depth of gravel drainage layer (ft)
T	=	time to fill the gravel drainage layer with water (use 2 hours for most designs) (hr)

Geometry and Size

1) Permeable pavement shall be sized to capture and treat the stormwater quality design volume (SQDV).

2) Pavement design options include:

a. Full or partial infiltration – A design for full infiltration uses an open graded base for maximum infiltration and storage of stormwater. The water infiltrates directly into the base and through the soil. Pipes may provide drainage in overflow conditions. Partial infiltration does not rely completely on infiltration through the soil to dispose all of the captured runoff. Some of the water may infiltrate into the soil and the remainder drained by pipes.

b. No infiltration – No infiltration is desirable when the soil has low permeability and low strength, or there are other site limitations. An underdrain should be provided if the depth to bedrock is less than 2 feet or the depth to the water table is less than 10 feet. By storing water for a time in the base and then slowly releasing it through pipes, the design behaves like an underground detention pond. In other cases, the soil of the sub-base may be compacted and stabilized to render improved support for vehicular loads. This practice reduces infiltration into the soil to nearly zero. The "no infiltration" option requires the use of geotextile and bedding between the pavement and the open graded base.

3) If permeable pavement is located on a site with a slope greater than 2%, the permeable pavement area should be terraced to prevent lateral flow through the subsurface. Permeable pavement cannot be located on a site with a slope greater than 5%.

4) Porous pavement systems generally consist of at least four different layers of material:

a. The top or wearing layer consists of either asphalt or concrete with a greater than normal percentage of voids (typically 12 to 20 percent in the case of asphalt). The wearing layer may also be comprised of lattice-type pavers (either hollow concrete blocks or paving stones made from solid conventional concrete or stone), which are set in a bedding material (sand, pea-sized gravel or turf grass).

b. Below the wearing layer, a stone reservoir layer or a thick layer of aggregate (e.g., 2 inch stone) provides the bulk of the water storage capacity for a porous pavement system. In the pavement design, it is important to ensure that this reservoir layer retains its load bearing capacity under saturated conditions, because it may take several days for complete drainage to occur.

c. Typically, porous pavement designs include two (or more) transition layers that can be constructed from 1 to 2 inch diameter stone. One transition layer separates the top wearing layer from the underlying stone reservoir layer. Another transition layer is used to separate the stone reservoir from the undisturbed subgrade soil. Some designs also add a geotextile layer to this bottom layer or some combination of stones and geotextiles.

d. Porous asphalt pavement, for example, consists of open grade asphalt mixture ranging in depth from 2 to 4 inches with 16 percent voids. The thickness selected depends on bearing strength and pavement design requirements. This layer sits on a 2 to 4 inch transition layer located over a stone reservoir. The bottom layer completes the transition to the underlying undisturbed soil using a combination transition/filter fabric layer.

e. The depth of each layer should be determined by a licensed civil engineer based on analyses of the hydrology, hydraulics, and structural requirements of the site.

5) Modular paving stones are also used to create porous pavements. These pavements can be constructed in situ by pouring concrete into special frames or by using preformed blocks. The top layer of these porous pavements consists of conventional concrete, with the intervening void areas filled with either turf or sand. A transition or bedding layer is used to make the transition to the reservoir layer. These lattice-type pavers or hollow concrete blocks are often used in conjunction with turf grasses and are used in low-traffic parking lots, lanes, or driveways. Porous pavements using paving stones have similar construction, but can be designed to have a much higher load bearing capacity, and therefore have more widespread applicability. Construction guidelines and design specifications are available from the manufacturers of these products.

6) Permeable pavement (including the base layers) should be designed to drain in less than 72 hours. The basis for this is that soils must be allowed to dry out periodically in order to restore hydraulic capacity to receive flows from subsequent storms, maintain infiltration rates, maintain adequate subsoil oxygen levels for healthy soil biota, and to provide proper soil conditions for biodegradation and retention of pollutants.

7) The percolation rate will decline as the surface becomes occluded and particulates accumulate in the infiltration layer. It is important that adequate conservatism is incorporated in the selection of design percolation rates.

Overflow

An overflow mechanism is required. Two options are provided:

Option 1: Perimeter control

Flows in excess of the design capacity of the permeable pavement system will require an overflow system connected to a downstream conveyance or other stormwater runoff BMP. In addition, if the pavement becomes clogged and infiltration decreases to the point that there is ponding, runoff will migrate off of the pavement via overland flow instead of infiltrating into the subsurface gravel layer. There are several options for handling overflow using perimeter controls such as:

1) Perimeter vegetated swale.

2) Perimeter bioretention.

3) Storm drain inlets.

4) Rock filled trench that funnels flow around pavement and into the subsurface gravel layer.

Option 2: Overflow pipe(s)

1) A vertical pipe should be connected to the underdrain.

2) The diameter, location, and quantity may vary with design and should be determined by a licensed civil engineer.

3) The pipe should be located away from vehicular traffic.

4) The piping system may incorporate an observational and/or cleanout well.

5) The top of the overflow pipe should be covered with a screen fastened over the overflow inlet.

Construction Considerations

1) Permeable pavement should be laid close to level and the bottom of the base layers must be level to ensure uniform infiltration.

2) Permeable pavement surfaces should not be used to store site materials, unless the surface is well protected from accidental spillage or other contamination.

3) To prevent/minimize soil compaction in the area of the permeable pavement installation, use light equipment with tracks or oversized tires.

4) Divert stormwater from the area as needed (before and during installation).

5) The pavement should be the last installation done at a development site. Landscaping should be completed and adjacent areas stabilized, before pavement installation to minimize the risk of clogging.

6) Vehicular traffic should be prohibited for at least 2 days after installation.

Operations and Maintenance

Permeable pavement mainly requires vacuuming and management of adjacent areas to limit sediment contamination and prevent clogging by fine sediment particles. Therefore, little special training is needed for maintenance crews. The following maintenance concerns and maintenance activities shall be considered and provided:

1) Trash tends to accumulate in paved areas, particularly in parking lots and along roadways. The need for litter removal should be determined through periodic inspection.

2) Regularly (e.g., monthly for a few months after initial installation, then quarterly) inspect pavement for pools of standing water after rain events, this could indicate surface clogging.

3) Actively (3 to 4 times per year, or more frequently depending onsite conditions) vacuum sweep the pavement to reduce the risk of clogging by frequently removing fine sediments before they can clog the pavement and subsurface layers. This also helps to prolong the functional period of the pavement.

4) Inspect for vegetation growth on pavement and remove when present.

5) Inspect for missing sand/gravel in spaces between pavers and replace as needed.

6) Activities that lead to ruts or depressions on the surface should be prevented or the integrity of the pavement should be restored by patching or repaving. Examples are vehicle tracks and utility maintenance.

7) Spot clogging of porous concrete may be remedied by drilling 0.5 inch holes every few feet in the concrete.

8) Interlocking pavers that are damaged should be replaced.

9) Maintain landscaped areas and reseed bare areas.

INF-6: Proprietary Infiltration

A number of vendors offer proprietary infiltration products that allow for similar or enhanced rates of infiltration and subsurface storage while offering durable prefrabricated structures. There are many varieties of proprietary infiltration BMPs.

Proprietary Infiltration BMPs

Photo Credits: 1. & 2. Contech Stormwater Solutions, Inc.

Application

- Mixed-use and commercial
- Roads and parking lots
- Parks and open spaces
- Single and multi-family residential

Routine Maintenance

- Removal trash, debris, and sediment at inlet and outlets
- Wet weather inspection to ensure drain time
- Inspect for mosquito breeding

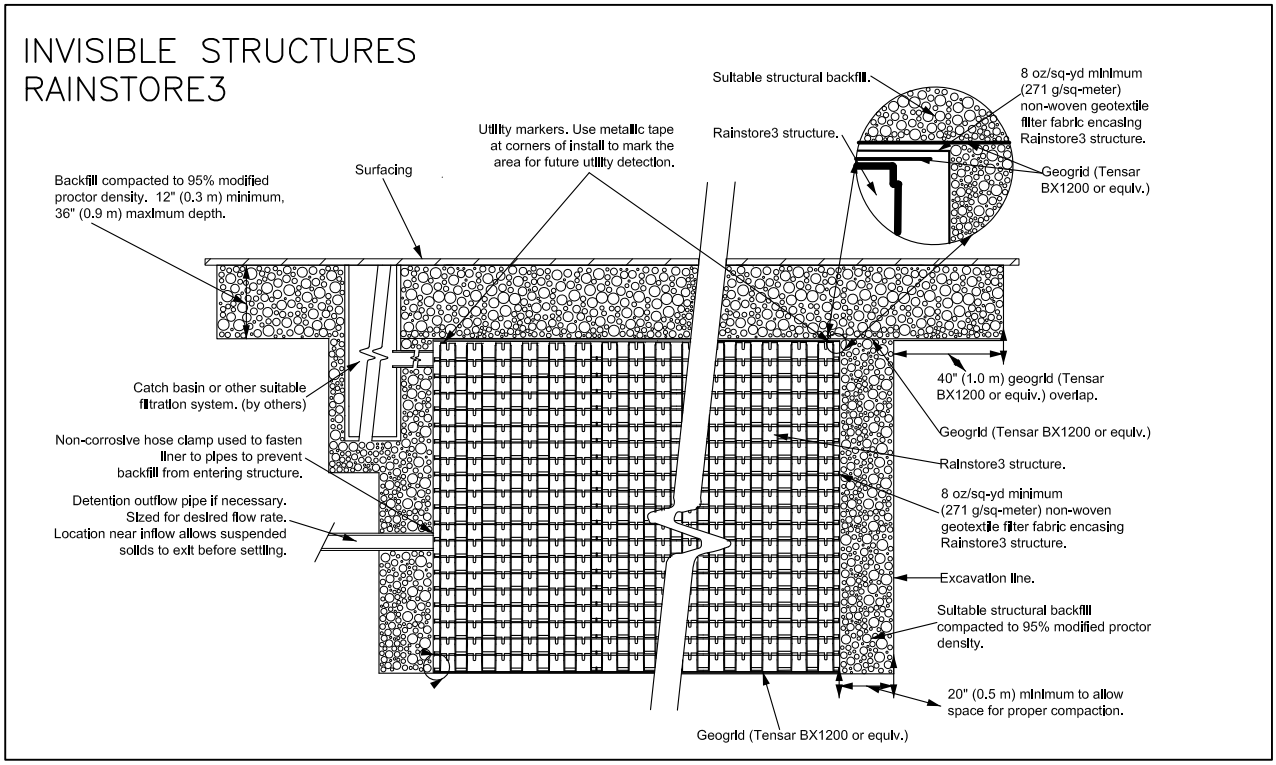

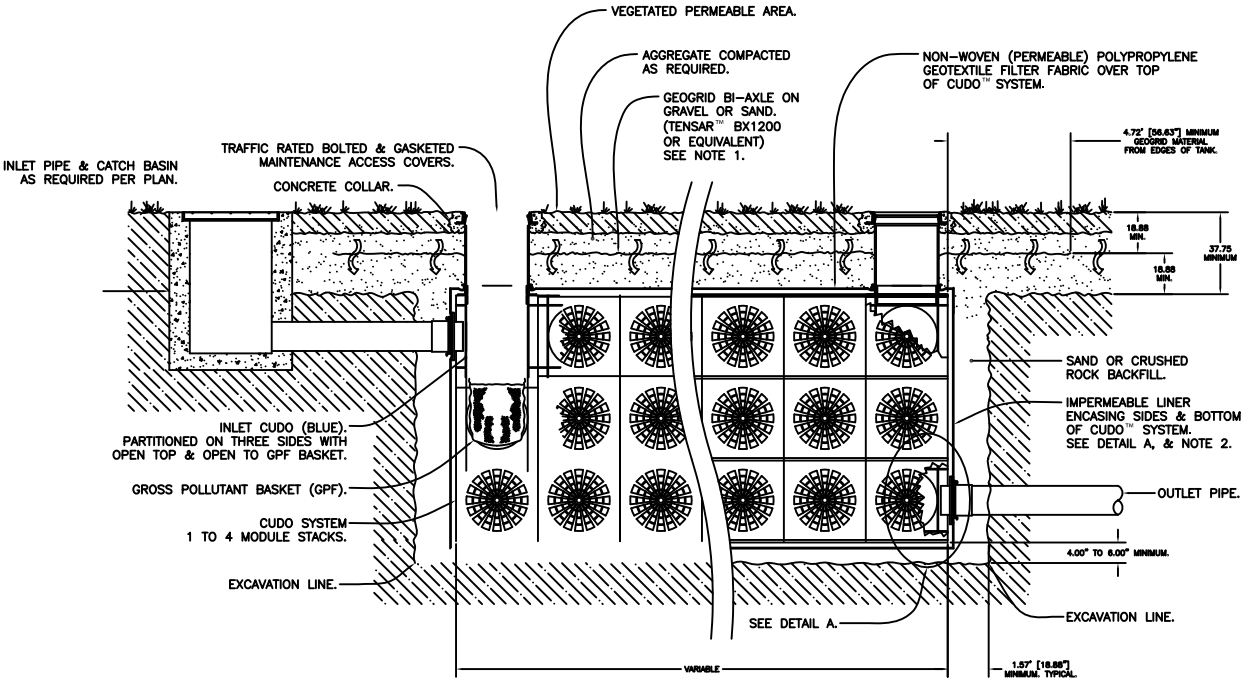

SECTION / CUTAWAY VIEW
SCALE: NONE

CUDO Stormwater Products, Inc.
P.O. Box 497 Occidental, CA 95465
Ph. (877) 876-3345 Fax (707) 876-3346

Geosyntec consultants

Figure 6-7: Proprietary Infiltration BMPs

Limitations

The following limitations shall be considered before choosing to use an infiltration BMP:

- Native soil infiltration rate - soil permeability of the infiltration basin location must be at least 0.5 inches per hour.
- Depth to groundwater, bedrock, or low permeability soil layer – 5 feet vertical separation is required between the bottom of the infiltration basin and the seasonal high groundwater level or mounded groundwater level, bedrock, or other barrier to infiltration to ensure that the facility will completely drain between storms and that infiltrating water will receive adequate treatment though the soils before it reaches the groundwater.
- Slope stability - infiltration BMPs must be sited at least 50 feet away from slopes steeper than 15 percent or an alternative setback established by the geotechnical expert for the project.
- Setbacks - a minimum setback (100 feet or more) must be provided between infiltration BMPs and potable wells, non-potable wells, drain fields and springs. Infiltration BMPs must be setback from building foundations at least eight feet or have an alternative setback established by the geotechnical expert for the project.
- Groundwater contamination - the application of infiltration BMPs should include significant pretreatment in an area identified as an unconfined aquifer, to ensure groundwater is protected for pollutants of concern.
- Contaminated soils or groundwater plumes - infiltration BMPs are not allowed at locations with contaminated soils or groundwater where the pollutants could be mobilized or exacerbated by infiltration, unless a site-specific analysis determines the infiltration would be beneficial.
- High pollutant land uses - infiltration BMPs should not be placed in high-risk areas such as at or near service/gas stations, truck stops, and heavy industrial sites due to the groundwater contamination risk unless a site-specific evaluation demonstrates that sufficient pretreatment is provided to address pollutants of concern, high risks areas are isolated from stormwater runoff, or infiltration areas have little chance of spill migration
- High sediment loading rates – infiltration BMPs may clog quickly if sediment loads are high (e.g., unstabilized site) or if flows are not adequately pretreated.

Table 6-15: Proprietary Infiltration Manufacturer Websites

Device	Manufacturer	Website
A-2000™	Contech® Construction Products Inc.	www.contech-cpi.com/stormwater/13
ChamberMaxx™	Contech® Construction Products Inc.	www.contech-cpi.com/stormwater/13
CON/SPAN Vaults™	Contech® Construction Products Inc.	www.contech-cpi.com/stormwater/13
CON/Storm™	Contech® Construction Products Inc.	www.contech-cpi.com/stormwater/13
Perforated Corrugated Metal Pipe (CMP)	Contech® Construction Products Inc.	www.contech-cpi.com/stormwater/13
Drywell StormFilter	Contech® Construction Products Inc.	www.contech-cpi.com/stormwater/13
CUDO® Water Storage System	KriStar Enterprises Inc.	www.kristar.com
D-Raintank® Matrix Tank Modules	Atlantis®	www.atlantis-america.com
EcoRain™ Modular Rain Tank	EcoRain Systems Inc.	www.ecorain.com
Landmax®	Hancor®	www.hancor.com
Landsaver™	Hancor®	www.hancor.com
Precast Concrete Dry Well	Jensen Precast®	www.jensenprecast.com
Rainstore[3]	Invisible Structures Inc.	www.invisiblestructures.com
StormChambers™	Hydrologic Solutions, Inc.	www.hydrologicsolutions.com
Stormtech® SC-740 and SC-310 Chambers	StormTech LLC	www.stormtech.com
StormTrap®	StormTrap	www.stormtrap.com
Triton Chambers™	Triton Stormwater Solutions	www.tritonsws.com

Geotechnical Considerations

An extensive geotechnical site investigation must be undertaken early in the site planning process to verify site suitability for the installation of infiltration facilities, due to the potential to contaminate groundwater, cause slope instability, impact surrounding structures, and have insufficient infiltration capacity. Soil infiltration rates and the water table depth should be evaluated to ensure that conditions are satisfactory for proper operation of an infiltration facility. See Appendix C for guidance on infiltration testing.

The project designer must demonstrate through infiltration testing, soil logs, and the written opinion of a licensed civil engineer that sufficiently permeable soils exist onsite to allow the construction of a properly functioning infiltration facility.

1) Infiltration facilities require a minimum soil infiltration rate of 0.5 inches/hour. If infiltration rates exceed 2.4 inches/hour such that pollutant removal may not be adequate to protect groundwater quality, then the runoff should be fully treated in an upstream BMP prior to infiltration to protect groundwater quality. Pretreatment for coarse sediment removal is required in all instances.

2) Groundwater separation must be at least 5 feet from the basin bottom to the measured season high groundwater elevation or estimated high groundwater mounding elevation. Measurements of groundwater levels must be made during the time when water level is expected to be at a maximum (i.e., toward the end of the wet season).

3) Sites with a slope greater than 25% (4:1) should be excluded. A geotechnical analysis and report addressing slope stability are required if located on slopes greater than 15%.

Soil Assessment and Site Geotechnical Investigation Reports

The soil assessment report should:

- State whether the site is suitable for the proposed proprietary infiltration BMP.;
- Recommend a design infiltration rate (see the Step 2 of sizing methodology section, "Determine the design percolation rate," in the Infiltration Basin fact sheet above);
- Identify the seasonal high depth to groundwater table surface elevation;
- Provide a good understanding of how the stormwater runoff will move in the soil (horizontally or vertically) and if there are any geological conditions that could inhibit the movement of water; and
- If a geotechnical investigation and report are required, the report should:
  - Provide a written opinion by a professional civil engineer describing whether the infiltration trench will compromise slope stability; and
  - Identify potential impacts to nearby structural foundations.

Setbacks

1) Infiltration facilities shall be setback a minimum of 100 feet from proposed or existing potable wells, non-potable wells, septic drain fields, and springs.

2) Infiltration BMPs must be sited at least 50 feet away from slopes steeper than 15 percent or an alternative setback established by the geotechnical expert for the project.

3) Infiltration BMPs must be setback from building foundations at least eight feet or have an alternative setback established by the geotechnical expert for the project.

Pretreatment

Pretreatment is required for proprietary infiltration BMPs in order to reduce the sediment load entering the facility and maintain the infiltration rate of the facility. Pretreatment refers to design features that provide settling of sediment particles before runoff reaches a management practice. This eases the long-term maintenance burden and likelihood of failure. Pretreatment is important for most stormwater treatment BMPs, but it is particularly important for infiltration BMPs. To ensure that pretreatment mechanisms are effective, designers should incorporate sediment reduction practices. Sediment reduction BMPs may include vegetated swales, vegetated filter strips, sedimentation basins, sedimentation manholes and hydrodynamic separation devices. The use of at least two pretreatment devices is highly recommended for infiltration BMPs.

Sizing

1) Proprietary infiltration BMPs shall be sized to capture and treat the stormwater quality design volume (SQDV). See Section 2 and Appendix E for calculating for further detail.

2) The percolation rate will decline as the surface becomes occluded and particulates accumulate in the infiltrative layer. It is important that adequate conservatism is incorporated in the selection of design percolation rates.

3) For the sizing guidelines, refer to the manufacturer's website.

Operations and Maintenance

See vendor's website for maintenance requirements.

INF-7: Bioinfiltration

Bioinfiltration facilities are designed for partial infiltration of runoff and partial biotreatment. These facilities are similar to bioretention devices with underdrains, but the underdrain is raised above the gravel sump to facilitate infiltration. These facilities can be used in areas where there are no hazards associated with infiltration, but infiltration of the full DCV may not be feasible due to low infiltration rates (Soil Type 3) or high depths of fill. These facilities may not result in retention of the DCV but they can be used to meet the MEP standards.

Bioretention in Parkway and parking lots

Photo Credits: Geosyntec Consultants

Application

- Commercial, residential, mixed use, institutional, and recreational uses
- Parking lot islands, traffic circles
- Road parkways & medians

Preventative Maintenance

- Repair small eroded areas
- Remove trash and debris and rake surface soils
- Remove accumulated fine sediments, dead leaves and trash
- Remove weeds and prune back excess plant growth
- Remove sediment and debris accumulation near inlet and outlet structures
- Periodically observe function under wet weather conditions

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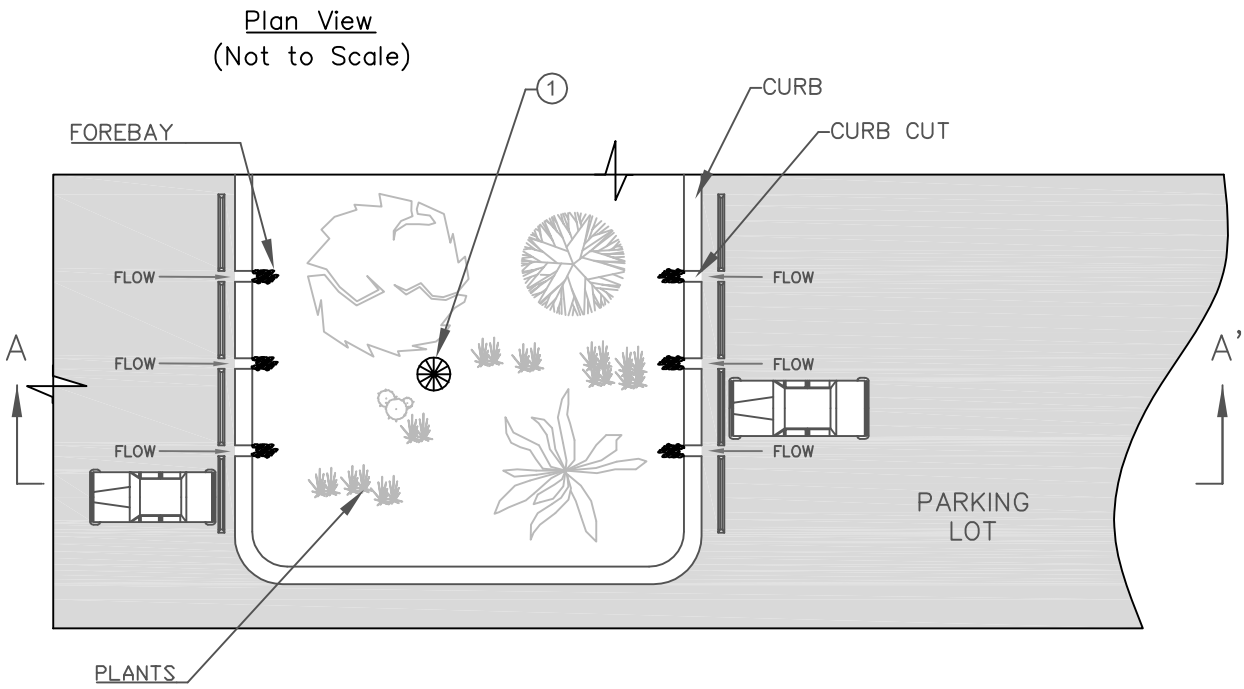

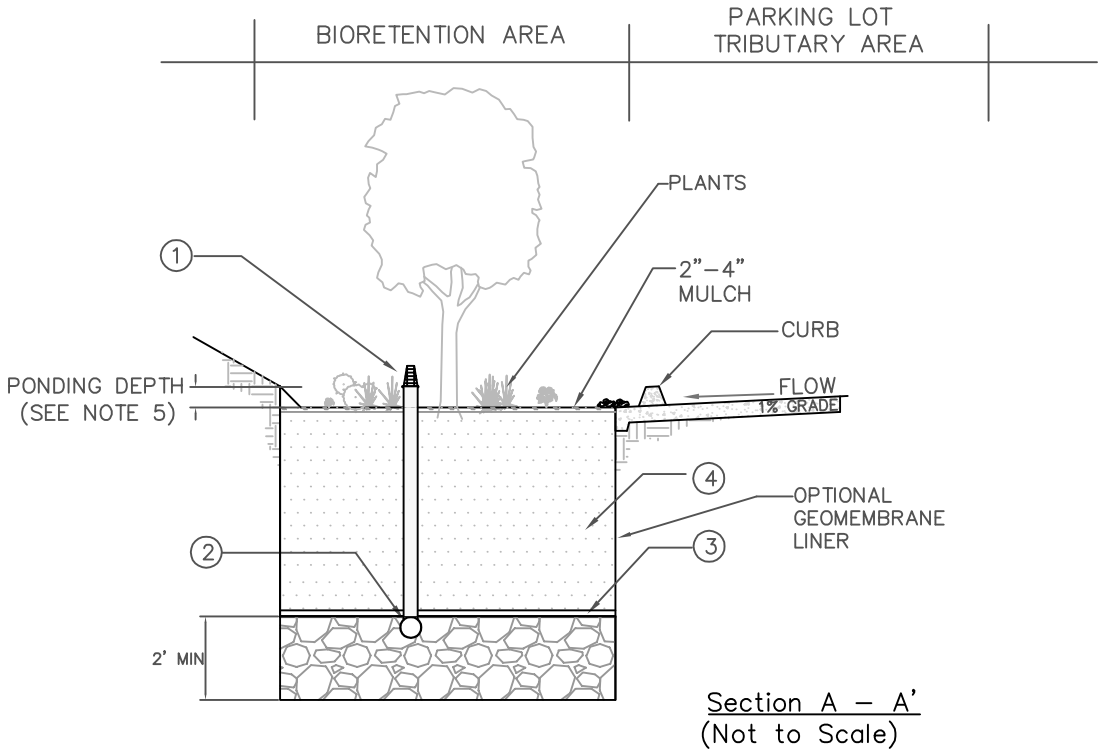

NOTES:

① OVERFLOW DEVICE: VERTICAL RISER OR EQUIVALENT.
② PERFORATED 6" MIN PVC PIPE UNDERDRAIN.
③ OPTIONAL CHOKING GRAVEL LAYER.
④ 2' MIN PLANTING MIX; 3' PREFERRED.
⑤ PONDING DEPTH 18" WITH FENCE; 6" WITHOUT FENCE.
⑥ 2' MIN GRAVEL LAYER DEPTH.

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Figure 6-8: Bioinfiltration

Limitations

The following limitations should be considered before choosing to use bioinfiltration:

1) Native soil infiltration rate - soil permeability at the bioinfiltration location must be no less than 0.3 inches per hour.

2) Depth to groundwater, bedrock, or low permeability soil layer – 5 feet vertical separation is required between the bottom of the infiltration trench and the seasonal high groundwater level or mounded groundwater level, bedrock, or other barrier to infiltration to ensure that the facility will completely drain between storms and that infiltrating water will receive adequate treatment though the soils before it reaches the groundwater.

3) Slope stability - infiltration BMPs must be sited at least 50 feet away from slopes steeper than 15 percent or an alternative setback established by the geotechnical expert for the project.

4) Setbacks - a minimum setback (100 feet or more) must be provided between infiltration BMPs and potable wells, non-potable wells, drain fields, and springs. Infiltration BMPs must be setback from building foundations at least eight feet or have an alternative setback established by the geotechnical expert for the project.

5) Groundwater contamination - the application of infiltration BMPs should include significant pretreatment in an area identified as an unconfined aquifer to ensure groundwater is protected for pollutants of concern.

6) Contaminated soils or groundwater plumes - infiltration BMPs are not allowed at locations with contaminated soils or groundwater where the pollutants could be mobilized or exacerbated by infiltration, unless a site-specific analysis determines that infiltration would be beneficial.

7) High pollutant land uses - infiltration BMPs should not be placed in high-risk areas such as at or near service/gas stations, truck stops, and heavy industrial sites due to the groundwater contamination risk unless a site-specific evaluation demonstrates that sufficient pretreatment is provided to address pollutants of concern, high risks areas are isolated from stormwater runoff, or infiltration areas have little chance of spill migration.

8) High sediment loading rates – infiltration BMPs may clog quickly if sediment loads are high (e.g., unstabilized site) or if flows are not adequately pretreated.

9) Vertical relief and proximity to storm drain - site must have adequate relief between the land surface and storm drain to permit vertical percolation through the soil media and collection.

Design Criteria

Bioinfiltration should be designed according to the requirements listed in Table 6-16 and outlined in the section below.

Table 6-16: Bioretention Design Criteria

Design Parameter	Unit	Design Criteria
Stormwater quality design volume (SQDV)	acre-feet	See Section 2 and Appendix E for calculating SQDV.
Forebay	-	Forebay should be provided for all tributary surfaces that contain landscaped areas. Forebays should be designed to prevent standing water during dry weather and should be planted with a plant palette that is tolerant of wet conditions.
Maximum drawdown time of water ponded on surface	hours	48
Maximum drawdown time of surface ponding plus subsurface pores	hours	96 (72 preferred)
Maximum ponding depth	inches	18
Minimum thickness of amended soil	feet	2 (3 preferred)
Minimum thickness of stabilized mulch	inches	2 to 4
Planting mix composition	-	60 to 80% fine sand, 20 to 40% compost
Underdrain sizing	-	Underdrain should be installed below the choking stone; 6 inch minimum diameter; 0.5% minimum slope; slotted, polyvinyl chloride (PVC) pipe (PVC SDR 35 or approved equivalent); spacing shall be determined to provide capacity for maximum rate filtered through amended media
Minimum thickness of gravel layer	feet	2
Overflow device	-	Required

Sizing Criteria

Bioinfiltration facilities can be sized using one of two methods: a simple sizing method or a routing modeling method. With either method the SQDV volume must be completely infiltrated within 96 hours (including subsurface pore space), and surface ponding must be infiltrated within 48 hours. The simple sizing procedure is provided below. For the routing modeling method, refer to TCM-4 Sand Filters.

Step 1: Calculate the Design Volume

Bioinfiltration facilities shall be sized to capture and partially infiltrate and partially biotreat the SQDV volume (see Section 2.3 and Appendix E).

Step 2: Determine the Design Percolation Rate

The percolation rate through the BMP and to the subsurface will decline between maintenance cycles as the surface becomes occluded and particulates accumulate in the infiltration layer. Monitoring of actual facility performance has shown that the full-scale infiltration rate is far lower than the rate measured by small-scale testing. It is important that adequate conservatism is incorporated in the selection of design percolation rates. For bioinfiltration facilities, the design percolation rate discussed here is the adjusted percolation rate of the underlying soils and not the percolation rate of the filter media bed. The measured short-term infiltration rate should be adjusted using a factor of safety of 2.0.

Step 3: Calculate the surface area

Determine the size of the required infiltrating surface by assuming the SQDV will fill the available ponding depth plus the void spaces in the media, based on the computed porosity of the filter media and optional aggregate layer.

1) Determine the maximum depth of surface ponding that can be infiltrated within the required surface drain time (48 hr), (d_{max}), as follows:

$$d_{\max} = \frac{P_{design} \times t_{ponding}}{12\frac{in}{ft}} \qquad \text{(Equation 6-14)}$$

Where:

$t_{ponding}$	=	required drain time of surface ponding (48 hrs)
P_{design}	=	design percolation rate of underlying soils (in/hr) (see Step 2, above)

d_{max}	=	the maximum depth of surface ponding water that can be infiltrated within the required drain time (ft), calculated using Equation 6-14

2) Choose surface ponding depth (d_p) such that:

$$d_p \leq d_{\max} \qquad \text{(Equation 6-15)}$$

Where:

d_p	=	selected surface ponding depth (ft)
d_{max}	=	the maximum depth of water that can be infiltrated within the required drain time (ft)

Choose thickness(es) of amended media and aggregate layer(s) and calculate total effective storage depth of the bioinfiltration area ($d_{effective}$), as follows:

$$d_{effective} \leq (d_p + n^*_{media} l_{media} + n_{gravel} l_{gravel}) \qquad \text{(Equation 6-16)}$$

Where:

$d_{effective}$	=	total equivalent depth of water stored in bioinfiltration area (ft), including surface ponding and volume available in pore spaces of media and gravel layers
d_p	=	surface ponding depth (ft), chosen using Equation 6=15
n^*_{media}	=	available porosity of amended soil media (ft/ft), approximately 0.25 ft/ft accounting for antecedent moisture conditions. This represents the volume of available pore space as a fraction of the total soil volume; sometimes has units of (ft^3/ft^3) or described as a percentage.
l_{media}	=	thickness of amended soil media layer (ft), minimum 2 ft
n_{gravel}	=	porosity of gravel layer (ft/ft), approximately 0.40 ft/ft
l_{gravel}	=	thickness of gravel layer (ft), minimum 2 ft

3) Check that entire effective depth (surface plus subsurface storage), $d_{effective}$, infiltrates in no greater than 96 hours as follows:

$$t_{total} = \frac{d_{effective}}{P_{design}} \times 12 \frac{in}{ft} \leq 96\ hr \qquad \text{(Equation 6-17)}$$

Where:

$d_{effective}$ = total equivalent depth of water stored in bioinfiltration area (ft), calculated using Equation 6-16

P_{design} = design percolation rate of underlying soils (in/hr) (see Step 2, above)

If $t_{total} > 96$ hrs, then reduce surface ponding depth and/or amended media thickness and/or gravel thickness and return to 1).

If $t_{total} \leq 96$ hrs, then proceed to 5).

4) Calculate required infiltrating surface area, (A_{req}):

$$A_{req} = \frac{SQDV}{d_{effective}} \qquad \text{(Equation 6-18)}$$

Where:

A_{req} = required infiltrating area (ft^2). Should be calculated at the contour corresponding to the mid ponding depth (i.e., $0.5 \times d_p$ from the bottom of the facility).

$SQDV$ = stormwater quality design volume (ft^3)

$d_{effective}$ = total equivalent depth of water stored in bioinfiltration area (ft), calculated using Equation 6-16

5) Calculate total footprint required by including a buffer for side slopes and freeboard; A_{req} is calculated at the contour corresponding to the mid ponding depth (i.e., $0.5 \times d_p$ from the bottom of the facility).

Geometry

1) Minimum planting soil depth should be 2 feet, although 3 feet is preferred.

   The intention is that the minimum planting soil depth should provide a beneficial root zone for the chosen plant palette and adequate water storage for the stormwater quality design volume. A deeper soil depth will provide a smaller surface area footprint.

2) Minimum gravel layer depth is 2 feet.

The intention is that the gravel sump provides partial retention of captured water.

3) Bioinfiltration should be designed to drain below the planting soil in less than 48 hours and completely drain from the gravel layer in 96 hours (both starting from the end of inflow).

   The intention is that soils must be allowed to dry out periodically in order to restore hydraulic capacity to receive flows from subsequent storms, maintain infiltration rates, maintain adequate soil oxygen levels for healthy soil biota and vegetation, and to provide proper soil conditions for biodegradation and retention of pollutants.

Flow Entrance and Energy Dissipation

The following types of flow entrance can be used for bioinfiltration cells:

1) Dispersed, low velocity flow across a landscape area. Dispersed flow may not be possible given space limitations or if the facility is controlling roadway or parking lot flows where curbs are mandatory.

2) Dispersed flow across pavement or gravel and past wheel stops for parking areas.

3) Curb cuts for roadside or parking lot areas: curb cuts should include rock or other erosion protection material in the channel entrance to dissipate energy. Flow entrance should drop 2 to 3 inches from curb line and it should provide a settling area and periodic sediment removal of coarse material before flow dissipates to the remainder of the cell.

4) Pipe flow entrance: Piped entrances, such as roof downspouts, should include rock, splash blocks, or other appropriate measures at the entrance to dissipate energy and disperse flows.

Woody plants (trees, shrubs, etc.) can restrict or concentrate flows and can be damaged by erosion around the root ball and should not be placed directly in the entrance flow path.

Underdrains

Underdrains should meet the following criteria:

1) 6-inch minimum diameter.

2) Underdrains should be made of slotted, polyvinyl chloride (PVC) pipe (PVC SDR 35 or approved equivalent). *The intention is that compared to round-hole perforated pipe, slotted underdrains provide greater intake capacity, clog resistant drainage, and reduced entrance velocity into the pipe, thereby reducing the chances of solids migration.*

3) Slotted pipe should have 2 to 4 rows of slots cut perpendicular to the axis of the pipe or at right angles to the pitch of corrugations. Slots should be 0.04 to 0.1 inches and should have a length of 1 to 1.25 inches. Slots should be longitudinally spaced such that the pipe has a minimum of one square inch of slot per lineal foot of pipe and should be placed with slots facing the bottom of the pipe.

4) Underdrains should be sloped at a minimum of 0.5%.

5) Rigid non-perforated observation pipes with a diameter equal to the underdrain diameter should be connected to the underdrain every 100 feet to provide a clean-out port as well as an observation well to monitor dewatering rates. The wells/cleanouts should be connected to the perforated underdrain with the appropriate manufactured connections. The wells/cleanouts should extend 6 inches above the top elevation of the bioinfiltration facility mulch, and should be capped with a lockable screw cap. The ends of the underdrain pipes not terminating in an observation well/cleanout should also be capped.

Gravel Layer

1) The following aggregate should be used for the gravel layer below the underdrain pipe. Place the underdrain below the choking stone, within the top 6 inches of the gravel layer.

Sieve size	Percent Passing
¾ inch	100
¼ inch	30-60
US No. 8	20-50
US No. 50	3-12
US No. 200	0-1

2) At the option of the designer/geotechnical engineer, a geotextile fabric may be placed between the planting media and the gravel layer. If a geotextile fabric is used, it should meet a minimum permittivity rate of 75 gal/min/ft^2, should not impede the infiltration rate of the soil medium, and should meet the following minimum materials requirements.

Geotextile Property	Value	Test Method
Trapezoidal Tear (lbs)	40 (min)	ASTM D4533
Permeability (cm/sec)	0.2 (min)	ASTM D4491
AOS (sieve size)	#60 - #70 (min)	ASTM D4751
Ultraviolet resistance	70% or greater	ASTM D4355

Preferably, aggregate (choking stone) should be used in place of filter fabric to reduce the potential for clogging. This aggregate layer should consist of 2 to 4 inches

of washed sand underlain with 2 inches of choking stone (Typically #8 or #89 washed).

3) Bioinfiltration facilities have the added benefit of enhanced nitrogen removal due to the elevated underdrain. This allows for a fluctuating anaerobic/aerobic zone below the drain pipe. *The intention is that denitrification within the anaerobic/anoxic zone is facilitated by microbes using forms of nitrogen (NO_2 and NO_3) instead of oxygen for respiration.*

4) The underdrain should drain freely to an acceptable discharge point. The underdrain can be connected to a downstream open conveyance (vegetated swale), to another bioinfiltration cell as part of a connected treatment system, to a storm drain, daylight to a vegetated dispersion area using an effective flow dispersion device, or to a storage facility for harvesting.

Overflow

An overflow device is required at the 18-inch ponding depth. The following, or equivalent should be provided:

1) A vertical PVC pipe (SDR 35) to act as an overflow riser.

2) The overflow riser(s) should be 6 inches or greater in diameter, so it can be cleaned without damage to the pipe.

The inlet to the riser should be at the ponding depth (18 inches for fenced bioinfiltration areas and 6 inches for areas that are not fenced), and be capped with a spider cap to exclude floating mulch and debris. Spider caps should be screwed in or glued, i.e., not removable.

Hydraulic Restriction Layers

Infiltration pathways may need to be restricted due to the close proximity of roads, foundations, or other infrastructure. A geomembrane liner, or other equivalent water proofing, may be placed along the vertical walls to reduce lateral flows. This liner should have a minimum thickness of 30 mils.

Planting/Storage Media

1) The planting media placed in the cell should achieve a long-term, in-place infiltration rate of at least 1 inch per hour. Higher infiltration rates are permissible. If the design long-term, in-place infiltration rate of the soil exceeds 12 inches per hour, documentation should be provided to demonstrate that the media will adequately address pollutants of concern at a higher flowrate. Bioinfiltration soil shall also support vigorous plant growth.

2) Planting media should consist of 60 to 80% fine sand and 20 to 40% compost.

3) Sand should be free of wood, waste, coating such as clay, stone dust, carbonate, etc., or any other deleterious material. All aggregate passing the No. 200 sieve size should be non-plastic. Sand for bioinfiltration should be analyzed by an accredited lab using #200, #100, #40, #30, #16, #8, #4, and 3/8 sieves (ASTM D 422 or as approved by the local permitting authority) and meet the following gradation (Note: all sands complying with ASTM C33 for fine aggregate comply with the gradation requirements below):

Sieve Size (ASTM D422)	% Passing (by weight)	
	Minimum	Maximum
3/8 inch	100	100
#4	90	100
#8	70	100
#16	40	95
#30	15	70
#40	5	55
#100	0	15
#200	0	5

Note: the gradation of the sand component of the media is believed to be a major factor in the hydraulic conductivity of the media mix. If the desired hydraulic conductivity of the media cannot be achieved within the specified proportions of sand and compost (#2), then it may be necessary to utilize sand at the coarser end of the range specified in above ("minimum" column).

4) Compost should be a well decomposed, stable, weed free organic matter source derived from waste materials including yard debris, wood wastes, or other organic materials not including manure or biosolids meeting standards developed by the US Composting Council (USCC). The product shall be certified through the USCC Seal of Testing Assurance (STA) Program (a compost testing and information disclosure program). Compost quality should be verified via a lab analysis to be:

- Feedstock materials shall be specified and include one or more of the following: landscape/yard trimmings, grass clippings, food scraps, and agricultural crop residues.
- Organic matter: 35-75% dry weight basis.
- Carbon and Nitrogen Ratio: 15:1 < C:N < 25:1
- Maturity/Stability: shall have dark brown color and a soil-like odor. Compost exhibiting a sour or putrid smell, containing recognizable grass or leaves, or is hot (120 F) upon delivery or rewetting is not acceptable.

- Toxicity: any one of the following measures is sufficient to indicate non-toxicity:
  - NH4:NH3 < 3
  - Ammonium < 500 ppm, dry weight basis
  - Seed Germination > 80% of control
  - Plant trials > 80% of control
  - e. Solvita® > 5 index value
- Nutrient content:
  - Total Nitrogen content 0.9% or above preferred
  - Total Boron should be <80 ppm, soluble boron < 2.5 ppm
- Salinity: < 6.0 mmhos/cm
- pH between 6.5 and 8 (may vary with plant palette)

Compost for bioinfiltration should be analyzed by an accredited lab using #200, ¼ inch, ½ inch, and 1 inch sieves (ASTM D 422 or as approved by the local permitting authority) and meet the following gradation:

Sieve Size (ASTM D422)	% Passing (by weight)	
	Minimum	Maximum
1 inch	99	100
½ inch	90	100
¼ inch	40	90
#200	2	10

Tests should be sufficiently recent to represent the actual material that is anticipated to be delivered to the site. If processes or sources used by the supplier have changed significantly since the most recent testing, new tests should be requested.

Note: the gradation of compost used in bioinfiltration media is believed to play an important role in the saturated hydraulic conductivity of the media. To achieve a higher saturated hydraulic conductivity, it may be necessary to utilize compost at the coarser end of this range ("minimum" column). The percent passing the #200 sieve (fines) is believed to be the most important factor in hydraulic conductivity.

In addition, a coarser compost mix provides more heterogeneity of the bioinfiltration media, which is believed to be advantageous for more rapid development of soil structure needed to support health biological processes. This may be an advantage for plant establishment with lower nutrient and water input.

5) The bioinfiltration area should be covered with 2 to 4 inches (average 3 inches) of mulch at the start and an additional placement of 1 to 2 inches of mulch should be added annually. *The intention is that to help sustain the nutrient levels, suppress weeds, retain moisture, and maintain infiltration capacity*.

Planting/Storage Media Design for Nutrient Sensitive Receiving Waters

1) Where the BMP discharges to receiving waters with nutrient impairments or nutrient TMDLs, the planting media placed in the cell should be designed with the specific goal of minimizing the potential for initial and long term leaching of nutrients from the media.

2) In general, the potential for leaching of nutrients can be minimized by:

    a. Utilizing stable, aged compost (as required of media mixes under all conditions).

    b. Utilizing other sources of organic matter, as appropriate, that are safe, non-toxic, and have lower potential for nutrient leaching than compost.

    c. Reducing the content of compost or other organic material in the media mix to the minimum amount necessary to support vigorous plant growth and healthy biological processes.

3) A landscape architect should be consulted to assist in the design of planting/storage media to balance the interests of plant establishment, water retention capacity (irrigation demand), and the potential for nutrient leaching. The following practices should be considered in developing the media mix design:

    a. The actual nutrient content and organic content of the selected compost source should be considered when specifying the proportions of compost and sand. The compost specification allows a range of organic content over approximately a factor of 2 and nutrient content may vary more widely. Therefore determining the actual organic content and nutrient content of the compost expected to be supplied is important in determining the proportion to be used for amendment.

    b. A commitment to periodic soil testing for nutrient content and a commitment to adaptive management of nutrient levels can help reduce the amount of organic amendment that must be provided initially. Generally, nutrients can be added planting areas through the addition of organic mulch, but cannot be removed.

    c. Plant palettes and the associated planting mix should be designed with native plants where possible. Native plants generally have a broader tolerance for nutrient content, and can be longer lived in leaner/lower nutrient soils. An additional benefit of lower nutrient levels is that native plants will generally have less competition from weeds.

d. Nutrients are better retained in soils with higher cation exchange capacity (CEC). CEC can be increased through selection of organic material with naturally high CEC, such as peat, and/or selection of inorganic material with high CEC such as some sands or engineered minerals (e.g., low P-index sands, zeolites, rhyolites, etc). Including higher CEC materials would tend to reduce the net leaching of nutrients.

e. Soil structure can be more important than nutrient content in plant survival and biologic health of the system. If a good soil structure can be created with very low amounts of compost, plants survivability should still be provided. Soil structure is loosely defined as the ability of the soil to conduct and store water and nutrients as well as the degree of aeration of the soil. While soil structure generally develops with time, planting/storage media can be designed to promote earlier development of soil structure. Soil structure is enhanced by the use of amendments with high hummus content (as found in well-aged organic material). In addition, soil structure can be enhanced through the use of compost/organic material with a distribution of particle sizes (i.e., a more heterogeneous mix). Finally, inorganic amendments such as polymer beads may be useful for promoting aeration and moisture retention associated with a good soil structure. An example of engineered soil to promote soil structure can be found here:

http://www.hort.cornell.edu/uhi/outreach/pdfs/custructuralsoilwebpdf.pdf

f. Younger plants are generally more tolerant of lower nutrient levels and tend to help develop soil structure as they grow. Starting plants from smaller transplants can help reduce the need for organic amendments and improve soil structure. The project should be able to accept a plant mortality rate that is somewhat higher than starting from larger plants and providing high organic content.

g. With these considerations, it is anticipated that less than 10 percent compost amendment could be used, while still balancing plant survivability and water retention.

Plants

1) Plant materials should be tolerant of summer drought, ponding fluctuations, and saturated soil conditions for 48 to 96 hours.

2) It is recommended that a minimum of three types of tree, shrubs, and/or herbaceous groundcover species be incorporated to protect against facility failure due to disease and insect infestations of a single species.

3) Native plant species and/or hardy cultivars that are not invasive and do not require chemical inputs should be used to the maximum extent practicable.

Operations and Maintenance

Bioinfiltration areas require annual plant, soil, and mulch layer maintenance to ensure optimum infiltration, storage, and pollutant removal capabilities. In general, bioinfiltration maintenance requirements are typical landscape care procedures and include:

1) Watering: Plants should be drought-tolerant. Watering may be required during prolonged dry periods after plants are established.

2) Erosion control: Inspect flow entrances, ponding area, and surface overflow areas periodically, and replace soil, plant material, and/or mulch layer in areas if erosion has occurred (see Appendix I for a bioinfiltration inspection and maintenance checklist). Properly designed facilities with appropriate flow velocities should not have erosion problems, except perhaps in extreme events. If erosion problems occur, the following should be reassessed: (1) flow velocities and gradients within the cell, and (2) flow dissipation and erosion protection strategies in the pretreatment area and flow entrance. If sediment is deposited in the bioinfiltration area, immediately determine the source within the contributing area, stabilize, and remove excess surface deposits.

3) Plant material: Depending on aesthetic requirements, occasional pruning and removing of dead plant material may be necessary. Replace all dead plants and if specific plants have a high mortality rate, assess the cause and, if necessary, replace with more appropriate species. Periodic weeding is necessary until plants are established. The weeding schedule should become less frequent if the appropriate plant species and planting density have been used and, as a result, undesirable plants excluded.

4) Nutrients and pesticides: The soil mix and plants should be selected for optimum fertility, plant establishment, and growth. Nutrient and pesticide inputs should not be required and may degrade the pollutant processing capability of the bioinfiltration area, as well as contribute pollutant loads to receiving waters. By design, bioinfiltration facilities are located in areas where phosphorous and nitrogen levels are often elevated and these should not be limiting nutrients. If in question, have soil analyzed for fertility.

5) Mulch: Replace mulch annually in bioinfiltration facilities where heavy metal deposition is likely (e.g., contributing areas that include industrial and auto dealer/repair parking lots and roads). In residential lots or other areas where metal deposition is not a concern, replace or add mulch as needed to maintain a 2 to 3 inch depth at least once every two years.

6) Soil: Soil mixes for bioinfiltration facilities are designed to maintain long-term fertility and pollutant processing capability. Estimates from metal attenuation research suggest that metal accumulation should not present an environmental

concern for at least 20 years in bioinfiltration systems. Replacing mulch in bioinfiltration facilities where heavy metal deposition is likely provides an additional level of protection for prolonged performance. If in question, have soil analyzed for fertility and pollutant levels.

RWH-1: Rainwater Harvesting

Rainwater harvesting BMPs capture and store stormwater runoff for later use. These BMPs are engineered to store a specified volume of water with no surface discharge until this volume is exceeded. Storage facilities that can be used to harvest rainwater include cisterns (above ground tanks), open storage reservoirs (e.g., ponds and lakes), and underground storage devices (tanks, vaults, pipes, arch spans, and proprietary storage systems). Uses of captured water may potentially include irrigation demand, indoor non-potable demand, industrial process water demand, or other demands. Rainwater harvesting systems typically include several components: (1) methods to divert runoff to the storage device, (2) an overflow for when the storage device is full, and (3) a distribution system to get the water to where it is intended to be used. Harvesting systems typically include pretreatment to remove large sediment and vegetative debris. Systems used for internal uses may require an additional level of treatment prior to use.

Cistern

Photo Credit: MetaEfficient

Application

- Any type of land use, provided adequate water demand

Preventative Maintenance

- Debris and sediment removal
- After-rain inspections

Limitations

Rainwater harvesting may be used to meet all of the 5% EIA requirement if reliable demand is available. Rainwater harvesting is not required to be used if the available demands do not meet the volume required for 80% capture using a 72 hour drawdown time.

Design Criteria

Specific considerations for cistern rainwater harvesting systems include:

- Cisterns should include screens on gutters and downspouts to remove vegetative debris and sediment from the runoff prior to entering the cistern.
- Above-ground cisterns should be secured in place.
- Above-ground cisterns should not be located on uneven or sloped surfaces; if installed on a sloped surface, the base where the cistern will be installed should be leveled and designed for the weight of the filled cistern prior to installation.
- Child-resistant covers and mosquito screens should be placed on all water entry holes.
- A first flush diverter may be installed so that initial runoff bypasses the cistern. Where a first flush diverter is used, the diverted flows must be directed to a pervious area so that no runoff is produced or another form of treatment must be provided for this flow.
- Above-ground cisterns should be installed in a location with easy access for maintenance or replacement.

Specific considerations for underground detention include:

- Access entry covers (36” diameter minimum) should be locking and within 50 feet of all areas of the detention tank.
- In cases where the detention facility provides sediment containment, the facility should be laid flat and there should be at least ½ foot of dead storage within the tank or vault.
- Outlet structures should be designed using the 100-year storm as overflow and should be easily accessible for maintenance activities.
- For detention facilities beneath roads and parking areas, structural requirements should meet H20 load requirements.
- In cases where groundwater may cause flotation, these forces should be counteracted with backfill, anchors, or other measures.

- Underground detention facilities should be installed on consolidated and stable native soil; if the facility is constructed in fill slopes, a geotechnical analysis should be performed to ensure stability.

General considerations include:

- In cases where there is non-potable indoor demand, proper pretreatment measures should be installed such as pre-filtration, cartridge filtration, and/or disinfection (which can also be provided between the cistern and point of use).
- Plumbing systems should be installed in accordance with the current California Building and Plumbing Codes (CBC – part of California Code of Regulations, Title 24).
- Underground detention facilities can be incorporated into a treatment train to provide initial or supplemental storage to other detention storage facilities and/or infiltration BMPs.
- Treatment of the captured rainwater (i.e. disinfection) may be required depending on the end use of the water.

Rainwater harvesting uses include:

- Harvested rainwater can be used for irrigation and other non-potable uses (if local, State, and Federal ordinances allow). The use of captured stormwater allows a reduced demand on the potable water supply. Cross-contamination should be prevented when make-up water is required for rainwater use demand by providing a backflow prevention system on the potable water supply line and/or an air gap.
- Irrigation Use
  - Subsurface (or drip) irrigation should not require disinfection pretreatment prior to use; other irrigation types, such as spray irrigation, may require additional pre-treatment prior to use
  - Selecting native and/or drought tolerant plants for landscaped area will reduce irrigation demand; however, they are still recommended for use.
- Domestic Use
  - Domestic uses may include toilet flushing and clothes washing (if local, State, and Federal ordinances allow).
  - Pretreatment requirements per local, State, or Federal codes and ordinances may apply.
- Other Non-Potable Uses

- Other potential non-potable uses may include vehicle/equipment washing, evaporative cooling, industrial processes, and dilution water for recycled water systems.

Sizing Criteria

The effectiveness of rainwater harvesting (RWH) systems is a function of tributary area, storage volume, demand patterns and magnitudes, and operational regime. If either of the latter two factors are too complex, simple design criteria metrics are not possible. The rainwater harvesting design criteria provided in this Fact Sheet are intended for the evaluation of systems that have relatively simple demand regimes and passive operation. If the answer to any of the following complexity screening questions is yes, a site-specific evaluation of rainwater harvesting effectiveness should be completed using a continuous simulation model with a long-term precipitation record.

Complexity Screening Questions:

- Does the proposed system have seasonally-varying demand other than irrigation?
- Will the system be operated by advanced control systems or otherwise actively controlled?
- Does the operational regime call for the system be shut down at any time during the rainy season?

Effectiveness of a harvesting system for retaining the SQDV depends on the cistern's effective storage capacity (i.e., the volume available for storage at the beginning of each event). Therefore, the required storage volume varies based on precipitation and demand. Using the following sizing charts, cisterns should be sized to achieve 80 percent capture efficiency. These nomographs are based on continuous simulation performed in EPA SWMM using precipitation and ET records representative of lowland regions (Oxnard Airport Precipitation Gauge, El Rio Spreading Grounds ET station) and mountainous regions (Ojai-Stewart Canyon Precipitation Gauge, Matilja ET Station) of the County.

Instructions for determining required cistern volume and demand are provided below:

Step 1: Determine Required Rainwater Harvesting Design Volume (RWHDV)

Note that a rainwater harvesting system sized for 80% capture runoff (as determined by continuous modeling), which can draw down in 72 hours is required to meet the 5% EIA standard. If the demand required to draw a tank sized for these parameters is not available, rainwater harvesting is not mandated for use. Partial capture of runoff is allowable if rainwater harvesting is desired for use. Sizing instructions for partial capture are included in Step 3.

1) Determine the design storm required for 80% capture with a 72 hour drawdown time by selecting the project region (lowland or mountainous), then determining where the 72 hour drawdown curve intersects the 80% capture line. Pivot down from this intersection to the x axis to read the design storm, d_{design}.

2) Determine the required rainwater harvesting system volume using the following equation:

$$RWHDV = C*(d_{design}/12)*A_{retain} \qquad \text{(Equation 6-19)}$$

Where:

RWHDV	=	rainwater harvesting design volume (acre-ft)
C	=	runoff coefficient, calculated using Appendix E and the site imperviousness
d_{design}	=	design storm required for 80% capture with a 72 hour drawdown time, estimated as described in 1) (inches)
A_{retain}	=	the drainage area from which runoff must be retained (acres)

Step 2: Determine the Required Daily Demand to Achieve 80% Capture

1) The required daily demand to achieve 80% capture of runoff can be calculated as follows:

$$Demand = [RWHDV/(72/24)] * (325{,}851) \qquad \text{(Equation 6-20)}$$

Where:

Demand	=	required project daily demand to draw down rainwater harvesting system sized for 80% capture in 72 hours (gallons)
RWHDV	=	rainwater harvesting design volume (acre-ft), from Step 1 above

If the project daily demand is less than the Demand calculated, the project is not required to utilize rainwater harvesting. If rainwater harvesting is desired for use for partial retention, if a longer drawdown time is desired, or if a predetermined daily demand is to be used, refer to Steps 3 and 4 below.

Step 3: Determine RWHDV for Partial Retention or a Longer Drawdown Time

1) Calculate RWHDV for selected combination of % capture and drawdown time using nomographs and the following equation:

$$RWHDV = C*(d_{design}/12)*A_{retain} \quad \text{(Equation 6-21)}$$

Where:

RWHDV	=	rainwater harvesting design volume (acre-ft)
C	=	runoff coefficient, calculated using Appendix E and the site imperviousness
d_{design}	=	design storm required for selected % capture and drawdown time (inches)
A_{retain}	=	the drainage area from which runoff must be retained (acres)

2) Determine the required daily demand for the selected capture efficiency and/or drawdown time:

$$Demand = [RWHDV/(t_{drawdown}/24)] * (325{,}851) \quad \text{(Equation 6-22)}$$

Where:

Demand	=	required project daily demand to draw down rainwater harvesting system sized for 80% capture in 72 hours (gallons)
RWHDV	=	rainwater harvesting design volume (acre-ft), from 1) above
$t_{drawdown}$	=	selected drawdown time (hours)

Step 4: Determine RWHDV for a Predetermined Daily Demand

1) Determine the daily demand requirement in acre-feet (1 acre-foot = 325,851 gallons).

2) Calculate the required RWHDV for the desired drawdown time using the following equation:

$$RWHDV = Demand *(t_{drawdown}/24) \quad \text{(Equation 6-23)}$$

Where:

Demand	=	required project daily demand (acre-feet)
RWHDV	=	rainwater harvesting design volume (acre-ft)
$t_{drawdown}$	=	selected drawdown time (hours)

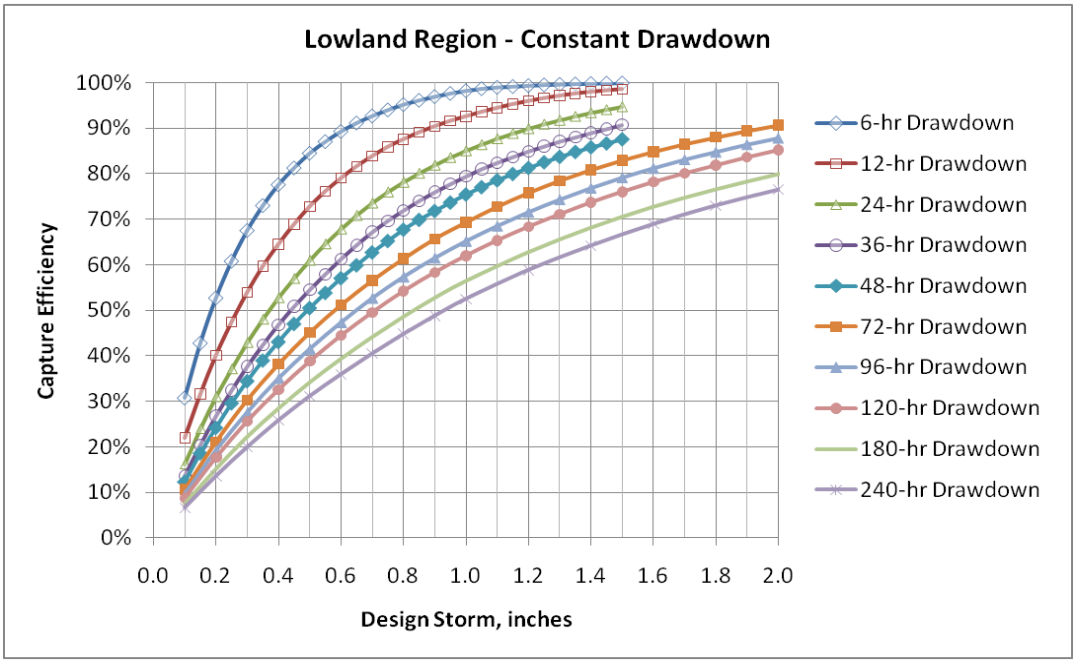
Lowland Region - Constant Drawdown
Capture Efficiency
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
Design Storm, inches
6-hr Drawdown
12-hr Drawdown
24-hr Drawdown
36-hr Drawdown
48-hr Drawdown
72-hr Drawdown
96-hr Drawdown
120-hr Drawdown
180-hr Drawdown
240-hr Drawdown

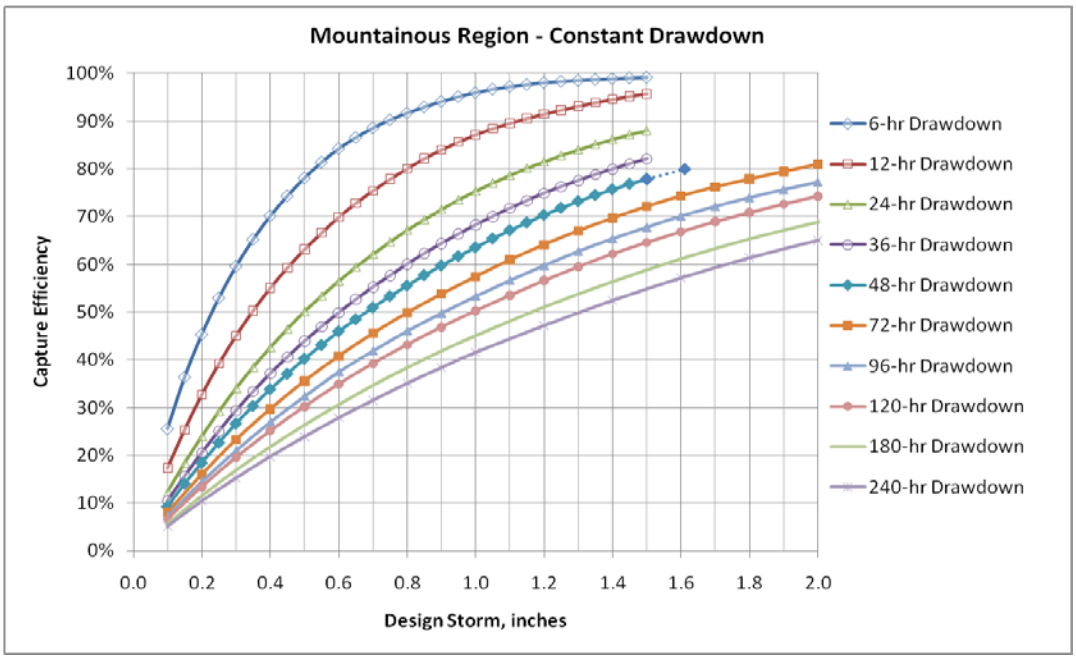
Mountainous Region - Constant Drawdown
Capture Efficiency
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
Design Storm, inches
6-hr Drawdown
12-hr Drawdown
24-hr Drawdown
36-hr Drawdown
48-hr Drawdown
72-hr Drawdown
96-hr Drawdown
120-hr Drawdown
180-hr Drawdown
240-hr Drawdown

Operations and Maintenance

1) Inspect storage facilities, associated pipes, and valve connections for leaks.

2) Clean gutters and filters of debris that has accumulated and is obstructing flow into the storage facility.

3) Clean and remove accumulated sediment annually.

4) Check cisterns for stability and anchor if necessary.

5) If the storage device is underground, ensure that a manhole is accessible, operational, and secure.

ET-1: Green Roof

Green roofs (also known as eco-roofs and vegetated roof covers) are roofing systems that layer a soil/vegetative cover over a waterproofing membrane. Green roofs rely on highly porous media and moisture retention layers to store intercepted precipitation and to support vegetation that can reduce the volume of stormwater runoff via evapotranspiration. There are two types of green roofing systems: extensive, which is a light-weight system; and intensive, which is a heavier system that allows for larger plants but requires additional structural support.

Green Roof Examples

Photo Credits:

1. Milwaukee Department of Environmental Sustainability;

2. Geosyntec Consultants

Application

- Building roofs
- Outdoor eating area roofs
- Parking structure or turnaround roofs

Preventative Maintenance

- Weeding and pruning
- Leaf and debris removal
- Regular membrane inspection
- Drain cleanout

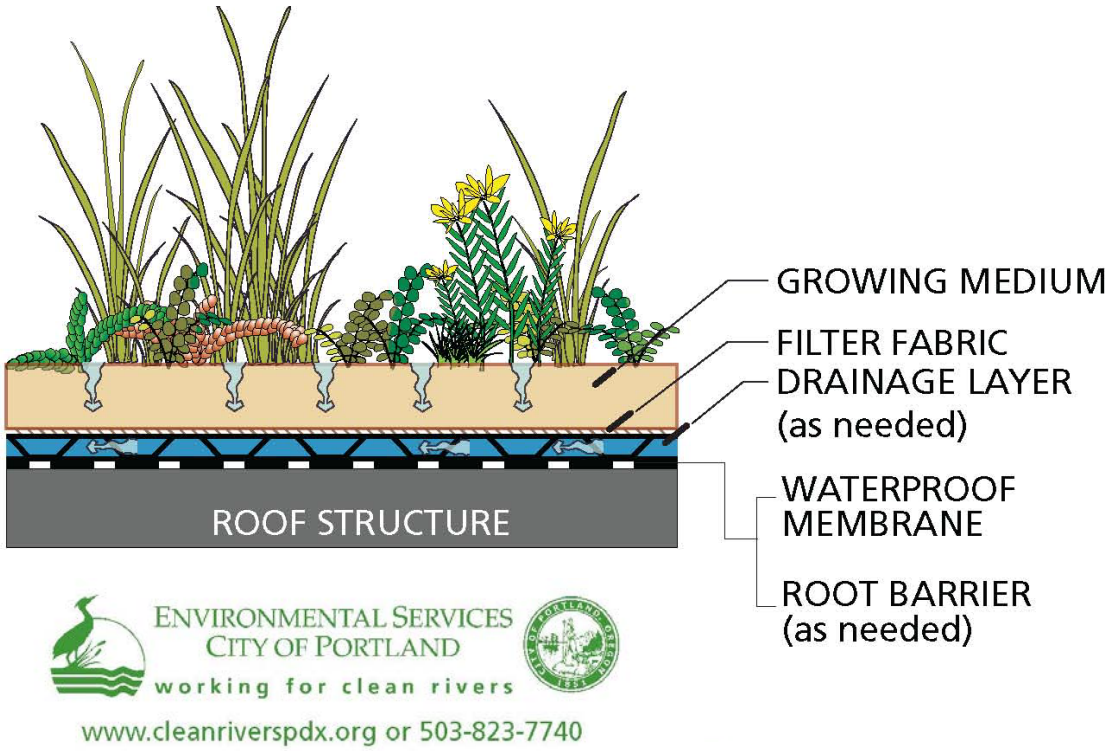

Exhibit A: Green Roof Schematic Courtesy of Portland, OR Environmental Services Department

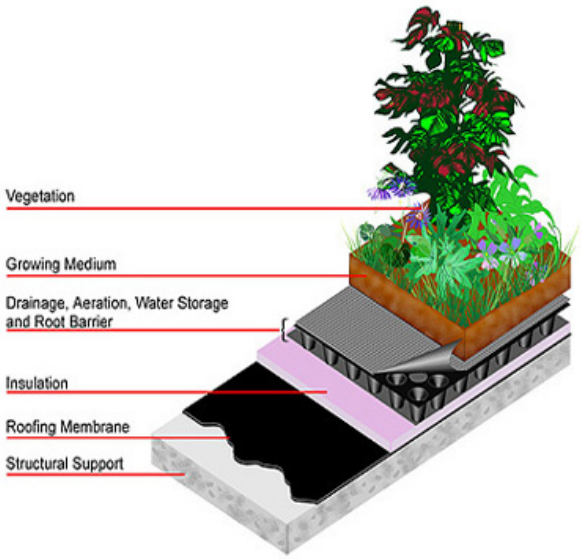

Exhibit B: Green Roof Schematic Courtesy of American Wick

Geosyntec consultants

Figure 6-9: Green Roofs

Limitations

The following describes additional site suitability recommendations and limitations for green roofs.

- Typically not used for steep roofs (>25%); and
- Structural roof support must be sufficient to support additional roof weight.

Design Criteria

Green roofs should be designed according to the requirements listed in Table 6-17 and outlined in the section below.

Table 6-17: Green Roof Design Criteria

Design Parameter	Unit	Design Criteria
Soil depth range	inch	2 – 6
Saturated soil weight	lbs. / sq. ft.	10 – 25
Maximum roof slope	%	25
Minimum roof slope	--	Flat
Vegetation type	--	Varies (see vegetation section below)
Vegetation height	--	Varies (see vegetation section below)

Sizing

Green roofs may provide quantifiable reduction in volume. However, they are not explicitly sized to meet the water quality treatment requirements. Rather, the volume reduction is accounted for implicitly in sizing calculations for the treatment BMPs for the remainder of the site by assuming that the roof area is pervious rather than impervious when calculating a runoff coefficient for the site.

Green Roof Components

Structural Support

The first requirement that must be met before installing a green roof is the structural support of the roof. The roof must be able to support the additional weight of the soil, water, and vegetation. A licensed structural engineer should be consulted to determine the proposed structural support during the design phase.

Waterproof Roofing Membrane

Waterproof roofing membrane is an integral part of a green roofing system. The waterproof membrane prevents the roof runoff from penetrating and damaging the roofing material. There are many materials available for this purpose and come in various forms (i.e., rolls, sheets, liquid) and exhibit different characteristics (e.g., flexibility, strength, etc.). Depending on the type of membrane chosen a root barrier may be required to prevent roots from compromising the integrity of the membrane.

Drainage Layer

Depending on the design of the roof, a drainage layer may be required to convey the excess runoff from of the roof. If a drainage layer is needed, there are numerous options including a gravel layer (which may require additional structural support), and many styles and types of plastic drainage layers.

Soil Considerations

The soil layer is an important factor in the construction and operation of green roofs. The soil layer must have excellent drainage, not be too heavy when saturated, and be adequately fertile as a growing medium for plants. Many companies sell their own proprietary soil mixes. However, a simple mix of ¼ topsoil, ¼ compost, and the remainder pumice perlite may be used for many applications. Other soil amendments may be substituted for the compost and the pumice perlite. The soil mix used should not contain any clay.

Vegetation

Green roofs must be vegetated in order to provide adequate treatment of runoff via filtration and evapotranspiration. Vegetation, when chosen and maintained appropriately, also improves the aesthetics of a site. Green roofs should be vegetated with a mix of erosion-resistant plant species that effectively bind the soil and can withstand the extreme environment of rooftops. A diverse selection of low growing plants that thrive under the specific site, climatic, and watering conditions should be identified. A mixture of drought-tolerant, self-sustaining (perennial or self-sowing without need for fertilizers, herbicides, and or pesticides) is most effective in the Ventura County region. Plants selected should also be low maintenance and able to withstand heat, cold, and high winds. Native or adapted sedum/succulent plants are preferred because they generally require less fertilizer, limited maintenance, and are more drought resistant than exotic plants. When appropriate, green roofs may be planted with larger plants. However, this depends on structural support and soil depth.

The following provides additional vegetation guidance for green roofs.

1) For extensive roofs, trees or shrubs may be used as long as the increased soil depth required may be supported.

2) Irrigation is required if the seed is planted in spring or summer. The use of a permanent smart (self-regulating) irrigation system or other watering system, may help provide maximal water quality performance. Drought-tolerant plants should be specified to minimize irrigation requirements. For projects seeking "High Performance Building" recognition, ASHRAE Standard 189.1 states that potable water cannot be used for irrigating green roofs after they are established.

3) Locate the green roof vegetation in an area without excessive shade to avoid poor vegetative growth. For moderately shaded areas, shade tolerant plants should be used.

4) A relevant plant list should be provided by a landscape professional and used as a guide to support project-specific planting recommendations, including recommendations on appropriate plants, fertilizer, mulching applications, and irrigation requirements (if any) to ensure healthy vegetation growth.

Drain

1) There must be a drain pipe (gutter) to convey runoff (both overflow and underdrain flow, if appropriate) safely from the roof to another basic or stormwater runoff BMP, a pervious area, or the stormwater conveyance system.

Construction Considerations

1) Building structure must be adequate to hold the additional weight of the soil, retained water, and plants.

2) Plants should be selected carefully to minimize maintenance and function properly.

Operations and Maintenance

1) During the establishment period, green roofs may need irrigation and occasional light fertilization until the plants have fully established themselves. Once healthy and fully established, properly selected climate-appropriate plants will no longer need irrigation except during extreme drought.

2) Weeding during the establishment period may be required to ensure proper establishment of the desired vegetation. Once established and assuming proper selection of vegetation, the vegetation should not require any preventative maintenance.

3) The roofing membrane should be inspected routinely, as it is a crucial element of the green roof. In addition, preventative inspection of the drainage paths is required to ensure that there are no clogs in the system. If a green roof is not properly draining, the moisture in the system may cause the roof to leak and/or the plants to drown or rot. Leaks in the roof may occur not only due to improper drainage, but also if the incorrect combination of waterproofing barrier, root barrier, and drainage systems

are selected. Leak inspections in the roofing system are advised, especially in locations prone to leaks, such as at all joints.

4) Inspect green roofs for erosion or damage to vegetation after every storm greater than 0.75 inches and at the end of the wet season to schedule summer maintenance and in the fall to ensure readiness for winter. Additional inspection after periods of heavy runoff is recommended. Green roofs should be checked for debris, litter, and signs of clogging.

5) Replanting and/or reseeding of vegetation may be required for reestablishment.

6) Vegetation should be healthy and dense enough to provide filtering while protecting underlying soils from erosion.

7) Fallen leaves and debris from deciduous plant foliage should be removed.

8) Invasive vegetation, such as Alligatorweed (*Alternanthera philoxeroides*), Halogeton (*Halogeton glomeratus*), Spotted Knapweed (*Centaurea maculosa*), Giant Reed (*Arundo donax*), Castor Bean (*Ricinus communis*), Perennial Pepperweed (*Lepidium latifolium*), and Yellow Starthistle (*Centaurea solstitalis*) should be removed and replaced with non-invasive species. For more information on invasive weeds, including biology and control of listed weeds, look at the encycloweedia located at the California Department of Food and Agriculture website or the California Invasive Plant Council website at www.cal-ipc.org.

9) Dead vegetation should be removed if greater than 10% of the area coverage. Vegetation should be replaced and established before the wet season to maintain cover density and control erosion where soils are exposed.

ET-2: Hydrologic Source Control BMPs

Hydrologic source control (HSC) BMPs are simple BMPs that are highly integrated with the site design to reduce runoff volume. The practices described in this fact sheet include impervious area dispersion, street trees, and rain barrels.

Application

- Building roofs
- Sidewalks and patios
- Landscaping hardscapes

Preventative Maintenance

- Weeding and pruning
- Leaf and debris removal

Hydrologic Source Control Examples

Photo Credits:

1. http://www.auburn.edu/projects/sustainability/website/newsletter/0910.php;

2. Geosyntec Consultants;

3. toronto.ca/environment/water.htm

Accounting for Hydrologic Source Controls in Hydrologic Calculations

The effects of HSC BMPs are accounted for in hydrologic calculations as an adjustment to the storm depth used in the SQDV calculations described in Section 2. Runoff volume calculations are performed exactly as described in Section 2, with the exception that the storm depth used in the calculation is adjusted prior to the calculation. Adjustments are based on the type and magnitude of HSC BMPs employed for the drainage area per guidance outlined in this Fact Sheet.

EXAMPLE 6.1: ACCOUNTING FOR HSCS IN HYDROLOGIC CALCULATIONS

Given:

- A drainage area consists of a 1 acre building roof surrounded by 0.25 acres of landscaping (80 percent composite imperviousness);
- The drainage from the roof is spread uniformly over the entire pervious area via splash pads and level spreaders;
- Soils are moderately well drained and have a shallow slope;
- For the purpose of this example, assume the hydrologic source control adjustment for this configuration of disconnected downspouts is 0.3 inches. For an actual project, hydrologic source control adjustment would be calculated based on instructions in this section; and
- The unadjusted design storm depth at the project site is 0.75 inches.

Result:

1) The designer uses 0.75 inches – 0.3 inches = 0.45 inches in the calculation of SQDV.

Impervious Area Dispersion

Impervious area dispersion refers to the practice of routing runoff from impervious areas, such as rooftops, walkways, and patios, onto the surface of adjacent pervious areas. Runoff is dispersed uniformly via splash block or dispersion trench and soaks into the ground as it moves slowly across the surface of the pervious area. Minor ponding may occur, but it is not the intent of this practice to actively promote localized on-lot infiltration, which should be designed as an infiltration BMP (see INF-1 through INF-6 above).

Design Considerations

1) Not likely to result in net increased infiltration over existing condition for previously pervious sites, but has potential to result in some geotechnical hazards associated with infiltration.

2) Significant pervious area should be available, at a ratio of at least 1 part pervious area capable of receiving flow to 5 parts impervious.

3) Pervious area receiving flow should have a slope ≤ 2 percent and path lengths of ≥ 10 feet per 1000 sf of impervious area.

4) Overflow from the pervious area up to the SQDV should be directed to a Retention BMP, Biofiltration BMP, or Treatment Control Measure. Larger flows should be directed to the storm drain system.

5) Soils in the pervious area should be preserved in their natural condition or improved with soil amendments (see Soil Amendments below).

6) Impervious area disconnection is an HSC that may be used as the first element in any treatment train.

7) The use of impervious area disconnection reduces the sizing requirement for downstream Retention BMPs, Biofiltration BMPs, and/or Treatment Control Measures.

Calculating HSC Retention Volume

1) The retention volume provided by downspout dispersion is a function of the ratio of impervious to pervious area.

2) Determine flow patterns in pervious area and estimate footprint of pervious area receiving dispersed flow. Calculate the ratio of pervious to impervious area.

3) Check soil conditions using the checklist below; amend if necessary.

4) Look up the storm retention depth (d_{HSC}), from the chart to the right.

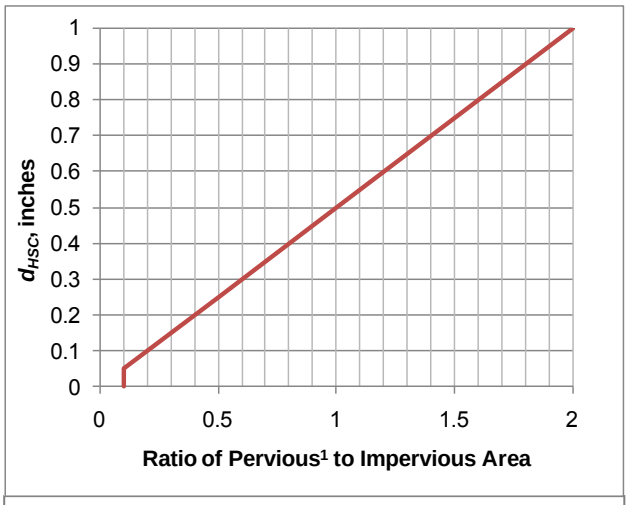

[1] Pervious area used in calculation should only include the pervious area receiving flow, not pervious area receiving only direct rainfall or upslope pervious drainage.

5) The max d_{HSC} is equal to the design storm depth for the project site.

Soil Condition Checklist

1) Soil should have a maximum slope of 2 percent.

2) Landscaping should be well-established.

3) Amended soils should consist of: 60 to 70% sand, 15 to 25% compost, 10 to 20% clean topsoil. The organic content of the soil mixture should be 8 to 12%; the pH range should be 5.5 to 7.5.

Additional References

- SMC LID Manual (pp 131): http://www.lowimpactdevelopment.org/guest75/pub/All_Projects/SoCal_LID_Manual/SoCalLID_Manual_FINAL_040910.pdf
- City of Portland Bureau of Environmental Services. 2010. How to manage stormwater – Disconnect Downspouts: http://www.portlandonline.com/bes/index.cfm?c=43081&a=177702
- Seattle Public Utility: http://www.cityofseattle.org/util/stellent/groups/public/@spu/@usm/documents/webcontent/spu01_006395.pdf
- Thurston County, Washington State (pp 10): http://www.co.thurston.wa.us/wwm/Engineering_Standards/Drainage_Manual/PDFs/DG-5%20Roof%20Runoff%20Control.pdf

Amended Soils

A soil amendment is any material added to the upper layer of soil especially in the vicinity of the root zone soil to improve its physical properties, such as the water retention, permeability, water infiltration, drainage, aeration and structure. The goal is to provide a better environment for roots. To do its work, an amendment should be thoroughly mixed into the soil. If it is merely buried, its effectiveness is reduced and it will interfere with water and air movement and root growth.

Amending a soil is different from mulching, although many mulches also are used as amendments. A mulch is left on the soil surface. Its purpose is to reduce evaporation and runoff, inhibit weed growth, and create an attractive appearance. Mulches also moderate soil temperature, helping to warm soils in the spring and cool them in the summer. Mulches may be incorporated into the soil as amendments after they have decomposed to the point that they no longer serve their purpose.

Organic amendments, such as compost, increase soil organic matter content and offer many benefits. Organic matter improves soil aeration, water infiltration, and both water- and nutrient-holding capacity. Many organic amendments contain plant nutrients and act as organic fertilizers. Organic matter also is an important energy source for bacteria, fungi and earthworms that live in the soil.

Design Considerations

1) Landscaped and other developed pervious areas can be amended to improve evapotranspiration and soil moisture storage capacity.

2) Landscape and other developed pervious areas can be amended to increase infiltration rates in cases where the limiting infiltration horizon exists near the surface of the soil column.

3) Soil amendments are common components of several Retention BMPs, Biofiltration BMPs, and Treatment Control Measures, including infiltration basins, bioretention, vegetated swales, filter strips, planter boxes, green roofs, dry extended detention basins, wet retention basins, and constructed treatment wetlands.

4) Compost, soil conditioners, and fertilizers should be rototilled into the native soil to a minimum depth of 6 inches; 12 inches preferred.

5) All soil amendments shall be free of sticks, glass, plastic, metal, debris larger than 1 inch, and other deleterious material.

6) Compost shall meet criteria listed in the guidelines for planting and storage media.

Calculating HSC Retention Volume

No retention credit is given for amended soils alone. Amended soils should be used to increase the retention volume of Retention BMPs, Biofiltration BMPs, and Treatment Control Measures.

Additional References

- San Diego County LID Handbook Appendix 4 (Factsheet 30): http://www.sdcounty.ca.gov/dplu/docs/LID-Appendices.pdf

- Colorado State University Extension website: http://www.ext.colostate.edu/pubs/garden/07235.html

Street Trees

By intercepting rainfall, trees can provide several aesthetic and stormwater benefits including peak flow control, increased infiltration and evapotranspiration, and runoff temperature reduction. The volume of precipitation intercepted by the canopy reduces the treatment volume required for downstream treatment BMPs. Shading reduces the heat island effect as well as the temperature of adjacent impervious surfaces over which stormwater flows, and thus reduces the heat transferred to the downstream waterbody. Tree roots also strengthen the soil structure and provide infiltrative pathways, simultaneously reducing erosion potential and enhancing infiltration.

Design Considerations

1) Street trees can be incorporated along sidewalks, streets, parking lots, or driveways.

2) Street trees can be used in combination with bioretention systems along medians or in traffic calming bays.

3) There should be sufficient space available to accommodate both the tree canopy and the root system.

4) The mature tree canopy, height, and root system should not interfere with subsurface utilities, overhead powerlines, buildings and foundations, or other existing or planned structures.

5) Depending on space constraints, a 20 to 30 foot canopy (at maturity) is recommended for stormwater mitigation.

6) Native, drought-tolerant species should be selected in order to minimize irrigation requirements and improve the long-term viability of the tree.

7) Trees should not impede pedestrian or vehicle sight lines.

8) Planting locations should receive adequate sunlight and wind protection. Other environmental factors should be considered prior to planting.

9) Soils should be preserved in their natural condition (if appropriate for planting) or restored via soil amendments. If necessary, a landscape architect should be consulted.

Calculating HSC Retention Volume

1) The retention volume provided by streets trees via canopy interception is dependent on the tree species, time of the year, and maturity.

2) To compute the retention credit, the expected impervious area covered by the full tree canopy after 4 years of growth should be computed (IA_{HSC}). The maximum retention depth credit for canopy interception (d_{HSC}) is 0.05 inches.

Additional References

- California Stormwater BMP Handbook: http://www.cabmphandbooks.com/Documents/Development/Section_3.pdf
- City of Los Angeles, Street Tree Division - Street Tree Selection Guide: http://bss.lacity.org/UrbanForestryDivision/StreetTreeSelectionGuide.htm
- Portland Stormwater Management Manual: http://www.portlandonline.com/bes/index.cfm?c=35122&a=55791
- San Diego County LID Handbook Fact Sheets: http://www.sdcounty.ca.gov/dplu/docs/LID-Appendices.pdf

Residential Rain Barrels

Rain barrels are above ground storage vessels that capture runoff from roof downspouts during rain events and detain that runoff for later use for irrigating landscaped areas.

Design Considerations

1) If detained water will be used for irrigation, sufficient vegetated areas and other impervious surfaces should be present in the drainage area.

2) Storage capacity and sufficient area for overflow dispersion should be accounted for.

3) Screens on gutters and downspouts to remove sediment and particles as the water enters the barrel or cistern should be provided.

4) Removable child-resistant covers and mosquito screening should be provided to prevent unwanted access.

5) Above-ground barrels should be secured in place.

6) Above-ground barrels should not be located on uneven or sloped surfaces. If installed on a sloped surface, the base where the rain barrel will be installed should be leveled prior to installation.

7) Overflow dispersion should occur greater than 5 feet from building foundations.

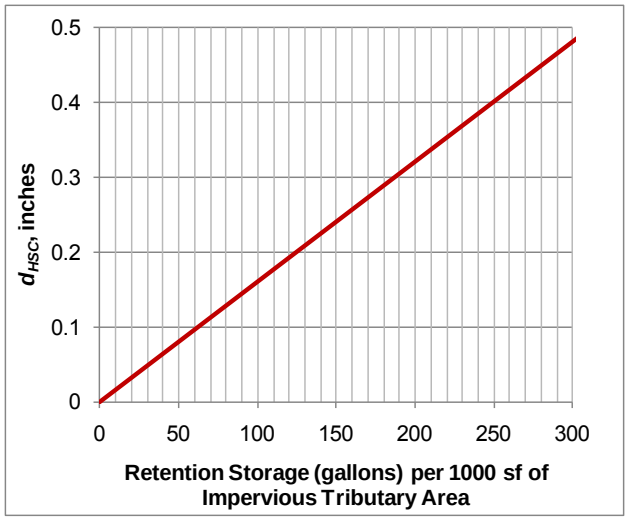

8) Dispersion should not cause geotechnical hazards related to slope stability.

9) Effective energy dissipation and uniform flow spreading methods should be employed to prevent erosion and facilitate dispersion.

10) Placement should allow easy access for regular maintenance.

Calculating HSC Retention Volume

1) The retention volume provided by rain barrels that are not actively managed can be computed as 50% of the total storage volume (e.g., 22.5 gallons for each 55 gallon barrel).

2) If the rain barrel is actively managed, then it should be treated as a cistern (see RWH-1).

3) Estimate the average retention volume per 1000 square feet impervious tributary area provided by rain barrels.

4) Look up the storm retention depth (d_{HSC}), from the chart to the right.

5) The max d_{HSC} is equal to the design storm depth for the project site.

Additional References

- Santa Barbara BMP Guidance Manual, Chapter 6: http://www.santabarbaraca.gov/NR/rdonlyres/91D1FA75-C185-491E-A882-49EE17789DF8/0/Manual_071008_Final.pdf
- County of Los Angeles LID Standards Manual: http://dpw.lacounty.gov/wmd/LA_County_LID_Manual.pdf
- SMC LID Manual (pp 114): http://www.lowimpactdevelopment.org/guest75/pub/All_Projects/SoCal_LID_Manual/SoCalLID_Manual_FINAL_040910.pdf
- San Diego County LID Handbook Appendix 4 (Factsheet 26): http://www.sdcounty.ca.gov/dplu/docs/LID-Appendices.pdf

BIO-1: Bioretention with Underdrain

Bioretention stormwater treatment facilities are landscaped shallow depressions that capture and filter stormwater runoff. These facilities function as a soil and plant based filtration device that removes pollutants through a variety of physical, biological, and chemical treatment processes. The facilities normally consist of a ponding area, mulch layer, planting soils, and plantings. As stormwater passes down through the planting soil, pollutants are filtered, adsorbed, and biodegraded by the soil and plants. Bioretention with an underdrain is a treatment control measures that can be used for areas with low permeability native soils or steep slopes. Bioretention may be designed without an underdrain to serve as a retention BMP in areas of high soil permeability (see INF-3 Bioretention) or partial retention/ partial biofiltration BMP (see INF-7: Bioinfiltration).

Bioretention in Parking Lots

Photo Credits: Geosyntec Consultants

Application

- Parking lots
- Roadway parkways and medians
- School entrances, courtyards, and walkways
- Playgrounds and sports fields

Preventative Maintenance

- Repair small eroded areas
- Remove trash and debris and rake surface soils
- Remove accumulated fine sediments, dead leaves, and trash
- Remove weeds and prune back excess plant growth
- Remove sediment and debris accumulation near inlet and outlet structures
- Periodically observe function under wet weather conditions

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Plan View
(Not to Scale)

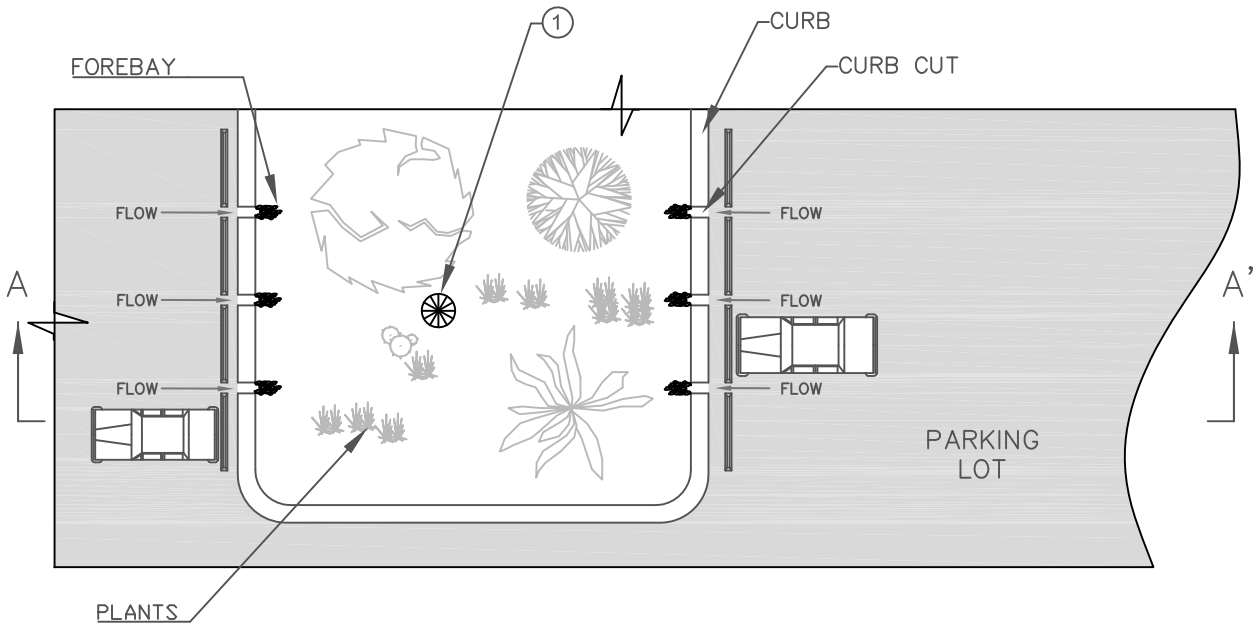

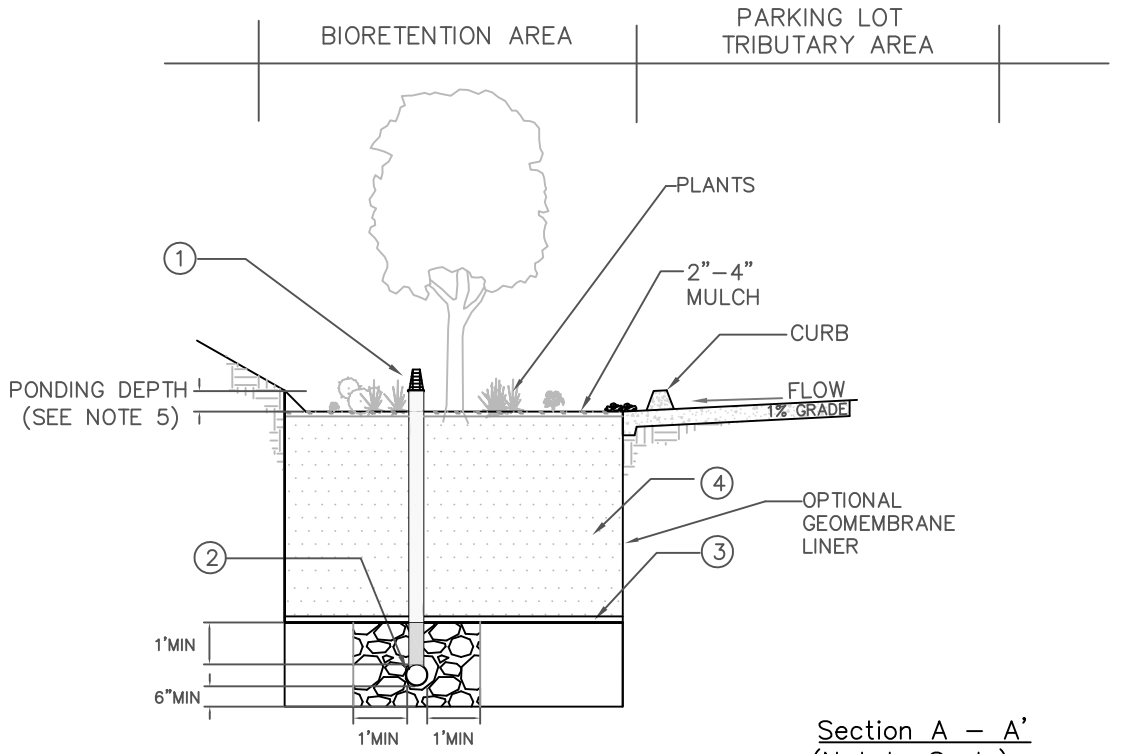

Section A – A'
(Not to Scale)

NOTES:

① OVERFLOW DEVICE: VERTICAL RISER OR EQUIVALENT.
② PERFORATED 6" MIN PVC PIPE UNDERDRAIN.
③ OPTIONAL CHOKING GRAVEL LAYER.
④ 2' MIN PLANTING MIX; 3' PREFERRED.
⑤ PONDING DEPTH 18" WITH FENCE; 6" WITHOUT FENCE.

Geosyntec consultants

Figure 6-10: Bioretention with Underdrain

Limitations

1) Vertical relief and proximity to storm drain - site must have adequate relief between land surface and storm drain to permit vertical percolation through the soil media and collection and conveyance in underdrain to storm drain system.

2) Depth to groundwater - shallow groundwater table may not permit complete drawdown between storms.

Design Criteria

Bioretention with an underdrain should be designed according to the requirements listed in Table 6-18 and outlined in the section below. BMP sizing worksheets are presented in Appendix E.

Table 6-18: Bioretention with an Underdrain Design Criteria

Design Parameter	Unit	Design Criteria
Stormwater quality design volume (SQDV)	acre-feet	See Section 2 and Appendix E for calculating SQDV.
Forebay	-	Forebay should be provided for all tributary surfaces that contain landscaped areas. Forebays should be designed to prevent standing water during dry weather and should be planted with a plant palette that is tolerant of wet conditions.
Maximum drawdown time of water ponded on surface	hours	72
Maximum drawdown time of surface ponding plus subsurface pores	hours	96 (72 preferred)
Maximum ponding depth	inches	18 inches
Minimum thickness of amended soils layer	feet	2 (3 preferred)
Minimum thickness of stabilized mulch	inches	2 to 4
Planting mix composition	-	60 to 80% fine sand, 20 to 40% compost
Underdrain sizing	-	6 inch minimum diameter; 0.5% minimum slope; slotted, polyvinyl chloride (PVC) pipe (PVC SDR 35 or approved equivalent); spacing shall be determined to provide

Design Parameter	Unit	Design Criteria
		capacity for maximum rate filtered through amended media
Gravel layer	-	A gravel bed should be provided around underdrain. Underdrain should have at least 1 foot of gravel installed to the sides and on top of the underdrain, and at least 0.5 feet of gravel installed below underdrain.
Overflow device	-	Required

Sizing Criteria

Bioretention facilities with underdrains shall be designed to capture and treat the SQDV. However because these systems commonly have a relatively high amended soil infiltration rate and shallow depth, these systems are typically capable of filtering a significant portion of the SQDV during a storm event. Therefore, a simplified routing approach is described in the following steps that accounts for the portion of the SQDV that is filtered during the storm event.

Step 1: Calculate the Design Volume

Bioretention facilities shall be sized to capture and biofilter the SQDV (see Section 2.3 and Appendix E).

Step 2: Determine the Design Percolation Rate

Sizing is based on the design saturated hydraulic conductivity (K_{sat}) of the amended soil layer. A target K_{sat} of 5 inches per hour is recommended for non-proprietary amended soil media. The media K_{sat} will decline between maintenance cycles as the surface becomes occluded and particulates accumulate in the amended soil layer. A factor of safety of 2.0 should be applied such that the resulting recommended design K_{sat} is 2.5 inches per hour. This value should be used for sizing unless sufficient rationale is provided to justify a higher design K_{sat}.

Step 3: Calculate the surface area

Determine the size of the required infiltrating surface by assuming the SQDV will fill the available ponding depth plus the void spaces in the media, based on the computed porosity of the filter media and aggregate layer.

1) Select a surface ponding depth (d_p) that satisfies geometric criteria and is congruent with the constraints of the site. Selecting a deeper ponding depth (18 inches maximum) generally yields a smaller footprint, however, it requires greater consideration for public safety, energy dissipation, and plant selection.

2) Compute time for selected ponding depth to filter through media:

$$t_{ponding} = \frac{d_p}{K_{design}} 12 \frac{in}{ft}$$ (Equation 6-24)

Where:

$t_{ponding}$	=	required drain time of surface ponding (≤ 72 hrs)
d_p	=	selected surface ponding water depth (ft)
K_{design}	=	media design saturated hydraulic conductivity (in/hr) (see Step 2, above)

If $t_{ponding}$ exceeds 72 hours, return to (1) and reduce surface ponding or increase media K_{design}. Otherwise, proceed to next step.

Note: In nearly all cases, $t_{ponding}$ will not approach 72 hours unless a low K_{design} is specified.

3) Compute depth of water that may be filtered during the design storm event as follows:

$$d_{filtered} = Minimum\left[\frac{K_{design} \times T_{routing}}{12 \, in/ft}, d_p\right]$$ (Equation 6-25)

Where:

$d_{filtered}$	=	depth of water that may be considered to be filtered during the design storm event (ft) for routing calculations; this value should not exceed the surface ponding depth (d_p)
K_{design}	=	design saturated hydraulic conductivity (in/hr) (see Step 2, above)
$T_{routing}$	=	storm duration that may be assumed for routing calculations; this should be assumed to be 3 hours unless rationale for an alternative assumption is provided
d_p	=	selected surface ponding water depth (ft)

The intention is that routing is important in the appropriate sizing of bioretention with underdrains. However, the depth of water considered to be filtered during the storm should be limited to the maximum ponding depth. This

results in designs that are robust to account for a variety of storm depths and durations. This limitation is for sizing calculations only. In reality, the depth that is filtered during a storm will vary based on storm depth, duration, and intensity. This TGM does not intend to limit the amount that may actually be filtered.

4) Calculate required infiltrating surface area (filter bottom area):

$$A_{req} = \frac{SQDV}{d_p + d_{filtered}} \qquad \text{(Equation 6-26)}$$

Where:

A_{req}	=	required infiltrating area (ft^2). Should be calculated at the contour corresponding to the mid ponding depth (i.e., $0.5 \times d_p$ from the bottom of the facility)
$SQDV$	=	stormwater quality design volume (ft^3)
d_p	=	selected surface ponding water depth (ft)
$d_{filtered}$	=	depth of water that can be considered to be filtered during the design storm event (ft) for routing calculations (See Equation 6-15)

5) Calculate total footprint required by including a buffer for side slopes and freeboard; A_{req} is calculated at the contour corresponding to the mid ponding depth (i.e., $0.5 \times d_p$ from the bottom of the facility).

Geometry

1) Minimum planting soil depth should be 2 feet, although 3 feet is preferred.

   The intention is that the minimum planting soil depth should provide a beneficial root zone for the chosen plant palette and adequate water storage for the stormwater quality design volume. A deeper soil depth will provide a smaller surface area footprint.

2) Bioretention should be designed to drain below the planting soil in less than 72 hours and completely drain from the underdrain in 96 hours (both starting from the end of inflow).

   The intention is that soils must be allowed to dry out periodically in order to restore hydraulic capacity to receive flows from subsequent storms, maintain infiltration rates, maintain adequate soil oxygen levels for healthy soil biota and vegetation, and to provide proper soil conditions for biodegradation and retention of pollutants.

Flow Entrance and Energy Dissipation

The following types of flow entrance can be used for bioretention cells:

1) Dispersed, low velocity flow across a landscape area. Dispersed flow may not be possible given space limitations or if the facility is controlling roadway or parking lot flows where curbs are mandatory.

2) Dispersed flow across pavement or gravel and past wheel stops for parking areas.

3) Curb cuts for roadside or parking lot areas: Curb cuts should include rock or other erosion protection material in the channel entrance to dissipate energy. Flow entrance should drop 2 to 3 inches from curb line and provide an area for settling and periodic removal of sediment and coarse material before flow dissipates to the remainder of the cell.

4) Pipe flow entrance: Piped entrances, such as roof downspouts, should include rock, splash blocks, or other appropriate measures at the entrance to dissipate energy and disperse flows.

5) Woody plants (trees, shrubs, etc.) can restrict or concentrate flows and can be damaged by erosion around the root ball and should not be placed directly in the entrance flow path.

Underdrains

Underdrains should meet the following criteria:

1) 6-inch minimum diameter.

2) Underdrains should be made of slotted, polyvinyl chloride (PVC) pipe (PVC SDR 35 or approved equivalent). *The intention is that compared to round-hole perforated pipe, slotted underdrains provide greater intake capacity, clog resistant drainage, and reduced entrance velocity into the pipe, thereby reducing the chances of solids migration.*

3) Slotted pipe should have 2 to 4 rows of slots cut perpendicular to the axis of the pipe or at right angles to the pitch of corrugations. Slots should be 0.04 to 0.1 inches and should have a length of 1 to 1.25 inches. Slots should be longitudinally spaced such that the pipe has a minimum of one square inch of slot per lineal foot of pipe and should be placed with slots facing the bottom of the pipe.

4) Underdrains should be sloped at a minimum of 0.5%.

5) Rigid non-perforated observation pipes with a diameter equal to the underdrain diameter should be connected to the underdrain every 100 feet to provide a clean-out port as well as an observation well to monitor dewatering rates. The wells/cleanouts should be connected to the perforated underdrain with the appropriate manufactured connections. The wells/cleanouts should extend 6 inches above the top

elevation of the bioretention facility mulch, and should be capped with a lockable screw cap. The ends of the underdrain pipes not terminating in an observation well/cleanout should also be capped.

6) The following aggregate should be used to provide a gravel blanket and bedding for the underdrain pipe. Place the underdrain on a bed of washed aggregate at a minimum thickness of 6 inches and cover it with the same aggregate to provide a 1 foot minimum depth around the top and sides of the slotted pipe.

Sieve size	Percent Passing
¾ inch	100
¼ inch	30-60
US No. 8	20-50
US No. 50	3-12
US No. 200	0-1

7) At the option of the designer/geotechnical engineer, a geotextile fabric may be placed between the planting media and the drain rock. If a geotextile fabric is used, it should meet a minimum permittivity rate of 75 gal/min/ft^2, should not impede the infiltration rate of the soil medium, and should meet the following minimum materials requirements.

Geotextile Property	Value	Test Method
Trapezoidal Tear (lbs)	40 (min)	ASTM D4533
Permeability (cm/sec)	0.2 (min)	ASTM D4491
AOS (sieve size)	#60 - #70 (min)	ASTM D4751
Ultraviolet resistance	70% or greater	ASTM D4355

Preferably, aggregate should be used in place of filter fabric to reduce the potential for clogging. This aggregate layer should consist of 2 to 4 inches of washed sand underlain with 2 inches of choking stone (Typically #8 or #89 washed).

8) For bioretention facilities enhanced to remove address nitrogen as the primary pollutant class, the underdrain should be elevated from the bottom of the bioretention facility by at least 6 inches within the gravel blanket to create a fluctuating anaerobic/aerobic zone below the drain pipe. *The intention is that denitrification within the anaerobic/anoxic zone is facilitated by microbes using forms of nitrogen (NO_2 and NO_3) instead of oxygen for respiration.*

An alternative enhanced nitrogen removal design is to include an internal water storage layer by adding a 90-degree elbow to the underdrain to raise the outlet. This design feature provides additional storage in the media. The bioretention facility must have at least 30 inches of planting media. The top of the elbow should be at

least 12 inches below the top of the planting media, and in poorly draining soils, should preferably be 18 to 24 inches below the top of the planting media. The top of the water storage layer should not be less than 12 inches from the bottom of the planting media layer. (For more information, see Urban Waterways publication).

9) The underdrain should drain freely to an acceptable discharge point. The underdrain can be connected to a downstream open conveyance (vegetated swale), to another bioretention cell as part of a connected treatment system, to a storm drain, daylight to a vegetated dispersion area using an effective flow dispersion device, or to a storage facility for rainwater harvesting.

Overflow

An overflow device is required at the maximum ponding depth. The following, or equivalent, should be provided:

1) A vertical PVC pipe (SDR 35) should be connected to the underdrain.

2) The overflow riser(s) should be 6 inches or greater in diameter, so it can be cleaned without damage to the pipe. The vertical pipe will provide access to cleaning the underdrains.

3) The inlet to the riser should be at the ponding depth (maximum 18 inches for fenced bioretention areas and 6 inches for areas that are not fenced), and be capped with a spider cap to exclude floating mulch and debris. Spider caps should be screwed in or glued (i.e., not removable).

Hydraulic Restriction Layers

Infiltration pathways may need to be restricted due to the close proximity of roads, foundations, or other infrastructure. A geomembrane liner, or other equivalent water proofing, may be placed along the vertical walls to reduce lateral flows. This liner should have a minimum thickness of 30 mils.

Planting/Storage Media

1) The planting media placed in the cell should achieve a long-term, in-place infiltration rate of at least 1 inch per hour. Higher infiltration rates are permissible. If the design long-term, in-place infiltration rate of the soil exceeds 12 inches per hour, documentation should be provided to demonstrate that the media will adequately address pollutants of concern at a higher flowrate. Bioretention soil shall also support vigorous plant growth.

2) Planting media should consist of 60 to 80% fine sand and 20 to 40% compost.

3) Sand should be free of wood, waste, coating such as clay, stone dust, carbonate, etc., or any other deleterious material. All aggregate passing the No. 200 sieve size should be non-plastic. Sand for bioretention should be analyzed by an accredited lab using

#200, #100, #40, #30, #16, #8, #4, and 3/8 sieves (ASTM D 422 or as approved by the local permitting authority) and meet the following gradation (Note: all sands complying with ASTM C33 for fine aggregate comply with the gradation requirements below):

Sieve Size (ASTM D422)	% Passing (by weight)	
	Minimum	Maximum
3/8 inch	100	100
#4	90	100
#8	70	100
#16	40	95
#30	15	70
#40	5	55
#100	0	15
#200	0	5

Note: the gradation of the sand component of the media is believed to be a major factor in the hydraulic conductivity of the media mix. If the desired hydraulic conductivity of the media cannot be achieved within the specified proportions of sand and compost (#2), then it may be necessary to utilize sand at the coarser end of the range specified in above ("minimum" column).

4) Compost should be a well decomposed, stable, weed free organic matter source derived from waste materials including yard debris, wood wastes, or other organic materials not including manure or biosolids meeting standards developed by the US Composting Council (USCC). The product shall be certified through the USCC Seal of Testing Assurance (STA) Program (a compost testing and information disclosure program). Compost quality should be verified via a lab analysis to be:

- Feedstock materials shall be specified and include one or more of the following: landscape/yard trimmings, grass clippings, food scraps, and agricultural crop residues.
- Organic matter: 35-75% dry weight basis.
- Carbon and Nitrogen Ratio: 15:1 < C:N < 25:1
- Maturity/Stability: shall have dark brown color and a soil-like odor. Compost exhibiting a sour or putrid smell, containing recognizable grass or leaves, or is hot (120 F) upon delivery or rewetting is not acceptable.
- Toxicity: any one of the following measures is sufficient to indicate non-toxicity:
  - NH4:NH3 < 3
  - Ammonium < 500 ppm, dry weight basis

- Seed Germination > 80% of control
- Plant trials > 80% of control
- Solvita® > 5 index value

- Nutrient content:
  - Total Nitrogen content 0.9% or above preferred
  - Total Boron should be <80 ppm, soluble boron < 2.5 ppm
- Salinity: < 6.0 mmhos/cm
- pH between 6.5 and 8 (may vary with plant palette)

Compost for bioretention should be analyzed by an accredited lab using #200, ¼ inch, ½ inch, and 1 inch sieves (ASTM D 422 or as approved by the local permitting authority) and meet the following gradation:

Sieve Size (ASTM D422)	% Passing (by weight)	
	Minimum	Maximum
1 inch	99	100
½ inch	90	100
¼ inch	40	90
#200	2	10

Tests should be sufficiently recent to represent the actual material that is anticipated to be delivered to the site. If processes or sources used by the supplier have changed significantly since the most recent testing, new tests should be requested.

Note: the gradation of compost used in bioretention media is believed to play an important role in the saturated hydraulic conductivity of the media. To achieve a higher saturated hydraulic conductivity, it may be necessary to utilize compost at the coarser end of this range ("minimum" column). The percent passing the #200 sieve (fines) is believed to be the most important factor in hydraulic conductivity.

In addition, a coarser compost mix provides more heterogeneity of the bioretention media, which is believed to be advantageous for more rapid development of soil structure needed to support health biological processes. This may be an advantage for plant establishment with lower nutrient and water input.

5) The bioretention area should be covered with 2 to 4 inches (average 3 inches) of mulch at the start and an additional placement of 1 to 2 inches of mulch should be added annually. *The intention is that to help sustain the nutrient levels, suppress weeds, retain moisture, and maintain infiltration capacity*.

Plants

Plant materials should be tolerant of summer drought, ponding fluctuations, and saturated soil conditions for 48 to 96 hours.

It is recommended that a minimum of three types of tree, shrubs, and/or herbaceous groundcover species be incorporated to protect against facility failure due to disease and insect infestations of a single species.

Native plant species and/or hardy cultivars that are not invasive and do not require chemical inputs should be used to the maximum extent practicable.

Operations and Maintenance

Bioretention areas require annual plant, soil, and mulch layer maintenance to ensure optimum infiltration, storage, and pollutant removal capabilities. In general, bioretention maintenance requirements are typical landscape care procedures and include:

1) Watering: Plants should be selected to be drought-tolerant and not require watering after establishment (2 to 3 years). Watering may be required during prolonged dry periods after plants are established.

2) Erosion control: Inspect flow entrances, ponding area, and surface overflow areas periodically, and replace soil, plant material, and/or mulch layer in areas if erosion has occurred (see Appendix I for a bioretention inspection and maintenance checklist). Properly designed facilities with appropriate flow velocities should not have erosion problems except perhaps in extreme events. If erosion problems occur, the following should be reassessed: (1) flow velocities and gradients within the cell, and (2) flow dissipation and erosion protection strategies in the pretreatment area and flow entrance. If sediment is deposited in the bioretention area, immediately determine the source within the contributing area, stabilize, and remove excess surface deposits.

3) Plant material: Depending on aesthetic requirements, occasional pruning and removing of dead plant material may be necessary. Replace all dead plants and if specific plants have a high mortality rate, assess the cause and, if necessary, replace with more appropriate species. Periodic weeding is necessary until plants are established. The weeding schedule should become less frequent if the appropriate plant species and planting density have been used and, as a result, undesirable plants have been excluded.

4) Nutrient and pesticides: The soil mix and plants are selected for optimum fertility, plant establishment, and growth. Nutrient and pesticide inputs should not be required and may degrade the pollutant processing capability of the bioretention area, as well as contribute pollutant loads to receiving waters. By design, bioretention facilities are located in areas where phosphorous and nitrogen levels are often

elevated and these should not be limiting nutrients. If in question, have soil analyzed for fertility.

5) Mulch: Replace mulch annually in bioretention facilities where high trash, sediment load, and heavy metal deposition is likely (e.g., heavy metal contributing areas include industrial and auto dealer/repair parking lots and roads). In residential lots or other areas where metal deposition is not a concern, replace or add mulch as needed to maintain a 2 to 3 inch depth at least once every two years.

6) Soil: Soil mixes for bioretention facilities are designed to maintain long-term fertility and pollutant processing capability. Replacing mulch in bioretention facilities where high trash, sediment load, and heavy metal deposition are likely provides an additional level of protection for prolonged performance. Estimates from metal attenuation research suggest that metal accumulation should not present an environmental concern for at least 20 years in bioretention systems. However, the saturated hydraulic conductivity should be assessed at least annually to ensure that the design water quality event is being treated. If in question, have soil analyzed for fertility and pollutant levels.

BIO-2: Planter Box

Planter boxes are bioretention treatment control measures that are completely contained within an impermeable structure with an underdrain (they do not infiltrate). These facilities function as a soil and plant based filtration device that removes pollutants through a variety of physical, biological, and chemical treatment processes. The facilities normally consist of a ponding area, mulch layer, planting soils, plantings, and an underdrain within the planter box. As stormwater passes down through the planting soil, pollutants are filtered, adsorbed, and biodegraded by the soil and plants. Planter boxes are comprised of a variety of materials, usually chosen to be the same material as the adjacent building or sidewalk.

Planter boxes may be placed adjacent to or near buildings, other structures, or sidewalks. Planter boxes can be used directly adjacent to buildings beneath downspouts as long as the boxes are properly lined on the building side and the overflow outlet discharges away from the building to ensure water does not percolate into footings or foundations. They can also be placed further away from buildings by conveying roof runoff in shallow engineered open conveyances, shallow pipes, or other innovative drainage structures.

Planter boxes extending along a building wall

Photo Credit: Geosyntec Consultants

Application

- Areas adjacent to buildings and sidewalks
- Building entrances, courtyards, and walkways

Preventative Maintenance

- Repair small eroded areas
- Remove trash and debris and rake surface soils
- Remove accumulated fine sediments, dead leaves, and trash
- Remove weeds and prune back excess plant growth
- Remove sediment and debris accumulation near inlet and outlet structures

  Periodically observe function under wet weather conditions

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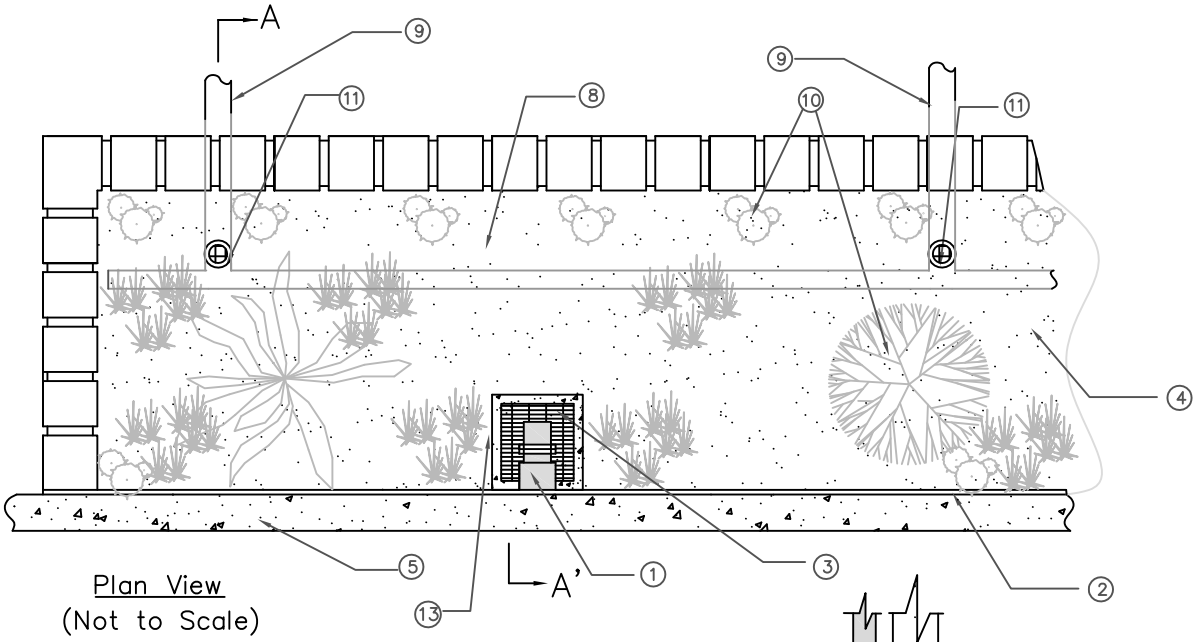

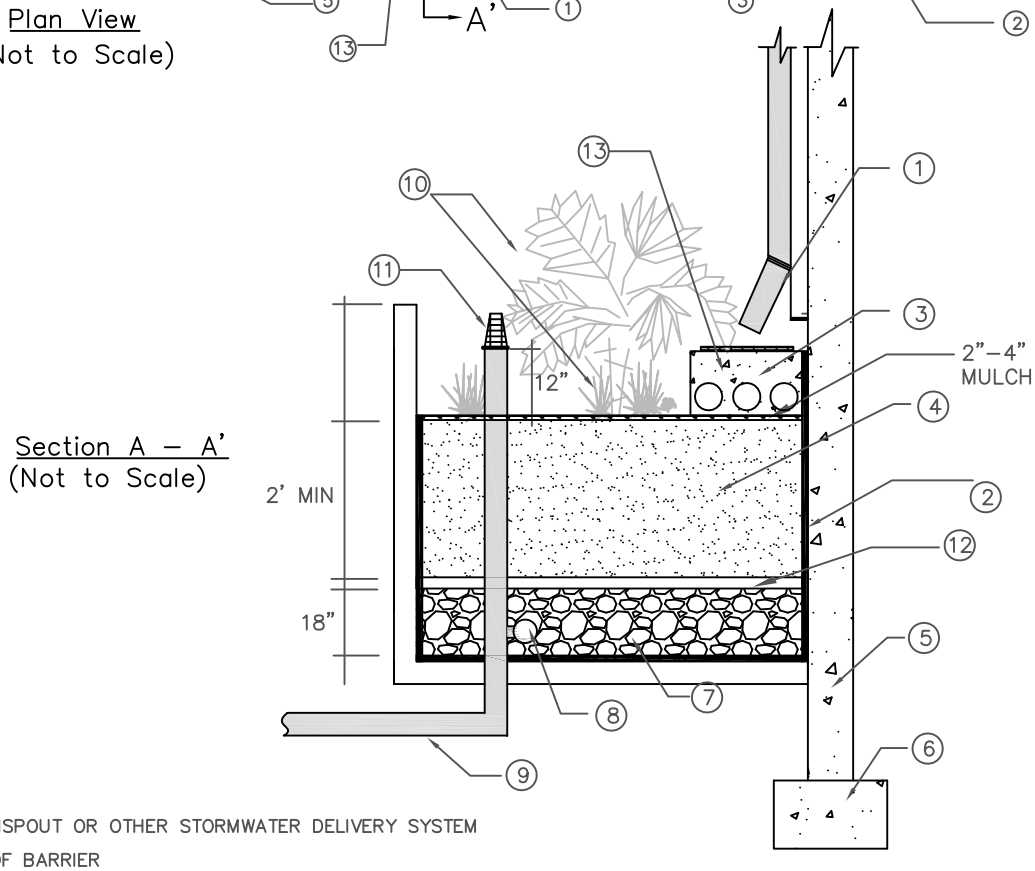

NOTES:

1. ROOF DOWNSPOUT OR OTHER STORMWATER DELIVERY SYSTEM
2. WATERPROOF BARRIER
3. SHALLOW ENERGY DISSIPATOR BASIN DISPERSES FLOW AT SOIL SURFACE
4. SOIL MIX (SEE PLANTING MEDIA SECTION)
5. BUILDING
6. FOUNDATION. INSTALL FOUNDATION DRAINS AS NEEDED
7. GRAVEL BEDDING (SEE UNDERDRAIN)
8. PERFORATED PIPE SHALL RUN ENTIRE LENGTH OF PLANTER
9. CONNECTION TO DOWNSTREAM CONVEYANCE SYSTEM
10. PLANTS
11. SET OVERFLOW 2" BELOW THE TOP OF THE PLANTER
12. OPTIONAL CHOKING GRAVEL LAYER

Geosyntec consultants

Figure 6-11: Planter Box

Limitations

The applicability of stormwater planter boxes is limited by the following site characteristics:

1) The tributary area (area draining to the planter box area) should be less than 15,000 ft^2.

2) Groundwater levels should be at least 2 ft lower than the bottom of the planter box.

3) Site must have adequate vertical relief between land surface and the stormwater conveyance system to permit connection of the underdrain to the stormwater conveyance system.

4) Planter boxes should not be located in areas with excessive shade to avoid poor vegetative growth. For moderately shaded areas, shade tolerant plants should be used.

Design Criteria

Planter boxes should be designed according to the requirements listed in Table 6-19 and outlined in the section below. BMP sizing worksheets are presented in Appendix E.

Table 6-19: Planter Box Design Criteria

Design Parameter	Unit	Design Criteria
Stormwater quality design volume (SQDV)	acre-feet	See Section 2 and Appendix E for calculating SQDV.
Drawdown time of planting soil	hours	12
Maximum ponding depth	inches	12
Minimum soil depth	feet	2; 3 preferred
Stabilized mulch depth	inches	2 to 3
Planting soil composition	-	60 to 70% sand, 30 to 40% compost
Underdrain	-	6 inch minimum diameter; 0.5% minimum slope; slotted, polyvinyl chloride (PVC) pipe (PVC SDR 35 or approved equivalent)
Overflow device	-	Required

Sizing Criteria

See Sizing Criteria section in the BIO-1: Bioretention with underdrains fact sheet.

Geometry and Size

1) Planter boxes areas should be sized to capture and treat the SQDV with a 12 inch maximum ponding depth. The mulch layer should be included as part of the ponding depth.

2) Minimum soil depth should be 2 feet, although 3 feet is preferred. *The intention is that a minimum soil depth should provide a beneficial root zone for the chosen plant palette and adequate water storage for the SQDV. A deeper planting soil depth will provide a smaller surface area footprint.*

3) Planter boxes should be designed to drain to below the planting soil depth in less than 48 hours. *The intention is that soils must be allowed to dry out periodically in order to restore hydraulic capacity to receive flows from subsequent storms, maintain infiltration rates, prevent long periods of saturation for plant health, maintain adequate soil oxygen levels for healthy soil biota and vegetation, reduce potential for vector breeding, and provide proper soil conditions for biodegradation and retention of pollutants.*

4) Any planter box shape configuration is possible as long as other design criteria are met.

5) The distance between the downspouts and the overflow outlet should be maximized. *The intention is to increase the opportunity for stormwater retention and filtration.*

6) Off-line configurations should be considered to minimize the possibility of scouring and resuspension of previously captured pollutants during large storms.

Structural Materials

1) Planter boxes should be constructed out of stone, concrete, brick, recycled plastic, or other permanent materials. Pressure-treated wood or other materials that may leach pollutants (e.g., arsenic, copper, zinc, etc.) should not be allowed.

2) The structure should be adequately sealed or a waterproof membrane installed to ensure water only exits the structure via the underdrain.

Flow Entrance and Energy Dissipation

The following types of flow entrance can be used for planter boxes:

1) Pipe flow entrance: Piped entrances, such as roof downspouts, should include rock, splash blocks, or other appropriate measures at the entrance to dissipate energy and disperse flows.

2) Woody plants (e.g., trees, shrubs, etc.) can restrict or concentrate flows and can be damaged by erosion around the root ball and should not be placed directly in the entrance flow path.

Underdrains

Underdrains are required and should meet the following criteria:

1) 6-inch minimum diameter.

2) Underdrains should be made of slotted, polyvinyl chloride (PVC) pipe (PVC SDR 35 or approved equivalent). *The intention is that in comparison to round-hole perforated pipe, slotted underdrains provide greater intake capacity, clog resistant drainage, and reduced entrance velocity into the pipe, thereby reducing the chances of solids migration.*

3) Slotted pipe should have 2 to 4 rows of slots cut perpendicular to the axis of the pipe or at right angles to the pitch of corrugations. Slots should be 0.04 to 0.1 inch and should have a length of 1 to 1.25 inches. Slots should be longitudinally spaced such that the pipe has a minimum of one square inch opening per lineal foot and should face down.

4) Underdrains should be sloped at a minimum of 0.5%.

5) Rigid non-perforated observation pipes with a diameter equal to the underdrain diameter should be connected to the underdrain every 100 feet to provide a clean-out port as well as an observation well to monitor dewatering rates. The wells/cleanouts should be connected to the perforated underdrain with the appropriate manufactured connections. The wells/cleanouts should extend 6 inches above the top elevation of the bioretention facility mulch, and should be capped with a lockable screw cap. The ends of underdrain pipes not terminating in an observation well/cleanout should also be capped.

6) The following aggregate should be used to provide a gravel blanket and bedding for the underdrain pipe. Place the underdrain on a bed of washed aggregate at a minimum thickness of 6 inches and cover it with the same aggregate to provide a 1 foot minimum depth around the top and sides of the slotted pipe.

Sieve size	Percent Passing
¾ inch	100
¼ inch	30-60
US No. 8	20-50
US No. 50	3-12
US No. 200	0-1

7) At the option of the designer/geotechnical engineer, a geotextile fabric may be placed between the planting media and the drain rock. If a geotextile fabric is used, it should

meet a minimum permittivity rate of 75 gal/min/ft^2, should not impede the infiltration rate of the soil medium, and should meet the following minimum materials requirements.

Geotextile Property	Value	Test Method
Trapezoidal Tear (lbs)	40 (min)	ASTM D4533
Permeability (cm/sec)	0.2 (min)	ASTM D4491
AOS (sieve size)	#60 - #70 (min)	ASTM D4751
Ultraviolet resistance	70% or greater	ASTM D4355

Preferably, aggregate should be used in place of filter fabric to reduce the potential for clogging. This aggregate layer should consist of 2 to 4 inches of washed sand underlain with 2 inches of choking stone (Typically #8 or #89 washed).

8) The underdrain should be elevated from the bottom of the bioretention facility by 6 inches within the gravel blanket to create a fluctuating anaerobic/aerobic zone below the drain pipe. *The intention is that denitrification within the anaerobic/anoxic zone is facilitated by microbes using forms of nitrogen (NO_2 and NO_3) instead of oxygen for respiration.*

9) The underdrain must drain freely to an acceptable discharge point. The underdrain can be connected to a downstream open conveyance (vegetated swale), to another bioretention cell as part of a connected treatment system, to a storm drain, daylight to a vegetated dispersion area using an effective flow dispersion device, or to a storage facility for rainwater harvesting.

Overflow

An overflow device is required to be set at 2 inches below the top of the planter and no more than 12 inches above the soil surface. The most common option is a vertical riser, described below.

Vertical riser

1) A vertical PVC pipe (SDR 35) should be connected to the underdrain.

2) The overflow riser(s) should be 6 inches or greater in diameter, so it can be cleaned without damage to the pipe. The vertical pipe will provide access to cleaning the underdrains.

3) The inlet to the riser should be a maximum of 12 inches above the planting soil, and be capped with a spider cap. Spider caps should be screwed in or glued (i.e., not removable).

Hydraulic Restriction Layers

A waterproof barrier should be provided to restrict moisture away from foundations. Geomembrane liners should have a minimum thickness of 30 mils. Equivalent waterproofing measures may be used.

Planting/Storage Media

1) The planting media placed in the cell should achieve a long-term, in-place infiltration rate of at least 1 inch per hour. Higher infiltration rates are permissible. If the design long-term, in-place infiltration rate of the soil exceeds 12 inches per hour, documentation should be provided to demonstrate that the media will adequately address pollutants of concern at a higher flowrate. Planter box soil shall also support vigorous plant growth.

2) Planting media should consist of 60 to 80% fine sand and 20 to 40% compost.

3) Sand should be free of wood, waste, coating such as clay, stone dust, carbonate, etc., or any other deleterious material. All aggregate passing the No. 200 sieve size should be non-plastic. Sand for the planter box should be analyzed by an accredited lab using #200, #100, #40, #30, #16, #8, #4, and 3/8 sieves (ASTM D 422 or as approved by the local permitting authority) and meet the following gradation (Note: all sands complying with ASTM C33 for fine aggregate comply with the gradation requirements below):

Sieve Size (ASTM D422)	% Passing (by weight)	
	Minimum	Maximum
3/8 inch	100	100
#4	90	100
#8	70	100
#16	40	95
#30	15	70
#40	5	55
#100	0	15
#200	0	5

Note: the gradation of the sand component of the media is believed to be a major factor in the hydraulic conductivity of the media mix. If the desired hydraulic conductivity of the media cannot be achieved within the specified proportions of sand and compost (#2), then it may be necessary to utilize sand at the coarser end of the range specified in above (“minimum” column).

4) Compost should be a well decomposed, stable, weed free organic matter source derived from waste materials including yard debris, wood wastes, or other organic materials not including manure or biosolids meeting standards developed by the US Composting Council (USCC). The product shall be certified through the USCC Seal

of Testing Assurance (STA) Program (a compost testing and information disclosure program). Compost quality should be verified via a lab analysis to be:

- Feedstock materials shall be specified and include one or more of the following: landscape/yard trimmings, grass clippings, food scraps, and agricultural crop residues.
- Organic matter: 35-75% dry weight basis.
- Carbon and Nitrogen Ratio: 15:1 < C:N < 25:1
- Maturity/Stability: shall have dark brown color and a soil-like odor. Compost exhibiting a sour or putrid smell, containing recognizable grass or leaves, or is hot (120 F) upon delivery or rewetting is not acceptable.
- Toxicity: any one of the following measures is sufficient to indicate non-toxicity:
    - NH4:NH3 < 3
    - Ammonium < 500 ppm, dry weight basis
    - Seed Germination > 80% of control
    - Plant trials > 80% of control
    - Solvita® > 5 index value
- Nutrient content:
    - Total Nitrogen content 0.9% or above preferred
    - Total Boron should be <80 ppm, soluble boron < 2.5 ppm
- Salinity: < 6.0 mmhos/cm
- pH between 6.5 and 8 (may vary with plant palette)

Compost for planter box should be analyzed by an accredited lab using #200, ¼ inch, ½ inch, and 1 inch sieves (ASTM D 422 or as approved by the local permitting authority) and meet the following gradation:

Sieve Size (ASTM D422)	% Passing (by weight)	
	Minimum	Maximum
1 inch	99	100
½ inch	90	100
¼ inch	40	90
#200	2	10

Tests should be sufficiently recent to represent the actual material that is anticipated to be delivered to the site. If processes or sources used by the supplier have changed significantly since the most recent testing, new tests should be requested.

Note: the gradation of compost used in planter box media is believed to play an important role in the saturated hydraulic conductivity of the media. To achieve a higher saturated hydraulic conductivity, it may be necessary to utilize compost at the coarser end of this range ("minimum" column). The percent passing the #200 sieve (fines) is believed to be the most important factor in hydraulic conductivity.

In addition, a coarser compost mix provides more heterogeneity of the planter box media, which is believed to be advantageous for more rapid development of soil structure needed to support health biological processes. This may be an advantage for plant establishment with lower nutrient and water input.

5) The planter box should be covered with 2 to 4 inches (average 3 inches) of mulch at the start and an additional placement of 1 to 2 inches of mulch should be added annually. *The intention is that to help sustain the nutrient levels, suppress weeds, retain moisture, and maintain infiltration capacity*.

Plants

1) Plant materials should be tolerant of summer drought, ponding fluctuations, and saturated soil conditions for 48 to 96 hours.

2) It is recommended that a minimum of three types of tree, shrubs, and/or herbaceous groundcover species be incorporated to protect against facility failure due to disease and insect infestations of a single species.

3) Native plant species and/or hardy cultivars that are not invasive and do not require chemical inputs should be used to the maximum extent practicable.

4) Plants should be selected carefully to minimize maintenance and function properly.

Operations and Maintenance

Planter boxes require annual plant, soil, and mulch layer maintenance to ensure optimum infiltration, storage, and pollutant removal capabilities. In general, planter box maintenance requirements are typical of landscape care procedures and include:

1) Watering: Plants should be selected to be drought-tolerant and do not require watering after establishment (2 to 3 years). Watering may be required during prolonged dry periods after plants are established.

2) Erosion control: Inspect flow entrances, ponding area, and surface overflow areas periodically, and replace soil, plant material, and/or mulch layer in areas if erosion has occurred (see Appendix I for an inspection and maintenance checklist). Properly designed facilities with appropriate flow velocities should not have erosion problems

except perhaps in extreme events. If erosion problems occur, the following should be reassessed: (1) flow velocities and gradients within the cell, and (2) flow dissipation and erosion protection strategies in the flow entrance. If sediment is deposited in the planter box, immediately determine the source within the contributing area, stabilize, and remove excess surface deposits.

3) Plant material: Depending on aesthetic requirements, occasional pruning and removing of dead plant material may be necessary. Replace all dead plants and if specific plants have a high mortality rate, assess the cause and, if necessary, replace with more appropriate species. Periodic weeding is necessary until plants are established. The weeding schedule should become less frequent if the appropriate plant species and planting density have been used and, as a result, undesirable plants have been excluded.

4) Nutrients and pesticides: The soil mix and plants are selected for optimum fertility, plant establishment, and growth. Nutrient and pesticide inputs should not be required and may degrade the pollutant processing capability of the planter box area, as well as contribute pollutant loads to receiving waters. By design, planter boxes are located in areas where phosphorous and nitrogen levels are often elevated and these should not be limiting nutrients. If in question, have soil analyzed for fertility.

5) Mulch: Replace mulch annually in planter boxes where high trash, sediment load, and heavy metal deposition is likely (e.g., heavy metal contributing areas include industrial, auto dealer/repair, parking lots, and roads). In residential lots or other areas where metal deposition is not a concern, replace or add mulch as needed to maintain a 2 to 3 inch depth at least once every two years.

6) Soil: Soil mixes for planter boxes are designed to maintain long-term fertility and pollutant processing capability. Replacing mulch in planter boxes where high trash, sediment load, and heavy metal deposition are likely provides an additional level of protection for prolonged performance. Estimates from metal attenuation research suggest that metal accumulation should not present an environmental concern for at least 20 years in planter boxes. However, the saturated hydraulic conductivity should be assessed at least annually to ensure that the design water quality event is being treated. If in question, have soil analyzed for fertility and pollutant levels.

BIO-3: Vegetated Swale

Vegetated swales are open, shallow channels with low-lying vegetation covering the side slopes and bottom that collect and slowly convey runoff to downstream discharge points. Vegetated swales provide pollutant removal through settling and filtration in the vegetation (usually grasses) lining the channels, provide the opportunity for stormwater volume reduction through infiltration and evapotranspiration, reduce the flow velocity, and conveying stormwater runoff. An effective vegetated swale achieves uniform sheet flow through a densely vegetated area for a period of several minutes. The vegetation in the swale can vary depending on its location and is the choice of the designer, depending on the design criteria outlined in this section.

Vegetated swale captures flow from a residential street

Photo Credit: Geosyntec Consultants

Application

- Open areas adjacent to parking lots
- Open spaces adjacent to athletic fields
- Roadway medians and shoulders

Preventative Maintenance

- Remove excess sediment, trash, and debris
- Clean and reset flow spreaders
- Mow regularly
- Remove sediment and debris build-up near inlets and outlets
- Repair minor erosion and scouring

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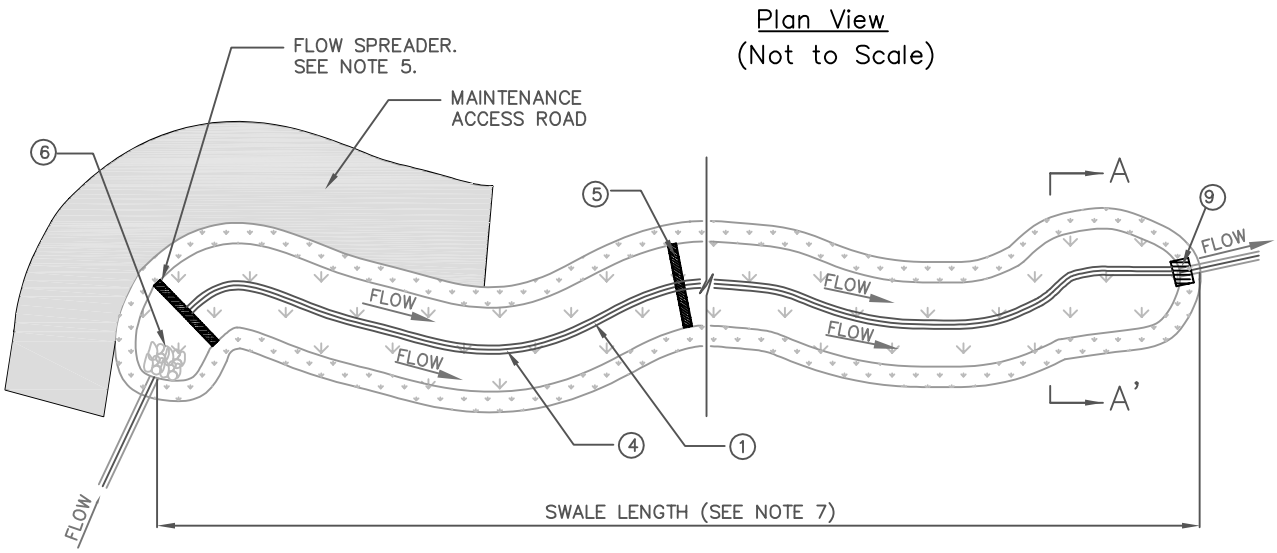

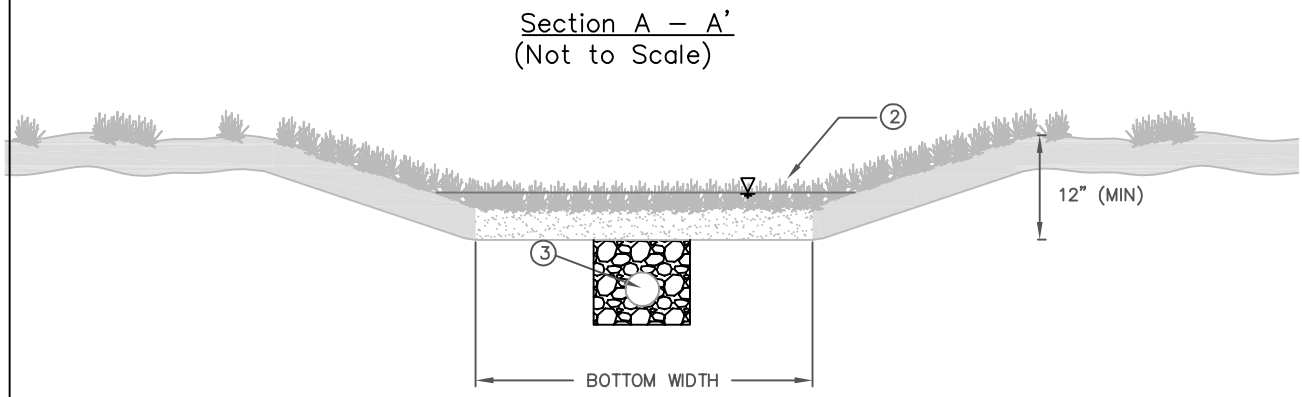

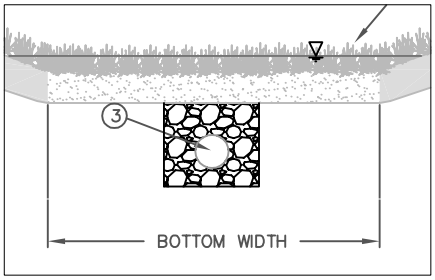

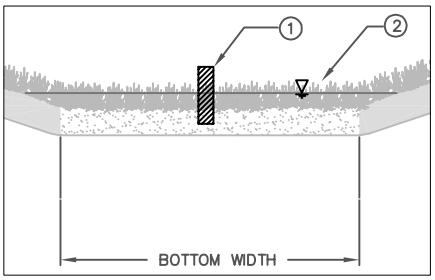

NOTES:

1. SWALE DIVIDER REQUIRED FOR BOTTOM WIDTHS > 10'. MINIMUM REQUIRED BOTTOM WIDTH IS 2' EXCLUDING WIDTH OF LOW FLOW CHANNEL. MAXIMUM BOTTOM WIDTH WITH DIVIDER IS 16'.
2. DEPTH OF FLOW FOR WATER QUALITY TREATMENT MUST NOT EXCEED TWO–THIRDS OF VEGETATION HEIGHT OR NOT GREATER THAN 2" FOR FREQUENTLY MOWED TURF.
3. IF AN UNDERDRAIN IS REQUIRED, IT MUST CONSIST OF AN AT LEAST 6" DIAMETER PERFORATED PIPE IN COARSE AGGREGATE BED CONNECTED TO STORM DRAIN. GRAVEL BED MUST EXTEND 6" BELOW AND 12" TO THE SIDE AND TOP OF THE PIPE.
4. IF NO UNDERDRAIN, LOW FLOW DRAIN SHALL EXTEND ENTIRE LENGTH OF SWALE AND SHALL HAVE A DEPTH OF 6" MINIMUM AND WIDTH NO MORE THAN 5% SWALE BOTTOM WIDTH. ANCHORED PLATE FLOW SPREADER IF USED, SHALL HAVE V–NOTCHES (MAX TOP WIDTH = 5% OF SWALE WIDTH) OR HOLES TO ALLOW PREFERENTIAL EXIT OF LOW FLOWS.
5. INSTALL CHECK DAMS OR GRADE CONTROL STRUCTURES FOR SLOPES > 2% AT 50' MAXIMUM SPACING TO ACHIEVE A MAXIMUM EFFECTIVE LONGITUDINAL SLOPE OF 2%. FLOW SPREADERS SHALL BE PROVIDED AT INLET AND AT THE BASE OF EACH CHECK DAM.
6. INSTALL ENERGY DISSIPATOR AT THE INLET OF VEGETATED SWALE.
7. SWALE LENGTH SHALL LENGTH REQUIRED TO PROVIDE 7 MINUTES RESIDENCE TIME.
8. INSTALL APPROPRIATE OUTLET STRUCTURE. ACCOMODATE LOW FLOW CHANNEL AND/OR UNDERDRAIN (IF PRESENT).
9. AMEND SOILS WITH 2" OF COMPOST TILLED INTO 6" OF NATIVE SOIL UNLESS NATIVE SOIL ORGANIC CONTENT > 10%.

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Figure 6-12: Vegetated Swale

Limitations

1) Compatibility with flood control - swales should not interfere with flood control functions of existing conveyance and detention structures.

2) Vegetation - select vegetation appropriately based on irrigation requirements and exposure (shady versus sunny areas). A thick vegetative cover is needed for vegetated swales to function properly. Native and drought tolerant plants are recommended.

3) Drainage area - each vegetated swale can treat a relatively small drainage area. Large areas should be divided and treated using multiple swales.

Design Criteria

Vegetated swales should be designed according to the requirements listed in Table 6-20 and outlined in the section below. BMP sizing worksheets are presented in Appendix E.

Table 6-20: Vegetated Swale Filter Design Criteria

Design Parameter	Unit	Design Criteria
Stormwater quality design flow rate (SQDF)	cfs	See Section 2 and Appendix E for calculating SQDF.
Swale Geometry	-	Trapezoidal
Minimum bottom width	feet	2
Maximum bottom width	feet	10; if greater than 10 must use swale dividers; with dividers, max is 16
Minimum length	feet	sufficient length to provide minimum contact time
Minimum slope in flow direction	%	0.2 (provide underdrains for slopes less < 0.5%)
Maximum slope in flow direction	%	2.0 (provide grade-control checks for slopes > 2.0)
Maximum flow velocity	ft/sec	1.0 (water quality treatment); 3.0 (flood conveyance)
Maximum depth of flow for water quality treatment	inches	3 to 5 (1 inch below top of grass)
Minimum residence (contact) time	minutes	7 (provide sufficient length to yield minimum residence time)
Vegetation type	--	Varies (see vegetation section below); Native and drought tolerant plants are recommended
Vegetation height	inches	4 to 6 (trim or mow to maintain height)

Sizing Criteria

The flow capacity of a vegetated swale is a function of the longitudinal slope (parallel to flow), the resistance to flow (i.e. Manning's roughness), and the cross sectional area. The cross section is normally approximately trapezoidal and the area is a function of the bottom width and side slopes. The flow capacity of vegetated swales should be such that the SQDF will not exceed a flow depth of 2/3 the height of the vegetation within the swale or 4 inches at the SQDF. Once design criteria have been selected, the resulting flow depth for the SQDF is checked. If the depth restriction is exceeded, swale parameters (e.g. longitudinal slope, width) are adjusted to reduce the flow depth.

Procedures for sizing vegetated swales are summarized below. A vegetated swale sizing worksheet and example are also provided.

Step 1: Select design flows

The swale sizing is based on the SQDF (see Section 2 and Appendix E).

Step 2: Calculate swale bottom width

The swale bottom width (b) is calculated based on Manning's equation for open-channel flow. This equation can be used to calculate discharges (Q) as follows:

$$Q = \frac{1.49AR^{0.67}S^{0.5}}{n} \qquad \text{(Equation 6-27)}$$

Where:

Q	=	flow rate (cfs)
n	=	Manning's roughness coefficient (unitless)
A	=	cross-sectional area of flow (ft2)
R	=	hydraulic radius (ft) = area divided by wetted perimeter
S	=	longitudinal slope (ft/ft)

For shallow flow depths in swales, channel side slopes are ignored in the calculation of bottom width. Use the following equation (a simplified form of Manning's formula) to estimate the swale bottom width (b):

$$b = \frac{SQDF * n_{wq}}{1.49y^{0.67}s^{0.5}} \qquad \text{(Equation 6-28)}$$

Where:

b	=	bottom width of swale (ft)

$SQDF$	=	stormwater quality design flow (cfs)
n_{wq}	=	Manning's roughness coefficient for shallow flow conditions = 0.2 (unitless)
y	=	design flow depth (ft)
s	=	longitudinal slope (along direction of flow) (ft/ft)

Proceed to Step 3 if the bottom width is calculated to be between 2 and 10 feet. A minimum 2-foot bottom width is required. Therefore, if the calculated bottom width is less than 2 feet, increase the width to 2 feet and recalculate the design flow depth y using the Equation 6-18, where $SQDF$, n_{wq}, and s are the same values as used above, but b = 2 feet.

The maximum allowable bottom width is 10 feet. Therefore, if the calculated bottom width exceeds 10 feet, then one of the following steps is necessary to reduce the design bottom width:

1) Increase the longitudinal slope (s) to a maximum of 2 feet in 100 feet (0.02 feet per foot).

2) Increase the design flow depth (y) to a maximum of 4 inches.

3) Place a divider lengthwise along the swale bottom (Figure 6-11) at least three-quarters of the swale length (beginning at the inlet), without compromising the design flow depth and swale lateral slope requirements. The swale width can be increased to an absolute maximum of 16 feet if a divider is provided.

Step 3: Determine design flow velocity

To calculate the design flow velocity (V_{wq}) through the swale, use the flow continuity equation:

$$V_{wq} = SQDF/A_{wq} \qquad \text{(Equation 6-29)}$$

Where:

V_{wq}	=	design flow velocity (fps)
$SQDF$	=	stormwater quality design flow (cfs)
A_{wq}	=	$by + Zy^2$ = cross-sectional area (ft^2) of flow at design depth, where Z = side slope length per unit height (e.g., Z = 3 if side slopes are 3H:1V)

If the design flow velocity exceeds 1 foot per second, go back to Step 2 and modify one or more of the design parameters (longitudinal slope, bottom width, or flow depth) to

reduce the design flow velocity to 1 foot per second or less. If the design flow velocity is calculated to be less than 1 foot per second, proceed to Step 4. *Note: It is desirable to have the design velocity as low as possible, both to improve treatment effectiveness and to reduce swale length requirements.*

Step 4: Calculate swale length

Use the following equation to determine the necessary swale length (L) to achieve a hydraulic residence time of at least 7 minutes:

$$L = 60 t_{hr} V_{wq} \qquad \text{(Equation 6-30)}$$

Where:

L	=	minimum allowable swale length (ft)
t_{hr}	=	hydraulic residence time (min)
V_{wq}	=	design flow velocity (fps), calculated by Equation 6-19

If there is adequate space on the site to accommodate a larger swale, consider using a greater length to increase the hydraulic residence time and improve the swale's pollutant removal capability. If the calculated length is too long for the site, or if it would cause layout problems, such as encroachment into shaded areas, proceed to Step 5 to further modify the layout. If the swale length can be accommodated on the site (meandering may help), proceed to Step 6.

Step 5: Adjust swale layout to fit on site

If the swale length calculated in Step 4 is too long for the site, the length can be reduced (to a minimum of 100 feet) by increasing the bottom width up to a maximum of 16 feet, as long as the 10 minute retention time is retained. However, the length cannot be increased in order to reduce the bottom width because Manning's depth-velocity-flow rate relationships would not be preserved. If the bottom width is increased to greater than 10 feet, a low flow dividing berm is needed to split the swale cross section in half to prevent channelization.

Length can be adjusted by calculating the top area of the swale and providing an equivalent top area with the adjusted dimensions.

1) Calculate the swale treatment top area (A_{top}), based on the swale length calculated in Step 4:

$$A_{top} = (b_i + b_{slope}) L_i \qquad \text{(Equation 6-31)}$$

Where:

A_{top}	=	top area (ft^2) at the design treatment depth
b_i	=	bottom width (ft), calculated in Step 2 using Equation 6-18
b_{slope}	=	the additional top width (ft) above the side slope for the design water depth (for 3:1 side slopes and a 4-inch water depth, b_{slope} = 2 feet)
L_i	=	initial length (ft) calculated in Step 4 using Equation 6-30

2) Use the swale top area and a reduced swale length (L_f) to increase the bottom width, using the following equation:

$$L_f = A_{top} / (b_f + b_{slope}) \qquad \text{(Equation 6-32)}$$

Where:

L_f	=	reduced swale length (ft)
b_f	=	increased bottom width (ft)

3) Recalculate V_{wq} according to Step 3 using the revised cross-sectional area A_{wq} based on the increased bottom width (b_f). Revise the design as necessary if the design flow velocity exceeds 1 foot per second.

4) Recalculate to ensure that the 10 minute retention time is retained.

Step 6: Provide conveyance capacity for flows higher than SQDF

Vegetated swales may be designed as flow-through channels that convey flows higher than the SQDF, or they may be designed to incorporate a high-flow bypass upstream of the swale inlet. A high-flow bypass usually results in a smaller swale size. If a high-flow bypass is provided, this step is not needed. If no high-flow bypass is provided, proceed with the procedure below. A flow splitter structure design is described in Appendix F.

1) Check the swale size to determine whether the swale can convey the flood control design storm peak flow (Refer to Ventura County Hydrology Manual, revised 2006).

2) The peak flow velocity of the flood control design storm (see Ventura County Hydrology Manual revised 2006) should be less than 3.0 feet per second. If this velocity exceeds 3.0 feet per second, return to Step 2 and increase the bottom width or flatten the longitudinal slope as necessary to reduce the flood control design storm peak flow velocity to 3.0 feet per second or less. If the longitudinal slope is flattened, the swale bottom width must be recalculated (Step 2) and must meet all design criteria.

Geometry and Size

1) In general, a trapezoidal channel shape should be assumed for sizing calculations above, but a more naturalistic channel cross-section is preferred.

2) Swales designed for water quality treatment purposes only are usually fairly shallow, generally less than 1 ft. Therefore, a side slope of 2:1 (H:V) can be used and is acceptable.

3) Swales shall be greater than 100 feet in length. The vegetated swale can be shorter than 100 feet if it is used for pretreatment only (i.e., prior to infiltration). Length can be increased by meandering the swale.

4) The minimum swale bottom width shall be 2 feet to allow for ease of mowing.

5) The maximum swale bottom width shall be limited to 10 feet, unless a swale divider is provided, then the maximum bottom width can be a maximum of 16 feet wide. The swale width is calculated without the swale diving berm. *The intention is that experience shows that when the width exceeds about 10 feet, it is difficult to keep the water from concentrating in low flow channels. It is also difficult to construct the bottom level without sloping to one side. Vegetated swales are best constructed by leveling the bottom after excavating. A single-width pass with a front-end loader produces a better result than a multiple-width pass.*

6) Swales that are required to convey flood flow as well as the SQDF should be sized to convey the flood control design storm and include a provision of freeboard as required by the local approval authority.

7) Gradual meandering bends in the swale are desirable for aesthetic purposes and to promote slower flow.

Bottom Slope

1) The longitudinal slope (along the direction of flow) should be between 1% and 6%.

2) If longitudinal slopes are less than 1.5% and the soils are poorly drained (e.g., silts and clays), then underdrains should be provided. A soils report to verify soils properties should be provided for swales less than 1.5%.

3) If longitudinal slope exceeds 2%, check dams with vertical drops of 12 inches or less should be provided to achieve a bottom slope of 2% or less between the drop structures.

4) The lateral (horizontal) slope at the bottom of the swale should be zero (flat) to discourage channeling.

Water Depth and Dry Weather Flow Drain

1) Water depth should not exceed 4 inches (or 2/3 of the expected vegetation height), except for frequently mowed turf swales, in which the depth should not exceed 2 inches.

2) The swale length must provide a minimum hydraulic residence time of 7 minutes.

3) A low flow drain should be provided if the potential for dry weather flows exists. The low flow drain should extend the entire length of the swale. The drain should have a minimum depth of 6 inches, and a width no more than 5% of the calculated swale bottom width. The width of the drain should be in addition to the required bottom width. The flow spreader at the swale inlet should have v-notches (maximum top width = 5% of swale width) or holes to allow preferential exit of low flows into the drain, if applicable. If an underdrain or gravel drainage layer is installed as discussed below, the low flow drain should be omitted.

Swale Inflow and Design Capacity

1) Whenever possible, inflow should be directed towards the upstream end of the swale and should, at a minimum, occur evenly over the length of the swale. Swale inflow design should provide for positive drainage into the swale to function on the long-term with minimal maintenance.

2) On-line vegetated swales should be designed to convey flow rates up to the post-development peak stormwater runoff discharge rate (flow rate) for the 100-yr 24-hour storm event, with appropriate freeboard (see Ventura County Hydrology Manual, revised 2006).

3) Off-line vegetated swales should be designed to convey the flow-based SQDF by using a flow diversion structure (e.g., flow splitter) which diverts the SQDF to the off-line vegetated swale designed to handle SQDF. Freeboard for off-line swales is not required, but should be provided if space is available. Flow splitter design specifications are described in Appendix F.

Energy Dissipation

1) Vegetated swales may be designed either on-line or off-line. If the facility is on-line, velocities should be maintained below the maximum design flow velocity of 3 feet per second to prevent scour and resuspension of deposited sediments.

2) The maximum flow velocity under the stormwater quality design flow rate should not exceed 1.0 foot per second. *The intention is that this maximum SQDV promotes settling and keeps vegetation upright.*

3) This velocity limitation combined with a maximum depth of 4 inches and bottom width of 10 feet results in a recommended maximum flow capacity of about 3.3 cfs,

after accounting for the side slopes. The contributory drainage area to each swale is limited so as not to exceed this recommended maximum flow capacity.

4) The maximum flow velocity during the 100-yr 24-hr storm event should not exceed 3.0 foot per second. This can be accomplished by:

    a. Splitting roadside swales near high points in the road so that flows drain in opposite directions, mimicking flow patterns on the road surface.

    b. Limiting tributary areas to long swales by diverting flows throughout the length of the swale at regular intervals, to the downstream stormwater conveyance system.

5) A flow spreader (see "Flow Spreaders" below) should be used at the inlet so that the entrance velocity is quickly dissipated and the flow is uniformly distributed across the whole swale. Energy dissipation controls should be constructed of sound materials such as stones, concrete, or proprietary devices that are rated to withstand the energy of the influent flows.

6) If check dams are used to reduce the longitudinal slope, a flow spreader should be provided at the toe of each vertical drop, with specifications described below.

7) If flow is to be introduced through curb cuts, place pavement approximately one inch above the elevation of the vegetated areas. Curb cuts should be at least 12 inches wide to prevent clogging.

Flow Spreaders

1) An anchored plate flow spreader or similar device should be provided at the inlet to the swale. Equivalent methods for spreading flows evenly throughout the width of the swale are acceptable.

2) The top surface of the flow spreader plate should be level, projecting a minimum of 2 inches above the ground surface of the water quality facility, or v-notched with notches 6 to 10 inches on center and 1 to 4 inches deep (use shallower notches with closer spacing).

3) A flow spreader plate should extend horizontally beyond the bottom width of the facility to prevent water from eroding the side slope. The plate should have a row of horizontal perforations at its base to prevent ponding for long durations. The horizontal extent should be such that the bank is protected for all flows up to the 100-yr 24-hr storm event (on-line swales) or the maximum flow that will enter the water quality facility (off-line swales).

4) Flow spreader plates should be securely fixed in place.

5) Flow spreader plates may be made of either concrete, stainless steel, or other durable material.

6) Anchor posts should be 4-inch square concrete, tubular stainless steel, or other material resistant to decay.

Check Dams

If check dams are required, they can be designed using a number of different materials, including riprap, earthen berms, or removal stop logs. Where vegetated swales parallel urban streets, the check dam can double as a crossing walk so that pedestrians have a pathway from the parked car to the building.

Check dams must be placed as to achieve the desired slope (1 to 6%) at a maximum of 50 feet apart. Check dams should be no higher than 12 inches. If riprap is used, the material should consist of well-graded stone consisting of a mixture of rock sizes. The following is an example of an acceptable gradation:

Particle Size	% Passing
24 inch	100
15 inch	75
9 inch	50
4 inch	10

Underdrains

If underdrains (not to be confused with a dry weather flow drain) are required, then they should meet the following criteria:

1) Underdrains should be made of slotted, polyvinyl chloride (PVC) pipe (PVC SDR 35 or approved equivalent). *The intention is that in comparison to round-hole perforated pipe, slotted underdrains provide greater intake capacity, clog resistant drainage, and reduced entrance velocity into the pipe, thereby reducing the chances of solids migration.*

2) Slotted pipe should have 2 to 4 rows of slots cut perpendicular to the axis of the pipe or at right angles to the pitch of corrugations. Slots should be 0.04 to 0.1 inch and should have a length of 1 to 1.25 inches. Slots should be longitudinally spaced such that the pipe has a minimum of one square inch of opening per linear foot of pipe.

3) Underdrains should be sloped at a minimum of 0.5%.

4) The underdrain pipe should be 6 inches or greater in diameter, so it can be cleaned without damage to the pipe. Clean-out risers with diameters equal to the underdrain pipe should be placed at the terminal ends of the underdrain and can be incorporated into the flow spreader and outlet structure to minimize maintenance obstacles in the swale. Intermediate clean-out risers may also be placed in the check dams or grade control structures. The cleanout risers should be capped with a lockable screw cap.

5) The underdrain should be placed parallel to the swale bottom and backfilled and underbedded with six inches of drain rock. The following coarse aggregate should be used to provide a gravel blanket and bedding for the underdrain pipe to provide a 1 foot minimum depth around the top and sides of the slotted pipe.

Sieve size	Percent Passing
¾ inch	100
¼ inch	30-60
US No. 8	20-50
US No. 50	3-12
US No. 200	0-1

6) At the option of the designer/geotechnical engineer, the drain rock may be wrapped in a geotextile fabric meeting the following minimum materials requirements. If a geotextile fabric is used, it should pass 75 gal/min/ft^2, should not impede the infiltration rate of the soil medium, and should meet the following minimum materials requirements.

Geotextile Property	Value	Test Method
Trapezoidal Tear (lbs)	40 (min)	ASTM D4533
Permeability (cm/sec)	0.2 (min)	ASTM D4491
AOS (sieve size)	#60 - #70 (min)	ASTM D4751
Ultraviolet resistance	70% or greater	ASTM D4355

Preferably, aggregate should be used in place of geotextile fabric to reduce the potential for clogging. This aggregate layer should consist of 2 to 4 inches of washed sand underlain with 2 inches of choking stone (Typically #8 or #89 washed).

7) The underdrain should drain freely to an acceptable discharge point. The underdrain can be connected to a downstream open conveyance (vegetated swale), to another bioretention cell as part of a connected treatment system, daylight to a vegetated dispersion area using an effective flow dispersion device, stored for rainwater harvesting, or to a storm drain.

Gravel Drainage Layer

To increase volume reduction and if soil conditions allow (infiltration rate > 0.5 in/hr), omit the low flow drain or underdrain and install an appropriately sized gravel drainage layer (typically a washed 57 stone) beneath the swale to achieve desired volume reduction goals. Where slopes are greater than 1%, the gravel drainage layer should be installed in combination with check dams (e.g., drop structures) to slow the flow in the swale and allow for infiltration into the gravel drainage layer and then into the subsurface. The base of the drainage layer should have zero slope. The drawdown time in the gravel drainage layer should not exceed 72 hours. The soil and gravel layers should

be separated with a geotextile filter fabric or a thin, 2 to 4 inch layer of pure sand and a thin layer (nominally two inches) of choking stone (such as #8). Sizing of the gravel drainage layer is based on volume reduction requirements.

Swale Divider

1) If a swale divider is used, the divider should be constructed of a firm material that will resist weathering and not erode, such as concrete, plastic, or compacted soil seeded with grass. Treated timber should not be used. Selection of divider material should take into account maintenance activities, such as mowing.

2) The divider should have a minimum height of 1 inch greater than the stormwater quality design water depth.

3) Earthen berms should be no steeper than 2H:1V.

4) Material other than earth should be embedded to a depth sufficient to be stable.

Soils

Swale soils should be amended with 2 inches of compost, unless the organic content is already greater than 10%. The compost should be mixed into the native soils to a depth of 6 inches to prevent soil layering and washout of compost. The compost will contain no sawdust, green or under-composted material, or any other toxic or harmful substance. It should contain no un-sterilized manure, which can lead to high levels of pathogen indictors (coliform bacteria) in the runoff.

Vegetation

Swales must be vegetated in order to provide adequate treatment of runoff via filtration. Vegetation, when chosen and maintained appropriately, also improves the aesthetics of a site. It is important to maximize water contact with vegetation and the soil surface.

1) The swale area should be appropriately vegetated with a mix of erosion-resistant plant species that effectively bind the soil. A diverse selection of low growing plants that thrive under the specific site, climatic, and watering conditions should be specified. A mixture of dry-area and wet-area grass species that can continue to grow through silt deposits is most effective. Native or adapted grasses are preferred because they generally require less fertilizer, limited maintenance, and are more drought-resistant than exotic plants. When appropriate, swales that are integrated within a project may use turf or other more intensive landscaping, while swales that are located on the project perimeter, within a park, or close to an open space area are encouraged to be planted with a more naturalistic plant palette.

2) Trees or shrubs may be used in the landscape as long as they do not over-shade the turf.

3) Above the design treatment elevation, a typical lawn mix or landscape plants can be used provided they do not shade the swale vegetation.

4) Irrigation is required if the seed is planted in the spring or summer. Use of a permanent irrigation system may help provide maximal water quality performance. Drought-tolerant grasses should be specified to minimize irrigation requirements.

5) Vegetative cover should be at least 4 inches in height, ideally 6 inches. Swale water depth should ideally be 2/3 of the height of the shortest plant species.

6) Locate the swale in an area without excessive shade to avoid poor vegetative growth. For moderately shaded areas, shade tolerant plants should be used.

7) Locate the swale away from large trees that may drop excessive leaves or needles, which may smother the grass or impede the flow through the swale. Landscape planter beds should be designed and located so that soil does not erode from the beds and enter a nearby swale.

Maintenance Access

1) Access to the swale inlet and outlet should be safely provided, with ample room for maintenance and operational activities.

Operations and Maintenance

1) Inspect vegetated swales for erosion or damage to vegetation after every storm greater than 0.75 inches for on-line swales and at least twice annually for off-line swales, preferably at the end of the wet season to schedule summer maintenance and in the fall to ensure readiness for winter. Additional inspection after periods of heavy runoff is recommended. Each swale should be checked for debris and litter and areas of sediment accumulation (see Appendix I for a vegetated swale inspection and maintenance checklist).

2) Swale inlets (curb cuts or pipes) should maintain a calm flow of water entering the swale. Remove sediment as needed at the inlet, if vegetation growth is inhibited in greater than 10% of the swale or if the sediment is blocking even distribution and entry of the water. Following sediment removal activities, replanting and/or reseeding of vegetation may be required for reestablishment.

3) Flow spreaders should provide even dispersion of flows across the swale. Sediments and debris should be removed from the flow spreader if blocking flows. Splash pads should be repaired if needed to prevent erosion. Spreader level should be checked and releveled if necessary.

4) Side slopes should be maintained to prevent erosion that introduces sediment into the swale. Slopes should be stabilized and planted using appropriate erosion control measures when native soil is exposed or erosion channels are formed.

5) Swales should drain within 48 hours of the end of a storm. Till the swale if compaction or clogging occurs and revegetate. If a perforated underdrain pipe is present, it should be cleaned if necessary.

6) Vegetation should be healthy and dense enough to provide filtering, while protecting underlying soils from erosion:

   - Mulch should be replenished as needed to ensure survival of vegetation.
   - Vegetation, large shrubs or trees that interfere with landscape swale operation should be pruned.
   - Fallen leaves and debris from deciduous plant foliage should be removed.
   - Grassy swales should be mowed to 4 to 6 inches height. Grass clippings should be removed.
   - Invasive vegetation, such as Alligatorweed (*Alternanthera philoxeroides*), Halogeton (*Halogeton glomeratus*), Spotted Knapweed (*Centaurea maculosa*), Giant Reed (*Arundo donax*), Castor Bean (*Ricinus communis*), Perennial Pepperweed (*Lepidium latifolium*), and Yellow Starthistle (*Centaurea solstitalis*) should be removed and replaced with non-invasive species. Invasive species should never contribute more than 10% of the vegetated area. For more information on invasive weeds, including biology and control of listed weeds, look at the encycloweedia located at the California Department of Food and Agriculture website or the California Invasive Plant Council website at www.cal-ipc.org.
   - Dead vegetation should be removed if greater than 10% of area coverage or when swale function is impaired. Vegetation should be replaced and established before the wet season to maintain cover density and control erosion where soils are exposed.

7) Check dams (if present) should control and distribute flow across the swale. Causes for altered water flow and/or channelization should be identified and obstructions cleared. Check dams and swale should be repaired if damaged.

8) The vegetated swale should be well maintained. Trash and debris, sediment, visual contamination (e.g., oils), noxious or nuisance weeds, should all be removed.

BIO-4: Vegetated Filter Strip

Filter strips are vegetated areas designed to treat sheet flow runoff from adjacent impervious surfaces or intensive landscaped areas such as golf courses. Filter strips decrease runoff velocity, filter out total suspended solids and associated pollutants, and provide some infiltration into underlying soils. While some assimilation of dissolved constituents may occur, filter strips are generally more effective in trapping sediment and particulate-bound metals, nutrients, and pesticides. Filter strips are more effective when the runoff passes through the vegetation and thatch layer in the form of shallow, uniform flow. Biological and chemical processes may help break down pesticides, uptake metals, and use nutrients that are trapped in the filter.

Vegetated filter strip captures runoff from freeway

Photo Credit: Washington Department of Transportation

Applications

- Areas adjacent to parking lots and driveways
- Road medians and shoulders

Preventative Maintenance

- Remove excess sediment
- Stabilize/repair minor erosion and scouring
- Remove trash and debris
- Mow regularly

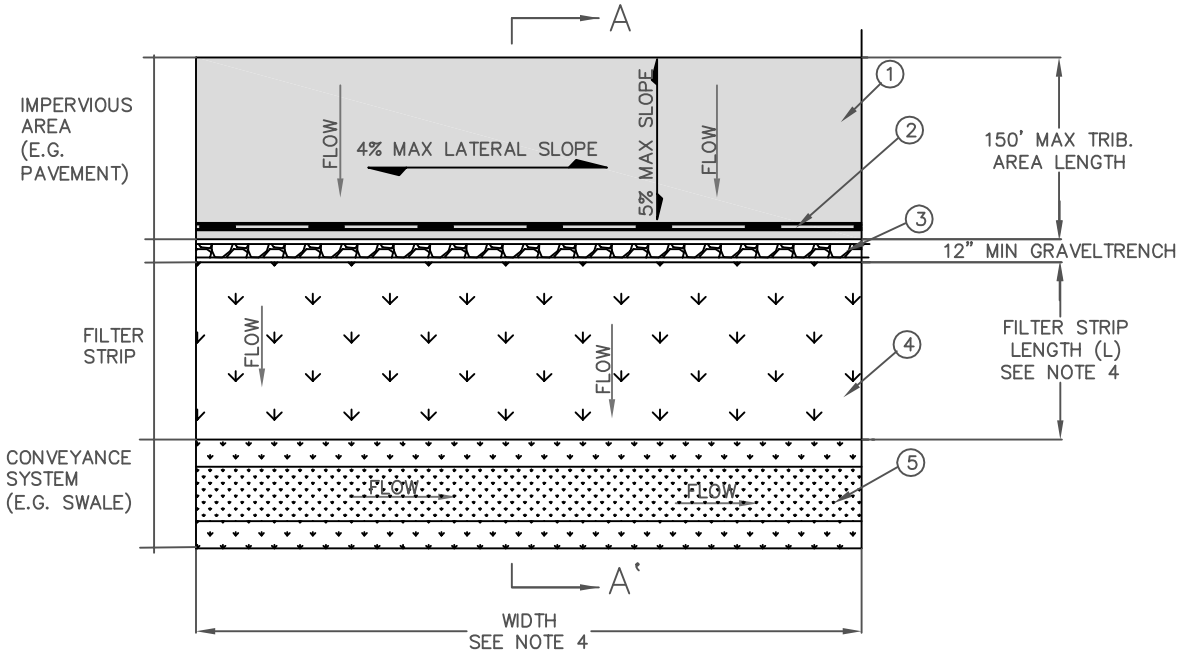

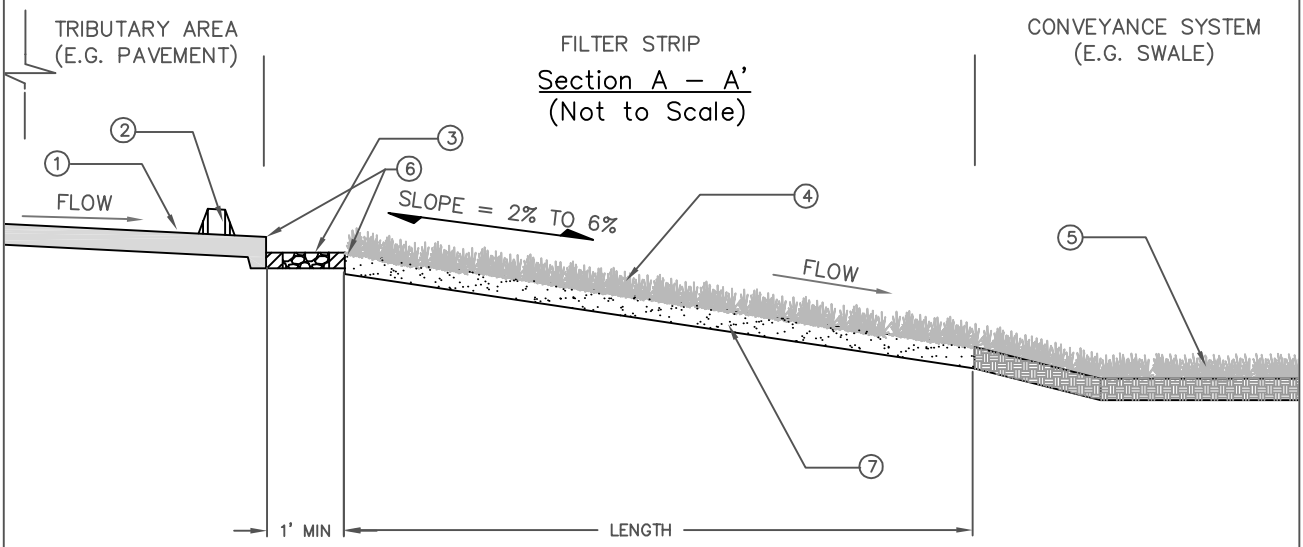

NOTES:

1. MAXIMUM LENGTH OF IMPERVIOUS TRIBUTARY AREA (PER UNIT WIDTH OF FILTER STRIP) SHALL BE 150'.
2. OPTIONAL NOTCHED CURB SPREADERS MAY BE USED IN CONJUNCTION WITH GRAVEL FLOW SPREADER.
3. GRAVEL FLOW SPREADER 6" DEEP BY 12" WIDE MIN SHALL BE PROVIDED.
4. VEGETATED FILTER STRIP SURFACE. SLOPE SHALL BE BETWEEN 2–4%. LENGTH OF STRIP MUST BE BETWEEN 15' AND 150'. WIDTH MUST BE EQUAL OR GREATER THAN THE WIDTH OF THE TRIBUTARY AREA.
5. INSTALL SWALE OR OTHER CONVEYANCE SYSTEM DOWNSTREAM OF FILTER STRIP.
6. TOP OF FILTER STRIP SHALL BE >1" BELOW TOP OF ADJACENT PAVEMENT.
7. AMEND SOILS WITH 2" OF COMPOST TILLED INTO 6" OF NATIVE SOIL UNLESS NATIVE SOIL ORGANIC CONTENT > 10%.

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Figure 6-13: Vegetated Filter Strip

Limitations

The following describes limitations for vegetated filter strips:

- High flow velocity - steep terrain and/or large tributary area may cause concentrated, erosive flows.
- Sheet flow - shallow, evenly-distributed flow across the entire width of the filter strip is required. Filter strips are designed to treat small areas. The maximum flow path from a contributing impervious surface should not exceed 150 feet. Flows should enter as sheet flow and not exceed a depth of 1 inch.
- Shallow grades – a limited site slope may cause ponding.
- Availability of pervious area adjacent to impervious area - filter strips require sheet flow from impervious areas.

Design Criteria

The main challenge associated with filter strips is maintaining sheet flow, which is critical to the performance of this BMP. If flows are concentrated, then little or no treatment of stormwater runoff is achieved and erosive rilling is likely. The use of a flow spreading device (e.g., gravel trench or level spreader) to deliver shallow, evenly-distributed sheet flow to the strip is required. Vegetated filter strips should be designed according to the requirements listed in Table 6-21 and outlined in the section below. BMP sizing worksheets are presented in Appendix E.

Table 6-21: Vegetated Filter Strip Design Criteria

Design Parameter	Unit	Design Criteria
Stormwater quality design flow (SQDF)	cfs	See Section 2 and Appendix E for calculating SQDF.
Maximum design flow depth	inches	1
Design residence time	minutes	7
Design flow velocity	ft/sec	< 1 ft/sec
Minimum length in flow direction	feet	15 (25 preferred); If sized for pretreatment only, filter strip can be a minimum of 4.
Maximum length (parallel to flow) of tributary area per unit width (perpendicular to flow) of filter strip	feet	150
Minimum slope in flow direction	%	2

Design Parameter	Unit	Design Criteria
Maximum slope in flow direction	%	4
Maximum lateral slope	%	4
Vegetation	-	Turf grass (irrigated) or approved equal
Minimum grass height	inches	2
Maximum grass height	inches	4 (typical) or as required to prevent shading
Elevation of flow spreader	inches	> 1 inch below the pavement surface

Sizing Criteria

The flow capacity of a vegetated filter strips (filter strips) is a function of the longitudinal slope (parallel to flow), the resistance to flow (e.g., Manning's roughness), and the width and length of the filter strip. The slope should be shallow enough to ensure that the depth of water will not exceed 1 inch over the filter strip. Similarly, the flow velocity should be less than 1 ft/sec. Procedures for sizing filter strips are summarized below. A filter strip sizing example is also provided.

Step 1: Calculate the design flow rate

The design flow is calculated based on the SQDF (see Section 2).

Step 2: Calculate the minimum width

Determine the minimum width (W_{min}), perpendicular to flow, allowable for the filter strip and design for that width or larger.

$$Wmin = (SQDF) / (qa,min) \qquad \text{(Equation 6-33)}$$

Where

W_{min} = minimum width of filter strip (and tributary area)

$SQDF$ = design flow (cfs)

$q_{a,min}$ = minimum linear unit application rate, 0.005 cfs/ft

Step 3: Calculate the design flow depth

The design flow depth (d_f) is calculated based on the width and the slope, parallel to the flow path, using a modified Manning's equation as follows:

$$d_f = 12 \times [SQDF * n_{wq} / 1.49 W_{trib} s^{0.5}]^{0.6} \qquad \text{(Equation 6-34)}$$

Where:

d_f	=	design flow depth (inches)
$SQDF$	=	design flow (cfs)
W	=	width of strip (perpendicular to flow = width of impervious surface contributing area (ft))
s	=	slope (ft/ft) of strip parallel to flow, average over the whole width
n_{wq}	=	Manning's roughness coefficient (0.25-0.30)

If d_f is greater than 1 inch (0.083 ft), then a shallower slope is required, or a filter strip cannot be used.

Step 4: Calculate the design velocity

The design flow velocity (V_{wq}) is based on the design flow, design flow depth, and width of the strip:

$$Vwq = SQDF / (df\ W) \qquad \text{(Equation 6-35)}$$

Where:

$d_{f,ft}$	=	design flow depth (ft) ($d_f/12$)
$SQDF$	=	stormwater quality design flow (cfs)
W	=	width of strip (perpendicular to flow = width of impervious surface contributing area (ft))

Step 5: Calculate the desired length of the filter strip

Determine the required length (L) to achieve a desired minimum residence time of 7 minutes using:

$$L = 60 t_{hr} * V_{wq} \qquad \text{(Equation 6-36)}$$

Where:

L	=	minimum allowable strip length (ft)
t_{hr}	=	hydraulic residence time (min)
V_{wq}	=	design flow velocity (fps) calculated by Equation 6-35

Geometry and Size

1) The width of the filter strip shall extend across the full width of the tributary area. The upstream boundary of the filter should be located contiguous to the developed tributary area.

2) The length (in direction of flow) should be between 15 and 150 feet. A minimum length of 25 feet is preferred. Filter strips used for pretreatment shall be at least 4 feet long (in direction of flow).

3) Filter strips shall be designed on slopes (parallel to the direction of flow) between 2% and 4%; steeper slopes tend to result in concentrated flow. Slopes less than 2% could pond runoff, and in poorly permeable soils, create a mosquito breeding habitat.

4) The lateral slope of strip (parallel to the edge of the pavement, perpendicular to the direction of flow) should be 4% or less.

5) Grading should be even: a filter strip with uneven grading perpendicular to the flow path will develop flow channels over time.

6) The top of the strip should be installed 2 to 5 inches below the adjacent pavement to allow for vegetation and sediment accumulation at the edge of the strip. A beveled transition is acceptable and may be required per roadside design specifications.

7) Both the top and toe of the slope should be as flat as possible to encourage sheet flow and prevent channeling and erosion. For engineered filter strips, the facility surface should be graded flat prior to placement of vegetation.

Energy Dissipation / Level Spreading

Runoff entering a filter strip must not be concentrated. A flow spreader should be installed at the edge of the pavement to uniformly distribute the flow along the entire width of the filter strip.

1) At a minimum, a gravel flow spreader (gravel-filled trench) should be placed between the impervious area contributing flows and the filter strip, and meet the following requirements:

    a. The gravel flow spreader should be a minimum of 6 inches deep and should be 12 inches wide.

    b. The gravel should be a minimum of 1 inch below the pavement surface. *The intention is that this allows sediment from the paved surface to be accommodated without blocking drainage onto the strip.*

2) The gravel flow spreader should be a minimum of 6 inches deep and should be 12 inches wide.

a. Where the ground surface is not level, the gravel spreader must be installed so that the bottom of the gravel trench and the outlet lip are level.

b. Along roadways, gravel flow spreaders must be placed and designed in accordance with County road design specifications for compacted road shoulders.

3) Curb ports and interrupted curbs may only be used in conjunction with a gravel spreader to better ensure that water sheet flows onto the strip, provided:

a. Curb ports use fabricated openings that allow concrete curbing to be poured or extruded while still providing an opening through the curb to admit water to the filter strip. Interrupted curbs are sections of curb placed to have gaps spaced at regular intervals along the total width of the treatment area. Openings or gaps in the curb should be at regular intervals but at least every 6 feet. The width of each opening should be a minimum of 11 inches.

b. At a minimum, gaps should be every 6 feet to allow distribution of flows into the treatment facility before they become too concentrated. The opening should be a minimum of 11 inches. Approximately 15 percent or more of the curb section length should be in open ports, and as a general rule, no opening should discharge more than 10 percent of the overall flow entering the facility.

4) Energy dissipaters are needed in a filter strips if sudden slope drops occur, such as locations where flows in a filter strip pass over a rockery or retaining wall aligned perpendicular to the direction of flow. Adequate energy dissipation at the base of a drop section can be provided by a riprap pad.

Access

1) Access should be provided at the upper edge of a filter strip to enable maintenance of the inflow spreader throughout the strip width and allow access for mowing equipment.

Water Depth and Velocity

1) The design water depth shall not exceed 1 inch.

2) Runoff flow velocities should not exceed approximately 1 foot per second across the filter strip surface.

Soils

Filter strip soils should be amended with 2 inches of compost, unless the organic content is already greater than 10%. The compost should be mixed into the native soils to a depth of 6 inches to prevent soil layering and washout of compost. The compost will contain no sawdust, green or under-composted material, or any other toxic or harmful substance. It

should contain no un-sterilized manure which can lead to high levels of potentially pathogenic bacteria in the runoff.

Vegetation

Filter strips must be uniformly graded and densely vegetated with erosion-resistant grasses that effectively bind the soil. Native or adapted grasses are preferred because they generally require less fertilizer and are more drought-resistant than exotic plants. The following vegetation guidelines should be followed for filter strips:

1) Sod (turf) can be used instead of grass seed, as long as there is complete coverage.

2) Irrigation should be provided to establish the grasses.

3) Grasses or turf should be maintained at a height of 2 to 4 inches. Regular mowing is often required to maintain the turf grass cover.

4) Trees or shrubs should not be used in abundance because they shade the turf and impede sheet flow.

Operations and Maintenance

Filter strips mainly require vegetation management. Therefore little special training is needed for maintenance crews. Typical maintenance activities and frequencies include:

1) Inspect strips at least twice annually for erosion or damage to vegetation, preferably at the end of the wet season to schedule summer maintenance and in the fall to ensure the strip is ready for winter. However, additional inspection after periods of heavy runoff is most desirable. The strip should be checked for debris and litter and areas of sediment accumulation (see Appendix I for a vegetated filter strip inspection and maintenance checklist).

2) Mow as frequently as necessary (at least twice a year) for safety and aesthetics or to suppress weeds and woody vegetation.

3) Trash tends to accumulate in strip areas, particularly along roadways. The need for litter removal should be determined through periodic inspection. Litter should always be removed prior to mowing.

4) Regularly inspect vegetated buffer strips for pools of standing water. Vegetated filter strips can become a nuisance due to mosquito breeding in level spreaders (unless designed to dewater completely in less than 72 hours), in pools of standing water if obstructions develop (e.g. debris accumulation, invasive vegetation), and/or if proper drainage slopes are not implemented and maintained.

5) Activities that lead to ruts or depressions on the surface of the filter strip should be prevented or the integrity of the strip should be restored by leveling and reseeding. Examples are vehicle tracks, utility maintenance, and pedestrian (short-cut) tracks.

6) Vegetation should be healthy and dense enough to provide filtering, while protecting underlying soils from erosion:

- Mulch should be replenished as needed to ensure survival of vegetation.
- Vegetation, large shrubs or trees that interfere with landscape swale operation should be pruned.
- Fallen leaves and debris from deciduous plant foliage should be removed.
- Filter strips should be mowed to 4 to 6 inches height. Grass clippings should be removed.
- Invasive vegetation, such as Alligatorweed (*Alternanthera philoxeroides*), Halogeton (*Halogeton glomeratus*), Spotted Knapweed (*Centaurea maculosa*), Giant Reed (*Arundo donax*), Castor Bean (*Ricinus communis*), Perennial Pepperweed (*Lepidium latifolium*), and Yellow Starthistle (*Centaurea solstitalis*) should be removed and replaced with non-invasive species. Invasive species should never contribute more than 10% of the vegetated area. For more information on invasive weeds, including biology and control of listed weeds, look at the encycloweedia located at the California Department of Food and Agriculture website or the California Invasive Plant Council website at www.cal-ipc.org.
- Dead vegetation should be removed if greater than 10% of area coverage or when filter strip function is impaired. Vegetation should be replaced and established before the wet season to maintain cover density and control erosion where soils are exposed.

BIO-5: Proprietary Biotreatment

Proprietary biotreatment devices are manufactured treatment BMPs that incorporate plants, soil, and microbes engineered to provide treatment at higher flow rates or volumes and with smaller footprints than their non-proprietary counterparts. Incoming flows are typically pretreated to remove larger particles/debris, filtered through a planting media (mulch, compost, soil, and plants), collected by an underdrain, and delivered to the stormwater conveyance system.

Proprietary Biotreatment Examples

Photo Credits: 1. Filterra®; 2. Stormtreat™

Application

- Parking lot islands
- Pickup/drop off turnarounds
- Roadway curbs

Maintenance

- Filter media replacement
- Sediment, trash, and debris removal
- Mulch replacement
- Vegetation upkeep and replacement

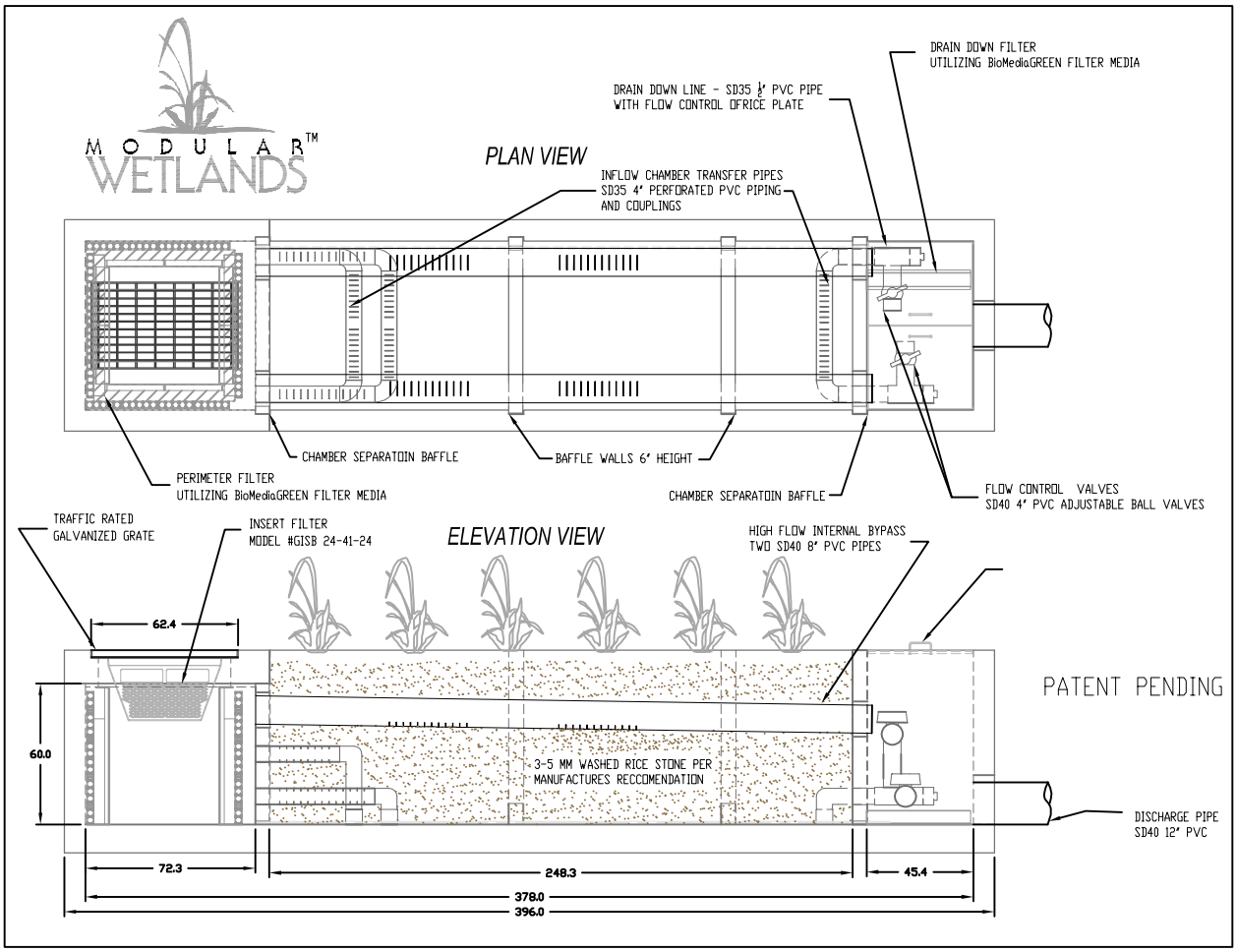

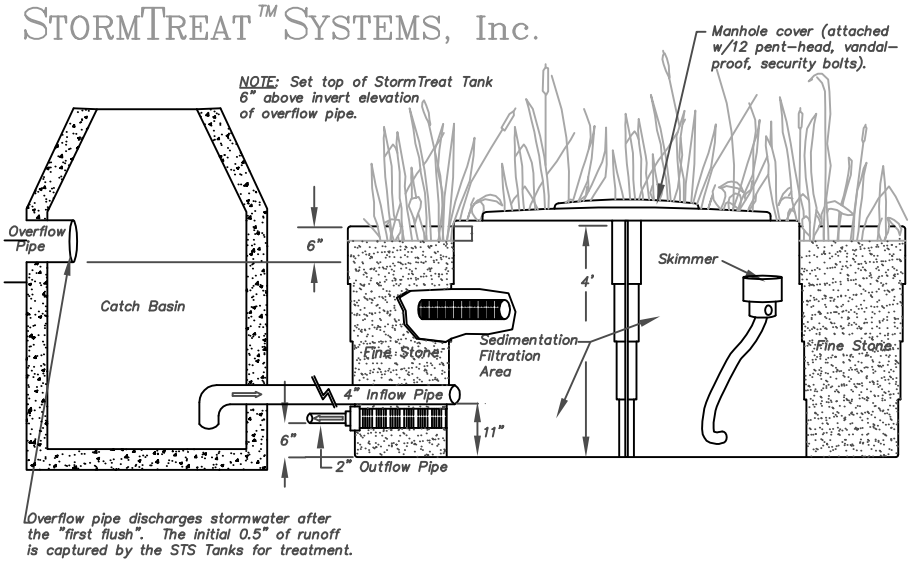

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Figure 6-14: Biotreatment Device

Table 6-22: Proprietary Biotreatment Device Manufacturer Websites

Device	Manufacturer	Website
DeepRoot® Silva Cell	DeepRoot® Urban Landscape Products	www.deeproot.com
Filterra®	Filterra® Bioretention Systems	www.filterra.com
Modular Wetlands (MWS-LINEAR)	Modular Wetlands Systems Inc.	www.modularwetlands.com
StormTreat™	StormTreat Systems Inc.	www.stormtreat.com
UrbanGreen BioFilter	Contech® Construction Products Inc.	www.contech-cpi.com/stormwater/13

Design Criteria

As proprietary biotreatment BMP vendors are constantly updating and expanding their product lines, refer to the specific vendor for the latest design and sizing guidance.

TCM-1: Dry Extended Detention Basin

Dry extended detention (ED) basins are basins whose outlets have been designed to detain the SQDV for 36 to 48 hours to allow sediment particles and associated pollutants to settle and be removed. Dry ED basins do not have a permanent pool. They are designed to drain completely between storm events. They can also be used to provide hydromodification and/or flood control by modifying the outlet control structure and providing additional detention storage. The slopes, bottom, and forebay of dry ED basins are typically vegetated. Without the addition of a sand filter beneath the basin, considerable stormwater volume reduction can still occur, depending on the infiltration capacity of the subsoil.

Extended Detention Basin Application

Photo Credit: Geosyntec Consultants

Application

- Adjacent to parking lots
- Road medians and shoulders
- Within open areas or play fields

Preventative Maintenance

- Remove trash and debris, minor sediment accumulation, and obstructions near inlet and outlet structures
- Replace top 2 to 4 inch of sand
- Mow or weed surface of filter

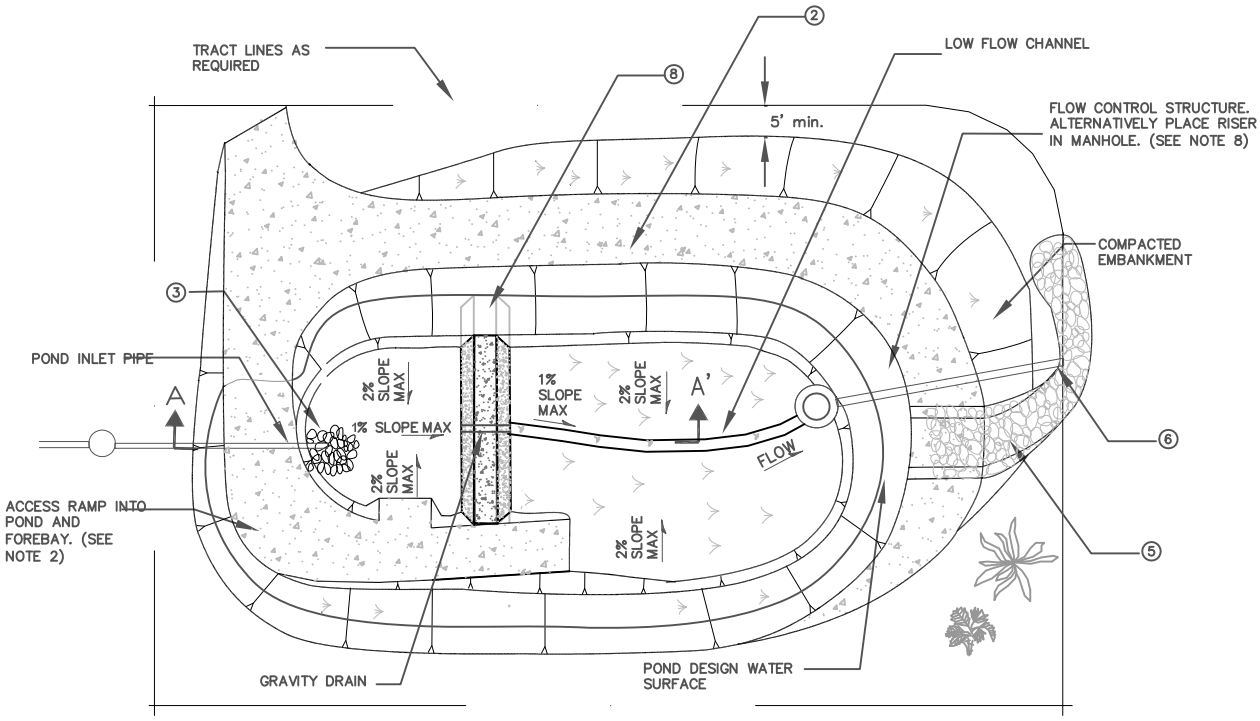

Plan View
(Not to Scale)

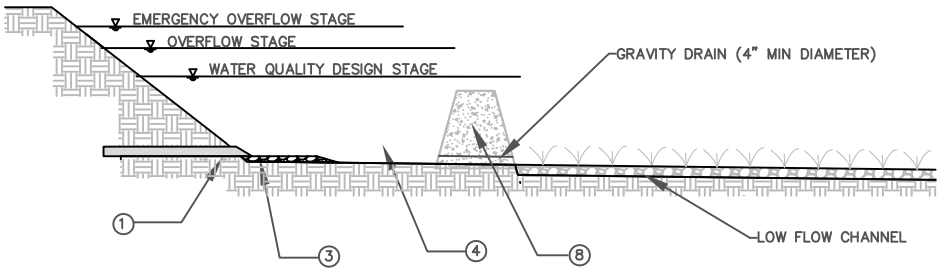

Section A – A'
(Not to Scale)

NOTES:

1. INLET PIPE SHALL BE DESIGNED AND LOCATED SO THAT NON–EROSIVE VELOCITIES OCCUR IN THE FOREBAY
2. MAINTENANCE RAMP SHOULD PROVIDE ACCESS TO BOTH THE FOREBAY AND MAIN BASIN.
3. RIP RAP APRON OR OTHER INLET ENERGY DISSIPATION SHALL BE PROVIDED SUCH THAT VELOCITIES IN THE FOREBAY ARE < 4 FT/S.
4. SEDIMENT FOREBAY SHOULD BE SIZED TO PROVIDE 5–15% OF THE TOTAL BASIN VOLUME.
5. EMERGENCY SPILLWAY MUST BE SIZED TO PASS 100–YEAR PEAK FLOW FOR ON–LINE BASINS, AND WATER QUALITY DESIGN FLOW FOR OFF–LINE BASINS.
6. OUTLET PIPE. ENERGY DISSIPATION SHALL BE PROVIDED UNLESS DISCHARGE IS TO PIPE OR HARDENED CHANNEL.
7. OUTLET STRUCTURE SHOULD BE SIZED TO DRAIN WATER QUALITY VOLUME IN 36 – 48 HOURS (SEE FIGURE 2–2 FOR PERFORATED RISER DETAILS). ALTERNATIVELY PLACE RISER STRUCTURE IN A MANHOLE (SEE FIGURE 2–3).
8. INSTALL EARTHEN BERM OR EQUIVALENT. TOP OF BERM SHALL BE 2' MINIMUM BELOW DESIGN WATER QUALITY STAGE. BERM SHALL BE KEYED INTO EMBANKMENT A MINIMUM OF 1' ON BOTH SIDES.

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Figure 6-15: Extended Detention Basin

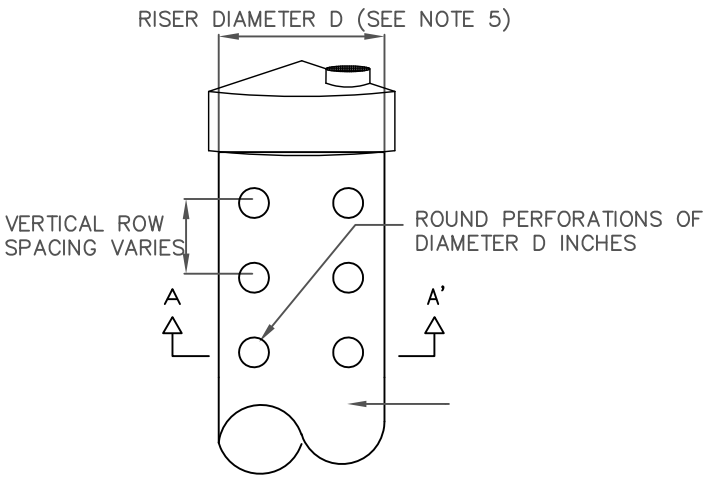

Perforated Riser Detail
(Not to Scale)

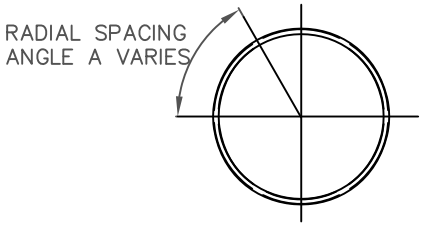

Section A – A'
(Not to Scale)

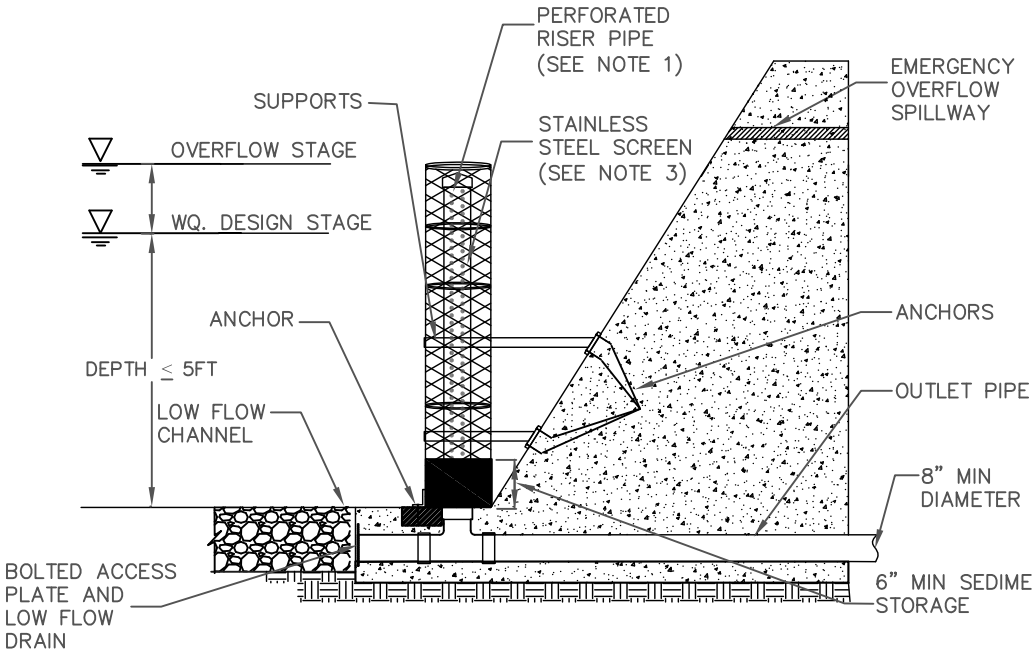

Perforated Riser Outlet Structure
(Not to Scale)

NOTES:

1. RISER PIPE SHALL BE SIZED TO PROVIDE 36 TO 48–HOUR FULL BRIM DRAW DOWN TIME.
2. TOTAL OUTLET CAPACITY: 100–YEAR PEAK FLOW FOR ON–LINE BASINS AND WATER QUALITY DESIGN FLOW FOR OFF–LINE BASINS.
3. SCREEN OPENINGS SHALL BE AT LEAST ¼" AND SHALL NOT EXCEED THE DIAMETER OF THE PERFORATIONS ON THE RISER.
4. RISER PIPE PERFORATION DIAMETER SHALL BE NO LESS THAN ½" AND NO MORE THAN 2"
5. MINIMUM PIPE DIAMETER (D) IS 2'
6. RISER PIPE MATERIAL IS CMP

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Figure 6-16: Perforated Riser Outlet

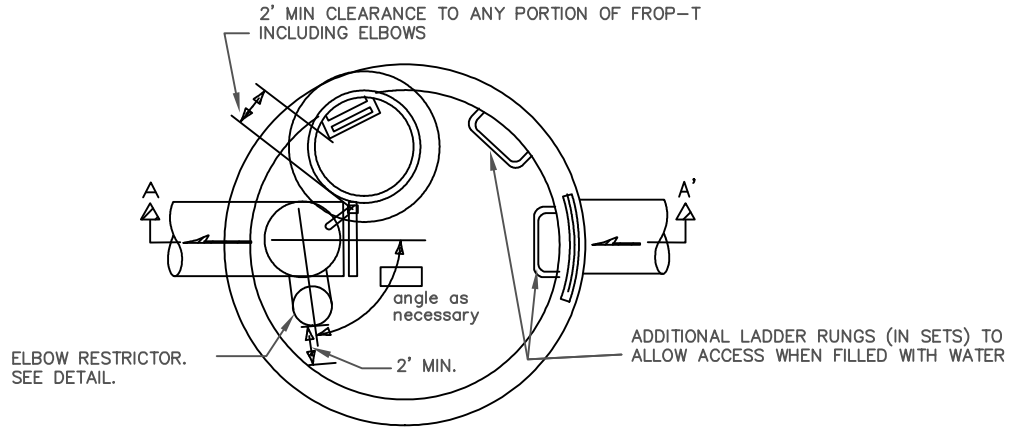

Plan View
(Not to Scale)

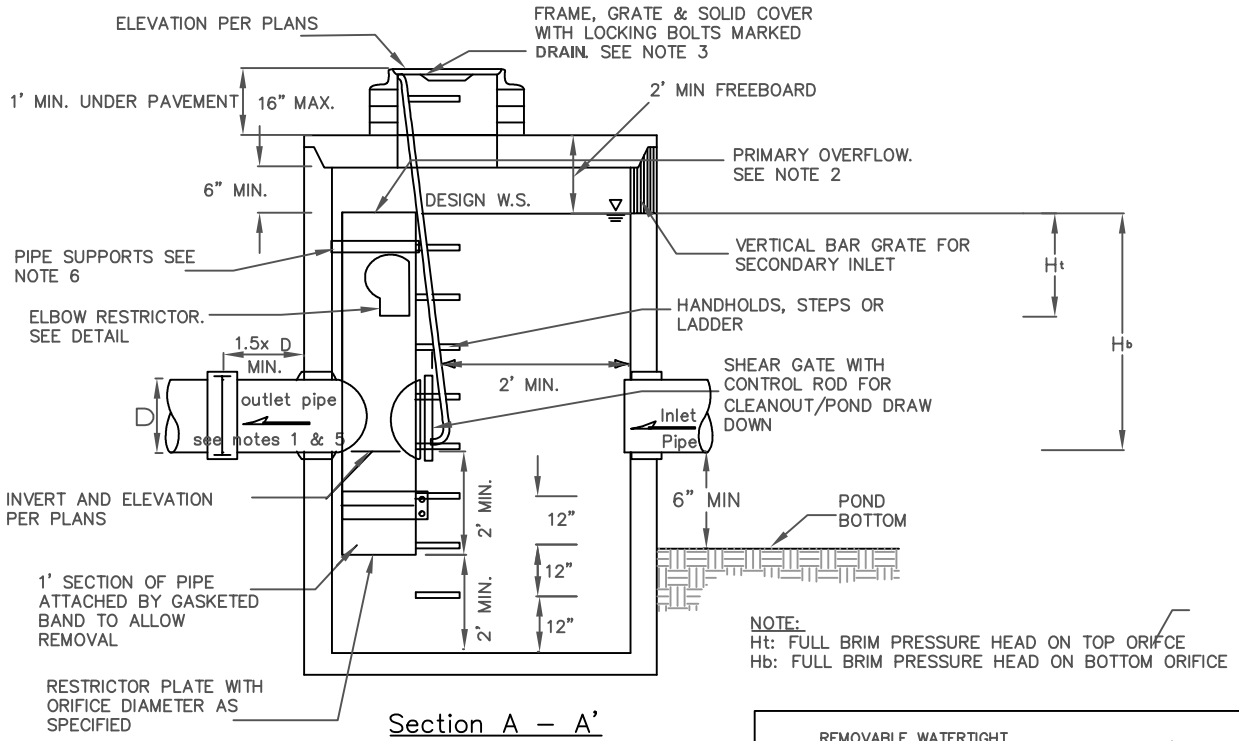

NOTE:
Ht: FULL BRIM PRESSURE HEAD ON TOP ORIFCE
Hb: FULL BRIM PRESSURE HEAD ON BOTTOM ORIFICE

Section A – A'
(Not to Scale)

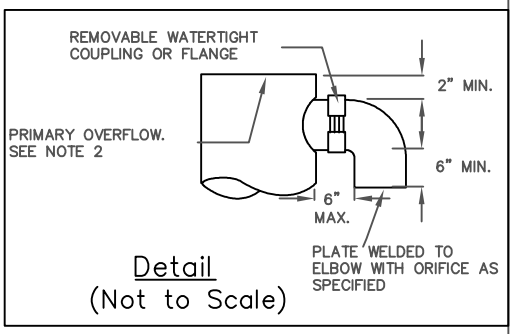

Detail
(Not to Scale)

NOTES:

1. USE A MINIMUM OF A 54" DIA TYPE 2 CATCH BASIN
2. OUTLET CAPACITY: 100-YEAR PEAK FLOW FOR ON-LINE BASINS.
3. METAL PARTS: CORROSION RESISTANT. NON-GALVANIZED PARTS PERFERRED. GALVANIZED PIPE PARTS TO HAVE ASPHALT TREATMENT.
4. FRAME AND LADDER OR STEPS OFFSET SO:
   A. CLEANOUT GATE IS VISIBLE FROM TOP.
   B. CLIMB-DOWN SPACE IS CLEAR OF RISER AND
   C. FRAME IS CLEAR OF CURB.
5. IF METAL OUTLET PIPE CONNECTS TO CEMENT CONCRETE PIPE: OUTLET PIPE TO HAVE SMOOTH O.D. EQUAL TO CONCRETE PIPE I.D. LESS ¼"
6. PROVIDE AT LEAST ONE 3 X .090 GAGE SUPPORT BRACKET ANCHORED TO CONCRETE WALL. (MAXIMUM 3' VERTICAL SPACING)
7. LOCATE ADDITIONAL LADDER RUNGS IN STRUCTURES USED AS ACCESS TO TANKS OR VAULTS TO ALLOW ACCESS WHEN CATCH BASIN IS FILLED WITH WATER

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Figure 6-17: Multiple Orifice Outlet

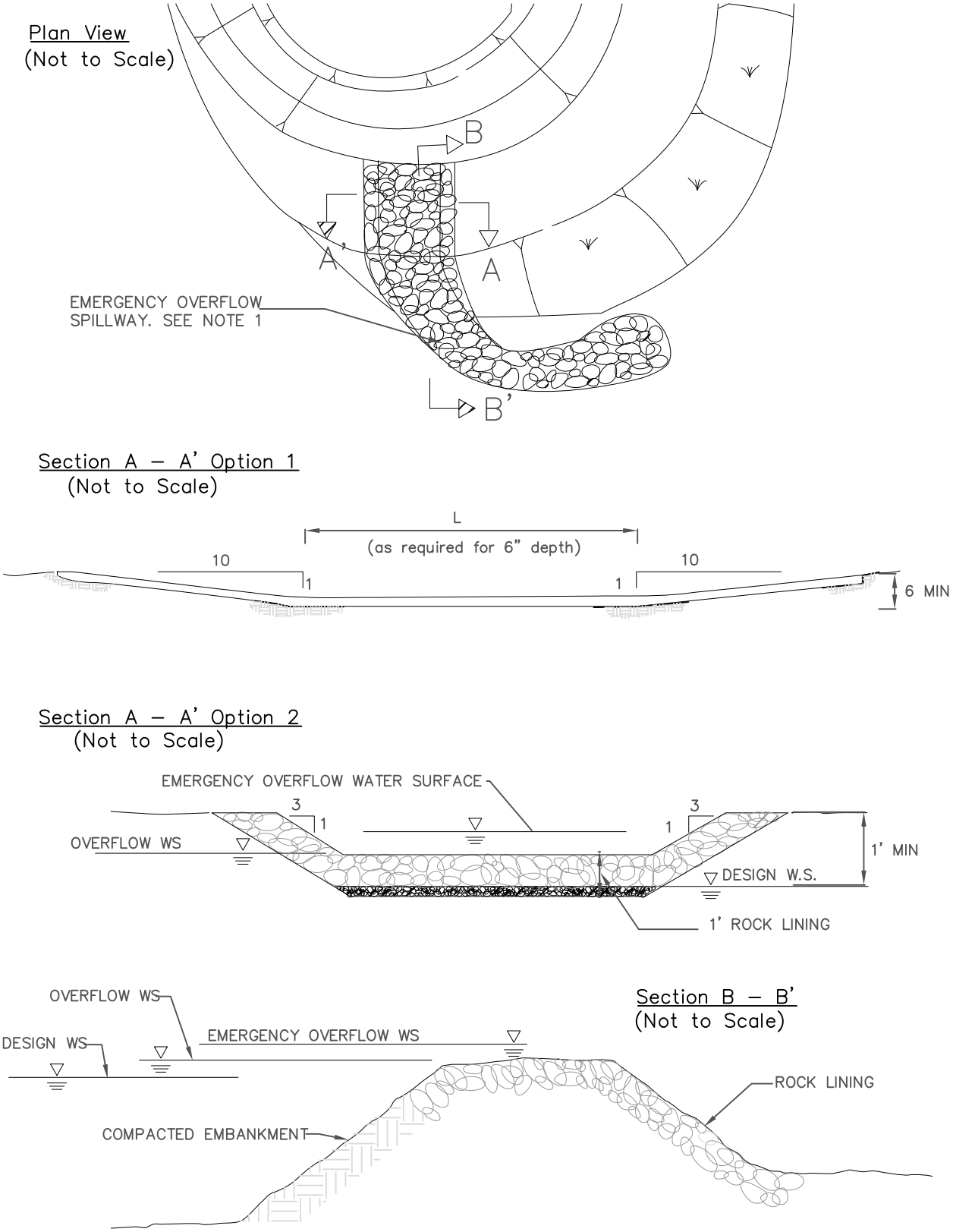

NOTES:

1. ALTERNATIVE SPILLWAY DESIGNS BASED ON THE CALIFORNIA DEPARTMENT OF WATER RESOURCES' GUIDELINES FOR THE DESIGN AND CONSTRUCTION OF SMALL EMBANKMENT DAMS OR AT THE DISCRETION OF THE DEPARTMENT

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Figure 6-18: Spillway

Limitations

Limitations for dry extended detention basins include:

- Surface space availability - typically 0.5 to 2.0 percent of the total tributary development area required.
- Depth to groundwater - bottom of basin should be 2 feet higher than the seasonal high water table elevation.
- Steep slopes - basins placed above slopes greater than 15 percent or within 200 feet from the top of a hazardous slope or landslide area require a geotechnical investigation.
- Compatibility with flood control - basins must not interfere with flood control functions of existing conveyance and detention structures.

Design Criteria

Dry extended detention basins should be designed according to the requirements listed in Table 6-23 and outlined in the section below. BMP sizing worksheets are presented in Appendix E.

Table 6-23: Dry Extended Detention Basin Design Criteria

Design Parameter	Unit	Design Criteria
Stormwater quality design volume (SQDV)	acre-feet	See Section 2 and Appendix E for calculating SQDV
Drawdown time for SQDV	hours	Top 50%: 12 hrs (minimum); Bottom 50%: 36 hrs
Basin Design Volume	acre-ft	1.2 * SQDV
Forebay basin size	acre-feet	5 to 15% of SQDV
Maximum forebay drain time	min	45
Low–flow channel depth	inches	9
Low-flow channel flow capacity		2*forebay outlet rate
Freeboard (minimum)	inches	12
Flow path length to width ratio	L:W	2:1, larger preferred; can be achieved using internal berms
Longitudinal slope	percentage	1 (forebay) and 0-2 (main basin)
Low flow channel geometry	feet	depth of 0.5 and width of 1
Minimum outflow device diameter	inches	18

Sizing Criteria

Dry extended detention (ED) basins are basins designed such that the SQDV is detained for 48 hours. This allows sediment particles and associated pollutants to settle and be removed from the stormwater. Procedures for sizing extended detention basins are summarized below. A sizing example is also provided.

Step 1: Calculate the design volume

Dry extended detention facilities shall be sized to capture and treat the SQDV (see Section E.1).

Step 2: Calculate the volume of the active basin

The total basin volume should be increased an additional 20% above the SQDV to account for sediment accumulation, at a minimum. If the basin is designed only for water quality treatment then the basin volume would be 120% of the SQDV. Freeboard is in additional to the total basin volume. Calculate the volume of the active basin (ft^2) (V_a):

$$V_a = 1.20*SQDV \qquad \text{(Equation 6-37)}$$

Step 3: Determine detention basin location and preliminary geometry based on site constraints

Based on site constraints, determine the basin geometry (area and length) and the storage available by developing an elevation-storage relationship for the basin. The cross-sectional geometry across the width of the basin should be approximately trapezoidal. Shallow side slopes are necessary if the basin is designed to have recreational uses during dry weather conditions.

1) Calculate the width of the basin footprint (W_{tot}) as follows:

$$W_{tot} = \frac{A_{tot}}{L_{tot}} \qquad \text{(Equation 6-38)}$$

Where:

A_{tot} = total surface area of the basin footprint (ft^2)

L_{tot} = total length of the basin footprint (ft)

2) Calculate the length of the active volume surface area including the internal berm but excluding the freeboard, ($L_{av\text{-}tot}$):

$$L_{av-tot} = L_{tot} - 2Zd_{fb} \qquad \text{(Equation 6-39)}$$

Where:

Z = interior side slope as length per unit height (H:V)

d_{fb} = freeboard depth (ft)

3) Calculate the width of the active volume surface area including the internal berm but excluding freeboard (ft), ($W_{av\text{-}tot}$):

$$W_{av-tot} = W_{tot} - 2Zd_{fb} \quad \text{(Equation 6-40)}$$

4) Calculate the total active volume surface area including the internal berm and excluding freeboard, ($A_{av\text{-}tot}$):

$$A_{av-tot} = L_{av-tot} \times W_{av-tot} \quad \text{(Equation 6-41)}$$

5) Calculate the area of the berm, (A_{berm}):

$$A_{berm} = W_{berm} \times L_{berm} \quad \text{(Equation 6-4243)}$$

Where:

W_{berm} = width of the internal berm

L_{berm} = length of the internal berm (= width excluding freeboard, $W_{av\text{-}tot}$)

6) Calculate the surface area excluding the internal berm and freeboard, A_{av}:

$$A_{av} = A_{av=tot} - A_{berm} \quad \text{(Equation 6-44)}$$

Step 4: Determine Dimensions of Forebay

The forebay should be sized to at least 5 to 15% of the basin active volume (V_a). Calculate the active volume of the forebay, (V_1):

$$V_1 = \frac{V_a \times \%V_1}{100} \quad \text{(Equation 6-45)}$$

Where:

$\%V_1$ = percent of V_a in forebay (%)

V_a = total active volume (ft^3)

7) Calculate the surface area for the active volume of forebay (A_1):

$$A_1 = \frac{V_1}{d_1} \quad \text{(Equation 6-46)}$$

Where:

d_1 = average depth for the forebay (ft)

8) Calculate the length of forebay, (L_1):

$$L_1 = \frac{A_1}{W_1} \quad \text{(Equation 6-47)}$$

Where:

W_1 = width of forebay (ft)

Step 5: Determine Dimensions of Cell 2

Cell 2 will consist of the remainder of the basin's active volume.

1) Calculate the active volume of Cell 2, (V_2):

$$V_2 = V_a - V_1 \quad \text{(Equation 6-48)}$$

Where:

V_a = total basin active volume (ft^3)

V_1 = volume of forebay (ft^3)

2) Calculate the surface area, A_2, for the active volume of Cell 2:

$$A_2 = A_{av} - A_1 \quad \text{(Equation 6-49)}$$

Where:

A_{av} = basin surface area excluding berm and freeboard (ft^2)

A_1 = surface area of forebay (ft^2)

3) Calculate the average depth (d_2) for the active volume of Cell 2:

$$d_2 = \frac{V_2}{A_2} \quad \text{(Equation 6-50)}$$

4) Calculate the length of Cell 2, (L_2):

$$L_2 = \frac{A_2}{W_2} \quad \text{(Equation 6-51)}$$

Where:

W_2 = width of Cell 2 (ft)

5) Verify that the length-to-width ratio of Cell 2 at half of d_2 is at least 1.5:1 with ≥2:1 preferred. If the length-to-width ratio is less than 1.5:1, modify input parameters until a ratio of at least 1.5:1 is achieved. If the input parameters cannot be modified as a result of site constraints, another site for the basin should be chosen. Calculate the length-to width (LW_{mid2}) ratio of Cell 2 at half of d_2 follows:

$$LW_{mid2} = \frac{L_{mid2}}{W_{mid2}} \qquad \text{(Equation 6-52)}$$

Where:

W_{mid2} = $W_2 - Zd_2$ (Equation 6-53)

L_{mid2} = $L_2 - Zd_2$ (Equation 6-54)

W_{mid2} = width of Cell 2 at half of d_2 (ft)

L_{mid2} = length of Cell 2 at half of d_2 (ft)

Z = interior side slope as length per unit height (H:V)

d_2 = cell 2 average depth (ft)

Step 6: Ensure Design Requirements and Site Constraints are achieved

Check design requirements and site constraints. Modify design geometry until requirements are met. If the chosen site for the basin is inadequate to meet the design requirements, choose a new location or alternative treatment BMP.

Step 7: Size Outlet Structure

The total drawdown time for the basin should be 48 hours. The outlet structure should be designed to release the bottom 50% of the detention volume (half-full to empty) over 36 hours, and the top half (full to half-full) in 12 hours. A primary overflow should be sized to pass the peak flow rate from the developed capital design storm. See Section 6 for outlet structure sizing methodologies.

Step 8: Determine Emergency Spillway Requirements

For online basins, an emergency overflow spillway should be sized to pass flows greater than the design peak runoff discharge rate for the 100-yr, 24-hr storm in order to prevent overtopping of the walls or berms in the event that a blockage of the riser occurs. For offline basins, an emergency spillway or riser should be sized to pass the 100-yr, 24-hr post-development peak stormwater runoff discharge rate directly to the downstream conveyance system or another acceptable discharge point. For sites where the emergency

spillway discharges to a steep slope, an emergency overflow riser, in addition to the spillway should be provided.

Sizing and Geometry

1) The total basin volume should be increased an additional 20% of the SQDV to account for sediment accumulation, at a minimum. If the basin is designed only for water quality treatment then the basin volume would be 120% of the SQDV. Freeboard is in addition to the total basin volume.

2) The minimum freeboard should be at least 1 foot above the emergency overflow water surface for dry extended detention basins.

3) The minimum flow-path length to width ratio at half basin height should be a minimum of 3:1 (L:W) and can be achieved using internal berms or other means to prevent short-circuiting. Intent: a long flow length will improve fine sediment removal.

4) The cross-sectional geometry across the width of the basin should be approximately trapezoidal. Shallow side slopes are necessary if the basin is designed to have recreational uses during dry weather conditions.

5) All dry ED basins should be free draining and a low flow channel should be provided. A low flow channel is a narrow, shallow trench filled with pea gravel and encased with filter fabric that runs the length of the basin to drain dry weather flows. The low flow channel should be of sufficient size considering the natural characteristics of the soil and have a positive-draining gradient flowing toward the outlet structure (typically 1 ft wide by 6 inches deep). If infiltration rates of subsurface soils are insufficient, the low flow channel should tie into perforated pipe at the outlet structure. If a sand filter or planting media is provided beneath the dry ED basin for increased volume reduction, it may be designed to take the place of the low flow channel.

6) The basin bottom should have a 1% longitudinal slope (direction of flow) in the forebay, and may range from 0 to 2% longitudinal slope in the main basin. The bottom of the basin should slope 2% toward the center low flow channel.

7) A basin should be large enough to allow for equipment access via a graded ramp.

Soils Considerations

1) The slopes of the detention basin should be analyzed for slope stability using rapid drawdown conditions and should meet the minimum standards set by the Ventura County Flood Control District. A 1.5 static factor of safety should be used. Seismic analysis is not required due to the temporary storage of water in the basin.

2) The infiltration capability of the dry ED basin can be enhanced by incorporating soil amendments.

Energy Dissipation

1) Energy dissipation controls constructed of sound materials such as stones, concrete, or proprietary devices that are rated to withstand the energy of the influent flow should be installed at the inlet to the sediment forebay. Flow velocity into the basin forebay should be controlled to 4 feet per second (ft/sec) or less.

2) Energy dissipation controls must also be used at the outlet/spillway from the detention basin unless the basin discharges to a storm drain or hardened channel.

Sediment Forebay

As untreated stormwater enters the dry ED basin, it passes through a sediment forebay for coarse solids removal. The forebay may be constructed using an internal berm constructed out of earthen embankment material, grouted riprap, stop logs, or other structurally sound material.

1) The basin should be sized so that 5 to 15% of the total basin volume is in the forebay and 85 to 95% of the total basin volume is in the main portion of the basin.

2) A gravity drain outlet from the forebay (2 inch minimum diameter) should extend the entire width of the internal berm and be designed to completely drain to the main basin within 10 minutes.

3) The forebay outlet should be offset (horizontally) from the inflow streamline to prevent short-circuiting.

4) Permanent steel post depth markers should be placed in the forebay to define sediment removal limits at 50% of the forebay sediment storage depth.

Vegetation

Vegetation within the dry ED basin provides erosion protection from wind and water and biofiltration of stormwater. The local permitting authority should review and approve any proposed basin landscape plan prior to implementation and following guidelines should be followed:

1) The bottom and slopes of the dry ED basin should be vegetated. A mix of erosion-resistant plant species that effectively bind the soil should be used on the slopes and a diverse selection of plants that thrive under the specific site, climatic, and watering conditions should be specified for the basin bottom. The basin bottom should not be planted with trees, shrubs, or other large woody plants that may interfere with sediment removal activities. The basin should be free of floating objects. Only native perennial grasses, forbs, or similar vegetation that can be replaced via seeding should be used on the basin bottom.

    a. Landscaping outside of the basin is required for all dry ED basins and should adhere to the following criteria so as not to hinder maintenance operations:

b. No trees or shrubs may be planted within 15 feet of inlet or outlet pipes or manmade drainage structures such as spillways, flow spreaders, or earthen embankments. Species with roots that seek water, such as willow or poplar, should not be used within 50 feet of pipes or manmade structures. Weeping willow (Salix babylonica) should not be planted in or near detention basins.

2) Prohibited non-native plant species will not be permitted. For more information on invasive weeds, including biology and control of listed weeds, look at the encycloweedia located at the California Department of Food and Agriculture website- or the California Invasive Plant Council website at www.cal-ipc.org.

3) A plant list provided by a landscape professional should be used as a guide only and should not replace project-specific planting recommendations, including recommendations on appropriate plants, fertilizer, mulching applications, and irrigation requirements (if any) to ensure healthy vegetation growth.

Sand Filter or Planting Media Layer

For increasing the volume reduction capability of a dry ED basin, an appropriately sized sand filter or planting media layer can be placed beneath the dry ED basin to achieve desired volume reduction goals if soil and slope conditions allow (i.e., infiltration rate greater than 0.5 in/hr but less than 2.4 in/hr; site slope less than 15%). The drawdown time of the sand filter or planting media layer should be less than 72 hours. The base of the sand filter or planting media layer should be level (i.e., zero slope). If a sand filter/planting media layer is provided over the length of the basin, it can take the place of the low-flow channel so long as it is designed to adequately infiltrate dry weather flows. Sizing of the sand filter and planting media layer for dry ED basins is the same as for sand filters and bioretention areas, respectively. The depth of water in the dry ED basin should not exceed 6 feet.

Outlet Structure and Drawdown Time

A drawdown time of 36 to 48 hours shall be provided for the SQDV. This drawdown time is for the volume in the basin above the sand filter layer (if provided) and serves the purpose of water quality treatment. An outflow device should be designed to release the bottom 50% of the detention volume (half-full to empty) over 24 to 32 hours, and the top half (full to half-full) in 12 to 16 hours. *The intention is that the drawdown schemes that detain low flows for longer periods than high flows have the following advantages over outlets that drain the basin evenly:*

- Greater flood control capabilities
- Enhanced treatment of low flows which make up the bulk of incoming flows.

Additional storage, detention, and outlet control is required to achieve pre-development stormwater runoff discharge rates for hydromodification control. The outlet structure

can be designed to achieve flow control for meeting the multiple objectives of water quality and flow attenuation.

The outflow device (i.e., outlet pipe) should be oversized (18 inch minimum diameter). There are two options that can be used for the outlet structure:

1) Uniformly perforated riser structures.

2) Multiple orifice structures (orifice plate).

The outlet structure can be placed in the basin with a debris screen (Figure 6-15) or housed in a standard manhole (Figure 6-16). If a multiple orifice structure is used, an orifice restriction (if necessary) should be used to limit orifice outflow to the maximum discharge rates allowable for achieving the desired water quality and flow control objectives. Orifice restriction plates should be removable for emergency situations. A removable trash rack should be provided at the outlet.

Note that a primary overflow (typically a riser pipe connected to the outlet works) should be sized to pass flows larger than the stormwater quality design storm (if the ED basin is sized only for water quality) or to pass flows larger than the peak flow rate of the maximum design storm to be detained in the basin (e.g., 100-yr, 24-hr). The primary overflow is intended to protect against overtopping or breaching of a basin embankment.

Perforated Risers Outlet Sizing Methodology

The following attributes influence the perforated riser outlet sizing calculations**:**

- Shape of the basin (e.g., trapezoidal)
- Depth and volume of the basin
- Elevation / depth of first row of holes
- Elevation / depth of last row of holes
- Size of perforations
- Number of rows or perforations and number of perforations per row
- Desired drawdown time (e.g., 16 hour and 32 hour draw down for top half and bottom half respectively, 48 hour total drawdown time for the stormwater quality design volume)

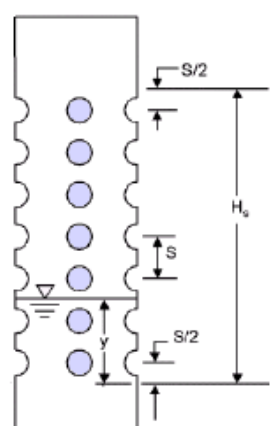

Perforated Riser Outlet

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The governing rate of discharge from a perforated riser structure can be calculated using Equation 6-44 below:

$$Q = C_p \frac{2A_p}{3H_s}\sqrt{2g}H^{3/2}$$

(Equation 6-55)

Where:

Q	=	riser flow discharge (cfs)
C_p	=	discharge coefficient for perforations (use 0.61)
A_p	=	cross-sectional area of all the holes (ft^2)
s	=	center to center vertical spacing between perforations (ft)
H_s	=	distance from s/2 below the lowest row of holes to s/2 above the top row of holes (McEnroe 1988).
H	=	effective head on the orifice (measured from center of orifice to water surface)

For the iterative computations needed to size the perforations in the riser and determine the riser height, a simplified version of Equation 6-44 may be used as shown below in Equation 6-45 and Equation 6-46:

$$Q = kH^{3/2}$$

(Equation 6-56)

Where:

H	=	effective head on the orifice (measured from center of orifice to water surface)

$$k = C_p \frac{2A_p}{3H_s}\sqrt{2g}$$

(Equation 6-57)

Where:

C_p	=	discharge coefficient for perforations (use 0.61)
A_p	=	cross-sectional area of all the holes (ft^2)
s	=	center to center vertical spacing between perforations (ft)

H_s	=	distance from s/2 below the lowest row of holes to s/2 above the top row of holes.
g	=	32.17 ft/sec^2

Uniformly perforated riser designs are defined by the depth or elevation of the first row of perforations, the length of the perforated section of pipe, and the size or diameter of each perforation.

Multiple Orifice Outlet Sizing Methodology

The following attributes influence multiple orifice outlet sizing calculations**:**

- Shape of the basin (e.g., trapezoidal)
- Depth and volume of the basin
- Elevation of each orifice
- Desired draw-down time (e.g., 16 hour and 32 hour draw down times for top half and bottom half respectively, 48 hour drawdown time for stormwater quality design volume)

The rate of discharge from a single orifice can be calculated using Equation 6-22.

$$Q = CA(2gH)^{0.5} \qquad \text{(Equation 6-58)}$$

Where:

Q	=	orifice flow discharge
C	=	discharge coefficient
A	=	cross-sectional area of orifice or pipe (ft2)
g	=	acceleration due to gravity (32.2 ft/s2)
H	=	effective head on the orifice (measured from center of orifice to water surface)

Multiple orifice designs are defined by the depth (or elevation) and the size (or diameter) of each orifice. The steps needed to size a dual orifice outlet are outlined in Appendix E; multiple orifices may be provided and sized using a similar approach.

Emergency Spillway

An emergency overflow spillway in addition to the primary overflow outlet (as described above) is required. The emergency spillway should be sized for flows greater than the

peak 100-year 24-hour storm if the basin is designed on-line or, if the basin is designed on-line, the spillway should be sized for flows greater than the basin design volume (e.g., stormwater quality design volume). The spillway should provide for adequate energy dissipation downstream. The spillway should allow for at least 12 inches of freeboard above the emergency overflow water surface elevation if the basin is on-line. If the basin is on-line, 2 feet of freeboard is preferable.

Spillways shall meet the California Department of Water Resources, Division of Safety of Dams Guidelines for the Design and Construction of Small Embankment Dams (http://damsafety.water.ca.gov/docs/GuidelinesSmallDams.pdf). *Intent: Emergency overflow spillways are intended to control the location of basin overtopping and safely direct overflows back into the downstream conveyance system or other acceptable discharge point.*

On-line Basins

1) On-line basins must have an emergency overflow spillway to prevent overtopping of walls or berms should blockage of the primary outlet occur based on a downstream risk assessment.

2) The overflow spillway must be sized to pass flows greater than the design peak runoff discharge rate for the 100-yr, 24-hr storm.

3) The minimum freeboard should be 1 foot (but preferably at least 2 feet) above the maximum water surface elevation over the emergency spillway.

Off-line Basins

1) Off-line basins must have either an emergency overflow spillway or an emergency overflow riser. The emergency overflow must be designed to pass the 100-yr 24-hr post-development peak stormwater runoff discharge rate directly to the downstream conveyance system or another acceptable discharge point. Where an emergency overflow spillway would discharge to a steep slope, an emergency overflow riser, in addition to the spillway should be provided.

2) The emergency overflow spillway shall be armored to withstand the energy of the spillway flows.

3) The minimum freeboard should be 1 foot above the maximum water surface elevation over the emergency spillway.

Side Slopes

1) Interior side slopes above the stormwater quality design depth and up to the emergency overflow water surface steeper than 4:1 (H:V) should be stabilized to prevent erosion with a method approved by the local permitting authority.

2) Exterior side slopes steeper than 2:1 (H:V) should be stabilized to prevent erosion with a method approved by the local permitting authority.

3) For any slope (interior or exterior) greater than 2:1 (H:V), a geotechnical investigation and report must be submitted and approved by the local permitting authority.

4) Landscaped slopes should be no greater than 3:1 (H:V) to allow for maintenance.

5) Basin walls may be vertical retaining walls, provided: (a) they are constructed of reinforced concrete, (b) a fence is provided along the top of the wall (see fencing below) or further back, and (c) the design is stamped by a licensed civil engineer and approved by the Local permitting authority.

Embankments

1) Earthworks and berm embankments should be performed in accordance with the latest edition of the "Greenbook Standard Specifications for Public Works Construction".

2) Embankments are earthen slopes or berms used for detaining or redirecting the flow of water.

3) Top of berm separating forebay and main basin should be 2 feet minimum below the stormwater quality design water surface and should be keyed into embankment a minimum of 1 foot on both sides.

4) Typically, the top width of berm embankments are at least 20 feet, but narrower embankments may be plausible if approved by the civil engineer and the Local permitting authority.

5) Basin berm embankments should be constructed on native consolidated soil (or adequately compacted and stable fill soils analyzed by a licensed civil engineer) free of loose surface soil materials, roots, and other organic debris.

6) The berm embankment should be constructed of compacted soil (95% minimum dry density, modified proctor method per ASTM D1557), placed in 6-inch lifts.

7) Basin berm embankments greater than 4 feet in height should be constructed by excavating a key equal to 50% of the berm embankment cross-sectional height and width. This requirement may be waived if specifically recommended by a licensed civil engineer.

8) The berm embankment should be constructed of compacted soil (95% minimum dry density, modified proctor method per ASTM D1557), placed in 6-inch lifts.

9) Low growing native or non-invasive perennial grasses should be planted on downstream embankment slopes. See vegetation section below.

Fencing

1) Safety is provided either by fencing of the facility or by managing the contours of the basin to eliminate drop-offs and other hazards.

2) If fences are required, fences should be designed and constructed in accordance with relevant standards and should typically be located at or above the overflow water surface elevation. Shrubs (approved, California-adapted species) can be used to hide the fencing. See vegetation section above.

Right-of-Way

1) Dry extended detention basins and associated access roads to be maintained by a public agency should be dedicated in fee or in an easement to the public agency with appropriate access.

Maintenance Access

1) Ownership of the basin and maintenance thereof is the responsibility of the developer/applicant. A maintenance agreement with the Local permitting authority is required to ensure adequate performance and allow emergency access to the facilities.

2) Maintenance access road(s) should be provided to the control structure and other drainage structures associated with the basin (e.g., inlet, emergency overflow or bypass structures). Manhole and catch basin lids should be in or at the edge of the access road.

3) A ramp into the basin should be constructed near the basin outlet. An access ramp is required for removal of sediment with a backhoe or loader and truck. The ramp should extend to the basin bottom to avoid damage to vegetation planted on the basin slope.

4) All access ramps and roads should be provided in accordance with the current policies of the Ventura County Flood Control District or local approval authority.

Construction Considerations

The use of treated wood or galvanized metal anywhere inside the facility is prohibited.

Operations and Maintenance

Maintenance is of primary importance if extended detention basins are to continue to function as originally designed. A maintenance agreement must be developed with the local approval authority to ensure adequate performance and allow emergency access. Maintenance of the basin is the responsibility of the development, unless otherwise agreed upon.

A specific maintenance plan shall be formulated for each facility outlining the schedule and scope of maintenance operations, as well as the data handling and reporting requirements. The following are general maintenance requirements:

1) The basin should be inspected semiannually or more frequently, and inspections after major storm events are encouraged (see Appendix I for guidance on facility maintenance inspections). Trash and debris should be removed as needed, but at least annually prior to the beginning of the wet season (see Appendix I for dry extended detention basin inspection and maintenance checklist).

2) Site vegetation should be maintained as follows:

   - Vegetation, large shrubs, or trees that limit access or interfere with basin operation should be pruned or removed.
   - Slope areas that have become bare should be revegetated and eroded areas should be regraded prior to being revegetated.
   - Grass should be mowed to 4 to 9 inch high and grass clippings should be removed.
   - Fallen leaves and debris from deciduous plant foliage should be raked and removed.
   - Invasive vegetation, such as Alligatorweed (Alternanthera philoxeroides), Halogeton (Halogeton glomeratus), Spotted Knapweed (Centaurea maculosa), Giant Reed (Arundo donax), Castor Bean (Ricinus communis), Perennial Pepperweed (Lepidium latifolium), and Yellow Starthistle (Centaurea solstitalis) should be removed and replaced with non-invasive species. Invasive species should never contribute more than 25% of the vegetated area. For more information on invasive weeds, including biology and control of listed weeds, look at the encycloweedia located at the California Department of Food and Agriculture website or the California Invasive Plant Council website at www.cal-ipc.org.
   - Dead vegetation should be removed if it exceeds 10% of area coverage. Vegetation should be replaced immediately to maintain cover density and control erosion where soils are exposed.
   - No herbicides or other chemicals should be used to control vegetation.

3) Sediment buildup exceeding 50% of the forebay capacity should be removed. Sediment from the remainder of the basin should be removed when 6 inches of sediment accumulates. Sediments should be tested for toxic substance accumulation in compliance with current disposal requirements if land uses in the catchment include commercial or industrial zones, or if visual or olfactory indications of pollution are noticed. If toxic substances are encountered at concentrations exceeding thresholds of Title 22, Section 66261 of the California Code of Regulations,

the sediment must be disposed of in a hazardous waste landfill. It is recommended to clean the forebay frequently to reduce frequency of main basin cleaning.

4) Remove sediment from basin when accumulation reaches 25% of original design depth. Cleaning is recommended to occur in early spring to allow vegetation to reestablish.

5) Repair erosion to banks and bottom of basin as required.

6) Following sediment removal activities, replanting, and/or reseeding of vegetation may be required for reestablishment.

7) Control vectors as needed.

TCM-2: Wet Detention Basin

Wet detention basins are constructed, naturalistic ponds with a permanent or seasonal pool of water (also called a "wet pool" or "dead storage"). Aquascape facilities, such as artificial lakes, are a special form of wet pool facility that can incorporate innovative design elements to allow them to function as a stormwater treatment facility in addition to an aesthetic water feature. Wetponds require base flows to exceed or match losses through evaporation and/or infiltration and they must be designed with the outlet positioned and/or operated in such a way as to maintain a permanent pool. Wetponds can be designed to provide extended detention of incoming flows using the volume above the permanent pool surface.

Wet Detention Basin

Photo Credit: Geosyntec Consultants

Application

- Regional detention & treatment
- Roads, highways, parking lots, commercial, residential
- Parks, open spaces, and golf courses

Preventative Maintenance

- inspected at a minimum annually and inspections after major storm events
- Pruned or remove vegetation, large shrubs, or trees that limit access or interfere with basin operation
- Remove sediment buildup at inlets and outlets

Plan View
(Not to Scale)

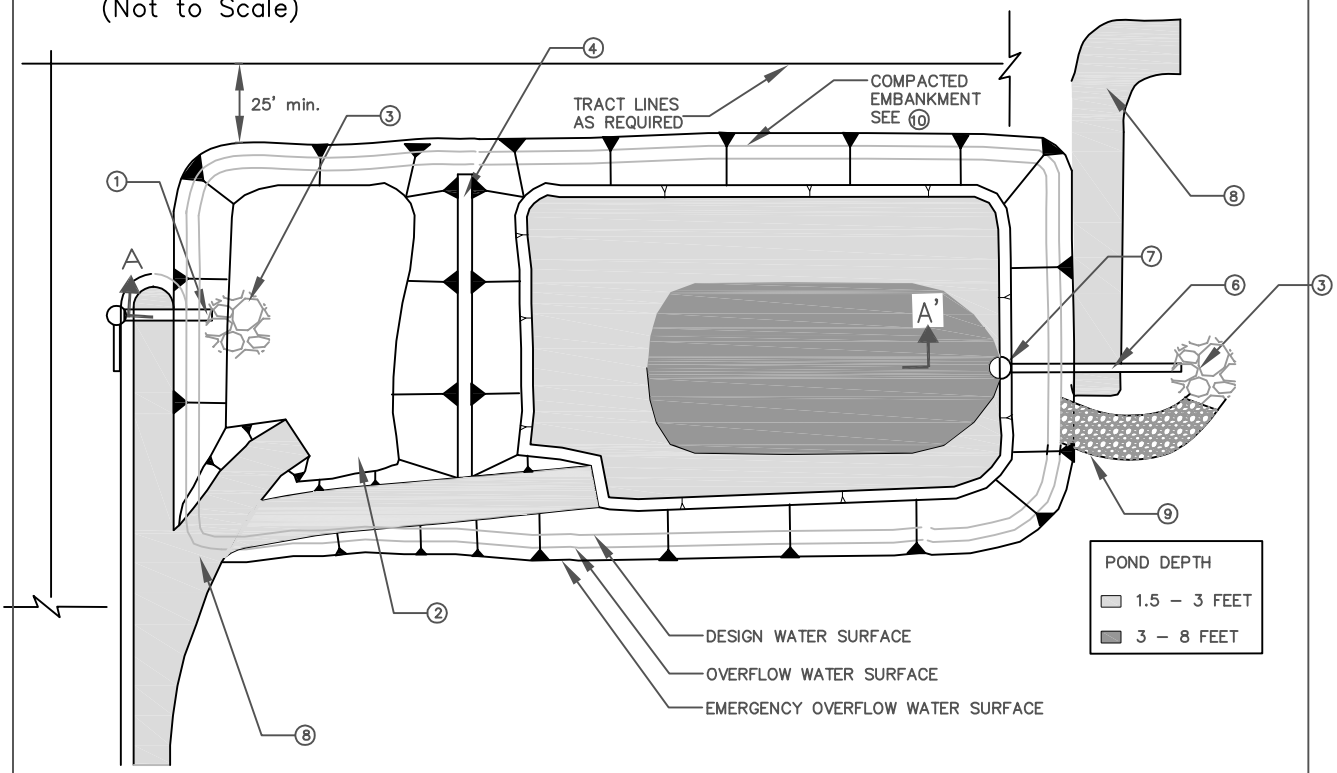

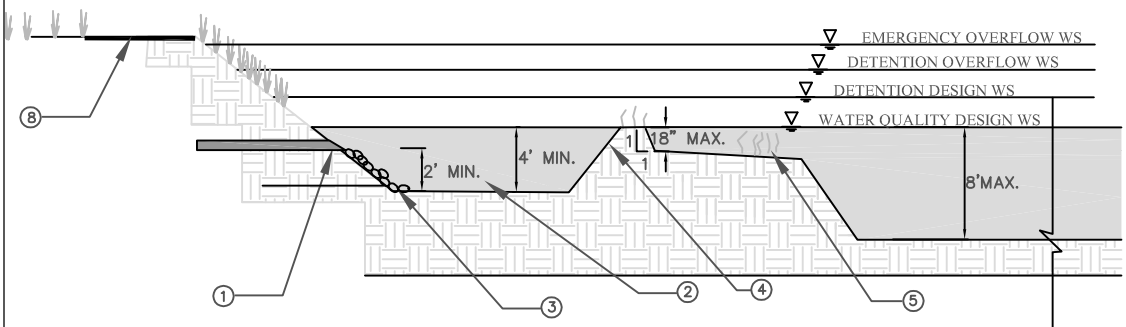

Section A - A'
(Not to Scale)

NOTES:

1. INLET PIPE SHOULD BE SUBMERGED WITH A MINIMUM OF 2' DISTANCE FROM THE BOTTOM
2. FIRST CELL VOLUME SHALL EQUAL 25% TO 35% OF TOTAL WETPOND VOLUME. DEPTH SHALL BE 4' MIN TO 8' MAX PLUS AN ADDITIONAL 1' MIN SEDIMENT STORAGE DEPTH.
3. RIP RAP APRON OR OTHER ENERGY DISSIPATION.
4. BERM SHALL EXTEND ACROSS ENTIRE WIDTH OF THE WETPOND.
5. EMERGENT VEGETATION SHALL BE PLANTED IN REGIONS OF THE POND THAT ARE 3' DEEP OR LESS.
6. SIZE OUTLET PIPE TO PASS 100-YEAR PEAK FLOW FOR ON-LINE PONDS AND WATER QUALITY PEAK FLOW FOR OFF-LINE PONDS.
7. WATER QUALITY OUTLET STRUCTURE. SEE FIGURE 8-2 AND FIGURE 8-3 FOR DETAILS.
8. MAINTENANCE ACCESS ROAD SHOULD PROVIDE ACCESS TO BOTH THE FIRST CELL AND MAIN BASIN.
9. INSTALL EMERGENCY OVERFLOW SPILLWAY AS NEEDED. SEE FIGURE 2-4 FOR DETAILS

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Figure 6-19: Wet Detention Basin

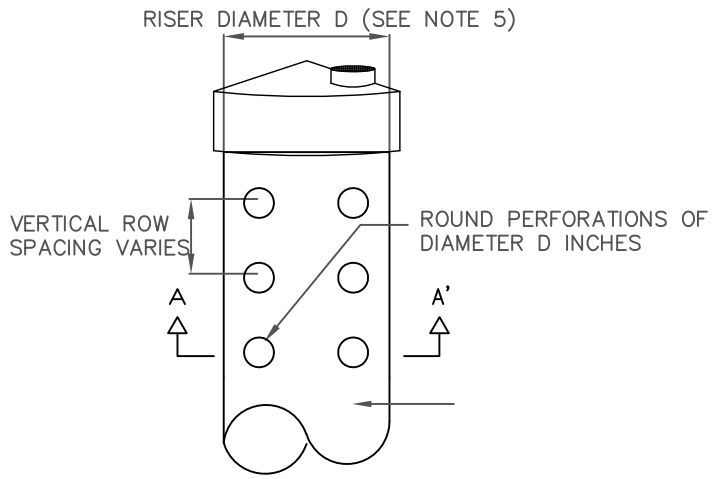

Perforated Riser Detail
(Not to Scale)

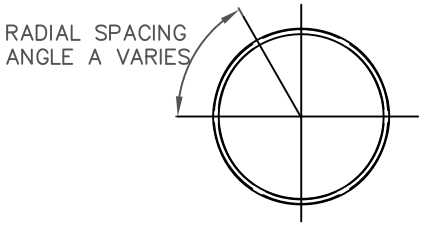

Section A – A'
(Not to Scale)

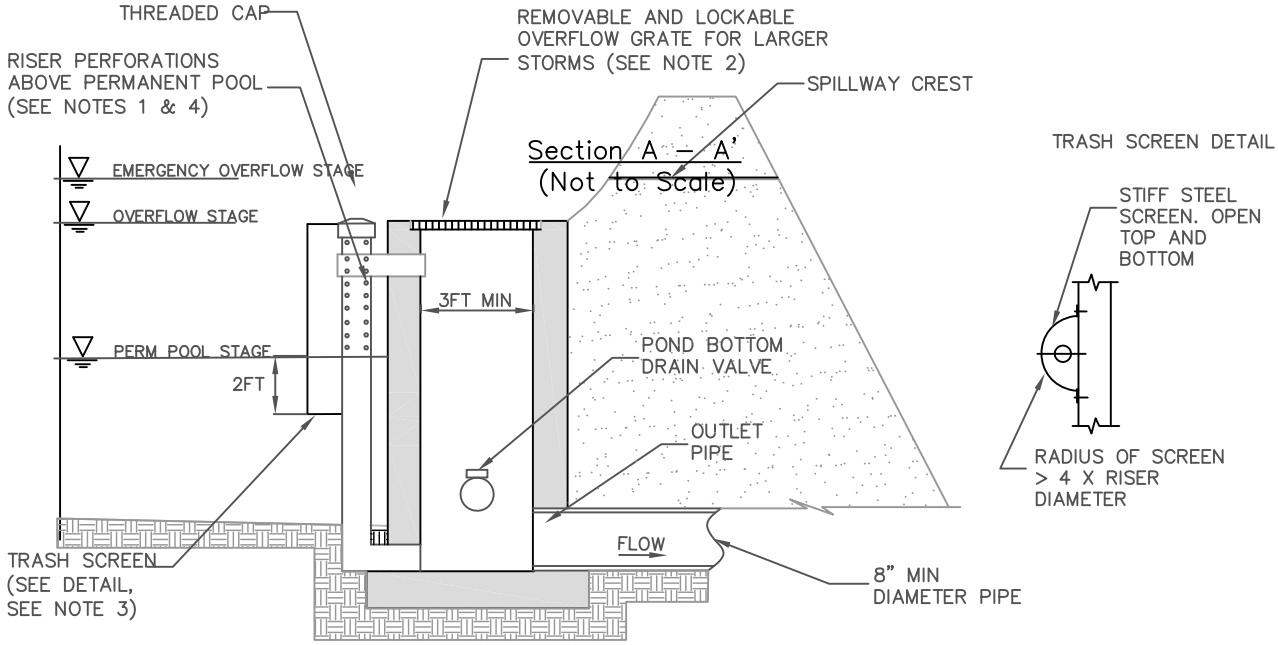

Section A – A'
(Not to Scale)

Perforated Riser Outlet Structure
(Not to Scale)

NOTES:

1. RISER PIPE SHALL BE SIZED TO PROVIDE 36 TO 48–HOUR FULL BRIM DRAW DOWN TIME.
2. TOTAL OUTLET CAPACITY: 100–YEAR PEAK FLOW FOR ON–LINE BASINS AND WATER QUALITY DESIGN FLOW FOR OFF–LINE BASINS.
3. SCREEN OPENINGS SHALL BE AT LEAST ¼" AND SHALL NOT EXCEED THE DIAMETER OF THE PERFORATIONS ON THE RISER.
4. RISER PIPE PERFORATION DIAMETER SHALL BE NO LESS THAN ½" AND NO MORE THAN 2"
5. MINIMUM PIPE DIAMETER (D) IS 2'
6. RISER PIPE MATERIAL IS CMP

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Figure 6-20: Riser Outlet

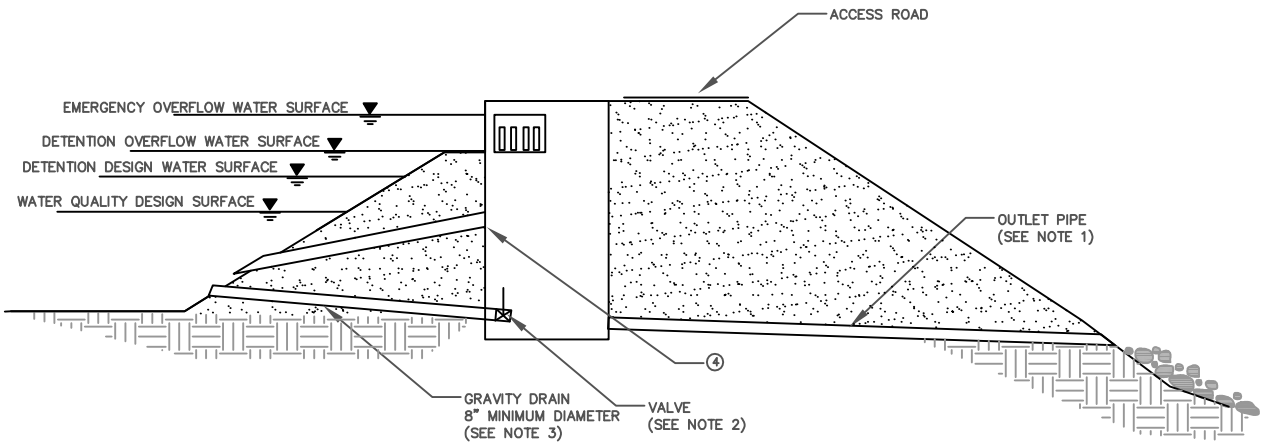

Inverted Pipe Outlet Structure
(Not to Scale)

NOTES:

1. SIZE OUTLET PIPE SYSTEM TO PASS 100-YEAR FLOW FOR ON-LINE PONDS AND WATER QUALITY PEAK FLOW FOR OFF-LINE PONDS.
2. VALVE MAY BE LOCATED INSIDE MANHOLE OR OUTSIDE WITH APPROVED OPERATIONAL ACCESS
3. INVERT OF DRAIN SHALL BE 6" MINIMUM BELOW TOP OF INTERNAL BERM. LOWER PLACEMENT IS DESIRABLE. INVERT SHALL BE 6" MINIMUM ABOVE BOTTOM OF POND.
4. OUTLET PIPE INVERT SHALL BE AT WETPOOL WATER SURFACE ELEVATION

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Figure 6-21: Inverted Pipe Outlet

Limitations

Limitations for wet detention basins include:

- Wet detention basins typically are used for treating areas larger than 10 acres and less than 10 square miles. They are especially applicable for regional water quality treatment and flow control.
- Off-line wet detention basins must not interfere with flood control functions of existing conveyance and detention structures.
- If wet detention basins are located in areas with site slopes greater than 15% or within 200 feet of a hazardous steep slope or mapped landslide area (on the uphill side), a geotechnical investigation and report must be provided to ensure that the basin does not compromise the stability of the site slope or surrounding slopes.
- Wet detention basins require a regular source of base flow if water levels are to be maintained. If base flow is insufficient during summer months, supplemental water may be necessary to maintain water levels.

Design Criteria

The main challenge associated with wet detention basins is maintaining desired water levels. A wet detention basin should be designed according to the requirements listed in Table 6-24 and outlined in the section below. BMP sizing worksheets are presented in Appendix E.

Table 6-24: Wet Detention Basin Design Criteria

Design Parameter	Unit	Design Criteria
Stormwater quality design volume, SQDV	acre-ft	See Section 2 and Appendix E for calculating SQDV.
Permanent Pool Volume		SQDV
Forebay Volume		5 to 10% of SQDV
Maximum Forebay Drain Time	min	45
Depth without sediment storage	feet	0.5-12 (littoral zone, 25-40% permanent pool) 4 (first cell minimum) 8 (any cell maximum) Deeper zone: 4-8 feet average; 12 feet maximum depth
Maximum residence time	Days	7 (dry weather)
Freeboard (minimum)	inches	12

Flow path length to width ratio	L:W	2:1 (larger preferred)
Side slope (maximum)	H:V	4:1 (H:V) Interior and 3:1 (H:V) Exterior
Longitudinal slope	percentage	1 (forebay) and 0-2 (main basin)
Vegetation Type	--	Varies see vegetation section below
Vegetation Height	--	Varies see vegetation section below
Buffer zone (minimum)	feet	25
Minimum outflow device diameter	inches	18

Sizing Criteria

Wet Detention basins may be designed with or without extended detention above the permanent pool. The extended detention portion of the wet detention basin above the permanent pool, if provided, functions like a dry extended detention (ED) basin (see VEG-5: Dry Extended Detention Basin). If there is no extended detention provided, wet detention basins shall be sized to provide a minimum wet pool volume equal to the stormwater quality design volume plus an additional 5% for sediment accumulation. If extended detention is provided above the permanent pool, the sizing is dependent of the functionality of the basin; the basin may function as water quality treatment only or water quality plus peak flow attenuation.

If the basin is designed for water quality treatment only, then the permanent pool volume should be a minimum of 10 percent of the stormwater quality design volume and the surcharge volume (above the permanent pool) should make up the remaining 90 percent. If extended detention is provided above the permanent pool and the basin is designed for water quality treatment and peak flow attenuation, then the permanent pool volume should be equal to the water quality treatment volume, and the surcharge volume should be sized to attenuate peak flows in order to meet the peak runoff discharge requirements. The extended detention portion of the wet detention basin above the permanent pool, if provided, functions like a dry extended detention (ED) basin (see VEG-5: Dry Extended Detention Basin).

Step 1: Calculate the design volume

Wet detention basins shall be sized with a permanent pool volume equal to the SQDV volume (see Section 2 and Appendix E).

Step 2: Determine the active design volume for the wet detention basin without extended detention

The active volume of the wet detention basin, V_a, shall be equal to the SQFV plus an additional 5% for sediment accumulation.

$$V_a = 1.05 \times SQDV \qquad \text{(Equation 6-59)}$$

Step 3: Determine pond location and preliminary geometry based on site constraints

Based on site constraints, determine the pond geometry and the storage available by developing an elevation-storage relationship for the pond. Note that a more natural geometry may be used and is in many cases recommended; the preliminary basin geometry calculations should be used for sizing purposes only.

1) Calculate the width of the pond footprint, W_{tot}, as follows:

$$W_{tot} = \frac{A_{tot}}{L_{tot}} \qquad \text{(Equation 6-60)}$$

Where:

A_{tot} = total surface area of the pond footprint (ft^2)

L_{tot} = total length of the pond footprint (ft)

1) Calculate the length of the active volume surface area including the internal berm but excluding the freeboard, $L_{av\text{-}tot}$:

$$L_{av-tot} = L_{tot} - 2Zd_{fb} \qquad \text{(Equation 6-61)}$$

Where:

Z = interior side slope as length per unit height

d_{fb} = freeboard depth

2) Calculate the width of the active volume surface area including the internal berm but excluding freeboard, $W_{av\text{-}tot}$:

$$W_{av-tot} = W_{tot} - 2Zd_{fb} \qquad \text{(Equation 6-62)}$$

3) Calculate the total active volume surface area including the internal berm and excluding freeboard, $A_{av\text{-}tot}$:

$$A_{av-tot} = L_{av-tot} \times W_{av-tot} \qquad \text{(Equation 6-63)}$$

4) Calculate the area of the berm, A_{berm}:

$$A_{berm} = W_{berm} \times L_{berm} \qquad \text{(Equation 6-64)}$$

Where:

W_{berm} = width of the internal berm

L_{berm} = length of the internal berm

5) Calculate the active volume surface area excluding the internal berm and freeboard, A_{wq}:

$$A_{wq} = A_{wq\ =\ tot} - A_{berm} \qquad \text{(Equation 6-65)}$$

Step 4: Determine Dimensions of Forebay

The wet detention basin should be divided into two cells separated by a berm or baffle. The forebay should contain between 5 and 10 percent of the total volume. The berm or baffle volume should not count as part of the total volume. Calculate the active volume of forebay, V_1:

$$V_1 = \frac{V_a \times \%V_1}{100} \qquad \text{(Equation 6-66)}$$

Where:

$\%V_1$ = percent of SQDV in forebay (%)

1) Calculate the surface area for the active volume of forebay, A_1:

$$A_1 = \frac{V_1}{d_1} \qquad \text{(Equation 6-67)}$$

Where:

d_1 = average depth fo rhte active volume of forebay (ft)

1) Calculate the length of forebay, L_1. Note, inlet and outlet should be configured to maximize the residence time.

$$L_1 = \frac{A_1}{W_1} \qquad \text{(Equation 6-68)}$$

Where:

W_1 = width of forebay (ft), $W_1 = W_{av\text{-}tot} = L_{berm}$

Step 5: Determine Dimensions of Cell 2

Cell 2 will consist of the remainder of the basin's active volume.

1) Calculate the active volume of Cell 2, V_2:

$$V_2 = V_a - V_1 \qquad \text{(Equation 6-69)}$$

2) The minimum wetpool surface area includes 0.3 acres of wetpool per acre-foot of permanent wetpool volume. Calculate A_{min2}:

$$A_{min2} = (V_2 \times 0.3 \frac{acres}{acre-feet}) \quad \text{(Equation 6-70)}$$

3) Calculate the actual wetpool surface area, A_2:

$$A_2 = A_{av} - A_1 \quad \text{(Equation 6-71)}$$

Verify that A_2 is greater than A_{min2}. If A_2 is less than A_{min2}, then modify input parameters to increase A_2 until it is greater than A_{min2}. If site constraints limit this criterion, then another site for the pond should be chosen.

4) Calculate the top length of Cell 2, L_2:

$$L_2 = \frac{A_2}{W_2} \quad \text{(Equation 6-72)}$$

Where:

W_2 = width of Cell 2 (ft), $W_2 = W_1 = W_{wq\text{-}tot} = L_{berm}$

5) Verify that the length-to-width ratio of Cell 2 is at least 1.5:1 with ≥ 2:1 preferred. If the length-to-width ratio is less than 1.5:1, modify input parameters until a ratio of at least 1.5:1 is achieved. If the input parameters cannot be modified as a result of site constraints, another site for the pond should be chosen.

$$LW_2 = \frac{L_2}{W_2} \quad \text{(Equation 6-73)}$$

6) Calculate the emergent vegetation surface area, A_{ev}:

$$A_{ev} = \frac{A_2 \bullet \%A_{ev}}{100} \quad \text{(Equation 6-74)}$$

Where:

$\%A_{ev}$ = percent of surface area that will be planted with emergent vegetation

7) Calculate the volume of the emergent vegetation shallow zone (1.5 – 3 ft), V_{ev}:

$$V_{ev} = A_{ev} \bullet d_{ev} \quad \text{(Equation 6-75)}$$

Where:

d_{ev} = average depth of the emergent vegetation shallow zone (1.5 – 3 ft)

8) Calculate the length of the emergent vegetation shallow zone, L_{ev}:

$$L_{ev} = \frac{A_{ev}}{W_{ev}} \qquad \text{(Equation 6-76)}$$

Where:

W_{ev} = width of the emergent vegetation shallow zone (ft), $W_{ev} = W_2$

9) Calculate the volume of the deep zone, V_{deep}:

$$V_{deep} = V_2 - V_{ev} \qquad \text{(Equation 6-77)}$$

10) Calculate the surface area of the deep (>3 ft) zone, A_{deep}:

$$A_{deep} = A_2 - A_{ev} \qquad \text{(Equation 6-78)}$$

11) Calculate the average depth of the deep zone (4-8 ft), d_{deep}:

$$d_{deep} = \frac{V_{deep}}{A_{deep}} \qquad \text{(Equation 6-79)}$$

12) Calculate length of the deep zone, L_{deep}:

$$L_{deep} = \frac{A_{deep}}{W_{deep}} \qquad \text{(Equation 6-80)}$$

Where:

W_{deep} = width of the deep zone (ft), $W_{deep} = W_2$

Step 6: Ensure design requirements and site constraints are achieved

Check design requirements and site constraints. Modify design geometry until requirements are met. If the chosen site for the basin is inadequate to meet the design requirements, choose a new location for the BMP.

Step 7: Size Outlet Structure

For extended detention wet detention basin, outlet structures should be designed to provide 12 to 48 hour emptying time for the water quality volume above the permanent pool.

The basin outlet pipe should be sized, at a minimum, to pass flows greater than the stormwater quality design peak flow for off-line basins or flows greater than the peak runoff discharge rate for the 100-year, 24-hr design storm for on-line basins.

Step 8: Determine Emergency Spillway Requirements

For online basins, an emergency overflow spillway should be sized to pass flows greater than the design peak runoff discharge rate for the 100-yr, 24-hr storm to prevent overtopping of the walls or berms in the event that a blockage of the riser occurs. For offline basins, an emergency spillway or riser should be sized to pass the water quality design storm. For sites where the emergency spillway discharges to a steep slope, an emergency overflow riser, in addition to the spillway should be provided.

Sizing and Geometry

1) If there is no extended detention provided, wet detention basins shall be sized to provide a minimum wet pool volume equal to the stormwater quality design volume plus an additional 5% for sediment accumulation. If extended detention is provided above the permanent pool and the basin is designed for water quality treatment only, then the permanent pool volume should be a minimum of 10 percent of the stormwater quality design volume and the surcharge volume (above the permanent pool) should make up the remaining 90 percent. If extended detention is provided above the permanent pool and the basin is designed for water quality treatment and peak flow attenuation, then the permanent pool volume shall be equal to the water quality treatment volume and the surcharge volume should be sized to attenuate peak flows to meet the peak runoff discharge requirements. The extended detention portion of the wet detention basin above the permanent pool, if provided, functions like a dry extended detention (ED) basin (see TCM-1: Dry Extended Detention Basin).

2) The wet detention basin should be divided into two cells separated by a berm or baffle. The first cell should contain between 25 to 35 percent of the total volume. The berm or baffle volume should not count as part of the total volume. Intent: The full-length berm or baffle reduces short-circuiting and promotes plug flow.

3) Wet detention basins with wetpool volumes less than or equal to 4,000 cubic feet may be single-celled (i.e., no baffle or berm is required).

4) Sediment storage should be provided in the first cell. The sediment storage should have a minimum depth of 1 foot. This volume should not be included as part of the required water quality volume.

5) The minimum depth of the first cell should be 4 feet, exclusive of sediment storage requirements. The depth of the first cell may be greater than the depth of the second cell. Average depth should be between 4 feet and 8 feet.

6) For wet detention basin depths in excess of 6 feet, some form of recirculation should be provided, such as a fountain or aerator, to prevent stratification, stagnation and low dissolved oxygen conditions.

7) The edge of the basin should slope from the surface of the permanent pool to a depth of 12 to 18 inches at a slope of 1:1 or greater. If soil conditions will not support a 1:1 (H:V) slope then the steepest slope that can be supported should be used or a shallow retaining wall constructed (18 inch max). Beyond the edge of the basin, a bench sloped at 4:1 (H:V) maximum should extend into the basin to a depth of at least 3 feet. A steeper slope may be used beyond the 3 foot depth to a maximum of 8 feet. Intent: steep slopes at water's edge will minimize very shallow areas that can support mosquitoes.

8) At least 25% of the basin area should be deeper than 3 feet to prevent the growth of emergent vegetation across the entire basin. If greater than 50% of the wet pool area is in excess of 6 feet deep, some form of recirculation should be provided, such as a fountain or aerator, to prevent stratification, stagnation and low dissolved oxygen conditions.

9) A wet detention basin should have a surface area of not less than 0.3 acres for each acre-foot of permanent pool volume. In addition, extra area needed to provide a design that meets all other provisions of this section should be provided. Additional surface area in excess of the minimum may be provided. There is no maximum surface area provided that all provisions of this section are met.

10) Inlets and outlets should be placed to maximize the flowpath through the facility. The flowpath length-to-width ratio should be a minimum of 1.5:1, but a flowpath length-to-width ratio of 2:1 or greater is preferred. The flowpath length is defined as the distance from the inlet to the outlet, as measured at mid-depth. The width at mid-depth can be found as follows: width = (average top width + average bottom width)/2. Intent: a long flowpath length will improve fine sediment removal.

11) All inlets should enter the first cell. If there are multiple inlets, the length-to-width ratio should be based on the average flowpath length for all inlets.

12) The minimum freeboard should be 1 foot above the maximum water surface elevation (2 feet preferred) for on-line basins and 1 foot above the maximum water surface elevation for on-line basins.

13) The maximum residence time for dry weather flows should be 7 days. Intent: Vector control.

Internal Berms and Baffles

1) A berm or baffle should extend across the full width of the wet detention basin and be keyed into the basin side slopes. If the berm embankments are greater than 4 feet in height, the berm should be constructed by excavating a key equal to 50% of the embankment cross-sectional height and width. This requirement may be waived if recommended by a licensed civil engineer for the specific site conditions. The geotechnical investigation must consider the situation in which one of the two cells is empty while the other remains full of water.

2) The top of the berm should extend to the permanent pool surface or be one foot below the permanent pool surface to discourage public access. If the top of the berm is at the water permanent pool surface, the side slopes should be 4H:1V. Berm side slopes may be steeper (up to 3:1) if the berm is submerged one foot.

3) If good vegetation cover is not established on the berm, erosion control measures should be used to prevent erosion of the berm back-slope when the basin is initially filled.

4) The interior berm or baffle may be a retaining wall provided that the design is prepared and stamped by a licensed civil engineer. If a baffle or retaining wall is used, it should be submerged one foot below the permanent pool surface to discourage access by pedestrians.

5) Internal earthen berms 6 feet high or less should have a minimum top width 6 feet or as recommended by a civil engineer.

Water Supply

1) Water balance calculations should be provided to demonstrate that adequate water supply will be present to maintain a pool of water during a drought year when precipitation is 50% of average for the site. Water balance calculations should include evapotranspiration, infiltration, precipitation, spillway discharge, and dry weather flow (where appropriate).

2) Where water balance indicates that losses will exceed inputs, a source of water should be provided to maintain the basin water surface elevation throughout the year. The water supply should be of sufficient quantity and quality to not have an adverse impact on the wet detention basin water quality. Water that meets drinking water standards should be assumed to be of sufficient quality.

3) Wet detention basin may be designed as seasonal ponds where the water balance and water supply conditions make it infeasible to sustain a permanent wet detention basin.

Soils Considerations

Wet detention basin implementation in areas with high permeability soils requires liners to increase the chances of maintaining a permanent pool in the basin. Liners can be either synthetic materials or imported lower permeability soils (i.e., clays). The water balance assessment should determine whether a liner is required.

If low permeability soils are used for the liner, a minimum of 18 inches of native soil amended with good topsoil or compost (one part compost mixed with 3 parts native soil) should be placed over the liner. If a synthetic material is used, a soil depth of 2 feet is recommended to prevent damage to the liner during planting.

Buffer Zone

A minimum of 25 feet buffer should be provided around the top perimeter of the wet detention basin. The portion of the access road outside of the maximum water level may be included as part of the buffer.

Stormwater Quality Design Features

1) Wet detention basins that are located in publicly-accessible or highly visible locations should include design features that will improve and maintain the quality of water within the BMP at a level suitable for the proposed location and uses of the surrounding area. Typical design features include aeration, pumped circulation, filters, biofilters, and other facilities that operate year-round to remove pollutants and nutrients. Stormwater quality design features will result in higher quality water in the BMP and lower discharges of pollutants downstream.

2) Wet detention basins in publicly-accessible or highly visible locations should have a maintenance plan that includes regular collection and removal of trash from the area within and surrounding the BMP.

3) If fencing is required for wet detention basins in publicly-accessible or highly visible locations, the fence can be designed to be aesthetically incorporated into the site and Shrubs (approved, California-adapted species) can be used to hide the fencing. See vegetation section below.

Energy Dissipation

1) The inlet to the wet detention basin should be submerged with the inlet pipe invert a minimum of two feet from the basin bottom (not including sediment storage). The top of the inlet pipe should be submerged at least 1 foot, if possible. Intent: The inlet is submerged to dissipate energy of the incoming flow. The distance from the bottom is set to minimize resuspension of settled sediments. Alternative inlet designs that accomplish these objectives are acceptable.

2) Energy dissipation controls should also be used at the outlet from the wet detention basin unless the basin discharges to a stormwater conveyance system or hardened channel.

Vegetation

A plan should be prepared that indicates how aquatic, temporarily submerged areas (extended detention wet detention basins) and terrestrial areas will be stabilized with vegetation.

1) If the second cell of the wet detention basin is 3 feet or shallower, the bottom area should be planted with emergent wetland vegetation.

2) Emergent aquatic vegetation should be planted to cover 25-75% of the area of the permanent pool.

3) Outside of the basin, native vegetation adapted for site conditions should be used in non-irrigated sites.

4) The area surrounding a wet detention basin should be landscaped to minimize erosion and should adhere to the following criteria so as not to hinder maintenance operations:

5) No trees or shrubs may be planted within 15 feet of inlet or outlet pipes or manmade drainage structures such as spillways, flow spreaders, or earthen embankments. Species with roots that seek water, such as willow or poplar, should not be used within 50 feet of pipes or manmade structures. Weeping willow (Salix babylonica) should not be planted in or near detention basins.

6) Prohibited non-native plant species will not be permitted. For more information on invasive weeds, including biology and control of listed weeds, look at the encycloweedia located at the California Department of Food and Agriculture website- or the California Invasive Plant Council website at www.cal-ipc.org.

7) A landscape professional should provide recommendations on appropriate plants, fertilizer, mulching applications, and irrigation requirements (if any) to ensure healthy vegetation growth.

Outlet Structure

1) An outlet pipe and outlet structure should be provided. The outlet pipe may be a perforated standpipe strapped to a manhole or placed in an embankment, suitable for extended detention, or may be back-sloped to a catch basin with a grated opening (jail house window) or manhole with a cone grate (birdcage). The grate or birdcage openings provide an overflow route should the basin outlet pipe become clogged.

2) For extended detention wet detention basin, outlet structures should be designed to provide 12 to 48 hour emptying time for the water quality volume above the permanent pool.

3) The basin outlet pipe should be sized, at a minimum, to pass flows greater than the stormwater quality design peak flow for off-line basins or flows greater than the peak runoff discharge rate for the 100-year, 24-hr design storm for on-line basins.

Emergency Spillway

An emergency overflow spillway in addition to the primary overflow outlet (as described above) is required. The emergency spillway should be sized for flows greater than the peak 100-year 24-hour storm if the basin is designed on-line or, if the basin is designed off-line, the spillway should be sized for flows greater than the basin design volume (e.g., stormwater quality design volume). The spillway provide for adequate energy dissipation

downstream. The spillway should allow for at least 12 inches of freeboard above the emergency overflow water surface elevation if the basin is on-line. If the basin is -line, 2 feet of freeboard is preferable.

Spillways shall meet the California Department of Water Resources, Division of Safety of Dams Guidelines for the Design and Construction of Small Embankment Dams (http://damsafety.water.ca.gov/docs/GuidelinesSmallDams.pdf). *Intent: Emergency overflow spillways are intended to control the location of basin overtopping and safely direct overflows back into the downstream conveyance system or other acceptable discharge point.*

On-line Basins

1) On-line basins must have an emergency overflow spillway to prevent overtopping of walls or berms should blockage of the primary outlet occur based on a downstream risk assessment.

2) The overflow spillway must be sized to pass flows greater than the design peak runoff discharge rate for the 100-yr, 24-hr storm.

3) The minimum freeboard should be 1 foot (but preferably at least 2 feet) above the maximum water surface elevation over the emergency spillway.

Off-line Basins

1) Off-line basins must have either an emergency overflow spillway or an emergency overflow riser. The emergency overflow must be designed to pass flows greater than the basin design volume (e.g., stormwater quality design volume) directly to the downstream conveyance system or another acceptable discharge point. Where an emergency overflow spillway would discharge to a steep slope, an emergency overflow riser, in addition to the spillway should be provided. See Appendix E for basin/pond outlet sizing worksheets.

2) The emergency overflow spillway should be armored to withstand the energy of the spillway flows. The spillway should be constructed of grouted rip-rap.

3) The minimum freeboard should be 1 foot above the maximum water surface elevation over the emergency spillway.

Side Slopes

1) Interior side slopes above the stormwater quality design depth and up to the emergency overflow water surface steeper than 4:1 (H:V) should be stabilized to prevent erosion with a method approved by the local permitting authority.

2) Exterior side slopes steeper than 2:1 (H:V) should be stabilized to prevent erosion with a method approved by the local permitting authority.

3) For any slope (interior or exterior) greater than 2:1 (H:V), a geotechnical investigation and report must be submitted and approved by the local permitting authority.

4) Landscaped slopes should be no steeper than 3:1 (H:V) to allow for maintenance.

5) Basin walls may be vertical retaining walls, provided: (a) they are constructed of reinforced concrete, (b) a fence is provided along the top of the wall (see fencing below) or further back, and (c) the design is stamped by a licensed civil engineer.

Embankments

1) Earthworks and berm embankments should be performed in accordance with the latest edition of the "Greenbook Standard Specifications for Public Works Construction".

2) Embankments are earthen slopes or berms used for detaining or redirecting the flow of water.

3) Top of berm should be 2 feet minimum below the stormwater quality design water surface and should be keyed into embankment a minimum of 1 foot on both sides.

4) Typically, the top width of berm embankments are at least 20 feet, but narrower embankments may be plausible if approved by the civil engineer and the Local permitting authority.

5) Basin berm embankments should be constructed on native consolidated soil (or adequately compacted and stable fill soils analyzed by a licensed civil engineer) free of loose surface soil materials, roots, and other organic debris.

6) The berm embankment should be constructed of compacted soil (95% minimum dry density, modified proctor method per ASTM D1557), placed in 6-inch lifts.

7) Basin berm embankments greater than 4 feet in height should be constructed by excavating a key equal to 50% of the berm embankment cross-sectional height and width. This requirement may be waived if specifically recommended by a licensed civil engineer.

8) The berm embankment should be constructed of compacted soil (95% minimum dry density, modified proctor method per ASTM D1557), placed in 6-inch lifts.

9) Low growing native or non-invasive perennial grasses should be planted on downstream embankment slopes. See vegetation section below.

Fencing

Safety is provided either by fencing of the facility or by managing the contours of the basin to eliminate drop-offs and other hazards.

1) If fences are required, fences should be designed and constructed in accordance with current and relevant policies and typically are required to be located at or above the overflow water surface elevation. Shrubs (approved, California-adapted species) can be used to hide the fencing. See vegetation section above.

Right-of-Way

2) Wet detention basins and associated access roads to be maintained by a public agency should be dedicated in fee or in an easement to the public agency with appropriate access.

Maintenance Access

1) Ownership of the basin and maintenance thereof is the responsibility of the developer/applicant. A maintenance agreement is required to ensure adequate performance and allow emergency access to the facilities.

2) Maintenance access road(s) should be provided to the control structure and other drainage structures associated with the basin (e.g., inlet, emergency overflow or bypass structures). Manhole and catch basin lids should be in or at the edge of the access road.

3) A ramp into the basin should be constructed near the basin outlet. An access ramp is required for removal of sediment with a backhoe or loader and truck. The ramp should extend to the basin bottom to avoid damage to vegetation planted on the basin slope.

4) All access ramps and roads should be provided in accordance with the current policies of the Flood Control District.

Vector Control

1) A Mosquito Management Plan or Service Contract should be approved or waived by the local Vector Control District for any facility that maintains a pool of water for 72 hours or more.

Operations and Maintenance

General Requirements

Maintenance is of primary importance if extended detention basins are to continue to function as originally designed. A maintenance agreement must be developed with the Flood Control District to ensure adequate performance and allow the County emergency access. Maintenance of the basin is the responsibility of the development, unless otherwise agreed upon.

A specific maintenance plan shall be formulated for each facility outlining the schedule and scope of maintenance operations, as well as the data handling and reporting requirements. The following are general maintenance requirements:

1) The basin should be inspected annually and inspections after major storm events are encouraged (see Appendix I for guidance on facility maintenance inspections). Trash and debris should be removed as needed, but at least annually prior to the beginning of the wet season (see Appendix I for dry extended detention basin inspection and maintenance checklist).

2) Site vegetation should be maintained as follows:

3) Vegetation, large shrubs, or trees that limit access or interfere with basin operation should be pruned or removed.

4) Slope areas that have become bare should be revegetated and eroded areas should be regraded prior to being revegetated.

5) Grass should be mowed to 4”-9” high and grass clippings should be removed.

6) Fallen leaves and debris from deciduous plant foliage should be raked and removed.

7) Invasive vegetation, such as Alligatorweed (Alternanthera philoxeroides), Halogeton (Halogeton glomeratus), Spotted Knapweed (Centaurea maculosa), Giant Reed (Arundo donax), Castor Bean (Ricinus communis), Perennial Pepperweed (Lepidium latifolium), and Yellow Starthistle (Centaurea solstitalis) should be removed and replaced with non-invasive species. Invasive species should never contribute more than 25% of the vegetated area. For more information on invasive weeds, including biology and control of listed weeds, look at the encycloweedia located at the California Department of Food and Agriculture website or the California Invasive Plant Council website at www.cal-ipc.org.

8) Dead vegetation should be removed if it exceeds 10% of area coverage. Vegetation should be replaced immediately to maintain cover density and control erosion where soils are exposed.

9) No herbicides or other chemicals should be used to control vegetation.

10) Sediment buildup exceeding 50% of the forebay capacity should be removed. Sediment from the remainder of the basin should be removed when 6 inches of sediment accumulates. Sediments should be tested for toxic substance accumulation in compliance with current disposal requirements if land uses in the catchment include commercial or industrial zones, or if visual or olfactory indications of pollution are noticed. If toxic substances are encountered at concentrations exceeding thresholds of Title 22, Section 66261 of the California Code of Regulations, the sediment must be disposed of in a hazardous waste landfill.

11) Following sediment removal activities, replanting, and/or reseeding of vegetation may be required for reestablishment.

Construction Considerations

The use of treated wood or galvanized metal anywhere inside the facility is prohibited. The use of galvanized fencing is permitted if in accordance with the Fencing requirement above.

TCM-3: Constructed Wetland

A constructed treatment wetland is a system consisting of a sediment forebay and one or more permanent micro-pools with aquatic vegetation covering a significant portion of the basin. Constructed treatment wetlands typically include components such as an inlet with energy dissipation, a sediment forebay for settling out coarse solids and to facilitate maintenance, a base with shallow sections (1 to 2 feet deep) planted with emergent vegetation, deeper areas or micro pools (3 to 5 feet deep), and a water quality outlet structure. The interactions between the incoming stormwater runoff, aquatic vegetation, wetland soils, and the associated physical, chemical, and biological unit processes are a fundamental part of constructed treatment wetlands.

Constructed Wetlands

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Application

- Regional detention & treatment
- Roads, highways, parking lots, commercial, residential
- Parks, open spaces, and golf courses

Preventative Maintenance

- inspected at a minimum annually and inspections after major storm events
- Pruned or remove vegetation, large shrubs, or trees that limit access or interfere with basin operation
- Remove sediment buildup at inlets and outlets

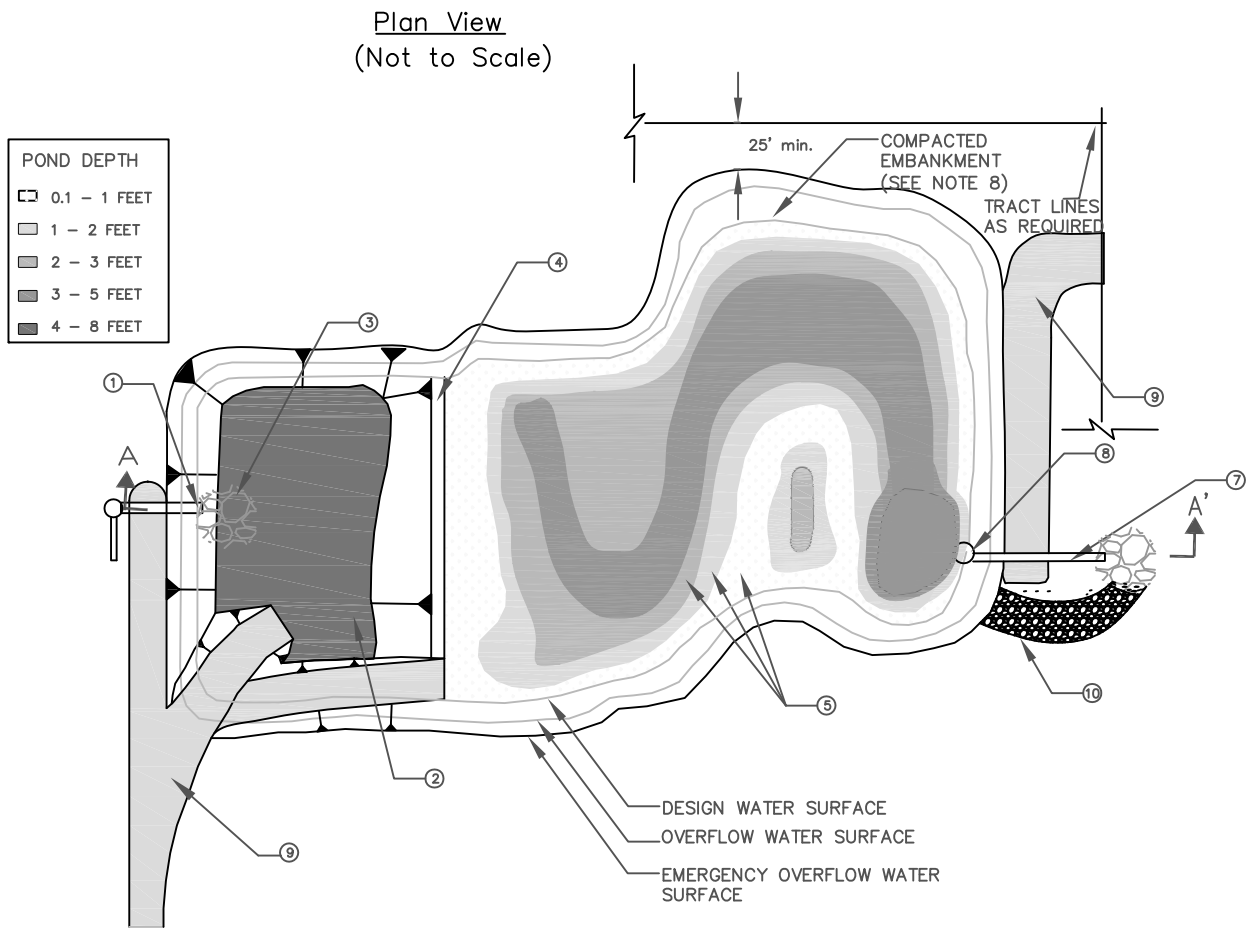

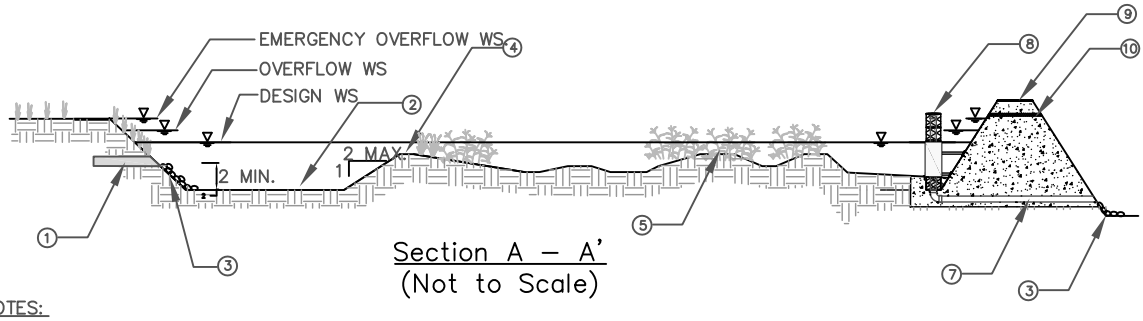

NOTES:

1. INLET PIPE SHOULD BE SUBMERGED WITH A MINIMUM OF 2' DISTANCE FROM THE BOTTOM
2. SEDIMENT FOREBAY. FORE BAY VOLUME SHALL EQUAL 10% TO 20% OF TOTAL WETLAND VOLUME. FOREBAY DEPTH SHALL BE 4' MIN TO 8' MAX PLUS AN ADDITIONAL 1' MIN SEDIMENT STORAGE DEPTH.
3. RIP RAP APRON OR OTHER INLET ENERGY DISSIPATION.
4. BERM AT DESIGN WATER SURFACE ELEVATION OR SUBMERGED 1' BELOW DESIGN WATER SURFACE ELEVAVTION. EXTEND BERM ACROSS ENTIRE WIDTH OF THE WETLAND.
5. WETLAND VEGETATION. PLANTING SCHEME MUST BE DESIGNED BY A WETLAND ECOLOGIST.
6. EMBANKMENT SIDE SLOPES SHALL BE NO STEEPER THAN 2H:1V OUTSIDE AND 3H:1V INSIDE
7. SIZE OUTLET PIPE TO PASS 100–YEAR PEAK FLOW FOR ONLINE AND WATER QUALTIY PEAK FLOW FOR OFFLINE BASINS.
8. WATER QUALITY OUTLET STRUCTURE. SEE FIGURE 7–2 AND FIGURE 7–3 FOR DETAILS.
9. MAINTENANCE RAMP SHOULD PROVIDE ACCESS TO BOTH THE FOREBAY AND MAIN BASIN.
10. INSTALL EMERGENGY OVERFLOW SPILWAY AS NEEDED. SEE FIGURE 2–4 FOR DETAILS

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Figure 6-22: Constructed Wetland

Limitations

- In theory, there are no limitations on the tributary area size draining to a constructed treatment wetland; however, constructed treatment wetlands usually require considerable land area. Typically, treatment wetlands capture runoff from tributary areas larger than 10 acres and less than 10 square miles. Smaller "pocket" wetlands can be feasible in areas where space is restricted.
- If the constructed treatment wetland is not used for flow control, the wetland must not interfere with flood control functions of existing conveyance and detention structures.
- Constructed treatment wetlands should not be permitted in areas with site slopes greater than 7% or within 200 feet (on the uphill side) of a steep slope hazard area or a mapped landslide area unless a geotechnical investigation and report is completed by a licensed civil engineer.
- Constructed treatment wetlands require a regular source of water (base flow) to maintain wetland vegetation and associated treatment processes. If adequate base flow is not available year-round, supplemental water may be needed during the summer months to maintain adequate base flow.

Design Criteria

The main challenge associated with constructed treatment wetlands is maintaining base flow to support vegetation. Constructed wetlands should be designed according to the requirements listed in Table 6-25 and outlined in the section below. Constructed wetland BMP sizing worksheets are presented in Appendix E.

Table 6-25: Constructed Wetland Design Criteria

Design Parameter	Unit	Design Criteria
Stormwater quality design volume, SQDV	acre-feet	See Section 2 and Appendix E for calculating SQDV.
Permanent pool volume	%	75% of SQDV
Drawdown time for extended detention (over permanent pool)	hours	48 ; 12 for 50% SQDV (minimum)
Sediment forebay volume	%	30 to 50% of permanent pool surface area
Depth of sediment forebay	feet	2-4 (1 foot of sediment storage required)
Wetland zone volume	%	50-70% of permanent pool surface area
Depth of wetland basin	feet	0.5 to 1.0 (30 to 50% should be 0.5 feet deep)

Design Parameter	Unit	Design Criteria
Wetland (littoral zone) bottom slope	%	10 maximum
Maximum residence time	Days	7 (dry weather)
Freeboard (minimum)	inches	12
Flow path length to width ratio	L:W	2:1, larger preferred
Side slope (maximum)	H:V	4:1 Interior; 3:1 Exterior
Vegetation Type	--	Varies see vegetation section below
Vegetation Height	--	Varies see vegetation section below
Buffer zone (minimum)	feet	25
Minimum outflow device diameter	inches	18

Sizing

In most cases, the constructed treatment wetland permanent pool should be sized to be greater than or equal to the stormwater quality design volume. If extended detention is provided above the permanent pool and the wetland is designed for water quality treatment only, then the permanent pool volume should be a minimum of 80 percent of the stormwater quality design volume and the surcharge volume (above the permanent pool) should make up the remaining 20 percent and provide at least 12 hours of detention. If extended detention is provided and the basin is designed for water quality treatment and peak flow attenuation, then the permanent pool volume should be equal to the water quality treatment volume and the surcharge volume should be sized to attenuate peak flows to meet the peak runoff discharge requirements. The extended detention portion of the wetland above the permanent pool, if provided, functions like a dry extended detention (ED) basin (see VEG-5: Dry Extended Detention Basin).

Step 1: Calculate the design volume

Constructed wetlands shall be sized to be greater than or equal to the SQDV volume (see Section 2 and Appendix E).

Step 2: Determine the Wetland Location, Wetland Type and Preliminary Geometry Based on Site Constraints

Based on site constraints, determine the wetland geometry and the storage available by developing an elevation-storage relationship for the wetland. The equations provided

below assume a trapezoidal geometry for cell 1 (Forebay) and cell 2, and assumes that the wetland does not have extended detention.

1) Calculate the width of the wetland footprint, W_{tot}, as follows:

$$W_{tot} = \frac{A_{tot}}{L_{tot}} \qquad \text{(Equation 6-81)}$$

Where:

A_{tot} = total surface area of the wetland footprint (ft^2)

L_{tot} = total length of the wetland footprint (ft)

2) Calculate the length of the water quality volume surface area including the internal berm but excluding the freeboard, $L_{wq\text{-}tot}$:

$$L_{wq-tot} = L_{tot} - 2Zd_{fb} \qquad \text{(Equation 6-82)}$$

Where:

Z = interior side slope as length per unit height

d_{fb} = freeboard depth

3) Calculate the width of the water quality volume surface area including the internal berm but excluding freeboard, $W_{wq\text{-}tot}$:

$$W_{wq-tot} = W_{tot} - 2Zd_{fb} \qquad \text{(Equation 6-83)}$$

4) Calculate the total water quality volume surface area including the internal berm and excluding freeboard, $A_{wq\text{-}tot}$:

$$A_{wq-tot} = L_{wq-tot} \times W_{wq-tot} \qquad \text{(Equation 6-84)}$$

5) Calculate the area of the berm, A_{berm}:

$$A_{berm} = W_{berm} \times L_{berm} \qquad \text{(Equation 6-85)}$$

Where:

W_{berm} = width of the internal berm

L_{berm} = length of the internal berm

6) Calculate the water quality surface area excluding the internal berm and freeboard, A_{wq}:

$$A_{wq} = A_{wq\ =\ tot} - A_{berm}$$ (Equation 6-86)

Step 3: Determine Dimensions of Forebay

30-50% of the SQDV is required to be within the active volume of forebay.

1) Calculate the active volume of forebay, V_1:

$$V_1 = \frac{SQDV \times \%V_1}{100}$$ (Equation 6-87)

Where:

$\%V_1$ = percent of SQDV in forebay (%)

2) Calculate the surface area for the active volume of forebay, A_1:

$$A_1 = \frac{V_1}{d_1}$$ (Equation 6-88)

Where:

d_1 = average depth fo rhte active volume of forebay (2 -4 ft) (ft)

3) Calculate the length of forebay, L_1. Note, inlet and outlet should be configured to maximize the residence time.

$$L_1 = \frac{A_1}{W_1}$$ (Equation 6-89)

Where:

W_1 = width of forebay (ft), $W_1 = W_{av\text{-}tot} = L_{berm}$

Step 4: Determine Dimensions of Cell 2

Cell 2 will consist of the remainder of the basin's active volume.

1) Calculate the active volume of Cell 2, V_2:

$$V_2 = SQDV - V_1$$ (Equation 6-90)

2) Calculate the surface area of Cell 2, A_2:

$$A_2 = A_{wq} - A_1$$ (Equation 6-91)

3) Calculate the top length of Cell 2, L_2:

$$L_2 = \frac{A_2}{W_2} \qquad \text{(Equation 6-92)}$$

Where:

W_2 = width of Cell 2 (ft), $W_2 = W_1 = W_{wq\text{-}tot} = L_{berm}$

4) Verify that the length-to-width ratio of Cell 2, LW_2, is at least 3:1 with ≥ 4:1 preferred. If the length-to-width ratio is less than 3:1, modify input parameters until a ratio of at least 3:1 is achieved. If the input parameters cannot be modified as a result of site constraints, another site for the pond should be chosen.

$$LW_2 = \frac{L_2}{W_2} \qquad \text{(Equation 6-93)}$$

5) Calculate the very shallow zone surface area, A_{vs}:

$$A_{vs} = \frac{A_2 \bullet \%A_{vs}}{100} \qquad \text{(Equation 6-94)}$$

Where:

$\%A_{vs}$ = percent of surface area of very shallow zone

6) Calculate the volume of the shallow zone, V_{vs}:

$$V_{vs} = A_{vs} \bullet d_{vs} \qquad \text{(Equation 6-95)}$$

Where:

d_{vs} = average depth of the very shallow zone (0.1 – 1 ft)

7) Calculate the length of the very shallow zone, L_{vs}:

$$L_{vs} = \frac{A_{vs}}{W_{vs}} \qquad \text{(Equation 6-96)}$$

Where:

W_{vs} = width of the very shallow zone (ft), $W_{vs} = W_2$

8) Calculate the surface area of the shallow zone, A_s:

$$A_s = \frac{A_2 \bullet \%A_s}{100} \qquad \text{(Equation 6-97)}$$

Where:

$\%A_s$ = percent of surface area of shallow zone

9) Calculate the volume of the shallow zone, V_s:

$$V_s = A_s \bullet d_s \qquad \text{(Equation 6-98)}$$

Where:

d_s = average depth of shallow zone (1 - 3 ft)

10) Calculate length of the shallow zone, L_s:

$$L_s = \frac{A_s}{W_s} \qquad \text{(Equation 6-99)}$$

Where:

W_s = width of the shallow zone (ft), $W_s = W_2$

11) Calculate the surface area of the deep zone, A_{deep}:

$$A_{deep} = A_2 - A_{vs} - A_s \qquad \text{(Equation 6-100)}$$

12) Calculate the volume of the deep zone, V_{deep}:

$$V_{deep} = V_2 - V_{vs} - V_s \qquad \text{(Equation 6-101)}$$

13) Calculate the average depth of the deep zone (3-5 ft), d_{deep}:

$$d_{deep} = \frac{V_{deep}}{A_{deep}} \qquad \text{(Equation 6-102)}$$

14) Calculate length of the deep zone, L_{deep}:

$$L_{deep} = \frac{A_{deep}}{W_{deep}} \qquad \text{(Equation 6-103)}$$

Where:

W_{deep} = width of the deep zone (ft), $W_{deep} = W_2$

Step 5: Ensure design requirements and site constraints are achieved

Check design requirements and site constraints. Modify design geometry until requirements are met. If the chosen site for the basin is inadequate to meet the design requirements, choose a new location or alternative treatment BMP.

Step 6: Size Outlet Structure

For wetlands with detention, the outlet structures should be designed to provide 12 hours emptying time for the water quality volume or the required detention necessary for achieving the peak runoff discharge requirements if the extended detention is designed for flow attenuation.

The wetland outlet pipe should be sized, at a minimum, to pass flows greater than the stormwater quality design peak flow for on-line basins or flows greater than the peak runoff discharge rate for the 100-year, 24-hr design storm for on-line basins.

Step 7: Determine Emergency Spillway Requirements

For online basins, an emergency overflow spillway should be sized to pass flows greater than the design peak runoff discharge rate for the 100-yr, 24-hr storm in order to prevent overtopping of the walls or berms in the event that a blockage of the riser occurs. For offline basins, an emergency spillway or riser should be sized to pass the 100-yr, 24-hr post-development peak storm water runoff discharge rate directly to the downstream conveyance system or another acceptable discharge point. For sites where the emergency spillway discharges to a steep slope, an emergency overflow riser, in addition to the spillway should be provided.

Sizing and Geometry

In most cases, the constructed treatment wetland permanent pool should be sized to be greater than or equal to the stormwater quality design volume. If extended detention is provided above the permanent pool and the wetland is designed for water quality treatment only, then the permanent pool volume should be a minimum of 80 percent of the stormwater quality design volume and the surcharge volume (above the permanent pool) should make up the remaining 20 percent and provide at least 12 hours of detention. If extended detention is provided and the basin is designed for water quality treatment and peak flow attenuation, then the permanent pool volume should be equal to the water quality treatment volume and the surcharge volume should be sized to attenuate peak flows to meet the peak runoff discharge requirements. A constructed treatment wetland design worksheets are presented in Appendix E. The extended detention portion of the wetland above the permanent pool, if provided, functions like a dry extended detention (ED) basin (see TCM-1: Dry Extended Detention Basin).

1) Constructed treatment wetlands should consist of at least two cells including a sediment forebay and a wetland basin.

2) The sediment forebay must contain between 10 and 20 percent of the total basin volume.

3) The depth of the sediment forebay should be between 4 and 8 feet.

4) One foot of sediment storage should be provided in the sediment forebay.

5) The "berm" separating the two basins should be uniform in cross-section and shaped such that its downstream side gradually slopes to the main wetland basin.

6) The top of berm should be either at the stormwater quality design water surface or submerged 1 foot below the stormwater quality design water surface, as with wet retention basins. Correspondingly, the side slopes of the berm should meet the following criteria:

    a. If the type of the berm is at the stormwater quality design water surface, the berm side slopes should be no steeper than 4H:1V.

    b. If the top of berm is submerged 1 foot, the upstream side slope may be a max of 3H:1V.

7) The constructed treatment wetlands should be designed with a "naturalistic" shape and a range of depths intermixed throughout the wetland basin to a maximum of 5 feet.

Depth Range (feet)	Percent by Area
0.1 to 1	15
1 to 3	55
3 to 5	30

8) The flowpath length-to-width ratio should be a minimum of 2:1, but preferably at least 4:1 or greater. *Intent: a high flow path length to width ratio will maximize fine sediment removal.*

9) The minimum freeboard should be 1 foot above the maximum water surface elevation for on-line basins (2 feet preferable) and 1 foot above the maximum water surface elevation for on-line basins.

10) Wetland pools should be designed such that the residence time for dry weather flows is no greater than 7 days. *Intent: Minimize vector and stagnation issues.*

Water Supply

Water balance calculations should be provided to demonstrate that adequate water supply will be present to maintain a permanent pool of water during a drought year when precipitation is 50% of average for the site. Water balance calculations should include evapotranspiration, infiltration, precipitation, spillway discharge, and dry weather flow (where appropriate).

Where water balance indicates that losses will exceed inputs, a source of water should be provided to maintain the wetland water surface elevation throughout the year. The water supply should be of sufficient quantity and quality to not have an adverse impact on the

wetland water quality. Water that meets drinking water standards should be assumed to be of sufficient quality.

Soils Considerations

1) Implementation of constructed treatment wetlands in areas with high permeability soils (>0.1 in/hr) requires liners to increase the chances of maintaining permanent pools and/or micro-pools in the basin. Liners can be either synthetic materials or imported lower permeability soils (i.e., clays). The water balance assessment should determine whether a liner is required. The following conditions can be used as a guideline.

2) The wetland basin should retain water for at least 10 months of the year.

3) The sediment forebay should retain at least 3 feet of water year-round.

4) Many wetland plants can adapt to periods of summer drought, so a limited drought period is allowed in the wetland basin. This may allow for a soil liner rather than a geosynthetic liner. The sediment forebay should retain water year-round for presettling to be effective.

5) If low permeability soils are used for the liner, a minimum of 18 inches of native soil amended with good topsoil or compost (one part compost mixed with 3 parts native soil) should be placed over the liner (see soil amendment Section 5.10). If a synthetic material is used, a soil depth of 2 feet is recommended to prevent damage to the liner during planting.

Buffer Zone

A minimum of 25 feet buffer should be provided around the top perimeter of the constructed treatment wetlands.

Energy Dissipation

1) The inlet to the constructed treatment wetland should be submerged with the inlet pipe invert a minimum of two feet from the cell bottom (not including sediment storage). The top of the inlet pipe should be submerged at least 1 foot, if possible. *Intent: the inlet is submerged to dissipate energy of the incoming flow. The distance from the bottom is set to minimize resuspension of settled sediments. Alternative inlet designs that accomplish these objectives are acceptable.*

2) Energy dissipation controls must also be used at the outlet/spillway from the constructed treatment wetlands unless the wetland discharges to a stormwater conveyance system or hardened channel.

Vegetation

1) The wetland cell(s) should be planted with emergent wetland plants following the recommendations of a wetlands specialist.

2) Landscaping outside of the basin is required for all constructed wetlands and should adhere to the following criteria so as not to hinder maintenance operations:

    a. No trees or shrubs may be planted within 15 feet of inlet or outlet pipes or manmade drainage structures such as spillways, flow spreaders, or earthen embankments. Species with roots that seek water, such as willow or poplar, should not be used within 50 feet of pipes or manmade structures. Weeping willow (*Salix babylonica*) should not be planted in or near detention basins.

    b. Prohibited non-native plant species will not be permitted. For more information on invasive weeds, including biology and control of listed weeds, look at the encycloweedia located at the California Department of Food and Agriculture website or the California Invasive Plant Council website at www.cal-ipc.org.

3) Project-specific planting recommendations should be provided by a wetland ecologist or a qualified landscape professional including recommendations on appropriate plants, fertilizer, mulching applications, and irrigation requirements (if any) to ensure healthy vegetation growth.

Outlet Structure

An outlet pipe and outlet structure should be provided. The outlet pipe may be a perforated standpipe strapped to a manhole or placed in an embankment, suitable for extended detention, or may be back-sloped to a catch basin with a grated opening (jail house window) or manhole with a cone grate (birdcage). The grate or birdcage openings provide an overflow route should the basin outlet pipe become clogged. The outlet should be protected from clogging by a skimmer shield that starts at the bottom of the permanent pool and extends above the SQDV depth. A trash rack is also required.

For wetlands with detention, the outlet structures should be designed to provide 12 hours emptying time for the water quality volume or the required detention necessary for achieving the peak runoff discharge requirements if the extended detention is designed for flow attenuation.

The wetland outlet pipe should be sized, at a minimum, to pass flows greater than the stormwater quality design peak flow for on-line basins or flows greater than the peak runoff discharge rate for the 100-year, 24-hr design storm for on-line basins.

See the dry extended detention section (see ST-1: Dry Extended Detention Basin) and Appendix E for further detail on outlet sizing.

Emergency Spillway

An emergency overflow spillway in addition to the primary overflow outlet (as described above) is required. The emergency spillway should be sized for flows greater than the peak 100-year 24-hour storm if the basin is designed on-line or, if the basin is designed on-line, the spillway should be sized for flows greater than the basin design volume (e.g., stormwater quality design volume). The spillway provide for adequate energy dissipation downstream. The spillway should allow for at least 12 inches of freeboard above the emergency overflow water surface elevation if the basin is on-line. If the basin is on-line, 2 feet of freeboard is preferable.

Spillways shall meet the California Department of Water Resources, Division of Safety of Dams Guidelines for the Design and Construction of Small Embankment Dams (http://damsafety.water.ca.gov/docs/GuidelinesSmallDams.pdf). *Intent: Emergency overflow spillways are intended to control the location of basin overtopping and safely direct overflows back into the downstream conveyance system or other acceptable discharge point.*

On-line Basins

1) On-line basins must have an emergency overflow spillway to prevent overtopping of walls or berms should blockage of the primary outlet occur based on a downstream risk assessment.

2) The overflow spillway must be sized to pass flows greater than the design peak runoff discharge rate for the 100-yr, 24-hr storm.

3) The minimum freeboard should be 1 foot (but preferably at least 2 feet) above the maximum water surface elevation over the emergency spillway.

Off-line Basins

1) Off-line basins must have either an emergency overflow spillway or an emergency overflow riser. The emergency overflow must be designed to pass the 100-yr 24-hr post-development peak stormwater runoff discharge rate (see Appendix E for further detail) directly to the downstream conveyance system or another acceptable discharge point. Where an emergency overflow spillway would discharge to a steep slope, an emergency overflow riser, *in addition* to the spillway should be provided.

2) The emergency overflow spillway should be armored to withstand the energy of the spillway flows. The spillway should be constructed of grouted rip-rap.

3) The minimum freeboard should be 1 foot above the maximum water surface elevation over the emergency spillway.

Side Slopes

1) Interior side slopes above the stormwater quality design depth and up to the emergency overflow water surface steeper than 4:1 (H:V) should be stabilized to prevent erosion with a method approved by the local permitting authority.

2) Exterior side slopes steeper than 2:1 (H:V) should be stabilized to prevent erosion with a method approved by the local permitting authority.

3) For any slope (interior or exterior) greater than 2:1 (H:V), a geotechnical investigation and report must be submitted and approved by the local permitting authority.

4) Landscaped slopes should be no steeper than 3:1 (H:V) to allow for maintenance.

5) Basin walls may be vertical retaining walls, provided: (a) they are constructed of reinforced concrete, (b) a fence is provided along the top of the wall (see fencing below) or further back, and (c) the design is stamped by a licensed civil engineer and approved by the local permitting authority.

Embankments

1) Earthworks and berm embankments should be performed in accordance with the latest edition of the "Greenbook Standard Specifications for Public Works Construction".

2) Embankments are earthen slopes or berms used for detaining or redirecting the flow of water.

3) Top of berm should be 2 feet minimum below the stormwater quality design water surface and should be keyed into embankment a minimum of 1 foot on both sides.

4) Typically, the top width of berm embankments are at least 20 feet, but narrower embankments may be plausible if approved by the civil engineer and the local permitting authority.

5) Basin berm embankments should be constructed on native consolidated soil (or adequately compacted and stable fill soils analyzed by a licensed civil engineer) free of loose surface soil materials, roots, and other organic debris.

6) Basin berm embankments greater than 4 feet in height should be constructed by excavating a key equal to 50% of the berm embankment cross-sectional height and width. This requirement may be waived if specifically recommended by a licensed civil engineer.

7) The berm embankment should be constructed of compacted soil (95% minimum dry density, modified proctor method per ASTM D1557), placed in 6-inch lifts.

8) Low growing native or non-invasive perennial grasses should be planted on downstream embankment slopes. See vegetation section below.

Fencing

Safety is provided either by fencing of the facility or by managing the contours of the basin to eliminate drop-offs and other hazards.

1) Provide fencing in accordance with the local permitting agency's requirements Perimeter fencing (minimum height of 42 inches) should be required on all basins exceeding two feet in depth or where interior side slopes are steeper than 6:1 (H:V).

2) If fences are required, fences should be designed and constructed in accordance with current policies of the local permitting agency and should be located at or above the overflow water surface elevation. Shrubs (approved, California-adapted species) can be used to hide the fencing. See vegetation section above.

Right-of-Way

1) Constructed treatment wetlands and associated access roads to be maintained by a public agency should be dedicated in fee or in an easement to the public agency with appropriate access.

Maintenance Access

1) Ownership of the basin and maintenance thereof is the responsibility of the developer/applicant. A maintenance agreement is required to ensure adequate performance and allow emergency access to the facilities.

2) Maintenance access road(s) should be provided to the control structure and other drainage structures associated with the basin (e.g., inlet, emergency overflow or bypass structures). Manhole and catch basin lids should be in or at the edge of the access road.

3) An access ramp into the basin should be constructed near the basin outlet. An access ramp is required for removal of sediment with a backhoe or loader and truck. The ramp should extend to the basin bottom to avoid damage to vegetation planted on the basin slope.

4) All access ramps and roads should be provided in accordance with the current policies of the Flood Control District.

Vector Control

1) A Mosquito Management Plan or Service Contract should be approved or waived by the local Vector Control District for any facility that maintains a pool of water for 72 hours or more.

Construction Considerations

The use of treated wood or galvanized metal anywhere inside the facility is prohibited. The use of galvanized fencing is permitted if in accordance with the Fencing requirement above.

Operations and Maintenance

Maintenance is of primary importance if constructed treatment wetlands basins are to continue to function as originally designed. A specific maintenance plan shall be formulated for each facility outlining the schedule and scope of maintenance operations, as well as the data handling and reporting requirements. The following are general maintenance requirements:

1) The constructed treatment wetlands basin should be inspected twice annually or more frequently, and inspections after major storm events are encouraged (see Appendix I for a constructed treatment wetland inspection and maintenance checklist). Trash and debris should be removed as needed, but at least annually prior to the beginning of the wet season.

2) Site vegetation should be maintained as frequently as necessary to maintain the aesthetic appearance of the site and to prevent clogging of outlets, creation of dead volumes, and barriers to mosquito fish to access pooled areas, and as follows:

3) Vegetation, large shrubs, or trees that limit access or interfere with basin operation should be pruned or removed.

4) Slope areas that have become bare should be revegetated and eroded areas should be regraded prior to being revegetated.

5) Invasive vegetation, such as Alligatorweed (*Alternanthera philoxeroides*), Halogeton (*Halogeton* glomeratus), Spotted Knapweed (*Centaurea maculosa*), Giant Reed (*Arundo donax*), Castor Bean (*Ricinus communis*), Perennial Pepperweed (*Lepidium latifolium*), and Yellow Starthistle (*Centaurea solstitalis*) should be removed and replaced with non-invasive species. Invasive species should never contribute more than 25% of the vegetated area. For more information on invasive weeds, including biology and control of listed weeds, look at the encycloweedia located at the California Department of Food and Agriculture website or the California Invasive Plant Council website at www.cal-ipc.org.

6) Dead vegetation should be removed if it exceeds 10% of area coverage. This does not include seasonal die-back where roots would grow back later in colder areas. Vegetation should be replaced immediately to maintain cover density and control erosion where soils are exposed.

7) Sediment buildup exceeding 6 inches over the storage capacity in the first cell should be removed. Sediments should be tested for toxic substance accumulation in compliance with current disposal requirements if land uses in the catchment include

commercial or industrial zones, or if visual or olfactory indications of pollution are noticed. If toxic substances are encountered at concentrations exceeding thresholds of Title 22, Section 66261 of the California Code of Regulations, the sediment must be disposed of in a hazardous waste landfill. Clean forebay every two years at a minimum, to avoid accumulation in main wetland area. Environmental regulations and permits may be involved with the removal of wetland deposits. When the main wetland area needs to be cleaned, it is suggested that the main area be cleaned one half at a time with at least one growing season in between cleanings. This will help to preserve the vegetation and enable the wetland to recover more quickly from the cleaning.

8) Repair erosion to banks and bottom as required.

9) Inspect outlet for clogging a minimum of twice a year, before and after the rainy season, after large storms, and more frequently if needed. Correct observed problems as necessary.

10) Following sediment removal activities, replanting, and/or reseeding of vegetation may be required for reestablishment.

TCM-4: Sand Filters

Sand filters operate much like bioretention facilities; however, instead of filtering stormwater through engineered soils, stormwater is filtered through a constructed sand bed with an underdrain system. Runoff enters the filter and spreads over the surface. As flows increase, water backs up on the surface of the filter where it is held until it can percolate through the sand. The treatment pathway is vertical (downward through the sand) to a perforated underdrain system that is connected to the downstream storm drainage system or to an infiltration facility. As stormwater passes through the sand, pollutants are trapped in the small pore spaces between sand grains or are adsorbed to the sand surface.

Sand filters connected to impervious surfaces

Photo Credits: Geosyntec Consultants

Application

- Adjacent to parking lots
- Road medians and shoulders
- Within open areas or play fields

Preventative Maintenance

- Remove trash and debris, minor sediment accumulation, and obstructions near inlet and outlet structures
- Replace top 2” – 4” of sand
- Mow or weed surface of filter

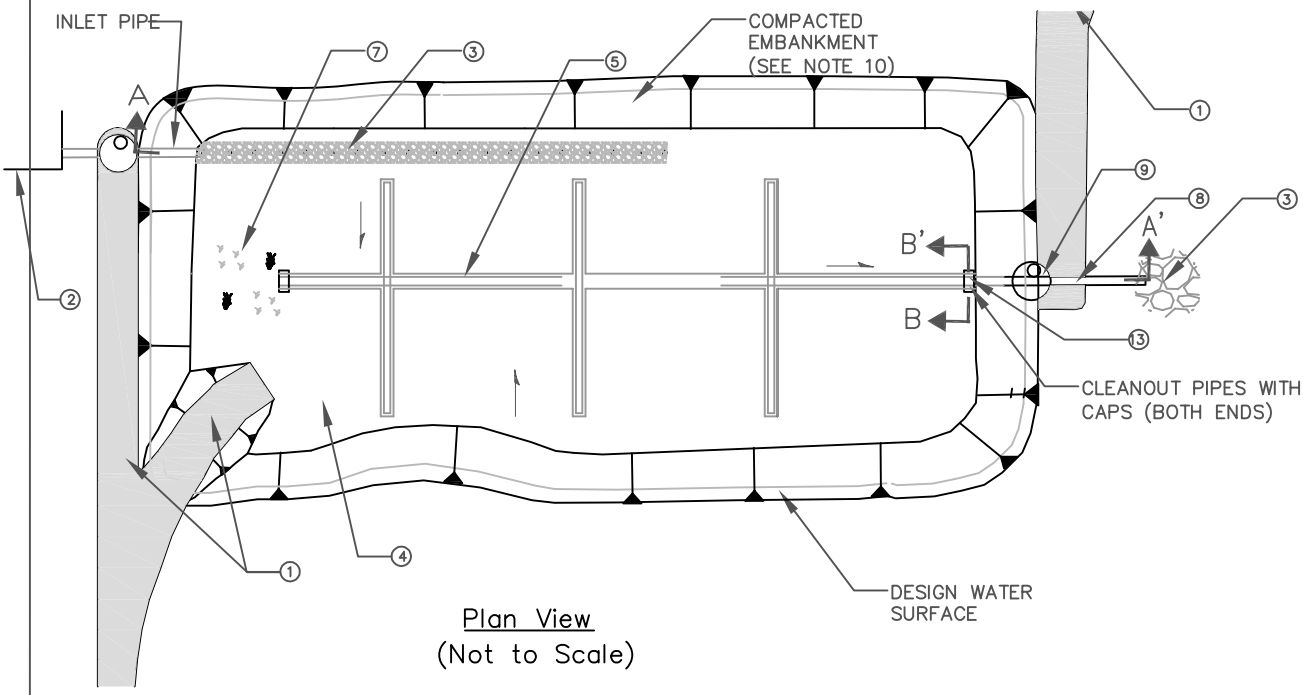

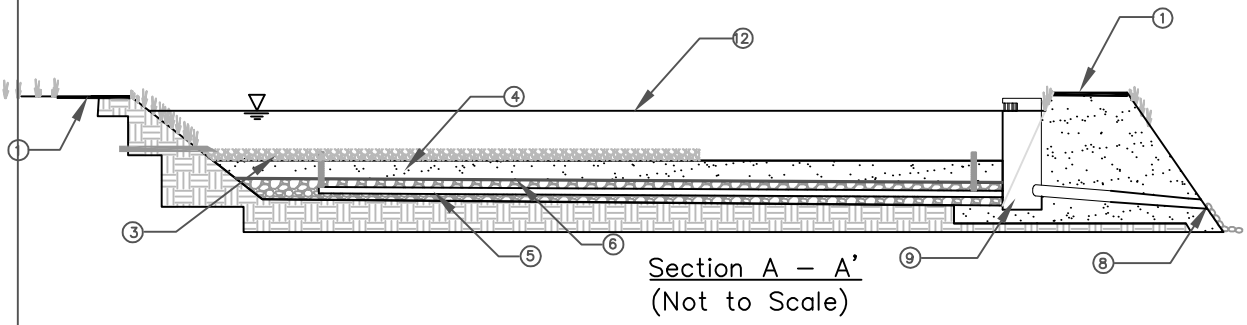

NOTES:

1. INSTALL MAINTENANCE ACCESS ROAD AND RAMP TO BOTTOM OF SAND FILTER.
2. UPSTREAM PRETREATMENT SHALL BE PROVIDED. IN THE ABSENCE OF PRETREATMENT, INCLUDE SEDIMENT FOREBAY WITH VOLUME EQUAL TO 10–20% OF TOTAL SAND FILTER VOLUME.
3. FLOW SPREADER TO EVENLY DISTRIBUTE FLOWS ALONG AT LEAST 20% OF PERIMETER.
4. FILTER BED SHALL BE A 24" MINIMUM SAND LAYER ON TOP OF 8" MINIMUM GRAVEL OR DRAIN ROCK BACKFILL.
5. 6" MINIMUM DIAMETER PERFORATED PIPE UNDERDRAIN SURROUNDED BY GRAVEL BEDDING. INSTALL AT 0.5% MINIMUM SLOPE
6. INSTALL GEOTEXTILE FABRIC OVERLAIN BY 1" OF DRAIN ROCK OR TRANSITIONALLY GRADED AGGREGRATE BETWEEN SAND AND GRAVEL LAYER.
7. VEGETATION MAY BE PLANTED ON TOP OF FILTER BED. NO TOP SOIL SHALL BE ADDED TO FILTER BED.
8. SIZE OUTLET PIPE STRUCTURE TO PASS WATER QUALITY DESIGN STORM AND INCLUDE AN EMERGENCY OVERFLOW.
9. EMERGENCY OVERFLOW STRUCTURE.
10. ¾" – 1½" WASHED DRAIN ROCK OR GRAVEL LAYER.
11. DESIGN WATER SURFACE. 6' MAX PONDING DEPTH.

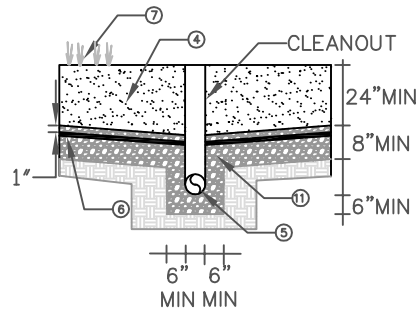

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Figure 6-23: Sand Filter

Limitations

Limitations for sand filters include:

- The sand filter should be located away from trees producing leaf litter or areas contributing significant eroded sediment to prevent clogging.
- Sand filters are should not be used in areas where heavy sediment loads are expected or in tributary areas that are not fully stabilized; high sediment loading rates may cause premature clogging of the filter. Pretreatment is essential.
- Site must have adequate relief between land surface and stormwater conveyance system to permit vertical percolation through the sand filter and collection and conveyance in the underdrain to stormwater conveyance system; four feet of elevation difference is recommended between the inlet and outlet of the filter.
- Not applicable in areas of high groundwater.
- Does not provide quantity control.

Design Criteria

The main challenge associated with sand filters is maintaining the filtration capacity, which is critical to the performance of this BMP. If flows entering the sand filter have high sediment concentrations, clogging of the sand filter is likely. Contribution of eroded soils or leaf litter may also reduce the infiltration and associated treatment capacity of the structure. Sand filters should be designed according to the requirements listed in Table 6-26 and outlined in the section below. BMP sizing worksheets are presented in Appendix E.

Table 6-26: Sand Filter Design Criteria

Design Parameter	Unit	Design Criteria
Stormwater quality design volume, SQDV	acre-feet	See Section 2 and Appendix E for calculating SQDV.
Max depth at SQDV	feet	3
Freeboard (minimum)	feet	1
Length to width ratio	L:W	2:1 (larger preferred)
Filter bed depth	inches	18 inches sand; 9 inches gravel
Max ponding depth above filter bed	feet	6
Drawdown time	Hours	?

Design Parameter	Unit	Design Criteria
Hydraulic conductivity of sand, k	in/hr	1 (equal to 2 ft/day)
Underdrains		6 inch minimum diameter; 0.5% minimum slope
Side slopes	H:V	4:1 (H:V) interior and 3:1 (H:V) exterior, unless stabilization has been approved by a licensed geotechnical engineer; or vertical concrete walls

Pretreatment

Pretreatment must be provided for sand filters in order to reduce the sediment load entering the filter. Pretreatment refers to design features that provide settling of large particles before runoff reaches the filter, easing the long-term maintenance burden. To ensure that pretreatment mechanisms are effective, designers shall incorporate pretreatment such as a biofiltration BMP, proprietary device, or sedimentation forebay. BMPs that are described in the 2011 TGM that may serve this purpose include:

For design specification of selected pre-treatment devices, refer to:

- VEG-3: Vegetated swale
- VEG-4: Vegetated filter strip
- PROP-1: Hydrodynamic separation device

Sizing Criteria

Background

Sand filter design is based on Darcy's law:

$$Q = KiA \qquad \text{(Equation 6-104)}$$

Where:

Q = water quality design flow (cfs)

K = hydraulic conductivity (fps)

A = surface area perpendicular to the direction of flow (ft^2)

i = hydraulic gradient (ft/ft) for a constant head and constant media depth, computed as follows:

$$i = \frac{h+l}{l} \qquad \text{(Equation 6-105)}$$

Where:

h	=	average depth of water above the filter (ft), defined for this design as $d/2$
d	=	maximum storage depth above the filter (ft)
l	=	thickness of sand media (ft)

Darcy's law underlies both the simple and the routing methods of design. The filtration rate V, or more correctly, $1/V$, is the direct input in the sand filter design. The relationship between the filtration rate V and hydraulic conductivity K is revealed by equating Darcy's law and the equation of continuity, $Q = VA$. Specifically:

$Q = KiA$ and $Q = VA$

So, $VA = KiA$

Or: $V = Ki$ (Equation 6-106)

Where,

V	=	filtration rate (ft/s)

Note that $V \neq K$. That is, the filtration rate is not the same as the hydraulic conductivity, but they do have the same units (distance per time). K can be equated to V by dividing V by the hydraulic gradient i, which is defined above.

The hydraulic conductivity K does not change with head nor is it dependent on the thickness of the media, only on the characteristics of the media and the fluid. A design hydraulic conductivity of 1 inch per hour (2 feet per day) used in this simple sizing method is based on bench-scale tests of conditioned rather than clean sand (KCSWDM, 2005) and represents the average sand bed condition as silt is captured and held in the sand bed.

Unlike the hydraulic conductivity, the filtration rate V changes with head and media thickness, although the media thickness is constant in the sand filter design.

Simple Sizing Method

The simple sizing method does not route flows through the filter. It determines the size of the filter based on the simple assumption that inflow is immediately discharged through the filter as if there were no storage volume. An adjustment factor (0.7) is applied to compensate for the greater filter size resulting from this method. Even with the adjustment factor, the simple method generally produces a larger filter size than the routing method.

Step 1: Determine the water quality design volume

Sand filters should be sized to capture and treat the stormwater quality design volume (see Section E.1).

Step 2: Determine maximum storage depth of water

Determine the maximum water storage depth (d) above the sand filter. This depth is defined as the depth at which water begins to overflow the reservoir pond, and it depends on the site topography and hydraulic constraints. The depth is chosen by the designer, but should be 6 feet or less.

Step 3: Calculate the sand filter area

Determine the sand filter area using the following equation:

$$A_{sf} = \frac{V_{wq} RL}{Kt(h+L)} \qquad \text{(Equation 6-107)}$$

Where,

A_{sf}	=	surface area of the sand filter bed (ft^2)
V_{wq}	=	water quality design volume (ft^3)
R	=	routing adjustment factor (use $R = 0.7$)
L	=	sand bed depth (ft)
K_{des}	=	design hydraulic conductivity of media (use 2 ft/day)
t	=	drawdown time (use 1 day)
h	=	average depth of water above the filter (ft), [use (d/2) with d from Step 2]

Routing Method

A continuous runoff model, such as US EPA's Stormwater Management Model (SWMM) Model, can be used to optimally size a sand filter. A continuous simulation model consists of three components: a representative long term period of rainfall data (≈ 20 years or greater) as the primary model input; a model component representing the tributary area to the sand filter that takes into account the amount of impervious area, soil types of the pervious area, vegetation, evapotranspiration, etc.; and a component that simulates the sand filter. Using this method, the filter should be sized to capture and treat the WQ design volume from the post-development tributary area.

The continuous simulation model routes predicted tributary runoff to the sand filter, where treatment is simulated as a function of the infiltrative (flow) capacity of the sand filter and the available storage volume above the sand filter. In a continuous runoff model such as SWMM, the physical parameters of the sand filter are represented with stage-storage-discharge relationships. Due to the computational power of ordinary desktop computers, long-term continuous simulations generally take only minutes to run. This allows the modeler to run several simulations for a range of sand filter sizes, varying either the surface area of the filter (and resulting flow capacity) or the storage capacity above the sand filter, or both. Sufficient continuous model simulations should be completed so that results encompass the WQ design volume capture goal.

Model results should be plotted for both varying storage depths above the filter and for varying filter surface area (and resulting flow capacity) while keeping all other parameters constant. The resulting relationship of percent capture as a function of sand filter flow and storage capacity can be used to optimally size a sand filter based on site conditions and restraints.

In addition to continuous simulation modeling, routing spreadsheets and/or other forms of routing modeling that incorporate rainfall-runoff relationships and infiltrative (flow) capacities of sand filters may be used to size facilities. Alternative sizing methodologies should be prepared with good engineering practices.

Sizing and Geometry

1) Sand filters shall be sized to capture and filter the Stormwater quality design volume, SQDV (See Section 2 and Appendix E for further detail).

2) Sand filters may be designed in any geometric configuration, but rectangular with a 2:1 length-to-width ratio or greater is preferred.

3) Filter bed depth must be at least 24 inches, but 36 inches is preferred.

4) Depth of water storage over the filter bed should be 6 feet maximum. Minimum freeboard is one foot.

5) Sand filters should be placed off-line to prevent scouring of the filter bed by high flows. The overflow structure must be designed to pass the stormwater quality design storm.

Sand Specification

Ideally the effective diameter of the sand, d_{10} (the diameter corresponding to the sieve size that passes 10% of sand grains), should be just small enough to ensure a good quality effluent while preventing penetration of stormwater particles to such a depth that they cannot be removed by surface scraping (~2-3 inches). This effective diameter usually lies in the range 0.20-0.35 mm. In addition, the coefficient of uniformity, Cu = d_{60}/d_{10}, should be less than 3.

The sand in a filter should consist of medium sand with few fines meeting ASTM C 33 size gradation (by weight) or equivalent as given in the table below.

U.S. Sieve Size	Percent Passing
3/8 inch	100
U.S. No. 4	95 to 100
U.S. No. 8	80 to 100
U.S. No. 16	50 to 85
U.S. No. 30	25 to 60
U.S. No. 50	5 to 30
U.S. No. 100	Less than 10

Finally, the silica (SiO_2) content of the sand should be greater than 95% by weight.

Underdrain

1) There are several underdrain system options which can be used in the design of a sand filter:

    a. A central underdrain collection pipe with lateral collection pipes in an 8 inch minimum gravel backfill or drain rock bed.

    b. Longitudinal pipes in an 8 inch minimum gravel backfill or drain rock bed, with a collection pipe at the outfall.

    c. Small sand filters may use a single underdrain pipe in an 8 inch minimum gravel backfill or drain rock bed.

2) All underdrain pipes and connectors should be 6 inches or greater so they can be cleaned without damage to the pipe. Clean-out risers with diameters equal to the underdrain pipe should be placed at the terminal ends of all pipes and extend to the surface of the filter. A valve box should be provided for access to the cleanouts and the cleanout assembly should be water tight to prevent short circuiting of the sand filter.

3) The underdrain pipe should be sized and perforated as to ensure free draining of the sand filter bed. Round perforations should be at least 1/2-inch in diameter and the pipe should be laid with holes downward.

4) The maximum perpendicular distance between any two lateral collection pipes or from the edge of the filter and the collection pipes should be 9 feet.

5) All pipes should be placed with a minimum slope of 0.5%.

6) The invert of the underdrain outlet should be above the seasonal high groundwater level.

7) At least 8 inches of gravel backfill should be maintained over all underdrain piping, and at least 6 inches should be maintained on both side and beneath the pipe to prevent damage by heavy equipment during maintenance. Either drain rock or gravel backfill may be used between pipes.

8) The bottom gravel layer should have a diameter at least 2X the size of the openings into the drainage system. The grains should be hard, preferably rounded, with a specific gravity of at least 2.5, and free of clay, debris and organic impurities.

9) Either a geotextile fabric or a two-inch transition gradation layer (preferred) should be placed between the sand layer and the drain rock or gravel backfill layer. If a geotextile is used, one inch of drain rock or gravel backfill should be place above the fabric. This allows for a transitional zone between sand and gravel and may reduce pooling of water at the liner interface. The geotextile should meet the following minimum materials requirements.

Geotextile Property	Value	Test Method
Trapezoidal Tear (lbs)	40 (min)	ASTM D4533
Permeability (cm/sec)	0.2 (min)	ASTM D4491
AOS (sieve size)	#60 - #70 (min)	ASTM D4751
Ultraviolet resistance	70% or greater	ASTM D4355

Flow Spreader

1) A flow spreader should be installed at the inlet along one side of the filter to evenly distribute incoming runoff across the filter and to prevent erosion of the filter surface.

    a. If the sand filter is curved or an irregular shape, a flow spreader should be provided for a minimum of 20 percent of the filter perimeter.

    b. If the length-to-width ratio of the filter is 2:1 or greater, a flow spreader should be located on the longer side and for a minimum length of 20 percent of the facility perimeter.

    c. In other situations, use good engineering judgment in positioning the spreader.

2) Erosion protection should be provided along the first foot of the sand bed adjacent to the flow spreader. Geotextile weighted with sand bags at 15-foot intervals may be used. Quarry spalls may also be used.

Vegetation

1) The use of vegetation in sand filters is optional. However, no top soil should be added to the sand filter bed because the fine-grained materials (silt and clay) would reduce the hydraulic capacity of the filter.

2) Growing grass or other vegetation requires the selection of species that can tolerate the demanding environment of a sand filter bed. Plants not receiving sufficient dry weather flows should be able to withstand long periods of drought during summer periods, followed by periods of saturation during storm events. A horticultural specialist should be consulted for advice on species selection.

3) A sod grown in sand may be used on the sand surface as long as there is no clay in the sand substrate and the particle size gradation of the substrate meets the sand filter specifications. No other sod should be used due to the high clay content in most sod soils.

4) To prevent uses that could compact and damage the filter surface, permanent structures are not permitted on sand filters (e.g. playground equipment).

Emergency Overflow Structure

Sand filters may only be placed off-line, but an emergency overflow must still be provided in the event the filter becomes clogged. The overflow structure must be able to safely convey flows from the stormwater quality design storm to the downstream conveyance system or other acceptable discharge point.

Side Slopes

1) Interior side slopes above the stormwater quality design depth and up to the emergency overflow water surface steeper than 4:1 (H:V) should be stabilized to prevent erosion with a method approved by the local permitting authority.

2) Exterior side slopes steeper than 2:1 (H:V) should be stabilized to prevent erosion with a method approved by the local permitting authority.

3) For any slope (interior or exterior) greater than 2:1 (H:V), a geotechnical investigation and report must be submitted and approved by the local permitting authority.

4) Pond walls may be vertical retaining walls, provided: (a) they are constructed of reinforced concrete, (b) a fence, which prevents access, is provided along the top of the wall or further back, and (c) the design is stamped by a licensed civil engineer and approved by the County.

Embankments

1) Embankments (earthen slopes or berms) may be used for detaining or redirecting the flow of water.

2) The minimum top width of all berm embankments should be 20 feet, or as approved by the geotechnical engineer.

3) Basin berm embankments should be constructed on native consolidated soil (or adequately compacted and stable fill soils analyzed by a licensed geotechnical engineer) free of loose surface soil materials, roots, and other organic debris.

4) Earthworks should be in accordance with Section 300-6 of the Standard Specifications for Public Works Construction, most recent edition.

5) Basin berm embankments greater than 4 feet in height should be constructed by excavating a key equal to 50% of the berm embankment cross-sectional height and width. This requirement may be waived if specifically recommended by a licensed geotechnical engineer.

6) The berm embankment should be constructed of compacted soil (95% minimum dry density, modified proctor method per ASTM D1557), placed in 6-inch lifts.

Maintenance Access

Maintenance access road(s) shall be provided to the control structure and other drainage structures associated with the basin (e.g., inlet, emergency overflow or bypass structures). Manhole and catch basin lids should be in or at the edge of the access road.

An access ramp is required for removal of sediment with a backhoe or loader and truck. The ramp should extend to the bottom of the sand filter.

Landscaping Outside of the Facility

A sand filter can add aesthetics to a site and should be incorporated into a project's landscape design. Interior side slopes may be stepped with flat areas to provide informal seating with a game or play area below. Perennial beds may be planted above the overflow water surface elevation. Large shrubs and trees are not recommended, however, as shading limits evaporation and falling leaves can clog the filter surface. If a sand filter area is intended for recreational uses, such as a volleyball area, the interior side slopes of the filter embankment should be no steeper than 3:1 and may be stepped.

1) No trees or shrubs may be planted within 10 feet of inlet or outlet pipes or manmade drainage structures such as spillways, flow spreaders, or earthen embankments. Species with roots that seek water, such as willow or poplar, should not be used within 50 feet of pipes or manmade structures.

2) Prohibited non-native plant species will not be permitted. For more information on invasive weeds, including biology and control of listed weeds, look at the

encycloweedia located at the California Department of Food and Agriculture website at or the California Invasive Plant Council website at www.cal-ipc.org.

Operations and Maintenance

Sand filters are subject to clogging by fine sediment, oil and grease, and other debris (e.g., trash and organic matter such as leaves). Filters and pretreatment facilities should be inspected every 6 months during the first year of operation. Inspection should also occur immediately following a storm event to assess the filtration capacity of the filter. Once the filter is performing as designed, the frequency of inspection may be reduced to once per year.

Most of the maintenance should be concentrated on the pretreatment practices, such as buffer strips and swales upstream of the trench to ensure that sediment does not reach the infiltration trench. Regular inspection should determine if the sediment removal structures require preventative maintenance.

Inspect basin a minimum of twice a year, before and after the rainy season, after large storm events, or more frequently if needed. Some important items to check for include: differential settlement, cracking; erosion, leakage, or tree growth on the embankment; the condition of the riprap in the inlet, outlet and pilot channels; sediment accumulation in the basin; and the vigor and density of the vegetation on the basin side slopes and floor. Correct observed problems as necessary.

- Remove litter and debris from banks and basin bottom as required.
- Repair erosion to banks and bottom as required.
- Check infiltration rate of sand bed twice annually, once after significant rainfall.
- Scarify top 3 to 5 inches of filters surface by raking once annually or as required to restore infiltration rate of the filter.
- Clean forebay every two years at a minimum, to avoid accumulation in main basin.
- Inspect outlet for clogging a minimum of twice a year, before and after the rainy season, after large storms, and more frequently if needed. Correct observed problems as necessary.

TCM-5: Cartridge Media Filter

Cartridge media filters are manufactured devices that typically consist of a series of cylindrical vertical filters contained in a catch basin, manhole, or vault that provide treatment through filtration and sedimentation. The manhole or vault may be divided into multiple chambers where the first chamber acts as a pre-settling basin for removal of coarse sediment while another chamber acts as the filter bay and houses the filter cartridges.

Cartridge Media Filters

Photo Credits: Contech Stormwater Solutions, Inc.

Application

- Parking lots
- Roadways
- Playgrounds
- Outdoor eating areas

Preventative Maintenance

- Filter media replacement
- Solids removal from vault, manhole, or catch basin
- Inspect for inlet and outlet for clogging

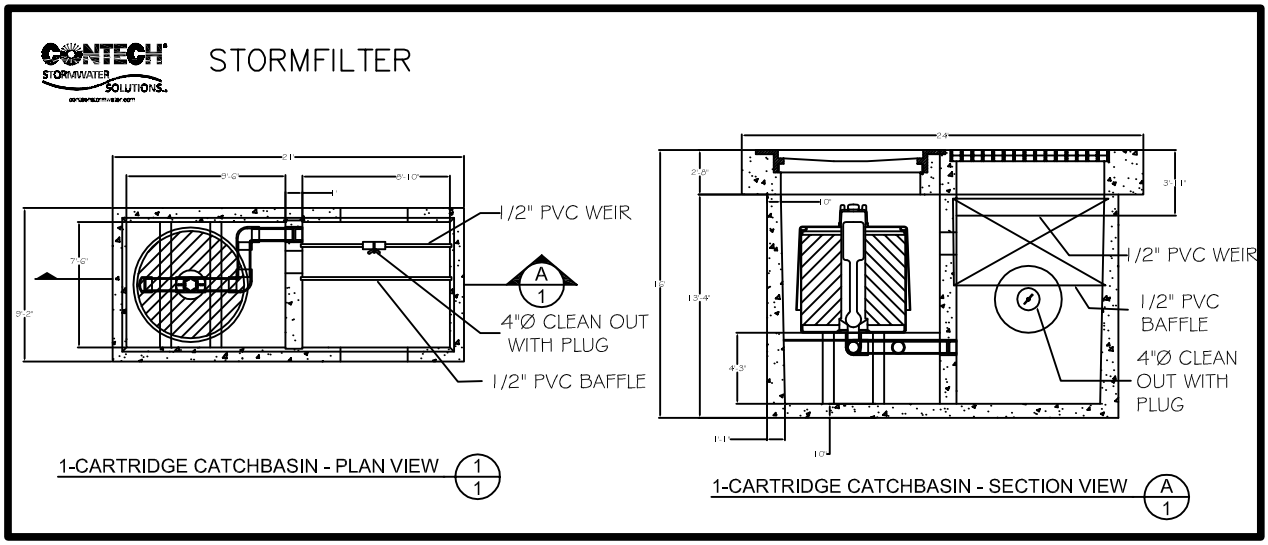

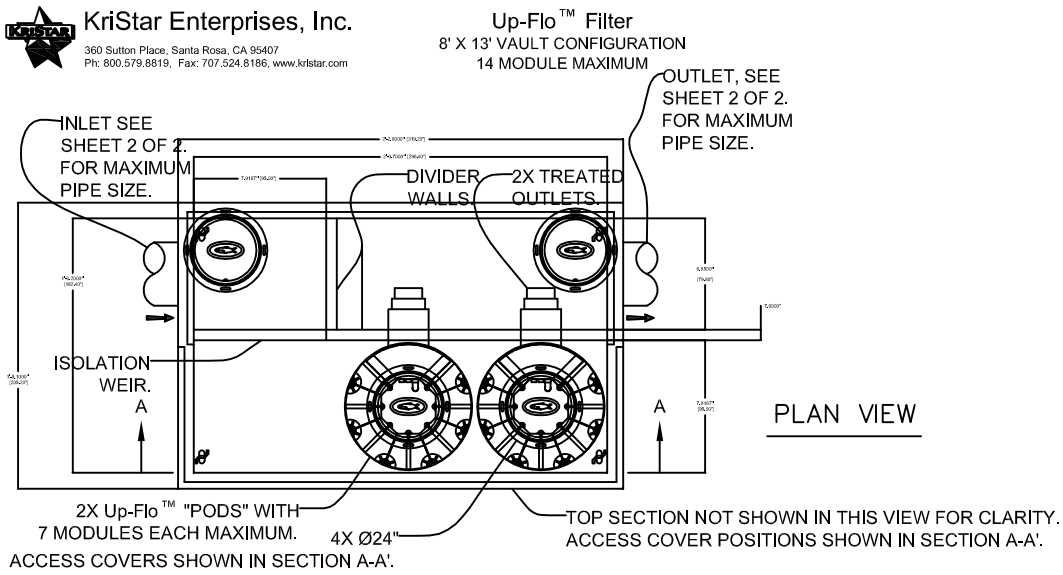

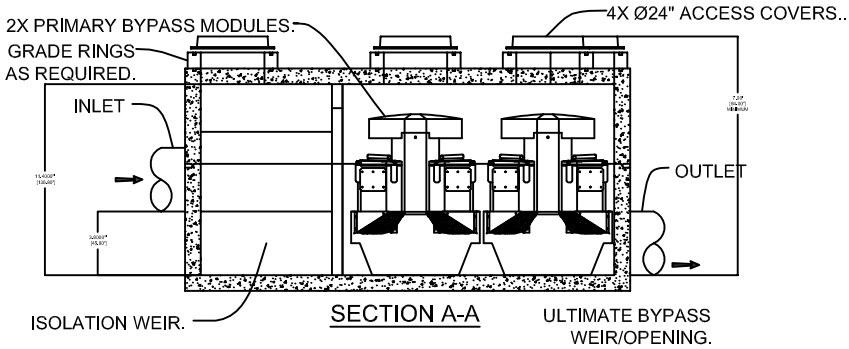

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Figure 6-24: Cartridge Media Filter

Table 6-27: Proprietary Cartridge Media Filter Manufacturer Websites

Device	Manufacturer	Website
BaySaver BayFilter	Baysaver Technologies Inc.	www.baysaver.com
ConTech StormFilter™	Contech® Construction Products Inc.	www.contech-cpi.com
CrystalStream	CrystalStream Technologies	www.crystalstream.com
KriStar Fossil Tee™ (media filter)	KriStar Enterprises Inc.	www.kristar.com
KriStar Up-Flo™ Filter and Perk™ Filter	KriStar Enterprises Inc.	www.kristar.com

Limitations

As with all filtration systems, use in catchments that have significant areas of non-stabilized soils can lead to premature clogging.

Design Criteria

1) Cartridge media filter BMP vendors are constantly updating and expanding their product lines, so refer to the latest design guidance from each of the vendors.

2) Selected filter media should target pollutants of concern. A combination of media is often recommended to maximize pollutant removal. Perlite is effective for removing TSS and oil and grease. Zeolite removes soluble metals, ammonium, and some organics. Vendors also offer proprietary medias (such as leaf compost or activated carbon) that are designed to remove soluble metals, organics, and other pollutants.

3) Manufacturers try to distinguish their products through innovative designs that aim at providing self cleaning and draining, uniformly loaded, and clog resistant cartridges that functional properly over a wide range of hydraulic loadings and pollutant concentrations.

4) All stormwater vaults containing cartridge filters that have standing water for longer than 72 hours can become a breeding area for mosquitoes. The selected BMP should have a system to completely drain the vault, such as weep holes in the bottom of the vault.

Sizing

1) Cartridge media filters should be sized to capture and treat the stormwater quality design flow rate.

2) Proprietary cartridge media filter devices, like most proprietary BMPs, and auxiliary components such as media, screens, baffles, and sumps are selected based onsite-specific conditions such as the loading that is expected and the desired frequency of maintenance. Sizing of proprietary devices is reduced to a simple process whereby a model can simply be selected from a table or a chart based on a few known quantities

(tributary area, location, design flow rate, etc). Most of the manufacturers either size the devices for potential clients or offer calculators on their websites that simplify the design process. For the latest sizing guidelines, refer to the manufacturer's website.

PT-1: Hydrodynamic Separation Device

Hydrodynamic separation devices (alternatively, swirl concentrators) are devices that remove trash, debris, and coarse sediment from incoming flows using screening, gravity settling, and centrifugal forces generated by forcing the influent into a circular motion. By having the water move in a circular fashion, rather than a straight line, it is possible to obtain significant removal of suspended sediments and attached pollutants with less space as compared to wet vaults and other settling devices. Hydrodynamic devices were originally developed for combined sewer overflows (CSOs), where they were used primarily to remove coarse inorganic solids. Hydrodynamic separation has been adapted for stormwater treatment by several manufacturers and is currently used to remove trash, debris, and other coarse solids down to sand-sized particles. Several types of hydrodynamic separation devices are also designed to remove floating oils and grease using sorbent media.

Hydrodynamic Separation

Photo Credits: 1. Contech Stormwater Solutions, Inc.; 2. Dave Weller, FedCo Construction

Application

- Parking lots
- Areas adjacent to parking lots
- Areas adjacent to buildings
- Road medians and shoulders

Preventative Maintenance

- Sediment, trash and debris removal
- Vector control

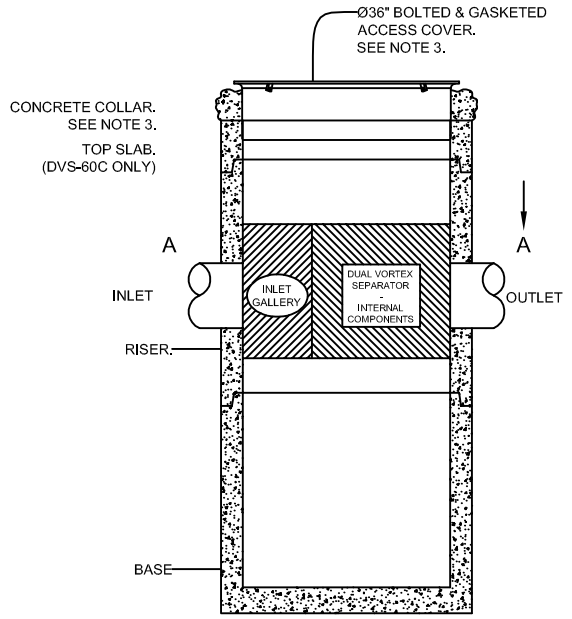

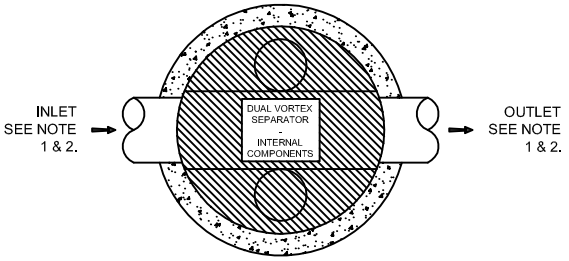

SECTION A-A

FloGard DUAL-VORTEX

KriStar Enterprises, Inc.

360 Sutton Place, Santa Rosa, CA 95407
Ph: 800.579.8819, Fax: 707.524.8186, www.kristar.com

CONTECH CDS SYSTEM

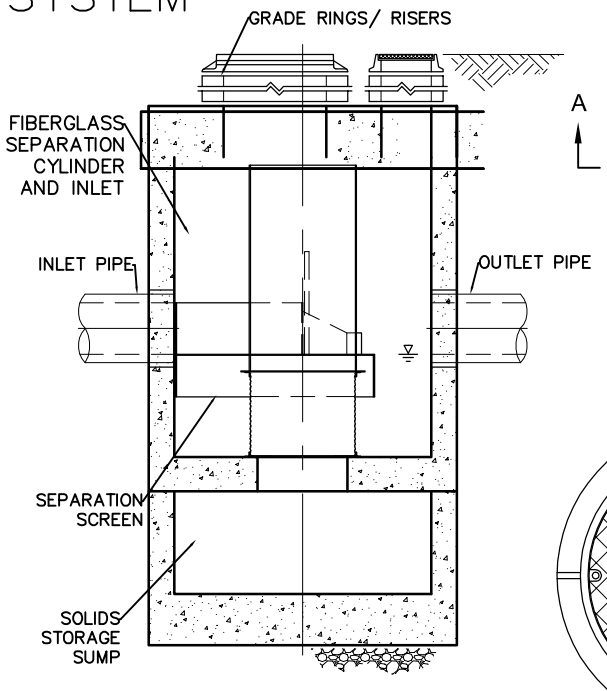

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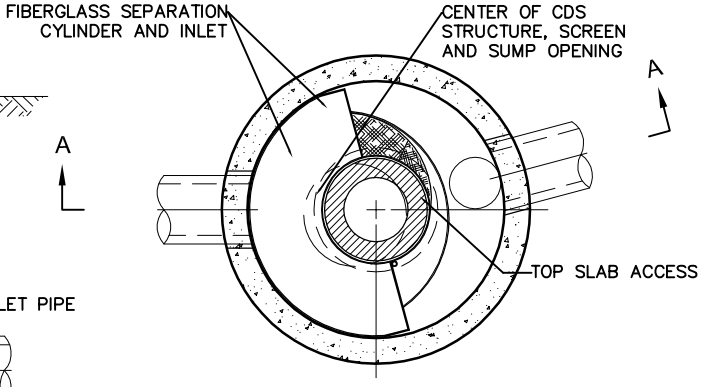

PLANVIEW
N.T.S

FRAME AND COVER
(DIAMETER VARIES)
N.T.S

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Figure 6-25: Hydrodynamic Separation

Table 6-28: Proprietary Hydrodynamic Device Manufacturer Websites

Device	Manufacturer	Website
Rinker In-Line Stormceptor®	Rinker Materials™	www.rinkerstormceptor.com
FloGard® Dual-Vortex Hydrodynamic Separator	KriStar Enterprises Inc.	www.kristar.com
Contech® CDS[a]™	Contech® Construction Products Inc.	www.contech-cpi.com
Contech® Vortechs™	Contech® Construction Products Inc.	www.contech-cpi.com
Contech® VorSentry™	Contech® Construction Products Inc.	www.contech-cpi.com
Contech® VorSentry™ HS	Contech® Construction Products Inc.	www.contech-cpi.com
BaySaver BaySeparator	Baysaver Technologies Inc.	www.baysaver.com

Limitations

Hydrodynamic separation devices are effective for the removal of course sediment, trash, and debris, and are useful as pretreatment in combination with other BMP types that target smaller particle sizes.

Hydrodynamic devices represent a wide range of device types that have different unit processes and design elements (e.g., storage versus flow-through designs, inclusion of media filtration, etc.) that vary significantly within the category. These design features likely have significant effects on BMP performance; therefore, generalized performance data for hydrodynamic devices is not practical.

Design Criteria

Proprietary hydrodynamic device BMP vendors are constantly updating and expanding their product lines, so refer to the latest design guidance from each of the vendors. General guidelines on the performance, sizing, operations and maintenance of proprietary devices are provided by the vendors.

Sizing

Hydrodynamic devices shall be sized to capture and treat the stormwater quality design flow rate and to completely drain within 72 hours.

Sizing of proprietary devices is reduced to a simple process whereby a model can simply be selected from a table or a chart based on a few known quantities (tributary area, location, design flow rate, design volume, etc). A few of the manufacturers either size the devices for potential clients or offer calculators on their websites that simplify the design process even further and lessens the possibility of using obsolete design information. For the latest sizing guidelines, refer to the manufacturer's website.

The hydrodynamic separators listed in Table 6-28 are designed to have a permanent pool of water stored within the system. Various methods of vector control are available to prevent mosquito breeding including manhole cover screens and the use of mosquito dunks. In many designs, oil and grease is stored at the water surface and provides a deterrent to mosquito breeding.

Operations and Maintenance

Hydrodynamic devices should be inspected every 6 months during the first year of operation. Inspection should also occur immediately following a storm event to assess the function of the device. Once the device is performing as designed, the frequency of inspection may be reduced to once per year.

PT-2: Catch Basin Insert

Catch basin inserts are manufactured filters or fabric placed in a drop inlet to remove sediment and debris and may include sorbent media (oil absorbent pouches) to remove floating oils and grease. Catch basin inserts are selected specifically based upon the orientation of the inlet.

Catch Basin Inserts

Photo Credits: 1. KriStar; 2. Aquashield

Application

- Parking lots
- Roads
- Athletic courts
- Outdoor food areas

Preventative Maintenance

- After storm inspection
- Sediment removal
- Trash removal
- Filter/sorbent media replacement

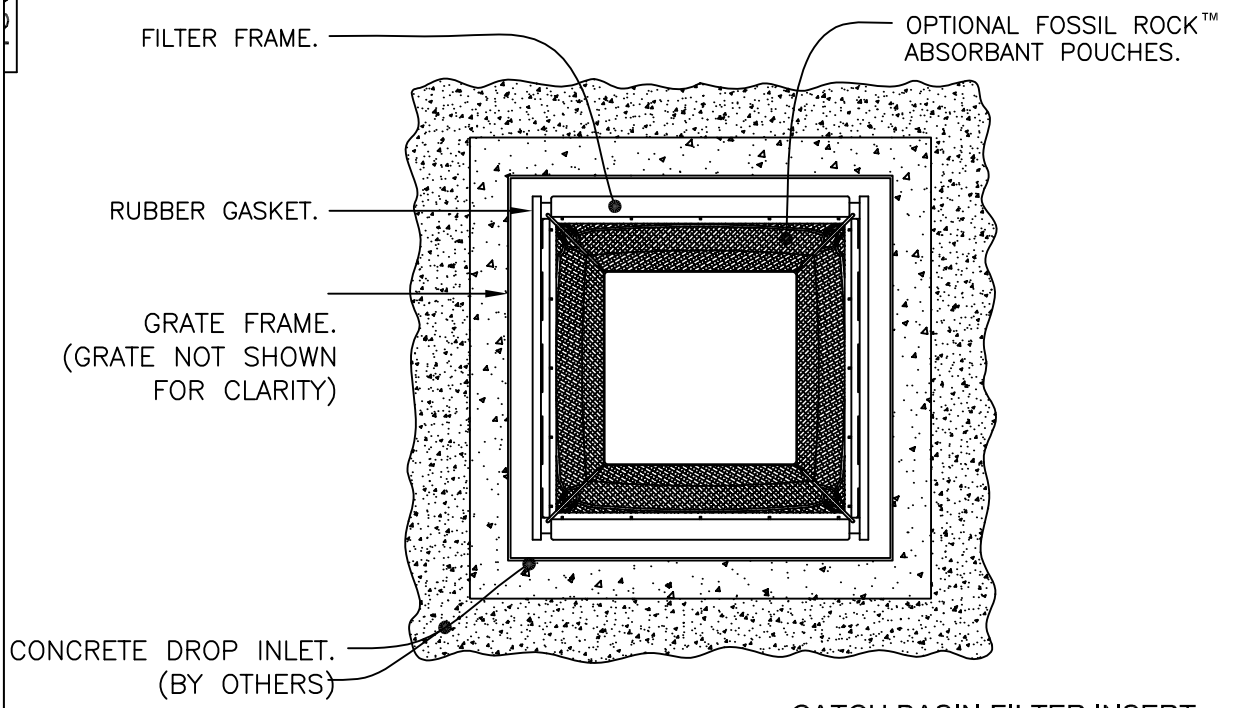

CATCH BASIN FILTER INSERT

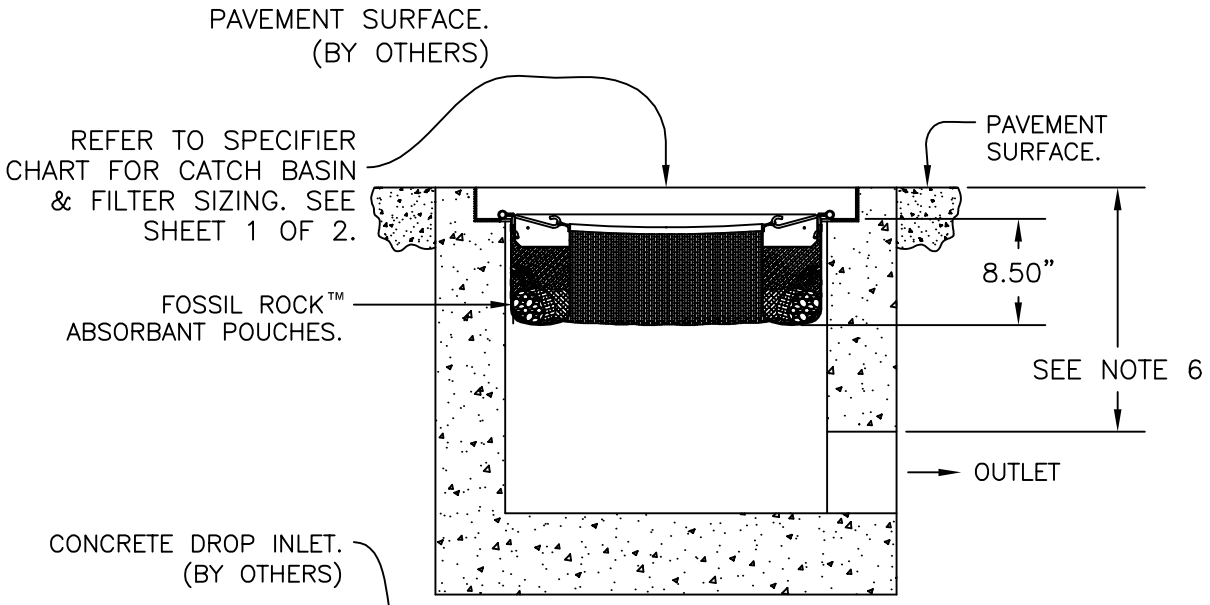

SECTION VIEW

KriStar Enterprises, Inc.
360 Sutton Place, Santa Rosa, CA 95407
Ph: 800.579.8819, Fax: 707.524.8186, www.kristar.com

FloGard®

Geosyntec consultants

Figure 6-26: Catch Basin

Table 6-29: Proprietary Catch Basin Insert Manufacturer Websites

Device	Manufacturer	Website
AbTech Industries Ultra-Urban Filter™	AbTech Industries	www.abtechindustries.com
Aquashield Aqua-Guardian™ Catch Basin Insert	Aquashield™ Inc.	www.aquashieldinc.com
Bowhead StreamGuard™	Aquashield™ Inc.	www.aquashieldinc.com
Contech® Triton Catch Basin Filter™	Contech® Construction Products Inc.	www.contech-cpi.com
Contech® Triton Curb Inlet Filter™	Contech® Construction Products Inc.	www.contech-cpi.com
Contech® Triton Basin StormFilter™	Contech® Construction Products Inc.	www.contech-cpi.com
Contech® Curb Inlet StormFilter™	Contech® Construction Products Inc.	www.contech-cpi.com
Curb Inlet Basket	SunTree Technologies Inc.	www.suntreetech.com
Curb Inlet Grates	EcoSense International™	www.ecosenseinternational.org
Grate Inlet Skimmer Box	SunTree Technologies Inc.	www.suntreetech.com
Hydro-Kleen™ Filtration System	Hydro Compliance Management Inc.	Not available
KriStar FloGard+PLUS®	KriStar Enterprises Inc.	www.kristar.com
KriStar FloGard®	KriStar Enterprises Inc.	www.kristar.com
KriStar FloGard LoPro Matrix Filter®	KriStar Enterprises Inc.	www.kristar.com
Nyloplast Storm-PURE Catch Basin Insert	Nyloplast Engineered Surface Drainage Products	www.nyloplast-us.com
StormBasin®	FabCo® Industries Inc.	www.fabco-industries.com
Stormdrain Solutions Interceptor	FabCo® Industries Inc.	www.fabco-industries.com
Stormdrain Solutions Inceptor®	Stormdrain Solutions	www.stormdrains.com
StormPod®	FabCo® Industries Inc.	www.fabco-industries.com
Stormwater Filtration Systems	EcoSense International™	www.ecosenseinternational.org
Ultra-CurbGuard®	UltraTech International Inc.	www.spillcontainment.com
Ultra-DrainGuard®	UltraTech International Inc.	www.spillcontainment.com
Ultra-GrateGuard®	UltraTech International Inc.	www.spillcontainment.com
Ultra-GutterGuard®	UltraTech International Inc.	www.spillcontainment.com
Ultra-InletGuard®	UltraTech International Inc.	www.spillcontainment.com

Limitations

Catch basin inserts come in such a wide range of configurations that it is practically impossible to generalize the expected performance. Inserts should mainly be used for catching coarse sediments and floatable trash, and are effective as pretreatment in combination with other types of structures that are recognized as water quality treatment BMPs. Trash and large objects can greatly reduce the effectiveness of catch basin inserts with respect to sediment and hydrocarbon capture. Frequent

maintenance and the use of screens and grates to keep trash out may decrease the likelihood of clogging and prevent obstruction and bypass of incoming flows.

Design Criteria

Catch basin inserts shall be sized to capture and treat the stormwater quality design flow rate.

Operations and Maintenance

1) Trash, debris, and sediment around insert grate and inside chamber requiring trash to be cleared.

2) Repair filter media if damaged or severely clogged.

3) Inspection of catch basin insert after each storm greater than 0.2 inches is recommended.

7 MAINTENANCE PLAN

This chapter identifies the basic information that should be included in a maintenance plan. Refer to Fact Sheets for individual control measures in Chapter 6 regarding device-specific maintenance requirements.

7.1 Site Map

1) Provide a site map showing boundaries of the site, acreage and drainage patterns/contour lines. Show each discharge location from the site and any drainage flowing onto the site. Distinguish between soft and hard surfaces on the map.

2) Identify locations of existing and proposed storm drain facilities, private sanitary sewer systems and grade-breaks for purposes of pollution prevention.

3) With legend, show locations of expected sources of pollution generation (outdoor work and storage areas, heavy traffic areas, delivery areas, trash enclosures, fueling areas, industrial clarifiers, wash-racks, etc). Identify any areas having contaminated soil or where toxins are stored or have been stored/disposed of in the past.

4) With legend, indicate types and locations of stormwater management control measures which will be built to permanently control stormwater pollution. Distinguish between pollution prevention, treatment, sewer diversion, and containment devices.

7.2 Baseline Descriptions

1) List the property owners and persons responsible for operation and maintenance of the stormwater management control measures onsite. Include phone numbers and addresses.

2) Identify the intended method of providing financing for operation, inspection, routine maintenance and upkeep of stormwater control measures.

3) List all permanent stormwater control measures. Provide a brief description of stormwater management control measures selected and if appropriate, facts sheets or additional information.

4) As appropriate for each stormwater control measure provide:

    a. A written description and check list of all maintenance and waste disposal activities that will be performed. Distinguish between the maintenance appropriate for a 2-year establishment period and expected long-term maintenance. For example, maintenance requirements for vegetation in a constructed wetland may be more intensive during the first few years until the vegetation is established. The post-establishment maintenance

plan should address maintenance needs (e.g., pruning, irrigation, weeding) for a larger, more stable system. Include maintenance performance procedures for facility components that require relatively unique maintenance knowledge, such as specific plant removal / replacement, landscape features, or constructed wetland maintenance. These procedures should provide enough detail for a person unfamiliar with maintenance to perform the activity, or identify the specific skills or knowledge necessary to perform and document the maintenance.

b. A description of site inspection procedures and documentation system, including record-keeping and retention requirements.

c. An inspection and maintenance schedule, preferably in the form of a table or matrix, for each activity for all facility components. The schedule should demonstrate how it will satisfy the specified level of performance, and how the maintenance / inspection activities relate to storm events and seasonal issues.

d. Identification of the equipment and materials required to perform the maintenance.

5) As appropriate, list all housekeeping procedures for prohibiting illicit discharges or potential illicit discharges to the storm drain. Identify housekeeping BMPs that reduce maintenance of Treatment Control Measures. These procedures are listed based on facility operations and can be found in the Ventura County Industrial/Commercial Clean Business Program document.

7.3 Spill Plan

1) Provide emergency notification procedures (phone and agency/persons to contact)

2) As appropriate for site, provide emergency containment and cleaning procedures.

3) Note downstream receiving water bodies or wetlands which may be affected by spills or chronic untreated discharges.

4) As appropriate, create an emergency sampling procedure for spills. (Emergency sampling can protect the property owner from erroneous liability for down-stream receiving area clean-ups).

7.4 Facility Changes

Operational or facility changes which significantly affect the character or quantity of pollutants discharging into the stormwater management control measures will require modifications to the Maintenance Plan and/or additional stormwater control measures.

7.5 Training

1) Identify appropriate persons to be trained and assure proper training.

2) Training to include:

   a. Good housekeeping procedures defined in the plan.

   b. Proper maintenance of all pollution mitigation devices.

   c. Identification and cleanup procedures for spills and overflows.

   d. Large-scale spill or hazardous material response.

   e. Safety concerns when maintaining devices and cleaning spills.

7.6 Basic Inspection and Maintenance Activities

1) Create and maintain onsite, a log for inspector names, dates and stormwater control measure devices to be inspected and maintained. Provide a checklist for each inspection and maintenance category.

2) Once annually, perform testing of any mechanical or electrical devices prior to wet weather.

3) Report any significant changes in stormwater management control measures to the site management. As appropriate, assure mechanical devices are working properly and/or landscaped BMP plantings are irrigated and nurtured to promote thick growth.

4) Note any significant maintenance requirements due to spills or unexpected discharges.

5) As appropriate, perform maintenance and replacement as scheduled and as needed in a timely manner to assure stormwater management control measures are performing as designed and approved.

6) Assure unauthorized low-flow discharges from the property do not by-pass stormwater control measures.

7) Perform an annual assessment of each pollution generation operation and its associated stormwater management control measures to determine if any part of the pollution reduction train can be improved.

7.7 Revisions of Pollution Mitigation Measures

If future correction or modification of past stormwater management control measures or procedures is required, the owner shall obtain approval from the governing stormwater

agency prior to commencing any work. Corrective measures or modifications shall not cause discharges to bypass or otherwise impede existing stormwater control measures.

7.8 Monitoring & Reporting Program

1) The governing stormwater agency may require a Monitoring & Reporting Program to assure the stormwater management control measures approved for the site are performing according to design.

2) If required by local permitting agency, the Maintenance Plan shall include performance testing and reporting protocols.

APPENDIX A : ACRONYMS AND GLOSSARY OF TERMS

A.1 Acronyms and Abbreviations

303(d)	303(d) List of Impaired Water Bodies
API	American Petroleum Institute (oil/water separator type)
BMP	Best Management Practice
CEQA	California Environmental Quality Act
CP	Coalescing Plate (oil/water separator type)
CTR	California Toxics Rule
CWA	Clean Water Act
CDFG	California Department of Fish and Game
EIA	Effective Impervious Area
EMC	Event Mean Concentration
ESA	Environmentally Sensitive Area
LID	Low Impact Development
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
RPAMP	Redevelopment Project Area Master Plan
SQDV	Stormwater Quality Design Volume
SQDF	Stormwater Quality Design Flow
TSS	Total Suspended Solids
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
WERF	Water Environment Research Foundation

A.2 Glossary

Automotive Repair Shop: A facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

Backfill: Earth or engineered material used to refill a trench or an excavation.

Berm: An earthen mound used to direct the flow of runoff around or through a structure.

Best Management Practice (BMP): Any program, technology, process, siting criteria, operational methods or measures, or engineered systems, which when implemented prevent, control, remove, or reduce pollution.

Best Management Practices (BMPs): Includes schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Biofiltration: The simultaneous process of filtration, infiltration, adsorption, and biological uptake of pollutants in stormwater that takes place when runoff flows over and through vegetated areas.

Bioretention Facility: A facility that utilizes soil infiltration and both woody and herbaceous plants to remove pollutants from stormwater runoff. Runoff is typically captured and infiltrated or released over a period of 24 to 48 hours.

Blue Roof: A roof that is designed to store rainwater, typically in a cistern-type device.

Brown Roof: A type of green roof which focuses on biodiversity and locally-sourced material.

Buffer Strip or Zone: Strip of erosion-resistant vegetation over which stormwater runoff is directed.

Capacity: The capacity of a stormwater drainage facility is the flow volume or rate that the facility (e.g., pipe, basin, vault, swale, ditch, drywell, etc.) is designed to safely contain, receive, convey, reduce pollutants from, or infiltrate stormwater to meet a specific performance standard. There are different performance standards for pollution reduction, flow control, conveyance, and destination/ disposal, depending on location.

Catch Basin: Box-like underground concrete structure with openings in curbs and gutters designed to collect runoff from streets and pavements.

Check Dam: Small temporary barrier, grade control structure, or dam constructed across a swale, drainage ditch, or area of concentrated flow with the intent to slow or stop runoff.

Clean Water Act (CWA): (33 U.S.C. 1251 et seq.) requirement of the National Pollutant Discharge Elimination System (NPDES) program are defined under Sections 307, 402, 318 and 405 of the CWA.

Commercial Development: Any development on private land that is not heavy industrial or residential. The category includes, but is not limited to: hospitals, laboratories and other medical facilities, educational institutions, recreational facilities, plant nurseries, multi-apartment buildings, car wash facilities, mini-malls and other business complexes, shopping malls, hotels, office buildings, public warehouses and other light industrial complexes.

Conduit: Any channel or pipe for directing the flow of water.

Construction General Permit: A NPDES permit issued by the State Water Resources Control Board (SWRCB) for the discharge of stormwater associated with construction activity from soil disturbance of five (5) acres or more.

Control Device: A device used to hold back or direct a calculated amount of stormwater to or from a stormwater management facility. Typical control structures include vaults or manholes fitted with baffles, weirs, or orifices.

Conveyance System: Any channel or pipe for collecting and directing the Stormwater.

Culvert: A covered channel or a large diameter pipe that crosses under a road, sidewalk, etc.

Dead-end Sump: A below surface collection chamber for small drainage areas that is not connected to the public storm drainage system. Accumulated water in the chamber must be pumped and disposed in accordance with all applicable laws.

Designated Public Access Points: Any pedestrian, bicycle, equestrian, or vehicular point of access to jurisdictional channels in the area of Ventura County subject to permit requirements.

Detention: The temporary storage of stormwater runoff to allow treatment by sedimentation and metered discharge of runoff at reduced peak flow rates.

Detention Facility: A facility designed to receive and hold stormwater and release it at a slower rate, usually over a number of hours. The full volume of stormwater that enters the facility is eventually released.

Detention Tank, Vault, or Oversized Pipe: A structural subsurface facility used to provide flow control for a particular drainage basin.

Development: any construction, rehabilitation, redevelopment or reconstruction of any public or private residential project (whether single-family, multi-unit or planned unit development); industrial, commercial, retail and any other non-residential projects, including public agency projects; or mass grading for future construction.

Directly Adjacent: Situated within 200 feet of the contiguous zone required for the continued maintenance, function, and structural stability of the environmentally sensitive area.

Directly Connected Impervious Area (DCIA): The area covered by a building, impermeable pavement, and/ or other impervious surfaces, which drains directly into the storm drain without first flowing across permeable land area (e.g. turf buffers).

Directly Discharging: Outflow from a drainage conveyance system that is composed entirely or predominantly of flows from the subject, property, development, subdivision, or industrial facility, and not commingled with the flows from adjacent lands.

Discharge: A release or flow of Stormwater or other substance from a conveyance system or storage container.

Disturbed Area: Any area that is altered as a result of land disturbance, such as: clearing, grading, grubbing, stockpiling and excavation.

Drainage Basin: A specific area that contributes stormwater runoff to a particular point of interest, such as a stormwater management facility, drainageway, wetland, river, or pipe.

Effective Impervious Area (EIA): That portion of the surface area that is hydrologically connected via sheet flow over a hardened conveyance or impervious surface without any intervening medium to mitigate flow volume.

Environmentally Sensitive Area (ESA): An area "in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which would be easily disturbed or degraded by human activities and developments" (California Public Resources Code § 30107.5). Areas subject to stormwater mitigation requirements are: 303(d) listed water bodies in all reaches that are unimproved, all California Coastal Commission's *Environmentally Sensitive Habitat Areas* as delineated on maps in Local Coastal Plans, and Regional Water Quality Control Board's Basin Plan Rare, Threatened or Endangered Species (RARE) and Preservation of Biological Habitats (BIOL) designated waterbodies. The California Department of Fish and Game's (CDFG) *Significant Natural Areas* map will be considered for inclusion as the department field-verifies the designated locations. Watershed restoration projects will be considered for inclusion as the department field verifies the designated locations.

Erosion: The wearing a way of land surface by wind or water. Erosion occurs naturally from weather or runoff, but can be intensified by land-clearing practices relating to farming; residential, commercial, or industrial development; road building; or timber cutting.

Excavation: The process of removing earth, stone, or other materials, usually by digging.

Existing Urban Area: Existing urban areas and corresponding maps in Appendix B are based on the cities' City Urban Restriction Boundaries (CURB) lines and the Existing Community designation in the unincorporated County. These boundaries are a growth management tool intended to channel growth and protect agricultural and open-space land. The 2011 TGM utilizes existing urban areas (as defined in Appendix B) to provide parameters around eligibility for alternative compliance in two areas: 1) Smart Growth and 2) low income housing projects.

Extended Detention Basin: A surface vegetated basin used to provide flow control for a particular drainage basin. Stormwater temporarily fills the extended detention basin during large storm events and is slowly released over a number of hours, reducing peak flow rates.

Facility: Is a collection of industrial process discharging stormwater associated with industrial activity within the property boundary or operational unit.

Filter Fabric: Geotextile of relatively small mesh or pore size that is used to: (a) allow water to pass through while keeping sediment out (permeable); or (b) prevent both runoff and sediment from passing through (impermeable).

Filter Strip: A gently sloping, densely grassed area used to filter, slow, and infiltrate stormwater.

Flow Control Facility: Any structure or drainage device that is designed, constructed, and maintained to collect, retain, infiltrate, or detain surface water runoff during and after a storm event for the purpose of controlling post-development quantity leaving the site.

Flow Control: The practice of limiting the release of peak flow rates, flow durations, and volumes from a site. Flow control is intended to protect downstream properties, infrastructure, and natural resources from the increased stormwater runoff flow rates and volumes resulting from development.

Grading: The cutting and/or filling of the land surface to a desired shape or elevation.

Green Roof: A roofing system that layers a soil/vegetative cover over a waterproofing membrane. Green roofs rely on highly porous media and moisture retention layers to store intercepted precipitation and to support vegetation that can reduce the volume of stormwater runoff via evapotranspiration

Hazardous Substance: (1) Any material that poses a threat to human health and/or the environment. Typical hazardous substances are toxic, corrosive, ignitable, explosive, or chemically reactive; (2) Any substance named by EPA to be reported if a designated quantity of the substance is spilled in the waters of the United States or if otherwise emitted into the environment.

Hazardous Waste: By-products of society that can pose a substantial or potential hazard to human health or the environment when improperly managed. Possesses at least one of four characteristics (flammable, corrosivity, reactivity, or toxicity), or appears on special EPA lists.

Hillside: Property located in an area with known erosive soil conditions, where the development contemplates grading on any natural slope that is 25 percent or greater.

Hydrodynamic Separation: Flow-through structures with a settling or separation unit to remove sediments and other pollutants in which no outside power source is required, because the energy of the flowing water allows the sediments to efficiently separate. Depending on the type of unit, this separation may be by means of swirl action or indirect filtration.

Illegal Discharges: Any discharge to a municipal separate storm sewer that is not composed entirely of stormwater except discharges authorized by an NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer) and discharges resulting from fire fighting activities.

Impervious Surface / Area: A hard surface area which either prevents or retards the entry of water into the predevelopment soil mantle. A hard surface area which causes water to run off the surface in greater quantities or at an increased rate of flow from the flow present under predevelopment conditions. Common impervious surfaces include, but are not limited to, roof tops, walkways, patios, driveways, parking lots or storage areas, (impermeable) concrete or asphalt paving, gravel roads, packed earthen materials, and oiled macadam or other surfaces which similarly impede the natural infiltration of storm water.

Industrial General Permit: A NPDES permit issued by the State Water Resources Control Board for the discharge of Stormwater associated with industrial activity.

Infiltration: The downward entry of water into the surface of the soil.

Infiltration Trench: A linear excavation, backfilled with gravel, used to filter pollutants and infiltrate storm water.

Integrated Pest Management Plan (IPMP): A balanced approach to pest management which incorporates the many aspects of plant health care in ways that mitigate harmful environmental impacts and protect human health.

Inlet: An entrance into a ditch, storm sewer, or other waterway.

Legacy Pollutants: Pollutants that are no longer in production but remain in site soils and groundwater and still have the potential to cause ecological and water quality impacts.

Material Storage Areas: On site locations where raw materials, products, final products, by-products, or waste materials are stored.

Maximum Extent Practicable (MEP): The technology-based permit requirement established by Congress in CWA section 402(p)(3)(B)(iii) that municipal dischargers of stormwater must meet. Technology-based requirements, including MEP, establish a level of pollutant control that is derived from available technology or other controls. MEP requires municipal dischargers to perform at maximum level that is practicable. Compliance with MEP may be achieved by emphasizing pollution prevention and source control BMPs in combination with structural and treatment methods where appropriate. The MEP approach is an ever evolving and advancing concept, which considers technical and economic feasibility.

Municipal Separate Storm Sewer System (MS4) Permit: : A NPDES permit issued by the Regional Water Quality Control Board for the discharge of Stormwater from Municipal Separate Storm Sewer Systems.

New Development: Land disturbing activities; structural development, including construction or installation of a building or structure, creation and replacement of impervious surfaces; and land subdivision.

Non-Stormwater Discharge: Any discharge to municipal separate storm drain that is not composed entirely of stormwater. Discharges containing process wastewater, non-contact cooling water, or sanitary wastewater are non-stormwater discharges.

Non-Structural Source Control Measure: Low technology, low cost activities, procedures or management practices designed to prevent pollutants associated with site functions and activities from being discharged with Stormwater runoff. Examples include good housekeeping practices, employee training, standard operating practices, inventory control measures, etc.

Notice of Intent (NOI): A formal notice to State Water Resources Control Board submitted by the owner/developer that a construction project is about to begin. The NOI provides information on the owner, location, type of project, and certifies that the permittee will comply with the conditions of the construction general permit.

NPDES Permit: An authorization, license, or equivalent control document issued by EPA or an approved State agency to implement the requirements of the NPDES program.

Operations and Maintenance (O&M): The continuing activities required to keep storm water management facilities and their components functioning in accordance with design objectives.

Outfall: The point where stormwater discharges from a pipe, channel, ditch, or other conveyance to a waterway.

Parking Lot: Land area or facility for the temporary parking or storage of motor vehicles used personally, for business or for commerce with an impervious surface area of 5,000 square feet or more, or with 25 or more parking spaces.

Permeability: A property of soil that enables water or air to move through it. Usually expressed in inches/hour or inches/day.

Pervious Surface/Area: A surface or area with a surface (i.e., soil, loose rock, permeable pavement, etc.) that allows water to infiltrate (soak) into the ground.

Planter Box: A structural facility filled with topsoil and gravel and planted with vegetation. The planter is completely sealed, and a perforated collection pipe is placed under the soil and gravel, along with an overflow provision, and directed to an acceptable destination point. The storm water planter receives runoff from impervious surfaces, which is filtered and retained for a period of time.

Pollutant: An elemental or physical material that can be mobilized or dissolved by water or air and creates a negative impact to human health and/ or the environment. Pollutants include suspended solids (sediment), heavy metals (such as lead, copper, zinc, and cadmium), nutrients (such as nitrogen and phosphorus), bacteria and viruses, organics (such as oil, grease, hydrocarbons, pesticides, and fertilizers), floatable debris, and increased temperature.

Pollutants of Concern: constituents that have exceeded Basin Plan Objectives, and California Toxics Rule chronic or acute objectives during monitoring at mass emission, receiving water, and land use stations.

Pollution Reduction: The practice of filtering, retaining, or detaining surface water runoff during and after a storm event for the purpose of maintaining or improving surface and/or groundwater quality.

Precipitation: Any form of rain or snow.

Predevelopment: The existing land use condition prior to the proposed development activity.

Practicable: Available and capable of being done, after taking into consideration existing technology, legal issues, and logistics in light of overall project purpose.

Pre-developed Condition: the native vegetation and soils that existed at a site prior to first development. The pre-developed condition may be assumed to be the

typical vegetation, soil, and stormwater runoff characteristics of open space areas in coastal Southern California unless reasonable historic information is provided that the area was atypical.

Pre-project Condition: the condition of the site at the time of the proposed project.

Pretreatment: Treatment of wastewater before it is discharged to a wastewater collection system.

Process Wastewater: Wastewater that has been used in one or more industrial processes.

Project: development, redevelopment, and land disturbing activities. The term is not limited to "project" as defined under CEQA (Reference: California Public Resources Code § 21065).

Public Facility: A street, right-of-way, park, sewer, drainage, storm water management, or other facility that is either currently owned by the City/County or will be conveyed to the City/County for maintenance responsibility after construction.

Rainwater Harvesting: Rainwater harvesting is a BMP that stores and uses rainwater or stormwater runoff. This is consistent with the use of the term "reuse" contained in Order R4-2010-0108.

Receiving Stream: (for purposes of this Manual only) any natural or man-made surface water body that receives and conveys stormwater runoff.

Redevelopment: Land-disturbing activity that results in the creation, addition, or replacement of 5,000 square feet or more of impervious surface area on an already developed site. Redevelopment includes, but is not limited to: the expansion of a building footprint; addition or replacement of a structure; replacement of impervious surface area that is not part of a routine maintenance activity; and land disturbing activities related to structural or impervious surfaces. It does not include routine maintenance to maintain original line and grade, hydraulic capacity, or original purpose of facility, nor does it include emergency construction activities required to immediately protect public health and safety. Note: redevelopment as defined here is not the same as a "Redevelopment Project" as defined by California redevelopment law.

Redevelopment Project Area Master Plan (RPAMP): A plan submitted to the Regional Water Board for approval by a Permittee or a coalition of Permittees to establish standards for redevelopment projects within Redevelopment Project Areas, in consideration of exceptional site constraints that inhibit site-by-site or project-by-project implementation of post-construction requirements. See Section 4.E.IV.3 of Order R4-2010-0108.

Restaurant: A stand-alone facility that sells prepared foods and/or drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and/or drinks for immediate consumption (SIC code 5812).

Retail Gasoline Outlet: Any facility engaged in selling gasoline and lubricating oils.

Retention Facility: A facility designed to receive and hold stormwater runoff. Rather than storing and releasing the entire runoff volume, retention facilities permanently retain a portion of the water on-site, where it infiltrates, evaporates, or is absorbed by surrounding vegetation. In this way, the full volume of storm water that enters the facility is not released off-site.

Retrofit: Retrofit projects implement structural treatment BMPs as a stand-alone project, without other site improvements. The BMP sizing requirements of this Technical Guidance Manual do not apply to retrofit projects.

Runoff: Water originating from rainfall and other precipitations (e.g., sprinkler irrigation) that is found in drainage facilities, rivers, streams, springs, seeps, ponds, lakes, wetlands, and shallow groundwater.

Runon: Stormwater surface flow or other surface flow which enters property other than that where it originated.

Secondary Containment: Structures, usually dikes or berms, surrounding tanks or other storage containers and designed to catch spilled material from the storage containers.

Sedimentation: The process of depositing soil particles, clays, sands, or other sediments that were picked up by runoff.

Sediments: Soil, sand, and minerals washed from land into water usually after rain, that accumulate in reservoirs, rivers, and harbors, destroying aquatic animal habitat and clouding the water so that adequate sunlight might not reach aquatic plants.

Site: land or water area where any “facility” or “activity” is physically located or conducted including adjacent land used in connection with the facility or activity.

Source Control BMP or Measure: Any schedules of activities, structural devices, prohibitions of practices, maintenance procedures, managerial practices or operational practices that aim to prevent Stormwater pollution by reducing the potential for contamination at the source of pollution.

Source Control BMPs: Operational practices or design features that prevent pollution by reducing potential pollutants at the source.

Spill Guard: A device used to prevent spills of liquid materials from storage containers.

Spill Prevention Control and Countermeasures Plan (SPCC): Plan consisting of structures, such as curbing, and action plans to prevent and respond to spills of hazardous substances as defined in the Clean Water Act.

Storm Drains: Above and below ground structures for transporting stormwater to streams or outfalls for flood control purposes.

Storm Drain System: Network of above and below-ground structures for transporting stormwater to streams or outfalls.

Storm Event: A rainfall event that produces more than 0.1 inch of precipitation and is separated from the previous storm event by at least 72 hours of dry weather.

Stormwater Discharge Associated with Industrial Activity: Discharge from any conveyance which is used for collecting and conveying stormwater which is related to manufacturing processing or raw materials storage areas at an industrial plant [see 40 CFR 122.26(b)(14)].

Stormwater: Stormwater runoff, snow-melt runoff, surface runoff, and drainage, excluding infiltration and irrigation tailwater.

Structural BMP or Control Measure: Any structural facility designed and constructed to mitigate the adverse impacts of stormwater and urban runoff pollution (e.g. canopy, structural enclosure). The category may include both Treatment Control BMPs and Source Control BMPs.

Total Project Area: Total project area (or “gross project area”) for new development and redevelopment projects is the disturbed, developed, and undisturbed portions within the project’s property (or properties) boundary, at the project scale submitted for first approval. Areas proposed to be permanently dedicated for open space purposes as part of the project are explicitly included in the "total project area." Areas of land precluded from development through a restrictive covenant, conservation easement, or other recorded document for the permanent preservation of open space prior to project submittal shall not be included in the "total project area."

Total Suspended Solids (TSS): Matter suspended in stormwater excluding litter, debris, and other gross solids exceeding 1 millimeter in diameter.

Treatment Control BMP or Measure: Any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media adsorption or any other physical, biological, or chemical process.

Treatment: The application of engineered systems that use physical, chemical, or biological processes to remove pollutants. Such processes include, but are not limited to, filtration, gravity settling, media adsorption, biodegradation, biological uptake, chemical oxidation and UV radiation.

Tributary Area: The area from which all runoff produced flows to the same specific discharge point.

Vegetated Facilities: Stormwater management facilities that rely on plantings to enhance their performance. Plantings can provide wildlife habitat and enhance many facility functions, including infiltration, pollutant removal, water cooling, flow calming, and prevention of erosion.

Vegetated Swale: A long and narrow, trapezoidal or semicircular channel, planted with a variety of trees, shrubs, and grasses or with a dense mix of grasses. Stormwater runoff from impervious surfaces is directed through the swale, where it is slowed and in some cases infiltrated, allowing pollutants to settle out. Check dams are often used to create small ponded areas to facilitate infiltration.

APPENDIX B : MAPS

NOTES:

1. Contact the local permitting authority for more detailed maps.
2. Existing Urban Area maps are current as of 11/2/10.

Legend

- River
- Lake
- National Forest
- 10-Digit Hydrologic Unit Boundary

Existing Urban Area

- Camarillo
- Fillmore
- Moorpark
- Oxnard
- Santa Paula
- Simi Valley
- Thousand Oaks
- Port Hueneme
- Ventura
- Ojai
- Urban County
- Non-Urban County
- Adjacent County

10 5 0 10 Miles

Hydrologic Areas

Ventura County, CA

Geosyntec consultants

Oakland Office | April 2010

Figure **B-1**

P:\GIS\Ventura_County_Manual\Projects\B-1_Ventura_County_Watersheds_MS4_Urban_Areas_042910.mxd, WHL, September 1, 2010

Legend

- BIOL Designated Waterbody
- 303(d) Listed Waterbody
- Environmentally Sensitive Habitat Areas
- Lake
- National Forest

Existing Urban Area

- Camarillo
- Fillmore
- Moorpark
- Oxnard
- Santa Paula
- Simi Valley
- Thousand Oaks
- Port Hueneme
- Ventura
- Ojai
- Urban County
- Non-Urban County
- Adjacent County

10 5 0 10 Miles

Environmentally Sensitive Areas
Ventura County, CA

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Figure **B-2**

B-2_Ventura_County_ESA_042910.mxd, WHL, September 1, 2010

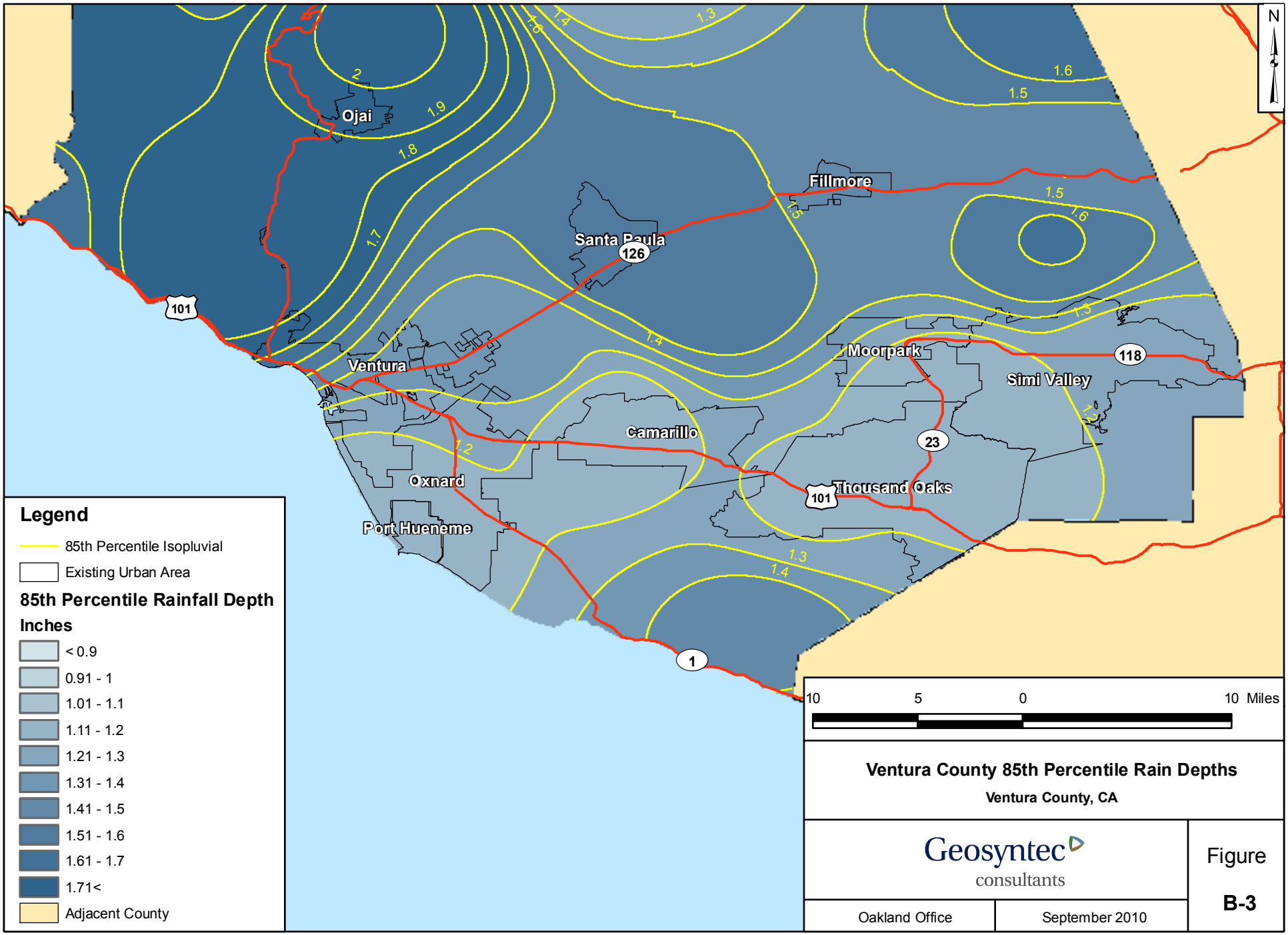

Ventura County 85th Percentile Rain Depths

Ventura County, CA

Geosyntec consultants

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Figure **B-3**

P:\GIS\Ventura_County_Manual\Projects\B-3_Ventura_County_85th_Isopluvials_092010.mxd, WHL, September 20, 2010

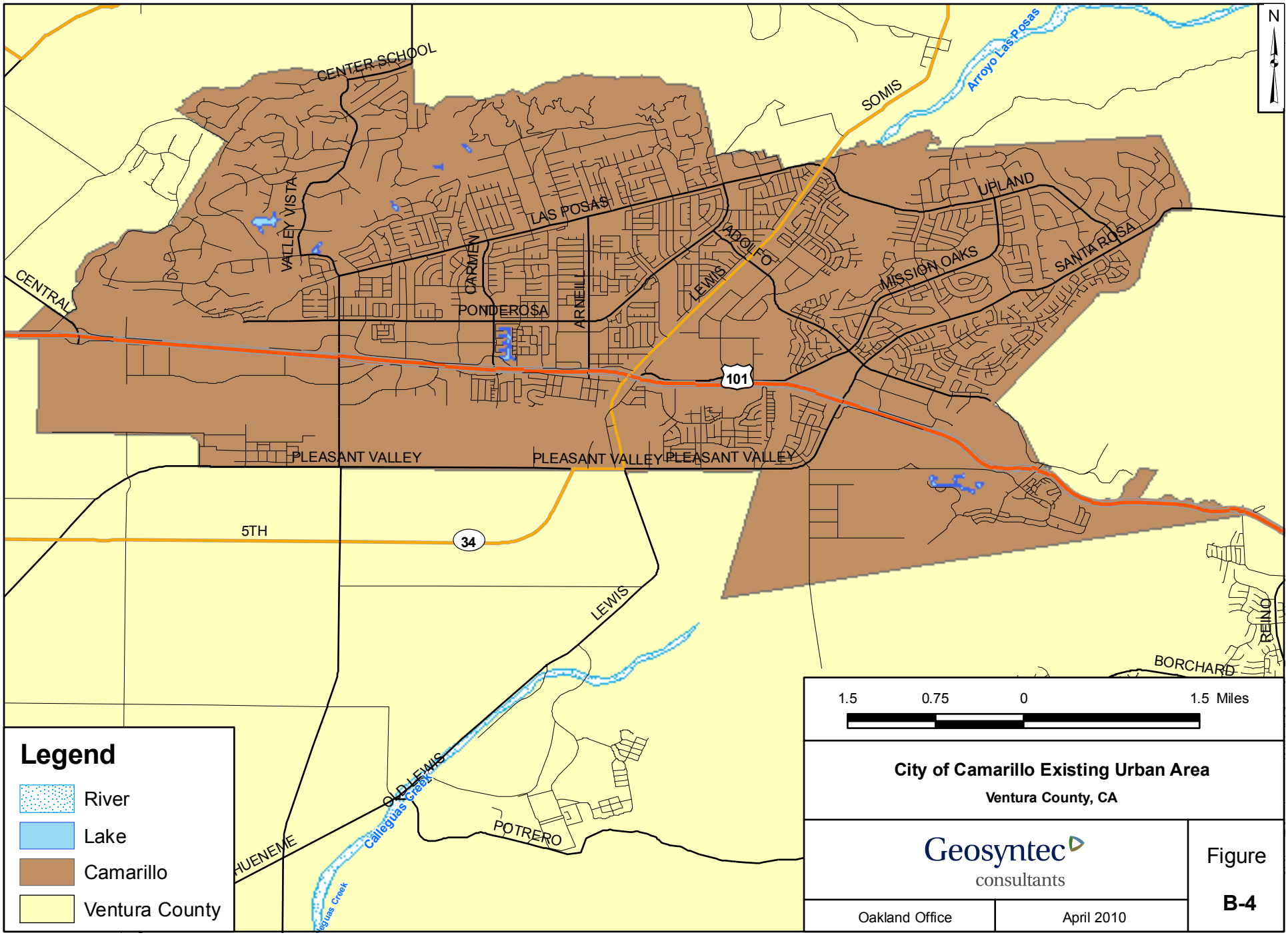

City of Camarillo Existing Urban Area

Ventura County, CA

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Figure **B-4**

P:\GIS\Ventura_County_Manual\Projects\B-4_Camarillo_MS4_Pop_Areas_092410.mxd, WHL, September 24, 2010

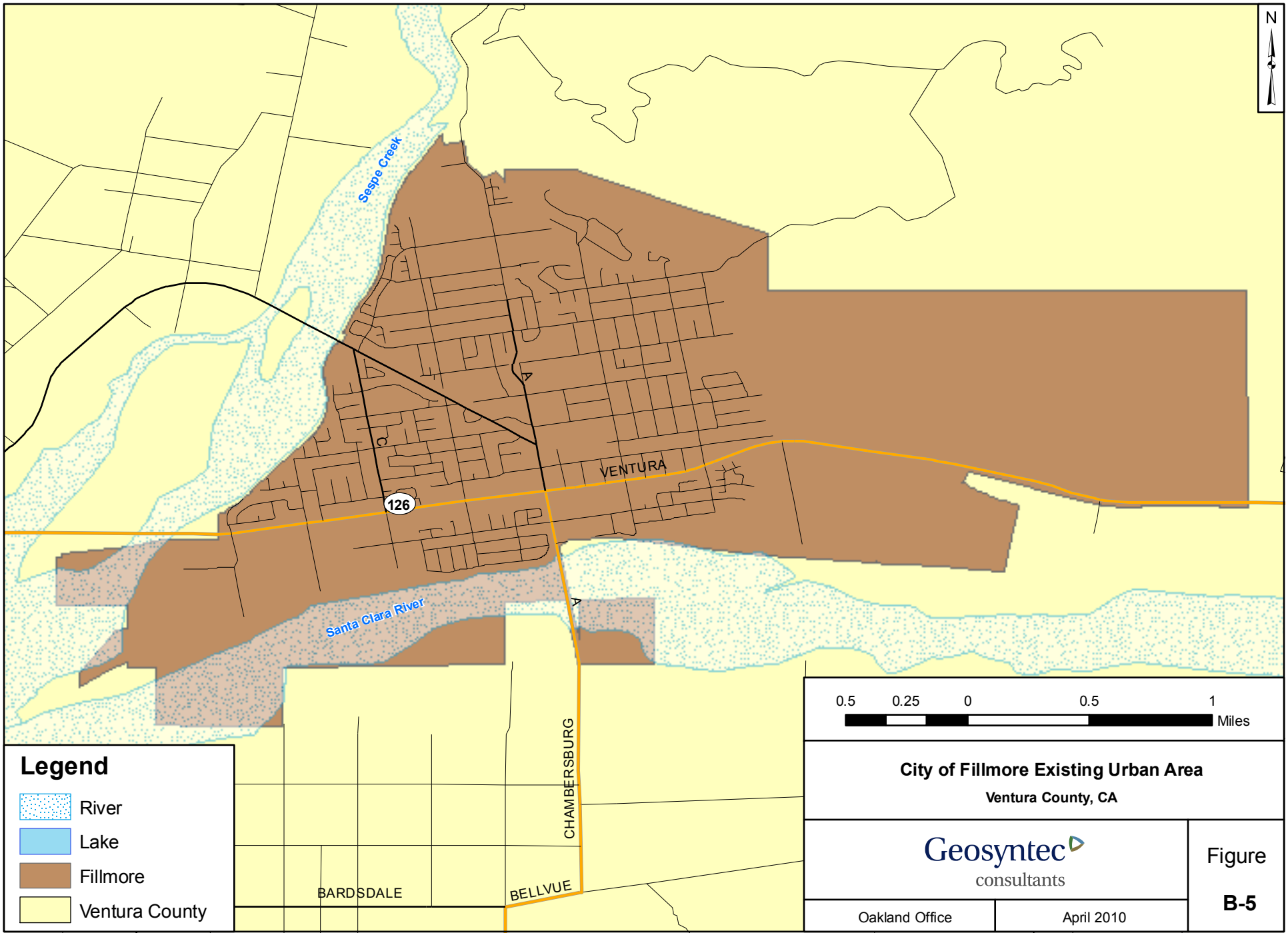

City of Fillmore Existing Urban Area

Ventura County, CA

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April 2010

Figure

B-5

P:\GIS\Ventura_County_Manual\Projects\B-5Fillmore_MS4_Pop_Areas_092310.mxd, WHL, September 24, 2010

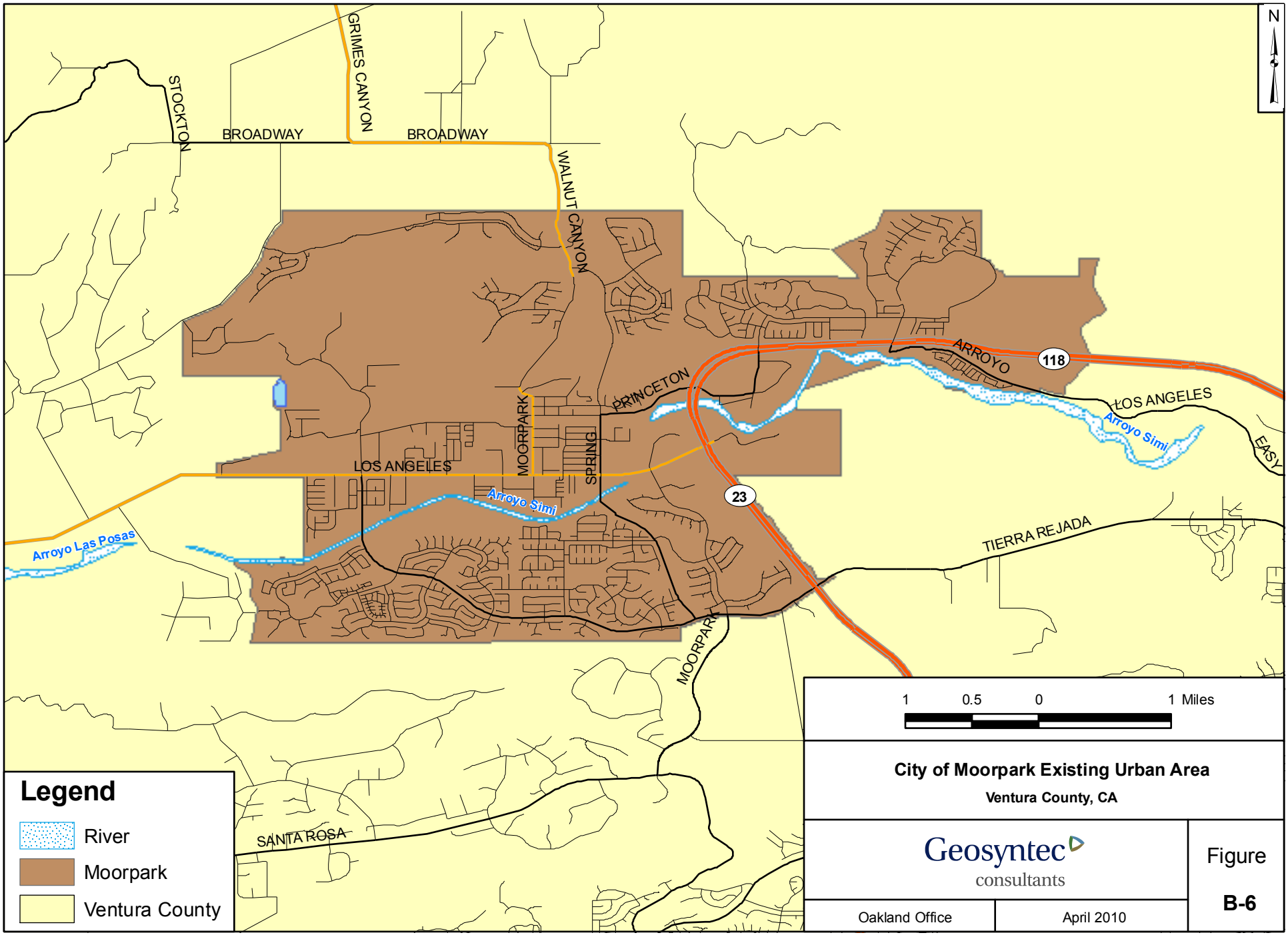

P:\GIS\Ventura_County_Manual\Projects\B-6_Moorpark_MS4_Pop_Areas_092310.mxd, WHL, September 23, 2010

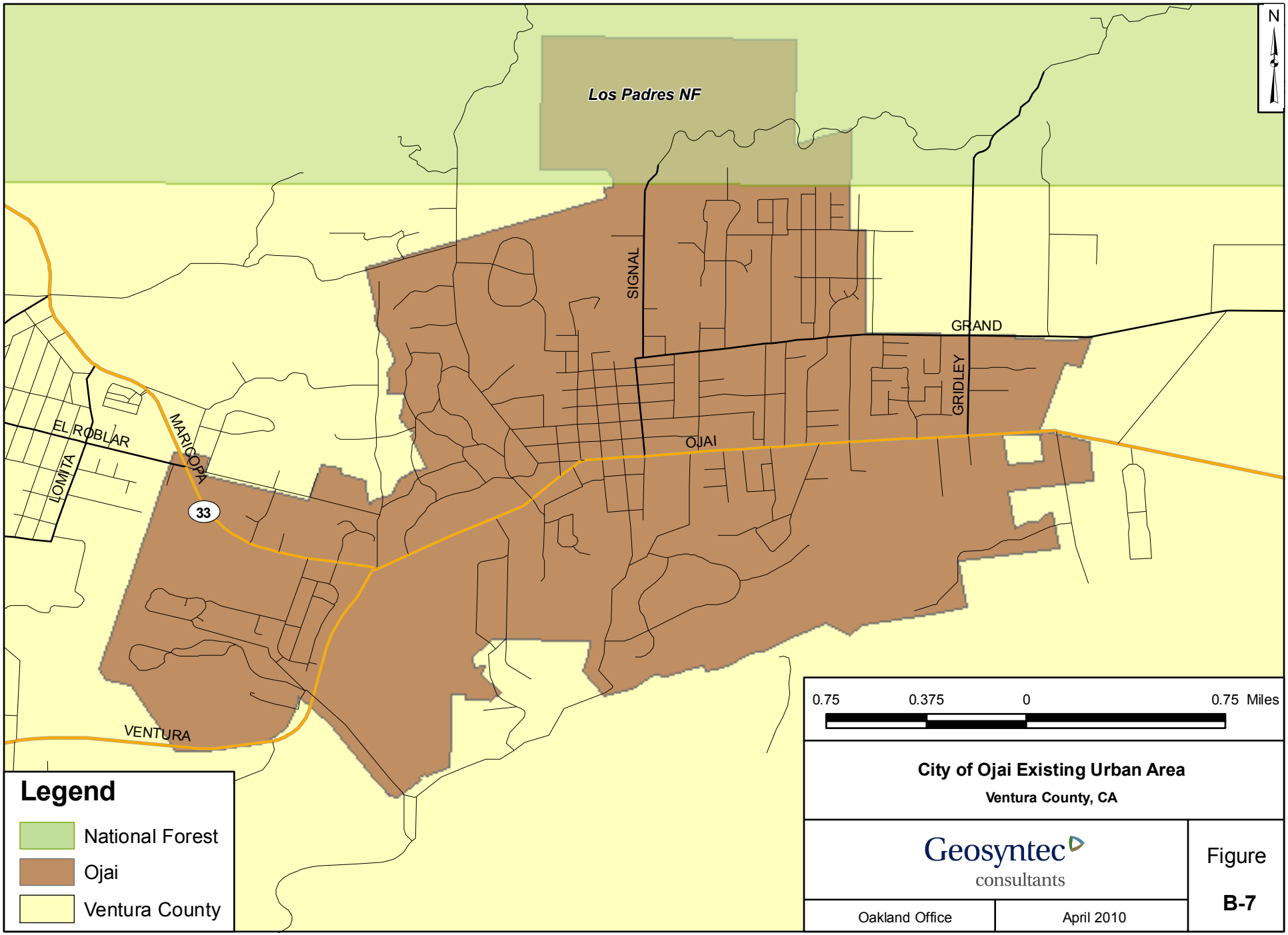

City of Ojai Existing Urban Area

Ventura County, CA

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Figure **B-7**

P:\GIS\Ventura_County_Manual\Projects\B-7_Ojai_MS4_Pop_Areas_092310.mxd, WHL, September 23, 2010

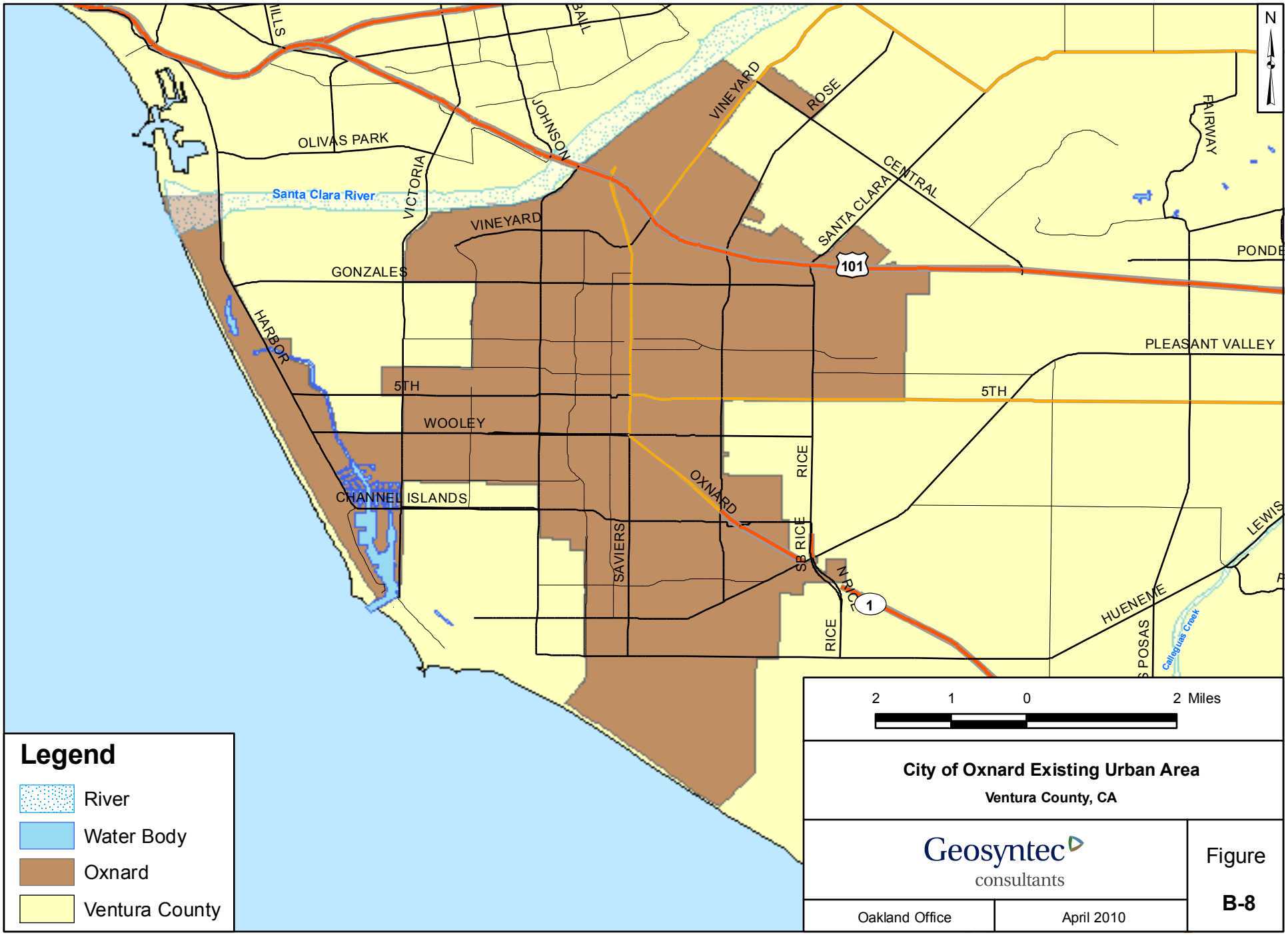

City of Oxnard Existing Urban Area

Ventura County, CA

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Figure **B-8**

P:\GIS\Ventura_County_Manual\Projects\B-8_Oxnard_MS4_Pop_Areas_092310.mxd, WHL, September 23, 2010

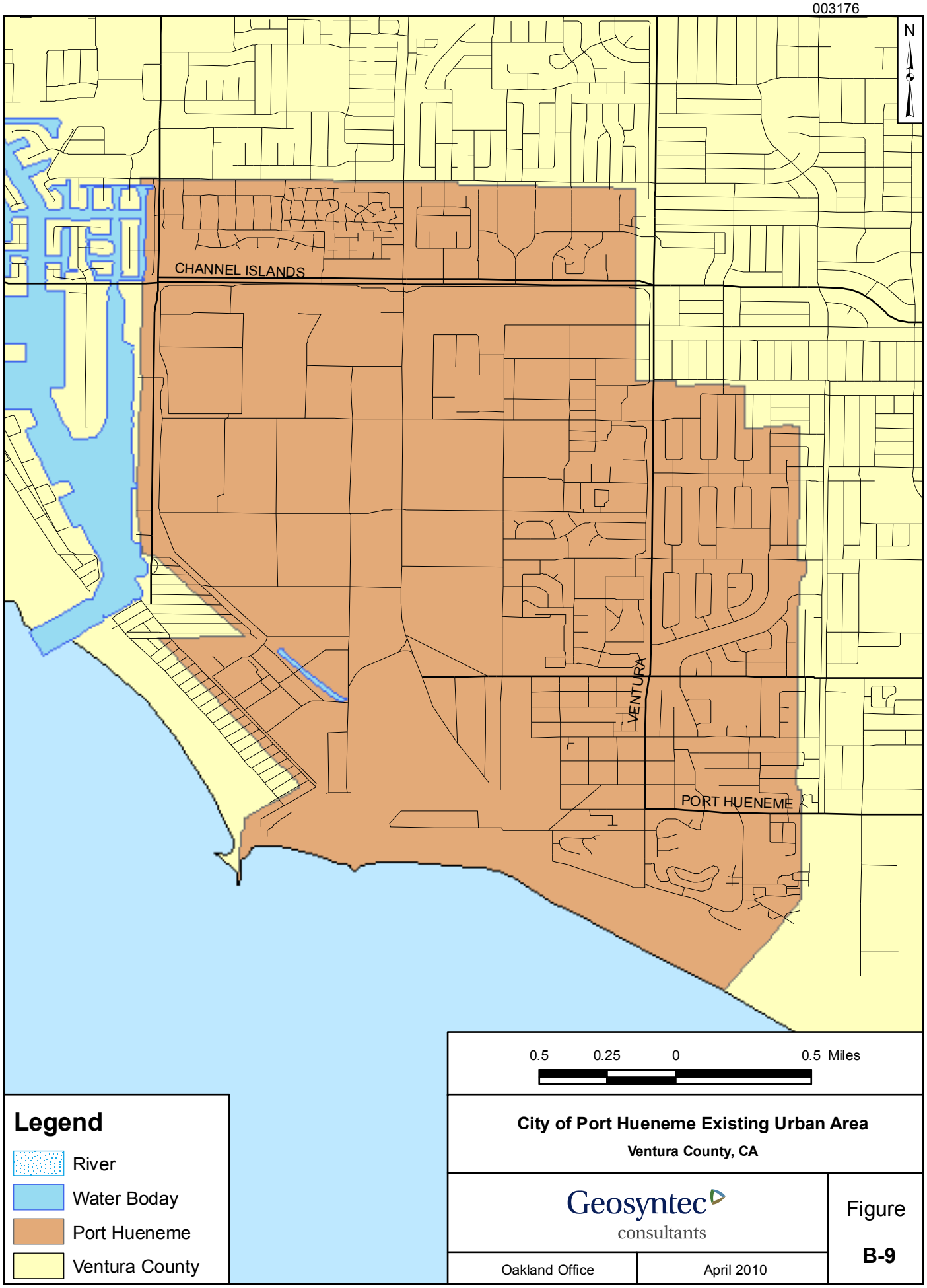

City of Port Hueneme Existing Urban Area

Ventura County, CA

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Figure **B-9**

P:\GIS\Ventura_County_Manual\Projects\B-9_Port_Hueneme_MS4_Urban_Areas_092310.mxd, WHL, September 23, 2010

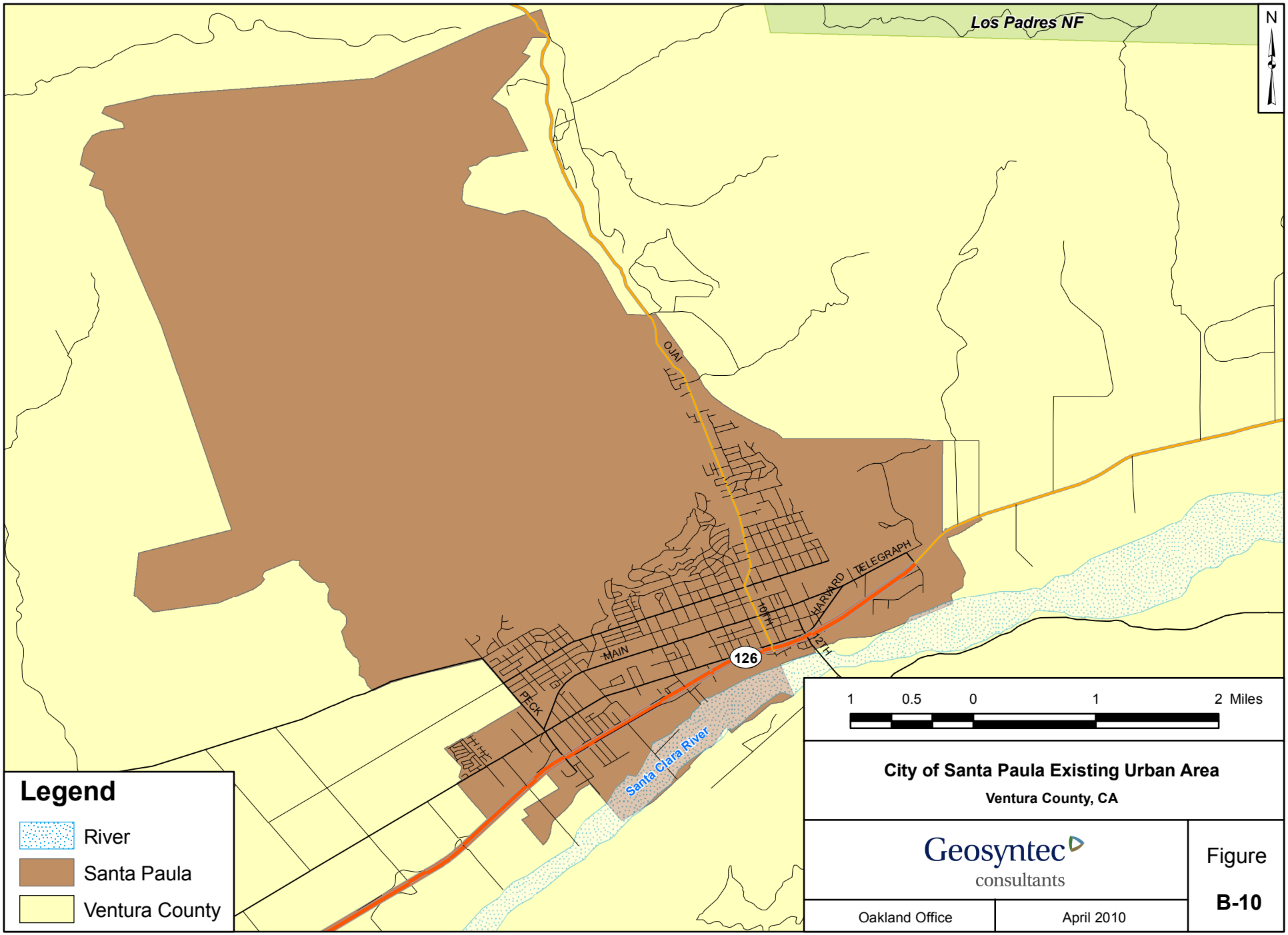

City of Santa Paula Existing Urban Area

Ventura County, CA

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Figure **B-10**

P:\GIS\Ventura_County_Manual\Projects\B-10_Santa_Paula_MS4_Pop_Areas_092310.mxd, WHL, September 23, 2010

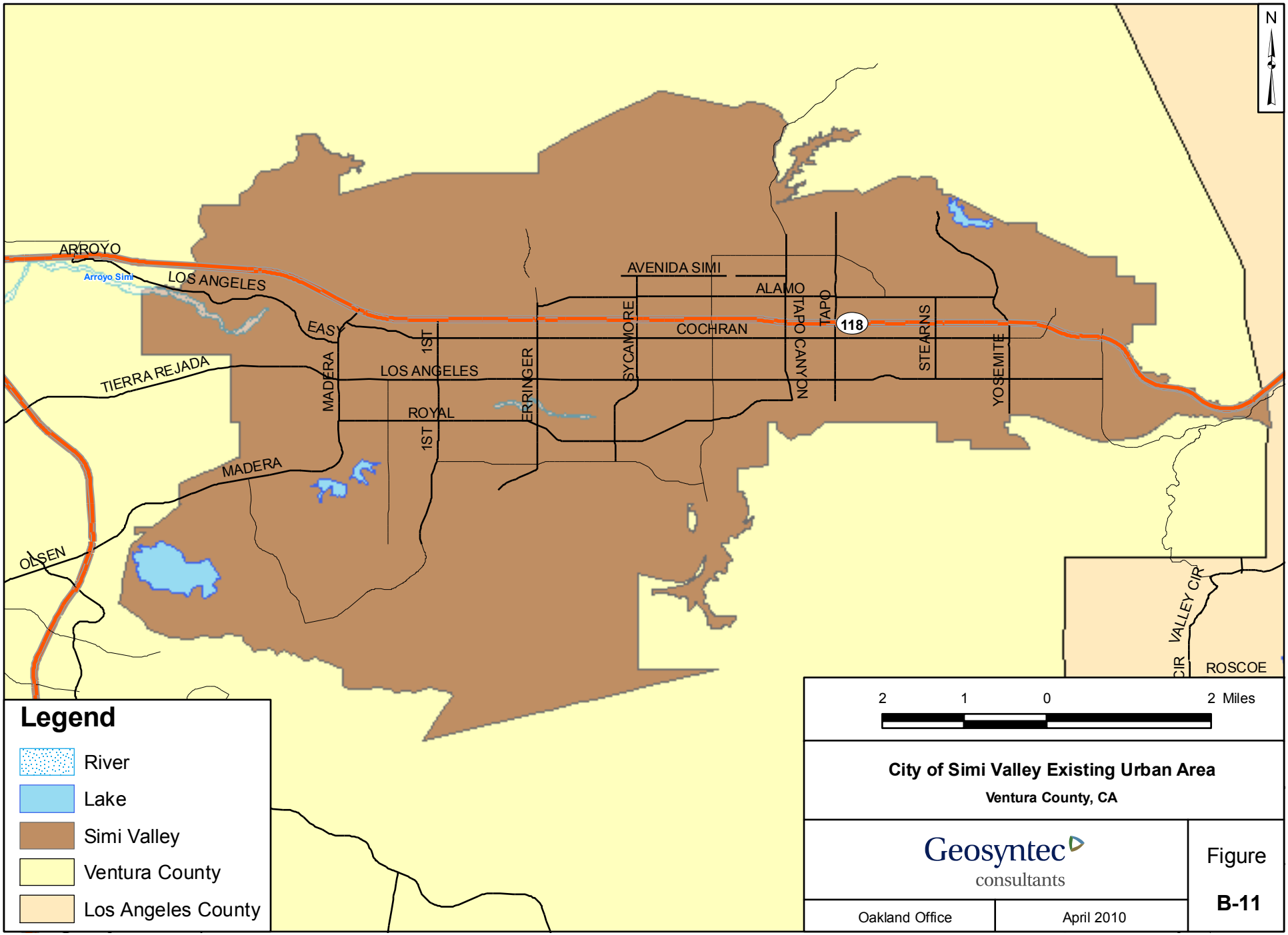

City of Simi Valley Existing Urban Area

Ventura County, CA

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Figure **B-11**

P:\GIS\Ventura_County_Manual\Projects\Simi_Valley_MS4_Pop_Areas_092310.mxd, WHL, September 23, 2010

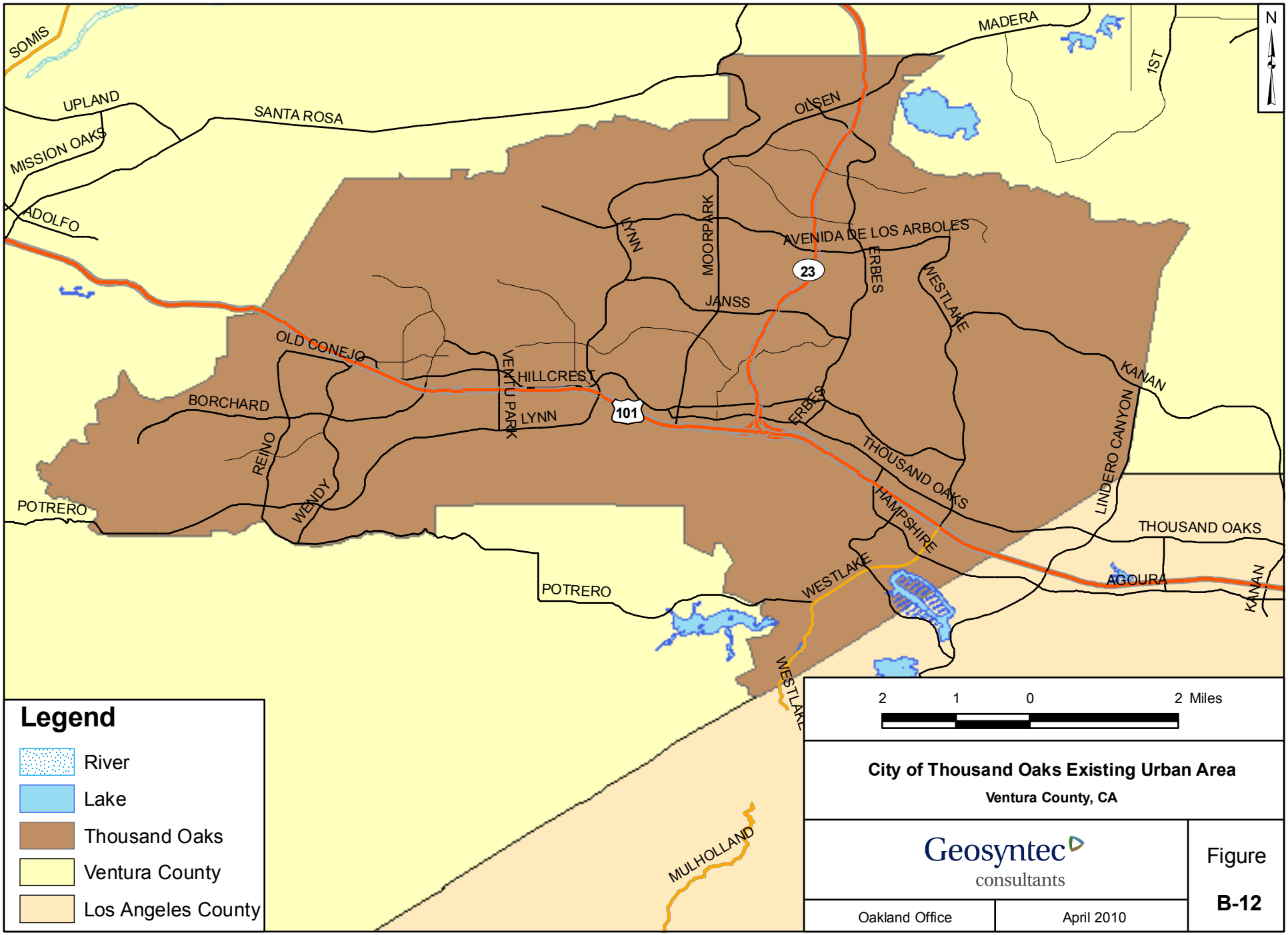

City of Thousand Oaks Existing Urban Area

Ventura County, CA

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Figure **B-12**

P:\GIS\Ventura_County_Manual\Projects\B-12_Thousand_Oaks_MS4_Pop_Areas_092310.mxd, WHL, September 23, 2010

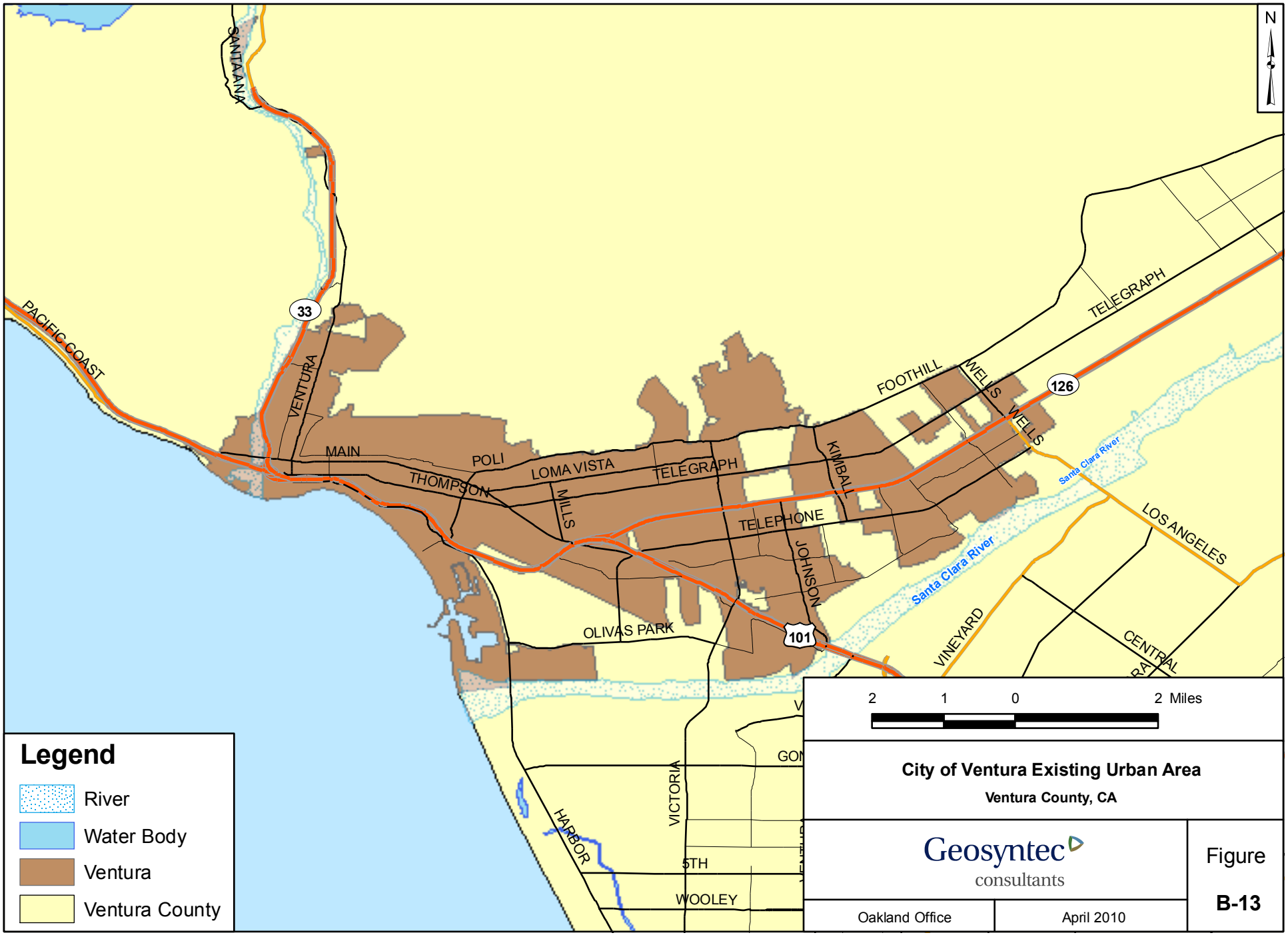

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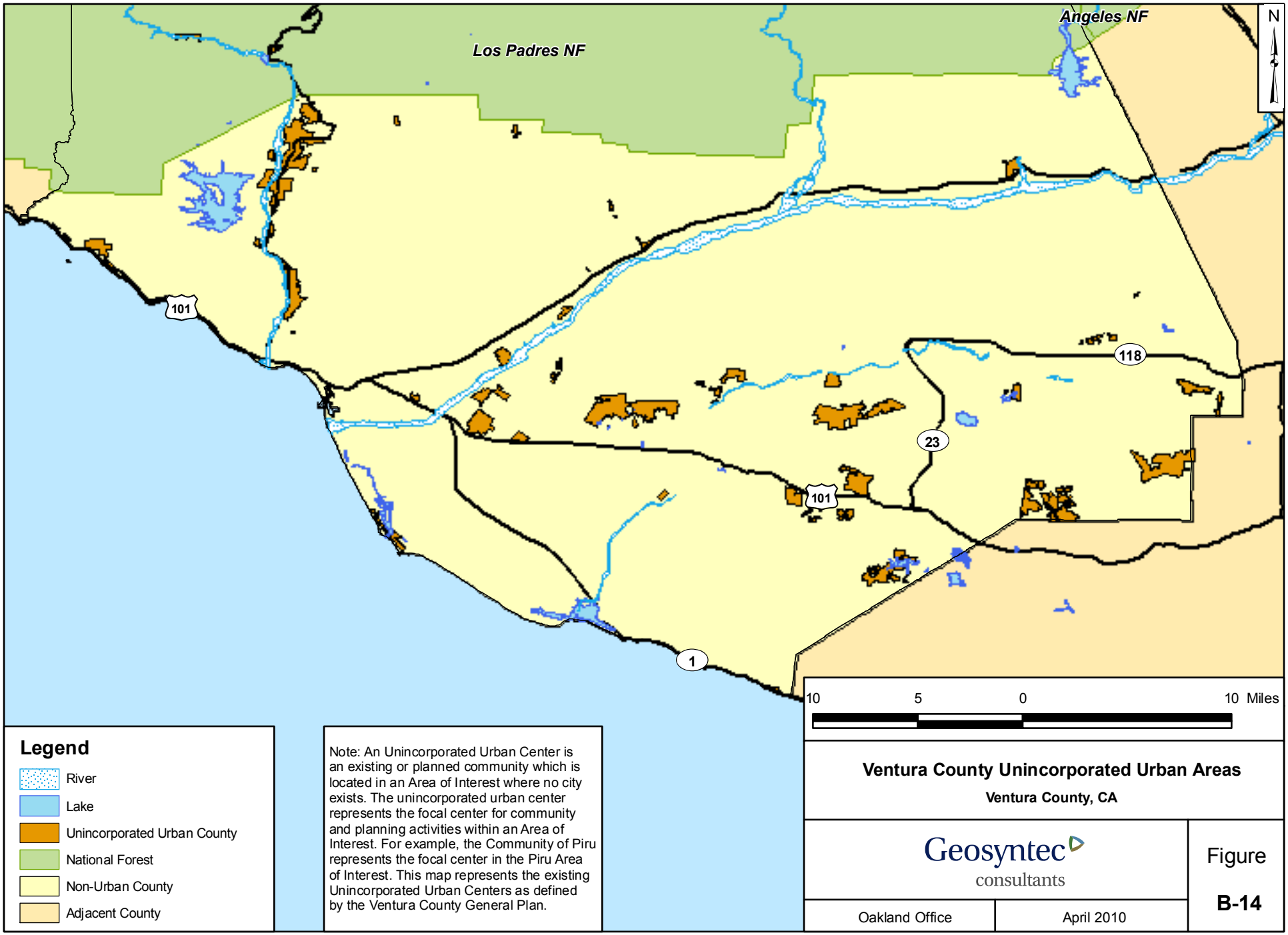

Ventura County Unincorporated Urban Areas

Ventura County, CA

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Figure **B-14**

P:\GIS\Ventura_County_Manual\Projects\B-14_Ventura_County_Urban_092310.mxd, WHL, September 23, 2010

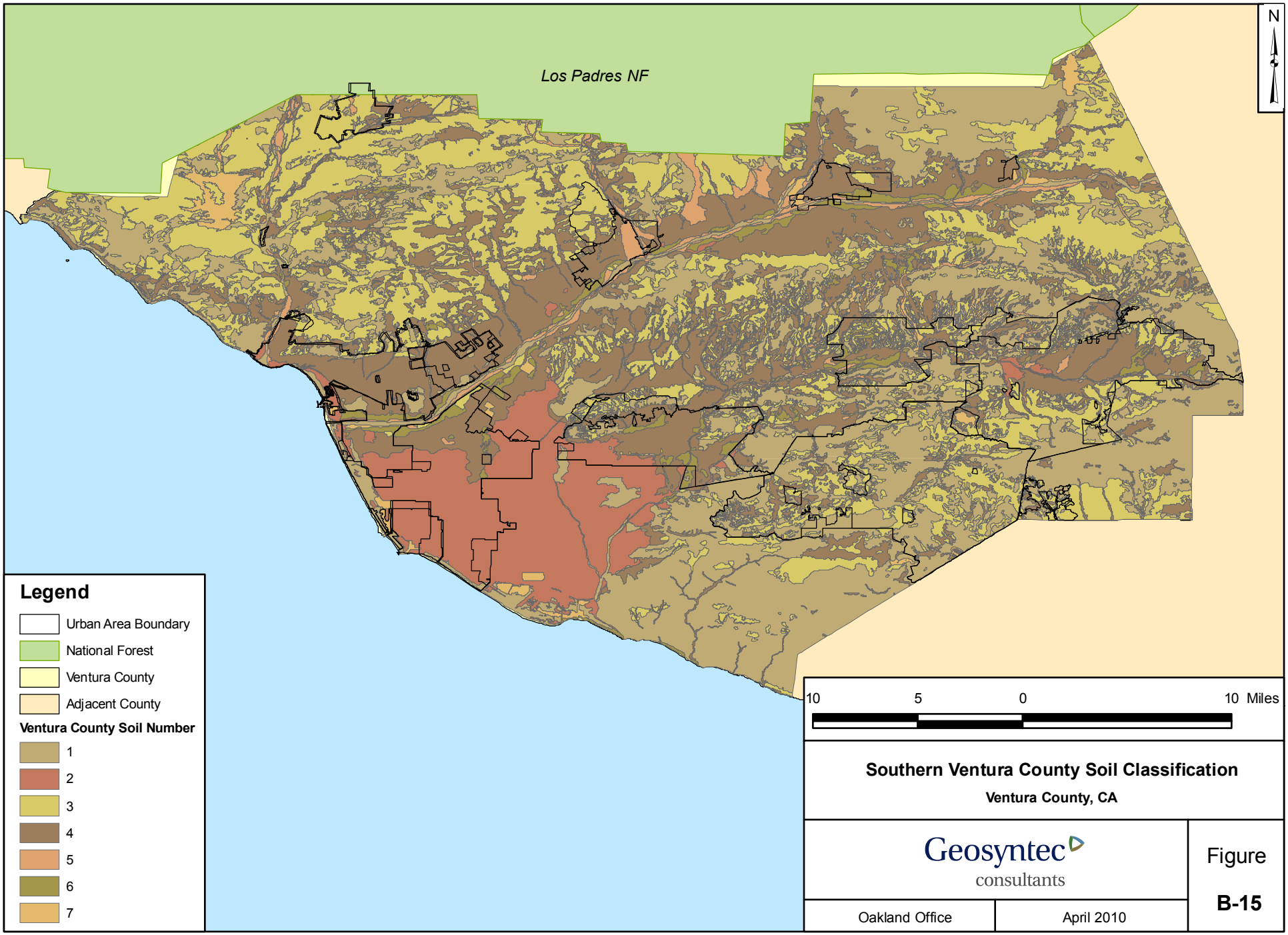

Southern Ventura County Soil Classification

Ventura County, CA

Geosyntec consultants

Oakland Office | April 2010

Figure **B-15**

P:\GIS\Ventura_County_Manual\Projects\B-15_Ventura_Soils_092310.mxd, WHL, September 23, 2010

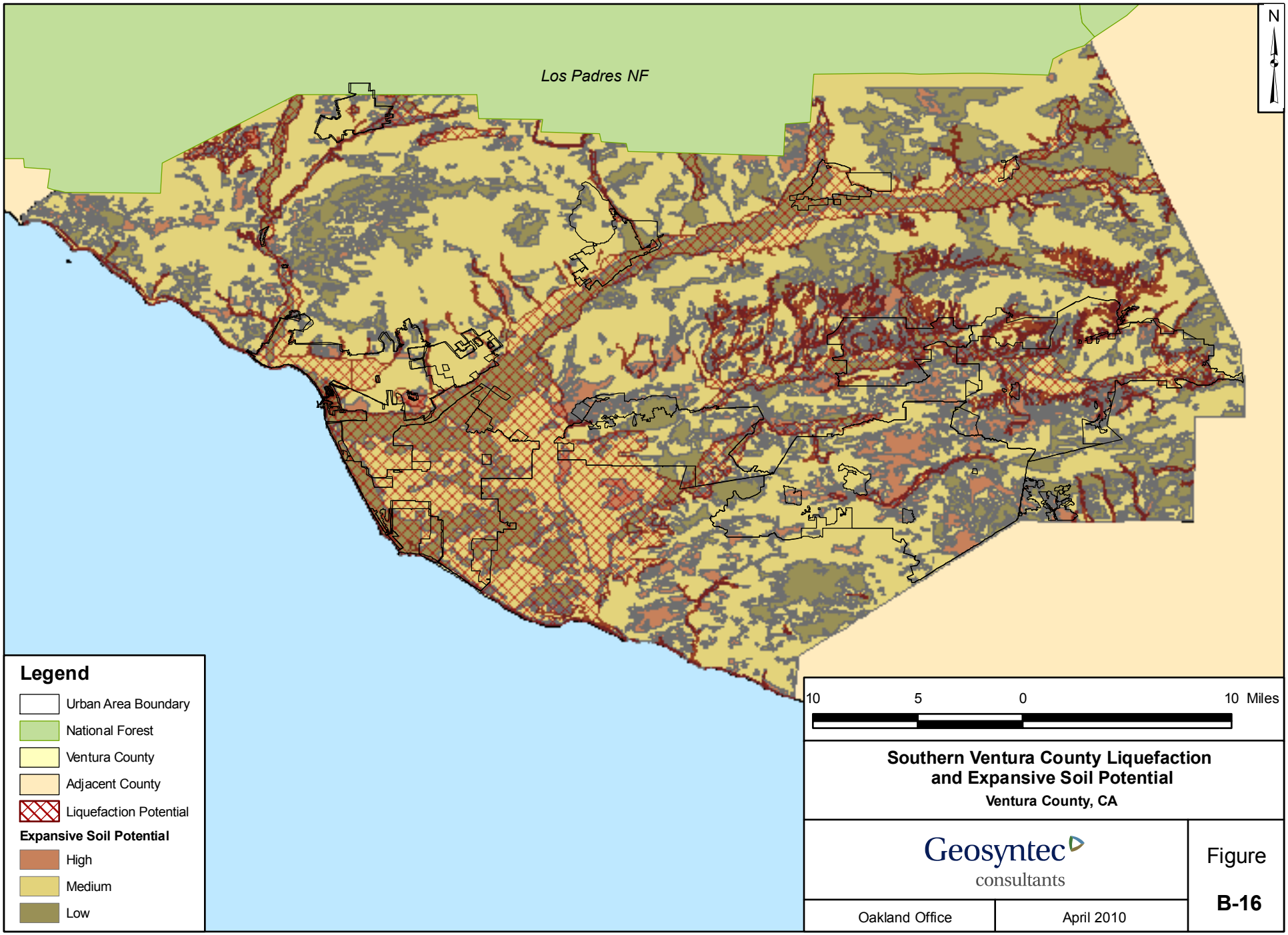

Southern Ventura County Liquefaction and Expansive Soil Potential

Ventura County, CA

Geosyntec consultants

Oakland Office | April 2010

Figure **B-16**

P:\GIS\Ventura_County_Manual\Projects\B-16_Liq_Expan_Soils_092310.mxd, WHL, September 23, 2010

APPENDIX C: SITE SOIL TYPE AND INFILTRATION TESTING

C.1 Introduction

The purpose of site soil and infiltration testing is to more accurately determine where LID and structural treatment BMPs should be located and if infiltration is feasible on the site. The preliminary site assessment, discussed in Section 3, will likely reduce the number of test pit investigations needed by identifying candidate test sites that are most amenable to infiltration. This section summarizes the methods for conducting (1) soil test pit investigations and (2) infiltration testing at key locations identified in the preliminary site assessment that require further investigation.

A qualified soil scientist or geotechnical professional should conduct the test pit investigation and infiltration tests. The professional should be experienced with the testing procedures as well as the hydraulic functioning of the potential BMPs to ensure that additional information regarding BMP siting is acquired during the test pit investigation and infiltration tests.

This appendix is not intended to be applied as a protocol for conducting soil and infiltration testing. Instead, this section is provided to assist in specifying and standardizing soil and infiltration testing techniques across sites within Ventura County where development is occurring.

C.2 Test Pit Investigations

A test pit investigation is an integral part of assessing site soil conditions. Soil maps and hydrologic soil groups are based on regional data and provide only a general understanding of what to expect; however, there are undoubtedly unknowns that will be discovered during these initial field observations. A test pit investigation involves digging or excavating a test pit (deep hole). By excavating a test pit, overall soil conditions (both vertically and horizontally) can be observed in addition to the soil horizons. To maximize the knowledge gained during the test pit investigation, many tests and observations should be conducted during this process.

Test pits should be excavated to a depth at least three feet deeper than the proposed bottom of non-infiltration BMPs and at least eleven feet deeper than the proposed bottom of infiltration BMPs. A project that imports fill must characterize the proposed soil profile at the specified depths. For example, if the proposed depth of fill is 5 feet below grade and an infiltration BMP is to be used in the location of the fill, both the fill and the native subsoil require soil characterization. Figure C-1 illustrates the proposed soil profile that would result with 3 feet of fill. Since the test pit must be excavated to a depth that is 11 feet deeper than the bottom of the proposed infiltration BMP, a test pit investigation of the top 8 feet of native subsoil is required, in addition to the laboratory sample of the fill material. Characterization of the fill material should be conducted in a laboratory. It is recommended that soil compaction is limited in the location of a proposed infiltration BMP.

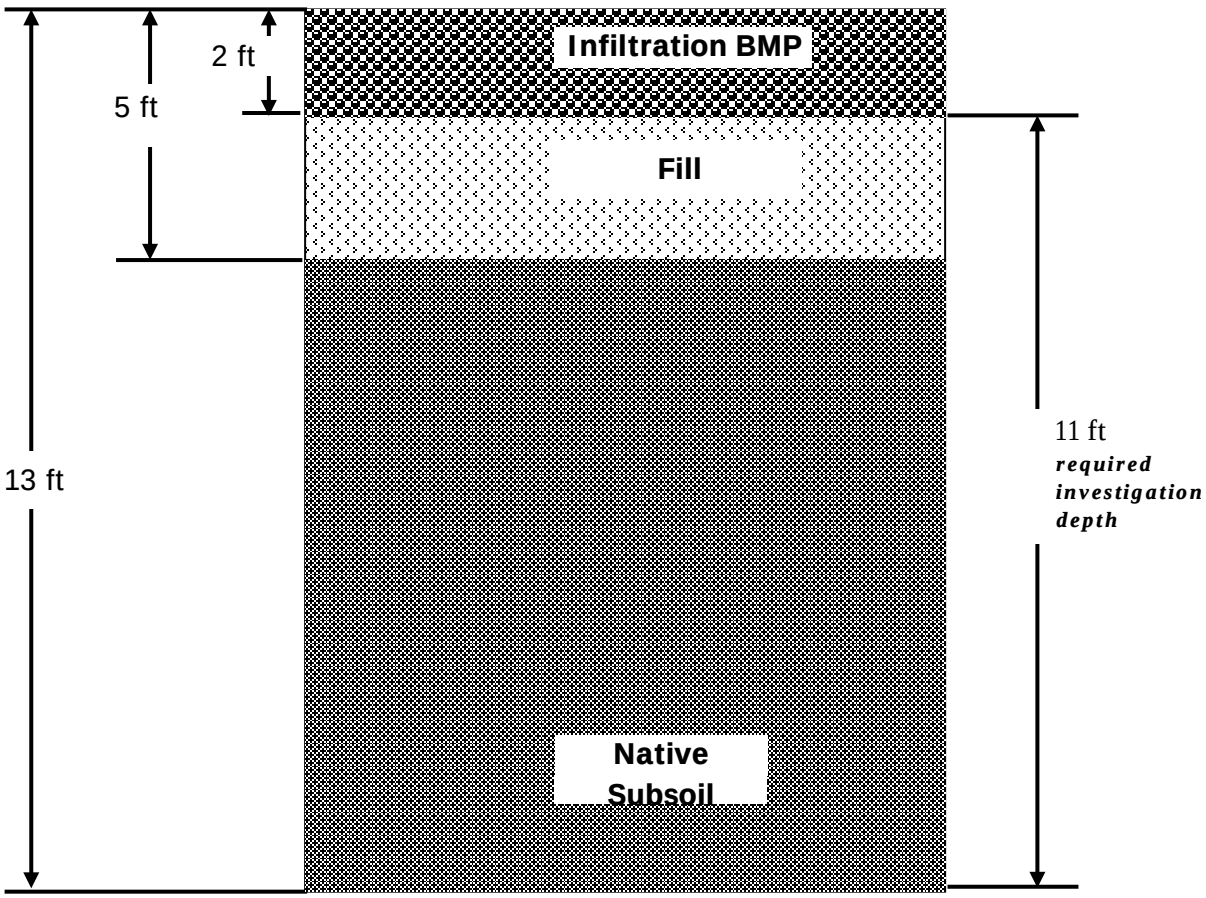

Figure C-1: Post-fill Soil Profile

As the test pit is excavated, the following measurements should be made:

Standard penetration testing to determined the relative density as it changes with depth (minimum intervals of 2 - 3 feet), and

Infiltration testing with at least one test occurring at the proposed bottom of the BMP and one test occurring of the bottom of the test pit (11 feet below the bottom of the infiltration BMP).

In addition, many observations should be made during and after the excavation of the soil pit, including:

- Elevation of groundwater table or indications of seasonally high groundwater table should be noted using the NRCS hydric soil field indicators guide (NRCS, 2003).
- Soil horizon observations, including: depths indicating upper and lower boundaries of the soil horizons, depths to limiting layers (i.e., bedrock and clay), soil textures, colors and their patterns, and estimates of the type and percent of coarse fragments.

- Locations and descriptions of macropores (i.e., pores and roots).
- Other pertinent information/observations.

The number of test pits required depends largely on the specific site and the proposed development plan. Additional tests should be conducted if local conditions indicate significant variability in soil types, geology, water table elevations, bedrock, topography, etc. Similarly, uniform site conditions may indicate that fewer test pits are required. Excessive testing and disturbance of the soil prior to construction is not recommended. When test pit investigations are complete, including infiltration testing, the pits should be refilled with the original soil and the surface replaced with the original topsoil.

C.3 Infiltration Testing

There are a variety of infiltration field test methodologies available to determine the infiltration rate of a soil. Infiltration tests should be conducted in the field in order to ensure that the measurements are representative of actual site conditions (including inherent heterogeneity). As mentioned above, usually infiltration rates should be determined at a minimum of two locations in each test pit and one must be conducted at the proposed bottom depth of the BMP. The actual number of infiltration tests required depends on the soil conditions; if the soils are highly variable, more tests may be required. To ensure groundwater is protected and that the infiltration BMP is not rendered ineffective by overload, it is important to periodically verify infiltration rates of the constructed BMP(s).

For BMPs that infiltrate water through the surface soil layer (e.g., bioretention areas, permeable pavement), choosing a method that measures infiltration in surface soils is important. For infiltration trenches and drywells, infiltration will occur at a greater depth in the soil matrix; therefore, borehole methods may be more appropriate.

Depending on the type of infiltration BMP and depth at which the infiltration test should be conducted, there are several types of infiltration tests that can be used including: disc permeameters, single and double ring infiltrometers, and borehole permeameters. Disc permeameters are typically used to provide estimates of soil near saturation but can prove to be difficult due to measures of three dimensional flow. This device is also commonly used for assessing infiltration rates of already constructed permeable pavements and is generally not used for assessing infiltration rates prior to site disturbance; therefore, the disc permeameter method will not be discussed further in this Appendix. Single and double ring infiltrometers directly measure vertical flow into the surface of the soil. Double ring infiltrometers account for lateral flow boundary affects with the addition of an outer water reservoir and are generally the preferred method for surface infiltration. Borehole permeameters are best suited to collect infiltration measurements below the soil surface. Two subsurface infiltration methods are discussed below including the Guelph and falling-head permeameters.

C.4 Double Ring Infiltrometer

The double ring infiltrometer method consists of driving two cylinders, one inside the other, into the ground and partially filling them with water and maintaining the liquid at a constant level (ASTM D3385-94). The volume of water added to the inner ring from a separate water reservoir, to maintain the constant head level is comparable to the volume of water infiltrating into the soil. The volume of water added to the inner ring divided by the time period for which the water was added is equal to the infiltration rate. A photograph of a common double ring infiltrometer is provided in Figure C-2.

Figure C-2: Double Ring Infiltrometer

Photo Credit: Geosyntec Consultants (Braga and Fitsik, 2008)

C.5 Borehole Guelph Infiltration Test

For shallow boreholes, the Guelph Permeameter has been developed as a field portable kit. This permeameter consists of a tube that is placed in a hand-drilled shallow borehole and water is provided to the tube through a separate reservoir. Water loss in the reservoir is used to estimate the hydraulic conductivity of the soil, which may be used to calculate infiltration based on various standard models (Soil Moisture Equipment, 2005). A photograph of a Guelph Permeameter is provided in Figure C-3. It is important to remember that this method will include vertical and lateral water flow from the borehole.

Figure C-3: Guelph Permeameter for Shallow Borehole Permeability

Photo Credit: USDA, 2005

C.6 Falling-Head Borehole Infiltration Test

The falling-head borehole infiltration test is commonly applied to assess infiltration at greater depths (e.g. 5 - 25 ft). The method is generally performed according to United States Bureau of Reclamation procedure 7300-89 (USBR, 1990). Caltrans has used the method to site stormwater infiltration structures (Caltrans, 2003). Essentially the method consists of boreholes, installing well casing with slots cut to release water at the target depths, backfilling the borehole, adding pre-soak water, and then filling again with water and recording the stage loss. An example diagram is shown in Figure C-4.

The testing procedures are summarized as follows:

1) Remove any smeared soil surfaces to provide a natural soil interface for testing the percolation of water. Remove all loose material. The U.S. EPA recommends scratching the sides with a sharp pointed instrument. (Note: upon tester's discretion, a 2-inch layer of coarse sand or fine gravel may be placed to protect the bottom from scouring and sediment.) Fill casing with clean water and allow to pre-soak for 24 hours or until the water has completely infiltrated.

2) Refill casing and monitor water level (distance from top of casing to top of water) for 1 hour. Repeat this procedure a total of four times. (Note: upon tester's discretion, the final field rate may either be the average of the four observations

or the value of the last observation. The final rate shall be reported in inches per hour.)

3) Testing may be done through a boring or open excavation.

4) The location of the test must be near the proposed facility.

5) Upon completion of the testing, the casings shall be immediately pulled and the test pit shall be back-filled.

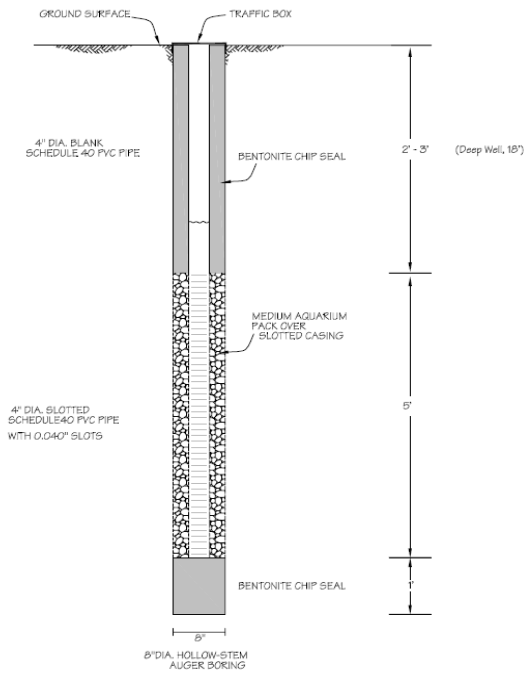

Figure C-4: Falling-Head Permeameter for Deep Borehole Permeability

Diagram Credit: Group Delta Consultants, 2008

C.7 Laboratory Soil Tests

If fill materials imported from off-site are part of an infiltration BMP design, a laboratory test is required to determine the infiltration rate of the fill soil. A sample of the fill soil from each area where a BMP will be located must be tested. The soil sample must be compacted to the same degree that will be present after final grading. Once prepared, the sample should be sent to a specialty laboratory to conduct a test of the infiltration rate. These results may then be used to assess the applicability of a specific BMP.

C.8 Assessment of Test Results

The results from field infiltration methods should be examined to consider data variability and sample distribution to determine if there has been adequate sampling. If the spatial variability (heterogeneity) is large, then additional field measurements may be necessary. The infiltration results should be compared to the information gathered on site soils and geology to see if they are consistent. The results of the site soils and infiltration testing may then be used in the siting, selection, sizing, and design of LID site design techniques and structural treatment BMPs.

C.9 References

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APPENDIX D : BMP PERFORMANCE GUIDANCE

D.1 Permit Requirement

Part 3, Section A.3 of Order R4-2010-0108 states the following:

3. *Each Permittee shall require that treatment control BMPs being implemented under the provisions of this Order shall be designed, at a minimum, to achieve the BMP performance criteria for storm water pollutants likely to be discharged as identified in Attachment "C", for an 85th percentile 24-hour runoff event determined as the maximized capture storm water volume for the area using a 48 to 72-hour draw down time, from the formula recommended in Urban Runoff Quality Management, WEF Manual of Practice No. 23/ASCE Manual of Practice No. 87, (1998). Expected BMP pollutant removal performance for effluent quality was developed from the WERF-ASCE/ U.S. EPA International BMP Database. Permittees shall select Treatment BMPs based on the primary class of pollutants likely to be discharged from the site/facility (e.g. metals from an auto repair shop). Permittees may develop guidance for appropriate Treatment BMPs for project type based on Attachment "C". For the treatment of pollutants causing impairments within the drainage of the impaired waterbody, permittees shall select BMPs from the top three performing BMP categories or alternative BMPs that are designed to meet or exceed the performance of the highest performing BMP for the pollutant causing impairment.*

Attachment C contains the following table:

Effluent Concentrations as Median Values

BMP Category	Total Suspended Solids (mg/L)	Total Nitrate-Nitrogen (mg/L)	Total Copper (µg/L)	Total Lead (µg/L)	Total Zinc (µg/L)
Detention Pond	27	0.48	15.9	14.6	58.7
Wet Pond	10	0.2	5.8	3.4	21.6
Wetland Basin	13	0.13	3.3	2.5	29.2
Biofilter	18	0.36	9.6	5.4	27.9
Media Filter	11	0.66	7.6	2.6	32.2
Hydrodynamic Device	23	0.29	11.8	5	75.1

Expected BMP pollutant performance for effluent quality was developed from the WERF-ASCE/U.S. EPA International BMP Database, 2007

D.2 Using Performance Statistics for BMP Selection

The observed performance of stormwater BMPs provides valuable quantitative information that can be used to infer the potential water quality benefits of stormwater BMP implementation. However, water quality data sets and the statistical methods used to summarize them inherently contain a high level of uncertainty. Consideration of this uncertainty is fundamental to the proper and responsible use of statistics. Some of the key issues that should be considered when

drawing conclusions from data contained in the ASCE International BMP Database for the purposes of developing BMP selection guidance are discussed below.

Number of Representative BMPs

Some BMP types are not well represented in the ASCE International BMP Database due to small data sets. For example, the "Wetland Basin" category only included nine studies nationwide as compared to over 50 for biofilters at the time the data analysis was conducted for the MS4 permit (2007). For some pollutants, such as total copper, data are only available for four Wetland Basin studies. While the BMP Database continues to grow, there are currently less than 300 BMP studies included, with only approximately 50 in California. The size of the data set provides an indicator of the reliability of that data in representing the "typical" effluent concentration for that BMP type.

BMP Categorization

The BMP studies within the BMP database represent a wide spectrum of BMP types with a variety of designs and sizing criteria. While some guidance is provided on how to categorize BMPs, data providers are responsible for categorizing their own BMPs. Some of these BMPs could be poorly categorized due to a variety of reasons, such as differences in terminology, missing or inadequately sized treatment components (e.g., forebays, vegetation, or permanent pools) or variable treatment function (e.g., a seasonal wet pond). Ideally, the BMPs should be grouped according to common design components and/or sizing criteria, but there currently aren't enough data with design information to support such analyses. However, the BMP Database is currently undergoing a restructuring that is redefining or sub-categorizing the current BMP categories within the database.

Statistical Significant Difference between BMP Influent/Effluent

Some of the median effluent values reported in the BMP Database are not statistically different than the median influent values (i.e., no concentration reductions on average). No significant difference may indicate either low influent concentrations or poor performing BMPs for that pollutant. In either case, the effluent value alone would not be a reliable indicator of BMP performance. For example, as summarized in Geosyntec and Wright Water (2008), the data for Wetland Basins, a "top performing" BMP according to Attachment C of the MS4 permit, did not conclusively show statistically significant removals of TSS, nitrate-nitrogen, or total lead. Data for hydrodynamic separators and media filters indicate they are also ineffective at reducing nitrate-nitrogen concentrations.

Statistical Significant Differences in Effluent between BMP Types

The median effluent concentrations of the various BMP types are not necessarily statistically significantly different from each other. Statistical significance can be determined by analyzing whether the 95th percent confidence intervals overlap. The

number of data points and the variability of those data points determine the confidence interval of each median value. If the effluent medians are not statistically significantly different from each other, it may not be possible to determine the "top three" performing BMPs as specified in the MS4 Permit. Confidence intervals about the median effluent concentrations for each BMP type are provided in Geosyntec and Wright Water (2008) (see attached).

D.3 Comparison of the Performance of Biofiltration BMPs and Retention BMPs

Background

Projects that demonstrate technical infeasibility for reducing EIA to ≤5% using Retention BMPs are eligible to use Biofiltration BMPs to achieve the EIA performance standard. Section 4.E.III.1.(b) of Order R4-2010-0108 states:

> *If on-site retention is determined to be technically infeasible pursuant to 4.E.III.2(b), an on-site biofiltration system that achieves equivalent stormwater volume and pollutant load reduction as would have been achieved by on-site retention shall satisfy the EIA limitation.*

Volume-based biofiltration BMPs shall be sized to treat 1.5 times the volume not retained using Retention BMPs. The remaining EIA requirement may also be satisfied with flow-based Biofiltration BMPs. Flow-based Biofiltration BMPs shall be sized for the remaining drainage area from which runoff must be retained (A_{Retain}) with a rainfall intensity that varies with time of concentration for the catchment tributary to the flow-based Biofiltration BMP, according to the following. Using this flow-based sizing method will achieve or exceed capture and treatment of 80% of the average annual runoff volume.

Time of Concentration, minutes	Design Intensity for 150% Sizing, in/hr
30	0.24
20	0.25
15	0.28
10	0.31
5	0.35

Methodology

A planning-level analysis was conducted to assess whether the range of Biofiltration BMPs included in the 2010 TGM, sized per these volume- or flow-based sizing criteria, would achieve equivalent pollutant load reduction to Retention BMPs. The following describes the step-wise method taken for the analysis.

Step 1: Estimate the Catchment Annual Load

Assumptions:

- Average Annual Rainfall- 14.5 inches (Oxnard Gauge) (precipitation, P)
- One acre Catchment (area, A)

Calculations:

1) Determine developed runoff coefficients for single-family, multi-family, commercial, and industrial land use types

    - Use average imperviousness values from Ventura Hydrology Manual (Exhibit 14B)
    - Assume soil group 2/3 (Group C soils) for pervious runoff coefficient (Cp, conservative value = 0.1)
    - Use developed runoff coefficient (C_d) equation from hydrology manual:

$$C_d = 0.95*(\text{imperviousness}) + (Cp)*(1\text{-imperviousness})$$

2) Calculate Average Annual Runoff Volume (cu-ft) using:

$$V_{avg\ annual} = C_d*(P/12)*A*43560$$

3) Multiply average annual runoff volume by respective event mean concentrations (EMCs) for pollutants of concern to get average annual loads.

    - Look at "EMC Arithmetic Means" to see EMCs by land use type.
    - EMCs calculated based on LA County Land Use specific data (LACDPW, 2000). Descriptive statistics estimated using the parametric bootstrap method suggested by Singh, Singh, and Engelhardt (1997).
    - Pollutants of concern: Total Suspended Solids (TSS), Total Copper, Total Zinc, and Total Nitrogen. TSS is representative of the sediment pollutant class as well as pollutants that are associated with particulates (e.g., total phosphorous, some metals, pesticides, some organics). Copper and zinc represent metals – lead has been removed from the environment using True Source Control (removal of lead from gasoline) and thus is not an important POC for Biofiltration BMP selection and design. Total nitrogen is representative in that it includes all of the species of nitrogen (organic nitrogen, ammonia, nitrate, and nitrite) and instead of focusing on one species (nitrate).

Step 2: Estimate Retention BMP Load Reduction

1) Determine Retention BMP Design volume:

- Design storm = 0.75”
- Use land use-based coefficients
- $V_{design} = C_d*(0.75/12)*A*43560$

2) Determine Retention BMP capture volume using CASQA 48-hour Drawdown Figure for Oxnard Gauge (CASQA, 2003)
   - Calculate Unit Basin Storage Volume using:
     - Unit Basin Storage Vol = V_{design} / A
   - Using developed runoff coefficients, interpolate between runoff coefficient lines to determine the percentage of total runoff captured by Retention BMP.
3) Determine Annual Load Reduction
   - The percentage of the annual load that is reduced is the same as the percentage of runoff captured by the Retention BMP, assuming that all captured runoff is retained. The percent capture calculated in (2) can be multiplied by the catchment annual pollutant load to obtain the load reduction.

Step 3: Estimate Biofiltration BMP Load Reduction

1) Determine BMP Design volume as described in 2.a above, except:
   - Design storm = 1.5*0.75 = 1.125 inches
2) Determine BMP capture volume using CASQA 24-hour Drawdown Figure for Oxnard Gauge (CASQA, 2003) as described in 2.b. above
3) Determine annual load reduction. Load reduction in Biofiltration BMPs can occur via two pathways: incidental infiltration and treatment.
   - Incidental infiltration in Biofiltration BMPs was discussed in a publication by Strecker, Quigley, Urbonas, and Jones (Strecker et al, 2004). That study observed as much as 40% volume reduction through incidental infiltration. A recent summary of the studies in the ASCE BMP Database found the following average volume reductions: filter strips, 38%; vegetated swales, 48%; and bioretention with underdrain, 61% (Geosyntec, 2011; attached to this appendix).
   - Pollutant Load reduction via incidental infiltration can be calculated as follows (20% is the percent of the captured volume assumed to be reduced via incidental infiltration for this discussion):

Load reduced = Average annual Load * Percent Runoff Captured by BMP * 20%

- Load reduction through treatment calculated based on published literature on pollutant removals from biofiltration facilities.

- Load reduction through treatment is calculated as follows:

Load reduced = Average annual Load * Percent Runoff Captured by BMP *80% * Assumed Average Percent Removal

Note: 80% = 100%-20%, i.e. the captured runoff that was not infiltrated via incidental infiltration

Constituent	Range of Reported Removal Efficiencies from Literature[1]	Selected Removal Efficiency for Effectiveness Evaluation[2]	Selected Removal Efficiency for Enhanced Nitrogen Removal[3]
TSS	54-89	79	79
Total Zinc	48-96	77	77
Total Copper	33-92	72	72
Total Nitrogen	21-54	25	50

[1] Range of values from literature cited below:

1. Hererra Consultants and Geosyntec Consultants, 2010. Filterra® Bioretention Systems: Technical Basis for High Flow Rate Treatment and Evaluation of Stormwater Quality Performance. September 2010.
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6. Geosyntec Consultants and Wright Water Engineers, Inc., 2008. Overview of Performance by BMP Category and Common Pollutant Type, International Stormwater BMP Database Update. June 2008
7. Geosyntec Consultants and Wright Water Engineers, Inc., 2010. Categorical Summary of BMP Performance for Nutrient Concentration Data Contained in the International Stormwater BMP Database. December, 2010

[2] Removal efficiency for TSS, Total Zinc, and Total Copper represent average of values from literature. Removal efficiency for TN is that expected from a 'standard biofilter', that is, one not designed for enhanced nitrogen removal

[3] Removal efficiency for TN represented as average value of removals from bioretention systems with an anaerobic zone for enhanced removal of nitrogen

- The total load reduction is calculated as the sum of the reductions from these two pathways. The percent load reduction is calculated by dividing the total load reduction by the annual pollutant load from the catchment

Step 4: Comparison of Annual Load Reductions

1) Load reductions are compared by subtracting the load reduction calculated for Biofiltration BMPs from the load reduction calculated for Retention BMPs to determine the 'deficit' load reduction.

Results

Step 1: Estimate the Catchment Annual Load

1) Determine developed runoff coefficients for single-family, multi-family, commercial, and industrial land use types

Land Use	Imperviousness	Runoff Coefficient (C)
Single Family Residential	0.3	0.36
Multi Family Residential	0.69	0.69
Commercial	0.85	0.82
Industrial	0.93	0.89

2) Calculate Average Annual Runoff Volume (cu-ft), and

3) Multiply average annual runoff volume by respective event mean concentrations (EMCs) for pollutants of concern to get average annual loads.

Land Use	Arithmetic Means from Lognormal EMC Statistics			
	TSS (mg/L)	Total Zinc (mg/L)	Total Copper (mg/L)	Total Nitrogen (mg/L as N)
Single Family Residential	124.2	71.9	18.7	3.74
Multi Family Residential	39.9	125.1	12.1	3.31
Commercial	67	237.1	31.4	3.99
Industrial	219.2	537.4	34.5	3.74

Land Use	Average Annual Runoff Volume (cu-ft)	Catchment Pollutant Loads (kg/yr)			
		TSS	Total Zinc	Total Copper	Total Nitrogen
Single Family Residential	18,685	65,716	38	10	1,979
Multi Family Residential	36,134	40,826	128	12	3,387
Commercial	43,292	82,135	291	38	4,891
Industrial	46,871	290,933	713	46	4,964

Step 2: Estimate Retention BMP Load Reduction

1) Determine Retention BMP Design volume

Land Use	Design Volume (cu-ft)
Single Family Residential	967
Multi Family Residential	1869
Commercial	2239
Industrial	2424

2) Determine Retention BMP capture volume using CASQA 48-hour Drawdown Figure for Oxnard Gauge (CASQA, 2003)

Land Use	Design Volume (cu-ft)	Unit Basin Storage Volume (inches)	Approx % Capture
Single Family Residential	966	0.27	60.0%
Multi Family Residential	1,869	0.51	62.5%
Commercial	2,239	0.62	62.5%
Industrial	2,424	0.67	60.0%

3) Determine Annual Load Reduction

	Average Annual Pollutant Load Reduction (kg/yr) = Influent * Approx % Cap			
Land Use	TSS	Total Zinc	Total Copper	Total Nitrogen
Single Family Residential	39,429	23	5.9	1,187
Multi Family Residential	25,516	80	7.7	2,117
Commercial	51,335	182	24.1	3,057
Industrial	174,560	428	27.5	2,978

	Percent of Total Annual Loads			
Land Use	TSS	Total Zinc	Total Copper	Total Nitrogen
Single Family Residential	60.0%	60.0%	60.0%	60.0%
Multi Family Residential	62.5%	62.5%	62.5%	62.5%
Commercial	62.5%	62.5%	62.5%	62.5%
Industrial	60.0%	60.0%	60.0%	60.0%

Step 3: Estimate Biofiltration BMP Load Reduction

1) Determine Biofiltration BMP Design volume

Land Use	Design Volume (cu-ft)
Single Family Residential	1,450
Multi Family Residential	2,803
Commercial	3,359
Industrial	3,637

2) Determine BMP capture volume using CASQA 24-hour Drawdown Figure for Oxnard Gauge (CASQA, 2003)

Land Use	Design Volume (cu-ft)	Unit Basin Storage Volume (inches)	Approx % Capture
Single Family Residential	1,450	0.40	87.50%
Multi Family Residential	2,803	0.77	87.50%
Commercial	3,359	0.93	90.00%
Industrial	3,637	1.00	87.50%

3) Determine annual load reduction. Load reduction in Biofiltration BMPs can occur via two pathways: incidental infiltration and treatment.

Incidental Infiltration Scenario #1: 20% Volume Reduction

Land Use	Pollutant Load Reduction from 20% Incidental Infiltration (kg/yr)			
	TSS	Total Zinc	Total Copper	Total Nitrogen
Single Family Residential	11,500	7	2	346
Multi Family Residential	7,144	22	2	593
Commercial	14,784	52	7	880
Industrial	50,913	125	8	869

Land Use	Pollutant Load Reduction from Standard Treatment (kg/yr)				Enhanced Nitrogen Load Reduction (kg/yr)[1]
	TSS	Total Zinc	Total Copper	Total Nitrogen	Total Nitrogen
Single Family Residential	36,341	21	5	346	693
Multi Family Residential	22,577	69	6	593	1,185
Commercial	46,719	161	20	880	1,761
Industrial	160,886	384	23	869	1,737

[1] Anticipated removal if an anaerobic zone is provided for Enhanced Nitrogen removal.

Land Use	Total Pollutant Load Reduction from Standard Treatment + Incidental Infiltration (20%) (kg/yr)				Enhanced Nitrogen Load Reduction + Incidental Infiltration (20%) (kg/yr)
	TSS	Total Zinc	Total Copper	Total Nitrogen	Total Nitrogen
Single Family Residential	47,841	27	6.7	693	1,039
Multi Family Residential	29,721	91	8.4	1,185	1,778
Commercial	61,503	213	26.8	1,761	2,641
Industrial	211,799	509	31.0	1,737	2,606

Land Use	Percent of Total Annual Loads from Standard Treatment + Incidental Infiltration (20%)				Enhanced Nitrogen % Load Reduction + Incidental Infiltration (20%)
	TSS	Total Zinc	Total Copper	Total Nitrogen	Total Nitrogen
Single Family Residential	72.8%	71.4%	67.7%	35.0%	52.5%
Multi Family Residential	72.8%	71.4%	67.7%	35.0%	52.5%
Commercial	74.9%	73.4%	69.6%	36.0%	54.0%
Industrial	72.8%	71.4%	67.7%	35.0%	52.5%

Step 4: Comparison of Annual Load Reductions

Load reductions are compared by subtracting the load reduction calculated for Biofiltration BMPs from the load reduction calculated for Retention BMPs to determine the 'deficit' load reduction.

Land Use	Biofiltration Pollutant Load Reduction Deficit - Standard Treatment + Incidental Infiltration (20%) (kg/yr)				Enhanced Nitrogen + Incidental Infiltration (20%) Pollutant Load Reduction Deficit (kg/yr)
	TSS	Total Zinc	Total Copper	Total Nitrogen	Total Nitrogen
Single Family Residential	-8,412	-4	-0.8	495	148
Multi Family Residential	-4,205	-11	-0.6	931	339
Commercial	-10,168	-32	-2.7	1,296	416
Industrial	-37,239	-81	-3.5	1,241	372

Note: a negative deficit means Biofiltration has a higher pollutant load reduction than Retention.

Land Use	Biofiltration Pollutant Load Reduction Deficit - Standard Treatment + Incidental Infiltration (20%) (%)				Enhanced Nitrogen + Incidental Infiltration (20%) Pollutant Load Reduction Deficit (%)
	TSS	Total Zinc	Total Copper	Total Nitrogen	Total Nitrogen
Single Family Residential	-12.8%	-11.4%	-7.7%	25.0%	7.5%
Multi Family Residential	-10.3%	-8.9%	-5.2%	27.5%	10.0%
Commercial	-12.4%	-10.9%	-7.1%	26.5%	8.5%
Industrial	-12.8%	-11.4%	-7.7%	25.0%	7.5%

Conclusion: Biofiltration BMPs sized for 1.5 times the SQDV, with an average incidental infiltration of 20% of the average annual runoff volume, which is a conservative estimate of incidental infiltration for all types of Biofiltration Treatment Measures, provide equivalent pollutant load reduction to Retention BMPs for TSS and metals.

Incidental Infiltration Scenario #2: 40% Volume Reduction

Land Use	Pollutant Load Reduction from 40% Incidental Infiltration (kg/yr)			
	TSS	Total Zinc	Total Copper	Total Nitrogen
Single Family Residential	23,000	13	3	693
Multi Family Residential	14,289	45	4	1,185
Commercial	29,569	105	14	1,761
Industrial	101,827	250	16	1,737

Land Use	Pollutant Load Reduction from Standard Treatment (kg/yr)				Enhanced Nitrogen Load Reduction (kg/yr)[1]
	TSS	Total Zinc	Total Copper	Total Nitrogen	Total Nitrogen
Single Family Residential	27,256	15	3.7	260	519
Multi Family Residential	16,932	52	4.7	445	889
Commercial	35,039	121	14.9	660	1,321
Industrial	120,665	288	17.2	652	1,303

[1] Anticipated removal if an anaerobic zone is provided for Enhanced Nitrogen removal.

Land Use	Total Pollutant Load Reduction from Standard Treatment + Incidental Infiltration (40%) (kg/yr)				Enhanced Nitrogen Load Reduction + Incidental Infiltration (40%) (kg/yr)
	TSS	Total Zinc	Total Copper	Total Nitrogen	Total Nitrogen
Single Family Residential	50,256	29	7.2	952	1,212
Multi Family Residential	31,221	97	9.0	1,630	2,074
Commercial	64,608	225	28.8	2,421	3,082
Industrial	222,491	538	33.3	2,389	3,040

Land Use	Percent of Total Annual Loads from Standard Treatment + Incidental Infiltration (40%)				Enhanced Nitrogen % Load Reduction + Incidental Infiltration (40%)
	TSS	Total Zinc	Total Copper	Total Nitrogen	Total Nitrogen
Single Family Residential	76.5%	75.4%	72.6%	48.1%	61.3%
Multi Family Residential	76.5%	75.4%	72.6%	48.1%	61.3%
Commercial	78.7%	77.6%	74.7%	49.5%	63.0%
Industrial	76.5%	75.4%	72.6%	48.1%	61.3%

Step 4: Comparison of Annual Load Reductions

Load reductions are compared by subtracting the load reduction calculated for Biofiltration BMPs from the load reduction calculated for Retention BMPs to determine the 'deficit' load reduction.

	Biofiltration Pollutant Load Reduction Deficit - Standard Treatment + Incidental Infiltration (40%) (kg/yr)				Enhanced Nitrogen + Incidental Infiltration (40%) Pollutant Load Reduction Deficit (kg/yr)
Land Use	TSS	Total Zinc	Total Copper	Total Nitrogen	Total Nitrogen
Single Family Residential	-10,827	-6	-1.2	235	-25
Multi Family Residential	-5,705	-17	-1.3	487	42
Commercial	-13,273	-44	-4.7	636	-24
Industrial	-47,931	-110	-5.8	589	-62

Note: a negative deficit means Biofiltration has a higher pollutant load reduction than Retention.

	Biofiltration Pollutant Load Reduction Deficit - Standard Treatment + Incidental Infiltration (40%) (%)				Enhanced Nitrogen + Incidental Infiltration (40%) Pollutant Load Reduction Deficit (%)
Land Use	TSS	Total Zinc	Total Copper	Total Nitrogen	Total Nitrogen
Single Family Residential	-16.5%	-15.4%	-12.6%	11.9%	-1.3%
Multi Family Residential	-14.0%	-12.9%	-10.1%	14.4%	1.2%
Commercial	-16.2%	-15.1%	-12.2%	13.0%	-0.5%
Industrial	-16.5%	-15.4%	-12.6%	11.9%	-1.3%

Conclusion: Biofiltration BMPs sized for 1.5 times the SQDV, with an average incidental infiltration of 40% of the average annual runoff volume, which is representative of vegetated swales and filter strips, provide equivalent pollutant load reduction to Retention BMPs for all of the pollutants of concern.

Incidental Infiltration Scenario #3: 60% Volume Reduction

Land Use	Pollutant Load Reduction from 60% Incidental Infiltration (kg/yr)			
	TSS	Total Zinc	Total Copper	Total Nitrogen
Single Family Residential	34,501	20	5	1,039
Multi Family Residential	21,433	67	6	1,778
Commercial	44,353	157	21	2,641
Industrial	152,740	374	24	2,606

Land Use	Pollutant Load Reduction from Standard Treatment (kg/yr)				Enhanced Nitrogen Load Reduction (kg/yr)[1]
	TSS	Total Zinc	Total Copper	Total Nitrogen	Total Nitrogen
Single Family Residential	18,170	10	2	173	346
Multi Family Residential	11,288	34	3	296	593
Commercial	23,359	81	10	440	880
Industrial	80,443	192	11	434	869

[1] Anticipated removal if an anaerobic zone is provided for Enhanced Nitrogen removal.

Land Use	Total Pollutant Load Reduction from Standard Treatment + Incidental Infiltration (60%) (kg/yr)				Enhanced Nitrogen Load Reduction + Incidental Infiltration (60%) (kg/yr)
	TSS	Total Zinc	Total Copper	Total Nitrogen	Total Nitrogen
Single Family Residential	52,671	30	7.7	1,212	1,385
Multi Family Residential	32,722	102	9.6	2,074	2,371
Commercial	67,712	238	30.7	3,082	3,522
Industrial	233,183	567	35.5	3,040	3,475

Land Use	Percent of Total Annual Loads from Standard Treatment + Incidental Infiltration (60%)				Enhanced Nitrogen % Load Reduction + Incidental Infiltration (60%)
	TSS	Total Zinc	Total Copper	Total Nitrogen	Total Nitrogen
Single Family Residential	80.2%	79.5%	77.6%	61.3%	70.0%
Multi Family Residential	80.2%	79.5%	77.6%	61.3%	70.0%
Commercial	82.4%	81.7%	79.8%	63.0%	72.0%
Industrial	80.2%	79.5%	77.6%	61.3%	70.0%

Step 4: Comparison of Annual Load Reductions

Load reductions are compared by subtracting the load reduction calculated for Biofiltration BMPs from the load reduction calculated for Retention BMPs to determine the 'deficit' load reduction.

Land Use	Biofiltration Pollutant Load Reduction Deficit - Standard Treatment + Incidental Infiltration (60%) (kg/yr)				Enhanced Nitrogen + Incidental Infiltration (60%) Pollutant Load Reduction Deficit (kg/yr)
	TSS	Total Zinc	Total Copper	Total Nitrogen	Total Nitrogen
Single Family Residential	-13,242	-7	-1.7	-25	-198
Multi Family Residential	-7,206	-22	-1.9	42	-254
Commercial	-16,378	-56	-6.7	-24	-465
Industrial	-58,623	-139	-8.1	-62	-496

Note: a negative deficit means Biofiltration has a higher pollutant load reduction than Retention.

Land Use	Biofiltration Pollutant Load Reduction Deficit - Standard Treatment + Incidental Infiltration (60%) (%)				Enhanced Nitrogen + Incidental Infiltration (60%) Pollutant Load Reduction Deficit (%)
	TSS	Total Zinc	Total Copper	Total Nitrogen	Total Nitrogen
Single Family Residential	-20.2%	-19.5%	-17.6%	-1.3%	-10.0%
Multi Family Residential	-17.7%	-17.0%	-15.1%	1.2%	-7.5%
Commercial	-19.9%	-19.2%	-17.3%	-0.5%	-9.5%
Industrial	-20.2%	-19.5%	-17.6%	-1.3%	-10.0%

Conclusion: Biofiltration BMPs sized for 1.5 times the SQDV, with an average incidental infiltration of 60% of the average annual runoff volume, which is representative of bioretention with an underdrain, is equivalent to or exceeds the pollutant load reduction of Retention BMPs for all of the pollutants of concern.

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APPENDIX E : BMP SIZING WORKSHEETS

E.1 Structural Treatment BMP Sizing Criteria

The BMP sizing criteria for determining the design volume or design flow for a proposed BMP are discussed in this appendix. These criteria must be used for all stormwater BMPs installed in new and re-development projects in Ventura County. This section outlines the rainfall analyses, Ventura County MS4 Permit sizing criteria, and recommended sizing methods for both volumetric and flow-based analysis.

Sizing Criteria

The type of rainfall analysis required depends on whether the BMP is a volume-based or flow-based BMP. This distinction between volume-based and flow-based controls is not always clear, especially in a sequence of BMPs or a treatment train. The following are general guidelines for each type of control.

- Volume-based BMPs are designed to treat a volume of runoff, which is detained for a certain period of time to allow for the settling of solids and associated pollutants. Volume-based BMPs included in this manual are bioretention, planter boxes, infiltration systems, and retention/detention BMPs.

- Flow-based BMPs treat water on a continuous flow basis. Flow-based BMPs included in this manual are vegetated swales, filter strips, filtration systems, and hydrodynamic devices.

The four volume-based and three flow-based BMP sizing criteria included in the Ventura County MS4 Permit (Order No. 09-0057) are included below.

The water quality design volume for volume-based BMPs must be determined using one of the following options:

1) The 85th percentile 24-hour runoff event determined as the maximized capture stormwater volume for the area using a 48 to 72-hour draw down time, from the formula recommended in Urban Runoff Quality Management, WEF Manual of Practice No. 23/ASCE Manual of Practice No. 87, (1998); or

2) The volume of annual runoff based on unit basin storage water quality volume to achieve 80 percent or more volume treatment; or

3) The volume of runoff produced from a 0.75 inch storm event; or

4) 80 percent of the average runoff volume using an appropriate public domain continuous flow model [such as Storm Water Management Model (SWMM) or Hydrologic Engineering Center – Hydrologic Simulation Program – Fortran (HEC-HSPF)], using the local rainfall record and relevant BMP sizing and design data.

Flow-based BMPs must be designed to capture and treat the water quality design flow rate generated from one of the following criterion:

1) The flow of runoff produced from a rain event equal to at least 0.2 inches per hour intensity; or

2) The flow of runoff produced from a rain event equal to at least 2 times the 85th percentile hourly rainfall intensity as determined from local rainfall records; or

3) Eight percent of the 50-year storm design flow rate as determined from the method provided below.

These sizing methods are explained below.

Methods for Determining the Water Quality Design Volume

Method 1: Urban Runoff Quality Management (URQM) Approach

The volume-based BMP sizing methodology described in Urban Runoff Quality Management (WEF Manual of Practice No. 23/ASCE Manual of Practice No. 87, (1998), pages 175-178) estimates the "maximized stormwater quality capture volume." The URQM approach is based on the translation of rainfall to runoff using two regression equations. The first regression equation, which relates rainfall to runoff, was developed using two years of data from more than 60 urban watersheds nationwide. The second regression equation relates mean annual runoff-producing rainfall depths to the "Maximized Water Quality Capture Volume" which corresponds to the "knee of the cumulative probability curve". This second regression was based on analysis of long-term rainfall data from seven rain gages representing climatic zones across the country. The Maximized Water Quality Capture Volume corresponds to approximately the 85th percentile runoff event, and ranges from 82 to 88%.

The two regression equations that form the URQM approach are as follows:

$$C = 0.858imp^3 - 0.78imp^2 + 0.774imp + 0.04 \qquad \text{(Equation E-1)}$$

$$P_o = (a \cdot C) \cdot P_6 \qquad \text{(Equation E-2)}$$

Where:

C	=	watershed runoff coefficient (unitless)
imp	=	watershed impervious ratio which is equal to the percent total imperviousness divided by 100 (ranges from 0 to 1)
P_o	=	maximized detention storage volume based on the volume capture ratio as its basis (watershed inches)

a	=	regression constant from least-squares analysis (unit less), a=1.582 and a=1.963 for 24 and 48 hour draw down, respectively
P_6	=	mean storm precipitation volume (watershed inches)

P_6 can be determined by two ways: Figure 5.3 in Urban Runoff Quality Management, or by performing analysis on local historical rainfall data. To determine the mean precipitation, EPA's Synoptic Rainfall Analysis Program – SYNOP – can be applied (see *Other Rainfall Analysis Methods* below).

The runoff coefficient equation in the URQM approach (Method 1) is not appropriate for the California BMP Handbook approach (Method 2), as Equation E-4 was developed in conjunction with the regression constants used in Method 1.

Method 2: Treatment of 80% or more of the Total Volume

Most water quality facilities are designed to treat only a portion of the runoff from a given site, as it is not economically feasible to capture 100% of the runoff. The percent of runoff treated by a basin is referred to as the "percent capture". There are a number of methods which allow calculation of the percent capture, including the California Stormwater Quality Association (CASQA) method (recommended by the 2002 Ventura County Manual), and using the EPA Stormwater Management Model (SWMM).

CASQA Method

The California Stormwater Quality Association (CASQA) BMP Handbook method estimates the basin volume to achieve various levels of volume capture (e.g., 80% for this sizing criterion). In the CASQA BMP Handbook New Development and Redevelopment (2003), a proprietary version of the Storage, Treatment, Overflow, Runoff Model (STORM) is used as the basis for the volume-based BMP sizing criteria. The model results are presented as the relationship between "unit basin storage volume" and "% volume capture" of the BMP", varying with drawdown time and runoff coefficient. Knowing the drawdown time, the runoff coefficient, and the desired percent capture will yield the "unit basin storage volume". The "unit basin storage volume" can then be used to size the BMP using the following equation (note that "unit basin storage volume" is given in inches, so units will have to be adjusted accordingly):

$$\text{BMP Volume} = \text{Unit Basin Storage Volume} \times \text{Tributary Area} \qquad \text{(Equation E-3)}$$

Results for several rain gauges are presented in Appendix D of the CASQA BMP Handbook New Development and Redevelopment (CASQA, 2003). Results are provided for a range of runoff coefficients and for 24 hour and 48 hour drawn down times. In order to use the curves provided in Appendix D, it is necessary to know the

runoff coefficient for the area tributary to the BMP, the drawn down time (a.k.a. drain time) of the facility, and the percent capture goal (e.g., 80%).

Drawdown time is the time required to drain a facility that has reached its design capacity; usually expressed in hours. Drain time is important as it is a surrogate for residence time, which affects the particle settling in the basin. Estimates for design drain time vary, and ideally would be determined based on site-specific information on the size, shape, and density or settling velocity of suspended particulates in the runoff. Because this information is generally not available for a specific site, estimates of appropriate ranges for settling time have generally relied on settling column test information reported in the literature.

An important source of drain time information is settling column tests conducted by Grizzard et. al. (1986) as part of the Nationwide Urban Runoff Program (NURP). Grizzard found that settling times of 48 hours resulted in removals of 80% to 90% of total suspended solids (TSS). Rapid initial removal was also observed in stormwater samples with medium (100 to 215 mg/L) and high (721 mg/L) initial TSS concentrations. For example, at settling times of 24 hours, the 80% to 90% removals were already achieved in samples with medium and high initial TSS, whereas only 50% to 60% removal was achieved in those with low initial TSS.

Given the data provided above, a drain time of 36 to 48 hours is recommended for sizing volume-based BMPs. This is also consistent with the recommendation of vector control agencies that structures be designed to drain in less than 72 hours to minimize mosquito breeding.

The rain gauge that is recommended for use for the area permitted by the Ventura county MS4 Permit (Order No. 09-0057) is the Oxnard Equipment Yard Gauge (168), which has a 40 year rainfall record. The graph included in the CASQA handbook can be seen in Figure E-1 below.

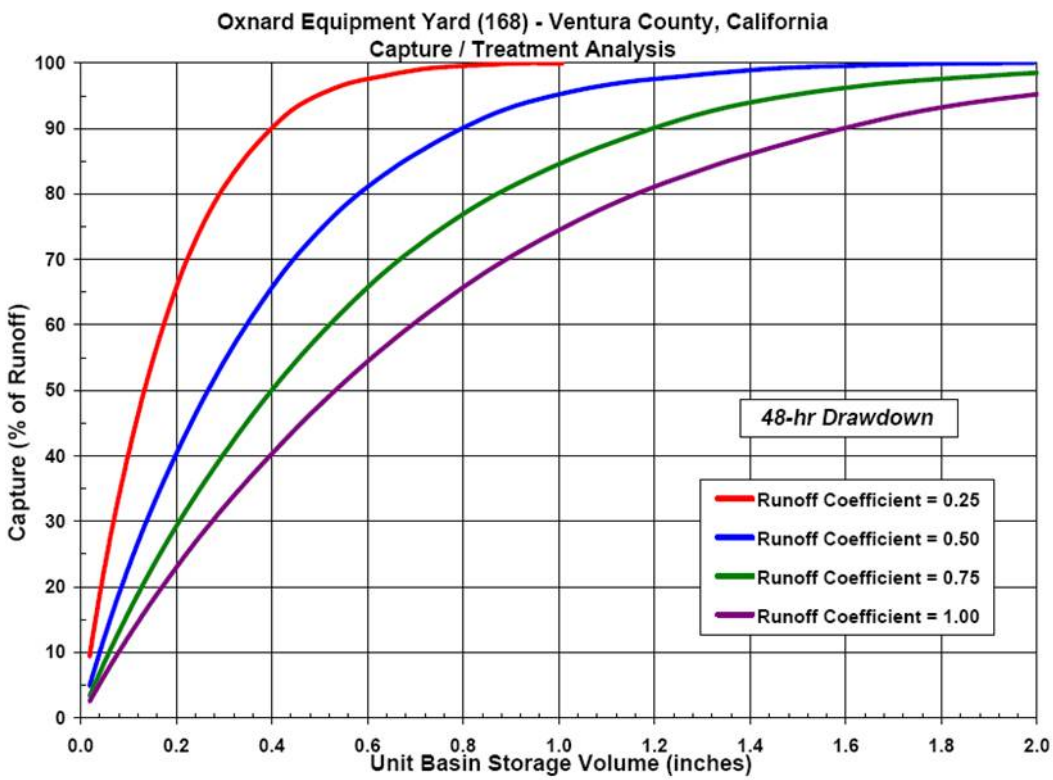

Figure E-1: CASQA 48-hour Drawdown Figure for Oxnard Gauge

This method has been modified for Ventura County. To use this method, follow the calculation procedure below. This refers to Figure E-3.

Ventura County Calculation Procedure

1) Review the area draining to the proposed treatment control measure. Determine the effective imperviousness (I_{WQ}) of the drainage area.

2) Estimate the total imperviousness (impervious percentage) of the site by the determining the weighted average of individual areas of like imperviousness.

3) Enter Figure E-2 along the horizontal axis with the value of total imperviousness calculated in Step 1. Move vertically up Figure E-2 until the appropriate curve (G-5.1 (filter strip) or G-5.2 (vegetated swale) employed individually or G-5.1 and G-5.2 employed together) is intercepted. Move horizontally across Figure E-2 until the vertical axis is intercepted. Read the Effective Imperviousness value along the vertical axis.

4) Note that if G-5.1 and/or G-5.2 are implemented on only a portion of the site, the site may be divided and effective imperviousness determined for the portion of the site for which site design controls have been implemented. The resulting effective imperviousness may be combined with total imperviousness of the

remainder of the site to determine a weighted average total imperviousness for the entire site.

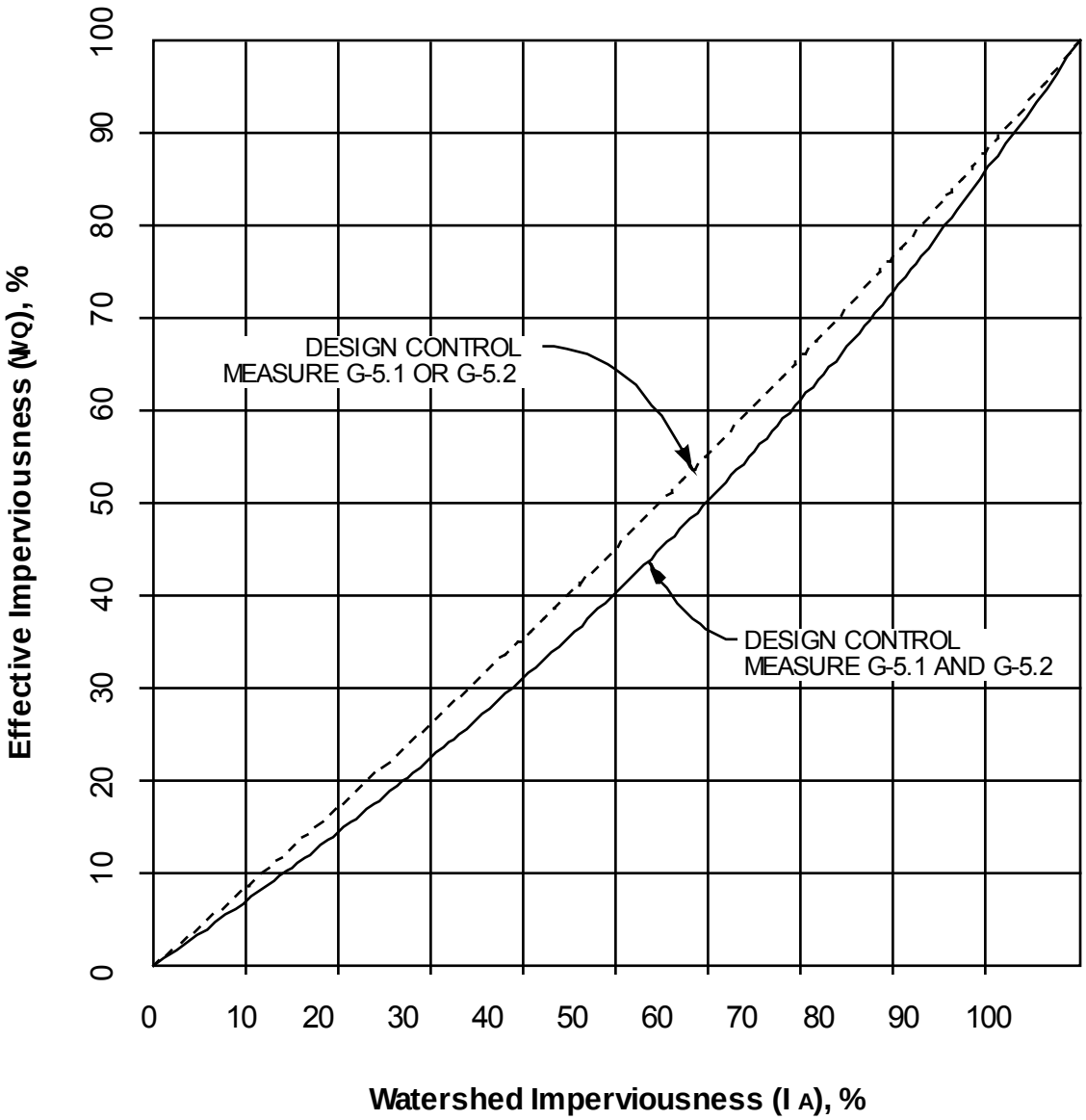

G-5.1: TURF BUFFER
G-5.2: GRASS-LINED CHANNEL

ADAPTED FROM URBAN STORM DRAIN CRITERIA MANUAL VOL. 3 - BEST MANAGEMENT PRACTICES, URBAN DRAINAGE AND FLOOD CONTROL DISTRICT, 11/99

Figure E-2: Effective Imperviousness based on Watershed Imperviousness

5) Figure E-3 provides a direct reading of Unit Basin Storage Volumes required for 80% annual capture of runoff for values of "I_{WQ}" determined in Step 1. Enter the horizontal axis of Figure E-3 with the "I_{WQ}" value from Step 1. Move vertically up

Figure E-3 until the appropriate drawdown period line is intercepted. (The design drawdown period specified in the respective Fact Sheet for the proposed treatment control measure.) Move horizontally across Figure E-3 from this point until the vertical axis is intercepted. Read the Unit Basin Storage Volume along the vertical axis.

6) Figure E-3 is based on Precipitation Gage 168, Oxnard Airport. This gage has a data record of approximately 40 years of hourly readings and is maintained by Ventura County Flood Control District. Figure E-3 is for use only in the permit area specified in Regional Board Order No. 00-108, NPDES Permit No. CAS004002.

7) The SQDV for the proposed treatment control measure is then calculated by multiplying the Unit Basin Storage Volume by the contributing drainage area. Due to the mixed units that result (e.g., acre-inches, acre-feet) it is recommended that the resulting volume be converted to cubic feet for use during design.

Example Stormwater Quality Design Volume Calculation

1) Determine the drainage area contributing to control measure, A_t. Example: 10 acres.

2) Determine the area of impervious surfaces in the drainage area, A_i. Example: 6.4 acres.

3) Calculate the percentage of impervious, $I_A = (A_i / A_t)*100$

   Example:

   Percent Imperviousness = $(A_i / A_t)*100$ = (6.4 acres/10 acres)*100 = 64%

4) Determine Effective Imperviousness using Figure 3-4.

   I_{WQ} = 60%

5) Determine design drawdown period for proposed control measure.

6) Determine the Unit Basin Storage Volume for 80% Annual Capture, V_u using Figure E-3.

   For $I_{WQ}/100$ = 0.60 and drawdown = 40 hrs, V_u = 0.64 in.

7) Calculate the volume of the basin, V_b, where

$$V_b = V_u * A_t. \qquad \text{(Equation E-4)}$$

Where

V_b = Volume of basin

V_u = Unit basin storage volume

A_t = Total tributary area

8) V_b = (0.64 in)(10 ac)(ft/12 in(43,560 ft^2 / ac) = 23,232 ft^3.

9) Solution: Size the proposed control measure for 23,232 ft^3 and 40-hour drawdown.

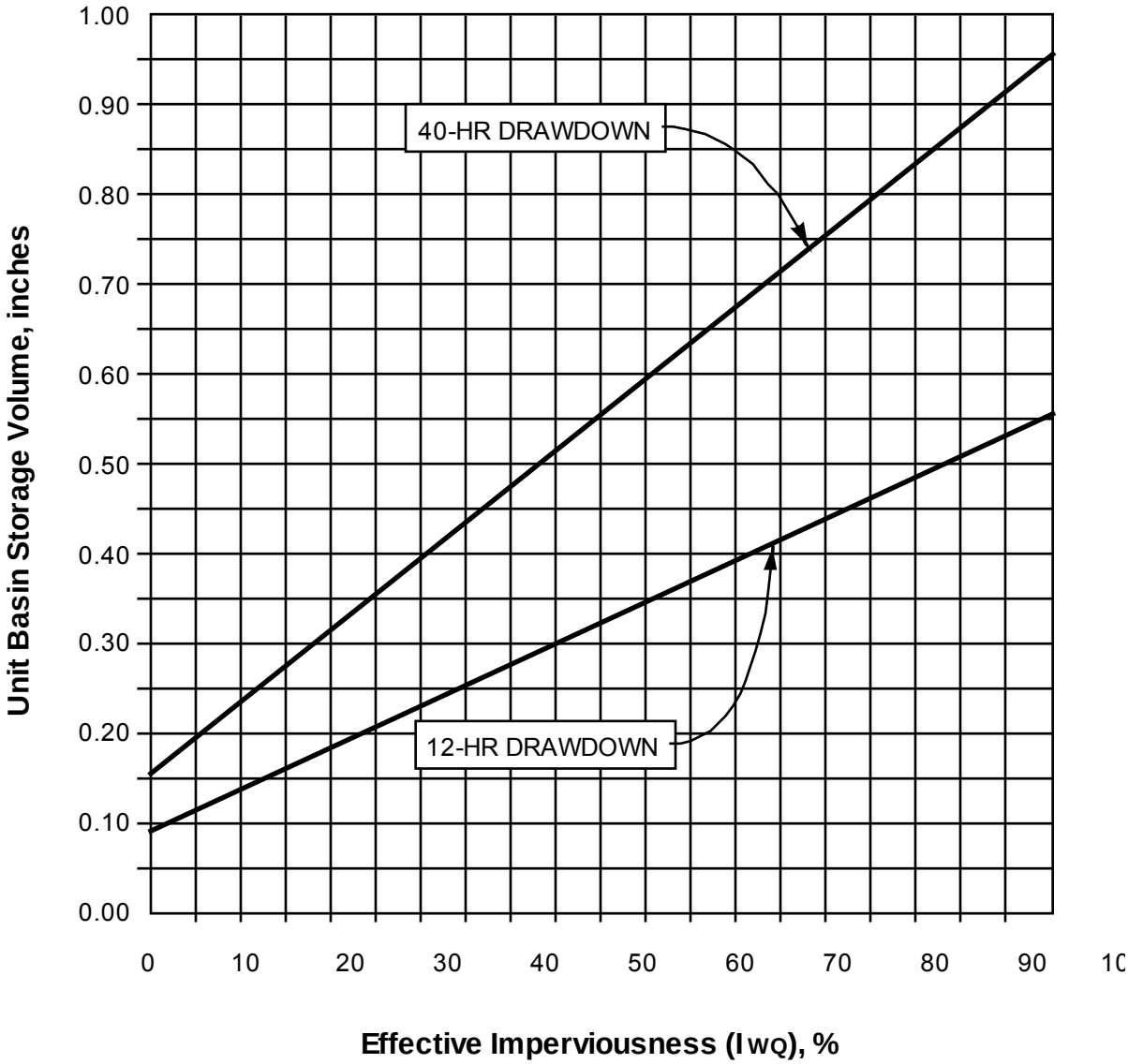

Figure E-3: Unit Basin Storage Volume for Design Volume Method 2

Method 3: 0.75 Inch Design Storm Approach

Equation E-8 can be used to determine the water quality design volume for Method 3.

Calculation Procedure

1) Determine the area from which runoff must be retained on-site (A_{retain}) using the method below:

   The allowable EIA for a project site can be calculated as follows:

   $EIA_{allowable} = (A_{project})*(\%_{allowable})$ (Equation E-5)

Where:

$EIA_{allowable}$	=	the maximum impervious area from which runoff can be treated and discharged off-site [and not retained on-site] (acres).
$A_{project}$	=	the total project area (acres). "Total project area" for new development and redevelopment projects is defined as the disturbed, developed, and undisturbed portions within the project's property (or properties) boundary, at the project scale submitted for first approval.
$\%_{allowable}$	=	ranges from 5 percent to 30 percent, based on a project specific assessment of technical feasibility for retaining runoff and whether the project is located in an existing urban area.

The drainage area from which Project generated runoff must be retained on-site is the total impervious area minus the $EIA_{allowable}$, which can be calculated as follows:

$A_{retain} = TIA - EIA_{allowable} = (P*A_{project}) - EIA_{allowable}$ (Equation E-6)

Where:

A_{retain}	=	the drainage area from which runoff must be retained (acres)
TIA	=	total impervious area (acres)
$EIA_{allowable}$	=	the maximum impervious area from which runoff can be treated and discharged off-site [and not retained on-site] (acres).
P	=	imperviousness of project area (%)/100
$A_{project}$	=	the total project area (acres)

Calculation Procedure

1) Determine the area from which runoff must be retained on-site (A_{retain}) using method above.

2) Determine the runoff coefficient per the following method:

$$C = 0.95*imp + C_p (1-imp) \quad \text{(Equation E-7)}$$

Where:

C	=	runoff coefficient
imp	=	impervious fraction of watershed
C_p	=	pervious runoff coefficient, determined using table below

Table E-1: Pervious Runoff Coefficient Based on Ventura Soil Type

Ventura Soil Type (Soil Number)	Cp value
1	0.15
2	0.10
3	0.10
4	0.05
5	0.05
6	0
7	0

3) The volume can be calculated using equation E-8 below:

$$SQDV = C*(0.75/12)*A_{retain} \quad \text{(Equation E-8)}$$

Where:

SQDV	=	the water quality design volume (acre-feet)
C_{imp}	=	runoff coefficient, calculated by equation (4) above
0.75	=	the design rainfall depth (in) [based on sizing method (c)]
A_{retain}	=	the drainage area from which runoff must be retained (acres)

Method 4: 80 percent of the average runoff volume using an appropriate public domain continuous flow model

Models that can be used for this calculation include the Storm Water Management Model (SWMM) or Hydrologic Engineering Center – Hydrologic Simulation Program – Fortran (HEC-HSPF)], using the local rainfall record and relevant BMP sizing and design data.

Sizing Method 4 allows for alternative sizing methods to be used as long as the selected method produces a water quality design volume based on historical rainfall records that achieves 80% capture of the average runoff volume. While sizing Methods 2 and 3 are appropriate for low lying areas within Ventura County, continuous simulation (using historical rainfall record) is well suited to sizing BMPs in locations with higher average rainfall. This method is the recommended sizing method for Ventura County, using appropriate local data inputs. For BMP locations at higher elevations, with larger rainfall, Method 1 is also better suited to sizing volume-based BMPs using rainfall representative of the site where the BMP will be located.

Continuous runoff modeling takes a long, uninterrupted record of observed rainfall data and transforms it into a record of runoff data. This is done by use of a set of mathematical algorithms that represent the rainfall-runoff processes. EPA's Stormwater Management Model (U.S. EPA, 2000) (SWMM) is one type of continuous runoff model. The runoff module of SWMM subdivides each drainage area into two inclined planes, one for impervious areas and one for pervious areas. Manning's equation is applied to estimate runoff taking into account rainfall intensity, initial losses, evapotranspiration, and infiltration (for pervious areas). The width and length of each plane is selected based on the drainage area configuration and existing and proposed drainage features. Hourly rainfall data is the primary model input for generating runoff volumes and rates. Additional input data are required to characterize imperviousness, soils, topography, and losses associated with evapotranspiration, infiltration, and initial losses.

Sizing BMPs using this type of alternative should only be conducted by qualified personnel with a thorough understanding of the simulated hydrologic processes and operation of the selected hydrology model.

Methods for Determining the Water Quality Design Flow

Each of the flow-based sizing alternatives is described in detail below.

Method 1: Runoff Produced by 0.2 Inches per Hour Rainfall Intensity

The rainfall analysis for flow-based controls focuses on estimating the design rainfall intensity, which is then converted to a design flow rate using the rational method shown in Equation E-9.

$$SQDF = CiA \qquad \text{(Equation E-9)}$$

Where:

SQDF	=	design flow rate (cfs)
C	=	runoff coefficient, calculated with the Ventura County Hydrology Manual method (see Equation E-5) (unitless)
i	=	rainfall intensity (in/hr) (0.2 in/hr)
A	=	watershed area (acres)

Note that 1 acre-in/hr = 1.0083 cfs; this conversion factor can be used with Equation D-9, but is not necessary as the uncertainty for the other parameters is generally well above 0.8%.

Method 2: Runoff Produced by Twice the 85th Percentile Rainfall Intensity

This method is analogous to the rational method used in Method 1, except that twice the historical 85th percentile rainfall intensity for the site location is used for the design rainfall intensity. This method is expected to result in a higher design rainfall intensity and design flow rate compared to Method 1 for most of the rain gages in the District.

Method 3: Runoff Produced by eight percent of the 50-year storm design flow rate

The Stormwater Quality Design Flow (SQDF) is defined to be equal to 8 percent of the peak rate of runoff flow from the 50-year storm as determined using the procedures set forth in the *Hydrology Manual*.

Calculation Procedure

1) The Stormwater Quality Design Flow (SQDF) in Ventura County is defined as SQDF

2) Calculate the peak rate of flow from the 50-year storm ($Q_{P,\ 50\ yr.}$) using the procedures set forth in the *Hydrology Manual* or as directed by the local agency Drainage Master Plan.

3) Convert $Q_{P,\ 50yr}$ (Step 2) to $Q_{P,\ SQDF}$ (Step 1).

$$Q_{P,\ SQDF} = 0.1 \times Q_{P,\ 50yr} \qquad \text{(Equation E-10)}$$

Example Stormwater Quality Design Flow Calculation

The steps below illustrate calculation of SQDF:

1) Calculate the peak rate of flow from a 50-year storm.

$Q_{p,\ 50\ yr.}$ = 10 cfs from the *Ventura County Hydrology Manual*

4) Convert $Q_{p,50\ yr}$ (Step 2) to $Q_{p,\ SQDF}$ (Step 1)

SQDF = 0.8 x 10 cfs (Equation E-11)

SQDF = 0.8 cfs

Rainfall Analysis Methods

The rainfall analysis methods listed below have the benefits of including the most recent rainfall data. Additionally, if the site is not close to an isohyet map rainfall gauge, these methods may be more accurate due to the variability of rainfall due to changing microclimates caused by elevation and distance from the ocean.

A resource available for obtaining rainfall data in Ventura County is the data collected and compiled by the National Climatic Data Center (NCDC).

There are many NCDC stations within Ventura County that collect or have collected hourly precipitation data. Some of these stations are no longer in operation and others may not have a sufficiently long period of record over which precipitation data has been collected to be of use for properly sizing treatment BMPs. NCDC data may be obtained online at the NCDC website http://www.ncdc.noaa.gov/oa/ncdc.html.

Rainfall Analysis Using EPA'S SYNOP Program

US EPA's Synoptic Rainfall Data Analysis Program (SYNOP) aggregates hourly rainfall data into individual storm events and computes event descriptive statistics. The SYNOP program calculates the duration, volume, and intensity for individual storms as well as average annual statistics. Recurrence interval and probability results are also available as output options. The SYNOP program allows the user to screen out storms that are not expected to result in runoff (see step 2 below).

The SYNOP rainfall analysis is conducted to output event-specific data in addition to average annual statistics. The individual storm event data can be ranked to give the 85th percentile storm or averaged to give the mean storm size.

Steps for conducting SYNOP rainfall analysis are as follows:

1) Obtain the hourly rainfall data for the gage of interest from the NCDC or other agency.

2) Run SYNOP for the available rain gage data. Model input parameters include the inter-event time and a minimum storm event size. The inter-event time specifies the minimum duration in which precipitation does not occur, used to define separate storm events, while the minimum storm event is the depth of precipitation generated by a storm below which runoff generally does not occur. Typically, an inter-event time of 6 hours (USEPA, 1989), and a minimum storm

event size of 0.10 inches are used (i.e., storms of 0.10 inches or less are not considered to produce runoff typically). Model results include event-specific and annual statistics during the period of record analyzed.

3) Rank and average the SYNOP storm event output.

References

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Schueler, T., 1987. "Controlling Urban Runoff: A Practical Manual for Planning and Designing Urban BMPs," Publication No. 87703, Metropolitan Washington Council of Governments, Washington, DC.

USEPA, Driscoll, E.D., E. Strecker, G. Palhegyi, 1989. Analysis of Storm Events, Characteristics for Selected Rain Gauges throughout the United States.

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E.2 INF-1 Infiltration Basin/ INF-2 Infiltration Trench/ INF-4 Drywell

This worksheet can be used for sizing INF-1 Infiltration Basins, INF-2 Infiltration Trenches, or INF-4 drywells. An infiltration basin is an earthen basin constructed into naturally pervious soils which retains the SQDV and allows the retained runoff to percolate into the underlying native soils over a specified period of time. Infiltration trenches are long, narrow, gravel-filled trenches, often vegetated, that infiltrate stormwater runoff from small drainage areas. Drywells are similar to infiltration trenches, but the geometry and materials are slightly different. A dry well may be either a small excavated pit filled with aggregate or a prefabricated storage chamber or pipe segment, with the depth of the drywell greater than the width.

Sizing Methodology

Infiltration facilities can be sized using one of two methods: a simple sizing method or a routing modeling method. With either method the SQDV volume must be completely infiltrated within 12 to 72 hours (see Appendix E, Section E.1 for a discussion on drawdown time and BMP performance). The simple sizing procedures provided below can be used for either infiltration basins, infiltration trenches (see INF-2: Infiltration Trench) or drywells (INF-4: Drywell). For the routing modeling method, refer to VEG-8 Sand Filters.

Step 1: Calculate the design volume

Infiltration facilities shall be sized to capture and infiltrate the SQDV volume (see Section 2 and Appendix E) with a 12 - 72 hour drawdown time (see Appendix E, Section E.1).

Step 2: Determine the Design Percolation Rate

The percolation rate will decline between maintenance cycles as particulates accumulate in the infiltrative layer and the surface becomes occluded. Additionally, monitoring of actual facility performance has shown that the full-scale infiltration rate is far lower than the rate measured by small-scale testing. It is important that adequate conservatism is incorporated in the selection of design percolation rates. For infiltration trenches, the design percolation rate discussed here is the percolation rate of the underlying soils, which will ultimately drive infiltration through the trench, and not the percolation rate of the filter media bed (refer to the "Geometry and Sizing" section of INF-2 for the recommended composition of the filter media bed for infiltration trenches). See INF-1: Infiltration Basin for guidance in developing design percolation rate correction factors.

Step 3: Calculate Surface Area

Determine the size of the required infiltrating surface by assuming the SQDV will fill the available ponding depth plus (for infiltration trenches/ drywells with aggregate)

the void spaces within the filter media based on the computed porosity of the media (normally about 32%).

1) Determine the maximum depth of runoff that can be infiltrated within the required drain time as follows:

$$d_{\max} = \frac{P_{design}}{12} t \qquad \text{(Equation E-12)}$$

Where:

d_{max}	=	the maximum depth of water that can be infiltrated within the required drain time (ft)
P_{design}	=	design percolation rate of underlying soils (in/hr)
t	=	required drain time (hrs)

2) Choose the ponding depth (d_p) and/or trench depth (d_t) such that:

$$d_{\max} \geq d_p \qquad \text{For Infiltration Basins} \qquad \text{(Equation E-13)}$$

$$d_{\max} \geq n_t d_t + d_p \qquad \text{For Infiltration Trenches or aggregate-filled Drywells} \qquad \text{(Equation E-14)}$$

Where:

d_{max}	=	the maximum depth of water that can be infiltrated within the required drain time (ft)
d_p	=	ponding depth (ft)
n_t	=	trench/drywell fill aggregate porosity (unitless)
d_t	=	depth of trench/drywell filter media (ft)

3) Calculate infiltrating surface area (filter bottom area) required:

$$A = \frac{SQDV}{((TP_{design}/12) + d_p)} \qquad \text{For Infiltration Basins} \qquad \text{(Equation E-15)}$$

$$A = \frac{SQDV}{((TP_{design}/12) + n_t d_t + d_p)} \qquad \text{For Infiltration Trenches or aggregate-filled Drywells} \qquad \text{(Equation E-16)}$$

Where:

$SQDV$	=	stormwater quality design volume (ft^3)

n_t	=	trench fill aggregate porosity (unitless)
P_{design}	=	design percolation rate (in/hr)
d_p	=	ponding depth (ft)
d_t	=	depth of trench filter media (ft)
T	=	fill time (time to fill to max ponding depth with water) (hrs) [use 2 hours for most designs]

Step 4: Size the forebay (applies to infiltration basins and trenches)

Infiltration facilities require pre-treatment to reduce sediment load into the basin. If a separate pre-treatment unit is not used, a forebay should be constructed for the facility. If a forebay is used, all inlets must enter the sediment forebay. The sediment forebay must be sized to 25% of the basin volume. The forebay must have interior slopes no steeper than 4:1.

1) Calculate the volume of the sediment forebay:

$$V_{forebay} = 0.25 \times SQDV \qquad \text{(Equation E-17)}$$

Where:

$V_{forebay}$	=	Volume of sediment forebay
SQDV	=	Stormwater Quality Design Volume of Infiltration Basin

2) Select the depth of forebay, $d_{forebay}$. This is recommended to be...

3) Determine bottom surface area of forebay:

$$A_{forebay} = \frac{V_{forebay}}{d_{forebay}} \qquad \text{(Equation E-18)}$$

Where:

$A_{forebay}$	=	Bottom surface area of forebay
$V_{forebay}$	=	Volume of forebay
$d_{forebay}$	=	Depth of forebay

4) Size forebay outlet pipe. Pipe must 8 inches in diameter, minimum, and must be sized such that the forebay drains completely within 10 minutes.

Step 5: Provide conveyance capacity for filter clogging

The infiltration facility should be placed off-line, but an emergency overflow must still be provided in the event the filter becomes clogged. Spillway and overflow

structures should be designed in accordance with applicable standards of the Ventura County Flood Control District or local jurisdiction.

Sizing Worksheet

Step 1: Determine water quality design volume	
1-1. Enter Project area (acres), $A_{project}$	$A_{project}$ = acres
1-2. Enter the maximum allowable percent of the Project area that may be effective impervious area (%) (refer to permit), ranges from 5-30%, $\%_{allowable}$	$\%_{allowable}$ = %
1-3. Determine the maximum allowable effective impervious area (acres), $EIA_{allowable} = (A_{project})*(\%_{allowable})$	$EIA_{allowable}$= acres
1-4. Enter Project impervious fraction, Imp (e.g. 60% = 0.60)	Imp=
1-5. Determine the Project Total Impervious area (acres), $TIA=A_{project}*Imp$	TIA= acres
1-6. Determine the total area from which runoff must be retained (acres), $A_{retain}=TIA-EIA_{allowable}$	A_{retain} = acres
1-7. Determine pervious runoff coefficient using Table E-1, C_p	C_p =
1-8. Calculate runoff coefficient, $C = 0.95*imp + C_p\ (1-imp)$	C =
1-9. Enter design rainfall depth of the storm (in), P_i	P_i = in
1-10. Calculate rainfall depth (ft), $P = P_i/12$	P = ft
1-11. Calculate water quality design volume (ft^3), $SQDV=43560\times C*P*A_{retain}$	SQDV= ft^3
Step 2: Determine the design percolation rate	
2-1. Enter measured soil percolation rate (in/hr, 0.5 in/hr min.), $P_{measured}$	$P_{measured}$ = in/hr
2-2. Determine percolation rate correction factor, S_A based on suitability assessment (see Section 6 INF-1)	S_A =

2-3. Determine percolation rate correction factor, S_B based on design (see Section 6 INF-1)	S_b =
2-4. Calculate combined safety factor, $S = S_A \times S_b$	S =
2-5. Calculate the design percolation rate (in/hr), $P_{design} = P_{measured}/S$	P_{design} = in/hr
Step 3: Calculate the surface area	
3-1. Enter required drain time(hours,72 hrs max.), t	t = hrs
3-2. Calculate max. depth of runoff that can be infiltrated within the t (ft), $d_{max} = P_{design}\ t/12$	d_{max} = ft
3-3. For basins, select ponding depth (ft), d_p, such that $d_p \leq d_{max}$	d_p = ft
3-4. For trenches, enter trench fill aggregate porosity, n_t	n_t =
3-5. For trenches, enter depth of trench fill (ft), d_t	d_t = ft
3-5. For trenches, select ponding depth d_p such that $d_p \leq d_{max} - n_t d_t$	d_p= ft
3-6. Enter the time to fill infiltration basin or trench with water (Use 2 hours for most designs), T	T = hrs
3-7. Calculate infiltrating surface area for infiltration basin (ft²): $A_b = SQDV/(T\ P_{design}\ /12+d_p)$ OR Calculate infiltrating surface area for infiltration trenches or aggregate- filled drywells (ft²): $A_t = SQDV/(T\ P_{design}\ /12+n_t d_t+dp)$	A_b = ft² A_t = ft²
Step 4: Size the forebay (infiltration basins or trenches)	
If a separate pre-treatment unit is designed for the infiltration facility, skip to Step 5. If not, continue through 4-1 through 4-4.	

4-1. Calculate the volume of the forebay (ft^3), $V_{forebay}$=0.25*SQDV	$V_{forebay}$= ft^3
4-2. Determine forebay depth (ft), $d_{forebay}$	$d_{forebay}$= ft
4-3. Calculate forebay bottom surface area (ft^2), $A_{forebay}=V_{forebay}/d_{forebay}$	$A_{forebay}$= ft^2
4-4. Provide outlet pipe such that the forebay drains to the infiltration facility within 10 minutes.	
Step 5: Provide conveyance capacity for filter clogging	
5-1.The infiltration facility should be placed off-line, but an emergency overflow must still be provided in the event the filter becomes clogged. Design emergency overflow in accordance with applicable standards of the Ventura County Flood Control District or local jurisdiction.	

Design Example

Step 1: Determine water quality design volume

For this design example, a 10-acre residential development with a 60% total impervious area is considered to drain to an infiltration basin. The 85th percentile storm event for the project location is 0.75 inches.

Step 1: Determine water quality design volume			
1-1. Enter Project area (acres), $A_{project}$	A =	10	acres
1-2. Enter the maximum allowable percent of the Project area that may be effective impervious area (%) (refer to permit), ranges from 5-30%, $\%_{allowable}$	$\%_{allowable}$ =	5	
1-3. Determine the maximum allowable effective impervious area (acres), $EIA_{allowable} = (A_{project})*(\%_{allowable})$	$EIA_{allowable}$=	0.5	acres
1-4. Enter Project impervious fraction, Imp (e.g. 60% = 0.60)	Imp=	0.6	
1-5. Determine the Project Total Impervious area (acres), $TIA=A_{project}*Imp$	TIA=	6	acres
1-6. Determine the total area from which runoff must be retained (acres), $A_{retain}=TIA-EIA_{allowable}$	A_{retain} =	5.5	acres
1-7. Determine pervious runoff coefficient using Table E-1, C_p	C_p =	0.05	
1-8. Calculate runoff coefficient, $C = 0.95*imp + C_p\ (1-imp)$	C =	0.59	
1-9. Enter design rainfall depth of the storm (in), P_i	P_i =	0.75	in
1-10. Calculate rainfall depth (ft), $P = P_i/12$	P =	0.06	ft
1-11. Calculate water quality design volume (ft^3), $SQDV=43560\times C*P*A_{retain}$	SQDV =	8,500	ft^3

Step 2: Calculate Design Infiltration Rate

Infiltration facilities require a minimum soil infiltration rate of 0.5 in/hr. If the rate exceeds 2.4 in/hr as in this example, then the runoff should be fully treated in an upstream BMP prior to infiltration to protect the groundwater quality.

Step 2: Determine the design percolation rate	
2-1. Enter measured soil percolation rate (0.5 in/hr min.), $P_{measured}$	$P_{measured}$ = 4.0 in/hr
2-2. Determine percolation rate correction factor, S_A, based on suitability assessment (see Section 6 INF-1)	S_A = 3
2-3. Determine percolation rate correction factor, S_B, based on design (see Section 6 INF-1)	S_b = 3
2-4. Calculate combined safety factor, $S = S_A \times S_b$	S = 9
2-5. Calculate the design percolation rate, $P_{design} = P_{measured}/S$	P_{design} = 0.44 in/hr

Step 3: Determine Facility Size

The size of the infiltrating surface is determined by assuming the SQDV will fill the available ponding depth (plus the void spaces of the computed porosity (usually about 32%) of the gravel in the trench).

Step 3: Calculate the surface area	
3-1. Enter drawdown time (72 hrs max.), t_d	t = 72 hrs
3-2. Calculate max. depth of runoff that can be infiltrated within the t, $d_{max} = P_{design}\ t/12$	d_{max}= 2.4 ft
3-3. Enter trench fill aggregate porosity, n_t	n_t= 0.32
3-4. Enter depth of trench fill, d_t	d_t = 4 ft
3-5. Select trench ponding depth d_p such that $d_p \leq d_{max} - n_t d_t$	d_p= 1.1 ft
3-6. Enter the time to fill infiltration basin or trench with water (Use 2 hours for most designs), T	T = 2 hrs

3-7. Calculate infiltrating surface area for infiltration basin: $A_b = SQDV/(T\ P_{design}\ /12+d_p)$	A_b = 7,250 ft^2

Step 4: Size the Forebay

A sediment forebay will be provided for this example as there is no separate pre-treatment unit provided.

Step 4: Size the forebay	
4-1. Calculate the volume of the forebay, $V_{forebay}$=0.25*SQDV	$V_{forebay}$= 2,100 ft^3
4-2. Determine forebay depth, $d_{forebay}$	$d_{forebay}$= 3 ft
4-3. Calculate forebay bottom surface area, $A_{forebay}=V_{forebay}/d_{forebay}$	$A_{forebay}$= 700 ft^2
4-4. Provide outlet pipe such that the forebay drains to the infiltration facility within 10 minutes.	

Step 5: Provide Conveyance Capacity for Flows Higher than Qwq

The infiltration facility should be placed off-line, but an emergency overflow for flows greater than the peak design storm must still be provided in the event the filter becomes clogged. Design emergency overflow in accordance with applicable standards of the Ventura County Flood Control District or local jurisdiction.

E.3 INF-3 Bioretention

Sizing Methodology

Bioretention areas can be sized using one of two methods: a simple sizing method or a routing method. The simple sizing procedure is summarized below. Continuous simulation modeling, routing spreadsheets, and/or other forms of routing modeling that incorporate rainfall-runoff relationships and infiltrative (flow) capacities of bioretention may be used to size facilities. Alternative sizing methodologies should be prepared with good engineering practices. For the routing modeling method, refer to the Sand Filter design guidance (FILT-1). A bioretention sizing worksheet and example are provided in this appendix. Planter boxes are sized the same as bioretention areas with underdrains using parameters appropriate for planter boxes.

With either method, the runoff entering the facility must completely drain the ponding area within 48 hours, and runoff must be completely infiltrated within 96 hours. Bioretention is to be sized, with or without underdrains, such that the SQDV will fill the available ponding depth, the void spaces in the planting soil, and the optional gravel layer below the media.

Step 1: Determine the stormwater quality design volume (SQDV)

Bioretention areas should be sized to capture and treat the water quality design volume (see Section E.1).

Step 2: Determine the Design Percolation Rate

The percolation rate will decline between maintenance cycles as particulates accumulate in the infiltrative layer and the surface becomes occluded. Additionally, monitoring of actual facility performance has shown that the full-scale infiltration rate is far lower than the rate measured by small-scale testing. It is important that adequate conservatism is incorporated in the selection of design percolation rates. For infiltrating bioretention facilities, the design percolation rate discussed here is the percolation rate of the underlying soils, which will drive infiltration through the facility. See INF-3: Bioretention for guidance in developing design percolation rate correction factors.

Step 3: Calculate the bioretention surface area

1) Determine the maximum depth of surface ponding that can be infiltrated within the required surface drain time:

$$d_{\max} = \frac{P_{design} \times t_{ponding}}{12\frac{in}{ft}}$$

Where:

$t_{ponding}$	=	required drain time of surface ponding (48 hrs)
P_{design}	=	design percolation rate of underlying soils (in/hr) (see Step 2, above)
d_{max}	=	the maximum depth of surface ponding water that can be infiltrated within the required drain time (ft)

2) Choose surface ponding depth (dp) such that:

$$d_p \leq d_{\max} \qquad \text{(Equation E-19)}$$

Where:

d_p	=	selected surface ponding depth (ft)
d_{max}	=	the maximum depth of water that can be infiltrated within the required drain time (ft)

3) Choose thickness(es) of amended media and aggregate layer(s) and calculate total effective storage depth of the bioretention area as follows:

$$d_{effective} \leq d_p + n^*_{media} l_{media} + n_{gravel} l_{gravel} \qquad \text{(Equation E-20)}$$

Where:

$d_{effective}$	=	total equivalent depth of water stored in bioretention area (ft)
d_p	=	surface ponding depth (ft)
n^*_{media}	=	available porosity of amended soil media (ft/ft), approximately 0.25 ft/ft accounting for antecedent moisture conditions
l_{media}	=	thickness of amended soil media layer (ft)
n_{gravel}	=	porosity of optional gravel layer (ft/ft), approximately 0.30 ft/ft
l_{gravel}	=	thickness of optional gravel layer (ft)

4) Check that entire effective depth (surface plus subsurface storage) infiltrates in no greater than 96 hours as follows:

$$t_{total} = \frac{d_{effective}}{P_{design}} \times 12 \frac{in}{ft} \leq 96\ hr \qquad \text{(Equation E-21)}$$

Where:

$d_{effective}$ = total equivalent depth of water stored in bioretention area (ft)

P_{design} = design percolation rate of underlying soils (in/hr) (see Step 2, above)

If t_{total} > 96 hrs, then reduce surface ponding depth and/or amended media thickness and/or gravel thickness and return to Step [A].

If $t_{total} \leq$ 96 hrs, then proceed to Step [E].

5) Calculate required infiltrating surface area (filter bottom area):

$$A_{req} = \frac{SQDV}{d_{effective}} \qquad \text{(Equation E-22)}$$

Where:

$SQDV$ = stormwater quality design volume (ft3)

Step 4: Calculate the bioretention total footprint

Calculate total footprint required by including a buffer for side slopes and freeboard; A_{req} is measured at the as the filter bottom area (toe of side slopes).

Sizing Worksheet

Step 1: Determine water quality design volume	
1-1. Enter Project area (acres), $A_{project}$	$A_{project}$ = acres
1-2. Enter the maximum allowable percent of the Project area that may be effective impervious area (%) (refer to permit), ranges from 5-30%, $\%_{allowable}$	$\%_{allowable}$ = %
1-3. Determine the maximum allowable effective impervious area (acres), $EIA_{allowable} = (A_{project})*(\%_{allowable})$	$EIA_{allowable}$= acres
1-4. Enter Project impervious fraction, Imp (e.g. 60% = 0.60)	Imp=
1-5. Determine the Project Total Impervious area (acres), $TIA=A_{project}*Imp$	TIA= acres
1-6. Determine the total area from which runoff must be retained (acres), $A_{retain}=TIA-EIA_{allowable}$	A_{retain} = acres
1-7. Determine pervious runoff coefficient using Table E-1, C_p	C_p =
1-8. Calculate runoff coefficient, $C = 0.95*imp + C_p\ (1-imp)$	C =
1-9. Enter design rainfall depth of the storm (in), P_i	P_i = in
1-10. Calculate rainfall depth (ft), $P = P_i/12$	P = ft
1-11. Calculate water quality design volume (ft^3), $SQDV=43560\times C*P*A_{retain}$	SQDV= ft^3

Step 2: Determine the design percolation rate	
2-1. Enter measured soil percolation rate (in/hr) (0.5 in/hr minimum), $P_{measured}$	$P_{measured}$ = in/hr
2-2. Determine percolation rate correction factor, S_A based on suitability assessment (see Section 6 INF-3)	S_A =

2-3. Determine percolation rate correction factor, S_B based on design (see Section 6 INF-3)	S_B =
2-4. Calculate combined safety factor, $S = S_A \times S_b$	S =
2-5. Calculate the design percolation rate (in/hr), $P_{design} = P_{measured}/S$	P_{design} = in/hr
Step 3: Calculate Bioretention Infiltrating surface area	
3-1. Enter water quality design volume (ft^3), *SQDV*	SQDV = ft^3
3-2. Enter design percolation rate (in/hr), P_{design}	P_{design} = in/hr
3.3 Enter the required drain time (48 hours), $t_{ponding}$	$t_{ponding}$ = hours
3-3. Calculate the maximum depth of surface ponding that can be infiltrated within the required drain time (ft): $d_{max} = (P_{design} \times t_{ponding})/12$	d_{max} = ft
3-4. Select surface ponding depth (ft), d_p, such that $d_p \leq d_{max}$	d_p = ft
3-5. Select thickness of amended media (ft,2 feet minimum, 3 preferred), l_{media}	l_{media} = ft
3-6. Enter porosity of amended media (roughly 25% or 0.25 ft/ft), n_{media}	n_{media}= ft/ft
3-7. Select thickness of optional gravel layer (ft), l_{gravel}	l_{gravel} = ft
3-8. Enter porosity of gravel (roughly 30% or 0.3 ft/ft), n_{gravel}	n_{gravel}= ft/ft
3-9. Calculate the total effective storage depth of bioretention facility (ft): $d_{effective} \leq (d_p + n_{media} l_{media} + n_{gravel} l_{gravel})$	$d_{effective}$= ft

3-10. Check that the entire effective depth infiltrates in required drainage time, 96 hours: $t_{total} = (d_{effective}/P_{design}) \times 12$ If t_{total} > 96 hours, reduce surface ponding depth and/or amended media thickness and/or gravel thickness and return to 3-4. If $t_{total} \leq$ 96 hours, proceed to 3-11.	t_{total} = hours
3-11. Calculate the required infiltrating surface area (ft^2): $A_{req} = SQDV/d_{effective}$	A_{req} = ft^2
Step 4: Calculate Bioretention Area Total Footprint	
4-1. Calculate total footprint required by including a buffer for side slopes and freeboard (ft^2) [A_{req} is measured at the as the filter bottom area (toe of side slopes)], A_{tot}	A_{tot} = ft^2

Design Example

Bioretention areas have several components that allow the pretreatment, spreading, filtration, collection and discharge of the incoming flows.

Step 1: Determine water quality design volume

For this design example, a 10-acre site with soil type 4 and 60% total impervious area is considered. The 85th percentile storm event for the project location is 0.75 inches.

Step 1: Determine water quality design volume			
1-1. Enter Project area (acres), $A_{project}$	$A_{project}$ =	10	acres
1-2. Enter the maximum allowable percent of the Project area that may be effective impervious area (%) (refer to permit), ranges from 5-30%, $\%_{allowable}$	$\%_{allowable}$ =	5	
1-3. Determine the maximum allowable effective impervious area (acres), $EIA_{allowable} = (A_{project})*(\%_{allowable})$	$EIA_{allowable}$=	0.5	acres
1-4. Enter Project impervious fraction, Imp (e.g. 60% = 0.60)	Imp=	0.6	
1-5. Determine the Project Total Impervious area (acres), $TIA=A_{project}*Imp$	TIA=	6	acres
1-6. Determine the total area from which runoff must be retained (acres), $A_{retain}=TIA-EIA_{allowable}$	A_{retain} =	5.5	acres
1-7. Determine pervious runoff coefficient using Table E-1, C_p	C_p =	0.05	
1-8. Calculate runoff coefficient, $C = 0.95*imp + C_p\ (1-imp)$	C =	0.59	
1-9. Enter design rainfall depth of the storm (in), P_i	P_i =	0.75	in
1-10. Calculate rainfall depth (ft), $P = P_i/12$	P =	0.06	ft
1-11. Calculate water quality design volume (ft^3), $SQDV=43560\times C*P*A_{retain}$	SQDV=	8,500	ft^3

Step 2: Determine the design percolation rate

For this design example, a native soil percolation rate of 1.5 in/hr is assumed.

Step 2: Determine the design percolation rate	
2-1. Enter measured soil percolation rate (in/hr, 0.5 in/hr minimum), $P_{measured}$	$P_{measured}$ = 4.0 in/hr
2-2. Determine percolation rate correction factor, S_A, based on suitability assessment (see Section 6 INF-1)	S_A = 3
2-3. Determine percolation rate correction factor, S_B, based on design (see Section 6 INF-1)	S_b = 3
2-4. Calculate combined safety factor, $S = S_A \times S_b$	S = 9
2-5. Calculate the design percolation rate (in/hr), $P_{design} = P_{measured}/S$	P_{design} = 0.44 in/hr

Step 3: Determine bioretention/ planter box area footprint

A bioretention area is designed with two components: (1) temporary storage reservoir to store runoff, and (2) a plant mix filter bed (planting soil mixed with sand content = 70%) through which the stored runoff must percolate to obtain treatment.

Step 3: Calculate bioretention/planter box surface area	
3-1. Enter water quality design volume (ft^3), *SQDV*	SQDV = 8,500 ft^3
3-2. Enter design percolation rate (in/hr), P_{design}	P_{design} = 0.375 in/hr
3.3 Enter the required drain time (48 hours), $t_{ponding}$	$t_{ponding}$ = 48 hours
3-3. Calculate the maximum depth of surface ponding (ft) that can be infiltrated within the required drain time (48 hours): $d_{max} = (P_{design} \times t_{ponding})/12$	d_{max} = 1.5 ft
3-4. Select surface ponding depth d_p such that $d_p \leq d_{max}$	d_p = 1.5 ft
3-5. Select thickness of amended media (2 feet minimum, 3 preferred), l_{media}	l_{media} = 3 ft

Step 3: Calculate bioretention/planter box surface area	
3-6. Enter porosity of amended media (roughly 25% or 0.25 ft/ft), n_{media}	n_{media}= 0.25 ft/ft
3-7. Select thickness of optional gravel layer (ft), l_{gravel}	l_{gravel} = 1 ft
3-8. Enter porosity of gravel (roughly 30% or 0.3 ft/ft), n_{gravel}	n_{gravel}= 0.3 ft/ft
3-9. Calculate the total effective storage depth of bioretention facility (ft): $d_{effective} \leq (d_p + n_{media} l_{media} + n_{gravel} l_{gravel})$	$d_{effective}$= 2.6 ft
3-10. Check that the entire effective depth infiltrates in required drainage time, 96 hours: $t_{total} = (d_{effective}/P_{design}) \times 12$ If t_{total} > 96 hours, reduce surface ponding depth and/or amended media thickness and/or gravel thickness and return to 3-4. If $t_{total} \leq$ 96 hours, proceed to 3-11.	t_{total} = 82 hours
3-11. Calculate the required infiltrating surface area (ft²), $A_{req} = SQDV/d_{effective}$	A_{req} = 3,300 ft²

Step 4: Calculate Bioretention Area Total Footprint

For this design example, a natural-shaped bioretention area is assumed, with 3:1 side slopes. To calculate the total footprint, the side slopes would be added to the design geometry.

E.4 INF-5 Permeable Pavement

Sizing Methodology

Permeable pavement (including the base layers) shall be designed to drain in less than 72 hours. The basis for this is that soils must be allowed to dry out periodically in order to restore hydraulic capacity; this is essential in order to receive flows from subsequent storms, maintain infiltration rates, maintain adequate sub soil oxygen levels for healthy soil biota, and to provide proper soil conditions for biodegradation and retention of pollutants.

Permeable pavement must be built and designed by a licensed civil engineer in accordance with Ventura County roadway and pavement specifications.

Step 1: Calculate the design volume

Permeable pavement shall be sized to capture and treat the stormwater quality design volume, SQDV (see Section 2 and Appendix E).

Step 2: Determine the Design Percolation Rate

The percolation rate will decline between maintenance cycles as particulates accumulate in the infiltrative layer and the surface becomes occluded. Additionally, monitoring of actual facility performance has shown that the full-scale infiltration rate is far lower than the rate measured by small-scale testing. It is important that adequate conservatism is incorporated in the selection of design percolation rates. For infiltrating bioretention facilities, the design percolation rate discussed here is the percolation rate of the underlying soils, which will drive infiltration through the facility. See INF-5: Permeable Pavement for guidance in developing design percolation rate correction factors.

Step 3: Determine gravel drainage layer depth

Permeable pavement (including the base layers) shall be designed to drain in less than 72 hours. The basis for this is that soils must be allowed to dry out periodically in order to restore hydraulic capacity to receive flows from subsequent storms, maintain infiltration rates, maintain adequate sub soil oxygen levels for healthy soil biota, and to provide proper soil conditions for biodegradation and retention of pollutants.

1) Calculate the maximum depth of runoff, d_{max}, that can be infiltrated within the drawdown time:

$$d_{\max} = \frac{P_{design} \bullet t}{12} \qquad \text{(Equation E-23)}$$

Where:

d_{max}	=	maximum depth that can be infiltrated (ft)
P_{design}	=	design percolation rate of underlying soils (in/hr) (see Step 2, above)
t	=	drawdown time (72 hrs maximum) (hr)

1) Select the gravel drainage layer depth, *l*, such that:

$$d_{\max} \geq n \times l \qquad \text{(Equation E-24)}$$

Where:

d_{max}	=	maximum depth that can be infiltrated (ft) (see 1) above)
n	=	gravel drainage layer porosity(unitless) (generally about 32% or 0.32 for gravel)
l	=	gravel drainage layer depth (ft)

Step 4: Determine infiltrating surface area

1) Calculate infiltrating surface area for permeable pavement, A:

$$A = \frac{SQDV}{\frac{TP_{design}}{12} + nl} \qquad \text{(Equation E-25)}$$

Where:

P_{design}	=	design percolation rate of underlying soils (in/hr) (see Step 2, above)
n	=	gravel drainage layer porosity(unitless)[about 32% or 0.32 for gravel]
l	=	depth of gravel drainage layer (ft)
T	=	time to fill the gravel drainage layer with water (use 2 hours for most designs) (hr)

Step 5: Provide conveyance capacity for clogging

The permeable pavement must have an emergency overflow for storm events greater than the design and in the event the permeable pavement becomes clogged. See INF-5 Permeable Pavement for overflow details.

Sizing Worksheet

Step 1: Determine water quality design volume	
1-1. Enter Project area (acres), $A_{project}$	$A_{project}$ = acres
1-2. Enter the maximum allowable percent of the Project area that may be effective impervious area (%) (refer to permit), ranges from 5-30%, $\%_{allowable}$	$\%_{allowable}$ %
1-3. Determine the maximum allowable effective impervious area (acres), $EIA_{allowable} = (A_{project})*(\%_{allowable})$	$EIA_{allowable}$= acres
1-4. Enter Project impervious fraction, Imp (e.g. 60% = 0.60)	Imp=
1-5. Determine the Project Total Impervious area (acres), $TIA=A_{project}*Imp$	TIA= acres
1-6. Determine the total area from which runoff must be retained (acres), $A_{retain}=TIA-EIA_{allowable}$	A_{retain} = acres
1-7. Determine pervious runoff coefficient using Table E-1, C_p	C_p =
1-8. Calculate runoff coefficient, $C = 0.95*imp + C_p\ (1-imp)$	C =
1-9. Enter design rainfall depth of the storm (in), P_i	P_i = in
1-10. Calculate rainfall depth (ft), $P = P_i/12$	P = ft
1-11. Calculate water quality design volume (ft^3), $SQDV=43560\times C*P*A_{retain}$	SQDV= ft^3
Step 2: Determine the design percolation rate	
2-1. Enter measured soil percolation rate (0.5 in/hr minimum), $P_{measured}$	$P_{measured}$ = in/hr
2-2. Determine percolation rate correction factor, S_A based on suitability assessment (see Section 6 INF-5)	S_A =

Step 2: Determine the design percolation rate	
2-3. Determine percolation rate correction factor, S_B based on design (see Section 6 INF-5)	S_B =
2-4. Calculate combined safety factor, $S = S_A \times S_b$	S =
2-5. Calculate the design percolation rate (in/hr), $P_{design} = P_{measured}/S$	P_{design} = in/hr
Step 3: Determine the Gravel Drainage Layer Depth	
3-1. Enter drawdown time (hours, 72 hrs max.), t	t = hours
3-2. Calculate max. depth of runoff (ft) that can be infiltrated within the t, $d_{max}=P_{design}t/12$	d_{max} = ft
3-3. Enter the gravel drainage layer porosity, n (typically 32% or 0.32 for gravel)	n =
3-4. Select the gravel drainage layer depth (ft) such that $d_{max} \geq n \times l$	l = ft
Step 4: Determine infiltrating surface area	
4-1. Enter gravel drainage layer porosity, n	n =
4-2. Enter depth of gravel drainage layer (ft), l	l = ft
4-3. Enter the time to fill the gravel drainage layer with water (Use 2 hours for most designs), T	T = hrs
4-4. Calculate infiltrating surface area (ft^3): $A=SQDV/((TP_{design}/12)+nl)$	A = ft^2
Step 5: Provide conveyance capacity for clogging	
5-1. The permeable pavement must have an emergency overflow for storm events greater than the design and in the event the permeable pavement becomes clogged.	

Design Example

Step 1: Determine Water Quality Design Volume

For this design example, a 10-acre residential development with a 60% total impervious area is considered. The 85th percentile storm event for the project location is 0.75 inches.

Step 1: Determine Water Quality Design Volume			
1-1. Enter Project area (acres), $A_{project}$	A =	10	acres
1-2. Enter the maximum allowable percent of the Project area that may be effective impervious area (%) (refer to permit), ranges from 5-30%, $\%_{allowable}$	$\%_{allowableble}$ =	5	
1-3. Determine the maximum allowable effective impervious area (acres), $EIA_{allowable} = (A_{project})*(\%_{allowable})$	$EIA_{allowable}$=	0.5	acres
1-4. Enter Project impervious fraction, Imp (e.g. 60% = 0.60)	Imp=	0.6	
1-5. Determine the Project Total Impervious area (acres), $TIA=A_{project}*Imp$	TIA=	6	acres
1-6. Determine the total area from which runoff must be retained (acres), $A_{retain}=TIA-EIA_{allowable}$	A_{retain} =	5.5	acres
1-7. Determine pervious runoff coefficient using Table E-1, C_p	C_p =	0.05	
1-8. Calculate runoff coefficient, $C = 0.95*imp + C_p\ (1-imp)$	C =	0.59	
1-9. Enter design rainfall depth of the storm (in), P_i	P_i =	0.75	in
1-10. Calculate rainfall depth (ft), $P = P_i/12$	P =	0.06	ft
1-11. Calculate water quality design volume (ft^3), $SQDV=43560\times C*P*A_{retain}$	SQDV =	8,500	ft^3

Step 2: Calculate Design Percolation Rate

Permeable pavement with no underdrain requires a minimum soil infiltration rate of 0.5 in/hr. For this design example, a native soil percolation rate of 1.5 in/hr is assumed.

Step 2: Determine the design percolation rate	
2-1. Enter measured soil percolation rate (0.5 in/hr min.), $P_{measured}$	$P_{measured}$ = 4.0 in/hr
2-2. Determine percolation rate correction factor, S_A, based on suitability assessment (see Section 6 INF-1)	S_A = 3
2-3. Determine percolation rate correction factor, S_B, based on design (see Section 6 INF-1)	S_b = 3
2-4. Calculate combined safety factor, $S = S_A \times S_b$	S = 9
2-5. Calculate the design percolation rate (in/hr), $P_{design} = P_{measured}/S$	P_{design} = 0.44 in/hr

Step 3: Determine maximum depth that can be infiltrated

Based on the design infiltration rate and the max drawdown, determine the maximum depth that can be infiltrated within the time constraints.

Step 3: Determine maximum depth that can be infiltrated	
3-1. Enter drawdown time (72 hrs max.), t	t = 72 hrs
3-2. Calculate max. depth of runoff (ft) that can be infiltrated within the t, $d_{max}=P_{design}t/12$	d_{max} = 2.6 ft
3-3. Enter the gravel drainage layer porosity, n (typically 32% or 0.32 for gravel)	n = 0.32
3-4. Select the gravel drainage layer depth (ft) such that $d_{max} \geq n \times l$	l = 8 ft

Step 4: Determine the infiltrating surface area (pavement area)

Using the depth calculated in Step 3, the required infiltrating surface area of the pavement can be calculated.

Step 4: Determine the infiltrating surface area			
4-1. Enter gravel drainage layer porosity, *n*	n =	0.32	
4-2. Enter depth of gravel drainage layer (ft), *l*	l =	8	ft
4-3. Enter the time to fill the gravel drainage layer with water (Use 2 hours for most designs), *T*	T =	2	hrs
4-4. Calculate infiltrating surface area (ft^3): $A=SQDV/(TP_{design}/12)+n*l))$	A =	1,630	ft^2

Step 5: Provide conveyance capacity for clogging

The permeable pavement must have an emergency overflow for storm events greater than the design and in the event the permeable pavement becomes clogged.

E.5 VEG-1 Bioretention/VEG-2 Planter Box

Sizing Methodology

Bioretention areas can be sized using one of two methods: a simple sizing method or a routing method. The simple sizing procedure is summarized below. Continuous simulation modeling, routing spreadsheets, and/or other forms of routing modeling that incorporate rainfall-runoff relationships and infiltrative (flow) capacities of bioretention may be used to size facilities. Alternative sizing methodologies should be prepared with good engineering practices. For the routing modeling method, refer to the Sand Filter design guidance (FILT-1). A bioretention sizing worksheet and example are provided in this appendix. Planter boxes are sized the same as bioretention areas with underdrains using parameters appropriate for planter boxes.

With either method, the runoff entering the facility must completely drain the ponding area within 48 hours, and runoff must be completely infiltrated within 96 hours. Bioretention is to be sized, with or without underdrains, such that the SQDV will fill the available ponding depth, the void spaces in the planting soil, and the optional aggregate layer.

Step 1: Determine the stormwater quality design volume (SQDV)

Bioretention areas should be sized to capture and treat the water quality design volume (see Section E.1).

Step 2: Determine the Design Percolation Rate

Sizing is based on the design saturated hydraulic conductivity (K_{sat}) of the amended soil layer. A target K_{sat} of 5 inches per hour is recommended for newly installed non-proprietary amended soil media. The media K_{sat} will decline between maintenance cycles as the surface becomes occluded and particulates accumulate in the amended soil layer. A factor of safety of 2.0 should be applied such that the resulting recommended design percolation rate is 2.5 inches per hour. This value should be used for sizing unless sufficient rationale is provided to justify a higher design percolation rate.

Step 3: Calculate the bioretention or planter box surface area

Determine the size of the required infiltrating surface by assuming the SQDV will fill the available ponding depth plus the void spaces in the media, based on the computed porosity of the filter media and optional aggregate layer.

1) Select a surface ponding depth (d_p) that satisfies geometric criteria and congruent with the constraints of the site. Selecting a deeper ponding depth (18 inches maximum) generally yields a smaller footprint, however requires greater consideration for public safety and energy dissipation.

2) Compute time for selected ponding depth to filter through media:

$$t_{ponding} = \frac{d_p}{K_{design}} 12 \frac{in}{ft} \leq 48 \text{ hours} \qquad \text{(Equation E-26)}$$

Where:

$t_{ponding}$	=	required drain time of surface ponding (48 hrs)
d_p	=	selected surface ponding water depth (ft)
K_{design}	=	design saturated hydraulic conductivity (in/hr) (see Step 2, above)

If $t_{ponding}$ exceeds 48 hours, return to (1) and reduce surface ponding or increase media K_{design}. Otherwise, proceed to next step.

Note: In nearly all cases, $t_{ponding}$ will not approach 48 hours unless a low Kdesign is specified.

3) Compute depth of water that may be considered to be filtered during the design storm event as follows:

$$d_{filtered} = Minimum\left[\frac{K_{design} \times T_{routing}}{12 \, in/ft}, \frac{d_p}{2}\right] \qquad \text{(Equation E-27),}$$

Where:

$d_{filtered}$	=	depth of water that may be considered to be filtered during the design storm event (ft) for routing calculations; this value should not exceed half of the surface ponding depth (d_p)
K_{design}	=	design saturated hydraulic conductivity (in/hr) (see Step 2, above)
$T_{routing}$	=	storm duration that may be assumed for routing calculations; this should be assumed to be **3 hours** unless rationale for an alternative assumption is provided
d_p	=	selected surface ponding water depth (ft)

4) Calculate required infiltrating surface area (filter bottom area):

$$A_{req} = \frac{SQDV}{d_p + d_{filtered}} \qquad \text{(Equation E-28)}$$

Where:

A_{req}	=	required area at bottom of filter area (ft^2); does not account for side slopes and freeboard
$SQDV$	=	stormwater quality design volume (ft^3)
d_p	=	selected surface ponding water depth (ft)
$d_{filtered}$	=	depth of water that can be considered to be filtered during the design storm event (ft) for routing calculations (See previous step)

Step 4: Calculate the bioretention total footprint

Calculate total footprint required by including a buffer for side slopes and freeboard; A_{req} is measured at the filter bottom area (toe of side slopes).

Step 5: Calculate underdrain system capacity

Underdrains are required for planter boxes and bioretention with underdrains. For guidance on sizing, refer to step 5 of the worksheet below. Alternatively, the Ventura County Hydrology Manual can be used for pipe sizing guidance.

Sizing Worksheet

Step 1: Determine water quality design volume	
1-1. Enter Project area (acres), $A_{project}$	$A_{project}$ = acres
1-2. Enter the maximum allowable percent of the Project area that may be effective impervious area (refer to permit), ranges from 5-30%, $\%_{allowable}$	$\%_{allowable}$ %
1-3. Determine the maximum allowed effective impervious area (ac), $EIA_{allowable} = (A_{project})*(\%_{allowable})$	$EIA_{allowable}$= acres
1-4. Enter Project impervious fraction, Imp (e.g. 60% = 0.60)	Imp=
1-5. Determine the Project Total Impervious area (acres), $TIA=A_{project}*Imp$	TIA= acres
1-6. Determine the total area from which runoff must be retained (acres), $A_{retain}=TIA-EIA_{allowable}$	A_{retain} = acres
1-7. Determine pervious runoff coefficient using Table E-1, C_p	C_p =
1-8. Calculate runoff coefficient, $C = 0.95*imp + C_p\ (1-imp)$	C =
1-9. Enter design rainfall depth of the storm (in), P_i	P_i = in
1-10. Calculate rainfall depth (ft), $P = P_i/12$	P = ft
1-11. Calculate water quality design volume (ft^3), $SQDV=43560 \bullet C*P*A_{retain}$	SQDV= ft^3

Step 2: Determine the design percolation rate	
2-1. Enter the design saturated hydraulic conductivity of the amended filter media (2.5 in/hr recommended rate), K_{design}	K_{design} = in/hr

Step 3: Calculate Bioretention/Planter Box surface area	
3-1. Enter water quality design volume (ft^3), *SQDV*	SQDV = ft^3
3-2. Enter design saturated hydraulic conductivity (in/hr), K_{design}	K_{design} = in/hr
3-3. Enter ponding depth (max 1.5 ft for Bioretention, 1 ft for Planter Box) above area, d_p	d_p = ft
3-4. Calculate the drawdown time for the ponded water to filter through media (hours), $t_{ponding} = (d_p/K_{design}) \times 12$	$t_{ponding}$= hrs
3-5. Enter the storm duration for routing calculations (use 3 hours unless there is rationale for an alternative), $T_{routing}$	$T_{routing}$ = hrs
3-6. Calculate depth of water (ft) filtered by using the following two equations: $d_{filtered,1} = (K_{design} \times T_{routing})/12$ $d_{filteret,2} = d_p /2$	$d_{filtered,1}$ = ft $d_{filtered,2}$ = ft
3.7 Enter the resultant depth (ft) (the lesser of the two calculated above), $d_{filtered}$	$d_{filtered}$ = ft
3-8. Calculate the infiltrating surface area as follows (ft^2): $A_{req} = SQDV/(d_p + d_{filtered})$	A_{req} = ft^2
Step 4: Calculate Bioretention Area Total Footprint	
4-1. Calculate total footprint required by including a buffer for side slopes and freeboard (ft^2) [A_{req} is measured at the as the filter bottom area (toe of side slopes)], A_{tot}	A_{tot} = ft^2
Step 5: Calculate Underdrain System Capacity	
To calculate the underdrain system capacity, continue through steps 5-1 to 5-7.	

Step 5: Calculate Underdrain System Capacity	
5-1. Calculated filtered flow rate to be conveyed by the longitudinal drain pipe, $Q_f = K_{design} A_{req}/43{,}200$	Q_f = cfs
5-2. Enter minimum slope for energy gradient, S_e	S_e =
5-3. Enter Hazen-Williams coefficient for plastic, C_{HW}	C_{HW} =
5-4. Enter pipe diameter (min 6 inches), D	D = in
5-5. Calculate pipe hydraulic radius (ft), $R_h = D/48$	R_h = ft
5-6. Calculate velocity at the outlet of the pipe (ft/s), $V_p = 1.318 C_{HW} R_h^{0.63} S_e^{0.54}$	V_p = ft/s
5-7. Calculate pipe capacity (cfs), $Q_{cap} = 0.25\pi(D/12)^2 V_p$	Q_{cap} = cfs

Design Example

Bioretention areas have several components that allow the pretreatment, spreading, filtration, collection and discharge of the incoming flows.

Step 1: Determine water quality design volume

For this design example, a 10-acre residential development with a 60% total impervious area is considered. The 85th percentile storm event for the project location is 0.75 inches.

Step 1: Determine Water Quality Design Volume			
1-1. Enter drainage area, A	A =	10	acres
1-2. Enter the maximum allowable percent of the Project area that may be effective impervious area (refer to permit), ranges from 5-30%, $\%_{allowable}$	$\%_{allowableble}$ =	5	
1-3. Determine the maximum allowed effective impervious area, $EIA_{allowable} = (A_{project})*(\%_{allowable})$	$EIA_{allowable}$=	0.5	acres
1-4. Enter Project impervious fraction, *Imp* (e.g. 60% = 0.60)	Imp=	0.6	
1-5. Determine the Project Total Impervious area, $TIA=A_{project}*Imp$	TIA=	6	acres
1-6. Determine the total area from which runoff must be retained, $A_{retain}=TIA-EIA_{allowable}$	A_{retain} =	5.5	acres
1-7. Determine pervious runoff coefficient using Table E-1, C_p	C_p =	0.05	
1-8. Calculate runoff coefficient, $C = 0.95*imp + C_p\ (1-imp)$	C =	0.59	
1-9. Enter design rainfall depth of the storm, P_i (in)	P_i =	0.75	in
1-10. Calculate rainfall depth, $P = P_i/12$	P =	0.06	ft
1-11. Calculate water quality design volume, $SQDV = 43560 \bullet P*A_{retain}*C$	SQDV =	8,500	ft^3

Step 2: Determine the design percolation rate

For this design example, the recommended amended filter hydraulic conductivity is used, 2.5 in/hr.

Step 2: Determine the design percolation rate	
2-1. Enter the design saturated hydraulic conductivity of the amended filter media (2.5 in/hr recommended rate), K_{design}	K_{design} = 2.5 in/hr

Step 3: Determine bioretention/ planter box area footprint

A bioretention area is designed with two components: (1) temporary storage reservoir to store runoff, and (2) a plant mix filter bed (planting soil mixed with sand content = 70%) through which the stored runoff must percolate to obtain treatment.

Step 3: Calculate Bioretention/Planter Box surface area	
3-1. Enter water quality design volume (ft^3), *SQDV*	SQDV = 8,500 ac-ft
3-2. Enter design saturated hydraulic conductivity (in/hr), K_{design}	K_{design} = 2.5 in/hr
3-3. Enter ponding depth (max 1.5 ft for Bioretention, 1 ft for Planter Box) above area, d_p	d_p = 1.5 ft
3-4. Calculate the drawdown time for the ponded water to filter through media (hours), $t_{ponding} = (d_p/K_{design}) \times 12$	$t_{ponding}$= 7.2 hrs
3-5. Enter the storm duration for routing calculations (use 3 hours unless there is rationale for an alternative), $T_{routing}$	$T_{routing}$ = 3 hrs
3-6. Calculate depth of water (ft) filtered by using the minimum of the following two equations: $d_{filtered,1} = (K_{design} \times T_{routing})/12$ $d_{filteret,2} = d_p /2$	$d_{filtered,1}$ = 0.63 ft $d_{filtered,2}$ = 0.75 ft
3.7 Enter the resultant depth (the minimum of the two calculated above), $d_{filtered}$	$d_{filtered}$ = 0.63 ft
3-8. Calculate the infiltrating surface area as follows (ft^2): $A_{req} = SQDV/(d_p + d_{filtered})$	A_{req} = 4,000 ft^2

Step 4: Calculate Bioretention Area Total Footprint

For this design example, a natural-shaped bioretention area is assumed, with 3:1 side slopes. To calculate the total footprint, the side slopes would be added to the design geometry.

Step 5: Calculate filter longitudinal underdrain collection pipe

All underdrain pipes must be 6 inches or greater in diameter to facilitate cleaning.

Step 5: Calculate underdrain system (required for planter box)			
To calculate the underdrain system capacity, continue through steps 5-1 to 5-7. If you don't need to calculate the underdrain capacity, skip this step.			
5-1. Calculated filtered flow rate to be conveyed by the longitudinal drain pipe (cfs), $Q_f = K_{design} A_{req}/43{,}200$	Q_f =	0.085	cfs
5-2. Enter minimum slope for energy gradient, S_e	S_e =	0.005	
5-3. Enter Hazen-Williams coefficient for plastic, C_{HW}	C_{HW} =	140	
5-4. Enter pipe diameter (min 6 in), D	D =	6	in
5-5. Calculate pipe hydraulic radius (ft), $R_h = D/48$	R_h =	0.13	ft
5-6. Calculate velocity at the outlet of the pipe (ft/s), $V_p = 1.318 C_{HW} R_h^{0.63} S_e^{0.54}$	V_p =	2.9	ft/s
5-7. Calculate pipe capacity (cfs), $Q_{cap} = 0.25\pi(D/12)^2 V_p$	Q_{cap} =	0.57	cfs

E.6 VEG-3 Vegetated Swale

Sizing Methodology

The flow capacity of a vegetated swale is a function of the longitudinal slope (parallel to flow), the resistance to flow (i.e. Manning's roughness), and the cross sectional area. The cross section is normally approximately trapezoidal and the area is a function of the bottom width and side slopes. The flow capacity of vegetated swales should be such that the design water quality flow rate will not exceed a flow depth of 2/3 the height of the vegetation within the swale or 4 inches at the water quality design flow rate. Once design criteria have been selected, the resulting flow depth for the design water quality design flow rate is checked. If the depth restriction is exceeded, swale parameters (e.g. longitudinal slope, width) are adjusted to reduce the flow depth.

Procedures for sizing vegetated swales are summarized below. A vegetated swale sizing worksheet and example are also provided.

Step 1: Select design flows

The swale sizing is based on the stormwater quality design flow SQDF (see Section E.1).

Step 2: Calculate swale bottom width

The swale bottom width is calculated based on Manning's equation for open-channel flow. This equation can be used to calculate discharges as follows:

$$Q = \frac{1.49 A R^{0.67} S^{0.5}}{n}$$

(Equation E-29)

Where:

Q	=	flow rate (cfs)
n	=	Manning's roughness coefficient (unitless)
A	=	cross-sectional area of flow (ft^2)
R	=	hydraulic radius (ft) = area divided by wetted perimeter
S	=	longitudinal slope (ft/ft)

For shallow flow depths in swales, channel side slopes are ignored in the calculation of bottom width. Use the following equation (a simplified form of Manning's formula) to estimate the swale bottom width:

$$b = \frac{SQDF * n_{wq}}{1.49 y^{0.67} s^{0.5}} \qquad \text{(Equation E-30)}$$

Where:

b	=	bottom width of swale (ft)
$SQDF$	=	stormwater quality design flow (cfs)
n_{wq}	=	Manning's roughness coefficient for shallow flow conditions = 0.2 (unitless)
y	=	design flow depth (ft)
s	=	longitudinal slope (along direction of flow) (ft/ft)

Proceed to Step 3 if the bottom width is calculated to be between 2 and 10 feet. A minimum 2-foot bottom width is required. Therefore, if the calculated bottom width is less than 2 feet, increase the width to 2 feet and recalculate the design flow depth y using the Equation 4-13, where Q_{wq}, n_{wq}, and s are the same values as used above, but b = 2 feet.

The maximum allowable bottom width is 10 feet; therefore if the calculated bottom width exceeds 10 feet, then one of the following steps is necessary to reduce the design bottom width:

1) Increase the longitudinal slope (s) to a maximum of 6 feet in 100 feet (0.06 feet per foot).

2) Increase the design flow depth (y) to a maximum of 4 inches.

3) Place a divider lengthwise along the swale bottom (Figure 3-1) at least three-quarters of the swale length (beginning at the inlet), without compromising the design flow depth and swale lateral slope requirements. Swale width can be increased to an absolute maximum of 16 feet if a divider is provided.

Step 3: Determine design flow velocity

To calculate the design flow velocity through the swale, use the flow continuity equation:

$$V_{wq} = SQDF / A_{wq} \qquad \text{(Equation E-31)}$$

Where:

V_{wq}	=	design flow velocity (fps)
$SQDF$	=	stormwater quality design flow (cfs)

A_{wq} = $by + Zy^2$ = cross-sectional area (ft²) of flow at design depth, where Z = side slope length per unit height (e.g., Z = 3 if side slopes are 3H:1V)

If the design flow velocity exceeds 1 foot per second, go back to Step 2 and modify one or more of the design parameters (longitudinal slope, bottom width, or flow depth) to reduce the design flow velocity to 1 foot per second or less. If the design flow velocity is calculated to be less than 1 foot per second, proceed to Step 4. *Note: It is desirable to have the design velocity as low as possible, both to improve treatment effectiveness and to reduce swale length requirements.*

Step 4: Calculate swale length

Use the following equation to determine the necessary swale length to achieve a hydraulic residence time of at least 7 minutes:

$$L = 60 t_{hr} V_{wq} \qquad \text{(Equation E-32)}$$

Where:

L = minimum allowable swale length (ft)

t_{hr} = hydraulic residence time (min)

V_{wq} = design flow velocity (fps)

The minimum swale length is 100 feet; therefore, if the swale length is calculated to be less than 100 feet, increase the length to a minimum of 100 feet, leaving the bottom width unchanged. If a larger swale can be fitted on the site, consider using a greater length to increase the hydraulic residence time and improve the swale's pollutant removal capability. If the calculated length is too long for the site, or if it would cause layout problems, such as encroachment into shaded areas, proceed to Step 5 to further modify the layout. If the swale length can be accommodated on the site (meandering may help), proceed to Step 6.

Step 5: Adjust swale layout to fit on site

If the swale length calculated in Step 4 is too long for the site, the length can be reduced (to a minimum of 100 feet) by increasing the bottom width up to a maximum of 16 feet, as long as the 10 minute retention time is retained. However, the length cannot be increased in order to reduce the bottom width because Manning's depth-velocity-flow rate relationships would not be preserved. If the bottom width is increased to greater than 10 feet, a low flow dividing berm is needed to split the swale cross section in half to prevent channelization.

Length can be adjusted by calculating the top area of the swale and providing an equivalent top area with the adjusted dimensions.

1) Calculate the swale treatment top area based on the swale length calculated in Step 4:

$$A_{top} = (b_i + b_{slope})L_i \qquad \text{(Equation E-33)}$$

Where:

A_{top} = top area (ft^2) at the design treatment depth

b_i = bottom width (ft) calculated in Step 2

b_{slope} = the additional top width (ft) above the side slope for the design water depth (for 3:1 side slopes and a 4-inch water depth, b_{slope} = 2 feet)

L_i = initial length (ft) calculated in Step 4

2) Use the swale top area and a reduced swale length L_f to increase the bottom width, using the following equation:

$$L_f = A_{top}/(b_f + b_{slope}) \qquad \text{(Equation E-34)}$$

Where:

L_f = reduced swale length (ft)

b_f = increased bottom width (ft).

3) Recalculate V_{wq} according to Step 3 using the revised cross-sectional area A_{wq} based on the increased bottom width b_f. Revise the design as necessary if the design flow velocity exceeds 1 foot per second.

4) Recalculate to assure that the 10 minute retention time is retained.

Step 6: Provide conveyance capacity for flows higher than SQDF

Vegetated swales may be designed as flow-through channels that convey flows higher than the water quality design flow rate, or they may be designed to incorporate a high-flow bypass upstream of the swale inlet. A high-flow bypass usually results in a smaller swale size. If a high-flow bypass is provided, this step is not needed. If no high-flow bypass is provided, proceed with the procedure below. Flow splitter structure design is described in Appendix G.

1) Check the swale size to determine whether the swale can convey the flood control design storm peak flows (Refer to the Ventura County Hydrology Manual, 2006).

2) The peak flow velocity of the flood control design storm (e.g., flood control design storm – see Ventura County Hydrology Manual, 2006)) must be less than 3.0 feet per second. If this velocity exceeds 3.0 feet per second, return to Step 2 and

increase the bottom width or flatten the longitudinal slope as necessary to reduce the flood control design storm peak flow velocity to 3.0 feet per second or less. If the longitudinal slope is flattened, the swale bottom width must be recalculated (Step 2) and must meet all design criteria.

Sizing Worksheet

Step 1: Determine water quality design flow		
1-1. Enter Project area (acres), $A_{project}$	A_{design} =	acres
1-2. Enter impervious fraction, Imp (e.g. 60% = 0.60)	Imp =	
1-3. Determine pervious runoff coefficient using Table E-1, C_p	C_p =	
1-4. Calculate runoff coefficient, $C = 0.95*imp + C_p\ (1\text{-}imp)$	C =	
1-5. Enter design rainfall intensity (in/hr), i	i =	in/hr
1-6. Calculate water quality design flow (cfs), $SQDF = CiA$	SQDF =	cfs
Step 2: Calculate swale bottom width		
2-1. Enter water quality design flow (cfs), $SQDF$	SQDF =	cfs
2-2. Enter Manning's roughness coefficient for shallow flow conditions, $n_{wq} = 0.2$	n_{wq} =	
2-3. Calculate design flow depth (ft), y	y =	ft
2-4. Enter longitudinal slope (ft/ft) (along direction of flow), s	s =	ft/ft
2-5. Calculate bottom width of swale (ft), $b = (SQDF*n_{wq})/(1.49y^{0.67}s^{0.5})$	b =	ft
2-6. If b is between 2 and 10 feet, go to Step 3		
2-7. If b is less than 2 ft, assume b = 2 ft and recalculate flow depth, $y = ((SQDF*n_{wq})/(2.98\ s^{0.5}))^{1.49}$	y =	ft

2-8. If b is greater than 10 ft, one of the following design adjustments must be made (recalculate variables as necessary): • Increase the longitudinal slope to a maximum of 0.06 ft/ft. • Increase the design flow depth to a maximum of 4 in (0.33 ft). • Place a divider lengthwise along the swale bottom (Figure 3-1) at least three-quarters of the swale length (beginning at the inlet). Swale width can be increased to an absolute maximum of 16 feet if a divider is provided.	
Step 3: Determine design flow velocity	
3-1. Enter side slope length per unit height (H:V) (e.g. 3 if side slopes are 3H :1V), *Z*	Z =
3-2. Enter bottom width of swale (ft), *b*	b = ft
3-3. Enter design flow depth (ft), *y*	y = ft
3-4. Calculate the cross-sectional area of flow at design depth (ft^2), $A_{wq} = by + Zy^2$	A_{wq} = ft^2
3-5. Calculate design flow velocity (ft/s), $V_{wq} = SQDF/ A_{wq}$	V_{wq} = ft/s
3-6. If the design flow velocity exceeds 1 ft/s, go back to Step 2 and change one or more of the design parameters to reduce the design flow velocity. If design flow velocity is less than 1 ft/s, proceed to Step 4.	
Step 4: Calculate swale length	
4-1. Enter hydraulic residence time (minutes, minimum 7 min), t_{hr}	t_{hr} = min
4-2. Calculate swale length (ft), $L = 60 t_{hr} V_{wq}$	L = ft

Step 4: Calculate swale length	
4-3. If L is too long for the site, proceed to Step 5 to adjust the swale layout If L is greater than 100 ft and will fit within the constraints of the site, skip to Step 6 If L is less than 100 ft, increase the length to a minimum of 100 ft, leaving the bottom width unchanged, and skip to Step 6	
Step 5: Adjust swale layout to fit within site constraints	
5-1. Enter the bottom width calculated in Step 2 (ft), $b_i = b$	b_i = ft
5-2. Enter design flow depth (ft), y	y= ft
5-3. Enter the swale side slope ratio (H:V), Z	Z = ft:ft
5-4. Enter the additional top width above the side slope for the design water depth (ft), $b_{slope} = 2Zy$	b_{slope} = ft
5-5. Enter the initial length calculated in Step 4 (ft), $Li = L$	L_i = ft
5-6. Calculate the top area at the design treatment depth (ft²), $A_{top} = (b_i + b_{slope}) \times L_i$	A_{top} = ft²
5-7. Choose a reduced swale length based on site constraints (ft), L_f	L_f = ft
5-8. Calculate the increased bottom width (ft), $b_f = (A_{top}/L_f) - b_{slope}$	b_f = ft
5-9. Recalculate the cross-sectional area of flow at design depth (ft2), $A_{wq,f} = b_f y + Zy^2$	$A_{wq,f}$ = ft²
5-10. Recalculate design flow velocity (ft/s), $V_{wq} = SQDF / A_{wq}$ Revise design as necessary if design flow velocity exceeds 1 ft/s.	V_{wq} = ft/s

5-11. Recalculate the hydraulic residence time (min), $t_{hr} = L_f/(60V_{wq})$ Ensure that t_{hr} is greater or equal to 10 minutes.	t_{hr} = min
5-12. When V_{wq} and t_{hr} are recalculated to meet requirements, proceed to Step 6.	
Step 6: Provide conveyance capacity for flows higher than SQDF (if swale is on-line)	
6-1. If the swale already includes a high-flow bypass to convey flows higher than the water quality design flow rate, skip this step and verify that all parameters meet design requirements to complete sizing	
6-2. If swale does not include a high-flow bypass, determine that the swale can convey flood control design storm peak flows. Calculate the capital peak flow velocity per Ventura County requirements (ft/s), V_p	V_p = ft/s
6-3. If V_p > 3.0 feet per second, return to Step 2 and increase the bottom width or flatten the longitudinal slope as necessary to reduce the flood control design storm peak flow velocity to 3.0 feet per second or less. If the longitudinal slope is flattened, the swale bottom width must be recalculated (Step 2) and must meet all design criteria.	

Design Example

Step 1: Determine water quality design Flow

For this design example, a 10-acre site with Type 4 soil and 60% total imperviousness is considered. Flow-based sizing Method 1 is assumed. Therefore, the design intensity is 0.2 in/hr.

Step 1: Determine water quality design flow			
1-1. Enter Project area (acres), $A_{project}$	A =	10	acres
1-2. Enter impervious fraction, Imp (e.g. 60% = 0.60)	Imp =	0.60	
1-3. Determine pervious runoff coefficient using Table E-1, C_p	C_p =	0.05	
1-4. Calculate runoff coefficient, $C = 0.95*imp + C_p\ (1\text{-}imp)$	C =	0.59	
1-5. Enter design rainfall intensity (in/hr), i	i =	0.2	in/hr
1-6. Calculate water quality design flow (cfs), $SQDF = CiA$	$SQDF$=	1.18	cfs

Step 2: Calculate Swale Bottom Width

The swale bottom width is calculated based on Manning's equation. The grass height in the swale will be maintained at 6-inches. The design flow depth is assumed to be 2/3 of the grass height, or 4 inches (0.33 ft). The default Manning's roughness coefficient is assumed appropriate for expected vegetation density and design depth. The slope was assumed to be 0.04.

Step 2: Calculate swale bottom width			
2-1. Enter water quality design flow (cfs), $SQDF$	SQDF =	1.18	cfs
2-2. Enter Manning's roughness coefficient for shallow flow conditions, n_{wq} = 0.2	n_{wq} =	0.2	
2-3. Calculate design flow depth (ft), y	y =	0.33	ft
2-4. Enter longitudinal slope (along direction of flow) (ft/ft), s	s =	0.04	ft/ft
2-5. Calculate bottom width of swale (ft),	b =	5.0	ft

Step 2: Calculate swale bottom width	
$b = Q_{wq}n_{wq} / 1.49y^{0.67}s^{0.5}$	
2-6. If *b* is between 2 and 10 feet, go to Step 3	
2-7. If *b* is less than 2 ft, assume *b* = 2 ft and recalculate flow depth, $y = (Q_{wq}n_{wq} / 2.98s^{0.5})^{1.49}$	Not applicable
2-8. If *b* is greater than 10 ft, one of the following design adjustments must be made (and recalculate as necessary): Increase the longitudinal slope to a maximum of 0.06 ft/ft. Increase the design flow depth to a maximum of 4 in (0.33 ft). Place a divider lengthwise along the swale bottom (Figure 3-1) at least three-quarters of the swale length (beginning at the inlet). Swale width can be increased to an absolute maximum of 16 feet if a divider is provided.	Not applicable

Step 3: Determine Design Flow Velocity

For this design example, it is assumed the side slopes will be designed as 3H: 1V, so Z = 3.

Step 3: Determine design flow velocity	
3-1. Enter side slope length per unit height (H:V) (e.g. 3 if side slopes are 3H :1V), *Z*	Z = 3
3-2. Enter bottom width of swale (ft), *b*	b = 5.0 ft
3-3. Enter design flow depth (ft), *y*	y = 0.33 ft
3-4. Calculate the cross-sectional area of flow at design depth (ft²), $A_{wq} = by + Zy^2$	A_{wq} = 2.0 ft²
3-5. Calculate design flow velocity (ft/s), $V_{wq} = SQDF / A_{wq}$	V_{wq} = 0.59 ft/s
3-6. If the design flow exceeds 1 ft/s, go back to Step 2 and change one or more of the design parameters to reduce the design flow velocity. If design flow velocity is less than 1 ft/s, proceed to Step 4.	

Step 4: Calculate Swale Length

Using the design flow velocity and a minimum residence time of 7 minutes, the length of the swale is calculated as follows. The swale length must be a minimum of 100 ft.

Step 4: Calculate swale length	
4-1. Enter hydraulic residence time (min 7 min), t_{hr} (min)	t_{hr} = 10 min
4-2. Calculate swale length, $L = 60 t_{hr} V_{wq}$	L = 354 ft
4-3. If L is too long for the site, proceed to Step 5 to adjust the swale layout If L is greater than 100 ft and will fit within the constraints of the site, skip to Step 6 If L is less than 100 ft, increase the length to a minimum of 100 ft, leaving the bottom width unchanged, and skip to Step 6	Not Applicable

Site constraints only allow a swale length of 300 feet. Therefore proceed to Step 5 to adjust the swale length.

Step 5: Adjust Swale Layout to Fit Within Site Constraints

To adjust swale length to 300 feet, the bottom width needs to be increased (up to a maximum of 16 ft if a divider is provided).

Step 5: Adjust swale layout to fit within site constraints	
5-1. Enter the bottom width calculated in Step 2 (ft), $b_i = b$	b_i = 5.0 ft
5-2. Enter design flow depth (ft), y	y= 0.33 ft
5-3. Enter the swale side slope ratio (H:V), Z	Z = 3 ft:ft
5-4. Enter the additional top width above the side slope for the design water depth (ft), $b_{slope} = 2Zy$	b_{slope} = 2 ft
5-5. Enter the initial length calculated in Step 4 (ft), $Li = L$	L_i = 354 ft
5-6. Calculate the top area at the design treatment depth (ft^2), $A_{top} = (b_i + b_{slope}) \times L_i$	A_{top} = 2,480 ft^2

5-7. Choose a reduced swale length based on site constraints (ft), L_f	L_f = 300 ft
5-8. Calculate the increased bottom width (ft), $b_f = (A_{top}/L_f) - b_{slope}$	b_f = 6.3 ft
5-9. Recalculate the cross-sectional area of flow at design depth (ft2), $A_{wq,f} = b_f y + Zy^2$	$A_{wq,f}$ = 2.4 ft^2
5-10. Recalculate design flow velocity (ft/s), $V_{wq} = SQDF/ A_{wq}$ Revise design as necessary if design flow velocity exceeds 1 ft/s.	V_{wq} = 0.49 ft/s
5-11. Recalculate the hydraulic residence time (min), $t_{hr} = L_f/(60V_{wq})$ Ensure that t_{hr} is greater or equal to 10 minutes.	t_{hr} = 10.2 min
5-12. When V_{wq} and t_{hr} are recalculated to meet requirements, proceed to Step 6.	

Since the new length and width yields V_{wq} and t_{hr} which meet requirements, continue to Step 6.

Step 6: Provide Conveyance Capacity for Flows Higher than SQDF

The swale will be offline such that all flows greater than SQDF will be bypassed.

E.7 VEG-4 Filter Strip

Sizing Methodology

The flow capacity of a vegetated filter strips (filter strips) is a function of the longitudinal slope (parallel to flow), the resistance to flow (e.g., Manning's roughness), and the width and length of the filter strip. The slope shall be small enough to ensure that the depth of water will not exceed 1 inch over the filter strip. Similarly, the flow velocity shall be less than 1 ft/sec. Procedures for sizing filter strips are summarized below. A filter strip sizing example is also provided.

Step 1: Calculate the design flow rate

The design flow is calculated based on the stormwater quality design flow rate, SQDF, as described in Section E.1.

Step 2: Calculate the minimum width

Determine the minimum width (i.e. perpendicular to flow) allowable for the filter strip and design for that width or larger.

$$W_{min} = (SQDF) / (q_{a,min}) \qquad \text{(Equation E-35)}$$

Where

W_{min}	=	minimum width of filter strip
$SQDF$	=	stormwater quality design flow (cfs)
$q_{a,min}$	=	minimum linear unit application rate, 0.005 cfs/ft

Step 3: Calculate the design flow depth

The design flow depth (d_f) is calculated based on the width and the slope (parallel to the flow path) using a modified Manning's equation as follows:

$$d_f = 12 * [SQDF * n_{wq} / 1.49 W_{trib} s^{0.5}]^{0.6} \qquad \text{(Equation E-36)}$$

Where:

d_f	=	design flow depth (inches)
$SQDF$	=	stormwater quality design flow (cfs)
W_{trib}	=	width (perpendicular to flow = width of impervious surface contributing area (ft))
s	=	slope (ft/ft) of strip parallel to flow, average over the whole width

n_{wq} = Manning's roughness coefficient (0.25-0.30)

If d_f is greater than 1 inch (0.083 ft), then a shallower slope is required, or a filter strip cannot be used.

Step 4: Calculate the design velocity

The design flow velocity is based on the design flow, design flow depth, and width of the strip:

$$V_{wq} = SQDF / (d_f \, W_{trib}) \qquad \text{(Equation E-37)}$$

Where:

$d_{f,ft}$ = design flow depth (ft) (d_f/12)

$SQDF$ = stormwater quality design flow (cfs)

W_{trib} = width (perpendicular to flow = width of impervious surface contributing area (ft))

Step 5: Calculate the desired length of the filter strip

Determine the required length (L) to achieve a desired minimum residence time of 7 minutes using:

$$L = 60 t_{hr} V_{wq} \qquad \text{(Equation E-38)}$$

Where:

L = minimum allowable strip length (ft)

t_{hr} = hydraulic residence time (s)

V_{wq} = design flow velocity (fps)

Sizing Worksheet

Step 1: Calculate the design flow		
1-1. Enter Project area (acres), $A_{project}$	A_{design} =	acres
1-2. Enter impervious fraction, *Imp* (e.g. 60% = 0.60)	Imp =	
1-3. Determine pervious runoff coefficient using Table E-1, C_p	C_p =	
1-4. Calculate runoff coefficient, $C = 0.95*imp + C_p\ (1\text{-}imp)$	C =	
1-5. Enter design rainfall intensity (in/hr), *i*	i =	in/hr
1-6. Calculate water quality design flow (cfs), *SQDF= CiA*	SQDF =	cfs
Step 2: Calculate the minimum width		
2-1. Enter the stormwater quality design flow (cfs), *SQDF*	SQDF =	cfs
2-2. Enter the minimum linear unit application rate (0.005 cfs/ft), $q_{a,min}$	$q_{a,min}$=	cfs/ft
2-3. Calculate the minimum width of filter strip (ft), W_{min}	W_{min}=	ft
Step 3: Calculate the design flow depth		
3-1. Enter filter strip longitudinal slope, *s* (ft/ft)	*s* =	ft/ft
3-2. Enter Manning roughness coefficient (0.25-0.30), n_{wq}	n_{wq} =	
3-3. Enter width of impervious surface contributing area (perpendicular to flow), *W* (ft)	W =	ft

Step 3: Calculate the design flow depth	
3-4. Calculate average depth of water using Manning equation (inches), $d_f = 12 * [SQDF * n_{wq} / 1.49 W_{trib} s^{0.5}]^{0.6}$	d_f = inches
3-5. If d_f > 1" (0.083 ft), go back step 3-1 and decrease the slope	
3-6. If the slope cannot be changed due to construction constraints, go to step 3-3 and increase the width perpendicular to flow.	
Step 4: Calculate the design velocity	
4-1. Enter depth of water (ft), $d_{f,ft} = d_f / 12$	d_f = ft
4-2. Enter width of strip (ft), W	W = ft
4-3. Calculate design flow velocity (ft/s), $V_{wq} = SQDF / (d_{f,ft} W)$	V_{wq}= ft/s
4-4. If the V_{wq} >1 ft/s, go back to step 3-1 and decrease the slope.	
Step 5: Calculate the length of the filter strip	
5-1. Enter desired residence time (minimum 7 minutes), t	t = min
5-2. Enter design flow velocity (ft/s), V_{wq}	V_{wq}= ft/s
5-3. Calculate length of the filter strip (ft), $L = 60 t V_{wq}$	L = ft
5-4. If L < 4 ft, go to step 3-1 and increase the slope	

Design Example

Step 1: Determine water quality design Flow

For this design example, a 10-acre site with Type 4 soil and 60% total imperviousness is considered. Flow-based sizing Method 1 is used, as described in Section E.1.

Step 1: Calculate the design flow			
1-1. Enter Project area (acres), $A_{project}$	A_{design} =	10	acres
1-2. Enter impervious fraction, *Imp* (e.g. 60% = 0.60)	Imp =	0.60	
1-3. Determine pervious runoff coefficient using Table E-1, C_p	C_p =	0.05	
1-4. Calculate runoff coefficient, $C = 0.95*imp + C_p\ (1\text{-}imp)$	C =	0.59	
1-5. Enter design rainfall intensity (in/hr), *i*	i =	0.2	in/hr
1-6. Calculate water quality design flow (cfs), $SQDF = CiA$	SQDF =	1.18	cfs

Step 2: Calculate the minimum width of filter strip

Determine the minimum width (i.e. perpendicular to flow) allowable for the filter strip and design for that width or larger.

Step 2: Calculate the minimum width			
2-1. Enter the stormwater quality design flow (cfs), *SQDF*	SQDF =	1.18	cfs
2-2. Enter the minimum linear unit application rate (0.005 cfs/ft), $q_{a,min}$	$q_{a,min}$=	0.005	cfs/ft
2-3. Calculate the minimum width of filter strip (ft), $W_{min}=SQDF/q_{a,min}$	W_{min}=	240	ft

Step 3: Calculate the Design Flow Depth

A slope of 3% was assumed for the filter strip (2-4% recommended). The design water depth should not exceed 1 inch. For this design example a manning's coefficient of 0.27 was used.

Step 3: Calculate the design flow depth	
3-1. Enter filter strip longitudinal slope, *s* (ft/ft)	s = 0.03 ft/ft
3-2. Enter Manning roughness coefficient (0.25-0.30), n_{wq}	n_{wq} = 0.27
3-3. Enter width of strip (=impervious surface contributing area perpendicular to flow), at least W_{min} (ft), *W*	W = 240 ft
3-4. Calculate average depth of water using Manning equation (inches), $d_f = 12 * [SQDF * n_{wq} / 1.49 W s^{0.5}]^{0.6}$	d_f = 0.51 in
3-5. If d_f > 1" (0.083 ft), go back step 3-1 and decrease the slope	
3-6. If the slope cannot be changed due to construction constraints, go to step 3-3 and increase the width perpendicular to flow.	

Step 4: Calculate the Design Velocity

The designed flow velocity should not exceed 1 foot/second across the filter strip.

Step 4: Calculate the design velocity	
4-1. Enter depth of water (ft), $d_{f,ft} = d_f / 12$	d_f = 0.043 ft
4-2. Enter width of strip (ft), *W*	W= 240 ft
4-3. Calculate design flow velocity (ft/s), $V_{wq} = SQDF / (d_{f,ft} W)$	V_{wq} = 0.11 ft/s
4-4. If the V_{wq} >1 ft/s, go back to step 3-1 and decrease the slope.	

Step 5: Calculate the Length of the Filter Strip

The filter strip should be at least 4 feet long (in the direction of flow) and accommodate a minimum residence time of 7 minutes to provide adequate water quality treatment.

Step 5: Calculate the length of the filter strip	
5-1. Enter desired residence time (minimum 10 minutes), *t*	t = 10 min
5-2. Enter design flow velocity (ft/s), V_{wq}	V_{wq}= 0.11 ft/s
5-3. Calculate length of the filter strip (ft), $L = 60tV_{wq}$	L = 66 ft
5-4. If L < 4 ft, go to step 3-1 and increase the slope	

E.8 TCM-1 Dry Extended Detention Basin

Sizing Methodology

Dry extended detention (ED) basins are basins designed such that the stormwater quality design volume, SQDV, is detained for 36 to 48 hours. This allows sediment particles and associated pollutants to settle and be removed from stormwater. Procedures for sizing extended detention basins are summarized below. A sizing example is also provided.

Step 1: Calculate the design volume

Dry extended detention facilities shall be sized to capture and treat the water quality design volume (see Section E.1).

Step 2: Calculate the volume of the active basin

The total basin volume shall be increased an additional 20% of the stormwater quality design volume to account for sediment accumulation, at a minimum. If the basin is designed only for water quality treatment then the basin volume would be 120% of the stormwater quality design volume, SQDV. Freeboard is in additional to the total basin volume. Calculate the volume of the active basin, V_a:

$$V_a = 1.20*SQDV \qquad \text{(Equation E-39)}$$

Step 3: Determine detention basin location and preliminary geometry based on site constraints

Based on site constraints, determine the basin geometry and the storage available by developing an elevation-storage relationship for the basin. The cross-sectional geometry across the width of the basin shall be approximately trapezoidal with a maximum side slope of 4:1 (H:V) on interior slopes and 3:1 (H:V) on exterior slopes unless specifically permitted by Ventura County (see Side Slopes below). Shallower side slopes are necessary if the basin is designed to have recreational uses during dry weather conditions.

1) Calculate the width of the basin footprint, W_{tot}, as follows:

$$W_{tot} = \frac{A_{tot}}{L_{tot}} \qquad \text{(Equation E-40)}$$

Where:

A_{tot} = total surface area of the basin footprint (ft^2)

L_{tot} = total length of the basin footprint (ft)

2) Calculate the length of the active volume surface area including the internal berm but excluding the freeboard, $L_{av\text{-}tot}$:

$$L_{av-tot} = L_{tot} - 2Zd_{fb} \qquad \text{(Equation E-41)}$$

Where:

Z = interior side slope as length per unit height

d_{fb} = freeboard depth

3) Calculate the width of the active volume surface area including the internal berm but excluding freeboard, $W_{av\text{-}tot}$:

$$W_{av-tot} = W_{tot} - 2Zd_{fb} \qquad \text{(Equation E-42)}$$

4) Calculate the total active volume surface area including the internal berm and excluding freeboard, $A_{av\text{-}tot}$:

$$A_{av-tot} = L_{av-tot} \times W_{av-tot} \qquad \text{(Equation E-43)}$$

5) Calculate the area of the berm, A_{berm}:

$$A_{berm} = W_{berm} \times L_{berm} \qquad \text{(Equation E-44)}$$

Where:

W_{berm} = width of the internal berm

L_{berm} = length of the internal berm

6) Calculate the surface area excluding the internal berm and freeboard, A_{av}:

$$A_{av} = A_{av=tot} - A_{berm} \qquad \text{(Equation E-45)}$$

Step 4: Determine Dimensions of Forebay

5-15% of the basin active volume, V_a, is required to be within the active volume of the forebay.

1) Calculate the active volume of forebay, V_1:

$$V_1 = \frac{V_a \times \%V_1}{100} \qquad \text{(Equation E-46)}$$

Where:

$\%V_1$ = percent of V_a in forebay (%)

V_a = active volume (ft^3)

2) Calculate the surface area for the active volume of forebay, A_1:

$$A_1 = \frac{V_1}{d_1} \qquad \text{(Equation E-47)}$$

Where:

d_1 = average depth for the active volume of forebay (ft)

3) Calculate the length of forebay, L_1:

$$L_1 = \frac{A_1}{W_1} \qquad \text{(Equation E-48)}$$

Where:

W_1 = width of forebay (ft)

Step 5: Determine Dimensions of Cell 2

Cell 2 will consist of the remainder of the basin's active volume.

1) Calculate the active volume of Cell 2, V_2:

$$V_2 = V_a - V_1 \qquad \text{(Equation E-49)}$$

Where:

V_a = total basin active volume (ft^3)

V_1 = volume of forebay (ft^3)

2) Calculate the surface area, A_2, for the active volume of Cell 2:

$$A_2 = A_{av} - A_1 \qquad \text{(Equation E-50)}$$

Where:

A_{av} = basin surface area excluding berm and freeboard (ft^2)

A_1 = surface area of forebay (ft^2)

3) Calculate the average depth, d_2, for the active volume of Cell 2:

$$d_2 = \frac{V_2}{A_2} \qquad \text{(Equation E-51)}$$

4) Calculate the length of Cell 2, L_2:

$$L_2 = \frac{A_2}{W_2}$$ (Equation E-52)

Where:

W_2 = width of Cell 2 (ft)

5) Verify that the length-to-width ratio of Cell 2 at half of d_2 is at least 1.5:1 with ≥ 2:1 preferred. If the length-to width ratio is less than 1.5:1, modify input parameters until a ratio of at least 1.5:1 is achieved. If the input parameters cannot be modified as a result of site constraints, another site for the basin should be chosen. Calculate the length-to width, LW_{mid2}, ratio of Cell 2 at half of d_2 follows:

$$LW_{mid2} = \frac{L_{mid2}}{W_{mid2}}$$ (Equation E-53)

Where:

$W_{mid2} = W_2 - Zd_2$ and (Equation E-54)

$L_{mid2} = L_2 - Zd_2$ (Equation E-55)

W_{mid2} = width of Cell 2 at half of d_2 (ft)

L_{mid2} = length of Cell 2 at half of d_2 (ft)

Z = interior side slope as length per unit height (H:V)

Step 6: Ensure Design Requirements and Site Constraints are achieved

Check design requirements and site constraints. Modify design geometry until requirements are met. If the chosen site for the basin is inadequate to meet the design requirements, choose a new location or alternative treatment BMP.

Step 7: Size Outlet Structure

The total drawdown time for the basin should be 36-48 hours. The outlet structure shall be designed to release the bottom 50% of the detention volume (half-full to empty) over 24-32 hours, and the top half (full to half-full) in 12-16 hours. A primary overflow should be sized to pass the peak flow rate from the developed capital design storm. See Section 6 for outlet structure sizing methodologies.

Step 8: Determine Emergency Spillway Requirements

For online basins, an emergency overflow spillway should be sized to pass flows greater than the design peak runoff discharge rate for the 100-yr, 24-hr storm in order to prevent overtopping of the walls or berms in the event that a blockage of the riser occurs. For offline basins, an emergency spillway or riser should be sized to pass

the 100-yr, 24-hr post-development peak storm water runoff discharge rate directly to the downstream conveyance system or another acceptable discharge point. For sites where the emergency spillway discharges to a steep slope, an emergency overflow riser, in addition to the spillway should be provided.

Sizing Worksheet

Step 1: Determine water quality design volume		
1-1. Enter Project area (acres), $A_{project}$	A =	acres
1-2. Enter the maximum allowable percent of the Project area that may be effective impervious area (refer to permit), ranges from 5-30%, $\%_{allowable}$	$\%_{allowable}$ =	%
1-3. Determine the maximum allowed effective impervious area (ac), $EIA_{allowable} = (A_{project})*(\%_{allowable})$	$EIA_{allowable}$=	acres
1-4. Enter Project impervious fraction, Imp (e.g. 60% = 0.60)	Imp=	
1-5. Determine the Project Total Impervious area (acres), $TIA=A_{project}*Imp$	TIA=	acres
1-6. Determine the total area from which runoff must be retained (acres), $A_{retain}=TIA-EIA_{allowable}$	A_{retain} =	acres
1-7. Determine pervious runoff coefficient using Table E-1, C_p	C_p =	
1-8. Calculate runoff coefficient, $C = 0.95*imp + C_p\ (1-imp)$	C =	
1-9. Enter design rainfall depth of the storm (in), P_i	P_i =	in
1-10. Calculate rainfall depth (ft), $P = P_i/12$	P =	ft
1-11. Calculate water quality design volume (ft^3), $SQDV=43560 \bullet C*P*A_{retain}$	SQDV =	ft^3
Step 2: Calculate the volume of the active basin		
2-1. Calculate basin active volume (includes water quality design volume + sediment storage volume) (ft^3), $V_a = 1.20 \times SQDV$	V_a =	ft^3

Step 3: Determine Detention Basin Location and Preliminary Geometry Based on Site Constraints	
3-1. Based on site constraints, determine the basin geometry and the storage available by developing an elevation-storage relationship for the basin. For this simple example, assume a trapezoidal geometry for cell 1 (forebay) and cell 2.	
3-2. Enter the total surface area of the basin footprint based on site constraints (ft^2), A_{tot}	A_{tot} = ft^2
3-3. Enter the length of the basin footprint based on site constraints (ft), L_{tot}	L_{tot} = ft
3-4. Calculate the width of the basin footprint (L:W = 1.5:1 min) (ft), $W_{tot} = A_{tot} / L_{tot}$	W_{tot} = ft
3-5. Enter interior side slope as length per unit height (H:V, min = 3), Z	Z =
3-6. Enter desired freeboard depth (ft), d_{fb} (min: 2 ft on-line; 1 ft offline)	d_{fb} = ft
3-7. Calculate the length of the active volume surface area including the internal berm but excluding freeboard, $L_{av\text{-}tot} = L_{tot} - 2Zd_{fb}$	$L_{av\text{-}tot}$ = ft
3-8. Calculate the width of the active volume surface area including the internal berm but excluding freeboard, $W_{av\text{-}tot} = W_{tot} - 2Zd_{fb}$	$W_{av\text{-}tot}$ = ft
3-9. Calculate the total active volume surface area including the internal berm and excluding freeboard, $A_{av\text{-}tot} = L_{av\text{-}tot} \times W_{av\text{-}tot}$	$A_{av\text{-}tot}$ = ft^2
3-10. Enter the width of the internal berm (6 ft min), W_{berm}	W_{berm} = ft
3-11. Enter the length of the internal berm (ft), $L_{berm} = W_{av\text{-}tot}$	L_{berm} = ft
3-12. Calculate the area of the berm (ft^2), $A_{berm} = W_{berm} \times L_{berm}$	A_{berm} = ft^2
3-13. Calculate the surface area excluding the internal berm and freeboard (ft^2), $A_{av} = A_{av\text{-}tot} - A_{berm}$	A_{av} = ft^2

Step 4: Determine Dimensions of forebay	
4-1. Enter the percent of V_a in forebay (5-15% required), $\%V_1$	$\%V_1$ = %
4-2. Calculate the active volume of forebay, $V_1 = (V_a \bullet \%V_1)/100$	V_1 = ft^3
4-3. Enter a desired average depth for the active volume of forebay, d_1	d_1 = ft
4-4. Calculate the surface area for the active volume of forebay, $A_1 = V_1 / d_1$	A_1 = ft^2
4-5. Enter the width of forebay, $W_1 = W_{av\text{-}tot} = L_{berm}$	W_1 = ft
4-6. Calculate the length of forebay (<u>Note:</u> inlet and outlet should be configured to maximize the residence time), $L_1 = A_1 / W1$	L_1 = ft
Step 5: Determine Dimensions of Cell 2	
5-1. Calculate the active volume of Cell 2, $V_2 = V_a - V_1$	V_2 = ft^3
5-2. Calculate the surface area of the active volume of Cell 2, $A_2 = A_{av} - A_1$	A_2 = ft^2
5-3. Calculate the average depth for the active volume of Cell 2, $d_2 = V_2 / A_2$	d_2 = ft
5-4. Enter the width of Cell 2, $W_2 = W_1 = W_{av\text{-}tot} = L_{berm}$	W_2 = ft
5-5. Calculate the length of Cell 2, $L_2 = A_2 / W_2$	L_2 = ft
5-6. Calculate the width of Cell 2 at half of d_2, $W_{mid2} = W_2 - Zd_2$	W_{mid2} = ft
5-7. Calculate the length of Cell 2 at half of d_2, $L_{mid2} = L_2 - Zd_2$	L_{mid2} = ft

5-8. Verify that the length-to-width ratio of Cell 2 at half of d_2 is at least 1.5:1 with ≥ 2:1 preferred. If the length-to-width ratio is less than 1.5:1, modify input parameters until a ratio of at least 1.5:1 is achieved. If the input parameters cannot be modified as a result of site constraints, another site for the basin should be chosen, $LW_{mid2} = L_{mid2} / W_{mid2}$	LW_{mid2} =
Step 6: Ensure Design Requirements and Site Constraints are Achieved	
6-1. Check design requirements and site constraints. Modify design geometry until requirements are met. If the chosen site for the basin is inadequate to meet the design requirements, choose a new location or alternative treatment BMP.	
Step 7: Size Outlet Structure	
7-1. The total drawdown time for the basin should be 36-48 hours. The outlet structure shall be designed to release the bottom 50% of the detention volume (half-full to empty) over 24-32 hours, and the top half (full to half-full) in 12-16 hours. A primary overflow should be sized to pass the peak flow rate from the developed capital design storm. See Section 6 for outlet structure sizing methodologies.	
Step 8: Determine Emergency Spillway Requirements	
8-1. For online basins, an emergency overflow spillway should be sized to pass flows greater than the design peak runoff discharge rate for the 100-yr, 24-hr storm in order to prevent overtopping of the walls or berms in the event that a blockage of the riser occurs. For offline basins, an emergency spillway or riser should be sized to pass the 100-yr, 24-hr post-development peak storm water runoff discharge rate directly to the downstream conveyance system or another acceptable discharge point. For sites where the emergency spillway discharges to a steep slope, an emergency overflow riser, in addition to the spillway should be provided.	

Design Example

Step 1: Determine water quality design volume

For this design example, a 10-acre residential development with a 60% total impervious area is considered. The 85th percentile storm event for the project location is 0.75 inches.

Step 1: Determine water quality design volume			
1-1. Enter Project area (acres), $A_{project}$	A =	10	acres
1-2. Enter the maximum allowable percent of the Project area that may be effective impervious area (refer to permit), ranges from 5-30%, $\%_{allowable}$	$\%_{allowable}$ =	5	
1-3. Determine the maximum allowed effective impervious area (ac), $EIA_{allowable} = (A_{project})*(\%_{allowable})$	$EIA_{allowable}$=	0.5	acres
1-4. Enter Project impervious fraction, Imp (e.g. 60% = 0.60)	Imp=	0.6	
1-5. Determine the Project Total Impervious area (acres), $TIA=A_{project}*Imp$	TIA=	6	acres
1-6. Determine the total area from which runoff must be retained (acres), $A_{retain}=TIA-EIA_{allowable}$	A_{retain} =	5.5	acres
1-7. Determine pervious runoff coefficient using Table E-1, C_p	C_p =	0.05	
1-8. Calculate runoff coefficient, $C = 0.95*imp + C_p\ (1-imp)$	C =	0.59	
1-9. Enter design rainfall depth of the storm (in), P_i	P_i =	0.75	in
1-10. Calculate rainfall depth (ft), $P = P_i/12$	P =	0.06	ft
1-11. Calculate water quality design volume (ft^3), $SQDV=43560 \bullet C*P*A_{retain}$	SQDV =	8,500	ft^3

Step 2: Calculate Volume of the Active Basin and the Forebay Basin

Step 2: Calculate the design volume of the active basin	
2-1. Calculate basin active design volume (includes water quality design volume + sediment storage volume), $V_a = 1.20*SQDV$	V_a = 10,000 ft^3

Step 3: Determine Detention Basin Location and Preliminary Geometry Based on Site Constraints

The detention basin in this example has an internal berm separating the forebay (Cell 1) and the main basin (Cell 2). The internal berm elevation is 2 ft below the elevation of the SUSMP volume within the entire basin. The berm length is equal to the width of the basin when filled to the active design volume.

Step 3: Determine Detention Basin Location and Preliminary Geometry Based on Site Constraints	
3-1. Based on site constraints, determine the basin geometry and the storage available by developing an elevation-storage relationship for the basin. For this simple example, assume a trapezoidal geometry for cell 1 (forebay) and cell 2.	
3-2. Enter the total surface area of the basin footprint based on site constraints, A_{tot}	A_{tot} = 8,000 ft^2
3-3. Enter the length of the basin footprint based on site constraints, L_{tot} (L:W = 1.5:1 min)	L_{tot} = 200 ft
3-4. Calculate the width of the basin footprint, $W_{tot} = A_{tot} / L_{tot}$	W_{tot} = 40 ft
3-5. Enter interior side slope as length per unit height (min = 3), Z	Z = 3
3-6. Enter desired freeboard depth, d_{fb} (min: 2 ft on-line; 1 ft offline)	d_{fb} = 2 ft
3-7. Calculate the length of the active volume surface area including the internal berm but excluding freeboard, $L_{av\text{-}tot} = L_{tot} - 2Zd_{fb}$	$L_{av\text{-}tot}$ = 188 ft

Step 3: Determine Detention Basin Location and Preliminary Geometry Based on Site Constraints	
3-8. Calculate the width of the active volume surface area including the internal berm but excluding freeboard, $W_{av\text{-}tot} = W_{tot} - 2Zd_{fb}$	$W_{av\text{-}tot}$ = 28 ft
3-9. Calculate the total active volume surface area including the internal berm and excluding freeboard, $A_{av\text{-}tot} = L_{av\text{-}tot} \bullet W_{av\text{-}tot}$	$A_{av\text{-}tot}$ = 5,300 ft^2
3-10. Enter the width of the internal berm (6 ft min), W_{berm}	W_{berm} = 6 ft
3-11. Enter the length of the internal berm, $L_{berm} = W_{av\text{-}tot}$	L_{berm} = 28 ft
3-12. Calculate the area of the berm, $A_{berm} = W_{berm} \bullet L_{berm}$	A_{berm} = 170 ft^2
3-13. Calculate the surface area excluding the internal berm and freeboard, $A_{av} = A_{av\text{-}tot} - A_{berm}$	A_{av} = 5,130 ft^2

Step 4: Calculate Dimensions of Cell 1

Calculate the dimensions of the forebay (Cell 1) based on the active design volume for Cell 1 (25% of V_a) and a desired average depth, d_1. The width of the forebay, W_1, is equivalent to the length of the berm, L_{berm}, and the width of Cell 2, W_2.

Step 4: Determine Dimensions of forebay	
4-1. Enter the percent of V_a in forebay (5-15% required), $\%V_1$	$\%V_1$ = 25 %
4-2. Calculate the active volume of forebay (including sediment storage), $V_1 = (V_a \bullet \%V_1)/100$	V_1 = 2,500 ft^3
4-3. Enter a desired average depth for the active volume of forebay, d_1	d_1 = 5 ft
4-4. Calculate the surface area for the active volume of forebay, $A_1 = V_1 / d_1$	A_1 = 500 ft^2

4-5. Enter the width of forebay, $W_1 = W_{wq\text{-}tot} = L_{berm}$	W_1 = 28 ft
4-6. Calculate the length of forebay (Note: inlet and outlet should be configured to maximize the residence time), $L_1 = A_1 / W1$	L_1 = 18 ft

Step 5: Calculate the Dimensions of Cell 2

Calculate the dimensions of the main basin (Cell 2) based on the active design volume for Cell 2 and a desired average depth, d_2. A calculation of the length, L_{mid2}, and width, W_{mid2}, at half basin depth, d_2, is conducted in order to verify that the length-to-width ratio at half d_2 is greater than 1.5:1.

Step 5: Calculate the dimensions of Cell 2	
5-1. Calculate the active volume of Cell 2, $V_2 = V_a - V_1$	V_2 = 7,500 ft^3
5-2. Calculate the surface area of the active volume of Cell 2, $A_2 = A_{av} - A_1$	A_2 = 4,630 ft^2
5-3. Calculate the average depth of the active volume of Cell 2, $d_2 = V_2 / A_2$	d_2 = 1.6 ft
5-4. Enter the width of Cell 2, $W_2 = W_1 = W_{av\text{-}tot} = L_{berm}$	W_2 = 28 ft
5-5. Calculate the length of Cell 2, $L_2 = A_2 / W_2$	L_2 = 166 ft
5-6. Calculate the width of Cell 2 at half of d_2, $W_{mid2} = W_2 - Zd_2$	W_{mid2} = 23 ft
5-7. Calculate the length of Cell 2 at half of d_2, $L_{mid2} = L_2 - Zd_2$	L_{mid2} = 161 ft
5-8. Verify that the length-to-width ratio of Cell 2 at half of d_2 is at least 1.5:1 with ≥ 2:1 preferred. If the length-to-width ratio is less than 1.5:1, modify input parameters until a ratio of at least 1.5:1 is achieved. If the input parameters cannot be modified as a result of site constraints, another site for the basin should be chosen, $LW_{mid2} = L_{mid2} / W_{mid2}$	LW_{mid2} = 7

Step 6: Ensure Design Requirements and Site Constraints are Achieved

Check design requirements and site constraints. Modify design geometry until requirements are met. If the chosen site for the basin is inadequate to meet the design requirements, choose a new location or an alternative treatment BMP.

Step 7: Size Outlet Structure

The total drawdown time for the basin should be 36-48 hours. The outlet structure shall be designed to release the bottom 50% of the detention volume (half-full to empty) over 24-32 hours, and the top half (full to half-full) in 12-16 hours. A primary overflow should be sized to pass the peak flow rate from the developed capital design storm. See Section 6 for outlet structure sizing methodologies.

Step 8: Determine Emergency Spillway Requirements

For online basins, an emergency overflow spillway should be sized to pass flows greater than the design peak runoff discharge rate for the 100-yr, 24-hr storm in order to prevent overtopping of the walls or berms in the event that a blockage of the riser occurs. For offline basins, an emergency spillway or riser should be sized to pass the 100-yr, 24-hr post-development peak storm water runoff discharge rate directly to the downstream conveyance system or another acceptable discharge point. For sites where the emergency spillway discharges to a steep slope, an emergency overflow riser, in addition to the spillway should be provided.

E.9 TCM-2 Wet Detention Basin

Sizing Methodology

Wet Detention basins may be designed with or without extended detention above the permanent pool. The extended detention portion of the wet detention basin above the permanent pool, if provided, functions like a dry extended detention (ED) basin (see VEG-5: Dry Extended Detention Basin). If there is no extended detention provided, wet detention basins shall be sized to provide a minimum wet pool volume equal to the stormwater quality design volume plus an additional 5% for sediment accumulation. If extended detention is provided above the permanent pool, the sizing is dependent of the functionality of the basin; the basin may function as water quality treatment only or water quality plus peak flow attenuation.

If and the basin is designed for water quality treatment only, then the permanent pool volume shall be a minimum of 10 percent of the stormwater quality design volume and the surcharge volume (above the permanent pool) shall make up the remaining 90 percent. If extended detention is provided above the permanent pool and the basin is designed for water quality treatment and peak flow attenuation, then the permanent pool volume shall be equal to the water quality treatment volume, and the surcharge volume shall be sized to attenuate peak flows in order to meet the peak runoff discharge requirements. The extended detention portion of the wet detention basin above the permanent pool, if provided, functions like a dry extended detention (ED) basin (see VEG-5: Dry Extended Detention Basin).

Step 1: Calculate the design volume

Wet detention basins shall be sized with a permanent pool volume equal to the SQDV volume (see Section 2 and Appendix E).

Step 2: Determine the active design volume for the wet detention basin without extended detention

The active volume of the wet detention basin, V_a, shall be equal to the SQFV plus an additional 5% for sediment accumulation.

$$V_a = 1.05 \times SQDV \qquad \text{(Equation E-56)}$$

Step 3: Determine pond location and preliminary geometry based on site constraints

Based on site constraints, determine the pond geometry and the storage available by developing an elevation-storage relationship for the pond. Note that a more natural geometry may be used and is in many cases recommended; the preliminary basin geometry calculations should be used for sizing purposes only.

1) Calculate the width of the pond footprint, W_{tot}, as follows:

$$W_{tot} = \frac{A_{tot}}{L_{tot}}$$ (Equation E-57)

Where:

A_{tot} = total surface area of the pond footprint (ft^2)

L_{tot} = total length of the pond footprint (ft)

7) Calculate the length of the active volume surface area including the internal berm but excluding the freeboard, $L_{av\text{-}tot}$:

$$L_{av-tot} = L_{tot} - 2Zd_{fb}$$ (Equation E-58)

Where:

Z = interior side slope as length per unit height

d_{fb} = freeboard depth

8) Calculate the width of the active volume surface area including the internal berm but excluding freeboard, $W_{av\text{-}tot}$:

$$W_{av-tot} = W_{tot} - 2Zd_{fb}$$ (Equation E-59)

9) Calculate the total active volume surface area including the internal berm and excluding freeboard, $A_{av\text{-}tot}$:

$$A_{av-tot} = L_{av-tot} \times W_{av-tot}$$ (Equation E-60)

10) Calculate the area of the berm, A_{berm}:

$$A_{berm} = W_{berm} \times L_{berm}$$ (Equation E-61)

Where:

W_{berm} = width of the internal berm

L_{berm} = length of the internal berm

11) Calculate the active volume surface area excluding the internal berm and freeboard, A_{wq}:

$$A_{wq} = A_{wq=tot} - A_{berm}$$ (Equation E-62)

Step 4: Determine Dimensions of Forebay

The wet detention basin shall be divided into two cells separated by a berm or baffle. The forebay shall contain between 5 and 10 percent of the total volume. The berm or

baffle volume shall not count as part of the total volume. Calculate the active volume of forebay, V_1:

$$V_1 = \frac{V_a \times \%V_1}{100} \qquad \text{(Equation E-63)}$$

Where:

$\%V_1$ = percent of SQDV in forebay (%)

1) Calculate the surface area for the active volume of forebay, A_1:

$$A_1 = \frac{V_1}{d_1} \qquad \text{(Equation E-64)}$$

Where:

d_1 = average depth fo rhte active volume of forebay (ft)

2) Calculate the length of forebay, L_1. Note, inlet and outlet should be configured to maximize the residence time.

$$L_1 = \frac{A_1}{W_1} \qquad \text{(Equation E-65)}$$

Where:

W_1 = width of forebay (ft), $W_1 = W_{av\text{-}tot} = L_{berm}$

Step 5: Determine Dimensions of Cell 2

Cell 2 will consist of the remainder of the basin's active volume.

3) Calculate the active volume of Cell 2, V_2:

$$V_2 = V_a - V_1 \qquad \text{(Equation E-66)}$$

4) The minimum wetpool surface area includes 0.3 acres of wetpool per acre-foot of permanent wetpool volume. Calculate A_{min2}:

$$A_{min2} = (V_2 \times 0.3 \frac{acres}{acre-feet}) \qquad \text{(Equation E-67)}$$

5) Calculate the actual wetpool surface area, A_2:

$$A_2 = A_{av} - A_1 \qquad \text{(Equation E-68)}$$

Verify that A_2 is greater than A_{min2}. If A_2 is less than A_{min2}, then modify input parameters to increase A_2 until it is greater than A_{min2}. If site constraints limit this criterion, then another site for the pond should be chosen.

6) Calculate the top length of Cell 2, L_2:

$$L_2 = \frac{A_2}{W_2}$$ (Equation E-69)

Where:

W_2 = width of Cell 2 (ft), $W_2 = W_1 = W_{wq\text{-}tot} = L_{berm}$

7) Verify that the length-to-width ratio of Cell 2 is at least 1.5:1 with ≥ 2:1 preferred. If the length-to-width ratio is less than 1.5:1, modify input parameters until a ratio of at least 1.5:1 is achieved. If the input parameters cannot be modified as a result of site constraints, another site for the pond should be chosen.

$$LW_2 = \frac{L_2}{W_2}$$ (Equation E-70)

8) Calculate the emergent vegetation surface area, A_{ev}:

$$A_{ev} = \frac{A_2 \bullet \%A_{ev}}{100}$$ (Equation E-71)

Where:

$\%A_{ev}$ = percent of surface area that will be planted with emergent vegetation

9) Calculate the volume of the emergent vegetation shallow zone (1.5 – 3 ft), V_{ev}:

$$V_{ev} = A_{ev} \bullet d_{ev}$$ (Equation E-72)

Where:

d_{ev} = average depth of the emergent vegetation shallow zone (1.5 – 3 ft)

10) Calculate the length of the emergent vegetation shallow zone, L_{ev}:

$$L_{ev} = \frac{A_{ev}}{W_{ev}}$$ (Equation E-73)

Where:

W_{ev} = width of the emergent vegetation shallow zone (ft), $W_{ev} = W_2$

11) Calculate the volume of the deep zone, V_{deep}:

$$V_{deep} = V_2 - V_{ev}$$ (Equation E-74)

12) Calculate the surface area of the deep (>3 ft) zone, A_{deep}:

$$A_{deep} = A_2 - A_{ev} \quad \text{(Equation E-75)}$$

13) Calculate the average depth of the deep zone (4-8 ft), d_{deep}:

$$d_{deep} = \frac{V_{deep}}{A_{deep}} \quad \text{(Equation E-76)}$$

14) Calculate length of the deep zone, L_{deep}:

$$L_{deep} = \frac{A_{deep}}{W_{deep}} \quad \text{(Equation E-77)}$$

Where:

W_{deep} = width of the deep zone (ft), $W_{deep} = W_2$

Step 6: Ensure design requirements and site constraints are achieved

Check design requirements and site constraints. Modify design geometry until requirements are met. If the chosen site for the basin is inadequate to meet the design requirements, choose a new location for the BMP.

Step 7: Size Outlet Structure

For extended detention wet detention basin, outlet structures shall be designed to provide 12 to 48 hour emptying time for the water quality volume above the permanent pool.

The basin outlet pipe shall be sized, at a minimum, to pass flows greater than the stormwater quality design peak flow for off-line basins or flows greater than the peak runoff discharge rate for the 100-year, 24-hr design storm for on-line basins.

Step 8: Determine Emergency Spillway Requirements

For online basins, an emergency overflow spillway should be sized to pass flows greater than the design peak runoff discharge rate for the 100-yr, 24-hr storm to prevent overtopping of the walls or berms in the event that a blockage of the riser occurs. For offline basins, an emergency spillway or riser should be sized to pass the water quality design storm. For sites where the emergency spillway discharges to a steep slope, an emergency overflow riser, in addition to the spillway should be provided.

Sizing Worksheet

Step 1: Determine water quality design volume		
1-1. Enter drainage area, A	A =	acres
1-2. Enter the maximum allowable percent of the Project area that may be effective impervious area (refer to permit), ranges from 5-30%, $\%_{allowable}$	$\%_{allowable}$ =	%
1-3. Determine the maximum allowed effective impervious area, $EIA_{allowable} = (A_{project})*(\%_{allowable})$	$EIA_{allowable}$=	acres
1-4. Enter Project impervious fraction, *Imp* (e.g. 60% = 0.60)	Imp=	
1-5. Determine the Project Total Impervious area, $TIA=A_{project}*Imp$	TIA=	acres
1-6. Determine the total area from which runoff must be retained, $A_{retain}=TIA-EIA_{allowable}$	A_{retain} =	acres
1-7. Determine pervious runoff coefficient using Table E-1, C_p	C_p =	
1-8. Calculate runoff coefficient, $C = 0.95*imp + C_p\ (1-imp)$	C =	
1-9. Enter design rainfall depth of the storm, P_i (in)	P_i =	in
1-10. Calculate rainfall depth, $P = P_i/12$	P =	ft
1-11. Calculate water quality design volume, $SQDV = 43560 \bullet P*A_{retain}*C$	SQDV =	ft^3
Step 2: Determine active design volume for the wet pond without extended detention		
2-1. Calculate the active design volume (without extended detention), $V_a = 1.05*SQDV$	V_a =	ft^3

Step 3: Determine Pond Location and Preliminary Geometry Based on Site Constraints	
3-1. Based on site constraints, determine the pond geometry and the storage available by developing an elevation-storage relationship for the pond. For this simple example, assume a trapezoidal geometry for cell 1 (forebay) and cell 2.	
3-2. Enter the total surface area of the pond footprint based on site constraints, A_{tot}	A_{tot} = ft^2
3-3. Enter the length of the pond footprint based on site constraints, L_{tot}	L_{tot} = ft
3-4. Calculate the width of the pond footprint, $W_{tot} = A_{tot} / L_{tot}$	W_{tot} = ft
3-5. Enter interior side slope as length per unit height (min = 3), Z	Z =
3-6. Enter desired freeboard depth, d_{fb} (1 ft min)	d_{fb} = ft
3-7. Calculate the length of the water quality volume surface area including the internal berm but excluding freeboard, $L_{av\text{-}tot} = L_{tot} - 2Zd_{fb}$	$L_{av\text{-}tot}$ = ft
3-8. Calculate the width of the water quality volume surface area including the internal berm but excluding freeboard, $W_{av\text{-}tot} = W_{tot} - 2Zd_{fb}$	$W_{av\text{-}tot}$ = ft
3-9. Calculate the total water quality volume surface area including the internal berm and excluding freeboard, $A_{av\text{-}tot} = L_{av\text{-}tot} \bullet W_{av\text{-}tot}$	$A_{av\text{-}tot}$ = ft^2
3-10. Enter the width of the internal berm (6 ft min), W_{berm}	W_{berm} = ft
3-11. Enter the length of the internal berm, $L_{berm} = W_{av\text{-}tot}$	L_{berm} = ft
3-12. Calculate the area of the berm, $A_{berm} = W_{berm} \bullet L_{berm}$	A_{berm} = ft^2

3-13. Calculate the water quality volume surface area excluding the internal berm and freeboard, $A_{av} = A_{av\text{-}tot} - A_{berm}$	A_{av} = ft^2
Step 4: Determine Dimensions of forebay	
4-1. Enter the percent of V_a in forebay (5-10% required), $\%V_1$	$\%V_1$ = %
4-2. Calculate the active volume of forebay (includes sediment storage volume), $V_1 = (V_a \bullet \%V_1) /100$	V_1 = ft^3
4-3. Enter desired average depth of forebay (5-9 ft including sediment storage of 1 ft), d_1	d_1 = ft
4-4. Calculate the surface area for the active volume of forebay, $A_1 = V_1 / d_1$	A_1 = ft^2
4-5. Enter the width of forebay, $W_1 = W_{av\text{-}tot} = L_{berm}$	W_1 = ft
4-6. Calculate the length of forebay (<u>Note:</u> inlet and outlet should be configured to maximize the residence time), $L_1 = A_1 / W1$	L_1 = ft
Step 5: Determine Dimensions of Cell 2	
5-1. Calculate the active volume of Cell 2, $V_2 = V_a - V_1$	V_2 = ft^3
5-2. Determine minimum wetpool surface area, $A_{min2} = V_2 \bullet 0.3$	A_{min2} = ft^2
5-3. Determine actual wetpool surface area, $A_2 = A_{av} - A_1$	A_2 = ft^2
5-4. • If A_2 is greater than A_{min2} then move on to step 5-5. • If A_2 is less than A_{min2}, then modify input parameters to increase A_2 until it is greater than A_{min2}. If site constraints limit this criterion, then another site for the pond should be chosen.	
5-5. Enter width of Cell 2, $W_2 = W_1 = W_{av\text{-}tot} = L_{berm}$	W_2 = ft

5-6. Calculate top length of Cell 2, $L_2 = A_2 / W_2$	L_2 = ft
5-7. Verify that the length-to-width ratio of Cell 2 is at least 1.5:1 with ≥ 2:1 preferred. If the length-to-width ratio is less than 1.5:1, modify input parameters until a ratio of at least 1.5:1 is achieved. If the input parameters cannot be modified as a result of site constraints, another site for the pond should be chosen, $LW_2 = L_2 / W_2$	LW_2 =
5-8. Enter percent of surface area that will be planted with emergent vegetation (25-75%), $\%A_{ev}$	$\%A_{ev}$ = %
5-9. Calculate emergent vegetation surface area, $A_{ev} = (A_2 \bullet \%A_{ev})/100$	A_{ev} = ft^2
5-10. Enter average depth of emergent vegetation shallow zone (1.5 – 3 ft), d_{ev}	d_{ev} = ft
5-11. Calculate volume of emergent vegetation shallow zone (1.5 – 3 ft), $V_{ev} = A_{ev} \bullet d_{ev}$	V_{ev} = ft^3
5-12. Enter width of emergent vegetation shallow zone, $W_{ev} = W_2$	W_{ev}= ft
5-13. Calculate length of emergent vegetation shallow zone, $L_{ev} = A_{ev} / W_{ev}$	L_{ev} = ft
5-14. Calculate volume of deep zone, $V_{deep} = V_2 - V_{ev}$	V_{deep} = ft^3
5-15. Calculate surface area of deep (>3 ft) zone, $A_{deep} = A_2 - A_{ev}$	A_{deep} = ft^2
5-16. Calculate average depth of deep zone (4 - 8 ft), $d_{deep} = V_{deep} / A_{deep}$	d_{deep} = ft
5-17. Enter width of deep zone, $W_{deep} = W_2$	W_{deep} = ft
5-18. Calculate length of deep zone, $L_{deep} = A_{deep} / W_{deeo}$	L_{deep} = ft

Step 6: Ensure Design Requirements and Site Constraints are Achieved
6-1. Check design requirements and site constraints. Modify design geometry until requirements are met. If the chosen site for the basin is inadequate to meet the design requirements, choose a new location for the BMP.
Step 7: Size Outlet Structure
7-1. The basin outlet pipe shall be sized, at a minimum, to pass flows greater than the stormwater quality design peak flow for off-line basins or flows greater than the peak runoff discharge rate for the 100-year, 24-hr design storm for on-line basins.
Step 8: Determine Emergency Spillway Requirements
8-1. For online basins, an emergency overflow spillway should be sized to pass flows greater than the design peak runoff discharge rate for the 100-yr, 24-hr storm to prevent overtopping of the walls or berms in the event that a blockage of the riser occurs. For offline basins, an emergency spillway or riser should be sized to pass the water quality design storm. For sites where the emergency spillway discharges to a steep slope, an emergency overflow riser, in addition to the spillway should be provided.

Design Example

Wet detention basin siting requires the following considerations prior to construction: (1) availability of base flow – wet detention basins require a regular source of water if water level is to be maintained, (2) surface space availability – large footprint area is required, and (3) compatibility with flood control – basins must not interfere with flood control functions of existing conveyance and detention structures.

The wet detention basin in this example does not have extended detention. An internal berm separates the forebay (Cell 1) and the main basin (Cell 2). The berm is at the elevation of the active volume design surface which is also the permanent wetpool elevation.

Step 1: Determine Water Quality Design Volume

For this design example, a 20-acre residential development with a 60% total impervious area is considered. The 85th percentile storm event for the project location is 0.75 inches.

Step 1: Determine water quality design volume			
1-1. Enter drainage area, A	A =	20	acres
1-2. Enter the maximum allowable percent of the Project area that may be effective impervious area (refer to permit), ranges from 5-30%, $\%_{allowable}$	$\%_{allowable}$ =	5	
1-3. Determine the maximum allowed effective impervious area, $EIA_{allowable} = (A_{project})*(\%_{allowable})$	$EIA_{allowable}$=	1.0	acres
1-4. Enter Project impervious fraction, *Imp* (e.g. 60% = 0.60)	Imp=	0.6	
1-5. Determine the Project Total Impervious area, $TIA=A_{project}*Imp$	TIA=	12	acres
1-6. Determine the total area from which runoff must be retained, $A_{retain}=TIA-EIA_{allowable}$	A_{retain} =	11	acres
1-7. Determine pervious runoff coefficient using Table E-1, C_p	C_p =	0.05	
1-8. Calculate runoff coefficient, $C = 0.95*imp + C_p\ (1-imp)$	C =	0.59	
1-9. Enter design rainfall depth of the storm, P_i (in)	P_i =	0.75	in
1-10. Calculate rainfall depth, $P = P_i/12$	P =	0.06	ft

1-11. Calculate water quality design volume, $SQDV = 43560 \bullet P * A_{retain} * C$	SQDV = 17,000 ft^3

Step 2: Determine Active Design Volume for a Wet Detention Basin without Extended Detention

If there is no extended detention provided, wet detention basins shall be sized to provide a minimum wet pool volume equal to the water quality design volume plus an additional 5% for sediment accumulation.

Step 2: Determine Active Design Volume for a Wet Detention Basin without Extended Detention	
2-1. Calculate the active design volume (without extended detention), $V_a = 1.05 * SQDV$	V_a = 17,800 ft^3

Step 3: Determine Pond Location and Preliminary Geometry Based on Site Constraints

A total footprint area and total length available for the basin is provided. This step calculates the total active volume surface area which is equivalent to the permanent wetpool surface area. This step also calculates the dimensions of the internal berm.

Step 3: Determine Pond Location and Preliminary Geometry Based on Site Constraints	
3-1. Based on site constraints, determine the pond geometry and the storage available by developing an elevation-storage relationship for the pond. For this simple example, assume a trapezoidal geometry for cell 1 (forebay) and cell 2.	
3-2. Enter the total surface area of the pond footprint based on site constraints, A_{tot}	A_{tot} = 7,500 ft^2
3-3. Enter the length of the pond footprint based on site constraints, L_{tot}	L_{tot} = 150 ft
3-4. Calculate the width of the pond footprint, $W_{tot} = A_{tot} / L_{tot}$	W_{tot} = 50 ft
3-5. Enter interior side slope as length per unit height (min = 3), Z	Z = 3

Step 3: Determine Pond Location and Preliminary Geometry Based on Site Constraints			
3-6. Enter desired freeboard depth, d_{fb} (1 ft min)	d_{fb} =	2	ft
3-7. Calculate the length of the water quality volume surface area including the internal berm but excluding freeboard, $L_{av\text{-}tot} = L_{tot} - 2Zd_{fb}$	$L_{av\text{-}tot}$ =	138	ft
3-8. Calculate the width of the water quality volume surface area including the internal berm but excluding freeboard, $W_{av\text{-}tot} = W_{tot} - 2Zd_{fb}$	$W_{av\text{-}tot}$ =	38	ft
3-9. Calculate the total water quality volume surface area including the internal berm and excluding freeboard, $A_{av\text{-}tot} = L_{av\text{-}tot} \bullet W_{av\text{-}tot}$	$A_{av\text{-}tot}$ =	4,940	ft^2
3-10. Enter the width of the internal berm (6 ft min), W_{berm}	W_{berm} =	6	ft
3-11. Enter the length of the internal berm, $L_{berm} = W_{av\text{-}tot}$	L_{berm} =	38	ft
3-12. Calculate the area of the berm, $A_{berm} = W_{berm} \bullet L_{berm}$	A_{berm} =	230	ft^2
3-13. Calculate the water quality volume surface area excluding the internal berm and freeboard, $A_{av} = A_{av\text{-}tot} - A_{berm}$	A_{av} =	4,710	ft^2

Step 4: Determine Dimensions of forebay

It should be assumed that the forebay should be 5-10% of the total active design volume, V_a.

Step 4: Determine Dimensions of Cell 1			
4-1. Enter the percent of V_a in forebay (5-10% required), $\%V_1$	$\%V_1$ =	20	%
4-2. Calculate the active volume of forebay (includes sediment storage volume), $V_1 = (V_a \bullet \%V_1) /100$	V_1 =	3,560	ft^3
4-3. Enter desired average depth of forebay (5-9 ft including sediment storage of 1 ft), d_1	d_1 =	8	ft

4-4. Calculate the surface area for the active volume of forebay, $A_1 = V_1 / d_1$	A_1 =	440	ft^2
4-5. Enter the width of forebay, $W_1 = W_{av\text{-}tot} = L_{berm}$	W_1 =	38	ft
4-6. Calculate the length of forebay (Note: inlet and outlet should be configured to maximize the residence time), $L_1 = A_1 / W1$	L_1 =	12	ft

Step 5: Determine Dimensions of Cell 2

Verify that the surface area and length-to-width ratio of Cell 2 meet the design criteria. Calculate volumes, depths and surface areas for the emergent vegetation shallow zone and the deep zone.

Step 5: Determine Dimensions of Cell 2			
5-1. Calculate the active volume of Cell 2, $V_2 = V_a - V_1$	V_2 =	14,200	ft^3
5-2. Determine minimum wetpool surface area, $A_{min2} = V_2 \bullet 0.3$	A_{min2} =	4,270	ft^2
5-3. Determine actual wetpool surface area, $A_2 = A_{av} – A_1$	A_2 =	4,270	ft^2
5-4. If A_2 is greater than A_{min2} then move on to step 5-5. If A_2 is less than A_{min2}, then modify input parameters to increase A_2 until it is greater than A_{min2}. If site constraints limit this criterion, then another site for the pond should be chosen.			
5-5. Enter width of Cell 2, $W_2 = W_1 = W_{av\text{-}tot} = L_{berm}$	W_2 =	38	ft
5-6. Calculate top length of Cell 2, $L_2 = A_2 / W_2$	L_2 =	110	ft
5-7. Verify that the length-to-width ratio of Cell 2 is at least 1.5:1 with ≥ 2:1 preferred. If the length-to-width ratio is less than 1.5:1, modify input parameters until a ratio of at least 1.5:1 is achieved. If the input parameters cannot be modified as a result of site constraints, another site for the pond should be chosen, $LW_2 = L_2 / W_2$	LW_2 =	2.9	
5-8. Enter percent of surface area that will be planted with emergent vegetation (25-75%), $\%A_{ev}$	$\%A_{ev}$ =	25	%

Step 5: Determine Dimensions of Cell 2	
5-9. Calculate emergent vegetation surface area, $A_{ev} = (A_2 \bullet \%A_{ev})/100$	A_{ev} = 1,070 ft^2
5-10. Enter average depth of emergent vegetation shallow zone (1.5 – 3 ft), d_{ev}	d_{ev} = 2 ft
5-11. Calculate volume of emergent vegetation shallow zone (1.5 – 3 ft), $V_{ev} = A_{ev} \bullet d_{ev}$	V_{ev} = 2,130 ft^3
5-12. Enter width of emergent vegetation shallow zone, $W_{ev} = W_2$	W_{ev}= 38 ft
5-13. Calculate length of emergent vegetation shallow zone, $L_{ev} = A_{ev} / W_{ev}$	L_{ev} = 56 ft
5-14. Calculate volume of deep zone, $V_{deep} = V_2 - V_{ev}$	V_{deep} = 13,100 ft^3
5-15. Calculate surface area of deep (>3 ft) zone, $A_{deep} = A_2 - A_{ev}$	A_{deep} = 3,200 ft^2
5-16. Calculate average depth of deep zone (4 - 8 ft), $d_{deep} = V_{deep} / A_{deep}$	d_{deep} = 4.1 ft
5-17. Enter width of deep zone, $W_{deep} = W_2$	W_{deep} = 28 ft
5-18. Calculate length of deep zone, $L_{deep} = A_{deep} / W_{deeo}$	L_{deep} = 114 ft

Step 6: Ensure Design Requirements and Site Conditions are Achieved

Check design requirements and site constraints. Modify design geometry until requirements are met. If the chosen site for the basin is inadequate to meet the design requirements, choose a new location for the BMP.

Step 7: Size Outlet Structure

The basin outlet pipe shall be sized, at a minimum, to pass flows greater than the stormwater quality design peak flow for off-line basins or flows greater than the peak runoff discharge rate for the 100-year, 24-hr design storm for on-line basins.

Step 8: Determine Emergency Spillway Requirements

For online basins, an emergency overflow spillway should be sized to pass flows greater than the design peak runoff discharge rate for the 100-yr, 24-hr storm to prevent overtopping of

the walls or berms in the event that a blockage of the riser occurs. For offline basins, an emergency spillway or riser should be sized to pass the water quality design storm. For sites where the emergency spillway discharges to a steep slope, an emergency overflow riser, in addition to the spillway should be provided.

E.10 TCM-3 Constructed Wetland

Sizing Methodology

In most cases, the constructed treatment wetland permanent pool shall be sized to be greater than or equal to the stormwater quality design volume. If extended detention is provided above the permanent pool and the wetland is designed for water quality treatment only, then the permanent pool volume shall be a minimum of 80 percent of the stormwater quality design volume and the surcharge volume (above the permanent pool) shall make up the remaining 20 percent and provide at least 12 hours of detention. If extended detention is provided and the basin is designed for water quality treatment and peak flow attenuation, then the permanent pool volume shall be equal to the water quality treatment volume and the surcharge volume shall be sized to attenuate peak flows to meet the peak runoff discharge requirements. The extended detention portion of the wetland above the permanent pool, if provided, functions like a dry extended detention (ED) basin (see VEG-5: Dry Extended Detention Basin).

Step 1: Calculate the design volume

Constructed wetlands shall be sized to be greater than or equal to the SQDV volume (see Section 2 and Appendix E).

Step 2: Determine the Wetland Location, Wetland Type and Preliminary Geometry Based on Site Constraints

Based on site constraints, determine the wetland geometry and the storage available by developing an elevation-storage relationship for the wetland. The equations provided below assume a trapezoidal geometry for cell 1 (Forebay) and cell 2, and assumes that the wetland does not have extended detention.

1) Calculate the width of the wetland footprint, W_{tot}, as follows:

$$W_{tot} = \frac{A_{tot}}{L_{tot}} \qquad \text{(Equation E-78)}$$

Where:

A_{tot} = total surface area of the wetland footprint (ft^2)

L_{tot} = total length of the wetland footprint (ft)

12) Calculate the length of the water quality volume surface area including the internal berm but excluding the freeboard, $L_{wq\text{-}tot}$:

$$L_{wq-tot} = L_{tot} - 2Zd_{fb} \qquad \text{(Equation E-79)}$$

Where:

Z = interior side slope as length per unit height

d_{fb} = freeboard depth

13) Calculate the width of the water quality volume surface area including the internal berm but excluding freeboard, $W_{wq\text{-}tot}$:

$$W_{wq-tot} = W_{tot} - 2Zd_{fb} \quad \text{(Equation E-80)}$$

14) Calculate the total water quality volume surface area including the internal berm and excluding freeboard, $A_{wq\text{-}tot}$:

$$A_{wq-tot} = L_{wq-tot} \times W_{wq-tot} \quad \text{(Equation E-81)}$$

15) Calculate the area of the berm, A_{berm}:

$$A_{berm} = W_{berm} \times L_{berm} \quad \text{(Equation E-82)}$$

Where:

W_{berm} = width of the internal berm

L_{berm} = length of the internal berm

16) Calculate the water quality surface area excluding the internal berm and freeboard, A_{wq}:

$$A_{wq} = A_{wq=tot} - A_{berm} \quad \text{(Equation E-83)}$$

Step 3: Determine Dimensions of Forebay

30-50% of the SQDV is required to be within the active volume of forebay.

1) Calculate the active volume of forebay, V_1:

$$V_1 = \frac{SQDV \times \%V_1}{100} \quad \text{(Equation E-84)}$$

Where:

$\%V_1$ = percent of SQDV in forebay (%)

2) Calculate the surface area for the active volume of forebay, A_1:

$$A_1 = \frac{V_1}{d_1} \quad \text{(Equation E-85)}$$

Where:

d_1 = average depth fo rhte active volume of forebay (2 -4 ft) (ft)

3) Calculate the length of forebay, L_1. Note, inlet and outlet should be configured to maximize the residence time.

$$L_1 = \frac{A_1}{W_1} \qquad \text{(Equation E-86)}$$

Where:

W_1 = width of forebay (ft), $W_1 = W_{av\text{-}tot} = L_{berm}$

Step 4: Determine Dimensions of Cell 2

Cell 2 will consist of the remainder of the basin's active volume.

1) Calculate the active volume of Cell 2, V_2:

$$V_2 = SQDV - V_1 \qquad \text{(Equation E-87)}$$

2) Calculate the surface area of Cell 2, A_2:

$$A_2 = A_{wq} - A_1 \qquad \text{(Equation E-88)}$$

3) Calculate the top length of Cell 2, L_2:

$$L_2 = \frac{A_2}{W_2} \qquad \text{(Equation E-89)}$$

Where:

W_2 = width of Cell 2 (ft), $W_2 = W_1 = W_{wq\text{-}tot} = L_{berm}$

4) Verify that the length-to-width ratio of Cell 2, LW_2, is at least 3:1 with ≥ 4:1 preferred. If the length-to-width ratio is less than 3:1, modify input parameters until a ratio of at least 3:1 is achieved. If the input parameters cannot be modified as a result of site constraints, another site for the pond should be chosen.

$$LW_2 = \frac{L_2}{W_2} \qquad \text{(Equation E-90)}$$

5) Calculate the very shallow zone surface area, A_{vs}:

$$A_{vs} = \frac{A_2 \bullet \%A_{vs}}{100} \qquad \text{(Equation E-91)}$$

Where:

$\%A_{vs}$ = percent of surface area of very shallow zone

6) Calculate the volume of the shallow zone, V_{vs}:

$$V_{vs} = A_{vs} \bullet d_{vs}$$ (Equation E-92)

Where:

d_{vs} = average depth of the very shallow zone (0.1 – 1 ft)

7) Calculate the length of the very shallow zone, L_{vs}:

$$L_{vs} = \frac{A_{vs}}{W_{vs}}$$ (Equation E-93)

Where:

W_{vs} = width of the very shallow zone (ft), $W_{vs} = W_2$

8) Calculate the surface area of the shallow zone, A_s:

$$A_s = \frac{A_2 \bullet \%A_s}{100}$$ (Equation E-94)

Where:

$\%A_s$ = percent of surface area of shallow zone

9) Calculate the volume of the shallow zone, V_s:

$$V_s = A_s \bullet d_s$$ (Equation E-95)

Where:

d_s = average depth of shallow zone (1 - 3 ft)

10) Calculate length of the shallow zone, L_s:

$$L_s = \frac{A_s}{W_s}$$ (Equation E-96)

Where:

W_s = width of the shallow zone (ft), $W_s = W_2$

11) Calculate the surface area of the deep zone, A_{deep}:

$$A_{deep} = A_2 - A_{vs} - A_s$$ (Equation E-97)

12) Calculate the volume of the deep zone, V_{deep}:

$$V_{deep} = V_2 - V_{vs} - V_s$$ (Equation E-98)

13) Calculate the average depth of the deep zone (3-5 ft), d_{deep}:

$$d_{deep} = \frac{V_{deep}}{A_{deep}} \qquad \text{(Equation E-99)}$$

14) Calculate length of the deep zone, L_{deep}:

$$L_{deep} = \frac{A_{deep}}{W_{deep}} \qquad \text{(Equation E-100)}$$

Where:

W_{deep} = width of the deep zone (ft), $W_{deep} = W_2$

Step 5: Ensure design requirements and site constraints are achieved

Check design requirements and site constraints. Modify design geometry until requirements are met. If the chosen site for the basin is inadequate to meet the design requirements, choose a new location or alternative treatment BMP.

Step 6: Size Outlet Structure

For wetlands with detention, the outlet structures shall be designed to provide 12 hours emptying time for the water quality volume or the required detention necessary for achieving the peak runoff discharge requirements if the extended detention is designed for flow attenuation.

The wetland outlet pipe shall be sized, at a minimum, to pass flows greater than the stormwater quality design peak flow for on-line basins or flows greater than the peak runoff discharge rate for the 100-year, 24-hr design storm for on-line basins.

Step 7: Determine Emergency Spillway Requirements

For online basins, an emergency overflow spillway should be sized to pass flows greater than the design peak runoff discharge rate for the 100-yr, 24-hr storm in order to prevent overtopping of the walls or berms in the event that a blockage of the riser occurs. For offline basins, an emergency spillway or riser should be sized to pass the 100-yr, 24-hr post-development peak storm water runoff discharge rate directly to the downstream conveyance system or another acceptable discharge point. For sites where the emergency spillway discharges to a steep slope, an emergency overflow riser, in addition to the spillway should be provided.

Sizing Worksheet

Step 1: Determine water quality design volume		
1-1. Enter drainage area, A	A =	acres
1-2. Enter the maximum allowable percent of the Project area that may be effective impervious area (refer to permit), ranges from 5-30%, $\%_{allowable}$	$\%_{allowable}$ =	%
1-3. Determine the maximum allowed effective impervious area, $EIA_{allowable} = (A_{project})*(\%_{allowable})$	$EIA_{allowable}$=	acres
1-4. Enter Project impervious fraction, *Imp* (e.g. 60% = 0.60)	Imp=	
1-5. Determine the Project Total Impervious area, $TIA=A_{project}*Imp$	TIA=	acres
1-6. Determine the total area from which runoff must be retained, $A_{retain}=TIA-EIA_{allowable}$	A_{retain} =	acres
1-7. Determine pervious runoff coefficient using Table E-1, C_p	C_p =	
1-8. Calculate runoff coefficient, $C = 0.95*imp + C_p\ (1-imp)$	C =	
1-9. Enter design rainfall depth of the storm, P_i (in)	P_i =	in
1-10. Calculate rainfall depth, $P = P_i/12$	P =	ft
1-11. Calculate water quality design volume, $SQDV = 43560 \bullet P*A_{retain}*C$	SQDV =	ft^3
Step 2: Determine Wetland Location, Wetland Type and Preliminary Geometry Based on Site Constraints		
2-1. Based on site constraints, determine the wetland geometry and the storage available by developing an elevation-storage relationship for the wetland. For this simple example, assume a trapezoidal geometry for cell 1 (forebay) and cell 2. The wetland does not have extended detention.		

2-2. Enter the total surface area of the wetland footprint based on site constraints, A_{tot}	A_{tot} = ft^2
2-3. Enter the length of the wetland footprint based on site constraints, L_{tot}	L_{tot} = ft
2-4. Calculate the width of the wetland footprint, $W_{tot} = A_{tot} / L_{tot}$	W_{tot} = ft
2-5. Enter interior side slope as length per unit height (min = 3), Z	Z =
2-6. Enter desired freeboard depth, d_{fb}	d_{fb} = ft
2-7. Calculate the length of the water quality volume surface area including the internal berm but excluding freeboard, $L_{wq\text{-}tot} = L_{tot} - 2Zd_{fb}$	$L_{wq\text{-}tot}$ = ft
2-8. Calculate the width of the water quality volume surface area including the internal berm but excluding freeboard, $W_{wq\text{-}tot} = W_{tot} - 2Zd_{fb}$	$W_{wq\text{-}tot}$ = ft
2-9. Calculate the total water quality volume surface area including the internal berm and excluding freeboard, $A_{wq\text{-}tot} = L_{wq\text{-}tot} \bullet W_{wq\text{-}tot}$	$A_{wq\text{-}tot}$ = ft^2
2-10. Enter the width of the internal berm (6 ft min), W_{berm}	W_{berm} = ft
2-11. Enter the length of the internal berm, $L_{berm} = W_{wq\text{-}tot}$	L_{berm} = ft
2-12. Calculate the area of the berm, $A_{berm} = W_{berm} \bullet L_{berm}$	A_{berm} = ft^2
2-13. Calculate the water quality volume surface area excluding the internal berm and freeboard, $A_{wq} = A_{wq\text{-}tot} - A_{berm}$	A_{wq} = ft^2
Step 3: Determine Dimensions of forebay	
3-1. Enter the percent of SQDV in forebay (30-50% required), $\%V_1$	$\%V_1$ = %
3-2. Calculate the active volume of forebay (includes water quality volume + sediment storage volume),	V_1 = ft^3

V_1 = (SQDV • %V_1) /100	
3-3. Enter desired average depth of forebay1 (2-4 ft including sediment storage of 1 ft), d_1	d_1 = ft
3-4. Calculate the surface area for the water quality volume of forebay, $A_1 = V_1 / d_1$	A_1 = ft^2
3-5. Enter the width of forebay, $W_1 = W_{av\text{-}tot} = L_{berm}$	W_1 = ft
3-6. Calculate the length of forebay (Note: inlet and outlet should be configured to maximize the residence time), $L_1 = A_1$ / W1	L_1 = ft
Step 4: Determine Dimensions of Cell 2	
4-1. Calculate the active volume of Cell 2, V_2 = SQDV - V_1	V_2 = ft^3
4-2. Calculate surface area of Cell 2, $A_2 = A_{wq} - A_1$	A_2 = ft^2
4-3. Enter width of Cell 2, $W_2 = W_1 = W_{wq\text{-}tot} = L_{berm}$	W_2 = ft
4-4. Calculate top length of Cell 2, $L_2 = A_2 / W_2$	L_2 = ft
4-5. Verify that the length-to-width ratio of Cell 2 is at least 3:1 with ≥ 4:1 preferred. If the length-to-width ratio is less than 3:1, modify input parameters until a ratio of at least 3:1 is achieved. If the input parameters cannot be modified as a result of site constraints, another site for the pond should be chosen, $LW_2 = L_2 / W_2$	LW_2 =
4-6. Enter percent of surface area of very shallow zone, %A_{vs}	%A_{vs} = %
4-7. Calculate very shallow zone surface area, A_{vs} = (A_2 • %A_{vs})/100	A_{vs} = ft^2
4-8. Enter average depth of very shallow zone (0.1 - 1 ft), d_{vs}	d_{vs} = ft
4-9. Calculate volume of very shallow zone, $V_{vs} = A_{vs}$ • d_{vs}	V_{vs} = ft^3
4-10. Enter width of very shallow zone, $W_{vs} = W_2$	W_{vs} = ft

4-11. Calculate length of very shallow zone, $L_{vs} = A_{vs} / W_{vs}$	L_{vs} = ft
4-12. Enter percent of surface area of shallow zone, $\%A_s$	$\%A_s$ = %
4-13. Calculate surface area of shallow zone, $A_s = (A_2 \bullet \%A_s)/100$	A_s = ft^2
4-14. Enter average depth of shallow zone (1 - 3 ft), d_s	d_s = ft
4-15. Calculate volume of shallow zone, $V_s = A_s \bullet d_s$	V_s = ft^3
4-16. Enter width of shallow zone, $W_s = W_2$	W_s = ft
4-17. Calculate length of shallow zone, $L_s = A_s / W_s$	L_s = ft
4-18. Calculate surface area of deep zone, $A_{deep} = A_2 - A_{vs} - A_s$	A_{deep} = ft^2
4-19. Calculate volume of deep zone, $V_{deep} = V_2 - V_{vs} - V_s$	V_{deep} = ft^3
4-20. Calculate average depth of deep zone (3 - 5 ft), $d_{deep} = V_{deep} / A_{deep}$	d_{deep} = ft
4-21. Enter width of deep zone, $W_{deep} = W_2$	W_{deep} = ft
4-22. Calculate length of deep zone, $L_{deep} = A_{deep} / W_{deeo}$	L_{deep} = ft
Step 5: Ensure Design Requirements and Site Constraints are Achieved	
5-1. Check design requirements and site constraints. Modify design geometry until requirements are met. If the chosen site for the wetland is inadequate to meet the design requirements, choose a new location for the wetland or select an alternative treatment BMP.	

Step 6: Size Outlet Structure
6-1. The wetland outlet pipe shall be sized, at a minimum, to pass flows greater than the stormwater quality design peak flow for off-line basins or flow from the capital storm for on-line basins.
Step 7: Determine Emergency Spillway Requirements
7-1. For online basins, an emergency overflow spillway should be sized to pass flows greater than the design peak runoff discharge rate for the 100-yr, 24-hr storm in order to prevent overtopping of the walls or berms in the event that a blockage of the riser occurs. For offline basins, an emergency spillway or riser should be sized to pass the 100-yr, 24-hr post-development peak storm water runoff discharge rate directly to the downstream conveyance system or another acceptable discharge point.

Design Example

Wetland siting requires the following considerations prior to construction: (1) availability of base flow – stormwater wetlands require a regular source of water to support wetland biota, (2) slope stability – stormwater wetlands are not permitted near steep slope hazard areas, (3) surface space availability – large footprint area is required, and (4) compatibility with flood control – basins must not interfere with flood control functions of existing conveyance and detention structures.

The wetland in this example does not have extended detention. An internal berm separates the forebay (Cell 1) and the main basin (Cell 2). The berm is at the elevation of the active volume (SQDV plus sediment storage volume) design surface which is also the permanent wetpool elevation.

Step 1: Determine Water Quality Design Volume

For this design example, a 20-acre residential development with a 60% total impervious area is considered. The 85th percentile storm event for the project location is 0.75 inches.

Step 1: Determine water quality design volume			
1-1. Enter drainage area, A	A =	20	acres
1-2. Enter the maximum allowable percent of the Project area that may be effective impervious area (refer to permit), ranges from 5-30%, $\%_{allowable}$	$\%_{allowable}$ =	5	
1-3. Determine the maximum allowed effective impervious area, $EIA_{allowable} = (A_{project})*(\%_{allowable})$	$EIA_{allowable}$=	1.0	acres
1-4. Enter Project impervious fraction, Imp (e.g. 60% = 0.60)	Imp=	0.6	
1-5. Determine the Project Total Impervious area, $TIA=A_{project}*Imp$	TIA=	12	acres
1-6. Determine the total area from which runoff must be retained, $A_{retain}=TIA-EIA_{allowable}$	A_{retain} =	11	acres
1-7. Determine pervious runoff coefficient using Table E-1, C_p	C_p =	0.05	
1-8. Calculate runoff coefficient, $C = 0.95*imp + C_p\ (1-imp)$	C =	0.59	
1-9. Enter design rainfall depth of the storm, P_i (in)	P_i =	0.75	in

1-10. Calculate rainfall depth, $P = P_i/12$	P = 0.06 ft
1-11. Calculate water quality design volume, $SQDV = 43560 \cdot P * A_{retain} * C$	SQDV = 17,000 ft^3

Step 2: Determine Pond Location and Preliminary Geometry Based on Site Constraints

A total footprint area and total length available for the wetland is provided. This step calculates the total active volume surface area which is equivalent to the permanent wetpool surface area. This step also calculates the dimensions of the internal berm.

Step 2: Determine Wetland Location, Wetland Type and Preliminary Geometry Based on Site Constraints	
2-1. Based on site constraints, determine the wetland geometry and the storage available by developing an elevation-storage relationship for the wetland. For this simple example, assume a trapezoidal geometry for cell 1 (forebay) and cell 2. The wetland does not have extended detention.	
2-2. Enter the total surface area of the wetland footprint based on site constraints, A_{tot}	A_{tot} = 7,500 ft^2
2-3. Enter the length of the wetland footprint based on site constraints, L_{tot}	L_{tot} = 200 ft
2-4. Calculate the width of the wetland footprint, $W_{tot} = A_{tot} / L_{tot}$	W_{tot} = 38 ft
2-5. Enter interior side slope as length per unit height (min = 3), Z	Z = 3
2-6. Enter desired freeboard depth, d_{fb}	d_{fb} = 2 ft
2-7. Calculate the length of the water quality volume surface area including the internal berm but excluding freeboard, $L_{wq\text{-}tot} = L_{tot} - 2Zd_{fb}$	$L_{wq\text{-}tot}$ = 188 ft
2-8. Calculate the width of the water quality volume surface area including the internal berm but excluding freeboard, $W_{wq\text{-}tot} = W_{tot} - 2Zd_{fb}$	$W_{wq\text{-}tot}$ = 26 ft

Step 2: Determine Wetland Location, Wetland Type and Preliminary Geometry Based on Site Constraints			
2-9. Calculate the total water quality volume surface area including the internal berm and excluding freeboard, $A_{wq\text{-}tot} = L_{wq\text{-}tot} \bullet W_{wq\text{-}tot}$	$A_{wq\text{-}tot}$ =	4,900	ft^2
2-10. Enter the width of the internal berm (6 ft min), W_{berm}	W_{berm} =	6	ft
2-11. Enter the length of the internal berm, $L_{berm} = W_{wq\text{-}tot}$	L_{berm} =	26	ft
2-12. Calculate the area of the berm, $A_{berm} = W_{berm} \bullet L_{berm}$	A_{berm} =	160	ft^2
2-13. Calculate the active volume surface area excluding the internal berm and freeboard, $A_{wq} = A_{wq\text{-}tot} - A_{berm}$	A_{wq} =	4,740	ft^2

Step 3: Determine Dimensions of Forebay

It should be assumed that the forebay should be 30-50% of the SQDV.

Step 3: Determine Dimensions of forebay			
3-1. Enter the percent of SQDV in forebay (30-50% required), $\%V_1$	$\%V_1$ =	30	%
3-2. Calculate the active volume of forebay (including sediment storage), V_1 = (SQDV • $\%V_1$)/100	V_1 =	5,100	ft^3
3-3. Enter desired average depth of forebay (2-4 ft including sediment storage of 1 ft), d_1	d_1 =	4	ft
3-4. Calculate the surface area for the water quality volume of forebay, $A_1 = V_1 / d_1$	A_1 =	1,275	ft^2
3-5. Enter the width of forebay, $W_1 = W_{av\text{-}tot} = L_{berm}$	W_1 =	38	ft
3-6. Calculate the length of forebay (<u>Note:</u> inlet and outlet should be configured to maximize the residence time), $L_1 = A_1 / W1$	L_1 =	34	ft

Step 4: Determine Dimensions of Cell 2

Verify that the surface area and length-to-width ratio of Cell 2 meet the design criteria. Calculate volumes, depths and surface areas for the very shallow, shallow and deep zones.

Step 4: Determine Dimensions of Cell 2			
4-1. Calculate the active volume of Cell 2, V_2 = SQDV - V_1	V_2 =	11,900	ft^3
4-2. Calculate surface area of Cell 2, $A_2 = A_{wq} - A_1$	A_2 =	3,460	ft^2
4-3. Enter width of Cell 2, $W_2 = W_1 = W_{wq\text{-}tot} = L_{berm}$	W_2 =	26	ft
4-4. Calculate top length of Cell 2, $L_2 = A_2 / W_2$	L_2 =	130	ft
4-5. Verify that the length-to-width ratio of Cell 2 is at least 3:1 with ≥ 4:1 preferred. If the length-to-width ratio is less than 3:1, modify input parameters until a ratio of at least 3:1 is achieved. If the input parameters cannot be modified as a result of site constraints, another site for the pond should be chosen, $LW_2 = L_2 / W_2$	LW_2 =	5	
4-6. Enter percent of surface area of very shallow zone, $\%A_{vs}$	$\%A_{vs}$ =	15	ft^2
4-7. Calculate very shallow zone surface area, $A_{vs} = (A_2 \cdot \%A_{vs})/100$	A_{vs} =	520	ft^2
4-8. Enter average depth of very shallow zone (0.1 - 1 ft), d_{vs}	d_{vs} =	1	ft
4-9. Calculate volume of very shallow zone, $V_{vs} = A_{vs} \cdot d_{vs}$	V_{vs} =	520	ft^3
4-10. Enter width of very shallow zone, $W_{vs} = W_2$	W_{vs} =	26	ft
4-11. Calculate length of very shallow zone, $L_{vs} = A_{vs} / W_{vs}$	L_{vs} =	20	ft
4-12. Enter percent of surface area of shallow zone, $\%A_s$	$\%A_s$ =	55	
4-13. Calculate surface area of shallow zone, $A_s = (A_2 \cdot \%A_s)/100$	A_s =	1,900	ft^2
4-14. Enter average depth of shallow zone (1 - 3 ft), d_s	d_s =	3	ft
4-15. Calculate volume of shallow zone, $V_s = A_s \cdot d_s$	V_s =	5,700	ft^3
4-16. Enter width of shallow zone, $W_s = W_2$	W_s =	26	ft
4-17. Calculate length of shallow zone, $L_s = A_s / W_s$	L_s =	220	ft

Step 4: Determine Dimensions of Cell 2			
4-18. Calculate surface area of deep zone, $A_{deep} = A_2 - A_{vs} - A_s$	A_{deep} =	1,040	ft^2
4-19. Calculate volume of deep zone, $V_{deep} = V_2 - V_{vs} - V_s$	V_{deep} =	5,680	ft^3
4-20. Calculate average depth of deep zone (3 - 5 ft), $d_{deep} = V_{deep} / A_{deep}$	d_{deep} =	5	ft
4-21. Enter width of deep zone, $W_{deep} = W_2$	W_{deep} =	26	ft
4-22. Calculate length of deep zone, $L_{deep} = A_{deep} / W_{deeo}$	L_{deep} =	40	ft

Step 5: Ensure Design Requirements and Site Conditions are Achieved

Check design requirements and site constraints. Modify design geometry until requirements are met. If the chosen site for the wetland is inadequate to meet the design requirements, choose a new location for the wetland or select an alternative treatment BMP.

Step 6: Size Outlet Structure

6-1. The wetland outlet pipe shall be sized, at a minimum, to pass flows greater than the stormwater quality design peak flow for off-line basins or flow from the capital storm for on-line basins.

Step 7: Determine Emergency Spillway Requirements

For online basins, an emergency overflow spillway should be sized to pass flows greater than the design peak runoff discharge rate for the 100-yr, 24-hr storm in order to prevent overtopping of the walls or berms in the event that a blockage of the riser occurs. For offline basins, an emergency spillway or riser should be sized to pass the 100-yr, 24-hr post-development peak storm water runoff discharge rate directly to the downstream conveyance system or another acceptable discharge point.

E.11 TCM-4 Sand Filters

Sizing Methodology

A sand filter is designed with two parts: (1) a temporary storage reservoir to store runoff, and (2) a sand filter bed through which the stored runoff must percolate. Usually the storage reservoir is simply placed directly above the filter, and the floor of the reservoir pond is the top of the sand bed. For this case, the storage volume also determines the hydraulic head over the filter surface, which increases the rate of flow through the sand.

Two methods are available for sizing sand filters: a simple method and a routing modeling method. The simple method uses standard values to define filter hydraulic characteristics for determining the sand surface area. This method is useful for planning purposes, for a first approximation to begin iterations in the detailed method, or when use of the detailed computer model is not desired or not available. The simple method very often results in a larger filter than the routing method.

Background

Sand filter design is based on Darcy's law:

$$Q = KiA \qquad \text{(Equation E-101)}$$

Where:

Q	=	water quality design flow (cfs)
K	=	hydraulic conductivity (fps)
A	=	surface area perpendicular to the direction of flow (ft^2)
i	=	hydraulic gradient (ft/ft) for a constant head and constant media depth, computed as follows:

$$i = \frac{h + l}{l} \qquad \text{(Equation E-102)}$$

Where:

h	=	average depth of water above the filter (ft), defined for this design as $d/2$
d	=	maximum storage depth above the filter (ft)
l	=	thickness of sand media (ft)

Darcy's law underlies both the simple and the routing methods of design. The filtration rate V, or more correctly, $1/V$, is the direct input in the sand filter design. The relationship between the filtration rate V and hydraulic conductivity K is revealed by equating Darcy's law and the equation of continuity, $Q = VA$. Specifically:

$$Q = KiA \quad \text{and} \quad Q = VA$$

So, $$VA = KiA$$

Or: $$V = Ki \qquad \text{(Equation E-103)}$$

Where,

V = filtration rate (ft/s)

Note that $V \neq K$. That is, the filtration rate is not the same as the hydraulic conductivity, but they do have the same units (distance per time). K can be equated to V by dividing V by the hydraulic gradient i, which is defined above.

The hydraulic conductivity K does not change with head nor is it dependent on the thickness of the media, only on the characteristics of the media and the fluid. A design hydraulic conductivity of 1 inch per hour (2 feet per day) used in this simple sizing method is based on bench-scale tests of conditioned rather than clean sand (KCSWDM, 2005) and represents the average sand bed condition as silt is captured and held in the sand bed.

Unlike the hydraulic conductivity, the filtration rate V changes with head and media thickness, although the media thickness is constant in the sand filter design.

Simple Sizing Method

The simple sizing method does not route flows through the filter. It determines the size of the filter based on the simple assumption that inflow is immediately discharged through the filter as if there were no storage volume. An adjustment factor (0.7) is applied to compensate for the greater filter size resulting from this method. Even with the adjustment factor, the simple method generally produces a larger filter size than the routing method.

Step 1: Determine the water quality design volume

Sand filters should be sized to capture and treat the stormwater quality design volume (see Section E.1).

Step 2: Determine maximum storage depth of water

Determine the maximum water storage depth (d) above the sand filter. This depth is defined as the depth at which water begins to overflow the reservoir pond, and it

depends on the site topography and hydraulic constraints. The depth is chosen by the designer, but shall be 6 feet or less.

Step 3: Calculate the sand filter area

Determine the sand filter area using the following equation:

$$A_{sf} = \frac{V_{wq} RL}{Kt(h+L)} \qquad \text{(Equation E-104)}$$

Where,

A_{sf}	=	surface area of the sand filter bed (ft^2)
V_{wq}	=	water quality design volume (ft^3)
R	=	routing adjustment factor (use R = 0.7)
L	=	sand bed depth (ft)
K	=	design hydraulic conductivity (use 2 ft/day)
t	=	drawdown time (use 1 day)
h	=	average depth of water above the filter (ft), (use $d/2$ with d from Step 1)

Routing Method

A continuous runoff model, such as US EPA's Storm Water Management Model (SWMM) Model, can be used to optimally size a sand filter. A continuous simulation model consists of three components: a representative long term period of rainfall data (≈ 20 years or greater) as the primary model input; a model component representing the tributary area to the sand filter that takes into account the amount of impervious area, soil types of the pervious area, vegetation, evapotranspiration, etc.; and a component that simulates the sand filter. Using this method, the filter should be sized to capture and treat the WQ design volume from the post-development tributary area.

The continuous simulation model routes predicted tributary runoff to the sand filter, where treatment is simulated as a function of the infiltrative (flow) capacity of the sand filter and the available storage volume above the sand filter. In a continuous runoff model such as SWMM, the physical parameters of the sand filter are represented with stage-storage-discharge relationships. Due to the computational power of ordinary desktop computers, long-term continuous simulations generally take only minutes to run. This allows the modeler to run several simulations for a range of sand filter sizes, varying either the surface area of the filter (and resulting flow capacity) or the storage capacity above the sand filter, or both. Sufficient

continuous model simulations should be completed so that results encompass the WQ design volume capture goal.

Model results should be plotted for both varying storage depths above the filter and for varying filter surface area (and resulting flow capacity) while keeping all other parameters constant. The resulting relationship of percent capture as a function of sand filter flow and storage capacity can be used to optimally size a sand filter based on site conditions and restraints.

In addition to continuous simulation modeling, routing spreadsheets and/or other forms of routing modeling that incorporate rainfall-runoff relationships and infiltrative (flow) capacities of sand filters may be used to size facilities. Alternative sizing methodologies should be prepared with good engineering practices.

Sizing Worksheet

Step 1: Determine water quality design volume		
1-1. Enter Project area (acres), $A_{project}$	$A_{project}$ =	acres
1-2. Enter the maximum allowable percent of the Project area that may be effective impervious area (refer to permit), ranges from 5-30%, $\%_{allowable}$	$\%_{allowable}$ =	%
1-3. Determine the maximum allowed effective impervious area (ac), $EIA_{allowable} = (A_{project})*(\%_{allowable})$	$EIA_{allowable}$=	acres
1-4. Enter Project impervious fraction, Imp (e.g. 60% = 0.60)	Imp=	
1-5. Determine the Project Total Impervious area (acres), $TIA=A_{project}*Imp$	TIA=	acres
1-6. Determine the total area from which runoff must be retained (acres), $A_{retain}=TIA-EIA_{allowable}$	A_{retain} =	acres
1-7. Determine pervious runoff coefficient using Table E-1, C_p	C_p =	
1-8. Calculate runoff coefficient, $C = 0.95*imp + C_p\ (1-imp)$	C =	
1-9. Enter design rainfall depth of the storm (in), P_i	P_i =	in
1-10. Calculate rainfall depth (ft), $P = P_i/12$	P =	ft
1-11. Calculate water quality design volume (ft^3), $SQDV=43560 \bullet C*P*A_{retain}$	SQDV=	ac-ft
Step 2: Determine maximum storage depth of water		
2-1. Determine the maximum storage depth (max 6 ft) of water above the sand filter, d (ft)	d =	ft

Step 3: Calculate sand filter area	
3-1. Enter water quality design volume, *SQDV*	SQDV = ft^3
3-2. Enter routing adjustment factor (use R =0.7), R	R =
3-3. Enter thickness of sand filter (min. 2 ft, 3 ft preferred), L	L = ft
3-4. Enter design hydraulic conductivity of media (use 2 ft/day), K_{des}	K = ft/day
3-5. Enter drawdown time, t	t = day
3-6. Calculate average depth of water above the filter, $h = d/2$	h = ft
3-7. Calculate sand filter area, $A_{sf} = (SQDV*RL)/(Kt\ (h+L))$	A_{sf} = ft^2
Step 4: Determine filter dimensions	
4-1. Sand filter area, A_{sf}	A_{sf} = ft^2
4-2. Enter geometric configuration, LR:W ratio (2:1 or greater), L_R	L_R =
4-3. Select the width of the sand filter, W	W = ft
4-4. Calculate the length of the sand filter, $L=WL_R$	L = ft
4-5. Calculate rate of filtration, $r_{wq} = K_i$; where $i = \frac{h+l}{l}$	r_{wq} = ft/d
Step 5: Calculate filter longitudinal underdrain collection pipe	
5-1. Calculated filtered flow rate, $Q_f = r_{wq}A_{sf}/86400$	Q_f = cfs
5-2. Enter minimum slope for energy gradient, S_e	S_e =

5-3. Enter Hazen-Williams coefficient for plastic, *C*	C =	
5-4. Enter pipe diameter (6" min.), *D*	D =	in
5-5. Calculate pipe hydraulic radius, $R_h = D/48$	R_h =	ft
5-6. Calculate velocity at the outlet of the pipe, $V_p = 1.318CR_h0.63S_e0.54$	V_p =	ft/s
5-7. Calculate pipe capacity, $Q_{cap} = 0.25\pi(D/12)^2V_p$	Q_{cap} =	cfs
Step 7: Provide conveyance capacity for filter clogging		
7-1. The sand filters should be placed off-line, but an emergency overflow must still be provided in the event the filter becomes clogged.		

Design Example

Step 1: Determine water quality design volume

For this design example, a 10-acre site with soil type 4 and 60% total impervious area is considered. The 85th percentile storm event for the project location is 0.75 inches.

Step 1: Determine water quality design volume			
1-1. Enter Project area (acres), $A_{project}$	$A_{project}$ =	10	acres
1-2. Enter the maximum allowable percent of the Project area that may be effective impervious area (refer to permit), ranges from 5-30%, $\%_{allowable}$	$\%_{allowable}$ =	5	
1-3. Determine the maximum allowed effective impervious area (ac), $EIA_{allowable} = (A_{project})*(\%_{allowable})$	$EIA_{allowable}$=	0.5	acres
1-4. Enter Project impervious fraction, Imp (e.g. 60% = 0.60)	Imp=	0.6	
1-5. Determine the Project Total Impervious area (acres), $TIA=A_{project}*Imp$	TIA=	6	acres
1-6. Determine the total area from which runoff must be retained (acres), $A_{retain}=TIA-EIA_{allowable}$	A_{retain} =	5.5	acres
1-7. Determine pervious runoff coefficient using Table E-1, C_p	C_p =	0.05	
1-8. Calculate runoff coefficient, $C = 0.95*imp + C_p\ (1-imp)$	C =	0.59	
1-9. Enter design rainfall depth of the storm (in), P_i	P_i =	0.75	in
1-10. Calculate rainfall depth (ft), $P = P_i/12$	P =	0.06	ft
1-11. Calculate water quality design volume (ft^3), $SQDV=43560 \bullet C*P*A_{retain}$	SQDV=	0.20	ac-ft

Step 1a: Determine maximum storage depth of water

Determine the maximum storage depth of water above the sand filter.

Step 1a: Determine maximum storage depth of water	
1a-1. Determine the maximum storage depth (max 6 ft) of water above the sand filter, *d* (ft)	*d* = 6 ft

Step 2: Calculate Sand Filter Area

A sand filter is designed with two components: (1) temporary storage reservoir to store runoff, and (2) a sand filter bed through which the stored runoff must percolate getting treatment.

The simple sizing method does not rout flows through the filter. The size of the filter is determined based on the simple assumption that inflow is immediately discharged through the filter. The adjustment factor, R, is applied to compensate for the greater filter size resulting from this method.

Step 2: Calculate sand filter area	
2-1. Enter water quality design volume, *SQDV*	SQDV = o.20 ac-ft
2-2. Enter routing adjustment factor (use R =0.7), *R*	*R* = 0.7
2-3. Enter thickness of sand filter (min. 2 ft, 3 ft preferred), *L*	*L* = 2 ft
2-4. Enter design hydraulic conductivity (use 2 ft/day), *K*	*K* = 2 ft/day
2-5. Enter drawdown time (use 1 day), *t*	*t* = 2 day
2-6. Calculate average depth of water above the filter, $h = d/2$	h = 3 ft
2-7. Calculate sand filter area, $A_{sf} = (SQDV*RL)/(Kt\ (h+L))$	A_{sf} = 0.014 acre

Step 3: Determine Filter Dimensions

Step 3: Determine filter dimensions	
3-1. Sand filter area in ft², $A_{sf(feet)}=A_{sf(acre)}*43{,}560$	A_{sf} = 610 ft²
3-2. Enter geometric configuration, LR:W ratio (2:1 min.), L_R	L_R = 2
3-3. Calculate the width of the sand filter, *W*	W = 18 ft

Step 3: Determine filter dimensions			
3-4. Calculate the length of the sand filter, *L*	*L* =	36	ft
3-5. Calculate rate of filtration, $r_{wq} = Ki$, where $i = \frac{h+l}{l}$	r_{wq} =	2.3	ft/d

Step 4: Calculate Filter Longitudinal Underdrain Collection Pipe

All underdrain pipes must be 6 inches or greater to facilitate cleaning.

Step 5: Calculate filter longitudinal underdrain collection pipe			
5-1. Calculated filtered flow rate, $Q_f = r_{wq}A_{sf}/86400$	Q_f =	0.01	cfs
5-2. Enter minimum slope for energy gradient, *Se*	S_e =	0.005	
5-3. Enter Hazen-Williams coefficient for plastic, *C*	C =	140	
5-4. Enter pipe diameter (6” min), *D*	*D* =	6	in
5-5. Calculate pipe hydraulic radius, $R_h = D/48$	R_h =	0.13	
5-6. Calculate velocity at the outlet of the pipe, $V_p = 1.318CR_h^{0.63}S_e^{0.54}$	V_p =	2.9	ft/s
5-7. Calculate pipe capacity, $Q_{cap} = 0.25\pi(D/12)^2V_p$	Q_{cap} =	0.57	cfs

Step 5: Provide Conveyance Capacity for Filter Clogging

The sand filters should be placed off-line, but an emergency overflow must still be provided in the event the filter becomes clogged.

APPENDIX F : FLOW SPLITTER DESIGN SPECIFICATIONS

F.1 Flow Splitter Introduction

Flow splitters must be provided for off-line facilities to divert the water quality design flow to the BMP and bypass higher flows. In most cases, it is a designer's choice whether storm water treatment BMPs described in this manual are designed as on-line or off-line; exceptions are vegetated strip filters, permeable pavement, and building BMPs which are designed on-line.

A crucial factor in designing flow splitters is to ensure that low flows are delivered to the treatment facility up to the water quality design flow rate. Above this rate, additional flows remain in the storm drain or are diverted to a bypass drain with minimal increase in head at the flow splitter structure to avoid surcharging the water quality facility under high flow conditions.

Flow splitters are typically manholes or vaults with baffles. In place of baffles, the splitter mechanism may be a half tee section with a solid top and an orifice in the bottom of the tee section. A full tee option may also be used (see "Design Criteria" below). Two possible design options for flow splitters are shown in the figures in this Appendix. Other equivalent designs that achieve the result of splitting low flows, up to the WQ design flow, into the WQ treatment facility and divert higher flows around the facility are also acceptable.

Flow splitters may be modeled using standard level pool routing techniques, as described in the Handbook of Applied Hydrology (Ven te Chow; 1964) and elsewhere. The stage/discharge relationship of the outflow pipes shall be determined using backwater analysis techniques. Weirs shall be analyzed as sharp-crested weirs.

Design Criteria

1) A flow splitter shall be designed to deliver the required water quality design flow rate to the storm water treatment facility.

17) The top of the weir shall be located at the water surface for the design flow. Remaining flows enter the bypass line.

18) The maximum head shall be minimized for flow in excess of the water quality design flow. Specifically, flow to the treatment facility at the flood control design storm water surface shall not increase the design water quality design flow by more than 10%.

19) Example designs are shown in the figures in this Appendix. Equivalent designs are also acceptable.

20) Special applications, such as roads, may require the use of a modified flow splitter. The baffle wall may be fitted with a notch and adjustable weir plate to proportion runoff volumes other than high flows.

21) For ponding facilities, backwater effects must be included in designing the height of the standpipe in the manhole.

22) Ladder or step and handhold access shall be provided. If the weir wall is higher than 36 inches, two ladders, on the either side of the wall, are required.

F.2 Material Requirements

1) The splitter baffle shall be installed in a standard manhole or vault. The baffle wall shall be made of material resistant to corrosion (minimum 4-inch thick reinforced concrete, Type 302 or Type 316 stainless steel plate, or equivalent).

23) The minimum clearance between the top of the baffle wall and the bottom of the manhole or vault cover shall be 4 feet; otherwise, dual access points shall be provided.

24) All metal parts shall be corrosion resistant. Examples of preferred materials include aluminum, stainless steel, and plastic. Zinc and galvanized materials are not permitted because of aquatic toxicity. Painting metal parts shall not be allowed because of poor longevity.

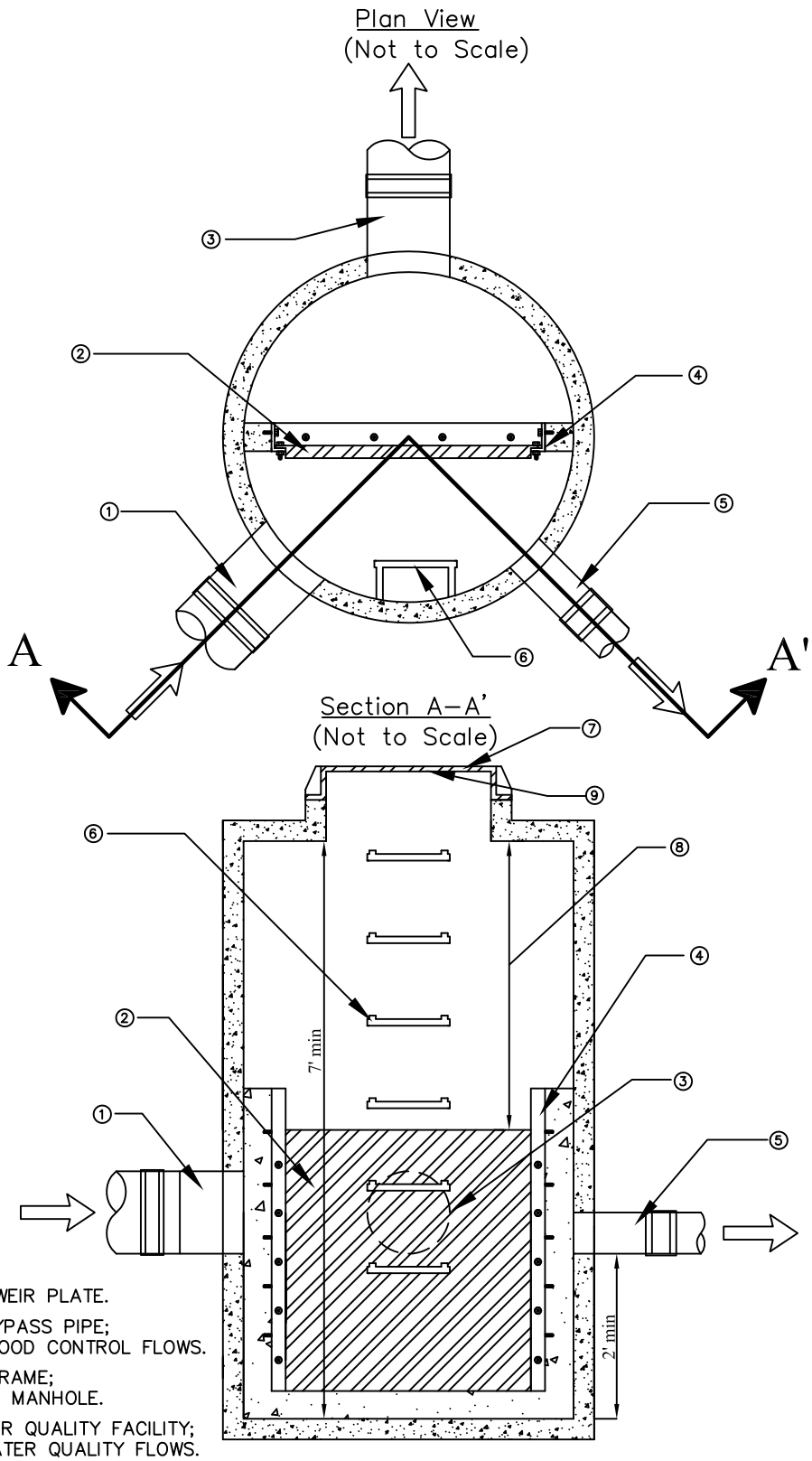

NOTES:

① INLET PIPE.

② ADJUSTABLE WEIR PLATE.

③ HIGH FLOW BYPASS PIPE; SIZED FOR FLOOD CONTROL FLOWS.

④ WEIR PLATE FRAME; ANCHORED TO MANHOLE.

⑤ PIPE TO WATER QUALITY FACILITY; SIZED FOR WATER QUALITY FLOWS.

⑥ ACCESS STEPS.

⑦ 24" ROUND FRAME AND SOLID LID.

⑧ 4' MIN DISTANCE OR PROVIDE SEPARATE ACCESS ON BOTH SIDES OF WEIR.

⑨ AFFIX PERMANENT IDENTIFICATION TAG.

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Figure F-1: Flow Splitter Option A

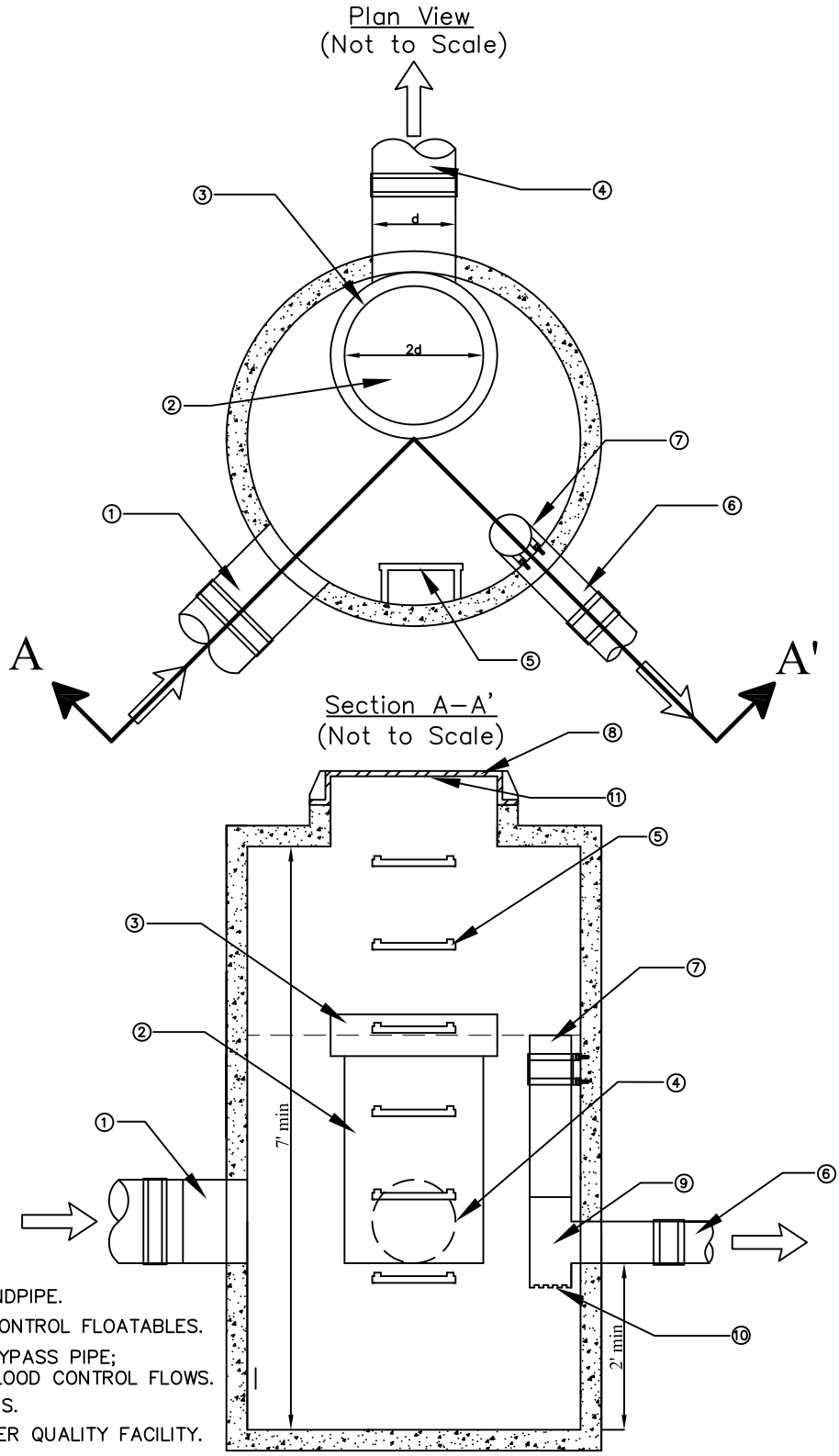

NOTES:

① INLET PIPE.
② BYPASS STANDPIPE.
③ BAFFLE TO CONTROL FLOATABLES.
④ HIGH FLOW BYPASS PIPE; SIZED FOR FLOOD CONTROL FLOWS.
⑤ ACCESS STEPS.
⑥ PIPE TO WATER QUALITY FACILITY.
⑦ RISER PIPE; TOP OF PIPE AT DESIGN ELEVATION FOR WATER QUALITY FLOWS.
⑧ 24" ROUND FRAME AND SOLID LID.
⑨ REMOVABLE "TEE" SECTION FOR CLEANOUT.
⑩ RISER PIPE ORIFICE SIZED FOR WATER QUALITY FLOWS.
⑪ AFFIX PERMANENT IDENTIFICATION TAG.

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Figure F-2: Flow Splitter Option B

APPENDIX G: DESIGN CRITERIA CHECKLISTS FOR STORMWATER RUNOFF BMPS

BIO-1 Bioretention Checklist

- ☐ Has the bioretention facility been sized to treat the water quality design volume, SQDV (see worksheet)?
- ☐ Does the bioretention have a maximum ponding depth of 18 in.?
- ☐ Is the planting soil depth at least 2 feet?
- ☐ Has an underdrain been provided if native soil permeability is less than 0.5 in/hr and infiltration is not possible/allowed?
- ☐ Has a gravel drainage layer been provided if native soil permeability is greater than 0.5 in/hr and infiltration is possible/allowed?
- ☐ Does the bioretention ponding depth drain below the planting soil in less than 48 hours?
- ☐ Is the gravel drainage layer sized to adequately meet the maximum drawdown time of 96 hours?
- ☐ Has the bioretention facility been properly sized as recommended in the manual?
- ☐ Does the flow entrance meet specifications (dispersed, low velocity flow; dispersed flow across pavement; flow spreading trench; cuts or wheel slots for parking lots)?
- ☐ Does the pipe flow entrance include erosion protection material to dissipate flow energy?
- ☐ Is the flow path unblocked by trees and shrubs?
- ☐ Is the underdrain at least 6 inches in diameter?
- ☐ Is the underdrain pipe made of accepted material (slotted PVC pipe conforming to ASTM C 3034 or equivalent HDPE pipe conforming to AASHTO 252M)?
- ☐ Does the slotted pipe have correct sizing and spacing of slots?
- ☐ Is the underdrain sloped at 0.5% or more?
- ☐ Are rigid observation pipes connected to underdrain every 250 to 300 feet of installed pipe?
- ☐ Do the observation pipe wells/clean outs extend 6 inches above top elevation of bioretention facility mulch and are they capped as required?

- ☐ Does the gravel underdrain bedding consist of the correct aggregate?
- ☐ If geotextile fabric is placed between the planting media and gravel layer, does it meet the specifications outlined in the manual?
- ☐ Does the gravel underdrain bedding extend at least 6 inches below the underdrain pipe (if needed) and does it provide 1 foot depth around top and sides of pipe?
- ☐ Does the underdrain drain freely to the accepted discharge point?
- ☐ Is an overflow device consisting of vertical PVC pipe included in design?
- ☐ Has the overflow device been installed at the 18-inch ponding depth?
- ☐ Is the overflow riser at least 6 inches in diameter?
- ☐ Has the inlet to the riser been positioned at least 6 inches above the planting media and capped with a spider cap?
- ☐ If bioretention is close to roads or infrastructure, have infiltration pathways been restricted with geomembrane (at least 30 mm) or clay liners?
- ☐ Is planting soil composed of correct aggregate (60-70% sand; 30-40% compost) and free of stones, stumps and roots?
- ☐ Does compost have acceptable characteristics?
- ☐ Is constructed bioretention facility covered with well-aged mulch, free of seeds, weeds, soil and roots, and at least 2-3 inches thick?
- ☐ Is all bioretention vegetation tolerant of summer drought, ponding fluctuations, and saturated soil conditions for 48 to 72 hours?
- ☐ Have an adequate number of different plant species been incorporated into the bioretention (It is recommended that 3 tree, 3 shrub, and 3 herbaceous groundcover species be included)?
- ☐ Have native plants been used to the maximum extent practicable?

BIO- 2 Planter Box Checklist

- ☐ Is the planter box tributary area less than 15,000 ft2?
- ☐ Is the groundwater level at least 2 feet below the bottom of the planter box?
- ☐ Is there adequate relief between land surface and stormwater conveyance system to permit vertical percolation?
- ☐ Is the planter box located in an area with adequate sunlight to support selected vegetation?
- ☐ Is the planter box sized to treat the water quality design volume, Vwq (see worksheet)?
- ☐ Does the planter box have a maximum ponding depth of 12 inches?
- ☐ Is the planting soil depth at least 2 feet (3 feet preferred)?
- ☐ Does the ponded water drain below the planting soil in less than 48 hours?
- ☐ Has the distance between the downspouts and the overflow outlet been maximized?
- ☐ Has the planter box been sized the same as a Bioretention facility with planter box parameters?
- ☐ Has the planter box been constructed with an appropriate non-leaching permanent material?
- ☐ Has the planter box structure been adequately sealed to ensure that water exits only via the underdrain?
- ☐ Has an underdrain been provided?
- ☐ If the entrance to the planter box is piped, has erosion protection been included in the design (erosion protection includes rock, splash blocks, etc.)?
- ☐ Is the entrance flow path unimpeded by woody plants (trees, shrubs)?
- ☐ Is the underdrain at least 6 inches in diameter?
- ☐ Is the underdrain pipe made of accepted material (slotted PVC pipe conforming to ASTM C 3034 or equivalent HDPE pipe conforming to AASHTO 252M)?
- ☐ Does the slotted pipe have correct sizing and spacing of slots?
- ☐ Is the underdrain sloped at 0.5% or more?

- ☐ Are rigid observation pipes connected to underdrain every 250 to 300 feet of installed pipe?
- ☐ Do the observation pipe wells/clean outs extend 6 inches above top elevation of the planter box mulch and are they capped as required?
- ☐ Does the gravel underdrain bedding consist of the correct aggregate?
- ☐ Does the gravel underdrain bedding extend at least 6 inches below the underdrain and does it provide 1 foot depth around top and sides of pipe?
- ☐ If geotextile fabric is used in the underdrain design, does it meet minimum materials requirements?
- ☐ Is the underdrain elevated from the bottom of the planter box by 6 inches?
- ☐ Does the underdrain drain freely to the intended discharge point?
- ☐ Is an overflow device consisting of vertical PVC pipe included in design?
- ☐ Is the overflow riser at least 6 inches in diameter?
- ☐ Is the inlet to the riser 6 inches above planting soil and capped with a spider cap?
- ☐ Has a waterproof barrier consisting of a 30 mil geomembrane or equivalent been provided to protect foundations from moisture?
- ☐ Is planting soil composed of correct aggregate (60-70% sand; 30-40% compost) and gradation, and free of stones, stumps and roots?
- ☐ Does compost have acceptable characteristics (see planting/storage media)?
- ☐ Is planter box covered with well-aged mulch, free of seeds, weeds, grass clippings, bark, soil and roots, and at least 2-3 inches thick?
- ☐ Do all soil minerals meet requirements?
- ☐ Is all planter box vegetation tolerant of summer drought, ponding fluctuations, and saturated soil conditions for 48 to 72 hours?
- ☐ Have an adequate number of different plant species been incorporated into the planter box design (It is recommended that 3 tree, 3 shrub, and 3 herbaceous groundcover species be included)?
- ☐ Have native plants been used to the maximum extent practicable?
- ☐ Have only slow-release fertilizers been included in the design?
- ☐ Have arrangements been made to replace planter box mulch layer annually?

- ☐ Have low-maintenance plants been selected for design?
- ☐ Has an effort been made to ensure that no treated wood or galvanized metal is used anywhere within the planter box design?

BIO-3 Proprietary Biotreatment Device Checklist

- ☐ Has the proprietary biotreatment device been selected from the list provided in the manual of from another Ventura County- approved list?
- ☐ Has the vendor been contacted for the latest design guidance on cartridge selection?
- ☐ Has the proprietary biotreatment device been installed as directed by the vendor?
- ☐ Have appropriate maintenance and operation arrangements been made to ensure upkeep of the device?
- ☐ Has the biotreatment device been sized to capture and treat the water quality design flow?

BIO-4 Vegetated Swale Checklist

- ☐ Does the climate provide adequate conditions for maintaining a vegetative cover? Has adequate vegetation been chosen given the climate?
- ☐ Is the grade in the area shallow so as to not allow ponding?
- ☐ Is the swale compatible with existing flood control functions?
- ☐ Has the swale been designed with a depth of one foot or less?
- ☐ Is the overall depth from the top of the side walls to the bottom of the swale at least 12 inches?
- ☐ Is the swale bottom width at least 2 feet?
- ☐ Is the swale bottom width no greater than 10 feet, or 16 feet with a dividing berm?
- ☐ If the swale is required to convey flood flows in addition to the water quality design flow, has the swale been designed for the flood control design storm and does it include 2 feet of freeboard?
- ☐ Have gradual meandering bends been incorporated into the design?
- ☐ Is the longitudinal slope (in direction of flow) between 1% and 6%?
- ☐ Has an underdrain been provided if soils are poorly drained and longitudinal slope is less than 1.5%? Has a soils report been provided if this is the case?
- ☐ If the longitudinal slope is greater than 6%, have appropriate check dams with vertical drops of 12 inches or less been provided in the design to reduce the slope?
- ☐ Is the horizontal slope at the bottom of the swale flat to discourage channeling?
- ☐ Has the swale been designed so that the water depth does not exceed 4 inches or 2/3 the height of vegetation (2 inches in frequently mowed turf swales?
- ☐ Does the swale length provide a minimum hydraulic residence time of 7 minutes?
- ☐ If soil and slope conditions require it, has an acceptable low flow drain been installed?
- ☐ Has the swale been designed to convey the SQDF?

- ☐ Has the swale been sized as recommended in Chapter 6 (also see worksheet, Appendix E)?
- ☐ Has the swale been designed as a flow-through channel or has a high-flow bypass been incorporated into the design for flows higher than the water quality design flow?
- ☐ Has inflow been directed towards the upstream end of the swale or, at a minimum, evenly over the length of the swale?
- ☐ If the swale is online, has it been designed to convey flows up to the post-development 100 year 24 hour storm, with freeboard, and velocities below 3 ft/s?
- ☐ If the swale is off-line, has it been designed to convey the water quality design flow rate using a flow splitter with velocities below 1 ft/s?
- ☐ If check dams are incorporated in the design, have flow spreaders been added at the toe of each vertical drop?
- ☐ If curb cuts are used, has pavement been placed 1 – 2 inches above the elevation of the vegetated area?
- ☐ Is the swale inflow designed to function long term with minimal maintenance?
- ☐ Has flow spreading at the inlet of the swale been achieved by a leveled anchored flow spreader or similar method?
- ☐ Does the flow spreader project a minimum of 2 inches above the ground surface with appropriately spaced notches and extend horizontally beyond facility to prevent erosion
- ☐ If an underdrain is required, does it meet appropriate criteria (PVC or equivalent, correct slot spacing and sizing, 6 inches minimum in diameter, sloped at 0.5%)?
- ☐ Is there gravel bedding at least 6 inches below and 1 foot to the top and sides of the underdrain?
- ☐ If a geotextile is included in the design, does it meet requirements?
- ☐ Does gravel drainage layer meet recommended criteria?
- ☐ Does swale divider, if included, meet criteria (minimum height of 1 inch above flow, slopes no steeper than 2H:1V, stable foundation)?

- ☐ Has swale soil been amended with compost if organic content is less than 10%?
- ☐ Have appropriate, hardy and native plants been used to the maximum extent practical?
- ☐ Is vegetative cover at least 4 inches in height (ideally 6 inches)?
- ☐ Has the swale been located away from trees that may drop leaves or provide insufficient sunlight?

BIO-5 Vegetated Filter Strip Checklist

- ☐ Is the slope of the filter strip designed to avoid both erosive flows and ponding?
- ☐ Has the strip been designed to evenly distribute flow across width and promote sheet flow?
- ☐ Does the width of the filter strip extend across the full width of the tributary area?
- ☐ Is the upstream boundary of the filter located contiguous to developed area?
- ☐ If filter strip is used for water quality purposes, is the length between 15 and 150 feet (25 feet preferred)? If the strip is used for pretreatment, is it at least 4 feet in length?
- ☐ Is the slope of the strip parallel to the direction of flow between 2% and 6%?
- ☐ Is the lateral slope (perpendicular to flow) of the strip 4% or less?
- ☐ Is grading across strip even?
- ☐ Has the top of the strip been installed 2 to 5 inches below any adjacent pavement (a beveled transition is also acceptable)?
- ☐ Are the top and toe of the slope as flat as possible (graded flat for engineered filter strips) to encourage sheet flow and prevent erosion?
- ☐ Has the design flow been calculated using the SQDF (see worksheet)?
- ☐ Has the design flow depth been calculated using a modified Manning's equation (see worksheet)?
- ☐ Have the design velocity and length been calculated using the design flow and design flow depth as recommended (see worksheet)?
- ☐ Has a flow spreader been implemented to uniformly distribute contributing flow along width of filter strip?
- ☐ If a gravel flow spreader is used, is it at least 6 inches deep, 12 inches wide and a minimum or 1 inch below the paved surface?
- ☐ Has the gravel flow spreader been leveled even where ground is not level?
- ☐ If the gravel flow spreader is placed along a roadway, have LA county design specifications been consulted and implemented?

- ☐ If a notched curb spreader and through-curb spreader are used, have they been used in conjunction with a gravel spreader?
- ☐ Have curb port/interrupted curb openings been spaced at intervals of at least every 6 feet?
- ☐ Do the curb port/interrupted curb openings have a width of at least 11 inches?
- ☐ Does 15% or more of the curb length consist of open ports and does each port discharge no more than 10% of the flow?
- ☐ Have energy dissipaters (such as a riprap pad) been used if a sudden slope drop occurs?
- ☐ Has access been provided at the upper edge of filter strip for mowing equipment and to enable maintenance of spreader?
- ☐ Is the design water depth 1 inch or less?
- ☐ Does the design velocity not exceed 1 foot per second?
- ☐ If the organic content of the filter strip soil does not exceed 10%, has the soil been amended with at least 2 inches of well-rotted acceptable compost at a depth of 6 inches?
- ☐ Is filter strip uniformly graded and densely vegetated with erosion-resistant grasses (preferably native or adapted species)?
- ☐ Has irrigation been provided to establish grasses?
- ☐ Have maintenance arrangements been made to maintain grass at a height of 2 to 4 inches?
- ☐ Have trees and shrubs been limited along the filter strip?
- ☐ Has an effort been made to ensure that no treated wood or galvanized metal is used anywhere within the design?

BIO-6 Green Roof Checklist

- ☐ Is the roof shallow enough to support a green roof (<25% slope)?
- ☐ Are the roof supports sufficient to support additional weight of soil, water, vegetation, and a drainage layer (if needed) [a licensed structural engineer should be consulted]?
- ☐ Has an appropriate waterproof membrane been placed below the green roof?
- ☐ Has an appropriate drainage layer been incorporated in the design (if required)?
- ☐ Has an appropriate soil mix been used in the design to allow for drainage, support vegetative growth, and that is not excessively heavy when wet?
- ☐ Has vegetation been carefully selected to improve aesthetics, resist erosion, withstand extreme environments, and tolerate drought without the need for fertilizers and pesticides and without a lot of maintenance requirements (see Appendix H for a recommended plant list)?
- ☐ Have native plants been chosen to the maximum extent practical?
- ☐ If trees or shrubs are incorporated, has an adequate soil depth been provided and is the additional soil depth supported by the roof structure?
- ☐ Has irrigation been provided to establish vegetation?
- ☐ Does vegetation cover 90% of the total area?
- ☐ Is the green roof located in an area without excessive shade to avoid poor vegetative growth?
- ☐ Is there an appropriate drain pipe or gutter to convey any runoff from roof to a stormwater BMP or stormwater conveyance system?

FILT-1 Sand Filter Checklist

- ☐ Has sand filter been located away from trees and areas that could contribute eroded sediment?
- ☐ If there is a chance for sediment to be present in flow to be treated, has pretreatment been provided?
- ☐ Does site have adequate relief to permit vertical percolation through sand filter and into conveyance system?
- ☐ Has pretreatment (vegetated swale or filter strip, hydrodynamic separator) been adequately provided to reduce the sediment load entering the filter?
- ☐ Has the sand filter been sized to capture the SQDV?
- ☐ Has the sand filter been designed with a 1.5:1 length to width ratio or greater?
- ☐ Is the filter bed depth at least 2 feet (3 feet preferred)?
- ☐ Is the depth of water storage over the filter bed 6 feet or less?
- ☐ Is the overflow structure designed to pass the water quality design storm?
- ☐ Has the sizing of the filter been determined using the adapted Darcy's Law equation recommended in the sizing methodology section in Chapter 6 (also see worksheet, Appendix E)?
- ☐ Does the sand meet the recommended specifications (0.2-0.35 mm diameter, Cu < 3, ASTM C 33 size gradation, etc.)?
- ☐ Has an underdrain been employed in the design? [Examples: central underdrain w/lateral pipes, longitudinal pipes, single pipe for small filters]
- ☐ Is the underdrain placed in an 8 inch minimum gravel backfill or drain rock bed?
- ☐ Are all underdrain pipes and connectors 6 inches or greater with clean-out risers of equal diameter?
- ☐ Have clean-out risers been placed at the terminal ends of all pipes and extend to the surface of the filter?
- ☐ Has a valve box been provided for access to the clean-outs and is it water tight?
- ☐ Are underdrain pipes laid with perforations downward, and are perforations at least ½ inch in diameter?

- ☐ Are all lateral collection pipes within 9 feet or less of each other (perpendicular distance)?
- ☐ Have all pipes been placed with a minimum slope of 0.5%?
- ☐ Is the invert of the underdrain outlet above the seasonal high groundwater level?
- ☐ Is gravel backfill present around the underdrain pipe at least 6 inches below and to the sides of the pipe and 8 inches above the pipe?
- ☐ Does the bottom gravel have a diameter of at least 2 times the size of the perforated openings to the drainage system and meet other specifications (specific gravity of 2.5 or more, rounded, free of debris)?
- ☐ Has an appropriate geotextile layer (see underdrain section) or 2-inch transition layer been placed between the sand layer and the drain rock/ gravel backfill layer?
- ☐ Has a flow spreader been installed at the inlet along one side of the filter (long side of the filter if L: W is 2:1 or greater; 20% of perimeter for curved or irregular shape)?
- ☐ Has erosion protection been provided along the first foot of the sand bed adjacent to the flow spreader (i.e. geotextile weighted with sand bags; quarry spalls)?
- ☐ Has no topsoil, clay, or sod (except sod grown in sand) has been added to the sand filter bed?
- ☐ Has vegetation been selected properly (i.e. must withstand drought, heavy saturation, etc.)?
- ☐ Are no permanent structures built on top of the sand filter bed?
- ☐ No large shrubs or trees should be planted in sand filter bed or within 15 feet of inlet or outlet pipes
- ☐ Have native plants been used to the maximum extent practicable?
- ☐ Has an emergency overflow structure been provided?
- ☐ Are interior side slopes above water quality design depth no steeper than 3:1 H:V?
- ☐ Are exterior side slopes no steeper than 2:1 H:V?
- ☐ If pond walls are vertical retaining walls, do they meet recommended specifications (see side slopes section)?

- ☐ Do embankments meet appropriate criteria [top width or 20 feet, constructed on native consolidated soil, in accordance with standard specifications, proper excavation, constructed of appropriate compacted soil]?
- ☐ Are maintenance access roads/ramps to filter provided?
- ☐ Have trees and shrubs been planted further than 10 feet away from inlet and outlet pipes (50 feet for 'water-seeking' plants such as willows and poplars)?
- ☐ Have prohibited non-native plants been removed from the site?
- ☐ Has an effort been made to ensure that no treated wood or galvanized metal is used anywhere within the planter box design?

FILT-2 Cartridge Media Filter

- ☐ Has the vendor been contacted for the latest design guidance on cartridge selection?
- ☐ Has the cartridge media filter been provided with a system to completely drain the system and prevent vector annoyances?
- ☐ Has the cartridge media filter been sized to capture and treat the SQDF?
- ☐ Have site considerations been taken into account when sizing the cartridge media filter and selecting features (often vendor websites offer assistance with this)?

INF-1 Infiltration Trench Checklist

- ☐ Has the infiltration trench been located away from steep slopes (>25%)?
- ☐ Is the infiltration trench set back from structures and leach fields?
- ☐ Is there at least 10 feet or vertical separation between the bottom of the infiltration trench and the shallow groundwater table?
- ☐ Is the depth to bedrock adequate to provide proper infiltration?
- ☐ Has the site been checked to ensure that no preexisting contamination is present?
- ☐ Does the site have low sediment loading rates to prevent infiltration trench clogging?
- ☐ Has a soil assessment report been completed, which determines the suitability of the site for an infiltration trench, recommends a design infiltration rate, identifies the high depth to groundwater table surface elevation, and examines how the stormwater runoff will move in the soil?
- ☐ Has a geotechnical investigation and report been provided if needed?
- ☐ Has the infiltration trench been located at a site that does not receive run off from sites that store or use chemicals or hazardous waste outside?
- ☐ Has the infiltration trench been set back from existing septic system drain fields and drinking water wells?
- ☐ Has pretreatment been provided with a vegetated swale, filter strip, sand filter or proprietary device?
- ☐ Is the trench at least 2 feet wide and 3 to 5 feet deep?
- ☐ Is the longitudinal slope of the trench 3% or less?
- ☐ Is the top layer of the media filter gravel/choking stone/geotextile fabric if flow is sheet flow and 12 inches of surface soil if flow enters through an underground pipe?
- ☐ Is middle layer of media filter 3-5 feet of washed 1.5 to 3 in. gravel with void space of 30 to 40%?
- ☐ Is bottom layer of media filter 6” of clean, washed sand?
- ☐ Have one or more observation wells been installed?

- ☐ Do observation wells consist of recommended slotted 4-6 inch diameter PVC well screen capped with lockable, above-ground lid?
- ☐ Has the infiltration trench been sized to capture and infiltrate the SUSMP defined water quality design volume?
- ☐ Has the infiltration trench been designed to infiltrate all runoff within 72 hours?
- ☐ Has the maximum depth of runoff, ponding depth/trench depth and infiltrating surface area been calculated using recommended design equations (see sizing methodology section/worksheet)?
- ☐ Is the bottom of the infiltration bed native soil, over-excavated to at least one foot in depth and replaced uniformly (with 2-4 inches of coarse sand amendments) without compaction?
- ☐ Has all vertical piping been classified correctly (see drainage section in manual)?
- ☐ Has an observation well been incorporated into the design to ensure that the 72 hour maximum drawdown time is met?
- ☐ Has an overflow route been provided to safely convey flows that overtop the facility or in the case that the facility becomes clogged?
- ☐ Has the overflow channel been designed to safely convey flows from peak design storm to a downstream conveyance system or acceptable discharge point?
- ☐ Has the infiltration trench been kept free of vegetation, and is all existing vegetation surrounding the trench been planted away from trench to avoid drip lines overhanging the facility?
- ☐ Is there safe maintenance access provided to the site for both wet and dry conditions?
- ☐ Has an access road along the length of the trench been provided if there is no existing road or parking lot that can be used for maintenance access?
- ☐ Has access to “operate a backhoe at ‘arms length’” been provided?
- ☐ Was the entire area draining to the facility stabilized before construction began?
- ☐ Have you ensured that the infiltration trench is not hydraulically connected to the storm water conveyance system?

- ☐ If heavy construction material was used to compact subgrade (not recommended), has the infiltrative capacity of the soil been restored via tilling or aerating prior to placing the infiltration bed?
- ☐ Were the exposed subgrade soils inspected by a civil engineer prior to construction to confirm suitable soil conditions for the infiltration facility?

INF-2 Drywell Checklist

- ☐ Has the drywell been located away from steep slopes (>25%)?
- ☐ Is the drywell set back from structures and leach fields?
- ☐ Is there at least 10 feet or vertical separation between the bottom of the drywell and the shallow groundwater table?
- ☐ Is the depth to bedrock adequate to provide proper infiltration?
- ☐ Has the site been checked to ensure that no preexisting contamination is present?
- ☐ Does the site have low sediment loading rates to prevent drywell from clogging?
- ☐ Has pretreatment been provided for all non-rooftop runoff flowing to the drywell?
- ☐ Has a geotechnical investigation and report been provided to ensure site meets specifications for an infiltration facility (including soil infiltration rate, groundwater separation, and no steep slopes)?
- ☐ Has a soil assessment report been completed, which determines the suitability of the site for an drywell, recommends a design infiltration rate, identifies the high depth to groundwater table surface elevation, and examines how the stormwater runoff will move in the soil?
- ☐ Has the drywell been located at a site that does not receive run off from sites that store or use chemicals or hazardous waste outside?
- ☐ Has the drywell been set back from existing septic system drain fields and drinking water wells?
- ☐ Has pretreatment been provided to prevent sediment and other large particulates?
- ☐ Is the surface area of the drywell large enough to infiltrate the storage volume in 72 hours based on maximum allowable depth?
- ☐ Is the top layer of the media filter gravel/choking stone/geotextile fabric if flow is sheet flow and 12 inches of surface soil if flow enters through an underground pipe (pipe should be fitted with a screen)?
- ☐ Is middle layer of media filter 3-5 feet of washed 1.5 to 3 in. gravel with void space of 30 to 40%?
- ☐ Is bottom layer of media filter 6” of clean, washed sand?

- ☐ Have one or more observation wells been installed?
- ☐ Do observation wells consist of recommended slotted 4-6 inch diameter PVC well screen capped with lockable, above-ground lid?
- ☐ Has the drywell been sized to capture and infiltrate the SUSMP defined water quality design volume?
- ☐ Has the drywell been designed to infiltrate all runoff within 72 hours?
- ☐ Has a long term percolation rate of 10% of the measured percolation rate been used in design (due to occlusion and particulate accumulation)?
- ☐ Has the maximum depth of runoff, ponding depth/trench depth and infiltrating surface area been calculated using recommended design equations (see sizing methodology section/worksheet)?
- ☐ Is the bottom of the infiltration bed native soil, over-excavated to at least one foot in depth and replaced uniformly (with 2-4 inches of coarse sand amendments) without compaction?
- ☐ Has all vertical piping been classified correctly (see drainage section in manual)?
- ☐ Has an observation well been incorporated to ensure that the 72 hour maximum drawdown time is met?
- ☐ Has an overflow route been provided to safely convey flows that overtop the facility or in the case that the facility becomes clogged?
- ☐ Has the overflow channel been designed to safely convey flows from peak design storm to a downstream conveyance system or acceptable discharge point?
- ☐ Has the drywell been kept free of vegetation, and is all existing vegetation surrounding the trench been planted away from trench to avoid drip lines overhanging the facility?
- ☐ Is there safe maintenance access provided to the site for both wet and dry conditions?
- ☐ Has maintenance access been provided?
- ☐ Was the entire area draining to the facility stabilized before construction began?
- ☐ Have you ensured that the infiltration trench is not hydraulically connected to the storm water system?

- ☐ If heavy construction material was used to compact subgrade (not recommended), has the infiltrative capacity of the soil been restored via tilling or aerating prior to placing the infiltration bed?
- ☐ Were the exposed subgrade soils inspected by a civil engineer prior to construction to confirm suitable soil conditions for the infiltration facility?

INF-3 Proprietary Infiltration BMPs Checklist

- ☐ Has the infiltration facility been located away from steep slopes (>25%)?
- ☐ Is the infiltration facility set back from structures and leach fields?
- ☐ Is there at least 10 feet or vertical separation between the bottom of the infiltration facility and the shallow groundwater table?
- ☐ Is the depth to bedrock adequate to provide proper infiltration?
- ☐ Has the site been checked to ensure that no preexisting contamination is present?
- ☐ Does the site have low sediment loading rates to prevent infiltration facility clogging?
- ☐ Has pretreatment been provided to prevent premature failure (If infiltration facility fails, complete construction is required)?
- ☐ Has infiltration facility been designed to receive runoff only from sections of the site that have been stabilized?
- ☐ If infiltration facility fails, complete construction is required
- ☐ Has a geotechnical investigation and report been provided to ensure site meets specifications for an infiltration facility (including soil infiltration rate, groundwater separation, and no steep slopes)?
- ☐ Has a soil assessment report been completed, which determines the suitability of the site for an infiltration trench, recommends a design infiltration rate, identifies the high depth to groundwater table surface elevation, and examines how the stormwater runoff will move in the soil?
- ☐ Has the infiltration trench been located at a site that does not receive run off from sites that store or use chemicals or hazardous waste outside?
- ☐ Has the infiltration BMP been sized to capture and treat the water quality design volume?
- ☐ Has a long term percolation rate of 10% of the measured percolation rate been used in design (due to occlusion and particulate accumulation)?
- ☐ Have the recommended sizing guidelines set by the vendor been referenced and used for selection and use of infiltration facility?

INF-4 Permeable Pavement Checklist

- ☐ Has the permeable pavement been located away from steep slopes (>25%)?
- ☐ Is the permeable pavement set back from structures and leach fields?
- ☐ Is there at least 10 feet or vertical separation between the bottom of the permeable pavement and the shallow groundwater table?
- ☐ Is the depth to bedrock adequate to provide proper infiltration?
- ☐ Has the site been checked to ensure that no preexisting contamination is present?
- ☐ Does the site have low sediment loading rates to prevent infiltration trench clogging?
- ☐ Has the permeable pavement been designed to receive runoff only from sections of the site that have been stabilized?
- ☐ Has a geotechnical investigation and report been provided to ensure site meets specifications for an infiltration facility (including soil infiltration rate, groundwater separation, and no steep slopes)?
- ☐ Has a soil assessment report been completed, which determines the suitability of the site for an infiltration trench, recommends a design infiltration rate, identifies the high depth to groundwater table surface elevation, and examines how the stormwater runoff will move in the soil?
- ☐ Has the permeable pavement been located at a site that does not receive run off from sites that store or use chemicals or hazardous waste outside?
- ☐ Has the run off been assessed for necessity of pretreatment?
- ☐ If pretreatment is required, has it been provided to treat run on before it reaches permeable pavement?
- ☐ Has the infiltration BMP been sized to capture and treat the water quality design volume?
- ☐ Have the infiltration capabilities of the site been assessed (i.e. full, partial, or no infiltration allowed)?
- ☐ If no infiltration is allowed, has an underdrain been prohibited?

- ☐ If permeable pavement is located on a site with a slope greater than 2%, has the area been terraced to prevent lateral flow through subsurface?
- ☐ Has the permeable pavement been designed to infiltrate flows through four different layers (incl. top wearing layer, stone reservoir, and transition layers) of material (or through a similar system)?
- ☐ Has the depth of each layer (and void space), along with the hydrology, hydraulics, and structural requirements of the site been determined and approved by a licensed civil engineer?
- ☐ If proprietary permeable pavement is used (i.e. concrete or other pavers), have the design requirements and installation steps been obtained from the vendor and referenced in the selection and construction of the permeable pavement?
- ☐ Has the permeable pavement been designed to drain in less than 72 hours and allowed to dry out periodically?
- ☐ Has a long term percolation rate of 10% of the measured percolation rate been used in design (due to occlusion and particulate accumulation)?
- ☐ Has an overflow mechanism been included in the pavement design?
- ☐ If the overflow mechanism employed is perimeter control, have controls such as a perimeter vegetated swale, perimeter Bioretention, storm drain inlets, or other acceptable control been implemented?
- ☐ If the overflow mechanism employed are overflow pipes, have the pipes been connected to the underdrain, are they located away from vehicular traffic, and is the top of the pipe fitted with a screen?
- ☐ Has the pavement been laid close to level with bottom of base layers level to ensure uniform infiltration?
- ☐ Are site materials stored away from permeable pavement?
- ☐ Has landscaping and stabilization of adjacent areas been completed before installation of pavement?

GS-1 Hydrodynamic Separation Device Checklist

- ☐ Has the vendor been contacted for the latest model and design guidance prior to selection of device?
- ☐ Has the device been sized to capture and treat the water quality design flow rate?
- ☐ Has the vendor been contacted for sizing and installation guidance?
- ☐ Has periodic maintenance been scheduled and budgeted for?

GS-2 Catch Basin Insert Checklist

- ☐ Has the vendor been contacted for the latest model and design guidance prior to selection of device?
- ☐ Has the insert been sized to capture and treat the water quality design flow rate?
- ☐ Has the vendor been contacted for sizing and installation guidance?
- ☐ Has periodic maintenance been scheduled and budgeted for?

APPENDIX H: STORMWATER CONTROL MEASURE ACCESS AND MAINTENANCE AGREEMENTS

(Long Form)

Recorded at the request of:

City of _____

After recording, return to:

City of _____

City Clerk

Stormwater Treatment Device Access and Maintenance Agreement

OWNER:

PROPERTY ADDRESS:_____

APN:

THIS AGREEMENT is made and entered into in_____, California, this___day of_____, by and between_____ _____, hereinafter referred to as "Owner" and the CITY OF____ _____, a municipal corporation, located in the County of Ventura, State of California hereinafter referred to as "CITY";

WHEREAS, the Owner owns real property ("Property") in the City of _____, County of Ventura, State of California, more specifically described in Exhibit "A" and depicted in Exhibit "B", each of which exhibits is attached hereto and incorporated herein by this reference;

WHEREAS, at the time of initial approval of development project known as____ _____within the Property described herein, the City required the project to employ on-site control measures to minimize pollutants in urban runoff;

WHEREAS, the Owner has chosen to install a _____ _____, hereinafter referred to as "Device", as the on-site control measure to minimize pollutants in urban runoff;

WHEREAS, said Device has been installed in accordance with plans and specifications accepted by the City;

WHEREAS, said Device, with installation on private property and draining only private property, is a private facility with all maintenance or replacement, therefore, the sole responsibility of the Owner in accordance with the terms of this Agreement;

WHEREAS, the Owner is aware that periodic and continuous maintenance, including, but not necessarily limited to, filter material replacement and sediment removal, is required to assure peak performance of Device and that, furthermore, such maintenance activity will require compliance with all Local, State, or Federal laws and regulations, including those pertaining to confined space and waste disposal methods, in effect at the time such maintenance occurs;

NOW THEREFORE, it is mutually stipulated and agreed as follows:

1) Owner hereby provides the City of City's designee complete access, of any duration, to the Device and its immediate vicinity at any time, upon reasonable notice, or in the event of emergency, as determined by City's Director of Public Works no advance notice, for the purpose of inspection, sampling, testing of the Device, and in case of emergency, to undertake all necessary repairs or other preventative measures at owner's expense as provided in paragraph 3 below. City shall make every effort at all times to minimize or avoid interference with Owner's use of the Property.

2) Owner shall use its best efforts diligently to maintain the Device in a manner assuring peak performance at all times. All reasonable precautions shall be exercised by Owner and Owner's representative or contractor in the removal and extraction of material(s) from the Device and the ultimate disposal of the material(s) in a manner consistent with all relevant laws and regulations in effect at the time. As may be requested from time to time by the City, the Owner shall provide the City with documentation identifying the material(s) removed, the quantity, and disposal destination.

3) In the event Owner, or its successors or assigns, fails to accomplish the necessary maintenance contemplated by this Agreement, within five (5) days of being given written notice by the City, the City is hereby authorized to cause any maintenance necessary to be done and charge the entire cost and expense to the Owner or Owner's successors or assigns, including administrative costs, attorneys fees and interest thereon at the maximum rate authorized by the Civil Code from the date of the notice of expense until paid in full.

4) The City may require the owner to post security in form and for a time period satisfactory to the city of guarantee of the performance of the obligations stated herein. Should the Owner fail to perform the obligations under the Agreement, the City may, in the case of a cash bond, act for the Owner using the proceeds from it, or in the case of a surety bond, require the sureties to perform the obligations of the Agreement. As an additional remedy, the Director may withdraw any previous stormwater related approval with respect to the

property on which a Device has been installed until such time as Owner repays to City it's reasonable costs incurred in accordance with paragraph 3 above.

5) This agreement shall be recorded in the Office of the Recorder of Ventura County, California, at the expense of the Owner and shall constitute notice to all successors and assigns of the title to said Property of the obligation herein set forth, and also a lien in such amount as will fully reimburse the City, including interest as herein above set forth, subject to foreclosure in event of default in payment.

6) In event of legal action occasioned by any default or action of the Owner, or its successors or assigns, then the Owner and its successors or assigns agree(s) to pay all costs incurred by the City in enforcing the terms of this Agreement, including reasonable attorney's fees and costs, and that the same shall become a part of the lien against said Property.

7) It is the intent of the parties hereto that burdens and benefits herein undertaken shall constitute covenants that run with said Property and constitute a lien there against.

8) The obligations herein undertaken shall be binding upon the heirs, successors, executors, administrators and assigns of the parties hereto. The term "Owner" shall include not only the present Owner, but also its heirs, successors, executors, administrators, and assigns. Owner shall notify any successor to title of all or part of the Property about the existence of this Agreement. Owner shall provide such notice prior to such successor obtaining an interest in all or part of the Property. Owner shall provide a copy of such notice to the City at the same time such notice is provided to the successor.

9) Time is of the essence in the performance of this Agreement.

10) Any notice to a party required or called for in this Agreement shall be served in person, or by deposit in the U.S. Mail, first class postage prepaid, to the address set forth below. Notice(s) shall be deemed effective upon receipt, or seventy-two (72) hours after deposit in the U.S. Mail, whichever is earlier. A party may change a notice address only by providing written notice thereof to the other party.

IF TO CITY:	IF TO OWNER:
_____	_____
_____	_____
_____	_____

IN WITNESS THEREOF, the parties hereto have affixed their signatures as of the date first written above.

APPROVED AS TO FORM:

_____

City Attorney

OWNER:

_____

Owner

Name: _____

Title: _____

CITY OF_____:

_____

Name:_____

Title:_____

OWNER:

_____

Name:_____

Title:_____

ATTEST:

_____

City Clerk Date

Notaries on Following Page

EXHIBIT A

(Legal Description)

EXHIBIT B

(Map/illustration)

(Short Form)

Recorded at the request of and mail to:

_____

_____

_____

Covenant and Agreement Regarding

Stormwater Treatment Device Maintenance

The undersigned hereby certify that we are the owners of hereinafter legally described real property located in the City of _____, County of Ventura, State of California.

Legal Description: _____

_____

as recorded in Book _____, Page_____,Records of Ventura County,

which property is located and known as **(Address):** _____

_____.

And in consideration of the City of _____ allowing_____

_____

on said property, we do hereby covenant and agree to and with said City to maintain according to the Maintenance Plan (Attachment 1), all structural stormwater treatment devices including the following:

_____

_____.

This Covenant and Agreement shall run all of the above described land and shall be binding upon ourselves, and future owners, encumbrances, their successors, heirs, or assignees and shall continue in effect until released by the authority of the City upon submittal of request, applicable fees, and evidence that this Covenant and Agreement is no longer required by law.

NOTARIES ON FOLLOWING PAGE

APPENDIX I : STORMWATER CONTROL MEASURE MAINTENANCE PLAN GUIDELINES AND CHECKLISTS

Included in this appendix are a series of checklists that can be used by both inspectors and maintenance personnel to ensure that observed deficiencies in BMPs are maintained appropriately. The BMP Inspection/Maintenance Checklists are presented in the following order:

1) Bioretention/Planter Box

25) Vegetated Swale Filter

26) Vegetated Filter Strip

27) Sand Filter

28) Infiltration BMPs

29) Permeable Pavement

30) Constructed Treatment Wetland

31) Wet Retention Basin

32) Dry Extended Detention Basin

33) Proprietary Devices

I.1 Bioretention/Planter Box Inspection and Maintenance Checklist

Date: _____ Work Order # _____

Type of Inspection: □ post-storm □ annual □ routine □ post-wet season □ pre-wet season

Facility: _____ Inspector(s): _____

Defect	Conditions When Maintenance Is Needed	Inspection Result (0, 1, or 2)†	Date Maintenance Performed	Comments or Action(s) Taken to Resolve Issue
Appearance	Untidy			
Trash and Debris Accumulation	Trash, plant litter and dead leaves accumulated on surface.			
Vegetation	Unhealthy plants and appearance.			
Irrigation	Functioning incorrectly (if applicable).			
Inlet	Inlet pipe blocked or impeded.			
Splash Blocks	Blocks or pads correctly positioned to prevent erosion.			
Overflow	Overflow pipe blocked or broken.			
Filter media	Infiltration design rate is met (e.g., drains 36-48 hours after moderate - large storm event).			

†Maintenance: Enter 0 if satisfactory, 1 if maintenance is needed and include WO#. Enter 2 if maintenance was performed same day.

I.2 Vegetated Swale Filter Inspection and Maintenance Checklist

Date: _____ Work Order # _____

Type of Inspection: □ post-storm □ annual □ routine □ post-wet season □ pre-wet season

Facility: _____ Inspector(s): _____

Defect	Conditions When Maintenance Is Needed	Inspection Result (0, 1, or 2)†	Date Maintenance Performed	Comments or Action(s) Taken to Resolve Issue
Appearance	Untidy			
Trash and Debris Accumulation	Trash and debris accumulated in the swale.			
Vegetation	When the grass becomes excessively tall (greater than 10-inches); when nuisance weeds and other vegetation start to take over.			
Excessive Shading	Vegetation growth is poor because sunlight does not reach swale. Evaluate vegetation suitability.			
Poor Vegetation Coverage	When vegetation is sparse or bare or eroded patches occur in more than 10% of the swale bottom. Evaluate vegetation suitability.			
Sediment Accumulation	Sediment depth exceeds 2 inches or covers more than 10% of design area.			
Standing Water	When water stands in the swale between storms and does not drain freely.			
Flow spreader or Check Dams	Flow spreader or check dams uneven or clogged so that flows are not uniformly distributed through entire swale width.			

Defect	Conditions When Maintenance Is Needed	Inspection Result (0, 1, or 2)†	Date Maintenance Performed	Comments or Action(s) Taken to Resolve Issue
Constant Baseflow	When small quantities of water continually flow through the swale, even when it has been dry for weeks and an eroded, muddy channel has formed in the swale bottom.			
Inlet/Outlet	Inlet/outlet areas clogged with sediment and/or debris.			
Erosion/ Scouring	Eroded or scoured swale bottom due to flow channelization, or higher flows. Eroded or rilled side slopes.			
	Eroded or undercut inlet/outlet structures			

†Maintenance: Enter 0 if satisfactory, 1 if maintenance is needed and include WO#. Enter 2 if maintenance was performed same day.

I.3 Vegetated Filter Strip Inspection and Maintenance Checklist

Date: _____ Work Order # _____

Type of Inspection: □ post-storm □ annual □ routine □ post-wet season □ pre-wet season

Facility: _____ Inspector(s): _____

Defect	Conditions When Maintenance Is Needed	Inspection Result (0, 1 or 2)†	Date Maintenance Performed	Comments or Action(s) Taken to Resolve Issue
Appearance	Untidy			
Trash and Debris Accumulation	Trash and debris accumulated on the filter strip.			
Vegetation	When the grass becomes excessively tall (greater than 10-inches); when nuisance weeds and other vegetation starts to take over.			
Excessive Shading	Grass growth is poor because sunlight does not reach swale. Evaluate grass species suitability.			
Poor Vegetation Coverage	When grass is sparse or bare or eroded patches occur in more than 10% of the swale bottom. Evaluate grass species suitability.			
Erosion/Scouring	Eroded or scoured areas due to flow channelization, or higher flows.			
Sediment Accumulation on Grass	Sediment depth exceeds 2 inches.			
Flow spreader	Flow spreader uneven or clogged so that flows are not uniformly distributed through entire filter width.			

†Maintenance: Enter 0 if satisfactory, 1 if maintenance is needed and include WO#. Enter 2 if maintenance was performed same day.

I.4 Sand Filter Inspection and Maintenance Checklist

Date: _____ Work Order # _____

Type of Inspection: □ post-storm □ annual □ routine □ post-wet season □ pre-wet season

Facility: _____ Inspector(s): _____

Defect	Conditions When Maintenance Is Needed	Inspection Result (0,1, or 2) †	Date Maintenance Performed	Comments or Action(s) taken to resolve issue
Trash & Debris	Any trash and debris which exceed 5 cubic feet per 1,000 square feet of filter bed area (one standard garbage can). In general, there shall be no visual evidence of dumping. If less than threshold all trash and debris will be removed as part of next scheduled maintenance.			
Inlet erosion	Visible evident of erosion occurring near flow spreader outlets.			
Slow drain time	Standing water long after storm has passed (after 24 to 48 hours) and/or flow through the overflow pipes occurs frequently.			
Concentrated Flow	Flow spreader uneven or clogged so that flows are not uniformly distributed across the sand filter.			
Appearance of poisonous, noxious or nuisance vegetation	Excessive grass and weed growth. Noxious weeds, woody vegetation establishing, Turf growing over rock filter			
Standing Water	Standing water long after storm has passed (after 24 to 48 hours), and/or flow through the overflow pipes occurs frequently.			

Defect	Conditions When Maintenance Is Needed	Inspection Result (0,1, or 2) †	Date Maintenance Performed	Comments or Action(s) taken to resolve issue
Tear in Filter Fabric	When there is a visible tear or rip in the filter fabric allowing water to bypass the fabric.			
Pipe Settlement	If piping has visibly settled more than 1 inch.			
Filter Media	Drawdown of water through the media takes longer than 1 hour and/or overflow occurs frequently.			
Short Circuiting	Flows do not properly enter filter cartridges.			

†Maintenance: Enter 0 if satisfactory, 1 if maintenance is needed and include WO#. Enter 2 if maintenance was performed same day.

I.5 Infiltration BMP Inspection and Maintenance Checklist

Date: _____ Work Order # _____

Type of Inspection: □ post-storm □ annual □ routine □ post-wet season □ pre-wet season

Facility: _____ Inspector(s): _____

Defect	Conditions When Maintenance Is Needed	Inspection Result (0,1, or 2) †	Date Maintenance Performed	Comments or Action(s) Taken to Resolve Issue
Appearance, vegetative health	Mowing and trimming vegetation is needed to prevent establishment of woody vegetation, and for aesthetic and vector reasons.			
Vegetation	Poisonous or nuisance vegetation or noxious weeds.			
	Excessive loss of turf or ground cover (if applicable).			
Trash & Debris	Trash and debris > 5 cf/1,000 sf (one standard size garbage can).			
Contaminants and Pollution	Any evidence of oil, gasoline, contaminants or other pollutants.			
Erosion	Undercut or eroded areas at inlet or outlet structures.			
Sediment and Debris	Accumulation of sediment, debris, and oil/grease on surface, inflow, outlet or overflow structures.			
Sediment and Debris	Accumulation of sediment and debris, in sediment forebay and pretreatment devices.			
Water drainage rate	Standing water, or by visual inspection of wells (if available), indicates design drain times are not being achieved (i.e., within 72 hours).			

Defect	Conditions When Maintenance Is Needed	Inspection Result (0,1, or 2) †	Date Maintenance Performed	Comments or Action(s) Taken to Resolve Issue
Media clogging surface layer	Lift surface layer (and filter fabric if installed) and check for media clogging with sediment (function may be able to be restored by replacing surface aggregate/filter cloth).			
Media clogging	Lift surface layer (and filter fabric if installed) and check for media clogging with sediment (partial or complete clogging which may require full replacement).			

†Maintenance: Enter 0 if satisfactory, 1 if maintenance is needed and include WO#. Enter 2 if maintenance was performed same day.

I.6 Permeable Pavement Inspection and Maintenance Checklist

Date: _____ Work Order # _____

Type of Inspection: □ post-storm □ annual □ routine □ post-wet season □ pre-wet season

Facility: _____ Inspector(s): _____

Defect	Conditions When Maintenance Is Needed	Inspection Result (0,1, or 2) †	Date Maintenance Performed	Comments or Action(s) taken to resolve issue
Sediment Accumulation	Sediment is visible			
Missing gravel/sand fill	There are noticeable gaps in between pavers			
Weeds/mosses filling voids	Vegetation is growing in/on permeable pavement			
Trash and Debris Accumulation	Trash and debris accumulated on the permeable pavement.			
Dead or dying vegetation in adjacent landscaping	Vegetation is dead or dying leaving bare soil prone to erosion			
Surface clog	Clogging is evidenced by ponding on the surface			
Overflow clog	Excessive build up of water accompanied by observation of low flow in observation well (connected to underdrain system) If a surface overflow system is used, observation of an obvious clog			
Visual contaminants and pollution	Any visual evidence of oil, gasoline, contaminants or other pollutants.			
Erosion	Tributary area Exhibits signs of erosion Noticeably not completely stabilized			

Defect	Conditions When Maintenance Is Needed	Inspection Result (0,1, or 2) †	Date Maintenance Performed	Comments or Action(s) taken to resolve issue
Deterioration/ Roughening	Integrity of pavement is compromised (i.e., cracks, depressions, crumbling, etc.)			
Subsurface Clog	Clogging is evidenced by ponding on the surface and is not remedied by addressing surface clogging.			

†Maintenance: Enter 0 if satisfactory, 1 if maintenance is needed and include WO#. Enter 2 if maintenance was performed same day.

I.7 Constructed Treatment Wetland Inspection and Maintenance Checklist

Date: _____ Work Order # _____

Type of Inspection: □ post-storm □ annual □ routine □ post-wet season □ pre-wet season

Facility: _____ Inspector(s): _____

Defect	Conditions When Maintenance Is Needed	Inspection Result (0,1, or 2) †	Date Maintenance Performed	Comments or Action(s) taken to resolve issue
Trash & Debris	Any trash and debris which exceed 5 cubic feet per 1,000 sf of basin area (one standard garbage can). In general, there shall be no visual evidence of dumping. If less than threshold all trash and debris will be removed as part of next scheduled maintenance. If trash and debris is observed blocking or partially blocking an outlet structure or inhibiting flows between cells, it shall be removed quickly			
Sediment Accumulation	Sediment accumulation in basin bottom that exceeds the depth of sediment zone plus 6 inches in the sediment forebay. If sediment is blocking an inlet or outlet, it shall be removed.			
Erosion	Erosion of basin's side slopes and/or scouring of basin bottom.			
Oil Sheen on Water	Prevalent and visible oil sheen.			

Defect	Conditions When Maintenance Is Needed	Inspection Result (0,1, or 2) †	Date Maintenance Performed	Comments or Action(s) taken to resolve issue
Noxious Pests	Visual observations or receipt of complaints of numbers of pests that would not be naturally occurring and could pose a threat to human or aquatic health.			
Water Level	First cell empty, doesn't hold water.			
Aesthetics	Minor vegetation removal and thinning. Mowing berms and surroundings			
Noxious Weeds	Any evidence of noxious weeds.			
Tree Growth	Tree growth does not allow maintenance access or interferes with maintenance activity (i.e., slope mowing, silt removal, vactoring, or equipment movements). If trees are not interfering, do not remove. Dead, diseased, or dying trees shall be removed.			
Settling of Berm	If settlement is apparent. Settling can be an indication of more severe problems with the berm or outlet works. A geotechnical engineer shall be consulted to determine the source of the settlement if the dike/berm is serving as a dam.			
Piping through Berm	Discernable water flow through basin berm. Ongoing erosion with potential for erosion to continue. A licensed geotechnical engineer shall be called in to inspect and evaluate condition and recommend repair of condition.			

Defect	Conditions When Maintenance Is Needed	Inspection Result (0,1, or 2) †	Date Maintenance Performed	Comments or Action(s) taken to resolve issue
Tree and Large Shrub Growth on Downstream Slope of Embankments	Tree and large shrub growth on downstream slopes of embankments may prevent inspection and provide habitat for burrowing rodents.			
Erosion on Spillway	Rock is missing and soil is exposed at top of spillway or outside slope.			
Gate/Fence Damage	Damage to gate/fence, including missing locks and hinges			

†Maintenance: Enter 0 if satisfactory, 1 if maintenance is needed and include WO#. Enter 2 if maintenance was performed same day.

I.8 Wet Retention Basin Inspection and Maintenance Checklist

Date: _____ Work Order # _____

Type of Inspection: □ post-storm □ annual □ routine □ post-wet season □ pre-wet season

Facility: _____ Inspector(s): _____

Defect	Conditions When Maintenance Is Needed	Inspection Result (0,1, or 2) †	Date Maintenance Performed	Comments or Action(s) taken to resolve issue
Trash & Debris	Any trash and debris which exceed 5 cubic feet per 1,000 sf of basin area (one standard garbage can) or if trash and debris is excessively clogging the outlet structure. If less than threshold all trash and debris will be removed as part of next scheduled maintenance.			
Sediment Accumulation	Sediment accumulation in basin bottom that exceeds the depth of the design sediment zone plus 6 inches, usually in the first cell.			
Erosion	Erosion of basin's side slopes and/or scouring of basin bottom.			
Oil Sheen on Water	Prevalent and visible oil sheen.			
Noxious Pests	Visual observations or receipt of complaints of numbers of pests that would not be naturally occurring and could pose a threat to human or aquatic health.			
Water Level	First cell empty, doesn't hold water.			
Algae Mats	Algae mats over more than 20% of the water surface.			
Aesthetics	Minor vegetation removal and thinning. Mowing berms and surroundings			

Defect	Conditions When Maintenance Is Needed	Inspection Result (0,1, or 2) †	Date Maintenance Performed	Comments or Action(s) taken to resolve issue
Noxious Weeds	Any evidence of noxious weeds.			
Tree Growth	Tree growth does not allow maintenance access or interferes with maintenance activity (i.e., slope mowing, silt removal, vactoring, or equipment movements). If trees are not interfering, do not remove. Dead, diseased, or dying trees shall be removed.			
Settling of Berm	If settlement is apparent. Settling can be an indication of more severe problems with the berm or outlet works. A geotechnical engineer shall be consulted to determine the source of the settlement if the dike/berm is serving as a dam.			
Piping through Berm	Discernable water flow through basin berm. Ongoing erosion with potential for erosion to continue. A licensed geotechnical engineer shall be called in to inspect and evaluate condition and recommend repair of condition.			
Tree and Large Shrub Growth on Downstream Slope of Embankments	Tree and large shrub growth on downstream slopes of embankments may prevent inspection and provide habitat for burrowing rodents.			
Erosion on Spillway	Rock is missing and soil is exposed at top of spillway or outside slope.			
Gate/Fence Damage	Damage to gate/fence, including missing locks and hinges			

†Maintenance: Enter 0 if satisfactory, 1 if maintenance is needed and include WO#. Enter 2 if maintenance was performed same day.

I.9 Dry Extended Detention Basin Inspection and Maintenance Checklist

Date: _____ Work Order # _____

Type of Inspection: □ post-storm □ annual □ routine □ post-wet season □ pre-wet season

Facility: _____ Inspector(s): _____

Defect	Conditions When Maintenance Is Needed	Inspection Result (0, 1 or 2)†	Date Maintenance Performed	Comments or Action(s) Taken to Resolve Issue
General				
Appearance	Untidy, un-mown (if applicable)			
Vegetation	Access problems or hazards; dead or dying trees			
	Poisonous or nuisance vegetation or noxious weeds			
Insects	Insects such as wasps and hornets interfere with maintenance activities.			
Rodent Holes	Any evidence of rodent holes if facility is acting as a dam or berm, or any evidence of water piping through dam or berm via rodent holes			
Trash and Debris	Trash and debris > 5 cf/1,000 sf (one standard size garbage can).			
Pollutants	Any evidence of oil, gasoline, contaminants or other pollutants			
Inlet/Outlet Pipe	Inlet/Outlet pipe clogged with sediment and/or debris. Basin not draining.			
Erosion	Erosion of the basin's side slopes and/or scouring of the basin bottom that exceeds 2-inches, or where continued erosion is prevalent.			

Defect	Conditions When Maintenance Is Needed	Inspection Result (0, 1 or 2)†	Date Maintenance Performed	Comments or Action(s) Taken to Resolve Issue
Piping	Evidence of or visible water flow through basin berm.			
Settlement of Basin Dike/Berm	Any part of these components that has settled 4-inches or lower than the design elevation, or inspector determines dike/berm is unsound.			
Overflow Spillway	Rock is missing and/or soil is exposed at top of spillway or outside slope.			
Sediment Accumulation in Basin Bottom	Sediment accumulations in basin bottom that exceeds the depth of sediment zone plus 6-inches.			
Tree or shrub growth	Trees > 4 ft in height with potential blockage of inlet, outlet or spillway; or potential future bank stability problems			
Debris Barriers (e.g., Trash Racks)				
Trash and Debris	Trash or debris that is plugging more than 20% of the openings in the barrier.			
Damaged/ Missing Bars	Bars are bent out of shape more than 3 inches.			
	Bars are missing or entire barrier missing.			
	Bars are loose and rust is causing 50% deterioration to any part of barrier.			
Inlet/Outlet Pipe	Debris barrier missing or not attached to pipe.			
Fencing				
Missing or broken parts	Any defect in the fence that permits easy entry to a facility.			

Defect	Conditions When Maintenance Is Needed	Inspection Result (0, 1 or 2)†	Date Maintenance Performed	Comments or Action(s) Taken to Resolve Issue
Erosion	Erosion more than 4 inches high and 12-18 inches wide, creating an opening under the fence.			
Damaged Parts	Damage to gate/fence, posts out of plumb, or rails bent more than 6 inches.			
Deteriorating Paint or Protective Coating	Part or parts that have a rusting or scaling condition that has affected structural adequacy.			
Gates				
Damaged or missing member	Missing gate or locking devices, broken or missing hinges, out of plum more than 6 inches and more than 1 foot out of design alignment, or missing stretcher bar, stretcher bands, and ties.			

†Maintenance: Enter 0 if satisfactory, 1 if maintenance is needed and include WO#. Enter 2 if maintenance was performed same day.

I.10 Proprietary Device Inspection and Maintenance Checklist

Date: _____ Work Order # _____

Type of Inspection: □ post-storm □ annual □ routine □ post-wet season □ pre-wet season

Facility: _____ Inspector(s): _____

Defect	Conditions When Maintenance Is Needed	Inspection Result (0,1, or 2) †	Date Maintenance Performed	Comments or Action(s) taken to resolve issue
Refer to the manufacturer's instructions for maintenance/inspection requirements, below are generic guidelines to supplement manufacturer's recommendations.				
Underground Vault				
Sediment Accumulation on Media	Sediment depth exceeds 0.25-inches.			
Sediment Accumulation in Vault	Sediment depth exceeds 6-inches in first chamber.			
Trash/Debris Accumulation	Trash and debris accumulated on compost filter bed.			
Sediment in Drain Pipes or Cleanouts	When drain pipes, clean-outs, become full with sediment and/or debris.			
Damaged Pipes	Any part of the pipes that are crushed or damaged due to corrosion and/or settlement.			
Access Cover Damaged/Not Working	Cover cannot be opened; one person cannot open the cover using normal lifting pressure, corrosion/deformation of cover.			
Vault Structure Includes Cracks in Wall, Bottom, Damage to	Cracks wider than 1/2-inch or evidence of soil particles entering the structure through the cracks, or maintenance/inspection personnel determine that the vault is not structurally sound.			

Defect	Conditions When Maintenance Is Needed	Inspection Result (0,1, or 2) †	Date Maintenance Performed	Comments or Action(s) taken to resolve issue
Frame and/or Top Slab	Cracks wider than 1/2-inch at the joint of any inlet/outlet pipe or evidence of soil particles entering through the cracks.			
Baffles	Baffles corroding, cracking warping, and/or showing signs of failure as determined by maintenance/inspection person.			
Access Ladder Damaged	Ladder is corroded or deteriorated, not functioning properly, not securely attached to structure wall, missing rungs, cracks, or misaligned.			
Below Ground Cartridge Type				
Filter Media	Drawdown of water through the media takes longer than 1 hour and/or overflow occurs frequently.			
Short Circuiting	Flows do not properly enter filter cartridges.			

†Maintenance: Enter 0 if satisfactory, 1 if maintenance is needed and include WO#. Enter 2 if maintenance was performed same day.

Walsh, Laurie@Waterboards

From: Laura Eisenberg <lcoleyeisenberg@ranchomv.com>
Sent: Friday, September 14, 2012 11:49 AM
To: Walsh, Laurie@Waterboards
Subject: Rancho Mission Viejo Comments on Admin Draft Order R9-2012-0011
Attachments: RMV Comments on Admin Draft Order R9-2012-001.pdf

Dear Ms. Walsh, please find attached for your consideration Rancho Mission Viejo's comments on Admin Draft Order R9-2012-0011. Should you have any questions regarding our comments, please feel free to contact me at (949) 240-3363 Ext 297.

Laura Coley Eisenberg
Vice President, Open Space & Resource Management
Rancho Mission Viejo
(949) 240-3363 Ext 297

RANCHO MISSION VIEJO

September 14, 2012

VIA EMAIL

Ms. Laurie Walsh, Senior Engineer
Regional Water Quality Control Board
San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4353

Reference: Tentative Order R9-2012-0011 Administrative Draft

Subject: Rancho Mission Viejo Comments

Dear Ms. Walsh:

Thank you for providing Rancho Mission Viejo (RMV) with the opportunity to review and comment on the referenced Administrative Draft Tentative Order ("Order"). We have participated in the meetings held to date on this Order. The discussions during the Sept 5th public meeting indicate that many provisions of the Order are still evolving, including the provisions specific to Development Planning. We are therefore focusing in this letter on the concept of watershed-scale planning.

In our opinion, the drafting of this Order represents an opportunity for the Regional Board to continue to recognize how the protection of water quality at the watershed scale can provide equal or greater benefits than the protection of water quality at a site-specific scale. The South Orange County municipal storm water permits have, since the first term permit, directed the co-permittees to implement methods of coordinating land use planning at the watershed scale and to address the impacts of development on water resources as early in the planning process as possible. As we have commented on prior orders and we discuss further below, RMV has been working diligently over many years in coordination with the County of Orange ("County") and the state and Federal resources agencies to implement these requirements. The County's approval of the Ranch Plan embodies the results of this process, and exemplifies what can be achieved when the co-permittees and the development community embrace the goals and intent of the water quality regulatory program. Our comments in this letter are intended to insure that the Order continues the Regional Board's recognition of this process as they have done in the current South Orange County MS4 permit.

DRUG USE IS LIFE ABUSE

28811 ORTEGA HIGHWAY • P.O. BOX 9 • SAN JUAN CAPISTRANO, CA 92693 • (949) 240-3363 • FAX (949) 248-1763

Background

Over the past several years, RMV in cooperation with the County, U.S. Army Corps of Engineers (USACE), U.S. Fish and Wildlife Service (USFWS) and the California Department of Fish and Game (CDFG) has undertaken three coordinated watershed-level planning efforts to determine the future land uses for south Orange County. These planning processes have resulted in approval of the Ranch Plan by the County, the San Juan Watershed/Western San Mateo Watershed Special Area Management Plan (SAMP) by the USACE, the Southern Subregion Habitat Conservation Plan (SSHCP) by USFWS and a Master Streambed Alteration Agreement (MSAA) for the Ranch Plan by CDFG.

Within your jurisdiction and the SSHCP Study Area, 32,818 acres are planned for protection as Habitat Reserve lands and a further 45,524 acres are identified as Supplemental Open Space. 6,928 acres have been identified as Future Development most of which will occur on RMV and 2,545 acres have been identified as Potential Development. Thus, new development within the Regional Board's jurisdiction within south Orange County will be very limited in the future, and significant protection of receiving water bodies within this area has occurred. The extent of protected receiving water bodies is illustrated by the attached SAMP figure titled Aquatic Resource Conservation Areas (Exhibit A).

To support the water quality, geomorphic, and habitat goals of the Ranch Plan, SAMP and SSHCP planning processes, RMV developed a comprehensive Water Quality Management Plan (WQMP) that addresses:

- pollutants and conditions of concern through consideration of the existing hydrologic/geomorphic conditions of the RMV watersheds and sub-watersheds,
- pre- and post project flow duration modeling to address hydromodification, and pollutant loading modeling.

The Conceptual WQMP set the framework for the future levels of WQMP preparation and identified the site design, source control, treatment control, and hydromodification control WQMP elements that will be implemented for each sub-basin within the RMV Ranch Plan. We believe, as do the participating Federal, state and local agencies, that implementation of the Ranch Plan, SSHCP, SAMP and MSAA and the associated Conceptual WQMP is key to protection of water quality and water bodies in the San Juan Creek and San Mateo watersheds.

Comment

RMV has previously submitted comments in support of watershed planning (see for example our letter of comment dated May 14, 2009 which we incorporate herein by reference) that the Regional Board recognized and acknowledged by including language in the current South Orange County Permit that provides for Alternative Compliance for Watershed-Based Planning (see Page 40-41 of Order R9-2009-0002). We respectfully request that the Regional Board continue to define Watershed Planning as an alternative and co-equal approach to the project-specific

requirements by inserting the following language into the Section E - Development Planning as follows:

> *(5) Alternative Compliance for Watershed-Based Planning*
>
> *Where a development project, greater than 100 acres in total project size or smaller than 100 acres in size yet part of a larger common plan of development that is over 100 acres, has been prepared using watershed and/or sub-watershed based water quality, hydrologic, and fluvial geomorphologic planning principles that implement regional LID BMPs in accordance with the sizing and location criteria of this Order and acceptable to the Regional Board, such standards shall govern review of projects with respect to Provision E.3. of this Order and shall be deemed to satisfy this Order's requirements for LID site design, buffer zone, infiltration and groundwater protection standards, source control, treatment control, and hydromodification control standards. Regional BMPs must clearly exhibit that they will not result in a net impact from pollutant loadings over and above the impact caused by capture and retention of the design storm. Regional BMPs may be used provided that the BMPs capture and retain the volume of runoff produced from the 24-hour 85th percentile storm event as defined in Provision E.3.c. and that such controls are located upstream of receiving waters. Any volume that is not retained by the LID BMPs, up to the design capture volume, must be treated using LID biofiltration sized for the design capture volume that has not been retained. Where regional LID implementation has been shown to be technically infeasible (per Section E.3.c.(4)(b)) any volume up to and including the design capture volume, not retained by LID BMPs, nor treated by LID biofiltration, must be treated using conventional treatment control BMPs in accordance with Section E.3.c.(2)(d) and participation in the mitigation program in Section E.3.c.(4)(c).*

We look forward to working with the Regional Board to further our collective desires to protect water quality through watershed planning. We also wish to indicate our support for the comments submitted by the Building Industry Association of Southern California, Inc. (BIA/SC) and the Construction Industry Coalition on Water Quality (CICWQ).

Should you have questions regarding our comments, please feel free to contact me at (949) 240-3363 or lcoleyeisenberg@ranchomv.com.

Sincerely,

Laura Coley Eisenberg
Vice President, Open Space & Resource Management

Attachment: Exhibit A

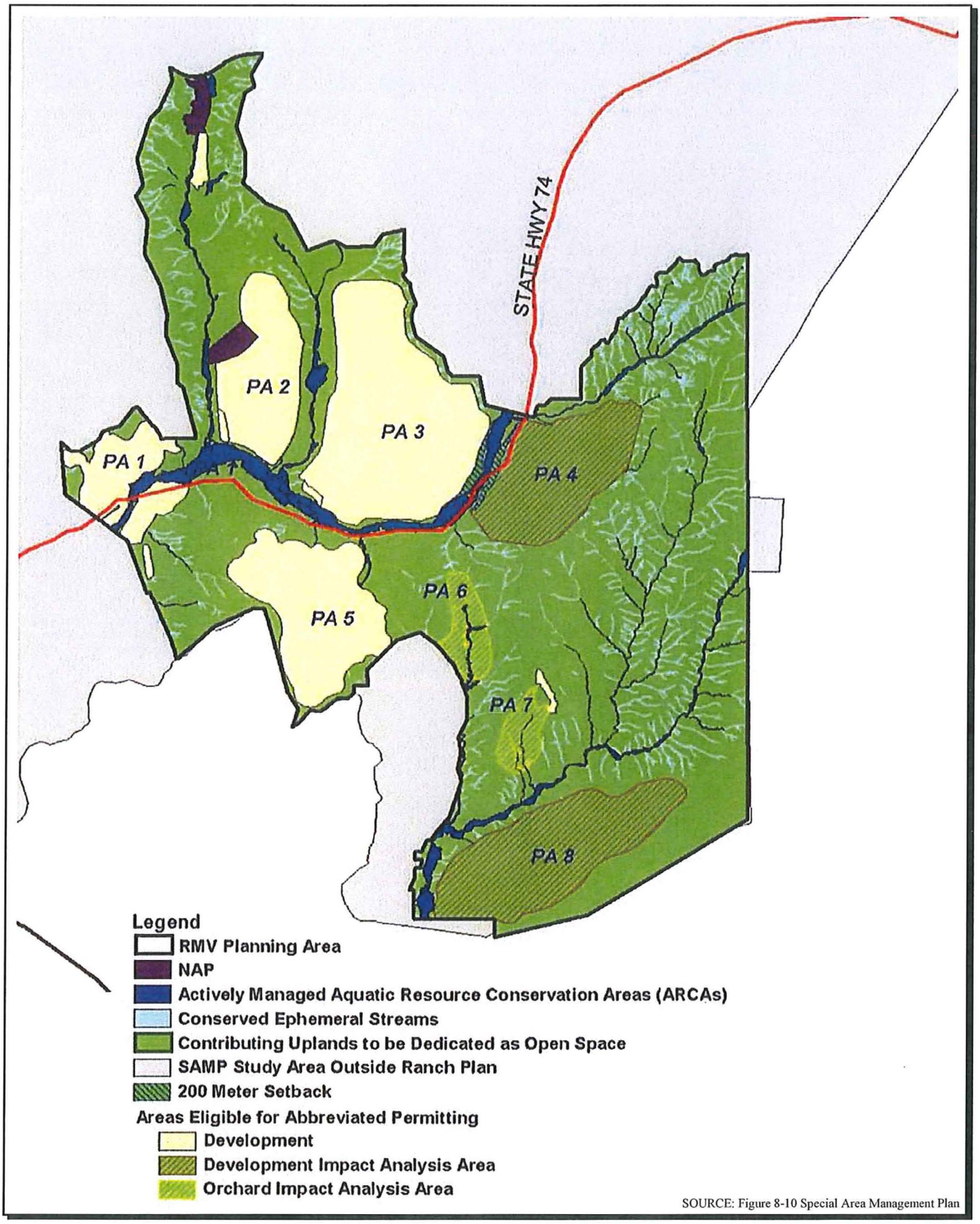

SOURCE: Figure 8-10 Special Area Management Plan

Aquatic Resources Conservation Areas

Exhibit
A

Walsh, Laurie@Waterboards

From: McPherson, Sheri <Sheri.McPherson@sdcounty.ca.gov>
Sent: Friday, September 14, 2012 12:53 PM
To: Walsh, Laurie@Waterboards; Chiu, Wayne@Waterboards; Becker, Eric@Waterboards; Barker, David@Waterboards
Cc: Tesoro, Cid; Brownyard, Teresa; Snyder, Todd
Subject: San Diego Copermittee Comments on Administrative Draft Permit (R9-2012-0011)
Attachments: CP_Comment_CL_091012.pdf; Final ADTO R9-2012-0011 Redline - SD Copermittees-9-14-2012.docx; Final ADTO R9-2012-0011 Redline - SD Copermittees-9-14-2012.pdf; Final ADTO R9-2012-0011 Clean - SD Copermittees- 9-14-2012.pdf; Final Draft Alt Prov D Rationale 9-14-12.pdf; Final ADTO R9-2012-2011 Comment Table-SD Copermittees- 9-14-2012.pdf

Laurie,

On behalf of the San Diego Copermittees, please find the following attached files for submittal on Administrative Draft MS4 Permit (R9-2012-0011):

- Signed cover letter
- Administrative Draft Permit with redline-strikeout Copermittee changes (MS Word version)
- Administrative Draft Permit with redline-strikeout Copermittee changes (pdf version)
- Administrative Draft Permit with Copermittee changes accepted (pdf version)
- Rationale supporting the proposed Alternate Provision D
- Comments table with explanations of proposed Copermittee changes

We will be delivering a CD of these documents this afternoon along with a hardcopy of the cover letter.

We hope that this will provide basis for continued discussion. Please let me know if you have questions.

Thank you,

Sheri

Sheri McPherson
County of San Diego
Watershed Protection Program
(858) 495-5285
sheri.mcpherson@sdcounty.ca.gov

****As of August 10, 2012 our offices will be relocated to 5510 Overland Avenue, Suite 410, San Diego, CA 92123. All email addresses, phone numbers and fax numbers will remain the same.**

County of San Diego

RICHARD E. CROMPTON
DIRECTOR

DEPARTMENT OF PUBLIC WORKS

5510 OVERLAND AVE, SUITE 410
SAN DIEGO, CALIFORNIA 92123-1295

(858) 694-2212 FAX: (858) 694-3597
Web Site: www.sdcounty.ca.gov/dpw/

September 14, 2012

Ms. Laurie Walsh
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Dear Ms. Walsh:

SAN DIEGO COUNTY COPERMITTEE COMMENT SUBMITTAL ON THE ADMINISTRATIVE DRAFT MUNICIPAL SEPARATE STORM SEWER (MS4) PERMIT (TENTATIVE ORDER NO. R9-2012-0011)

Thank you for the opportunity to comment on the Administrative Draft Municipal Separate Storm Sewer (MS4) Permit that is proposed to cover portions of San Diego County, Orange County, and Riverside County (Tentative Order No. R9-2012-0011). The County of San Diego, as Principal Permittee, submits the attached comments on behalf of the 21 Copermittees subject to Regional Water Quality Control Board (Regional Board) Order 2007-0001, the existing San Diego County MS4 Permit. Our comments reflect a general consensus of the San Diego Copermittees. However, although we have strived to obtain unanimity in our proposed permit revisions, individual Copermittees do sometimes have differing opinions. These will be expressed in separate written comments provided by individual Copermittees.

The San Diego Copermittees commend the Regional Board for expanding public involvement in the development of a revised MS4 permit. We greatly appreciate that staff has provided an early draft for review as well as an opportunity to provide alternative language prior to the formal comment period. The focused meetings held between June and August of 2012 allowed the Copermittees and other stakeholders to share thoughts on how the permit can be structured to most effectively and efficiently improve water quality. We are confident that this will ultimately result in an improved permit for the region. The San Diego Copermittees' recommended edits to the Administrative Draft Permit are attached. The supporting rationale for each is provided

in a separate comment table. Most edits are in the form of redline-strikeout changes. However, as discussed during the focused meetings, we have in some cases developed entirely new language for certain permit provisions (Provision D – Water Quality Monitoring & Assessment, and major portions of Provision E – Jurisdictional Runoff Management Programs).

We understand that Regional Board staff will be considering input from a variety of parties, and that the recommendations provided here must be viewed in that overall context. We expect that additional explanation and discussion will be needed to fully understand the Copermittees' specific reasoning for many of these recommended edits. We look forward to continuing dialogue with Regional Board staff and stakeholders while revised Permit language is being drafted.

A few of the key areas of proposed input are highlighted below.

1. **Provision A.** Modifications must be made to Provision A to ensure that implementation of the iterative process continues to serve as the basis for compliance with the MS4 Permit. In light of the recent 9th Circuit Court of Appeals opinion that Receiving Water Limitations are separately enforceable permit provisions, regardless of fulfillment of the iterative process, Copermittees face significant exposure to third party lawsuits in any instance that an MS4 is found to be "causing or contributing to a violation of water quality standards." Such exposure is unreasonable in cases where Copermittees are addressing prioritized issues through a Water Quality Improvement Plan that has been publically vetted and approved by the Regional Board Executive Officer. In recommending changes to Provision A, the San Diego Copermittees are requesting more certainty with regard to what constitutes permit compliance. Although we have provided recommended changes to Provision A language, we request Regional Board staff and counsel to actively participate in the pending statewide dialogue on this important issue. An initial workshop on Receiving Water Limitations language in MS4 permits has been scheduled for November 20, 2012, in Sacramento. The San Diego Copermittees recommend that any precedential language developed as part of this statewide process be incorporated into the proposed permit as soon as possible.

2. **Adaptive Management.** Adaptive management provisions are critical to fostering ongoing program improvement during this and future permit cycles. Suggested edits have been made to clarify and simplify proposed adaptive management provisions. In particular, text has been added to the introductory portion of Provision E stating the conditions under which modifications to baseline jurisdictional requirements can be made. Other suggested language within Section B clarifies how such modifications can be made as part of a Water Quality Improvement Plan.

3. **Numeric Targets and Action Levels.** Regional Board staff indicated during the focused meetings that numeric targets will be required as part of Water Quality Improvement Plans only to guide Copermittee activities, rather than as enforceable permit standards. Similarly, staff indicated that Non-Stormwater Action Levels (NALs) and Stormwater Action Levels (SALs) are intended as tools to support priority-setting and assessment; not as triggers for immediate follow-up action or enforceable permit standards. The Copermittees support this interpretation, and look forward to reviewing modified permit language that supports it.

4. **Water Quality Monitoring.** The San Diego Copermittees were very encouraged to hear at the September 5th workshop that the revised permit will likely feature a monitoring program very similar to the one we proposed at the July 25th Focused Meeting. We very much appreciate staff's openness to considering a more strategic alternative. We believe that these changes will better complement the adaptive management approach supported by the Regional Board, Copermittees, and other stakeholders. As discussed, based on 15-20 years of monitoring experience, the Copermittees have an understanding of receiving water quality issues, and now want to focus on identifying and prioritizing sources and designing special studies to determine how to best implement solutions to address water quality problems.

5. **Development Planning.** Revisions to the Development Planning section are proposed in a number of key areas to clarify these requirements and to allow Copermittees to more efficiently implement programs within their jurisdictions. Key items include: (1) the ability to exempt single family residential and street projects incorporating designated minimum BMPs from Priority Development Project processing requirements, (2) the addition of a second tier standard allowing equal pollutant removal to meet the retention standard prior to requiring mitigation, and (3) clarification of alternative compliance program timing and project types to improve the effectiveness of mitigation programs.

6. **Existing Development.** Significant edits are proposed for this section. First, source inventory requirements are modified to strategically focus Copermittee inspection and oversight resources on the most important industrial, commercial, and municipal sources. Residential sources have also been given their own subsection. These changes maintain the increased emphasis on residential areas contained in the Administrative Draft, but provide the flexibility needed to more efficiently and effectively address them. Finally, Enforcement Response Plan requirements are simplified to eliminate redundancies and to allow Copermittees to best utilize existing approaches and documentation.

Again, the Copermittees thank the Regional Board for creating an open and transparent permit reissuance process and for encouraging public input on this early draft. Please contact Todd Snyder (858) 694-3482 if you have any questions on our suggested changes and to schedule meetings with Copermittee representatives to continue this important dialogue.

Sincerely,

CID TESORO, LUEG Program Manager
Department of Public Works

CT:sm

SAN DIEGO COPERMITTEE COMMENTS ON TENTATIVE ORDER NO. R9-2012-0011				
Permit Section	**Permit Page (Original)**	**Section Title**	**Reason for Proposed Changes/Comments**	**Proposed Changes**
Cover Page	1-2	Cover Page	The Copermittees request clarification that waste discharge requirements are for their respective jurisdictions, in order to limit the entire permit to within each Copermittee's jurisdictional boundaries and preempt any such clauses that would extend requirements beyond the Copermittee's jurisdiction.	**As shown in the attached revised Permit, revise the cover page as follows:** "The San Diego County Copermittees in Table 1a are subject to waste discharge requirements <u>within their respective jurisdictions</u> set forth in this Order" This change is also requested for other sections of the Permit, including Provision A. Add the same language for Orange and Riverside County Copermittees. **Also make this change to the cover page:** This Order provides permit coverage for the Copermittee discharges described in Table 2. <u>"Copermittees need only comply with permit conditions relating to discharges from the municipal separate storm sewers for which they are operators." 40 CFR §122.26(a)(3)(vi).</u>
General Comment	Multiple	Multiple	The term "prohibit" is broader than Clean Water Act requirements, and should be changed to "effectively prohibit." CWA section 402(p) (3) (B) (ii) reads as follows: (B) Municipal Discharge – Permits for discharges from municipal storm sewers – (ii) shall include a requirement to	**Revise language throughout the Permit to read as follows:** Change "prohibit" to "effectively prohibit."

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SAN DIEGO COPERMITTEE COMMENTS ON TENTATIVE ORDER NO. R9-2012-0011				
Permit Section	**Permit Page (Original)**	**Section Title**	**Reason for Proposed Changes/Comments**	**Proposed Changes**
			effectively prohibit non-stormwater discharges into the storm sewer; (Emphasis added) The provision does not provide any reference to exemptions. Rather the section may be read that a permit shall "effectively prohibit non-stormwater discharges" but may exempt certain discharges that are not significant sources of pollutants from the prohibition. The section does not require a full prohibition but rather an effective prohibition. The operative word is "effective". The more precise and correct finding/provision should note that non-stormwater discharges are effectively prohibited (per 402 (p) (3) (B) (ii)). However discharges that are not significant sources of pollutants are exempted from the prohibition. In a practical sense the use of word "effective" provides flexibility to assess the impacts of relatively benign discharges such as landscape irrigation, air condition condensate, individual car washing, and non-emergency fire fighting flows or non-anthropogenic sources before instituting a prohibition.	
General Comment	Multiple	Multiple	Jurisdictional boundaries only partially define the geographic extent of areas where Copermittees can control, reduce, or prohibit stormwater pollutants. The other component that must be incorporated into the Permit language is	**Clarify/Make distinction between different MS4 classifications:** Throughout the Permit replace "MS4s" with "MS4s owned and operated by the Copermittee".

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SAN DIEGO COPERMITTEE COMMENTS ON TENTATIVE ORDER NO. R9-2012-0011				
Permit Section	**Permit Page (Original)**	**Section Title**	**Reason for Proposed Changes/Comments**	**Proposed Changes**
			ownership/operation. There can be multiple MS4s within a municipal boundary (e.g., Phase 2 MS4s), and some MS4 areas are neither owned nor operated by Copermittees, preventing them from controlling pollutants or flows. The Permit should clarify that Permit requirements apply to MS4s owned and operated by the Copermittees. Other MS4 permits in California, including the Los Angeles County MS4 permit, include the "owned and operated" distinction.	
I. FINDINGS				
8	2	Jurisdiction	40 CFR 131.10(a) is applicable to waters of the U.S. for beneficial use designations. Application to waters of the state, which the Regional Board has asserted includes the MS4, beyond beneficial use designations is too broad of an interpretation. It could mean that, for example, storm drain inlet drainage inserts are no longer allowed as they would be a TCBMP in a waters of the state. This finding also conflicts with other Provisions requiring TCBMPs.	**As shown in the attached revised Permit, revise the sentence as follows**: Treatment control best management practices (BMPs) must not be constructed in waters of the U.S.
9	2	Discharge Characteristics and Runoff Management	Discharges may contain waste or pollutants, but it should not be presumed that they necessarily always contain waste or pollutants.	**As shown in the attached revised Permit, revise the section to:** "Discharges from the MS4s <u>may</u> contain waste, as defined in the CWC, and pollutants that adversely affect the quality of the waters of the state. A discharge from an MS4 is a "discharge of pollutants from a point source" into waters of the U.S. as defined in the CWA. Storm water and non-storm water discharges from the MS4s <u>may</u> contain pollutants that cause or threaten to cause a

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SAN DIEGO COPERMITTEE COMMENTS ON TENTATIVE ORDER NO. R9-2012-0011				
Permit Section	**Permit Page (Original)**	**Section Title**	**Reason for Proposed Changes/Comments**	**Proposed Changes**
				violation of surface water quality standards, as outlined in the Basin Plan."
11	3	Discharge Characteristics and Runoff Management	This finding does not apply to developed area that is subject to SUSMP or HMP requirements. These requirements are specifically designed to reduce loads.	**As shown in the attached revised Permit, revise the section to:** "Therefore, runoff leaving a developed area <u>not subject to SUSMP or HMP requirements</u> contains greater pollutant loads and is significantly greater in runoff volume velocity, and peak flow rate than pre-development runoff from the same area."
II. PROVISIONS				
A. Prohibitions and Limitations				
A	9	Prohibitions and Limitations	The goals of Provision A are multiple, and the Copermittees appreciate the Regional Board's mission to "protect, preserve, enhance, and restore" water quality. For NPDES compliance purposes, however, a concise goal statement that is more central to MS4 permitting is requested. This goal statement provides context to several requested revisions to subsequent provisions. This goal statement is consistent with the intent of the permit program established by Section 402(p)(3)(B) of the Clean Water Act.	**As shown in the attached revised Permit, revise the second sentence of the introductory paragraph of Provision A to:** "The goal of this provision is to ~~protect, preserve, enhance, and restore the~~ <u>address the impacts of MS4 discharges so that such discharges do not impair</u> water quality and designated beneficial uses of waters of the state."
A	9	Prohibitions and Limitations	The proposed Prohibitions and Limitation provisions may be construed as stand-alone provisions that could expose the Copermittees to state and federal enforcement actions, as well as to third party actions under the federal Clean Water Act's citizen suit provisions.	**As shown in the attached revised Permit, insert the following sentence at the end of the introductory paragraph of Provision A:** "The process for determination of compliance with the Discharge Prohibitions (A.1), Receiving Water Limitations (A.2), and Effluent Limitations (A.3) is defined in Provision A.4."

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SAN DIEGO COPERMITTEE COMMENTS ON TENTATIVE ORDER NO. R9-2012-0011				
Permit Section	**Permit Page (Original)**	**Section Title**	**Reason for Proposed Changes/Comments**	**Proposed Changes**
			Consistent with the recent 9th Circuit Court of Appeal decision, each provision of the permit could be read separately so if provision A.2.a states that "the MS4 must not cause or contribute to a violations of a water quality standard" then that is the stand-alone provision, and the accompanying language found in A.4 (Compliance with Discharge Prohibitions) regarding compliance may be considered irrelevant. As such, a clear linkage between the compliance provisions and the prohibitions, receiving water limitations, and effluent limitations must be established.	In this manner, Provisions A.1, A.2, and A.3 are clearly linked to A.4, as opposed to being standalone provisions.
A.1.a	9	Prohibitions and Limitations	Provision A.1.a prohibits certain discharges into waters of the state. NPDES permits under the authority of the Clean Water Act regulate discharges into navigable (surface) waters. Expanding the scope of the Discharge Prohibitions to waters of the state would expand the scope of the Permit to protect groundwater. While the Board has legal authority to protect groundwater under Porter-Cologne, this exceeds federal requirements and would represent an unfunded mandate. Other MS4 permits in California, including the Los Angeles County MS4 permit, protect "waters of the United States."	Throughout the Permit, change "waters of the state" to "waters of the United States", where applicable. The change for Provision A.1.a is as follows: "…in receiving waters of the United States ~~state~~ are effectively prohibited."
A.1.a	9	Prohibitions and Limitations	The Discharge Prohibitions do not establish a sufficient linkage with	**As shown in the attached revised Permit:**

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SAN DIEGO COPERMITTEE COMMENTS ON TENTATIVE ORDER NO. R9-2012-0011				
Permit Section	**Permit Page (Original)**	**Section Title**	**Reason for Proposed Changes/Comments**	**Proposed Changes**
			approved compliance schedules for TMDLs that have been incorporated into the Basin Plan. TMDLs adopted within the region include a schedule to provide MS4 Permittees the time necessary to develop and implement a plan to achieve water quality standards in impaired waters. The compliance schedules for effective TMDLs have been incorporated into Attachment E and language is included in the RWLs provisions (A.2.c.) and the Effluent Limitations provisions (A.3.b.) pointing to the TMDL compliance schedules. However, by not including similar language within Discharge Prohibitions, these provisions could result in violations of the permit even though the implementation compliance dates have not yet passed. Without modification, the Discharge Prohibitions *conflict* with TMDL compliance schedules. Language should be included to clarify that in instances where a TMDL is in place, or a TMDL is being developed, the permittees shall achieve compliance with these provisions as outlined in Attachment E (Specific Provisions for Total Maximum Daily Loads).	**Revise A.1.a and A.1.c by adding the following onto the end of the provision:** "…, unless the Copermittee is addressing the discharges through Provision A.1.e or A.4 through the process set forth in Provision A.4." **Add new part 1.e as follows:** "For discharges associated with water body pollutant combinations addressed in a TMDL in Attachment E of this Order, the affected Copermittees shall achieve compliance as outlined in Attachment E (Total Maximum Daily Load Provisions).
A.1.d	9	Discharge Prohibitions	The first sentence seems to conflict with the remainder of the paragraph and may create a conflict with the State Water Board's policy if not clarified. The revised language clarifies authorized and	**As shown in the attached revised Permit, revise A.1.d as follows:** "~~Discharges from MS4s to ASBS are prohibited unless specifically authorized.~~ Stormwater discharges from the City of

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SAN DIEGO COPERMITTEE COMMENTS ON TENTATIVE ORDER NO. R9-2012-0011				
Permit Section	**Permit Page (Original)**	**Section Title**	**Reason for Proposed Changes/Comments**	**Proposed Changes**
			unauthorized discharges to the ASBS and limits the jurisdiction. Furthermore, this Discharge Prohibition covers MS4 impacts on ASBS, and thus the Receiving Water Limitation is unnecessary and conflicting.	San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 applicable to these discharges, included in Attachment A to this Order. <u>All other discharges from MS4s to ASBS are prohibited, unless authorized by a subsequent order.</u>" In addition, A.2.c should be deleted.
A.2.a, A.2.c	9-10	Receiving Water Limitations	Without modification to the RWLs, they conflict with TMDL compliance schedules. Language should be included to clarify that in instances where a TMDL is in place, or a TMDL is being developed, the permittees shall achieve compliance with these provisions as outlined in Attachment E (Specific Provisions for Total Maximum Daily Loads). Without the requested change, the RWLs put the municipalities in immediate and ongoing non-compliance with the permit, as opposed to incorporating TMDL implementation schedules.	**To provide a more direct tie in between Provision A.2.a, TMDL compliance schedules and A.4.a. the following language is proposed, as shown in the attached revised Permit**. **As shown in the attached revised Permit, replace 2.c with**: "For receiving water limitations associated with a water body pollutant combination addressed in a TMDL in Attachment E of this Order, the Copermittees shall achieve compliance as outlined in Attachment E (Total Maximum Daily Load Provisions)." Provision A.2.a should also be revised to make clear that compliance with the Receiving Water Limitations is determined by compliance with the iterative process. However, the Copermittees have not proposed redline language at this time in anticipation of the State Board's forthcoming November workshop on this important issue, which will presumably inform the development of state-wide language. The proposed language in Provision A.1.a provides an example of an approach for addressing this issue in Provision A.2.a. We request that Regional Board staff coordinate with the Copermittees to develop updated RWL language.

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SAN DIEGO COPERMITTEE COMMENTS ON TENTATIVE ORDER NO. R9-2012-0011				
Permit Section	**Permit Page (Original)**	**Section Title**	**Reason for Proposed Changes/Comments**	**Proposed Changes**
A.2.a.3.b	10	Receiving Water Limitations	The Sediment Quality Control Plan applies specifically to bays and estuaries and only and subtidal surficial sediments that have been deposited or emplaced seaward of the intertidal zone. Many Copermittees do not discharge to the intertidal zone. Text must be revised to clarify that this does not apply to inland MS4 discharges.	**As shown in the attached revised Permit, revise A.2.a.3.b as follows**: "Sediment Quality Control Plan which includes the following narrative objectives for bays and estuaries:"
A.2.a.4.b.	10	Receiving Water Limitations	Footnote to A.2.a.4.b requires Copermittees to not cause or contribute to the more stringent of a water quality objective or a CTR criterion. Instances may exist where it has been determined that one or the other is more appropriate given site specific conditions or analysis (i.e., a TMDL has been established).	**As shown in the attached revised Permit, attach the following to the end of footnote 3**: "unless a previous regulatory action (i.e., TMDL) has specified otherwise."
A.3	11	Effluent Limitations	Two types of effluent limitations, technology-based and water-quality based, are described in A.3, which should be reflected in the Permit.	**As shown in the attached revised Permit, add subsections (a) and (b) for Technology-based and Water Quality-based Effluent Limitations, respectively.**
A.3	11	Effluent Limitations	The effluent limitations and compliance with limitations should be more accurately linked to Attachment E; currently the language reads in a manner that is stand-alone from Attachment E. Instead, the language should reference Attachment E and the compliance determination language the Copermittees propose for inclusion therein. The language should say "as described in" Attachment E rather than "in." In	**As shown in the attached revised Permit, revised the WQBEL language in A.3 as follows to better reflect the role of Attachment E:** "For a water body-pollutant combination addressed in a TMDL in Attachment E of this Order, ~~Pollutants~~ pollutants in discharges from MS4s must be reduced to comply with ~~any~~ effluent limitations expressed as WQBELs required to meet the WLAs established for ~~the~~ those TMDLs as described in Provision A.4 and Attachment E to this Order, pursuant to the applicable TMDL compliance schedules."

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Permit Section	**Permit Page (Original)**	**Section Title**	**Reason for Proposed Changes/Comments**	**Proposed Changes**
			addition, compliance with effluent limitations should be linked to Provision A.4 as described in the next comment.	
A.3	11	Effluent Limitations	Similar to the WQBELs, the technology-based effluent limits should be linked to Provision A.4 as described in the comment below.	**As shown in the attached revised Permit, please add the following language to the end of the sentence that ends with "must be reduced to the MEP" in A.3.a:** "through timely implementation of control measures and other actions as specified in Provisions B and E as described in Provision A.4."
A.4.a.1	11	Compliance with Discharge Prohibition and Receiving Water Limitations Compliance with Discharge Prohibitions, Receiving Water Limitations, <u>and Effluent Limitations</u> (Title Revision)	Provision A.4 describes the iterative process for MS4s to respond to exceedances of water quality standards that persist. However, the language in A.4 appears too broad and suggests the Copermittees should revise their WQIPs even in cases when (1) TMDL pollutant WLAs are exceeded but the TMDL compliance date has not yet occurred and (2) non-TMDL pollutant RWLs are exceeded and the pollutant is a WQIP priority but the BMP implementation schedule described in the WQIP has not yet been exhausted. In these two cases, the water quality standards exceedances are "expected" and no WQIP update is needed; instead the Copermittees should simply complete the implementation of actions identified in the WQIP.	**As shown in the attached revised Permit, insert the following language at the beginning of A.4.a.(1): "**<u>For pollutants that are not in process of being addressed via specific, scheduled actions in the Water Quality Improvement Plan,</u> .." **Insert a new A.4.a.(2) as follows:** "For pollutants in the process of being addressed via a specific, scheduled program in a Water Quality Improvement Plan, the Copermittee(s) shall continue to implement that program as described in the Water Quality Improvement Plan approved by the Regional Board."
A.4.a.1	11	Compliance with Discharge	Provision A.4.a.1 states that in the case of	**As shown in the attached revised Permit, add an exception to Provision A.4.a.(1) to acknowledge forthcoming TMDLs, as follows:**

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		Prohibition and Receiving Water Limitations	persistent water quality standard exceedances, Copermittees shall update their WQIPs in their Annual Reports, "unless the San Diego Water Board directs an earlier submittal." This provision should also consider the scenario where a TMDL is in the process of being developed. In this case, the Copermittees should update their numeric targets/goals to reflect the TMDL WLAs. However, until the TMDL is adopted, the Copermittees have no TMDL WLAs on which to base their numeric goals.	"Copermittees must submit the following updates to the Water Quality Improvement Plan required under Provision B as part of the Annual Report required under Provision F.3.b or Water Quality Improvement Plan update Provision B.5.a, unless the San Diego Water Board either 1) directs an earlier submittal or 2) allows for the adoption of a forthcoming TMDL to establish wasteload allocations that will form the basis of revisions to the Water Quality Improvement Plan:"
A.4.a.1.b	11	Compliance with Discharge Prohibition and Receiving Water Limitations	Language clarification.	**As shown in the attached revised Permit, revise wording, as follows:** "~~Additional w~~ Water quality improvement strategies (e.g., BMPs, retrofitting projects, stream and/or habitat rehabilitation, restoration projects, etc.)"
A.4.a.2	12	Compliance with Discharge Prohibition and Receiving Water Limitations	Copermittees need more than 30 days to update and implement their plans. The San Diego Water Board should also provide a timeline for providing comments and requesting modifications. The timeline should be reasonable and consistent with the Copermittee implementation timeline. Most importantly, the revision process should be identical to the modification and submission process described in Provision B.	**As shown in the attached revised Permit, revise section A.4.a.2., as follows:** Replace the language in sub-bullets (e) and (f) with language that is identical to the language in Provision B, as follows: "As described in Provision B.6, Copermittees must submit requested modifications to the [insert either "Water Quality Improvement Plan" or "jurisdiction runoff management program"] either in the Annual Report required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge (ROWD) required pursuant to Provision F.5.b"
A.4.b	12	Compliance with		**To match the language in Order 99-05, as shown in the**

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		Discharge Prohibition and Receiving Water Limitations Compliance with Discharge Prohibitions, Receiving Water Limitations, and Effluent Limitations (Title Revision)	Provision A.4.b notes that should water quality exceedances continue to occur even after the MS4 has engaged in the "iterative" process and is implementing enhanced water quality improvement strategies, the MS4 must still redo the "iterative" process unless the Regional Board decides otherwise. This approach is not consistent with other stormwater permits (e.g., the recent Caltrans permit) in which the Copermittee does not have to reinstitute the iterative process unless directed to do so by the Regional Board. This distinction is important, as the WQIP process will be underway throughout the course of the Permit, and being required to "re-iterate" when a process is already underway to address exceedances is unreasonable.	**attached Revised, replace A.4.b with the following language:** "So long as the Copermittees have complied with the procedures set forth above and are implementing the revised Water Quality Improvement Plans, the Copermittees do not have to repeat the same procedure for continuing or recurring exceedances of the same discharge prohibitions, effluent limitations, and receiving water limitations unless directed to by the San Diego Water Board."
A.4.c	12	Compliance with Discharge Prohibition and Receiving Water Limitations Compliance with Discharge Prohibitions, Receiving Water Limitations, and Effluent Limitations (Title Revision)	The Copermittees envision WQIPs as the foundation for a BMP-based compliance approach for the Discharge Prohibitions and RWLs. However, the language in the Provision A does not clearly link compliance with the iterative process set forth in the WQIPs. In essence, the language suggests that even if Copermittees expend significant resources to develop and fully implement WQIPs that are progressing towards attainment of water quality standards, they may still be found to be out of compliance for single exceedances.	**As shown in the attached revised Permit, modify the opening paragraph to A.4 to reflect the 99-05 order, using the WQIP in place of the SWMP, as follows:** 1. Change the title of the section and first sentence in A.4 to also include effluent limitations (A.3) 2. Add the following language to the end of the paragraph: "The Water Quality Improvement Plans described in Provision B shall be designed to achieve compliance with the discharge prohibitions, receiving water limitations, and effluent limitations. Copermittees shall be considered in compliance with A.1, A.2 and A.3 unless the Regional Board has denied approval of a Water Quality Improvement Plan or subsequent update as described in

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			The iterative process is a fundamental aspect of MS4 programs, as envisioned by State Water Board Order 99-05 and later reconfirmed in Order WQ 2001-15 (BIA Order), and is the mechanism by which MS4 Permittees should demonstrate compliance (i.e., implementation of the iterative process equals compliance). The WQIPs now provide a mechanism to "raise the bar" with regards to the detail and quantitative analyses used to identify pollutant sources, implement BMPs to address those sources, and increase the number or size of BMPs until water quality standards are attained. However, as Provision A.4 is written, the envisioned strategic compliance process falls short, and the WQIPs are simply documents that do not appear to have a meaningful linkage to MS4 compliance. An unintended but potentially significant consequence of this compliance uncertainty is that Copermittees will be faced with increased difficulty successfully securing program funding because even substantial increases in funding would not eliminate the potential for non-compliance.	Provision B and F.1. In addition to the above suggested changes, these changes must be coupled with changes to the Permit which define a Regional Board approval review and process for initial plan submittals and updates. These Regional Board approvals, when provided, will define a clear mechanism for compliance with Provision A.1 and A.3. Note that compliance with Provision A.2 could also follow the same determination process. We request that Regional Board staff coordinate with the Copermittees to develop updated RWL language. However, the Copermittees have not proposed redline language at this time in anticipation of the State Board's forthcoming November workshop on this important issue, which will presumably inform the development of state-wide language. The proposed language in Provision A.4 could easily be expanded to also reference Provision A.2 (RWLs). We request that Regional Board staff coordinate with the Copermittees to develop updated RWL language.
B. Water Quality Improvement Plans				
B	13	Water Quality	Similar to comments regarding the goal	**As shown in the attached revised Permit, revise the second**

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		Improvement Plans	statement in Provision A, the Copermittees request a revision to the WQIP goal statement. A concise goal statement that is more central to MS4 permitting is requested. This goal statement provides context to several requested revisions to subsequent provisions.	**sentence of the first paragraph of Provision B as follows:** "The goal of the Water Quality Improvement Plan is to 1) effectively prohibit non-storm water discharges into the MS4s, 2) reduce pollutants in storm water discharges from the MS4s to the MEP, and 3) support the attainment and reasonable protection, preservation, and enhancement ~~and restoration~~ of water quality and designated beneficial uses of waters of the state."
B	13	Water Quality Improvement Plans	Similarly, the Copermittees request revisions to the required/critical elements of the WQIPs. These elements reflect several requested revisions to the WQIP process (e.g., B.2), described below.	**As shown in the attached revised Permit, revise the second paragraph of Provision B as follows:** The Copermittees must develop Water Quality Improvement Plans for each Watershed Management Area that 1) prioritize water quality ~~issues~~conditions resulting from the Copermittee's MS4 discharges to and from the MS4s within each Watershed Management Area, 2) identify MS4 pollutant sources and other stressors associated with ~~those~~the water quality priorities, 3) define numeric ~~targets~~goals and schedules to ~~achieve improvement of~~address water quality priorities, 4) describe water quality improvement strategies to achieve numeric ~~targets~~goals, and 5) develop and execute a coordinated monitoring and assessment program to facilitate adaptive management of the Water Quality Improvement Plans and ~~determine progress towards achieving improved water quality~~those goals.
B	13	Water Quality Improvement Plans	The Copermittees envision the WQIPs as the foundation for a BMP-based compliance approach for the Discharge Prohibitions and RWLs. However, language needs to be added to Provision B to provide a clear linkage between Provision A and B.	**As shown in the attached revised Permit, insert the following into the first paragraph of Provision B:** Therefore, implementation of the WQIPs also provides the basis for complying with Provisions A.1 and A.3, as described in Provision A.4.

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			Note that Provision A.2 is excluded to acknowledge the State's November workshop regarding Receiving Water Limitations. However, it seems logical that RWLs would be included, and we request that Regional Board staff coordinate with the Copermittees to develop updated RWL language.	
B	13	Water Quality Improvement Plans	It is unclear whether the 12-month timeline identified in the third paragraph of Provision B applies to the development of the WQIP or the implementation of the BMPs identified in the WQIP. It would appear that the provision requires that the MS4s must *implement* all the requirements (including BMPs) of Provision B within 12 months of permit adoption.	**As shown in the attached revised Permit, revise the last introductory paragraph of Provision B, as follows:** The Copermittees must submit Water Quality Improvement Plans for public review and Regional Board Executive Officer review and approval per the schedule outline in Provision B.
B	13	Water Quality Improvement Plans	The development of a WQIP will require at a minimum of 18 months and BMP implementation will likely be staggered over a certain time frame. Once the permit is adopted, Copermittees will begin the planning process. However, Copermittees must have at least one full fiscal year budgeting cycle within which to seek additional funding to implement the WQIP from our governing bodies (i.e., City councils and County supervisors). Thus the more reasonable time schedule is to require the	**See the proposed changes to the last paragraph of the opening section of Provision B in the attached revised Permit.** Also see the new Section B.6, which combines the submittal, modification, and implementation requirements. 1. The complete WQIPs and corresponding jurisdiction measures are submitted within 18 months. (B.6.a) 2. WQIP implementation is initiated at the beginning of the next fiscal year. (B.6.a) 3. JRMPs are modified in accordance with WQIP modifications (B.6.b)

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			development of the WQIP within 18 months and the implementations of the BMPs to occur consistent with the final approved WQIP.	
B.1	13-14	Watershed Management Areas	Several changes to Table B-1 are requested. The Copermittees request addition of a tenth WMA, for Mission Bay which is entirely in the jurisdiction of the City of San Diego. Furthermore, the City of Poway is not a responsible Copermittee for San Diego River. City of Escondido is not a responsible Copermittee for San Luis Rey River. Finally, the waterbody Loma Alta Slough should be listed under the Carlsbad WMA. Penasquitos WMA includes Miramar Reservoir HA and Poway HA.	**Make the following changes to Table B-1, per the attached revised Permit:** 1. Add a WMA for Mission Bay which includes Scripps HA, Miramar HA, and Tecolote HA. 2. Remove Penasquitos HA and Mission Bay HA from Penasquitos WMA and insert Miramar Reservoir HA and Poway HA. 3. Remove City of Poway from San Diego River 4. Remove City of Escondido from San Luis Rey River. 5. Add the waterbody "Loma Alta Slough" to the Carlsbad WMA.
B.2	15-18	Identification of Water Quality Priorities	The Copermittees have fully embraced the concept of WQIPs and appreciate the Regional Board's approach to identifying priorities, setting goals, and developing a strategy and schedule to meet those goals. The Copermittees have identified an alternative to Provision B.2, which follows the general approach proposed by the Regional Board but increases focus on addressing MS4 impacts.	The following changes are requested, as detailed in the attached revised Permit section B and further described in subsequent comments: 1. Revisions are proposed to section B.2.a to refine the purpose and add considerations for assessing receiving water conditions. 2. A new section B.2.b is proposed to provide a linkage between receiving water conditions and corresponding impacts from the MS4s (versus other sources). 3. Section B.2.c is expanded to describe the considerations when identifying priority receiving water conditions. 4. Section B.2.d is refined to focus on MS4 impacts and pollutant generating activities. 5. Section B.2.e is refined to elucidate the meaning of numeric goals and their implication for MS4 compliance.

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				6. The schedule component of B.2.e is moved to a new section B.6 to improve organization of WQIP concepts.
B.2.a	15-16	Assessment of Receiving Water Conditions	The assessment of receiving water conditions is a critical first step to WQIP development. Changes to purpose of this step are proposed, to focus on water quality issues related to MS4s. Further, data quality and relevance are critical to this assessment, and requirement to consider "all available data" should be refined to address accessibility and quality control issues. Finally, whether a receiving water condition can be achieved and maintained should be assessed.	**As shown in the attached revised Permit, the following changes/revisions were made in Permit section B.2.a:** **Revise the opening paragraph**: "The Copermittees must consider the following, at a minimum, to support the identification of water quality priorities based on the impacts of MS4 discharges on receiving water beneficial uses:" **Under part (7):** replace "All available data" with "Available, relevant, and appropriately collected…data meeting appropriate QA/QC standards" **Insert a new part (10):** "The potential for long-term achievement and maintenance of beneficial use attainment in the Watershed Management Area."
Language Addition B.2.b	16	Assessment of MS4 Discharge Quality and Impacts	For WQIP development, it is critical to differentiate between receiving water conditions and MS4 discharges and impacts. Many receiving water conditions are not driven by MS4 impacts, and Copermittees can have the greatest effect on receiving water quality by focusing on reduction of pollutants discharged by their MS4s.	**As shown in the attached revised Permit, add a new section B.2.b titled "Assessment of MS4 Discharge Quality and Impacts", as follows:** "To support the identification of priorities based on the impacts of MS4 discharges on receiving water beneficial uses, the Copermittees must review appropriately collected MS4 discharge quality data and consider the extent to which MS4s cause or contribute to the adverse impacts to receiving water beneficial uses identified in B.2.a. Considerations include: (1) Locations of the Copermittees' MS4 discharges with respect to receiving waters; (2) MS4 discharge quality results relevant to impacts in receiving waters and action levels, including the temporal and geographic variation of the results:

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				(3) The requirements of Provisions A.1 and A.3.; and (4) Whether MS4 discharge quality is sufficiently well known or other information is available to assess whether MS4 discharges are causing or contributing to specific receiving water conditions, or whether additional data need to be collected through the Monitoring and Assessment Program developed as part of the Water Quality Improvement Plan."
B.2.b	16-17	Identify Priority Pollutants and Receiving Water Conditions	We appreciate the Regional Board's approach to identifying priorities for receiving water conditions. Our proposed revisions to the Permit add several elements that should be included by Copermittees when identifying priority receiving water conditions. Following the Regional Board's approach, "priorities" are also differentiated from "highest priorities." Note the proposed revision to the title of the section, which better reflects the envisioned effort/outcome.	Move Provision B.2.b down to B.2.c. **As shown in the attached revised Permit, make two changes:** **#1: Revise the last paragraph of B.2.c as follows:** The Copermittees must identify the highest water quality priorities to be addressed by the Water Quality Improvement Plan, <u>and describe the reasoning for selecting a subset of receiving water conditions as the highest priority(ies).</u> **#2: Rename section to "Identification of Priority Receiving Water Conditions" and add the following to the end of the Section B.2., as follows:** The Water Quality Improvement Plans shall describe the following for the highest priority receiving water condition(s): (1) The beneficial use(s) and pollutant(s) associated with the priority receiving water condition(s); (2) The geographic extent of the priority receiving water condition(s)within the WMA, if known; (3) The Copermittees with MS4s that contribute discharges to the priority water receiving condition(s); (4) The temporal extent of the priority receiving condition(s) (i.e., dry weather and/or wet weather); and

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				(5) Whether receiving waters have been monitored sufficiently to adequately characterize the priority receiving condition(s), including a consideration of spatial and temporal variation"
B.2.c	16-17	Pollutant Source and/or Stressor Identification	The success of WQIPs will hinge on the ability of MS4s to identify and abate sources of pollutants within the MS4s. The pollutant source identification process proposed by the Regional Board is too broad and inhibits the Copermittees from focusing on the sources they are most able to control. In addition, some pollutants are poorly understood and need to be further investigated to allow for design of pollutant control strategies [new sub-bullet d.(4).(5)]. The proposed revisions to the Source ID section are intended to effectively focus the WQIP prioritization process.	**As shown in the attached revised Permit, rename section to "MS4 Pollutant Source Identification" and revise the section, as follows:** See the changes proposed in the attached revised Permit, which focuses the Source ID section on MS4 sources and impacts. **The new section B.2.d follows:** "The Copermittees must identify <u>and prioritize</u> known and suspected storm water and non-storm water pollutant sources within the MS4 associated with the highest priority receiving water conditions identified under B.2.c. The identification of known and suspected sources of the highest water quality priorities as identified for Provision B.2.c shall consider the following : (1) Land uses and their potential contribution to the highest priority receiving water conditions; (2) Pollutant generating facilities, areas, and/or activities within the Watershed Management Area;: (3) Locations of the Copermittees' MS4s outfalls. (4) Review of available data, including: (a) Findings from the Copermittees' illicit discharge detection and elimination programs, (b) Findings from the Copermittees' MS4 outfall monitoring, (c) Other available, relevant, and appropriately-collected data, information, or studies related to

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				pollutant sources and pollutant-generating activities that contribute to the highest priority receiving water conditions identified in Provision B.2. (5) Whether MS4 sources are sufficiently well known to design an effective, directed control strategy, or whether additional source/stressor identification needs to be conducted through the Monitoring and Assessment Program developed as part of the Water Quality Improvement Plan to identify and prioritize sources/stressors within the watershed."
B.2.d	17-18	Numeric Targets and Schedules	We appreciate the Board staff efforts to allow the MS4s to prioritize their water quality issues and to develop a plan to address these issues. However, the terminology in Provision B.2.d regarding interim and final targets are terms used in TMDL program and their use here confuses the issue. In fact, Provision 2.d (3)(e) clearly ties the numeric "targets" with a TMDL. The WQIP should identify interim and final numeric "goals" to keep the distinction clear between a TMDL and a WQIP. It is entirely possible that the interim goal may in fact be the same as an interim TMDL target but not necessarily.	**Replace "numeric target" with "numeric goal" throughout Provision B.**
B.2.d	17-18	Numeric Targets and Schedules	It will be critical to quantify the expected outcomes of WQIP implementation efforts, and numeric goals serve to elucidate those expected outcomes. Based on the proposed revisions to the	**As shown in attached revised Permit, revise section B.2.e.(1)-(2), as follows:** The Copermittees must develop and incorporate interim and final numeric goals into the Water Quality Improvement Plans. Numeric goals and schedules are intended to support Water

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			WQIP goals and elements, revisions to the description of the purpose of numeric goals are also proposed. Furthermore the notation of "target" implies a compliance effluent limit and thereby subject to enforcement action, versus goals set by the Copermittees that do not trigger any enforcement action by themselves.	Quality Improvement Plan development and to measure progress towards addressing the highest priority receiving water conditions identified under B.2.b. Numeric goals are not enforceable compliance standards, effluent limitations, or receiving water limitations. When establishing numeric goals and corresponding schedules, the Copermittees must consider the following: (1) Final numeric goals must be based on measureable criteria or indicators, to be achieved in the receiving waters and/or MS4 discharges for the highest priority receiving water conditions which will be capable of demonstrating progress toward the achievement of the restoration and/or protection of water quality standards in receiving waters; and (2) Interim numeric goals must be based on measureable criteria or indicators that can demonstrate incremental progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges. **Footnote 7:** "Interim and final numeric goals may take a variety of forms such as TMDL targets, TMDL wasteload allocations, TMDL based WQBELs incorporated in Attachment E of this Order, action levels, pollutant concentration, load reductions, number of impaired water bodies delisted from the List of Water Quality Impaired Segments, Index of Biotic Integrity (IBI) scores, or other appropriate metrics. Interim and final numeric goals are not necessarily limited to one criterion or indicator, but may include multiple criteria and/or indicators. To the extent that a goal is not based on an enforceable regulatory mechanism (i.e., TMDL, WLA), WQIP goals and schedules may be revised through the iterative process. Numeric goals are not subject to enforcement or non-compliance actions under this Order."

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B.3	18-19	Water Quality Improvement Strategies and Schedules	The current version of B.3 requires that the MS4s have <u>all</u> of the following water quality improvement strategies in their WQIP (sub-bullets B.3.a.1 through B.3.a.4): structural and non-structural BMPs, retrofit projects, stream and/or habitat rehabilitation, and other water quality improvements associated with eliminating non-stormwater discharges to the MS4s. This may be an appropriate menu of actions to choose from, but pending the water quality issues and the watershed, the WQIP strategies may include all or only one of the strategies listed.	**As shown in the revised Permit, revise section B.3, as follows:** See the changes proposed in the attached revised Permit section B.3. Sub-bullets B.3.a.1 through a.4 are revised and condensed into two sub-bullets, one for JRMP activities and one for other structural and non-structural BMPs. The two sub-bullets (1) and (2) compose the universe of BMPs that would be implemented by the Copermittees to meet the WQIP numeric goals. **a. WATER QUALITY IMPROVEMENT STRATEGIES** The water quality improvement strategies must prioritize, based on their likely effectiveness and efficiency, and implement measures, as appropriate, to effectively prohibit non-storm water discharges into its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, and achieve the interim and final numeric goals in accordance with the schedules in Provision B.2.e. Measures include: (1) Copermittee-selected activities identified in Provision E ,either as described in the jurisdictional runoff management programs or as modified with justification, that will address priority receiving water conditions; and (2) Additional structural and/or non-structural BMPs, as selected by the Copermittee, that are designed to achieve the interim and final numeric goals identified in Provision B.2.e.

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B.3.b	19	Implementation Schedules	The requirement that "Final dates for achieving final numeric targets must not extend more than 10 years..." may be broadly misinterpreted as currently written with major implications. Based on conversations with Regional Board staff, it is understood that goals can take a number of forms and the "10 year" requirement is not intended as a requirement to attain all Basin Plan water quality standards within 10 years. However, to ensure this requirement is not misinterpreted by third parties, language should be added to make this clarification.	**As shown in the attached revised Permit, add a footnote to sub-bullet (5), as follows:** "Achievement of final numeric goals within 10 years represents progress towards attainment of water quality standards, but is not a requirement to fully attain all applicable water quality standards or all priority receiving water conditions within 10 years."
B.4	19-20	Water Quality Improvement Monitoring and Assessment	Monitoring and assessment will be a critical component of the WQIP process. The vision for WQIP monitoring and assessment is reflected in the proposed revised language for Permit section B.4. A major aspect of this vision is that monitoring requirements in Provision D will be fully integrated into the WQIPs and modified as the WQIPs evolve. The proposed language clarifies the Copermittee's vision for purpose and components of WQIP monitoring and assessment. The requested linkage with Provision D is highlighted through the proposed revision.	As shown in the attached revised Permit revise section B.4, as follows: The Copermittees in each Watershed Management Area must develop an integrated Water Quality Improvement Plan Monitoring and Assessment Program that assesses: 1) progress toward achieving the numeric goals and schedules, 2) progress toward addressing the highest priority receiving water conditions for each Watershed Management Area, and 3) each Copermittee's overall efforts implementing the requirements of Provision B[10]. The water quality improvement monitoring and assessment program must include the monitoring and assessment requirements of Provision D, which may be modified for consistency with the priority receiving water conditions of each Watershed Management Area and associated Copermittees. For Watershed Management Areas with applicable TMDLs, the water quality monitoring and assessment program must incorporate the specific monitoring and assessment requirements of Attachment E. For Watershed Management Areas with any ASBS, the water

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				quality monitoring and assessment program must also incorporate the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-001**2** (see Attachment A).
B.5	20-21	Adaptive Management Process	The WQIPs provide an opportunity to synchronize water quality improvement strategies (e.g, TMDL implementation) and jurisdictional runoff management programs. The Adaptive Management section B.5 proposed by the Regional Board has two components: WQIP adaptive management and JRMP adaptive management. With the proposed expanded scope of the WQIPs proposed by the Copermittees, the two components of the adaptive management process are not WQIP and JRMP, instead the components are (1) Priority Receiving Water Conditions and Numeric Goals and (2) Water Quality Improvement Strategies and Schedules. The proposed revisions to section B.5 reflect the Copermittee's vision for WQIP implementation. Most of the components of the adaptive management process proposed by the Regional Board (sub-bullets B.5.a.1.a thru h and B.5.b.1.a thru e) are included. The proposed language adds clarification	**As shown in the attached revised Permit revise section B.5, as follows:** The Copermittees in each Watershed Management Area must implement the iterative process, adapting the Water Quality Improvement Plan, jurisdictional runoff management programs and monitoring and assessment programs, as necessary, to become more effective and meet the requirements of Provisions A, and shall consider the following: **a. PRIORITY RECEIVING WATER CONDITIONS AND NUMERIC GOALS** The priority receiving water conditions and numeric goals, developed pursuant to B.2.c. and B.2.e respectively, shall guide jurisdictional implementation efforts for the duration of this Order. Recommendations for changes to priority receiving water conditions and numeric goals shall be provided in the Report of Waste Discharge and shall consider the following: (1) Achieving the outcome of improved water quality in MS4 discharges and receiving waters through implementation of the water quality improvement strategies identified in the Water Quality Improvement Plan; (2) Progress toward achieving interim and final numeric goals in receiving waters and/or MS4 discharges for the highest water quality priorities

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			on the purpose of the adaptive management process and re-organizes into two alternative management categories: (1) Priority Receiving Water Conditions and Numeric Goals and (2) Water Quality Improvement Strategies and Schedules. Note that these two management categories are adapted on different timelines: • Priority Receiving Water Conditions and Numeric Goals would be adapted, at a minimum, on a frequency that corresponds to Permit cycles (every 5 years). In this manner the ROWD for future permits is supported by the WQIP process. It is <u>not</u> expected that priority receiving water conditions and numeric goals would vary on a shorter frequency, and thus resources for adaptive management should be focused on the strategies/BMPs used to *achieve* the numeric goals. • Water Quality Improvement Strategies and Schedules would be adapted annually, allowing modification to the JRMP elements, structural BMPs, and non-structural BMPs for achieving numeric goals.	in the Watershed Management Area (3) New scientific information or new or updated policies or regulations that affect identified numeric goals including revised water quality objectives or TMDLs; (4) Spatial and temporal accuracy of monitoring data collected to inform prioritization of water quality problems and implementation measures to address the highest priority receiving water conditions; (5) Availability of new information and data from sources other than the jurisdictional runoff management programs within the Watershed Management Area that informs the effectiveness of the actions implemented by the Copermittees; (6) The factors listed in Provision B.2.a.(1)-(10); (7) San Diego Water Board recommendations; and (8) Recommendations for modifications solicited through a public participation process. **b. WATER QUALITY IMPROVEMENT STRATEGIES AND SCHEDULES** The water quality improvement strategies and schedules required pursuant to B.3and B.4 shall be adapted as new information becomes available to inform more effective and efficient means of achieving the numeric goals established in B.2.e. Copermittees shall consider adaptation to jurisdictional programs and monitoring and assessment strategies and schedules at least

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			Finally, to improve organization, it is proposed that the requirements regarding WQIP and JRMP modification and submittals (sub-bullets B.5.a.2 thru 3 and B.5.b.2 thru 3) be moved to a new section B.6.	annually considering the following when applicable: (1) Changes to priority receiving water conditions and numeric goals based on recommendations from B.5.a.; (2) Measurable or demonstrable reductions of non-storm water discharges to each Copermittee's MS4; (3) Measurable or demonstrable reductions of pollutants in storm water discharges from each Copermittee's MS4 to the MEP; (4) Information on the MS4 sources and/or pollutant-generating activities determined to be most significantly contributing to priority receiving water conditions; (5) Efficiency in implementing the Water Quality Improvement Plan; (6) San Diego Water Board recommendations; and (7) Recommendations for modifications solicited through a public participation process.
B.6	21	Water Quality Improvement Plan Implementation	The development of a WQIP will require at a minimum of 18 months and BMP implementation will likely be staggered over a certain time frame. Once the permit is adopted, Copermittees will begin the planning process. However, Copermittees must have at least one full	**As shown in the attached revised Permit revise section B.6, as follows:** **6. Water Quality Improvement Plan Submittal, Implementation, and Modifications**

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			fiscal year budgeting cycle within which to seek additional funding to implement the WQIP from our governing bodies (i.e., City councils and County supervisors). Thus the more reasonable time schedule is to require the development of the WQIP within 18 months and the implementations of the BMPs to occur consistent with the final approved WQIP. Furthermore, adaptive management submittals (i.e., WQIP, JRMP and monitoring modifications) and modifications should be specified under Provision F. In this manner, submittal requirements will be organized and easier for Permittees to follow. As such, the submittal requirements that were previously described under section B.5.a.2 thru 3 and section B.5.b.2 thru 3 were modified and moved to Provision F.	Requirements for Water Quality Improvement Plan submittals and modifications are described in Provision F. Requirements for corresponding modifications to the jurisdictional runoff management programs and monitoring and assessment program are also described in Provision F. Copermittees must commence with implementation of the Water Quality Improvement Plan no later than the fiscal year (July 1) following San Diego Water Board approval of the Water Quality Improvement Plan.
C. Action Levels				
C. (Intro)	22	Action Levels	The Draft Order in Provision B states that the goal of the WQIP is to identify the highest water quality priorities within a watershed and implement strategies to achieve improvements in the quality of discharge and receiving waters. Furthermore in Provision B.2.d the Permittees are required to develop and	**As shown in the attached revised Permit, revise introductory paragraphs of section C, as follows:** "The purpose of this provision is for the Copermittees to incorporate numeric non-storm water and storm water action levels in the Water Quality Improvement Plans. The action levels shall be used to guide the following program planning efforts and measure progress towards attaining the reasonable protection,

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			use *interim and final numeric targets/goals* to measure progress towards the protection/enhancement of the receiving waters and beneficial uses. The choice of the target/goals of the watershed may be biological, chemical, or physical based and may include multiple criteria and/or indicators. The permit should provide a clear linkage between Provision B and Provision C and state that the WQIP should guide the customization of the NALs/SALs to meet the highest water quality priorities in a given watershed and that NALs/SALs will be used to assist Copermittees in reaching the goals specified in the WQIP. The introduction to Provision C indicates that the *action levels* (NALs and/or SALs) will be incorporated into the WQIPs (B.2.d) and used to: a) Measure progress towards the protection/ enhancement of the receiving waters and beneficial uses (B.4) ; b) Direct and focus the JRMP implementation efforts for addressing MS4 discharges (D.4.a); and c) Detect and eliminate non-stormwater and illicit discharges to the MS4 (E.2) Although action levels will be used for several different purposes, the action	preservation, and enhancement of water quality and designated beneficial uses of waters of the state: 1) Support development and prioritization of water quality improvement strategies through the Water Quality Improvement Plans. Discharge data above action levels can be evaluated using a statistical approach considering the frequency, magnitude, and loading of discharges to the receiving waters to support development of actions and prioritization of their implementation. 2) Assist in the effective prohibition of non-stormwater discharges from the MS4 pursuant to Provision E.2. 3) Support the detection and elimination of illicit discharges to the MS4 pursuant to Provision E.2. These goals will be accomplished through monitoring and assessing the quality of the MS4 discharges prior to and during the implementation of the Water Quality Improvement Plans. Exceedances of action levels are not subject to enforcement or non-compliance actions under this Order. ”

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			levels defined in Provision C.1 and C. 2 are chemically based and may be in conflict with the selected watershed metrics. As an example, if the watershed metric is improved IBI scores for a water body, then NALs and SALs associated with water chemistry are unlikely to be the best metric to evaluate progress towards improving IBI scores or for assessing our implementation efforts. Thus, the chemically based NALs/SALs may direct resources away from the watershed priorities. Since Provision C indicates that there are three different purposes for the action levels, the permit should recognize that the action levels for each permit provision (B.4, D.4.a, and/or E.2) may be based on different constituents, metrics, and/or may be different values. As a result, the permit should establish the purposes of the action levels and then allow the Copermittees to establish the numeric action levels. For our purpose we would submit that the action levels should be developed to support program planning and measure progress towards attaining the protection of the beneficial uses.	

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C. (Intro)	22	Action Levels	The development of action levels, including the timeline should be clearly linked to the Water Quality Improvement Plans. A timeline that is separate and different from the development of the Water Quality Improvement Plans is not necessary. Previously developed action levels should serve as interim action levels until the Water Quality Improvement Plans are completed.	**As shown in the attached revised Permit, revise concluding paragraph of section C, as follows:** Action levels will be developed and incorporated into the Water Quality Improvement Plans (Provision B) including the Illicit Discharge Detection and Elimination (IDDE) Program (Provision E.2). Depending upon the goals/objectives for the use of the action levels and the priority receiving water conditions, the constituents and values at which they are set may differ between watersheds. Copermittees may develop Watershed Management Area specific numeric action levels for non-storm water and storm water MS4 discharges using an approach approved by the Regional Board or use the default non-stormwater and stormwater action levels prescribed within C.1 and C.2 below, respectively. The Copermittees will submit action levels as part of their Water Quality Improvement Plan(s). The action levels established as part of R9-2007-0001 will serve as the interim action levels until the Water Quality Improvement Plans are completed and approved.
C.1	22-24	Non-Stormwater Action Levels	Referencing the CTR as a "source" is misleading. It is unclear why the Board is excluding the conversion factor from the CMC and CCC Metals Criteria equations from the CTR to generate total recoverable metals criteria. Table notes need to be updated to explain how NALs were derived. It should be made clear that the MDALs and AMALs were calculated using State Implementation Standard (SIP) procedures.	Add appropriate references to the State Implementation Standard procedures and provide a narrative explanation for reasoning and application in the fact sheet, when provided.
C.1	22-24	Non-Stormwater Action Levels	Provision C.1.b of the permit requires that additional NALs must be	The permit should provide a clear linkage between Provision B and Provision C and allow the WQIP to guide the customization

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			incorporated into the Permit for any constituents causing or contributing to conditions associated with the highest non-stormwater related water quality priorities. However the provision does not identify other options for the development of NALs. The Copermittees believe it necessary to have the flexibility to develop NALs that are relevant to their watershed issues.	of the NALs based on the watershed needs. Furthermore the permit should identify past and current dry weather monitoring as a basis for the development of NALs that are watershed specific.
C.2	25	Storm Water Action Levels	Provision C.2.b requires that additional SALs must be incorporated into the Permit for any constituents causing or contributing to conditions associated with the highest non-stormwater related water quality priorities. The development of SALs may be based on one of 3 options: 1) water quality standards; 2) site specific conditions; and 3) numeric WQBELs. As noted previously the Copermittees believe that it is critical that flexibility be provided in the development and implementation of the SALs to allow the Copermittees to address their highest water quality issue(s). Consequently the Copermittees support other options for developing SALs.	Other options that should be included for the development of the SALs in the Permit are the approaches identified in the California Storm Water Panel in its report, "The Feasibility of Numerical Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities" (June 2006). As previously noted, if the Copermittees do not establish action levels to support the WQIP then the Copermittees must use the SALs identified in Provision C.
D. Monitoring and Assessment Requirements				
D	26-52	Monitoring and Assessment Requirements	Current provisions are overly prescriptive and constrain the efficient or best use of Copermittee resources or for adaptive management. Significant efforts have been invested by the State and Regional Boards as well as Copermittees to	Remove current Provision D and replace with the Provision D attached.

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			develop a structured, question-driven monitoring approach. These efforts provide for the development of an effective and appropriate alternative to address the monitoring needs of the permit, which include an evaluation of the effective prohibition of non-stormwater discharges, attainment of MEP, evaluation of impacts to and improvements in receiving waters, and collection of data to support management of stormwater programs.	
D.1.a	26	Jurisdictional Non-Stormwater Monitoring	The Copermittees' past monitoring results illustrate that chemical water quality monitoring data for dry weather inter-MS4 flows is not effective for eliminating dry weather discharges. The approach outlined in the Administrative Draft Tentative Order would generate a great deal of water quality data for dry weather flows and identify some IC/IDs. However, since the purpose of the program is to eliminate dry weather flows and IC/ID flows entirely, there is little value to collecting extensive dry weather water quality data for MS4 sites. Very little of the water quality data collected would support assessment of the stated program management objective to effectively prohibit non-storm water discharges to the MS4s. Consequently, this extremely resource intensive approach will be relatively inefficient in eliminating the MS4 flows and IC/IDs	*If Provision D is not replaced, modify language to allow greater flexibility in monitoring to eliminate IC/IDs based on Copermittees' experience and understanding of how to effectively address non-stormwater discharges.*

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			with any potential to adversely impact receiving waters. *See the Dry Weather Outfall Monitoring and Discussion of IDDE Program Efficiency and Effectiveness Sections of the Alternative Provision D Supporting Documentation for additional details.*	
D.1.a.2	32	Dry Weather Ambient Receiving Water Monitoring Program	TO Provision D does not take advantage of the current state of knowledge of receiving water conditions and does not integrate the many existing receiving water monitoring efforts. The proposed monitoring would result in a significant and unnecessary duplication of monitoring efforts by the Copermittees in receiving waters. Copermittees propose to integrate the numerous receiving waters programs at the WMA level. *See the Receiving Water Monitoring Section of the Alternative Provision D Supporting Documentation for additional details.*	*If Provision D is not replaced, modify language to allow greater flexibility and coordination of monitoring to achieve program objectives considering existing receiving water programs that may already meet the goals of Provision D.*
D.1.a.2	32	Dry Weather Jurisdictional Receiving Water Boundary Monitoring	Jurisdictional receiving water dry weather boundary monitoring proposed in the TO does not support the three key monitoring goals. Monitoring conducted by the Copermittees' and others have shown jurisdictional boundary monitoring of the type proposed in the TO to be ineffective in estimating water quality impacts and loading from MS4	*If Provision D is not replaced, remove the jurisdictional receiving water boundary monitoring.*

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			discharges (particularly from one jurisdiction to the next). This is due to a combination of factors, including high variability of the constituent concentrations in receiving waters and discharges, typically small percentages of MS4 discharge flows and pollutant loads in the receiving waters, and uncertainty of the source of flow changes within jurisdictional boundaries. The combination of high variability and relatively small impacts or differences requires high numbers of samples to detect significant and programmatically relevant differences and would be unlikely to support programmatic changes or guide improvements to water quality. *See the Discussion of Jurisdictional Boundary Monitoring of the Alternative Provision D Supporting Documentation for additional details.*	
D.1.a.2	32	Jurisdictional Monitoring Requirements	It would be useful to call for the monitoring program to adhere to the design recommendations in the SWAMP Assessment Framework, which calls for structured, question-driven monitoring.	If Provision D is not replaced, the following language should be revised: "…within and through its jurisdiction. <u>The design of the receiving water monitoring program should follow the guidance on structured question-driven monitoring outlined in the SWAMP Assessment Framework. In addition, the design should be comparable with, to the extent practicable, regional scale monitoring designs and approaches being developed for the San Diego River watershed and coastal estuaries in the San Diego Region.</u> Any available monitoring …"
D.1.a.2.a.	32	Jurisdictional	Add an emphasis on improving	If Provision D is not replaced, the following language should be

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		Monitoring Requirements	comparability of data and coordination of sampling.	revised: "…may be utilized as a dry weather ambient receiving water monitoring station, with an emphasis on improving coordination among sampling efforts and the comparability of monitoring data."
D.1.b	34-38	Jurisdictional Monitoring Requirements	Proposed monitoring of five MS4 outfalls in every jurisdiction is greatly in excess of the monitoring needed to characterize similar land uses and drainages. Monitoring of representative sites for homogeneous land uses or mixed-use land uses can be coordinated and the results shared among jurisdictions. *See the Wet Weather Outfall Monitoring section of the Alternative Provision D Supporting Documentation for additional details.*	*If Provision D is not replaced, modify language to allow greater flexibility and coordination of monitoring (i.e., site selection, frequency, and parameters) to achieve program objectives while focusing resources on receiving water priorities and supporting development and implementation of management actions.*
D.2	38-42	Watershed Monitoring Requirements	Section D.2 of the Tentative Order requires more reference watershed monitoring stations (one for each WMA) than are needed to assess receiving water conditions and establish reference conditions for the region. The Copermittees propose to use the results of the San Diego Region Stream Reference Study in lieu of this requirement. Regional reference sites that are based on similar geology and watershed size will provide an appropriate measure of the expected receiving water conditions achievable in Copermittees' jurisdictions as a result of the future implementation of	*If Provision D is not replaced, modify language to allow for the use of the San Diego Region Stream Reference Study results to meet the reference watershed requirements.*

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			their WQIPs. *See the Receiving Water Monitoring Section of the Alternative Provision D Supporting Documentation for additional details.*	
D.2	38-42	Watershed Monitoring Requirements	Monitoring proposed for MLS sites is more frequent than required to answer relevant management questions about trends in receiving water conditions. ~~Wet weather m~~Monitoring at MLS sites can be reduced to once every five years, based on the statistical simulations conducted for development of the ROWD (2011 and included in Attachment 2-1). *See the Receiving Water Monitoring Section of the Alternative Provision D Supporting Documentation for additional details.*	*If Provision D is not replaced, reduce wet weather monitoring frequency at MLS sites to once every five years.*
D.2.a	38	Watershed Monitoring Requirements	There is no additional value to continuing the TWAS monitoring in its current form because the constituent concentrations and patterns are generally similar at the TWAS and MLS (and especially within a watershed), (See Attachment 2-1 from the ROWD (2011)). Additional focused receiving water monitoring to address information needs should be evaluated and addressed by Copermittee Program Managers in the WQIP Monitoring and Assessment Plans. *See the Receiving Water Monitoring Section of the Alternative Provision D*	*If Provision D is not replaced, modify language to allow greater flexibility and coordination of monitoring to achieve program objectives consistent with the determination of receiving water priorities through the WQIP development process.*

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			Supporting Documentation for additional details.	
D.2.a	38	Watershed Monitoring Requirements	The distinction between these stations and those called for in D.1.a.2 is not clear, partly because the channel types have not been more completely defined but also because no monitoring questions have been stated. There could be overlap between these two types of stations, especially because the receiving water stations are to be located in natural or undisturbed areas.	If Provision D is not replaced, Clarify the distinction between receiving water and watershed stations. Define management / monitoring questions that follow the SWAMP Assessment Framework guidance.
D.2.a.1	38	Watershed Monitoring Requirements	It is not clear how the data from the mass loading stations will be used; as there is no monitoring question or link to a management issue or decision.	If Provision D is not replaced, Define management / monitoring questions that follow the SWAMP Assessment Framework guidance. Show how the mass loading data will be used. Delete these stations if the value of the data cannot be demonstrated.
D.2.a.4	38	Watershed Monitoring Requirements	A single reference station is not very useful and has all sorts of statistical problems if used in isolation. It would be better to use regional reference data where available.	If Provision D is not replaced, use the San Diego Stream Reference Study for reference stations.
D.2.a.5	38	Watershed Monitoring Requirements	The rationale for this station is not clear. There is no management / monitoring question or link to a management issue or decisions. In addition, there is no readily obvious scientific reason why a midpoint station would be useful.	If Provision D is not replaced, Delete this requirement.
D.2.e and D.3	45-46	WMA Special Studies and Regional Special Studies	Reduce the number of Special Studies from 3 to 2 per WMA in consideration of the planning period required to develop the Monitoring and Assessment Plan	Reduce the number of Special Studies from 3 to 2 per WMA.

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			required as part of the WQIP. *See the Source/Stressor ID and Special Studies section of the Alternative Provision D Supporting Documentation for additional details.*	
D.4.b and D.4.c	51-52	Assessment Requirements	See comment A.4. Language should be added to limit Copermittees responsibilities to within their jurisdiction.	*If Provision D is not replaced, the following language should be revised:* "The Copermittees, within their respective jurisdictions of ~~in~~ each Watershed Management Area, must…"
E. Jurisdictional Runoff Management Programs				
E	53-89	Jurisdictional Runoff Management Programs	Minor grammatical correction in the first sentence.	"The purpose of this provision is for each Copermittee to implement a program to control the contribution of pollutants to and the discharges from the MS4 within its jurisdiction."
E	53-89	Jurisdictional Runoff Management Programs	As stated in the second introductory paragraph in Provision E "The jurisdictional runoff management programs implemented by each Copermittee must be consistent with the Water Quality Improvement Plan for the applicable Watershed Management Area required by Provision B." Additionally, as stated in the introduction to the WQIP (Provision B) "The purpose of this provision is to develop Water Quality Improvement Plans that guide the Copermittees' jurisdictional runoff management program implementation efforts…" However, the provisions do not clearly allow for the appropriate modification of the JRMP requirements contained in the permit.	Include language into the introductory paragraph that clearly indicates that the JRMP requirements contained in Provision E may be modified to allow for implementation of the JRMP consistent with the WQIP if appropriate justification is provided. Suggested language is provided in the attached strikeout version of Provision E.

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E and Attachment C	Throughout	Jurisdictional Runoff Management Programs	Clarification.	Refer to Permanent BMPs as Structural BMPs and add a definition for structural BMPs into Attachment C.
E	Throughout	Jurisdictional Runoff Management Programs	Clarification for consistency.	Change "~~Permanent BMP Sizing Criteria Design Manual"~~ to "BMP Design Manual" and make reference to the current design requirements under R9-2007-0001.
E.1.a.2	53	Legal Authority Establishment and Enforcement	Sites regulated under the Construction and Industrial General Permits are regulated elsewhere and through alternative means. Clarification is necessary for sites that are not regulated under the respective General Permits.	"Control the contribution of pollutants in discharges of runoff associated with industrial and construction activity to its MS4 and control the quality of runoff from industrial and construction sites that do not~~, including industrial and construction sites which~~ have coverage under the statewide General Permit for Discharges of Storm Water Associated with Industrial Activities (Industrial General Permit) or General Permit for Discharges of Storm Water Associated with Construction Activities (Construction General Permit)~~, as well as to those sites which do not~~; "
E.1.a.4 and E.1.a.5	53-54	Legal Authority Establishment and Enforcement	The Copermittees do not have jurisdiction to control MS4 discharges outside of their respective MS4s and the Regional Board does not have the authority to require interagency agreements to grant such jurisdiction, particularly for those agencies not subject to the Order (Caltrans, Native American Tribes, Military installations, etc.)	Remove, reword, and/or combine the two subsections as follows : ~~"Control through interagency agreements among Copermittees the contribution of pollutants from one portion MS4 to another portion of the MS4;"~~ and ~~"Control through interagency agreements with other owners of the MS4 such as Caltrans, the U.S. federal government, or sovereign Native American Tribes, where possible, the contribution of pollutants from one portion of the MS4 to another portion of the MS4;"~~ "Coordinate, as possible, with other agencies to minimize the contribution of pollutant discharges from the Copermittee's portion of the MS4 to portions of the MS4 under another agency's jurisdiction and from other agency's portions of the MS4 to the portion of the MS4 under the Copermittee's jurisdiction"
E.2.a	54-57	Illicit Discharge Detection and	The addition of "to the extent allowable by law", as referenced from the Phase II	"To the extent allowable by law, ~~E~~each Copermittee must address all non-storm water discharges as illicit discharges, where the

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		Elimination	Regulations, limits Copermittees responsibility to those that they have the legal authority to implement. Copermittees cannot implement programs outside of what they have legal authority to do. In addition, some non-storm water discharges are authorized under the permit unless the Copermittee or San Diego Water Board determines they are a source of pollutants in receiving waters. Language should be provided to account for subsection E.2.a.(3).	likelihood exists that they are a source of pollutants to waters of the U.S."
E.2.a.1	55	Illicit Discharge Detection and Elimination	Uncontaminated pumped groundwater is the only category under this section that is required to be permitted under an NPDES Permit. It should be added to the initial paragraph and the remainder of the bullets should be added to E.2.a.(3), as they are impractical to be permitted and are currently not required to be permitted.	"Discharges of non-storm water to the MS4 from uncontaminated pumped groundwater ~~the following categories~~ must be addressed as illicit discharges where there is evidence that suggests that they are the source of pollutants to waters of the U.S., unless the discharge has coverage under NPDES Permit No. CAG919001 (Order No. R9-2007-0034, or subsequent order) for discharges to San Diego Bay, or NPDES Permit No. CAG919002 (Order No. R9-2008-0002, or subsequent order) for discharges to surface waters other than San Diego Bay: ~~(a) Uncontaminated pumped ground water;~~ ~~(b) Discharges from foundation drains;~~ ~~(c) Water from crawl space pumps; and~~ ~~(d) Water from footing drains."~~
E.2.a.2	55	Illicit Discharge Detection and Elimination	Limit to within the Copermittee's jurisdiction per prior comments and reword the applicable permitting portion to allow flexibility for any subsequent	Discharges of non-storm water from water line flushing and water main breaks to the MS4 must be addressed as illicit discharges unless the discharge has coverage under a valid NPDES Permit, ~~No. CAG 679001 (~~Order No. R9-2010-0003, or a subsequent

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			NPDES permits that may be issued.	order~~)~~. This includes water line flushing and water main break discharges from water purveyors under the Copermittee's jurisdiction that has been issued a water supply permit by the California Department of Public Health or federal military installations.
E.2.a.3	55	Illicit Discharge Detection and Elimination	Non-storm water sources should be limited to anthropogenic sources within the Copermittees jurisdiction to enable to Copermittees to address those sources in which they have control over. Also, see comment E.2.a.1.	Limit the source of pollutants in receiving waters to anthropogenic sources identified as an illicit discharge within the Copermittees jurisdiction and add discharges from foundation drains, water from crawl space pumps, and water from footing drains.
E.2.a.4	56	Illicit Discharge Detection and Elimination	See comment E.2.a.	Add "or similar means where there is evidence that those discharges are a source of pollutants to waters of the U.S."
E.2.a.4.a	56	Illicit Discharge Detection and Elimination	Individual buildings may require substantial structural modifications to redirect air conditioning condensation to landscaped areas. Redirection should be encouraged instead of required.	"The discharge of air conditioning condensation ~~must~~ should be directed to landscaped areas or other pervious surfaces where feasible;"
E.2.a.4.b	56	Illicit Discharge Detection and Elimination	Complete removal of residential car washing activities is unrealistic and resources would be better used to educate the public. Public outreach has proven to be also effective in minimizing water and detergent use and encouraging the use of commercial facilities.	"~~(i)~~ The discharge of wash water must be encouraged through public outreach and education (i) to be directed to landscaped areas or other pervious surfaces where feasible, and (ii) to m~~M~~inimize the use of water for vehicle washing, use as little washing detergent and other vehicle wash products as possible, wash vehicles at commercial wash facilities, and implement other practices or behaviors that will prevent the discharge of pollutants associated with individual residential vehicle washing from entering the MS4; and"
E.2.a.4.c.ii	56	Illicit Discharge Detection and Elimination	Clarify. Discharges of saline water to the MS4 cannot be directed out of the MS4 once the discharge has occurred. Allow saline discharges to salt water receiving waters.	"The discharge of saline swimming pool water ~~to the MS4~~ must be directed to the sanitary sewer, landscaped areas, or other pervious surfaces that can accommodate the volume of water or to the MS4 if the MS4 discharges to a saltwater receiving water."

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E.2.a.5.a.1	56	Illicit Discharge Detection and Elimination	Building fire suppression system maintenance discharges should not be considered an illicit discharge if BMPs are implemented to prevent discharge of pollutants to the MS4.	Add "where BMPs are implemented."
E.2.a.5.b	57	Illicit Discharge Detection and Elimination	Emergency firefighting discharges are exempted in the Clean Water Act. BMPs should be encouraged, not required to be implemented, particularly in emergency situations that may result in the destruction of life and property.	"Each Copermittee ~~must~~ should develop"
E.2.b.1.d	57	Illicit Discharge Detection and Elimination	MS4 and Private Outfalls should be clearly defined. The Clean Water Act definition of MS4 Outfalls limits outfalls to "major outfalls", limiting the responsibility of Copermittees' mapping of outfalls to "major outfalls" and clarifying the definition of what constitutes a "private outfall".	"All known locations of MS4 outfalls as defined by 40 CFR §122.26(b)(5-6) and private outfalls, as defined by 40 CFR 122.26(b)(9), that discharge runoff collected from areas within the Copermittee's jurisdiction,"
E.2.b.1.e	58	Illicit Discharge Detection and Elimination	Clause is redundant and confusing.	~~(i.e., receiving water segments that are both a receiving water and part of the MS4),~~
E.2.b.2	58	Illicit Discharge Detection and Elimination	Clarification is necessary to limit employee responsibilities to within the terms of their employment.	"Each Copermittee must use Copermittee personnel and contractors to assist in identifying and reporting illicit discharges and connections, if observed during the course of their daily employment activities;"
E.2.b.4	58	Illicit Discharge Detection and Elimination	The addition of language is necessary to limit Copermittees responsibility to standards that may reasonably be met.	"Each Copermittee must implement practices and procedures (including a notification mechanism) to prevent, respond to, contain, and clean up any spills that may discharge into the MS4 within their jurisdiction from any source. The Copermittee must coordinate with spill response teams to prevent to the extent possible entry of spills into the MS4, and prevent contamination of waters of the U.S. ~~surface water, ground water, and soil~~."

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E.2.b.5	58	Illicit Discharge Detection and Elimination: Prevent and Detect	Clarification is needed for circumstances where the source of an illicit connection and/or discharge is from another MS4. Add language to E.2.b(5) and move current E.2.b(5) to E.2.b(6).	Add language to clarify responsibility: (5) Copermittees are responsible for control of discharges to their MS4. In the event that the source of an illicit discharge or connection is from another MS4, the Copermittee shall notify and, if necessary coordinate, with the upstream MS4 to implement and/or enforce corrective actions. Move current E.2.b(5) to E.2.b(6).
E.2.c	58	Illicit Discharge Detection and Elimination: Field Screening and Monitoring	Visual observations should be acknowledged as a way to detect non-storm water and illicit discharges and connections.	Add "Visual Observations" to the provision header and acknowledge within the text.
E.2.d	58-61	Investigate and Eliminate Illicit Discharges and Connections	See the comments above for C.1. NALs should guide JRMP implementation and management actions through the iterative process set forth in the WQIP and may trigger follow up investigations, but may trigger other alternative actions. Actions taken based on NAL exceedances should be defined in the WQIP and/or JRMP based on the most effective actions to reach their watershed-based goals.	Clarify language to state that NAL exceedances during IDDE monitoring/investigations may trigger action levels, including but not limited to follow-up investigations based on the highest watershed priorities set forth and the iterative process provided in the WQIP. In addition, limit E.2.d.1.d to exclude identified natural sources.
E.2.d.2 and E.2.d.3	59 – 61	Illicit Discharge Detection and Elimination: Investigate and Eliminate	Sections 2 and 3 outline the procedures that Copermittees must have in place. Not all language under these headers speak to procedures. Additionally, some overlap exists between these two sections.	Edits were made to ensure that requirements addressed the development of procedures. Additional edits made for clarity and to reduce overlap between sections. See the strikeout document of the admin draft for specifics.
E.2.d.2	59	Illicit Discharge Detection and Elimination	TCBMPs may be part of the MS4 and specifically designed to receive and contain pollutants. The language, as written, is inconsistent with the TCBMP requirements prescribed in Provision E.3.a of the proposed permit. Limiting language should also be added for	"Each Copermittee must implement procedures to investigate and inspect portions of its MS4 that, based on reports or notifications, field screening and monitoring, or other appropriate information, indicate a reasonable potential of ~~receiving, containing, or~~ discharging pollutants to receiving waters within the Copermittees jurisdiction due to illicit discharges, illicit connections, or other sources of non-storm water."

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			discharges to receiving waters within the jurisdiction of the Copermittee.	
E.2.d.4	61	Illicit Discharge Detection and Elimination	Language used in the current Orange County Permit (Provision R9-2009-0002) provides clearer language regarding follow through.	Use Orange County permit language instead: If the Copermittee suspects the source of the non-storm water discharge as natural in origin (i.e. non-anthropogenically influenced) and in conveyance into the MS4, then the Copermittee must ~~collect the data and evidence necessary to demonstrate to the San Diego Water Board that it is natural in origin; and~~ document the rationale for why the discharge does not need further investigation. This documentation shall be included in the Annual Report.
E.3	61	Permanent BMP Requirements for All Development Projects	No jurisdictional limitations are provided in this section. As a result, language in the subsections may be interpreted as expanding Copermittee requirements outside their MS4 jurisdiction. In addition how the Copermittees implement their program should be a decision left to each Copermittee.	Reword to "Each Copermittee, within their respective jurisdictions, must ~~use their land use/planning authorities to~~ implement a development planning program…"
E.3.a	61	Permanent BMP Requirements for All Development Projects	Added language to clarify that not all the prescribed BMPs in Section E.3.a.are applied to every project. These BMPs are applied as practical and feasible and as applicable based on the sites condition and nature of development.	"Each Copermittee, as practical and feasible, must prescribe the following BMP requirements during the planning process (i.e. prior to project approval and issuance of grading or building permits) for all development projects ~~(regardless of project type or size)~~ where local permits are issued, including unpaved roads and flood management projects, except emergency projects implemented for the protection of persons and property:
E.3.a.2	62	Permanent BMP Requirements for All Development Projects	Source control BMP requirements apply to all projects and should be located in one place in the Provision. Language regarding source control BMPs from E.3.c should be moved here. A definition of "properly designed" should also be provided in Attachment C.	Add "Each Copermittee must require each Priority Development Project to implement applicable source control BMPs." A definition of properly designed has been added to Attachment C.

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E.3.a.4 and E.3.a.5	63-64	Long-Term Permanent BMP Maintenance and Infiltration and Groundwater Protection	Structural BMP maintenance is required under PDPs and infiltration and groundwater protection are again only necessary under PDP requirements.	Both sections were moved under PDP requirements, after section Hydromodification Management BMP Requirements and before Alternative Compliance for Technical Infeasibility.
E.3.a.5.a.vi	64	Permanent BMP Requirements for All Development Projects	Treatment with infiltration BMPs should be allowed if no significant pollutant levels are present (e.g. light industrial building with all activities inside).	(moved under PDP) "Infiltration treatment control BMPs must not be used for areas of industrial or light industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee, unless runoff does not exceed Basin Plan water quality standards or runoff is first treated or filtered to remove pollutants prior to infiltration; and"
E.3.b.1.b	64-65	Definition of Priority Development Project	Limit requirements to projects that were not previously subject to prior PDP requirements.	Where redevelopment results in an increase of more than fifty percent of the impervious surfaces of a previously existing development and was not subject to previous Priority Project Development requirements, the performance and sizing requirements apply to the entire development.
E.3.b.1.c	65	Definition of Priority Development Project	Clarify that regardless of the 50% threshold, portions of the site that were subject to and met previous Priority Development Project requirements and will remain undisturbed are not subject to the new requirements. Proposed language has been modified from Ventura County NPDES MS4 Permit (Order No. 00-108).	Add the following: (c) Projects where redevelopment results in an increase of more than fifty percent of impervious surfaces of a previously existing development, and the existing development *was* subject to previous Priority Project Development Requirements, only the altered portion of development is subject to the new Priority Development Project requirements.
E.3.b.2	65-66	Priority Development Project Categories	This provision establishes the scope of development projects subject to the post-construction controls. Sometimes the criterion is based on impervious area and other times it is based on surface area. Revision for consistency is proposed. Also, this is an increase in requirements from the prior permit, which was limited to much larger development projects.	In the interest of consistency, revise the criterion so that impervious area is the mechanism for determining applicability ~~as it is an accurate surrogate for establishing project eligibility~~. Also, add language to E.3.b.2.e to clarify that applicable discharges to an ESA are "not commingled with flows"

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E.3.b.2.g	66	Priority Development Project	This requires streets, roads, highways, freeways, and residential driveways over 5,000 square feet be considered priority development projects. The residential driveways category was added under the proposed permit and will require additional Copermittee effort for Storm Water Management Plan review, TCBMP inventory, inspections, and maintenance verification without proportional water quality benefit. Residential driveways should be removed from this Provision as they carry much lower traffic volumes and therefore do not have the potential to generate the high levels of pollutants that streets and highways generate. Residential driveways would be subject to the requirements of residential development.	"Streets, roads, highways, <u>and</u> freeways, ~~and residential driveways~~. This category is defined as any paved impervious surface that is 5,000 square feet or more used for the transportation of automobiles, trucks, motorcycles, and other vehicles."
E.3.b.3.c and E.3.b.3.d	66	Priority Development Project	An exemption for Priority Development Projects should be provided for driveways constructed with permeable surfaces.	Add driveways to (c) and (d). Add parking lots to (d).
E.3.b.3.e	66	Priority Development Project Categories	This exemption allows small individual residential projects to apply minimum BMPs that meet a minimum performance standards without the burden of preparing a full Storm Water Management Plan, , review cycles, and other burdensome administrative tasks that don't benefit water quality. Under the current proposed language, single family residence as small as 5,000sf may be subject to PDP requirements, and is	Add language as follows: <u>(e) Single-family residential projects that are not part of a larger development or proposed subdivision and implement BMPs that meet minimum performance standards, as outlined in the BMP Design Manual.</u>

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			lumped in with industrial and commercial development. The potential pollutants generated by small residential is not as significant as industrial or commercial and can be effectively reduced by effective source control and minimum permanent BMPs rather than going thru an extensive PDP and HMP analysis and BMP sizing.	
E.3.b.3.f	66	Priority Development Project Exemption	This exemption provides an alternative design standard for smaller roadway projects. Existing roads may provide a great retrofit opportunity, but have many challenges due to physical constraints. Existing roads are considered utility corridors, in addition to being adjacent to buildings and structures which makes it physically impossible to fit BMPs that meet PDP sizing criteria. Therefore, Green Street concepts is a great approach.	Add language as follows: (f) Any paved impervious surface that is 5,000 square feet or more used for the transportation of automobiles, trucks, motorcycles, and other vehicles~~.~~ that follows the USEPA guidance regarding Managing Wet Weather with Green Infrastructure: Green Streets[1] to the MEP. 1:http://water.epa.gov/infrastructure/greeninfrastructure/index.cfm
E.3.c	66-71	PDP	Permanent BMPs which include source control (stenciling, trash lids, efficient irrigation) were being confused with structural BMPs (bioretention, basins, etc) that require inventory tracking and perpetual maintenance. Therefore two different terms are used in the different scenarios. A definition of Structural BMPs was added.	In places where it applied, Permanent was replaced with Structural
E.3.c.1	66	Source Control BMP Requirements	Source Control requirements apply to all projects and should be moved up. See comment E.3.a.(2)	Move Section language to Provision E.3.a.(2).
E.3.c.2.b	67	Priority Development	Retention should be limited to that which is found during undeveloped conditions	(Now E.3.c.(1)(b)) "Each Priority Development Project must be required to implement LID BMPs that are sized and designed to

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		Project BMP Implementation and Oversight	Requiring strict retention of the 85th percentile storm volume without consideration of the natural condition will result in lesser flows necessary for downstream habitats and may result in impacts to habitat and beneficial uses. The recommended language requires mimicking of natural hydrology while still providing improved pollution reduction.	retain the difference in volume ~~equivalent to~~ between the runoff volume produced in the post-project condition as compared to the pre-project condition resulting from a 24-hour 85th percentile storm event ("design capture volume"). A footnote should also be provided clarifying that the "Design capture volume is a single event based volume available after an extended dry period".
E.3.c.2.c	67	Retention Standard	A second tier standard is proposed for sites where on site retention is not feasible due to adverse soils or other conditions. The proposed language allows projects to provide pollutant removal equal to the retention standard by capturing and treating a larger volume. Since equal pollutant removal is to be achieved, offsite mitigation should not be required if the second tier standard is met.	(Now E.3.c.(1)(c)) If onsite retention of the design capture volume using LID BMPs is technically infeasible per Provision E.3.c.(4), flow-thru LID and/or conventional treatment control BMPs must be implemented to provide equal pollutant removal for the portion of the design capture volume that is not retained onsite. Flow-thru LID treatment control BMPs must be designed for an appropriate surface loading rate to prevent erosion, scour and channeling within the BMP; or
E.3.c.2.d	67	Retention and Treatment Mitigation	The requirement for offsite mitigation should only apply to projects that do not meet predevelopment retention or equal pollutant load removal standards.	(Now E.3.c.(1)(d)) If retention and/or equivalent pollutant removal of the design capture volume to meet E.3.c.(2)(a) or E.3.c.(2)(b) are infeasible onsite, project applicants must perform mitigation for the portion of the pollutant load in the design capture volume that is not retained or equally treated onsite, as described in Provision E.3.c.(6)
E.3.c.3	68	Hydromodification Management BMP Requirements	The Regional Board adopted the San Diego Hydromodification Management Plan (HMP) in July 2010. Significant work, technical analysis and input have gone into the development of the HMP and these requirements have been in effect for only 16 months. Rather than	(Now E.3.c.(2) Each Copermittee must require each Priority Development Project disturbing greater than one acre to implement hydromodification management BMPs, as described in the Copermittees current HMP, as applicable.

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			providing separate criteria, the permit should acknowledge implementation of the Regional Board approved HMP as a sufficient mechanism for meeting hydromodification requirements. The one acre threshold is consistent with the threshold recently established by the State Board for Phase II permits and discussed during the HMP workshop.	
E.3.c.3.a	68	HMP Requirements	The requirement to match naturally occurring pre-development runoff conditions holds redevelopment to a higher standard than new development. Redevelopment is widely accepted as benefiting water quality, Redevelopment should be incentivized to ensure an overall improvement of water quality. The main obstacle for removing concrete lining in existing channels is lack of space available to contain the peak flow (Q100). The HMP requirements target much smaller flow rates (Q2 to Q10); therefore, requiring this standard for redevelopment projects is unlikely to increase the ability for channels to be rehabilitated.	(Now E.3.c.(2)(a) Post-project runoff flow rates and durations do not exceed pre-development ~~(naturally occurring)~~ runoff flow rates and durations by more than 10 percent (for the range of flows that result in increased potential for erosion or degraded channel conditions downstream of Priority Development Projects). Added the EPA (64 Federal Register 68722, 68761) definition of Pre-development to the permit definitions.
E.3.c.3.b	68	HMP Requirements	Flexibility is to allow assessment, preservation and compensation for sediment supply losses due to development on a regional basis.	(Now E.3.c(2)(b) Projects shall preserve (where feasible) or provide compensation for significant losses of sediment supply anticipated as a result of development.
E.3.a.4 and E.3.a.5 (moved	63-64	Long-Term Permanent BMP	Structural BMP maintenance is required under PDPs and infiltration and	(Now E.3.**c**.(4) and (5)

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here)		Maintenance and Infiltration and Groundwater Protection	groundwater protection are again only necessary under PDP requirements.	Both sections Long-Term Structural BMP Maintenance and Infiltration and Groundwater Protection were moved here under PDP requirements.
E.3.c.4	69	Alternative Compliance for Technical Infeasibility: Mitigation	Allowing alternative compliance encourages innovative solutions that are not specifically called out in the permit. Alternatives are only valid if it is demonstrated that they can provide equal or better progress towards permit goals.	(Now E.3.c.(6)) Add "Alternative compliance is an optional program for the Copermittees to utilize if it is determined to provide an equal or greater benefit than onsite compliance. Where alternative compliance is allowed, it is the sole responsibility of the project applicant to execute the alternative compliance and comply with the following requirements: ~~subject to the following requirements:~~"
E.3.c.4.b	69-70	Criteria for Technical Infeasibility	On some very small projects, required orifice sizes are so small that effective maintenance is not possible.	(Now E.3.c.(6)(b) HMP flow rate requirements that result in BMP orifice sizes too small for efficient maintenance; and
E.3.c.4.c	70	Alternative Compliance for Technical Infeasibility: Mitigation	The permit should clearly provide Copermittees' with the flexibility to identify and craft an alternative compliance program that meets their specific program needs.. For example, a retrofit project is likely to capture, retain, and treat a mix of land uses. As a result, an offsite project's (i.e., regional retrofit) land uses (and associated EMCs) may not exactly line up with the land use of the new development.	(Now E.3.c.(6)(c)(i)) Modify language as follows: and/or ~~increased pollutant loads~~ water quality equivalence expected to be discharged from the site. The Project applicant must perform offsite mitigation for: [a] The portion of the pollutant load in the design capture volume that is not retained or equally treated onsite, and/or [b] The portion of the increased potential erosion of downstream receiving waters not fully controlled with hydromodification management BMPs onsite. ~~For the pollutant load in the volume of storm water not retained onsite with retention LID BMPs, or increased potential erosion of downstream receiving waters not fully controlled onsite with hydromodification management~~

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				~~BMPs, the Copermittee must require the project applicant to either 1) implement an offsite mitigation project, and/or 2) provide sufficient funding for a public or private offsite mitigation project via a mitigation fund.~~
E.3.c.4.c.i	70-71	Mitigation Project Locations	Aligning project locations with the watershed management areas as detailed in the WQIPs.	(Now E.3.c.(6).(c).(ii)) Replace hydrologic unit with Watershed Management Area
E.3.c.4.c.ii	71	Mitigation Project Types	Groundwater recharge and downstream flows are necessary for healthy receiving waters. Allowing offsite groundwater replenishment encourages more regional facilities. Added groundwater recharge projects, and further defined that in stream impervious surfaces are not applicable for credit.	(Now E.3.c.(6).(c).(iii)) Offsite mitigation projects may include, where applicable and feasible, retrofitting opportunities and stream and/or habitat rehabilitation or restoration opportunities identified in the Water Quality Improvement Plans, identified pursuant to Provision B.3.. Other offsite mitigation projects may include green streets or infrastructure projects, *groundwater recharge projects,* or regional BMPs upstream of receiving waters. Mitigation credit will not be given to portions of in stream mitigation projects using impervious hardscape materials such as concrete. Project applicants seeking to utilize these alternative compliance provisions may propose other offsite mitigation projects, which the Copermittees may approve if they meet the requirements of Provision E.3.c.(4).
E.3.c.4.c.iii	71	Mitigation Project Timing	The requirement that offsite mitigation projects "be completed upon the granting of occupancy for the first project that contributes funds towards the offsite mitigation project…" is not feasible. Due to the length of time it takes to acquire all of the necessary permits, this timeline is not realistic for regional facilities and will serve as a deterrent to	(Now E.3.c.(6).(c).(iv)) Modify as follows: Offsite mitigation funding ~~projects~~ must be secured by the applicant and verified by the Copermittee prior to granting construction permits or recording of maps,whichever comes first, for each ~~completed upon the granting of occupancy for the first project that contributed funds toward the offsite mitigation project, unless a longer period is authorized by the San Diego~~

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			their construction as an alternative compliance mechanism. Additionally, it may take several years for a Copermittee to accumulate the funds necessary for the design, construction and permitting of a regional facility.	~~Water Board.~~
E.3.d	71	BMP Design Manual	Rename "Permanent BMP Sizing Criteria Design Manual" to simply the "BMP Design Manual". Simplicity is best for project applicants.	Update BMP Design Manual
E.3.e.2.a	73	Priority Development Project BMP Implementation and Oversight	Removal of the term "continuously" is suggested so ensure Copermittees do not have to allocate resources for incessant updates to the database. Language should also be added to clarify that, although the database will be watershed-based, each Copermittee is responsible only for inventory under their jurisdiction.	"Each Copermittee must develop and ~~continuously~~ regularly maintain a watershed-based database to track and inventory all Priority Development Projects and associated structural ~~permanent~~ BMPs within their jurisdiction. Inventories must be accurate and complete beginning from January 2002 for the San Diego County Copermittees, February 2003 for the Orange County Copermittees, and July 2005 for the Riverside County Copermittees. The database must include, at a minimum, the following information:"
E.4	75	Construction Management	Storm Water Pollution Prevention Plan (SWPPP) is a State General Construction Permit term, and should not be used within the MS4 permit so that there is no confusion. Replace with Pollution Control Plan.	Replaced SWPPP with Pollution Control Plan.
E.4.	75	Construction Management	The language has been updated so that the Copermittee can define which construction projects will be inventoried within its jurisdictional program. Not all jurisdictions apply permits the same way, therefore each needs the ability to address their processes in regards to construction projects. This will eliminate projects in	a. Construction Program Management Each copermittee must define in the Jurisdictional Runoff Management Plan the following: (1) Define construction sites to be inventoried, such as sites that involve ground disturbance or soil disturbing activities. (2) Define a process for ensuring adequate construction BMP implementation for non-

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			the inventory that are issued local building or construction permits but have no ground disturbance, e.g. plumbing, electrical, mechanical, decks, patios, etc.	inventoried sites. Non-inventoried sites involve minor construction activities that are not anticipated to create storm water pollution such as interior improvements, small miscellaneous residential improvements such as patio covers, plumbing, electrical and mechanical work.
E.5	79-85	Existing Development Management	After years of implementation of existing development programs, the Copermittees have the knowledge and experience to implement programs consistent with the goals of the Order and the adaptive management process required under the Order. In order to accomplish this goal, the Copermittees have reorganized and provided a concise existing development section as an alternative to the current provision E.	Replace the current provision E.5 with the proposed Provision E.5 located in the strikeout version provided.
E.5.a	79	Existing Development Management	Adding the term "reasonable potential to discharge" allows flexibility for the Copermittees to determine priorities. Practically all existing properties have the potential to generate pollutant loads and the inspection program will be ineffective and impractical to implement as written. The focus needs to be on significant pollutant load discharges so inspections and enforcement can actually succeed in receiving water pollutant load reductions versus spending an exhaustive amount of time and money inspecting sites that discharge no pollutant loads, but have the potential to generate minimal loads.	*If the current Provision E.5 is not replaced, modify as follows:* "Each Copermittee must maintain an updated watershed-based inventory of all its existing development that has the reasonable potential to ~~may potentially~~ ~~generate~~ discharge a pollutant load to and from the MS4".
E.5.a.1.c	79	Existing Development	The SIC Code system was replaced by the NAICS Code system in 1997. As a	*If the current Provision E.5 is not replaced, modify as follows:*

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		Management	result, the use of the SIC Code system is being phased out.	c) SIC Code or NAICS Code, if applicable;
E.5.a.4, E.5.a.7	79	Existing Development Management	Mobile home parks are outside the jurisdiction of Copermittees. Also, minor grammatical corrections.	*If the current Provision E.5 is not replaced, modify as follows:* "(4) Identification ~~if a business is a~~ of mobile businesses; " "(7) ~~Identification if an area is a~~ Common Interest Areas (CIAs) / Home Owner Associations (HOAs)~~, or and mobile home parks~~; "
E.5.a.13	80	Existing Development Management	The continual requirement for map updating is excessive. Regularly updated maps should be sufficient for up-to-date information without requiring Copermittees to expend excessive resources.	*If the current Provision E.5 is not replaced, modify as follows:* "A ~~continually~~ regularly updated map showing the location of inventoried existing development, watershed boundaries, water bodies, and pollutants generated at the inventoried existing development."
E.5.b	80	Retrofitting and Channel Rehabilitation in Areas of Existing Development	This is a new requirement, as compared to the prior permit, which only requires an evaluation of channels that may be retrofitted. In many instances, channel rehabilitation may not be feasible and other options for improving discharge water quality would need to be considered. Language should be clarified to indicate retrofit and channel rehabilitation are options the Copermittees have at their disposal, but are not necessarily obligatory.	*If the current Provision E.5 is not replaced, modify as follows:* Remove this Provision entirely or include it as an option for compliance as stated below: "…and rehabilitate~~–~~channels and/or receiving waters to restore impaired beneficial uses of streams within its jurisdiction, as feasible."
E.5.b.3	80	Existing Development Management	The proposed permit requires the Copermittees to "encourage" landowner retrofit to private property through the "Copermittee's use of subsidies, penalties, or other incentives." Copermittees will face serious enforcement (and possibly legal) issues if	*If the current Provision E.5 is not replaced, modify as follows:* Each Copermittee must implement retrofit and channel rehabilitation projects, as feasible, that address the highest water quality priorities identified in the Water Quality Improvement Plan pursuant to Provision B.3.a. Ranking may also take into account water quality, project feasibility cost effectiveness, and

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			they attempt to penalize private landowners for failing to expend their own time, effort, and money retrofitting properties that landowners had no intention of altering in the first place. In addition, water quality, feasibility, cost effectiveness, and community acceptance should be considered when a strategy is developed for retrofit and/or channel rehabilitation.	community acceptance. The Copermittee ~~must~~ should encourage private landowners to implement retrofit designs, at minimum, through the use of public education and outreach. ~~and channel rehabilitation projects whenever practical. Private landowners should be encouraged through the Copermittee's use of subsidies, penalties, or other incentives.~~
E.5.b.5	81	Existing Development Management	See comments for Provision E.5.b.	*If the current Provision E.5 is not replaced, modify as follows:* "Where retrofitting and channel rehabilitation within specific areas of existing development under the Copermittees jurisdiction are determined to be infeasible to restore and protect receiving waters from the highest water quality priorities identified in the Water Quality Improvement Plan, each Copermittee ~~must~~ may identify, develop, and implement regional retrofitting and channel rehabilitation projects..."
E.5.b.7	81	Existing Development Management	Resource re-allocation will assist in neutralizing costs for any channel rehabilitation/retrofit projects undertaken by the Copermittees and will have a more significant likelihood of improving water quality than monitoring. Add.	*If the current Provision E.5 is not replaced, modify as follows:* (7) Upon Regional Board approval and in lieu of monitoring during any given year, the Copermittees may reallocate resources originally authorized for water quality monitoring for retrofit and/or rehabilitation project(s), for a maximum of two nonconsecutive years during the permit term.
E.5.c.1	81	Existing Development Management	Required use of pollution prevention methods will be extremely difficult to enforce, particularly if residential land uses are included.	*If the current Provision E.5 is not replaced, modify as follows:* Each Copermittee must ~~require~~ promote the use of pollution prevention methods by the inventoried existing development through public outreach.
E.5.c.2	81	Existing Development	See comment E.5.a.	*If the current Provision E.5 is not replaced, modify as follows:*

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		Management		"Each Copermittee must designate a minimum set of BMPs required for all inventoried existing development with the reasonable potential to discharge pollutant loads to their MS4, including special event venues ~~that have the potential to generate pollutants~~."
E.5.c.3	81	Existing Development Management	See comment E.5.a.	*If the current Provision E.5 is not replaced, modify as follows:* Each Copermittee must implement, or require the implementation of, designated BMPs at inventoried existing development that have the reasonable potential to ~~generate~~ discharge pollutant~~s~~ loads from their MS4.
E.5.c.4	82	Existing Development Management	See comment E.5.a.	*If the current Provision E.5 is not replaced, modify as follows:* Each Copermittee must operate and maintain, or require the operation and maintenance of designated BMPs at all inventoried existing development that have been identified by the Copermittee as having the reasonable potential to discharge pollutant loads to their MS4.
E.5.c.4.b	82	Existing Development Management	Clarification is necessary that Copermittees are only responsible for the work conducted within their jurisdiction and under their authority.	*If the current Provision E.5 is not replaced, modify as follows:* "Each Copermittee must implement procedures during the operation and maintenance of public streets, unpaved roads, paved roads, and paved highways and freeways, conducted under their authority and within their jurisdiction, that will reduce the contribution of storm water pollutants to the MEP and effectively prohibit the discharge of non-storm water pollutants from the MS4 to receiving water bodies. During maintenance of unpaved roads, each Copermittee must examine the feasibility of replacing existing culverts or designing new culverts/bridge crossings to maintain natural stream geomorphology.
E.5.c.5	82	Existing Development Management	See comment E.5.a.	*If the current Provision E.5 is not replaced, modify as follows:* "Each Copermittee must implement procedures, or require the

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				implementation of procedures, to reduce the contribution of pollutants in storm water to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from inventoried existing development ~~into and from the MS4s.~~ identified by the Copermittee as having the reasonable potential to discharge pollutant loads into or from their MS4."
E.5.d	83	Existing Development Management	See comment E.5.a.	*If the current Provision E.5 is not replaced, modify as follows:* "Each Copermittee must conduct inspections of inventoried existing development that have been identified by the Copermittee as having the reasonable potential to discharge pollutant loads from their MS4 to ensure compliance with applicable local ordinances and permits, and the requirements of this Order."
E.5.d.1	83	Existing Development Management	See comment E.5.a.	*If the current Provision E.5 is not replaced, modify as follows:* "Each Copermittee must establish appropriate inspection frequencies for inventoried existing development based on the priorities set forth in the Water Quality Improvement Plan, and the potential for discharging pollutants via storm water and non-storm water runoff. At a minimum, inventoried existing development that has been identified by the Copermittee as having the reasonable potential to discharge pollutant loads to and from their MS4 must be inspected once ~~every five years~~ during the permit term. Inventoried existing development must also be inspected within six months of any change in property ownership or ~~change~~ increase in pollutant generating activity.."
E.5.d.2.d through E.5.d.2.f	83-84	Existing Development Management	The addition of "if present" is necessary for clarification.	*If the current Provision E.5 is not replaced, modify as follows:* "(d)Visual observations of actual non-storm water discharges, if present; (e)Visual observations of actual or potential discharge of pollutants, if present;

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				(f)Visual observations of actual or potential illicit connections, if present; and…"
E.5.e	85	Existing Development Management	Limiting language should be included for the Copermittee's jurisdiction. The existing development inventory and enforcement should be limited to development with the reasonable potential to discharge pollutants.	*If the current Provision E.5 is not replaced, modify as follows:* "Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried existing development identified by the Copermittee as having the reasonable potential to discharge pollutant loads from the MS4 within their jurisdiction, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6."
E.6	85	Enforcement Response Plans	Enforcement response plans are already codified in Copermittees' municipal codes. This section increases requirements for enforcement response and should be made more concise.	Recommend replacement of Enforcement Response Plan Provision with Copermittee streamlined provision, contained in the strikeout provided.
E.6.b.5	87	Enforcement Response Plans	Two weeks compliance is an extremely short time period for maintenance of TCBMPs and reasonable only if the next rain event is within that two week period. One month is much more reasonable and realistic for confirmation of TCBMP maintenance and is consistent with Copermittee implementation experience and existing ordinances.	*If the current Provision E.6 is not replaced, modify as follows:* "For violations of permanent BMP maintenance requirements, all violations must be corrected in a timely manner with the goal of correcting them before the next rain event but no longer than than ~~10 business~~ 30 calendar days after the violations are discovered. If more than ~~10 business~~ 30 calendar days are required for compliance, a rationale must be recorded in the electronic database or equivalent tabular system used to track permanent BMP inspections. "
E.6.c.2	87-88	Enforcement Response Plans	Criminal penalties should be limited to intentional or criminally negligent acts.	*If the current Provision E.6 is not replaced, modify as follows:* The enforcement process must include, at a minimum, appropriate sanctions to compel compliance, such as: (a) Verbal and written notices of violation;

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				(b) Cleanup requirements; (c) Fines; (d) Bonding requirements; (e) Administrative and criminal (if intentional or criminally negligent) penalties; (f) Liens; (g) Stop work orders; and (h) Permit and occupancy denials.
E.6.c.4	88	Enforcement Response Plans	See comment E.6.b.5.	*If the current Provision E.6 is not replaced, modify as follows:* Change 10 business days to 30 calendar days.
E.6.d.1	88	Enforcement Response Plans	San Diego Water Board notice should be consistent with 40 CFR §122.41(l)(6) and the State of California Construction General Permit. Generally, the requirements should be 24 hour verbal notice and five day written notification. Also, email should suffice as written notice.	"Each Copermittee must notify the San Diego Water Board in writing within ~~48 hours~~ 5 calendar days of issuing ~~high level~~ escalated enforcement (as defined in the Copermittee's Enforcement Response Plan) to a construction site that poses a significant threat to water quality as a result of violations or other non-compliance with its permits and applicable local ordinances, and the requirements of this Order. Written notification may be provided electronically in email form."
E.7.b.	89	Public Education and Participation	Public participation activities are more closely related to education and outreach, and are inherently different from intergovernmental coordination. Therefore public participation should be included with outreach activities. Move from E.7.b. to E.7.a.	"Each Copermittee must implement a public education and participation program, as appropriate, to promote and encourage the development of programs, management practices, control techniques and systems, design and engineering methods, and behaviors that reduce the discharge of pollutants in storm water to the MEP, prevent controllable non-storm water discharges from entering the MS4, and protect water quality standards in receiving waters. The public education program must include~~, at minimum,~~ the following:"
E.7.a.(1)	89	Public Education and Participation	There is specific emphasis on pesticides, herbicides and fertilizers. The rationale for the specificity of these topics is unclear. Given the emphasis on showing changes in water quality, education	Educational activities, public information activities, and other appropriate outreach activities intended to reduce pollutants ~~associated with the application of pesticides, herbicides and fertilizer in storm water discharges~~ of concern from the MS4 to the MEP. Activities shall be determined and prioritized by

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			efforts should be focused on activities that address the pollutants of concern and behaviors that are tied to water quality issues. Therefore, each Copermittee, by jurisdiction and watershed, should identify, determine and prioritize the activities that address priorities consistent with Provision B.	Copermittees by jurisdiction and/or watershed (Section 5.c.(5) to address the highest threats to water quality, such as pesticides, herbicides and fertilizers, used oil, toxic waste, etc.;
E.7.a (2)	89	Public Education and Participation	There is specific emphasis on used oil and toxic material disposal. The rationale for the specificity in education topics is unclear. As stated above, Copermittees should be able to target education efforts on the pollutants and behaviors most commonly linked to the water quality issues within their respective jurisdictions and watersheds. Thus, this section is incorporated in the changes proposed above and would become part of E.7.a.1.	Move section E.7.a(2) into E.7.a(1).
E.7.a(3)	89	Public Education and Participation	There is specific emphasis on construction site operators as a target audience, with "other target audiences as determined by the Copermittee(s)". The rationale for this is unclear. Per the justification above, each Copermittee should be able to determine target audiences in accordance with high risk activities and high priority pollutants within their jurisdiction and watershed(s). Once re-worded, this paragraph then becomes E.7.a (2), because the first two paragraphs have been combined per the comments above. .	"Appropriate education and training measures ~~for construction site operators and other~~ specific target audiences, as determined and prioritized by the Copermittees by jurisdiction and watershed, based on high risk behaviors and pollutants of concern, such as construction site operators, residents, underserved target audiences and school-aged children."
E.7.b	89	Public Education	Inclusion of evaluation and assessment	Include the following language as E.7.a(3):

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		and Participation	for education and outreach activities is a critical tool for adaptive management and should be addressed. Use of assessment is heavily cited in the development of the overall Water Quality Improvement Plan strategy. In addition, the purpose of intergovernmental coordination on respective JRMPs is unclear. Append to allow for watershed and regional collaboration of education and outreach activities based on effectiveness as determined by the Copermittees. Remove requirement for intergovernmental collaboration on jurisdictional runoff management programs. Add E.7.b as evaluation and assessment and move the current E.7.b to E.7.c.	b. "Each Copermittee shall incorporate a mechanism for evaluation and assessment of educational and other outreach activities, as needed, to identify progress and incorporate modifications necessary to increase the effectiveness of the public education program." c. "Each Copermittee may determine, where appropriate and effective, mechanisms for intergovernmental coordination on education and outreach activities. ~~must incorporate a mechanism for public participation and where necessary intergovernmental coordination in updating, developing, and implementing its jurisdictional runoff management program.~~
F. Reporting				
F.1 and F.2	90	Reporting	Changes for consistency with Provision B.6.	Change timeframe from 12 to 18 months.
F.1	90	Reporting	Minor changes incorporated for consistency with Provision B.	Incorporate timeline consistent with Provision B.
F.2.a	90	Reporting	Additional language is necessary to clarify that modification of program elements of the jurisdictional runoff management program will include rationale for any changes to program elements prescribed in Provision E.	Add "Jurisdictional Runoff Management Program document updates that modify program elements from the requirements of Provision E must provide rationale for the modifications within the update documents." Add similar language for the BMP design manual and the Water Quality Improvement updates.
F.2.b	90	Reporting	See F.2.a.	See F.2.a.
F.2.c	91	Reporting	See F.2.a.	See F.2.a.
F.3.b	91	Reporting	Clarification.	"…The first Annual Report must be prepared for the reporting period beginning July 1 after adoption of the permit, and upon

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				San Diego Water Board determination that ~~the date the San Diego Water Board determines that~~…"
F.3.b.	91-92	Reporting	The San Diego Water Board should provide flexibility to allow updates to the Jurisdictional Runoff Management Program Annual Report Form (Attachment D).	Clarify "(Attachment D or approved revision" throughout the Provision.
F.3.b.1 (a through c)	91	Reporting	Monitoring data should be discussed under proposed modifications of the WQIP.	Move a through c under (iii) in original document (now iv).
F.3.b.1.d	92	Reporting	See F.2.a.	Add: (iii) "Proposed modifications to water quality improvement or jurisdictional strategies with associated rationale for such modifications,"
F.3.b.2	92	Reporting	Each Copermittee must submit the report form for each WMA in which they have jurisdiction. Language has been clarified.	Add: "Each Copermittee's Annual Report form must summarize the jurisdictional activities in the WMAs in which the Copermittee has jurisdiction."
F.4	93	Reporting	The Copermittees require language clarification that the regional clearinghouse may be maintained by another agency.	Add a footnote: "The Copermittee may elect to develop and maintain the clearinghouse(s) provided by other Copermittees or agencies."
F.5	93	Reporting	See F.4.	Add similar language from F.4.
G. Principal Watershed Copermittee Responsibilities				
G	96	Principal Watershed Copermittee Responsibilities	Coordinating and developing, with the other Copermittees, the requirements of Provisions F.3.c, F.4, and F.5.b of this Order.	Remove requirement that Principal Copermittee can only be Principal Copermittee for 2 watersheds. Clarify that all Copermittees have some level of commitment, not just the Principal Watershed Copermittee.
H. Modification of Programs				
H	97	Modification of Programs	Modifications of programs are allowed under the WQIP as part of the iterative process and adaptive management. Language should be added to that effect or there may be annual amendments to	"Proposed modifications outside of the WQIP process that are not minor require amendment of this Order in accordance with this Order's rules, policies, and procedures."

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			the Order.	
I. Standard Permit Provisions and General Provisions				
			N/A	None.
Attachment A. Discharge Prohibitions				
Attachment A, 2	A-1	Attachment B to State Water Board Resolution 2012-001X	The Resolution has been adopted as 2012-0012 and should be updated accordingly throughout the document. Order should be incorporated by reference instead duplication.	Reference adopted SWRCB Resolution 2012-0012.
Attachment B. Standard Permit Provisions and General Provisions				
Attachment B	B1-B5	Standard Permit Provisions and General Provisions	This attachment incorporates the standard NPDES permit provisions as identified in 40 CFR 122.41. Although correctly transposed from the regulations the provisions are obviously developed for a traditional point source permit (i.e. wastewater permit). As such there are a number of standard provision that pose challenges to the Copermittees to comply with. Clarification is requested on a number of the provisions.	See specific changes noted below.
Attachment B, 1.m	B-7	Bypass	This provision requires the Copermittees to notify the Regional Board whenever an anticipated or unanticipated bypass will occur. Given the nature of storm events and the fact that stormwater treatment BMPs include bypass provisions to protect the BMP integrity it would appear that the Copermittees should notify the Regional Board anytime a storm is predicted to ensure compliance with the provision (whether anticipated or unanticipated). This provision was crafted for typical wastewater discharges	Delete this provision.

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			and has little relevance to stormwater.	
Attachment C. Acronyms, Abbreviations and Definitions				
Attachment C	C1-C10	Definitions	Definitions need to be added for: properly designed, BMP Design Manual, Public Education, Outreach, and Participation channel rehabilitation and improvement, and retrofit. As currently written, the permit authorizes subjective broad authority and deference to the Regional Board in interpretation of the definitions, if not included. Minor clarifications and grammatical corrections are also included.	Suggested definitions are provided in the strikeout.
Attachment C	C-6	Definitions – MS4	The addition of CWA language to the definition of MS4 limits Copermittees' responsibilities to within their jurisdiction and strengthens support that Copermittees are not responsible for discharges in MS4s that they do not operate.	Add "Copermittees need only comply with permit conditions relating to discharges from the municipal separate storm sewers for which they are operators." 40 CFR §122.21(a)(vi).
Attachment C	C-7	Definitions – Pre-Development Runoff Conditions	The definition for Pre-Development Runoff Conditions should be the exact language codified in the Federal Register at 64 FR §68761.	**Replace the definition as follows:** **Pre-Development Runoff Conditions** – "Runoff conditions that exist onsite immediately before the planned development activities occur. Pre-development is not intended to be interpreted as that period before any human-induced land disturbance activity has occurred." 64 FR §68761.
Attachment C	C-7	Definitions – Public Education, Outreach, and Participation	Neither Public Education and Outreach, nor Public Participation are mentioned in the definitions section of Attachment C. Please add definitions for these non-structural BMPs.	**Add "Public Education, Outreach and Participation** – Programs to educate residents, businesses and visitors about the importance of water quality and water quality programs so that they will support local efforts and understand their role in protecting receiving waters. The Education and Outreach Program will increase knowledge and awareness, improve attitudes toward

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				storm pollution prevention, and provide a foundation for changing behaviors that contribute to storm water pollution."
Attachment C	C-10	Definitions – Waters of the state	Current permit language, citing the California Water Code, presupposes that all portions of the MS4 are considered waters covered by the definition of waters of the state, "Any water, surface or underground, including saline waters within the boundaries of the State [CWC Provision 13050 (e)]." This language should be limited based on the intent of the definition (natural water sources) and should not include dry man-made structures that collect runoff for the sole purpose of flow volume/velocity and/or pollutant reduction.	**"Waters of the State** - Any water, surface or underground, including saline waters within the boundaries of the State [CWC Provision 13050 (e)]. The definition of the Waters of the State is broader than that for the Waters of the United States in that all water in the State is considered to be a Waters of the State ~~regardless of circumstance or condition~~. Under this definition, portions of a MS4 may be ~~is always~~ considered to be a Waters of the State. However, man-made portions of the MS4 constructed for the sole purpose of flow and/or pollutant reduction will not be considered Waters of the State."
Attachment D. Jurisdictional Runoff Management Program Annual Report Form				
			N/A	None.
Attachment E. Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2012-0011				
Attachment E	E-1 to E-30	Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2012-0011	Most requirements are outlined already in the TMDLs and the redundancy of this Attachment is unnecessary. In fact, Attachment E *adds* many TMDL requirements not provided in the TMDL Resolutions, circumventing the TMDL public process. Implementation will be inconsistent with previously adopted resolutions and CLRPs and MPs already drafted, submitted, approved, and/or implemented. A summary of inconsistencies between the TMDLs and Attachment E, where the City of San	On page E-1, reword to clarify that TMDL implementation must be incorporated into the WQIP and Monitoring sections by the Copermittees and reference the Resolution Numbers in the TMDL list and add recommended compliance language per comments below. Address all inconsistencies with the TMDL Resolutions (provided as attachment).

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			Diego is listed as a responsible party, are provided as an attachment to this table.	
Attachment E	E-1	Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2012-0011	The Rainbow Creek TMDL for Total Nitrogen and Phosphorous does not include Wasteload Allocations for the County of San Diego Copermittees. The TMDL only contains Load Allocations. Load allocations should not be implemented through an NPDES permit. It is inappropriate to simply "re-name" the Load Allocations as Wasteload Allocations.	Strike the following TMDL from Attachment E in its entirety: Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed
Attachment E	E-1 to E-30	Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2012-0011	State and federal law do not require the use of numeric effluent limitations for MS4 permittees, but rather encourage flexible implementation of best management practices through an iterative process. Specifically, the choice to include either management practices or numeric limitations in MS4 permits is within the regulatory agency's discretion, and on the question of whether MS4 permits must contain numeric effluent limitations, the court upheld EPA's use of iterative BMPs in place of numeric effluent limitations for storm water discharges. (See *Defenders of Wildlife v. Browner*, 191 F.3d 1159, 1166-1167 (9th Cir. 1999)[1]	See recommended changes in the attached revised Permit to the following: • Provision A.4.c • Provision A.4.d • Provision B (first paragraph) • Provision B.3 Additionally, within the requirements for each individual TMDL in Attachment E, include language similar to the following,: Compliance may be demonstrated via any one of the following methods: 1. There is no discharge from the MS4, or 2. Applicable effluent limitations are met, or 3. Receiving waters meet the applicable receiving water limitations or water quality objective, or 4. Loading from the MS4 is such that it does not cause water

[1] See also California Regional Water Quality Control Board San Diego Region - Fact Sheet / Technical Report For Order No. R9-2010-0016 / NPDES NO. CAS0108766.

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			Given the challenges with meeting the numeric WQBELs (even with the implementation of a comprehensive suite of BMPs) and the flexibility allowed by State and federal regulations and guidance, a BMP-based WQBEL approach should be allowed for complying with TMDLs. Removing the numeric WQBELs is not proposed. Rather, inclusion of a WQIP-based "compliance path" is recommended. The WQIPs can and should be used as the basis for establishing WQBELs expressed as BMPs. The WQIPs can satisfy the necessary elements of BMP-based WQBELs. For example, the WQIPs would meet the requirements described in the 2010 EPA memo (which updated key aspects of the 2002 memorandum) regarding federal expectations for incorporation of TMDLs WLAs into NPDES stormwater permits as BMP-based WQBELs.	quality objective exceedances, or 5. For Copermittee(s) that are implementing a Regional Board-approved WQIP, WQBELs will be implemented as BMPs and compliance will be based upon implementing all provisions of the WQIP in accordance with the approved milestones and schedule.
Attachment E	E-1 to E-30	Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2012-0011	The findings of California's Stormwater Blue Ribbon Panel, which was convened specifically to examine the feasibility of incorporating numeric effluent limits in stormwater permits, ultimately concluded that numeric limits were generally infeasible across all three stormwater activities (municipal, industrial, and construction), with a few exceptions (*The*	See recommended changes in the attached revised Permit to the following: • Provision A.4.c • Provision A.4.d • Provision B (first paragraph) • Provision B.3 Additionally, within the requirements for each individual TMDL in Attachment E, include language similar to the following,:

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			Feasibility of Numeric Effluent Limits Applicable to Discharges of Stormwater Associated with Municipal, Industrial and Construction Activities, June 19, 2006). Additionally, state law and policy does not require the use of numeric effluent limitations in MS4 permits. In 2009, the State Water Board affirmed this approach in a precedential order, stating: > [i]t is our intent that federally mandated TMDLs be given substantive effect. Doing so can improve the efficacy of California's NPDES storm water permits. This is not to say that a wasteload allocation will result in numeric effluent limitations for municipal storm water dischargers. Whether a future municipal storm water permit requirement appropriately implements a storm water wasteload allocation will need to be decided on the regional water quality control board's findings *supporting either the numeric or non-numeric* effluent limitations contained in the permit. (Order WQ 2009-0008, In the Matter of the Petition of County of Los Angeles and Los Angeles County Flood Control District, at p. 10	Compliance may be demonstrated via any one of the following methods: 1. There is no discharge from the MS4, or 2. Applicable effluent limitations are met, or 3. Receiving waters meet the applicable receiving water limitations or water quality objective, or 4. Loading from the MS4 is such that it does not cause water quality objective exceedances, or 5. For Copermittee(s) that are implementing a Regional Board-approved WQIP, WQBELs will be implemented as BMPs and compliance will be based upon implementing all provisions of the WQIP in accordance with the approved milestones and schedule.

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			(emphasis added).)	
Attachment E. Part 1.b, 2.b, 3.b, 4.b, 5.b, and 6.b	E-2, E-4, E-6, E-9, E-13, and E-19	Water Quality Based Effluent Limitations	Federal regulations (40 CFR 122.44(d)(1)(vii)(B)) require inclusion of effluent limits that are "consistent with the assumptions and requirements of any available wasteload allocation for the discharge prepared by the State and approved by EPA." Attachment E outlines the requirements of effective TMDLs and appears to incorporate numeric receiving water limitations (RWL) <u>and</u> effluent limitations, where the effluent limitations are set equal to the TMDL Waste Load Allocations (WLAs) and the RWLs are set equal to the TMDL numeric targets. This approach results in a situation where the Copermittees are in double jeopardy. Copermittees should not be put in double jeopardy by being required to meet both RWLs and effluent limitations. Rather, attainment of either RWLs **<u>or</u>** effluent limitations should represent compliance with the permit and the requirements of the TMDL.	See recommended changes in the attached revised Permit. Additional language should be added to the WQBELs sections for all TMDLs in Attachment E to clearly define compliance with WQBELs via any of the following methods: - There is no discharge from the MS4, **OR** - Applicable effluent limitations are met, **OR** - Receiving waters meet the applicable receiving water limitations or water quality objective, **OR** - Loading from the MS4 is such that it does not cause water quality objective exceedances, **OR** - For Copermittee(s) that are implementing a Regional Board-approved WQIP, WQBELs will be implemented as BMPs and compliance will be based upon implementing all provisions of the WQIP in accordance with the approved milestones and schedule.
Attachment E	E-1 to E-30	Multiple	Attachment E specifies outfall monitoring requirements for several TMDLs, "in accordance with the requirements of Provisions D.1,	Modify the Specific Monitoring and Assessment Requirements for the following TMDLs: 1. Total Maximum Daily Load for Diazinon in Chollas

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			D.4.a.(1)(b), and D.4.a.(3)(b) of this Order." Adding outfall monitoring to the TMDL provisions is inappropriate and unnecessary. Attachment E should focus on integrating the monitoring requirements *specified in the TMDL Basin Plan Amendments.* The monitoring requirements for TMDLs were developed through a public comment process and adopted by the Regional Board, and are the only monitoring requirements that should be specified in Attachment E. Furthermore, there is no reason to re-state the requirements from Provision D, which makes it likely that Attachment E and Provision D will have inconsistencies. Provision D requirements should only be listed in Provision D.	Creek Watershed 2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin 3. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek 4. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay Specifically, for each of these TMDLs, the sub-bullet under section (d) regarding effluent monitoring should be stricken and replaced with the following: "The Responsible Copermittees must implement the monitoring and assessment requirements issued under Order No. XXXX. The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.", where "XXXX" reflects the order numbers for each TMDL, shown in the attached revised Permit on Page E-1. For the Chollas Creek Metals and Diazinon TMDLs, the XXX refers to the order number for the issued Investigation Orders. For the Project I Bacteria TMDL, specific changes to the monitoring requirements are requested to reflect those specified in the TMDL Basin Plan Amendment, as described below.
Attachment E. Part 4.b.	E-10	Water Quality Based Effluent Limitations	The TMDL for Dissolved Copper, Lead, and Zinc in Chollas Creek states that "If all copper, lead, and zinc concentrations in urban runoff to Chollas Creek meet their respective TMDL concentrations, the loading capacity of the creek should	If WQBELs are to be expressed as numeric effluent limits consistent with the WLAs, then mass-based WQBELs should be included as a mechanism for demonstrating compliance to allow for options to demonstrate load-based pollutant reductions. As described above, the mass-based WQBELs should only be included with an "or" statement (not an "and" statement).

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			not be exceeded" (Section 8). The TMDL further states that "because this WLA is concentration-based it will apply to each land use and each sub-watershed at all times and will not be specific to any land use or sub-watershed (Section 8.1)." Requiring all land uses and sub-watersheds to meet effluent limits consistent with RWLs is not a cost-effective or practicable approach to BMP strategy development. Volume reduction strategies such as Low Impact Development and Green Infrastructure should be a viable compliance path for the San Diego region. The WQBELs should include the mass-load based WLAs to consider the pollutant loads reduced, which will be impacted by both pollutant concentration reductions *and* stormwater volume reductions. Alternatives for load-based approaches should be included as effluent limitations, which will correspond to targets for meaningful CLRP and WQIP development.	The recommended Compliance Determination language in the attached revised Permit addresses this issue.
Attachment E. Part 6.a	E-16 to E-19	Applicability	Since adoption of the Project I Bacteria TMDL, the Copermittees have submitted data analysis to the Regional Board to demonstrate that 303(d) listings for San Marcos HA, San Dieguito River HA, and Los Penasquitos HA were incorrectly applied to REC beneficial uses. The	In Table 6.0, the San Dieguito River WMA and Carlsbad WMAs should be deleted. The Los Penasquitos WMA should be re-named to the Mission Bay WMA and Torrey Pines State Beach at Del Mar should be removed. The recommended language in the attached revised Permit addresses this issue by also adding the following to Specific Provision 6.a.(5):

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<table>
<tr><th colspan="5">SAN DIEGO COPERMITTEE COMMENTS ON TENTATIVE ORDER NO. R9-2012-0011</th></tr>
<tr><th>Permit Section</th><th>Permit Page (Original)</th><th>Section Title</th><th>Reason for Proposed Changes/Comments</th><th>Proposed Changes</th></tr>
<tr><td></td><td></td><td></td><td>Regional Board has concurred with the findings for each HA and stated that these HAs are “not subject to further action under Resolution No. R9-2010-0001.” Similar responses are expected for the other HAs.</td><td>“Subsequent to TMDL adoption, it has been established by the Regional Board that the following water bodies are not subject to further action under Resolution No. R9-2010-001, and therefore are not subject to Bacteria TMDL requirements described herein and are not included in Table 6.0:
<table>
<tr><th>Watershed Management Area</th><th>Water Body</th><th>Segment or Area</th></tr>
<tr><td>Carlsbad</td><td>Pacific Ocean Shoreline</td><td>at Moonlight State Beach</td></tr>
<tr><td>San Dieguito River</td><td>Pacific Ocean Shoreline</td><td>at San Dieguito Lagoon mouth</td></tr>
<tr><td>Penasquitos</td><td>Pacific Ocean Shoreline</td><td>Torrey Pines State Beach at Del Mar (Anderson Canyon)</td></tr>
</table></td></tr>
<tr><td>Attachment E. Part 6.b</td><td>E-19</td><td>Receiving Water Limitations</td><td>The Basin Plan Amendment for the Project I Bacteria TMDL contains Receiving Water Limitations. These Receiving Water Limitations should be incorporated directly into the Permit. However, Attachment E contains Receiving Water Limitations that do <u>not</u> match those from the TMDL. The Regional Board should not revise or translate the RWLs from the TMDL, they should be incorporated directly. The RWLs incorporated into Attachment E have several discrepancies with the</td><td>Replace entirely the RWLs in the Permit with those from the TMDL.

The attached revised Permit incorporates RWLs for beaches (Table 6.1) and RWLs for Creeks (Table 6.2). Note these RWLs were pasted directly from the Basin Plan Amendment (Attachment A, page 52).</td></tr>
</table>

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SAN DIEGO COPERMITTEE COMMENTS ON TENTATIVE ORDER NO. R9-2012-0011				
Permit Section	**Permit Page (Original)**	**Section Title**	**Reason for Proposed Changes/Comments**	**Proposed Changes**
			RWLs in the TMDL, including application of single sample targets to the dry weather RWLs and application of total coliform RWLs for inland waters.	
Attachment E. Part 6.b	E-19 and E-20	Water Quality Based Effluent Limitations	Attachment E specifies WQBELs for dry weather flows as both receiving water and effluent limitations for the Project I Bacteria TMDL, in terms of zero allowable exceedances of the single sample maximum and the 30-day geometric mean. However, the dry weather component of the TMDL only considered the 30-day geometric mean, and did not consider the single sample maximum within its calculation. Incorporating single sample effluent limitations into the Permit goes beyond the TMDL requirements. In addition, if the TMDL had included single sample limits, there would have been a corresponding allowable exceedance frequency, just as for wet weather. The 22% allowable exceedance rate for wet weather was based on a reference beach within the Los Angeles Region, and although not used in the technical approach for the San Diego Beaches and Creeks TMDL, the reference beach also exhibits exceedances during dry weather, which is incorporated into beach TMDLs in the Los Angeles region.	It is recommended that the single sample maximum not be used for dry weather WQBELs. At a minimum, an acceptable dry weather exceedance frequency should be assumed and applied. Specific Provision 6.b.(2) of the attached revised Permit addresses this issue by (1) incorporating the RWLs directly from the TMDL, and (2) linking the receiving water limitations and effluent limitations.
Attachment E.	E-20	Water Quality		If WQBELs are to be expressed as numeric effluent limits

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SAN DIEGO COPERMITTEE COMMENTS ON TENTATIVE ORDER NO. R9-2012-0011				
Permit Section	**Permit Page (Original)**	**Section Title**	**Reason for Proposed Changes/Comments**	**Proposed Changes**
Part 6.b		Based Effluent Limitations	The Project I Bacteria TMDL applies mass-load based TMDLs to point sources. Many of the BMPs used for achieving pollutant reductions, such as structural BMPs and green infrastructure, emphasize infiltration and associated volume reduction as the primary mechanism for reducing urban runoff. A significant investment could be made to implement structural BMPs to reduce urban runoff to meet the mass-load based WLAs assigned in the TMDL. These reductions could result in meeting the mass-based WLA and have a positive impact on receiving waters by significantly reducing urban loads to receiving waters. However, even the small amount of flows remaining could exceed the numeric effluent limitations currently in the Permit, but not cause or contribute to WQO exceedances. In this manner, a violation of the numeric WQBELs would result in zero credit for the millions invested and penalty for discharges that did not negatively impact attainment of WQ standards. Volume reduction strategies such as Low Impact Development and Green Infrastructure should be a viable compliance path for the San Diego region. The WQBELs should include the mass-load based WLAs to consider the pollutant loads reduced, which will be	consistent with the WLAs, the mass based WLAs for both dry and wet weather presented in the TMDL should be included as a mechanism for demonstrating compliance to 1) be consistent with the assumptions of the WLAs and 2) allow for options to demonstrate load based pollutant reductions. The attached revised Permit addresses this issue by incorporating the mass-based wasteload allocations into Section 6.b.(2).

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			impacted by both pollutant concentration reductions *and* stormwater volume reductions.	
Attachment E. Part 6.b	E-19-E-20	Water Quality Based Effluent Limitations	The reference conditions and associated allowable exceedance frequencies for WQBELs addressing Project I Bacteria TMDL were based on a marine reference beach within Los Angeles, and are not necessarily applicable to fresh water flows in the San Diego Region. The Los Angeles reference beach was influenced by salt water (increasing bacterial die-off) and mixing/dilution from wave action that likely resulted in lower exceedances of REC-1 objectives than would be found in a freshwater stream. Freshwater TMDLs in the Los Angeles region now incorporate freshwater reference systems (instead of a marine reference system), and the marine beach exceedance rates have been updated through a recent TMDL reopener for Santa Monica Bay. In addition, a reference study is currently underway for the San Diego Region.	The permit should include language that allows for update of the allowable exceedance frequencies as these results become available. The attached revised Permit addresses this issue by added the following paragraph to Specific Provision 6.b.(1).(a): "The allowable exceedance frequencies in Table 6.1 and Table 6.2 can be updated by the Regional Board Executive Officer if sufficient data is provided regarding reference systems in the San Diego Region."
Attachment E. Part 6.c	E-21	Compliance Schedule	Total coliform WQOs do not apply to inland waters.	As shown in the attached revised Permit, add a footnote to Table 6.3 as follows: "Total coliform receiving water limitations apply only to segments of areas of Pacific Ocean Shoreline listed in Table 6.0."
Attachment E. Part 6.c	E-21 to E-27	Compliance Schedule	The CLRPs to be submitted by Copermitees will propose interim compliance dates, as allowed by the	The interim compliance dates should not be specified in the Permit. Instead, the Permit should reference the submitted and

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SAN DIEGO COPERMITTEE COMMENTS ON TENTATIVE ORDER NO. R9-2012-0011				
Permit Section	**Permit Page (Original)**	**Section Title**	**Reason for Proposed Changes/Comments**	**Proposed Changes**
			Project I Bacteria TMDL, generally 7 and 10 years, respectively, to meet the 50% reduction milestone for dry and wet weather. The CLRPs submitted by Copermittees may not all propose the same interim compliance dates and the Permit should acknowledge the flexibility allowed by the TMDL (see page 68 of Attachment A of the Basin Plan Amendment). In fact, this scheduling flexibility was a primary "incentive" for Copermitees to develop CLRPs instead of BLRPs.	Regional Board-approved CLRPs. This approach will avoid conflict between the TMDL, Permit, and CLRPs. The attached revised Permit addresses this issue by revising the opening of Section 6.c.(2): "The Responsible Copermittees must comply with the following interim WQBELs by the interim compliance dates <u>submitted in the Regional Board-approved CLRPs and supported by Order No. R9-2010-0001</u>:" Table 6.5 should be deleted from Attachment E to allow the CLRPs the scheduling flexibility provided in the TMDL adopted by the Regional Board.
Attachment E. Part 6.c	E-21 thru E-27	Compliance Schedule	Similar to the flexibility allowed for scheduling, the TMDL allows CLRPs flexibility in expressing and achieving TMDL milestones/interim requirements. Furthermore, the wet weather interim compliance dates are well-beyond the term of this Permit, and should be not included in Attachment E.	Delete Table 6.4 because (1) the CLRPs have flexibility to express interim milestones and (2) the wet weather interim requirements do not apply until 2022, well beyond the term of this Permit.
Attachment E. Part 6.c	E-27	Compliance Schedule	The Copermittees request an acknowledgement of the TMDL reopener scheduled for April 2016 which falls within the term of this Permit.	Add a part (3) to Specific Provision 6.c: "(3) <u>Submittals to Support TMDL Basin Plan Amendment</u> The Responsible Copermittees are encouraged to submit data to support the TMDL reopener scheduled for April 2016 including but not limited to data related to reference watershed monitoring and beneficial use usage frequency."
Attachment E. Part 6.d	E-27	Compliance Determination	The BPA for the Project I Bacteria TMDL contains specific language regarding MS4 compliance determination	As shown in the attached revised Permit, add the following language to Section 6 of Attachment E, which is *pasted directly* from the BPA:

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(new section added to revised)			in the case that receiving water limitations are not attained. This language should be added directly to the Permit.	"The municipal MS4s may demonstrate that their discharges are not causing the exceedances in the receiving waters by providing data from their discharge points to the receiving waters, by providing data collected at jurisdictional boundaries, and/or by using other methods accepted by the San Diego Water Board. Otherwise, at the end of the wet weather TMDL compliance schedule, the municipal Phase I MS4s will be held responsible and considered out of compliance unless other information or evidence indicates another controllable or uncontrollable source is responsible for the exceedances in the receiving waters. If controllable sources other than discharges from the municipal Phase I MS4s are identified before or after the end of the wet weather TMDL Compliance Schedules as causing the exceedances, those controllable sources will be responsible for reducing their bacteria loads and/or demonstrating that discharges from those sources are not causing the exceedances. If controllable sources other than the Phase I MS4s are identified as causing the exceedances, and the Phase I MS4s have demonstrated they are not causing or contributing to the exceedances, the Phase I MS4s will not be considered out of compliance. The San Diego Water Board shall implement additional actions (e.g., issue enforcement actions, amend existing NPDES requirements or conditional waivers), as needed, to bring all those controllable sources into compliance with the wet weather TMDLs."
Attachment E. Part 6.d	E-27	Specific Monitoring and Assessment Requirements	As described above, the CLRPs envisioned in the Project I Bacteria TMDL include flexibility to develop certain components based on watershed-specific issues and conditions. Each CLRP submitted by the Copermittees will include a monitoring and assessment component. It is important to allow the	As shown in the attached revised Permit, include the following at the beginning of the Monitoring and Assessment section: "The BLRPs and CLRPs to be submitted by the Copermittees and approved by the Regional Board Executive Officer contain monitoring programs. Implementation of those Regional Board-approved monitoring programs constitutes compliance with the

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Permit Section	**Permit Page (Original)**	**Section Title**	**Reason for Proposed Changes/Comments**	**Proposed Changes**
			CLRP process to drive the monitoring programs.	Monitoring Station and Monitoring Procedure requirements, described below."
Attachment E. Part 6.d	E-27	Specific Monitoring and Assessment Requirements	The Project I Bacteria TMDL included specific beach monitoring requirements, which were subject to a public comment process and adopted by the Regional Board. Attachment E adds many additional components to these requirements, which undermines the TMDL adoption and public commenting process. Instead of re-interpreting and adding onto the TMDL monitoring requirements in the Basin Plan Amendment, the Permit should adopt those requirements directly (BPA Attachment A, page 50-51).	As shown in the attached revised Permit, the beach monitoring requirement should be incorporated directly from the TMDL. The following language/requirement for beaches is *pasted directly* from the TMDL: "(1) Monitoring and Assessment Requirements for Beaches (a) Monitoring Stations For beaches addressed by these TMDLs, monitoring locations should consist of, at a minimum, the same locations used to collect data required under MS4 NPDES monitoring requirements and beach monitoring for Health and Safety Code section 115880.75 If exceedances of the receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations and/or other source identification methods must also be used to demonstrate that the bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters. (b) Monitoring Procedures (i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. (ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations at least once within the first 24 hours of the end of a storm event that occurs during the rainy season (i.e., October 1 through April 30).

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Permit Section	**Permit Page (Original)**	**Section Title**	**Reason for Proposed Changes/Comments**	**Proposed Changes**
				(iii) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria."
Attachment E. Part 6.d	E-27	Specific Monitoring and Assessment Requirements	Similarly, the creek monitoring requirements should reflect the TMDL that was approved and subject to public comment (BPA Attachment A, page 50-51). Note that total coliform should not be a requirement for creek monitoring, as creeks are not subject to total coliform WQOs, RWLs, or WLAs.	As shown in the attached revised Permit, the creek monitoring requirement should be incorporated directly from the TMDL. The following language/requirement for creeks is *pasted directly* from the TMDL: "Monitoring and Assessment Requirements for Creeks and Creek Mouths (a) Monitoring Stations For creeks addressed by these TMDLs, monitoring locations should consist of, at a minimum, a location at or near the mouth of the creek (e.g., Mass Loading Station or Mass Emission Station) and one or more locations upstream of the mouth (e.g., Watershed Assessment Stations). If exceedances of the receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations and/or other source identification methods must also be used to demonstrate that the bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters. (b) Monitoring Procedures (i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. (ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations within the first 24 hours of the end of a storm event that occurs

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Permit Section	**Permit Page (Original)**	**Section Title**	**Reason for Proposed Changes/Comments**	**Proposed Changes**
				during the rainy season (i.e., October 1 through April 30) (iii) Samples collected from receiving water monitoring stations must be analyzed for fecal coliform and *Enterococcus* indicator bacteria."

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ADMINISTRATIVE DRAFT

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

TENTATIVE
ORDER NO. R9-2012-0011
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The San Diego County Copermittees in Table 1a are subject to waste discharge requirements within their respective jurisdictions set forth in this Order.

Table 1a. San Diego County Copermittees

City of Carlsbad	City of Oceanside
City of Chula Vista	City of Poway
City of Coronado	City of San Diego
City of Del Mar	City of San Marcos
City of El Cajon	City of Santee
City of Encinitas	City of Solana Beach
City of Escondido	City of Vista
City of Imperial Beach	County of San Diego
City of La Mesa	San Diego County Regional Airport Authority
City of Lemon Grove	Unified Port District of San Diego
City of National City	

The Orange County Copermittees in Table 1b are subject to waste discharge requirements within their respective jurisdictions set forth in this Order upon expiration of Order No. R9-2009-0002, NPDES No. CAS0108740 on December 16, 2014.

Table 1b. Orange County Copermittees

City of Aliso Viejo	City of Ranch Santa Margarita
City of Dana Point	City of San Clemente
City of Laguna Beach	City of San Juan Capistrano
City of Laguna Hills	City of Laguna Woods
City of Laguna Niguel	County of Orange
City of Lake Forest	Orange County Flood Control District
City of Mission Viejo	

ADMINISTRATIVE DRAFT

The Riverside County Copermittees in Table 1c are subject to waste discharge requirements within their respective jurisdictions set forth in this Order upon expiration of Order No. R9-2010-0016, NPDES No. CAS0108766 on November 10, 2015.

Table 1c. Riverside County Copermittees

City of Murrieta	County of Riverside
City of Temecula	Riverside County Flood Control and Water Conservation District
City of Wildomar	

The Orange County Copermittees and Riverside County Copermittees may enroll under this Order at a date earlier than the expiration date of their current Orders subject to the conditions described in Provision F.6 of this Order and the Copermittees in the respective county receive a Notice of Enrollment (NOE) from the San Diego Water Board.

The term Copermittee in this Order refers to any San Diego County, Orange County, or Riverside County Copermittee enrolled under this Order, unless specified otherwise.

This Order provides permit coverage for the Copermittee discharges described in Table 2. "Co-permittees need only comply with permit conditions relating to discharges from the municipal separate storm sewers for which they are operators." 40 CFR §122.26(a)(3)(vi).

Table 2. Discharge Locations and Receiving Waters

Discharge Points	Locations throughout San Diego Region
Discharge Description	Municipal Separate Storm Sewer System (MS4) Discharges
Receiving Waters	Waters of the U.S.: Inland Surface Waters, Enclosed Bays and Estuaries, and Coastal Ocean Waters of the San Diego Region

Table 3. Administrative Information

This Order was adopted by the San Diego Water Board on:	**Month Day, 2012**
This Order will become effective on:	**Month Day, 2012**
This Order will expire on:	**Month Day, 2017**
The Copermittees must file a Report of Waste Discharge (ROWD) in accordance with Title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than 180 days in advance of the Order expiration date.	

I, David W. Gibson, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on Month Day, 2012.

TENTATIVE

David W. Gibson
Executive Officer

ADMINISTRATIVE DRAFT

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I. FINDINGS

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), finds that:

JURISDICTION

1. **MS4 Ownership or Operation.** Each of the Copermittees owns or operates an MS4, through which it discharges storm water and non-storm water into waters of the U.S. within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the U.S.

2. **Legal and Regulatory Authority.** This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]) adopted by the United States Environmental Protection Agency (USEPA), and chapter 5.5, division 7 of the California Water Code (CWC) (commencing with section 13370). This Order serves as an NPDES permit for discharges from MS4s to surface waters. This Order also serves as waste discharge requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

3. **CWA Technology Based Standards and Prohibitions.** Pursuant to CWA section 402(p)(3)(B), NPDES permits for storm water discharges from MS4s must include requirements to effectively prohibit non-storm water discharges into MS4s, and require controls to reduce the discharge of pollutants in storm water to the maximum extent practicable (MEP).

4. **CWA NPDES Permit Conditions.** Pursuant to CWA section 402(a)(2), NPDES permits must prescribe conditions to assure compliance with CWA section 402(p)(3)(B) and 40 CFR 122.26(d)(2)(iv)(B). This Order prescribes conditions to assure compliance with the CWA requirements for owners and operators of MS4s to effectively prohibit non-storm water discharges in to the MS4s, and require controls to reduce the discharge of pollutants in storm water from the MS4s to the MEP.

5. **CWA and CWC Monitoring Requirements.** Pursuant to 40 CFR 122.48, NPDES permits must specify requirements for recording and reporting monitoring results. In addition, CWC sections 13267 and 13383 authorize the San Diego Water Board to require technical and monitoring reports. This Order establishes monitoring and reporting requirements to implement federal and State requirements.

6. **Total Maximum Daily Loads.** CWA section 303(d)(1)(A) requires that "[e]ach state shall identify those waters within its boundaries for which the effluent limitations…are not stringent enough to implement any water quality standard applicable to such waters." The CWA also requires states to establish a priority ranking of impaired water bodies known as Water Quality Limited Segments and to establish Total Maximum Daily Loads (TMDLs) for such waters. This priority list of impaired water bodies is called the Clean Water Act Section 303(d) List of Water Quality Limited Segments, commonly referred to as the 303(d) List. The CWA requires the 303(d) List to be updated every two years. Requirements of this Order implement the TMDLs adopted by the San Diego Water Board and approved by USEPA.

7. **Non-Storm Water Discharges.** Pursuant to CWA section 402(p)(3)(B)(ii), this Order requires each Copermittee to effectively prohibit discharges of non-storm water into its MS4. Nevertheless, non-storm water discharges into and from the MS4s continue to be reported to the San Diego Water Board by the Copermittees and other persons. Monitoring conducted by the Copermittees, as well as the 303(d) List, have identified dry weather, non-storm water discharges from the MS4s as a source of pollutants causing or contributing to receiving water quality impairments in the San Diego Region. The federal regulations [40 CFR 122.26(d)(2)(iv)(B)] require the Copermittees to have a program to prevent all types of non-storm water discharges, or illicit discharges, from entering the MS4. The federal regulations, however, allow for specific categories of non-storm water discharges or flows to be addressed as illicit discharges only where such discharges are identified as sources of pollutants to waters of the U.S.

8. **In-Stream Treatment Systems.** Pursuant to federal regulations [40 CFR 131.10(a)], in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S. Authorizing the construction of a runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to accepting waste assimilation as an appropriate use for that water body. Runoff treatment must occur prior to the discharge of runoff into receiving waters. Treatment control best management practices (BMPs) must not be constructed in waters of the U.S. ~~or state.~~ Construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body.

DISCHARGE CHARACTERISTICS AND RUNOFF MANAGEMENT

9. **Point Source Discharges of Pollutants.** Discharges from the MS4s may contain waste, as defined in the CWC, and pollutants that adversely affect the quality of the waters of the state. A discharge from an MS4 is a "discharge of pollutants from a point source" into waters of the U.S. as defined in the CWA. Storm water and non-storm water discharges from the MS4s may contain pollutants that cause or threaten to cause a violation of surface water quality standards, as outlined in the Basin Plan. Storm water and non-storm water discharges from the MS4s are subject to the

conditions and requirements established in the Basin Plan for point source discharges.

10. **Potential Beneficial Use Impairment.** The discharge of pollutants and/or increased flows from MS4s may cause or threaten to cause the concentration of pollutants to exceed applicable receiving water quality objectives and impair or threaten to impair designated beneficial uses resulting in a condition of pollution, contamination, or nuisance.

11. **Pollutants Generated by Land Development.** Land development has created and continues to create new sources of non-storm water discharges and pollutants in storm water discharges as human population density increases. This brings higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash. Pollutants from these sources are dumped or washed off the surface by non-storm water or storm water flows into and from the MS4s. When development converts natural vegetated pervious ground cover to impervious surfaces such as paved highways, streets, rooftops, and parking lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving a developed area not subject to SUSMP or HMP requirements contains greater pollutant loads and is significantly greater in runoff volume, velocity, and peak flow rate than pre-development runoff from the same area.

12. **Runoff Discharges to Receiving Waters.** The MS4s discharge runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within the eleven hydrologic units comprising the San Diego Region. Numerous receiving water bodies and water body segments have been designated as impaired by the San Diego Water Board pursuant to CWA section 303(d).

13. **Pollutants in Runoff.** The most common pollutants in runoff discharged from the MS4s include total suspended solids, sediment, pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., cadmium, copper, lead, and zinc), petroleum products and polynuclear aromatic hydrocarbons, synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus), oxygen-demanding substances (decaying vegetation, animal waste), detergents, and trash.

14. **Human Health and Aquatic Life Impairment.** Pollutants in runoff discharges from the MS4s can threaten and adversely affect human health and aquatic organisms. Adverse responses of organisms to chemicals or physical agents in runoff range from physiological responses such as impaired reproduction or growth anomalies to mortality. Increased volume, velocity, rate, and duration of storm water runoff greatly accelerate the erosion of downstream natural channels. This alters stream channels and habitats and can adversely affect aquatic and terrestrial organisms.

15. **Water Quality Effects.** The Copermittees' water quality monitoring data submitted to date documents persistent exceedances of Basin Plan water quality objectives for runoff-related pollutants at various watershed monitoring stations. Persistent toxicity

has also been observed at several watershed monitoring stations. In addition, bioassessment data indicate that the majority of the monitored receiving waters have Poor to Very Poor Index of Biotic Integrity (IBI) ratings. These findings indicate that runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in the San Diego Region. Non-storm water discharges from the MS4s have been shown to contribute significant levels of pollutants and flow in arid, developed Southern California watersheds, and contribute significantly to exceedances of applicable receiving water quality objectives.

16. **Non-Storm Water Discharges.** ~~Non-storm water discharges from the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard from CWA 402(p)(3)(B)(iii), which is explicitly for "Municipal … *Stormwater Discharges* (emphasis added)" from the MS4s.~~ Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s must be effectively prohibited.

17. **Best Management Practices.** Pollutants can be effectively reduced in runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Pollution prevention is the reduction or elimination of pollutant generation at its source and is the best "first line of defense". Source control BMPs (both structural and non-structural) minimize the contact between pollutants and runoff, therefore keeping pollutants onsite and out of receiving waters. Treatment control BMPs remove pollutants that have been mobilized by storm water or non-storm water flows.

18. **BMP Implementation.** Runoff needs to be addressed during the three major phases of development (planning, construction, and use) in order to reduce the discharge of storm water pollutants to the MEP, effectively prohibit non-storm water discharges, and protect receiving waters. Development which is not guided by water quality planning policies and principles can result in increased pollutant load discharges, flow rates, and flow durations which can negatively affect receiving water beneficial uses. Construction sites without adequate BMP implementation result in sediment runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. Existing development can generate substantial pollutant loads which are discharged in runoff to receiving waters.

19. **Long Term Planning and Implementation.** Federal regulations require municipal storm water permits to expire 5 years from adoption, after which the permit must be renewed and reissued. The San Diego Water Board recognizes that the degradation of water quality and impacts to beneficial uses of the waters in the San Diego Region occurred over several decades. The San Diego Water Board further recognizes that a decade or more may be necessary to realize demonstrable improvement to the quality of waters in the Region. This Order includes a long term planning and implementation approach that will require more than a single permit term to complete.

WATER QUALITY STANDARDS

20. **Basin Plan.** The San Diego Water Board adopted a Water Quality Control Plan for the San Diego Basin (Basin Plan) on September 8, 1994 that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for receiving waters addressed through the plan. The Basin Plan was subsequently approved by the State Water Resources Control Board (State Water Board) on December 13, 1994. Subsequent revisions to the Basin Plan have also been adopted by the San Diego Water Board and approved by the State Water Board. Requirements of this Order implement the Basin Plan.

    The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Process Supply (PROC), Industrial Service Supply (IND), Ground Water Recharge (GWR), Contact Water Recreation (REC1), Non-contact Water Recreation (REC2), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Freshwater Replenishment (FRSH), Hydropower Generation (POW), and Preservation of Biological Habitats of Special Significance (BIOL). The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region: Navigation (NAV), Commercial and Sport Fishing (COMM), Estuarine Habitat (EST), Marine Habitat (MAR), Aquaculture (AQUA), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN), and Shellfish Harvesting (SHELL).

21. **Ocean Plan.** The State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, and 2005. The State Water Board adopted the latest amendment on April 21, 2005 and it became effective on February 14, 2006. The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean. Requirements of this Order implement the Ocean Plan.

    The Ocean Plan identifies the following beneficial uses of ocean waters of the state to be protected: Industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture; preservation and enhancement of designated Areas of Special Biological Significance; rare and endangered species; marine habitat; fish spawning and shellfish harvesting

22. **Sediment Quality Control Plan**. On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret

the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

23. **National Toxics Rule and California Toxics Rule.** USEPA adopted the NTR on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the National toxics Rule (NTR) applied in California. On May 18, 2000, USEPA adopted the California Toxics Rule (CTR). The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants

24. **Antidegradation Policy.** This Order is in conformance with the federal Antidegradation Policy described in 40 CFR 131.12, and State Water Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality Waters in California*. Federal regulations at 40 CFR 131.12 require that the State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The San Diego Water Board's Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies.

CONSIDERATIONS UNDER FEDERAL LAW

25. **Coastal Zone Act Reauthorization Amendments.** Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states with approved coastal zone management programs to address non-point pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point pollution: agriculture, silviculture, urban, marinas, and hydromodification. This Order addresses the management measures required for the urban category, with the exception of septic systems. The runoff management programs developed pursuant to this Order fulfill the need for coastal cities to develop a runoff non-point source plan identified in the Non-Point Source Program Strategy and Implementation Plan. The San Diego Water Board addresses septic systems through the administration of other programs.

26. **Endangered Species Act.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 USCA sections 1531 to 1544). This Order requires compliance with receiving water limits, and other requirements to protect the beneficial uses of waters of the State. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

CONSIDERATIONS UNDER STATE LAW

27. **Unfunded Mandates.** This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following:

    a. This Order implements federally mandated requirements under CWA section 402. (33 USC 1342(p)(3)(B).)

    b. The local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental and new dischargers who are issued NPDES permits for storm water and non-storm water discharges.

    c. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order.

    d. The Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC 1311(a)) and in lieu of numeric restrictions on their MS4 discharges (i.e. effluent limitations).

    e. The local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under State law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

    f. The provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards. (33 USC 1313(d).) Once the USEPA or a state develops a TMDL, federal law requires that permits must contain effluent limitations consistent with the assumptions and requirements of any applicable wasteload allocation. (40 CFR 122.44(d)(1)(vii)(B).)

28. **California Environmental Quality Act.** The issuance of WDRs and an NPDES permit for the discharge of runoff from MS4s to waters of the U.S. is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 et seq.) in accordance with CWC section 13389.

STATE WATER BOARD DECISIONS

29. **Compliance with Prohibitions and Limitations.** The receiving water limitation language specified in this Order is consistent with language recommended by the USEPA and established in State Water Board Order WQ-99-05, *Own Motion Review of the Petition of Environmental Health Coalition to Review Waste Discharge Requirements Order No. 96-03, NPDES Permit No. CAS0108740*, adopted by the State Water Board on June 17, 1999. The receiving water limitation language in this Order requires compliance with water quality standards, which for storm water discharges is to be achieved through an iterative approach requiring the

implementation of improved and better-tailored BMPs over time. Implementation of the iterative approach to comply with receiving water limitations based on applicable water quality standards is necessary to ensure that storm water discharges from the MS4 ultimately will not cause or contribute to violations of water quality standards and the creation of conditions of pollution, contamination, or nuisance.

30. **Special Conditions for Areas of Special Biological Significance.** On March 20, 2012, the State Water Board approved Resolution No. 2012-0012~~X~~ approving an exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges. The Resolution requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBSs. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject terms and conditions of the Resolution. The Special Protections contained in Attachment B to the Resolution applicable to these discharges are hereby incorporated in this Order as if fully set forth herein.

ADMINISTRATIVE FINDINGS

31. **Executive Officer Delegation of Authority.** The San Diego Water Board by prior resolution has delegated all matters that may legally be delegated to its Executive Officer to act on its behalf pursuant to CWC section 13223. Therefore, the Executive Officer is authorized to act on the San Diego Water Board's behalf on any matter within this Order unless such delegation is unlawful under CWC section 13223 or this Order explicitly states otherwise.

32. **Standard Provisions.** Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR 122.42, are provided in Attachment B to this Order.

33. **Fact Sheet.** The Fact Sheet for this Order contains background information, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of this Order. The Fact Sheet is hereby incorporated into this Order and constitutes part of the Findings of this Order.

34. **Public Notice.** The San Diego Water Board notified the Copermittees, and interested agencies and persons of its intent to prescribe WDRs for MS4 discharges of pollutants to waters of the U.S. and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet.

35. **Public Hearing.** The San Diego Water Board held a public hearing on Month Day, 2012 and heard and considered all comments pertaining to the terms and conditions of this Order. Details of the public hearing are provided in the Fact Sheet.

II. PROVISIONS

THEREFORE, IT IS HEREBY ORDERED that the Copermittees, in order to meet the provisions contained in division 7 of the CWC and regulations adopted thereunder, and the provisions of the CWA and regulations adopted thereunder, must each comply with the following:

A. PROHIBITIONS AND LIMITATIONS

[NOTE: The receiving water limitations language contained in provision A raises significant legal and policy issues that require further discussion and revision. The receiving water limitations language in Provision A generally follows the language required by the State Board's precedential Order WQ 99-05. In the State Board's precedential order WQ 2001-15, the State Board determined that the mandatory receiving water limitations language found in Order 99-05 "does not require strict compliance with water quality standards." Instead, the State Board concluded that compliance with water quality standards is "to be achieved over time, through an iterative approach requiring improved BMPs." Despite this policy statement from the State Board, in 2011, the 9th Circuit interpreted the State Board's mandatory language in a manner that requires strict and immediate compliance with water quality standards. The State Board has recently scheduled a workshop for November 20 to address the receiving water limitations language. The San Diego Copermittees support revisions to the receiving water limitations language that align the language with the State Board's policy that compliance with water quality standards is "to be achieved over time, through an iterative approach requiring improved BMPs." Storm water organizations such as CASQA have already submitted language to the State Board designed to address this conflict between the State Board's policy and the 9th Circuit decision. The redlines submitted below are not designed to address all the issues raised by this conflict. Instead, the redlines address, for this draft permit, how compliance with water quality standards will be achieved for water bodies covered by an adopted TMDL or covered in the WQIPs. The San Diego Copermittees will participate in the State Board process regarding the larger issues involving the receiving water limitations language, and encourage the Regional Board to do so as well. The San Diego Copermittees reserve the right to submit additional language intended to align all of the receiving water limitations language in this draft permit with State Board policy as the State Board workshop process evolves. At this time, however, the San Diego Copermittees believe it is premature to submit such language given the pending State Board process and the proposed CASQA language.]

The purpose of this provision is to describe the conditions under which storm water and non-storm water discharges into and from MS4s are prohibited or limited. The goal of this provision is to ~~protect, preserve, enhance, and restore~~ address the impacts of MS4 discharges so that such discharges do not impair water quality and designated beneficial uses of waters of the U.S. This goal will be accomplished through implementation of control measures that effectively prohibit non-storm water discharges into and from the Copermittees' MS4s, and reduce pollutants in storm water discharges

from the Copermittees' MS4s to the MEP. The process for determination of compliance with the Discharge Prohibitions (A.1), Receiving Water Limitations (A.2), and Effluent Limitations (A.3) is defined in Provision A.4.

1. Discharge Prohibitions

a. Discharges ~~into and~~ from MS4s owned and operated by a Copermittee in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the ~~state~~ U.S. are effectively prohibited, unless the Copermittee is addressing the discharges through Provision A.1.e or A.4 through the process set forth in Provision A.4.

b. Non-storm water discharges into ~~and from~~ MS4s are effectively prohibited, unless such discharges are either authorized by a separate NPDES permit, or the discharge is a category of non-storm water discharges or flows that must be addressed pursuant to Provisions E.2.a.(1)-(5) of this Order.

c. Discharges from MS4s are subject to all waste discharge prohibitions in the Basin Plan, included in Attachment A to this Order, unless the Copermittee is addressing the discharges through Provision A.1.e or A.4 through the process set forth in Provision A.4.

d. ~~Discharges from MS4s to ASBS are prohibited.~~ Storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-001**2**~~X~~ applicable to these discharges, included in Attachment A to this Order. All other discharges from MS4s to ASBS are prohibited, unless authorized by a subsequent order.

e. For discharges associated with water body pollutant combinations addressed in a TMDL in Attachment E of this Order, the affected Copermittees shall achieve compliance as outlined in Attachment E (Total Maximum Daily Load Provisions).

2. Receiving Water Limitations

a. Discharges from MS4s owned and operated by a Copermittee must not cause or contribute to the violation of water quality standards in any receiving waters, including ~~but not limited to~~ all applicable provisions contained in the list below including any modifications unless the Copermittee is addressing the discharges through Provision A.2.b or A.4 through the process set forth in Provision A.4:

(1) The San Diego Water Board's Basin Plan, including beneficial uses, water quality objectives, and implementation plans;

(2) State Water Board plans for water quality control including the following:

(a) Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries (Thermal Plan), and

(b) The Ocean Plan, including beneficial uses, water quality objectives, and implementation plans;

(3) State Water Board policies for water and sediment quality control including the following:

(a) Water Quality Control Policy for the Enclosed Bays and Estuaries of California,

(b) Sediment Quality Control Plan which includes the following narrative objectives for bays and estuaries:

(i) Pollutants in sediments shall not be present in quantities that, alone or in combination, are toxic to benthic communities, and

(ii) Pollutants shall not be present in sediments at levels that will bioaccumulate in aquatic life to levels that are harmful to human health,

(c) The Statement of Policy with Respect to Maintaining High Quality of Waters in California (State Water Board Resolution No. 68-16).

(4) Priority pollutant criteria promulgated by the USEPA through the following:

(a) National Toxics Rule (NTR)[1] (promulgated on December 22, 1992 and amended on May 4, 1995), and

(b) California Toxics Rule (CTR)[2,3]

~~**a.** Discharges from MS4s composed of storm water runoff must not alter natural ocean water quality in an ASBS.~~

~~**b.** Discharges from MS4s must not cause or contribute to the violation of any receiving water limitations expressed as water quality based effluent limitations (WQBELs) required to meet the WLAs established for the TMDLs in to this Order, pursuant to the applicable TMDL compliance schedules.~~

b. For receiving water limitations associated with a water body pollutant combination addressed in a TMDL in Attachment E of this Order, the Copermittees shall achieve compliance as outlined in Attachment E (Total

[1] 40 CFR 131.36
[2] 65 Federal Register 31682-31719 (May 18, 2000), adding Section 131.38 to 40 CFR
[3] If a water quality objective and a CTR criterion are in effect for the same priority pollutant, the more stringent of the two applies, unless a previous regulatory action (i.e., TMDL) has specified otherwise.

Maximum Daily Load Provisions).

3. Effluent Limitations

a. Technology Based Effluent Limits
Pollutants in storm water discharges from MS4s must be reduced to the MEP~~.~~[4], through timely implementation of control measures and other actions as specified in Provisions B and E as described in Provision A.4.

b. Water Quality Based Effluent Limits
For a water body-pollutant combination addressed in a TMDL in Attachment E of this Order, ~~P~~pollutants in discharges from MS4s must be reduced to comply with ~~any~~ effluent limitations expressed as WQBELs required to meet the WLAs established for those TMDLs as described in Provision A.4 and Attachment E to this Order, pursuant to the applicable TMDL compliance schedules.

4. Compliance with Discharge Prohibitions, ~~and~~ Receiving Water Limitations, and Effluent Limitations

Each Copermittee must comply with the discharge prohibitions (A.1), ~~and~~ receiving water limitations (A.2), and effluent limitations (A.3) of this Order through timely implementation of strategies, control measures, and other actions as specified in Provisions B and E of this Order, including any modifications. The Water Quality Improvement Plans described in Provision B shall be designed to achieve compliance with the discharge prohibitions, receiving water limitations, and effluent limitations. Copermittees shall be considered in compliance with A.1, A.2, and A.3 unless the Regional Board has denied approval of a Water Quality Improvement Plan or subsequent update as described in Provisions B and F.1.

a. If exceedance(s) of water quality standards persist in receiving waters notwithstanding implementation of this Order, the Copermittees must comply with the following procedures:

(1) For pollutants that are not in the process of being addressed via specific scheduled actions in a Water Quality Improvement Plan, ~~U~~upon a determination by either the Copermittees or the San Diego Water Board that discharges from the MS4 are causing or contributing to an exceedance of an applicable water quality standard, the Copermittees must submit the following updates to the Water Quality Improvement Plan required under Provision B as part of the Annual Report required under Provision F.3.b~~,~~ or Water Quality Improvement Plan update Provision B.5.a, unless the San Diego Water Board

[4] This does not apply to MS4 discharges which receive subsequent treatment to reduce pollutants in storm water discharges to the MEP prior to entering receiving waters (e.g., low flow diversions to the sanitary sewer). Runoff treatment must occur prior to the discharge of runoff into receiving waters per Finding 8.

either: 1) directs an earlier submittal; or 2) allows for the adoption of a forthcoming TMDL to establish wasteload allocations that will form the basis of revisions to the Water Quality Improvement Plan:

(a) The water quality improvement strategies being implemented that are effective and will continue to be implemented;

(b) ~~Additional w~~Water quality improvement strategies (~~i.~~e.g. BMPs, retrofitting projects, stream and/or habitat rehabilitation, ~~or~~ restoration projects, etc.) that will be implemented to reduce or eliminate any pollutants or conditions that are causing or contributing to the exceedance of water quality standards;

(c) Updates to the schedule for implementation of the existing and additional water quality improvement strategies; and

(d) Updates, when necessary, to the schedule for achieving compliance with the discharge prohibitions and receiving water limitations of this Order;

(e) As described in Provision B.6, Copermittees must submit requested modifications to the Water Quality Improvement Plan either in the Annual Report required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge (ROWD) required pursuant to Provision F.5.b. ;~~The San Diego Water Board may require the incorporation of additional modifications to the Water Quality Improvement Plan required under Provision B. The applicable Copermittees must submit any modifications to the update to the Water Quality Improvement Plan within 30 days of notification that additional modifications are required by the San Diego Water Board, or as otherwise directed~~;

(f) As described in Provision B.6, upon ~~Within 30 days of the~~ San Diego Water Board determination that the update to the Water Quality Improvement Plan meets the requirements of this Order, the Copermittees must submit requested modifications to the jurisdictional runoff management programs either in the Annual Report required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge (ROWD) required pursuant to Provision F.5.b.~~revise the jurisdictional runoff management program documents to incorporate the updated water quality improvement strategies that have been and will be implemented, the implementation schedule, and any additional monitoring required~~; and

(g) The Copermittees must implement the revised jurisdictional runoff management programs and updated jurisdictional monitoring and assessment component of the Water Quality Improvement Plan.

(2) For pollutants in the process of being addressed via a specific, scheduled program in a Water Quality Improvement Plan, the Copermittee(s) shall continue to implement that program as described in the Water Quality Improvement Plan approved by the Regional Board;

b. So long as the Copermittees have complied with the procedures set forth above and are implementing the Water Quality Improvement Plan(s) approved by the Regional Board, the Copermittees ~~must~~ do not have to repeat the same procedure ~~set forth above to comply with~~ for continuing or recurring exceedances of the same discharge prohibitions, effluent limitations, and receiving water limitations ~~of this Order for continuing or recurring exceedances of the same water quality standard(s) following implementation of scheduled actions~~ unless directed to ~~do otherwise~~ by the San Diego Water Board.

~~**a.** Nothing in Provisions A.4. and A.4. prevents the San Diego Water Board from enforcing any provision of this Order while the applicable Copermittees prepare and implement the above update to the Water Quality Improvement Plan and jurisdictional runoff management programs.~~

B. WATER QUALITY IMPROVEMENT PLANS

The purpose of this provision is to develop Water Quality Improvement Plans that guide the Copermittees' jurisdictional runoff management program implementation efforts towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plan is to 1) effectively prohibit non-storm water discharges into the MS4s, 2) reduce pollutants in storm water discharges from the MS4s to the MEP, and 3) support attainment and ~~the~~ reasonable protection, preservation~~,~~ and enhancement~~, and restoration~~ of water quality and designated beneficial uses of waters of the state. Therefore, implementation of the WQIPs also provides the basis for complying with Provisions A.1 and A.3, as described in Provision A.4. This goal will be accomplished through an adaptive planning and management process that identifies the highest water quality priorities within a watershed and implements strategies, control measures, and BMPs to achieve improvements in the quality of discharges from the MS4s and receiving waters.

The Copermittees must develop Water Quality Improvement Plans for each Watershed Management Area that 1) prioritize water quality ~~issues~~conditions resulting from the Copermittee's MS4 discharges ~~to and from the MS4s with~~in each Watershed Management Area, 2) identify MS4 pollutant sources ~~and other stressors~~ associated with ~~those~~the water quality priorities, 3) define numeric ~~targets~~goals and schedules to ~~achieve improvement of~~address water quality priorities, 4) describe water quality improvement strategies to achieve numeric ~~targets~~goals, and 5) develop and execute a coordinated monitoring and assessment program to facilitate adaptive management of the Water Quality Improvement Plans and determine progress towards achieving improved water quality in MS4 discharges and receiving waters ~~improved water quality.~~

The Copermittees must ~~implement all~~submit Water Quality Improvement Plans for public review and Regional Board Executive Officer review and approval per the ~~requirements of~~ schedule outline in Provision ~~no later than 12 months after the adoption of this Order, or in accordance with Provision F.5~~B.~~6 of this Order.~~

~~1.~~
~~2.~~1. **Watershed Management Areas**

The Copermittees must develop Water Quality Improvement Plans for each of the Watershed Management Areas in Table B-1. A total of ~~nine~~ten Water Quality Improvement Plans must be developed for the San Diego Region.

Table B-1. Watershed Management Areas

Watershed Management Area	Hydrologic Unit(s)	Major Surface Water Bodies	Responsible Copermittees
South Orange County	San Juan (901.00)	Aliso Creek San Juan Creek San Mateo Creek Pacific Ocean	- City of Aliso Viejo[1] - City of Dana Point[1] - City of Laguna Beach[1] - City of Laguna Hills[1] - City of Laguna Niguel[1] - City of Laguna Woods[1] - City of Lake Forest[1] - City of Mission Viejo[1] - City of Rancho Santa Margarita[1] - City of San Clemente[1] - City of San Juan Capistrano[1] - County of Orange[1] - Orange County Flood Control District[1]
Santa Margarita River	Santa Margarita (902.00)	Murrieta Creek Temecula Creek Santa Margarita River Santa Margarita Lagoon Pacific Ocean	- City of Murrieta[2] - City of Temecula[2] - City of Wildomar[2] - County of Riverside[2] - County of San Diego[3] - Riverside County Flood Control and Water Conservation District[2]
San Luis Rey River	San Luis Rey (903.00)	San Luis Rey River San Luis Rey Estuary Pacific Ocean	~~- City of Escondido~~ - City of Oceanside - City of Vista - County of San Diego
Carlsbad	Carlsbad (904.00)	Loma Alta Slough Buena Vista Lagoon Agua Hedionda Lagoon Batiquitos Lagoon San Elijo Lagoon Pacific Ocean	- City of Carlsbad - City of Encinitas - City of Escondido - City of Oceanside - City of San Marcos - City of Solana Beach - City of Vista - County of San Diego
San Dieguito River	San Dieguito (905.00)	San Dieguito River San Dieguito Lagoon Pacific Ocean	- City of Del Mar - City of Escondido - City of Poway - City of San Diego - City of Solana Beach - County of San Diego
Penasquitos	~~Penasquitos~~ Reservoir HA (906.~~00~~10) Poway HA (906.20) Miramar HA (906.40)	Los Penasquitos Lagoon ~~Mission Bay~~ Pacific Ocean	- City of Del Mar - City of Poway - City of San Diego - County of San Diego
Mission Bay	Scripps HA (906.30) Miramar HA (906.40) Tecolote HA (906.50)	Mission Bay Pacific Ocean	-City of San Diego
San Diego River	San Diego (907.00)	San Diego River Pacific Ocean	- City of El Cajon - City of La Mesa ~~- City of Poway~~ - City of San Diego - City of Santee - County of San Diego

Table B-1. Watershed Management Areas

Watershed Management Area	Hydrologic Unit(s)	Major Surface Water Bodies	Responsible Copermittees
San Diego Bay	Pueblo San Diego (908.00) Sweetwater (909.00) Otay (910.00)	Sweetwater River Otay River San Diego Bay Pacific Ocean	- City of Chula Vista - City of Coronado - City of Imperial Beach - City of La Mesa - City of Lemon Grove - City of National City - City of San Diego - County of San Diego - San Diego County Regional Airport Authority - Unified Port of San Diego
Tijuana River	Tijuana (911.00)	Tijuana River Tijuana Estuary Pacific Ocean	- City of Imperial Beach - City of San Diego - County of San Diego

Notes:
1. The Orange County Copermittees will be enrolled under this Order upon expiration of Order No. R9-2009-0002, or earlier if the Orange County Copermittees meet the conditions in Provision F.6.
2. The Riverside County Copermittees will be enrolled under this Order upon expiration of Order No. R9-2010-0016, or earlier if the Riverside County Copermittees meet the conditions in Provision F.6.
3. The County of San Diego will not be required to implement the requirements of Provision B for the Santa Margarita River Watershed Management Area until the Riverside County Copermittees are enrolled under this Order. Until then, the County of San Diego is responsible for implementing and complying with the requirements of Provisions D.1, D.4.a.(1)&(3), E, F.2.a-b, F.3.b, and F.4 for the areas of the Santa Margarita River Watershed Management Area within its jurisdiction.

~~3.~~2. Identification of Water Quality Priorities

The Copermittees must identify the water quality priorities within each Watershed Management Area that will be addressed by the Water Quality Improvement Plan. Where appropriate, Watershed Management Areas may be separated into subwatersheds to focus water quality prioritization and jurisdictional ~~runoff management program~~ implementation efforts by receiving water.

a. Assessment of Receiving Water Conditions

The Copermittees must ~~review pollutant sources, discharges, and receiving water conditions and assess~~consider the following, at a minimum, to ~~determine~~support the ~~degree~~identification of ~~adverse~~water quality priorities based on the impacts ~~to~~of MS4 discharges on receiving water beneficial uses:

(1) Receiving waters listed as impaired on the CWA Section 303(d) List of Water Quality Limited Segments (303(d) List);

(2) TMDLs adopted and under development by the San Diego Water Board;

(3) The requirements of Provision A.2;

~~(3)~~(4) Receiving waters recognized as sensitive or highly valued by the Copermittees, including estuaries designated under the National Estuary Program under CWA section 320, wetlands defined by the State or U.S. Fish and Wildlife Service's National Wetlands Inventory as wetlands, and

receiving waters identified as ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-001**2**~~X~~ (Attachment A);

~~(4)~~(5) Water quality standards established in the Basin Plan;

~~(5)~~(6) Known historical versus current physical, chemical, and biological water quality conditions;

~~(6)~~(7) ~~All available~~ Available, relevant, and appropriately collected physical, chemical, and biological receiving water monitoring data meeting appropriate QA/QC standards, including~~, but not limited to,~~ data describing:

(a) Chemical constituents;

(b) Water quality parameters (i.e. pH, temperature, conductivity, etc.);

(c) Toxicity Identification Evaluations for both receiving water column and sediment;

(d) Trash impacts;

(e) Bioassessments; and

(f) Physical habitat.

~~(7)~~(8) Available evidence of erosional impacts in receiving waters due to accelerated flows (i.e. hydromodification); ~~and~~

~~(8)~~(9) Available evidence of adverse impacts to the chemical, physical, and biological integrity of receiving waters~~.~~; and

(10) The potential for long-term achievement and maintenance of beneficial use attainment in the Watershed Management Area.

b. ASSESSMENT OF MS4 DISCHARGE QUALITY AND IMPACTS

To support the identification of priorities based on the impacts of MS4 discharges on receiving water beneficial uses, the Copermittees must review appropriately collected MS4 discharge quality data and consider the extent to which MS4s cause or contribute to the adverse impacts to receiving water beneficial uses identified in B.2.a. Considerations include:

(1) Locations of the Copermittees' MS4 discharges with respect to receiving waters;

(2) MS4 discharge quality results relevant to impacts in receiving waters and action levels, including the temporal and geographic variation of the results:

(3) The requirements of Provisions A.1 and A.3.; and

(4) Whether MS4 discharge quality is sufficiently well known or other information is available to assess whether MS4 discharges are causing or contributing to specific receiving water conditions, or whether additional data need to be collected through the Monitoring and Assessment Program developed as part of the Water Quality Improvement Plan.

~~b.~~c. IDENTIFICATION OF ~~IDENTIFY~~PRIORITY ~~POLLUTANTS AND~~ RECEIVING WATER CONDITIONS

The Copermittees must use the information gathered in Provision B.2.a~~.~~ and B.2.b. to develop a list of water quality priorities as pollutants and/or receiving water conditions that are the highest threat to receiving water quality or that most adversely affect the physical, chemical, and biological integrity of receiving waters. The Copermittees must identify the highest water quality priorities to be addressed by the Water Quality Improvement Plan, and describe the reasoning for selecting a subset of receiving water conditions as the highest priority(ies)~~.~~ The Water Quality Improvement Plans shall describe the following for the highest priority receiving water condition:

(1) The beneficial use(s) and pollutant(s) associated with the priority receiving water condition(s);

(2) The geographic extent of the priority receiving water condition(s)within the WMA, if known;

(3) The Copermittees with MS4s that contribute discharges to the priority water receiving condition(s);

(4) The temporal extent of the priority receiving condition(s) (i.e., dry weather and/or wet weather); and

(5) Whether receiving waters have been monitored sufficiently to adequately characterize the priority receiving condition(s), including a consideration of spatial and temporal variation.

~~c.~~d. MS4 POLLUTANT SOURCE ~~AND/OR STRESSOR~~ IDENTIFICATION

The Copermittees must identify and prioritize known and suspected storm water and non-storm water pollutant sources ~~and any other stressors causing or contributing to~~within the MS4 associated with the highest priority receiving water conditions identified under B.2.c~~quality priorities.~~ . The identification of known

and suspected sources of the highest water quality priorities as identified for Provision B.2.c ~~must~~ shall consider the following :

(1) Land uses and their potential contribution to the highest priority receiving water conditions;

~~(9)~~(2) Pollutant generating facilities ~~or~~, areas, and/or activities within the Watershed Management Area~~, including:~~;

~~(10) Each Copermittee's inventory of construction, municipal, commercial, industrial, and residential facilities, areas, and/or activities,~~
~~(11)~~
~~(12) Publicly owned parks and/or recreational areas,~~
~~(13)~~
~~(14) Open space areas,~~
~~(15)~~
~~(16) All currently operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste, and~~
~~(17)~~
~~(18) Areas not within the Copermittees' jurisdictions (e.g., tribal lands, state lands, federal lands) that may be pollutant sources related to the highest water quality priorities within the Watershed Management Area;~~
~~(19)~~
~~(20)~~ Locations of the Copermittees' MS4s~~, including the following:~~
~~(21)~~
~~(22)~~(3) ~~All MS4~~ outfalls ~~that discharge to receiving waters, and~~ .

~~(23) Locations of major structural controls for storm water and non-storm water (e.g., retention basins, detention basins, major infiltration devices, etc.);~~
~~(24)~~
~~(25) Other known and suspected sources of non-storm water or pollutants in storm water discharges to receiving waters within the Watershed Management Area, including the following:~~
~~(26)~~
~~(27) Other MS4 outfalls (e.g., Phase II Municipal and Caltrans),~~
~~(28)~~
~~(29) Other NPDES permitted discharges,~~
~~(30)~~
~~(31) Any other discharges that may be considered point sources (e.g., private outfalls), and~~
~~(32)~~
~~(33) Any other discharges that may be considered non-point sources (e.g., agriculture, wildlife or other natural sources);~~
~~(34)~~
~~(35)~~(4) Review of available data, including ~~but not limited to~~:

(a) Findings from the Copermittees' illicit discharge detection and elimination programs,

(b) Findings from the Copermittees' MS4 outfall monitoring,

~~(c) Findings from the Copermittees' receiving water monitoring,~~
~~(d)~~
~~(e) Findings from the Copermittees' MS4 discharges and receiving water assessments, and~~
~~(f)~~
~~(g)~~(c) ~~Any other~~Other available, relevant, and appropriately-collected data, information, or studies related to pollutant sources and ~~conditions~~ pollutant-generating activities that contribute to the highest priority receiving water ~~quality priorities as~~conditions identified ~~for~~ in Provision B.2.c~~c~~.

(5) Whether MS4 sources are sufficiently well known to design an effective, efficient[5], directed control strategy, or whether additional source/stressor identification needs to be conducted through the Monitoring and Assessment Program developed as part of the Water Quality Improvement Plan to identify and prioritize sources/stressors within the watershed.

~~d.~~e. NUMERIC ~~TARGETS AND SCHEDULES~~GOALS

The Copermittees must develop and incorporate interim and final numeric ~~targets~~[6] ~~and schedules~~ goals[7] into the Water Quality Improvement Plans. Numeric ~~targets~~goals and schedules ~~must be used~~are intended to support Water Quality Improvement Plan development and to measure progress towards addressing the highest priority receiving water conditions identified under B.2.c~~water quality priorities and an ultimate outcome of protections, preservation, enhancement, and restoration of~~. Numeric goals are not enforceable compliance standards, effluent limitations, or receiving water ~~beneficial uses.~~ limitations.

[5] Copermittees are encouraged to use a sustainability analysis, or Triple Bottom Line analysis, that considers environmental, social and economic factors when estimating the potential efficiency of control strategies.
~~[6] Interim and final numeric targets may take a variety of forms such as pollutant concentration, load reductions, number of impaired water bodies delisted from the List of Water Quality Impaired Segments, Index of Biotic Integrity (IBI) scores, or other appropriate metrics. Interim and final numeric targets are not necessarily limited to one criterion or indicator, but may include multiple criteria and/or indicators.~~
[7] Interim and final numeric goals may take a variety of forms such as TMDL targets, TMDL wasteload allocations, TMDL based WQBELs incorporated in Attachment E of this Order, action levels, pollutant concentration, load reductions, number of impaired water bodies delisted from the List of Water Quality Impaired Segments, Index of Biotic Integrity (IBI) scores, or other appropriate metrics. Interim and final numeric goals are not necessarily limited to one criterion or indicator, but may include multiple criteria and/or indicators. To the extent that a goal is not based on an enforceable regulatory mechanism (i.e., TMDL, WLA), WQIP goals and schedules may be revised through the iterative process. Numeric goals are not subject to enforcement or non-compliance actions under this Order.

When ~~developing~~establishing numeric ~~targets~~goals and corresponding schedules, the Copermittees must consider the following:

(1) Final numeric ~~targets~~goals must be based on measureable criteria or indicators, to be achieved in the receiving waters and/or MS4 discharges for the highest priority receiving water ~~quality priorities~~conditions which will ~~result in~~be capable of demonstrating progress toward the achievement of the restoration and/or protection of water quality standards in receiving waters; and

(2) Interim numeric ~~targets~~goals must be based on measureable criteria or indicators that can demonstrate incremental progress toward achieving the final numeric ~~targets~~goals in the receiving waters and/or MS4 discharges~~;~~. ~~and~~

(3) Schedules must be adequate for measuring progress toward achieving the interim and final numeric ~~targets~~ goals required for Provisions B.2.d. ~~and B.2.d.~~. Schedules must incorporate the following:

(a) Interim dates for achieving the interim numeric goals~~targets~~,

(b) Compliance schedules for any applicable TMDLs in Attachment E to this Order,

(c) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-001**2**~~**X**~~ (see Attachment A),

(d) Achievement of the final numeric goals ~~targets~~ in the receiving waters and/or MS4 discharges for the highest water quality priorities must be as soon as possible, and

~~(d)~~(e) Final dates for achieving the final numeric goals ~~targets~~ must not extend more than 10 years beyond the date this Order is adopted, unless the schedule includes an applicable TMDL in Attachment E to this Order[8].

~~4.~~3. Water Quality Improvement Strategies and Schedules

The Copermittees must develop specific water quality improvement strategies to address the highest ~~water quality~~ priority~~ies~~ receiving water conditions identified within a Watershed Management Area. The water quality improvement strategies must address the highest water quality priorities by preventing or eliminating non-storm water discharges to and from the MS4, reducing pollutants in storm water discharges from the MS4 to the MEP, and restoring and/or protecting the water quality standards of receiving waters.

[8] Achievement of final numeric goals within 10 years represents progress towards attainment of water quality standards, but is not a requirement to fully attain all applicable water quality standards or all priority receiving water conditions within 10 years.

a. WATER QUALITY IMPROVEMENT STRATEGIES

The Copermittees must prioritize water quality improvement strategies, ~~must prioritize~~based on their likely effectiveness and efficiency, and implement ~~the following~~ measures, as appropriate, to effectively prohibit non-storm water discharges into its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, and achieve the interim and final numeric ~~targets~~goals in accordance with the schedules ~~required for~~in Provision B.2~~.~~:.e. Measures include:

(1) Copermittee-selected activities identified in Provision E ,either as described in the jurisdictional runoff management programs or as modified with justification, that will address priority receiving water conditions; and

~~(1)~~ Additional ~~S~~structural and/or non-structural BMPs (to include public outreach and participation programs), as selected by the Copermittee, that are designed to achieve the interim and final numeric goals identified in Provision B.2.e.~~targets in the receiving waters and/or MS4 discharges;~~

~~(2)~~

~~(3) Retrofitting projects for areas of existing development known or suspected to contribute to the highest water quality priorities, and where retrofitting will contribute to reducing or eliminating non-storm water discharges to the MS4 and/or reducing pollutants in storm water discharges from the MS4 to the MEP;~~

~~(4)~~

~~(5)~~(2) ~~Stream and/or habitat rehabilitation or restoration projects where stream and/or habitat rehabilitation or restoration are necessary for, or will contribute to demonstrable improvements in the physical, chemical, and biological receiving water conditions and restoration and/or protection of water quality standards in receiving waters; and~~

~~Other water quality improvement strategies that will result in preventing or eliminating non-storm water discharges to and from the MS4, reducing pollutants in storm water discharges from the MS4 to the MEP, and restoring and/or protecting the water quality standards of receiving waters.~~

b. IMPLEMENTATION SCHEDULES

~~(6)~~ The Copermittees must develop schedules for implementing the water quality improvement strategies identified under Provision B.3.a to achieve the interim and final numeric ~~targets~~goals identified in ~~the receiving waters and/or MS4 discharges for the highest water quality priorities~~B.2.e in the Watershed Management Area. Schedules must be developed for both the water quality improvement strategies implemented by each Copermittee within its

jurisdiction and for strategies that ~~will be implemented by multiple Copermittees~~ Copermittees' choose to implement on a collaborative basis~~.~~

(1) .

~~(2)~~

~~(3) Interim dates for achieving the interim numeric targets;~~

~~(4)~~

~~(5) Compliance schedules for any applicable TMDLs in Attachment E to this Order;~~

~~(6)~~

~~(7) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-001**X** (see Attachment A);~~

~~(8)~~

~~(9) Achievement of the final numeric targets in the receiving waters and/or MS4 discharges for the highest water quality priorities must be as soon as possible, and~~

~~(10)~~(2) ~~Final dates for achieving the final numeric targets must not extend more than 10 years beyond the date this Order is adopted, unless the schedule includes an applicable TMDL in Attachment E to this Order~~The Copermittees must incorporate the implementation compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-001~~X~~2 (see Attachment A).

~~5.~~4. Water Quality Improvement Monitoring and Assessment

The Copermittees in each Watershed Management Area must develop an integrated ~~program to assess the~~Water Quality Improvement Plan Monitoring and Assessment Program that assesses: 1) progress toward achieving the numeric ~~targets~~goals and schedules, ~~and~~2) ~~the~~ progress toward addressing the highest priority receiving water ~~quality priorities~~conditions for each Watershed Management Area, and 3) each Copermittee's overall efforts implementing the requirements of Provision B. The water quality improvement monitoring and assessment program must include the monitoring and assessment requirements of Provision D~~.~~, which may be modified for consistency with the priority receiving water conditions of each Watershed Management Area and associated Copermittees. For Watershed Management Areas with applicable TMDLs, the water quality monitoring and assessment program must incorporate the specific monitoring and assessment requirements of Attachment E. For Watershed Management Areas with any ASBS, the water quality monitoring and assessment program must also incorporate the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-001**2**~~**X**~~ (see Attachment A).

~~6.~~5. Iterative and Adaptive Management Process

~~a. Water Quality Improvement Plan Adaptive Management Process~~

The Copermittees in each Watershed Management Area must implement the iterative

process, ~~at least once every 3 years,~~ adapting the Water Quality Improvement Plan, jurisdictional runoff management programs and monitoring and assessment programs, as necessary, to become more effective~~, based on, but not limited to~~ and meet the requirements of Provisions A, and shall consider the following~~ considerations~~:

a. PRIORITY RECEIVING WATER CONDITIONS AND NUMERIC GOALS
The priority receiving water conditions and numeric goals, developed pursuant to B.2.c. and B.2.e respectively, shall guide jurisdictional implementation efforts for the duration of this Order. Recommendations for changes to priority receiving water conditions and numeric goals shall be provided in the Report of Waste Discharge and shall consider the following:

(1) Achieving the outcome of improved water quality in MS4 discharges and receiving waters through implementation of the water quality improvement strategies identified in the Water Quality Improvement Plan;

(2) Progress toward achieving interim and final numeric ~~targets~~goals in receiving waters and/or MS4 discharges for the highest water quality priorities in the Watershed Management Area~~,~~

~~(3) Appropriateness of the highest water quality priorities identified for the Watershed Management Area;~~
~~(4)~~
~~(5) Progress toward achieving outcomes according to established schedules;~~
~~(6)~~
(3) New scientific information or new or updated policies or regulations that affect identified numeric goals including revised water quality objectives or TMDLs;

~~(7)~~(4) Spatial and temporal accuracy of monitoring data collected to inform prioritization of water quality problems and implementation measures to address the highest priority receiving water ~~quality problems~~conditions;

~~(8)~~(5) Availability of new information and data from sources other than the jurisdictional runoff management programs within the Watershed Management Area that informs the effectiveness of the actions implemented by the Copermittees;

(6) The factors listed in Provision B.2.a.(1)-(10);

~~(9)~~(7) San Diego Water Board recommendations; and

~~(10)~~(8) Recommendations for modifications ~~to the Water Quality Improvement Plan~~ solicited through a public participation process.

b. ~~BASED ON THE RESULTS OF THE ITERATIVE PROCESS~~ WATER QUALITY IMPROVEMENT STRATEGIES AND SCHEDULES

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(1) The water quality improvement strategies and schedules required pursuant to Provision B.5.a., theProvisions B.3 and B.4 shall be adapted as new information becomes available to inform more effective and efficient means of achieving the numeric goals established in Provision B.2.e. Copermittees must report any modifications necessaryshall consider adaptation to improve the effectiveness of the Water Quality Improvement Plan in the Annual Report required pursuant to Provision , or as part of the Report of Waste Discharge (ROWD) required pursuant to Provision F.5..

(2) The Copermittees must implement any modifications to the Water Quality Improvement Plan in accordance with the schedules developed pursuant to Provisions B.2. and B.3., unless directed otherwise by the San Diego Water Board.

b. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ADAPTIVE MANAGEMENT PROCESS

Each Copermittee in the Watershed Management Area must implement the iterative process,jurisdictional runoff management programs and monitoring and assessment strategies and schedules at least annually, adapting its jurisdictional runoff management program to become more effective, based on, but not limited to considering the following:

(1) Changes to priority receiving water conditions and numeric goals based on recommendations from B.5.a.;

(11)(2) Measurable or demonstrable reductions of non-storm water discharges to and from each Copermittee's MS4;

(12)(3) Measurable or demonstrable reductions of pollutants in storm water discharges from each Copermittee's MS4 to the MEP;

(4) Information on the MS4 sources and/or pollutant-generating activities determined to be most significantly contributing to priority receiving water conditions;

(13)(5) Efficiency in implementing the Water Quality Improvement Plan;

(14)(6) San Diego Water Board recommendations; and

(15)(7) Recommendations for modifications to each Copermittee's jurisdictional runoff management program solicited through a public participation process..

6. Water Quality Improvement Plan Submittal, Implementation, and Modifications

Copermittee Draft

Requirements for Water Quality Improvement Plan submittals and modifications are described in Provision F. Requirements for corresponding modifications to the jurisdictional runoff management programs and monitoring and assessment program are also described in Provision F.

~~The~~ Copermittees must commence with implementation of the Water Quality Improvement Plan no later than ~~180 days after submission, unless otherwise directed in writing by the San Diego Water Board.~~ the fiscal year (July 1) following San Diego Water Board approval of the Water Quality Improvement Plan.

~~(1) modifications necessary to improve the effectiveness its jurisdictional runoff management program document in the Annual Report required pursuant to Provision , or as part of the ROWD required pursuant to Provision F.5..~~

~~Each Copermittee must implement any modifications to its jurisdictional runoff management program in accordance with the schedules developed pursuant to Provisions B.2. and B.3., unless directed otherwise by the San Diego Water Board.~~

~~**7. Water Quality Improvement Plan Implementation**~~

~~Copermittees must commence with implementation of the Water Quality Improvement Plan no later than 180 days after submission, unless otherwise directed in writing by the San Diego Water Board.~~

C. ACTION LEVELS

The purpose of this provision is for the Copermittees to incorporate numeric non-storm water and storm water action levels in the Water Quality Improvement Plans. The action levels ~~will~~shall be used to guide the following program planning efforts and measure progress towards attaining the reasonable protection, preservation, and enhancement~~, and restoration~~ of water quality and designated beneficial uses of waters of the state~~. This goal will be accomplished through monitoring and assessing the quality of the MS4 discharges during the implementation of the Water Quality Improvement Plans.~~:

1. ~~The Copermittees must incorporate numeric action levels in the~~ Support development and prioritization of water quality improvement strategies through the Water Quality Improvement Plans ~~to direct and focus~~. Discharge data above action levels can be evaluated using a statistical approach considering the ~~Copermittees' jurisdictional runoff management program implementation efforts for addressing MS4~~ frequency, magnitude, and loading of discharges to the receiving waters~~. The numeric action levels will be used as part of the MS4~~ to support development of actions and prioritization of their implementation.
2. Assist in the effective prohibition of non-stormwater discharges ~~assessments required under~~ from the MS4 pursuant to Provision ~~, and each Copermittee's program to detect and eliminate non-storm water~~ E.2.
3. Support the detection and elimination of illicit discharges to the MS4 ~~required under~~pursuant to Provision ~~. Numeric~~E.2.

These goals will be accomplished through monitoring and assessing the quality of the MS4 discharges prior to and during the implementation of the Water Quality Improvement Plans. Exceedances of action levels are not subject to enforcement or non-compliance actions under this Order.

Action levels will be developed and incorporated into the Water Quality Improvement Plans (Provision B) including the Illicit Discharge Detection and Elimination (IDDE) Program (Provision E.2). Depending upon the goals/objectives for the use of the action levels ~~must be developed~~ and the priority receiving water conditions, the constituents and values at which they are set may differ between watersheds. Copermittees may develop Watershed Management Area specific numeric action levels for non-storm water and storm water MS4 discharges~~,~~ using an approach approved by the Regional Board or use the default non-stormwater and stormwater action levels prescribed within C.1 and C.2 below, respectively. The Copermittees will submit action levels as part of their Water Quality Improvement Plan(s). The action levels established as ~~follows:~~part of R9-2007-0001 will serve as the interim action levels until the Water Quality Improvement Plans are completed and approved.

~~8.~~1. Non-Storm Water Action Levels

a. The following non-storm water action levels (NALs) must be incorporated ~~in the Water Quality Improvement Plan~~:

(1) Non-Storm Water Discharges from MS4s to Ocean Surf Zone

Table C-1. Non-Storm Water Action Levels for Discharges from MS4s to Ocean Surf Zone

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Total Coliform	MPN/100 ml	1,000	-	10,000/1,000[1]	OP
Fecal Coliform	MPN/100 ml	200[2]	-	400	OP
Enterococci	MPN/100 ml	35	-	104[3]	OP

Abbreviations/Acronyms
AMAL – average monthly action level
OP – Ocean Plan water quality objective
MDAL – maximum daily action level
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Total coliform density ~~shall not exceed~~NAL is 1,000 MPN/100 ml when the fecal/total coliform ratio exceeds 0.1
2. Fecal coliform density ~~may not exceed~~ NAL is 200 MPN per 100 ml during any 30 day period
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas"

~~(3)~~

~~(4)~~(2) Non-Storm Water Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Table C-2. Non-Storm Water Action Levels for Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Turbidity	NTU	75	-	225	OP
pH	Units	Within limit of 6.0 to 9.0 at all times			OP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	35	-	104[3]	BP
Priority Pollutants	ug/L	See Table C-3			

Abbreviations/Acronyms:

AMAL – average monthly action level
OP – Ocean Plan water quality objective
NTU – Nephelometric Turbidity Units
ug/L – micrograms per liter
MDAL – maximum daily action level
BP – Basin Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:

1. Based on a minimum of not less than five samples for any 30-day period
2. ~~No~~NAL is reached if ~~more than 10 percent of total samples may exceed 400 MPN per 100 ml during any 30 day period~~
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas" and is not applicable to waterbodies that are not designated REC-1.

Table C-3. Non-Storm Water Action Levels for Priority Pollutants

Parameter	Units	Freshwater (CTR)		Saltwater (CTR)	
		MDAL	AMAL	MDAL	AMAL
Cadmium	ug/L	**	**	16	8
Copper	ug/L	*	*	5.8	2.9
Chromium III	ug/L	**	**	-	-
Chromium VI	ug/L	16	8.1	83	41
Lead	ug/L	*	*	14	2.9
Nickel	ug/L	**	**	14	6.8
Silver	ug/L	*	*	2.2	1.1
Zinc	ug/L	*	*	95	47

Abbreviations/Acronyms:
CTR – California Toxic Rule
AMAL – average monthly action level
ug/L – micrograms per liter
MDAL – maximum daily action level

Notes:
* Action levels developed on a case-by-case basis (see below)
** Action levels developed on a case-by-case basis (see below), but calculated criteria are not to exceed Maximum Contaminant Levels (MCLs) under the California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64431

The Cadmium, Copper, Chromium (III), Lead, Nickel, Silver and Zinc NALs for MS4 discharges to freshwater receiving waters will be developed on a case-by-case basis because the freshwater criteria are based on site-specific water quality data (receiving water hardness). For these priority pollutants, the following equations (40 CFR 131.38.b.2) will be required:

Cadmium (Total Recoverable) = exp(0.7852[ln(hardness)] -2.715)
Chromium III (Total Recoverable) = exp(0.8190[ln(hardness)] + .6848)
Copper (Total Recoverable) = exp(0.8545[ln(hardness)] - 1.702)
Lead (Total Recoverable) = exp(1.273[ln(hardness)] - 4.705)
Nickel (Total Recoverable) = exp(.8460[ln(hardness)] + 0.0584)
Silver (Total Recoverable) = exp(1.72[ln(hardness)] - 6.52)
Zinc (Total Recoverable) = exp(0.8473[ln(hardness)] + 0.884)

~~(5)~~(3) Non-Storm Water Discharges from MS4s to Inland Surface Waters

Table C-4. Non-Storm Water Action Levels for Discharges from MS4s to Inland Surface Waters

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Dissolved Oxygen	mg/L	Not less than 5.0 in WARM waters and not less than 6.0 in COLD waters			BP
Turbidity	NTU	-	20	See MDAL	BP
pH	Units	Within limit of 6.5 to 8.5 at all times			BP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	33	-	61[3]	BP
Total Nitrogen	mg/L	-	1.0	See MDAL	BP
Total Phosphorus	mg/L	-	0.1	See MDAL	BP
MBAS	mg/L	-	0.5	See MDAL	BP
Iron	mg/L	-	0.3	See MDAL	BP
Manganese	mg/L	-	0.05	See MDAL	BP
Priority Pollutants	ug/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
BP – Basin Plan water quality objective
COLD – cold freshwater habitat beneficial use
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
MDAL – maximum daily action level
WARM – warm freshwater habitat beneficial use
MBAS – Methylene Blue Active Substances
MPN/100 ml – most probable number per 100 milliliters
ug/L – micrograms per liter

Notes:
1. Based on a minimum of not less than five samples for any 30-day period
2. ~~No~~NAL is reached if more than 10 percent of total samples ~~may~~ exceed 400 MPN per 100 ml during any 30 day period
3. This value has been set to the Basin Plan water quality objective for freshwater "designated beach areas" and is not applicable to waterbodies that are not designated REC-1.

b. If not identified in Provision C.1.a, NALs must be identified and incorporated in the Water Quality Improvement Plan for any pollutants or waste constituents causing or contributing, or threatening to cause or contribute to a condition of pollution or nuisance in waters of the ~~state~~ U.S. associated with the highest water quality priorities related to non-storm water discharges from the MS4s. NALs must be based on:

(1) Applicable water quality standards which may be dependent upon site-specific or receiving water-specific conditions or assumptions to be identified by the Copermittees; or

(2) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. Dry weather monitoring and assessment data from MS4 outfalls collected in accordance with Provision D.1 may be used to develop or revise NALs based upon watershed-specific data. Revision of NALs is subject to Regional Board EO approval.

~~10.~~
~~11.~~2. **Storm Water Action Levels**

a. The following storm water action levels (SALs) for discharges of storm water from the MS4 must be incorporated ~~in the Water Quality Improvement Plan:~~:

Table C-5. Storm Water Action Levels for Discharges from MS4s to Receiving Waters

Parameter	Units	Action Level
Turbidity	NTU	126
Nitrate & Nitrite (Total)	mg/L	2.6
Phosphorus (Total P)	mg/L	1.46
Cadmium (Total Cd)*	µg/L	3.0
Copper (Total Cu)*	µg/L	127
Lead (Total Pb)*	µg/L	250
Zinc (Total Zn)*	µg/L	976

Abbreviations/Acronyms:
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
ug/L – micrograms per liter

Notes:
* The sampling must include a measure of receiving water hardness at each MS4 outfall. If a total metal concentration exceeds the corresponding metals SAL in Table C-5, that concentration must be compared to the California Toxics Rule criteria and the USEPA 1-hour maximum concentration for the detected level of receiving water hardness associated with that sample. If it is determined that the sample's total metal concentration for that specific metal exceeds that SAL, but does not exceed the applicable USEPA 1-hour maximum concentration criterion for the measured level of hardness, then the sample result will not be considered ~~as an excursion~~ above the SAL for that measurement.

b. If not identified in Provision C.2.a, SALs must be identified and incorporated in the Water Quality Improvement Plan for pollutants or waste constituents causing or contributing, or threatening to cause or contribute to a condition of pollution or nuisance in waters of the state associated with the highest water quality priorities related to storm water discharges from the MS4s. SALs must be based on:

(1) Federal and State water quality guidance and/or water quality standards; ~~and~~or

(2) Site-specific or receiving water-specific conditions; or

(3) One of the approaches recommended by the California Water Board's Storm Water Panel in its report, "The Feasibility of Numerical Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities" (June 2006).

~~(3)~~(4) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. Wet weather monitoring and assessment data from MS4 outfalls collected in accordance with Provision D.1.b may be used to develop or revise SALs based upon watershed-specific data. Revision of SALs is subject to San Diego Water

Internal Draft

Board approval.

~~C.~~D. MONITORING AND ASSESSMENT REQUIREMENTS

[NOTE: This section has been replaced with a proposed alternative version of provision D.]

Water quality monitoring and assessment shall be question-driven and designed to support adaptive storm water management and the iterative process outlined in Provision B. The monitoring and assessment activities shall be based on a logical hierarchy in which overall management goals help define clear management questions, which are addressed by specific monitoring activities designed to produce data targeted to defined assessment needs. The monitoring and assessment activities shall follow relevant and applicable guidance provided in the SWAMP Assessment Framework (Bernstein, 2010[9]), A Framework for Monitoring and Assessment in the San Diego Region (SDRWQCB, 2011[10]), and the Southern California Stormwater Monitoring Coalition's (SMC) Model Monitoring Program (SMC, 2004[11]).

The monitoring and assessment shall be designed in two phases. A transitional program shall be implemented beginning the first day of October in the year following permit adoption, and continue until the first day of October following commencement of Water Quality Improvement Plan implementation, pursuant to Provision B. The transitional ("pre-WQIP") program shall build on the experience gained implementing water quality monitoring programs under previous Orders and shall address the SMC questions as described below. The second ("post-WQIP") phase of the Monitoring and Assessment Program shall address the watershed priorities identified in the Water Quality Improvement Plans as developed for each watershed pursuant to Provision B. This phase of monitoring shall begin with implementation of the approved WQIPs. The transitional (pre-WQIP) phase of monitoring and assessment applies only to the San Diego County Copermittees; the Orange County and Riverside County permittees affected by this regional permit are expected to participate during the post-WQIP phase, after officially enrolling under the regional permit.

As a starting point, the Monitoring and Assessment Program shall be designed to address the overarching management questions developed by the SMC:

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[9] Bernstein, Brock, 2010. "SWAMP Assessment Framework." Prepared for the Surface Water Ambient Monitoring Program (SWAMP). December, 2010). http://www.swrcb.ca.gov/water_issues/programs/swamp/docs/reports/app_c_assess_frmwrk.pdf.

[10] SDRWQCB, 2011. "A Framework for Monitoring and Assessment in the San Diego Region." California Regional Water Quality Control Board, San Diego Region, Staff Report, Working Draft. May 2012. Prepared by Lilian Busse and Bruce Posthumus. http://www.waterboards.ca.gov/sandiego/board_info/agendas/2012/Jun/item9/eosr0612MonitoringFramework.SD1.pdf

[11] SMC, 2004. "Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California." A report from the Stormwater Monitoring Coalition's Model Monitoring Technical Committee. August 2004. Technical Report #419. http://www.lmtf.org/FoLM/Poliact/EColi/419_smc_mm.pdf

1. Are conditions in receiving waters protective, or likely to be protective, of beneficial uses? This question will be addressed by comparing indicator values to the relevant benchmarks or objectives and/or to background conditions.

2. What is the extent and magnitude of the current or potential receiving water problems? This question will be addressed by mapping the spatial extent and/or temporal persistence of problems, the severity of impacts, and/or the degree to which benchmarks are exceeded.
3. What is the relative urban runoff contribution to the receiving water problem(s)? This question will be addressed by comparing concentrations and loads of priority constituents to those from other sources, including background.

4. What are the sources of urban runoff that contribute to receiving water problem(s)? This question will be addressed by characterizing and prioritizing discharges and using targeted source identification protocols to track the origin of specific constituents.

5. Are conditions in receiving waters getting better or worse? This question will be addressed by time series analyses of individual indicators and/or of aggregate or cumulative indices of condition.

Given that substantial work has already been accomplished and other work is ongoing to address the questions related to receiving water condition assessment (questions 1, 2, 5), the Copermittees shall focus their efforts principally on questions 3 and 4. All five questions need not be addressed simultaneously to the same degree. As watershed problems are identified, effort should shift to diagnosis (questions 4 and 5) until the problems have been addressed, at which point effort may shift back to broader assessment (questions 1 and 2) in search of other problems to address.

During the transitional (pre-WQIP) period, where feasible the Copermittees shall develop more specific monitoring questions to guide the design of specific monitoring activities and address specific assessment needs. The information so generated will be used to guide management actions, based on the results of the monitoring data assessments.

As part of each WQIP, the Copermittees shall develop a water quality Monitoring and Assessment Program (Monitoring and Assessment Program) for each Watershed Management Area (WMA), as provided in Table B-1. Using the overarching SMC management questions as guidance, each Monitoring and Assessment Program shall include specific monitoring questions appropriate to address the assessment needs of each specific WMA. The monitoring activities shall be designed to generate data needed to address priority issues identified in the WQIPs, and the resulting monitoring data and assessments shall be supplied to program planners to help inform management actions. If a WMA has an approved Comprehensive Load Reduction Plan (CLRP), the CLRP shall be incorporated into the WQIP.

Each Copermittee covered by this permit shall participate in development and implementation of the Monitoring and Assessment Program for each WMA in which they have jurisdiction. The Copermittees shall consider the needs of regional monitoring and assessment activities in the development of each Monitoring and Assessment Program and make allowances as needed for regional coordination.

1. Receiving Waters Monitoring

Until approval and implementation of the WQIPs, the Copermittees shall perform receiving water monitoring to address management questions and specific questions, as specified in Provisions D.1.a-D.1.g below:

a. SMC REGIONAL MONITORING

Management Questions: Are conditions in receiving waters protective, or likely to be protective, of beneficial uses? What is the extent and magnitude of the current or potential receiving water problems?

The Copermittees shall participate in the SMC Regional Monitoring Program through its planned completion. The SMC monitoring program seeks to coordinate and leverage existing monitoring efforts to produce regional estimates of condition, improve data comparability and quality assurance, and maximize data availability, while conserving monitoring expenditures. The primary goal of this program is to implement an ongoing, large scale regional monitoring program for southern California's coastal streams and rivers. A comprehensive program was designed by the SMC, in which each participating group assesses its local watersheds and then contributes their portion to the overall regional assessment. The SMC Regional Monitoring Program involves a probabilistic design for characterization of coastal watersheds using bioassessment metrics and related analyses, including, but may not be limited to: physical habitat characterization, Southern California Index of Biological Integrity scoring, macroinvertebrate and algal taxonomy, algal biomass, water chemistry, and toxicity. The study incorporates both reference and non-reference streams and may identify additional biological and/or chemical stressors affecting stream health, such as channel alteration and presence of invasive species.

b. SOUTHERN CALIFORNIA BIGHT REGIONAL MONITORING

Management Questions: Are conditions in receiving waters protective, or likely to be protective, of beneficial uses? What is the extent and magnitude of the current or potential receiving water problems?

The Copermittees shall participate in the Southern California Bight Regional Monitoring program as a trade-off with other routine monitoring requirements. The Bight program involves detailed characterization of coastal and offshore receiving waters, as well as targeted special studies. The Bight regional monitoring effort is designed to build upon the data collected during the previous Bight regional

programs, to assess the extent of contamination in the Southern California Bight. Receiving water samples are collected in or near coastal areas, bays, estuaries, offshore islands, and open water/deep ocean within the Bight. Water quality and sediment samples may be collected to provide data for model input, to assess long-term trends, and to answer management questions developed by the diverse group of stakeholders in the Southern California Bight Region as part of the program. In addition, special studies such as potential new technology implementation (i.e. bioanalytical screening and/or genetic coding) may be conducted as part of the Bight Regional Monitoring.

c. SEDIMENT QUALITY MONITORING

Management Questions: Are conditions in receiving waters protective, or likely to be protective, of beneficial uses? What is the extent and magnitude of the current or potential receiving water problems?

Specific Question: What is the condition of sediments in enclosed bays and estuaries with respect to the statewide sediment quality objectives?

Copermittees shall perform monitoring of bay and lagoon sediments, as applicable, under the Copermittees' responsibility to conform to the requirements of the Statewide Sediment Quality Objectives regulatory program, per State Water Resources Control Board Resolution No. 2008-0070 – Adoption of a Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality.

d. HYDROMODIFICATION MANAGEMENT PLAN (HMP) MONITORING

Management Questions: Are conditions in receiving waters protective, or likely to be protective, of beneficial uses? What is the extent and magnitude of the current or potential receiving water problems?

The Copermittees shall perform receiving water monitoring as required per their Hydromodification Management Plan Monitoring Plans, as approved by the California Regional Water Quality Control Board, San Diego Region.

e. TMDL MONITORING

Management Questions: Are conditions in receiving waters protective, or likely to be protective, of beneficial uses? Are conditions in receiving waters getting better or worse?

Specific question: What is the progress in achieving and complying with adopted TMDL targets?

The Copermittees shall conduct receiving water monitoring to address monitoring requirements associated with TMDLs as specified below.

(1) The Copermittees shall perform water quality monitoring as required per the Implementation Plans or approved CLRPs of effective TMDLs, including compliance monitoring for the following TMDLs:

(a) TMDL for Diazinon in Chollas Creek Watershed Resolution No. R9-2002-0123; Effective as of September 11, 2003.

(b) TMDLs for Dissolved Copper in Shelter Island Yacht Basin Resolution No. R9-2005-0019; Effective as of December 2, 2005.

(c) TMDLs for Dissolved Copper, Lead, and Zinc in Chollas Creek Resolution No. R9-2007-0043; Effective as of October 22, 2008.

(d) TMDLs for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay Resolution No. R9-2008-0027; Effective as of September 15, 2009.

(e) Revised TMDLs for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek) Resolution No. R9-2010-0001; Effective as of April 4, 2011.

(2) TMDL monitoring shall be coordinated and/or integrated with monitoring specified in an approved CLRP or equivalent implementation plan.

f. ASBS SPECIAL PROTECTIONS MONITORING

Management Questions: Are conditions in receiving waters protective, or likely to be protective, of beneficial uses? Are conditions in receiving waters getting better or worse?

The Copermittees responsible for discharges to Areas of Special Biological Significance (ASBS) as regulated per the Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges, State Water Resources Control Board Resolution No. 2012-0012, shall perform receiving water monitoring as required, per the adopted ASBS Special Protections.

g. SAN DIEGO REGIONAL REFERENCE STREAM STUDY

Management Question: Are conditions in receiving waters protective, or likely to be protective, of beneficial uses? What is the extent and magnitude of the current or potential receiving water problems?

Specific Question: What are the concentrations/loads of bacteria, nutrients, and metals in reference streams in Southern California?

The Copermittees shall participate in reference stream receiving water monitoring and data analysis under the San Diego Regional Reference Stream Study as a Regional Study. The San Diego Regional Reference Stream Study is intended to characterize background concentrations of bacteria, nutrients, and metals in natural streams within the jurisdiction of the San Diego Water Board (Region 9). Samples shall be collected during wet and dry weather at sites considered representative of natural conditions (a contributing drainage area at least 95 percent undeveloped) and that vary in regards to hydrology, catchment size, and geology. The results of the study may be used to assist determination of scientifically-based reference stream numeric goals for indicator bacteria, nutrients, and metals.

h. LONG-TERM RECEIVING WATER MONITORING, POST-WQIP ADOPTION

Management Question: Are conditions in receiving waters getting better or worse?

Following adoption of the WQIPs, the Copermittees shall conduct long-term receiving water monitoring to be performed in each WMA during WQIP implementation, for assessment of long-term trends, as specified below:

(1) The Copermittees in each Watershed Management Area shall select one long-term receiving water station from among the existing mass loading stations (MLS) and temporary watershed assessment stations (TWAS) to be representative of receiving water quality within the WMA.

(2) During the permit term, the Copermittees shall perform monitoring during three wet weather events and three dry weather events at each of the long-term stations selected by the Copermittees and approved by the San Diego Water Board.

(3) <u>Dry Weather Receiving Water Monitoring</u>

During the permit term, the Copermittees shall perform monitoring during three dry weather events, at minimum, at each of the long-term stations. One event must be conducted during the dry season (May 1-September 30) and one event must be conducted during a dry weather period during the wet season (October 1 –April 30), after the first wet weather event of the season, with an antecedent dry period of at least 72 hours following any storm event producing measurable rainfall of greater than 0.1 inch.

(a) For each dry weather receiving water monitoring event, the Copermittees must record field observations consistent with Table D-1 at each monitoring station.

Table D-1. Field Observations for Dry Weather Ambient Receiving Water Monitoring Stations

Field Observations
• Station identification and location. • Presence of flow, or pooled or ponded water. • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate), - Flow characteristics (i.e. presence of floatables, surface scum, or sheens, odor, color), • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, or sheens, odor, color). • Station description (i.e. deposits or stains, vegetation condition, structural condition, observable biology). • Presence and assessment of trash in and around station.

(b) If flow is present during the dry weather watershed monitoring event, and conditions allow the collection of the data, the Copermittee must monitor and record the parameters in Table D-2.

Table D-2. Field Monitoring Parameters for Receiving Water and Persistent MS4 Monitoring Stations

Parameters
• pH • Temperature • Specific conductivity • Dissolved oxygen • Turbidity

(c) Samples must be collected and analyzed as follows:

(i) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, indicator bacteria, and toxicity. Analytes that are field measured do not need to be analyzed by a laboratory.

(ii) For all other constituents, composite samples shall be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques: time-weighted composites composed of 24 discrete hourly samples, or flow-weighted composites collected over a typical 24 hour period. Only one analysis of the composite of aliquots is required.

(d) Samples shall be collected for analysis of the following parameters: TMDL or CLRP constituents in watersheds where the Copermittees are responsible parties in an adopted TMDL Implementation Plan, constituents listed as a cause of impairment on a CWA Section 303(d) listing for the receiving water body reach to which the outfall discharges, applicable NAL constituents, and constituents identified by the Copermittees as the watershed priorities in their respective WQIPs, as well as the constituents listed in Table D-3.

Table D-3. Analytical Monitoring Constituents for Receiving Water Monitoring Stations

Conventionals, Nutrients, Hydrocarbons	Metals (Total and Dissolved)	Pesticides	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity[1] • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus[1] • Orthophosphate • Nitrite[1,2] • Nitrate[1,2] • Total Kjeldahl Nitrogen • Ammonia	• Arsenic • Cadmium[1] • Chromium • Copper[1] • Iron • Lead[1] • Mercury • Nickel • Selenium • Thallium • Zinc[1]	• Organo-phosphate pesticides • Pyrethroid pesticides	•Total Coliform • Fecal Coliform[3] •*Enterococcus*

Notes:
1. Constituent with a storm water action level (SAL) specified under Provision C.2.
2. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
3. *E. Coli* may be substituted for Fecal Coliform.

(e) Dry Weather Receiving Water Toxicity Monitoring:

For each dry weather monitoring event, grab or composite samples from each monitoring station must be collected and analyzed for toxicity in accordance with Table D-4.

Table D-4. Toxicity Testing for Receiving Water Monitoring Stations

Freshwater Organism	Test Approach per Event	EPA Protocol[1]
Pimephales promelas (fathead minnow)	Wet: 1 acute Dry: 1 acute and chronic	EPA-821-R-02-012
Hyalella azteca	Wet: 1 acute Dry: 1 acute and chronic	EPA-821-R-02-012
Psuedokirchneriella subcapitata (formerly *Selenastrum capricornutum*, unicellular algae)	Wet: 1 acute Dry: 1 acute and chronic	EPA-821-R-02-013

Notes:
1. EPA protocols shall be utilized for toxicity testing unless alternate toxicity testing protocols have been approved by the San Diego Regional Water Quality Control Board. Chronic toxicity testing will also be conducted at dry weather mass loading stations unless the channel flows are diverted year-round during dry weather conditions to the sanitary sewer for treatment

(f) Receiving Water Bioassessment Monitoring:

Copermittees shall perform Bioassessment monitoring once during the permit term in accordance with the SMC Model Monitoring Program "Triad" assessment approach (SMC, 2004). Copermittees shall conduct sampling, analysis, and reporting of specified in-stream biological and habitat data according to the protocols specified in the SCCWRP Tech Report No. 539, or subsequent protocols, if developed, that have been widely-accepted as an appropriate alternative for Southern California receiving waters. Bioassessment monitoring may be conducted in conjunction with SMC Regional Monitoring and/or other dry weather receiving water monitoring. A physical assessment shall be conducted that will include details of the channel condition including channel dimensions, hydrologic and geomorphic conditions, and presence and condition of vegetation and habitat.

(4) Wet Weather Receiving Water Monitoring

During the permit term, Copermittees shall perform monitoring during three wet weather events at each of the long-term receiving water monitoring stations. Each monitoring station must be monitored during the wet season beginning October 1 and ending April 30.

(a) For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each monitoring station:

(i) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event;

(ii) The flow rates and volumes measured or estimated. Data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board;

(iii) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(iv) Presence and assessment of trash in and around station.

(b) For each wet weather receiving water monitoring event, the parameters in Table D-2 must be monitored and recorded in the field.

(c) Samples must be collected and analyzed as follows:

(i) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, indicator bacteria, and toxicity. Analytes that are field measured do not need to be analyzed by a laboratory.

(ii) For all other constituents, composite samples shall be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques: time-weighted composites composed of 24 discrete hourly samples, or flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter. Only one analysis of the composite of aliquots is required.

(iii) Copermittees should implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods.

(d) Samples shall be collected for analysis of the following parameters: TMDL or CLRP constituents in watersheds where the Copermittees are responsible parties in an adopted TMDL Implementation Plan, constituents listed as a cause of impairment on a CWA Section 303(d) listing for the receiving water body reach to which the outfall discharges,

applicable SAL constituents, and constituents identified by the Copermittees as the watershed priorities in their respective WQIPs, as well as the constituents listed in Table D-3.

(e) Wet Weather Receiving Water Toxicity Monitoring

Grab samples or composites from each monitoring station must be collected and analyzed for toxicity in accordance with Table D-4.

i. OTHER RECEIVING WATER MONITORING, POST-WQIP ADOPTION

After adoption of the WQIPs, the Copermittees shall conduct monitoring based on the approved WQIPs, in addition to long-term receiving water monitoring as described in Provision D.1.h, to include constituents identified by the Copermittees as the watershed priorities in their respective WQIPs. Nothing in this Provision is intended to prevent Copermittee collection of additional receiving water data, as necessary, to support and implement respective WQIPs. This monitoring shall include, at minimum, integration of the following receiving water requirements within the WQIPs, as appropriate for specific watersheds:

(a) Participation in SMC Regional Monitoring Program, where applicable

(b) Sediment Quality Monitoring in applicable estuaries

(c) Hydromodification Management Plan (HMP) Monitoring as applicable

(d) TMDL Monitoring where implementation plans have been approved and are under implementation, and

(e) ASBS Special Protections Monitoring, where applicable.

j. RECEIVING WATER MONITORING REPORTING

The Copermittees shall report on the progress of the receiving water monitoring and the results or findings of such monitoring, when completed, in the Annual Report pursuant to Provision F.3.b.

2. MS4 Outfall Discharge Monitoring

Discharge monitoring shall involve both Non-Storm Water (Dry Weather) and Storm Water (Wet Weather) components. The Copermittees shall perform monitoring, as necessary, to identify non-storm water discharges and illegal connections/illicit discharges (IC/IDs) pursuant to Provision E.2 of this Order. To accomplish this, the monitoring may include a variety of water quality and other monitoring techniques, including visual and other observations. Copermittees shall investigate dry weather flows and prioritize outfalls with observed flows for follow-up action as detailed below.

a. Storm Water Outfall Inventory

Management Questions: What is the relative urban runoff contribution to receiving water problem(s)? What are the sources of urban runoff that contribute to receiving water problem(s)?

- Each Copermittee shall identify all major outfalls, as defined by 40 CFR §122.26(b)(5-6), that discharge directly to named receiving waters within its jurisdiction, and geo-locate those outfalls on a map of the MS4 pursuant to Provision E.2.b of this Order. This information shall be compiled in a storm water outfall inventory, which also shall include applicable information including HSA, jurisdiction, outlet size, and approximate drainage area. Only MS4 outfalls with safe access and for which access is gained without disturbing critical habitat will be considered in the number of eligible major MS4 outfalls.

b. Non-Storm Water Transient Flow (Dry Weather) Monitoring, IDDE Investigation

Management Questions: What is the relative urban runoff contribution to receiving water problem(s)? What are the sources of urban runoff that contribute to receiving water problem(s)?

Specific Questions: Which non-storm water discharges are transient and which are persistent? Which discharges should be investigated as potential IDDEs? Which outfalls exhibit persistent dry weather flows?

The Copermittees shall perform non-storm transient flow discharge monitoring to address the above management and specific questions as follows:

(1) Each Copermittee shall prioritize the major MS4 outfalls within its jurisdiction from the list of major outfalls developed pursuant to Provision D.a., based on criteria and rationale that include potential threat to water quality.

(2) Copermittees with less than 125 major MS4 outfalls that discharge to a receiving water shall visually inspect 80% of the outfalls twice per year during dry weather.

(3) Copermittees with 125 or more but less than 250 major MS4 outfalls that discharge to a receiving water shall visually inspect a prioritized list of major MS4 outfalls that discharge to a receiving water annually. The total number of inspections per Copermittees with 125 or more but less than 250 major MS4s will be a minimum of the total number of all major MS4 outfalls locations once with annual visual inspections. Major MS4 outfalls shall be prioritized based on threat to water quality and will consider factors such as:

- Assessment of connectivity of the discharge to a flowing receiving water
- Reported exceedances in water quality data
- Surrounding land use
- Presence of watershed priority constituents, TMDLs & CWA 303(d) list of impaired water bodies
- Flow rate

(4) Copermittees with 250 or more major MS4 outfalls that discharge to a receiving water shall visually inspect a prioritized list of major MS4 outfalls that discharge to a receiving water annually. The total number of inspections per Copermittees with 250 or greater major MS4s will be a minimum of 250 to a maximum of 500 locations with annual visual inspections. Where possible, inspections will be conducted year round. Major MS4 outfalls shall be prioritized based on threat to water quality and will consider factors such as:

- Assessment of connectivity of the discharge to a flowing receiving water
- Reported exceedances in water quality data
- Surrounding land use
- Presence of watershed priority constituents, TMDLs & CWA 303(d) list of impaired water bodies
- Flow rate

(5) Obvious illicit discharges (i.e., unusual color, unusual odor, or high flow) shall be investigated immediately pursuant to Provision E.2.

(6) An antecedent dry period of at least 72 hours following any storm event producing measurable rainfall of greater than 0.1 inch is required prior to conducting dry weather visual inspections.

(7) During a visual inspection, field personnel shall note visual and other

observations, including those provided in Table D-5 of this Order.

(a) During a visual inspection, an inspection form will be filled out documenting observations in conformance with table D-5.

(b) Inspections of major outfalls conducted pursuant to Provision E of this order, including but not limited to complaint follow-ups, may be accounted for as the visual inspection for the major outfall under this Provision.

Table D-5. Field Observations for Non-Storm Water MS4 Monitoring Stations

Field Observations
• Station identification and location. • Presence of flow, or pooled or ponded water from the outfall. • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate), - Flow characteristics (i.e. presence of floatables, surface scum, or sheens, odor, color), - Flow source(s) suspected or identified from non-storm water source investigation, and - Flow source(s) eliminated during non-storm water source identification. • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, or sheens, odor, color), and - Known or suspected source(s) of pooled or ponded water. • Station description (i.e. deposits or stains, vegetation condition, structural condition, observable biology). • Presence and assessment of trash in and around station. • Evidence or signs of illicit connections or illegal dumping.

(8) Evidence of obvious illegal discharges, such as obvious odor, discoloration, or floating foam or scum, shall be followed up immediately.

(9) The field observations shall be evaluated together with existing information available from prior inspections and prior monitoring results to determine whether the non-storm water (dry weather) discharge flow is likely to be transient or persistent[12].

[12] Persistent flow, as modified from the SMC Model Monitoring Program definition of persistent WQO exceedance, is defined as "the presence of flow, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch of precipitation during three consecutive monitoring and/or inspection events". All other flow is considered transient.

(a) If the flow is deemed to be transient, observations shall be used to conduct IDD E investigations where warranted pursuant to Provision E.2.

(b) If the nature and source of the observed flow is already known, this shall be noted on the field log, including whether the observed flow results from a non-storm water discharge conditionally allowed per Provision E.2.a.

(10) Where the non-storm water (dry weather) discharge flow is deemed to be persistent in Provision D.2.a.(8), the outfall shall be referred to the characterization and prioritization process described in Provision D.2.c. .

(11) The framework developed in the transitional monitoring program shall be used as a basis to design a continuing IDDE monitoring program as part of the Monitoring and Assessment Program in each WQIP.

c. NON-STORM WATER PERSISTENT FLOW (DRY WEATHER) OUTFALL MONITORING

Management Questions: What is the relative urban runoff contribution to receiving water problem(s)? What are the sources of urban runoff that contribute to receiving water problem(s)?

Specific Questions: Which outfalls exhibit persistent dry weather flows? Do discharge concentrations at MS4 outfalls meet applicable permit action levels? Which MS4 outfalls impact receiving water quality during dry weather?

The Copermittees shall perform non-storm water persistent flow discharge monitoring to address the above-listed management and specific questions as follows:

(1) Based upon the results of the investigation conducted pursuant to Provision D.2.b., each Copermittee shall add to the storm water outfall inventory compiled pursuant to Provision D.2.a., a classification of whether the outfall produces persistent discharge flow, transient flow, or no dry weather flow. The inventory shall provide notations on the basis for that classification; the classification may be based on historical data and/or contemporary observations, including information generated per Provision D.2.b..

(2) The Copermittees shall prioritize the outfalls identified as having persistent dry weather in the stormwater outfall inventory, pursuant to Provision D.2.c.(1). Historical data may be used to assist prioritization, where available. The prioritization shall be prepared based on criteria to be developed by the Copermittees, and a brief rationale for the prioritization shall be provided to accompany the map.

(3) Based on the prioritization of major outfalls developed under Provision

D.2.c.(2), the Copermittees shall identify, at minimum, a number of major outfalls to monitor within each watershed management area equivalent to the number of urbanized HSAs within the WMA.. The selected outfalls shall be listed by urbanized HSA and indicated on the map prepared pursuant to Provision D.2.a..

(4) The Copermittees shall monitor each major outfall identified in Provision D.2.c.(3) two times annually under dry weather conditions until one of the following occurs, at which point the outfall may be removed from the list:

(a) Flows are reduced to near-zero for three consecutive visits, or

(b) The source(s) of flows are determined to be derived from a non-storm water discharge source conditionally allowed per Provision E.2.a, or

(c) The source of the discharge is determined to be covered by a separate NPDES permit.

(d) The Copermittees shall document any such removal of sites from the outfall monitoring list in their annual report. Outfalls so removed must be replaced with then next highest prioritized MS4 outfall in the WMA per Provision D.2.c.(3), unless there are no remaining qualifying outfalls within the urbanized HSAs of the WMA.

(e) Where these criteria are not met but the threat to water quality is reduced, the outfall may be prioritized accordingly for continued follow up activity.

(5) During each semi-annual visit, the Copermittee must record field observations consistent with Table D-5 at each non-storm water MS4 monitoring station within its jurisdiction.

(6) Prior to WQIP approval, each semi-annual visit in which measurable flow is present from an outfall listed under Provision D.2.c.(3) must include the following:

(a) Grab samples shall be collected for analysis for the constituents listed in Table D-6, unless the Copermittee has historical data that can demonstrate or provide justification that the analysis of the constituent is not necessary.

Table D-6. Analytical Monitoring Constituents for Non-Storm Water MS4 Monitoring Stations

Conventionals, Nutrients, Hydrocarbons	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Total Phosphorus • Ortho-phosphate • Nitrite[1] • Nitrate[1] • Total Kjeldahl Nitrogen • Ammonia as N • Chlorine	• Cadmium • Copper • Lead • Zinc	•Total Coliform • Fecal Coliform[2] •*Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(b) Field measurements shall be collected for the parameters listed in Table D-2.

(c) If the Copermittee identifies and eliminates the source of non-storm water discharge, analysis of the sample is not required.

(7) As part of the WQIP, Copermittees must develop a program to characterize the persistent non-storm water discharges and pollutant loads from the Copermittee's major MS4 outfalls. As part of the development of the Monitoring and Assessment Program for each WMA, the number and selection of outfalls shall be re-evaluated and determined anew for each WMA, along with the appropriate monitoring frequency and methods.

(8) After WQIP approval, each visit in which measurable flow is present from an outfall listed under Provision D.2.c.(3), as modified by approved changes pursuant to Provision D.2.c.(7) must include the following:

(a) Samples shall be collected for analysis of the following parameters:

(i) Constituents identified by the Copermittees as highest watershed priorities,

(ii) TMDL constituents in watersheds where the Copermittees are responsible parties in an effective TMDL Implementation Plan for the receiving water body reach to which the outfall discharges,

(iii) Constituents listed as a cause of impairment on a CWA Section

303(d) listing for the receiving water body reach to which the outfall discharges, and

(iv) Applicable NAL constituents.

(b) Field measurements shall be collected for the parameters listed in Table D-2.

(9) Annually, the Copermittees shall evaluate the data produced by the persistent flow outfall monitoring and inspections, rank the outfalls according to potential threat to receiving water quality, and produce a prioritized list of major outfalls for follow-up action. The prioritized list shall be used to update the WQIP, with the goal of reducing flows and/or loads in order of the ranked priority list through targeted programmatic actions and source investigations.

d. STORM WATER (WET WEATHER) OUTFALL MONITORING

Management Questions: What is the relative urban runoff contribution to receiving water problem(s)? What are the sources of urban runoff that contribute to receiving water problem(s)?

Specific Questions: Which MS4 outfalls impact receiving water quality during wet weather? Do discharge concentrations at MS4 outfalls meet applicable permit action levels? How do representative MS4 outlet discharge concentrations, loads, and flows change over time?

The Copermittees shall perform storm water discharge monitoring to address the above-listed management and specific questions as follows:

(1) Prior to adoption of the WQIPs, the San Diego Copermittees shall continue the MS4 outfall monitoring program implemented under Order No. R9-2007-0001 per RWQCB approved plan through its planned completion to continue to obtain data from a representative cross-section of discharges.

(2) Prior to adoption of the WQIPs, the San Diego Copermittees shall perform storm water discharge monitoring based on representative outfalls to address the above-listed management questions as follows:

(a) The Copermittees shall select, at minimum, three monitoring stations at representative major MS4 outfalls with homogenous land use types and/or typical mixed-use drainage areas per WMA from the map developed pursuant to Provision D.2.a. Historical data may be used to assist site selection, where available. These outfalls shall be geo-located on a map showing the urban hydrologic sub-areas (HSAs), land use drainage areas, and jurisdictional boundaries within the permitted area.

(b) Each selected monitoring station must be monitored twice during the wet season, beginning October 1 and ending April 30.

(c) For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each monitoring station:

(i) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event;

(ii) The flow rates and volumes measured or estimated. Data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board;

(d) For each wet weather monitoring event, the parameters in Table D-2 must be monitored and recorded in the field. Samples shall be collected for analysis of parameters listed in Table D-7, according to the following methods:

(i) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, and indicator bacteria. Analytes that are field measured do not need to be analyzed by a laboratory.

(ii) For all other constituents, composite samples shall be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

[a] Through use of automated equipment to collect time-weighted composites composed of 24 discrete hourly samples, or flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter. Only one analysis of the composite of aliquots is required.

[b] If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours. Only one analysis of the composite of aliquots is required.

(iii) Copermittees should implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods.

Table D-7. Analytical Monitoring Constituents for Wet Weather MS4 Outfall Monitoring Stations

Conventionals, Nutrients, Hydrocarbons	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity[1] • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus[1] • Orthophosphate • Nitrite[1,2] • Nitrate[1,2] • Total Kjeldahl Nitrogen • Ammonia	• Arsenic • Cadmium[1] • Chromium • Copper[1] • Iron • Lead[1] • • Nickel • Selenium • Thallium • Zinc[1]	•Total Coliform • Fecal Coliform[3] •*Enterococcus*

Notes:
1. Constituent with a storm water action level (SAL) specified under Provision C.2.
2. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
3. *E. Coli* may be substituted for Fecal Coliform.

(3) After adoption of the WQIPs, the Copermittees shall perform storm water discharge monitoring based on representative major MS4 outfalls to address the above-listed management questions, and according to the needs for outfall monitoring as defined in the monitoring and assessment sections of the WQIPs. Samples shall be collected for analysis of parameters identified by the Copermittees as watershed priorities in the WQIP. Copermittees shall consider constituents based on factors including, but not limited to:

(a) Constituents identified as the highest water quality priorities.

(b) TMDL constituents in watersheds where the Copermittees are responsible parties in an effective TMDL Implementation Plan for the receiving water body reach to which the outfall discharges,

(c) Constituents listed as a cause of impairment on a CWA Section 303(d) listing for the receiving water body reach to which the outfall discharges, and

(d) Applicable SAL constituents.

e. MS4 OUTFALL DISCHARGE MONITORING REPORTING

The Copermittees shall report on the progress of the MS4 outfall monitoring and the results or findings of such monitoring, when completed, in the Annual Report pursuant to Provision F.3.b.

3. Source/Stressor Identification

Management Question: What are the sources of urban runoff that contribute to receiving water problem(s)?

The Copermittees shall perform Source/Stressor Identification studies as needed to investigate sources of pollutants or stressors in cases where MS4 discharges are deemed to be causing or contributing to receiving water priorities, based on monitoring performed under Provisions D.1 and D.2. The results of the Stressor/Source Identification studies may be shared regionally among the Copermittees to provide information useful in improving adaptive management of urban runoff through implementation of the WQIPs.

The principal role of Source/Stressor Identification is to identify and prioritize pollutant generating activities and source categories. Identification of high-priority sources is an important step in support of the WQIP process, to help inform the development of effective pollutant reduction strategies for particular priority constituents on a watershed-specific basis.

Source identification shall be conducted on a constituent-specific basis. The source identification efforts shall focus on constituents identified as watershed priorities, and include prioritization of sources based on magnitude, controllability, and other factors. The constituent-specific source identification process shall include, at a minimum, the following steps:

- Step 1: Compile known information on the specific priority constituent. This information includes data on potential sources and movement of a particular constituent within the urban watershed. Data generated by the Copermittees and others, as well as information available from a literature research on the priority constituent shall be compiled and analyzed as appropriate.

- Step 2: Based on the compiled information generated on the priority constituent, identify data gaps, if any. Targeted studies may be planned where appropriate to fill identified data gaps; such studies would be performed as Special Studies per Provision D.4. For example, targeted studies may be performed to quantify the relative loading of a priority constituent from a particular pollutant generating activity, or to improve understanding of the fate of a constituent in the environment.

- Step 3: Based on the information compiled, develop an inventory of sources and consider how to prioritize them within the watershed for potential follow-up action. Examples of prioritization criteria for sources include relative magnitude in discharges, geographical distribution (i.e., regional or localized), frequency of occurrence in discharges, human health risk, and controllability.

- Step 4: Develop a prioritized list of sources for the priority constituent and deliver to the Copermittee staff responsible for implementing WQIPs.

Prior to adoption of the WQIPs, the San Diego Copermittees shall continue source identification studies pertaining to compliance with TMDLs and the development of the CLRP implemented under Order No. R9-2007-0001.

Following adoption of the WQIPs, the Copermittees shall conduct source/stressor identification studies as necessary to support the WQIP watershed priorities and strategies. The plans for source/stressor ID studies must be submitted as part of the Monitoring and Assessment Programs included as part of the WQIPs required pursuant to Provision B of this Order.

The Copermittees shall report on the progress of the source/stressor ID studies and the results or findings of such studies, when completed, in the Annual Report pursuant to Provision F.3.b.

4. Special Studies

The Copermittees shall conduct Special Studies to address information needs as identified for receiving waters per monitoring performed pursuant to Provision D.1, for MS4 outfall discharges per monitoring performed pursuant to Provision D.2, and in Source/Stressor Identification studies per Provision D.3; to provide information on BMP effectiveness; and otherwise as needed to support implementation or evaluation of the WQIP strategies for the identified highest water quality priorities.

Within the permit term, two Special Studies shall be conducted within each Watershed Management Area, to address specific questions developed for each Watershed Management Area, and two regional special studies shall be conducted to answer regional questions.

a. The monitoring plans for the special studies must be submitted as part of the Monitoring and Assessment Programs included as part of the Water Quality Improvement Plans required pursuant to Provision B. The special studies must, at a minimum, be in conformance with the following criteria:

(1) The special studies must be related to water quality priorities identified by the Copermittees within the Watershed Management Area or San Diego Region, and the monitoring plans for the special studies must address specific watershed or regional questions;

(2) The special studies must be implemented within specific Watershed Management Areas or regionally within the San Diego Region;

(3) The special studies must include some form of participation by all Copermittees within the Watershed Management Area or San Diego Region, as applicable;

(4) One of the two required special studies within each Watershed Management Area may be replaced by a regional special study pursuant to D.4.a. (1) through D.4.a.(3); and

(5) A special study done pursuant to D.4.a. (1) through D.4.a.(4) that is started prior to the submittal of the WQIP, but is completed during the permit term, shall meet the requirements of a special study for a Watershed Management Area or San Diego Region, as applicable.

b. The Copermittees shall report on the progress of the special studies and the results or findings of such studies, when completed, in the Annual Report pursuant to Provision F.3.b.

Examples of special studies include:

- Enhance outreach & education by expanding residential BMP rebate programs (irrigation, rainwater harvesting and turf conversion) to multi-family housing
- Enhance outreach & education by increasing enforcement of over-irrigation regulation
- Conduct Catch Basin Inlet Cleaning Study assessment
- Implement Residential & Commercial Area Patrolling
- Implement Targeted Aggressive Street Sweeping Study
- Develop Watershed Urban Runoff Management Program Inspection Program (separate from commercial/industrial inspections, targets all businesses in specific areas)
- Conduct an investigation to improve the understanding of the linkage between groundwater and surface water hydrology and potential impacts to receiving water beneficial uses
- Conduct targeted field investigations to provide additional spatial or temporal information on the highest priority constituents or activities to inform or improve the efficiency of implementation efforts in the WMA.

The Regional Reference Stream Study is an example of a regional special study.

5. Assessment Requirements

The Copermittees must report the progress and findings of the following assessments, when available and as applicable to each WMA, as part of the Annual Report for each WMA, as required pursuant to Provision F. Assessments that occur only once per permit term, or are based on monitoring that occurs only once per permit term, shall be reported as part of the applicable Annual Report, or included within the Copermittees' Report of Waste Discharge, prior to commencement of the subsequent permit term.

a. RECEIVING WATER MONITORING

The Copermittees shall perform analysis and assessments of data and information produced per Provision D.1, addressing for each Receiving Water Monitoring element the management and specific questions as shown in Provision D.1 and below. The analysis and assessments shall relate the monitoring data compiled for each component to the conditions of affected receiving waters and status of relevant receiving water beneficial uses.

(1) SMC Regional Monitoring

Management Questions: Are conditions in receiving waters protective, or likely to be protective, of beneficial uses? What is the extent and magnitude of the current or potential receiving water problems?

The Copermittees shall incorporate results of the SMC Regional Monitoring Program, when available, into the analysis and assessments conducted as part of WQIP planning and implementation. The SMC Program is designed to provide a representative sampling of receiving water quality in coastal rivers and streams in the region's watersheds, based on a probabilistic design for characterization of coastal watersheds, using bioassessment metrics and related analyses. The analysis and assessments of the data shall relate the SMC monitoring data to the condition of receiving waters and status of receiving water beneficial uses.

(2) Bight Regional Monitoring

Management Questions: Are conditions in receiving waters protective, or likely to be protective, of beneficial uses? What is the extent and magnitude of the current or potential receiving water problems?

The Copermittees shall incorporate results of the Bight Regional Monitoring Program, when available, into the analysis and assessments conducted as part of WQIP planning and implementation. The Bight regional monitoring effort involves detailed characterization of coastal and offshore receiving waters, as well as targeted special studies. The analysis and assessments of the data shall relate the Bight monitoring data to the condition of receiving waters and status of receiving water beneficial uses.

(3) Sediment Quality

Management Questions: Are conditions in receiving waters protective, or likely to be protective, of beneficial uses? What is the extent and magnitude of the current or potential receiving water problems?

Specific Question: What is the condition of sediments in enclosed bays and estuaries with respect to the statewide sediment quality objectives?

The Copermittees shall incorporate results of the sediment quality monitoring of bay and estuarine sediments, when available, into the analysis and assessments conducted as part of WQIP planning and implementation. The analysis and assessments of the data shall relate sediment quality data to the condition of receiving waters and status of receiving water beneficial uses.

The analysis of sediment quality data also shall conform to the requirements of the Statewide Sediment Quality Objectives regulatory program, per State Water Resources Control Board Resolution No. 2008-0070 – Adoption of a Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality. The Copermittees shall include the results of this analysis, when available and as applicable to each WMA, in the Annual Report pursuant to Provision F.3.b.

(4) Hydromodification Management Plan (HMP) Monitoring

Management Questions: Are conditions in receiving waters protective, or likely to be protective, of beneficial uses? What is the extent and magnitude of the current or potential receiving water problems?

The Copermittees shall incorporate results of the receiving water monitoring required per their Hydromodification Management Monitoring Plans, as approved by the California Regional Water Quality Control Board, San Diego Region, when available, into the analysis and assessments conducted as part of WQIP planning and implementation. The analysis and assessments of the data shall relate HMP monitoring data to the condition of receiving waters and status of receiving water beneficial uses. The Copermittees shall include the results of this analysis, when available and as applicable to each WMA, in the Annual Report pursuant to Provision F.3.b.

(5) TMDL Monitoring

Management Questions: Are conditions in receiving waters protective, or likely to be protective, of beneficial uses? Are conditions in receiving waters getting better or worse?

Specific question: What is the progress in achieving and complying with

adopted TMDL targets?

The Copermittees shall incorporate results of TMDL monitoring, when available, into the analysis and assessments conducted as part of WQIP planning and implementation. The analysis and assessments of the TMDL monitoring data shall be integrated with other receiving water data in assessments of the condition of receiving waters and status of receiving water beneficial uses.

The Copermittees shall annually evaluate receiving water data produced per Provision D.1.e. to determine whether TMDL targets are being met, for applicable receiving waters as specified in adopted TMDLs and include the results of this evaluation, when available and as applicable to each WMA, in the Annual Report pursuant to Provision F.3.b.

The analysis of TMDL monitoring data also shall conform to the requirements of the adopted TMDLs and associated Implementation Plans, to demonstrate compliance with the applicable terms of adopted TMDLs and Implementation Plans.

(6) ASBS Special Protections Monitoring

Management Questions: Are conditions in receiving waters protective, or likely to be protective, of beneficial uses? Are conditions in receiving waters getting better or worse?

The Copermittees responsible for discharges to Areas of Special Biological Significance (ASBS) as regulated per the Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges, State Water Resources Control Board Resolution No. 2012-0012, shall incorporate results of ASBS monitoring, when available, into the analysis and assessments conducted as part of WQIP planning and implementation. The analysis and assessments of the ASBS monitoring data shall be integrated with other receiving water data in assessments of the condition of receiving waters and status of receiving water beneficial uses.

The Copermittees for whom ASBS monitoring is required under the terms of the adopted ASBS Special Protections shall evaluate the data as required per State Water Resources Control Board Resolution No. 2012-0012, and include the results of this evaluation, when available and as applicable to each WMA, in the Annual Report pursuant to Provision F.3.b.

(7) Long-Term Receiving Water Monitoring

Management Question: Are conditions in receiving waters getting better or

worse?

The Copermittees shall incorporate the results of the Long-Term Receiving Water Monitoring into the analysis and assessments conducted as part of the adaptive management process. The analysis and assessments of the Long-Term monitoring data shall be integrated with other receiving water data in assessments of the condition of receiving waters and status of receiving water beneficial uses.

The Copermittees shall evaluate the data produced by the receiving water monitoring pursuant to Provision D.1.g, and incorporate new receiving water data into time series plots for each long-term monitoring constituent, for each WMA. Once per permit term the Copermittee shall perform statistical trends analysis on the cumulative long-term receiving water data set.

(8) Integrated Receiving Water Assessment

Management Questions: Are conditions in receiving waters protective, or likely to be protective, of beneficial uses? What is the extent and magnitude of the current or potential receiving water problems? Are conditions in receiving waters getting better or worse?

Once during the permit term, for each watershed management area, the Copermittees shall integrate the analyses and assessments of the results of the SMC Regional Monitoring Program, Bight Regional Monitoring Program, Sediment Quality monitoring, HMP Monitoring, TMDL monitoring, ASBS monitoring, and Long-term receiving water monitoring, as performed per Provisions D.5.a.(1)-D.5.a.(7), as well as other data as available and applicable, to assess the condition of receiving waters and status of receiving water beneficial uses, and identify data or information gaps. The integrated assessment shall include, as appropriate to address any identified data gaps, recommendations for additional monitoring as may be required to adequately characterize conditions in receiving waters, or where special studies may be needed to address specific information needs.

b. MS4 OUTFALL DISCHARGE MONITORING

The Copermittees shall perform analysis and assessments of data and information produced per Provision D.2, addressing the management and specific questions as shown in Provision D.2 and below. The Copermittees shall include the results of this analysis, when available and as applicable to each WMA, in the Annual Report pursuant to Provision F.3.b.

(1) <u>Transient Non-Storm Water (Dry Weather) Monitoring, IC/ID Investigation</u>

Management Questions: What is the relative urban runoff contribution to

receiving water problem(s)? What are the sources of urban runoff that contribute to receiving water problem(s)?

Specific Questions: Which non-storm water discharges are transient and which are persistent? Which discharges should be investigated as potential IC/IDs? Which outfalls exhibit persistent dry weather flows?

(a) Where the presence of non-storm water (dry weather) flow is noted from an outfall during a visual inspection, field personnel shall note visual and other observations (including approximate/estimated flow rate, changes in flow rate during inspection, changes in flow rate over previous inspections, color, presence of foam or sheen, and odor) on a field log. Inspectors also shall note where there is evidence of past flow and record pertinent observations at all sites visited.

(b) The field observations shall be evaluated together with existing information available from prior inspections and prior monitoring results to determine whether the non-storm water (dry weather) discharge flow is likely to be transient or persistent. If the flow is deemed to be transient as indicated by pooled or ponded water or other evidence of recent flow, and there is evidence of an illicit discharge such as obvious odor, discoloration, foam or scum, the observations shall be used to conduct IC/ID investigations pursuant to Provision E.2. If the nature and source of the observed flow is already known, this shall be noted on the field log, including whether the observed flow results from a non-storm water discharge conditionally allowed per Provision E.2.a.

(c) Where the non-storm water (dry weather) discharge flow is deemed to be persistent in Provision D.2.b.(9), the outfall shall be referred to the characterization and prioritization process described in Provision D.2.c.

(2) <u>Persistent Non-Storm Water (Dry Weather) Outfall Monitoring</u>

Management Questions: What is the relative urban runoff contribution to receiving water problem(s)? What are the sources of urban runoff that contribute to receiving water problem(s)?

Specific Questions: Which outfalls exhibit persistent dry weather flows? Do discharge concentrations at MS4 outfalls meet applicable permit action levels? Which MS4 outfalls impact receiving water quality during dry weather?

(a) Identification and Prioritization of Outfalls with Persistent Flow

Annually, the Copermittees shall evaluate the data produced by the dry weather outfall monitoring pursuant to Provision D.2.c., rank the outfalls according to potential threat to receiving water quality, and produce a

prioritized list of outfalls for follow-up action. The Copermittees must analyze the non-storm water monitoring data collected pursuant to Provision D.2.c. and consider NAL exceedances in prioritizing outfalls. The prioritized list shall be provided in the Annual Report for each WMA pursuant to Provision F.3.b. The prioritized list shall be used to update the WQIPs with the goal of reducing flows/ loads in order of the ranked priority list, through targeted programmatic actions and source investigations.

(b) Evaluate Potential Impacts to Receiving Waters from Persistent Non-Storm Water Outfall Flows

Annually, the Copermittees shall evaluate the data produced by the dry weather outfall monitoring pursuant to Provision D.2.c., and compare the outfall monitoring data to relevant receiving water quality data, to identify outfalls that may cause or contribute to receiving water quality problems.

(c) Calculate Loadings to Receiving Waters from Persistent Non-Storm Water Outfall Flows

Annually, the Copermittees shall estimate discharge loadings from the data produced by the dry weather outfall monitoring pursuant to Provision D.2.c., and rank the monitored outfalls in order from highest to lowest loading, to identify outfalls that may cause or contribute to receiving water quality problems. As part of this annual estimation, the Copermittees shall identify areas where program implementation is thought to have resulted in reductions or elimination of loads from MS4 outfalls.

(d) The Copermittees in each Watershed Management Area must review the non-storm water flow and pollutant load analyses required pursuant to Provision D.4.b.(2)(d) on an annual basis to:

(i) Identify the pollutant load reductions that are thought to be attributable to water quality management actions within the high priority outfall drainage areas

(ii) Assess the effectiveness of the water quality improvement strategies being implemented within the Watershed Management Area toward reducing or eliminating non-storm water discharges and pollutant loads discharging from the MS4 to receiving waters; and

(iii) Identify modifications necessary to increase the effectiveness of the water quality improvement strategies toward reducing or eliminating non-storm water discharges and pollutant loads discharging from the MS4 to receiving waters.

(3) Storm Water (Wet Weather) Outfall Monitoring

Management Questions: What is the relative urban runoff contribution to receiving water problem(s)? What are the sources of urban runoff that contribute to receiving water problem(s)?

Specific Questions: Do discharge concentrations at MS4 outfalls meet applicable permit action levels? Which MS4 outfalls impact receiving water quality during wet weather? How do representative MS4 outlet discharge concentrations, loads, and flows change over time?

(a) Comparisons of Wet Weather Outfall Quality to Storm Water Action Levels

The Copermittees shall analyze the storm water monitoring data collected pursuant to Provision D.2.c and consider SAL exceedances in prioritizing outfalls for further investigation, and assessing progress towards addressing WQIP priorities.

(b) Evaluate Potential Impacts to Receiving Waters

Annually, the Copermittees shall evaluate the data produced by the wet weather outfall monitoring pursuant to Provision D.2.c, and compare the outfall monitoring data to relevant receiving water quality data, to identify outfalls that may cause or contribute to receiving water quality problems.

(c) Calculate Loadings to Receiving Waters from Storm Water Outfall Flows

Annually, the Copermittees shall estimate discharge loadings from the data produced by the wet weather outfall monitoring pursuant to Provision D.2.c. As part of this annual estimation, the Copermittees shall identify areas where program implementation is thought to have resulted in reductions or elimination of loads from MS4 outfalls.

(d) The Copermittees in each Watershed Management Area must review the storm water flow and pollutant load analyses required pursuant to Provision D.5.b.(3)(c) on an annual basis to:

(i) Identify the pollutant load reductions that are thought to be attributable to water quality management actions within the monitored outfall drainage areas

(ii) Assess the effectiveness of the water quality improvement strategies being implemented within the Watershed Management Area toward reducing storm water pollutant loads discharging from the MS4 to receiving waters; and

(iii) Identify modifications necessary to increase the effectiveness of the water quality improvement strategies toward reducing storm water

pollutant loads discharging from the MS4 to receiving waters.

(e) Characterization of Trends Over Time

The Copermittees shall evaluate the data produced by the wet weather outfall monitoring pursuant to Provision D.2.c, and incorporate new outfall monitoring data into time series plots for each long-term monitoring constituent, for each WMA. Once per permit term the Copermittee shall perform statistical trends analysis on the cumulative long-term MS4 outfall water quality data set.

c. SOURCE IDENTIFICATION

Management Question: What are the sources of urban runoff that contribute to receiving water problem(s)?

The principal role of Source/Stressor Identification is to identify and prioritize pollutant generating activities and source categories. Identification of high-priority sources is an important step in support of the WQIP process, to help inform the development of effective pollutant reduction strategies for particular priority constituents on a watershed-specific basis.

Source identification shall be conducted on a constituent-specific basis. The source identification efforts shall focus on constituents identified as watershed priorities, and include prioritization of sources based on magnitude, controllability, and other factors.

Following WQIP approval and implementation, source identification studies shall be used to improve WQIP effectiveness. For each Watershed Management Area, the Copermittees shall perform the investigation pursuant to Provision D.3, as necessary to address identified watershed priorities, including production of a prioritized list of sources or potential sources that warrant additional investigation and/or development of control strategies through the WQIPs.

Annually, the Copermittees shall evaluate the results and findings produced by the source/stressor identification studies conducted pursuant to Provision D.3, and inform Copermittee staff responsible for WQIP implementation of the relative magnitudes and/or priority rankings of identified sources. The Copermittees shall include the results of this analysis, when available and as applicable to each WMA, in the Annual Report pursuant to Provision F.3.b.

d. SPECIAL STUDIES

Following WQIP approval and implementation, special studies shall be identified to fill data gaps and provide targeted information to improve WQIP effectiveness. Upon completion of each Special Study conducted pursuant to Provision D.4, the Copermittees shall evaluate the study results and apply the results to the implementation of WQIPs within each Watershed Management Area as applicable.

Annually, the Copermittees shall evaluate the results and findings produced by the special studies conducted pursuant to Provision D.4, and assess their relevance to the Copermittees' efforts to better characterize WMAs and receiving water conditions, to understand urban runoff pollutant sources, and to control and limit the discharges of pollutants from MS4 outfalls to the maximum extent practicable. The Copermittees shall include the results of this analysis, when available and as applicable to each WMA, in the Annual Report pursuant to Provision F.3.b.

e. INTEGRATED EVALUATION OF WATER QUALITY IMPROVEMENT STRATEGIES

Once during the permit term, for each watershed management area, the Copermittees shall integrate the analyses and results of the monitoring performed pursuant to Provisions D.1-D.4, and the results of the assessments performed pursuant to Provision D.5.a.-D.5.d, as well as other data as available and applicable, to assess: 1) progress towards achieving the numeric goals and schedules established per the approved WQIPs, 2) progress toward addressing the highest priority receiving water conditions established for each Watershed Management Area, and 3) water quality improvements that are thought to be attributable to the Copermittees' implementation of the requirements of Provision B. For Watershed Management Areas with applicable TMDLs, the integrated evaluation must incorporate the specific monitoring and assessment requirements of Attachment E. For Watershed Management Areas with any ASBS, the water quality monitoring and assessment program must also incorporate the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012. The integrated evaluation shall include the following:

(1) The conditions of receiving waters and status of receiving water beneficial uses,

(2) The extent to which MS4 discharges cause or contribute to receiving water problems during both dry weather and wet weather,

(3) The estimated reductions in loadings from MS4 discharges attributable to the Copermittees' stormwater management activities, for both dry and wet weather,

(4) The principal identified sources of pollutants that are responsible for constituents in MS4 discharges that cause or contribute to receiving water

problems,

(5) The results of the cumulative special studies and their application to improvement of the WQIPs for the Watershed Management Areas,

(6) Progress toward achieving the interim and final numeric targets for restoring impacted beneficial uses in receiving waters with adopted TMDL Implementation Plans;

(7) Any identified data or information gaps, along with recommendations for additional monitoring, special studies, or other investigations to address the data and information needs.

~~D.~~E. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS

The purpose of this provision is for each Copermittee to implement a program to control the ~~contribution~~discharge of pollutants to and ~~the discharges~~ from ~~the MS4 with~~ its respective MS4 to receiving waters within its jurisdiction. The goals of this ~~provision~~ program ~~is~~ are to: 1) effectively prohibit non-storm water discharges into the MS4s, 2) reduce pollutants in storm water discharges from the MS4s to the MEP, and 3) ~~to reduce the discharge of pollutants in storm water to the MEP and effectively prohibit non-storm water discharges to provide~~ support the attainment and the reasonable protection, preservation,~~,~~ and enhancement~~, and restoration of~~ water quality and designated beneficial uses of waters of the ~~state~~U.S**.** The~~i~~se goals will be accomplished through compliance with the jurisdictional runoff management program requirements of this Provision, and as modified or supplemented per Provision B (Water Quality Improvement Plans).

Each Copermittee must implement all the requirements of Provision E no later than ~~12~~ 18 months after the adoption of this Order, or in accordance with Provision F.5.a. Each Copermittee must update its jurisdictional runoff management program document, in accordance with Provision F.2.a, to include all the requirements of Provision E. The jurisdictional runoff management programs implemented by each Copermittee must be consistent with the Water Quality Improvement Plan for the applicable Watershed Management Area required by Provision B. Until the Copermittee has updated its jurisdictional runoff management program document with the requirements of Provision E, the Copermittee must continue implementing its current jurisdictional runoff management program.

Modification of Jurisdictional Runoff Management Program Requirements

The requirements of this section apply to each Copermittee on a jurisdiction-wide basis. Copermittees that are in multiple WMAs may implement any activity or requirement at a level different than a specified minimum within any individual WMA so long as the requirement (as specified below) is met for the jurisdiction as a whole and compliance with all other applicable permit directives is maintained jurisdictionally and within each WMA.

Upon approval of the Executive Officer, specific requirements may be reduced or waived on a jurisdictional basis only where the following conditions have been met:

- The Copermittee's proposed JRMP modifications must be submitted to the San Diego Water Board for a 30 day public review and comment period. The San Diego Water Board will issue a public notice and solicit public comments on the JRMP modification for a minimum of 30 days. Based on the comments received, the San Diego Water Board will determine whether to hold a public hearing or to limit public input to submittal of written comments. If no hearing is held the San Diego Water Board will notify the Copermittee that the JRMP modification has been approved

following its review and determination that it meets the requirements of this Order;

- On RWQCB approval, the Copermittee's JRMP must be amended per Section II.F.2.a. to incorporate the modification(s);

- Applicable portions of any WQIP to which an approved modification applies must be modified to reference or incorporate it, and the updated WQIP made available on the Regional Clearinghouse pursuant to Provision F.4.

1. Legal Authority Establishment and Enforcement

a. Each Copermittee must establish, maintain, and enforce adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 through statute, ordinance, permit, contract, order, or similar means to the extent allowable by law. This legal authority must ~~, at a minimum,~~ authorize the Copermittee to:

(1) Effectively ~~P~~prohibit and eliminate all illicit discharges and illicit connections to its MS4;

(2) Control the contribution of pollutants in discharges of runoff associated with industrial and construction activity to its MS4 and control the quality of runoff from industrial and construction sites, including industrial and construction sites ~~which~~that do not have coverage under the statewide General Permit for Discharges of Storm Water Associated with Industrial Activities (Industrial General Permit) or General Permit for Discharges of Storm Water Associated with Construction Activities (Construction General Permit~~), as well as to those sites which do not;~~);

(3) Control the discharge of spills, dumping, or disposal of materials other than storm water into its MS4;

~~(4) Control through interagency agreements among Copermittees~~Coordinate, as possible, with other agencies to minimize the contribution of ~~pollutants~~pollutant discharges from ~~one portion MS4 to another portion of~~ the ~~MS4;~~

~~(5)~~

~~(6)~~(4) ~~Control through interagency agreements with other owners of the MS4 such as Caltrans, the U.S. federal government, or sovereign Native American Tribes, where possible, the contribution of pollutants from one~~Copermittee's portion of the MS4 to ~~another portion of~~ portions of the MS4 under another agency's jurisdiction and from the other agency's portions of the MS4 to the ~~MS4~~portion of the MS4 under the Copermittee's jurisdiction;

~~(7)~~(5) Require compliance with conditions in its statutes, ordinances, permits, contracts, orders, or similar means to hold dischargers to its MS4 accountable for their contributions of pollutants and flows;

~~(8)~~(6) Require the use of BMPs to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

~~(9)~~(7) Require documentation on the effectiveness of BMPs implemented to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

~~(10)~~(8) Utilize enforcement mechanisms to require compliance with its statutes, ordinances, permits, contracts, orders, or similar means; and

~~(11)~~(9) Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with its statutes, ordinances, permits, contracts, orders, or similar means and with the requirements of this Order, including the prohibition of illicit discharges and connections to its MS4; the Copermittee must also have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from industrial facilities, including construction sites, discharging into its MS4.

b. With the first Annual Report required by Provision F.3.b, each Copermittee must submit a statement certified by its Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative that the Copermittee has taken the necessary steps to obtain and maintain full legal authority within its jurisdiction to implement and enforce each of the requirements contained in this Order.

2. Illicit Discharge Detection and Elimination

Each Copermittee must implement a program to actively detect and eliminate illicit discharges and improper disposal into the MS4, or otherwise require the discharger to apply for and obtain a separate NPDES permit. The illicit discharge detection and elimination program must include, at a minimum, the following requirements:

a. Non-Storm Water Discharges

To the extent allowable by law, ~~E~~each Copermittee must address all non-storm water discharges as illicit discharges~~,~~ where the likelihood exists that they are a source of pollutants to waters of the U.S., unless a non-storm water discharge is either identified as a discharge authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to the following requirements:

(1) Discharges of non-storm water to the MS4 from uncontaminated pumped groundwater ~~the following categories~~ must be addressed as illicit discharges where there is evidence that suggests that they are the source of pollutants to waters of the U.S., unless the discharge has coverage under NPDES Permit No. CAG919001 (Order No. R9-2007-0034, or subsequent order) for discharges to San Diego Bay, or NPDES Permit No. CAG919002 (Order No. R9-2008-0002, or subsequent order) for discharges to surface waters other than San Diego Bay:

~~(a) Uncontaminated pumped ground water;~~

~~(b) Discharges from foundation drains;~~

~~(c) Water from crawl space pumps; and~~

~~(d) Water from footing drains.~~

(2) Discharges of non-storm water from water line flushing and water main breaks to the MS4 must be addressed as illicit discharges unless the discharge has coverage under a valid NPDES Permit ~~No. CAG 679001 (~~, Order No. R9-2010-0003, or a subsequent order~~)~~. This includes water line flushing and water main break discharges from water purveyors under the Copermittee's jurisdiction that has been issued a water supply permit by the California Department of Public Health or federal military installations. Discharges from recycled or reclaimed water lines to the MS4 must be addressed as illicit discharges, unless the discharges have coverage under a separate NPDES permit.

(3) Discharges of non-storm water to the MS4 from the following categories must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a anthropogenic source of pollutants to receiving waters within the Copermittee's jurisdiction:

(a) Discharges from foundation drains;

(b) Water from crawl space pumps;

(c) Water from footing drains.

~~(a)~~(d) Diverted stream flows;

~~(b)~~(e) Rising ground waters;

~~(c)~~(f) Uncontaminated ground water infiltration to MS4s;

~~(d)~~(g) Springs;

~~(e)~~(h) Flows from riparian habitats and wetlands; and

~~(f)~~(i) Discharges from potable water sources.

(4) Discharges of non-storm water to the MS4 from the following categories must be controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means where there is evidence that those discharges are a source of pollutants to waters of the~~.~~ U.S. Discharges of non-storm water to the MS4 from the following categories not controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means must be addressed by the Copermittee as illicit discharges.

(a) Air conditioning condensation

The discharge of air conditioning condensation ~~must~~ should be directed to landscaped areas or other pervious surfaces where feasible;

(b) Individual residential vehicle washing

The discharge of wash water must be ~~directed to landscaped areas or other pervious surfaces where feasible, and~~encouraged through public outreach and education:

(i) To be directed to landscaped areas or other pervious surfaces where feasible, and

~~(i)~~(ii) To ~~M~~minimize the use of water for vehicle washing, use as little washing detergent and other vehicle wash products as possible, wash vehicles at commercial wash facilities, and implement other practices or behaviors that will prevent the discharge of pollutants associated with individual residential vehicle washing from entering the MS4; and

(c) Dechlorinated swimming pool discharges

(i) Eliminate residual chlorine, algaecide, filter backwash, or other pollutants from swimming pools prior to discharging to the MS4, and

(ii) The discharge of saline swimming pool water ~~to the MS4~~ must be directed to the sanitary sewer, landscaped areas, ~~or~~ other pervious surfaces that can accommodate the volume of water, or to the MS4 if the MS4 discharges to a saltwater receiving water.

(5) Firefighting discharges to the MS4 must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a significant source of pollutants to receiving waters. Firefighting discharges to the MS4 not identified as a significant source of pollutants to receiving waters, must be addressed, at a minimum, as follows:

(a) Non-emergency firefighting discharges

(i) Building fire suppression system maintenance discharges (e.g. sprinkler line flushing) to the MS4 must be addressed as illicit discharges where BMPs are not implemented.

(ii) Non-emergency firefighting discharges (i.e., discharges from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems) must be addressed by a program, to be developed and implemented by the Copermittee, to reduce or eliminate pollutants in such discharges from entering the MS4.

(b) Emergency firefighting discharges

Each Copermittee ~~must~~ should develop and encourage implementation of BMPs to reduce or eliminate pollutants in emergency firefighting discharges to the MS4s and receiving waters within its jurisdiction. During emergency situations, priority of efforts should be directed toward life, property, and the environment (in descending order). BMPs ~~should~~ shall not interfere with immediate emergency response operations or impact public health and safety.

(6) If the Copermittee or San Diego Water Board identifies any category of non-storm water discharges listed under Provisions E.2.a.(1)-(4) as a source of pollutants to receiving waters, the category must be prohibited through ordinance, order, or similar means and addressed as an illicit discharge.

b. Prevent and Detect Illicit Discharges And Connections

Each Copermittee must include the following measures within its program to prevent and detect illicit discharges to the MS4:

(1) Each Copermittee must maintain an updated map of its entire MS4 and the corresponding drainage areas. The accuracy of the MS4 map must be confirmed during non-storm water MS4 monitoring events. The MS4 map must be included as part of the jurisdictional runoff management program document. Any geographic information system (GIS) layers or files used by the Copermittee to maintain the MS4 map must be made available to the San Diego Water Board upon request. The MS4 map must identify the following:

(a) All segments of the MS4 owned, operated, and maintained by the Copermittee,

(b) All known locations of inlets that discharge and/or collect runoff into the Copermittee's MS4,

(c) All known locations of connections with other MS4s not owned or operated by the Copermittee (e.g. Caltrans MS4s),

(d) All known locations of MS4 outfalls as defined by 40 CFR §122.26(B)(5-6) and private outfalls as defined by 40 CFR §122.26(B)(9) that discharge runoff collected from areas within the Copermittee's jurisdiction,

(e) All segments of receiving waters within the Copermittee's jurisdiction that receive and convey runoff discharged from the Copermittee's MS4 outfalls ~~(i.e., receiving water segments that are both a receiving water and part of the MS4)~~, and

(f) Locations of the non-storm water MS4 monitoring stations, identified pursuant to Provision D.2.b, within its jurisdiction;

(2) Each Copermittee must use Copermittee personnel and contractors to assist in identifying and reporting illicit discharges and connections, if observed, during the course of their daily employment activities;

(3) Each Copermittee must promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges to or from the MS4. Each Copermittee must facilitate public reporting through development and operation of a public hotline. Public hotlines can be Copermittee-specific or shared by the Copermittees. All public hotlines must be capable of receiving reports in both English and Spanish 24 hours per day and seven days per week;

(4) Each Copermittee must implement practices and procedures (including a notification mechanism) to prevent, respond to, contain, and clean up any spills that may discharge into the MS4 within their jurisdiction from any source. The Copermittee must coordinate with spill response teams to prevent to the extent possible entry of spills into the MS4, and prevent contamination ~~of surface water, ground water, and soil~~waters of the ~~.~~U.S. The Copermittee must coordinate spill prevention, containment, and response activities throughout all appropriate Copermittee departments, programs, and agencies; ~~and~~

~~(4)~~(5) Copermittees are responsible for control of discharges to their MS4. In the event that the source of an illicit discharge or connection is from another MS4, the Copermittee shall notify and, if necessary coordinate, with the upstream MS4 to implement and/or enforce corrective actions; and

~~(5)~~(6) Each Copermittee must implement practices and procedures to prevent and limit infiltration of seepage from sanitary sewers (including private laterals and failing septic systems) to the MS4.

c. Visual Observations, Field Screening, And/or Monitoring

Each Copermittee must conduct visual observations, field screening and/or monitoring of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4 in accordance with the jurisdictional non-storm water MS4 monitoring program requirements in Provision D.2.b.

d. Investigate and Eliminate Illicit Discharges And Connections

Each Copermittee must include the following measures within its program to investigate and eliminate illicit discharges to the MS4:

(1) Each Copermittee must prioritize and determine when follow-up investigations will be performed in response to visual observations and/or water quality monitoring data collected during an investigation of a detected non-storm water or illicit discharge to or from the MS4. The criteria for follow-up investigations must include the following:

(a) Pollutants identified as causing or contributing to the highest water quality priorities identified in the Water Quality Improvement Plan;

(b) Pollutants identified as causing or contributing, or threatening to cause or contribute to impairments in water bodies on the 303(d) List and/or in environmentally sensitive areas (ESAs), located within its jurisdiction;

(c) Pollutants identified from sources or land uses known to exist within the area, drainage basin, or watershed that discharges to the portion of the MS4 within its jurisdiction included in the investigation; and

(d) Pollutants identified as causing or contributing to and exceedance of an NAL[13] where the source has not been identified as natural described in Provision C.1; and

(e) Pollutants identified as a threat to human health or the environment.

(2) Each Copermittee must implement procedures to investigate and inspect portions of its MS4 that~~,~~ based on reports or notifications, visual observations, field screening ~~and~~, monitoring, or other appropriate information, indicate a reasonable potential of ~~receiving, containing, or~~ discharging pollutants to receiving waters within the Copermittees jurisdiction due to illicit discharges, illicit connections, or other sources of non-storm water. ~~The procedures must include the following:~~

(a) The Copermittee may develop criteria to assess the validity of, and prioritize the response to, each report or notification received. Each Copermittee must respond to each report or notification (e.g., public hotline reports, staff or contractor reports and notifications, etc.) of an incident in a timely manner. ~~The Copermittee may develop criteria to assess the validity of, and prioritize the response to, each report or notification received;~~

(b) ~~Each Copermittee must immediately investigate and seek~~Procedures should address field investigations to identify sources or potential sources for the discharge, unless the source or potential source has already been

[13] NAL exceedances discovered during the course of IDDE monitoring and/or investigations may trigger action levels, including but not limited to, follow-up investigations based on the highest watershed priorities set forth and the iterative process provided in the WQIP.

identified during previous investigations. The criteria established in Provision E.d.(2)(a) shall be used to prioritize response based on highest watershed priorities as established for the iterative process and determined in the Water Quality Improvement Plan, including:

(i) Obvious illicit discharges must be immediately investigated to identify the source(s) of discharges of non-storm water where flows are observed in and from the MS4 during the field screening and monitoring required pursuant to Provision D.2.b;~~.~~

(ii) The investigation must include field investigations to identify sources or potential sources for the discharge, unless the source or potential source has already been identified during previous investigations;

(iii) The investigation may include field investigations, reviewing Copermittee inventories, and other land use data to identify potential sources of the discharge; and

~~(i)~~(iv) Procedures should address tracking of illicit discharges and connections.

~~(i)~~

~~(b) Each Copermittee must investigate and seek to identify the source(s) of non-storm water discharges from the MS4 where there is evidence of non-storm water having been discharged into or from the MS4 (e.g., pooled water). The investigation may include field investigations, reviewing Copermittee inventories, and other land use data to identify potential sources of the discharge; and~~

(3) Each Copermittee must maintain records and a database of the investigations, including the following information:

(a) Location of incident, including hydrologic subarea, portion of MS4 receiving the non-storm water or illicit discharge, and point of discharge or potential discharge from MS4 to receiving water,

(b) Source of information initiating the investigation (e.g., public hotline reports, staff or contractor reports and notifications, monitoring data, etc.),

(c) Date the information used to initiate the investigation was received,

(d) Date the investigation was initiated,

(e) Dates of follow-up investigations,

(i) Identified or suspected source of the illicit discharge or connection, if determined,

(f) Known or suspected related incidents, if any,

(g) Result of the investigation, and

(h) If a source cannot be identified and the investigation is not continued, a rationale for why a discharge does not pose a threat to water quality and/or does not require additional investigation.

(4) Each Copermittee must initiate the implementation of procedures, in a timely manner, to eliminate all detected and identified illicit discharges and connections within its jurisdiction. The procedures must include the following:

~~Each Copermittee must enforce its~~

(a) Procedures outlined by the Copermittee should address legal authority, as required under Provision E.1, to ~~eliminate~~enforce the elimination of illicit discharges and connections to ~~its~~the MS4. If the Copermittee identifies the source as a controllable source of non-storm water or illicit discharge or connection, the Copermittee must implement its Enforcement Response Plan pursuant to Provision E.6 and enforce its legal authority ~~to prohibit~~to effectively prohibit and eliminate illicit discharges and connections to its MS4~~;~~. Responses to discharges may include:

(i) If the Copermittee identifies the source of the discharge as a category of non-storm water discharges in Provision E.2.a, and the discharge ~~to or from the MS4 is~~ in exceedance of NALs developed ~~under Provision ;~~in the Water Quality Implementation Plan, then the Copermittees must determine if this is an isolated incident or set of circumstances, or if the category of discharge must be addressed through the prohibition of that category of discharge as an illicit discharge pursuant to Provision E.2.a.(6);

(ii) If the Copermittee suspects the source of the non-storm water discharge as natural in origin (i.e. non-anthropogenically influenced) and in conveyance into the MS4, then the Copermittee must ~~collect the data and evidence necessary to demonstrate to the San Diego Water Board that it is natural in origin; and~~document the rationale for why the discharge does not need further investigation. This documentation shall be included in the Annual Report.

(iii) If the Copermittee is unable to identify and document the source of a recurring non-storm water discharge to or from the MS4, then the Copermittee must address the discharge as an illicit discharge and update its jurisdictional runoff management program to address the common and suspected sources of the non-storm water discharge within its jurisdiction in accordance with the Copermittee's priorities.

(5) Each Copermittee must submit a summary of the non-storm water discharges and illicit discharges and connections investigated and eliminated within its

jurisdiction with each Annual Report required under Provision F.3.b of this Order.

3. Development Planning

Each Copermittee ~~must use~~, within ~~their land use/planning authorities to~~ its respective jurisdiction, must implement a development planning program that includes, at a minimum, the following requirements.

a. Permanent BMP Requirements for All Development Projects

Each Copermittee ~~-~~, as practical and feasible, must prescribe ~~the following~~ BMP requirements during the planning process (i.e. prior to project approval and issuance of grading or building permits) for all development projects ~~(regardless of project type or size),~~ where local permits are issued, including unpaved roads and flood management projects, except emergency projects implemented for the protection of persons and property:

(1) General Requirements

(a) All BMPs must be located so as to remove pollutants from runoff prior to its discharge to any receiving waters, and as close to the source as possible;

(b) Multiple development projects may use shared permanent BMPs as long as construction of any shared BMP is completed prior to the use or occupation of any development project from which the BMP will receive runoff; and

(c) Permanent BMPs must not be constructed within ~~a~~ waters of the U.S. ~~or waters of the state.~~

(2) Source Control BMP Requirements

Each Copermittee must require each Priority Development Project to implement applicable source control BMPs. The following source control BMPs must be implemented at all development projects where applicable and feasible:

(a) Prevention of illicit discharges into the MS4;

(b) Storm drain system stenciling or signage;

(c) Properly designed outdoor material storage areas;

(d) Properly designed outdoor work areas;

(e) Properly designed trash storage areas; and

(f) Any additional BMPs necessary to minimize pollutant generation at each project.

(3) Low Impact Development (LID) BMP Requirements

The following LID BMPs must be implemented at all development projects where applicable and feasible:

(a) Maintenance or restoration of natural storage reservoirs and drainage corridors (including topographic depressions, areas of permeable soils, natural swales, and ephemeral and intermittent streams);[14]

(b) Buffer zones for natural water bodies (where buffer zones are technically infeasible, require project applicant to include other buffers such as trees, access restrictions, etc.);

(c) Conservation of natural areas within the project footprint including existing trees, other vegetation, and soils;

(d) Construction of streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided public safety is not compromised;

(e) Minimization of the impervious footprint of the project;

(f) Minimization of soil compaction to landscaped areas;

(g) Disconnection of impervious surfaces through distributed pervious areas;

(h) Landscaped or other pervious areas designed and constructed to effectively receive and infiltrate, retain and/or treat runoff from impervious areas, prior to discharge to the MS4;

(i) Small collection strategies located at, or as close as possible to, the source (i.e. the point where storm water initially meets the ground) to minimize the transport of runoff and pollutants to receiving waters;

(j) Use of permeable materials for projects with low traffic areas and appropriate soil conditions;

(k) Landscaping with native or drought tolerant species; and

[14] Development projects proposing to dredge or fill materials in waters of the U.S. must obtain a CWA Section 401 Water Quality Certification. Projects proposing to dredge or fill waters of the State must obtain Waste Discharge Requirements.

(l) Harvesting and using precipitation.

~~(4) Long-Term Permanent BMP Maintenance~~

~~Each Copermittee must require the project applicant to submit proof of the mechanism under which ongoing long-term maintenance of all permanent BMPs will be conducted.~~

~~(5) Infiltration and Groundwater Protection~~

~~(a) Infiltration and treatment control BMPs designed to primarily function as large, centralized infiltration devices (such as large infiltration trenches and infiltration basins) must not cause or contribute to an exceedance of an applicable groundwater quality objective. At a minimum, such infiltration and treatment control BMPs must be in conformance with the design criteria listed below, unless the development project applicant demonstrates to the Copermittee that one or more of the specific design criteria listed below are not necessary to protect groundwater quality. The design criteria listed below do not apply to small infiltration systems dispersed throughout a development project.~~

~~(i) Runoff must undergo pretreatment such as sedimentation or filtration prior to infiltration;~~

~~(ii) Pollution prevention and source control BMPs must be implemented at a level appropriate to protect groundwater quality at sites where infiltration treatment control BMPs are to be used;~~

~~(iii) Infiltration treatment control BMPs must be adequately maintained to remove pollutants in storm water to the MEP;~~

~~(iv) The vertical distance from the base of any infiltration treatment control BMP to the seasonal high groundwater mark must be at least 10 feet. Where groundwater basins do not support beneficial uses, this vertical distance criteria may be reduced, provided groundwater quality is maintained;~~

~~(v) The soil through which infiltration is to occur must have physical and chemical characteristics (e.g., appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses;~~

~~(vi) Infiltration treatment control BMPs must not be used for areas of industrial or light industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee, unless first treated or filtered to remove pollutants prior to infiltration; and~~

~~(vii) Infiltration treatment control BMPs must be located a minimum of 100 feet horizontally from any water supply wells.~~

~~(b) The Copermittees may collectively or individually develop alternative mandatory design criteria to that listed above for infiltration and treatment control BMPs which are designed to primarily function as centralized infiltration devices. Before implementing the alternative design criteria in the development planning process the Copermitee(s) must:~~

~~(i) Notify the San Diego Water Board of the intent to implement the alternative design criteria submitted; and~~

~~(ii) Comply with any conditions set by the San Diego Water Board.~~

b. Priority Development Projects

(1) Definition of Priority Development Project

Priority Development Projects include the following:

(a) All new development projects that fall under the Priority Development Project categories listed under Provision E.3.b.(2). Where a new development project feature, such as a parking lot, falls into a Priority Development Project category, the entire project footprint is subject to Priority Development Project requirements; and

(b) Those redevelopment projects that create, add, or replace at least 5,000 square feet of impervious surfaces on an already developed site, ~~or~~ and the redevelopment project is a Priority Development Project category listed under Provision E.3.b.(2). Where redevelopment results in an increase of less than fifty percent of the impervious surfaces of a previously existing development, and the existing development was not subject to Priority Development Project requirements, the performance and sizing requirements discussed in Provisions E.3.c.(2) and E.3.c.(3) apply only to the addition or replacement, and not to the entire development. Where redevelopment results in an increase of more than fifty percent of the impervious surfaces of a previously existing development and was not subject to previous Priority Project Development requirements, the performance and sizing requirements apply to the entire development.

(c) Projects where redevelopment results in an increase of more than fifty percent of impervious surfaces of a previously existing development, and the existing development was subject to previous Priority Project Development requirements, only the altered portion of development is subject to the Priority Development Project requirements in this Order.

(2) Priority Development Project Categories

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This category includes commercial, industrial, residential, mixed-use, and public development projects on public or private land which fall under the planning and building authority of the Copermittee.

(b) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

(c) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812), where the land area for development is 5,000 square feet or more~~.~~ of impervious surface.

(d) Hillside development projects. This category includes any development which creates 5,000 square feet or more of impervious surface which is located in an area with known erosive soil conditions, where the development will grade on any natural slope that is twenty-five percent or greater.

(e) Environmentally sensitive areas (ESAs). This category includes any development located within, directly adjacent to, or discharging directly to an ESA, which either creates 2,500 square feet of impervious surface on a proposed project site or increases the area of imperviousness of a proposed project site to 10 percent or more of its naturally occurring condition. "Directly adjacent to" means situated within 200 feet of the ESA. "Discharging directly to" means outflow from a drainage conveyance system that collects runoff from the subject development or redevelopment site ~~and~~ which terminates at or in receiving waters within the ESA and is not comingled with flows from adjacent lands.

(f) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce that has 5,000 square feet or more of impervious surface.

(g) Streets, roads, highways, and freeways~~, and residential driveways~~. This category is defined as any paved impervious surface that is 5,000 square feet or more used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

(h) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more of impervious surface or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

(i) Large development projects. This category includes any post-construction pollutant-generating new development projects that result in the disturbance of one acre or more of land.

(3) Priority Development Project Exemptions

Each Copermittee has the discretion to exempt the following projects from being defined as Priority Development Projects:

(a) Sidewalks constructed as part of new streets or roads and designed to direct storm water runoff to adjacent vegetated areas;

(b) Bicycle lanes that are constructed as part of new streets or roads but are not hydraulically connected to the new streets or roads and designed to direct storm water runoff to adjacent vegetated areas;

(c) Impervious trails and driveways constructed and designed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas;

(d) Sidewalks, bicycle lanes, driveways, parking lots, or trails constructed with permeable surfaces.

(e) Single-family residential projects that are not part of a larger development or proposed subdivision and implement BMPs that meet minimum performance standards, as outlined in the BMP Design Manual.[15]

(f) Any paved impervious surface that is 5,000 square feet or more used for the transportation of automobiles, trucks, motorcycles, and other vehicles that follows the USEPA guidance regarding Management Wet Weather with Green Infrastructure: Green Streets[16] to the MEP.

[15] The BMP Design Manual was formerly known as the Standard Urban Storm Water Mitigation Plan under Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016.
[16] http://water.epa.gov/infrastructure/greeninfrastructure/index.cfm

c. Priority Development Project ~~Permanent~~ Structural BMP Performance and Sizing Requirements

In addition to the BMP requirements listed for all development projects under Provision E.3.a, Priority Development Projects must also implement ~~permanent~~ structural BMPs that conform to performance and sizing requirements.

~~(1) Source Control BMP Requirements~~

~~Each Copermittee must require each Priority Development Project to implement applicable source control BMPs listed under Provision E.3.a.(2).~~

(1) Retention and Treatment Control BMP Requirements

Each Copermittee must require each Priority Development Project to implement BMPs to retain and treat pollutants onsite in the following order:

(a) Each Priority Development Project must be required to implement LID BMPs as described in Provision E.3.a.(3); and~~.~~

(b) Each Priority Development Project must be required to implement LID BMPs that are sized and designed to retain the difference in volume ~~equivalent to~~between the runoff volume produced in the post-development condition as compared to the pre-development runoff condition resulting from a 24-hour 85th percentile storm event[17] ("design capture volume[18]"); or

(c) If onsite retention of the design capture volume using LID BMPs is technically infeasible per Provision E.3.c.(4), flow-thru LID and/or conventional treatment control BMPs must be implemented to provide equal pollutant removal for ~~treat~~ the portion of the design capture volume that is not retained onsite. Flow-thru LID treatment control BMPs must be designed for an appropriate surface loading rate to prevent erosion, scour and channeling within the BMP; or~~.~~

~~(c)~~(d) If retention and/or equivalent pollutant removal of the design capture volume to meet E.3.c.(2)(a) or E.3.c.(2)(b) are infeasible

[17] This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals.

[18] Design capture volume is a single event based volume occurring after an extended dry period.

onsite~~Additionally~~, project applicants must perform mitigation for the portion of the pollutant load in the design capture volume that is not retained or equally treated onsite, as described in Provision E.3.c.(54)(c).

~~(d)~~(e) All onsite treatment control BMPs must:

(i) Be correctly sized and designed so as to remove pollutants from storm water to the MEP;

(ii) Be sized to comply with the following numeric sizing criteria:

[a] Volume-based treatment control BMPs must be designed to mitigate (infiltrate, filter, or treat) the remaining portion of the design capture volume that was not retained onsite; or

[b] Flow-based treatment control BMPs must be designed to mitigate (filter or treat) either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event; or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two.

(iii) Be ranked with high or medium pollutant removal efficiency for the project's most significant pollutants of concern. Treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

(2) Hydromodification Management BMP Requirements

Each Copermittee must require each Priority Development ~~Project~~Project disturbing greater than one acre to implement hydromodification management BMPs, ~~so that:~~as described in the Copermittees current HMP, as applicable.

(a) Post-project runoff flow rates and durations do not exceed pre-development ~~(naturally occurring)~~ runoff flow rates and durations by more than 10 percent (for the range of flows that result in increased potential for erosion or degraded channel conditions downstream of Priority Development Projects).

(i) In evaluating the range of flows that results in increased potential for erosion of natural (non-hardened) channels, the lower boundary must correspond with the critical channel flow that produces the

critical shear stress that initiates channel bed movement or that erodes the toe of channel banks.

(ii) For artificially hardened channels, analysis to identify the lower boundary must use characteristics of a natural stream segment similar to that found in the watershed. The lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or erodes the toe of the channel banks.

~~(i)~~(iii) The Copermittees may use monitoring results pursuant to Provision D.5.a.(4) to re-define the range of flows resulting in increased potential for erosion or degraded channel conditions, as warranted by the data.

(b) Projects shall preserve (where feasible) or provide compensation for significant losses of sediment supply anticipated as a result of development. ~~Post-project runoff flow rates and durations must compensate for the loss of sediment supply due to the development project, should loss of sediment supply occur as a result of the development project.~~

(c) If hydromodification management BMPs are technically infeasible per Provision E.3.c.(5~~4~~), project applicants must perform mitigation for the portion of the runoff volume that is not controlled and will cause or contribute to increased potential for erosion of receiving waters downstream of the Priority Development Project, as described in Provision E.3.c.(5~~4~~)(c).

(d) Exemptions

Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP requirements where the project:

(i) Discharges storm water runoff into underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;

(ii) Discharges storm water runoff into conveyance channels whose bed and bank are stabilized (e.g. concrete lined, ~~-~~an engineered interlocking paver, gabion system etc…) all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; or

(iii) Discharges storm water runoff into other areas identified by the San Diego Water Board as exempt from the requirements of Provisions E.3.c.(3) ~~.~~.

(3) Long-Term Structural BMP Maintenance

Each Copermittee must require the project applicant to submit proof of the mechanism under which ongoing long-term maintenance of all structural BMPs will be conducted.

(4) Infiltration and Groundwater Protection

(a) Infiltration and treatment control BMPs designed to primarily function as large, centralized infiltration devices (such as large infiltration trenches and infiltration basins) must not cause or contribute to an exceedance of an applicable groundwater quality objective. At a minimum, such infiltration and treatment control BMPs must be in conformance with the design criteria listed below, unless the development project applicant demonstrates to the Copermittee that one or more of the specific design criteria listed below are not necessary to protect groundwater quality. The design criteria listed below do not apply to small infiltration systems dispersed throughout a development project.

(i) Runoff must undergo pretreatment such as sedimentation or filtration prior to infiltration;

(ii) Pollution prevention and source control BMPs must be implemented at a level appropriate to protect groundwater quality at sites where infiltration treatment control BMPs are to be used;

(iii) Infiltration treatment control BMPs must be adequately maintained to remove pollutants in storm water to the MEP;

(iv) The vertical distance from the base of any infiltration treatment control BMP to the seasonal high groundwater mark must be at least 10 feet. Where groundwater basins do not support beneficial uses, this vertical distance criteria may be reduced, provided groundwater quality is maintained;

(v) The soil through which infiltration is to occur must have physical and chemical characteristics (e.g., appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses;

(vi) Infiltration treatment control BMPs must not be used for areas of industrial or light industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee, unless runoff does not exceed Basin Plan water quality standards or runoff is first treated or filtered to remove pollutants prior to infiltration; and

(vii) Infiltration treatment control BMPs must be located a minimum of 100 feet horizontally from any water supply wells.

(b) The Copermittees may collectively or individually develop alternative mandatory design criteria to that listed above for infiltration and treatment control BMPs which are designed to primarily function as centralized

infiltration devices. Before implementing the alternative design criteria in the development planning process the Copermittee(s) must:

(i) Notify the San Diego Water Board of the intent to implement the alternative design criteria submitted; and

(ii) Comply with any conditions set by the San Diego Water Board.

~~(3)~~(5) Alternative Compliance for Technical Infeasibility

At the discretion of each Copermittee, alternative compliance may be allowed for certain Priority Development Projects to comply with Provisions E.3.c.(1~~2~~) and E.3.c.(2~~3~~)~~,~~. Alternative compliance is an optional program for the Copermittees to utilize if it is determined to provide an equal or greater benefit than onsite compliance. Where alternative compliance is allowed, it is the sole responsibility of the project applicant to execute the alternative compliance and comply with the following requirements:~~subject to the following requirements:~~

(a) Applicability

Priority Development Projects may be allowed alternative compliance if:

(i) The Copermittee reviews and ~~approves~~ accepts site-specific hydrologic and/or design analysis performed by a registered professional engineer, geologist, architect, or landscape architect;

(ii) The project applicant demonstrates, and the Copermittee determines and documents, that ~~retention LID and/or hydromodification management~~ BMPs per Provisions E.3.c.(1~~2~~) and E.3.c.(2~~3~~) were incorporated into the project design to the maximum extent technically feasible given the project site conditions;

(iii) The project applicant is required to perform mitigation described in Provision E.3.c.(5~~4~~)(c)~~(c)~~ with a net result of at least the same level of water quality protection as would have been achieved if the Priority Development Project had fully implemented the ~~retention LID and hydromodification management~~ BMP requirements under Provisions E.3.c.(1~~2~~) and E.3.c.(2~~3~~) onsite.

(b) Criteria For Technical Infeasibility

Each Copermittee must develop, or develop in collaboration with the other Copermittees, criteria to determine technical infeasibility for fully implementing the ~~retention LID and hydromodification management~~ BMP requirements under Provisions E.3.c.(~~2~~1) and E.3.c.(2~~3~~) and include these requirements in the ~~Permanent~~ BMP ~~Sizing Criteria~~ Design Manual pursuant to Provision E.3.d. Technical infeasibility may result from conditions including, but not limited to:

(i) Locations that cannot meet the infiltration and groundwater protection requirements in Provision E.3.c~~a~~.(4~~5~~) due to the presence of shallow bedrock, contaminated soils, near surface groundwater, underground facilities, or utilities;

(ii) Brownfield development sites or other locations where pollutant mobilization is a documented concern;

(iii) The design of the site precludes the use of soil amendments, plantings of vegetation, or other designs that can be used to infiltrate and evapotranspirate runoff;

(iv) Soils cannot be sufficiently amended to provide for the requisite infiltration rates;

(v) Locations with geotechnical hazards;

(vi) Insufficient onsite and/or offsite demand for storm water use;

(vii) Modifications to an existing building to manage storm water are not feasible due to structural or plumbing constraints;

~~(vii)~~(viii) HMP flow rate requirements that result in BMP orifice sizes too small for efficient maintenance; and

~~(viii)~~(ix) Smart growth and infill or redevelopment locations where the density and/or nature of the project would create significant difficulty for compliance with Provisions E.3.c.(2) and E.3.c.(3) onsite.

(c) Mitigation

Priority Development Projects that meet the Copermittee's technical infeasibility criteria developed pursuant to Provision E.3.c.(5~~4~~)(b)~~(b)~~ must be required to mitigate for the increased flow rates, increased flow durations, and/or ~~increased pollutant loads~~water quality equivalence expected to be discharged from the site.

(i) The Project applicant must perform offsite mitigation for:

[a] The portion of the pollutant load in the design capture volume that is not retained or equally treated onsite, and/or

[b] The portion of the increased potential erosion of downstream receiving waters not fully controlled with hydromodification management BMPs onsite.

~~For the pollutant load in the volume of storm water not retained onsite with retention LID BMPs, or increased potential erosion of downstream receiving waters not fully controlled onsite with hydromodification management BMPs, the Copermittee must require the project applicant to either 1) implement an offsite mitigation project, and/or 2) provide sufficient funding for a public or private offsite mitigation project via a mitigation fund.~~

~~(i)~~(ii) Mitigation Project Locations

Offsite mitigation projects must be implemented within the same ~~hydrologic unit~~Watershed Management Area as the Priority Development Project, and preferably within the same hydrologic subarea. Mitigation projects outside of the hydrologic subarea but within the same ~~hydrologic unit~~Watershed Management Area may be approved provided that the project applicant demonstrates that mitigation projects within the same hydrologic subarea are infeasible and that the mitigation project will address similar potential impacts expected from the Priority Development Project.

~~(ii)~~(iii) Mitigation Project Types

Offsite mitigation projects ~~must~~ may include, where applicable and feasible, retrofitting opportunities and stream and/or habitat rehabilitation or restoration opportunities identified in the Water Quality Improvement Plans, identified pursuant to Provision B.3.. Other offsite mitigation projects may include green streets or infrastructure projects, groundwater recharge projects, or regional BMPs upstream of receiving waters. Mitigation credit will not be given to portions of in stream mitigation projects using impervious~~In-stream rehabilitation or restoration measures to protect or prevent adverse physical changes to creek bed and banks must not include the use of non-naturally occurring~~ hardscape materials such as concrete~~, riprap, or gabions~~. Project applicants seeking to utilize these alternative compliance provisions may propose other offsite mitigation projects, which the Copermittees may approve if they meet the requirements of Provision E.3.c.(4).

~~(iii)~~(iv) Mitigation Project Timing

The Copermittee and/or project applicant must develop a schedule for the completion of offsite mitigation projects, including milestone dates to identify, fund, design, and construct the projects. Offsite mitigation funding ~~projects~~ must be secured by the applicant and verified by the Copermittee prior to granting construction permits or recording of maps, whichever comes first. ~~completed upon the granting of occupancy for the first project that contributed funds toward the offsite mitigation project, unless a longer period is authorized by the San Diego Water Board.~~.

~~(iv)~~(v) Mitigation Fund

A Copermittee may choose to implement additional mitigation programs (e.g., pollutant credit system, mitigation fund) as a means for developing and implementing offsite mitigation projects, provided the projects conform to the requirements for project locations, types, and timing described above.

d. Update ~~Permanent~~ BMP ~~Sizing Criteria~~ Design Manual ~~(BMP Design Manual)~~

Each Copermittee must update its ~~Permanent BMP Sizing Criteria Design Manual (~~BMP Design Manual~~)~~[19] pursuant to Provision F.2.b or Provision F.5.a. Until the Copermittee has updated its BMP Design Manual with the requirements of Provision E.3.c, the Copermittee must continue implementing its current BMP Design Manual. Unless directed otherwise by the San Diego Water Board, the Copermittee must implement the BMP Design Manual within 180 days of completing the update. The update of the BMP Design Manual must include the

~~[19] The Permanent BMP Sizing Criteria Design Manual was formerly known as the Standard Storm Water Mitigation Plan under Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016.~~

following:

(1) Updated procedures to determine the nature and extent of storm water requirements applicable to a potential development or redevelopment project. These procedures must inform project applicants of the storm water management requirements applicable to their project including, but not limited to, general requirements for all development projects, LID and conventional BMP design procedures and requirements, hydromodification management requirements, requirements specific to phased projects, and procedures specific to private developments and public improvement projects;

(2) Updated procedures to identify pollutants and conditions of concern for selecting the most appropriate ~~permanent~~ structural BMPs that consider, at a minimum, the following:

(a) Receiving water quality (including pollutants for which receiving waters are listed as impaired under CWA section 303(d));

(b) Priority pollutants or receiving water conditions contributing to the highest water quality priorities identified in the Water Quality Improvement Plan;

(c) Land use type of the project and pollutants associated with that land use type; and

(d) Pollutants expected to be present onsite.

(3) Updated procedures for designing ~~permanent~~ structural BMPs, including any updated performance and sizing requirements to be consistent with the requirements of Provision E.3.c for all BMPs listed in the BMP Design Manual;

(4) Long-term maintenance criteria for each BMP listed in the BMP Design Manual; and

(5) Criteria and mitigation requirements, in accordance with the requirements under Provision E.3.c.(4), if the Copermittee elects to allow alternative compliance for technical infeasibility within its jurisdiction.

e. Priority Development Project BMP Implementation and Oversight

Each Copermittee must implement a program to ensure structural ~~permanent~~ BMPs on all Priority Development Projects are designed, constructed, and maintained to remove pollutants in storm water to the MEP.

(1) Structural~~Permanent~~ BMP Approval and Verification Process

(a) Each Copermittee must ensure that for all Priority Development Project applications that have not received prior lawful approval by the Copermittee by 18~~2~~ months after the adoption of this Order, or pursuant to Provision F.5.a~~a~~, the requirements of Provision E.3 are implemented. For project applications that have received prior lawful approval by 18~~2~~ months after the adoption of this Order, or pursuant to Provision F.5.a~~a~~, the Copermittee may allow previous land development requirements to apply.

(b) Each Copermittee must identify the roles and responsibilities of various municipal departments in implementing the structural~~permanent~~ BMP requirements, including each stage of a project from application review and approval through BMP maintenance and inspections.

(c) Each Copermittee must ensure that appropriate easements and ownerships are properly recorded in public records and the information is conveyed to all appropriate parties when there is a change in project or site ownership.

(d) Each Copermittee must ensure that prior to occupancy and/or intended use of any portion of the Priority Development Project, each ~~permanent~~ structural BMP must be inspected to verify that they have been constructed and are operating in compliance with all of its specifications, plans, permits, ordinances, and the requirements of this Order.

(2) Priority Development Project Inventory and Prioritization

(a) Each Copermittee must develop and ~~continuously~~regularly maintain a watershed-based database to track and inventory all Priority Development Projects and associated structural~~permanent~~ BMPs within their jurisdiction. Inventories must be accurate and complete beginning from January 2002 for the San Diego County Copermittees, February 2003 for the Orange County Copermittees, and July 2005 for the Riverside County Copermittees, where data is available. The database must include, at a minimum, the following information:

(i) Priority Development Project location (address and hydrologic subarea);

(ii) Descriptions of structural BMP type(s);

(iii) Date(s) of construction;

(iv) Party responsible for ~~permanent~~ structural BMP maintenance;

(v) Dates and findings of ~~permanent~~ structural BMP maintenance verifications; and

(vi) Corrective actions and/or resolutions.

(b) Each Copermittee must prioritize the Priority Development Projects with ~~permanent~~ structural BMPs within its jurisdiction. The designation of Priority Development Projects as high priority must consider the following:

(i) The highest water quality priorities identified in the Water Quality Improvement Plan;

(ii) Receiving water quality;

(iii) Number and sizes of ~~permanent~~ structural BMPs;

(iv) Recommended maintenance frequency of ~~permanent~~ structural BMPs;

(v) Likelihood of operation and maintenance issues of structural ~~permanent~~ BMPs;

(vi) Land use and expected pollutants generated; and

(vii) Compliance record.

(3) Structural ~~Permanent~~ BMP Maintenance Verifications and Inspections

Each Copermittee is required to verify that structural ~~permanent~~ BMPs on each Priority Development Project are adequately maintained, and continue to operate effectively to remove pollutants in storm water to the MEP through inspections, self-certifications, surveys, or other equally effective approaches.

(a) All (100 percent) of the structural ~~permanent~~ BMPs at Priority Development Projects that are designated as high priority must be inspected directly by the Copermittee annually prior to each rainy season;

(b) For verifications performed through a means other than direct Copermittee inspection, adequate documentation must be required by the Copermittee to provide assurance that the required maintenance of structural ~~permanent~~ BMPs at each Priority Development Project has been completed; and

(c) Appropriate follow-up measures (including re-inspections, enforcement, etc.) must be conducted to ensure that structural ~~permanent~~ BMPs at each Priority Development Project continue to reduce pollutants in storm water to the MEP as originally designed.

f. Development Project Enforcement

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all development projects, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement

Response Plan pursuant to Provision E.6.

4. Construction Management

Each Copermittee must implement a construction management program that includes~~, at a minimum,~~ the following requirements:

a. Construction Program Management

Each Copermittee must define in the Jurisdictional Runoff Management Plan the following:

(1) Define construction sites to be inventoried, such as sites that involve ground disturbance or soil disturbing activities; and

(2) Define a process for ensuring adequate construction BMP implementation for non-inventoried sites. Non-inventoried sites involve minor construction activities that are not anticipated to create storm water pollution such as interior improvements, small miscellaneous residential improvements such as patio covers, plumbing, electrical, and mechanical work.

~~a.~~**b.** Project Approval Process

Prior to ~~approval and~~ issuance of any local permit that allows commencement of construction~~, grading, or building permits~~ activities for any inventoried construction site, ~~a project~~ each Copermittee must:

(1) Require a ~~project~~site-specific ~~storm water pollution prevention plan (SWPPP)~~Pollution Control Plan, or equivalent construction BMP or erosion control plan, to be submitted by the project applicant ~~for~~ to the Copermittee~~'s approval~~;

(2) ~~Ensure~~ Confirm the Pollution Control Plan~~SWPPP~~, or equivalent construction BMP or erosion control plan, complies with the local grading ordinance, other applicable local ordinances, and the requirements of this Order; and

(3) ~~Ensure~~ Confirm the Pollution Control Plan~~SWPPP~~, or equivalent construction BMP or erosion control plan, includes seasonally appropriate and effective BMPs and management measures described in Provision E.4.c, as applicable to the project.

~~(1) Verify that the project applicant has obtained coverage under applicable permits, including, but not limited to the Construction General Permit, Clean Water Act Section 401 Water Quality Certification and Section 404 Permit, and California Department of Fish and Game Streambed Alteration Agreement.~~

~~b.~~**c.** Construction Site Inventory and Tracking

(1) Each Copermittee must maintain, and update at least monthly, a watershed-based inventory of all applicable construction sites ~~requiring construction, grading, or building permits~~ within its jurisdiction. The inventory must include:

(a) Relevant contact information for each site (e.g., name, address, phone, and email for the owner and contractor);

(b) The basic site information including location (address and hydrologic subarea), Waste Discharge Identification (WDID) number (if applicable), size of the site, and approximate area of disturbance;

(c) Whether or not the site is considered a high threat to water quality, as defined in Provision E.4.b.(2) below;

~~(a) The project start and anticipated completion dates;~~

(d) Current construction phase;

(e) The required inspection frequency, as defined in the Copermittee's jurisdictional runoff management program document;

(f) The date the Copermittee ~~approved~~ accepted the project-specific Pollution Control Plan~~SWPPP~~, or equivalent construction BMP or erosion control plan; and

(g) Whether or not there are ongoing enforcement actions administered to the site.

(2) Each Copermittee must identify all construction sites within its jurisdiction that represent a high threat to downstream surface water quality. At a minimum, high threat to water quality sites must include:

(a) Sites located within a hydrologic subarea where sediment is known or suspected to contribute to the highest water quality priorities identified in the Water Quality Improvement Plan;

(b) Sites located within the same hydrologic subarea and tributary to a CWA section 303(d) water body segment impaired for sediment;

(c) Sites located within, directly adjacent to, or discharging directly to a receiving water within an ESA; and

(d) Other sites determined by the Copermittees or the San Diego Water Board as a high threat to water quality.

~~c.~~d. Construction Site BMP and Management Measure Implementation

Each Copermittee must implement, or require the implementation of effective BMPs to reduce discharges of pollutants in storm water from construction sites to the MEP, and prevent non-storm water discharges into the MS4. These BMPs must be site specific, seasonally appropriate, and construction phase appropriate. BMPs and management measures must be implemented at each construction site year round. Dry season BMP implementation must plan for and address unseasonal rain events that may occur during the dry season (May 1 through September 30). Copermittees must implement, or require the implementation of, BMPs and management measures in the following categories:

(1) Project Planning;

(2) Good Site Management "Housekeeping", including waste management;

(3) Non-storm Water Management;

(4) Erosion Control;

(5) Sediment Control;

(6) Run-on and Run-off Control; and

(7) Active/Passive Sediment Treatment Systems, where applicable.

~~d.~~e. Construction Site Inspections

Each Copermittee must conduct construction site inspections to ~~ensure~~ confirm compliance with its permits and applicable local ordinances, and the requirements of this Order. Priority for site inspections must consider threat to water quality pursuant to Provision E.4.b as well as the nature of the construction activity, topography, and the characteristics of soils and receiving water quality.

(1) Inspection Frequency

(a) Each Copermittee must conduct inspections at all inventoried sites, including high threat to water quality sites, at an appropriate frequency for each phase of construction to ~~ensure~~ confirm the site reduces the discharge of pollutants in storm water from construction sites to the MEP, and prevents non-storm water discharges from entering the MS4.

(b) Each Copermittee must establish appropriate inspection frequencies for high threat to water quality sites, and all other sites, for each phase of construction. Inspection frequencies appropriate for addressing the highest water quality priorities identified in the Water Quality Improvement Plan, and for complying with the requirements of this Order must be

identified in each Copermittee's jurisdictional runoff management program document.

(c) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e., re-inspection, enforcement) necessary to ~~ensure~~ confirm site compliance with its permits and applicable local ordinances, and the requirements of this Order.

(2) Inspection Content

Inspections of construction sites by the Copermittee must include, at a minimum:

(a) Verification of coverage under the Construction General Permit (Notice of Intent (NOI) and/or WDID number) during initial inspections, when applicable;

(b) Assessment of compliance with its permits and applicable local ordinances related to pollution prevention, including the implementation and maintenance of applicable BMPs;

(c) Assessment of BMP adequacy and effectiveness;

(d) Visual observations of actual non-storm water discharges;

(e) Visual observations of actual or potential discharge of sediment and/or construction related materials from the site;

(f) Visual observations of actual or potential illicit connections; and

(g) If any violations are found and BMP enhancements are needed, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried construction sites. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Site name, location (address and hydrologic subarea), and WDID number (if applicable);

(b) Inspection date;

(c) Weather conditions during inspection;

~~(a) Approximate amount of rainfall since last inspection;~~

(d) Description ~~and photo documentation~~ of problems observed with BMPs and indication of need for BMP addition/repair/replacement and any scheduled re-inspection, and date of re-inspection;

(e) Descriptions of any other specific inspection comments which must, at a minimum, include rationales for longer compliance time~~.~~;

(f) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(g) Resolution of problems noted and date problems fixed.

~~e.~~f. Construction Site Enforcement

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried construction sites, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

5. Existing Development Management
[NOTE: This section is provided as an alternate to the original language.]

Each Copermittee must implement an existing development management program that includes the following requirements:

a. Industrial, Commercial, and Municipal Sources

~~(4)~~(1) Source Identification and Prioritization

Each Copermittee must identify sources and maintain an updated watershed-based inventory of its existing industrial, commercial, and municipal development that has the reasonable potential to discharge a pollutant load to and from the MS4. The use of an automated database system, such as GIS, is highly recommended. The inventory must, at a minimum, include:

(a) Name, location (address and hydrological subarea) of each source;

(b) A designation of the source as municipal, commercial, or industrial;

(c) SIC Code or NAICS Code, if applicable;

(d) Industrial General Permit NOI and/or WDID number, if applicable;

(e) Identification of pollutants generated or potentially generated by the source;

(f) Whether the source is adjacent to an ESA;

(g) Whether the source is tributary to and within the same hydrologic subarea as a CWA section 303(d) water body segment and generates or potentially generates pollutants for which the water body segment is impaired; and

(h) Whether the source contributes or potentially contributes to the highest water quality priorities identified in the Water Quality Improvement Plan;

~~(5)~~(2) BMP Implementation and Maintenance

Each Copermittee must designate a minimum set of BMPs required for all inventoried existing development with the reasonable potential to discharge pollutant loads from their MS4, including special event venues. The designated minimum BMPs must be specific to facility types and pollutant-generating activities, as appropriate.

(a) Pollution Prevention

Each Copermittee must promote the use of pollution prevention methods, where appropriate.

(b) BMP Operation and Maintenance

(i) Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at sources within its jurisdiction.

(ii) Each Copermittee must implement a schedule of operation and maintenance activities for its MS4 and related structures (including but not limited to catch basins, storm drain inlets, detention basins, etc.), and verify proper operation of all its municipal structural treatment controls. Operations and maintenance activities may include:

[a] Inspections of MS4 and related structures;

[b] Cleaning of MS4 and related structures; and

[c] Proper disposal of materials removed from cleaning of MS4 and related structures.

(iii) Each Copermittee must implement a schedule of operation and maintenance activities for public: streets, unpaved roads, paved roads, and paved highways and freeways within its jurisdiction.

(iv) Each Copermittee must implement controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers. Copermittees that operate both a municipal sanitary sewer system and a MS4 must implement controls and measures to prevent and eliminate seeping sewage from infiltrating the MS4. Copermittees that do not operate both a municipal sanitary sewer system and a MS4 are encouraged to coordinate with sewering agencies to keep themselves informed of relevant and appropriate maintenance activities and capital projects in their jurisdiction.

(c) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must implement procedures, or require the implementation of procedures, as appropriate, to reduce discharges of pollutants associated with the application, storage, and disposal of pesticides, herbicides and fertilizers at sources within its jurisdiction.

~~(6)~~(3) Measures to Address Highest Water Quality Priorities

Each Copermittee must conduct or require measures as necessary to address sources or areas that discharge pollutants identified as contributing to the highest water quality priorities in the Water Quality Improvement Plan. These measures must be identified as applicable in each WQIP strategy, and may include any of the following:

(a) Copermittee Program Activities

Each Copermittee may make modifications to its program activities (e.g. increased or focused education, inspections, etc.) to address sources that discharge pollutants identified as contributing to the highest water quality priorities in the Water Quality Improvement Plan.

(b) Additional Control Measures

Each Copermittee may require additional pollution prevention measures and control measures at sources that discharge pollutants identified as contributing to the highest water quality priorities in the Water Quality Improvement Plan, including consideration of retrofit and channel rehabilitation and improvement opportunities, as identified in Provision 5.a.2.(c)

(c) Retrofit

Each Copermittee must develop a strategy to facilitate the implementation of

retrofit projects. Existing development in high priority areas should be assessed for inclusion in the retrofit plan. Retrofit plans should focus on pollutants and areas identified as high priority within the Water Quality Improvement Plans, with the highest priority projects included in the Water Quality Improvement Plans.

(i) Retrofit projects may be prioritized based on their relative benefit to water quality, feasibility, cost effectiveness, and community acceptance.

(ii) Retrofit projects in the highest priority areas should be included in the review for the Water Quality Improvement Plan to provide additional pollutant removal from storm water discharges.

(d) Channel Rehabilitation and Improvement

Each Copermittee must develop a strategy to facilitate the implementation of channel rehabilitation and improvement projects. Existing channels in high priority areas should be assessed for inclusion in the channel rehabilitation and improvement plan. Channel rehabilitation and improvement plans should focus on pollutants and areas identified as high priority within the Water Quality Improvement Plans.

(i) Channel rehabilitation and improvement projects may be selected to address hydromodification, restore wetland and riparian habitat, or to address other water quality issues prioritized in the Water Quality Improvement Plan.

(ii) Channel rehabilitation and improvement projects may be prioritized based on their relative benefit to water quality, feasibility, cost effectiveness, and community acceptance.

(iii) Channel rehabilitation and improvement projects in the highest priority areas should be included in the review for the Water Quality Improvement Plan to provide additional pollutant removal from storm water discharges.

~~(7)~~(4) Inspection Requirements:

(a) Inspection Frequency

(i) Each Copermittee must establish appropriate inspection frequencies for inventoried industrial, commercial, and municipal sources based on the potential for discharging pollutants via storm water and non-storm water discharges, and should reflect the priorities set forth in the Water Quality Improvement Plan.

(ii) Each Copermittee must conduct inspections annually with a level of effort equivalent to 20% of their industrial, commercial, and municipal inventory combined[20][21]. If facilities require multiple inspections during any given year, those additional inspections may count towards this total.

(iii) Inventoried existing development must be inspected, as needed, in response to valid public complaints and findings from the Copermittee's municipal and contract staff inspections.

(iv) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e. education and outreach, re-inspection, enforcement) as necessary to confirm compliance in accordance with its enforcement response plan pursuant to Provision E.6.

(b) Inspection Content

Inspections of industrial, commercial, and municipal facilities by the Copermittee may include the following:

(i) Industrial, commercial, and municipal facilities name and location (address and hydrologic subarea);

(ii) Inspection and re-inspection date(s);

(iii) Assessment of compliance with its applicable local ordinances and permits related to non-storm water and storm water discharges and runoff;

(iv) Assessment of BMPs implementation;

(v) Verification of coverage under the Industrial General Permit (NOI and/or WDID number), when applicable;

(vi)

(vii) Visual observations of actual non-storm water discharges, if present;

(viii) Visual observations of actual or potential discharge of pollutants, if present; and

(ix) Visual observations of actual or potential illicit connections, if present.

[20] Excludes linear facilities (MS4 and roads).

(c) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried industrial, commercial, and municipal facilities. The Copermittee must maintain all inspection records in an electronic database or tabular format, either in paper or electronic inspection records files, which must be made available to the San Diego Water Board upon request.

Inspection records must include the information necessary to effectively manage and implement the industrial, commercial, and municipal facilities inspection program, as described in each Copermittee's jurisdictional runoff management plan

b. Residential Sources

(1) Source Identification and Prioritization:

An inventory of residential sources within each Copermittees jurisdiction must be developed as follows:

(a) Designation of Residential Management Areas

Each Copermittee must divide areas of residential development into Residential Management Areas. Residential Management Areas may be designated by one or more of the following: Hydrologic Sub Area, land use (e.g. single family, multi family, rural, Common Interest Areas, ~~or~~ Home Owner Associations), and/or residential target audiences, and/or other accepted methods to be included in each Copermittee-approved jurisdictional runoff management plan.

(b) Prioritization of Residential Management Areas

Copermittees must prioritize Residential Management Areas for the purposes of ~~prioritizing and~~ directing their residential programs. Prioritization must consider whether the Residential Management Area contributes or potentially contributes to the highest water quality priorities identified in the Water Quality Improvement Plan, and consideration of other program information or information from other relevant programs:

(c) A regularly updated map must be developed showing the locations of the highest priority inventoried Residential Management Areas, watershed boundaries, and water bodies at or near them.

(2) BMP Implementation and Maintenance

(a) Designate BMPs

Each Copermittee must designate and ~~require~~ encourage the implementation of a minimum set of BMPs for all residential sources or residential target audiences with the reasonable potential to discharge significant pollutant loads from their MS4.The designated minimum BMPs must be source-specific, and must address each of the following as appropriate.

(i) Pollution Prevention

Each Copermittee must promote the use of pollution prevention methods, where appropriate.

(ii) BMP Operation and Maintenance

Each Copermittee must ~~operate~~ designate and ~~maintain, or~~ require the operation and maintenance of designated BMPs for residential sources within its jurisdiction.

(iii) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must ~~require~~ designate and encourage, as appropriate, the implementation of practices to reduce discharges of pollutants associated with the application, storage, and disposal of pesticides, herbicides and fertilizers at residential sources within its jurisdiction.

(3) Measures to Address Highest Water Quality Priorities

Each Copermittee must ~~conduct~~ designate or require measures as necessary to address residential sources or ~~areas~~ residential target audiences that discharge pollutants identified as contributing to the highest water quality priorities in the Water Quality Improvement Plan. These measures must be identified as applicable in each WQIP strategy, and may include any of the following:

(a) Copermittee Program Activities

Each Copermittee may make modifications to its program activities (e.g. increased or focused education, inspections, etc.) to address residential sources that discharge pollutants identified as contributing to the highest water quality priorities in the Water Quality Improvement Plan.

(b) Additional Control Measures

Each Copermittee may require additional pollution prevention and control measures at sources that discharge pollutants identified as contributing to the highest water quality priorities in the Water Quality Improvement Plan.

(c) Retrofit

Each Copermittee must encourage through education or other means the implementation of retrofit projects at residential sources or areas.

(4) Residential Management Area Oversight:

(a) Residential Area Assessment

Each Copermittee must conduct representative evaluations (e.g. visual observations, water use analysis, and other historical data) of its high ~~prioritized~~ priority Residential Management Areas as defined in the Water Quality Improvement Plan to update implementation strategies. Each Copermittee must develop a program to facilitate oversight and assessment in residential areas. Oversight may include complaint investigation, IDDE Activities, follow-up on monitoring obdervations, visual observations, outreach and education, water use analysis, or other methods deemed necessary to facilitate BMP implementation. Each Copermittee should conduct assessment of its oversight activities in prioritized residential areas to inform any updates to the WQIP.

~~(b) Residential Program Update~~

~~Within two years, each Copermittee must develop and submit for Regional Board approval an updated residential program strategy based on assessment findings. Until Copermittees implement an updated residential program, they must continue performing their existing programs.~~

~~(c)~~(b) Follow up Actions

Each Copermittee must prioritize ~~and implement~~ its follow up actions and enforcement (e.g. education and outreach, re-assessment~~, enforcement~~) in accordance with its Enforcement Response Plan pursuant to Provision E.6.

~~(d)~~(c) ~~Assessment Tracking and~~ Record~~-keepings~~

~~Assessment r~~Records must be ~~tracked and~~ sufficiently detailed in order to determine compliance with the requirements of this Order and any progress made toward the modification of residential management

strategies, or addressing the highest water quality priorities identified in the Water Quality Improvement Plan.

~~1) The following municipal facilities:~~

~~(a) Flood management and flood control devices and structures,~~

~~(b) Operating or closed municipal landfills,~~

~~(c) Publicly owned treatment works (including water and wastewater treatment plants) and sanitary sewer collection systems,~~

~~(d) Corporate yards, including maintenance and storage yards for materials, waste, equipment, and vehicles,~~

~~(e) Hazardous waste collection facilities, and~~

~~(f) Other treatment, storage or disposal facilities for municipal waste;~~

~~2) Identification if a business is a mobile business;~~

~~3) SIC Code, if applicable;~~

~~4) Industrial General Permit NOI and/or WDID number, if applicable;~~

~~5) Identification if an area is a Common Interest Area (CIA) / Home Owner Association (HOA), or mobile home park;~~

~~6) Identification of pollutants generated and potentially generated by the facility, area, and/or activity;~~

~~7) Status of facility, area, and/or activity as active or inactive;~~

~~8) Whether the facility, area, and/or activity is adjacent to an ESA;~~

~~9) Whether the facility, area, and/or activity is tributary to and within the same hydrologic subarea as a CWA section 303(d) water body segment and generates pollutants for which the water body segment is impaired;~~

~~10) Whether the facility, area, and/or activity contributes or potentially contributes to the highest water quality priorities identified in the Water Quality Improvement Plan; and~~

~~11) A continually updated map showing the location of inventoried existing development, watershed boundaries, water bodies, and pollutants generated at the inventoried existing development.~~

~~**c.** Retrofitting and Channel Rehabilitation in Areas of Existing Development~~

~~Each Copermittee must develop and implement a program to retrofit areas of existing development to reduce the discharge of pollutants in storm water from the MS4 to the MEP and effectively prohibit non-storm water discharges into its MS4, and rehabilitate channels to restore impaired beneficial uses of streams within its jurisdiction.~~

~~(1) Each Copermittee must identify areas of existing development as candidates for retrofitting, and channels in areas of existing development as candidates for rehabilitation within its jurisdiction. Areas of existing development must be selected based on a likelihood that retrofitting and channel rehabilitation will address the highest water quality priorities identified in the Water Quality Improvement Plan prepared pursuant to Provision B.~~

~~(2) Each Copermittee must evaluate and rank the areas of existing development identified pursuant to Provisions E.5.a and E.5.b.(1) for retrofitting and channel rehabilitation. The evaluation must include an assessment of those areas where pollutant removal from storm water and effective prohibition of non-storm water discharges through retrofitting existing development will provide the most benefit to water quality. The evaluation must also include an assessment of the channels within its jurisdiction where channel rehabilitation will improve beneficial uses of streams within the Copermittee's jurisdiction. Data collected during the implementation of the Water Quality Improvement Plan must be used to inform each area assessment and rank determination.~~

~~(3) Each Copermittee must implement retrofit and channel rehabilitation projects that address the highest water quality priorities identified in the Water Quality Improvement Plan pursuant to Provision B.3.a. The Copermittee must encourage private landowners to implement retrofit and channel rehabilitation projects whenever practical. Private landowners should be encouraged through the Copermittee's use of subsidies, penalties, or other incentives.~~

~~(4) Each Copermittee must evaluate the flood management and flood control devices and structures in its inventory to determine if it is feasible to retrofit the device or structure, to provide additional pollutant removal from storm water. A Copermittee must consider the highest water quality priorities identified in their Water Quality Improvement Plan as part of each assessment.~~

~~(5) Where retrofitting and channel rehabilitation within specific areas of existing development are determined to be infeasible to restore and protect receiving waters from the highest water quality priorities identified in the Water Quality Improvement Plan, each Copermittee must identify, develop, and implement regional retrofitting and channel rehabilitation projects (i.e. projects that can receive and/or treat storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment) adjacent to and/or downstream of the areas of existing development. The Copermittees may collaborate and cooperate with each~~

~~other to develop regional retrofitting and channel rehabilitation projects. The Copermittees are also encouraged to partner with existing efforts in other Watershed Management Areas, and the Integrated Regional Water Management (IRWM) Groups in San Diego County, South Orange County, and Southwest Riverside County.~~

~~**d.** Existing Development BMP Implementation and Maintenance~~

~~**1)** Pollution Prevention~~

~~Each Copermittee must require the use of pollution prevention methods by the inventoried existing development.~~

~~**2)** Designate BMPs~~

~~Each Copermittee must designate a minimum set of BMPs required for all inventoried existing development, including special event venues, that have the potential to generate pollutants. The designated minimum BMPs must be specific to facility types and pollutant-generating activities, as appropriate.~~

~~**3)** BMP Implementation~~

~~Each Copermittee must implement, or require the implementation of, designated BMPs at inventoried existing development that have the potential to generate pollutants. A Copermittee must require additional pollution prevention measures and enhanced BMPs at inventoried existing development that discharges pollutants identified as contributing to the highest water quality priorities in the Water Quality Improvement Plan.~~

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~~**4)** BMP Operation and Maintenance~~

~~Each Copermittee must operate and maintain, or require the operation and maintenance of designated BMPs at all inventoried existing development.~~

~~(b) Each Copermittee must implement a schedule of operation and maintenance activities for its MS4 and related structures (including but not limited to catch basins, storm drain inlets, detention basins, etc.), and verify proper operation of all its municipal structural treatment controls designed to reduce pollutants (including floatables) in storm water discharges to or from its MS4s and related drainage structures.~~

~~(c) Each Copermittee must implement procedures during the operation and maintenance of public streets, unpaved roads, paved roads, and paved highways and freeways that will reduce the contribution of storm water pollutants to the MEP and effectively prohibit non-storm water pollutants from the MS4 to receiving water bodies. During maintenance of unpaved roads, each Copermittee must examine the feasibility of replacing existing culverts or designing new culverts/bridge crossings to maintain natural stream geomorphology.~~

~~(d) Each Copermittee must implement controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers. Copermittees that operate both a municipal sanitary sewer system and a MS4 must implement controls and measures to prevent and eliminate seeping sewage from infiltrating the MS4. Copermittees that do not operate both a municipal sanitary sewer system and a MS4 must keep themselves informed of relevant and appropriate maintenance activities and sanitary sewage projects in their jurisdiction that may cause or contribute to seepage of sewage into the MS4.~~

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~~**5)** Pesticides, Herbicides, and Fertilizers BMPs~~

~~Each Copermittee must implement procedures, or require the implementation of procedures, to reduce the contribution of pollutants in storm water to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from inventoried existing development into and from the MS4s. The Copermittee must require additional pollution prevention measures and enhanced BMPs at inventoried existing development that discharges pesticides, herbicides, or fertilizers identified as contributing to the highest water quality priorities in the Water Quality Improvement Plan. Such BMPs must include, as appropriate educational activities, permits, certifications and other measures for applicators and distributors.~~

~~e. Existing Development Inspections~~

~~Each Copermittee must conduct inspections of inventoried existing development to ensure compliance with applicable local ordinances and permits, and the requirements of this Order.~~

~~(1) Inspection Frequency~~

~~(a) Each Copermittee must establish appropriate inspection frequencies for inventoried existing development based on the priorities set forth in the Water Quality Improvement Plan, and the potential for discharging pollutants via storm water and non-storm water runoff. At a minimum, inventoried existing development must be inspected once every five years. Inventoried existing development must also be inspected within six months of any change in property ownership or change in pollutant generating activity. The frequency of inspection at inventoried existing development must be appropriate to ensure that applied BMPs are sufficient to reduce the discharge of pollutants in storm water from the MS4 to the MEP and effectively prohibit non-storm water discharges to the MS4.~~

~~(b) Inventoried existing development must be inspected, as needed, in response to valid public complaints and findings from the Copermittee's municipal and contract staff inspections.~~

~~(c) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e. re-inspection, enforcement) necessary to ensure compliance with its applicable local ordinances and permits, the most current jurisdictional runoff management program document, the Water Quality Improvement Plan, and the requirements of this Order.~~

~~(2) Inspection Content~~

~~Inspections of existing development by the Copermittee must include, at a minimum:~~

~~(a) Assessment of compliance with its applicable local ordinances and permits related to non-storm water and storm water discharges and runoff;~~

~~(b) Assessment of the implementation, maintenance and effectiveness of the designated minimum and/or enhanced BMPs;~~

~~(c) Verification of coverage under the Industrial General Permit (NOI and/or WDID number), when applicable;~~

~~(d) Visual observations of actual non-storm water discharges;~~

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~~(e) Visual observations of actual or potential discharge of pollutants;~~

~~(f) Visual observations of actual or potential illicit connections; and~~

~~(g) If any violations are found and BMP enhancements are needed, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.~~

~~(3) Inspection Tracking and Records~~

~~Each Copermittee must track all inspections and re-inspections at all inventoried existing development. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must be sufficiently detailed in order to determine compliance with the requirements of this Order and any progress made towards addressing the highest water quality priorities identified in the Water Quality Improvement Plan. Inspection records must include, at a minimum:~~

~~(a) Existing development name and location (address and hydrologic subarea);~~

~~(b) Inspection and re-inspection date(s);~~

~~(c) Weather conditions during inspection;~~

~~(d) Description and photo documentation of problems observed with BMPs and indication of need for BMP addition/repair/replacement and any scheduled re-inspection, and date of re-inspection;~~

~~(e) Description of actions to reduce pollutants in storm water runoff to the MEP and actions to effectively prohibit non-storm discharges into the MS4 at the inventoried existing development;~~

~~(f) Photo documentation of observed actions or BMPs to reduce pollutants in storm water runoff to the MEP and actions to effectively prohibit non-storm discharges into the storm drain;~~

~~(g) If the facility, area, and/or activity has been designated or identified as a contributor to the highest water quality priorities identified in the Water Quality Improvement Plan, then the inspection report must include a description of any specific or additional actions taken to reduce or eliminate the contribution of the facility, area, and/or activity to the highest water quality priorities;~~

~~(h) Descriptions of any other specific inspection comments which must, at a minimum, include rationales for longer compliance time;~~

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~~(i) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and~~

~~(j) Resolution of problems noted and date problems fixed.~~

~~f.~~c. Existing Development Enforcement

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried existing development identified by the Copermittee as having the reasonable potential to discharge pollutant loads from the MS4 within their jurisdiction, ~~as necessary, to achieve compliance with the requirements of this Order,~~ in accordance with its Enforcement Response Plan pursuant to Provision E.6.

~~5.~~6. Enforcement Response Plans

Each Copermittee must develop and implement an Enforcement Response Plan ~~-~~as part of its jurisdictional runoff management program document. The Enforcement Response Plan must ~~include the protocols for progressively stricter responses, including timeframes allowed for corrections of problems, and for various field violation scenarios~~describe the applicable protocols and options for enforcing compliance with the provisions of this Order. The Enforcement Response Plan must include ~~, at a minimum,~~ the following ~~requirements~~:

a. ENFORCEMENT RESPONSE PLAN COMPONENTS

The Enforcement Response Plans shall include the following individual components:

(1) The Illicit Discharge Detection and Elimination Enforcement Components provided in Provision E.2;

(2) The Development Planning Enforcement Component provided in Provision E.3;

(3) The Construction Management Enforcement Component provided in Provision E.4; and

(4) The Existing Development Management Enforcement Component provided in Provision E.5.

Existing enforcement plans or procedures may be used to partially or wholly satisfy the requirements of any Enforcement Response Plan component.

b. ENFORCEMENT APPROACHES AND OPTIONS

Each Enforcement Response Plan component must describe the Copermittee's approach to correcting noncompliance with its permits, applicable local ordinances, and this Order. It must describe protocols for progressively stricter responses, including, as applicable, timeframes allowed to bring areas or facilities into compliance. The enforcement process must include appropriate sanctions to compel compliance, such as:

(1) Verbal and written notices of violation;
(2) Cleanup requirements;
(3) Fines
(4) Bonding requirements;
(5) Administrative and criminal (if intentional or criminally negligent) penalties;
(6) Liens;
(7) Stop work orders; and

(8) Permit and occupancy denials.

c. CORRECTION OF VIOLATIONS

(1) Violations must be corrected in a timely manner with the goal of correcting them within 30 calendar days after the violations are discovered, and prior to the next predicted rain event, when possible.

(2) If more than 30 calendar days are required for compliance, then a rationale must be recorded in the applicable electronic database or tabular system used to track compliance.

d. ESCALATED ENFORCEMENT PRIORITIES

(1) Each Enforcement Response Plan must include a definition of "escalated enforcement priorities". Escalated enforcement priorities shall be defined to include any enforcement scenario where a violation or other non-compliance is determined to constitute a significant contribution to any of the highest water quality priorities identified in the Water Quality Improvement Plan. Escalated enforcement priorities may be defined differently for development planning; construction sites; commercial, industrial, and municipal sources; and residential management areas.

(2) Where a violation involving a pollutant or stressor that has been identified as a highest water quality priority is not determined to represent an escalated enforcement priority, a rationale must be recorded in the applicable electronic database or tabular system used to track compliance.

(3) Escalated enforcement actions must continue to increase in severity, as necessary, to compel compliance as soon as possible.

~~**a.** Illicit Discharge Detection and Elimination Enforcement Component~~

~~The Enforcement Response Plan must describe required enforcement actions to eliminate non-storm water discharges and illicit discharges or connections to the Copermittee's MS4.~~

~~(1) The Enforcement Response Plan must include a definition of "high level enforcement" for non-storm water discharges and illicit discharges or connections. "High level enforcement" for non-storm water discharges and illicit discharges or connections may be defined differently for construction sites, municipal, commercial, industrial, and residential areas of existing development.~~

~~(2) Non-storm water discharges and illicit discharges or connections must be addressed with an escalating series of enforcement actions as follows:~~

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~~(a) If the non-storm water discharge and illicit discharge or connection is a source of pollutants contributing to the highest water quality priorities identified in the Water Quality Improvement Plan, then high level enforcement actions must be immediately issued, and subsequent high level enforcement actions must continue to escalate, as necessary, to compel the elimination of the discharge or connection as soon as possible; or~~

~~(b) If the non-storm water discharge and illicit discharge or connection is not a source of pollutants contributing to the highest water quality priorities identified in the Water Quality Improvement Plan, then escalating enforcement actions must be issued, and enforcement actions must result in the elimination of the discharge or connection as quickly as the Copermittee's available resources allow.~~

~~(3) If the Copermittee identifies the source, and the source is a controllable non-storm water discharge (i.e. anthropogenically influenced) or a controllable illicit discharge or connection, then the Copermittee must implement the following:~~

~~(a) Immediately enforce its legal authority to eliminate controllable sources of non-storm water and illicit discharges or connections upon identifying the source; and~~

~~(b) For controllable sources of non-storm water discharges and illicit discharges or connections that cannot be eliminated immediately upon identification, the discharge or connection must be eliminated in a timely manner with the goal of eliminating the discharge or connection within 10 business days after the source is identified. If more than 10 business days are required to eliminate the discharge or connection, a rationale must be recorded in the electronic database or equivalent tabular system used to track the investigations of non-storm water and illicit discharges and connections.~~

~~(4) If the Copermittee identifies the source as a non-storm water discharge to or from the MS4 that is in exceedance of NALs developed pursuant to Provision C.1, and in violation or threatened violation of an existing separate NPDES permit (e.g. the groundwater dewatering NPDES permit), then the Copermittee must report, within three business days, the findings to the San Diego Water Board including all pertinent information regarding the discharger and discharge characteristics.~~

~~**b.** Development Projects Enforcement Component~~

~~The Enforcement Response Plan must describe required enforcement actions to compel compliance with the Copermittee's BMP Design Manual requirements for~~

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~~development projects.~~

~~(1) The Enforcement Response Plan must include a definition of "high level enforcement" for development projects.~~

~~(2) The enforcement process must include appropriate sanctions to compel compliance with requirements of the Copermittee's BMP Design Manual or this Order. Sanctions must include, at a minimum, the following tools or their equivalent:~~

~~(a) Non-monetary penalties;~~

~~(b) Fines;~~

~~(c) Bonding requirements;~~

~~(d) Administrative and criminal penalties;~~

~~(e) Liens; and~~

~~(f) Permit or occupancy denials.~~

~~(3) Occupancy must be denied until a development project is in full compliance with the Copermittee's BMP Design Manual requirements. Documentation of full compliance with the Copermittee's BMP Design Manual requirements must be recorded in the electronic database or equivalent tabular system used to track development projects.~~

~~(4) Violations or other non-compliance that contribute or potentially contribute to the highest water quality priorities identified in the Water Quality Improvement Plan must be issued high level enforcement actions. High level enforcement actions must continue to escalate, as necessary, to compel compliance as soon as possible.~~

~~(5) For violations of permanent BMP maintenance requirements, all violations must be corrected in a timely manner with the goal of correcting them before the next rain event but no longer than 10 business days after the violations are discovered. If more than 10 business days are required for compliance, a rationale must be recorded in the electronic database or equivalent tabular system used to track permanent BMP inspections.~~

~~**a.** Construction / Existing Development Enforcement Component~~

~~The Enforcement Response Plan must describe required enforcement actions to compel compliance with its permits and applicable local ordinances, and the requirements of this Order, at construction sites and areas of existing development.~~

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~~(1) The Enforcement Response Plan must include a definition of "high level enforcement" for construction sites and areas of existing development. "High level enforcement" may be defined differently for construction sites, municipal, commercial, industrial, and residential areas of existing development.~~

~~(2) The enforcement process must include, at a minimum, appropriate sanctions to compel compliance, such as:~~

~~(a) Verbal and written notices of violation;~~

~~(b) Cleanup requirements;~~

~~(c) Fines;~~

~~(d) Bonding requirements;~~

~~(e) Administrative and criminal penalties;~~

~~(f) Liens;~~

~~(g) Stop work orders; and~~

~~(h) Permit and occupancy denials.~~

~~(3) Violations or other non-compliance that contribute or potentially contribute to the highest water quality priorities identified in the Water Quality Improvement Plan must be issued high level enforcement actions. High level enforcement actions must continue to escalate, as necessary, to compel compliance as soon as possible.~~

~~(4) All violations must be corrected in a timely manner with the goal of correcting them before the next rain event but no longer than 10 business days after the violations are discovered. If more than 10 business days are required for compliance, then a rationale must be recorded in the electronic database or equivalent tabular system used to track construction site and existing development inspections.~~

~~g.~~e. REPORTING OF NON-COMPLIANT SITES

(1) Each Copermittee must notify the San Diego Water Board verbally within 24 hours and in writing within ~~48 hours~~ 5 calendar days of issuing ~~high level~~escalated enforcement (as defined in the Copermittee's Enforcement Response Plan) to a construction site that poses a significant threat to water quality as a result of violations or other non-compliance with its permits and applicable local ordinances, and the requirements of this Order. Written notification may be provided electronically in email form.

(2) Each Copermittee must notify the San Diego Water Board of non-filers under the Industrial General Permit and Construction General Permit by email to Nonfilers_R9@waterboards.ca.gov.

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~~6.~~7. Public Education and Participation

a. Each Copermittee must implement a public education and participation program, as appropriate, to promote and encourage the development of programs, management practices, control techniques and systems, design and engineering methods, and behaviors that reduce the discharge of pollutants in storm water to the MEP, prevent controllable non-storm water discharges from entering the MS4, and protect water quality standards in receiving waters. The public education program must include ~~, at a minimum,~~ the following:

(1) Educational activities, public information activities, and other appropriate outreach activities intended to reduce pollutants ~~associated with the application of pesticides, herbicides and fertilizer in storm water discharges to and~~of concern from its MS4 to the MEP. Activities shall be determined and prioritized by Copermittees by jurisdiction and/or watershed (Section 5.c.(5) to address the highest threats to water quality (e.g. pesticides, herbicides and fertilizers, used oil, toxic waste, etc.);

~~(1) Educational activities, public information activities, and other appropriate outreach activities to facilitate the proper management and disposal of used oil and toxic materials; and~~

(2) Appropriate education and training measures for ~~construction site operators and other~~ specific target audiences, as determined and prioritized by the Copermittee(s) by jurisdiction and watershed, based on high risk behaviors and pollutants of concern, such as construction site operators, residents, underserved target audiences and school-aged children.

b. Each Copermittee shall incorporate a mechanism for evaluation and assessment of educational and other outreach activities, as needed, to identify progress and incorporate modifications necessary to increase the effectiveness of the public education program.

~~b.~~c. Each Copermittee may determine, where appropriate and effective, mechanisms for intergovernmental coordination on education and outreach activities.~~must incorporate a mechanism for public participation and where necessary intergovernmental coordination in updating, developing, and implementing its jurisdictional runoff management program.~~

~~7.~~8. Fiscal Analysis

a. Each Copermittee must secure the resources necessary to meet all the requirements of this Order.

b. Each Copermittee must conduct an annual fiscal analysis of their jurisdictional runoff management programs in their entirety. The fiscal analysis must include the following:

Identification of the various categories of expenditures necessary to implement the requirements of this Order, including a description of the specific items to be accounted for in each category of expenditures;
~~(1) The capital and operation and maintenance expenditures necessary to implement the requirements of this Order;~~

(1) The staff resources needed and allocated to meet the requirements of this Order, including any development, implementation, and enforcement activities required;
(2) The fiscal analysis must provide estimated expenditures for Provisions E.8.b.0 and E.8.b.(1) for each Copermittee's jurisdictional runoff management program budget for the current reporting period.~~during the reporting period, the preceding reporting period, and the next reporting period; and~~

(3) The source(s) of funds that are proposed to meet the necessary expenditures described in Provisions E.8.b.0 and E.8.b.(1), including legal restrictions on the use of such funds.

c. Each Copermittee must submit a summary of the annual fiscal analysis with each Annual Report required pursuant to Provision F.3.b.

d. Each Copermittee must provide the documentation used to develop the summary of the annual fiscal analysis upon request by the San Diego Water Board.

~~E.~~F. REPORTING

The purpose of this provision is to determine and document compliance with the requirements set forth in this Order. The goal of this provision is to communicate to the San Diego Water Board and the people of the State of California the implementation status of each jurisdictional runoff management program and compliance with the requirements of this Order. This goal is to be accomplished through the submittal of specific deliverables to the San Diego Water Board by the Copermittees.

1. Water Quality Improvement Plans

The Copermittees for each Watershed Management Area must develop and submit a complete Water Quality Improvement Plan in accordance with the requirements of Provision B, no later than ~~12~~ 18 months after the adoption of this Order for a 30 day public review and comment period. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of 30 days. Based on the comments received, the San Diego Water Board will determine whether to hold a public hearing or to limit public input to submittal of written comments. If no hearing is held the San Diego Water Board will notify the Copermittees that the Water Quality Improvement Plan has been accepted as complete following its review and determination that the Water Quality Improvement Plan meets the requirements of this Order Water Quality Improvement Plans are deemed approved if no response is provided to the Copermittees within 2 months of the submittal date. Water Quality Improvement Plans must be made available on the Regional Clearinghouse required pursuant to Provision F.4.

a. WATER QUALITY IMPROVEMENT PLAN SUBMITTAL AND IMPLEMENTATION

Copermittees must submit requested modifications to the Water Quality Improvement Plan either in the Annual Report required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge (ROWD) required pursuant to Provision F.5.b. Once approved by the San Diego Water Board Executive Officer, the Copermittees must implement any modifications to the Water Quality Improvement Plan in accordance with the schedules developed pursuant to Provisions B.2 and B.3.b. Requests for modification are deemed approved if no response is provided to the requesting Copermittee(s) within 2 months of the request date.

b. CORRESPONDING MODIFICATIONS TO JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS AND MONITORING AND ASSESSMENT PROGRAMS

Copermittees must submit requested modifications to the jurisdictional runoff management programs and monitoring and assessment programs either in the Annual Report required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge (ROWD) required pursuant to Provision F.5.b. Once approved by the San Diego Water Board Executive Officer, the Copermittees must implement any modifications to the Water Quality Improvement Plan in

accordance with the schedules developed pursuant to Provisions B.3.b. Requests for modification are deemed approved if no response is provided to the requesting Copermittee(s) within 2 months of the request date.

2. Updates

a. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATES

Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E. The update must be completed no later than ~~12~~18 months after the adoption of this Order. Updated jurisdictional runoff management program documents must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Subsequent updates may be submitted as part of the Annual Reports, and updated jurisdictional runoff management program documents must be made available on the Regional Clearinghouse.

Jurisdictional Runoff Management Program document updates that modify program elements from the requirements of Provision E must provide rationale for the modifications within the update documents.

b. ~~PERMANENT~~ BMP ~~SIZING CRITERIA~~ DESIGN MANUAL UPDATES

Each Copermittee must update its BMP Design Manual to incorporate the requirements of Provision E.3.d. The update must be completed no later than 18~~12~~ months after the adoption of this Order. Updated BMP Design Manuals must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Subsequent updates may be submitted as part of the Annual Reports. Updated BMP Design Manuals must be made available on the Regional Clearinghouse.

BMP Design Manual updates that modify program elements from the requirements of Provision E must provide rationale for the modifications within the update documents.

c. WATER QUALITY IMPROVEMENT PLAN UPDATES

The Copermittees for each Watershed Management Area must submit updates to the Water Quality Improvement Plan as part of the Annual Reports. Updated Water Quality Improvement Plans must be made available on the Regional Clearinghouse required pursuant to Provision F.4.

Water Quality Improvement Plan updates that modify program elements from the requirements of Provision E must provide rationale for the modifications within the update documents.

3. Progress Reporting

a. PROGRESS REPORT PRESENTATIONS

The Copermittees for each Watershed Management Area must appear before the San Diego Water Board, as requested by the San Diego Water Board, to provide progress reports on the implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs.

b. ANNUAL REPORTS

(1) The Copermittees for each Watershed Management Area must submit an Annual Report for each reporting period, which begins July 1 and ends June ~~-~~30 in the following year, no later than ~~October~~ January 31 of the following ~~the end of the reporting period~~year. This is to accommodate the monitoring year from October 1 to September 30 of the subsequent year. The first Annual Report must be prepared for the reporting period beginning ~~from~~July 1 after adoption of the ~~date the~~permit, and upon San Diego Water Board ~~determines~~determination that the Water Quality Improvement Plan meets the requirements of this Order to June 30 in the following year. Annual Reports must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Each Annual Report must include the following:

~~(a) The jurisdictional and watershed monitoring data collected pursuant to Provisions D.1 and D.2, summarized and presented in tabular and graphical form;~~

~~(b) Progress of the special studies required pursuant to Provisions D.2 and D.3, and the results or findings when a special study, or each phase of a special study, is completed;~~

~~(c) The findings from the assessments required pursuant to Provision D.4;~~

(a) The progress of implementing the Water Quality Improvement Plan, including, but not limited to, the following:

(i) The progress toward achieving the interim and final numeric ~~targets~~goals for the highest water quality priorities for the Watershed Management Area,

(ii) The water quality improvement strategies that were implemented and/or no longer implemented by each of the Copermittees during the reporting period and previous reporting periods, and are planned to be implemented during the next reporting period,

(iii) Proposed modifications to water quality improvement or jurisdictional strategies with associated rationale for such modifications,

(iv) Previously proposed modifications or updates incorporated into the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document and implemented by the Copermittees in the Watershed Management Area,

[a] The monitoring data collected pursuant to Provision D, summarized and presented in tabular and graphical form;

[b] Progress of the special studies required pursuant to Provision D, and the results or findings when a special study, or each phase of a special study, is completed;

[c] The findings from the assessments required pursuant to Provision D; and

~~[a] and~~

(v) Proposed modifications or updates to the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document;

(b) A completed Jurisdictional Runoff Management Program Annual Report Form (Attachment D or approved revision) for each Copermittee in the Watershed Management Area, certified by a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative.

(2) Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (Attachment D or approved revision) no later than October 31 of each year until the first Annual Report is required to be submitted. Each Copermittee's Annual Report form must summarize the jurisdictional activities in the WMAs in which the Copermittee has jurisdiction.

(3) Each Copermittee must provide any data or documentation utilized in developing the Annual Report upon request by the San Diego Water Board. Any monitoring data utilized in developing the Annual Report must be uploaded to the California Environmental Data Exchange Network (CEDEN).[22] Any monitoring and assessment data utilized in developing the

[22] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

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Annual Report must be provided on the Regional Clearinghouse required pursuant to Provision F.4.

c. REGIONAL MONITORING AND ASSESSMENT REPORT

(1) The Copermittees must submit a Regional Monitoring and Assessment Report no later than 180 days in advance of the expiration date of this Order. The Regional Monitoring and Assessment Report may be submitted as part of the ROWD required pursuant to Provision F.5.b. The Copermittees must review the jurisdictional and watershed monitoring data, data analyses, and assessments required pursuant to Provision D.4, to assess the following:

(a) The beneficial uses of the receiving waters within the San Diego Region that are protected or must be restored;

(b) The progress toward restoring impacted beneficial uses in the receiving waters within the San Diego Region; and

(c) Pollutants or conditions of emerging concern that may impact beneficial uses in the receiving waters within the San Diego Region.

(2) The Regional Monitoring and Assessment Report must include recommendations for improving the implementation and assessment of the Water Quality Improvement Plans and jurisdictional runoff management programs.

(3) Each Copermittee must provide any data or documentation utilized in developing the Regional Monitoring and Assessment Report upon request by the San Diego Water Board. Any monitoring and assessment data utilized in developing the Regional Monitoring and Assessment Report must be provided on the Regional Clearinghouse required pursuant to Provision F.4.

4. Regional Clearinghouse

The Copermittees[23] must develop, update, and maintain an internet-based Regional Clearinghouse that can be used to store, disseminate, and share the Copermittees' Water Quality Improvement Plans, Annual Reports, jurisdictional runoff management program documents, monitoring data, special studies, and any other data or information generated by the Copermittees during the implementation of this Order. Monitoring data collected pursuant to Provision D must be uploaded to CEDEN,[24]

[23] The Copermittee may elect to develop and maintain the clearinghouse(s) provided by other Copermittees or agencies.

[24] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

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with links to the uploaded data available on the Regional Clearinghouse. The Regional Clearinghouse may be linked to other internet-based data portals and databases where the original documents and data are stored. The Regional Clearinghouse must be available and accessible to members of the public. The Regional Clearinghouse must be developed and made available to the public no later than 18~~2~~ months after the adoption of this Order.

5. Report of Waste Discharge

a. The Orange County Copermittees and the Riverside County Copermittees, are required to submit a complete ROWD pursuant to the requirements of their current Orders and are enrolled under this Order upon expiration of their current Orders. Upon expiration of their current Orders, the Copermittees in each county must comply with the requirements of this Order by July 1 after enrollment under this Order, unless early enrollment is granted pursuant to Provision F.6 of this Order. The current Orders for the Orange County Copermittees and Riverside County Copermittees are rescinded upon their expiration date except for enforcement purposes.

b. The Copermittees must submit to the San Diego Water Board a complete ROWD as an application for the re-issuance of this NPDES permit. The ROWD must be submitted no later than 180 days in advance of the expiration date of this Order. The Copermittee may elect to develop and submit the in conjunction with or provided by another Copermittee. The ROWD must contain the following minimum information:

(1) Names and addresses of the Copermittees;

(2) Names and titles of the primary contacts of the Copermittees;

(1) Proposed changes to the Copermittees' Water Quality Improvement Plans and the supporting justification;

(3) Proposed changes to the Copermittees' jurisdictional runoff management programs and the supporting justification;

(4) Any other information necessary for the re-issuance of this Order; and

(5) Any other information required by federal regulations for NPDES permit reissuance.

6. Application for Early Enrollment

a. The Orange County Copermittees, collectively, or Riverside County Copermittees, collectively, may apply for early enrollment under this Order by submitting a Report of Waste Discharge Form 200 for each individual

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Copermittee in the respective county, with a written request for early enrollment under this Order that certifies the following conditions have been met:

(1) A Water Quality Improvement Plan has been developed in accordance with the requirements of Provision B, which can and will be implemented immediately upon enrollment under this Order;

(2) Each Copermittee in the county has updated its jurisdictional runoff management program document to incorporate the requirements of Provision E, which can and will be implemented immediately upon enrollment under this Order; and

(3) Each Copermittee in the county has updated its BMP Design Manual to incorporate the requirements of Provision E.3.d, which can and will be implemented immediately upon enrollment under this Order.

b. The San Diego Water Board will review the application for early enrollment and associated documents for completeness. A Notice of Enrollment (NOE) under this Order will be issued to the Copermittees in the respective county by the San Diego Water Board upon completion of the early enrollment application requirements. The effective enrollment date will be specified in the NOE and the Copermittees in the respective county are authorized to have MS4 discharges pursuant to the requirements of this Order starting on the date specified in the NOE. The existing Order for that county is rescinded upon the effective enrollment date specified in the NOE except for enforcement purposes.

7. Reporting Provisions

Each Copermittee must comply with all the reporting and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

~~F.~~G. PRINCIPAL WATERSHED COPERMITTEE RESPONSIBILITIES

1. The Copermittees within each Watershed Management Area must designate a Principal Watershed Copermittee and notify the San Diego Water Board of the name of the Principal Watershed Copermittee. ~~An individual Copermittee should not be designated a Principal Watershed Copermittee for more than two Watershed Management Areas.~~ The notification may be submitted with the Water Quality Improvement Plan required pursuant to Provision F.1 of this Order.

2. The Principal Watershed Copermittee is responsible for, at a minimum, the following:

a. Serving as liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues, and when necessary and appropriate, representing the Copermittees in the Watershed Management Area before the San Diego Water Board.

b. Facilitating the development of the Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order

c. Coordinating the submittal of the deliverables required by Provisions F.1, F.2, F.3.a, and F.3.b of this Order.

d. Coordinating and developing, with the other ~~Principal Watershed~~ Copermittees, the requirements of Provisions F.3.c, F.4, and F.5.b~~b~~ of this Order.

~~G.~~H. MODIFICATION OF PROGRAMS

1. Modifications of the Order may be initiated by the San Diego Water Board or by the Copermittees. Requests by Copermittees must be made to the San Diego Water Board.

2. Minor modifications to the Order may be made by the San Diego Water Board where the proposed modification complies with all the prohibitions and limitations, and other requirements of this Order.

3. Proposed modifications outside of the WQIP process that are not minor require amendment of this Order in accordance with this Order's rules, policies, and procedures.

~~H.~~I. STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

Each Copermittee must comply with all the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

ATTACHMENT A

DISCHARGE PROHIBITIONS

1. Basin Plan Waste Discharge Prohibitions

California Water Code Section 13243 provides that a Regional Water Board, in a water quality control plan, may specify certain conditions or areas where the discharge of waste or certain types of waste is not permitted. The following waste discharge prohibitions in the Water Quality Control Plan for the San Diego Basin (Basin Plan) are applicable to any person, as defined by Section 13050(c) of the California Water Code, who is a citizen, domiciliary, or political agency or entity of California whose activities in California could affect the quality of waters of the state within the boundaries of the San Diego Region.

1. The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in California Water Code Section 13050, is prohibited.

2. The discharge of waste to land, except as authorized by waste discharge requirements or the terms described in California Water Code Section 13264 is prohibited.

3. The discharge of pollutants or dredged or fill material to waters of the United States except as authorized by a National Pollutant Discharge Elimination System (NPDES) permit or a dredged or fill material permit (subject to the exemption described in California Water Code Section 13376) is prohibited.

4. Discharges of recycled water to lakes or reservoirs used for municipal water supply or to inland surface water tributaries thereto are prohibited, unless this San Diego Water Board issues a NPDES permit authorizing such a discharge; the proposed discharge has been approved by the State Department of Health Services (DHS) and the operating agency of the impacted reservoir; and the discharger has an approved fail-safe long-term disposal alternative.

5. The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the San Diego Water Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

6. The discharge of waste in a manner causing flow, ponding, or surfacing on lands not owned or under the control of the discharger is prohibited, unless the discharge is authorized by the San Diego Water Board.

7. The dumping, deposition, or discharge of waste directly into waters of the state, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the San Diego Water Board.

8. Any discharge to a storm water conveyance system that is not composed entirely of "*storm water*" is prohibited unless authorized by the San Diego Water Board. [The federal regulations, 40 CFR 122.26(b)(13), define storm water as storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from fire fighting activities.] [§122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

9. The unauthorized discharge of treated or untreated sewage to waters of the state or to a storm water conveyance system is prohibited.

10. The discharge of industrial wastes to conventional septic tank/subsurface disposal systems, except as authorized by the terms described in California Water Code Section 13264, is prohibited.

11. The discharge of radioactive wastes amenable to alternative methods of disposal into the waters of the state is prohibited.

12. The discharge of any radiological, chemical, or biological warfare agent into waters of the state is prohibited.

13. The discharge of waste into a natural or excavated site below historic water levels is prohibited unless the discharge is authorized by the San Diego Water Board.

14. The discharge of sand, silt, clay, or other earthen materials from any activity, including land grading and construction, in quantities which cause deleterious bottom deposits, turbidity or discoloration in waters of the state or which unreasonably affect, or threaten to affect, beneficial uses of such waters is prohibited.

15. The discharge of treated or untreated sewage from vessels to Mission Bay, Oceanside Harbor, Dana Point Harbor, or other small boat harbors is prohibited.

16. The discharge of untreated sewage from vessels to San Diego Bay is prohibited.

17. The discharge of treated sewage from vessels to portions of San Diego Bay that are less than 30 feet deep at mean lower low water (MLLW) is prohibited.

18. The discharge of treated sewage from vessels, which do not have a properly functioning ~~US~~ U.S. Coast Guard certified Type I or Type II marine sanitation device, to portions of San Diego Bay that are greater than 30 feet deep at mean lower low water (MLLW) is prohibited.

2. Attachment B to State Water Board Resolution 2012-0012~~X~~

Copermittees that discharge into Areas of Special Biological Significance must comply with State Water Board Resolution No. 2012-0012.

~~**Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges**~~

~~I. PROVISIONS FOR POINT SOURCE DISCHARGES OF STORM WATER AND NONPOINT SOURCE WASTE DISCHARGES~~

~~The following terms, prohibitions, and special conditions (hereafter collectively referred to as special conditions) are established as limitations on point source storm water and nonpoint source discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in Areas of Special Biological Significance (ASBS), as required for State Water Quality Protection Areas pursuant to California Public Resources Code Sections 36700(f) and 36710(f). These Special Protections are adopted by the State Water Board as part of the California Ocean Plan (Ocean Plan) General Exception.~~

~~The special conditions are organized by category of discharge. The State Water Resources Control Board (State Water Board) and Regional Water Quality Control Boards (Regional Water Boards) will determine categories and the means of regulation for those categories [e.g., Point Source Storm Water National Pollutant Discharge Elimination System (NPDES) or Nonpoint Source].~~

~~**A. PERMITTED POINT SOURCE DISCHARGES OF STORM WATER**~~

~~1. General Provisions for Permitted Point Source Discharges of Storm Water~~

~~a. Existing storm water discharges into an ASBS are allowed only under the following conditions:~~

~~(1) The discharges are authorized by an NPDES permit issued by the State Water Board or Regional Water Board;~~

~~(2) The discharges comply with all of the applicable terms, prohibitions, and special conditions contained in these Special Protections; and~~

~~(3) The discharges:~~

~~(i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;~~

~~(ii) Are designed to prevent soil erosion;~~

~~(iii) Occur only during wet weather;~~

~~(iv) Are composed of only storm water runoff.~~

~~b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.~~

~~c. The discharge of trash is prohibited.~~

~~d. Only discharges from existing storm water outfalls are allowed. Any proposed or new storm water runoff discharge shall be routed to existing storm water discharge outfalls and shall not result in any new contribution of waste to an ASBS (i.e., no additional pollutant loading). "Existing storm water outfalls" are those that were constructed or under construction prior to January 1, 2005. "New contribution of waste" is defined as any addition of waste beyond what would have occurred as of January 1, 2005. A change to an existing storm water outfall, in terms of re-location or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.~~

~~e. Non-storm water discharges are prohibited except as provided below:~~

~~(1) The term "non-storm water discharges" means any waste discharges from a municipal separate storm sewer system (MS4) or other NPDES permitted storm drain system to an ASBS that are not composed entirely of storm water.~~

~~(2) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability or occur naturally:~~

~~(i) Discharges associated with emergency fire fighting operations.~~

~~(ii) Foundation and footing drains.~~

~~(iii) Water from crawl space or basement pumps.~~

~~(iv) Hillside dewatering.~~

~~(v) Naturally occurring groundwater seepage via a storm drain.~~

~~(vi) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.~~

~~(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.~~

~~2. Compliance Plans for Inclusion in Storm Water Management Plans (SWMP) and Storm Water Pollution Prevention Plans (SWPPP).~~

~~The discharger shall specifically address the prohibition of non-storm water runoff and the requirement to maintain natural water quality for storm water discharges to an ASBS in an ASBS Compliance Plan to be included in its SWMP or a SWPPP, as appropriate to permit type. If a statewide permit includes a SWMP, then the discharger shall prepare a stand-alone compliance plan for ASBS discharges . The ASBS Compliance Plan is subject to approval by the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (for permits issued by Regional Water Boards).~~

~~a. The Compliance Plan shall include a map of surface drainage of storm water runoff, showing areas of sheet runoff, prioritize discharges, and describe any structural Best~~

~~Management Practices (BMPs) already employed and/or BMPs to be employed in the future. Priority discharges are those that pose the greatest water quality threat and which are identified to require installation of structural BMPs. The map shall also show the storm water conveyances in relation to other features such as service areas, sewage conveyances and treatment facilities, landslides, areas prone to erosion, and waste and hazardous material storage areas, if applicable. The SWMP or SWPPP shall also include a procedure for updating the map and plan when changes are made to the storm water conveyance facilities.~~

~~b. The ASBS Compliance Plan shall describe the measures by which all non-authorized non-storm water runoff (e.g., dry weather flows) has been eliminated, how these measures will be maintained over time, and how these measures are monitored and documented.~~

~~c. For Municipal Separate Storm Sewer System (MS4s), the ASBS Compliance Plan shall require minimum inspection frequencies as follows:~~

~~(1) The minimum inspection frequency for construction sites shall be weekly during rainy season;~~

~~(2) The minimum inspection frequency for industrial facilities shall be monthly during the rainy season;~~

~~(3) The minimum inspection frequency for commercial facilities (e.g., restaurants) shall be twice during the rainy season; and~~

~~(4) Storm water outfall drains equal to or greater than 18 inches (457 mm) in diameter or width shall be inspected once prior to the beginning of the rainy season and once during the rainy season and maintained to remove trash and other anthropogenic debris.~~

~~d. The ASBS Compliance Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff, that are necessary to comply with these special conditions, will be achieved through BMPs. Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that such installation would pose a threat to health or safety. BMPs to control storm water runoff discharges (at the end-of-pipe) during a design storm shall be designed to achieve on average the following target levels:~~

~~(1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or~~

~~(2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges. The baseline for the reduction is the effective date of the Exception. The baseline for these determinations is the effective date of the Exception, and the reductions must be achieved and documented within four (4) years of the effective date.~~

e. The ASBS Compliance Plan shall address erosion control and the prevention of anthropogenic sedimentation in ASBS. The natural habitat conditions in the ASBS shall not be altered as a result of anthropogenic sedimentation.

f. The ASBS Compliance Plan shall describe the non-structural BMPs currently employed and planned in the future (including those for construction activities), and include an implementation schedule. The ASBS Compliance Plan shall include non-structural BMPs that address public education and outreach. Education and outreach efforts must adequately inform the public that direct discharges of pollutants from private property not entering an MS4 are prohibited. The ASBS Compliance Plan shall also describe the structural BMPs, including any low impact development (LID) measures, currently employed and planned for higher threat discharges and include an implementation schedule. To control storm water runoff discharges (at the end-of-pipe) during a design storm, permittees must first consider using LID practices to infiltrate, use, or evapotranspirate storm water runoff on-site.

g. The BMPs and implementation schedule shall be designed to ensure that natural water quality conditions in the receiving water are achieved and maintained by either reducing flows from impervious surfaces or reducing pollutant loading, or some combination thereof.

h. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents in storm water runoff that alter natural ocean water quality and the sources of these constituents.

(2) The report shall describe BMPs that are currently being implemented, BMPs that are identified in the SWMP or SWPPP for future implementation, and any additional BMPs that may be added to the SWMP or SWPPP to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the BMPs.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits), the discharger shall revise its ASBS Compliance Plan to incorporate any new or modified BMPs that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised SWMP or SWPPP, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural ocean water quality conditions due to the same constituent.

(5) Compliance with this section does not excuse violations of any term, prohibition, or condition contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within one year from the effective date of the Exception, the discharger shall submit a written ASBS Compliance Plan to the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that describes its strategy to comply with these special conditions, including the requirement to maintain natural water quality in the affected ASBS. The ASBS Compliance Plan shall include a time schedule to implement appropriate non-structural and structural controls (implementation schedule) to comply with these special conditions for inclusion in the discharger's SWMP or SWPPP, as appropriate to permit type.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these special conditions shall be implemented.

d. Within four (4) years of the effective date of the Exception, any structural controls identified in the ASBS Compliance Plan that are necessary to comply with these special conditions shall be operational.

e. Within four (4) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water, pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data, and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

(1) for municipalities, a demonstration of significant hardship to discharger ratepayers, by showing the relationship of storm water fees to annual household income for

~~residents within the discharger's jurisdictional area, and the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or~~

~~(2) for other governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process.~~

~~**B. NONPOINT SOURCE DISCHARGES**~~

~~*[NOT INCLUDED]*~~
~~*[PROVISIONS FOR NONPOINT SOURCE DISCHARGES NOT APPLICABLE]*~~

~~II. ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES~~

~~*[NOT INCLUDED]*~~
~~*[ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES NOT APPLICABLE]*~~

~~III. ADDITIONAL REQUIREMENTS – WATERFRONT AND MARINE OPERATIONS~~

~~*[NOT INCLUDED]*~~
~~*[ADDITIONAL REQUIREMENTS FOR WATERFRONT AND MARINE OPERATIONS NOT APPLICABLE]*~~

~~IV. MONITORING REQUIREMENTS~~

~~Monitoring is mandatory for all dischargers to assure compliance with the Ocean Plan. Monitoring requirements include both: (A) core discharge monitoring, and (B) ocean receiving water monitoring. The State and Regional Water Boards must approve sampling site locations and any adjustments to the monitoring programs. All ocean receiving water and reference area monitoring must be comparable with the Water Boards' Surface Water Ambient Monitoring Program (SWAMP).~~

~~Safety concerns: Sample locations and sampling periods must be determined considering safety issues. Sampling may be postponed upon notification to the State and Regional Water Boards if hazardous conditions prevail.~~

~~Analytical Chemistry Methods: All constituents must be analyzed using the lowest minimum detection limits comparable to the Ocean Plan water quality objectives. For metal analysis, all samples, including storm water effluent, reference samples, and ocean receiving water samples, must be analyzed by the approved analytical method with the lowest minimum detection limits (currently Inductively Coupled Plasma/Mass Spectrometry) described in the Ocean Plan.~~

~~**A. CORE DISCHARGE MONITORING PROGRAM**~~

~~1. General sampling requirements for timing and storm size:~~

~~Runoff must be collected during a storm event that is greater than 0.1 inch and generates runoff, and at least 72 hours from the previously measurable storm event. Runoff samples shall be collected when post-storm receiving water is sampled, and analyzed for the same constituents as receiving water and reference site samples (see section IV B) as described below.~~

~~2. Runoff flow measurements~~

~~a. For municipal/industrial storm water outfalls in existence as of December 31, 2007, 18 inches (457mm) or greater in diameter/width (including multiple outfall pipes in combination having a width of 18 inches, runoff flows must be measured or calculated, using a method acceptable to and approved by the State and Regional Water Boards.~~
~~b. This will be reported annually for each precipitation season to the State and Regional Water Boards.~~

~~3. Runoff samples – storm events~~

~~a. For outfalls equal to or greater than 18 inches (0.46m) in diameter or width:~~

~~(1) samples of storm water runoff shall be analyzed during the same storm as receiving water samples for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination, ; and~~

~~(2) samples of storm water runoff shall be analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS~~

~~(3) If an applicant has no outfall greater than 36 inches, then storm water runoff from the applicant's largest outfall shall be further analyzed during the same storm as receiving water samples for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates).~~

~~b. For outfalls equal to or greater than 36 inches (0.91m) in diameter or width:~~

~~(1) samples of storm water runoff shall be analyzed during the same storm as receiving water samples for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and~~

~~(2) samples of storm water runoff shall be further analyzed during the same storm as receiving water samples for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates) and~~

~~(3) samples of storm water runoff shall be analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.~~

c. For an applicant not participating in a regional monitoring program [see below in Section IV (B)] in addition to (a.) and (b.) above, a minimum of the two largest outfalls or 20 percent of the larger outfalls, whichever is greater, shall be sampled (flow weighted composite samples) at least three times annually during wet weather (storm event) and analyzed for all Ocean Plan Table A constituents, Table B constituents for marine aquatic life protection (except for toxicity, only chronic toxicity for three species shall be required), DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, and Ocean Plan indicator bacteria. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one (the largest) such discharge shall be sampled annually in each Region.

4. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may reduce or suspend core monitoring once the storm runoff is fully characterized. This determination may be made at any point after the discharge is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

B. OCEAN RECEIVING WATER AND REFERENCE AREA MONITORING PROGRAM

In addition to performing the Core Discharge Monitoring Program in Section II.A above, all applicants having authorized discharges must perform ocean receiving water monitoring. In order to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS, dischargers may choose either (1) an individual monitoring program, or (2) participation in a regional integrated monitoring program.

1. Individual Monitoring Program: The requirements listed below are for those dischargers who elect to perform an individual monitoring program to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within the affected ASBS. In addition to Core Discharge Monitoring, the following additional monitoring requirements shall be met:

   a. Three times annually, during wet weather (storm events), the receiving water at the point of discharge from the outfalls described in section (IV)(A)(3)(c) above shall be sampled and analyzed for Ocean Plan Table A constituents, Table B constituents for marine aquatic life, DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, salinity, chronic toxicity (three species), and Ocean Plan indicator bacteria.

      The sample location for the ocean receiving water shall be in the surf zone at the point of discharges; this must be at the same location where storm water runoff is sampled. Receiving water shall be sampled at approximately the same time prior to (pre-storm) and during (or immediately after) the same storm (post storm). Reference water quality shall also be sampled and analyzed for the same constituents pre-storm and post-storm, during the same storms when receiving water is sampled. Reference stations will be determined by the State Water Board's Division of Water Quality and the applicable Regional Water Board(s).

   b. Sediment sampling shall occur at least three times during every five (5) year period. The subtidal sediment (sand or finer, if present) at the discharge shall be sampled and analyzed for Ocean Plan Table B constituents for marine aquatic life, DDT, PCBs, PAHs,

~~pyrethroids, and OP pesticides. For sediment toxicity testing, only an acute toxicity test using the amphipod Eohaustorius estuarius must be performed.~~

~~c. A quantitative survey of intertidal benthic marine life shall be performed at the discharge and at a reference site. The survey shall be performed at least once every five (5) year period. The survey design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The results of the survey shall be completed and submitted to the State Water Board and Regional Water Board at least six months prior to the end of the permit cycle.~~

~~d. Once during each five (5) year period, a bioaccumulation study shall be conducted to determine the concentrations of metals and synthetic organic pollutants at representative discharge sites and at representative reference sites. The study design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The bioaccumulation study may include California mussels (Mytilus californianus) and/or sand crabs (Emerita analoga or Blepharipoda occidentalis). Based on the study results, the Regional Water Board and the State Water Board's Division of Water Quality, may adjust the study design in subsequent permits, or add or modify additional test organisms (such as shore crabs or fish), or modify the study design appropriate for the area and best available sensitive measures of contaminant exposure.~~

~~e. Marine Debris: Representative quantitative observations for trash by type and source shall be performed along the coast of the ASBS within the influence of the discharger's outfalls. The design, including locations and frequency, of the marine debris observations is subject to approval by the Regional Water Board and State Water Board's Division of Water Quality.~~

~~f. The monitoring requirements of the Individual Monitoring Program in this section are minimum requirements. After a minimum of one (1) year of continuous water quality monitoring of the discharges and ocean receiving waters, the Executive Director of the State Water Board (statewide permits) or Executive officer of the Regional Water Board (Regional Water Board permits) may require additional monitoring, or adjust, reduce or suspend receiving water and reference station monitoring. This determination may be made at any point after the discharge and receiving water is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.~~

~~2. Regional Integrated Monitoring Program: Dischargers may elect to participate in a regional integrated monitoring program, in lieu of an individual monitoring program, to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS. This regional approach shall characterize natural water quality, pre- and post-storm, in ocean reference areas near the mouths of identified open space watersheds and the effects of the discharges on natural water quality (physical, chemical, and toxicity) in the ASBS receiving waters, and should include benthic marine aquatic life and bioaccumulation components. The design of the ASBS stratum of a regional integrated monitoring program may deviate from the otherwise prescribed individual monitoring approach (in Section IV.B.1) if approved by the State Water Board's Division of Water Quality and the Regional Water Boards.~~

~~a. Ocean reference areas shall be located at the drainages of flowing watersheds with minimal development (in no instance more than 10% development), and shall not be located in CWA Section 303(d) listed waterbodies or have tributaries that are 303(d)~~

~~listed. Reference areas shall be free of wastewater discharges and anthropogenic non-storm water runoff. A minimum of low threat storm runoff discharges (e.g. stream highway overpasses and campgrounds) may be allowed on a case-by-case basis. Reference areas shall be located in the same region as the ASBS receiving water monitoring occurs. The reference areas for each Region are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean reference water samples must be collected from each station, each from a separate storm. A minimum of one reference location shall be sampled for each ASBS receiving water site sampled per responsible party. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.~~

~~b. ASBS ocean receiving water must be sampled in the surf zone at the location where the runoff makes contact with ocean water (i.e. at "point zero"). Ocean receiving water stations must be representative of worst-case discharge conditions (i.e. co-located at a large drain greater than 36 inches, or if drains greater than 36 inches are not present in the ASBS then the largest drain greater than18 inches.) Ocean receiving water stations are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean receiving water samples must be collected during each storm season from each station, each from a separate storm. A minimum of one receiving water location shall be sampled in each ASBS per responsible party in that ASBS. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.~~

~~c. Reference and receiving water sampling shall commence during the first full storm season following the adoption of these special conditions, and post-storm samples shall be collected when annual storm water runoff is sampled. Sampling shall occur in a minimum of two storm seasons. For those ASBS dischargers that have already participated in the Southern California Bight 2008 ASBS regional monitoring effort, sampling may be limited to only one storm season.~~

~~d. Receiving water and reference samples shall be analyzed for the same constituents as storm water runoff samples. At a minimum, constituents to be sampled and analyzed in reference and discharge receiving waters must include oil and grease, total suspended solids, Ocean Plan Table B metals for protection of marine life, Ocean Plan PAHs, pyrethroids, OP pesticides, ammonia, nitrate, phosphates, and critical life stage chronic toxicity for three species. In addition, within the range of the southern sea otter, indicator bacteria or some other measure of fecal contamination shall be analyzed.~~

~~3. Waterfront and Marine Operations: In addition to the above requirements for ocean receiving water monitoring, additional monitoring must be performed for marinas and boat launch and pier facilities:~~

~~a. For all marina or mooring field operators, in mooring fields with 10 or more occupied moorings, the ocean receiving water must be sampled for Ocean Plan indicator bacteria, residual chlorine, copper, zinc, grease and oil, methylene blue active substances (MBAS), and ammonia nitrogen.~~

~~(1) For mooring field operators opting for an individual monitoring program (Section IV.B.1 above), this sampling must occur weekly (on the weekend) from May through October.~~

~~(2) For mooring field operators opting to participate in a regional integrated monitoring program (Section IV.B.2 above), this sampling must occur monthly from May through October on a high use weekend in each month. The Water Boards may allow a reduction in the frequency of sampling, through the regional monitoring program, after the first year of monitoring.~~

~~b. For all mooring field operators, the subtidal sediment (sand or finer, if present) within mooring fields and below piers shall be sampled and analyzed for Ocean Plan Table B metals (for marine aquatic life beneficial use), acute toxicity, PAHs, and tributyltin. For sediment toxicity testing, only an acute toxicity test using the amphipod Eohaustorius estuarius must be performed. This sampling shall occur at least three times during a five (5) year period. For mooring field operators opting to participate in a regional integrated monitoring program, the Water Boards may allow a reduction in the frequency of sampling after the first sampling effort's results are assessed.~~

ATTACHMENT B

STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

1. Standard Permit Provisions

Code of Federal Regulations Title 40 Section 122.41 (40 CFR 122.41) includes conditions, or provisions, that apply to all National Pollutant Discharge Elimination System (NPDES) permits. Additional provisions applicable to NPDES permits are in 40 CFR 122.42. All applicable provisions in 40 CFR 122.41 and 40 CFR 122.42 must be incorporated into this Order and NPDES permit. The applicable 40 CFR 122.41 and 40 CFR 122.42 provisions are as follows:

a. DUTY TO COMPLY [40 CFR 122.41(a)]

The Copermittee must comply with all of the provisions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

(1) The Copermittee must comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement. [40 CFR 122.41(a)(1)]

(2) The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to a civil penalty not to exceed $25,000 per day for each violation. The CWA provides that any person who *negligently* violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than 2 years, or both. Any person who *knowingly* violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal

penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both. Any person who knowingly violates Section 301, 302, 303, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, and who knows at that time that he thereby places another person in imminent danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.
[40 CFR 122.41(a)(2)]

(3) Any person may be assessed an administrative penalty by the San Diego Regional Water Quality Control Board (San Diego Water Board), State Water Resources Control Board (State Water Board), or United States Environmental Protection Agency (USEPA) for violating Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.
[40 CFR 122.41(a)(3)]

b. DUTY TO REAPPLY [40 CFR 122.41(B)]

If a Copermittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Copermittee must apply for and obtain a new permit.

c. NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE [40 CFR 122.41(C)]

It shall not be a defense for a Copermittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

d. DUTY TO MITIGATE [40 CFR 122.41(D)]

The Copermittee must take all reasonable steps to minimize or prevent any discharge or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

e. PROPER OPERATION AND MAINTENANCE [40 CFR 122.41(E)]

The Copermittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Copermittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by a Copermittee only when the operation is necessary to achieve compliance with the conditions of this permit.

f. PERMIT ACTIONS [40 CFR 122.41(F)]

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Copermittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

g. PROPERTY RIGHTS [40 CFR 122.41(G)]

This permit does not convey any property rights of any sort, or any exclusive privilege.

h. DUTY TO PROVIDE INFORMATION [40 CFR 122.41(H)]

The Copermittee must furnish to the San Diego Water Board, State Water Board, or USEPA within a reasonable time, any information which the San Diego Water Board, State Water Board, or USPEA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Copermittee must also furnish to the San Diego Water Board, State Water Board, or USPEA upon request, copies of records required to be kept by this permit.

i. INSPECTION AND ENTRY [40 CFR 122.41(I)]

The Copermittee must allow the San Diego Water Board, State Water Board, USEPA, and/or their authorized representative (including an authorized contractor acting as their representative), upon presentation of credentials and other documents as may be required by law, to:

(1) Enter upon the Copermittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit; [40 CFR 122.41(i)(1)]

(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit; [40 CFR 122.41(i)(2)]

(3) Inspect and photograph at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; [40 CFR 122.41(i)(3)] and

(4) Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location. [40 CFR 122.41(i)(4)]

j. MONITORING AND RECORDS [40 CFR 122.41(J)]

(1) Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity. [40 CFR 122.41(j)(1)]

(2) Except for records of monitoring information required by this permit related to the Copermittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five (5) years (or longer as required by 40 CFR Part 503), the Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time. [40 CFR 122.41(j)(2)]

(3) Records for monitoring information must include: [40 CFR 122.41(j)(3)]

(a) The date, exact place, and time of sampling or measurements; [40 CFR 122.41(j)(3)(i)]
(b) The individual(s) who performed the sampling or measurements; [40 CFR 122.41(j)(3)(ii)]
(c) The date(s) analyses were performed; [40 CFR 122.41(j)(3)(iii)]
(d) The individual(s) who performed the analyses; [40 CFR 122.41(j)(3)(iv)]
(e) The analytical techniques or methods used; [40 CFR 122.41(j)(3)(v)] and
(f) The results of such analyses. [40 CFR 122.41(j)(3)(vi)]

(4) Monitoring must be conducted according to test procedures under 40 CFR Part 136 unless another method is required under 40 CFR Subchapters N or O.
[40 CFR 122.41(j)(4)]

In the case of pollutants for which there are no approved methods under 40 CFR Part 136 or otherwise required under 40 CFR Subchapters N and O, monitoring must be conducted according to a test procedure specified in the permit for such pollutants. [40 CFR 122.44(i)(1)(iv)]

(5) The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not

more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. [40 CFR 122.41(j)(5)]

k. SIGNATORY REQUIREMENT [40 CFR 122.41(K)]

(1) All applications, reports, or information submitted to the San Diego Water Board, State Water Board, or USEPA must be signed and certified. (See 40 CFR 122.22) [40 CFR 122.41(k)(1)]

(a) *For a municipality, State, Federal, or other public agency.* [All applications must be signed] [b]y either a principal executive officer or ranking elected official. [40 CFR 122.22(a)(3)]

(b) All reports required by permits, and other information requested by the San Diego Water Board, State Water Board, or USEPA must be signed by a person described in paragraph (a) of this section, or by a duly authorized representative of that person. A person is a duly authorized representative only if: [40 CFR 122.22(b)]

(i) The authorization is made in writing by a person described in paragraph (a) of this section; [40 CFR 122.22(b)(1)]

(ii) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company, (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) [40 CFR 122.22(b)(2)] and,

(iii) The written authorization is submitted to the San Diego Water Board and State Water Board. [40 CFR 122.22(b)(3)]

(c) *Changes to authorization.* If an authorization under paragraph (b) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (b) of this section must be submitted to the San Diego Water Board prior to or together with any reports, information, or applications to be signed by an authorized representative. [40 CFR 122.22(c)]

(d) *Certification.* Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly

responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." [40 CFR 122.22(d)]

(2) The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both. [40 CFR 122.41(k)(2)]

l. REPORTING REQUIREMENTS [40 CFR 122.41(L)]

(1) *Planned changes.* The Copermittee must give notice to the San Diego Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when: [40 CFR 122.41(l)(1)]

(a) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b);
[40 CFR 122.41(l)(1)(i)] or

(b) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1).
[40 CFR 122.41(l)(1)(ii)]

(c) The alteration or addition results in a significant change in the Copermittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. [40 CFR 122.41(l)(1)(iii)]

(2) Anticipated noncompliance. The Copermittee must give advance notice to the San Diego Water Board or State Water Board of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.
[40 CFR 122.41(l)(2)]

(3) *Transfers*. This permit is not transferable to any person except after notice to the San Diego Water Board. The San Diego Water Board may require modification or revocation and reissuance of the permit to change the name of the Copermittee and incorporate such other requirements as may be necessary under the CWA.
[40 CFR 122.41(l)(3)]

(4) Monitoring reports. Monitoring results must be reported at the intervals specified elsewhere in this permit. [40 CFR 122.41(l)(4)]

(a) Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the San Diego Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices. [40 CFR 122.41(l)(4)(i)]

(b) If the Copermittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or another method required for an industry-specific waste stream under 40 CFR Subchapters N or O, the results of this monitoring must be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the San Diego Water Board or State Water Board.
[40 CFR 122.41(l)(4)(ii)]

(c) Calculations for all limitations which require averaging of measurements must utilize an arithmetic mean unless otherwise specified in the permit.
[40 CFR 122.41(l)(4)(iii)]

(5) *Compliance schedules*. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date. [40 CFR 122.41(l)(5)]

(6) Twenty-four hour reporting.

(a) The Copermittee must report any noncompliance that may endanger health or the environment. Any information must be provided orally within 24 hours from the time the Copermittee becomes aware of the circumstances. A written submission must also be provided within five (5) days of the time the Copermittee becomes aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6)(i)]

(b) The following must be included as information which must be reported within 24 hours under this paragraph: [40 CFR 122.41(l)(6)(ii)]

(i) Any unanticipated bypass that exceeds any effluent limitation in the permit (See 40 CFR 122.41(g)). [40 CFR 122.41(l)(6)(ii)(A)]

(ii) Any upset which exceeds any effluent limitation in the permit. [40 CFR 122.41(l)(6)(ii)(B)] and,

(iii) Violation of a maximum daily discharge limitation for any of the pollutants listed by the San Diego Water Board in the permit to be reported within 24 hours. (See 40 CFR 122.44(g)) [40 CFR 122.41(l)(6)(ii)(C)]

(c) The San Diego Water Board may waive the above-required written report on a case-by-case basis if the oral report has been received within 24 hours. [40 CFR 122.41(l)(6)(iii)]

(7) .*Other noncompliance.* The Copermittee must report all instances of noncompliance not reported in accordance with the standard provisions required under 40 CFR 122.41(l)(4), (5), and (6), at the time monitoring reports are submitted. The reports must contain the information listed in the standard provisions required under 40 CFR 122.41(l)(6). [40 CFR 122.41(l)(7))]

(8) *Other information.* When the Copermittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the San Diego Water Board, State Water Board, or USEPA, the Copermittee must promptly submit such facts or information. [40 CFR 122.41(l)(8)]

~~**a. BYPASS** [40 CFR 122.41(m)]~~

~~(1) *Definitions.*~~

~~(a) "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. [40 CFR 122.41(m)(1)(i)] or~~

~~(b) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production. [40 CFR 122.41(m)(1)(ii)]~~

~~(2) *Bypass not exceeding limitations.* The Copermittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the standard provisions required under 40 CFR 122.41(m)(3) and (4). [40 CFR 122.41(m)(2)]~~

~~(3) *Notice.*~~

~~(a) *Anticipated bypass.* If the Copermittee knows in advance of the need for a bypass, it must submit a notice, if possible at least ten days before the date of the bypass. [40 CFR 122.41(m)(3)(i)] or~~

~~(b) *Unanticipated bypass*. The Copermittee must submit notice of an unanticipated bypass in accordance with the standard provisions required under 40 CFR 122.41(l)(6) (24-hour notice).~~
~~[40 CFR 122.41(m)(3)(ii)]~~

~~(4) *Prohibition of Bypass.*~~

~~(a) Bypass is prohibited, and the San Diego Water Board may take enforcement action against a Copermittee for bypass, unless:~~
~~[40 CFR 122.41(m)(4)(i)]~~

~~(i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; [40 CFR 122.41(m)(4)(i)(A)]~~
~~(ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance;~~
~~[40 CFR 122.41(m)(4)(i)(B)] and,~~
~~(iii) The Copermittee submitted notice in accordance with the standard provisions required under 40 CFR 122.41(m)(3).~~
~~[40 CFR 122.41(m)(4)(i)(C)]~~

~~(b) The San Diego Water Board may approve an anticipated bypass, after considering its adverse effects, if the San Diego Water Board determines that it will meet the three conditions listed above.~~
~~[40 CFR 122.41(m)(4)(ii)]~~

m. UPSET [40 CFR 122.41(N)]

(1) *Definition.* "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Copermittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. [40 CFR 122.41(n)(1)]

(2) *Effect of an upset*. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the standard provisions required under 40 CFR 122.41(n)(3) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. [40 CFR 122.41(n)(2)]

(3) *Conditions necessary for a demonstration of upset*. A Copermittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:
[40 CFR 122.41(n)(3)]

(a) An upset occurred and that the Copermittee can identify the cause(s) of the upset; [40 CFR 122.41(n)(3)(i)]
(b) The permitted facility was at the time being properly operated; [40 CFR 122.41(n)(3)(ii)] and
(c) The Copermittee submitted notice of the upset in accordance with the standard provisions required under 40 CFR 122.41(l)(6)(ii)(B) (24-hour notice).
[40 CFR 122.41(n)(3)(iii)]
(d) The Copermittee complied with any remedial measures pursuant to the standard provisions required under 40 CFR 122.41(d).
[40 CFR 122.41(n)(3)(iii)]

(4) *Burden of proof*. In any enforcement proceeding, the Copermittee seeking to establish the occurrence of an upset has the burden of proof.
[40 CFR 122.41(n)(4)]

n. STANDARD PERMIT PROVISIONS FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS
[40 CFR 122.42(C)]

The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the San Diego Water Board or State Water Board under 40 CFR 122.26(a)(1)(v) must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report must include:

(1) The status of implementing the components of the storm water management program that are established as permit conditions; [40 CFR 122.42(c)(1)]

(1) ~~Proposed changes to the storm water management programs that are established as permit conditions. Such proposed changes must be consistent with 40 CFR 122.26(d)(2)(iii); [40 CFR 122.42(c)(2)] and~~e

(2) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under 40 CFR 122.26(d)(2)(iv) and (v);
[40 CFR 122.42(c)(3)]

(3) A summary of data, including monitoring data, that is accumulated throughout the reporting year; [40 CFR 122.42(c)(4)]

(4) Annual expenditures and budget for year following each annual report;
[40 CFR 122.42(c)(5)]

(5) A summary describing the number and nature of enforcement actions, inspections, and public education programs; [40 CFR 122.42(c)(6)]

(6) Identification of water quality improvements or degradation. [40 CFR 122.42(c)(7)]

o. STANDARD PERMIT PROVISIONS FOR STORM WATER DISCHARGES [40 CFR 122.42(D)]

The initial permits for discharges composed entirely of storm water issued pursuant to 40 CFR 122.26(e)(7) must require compliance with the conditions of the permit as expeditiously as practicable, but in no event later than three years after the date of issuance of the permit.

2. General Provisions

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. The general provisions applicable to this Order and NPDES permit are as follows:

a. DISCHARGE OF WASTE IS A PRIVILEGE

No discharge of waste into the waters of the State, whether or not such discharge is made pursuant to waste discharge requirements, shall create a vested right to continue such discharge. All discharges of waste into waters of the State are privileges, not rights. [CWC Section 13263(g)]

b. DURATION OF ORDER AND NPDES PERMIT

(1) *Effective date*. This Order and NPDES permit becomes effective on the date of its adoption provided the USEPA has no objection. If the USEPA objects to its issuance, this Order shall not become effective until such objection is withdrawn. This Order supersedes Order No. R9-2007-0001 upon the effective date of this Order, and supercedes Order Nos. R9-2009-0002 and R9-2010-0016 upon their expiration.

(2) *Expiration*. This Order and NPDES permit expires five years after adoption. [40 CFR 122.46(a)]

(3) *Continuation of expired order*. After this Order and NPDES permit expires, the terms and conditions of this Order and NPDES permit are automatically continued pending issuance of a new permit if all requirements of the federal NPDES regulations on the continuation of expired permits (40 CFR 122.6) are complied with.

c. AVAILABILITY

A copy of this Order must be kept at a readily accessible location and must be available to on-site personnel at all times.

d. CONFIDENTIALITY OF INFORMATION

Except as provided for in 40 CFR 122.7, no information or documents submitted in accordance with or in application for this Order will be considered confidential, and all such information and documents shall be available for review by the public at the San Diego Water Board office.

Claims of confidentiality for the following information will be denied: [40 CFR 122.7(b)]

(1) The name and address of any permit applicant or Copermittee; [40 CFR 122.7(b)(1)] and

(2) Permit applications and attachments, permits, and effluent data. [40 CFR 122.7(b)(2)]

e. EFFLUENT LIMITATIONS

(1) *Interim effluent limitations*. The Copermittee must comply with any interim effluent limitations as established by addendum, enforcement action, or revised waste discharge requirements which have been, or may be, adopted by the San Diego Water Board.

(2) *Other effluent limitations and standards*. If any applicable toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant and that standard or prohibition is more stringent than any limitation on the pollutant in the permit, the San Diego Water Board shall institute proceedings under these regulations to modify or revoke and reissue the permit to conform to the toxic effluent standard or prohibition. [40 CFR 122.44(b)(1)]

f. DUTY TO MINIMIZE OR CORRECT ADVERSE IMPACTS

The Copermittee must take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this Order, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the noncompliance.

g. PERMIT ACTIONS

The filing of a request by the Copermittee for modification, revocation and reissuance, or termination of this Order, or a notification of planned change in or anticipated noncompliance with this Order does not stay any condition of this Order. (See 40 CFR 122.41(f)) In addition, the following provisions apply to this Order:

(1) Upon application by any affected person, or on its own motion, the San Diego Water Board may review and revise the requirements in this Order. All requirements must be reviewed periodically. [CWC Section 13263(e)]

(2) This Order may be terminated or modified for cause, including, but not limited to, all of the following: [CWC Section 13381]

(a) Violation of any condition contained in the requirements of this Order. [CWC Section 13381(a)]

(b) Obtaining the requirements in this Order by misrepresentation, or failure to disclose fully all relevant facts. [CWC Section 13381(b)]

(c) A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge. [CWC Section 13381(c)]

(3) When this Order is transferred to a new owner or operator, such requirements as may be necessary under the CWC may be incorporated into this Order.

h. NPDES PERMITTED NON-STORM WATER DISCHARGES

The San Diego Water Board has, in prior years, issued a limited number of individual NPDES permits for non-storm water discharges to MS4s. The San Diego Water Board or State Water Board may in the future, upon prior notice to the Copermittee(s), issue an NPDES permit for any non-storm water discharge (or class of non-storm water discharges) to an MS4.

i. MONITORING

In addition to the standard provisions required under 40 CFR 122.41(j) and (l)(4), the following general monitoring provisions apply to this Order:

(1) Where procedures are not otherwise specified in Order, sampling, analysis and quality assurance/quality control must be conducted in accordance with the Quality Assurance Management Plan (QAMP) for the State of California's Surface Water Ambient Monitoring Program (SWAMP), adopted by the State Water Resources Control Board (State Water Board).

(2) Pursuant to 40 CFR 122.41(j)(2) and CWC Section 13383(a), each Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five (5) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time.

(3) All chemical, bacteriological, and toxicity analyses must be conducted at a laboratory certified for such analyses by the California Department of Public Health or a laboratory approved by the San Diego Water Board.

(4) For priority toxic pollutants that are identified in the California Toxics Rule (CTR) (65 Fed. Reg. 31682), the Copermittees must instruct their laboratories to establish

calibration standards that are equivalent to or lower than the Minimum Levels (MLs) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP). If a Copermittee can demonstrate that a particular ML is not attainable, in accordance with procedures set forth in 40 CFR Part 136, the lowest quantifiable concentration of the lowest calibration standard analyzed by a specific analytical procedure (assuming that all the method specified sample weights, volumes, and processing steps have been followed) may be used instead of the ML listed in Appendix 4 of the SIP. The Copermittee must submit documentation from the laboratory to the San Diego Water Board for approval prior to raising the ML for any priority toxic pollutant.

j. ENFORCEMENT

(1) The San Diego Water Board is authorized to enforce the terms of this Order under several provisions of the CWC, including, but not limited to, CWC Sections 13385, 13386, and 13387.

(2) Nothing in this Order shall be construed to protect the Copermittee from its liabilities under federal, state, or local laws.

(3) The CWC provides for civil and criminal penalties comparable to, and in some cases greater than, those provided for under the CWA.

(4) Except as provided in the standard conditions required under 40 CFR 122.41(m) and (n), nothing in this Order shall be construed to relieve the Copermittee from civil or criminal penalties for noncompliance.

(5) Nothing in this Order shall be construed to preclude the institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties to which the Copermittee is or may be subject to under Section 311 of the CWA.

(6) Nothing in this Order shall be construed to preclude institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authoring preserved by Section 510 of the CWA.

k. SEVERABILITY

The provisions of this Order are severable, and if any provision of this Order, or the application of any provisions of this Order to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this Order shall not be affected thereby.

l. APPLICATIONS

Any application submitted by a Copermittee for reissuance or modification of this Order must satisfy all applicable requirements specified in federal regulations as well as any additional requirements for submittal of a Report of Waste Discharge specified in the CWC and the California Code of Regulations.

m. IMPLEMENTATION

All plans, reports and subsequent amendments submitted in compliance with this Order must be implemented immediately (or as otherwise specified). All submittals by Copermittees must be adequate to implement the requirements of this Order.

n. REPORT SUBMITTALS

(1) All report submittals must include an executive summary, introduction, conclusion, recommendations, and signed certified statement.

(2) Each Copermittee must submit a signed certified statement covering its responsibilities for each applicable submittal.

(3) The Principal Watershed Copermittee(s) must submit a signed certified statement covering its responsibilities for each applicable submittal and the sections of the submittals for which it is responsible.

(4) Unless otherwise directed, the Copermittees must submit one hard copy and one electronic copy of each report required under this Order to the San Diego Water Board, and one electronic copy to the USEPA.

(5) The Copermittees must submit reports and provide notifications as required by this Order to the following:

EXECUTIVE OFFICER
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
9174 SKY PARK COURT, SUITE 100
SAN DIEGO CA 92123-4340
Telephone: (858) 467-2952 Fax: (858) 571-6972

EUGENE BROMLEY
US ENVIRONMENTAL PROTECTION AGENCY
REGION IX
PERMITS ISSUANCE SECTION (W-5-1)
75 HAWTHORNE STREET
SAN FRANCISCO CA 94105

ADMINISTRATIVE DRAFT

ATTACHMENT C

ACRONYMS AND ABBREVIATIONS

1. Acronyms and Abbreviations

AMAL	Average Monthly Action Level
ASBS	Area(s) of Special Biological Significance
BMP	Best Management Practice
~~BMP Design Manual~~	~~Permanent BMP Sizing Criteria Design Manual~~
Basin Plan	Water Quality Control Plan for the San Diego Basin
CEQA	California Environmental Quality Act
CCR	California Code of Regulations
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWC	California Water Code
CZARA	Coastal Zone Act Reauthorization Amendments of 1990
ERP	Enforcement Response Plan
ESAs	Environmentally Sensitive Areas
GIS	Geographic Information System
IBI	Index of Biotic Integrity
LID	Low Impact Development
MDAL	Maximum Daily Action Level
MEP	Maximum Extent Practicable
ML	Minimum Level
MS4	Municipal Separate Storm Sewer System
NAL	Non-Storm Water Action Level
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
ROWD	Report of Waste Discharge (application for NPDES reissuance)
SAL	Storm Water Action Level
San Diego Water Board	California Regional Water Quality Control Board, San Diego Region
SIC	Standard Industrial Classification Code
State Water Board	State Water Resources Control Board
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
Waters of the U.S.	Waters of the United States

WDID	Waste Discharge Identification Number
WLA	Waste Load Allocation
WQBEL	Water Quality Based Effluent Limitation

DEFINITIONS

2. Definitions

Active/Passive Sediment Treatment - Using mechanical, electrical or chemical means to flocculate or coagulate suspended sediment for removal from runoff from construction sites prior to discharge.

Anthropogenic Litter – Trash generated from human activities, not including sediment.

Average Monthly Action Level – The highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month or the geometric mean for bacteria, as applicable.

Beneficial Uses - The uses of water necessary for the survival or well being of man, plants, and wildlife. These uses of water serve to promote tangible and intangible economic, social, and environmental goals. "Beneficial Uses" of the waters of the State that may be protected include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. Existing beneficial uses are uses that were attained in the surface or ground water on or after November 28, 1975; and potential beneficial uses are uses that would probably develop in future years through the implementation of various control measures. "Beneficial Uses" are equivalent to "Designated Uses" under federal law. [California Water Code Section 13050(f)].

Best Management Practices (BMPs) - Defined in 40 CFR 122.2 as schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. In the case of municipal ~~storm water~~discharge permits, BMPs may be used in place of numeric effluent limits.

Bioassessment - The use of biological community information to evaluate the biological integrity of a water body and its watershed. With respect to aquatic ecosystems, bioassessment is the collection and analysis of samples of the benthic macroinvertebrate community together with physical/habitat quality measurements associated with the sampling site and the watershed to evaluate the biological condition (i.e. biotic integrity) of a water body.

Biocriteria - Under the CWA, numerical values or narrative expressions that define a desired biological condition for a water body that are legally enforceable. The USEPA defines biocriteria as: "numerical values or narrative expressions that describe the reference biological integrity of aquatic communities inhabiting waters of a given designated aquatic life use… (that)…describe the characteristics of water body segments least impaired by human activities."

Biofiltration - Practices that use vegetation and amended soils to detain and treat runoff from impervious areas. Treatment is through filtration, infiltration, adsorption, ion exchange, and biological uptake of pollutants.

Biological Integrity - Defined in Karr J.R. and D.R. Dudley. 1981. Ecological perspective on water quality goals. *Environmental Management* 5:55-68 as: "A balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitat of the region." Also referred to as ecosystem health.

BMP Design Manual – A plan developed to eliminate, reduce, or mitigate the impacts of runoff from development projects, including Priority Development Projects.

Channel Rehabilitation and Improvement –Remedial measures or activities for the purpose of improving or restoring the environmental health of streams, channels or river systems. Techniques may vary from in-stream restoration techniques to off-line stormwater management practices installed in the system corridor or upland areas. Rehabilitation techniques may include, but are not limited to the following: riparian zone restoration, constructed wetlands, bank stabilization, channel modifications, and daylighting of drainage systems. Effectiveness may be measured in various manners, including: assessments of habitat, reduced streambank erosion, and restoration of water and sediment transport balance.

Clean Water Act Section 303(d) Water Body - An impaired water body in which water quality does not meet applicable water quality standards and/or is not expected to meet water quality standards, even after the application of technology based pollution controls required by the CWA. The discharge of runoff to these water bodies by the Copermittees is significant because these discharges can cause or contribute to violations of applicable water quality standards.

Construction Site – Any project, including projects requiring coverage under the Construction General Permit, that involves soil disturbing activities including, but not limited to, clearing, grading, disturbances to ground such as stockpiling, and excavation. This does not include minor construction activities such as interior remodeling, plumbing, electrical, or mechanical work.

Contamination - As defined in the Porter-Cologne Water Quality Control Act, contamination is "an impairment of the quality of waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste whether or not waters of the State are affected."

Copermittee – An incorporated city within the County of Orange, County of Riverside, or County of San Diego in the San Diego Region (Region 9), the County of Orange, the County of Riverside, the County of San Diego, the Orange County Flood Control District, the Riverside County Water Conservation and Flood Control District, the San Diego Regional Airport Authority, or the Unified Port District of San Diego.

Copermittees – All of the individual Copermittees, collectively.

Critical Channel Flow (Qc) – The channel flow that produces the critical shear stress that initiates bed movement or that erodes the toe of channel banks. When measuring Qc, it should be based on the weakest boundary material – either bed or bank.

Daily Discharge – Defined as either: (1) the total mass of the constituent discharged over the calendar day or any 24 hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a

constituent with limitations expressed in other units of measurement (e.g. concentration.)

The Daily Discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day, or other 24 hour period other than a day), or by the arithmetic mean of analytical results from one or more grab samples taken over the course of a day.

Development Projects - Construction, rehabilitation, redevelopment, or reconstruction of any public or private projects involving land disturbance activities. ~~residential project, industrial, commercial, or any other projects.~~

Dry Season – ~~The period of time from~~ May 1 to September 30. ~~when rainfall is not expected to occur the San Diego.~~

Dry Weather – Weather is considered dry if the preceding 72 hours has been without measurable precipitation (>0.1 inch).

Enclosed Bays – Enclosed bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost bay works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays do not include inland surface waters or ocean waters.

Erosion – When land is diminished or worn away due to wind, water, or glacial ice. Often the eroded debris (silt or sediment) becomes a pollutant via storm water runoff. Erosion occurs naturally but can be intensified by land clearing activities such as farming, development, road building, and timber harvesting.

Environmentally Sensitive Areas (ESAs) - Areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; areas designated as preserves or their equivalent under the Natural Communities Conservation Program within the Cities and County of Orange; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.

Estuaries – Waters, including coastal lagoons, located at the mouth of streams that serve as areas of mixing fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and ocean water. Estuaries do not include inland surface waters or ocean waters.

Existing Development – Any area that has been developed and exists for municipal, commercial, industrial, or residential purposes, uses, or activities. May include areas that are not actively used for its originally developed purpose, but may be re-purposed or redeveloped for another use or activity.

Flow Duration – The long-term period of time that flows occur above a threshold that causes significant sediment transport and may cause excessive erosion damage to creeks and streams

(not a single storm event duration). The simplest way to visualize this is to consider a histogram of pre- and post-project flows using long-term records of hourly data. To maintain pre-development flow duration means that the total number of hours (counts) within each range of flows in a flow-duration histogram cannot increase between the pre- and post-development condition. Flow duration within the range of geomorphologically significant flows is important for managing erosion.

Grading - The cutting and/or filling of the land surface to a desired slope or elevation.

Hazardous Material – Any substance that poses a threat to human health or the environment due to its toxicity, corrosiveness, ignitability, explosive nature or chemical reactivity. These also include materials named by the USEPA in 40 CFR 116 to be reported if a designated quantity of the material is spilled into the waters of the U.S. or emitted into the environment.

Hazardous Waste - Hazardous waste is defined as "any waste which, under Section 600 of Title 22 of this code, is required to be managed according to Chapter 30 of Division 4.5 of Title 22 of this code" [CCR Title 22, Division 4.5, Chapter 11, Article 1].

Household Hazardous Waste – Paints, cleaning products, and other wastes generated during home improvement or maintenance activities.

Hydromodification – The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, interflow and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

Illicit Connection – Any connection to the MS4 that conveys an illicit discharge.

Illicit Discharge - Any discharge to the MS4 that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from fire fighting activities [40 CFR 122.26(b)(2)].

Inactive Areas – Areas of construction activity that are not active and those that have been active and are not scheduled to be re-disturbed for at least 14 days.

Infiltration – Water other than wastewater that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow [40 CFR 35.2005(20)].

Inland Surface Waters – Includes all surface waters of the ~~State~~ U.S. that do not include the ocean, enclosed bays, or estuaries.

Jurisdictional Runoff Management Program Document – A written description of the specific jurisdictional runoff management measures and programs that each Copermittee will implement to comply with this Order and ensure that storm water pollutant discharges in runoff are reduced to the MEP and do not cause or contribute to a violation of water quality standards.

Low Impact Development (LID) – A storm water management and land development strategy that emphasizes conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions.

Low Impact Development Best Management Practices (LID BMPs) – LID BMPs include schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States through storm water management and land development strategies that emphasize conservation ~~s~~and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions. LID BMPs include retention practices that do not allow runoff, such as infiltration, rain water harvesting and reuse, and evapotranspiration. LID BMPs also include flow-through practices such as biofiltration that may have some discharge of storm water following pollutant reduction.

Major Outfall – As defined in the Code of Federal Regulations, a major outfall is a MS4 outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (i.e. discharge from a single conveyance other than a circular pipe which is associated with a drainage area of more than 50 acres); or, for MS4s that receive storm water from lands zoned for industrial activity (based on comprehensive zoning plans or equivalent), a MS4 outfall that discharges from a single pipe with an inside diameter of 12 inches or more or from its equivalent (i.e. discharge from other than a circular pipe associated with a drainage area of 2 acres or more).

Maximum Daily Action Level (MDAL) –The highest allowable daily discharge of a pollutant, over a calendar day (or 24 hour period). For pollutants with action levels expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with action levels expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

Maximum Extent Practicable (MEP) – The technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) for storm water that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) in combination with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than BAT. A definition for MEP is not provided either in the statute or in the regulations. Instead the definition of MEP is dynamic and will be defined by the following process over time: municipalities propose their definition of MEP by way of their runoff management programs. Their total collective and individual activities conducted pursuant to the runoff management programs becomes their proposal for MEP as it applies both to their overall effort, as well as to specific activities (e.g., MEP for street sweeping, or MEP for MS4 maintenance). In the absence of a proposal acceptable to the San Diego Water Board, the San Diego Water Board defines MEP.

In a memo dated February 11, 1993, entitled "Definition of Maximum Extent Practicable," Elizabeth Jennings, Senior Staff Counsel, SWRCB addressed the achievement of the MEP standard as follows:

"*To achieve the MEP standard, municipalities must employ whatever Best Management*

Practices (BMPs) are technically feasible (i.e., are likely to be effective) and are not cost prohibitive. The major emphasis is on technical feasibility. Reducing pollutants to the MEP means choosing effective BMPs, and rejecting applicable BMPs only where other effective BMPs will serve the same purpose, or the BMPs would not be technically feasible, or the cost would be prohibitive. In selecting BMPs to achieve the MEP standard, the following factors may be useful to consider:

a. Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?
b. Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?
c. Public Acceptance: Does the BMP have public support?
d. Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?
e. Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc.?

The final determination regarding whether a municipality has reduced pollutants to the maximum extent practicable can only be made by the Regional or State Water Boards, and not by the municipal discharger. If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit derived, it would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs that would address a pollutant source, or to pick a BMP based solely on cost, which would be clearly less effective. In selecting BMPs the municipality must make a serious attempt to comply and practical solutions may not be lightly rejected. In any case, the burden would be on the municipal discharger to show compliance with its permit. After selecting a menu of BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented."

Monitoring Year – The monitoring year begins annually on July 1st and ends on June 30th.

Municipal Separate Storm Sewer System (MS4) – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designated or used for collecting or conveying storm water; (iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.26. "Co-permittees need only comply with permit conditions relating to discharges from the municipal separate storm sewers for which they are operators." 40 CFR §122.26(a)(3)(vi).

National Pollutant Discharge Elimination System (NPDES) - The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of

the CWA.

Non-Storm Water - All discharges to and from a MS4 that do not originate from precipitation events (i.e., all discharges from a MS4 other than storm water). Non-storm water includes illicit discharges and NPDES permitted discharges.

Nuisance - As defined in the Porter-Cologne Water Quality Control Act, a nuisance is "anything which meets all of the following requirements: 1) Is injurious to health, or is indecent, or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. 2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. 3) Occurs during~~,~~ or as a result of~~,~~ the treatment or disposal of wastes."

Ocean Waters – the territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the State Board's California Ocean Plan.

Order – Unless otherwise specified, refers to this Order, Order No. R9-2012-0011 (NPDES No. CAS0109266).
~~**Permanent BMP Sizing Criteria Design Manual** – A plan developed to eliminate, reduce, or mitigate the impacts of runoff from development projects, including Priority Development Projects.~~
Person - A person is defined as an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof [40 CFR 122.2].

Point Source - Any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, landfill leachate collection systems, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

Pollutant - Any agent that may cause or contribute to the degradation of water quality such that a condition of pollution or contamination is created or aggravated.

Pollution - As defined in the Porter-Cologne Water Quality Control Act, pollution is "the alteration of the quality of the waters of the State by waste, to a degree that unreasonably affects the either of the following: 1) The waters for beneficial uses; or 2) Facilities that serve these beneficial uses." Pollution may include contamination.

Pollution Prevention - Pollution prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control BMPs, treatment control BMPs, or disposal.

Permanent BMPs - A subset of BMPs including structural and non-structural controls which detain, retain, filter, remove, or educate to prevent the release of pollutants to surface waters from development projects in perpetuity, after construction of a project is completed.

Pre-Development Runoff Conditions ~~**(Discharge Rates, Durations, Etc.)**~~ – "Runoff conditions that exist~~ed~~ onsite immediately before the ~~existing development was constructed, or exists onsite before~~ planned development activities occur. Pre-development is not intended to

be interpreted as that period before any human-induced land disturbance activity has occurred." 64 FR 68761.~~This definition includes natural watershed hydrology before any human induced land alterations.~~

Priority Development Projects - New development and redevelopment projects defined under Provision E.3.b of Order No. R9-2012-0011.

Properly Designed – Designed in accordance with the Copermittee's BMP Design Manual and/or any appropriate design requirements set forth by the Copermittee and based on widely accepted design criteria.

Public Education, Outreach and Participation – Programs to educate residents, businesses and visitors about the importance of water quality and water quality programs so that they will support local efforts and understand their role in protecting receiving waters. The Education and Outreach Program will increase knowledge and awareness, improve attitudes toward storm pollution prevention, and provide a foundation for changing behaviors that contribute to storm water pollution.

Rainy Season (aka Wet Season) – ~~The period of time from~~ October 1 to April 30. ~~when the San Diego Region experiences the most rainfall.~~

Receiving Waters – Waters of the ~~United States~~U.S.

Receiving Water Limitations - Waste discharge requirements issued by the San Diego Water Board typically include both: (1) "Effluent Limitations" (or "Discharge Limitations") that specify the technology-based or water-quality-based effluent limitations; and (2) "Receiving Water Limitations" that specify the water quality objectives in the Basin Plan as well as any other limitations necessary to attain those objectives. In summary, the "Receiving Water Limitations" provision is the provision used to implement the requirement of CWA section 301(b)(1)(C) that NPDES permits must include any more stringent limitations necessary to meet water quality standards.

Redevelopment - The creation, addition, and or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include trenching and resurfacing associated with utility work; parking lots; resurfacing existing roadways; cutting and reconfiguring of surface parking lots; new sidewalk construction, pedestrian ramps, or bike lane on existing roads; and routine replacement of damaged pavement, such as pothole repair.

Retain –Keep or hold in a particular place, condition, or position without discharge to surface waters.

Retrofit – Retrofit is defined as a stormwater management practice (usually structural) put into place after development has occurred in watersheds where practices previously did not exist or are ineffective. The purpose of retrofits is to improve water quality, protect downstream channels, reduce flooding, or meet other specific objectives. Some examples of retrofits include, but are not limited to the following: green roofs, downspout and impervious cover disconnection,

permeable pavement, bioretention, rain barrels, rain gardens, vacant lot stabilization, trash area enclosures, additional trash and waste disposal containers.

Runoff - All flows in a storm water conveyance system that consists of the following components: (1) storm water (wet weather flows) and (2) non-storm water including dry weather flows.

San Diego Water Board – As used in this document the term "San Diego Water Board" is synonymous with the term "Regional Board" as defined in Water Code section 13050(b) and is intended to refer to the California Regional Water Quality Control Board for the San Diego Region as specified in Water Code Section 13200.

Sediment - Soil, sand, and minerals washed from land into water. Sediment resulting from anthropogenic sources (i.e. human induced land disturbance activities) is considered a pollutant. This Order regulates only the discharges of sediment from anthropogenic sources and does not regulate naturally occurring sources of sediment. Sediment can destroy fish-nesting areas, clog animal habitats, and cloud waters so that sunlight does not reach aquatic plants.

Shared Treatment Control BMP - BMPs used by multiple developments to infiltrate, filter, or treat the required volume or flow prior to discharge to a receiving water. This could include, for example, a treatment BMP at the end of an enclosed storm drain that collects runoff from several commercial developments.

Source Control BMP – Land use or site planning practices, or structural or nonstructural measures that aim to prevent runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between pollutants and runoff.

State Water Quality Protection Area – A nonterrestrial marine or estuarine area designated to protect marine species or biological communities from an undesirable alteration in natural water quality, including, but not limited to, areas of special biological significance that have been designated by the State Water Board through its water quality control planning process. Areas of special biological significance are a subset of State Water Quality Protection Areas, and require special protection as determined by the State Water Resources Control Board pursuant to the California Ocean Plan adopted and reviewed pursuant to Article 4 (commencing with Section 13160) of Chapter 3 of Division 7 of the California Water Code and pursuant to the Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California (California Thermal Plan) adopted by the State Water Board.

Storm Water – Per 40 CFR 122.26(b)(13), means storm water runoff, snowmelt runoff and surface runoff and drainage. ~~Surface runoff and drainage pertains to runoff and drainage resulting from precipitation events.~~

Structural BMP – Any structural control which detains, retains, or filters, to reduce the release of pollutants to surface waters from development projects (e.g. treatment control BMPs) which remains after construction.

Total Maximum Daily Load (TMDL) - The maximum amount of a pollutant that can be discharged into a water body from all sources (point and non-point) and still maintain water quality standards. Under CWA section 303(d), TMDLs must be developed for all water bodies

that do not meet water quality standards after application of technology-based controls.

Toxicity - Adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies). The water quality objectives for toxicity provided in the Basin Plan, state in part…"All waters shall be free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life….The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge".

Treatment Control BMP – Any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media absorption or any other physical, biological, or chemical process.

Unpaved Road – Any long, narrow stretch without pavement used for traveling by motor passenger vehicles between two or more points. Unpaved roads are generally constructed of dirt, gravel, aggregate or macadam and may be improved or unimproved.

Waste - As defined in CWC Section 13050(d), "waste includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal."

Article 2 of CCR Title 23, Chapter 15 (Chapter 15) contains a waste classification system that applies to solid and semi-solid waste, which cannot be discharged directly or indirectly to water of the state and which therefore must be discharged to land for treatment, storage, or disposal in accordance with Chapter 15. There are four classifications of waste (listed in order of highest to lowest threat to water quality): hazardous waste, designated waste, non-hazardous solid waste, and inert waste.

Water Quality Objective - Numerical or narrative limits on constituents or characteristics of water designated to protect designated beneficial uses of the water. [California Water Code Section 13050 (h)]. California's water quality objectives are established by the State and Regional Water Boards in the Water Quality Control Plans. Numeric or narrative limits for pollutants or characteristics of water designed to protect the beneficial uses of the water. In other words, a water quality objective is the maximum concentration of a pollutant that can exist in a receiving water and still generally ensure that the beneficial uses of the receiving water remain protected (i.e., not impaired). Since water quality objectives are designed specifically to protect the beneficial uses, when the objectives are violated the beneficial uses are, by definition, no longer protected and become impaired. This is a fundamental concept under the Porter Cologne Act. Equally fundamental is Porter Cologne's definition of pollution. A condition of pollution exists when the water quality needed to support designated beneficial uses has become unreasonably affected or impaired; in other words, when the water quality objectives have been violated. These underlying definitions (regarding beneficial use protection) are the reason why all waste discharge requirements implementing the federal NPDES regulations require compliance with water quality objectives. (Water quality objectives are also called water quality criteria in the CWA.)

Water Quality Standards - Water quality standards, as defined in Clean Water Act section 303(c) consist of the beneficial uses (e.g., swimming, fishing, municipal drinking water supply,

etc.,) of a water body and criteria (referred to as water quality objectives in the California Water Code) necessary to protect those uses. Under the Water Code, the water boards establish beneficial uses and water quality objectives in water quality control or basin plans. Together with an anti-degradation policy, these beneficial uses and water quality objectives serve as water quality standards under the Clean Water Act. In Clean Water Act parlance, state beneficial uses are called "designated uses" and state water quality objectives are called "criteria." Throughout this Order, the relevant term is used depending on the statutory scheme.

Waters of the State - Any water, surface or underground, including saline waters within the boundaries of the State [CWC section 13050 (e)]. The definition of the Waters of the State is broader than that for the Waters of the United States in that all water in the State is considered to be a Waters of the State~~ regardless of circumstances or condition.~~. Under this definition, portions of a MS4 ~~is always~~may be considered to be a Waters of the State. However, man-made portions of the MS4 constructed for the sole purpose of flow and/or pollutant reduction are not considered waters of the state.

Waters of the United States - As defined in the 40 CFR 122.2, the Waters of the U.S. are defined as: "(a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate "wetlands;" (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters otherwise defined as waters of the United States under this definition: (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial seas; and (g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA."

Watershed - That geographical area which drains to a specified point on a water course, usually a confluence of streams or rivers (also known as drainage area, catchment, or river basin).

Wet Season (aka Rainy Season) – The period of time from October 1 to April 30 when the San Diego Region experiences the most rainfall.

Wet Weather – Weather is considered wet if there is a storm event of 0.1 inches and greater and the following 72 hours, unless defined in another regulatory mechanism such as a TMDL.

ATTACHMENT D

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

FY _____

I. COPERMITTEE INFORMATION

Copermittee Name:

Copermittee Primary Contact Name:

Copermittee Primary Contact Information:
Address:
City: County: State: Zip:
Telephone: Fax: Email:

II. LEGAL AUTHORITY

Has the Copermittee established adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 that complies with Order No. R9-2012-0011?	YES NO	☐ ☐
A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority?	YES NO	☐ ☐

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

Was an update of the jurisdictional runoff management program document required or recommended by the San Diego Water Board?	YES NO	☐ ☐
If YES to the question above, did the Copermittee update its jurisdictional runoff management program document and make it available on the Regional Clearinghouse?	YES NO	☐ ☐

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

Has the Copermittee implemented a program to actively detect and eliminate illicit discharges and connections to its MS4 that complies with Order No. R9-2012-0011?	YES NO	☐ ☐

Number of non-storm water discharges reported by the public	
Number of non-storm water discharges detected by Copermittee staff or contractors	
Number of non-storm water discharges investigated by the Copermittee	
Number of sources of non-storm water discharges identified	
Number of non-storm water discharges eliminated	
Number of sources of illicit discharges or connections identified	
Number of illicit discharges or connections eliminated	
Number of enforcement actions issued	
Number of high level enforcement actions issued	

V. DEVELOPMENT PLANNING PROGRAM

Has the Copermittee implemented a development planning program that complies with Order No. R9-2012-0011?	YES NO	☐ ☐
Was an update to the ~~Permanent~~ BMP ~~Sizing Criteria~~ Design Manual required or recommended by the San Diego Water Board?	YES NO	☐ ☐
If YES to the question above, did the Copermittee update its ~~Permanent~~ BMP ~~Sizing Criteria~~ Design Manual and make it available on the Regional Clearinghouse?	YES NO	☐ ☐

Number of proposed development projects in review	
Number of Priority Development Projects in review	
Number of Priority Development Projects approved	
Number of approved Priority Development Projects exempt from any BMP requirements	
Number of approved Priority Development Projects requiring mitigation	
Number of Priority Development Projects granted occupancy	

Number of completed Priority Development Projects in inventory	
Number of high priority Priority Development Project ~~permanent~~ structural BMP inspections	
Number of Priority Development Project ~~permanent~~ structural BMP violations	
Number of enforcement actions issued	

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM

Number of high level enforcement actions issued	

FY _____

VI. CONSTRUCTION MANAGEMENT PROGRAM

Has the Copermittee implemented a construction management program that complies with Order No. R9-2012-0011?	YES	☐
	NO	☐

Number of construction sites in inventory	
Number of active construction sites in inventory	
Number of inactive construction sites in inventory	
Number of construction sites closed/completed during reporting period	
Number of construction site inspections	
Number of construction site violations	
Number of enforcement actions issued	
Number of high level enforcement actions issued	

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

Has the Copermittee implemented an existing development management program that complies with Order No. R9-2012-0011?	YES	☐
	NO	☐

	Municipal	Commercial	Industrial	Residential
Number of existing developments in inventory				
Number of existing development inspections				
Number of follow-up inspections				
Number of existing development violations				
Number of enforcement actions issued				
Number of high level enforcement actions issued				

VIII. PUBLIC EDUCATION AND PARTICIPATION

Has the Copermittee implemented a public education program that complies with Order No. R9-2012-0011?	YES	☐
	NO	☐
Has the Copermittee implemented a mechanism for public participation and where necessary intergovernmental coordination that complies with Order No. R9-2012-0011?	YES	☐
	NO	☐

IX. FISCAL ANALYSIS

Has the Copermittee attached to this form a summary of its fiscal analysis that complies with Order No. R9-2012-0011?	YES	☐
	NO	☐

X. CERTIFICATION

I [☐ Principal Executive Officer ☐ Ranking Elected Official ☐ Duly Authorized Representative] certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature	Date
Print Name	Title
Telephone Number	Email

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
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ATTACHMENT E

SPECIFIC PROVISIONS FOR TOTAL MAXIMUM DAILY LOADS APPLICABLE TO ORDER NO. R9-2012-0011

These provisions implement Total Maximum Daily Loads (TMDLs), adopted by the San Diego Water Board and approved by USEPA under Clean Water Act section 303(c), which are applicable to discharges regulated under this Order. The provisions and schedules for implementation of the TMDLs described below must be incorporated into the Water Quality Improvement Plans and monitoring requirements, required pursuant to Provision-s B and D of this Order, respectively, for the specified Watershed Management Areas.

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed~~Total Maximum Daily Load for Diazinon in Chollas Creek Watershed~~ Resolution No. R9-2002-0123
2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin Resolution No. R9-2005-0019
3. ~~Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed~~
4. ~~4.~~3. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek Resolution No. R9-2007-0043
5. ~~5.~~4. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay Resolution No. R9-2008-0027
6. ~~6.~~5. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek) Resolution No. R9-2010-0001

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2002-0123

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	August 14, 2002
State Water Board Approval Date:	July 16, 2003
Office of Administrative Law Approval Date:	September 11, 2003
US EPA Approval Date:	November 3, 2003

(3) TMDL Effective Date: September 11, 2003

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, Unified Port District of San Diego

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for Chollas Creek consist of the following:

(1) Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedule under Specific Provision 1.~~II~~c:

Table 1.1
Receiving Water Limitations as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Diazinon	Acute	0.08 µg/L	1 hour
	Chronic	0.05 µg/L	4 days

(2) Effluent Limitations

Discharges from the MS4s must not contain concentrations that exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 1.~~II~~c:

Table 1.2
Effluent Limitations as Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation	Averaging Period
Diazinon	Acute	0.072 µg/L	1 hour
	Chronic	0.045 µg/L	4 days

(3) Best Management Practices

~~The following~~ BMPs for Chollas Creek ~~must~~may be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area and implemented by the Responsible Copermittees:

~~(a) The Responsible Copermittees must implement BMPs capable of achieving the WQBELs under Specific Provision 1. for Chollas Creek.~~
~~(b) Responsible Copermittees must implement the Diazinon Toxicity Control Plan and Diazinon Public Outreach/Education Program as described in the report titled, *Technical Report for Total Maximum Daily Load for Diazinon in Chollas Creek Watershed, San Diego County*, dated August 14, 2002, including subsequent modifications, in order to achieve the WQBELs under Specific Provision 1..~~

~~(c)~~(a) The Responsible Copermittees should coordinate ~~the~~any implemented BMPs to address this TMDL with Caltrans ~~wherever and whenever~~ , as possible.

c. COMPLIANCE SCHEDULE

The Responsible Copermittees were required to achieve their WLA by December 31, 2010. The Responsible Copermittees must be in compliance with the WQBELs under Specific Provision 1.~~kk~~b.

d. COMPLIANCE DETERMINATION

Compliance with WQBELs or WLAs may be demonstrated via any one of the following methods:

(1) There is no discharge from the MS4, or
(2) Applicable effluent limitations are met, or
(3) Receiving waters meet the applicable receiving water limitations or water quality objective, or
(4) Loading from the MS4 is such that it does not cause water quality objective exceedances, or
(5) Implementation of a Water Quality Improvement Plan determined by the Regional Board Executive Officer to comply with Provision A as described in Provision A.4.

~~d.~~e. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(a) The Responsible Copermittees must implement the monitoring and

assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

~~The Responsible Copermittees must monitor the effluent of the MS4 outfalls for diazinon within the Chollas Creek watershed, and calculate or estimate the monthly and annual diazinon loads, in accordance with the requirements of Provisions , , and of this Order. The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision of this Order.~~

2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0019

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	September 22, 2005
Office of Administrative Law Approval Date:	December 2, 2005
US EPA Approval Date:	February 8, 2006

(3) TMDL Effective Date: December 2, 2005

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Shelter Island Yacht Basin

(6) Responsible Copermittees: City of San Diego, San Diego Unified Port District

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for Shelter Island Shoreline Park consist of the following:

(1) Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedule under Specific Provision 2.~~qq~~c:

Table 2.1
Receiving Water Limitations as Concentrations in Shelter Island Yacht Basin

Constituent	Exposure Duration	Effluent Limitation	Averaging Period
Dissolved Copper	Acute	4.8 µg/L	1 hour
	Chronic	3.1 µg/L	4 days

(2) Effluent Limitations

Discharges from the MS4s must not contain pollutant loads that exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 2.c~~qq~~:

Table 2.2
Effluent Limitations as Annual Loads in MS4 Discharges to Shelter Island Yacht Basin

Constituent	Effluent Limitation
Dissolved Copper	30 kg/yr

(3) Best Management Practices

The Responsible Copermittees ~~must~~may implement BMPs ~~capable of achieving~~to support the achievement of WQBELs under Specific Provision 2.~~pp~~ b for Shelter Island Yacht Basin.

c. COMPLIANCE SCHEDULE

The Responsible Copermittees ~~was~~ are required to achieve ~~its~~ respective WLAs ~~upon the effective date of the TMDL,~~by December 2, ~~2005~~2022. The Responsible Copermittees must be in compliance with the WQBELs under Specific Provision 2.~~pp~~b.

d. COMPLIANCE DETERMINATION

Compliance with WQBELs or WLAs may be demonstrated via any one of the following methods:

(1) There is no discharge from the MS4, or
(2) Applicable effluent limitations are met, or
(3) Receiving waters meet the applicable receiving water limitations or water quality objective, or
(4) Loading from the MS4 is such that it does not cause water quality objective exceedances, or
(5) Implementation of a Water Quality Improvement Plan determined by the Regional Board Executive Officer to comply with Provision A as described in Provision A.4.

~~d.~~e. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

The Responsible Copermittees must ~~monitor~~implement the ~~effluent of its MS4 outfalls for dissolved copper, and calculate or estimate the monthly and annual dissolved copper loads, in accordance with the~~ monitoring and assessment requirements ~~of Provisions , , and of this~~ issued under Order~~.~~ No. R9-2005-0019. The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed
4.
5. Applicability
6.
7. TMDL Basin Plan Amendment: Resolution No. R9-2005-0036
8.
9. TMDL Adoption and Approval Dates:
10.
11. San Diego Water Board Adoption Date: February 9, 2005
12. State Water Board Approval Date: November 16, 2005
13. Office of Administrative Law Approval Date: February 1, 2006
14. US EPA Approval Date: March 22, 2006
15.
16. TMDL Effective Date: February 1, 2006
17.
18. Watershed Management Area: Santa Margarita River
19.
20. Water Body: Rainbow Creek
21.
22. Responsible Copermittee: County of San Diego
23.
24. Water Quality Based Effluent Limitations
25.
26. The WQBELs for Rainbow Creek consist of the following
27.
28. Receiving Water Limitations
29.
30. Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedule under Specific Provision 3.c.(1):
31.
32. Table 3.1
33. Receiving Water Limitations as
34. Concentrations in Rainbow Creek

35. Constituent	36. Receiving Water 37. Limitation
38. Nitrate (as N)	39. 10 mg/L
40. Total Nitrogen	41. 1 mg/L
42. Total Phosphorus	43. 0.1 mg/L

44.

~~46.~~
~~47. Effluent Limitations~~
~~48.~~
~~49. Discharges from the MS4s must not contain concentrations that exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 3.c.(1):~~
~~50.~~
~~51. Table 3.2~~
~~52. Effluent Limitations as Concentrations in~~
~~53. MS4 Discharges to Rainbow Creek~~

~~54. Constituent~~	~~55. Effluent 56. Limitation~~
~~57. Nitrate (as N)~~	~~58. 10 mg/L~~
~~59. Total Nitrogen~~	~~60. 1 mg/L~~
~~61. Total Phosphorus~~	~~62. 0.1 mg/L~~

~~63.~~
~~64. Pollutant loads from given land uses discharging to and from the MS4s must not exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 3.c.(1):~~
~~65.~~
~~66. Table 3.3~~
~~67. Effluent Limitations as Annual Loads in~~
~~68. MS4 Discharges to Rainbow Creek~~

~~69. Land Use~~	~~70. Total N~~	~~71. Total P~~
~~72. Commercial nurseries~~	~~73. 116 kg/yr~~	~~74. 3 kg/yr~~
~~75. Park~~	~~76. 3 kg/yr~~	~~77. 0.1 kg/yr~~
~~78. Residential areas~~	~~79. 149 kg/yr~~	~~80. 12 kg/yr~~
~~81. Urban areas~~	~~82. 27 kg/yr~~	~~83. 6 kg/yr~~

~~84.~~
~~85. Interim effluent limitations expressed as pollutant loads are given in the compliance schedule under Specific Provision 3.0.~~
~~86.~~
~~87. Best Management Practices~~
~~88.~~
~~89. The Responsible Copermittee must implement BMPs capable of achieving the WQBELs under Specific Provision 3.b for Rainbow Creek.~~
~~90.~~

~~**91. The Responsible Copermittee should coordinate the BMPs to address this TMDL with Caltrans and other sources wherever and whenever possible.**~~

~~**92.**~~

94. Compliance Schedule
95.
96. WLA Compliance Date
97.
98. The Responsible Copermittee is required to achieve its WLAs, thus must be in compliance with the WQBELs under Specific Provision 3.b, by December 31, 2021.
99.
100. Interim Compliance Requirements
101.
102. Table 3.4
103. Interim Effluent Limitations as Annual Loads in
104. MS4 Discharges from Specific Land Uses to Rainbow Creek

105.	106. Total N 107. Interim Effluent Limitations 108. (kg/yr)			109. Total P 110. Interim Effluent Limitations 111. (kg/yr)		
112.	113. Interim Compliance Date			114. Interim Compliance Date		
115. Land Use	116. 2009	117. 2013	118. 2017	119. 2009	120. 2013	121. 2017
122. Commercial nurseries	123. 399	124. 299	125. 196	126. 20	127. 16	128. 10
129. Park	130. 5	131. 3	132. 3	133. 0.15	134. 0.10	135. 0.10
136. Residential areas	137. 507	138. 390	139. 260	140. 99	141. 74	142. 47
143. Urban areas	144. 40	145. 27	146. 27	147. 9	148. 6	149. 6

150.
151. Specific Monitoring and Assessment Requirements
152.
153. The Responsible Copermittee must implement the Sampling and Analysis Plan for Rainbow Creek Nutrient Reduction TMDL Implementation Water Quality Monitoring, dated January 2010. The results of any monitoring conducted during the reporting period, and assessment of whether the interim and final WQBELs have been achieved must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.
154.

~~155.~~3. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2007-0043

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2007
State Water Board Approval Date:	July 15, 2008
Office of Administrative Law Approval Date:	October 22, 2008
US EPA Approval Date:	December 18, 2008

(3) TMDL Effective Date: October 22, 2008

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District ~~of San Diego~~

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for Chollas Creek consist of the following:

(1) Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedule under Specific Provision 4.c.(1):

Table 3.1
Receiving Water Limitations as Concentrations in Chollas Creek

Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$(0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$(0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$(0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$(0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER.

(2) Effluent Limitations

Discharges from the MS4s must not contain pollutant loads that exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 4.c.(1):

Table 3.2
Effluent Limitations as Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER.

(3) Best Management Practices

(a) The Responsible Copermittee ~~must~~may implement BMPs ~~capable of achieving~~to support the achievement of WQBELs under Specific Provision 4.c~~uu~~ for Chollas Creek.

(b) The Responsible Copermittees should coordinate the BMPs to address this TMDL with Caltrans and the U.S. Navy ~~wherever and whenever~~, as possible.

c. COMPLIANCE SCHEDULE

(1) WLA Compliance Date

The Responsible Copermittee is required to achieve the WLA, thus must be in compliance with the WQBELs under Specific Provision 4.b~~uu~~, by October 22, 2028.

(2) Interim Compliance Requirements

The Responsible Copermittee must comply with the following interim WQBELs by the interim compliance date:

Table 3.3
Interim Effluent Limitations as Concentrations in MS4 Discharges to Chollas Creek

Interim Compliance Date	Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
October 22, 2018	Dissolved Copper	Acute	1.2 x 90% x (0.96) x $e^{[0.9422 \times \ln(\text{hardness}) - 1.700]}$ x WER*	1 hour
		Chronic	1.2 x 90% x (0.96) x $e^{[0.8545 \times \ln(\text{hardness}) - 1.702]}$ x WER*	4 days
	Dissolved Lead	Acute	1.2 x 90% x [1.46203 – 0.145712 x ln(hardness)] x $e^{[1.273 \times \ln(\text{hardness}) - 1.460]}$ x WER*	1 hour
		Chronic	1.2 x 90% x [1.46203 – 0.145712 x ln(hardness)] x $e^{[1.273 \times \ln(\text{hardness}) - 4.705]}$ x WER*	4 days
	Dissolved Zinc	Acute	1.2 x 90% x (0.978) x $e^{[0.8473 \times \ln(\text{hardness}) + 0.884]}$ x WER*	1 hour
		Chronic	1.2 x 90% x (0.986) x $e^{[0.8473 \times \ln(\text{hardness}) + 0.884]}$ x WER*	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER.

d. Compliance Determination

Compliance with WQBELs or WLAs may be demonstrated via any one of the following methods:

(1) There is no discharge from the MS4, or
(2) Applicable effluent limitations are met, or
(3) Receiving waters meet the applicable receiving water limitations or water quality objective, or
(4) Loading from the MS4 is such that it does not cause water quality objective exceedances, or
(5) Implementation of a Water Quality Improvement Plan determined by the Regional Board Executive Officer to comply with Provision A as described in Provision A.4.

~~d.~~e. Specific Monitoring and Assessment Requirements

(a) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*, when it is amended to include monitoring requirements for the Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

(b) The Responsible Copermittees must ~~monitor~~implement the ~~effluent of the MS4 outfalls discharging to Chollas Creek for dissolved copper, lead, and zinc, and calculate or estimate the monthly and annual dissolved copper, lead, and zinc loads, in accordance with the~~ monitoring and assessment requirements ~~of Provisions , , and of~~ issued under Order No. R9-2007-0043, as consistent with this Order~~.~~.. The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

~~156.~~4. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2008-0027

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 11, 2008
State Water Board Approval Date:	June 16, 2009
Office of Administrative Law Approval Date:	September 15, 2009
US EPA Approval Date:	October 26, 2009

(3) TMDL Effective Date: September 15, 2009

(4) Watershed Management Areas: See Table 5.0

(5) Water Bodies: See Table 5.0

(6) Responsible Copermittees: See Table 5.0

Table 4.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County	Dana Point Harbor	Baby Beach	-City of Dana Point -County of Orange
San Diego Bay	San Diego Bay	Shelter Island Shoreline Park	-Unified Port of San Diego

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Receiving Water Limitations

(a) Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedules under Specific Provisions 5.c.(1)(a) and 5.c.(2):

Table 4.1
Receiving Water Limitations as Bacteria Densities in the Water Body

	Receiving Water Limitations	
Constituent	**Single Sample Maximum[1,2]**	**30-Day Geometric Mean[2]**
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.

(b) If the above receiving water limitations are not met in the receiving water, the Responsible Copermittees must demonstrate that the discharges from the MS4s are not causing or contributing to the violation of receiving water limitations. The Copermittee must provide data that demonstrate the discharges from the MS4s are meeting the effluent limitations under Specific Provision 5.b.(2).

(2) Effluent Limitations

Discharges from the MS4s must not contain densities that exceed the following effluent limitations by the end of the compliance schedules under Specific Provisions 5.c.(1)(a) and 5.c.(2) to demonstrate the discharge is not causing or contributing to a violation of receiving water quality standards:

Table 4.2
Effluent Limitations as Bacteria Densities in MS4 Discharges to the Water Body

	Effluent Limitations	
Constituent	**Single Sample Maximum[1,2]**	**30-Day Geometric Mean[2]**
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.

Interim effluent limitations expressed as pollutant loads are given in the compliance schedule under Specific Provision 5.c~~aaa~~.

(3) Best Management Practices

(a) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 5.0 fulfill the Bacteria Load Reduction Plan (BLRP) requirements in Resolution No. R9-2008-0027.

(b) The Responsible Copermittee must implement BMPs capable of achieving the WQBELs under Specific Provision 5.0 for the segments or areas of the water bodies listed in Table 5.0

c. COMPLIANCE SCHEDULE

(1) Baby Beach in Dana Point Harbor

(a) WLA Compliance Dates

The Responsible Copermittees for MS4 discharges to Baby Beach are required to achieve the WLA, thus must be in compliance with the WQBELs under Specific Provision 5.0, according to the following compliance schedule:

Table 4.3
Compliance Schedule Dates to Achieve Baby Beach WLAs

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform	September 15, 2014	September 15, 2009
Fecal Coliform		September 15, 2009
Enterococcus		September 15, 2019

(b) Interim Compliance Requirements

The Responsible Copermittees for MS4 discharges to Baby Beach must comply with the following interim WQBELs by the interim compliance date:

Table 4.4
Interim Effluent Limitations as Loads in MS4 Discharges to Baby Beach

Constituent	Interim Compliance Date	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	5.32×10^9 MPN/day	NA*
Fecal Coliform	September 15, 2012	0.59×10^9 MPN/day	NA*
Enterococcus	September 15, 2012	0.42×10^9 MPN/day	NA**
	September 15, 2016	NA*	207×10^9 MPN/30days

Notes:
* The WQBELs under Specific Provision 5.b must already be achieved by the given interim compliance date.
** There is no corresponding interim WQBEL for the given interim compliance date.

(2) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park is required to achieve the WLA, thus must be in compliance with the WQBELs under Specific Provision 5.0, by December 31, 2012.

d. COMPLIANCE DETERMINATION

Compliance with WQBELs or WLAs may be demonstrated via any one of the following methods:

(1) There is no discharge from the MS4, or
(2) Applicable effluent limitations are met, or
(3) Receiving waters meet the applicable receiving water limitations or water

quality objective, or

(4) Loading from the MS4 is such that it does not cause water quality objective exceedances, or

(5) Implementation of a Water Quality Improvement Plan determined by the Regional Board Executive Officer to comply with Provision A as described in Provision A.4.

~~d.~~e. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) Monitoring Stations and Procedures

~~(a)~~ The Responsible Copermittees must implement the monitoring requirements issued under Order No. R9-2008-0027. ~~designate the MS4 outfalls within their jurisdiction discharging to the segments or areas of the water bodies listed in Table 5.0 as high priority non-storm water MS4 monitoring stations, in accordance with the requirements of Provision D.1.~~

~~(b)~~

~~(c) The Responsible Copermittees must establish at least one monitoring station within the receiving water body.~~

~~(2) Monitoring Procedures~~

~~(a) The Responsible Copermittees must monitor the effluent of the designated MS4 outfalls within their jurisdiction discharging during dry weather conditions to the segments or areas of the water bodies listed in Table 5.0 in accordance with the dry weather jurisdictional monitoring requirements of Provision D.1.a.(1)(b). Samples required to be submitted to a laboratory for analysis must include analysis for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.~~

~~(b) The Responsible Copermittees must monitor, within the first 24 hours of each storm event,[25] the effluent of the designated MS4 outfalls within their jurisdiction discharging to the segments or areas of the water bodies listed in Table 5.0 in accordance with the wet weather jurisdictional monitoring requirements of Provision D.1.b.(1)(b) of this Order. Samples required to be submitted to a laboratory for analysis must include analysis for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.~~

~~(c) The Responsible Copermittees must collect samples from the monitoring stations within the receiving water body for each dry weather and wet weather MS4 outfall monitoring event. Samples must be analyzed for total~~

~~[25] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].~~

~~coliform, fecal coliform, and *Enterococcus* indicator bacteria.~~

~~(3)~~(2) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs have been achieved.

(b) The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

~~157.~~5. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2010-0001

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date: ___February 10, 2010
State Water Board Approval Date: ___December 14, 2010
Office of Administrative Law Approval Date: ___April 4, 2011
US EPA Approval Date: ___June 22, 2011

(3) TMDL Effective Date: April 4, 2011

(4) Watershed Management Areas: See Table 6.0

(5) Water Bodies: See Table 6.0

The water bodies identified in Table 6.0 are subject to the requirements of this Attachment E, except those water bodies listed in Table 6.0 that have been delisted from the 303(d) list for REC-1 bacteria impairments. These delisted water bodies are not subject to the requirements of this Attachment E so long as monitoring data continues to support compliance with water quality standards.

(6) Responsible Copermittees: See Table 6.0

Table 5.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	-City of Laguna Beach -County of Orange -Orange County Flood Control District
		at Heisler Park - North	
	Pacific Ocean Shoreline	at Main Laguna Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Woods -County of Orange -Orange County Flood Control District
		Laguna Beach at Ocean Avenue	
		Laguna Beach at Cleo Street	
		Arch Cove at Bluebird Canyon Road	
		Laguna Beach at Dumond Drive	

Table 5.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County (cont'd)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Hills -City of Laguna Niguel -City of Laguna Woods -City of Lake Forest -City of Mission Viejo -County of Orange -Orange County Flood Control District
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	
	Aliso Creek Mouth	at mouth	
	Pacific Ocean Shoreline	Aliso Beach at West Street	-City of Dana Point -City of Laguna Beach -City of Laguna Niguel -County of Orange -Orange County Flood Control District
		Aliso Beach at Table Rock Drive	
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)	
		at Salt Creek (large outlet)	
		Salt Creek Beach at Salt Creek service road	
		Salt Creek Beach at Strand Road	
	Pacific Ocean Shoreline	at San Juan Creek	-City of Dana Point -City of Laguna Hills -City of Laguna Niguel -City of Mission Viejo -City of Rancho Santa Margarita -City of San Juan Capistrano -County of Orange -Orange County Flood Control District
	San Juan Creek	lower 1 mile	
	San Juan Creek Mouth	at mouth	

Table 5.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I- Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County (cont'd)	Pacific Ocean Shoreline	at Poche Beach	- City of Dana Point -City of San Clemente -County of Orange -Orange County Flood Control District
		Ole Hanson Beach Club Beach at Pico Drain	
		San Clemente City Beach at El Portal Street Stairs	
		San Clemente City Beach at Mariposa Street	
		San Clemente City Beach at Linda Lane	
		San Clemente City Beach at South Linda Lane	
		San Clemente City Beach at Lifeguard Headquarters	
		under San Clemente Municipal Pier	
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	
		San Clemente State Beach at Riviera Beach	
		Can Clemente State Beach at Cypress Shores	
San Luis Rey River	Pacific Ocean Shoreline	at San Luis Rey River mouth	-City of Oceanside -City of Vista -County of San Diego
Carlsbad	Pacific Ocean Shoreline	at Moonlight State Beach	-City of Carlsbad -City of Encinitas -City of Escondido -City of Oceanside -City of San Marcos -City of Solana Beach ~~-City of Vista~~ -County of San Diego
San Dieguito River	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	-City of Del Mar -City of Escondido -City of Poway -City of San Diego -City of Solana Beach -County of San Diego
Penasquitos (Miramar Reservior HA)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	-City of Del Mar -City of Poway -City of San Diego -County of San Diego
Mission Bay	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	-City of San Diego
		La Jolla Shores Beach at Caminito del Oro	

Table 5.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I- Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
		La Jolla Shores Beach at Vallecitos	
Mission Bay (cont'd)	Pacific Ocean Shoreline	La Jolla Shores Beach at Avenida de la Playa	-City of San Diego
		at Casa Beach, Children's Pool	
		South Casa Beach at Coast Boulevard	
		Whispering Sands Beach at Ravina Street	
		Windansea Beach at Vista de la Playa	
		Windansea Beach at Bonair Street	
		Windansea Beach at Playa del Norte	
		Windansea Beach at Palomar Avenue	
		at Tourmaline Surf Park	
		Pacific Beach at Grand Avenue	
	Tecolote Creek	Entire reach and tributaries	-City of San Diego
San Diego River	Forrester Creek	lower 1 mile	City of El Cajon ~~-City of La Mesa~~ -City of Santee -County of San Diego
	San Diego River	lower 6 miles	-City of El Cajon -City of La Mesa -City of San Diego -City of Santee -County of San Diego
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	
San Diego Bay	Chollas Creek	lower 1.2 miles	-City of La Mesa -City of Lemon Grove -City of San Diego -County of San Diego -San Diego Unified Port District

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for segments or areas of the water bodies listed in Table 6.0 consist of the following:

(1) Receiving Water Limitations

(a) Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedules under Specific Provision 6.c.(1):

Table 5.1
Receiving Water Limitations as Bacteria Densities and Allowable Exceedance Frequencies in the Water Body

Receiving Water Limitations				
Constituent	**Single Sample Maximum[1,2] (MPN/100mL)**	**Single Sample Maximum Allowable Exceedance Frequency[3]**	**30-Day Geometric Mean[2] (MPN/100mL)**	**30-Day Geometric Mean Allowable Exceedance Frequency**
Total Coliform	10,000	22% / 0%	1,000	0%
Fecal Coliform	400	22% / 0%	200	0%
Enterococcus	104[4] / 61[5]	22% / 0%	35[4] / 33[5]	0%

Notes:
1. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
3. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. The 0% single sample maximum allowable exceedance frequency applies to dry weather days.
4. This *Enterococcus* receiving water limitation applies to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
5. This *Enterococcus* receiving water limitations applies to segments or areas of creeks or creek mouths listed in Table 6.0.

Interim receiving water limitations expressed as allowable exceedance frequencies are given in the compliance schedule under Specific Provision 6.c~~fff~~.

(b) If the above receiving water limitations are not met in the receiving water, the Responsible Copermittees must demonstrate that the discharges from the MS4s are not causing or contributing to the violation of receiving water limitations. The Copermittee must provide data that demonstrate the discharges from the MS4s are meeting the effluent limitations under Specific Provision 6.b~~.~~.

(2) Effluent Limitations

Discharges from the MS4s must not ~~contain densities that exceed the following effluent limitations by the end of the compliance schedules under Specific Provision 6.c. to demonstrate the discharge is not causing~~cause or ~~contributing~~contribute to a violation of receiving water ~~quality standards~~limitations. The mass-based waste load allocations presented in Resolution No. R9-2010-0001 can be used to demonstrate that loading from the MS4 is such that it does not cause water quality objective exceedances,

as described in bullet (4) under Specific Provision 6.d. ~~:~~

~~**Table 6.2**~~
~~*Effluent Limitations as Bacteria Densities and Allowable Exceedance Frequencies in MS4 Discharges to the Water Body*~~

	~~Effluent Limitations~~			
~~Constituent~~	~~Single Sample Maximum[1,2] (MPN/100mL)~~	~~Single Sample Maximum Allowable Exceedance Frequency[3]~~	~~30-Day Geometric Mean[2] (MPN/100mL)~~	~~30-Day Geometric Mean Allowable Exceedance Frequency~~
~~Total Coliform~~	~~10,000~~	~~22% / 0%~~	~~1,000~~	~~0%~~
~~Fecal Coliform~~	~~400~~	~~22% / 0%~~	~~200~~	~~0%~~
~~*Enterococcus*~~	~~104[4] / 61[5]~~	~~22% / 0%~~	~~35[4] / 33[5]~~	~~0%~~

~~Notes:~~
~~1. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.~~
~~2. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.~~
~~3. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. The 0% single sample maximum allowable exceedance frequency applies to dry weather days~~
~~4. This *Enterococcus* effluent limitation applies to MS4 discharges to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.~~
~~5. This *Enterococcus* effluent limitation applies to MS4 discharges to segments or areas of creeks or creek mouths listed in Table 6.0.~~

~~Interim effluent limitations expressed as allowable exceedance frequencies are given in the compliance schedule under Specific Provision 6.c.~~

(3) Best Management Practices

(a) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 6.0 ~~fulfill~~will incorporate the Comprehensive Load Reduction ~~Plan~~Plans (CLRP) ~~requirements in~~drafted pursuant to Resolution No. R9-2010-0001.

(b) The Responsible Copermittee ~~must~~may implement BMPs ~~capable of achieving~~to support the achievement of WQBELs under Specific Provision 6.b~~eee~~ for the segments or areas of the water bodies listed in Table 6.0.

(c) The Responsible Copermittees ~~should coordinate~~may implement BMPs to support the ~~BMPs~~achievement of ~~to address~~ this TMDL with Caltrans and owners/operators of small MS4s ~~wherever and whenever~~, as possible.

c. COMPLIANCE SCHEDULE

(1) WLA Compliance Dates

The Responsible Copermittees for MS4 discharges to a segment or area of the water bodies listed in Table 6.0 are required to achieve the WLA, thus must be in compliance with the WQBELs under Specific Provision 6.b, according to the following compliance schedule:

Table 5.2
Compliance Schedule Dates to Achieve Indicator Bacteria WLAs

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform[1]	April 4, 2021	April 4, 2031
Fecal Coliform		
Enterococcus		

1 - Total coliform receiving water limitations apply only to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.

(2) Interim Compliance Requirements

The Responsible Copermittees must comply with the ~~following~~ interim WQBELs by the interim compliance dates~~:~~ provided as part of the CLRP and supported by Order No. R9-2010-0001.

(a) Interim Dry Weather WQBELs

Interim dry weather WQBELS are expressed as receiving water limitations. The Responsible Copermittee must calculate the "existing" exceedance frequencies of the 30-day geometric mean water quality objectives for each of the indicator bacteria by analyzing the monitoring data collected between January 1, 2002 and April 4, 2011. "Existing" exceedance frequencies may be calculated by segment or area of a water body, or by water body, and/or by Watershed Management Area listed in Table 6.0. Separate "existing" exceedance frequencies must be calculated for beaches and creeks/creek mouths.

The Responsible Copermittees must achieve a 50 percent reduction in the "existing" exceedance frequency of the 30-day geometric mean WQBELs for the segments or areas of the water bodies listed in Table 6.0 ~~by the interim compliance dates for achieving the interim dry weather WQBELs given in Table 6.5~~. A 50 percent reduction in the "existing" exceedance frequency is equivalent to half of the "existing" exceedance frequency of the 30-day geometric mean WQBELs.

(3) Submittals to Support TMDL Basin Plan Amendment

The Responsible Copermittees are encouraged to submit data to support the TMDL reopener scheduled for April 2016 including but not limited to data related to reference watershed monitoring and beneficial use usage frequency.

~~**d.** The "existing" exceedance frequencies and the interim dry weather allowable exceedance frequencies (i.e. interim dry weather WQBELs) calculated by the Responsible Copermittees must be included in the Water Quality Improvement Plans for the applicable Watershed Management Areas.~~

~~**e.**~~

~~**f.** Interim Wet Weather WQBELs~~

~~**g.**~~

~~**h.** The Responsible Copermittees must achieve the interim wet weather WQBELs in~~

Table 6.4, expressed as interim allowable exceedance frequencies, by the interim compliance dates for achieving the interim wet weather WQBELs given in Table 6.5.

i.

j. Table 6.4

k. Interim Wet Weather WQBELs Expressed as

l. Interim Wet Weather Allowable Exceedance Frequencies

m. Watershed	n.	o.	p. Interim Wet Weather q. Allowable Exceedance Frequencies		
r. Management Area	s. Water Body	t. Segment or Area	u. Total Coliform	v. Fecal Coliform	w. Enterococcus
x. South Orange County	y. Pacific Ocean Shoreline	z. Cameo Cove at Irvine Cove Drive – Riviera Way	aa. 38%	bb. 37%	cc. 39%
		dd. at Heisler Park - North			
	ee. Pacific Ocean Shoreline	ff. at Main Laguna Beach			
		gg. Laguna Beach at Ocean Avenue			
		hh. Laguna Beach at Cleo Street			
		ii. Arch Cove at Bluebird Canyon Road			
		jj. Laguna Beach			

		~~at Dumond Drive~~			
	~~**kk.** Pacific Ocean Shoreline~~	~~**ll.** Laguna Beach at Lagunita Place /~~ ~~**mm.** Blue Lagoon Place at Aliso Beach~~	~~**nn.** 41%~~	~~**oo.** 41%~~	~~**pp.** 42%~~
	~~**qq.** Aliso Creek~~	~~**rr.** Entire reach (7.2 miles) and associated tributaries:~~ ~~**ss.** Aliso Hills Channel~~ ~~**tt.** English Canyon Creek~~ ~~**uu.** Dairy Fork Creek~~ ~~**vv.** Sulfur Creek~~ ~~**ww.** Wood Canyon Creek~~	~~**xx.** 41%~~	~~**yy.** 41%~~	~~**zz.** 42%~~
	~~**aaa.** Aliso Creek Mouth~~	~~**bbb.** at mouth~~	~~**ccc.** 41%~~	~~**ddd** 41%~~	~~**eee.** 42%~~
	~~**fff.** Pacific Ocean Shoreline~~	~~**ggg.** Aliso Beach at West Street~~	~~**hhh** 36%~~	~~**iii.** 36%~~	~~**jjj.** 36%~~
		~~**kkk.** Aliso Beach at Table Rock Drive~~			
		~~**lll.** 100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)~~			
		~~**mmm.** at Salt Creek (large outlet)~~			

		~~**nnn.** Salt Creek Beach at Salt Creek service road~~			
		~~**ooo.** Salt Creek Beach at Strand Road~~			

qqq. Table 6.4 (Cont'd)
rrr. Interim Wet Weather WQBELs Expressed as
sss. Interim Wet Weather Allowable Exceedance Frequencies

ttt. Watershed	uuu.	vvv.	www. Interim Wet Weather xxx. Allowable Exceedance Frequencies		
vvv. Management Area	zzz. Water Body	aaaa. Segment or Area	bbb. Total Coliform	ccc. Fecal Coliform	ddd. Enterococcus
eeee. South Orange County ffff. (cont'd)	gggg. Pacific Ocean Shoreline	hhhh. at San Juan Creek	iiii. 44%	jjjj. 44%	kkkk. 48%
	llll. San Juan Creek	mmmm. lower 1 mile	nnn. 44%	ooo. 44%	ppp. 47%
	qqqq. San Juan Creek Mouth	rrrr. at mouth	sssss. 44%	tttt. 44%	uuu. 47%

		~~**wwww.** at Poche Beach~~			
		~~**aaaaa.** Ole Hanson Beach Club Beach at Pico Drain~~			
		~~**bbbbb.** San Clemente City Beach at El Portal Street Stairs~~			
		~~**ccccc.** San Clemente City Beach at Mariposa Street~~			
		~~**ddddd.** San Clemente City Beach at Linda Lane~~			
	~~**vvvv.** Pacific Ocean Shoreline~~	~~**eeeee.** San Clemente City Beach at South Linda Lane~~	~~**xxxx**~~ ~~35%~~	~~**yyyy**~~ ~~35%~~	~~**zzzz**~~ ~~36%~~
		~~**fffff.** San Clemente City Beach at Lifeguard Headquarters~~			
		~~**ggggg.** under San Clemente Municipal Pier~~			
		~~**hhhhh.** San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)~~			
		~~**iiiii.** San Clemente State Beach at Riviera Beach~~			
		~~**jjjjj.** Can Clemente State Beach at Cypress Shores~~			

~~**kkkkk.** San Luis Rey River~~	~~**llll.** Pacific Ocean Shoreline~~	~~**mmmmm.** at San Luis Rey River mouth~~	~~**nnn** 45%~~	~~**ooo** 44%~~	~~**ppp** 47%~~
~~**qqqqq.** Carlsbad~~	~~**rrrrr.** Pacific Ocean Shoreline~~	~~**sssss.** at Moonlight State Beach~~	~~**ttttt.** 40%~~	~~**uuu** 40%~~	~~**vvv** 41%~~
~~**wwwww** San Dieguito River~~	~~**xxxxx.** Pacific Ocean Shoreline~~	~~**yyyyy.** at San Dieguito Lagoon mouth~~	~~**zzzz** 33%~~	~~**aaa** 33%~~	~~**bbb** 36%~~

~~**dddddd.** Table 6.4 (Cont'd)~~
~~**eeeeee.** Interim Wet Weather WQBELs Expressed as~~
~~**ffffff.** Interim Wet Weather Allowable Exceedance Frequencies~~

~~**aaaaaa.** Watershed~~	~~**hhhhhh.** Water Body~~	~~**iiiiii.** Segment or Area~~	~~**jjjjjj.** Interim Wet Weather~~ ~~**kkkkkk.** Allowable Exceedance Frequencies~~		
			~~**ooo.** Total Coliform~~	~~**ppp.** Fecal Coliform~~	~~**qqq.** Enterococcus~~
~~**lllll.** Management Area~~					
	~~**sssssss.** Pacific Ocean Shoreline~~	~~**ttttttt.** Torrey Pines State Beach at Del Mar (Anderson Canyon)~~	~~**uuu.** 26%~~	~~**vvvv.** 26%~~	~~**www.** 26%~~
~~**rrrrrr.** Penasquitos~~	~~**xxxxxx.** Pacific Ocean Shoreline~~	~~**yyyyyy.** La Jolla Shores Beach at El Paseo Grande~~	~~**zzzz.** 37%~~	~~**aaaa.** 37%~~	~~**bbb.** 37%~~
		~~**cccccccc.** La Jolla Shores Beach at Caminito del Oro~~			
		~~**dddddddd.** La Jolla Shores Beach at Vallecitos~~			

		eeeeeee. La Jolla Shores Beach at Avenida de la Playa			
		fffffff. at Casa Beach, Children's Pool			
		ggggggg. South Casa Beach at Coast Boulevard			
		hhhhhhh. Whispering Sands Beach at Ravina Street			
		iiiiiii. Windansea Beach at Vista de la Playa			
		jjjjjjj. Windansea Beach at Bonair Street			
		kkkkkkk. Windansea Beach at Playa del Norte			
		lllllll. Windansea Beach at Palomar Avenue			
		mmmmmmm. at Tourmaline Surf Park			
		nnnnnnn. Pacific Beach at Grand Avenue			
	oooooo Tecolote Creek	**pppppppp.** Entire reach and tributaries	**qqq** 4 9 %	**rrrrr** 4 9 %	**sss** 5 1 %

	~~uuuuuu~~ ~~Forrester Creek~~	~~vvvvvvv.~~ ~~lower 1 mile~~	~~www~~ ~~46%~~	~~xxx~~ ~~43%~~	~~yyy~~ ~~49%~~
~~tttttt.~~ ~~San Diego River~~	~~zzzzzzz.~~ ~~San Diego River~~	~~aaaaaaaa.~~ ~~lower 6 miles~~	~~bbb~~ ~~46%~~	~~ccc~~ ~~43%~~	~~ddd~~ ~~49%~~
	~~eeeeeee~~ ~~Pacific Ocean Shoreline~~	~~fffffff.~~ ~~at San Diego River mouth at Dog Beach~~	~~ggg~~ ~~46%~~	~~hhh~~ ~~43%~~	~~iiiiiii~~ ~~51%~~
~~jjjjjjjj.~~ ~~San Diego Bay~~	~~kkkkkkk~~ ~~Chollas Creek~~	~~lllllll.~~ ~~lower 1.2 miles~~	~~mm~~ ~~41%~~	~~nnn~~ ~~41%~~	~~ooo~~ ~~43%~~

~~pppppppp.~~
~~qqqqqqqq.~~

~~**sssssssss.** Interim WQBEL Compliance Dates~~
~~**ttttttttt.**~~
~~**uuuuuuuuu.** The Responsible Copermittees must achieve the interim WQBELs under Specific Provisions 6.c.(2) and 6.c.(2) by the interim compliance dates given in Table 6.5.~~
~~**vvvvvvvvv.**~~
~~**wwwwwwwww.** Table 6.5~~
~~**xxxxxxxxx.** Interim Compliance Dates to Achieve Interim WQBELs~~

~~**yyyyyyyyy.** **ccccccccc.** Watershed Management Area~~	~~**zzzzzzzzz.** **ddddddddd.** Water Body~~	~~**aaaaaaaaaa.** **eeeeeeeeee.** Segment or Area~~	~~**bbbbbbbbbb.** Inte Dates **fffffffff.** Interim **gggggggggg.** Dry Weather **hhhhhhhhhh.** WQBELs~~	
~~**IIIIIIIII.** South Orange County~~	~~**mmmmmmmmm.** Pacific Ocean Shoreline~~	~~**nnnnnnnnn.** Cameo Cove at Irvine Cove Drive – Riviera Way~~	~~**oooooooooo.** April 4, 2016~~	
		~~**qqqqqqqqqq.** at Heisler Park - North~~		
	~~**rrrrrrrrr.** Pacific Ocean Shoreline~~	~~**ssssssssss.** at Main Laguna Beach~~	~~**tttttttttt.** April 4, 2016~~	
		~~**vvvvvvvvvv.** Laguna Beach at Ocean Avenue~~		
		~~**wwwwwwwwww.** Laguna Beach at Cleo Street~~		
		~~**xxxxxxxxxx.** Arch Cove at Bluebird Canyon Road~~		
		~~**yyyyyyyyyy.** Laguna Beach at Dumond~~		

			~~Drive~~	
	~~zzzzzzzzz.~~ ~~Pacific Ocean Shoreline~~	~~aaaaaaaaaa.~~ ~~Laguna Beach at Lagunita Place /~~ ~~bbbbbbbbbb.~~ ~~Blue Lagoon Place at Aliso Beach~~	~~cccccccccc.~~ ~~April 4, 2016~~	
	~~eeeeeeeeee.~~ ~~Aliso Creek~~	~~ffffffffff. Entire reach (7.2 miles) and associated tributaries:~~ ~~gggggggggg.~~ ~~- Aliso Hills Channel~~ ~~hhhhhhhhhh.~~ ~~- English Canyon Creek~~ ~~iiiiiiiiii.~~ ~~- Dairy Fork Creek~~ ~~jjjjjjjjjj.~~ ~~- Sulfur Creek~~ ~~kkkkkkkkkk.~~ ~~- Wood Canyon Creek~~	~~llllllllll. April 4, 2018~~	
	~~nnnnnnnnnn.~~ ~~Aliso Creek Mouth~~	~~oooooooooo.~~ ~~at mouth~~	~~pppppppppp.~~ ~~April 4, 2018~~	
	~~rrrrrrrrrr. Pacific Ocean Shoreline~~	~~ssssssssss.~~ ~~Aliso Beach at West Street~~ ~~vvvvvvvvvv.~~ ~~Aliso Beach at Table Rock Drive~~	~~tttttttttt. April 4, 2016~~	

		~~wwwwwwwwwwv~~ ~~100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)~~		
		~~xxxxxxxxxx. at Salt Creek (large outlet)~~		
		~~yyyyyyyyyy. Salt Creek Beach at Salt Creek service road~~	~~zzzzzzzzzz. April 4, 2017~~	
		~~bbbbbbbbbbb. Salt Creek Beach at Strand Road~~	~~cccccccccccc. April 4, 2017~~	

~~**fffffffffff.** Table 6.5 (Cont'd)~~
~~**gggggggggggg.** Interim Compliance Dates to Achieve Interim WQBELs~~

~~**hhhhhhhhhhh.** **IIIIIIIIII.** Watershed Management Area~~	~~**iiiiiiiiiii.** **mmmmmmmm** Water Body~~	~~**jjjjjjjjjj.** **nnnnnnnnnnn.** Segment or Area~~	~~**kkkkkkkkkkk.** Inte Dates **ooooooooooo.** Interim **ppppppppppp.** Dry Weather **qqqqqqqqqqq.** WQBELs~~
~~**uuuuuuuuuuu.** South Orange County **vvvvvvvvvvv.** (cont'd)~~	~~**wwww

		~~tttttttttttt. San Clemente City Beach at Linda Lane~~	~~uuuuuuuuuuuuu. April 4, 2016~~	
		~~wwwwwwwwwwv San Clemente City Beach at South Linda Lane~~	~~xxxxxxxxxxxx. April 4, 2018~~	
		~~zzzzzzzzzzzz. San Clemente City Beach at Lifeguard Headquarters~~	~~aaaaaaaaaaaaa. April 4, 2017~~	
		~~ccccccccccccc. under San Clemente Municipal Pier~~		
		~~dddddddddddd San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)~~	~~eeeeeeeeeeeee. April 4, 2018~~	
		~~ggggggggggggg San Clemente State Beach at Riviera Beach~~	~~hhhhhhhhhhhhl April 4, 2016~~	
		~~jjjjjjjjjjjj. Can Clemente State Beach at Cypress Shores~~	~~kkkkkkkkkkkkk. April 4, 2017~~	

~~mmmmmmmmmm~~ ~~San Luis Rey River~~	~~nnnnnnnnnn~~ ~~Pacific Ocean Shoreline~~	~~oooooooooooo~~ ~~at San Luis Rey River mouth~~	~~pppppppppppp~~ ~~April 4, 2017~~	
~~rrrrrrrrrrrr.~~ ~~Carlsbad~~	~~sssssssssss~~ ~~Pacific Ocean Shoreline~~	~~ttttttttttttt.~~ ~~at Moonlight State Beach~~	~~uuuuuuuuuuuu~~ ~~April 4, 2016~~	
~~wwwwwwwwwww~~ ~~San Dieguito River~~	~~xxxxxxxxxxx~~ ~~Pacific Ocean Shoreline~~	~~yyyyyyyyyyyyy.~~ ~~at San Dieguito Lagoon mouth~~	~~zzzzzzzzzzzzz.~~ ~~April 4, 2016~~	

~~ccccccccccccccc. Table 6.5 (Cont'd)~~
~~dddddddddddddd. Interim Compliance Dates to Achieve Interim WQBELs~~

~~eeeeeeeeeeeeee. iiiiiiiiiiiiii. Watershed Management Area~~	~~ffffffffffffff. jjjjjjjjjjjjjj. Water Body~~	~~gggggggggggggg kkkkkkkkkkkkkk. Segment or Area~~	~~hhhhhhhhhhhh Compliance iiiiiiiiiiiiii. Interim mmmmmmmmm Dry Weather nnnnnnnnnnn WQBELs~~
~~rrrrrrrrrrrrrr. Penasquitos~~	~~ssssssssssssss Pacific Ocean Shoreline~~	~~tttttttttttttt. Torrey Pines State Beach at Del Mar (Anderson Canyon)~~	~~uuuuuuuuuuu April 4, 2016~~
	~~wwww

		~~ccccccccccccccc~~ ~~South Casa Beach at Coast Boulevard~~	
		~~dddddddddddddd~~ ~~Whispering Sands Beach at Ravina Street~~	
		~~eeeeeeeeeeeeeee~~ ~~Windansea Beach at Vista de la Playa~~	
		~~fffffffffffff.~~ ~~Windansea Beach at Bonair Street~~	
		~~gggggggggggggg~~ ~~Windansea Beach at Playa del Norte~~	
		~~hhhhhhhhhhhhh~~ ~~Windansea Beach at Palomar Avenue~~	
		~~iiiiiiiiiiiii.~~ ~~at Tourmaline Surf Park~~	
		~~jjjjjjjjjjjjj.~~ ~~Pacific Beach at Grand Avenue~~	
	~~kkkkkkkkkkkkk~~ ~~Tecolote Creek~~	~~lllllllllllll.~~ ~~Entire reach and tributaries~~	
~~mmmmmmmmmm~~ ~~San Diego River~~	~~nnnnnnnnnnn~~ ~~Forrester Creek~~	~~oooooooooooooo~~ ~~lower 1 mile~~	~~pppppppppp~~ ~~April 4, 2018~~
	~~rrrrrrrrrrrrrr.~~ ~~San Diego River~~	~~ssssssssssssss~~ ~~lower 6 miles~~	
	~~ttttttttttttttt.~~ ~~Pacific Ocean Shoreline~~	~~uuuuuuuuuuuuuu~~ ~~at San Diego River mouth at Dog Beach~~	

~~vvvvvvvvvvvvvv. San Diego Bay~~	~~wwwwwwwwwww Chollas Creek~~	~~xxxxxxxxxxxxxxx lower 1.2 miles~~	~~yyyyyyyyyyy April 4, 2018~~

d. COMPLIANCE DETERMINATION

Compliance with WQBELs or WLAs may be demonstrated via any one of the following methods:

(1) There is no discharge from the MS4, or
(2) Applicable effluent limitations are met, or
(3) Receiving waters meet the applicable receiving water limitations or water quality objective, or
(4) Loading from the MS4 is such that it does not cause water quality objective exceedances, or
(5) Implementation of a Water Quality Improvement Plan determined by the Regional Board Executive Officer to comply with Provision A as described in Provision A.4.

Furthermore, as stated in the TMDL:

The Phase I MS4s may demonstrate that their discharges are not causing the exceedances in the receiving waters by providing data from their discharge points to the receiving waters, by providing data collected at jurisdictional boundaries, and/or using other methods accepted by the San Diego Water Board. Otherwise, at the end of the [wet or] dry weather TMDL compliance schedule, the municipal Phase I MS4s will be held responsible and considered out of compliance unless other information or evidence indicates another controllable or uncontrollable source is responsible for the exceedances in the receiving waters. If controllable sources other than discharges from the municipal Phase I MS4s are identified before or after the end of the [wet or] dry weather TMDL Compliance Schedule as causing the exceedances, those controllable sources will be responsible for reducing their bacteria loads and/or demonstrating that discharges from those sources are not causing the exceedances. The San Diego Water Board shall implement additional actions (e.g., issue enforcement actions, amend existing NPDES requirements or conditional waivers), as needed, to bring all controllable sources into compliance with the [wet or] dry weather TMDLs.

~~aaaaaaaaaaaaaaaaa.e.~~ Specific Monitoring and Assessment Requirements

The Bacteria Load Reduction Plans (BLRPs) and CLRPs to be submitted by the Copermittees and approved by the Regional Board Executive Officer contain monitoring programs. Implementation of those Regional Board-approved monitoring programs constitutes compliance with the Monitoring Station and Monitoring Procedure requirements, described below.

(1) Monitoring and Assessment Requirements for Beaches

(a) Monitoring Stations

~~(i) The Responsible Copermittees must designate the MS4 outfalls within their jurisdiction discharging to the Pacific Ocean Shoreline segments or areas listed in Table 6.0 as high priority non-storm water MS4 monitoring stations, in accordance with the requirements of Provision of this Order.~~

~~(ii) For the Pacific Ocean Shoreline segments or areas listed in Table 6.0 with MS4 outfalls, the Responsible Copermittees must establish at least one monitoring station within the receiving water.~~

For beaches addressed by these TMDLs, monitoring locations should consist of, at a minimum, the same locations used to collect data required under MS4 NPDES monitoring requirements and beach monitoring for Health and Safety Code section 115880.[75] If exceedances of the receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations and/or other source identification methods must also be used to demonstrate that the bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

[75] Commonly referred to as AB 411 monitoring

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly.

~~(i)~~(ii) ~~The Responsible Copermittees must monitor the effluent of the designated MS4 outfalls within their jurisdiction discharging during dry weather to the Pacific Ocean Shoreline segments or areas listed in Table 6.0 in accordance with the dry weather jurisdictional monitoring requirements of Provision of this Order. Samples required to be submitted to a laboratory for analysis must include analysis for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.~~

(iii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations at least once within the first 24 hours of the end of a storm event[26] that occurs during the rainy season (i.e., October 1 through April 30).

~~(ii) The Responsible Copermittees must monitor, within the first 24 hours of each storm event,[27] the effluent of the designated MS4 outfalls within their jurisdiction discharging to the Pacific Ocean Shoreline segments or areas listed in Table 6.0 in accordance with the wet weather jurisdictional monitoring requirements of Provision of this Order. Samples required to be submitted to a laboratory for analysis must include analysis for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.~~

~~(iii)~~(iv) ~~The Responsible Copermittees must collect samples from the monitoring stations within the receiving water body for each dry weather and wet weather MS4 outfall monitoring event.~~ Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs for the Pacific Ocean Shoreline segments or areas listed in

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[26] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

~~[27] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].~~

Table 6.0 have been achieved.

~~(i)~~(ii) The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

(2) Monitoring and Assessment Requirements for Creeks and Creek Mouths

(a) Monitoring Stations

~~(i) The Responsible Copermittees must establish at least one receiving water monitoring station at or near the mouth of the creeks listed in Table 6.0.~~

~~(ii)~~

~~(iii) The Responsible Copermittees must establish at least one receiving water monitoring station upstream of the station established for Specific Provision 6.d.(2)(a). At least one monitoring station must be established for each Responsible Copermittee at the most downstream location within its jurisdiction, and one monitoring station at the most upstream location within its jurisdiction.~~

~~(iv) The Responsible Copermittees must identify the MS4 outfalls discharging to the segments or areas of the creeks and creek mouths listed in Table 6.0. The Responsible Copermittees must identify the MS4 outfalls that are monitored in accordance with the dry weather jurisdictional monitoring requirements of Provision of this Order and the wet weather jurisdictional monitoring requirements of Provision of this Order.~~

For creeks addressed by these TMDLs, monitoring locations should consist of, at a minimum, a location at or near the mouth of the creek (e.g., Mass Loading Station or Mass Emission Station) and one or more locations upstream of the mouth (e.g., Watershed Assessment Stations). If exceedances of the receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations and/or other source identification methods must also be used to demonstrate that the bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations ~~at least monthly.~~ according to the WQIP.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations within the first 24 hours of

(iii) the end of a storm event[28] that occurs during the rainy season (i.e., October 1 through April 30).

(iv)

(v) Samples collected from receiving water monitoring stations must be analyzed for ~~total coliform,~~ fecal coliform~~,~~ and *Enterococcus* indicator bacteria.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the receiving water monitoring data to assess whether the interim and final receiving water WQBELs for the creeks and creek mouths listed in Table 6.0 have been achieved.

~~(ii) If the receiving water WQBELs for the creeks and creek mouths listed in Table 6.0 have not been achieved, the Responsible Copermittees must review the MS4 outfall monitoring data to assess whether the interim and final effluent WQBELs have been achieved.~~

~~(iii) The Responsible Copermittee must identify and incorporate additional MS4 outfall and receiving water monitoring stations and/or adjust monitoring frequencies to identify sources causing exceedances of the receiving water WQBELs.~~

~~(iv)~~(ii) The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

[28] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

ADMINISTRATIVE DRAFT

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

TENTATIVE
ORDER NO. R9-2012-0011
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The San Diego County Copermittees in Table 1a are subject to waste discharge requirements within their respective jurisdictions set forth in this Order.

Table 1a. San Diego County Copermittees

City of Carlsbad	City of Oceanside
City of Chula Vista	City of Poway
City of Coronado	City of San Diego
City of Del Mar	City of San Marcos
City of El Cajon	City of Santee
City of Encinitas	City of Solana Beach
City of Escondido	City of Vista
City of Imperial Beach	County of San Diego
City of La Mesa	San Diego County Regional Airport Authority
City of Lemon Grove	Unified Port District of San Diego
City of National City	

The Orange County Copermittees in Table 1b are subject to waste discharge requirements within their respective jurisdictions set forth in this Order upon expiration of Order No. R9-2009-0002, NPDES No. CAS0108740 on December 16, 2014.

Table 1b. Orange County Copermittees

City of Aliso Viejo	City of Ranch Santa Margarita
City of Dana Point	City of San Clemente
City of Laguna Beach	City of San Juan Capistrano
City of Laguna Hills	City of Laguna Woods
City of Laguna Niguel	County of Orange
City of Lake Forest	Orange County Flood Control District
City of Mission Viejo	

The Riverside County Copermittees in Table 1c are subject to waste discharge requirements within their respective jurisdictions set forth in this Order upon expiration of Order No. R9-2010-0016, NPDES No. CAS0108766 on November 10, 2015.

Table 1c. Riverside County Copermittees

City of Murrieta	County of Riverside
City of Temecula	Riverside County Flood Control and Water Conservation District
City of Wildomar	

The Orange County Copermittees and Riverside County Copermittees may enroll under this Order at a date earlier than the expiration date of their current Orders subject to the conditions described in Provision F.6 of this Order and the Copermittees in the respective county receive a Notice of Enrollment (NOE) from the San Diego Water Board.

The term Copermittee in this Order refers to any San Diego County, Orange County, or Riverside County Copermittee enrolled under this Order, unless specified otherwise.

This Order provides permit coverage for the Copermittee discharges described in Table 2. "Co-permittees need only comply with permit conditions relating to discharges from the municipal separate storm sewers for which they are operators." 40 CFR §122.26(a)(3)(vi).

Table 2. Discharge Locations and Receiving Waters

Discharge Points	Locations throughout San Diego Region
Discharge Description	Municipal Separate Storm Sewer System (MS4) Discharges
Receiving Waters	Waters of the U.S.: Inland Surface Waters, Enclosed Bays and Estuaries, and Coastal Ocean Waters of the San Diego Region

Table 3. Administrative Information

This Order was adopted by the San Diego Water Board on:	**Month Day, 2012**
This Order will become effective on:	**Month Day, 2012**
This Order will expire on:	**Month Day, 2017**
The Copermittees must file a Report of Waste Discharge (ROWD) in accordance with Title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than 180 days in advance of the Order expiration date.	

I, David W. Gibson, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on Month Day, 2012.

TENTATIVE

David W. Gibson
Executive Officer

ADMINISTRATIVE DRAFT

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I. FINDINGS

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), finds that:

JURISDICTION

1. **MS4 Ownership or Operation.** Each of the Copermittees owns or operates an MS4, through which it discharges storm water and non-storm water into waters of the U.S. within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the U.S.

2. **Legal and Regulatory Authority.** This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]) adopted by the United States Environmental Protection Agency (USEPA), and chapter 5.5, division 7 of the California Water Code (CWC) (commencing with section 13370). This Order serves as an NPDES permit for discharges from MS4s to surface waters. This Order also serves as waste discharge requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

3. **CWA Technology Based Standards and Prohibitions.** Pursuant to CWA section 402(p)(3)(B), NPDES permits for storm water discharges from MS4s must include requirements to effectively prohibit non-storm water discharges into MS4s, and require controls to reduce the discharge of pollutants in storm water to the maximum extent practicable (MEP).

4. **CWA NPDES Permit Conditions.** Pursuant to CWA section 402(a)(2), NPDES permits must prescribe conditions to assure compliance with CWA section 402(p)(3)(B) and 40 CFR 122.26(d)(2)(iv)(B). This Order prescribes conditions to assure compliance with the CWA requirements for owners and operators of MS4s to effectively prohibit non-storm water discharges in to the MS4s, and require controls to reduce the discharge of pollutants in storm water from the MS4s to the MEP.

5. **CWA and CWC Monitoring Requirements.** Pursuant to 40 CFR 122.48, NPDES permits must specify requirements for recording and reporting monitoring results. In addition, CWC sections 13267 and 13383 authorize the San Diego Water Board to require technical and monitoring reports. This Order establishes monitoring and reporting requirements to implement federal and State requirements.

6. **Total Maximum Daily Loads.** CWA section 303(d)(1)(A) requires that "[e]ach state shall identify those waters within its boundaries for which the effluent limitations…are not stringent enough to implement any water quality standard applicable to such waters." The CWA also requires states to establish a priority ranking of impaired water bodies known as Water Quality Limited Segments and to establish Total Maximum Daily Loads (TMDLs) for such waters. This priority list of impaired water bodies is called the Clean Water Act Section 303(d) List of Water Quality Limited Segments, commonly referred to as the 303(d) List. The CWA requires the 303(d) List to be updated every two years. Requirements of this Order implement the TMDLs adopted by the San Diego Water Board and approved by USEPA.

7. **Non-Storm Water Discharges.** Pursuant to CWA section 402(p)(3)(B)(ii), this Order requires each Copermittee to effectively prohibit discharges of non-storm water into its MS4. Nevertheless, non-storm water discharges into and from the MS4s continue to be reported to the San Diego Water Board by the Copermittees and other persons. Monitoring conducted by the Copermittees, as well as the 303(d) List, have identified dry weather, non-storm water discharges from the MS4s as a source of pollutants causing or contributing to receiving water quality impairments in the San Diego Region. The federal regulations [40 CFR 122.26(d)(2)(iv)(B)] require the Copermittees to have a program to prevent all types of non-storm water discharges, or illicit discharges, from entering the MS4. The federal regulations, however, allow for specific categories of non-storm water discharges or flows to be addressed as illicit discharges only where such discharges are identified as sources of pollutants to waters of the U.S.

8. **In-Stream Treatment Systems.** Pursuant to federal regulations [40 CFR 131.10(a)], in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S. Authorizing the construction of a runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to accepting waste assimilation as an appropriate use for that water body. Runoff treatment must occur prior to the discharge of runoff into receiving waters. Treatment control best management practices (BMPs) must not be constructed in waters of the U.S. Construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body.

DISCHARGE CHARACTERISTICS AND RUNOFF MANAGEMENT

9. **Point Source Discharges of Pollutants.** Discharges from the MS4s may contain waste, as defined in the CWC, and pollutants that adversely affect the quality of the waters of the state. A discharge from an MS4 is a "discharge of pollutants from a point source" into waters of the U.S. as defined in the CWA. Storm water and non-storm water discharges from the MS4s may contain pollutants that cause or threaten to cause a violation of surface water quality standards, as outlined in the Basin Plan. Storm water and non-storm water discharges from the MS4s are subject to the

conditions and requirements established in the Basin Plan for point source discharges.

10. **Potential Beneficial Use Impairment.** The discharge of pollutants and/or increased flows from MS4s may cause or threaten to cause the concentration of pollutants to exceed applicable receiving water quality objectives and impair or threaten to impair designated beneficial uses resulting in a condition of pollution, contamination, or nuisance.

11. **Pollutants Generated by Land Development.** Land development has created and continues to create new sources of non-storm water discharges and pollutants in storm water discharges as human population density increases. This brings higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash. Pollutants from these sources are dumped or washed off the surface by non-storm water or storm water flows into and from the MS4s. When development converts natural vegetated pervious ground cover to impervious surfaces such as paved highways, streets, rooftops, and parking lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving a developed area not subject to SUSMP or HMP requirements contains greater pollutant loads and is significantly greater in runoff volume, velocity, and peak flow rate than pre-development runoff from the same area.

12. **Runoff Discharges to Receiving Waters.** The MS4s discharge runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within the eleven hydrologic units comprising the San Diego Region. Numerous receiving water bodies and water body segments have been designated as impaired by the San Diego Water Board pursuant to CWA section 303(d).

13. **Pollutants in Runoff.** The most common pollutants in runoff discharged from the MS4s include total suspended solids, sediment, pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., cadmium, copper, lead, and zinc), petroleum products and polynuclear aromatic hydrocarbons, synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus), oxygen-demanding substances (decaying vegetation, animal waste), detergents, and trash.

14. **Human Health and Aquatic Life Impairment.** Pollutants in runoff discharges from the MS4s can threaten and adversely affect human health and aquatic organisms. Adverse responses of organisms to chemicals or physical agents in runoff range from physiological responses such as impaired reproduction or growth anomalies to mortality. Increased volume, velocity, rate, and duration of storm water runoff greatly accelerate the erosion of downstream natural channels. This alters stream channels and habitats and can adversely affect aquatic and terrestrial organisms.

15. **Water Quality Effects.** The Copermittees' water quality monitoring data submitted to date documents persistent exceedances of Basin Plan water quality objectives for runoff-related pollutants at various watershed monitoring stations. Persistent toxicity

has also been observed at several watershed monitoring stations. In addition, bioassessment data indicate that the majority of the monitored receiving waters have Poor to Very Poor Index of Biotic Integrity (IBI) ratings. These findings indicate that runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in the San Diego Region. Non-storm water discharges from the MS4s have been shown to contribute significant levels of pollutants and flow in arid, developed Southern California watersheds, and contribute significantly to exceedances of applicable receiving water quality objectives.

16. **Non-Storm Water Discharges.** Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s must be effectively prohibited.

17. **Best Management Practices.** Pollutants can be effectively reduced in runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Pollution prevention is the reduction or elimination of pollutant generation at its source and is the best "first line of defense". Source control BMPs (both structural and non-structural) minimize the contact between pollutants and runoff, therefore keeping pollutants onsite and out of receiving waters. Treatment control BMPs remove pollutants that have been mobilized by storm water or non-storm water flows.

18. **BMP Implementation.** Runoff needs to be addressed during the three major phases of development (planning, construction, and use) in order to reduce the discharge of storm water pollutants to the MEP, effectively prohibit non-storm water discharges, and protect receiving waters. Development which is not guided by water quality planning policies and principles can result in increased pollutant load discharges, flow rates, and flow durations which can negatively affect receiving water beneficial uses. Construction sites without adequate BMP implementation result in sediment runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. Existing development can generate substantial pollutant loads which are discharged in runoff to receiving waters.

19. **Long Term Planning and Implementation.** Federal regulations require municipal storm water permits to expire 5 years from adoption, after which the permit must be renewed and reissued. The San Diego Water Board recognizes that the degradation of water quality and impacts to beneficial uses of the waters in the San Diego Region occurred over several decades. The San Diego Water Board further recognizes that a decade or more may be necessary to realize demonstrable improvement to the quality of waters in the Region. This Order includes a long term planning and implementation approach that will require more than a single permit term to complete.

WATER QUALITY STANDARDS

20. **Basin Plan.** The San Diego Water Board adopted a Water Quality Control Plan for the San Diego Basin (Basin Plan) on September 8, 1994 that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for receiving waters addressed through the plan. The Basin Plan was subsequently approved by the State Water Resources Control Board (State Water Board) on December 13, 1994. Subsequent revisions to the Basin Plan have also been adopted by the San Diego Water Board and approved by the State Water Board. Requirements of this Order implement the Basin Plan.

    The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Process Supply (PROC), Industrial Service Supply (IND), Ground Water Recharge (GWR), Contact Water Recreation (REC1), Non-contact Water Recreation (REC2), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Freshwater Replenishment (FRSH), Hydropower Generation (POW), and Preservation of Biological Habitats of Special Significance (BIOL). The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region: Navigation (NAV), Commercial and Sport Fishing (COMM), Estuarine Habitat (EST), Marine Habitat (MAR), Aquaculture (AQUA), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN), and Shellfish Harvesting (SHELL).

21. **Ocean Plan.** The State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, and 2005. The State Water Board adopted the latest amendment on April 21, 2005 and it became effective on February 14, 2006. The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean. Requirements of this Order implement the Ocean Plan.

    The Ocean Plan identifies the following beneficial uses of ocean waters of the state to be protected: Industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture; preservation and enhancement of designated Areas of Special Biological Significance; rare and endangered species; marine habitat; fish spawning and shellfish harvesting

22. **Sediment Quality Control Plan**. On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret

the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

23. **National Toxics Rule and California Toxics Rule.** USEPA adopted the NTR on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the National toxics Rule (NTR) applied in California. On May 18, 2000, USEPA adopted the California Toxics Rule (CTR). The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants

24. **Antidegradation Policy.** This Order is in conformance with the federal Antidegradation Policy described in 40 CFR 131.12, and State Water Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality Waters in California*. Federal regulations at 40 CFR 131.12 require that the State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The San Diego Water Board's Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies.

CONSIDERATIONS UNDER FEDERAL LAW

25. **Coastal Zone Act Reauthorization Amendments.** Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states with approved coastal zone management programs to address non-point pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point pollution: agriculture, silviculture, urban, marinas, and hydromodification. This Order addresses the management measures required for the urban category, with the exception of septic systems. The runoff management programs developed pursuant to this Order fulfill the need for coastal cities to develop a runoff non-point source plan identified in the Non-Point Source Program Strategy and Implementation Plan. The San Diego Water Board addresses septic systems through the administration of other programs.

26. **Endangered Species Act.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 USCA sections 1531 to 1544). This Order requires compliance with receiving water limits, and other requirements to protect the beneficial uses of waters of the State. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

CONSIDERATIONS UNDER STATE LAW

27. **Unfunded Mandates.** This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following:

    a. This Order implements federally mandated requirements under CWA section 402. (33 USC 1342(p)(3)(B).)

    b. The local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental and new dischargers who are issued NPDES permits for storm water and non-storm water discharges.

    c. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order.

    d. The Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC 1311(a)) and in lieu of numeric restrictions on their MS4 discharges (i.e. effluent limitations).

    e. The local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under State law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

    f. The provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards. (33 USC 1313(d).) Once the USEPA or a state develops a TMDL, federal law requires that permits must contain effluent limitations consistent with the assumptions and requirements of any applicable wasteload allocation. (40 CFR 122.44(d)(1)(vii)(B).)

28. **California Environmental Quality Act.** The issuance of WDRs and an NPDES permit for the discharge of runoff from MS4s to waters of the U.S. is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 et seq.) in accordance with CWC section 13389.

STATE WATER BOARD DECISIONS

29. **Compliance with Prohibitions and Limitations.** The receiving water limitation language specified in this Order is consistent with language recommended by the USEPA and established in State Water Board Order WQ-99-05, *Own Motion Review of the Petition of Environmental Health Coalition to Review Waste Discharge Requirements Order No. 96-03, NPDES Permit No. CAS0108740*, adopted by the State Water Board on June 17, 1999. The receiving water limitation language in this Order requires compliance with water quality standards, which for storm water discharges is to be achieved through an iterative approach requiring the

implementation of improved and better-tailored BMPs over time. Implementation of the iterative approach to comply with receiving water limitations based on applicable water quality standards is necessary to ensure that storm water discharges from the MS4 ultimately will not cause or contribute to violations of water quality standards and the creation of conditions of pollution, contamination, or nuisance.

30. **Special Conditions for Areas of Special Biological Significance.** On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving an exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges. The Resolution requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBSs. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject terms and conditions of the Resolution. The Special Protections contained in Attachment B to the Resolution applicable to these discharges are hereby incorporated in this Order as if fully set forth herein.

ADMINISTRATIVE FINDINGS

31. **Executive Officer Delegation of Authority.** The San Diego Water Board by prior resolution has delegated all matters that may legally be delegated to its Executive Officer to act on its behalf pursuant to CWC section 13223. Therefore, the Executive Officer is authorized to act on the San Diego Water Board's behalf on any matter within this Order unless such delegation is unlawful under CWC section 13223 or this Order explicitly states otherwise.

32. **Standard Provisions.** Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR 122.42, are provided in Attachment B to this Order.

33. **Fact Sheet.** The Fact Sheet for this Order contains background information, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of this Order. The Fact Sheet is hereby incorporated into this Order and constitutes part of the Findings of this Order.

34. **Public Notice.** The San Diego Water Board notified the Copermittees, and interested agencies and persons of its intent to prescribe WDRs for MS4 discharges of pollutants to waters of the U.S. and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet.

35. **Public Hearing.** The San Diego Water Board held a public hearing on Month Day, 2012 and heard and considered all comments pertaining to the terms and conditions of this Order. Details of the public hearing are provided in the Fact Sheet.

II. PROVISIONS

THEREFORE, IT IS HEREBY ORDERED that the Copermittees, in order to meet the provisions contained in division 7 of the CWC and regulations adopted thereunder, and the provisions of the CWA and regulations adopted thereunder, must each comply with the following:

A. PROHIBITIONS AND LIMITATIONS

[NOTE: The receiving water limitations language contained in provision A raises significant legal and policy issues that require further discussion and revision. The receiving water limitations language in Provision A generally follows the language required by the State Board's precedential Order WQ 99-05. In the State Board's precedential order WQ 2001-15, the State Board determined that the mandatory receiving water limitations language found in Order 99-05 "does not require strict compliance with water quality standards." Instead, the State Board concluded that compliance with water quality standards is "to be achieved over time, through an iterative approach requiring improved BMPs." Despite this policy statement from the State Board, in 2011, the 9th Circuit interpreted the State Board's mandatory language in a manner that requires strict and immediate compliance with water quality standards. The State Board has recently scheduled a workshop for November 20 to address the receiving water limitations language. The San Diego Copermittees support revisions to the receiving water limitations language that align the language with the State Board's policy that compliance with water quality standards is "to be achieved over time, through an iterative approach requiring improved BMPs." Storm water organizations such as CASQA have already submitted language to the State Board designed to address this conflict between the State Board's policy and the 9th Circuit decision. The redlines submitted below are not designed to address all the issues raised by this conflict. Instead, the redlines address, for this draft permit, how compliance with water quality standards will be achieved for water bodies covered by an adopted TMDL or covered in the WQIPs. The San Diego Copermittees will participate in the State Board process regarding the larger issues involving the receiving water limitations language, and encourage the Regional Board to do so as well. The San Diego Copermittees reserve the right to submit additional language intended to align all of the receiving water limitations language in this draft permit with State Board policy as the State Board workshop process evolves. At this time, however, the San Diego Copermittees believe it is premature to submit such language given the pending State Board process and the proposed CASQA language.]

The purpose of this provision is to describe the conditions under which storm water and non-storm water discharges into and from MS4s are prohibited or limited. The goal of this provision is to address the impacts of MS4 discharges so that such discharges do not impair water quality and designated beneficial uses of waters of the U.S. This goal will be accomplished through implementation of control measures that effectively prohibit non-storm water discharges into and from the Copermittees' MS4s, and reduce pollutants in storm water discharges from the Copermittees' MS4s to the MEP. The

process for determination of compliance with the Discharge Prohibitions (A.1), Receiving Water Limitations (A.2), and Effluent Limitations (A.3) is defined in Provision A.4.

1. Discharge Prohibitions

a. Discharges from MS4s owned and operated by a Copermittee in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the U.S. are effectively prohibited, unless the Copermittee is addressing the discharges through Provision A.1.e or A.4 through the process set forth in Provision A.4.

b. Non-storm water discharges into MS4s are effectively prohibited, unless such discharges are either authorized by a separate NPDES permit, or the discharge is a category of non-storm water discharges or flows that must be addressed pursuant to Provisions E.2.a.(1)-(5) of this Order.

c. Discharges from MS4s are subject to all waste discharge prohibitions in the Basin Plan, included in Attachment A to this Order, unless the Copermittee is addressing the discharges through Provision A.1.e or A.4 through the process set forth in Provision A.4.

d. Storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-001**2** applicable to these discharges, included in Attachment A to this Order. All other discharges from MS4s to ASBS are prohibited, unless authorized by a subsequent order.

e. For discharges associated with water body pollutant combinations addressed in a TMDL in Attachment E of this Order, the affected Copermittees shall achieve compliance as outlined in Attachment E (Total Maximum Daily Load Provisions).

2. Receiving Water Limitations

a. Discharges from MS4s owned and operated by a Copermittee must not cause or contribute to the violation of water quality standards in any receiving waters, including all applicable provisions contained in the list below including any modifications unless the Copermittee is addressing the discharges through Provision A.2.b or A.4 through the process set forth in Provision A.4:

(1) The San Diego Water Board's Basin Plan, including beneficial uses, water quality objectives, and implementation plans;

(2) State Water Board plans for water quality control including the following:

(a) Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries (Thermal Plan), and

(b) The Ocean Plan, including beneficial uses, water quality objectives, and implementation plans;

(3) State Water Board policies for water and sediment quality control including the following:

(a) Water Quality Control Policy for the Enclosed Bays and Estuaries of California,

(b) Sediment Quality Control Plan which includes the following narrative objectives for bays and estuaries:

(i) Pollutants in sediments shall not be present in quantities that, alone or in combination, are toxic to benthic communities, and

(ii) Pollutants shall not be present in sediments at levels that will bioaccumulate in aquatic life to levels that are harmful to human health,

(c) The Statement of Policy with Respect to Maintaining High Quality of Waters in California (State Water Board Resolution No. 68-16).

(4) Priority pollutant criteria promulgated by the USEPA through the following:

(a) National Toxics Rule (NTR)[1] (promulgated on December 22, 1992 and amended on May 4, 1995), and

(b) California Toxics Rule (CTR)[2,3]

b. For receiving water limitations associated with a water body pollutant combination addressed in a TMDL in Attachment E of this Order, the Copermittees shall achieve compliance as outlined in Attachment E (Total Maximum Daily Load Provisions).

3. Effluent Limitations

a. Technology Based Effluent Limits
Pollutants in storm water discharges from MS4s must be reduced to the MEP[4],

[1] 40 CFR 131.36
[2] 65 Federal Register 31682-31719 (May 18, 2000), adding Section 131.38 to 40 CFR
[3] If a water quality objective and a CTR criterion are in effect for the same priority pollutant, the more stringent of the two applies, unless a previous regulatory action (i.e., TMDL) has specified otherwise.
[4] This does not apply to MS4 discharges which receive subsequent treatment to reduce pollutants in storm water discharges to the MEP prior to entering receiving waters (e.g., low flow diversions to the

through timely implementation of control measures and other actions as specified in Provisions B and E as described in Provision A.4.

b. Water Quality Based Effluent Limits
For a water body-pollutant combination addressed in a TMDL in Attachment E of this Order, pollutants in discharges from MS4s must be reduced to comply with effluent limitations expressed as WQBELs required to meet the WLAs established for those TMDLs as described in Provision A.4 and Attachment E to this Order, pursuant to the applicable TMDL compliance schedules.

4. Compliance with Discharge Prohibitions, Receiving Water Limitations, and Effluent Limitations

Each Copermittee must comply with the discharge prohibitions (A.1), receiving water limitations (A.2), and effluent limitations (A.3) of this Order through timely implementation of strategies, control measures, and other actions as specified in Provisions B and E of this Order, including any modifications. The Water Quality Improvement Plans described in Provision B shall be designed to achieve compliance with the discharge prohibitions, receiving water limitations, and effluent limitations. Copermittees shall be considered in compliance with A.1, A.2, and A.3 unless the Regional Board has denied approval of a Water Quality Improvement Plan or subsequent update as described in Provisions B and F.1.

a. If exceedance(s) of water quality standards persist in receiving waters notwithstanding implementation of this Order, the Copermittees must comply with the following procedures:

(1) For pollutants that are not in the process of being addressed via specific scheduled actions in a Water Quality Improvement Plan, upon a determination by either the Copermittees or the San Diego Water Board that discharges from the MS4 are causing or contributing to an exceedance of an applicable water quality standard, the Copermittees must submit the following updates to the Water Quality Improvement Plan required under Provision B as part of the Annual Report required under Provision F.3.b or Water Quality Improvement Plan update Provision B.5.a, unless the San Diego Water Board either: 1) directs an earlier submittal; or 2) allows for the adoption of a forthcoming TMDL to establish wasteload allocations that will form the basis of revisions to the Water Quality Improvement Plan:

(a) The water quality improvement strategies being implemented that are effective and will continue to be implemented;

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sanitary sewer). Runoff treatment must occur prior to the discharge of runoff into receiving waters per Finding 8.

(b) Water quality improvement strategies (e.g. BMPs, retrofitting projects, stream and/or habitat rehabilitation, restoration projects, etc.) that will be implemented to reduce or eliminate any pollutants or conditions that are causing or contributing to the exceedance of water quality standards;

(c) Updates to the schedule for implementation of the existing and additional water quality improvement strategies; and

(d) Updates, when necessary, to the schedule for achieving compliance with the discharge prohibitions and receiving water limitations of this Order;

(e) As described in Provision B.6, Copermittees must submit requested modifications to the Water Quality Improvement Plan either in the Annual Report required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge (ROWD) required pursuant to Provision F.5.b. ;;

(f) As described in Provision B.6, upon San Diego Water Board determination that the update to the Water Quality Improvement Plan meets the requirements of this Order, the Copermittees must submit requested modifications to the jurisdictional runoff management programs either in the Annual Report required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge (ROWD) required pursuant to Provision F.5.b.; and

(g) The Copermittees must implement the revised jurisdictional runoff management programs and updated jurisdictional monitoring and assessment component of the Water Quality Improvement Plan.

(2) For pollutants in the process of being addressed via a specific, scheduled program in a Water Quality Improvement Plan, the Copermittee(s) shall continue to implement that program as described in the Water Quality Improvement Plan approved by the Regional Board;

b. So long as the Copermittees have complied with the procedures set forth above and are implementing the Water Quality Improvement Plan(s) approved by the Regional Board, the Copermittees do not have to repeat the same procedure for continuing or recurring exceedances of the same discharge prohibitions, effluent limitations, and receiving water limitations unless directed to by the San Diego Water Board.

B. WATER QUALITY IMPROVEMENT PLANS

The purpose of this provision is to develop Water Quality Improvement Plans that guide the Copermittees' jurisdictional runoff management program implementation efforts towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plan is to 1) effectively prohibit non-storm water discharges into the MS4s, 2) reduce pollutants in storm water discharges from the MS4s to the MEP, and 3) support attainment and reasonable protection, preservation and enhancement of water quality and designated beneficial uses of waters of the state. Therefore, implementation of the WQIPs also provides the basis for complying with Provisions A.1 and A.3, as described in Provision A.4. This goal will be accomplished through an adaptive planning and management process that identifies the highest water quality priorities within a watershed and implements strategies, control measures, and BMPs to achieve improvements in the quality of discharges from the MS4s and receiving waters.

The Copermittees must develop Water Quality Improvement Plans for each Watershed Management Area that 1) prioritize water quality conditions resulting from the Copermittee's MS4 discharges in each Watershed Management Area, 2) identify MS4 pollutant sources associated with the water quality priorities, 3) define numeric goals and schedules to address water quality priorities, 4) describe water quality improvement strategies to achieve numeric goals, and 5) develop and execute a coordinated monitoring and assessment program to facilitate adaptive management of the Water Quality Improvement Plans and determine progress towards achieving improved water quality in MS4 discharges and receiving waters

The Copermittees must submit Water Quality Improvement Plans for public review and Regional Board Executive Officer review and approval per the schedule outline in Provision B.

1. Watershed Management Areas

The Copermittees must develop Water Quality Improvement Plans for each of the Watershed Management Areas in Table B-1. A total of ten Water Quality Improvement Plans must be developed for the San Diego Region.

Table B-1. Watershed Management Areas

Watershed Management Area	Hydrologic Unit(s)	Major Surface Water Bodies	Responsible Copermittees
South Orange County	San Juan (901.00)	Aliso Creek San Juan Creek San Mateo Creek Pacific Ocean	- City of Aliso Viejo[1] - City of Dana Point[1] - City of Laguna Beach[1] - City of Laguna Hills[1] - City of Laguna Niguel[1] - City of Laguna Woods[1] - City of Lake Forest[1] - City of Mission Viejo[1] - City of Rancho Santa Margarita[1] - City of San Clemente[1] - City of San Juan Capistrano[1] - County of Orange[1] - Orange County Flood Control District[1]
Santa Margarita River	Santa Margarita (902.00)	Murrieta Creek Temecula Creek Santa Margarita River Santa Margarita Lagoon Pacific Ocean	- City of Murrieta[2] - City of Temecula[2] - City of Wildomar[2] - County of Riverside[2] - County of San Diego[3] - Riverside County Flood Control and Water Conservation District[2]
San Luis Rey River	San Luis Rey (903.00)	San Luis Rey River San Luis Rey Estuary Pacific Ocean	- City of Oceanside - City of Vista - County of San Diego
Carlsbad	Carlsbad (904.00)	Loma Alta Slough Buena Vista Lagoon Agua Hedionda Lagoon Batiquitos Lagoon San Elijo Lagoon Pacific Ocean	- City of Carlsbad - City of Encinitas - City of Escondido - City of Oceanside - City of San Marcos - City of Solana Beach - City of Vista - County of San Diego
San Dieguito River	San Dieguito (905.00)	San Dieguito River San Dieguito Lagoon Pacific Ocean	- City of Del Mar - City of Escondido - City of Poway - City of San Diego - City of Solana Beach - County of San Diego
Penasquitos	Reservoir HA (906.10) Poway HA (906.20) Miramar HA (906.40)	Los Penasquitos Lagoon Pacific Ocean	- City of Del Mar - City of Poway - City of San Diego - County of San Diego
Mission Bay	Scripps HA (906.30) Miramar HA (906.40) Tecolote HA (906.50)	Mission Bay Pacific Ocean	-City of San Diego
San Diego River	San Diego (907.00)	San Diego River Pacific Ocean	- City of El Cajon - City of La Mesa - City of San Diego - City of Santee - County of San Diego

Table B-1. Watershed Management Areas

Watershed Management Area	Hydrologic Unit(s)	Major Surface Water Bodies	Responsible Copermittees
San Diego Bay	Pueblo San Diego (908.00) Sweetwater (909.00) Otay (910.00)	Sweetwater River Otay River San Diego Bay Pacific Ocean	- City of Chula Vista - City of Coronado - City of Imperial Beach - City of La Mesa - City of Lemon Grove - City of National City - City of San Diego - County of San Diego - San Diego County Regional Airport Authority - Unified Port of San Diego
Tijuana River	Tijuana (911.00)	Tijuana River Tijuana Estuary Pacific Ocean	- City of Imperial Beach - City of San Diego - County of San Diego

Notes:
1. The Orange County Copermittees will be enrolled under this Order upon expiration of Order No. R9-2009-0002, or earlier if the Orange County Copermittees meet the conditions in Provision F.6.
2. The Riverside County Copermittees will be enrolled under this Order upon expiration of Order No. R9-2010-0016, or earlier if the Riverside County Copermittees meet the conditions in Provision F.6.
3. The County of San Diego will not be required to implement the requirements of Provision B for the Santa Margarita River Watershed Management Area until the Riverside County Copermittees are enrolled under this Order. Until then, the County of San Diego is responsible for implementing and complying with the requirements of Provisions D.1, D.4.a.(1)&(3), E, F.2.a-b, F.3.b, and F.4 for the areas of the Santa Margarita River Watershed Management Area within its jurisdiction.

2. Identification of Water Quality Priorities

The Copermittees must identify the water quality priorities within each Watershed Management Area that will be addressed by the Water Quality Improvement Plan. Where appropriate, Watershed Management Areas may be separated into subwatersheds to focus water quality prioritization and jurisdictional implementation efforts by receiving water.

a. Assessment of Receiving Water Conditions

The Copermittees must consider the following, at a minimum, to support the identification of water quality priorities based on the impacts of MS4 discharges on receiving water beneficial uses:

(1) Receiving waters listed as impaired on the CWA Section 303(d) List of Water Quality Limited Segments (303(d) List);

(2) TMDLs adopted and under development by the San Diego Water Board;

(3) The requirements of Provision A.2;

(4) Receiving waters recognized as sensitive or highly valued by the Copermittees, including estuaries designated under the National Estuary Program under CWA section 320, wetlands defined by the State or U.S. Fish and Wildlife Service's National Wetlands Inventory as wetlands, and

receiving waters identified as ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-001**2** (Attachment A);

(5) Water quality standards established in the Basin Plan;

(6) Known historical versus current physical, chemical, and biological water quality conditions;

(7) Available, relevant, and appropriately collected physical, chemical, and biological receiving water monitoring data meeting appropriate QA/QC standards, including data describing:

(a) Chemical constituents;

(b) Water quality parameters (i.e. pH, temperature, conductivity, etc.);

(c) Toxicity Identification Evaluations for both receiving water column and sediment;

(d) Trash impacts;

(e) Bioassessments; and

(f) Physical habitat.

(8) Available evidence of erosional impacts in receiving waters due to accelerated flows (i.e. hydromodification);

(9) Available evidence of adverse impacts to the chemical, physical, and biological integrity of receiving waters; and

(10) The potential for long-term achievement and maintenance of beneficial use attainment in the Watershed Management Area.

b. ASSESSMENT OF MS4 DISCHARGE QUALITY AND IMPACTS

To support the identification of priorities based on the impacts of MS4 discharges on receiving water beneficial uses, the Copermittees must review appropriately collected MS4 discharge quality data and consider the extent to which MS4s cause or contribute to the adverse impacts to receiving water beneficial uses identified in B.2.a. Considerations include:

(1) Locations of the Copermittees' MS4 discharges with respect to receiving waters;

(2) MS4 discharge quality results relevant to impacts in receiving waters and action levels, including the temporal and geographic variation of the results:

(3) The requirements of Provisions A.1 and A.3.; and

(4) Whether MS4 discharge quality is sufficiently well known or other information is available to assess whether MS4 discharges are causing or contributing to specific receiving water conditions, or whether additional data need to be collected through the Monitoring and Assessment Program developed as part of the Water Quality Improvement Plan.

c. IDENTIFICATION OF PRIORITY RECEIVING WATER CONDITIONS

The Copermittees must use the information gathered in Provision B.2.a and B.2.b. to develop a list of water quality priorities as pollutants and/or receiving water conditions that are the highest threat to receiving water quality or that most adversely affect the physical, chemical, and biological integrity of receiving waters. The Copermittees must identify the highest water quality priorities to be addressed by the Water Quality Improvement Plan, and describe the reasoning for selecting a subset of receiving water conditions as the highest priority(ies) The Water Quality Improvement Plans shall describe the following for the highest priority receiving water condition:

(1) The beneficial use(s) and pollutant(s) associated with the priority receiving water condition(s);

(2) The geographic extent of the priority receiving water condition(s)within the WMA, if known;

(3) The Copermittees with MS4s that contribute discharges to the priority water receiving condition(s);

(4) The temporal extent of the priority receiving condition(s) (i.e., dry weather and/or wet weather); and

(5) Whether receiving waters have been monitored sufficiently to adequately characterize the priority receiving condition(s), including a consideration of spatial and temporal variation.

d. MS4 POLLUTANT SOURCE IDENTIFICATION

The Copermittees must identify and prioritize known and suspected storm water and non-storm water pollutant sources within the MS4 associated with the highest priority receiving water conditions identified under B.2.c. The identification of known and suspected sources of the highest water quality priorities as identified for Provision B.2.c shall consider the following :

(1) Land uses and their potential contribution to the highest priority receiving water conditions;

(2) Pollutant generating facilities, areas, and/or activities within the Watershed Management Area;

(3) Locations of the Copermittees' MS4s outfalls.

(4) Review of available data, including:

(a) Findings from the Copermittees' illicit discharge detection and elimination programs,

(b) Findings from the Copermittees' MS4 outfall monitoring,

(c) Other available, relevant, and appropriately-collected data, information, or studies related to pollutant sources and pollutant-generating activities that contribute to the highest priority receiving water conditions identified in Provision B.2.c.

(5) Whether MS4 sources are sufficiently well known to design an effective, efficient[5], directed control strategy, or whether additional source/stressor identification needs to be conducted through the Monitoring and Assessment Program developed as part of the Water Quality Improvement Plan to identify and prioritize sources/stressors within the watershed.

e. NUMERIC GOALS

The Copermittees must develop and incorporate interim and final numeric goals[6] into the Water Quality Improvement Plans. Numeric goals and schedules are intended to support Water Quality Improvement Plan development and to measure progress towards addressing the highest priority receiving water conditions identified under B.2.c. Numeric goals are not enforceable compliance standards, effluent limitations, or receiving water limitations. When establishing numeric goals and corresponding schedules, the Copermittees must consider the following:

[5] Copermittees are encouraged to use a sustainability analysis, or Triple Bottom Line analysis, that considers environmental, social and economic factors when estimating the potential efficiency of control strategies.

[6] Interim and final numeric goals may take a variety of forms such as TMDL targets, TMDL wasteload allocations, TMDL based WQBELs incorporated in Attachment E of this Order, action levels, pollutant concentration, load reductions, number of impaired water bodies delisted from the List of Water Quality Impaired Segments, Index of Biotic Integrity (IBI) scores, or other appropriate metrics. Interim and final numeric goals are not necessarily limited to one criterion or indicator, but may include multiple criteria and/or indicators. To the extent that a goal is not based on an enforceable regulatory mechanism (i.e., TMDL, WLA), WQIP goals and schedules may be revised through the iterative process. Numeric goals are not subject to enforcement or non-compliance actions under this Order.

(1) Final numeric goals must be based on measureable criteria or indicators, to be achieved in the receiving waters and/or MS4 discharges for the highest priority receiving water conditions which will be capable of demonstrating progress toward the achievement of the restoration and/or protection of water quality standards in receiving waters; and

(2) Interim numeric goals must be based on measureable criteria or indicators that can demonstrate incremental progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges.

(3) Schedules must be adequate for measuring progress toward achieving the interim and final numeric goals required for Provisions B.2.d. Schedules must incorporate the following:

(a) Interim dates for achieving the interim numeric goals,

(b) Compliance schedules for any applicable TMDLs in Attachment E to this Order,

(c) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-001**2** (see Attachment A),

(d) Achievement of the final numeric goals in the receiving waters and/or MS4 discharges for the highest water quality priorities must be as soon as possible, and

(e) Final dates for achieving the final numeric goals must not extend more than 10 years beyond the date this Order is adopted, unless the schedule includes an applicable TMDL in Attachment E to this Order[7].

3. Water Quality Improvement Strategies and Schedules

The Copermittees must develop specific water quality improvement strategies to address the highest priority receiving water conditions identified within a Watershed Management Area. The water quality improvement strategies must address the highest water quality priorities by preventing or eliminating non-storm water discharges to and from the MS4, reducing pollutants in storm water discharges from the MS4 to the MEP, and restoring and/or protecting the water quality standards of receiving waters.

a. Water Quality Improvement Strategies

[7] Achievement of final numeric goals within 10 years represents progress towards attainment of water quality standards, but is not a requirement to fully attain all applicable water quality standards or all priority receiving water conditions within 10 years.

The Copermittees must prioritize water quality improvement strategies, based on their likely effectiveness and efficiency, and implement measures, as appropriate, to effectively prohibit non-storm water discharges into its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, and achieve the interim and final numeric goals in accordance with the schedules in Provision B.2.e. Measures include:

(1) Copermittee-selected activities identified in Provision E ,either as described in the jurisdictional runoff management programs or as modified with justification, that will address priority receiving water conditions; and

(2) Additional structural and/or non-structural BMPs (to include public outreach and participation programs), as selected by the Copermittee, that are designed to achieve the interim and final numeric goals identified in Provision B.2.e.

b. IMPLEMENTATION SCHEDULES

(1) The Copermittees must develop schedules for implementing the water quality improvement strategies identified under Provision B.3.a to achieve the interim and final numeric goals identified in B.2.e in the Watershed Management Area. Schedules must be developed for both the water quality improvement strategies implemented by each Copermittee within its jurisdiction and for strategies that Copermittees' choose to implement on a collaborative basis.
(2) The Copermittees must incorporate the implementation compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

4. Water Quality Improvement Monitoring and Assessment

The Copermittees in each Watershed Management Area must develop an integrated Water Quality Improvement Plan Monitoring and Assessment Program that assesses: 1) progress toward achieving the numeric goals and schedules, 2) progress toward addressing the highest priority receiving water conditions for each Watershed Management Area, and 3) each Copermittee's overall efforts implementing the requirements of Provision B. The water quality improvement monitoring and assessment program must include the monitoring and assessment requirements of Provision D, which may be modified for consistency with the priority receiving water conditions of each Watershed Management Area and associated Copermittees. For Watershed Management Areas with applicable TMDLs, the water quality monitoring and assessment program must incorporate the specific monitoring and assessment requirements of Attachment E. For Watershed Management Areas with any ASBS, the water quality monitoring and assessment program must also incorporate the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-001**2** (see Attachment A).

5. Iterative and Adaptive Management Process

The Copermittees in each Watershed Management Area must implement the iterative process, adapting the Water Quality Improvement Plan, jurisdictional runoff management programs and monitoring and assessment programs, as necessary, to become more effective and meet the requirements of Provisions A, and shall consider the following:

a. PRIORITY RECEIVING WATER CONDITIONS AND NUMERIC GOALS
The priority receiving water conditions and numeric goals, developed pursuant to B.2.c. and B.2.e respectively, shall guide jurisdictional implementation efforts for the duration of this Order. Recommendations for changes to priority receiving water conditions and numeric goals shall be provided in the Report of Waste Discharge and shall consider the following:

(1) Achieving the outcome of improved water quality in MS4 discharges and receiving waters through implementation of the water quality improvement strategies identified in the Water Quality Improvement Plan;

(2) Progress toward achieving interim and final numeric goals in receiving waters and/or MS4 discharges for the highest water quality priorities in the Watershed Management Area

(3) New scientific information or new or updated policies or regulations that affect identified numeric goals including revised water quality objectives or TMDLs;

(4) Spatial and temporal accuracy of monitoring data collected to inform prioritization of water quality problems and implementation measures to address the highest priority receiving water conditions;

(5) Availability of new information and data from sources other than the jurisdictional runoff management programs within the Watershed Management Area that informs the effectiveness of the actions implemented by the Copermittees;

(6) The factors listed in Provision B.2.a.(1)-(10);

(7) San Diego Water Board recommendations; and

(8) Recommendations for modifications solicited through a public participation process.

b. WATER QUALITY IMPROVEMENT STRATEGIES AND SCHEDULES
The water quality improvement strategies and schedules required pursuant to Provisions B.3 and B.4 shall be adapted as new information becomes available

to inform more effective and efficient means of achieving the numeric goals established in Provision B.2.e. Copermittees shall consider adaptation to jurisdictional runoff management programs and monitoring and assessment strategies and schedules at least annually considering the following:

(1) Changes to priority receiving water conditions and numeric goals based on recommendations from B.5.a.;

(2) Measurable or demonstrable reductions of non-storm water discharges to each Copermittee's MS4;

(3) Measurable or demonstrable reductions of pollutants in storm water discharges from each Copermittee's MS4 to the MEP;

(4) Information on the MS4 sources and/or pollutant-generating activities determined to be most significantly contributing to priority receiving water conditions;

(5) Efficiency in implementing the Water Quality Improvement Plan;

(6) San Diego Water Board recommendations; and

(7) Recommendations for modifications solicited through a public participation process.

6. Water Quality Improvement Plan Submittal, Implementation, and Modifications

Requirements for Water Quality Improvement Plan submittals and modifications are described in Provision F. Requirements for corresponding modifications to the jurisdictional runoff management programs and monitoring and assessment program are also described in Provision F.

Copermittees must commence with implementation of the Water Quality Improvement Plan no later than the fiscal year (July 1) following San Diego Water Board approval of the Water Quality Improvement Plan.

C. ACTION LEVELS

The purpose of this provision is for the Copermittees to incorporate numeric non-storm water and storm water action levels in the Water Quality Improvement Plans. The action levels shall be used to guide the following program planning efforts and measure progress towards attaining the reasonable protection, preservation, and enhancement of water quality and designated beneficial uses of waters of the state:

1. Support development and prioritization of water quality improvement strategies through the Water Quality Improvement Plans. Discharge data above action levels can be evaluated using a statistical approach considering the frequency, magnitude, and loading of discharges to the receiving waters to support development of actions and prioritization of their implementation.
2. Assist in the effective prohibition of non-stormwater discharges from the MS4 pursuant to Provision E.2.
3. Support the detection and elimination of illicit discharges to the MS4 pursuant to Provision E.2.

These goals will be accomplished through monitoring and assessing the quality of the MS4 discharges prior to and during the implementation of the Water Quality Improvement Plans. Exceedances of action levels are not subject to enforcement or non-compliance actions under this Order.

Action levels will be developed and incorporated into the Water Quality Improvement Plans (Provision B) including the Illicit Discharge Detection and Elimination (IDDE) Program (Provision E.2). Depending upon the goals/objectives for the use of the action levels and the priority receiving water conditions, the constituents and values at which they are set may differ between watersheds. Copermittees may develop Watershed Management Area specific numeric action levels for non-storm water and storm water MS4 discharges using an approach approved by the Regional Board or use the default non-stormwater and stormwater action levels prescribed within C.1 and C.2 below, respectively. The Copermittees will submit action levels as part of their Water Quality Improvement Plan(s). The action levels established as part of R9-2007-0001 will serve as the interim action levels until the Water Quality Improvement Plans are completed and approved.

1. Non-Storm Water Action Levels

a. The following non-storm water action levels (NALs) must be incorporated:

(1) Non-Storm Water Discharges from MS4s to Ocean Surf Zone

Table C-1. Non-Storm Water Action Levels for Discharges from MS4s to Ocean Surf Zone

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Total Coliform	MPN/100 ml	1,000	-	10,000/1,000[1]	OP
Fecal Coliform	MPN/100 ml	200[2]	-	400	OP
Enterococci	MPN/100 ml	35	-	104[3]	OP

Abbreviations/Acronyms
AMAL – average monthly action level
OP – Ocean Plan water quality objective
MDAL – maximum daily action level
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Total coliform density NAL is 1,000 MPN/100 ml when the fecal/total coliform ratio exceeds 0.1
2. Fecal coliform density NAL is 200 MPN per 100 ml during any 30 day period
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas"

(2) Non-Storm Water Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Table C-2. Non-Storm Water Action Levels for Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Turbidity	NTU	75	-	225	OP
pH	Units	Within limit of 6.0 to 9.0 at all times			OP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	35	-	104[3]	BP
Priority Pollutants	ug/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
OP – Ocean Plan water quality objective
NTU – Nephelometric Turbidity Units
ug/L – micrograms per liter
MDAL – maximum daily action level
BP – Basin Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Based on a minimum of not less than five samples for any 30-day period
2. NAL is reached ifmore than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas" and is not applicable to waterbodies that are not designated REC-1.

Table C-3. Non-Storm Water Action Levels for Priority Pollutants

Parameter	Units	Freshwater (CTR)		Saltwater (CTR)	
		MDAL	AMAL	MDAL	AMAL
Cadmium	ug/L	**	**	16	8
Copper	ug/L	*	*	5.8	2.9
Chromium III	ug/L	**	**	-	-
Chromium VI	ug/L	16	8.1	83	41
Lead	ug/L	*	*	14	2.9
Nickel	ug/L	**	**	14	6.8
Silver	ug/L	*	*	2.2	1.1
Zinc	ug/L	*	*	95	47

Abbreviations/Acronyms:
CTR – California Toxic Rule
AMAL – average monthly action level
ug/L – micrograms per liter
MDAL – maximum daily action level

Notes:
* Action levels developed on a case-by-case basis (see below)
** Action levels developed on a case-by-case basis (see below), but calculated criteria are not to exceed Maximum Contaminant Levels (MCLs) under the California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64431

The Cadmium, Copper, Chromium (III), Lead, Nickel, Silver and Zinc NALs for MS4 discharges to freshwater receiving waters will be developed on a case-by-case basis because the freshwater criteria are based on site-specific water quality data (receiving water hardness). For these priority pollutants, the following equations (40 CFR 131.38.b.2) will be required:

Cadmium (Total Recoverable) = exp(0.7852[ln(hardness)] -2.715)
Chromium III (Total Recoverable) = exp(0.8190[ln(hardness)] + .6848)
Copper (Total Recoverable) = exp(0.8545[ln(hardness)] - 1.702)
Lead (Total Recoverable) = exp(1.273[ln(hardness)] - 4.705)
Nickel (Total Recoverable) = exp(.8460[ln(hardness)] + 0.0584)
Silver (Total Recoverable) = exp(1.72[ln(hardness)] - 6.52)
Zinc (Total Recoverable) = exp(0.8473[ln(hardness)] + 0.884)

(3) Non-Storm Water Discharges from MS4s to Inland Surface Waters

Table C-4. Non-Storm Water Action Levels for Discharges from MS4s to Inland Surface Waters

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Dissolved Oxygen	mg/L	Not less than 5.0 in WARM waters and not less than 6.0 in COLD waters			BP
Turbidity	NTU	-	20	See MDAL	BP
pH	Units	Within limit of 6.5 to 8.5 at all times			BP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	33	-	61[3]	BP
Total Nitrogen	mg/L	-	1.0	See MDAL	BP
Total Phosphorus	mg/L	-	0.1	See MDAL	BP
MBAS	mg/L	-	0.5	See MDAL	BP
Iron	mg/L	-	0.3	See MDAL	BP
Manganese	mg/L	-	0.05	See MDAL	BP
Priority Pollutants	ug/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
BP – Basin Plan water quality objective
COLD – cold freshwater habitat beneficial use
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
MDAL – maximum daily action level
WARM – warm freshwater habitat beneficial use
MBAS – Methylene Blue Active Substances
MPN/100 ml – most probable number per 100 milliliters
ug/L – micrograms per liter

Notes:
1. Based on a minimum of not less than five samples for any 30-day period

2. NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period
3. This value has been set to the Basin Plan water quality objective for freshwater "designated beach areas" and is not applicable to waterbodies that are not designated REC-1.

b. If not identified in Provision C.1.a, NALs must be identified and incorporated in the Water Quality Improvement Plan for any pollutants or waste constituents causing or contributing, or threatening to cause or contribute to a condition of pollution or nuisance in waters of the U.S. associated with the highest water quality priorities related to non-storm water discharges from the MS4s. NALs must be based on:

(1) Applicable water quality standards which may be dependent upon site-specific or receiving water-specific conditions or assumptions to be identified by the Copermittees; or

(2) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. Dry weather monitoring and assessment data from MS4 outfalls collected in accordance with Provision D.1 may be used to develop or revise NALs based upon watershed-specific data. Revision of NALs is subject to Regional Board EO approval.

2. Storm Water Action Levels

a. The following storm water action levels (SALs) for discharges of storm water from the MS4 must be incorporated:

Table C-5. Storm Water Action Levels for Discharges from MS4s to Receiving Waters

Parameter	Units	Action Level
Turbidity	NTU	126
Nitrate & Nitrite (Total)	mg/L	2.6
Phosphorus (Total P)	mg/L	1.46
Cadmium (Total Cd)*	µg/L	3.0
Copper (Total Cu)*	µg/L	127
Lead (Total Pb)*	µg/L	250
Zinc (Total Zn)*	µg/L	976

Abbreviations/Acronyms:
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
ug/L – micrograms per liter

Notes:
* The sampling must include a measure of receiving water hardness at each MS4 outfall. If a total metal concentration exceeds the corresponding metals SAL in Table C-5, that concentration must be compared to the California Toxics Rule criteria and the USEPA 1-hour maximum concentration for the detected level of receiving water hardness associated with that sample. If it is determined that the sample's total metal concentration for that specific metal exceeds that SAL, but does not exceed the applicable USEPA 1-hour maximum concentration criterion for the measured level of hardness, then the sample result will not be considered above the SAL for that measurement.

b. If not identified in Provision C.2.a, SALs must be identified and incorporated in

the Water Quality Improvement Plan for pollutants or waste constituents causing or contributing, or threatening to cause or contribute to a condition of pollution or nuisance in waters of the state associated with the highest water quality priorities related to storm water discharges from the MS4s. SALs must be based on:

(1) Federal and State water quality guidance and/or water quality standards; or

(2) Site-specific or receiving water-specific conditions; or

(3) One of the approaches recommended by the California Water Board's Storm Water Panel in its report, "The Feasibility of Numerical Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities" (June 2006).

(4) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. Wet weather monitoring and assessment data from MS4 outfalls collected in accordance with Provision D.1.b may be used to develop or revise SALs based upon watershed-specific data. Revision of SALs is subject to San Diego Water Board approval.

D. MONITORING AND ASSESSMENT REQUIREMENTS

[NOTE: This section has been replaced with a proposed alternative version of provision D.]

Water quality monitoring and assessment shall be question-driven and designed to support adaptive storm water management and the iterative process outlined in Provision B. The monitoring and assessment activities shall be based on a logical hierarchy in which overall management goals help define clear management questions, which are addressed by specific monitoring activities designed to produce data targeted to defined assessment needs. The monitoring and assessment activities shall follow relevant and applicable guidance provided in the SWAMP Assessment Framework (Bernstein, 2010[8]), A Framework for Monitoring and Assessment in the San Diego Region (SDRWQCB, 2011[9]), and the Southern California Stormwater Monitoring Coalition's (SMC) Model Monitoring Program (SMC, 2004[10]).

The monitoring and assessment shall be designed in two phases. A transitional program shall be implemented beginning the first day of October in the year following permit adoption, and continue until the first day of October following commencement of Water Quality Improvement Plan implementation, pursuant to Provision B. The transitional ("pre-WQIP") program shall build on the experience gained implementing water quality monitoring programs under previous Orders and shall address the SMC questions as described below. The second ("post-WQIP") phase of the Monitoring and Assessment Program shall address the watershed priorities identified in the Water Quality Improvement Plans as developed for each watershed pursuant to Provision B. This phase of monitoring shall begin with implementation of the approved WQIPs. The transitional (pre-WQIP) phase of monitoring and assessment applies only to the San Diego County Copermittees; the Orange County and Riverside County permittees affected by this regional permit are expected to participate during the post-WQIP phase, after officially enrolling under the regional permit.

As a starting point, the Monitoring and Assessment Program shall be designed to address the overarching management questions developed by the SMC:

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[8] Bernstein, Brock, 2010. "SWAMP Assessment Framework." Prepared for the Surface Water Ambient Monitoring Program (SWAMP). December, 2010). http://www.swrcb.ca.gov/water_issues/programs/swamp/docs/reports/app_c_assess_frmwrk.pdf.

[9] SDRWQCB, 2011. "A Framework for Monitoring and Assessment in the San Diego Region." California Regional Water Quality Control Board, San Diego Region, Staff Report, Working Draft. May 2012. Prepared by Lilian Busse and Bruce Posthumus. http://www.waterboards.ca.gov/sandiego/board_info/agendas/2012/Jun/item9/eosr0612MonitoringFramework.SD1.pdf

[10] SMC, 2004. "Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California." A report from the Stormwater Monitoring Coalition's Model Monitoring Technical Committee. August 2004. Technical Report #419. http://www.lmtf.org/FoLM/Poliact/EColi/419_smc_mm.pdf

1. Are conditions in receiving waters protective, or likely to be protective, of beneficial uses? This question will be addressed by comparing indicator values to the relevant benchmarks or objectives and/or to background conditions.

2. What is the extent and magnitude of the current or potential receiving water problems? This question will be addressed by mapping the spatial extent and/or temporal persistence of problems, the severity of impacts, and/or the degree to which benchmarks are exceeded.
3. What is the relative urban runoff contribution to the receiving water problem(s)? This question will be addressed by comparing concentrations and loads of priority constituents to those from other sources, including background.

4. What are the sources of urban runoff that contribute to receiving water problem(s)? This question will be addressed by characterizing and prioritizing discharges and using targeted source identification protocols to track the origin of specific constituents.

5. Are conditions in receiving waters getting better or worse? This question will be addressed by time series analyses of individual indicators and/or of aggregate or cumulative indices of condition.

Given that substantial work has already been accomplished and other work is ongoing to address the questions related to receiving water condition assessment (questions 1, 2, 5), the Copermittees shall focus their efforts principally on questions 3 and 4. All five questions need not be addressed simultaneously to the same degree. As watershed problems are identified, effort should shift to diagnosis (questions 4 and 5) until the problems have been addressed, at which point effort may shift back to broader assessment (questions 1 and 2) in search of other problems to address.

During the transitional (pre-WQIP) period, where feasible the Copermittees shall develop more specific monitoring questions to guide the design of specific monitoring activities and address specific assessment needs. The information so generated will be used to guide management actions, based on the results of the monitoring data assessments.

As part of each WQIP, the Copermittees shall develop a water quality Monitoring and Assessment Program (Monitoring and Assessment Program) for each Watershed Management Area (WMA), as provided in Table B-1. Using the overarching SMC management questions as guidance, each Monitoring and Assessment Program shall include specific monitoring questions appropriate to address the assessment needs of each specific WMA. The monitoring activities shall be designed to generate data needed to address priority issues identified in the WQIPs, and the resulting monitoring data and assessments shall be supplied to program planners to help inform management actions. If a WMA has an approved Comprehensive Load Reduction Plan (CLRP), the CLRP shall be incorporated into the WQIP.

Each Copermittee covered by this permit shall participate in development and implementation of the Monitoring and Assessment Program for each WMA in which they have jurisdiction. The Copermittees shall consider the needs of regional monitoring and assessment activities in the development of each Monitoring and Assessment Program and make allowances as needed for regional coordination.

1. Receiving Waters Monitoring

Until approval and implementation of the WQIPs, the Copermittees shall perform receiving water monitoring to address management questions and specific questions, as specified in Provisions D.1.a-D.1.g below:

a. SMC REGIONAL MONITORING

Management Questions: Are conditions in receiving waters protective, or likely to be protective, of beneficial uses? What is the extent and magnitude of the current or potential receiving water problems?

The Copermittees shall participate in the SMC Regional Monitoring Program through its planned completion. The SMC monitoring program seeks to coordinate and leverage existing monitoring efforts to produce regional estimates of condition, improve data comparability and quality assurance, and maximize data availability, while conserving monitoring expenditures. The primary goal of this program is to implement an ongoing, large scale regional monitoring program for southern California's coastal streams and rivers. A comprehensive program was designed by the SMC, in which each participating group assesses its local watersheds and then contributes their portion to the overall regional assessment. The SMC Regional Monitoring Program involves a probabilistic design for characterization of coastal watersheds using bioassessment metrics and related analyses, including, but may not be limited to: physical habitat characterization, Southern California Index of Biological Integrity scoring, macroinvertebrate and algal taxonomy, algal biomass, water chemistry, and toxicity. The study incorporates both reference and non-reference streams and may identify additional biological and/or chemical stressors affecting stream health, such as channel alteration and presence of invasive species.

b. SOUTHERN CALIFORNIA BIGHT REGIONAL MONITORING

Management Questions: Are conditions in receiving waters protective, or likely to be protective, of beneficial uses? What is the extent and magnitude of the current or potential receiving water problems?

The Copermittees shall participate in the Southern California Bight Regional Monitoring program as a trade-off with other routine monitoring requirements. The Bight program involves detailed characterization of coastal and offshore receiving waters, as well as targeted special studies. The Bight regional monitoring effort is designed to build upon the data collected during the previous Bight regional

programs, to assess the extent of contamination in the Southern California Bight. Receiving water samples are collected in or near coastal areas, bays, estuaries, offshore islands, and open water/deep ocean within the Bight. Water quality and sediment samples may be collected to provide data for model input, to assess long-term trends, and to answer management questions developed by the diverse group of stakeholders in the Southern California Bight Region as part of the program. In addition, special studies such as potential new technology implementation (i.e. bioanalytical screening and/or genetic coding) may be conducted as part of the Bight Regional Monitoring.

c. SEDIMENT QUALITY MONITORING

Management Questions: Are conditions in receiving waters protective, or likely to be protective, of beneficial uses? What is the extent and magnitude of the current or potential receiving water problems?

Specific Question: What is the condition of sediments in enclosed bays and estuaries with respect to the statewide sediment quality objectives?

Copermittees shall perform monitoring of bay and lagoon sediments, as applicable, under the Copermittees' responsibility to conform to the requirements of the Statewide Sediment Quality Objectives regulatory program, per State Water Resources Control Board Resolution No. 2008-0070 – Adoption of a Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality.

d. HYDROMODIFICATION MANAGEMENT PLAN (HMP) MONITORING

Management Questions: Are conditions in receiving waters protective, or likely to be protective, of beneficial uses? What is the extent and magnitude of the current or potential receiving water problems?

The Copermittees shall perform receiving water monitoring as required per their Hydromodification Management Plan Monitoring Plans, as approved by the California Regional Water Quality Control Board, San Diego Region.

e. TMDL MONITORING

Management Questions: Are conditions in receiving waters protective, or likely to be protective, of beneficial uses? Are conditions in receiving waters getting better or worse?

Specific question: What is the progress in achieving and complying with adopted TMDL targets?

The Copermittees shall conduct receiving water monitoring to address monitoring requirements associated with TMDLs as specified below.

(1) The Copermittees shall perform water quality monitoring as required per the Implementation Plans or approved CLRPs of effective TMDLs, including compliance monitoring for the following TMDLs:

(a) TMDL for Diazinon in Chollas Creek Watershed Resolution No. R9-2002-0123; Effective as of September 11, 2003.

(b) TMDLs for Dissolved Copper in Shelter Island Yacht Basin Resolution No. R9-2005-0019; Effective as of December 2, 2005.

(c) TMDLs for Dissolved Copper, Lead, and Zinc in Chollas Creek Resolution No. R9-2007-0043; Effective as of October 22, 2008.

(d) TMDLs for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay Resolution No. R9-2008-0027; Effective as of September 15, 2009.

(e) Revised TMDLs for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek) Resolution No. R9-2010-0001; Effective as of April 4, 2011.

(2) TMDL monitoring shall be coordinated and/or integrated with monitoring specified in an approved CLRP or equivalent implementation plan.

f. ASBS SPECIAL PROTECTIONS MONITORING

Management Questions: Are conditions in receiving waters protective, or likely to be protective, of beneficial uses? Are conditions in receiving waters getting better or worse?

The Copermittees responsible for discharges to Areas of Special Biological Significance (ASBS) as regulated per the Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges, State Water Resources Control Board Resolution No. 2012-0012, shall perform receiving water monitoring as required, per the adopted ASBS Special Protections.

g. SAN DIEGO REGIONAL REFERENCE STREAM STUDY

Management Question: Are conditions in receiving waters protective, or likely to be protective, of beneficial uses? What is the extent and magnitude of the current or potential receiving water problems?

Specific Question: What are the concentrations/loads of bacteria, nutrients, and metals in reference streams in Southern California?

The Copermittees shall participate in reference stream receiving water monitoring and data analysis under the San Diego Regional Reference Stream Study as a Regional Study. The San Diego Regional Reference Stream Study is intended to characterize background concentrations of bacteria, nutrients, and metals in natural streams within the jurisdiction of the San Diego Water Board (Region 9). Samples shall be collected during wet and dry weather at sites considered representative of natural conditions (a contributing drainage area at least 95 percent undeveloped) and that vary in regards to hydrology, catchment size, and geology. The results of the study may be used to assist determination of scientifically-based reference stream numeric goals for indicator bacteria, nutrients, and metals.

h. LONG-TERM RECEIVING WATER MONITORING, POST-WQIP ADOPTION

Management Question: Are conditions in receiving waters getting better or worse?

Following adoption of the WQIPs, the Copermittees shall conduct long-term receiving water monitoring to be performed in each WMA during WQIP implementation, for assessment of long-term trends, as specified below:

(1) The Copermittees in each Watershed Management Area shall select one long-term receiving water station from among the existing mass loading stations (MLS) and temporary watershed assessment stations (TWAS) to be representative of receiving water quality within the WMA.

(2) During the permit term, the Copermittees shall perform monitoring during three wet weather events and three dry weather events at each of the long-term stations selected by the Copermittees and approved by the San Diego Water Board.

(3) <u>Dry Weather Receiving Water Monitoring</u>

During the permit term, the Copermittees shall perform monitoring during three dry weather events, at minimum, at each of the long-term stations. One event must be conducted during the dry season (May 1-September 30) and one event must be conducted during a dry weather period during the wet season (October 1 –April 30), after the first wet weather event of the season, with an antecedent dry period of at least 72 hours following any storm event producing measurable rainfall of greater than 0.1 inch.

(a) For each dry weather receiving water monitoring event, the Copermittees must record field observations consistent with Table D-1 at each monitoring station.

Table D-1. Field Observations for Dry Weather Ambient Receiving Water Monitoring Stations

Field Observations
• Station identification and location. • Presence of flow, or pooled or ponded water. • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate), - Flow characteristics (i.e. presence of floatables, surface scum, or sheens, odor, color), • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, or sheens, odor, color). • Station description (i.e. deposits or stains, vegetation condition, structural condition, observable biology). • Presence and assessment of trash in and around station.

(b) If flow is present during the dry weather watershed monitoring event, and conditions allow the collection of the data, the Copermittee must monitor and record the parameters in Table D-2.

Table D-2. Field Monitoring Parameters for Receiving Water and Persistent MS4 Monitoring Stations

Parameters
• pH • Temperature • Specific conductivity • Dissolved oxygen • Turbidity

(c) Samples must be collected and analyzed as follows:

(i) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, indicator bacteria, and toxicity. Analytes that are field measured do not need to be analyzed by a laboratory.

(ii) For all other constituents, composite samples shall be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques: time-weighted composites composed of 24 discrete hourly samples, or flow-weighted composites collected over a typical 24 hour period. Only one analysis of the composite of aliquots is required.

(d) Samples shall be collected for analysis of the following parameters: TMDL or CLRP constituents in watersheds where the Copermittees are responsible parties in an adopted TMDL Implementation Plan, constituents listed as a cause of impairment on a CWA Section 303(d) listing for the receiving water body reach to which the outfall discharges, applicable NAL constituents, and constituents identified by the Copermittees as the watershed priorities in their respective WQIPs, as well as the constituents listed in Table D-3.

Table D-3. Analytical Monitoring Constituents for Receiving Water Monitoring Stations

Conventionals, Nutrients, Hydrocarbons	Metals (Total and Dissolved)	Pesticides	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity[1] • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus[1] • Orthophosphate • Nitrite[1,2] • Nitrate[1,2] • Total Kjeldahl Nitrogen • Ammonia	• Arsenic • Cadmium[1] • Chromium • Copper[1] • Iron • Lead[1] • Mercury • Nickel • Selenium • Thallium • Zinc[1]	• Organo-phosphate pesticides • Pyrethroid pesticides	•Total Coliform • Fecal Coliform[3] •*Enterococcus*

Notes:
1. Constituent with a storm water action level (SAL) specified under Provision C.2.
2. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
3. *E. Coli* may be substituted for Fecal Coliform.

(e) Dry Weather Receiving Water Toxicity Monitoring:

For each dry weather monitoring event, grab or composite samples from each monitoring station must be collected and analyzed for toxicity in accordance with Table D-4.

Table D-4. Toxicity Testing for Receiving Water Monitoring Stations

Freshwater Organism	Test Approach per Event	EPA Protocol[1]
Pimephales promelas (fathead minnow)	Wet: 1 acute Dry: 1 acute and chronic	EPA-821-R-02-012
Hyalella azteca	Wet: 1 acute Dry: 1 acute and chronic	EPA-821-R-02-012
Psuedokirchneriella subcapitata (formerly *Selenastrum capricornutum*, unicellular algae)	Wet: 1 acute Dry: 1 acute and chronic	EPA-821-R-02-013

Notes:
1. EPA protocols shall be utilized for toxicity testing unless alternate toxicity testing protocols have been approved by the San Diego Regional Water Quality Control Board. Chronic toxicity testing will also be conducted at dry weather mass loading stations unless the channel flows are diverted year-round during dry weather conditions to the sanitary sewer for treatment

(f) Receiving Water Bioassessment Monitoring:

Copermittees shall perform Bioassessment monitoring once during the permit term in accordance with the SMC Model Monitoring Program "Triad" assessment approach (SMC, 2004). Copermittees shall conduct sampling, analysis, and reporting of specified in-stream biological and habitat data according to the protocols specified in the SCCWRP Tech Report No. 539, or subsequent protocols, if developed, that have been widely-accepted as an appropriate alternative for Southern California receiving waters. Bioassessment monitoring may be conducted in conjunction with SMC Regional Monitoring and/or other dry weather receiving water monitoring. A physical assessment shall be conducted that will include details of the channel condition including channel dimensions, hydrologic and geomorphic conditions, and presence and condition of vegetation and habitat.

(4) Wet Weather Receiving Water Monitoring

During the permit term, Copermittees shall perform monitoring during three wet weather events at each of the long-term receiving water monitoring stations. Each monitoring station must be monitored during the wet season beginning October 1 and ending April 30.

(a) For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each monitoring station:

(i) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event;

(ii) The flow rates and volumes measured or estimated. Data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board;

(iii) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(iv) Presence and assessment of trash in and around station.

(b) For each wet weather receiving water monitoring event, the parameters in Table D-2 must be monitored and recorded in the field.

(c) Samples must be collected and analyzed as follows:

(i) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, indicator bacteria, and toxicity. Analytes that are field measured do not need to be analyzed by a laboratory.

(ii) For all other constituents, composite samples shall be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques: time-weighted composites composed of 24 discrete hourly samples, or flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter. Only one analysis of the composite of aliquots is required.

(iii) Copermittees should implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods.

(d) Samples shall be collected for analysis of the following parameters: TMDL or CLRP constituents in watersheds where the Copermittees are responsible parties in an adopted TMDL Implementation Plan, constituents listed as a cause of impairment on a CWA Section 303(d) listing for the receiving water body reach to which the outfall discharges,

applicable SAL constituents, and constituents identified by the Copermittees as the watershed priorities in their respective WQIPs, as well as the constituents listed in Table D-3.

(e) Wet Weather Receiving Water Toxicity Monitoring

Grab samples or composites from each monitoring station must be collected and analyzed for toxicity in accordance with Table D-4.

i. OTHER RECEIVING WATER MONITORING, POST-WQIP ADOPTION

After adoption of the WQIPs, the Copermittees shall conduct monitoring based on the approved WQIPs, in addition to long-term receiving water monitoring as described in Provision D.1.h, to include constituents identified by the Copermittees as the watershed priorities in their respective WQIPs. Nothing in this Provision is intended to prevent Copermittee collection of additional receiving water data, as necessary, to support and implement respective WQIPs. This monitoring shall include, at minimum, integration of the following receiving water requirements within the WQIPs, as appropriate for specific watersheds:

(a) Participation in SMC Regional Monitoring Program, where applicable

(b) Sediment Quality Monitoring in applicable estuaries

(c) Hydromodification Management Plan (HMP) Monitoring as applicable

(d) TMDL Monitoring where implementation plans have been approved and are under implementation, and

(e) ASBS Special Protections Monitoring, where applicable.

j. RECEIVING WATER MONITORING REPORTING

The Copermittees shall report on the progress of the receiving water monitoring and the results or findings of such monitoring, when completed, in the Annual Report pursuant to Provision F.3.b.

2. MS4 Outfall Discharge Monitoring

Discharge monitoring shall involve both Non-Storm Water (Dry Weather) and Storm Water (Wet Weather) components. The Copermittees shall perform monitoring, as necessary, to identify non-storm water discharges and illegal connections/illicit discharges (IC/IDs) pursuant to Provision E.2 of this Order. To accomplish this, the monitoring may include a variety of water quality and other monitoring techniques, including visual and other observations. Copermittees shall investigate dry weather flows and prioritize outfalls with observed flows for follow-up action as detailed below.

a. Storm Water Outfall Inventory

Management Questions: What is the relative urban runoff contribution to receiving water problem(s)? What are the sources of urban runoff that contribute to receiving water problem(s)?

- Each Copermittee shall identify all major outfalls, as defined by 40 CFR §122.26(b)(5-6), that discharge directly to named receiving waters within its jurisdiction, and geo-locate those outfalls on a map of the MS4 pursuant to Provision E.2.b of this Order. This information shall be compiled in a storm water outfall inventory, which also shall include applicable information including HSA, jurisdiction, outlet size, and approximate drainage area. Only MS4 outfalls with safe access and for which access is gained without disturbing critical habitat will be considered in the number of eligible major MS4 outfalls.

b. Non-Storm Water Transient Flow (Dry Weather) Monitoring, IDDE Investigation

Management Questions: What is the relative urban runoff contribution to receiving water problem(s)? What are the sources of urban runoff that contribute to receiving water problem(s)?

Specific Questions: Which non-storm water discharges are transient and which are persistent? Which discharges should be investigated as potential IDDEs? Which outfalls exhibit persistent dry weather flows?

The Copermittees shall perform non-storm transient flow discharge monitoring to address the above management and specific questions as follows:

(1) Each Copermittee shall prioritize the major MS4 outfalls within its jurisdiction from the list of major outfalls developed pursuant to Provision D.a., based on criteria and rationale that include potential threat to water quality.

(2) Copermittees with less than 125 major MS4 outfalls that discharge to a receiving water shall visually inspect 80% of the outfalls twice per year during dry weather.

(3) Copermittees with 125 or more but less than 250 major MS4 outfalls that discharge to a receiving water shall visually inspect a prioritized list of major MS4 outfalls that discharge to a receiving water annually. The total number of inspections per Copermittees with 125 or more but less than 250 major MS4s will be a minimum of the total number of all major MS4 outfalls locations once with annual visual inspections. Major MS4 outfalls shall be prioritized based on threat to water quality and will consider factors such as:

- Assessment of connectivity of the discharge to a flowing receiving water
- Reported exceedances in water quality data
- Surrounding land use
- Presence of watershed priority constituents, TMDLs & CWA 303(d) list of impaired water bodies
- Flow rate

(4) Copermittees with 250 or more major MS4 outfalls that discharge to a receiving water shall visually inspect a prioritized list of major MS4 outfalls that discharge to a receiving water annually. The total number of inspections per Copermittees with 250 or greater major MS4s will be a minimum of 250 to a maximum of 500 locations with annual visual inspections. Where possible, inspections will be conducted year round. Major MS4 outfalls shall be prioritized based on threat to water quality and will consider factors such as:

- Assessment of connectivity of the discharge to a flowing receiving water
- Reported exceedances in water quality data
- Surrounding land use
- Presence of watershed priority constituents, TMDLs & CWA 303(d) list of impaired water bodies
- Flow rate

(5) Obvious illicit discharges (i.e., unusual color, unusual odor, or high flow) shall be investigated immediately pursuant to Provision E.2.

(6) An antecedent dry period of at least 72 hours following any storm event producing measurable rainfall of greater than 0.1 inch is required prior to conducting dry weather visual inspections.

(7) During a visual inspection, field personnel shall note visual and other

observations, including those provided in Table D-5 of this Order.

(a) During a visual inspection, an inspection form will be filled out documenting observations in conformance with table D-5.

(b) Inspections of major outfalls conducted pursuant to Provision E of this order, including but not limited to complaint follow-ups, may be accounted for as the visual inspection for the major outfall under this Provision.

Table D-5. Field Observations for Non-Storm Water MS4 Monitoring Stations

Field Observations
• Station identification and location. • Presence of flow, or pooled or ponded water from the outfall. • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate), - Flow characteristics (i.e. presence of floatables, surface scum, or sheens, odor, color), - Flow source(s) suspected or identified from non-storm water source investigation, and - Flow source(s) eliminated during non-storm water source identification. • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, or sheens, odor, color), and - Known or suspected source(s) of pooled or ponded water. • Station description (i.e. deposits or stains, vegetation condition, structural condition, observable biology). • Presence and assessment of trash in and around station. • Evidence or signs of illicit connections or illegal dumping.

(8) Evidence of obvious illegal discharges, such as obvious odor, discoloration, or floating foam or scum, shall be followed up immediately.

(9) The field observations shall be evaluated together with existing information available from prior inspections and prior monitoring results to determine whether the non-storm water (dry weather) discharge flow is likely to be transient or persistent[11].

[11] Persistent flow, as modified from the SMC Model Monitoring Program definition of persistent WQO exceedance, is defined as "the presence of flow, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch of precipitation during three consecutive monitoring and/or inspection events". All other flow is considered transient.

(a) If the flow is deemed to be transient, observations shall be used to conduct IDD E investigations where warranted pursuant to Provision E.2.

(b) If the nature and source of the observed flow is already known, this shall be noted on the field log, including whether the observed flow results from a non-storm water discharge conditionally allowed per Provision E.2.a.

(10) Where the non-storm water (dry weather) discharge flow is deemed to be persistent in Provision D.2.a.(8), the outfall shall be referred to the characterization and prioritization process described in Provision D.2.c. .

(11) The framework developed in the transitional monitoring program shall be used as a basis to design a continuing IDDE monitoring program as part of the Monitoring and Assessment Program in each WQIP.

c. NON-STORM WATER PERSISTENT FLOW (DRY WEATHER) OUTFALL MONITORING

Management Questions: What is the relative urban runoff contribution to receiving water problem(s)? What are the sources of urban runoff that contribute to receiving water problem(s)?

Specific Questions: Which outfalls exhibit persistent dry weather flows? Do discharge concentrations at MS4 outfalls meet applicable permit action levels? Which MS4 outfalls impact receiving water quality during dry weather?

The Copermittees shall perform non-storm water persistent flow discharge monitoring to address the above-listed management and specific questions as follows:

(1) Based upon the results of the investigation conducted pursuant to Provision D.2.b., each Copermittee shall add to the storm water outfall inventory compiled pursuant to Provision D.2.a., a classification of whether the outfall produces persistent discharge flow, transient flow, or no dry weather flow. The inventory shall provide notations on the basis for that classification; the classification may be based on historical data and/or contemporary observations, including information generated per Provision D.2.b..

(2) The Copermittees shall prioritize the outfalls identified as having persistent dry weather in the stormwater outfall inventory, pursuant to Provision D.2.c.(1). Historical data may be used to assist prioritization, where available. The prioritization shall be prepared based on criteria to be developed by the Copermittees, and a brief rationale for the prioritization shall be provided to accompany the map.

(3) Based on the prioritization of major outfalls developed under Provision

D.2.c.(2), the Copermittees shall identify, at minimum, a number of major outfalls to monitor within each watershed management area equivalent to the number of urbanized HSAs within the WMA.. The selected outfalls shall be listed by urbanized HSA and indicated on the map prepared pursuant to Provision D.2.a..

(4) The Copermittees shall monitor each major outfall identified in Provision D.2.c.(3) two times annually under dry weather conditions until one of the following occurs, at which point the outfall may be removed from the list:

(a) Flows are reduced to near-zero for three consecutive visits, or

(b) The source(s) of flows are determined to be derived from a non-storm water discharge source conditionally allowed per Provision E.2.a, or

(c) The source of the discharge is determined to be covered by a separate NPDES permit.

(d) The Copermittees shall document any such removal of sites from the outfall monitoring list in their annual report. Outfalls so removed must be replaced with then next highest prioritized MS4 outfall in the WMA per Provision D.2.c.(3), unless there are no remaining qualifying outfalls within the urbanized HSAs of the WMA.

(e) Where these criteria are not met but the threat to water quality is reduced, the outfall may be prioritized accordingly for continued follow up activity.

(5) During each semi-annual visit, the Copermittee must record field observations consistent with Table D-5 at each non-storm water MS4 monitoring station within its jurisdiction.

(6) Prior to WQIP approval, each semi-annual visit in which measurable flow is present from an outfall listed under Provision D.2.c.(3) must include the following:

(a) Grab samples shall be collected for analysis for the constituents listed in Table D-6, unless the Copermittee has historical data that can demonstrate or provide justification that the analysis of the constituent is not necessary.

Table D-6. Analytical Monitoring Constituents for Non-Storm Water MS4 Monitoring Stations

Conventionals, Nutrients, Hydrocarbons	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Total Phosphorus • Ortho-phosphate • Nitrite[1] • Nitrate[1] • Total Kjeldahl Nitrogen • Ammonia as N • Chlorine	• Cadmium • Copper • Lead • Zinc	•Total Coliform • Fecal Coliform[2] •*Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(b) Field measurements shall be collected for the parameters listed in Table D-2.

(c) If the Copermittee identifies and eliminates the source of non-storm water discharge, analysis of the sample is not required.

(7) As part of the WQIP, Copermittees must develop a program to characterize the persistent non-storm water discharges and pollutant loads from the Copermittee's major MS4 outfalls. As part of the development of the Monitoring and Assessment Program for each WMA, the number and selection of outfalls shall be re-evaluated and determined anew for each WMA, along with the appropriate monitoring frequency and methods.

(8) After WQIP approval, each visit in which measurable flow is present from an outfall listed under Provision D.2.c.(3), as modified by approved changes pursuant to Provision D.2.c.(7) must include the following:

(a) Samples shall be collected for analysis of the following parameters:

(i) Constituents identified by the Copermittees as highest watershed priorities,

(ii) TMDL constituents in watersheds where the Copermittees are responsible parties in an effective TMDL Implementation Plan for the receiving water body reach to which the outfall discharges,

(iii) Constituents listed as a cause of impairment on a CWA Section

303(d) listing for the receiving water body reach to which the outfall discharges, and

(iv) Applicable NAL constituents.

(b) Field measurements shall be collected for the parameters listed in Table D-2.

(9) Annually, the Copermittees shall evaluate the data produced by the persistent flow outfall monitoring and inspections, rank the outfalls according to potential threat to receiving water quality, and produce a prioritized list of major outfalls for follow-up action. The prioritized list shall be used to update the WQIP, with the goal of reducing flows and/or loads in order of the ranked priority list through targeted programmatic actions and source investigations.

d. STORM WATER (WET WEATHER) OUTFALL MONITORING

Management Questions: What is the relative urban runoff contribution to receiving water problem(s)? What are the sources of urban runoff that contribute to receiving water problem(s)?

Specific Questions: Which MS4 outfalls impact receiving water quality during wet weather? Do discharge concentrations at MS4 outfalls meet applicable permit action levels? How do representative MS4 outlet discharge concentrations, loads, and flows change over time?

The Copermittees shall perform storm water discharge monitoring to address the above-listed management and specific questions as follows:

(1) Prior to adoption of the WQIPs, the San Diego Copermittees shall continue the MS4 outfall monitoring program implemented under Order No. R9-2007-0001 per RWQCB approved plan through its planned completion to continue to obtain data from a representative cross-section of discharges.

(2) Prior to adoption of the WQIPs, the San Diego Copermittees shall perform storm water discharge monitoring based on representative outfalls to address the above-listed management questions as follows:

(a) The Copermittees shall select, at minimum, three monitoring stations at representative major MS4 outfalls with homogenous land use types and/or typical mixed-use drainage areas per WMA from the map developed pursuant to Provision D.2.a. Historical data may be used to assist site selection, where available. These outfalls shall be geo-located on a map showing the urban hydrologic sub-areas (HSAs), land use drainage areas, and jurisdictional boundaries within the permitted area.

(b) Each selected monitoring station must be monitored twice during the wet season, beginning October 1 and ending April 30.

(c) For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each monitoring station:

(i) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event;

(ii) The flow rates and volumes measured or estimated. Data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board;

(d) For each wet weather monitoring event, the parameters in Table D-2 must be monitored and recorded in the field. Samples shall be collected for analysis of parameters listed in Table D-7, according to the following methods:

(i) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, and indicator bacteria. Analytes that are field measured do not need to be analyzed by a laboratory.

(ii) For all other constituents, composite samples shall be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

[a] Through use of automated equipment to collect time-weighted composites composed of 24 discrete hourly samples, or flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter. Only one analysis of the composite of aliquots is required.

[b] If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours. Only one analysis of the composite of aliquots is required.

(iii) Copermittees should implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods.

Table D-7. Analytical Monitoring Constituents for Wet Weather MS4 Outfall Monitoring Stations

Conventionals, Nutrients, Hydrocarbons	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity[1] • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus[1] • Orthophosphate • Nitrite[1,2] • Nitrate[1,2] • Total Kjeldahl Nitrogen • Ammonia	• Arsenic • Cadmium[1] • Chromium • Copper[1] • Iron • Lead[1] • • Nickel • Selenium • Thallium • Zinc[1]	•Total Coliform • Fecal Coliform[3] •*Enterococcus*

Notes:
1. Constituent with a storm water action level (SAL) specified under Provision C.2.
2. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
3. *E. Coli* may be substituted for Fecal Coliform.

(3) After adoption of the WQIPs, the Copermittees shall perform storm water discharge monitoring based on representative major MS4 outfalls to address the above-listed management questions, and according to the needs for outfall monitoring as defined in the monitoring and assessment sections of the WQIPs. Samples shall be collected for analysis of parameters identified by the Copermittees as watershed priorities in the WQIP. Copermittees shall consider constituents based on factors including, but not limited to:

(a) Constituents identified as the highest water quality priorities.

(b) TMDL constituents in watersheds where the Copermittees are responsible parties in an effective TMDL Implementation Plan for the receiving water body reach to which the outfall discharges,

(c) Constituents listed as a cause of impairment on a CWA Section 303(d) listing for the receiving water body reach to which the outfall discharges, and

(d) Applicable SAL constituents.

e. MS4 OUTFALL DISCHARGE MONITORING REPORTING

The Copermittees shall report on the progress of the MS4 outfall monitoring and the results or findings of such monitoring, when completed, in the Annual Report pursuant to Provision F.3.b.

3. Source/Stressor Identification

Management Question: What are the sources of urban runoff that contribute to receiving water problem(s)?

The Copermittees shall perform Source/Stressor Identification studies as needed to investigate sources of pollutants or stressors in cases where MS4 discharges are deemed to be causing or contributing to receiving water priorities, based on monitoring performed under Provisions D.1 and D.2. The results of the Stressor/Source Identification studies may be shared regionally among the Copermittees to provide information useful in improving adaptive management of urban runoff through implementation of the WQIPs.

The principal role of Source/Stressor Identification is to identify and prioritize pollutant generating activities and source categories. Identification of high-priority sources is an important step in support of the WQIP process, to help inform the development of effective pollutant reduction strategies for particular priority constituents on a watershed-specific basis.

Source identification shall be conducted on a constituent-specific basis. The source identification efforts shall focus on constituents identified as watershed priorities, and include prioritization of sources based on magnitude, controllability, and other factors. The constituent-specific source identification process shall include, at a minimum, the following steps:

- Step 1: Compile known information on the specific priority constituent. This information includes data on potential sources and movement of a particular constituent within the urban watershed. Data generated by the Copermittees and others, as well as information available from a literature research on the priority constituent shall be compiled and analyzed as appropriate.

- Step 2: Based on the compiled information generated on the priority constituent, identify data gaps, if any. Targeted studies may be planned where appropriate to fill identified data gaps; such studies would be performed as Special Studies per Provision D.4. For example, targeted studies may be performed to quantify the relative loading of a priority constituent from a particular pollutant generating activity, or to improve understanding of the fate of a constituent in the environment.

- Step 3: Based on the information compiled, develop an inventory of sources and consider how to prioritize them within the watershed for potential follow-up action. Examples of prioritization criteria for sources include relative magnitude in discharges, geographical distribution (i.e., regional or localized), frequency of occurrence in discharges, human health risk, and controllability.

- Step 4: Develop a prioritized list of sources for the priority constituent and deliver to the Copermittee staff responsible for implementing WQIPs.

Prior to adoption of the WQIPs, the San Diego Copermittees shall continue source identification studies pertaining to compliance with TMDLs and the development of the CLRP implemented under Order No. R9-2007-0001.

Following adoption of the WQIPs, the Copermittees shall conduct source/stressor identification studies as necessary to support the WQIP watershed priorities and strategies. The plans for source/stressor ID studies must be submitted as part of the Monitoring and Assessment Programs included as part of the WQIPs required pursuant to Provision B of this Order.

The Copermittees shall report on the progress of the source/stressor ID studies and the results or findings of such studies, when completed, in the Annual Report pursuant to Provision F.3.b.

4. Special Studies

The Copermittees shall conduct Special Studies to address information needs as identified for receiving waters per monitoring performed pursuant to Provision D.1, for MS4 outfall discharges per monitoring performed pursuant to Provision D.2, and in Source/Stressor Identification studies per Provision D.3; to provide information on BMP effectiveness; and otherwise as needed to support implementation or evaluation of the WQIP strategies for the identified highest water quality priorities.

Within the permit term, two Special Studies shall be conducted within each Watershed Management Area, to address specific questions developed for each Watershed Management Area, and two regional special studies shall be conducted to answer regional questions.

a. The monitoring plans for the special studies must be submitted as part of the Monitoring and Assessment Programs included as part of the Water Quality Improvement Plans required pursuant to Provision B. The special studies must, at a minimum, be in conformance with the following criteria:

(1) The special studies must be related to water quality priorities identified by the Copermittees within the Watershed Management Area or San Diego Region, and the monitoring plans for the special studies must address specific watershed or regional questions;

(2) The special studies must be implemented within specific Watershed Management Areas or regionally within the San Diego Region;

(3) The special studies must include some form of participation by all Copermittees within the Watershed Management Area or San Diego Region, as applicable;

(4) One of the two required special studies within each Watershed Management Area may be replaced by a regional special study pursuant to D.4.a. (1) through D.4.a.(3); and

(5) A special study done pursuant to D.4.a. (1) through D.4.a.(4) that is started prior to the submittal of the WQIP, but is completed during the permit term, shall meet the requirements of a special study for a Watershed Management Area or San Diego Region, as applicable.

b. The Copermittees shall report on the progress of the special studies and the results or findings of such studies, when completed, in the Annual Report pursuant to Provision F.3.b.

Examples of special studies include:

- Enhance outreach & education by expanding residential BMP rebate programs (irrigation, rainwater harvesting and turf conversion) to multi-family housing
- Enhance outreach & education by increasing enforcement of over-irrigation regulation
- Conduct Catch Basin Inlet Cleaning Study assessment
- Implement Residential & Commercial Area Patrolling
- Implement Targeted Aggressive Street Sweeping Study
- Develop Watershed Urban Runoff Management Program Inspection Program (separate from commercial/industrial inspections, targets all businesses in specific areas)
- Conduct an investigation to improve the understanding of the linkage between groundwater and surface water hydrology and potential impacts to receiving water beneficial uses
- Conduct targeted field investigations to provide additional spatial or temporal information on the highest priority constituents or activities to inform or improve the efficiency of implementation efforts in the WMA.

The Regional Reference Stream Study is an example of a regional special study.

5. Assessment Requirements

The Copermittees must report the progress and findings of the following assessments, when available and as applicable to each WMA, as part of the Annual Report for each WMA, as required pursuant to Provision F. Assessments that occur only once per permit term, or are based on monitoring that occurs only once per permit term, shall be reported as part of the applicable Annual Report, or included within the Copermittees' Report of Waste Discharge, prior to commencement of the subsequent permit term.

a. RECEIVING WATER MONITORING

The Copermittees shall perform analysis and assessments of data and information produced per Provision D.1, addressing for each Receiving Water Monitoring element the management and specific questions as shown in Provision D.1 and below. The analysis and assessments shall relate the monitoring data compiled for each component to the conditions of affected receiving waters and status of relevant receiving water beneficial uses.

(1) SMC Regional Monitoring

Management Questions: Are conditions in receiving waters protective, or likely to be protective, of beneficial uses? What is the extent and magnitude of the current or potential receiving water problems?

The Copermittees shall incorporate results of the SMC Regional Monitoring Program, when available, into the analysis and assessments conducted as part of WQIP planning and implementation. The SMC Program is designed to provide a representative sampling of receiving water quality in coastal rivers and streams in the region's watersheds, based on a probabilistic design for characterization of coastal watersheds, using bioassessment metrics and related analyses. The analysis and assessments of the data shall relate the SMC monitoring data to the condition of receiving waters and status of receiving water beneficial uses.

(2) Bight Regional Monitoring

Management Questions: Are conditions in receiving waters protective, or likely to be protective, of beneficial uses? What is the extent and magnitude of the current or potential receiving water problems?

The Copermittees shall incorporate results of the Bight Regional Monitoring Program, when available, into the analysis and assessments conducted as part of WQIP planning and implementation. The Bight regional monitoring effort involves detailed characterization of coastal and offshore receiving waters, as well as targeted special studies. The analysis and assessments of the data shall relate the Bight monitoring data to the condition of receiving waters and status of receiving water beneficial uses.

(3) Sediment Quality

Management Questions: Are conditions in receiving waters protective, or likely to be protective, of beneficial uses? What is the extent and magnitude of the current or potential receiving water problems?

Specific Question: What is the condition of sediments in enclosed bays and estuaries with respect to the statewide sediment quality objectives?

The Copermittees shall incorporate results of the sediment quality monitoring of bay and estuarine sediments, when available, into the analysis and assessments conducted as part of WQIP planning and implementation. The analysis and assessments of the data shall relate sediment quality data to the condition of receiving waters and status of receiving water beneficial uses.

The analysis of sediment quality data also shall conform to the requirements of the Statewide Sediment Quality Objectives regulatory program, per State Water Resources Control Board Resolution No. 2008-0070 – Adoption of a Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality. The Copermittees shall include the results of this analysis, when available and as applicable to each WMA, in the Annual Report pursuant to Provision F.3.b.

(4) Hydromodification Management Plan (HMP) Monitoring

Management Questions: Are conditions in receiving waters protective, or likely to be protective, of beneficial uses? What is the extent and magnitude of the current or potential receiving water problems?

The Copermittees shall incorporate results of the receiving water monitoring required per their Hydromodification Management Monitoring Plans, as approved by the California Regional Water Quality Control Board, San Diego Region, when available, into the analysis and assessments conducted as part of WQIP planning and implementation. The analysis and assessments of the data shall relate HMP monitoring data to the condition of receiving waters and status of receiving water beneficial uses. The Copermittees shall include the results of this analysis, when available and as applicable to each WMA, in the Annual Report pursuant to Provision F.3.b.

(5) TMDL Monitoring

Management Questions: Are conditions in receiving waters protective, or likely to be protective, of beneficial uses? Are conditions in receiving waters getting better or worse?

Specific question: What is the progress in achieving and complying with

adopted TMDL targets?

The Copermittees shall incorporate results of TMDL monitoring, when available, into the analysis and assessments conducted as part of WQIP planning and implementation. The analysis and assessments of the TMDL monitoring data shall be integrated with other receiving water data in assessments of the condition of receiving waters and status of receiving water beneficial uses.

The Copermittees shall annually evaluate receiving water data produced per Provision D.1.e. to determine whether TMDL targets are being met, for applicable receiving waters as specified in adopted TMDLs and include the results of this evaluation, when available and as applicable to each WMA, in the Annual Report pursuant to Provision F.3.b.

The analysis of TMDL monitoring data also shall conform to the requirements of the adopted TMDLs and associated Implementation Plans, to demonstrate compliance with the applicable terms of adopted TMDLs and Implementation Plans.

(6) ASBS Special Protections Monitoring

Management Questions: Are conditions in receiving waters protective, or likely to be protective, of beneficial uses? Are conditions in receiving waters getting better or worse?

The Copermittees responsible for discharges to Areas of Special Biological Significance (ASBS) as regulated per the Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges, State Water Resources Control Board Resolution No. 2012-0012, shall incorporate results of ASBS monitoring, when available, into the analysis and assessments conducted as part of WQIP planning and implementation. The analysis and assessments of the ASBS monitoring data shall be integrated with other receiving water data in assessments of the condition of receiving waters and status of receiving water beneficial uses.

The Copermittees for whom ASBS monitoring is required under the terms of the adopted ASBS Special Protections shall evaluate the data as required per State Water Resources Control Board Resolution No. 2012-0012, and include the results of this evaluation, when available and as applicable to each WMA, in the Annual Report pursuant to Provision F.3.b.

(7) Long-Term Receiving Water Monitoring

Management Question: Are conditions in receiving waters getting better or

worse?

The Copermittees shall incorporate the results of the Long-Term Receiving Water Monitoring into the analysis and assessments conducted as part of the adaptive management process. The analysis and assessments of the Long-Term monitoring data shall be integrated with other receiving water data in assessments of the condition of receiving waters and status of receiving water beneficial uses.

The Copermittees shall evaluate the data produced by the receiving water monitoring pursuant to Provision D.1.g, and incorporate new receiving water data into time series plots for each long-term monitoring constituent, for each WMA. Once per permit term the Copermittee shall perform statistical trends analysis on the cumulative long-term receiving water data set.

(8) Integrated Receiving Water Assessment

Management Questions: Are conditions in receiving waters protective, or likely to be protective, of beneficial uses? What is the extent and magnitude of the current or potential receiving water problems? Are conditions in receiving waters getting better or worse?

Once during the permit term, for each watershed management area, the Copermittees shall integrate the analyses and assessments of the results of the SMC Regional Monitoring Program, Bight Regional Monitoring Program, Sediment Quality monitoring, HMP Monitoring, TMDL monitoring, ASBS monitoring, and Long-term receiving water monitoring, as performed per Provisions D.5.a.(1)-D.5.a.(7), as well as other data as available and applicable, to assess the condition of receiving waters and status of receiving water beneficial uses, and identify data or information gaps. The integrated assessment shall include, as appropriate to address any identified data gaps, recommendations for additional monitoring as may be required to adequately characterize conditions in receiving waters, or where special studies may be needed to address specific information needs.

b. MS4 OUTFALL DISCHARGE MONITORING

The Copermittees shall perform analysis and assessments of data and information produced per Provision D.2, addressing the management and specific questions as shown in Provision D.2 and below. The Copermittees shall include the results of this analysis, when available and as applicable to each WMA, in the Annual Report pursuant to Provision F.3.b.

(1) <u>Transient Non-Storm Water (Dry Weather) Monitoring, IC/ID Investigation</u>

Management Questions: What is the relative urban runoff contribution to

receiving water problem(s)? What are the sources of urban runoff that contribute to receiving water problem(s)?

Specific Questions: Which non-storm water discharges are transient and which are persistent? Which discharges should be investigated as potential IC/IDs? Which outfalls exhibit persistent dry weather flows?

(a) Where the presence of non-storm water (dry weather) flow is noted from an outfall during a visual inspection, field personnel shall note visual and other observations (including approximate/estimated flow rate, changes in flow rate during inspection, changes in flow rate over previous inspections, color, presence of foam or sheen, and odor) on a field log. Inspectors also shall note where there is evidence of past flow and record pertinent observations at all sites visited.

(b) The field observations shall be evaluated together with existing information available from prior inspections and prior monitoring results to determine whether the non-storm water (dry weather) discharge flow is likely to be transient or persistent. If the flow is deemed to be transient as indicated by pooled or ponded water or other evidence of recent flow, and there is evidence of an illicit discharge such as obvious odor, discoloration, foam or scum, the observations shall be used to conduct IC/ID investigations pursuant to Provision E.2. If the nature and source of the observed flow is already known, this shall be noted on the field log, including whether the observed flow results from a non-storm water discharge conditionally allowed per Provision E.2.a.

(c) Where the non-storm water (dry weather) discharge flow is deemed to be persistent in Provision D.2.b.(9), the outfall shall be referred to the characterization and prioritization process described in Provision D.2.c.

(2) <u>Persistent Non-Storm Water (Dry Weather) Outfall Monitoring</u>

Management Questions: What is the relative urban runoff contribution to receiving water problem(s)? What are the sources of urban runoff that contribute to receiving water problem(s)?

Specific Questions: Which outfalls exhibit persistent dry weather flows? Do discharge concentrations at MS4 outfalls meet applicable permit action levels? Which MS4 outfalls impact receiving water quality during dry weather?

(a) Identification and Prioritization of Outfalls with Persistent Flow

Annually, the Copermittees shall evaluate the data produced by the dry weather outfall monitoring pursuant to Provision D.2.c., rank the outfalls according to potential threat to receiving water quality, and produce a

prioritized list of outfalls for follow-up action. The Copermittees must analyze the non-storm water monitoring data collected pursuant to Provision D.2.c. and consider NAL exceedances in prioritizing outfalls. The prioritized list shall be provided in the Annual Report for each WMA pursuant to Provision F.3.b. The prioritized list shall be used to update the WQIPs with the goal of reducing flows/ loads in order of the ranked priority list, through targeted programmatic actions and source investigations.

(b) Evaluate Potential Impacts to Receiving Waters from Persistent Non-Storm Water Outfall Flows

Annually, the Copermittees shall evaluate the data produced by the dry weather outfall monitoring pursuant to Provision D.2.c., and compare the outfall monitoring data to relevant receiving water quality data, to identify outfalls that may cause or contribute to receiving water quality problems.

(c) Calculate Loadings to Receiving Waters from Persistent Non-Storm Water Outfall Flows

Annually, the Copermittees shall estimate discharge loadings from the data produced by the dry weather outfall monitoring pursuant to Provision D.2.c., and rank the monitored outfalls in order from highest to lowest loading, to identify outfalls that may cause or contribute to receiving water quality problems. As part of this annual estimation, the Copermittees shall identify areas where program implementation is thought to have resulted in reductions or elimination of loads from MS4 outfalls.

(d) The Copermittees in each Watershed Management Area must review the non-storm water flow and pollutant load analyses required pursuant to Provision D.4.b.(2)(d) on an annual basis to:

(i) Identify the pollutant load reductions that are thought to be attributable to water quality management actions within the high priority outfall drainage areas

(ii) Assess the effectiveness of the water quality improvement strategies being implemented within the Watershed Management Area toward reducing or eliminating non-storm water discharges and pollutant loads discharging from the MS4 to receiving waters; and

(iii) Identify modifications necessary to increase the effectiveness of the water quality improvement strategies toward reducing or eliminating non-storm water discharges and pollutant loads discharging from the MS4 to receiving waters.

(3) Storm Water (Wet Weather) Outfall Monitoring

Management Questions: What is the relative urban runoff contribution to receiving water problem(s)? What are the sources of urban runoff that contribute to receiving water problem(s)?

Specific Questions: Do discharge concentrations at MS4 outfalls meet applicable permit action levels? Which MS4 outfalls impact receiving water quality during wet weather? How do representative MS4 outlet discharge concentrations, loads, and flows change over time?

(a) Comparisons of Wet Weather Outfall Quality to Storm Water Action Levels

The Copermittees shall analyze the storm water monitoring data collected pursuant to Provision D.2.c and consider SAL exceedances in prioritizing outfalls for further investigation, and assessing progress towards addressing WQIP priorities.

(b) Evaluate Potential Impacts to Receiving Waters

Annually, the Copermittees shall evaluate the data produced by the wet weather outfall monitoring pursuant to Provision D.2.c, and compare the outfall monitoring data to relevant receiving water quality data, to identify outfalls that may cause or contribute to receiving water quality problems.

(c) Calculate Loadings to Receiving Waters from Storm Water Outfall Flows

Annually, the Copermittees shall estimate discharge loadings from the data produced by the wet weather outfall monitoring pursuant to Provision D.2.c. As part of this annual estimation, the Copermittees shall identify areas where program implementation is thought to have resulted in reductions or elimination of loads from MS4 outfalls.

(d) The Copermittees in each Watershed Management Area must review the storm water flow and pollutant load analyses required pursuant to Provision D.5.b.(3)(c) on an annual basis to:

(i) Identify the pollutant load reductions that are thought to be attributable to water quality management actions within the monitored outfall drainage areas

(ii) Assess the effectiveness of the water quality improvement strategies being implemented within the Watershed Management Area toward reducing storm water pollutant loads discharging from the MS4 to receiving waters; and

(iii) Identify modifications necessary to increase the effectiveness of the water quality improvement strategies toward reducing storm water

pollutant loads discharging from the MS4 to receiving waters.

(e) Characterization of Trends Over Time

The Copermittees shall evaluate the data produced by the wet weather outfall monitoring pursuant to Provision D.2.c, and incorporate new outfall monitoring data into time series plots for each long-term monitoring constituent, for each WMA. Once per permit term the Copermittee shall perform statistical trends analysis on the cumulative long-term MS4 outfall water quality data set.

c. SOURCE IDENTIFICATION

Management Question: What are the sources of urban runoff that contribute to receiving water problem(s)?

The principal role of Source/Stressor Identification is to identify and prioritize pollutant generating activities and source categories. Identification of high-priority sources is an important step in support of the WQIP process, to help inform the development of effective pollutant reduction strategies for particular priority constituents on a watershed-specific basis.

Source identification shall be conducted on a constituent-specific basis. The source identification efforts shall focus on constituents identified as watershed priorities, and include prioritization of sources based on magnitude, controllability, and other factors.

Following WQIP approval and implementation, source identification studies shall be used to improve WQIP effectiveness. For each Watershed Management Area, the Copermittees shall perform the investigation pursuant to Provision D.3, as necessary to address identified watershed priorities, including production of a prioritized list of sources or potential sources that warrant additional investigation and/or development of control strategies through the WQIPs.

Annually, the Copermittees shall evaluate the results and findings produced by the source/stressor identification studies conducted pursuant to Provision D.3, and inform Copermittee staff responsible for WQIP implementation of the relative magnitudes and/or priority rankings of identified sources. The Copermittees shall include the results of this analysis, when available and as applicable to each WMA, in the Annual Report pursuant to Provision F.3.b.

d. SPECIAL STUDIES

Following WQIP approval and implementation, special studies shall be identified to fill data gaps and provide targeted information to improve WQIP effectiveness. Upon completion of each Special Study conducted pursuant to Provision D.4, the Copermittees shall evaluate the study results and apply the results to the implementation of WQIPs within each Watershed Management Area as applicable.

Annually, the Copermittees shall evaluate the results and findings produced by the special studies conducted pursuant to Provision D.4, and assess their relevance to the Copermittees' efforts to better characterize WMAs and receiving water conditions, to understand urban runoff pollutant sources, and to control and limit the discharges of pollutants from MS4 outfalls to the maximum extent practicable. The Copermittees shall include the results of this analysis, when available and as applicable to each WMA, in the Annual Report pursuant to Provision F.3.b.

e. INTEGRATED EVALUATION OF WATER QUALITY IMPROVEMENT STRATEGIES

Once during the permit term, for each watershed management area, the Copermittees shall integrate the analyses and results of the monitoring performed pursuant to Provisions D.1-D.4, and the results of the assessments performed pursuant to Provision D.5.a.-D.5.d, as well as other data as available and applicable, to assess: 1) progress towards achieving the numeric goals and schedules established per the approved WQIPs, 2) progress toward addressing the highest priority receiving water conditions established for each Watershed Management Area, and 3) water quality improvements that are thought to be attributable to the Copermittees' implementation of the requirements of Provision B. For Watershed Management Areas with applicable TMDLs, the integrated evaluation must incorporate the specific monitoring and assessment requirements of Attachment E. For Watershed Management Areas with any ASBS, the water quality monitoring and assessment program must also incorporate the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012. The integrated evaluation shall include the following:

(1) The conditions of receiving waters and status of receiving water beneficial uses,

(2) The extent to which MS4 discharges cause or contribute to receiving water problems during both dry weather and wet weather,

(3) The estimated reductions in loadings from MS4 discharges attributable to the Copermittees' stormwater management activities, for both dry and wet weather,

(4) The principal identified sources of pollutants that are responsible for constituents in MS4 discharges that cause or contribute to receiving water

problems,

(5) The results of the cumulative special studies and their application to improvement of the WQIPs for the Watershed Management Areas,

(6) Progress toward achieving the interim and final numeric targets for restoring impacted beneficial uses in receiving waters with adopted TMDL Implementation Plans;

(7) Any identified data or information gaps, along with recommendations for additional monitoring, special studies, or other investigations to address the data and information needs.

E. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS

The purpose of this provision is for each Copermittee to implement a program to control the discharge of pollutants to and from its respective MS4 to receiving waters within its jurisdiction. The goals of this program are to: 1) effectively prohibit non-storm water discharges into the MS4s, 2) reduce pollutants in storm water discharges from the MS4s to the MEP, and 3) support the attainment and the reasonable protection, preservation, and enhancement water quality and designated beneficial uses of waters of the U.S. These goals will be accomplished through compliance with the jurisdictional runoff management program requirements of this Provision, and as modified or supplemented per Provision B (Water Quality Improvement Plans).

Each Copermittee must implement all the requirements of Provision E no later than 18 months after the adoption of this Order, or in accordance with Provision F.5.a. Each Copermittee must update its jurisdictional runoff management program document, in accordance with Provision F.2.a, to include all the requirements of Provision E. The jurisdictional runoff management programs implemented by each Copermittee must be consistent with the Water Quality Improvement Plan for the applicable Watershed Management Area required by Provision B. Until the Copermittee has updated its jurisdictional runoff management program document with the requirements of Provision E, the Copermittee must continue implementing its current jurisdictional runoff management program.

Modification of Jurisdictional Runoff Management Program Requirements

The requirements of this section apply to each Copermittee on a jurisdiction-wide basis. Copermittees that are in multiple WMAs may implement any activity or requirement at a level different than a specified minimum within any individual WMA so long as the requirement (as specified below) is met for the jurisdiction as a whole and compliance with all other applicable permit directives is maintained jurisdictionally and within each WMA.

Upon approval of the Executive Officer, specific requirements may be reduced or waived on a jurisdictional basis only where the following conditions have been met:

- The Copermittee's proposed JRMP modifications must be submitted to the San Diego Water Board for a 30 day public review and comment period. The San Diego Water Board will issue a public notice and solicit public comments on the JRMP modification for a minimum of 30 days. Based on the comments received, the San Diego Water Board will determine whether to hold a public hearing or to limit public input to submittal of written comments. If no hearing is held the San Diego Water Board will notify the Copermittee that the JRMP modification has been approved following its review and determination that it meets the requirements of this Order;

- On RWQCB approval, the Copermittee's JRMP must be amended per Section II.F.2.a. to incorporate the modification(s);

- Applicable portions of any WQIP to which an approved modification applies must be modified to reference or incorporate it, and the updated WQIP made available on the Regional Clearinghouse pursuant to Provision F.4.

1. Legal Authority Establishment and Enforcement

a. Each Copermittee must establish, maintain, and enforce adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 through statute, ordinance, permit, contract, order, or similar means to the extent allowable by law. This legal authority must authorize the Copermittee to:

(1) Effectively prohibit and eliminate all illicit discharges and illicit connections to its MS4;

(2) Control the contribution of pollutants in discharges of runoff associated with industrial and construction activity to its MS4 and control the quality of runoff from industrial and construction sites, including industrial and construction sites that do not have coverage under the statewide General Permit for Discharges of Storm Water Associated with Industrial Activities (Industrial General Permit) or General Permit for Discharges of Storm Water Associated with Construction Activities (Construction General Permit);

(3) Control the discharge of spills, dumping, or disposal of materials other than storm water into its MS4;

(4) Coordinate, as possible, with other agencies to minimize the contribution of pollutant discharges from the Copermittee's portion of the MS4 to portions of the MS4 under another agency's jurisdiction and from the other agency's portions of the MS4 to the portion of the MS4 under the Copermittee's jurisdiction;

(5) Require compliance with conditions in its statutes, ordinances, permits, contracts, orders, or similar means to hold dischargers to its MS4 accountable for their contributions of pollutants and flows;

(6) Require the use of BMPs to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(7) Require documentation on the effectiveness of BMPs implemented to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(8) Utilize enforcement mechanisms to require compliance with its statutes, ordinances, permits, contracts, orders, or similar means; and

(9) Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with its statutes, ordinances, permits, contracts, orders, or similar means and with the requirements of this Order, including the prohibition of illicit discharges and connections to its MS4; the Copermittee must also have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from industrial facilities, including construction sites, discharging into its MS4.

b. With the first Annual Report required by Provision F.3.b, each Copermittee must submit a statement certified by its Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative that the Copermittee has taken the necessary steps to obtain and maintain full legal authority within its jurisdiction to implement and enforce each of the requirements contained in this Order.

2. Illicit Discharge Detection and Elimination

Each Copermittee must implement a program to actively detect and eliminate illicit discharges and improper disposal into the MS4, or otherwise require the discharger to apply for and obtain a separate NPDES permit. The illicit discharge detection and elimination program must include, at a minimum, the following requirements:

a. Non-Storm Water Discharges

To the extent allowable by law, each Copermittee must address all non-storm water discharges as illicit discharges where the likelihood exists that they are a source of pollutants to waters of the U.S., unless a non-storm water discharge is either identified as a discharge authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to the following requirements:

(1) Discharges of non-storm water to the MS4 from uncontaminated pumped groundwater must be addressed as illicit discharges where there is evidence that suggests that they are the source of pollutants to waters of the U.S., unless the discharge has coverage under NPDES Permit No. CAG919001 (Order No. R9-2007-0034, or subsequent order) for discharges to San Diego Bay, or NPDES Permit No. CAG919002 (Order No. R9-2008-0002, or subsequent order) for discharges to surface waters other than San Diego Bay:

(2) Discharges of non-storm water from water line flushing and water main breaks to the MS4 must be addressed as illicit discharges unless the discharge has coverage under a valid NPDES Permit, Order No. R9-2010-0003, or a subsequent order. This includes water line flushing and water

main break discharges from water purveyors under the Copermittee's jurisdiction that has been issued a water supply permit by the California Department of Public Health or federal military installations. Discharges from recycled or reclaimed water lines to the MS4 must be addressed as illicit discharges, unless the discharges have coverage under a separate NPDES permit.

(3) Discharges of non-storm water to the MS4 from the following categories must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a anthropogenic source of pollutants to receiving waters within the Copermittee's jurisdiction:

(a) Discharges from foundation drains;

(b) Water from crawl space pumps;

(c) Water from footing drains.

(d) Diverted stream flows;

(e) Rising ground waters;

(f) Uncontaminated ground water infiltration to MS4s;

(g) Springs;

(h) Flows from riparian habitats and wetlands; and

(i) Discharges from potable water sources.

(4) Discharges of non-storm water to the MS4 from the following categories must be controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means where there is evidence that those discharges are a source of pollutants to waters of the U.S. Discharges of non-storm water to the MS4 from the following categories not controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means must be addressed by the Copermittee as illicit discharges.

(a) Air conditioning condensation

The discharge of air conditioning condensation should be directed to landscaped areas or other pervious surfaces where feasible;

(b) Individual residential vehicle washing

The discharge of wash water must be encouraged through public outreach and education:

(i) To be directed to landscaped areas or other pervious surfaces where feasible, and

(ii) To minimize the use of water for vehicle washing, use as little washing detergent and other vehicle wash products as possible, wash vehicles at commercial wash facilities, and implement other practices or behaviors that will prevent the discharge of pollutants associated with individual residential vehicle washing from entering the MS4; and

(c) Dechlorinated swimming pool discharges

(i) Eliminate residual chlorine, algaecide, filter backwash, or other pollutants from swimming pools prior to discharging to the MS4, and

(ii) The discharge of saline swimming pool water must be directed to the sanitary sewer, landscaped areas, other pervious surfaces that can accommodate the volume of water, or to the MS4 if the MS4 discharges to a saltwater receiving water.

(5) Firefighting discharges to the MS4 must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a significant source of pollutants to receiving waters. Firefighting discharges to the MS4 not identified as a significant source of pollutants to receiving waters, must be addressed, at a minimum, as follows:

(a) Non-emergency firefighting discharges

(i) Building fire suppression system maintenance discharges (e.g. sprinkler line flushing) to the MS4 must be addressed as illicit discharges where BMPs are not implemented.

(ii) Non-emergency firefighting discharges (i.e., discharges from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems) must be addressed by a program, to be developed and implemented by the Copermittee, to reduce or eliminate pollutants in such discharges from entering the MS4.

(b) Emergency firefighting discharges

Each Copermittee should develop and encourage implementation of BMPs to reduce or eliminate pollutants in emergency firefighting

discharges to the MS4s and receiving waters within its jurisdiction. During emergency situations, priority of efforts should be directed toward life, property, and the environment (in descending order). BMPs shall not interfere with immediate emergency response operations or impact public health and safety.

(6) If the Copermittee or San Diego Water Board identifies any category of non-storm water discharges listed under Provisions E.2.a.(1)-(4) as a source of pollutants to receiving waters, the category must be prohibited through ordinance, order, or similar means and addressed as an illicit discharge.

b. Prevent and Detect Illicit Discharges And Connections

Each Copermittee must include the following measures within its program to prevent and detect illicit discharges to the MS4:

(1) Each Copermittee must maintain an updated map of its entire MS4 and the corresponding drainage areas. The accuracy of the MS4 map must be confirmed during non-storm water MS4 monitoring events. The MS4 map must be included as part of the jurisdictional runoff management program document. Any geographic information system (GIS) layers or files used by the Copermittee to maintain the MS4 map must be made available to the San Diego Water Board upon request. The MS4 map must identify the following:

(a) All segments of the MS4 owned, operated, and maintained by the Copermittee,

(b) All known locations of inlets that discharge and/or collect runoff into the Copermittee's MS4,

(c) All known locations of connections with other MS4s not owned or operated by the Copermittee (e.g. Caltrans MS4s),

(d) All known locations of MS4 outfalls as defined by 40 CFR §122.26(B)(5-6) and private outfalls as defined by 40 CFR §122.26(B)(9) that discharge runoff collected from areas within the Copermittee's jurisdiction,

(e) All segments of receiving waters within the Copermittee's jurisdiction that receive and convey runoff discharged from the Copermittee's MS4 outfalls, and

(f) Locations of the non-storm water MS4 monitoring stations, identified pursuant to Provision D.2.b, within its jurisdiction;

(2) Each Copermittee must use Copermittee personnel and contractors to assist in identifying and reporting illicit discharges and connections, if observed, during the course of their daily employment activities;

(3) Each Copermittee must promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges to or from the MS4. Each Copermittee must facilitate public reporting through development and operation of a public hotline. Public hotlines can be Copermittee-specific or shared by the Copermittees. All public hotlines must be capable of receiving reports in both English and Spanish 24 hours per day and seven days per week;

(4) Each Copermittee must implement practices and procedures (including a notification mechanism) to prevent, respond to, contain, and clean up any spills that may discharge into the MS4 within their jurisdiction from any source. The Copermittee must coordinate with spill response teams to prevent to the extent possible entry of spills into the MS4, and prevent contamination waters of the U.S. The Copermittee must coordinate spill prevention, containment, and response activities throughout all appropriate Copermittee departments, programs, and agencies;

(5) Copermittees are responsible for control of discharges to their MS4. In the event that the source of an illicit discharge or connection is from another MS4, the Copermittee shall notify and, if necessary coordinate, with the upstream MS4 to implement and/or enforce corrective actions; and

(6) Each Copermittee must implement practices and procedures to prevent and limit infiltration of seepage from sanitary sewers (including private laterals and failing septic systems) to the MS4.

c. Visual Observations, Field Screening, And/or Monitoring

Each Copermittee must conduct visual observations, field screening and/or monitoring of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4 in accordance with the jurisdictional non-storm water MS4 monitoring program requirements in Provision D.2.b.

d. Investigate and Eliminate Illicit Discharges And Connections

Each Copermittee must include the following measures within its program to investigate and eliminate illicit discharges to the MS4:

(1) Each Copermittee must prioritize and determine when follow-up investigations will be performed in response to visual observations and/or water quality monitoring data collected during an investigation of a detected non-storm water or illicit discharge to or from the MS4. The criteria for follow-up investigations must include the following:

(a) Pollutants identified as causing or contributing to the highest water quality priorities identified in the Water Quality Improvement Plan;

(b) Pollutants identified as causing or contributing, or threatening to cause or contribute to impairments in water bodies on the 303(d) List and/or in environmentally sensitive areas (ESAs), located within its jurisdiction;

(c) Pollutants identified from sources or land uses known to exist within the area, drainage basin, or watershed that discharges to the portion of the MS4 within its jurisdiction included in the investigation; and

(d) Pollutants identified as causing or contributing to and exceedance of an NAL[12] where the source has not been identified as natural described in Provision C.1; and

(e) Pollutants identified as a threat to human health or the environment.

(2) Each Copermittee must implement procedures to investigate and inspect portions of its MS4 that based on reports or notifications, visual observations, field screening, monitoring, or other appropriate information, indicate a reasonable potential of discharging pollutants to receiving waters within the Copermittees jurisdiction due to illicit discharges, illicit connections, or other sources of non-storm water.

(a) The Copermittee may develop criteria to assess the validity of, and prioritize the response to, each report or notification received. Each Copermittee must respond to each report or notification (e.g., public hotline reports, staff or contractor reports and notifications, etc.) of an incident in a timely manner.

(b) Procedures should address field investigations to identify sources or potential sources for the discharge, unless the source or potential source has already been identified during previous investigations. The criteria established in Provision E.d.(2)(a) shall be used to prioritize response based on highest watershed priorities as established for the iterative process and determined in the Water Quality Improvement Plan, including:

(i) Obvious illicit discharges must be immediately investigated to identify the source(s) of discharges of non-storm water where flows are observed in and from the MS4 during the field screening and monitoring required pursuant to Provision D.2.b;

[12] NAL exceedances discovered during the course of IDDE monitoring and/or investigations may trigger action levels, including but not limited to, follow-up investigations based on the highest watershed priorities set forth and the iterative process provided in the WQIP.

(ii) The investigation must include field investigations to identify sources or potential sources for the discharge, unless the source or potential source has already been identified during previous investigations;

(iii) The investigation may include field investigations, reviewing Copermittee inventories, and other land use data to identify potential sources of the discharge; and

(iv) Procedures should address tracking of illicit discharges and connections.

(3) Each Copermittee must maintain records and a database of the investigations, including the following information:

(a) Location of incident, including hydrologic subarea, portion of MS4 receiving the non-storm water or illicit discharge, and point of discharge or potential discharge from MS4 to receiving water,

(b) Source of information initiating the investigation (e.g., public hotline reports, staff or contractor reports and notifications, monitoring data, etc.),

(c) Date the information used to initiate the investigation was received,

(d) Date the investigation was initiated,

(e) Dates of follow-up investigations,

(i) Identified or suspected source of the illicit discharge or connection, if determined,

(f) Known or suspected related incidents, if any,

(g) Result of the investigation, and

(h) If a source cannot be identified and the investigation is not continued, a rationale for why a discharge does not pose a threat to water quality and/or does not require additional investigation.

(4) Each Copermittee must initiate the implementation of procedures, in a timely manner, to eliminate all detected and identified illicit discharges and connections within its jurisdiction. The procedures must include the following:

(a) Procedures outlined by the Copermittee should address legal authority, as required under Provision E.1, to enforce the elimination of illicit discharges and connections to the MS4. If the Copermittee identifies the source as a controllable source of non-storm water or illicit discharge or connection, the Copermittee must implement its Enforcement Response Plan pursuant to Provision E.6 and enforce its legal authority to effectively prohibit and

eliminate illicit discharges and connections to its MS4. Responses to discharges may include:

(i) If the Copermittee identifies the source of the discharge as a category of non-storm water discharges in Provision E.2.a, and the discharge in exceedance of NALs developed in the Water Quality Implementation Plan, then the Copermittees must determine if this is an isolated incident or set of circumstances, or if the category of discharge must be addressed through the prohibition of that category of discharge as an illicit discharge pursuant to Provision E.2.a.(6);

(ii) If the Copermittee suspects the source of the non-storm water discharge as natural in origin (i.e. non-anthropogenically influenced) and in conveyance into the MS4, then the Copermittee must document the rationale for why the discharge does not need further investigation. This documentation shall be included in the Annual Report.

(iii) If the Copermittee is unable to identify and document the source of a recurring non-storm water discharge to or from the MS4, then the Copermittee must address the discharge as an illicit discharge and update its jurisdictional runoff management program to address the common and suspected sources of the non-storm water discharge within its jurisdiction in accordance with the Copermittee's priorities.

(5) Each Copermittee must submit a summary of the non-storm water discharges and illicit discharges and connections investigated and eliminated within its jurisdiction with each Annual Report required under Provision F.3.b of this Order.

3. Development Planning

Each Copermittee, within its respective jurisdiction, must implement a development planning program that includes, at a minimum, the following requirements.

a. Permanent BMP Requirements for All Development Projects

Each Copermittee, as practical and feasible, must prescribe BMP requirements during the planning process (i.e. prior to project approval and issuance of grading or building permits) for all development projects where local permits are issued, including unpaved roads and flood management projects, except emergency projects implemented for the protection of persons and property:

(1) General Requirements

(a) All BMPs must be located so as to remove pollutants from runoff prior to its discharge to any receiving waters, and as close to the source as possible;

(b) Multiple development projects may use shared permanent BMPs as long as construction of any shared BMP is completed prior to the use or occupation of any development project from which the BMP will receive runoff; and

(c) Permanent BMPs must not be constructed within waters of the U.S.

(2) Source Control BMP Requirements

Each Copermittee must require each Priority Development Project to implement applicable source control BMPs. The following source control BMPs must be implemented at all development projects where applicable and feasible:

(a) Prevention of illicit discharges into the MS4;

(b) Storm drain system stenciling or signage;

(c) Properly designed outdoor material storage areas;

(d) Properly designed outdoor work areas;

(e) Properly designed trash storage areas; and

(f) Any additional BMPs necessary to minimize pollutant generation at each project.

(3) Low Impact Development (LID) BMP Requirements

The following LID BMPs must be implemented at all development projects where applicable and feasible:

(a) Maintenance or restoration of natural storage reservoirs and drainage corridors (including topographic depressions, areas of permeable soils, natural swales, and ephemeral and intermittent streams);[13]

[13] Development projects proposing to dredge or fill materials in waters of the U.S. must obtain a CWA Section 401 Water Quality Certification. Projects proposing to dredge or fill waters of the State must obtain Waste Discharge Requirements.

(b) Buffer zones for natural water bodies (where buffer zones are technically infeasible, require project applicant to include other buffers such as trees, access restrictions, etc.);

(c) Conservation of natural areas within the project footprint including existing trees, other vegetation, and soils;

(d) Construction of streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided public safety is not compromised;

(e) Minimization of the impervious footprint of the project;

(f) Minimization of soil compaction to landscaped areas;

(g) Disconnection of impervious surfaces through distributed pervious areas;

(h) Landscaped or other pervious areas designed and constructed to effectively receive and infiltrate, retain and/or treat runoff from impervious areas, prior to discharge to the MS4;

(i) Small collection strategies located at, or as close as possible to, the source (i.e. the point where storm water initially meets the ground) to minimize the transport of runoff and pollutants to receiving waters;

(j) Use of permeable materials for projects with low traffic areas and appropriate soil conditions;

(k) Landscaping with native or drought tolerant species; and

(l) Harvesting and using precipitation.

b. Priority Development Projects

(1) Definition of Priority Development Project

Priority Development Projects include the following:

(a) All new development projects that fall under the Priority Development Project categories listed under Provision E.3.b.(2). Where a new development project feature, such as a parking lot, falls into a Priority Development Project category, the entire project footprint is subject to Priority Development Project requirements; and

(b) Those redevelopment projects that create, add, or replace at least 5,000 square feet of impervious surfaces on an already developed site, and the redevelopment project is a Priority Development Project category listed

under Provision E.3.b.(2). Where redevelopment results in an increase of less than fifty percent of the impervious surfaces of a previously existing development, and the existing development was not subject to Priority Development Project requirements, the performance and sizing requirements discussed in Provisions E.3.c.(2) and E.3.c.(3) apply only to the addition or replacement, and not to the entire development. Where redevelopment results in an increase of more than fifty percent of the impervious surfaces of a previously existing development and was not subject to previous Priority Project Development requirements, the performance and sizing requirements apply to the entire development.

(c) Projects where redevelopment results in an increase of more than fifty percent of impervious surfaces of a previously existing development, and the existing development was subject to previous Priority Project Development requirements, only the altered portion of development is subject to the Priority Development Project requirements in this Order.

(2) Priority Development Project Categories

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This category includes commercial, industrial, residential, mixed-use, and public development projects on public or private land which fall under the planning and building authority of the Copermittee.

(b) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

(c) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812), where the land area for development is 5,000 square feet or more of impervious surface.

(d) Hillside development projects. This category includes any development which creates 5,000 square feet or more of impervious surface which is located in an area with known erosive soil conditions, where the development will grade on any natural slope that is twenty-five percent or greater.

(e) Environmentally sensitive areas (ESAs). This category includes any development located within, directly adjacent to, or discharging directly to an ESA, which either creates 2,500 square feet of impervious surface on a proposed project site or increases the area of imperviousness of a proposed project site to 10 percent or more of its naturally occurring

condition. "Directly adjacent to" means situated within 200 feet of the ESA. "Discharging directly to" means outflow from a drainage conveyance system that collects runoff from the subject development or redevelopment site which terminates at or in receiving waters within the ESA and is not comingled with flows from adjacent lands.

(f) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce that has 5,000 square feet or more of impervious surface.

(g) Streets, roads, highways, and freeways. This category is defined as any paved impervious surface that is 5,000 square feet or more used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

(h) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more of impervious surface or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

(i) Large development projects. This category includes any post-construction pollutant-generating new development projects that result in the disturbance of one acre or more of land.

(3) Priority Development Project Exemptions

Each Copermittee has the discretion to exempt the following projects from being defined as Priority Development Projects:

(a) Sidewalks constructed as part of new streets or roads and designed to direct storm water runoff to adjacent vegetated areas;

(b) Bicycle lanes that are constructed as part of new streets or roads but are not hydraulically connected to the new streets or roads and designed to direct storm water runoff to adjacent vegetated areas;

(c) Impervious trails and driveways constructed and designed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas;

(d) Sidewalks, bicycle lanes, driveways, parking lots, or trails constructed with permeable surfaces.

(e) Single-family residential projects that are not part of a larger development or proposed subdivision and implement BMPs that meet minimum performance standards, as outlined in the BMP Design Manual.[14]

(f) Any paved impervious surface that is 5,000 square feet or more used for the transportation of automobiles, trucks, motorcycles, and other vehicles that follows the USEPA guidance regarding Management Wet Weather with Green Infrastructure: Green Streets[15] to the MEP.

c. Priority Development Project Structural BMP Performance and Sizing Requirements

In addition to the BMP requirements listed for all development projects under Provision E.3.a, Priority Development Projects must also implement structural BMPs that conform to performance and sizing requirements.

(1) Retention and Treatment Control BMP Requirements

Each Copermittee must require each Priority Development Project to implement BMPs to retain and treat pollutants onsite in the following order:

(a) Each Priority Development Project must be required to implement LID BMPs as described in Provision E.3.a.(3); and

(b) Each Priority Development Project must be required to implement LID BMPs that are sized and designed to retain the difference in volume between the runoff volume produced in the post-development condition as compared to the pre-development runoff condition resulting from a 24-hour 85th percentile storm event[16] ("design capture volume[17]"); or

(c) If onsite retention of the design capture volume using LID BMPs is technically infeasible per Provision E.3.c.(4), flow-thru LID and/or conventional treatment control BMPs must be implemented to provide equal pollutant removal for the portion of the design capture volume that is

[14] The BMP Design Manual was formerly known as the Standard Urban Storm Water Mitigation Plan under Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016.
[15] http://water.epa.gov/infrastructure/greeninfrastructure/index.cfm
[16] This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals.
[17] Design capture volume is a single event based volume occurring after an extended dry period.

not retained onsite. Flow-thru LID treatment control BMPs must be designed for an appropriate surface loading rate to prevent erosion, scour and channeling within the BMP; or

(d) If retention and/or equivalent pollutant removal of the design capture volume to meet E.3.c.(2)(a) or E.3.c.(2)(b) are infeasible onsite, project applicants must perform mitigation for the portion of the pollutant load in the design capture volume that is not retained or equally treated onsite, as described in Provision E.3.c.(5)(c).

(e) All onsite treatment control BMPs must:

(i) Be correctly sized and designed so as to remove pollutants from storm water to the MEP;

(ii) Be sized to comply with the following numeric sizing criteria:

[a] Volume-based treatment control BMPs must be designed to mitigate (infiltrate, filter, or treat) the remaining portion of the design capture volume that was not retained onsite; or

[b] Flow-based treatment control BMPs must be designed to mitigate (filter or treat) either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event; or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two.

(iii) Be ranked with high or medium pollutant removal efficiency for the project's most significant pollutants of concern. Treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

(2) Hydromodification Management BMP Requirements

Each Copermittee must require each Priority Development Project disturbing greater than one acre to implement hydromodification management BMPs, as described in the Copermittees current HMP, as applicable.

(a) Post-project runoff flow rates and durations do not exceed pre-development runoff flow rates and durations by more than 10 percent (for the range of flows that result in increased potential for erosion or degraded channel conditions downstream of Priority Development Projects).

(i) In evaluating the range of flows that results in increased potential for erosion of natural (non-hardened) channels, the lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks.

(ii) For artificially hardened channels, analysis to identify the lower boundary must use characteristics of a natural stream segment similar to that found in the watershed. The lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or erodes the toe of the channel banks.

(iii) The Copermittees may use monitoring results pursuant to Provision D.5.a.(4) to re-define the range of flows resulting in increased potential for erosion or degraded channel conditions, as warranted by the data.

(b) Projects shall preserve (where feasible) or provide compensation for significant losses of sediment supply anticipated as a result of development.

(c) If hydromodification management BMPs are technically infeasible per Provision E.3.c.(5), project applicants must perform mitigation for the portion of the runoff volume that is not controlled and will cause or contribute to increased potential for erosion of receiving waters downstream of the Priority Development Project, as described in Provision E.3.c.(5)(c).

(d) Exemptions

Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP requirements where the project:

(i) Discharges storm water runoff into underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;

(ii) Discharges storm water runoff into conveyance channels whose bed and bank are stabilized (e.g. concrete lined,an engineered interlocking paver, gabion system etc…) all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; or

(iii) Discharges storm water runoff into other areas identified by the San Diego Water Board as exempt from the requirements of Provisions E.3.c.(3) .

(3) Long-Term Structural BMP Maintenance

Each Copermittee must require the project applicant to submit proof of the mechanism under which ongoing long-term maintenance of all structural BMPs will be conducted.

(4) Infiltration and Groundwater Protection

(a) Infiltration and treatment control BMPs designed to primarily function as large, centralized infiltration devices (such as large infiltration trenches and infiltration basins) must not cause or contribute to an exceedance of an applicable groundwater quality objective. At a minimum, such infiltration and treatment control BMPs must be in conformance with the design criteria listed below, unless the development project applicant demonstrates to the Copermittee that one or more of the specific design criteria listed below are not necessary to protect groundwater quality. The design criteria listed below do not apply to small infiltration systems dispersed throughout a development project.

(i) Runoff must undergo pretreatment such as sedimentation or filtration prior to infiltration;

(ii) Pollution prevention and source control BMPs must be implemented at a level appropriate to protect groundwater quality at sites where infiltration treatment control BMPs are to be used;

(iii) Infiltration treatment control BMPs must be adequately maintained to remove pollutants in storm water to the MEP;

(iv) The vertical distance from the base of any infiltration treatment control BMP to the seasonal high groundwater mark must be at least 10 feet. Where groundwater basins do not support beneficial uses, this vertical distance criteria may be reduced, provided groundwater quality is maintained;

(v) The soil through which infiltration is to occur must have physical and chemical characteristics (e.g., appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses;

(vi) Infiltration treatment control BMPs must not be used for areas of industrial or light industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee, unless runoff does not exceed Basin Plan water quality standards or runoff is first treated or filtered to remove pollutants prior to infiltration; and

(vii) Infiltration treatment control BMPs must be located a minimum of 100 feet horizontally from any water supply wells.

(b) The Copermittees may collectively or individually develop alternative mandatory design criteria to that listed above for infiltration and treatment control BMPs which are designed to primarily function as centralized

infiltration devices. Before implementing the alternative design criteria in the development planning process the Copermittee(s) must:

(i) Notify the San Diego Water Board of the intent to implement the alternative design criteria submitted; and

(ii) Comply with any conditions set by the San Diego Water Board.

(5) Alternative Compliance for Technical Infeasibility

At the discretion of each Copermittee, alternative compliance may be allowed for certain Priority Development Projects to comply with Provisions E.3.c.(1) and E.3.c.(2). Alternative compliance is an optional program for the Copermittees to utilize if it is determined to provide an equal or greater benefit than onsite compliance. Where alternative compliance is allowed, it is the sole responsibility of the project applicant to execute the alternative compliance and comply with the following requirements:

(a) Applicability

Priority Development Projects may be allowed alternative compliance if:

(i) The Copermittee reviews and accepts site-specific hydrologic and/or design analysis performed by a registered professional engineer, geologist, architect, or landscape architect;

(ii) The project applicant demonstrates, and the Copermittee determines and documents, that BMPs per Provisions E.3.c.(1) and E.3.c.(2) were incorporated into the project design to the maximum extent technically feasible given the project site conditions;

(iii) The project applicant is required to perform mitigation described in Provision E.3.c.(5)(c) with a net result of at least the same level of water quality protection as would have been achieved if the Priority Development Project had fully implemented the BMP requirements under Provisions E.3.c.(1) and E.3.c.(2) onsite.

(b) Criteria For Technical Infeasibility

Each Copermittee must develop, or develop in collaboration with the other Copermittees, criteria to determine technical infeasibility for fully implementing the BMP requirements under Provisions E.3.c.(1) and E.3.c.(2) and include these requirements in the BMP Design Manual pursuant to Provision E.3.d. Technical infeasibility may result from conditions including, but not limited to:

(i) Locations that cannot meet the infiltration and groundwater protection requirements in Provision E.3.c.(4) due to the presence of shallow bedrock, contaminated soils, near surface groundwater, underground facilities, or utilities;

(ii) Brownfield development sites or other locations where pollutant mobilization is a documented concern;

(iii) The design of the site precludes the use of soil amendments, plantings of vegetation, or other designs that can be used to infiltrate and evapotranspirate runoff;

(iv) Soils cannot be sufficiently amended to provide for the requisite infiltration rates;

(v) Locations with geotechnical hazards;

(vi) Insufficient onsite and/or offsite demand for storm water use;

(vii) Modifications to an existing building to manage storm water are not feasible due to structural or plumbing constraints;

(viii) HMP flow rate requirements that result in BMP orifice sizes too small for efficient maintenance; and

(ix) Smart growth and infill or redevelopment locations where the density and/or nature of the project would create significant difficulty for compliance with Provisions E.3.c.(2) and E.3.c.(3) onsite.

(c) Mitigation

Priority Development Projects that meet the Copermittee's technical infeasibility criteria developed pursuant to Provision E.3.c.(5)(b) must be required to mitigate for the increased flow rates, increased flow durations, and/or water quality equivalence expected to be discharged from the site.

(i) The Project applicant must perform offsite mitigation for:

[a] The portion of the pollutant load in the design capture volume that is not retained or equally treated onsite, and/or

[b] The portion of the increased potential erosion of downstream receiving waters not fully controlled with hydromodification management BMPs onsite.

(ii) Mitigation Project Locations

Offsite mitigation projects must be implemented within the same Watershed Management Area as the Priority Development Project, and preferably within the same hydrologic subarea. Mitigation projects outside of the hydrologic subarea but within the same Watershed Management Area may be approved provided that the project applicant demonstrates that mitigation projects within the same hydrologic subarea are infeasible and that the mitigation project will address similar potential impacts expected from the Priority Development Project.

(iii) Mitigation Project Types

Offsite mitigation projects may include, where applicable and feasible, retrofitting opportunities and stream and/or habitat rehabilitation or restoration opportunities identified in the Water Quality Improvement Plans, identified pursuant to Provision B.3.. Other offsite mitigation projects may include green streets or infrastructure projects, groundwater recharge projects, or regional BMPs upstream of receiving waters. Mitigation credit will not be given to portions of in stream mitigation projects using impervious hardscape materials such as concrete. Project applicants seeking to utilize these alternative compliance provisions may propose other

offsite mitigation projects, which the Copermittees may approve if they meet the requirements of Provision E.3.c.(4).

(iv) Mitigation Project Timing

The Copermittee and/or project applicant must develop a schedule for the completion of offsite mitigation projects, including milestone dates to identify, fund, design, and construct the projects. Offsite mitigation funding must be secured by the applicant and verified by the Copermittee prior to granting construction permits or recording of maps, whichever comes first. .

(v) Mitigation Fund

A Copermittee may choose to implement additional mitigation programs (e.g., pollutant credit system, mitigation fund) as a means for developing and implementing offsite mitigation projects, provided the projects conform to the requirements for project locations, types, and timing described above.

d. Update BMP Design Manual

Each Copermittee must update its BMP Design Manual pursuant to Provision F.2.b or Provision F.5.a. Until the Copermittee has updated its BMP Design Manual with the requirements of Provision E.3.c, the Copermittee must continue implementing its current BMP Design Manual. Unless directed otherwise by the San Diego Water Board, the Copermittee must implement the BMP Design Manual within 180 days of completing the update. The update of the BMP Design Manual must include the following:

(1) Updated procedures to determine the nature and extent of storm water requirements applicable to a potential development or redevelopment project. These procedures must inform project applicants of the storm water management requirements applicable to their project including, but not limited to, general requirements for all development projects, LID and conventional BMP design procedures and requirements, hydromodification management requirements, requirements specific to phased projects, and procedures specific to private developments and public improvement projects;

(2) Updated procedures to identify pollutants and conditions of concern for selecting the most appropriate structural BMPs that consider, at a minimum, the following:

(a) Receiving water quality (including pollutants for which receiving waters are listed as impaired under CWA section 303(d));

(b) Priority pollutants or receiving water conditions contributing to the highest water quality priorities identified in the Water Quality Improvement Plan;

(c) Land use type of the project and pollutants associated with that land use type; and

(d) Pollutants expected to be present onsite.

(3) Updated procedures for designing structural BMPs, including any updated performance and sizing requirements to be consistent with the requirements of Provision E.3.c for all BMPs listed in the BMP Design Manual;

(4) Long-term maintenance criteria for each BMP listed in the BMP Design Manual; and

(5) Criteria and mitigation requirements, in accordance with the requirements under Provision E.3.c.(4), if the Copermittee elects to allow alternative compliance for technical infeasibility within its jurisdiction.

e. Priority Development Project BMP Implementation and Oversight

Each Copermittee must implement a program to ensure structural BMPs on all Priority Development Projects are designed, constructed, and maintained to remove pollutants in storm water to the MEP.

(1) Structural BMP Approval and Verification Process

(a) Each Copermittee must ensure that for all Priority Development Project applications that have not received prior lawful approval by the Copermittee by 18 months after the adoption of this Order, or pursuant to Provision F.5.a, the requirements of Provision E.3 are implemented. For project applications that have received prior lawful approval by 18 months after the adoption of this Order, or pursuant to Provision F.5.a, the Copermittee may allow previous land development requirements to apply.

(b) Each Copermittee must identify the roles and responsibilities of various municipal departments in implementing the structural BMP requirements, including each stage of a project from application review and approval through BMP maintenance and inspections.

(c) Each Copermittee must ensure that appropriate easements and ownerships are properly recorded in public records and the information is conveyed to all appropriate parties when there is a change in project or site ownership.

(d) Each Copermittee must ensure that prior to occupancy and/or intended use of any portion of the Priority Development Project, each structural BMP must be inspected to verify that they have been constructed and are

operating in compliance with all of its specifications, plans, permits, ordinances, and the requirements of this Order.

(2) Priority Development Project Inventory and Prioritization

(a) Each Copermittee must develop and regularly maintain a watershed-based database to track and inventory all Priority Development Projects and associated structural BMPs within their jurisdiction. Inventories must be accurate and complete beginning from January 2002 for the San Diego County Copermittees, February 2003 for the Orange County Copermittees, and July 2005 for the Riverside County Copermittees, where data is available. The database must include, at a minimum, the following information:

(i) Priority Development Project location (address and hydrologic subarea);

(ii) Descriptions of structural BMP type(s);

(iii) Date(s) of construction;

(iv) Party responsible for structural BMP maintenance;

(v) Dates and findings of structural BMP maintenance verifications; and

(vi) Corrective actions and/or resolutions.

(b) Each Copermittee must prioritize the Priority Development Projects with structural BMPs within its jurisdiction. The designation of Priority Development Projects as high priority must consider the following:

(i) The highest water quality priorities identified in the Water Quality Improvement Plan;

(ii) Receiving water quality;

(iii) Number and sizes of structural BMPs;

(iv) Recommended maintenance frequency of structural BMPs;

(v) Likelihood of operation and maintenance issues of structural BMPs;

(vi) Land use and expected pollutants generated; and

(vii) Compliance record.

(3) Structural BMP Maintenance Verifications and Inspections

Each Copermittee is required to verify that structural BMPs on each Priority Development Project are adequately maintained, and continue to operate effectively to remove pollutants in storm water to the MEP through

inspections, self-certifications, surveys, or other equally effective approaches.

(a) All (100 percent) of the structural BMPs at Priority Development Projects that are designated as high priority must be inspected directly by the Copermittee annually prior to each rainy season;

(b) For verifications performed through a means other than direct Copermittee inspection, adequate documentation must be required by the Copermittee to provide assurance that the required maintenance of structural BMPs at each Priority Development Project has been completed; and

(c) Appropriate follow-up measures (including re-inspections, enforcement, etc.) must be conducted to ensure that structural BMPs at each Priority Development Project continue to reduce pollutants in storm water to the MEP as originally designed.

f. Development Project Enforcement

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all development projects, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

4. Construction Management

Each Copermittee must implement a construction management program that includes the following requirements:

a. Construction Program Management

Each Copermittee must define in the Jurisdictional Runoff Management Plan the following:

(1) Define construction sites to be inventoried, such as sites that involve ground disturbance or soil disturbing activities; and

(2) Define a process for ensuring adequate construction BMP implementation for non-inventoried sites. Non-inventoried sites involve minor construction activities that are not anticipated to create storm water pollution such as interior improvements, small miscellaneous residential improvements such as patio covers, plumbing, electrical, and mechanical work.

b. Project Approval Process

Prior to issuance of any local permit that allows commencement of construction activities for any inventoried construction site, each Copermittee must:

(1) Require a site-specific Pollution Control Plan, or equivalent construction BMP or erosion control plan, to be submitted by the project applicant to the Copermittee;

(2) Confirm the Pollution Control Plan, or equivalent construction BMP or erosion control plan, complies with the local grading ordinance, other applicable local ordinances, and the requirements of this Order; and

(3) Confirm the Pollution Control Plan, or equivalent construction BMP or erosion control plan, includes seasonally appropriate and effective BMPs and management measures described in Provision E.4.c, as applicable to the project.

c. Construction Site Inventory and Tracking

(1) Each Copermittee must maintain, and update at least monthly, a watershed-based inventory of all applicable construction sites within its jurisdiction. The inventory must include:

(a) Relevant contact information for each site (e.g., name, address, phone, and email for the owner and contractor);

(b) The basic site information including location (address and hydrologic subarea), Waste Discharge Identification (WDID) number (if applicable), size of the site, and approximate area of disturbance;

(c) Whether or not the site is considered a high threat to water quality, as defined in Provision E.4.b.(2) below;

(d) Current construction phase;

(e) The required inspection frequency, as defined in the Copermittee's jurisdictional runoff management program document;

(f) The date the Copermittee accepted the project-specific Pollution Control Plan, or equivalent construction BMP or erosion control plan; and

(g) Whether or not there are ongoing enforcement actions administered to the site.

(2) Each Copermittee must identify all construction sites within its jurisdiction that represent a high threat to downstream surface water quality. At a minimum, high threat to water quality sites must include:

(a) Sites located within a hydrologic subarea where sediment is known or suspected to contribute to the highest water quality priorities identified in the Water Quality Improvement Plan;

(b) Sites located within the same hydrologic subarea and tributary to a CWA section 303(d) water body segment impaired for sediment;

(c) Sites located within, directly adjacent to, or discharging directly to a receiving water within an ESA; and

(d) Other sites determined by the Copermittees or the San Diego Water Board as a high threat to water quality.

d. Construction Site BMP and Management Measure Implementation

Each Copermittee must implement, or require the implementation of effective BMPs to reduce discharges of pollutants in storm water from construction sites to the MEP, and prevent non-storm water discharges into the MS4. These BMPs must be site specific, seasonally appropriate, and construction phase appropriate. BMPs and management measures must be implemented at each construction site year round. Dry season BMP implementation must plan for and address unseasonal rain events that may occur during the dry season (May 1 through September 30). Copermittees must implement, or require the implementation of, BMPs and management measures in the following categories:

(1) Project Planning;

(2) Good Site Management "Housekeeping", including waste management;

(3) Non-storm Water Management;

(4) Erosion Control;

(5) Sediment Control;

(6) Run-on and Run-off Control; and

(7) Active/Passive Sediment Treatment Systems, where applicable.

e. Construction Site Inspections

Each Copermittee must conduct construction site inspections to confirm compliance with its permits and applicable local ordinances, and the requirements of this Order. Priority for site inspections must consider threat to water quality pursuant to Provision E.4.b as well as the nature of the construction activity, topography, and the characteristics of soils and receiving water quality.

(1) <u>Inspection Frequency</u>

(a) Each Copermittee must conduct inspections at all inventoried sites, including high threat to water quality sites, at an appropriate frequency for each phase of construction to confirm the site reduces the discharge of pollutants in storm water from construction sites to the MEP, and prevents non-storm water discharges from entering the MS4.

(b) Each Copermittee must establish appropriate inspection frequencies for high threat to water quality sites, and all other sites, for each phase of construction. Inspection frequencies appropriate for addressing the highest water quality priorities identified in the Water Quality Improvement Plan, and for complying with the requirements of this Order must be

identified in each Copermittee's jurisdictional runoff management program document.

(c) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e., re-inspection, enforcement) necessary to confirm site compliance with its permits and applicable local ordinances, and the requirements of this Order.

(2) Inspection Content

Inspections of construction sites by the Copermittee must include, at a minimum:

(a) Verification of coverage under the Construction General Permit (Notice of Intent (NOI) and/or WDID number) during initial inspections, when applicable;

(b) Assessment of compliance with its permits and applicable local ordinances related to pollution prevention, including the implementation and maintenance of applicable BMPs;

(c) Assessment of BMP adequacy and effectiveness;

(d) Visual observations of actual non-storm water discharges;

(e) Visual observations of actual or potential discharge of sediment and/or construction related materials from the site;

(f) Visual observations of actual or potential illicit connections; and

(g) If any violations are found and BMP enhancements are needed, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried construction sites. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Site name, location (address and hydrologic subarea), and WDID number (if applicable);

(b) Inspection date;

(c) Weather conditions during inspection;

(d) Description of problems observed with BMPs and indication of need for BMP addition/repair/replacement and any scheduled re-inspection, and date of re-inspection;

(e) Descriptions of any other specific inspection comments which must, at a minimum, include rationales for longer compliance time;

(f) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(g) Resolution of problems noted and date problems fixed.

f. Construction Site Enforcement

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried construction sites, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

5. Existing Development Management

[NOTE: This section is provided as an alternate to the original language.]

Each Copermittee must implement an existing development management program that includes the following requirements:

a. Industrial, Commercial, and Municipal Sources

(1) Source Identification and Prioritization

Each Copermittee must identify sources and maintain an updated watershed-based inventory of its existing industrial, commercial, and municipal development that has the reasonable potential to discharge a pollutant load to and from the MS4. The use of an automated database system, such as GIS, is highly recommended. The inventory must, at a minimum, include:

(a) Name, location (address and hydrological subarea) of each source;

(b) A designation of the source as municipal, commercial, or industrial;

(c) SIC Code or NAICS Code, if applicable;

(d) Industrial General Permit NOI and/or WDID number, if applicable;

(e) Identification of pollutants generated or potentially generated by the source;

(f) Whether the source is adjacent to an ESA;

(g) Whether the source is tributary to and within the same hydrologic subarea as a CWA section 303(d) water body segment and generates or potentially generates pollutants for which the water body segment is impaired; and

(h) Whether the source contributes or potentially contributes to the highest water quality priorities identified in the Water Quality Improvement Plan;

(2) BMP Implementation and Maintenance

Each Copermittee must designate a minimum set of BMPs required for all inventoried existing development with the reasonable potential to discharge pollutant loads from their MS4, including special event venues. The designated minimum BMPs must be specific to facility types and pollutant-generating activities, as appropriate.

(a) Pollution Prevention

Each Copermittee must promote the use of pollution prevention methods, where appropriate.

(b) BMP Operation and Maintenance

(i) Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at sources within its jurisdiction.

(ii) Each Copermittee must implement a schedule of operation and maintenance activities for its MS4 and related structures (including but not limited to catch basins, storm drain inlets, detention basins, etc.), and verify proper operation of all its municipal structural treatment controls. Operations and maintenance activities may include:

[a] Inspections of MS4 and related structures;

[b] Cleaning of MS4 and related structures; and

[c] Proper disposal of materials removed from cleaning of MS4 and related structures.

(iii) Each Copermittee must implement a schedule of operation and maintenance activities for public: streets, unpaved roads, paved

roads, and paved highways and freeways within its jurisdiction.

(iv) Each Copermittee must implement controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers. Copermittees that operate both a municipal sanitary sewer system and a MS4 must implement controls and measures to prevent and eliminate seeping sewage from infiltrating the MS4. Copermittees that do not operate both a municipal sanitary sewer system and a MS4 are encouraged to coordinate with sewering agencies to keep themselves informed of relevant and appropriate maintenance activities and capital projects in their jurisdiction.

(c) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must implement procedures, or require the implementation of procedures, as appropriate, to reduce discharges of pollutants associated with the application, storage, and disposal of pesticides, herbicides and fertilizers at sources within its jurisdiction.

(3) Measures to Address Highest Water Quality Priorities

Each Copermittee must conduct or require measures as necessary to address sources or areas that discharge pollutants identified as contributing to the highest water quality priorities in the Water Quality Improvement Plan. These measures must be identified as applicable in each WQIP strategy, and may include any of the following:

(a) Copermittee Program Activities

Each Copermittee may make modifications to its program activities (e.g. increased or focused education, inspections, etc.) to address sources that discharge pollutants identified as contributing to the highest water quality priorities in the Water Quality Improvement Plan.

(b) Additional Control Measures

Each Copermittee may require additional pollution prevention measures and control measures at sources that discharge pollutants identified as contributing to the highest water quality priorities in the Water Quality Improvement Plan, including consideration of retrofit and channel rehabilitation and improvement opportunities, as identified in Provision 5.a.2.(c)

(c) Retrofit

Each Copermittee must develop a strategy to facilitate the implementation of retrofit projects. Existing development in high priority areas should be assessed for inclusion in the retrofit plan. Retrofit plans should focus on

pollutants and areas identified as high priority within the Water Quality Improvement Plans, with the highest priority projects included in the Water Quality Improvement Plans.

(i) Retrofit projects may be prioritized based on their relative benefit to water quality, feasibility, cost effectiveness, and community acceptance.

(ii) Retrofit projects in the highest priority areas should be included in the review for the Water Quality Improvement Plan to provide additional pollutant removal from storm water discharges.

(d) Channel Rehabilitation and Improvement

Each Copermittee must develop a strategy to facilitate the implementation of channel rehabilitation and improvement projects. Existing channels in high priority areas should be assessed for inclusion in the channel rehabilitation and improvement plan. Channel rehabilitation and improvement plans should focus on pollutants and areas identified as high priority within the Water Quality Improvement Plans.

(i) Channel rehabilitation and improvement projects may be selected to address hydromodification, restore wetland and riparian habitat, or to address other water quality issues prioritized in the Water Quality Improvement Plan.

(ii) Channel rehabilitation and improvement projects may be prioritized based on their relative benefit to water quality, feasibility, cost effectiveness, and community acceptance.

(iii) Channel rehabilitation and improvement projects in the highest priority areas should be included in the review for the Water Quality Improvement Plan to provide additional pollutant removal from storm water discharges.

(4) Inspection Requirements:

(a) Inspection Frequency

(i) Each Copermittee must establish appropriate inspection frequencies for inventoried industrial, commercial, and municipal sources based on the potential for discharging pollutants via storm water and non-storm water discharges, and should reflect the priorities set forth in the Water Quality Improvement Plan.

(ii) Each Copermittee must conduct inspections annually with a level of effort equivalent to 20% of their industrial, commercial, and

municipal inventory combined[18][19]. If facilities require multiple inspections during any given year, those additional inspections may count towards this total.

(iii) Inventoried existing development must be inspected, as needed, in response to valid public complaints and findings from the Copermittee's municipal and contract staff inspections.

(iv) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e. education and outreach, re-inspection, enforcement) as necessary to confirm compliance in accordance with its enforcement response plan pursuant to Provision E.6.

(b) Inspection Content

Inspections of industrial, commercial, and municipal facilities by the Copermittee may include the following:

(i) Industrial, commercial, and municipal facilities name and location (address and hydrologic subarea);

(ii) Inspection and re-inspection date(s);

(iii) Assessment of compliance with its applicable local ordinances and permits related to non-storm water and storm water discharges and runoff;

(iv) Assessment of BMPs implementation;

(v) Verification of coverage under the Industrial General Permit (NOI and/or WDID number), when applicable;

(vi)

(vii) Visual observations of actual non-storm water discharges, if present;

(viii) Visual observations of actual or potential discharge of pollutants, if present; and

(ix) Visual observations of actual or potential illicit connections, if present.

[18] Excludes linear facilities (MS4 and roads).

(c) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried industrial, commercial, and municipal facilities. The Copermittee must maintain all inspection records in an electronic database or tabular format, either in paper or electronic inspection records files, which must be made available to the San Diego Water Board upon request.

Inspection records must include the information necessary to effectively manage and implement the industrial, commercial, and municipal facilities inspection program, as described in each Copermittee's jurisdictional runoff management plan

b. Residential Sources

(1) Source Identification and Prioritization:

An inventory of residential sources within each Copermittees jurisdiction must be developed as follows:

(a) Designation of Residential Management Areas

Each Copermittee must divide areas of residential development into Residential Management Areas. Residential Management Areas may be designated by one or more of the following: Hydrologic Sub Area, land use (e.g. single family, multi family, rural, Common Interest Areas, Home Owner Associations), and/or residential target audiences, and/or other accepted methods to be included in each Copermittee-approved jurisdictional runoff management plan.

(b) Prioritization of Residential Management Areas

Copermittees must prioritize Residential Management Areas for the purposes of directing their residential programs. Prioritization must consider whether the Residential Management Area contributes or potentially contributes to the highest water quality priorities identified in the Water Quality Improvement Plan, and consideration of other program information or information from other relevant programs:

(c) A regularly updated map must be developed showing the locations of the highest priority inventoried Residential Management Areas, watershed boundaries, and water bodies at or near them.

(2) BMP Implementation and Maintenance

(a) Designate BMPs

Each Copermittee must designate and encourage the implementation of a minimum set of BMPs for all residential sources or residential target audiences with the reasonable potential to discharge significant pollutant loads from their MS4.The designated minimum BMPs must be source-specific, and must address each of the following as appropriate.

(i) Pollution Prevention

Each Copermittee must promote the use of pollution prevention methods, where appropriate.

(ii) BMP Operation and Maintenance

Each Copermittee must designate and require the operation and maintenance of designated BMPs for residential sources within its jurisdiction.

(iii) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must designate and encourage, as appropriate, the implementation of practices to reduce discharges of pollutants associated with the application, storage, and disposal of pesticides, herbicides and fertilizers at residential sources within its jurisdiction.

(3) Measures to Address Highest Water Quality Priorities

Each Copermittee must designate or require measures as necessary to address residential sources or residential target audiences that discharge pollutants identified as contributing to the highest water quality priorities in the Water Quality Improvement Plan. These measures must be identified as applicable in each WQIP strategy, and may include any of the following:

(a) Copermittee Program Activities

Each Copermittee may make modifications to its program activities (e.g. increased or focused education, inspections, etc.) to address residential sources that discharge pollutants identified as contributing to the highest water quality priorities in the Water Quality Improvement Plan.

(b) Additional Control Measures

Each Copermittee may require additional pollution prevention and control measures at sources that discharge pollutants identified as contributing to the highest water quality priorities in the Water Quality Improvement Plan.

(c) Retrofit

Each Copermittee must encourage through education or other means the implementation of retrofit projects at residential sources or areas.

(4) Residential Management Area Oversight:

(a) Residential Area Assessment

Each Copermittee must conduct representative evaluations (e.g. visual observations, water use analysis, and other historical data) of its high priority Residential Management Areas as defined in the Water Quality Improvement Plan to update implementation strategies. Each Copermittee must develop a program to facilitate oversight and assessment in residential areas. Oversight may include complaint investigation, IDDE Activities, follow-up on monitoring obdervations, visual observations, outreach and education, water use analysis, or other methods deemed necessary to facilitate BMP implementation. Each Copermittee should conduct assessment of its oversight activities in prioritized residential areas to inform any updates to the WQIP.

(b) Follow up Actions

Each Copermittee must prioritize its follow up actions and enforcement (e.g. education and outreach, re-assessment) in accordance with its Enforcement Response Plan pursuant to Provision E.6.

(c) Record-keeping

Records must be sufficiently detailed in order to determine compliance with the requirements of this Order and any progress made toward the modification of residential management strategies, or addressing the highest water quality priorities identified in the Water Quality Improvement Plan.

c. Existing Development Enforcement

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried existing development identified by the

Copermittee as having the reasonable potential to discharge pollutant loads from the MS4 within their jurisdiction, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

6. Enforcement Response Plans

Each Copermittee must develop and implement an Enforcement Response Plan as part of its jurisdictional runoff management program document. The Enforcement Response Plan must describe the applicable protocols and options for enforcing compliance with the provisions of this Order. The Enforcement Response Plan must include the following:

a. Enforcement Response Plan Components

The Enforcement Response Plans shall include the following individual components:

(1) The Illicit Discharge Detection and Elimination Enforcement Components provided in Provision E.2;

(2) The Development Planning Enforcement Component provided in Provision E.3;

(3) The Construction Management Enforcement Component provided in Provision E.4; and

(4) The Existing Development Management Enforcement Component provided in Provision E.5.

Existing enforcement plans or procedures may be used to partially or wholly satisfy the requirements of any Enforcement Response Plan component.

b. Enforcement Approaches and Options

Each Enforcement Response Plan component must describe the Copermittee's approach to correcting noncompliance with its permits, applicable local ordinances, and this Order. It must describe protocols for progressively stricter responses, including, as applicable, timeframes allowed to bring areas or facilities into compliance. The enforcement process must include appropriate sanctions to compel compliance, such as:

(1) Verbal and written notices of violation;
(2) Cleanup requirements;
(3) Fines
(4) Bonding requirements;
(5) Administrative and criminal (if intentional or criminally negligent) penalties;
(6) Liens;
(7) Stop work orders; and
(8) Permit and occupancy denials.

c. CORRECTION OF VIOLATIONS

(1) Violations must be corrected in a timely manner with the goal of correcting them within 30 calendar days after the violations are discovered, and prior to the next predicted rain event, when possible.

(2) If more than 30 calendar days are required for compliance, then a rationale must be recorded in the applicable electronic database or tabular system used to track compliance.

d. ESCALATED ENFORCEMENT PRIORITIES

(1) Each Enforcement Response Plan must include a definition of "escalated enforcement priorities". Escalated enforcement priorities shall be defined to include any enforcement scenario where a violation or other non-compliance is determined to constitute a significant contribution to any of the highest water quality priorities identified in the Water Quality Improvement Plan. Escalated enforcement priorities may be defined differently for development planning; construction sites; commercial, industrial, and municipal sources; and residential management areas.

(2) Where a violation involving a pollutant or stressor that has been identified as a highest water quality priority is not determined to represent an escalated enforcement priority, a rationale must be recorded in the applicable electronic database or tabular system used to track compliance.

(3) Escalated enforcement actions must continue to increase in severity, as necessary, to compel compliance as soon as possible.

e. REPORTING OF NON-COMPLIANT SITES

(1) Each Copermittee must notify the San Diego Water Board verbally within 24 hours and in writing within 5 calendar days of issuing escalated enforcement (as defined in the Copermittee's Enforcement Response Plan) to a construction site that poses a significant threat to water quality as a result of violations or other non-compliance with its permits and applicable local ordinances, and the requirements of this Order. Written notification may be provided electronically in email form.

(2) Each Copermittee must notify the San Diego Water Board of non-filers under the Industrial General Permit and Construction General Permit by email to Nonfilers_R9@waterboards.ca.gov.

7. Public Education and Participation

a. Each Copermittee must implement a public education and participation program, as appropriate, to promote and encourage the development of programs, management practices, control techniques and systems, design and engineering methods, and behaviors that reduce the discharge of pollutants in storm water to the MEP, prevent controllable non-storm water discharges from entering the MS4, and protect water quality standards in receiving waters. The public education program must include the following:

(1) Educational activities, public information activities, and other appropriate outreach activities intended to reduce pollutants of concern from its MS4 to the MEP. Activities shall be determined and prioritized by Copermittees by jurisdiction and/or watershed (Section 5.c.(5) to address the highest threats to water quality (e.g. pesticides, herbicides and fertilizers, used oil, toxic waste, etc.);

(2) Appropriate education and training measures for specific target audiences, as determined and prioritized by the Copermittee(s) by jurisdiction and watershed, based on high risk behaviors and pollutants of concern, such as construction site operators, residents, underserved target audiences and school-aged children.

b. Each Copermittee shall incorporate a mechanism for evaluation and assessment of educational and other outreach activities, as needed, to identify progress and incorporate modifications necessary to increase the effectiveness of the public education program.

c. Each Copermittee may determine, where appropriate and effective, mechanisms for intergovernmental coordination on education and outreach activities.

8. Fiscal Analysis

a. Each Copermittee must secure the resources necessary to meet all the requirements of this Order.

b. Each Copermittee must conduct an annual fiscal analysis of their jurisdictional runoff management programs in their entirety. The fiscal analysis must include the following:

Identification of the various categories of expenditures necessary to implement the requirements of this Order, including a description of the specific items to be accounted for in each category of expenditures;

(1) The staff resources needed and allocated to meet the requirements of this Order, including any development, implementation, and enforcement activities required;

(2) The fiscal analysis must provide estimated expenditures for Provisions E.8.b.0 and E.8.b.(1) for each Copermittee's jurisdictional runoff management program budget for the current reporting period.

(3) The source(s) of funds that are proposed to meet the necessary expenditures described in Provisions E.8.b.0 and E.8.b.(1), including legal restrictions on the use of such funds.

c. Each Copermittee must submit a summary of the annual fiscal analysis with each Annual Report required pursuant to Provision F.3.b.

d. Each Copermittee must provide the documentation used to develop the summary of the annual fiscal analysis upon request by the San Diego Water Board.

F. REPORTING

The purpose of this provision is to determine and document compliance with the requirements set forth in this Order. The goal of this provision is to communicate to the San Diego Water Board and the people of the State of California the implementation status of each jurisdictional runoff management program and compliance with the requirements of this Order. This goal is to be accomplished through the submittal of specific deliverables to the San Diego Water Board by the Copermittees.

1. Water Quality Improvement Plans

The Copermittees for each Watershed Management Area must develop and submit a complete Water Quality Improvement Plan in accordance with the requirements of Provision B, no later than 18 months after the adoption of this Order for a 30 day public review and comment period. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of 30 days. Based on the comments received, the San Diego Water Board will determine whether to hold a public hearing or to limit public input to submittal of written comments. If no hearing is held the San Diego Water Board will notify the Copermittees that the Water Quality Improvement Plan has been accepted as complete following its review and determination that the Water Quality Improvement Plan meets the requirements of this Order Water Quality Improvement Plans are deemed approved if no response is provided to the Copermittees within 2 months of the submittal date. Water Quality Improvement Plans must be made available on the Regional Clearinghouse required pursuant to Provision F.4.

a. WATER QUALITY IMPROVEMENT PLAN SUBMITTAL AND IMPLEMENTATION

Copermittees must submit requested modifications to the Water Quality Improvement Plan either in the Annual Report required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge (ROWD) required pursuant to Provision F.5.b. Once approved by the San Diego Water Board Executive Officer, the Copermittees must implement any modifications to the Water Quality Improvement Plan in accordance with the schedules developed pursuant to Provisions B.2 and B.3.b. Requests for modification are deemed approved if no response is provided to the requesting Copermittee(s) within 2 months of the request date.

b. CORRESPONDING MODIFICATIONS TO JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS AND MONITORING AND ASSESSMENT PROGRAMS

Copermittees must submit requested modifications to the jurisdictional runoff management programs and monitoring and assessment programs either in the Annual Report required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge (ROWD) required pursuant to Provision F.5.b. Once approved by the San Diego Water Board Executive Officer, the Copermittees must implement any modifications to the Water Quality Improvement Plan in

accordance with the schedules developed pursuant to Provisions B.3.b. Requests for modification are deemed approved if no response is provided to the requesting Copermittee(s) within 2 months of the request date.

2. Updates

a. Jurisdictional Runoff Management Program Document Updates

Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E. The update must be completed no later than 18 months after the adoption of this Order. Updated jurisdictional runoff management program documents must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Subsequent updates may be submitted as part of the Annual Reports, and updated jurisdictional runoff management program documents must be made available on the Regional Clearinghouse.

Jurisdictional Runoff Management Program document updates that modify program elements from the requirements of Provision E must provide rationale for the modifications within the update documents.

b. BMP Design Manual Updates

Each Copermittee must update its BMP Design Manual to incorporate the requirements of Provision E.3.d. The update must be completed no later than 18 months after the adoption of this Order. Updated BMP Design Manuals must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Subsequent updates may be submitted as part of the Annual Reports. Updated BMP Design Manuals must be made available on the Regional Clearinghouse.

BMP Design Manual updates that modify program elements from the requirements of Provision E must provide rationale for the modifications within the update documents.

c. Water Quality Improvement Plan Updates

The Copermittees for each Watershed Management Area must submit updates to the Water Quality Improvement Plan as part of the Annual Reports. Updated Water Quality Improvement Plans must be made available on the Regional Clearinghouse required pursuant to Provision F.4.

Water Quality Improvement Plan updates that modify program elements from the requirements of Provision E must provide rationale for the modifications within the update documents.

3. Progress Reporting

a. PROGRESS REPORT PRESENTATIONS

The Copermittees for each Watershed Management Area must appear before the San Diego Water Board, as requested by the San Diego Water Board, to provide progress reports on the implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs.

b. ANNUAL REPORTS

(1) The Copermittees for each Watershed Management Area must submit an Annual Report for each reporting period, which begins July 1 and ends June 30 in the following year, no later than January 31 of the following year. This is to accommodate the monitoring year from October 1 to September 30 of the subsequent year. The first Annual Report must be prepared for the reporting period beginning July 1 after adoption of the permit, and upon San Diego Water Board determination that the Water Quality Improvement Plan meets the requirements of this Order to June 30 in the following year. Annual Reports must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Each Annual Report must include the following:

(a) The progress of implementing the Water Quality Improvement Plan, including, but not limited to, the following:

(i) The progress toward achieving the interim and final numeric goals for the highest water quality priorities for the Watershed Management Area,

(ii) The water quality improvement strategies that were implemented and/or no longer implemented by each of the Copermittees during the reporting period and previous reporting periods, and are planned to be implemented during the next reporting period,

(iii) Proposed modifications to water quality improvement or jurisdictional strategies with associated rationale for such modifications,

(iv) Previously proposed modifications or updates incorporated into the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document and implemented by the Copermittees in the Watershed Management Area,

[a] The monitoring data collected pursuant to Provision D, summarized and presented in tabular and graphical form;

[b] Progress of the special studies required pursuant to Provision D, and the results or findings when a special study, or each phase of a special study, is completed;

[c] The findings from the assessments required pursuant to Provision D; and

(v) Proposed modifications or updates to the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document;

(b) A completed Jurisdictional Runoff Management Program Annual Report Form (Attachment D or approved revision) for each Copermittee in the Watershed Management Area, certified by a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative.

(2) Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (Attachment D or approved revision) no later than October 31 of each year until the first Annual Report is required to be submitted. Each Copermittee's Annual Report form must summarize the jurisdictional activities in the WMAs in which the Copermittee has jurisdiction.

(3) Each Copermittee must provide any data or documentation utilized in developing the Annual Report upon request by the San Diego Water Board. Any monitoring data utilized in developing the Annual Report must be uploaded to the California Environmental Data Exchange Network (CEDEN).[20] Any monitoring and assessment data utilized in developing the Annual Report must be provided on the Regional Clearinghouse required pursuant to Provision F.4.

c. REGIONAL MONITORING AND ASSESSMENT REPORT

(1) The Copermittees must submit a Regional Monitoring and Assessment Report no later than 180 days in advance of the expiration date of this Order. The Regional Monitoring and Assessment Report may be submitted as part of the ROWD required pursuant to Provision F.5.b. The Copermittees must review the jurisdictional and watershed monitoring data, data analyses, and assessments required pursuant to Provision D.4, to assess the following:

[20] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

(a) The beneficial uses of the receiving waters within the San Diego Region that are protected or must be restored;

(b) The progress toward restoring impacted beneficial uses in the receiving waters within the San Diego Region; and

(c) Pollutants or conditions of emerging concern that may impact beneficial uses in the receiving waters within the San Diego Region.

(2) The Regional Monitoring and Assessment Report must include recommendations for improving the implementation and assessment of the Water Quality Improvement Plans and jurisdictional runoff management programs.

(3) Each Copermittee must provide any data or documentation utilized in developing the Regional Monitoring and Assessment Report upon request by the San Diego Water Board. Any monitoring and assessment data utilized in developing the Regional Monitoring and Assessment Report must be provided on the Regional Clearinghouse required pursuant to Provision F.4.

4. Regional Clearinghouse

The Copermittees[21] must develop, update, and maintain an internet-based Regional Clearinghouse that can be used to store, disseminate, and share the Copermittees' Water Quality Improvement Plans, Annual Reports, jurisdictional runoff management program documents, monitoring data, special studies, and any other data or information generated by the Copermittees during the implementation of this Order. Monitoring data collected pursuant to Provision D must be uploaded to CEDEN,[22] with links to the uploaded data available on the Regional Clearinghouse. The Regional Clearinghouse may be linked to other internet-based data portals and databases where the original documents and data are stored. The Regional Clearinghouse must be available and accessible to members of the public. The Regional Clearinghouse must be developed and made available to the public no later than 18 months after the adoption of this Order.

5. Report of Waste Discharge

a. The Orange County Copermittees and the Riverside County Copermittees, are required to submit a complete ROWD pursuant to the requirements of their current Orders and are enrolled under this Order upon expiration of their current

[21] The Copermittee may elect to develop and maintain the clearinghouse(s) provided by other Copermittees or agencies.
[22] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

Orders. Upon expiration of their current Orders, the Copermittees in each county must comply with the requirements of this Order by July 1 after enrollment under this Order, unless early enrollment is granted pursuant to Provision F.6 of this Order. The current Orders for the Orange County Copermittees and Riverside County Copermittees are rescinded upon their expiration date except for enforcement purposes.

b. The Copermittees must submit to the San Diego Water Board a complete ROWD as an application for the re-issuance of this NPDES permit. The ROWD must be submitted no later than 180 days in advance of the expiration date of this Order. The Copermittee may elect to develop and submit the in conjunction with or provided by another Copermittee. The ROWD must contain the following minimum information:

(1) Names and addresses of the Copermittees;

(2) Names and titles of the primary contacts of the Copermittees;

(1) Proposed changes to the Copermittees' Water Quality Improvement Plans and the supporting justification;

(3) Proposed changes to the Copermittees' jurisdictional runoff management programs and the supporting justification;

(4) Any other information necessary for the re-issuance of this Order; and

(5) Any other information required by federal regulations for NPDES permit reissuance.

6. Application for Early Enrollment

a. The Orange County Copermittees, collectively, or Riverside County Copermittees, collectively, may apply for early enrollment under this Order by submitting a Report of Waste Discharge Form 200 for each individual Copermittee in the respective county, with a written request for early enrollment under this Order that certifies the following conditions have been met:

(1) A Water Quality Improvement Plan has been developed in accordance with the requirements of Provision B, which can and will be implemented immediately upon enrollment under this Order;

(2) Each Copermittee in the county has updated its jurisdictional runoff management program document to incorporate the requirements of Provision E, which can and will be implemented immediately upon enrollment under this Order; and

(3) Each Copermittee in the county has updated its BMP Design Manual to incorporate the requirements of Provision E.3.d, which can and will be implemented immediately upon enrollment under this Order.

b. The San Diego Water Board will review the application for early enrollment and associated documents for completeness. A Notice of Enrollment (NOE) under this Order will be issued to the Copermittees in the respective county by the San Diego Water Board upon completion of the early enrollment application requirements. The effective enrollment date will be specified in the NOE and the Copermittees in the respective county are authorized to have MS4 discharges pursuant to the requirements of this Order starting on the date specified in the NOE. The existing Order for that county is rescinded upon the effective enrollment date specified in the NOE except for enforcement purposes.

7. Reporting Provisions

Each Copermittee must comply with all the reporting and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

G. PRINCIPAL WATERSHED COPERMITTEE RESPONSIBILITIES

1. The Copermittees within each Watershed Management Area must designate a Principal Watershed Copermittee and notify the San Diego Water Board of the name of the Principal Watershed Copermittee. The notification may be submitted with the Water Quality Improvement Plan required pursuant to Provision F.1 of this Order.

2. The Principal Watershed Copermittee is responsible for, at a minimum, the following:

a. Serving as liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues, and when necessary and appropriate, representing the Copermittees in the Watershed Management Area before the San Diego Water Board.

b. Facilitating the development of the Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order

c. Coordinating the submittal of the deliverables required by Provisions F.1, F.2, F.3.a, and F.3.b of this Order.

d. Coordinating and developing, with the other Copermittees, the requirements of Provisions F.3.c, F.4, and F.5.b of this Order.

H. MODIFICATION OF PROGRAMS

1. Modifications of the Order may be initiated by the San Diego Water Board or by the Copermittees. Requests by Copermittees must be made to the San Diego Water Board.

2. Minor modifications to the Order may be made by the San Diego Water Board where the proposed modification complies with all the prohibitions and limitations, and other requirements of this Order.

3. Proposed modifications outside of the WQIP process that are not minor require amendment of this Order in accordance with this Order's rules, policies, and procedures.

I. STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

Each Copermittee must comply with all the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

ADMINISTRATIVE DRAFT

ATTACHMENT A

DISCHARGE PROHIBITIONS

1. Basin Plan Waste Discharge Prohibitions

California Water Code Section 13243 provides that a Regional Water Board, in a water quality control plan, may specify certain conditions or areas where the discharge of waste or certain types of waste is not permitted. The following waste discharge prohibitions in the Water Quality Control Plan for the San Diego Basin (Basin Plan) are applicable to any person, as defined by Section 13050(c) of the California Water Code, who is a citizen, domiciliary, or political agency or entity of California whose activities in California could affect the quality of waters of the state within the boundaries of the San Diego Region.

1. The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in California Water Code Section 13050, is prohibited.

2. The discharge of waste to land, except as authorized by waste discharge requirements or the terms described in California Water Code Section 13264 is prohibited.

3. The discharge of pollutants or dredged or fill material to waters of the United States except as authorized by a National Pollutant Discharge Elimination System (NPDES) permit or a dredged or fill material permit (subject to the exemption described in California Water Code Section 13376) is prohibited.

4. Discharges of recycled water to lakes or reservoirs used for municipal water supply or to inland surface water tributaries thereto are prohibited, unless this San Diego Water Board issues a NPDES permit authorizing such a discharge; the proposed discharge has been approved by the State Department of Health Services (DHS) and the operating agency of the impacted reservoir; and the discharger has an approved fail-safe long-term disposal alternative.

5. The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the San Diego Water Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

6. The discharge of waste in a manner causing flow, ponding, or surfacing on lands not owned or under the control of the discharger is prohibited, unless the discharge is authorized by the San Diego Water Board.

7. The dumping, deposition, or discharge of waste directly into waters of the state, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the San Diego Water Board.

8. Any discharge to a storm water conveyance system that is not composed entirely of "*storm water*" is prohibited unless authorized by the San Diego Water Board. [The federal regulations, 40 CFR 122.26(b)(13), define storm water as storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from fire fighting activities.] [§122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

9. The unauthorized discharge of treated or untreated sewage to waters of the state or to a storm water conveyance system is prohibited.

10. The discharge of industrial wastes to conventional septic tank/subsurface disposal systems, except as authorized by the terms described in California Water Code Section 13264, is prohibited.

11. The discharge of radioactive wastes amenable to alternative methods of disposal into the waters of the state is prohibited.

12. The discharge of any radiological, chemical, or biological warfare agent into waters of the state is prohibited.

13. The discharge of waste into a natural or excavated site below historic water levels is prohibited unless the discharge is authorized by the San Diego Water Board.

14. The discharge of sand, silt, clay, or other earthen materials from any activity, including land grading and construction, in quantities which cause deleterious bottom deposits, turbidity or discoloration in waters of the state or which unreasonably affect, or threaten to affect, beneficial uses of such waters is prohibited.

15. The discharge of treated or untreated sewage from vessels to Mission Bay, Oceanside Harbor, Dana Point Harbor, or other small boat harbors is prohibited.

16. The discharge of untreated sewage from vessels to San Diego Bay is prohibited.

17. The discharge of treated sewage from vessels to portions of San Diego Bay that are less than 30 feet deep at mean lower low water (MLLW) is prohibited.

18. The discharge of treated sewage from vessels, which do not have a properly functioningU.S.Coast Guard certified Type I or Type II marine sanitation device, to portions of San Diego Bay that are greater than 30 feet deep at mean lower low water (MLLW) is prohibited.

2. Attachment B to State Water Board Resolution 2012-0012

Copermittees that discharge into Areas of Special Biological Significance must comply with State Water Board Resolution No. 2012-0012.

ATTACHMENT B

STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

1. Standard Permit Provisions

Code of Federal Regulations Title 40 Section 122.41 (40 CFR 122.41) includes conditions, or provisions, that apply to all National Pollutant Discharge Elimination System (NPDES) permits. Additional provisions applicable to NPDES permits are in 40 CFR 122.42. All applicable provisions in 40 CFR 122.41 and 40 CFR 122.42 must be incorporated into this Order and NPDES permit. The applicable 40 CFR 122.41 and 40 CFR 122.42 provisions are as follows:

a. DUTY TO COMPLY [40 CFR 122.41(a)]

The Copermittee must comply with all of the provisions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

(1) The Copermittee must comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement. [40 CFR 122.41(a)(1)]

(2) The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to a civil penalty not to exceed $25,000 per day for each violation. The CWA provides that any person who *negligently* violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than 2 years, or both. Any person who *knowingly* violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal

penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both. Any person who knowingly violates Section 301, 302, 303, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, and who knows at that time that he thereby places another person in imminent danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.
[40 CFR 122.41(a)(2)]

(3) Any person may be assessed an administrative penalty by the San Diego Regional Water Quality Control Board (San Diego Water Board), State Water Resources Control Board (State Water Board), or United States Environmental Protection Agency (USEPA) for violating Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.
[40 CFR 122.41(a)(3)]

b. DUTY TO REAPPLY [40 CFR 122.41(B)]

If a Copermittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Copermittee must apply for and obtain a new permit.

c. NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE [40 CFR 122.41(C)]

It shall not be a defense for a Copermittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

d. DUTY TO MITIGATE [40 CFR 122.41(D)]

The Copermittee must take all reasonable steps to minimize or prevent any discharge or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

e. PROPER OPERATION AND MAINTENANCE [40 CFR 122.41(E)]

The Copermittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Copermittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by a Copermittee only when the operation is necessary to achieve compliance with the conditions of this permit.

f. PERMIT ACTIONS [40 CFR 122.41(F)]

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Copermittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

g. PROPERTY RIGHTS [40 CFR 122.41(G)]

This permit does not convey any property rights of any sort, or any exclusive privilege.

h. DUTY TO PROVIDE INFORMATION [40 CFR 122.41(H)]

The Copermittee must furnish to the San Diego Water Board, State Water Board, or USEPA within a reasonable time, any information which the San Diego Water Board, State Water Board, or USPEA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Copermittee must also furnish to the San Diego Water Board, State Water Board, or USPEA upon request, copies of records required to be kept by this permit.

i. INSPECTION AND ENTRY [40 CFR 122.41(I)]

The Copermittee must allow the San Diego Water Board, State Water Board, USEPA, and/or their authorized representative (including an authorized contractor acting as their representative), upon presentation of credentials and other documents as may be required by law, to:

(1) Enter upon the Copermittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit; [40 CFR 122.41(i)(1)]

(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit; [40 CFR 122.41(i)(2)]

(3) Inspect and photograph at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; [40 CFR 122.41(i)(3)] and

(4) Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location. [40 CFR 122.41(i)(4)]

j. MONITORING AND RECORDS [40 CFR 122.41(J)]

(1) Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity. [40 CFR 122.41(j)(1)]

(2) Except for records of monitoring information required by this permit related to the Copermittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five (5) years (or longer as required by 40 CFR Part 503), the Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time. [40 CFR 122.41(j)(2)]

(3) Records for monitoring information must include: [40 CFR 122.41(j)(3)]

(a) The date, exact place, and time of sampling or measurements; [40 CFR 122.41(j)(3)(i)]
(b) The individual(s) who performed the sampling or measurements; [40 CFR 122.41(j)(3)(ii)]
(c) The date(s) analyses were performed; [40 CFR 122.41(j)(3)(iii)]
(d) The individual(s) who performed the analyses; [40 CFR 122.41(j)(3)(iv)]
(e) The analytical techniques or methods used; [40 CFR 122.41(j)(3)(v)] and
(f) The results of such analyses. [40 CFR 122.41(j)(3)(vi)]

(4) Monitoring must be conducted according to test procedures under 40 CFR Part 136 unless another method is required under 40 CFR Subchapters N or O.
[40 CFR 122.41(j)(4)]

In the case of pollutants for which there are no approved methods under 40 CFR Part 136 or otherwise required under 40 CFR Subchapters N and O, monitoring must be conducted according to a test procedure specified in the permit for such pollutants. [40 CFR 122.44(i)(1)(iv)]

(5) The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not

more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. [40 CFR 122.41(j)(5)]

k. SIGNATORY REQUIREMENT [40 CFR 122.41(K)]

(1) All applications, reports, or information submitted to the San Diego Water Board, State Water Board, or USEPA must be signed and certified. (See 40 CFR 122.22) [40 CFR 122.41(k)(1)]

(a) *For a municipality, State, Federal, or other public agency.* [All applications must be signed] [b]y either a principal executive officer or ranking elected official. [40 CFR 122.22(a)(3)]

(b) All reports required by permits, and other information requested by the San Diego Water Board, State Water Board, or USEPA must be signed by a person described in paragraph (a) of this section, or by a duly authorized representative of that person. A person is a duly authorized representative only if: [40 CFR 122.22(b)]

(i) The authorization is made in writing by a person described in paragraph (a) of this section; [40 CFR 122.22(b)(1)]

(ii) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company, (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) [40 CFR 122.22(b)(2)] and,

(iii) The written authorization is submitted to the San Diego Water Board and State Water Board. [40 CFR 122.22(b)(3)]

(c) *Changes to authorization.* If an authorization under paragraph (b) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (b) of this section must be submitted to the San Diego Water Board prior to or together with any reports, information, or applications to be signed by an authorized representative. [40 CFR 122.22(c)]

(d) *Certification.* Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly

responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." [40 CFR 122.22(d)]

(2) The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both. [40 CFR 122.41(k)(2)]

l. REPORTING REQUIREMENTS [40 CFR 122.41(L)]

(1) *Planned changes.* The Copermittee must give notice to the San Diego Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when: [40 CFR 122.41(l)(1)]

(a) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b);
[40 CFR 122.41(l)(1)(i)] or

(b) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1).
[40 CFR 122.41(l)(1)(ii)]

(c) The alteration or addition results in a significant change in the Copermittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. [40 CFR 122.41(l)(1)(iii)]

(2) Anticipated noncompliance. The Copermittee must give advance notice to the San Diego Water Board or State Water Board of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.
[40 CFR 122.41(l)(2)]

(3) *Transfers*. This permit is not transferable to any person except after notice to the San Diego Water Board. The San Diego Water Board may require modification or revocation and reissuance of the permit to change the name of the Copermittee and incorporate such other requirements as may be necessary under the CWA.
[40 CFR 122.41(l)(3)]

(4) Monitoring reports. Monitoring results must be reported at the intervals specified elsewhere in this permit. [40 CFR 122.41(l)(4)]

(a) Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the San Diego Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices. [40 CFR 122.41(l)(4)(i)]

(b) If the Copermittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or another method required for an industry-specific waste stream under 40 CFR Subchapters N or O, the results of this monitoring must be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the San Diego Water Board or State Water Board.
[40 CFR 122.41(l)(4)(ii)]

(c) Calculations for all limitations which require averaging of measurements must utilize an arithmetic mean unless otherwise specified in the permit.
[40 CFR 122.41(l)(4)(iii)]

(5) *Compliance schedules*. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date. [40 CFR 122.41(l)(5)]

(6) Twenty-four hour reporting.

(a) The Copermittee must report any noncompliance that may endanger health or the environment. Any information must be provided orally within 24 hours from the time the Copermittee becomes aware of the circumstances. A written submission must also be provided within five (5) days of the time the Copermittee becomes aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6)(i)]

(b) The following must be included as information which must be reported within 24 hours under this paragraph: [40 CFR 122.41(l)(6)(ii)]

(i) Any unanticipated bypass that exceeds any effluent limitation in the permit (See 40 CFR 122.41(g)). [40 CFR 122.41(l)(6)(ii)(A)]

(ii) Any upset which exceeds any effluent limitation in the permit. [40 CFR 122.41(l)(6)(ii)(B)] and,

(iii) Violation of a maximum daily discharge limitation for any of the pollutants listed by the San Diego Water Board in the permit to be reported within 24 hours. (See 40 CFR 122.44(g)) [40 CFR 122.41(l)(6)(ii)(C)]

(c) The San Diego Water Board may waive the above-required written report on a case-by-case basis if the oral report has been received within 24 hours. [40 CFR 122.41(l)(6)(iii)]

(7) .*Other noncompliance.* The Copermittee must report all instances of noncompliance not reported in accordance with the standard provisions required under 40 CFR 122.41(l)(4), (5), and (6), at the time monitoring reports are submitted. The reports must contain the information listed in the standard provisions required under 40 CFR 122.41(l)(6). [40 CFR 122.41(l)(7))]

(8) *Other information.* When the Copermittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the San Diego Water Board, State Water Board, or USEPA, the Copermittee must promptly submit such facts or information. [40 CFR 122.41(l)(8)]

m. UPSET [40 CFR 122.41(N)]

(1) *Definition.* "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Copermittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. [40 CFR 122.41(n)(1)]

(2) *Effect of an upset*. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the standard provisions required under 40 CFR 122.41(n)(3) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. [40 CFR 122.41(n)(2)]

(3) *Conditions necessary for a demonstration of upset*. A Copermittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that: [40 CFR 122.41(n)(3)]

(a) An upset occurred and that the Copermittee can identify the cause(s) of the upset; [40 CFR 122.41(n)(3)(i)]
(b) The permitted facility was at the time being properly operated; [40 CFR 122.41(n)(3)(ii)] and
(c) The Copermittee submitted notice of the upset in accordance with the standard provisions required under 40 CFR 122.41(l)(6)(ii)(B) (24-hour notice). [40 CFR 122.41(n)(3)(iii)]
(d) The Copermittee complied with any remedial measures pursuant to the standard provisions required under 40 CFR 122.41(d). [40 CFR 122.41(n)(3)(iii)]

(4) *Burden of proof*. In any enforcement proceeding, the Copermittee seeking to establish the occurrence of an upset has the burden of proof. [40 CFR 122.41(n)(4)]

n. STANDARD PERMIT PROVISIONS FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS [40 CFR 122.42(C)]

The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the San Diego Water Board or State Water Board under 40 CFR 122.26(a)(1)(v) must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report must include:

(1) The status of implementing the components of the storm water management program that are established as permit conditions; [40 CFR 122.42(c)(1)]

(1) e

(2) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under 40 CFR 122.26(d)(2)(iv) and (v); [40 CFR 122.42(c)(3)]

(3) A summary of data, including monitoring data, that is accumulated throughout the reporting year; [40 CFR 122.42(c)(4)]

(4) Annual expenditures and budget for year following each annual report; [40 CFR 122.42(c)(5)]

(5) A summary describing the number and nature of enforcement actions, inspections, and public education programs; [40 CFR 122.42(c)(6)]

(6) Identification of water quality improvements or degradation. [40 CFR 122.42(c)(7)]

o. STANDARD PERMIT PROVISIONS FOR STORM WATER DISCHARGES [40 CFR 122.42(D)]

The initial permits for discharges composed entirely of storm water issued pursuant to 40 CFR 122.26(e)(7) must require compliance with the conditions of the permit as expeditiously as practicable, but in no event later than three years after the date of issuance of the permit.

2. General Provisions

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. The general provisions applicable to this Order and NPDES permit are as follows:

a. DISCHARGE OF WASTE IS A PRIVILEGE

No discharge of waste into the waters of the State, whether or not such discharge is made pursuant to waste discharge requirements, shall create a vested right to continue such discharge. All discharges of waste into waters of the State are privileges, not rights. [CWC Section 13263(g)]

b. DURATION OF ORDER AND NPDES PERMIT

(1) *Effective date*. This Order and NPDES permit becomes effective on the date of its adoption provided the USEPA has no objection. If the USEPA objects to its issuance, this Order shall not become effective until such objection is withdrawn. This Order supersedes Order No. R9-2007-0001 upon the effective date of this Order, and supercedes Order Nos. R9-2009-0002 and R9-2010-0016 upon their expiration.

(2) *Expiration*. This Order and NPDES permit expires five years after adoption. [40 CFR 122.46(a)]

(3) *Continuation of expired order*. After this Order and NPDES permit expires, the terms and conditions of this Order and NPDES permit are automatically continued pending issuance of a new permit if all requirements of the federal NPDES regulations on the continuation of expired permits (40 CFR 122.6) are complied with.

c. AVAILABILITY

A copy of this Order must be kept at a readily accessible location and must be available to on-site personnel at all times.

d. CONFIDENTIALITY OF INFORMATION

Except as provided for in 40 CFR 122.7, no information or documents submitted in accordance with or in application for this Order will be considered confidential, and all such information and documents shall be available for review by the public at the San Diego Water Board office.

Claims of confidentiality for the following information will be denied: [40 CFR 122.7(b)]

(1) The name and address of any permit applicant or Copermittee; [40 CFR 122.7(b)(1)] and

(2) Permit applications and attachments, permits, and effluent data. [40 CFR 122.7(b)(2)]

e. EFFLUENT LIMITATIONS

(1) *Interim effluent limitations*. The Copermittee must comply with any interim effluent limitations as established by addendum, enforcement action, or revised waste discharge requirements which have been, or may be, adopted by the San Diego Water Board.

(2) *Other effluent limitations and standards*. If any applicable toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant and that standard or prohibition is more stringent than any limitation on the pollutant in the permit, the San Diego Water Board shall institute proceedings under these regulations to modify or revoke and reissue the permit to conform to the toxic effluent standard or prohibition. [40 CFR 122.44(b)(1)]

f. DUTY TO MINIMIZE OR CORRECT ADVERSE IMPACTS

The Copermittee must take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this Order, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the noncompliance.

g. PERMIT ACTIONS

The filing of a request by the Copermittee for modification, revocation and reissuance, or termination of this Order, or a notification of planned change in or anticipated noncompliance with this Order does not stay any condition of this Order. (See 40 CFR 122.41(f)) In addition, the following provisions apply to this Order:

(1) Upon application by any affected person, or on its own motion, the San Diego Water Board may review and revise the requirements in this Order. All requirements must be reviewed periodically. [CWC Section 13263(e)]

(2) This Order may be terminated or modified for cause, including, but not limited to, all of the following: [CWC Section 13381]

(a) Violation of any condition contained in the requirements of this Order. [CWC Section 13381(a)]

(b) Obtaining the requirements in this Order by misrepresentation, or failure to disclose fully all relevant facts. [CWC Section 13381(b)]

(c) A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge. [CWC Section 13381(c)]

(3) When this Order is transferred to a new owner or operator, such requirements as may be necessary under the CWC may be incorporated into this Order.

h. NPDES PERMITTED NON-STORM WATER DISCHARGES

The San Diego Water Board has, in prior years, issued a limited number of individual NPDES permits for non-storm water discharges to MS4s. The San Diego Water Board or State Water Board may in the future, upon prior notice to the Copermittee(s), issue an NPDES permit for any non-storm water discharge (or class of non-storm water discharges) to an MS4.

i. MONITORING

In addition to the standard provisions required under 40 CFR 122.41(j) and (l)(4), the following general monitoring provisions apply to this Order:

(1) Where procedures are not otherwise specified in Order, sampling, analysis and quality assurance/quality control must be conducted in accordance with the Quality Assurance Management Plan (QAMP) for the State of California's Surface Water Ambient Monitoring Program (SWAMP), adopted by the State Water Resources Control Board (State Water Board).

(2) Pursuant to 40 CFR 122.41(j)(2) and CWC Section 13383(a), each Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five (5) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time.

(3) All chemical, bacteriological, and toxicity analyses must be conducted at a laboratory certified for such analyses by the California Department of Public Health or a laboratory approved by the San Diego Water Board.

(4) For priority toxic pollutants that are identified in the California Toxics Rule (CTR) (65 Fed. Reg. 31682), the Copermittees must instruct their laboratories to establish

calibration standards that are equivalent to or lower than the Minimum Levels (MLs) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP). If a Copermittee can demonstrate that a particular ML is not attainable, in accordance with procedures set forth in 40 CFR Part 136, the lowest quantifiable concentration of the lowest calibration standard analyzed by a specific analytical procedure (assuming that all the method specified sample weights, volumes, and processing steps have been followed) may be used instead of the ML listed in Appendix 4 of the SIP. The Copermittee must submit documentation from the laboratory to the San Diego Water Board for approval prior to raising the ML for any priority toxic pollutant.

j. ENFORCEMENT

(1) The San Diego Water Board is authorized to enforce the terms of this Order under several provisions of the CWC, including, but not limited to, CWC Sections 13385, 13386, and 13387.

(2) Nothing in this Order shall be construed to protect the Copermittee from its liabilities under federal, state, or local laws.

(3) The CWC provides for civil and criminal penalties comparable to, and in some cases greater than, those provided for under the CWA.

(4) Except as provided in the standard conditions required under 40 CFR 122.41(m) and (n), nothing in this Order shall be construed to relieve the Copermittee from civil or criminal penalties for noncompliance.

(5) Nothing in this Order shall be construed to preclude the institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties to which the Copermittee is or may be subject to under Section 311 of the CWA.

(6) Nothing in this Order shall be construed to preclude institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authoring preserved by Section 510 of the CWA.

k. SEVERABILITY

The provisions of this Order are severable, and if any provision of this Order, or the application of any provisions of this Order to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this Order shall not be affected thereby.

l. APPLICATIONS

Any application submitted by a Copermittee for reissuance or modification of this Order must satisfy all applicable requirements specified in federal regulations as well as any additional requirements for submittal of a Report of Waste Discharge specified in the CWC and the California Code of Regulations.

m. IMPLEMENTATION

All plans, reports and subsequent amendments submitted in compliance with this Order must be implemented immediately (or as otherwise specified). All submittals by Copermittees must be adequate to implement the requirements of this Order.

n. REPORT SUBMITTALS

(1) All report submittals must include an executive summary, introduction, conclusion, recommendations, and signed certified statement.

(2) Each Copermittee must submit a signed certified statement covering its responsibilities for each applicable submittal.

(3) The Principal Watershed Copermittee(s) must submit a signed certified statement covering its responsibilities for each applicable submittal and the sections of the submittals for which it is responsible.

(4) Unless otherwise directed, the Copermittees must submit one hard copy and one electronic copy of each report required under this Order to the San Diego Water Board, and one electronic copy to the USEPA.

(5) The Copermittees must submit reports and provide notifications as required by this Order to the following:

EXECUTIVE OFFICER
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
9174 SKY PARK COURT, SUITE 100
SAN DIEGO CA 92123-4340
Telephone: (858) 467-2952 Fax: (858) 571-6972

EUGENE BROMLEY
US ENVIRONMENTAL PROTECTION AGENCY
REGION IX
PERMITS ISSUANCE SECTION (W-5-1)
75 HAWTHORNE STREET
SAN FRANCISCO CA 94105

ADMINISTRATIVE DRAFT

ATTACHMENT C

ACRONYMS AND ABBREVIATIONS

1. Acronyms and Abbreviations

AMAL	Average Monthly Action Level
ASBS	Area(s) of Special Biological Significance
BMP	Best Management Practice
Basin Plan	Water Quality Control Plan for the San Diego Basin
CEQA	California Environmental Quality Act
CCR	California Code of Regulations
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWC	California Water Code
CZARA	Coastal Zone Act Reauthorization Amendments of 1990
ERP	Enforcement Response Plan
ESAs	Environmentally Sensitive Areas
GIS	Geographic Information System
IBI	Index of Biotic Integrity
LID	Low Impact Development
MDAL	Maximum Daily Action Level
MEP	Maximum Extent Practicable
ML	Minimum Level
MS4	Municipal Separate Storm Sewer System
NAL	Non-Storm Water Action Level
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
ROWD	Report of Waste Discharge (application for NPDES reissuance)
SAL	Storm Water Action Level
San Diego Water Board	California Regional Water Quality Control Board, San Diego Region
SIC	Standard Industrial Classification Code
State Water Board	State Water Resources Control Board
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
Waters of the U.S.	Waters of the United States
WDID	Waste Discharge Identification Number

WLA	Waste Load Allocation
WQBEL	Water Quality Based Effluent Limitation

DEFINITIONS

2. Definitions

Active/Passive Sediment Treatment - Using mechanical, electrical or chemical means to flocculate or coagulate suspended sediment for removal from runoff from construction sites prior to discharge.

Anthropogenic Litter – Trash generated from human activities, not including sediment.

Average Monthly Action Level – The highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month or the geometric mean for bacteria, as applicable.

Beneficial Uses - The uses of water necessary for the survival or well being of man, plants, and wildlife. These uses of water serve to promote tangible and intangible economic, social, and environmental goals. "Beneficial Uses" of the waters of the State that may be protected include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. Existing beneficial uses are uses that were attained in the surface or ground water on or after November 28, 1975; and potential beneficial uses are uses that would probably develop in future years through the implementation of various control measures. "Beneficial Uses" are equivalent to "Designated Uses" under federal law. [California Water Code Section 13050(f)].

Best Management Practices (BMPs) - Defined in 40 CFR 122.2 as schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. In the case of municipal discharge permits, BMPs may be used in place of numeric effluent limits.

Bioassessment - The use of biological community information to evaluate the biological integrity of a water body and its watershed. With respect to aquatic ecosystems, bioassessment is the collection and analysis of samples of the benthic macroinvertebrate community together with physical/habitat quality measurements associated with the sampling site and the watershed to evaluate the biological condition (i.e. biotic integrity) of a water body.

Biocriteria - Under the CWA, numerical values or narrative expressions that define a desired biological condition for a water body that are legally enforceable. The USEPA defines biocriteria as: "numerical values or narrative expressions that describe the reference biological integrity of aquatic communities inhabiting waters of a given designated aquatic life use… (that)…describe the characteristics of water body segments least impaired by human activities."

Biofiltration - Practices that use vegetation and amended soils to detain and treat runoff from impervious areas. Treatment is through filtration, infiltration, adsorption, ion exchange, and biological uptake of pollutants.

Biological Integrity - Defined in Karr J.R. and D.R. Dudley. 1981. Ecological perspective on

water quality goals. *Environmental Management* 5:55-68 as: "A balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitat of the region." Also referred to as ecosystem health.

BMP Design Manual – A plan developed to eliminate, reduce, or mitigate the impacts of runoff from development projects, including Priority Development Projects.

Channel Rehabilitation and Improvement –Remedial measures or activities for the purpose of improving or restoring the environmental health of streams, channels or river systems. Techniques may vary from in-stream restoration techniques to off-line stormwater management practices installed in the system corridor or upland areas. Rehabilitation techniques may include, but are not limited to the following: riparian zone restoration, constructed wetlands, bank stabilization, channel modifications, and daylighting of drainage systems. Effectiveness may be measured in various manners, including: assessments of habitat, reduced streambank erosion, and restoration of water and sediment transport balance.

Clean Water Act Section 303(d) Water Body - An impaired water body in which water quality does not meet applicable water quality standards and/or is not expected to meet water quality standards, even after the application of technology based pollution controls required by the CWA. The discharge of runoff to these water bodies by the Copermittees is significant because these discharges can cause or contribute to violations of applicable water quality standards.

Construction Site – Any project, including projects requiring coverage under the Construction General Permit, that involves soil disturbing activities including, but not limited to, clearing, grading, disturbances to ground such as stockpiling, and excavation. This does not include minor construction activities such as interior remodeling, plumbing, electrical, or mechanical work.

Contamination - As defined in the Porter-Cologne Water Quality Control Act, contamination is "an impairment of the quality of waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste whether or not waters of the State are affected."

Copermittee – An incorporated city within the County of Orange, County of Riverside, or County of San Diego in the San Diego Region (Region 9), the County of Orange, the County of Riverside, the County of San Diego, the Orange County Flood Control District, the Riverside County Water Conservation and Flood Control District, the San Diego Regional Airport Authority, or the Unified Port District of San Diego.

Copermittees – All of the individual Copermittees, collectively.

Critical Channel Flow (Qc) – The channel flow that produces the critical shear stress that initiates bed movement or that erodes the toe of channel banks. When measuring Qc, it should be based on the weakest boundary material – either bed or bank.

Daily Discharge – Defined as either: (1) the total mass of the constituent discharged over the calendar day or any 24 hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g. concentration.)

The Daily Discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day, or other 24 hour period other than a day), or by the arithmetic mean of analytical results from one or more grab samples taken over the course of a day.

Development Projects - Construction, rehabilitation, redevelopment, or reconstruction of any public or private projects involving land disturbance activities.

Dry Season –May 1 to September 30.

Dry Weather – Weather is considered dry if the preceding 72 hours has been without measurable precipitation (>0.1 inch).

Enclosed Bays – Enclosed bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost bay works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays do not include inland surface waters or ocean waters.

Erosion – When land is diminished or worn away due to wind, water, or glacial ice. Often the eroded debris (silt or sediment) becomes a pollutant via storm water runoff. Erosion occurs naturally but can be intensified by land clearing activities such as farming, development, road building, and timber harvesting.

Environmentally Sensitive Areas (ESAs) - Areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; areas designated as preserves or their equivalent under the Natural Communities Conservation Program within the Cities and County of Orange; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.

Estuaries – Waters, including coastal lagoons, located at the mouth of streams that serve as areas of mixing fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and ocean water. Estuaries do not include inland surface waters or ocean waters.

Existing Development – Any area that has been developed and exists for municipal, commercial, industrial, or residential purposes, uses, or activities. May include areas that are not actively used for its originally developed purpose, but may be re-purposed or redeveloped for another use or activity.

Flow Duration – The long-term period of time that flows occur above a threshold that causes significant sediment transport and may cause excessive erosion damage to creeks and streams (not a single storm event duration). The simplest way to visualize this is to consider a histogram of pre- and post-project flows using long-term records of hourly data. To maintain pre-development flow duration means that the total number of hours (counts) within each range of

flows in a flow-duration histogram cannot increase between the pre- and post-development condition. Flow duration within the range of geomorphologically significant flows is important for managing erosion.

Grading - The cutting and/or filling of the land surface to a desired slope or elevation.

Hazardous Material – Any substance that poses a threat to human health or the environment due to its toxicity, corrosiveness, ignitability, explosive nature or chemical reactivity. These also include materials named by the USEPA in 40 CFR 116 to be reported if a designated quantity of the material is spilled into the waters of the U.S. or emitted into the environment.

Hazardous Waste - Hazardous waste is defined as "any waste which, under Section 600 of Title 22 of this code, is required to be managed according to Chapter 30 of Division 4.5 of Title 22 of this code" [CCR Title 22, Division 4.5, Chapter 11, Article 1].

Household Hazardous Waste – Paints, cleaning products, and other wastes generated during home improvement or maintenance activities.

Hydromodification – The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, interflow and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

Illicit Connection – Any connection to the MS4 that conveys an illicit discharge.

Illicit Discharge - Any discharge to the MS4 that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from fire fighting activities [40 CFR 122.26(b)(2)].

Inactive Areas – Areas of construction activity that are not active and those that have been active and are not scheduled to be re-disturbed for at least 14 days.

Infiltration – Water other than wastewater that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow [40 CFR 35.2005(20)].

Inland Surface Waters – Includes all surface waters of the U.S. that do not include the ocean, enclosed bays, or estuaries.

Jurisdictional Runoff Management Program Document – A written description of the specific jurisdictional runoff management measures and programs that each Copermittee will implement to comply with this Order and ensure that storm water pollutant discharges in runoff are reduced to the MEP and do not cause or contribute to a violation of water quality standards.

Low Impact Development (LID) – A storm water management and land development strategy that emphasizes conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic

functions.

Low Impact Development Best Management Practices (LID BMPs) – LID BMPs include schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States through storm water management and land development strategies that emphasize conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions. LID BMPs include retention practices that do not allow runoff, such as infiltration, rain water harvesting and reuse, and evapotranspiration. LID BMPs also include flow-through practices such as biofiltration that may have some discharge of storm water following pollutant reduction.

Major Outfall – As defined in the Code of Federal Regulations, a major outfall is a MS4 outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (i.e. discharge from a single conveyance other than a circular pipe which is associated with a drainage area of more than 50 acres); or, for MS4s that receive storm water from lands zoned for industrial activity (based on comprehensive zoning plans or equivalent), a MS4 outfall that discharges from a single pipe with an inside diameter of 12 inches or more or from its equivalent (i.e. discharge from other than a circular pipe associated with a drainage area of 2 acres or more).

Maximum Daily Action Level (MDAL) –The highest allowable daily discharge of a pollutant, over a calendar day (or 24 hour period). For pollutants with action levels expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with action levels expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

Maximum Extent Practicable (MEP) – The technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) for storm water that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) <u>in combination</u> with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than BAT. A definition for MEP is not provided either in the statute or in the regulations. Instead the definition of MEP is dynamic and will be defined by the following process over time: municipalities propose their definition of MEP by way of their runoff management programs. Their total collective and individual activities conducted pursuant to the runoff management programs becomes their proposal for MEP as it applies both to their overall effort, as well as to specific activities (e.g., MEP for street sweeping, or MEP for MS4 maintenance). In the absence of a proposal acceptable to the San Diego Water Board, the San Diego Water Board defines MEP.

In a memo dated February 11, 1993, entitled "Definition of Maximum Extent Practicable," Elizabeth Jennings, Senior Staff Counsel, SWRCB addressed the achievement of the MEP standard as follows:

> "*To achieve the MEP standard, municipalities must employ whatever Best Management Practices (BMPs) are technically feasible (i.e., are likely to be effective) and are not cost prohibitive. The major emphasis is on technical feasibility. Reducing pollutants to the MEP means choosing effective BMPs, and rejecting applicable BMPs only where other effective*

BMPs will serve the same purpose, or the BMPs would not be technically feasible, or the cost would be prohibitive. In selecting BMPs to achieve the MEP standard, the following factors may be useful to consider:

a. Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?
b. Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?
c. Public Acceptance: Does the BMP have public support?
d. Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?
e. Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc.?

The final determination regarding whether a municipality has reduced pollutants to the maximum extent practicable can only be made by the Regional or State Water Boards, and not by the municipal discharger. If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit derived, it would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs that would address a pollutant source, or to pick a BMP based solely on cost, which would be clearly less effective. In selecting BMPs the municipality must make a serious attempt to comply and practical solutions may not be lightly rejected. In any case, the burden would be on the municipal discharger to show compliance with its permit. After selecting a menu of BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented."

Monitoring Year – The monitoring year begins annually on July 1st and ends on June 30th.

Municipal Separate Storm Sewer System (MS4) – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designated or used for collecting or conveying storm water; (iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.26. "Co-permittees need only comply with permit conditions relating to discharges from the municipal separate storm sewers for which they are operators." 40 CFR §122.26(a)(3)(vi).

National Pollutant Discharge Elimination System (NPDES) - The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the CWA.

Non-Storm Water - All discharges to and from a MS4 that do not originate from precipitation

events (i.e., all discharges from a MS4 other than storm water). Non-storm water includes illicit discharges and NPDES permitted discharges.

Nuisance - As defined in the Porter-Cologne Water Quality Control Act, a nuisance is "anything which meets all of the following requirements: 1) Is injurious to health, or is indecent, or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. 2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. 3) Occurs during or as a result of the treatment or disposal of wastes."

Ocean Waters – the territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the State Board's California Ocean Plan.

Order – Unless otherwise specified, refers to this Order, Order No. R9-2012-0011 (NPDES No. CAS0109266).

Person - A person is defined as an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof [40 CFR 122.2].

Point Source - Any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, landfill leachate collection systems, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

Pollutant - Any agent that may cause or contribute to the degradation of water quality such that a condition of pollution or contamination is created or aggravated.

Pollution - As defined in the Porter-Cologne Water Quality Control Act, pollution is "the alteration of the quality of the waters of the State by waste, to a degree that unreasonably affects the either of the following: 1) The waters for beneficial uses; or 2) Facilities that serve these beneficial uses." Pollution may include contamination.

Pollution Prevention - Pollution prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control BMPs, treatment control BMPs, or disposal.

Permanent BMPs - A subset of BMPs including structural and non-structural controls which detain, retain, filter, remove, or educate to prevent the release of pollutants to surface waters from development projects in perpetuity, after construction of a project is completed.

Pre-Development Runoff Conditions – "Runoff conditions that exist onsite immediately before the planned development activities occur. Pre-development is not intended to be interpreted as that period before any human-induced land disturbance activity has occurred." 64 FR 68761.

Priority Development Projects - New development and redevelopment projects defined under Provision E.3.b of Order No. R9-2012-0011.

Properly Designed – Designed in accordance with the Copermittee's BMP Design Manual

and/or any appropriate design requirements set forth by the Copermittee and based on widely accepted design criteria.

Public Education, Outreach and Participation – Programs to educate residents, businesses and visitors about the importance of water quality and water quality programs so that they will support local efforts and understand their role in protecting receiving waters. The Education and Outreach Program will increase knowledge and awareness, improve attitudes toward storm pollution prevention, and provide a foundation for changing behaviors that contribute to storm water pollution.

Rainy Season (aka Wet Season) –October 1 to April 30.

Receiving Waters – Waters of the U.S.

Receiving Water Limitations - Waste discharge requirements issued by the San Diego Water Board typically include both: (1) “Effluent Limitations” (or “Discharge Limitations”) that specify the technology-based or water-quality-based effluent limitations; and (2) “Receiving Water Limitations” that specify the water quality objectives in the Basin Plan as well as any other limitations necessary to attain those objectives. In summary, the “Receiving Water Limitations” provision is the provision used to implement the requirement of CWA section 301(b)(1)(C) that NPDES permits must include any more stringent limitations necessary to meet water quality standards.

Redevelopment - The creation, addition, and or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include trenching and resurfacing associated with utility work; parking lots; resurfacing existing roadways; cutting and reconfiguring of surface parking lots; new sidewalk construction, pedestrian ramps, or bike lane on existing roads; and routine replacement of damaged pavement, such as pothole repair.

Retain –Keep or hold in a particular place, condition, or position without discharge to surface waters.

Retrofit – Retrofit is defined as a stormwater management practice (usually structural) put into place after development has occurred in watersheds where practices previously did not exist or are ineffective. The purpose of retrofits is to improve water quality, protect downstream channels, reduce flooding, or meet other specific objectives. Some examples of retrofits include, but are not limited to the following: green roofs, downspout and impervious cover disconnection, permeable pavement, bioretention, rain barrels, rain gardens, vacant lot stabilization, trash area enclosures, additional trash and waste disposal containers.

Runoff - All flows in a storm water conveyance system that consists of the following components: (1) storm water (wet weather flows) and (2) non-storm water including dry weather flows.

San Diego Water Board – As used in this document the term "San Diego Water Board" is synonymous with the term "Regional Board" as defined in Water Code section 13050(b) and is intended to refer to the California Regional Water Quality Control Board for the San Diego

Region as specified in Water Code Section 13200.

Sediment - Soil, sand, and minerals washed from land into water. Sediment resulting from anthropogenic sources (i.e. human induced land disturbance activities) is considered a pollutant. This Order regulates only the discharges of sediment from anthropogenic sources and does not regulate naturally occurring sources of sediment. Sediment can destroy fish-nesting areas, clog animal habitats, and cloud waters so that sunlight does not reach aquatic plants.

Shared Treatment Control BMP - BMPs used by multiple developments to infiltrate, filter, or treat the required volume or flow prior to discharge to a receiving water. This could include, for example, a treatment BMP at the end of an enclosed storm drain that collects runoff from several commercial developments.

Source Control BMP – Land use or site planning practices, or structural or nonstructural measures that aim to prevent runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between pollutants and runoff.

State Water Quality Protection Area – A nonterrestrial marine or estuarine area designated to protect marine species or biological communities from an undesirable alteration in natural water quality, including, but not limited to, areas of special biological significance that have been designated by the State Water Board through its water quality control planning process. Areas of special biological significance are a subset of State Water Quality Protection Areas, and require special protection as determined by the State Water Resources Control Board pursuant to the California Ocean Plan adopted and reviewed pursuant to Article 4 (commencing with Section 13160) of Chapter 3 of Division 7 of the California Water Code and pursuant to the Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California (California Thermal Plan) adopted by the State Water Board.

Storm Water – Per 40 CFR 122.26(b)(13), means storm water runoff, snowmelt runoff and surface runoff and drainage.

Structural BMP – Any structural control which detains, retains, or filters, to reduce the release of pollutants to surface waters from development projects (e.g. treatment control BMPs) which remains after construction.

Total Maximum Daily Load (TMDL) - The maximum amount of a pollutant that can be discharged into a water body from all sources (point and non-point) and still maintain water quality standards. Under CWA section 303(d), TMDLs must be developed for all water bodies that do not meet water quality standards after application of technology-based controls.

Toxicity - Adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies). The water quality objectives for toxicity provided in the Basin Plan, state in part…"All waters shall be free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life….The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge".

Treatment Control BMP – Any engineered system designed to remove pollutants by simple

gravity settling of particulate pollutants, filtration, biological uptake, media absorption or any other physical, biological, or chemical process.

Unpaved Road – Any long, narrow stretch without pavement used for traveling by motor passenger vehicles between two or more points. Unpaved roads are generally constructed of dirt, gravel, aggregate or macadam and may be improved or unimproved.

Waste - As defined in CWC Section 13050(d), "waste includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal."

Article 2 of CCR Title 23, Chapter 15 (Chapter 15) contains a waste classification system that applies to solid and semi-solid waste, which cannot be discharged directly or indirectly to water of the state and which therefore must be discharged to land for treatment, storage, or disposal in accordance with Chapter 15. There are four classifications of waste (listed in order of highest to lowest threat to water quality): hazardous waste, designated waste, non-hazardous solid waste, and inert waste.

Water Quality Objective - Numerical or narrative limits on constituents or characteristics of water designated to protect designated beneficial uses of the water. [California Water Code Section 13050 (h)]. California's water quality objectives are established by the State and Regional Water Boards in the Water Quality Control Plans. Numeric or narrative limits for pollutants or characteristics of water designed to protect the beneficial uses of the water. In other words, a water quality objective is the maximum concentration of a pollutant that can exist in a receiving water and still generally ensure that the beneficial uses of the receiving water remain protected (i.e., not impaired). Since water quality objectives are designed specifically to protect the beneficial uses, when the objectives are violated the beneficial uses are, by definition, no longer protected and become impaired. This is a fundamental concept under the Porter Cologne Act. Equally fundamental is Porter Cologne's definition of pollution. A condition of pollution exists when the water quality needed to support designated beneficial uses has become unreasonably affected or impaired; in other words, when the water quality objectives have been violated. These underlying definitions (regarding beneficial use protection) are the reason why all waste discharge requirements implementing the federal NPDES regulations require compliance with water quality objectives. (Water quality objectives are also called water quality criteria in the CWA.)

Water Quality Standards - Water quality standards, as defined in Clean Water Act section 303(c) consist of the beneficial uses (e.g., swimming, fishing, municipal drinking water supply, etc.,) of a water body and criteria (referred to as water quality objectives in the California Water Code) necessary to protect those uses. Under the Water Code, the water boards establish beneficial uses and water quality objectives in water quality control or basin plans. Together with an anti-degradation policy, these beneficial uses and water quality objectives serve as water quality standards under the Clean Water Act. In Clean Water Act parlance, state beneficial uses are called "designated uses" and state water quality objectives are called "criteria." Throughout this Order, the relevant term is used depending on the statutory scheme.

Waters of the State - Any water, surface or underground, including saline waters within the boundaries of the State [CWC section 13050 (e)]. The definition of the Waters of the State is broader than that for the Waters of the United States in that all water in the State is considered to be a Waters of the State. Under this definition, portions of a MS4 may be considered to be a Waters of the State. However, man-made portions of the MS4 constructed for the sole purpose of flow and/or pollutant reduction are not considered waters of the state.

Waters of the United States - As defined in the 40 CFR 122.2, the Waters of the U.S. are defined as: "(a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate "wetlands;" (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters otherwise defined as waters of the United States under this definition: (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial seas; and (g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA."

Watershed - That geographical area which drains to a specified point on a water course, usually a confluence of streams or rivers (also known as drainage area, catchment, or river basin).

Wet Season (aka Rainy Season) – The period of time from October 1 to April 30 when the San Diego Region experiences the most rainfall.

Wet Weather – Weather is considered wet if there is a storm event of 0.1 inches and greater and the following 72 hours, unless defined in another regulatory mechanism such as a TMDL.

ATTACHMENT D

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

FY _____

I. COPERMITTEE INFORMATION

Copermittee Name:

Copermittee Primary Contact Name:

Copermittee Primary Contact Information:
Address:
City: County: State: Zip:
Telephone: Fax: Email:

II. LEGAL AUTHORITY

Has the Copermittee established adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 that complies with Order No. R9-2012-0011?	YES NO	☐ ☐
A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority?	YES NO	☐ ☐

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

Was an update of the jurisdictional runoff management program document required or recommended by the San Diego Water Board?	YES NO	☐ ☐
If YES to the question above, did the Copermittee update its jurisdictional runoff management program document and make it available on the Regional Clearinghouse?	YES NO	☐ ☐

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

Has the Copermittee implemented a program to actively detect and eliminate illicit discharges and connections to its MS4 that complies with Order No. R9-2012-0011?	YES NO	☐ ☐

Number of non-storm water discharges reported by the public	
Number of non-storm water discharges detected by Copermittee staff or contractors	
Number of non-storm water discharges investigated by the Copermittee	
Number of sources of non-storm water discharges identified	
Number of non-storm water discharges eliminated	
Number of sources of illicit discharges or connections identified	
Number of illicit discharges or connections eliminated	
Number of enforcement actions issued	
Number of high level enforcement actions issued	

V. DEVELOPMENT PLANNING PROGRAM

Has the Copermittee implemented a development planning program that complies with Order No. R9-2012-0011?	YES NO	☐ ☐
Was an update to the BMP Design Manual required or recommended by the San Diego Water Board?	YES NO	☐ ☐
If YES to the question above, did the Copermittee update its BMP Design Manual and make it available on the Regional Clearinghouse?	YES NO	☐ ☐

Number of proposed development projects in review	
Number of Priority Development Projects in review	
Number of Priority Development Projects approved	
Number of approved Priority Development Projects exempt from any BMP requirements	
Number of approved Priority Development Projects requiring mitigation	
Number of Priority Development Projects granted occupancy	

Number of completed Priority Development Projects in inventory	
Number of high priority Priority Development Project structural BMP inspections	
Number of Priority Development Project structural BMP violations	
Number of enforcement actions issued	
Number of high level enforcement actions issued	

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM
FY _____

VI. CONSTRUCTION MANAGEMENT PROGRAM

Has the Copermittee implemented a construction management program that complies with Order No. R9-2012-0011?	YES	☐
	NO	☐

Number of construction sites in inventory	
Number of active construction sites in inventory	
Number of inactive construction sites in inventory	
Number of construction sites closed/completed during reporting period	
Number of construction site inspections	
Number of construction site violations	
Number of enforcement actions issued	
Number of high level enforcement actions issued	

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

Has the Copermittee implemented an existing development management program that complies with Order No. R9-2012-0011?	YES	☐
	NO	☐

	Municipal	Commercial	Industrial	Residential
Number of existing developments in inventory				
Number of existing development inspections				
Number of follow-up inspections				
Number of existing development violations				
Number of enforcement actions issued				
Number of high level enforcement actions issued				

VIII. PUBLIC EDUCATION AND PARTICIPATION

Has the Copermittee implemented a public education program that complies with Order No. R9-2012-0011?	YES	☐
	NO	☐
Has the Copermittee implemented a mechanism for public participation and where necessary intergovernmental coordination that complies with Order No. R9-2012-0011?	YES	☐
	NO	☐

IX. FISCAL ANALYSIS

Has the Copermittee attached to this form a summary of its fiscal analysis that complies with Order No. R9-2012-0011?	YES	☐
	NO	☐

X. CERTIFICATION

I [☐ Principal Executive Officer ☐ Ranking Elected Official ☐ Duly Authorized Representative] certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature	Date
Print Name	Title
Telephone Number	Email

ADMINISTRATIVE DRAFT

ATTACHMENT E

SPECIFIC PROVISIONS FOR TOTAL MAXIMUM DAILY LOADS APPLICABLE TO ORDER NO. R9-2012-0011

These provisions implement Total Maximum Daily Loads (TMDLs), adopted by the San Diego Water Board and approved by USEPA under Clean Water Act section 303(c), which are applicable to discharges regulated under this Order. The provisions and schedules for implementation of the TMDLs described below must be incorporated into the Water Quality Improvement Plans and monitoring requirements, required pursuant to Provisions B and D of this Order, respectively, for the specified Watershed Management Areas.

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed Resolution No. R9-2002-0123
2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin Resolution No. R9-2005-0019
3. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek Resolution No. R9-2007-0043
4. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay Resolution No. R9-2008-0027
5. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek) Resolution No. R9-2010-0001

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2002-0123

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	August 14, 2002
State Water Board Approval Date:	July 16, 2003
Office of Administrative Law Approval Date:	September 11, 2003
US EPA Approval Date:	November 3, 2003

(3) TMDL Effective Date: September 11, 2003

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, Unified Port District of San Diego

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for Chollas Creek consist of the following:

(1) Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedule under Specific Provision 1.c:

Table 1.1
Receiving Water Limitations as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Diazinon	Acute	0.08 µg/L	1 hour
	Chronic	0.05 µg/L	4 days

(2) Effluent Limitations

Discharges from the MS4s must not contain concentrations that exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 1.c:

Table 1.2
Effluent Limitations as Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation	Averaging Period
Diazinon	Acute	0.072 µg/L	1 hour
	Chronic	0.045 µg/L	4 days

(3) Best Management Practices

BMPs for Chollas Creek may be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area and implemented by the Responsible Copermittees:

(a) The Responsible Copermittees should coordinate any implemented BMPs to address this TMDL with Caltrans, as possible.

c. COMPLIANCE SCHEDULE

The Responsible Copermittees were required to achieve their WLA by December 31, 2010. The Responsible Copermittees must be in compliance with the WQBELs under Specific Provision 1.b.

d. COMPLIANCE DETERMINATION

Compliance with WQBELs or WLAs may be demonstrated via any one of the following methods:

(1) There is no discharge from the MS4, or
(2) Applicable effluent limitations are met, or
(3) Receiving waters meet the applicable receiving water limitations or water quality objective, or
(4) Loading from the MS4 is such that it does not cause water quality objective exceedances, or
(5) Implementation of a Water Quality Improvement Plan determined by the Regional Board Executive Officer to comply with Provision A as described in Provision A.4.

e. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(a) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0019

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	September 22, 2005
Office of Administrative Law Approval Date:	December 2, 2005
US EPA Approval Date:	February 8, 2006

(3) TMDL Effective Date: December 2, 2005

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Shelter Island Yacht Basin

(6) Responsible Copermittees: City of San Diego, San Diego Unified Port District

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for Shelter Island Shoreline Park consist of the following:

(1) Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedule under Specific Provision 2.c:

Table 2.1
Receiving Water Limitations as Concentrations in Shelter Island Yacht Basin

Constituent	Exposure Duration	Effluent Limitation	Averaging Period
Dissolved Copper	Acute	4.8 µg/L	1 hour
	Chronic	3.1 µg/L	4 days

(2) Effluent Limitations

Discharges from the MS4s must not contain pollutant loads that exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 2.c:

Table 2.2
Effluent Limitations as Annual Loads in MS4 Discharges to Shelter Island Yacht Basin

Constituent	Effluent Limitation
Dissolved Copper	30 kg/yr

(3) Best Management Practices

The Responsible Copermittees may implement BMPs to support the achievement of WQBELs under Specific Provision 2.b for Shelter Island Yacht Basin.

c. COMPLIANCE SCHEDULE

The Responsible Copermittees are required to achieve respective WLAs by December 2, 2022. The Responsible Copermittees must be in compliance with the WQBELs under Specific Provision 2.b.

d. COMPLIANCE DETERMINATION

Compliance with WQBELs or WLAs may be demonstrated via any one of the following methods:

(1) There is no discharge from the MS4, or
(2) Applicable effluent limitations are met, or
(3) Receiving waters meet the applicable receiving water limitations or water quality objective, or
(4) Loading from the MS4 is such that it does not cause water quality objective exceedances, or
(5) Implementation of a Water Quality Improvement Plan determined by the Regional Board Executive Officer to comply with Provision A as described in Provision A.4.

e. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

The Responsible Copermittees must implement the monitoring and assessment requirements issued under Order No. R9-2005-0019. The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

3. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2007-0043

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2007
State Water Board Approval Date:	July 15, 2008
Office of Administrative Law Approval Date:	October 22, 2008
US EPA Approval Date:	December 18, 2008

(3) TMDL Effective Date: October 22, 2008

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for Chollas Creek consist of the following:

(1) Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedule under Specific Provision 4.c.(1):

Table 3.1
Receiving Water Limitations as Concentrations in Chollas Creek

Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$(0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$(0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$(0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$(0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER.

(2) Effluent Limitations

Discharges from the MS4s must not contain pollutant loads that exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 4.c.(1):

Table 3.2
Effluent Limitations as Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER.

(3) Best Management Practices

(a) The Responsible Copermittee may implement BMPs to support the achievement of WQBELs under Specific Provision 4.c for Chollas Creek.

(b) The Responsible Copermittees should coordinate the BMPs to address this TMDL with Caltrans and the U.S. Navy, as possible.

c. COMPLIANCE SCHEDULE

(1) WLA Compliance Date

The Responsible Copermittee is required to achieve the WLA, thus must be in compliance with the WQBELs under Specific Provision 4.b, by October 22, 2028.

(2) Interim Compliance Requirements

The Responsible Copermittee must comply with the following interim WQBELs by the interim compliance date:

Table 3.3
Interim Effluent Limitations as Concentrations in MS4 Discharges to Chollas Creek

Interim Compliance Date	Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
October 22, 2018	Dissolved Copper	Acute	1.2 x 90% x (0.96) x $e^{[0.9422 \times \ln(\text{hardness}) - 1.700]}$ x WER*	1 hour
		Chronic	1.2 x 90% x (0.96) x $e^{[0.8545 \times \ln(\text{hardness}) - 1.702]}$ x WER*	4 days
	Dissolved Lead	Acute	1.2 x 90% x [1.46203 – 0.145712 x ln(hardness)] x $e^{[1.273 \times \ln(\text{hardness}) - 1.460]}$ x WER*	1 hour
		Chronic	1.2 x 90% x [1.46203 – 0.145712 x ln(hardness)] x $e^{[1.273 \times \ln(\text{hardness}) - 4.705]}$ x WER*	4 days
	Dissolved Zinc	Acute	1.2 x 90% x (0.978) x $e^{[0.8473 \times \ln(\text{hardness}) + 0.884]}$ x WER*	1 hour
		Chronic	1.2 x 90% x (0.986) x $e^{[0.8473 \times \ln(\text{hardness}) + 0.884]}$ x WER*	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER.

d. Compliance Determination

Compliance with WQBELs or WLAs may be demonstrated via any one of the following methods:

(1) There is no discharge from the MS4, or
(2) Applicable effluent limitations are met, or
(3) Receiving waters meet the applicable receiving water limitations or water quality objective, or
(4) Loading from the MS4 is such that it does not cause water quality objective exceedances, or
(5) Implementation of a Water Quality Improvement Plan determined by the Regional Board Executive Officer to comply with Provision A as described in Provision A.4.

e. Specific Monitoring and Assessment Requirements

(a) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*, when it is amended to include monitoring requirements for the Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

(b) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Order No. R9-2007-0043, as consistent with this Order.. The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

4. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2008-0027

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 11, 2008
State Water Board Approval Date:	June 16, 2009
Office of Administrative Law Approval Date:	September 15, 2009
US EPA Approval Date:	October 26, 2009

(3) TMDL Effective Date: September 15, 2009

(4) Watershed Management Areas: See Table 5.0

(5) Water Bodies: See Table 5.0

(6) Responsible Copermittees: See Table 5.0

Table 4.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County	Dana Point Harbor	Baby Beach	-City of Dana Point -County of Orange
San Diego Bay	San Diego Bay	Shelter Island Shoreline Park	-Unified Port of San Diego

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Receiving Water Limitations

(a) Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedules under Specific Provisions 5.c.(1)(a) and 5.c.(2):

Table 4.1
Receiving Water Limitations as Bacteria Densities in the Water Body

	Receiving Water Limitations	
Constituent	**Single Sample Maximum[1,2]**	**30-Day Geometric Mean[2]**
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.

(b) If the above receiving water limitations are not met in the receiving water, the Responsible Copermittees must demonstrate that the discharges from the MS4s are not causing or contributing to the violation of receiving water limitations. The Copermittee must provide data that demonstrate the discharges from the MS4s are meeting the effluent limitations under Specific Provision 5.b.(2).

(2) Effluent Limitations

Discharges from the MS4s must not contain densities that exceed the following effluent limitations by the end of the compliance schedules under Specific Provisions 5.c.(1)(a) and 5.c.(2) to demonstrate the discharge is not causing or contributing to a violation of receiving water quality standards:

Table 4.2
Effluent Limitations as Bacteria Densities in MS4 Discharges to the Water Body

	Effluent Limitations	
Constituent	**Single Sample Maximum[1,2]**	**30-Day Geometric Mean[2]**
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.

Interim effluent limitations expressed as pollutant loads are given in the compliance schedule under Specific Provision 5.c.

(3) Best Management Practices

(a) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 5.0 fulfill the Bacteria Load Reduction Plan (BLRP) requirements in Resolution No. R9-2008-0027.

(b) The Responsible Copermittee must implement BMPs capable of achieving the WQBELs under Specific Provision 5.0 for the segments or areas of the water bodies listed in Table 5.0

c. COMPLIANCE SCHEDULE

(1) Baby Beach in Dana Point Harbor

(a) WLA Compliance Dates

The Responsible Copermittees for MS4 discharges to Baby Beach are required to achieve the WLA, thus must be in compliance with the WQBELs under Specific Provision 5.0, according to the following compliance schedule:

Table 4.3
Compliance Schedule Dates to Achieve Baby Beach WLAs

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform	September 15, 2014	September 15, 2009
Fecal Coliform		September 15, 2009
Enterococcus		September 15, 2019

(b) Interim Compliance Requirements

The Responsible Copermittees for MS4 discharges to Baby Beach must comply with the following interim WQBELs by the interim compliance date:

Table 4.4
Interim Effluent Limitations as Loads in MS4 Discharges to Baby Beach

Constituent	Interim Compliance Date	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	5.32×10^9 MPN/day	NA*
Fecal Coliform	September 15, 2012	0.59×10^9 MPN/day	NA*
Enterococcus	September 15, 2012	0.42×10^9 MPN/day	NA**
	September 15, 2016	NA*	207×10^9 MPN/30days

Notes:
* The WQBELs under Specific Provision 5.b must already be achieved by the given interim compliance date.
** There is no corresponding interim WQBEL for the given interim compliance date.

(2) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park is required to achieve the WLA, thus must be in compliance with the WQBELs under Specific Provision 5.0, by December 31, 2012.

d. COMPLIANCE DETERMINATION

Compliance with WQBELs or WLAs may be demonstrated via any one of the following methods:

(1) There is no discharge from the MS4, or
(2) Applicable effluent limitations are met, or
(3) Receiving waters meet the applicable receiving water limitations or water quality objective, or

(4) Loading from the MS4 is such that it does not cause water quality objective exceedances, or
(5) Implementation of a Water Quality Improvement Plan determined by the Regional Board Executive Officer to comply with Provision A as described in Provision A.4.

e. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) Monitoring Stations and Procedures

The Responsible Copermittees must implement the monitoring requirements issued under Order No. R9-2008-0027.

(2) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs have been achieved.

(b) The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

5. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2010-0001

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 10, 2010
State Water Board Approval Date:	December 14, 2010
Office of Administrative Law Approval Date:	April 4, 2011
US EPA Approval Date:	June 22, 2011

(3) TMDL Effective Date: April 4, 2011

(4) Watershed Management Areas: See Table 6.0

(5) Water Bodies: See Table 6.0

The water bodies identified in Table 6.0 are subject to the requirements of this Attachment E, except those water bodies listed in Table 6.0 that have been delisted from the 303(d) list for REC-1 bacteria impairments. These delisted water bodies are not subject to the requirements of this Attachment E so long as monitoring data continues to support compliance with water quality standards.

(6) Responsible Copermittees: See Table 6.0

Table 5.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	-City of Laguna Beach -County of Orange -Orange County Flood Control District
		at Heisler Park - North	
	Pacific Ocean Shoreline	at Main Laguna Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Woods -County of Orange -Orange County Flood Control District
		Laguna Beach at Ocean Avenue	
		Laguna Beach at Cleo Street	
		Arch Cove at Bluebird Canyon Road	
		Laguna Beach at Dumond Drive	

Table 5.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County (cont'd)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Hills -City of Laguna Niguel -City of Laguna Woods -City of Lake Forest -City of Mission Viejo -County of Orange -Orange County Flood Control District
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	
	Aliso Creek Mouth	at mouth	
	Pacific Ocean Shoreline	Aliso Beach at West Street	-City of Dana Point -City of Laguna Beach -City of Laguna Niguel -County of Orange -Orange County Flood Control District
		Aliso Beach at Table Rock Drive	
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)	
		at Salt Creek (large outlet)	
		Salt Creek Beach at Salt Creek service road	
		Salt Creek Beach at Strand Road	
	Pacific Ocean Shoreline	at San Juan Creek	-City of Dana Point -City of Laguna Hills -City of Laguna Niguel -City of Mission Viejo -City of Rancho Santa Margarita -City of San Juan Capistrano -County of Orange -Orange County Flood Control District
	San Juan Creek	lower 1 mile	
	San Juan Creek Mouth	at mouth	

Table 5.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I- Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County (cont'd)	Pacific Ocean Shoreline	at Poche Beach	- City of Dana Point -City of San Clemente -County of Orange -Orange County Flood Control District
		Ole Hanson Beach Club Beach at Pico Drain	
		San Clemente City Beach at El Portal Street Stairs	
		San Clemente City Beach at Mariposa Street	
		San Clemente City Beach at Linda Lane	
		San Clemente City Beach at South Linda Lane	
		San Clemente City Beach at Lifeguard Headquarters	
		under San Clemente Municipal Pier	
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	
		San Clemente State Beach at Riviera Beach	
		Can Clemente State Beach at Cypress Shores	
San Luis Rey River	Pacific Ocean Shoreline	at San Luis Rey River mouth	-City of Oceanside -City of Vista -County of San Diego
Carlsbad	Pacific Ocean Shoreline	at Moonlight State Beach	-City of Carlsbad -City of Encinitas -City of Escondido -City of Oceanside -City of San Marcos -City of Solana Beach -County of San Diego
San Dieguito River	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	-City of Del Mar -City of Escondido -City of Poway -City of San Diego -City of Solana Beach -County of San Diego
Penasquitos (Miramar Reservior HA)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	-City of Del Mar -City of Poway -City of San Diego -County of San Diego
Mission Bay	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	-City of San Diego
		La Jolla Shores Beach at Caminito del Oro	
		La Jolla Shores Beach at Vallecitos	

Table 5.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I- Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
Mission Bay (cont'd)	Pacific Ocean Shoreline	La Jolla Shores Beach at Avenida de la Playa	-City of San Diego
		at Casa Beach, Children's Pool	
		South Casa Beach at Coast Boulevard	
		Whispering Sands Beach at Ravina Street	
		Windansea Beach at Vista de la Playa	
		Windansea Beach at Bonair Street	
		Windansea Beach at Playa del Norte	
		Windansea Beach at Palomar Avenue	
		at Tourmaline Surf Park	
		Pacific Beach at Grand Avenue	
	Tecolote Creek	Entire reach and tributaries	-City of San Diego
San Diego River	Forrester Creek	lower 1 mile	City of El Cajon -City of Santee -County of San Diego
	San Diego River	lower 6 miles	-City of El Cajon -City of La Mesa -City of San Diego -City of Santee -County of San Diego
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	
San Diego Bay	Chollas Creek	lower 1.2 miles	-City of La Mesa -City of Lemon Grove -City of San Diego -County of San Diego -San Diego Unified Port District

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for segments or areas of the water bodies listed in Table 6.0 consist of the following:

(1) Receiving Water Limitations

(a) Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedules under Specific Provision 6.c.(1):

Table 5.1
Receiving Water Limitations as Bacteria Densities and Allowable Exceedance Frequencies in the Water Body

	Receiving Water Limitations			
Constituent	**Single Sample Maximum[1,2] (MPN/100mL)**	**Single Sample Maximum Allowable Exceedance Frequency[3]**	**30-Day Geometric Mean[2] (MPN/100mL)**	**30-Day Geometric Mean Allowable Exceedance Frequency**
Total Coliform	10,000	22% / 0%	1,000	0%
Fecal Coliform	400	22% / 0%	200	0%
Enterococcus	104[4] / 61[5]	22% / 0%	35[4] / 33[5]	0%

Notes:
1. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
3. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. The 0% single sample maximum allowable exceedance frequency applies to dry weather days.
4. This *Enterococcus* receiving water limitation applies to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
5. This *Enterococcus* receiving water limitations applies to segments or areas of creeks or creek mouths listed in Table 6.0.

Interim receiving water limitations expressed as allowable exceedance frequencies are given in the compliance schedule under Specific Provision 6.c.

(b) If the above receiving water limitations are not met in the receiving water, the Responsible Copermittees must demonstrate that the discharges from the MS4s are not causing or contributing to the violation of receiving water limitations. The Copermittee must provide data that demonstrate the discharges from the MS4s are meeting the effluent limitations under Specific Provision 6.b.

(2) Effluent Limitations

Discharges from the MS4s must not cause or contribute to a violation of receiving water limitations. The mass-based waste load allocations presented in Resolution No. R9-2010-0001 can be used to demonstrate that loading from the MS4 is such that it does not cause water quality objective exceedances, as described in bullet (4) under Specific Provision 6.d.

(3) Best Management Practices

(a) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 6.0 will incorporate the Comprehensive Load Reduction Plans (CLRP) drafted pursuant to Resolution No. R9-2010-0001.

(b) The Responsible Copermittee may implement BMPs to support the achievement of WQBELs under Specific Provision 6.b for the segments or areas of the water bodies listed in Table 6.0.

(c) The Responsible Copermittees may implement BMPs to support the achievement of this TMDL with Caltrans and owners/operators of small MS4s, as possible.

c. COMPLIANCE SCHEDULE

(1) WLA Compliance Dates

The Responsible Copermittees for MS4 discharges to a segment or area of the water bodies listed in Table 6.0 are required to achieve the WLA, thus must be in compliance with the WQBELs under Specific Provision 6.b, according to the following compliance schedule:

Table 5.2
Compliance Schedule Dates to Achieve Indicator Bacteria WLAs

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform[1]	April 4, 2021	April 4, 2031
Fecal Coliform		
Enterococcus		

1 - Total coliform receiving water limitations apply only to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.

(2) Interim Compliance Requirements

The Responsible Copermittees must comply with the interim WQBELs by the interim compliance dates provided as part of the CLRP and supported by Order No. R9-2010-0001.

(a) Interim Dry Weather WQBELs

Interim dry weather WQBELS are expressed as receiving water limitations. The Responsible Copermittee must calculate the "existing" exceedance frequencies of the 30-day geometric mean water quality objectives for each of the indicator bacteria by analyzing the monitoring data collected between January 1, 2002 and April 4, 2011. "Existing" exceedance frequencies may be calculated by segment or area of a water body, or by water body, and/or by Watershed Management Area listed in Table 6.0. Separate "existing" exceedance frequencies must be calculated for beaches and creeks/creek mouths.

The Responsible Copermittees must achieve a 50 percent reduction in the "existing" exceedance frequency of the 30-day geometric mean WQBELs for the segments or areas of the water bodies listed in Table 6.0. A 50 percent reduction in the "existing" exceedance frequency is equivalent to half of the "existing" exceedance frequency of the 30-day geometric mean WQBELs.

(3) Submittals to Support TMDL Basin Plan Amendment

The Responsible Copermittees are encouraged to submit data to support the TMDL reopener scheduled for April 2016 including but not limited to data related to reference watershed monitoring and beneficial use usage frequency.

d. COMPLIANCE DETERMINATION

Compliance with WQBELs or WLAs may be demonstrated via any one of the following methods:

(1) There is no discharge from the MS4, or
(2) Applicable effluent limitations are met, or
(3) Receiving waters meet the applicable receiving water limitations or water quality objective, or

(4) Loading from the MS4 is such that it does not cause water quality objective exceedances, or
(5) Implementation of a Water Quality Improvement Plan determined by the Regional Board Executive Officer to comply with Provision A as described in Provision A.4.

Furthermore, as stated in the TMDL:

The Phase I MS4s may demonstrate that their discharges are not causing the exceedances in the receiving waters by providing data from their discharge points to the receiving waters, by providing data collected at jurisdictional boundaries, and/or using other methods accepted by the San Diego Water Board. Otherwise, at the end of the [wet or] dry weather TMDL compliance schedule, the municipal Phase I MS4s will be held responsible and considered out of compliance unless other information or evidence indicates another controllable or uncontrollable source is responsible for the exceedances in the receiving waters. If controllable sources other than discharges from the municipal Phase I MS4s are identified before or after the end of the [wet or] dry weather TMDL Compliance Schedule as causing the exceedances, those controllable sources will be responsible for reducing their bacteria loads and/or demonstrating that discharges from those sources are not causing the exceedances. The San Diego Water Board shall implement additional actions (e.g., issue enforcement actions, amend existing NPDES requirements or conditional waivers), as needed, to bring all controllable sources into compliance with the [wet or] dry weather TMDLs.

e. Specific Monitoring and Assessment Requirements

The Bacteria Load Reduction Plans (BLRPs) and CLRPs to be submitted by the Copermittees and approved by the Regional Board Executive Officer contain monitoring programs. Implementation of those Regional Board-approved monitoring programs constitutes compliance with the Monitoring Station and Monitoring Procedure requirements, described below.

(1) Monitoring and Assessment Requirements for Beaches

(a) Monitoring Stations

For beaches addressed by these TMDLs, monitoring locations should consist of, at a minimum, the same locations used to collect data required under MS4 NPDES monitoring requirements and beach monitoring for Health and Safety Code section 115880.[75] If exceedances of the receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations and/or other source identification methods must also be used to demonstrate that the bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly.

(ii)

(iii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations at least once within the first 24 hours of the end of a storm event[23] that occurs during the rainy season (i.e., October 1 through April 30).

(iv) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs for the Pacific Ocean Shoreline segments or areas listed in Table 6.0 have been achieved.

(ii) The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

(2) Monitoring and Assessment Requirements for Creeks and Creek Mouths

(a) Monitoring Stations

For creeks addressed by these TMDLs, monitoring locations should consist of, at a minimum, a location at or near the mouth of the creek (e.g., Mass Loading Station or Mass Emission Station) and one or more locations upstream of the mouth (e.g., Watershed Assessment Stations). If exceedances of the receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations and/or other source identification methods must also be used to demonstrate that the bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

[23] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations according to the WQIP.
(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations within the first 24 hours of
(iii) the end of a storm event[24] that occurs during the rainy season (i.e., October 1 through April 30).
(iv)
(v) Samples collected from receiving water monitoring stations must be analyzed for fecal coliform and *Enterococcus* indicator bacteria.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the receiving water monitoring data to assess whether the interim and final receiving water WQBELs for the creeks and creek mouths listed in Table 6.0 have been achieved.

(ii) The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

[24] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

SEPTEMBER 14, 2012

COUNTY OF SAN DIEGO COPERMITTEES

Supporting Documentation and Rationale for Alternative Provision II.D Monitoring and Assessment Requirements

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Attachment

Attachment 2-1: Receiving Water Monitoring Program Review (taken from the *San Diego County Copermittees Report of Waste Discharge*)

INTRODUCTION

The purpose of this document is to provide rationale to support the monitoring alternative developed by the San Diego County Copermittees in collaboration with the County of Orange and the County of Riverside for the San Diego Region Municipal Separate Storm Sewer Systems (MS4) NPDES Permit. The permit was released as an administrative draft by the San Diego Regional Water Quality Control Board (Regional Water Board) as Tentative Order No. R9-2012-0011. The Tentative Order contains a Monitoring and Assessment component (Provision II.D) that describes the elements of a monitoring program intended to generate data to assess the following three fundamental programmatic management questions/objectives from the agenda for the July 25, 2012 Monitoring and Assessment Focus Meeting on the Tentative Order:

1. *Are the Copermittees' Jurisdictional runoff management programs effectively prohibiting non-storm water discharges to their MS4s?*

2. *Are the Copermittees' Jurisdictional runoff management programs reducing pollutants in storm water to the Maximum Extent Practicable (MEP)?*

3. *Are the physical, chemical, and biological conditions of receiving waters being improved by the Copermittees' Water Quality Improvement Plans (WQIPs) for receiving waters that don't adequately support designated beneficial uses?*

It is also the goal of the Copermittees to answer these programmatic questions and achieve the management goals as efficiently as possible.

To accommodate the adaptive management approach supported by the Water Board, Copermittees propose to coordinate Provision II.D requirements with Section II.B language to require a strategic Monitoring and Assessment Program to be tailored to the needs of each Watershed Management Area (WMA) to be prepared as part of the Water Quality Improvement Plans (WQIPs). To provide useful feedback to the overall program, the Monitoring and Assessment Program is proposed to be developed during the long range planning process of the WQIP during the first 12 months after Permit adoption. The monitoring program is one piece of the overall implementation and needs to be coordinated with the other programmatic elements of implementation to provide the most useful information.

Based on 15 to 20 years of monitoring experience, the Copermittees have an understanding of receiving water quality issues, and now want more of a focus on a) identifying and prioritizing sources, and b) designing special studies to determine how to best implement solutions to address water quality problems. The Copermittees believe that this is the nexus to effective implementation, because it supports adaptive management and can both guide and utilize other programmatic implementation efforts to improve water quality.

To accomplish this, a phased approach is included in Alternative Provision II.D, with a Pre-WQIP or transitional period and a Post-WQIP phase after the Monitoring and Assessment Programs are developed as part of the WQIPs. Depending upon the adoption date of the final Order, the transitional phasing of monitoring would be

approximately two to three years to accommodate the public review, Water Board review and the lead time necessary for Copermittees' to plan and commit resources in the budgeting process. Transitional monitoring will build on the foundation of over 15 years of monitoring experience and the recommendations in the San Diego County Copermittees Report of Waste Discharge (ROWD) (San Diego County Copermittees, 2011). Additionally, the Copermittees have tailored the transitional monitoring to be responsive to the Water Board's three key questions. Transitional monitoring would only apply to the San Diego County Copermittees as Orange County and Riverside County Copermittees are scheduled to enroll at a later date. The transitional monitoring requirements will be reassessed as part of the development of the WQIP's Monitoring and Assessment Program and adjusted as necessary to support the highest priorities in each WMA.

The key changes proposed in Alternative Provision II.D are as follows:

1. **Question-Driven Approach: The** Copermittees support a Question-Driven Approach to design strategic and efficient monitoring plans that are responsive to Program Managers' needs to improve the implementation of effective stormwater programs. See the Question-Driven Monitoring Design section for further details.
2. **Adaptive Management:** Provide program managers with needed information to support changes to program priorities, monitoring locations, special studies, and BMPs. See the "Monitoring Designed to Support Adaptive Management" section of this document for additional details.
3. **Receiving Water and Watershed Monitoring (T.O. Provisions II.D.1.a(2), II.D.1.b, II.D.2.b, and II.D.2.c)**: Copermittees propose to integrate the numerous receiving waters programs at the WMA level. See the "Receiving Water Monitoring" section of this document for additional details.
4. **Jurisdictional Non-Stormwater monitoring (T.O. Provision II.D.1.a):** Instead of extensive MS4 outfall chemical field screening and analysis, Copermittees propose to conduct a targeted program to reduce persistent flows that impact receiving water quality. This will allow resources to prioritize persistent non-stormwater discharges and focus actions to improve water quality. Copermittees are also proposing a broad program to eliminate transient illicit connections /illegal discharges (IC/ID) through visual surveys to be conducted over a large spatial area with appropriate follow-up criteria. See the "Dry Weather Outfall Monitoring" and "Discussion of IDDE Program Efficiency and Effectiveness" sections of this document for additional details.
5. **Jurisdictional Stormwater monitoring (T.O. Provision II.D.1.b):** Instead of extensive MS4 outfall chemical monitoring, monitor homogeneous land uses or representative mixed-use land uses and extrapolate the results to other drainages. This wet weather runoff data will provide a local understanding of wet weather discharges for San Diego County, and will better inform the planning process by prioritizing drainages and land uses for implementation efforts. Selection of these representative outfalls can be coordinated and shared among Copermittees to provide the most efficient representation and characterization. Modeling currently being done for some watersheds as part of the bacteria TMDL implementation plan effort may also be built upon.

See the "Wet Weather Outfall Monitoring" section of this document for additional details.

6. **Jurisdictional Receiving Water Boundary Monitoring (T.O. Provision II.D.1.a(2)):** Jurisdictional receiving water boundary monitoring proposed in the Tentative Order does not support the three key goals. Monitoring conducted by the Copermittees' and others have shown jurisdictional boundary monitoring of the type proposed in the Tentative Order not to be effective in estimating water quality impacts and loading from MS4 discharges. This is due to a combination of factors, including typically high variability of the constituent concentrations in receiving waters and discharges, and typically small percentages of MS4 discharge flows and pollutant loads in the receiving waters. This combination of high variability and relatively small impacts or differences requires high numbers of samples to detect significant and programmatically relevant differences and would be unlikely to support any programmatic changes or guide improvements to water quality. See the "Discussion of Jurisdictional Boundary Monitoring" section of this document for additional details and rationale for an alternative approach.
7. **Source Identification Studies:** Prior to adoption of the WQIPs, the Copermittees will continue source identification studies pertaining to compliance with TMDLs and the development of the CLRP implemented under Order No. R9-2007-0001. Following adoption of the WQIPs, the Copermittees will conduct source and stressor identification studies based on Monitoring and Assessment Plans developed for the WQIPs. The plans for the studies will be submitted with the WQIP for approval by the Water Board. See the "Source/Stressor ID and Special Studies" section of this document for additional details.
8. **Special Studies and Pilot BMPs:** The Copermittees will conduct Special Studies to address information needs as identified by Source/Stressor Identification studies above, and otherwise as needed to support implementation of the WQIPs. Within the permit term, two Special Studies will be conducted within each WMA: one to address specific questions developed for each WMA, and two Regional special studies will be conducted to answer broader regional questions. See the "Source/Stressor ID and Special Studies" section of this document for additional details.

The Copermittees also recognize that the Water Board wants to see jurisdictional accountability. Jurisdictional accountability should focus on continuing implementation of the iterative stormwater management process, and will be supported by data collected at prioritized targeted MS4 outfalls and programmatic implementation activities to be included in the WQIPs.

APPROACH TO MONITORING AND ASSESSMENT

Question-Driven Monitoring Design

Consistent with the Copermittees' ROWD (San Diego County Copermittees, 2011), the transitional (Pre-WQIP) monitoring program proposed by the Copermittees was

developed using a question-driven approach that is widely supported by local, state and federal regulatory agencies. This same question-driven approach will be used to develop the strategic Monitoring and Assessment Programs of the WQIPs that will be tailored to the needs of each WMA. As described in the Copermittees' Alternative Provision II.D, the Monitoring and Assessment Program is based on a logical hierarchy in which **1)** overall management objectives help define **2)** clear management questions which can be addressed by **3)** specific question and assessment frameworks that are then implemented with **4)** data produced by monitoring designs. Wide acceptance of this approach to monitoring design is illustrated by its recommended use in several recent statewide policy documents related to monitoring and assessment. A December 2008 report[1] of the California Water Quality Monitoring Council to the Secretaries of CalEPA and the Resources Agency lays out a basic approach to correcting widespread problems in water quality monitoring and assessment, and the Comprehensive Strategy of December 2010[2] provides additional detail on the Council's approach. The SWAMP Assessment Framework[3] is a companion document that provides more specific guidance to Regional Water boards on question-driven monitoring design as outlined in U.S. EPA's *Elements of a State Water Monitoring and Assessment Program*[4]. Relevant regional examples and implementations of this approach also include the Southern California Stormwater Monitoring Coalition's *Model Monitoring Program* (SMC, 2004), and The San Diego Regional Water Board's own *A Framework for Monitoring & Assessment in the San Diego Region* (SDRWQCB, 2012). At the June 2012 San Diego Regional Water Board meeting, Water Board staff presented this approach and it was well received by the Board. The Copermittees' process for developing the monitoring program aligns well with the condition assessment process proposed by Water Board staff at the June 2012 meeting, with an additional emphasis on setting priorities.

These referenced guidance documents stress the importance of basing monitoring on clear questions that support explicit decisions ensuring that data are gathered only when there is a validated assessment framework in place (i.e., data are collected only after it has been determined how they are going to be analyzed and evaluated). Clear motivating questions provide *"the functional link between broader concerns about beneficial uses and the technical specifications of monitoring designs" (SWAMP, 2010).* These technical monitoring specifications are designed to meet the data analysis and interpretation requirements of the assessment methods most appropriate to addressing the questions, including trend analysis and comparison to benchmarks. Additionally, all four of these documents follow in the footsteps of an earlier National

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[1] *Maximizing the Efficiency and Effectiveness of Water Quality Data Collection and Dissemination and Ensuring that Collected Data are Maintained and Available for Use by Decision-makers and the Public*. Recommendations of the California Water Quality Monitoring Council, State of California, December 2008.

[2] *A Comprehensive Monitoring Program Strategy for California*. Recommendations of the California Water Quality Monitoring Council, State of California, December 2010.

[3] *SWAMP Assessment Framework*. Prepared by Brock Bernstein for the Surface Water Ambient Monitoring Program, California Water Boards. December 2010.

[4] Elements of a State Water Monitoring and Assessment Program. EPA 841-B-03-003. Assessment and Watershed Protection Division, Office of Wetlands, Oceans and Watershed. U.S. Environmental Protection Agency. March 2003.

Research Council report on monitoring[5], which emphasized the importance of building on clear conceptual models and questions that are linked to management needs.

The use of conceptual models, questions, links to management decisions, and the need for defining analysis and assessment methods prior to developing a monitoring program are all key aspects of monitoring design that are now widely acknowledged. In addition, monitoring design and assessment are now commonly discussed in the context of the need to adapt monitoring targets, questions, and assessment methods as knowledge improves and more fundamental questions are answered. A short list of additional representative papers, books, and reports on this topic is provided with the references for this document.

Monitoring Designed to Support Adaptive Management

The purpose of monitoring is to provide the Copermittees' program managers with information needed to make management decisions to improve stormwater management programs and water quality. Although the monitoring proposed in Tentative Order Provision II.D is comprehensive in its scope, the extensive chemical analysis-based monitoring does not support an adaptive management approach and was not specifically designed to answer questions that support and guide effective management. Consequently, the Copermittees are proposing to replace Tentative Order Provision II.D with this Alternative Provision II.D, in order to better provide program managers with information needed to support effective adaptive management of water quality programs, and better support the development of tangible water quality solutions.

The Monitoring and Assessment Framework

The Copermittees' are proposing to implement a monitoring and assessment framework that provides the necessary feedback to Program Managers to improve implementation strategies. To facilitate this, a question-driven approach will be used, as illustrated in Figure 1. Broad management questions based on the SMC Model MS4 Stormwater Guidance are on the left side of Figure 1. The assessment questions listed on the right side of Figure 1 have been derived from the Tentative Order, with the addition of two additional questions related to source/stressor and BMP/special studies. The monitoring elements identified in the center column of **Figure 1** each are driven by a list of specific questions (not shown in this Figure) to aid in planning and design. For monitoring program design, the process starts at the top of the diagram, at the watershed scale, and proceeds down the diagram to the specific drainage scale. For assessment, data from the specific drainage scale is fed step-wise into the upper levels of the diagram. This assessment process is designed to provide feedback at the different levels so that ultimately Copermittees are addressing real problems in an efficient and effective manner using the adaptive management paradigm.

During the transitional, pre-WQIP phase, monitoring and assessment activities will be based on previously-identified information needs and management questions, as well as on ongoing monitoring and assessment activities. During the process of developing

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[5] *Managing Troubled Waters: The Role of Marine Environmental Monitoring*. National Research Council. National Academies Press, Washington, DC. 1990.

the WQIP for each WMA, the monitoring and assessment activities will then be tailored to the needs of each WMA. Using the framework shown in Figure 1, the information generated by the monitoring and assessment activities will help inform stormwater program management and implementation, and contribute to development of solutions for the identified water quality issues.

The Copermittees recognize that the watersheds are at different stages of understanding with respect to each of the four monitoring activity components shown in Figure 1. Those with active TMDLs, such as Chollas Creek, have a more mature program and may be farther along in understanding where their programs should focus. The Chollas Creek program will emphasize source identification and follow up with special studies to develop effective implementation strategies. Other watersheds may be still be developing the linkage between identified receiving waters problems and the contributions from the Copermittees' MS4s. The goal of the Monitoring and Assessment Programs will be to strategically tailor the balance of monitoring for each of the four components to the prioritized needs of the specific WMA. The result will be efficient, coordinated monitoring with an enhanced watershed and TMDL focus.

Figure 1. Monitoring and Assessment Design Structure

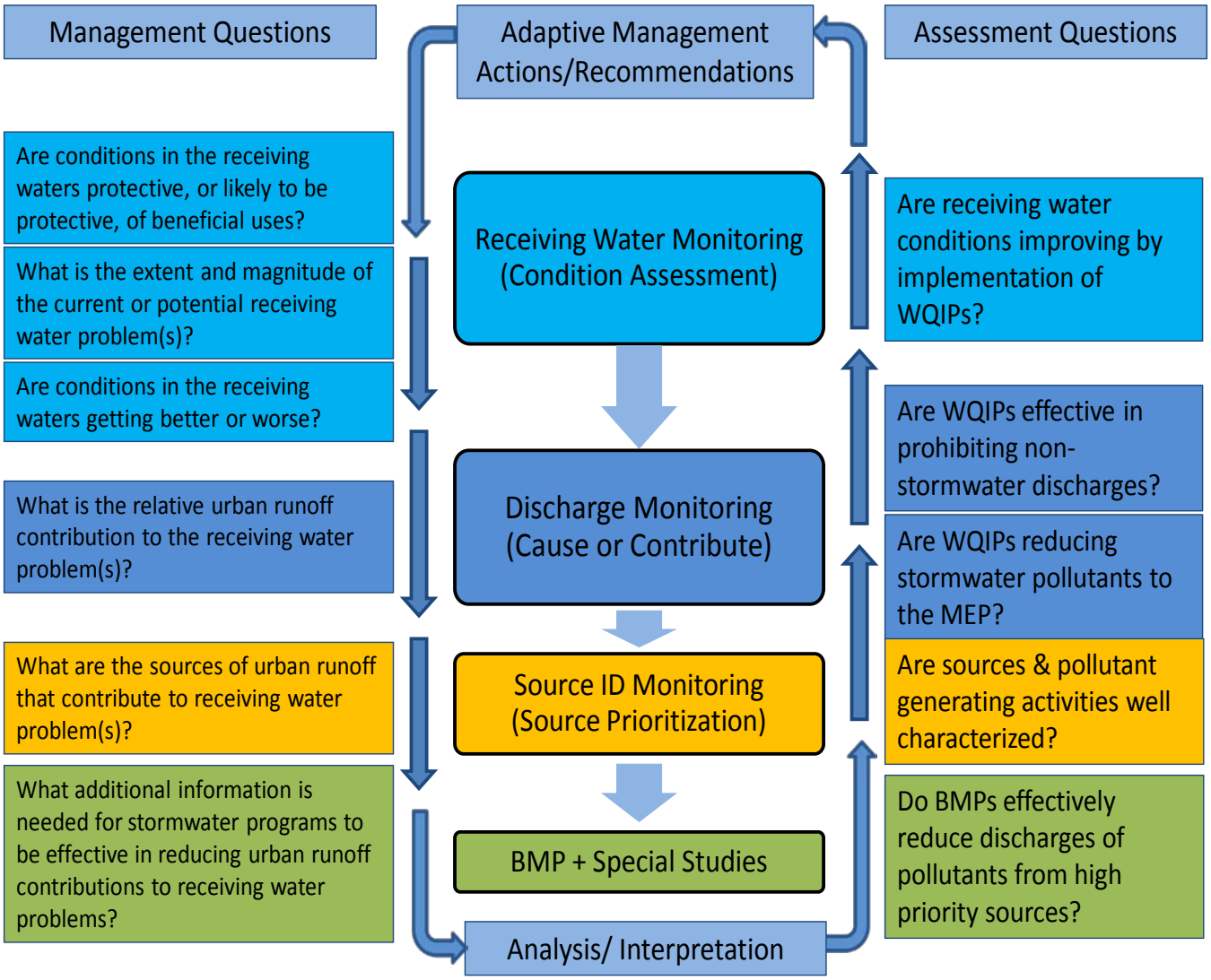

The main purpose of receiving water monitoring is to assess attainment of designated beneficial uses. Watershed receiving water priorities (Watershed priorities) are well established through prior monitoring of receiving waters in San Diego County (see Attachment 2-1of ROWD (San Diego County Copermittees, 2011), as well as the LTEA report (San Diego County Copermittees, 2011)). With watershed priorities well established for the next permit cycle, monitoring should be reduced in receiving waters and those efforts and resources can be refocused to determine to what degree discharges from the MS4s contribute to the identified watershed priorities. Receiving water monitoring will still be necessary to help assess stormwater program effectiveness, as shown in the feedback loop on the Conceptual Framework diagram (Figure 1). In this same context, receiving water priorities also may be revised over time as water quality management efforts are successful, or understanding of water

quality issues evolves. The Copermittees' participation in TMDLs also may involve receiving water monitoring to determine the effectiveness of TMDL implementation.

For constituents for which MS4 discharges are determined to contribute significantly to receiving water problems, source identification and prioritization studies may be performed on a constituent-specific basis. Such follow-up investigations may involve monitoring in the form of watershed-driven targeted studies. The results of the watershed-driven source investigations can then be used in the watershed planning process to develop strategies for reduction of the high priority sources of discharges of the subject constituent.

The Monitoring and Assessment Design framework includes the analysis of appropriate data to evaluate program effectiveness and identify data gaps, if any. This completes the monitoring information cycle to guide the alternate adaptive management approach.

Prioritization of Water Quality Issues to Foster Efficiency

There is a general consensus at focus meetings that identifying and focusing on water quality priorities (whether in constituents, sources, or effective outreach management practices) is the most efficient and effective way to manage the Copermittees' programs and resources for protecting and improving water quality. Prioritization developed within the WQIP and adaptive management of the programs over time are the primary strategies for achieving this while maintaining effective long-term monitoring efforts in all four monitoring categories (receiving water, MS4 discharges, source identification, and special studies). The Copermittees are committed to retaining monitoring that will continue to characterize and assess receiving water and outfall conditions, while placing increased focus on source identification and source control. This increased focus on information that supports decision about management of water quality will more effectively advance the Copermittees and the Water Board's common objective of improving receiving water and outfall water quality.

Adaptive Management, Jurisdictional Accountability, and Compliance

There has been general agreement at focus meetings with the Water Board staff and stakeholders that compliance with the WQIPs and the Jurisdictional Runoff Management Programs (JRMPs) is based on an adaptive management process, and that monitoring should be included within that context in the permit. The accountability provided by the JRMPs is based on actions implemented by the Copermittees and programmatic results, and may not depend on receiving water or outfall water quality. As an example, if a concentrated outreach effort has been implemented in a priority residential drainage area because of the frequency of broken or mismanaged sprinklers, and after a year there are fewer homes with irrigation issues, then that demonstrates jurisdictional accountability and effectiveness by reducing discharges to the MS4 and the receiving waters, even when changes in receiving water quality can't be immediately or easily demonstrated. Similarly, jurisdictional accountability and compliance with the monitoring requirements should be assessed based on the effectiveness of completed monitoring in answering the questions driving the need for monitoring.

Strategic Monitoring Approach

The Copermittees propose to include the following steps in developing the Monitoring and Assessment Programs for each WMA, as part of the development of the WQIPs:

1. Establish stormwater management priorities specific for each WMA ("Watershed Priorities") as part of WQIP development.
2. Compile existing monitoring data & assess available information for receiving waters, MS4 discharges, & sources or stressors within the watershed.
3. Identify regulatory & non-regulatory drivers that apply to water quality monitoring within the watershed, & list all associated monitoring responsibilities assigned to the Copermittees.
4. Evaluate the watershed priorities in context of available monitoring data & existing monitoring responsibilities, & develop specific management questions for each priority issue.
5. Establish metrics & identify assessments that should be performed to supply information needed to address the management questions.
6. Identify elements of a watershed-based monitoring program needed to address the watershed management questions & perform the necessary assessments.
7. Develop detailed monitoring plan to address the identified monitoring needs, coordinated with other ongoing monitoring in the watershed.

ALTERNATIVE PROVISION II.D - ELEMENTS AND RATIONALE

Receiving Water Monitoring

To address the need to assess receiving water conditions, the Copermittees propose to use a triad approach involving chemical, toxicity, and biological monitoring to evaluate the overall physical, chemical and biological conditions of receiving waters prior to the adoption of the WQIPs' Monitoring and Assessment Programs. This regionally coordinated and integrated approach will be implemented instead of the extensive chemical monitoring of receiving waters proposed in Sections II.D.1.a(2), II.D.1.b, II.D.2.b, and II.D.2.c, of the Tentative Order.

Figure 2 illustrates use of the question-driven approach in designing specific activities for receiving water monitoring and assessment. The process moves from left to right. Starting from the left hand side of the diagram, the assessment question derives from the current Provision II.D: Are there improvements in the conditions of receiving waters? The second column lists the relevant Stormwater Monitoring Coalition (SMC) management questions. These three SMC questions can be summarized as a status question, an extent and magnitude question, and a long-term trend question. The management questions are meant to provide context for the more specific, technical monitoring sub-questions and associated monitoring activities. Monitoring results from any given activity may only partially contribute to answers for the overarching "big picture" management questions. The Specific questions in the next column are the detailed study questions used to design the monitoring program. Several example study question are presented here and linked to the specific activity in the last column. Each activity responds to one or more study questions. When study questions are answered, then the specific activity is completed. The next prioritized study question can then begin as part of the adaptive process.

The Copermittees' proposed Regional monitoring and integrated assessments represent a cost-effective approach that avoids duplication of monitoring efforts, and provides a comprehensive evaluation of receiving waters conditions.

Figure 2. Receiving Water Monitoring and Assessment Planning Process, Showing Example Specific Questions

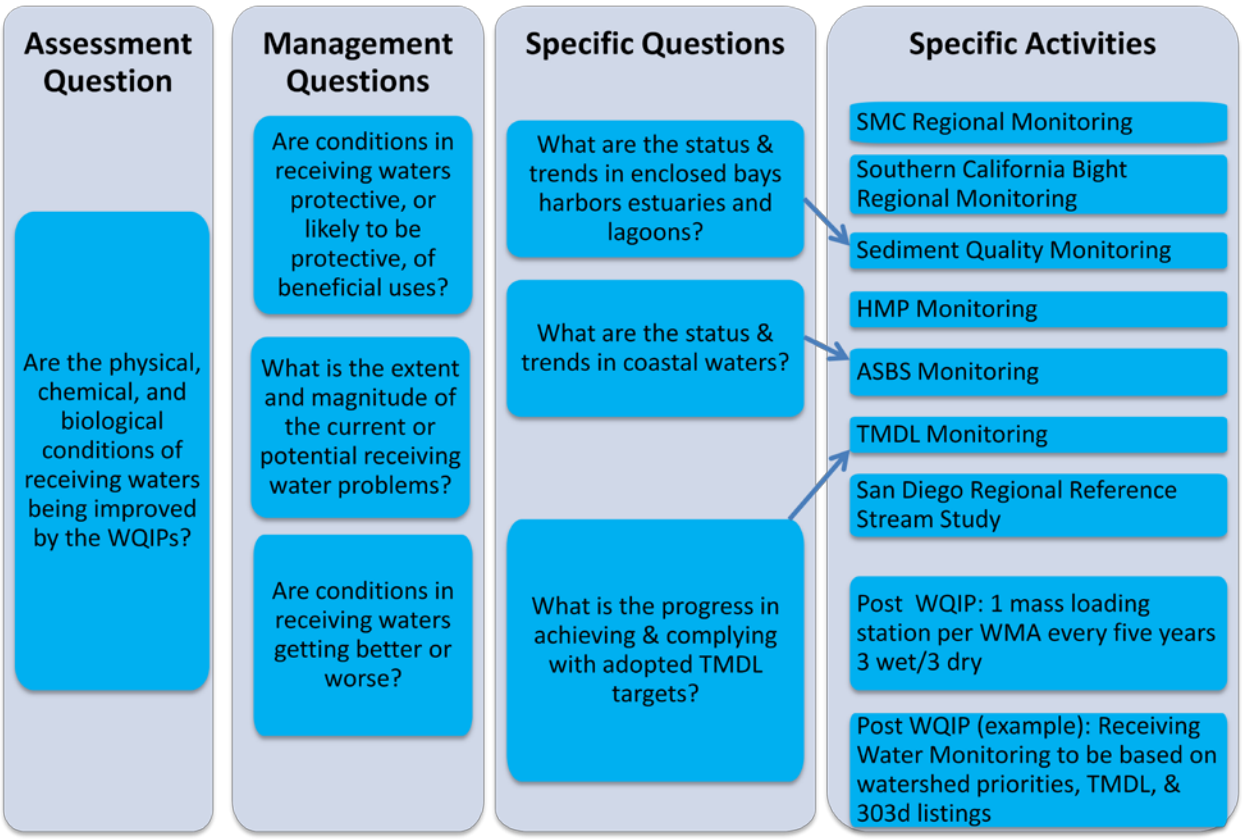

Pre-WQIP Monitoring

In the Alternative Provision II.D, the assessment of receiving water conditions and improvements in receiving water conditions is addressed by an approach that integrates and coordinates seven existing regional receiving water programs rather than focusing on watershed specific sites. The Copermittees also plan to leverage additional opportunities for regional coordination through the Southern California Bight 2013 Regional Monitoring Program, as well as make use of third party data where feasible. Specific elements of the Copermittees' receiving water approach are discussed in the following paragraphs.

a. SMC Regional Monitoring

Management Questions addressed: *Are conditions in receiving waters protective, or likely to be protective, of beneficial uses? What is the extent and magnitude of the current or potential receiving water problems?*

The Copermittees are committed to participate in the SMC Regional Monitoring Program through its planned completion, and to provide a statistically sound representative sampling of receiving water quality in the region's watersheds.

Copermittees currently sample 16 sites annually across the urbanized region of San Diego County. The SMC Regional Monitoring Program uses a probabilistic design to characterize coastal watersheds using bioassessment metrics and related analyses, including but not limited to: physical habitat characterization, Southern California Index of Biological Integrity scoring, macroinvertebrate and algal taxonomy, algal biomass, water chemistry, and toxicity. The study incorporates both reference and non-reference streams and is designed to identify potential additional biological and/or chemical stressors affecting stream health, such as channel alteration and presence of invasive species.

b. Southern California Bight Regional Monitoring

Management Questions addressed: *Are conditions in receiving waters protective, or likely to be protective, of beneficial uses? What is the extent and magnitude of the current or potential receiving water problems?*

The Copermittees will participate in the Southern California Bight Regional Monitoring program as a trade-off with other routine monitoring requirements to the extent allowable under the 2007 Permit. Planning begins in September 2012 and Copermittees plan to divert funds from the 2012-2013 Ambient Bay and Lagoon Program to the Summer 2013 Bight 13 Program. Additionally, Copermittees are willing to use these funds allocated for 2013-2014 to conduct additional Ambient Bay and Lagoon Monitoring in Summer of 2013, pending Water Board approval. Although the Bight Study design is not finalized, Copermittees anticipate focusing on addressing the Sediment Quality Objectives per State Water Resources Control Board Resolution No. 2008-0070, *Adoption of a Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality*.

The Bight program involves detailed characterization of coastal and offshore receiving waters, as well as targeted special studies. The Bight regional monitoring effort is designed to build upon the data collected during the Bight 08 regional program, to assess the extent of contamination in the Southern California Bight. Receiving water samples are collected in or near coastal areas, bays, estuaries, offshore islands, and open water/deep ocean within the Bight. Water quality and sediment samples may be collected to provide data for model input, to answer management questions developed by the stakeholders as part of the program. In addition, special studies such as influence of emerging contaminants and potential new technology implementation (i.e. bioanalytical screening and/or genetic coding) may be conducted as part of the Bight 13 Regional Monitoring. Copermittees will leverage as appropriate with these other programs to further scientific understanding of the potential affects of discharges from MS4s to the overall health of the receiving waters.

c. Sediment Quality Monitoring

Management Questions addressed: *Are conditions in receiving waters protective, or likely to be protective, of beneficial uses? What is the extent and magnitude of the current or potential receiving water problems?*

Specific Question: *What is the condition of sediments in enclosed bays and estuaries with respect to the statewide sediment quality objectives?*

The Copermittees anticipate performing monitoring of bay and lagoon sediments, as needed, as part of Bight 13 monitoring under the Copermittees' responsibility to conform to the requirements of the Statewide Sediment Quality Objectives regulatory program, per State Water Resources Control Board Resolution No. 2008-0070 – Adoption of a Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality.

d. Hydromodification Management Plan (HMP) Monitoring

Management Questions addressed: *Are conditions in receiving waters protective, or likely to be protective, of beneficial uses? What is the extent and magnitude of the current or potential receiving water problems?*

The Copermittees will perform receiving water monitoring as required per Section 8 of the approved 2010 Hydromodification Management Plan (HMP) Monitoring Plan, as Revised July 14, 2010, and California Regional Water Quality Control Board, San Diego Region, Resolution No. R9-2010-0066. Additionally, geomorphic assessments will be included in the long-term monitoring receiving water program to address long-term trends to evaluate the effects of hydromodification.

e. TMDL Monitoring

Management Questions addressed: *Are conditions in receiving waters protective, or likely to be protective, of beneficial uses? Are conditions in receiving waters getting better or worse?*

Specific question: *What is the progress in achieving and complying with adopted TMDL targets?*

The Copermittees shall perform water quality monitoring as required per the Implementation Plans or approved CLRPs of effective TMDLs, including compliance monitoring for the following TMDLs:

- TMDL for Diazinon in Chollas Creek Watershed Resolution No. R9-2002-0123; Effective as of September 11, 2003.
- TMDLs for Dissolved Copper in Shelter Island Yacht Basin Resolution No. R9-2005-0019; Effective as of December 2, 2005.
- TMDLs for Dissolved Copper, Lead, and Zinc in Chollas Creek Resolution No. R9-2007-0043; Effective as of October 22, 2008.
- TMDLs for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay Resolution No. R9-2008-0027; Effective as of September 15, 2009.
- Revised TMDLs for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek) Resolution No. R9-2010-0001; Effective as of April 4, 2011.

f. San Diego Regional Reference Stream Study

Management Questions addressed: *Are conditions in receiving waters protective, or likely to be protective, of beneficial uses?*

The San Diego Regional Reference Stream Study is designed to characterize background concentrations of bacteria, nutrients, and trace metals in natural streams within the jurisdiction of the San Diego Water Board. The study includes sampling during wet and dry weather at up to 12 sites considered representative of natural conditions (a contributing drainage area at least 95 percent undeveloped) and that vary in regards to hydrology, catchment size, and geology. This Study started began in 2012 and is anticipated to be completed over the next three years.

WQIP Monitoring

The WQIP monitoring will build on the above benefits and support an assessment-driven, adaptive management approach in the WQIP Management and Assessment Plan to focus monitoring on the needs of the Program Managers to address focused receiving waters monitoring where needed.

As previously indicated, ongoing monitoring programs will be reassessed for the WQIP, and modified as necessary (with Water Board Executive Officer's approval) to support the highest priorities in each WMA. The Monitoring and Assessment Programs developed as part of the WQIPs will promote efficient use of resources and produce data meaningful for the management and improvement of receiving water quality. In the proposed Alternative Provision II.D, assessment of receiving water conditions and improvements in receiving water conditions is addressed by an approach that integrates seven existing regional receiving water programs rather than focusing on watershed specific sites. Following the question-driven approach of Figure 1, the minimum requirements to be addressed in the WQIP will include the seven specific monitoring elements summarized under the pre-WQIP monitoring as applicable to the WMA and the long-term receiving water monitoring element as described below and in Figure 2.

Long-Term Receiving Water Monitoring

Management Question addressed: Are conditions in receiving waters getting better or worse?

The Copermittees will conduct receiving water monitoring for assessment of long-term trends using receiving water stations selected from among the existing mass loading stations (MLS) and temporary watershed assessment stations (TWAS). These long-term receiving water stations will be selected to be representative of regional receiving water quality and must be approved by the Executive Officer prior to monitoring. The frequency of monitoring will be three wet weather events and three dry weather events every five years.

Discussion of Long-Term Monitoring

The rationale for changes to the Receiving Water and Watershed Monitoring as proposed in T.O. Provisions II.D.1.a (2), II.D.1.b, ii.D.2.b, and II.D.2.c is provided below.

Mass Loading Station Monitoring can be reduced to once every five years, based on the statistical simulations conducted for in the ROWD (2011 and included in Attachment 2-1). The analyses conducted for the ROWD shows that decreasing the

sampling frequency to every five years will not affect the ability to detect long-term trends. This conclusion is further supported by the finding that priority constituents have not changed substantially for individual MLS receiving water sites in the past five years. The 5-year frequency for receiving water monitoring will continue to allow adequate detection of trends in the long-term, as needed to answer SMC management question 5. Consequently, because all mass loading stations have already been sampled in the 2011-2012 or 2012-2013 monitoring seasons, ongoing long-term monitoring will be addressed in the WQIP Monitoring and Assessment Programs, instead of implementing additional long-term trend monitoring during the Pre-WQIP period. This allows resources to be redirected from these receiving water monitoring efforts to monitoring efforts that better support solutions with increasing emphasis on MS4 outfall monitoring, source identification and source abatement activities. The Copermittees are committed to evaluating wet weather receiving water conditions at one MLS station per WMA to preserve long-term trends, assess receiving water quality and programmatic effectiveness, and evaluate WMAs comparatively.

Constituent priorities in receiving waters for 2010 are similar to those of the previous assessment in 2005. Additionally, the upstream TWAS and downstream MLS have similar constituent priorities. Based on this knowledge, the core SMC receiving water monitoring questions 1 and 2 (i.e., the questions addressing impacts to beneficial uses and the magnitude and extent of problems) have already been successfully addressed by the monitoring for the 2007 Permit. Because the constituent concentrations and patterns are generally similar at the TWAS and MLS (and especially within a watershed), there is no additional value to continuing the TWAS monitoring in its current form (*See Attachment 2-1 from the ROWD (San Diego County Copermittees, 2011)*). Additional focused receiving water monitoring to address key needs will be evaluated and addressed by Program Managers in the WQIP Monitoring and Assessment Programs.

Reference Site Monitoring: In Section II.D.2.a of the Tentative Order, the Regional Water Board included a requirement to monitor at least one reference watershed monitoring station for each WMA. The Copermittees propose to use the results of the San Diego Region Stream Reference Study in lieu of this requirement. Regional reference sites that are based on similar geology and watershed size will provide an appropriate measure of the expected receiving water conditions achievable in Copermittees' jurisdictions as a result of the future implementation of their WQIPs. Within the framework of the three compliance assessment areas, the intended purpose of monitoring reference sites for each WMA is to support assessments of whether *the physical, chemical, and biological conditions of receiving waters are being improved by the WQIPs.*

The specific assessments that receiving water monitoring programs are generally designed to support also include: *Are conditions in receiving waters protective or likely to be protective of beneficial uses? What is the extent and magnitude of the current or potential receiving water problems?* The proposed regional and reference condition monitoring will provide the needed information about the range of physical, chemical, and biological conditions that are natural in receiving waters of the San Diego region under both wet and dry conditions. This information will be incorporated into the Copermittees' Integrated Evaluation of Water Quality Improvement Strategies to support several related assessments:

- The conditions of receiving waters and status of receiving water beneficial uses,
- The extent to which MS4 discharges cause or contribute to receiving water problems during both dry weather and wet weather,
- Appropriateness of final dry weather and wet weather numeric goals that will restore the inadequately supported beneficial uses in the receiving waters;
- Characterizing non-storm water and storm water pollutant loads from receiving water flows within the authority of the Copermittee to control and from other non-anthropogenic sources;
- Progress of the water quality improvement strategies toward attaining non-storm water and storm water pollutant load reductions or improvements to water quality conditions;

Bacteria Compliance Monitoring: Copermittees propose to address the need for Bacteria Compliance Monitoring with the recently developed monitoring programs prepared to comply with bacteria TMDL implementation requirements (due to be submitted to the Water Board in October 2012). This monitoring will be conducted in place of the extensive bacteria compliance monitoring proposed in Attachment E of the Tentative Order to comply with the Bacteria TMDL that applies to 20 waterbodies. The current language proposed in Attachment E would replace the results of the recent stakeholder planning effort that has just been completed, and the monitoring proposed in the Tentative Order is so extensive that Copermittee resources for implementation would be redirected to monitoring that would not improve water quality.

Discussion of Jurisdictional Boundary Monitoring

In Section II.D.1.a(2)(a) of the Tentative Order, the Regional Water Board included a requirement to monitor at hydrologically connected receiving water monitoring stations in the lowest and upper most parts of the WMA near the boundary of its jurisdiction during dry weather. The monitoring described in the Tentative Order will not effectively address the three main programmatic objectives, and it will also not provide an effective means to assess jurisdictional accountability if that is the goal of the monitoring. An upstream-downstream monitoring approach in receiving waters has been shown to be a relatively ineffective method of detecting statistically and programmatically significant changes in the receiving waters from one location to the next or for the assessment of impacts of discharges on receiving waters.

There are a number of related reasons why receiving water monitoring is not an effective means of evaluating jurisdictional accountability or characterizing jurisdictional pollutant loads from dry weather MS4 discharges. The first reason is that receiving water monitoring is simply a less direct measure of jurisdictional performance and loads than the discharge monitoring that is already included in the program. A second related reason is that MS4 discharges typically comprise only a fraction of the receiving water flows and loads. A third factor is the typically high variability of the concentrations of analytes in receiving waters and discharges. This high variability in combination with the first two factors results in a low “signal to noise ratio” when the signal of interest is effects of discharges on receiving water concentrations.

The practical consequence of this combination of high variability and relatively small differences is that it requires high numbers of samples to detect statistically and programmatically significant differences expected between receiving water locations. Real differences expected between typical upstream/downstream receiving water sites are commonly less than 10%. Differences in concentrations that would be considered relevant to assessing jurisdictional accountability and impacts would be established by the Water Board and Copermittees, but are probably also in the range of 10% or less of average concentrations for any specific parameter.

Several of these challenges in using receiving water quality monitoring to distinguish differences of this magnitude are illustrated with a regionally relevant example of trace metals TMDL monitoring data for Ballona Creek (Los Angeles County). The Ballona Creek example is an appropriate comparison for the Copermittees' region based on similar geography, climate, hydrology, and a similarly high degree of urbanization in the watershed. The receiving water monitoring data for this program were collected over more than a 10-year period from 2001 to 2011 and include wet and dry season monitoring events. For this example, dry weather results (n>50 samples per site) are presented for copper for the four Ballona Creek locations (Figure 3). The variability of the data is illustrated by the range (between 1 and 2 orders of magnitude for dissolved copper and total copper) and coefficients of variance for untransformed data of 0.5 - 0.75 for most sites. Although there is an increasing percentage of urban influence from upstream to downstream for these sites (from left to right in Figure 3), there is no discernable trend in the receiving water quality. Using more rigorous analysis of variance methods (ANOVA) to evaluate the Ballona data, the differences in mean concentrations of total copper were not statistically significant from site to site, although the largest difference between site means was greater than 22%. Differences in mean concentrations of dissolved copper were statistically significant among sites, but the smallest significant difference detected was 36%, and the next smallest *non*-significant difference was 30%. Applying statistical power analysis to further evaluate the ability to distinguish "signal" from "noise" in the Ballona Creek dissolved copper data, it can be seen that reliably detecting differences as small as 20% between sites would require more than 100 sample events, and differences as small as 10% would require more than 700 events even at a lower statistical power of 80% (Table 2).

The analysis of the Ballona Creek TMDL data illustrate why jurisdictional boundary monitoring in receiving waters would be an inefficient and impractical means of assessing impacts from the Copermittees' discharges. The Ballona Creek system is reasonably representative of conditions expected in the Copermittees' receiving waters, and is based on a robust data set. The variability of the Ballona copper data is also typical or slightly lower than is common for relatively small urban receiving waters and is therefore a reasonable conservative surrogate for other systems and parameters. Some parameters would be expected to be slightly less variable (e.g., conductivity, hardness) and might require somewhat fewer samples to detect programmatically relevant differences. However, the majority of priority constituents are likely to be equally or more variable than total or dissolved copper (e.g., bacteria, strongly particulate associated pollutants such as legacy organochlorine pesticides and many other trace metals), and would require similar or more samples to detect meaningful differences between sites.

A similar analysis was performed on data from Chollas Creek in San Diego County, involving 60 or more samples for each site from the period 1994-2010, with very similar results.

Figure 3. Ballona Creek Dry Weather Copper Data

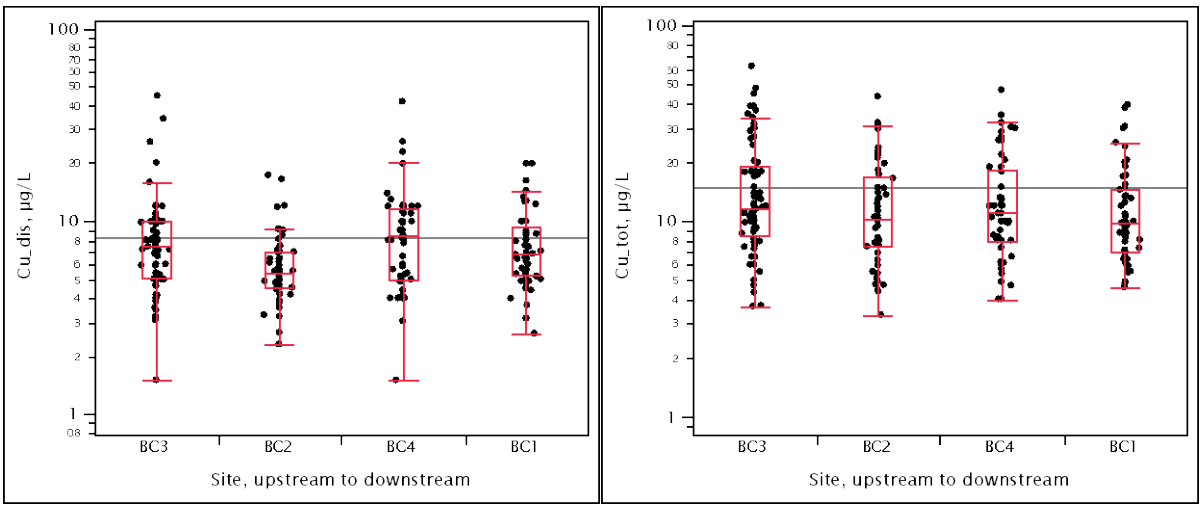

Table 1. Analysis Of Variance Results For Ballona Creek Copper Data

Dissolved copper						Total copper					
Source	DF	Sum of Squares	Mean Square	F Ratio	p-value	Source	DF	Sum of Squares	Mean Square	F Ratio	p-value
Model	3	331.6	110.52	3.65	0.0133*	Model	3	1.84	0.614	1.5574	0.2005
Error	228	6901.1	30.27			Error	228	89.91	0.394		
C. Total	231	7232.6				C. Total	231	91.75			

LSMeans Ordered Differences, Tukey HSD

Site			Least Sq Mean	Median	Site		Least Sq Mean	Median
BC4	A		9.4	8.5	BC3	A	13.2	11.6
BC3	A		8.8	7.5	BC4	A	11.7	11.0
BC1	A	B	8.3	6.8	BC2	A	10.9	10.3
BC2		B	6.1	5.4	BC1	A	10.6	9.7

Levels connected by same letter are *not* significantly different.

Table 2. Minimum Detectable Differences Between Sites

Power analysis results based on Ballona dissolved copper data, with a typical COV in log-scale of 0.2. Analysis is based on detection of differences between two sites, at a 95% confidence level, and a statistical power of 80% or 90% probability of detecting the difference.

	Minimum Detectible Significant Difference for stated sample size	
Sample size	**Power=0.8**	**Power = 0.9**
20	45%	53%
40	32%	37%
60	26%	30%
80	22%	26%
100	20%	23%
787	10%	12%

The jurisdictional boundary monitoring approach would also be ineffective at detecting differences in jurisdictional receiving water quality or impacts, since the relative differences in similar adjoining jurisdictions would be expected to be small (e.g., often less than a 10% difference in average pollutant concentrations). In each case, an upstream-downstream monitoring approach will be an ineffective method of assessing the impacts of dry weather discharges on the receiving water or differences between jurisdictional program effectiveness, as well as programmatic compliance with the management objective of eliminating dry weather MS4 discharges.

An additional unrelated challenge is that in many cases, the differences in flows and loads between upstream and downstream receiving water locations are not an adequately reliable measure of jurisdictional flow (and therefore loads and impacts). This is because of unmeasured losses or gains in flow due to the equilibrium between the surface water and groundwater. Interaction with groundwater is normal for most surface water streams, but is typically seasonally variable and difficult to accurately measure and characterize. The uncertainty due to the uncharacterized effect of these fluxes with groundwater is magnified in smaller and often ephemeral receiving water streams in the Copermittees' jurisdictions.

If the dry weather jurisdictional receiving water monitoring described in the Tentative Order is intended to support assessments of whether *the physical, chemical, and biological conditions of receiving waters are being improved by the WQIPs*, the Copermittees' proposed coordinated regional approach to receiving water monitoring provides a more effective means to accomplish this objective (as described in the following section).

Benefits of Proposed Receiving Water Monitoring Approach

The principal benefits of the Copermittees' Alternative Provision II.D approach to receiving water monitoring and assessment, as described above, can be summarized as follows:

- Supports broad spatial and temporal representation
- Integrates existing receiving water monitoring programs
- Builds on the existing receiving water data collected by Copermittees and others

- Preserves long-term trend assessments based on scientifically sound, detailed statistical analyses of data collected over the last 10 to 15 years, and allows continued comparisons of WMAs
- Supports question/assessment-driven, adaptive management approach

Dry Weather Outfall Monitoring

Instead of the extensive chemical testing of MS4 outfalls proposed in the Tentative Order, Copermittees propose a more strategic approach based on knowledge from 15 to 20 years of dry weather monitoring. Follow up actions based on chemical action levels have not proven to be an efficient use of resources. As reported in the Copermittees' recent ROWD ((San Diego County Copermittees, 2011) See Attachment 1-1), follow-up investigations are rarely effective even when required within two business days after discovery. This is due largely to the intervening time between sampling the discharge and reporting the laboratory analytical results (typically more than a week). The resulting upstream investigations conducted over a week after the IC/ID was observed were rarely able to detect the source of the IC/ID and the two-day response requirement caused significant disruption of other higher priority efforts. The Copermittees found that the disruption to conduct the investigation was not an effective use of resources and rarely resulted in the elimination of more IC/IDs. The Copermittees will evaluate the alternative approach described in the Copermittees' proposed alternative Provision II.D during the Pre-WQIP monitoring phase. Based on its merits, the approach may be further refined in the Monitoring and Assessment Program developed as part of the WQIP with justifications.

Figure 4 illustrates use of the question-driven approach in designing specific activities for dry weather outfall monitoring and assessment.

Figure 4. Dry Weather Outfall Monitoring and Assessment Planning Process

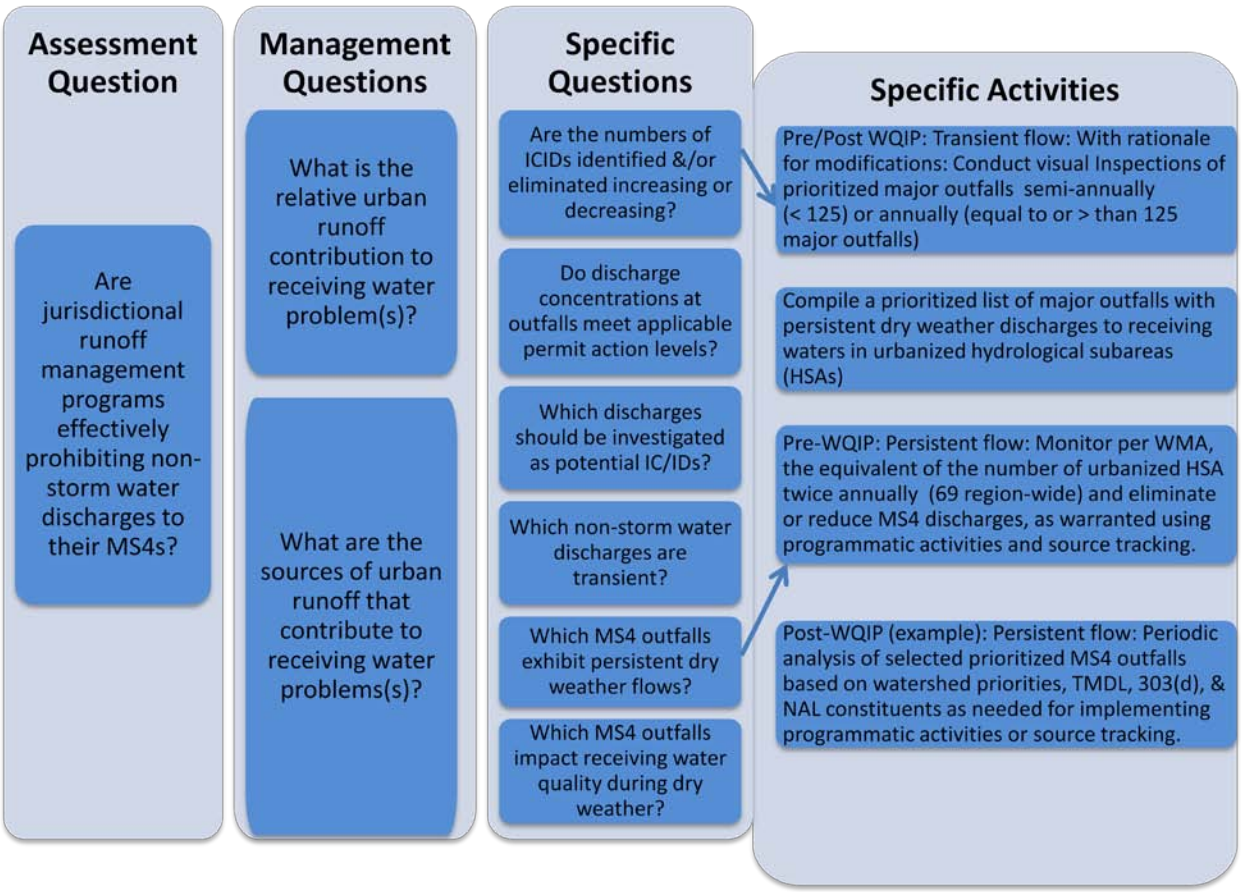

Pre-WQIP Monitoring

In Section II.D.1.a of the Tentative Order, the Regional Water Board includes a requirement to monitor outfalls and inter-MS4 sites as part of each Copermittees' Dry Weather Jurisdictional Monitoring. Within the framework of the three compliance assessment areas, the intended purpose of monitoring dry weather MS4 outfalls is to support assessments of whether *jurisdictional runoff management programs effectively prohibit non-storm water discharges into their MS4s.*

As with the other proposed monitoring elements, the non-stormwater discharge monitoring in Alternative Provision II.D follows a question/assessment-driven approach. The primary assessment question driving this monitoring element is "*Are jurisdictional runoff management programs effectively prohibiting non-storm water discharges to their MS4s*?" To answer this overarching question, monitoring is focused on the following SMC management questions:

> *What is the relative urban runoff contribution to receiving water problem(s)?*
>
> *What are the sources of urban runoff that contribute to receiving water problems(s)?*

From these two management questions, specific monitoring questions have been developed to drive the design of an efficient and effective MS4 outfall monitoring program. Where possible, these questions are aligned directly with assessment questions in the draft Tentative Order. The specific monitoring questions developed to drive the initial monitoring design are:

Are the numbers of IC/IDs identified or eliminated increasing or decreasing?

Do pollutant concentrations at outfalls meet applicable permit action levels?

Which non-storm water discharges are transient?

Which MS4 outfalls exhibit persistent dry weather flows?

These questions have led the Copermittees to develop a two-pronged approach to effectively prohibit non-stormwater MS4 discharges. The first element targets transient discharges and is focused on IDDE, The second element is strategically designed to prioritize and address outfalls with persistent non-stormwater flows. These approaches are outlined below.

Transient flows: Prior to the completing the WQIP, transient flows will be addressed through visual inspection of major MS4 outfalls that discharge to a receiving water (in addition to other programmatic components such as construction, industrial/commercial, and municipal inspection programs, and responses to hot line complaints). All of the major MS4 outfall inspections will be conducted in dry weather as defined by the permit and will be conducted year round where possible. Obvious illicit discharges (e.g., those with unusual color, unusual odor, or high flows) shall be investigated immediately. The scope of the dry weather outfall inspection program will be adjusted based on the number of major MS4 outfalls that discharge to receiving waters:

- Copermittees with fewer than 125 major MS4 outfalls that discharge to a receiving water shall visually inspect 80% of these outfalls twice annually.
- Copermittees with 125-249 major MS4 outfalls that discharge to a receiving water shall visually inspect a prioritized list of these outfalls annually. .
- Copermittees with 250 or more major MS4 outfalls that discharge to a receiving water shall visually inspect a prioritized subset of these outfalls annually. The total number of annual inspections per Copermittee with 250 or more major MS4s will be a minimum of 250 and up to a maximum of 500 locations.

The major MS4 outfalls that are safe to access and avoid disturbances of critical habitat shall be prioritized based on threat to water quality and will consider factors including but not limited to:

- Proximity to a flowing receiving water
- Reported exceedances in water quality data
- Surrounding land use
- Presence of watershed priority constituents, TMDLs & CWA 303(d) list of impaired water bodies
- Flow rate

Persistent Flows: Prior to the completing the WQIP, the Copermittees' approach to effectively prohibit persistent non-stormwater discharges will focus on Major MS4 outfalls in the Urbanized Area (see Figure 5). Under this approach, Copermittees will:

- Identify persistent flows and develop a prioritized list of outfalls based on their threat to water quality. Prioritization will be based on visual surveys and historical knowledge. As in the SMC Model Monitoring Program, "persistent" is defined as observable flows in 3 consecutive site visits.
- Reduce dry weather flows through programmatic actions and source investigations
- Twice annually, Copermittees will monitor an average of one prioritized outfall in each urbanized hydrological subarea (there are 69 urbanized HSAs in San Diego County); However, WMAs will have the discretion to monitor the equivalent number of the highest priority outfalls and not necessarily in each of the HSAs. Samples will initially be analyzed for a broad list of constituents, and subsequent monitoring will focus on constituents of concern as needed to guide effective reduction & elimination.
- If persistent dry weather flows in a priority outfall are determined to be (a) conditionally allowed per Provision II.E.2.a, (b) anthropogenic and effectively eliminated, or (c) covered by another NPDES permit; then the outfall will be replaced in the monitoring program with the next highest priority outfall.
- Allow flexibility in location of persistent flows (guided by the prioritizations) for each WMA to maximize effectiveness of program. Specifically, within the constraints of the minimum required number of monitored outfalls, Copermittees may choose to monitor more than one high priority flow in some HSAs, and none in other HSAs with only low-priority persistent flows.

The Copermittees will evaluate the data produced by the dry weather outfall monitoring and inspections annually, rank outfalls according to potential threats to receiving water quality, exeedance of numeric action levels, and prioritize the outfalls. The prioritized list shall be submitted in the Annual Report to the Regional Board and used to update the WQIP, with the goal of eliminating or reducing flows and/or loads in order of the ranked priority list through targeted programmatic actions and source investigations. As part of the Annual Report, Copermittees shall also report the non-storm water discharges and pollutant loads from the Copermittee's MS4based on these data. Targeting the high priority outfalls allows elimination or reduction of the routine monitoring of inter-MS4 and non-major outfalls included in the TO Dry Weather Jurisdictional Monitoring without adversely affecting the ability of the Copermittees to make programmatic assessments about the effectiveness of their jurisdictional runoff management programs to prohibit non-storm water discharges to their MS4s. By targeting high priority outfalls, it also provides support for conservative assessment of whether dry weather discharges have the potential to impact receiving waters.

Figure 5. San Diego County MS4 System in Urban Areas

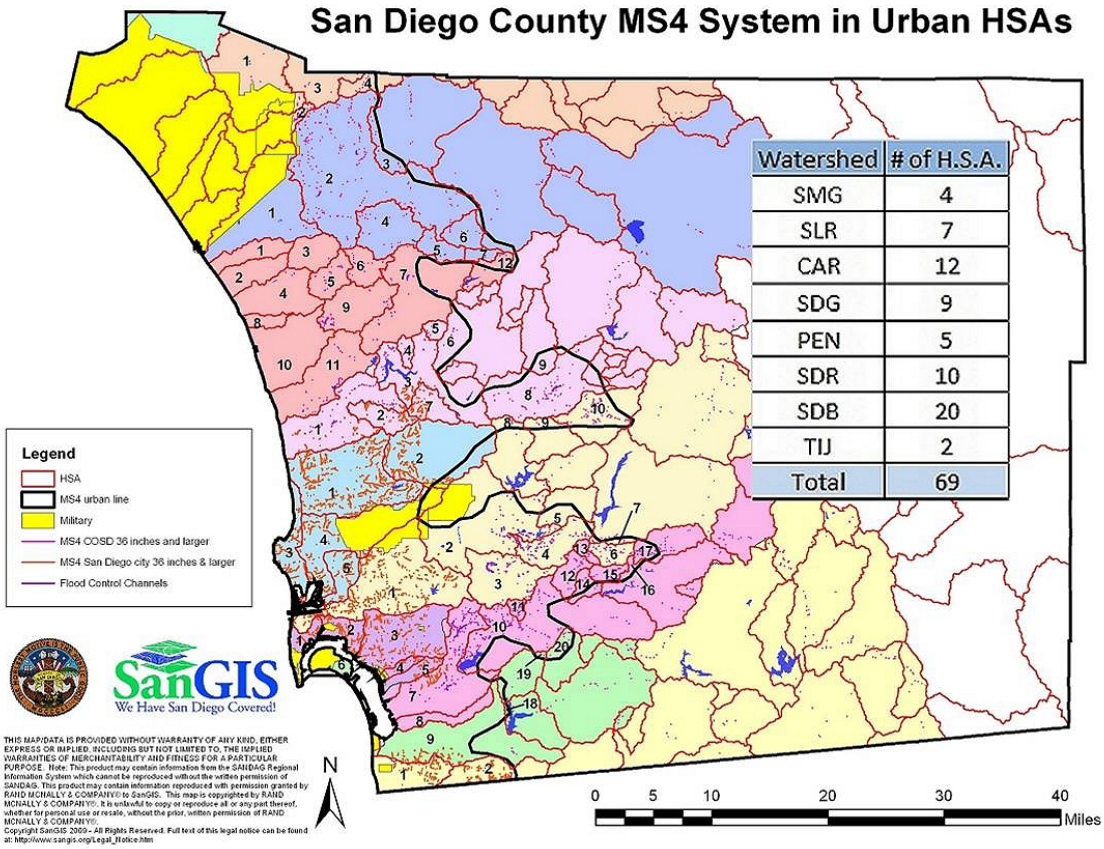

Table Notes: HSAs are numbered and outlined in red for each watershed. The inland extent of the approximate urban area is indicated by a solid black line.

Discussion of IDDE Program Efficiency and Effectiveness (Transient Flow)

The Copermittees' proposed approach to detect and eliminate non-storm water discharges and illicit connections/illegal discharges (IC/IDs) is directly focused on potential impacts to receiving waters. The proposed dry weather transient outfall monitoring targets all major outfalls that discharge directly to receiving waters within each jurisdiction. Each of these major outfalls will be visually inspected once or twice annually (up to 500 per jurisdiction) during dry weather conditions – once in dry season and once during wet season. Outfalls with persistent[6] dry weather flows will be addressed by the characterization and prioritization process described in the

[6] Persistent flow, as modified from the SMC Model Monitoring Program definition of persistent WQO exceedance, is defined as "the presence of flow, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch of precipitation during three consecutive monitoring and/or inspection events". All other flow is considered transient.

Copermittees' Alternative Provision II.D.2.b., as described above, and as applicable in the approved WQIP. Outfalls with transient dry weather flows will follow the procedures to be developed under Provision II.E.2.d. Where inspections indicate evidence of transient discharges through color, odor, unusual flow, etc – investigations will follow immediately. In cases where field test kits are deemed to be helpful, they will be used. Where inspections indicate persistent flow, outfalls will be included in the NSW discharge program to address persistent flows.

One aspect of the Tentative Order's Dry Weather Jurisdictional Monitoring is intended specifically to detect and eliminate non-storm water discharges and illicit discharges and connections (IC/IDs) to the Copermittees' MS4. As described in Section II.D.1.a of the TO, this would consist of monthly monitoring of all outfalls or MS4 segments in each quarter-mile section within the Copermittees' jurisdictions. This strategy would require sampling and field measurements at hundreds of sites in many of the jurisdictions, and analysis of thousands of samples per year for a variety of laboratory analytical parameters. Although the approach outlined in the Tentative Order would generate a great deal of water quality data for dry weather flows and IC/IDs, experience indicates that most of the flows sampled would be unlikely to have any impacts on receiving water. Additionally, since the purpose of the program is to eliminate dry weather flows and IC/IDs entirely, there is little value to collecting the dry weather water quality data for MS4 sites other than for outfalls. Most of the water quality data collected would not support assessment of the stated program management objective, which is to effectively prohibit non-storm water discharges to their MS4s. Consequently, this approach will be extremely resource intensive while also being relatively inefficient in eliminating the MS4 flows and IC/IDs with potential to adversely impact receiving waters.

As has been discussed and generally agreed to by the SDRWQCB and other TO stakeholders in focus meetings, the goal of the program is to eliminate dry weather flows entirely. If flows can be eliminated based on visual observations and IC/ID investigations, then there is little value to collecting water quality data and, according to the strategic monitoring frameworks available, this monitoring would not be necessary as it is not required to answer the management and assessment questions. Not only is water quality information not needed to get the desired results (i.e., liminating dry weather discharges), but the Copermittees' past monitoring results illustrate that this type of monitoring is relatively ineffective for this purpose. As an example, based on the number of samples collected between 2007 and 2009 through the current permit's monitoring program, only 3.7% of the samples collected resulted in a successful detection and elimination of an illicit discharge (County of San Diego Copermittees' 2011 ROWD Attachment 1-1).

In contrast, IDDE programs based on responding to complaints about dry weather flows have been demonstrated to have a much higher rate of detecting and eliminating dry weather flows (~41% of inspections by the County of San Diego, and an average of 58% of inspections by seven other Copermittees using this approach). Another approach used by the County of San Diego Copermittees, the Industrial/Commercial Inspection Program, demonstrated that these industrial and commercial facilities had a very high level of compliance, with no illicit discharges or connections detected in a total of 1351 inspections conducted in 2009-2011 (Table 3). The industrial/commercial, municipal, and construction inspections have a large spatial coverage. The Copermittees attribute the success and effectiveness of this program in

preventing IC/IDs to their process of proactively engaging facility owners and operators through outreach and routine inspections.

Table 3. Illicit Discharge Detection and Elimination Programs, FY 2009-2011

Program	Total Site Visits	Total ICIDs Detected	Total ICIDs Eliminated	ICIDs eliminated per inspection
Total Industrial/Commercial Inspections Results	1351	0	0	0.0%
Total Complaint Responses	939	382	382	40.7%
Total Dry Weather Monitoring	174	0	0	0.0%

The proposed transient flow program is rooted in a three-pronged approach designed to provide broad spatial and increased temporal coverage. The focus is on three main areas: sources, the MS4, and outfalls discharging to receiving waters.

Experience shows that the main sources of NSW discharges are addressed via programs such as ICM inspections. Based on an analysis of recent data, this program appears effective in preventing illicit discharges through routine contact, OAE, and facility inspections. This program is broad in spatial coverage and occurs throughout the year.

The MS4 is continually monitored via jurisdictional programs such as complaint response, MS4 cleaning, and staff/citizen patrolling and reporting of illicit discharges. These programs have been shown to be effective in responding to and eliminating transient discharges. They also have a broad spatial element and are ongoing throughout the year.

One aspect of the Tentative Order's Dry Weather Jurisdictional Monitoring is intended specifically to detect and eliminate non-storm water discharges and illicit discharges and connections (IC/IDs) to the Copermittees' MS4. As described in Section II.D.1.a of the TO, this would consist of monthly monitoring of all outfalls or MS4 segments in each quarter-mile section within the Copermittees' jurisdictions. This strategy would require sampling and field measurements at hundreds of sites in many of the jurisdictions, and analysis of thousands of samples per year for a variety of laboratory analytical parameters. Although the approach outlined in the Tentative Order would generate a great deal of water quality data for dry weather flows and IC/IDs, experience indicates that most of the flows sampled would be unlikely to have any impacts on receiving water. Additionally, since the purpose of the program is to eliminate dry weather flows and IC/IDs entirely, there is little value to collecting the dry weather water quality data for MS4 sites other than for outfalls. Most of the water quality data collected would not support assessment of the stated program management objective, which is to effectively prohibit non-storm water discharges to their MS4s. Consequently, this approach will be extremely resource intensive while also being relatively inefficient in eliminating the MS4 flows and IC/IDs with potential to adversely impact receiving waters.

The third element of the proposed transient approach consists of visual monitoring at major MS4 outfalls. This requires the updating of inventories and periodic surveys of major outfalls, looking for flow indicative of illicit discharges. Where surveys indicate evidence of transient discharges through color, odor, unusual flow, etc – investigations

will follow. In cases where test kits are deemed to be helpful, they will be used. Where inspections indicate persistent flow, outfalls will be included in the non-storm water discharge program to address persistent flows.

WQIP Monitoring

The pre-WQIP program to control transient and persistent dry weather discharges will continue after completion of the WQIP, with any Water Board approved modifications needed to be responsive to Program Managers and to focus on watershed priorities, TMDLs & 303d-listed water bodies.

Benefits of Proposed Dry Weather Outfall Monitoring Approach

The principal benefits of the Copermittees' Alternative Provision II.D dry weather outfall monitoring approach, as described above, can be summarized as follows:

- Broad spatial and temporal coverage
- Supports assessment-driven, adaptive management approach
- Distinction between persistent and transient flows focuses resources on eliminating and/or controlling high priority threats to receiving waters quality
- Utilizing other elements of the stormwater programs (inspections, complaint calls) and third party information will efficiently and effectively assist jurisdictions in eliminating non-storm water discharges

Wet Weather Outfall Monitoring

Within the framework of the three compliance assessment areas, the intended purpose of monitoring wet weather MS4 outfalls is to support assessments of whether *jurisdictional runoff management programs are reducing pollutants in storm water to the MEP.* The management questions related to this objective include: *What is the relative urban runoff contribution to receiving water problem(s)? What are the sources of urban runoff that contribute to receiving water problem(s)?* Additional related specific questions include: *Which MS4 outfalls impact receiving water quality during wet weather? Do discharge concentrations at MS4 outfalls meet applicable permit action levels? How do representative MS4 outlet discharge concentrations, loads, and flows change over time?* The Copermittees' approach to wet weather outfall monitoring is illustrated in Figure 6.

Pre-WQIP Monitoring

For the Jurisdictional Stormwater monitoring in Section II.D.1.b, instead of extensive MS4 outfall chemical monitoring, the Copermittees propose to monitor representative homogeneous land uses or mixed land uses.. These representative data will be extrapolated to better inform the planning process by prioritizing drainages for implementation efforts. Using the specific questions to guide design, the Copermittees commit to completing the current MS4 outfall program as part of the Pre-WQIP monitoring. Additionally, the Pre-WQIP outfall monitoring will consist of at least 3 monitoring stations per watershed management area. Selection of the representative outfalls with homogeneous land use types may be coordinated and shared among Copermittees to provide the most efficient representation and characterization of major land use categories. Representative typical mixed use sites also may be used as a cross check of the land-use-specific modeling results. Modeling currently being done for some watersheds as part of the bacteria implementation plan effort also may be built upon.

This proposed MS4 program will be more resource-intensive than the Copermittees' current MS4 program, and demonstrates the Copermittees' commitment to gathering useful data to target implementation activities. The post-WQIP program will continue a commitment to perform monitoring of outfalls to characterize pollutants from the MS4s. The design of the program will evolve depending on the specific questions and needs of the WMA. For example, if the question of trends is most important to demonstrate progress, then sampling representative MS4 outfalls with typical mixed use drainage areas may be preferred.

Figure 6 illustrates use of the question-driven approach in designing specific activities for wet weather outfall monitoring and assessment.

Figure 6. Wet Weather Outfall Monitoring and Assessment Planning Process

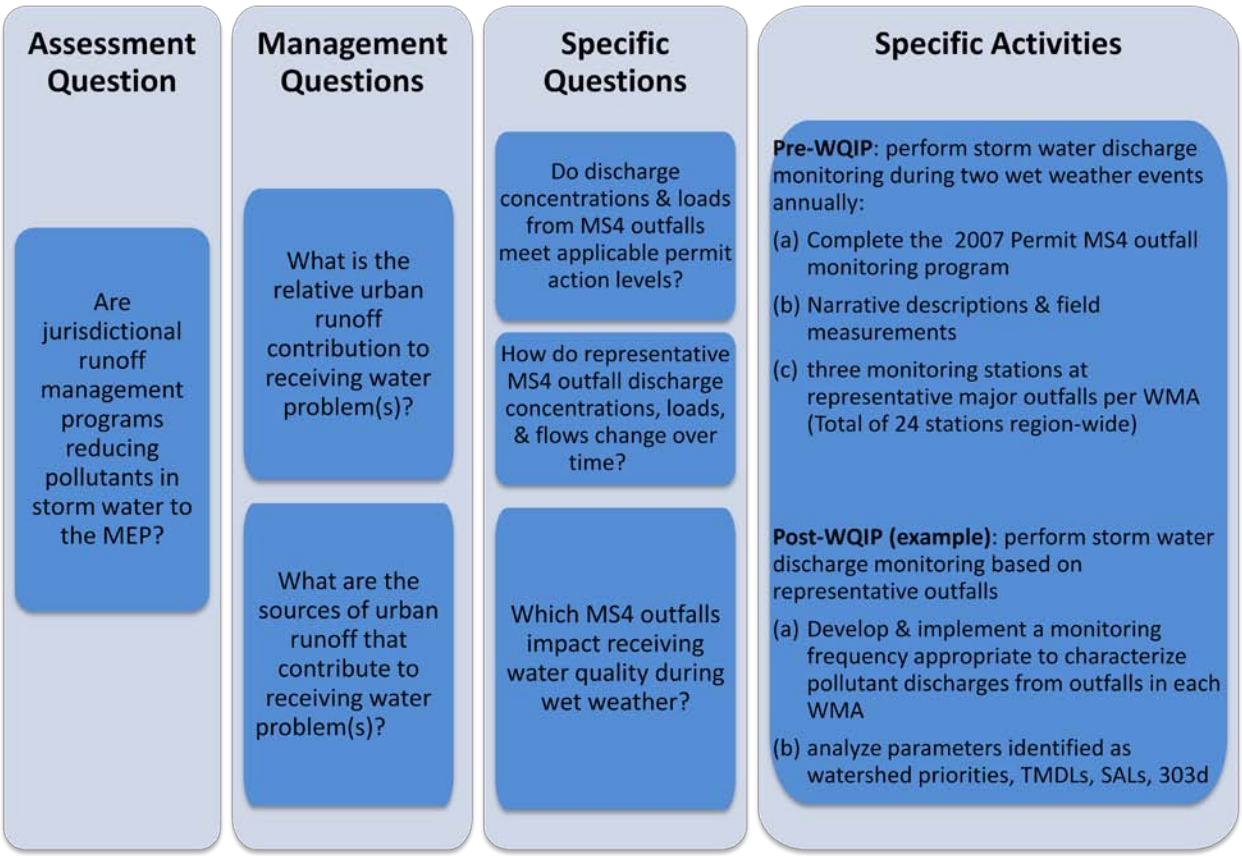

WQIP Monitoring

The outfall monitoring in the WQIPs will continue monitoring at representative major MS4 outfalls with homogenous land uses and/or typical mixed-use drainage areas. Selection of these representative outfall locations may be coordinated and shared among the Copermittees to provide the most efficient representation and characterization of major land use categories (residential, commercial, industrial). The number of sites, the frequency of sampling, and the analyte list may be modified in the WQIPs with Regional Board approval. An adaptive strategy, based on analysis of data collected is proposed and is further discussed in the following paragraphs. The data analysis is anticipated to occur once during the permit cycle.

This adaptive strategy for wet weather outfall monitoring provides a number of significant benefits relevant to program flexibility and effectiveness, and storm water runoff quality management.

An assessment of the wet weather outfall monitoring program allows identification of data gaps and priorities that can be addressed with the ongoing representative wet weather outfall monitoring. By employing statistical power analysis based on available runoff quality data to support the development of the wet weather monitoring, the Copermittees can gain an understanding of how many sites and events are needed to

adequately address the management questions about potential impacts and trends for each land use and pollutant of interest. This becomes especially valuable in making informed decisions about allocating resources to continue or modify existing monitoring. For example, continued monitoring of an already well-characterized site or category will provide little additional useful information about differences from other categories or impacts on receiving water. This is illustrated in Figure 7 with a generic power curve showing that for sample sizes greater than 40, the ability to identify differences does not increase substantially, and the proportional value of additional data therefore decreases. In the context of making storm water runoff management decisions, this means that continuing to collect data to answer the same question will not provide a substantially better or more accurate answer after a certain number of samples. In the context of adaptive management, when that point is reached, resources should be shifted to answer different or new questions.

Figure 7. Power Curve For Difference Of Single Sample Mean, 95% Confidence Level And 90% Statistical Power

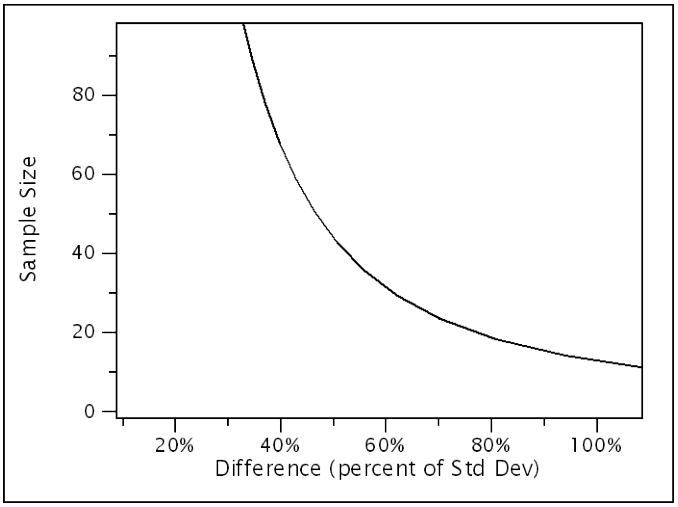

The monitoring design for wet weather monitoring also should consider available comparable runoff quality data from other programs in the region and statewide (e.g., Ventura County, Sacramento County, SCCWRP Urban Runoff Study, etc.). If the data from these programs indicate that runoff quality for specific land uses does not differ significantly between or within land uses, the monitoring design and level of monitoring effort can be adjusted accordingly. This evaluation will be performed later in the Permit Term.

Benefits of Proposed Wet Weather Outfall Monitoring Approach

The principal benefits of the Copermittees' Alternative Provision II.D wet weather outfall monitoring approach, as described above, can be summarized as follows:

- Broad spatial & temporal coverage
- Ability to extrapolate results across each WMA
- Supports assessment-driven, adaptive management approach

- Flexibility in site selection will focus resources on the highest watershed priorities, whether it be for representative drainage area data or homogeneous land-use based data.

Source/Stressor ID and Special Studies

The Copermittees recognize that the watersheds are at different stages of understanding with respect to each of the four monitoring components identified in Figure 1. The Copermittees anticipate an increased focus on Source/Stressor Identification and Special Studies (See Figure 8 and Figure 9) in the next permit cycle for watersheds with well-defined priorities such as adopted TMDLs. The Copermittees' approach to these elements is to continue implementation of already planned efforts, and to develop additional efforts with the long-term planning process for Monitoring and Assessment as part of the WQIP. The results of the watershed-driven source investigations can then be used in the watershed planning process to develop strategies for reduction of the high priority sources of discharges of the subject constituent.

Management Question: *What are the sources of urban runoff that contribute to receiving water problem(s)?*

The Copermittees will perform Source/Stressor Identification studies as needed to investigate sources of pollutants or stressors in cases where MS4 discharges are deemed to be causing or contributing to receiving water priorities, based on monitoring performed. Stressor/Source Identification studies will make use of relevant available water quality data and related information. The results of the Stressor/Source Identification studies will be shared regionally among the Copermittees to provide information useful for improving adaptive management of urban runoff through implementation of the WQIPs.

The principal role of Source/Stressor Identification is to identify and prioritize pollutant generating activities and source categories. Identification of high-priority sources is an important step in support of the WQIP process, primarily to inform the development of effective watershed-specific pollutant reduction strategies for particular priority constituents. Source identification will be conducted on a constituent-specific basis. The source identification efforts will focus on constituents identified as watershed priorities, and include a prioritization of sources based on magnitude, controllability, and other factors. For example, in the case that indicator bacteria was determined to be the highest priority constituent. If an analysis of potential sources of bacteria also indicated that human sources of bacteria have a higher risk of containing illness causing pathogens than non-human sources, the initial source ID efforts would emphasize using surveys and microbial source tracking or other methods to identify human sources of bacteria, so that these human sources can be prioritized and implementation of appropriate strategies developed.

Another role of Source/stressor identification is to identify and prioritize pollutant generating activities and source categories. Polluting generating activities (PGAs) are activities that can result in the release of pollutants. For example, restaurants are identified as a potential source of bacteria. Restaurant PGAs that could release bacteria include hosing out dumpsters and washing off floor mats in the parking lot. Once the PGAs are identified and prioritized, then behavioral changes can be targeted. Identification of high priority sources is an important step in support of the WQIP process, to help inform the development of effective pollutant control strategies for particular priority constituents on a watershed-specific basis.

Figure 8 illustrates use of the question-driven approach in designing specific activities for source identification monitoring and assessment.

Figure 9 illustrates use of the question-driven approach in designing specific activities for special studies monitoring and assessment.

Figure 8. Source and Stressor Identification Monitoring and Assessment Planning Process

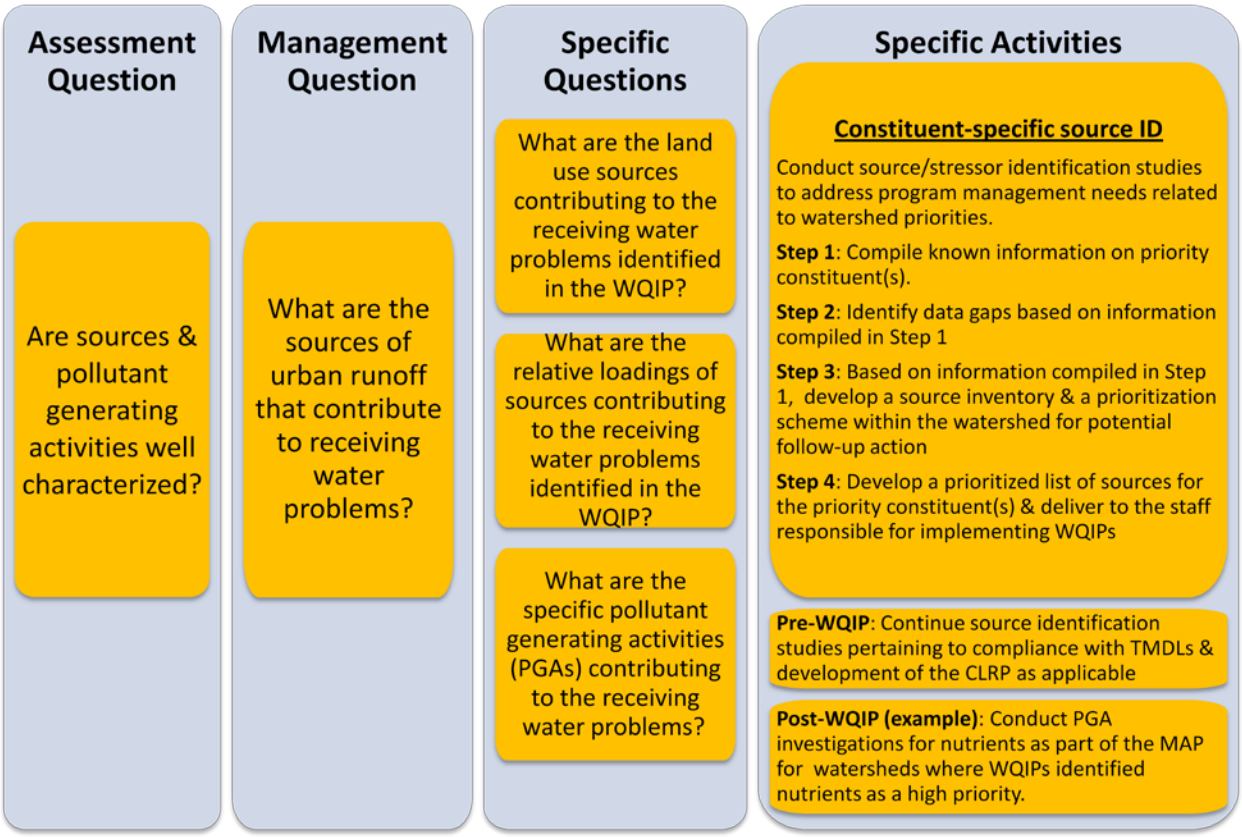

Figure 9. Special Studies Monitoring and Assessment Planning Process

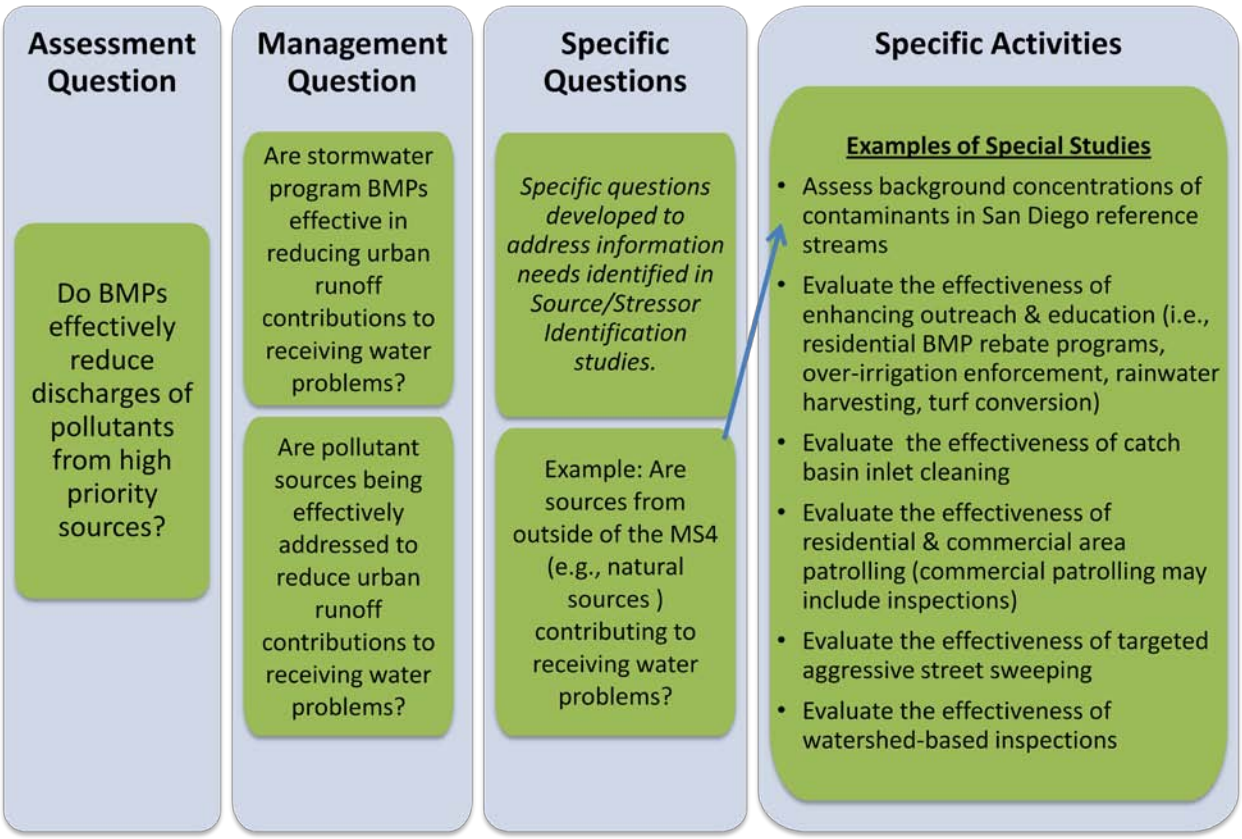

Pre-WQIP Monitoring

Prior to adoption of the WQIP, the Copermittees will continue source identification and special studies pertaining to compliance with TMDLs and the development of the CLRP implemented under Order No. R9-2007-0001. As indicated previously in this report, the San Diego Region Stream Reference Study is a Regional Study to be implemented during the Pre-WQIP period. Additional Special Studies, such as BMP pilot studies or focused source identification studies will be implemented in some watersheds. Details of these studies will be included in the WQIP or Copermittees will provide criteria to guide when a special study is required as part of the WQIP planning process. This focus of the Copermittees' resources on the appropriate sources/activities will result in effective implementation strategies for water quality management.

WQIP Monitoring

Following adoption of the WQIPs, the Copermittees shall conduct source/stressor identification and special studies based on Monitoring and Assessment Plans developed for the WQIPs. The plans or the conditions for when special studies are appropriate will be submitted with the WQIPs.

Benefits of Proposed Source ID and Special Studies Monitoring Approach

The principal benefits of the Copermittees' Alternative Provision II.D Source Identification and Special Studies monitoring approach, as described above, can be summarized as follows:

- Responsive to Program Management needs
- Provides programs with information to verify, quantify, and prioritize sources
- Provides links between sources, activities & effects on runoff quantity & quality
- Answers questions related to program & BMP effectiveness
- Addresses data gaps to allow more effective program implementation
- Provides scientifically valid information related to regulatory principles

ADDITIONAL MONITORING DESIGN REFERENCES

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RECEIVING WATER ASSESSMENT OF MASS LOADING STATIONS/ TEMPORARY WATERSHED ASSESSMENT STATIONS

Wet and dry weather samples are collected at mass loading stations (MLS) and temporary watershed assessment stations (TWAS) within nine watershed management areas. Samples are collected per the requirements of Table 1 of the San Diego Regional Water Quality Control Board Order No. R9-2007-001 (Permit). The MLS stations have been consistently sampled for the last 10 to 15 years whereas the TWAS address specific questions beginning with the 2007 Permit and were not designed to be long term monitoring stations.

This monitoring is designed to answer core management questions 1, 2, and 5. The core monitoring management questions per the Permit are as follows:

1. *Are conditions in receiving waters protective, or likely to be protective, of beneficial uses?*
2. *What is the extent and magnitude of the current or potential receiving water problems?*
3. *What is the relative urban runoff contribution to the receiving water problem(s)?*
4. *What are the sources of urban runoff that contribute to receiving water problem(s)?*
5. *Are conditions in receiving waters getting better or worse?*

Analysis of receiving water data was conducted to evaluate progress so far on questions 1, 2 and 5. Additionally, the following sub-questions were analyzed to guide the Copermittees' monitoring recommendations for the next permit:

1. Have priority constituents changed over this current Permit cycle compared to the previous?
2a. How have the TWAS contributed to the understanding of the spatial extent and magnitude of receiving water problems?
2b. How do the monitoring results of the upstream TWAS compare to the downstream MLS?
2c. Can wet weather priority constituents be linked to land uses in the watersheds?
3. What frequency of sampling at the MLS is necessary to maintain the detection of long-term trends of receiving water quality?

Statistical analysis of the water quality data from the MLs and TWAS concluded that:

- Receiving water constituent priorities in 2010 are similar to the previous assessment conducted in 2005 for wet weather. Dry weather ambient monitoring was added in the 2007 Permit to address seasonal variability. With few exceptions, priority constituents are the same in all watersheds. Wet weather priorities, in general, are bacteria and sediment. Dry weather priorities, in general, are bacteria, nutrients and total dissolved solids (TDS). Synthetic pyrethroids, not analyzed under the previous Permit, are an emerging regional issue beginning to be addressed at the state and national levels.
- With few exceptions, the constituent priorities at TWAS and MLS across the region are similar. Constituent concentrations and patterns of occurrence are similar at TWAS and MLS in the same watershed.

- Additional constituent priorities were identified in Chollas Creek Watershed (copper and zinc) and Tijuana River Watershed (e.g., ammonia, surfactants (MBAS), and biological chemical oxygen demand). Both of these watersheds have unique characteristics compared to the rest of the region. Tijuana River is subject to periodic sewage discharges from across the international border and Chollas Creek has a high density of industrial facilities and transportation corridors.
- Statistical analysis of 8 to 18 years of wet weather receiving water data indicate that sampling frequency may be reduced from alternate years to once every five years without increasing the amount of time necessary to detect long term trends. Because wet weather data has a higher variability than dry weather data, it is assumed that a reduced frequency for ambient dry monitoring will also be appropriate.
- Statistical analysis of the wet weather receiving water data also showed that if a significant increasing or decreasing trend is observed, a reduction of sampling frequency from alternate years to every five years will not increase the time necessary to detect a significant trend.

Conclusions

Constituent priorities in receiving water are similar in 2010 to the previous 2005 assessment. Additionally, the upstream TWAS and downstream MLS have similar constituent priorities. Therefore, core monitoring questions 1 and 2 (i.e., impact to beneficial uses and the magnitude and lateral extent of problem) have been successfully addressed by the monitoring of the 2007 Permit. Because the constituent concentrations and patterns are generally similar at the TWAS and MLS, especially within a watershed, there is no added value to continuing TWAS monitoring in its current form. The similarity of priority constituents across the region support reducing the number of receiving water stations from the 2007 Permit. Several stations (3 to 5 across the region) close to the mouth of the watershed will be adequate to monitor receiving water conditions in the region. The region has the wet weather constituent priorities of bacteria and sediment and the dry weather constituent priorities of bacteria, nutrients and TDS. Resources can be reduced from receiving water monitoring and redirected to working on how to fix the problems by increasing emphasis on MS4 outfall monitoring, source identification and source abatement activities.

Wet weather sampling at the MLS may be reduced to once every five years. The statistical simulation results show that decreasing the sampling frequency to every five years will not affect the ability to detect long-term trends. This finding is further supported by the finding that receiving water priority constituents have not changed substantially at individual MLS during the past five years. Therefore, reduced receiving water monitoring will still allow for detection of trends in the long-term, answering management question 5.

Supporting Documentation

A list of watershed management area and mass loading station (MLS) acronyms is presented in Table 1.

Table 1. Watershed Management Area and Watershed Acronym List

Watershed Management Area	Watershed Name	Mass Loading Station

Watershed Management Area	Watershed Name	Mass Loading Station
Santa Margarita	Santa Margarita River	SMR-MLS; SMR-MLS2
San Luis Rey River	San Luis Rey River	SLR-MLS
Carlsbad Watershed	Loma Alta Creek	LAC-TWAS-1
	Buena Vista Creek	BVC-TWAS-1
	Agua Hedionda Creek	AHC-MLS; AHC-TWAS-1
	Escondido Creek	ESC-MLS; ESC-TWAS-1
San Dieguito River	San Dieguito Creek	SDC-MLS; SDC-TWAS-1; SDC-TWAS-2
Los Peñasquitos River	Los Peñasquitos	LPC-MLS; LPC-TWAS-1; LPC-TWAS-2
Mission Bay and La Jolla	Tecolote Creek	TC-MLS
	Mission Bay	MB-TWAS-1; MB-TWAS-2
San Diego River	San Diego River	SDR-MLS; SDR-TWAS-1; SDR-TWAS-2; SDR-TWAS-3
San Diego Bay	Chollas Creek	CC-SD8(1)-MLS; CC-NF54
	Sweetwater River	SR-MLS; SR-TWAS-1
	Otay River	OR-TWAS-1
Tijuana River	Tijuana River	TJR-MLS; TJR-TWAS-1; TJR-TWAS-2

Sub-Question #1: *Have priority constituents changed over this current Permit cycle compared to the previous?*

Determination of whether or not receiving water priorities remained similar between the Baseline Long Term Effectiveness Assessment (BLTEA) and the current long term effectiveness assessment (LTEA) was made by comparing the two sets of results at the watershed level. The BLTEA analysis was conducted in 2005 and grouped wet and ambient data from the municipal separate storm sewer system (MS4) and the receiving waters, along with whether or not an constituent was included on the Section (§) 303(d) list. The LTEA analysis was conducted in 2010 and evaluated data from the MS4, receiving water (RW), wet, and ambient separately. In addition, inclusion of a constituent on the §303(d) list did not result in that constituent categorized as high priority. Constituent groups are used for the comparison of the BLTEA and the receiving waters LTEA. Priorities within watersheds were also evaluated. The purpose of this evaluation was to determine if the answer to management question #1 (conditions in receiving waters protective of beneficial uses) is the same in 2010 (LTEA) as the 2005 (BLTEA).

As shown in Table 2, wet weather priorities are similar between the BLTEA and the LTEA, as well as across the region. Cells highlighted orange are high priorities (greater than 50-percent exceedance of water quality benchmark (WQB)) and yellow cells are medium priorities (greater than 25-percent exceedance of WQBs, up to and including 50-percent exceedance of WQBs). A comparison of BLTEA and LTEA priority results at each MLS indicates that priorities remain similar between the two evaluations. Due to the dry weather ambient monitoring element initiated in the 2007 Permit, seasonal differences in priority constituents were identified in receiving water. Nutrients were not found to be a priority constituent during wet weather monitoring, but were a high priority constituent across many watersheds during dry weather conditions. These seasonal variations may in part be attributed to the differences in WQBs between seasons.

Since 2005, Copermittees participation in the Stormwater Monitoring Coalition (SMC) Regional Monitoring Program has provided additional ambient dry weather nutrient data. In general, during dry weather bacteria, nutrients, and TDS are constituent priorities found in watershed

management areas across the region. In general, during wet weather, bacteria and sediments (total suspended sediments) are region-wide constituent priorities.

Table 2. Comparison of 2005 Baseline Long Term Effectiveness Assessment and 2010 Long Term Effectiveness Assessment Priority Results

Priority Group	BLTEA or LTEA	SMR-MLS	SLR-MLS	AHC-MLS	ESC-MLS	SDC-MLS	LPC-MLS	TC-MLS	SDR-MLS	CC-SD8(1)	SR-MLS	TJR-MLS
Baseline Long Term Effectiveness Assessment Priorities												
Bacteria	BLTEA											
Gross Pollutants	BLTEA											
Heavy Metals	BLTEA											
Nutrients	BLTEA											
Pesticides	BLTEA											
Sediment	BLTEA											
Total Dissolved Solids	BLTEA											
Toxicity	BLTEA											
Turbidity	BLTEA											
2010 Long Term Effectiveness Assessment Wet Weather Priorities												
Bacteria	LTEA-WET											
Gross Pollutants	LTEA-WET											
Heavy Metals	LTEA-WET											
Nutrients	LTEA-WET											
Pesticides	LTEA-WET											
Sediment	LTEA-WET											
Total Dissolved Solids	LTEA-WET											
Toxicity	LTEA-WET											
Turbidity	LTEA-WET											
2010 Long Term Effectiveness Assessment Dry Weather Priorities												
Bacteria	LTEA-DRY											
Gross Pollutants	LTEA-DRY											
Heavy Metals	LTEA-DRY											
Nutrients	LTEA-DRY											
Pesticides	LTEA-DRY											
Sediment	LTEA-DRY											
Total Dissolved Solids	LTEA-DRY											
Toxicity	LTEA-DRY											
Turbidity	LTEA-DRY											

BLTEA Priorities were based on Section 303(d) listing and combined wet and dry weather data
Orange highlights indicate high priorities (>50% exceedance of WQOs/WQBs), and yellow highlights indicate medium priorities (>25-50% exceedance of WQOs/WQBs)

Sub-Question #2a. How have the TWAS contributed to the understanding of the spatial extent and magnitude of receiving water problems?

and

Sub-Question #2b. How do the monitoring results of the upstream TWAS compare to the downstream MLS?

Priority constituents were also examined within watersheds to determine whether or not Priorities remained consistent throughout a watershed, and to help determine whether or not the TWAS have contributed to the understanding of the spatial extent and magnitude of receiving water quality problems. Three watersheds were examined in detail, and are presented in Table 3. The results demonstrate that Priorities remained consistent within the same watershed. Some differences in upstream and downstream relationships may be due to differences in the Basin Plan objectives in a specific hydrologic subarea (e.g. the TDS results for San Diego River stations).

Table 3. Agua Hedionda Creek, Escondido Creek, and San Diego River Mass Loading Station and Temporary Watershed Assessment Station Wet Weather Priority Constituent Comparison

Station	HSA	No. Samples	Assessment Scores - NPDES Monitoring - Wet Weather					
			Chemistry	Toxicity	IBI	Bacterio-logical	Nutrients	TDS
Agua Hedionda Hydrologic Area								
AHC-MLS	Los Monos (904.31)	9	TSS, Turbidity, Bifenthrin	*Hyalella azteca* acute	Very Poor	Fecal Coliforms		TDS
AHC-TWAS-1	Los Monos (904.31)	2	TSS, Turbidity, Chlorpyrifos, Bifenthrin	*Hyalella azteca* acute	Very Poor	Fecal Coliforms		TDS
Escondido Creek Hydrologic Area								
ESC-MLS	San Elijo (904.61)	9	Turbidity, Bifenthrin, TSS		NA	Fecal Coliforms		TDS
ESC-TWAS-1	Escondido (904.62)	2	Turbidity, Bifenthrin, TSS, Diazinon		Very Poor	Fecal Coliforms		TDS
San Diego River Hydrologic Area								
SDR-MLS	Mission San Diego (907.11)	9	Turbidity Bifenthrin		Very Poor	Fecal Coliforms		
SDR-TWAS-1	Mission San Diego (907.11)	2	Turbidity/Bifenthrin Surfactants (MBAS)	*Ceriodaphnia dubia* reproduction	Very Poor	Fecal Coliforms		TDS
SDR-TWAS-2	Santee (907.12)	2	TSS/Turbidity Bifenthrin/Permethrin pH/BOD	*Hyalella azteca* acute survival	Very Poor	Fecal Coliforms		

Station	HSA	No. Samples	Assessment Scores - NPDES Monitoring - Wet Weather					
			Chemistry	Toxicity	IBI	Bacterio-logical	Nutrients	TDS
SDR-TWAS-3	Santee (907.12)	2	Turbidity Bifenthrin		Very Poor	Fecal Coliforms		

-Orange highlights indicate high priorities (>50% exceedance of WQOs/WQBs), yellow highlights indicate medium priorities (>25-50% exceedance of WQOs/WQBs), blue indicates low priorities (≤25% exceedance of WQOs/WQBs). Only group scores of blue (low priority) are presented in the table.
-NA, not applicable no data collected

Sub-Question #2c.Can wet weather priority constituents be correlated to land uses in the watersheds?

A cluster evaluation was conducted to evaluate whether or not watersheds with similar land use also exhibited similar Priority constituent concentrations during wet conditions. The TWAS data were included to evaluate whether or not Priority constituent similarities between MLS and TWAS were found within watersheds.

Land use proportions upstream of each receiving water catchment (MLS or TWAS) were calculated using Geographic Information System (GIS), and compared using cluster analysis. The results of the analysis are presented in Figure 1. A map of the cluster results is presented in Figure 2. Several distinct land use group patterns were found, three of which are discussed here. Cluster “A” is defined by watersheds that contain relatively large proportions of industrial and agricultural land uses, and includes Agua Hedionda Creek (AHC-MLS and AHC-TWAS-1), San Dieguito Creek (SDC-MLS), Loma Alta Creek (LAC-TWAS-1), and Otay River (OR-TWAS-1). Cluster “C1” is defined by the highly urbanized watersheds, and includes relatively high proportions of public facilities, residential, transportation, and commercial land uses. This group includes Buena Vista Creek (BVC-TWAS-1), Sweetwater River (SR-MLS), Chollas Creek (CC-SD8(1)-MLS and CC-NF54-MLS), and portions of San Dieguito (SDC-TWAS-1). Finally, the most rural watersheds are characterized by Clusters “D1, D2, and E”, which include relatively large proportions of vacant and undeveloped land, agriculture, and spaced rural residential land uses. Watersheds included in the cluster are portions of San Dieguito (SDC-TWAS-2), San Luis Rey (SLR-MLS and SLR-TWAS-1), Sweetwater River (SR-TWAS-1), Tijuana River (TJR-MLS, TJR-TWAS-1, TJR-TWAS-2), and Santa Margarita River (SMR-MLS and SMR-MLS2).

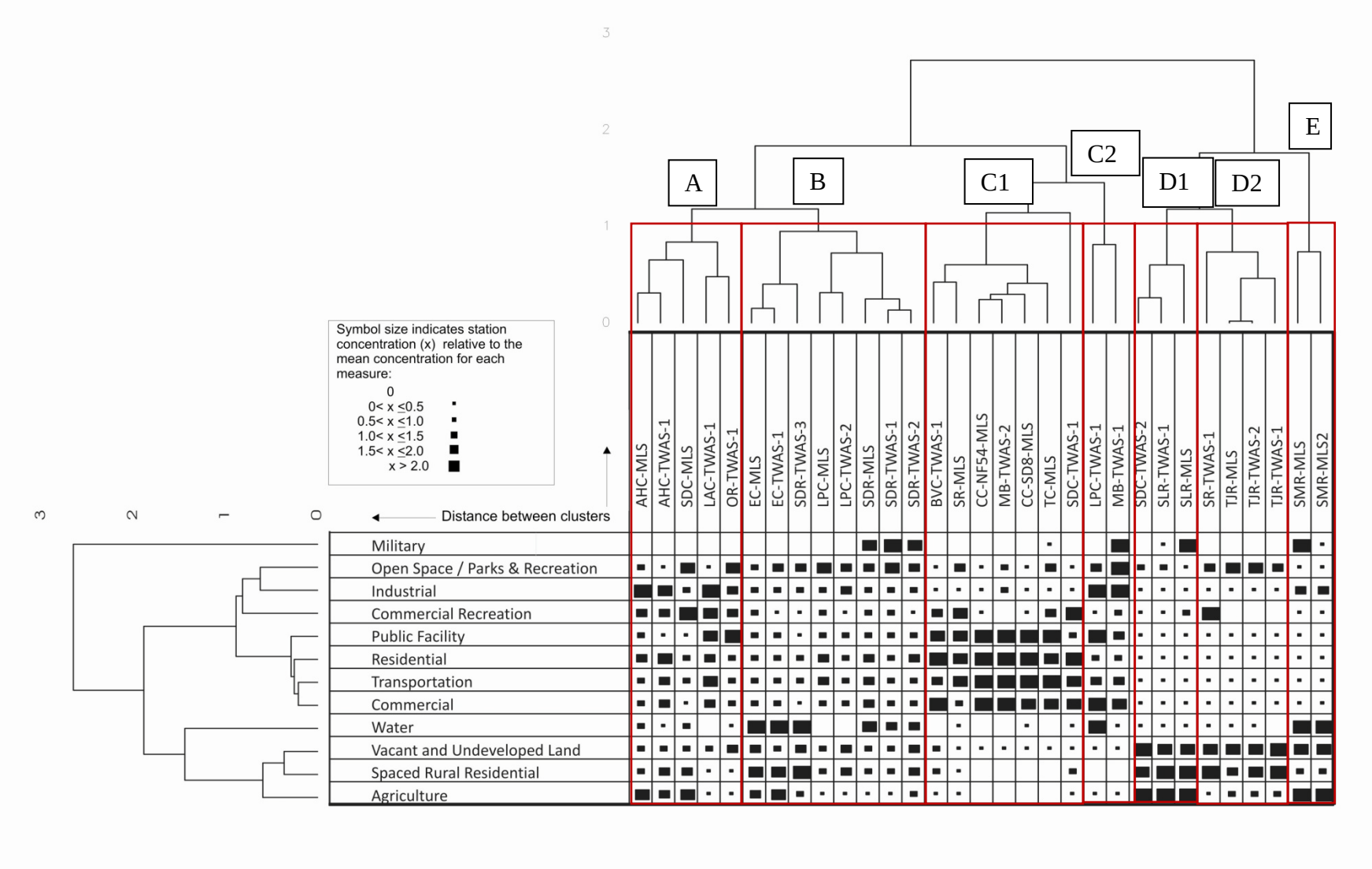

Figure 1. Land Use Cluster Analysis of the Mass Loading Station and Temporary Watershed Assessment Stations

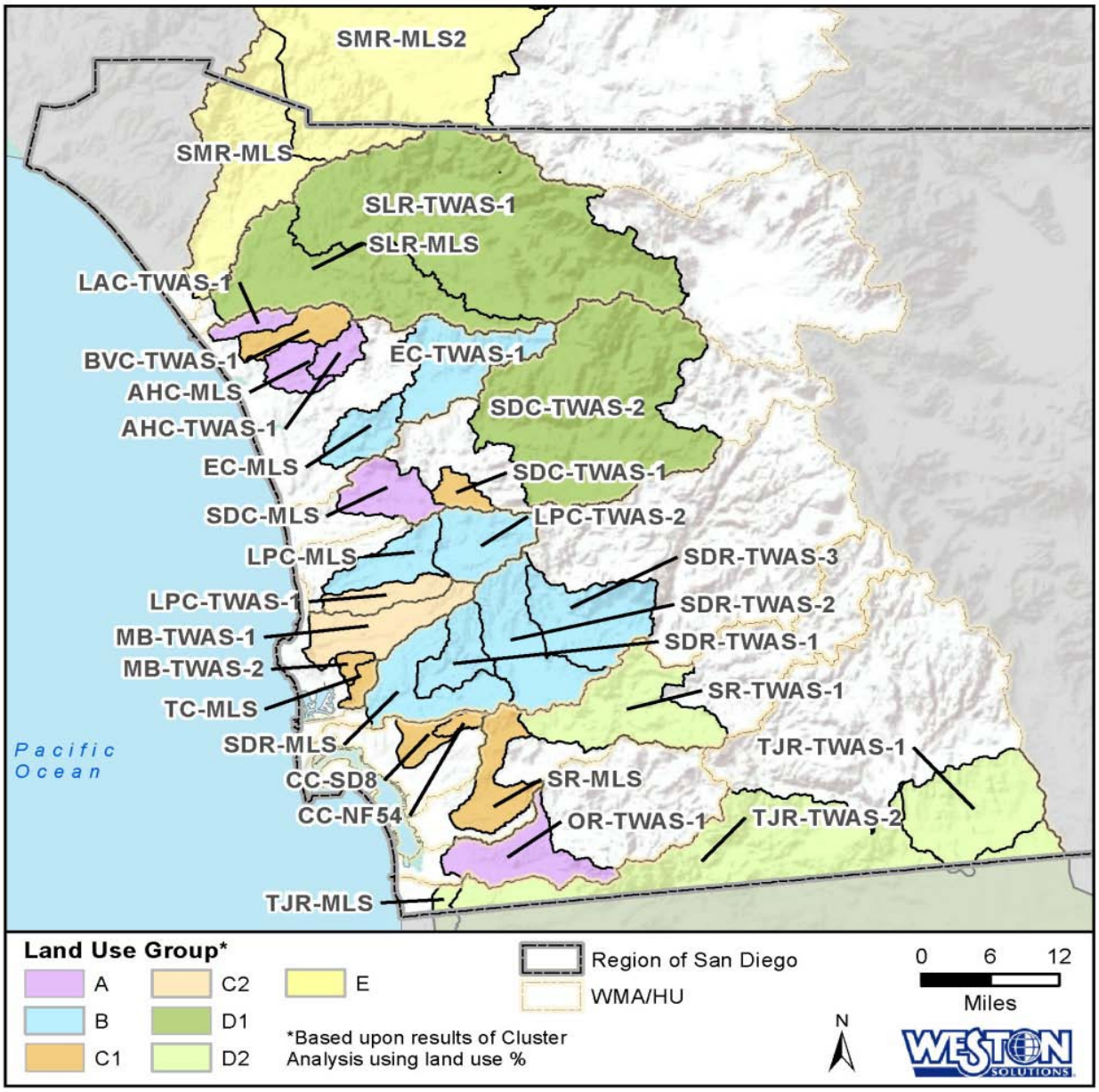

Figure 2. Land Use Cluster Analysis Results

The patterns of constituent concentrations at each MLS and TWAS were also evaluated using cluster analysis. The five-year LTEA dataset was used, and included wet weather data only, as receiving water constituent concentrations are expected to be more related to wash-off during wet events than during ambient conditions.

Results of the analysis are presented in Figure 3. In general, MLS and TWAS samples clustered together over time and a distinct sewage pattern was observed for Tijuana River (TJR-MLS and TJR-TWAS-2, highlighted blue) along with higher toxicity (highlighted orange). Chollas Creek (CC-SD8(1)-MLS) samples exhibited relatively higher concentrations of metals than other MLS and TWAS stations (highlighted purple). However, the groupings based on the water quality data do not directly correspond to the land use cluster analysis results. Therefore, based on constituent

concentrations, there does not appear to be a strong correlation between land use and constituent concentrations (i.e., individual land uses do not relate directly to stormwater concentrations). The exceptions are Tijuana River and Chollas Creek, which have unique activities. Tijuana River is subject to sewage discharge and Chollas Creek has a high density of industrial facilities and transportation corridors. The SDC-TWAS-2 grouping with the Tijuana River (TJR-MLS) sites was due to the post-fire stormwater monitoring results which were highly impacted by the 2007 San Diego Wildfires.

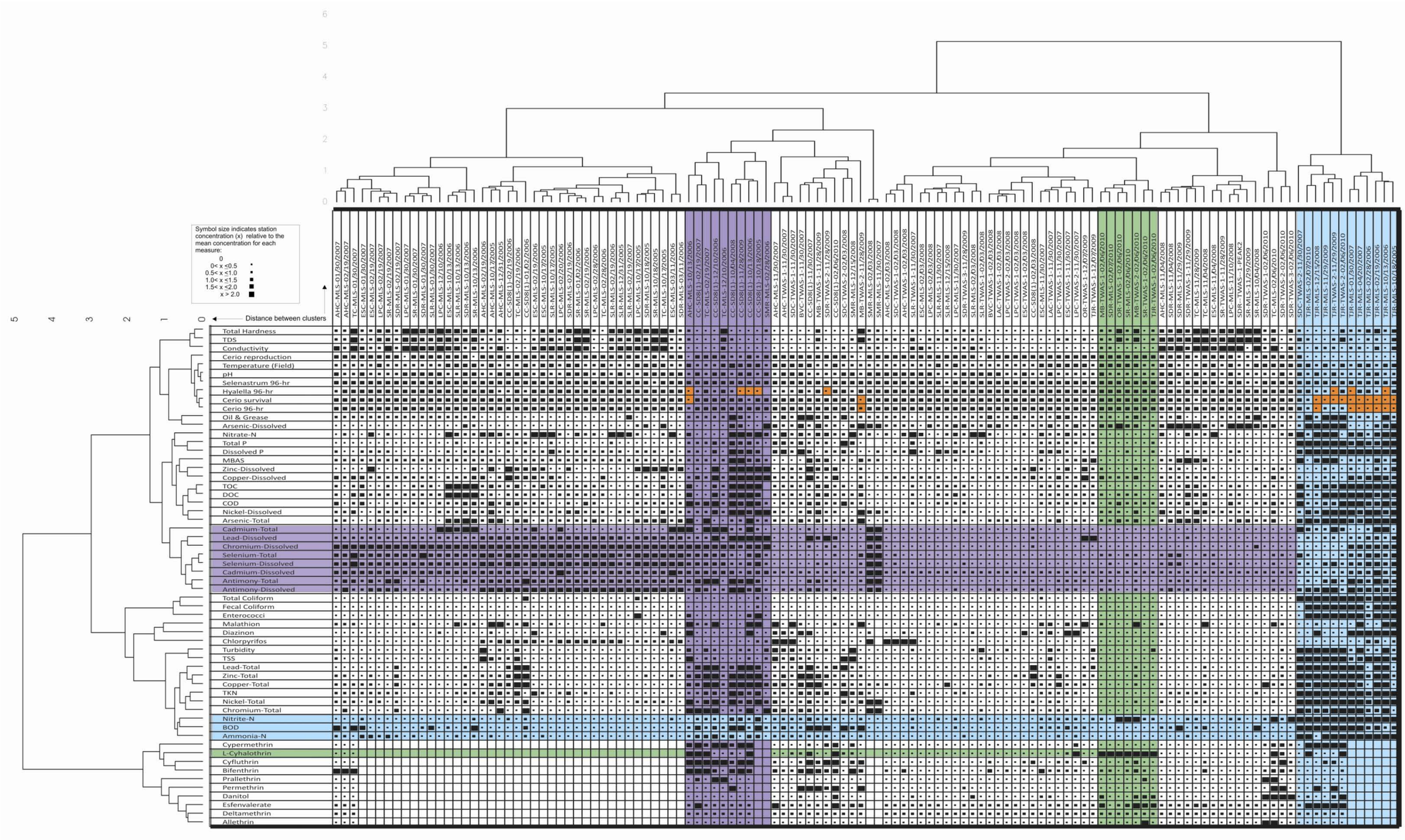

Figure 3. Cluster Analysis Results for Wet Weather Concentrations at Mass Loading Station and Temporary Watershed Assessment Stations during 2005-2010

Sub-Question #3: What frequency of sampling at the MLS is necessary to maintain the detection of long-term trends of receiving water quality?

A statistical analysis was conducted to determine whether or not a reduction in sample frequency from two wet weather events every other year to three wet weather events every five years at the MLS would decrease the Copermittees' ability to detect long-term receiving water trends. In particular, the question of whether a change in sampling frequency would affect Copermittees' ability to detect when the constituent concentrations fall below the WQB (or, for increasing trends, above the WQB) was evaluated.

The statistical analysis utilized the data from the existing program, between 8 and 18 years of data and 113 constituents at 10 MLS. The MLS and constituent combinations included all high priority constituents at each MLS, as well as constituents with greater than 50-percent detection frequency (more than half of the results were greater than the reporting limit). In addition, each MLS and constituent combination was tested for normality and log-normality (results in Attachment 1a). Only constituents that were found to be normal or log-normally distributed were included in the final statistical analysis dataset, because of the statistical method requirements. The final statistical analysis dataset included 66 analytes at 10 MLS. A full explanation of statistical tools utilized to assess the recommended monitoring program compared with the existing program is presented in Attachment 1a.

The existing data were used to evaluate trends (increasing, decreasing, or no trend), and the slope of the line was utilized to project future sampling results. Of the constituents included in the analysis, 2 were found to be significantly decreasing, 11 were found to be significantly increasing, and 53 did not exhibit a significant trend.

The statistical analysis included two scenarios, 1) the current program of two samples every other year and, 2) three samples every five years. The scenarios were compared to determine whether or not a reduction in monitoring frequency will increase the number of years it will take before the measured constituent of concern is observed below the WQO or WQB. Constituents that exhibited significant or non-significant decreasing or increasing trends were included in the analysis.

Comparison of the two scenarios found that, given the continuation of the existing trend line, decreasing the sampling frequency from two storm events every two years (n=5 per permit cycle) to three storm events every five years will not increase the amount of time necessary to detect when a decreasing or increasing trend crosses the WQO with 95-percent confidence. For MLS and constituent combinations that currently exhibit a significant increasing or decreasing trend, decreasing the sampling frequency will not decrease the ability to detect trends. For constituent and MLS combinations that do not exhibit significant trends, there is no difference between the two scenarios to detect when annual average concentrations first fall below or above the WQB or WQO with 95-percent confidence.

TSS was selected to illustrate the simulation results because it is often correlated to other constituents during storm events, including total phosphorus, bacteria, and total metals. Regionally, bacteria and TSS are Priority constituents during wet weather events. Therefore, evaluation to detect when these Priorities fall below WQOs is highlighted in the analysis. Results of the correlation analysis used to justify examination of TSS as a surrogate for other

constituents is included in Attachment 1b. Statistically significant correlations are highlighted yellow in the table (alpha=0.10).

Significantly Decreasing Trends

Only two of the 66 constituent and MLS combinations included in the statistical analysis exhibited statistical decreasing trends. These included total suspended solids (TSS) at Tecolote Creek Mass Loading Station (TC-MLS) and TDS at SLR-MLS. Figure 4 below illustrates the statistical assessment results for TC-MLS. The upper and lower 95-percent confidence interval is shown as a green and light blue line, respectively. Currently, there is a significantly decreasing trend for TSS at this MLS. Observed data are shown as black diamonds, and simulated data are shown as light blue diamonds. The existing program of two wet weather events every other year is compared to three events every five years at TC-MLS. Given the steep decreasing trend at TC-MLS (Figure 4), changes to the frequency of monitoring will not increase the amount of time required to detect when the 95-percent confidence interval falls below the wet weather water quality benchmark of 100 mg/L for TSS (shown in red on the graphs). As shown in Figure 4, the anticipated date to detect TSS concentrations below the WQO is during 2010 for both scenarios (shown as a vertical fuchsia line).

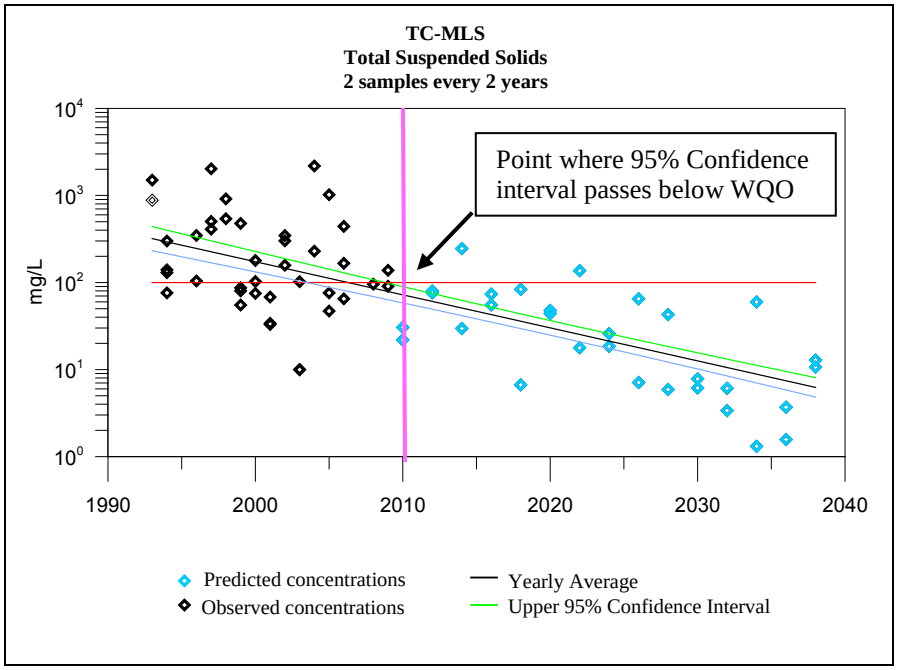

Figure 4. Statistical Analysis Results

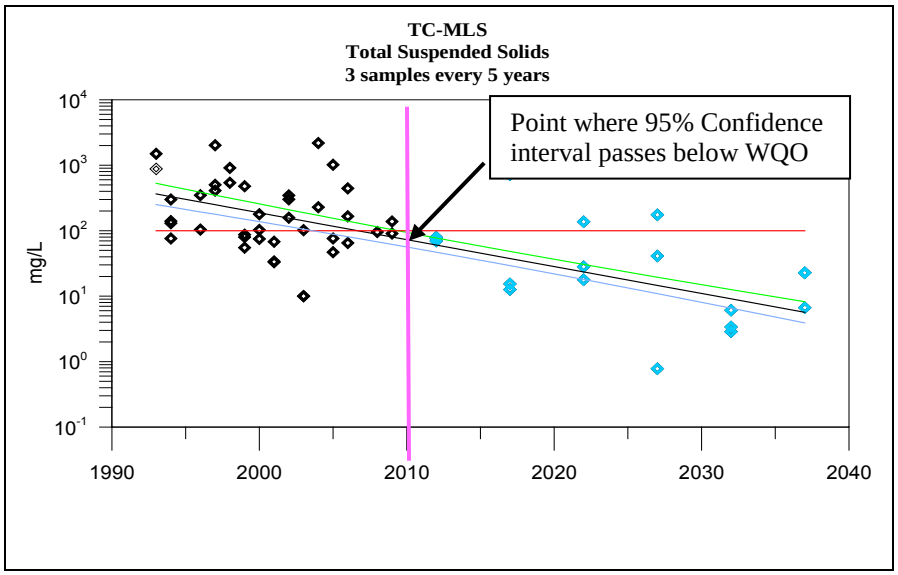

Comparison for Mass Loading Station with Significantly Decreasing Trend, Tecolote Creek Simulated Total Suspended Solids concentrations with Trend Line and 95-percent confidence interval bound

Significantly Increasing Trends

Eleven of the 66 constituent and MLS combinations included in the statistical analysis were found to be statistically increasing over time. Of these 11, four were turbidity, three were Total coliform, two were Fecal coliform, one was for TSS, and one was for total phosphorus.

The increasing trend shown in Figure 5 of TSS at Tijuana River MLS (TJR-MLS) (shown as the black line) illustrates the finding that if a significant increasing trend is observed, a reduction in sampling frequency will not affect the Copermittees' ability to detect it. Additional examples are provided in Attachment 1c that supports this conclusion.

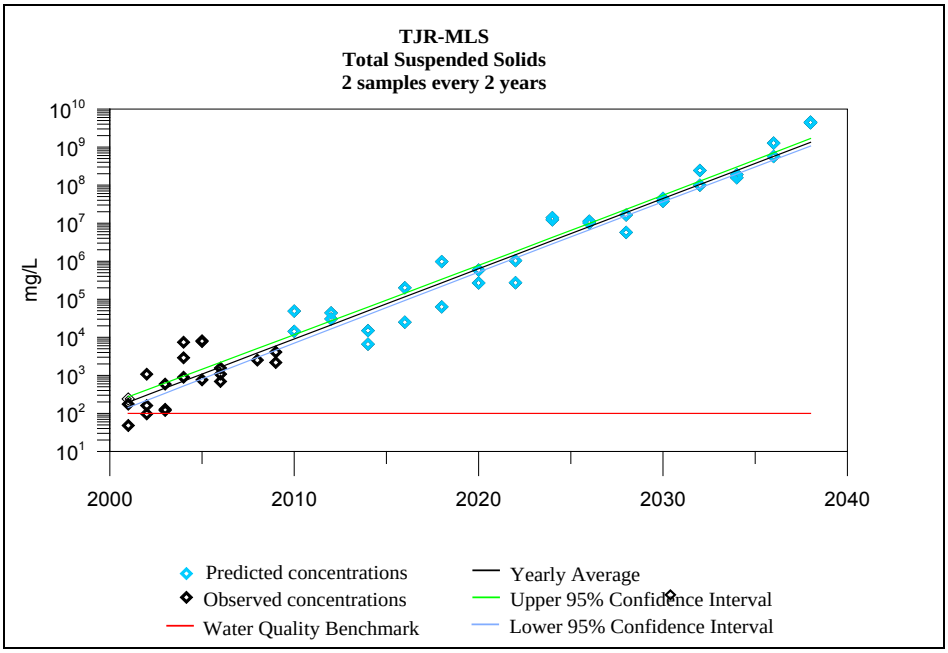

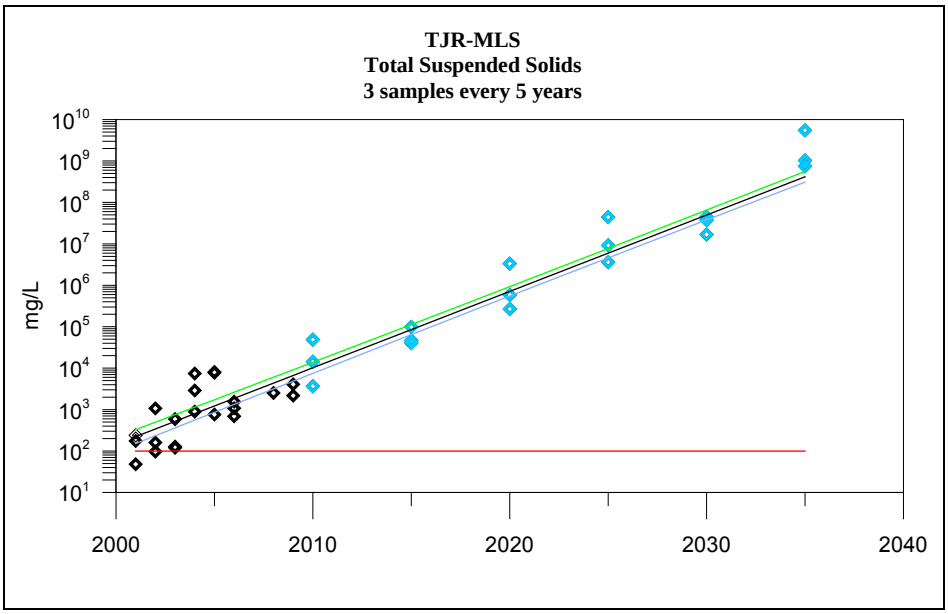

Figure 5. Statistical Analysis Results Comparison for Mass Loading Station with Significantly Increasing Trend, Tijuana River Simulated Total Suspended Solids concentrations with Trend Line and 95-percent confidence interval bound

No Significant Trends

Constituent and MLS combinations for which no significant increasing or decreasing trend has been observed present the worst case scenario for sample frequency reduction (53 of the 66 constituent and MLS pairs analyzed). The two scenarios are compared for TSS at Chollas Creek Mass Loading Station (CC-SD8(1)-MLS) and TSS at San Dieguito River (SDC-MLS) in Figure 6. The trend is generally decreasing at CC-SD8(1) and generally increasing at SDC-MLS.

In the CC-SD8(1) example, because a significant trend is not currently observed, the existing trend line will take a considerable amount of time before the upper 95-percent confident interval passes the WQB. As noted in Figure 6, although the average result is expected to cross the WQB in 2054 at the two year sampling frequency, and 2047 for the five year frequency, the 95-percent confidence interval is not predicted to fall below the WQB before the next 50 years. This finding is based on the variability of the data. Because the data are highly variable, sampling every two years actually makes it more difficult to predict when the average annual TSS concentrations will fall below the WQB. Therefore, decreasing the sample frequency from every other year to every five years will not decrease the Copermittees' ability to detect a decreasing trend. If the existing slope of the line changes to decrease faster, this scenario would result in less time to detect a trend in either instance.

At SDC-MLS a generally increasing TSS trend is observed. This example is included here to illustrate that although the current TSS levels are below the WQB, it is possible to predict when TSS concentrations will meet or exceed the WQB using either the current monitoring program or the reduced sampling frequency to every five years. In this instance, the average annual TSS concentrations are not expected to exceed the WQB within the next 50 years. The lower 95-percent confidence interval does not pass the WQB in this example.

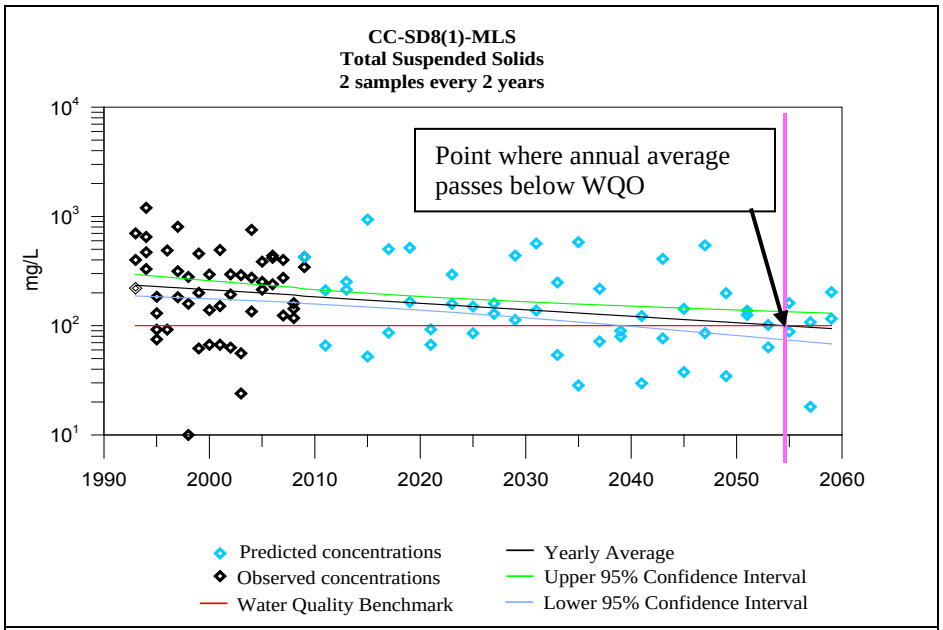
CC-SD8(1)-MLS
Total Suspended Solids
2 samples every 2 years
Point where annual average passes below WQO
mg/L
10^4
10^3
10^2
10^1
1990
2000
2010
2020
2030
2040
2050
2060
Predicted concentrations
Observed concentrations
Water Quality Benchmark
Yearly Average
Upper 95% Confidence Interval
Lower 95% Confidence Interval

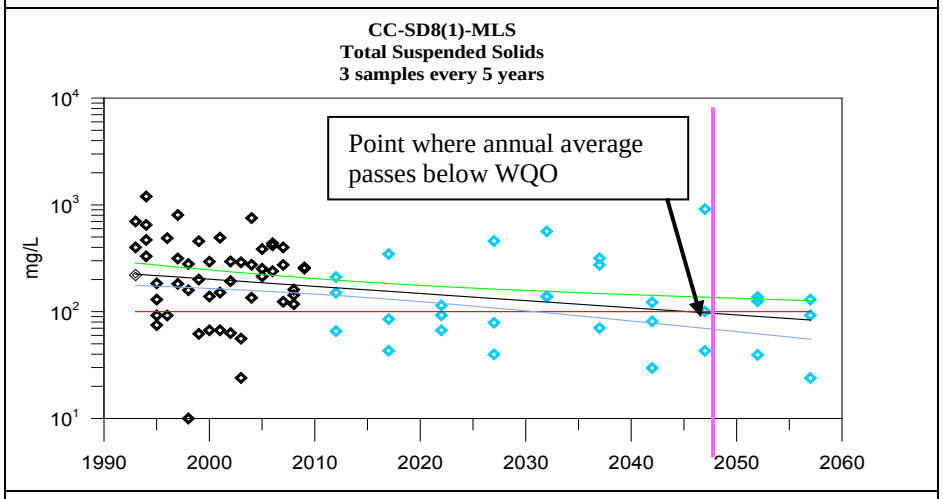
CC-SD8(1)-MLS
Total Suspended Solids
3 samples every 5 years
Point where annual average passes below WQO
mg/L
10^4
10^3
10^2
10^1
1990
2000
2010
2020
2030
2040
2050
2060

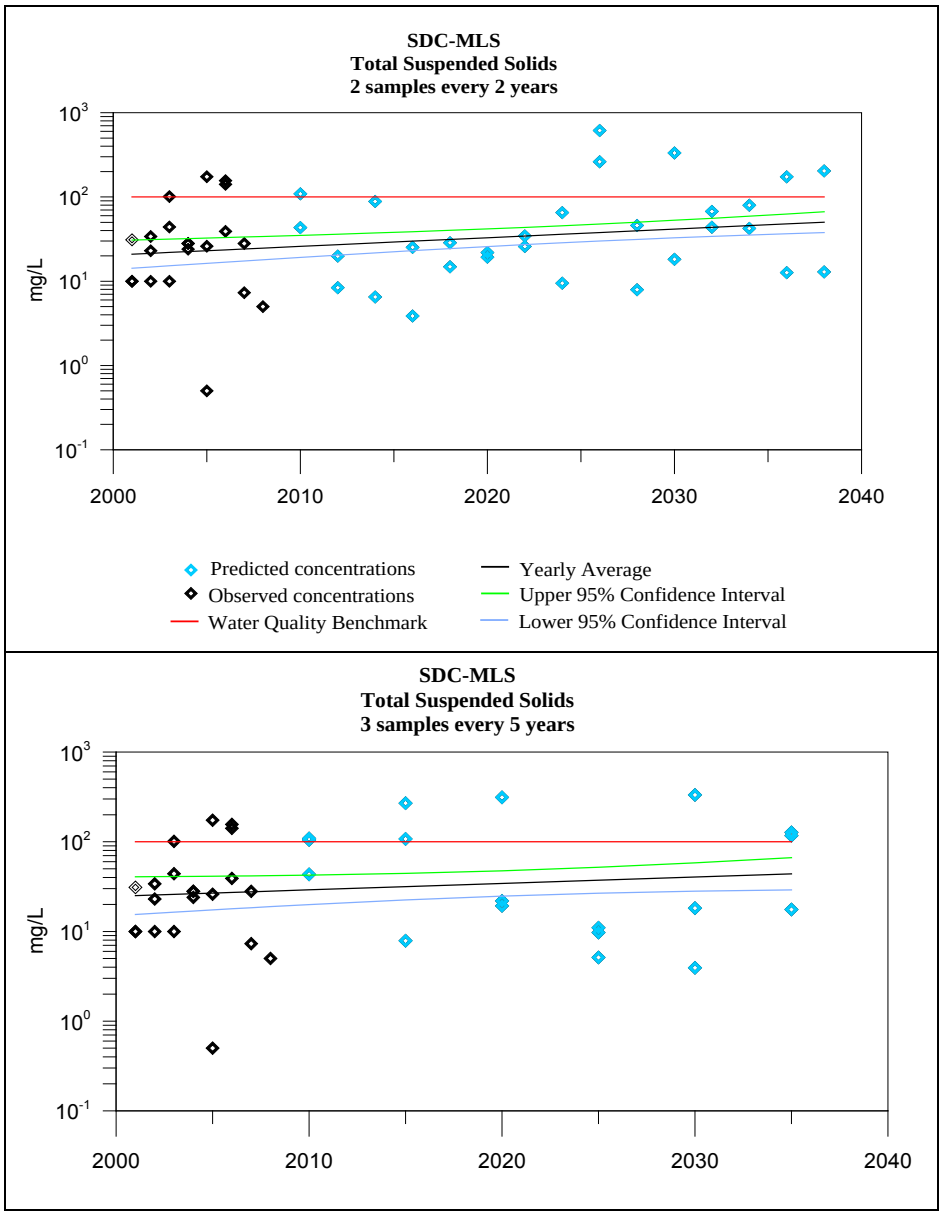

Figure 6. Tecolote Creek and Chollas Creek Simulated Total Suspended Solids concentrations with Trend Line and 95-percent confidence interval bound

MLS	Contituent	n	Normality Result	2009 and 2010 Trend Results
AHC-MLS	Bifenthrin by NCI	6	Normal	No Significant Trend
AHC-MLS	Dissolved Organic Carbon	9	Normal	No Significant Trend
AHC-MLS	Fecal Coliforms	31	Unknown	Significant Increasing Trend
AHC-MLS	Malathion	9	Log-Normal	No Significant Trend
AHC-MLS	MBAS	9	Unknown	No Significant Trend
AHC-MLS	Selenium,Total	9	Unknown	No Significant Trend
AHC-MLS	Total Coliforms	9	Normal	Significant Increasing Trend
AHC-MLS	Total Dissolved Solids	29	Unknown	No Significant Trend
AHC-MLS	Total Phosphorus-Low Range	9	Log-Normal	No Significant Trend
AHC-MLS	Total Suspended Solids	29	Unknown	Significant Increasing Trend
AHC-MLS	Turbidity	29	Log-Normal	Significant Increasing Trend
CC-SD8(1)	Bifenthrin by NCI	12	Log-Normal	No Significant Trend
CC-SD8(1)	Biochemical Oxygen Demand	48	Unknown	No Significant Trend
CC-SD8(1)	COD	47	Unknown	No Significant Trend
CC-SD8(1)	Copper,Dissolved	42	Log-Normal	No Significant Trend
CC-SD8(1)	Dissolved Organic Carbon	14	Log-Normal	No Significant Trend
CC-SD8(1)	Fecal Coliforms	50	Unknown	No Significant Trend
CC-SD8(1)	Lead,Dissolved	42	Unknown	No Significant Trend
CC-SD8(1)	Malathion	15	Unknown	No Significant Trend
CC-SD8(1)	MBAS	47	Unknown	Significant Decreasing Trend
CC-SD8(1)	Permethrin by NCI	12	Unknown	No Significant Trend
CC-SD8(1)	Selenium,Total	11	Unknown	No Significant Trend
CC-SD8(1)	Total Coliforms	15	Log-Normal	Significant Increasing Trend
CC-SD8(1)	Total Phosphorus-Low Range	11	Normal	No Significant Trend
CC-SD8(1)	Total Suspended Solids	51	Log-Normal	No Significant Trend
CC-SD8(1)	Turbidity	48	Log-Normal	Significant Increasing Trend
CC-SD8(1)	Zinc,Dissolved	42	Unknown	No Significant Trend
ESC-MLS	Bifenthrin by NCI	3	Normal	No Significant Trend
ESC-MLS	Dissolved Organic Carbon	9	Log-Normal	No Significant Trend
ESC-MLS	Fecal Coliforms	21	Log-Normal	No Significant Trend
ESC-MLS	Malathion	9	Unknown	No Significant Trend
ESC-MLS	MBAS	9	Unknown	No Significant Trend
ESC-MLS	Selenium,Total	9	Unknown	No Significant Trend
ESC-MLS	Total Coliforms	9	Log-Normal	No Significant Trend
ESC-MLS	Total Dissolved Solids	21	Normal	No Significant Trend
ESC-MLS	Total Phosphorus-Low Range	9	Normal	No Significant Trend
ESC-MLS	Total Suspended Solids	21	Log-Normal	No Significant Trend
ESC-MLS	Turbidity	21	Log-Normal	No Significant Trend
LPC-MLS	Bifenthrin by NCI	3	Normal	No Significant Trend
LPC-MLS	Dissolved Organic Carbon	9	Normal	No Significant Trend
LPC-MLS	Fecal Coliforms	21	Unknown	Significant Increasing Trend
LPC-MLS	Malathion	9	Unknown	No Significant Trend
LPC-MLS	MBAS	9	Unknown	No Significant Trend
LPC-MLS	Selenium,Total	9	Unknown	No Significant Trend
LPC-MLS	Total Coliforms	9	Log-Normal	No Significant Trend
LPC-MLS	Total Dissolved Solids	21	Unknown	No Significant Trend
LPC-MLS	Total Phosphorus-Low Range	9	Log-Normal	No Significant Trend
LPC-MLS	Turbidity	21	Log-Normal	No Significant Trend
SDC-MLS	Bifenthrin by NCI	3	Unknown	No Significant Trend
SDC-MLS	Dissolved Organic Carbon	9	Normal	No Significant Trend
SDC-MLS	Fecal Coliforms	21	Log-Normal	No Significant Trend
SDC-MLS	Malathion	9	Unknown	No Significant Trend
SDC-MLS	MBAS	9	Unknown	No Significant Trend

SDC-MLS	Selenium,Total	9	Log-Normal	No Significant Trend
SDC-MLS	Total Coliforms	9	Log-Normal	No Significant Trend
SDC-MLS	Total Dissolved Solids	21	Normal	No Significant Trend
SDC-MLS	Total Phosphorus-Low Range	9	Normal	Significant Increasing Trend
SDC-MLS	Total Suspended Solids	21	Log-Normal	No Significant Trend
SDC-MLS	Turbidity	21	Log-Normal	No Significant Trend
SDR-MLS	Bifenthrin by NCI	3	Unknown	No Significant Trend
SDR-MLS	Dissolved Organic Carbon	9	Unknown	Significant Increasing Trend
SDR-MLS	Fecal Coliforms	21	Log-Normal	No Significant Trend
SDR-MLS	Malathion	9	Unknown	No Significant Trend
SDR-MLS	MBAS	9	Unknown	No Significant Trend
SDR-MLS	Selenium,Total	9	Unknown	No Significant Trend
SDR-MLS	Total Coliforms	9	Log-Normal	No Significant Trend
SDR-MLS	Total Phosphorus-Low Range	9	Normal	No Significant Trend
SDR-MLS	Turbidity	21	Log-Normal	No Significant Trend
SLR-MLS	Bifenthrin by NCI	3	Normal	No Significant Trend
SLR-MLS	Dissolved Organic Carbon	9	Log-Normal	No Significant Trend
SLR-MLS	Fecal Coliforms	21	Log-Normal	Significant Increasing Trend
SLR-MLS	Malathion	9	Log-Normal	No Significant Trend
SLR-MLS	MBAS	9	Unknown	No Significant Trend
SLR-MLS	Selenium,Total	9	Unknown	No Significant Trend
SLR-MLS	Total Coliforms	9	Log-Normal	Significant Increasing Trend
SLR-MLS	Total Dissolved Solids	21	Normal	Significant Decreasing Trend
SLR-MLS	Total Phosphorus-Low Range	9	Normal	No Significant Trend
SLR-MLS	Turbidity	21	Log-Normal	Significant Increasing Trend
SR-MLS	Bifenthrin by NCI	3	Unknown	No Significant Trend
SR-MLS	Dissolved Organic Carbon	9	Unknown	No Significant Trend
SR-MLS	Fecal Coliforms	21	Log-Normal	No Significant Trend
SR-MLS	Malathion	9	Unknown	No Significant Trend
SR-MLS	MBAS	9	Unknown	No Significant Trend
SR-MLS	Selenium,Total	9	Unknown	No Significant Trend
SR-MLS	Total Coliforms	9	Log-Normal	No Significant Trend
SR-MLS	Total Dissolved Solids	21	Normal	No Significant Trend
SR-MLS	Total Phosphorus-Low Range	9	Normal	No Significant Trend
SR-MLS	Turbidity	21	Log-Normal	No Significant Trend
TC-MLS	Bifenthrin by NCI	6	Normal	No Significant Trend
TC-MLS	Dissolved Organic Carbon	9	Normal	No Significant Trend
TC-MLS	Fecal Coliforms	41	Unknown	No Significant Trend
TC-MLS	Malathion	9	Unknown	No Significant Trend
TC-MLS	MBAS	9	Unknown	No Significant Trend
TC-MLS	Selenium,Total	9	Normal	No Significant Trend
TC-MLS	Total Coliforms	9	Log-Normal	No Significant Trend
TC-MLS	Total Dissolved Solids	41	Unknown	No Significant Trend
TC-MLS	Total Phosphorus-Low Range	9	Normal	No Significant Trend
TC-MLS	Total Suspended Solids	40	Log-Normal	Significant Decreasing Trend
TC-MLS	Turbidity	40	Log-Normal	No Significant Trend
TJR-MLS	Bifenthrin by NCI	3	Normal	No Significant Trend
TJR-MLS	Biochemical Oxygen Demand	21	Unknown	No Significant Trend
TJR-MLS	COD	21	Log-Normal	No Significant Trend
TJR-MLS	Diazinon	21	Unknown	Significant Decreasing Trend
TJR-MLS	Dissolved Organic Carbon	9	Normal	No Significant Trend
TJR-MLS	Fecal Coliforms	21	Log-Normal	Significant Increasing Trend
TJR-MLS	Malathion	15	Unknown	No Significant Trend
TJR-MLS	MBAS	21	Log-Normal	No Significant Trend
TJR-MLS	Selenium,Total	9	Unknown	No Significant Trend

TJR-MLS	Total Coliforms	9	Unknown	Significant Increasing Trend
TJR-MLS	Total Phosphorus-Low Range	21	Log-Normal	No Significant Trend
TJR-MLS	Total Suspended Solids	21	Log-Normal	Significant Increasing Trend
TJR-MLS	Turbidity	21	Log-Normal	Significant Increasing Trend

Client Sample ID	AHC-MLS		CC-SD8(1)		ESC-MLS		LPC-MLS		SDC-MLS		SDR-MLS		SLR-MLS		SR-MLS		TC-MLS		TJR-MLS	
N=number of samples	N	TSS	N	TSS	N	TSS	N	TSS	N	TSS	N	TSS	N	TSS	N	TSS	N	TSS	N	TSS
Critical Value	31	0.236	50	0.184	21	0.292	21	0.292	21	0.292	21	0.292	21	0.292	21	0.292	41	0.309	21	0.292
	9	0.483	15	0.354	9	0.483	9	0.483	9	0.483	9	0.483	9	0.483	9	0.483	9	0.483	9	0.483
Fecal Coliforms	31	0.578	50	0.191	21	0.357	21	0.259	21	0.045	21	-0.667	21	0.468	21	0.606	41	-0.150	21	0.549
Enterococcus	9	0.469	15	-0.173	9	0.571	9	0.433	9	-0.402	9	-0.286	9	-0.009	9	0.000	9	0.477	9	-0.405
Total Coliforms	9	0.405	15	-0.008	9	0.261	9	0.102	9	-0.504	9	-0.595	9	0.525	9	0.300	9	0.185	9	0.137
Total Dissolved Phosphorus	9	0.803	11	0.191	9	0.418	9	0.567	9	-0.402	9	0.117	9	0.220	9	0.183	9	-0.126	9	-0.267
Total Phosphorus Low Range	9	0.778	11	0.145	9	0.879	9	0.433	9	0.226	9	0.450	9	0.407	9	-0.374	9	0.900	21	-0.227
Nitrate as N	9	0.567	14	-0.266	9	-0.150	9	0.460	9	-0.209	9	-0.300	9	0.220	9	-0.076	9	-0.025	9	-0.071
Nitrite as N	9	-0.277	14	-0.304	9	0.678	9	0.059	9	-0.406	9	-0.753	9	0.334	9	0.571	9	0.237	9	-0.323
Total Kjeldahl Nitrogen	9	0.254	14	-0.134	9	0.109	9	0.567	9	0.519	9	0.192	8	0.037	9	-0.070	9	0.650	9	-0.400
Antimony, Total	9	-0.274	11	0.110	9	0.420	9	0.726	9	-0.069	9	0.582	9	-0.053	9	0.609	9	-0.085	9	-0.109
Arsenic, Total	9	0.412	11	-0.055	9	0.252	9	0.429	9	-0.387	9	-0.267	9	0.838	9	-0.079	9	0.067	9	0.285
Cadmium, Total	9	0.366	11	0.258	9	0.034	9	0.257	9	0.707	9	0.502	9	0.279	9	0.286	9	0.722	9	0.752
Chromium, Total	9	-0.136	11	0.402	9	0.256	9	0.548	9	-0.183	9	-0.089	9	0.373	9	0.486	9	0.165	9	-0.393
Copper, Total	9	0.567	11	0.282	9	0.633	9	0.502	9	0.373	9	0.353	9	0.436	9	0.603	9	0.837	9	-0.100
Lead, Total	9	0.672	11	0.564	9	0.848	9	0.749	9	0.414	9	0.954	9	0.372	9	0.982	9	0.833	9	0.050
Nickel, Total	9	0.695	11	-0.036	9	0.470	9	-0.085	9	0.547	9	0.218	9	0.701	9	-0.288	9	0.603	9	0.133
Selenium, Total	9	0.279	11	0.019	9	0.139	9	0.000	9	0.341	9	0.366	9	-0.171	9	-0.383	9	-0.200	9	-0.248
Zinc, Total	9	0.883	15	0.178	9	0.617	9	-0.017	9	0.109	9	0.728	9	-0.019	9	0.579	9	0.817	9	0.183
Diazinon	9	0.638	15	0.422	9	0.096	9	0.112	9	-0.091	9	0.091	9	0.532	9	-0.715	9	-0.279	21	-0.720
Malathion	9	0.200	15	0.236	9	0.409	9	0.493	9	-0.075	9	0.018	9	0.231	9	-0.063	9	-0.042	15	-0.587

A longer record for fecal coliforms was included here, but in general five years of data were assessed (n=9) for all stations and analytes

Results highlighted yellow are statistically significant, alpha =0.1

Attachment 2-1c: Statistical Analysis Methods

Statistical Analysis Methods

The focus of the statistical analysis was to determine whether or not proposed changes to the receiving water monitoring frequency will impact the Copermittees' ability to answer management question #5:

Are conditions in receiving waters getting better or worse?

In particular, the frequency of monitoring to determine whether or not constituent concentrations are improving or worsening over time must be assessed before changes to the monitoring program can occur. This question was addressed by evaluating how changes to monitoring frequency will affect how many more years will be necessary to detect when constituent concentrations are improving (i.e., falling below the water quality objective (WQO) with 95-percent confidence) or worsening (i.e., rising above the WQO with 95-percent confidence).

The approach employed to evaluate the effects of reducing the receiving water monitoring frequency from two wet events every two years to three wet events every five years was based on a Monte Carlo simulation approach. This approach is often used to predict or simulate future outcomes based on existing knowledge.

The Monte Carlo simulations, referred to as statistical analysis in the text, utilized empirical data from the existing program to predict or model the future data sets and estimate when water quality objectives (WQOs) will be reached assuming the current trends continue. The same methodology was followed as that used during the 2005 ROWD report development, summarized below, whereby an exponential decay model was used to estimate the future average yearly concentrations (based on the current rate of change). Simulated samples were randomly drawn from a log-normal distribution centered on each future average annual concentration. The intra-year variability of the existing dataset was used when defining log-normal distributions from which to make the random draws. Three criteria were necessary to include constituents within the analysis, 1) constituent results must have been detected (above the reporting limit) in at least half of the samples at an individual mass loading station (MLS), and 2) constituents must exhibit normal or log-normal distributions at individual MLS, 3) constituents must be high priority consitituents. The Shapiro-Wilk test for normality and visual inspection of the data were used to identify constituents that met the normality requirements of this analysis (Technical Memo, Attachment 1a).

A major consideration for redesigning a monitoring program is an evaluation of the impacts the changes may have on the analysis and interpretation of the results. The recommendation to change the frequency of monitoring from two wet events every other year to three events every five years necessitated a thorough examination of the potential impacts on how the sampling frequency will affect the ability to detect trends in the data. Both the effect on existing trends and non-significant trends were evaluated.

The statistical analysis utilized the data from the existing program, between 8 and 18 years of data and 113 constituents at 10 MLS. The MLS and constituent combinations included all high priority constituents at each MLS, as well as constituents with greater than 50-percent detection frequency (more than half of the results were greater than the reporting limit). In addition, each MLS and constituent combination was tested for normality and log-normality (results in Technical Memo, Attachment 1a). Only constituents that were found to be normal or log-normally distributed were included in the final statistical analysis dataset, because of the statistical method requirements. The final statistical analysis dataset included 66 analytes at 10 MLS (58-percent of the original constituents included in the evaluation).

The existing data were used to evaluate trends (increasing, decreasing, or no trend), and the slope of the line was utilized to project future sampling results. Of the constituents included in the analysis, 2 (3-percent) were found to be significantly decreasing, 11 (17-percent) were found to be significantly increasing, and 53 (80-percent) did not exhibit a significant trend.

The analysis uses either the $\log_{10}$ transformed data or original results (based on the distribution of the data) regressed with year to determine the equation of the regression line drawn through the data. The regression equation was used to compute the predicted mean value in future years based on the standard deviation from the regression analysis. Data were generated for each future year that have a mean equal to the predicted mean and were randomly distributed within the bounds of the standard deviation. Using these simulated data with the existing data, the regression was rerun and the point in time when the upper 95% confidence bound crossed below the WQO was determined. Because this was just one random simulation that may have been anomalous, the process was repeated with 100 sets of randomly simulated data based on the original equation. The entire set of 100 regressions was then evaluated to determine when the upper confidence bound would be below the WQO 95 out of 100 times. This is the number of years of sampling that must occur to be extremely confident that the concentration meets the objective; whereas in determining compliance the actual results are compared to the relevant WQO. The process started with the addition of one more year of sampling and evaluated whether the confidence bound met the criteria, if not, sequential years were added until the upper bound was below the WQO for 95 of the 100 datasets.

This whole process was performed for sampling a) two wet events every year into the future, b) three wet events every five years. Examples of this analysis for constituents with significant and non-significant decreasing and increasing trends are discussed in this document.

Decreasing Trends

Two constituents with significant decreasing trends (TSS at TC-MLS and TDS at SLR-TDS), along with TSS at CC-SD8(1)-MLS were selected as examples because they have established WQOs that are below the current concentrations and provide cases with differing numbers of existing data points as well as a variety of slopes with decreasing concentrations through time.

Example constituents include:

1. TSS data from TC-MLS with eight years of existing data and a statistically significant decreasing trend;
2. TDS data from SLR-MLS, with eight years of data and a statistically significant decreasing trend;
3. TSS data from CC-SD8(1)-MLS, with 18 years of existing data and a non-significant decreasing trend.

The plots shown below for each example constituent and frequency of sampling represent one of the randomly generated datasets for which the upper confidence bound crosses the WQO at the point where 95 of the 100 regression lines would be below this line. Vertical lines on the plots indicate the years in which the mean and upper bound cross below the WQO (horizontal line).

Example 1. Total Suspended Solids data from TC-MLS with eight years of existing data and a statistically significant decreasing trend

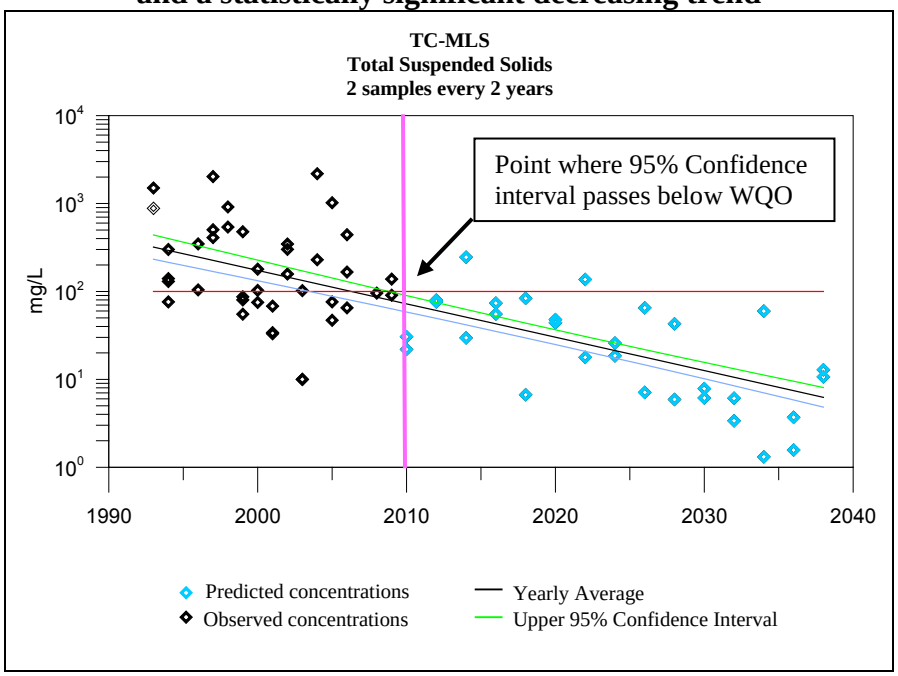

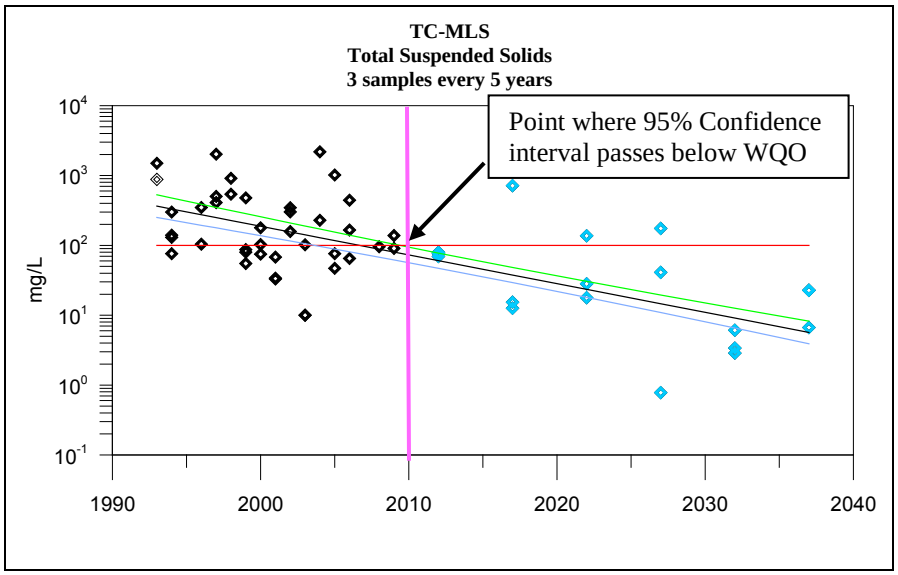

The WQO for TSS is 100 mg/L (shown by horizontal red line). As shown above in Example 1, if sampling during wet weather were to continue at two events every other year, the mean value for TSS would be below the WQO in 2007 and the upper confidence bound would drop below in 2010. The second plot in Example 1 shows the change if sampling was to occur every five years: the mean would also go below the WQO in 2007 and the upper confidence bound would still cross in 2010. In this example, reduction of sampling frequency results in no increase in the number of years necessary to observe when the TSS concentrations will fall below the WQB.

Example 2. Total Dissolved Solids data from SLR-MLS with eight years of existing data and a significant decreasing trend

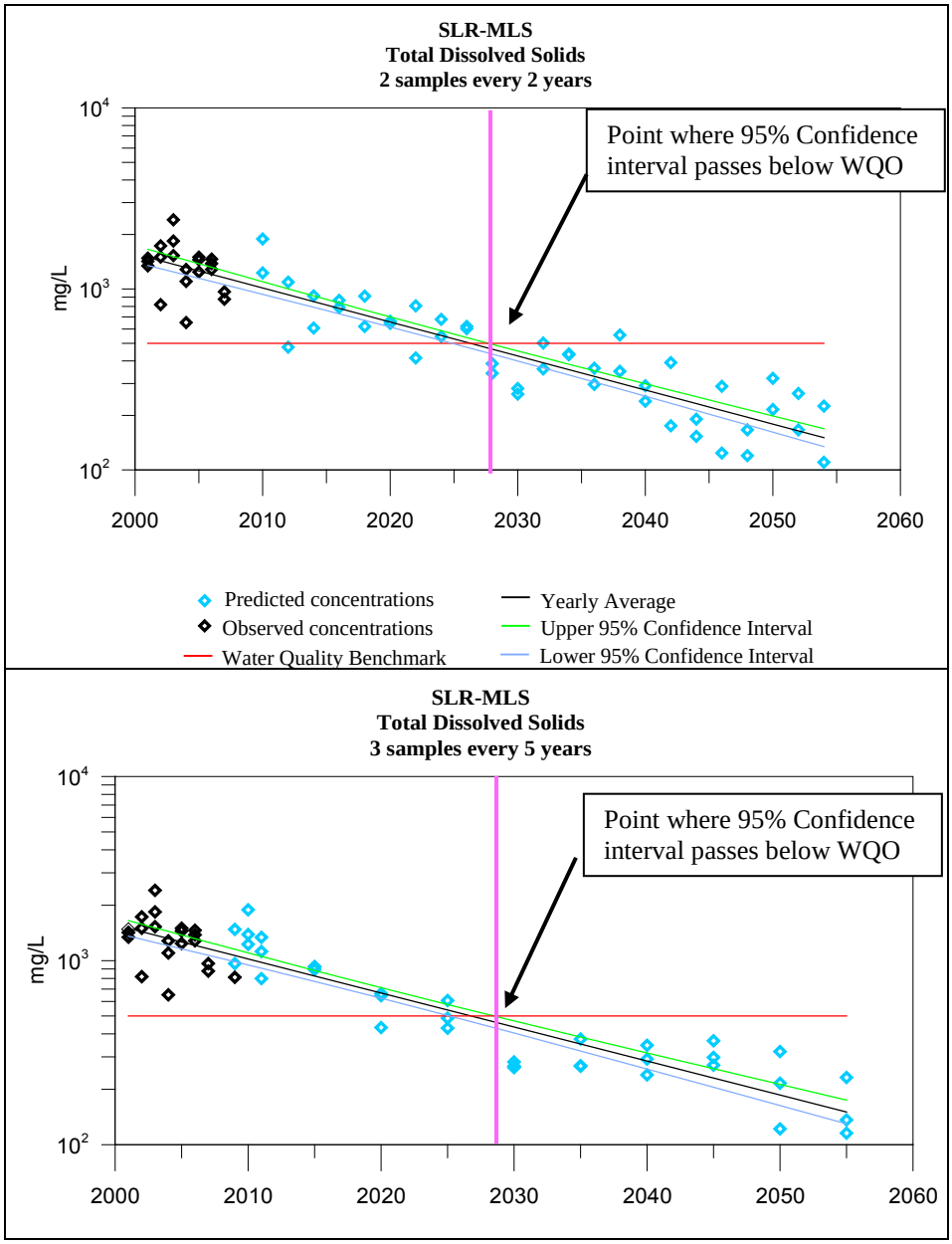

The WQO for TDS varies dependent on the hydrologic unit, as stated in the San Diego Basin Plan. In San Luis Rey the WQO is 500 mg/L. The trend at SLR-MLS is significantly decreasing, but at a slower rate than TC-MLS. As shown above in Example 2, if sampling during wet weather were to continue at two events every other year, the mean value for TDS would be below the WQO in 2025 and the upper confidence bound would drop below in 2028. The second plot in Example 2 shows the change if sampling was to occur every five years: the mean would go below the WQO in 2026 and the upper confidence bound would cross in 2029. In this

example, reduction of sampling frequency results in an approximate one year increase in the number of years necessary to observe when the TDS concentrations will fall below the WQB.

Example 3. Total Suspended Solids data from CC-SD8(1)-MLS with 18 years of existing data and a non-significant decreasing trend

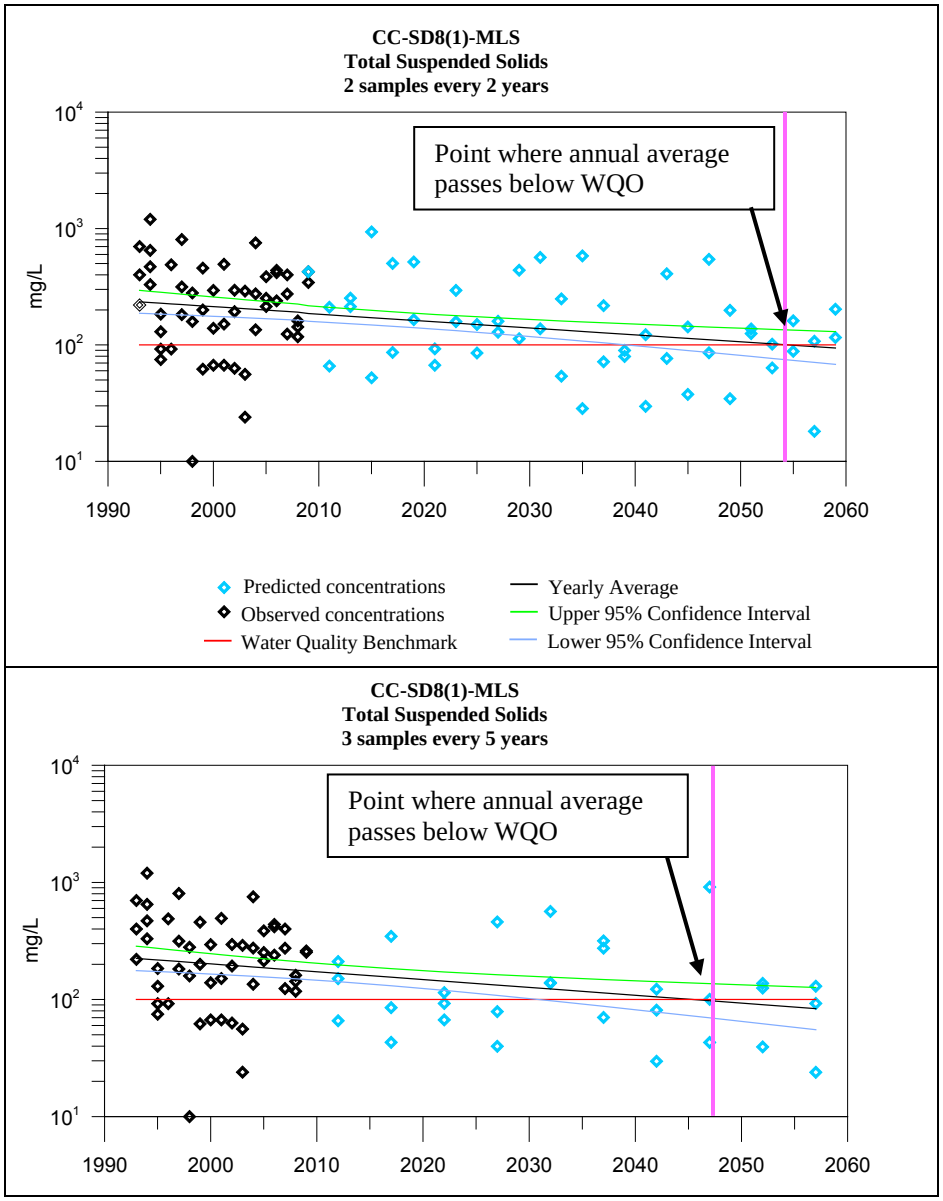

In the CC-SD8(1) example the WQO is 100 mg/L, and because a significant trend is not currently observed, the existing trend line will take a considerable amount of time before the upper 95-percent confident interval passes the WQO. As shown in Example 3, above, although the average result is expected to cross the WQO in 2054 at the two year sampling frequency, and 2047 for the five year frequency, the 95-percent confidence interval is not predicted to fall below the WQO before the next 50 years. This finding is based on the variability of the data. Because

the data are highly variable, sampling every two years actually makes it more difficult to predict when the average annual TSS concentrations will fall below the WQO. Therefore, decreasing the sample frequency from every other year to every five years will not decrease the Copermittees' ability to detect a decreasing trend. If the existing slope of the line changes to decrease faster, this scenario would result in less time to detect a trend in either instance.

Increasing Trends

Two constituents with significant increasing trends and one constituent with a non-significant increasing trend were evaluated to determine whether or not a reduction in sampling frequency from two wet events every other year to three wet events every five years would increase the number of years necessary to determine when constituent concentrations will exceed WQOs. As above, both significant and non-significant trends were considered.

Example constituents include:

4. Total phosphorus data from AHC-MLS with 13 years of existing data and a statistically significant increasing trend;
5. TSS data from TJR-MLS, with eight years of data and a statistically significant increasing trend;
6. TSS data from SDC-MLS, with 8 years of existing data and a non-significant increasing trend.

The plots shown below for each example constituent and frequency of sampling represent one of the randomly generated datasets for which the lower confidence bound crosses the WQO at the point where 95 of the 100 regression lines would be above this line. Vertical lines on the plots indicate the years in which the mean and upper bound cross above the WQO (horizontal line).

Example 4. Total phosphorus data from AHC-MLS with 13 years of existing data and a statistically significant increasing trend.

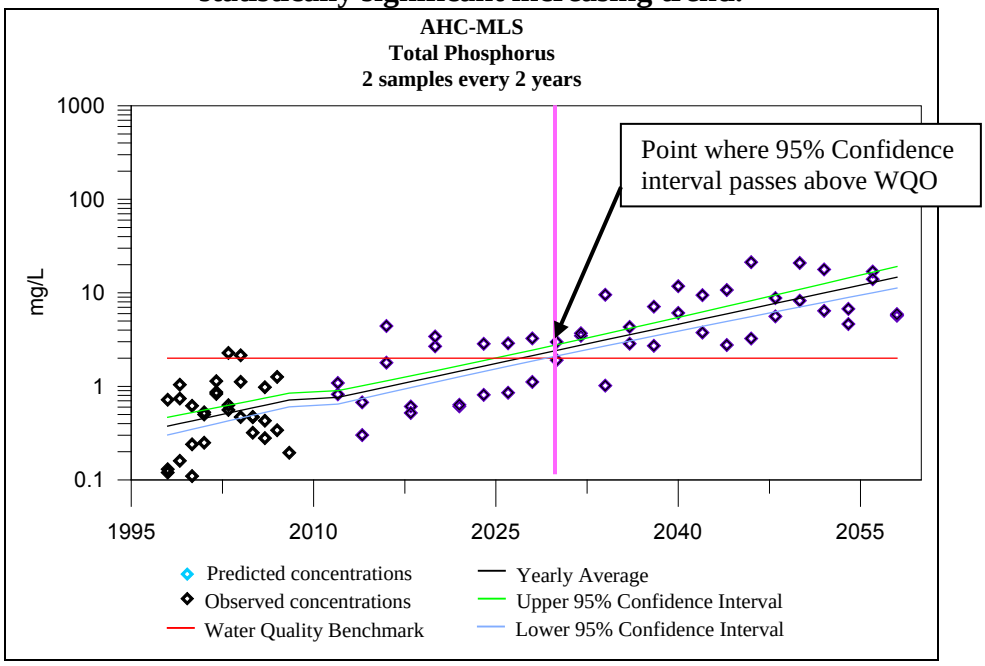

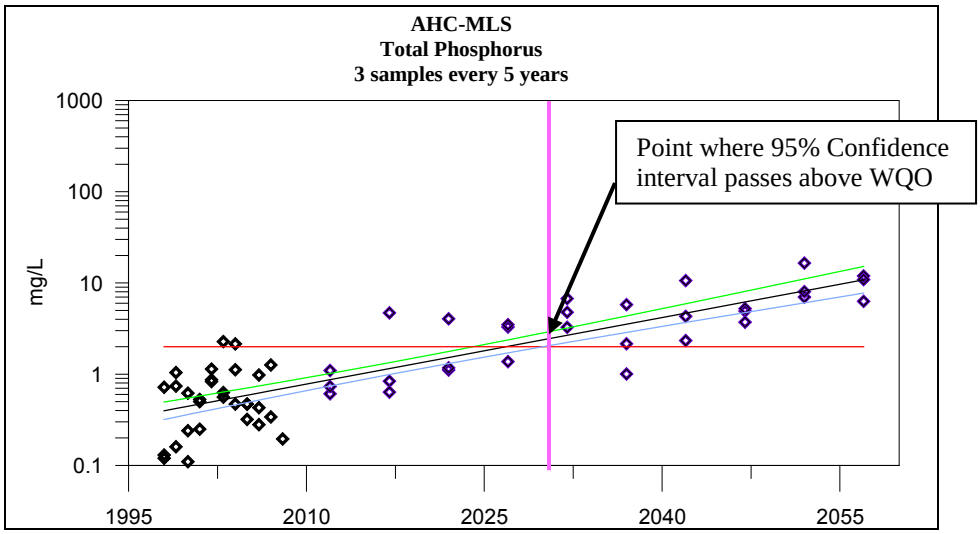

Total phosphorus concentrations at AHC-MLS are currently below WQOs, but are increasing at a slow rate. In Example 4, the simulation results show that a reduction in sample frequency from two wet events every two years to three wet events every five years will not decrease the ability to detect when the total phosphorus concentrations will exceed the WQO. The first plot in Example 4 shows that the year the 95-percent confidence limit will pass the WQO is approximately 2028. In the second plot in Example 4 (3 samples every 5 years) the year that the 95-percent confidence limit for total phosphorus exceeds the WQO is also approximately 2028. Therefore, a reduction in sample frequency from two wet events every two years to three wet events every five years will not decrease the chance of detecting when the total phosphorus concentrations will exceed the WQO.

Example 5. Total suspended solids data from TJR-MLS with 8 years of data and a statistically significant increasing trend.

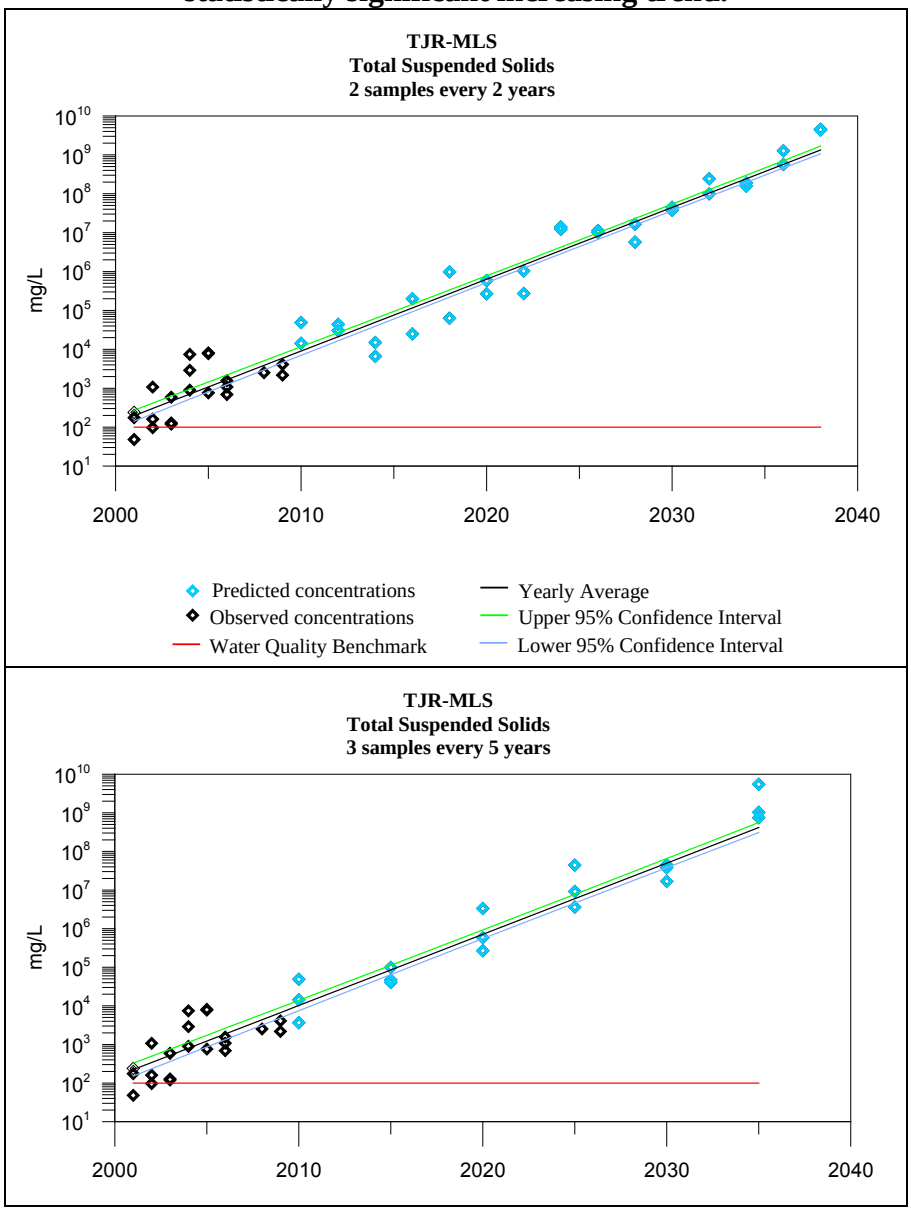

The steep increasing trend for TSS at TJR-MLS illustrates the finding that if a significant increasing trend is observed, a reduction in sampling frequency will not decrease the ability to detect it. In Example 5, the constituent concentrations are above the WQO and increasing at a rapid pace. Therefore, the reduction in sampling frequency from two wet events every two years to three wet events every five years will not decrease the statistical ability to detect significant trends.

Example 6. Total suspended solids data from SDC-MLS with 8 years of data and a non-significant increasing trend

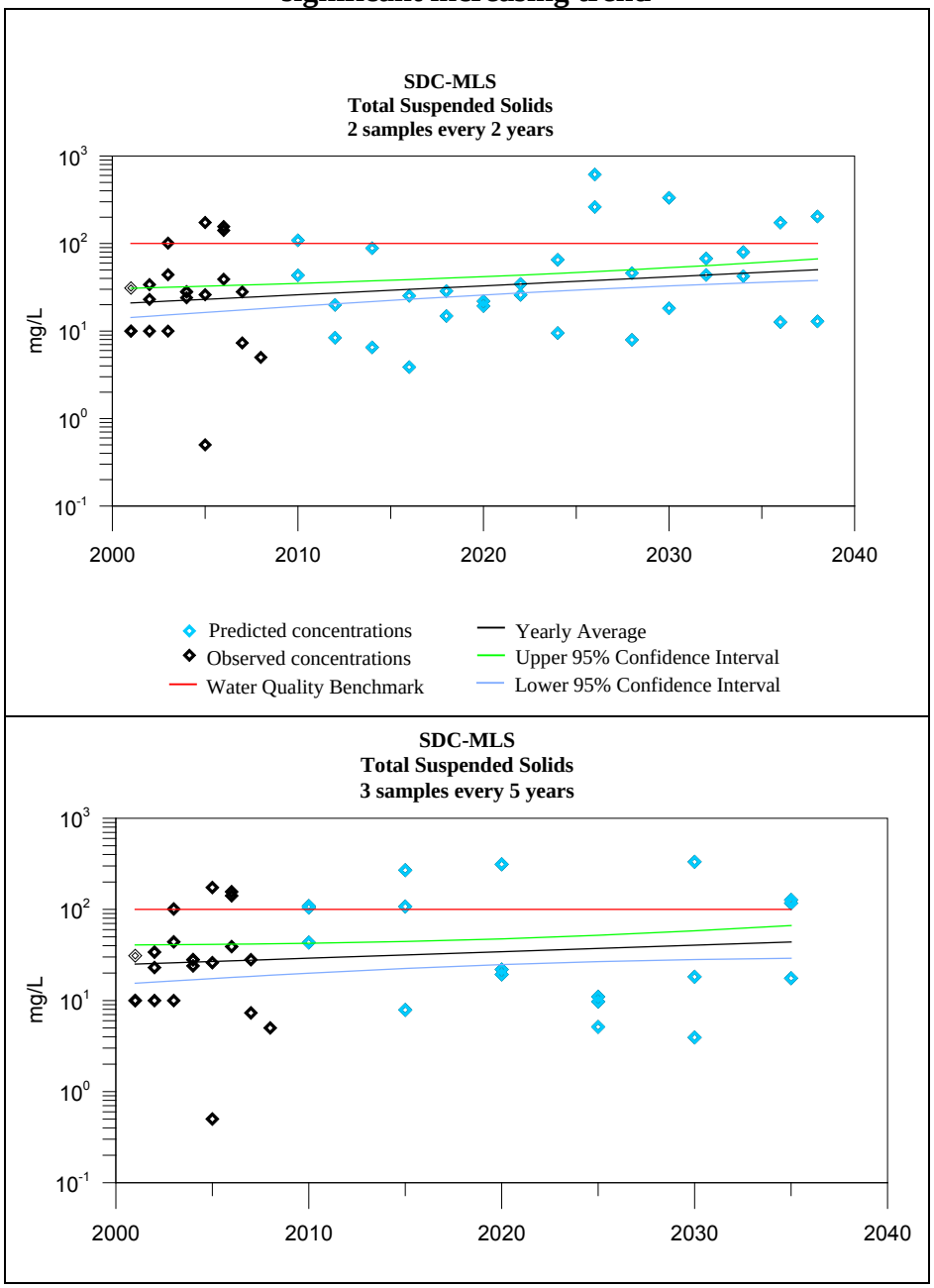

At SDC-MLS a generally increasing TSS trend is observed (Example 6). This example is included here to illustrate how a reduction in sample frequency will affect the Copermittees' ability to detect significant trends and to determine when TSS concentrations meet or exceed the WQO. Although the current TSS levels are below the WQB, it is possible to predict when TSS concentrations will meet or exceed the WQO using either the current monitoring program (two wet events every two years) or the reduced sampling frequency to three wet events every five years. In this instance, the average annual TSS concentrations are not expected to exceed the WQO within the next 30 years. The lower 95-percent confidence interval does not pass the WQO in this example.

San Diego County Water Authority
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September 13, 2012

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Santa Fe Irrigation District
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Vallecitos Water District
Valley Center Municipal Water District
Vista Irrigation District
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OTHER REPRESENTATIVE

County of San Diego

Ms. Lori Walsh
San Diego Regional Water Quality Control Board
9174 Sky Park Court
San Diego, CA 92123

RE: Comments on Revised Administrative Draft of Regional MS4 permit

Dear Ms. Walsh:

Thank you for the opportunity to provide comments on the San Diego Water Board's revised administrative draft of the Regional Municipal Separate Storm Sewer System (MS4) permit, Tentative Order No. R9-2012-0011. The San Diego County Water Authority is a regional wholesale water agency within San Diego County, with twenty-four member retail agencies. The Water Authority's mission is to provide a safe and reliable water supply to our member agencies. While our primary mission is the delivery of potable water supplies, recycled water is also an important component of our region's current and projected water supply resources mix. Therefore, the potential impact of the storm water permit requirements on both potable and recycled water supplies is of interest to us. We appreciate your efforts to recognize existing NPDES permits and minimize duplication of effort by regulatory agencies.

We do have the following comments on the permit provisions in E. 2. a.(2), page 55 :

1. The language on illicit discharges of non-storm water from line breaks and water main breaks lacks clarity. Therefore, we are recommending revised wording that will make it clear that any discharge under the NPDES Permit No. CAG 679001 (Order No. R9-2010-003) is exempt from regulation under the storm water permit.

2. We recommend that recycled water or potable water discharges not covered under a separate NPDES permit are illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a source of pollutants to receiving waters. This will avoid the need for regulatory action in response to a recycled water main break or leak which may have no real impact to receiving waters.

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RECYCLED PAPER

Our proposed modifications are shown in the attachment to this letter. Thank you for the opportunity to comment. If you have any questions regarding this letter, please contact Lesley Dobalian at (858) 522-6747.

Sincerely,

Ken Weinberg
Director of Water Resources

Attachment

Attachment

Suggested revisions to Tentative Order No. R9-2012-0011

Section II. E. Jurisdictional Runoff Management Programs
2. Illicit Discharge Detection and Elimination
a. Non-Storm Water Discharges

Each Copermittee must address all non-storm water discharges as illicit discharges, unless ~~a non-storm water discharge~~it is ~~either identified as a discharge~~ authorized by a separate NPDES permit. Illict~~, or identified as a category of non-storm water~~ discharges or flows are identified ~~that must be addressed~~ pursuant to the following requirements:

(1) Discharges of non-storm water to the MS4 from the following categories must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG919001 (Order No. R9-2007-0034, or subsequent order) for discharges to San Diego Bay, or NPDES Permit No. CAG919002 (Order No. R9-2008-0002, or subsequent order) for discharges to surface waters other than San Diego Bay:

(a) Uncontaminated pumped ground water;

(b) Discharges from foundation drains; 3

(c) Water from crawl space pumps; and

(d) Water from footing drains.

~~(2) Discharges of non-storm water from water line flushing and water main breaks to the MS4 must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG 679001 (Order No. R9-2010-0003, or subsequent order). This includes water line flushing and water main break discharges from water purveyors issued a water supply permit by the California Department of Public Health or federal military installations. Discharges from recycled or reclaimed water lines to the MS4 must be addressed as illicit discharges, unless the discharges have coverage under a separate NPDES permit.~~

(~~3~~2) Discharges of non-storm water to the MS4 from the following categories must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a source of pollutants to receiving waters:

(a) Diverted stream flows;

(b) Rising ground waters;

(c) Uncontaminated ground water infiltration to MS4s;

(d) Springs;

(e) Flows from riparian habitats and wetlands;

(f) Discharges from potable water sources

(g) Discharges from water line flushing and water main breaks to the MS4, that are not covered under NPDES Permit No. CAG 679001 (Order No. R9-2010-0003, or subsequent order).

(h) Discharges from recycled or reclaimed water lines to the MS4 that are not covered under a separate NPDES permit.

003976

SAN DIEGO NORTH
Economic Development Council
PROSPERITY ON PURPOSE

San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA. 92123-4340

September 14, 2012

Dear Sir:

We have recently become aware that the SDRWQCB is proposing new regulations related to storm water discharges. Several of the organizations affiliated with the San Diego North Economic Development Council are concerned about the magnitude of the proposed changes. We contacted other potentially affected parties including a culvert manufacturer, a water district, a property developer, and the office of an elected county official. All those contacted did not even know about the proposed regulations.

We believe the effort to publicize the regulations was inadequate and the response period was too short. It is requested that you extend the period for public comment and make additional efforts to publicize the proposed regulations.

As we understand the changes, they involve additional measurement and reporting. We believe that the sources are generally known and additional efforts should be devoted to steps that improve water quality. We appreciate that your efforts may be somewhat controversial and potentially costly, and that is all the more reason to be careful in making these changes.

Sincerely,

Rick Gittings
Interim CEO
San Diego North EDC

760.510.3179 www.sdnedc.org 950 Boardwalk, Suite 303, San Marcos, CA 92078

Walsh, Laurie@Waterboards

From: Doug Kot <doug@usgbc-sd.org>
Sent: Friday, September 14, 2012 4:55 PM
To: Walsh, Laurie@Waterboards
Cc: Chiu, Wayne@Waterboards
Subject: Re: Word document of MS4 permit?
Attachments: 2012-09-14_Regional_MS4_Admin_Draft_Permit_Comment_from_SDGBC_v1.pdf

Laurie,

Please see the attached comments from the U.S Green Building Council - San Diego (dba the San Diego Green Building Council). We are grateful for the opportunity to submit our comments and look forward to participating in the next stages of the process.

Thanks,
Doug

Douglas Kot, AIA, LEED Faculty
Executive Director
San Diego Green Building Council
5010 Shoreham Place
San Diego, CA 92122

doug@usgbc-sd.org
619-944-8607

Our buildings and communities will regenerate and sustain the health and vitality of all life within a generation.

Support Green Building in San Diego

On Tue, Sep 4, 2012 at 12:15 PM, Chiu, Wayne@Waterboards <Wayne.Chiu@waterboards.ca.gov> wrote:

Here you go. Looking forward to seeing your comments.

From: Jill Witkowski [mailto:jill@sdcoastkeeper.org]
Sent: Tuesday, September 04, 2012 11:47 AM
To: Chiu, Wayne@Waterboards; Walsh, Laurie@Waterboards
Cc: Doug Kot; Colin Kelly
Subject: Word document of MS4 permit?

Hi Wayne and Laurie,

Could you please send me a word document of the MS4 permit so we can ideally prepare a redline/strikeout to include with our comments?

Thanks,

Jill

Jill Witkowski

Waterkeeper

San Diego Coastkeeper®

www.sdcoastkeeper.org
2825 Dewey Rd, Suite 200

San Diego, CA 92106
619.758.7743 x119

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SAN DIEGO GREEN BUILDING COUNCIL

September 14, 2012

Via e-mail to lwalsh@waterboards.ca.gov
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

RE: Comments from the San Diego Green Building Council on Tentative Order Number: R9-2012-0011

Dear Ms. Walsh,

U.S. Green Building Council San Diego[1] respectfully submits the following comments on the administrative draft of the San Diego Regional Municipal Separate Storm Sewer System permit, Revised Tentative Order No. R9-2012-0011 ("Administrative Draft Permit").

BACKGROUND

The U.S. Green Building Council San Diego is a 501(c)(3) California non-profit corporation with the mission *to inspire, educate and collaborate within our communities to transform our built environment toward true sustainability*. Our support comes from the development, design, construction, facility management and other professional industries related to the built environment. We advocate for development that has reduced environmental impact, which is economically viable and socially responsible.

Water quality is critical to regional sustainability. Stormwater runoff is widely considered to be one of the world's most significant environmental problems. In the San Diego Region, storm drains discharge stormwater directly to our beaches without any treatment. Pollutants in runoff discharges impair receiving waters, threaten or harm the health of humans or aquatic organisms, and impair designated beneficial uses such as swimming at our local beaches. We encourage a science-based 'all-in' approach that incorporates site-based Low Impact Development (LID) strategies, urban infrastructure LID strategies and effective hydromodification management strategies. Our overall response to stormwater strategies in the administrative draft MS-4 can be summarized as: first *avoid*, then *reduce*, and only *delay* as a last resort (from the SUDS Sustainable Urban Drainage Systems program in the UK).

[1] *These comments were prepared with support from our volunteer community, including Rosalind Haselbeck, Ph.D. principal of Building Green Futures.*

COMMENTS

I. The Final Permit should require copermittees to engage stakeholders in developing Water Quality Improvement Plans.

The Administrative Draft Permit provides for public participation in Water Quality Improvement Plans to a single 30 day public review and comment period. The Final Permit should require copermittees to involve stakeholders throughout the Water Quality Improvement Plan development process. The Final permit should include opportunity for additional review periods. The Final Permit should ensure that the public review periods are staggered to encourage greater participation from a variety of stakeholders. The Final Permit should require that copermittees engage interested parties in establishing water quality priorities through the solicitation of water quality monitoring data as well as the establishment of a priority pollutant list. The Final Permit should require a public hearing for the Proposed Water Quality Improvement Plans.

Ongoing Adaptive Management Process should formalize the public participation process and the updates should occur more frequently than every three years.

II. The Final Permit should recognize the EPA's findings that Low Impact Development Best Management Practices are a cost-effective approach to improving water quality and enhancing community.

Implementation of Low Impact Development (LID) strategies provide environmental and economic benefits and reduce negative downstream water quality impacts. In addition other public benefits are associated with LID strategies, such as cleaner air, reduced urban temperatures, increased energy efficiency, and landscape amenities. The Final Permit should include similar language to clarify the environmental and economic benefits of LID Best Management Practices (BMPs) that form the basis of the Regional Board's policy decisions relating to development planning.

The Administrative Draft Permit should clearly define the best in class BMPs and create a system to catalogue the implementation strategies used by the various copermittees. The database should include the measured water quality impacts from each site to be used as a resource for future projects and development.

III. The Final Permit should define "Infeasible" and require developers to investigate a range of feasible projects to determine the greatest water quality benefits.

Allowing Copermittees to develop their own criteria as to what is "technically infeasible" runs the risk of Copermittees bowing to political pressure from special interest and can result in unfair completion for development between copermittees. The intent of the system approach to watershed management must require that all jurisdictions within that watershed have the same criteria for feasible; the Final Permit is the only way to ensure that there is uniform definition of "feasible" and "infeasible".

IV. The Final Permit should consider combining innovative with traditional stormwater mitigation strategies.

Low Impact Development (LID) techniques are typically viewed as small scale interventions that complement traditional detention basins but may not be able to fully meet the hydromodification requirements (peak flow and duration) of Priority Development Projects. Creative use of LID techniques can expand their capacity and effectiveness. For example: rainwater cisterns can provide a dual function with water conservation and stormwater mitigation. The design storm volume can be released from the cistern in response to a weather station at a rate determined by when the storm is expected, or manually by slow release of the pre-determined volume. The cistern can be sized to provide a sizable portion of the irrigation requirements. The design storm volume can be released into a bioretention cell or other landscaped area. Detention basins can serve as the final overflow for underdrains from bioretention cells

or bioswales to reduce the peak flow of stormwater runoff. The discharge from the detention basin in this case will have a reduced flow and reduced pollutant load due to pre-treatment.

Air Conditioning (AC) condensate is a great water source for irrigation and can be combined with the LID/stormwater mitigation practice of rainwater capture. The combination of AC condensate and rainwater provides a nearly year-round alternative water source for irrigation or indoor non-potable use. Vehicle wash water should not be discharged except into a landscaped area. Depending on product selection, vehicle wash water may also be diverted into a greywater surge tank for landscape irrigation.

V. The Final Permit should emphasize green municipal infrastructure practices that can mitigate stormwater impacts.

The strategy of "green streets" OR "green infrastructure practice" includes street-side, in-street (traffic circles, median strips), and parking lots. All of these green infrastructure practices share common themes of curb cuts to bioretention cells at a lower elevation than the street. Stormwater is typically infiltrated on site with engineered soil or gravel. Overflow during peak storm events is either directed to the storm drain via an underdrain or infiltrated at a second site nearby.

All of these approaches produce "green swathes" in urban areas which mitigate stormwater and provide aesthetic and community benefits. Finally, the local residents have the opportunity to become "stewards of their watershed". There are great examples of green streets: Elmer Avenue in Los Angeles (see: http://www.treepeople.org/sun-valley-watershed#Elmer) as well as many examples in the city of Tucson (see: http://www.watershedmg.org/sites/default/files/greenstreets/WMG_GISWNH_1.0.pdf).

Note that doing projects with existing development that are transparent, such as curb cuts that produce green streets, provide an important opportunity for education. Ultimately visible solutions that are aesthetically pleasing can influence individuals and communities toward patterns of more responsible consumption and use of water due to their increased knowledge and experience.

VI. The Final Permit should be applicable to all projects, without regard to minimum size.

The EPA's construction general permit outlines the provisions necessary to comply with Phase I and Phase II of the National Pollutant Discharge Elimination System (NPDES) program. Currently the permit only applies to construction sites greater than 1 acre (0.4 hectare), we recommend that the requirements are applied to all projects, regardless of size. Information on the EPA construction general permit is available at http://cfpub.epa.gov/npdes/stormwater/cgp.cfm.

CONCLUSION

In conclusion, the U.S. Green Building Council – San Diego appreciates the approach and effort the Regional Board and its staff have put towards developing an MS4 permit for the San Diego Region. We believe that this watershed system approach will better improve the environmental, economic and social impacts associated with current water quality in our region. We look forward to a constructive relationship with the Regional Board.

Respectfully submitted,

Douglas Kot
Executive Director
U.S. Green Building Council - San Diego

SDGE

A Sempra Energy utility®

Susan M. Hector
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2012 SEP 14 P 4: 54
SAN DIEGO REGIONAL
WATER QUALITY
CONTROL BOARD

September 14, 2012

California Regional Water Quality Control Board
San Diego Region
Ms. Laurie Walsh
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

VIA E-Mail: lwalsh@waterboards.ca.gov

RE: **Comments and Recommendations Regarding the National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region (Tentative Order No. R9-2012-0011, NPDES No. CAS0109266)**

Dear Ms. Walsh and Board Members:

The San Diego Gas & Electric Company (SDG&E) provides transmission and distribution of natural gas and electricity throughout San Diego County and southern Orange County. Delivery of these essential public services requires routine and emergency construction, operation and maintenance of its linear utility infrastructure. A primary mandate to utilities and other entities with linear facilities regulated by the California Public Utilities Commission and/ or other state and federal regulatory agencies is to provide safe and reliable service. The above-referenced draft MS4 permit (draft Permit) would impact SDG&E facilities in our service territory, which is located primarily within Region 9.

Our primary concern with the draft Permit is that in certain respects it contains language that is not consistent with the General Construction Permit (NPDES NO. CAS000002 ORDER NO. 2009-0009-DWQ), EPA regulations nor the State Water Board's March 2012 "Exceptions to the Ocean Plan for Discharges to Areas of Biological Significance" findings. As written, the draft Permit would detrimentally impact the construction, maintenance and operations of our linear facilities. Our comments and recommended revisions to the draft Permit on specific issues are provided below.

Illicit Discharges vs. Non-Storm Water Discharges

The draft Permit appears to use the terms "illicit discharges" and "non-storm water discharges" interchangeably throughout the draft Permit. These terms have different meanings and cannot be used interchangeably. The draft Permit's definition of illicit discharges excludes discharges subject to NPDES permits and discharges resulting from firefighting activities. That is, non-storm water discharges made pursuant to NPDES permits and discharges resulting from firefighting activities are **not** illicit discharges.

However, Finding 7 of the draft Permit states:

> The federal regulations [40 CFR 122.26(d)(2)(iv)(B)] require the Copermittees to have a program to prevent all types of non-storm water discharges, ***or illicit discharges***, from entering the MS4. [***emphasis added.***]

This finding appears to equate non-storm water discharges and illicit discharges and, as such, it is inconsistent with federal regulations [40cfr122.26(d)(2)(iv)(b)], which requires that the Copermittees have a program to:

> "...detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) ***illicit discharges*** and improper disposal into the storm sewer." [***emphasis added.***]

So under federal regulation, the Copermittees's program must address illicit discharges (which do not include discharges made pursuant to NPDES permits and discharges resulting from firefighting activities) as opposed to "all types of non-storm water discharges" as stated in Finding 7.

This confusion is exacerbated by the draft Permit's definition of "non-stormwater discharges," which states:

> All discharges to and from a MS4 that do not originate from precipitation events (i.e., all discharges from a MS4 other than storm water). Non-storm water includes illicit discharges ***and NPDES permitted discharges***. [***emphasis added.***]

Including "NPDES permitted discharges" in the definition of "non-stormwater" leads to the incorrect conclusion that, because the draft Permit prohibits discharges of non-stormwater to MS4s, NPDES permitted discharges are also prohibited. **We urge the RWQCB to revise the draft Permit to eliminate this confusion**.

<u>"Source of Pollutants" vs. "Significant Source of Pollutants"</u>

The draft Permit is inconsistent with EPA regulations regarding the standard for when certain categories of illicit discharges need to be addressed. Finding 7 of the draft Permit states:

> The federal regulations [40 CFR 122.26(d)(2)(iv)(B)] require the Copermittees to have a program to prevent all types of non-storm water discharges, or illicit discharges, from entering the MS4. The federal regulations, however, allow for specific categories of non-storm water discharges or flows to be addressed as illicit discharges only where such discharges are identified as ***sources of pollutants*** to waters of the U.S. [***emphasis added.***]

The quoted federal regulation requires the Copermittees to address the listed illicit discharges when they are found to be a "significant source" of pollutants; however the draft Permit finding states this is required when the MS4 finds the discharge to be a "source" of pollutants. **We urge the RWQCB to revise this language (and Section E.2.a.3, E.2.a.6 and any other section based on 40 CFR 122.26(d)(2)(iv)(B)) to be consistent with the federal regulations.**

<u>Discharges to Areas of Special Biological Significance</u>

The draft Permit should clarify that non-storm water discharges (e.g., potable hydrotest dewatering, groundwater dewatering discharges, etc.) made pursuant to NPDES permits to MS4 systems that discharge to Areas of Special Biological Significance (ASBS) are authorized. These types of discharges are critical to on-going infrastructure development, maintenance and operation and the State Water Board's March 2012 "Exceptions to the Ocean Plan for Discharges to Areas of Biological Significance" provides that the NPDES permitting authority can authorize these discharges to ASBS by making an appropriate finding in the applicable MS4 permit. **We urge the RWQCB to include the following language as part of Finding 30:**

> "The ASBS exception authorizes the discharge of non-stormwater to a MS4 when an NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS. Since NPDES permits for non-stormwater discharges contain conditions and requirements to protect water quality and many of these permits are for short-term and/ or intermittent discharges

(e.g., discharges from underground utility substructures, construction groundwater dewatering, and hydrostatic test water), the RWQCB authorizes their discharge to MS4 systems that discharge to ASBS."

Further, Section 2.I.A.1.e. in Attachment A (non-storm water discharges to MS4s that discharge to ASBS) is missing language that was included in the adopted exception. **We urge the RWQCB to revise Section 2.I.A.1.e. in Attachment A (non-storm water discharges to MS4s that discharge to ASBS) to be consistent with the language adopted into the ASBS exception, as follows:**

e. Non-storm water discharges are prohibited except as provided below:

(1) The term "non-storm water discharges" means any waste discharges from a Municipal separate storm sewer system (MS4) or other NPDES permitted storm drain system to an ASBS that are not composed entirely of storm water.

(2)(i) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability or occur naturally:

(a) Discharges associated with emergency fire fighting operations.
(b) Foundation and footing drains.
(c) Water from crawl space or basement pumps.
(d) Hillside dewatering.
(e) Naturally occurring groundwater seepage via a storm drain.
(f) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(ii) An NPDES permitting authority may authorize non-storm water discharges to an MS4 with a direct discharge to an ASBS only to the extent the NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

Non-stormwater Action Levels

The draft Permit should not subject non-stormwater discharges made pursuant to NPDES permits to action levels. Section II.C.1. would subject non-stormwater discharges to action levels. However, non-stormwater discharges that have NPDES permits are subject to their own discharge requirements. Setting additional, perhaps conflicting, requirements on these discharges is unnecessary and may lead to confusion. **We therefore urge the RWQCB to revise the draft Permit to clarify that the proposed non-stormwater action levels are not applicable to non-stormwater discharges that have NPDES permits**.

Development Planning

The draft Permit should not subject linear underground/ overhead (utility) projects (or LUPs) to permanent post-construction requirements. Section E.3. requires permanent BMP for all development projects. Construction of LUPs are regulated pursuant to the State Water Board's Stormwater Construction General Permit (CGP). Finding 76 in the CGP specifically excludes LUPs from permanent post-construction requirements due the nature of their construction. For consistency with the CGP, this draft Permit needs to be revised to clarify that Section E.3. is not applicable to LUPs (including associated unpaved roads) as defined in the CGP. **We urge the RWQCB to make this revision.**

BMP Operation and Maintenance for Roads

Section E.5.c.4.b. requires the Copermittees to "...implement procedures during the operation and maintenance of public streets, unpaved roads, paved roads, and paved highways and freeways...". In order to be consistent with 40 CFR 122.26.d.iv.2.A.3., this section needs to clarify that these requirements are not applicable to private roads. This same issue was addressed during the adoption process for the MS4 permit for southern Riverside County (Order R9-2010-0016) and the language was revised to clarify that these requirements were applicable only to Copermittee maintained roads. **We urge the RWQCB to revise this language to be consistent with Order R9-2010-0016 and 40 CFR 122.26.d.iv.2.A.3., and state that the requirements are applicable only to public Copermittee maintained roads.**

Please call Fred Jacobsen at 858-637-3723 if you have any questions regarding our comments.

Thank you for this opportunity to provide you with our comments.

Sincerely,

Susan M Hector

Susan M. Hector
Environmental Programs Manager

Walsh, Laurie@Waterboards

From: Yancey-York, Crystal <CYancey-York@semprautilities.com>
Sent: Friday, September 14, 2012 1:41 PM
To: Walsh, Laurie@Waterboards
Cc: Franks, Dianne; Kwan, Karen W.
Subject: Comments and Recommendations on Tentative Order No. R9-2012-0011, NPDES No. CAS0109266
Attachments: SCG Comments 9-2012.pdf

Ms. Walsh,

Attached please find the Southern California Gas Company's comments and recommendations regarding Tentative Order No. R9-2012-0011, NPDES No. CAS0109266. If you have any questions please feel free to contact me.

Thank you,
Crystal Yancey-York
Southern California Gas Co.
Env. Programs Manager
213-244-5819
Cell: 714-222-9642

Southern California Gas Company

A Sempra Energy utility®

Southern California Gas Company
555 W. Fifth Street, ML GT17E2
Los Angeles, CA 90013-1036

September 14, 2012

California Regional Water Quality Control Board
San Diego Region
Ms. Laurie Walsh
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

VIA E-Mail: lwalsh@waterboards.ca.gov

RE: Comments and Recommendations Regarding the National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region (Tentative Order No. R9-2012-0011, NPDES NO. CAS0109266)

Dear Ms. Walsh and Board Members:

Southern California Gas Company (SoCalGas) provides essential public services to over 20 million consumers and utility rate payers in a total service area of over 20,000 square miles. We also provide these services to governmental agencies and other entities, which in turn, provide fire protection, law enforcement, and emergency care (e.g., hospitals) to communities.

The above-referenced draft MS4 permit (draft Permit) would impact SoCalGas facilities in our service territory, which includes areas of Region 9. Our primary concern with the draft Permit is that in certain respects it contains language that is not consistent with the General Construction Permit (NPDES NO. CAS000002 ORDER NO. 2009-0009-DWQ), Environmental Protection Agency (EPA) regulations nor the State Water Resources Control Board's March 2012 "Exceptions to the Ocean Plan for Discharges to Areas of Biological Significance" findings. As written, the draft Permit would detrimentally impact the construction, maintenance and operations of our linear facilities. Our comments and recommended revisions to the draft Permit on specific issues are provided below.

Illicit Discharges vs. Non-Storm Water Discharges

The draft Permit appears to use the terms "illicit discharges" and "non-storm water discharges" interchangeably throughout the draft Permit. These terms have different meanings and cannot be used interchangeably.

The draft Permit's definition of illicit discharges excludes discharges subject to NPDES permits and discharges resulting from firefighting activities. That is, non-storm water discharges made pursuant to NPDES permits and discharges resulting from firefighting activities are **not** illicit discharges.

However, Finding 7 of the draft Permit states:

> The federal regulations [40 CFR 122.26(d)(2)(iv)(B)] require the Copermittees to have a program to prevent all types of non-storm water discharges, ***or illicit discharges***, from entering the MS4. [***Emphasis added.***]

This finding appears to equate non-storm water discharges and illicit discharges and, as such, it is inconsistent with federal regulations [40 CFR 122.26(d)(2)(iv)(b)], which requires that the Copermittees have a program to:

> "...detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) ***illicit discharges*** and improper disposal into the storm sewer." [***Emphasis added.***]

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This confusion is exacerbated by the draft Permit's definition of "non-stormwater discharges," as:

> All discharges to and from a MS4 that do not originate from precipitation events (i.e., all discharges from a MS4 other than storm water). Non-storm water includes illicit discharges ***and NPDES permitted discharges***. [***Emphasis added.***]

Including "NPDES permitted discharges" in the definition of "non-stormwater" leads to the incorrect conclusion that, because the draft Permit prohibits discharges of non-stormwater to MS4s, NPDES permitted discharges are also prohibited.

We urge the Regional Water Quality Control Board (RWQCB) to revise the draft Permit to eliminate this confusion.

"Source of Pollutants" vs. "Significant Source of Pollutants"

The draft Permit is inconsistent with EPA regulations regarding the standard for when certain categories of illicit discharges need to be addressed.

Finding 7 of the draft Permit states:

> The federal regulations [40 CFR 122.26(d)(2)(iv)(B)] require the Copermittees to have a program to prevent all types of non-storm water discharges, or illicit discharges, from entering the MS4. The federal regulations, however, allow for specific categories of non-storm water discharges or flows to be addressed as illicit discharges only where such discharges are identified as ***sources of pollutants*** to waters of the U.S. [***Emphasis added.***]

The quoted federal regulation requires the Copermittees to address the listed illicit discharges when they are found to be a "significant source" of pollutants; however the draft Permit finding states this is required when the MS4 finds the discharge to be a "source" of pollutants.

We urge the RWQCB to revise this language (and Section E.2.a.3, E.2.a.6 and any other section based on 40 CFR 122.26(d)(2)(iv)(B)) to be consistent with the federal regulations.

Discharges to Areas of Special Biological Significance

The draft Permit should clarify that non-storm water discharges (e.g., potable hydrotest dewatering, groundwater dewatering discharges, etc.) made pursuant to NPDES permits to MS4 systems that discharge to Areas of Special Biological Significance (ASBS) are authorized. These types of discharges are critical to on-going infrastructure development, maintenance and operation and the State Water Resources Control Board's March 2012 "Exceptions to the Ocean Plan for Discharges to Areas of Biological Significance" provides that the NPDES permitting authority can authorize these discharges to ASBS by making an appropriate finding in the applicable MS4 permit.

We urge the RWQCB to include the following language as part of Finding 30:

> "The ASBS exception authorizes the discharge of non-stormwater to a MS4 when an NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS. Since NPDES permits for non-stormwater discharges contain conditions and requirements to protect water quality and many of these permits are for short-term and/ or intermittent discharges (e.g., discharges from underground utility substructures, construction groundwater dewatering, and hydrostatic test water), the RWQCB authorizes their discharge to MS4 systems that discharge to ASBS."

Further, Section 2.I.A.1.e. in Attachment A (non-storm water discharges to MS4s that discharge to ASBS) is missing language that was included in the adopted exception.

We urge the RWQCB to revise Section 2.I.A.1.e. in Attachment A (non-storm water discharges to MS4s that discharge to ASBS) to be consistent with the language adopted into the ASBS exception, as follows:

e. Non-storm water discharges are prohibited except as provided below:

(1) The term "non-storm water discharges" means any waste discharges from a Municipal separate storm sewer system (MS4) or other NPDES permitted storm drain system to an ASBS that are not composed entirely of storm water.

(2)(i) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability or occur naturally:

(a) Discharges associated with emergency fire fighting operations.
(b) Foundation and footing drains.
(c) Water from crawl space or basement pumps.
(d) Hillside dewatering.
(e) Naturally occurring groundwater seepage via a storm drain.
(f) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(ii) An NPDES permitting authority may authorize non-storm water discharges to an MS4 with a direct discharge to an ASBS only to the extent the NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

<u>Non-stormwater Action Levels</u>

The draft Permit should not subject non-stormwater discharges made pursuant to NPDES permits to action levels. Section II.C.1. would subject non-stormwater discharges to action levels. However, non-stormwater discharges that have NPDES permits are subject to their own discharge requirements. Setting additional, perhaps conflicting, requirements on these discharges is unnecessary and may lead to confusion.

We therefore urge the RWQCB to revise the draft Permit to clarify that the proposed non-stormwater action levels are not applicable to non-stormwater discharges that have NPDES permits.

Development Planning

The draft Permit should not subject linear underground/ overhead (utility) projects (or LUPs) to permanent post-construction requirements. Section E.3. requires permanent BMP for all development projects. Construction of LUPs are regulated pursuant to the State Water Board's Stormwater Construction General Permit (CGP). Finding 76 in the CGP specifically excludes LUPs from permanent post-construction requirements due the nature of their construction. For consistency with the CGP, this draft Permit needs to be revised to clarify that Section E.3. is not applicable to LUPs (including associated unpaved roads) as defined in the CGP.

We urge the RWQCB to make this revision.

BMP Operation and Maintenance for Roads

Section E.5.c.4.b. requires the Copermittees to implement procedures during the operation and maintenance of public streets, unpaved roads, paved roads, and paved highways and freeways...". In order to be consistent with 40 CFR 122.26.d.iv.2.A.3., this section needs to clarify that these requirements are not applicable to private roads. This same issue was addressed during the adoption process for the MS4 permit for southern Riverside County (Order R9-2010-0016) and the language was revised to clarify that these requirements were applicable only to Copermittee maintained roads.

We urge the RWQCB to revise this language to be consistent with Order R9-2010-0016 and 40 CFR 122.26.d.iv.2.A.3., and state that the requirements are applicable only to public Copermittee maintained roads.

Thank you for this opportunity to provide you with our comments.

Sincerely,

Crystal Yancey-York
Southern California Gas Company
Environmental Manager

Walsh, Laurie@Waterboards

From: michael beanan <conxtns@hotmail.com>
Sent: Friday, September 14, 2012 10:49 AM
To: Walsh, Laurie@Waterboards
Subject: MS4 Focus Comments
Attachments: MS4 Focused Mtg Comments.docx

Laurie,

Please find attached Supplemental Comments to the Draft MS4 Permit. The South Laguna Civic Association is a co-signatory to Coastkeeper's extensive comment letter. My supplemental comments are in addition to highlight specific issues in the Aliso Watershed and, due to time constraints, are presented as my personal input since the SLCA Board did not have an opportunity to review these remarks for revisions.

SDRWQCB routinely encourages open dialogue and promote a variety of opportunities to provide feedback and recommendations. I appreciate this willingness to understand different perspectives and allow input from NGOs as well as individuals.

We will look forward to your efforts to integrate our comments into the next Draft MS4 Permit.

Mike

September 13, 2012

Laurie Walsh
San Diego Regional Water Quality Control Board

RE: Supplemental Comments
Administrative Draft of Tentative Order No. R9-2012-0011, NPDES No. CAS0109266
Municipal Separate Storm Sewer Systems (MS4s)
Draining the Watersheds within the San Diego Region

Thank you for your staff efforts to incorporate input from key stakeholder groups in drafting a new regional MS4 Permit. As follow-up to the series of MS4 Focused Meetings, please review supplemental comments consistent with the format of "Concept Summaries" as discussed at the Wednesday, September 5, 2012 Workshop.

1. Public Review / Transparency

   All Co-permitees must recognize the San Diego Region is a coastal ecosystem with each member sharing equally in the water quality impacts to coastal receiving waters. Co-permitees should indicate how each project reduces impacts to specifically improve coastal receiving waters. California has established the highest protection for shellfish habitat and a clear appreciation for impacts to fisheries and public health along the coast must be acknowledged by Co-permitees. Public review is contingent upon access to useful information. Intricate mathematical models for pollutant loads, duplicating monitoring reports buried among websites and technical data do little to inform the public discussion.

   More useful will be urban runoff maps color coded to identify known point sources culminating in coastal plume maps. Correlating thermal maps, chlorophyll maps, algae blooms and water column data will reveal the size and migratory behavior of urban runoff plumes impacting coastal receiving waters. Integrating coastal currents, counter currents and ocean upwelling dynamics can educate while evaluating progress in reducing these contaminated plumes. Scripps, SCCRP, UC Irvine and other research agencies have the capacity to develop and manage plume maps. How does the coastal plume interact with established whale migration routes and foraging grounds protected by various State and Federal regulations?

Whale migrating route only 300 yards off of South Laguna at Thousand Steps Beach

To encourage public participation, a picture can be worth more than a thousand words (or charts).

2. Adaptive Management Approach

   Adaptive management requires greater clarification. Some apply the concept to justify last minute changes or random adjustments to the operations of a project. Within this context, "adaptive management" spawns chaos and confusion to defeat coordinated progress. Any measure to adapt a given plan should occur in a well scheduled fashion following careful consideration to avoid erratic project management. When an adaptive measure is required, public transparency requires an opportunity to comment to support, challenge or provide an alternative to the new proposed management decision.

3. Prohibition Provision A

   The Clean Water Act did not contemplate the irresponsible waste of recycled water carelessly discharged into creek and coastal receiving waters. Clean Water Act, Section 402: National Pollutant Discharge Elimination System, Section (O) Anti-backsliding provisions prohibit the sequential increases of non-storm urban runoff accompanying developments over the past 20 years. Shifting baselines away from natural creek flow rates in a semi-arid ecology mask the incremental degradation of watersheds and coastal receiving waters. The absence of effective enforcement actions over the previous permit period allows known inland storm drain point sources among Co-permitees to continue illicit discharges. Without effective enforcement and Clean-up and Abatement Orders, Co-permitees have little incentive to allocate resources for complete, effective prohibition measures to eliminate non-storm water discharges into protected coastal receiving waters.

4. NALs and SALs
   No comment

5. Monitoring (and Mitigation)

   Please see comments above in Item 1. Monitoring should produce useful data and timely enforcement action to abate non-storm water discharges. Clear graphics and maps charting point sources and impact areas can improve public education and increase awareness among all Co-permitees as to their cumulative impacts. Third party information provides photographic evidence and data to highlight success and shortcomings.

   Monitoring can also include Fish Aggregation Devices (FADs) such as modified “Aquapods” anchored offshore to metabolize excess nutrients discharged from impaired creeks into coastal receiving waters. While full abatement of non-storm water flows is the goal, FADs can function as underwater wetland recovery systems to reduce the accumulation of targeted constituents in coastal waters.

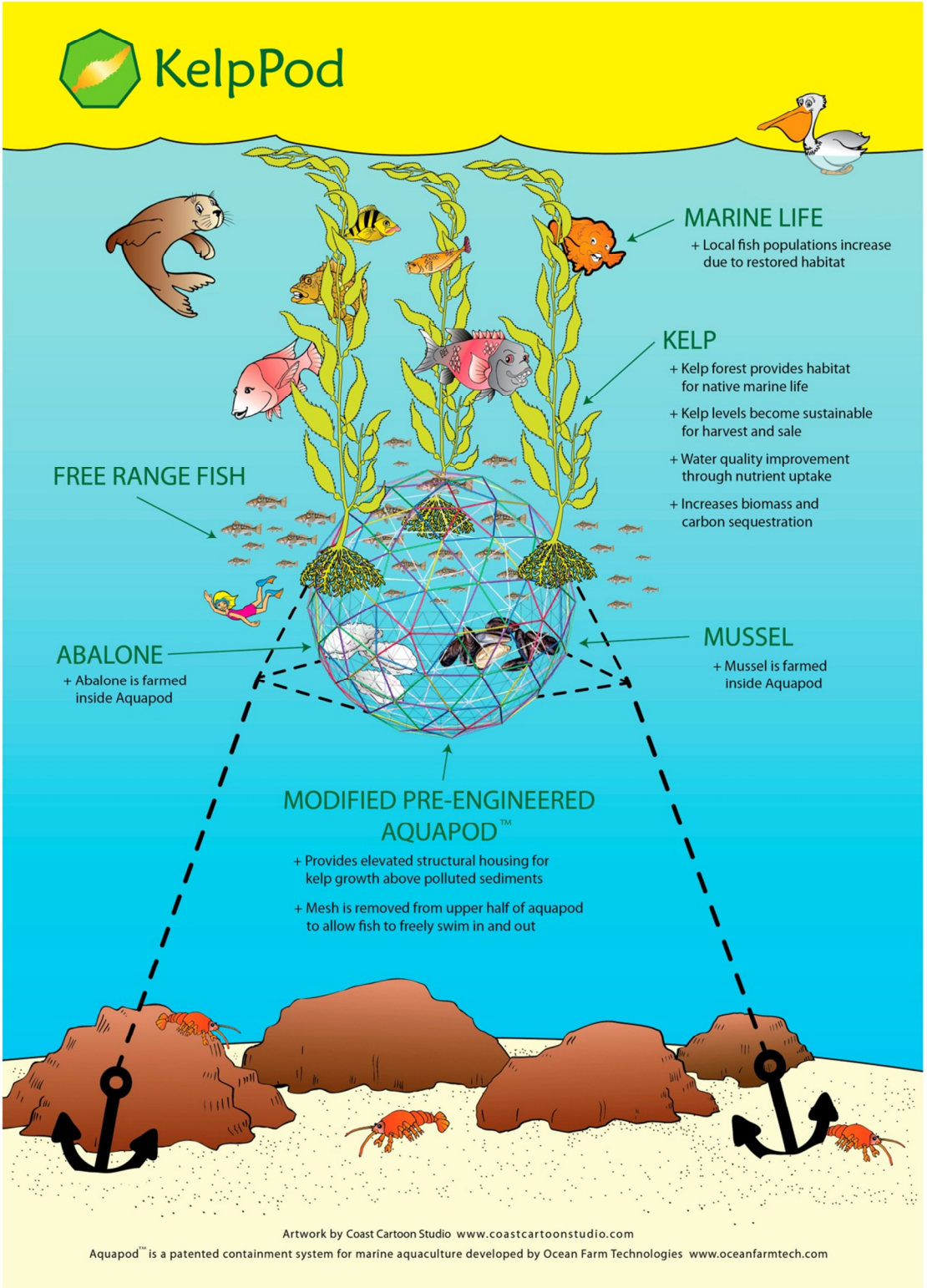
KelpPod
MARINE LIFE
+ Local fish populations increase due to restored habitat
KELP
+ Kelp forest provides habitat for native marine life
+ Kelp levels become sustainable for harvest and sale
+ Water quality improvement through nutrient uptake
+ Increases biomass and carbon sequestration
FREE RANGE FISH
ABALONE
+ Abalone is farmed inside Aquapod
MUSSEL
+ Mussel is farmed inside Aquapod
MODIFIED PRE-ENGINEERED AQUAPOD™
+ Provides elevated structural housing for kelp growth above polluted sediments
+ Mesh is removed from upper half of aquapod to allow fish to freely swim in and out
Artwork by Coast Cartoon Studio www.coastcartoonstudio.com
Aquapod™ is a patented containment system for marine aquaculture developed by Ocean Farm Technologies www.oceanfarmtech.com

6. LID/Hydromod Design Requirements

   Low Impact Development and Re-Development/Hydro Mod Requirements seem to suffer from a lack of imagination and familiarity with alternatives among developers and Co-permitees. One potential consideration is an aggressive stormwater capture program converting playing fields, parking lots, streets and canyons along the urban interface to capture stormwater and non-stormwater flows for multiple beneficial reuse opportunities. Street cisterns can effectively capture and retain millions of gallons for irrigation and other purposes. The San Diego Region is routinely threatened with wildfires where storm water capture systems and lined wells can retain water for fire suppression or other emergency purposes while protecting downstream creek and coastal ecosystems.

   Monetizing storm water capture volumes and other “new water” resources over a 30 year facility life cycle can yield revenues capable of covering construction and maintenance costs while effectively protecting ecosystems. An accounting of local natural water resources and its monetized equivalency over time against the cost of imported water will motivate innovations to responsibly manage this precious resource. The value of captured water in a regional disaster is priceless and some project costs might be eligible for FEMA disaster preparedness grants.

7. Existing Development Requirements

   Existing developments continue to violate current MS4 requirements. Non-storm water flows flood the Aliso Estuary and Aliso Beach on a daily basis to breach the beach sand berm – a naturally occurring coastal landform functioning to protect coastal water quality. Monthly monitoring reports reveal creek flow rates during January’s winter to be the same as summer flows in July.

U.S. Fish & Wildlife Service

Draft Recovery Plan for the Tidewater Goby

(Eucyclogobius newberryi)

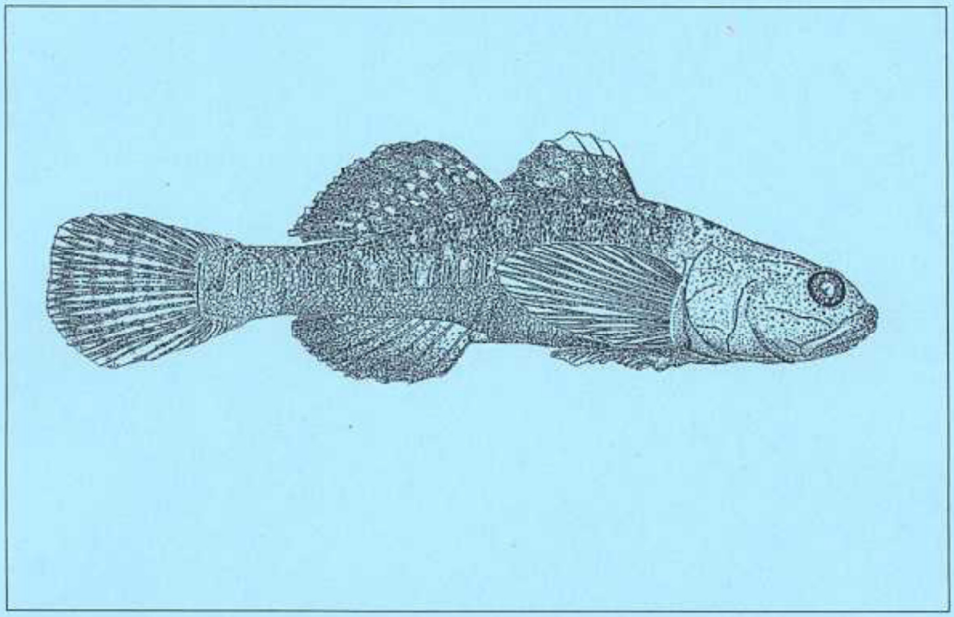

Estuarine restoration for Tidewater Goby at Aliso Beach (a Federal, State, County and local priority) cannot proceed with elevated non storm water flows flooding the coast. Inspections without effective enforcement allow the Co-permitees to continue to pollute without significant consequences or fines. However, inspections followed by prompt enforcement motivate Co-permitees to direct financial resources in achieving compliance while avoiding fines.

8. Timing of Deliverables

   Due to the vast distances in the San Diego Region, consider webcast participation in workshops as modeled during the recent Marine Life Protection Act public participation process. Clear graphics, maps and charts displayed on-line can facilitate communication and focus discussion on known problem areas.

The health of our community and visitors to the coast depend upon responsible action by Co-permitees to effectively prohibit non-storm water discharges and mitigate elevated flows from poorly engineered developments. All Co-permitees as well as major developers promote their proximity to beach and coastal recreational opportunities. Their residents frequent the local beaches where their health and well-being remain imperiled by non-storm water urban runoff contaminates. As time goes on, many will wonder why we have allowed water to become a problem rather than a resource.

Clear regulations and prompt enforcement effectively prohibit a variety of behaviors from cell phone use while driving to smoking in public places in an effort to protect public health and safety. As an impacted community, the South Laguna Civic Association appreciates the efforts of staff to design and implement MS4 regulations yielding measurable improvements to regional water quality.

Michael Beanan
South Laguna

mike@southlaguna.org

Walsh, Laurie@Waterboards

From: Arne Anselm <Arne.Anselm@ventura.org>
Sent: Monday, September 17, 2012 2:36 PM
To: Walsh, Laurie@Waterboards
Subject: Draft San Diego Stormwater Permit
Attachments: San Diego Reg Permit_Admin Draft 9.17.12_1.pdf

Please find attached comments from Ventura County Watershed Protection District on the Draft San Diego Stormwater Permit.

Arne Anselm
Water Quality Manager
Ventura County Watershed Protection District
805.654.3942
www.vcstormwater.org

Ventura County Watershed Protection District

PUBLIC WORKS AGENCY
JEFF PRATT
Agency Director

Tully Clifford, Director
Watershed Protection District

Gerhardt Hubner
Water/Environmental Resources

Karl Novak
Operations/Maintenance

Peter Sheydayi
Design/Construction

Sergio Vargas
Planning/Regulatory

September 17, 2012

Laurie Walsh
California Regional Water Quality Control Board (via email)
9174 Sky Park Court, Suite 100
San Diego, CA 92123

SUBJECT: ADMINISTRATIVE DRAFT, SAN DIEGO REGIONAL MS4 PERMIT, TENTATIVE ORDER 2012-0011

Ms. Walsh:

As the Principal Permittee of the Ventura Countywide Stormwater Quality Management Program responsible for stormwater monitoring, we have concerns regarding the draft San Diego Region Municipal Separate Storm Sewer Systems (MS4) NPDES Permit, released as an administrative draft by the San Diego Regional Water Quality Control Board (Regional Water Board) as Tentative Order No. R9-2012-0011 (NPDES NO. CAS0109266). We share the same concerns of the San Diego County Stormwater Copermittees that the monitoring and assessment program, as contained in the administrative draft order, would require excessive expenditures of monitoring funds without clear benefits to the implementation of the stormwater management program.

In particular, we support the concept of the draft Monitoring and Assessment component (permit Provision II.D) provided by the San Diego Copermittees which is highly compatible with the SMC's Model Monitoring Program and the state's SWAMP Assessment Framework. This alternative provides several strong advantages, including:

- An emphasis on monitoring, based upon a question-driven approach
- A framework for designing monitoring programs to effectively support adaptive management within watershed management areas
- A clear and important role for source identification studies to address priority constituents
- A defined process to focus monitoring and assessment resources on activities most likely to provide useful information that will result in reduction of pollutants from MS4s

The Copermittees' alternative represents an important step in the evolution of stormwater monitoring to better address high-priority water quality problems, and provide stormwater managers with more useful information to improve stormwater management program effectiveness. We strongly encourage the Regional Water Board to adopt the concepts presented in San Diego Copermittees' Alternative Provision D.

Sincerely,

Gerhardt Hubner
Deputy Director

C: Tully Clifford, Director, Ventura County Watershed Protection District
Jeff Pratt, Director, Ventura County Public Works Agency
Ventura County Stormwater Quality Management Program

From: lyris@swrcb18.waterboards.ca.gov
To: Chiu, Wayne@Waterboards
Subject: POSTED - Comments Received on the Administrative Draft MS4 Permit
Date: Thursday, September 20, 2012 11:36:11 AM

CoPermittee's and Stakeholders,

The comments received on the Administrative Draft MS4 Permit are now posted on the Regional Boards Website at

http://www.waterboards.ca.gov/rwqcb9/water_issues/programs/stormwater/index.shtml

If you have any questions regarding the postings please contact me.

Laurie Walsh, PE
San Diego Water Board
Lwalsh@waterboards.ca.gov
858-467-2970

You are currently subscribed to reg9_sandiegoco_ms4permit as: wchiu@waterboards.ca.gov.

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or send a blank email to leave-388217-508208.cee2a373662e566393e62f0af18d11cf@swrcb18.waterboards.ca.gov

From: lyris@swrcb18.waterboards.ca.gov
To: Chiu, Wayne@Waterboards
Subject: REVISED Administrative Draft Regional MS4 Permit is now Posted on the San Diego Water Board Website
Date: Friday, October 12, 2012 3:57:48 PM

Interested Parties,

The **Revised Administrative Draft MS4 Permit** is now posted on the San Diego Water Boards Website at http://www.waterboards.ca.gov/sandiego/. The Revised Administrative Draft includes proposed changes to the Administrative Draft Regional MS4 Permit originally released on April 9, 2012. This redline/strikeout version of the Administrative Draft shows proposed changes to the Regional MS4 Permit after considering comments received on September 14, 2012. The San Diego Water Board Permit Team greatly appreciated all of the effort Copermittees, Stakeholders, and other Interested Parties put into the comments.

The Revised Administrative Draft will be discussed during the upcoming October 24, 2012 Final Focused Meeting. We also have scheduled a Public Workshop on November 13, 2012 to introduce Tentative Order R9-2013-0001 to the Regional Board. Please note that the November Public Workshop is NOT at the Regional Board Office. It is going to be held on Tuesday, November 13, 2012 at 9:00 a.m. at the

NOVEMBER 13 TH PUBLIC WORKSHOP
City of San Diego Public Utilities Department
Wastewater Branch Auditorium
9192 Topaz Way, San Diego, California
San Diego, CA 92123

For more information on the October 24, 2012 Final Focus Meeting, the November 13, 2012 Public Workshop, and copies of any of the Regional MS4 documents released to date visit the Storm Water page on the San Diego Water Boards Website at
http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

If you have any questions please contact me.

Laurie Walsh P.E.
San Diego Water Board
858-467-2970
lwalsh@waterboards.ca.gov

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or send a blank email to leave-397162-508208.cee2a373662e566393e62f0af18d11cf@swrcb18.waterboards.ca.gov

ADMINISTRATIVE DRAFT

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD SAN DIEGO REGION

TENTATIVE
ORDER NO. R9-2013-0001 ~~2012-0011~~
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The San Diego County Copermittees in Table 1a are subject to waste discharge requirements set forth in this Order.

Table 1a. San Diego County Copermittees

City of Carlsbad	City of Oceanside
City of Chula Vista	City of Poway
City of Coronado	City of San Diego
City of Del Mar	City of San Marcos
City of El Cajon	City of Santee
City of Encinitas	City of Solana Beach
City of Escondido	City of Vista
City of Imperial Beach	County of San Diego
City of La Mesa	San Diego County Regional Airport Authority
City of Lemon Grove	San Diego Unified Port District ~~of San Diego~~
City of National City	

After the San Diego Water Board receives and considers the Orange County Copermittees' Report of Waste Discharge and makes any necessary changes to the Order, ~~T~~the Orange County Copermittees in Table 1b ~~are~~ will become subject to waste discharge requirements set forth in this Order ~~upon~~ after expiration of Order No. R9-2009-0002, NPDES No. CAS0108740 on or after December 16, 2014.

Table 1b. Orange County Copermittees

City of Aliso Viejo	City of Ranch Santa Margarita
City of Dana Point	City of San Clemente
City of Laguna Beach	City of San Juan Capistrano
City of Laguna Hills	City of Laguna Woods
City of Laguna Niguel	County of Orange
City of Lake Forest	Orange County Flood Control District
City of Mission Viejo	

After the San Diego Water Board receives and considers the Riverside County Copermittees' Report of Waste Discharge and makes any necessary changes to this Order, ~~T~~the Riverside County Copermittees in Table 1c ~~are~~ will become subject to waste discharge requirements set forth in this Order ~~upon~~ after expiration of Order No. R9-2010-0016, NPDES No. CAS0108766 on or after November 10, 2015.

Table 1c. Riverside County Copermittees

City of Murrieta	County of Riverside
City of Temecula	Riverside County Flood Control and Water Conservation District
City of Wildomar	

The Orange County Copermittees and Riverside County Copermittees may ~~enroll~~ become subject to the requirements of ~~under~~ this Order at a date earlier than the expiration date of their current Orders subject to the conditions described in Provision F.6 of this Order ~~and~~ if the Copermittees in the respective county receive a ~~Notice~~ notification of coverage ~~Enrollment (NOE)~~ from the San Diego Water Board.

The term Copermittee in this Order refers to any San Diego County, Orange County, or Riverside County Copermittee ~~enrolled~~ covered under this Order, unless specified otherwise.

This Order provides permit coverage for the Copermittee discharges described in Table 2.

Table 2. Discharge Locations and Receiving Waters

Discharge Points	Locations throughout San Diego Region
Discharge Description	Municipal Separate Storm Sewer System (MS4) Discharges
Receiving Waters	Inland Surface Waters, Enclosed Bays and Estuaries, and Coastal Ocean Waters of the San Diego Region

Table 3. Administrative Information

This Order was adopted by the San Diego Water Board on:	**Month Day, 2013 ~~2012~~**
This Order will become effective on:	**Month Day, 2013 ~~2012~~**
This Order will expire on:	**Month Day, 2018 ~~2017~~**
The Copermittees must file a Report of Waste Discharge ~~(ROWD)~~ in accordance with Title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than 180 days in advance of the Order expiration date.	

I, David W. Gibson, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on Month Day, 2013 ~~2012~~.

TENTATIVE

David W. Gibson
Executive Officer

ADMINISTRATIVE DRAFT

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I. FINDINGS

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), finds that:

JURISDICTION

1. **MS4 Ownership or Operation.** Each of the Copermittees owns or operates an MS4, through which it discharges storm water and non-storm water into waters of the U.S. within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the U.S.

2. **Legal and Regulatory Authority.** This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]) adopted by the United States Environmental Protection Agency (USEPA), and chapter 5.5, division 7 of the California Water Code (CWC) (commencing with section 13370). This Order serves as an NPDES permit for discharges from MS4s to surface waters. This Order also serves as waste discharge requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

   The San Diego Water Board has the legal authority to issue a regional MS4 permit pursuant to its authority under CWA section 402(p)(3)(B) and 40 CFR 122.26(a)(1)(v). The USEPA also made it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide permits. (See 55 Federal Register 47990, 48039-48042.)

   The federal regulations make it clear that the Copermittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators. (40 CFR 122.26(a)(3)(vi).) This Order does not require the Copermittees to manage storm water outside of their jurisdictional boundaries, but rather to work collectively to improve storm water management within watersheds.

3. **CWA Technology Based Standards and Prohibitions.** Pursuant to CWA section 402(p)(3)(B), NPDES permits for storm water discharges from MS4s must include requirements to effectively prohibit non-storm water discharges into MS4s, and require controls to reduce the discharge of pollutants in storm water to the maximum extent practicable (MEP).

4. **CWA NPDES Permit Conditions.** Pursuant to CWA section 402(a)(2), NPDES permits must prescribe conditions, including conditions on data and information

collection, reporting, and other requirements as the San Diego Water Board deems appropriate, to assure compliance with CWA section 402(p)(3)(B) and 40 CFR 122.26(d)(2)(iv)~~(B)~~. This Order prescribes conditions to assure compliance with the CWA requirements for owners and operators of MS4s to effectively prohibit non-storm water discharges in to the MS4s, and require controls to reduce the discharge of pollutants in storm water from the MS4s to the MEP.

5. **CWA and CWC Monitoring Requirements.** Pursuant to 40 CFR 122.48, NPDES permits must specify requirements for recording and reporting monitoring results. In addition, CWC sections 13267 and 13383 authorize the San Diego Water Board to require technical and monitoring reports. This Order establishes monitoring and reporting requirements to implement federal and State requirements.

6. **Total Maximum Daily Loads.** CWA section 303(d)(1)(A) requires that "[e]ach state shall identify those waters within its boundaries for which the effluent limitations…are not stringent enough to implement any water quality standard applicable to such waters." The CWA also requires states to establish a priority ranking of impaired water bodies known as Water Quality Limited Segments and to establish Total Maximum Daily Loads (TMDLs) for such waters. This priority list of impaired water bodies is called the Clean Water Act Section 303(d) List of Water Quality Limited Segments, commonly referred to as the 303(d) List. The CWA requires the 303(d) List to be updated every two years. Requirements of this Order implement the TMDLs adopted by the San Diego Water Board and approved by USEPA.

7. **Non-Storm Water Discharges.** Pursuant to CWA section 402(p)(3)(B)(ii), this Order requires each Copermittee to effectively prohibit discharges of non-storm water into its MS4. Nevertheless, non-storm water discharges into and from the MS4s continue to be reported to the San Diego Water Board by the Copermittees and other persons. Monitoring conducted by the Copermittees, as well as the 303(d) List, have identified dry weather, non-storm water discharges from the MS4s as a source of pollutants causing or contributing to receiving water quality impairments in the San Diego Region. The federal regulations [40 CFR 122.26(d)(2)(iv)(B)(1)] require the Copermittees to have a program to prevent ~~all types of non-storm water discharges, or~~ illicit discharges~~, from entering~~ to the MS4. The federal regulations, however, allow for specific categories of non-storm water discharges or flows to be addressed as illicit discharges only where such discharges are identified as sources of pollutants to waters of the U.S.

8. **In-Stream Treatment Systems.** Pursuant to federal regulations [40 CFR 131.10(a)], in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S. Authorizing the construction of a runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to accepting waste assimilation as an appropriate use for that water body. Runoff treatment must occur prior to the discharge of runoff into receiving waters. Treatment control best management practices (BMPs) must not be constructed in

waters of the U.S~~. or state~~. Construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body.

DISCHARGE CHARACTERISTICS AND RUNOFF MANAGEMENT

9. **Point Source Discharges of Pollutants.** Discharges from the MS4s contain waste, as defined in the CWC, and pollutants that adversely affect the quality of the waters of the state. A discharge from an MS4 is a "discharge of pollutants from a point source" into waters of the U.S. as defined in the CWA. Storm water and non-storm water discharges from the MS4s contain pollutants that cause or threaten to cause a violation of surface water quality standards, as outlined in the Basin Plan. Storm water and non-storm water discharges from the MS4s are subject to the conditions and requirements established in the Basin Plan for point source discharges.

10. **Potential Beneficial Use Impairment.** The discharge of pollutants and/or increased flows from MS4s may cause or threaten to cause the concentration of pollutants to exceed applicable receiving water quality objectives and impair or threaten to impair designated beneficial uses resulting in a condition of pollution, contamination, or nuisance.

11. **Pollutants Generated by Land Development.** Land development has created and continues to create new sources of non-storm water discharges and pollutants in storm water discharges as human population density increases. This brings higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash. Pollutants from these sources are dumped or washed off the surface by non-storm water or storm water flows into and from the MS4s. When development converts natural vegetated pervious ground cover to impervious surfaces such as paved highways, streets, rooftops, and parking lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving a developed area without BMPs that can maintain pre-development conditions will contain~~s~~ greater pollutant loads and ~~is~~ have significantly greater ~~in~~ runoff volume, velocity, and peak flow rate than pre-development runoff from the same area.

12. **Runoff Discharges to Receiving Waters.** The MS4s discharge runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within the eleven hydrologic units comprising the San Diego Region. Historic and current development makes use of natural drainage patterns and features as conveyances for runoff. Rivers, streams and creeks in developed areas used in this manner are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and receiving water. Numerous receiving water bodies and water body segments have been designated as impaired by the San Diego Water Board pursuant to CWA section 303(d).

13. **Pollutants in Runoff.** The most common pollutants in runoff discharged from the MS4s include total suspended solids, sediment, pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., cadmium, copper, lead, and zinc), petroleum products and polynuclear aromatic hydrocarbons, synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus), oxygen-demanding substances (decaying vegetation, animal waste), detergents, and trash. As operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not prohibit or otherwise control. These discharges may cause or contribute to a condition of contamination or a violation of water quality standards.

14. **Human Health and Aquatic Life Impairment.** Pollutants in runoff discharged~~s~~ from the MS4s can threaten and adversely affect human health and aquatic organisms. Adverse responses of organisms to chemicals or physical agents in runoff range from physiological responses such as impaired reproduction or growth anomalies to mortality. Increased volume, velocity, rate, and duration of storm water runoff greatly accelerate the erosion of downstream natural channels. This alters stream channels and habitats and can adversely affect aquatic and terrestrial organisms.

15. **Water Quality Effects.** The Copermittees' water quality monitoring data submitted to date documents persistent exceedances of Basin Plan water quality objectives for runoff-related pollutants at various watershed monitoring stations. Persistent toxicity has also been observed at several watershed monitoring stations. In addition, bioassessment data indicate that the majority of the monitored receiving waters have Poor to Very Poor Index of Biological~~tic~~ Integrity (IBI) ratings. These findings indicate that runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in the San Diego Region. Non-storm water discharges from the MS4s have been shown to contribute significant levels of pollutants and flow in arid, developed Southern California watersheds, and contribute significantly to exceedances of applicable receiving water quality objectives.

16. **Non-Storm Water Discharges.** Non-storm water discharges from the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard ~~from~~ of CWA section 402(p)(3)(B)(iii), which is explicitly for "Municipal … *Stormwater Discharges* (emphasis added)" from the MS4s. Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s must be effectively prohibited.

17. **Best Management Practices.** Waste and pollutants which are deposited and accumulate in MS4 drainage structures will be discharged from these structures to waters of the U.S. unless they are removed. These discharges may cause or

contribute to, or threaten to cause or contribute to, a condition of pollution in receiving waters. For this reason, ~~P~~pollutants in storm water discharges from the MS4s can be and must be effectively reduced in runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Pollution prevention is the reduction or elimination of pollutant generation at its source and is the best "first line of defense". Source control BMPs (both structural and non-structural) minimize the contact between pollutants and runoff, therefore keeping pollutants onsite and out of receiving waters. Treatment control BMPs remove pollutants that have been mobilized by storm water or non-storm water flows.

18. **BMP Implementation.** Runoff needs to be addressed during the three major phases of development (planning, construction, and use) in order to reduce the discharge of storm water pollutants to the MEP, effectively prohibit non-storm water discharges, and protect receiving waters. Development which is not guided by water quality planning policies and principles can result in increased pollutant load discharges, flow rates, and flow durations which can negatively affect receiving water beneficial uses. Construction sites without adequate BMP implementation result in sediment runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. Existing development can generate substantial pollutant loads which are discharged in runoff to receiving waters. Retrofitting areas of existing development with storm water pollutant control and hydromodification management BMPs is necessary to address storm water discharges from existing development that may cause or contribute to a condition of pollution or a violation of water quality standards.

19. **Long Term Planning and Implementation.** Federal regulations require municipal storm water permits to expire 5 years from adoption, after which the permit must be renewed and reissued. The San Diego Water Board recognizes that the degradation of water quality and impacts to beneficial uses of the waters in the San Diego Region occurred over several decades. The San Diego Water Board further recognizes that a decade or more may be necessary to realize demonstrable improvement to the quality of waters in the Region. This Order includes a long term planning and implementation approach that will require more than a single permit term to complete.

WATER QUALITY STANDARDS

20. **Basin Plan.** The San Diego Water Board adopted a Water Quality Control Plan for the San Diego Basin (Basin Plan) on September 8, 1994 that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for receiving waters addressed through the plan. The Basin Plan was subsequently approved by the State Water Resources Control Board (State Water Board) on December 13, 1994. Subsequent revisions to the Basin Plan have also been adopted by the San Diego Water Board and approved by the State Water Board. Requirements of this Order implement the Basin Plan.

The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Process Supply (PROC), Industrial Service Supply (IND), Ground Water Recharge (GWR), Contact Water Recreation (REC1), Non-contact Water Recreation (REC2), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Freshwater Replenishment (FRSH), Hydropower Generation (POW), and Preservation of Biological Habitats of Special Significance (BIOL). The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region: Navigation (NAV), Commercial and Sport Fishing (COMM), Estuarine Habitat (EST), Marine Habitat (MAR), Aquaculture (AQUA), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN), and Shellfish Harvesting (SHELL).

21. **Ocean Plan.** The State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, and 2005. The State Water Board adopted the latest amendment on April 21, 2005 and it became effective on February 14, 2006. The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean. Requirements of this Order implement the Ocean Plan.

    The Ocean Plan identifies the following beneficial uses of ocean waters of the state to be protected: Industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture; preservation and enhancement of designated Areas of Special Biological Significance; rare and endangered species; marine habitat; fish spawning and shellfish harvesting

22. **Sediment Quality Control Plan**. On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

23. **National Toxics Rule and California Toxics Rule.** USEPA adopted the NTR on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the National toxics Rule (NTR) applied in California. On May 18, 2000, USEPA adopted the California Toxics Rule (CTR). The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants.

24. **Antidegradation Policy.** This Order is in conformance with the federal Antidegradation Policy described in 40 CFR 131.12, and State Water Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality Waters in California*. Federal regulations at 40 CFR 131.12 require that the State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The San Diego Water Board's Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies.

CONSIDERATIONS UNDER FEDERAL LAW

25. **Coastal Zone Act Reauthorization Amendments.** Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states with approved coastal zone management programs to address non-point pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point pollution: agriculture, silviculture, urban, marinas, and hydromodification. This Order addresses the management measures required for the urban category, with the exception of septic systems. The runoff management programs developed pursuant to this Order fulfill the need for coastal cities to develop a runoff non-point source plan identified in the Non-Point Source Program Strategy and Implementation Plan. The San Diego Water Board addresses septic systems through the administration of other programs.

26. **Endangered Species Act.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 USC~~A~~ sections 1531 to 1544). This Order requires compliance with receiving water limits, and other requirements to protect the beneficial uses of waters of the State. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

27. **Report of Waste Discharge Process.** The waste discharge requirements set forth in this Order are based upon the Report of Waste Discharge submitted by the San Diego County Copermittees prior to the expiration of Order No. R9-2007-0001 (NPDES No. CAS0109266). The Orange County and Riverside County Copermittees are not immediately covered by the waste discharge requirements in this Order. The San Diego Water Board understands that each municipality is unique although the Counties share watersheds and geographical boundaries. The Order will continue to use the Report of Waste Discharge process prior to initially making Orange County or Riverside County Copermittees subject to the requirements of this Order.

The federal regulations (40 CFR 122.21(d)(2)) and the Water Code (CWC 13376) impose a duty on the Copermittees to reapply for continued coverage through submittal of a Report of Waste Discharge no later than 180 days prior to expiration of a currently effective permit. This requirement is set forth in the Orange County Copermittees' and Riverside County Copermittees' currently effective permits at Provisions K.2.b and K.2.c, respectively. The Orange County Permit, Order No. R9-2009-0002 (NPDES No. CAs0108740) expires on December 16, 2014 and the Riverside County MS4 Permit, Order No. R9-2010-0016 (NPDES No. CAS0108766) expires on November 10, 2015.

Unless the Orange County or Riverside County Copermittees apply for and receive early coverage under this Order, the Orange County Copermittees' and the Riverside County Copermittees' respective permits will be superseded by this Order upon expiration of their respective permits, subject to any necessary revisions to the requirements of this Order made after the San Diego Water Board considers their respective Reports of Waste Discharge through the public process provided in 40 CFR 124.

CONSIDERATIONS UNDER STATE LAW

28. **Unfunded Mandates.** This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following:

a. This Order implements federally mandated requirements under CWA section 402. (33 USC 1342(p)(3)(B).)

b. The local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental and new dischargers who are issued NPDES permits for storm water and non-storm water discharges.

c. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order.

d. The Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC 1311(a)) and in lieu of numeric restrictions on their MS4 discharges (i.e. effluent limitations).

e. The local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under State law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

f. The provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards. (33 USC 1313(d).) Once the USEPA or a state develops a TMDL, federal law requires that permits must contain water quality

based effluent limitations consistent with the assumptions and requirements of any applicable wasteload allocation. (40 CFR 122.44(d)(1)(vii)(B).)

29. **California Environmental Quality Act.** The issuance of WDRs and an NPDES permit for the discharge of runoff from MS4s to waters of the U.S. is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 et seq.) in accordance with CWC section 13389.

STATE WATER BOARD DECISIONS

30. **Compliance with Prohibitions and Limitations.** The receiving water limitation language specified in this Order is consistent with language recommended by the USEPA and established in State Water Board Order WQ-99-05, *Own Motion Review of the Petition of Environmental Health Coalition to Review Waste Discharge Requirements Order No. 96-03, NPDES Permit No. CAS0108740*, adopted by the State Water Board on June 17, 1999. The receiving water limitation language in this Order requires ~~compliance with~~ storm water discharges from MS4s to not cause or contribute to a violation of water quality standards, which ~~for storm water discharges~~ is to be achieved through an iterative approach requiring the implementation of improved and better-tailored BMPs over time. Implementation of the iterative approach to comply with receiving water limitations based on applicable water quality standards is necessary to ensure that storm water discharges from the MS4 ultimately will not cause or contribute to violations of water quality standards and the creation of conditions of pollution, contamination, or nuisance.

31. **Special Conditions for Areas of Special Biological Significance.** On March 20, 2012~~X~~, the State Water Board approved Resolution No. 2012-0012 approving an exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges. The Resolution requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBSs. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject terms and conditions of the Resolution. The Special Protections contained in Attachment B to the Resolution applicable to these discharges are hereby incorporated in this Order as if fully set forth herein.

ADMINISTRATIVE FINDINGS

32. **Executive Officer Delegation of Authority.** The San Diego Water Board by prior resolution has delegated all matters that may legally be delegated to its Executive Officer to act on its behalf pursuant to CWC section 13223. Therefore, the

Executive Officer is authorized to act on the San Diego Water Board's behalf on any matter within this Order unless such delegation is unlawful under CWC section 13223 or this Order explicitly states otherwise.

33. **Standard Provisions.** Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR 122.42, are provided in Attachment B to this Order.

34. **Fact Sheet.** The Fact Sheet for this Order contains background information, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of this Order. The Fact Sheet is hereby incorporated into this Order and constitutes part of the Findings of this Order.

35. **Public Notice.** The San Diego Water Board notified the Copermittees, and interested agencies and persons of its intent to prescribe WDRs for MS4 discharges of pollutants to waters of the U.S. and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet.

36. **Public Hearing.** The San Diego Water Board held a public hearing on Month Day, 2013 ~~2012~~ and heard and considered all comments pertaining to the terms and conditions of this Order. Details of the public hearing are provided in the Fact Sheet.

II. PROVISIONS

THEREFORE, IT IS HEREBY ORDERED that the Copermittees, in order to meet the provisions contained in division 7 of the CWC and regulations adopted thereunder, and the provisions of the CWA and regulations adopted thereunder, must each comply with the following:

A. PROHIBITIONS AND LIMITATIONS

The purpose of this provision is to describe the conditions under which storm water and non-storm water discharges into and from MS4s are prohibited or limited. The goal of this provision is to protect~~, preserve, enhance, and restore~~ the water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through the implementation of ~~control measures~~ water quality improvement strategies and runoff management programs that effectively prohibit non-storm water discharges into ~~and from~~ the Copermittees' MS4s, and reduce pollutants in storm water discharges from the Copermittees' MS4s to the MEP.

1. Discharge Prohibitions

a. Discharges ~~into and~~ from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the state are prohibited.

b. Non-storm water discharges into ~~and from~~ MS4s are to be effectively prohibited, unless such discharges are either authorized by a separate NPDES permit, or the discharge is a category of non-storm water discharges or flows that must be addressed pursuant to Provisions E.2.a.(1)-(5) of this Order.

c. Discharges from MS4s are subject to all waste discharge prohibitions in the Basin Plan, included in Attachment A to this Order.

d. ~~Discharges from MS4s to ASBS are prohibited.~~ Storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012~~X~~ applicable to these discharges, included in Attachment A to this Order. All other discharges from the Copermittees' MS4s to ASBS are prohibited.

2. Receiving Water Limitations

a. Discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters, including but not limited to all applicable provisions contained in:

(1) The San Diego Water Board's Basin Plan, including beneficial uses, water quality objectives, and implementation plans;

(2) State Water Board plans for water quality control including the following:

(a) Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries (Thermal Plan), and

(b) The Ocean Plan, including beneficial uses, water quality objectives, and implementation plans;

(3) State Water Board policies for water and sediment quality control including the following:

(a) Water Quality Control Policy for the Enclosed Bays and Estuaries of California,

(b) Sediment Quality Control Plan which includes the following narrative objectives for bays and estuaries:

(i) Pollutants in sediments shall not be present in quantities that, alone or in combination, are toxic to benthic communities, and

(ii) Pollutants shall not be present in sediments at levels that will bioaccumulate in aquatic life to levels that are harmful to human health,

(c) The Statement of Policy with Respect to Maintaining High Quality of Waters in California ~~(State Water Board Resolution No. 68-16)~~.[1]

(4) Priority pollutant criteria promulgated by the USEPA through the following:

(a) National Toxics Rule (NTR)[2] (promulgated on December 22, 1992 and amended on May 4, 1995), and

(b) California Toxics Rule (CTR)[3,4]

b. Discharges from MS4s composed of storm water runoff must not alter natural ocean water quality in an ASBS.

[1] State Water Board Resolution No. 68-16
[2] 40 CFR 131.36
[3] 65 Federal Register 31682-31719 (May 18, 2000), adding Section 131.38 to 40 CFR
[4] If a water quality objective and a CTR criterion are in effect for the same priority pollutant, the more stringent of the two applies.

~~c. Discharges from MS4s must not cause or contribute to the violation of any receiving water limitations expressed as water quality based effluent limitations (WQBELs) required to meet the WLAs established for the TMDLs in Attachment E to this Order, pursuant to the applicable TMDL compliance schedules.~~

3. Effluent Limitations

a. TECHNOLOGY BASED EFFLUENT LIMITATIONS

Pollutants in storm water discharges from MS4s must be reduced to the MEP.[5]

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

~~Pollutants in d~~Discharges from MS4s must ~~be reduced to~~ comply with any water quality based effluent limitations ~~expressed as~~ (WQBELs) ~~required to meet the WLAs~~ established for the TMDLs in Attachment E to this Order, pursuant to the applicable TMDL compliance schedules.

4. Compliance with Discharge Prohibitions and Receiving Water Limitations

Each Copermittee must achieve compliance with ~~comply with the discharge prohibitions and receiving water limitations~~ Provisions A.1.a, A.1.c and A.2.a of this Order through timely implementation of control measures and other actions as specified in Provisions B and E of this Order, including any modifications. The Water Quality Improvement Plans required under Provision B must be designed and adapted to ultimately achieve compliance with Provisions A.1.a, A.1.c and A.2.a.

a. If exceedance(s) of water quality standards persist in receiving waters notwithstanding implementation of this Order, the Copermittees must comply with the following procedures:

(1) For exceedance(s) of a water quality standard in the process of being addressed by the Water Quality Improvement Plan, the Copermittee(s) must implement the Water Quality Improvement Plan as accepted by the San Diego Water Board, and update the Water Quality Improvement Plan, as necessary, pursuant to Provision F.2.c;

~~(1)~~(2) Upon a determination by either the Copermittees or the San Diego Water Board that discharges from the MS4 are causing or contributing to a new exceedance of an applicable water quality standard not addressed by the Water Quality Improvement Plan, the Copermittees must submit the following

[5] This does not apply to MS4 discharges which receive subsequent treatment to reduce pollutants in storm water discharges to the MEP prior to entering receiving waters (e.g., low flow diversions to the sanitary sewer). Runoff treatment must occur prior to the discharge of runoff into receiving waters per Finding 8.

updates to the Water Quality Improvement Plan ~~required under Provision B~~ pursuant to Provision F.2.c or as part of the Annual Report required under Provision F.3.b, unless the San Diego Water Board directs an earlier submittal:

(a) The water quality improvement strategies being implemented that are effective and will continue to be implemented,

(b) ~~Additional w~~Water quality improvement strategies (i.e. BMPs, retrofitting projects, stream and/or habitat rehabilitation or restoration projects adjustments to jurisdictional runoff management programs, etc.) that will be implemented to reduce or eliminate any pollutants or conditions that are causing or contributing to the exceedance of water quality standards,

(c) Updates to the schedule for implementation of the existing and additional water quality improvement strategies, and

(d) Updates~~, when necessary,~~ to the monitoring and assessment program to track progress toward ~~schedule for~~ achieving compliance with Provisions A.1.a, A.1.c and A.2.a ~~the discharge prohibitions and receiving water limitations~~ of this Order;

(3) The San Diego Water Board may require the incorporation of additional modifications to the Water Quality Improvement Plan required under Provision B. The applicable Copermittees must submit any modifications to the update to the Water Quality Improvement Plan within ~~30~~ 90 days of notification that additional modifications are required by the San Diego Water Board, or as otherwise directed;

(4) Within ~~30~~ 90 days of the San Diego Water Board determination that the update to the Water Quality Improvement Plan meets the requirements of this Order, the applicable Copermittees must revise the jurisdictional runoff management program documents to incorporate the updated water quality improvement strategies that have been and will be implemented, the implementation schedule, and any additional monitoring required; and

(5) ~~The~~ Each Copermittee~~s~~ must implement the ~~revised jurisdictional runoff management programs and~~ updated ~~jurisdictional monitoring and assessment component of the~~ Water Quality Improvement Plan.

b. The ~~Copermittees must repeat the~~ procedure set forth above to ~~comply~~ achieve compliance with ~~discharge prohibitions and receiving water limitations~~ Provisions A.1.a, A.1.c and A.2.a of this Order do not have to be repeated for continuing or recurring exceedances of the same water quality standard(s) following implementation of scheduled actions unless directed to do otherwise by the San Diego Water Board.

c. Nothing in Provisions A.4.a and A.4.b prevents the San Diego Water Board from enforcing any provision of this Order while the applicable Copermittees prepare and implement the above update to the Water Quality Improvement Plan and jurisdictional runoff management programs.

B. WATER QUALITY IMPROVEMENT PLANS

The purpose of this provision is to develop Water Quality Improvement Plans that guide the Copermittees' jurisdictional runoff management programs ~~implementation efforts~~ towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plans is to ~~attain the reasonable~~ protect~~ion~~, preserve~~ation~~, enhance~~ment~~, and restore~~ation~~ ~~of~~ the water quality and designated beneficial uses of waters of the state. This goal will be accomplished through an adaptive planning and management process that identifies the highest priority water quality conditions ~~priorities~~ within a watershed and implements strategies~~, control measures, and BMPs~~ through the jurisdictional runoff management programs to achieve improvements in the quality of discharges from the MS4s and receiving waters.

~~The Copermittees must develop Water Quality Improvement Plans that 1) prioritize water quality issues resulting from discharges to and from the MS4s within each Watershed Management Area, 2) identify pollutant sources and other stressors associated with those water quality priorities, 3) define numeric targets and schedules to achieve improvement of water quality priorities, 4) describe water quality improvement strategies to achieve numeric targets, and 5) execute a coordinated monitoring and assessment program to determine progress towards achieving improved water quality.~~

~~The Copermittees must implement all the requirements of Provision B no later than 12 months after the adoption of this Order, or in accordance with Provision F.5.a of this Order.~~

1. Watershed Management Areas

The Copermittees must develop a Water Quality Improvement Plan~~s~~ for each of the Watershed Management Areas in Table B-1. A total of ~~nine~~ ten Water Quality Improvement Plans must be developed for the San Diego Region.

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
San Juan (901.00)	South Orange County	- Aliso Creek - San Juan Creek - San Mateo Creek - Pacific Ocean - Heisler Park ASBS	- City of Aliso Viejo[1] - City of Dana Point[1] - City of Laguna Beach[1] - City of Laguna Hills[1] - City of Laguna Niguel[1] - City of Laguna Woods[1] - City of Lake Forest[1] - City of Mission Viejo[1] - City of Rancho Santa Margarita[1] - City of San Clemente[1] - City of San Juan Capistrano[1] - County of Orange[1] - Orange County Flood Control District[1]

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
Santa Margarita (902.00)	Santa Margarita River	- Murrieta Creek - Temecula Creek - Santa Margarita River - Santa Margarita Lagoon - Pacific Ocean	- City of Murrieta[2] - City of Temecula[2] - City of Wildomar[2] - County of Riverside[2] - County of San Diego[3] - Riverside County Flood Control and Water Conservation District[2]
San Luis Rey (903.00)	San Luis Rey River	- San Luis Rey River - San Luis Rey Estuary - Pacific Ocean	~~- City of Escondido~~ - City of Oceanside - City of Vista - County of San Diego
Carlsbad (904.00)	Carlsbad	- Loma Alta Slough - Buena Vista Lagoon - Agua Hedionda Lagoon - Batiquitos Lagoon - San Elijo Lagoon - Pacific Ocean	- City of Carlsbad - City of Encinitas - City of Escondido - City of Oceanside - City of San Marcos - City of Solana Beach - City of Vista - County of San Diego
San Dieguito (905.00)	San Dieguito River	- San Dieguito River - San Dieguito Lagoon - Pacific Ocean	- City of Del Mar - City of Escondido - City of Poway - City of San Diego - City of Solana Beach - County of San Diego
Penasquitos (906.00)	Penasquitos	- Los Penasquitos Lagoon ~~- Mission Bay~~ - Pacific Ocean	- City of Del Mar - City of Poway - City of San Diego - County of San Diego
	Mission Bay	- Mission Bay - Pacific Ocean - San Diego Marine Life Refuge ASBS	- City of San Diego
San Diego (907.00)	San Diego River	- San Diego River - Pacific Ocean	- City of El Cajon - City of La Mesa ~~- City of Poway~~ - City of San Diego - City of Santee - County of San Diego
Pueblo San Diego (908.00) Sweetwater (909.00) Otay (910.00)	San Diego Bay	- Sweetwater River - Otay River - San Diego Bay - Pacific Ocean	- City of Chula Vista - City of Coronado - City of Imperial Beach - City of La Mesa - City of Lemon Grove - City of National City - City of San Diego - County of San Diego - San Diego County Regional Airport Authority - San Diego Unified Port District ~~of San Diego~~
Tijuana (911.00)	Tijuana River	- Tijuana River - Tijuana Estuary - Pacific Ocean	- City of Imperial Beach - City of San Diego - County of San Diego

Notes:
1. The Orange County Copermittees will be ~~enrolled~~ covered under this Order ~~upon~~ after expiration of Order No. R9-2009-0002, or earlier if the Orange County Copermittees meet the conditions in Provision F.6.
2. The Riverside County Copermittees will be ~~enrolled~~ covered under this Order ~~upon~~ after expiration of Order No. R9-2010-

0016, or earlier if the Riverside County Copermittees meet the conditions in Provision F.6.

3. The County of San Diego ~~will not be~~ is required to implement the requirements of Provision B for its jurisdiction within the Santa Margarita River Watershed Management Area until the Riverside County Copermittees ~~are~~ have been notified of coverage ~~enrolled~~ under this Order. ~~Until then, the County of San Diego is responsible for implementing and complying with the requirements of Provisions D.1, D.4.a.(1)&(3), E, F.2.a-b, F.3.b, and F.4 for the areas of the Santa Margarita River Watershed Management Area within its jurisdiction.~~

2. ~~Identification of~~ Priority Water Quality Conditions ~~Priorities~~

The Copermittees must identify the water quality priorities within each Watershed Management Area that will be addressed by the Water Quality Improvement Plan. Where appropriate, Watershed Management Areas may be separated into subwatersheds to focus water quality prioritization and jurisdictional runoff management program implementation efforts by receiving water.

a. Assessment of Receiving Water Conditions

The Copermittees must ~~review pollutant sources, discharges, and receiving water conditions and assess~~ consider the following, at a minimum, to ~~determine the degree of adverse~~ identify water quality priorities based on impacts of MS4 discharges on ~~to~~ receiving water beneficial uses:

(1) Receiving waters listed as impaired on the CWA Section 303(d) List of Water Quality Limited Segments (303(d) List);

(2) TMDLs adopted and under development by the San Diego Water Board;

(3) Receiving waters recognized as sensitive or highly valued by the Copermittees, including estuaries designated under the National Estuary Program under CWA section 320, wetlands defined by the State or U.S. Fish and Wildlife Service's National Wetlands Inventory as wetlands, and receiving waters identified as ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012~~X~~ (Attachment A);

(4) The receiving water limitations of Provision A.2; ~~Water quality standards established in the Basin Plan;~~

(5) Known historical versus current physical, chemical, and biological water quality conditions;

(6) ~~All a~~Available, relevant, and appropriately collected and analyzed physical, chemical, and biological receiving water monitoring data, including, but not limited to, data describing:

(a) Chemical constituents,~~;~~

(b) Water quality parameters (i.e. pH, temperature, conductivity, etc.),~~;~~

(c) Toxicity Identification Evaluations for both receiving water column and sediment,~~;~~

(d) Trash impacts,~~;~~

(e) Bioassessments,~~;~~ and

(f) Physical habitat;~~.~~

(7) Available evidence of erosional impacts in receiving waters due to accelerated flows (i.e. hydromodification); ~~and~~

(8) Available evidence of adverse impacts to the chemical, physical, and biological integrity of receiving waters;~~.~~ and

(9) The potential improvements in the overall condition of the Watershed Management Area that can be achieved.

b. ASSESSMENT OF IMPACTS FROM MS4 DISCHARGES

The Copermittees must consider the following, at a minimum, to identify the potential impacts to receiving waters that may be caused or contributed to by discharges from the Copermittees' MS4s:

(1) The discharge prohibitions of Provision A.1 and effluent limitations of Provision A.3; and

(2) Available, relevant, and appropriately collected and analyzed storm water and non-storm water monitoring data from the Copermittees' MS4 outfalls;

(3) Locations of each Copermittee's MS4 outfalls that discharge to receiving waters;

(4) Locations of MS4 outfalls that are known to persistently discharge non-storm water to receiving waters likely causing or contributing to impacts on receiving water beneficial uses;

(5) Locations of MS4 outfalls that are known to discharge pollutants in storm water causing or contributing to impacts on receiving water beneficial uses; and

(6) The potential improvements in the quality of discharges from the MS4 that can be achieved.

c. IDENTIFICATION~~Y~~ OF PRIORITY ~~POLLUTANTS AND RECEIVING~~ WATER QUALITY CONDITIONS

(1) The Copermittees must use the information gathered ~~in~~ for Provisions B.2.a~~.~~ and B.2.b to develop a list of priority water quality conditions ~~priorities~~ as pollutants, stressors and/or receiving water conditions that are the highest

threat to receiving water quality or that most adversely affect the physical, chemical, and biological integrity of receiving waters. The list must include the following information for each priority water quality condition:

(a) The beneficial use(s) associated with the priority water quality condition;

(b) The geographic extent of the priority water quality condition within the Watershed Management Area, if known;

(c) The temporal extent of the priority water quality condition (e.g., dry weather and/or wet weather);

(d) The Copermittees with MS4s discharges that may cause or contribute to the priority water quality condition; and

(e) An assessment of the adequacy of and data gaps in the monitoring data to characterize the conditions causing or contributing to the priority water quality condition, including a consideration of spatial and temporal variation.

(2) The Copermittees must identify the highest priority water quality conditions ~~water quality priorities~~ to be addressed by the Water Quality Improvement Plan, and provide a rationale for selecting a subset of the water quality conditions identified pursuant to Provision B.2.c.(1) as the highest priorities.

d. IDENTIFICATION OF MS4 ~~POLLUTANT~~ SOURCES OF POLLUTANTS AND/OR STRESSORS ~~IDENTIFICATION~~

The Copermittees must identify and prioritize known and suspected sources of storm water and non-storm water pollutants ~~sources~~ and/or ~~any~~ other stressors associated with MS4 discharges that cause~~ing~~ or contribute~~ing~~ to the highest priority water quality conditions ~~priorities~~ identified under Provision B.2.c. The identification of known and suspected sources of pollutants and/or stressors ~~of~~ that cause or contribute to the highest priority water quality conditions ~~priorities~~ as identified for Provision B.2.c~~b~~ must consider the following:

(1) Pollutant generating facilities, ~~or~~ areas, and/or activities within the Watershed Management Area, including:

(a) Each Copermittee's inventory of construction sites, ~~municipal,~~ commercial facilities or areas, industrial facilities, municipal facilities, and residential ~~facilities,~~ areas~~, and/or activities~~,

(b) Publicly owned parks and/or recreational areas,

(c) Open space areas,

(d) All currently operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste, and

(e) Areas not within the Copermittees' jurisdictions (e.g., Phase II MS4s, tribal lands, state lands, federal lands) that ~~may~~ are known or suspected to be discharging to the Copermittees' MS4s ~~pollutant sources related to the highest water quality priorities within the Watershed Management Area~~;

(2) Locations of the Copermittees' MS4s, including the following:

(a) All MS4 outfalls that discharge to receiving waters, and

(b) Locations of major structural controls for storm water and non-storm water (e.g., retention basins, detention basins, major infiltration devices, etc.);

(3) Other known and suspected sources of non-storm water or pollutants in storm water discharges to receiving waters within the Watershed Management Area, including the following:

(a) Other MS4 outfalls (e.g., Phase II Municipal and Caltrans),

(b) Other NPDES permitted discharges,

(c) Any other discharges that may be considered point sources (e.g., private outfalls), and

(d) Any other discharges that may be considered non-point sources (e.g., agriculture, wildlife or other natural sources);

(4) Review of available data, including but not limited to:

(a) Findings from the Copermittees' illicit discharge detection and elimination programs,

(b) Findings from the Copermittees' MS4 outfall discharge monitoring,

(c) Findings from the Copermittees' receiving water monitoring,

(d) Findings from the Copermittees' MS4 outfall discharge~~s~~ and receiving water assessments, and

(e) ~~Any o~~Other available, relevant, and appropriately collected data, information, or studies related to pollutant sources and/or stressors ~~conditions~~ that contribute to the highest priority water quality conditions ~~priorities~~ as identified for Provision B.2.c~~b~~.

(5) The adequacy of the available data to identify and prioritize sources and/or stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c.

e. NUMERIC ~~TARGETS~~ GOALS AND SCHEDULES

The Copermittees must develop and incorporate interim and final numeric ~~targets~~ goals[6] and schedules into the Water Quality Improvement Plan~~s~~. Numeric ~~targets~~ goals ~~and schedules~~ must be used to support Water Quality Improvement Plan implementation and measure progress towards addressing the highest priority water quality conditions ~~priorities and an ultimate outcome of protections, preservation, enhancement, and restoration of receiving water beneficial uses~~ identified under Provision B.2.c. When ~~developing~~ establishing numeric ~~targets~~ goals and corresponding schedules, the Copermittees must consider the following:

(1) Final numeric ~~targets~~ goals must be based on measureable criteria or indicators, to be achieved in the receiving waters and/or MS4 discharges for the highest priority water quality conditions ~~priorities~~ which will ~~result~~ be capable of demonstrating ~~in~~ the achievement of the restoration and/or protection of water quality standards in receiving waters;

(2) Interim numeric ~~targets~~ goals must be based on measureable criteria or indicators that can demonstrate incremental progress toward achieving the final numeric ~~targets~~ goals in the receiving waters and/or MS4 discharges; and

(3) Schedules must be adequate for measuring progress toward achieving the interim and final numeric ~~targets~~ goals required for Provisions B.2.~~d~~e.(1) and B.2.~~d~~e.(2). Schedules must incorporate the following:

(a) Interim dates for achieving the interim numeric ~~targets~~ goals,

(b) Compliance schedules for any applicable TMDLs in Attachment E to this Order,

(c) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012~~X~~ (see Attachment A),

[6] Interim and final numeric ~~targets~~ goals may take a variety of forms such as TMDL established WQBELs, action levels, pollutant concentration, load reductions, number of impaired water bodies delisted from the List of Water Quality Impaired Segments, Index of Biotic Integrity (IBI) scores, or other appropriate metrics. Interim and final numeric ~~targets~~ goals are not necessarily limited to one criterion or indicator, but may include multiple criteria and/or indicators. Except for TMDL established WQBELs, interim and final numeric goals and corresponding schedules may be revised through the adaptive management process under Provision B.5.

(d) Achievement of the final numeric ~~targets~~ goals in the receiving waters and/or MS4 discharges for the highest water quality priorities must be as soon as possible, and

(e) Final dates for achieving the final numeric ~~targets~~ goals must not initially extend more than 10 years beyond the date this Order is adopted, unless a longer period of time is authorized by the San Diego Water Board Executive Officer or the schedule includes an applicable TMDL in Attachment E to this Order.

3. Water Quality Improvement Strategies and Schedules

The Copermittees must develop specific water quality improvement strategies to address the highest priority water quality conditions ~~priorities~~ identified within a Watershed Management Area. The water quality improvement strategies must address the highest priority water quality conditions ~~priorities~~ by preventing or eliminating non-storm water discharges to and from the MS4, reducing pollutants in storm water discharges from the MS4 to the MEP, and restoring and/or protecting the water quality standards of receiving waters.

a. WATER QUALITY IMPROVEMENT STRATEGIES

The Copermittees must identify and prioritize water quality improvement strategies based on their likely effectiveness and efficiency, ~~must prioritize~~ and implement ~~the following~~ strategies to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, improve the physical, chemical, and biological receiving water conditions, and achieve the interim and final numeric ~~targets~~ goals in accordance with the schedules required for Provision B.2.e.(3)~~c~~. The following water quality improvement strategies must be included and described in the Water Quality Improvement Plan:

(1) Specific strategies and/or activities that may be implemented by one or more Copermittees within their jurisdictions through the jurisdictional runoff management programs that will address the highest priority water quality conditions within the Watershed Management Area, in accordance with the following requirements:

(a) Strategies and/or activities must, at a minimum, be described for each jurisdictional runoff management program component where strategies to address the highest priority water quality conditions are required under Provision E;

(b) The Water Quality Improvement Plan must describe the circumstances or conditions when and where the strategies or/activities should be or will be implemented, but specific details about how each Copermittee will implement the strategies and/or activities within its jurisdiction are not required; and

(c) Descriptions of strategies and/or activities must include any monitoring, information collection, special studies, and/or data analysis that is necessary to assess the effectiveness of the strategy and/or activity toward addressing the highest priority water quality conditions.

~~(1)~~

(2) Additional ~~Structural and/or non-structural BMPs~~ strategies and/or activities that may be implemented within the Watershed Management Area on a jurisdictional, sub-watershed, or watershed scale by one or more Copermittees, not specifically required under Provision E, which are designed to achieve the interim and final numeric goals identified in Provisions B.2.e.(1) and B.2.e.(2) ~~targets in the receiving waters and/or MS4 discharges~~;

~~(2) Retrofitting projects for areas of existing development known or suspected to contribute to the highest water quality priorities, and where retrofitting will contribute to reducing or eliminating non-storm water discharges to the MS4 and/or reducing pollutants in storm water discharges from the MS4 to the MEP;~~

~~(3) Stream and/or habitat rehabilitation or restoration projects where stream and/or habitat rehabilitation or restoration are necessary for, or will contribute to demonstrable improvements in the physical, chemical, and biological receiving water conditions and restoration and/or protection of water quality standards in receiving waters; and~~

~~(4) Other water quality improvement strategies that will result in preventing or eliminating non-storm water discharges to and from the MS4, reducing pollutants in storm water discharges from the MS4 to the MEP, and restoring and/or protecting the water quality standards of receiving waters.~~

b. IMPLEMENTATION SCHEDULES

(1) The Copermittees must develop schedules for implementing the water quality improvement strategies identified under Provision B.3.a to achieve the interim and final numeric ~~targets~~ goals identified under Provision B.2.e.(1) and B.2.e.(2)~~B.2.e~~ ~~in the receiving waters and/or MS4 discharges for the highest water quality priorities in the Watershed Management Area~~. Schedules must be developed for both the water quality improvement strategies implemented by each Copermittee within its jurisdiction and for strategies that ~~will be implemented by multiple~~ the Copermittees choose to implement on a collaborative basis.

(2) The Copermittees must incorporate the implementation compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012~~X~~ (see Attachment A).

4. Water Quality Improvement Monitoring and Assessment Program

a. The Copermittees in each Watershed Management Area must develop and incorporate an integrated monitoring and assessment program into the Water Quality Improvement Plan that assesses: 1) the progress toward achieving the numeric ~~targets~~ goals and schedules, ~~and~~ 2) the progress toward addressing the highest priority water quality conditions ~~priorities~~ for each Watershed Management Area, and 3) each Copermittee's overall efforts to implement the Water Quality Improvement Plan.

b. The ~~water quality improvement~~ monitoring and assessment program must ~~include~~ incorporate the monitoring and assessment requirements of Provision D, which may allow the Copermittees to modify the program to be consistent with and focus on the highest priority water quality conditions for each Watershed Management Area.

c. For Watershed Management Areas with applicable TMDLs, the ~~water quality~~ monitoring and assessment program must incorporate the specific monitoring and assessment requirements of Attachment E.

d. For Watershed Management Areas with any ASBS, the water quality monitoring and assessment program must also incorporate the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

5. Iterative Approach and Adaptive Management Process

The Copermittees in each Watershed Management Area must implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a, and must consider the following:

~~a. WATER QUALITY IMPROVEMENT PLAN ADAPTIVE MANAGEMENT PROCESS~~

a. RE-EVALUATION OF PRIORITY WATER QUALITY CONDITIONS

The priority water quality conditions, and numeric goals and corresponding schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.2.c and B.2.e, may be re-evaluated by the Copermittees as needed during the term of this Order as part of the Annual Report. Re-evaluation and recommendations for modifications to the priority water quality conditions, and numeric goals and corresponding schedules must be provided in the Report of Waste Discharge, and must consider the following:

~~(1) The Copermittees in each Watershed Management Area must implement the iterative process, at least once every 3 years, adapting the Water Quality Improvement Plan to become more effective, based on, but not limited to the following considerations:~~

~~(a)~~
(1) Achieving the outcome of improved water quality in MS4 discharges and receiving waters through implementation of the water quality improvement strategies identified in the Water Quality Improvement Plan;

~~(b)~~
(2) Progress toward achieving interim and final numeric ~~targets~~ goals in receiving waters and/or MS4 discharges for the highest priority water quality conditions ~~priorities~~ in the Watershed Management Area,

~~(c) Appropriateness of the highest water quality priorities identified for the Watershed Management Area;~~

~~(d)~~
(3) Progress toward achieving outcomes according to established schedules;

(4) New information developed when the requirements of Provisions B.2.a-c ~~and B.2.c~~ have been re-evaluated;

(5) New policies or regulations that may affect identified numeric goals;

~~(e)~~
(6) Spatial and temporal accuracy of monitoring data collected to inform prioritization of water quality conditions ~~problems~~ and implementation ~~measures~~ strategies to address the highest priority water quality conditions ~~problems~~;

~~(f)~~
(7) Availability of new information and data from sources other than the jurisdictional runoff management programs within the Watershed Management Area that informs the effectiveness of the actions implemented by the Copermittees;

~~(g)~~
(8) San Diego Water Board recommendations; and

~~(h)~~
(9) Recommendations for modifications ~~to the Water Quality Improvement Plan~~ solicited through a public participation process.

b. ADAPTATION OF STRATEGIES AND SCHEDULES

The water quality improvement strategies and schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.3, must be re-evaluated and adapted as new information becomes available to result in more effective and efficient measures to achieve the numeric goals established pursuant to Provision B.2.e. Re-evaluation of and modifications to the water quality

improvement strategies must be provided in the Annual Report, and must consider the following:

~~(5) Based on the results of the iterative process required pursuant to Provision B.5.a.(1), the Copermittees must report any modifications necessary to improve the effectiveness of the Water Quality Improvement Plan in the Annual Report required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge (ROWD) required pursuant to Provision F.5.b.~~

~~(6) The Copermittees must implement any modifications to the Water Quality Improvement Plan in accordance with the schedules developed pursuant to Provisions B.2.d and B.3.b, unless directed otherwise by the San Diego Water Board.~~

~~**b. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ADAPTIVE MANAGEMENT PROCESS**~~

~~(1) Each Copermittee in the Watershed Management Area must implement the iterative process, at least annually, adapting its jurisdictional runoff management program to become more effective, based on, but not limited to the following:~~

(1) Modifications to the priority water quality conditions, and numeric goals and corresponding schedules based on Provision B.5.a;

~~(a)~~
(2) Measurable or demonstrable reductions of non-storm water discharges to and from each Copermittee's MS4;

~~(b)~~
(3) Measurable or demonstrable reductions of pollutants in storm water discharges from each Copermittee's MS4 to the MEP;

(4) New information developed when the requirements of Provisions B.2.b and B.2.d have been re-evaluated;

~~(c)~~
(5) Efficiency in implementing the Water Quality Improvement Plan;

~~(d)~~
(6) San Diego Water Board recommendations; and

~~(e)~~
(7) Recommendations for modifications ~~to each Copermittee's jurisdictional runoff management program~~ solicited through a public participation process.

~~(2) Based on the results of the iterative process required pursuant to Provision B.5.b.(1), each Copermittee must report any modifications necessary to~~

~~improve the effectiveness its jurisdictional runoff management program document in the Annual Report required pursuant to Provision F.3.b, or as part of the ROWD required pursuant to Provision F.5.b.~~

~~(3) Each Copermittee must implement any modifications to its jurisdictional runoff management program in accordance with the schedules developed pursuant to Provisions B.2.d and B.3.b, unless directed otherwise by the San Diego Water Board.~~

c. ADAPTATION OF MONITORING AND ASSESSMENT PROGRAM

The water quality improvement monitoring and assessment program, included in the Water Quality Improvement Plan pursuant to Provisions B.4, must be re-evaluated and adapted when new information becomes available. Re-evaluation and recommendations for modifications to the monitoring and assessment program, pursuant to the requirements of Provision D, may be provided in the Annual Report, but must be provided in the Report of Waste Discharge.

6. Water Quality Improvement Plan Submittal, Updates, and Implementation

a. The Copermittees must submit the Water Quality Improvement Plans in accordance with the requirements of Provision F.1.

b. The Copermittees must submit proposed updates to the Water Quality Improvement Plan for acceptance by the San Diego Water Board Executive Officer in accordance with the requirements of Provision F.2.c.

c. The Copermittees must commence with implementation of the Water Quality Improvement Plans immediately after acceptance ~~no later than 180 days after submission, unless otherwise directed in writing~~ by the San Diego Water Board, in accordance with the schedules, or subsequently updated schedules, within the Water Quality Improvement Plan.

C. ACTION LEVELS

The purpose of this provision is for the Copermittees to incorporate numeric ~~non-storm water and storm water~~ action levels in the Water Quality Improvement Plans. The action levels will be used to guide Water Quality Improvement Plan implementation efforts and measure progress towards ~~attaining~~ the ~~reasonable~~ protection~~, preservation, enhancement, and restoration~~ of water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through monitoring and assessing the quality of the MS4 discharges prior to and during the implementation of the Water Quality Improvement Plans.

~~The Copermittees must incorporate numeric action levels in the Water Quality Improvement Plans, to direct and focus the Copermittees' jurisdictional runoff management program implementation efforts for addressing MS4 discharges to receiving waters. The numeric action levels will be used as part of the MS4 discharges assessments required under Provision D.4.a, and each Copermittee's program to detect and eliminate non-storm water and illicit discharges to the MS4 required under Provision E.2. Numeric action levels must be developed for non-storm water and storm water MS4 discharges, as follows:~~

1. Non-Storm Water Action Levels[7]

The Copermittees must develop and incorporate numeric non-storm water action levels (NALs) into the Water Quality Improvement Plan to: 1) support the development and prioritization of water quality improvement strategies for addressing non-storm water discharges to and from the MS4s, 2) assess the effectiveness of the water quality improvement strategies toward addressing MS4 non-storm water discharges, required pursuant to Provision D.4.b.(1), and 3) support the detection and elimination of non-storm water and illicit discharges to and from the MS4, required pursuant to Provision E.2.[8]

a. The following ~~non-storm water action levels (~~NALs~~)~~ must be incorporated ~~in the Water Quality Improvement Plan~~:

(1) Non-Storm Water Discharges from MS4s to Ocean Surf Zone

Table C-1. Non-Storm Water Action Levels for Discharges from MS4s to Ocean Surf Zone

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Total Coliform	MPN/100 ml	1,000	-	10,000/1,000[1]	OP

[7] NALs are not considered by the San Diego Water Board to be enforceable limitations.
[8] The Copermittees may utilize NALs or other benchmarks currently established by the Copermittees as interim NALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

Fecal Coliform	MPN/100 ml	200[2]	-	400	OP
Enterococci	MPN/100 ml	35	-	104[3]	OP

Abbreviations/Acronyms
AMAL – average monthly action level
OP – Ocean Plan water quality objective
MDAL – maximum daily action level
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Total coliform density ~~shall not exceed~~ NAL is 1,000 MPN/100 ml when the fecal/total coliform ratio exceeds 0.1
2. Fecal coliform density ~~may not exceed~~ NAL is 200 MPN per 100 ml during any 30 day period
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas"

(2) Non-Storm Water Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Table C-2. Non-Storm Water Action Levels for Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Turbidity	NTU	75	-	225	OP
pH	Units	Within limit of 6.0 to 9.0 at all times			OP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	35	-	104[3]	BP
Priority Pollutants	ug/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
OP – Ocean Plan water quality objective
NTU – Nephelometric Turbidity Units
ug/L – micrograms per liter
MDAL – maximum daily action level
BP – Basin Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Based on a minimum of not less than five samples for any 30-day period
2. The NAL is reached if ~~No~~ more than 10 percent of total samples ~~may~~ exceed 400 MPN per 100 ml during any 30 day period
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas" and is not applicable to waterbodies that are not designated with the water contact recreation (REC-1) beneficial use

Table C-3. Non-Storm Water Action Levels for Priority Pollutants

Parameter	Units	Freshwater (CTR)		Saltwater (CTR)	
		MDAL	AMAL	MDAL	AMAL
Cadmium	ug/L	**	**	16	8
Copper	ug/L	*	*	5.8	2.9
Chromium III	ug/L	**	**	-	-
Chromium VI	ug/L	16	8.1	83	41
Lead	ug/L	*	*	14	2.9
Nickel	ug/L	**	**	14	6.8
Silver	ug/L	*	*	2.2	1.1
Zinc	ug/L	*	*	95	47

Abbreviations/Acronyms:
CTR – California Toxic Rule
AMAL – average monthly action level
ug/L – micrograms per liter
MDAL – maximum daily action level

Notes:
* Action levels developed on a case-by-case basis (see below)
** Action levels developed on a case-by-case basis (see below), but calculated criteria are not to exceed Maximum Contaminant Levels (MCLs) under the California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64431

The Cadmium, Copper, Chromium (III), Lead, Nickel, Silver and Zinc NALs for MS4 discharges to freshwater receiving waters will be developed on a case-by-case basis because the freshwater criteria are based on site-specific water quality data (receiving water hardness). For these priority pollutants, the following equations (40 CFR 131.38.b.2) will be required:

Cadmium (Total Recoverable)	= exp(0.7852[ln(hardness)] - 2.715)
Chromium III (Total Recoverable)	= exp(0.8190[ln(hardness)] + 0.6848)
Copper (Total Recoverable)	= exp(0.8545[ln(hardness)] - 1.702)
Lead (Total Recoverable)	= exp(1.273[ln(hardness)] - 4.705)
Nickel (Total Recoverable)	= exp(.8460[ln(hardness)] + 0.0584)
Silver (Total Recoverable)	= exp(1.72[ln(hardness)] - 6.52)
Zinc (Total Recoverable)	= exp(0.8473[ln(hardness)] + 0.884)

(3) Non-Storm Water Discharges from MS4s to Inland Surface Waters

Table C-4. Non-Storm Water Action Levels for Discharges from MS4s to Inland Surface Waters

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Dissolved Oxygen	mg/L	Not less than 5.0 in WARM waters and not less than 6.0 in COLD waters			BP
Turbidity	NTU	-	20	See MDAL	BP
pH	Units	Within limit of 6.5 to 8.5 at all times			BP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	33	-	61[3]	BP
Total Nitrogen	mg/L	-	1.0	See MDAL	BP
Total Phosphorus	mg/L	-	0.1	See MDAL	BP
MBAS	mg/L	-	0.5	See MDAL	BP
Iron	mg/L	-	0.3	See MDAL	BP
Manganese	mg/L	-	0.05	See MDAL	BP
Priority Pollutants	ug/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
BP – Basin Plan water quality objective
COLD – cold freshwater habitat beneficial use
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
MDAL – maximum daily action level
WARM – warm freshwater habitat beneficial use
MBAS – Methylene Blue Active Substances
MPN/100 ml – most probable number per 100 milliliters
ug/L – micrograms per liter

Notes:
1. Based on a minimum of not less than five samples for any 30-day period
2. The NAL is reached if ~~No~~ more than 10 percent of total samples ~~may~~ exceed 400 MPN per 100 ml during any 30 day period
3. This value has been set to the Basin Plan water quality objective for freshwater "designated beach areas" and is not applicable to waterbodies that are not designated with the water contact recreation (REC-1) beneficial use

b. If not identified in Provision C.1.a, NALs must be identified, developed and incorporated in the Water Quality Improvement Plan for any pollutants or waste constituents that cause~~ing~~ or contribute~~ing~~, or are threatening to cause or contribute to a condition of pollution or nuisance in waters of the state associated with the highest priority water quality conditions ~~priorities~~ related to non-storm water discharges from the MS4s. NALs must be based on:

(1) Applicable water quality standards which may be dependent upon site-specific or receiving water-specific conditions or assumptions to be identified by the Copermittees; or

(2) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the NALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary NALs specific to the Watershed Management Area at levels greater than the NALs required by Provisions C.1.a and C.1.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for addressing non-storm water discharges to and from the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and from the MS4. The secondary NALs may be developed using an approach acceptable to the San Diego Water Board.

d. Dry weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.b may be utilized to develop or revise NALs based on watershed-specific data, subject to San Diego Water Board Executive Officer approval.

2. Storm Water Action Levels[9]

The Copermittees must develop and incorporate numeric storm water action levels (SALs) in the Water Quality Improvement Plans to: 1) support the development and prioritization of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s, and 2) assess the effectiveness of the water quality improvement strategies toward reducing pollutants in storm water discharges, required pursuant to Provision D.4.b.(2).[10]

a. The following ~~storm water action levels (~~SALs~~)~~ for discharges of storm water from the MS4 must be incorporated ~~in the Water Quality Improvement Plan~~:

Table C-5. Storm Water Action Levels for Discharges from MS4s to Receiving Waters

Parameter	Units	Action Level
Turbidity	NTU	126
Nitrate & Nitrite (Total)	mg/L	2.6
Phosphorus (Total P)	mg/L	1.46
Cadmium (Total Cd)*	µg/L	3.0
Copper (Total Cu)*	µg/L	127
Lead (Total Pb)*	µg/L	250
Zinc (Total Zn)*	µg/L	976

Abbreviations/Acronyms:
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
ug/L – micrograms per liter

Notes:
* The sampling must include a measure of receiving water hardness at each MS4 outfall. If a total metal concentration exceeds the corresponding metals SAL in Table C-5, that concentration must be compared to the California Toxics Rule criteria and the USEPA 1-hour maximum concentration for the detected level of receiving water hardness associated with that sample. If it is determined that the sample's total metal concentration for that specific metal exceeds that SAL, but does not exceed the

[9] SALs are not considered by the San Diego Water Board to be enforceable limitations.
[10] The Copermittees may utilize SALs or other benchmarks currently established by the Copermittees as interim SALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

applicable USEPA 1-hour maximum concentration criterion for the measured level of hardness, then the sample result will not be considered ~~as an excursion~~ above the SAL for that measurement.

b. If not identified in Provision C.2.a, SALs must be identified, developed and incorporated in the Water Quality Improvement Plan for pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in waters of the state associated with the highest water quality priorities related to storm water discharges from the MS4s. SALs must be based on:

(1) Federal and State water quality guidance and/or water quality standards; and

(2) Site-specific or receiving water-specific conditions; or

(3) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the SALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary SALs specific to the Watershed Management Area at levels greater than the SALs required by Provisions C.2.a and C.2.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s. The secondary SALs may be developed based on the approaches recommended by the State Water Board's Storm Water Panel[11] or using an approach acceptable to the San Diego Water Board.

d. Wet weather monitoring ~~and assessment~~ data from MS4 outfalls collected in accordance with Provision D.2.c ~~D.1.b~~ may be used to develop or revise SALs based upon watershed-specific data, ~~. Revision of SALs is~~ subject to San Diego Water Board Executive Officer approval.

[11] Storm Water Panel Recommendations to the California State Water Resources Control Board: The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities (June 2006)

D. MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS

The purpose of this provision is for the Copermittees to monitor and assess the impact on the chemical, physical, and biological ~~impact on~~ conditions of receiving waters caused by discharges from the Copermittees' MS4s under wet weather and dry weather conditions. The goal of this provision is to inform the Copermittees about the nexus between the health of receiving waters and the water quality condition of the discharges from their MS4s. This goal will be accomplished through ~~implementing and complying with the~~ monitoring and assessing the conditions of the receiving waters, discharges from the MS4s, pollutant sources and/or stressors, and effectiveness of the water quality improvement strategies implemented as part of the Water Quality Improvement Plans ~~assessment requirements of this Order~~.

The Copermittees must incorporate and implement the following minimum monitoring and assessment program requirements into each Water Quality Improvement Plan.~~:~~

~~1. Jurisdictional Monitoring Requirements~~

~~c. DRY WEATHER JURISDICTIONAL MONITORING [D.1.a]~~

~~For dry weather days,[12] each Copermittee must implement the following minimum monitoring requirements within its jurisdiction:~~

~~(1) Non-Storm Water MS4 Monitoring Program [D.1.a.(1)]~~

~~Each Copermittee must develop and conduct a program to monitor and characterize non-storm water flows and pollutant loads during dry weather conditions within its jurisdiction. The non-storm water MS4 monitoring program must be utilized to detect and eliminate non-storm water discharges and illicit discharges and connections to the Copermittee's MS4. Any available monitoring data not collected specifically to meet these requirements may be utilized by the Copermittee. The non-storm water MS4 monitoring program must meet the following minimum requirements:~~

~~(a) Non-Storm Water MS4 Monitoring Stations [D.1.a.(1)(a)]~~

~~Each Copermittee must identify the non-storm water MS4 monitoring stations within its jurisdiction that will be screened and monitored during dry weather days to identify non-storm water discharges and illicit discharges and connections to the MS4. Non-storm water MS4 monitoring stations must be selected in accordance with the following guidelines and criteria:~~

~~(i) A grid system consisting of perpendicular north-south and east-west~~

~~[12] Dry weather day is defined as any day with less than 0.1 inches of rain observed on each of the previous 3 days.~~

~~lines spaced ¼ mile apart must be overlayed on a map of the Copermittee's MS4. All cells that contain a segment of the Copermittee's MS4 must be identified;~~

~~(ii) At least one non-storm water MS4 monitoring station must be selected in each cell containing a segment of the Copermittee's MS4, which must consist of one of the following:~~

~~[a] A major outfall,~~
~~[b] Other outfall point, or~~
~~[c] Other point of access (e.g., manhole);~~

~~(iii) Each non-storm water MS4 monitoring station should be located downstream of any areas that are known or suspected to be sources of non-storm water discharges and/or illicit discharges or connections to the MS4;~~

~~(iv) Each non-storm water MS4 monitoring station must be located to the degree practicable at the farthest outfall, manhole, or other accessible location downstream in the MS4, within each cell;~~

~~(v) In addition to the non-storm water MS4 monitoring stations identified in accordance with Provisions D.1.a.(1)(a)(i)-(iv) above, each Copermittee must identify stations that will be screened and monitored during dry weather days to identify non-storm water discharges from sources not directly under the jurisdiction of the Copermittee.[13] These stations must be selected in accordance with the following guidelines and criteria:~~

~~[a] Stations should be located at or prior to the point of discharge into the Copermittee's MS4, but may be located downstream of the source as long as the station remains appropriate for characterizing the discharge from the source not within the authority of the Copermittee to control,~~
~~[b] Any non-storm water MS4 monitoring station identified in accordance with Provisions D.1.a.(1)(a)(i)-(iv) and located at the point of discharge or directly downstream of a known or suspected source of non-storm water discharges not within the authority of the Copermittee to control may also be utilized as a station to monitor the source not within the authority of the Copermittee to control;~~

~~(vi) The following factors should be considered in determining the location of each non-storm water MS4 monitoring station:~~

~~[a] Safety of personnel and accessibility of the location,~~
~~[b] Total area draining to the location,~~

~~[13] Sources not directly under the jurisdiction of and subject to regulation by the Copermittee may include lands or areas under the jurisdiction of other Copermittees, owners or operators of federal and state lands or facilities, tribal lands, special districts, etc.~~

~~[c] Population density of the area draining to the location,~~
~~[d] Traffic density,~~
~~[e] Age of the structures or buildings in the area,~~
~~[f] History of the area,~~
~~[g] Land use types draining to the location,~~
~~[h] Hydrological conditions, and~~
~~[i] Recommendations from the San Diego Water Board; and~~

~~(vii) No more than 500 non-storm water MS4 monitoring stations need to be selected by each Copermittee within its jurisdiction for any given year.~~

~~(b) Non-Storm Water MS4 Station Prioritization [D.1.a.(1)(b)]~~

~~Based on the first year of non-storm water field observations collected consistent with the Provision D.1.a.(1)(c)(i), each Copermittee must identify the high priority non-storm water MS4 monitoring stations. The non-storm water MS4 monitoring stations that meet the following criteria must be identified as high priority:~~

~~(i) The Copermittee has not identified and eliminated the source of the non-storm water discharges; or~~

~~(ii) The Copermittee has not been able to eliminate the source of an identified illicit discharge, and~~

~~(iii) The non-storm water discharges and/or illicit discharges are known or suspected to contribute and/or contain pollutants that cause or contribute, or threaten to cause or contribute to a condition of pollution or nuisance associated with the highest water quality priorities related to discharges from the MS4s.~~

~~(iv) The Copermittee may also designate any non-storm water MS4 monitoring stations that do not meet the criteria above as high priority.~~

~~(c) Non-Storm Water Monitoring Procedures [D.1.a.(1)(c)]~~

~~Each Copermittee must monitor the non-storm water MS4 monitoring stations within its jurisdiction as follows:~~

~~(i) *Non-Storm Water Field Observations* [D.1.a.(1)(c)(i)]~~

~~[a] Monitoring events for each non-storm water MS4 monitoring station must be scheduled as follows:~~
~~[1] During the first year of enrollment under this Order, the Copermittee must record field observations consistent with Table D-1 at each non-storm water MS4 monitoring station within its jurisdiction at least one time per month;~~

~~*Table D-1 Field Observations for Non-Storm Water MS4 Monitoring Stations*~~

~~**Table D-1. Field Observations for Non-Storm Water MS4 Monitoring Stations**~~

~~**Field Observations**~~
~~• Station identification and location.~~ ~~• Presence of flow, or pooled or ponded water.~~ ~~• If flow is present:~~ ~~– Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate),~~ ~~– Flow characteristics (i.e. presence of floatables, surface scum, or sheens, odor, color),~~ ~~– Flow source(s) suspected or identified from non-storm water source investigation, and~~ ~~– Flow source(s) eliminated during non-storm water source identification.~~ ~~• If pooled or ponded water is present:~~ ~~– Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, or sheens, odor, color), and~~ ~~– Known or suspected source(s) of pooled or ponded water.~~ ~~• Station description (i.e. deposits or stains, vegetation condition, structural condition, observable biology).~~ ~~• Presence and assessment of trash in and around station.~~ ~~• Evidence or signs of illicit connections or illegal dumping.~~

~~[2] For any stations monitoring sources not within the authority of the Copermittee to control where flows are observed during the first year of enrollment under this Order, the Copermittee must develop a field screening and monitoring schedule that can characterize the monthly non-storm water discharges and pollutant loads from the sources in or discharging to the Copermittee's MS4;~~

~~[3] High priority non-storm water MS4 monitoring stations must be monitored in accordance with the following:~~

~~A. Each Copermittee must designate at least 5 high priority non-storm water MS4 monitoring stations that are representative of non-storm water discharges from areas consisting primarily of residential, commercial, and industrial land uses present within and directly under the Copermittee's jurisdiction. Where there are less than 5 non-storm water MS4 monitoring stations within a Copermittee's jurisdiction, all stations must be designated as high priority, and~~

~~B. Each Copermittee must develop a monitoring schedule that can characterize the monthly non-storm water discharges and pollutant loads in or discharging from the high priority non-storm water MS4 monitoring stations;~~

~~[4] At least 10 percent of the non-storm water MS4 monitoring stations not identified as high priority must be screened and monitored each month. In addition, each non-storm water MS4 monitoring station must be screened and monitored at least once per year. If non-storm water flows are observed at~~

~~any non-storm water MS4 monitoring stations not identified as high priority, then they must become high priority pursuant to Provision D.1.a.(1)(b).~~

~~[b] For each monitoring events required above, the narrative descriptions and observations in Table D-1 must be recorded at each non-storm water MS4 monitoring station.~~

~~(ii) *Non-Storm Water Field Monitoring* [D.1.a.(1)(c)(ii)]~~

~~If flows, or pooled or ponded water are present during the field observations required under Provision D.1.a.(1)(c)(i), the Copermittee must monitor and record the parameters in Table D-2:~~

~~*Table D-2 Field Monitoring Parameters for Non-Storm Water MS4 Monitoring Stations*~~

~~**Table D-2. Field Monitoring Parameters for Non-Storm Water MS4 Monitoring Stations**~~

~~Parameters~~
~~• pH~~
~~• Temperature~~
~~• Specific conductivity~~
~~• Dissolved oxygen~~
~~• Turbidity~~
~~• Total chlorine~~
~~• Total copper*~~
~~• Total phenol~~
~~• Detergents (or surfactants)*~~
~~• Total hardness*~~
~~• Reactive phosphorus*~~
~~• Nitrate*~~
~~• Ammonia as nitrogen*~~

~~* Field measurement not required if flow is observed and collection of a sample for analysis is required.~~

~~(iii) *Non-Storm Water Analytical Monitoring* [D.1.a.(1)(c)(iii)]~~

~~If flows are present during the field observations required under Provision D.1.a.(1)(c)(i), samples must be collected and analyzed as follows:~~

~~[a] If the Copermittee identifies and eliminates the source of non-storm water discharge, analysis of the sample is not required, but encouraged;~~

~~[b] During the first year of enrollment under this Order, samples must be collected if flows are observed at non-storm water MS4 monitoring stations. Samples must be analyzed for the following constituents, unless the Copermittee has historical data that can demonstrate or provide justification that the analysis of the constituent is not necessary:~~

~~[1] Any pollutants identified as the highest priority for the Watershed Management Area in the Water Quality Improvement Plan,~~

~~[2] Any pollutants or constituents that the Copermittee has identified as a potential concern to receiving waters requiring additional data collection,~~

~~[3] Constituents listed in Table D-3;~~

~~*Table D-3 Analytical Monitoring Constituents for Non-Storm Water MS4 Monitoring Stations*~~

~~**Table D-3. Analytical Monitoring Constituents for Non-Storm Water MS4 Monitoring Stations**~~

~~Conventionals, Nutrients, Hydrocarbons~~	~~Pesticides~~	~~Metals (Total and Dissolved)~~	~~Indicator Bacteria~~
~~• Total Dissolved Solids~~ ~~• Total Suspended Solids~~ ~~• Total Phosphorus~~ ~~• Dissolved Phosphorus~~ ~~• Nitrite[1]~~ ~~• Nitrate[1]~~ ~~• Total Kjeldhal Nitrogen~~ ~~• Ammonia~~ ~~• Oil and Grease~~	~~• Diazinon~~ ~~• Chlorpyrifos~~ ~~• Pyrethroids~~	~~• Cadmium~~ ~~• Copper~~ ~~• Lead~~ ~~• Zinc~~	~~• Total Coliform~~ ~~• Fecal Coliform[2]~~ ~~• *Enterococcus*~~

~~Notes:~~

~~1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.~~

~~2. *E. Coli* may be substituted for Fecal Coliform.~~

~~[c] **After** the first year of enrollment under this Order, samples must be collected from all high priority non-storm water MS4 monitoring stations for analysis at least two times per year. Samples must be collected at least once during the dry season (May-September) and at least once after the first storm event of the wet season (October-April). Samples must be analyzed for the following constituents:~~

~~[1] Any pollutants identified as the highest priority for the Watershed Management Area in the Water Quality Improvement Plan,~~

~~[2] Any pollutants or constituents that the Copermittee has identified as a potential concern to receiving waters requiring additional data collection, and~~

~~[3] Constituents listed in Table D-3 must be analyzed at least once per year;~~

~~[d] Samples must be collected from all non-storm water MS4 monitoring stations not identified as high priority for analysis if flows are observed during required field screening and monitoring events. Samples must be analyzed for the following constituents, unless the Copermittee has historical data that can demonstrate or provide justification that the analysis of the constituent is not necessary:~~

~~[1] Any pollutants identified as the highest priority for the Watershed Management Area in the Water Quality Improvement Plan,~~

~~[2] Any pollutants or constituents that the Copermittee has identified as a potential concern to receiving waters requiring additional data collection, and~~

~~[3] Constituents listed in Table D-3.~~

~~PROVISION D: MONITORING AND ASSESSMENT REQUIREMENTS~~

~~D.1. Jurisdictional Monitoring Requirements~~

~~(2) Dry Weather Ambient Receiving Water Monitoring Program [D.1.a.(2)]~~

~~Each Copermittee must develop and conduct a program to monitor and characterize the ambient conditions of the receiving waters utilized for conveying non-storm water within and through its jurisdiction. Any available monitoring data not collected specifically to meet these requirements may be utilized by the Copermittee. The dry weather ambient receiving water monitoring program must meet the following minimum requirements:~~

~~(a) Dry Weather Ambient Receiving Water Monitoring Stations [D.1.a.(2)(a)]~~

~~Each Copermittee must identify the dry weather ambient receiving water monitoring stations that will be screened and monitored. Any location in a receiving water that is already monitored by the Copermittee or another entity may also be utilized as a dry weather ambient receiving water monitoring station. The monitoring stations must be selected in accordance with the following criteria:~~

~~(i) The following factors should be considered in determining the location of each dry weather ambient receiving water monitoring station:~~

~~[a] Permission to cross private property and public land,~~
~~[b] Safety of personnel and accessibility of the location,~~
~~[c] Location can complement or supplement historical ambient receiving water data,~~
~~[d] Location should not be in close proximity to any MS4 outfalls or other point source discharges to the receiving water,~~
~~[e] Natural or relatively unaltered areas in receiving waters are preferred, and~~
~~[f] Recommendations from the San Diego Water Board;~~

~~(ii) Locate at least one monitoring station in the lowest part of the Watershed Management Area near the boundary of its jurisdiction;~~

~~(iii) Locate at least one monitoring station located in the uppermost part of the Watershed Management Area near the boundary of its jurisdiction; and~~

~~(iv) The monitoring stations identified in Provisions D.1.a.(2)(a)(ii) and D.1.a.(2)(a)(iii) must be hydraulically connected.~~

~~(b) Dry Weather Ambient Receiving Water Monitoring Procedures [D.1.a.(2)(b)]~~

~~Each Copermittee must monitor the dry weather ambient receiving water monitoring stations as follows:~~

~~(i) *Dry Weather Ambient Receiving Water Field Observations* [D.1.a.(2)(b)(i)]~~

~~Monitoring events for each monitoring station must be scheduled as follows:~~

~~[a] During the first year of enrollment under this Order, the Copermittee must record field observations consistent with Table D-4 at each dry weather ambient receiving water monitoring station at least one time per month; and~~

~~*Table D-4 Field Observations for Dry Weather Ambient Receiving Water Monitoring Stations*~~

~~**Table D-4. Field Observations for Dry Weather Ambient Receiving Water Monitoring Stations**~~

~~Field Observations~~
~~• Station identification and location.~~ ~~• Presence of flow, or pooled or ponded water.~~ ~~• If flow is present:~~ ~~- Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate),~~ ~~- Flow characteristics (i.e. presence of floatables, surface scum, or sheens, odor, color),~~ ~~• If pooled or ponded water is present:~~ ~~- Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, or sheens, odor, color),.~~ ~~• Station description (i.e. deposits or stains, vegetation condition, structural condition, observable biology).~~ ~~• Presence and assessment of trash in and around station.~~

~~[b] For any monitoring stations where flows are observed during the first year of enrollment under this Order, the Copermittee must develop a field screening and monitoring schedule that can characterize the monthly flows and pollutant loads in the receiving water.~~

~~(ii) *Dry Weather Ambient Receiving Water Field Monitoring* [D.1.a.(2)(b)(ii)]~~

~~If flow, or pooled or ponded water is present during the field observations required under Provision D.1.a.(2)(b)(i), the Copermittee must monitor and record the parameters in Table D-2.~~

~~(iii) *Dry Weather Ambient Receiving Water Analytical Monitoring* [D.1.a.(2)(b)(iii)]~~

~~If flows are present during the field observations required under Provision D.1.a.(2)(b)(i), samples of the ambient receiving water flows must be collected and analyzed as follows:~~

~~[a] During the first year of enrollment under this Order, samples must be collected for each observation of flow in the ambient receiving water monitoring stations for analysis. Samples must be analyzed for the following constituents:~~

~~[1] Any pollutants identified as the highest priority for the Watershed Management Area in the Water Quality Improvement Plan,~~

~~[2] Any non-storm water pollutants or constituents that the Copermittee has identified as a potential concern to receiving waters requiring additional data collection, and~~

~~[3] Constituents listed in Table D-3; and~~

~~[b] **After** the first year of enrollment under this Order, samples of flows observed at ambient receiving water monitoring stations must be collected for analysis at least two times during the remaining term of this Order. Samples must be collected at least once during the dry season (May-September) and at least once after the first storm event of the wet season (October-April). Samples must be analyzed for the following constituents:~~

~~[1] Any pollutants identified as the highest priority for the Watershed Management Area in the Water Quality Improvement Plan,~~

~~[2] Any pollutants or constituents that the Copermittee has identified as a potential concern to receiving waters requiring additional data collection,~~

~~[3] Constituents listed in Table D-3 must be analyzed at least once per year.~~

~~**d. WET WEATHER JURISDICTIONAL MONITORING** [D.1.b]~~

~~For wet weather days,[14] each Copermittee must implement the following minimum monitoring requirements within its jurisdiction:~~

~~(1) Storm Water MS4 Outfall Monitoring Program [D.1.b.(1)]~~

~~Each Copermittee must develop and conduct a program to monitor and characterize the storm water flows and pollutant loads from the MS4 outfalls within its jurisdiction during wet weather days. Any available monitoring data not collected specifically to meet these requirements may be utilized by the Copermittee. The monitoring program must meet the following minimum requirements:~~

~~(a) Storm Water MS4 Outfall Monitoring Stations [D.1.b.(1)(a)]~~

~~Each Copermittee must identify the wet weather MS4 outfall monitoring stations within its jurisdiction that will be monitored and sampled during wet weather days. Any non-storm water MS4 monitoring station identified under Provision D.1.a.(1)(a) may also be utilized as a storm water MS4 outfall monitoring station. Monitoring stations must be selected in accordance with the following guidelines and criteria:~~

~~(i) The following factors should be considered in determining the location of each wet weather MS4 outfall monitoring station:~~

~~[a] Safety of personnel and accessibility of the location,~~

~~[b] Total area draining to the location,~~

~~[14] Wet weather day defined as any day with 0.1 inches of rain or greater and the following 3 days.~~

~~[c] Population density of the area draining to the location,~~
~~[d] Traffic density,~~
~~[e] Age of the structures or buildings in the area,~~
~~[f] History of the area,~~
~~[g] Land use types draining to the location,~~
~~[h] Hydrological conditions, and~~
~~[i] Recommendations from the San Diego Water Board.~~

~~(ii) Each wet weather MS4 outfall monitoring station must consist of one of the following:~~

~~[a] A major outfall, or~~
~~[b] Other outfall point, or~~
~~[c] Other point of access (e.g., manhole), only as an alternate location if safety during wet weather discharge sampling at available outfall locations discharging to receiving waters is a significant concern and limits accessibility;~~

~~(iii) Each Copermittee must designate at least 5 monitoring stations that are representative of storm water flows from areas consisting primarily of residential, commercial, and industrial land uses present within the Copermittee's jurisdiction. Where there are less than 5 MS4 outfalls within a Copermittee's jurisdiction, all MS4 outfalls must be designated as wet weather MS4 outfall monitoring stations.~~

~~(iv) Any monitoring station that does not have any SAL exceedances for 3 successive years may be replaced with a different monitoring station.~~

~~(b) Storm Water MS4 Outfall Monitoring Procedures [D.1.b.(1)(b)]~~

~~Each Copermittee must develop monitoring procedures to be consistent with the following criteria:~~

~~(i) A narrative description must be provided of the station identification and location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event which generated the sampled discharge and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event;~~

~~(ii) Flow rates and volumes for each monitoring station must be measured or estimated during each monitoring event in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), sections 3.2.1 or 3.2.2, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board;~~

~~(iii) Each Copermittee must develop and implement a monitoring frequency during the wet season to characterize pollutant discharges from the MS4 outfalls within its jurisdiction. At a minimum, storm~~

~~water samples must be collected from two storm events occurring at least one month apart for each monitoring station. Samples must be collected as follows:~~

~~[a] Grab samples may be collected only for pH, temperature, specific conductivity, dissolved oxygen, hardness, oil and grease, and indicator bacteria,~~

~~[b] For all other constituents, one of the following methods must be used to collect the samples:~~

~~[1] A 24-hour composite sample, using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours. Results of the analyses of individual grab samples may be averaged to obtain the daily average,~~

~~[2] A flow-weighted composite sample for either the entire discharge or for the first 3 hours of the discharge. The flow-weighted composite sample for the storm water discharge may be taken with a continuous sampler or as a combination of a minimum of three sample aliquots taken in each hour of discharge for the entire discharge or for the first three hours of the discharge, with each aliquot being separated by a minimum period of fifteen minutes. Only one analysis of the composite of aliquots is required, or~~

~~[3] A minimum of one grab sample may be collected for storm water discharges from holding ponds or other impoundments with a retention period greater than 24 hours;~~

~~(iv) Storm water MS4 outfall monitoring stations must be monitored and sampled during the first wet weather event of the wet season. Samples must be analyzed for the following constituents:~~

~~[a] Any pollutants contributing to the highest water quality priorities for the Watershed Management Area as identified in the Water Quality Improvement Plan,~~

~~[b] Any non-storm water pollutants or constituents that the Copermittee has identified as a potential concern to receiving waters requiring additional data collection, and~~

~~[c] Constituents listed in Table D-5.~~

~~*Table D-5 Analytical Monitoring Constituents for Wet Weather MS4 Outfall Monitoring Stations*~~

~~**Table D-5. Analytical Monitoring Constituents for Wet Weather MS4 Outfall Monitoring Stations**~~

~~Conventionals, Nutrients, Hydrocarbons~~	~~Pesticides~~	~~Metals (Total and Dissolved)~~	~~Indicator Bacteria~~
~~• Total Dissolved Solids~~ ~~• Total Suspended Solids~~ ~~• Turbidity[1]~~ ~~• Total Hardness~~ ~~• pH~~ ~~• Specific Conductivity~~ ~~• Temperature~~ ~~• Dissolved Oxygen~~ ~~• Biological Oxygen Demand, 5-day~~ ~~• Chemical Oxygen Demand~~ ~~• Total Organic Carbon~~ ~~• Dissolved Organic Carbon~~ ~~• Sulfate~~ ~~• Methylene Blue Active Substances (MBAS)~~ ~~• Total Phosphorus[1]~~ ~~• Dissolved Phosphorus~~ ~~• Nitrite[1,2]~~ ~~• Nitrate[1,2]~~ ~~• Total Kjeldhal Nitrogen~~ ~~• Ammonia~~ ~~• Oil and Grease~~	~~• Diazinon~~ ~~• Chlorpyrifos~~ ~~• Pyrethroids~~	~~• Arsenic~~ ~~• Cadmium[1]~~ ~~• Chromium~~ ~~• Copper[1]~~ ~~• Iron~~ ~~• Lead[1]~~ ~~• Manganese~~ ~~• Mercury~~ ~~• Nickel~~ ~~• Selenium~~ ~~• Silver~~ ~~• Thallium~~ ~~• Zinc[1]~~	~~• Total Coliform~~ ~~• Fecal Coliform[3]~~ ~~• *Enterococcus*~~

~~Notes:~~

~~1. Constituent with a storm water action level (SAL) specified under Provision C.2.~~
~~2. Nitrite and nitrate may be combined and reported as nitrite+nitrate.~~
~~3. *E. Coli* may be substituted for Fecal Coliform.~~

~~(v) Samples collected after the first wet weather monitoring event and during the remaining period of the wet season must be analyzed for the following constituents:~~

~~[a] Any pollutants contributing to the highest water quality priorities for the Watershed Management Area as identified in the Water Quality Improvement Plan.~~

~~[b] Any pollutants or constituents that the Copermittee has identified as a potential concern to receiving waters requiring additional data collection.~~

~~(2) Storm Water Pollutant Source Identification Monitoring Program [D.1.b.(2)]~~

~~Each Copermittee must develop and conduct a program within its jurisdiction to identify the sources of pollutants in storm water discharged from the Copermittee's MS4 during wet weather conditions. Any available monitoring data not collected specifically to meet these requirements may be utilized by the Copermittee. The storm water pollutant source identification monitoring~~

~~program must include focused monitoring which moves upstream into each MS4 outfall drainage area as necessary to identify sources of the highest water quality priorities in the receiving waters. The wet weather source identification monitoring program must begin no later than the wet season following the date the San Diego Water Board determines that the Water Quality Improvement Plan meets the requirements of this Order.~~

~~2.~~

1. Receiving Water ~~Watershed~~ Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the condition of the receiving waters in each Watershed Management Area during dry weather and wet weather. Following acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct long-term receiving water monitoring during implementation of the Water Quality Improvement Plan to assess the long term trends and determine if conditions in receiving waters are improving. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must develop and/or update its written dry weather and wet weather receiving water monitoring procedures to be consistent with the following criteria:

a. Transitional Receiving Water Monitoring

Until the monitoring requirements of Provisions D.1.b-e are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following receiving water monitoring in the Watershed Management Area:

(1) Continue the receiving water monitoring programs required in Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016;

(2) Continue the monitoring in the Hydromodification Management Plans approved by the San Diego Water Board;

(3) Participate in the following regional receiving water monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring,

(b) Southern California Bight Regional Monitoring, and

(c) Sediment Quality Monitoring;

(4) Implement the monitoring programs developed as part of any implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans,

Comprehensive Load Reduction Plans) for the TMDLs in Attachment E to this Order; and

(5) For Watershed Management Areas with ASBS, implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

~~a.~~

b. LONG-TERM RECEIVING WATER ~~WATERSHED~~ MONITORING STATIONS ~~[D.2.a]~~

The Copermittees must select at least one ~~identify watershed~~ long-term receiving water monitoring station~~s~~ from among the existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees to be representative of the receiving water quality ~~with~~in the Watershed Management Area. Additional long-term receiving water monitoring stations must be selected where necessary to support the implementation and adaptation of the Water Quality Improvement Plan. ~~The watershed monitoring stations must be selected in accordance with the following criteria:~~

~~(1) All mass loading stations (MLSs) previously established by the Copermittees in each Watershed Management Area must continue to be utilized as watershed monitoring stations;~~

~~(2) All temporary watershed assessment stations (TWASs), bioassessment stations, and stream assessment stations previously established by the Copermittees must be considered for continued use as watershed monitoring stations;~~

~~(3) Any dry weather ambient receiving water monitoring station identified pursuant to Provision D.1.a.(2)(a) may be considered for use as a watershed monitoring station;~~

~~(4) At least one reference watershed monitoring station must be selected for each Watershed Management Area; and~~

~~(5) At least one watershed monitoring station located between and hydrologically connected to each MLS and each reference station must be selected for each Watershed Management Area.~~

~~b.~~

c. DRY WEATHER ~~WATERSHED~~ RECEIVING WATER MONITORING ~~[D.2.b]~~

During the term of the Order, the Copermittees must perform monitoring during at least three dry weather monitoring events at each of the long-term receiving water monitoring stations. At least one monitoring event must be conducted

during the dry season (May 1 – September 30) and at least one monitoring event must be conducted during a dry weather period during the wet season (October 1 – April 30), after the first wet weather event of the season, with an antecedent dry period of at least 72 hours following a storm event producing measureable rainfall of greater than 0.1 inch. ~~The Copermittees must develop and conduct a program to monitor the condition of the receiving waters in each Watershed Management Area during dry weather conditions. Any available monitoring data not collected specifically to meet these requirements may be utilized by the Copermittees. For dry weather days, the Copermittees must develop and/or update its written dry weather watershed monitoring procedures to be consistent with the following criteria:~~

(1) Dry Weather ~~Watershed~~ Receiving Water Field Observations ~~[D.2.b.(1)]~~

For each dry weather ~~watershed~~ monitoring event, the Copermittees must record field observations consistent with Table D-1~~4~~ at each long-term receiving water monitoring station. ~~Dry weather watershed monitoring is required at least every two years for each monitoring station. At least two dry weather watershed monitoring events must be scheduled for each watershed monitoring station per monitoring year. One monitoring event is required during the dry season (May-September) and one monitoring event is required on a dry weather day during the wet season (October-April), after the first storm event.~~

Table D-1. Field Observations for Receiving Water Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, or sheens, odor, color) • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, or sheens, odor, color) • Station description (i.e. deposits or stains, vegetation condition, structural condition, and observable biology) • Presence and assessment of trash in and around station

(2) Dry Weather ~~Watershed~~ Receiving Water Field Monitoring ~~[D.2.b.(2)]~~

For each dry weather monitoring event, ~~If flow, or pooled or ponded water is present during the dry weather watershed monitoring event required pursuant to Provision D.2.b.(1), and~~ if conditions allow the collection of the data, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

Table D-2. Field Monitoring Parameters for Receiving Water Monitoring Stations

Parameters
• pH
• Temperature
• Specific conductivity
• Dissolved oxygen
• Turbidity

(3) Dry Weather ~~Watershed~~ Receiving Water Analytical Monitoring ~~[D.2.b.(3)]~~

For each dry weather monitoring event, the Copermittees must ~~Samples from each monitoring station must be collected for analysis at least every two years. At least two dry weather watershed analytical monitoring events must be scheduled for each watershed monitoring station per monitoring year. Samples must be collected once during the dry season (May-September) and once on a dry weather day during the wet season (October-April), after the first storm event. Analytical monitoring samples must be~~ collect~~ed~~ and analyze~~d~~ samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected ~~only~~ for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, ~~oil and grease,~~ and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) ~~t~~Time-weighted composites composed of 24 discrete hourly samples ~~must be collected; and~~, or

(ii) Flow-weighted composites collected over a typical 24-hour period;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents ~~Any other pollutants~~ contributing to the highest priority water quality conditions ~~priorities for the Watershed Management Area as~~ identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List, ~~Any pollutants that the Copermittee has identified as a potential concern to receiving waters requiring additional data collection, and~~

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable NAL constituents, and

(v) Constituents listed in Table D-3~~5~~.

Table D-3. Analytical Monitoring Constituents for Receiving Water Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Pesticides	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Mercury • Nickel • Selenium • Thallium • Zinc	• Organophosphate Pesticides • Pyrethroid Pesticides	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(4) Dry Weather ~~Watershed~~ Receiving Water Toxicity Monitoring ~~[D.2.b.(4)]~~

For each dry weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for toxicity in accordance with Table D-4: ~~Samples from each monitoring station must be collected for toxicity testing at least every two years. At least two dry weather watershed toxicity monitoring events must be scheduled for each watershed monitoring station per monitoring year. Samples must be collected once during the dry season (May-September) and once on a dry weather day during the wet season (October-April), after the first storm event. Toxicity testing must be conducted in accordance with the following table:~~

Table D-4~~6~~. Dry Weather Toxicity Testing for ~~Dry Weather~~ Receiving Water ~~Watershed~~ Monitoring Stations ~~Flows~~

Freshwater Organism	Test Approach	EPA Protocol[2]
Pimephales promelas	1 acute 1 chronic[1]	EPA-821-R-02-012
Hyalella Azteca	1 acute 1 chronic[1]	EPA-821-R-02-012
Psuedokirchneriella subcapitata	1 acute 1 chronic[1]	EPA-821-R-02-013

Notes:
1. Chronic toxicity testing is not required at receiving water monitoring stations located at mass loading stations if the channel flows are diverted year-round during dry weather conditions to the sanitary sewer for treatment.
2. EPA protocols must be utilized for toxicity testing unless alternate toxicity testing protocols have been approved by the San Diego Water Board.

~~Dry Weather Watershed Monitoring Station~~	~~Freshwater Organisms~~	~~Estuarine and Marine Organisms~~
~~Mass Loading Stations[1]~~	~~3 acute[2]~~ ~~3 chronic[2]~~	~~1 chronic[3]~~
~~Others Stations~~	~~3 acute[2]~~ ~~3 chronic[2]~~	~~None~~

~~Notes:~~
~~1. Dry weather toxicity testing at a mass loading station may be omitted if the channel flows are diverted year-round during dry weather conditions to the sanitary sewer for treatment.~~
~~2. The presence of acute toxicity must be determined in accordance with USEPA protocol EPA-821-R-02-012. The presence of chronic toxicity must be determined in accordance with USEPA protocol EPA-821-R-02-013. Toxicity testing must include the use of *Pimephales promelas* (fathead minnow), *Hyalella azteca*, and *Psuedokirchneriella subcapitata* (formerly *Selenastrum capricornutum*, unicellular algae).~~
~~3. The presence of chronic marine toxicity must be determined in accordance with USEPA guidance EPA 600/R95/136, except for chronic mysid tests which must be conducted in accordance with USEPA protocol EPA-821-R-02-014. *Americamysis bahia* may be used as a marine test organism if *Holmesimysis costata* cannot be reasonably obtained. The use of, and justification for, *A. bahia* must be clearly reported in the Annual Report.~~

(5) Dry Weather ~~Watershed~~ Receiving Water Bioassessment Monitoring ~~[D.2.b.(5)]~~

Bioassessment monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order ~~every two years~~. The Copermittees must ~~Bioassessment monitoring is required to be conducted in May or June for each watershed monitoring station, and must be~~ conduct~~ed~~ bioassessment monitoring during at least one dry weather monitoring event at each long-term receiving water monitoring station as follows:

(a) The following bioassessment samples and measurements must be collected:

(i) Macroinvertebrate samples must be collected in accordance with the "Reachwide Benthos (Multihabitat) Procedure" in the most current Surface Water Ambient Monitoring Program (SWAMP)

Bioassessment Standard Operating Procedures (SOP), and amendments, as applicable;[15]

(ii) The "Full" suite of physical habitat characterization measurements must be collected in accordance with the most current SWAMP Bioassessment SOP, and as summarized in the SWAMP Stream Habitat Characterization Form – Full Version;[16] and

(iii) Freshwater algae samples must be collected in accordance with the SWAMP Standard Operating Procedures for Collecting Algae Samples.[17] Analysis of samples must include algal taxonomic composition (diatoms and soft algae) and algal biomass.

(b) The bioassessment samples, measurements, and appropriate water chemistry data must be used to calculate the following:

(i) An Index of Biological~~tic~~ Integrity (IBI) for macroinvertebrates for each monitoring station where bioassessment monitoring was conducted, based on the most current calculation method;[18] and

(ii) An IBI for algae for each monitoring station where bioassessment monitoring was conducted, when a calculation method is developed.[19]

(c) In lieu of the requirements of Provision D.1.c.(5)(a), the Copermittees may conduct the bioassessment monitoring in accordance with the "Triad" assessment approach[20] to calculate the IBIs required for Provision D.1.c.(5)(b). The Copermittees must conduct sampling, analysis, and reporting of specified in-stream biological and habitat data according to the protocols specified in the SCCWRP Technical Report No. 539, or subsequent protocols, if developed.

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[15] Ode, P.R.. 2007. Standard operating procedures for collecting macroinvertebrate samples and associated physical and chemical data for ambient bioassessments in California. California State Water Resources Control Board Surface Water Ambient Monitoring Program (SWAMP) Bioassessment SOP 001. http://www.swrcb.ca.gov/water_issues/programs/swamp/tools.shtml#monitoring

[16] Available at: http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/reports/fieldforms_fullversion052908.pdf

[17] Fetscher et al. 2009. Standard Operating Procedures for Collecting Stream Algae Samples and Associated Physical Habitat and Chemical Data for Ambient Bioassessments in California.

[18] The most current calculation method at the time the Order was adopted is outlined in "A Quantitative Tool for Assessing the Integrity of Southern California Coastal Streams" (Ode, et al. 2005. Environmental Management. Vol. 35, No. 1, pp. 1-13). If an updated or new calculation method is developed, either both (i.e. current and updated/new) methods must be used, or historical IBIs must be recalculated with the updated or new calculation method.

[19] When a calculation method is developed, IBIs must be calculated for all available and appropriate historical data.

[20] Stormwater Monitoring Coalition Model Monitoring Technical Committee, 2004. Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California. Technical Report #419. August 2004.

(6) Dry Weather ~~Watershed~~ Receiving Water Hydromodification Monitoring ~~[D.2.b.(6)]~~

In addition to the hydromodification monitoring conducted as part of the Copermittees' Hydromodification Management Plans, hydromodification monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. ~~for any year dry weather watershed monitoring is required, hydromodification monitoring is required to be conducted at least once during the dry weather season (May-September) for each monitoring station.~~ The Copermittees must collect the following hydromodification monitoring observations and measurements ~~must be collected~~ within an appropriate domain of analysis during at least one dry weather monitoring event for ~~the~~ each long-term receiving water monitoring station:

(a) Channel conditions, including:

(i) Channel dimensions,

(ii) Hydrologic and geomorphic conditions, and

(iii) Presence and condition of vegetation and habitat;

(b) Location of discharge points;

(c) Habitat integrity;

(d) Photo documentation of existing erosion and habitat impacts, with location (i.e. latitude and longitude coordinates) where photos were taken;

(e) Measurement or estimate of dimensions of any existing channel bed or bank eroded areas, including length, width, and depth of any incisions; and

(f) Known or suspected cause(s) of existing downstream erosion or habitat impact, including flow, soil, slope, and vegetation conditions, as well as upstream land uses and contributing new and existing development.

~~(7) Dry Weather Watershed Sediment Quality Monitoring [D.2.b.(7)]~~

~~Sediment monitoring must be performed by the Copermittees to assess compliance with sediment quality receiving water limits applicable to MS4 discharges to enclosed bays and estuaries. The monitoring may be performed either by individual or multiple Copermittees to assess compliance with receiving water limits, or through participation in a water body monitoring coalition. The Copermittees must identify sediment sampling stations that are spatially representative of the sediment within the water body segment or region of interest. Sediment quality monitoring must be conducted at least~~

~~once every two years between June and September. Sediment quality monitoring must be conducted in conformance with the monitoring requirements set forth in the State Water Board Sediment Quality Control Plan.~~

~~c.~~

d. WET WEATHER ~~WATERSHED~~ RECEIVING WATER MONITORING ~~[D.2.c]~~

During the term of the Order, the Copermittees must perform monitoring during at least three wet weather monitoring events at each long-term receiving water monitoring station. At least one wet weather monitoring event must be conducted during the first wet weather event of the wet season (October 1 – April 30), and at least one wet weather monitoring event during a wet weather event that occurs after February 1. ~~The Copermittees in each Watershed Management Area must develop and conduct a program to monitor the condition in receiving waters and characterize storm water flows during wet weather days of the wet season. Any available monitoring data not collected specifically for this Order that meet the monitoring requirements may be utilized by the Copermittee. For wet weather days, the Copermittees must develop and/or update its written wet weather watershed monitoring procedures to be consistent with the following criteria:~~

(1) Wet Weather ~~Watershed~~ Receiving Water Field Observations ~~[D.2.c.(1)]~~

~~Wet weather watershed monitoring events are required at least once every two years for each dry weather watershed monitoring station. Each monitoring station must be monitored during at least two wet weather events in any period (July 1 to June 30) that monitoring is required, including the first wet weather event of the wet season beginning October 1 and ending April 30, and at least one wet weather event after February 1.~~ For each wet weather ~~watershed~~ monitoring event, the following narrative descriptions and observations must be recorded at each long-term receiving water monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event;

(b) The flow rates and volumes measured or estimated. Data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board;

(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(d) Presence and assessment of trash in and around station.

(2) Wet Weather ~~Watershed~~ Receiving Water Field Monitoring ~~[D.2.c.(2)]~~

For each wet weather ~~watershed~~ monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station ~~must be monitored and recorded~~.

(3) Wet Weather ~~Watershed~~ Receiving Water Analytical Monitoring ~~[D.2.c.(3)]~~

For each wet weather monitoring event, the Copermittees must ~~Samples from each wet weather watershed monitoring station must be collected for analysis at least two times during the term of this Order, at least once for the first wet weather event of the wet season, and at least once for a wet weather event after February 1. Wet weather samples must be~~ collect~~ed~~ and analyze~~d~~ samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected ~~only~~ for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, ~~oil and grease,~~ and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques ~~one of the following methods must be used to collect the samples~~:

(i) Time-weighted composites composed of 24 discrete hourly samples ~~A 24-hour composite sample, using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours. Results of the analyses of individual grab samples may be averaged to obtain the daily average~~, which may be collected through the use of automated equipment, or

(ii) ~~A f~~Flow-weighted composites collected over the length of the storm event or a typical 24-hour period, which may be collected through the use of automated equipment ~~sample for either the entire discharge or~~

~~for the first 3 hours of the discharge. The flow-weighted composite sample for the storm water discharge may be taken with a continuous sampler or as a combination of a minimum of three sample aliquots taken in each hour of discharge for the entire discharge or for the first three hours of the discharge, with each aliquot being separated by a minimum period of fifteen minutes. Only one analysis of the composite of aliquots is required; and~~

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents ~~Any other pollutants~~ contributing to the highest priority water quality conditions ~~priorities for the Watershed Management Area as~~ identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,~~Any water pollutants or constituents that the Copermittee has identified as a potential concern to receiving waters requiring additional data collection, and~~

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) Constituents listed in Table D-3~~5~~.

(4) Wet Weather ~~Watershed~~ Receiving Water Toxicity Monitoring ~~[D.2.c.(4)]~~

For each wet weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for toxicity in accordance with Table D-5: ~~Samples from each wet weather watershed monitoring station must be collected for toxicity testing at least two times during the term of this Order, at least once for the first wet weather event of the wet season, and at least once for a wet weather event after February 1. Toxicity testing must be conducted in accordance with the following table:~~

Table D-5. Wet Weather Toxicity Testing for Receiving Water Monitoring Stations

Freshwater Organism	Test Approach	EPA Protocol[1]
Pimephales promelas	1 acute	EPA-821-R-02-012
Hyalella Azteca	1 acute	EPA-821-R-02-012
Psuedokirchneriella subcapitata	1 acute	EPA-821-R-02-013

Notes:
1. EPA protocols must be utilized for toxicity testing unless alternate toxicity testing protocols have been approved by the San Diego Water Board.

~~**Table D-7. Toxicity Testing for Wet Weather Watershed Monitoring Station Flows**~~

~~Wet Weather Watershed Monitoring Station~~	~~Freshwater Organisms~~	~~Estuarine and Marine Organisms~~
~~Mass Loading Stations~~	~~3 acute[1]~~	~~1 acute[2]~~ ~~2 chronic[2]~~
~~Others Stations~~	~~None~~	~~None~~

~~Notes:~~

~~1. The presence of acute toxicity must be determined in accordance with USEPA protocol EPA-821-R-02-012. Toxicity testing must include the use of *Pimephales promelas* (fathead minnow), *Hyalella azteca*, and *Psuedokirchneriella subcapitata* (formerly *Selenastrum capricornutum*, unicellular algae).~~

~~2. The presence of acute toxicity must be determined in accordance with USEPA protocol EPA-821-R-02-012. The presence of chronic marine toxicity must be determined in accordance with USEPA guidance EPA 600/R95/136, except for chronic mysid tests which must be conducted in accordance with USEPA protocol EPA-821-R-02-014. *Americamysis bahia* may be used as a marine test organism if *Holmesimysis costata* cannot be reasonably obtained. The use of, and justification for, *A. bahia* must be clearly reported in the Annual Report.~~

e. OTHER RECEIVING WATER MONITORING REQUIREMENTS

(1) Regional Monitoring

The Copermittees must participate in the following regional receiving waters monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring; and

(b) Southern California Bight Regional Monitoring.

(2) Sediment Quality Monitoring

The Copermittees must perform sediment monitoring to assess compliance with sediment quality receiving water limits applicable to MS4 discharges to enclosed bays and estuaries. The monitoring may be performed either by individual or multiple Copermittees to assess compliance with receiving water limits, or through participation in a water body monitoring coalition. The Copermittees must identify sediment sampling stations that are spatially representative of the sediment within the water body segment or region of interest. Sediment quality monitoring must be conducted in conformance with the monitoring requirements set forth in the State Water Board Sediment Quality Control Plan.

(3) ASBS Monitoring

For Watershed Management Areas with ASBS, the Copermittees must implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

~~d.~~

f. ALTERNATIVE WATERSHED MONITORING REQUIREMENTS ~~[D.2.d]~~

~~In lieu of implementing the watershed monitoring requirements under Provisions D.2.a-c, t~~The San Diego Water Board may modify the long-term receiving water monitoring requirements directing the Copermittees to participate in an alternative watershed monitoring effort with other regulated entities, other interested parties, and the San Diego Water Board in the development, refinement, implementation, and coordination of regional monitoring and assessment programs to determine the status and trends of water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams.

~~**e. WATERSHED MANAGEMENT AREA SPECIAL STUDIES** [D.2.e]~~

~~(1) Within the term of this Order, the Copermittees must implement at least three special studies in each Watershed Management Area. The Copermittees are to determine which special studies will be developed and implemented in the Watershed Management Area. The monitoring plans for the Watershed Management Area special studies must be submitted with the Water Quality Improvement Plan required pursuant to Provision F.1. The Watershed Management Area special studies must, at a minimum, be in conformance with the following criteria:~~

~~(a) The special studies must be related to the highest water quality priorities identified by the Copermittees within the Watershed Management Area;~~

~~(b) The special studies must be implemented within the Watershed Management Area;~~

~~(c) The special studies must require some form of participation by all Copermittees within the Watershed Management Area; and~~

~~(d) One of the three required special studies may be implemented as part of a regional special study required pursuant to Provision D.3.~~

~~(2) The Copermittees must report the progress and findings of the Watershed Management Area Special Studies as part of the Annual Report for each Watershed Management Area, as required pursuant to Provision F.3.b.~~

2. MS4 Outfall Discharge Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the discharges from the MS4 outfalls in each Watershed Management Area during dry weather and wet weather. Following acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct MS4 outfall discharge monitoring during implementation of the Water Quality Improvement Plan

to assess the effectiveness of their jurisdictional runoff management programs toward effectively prohibiting non-storm water discharges and reducing pollutants in storm water discharges to and from their MS4s. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must develop and/or update its written dry weather and wet weather MS4 outfall monitoring procedures to be consistent with the following criteria:

a. TRANSITIONAL MS4 OUTFALL DISCHARGE MONITORING

Until the monitoring requirements of Provisions D.2.b-c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following MS4 outfall discharge monitoring in the Watershed Management Area:

(1) MS4 Outfall Discharge Monitoring Station Inventory

Each Copermittee must identify all major MS4 outfalls that discharge directly to receiving waters within its jurisdiction and geo-locate those outfalls on a map of the MS4 pursuant to Provision E.2.b.(1). This information must be compiled into a MS4 outfall discharge monitoring station inventory, and must include the following information:

(a) Watershed Management Area;

(b) Hydrologic subarea;

(c) Outlet size;

(d) Accessibility (i.e. safety and without disturbance of critical habitat);

(e) Approximate drainage area; and

(f) Classification of whether the MS4 outfall is known to have persistent dry weather flows, transient dry weather flows, no dry weather flows, or unknown dry weather flows.

(2) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Until the monitoring requirements of Provision D.2.b are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, each Copermittee must perform dry weather MS4 outfall field screening monitoring to identify non-storm water and illicit discharges within its jurisdiction in accordance with Provision E.2.c, to determine which discharges are transient flows and which are persistent

flows, and prioritize the dry weather MS4 discharges that will be investigated and eliminated in accordance with Provision E.2.d. Each Copermittee must conduct the following dry weather MS4 outfall discharge field screening monitoring within its jurisdiction:

(a) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Frequency

Each Copermittee must field screen the MS4 outfalls in its inventory developed pursuant to Provision D.2.a.(1) as follows:

(i) For Copermittees with less than 125 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 80 percent of the outfalls must be visually inspected two times per year during dry weather conditions.

(ii) For Copermittees with 125 major MS4 outfalls or more, but less than or equal to 500, that discharge to receiving waters within a Watershed Management Area all the outfalls must be visually inspected at least annually during dry weather conditions.

(iii) For Copermittees with more than 500 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 500 outfalls must be visually inspected at least annually during dry weather conditions. Copermittees with more than 500 major MS4 outfalls within a Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(iv) For Copermittees with more than 500 major MS4 outfalls within its jurisdiction that are located in more than one Watershed Management Area, at least 500 major MS4 outfalls within its inventory must be visually inspected at least annually during dry weather conditions. Copermittees with more than 500 major MS4 outfalls in more than one Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;

[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(v) Inspections of major MS4 outfalls conducted in response to public reports and staff or contractor reports and notifications may count toward the required visual inspections of MS4 outfall discharge monitoring stations.

(b) Transitional Dry Weather MS4 Outfall Discharge Field Screening Visual Observations

(i) An antecedent dry period of at least 72 hours following any storm event producing measurable rainfall greater than 0.1 inch is required prior to conducting field screening visual observations during a field screening monitoring event.

(ii) During the field screening monitoring event, each Copermittee must record visual observations consistent with Table D-6 at each MS4 outfall discharge monitoring station inspected.

Table D-6. Field Screening Visual Observations for MS4 Outfall Discharge Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, or sheens, odor, color) - Flow source(s) suspected or identified from non-storm water source investigation - Flow source(s) eliminated during non-storm water source identification • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, or sheens, odor, color) - Known or suspected source(s) of pooled or ponded water • Station description (i.e. deposits or stains, vegetation condition, structural condition, observable biology) • Presence and assessment of trash in and around station • Evidence or signs of illicit connections or illegal dumping

(iii) Each Copermittee must implement the requirements of Provisions E.2.d.(2)(c)-(e) based on the field observations.

(iv) Each Copermittee must evaluate field observations together with existing information available from prior reports, inspections and

monitoring results to determine whether any observed flowing, pooled, or ponded waters are likely to be transient or persistent flow.[21]

(c) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Records

Based upon the results of the transitional dry weather MS4 outfall discharge field screening monitoring conducted pursuant to Provisions D.2.a.(2)(a)-(b), each Copermittee must update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow.

(3) Transitional Wet Weather MS4 Outfall Discharge Monitoring

Until the monitoring requirements of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(a) Transitional Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees must select at least five wet weather MS4 outfall discharge monitoring stations from the inventories developed pursuant to Provision D.2.a.(1) that are representative of storm water discharges from areas consisting primarily of residential, commercial, industrial, and typical mixed-use land uses present within the Watershed Management Area.

(b) Transitional Wet Weather MS4 Outfall Discharge Monitoring Frequency

Each wet weather MS4 outfall discharge monitoring station selected pursuant to Provision D.2.a.(3)(a) must be monitored twice during the wet season (October 1 – April 30). One wet weather monitoring event must be conducted during the first wet weather event of the wet season, and one wet weather monitoring event at least a month after the first wet weather event of the wet season.

(c) Transitional Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

[21] Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

(i) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(ii) The flow rates and volumes measured or estimated. Data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board.

(iii) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(iv) Presence and assessment of trash in and around station.

(d) Transitional Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(e) Transitional Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, and indicator bacteria;

(iv) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

[a] Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

[b] Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment.

[c] If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours.

(v) Only one analysis of the composite of aliquots is required;

(vi) The samples must be analyzed for the following constituents:

[a] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

[b] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and

[c] Constituents listed in in Table D-7.

Table D-7. Analytical Monitoring Constituents for Wet Weather MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Nickel • Selenium • Thallium • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(f) Other Transitional Wet Weather MS4 Outfall Discharge Monitoring

The San Diego County Copermittees must continue the wet weather MS4 outfall monitoring program developed under Order No. R9-2007-0001, as approved by the San Diego Water Board, through its planned completion.

b. Dry Weather MS4 Outfall Discharge Monitoring

Each Copermittee must perform dry weather MS4 outfall monitoring to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. Each Copermittee must conduct the following dry weather MS4 outfall discharge monitoring within its jurisdiction:

(1) Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Each Copermittee must continue to perform the dry weather MS4 outfall discharge field screening monitoring in accordance with the requirements of Provision D.2.a.(2). The Copermittee may adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of persistent flow non-storm water discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of visual inspections performed is equivalent to the number of visual inspections required under Provision D.2.a.(2)(a).

(2) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring

Each Copermittee must perform non-storm water persistent flow MS4 outfall discharge monitoring to determine which persistent non-storm water discharges contain concentrations of pollutants below NALs, and which persistent non-storm water discharges impact receiving water quality during dry weather. Each Copermittee must conduct the following non-storm water persistent flow MS4 outfall discharge monitoring within its jurisdiction:

(a) Prioritization of Non-Storm Water Persistent Flow MS4 Outfalls

Based upon the dry weather MS4 outfall discharge field screening monitoring records developed pursuant to Provision D.2.a.(2)(c), each Copermittee must identify and prioritize the MS4 outfalls with persistent flows based on the highest priority water quality conditions identified in the Water Quality Improvement Plan and any additional criteria developed by the Copermittee, which may include historical data and data from sources other what the Copermittee collects.

(b) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring Frequency

(i) Based on the prioritization of major MS4 outfalls developed under Provision D.2.b.(2)(a), each Copermittee must identify, at a minimum, the 10 highest priority major MS4 outfalls with non-storm water persistent flows that the Copermittee will monitor within each

Watershed Management Area within its jurisdiction. The location of the highest priority non-storm water persistent flow MS4 outfall monitoring stations must be identified on the map required pursuant to Provision E.2.b.(1).

(ii) Each of the highest priority non-storm water persistent flow MS4 outfall monitoring stations identified pursuant to Provision D.2.b.(2)(b)(i) must be monitored under dry weather conditions at least semi-annually until one of the following occurs:

[a] The non-storm water discharges have been effectively eliminated (i.e. no flowing, pooled, or ponded water) for three consecutive dry weather monitoring events; or

[b] The source(s) of the persistent flows has been identified as a category of non-storm water discharges that does not require an NPDES permit and does not have to be addressed as an illicit discharge because it was not identified as a source of pollutants (i.e. constituents in non-storm water discharge do not exceed NALs), and the persistent flow can be re-prioritized to a lower priority; or

[c] The constituents in the persistent flow non-storm water discharge do not exceed NALs, and the persistent flow can be re-prioritized to a lower priority; or

[d] The source(s) of the persistent flows has been identified as a non-storm water discharge authorized by a separate NPDES permit.

(iii) Where the criteria under Provision D.2.b.(2)(c)(ii) are not met, but the threat to water quality has been reduced by the Copermittee, the highest priority persistent flow MS4 outfall monitoring stations may be reprioritized accordingly for continued dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1).

(iv) Each Copermittee must document removal or re-prioritization of the highest priority persistent flow MS4 outfall monitoring stations identified under Provision D.2.b.(2)(b) in the Annual Report. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized MS4 major outfall in the Watershed Management Area within its jurisdiction, unless there are no remaining qualifying major MS4 outfalls within the Copermittee's jurisdiction in the Watershed Management Area.

(c) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Observations

During each semi-annual monitoring event, each Copermittee must record field observations consistent with Table D-6 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(d) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Monitoring

During each semi-annual monitoring event, if conditions allow the collection of the data, each Copermittee must monitor and record the parameters in Table D-2 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(e) Non-Storm Water Persistent Flow MS4 Outfall Discharge Analytical Monitoring

During each semi-annual monitoring event in which measurable flow is present, each Copermittee must collect and analyze samples from each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Collect grab or composite samples to be analyzed for the following constituents:

[a] Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,
[b] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,
[c] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,
[d] Applicable NAL constituents, and
[e] Constituents listed in Table D-8, unless the Copermittee has historical data that can demonstrate or provide justification that the analysis of the constituent is not necessary.

Table D-8. Analytical Monitoring Constituents for Persistent Flow MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Total Hardness • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Cadmium • Copper • Lead • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(iv) If the Copermittee identifies and eliminates the source of the persistent flow non-storm water discharge, analysis of the sample is not required.

c. WET WEATHER MS4 OUTFALL DISCHARGE MONITORING

The Copermittees must perform wet weather MS4 outfall monitoring to identify sources of pollutants in storm water discharges from the MS4s in the Watershed Management Area. The Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(1) Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees may adjust the wet weather MS4 outfall discharge monitoring locations and frequencies in the Watershed Management Area, as needed, to identify sources of pollutants in storm water discharges from MS4s in the Watershed Management Area in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of stations is at least equivalent to the number of stations required under Provision D.2.a.(3)(a).

(2) Wet Weather MS4 Outfall Discharge Monitoring Frequency

The Copermittees must monitor the wet weather MS4 outfall discharge monitoring stations in the Watershed Management Area at an appropriate frequency to identify sources of pollutants in storm water discharges from the MS4s causing or contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan.

(3) Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(b) The flow rates and volumes measured or estimated. Data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board.

(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(d) Presence and assessment of trash in and around station.

(4) Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(5) Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment.

(iii) If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours.

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and

(iv) Applicable SAL constituents.

3. ~~Regional~~ Special Studies

a. Within the term of this Order, the Copermittees must develop and implement the following special studies:

(1) At least three special studies in each Watershed Management Area to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that cause or contribute to highest priority water quality conditions identified in the Water Quality Improvement Plan.

(2) ~~a~~At least two ~~regional~~ special studies for the San Diego Region to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that are impacting receiving waters on a regional basis in the San Diego Region.

(3) One of the three special studies in each Watershed Management Area may be replaced by a special study implemented pursuant to Provision D.3.a.(2).

b. ~~The Copermittees must determine which regional special studies will be developed and implemented. The regional special studies must be identified in the Water Quality Improvement Plans required pursuant to Provision F.1.~~ The ~~regional~~ special studies must, at a minimum, be in conformance with the following criteria:

~~**a.**~~

(1) The special studies must be related to ~~a~~ the highest priority water quality conditions ~~priority issue or potential water quality concern~~ identified by the Copermittees in the Watershed Management Area and/or for the entire San Diego Region;

~~**b.**~~

(2) The special studies developed pursuant to Provision D.3.a.(1) must ~~be~~:

(a) Be implemented within the applicable Watershed Management Area, and

(b) Require some form of participation by all the Copermittees within the Watershed Management Area;

(3) The special studies developed pursuant to Provision D.3.a.(2) must:

(a) Be implemented within the San Diego Region,~~;~~ and

~~**c.**~~

(b) ~~The special studies must r~~Require some form of participation by all Copermittees ~~enrolled~~ covered under the requirements of this Order.

c. Special studies developed to identify sources of pollutants and/or stressors should be pollutant and/or stressor specific and based on historical monitoring data and monitoring performed pursuant to Provisions D.1 and D.2. Development of source identification special studies should include the following:

(1) A compilation of known information on the specific pollutant and/or stressor, including data on potential sources and movement of the pollutant and/or stressor within the watershed. Data generated by the Copermittees and others, as well as information available from a literature research on the pollutant and/or stressor should be compiled and analyzed as appropriate.

(2) An identification of data gaps, based on the compiled information generated on the specific pollutant and/or stressor in Provision D.3.d.(1). Source identification special studies should be developed to fill identified data gaps.

(3) A monitoring plan that will collect and provide data the Copermittees can utilize to do the following:

(a) Quantify the relative loading or impact of a pollutant and/or stressor from a particular source or pollutant generating activity;

(b) Improve understanding of the fate of a pollutant and/or stressor in the environment;

(c) Develop an inventory of known and suspected sources of a pollutant and/or stressor in the Watershed Management Area; and/or

(d) Prioritize known and suspected sources of a pollutant and/or stressor based on relative magnitude in discharges, geographical distribution (i.e., regional or localized), frequency of occurrence in discharges, human health risk, and controllability.

d. Special studies initiated prior to the acceptance of the Water Quality Improvement Plan that meet the requirements of Provision D.3.b and are completed during the term of this Order may be utilized to fulfill the special study requirements of Provision D.3.a.

e. The Copermittees must submit the monitoring plans for the special studies in the Water Quality Improvement Plans required pursuant to Provision F.1.

f. The Copermittees are encouraged to share the results of the special studies regionally among the Copermittees to provide information useful in improving and adapting the management of non-storm water and storm water runoff through the implementation of the Water Quality Improvement Plans.

4. Assessment Requirements

Each Copermittee must evaluate the data collected pursuant to Provisions D.1, D.2 and D.3, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E, to ~~identify causes of exceedances of action levels developed pursuant to Provision C, assess the quality of the discharges into and from the MS4s, and assess the quality of receiving waters. Each Copermittee must also~~ assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a ~~required pursuant to Provision B.3 in restoring and protecting beneficial uses of receiving waters~~. Assessments must be performed as described in the following provisions:

a. RECEIVING WATERS ASSESSMENTS

(1) The Copermittees must assess and report the conditions of the receiving waters in the Watershed Management Area as follows:

(a) Based on data collected pursuant to Provision D.1.a, the assessments under Provision D.4.a.(2) must be included in the first Annual Report required pursuant to Provision F.3.b.(1).

(b) Based on the data collected pursuant to Provisions D.1.a-e, the assessments required under Provision D.4.a.(2) must be included in the Report of Waste Discharge required pursuant to Provision F.5.b.

(2) The Copermittees must assess the status and trends of receiving water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under dry weather and wet weather conditions. For each of the three types of receiving waters in each Watershed Management Area the Copermittees must:

(a) Determine whether or not the conditions of the receiving waters are protective of the designated beneficial uses;

(b) Identify the most critical beneficial uses that must be protected or restored to ensure overall health of the receiving water;

(c) Determine whether or not those critical beneficial uses are being protected and where those beneficial used must be restored;

(d) Identify short-term and/or long-term improvements or degradation of those critical beneficial uses;

(e) Identify data gaps in the monitoring data necessary to assess Provisions D.4.a.(2)(a)-(d).

b. MS4 OUTFALL DISCHARGES ASSESSMENTS ~~[D.4.a]~~

(1) ~~Jurisdictional~~ Non-Storm Water Discharges Reduction Assessments ~~[D.4.a.(1)]~~

(a) Each Copermittee must assess and report the progress of its illicit discharge detection and elimination program, required to be implemented pursuant to Provision E.2, toward reducing and effectively prohibiting non-storm water and illicit discharges into the MS4 within its jurisdiction as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(2), the assessments under Provision D.4.b.(1)(b) must be included in the first Annual Report required pursuant to Provision F.3.b.(1).

(ii) Based on the data collected pursuant to Provisions D.2.b, the assessments required under Provision D.4.b.(1)(c) must be included in the first Annual Report required pursuant to Provision F.3.b.(1), and annually thereafter.

(iii) Based on the data collected pursuant to Provisions D.2.b, the assessment required under Provision D.4.b.(1)(c) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.a.(2), each Copermittee must assess and report the following:

(i) Identify the known and suspected controllable sources (e.g. facilities, areas, land uses, pollutant generating activities) of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area;

(ii) Identify sources of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area that have been reduced or eliminated during the transitional monitoring period; and

(iii) Identify modifications to the field screening monitoring locations and frequencies for the MS4 outfalls in its inventory necessary to identify and eliminate sources of persistent flow non-storm water discharges pursuant to Provision D.2.b.(1).

(c) Based on the dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b, each Copermittee must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(1)(b);

(ii) Based on the data collected and applicable NALs in the Water Quality Improvement Plan, rank the MS4 outfalls in the Copermittee's jurisdiction according to potential threat to receiving water quality, and produce a prioritized list of major MS4 outfalls for follow-up action to update the Water Quality Improvement Plan, with the goal of eliminating persistent flow non-storm water discharges and/or pollutant loads in order of the ranked priority list through targeted programmatic actions and source investigations;

(iii) For the highest priority major MS4 outfalls with persistent flows that are in exceedance of NALs, identify the known and suspected sources within the Copermittee's jurisdiction in the Watershed Management Area that may cause or contribute to the NAL exceedances;

~~(a) Non-Storm Water Action Levels [D.4.a.(1)(a)]~~

~~Each Copermittee must analyze the jurisdictional non-storm water monitoring data collected pursuant to Provision D.1.a and identify causes~~

~~of NAL exceedances. The analysis must include, but not be limited to, all of the following considerations:~~

~~(i) For non-storm water discharges from the Copermittee's MS4 outfalls to receiving waters within the Copermittee's jurisdiction causing exceedances of NALs, the Copermittee must analyze its municipal, commercial, industrial, and residential inventories and activities, and other land use data, and identify sources or potential sources that may have caused or contributed to the NAL exceedances;~~

~~(ii) Each Copermittee must provide non-storm water monitoring and analytical data to demonstrate that NAL exceedances were caused by pollutants which are not anthropogenic in origin; and~~

~~(iii) Each Copermittee must provide non-storm water monitoring and analytical data to demonstrate that NAL exceedances were caused by pollutants which originate from sources or potential sources not within the authority of the Copermittee to control (e.g. Phase II dischargers or Caltrans).~~

~~(b) Calculate Jurisdictional Non-Storm Water Discharges and Pollutant Loads [D.4.a.(1)(b)]~~

(iv) Each Copermittee must analyze the ~~jurisdictional non-storm water monitoring~~ data collected pursuant to Provision D.2.b, and utilize a model or other method, ~~D.1.a~~ to calculate or estimate the non-storm water ~~discharges~~ volumes and pollutant loads discharged from all the major MS4s outfalls ~~and receiving waters~~ in ~~each~~ its jurisdiction identified as having persistent dry weather flows during the monitoring year. These calculations or estimates must be updated annually ~~in the Annual Report required per Provision F.3.b~~. Each Copermittee must calculate or estimate:

~~(i) Monthly non-storm water discharges and pollutant loads from each known or potential source not within the authority of the Copermittee to control to an MS4 or receiving waters within the Copermittee's jurisdiction;~~

~~(ii)~~

[a] ~~Monthly~~ Annual non-storm water ~~discharges~~ volumes and pollutant loads discharged from the Copermittee's major MS4 outfalls to receiving waters within the Copermittee's jurisdiction, with an estimate of the percent contribution from each ~~land use type within the drainage basin~~ known and suspected source for each MS4 outfall;

~~(iii) Monthly non-storm water flows and pollutant loads in receiving waters at the downstream boundary of the Copermittee's jurisdiction; and~~

~~(iv)~~

[b] ~~Monthly~~ Annual non-storm water ~~flows~~ volumes and pollutant loads ~~in receiving waters~~ from areas or facilities subject to the Copermittee's legal authority that are discharged from the Copermittee's major MS4 outfalls to downstream receiving waters.

~~(c) Review Progress and Evaluate Jurisdictional Actions [D.4.a.(1)(c)]~~

(v) Each Copermittee must review the data collected pursuant to Provision D.2.b and findings from the assessments ~~NAL exceedances, discharge and flow analyses, and pollutant load analyses~~ required pursuant to Provision~~s~~ D.4.b.(1)(c)(i)-(iv) ~~D.4.a.(1)(a) and D.4.a.(1)(b)~~ on an annual basis to:

~~(i)~~

[a] Identify reductions and progress in achieving reductions in non-storm water and illicit discharges ~~and connections from different land uses and/or drainage areas~~ to ~~its~~ the Copermittee's MS4 in the Watershed Management Area;

~~(ii)~~

[b] Assess the effectiveness of ~~current actions~~ water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward ~~the~~ reducing~~tion~~ or eliminating~~on~~ of non-storm water ~~discharges~~ and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction, with an estimate, if possible, of the non-storm water volume and/or pollutant load reductions attributable to specific water quality strategies implemented by the Copermittee; and

~~(iii)~~

[c] Identify modifications necessary to increase the effectiveness of the ~~jurisdictional runoff management program~~ water quality improvement strategies implemented by the Copermittee in the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging~~es to and~~ from the MS4 to receiving waters within its jurisdiction.

(vi) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(v).

~~(2) Watershed Management Area Non-Storm Water Assessment [D.4.a.(2)]~~

~~(a) Calculate Watershed Non-Storm Water Flows and Pollutant Loads [D.4.a.(2)(a)]~~

~~The Copermittees must analyze the jurisdictional non-storm water and watershed monitoring data collected per Provisions D.1.a and D.2.b to calculate non-storm water flows and pollutant loads in receiving waters for each Watershed Management Area. These calculations must be updated annually in the Annual Report required per Provision F.3.b. The Copermittees must develop or utilize appropriate methods or models to calculate:~~

~~(i) Monthly non-storm water runoff flows and pollutant loads at each watershed monitoring station from different land uses and drainage basins;~~

~~(ii) Monthly non-storm water flows and pollutant loads at each watershed monitoring station from all the Copermittees' MS4 outfalls to receiving waters, with an estimate of the percent contribution from different land uses; and~~

~~(iii) Monthly non-storm water flows and pollutant loads at each watershed monitoring station, with an estimate of the percent contribution from both areas or facilities subject to the Copermittees' legal authority and areas or facilities not subject to the Copermittees' legal authority.~~

~~(b) Evaluate Water Quality Improvement Strategies [D.4.a.(2)(b)]~~

~~The Copermittees in each Watershed Management Area must review the non-storm water flow and pollutant load analyses required pursuant to Provision D.4.a.(2)(a) on an annual basis to:~~

~~(i) Assess the effectiveness of the water quality improvement strategies being implemented within the Watershed Management Area toward reducing or eliminating non-storm water discharges and pollutant loads from entering and discharging from the MS4 to receiving waters; and~~

~~(ii) Identify modifications necessary to increase the effectiveness of the water quality improvement strategies toward reducing or eliminating non-storm water discharges and pollutant loads from entering and discharging from the MS4 to receiving waters.~~

~~(3)~~
(2) ~~Jurisdictional~~ Storm Water Pollutant Discharges Reduction Assessments ~~[D.4.a.(3)]~~

(a) The Copermittees must assess and report the progress of the water quality improvement strategies, required to be implemented pursuant to Provisions B and E, toward reducing pollutants in storm water discharges from the MS4s within the Watershed Management Area as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(3), the assessments under Provision D.4.b.(2)(b) must be included in the first Annual Report required pursuant to Provision F.3.b.(1).

(ii) Based on the data collected pursuant to Provisions D.2.c, the assessments required under Provision D.4.b.(2)(c) must be included in the first Annual Report required pursuant to Provision F.3.b.(1), and annually thereafter.

(iii) Based on the data collected pursuant to Provisions D.2.c, the assessment required under Provisions D.4.b.(2)(c)-(d) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.a.(3) the Copermittee must assess and report the following:

~~(a) Storm Water Action Levels [D.4.a.(3)(a)]~~

~~(i) For storm water discharges from the Copermittee's storm water MS4 outfall monitoring stations with analytical monitoring data indicating exceedances of SALs, the Copermittee must analyze its municipal, commercial, industrial, and residential inventories and activities, and other land use data and identify sources or potential sources that may have caused or contributed to the SAL exceedances;~~

~~(ii) Each Copermittee must provide storm water monitoring and analytical data to demonstrate that SAL exceedances were caused by the constituents in storm water discharges from the MS4 which are not anthropogenic in origin; and~~

~~(iii) Each Copermittee must provide storm water monitoring and analytical data to demonstrate that SAL exceedances were caused by the constituents in storm water discharges from the MS4 which originate from sources or potential sources not within the authority of the Copermittee to control.~~

~~(b) Calculate Jurisdictional Storm Water Discharges and Pollutant Loads [D.4.a.(3)(b)]~~

(i) ~~Each~~ The Copermittees must analyze the ~~jurisdictional storm water~~ monitoring data collected pursuant to Provision D.2.a.(3), and utilize a watershed model or other method, ~~D.1.b~~ to calculate or estimate storm water ~~discharges~~ volumes and pollutant loads discharged from the MS4s in each Copermittee's jurisdiction within the Watershed Management Area. ~~These calculations must be updated annually in the Annual Report required per Provision F.3.b.~~ ~~Each~~ The

Copermittees must calculate or estimate the following for each monitoring year:

~~(i) The monthly mean rainfall estimates (or summary of weather bureau data) and the monthly average number of storm events;~~

~~(ii)~~

[a] The average storm water runoff coefficient for each land use type within the Watershed Management Area ~~Copermittee's jurisdiction~~;

~~(iii)~~

[b] The volume of storm water discharged from each of the Copermittee's major MS4 outfalls ~~to receiving waters with~~in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch;

~~(iv)~~

[c] The pollutant loads discharged from each of the Copermittee's major MS4 outfalls in its jurisdiction to receiving waters within ~~its jurisdiction~~ the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch; and

~~(v)~~

[d] The percent contribution of storm water volumes and pollutant loads discharged from each land use type within the drainage basin to ~~storm water discharges for~~ each of the Copermittee's major MS4 outfalls ~~with~~in its jurisdiction~~,~~ to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch.

(ii) Identify modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify sources pollutants in storm water discharges from the MS4s in the Watershed Management Area pursuant to Provision D.2.c.(1).

(c) Based on the wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.c the Copermittee must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(2)(b);

(ii) Based on the data collected and applicable SALs in the Water Quality Improvement Plan, rank the MS4 outfalls in the Watershed Management Area according to potential threat to receiving water quality, and produce a prioritized list of major MS4 outfalls for follow-up action to update the Water Quality Improvement Plan;

~~(c) Review Progress and Evaluate Jurisdictional Actions [D.4.a.(3)(c)]~~

(iii) ~~Each~~ The Copermittee must review the data collected pursuant to Provision D.2.c and findings from the assessments ~~SAL exceedances, discharge analyses, and pollutant load analyses~~ required pursuant to Provisions D.4.b.(2)(c)(i)-(ii) ~~D.4.a.(3)(a) and D.4.a.(3)(b)~~ on an annual basis to:

~~(i)~~

[a] Identify reductions and progress in achieving reductions in pollutant concentrations and/or pollutant loads from different land uses and/or drainage areas discharging from ~~its~~ the Copermittees' MS4s in the Watershed Management Area;

~~(ii)~~

[b] Assess the effectiveness of ~~current actions~~ water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward ~~the~~ reducing~~tion of~~ pollutants in storm water discharges from the MS4s to receiving waters within ~~its jurisdiction~~ the Watershed Management Area to the MEP, with an estimate, if possible, of the pollutant load reductions attributable to specific water quality strategies implemented by the Copermittees; and

~~(iii)~~

[c] Identify modifications necessary to increase the effectiveness of the ~~jurisdictional runoff management program~~ water quality improvement strategies implemented by the Copermittees in the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters in the Watershed Management Area ~~within its jurisdiction~~ to the MEP.

(iv) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(iii).

(d) The Copermittees must evaluate all the data collected pursuant to Provision D.2.c, and incorporate new outfall monitoring data into time series plots for each long-term monitoring constituent for the Watershed Management Area, and perform statistical trends analysis on the cumulative long-term wet weather MS4 outfall discharge water quality data set.

~~(4) Watershed Management Area Storm Water Assessment [D.4.a.(4)]~~

~~(a) Calculate Watershed Storm Water Flows and Pollutant Loads [D.4.a.(4)(a)]~~

~~The Copermittees must analyze the jurisdictional storm water and watershed monitoring data collected per Provisions D.1.b and D.2.c to~~

~~calculate storm water flows and pollutant loads in receiving waters for each Watershed Management Area. These calculations must be updated annually in the Annual Report required per Provision F.3.b. The Copermittees must develop or utilize appropriate methods or models to calculate:~~

~~(i) Storm water runoff flows and pollutant loads at each watershed monitoring station from different land uses and drainage basins;~~

~~(ii) Storm water flows and pollutant loads at each watershed monitoring station from all the Copermittees' MS4 outfalls, with an estimate of the percent contribution from different land uses; and~~

~~(iii) Storm water pollutant loads in receiving waters at each watershed monitoring station, with an estimate of the percent contribution from both areas or facilities subject to the Copermittees' legal authority and areas or facilities not within the authority of the Copermittees to control.~~

~~(b) Evaluate Water Quality Improvement Strategies [D.4.a.(4)(b)]~~

~~The Copermittees in each Watershed Management Area must review the storm water flow and pollutant load analyses required pursuant to Provision D.4.a.(4)(a) on an annual basis to:~~

~~(i) Assess the effectiveness of the water quality improvement strategies being implemented in each Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to the MEP; and~~

~~(ii) Identify modifications necessary to increase the effectiveness of the water quality improvement strategies toward reducing pollutants in storm water discharges from the MS4s to the MEP.~~

~~b. Receiving Waters Assessments [D.4.b]~~

~~The Copermittees must annually perform assessments of receiving waters based on data collected pursuant to Provision D.2 and any appropriate receiving water monitoring data available from other sources. The receiving waters assessments must analyze the status and trends of water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under dry weather and wet weather conditions. For each of the three types of receiving waters, the Copermittees in each Watershed Management Area must:~~

~~(a) Identify the most critical beneficial uses that must be protected or restored to ensure overall health of the receiving water;~~

~~(b) Determine whether or not those critical beneficial uses are being protected or must be restored; and~~

~~(c) Identify short-term and/or long-term improvements or degradation of those critical beneficial uses.~~

c. SPECIAL STUDIES ASSESSMENTS

The Copermittees must annually evaluate the results and findings from the special studies developed and implemented pursuant to Provision D.3, and assess their relevance to the Copermittees' efforts to characterize receiving water conditions, understand sources of pollutants and/or stressors, and control and reduce the discharges of pollutants from the MS4 outfalls to receiving waters in the Watershed Management Area. The Copermittees must report the results of the special studies assessments applicable to the Watershed Management Area, and identify any necessary modifications or updates to the Water Quality Improvement Plan based on the results in the Annual Reports required pursuant to Provision F.3.b.

d. INTEGRATED ASSESSMENT OF WATER QUALITY IMPROVEMENT PLAN ~~ASSESSMENTS~~ ~~[D.4.c]~~

As part of the iterative approach and adaptive management process required for the Water Quality Improvement Plan pursuant to Provision B.5, ~~T~~the Copermittees in each Watershed Management Area must integrate ~~review the numeric targets in the Water Quality Improvement Plan,~~ the data collected pursuant to Provisions D.1-D.3 ~~and D.2~~, ~~and~~ the findings from the assessments required pursuant to Provisions D.4.a-c ~~and D.4.b~~ , and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to assess the effectiveness of, and identify necessary modifications to, the Water Quality Improvement Plan ~~following~~ as follows:

(1) The Copermittees must re-evaluate the priority water quality conditions and numeric goals for the Watershed Management Area, as needed, during the term of this Order pursuant to Provision B.5.a. The re-evaluation and recommendations for modifications to the priority water quality conditions, and/or numeric goals and corresponding schedules may be provided in the Annual Reports required pursuant to Provision F.3.b, but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The priority water quality conditions and numeric goals for the Watershed Management Area must be re-evaluated as follows:

(a) Re-evaluate the receiving water conditions in the Watershed Management Area in accordance with Provision B.2.a;

(b) Re-evaluate the impacts on receiving waters in the Watershed Management Area from MS4 discharges in accordance with Provision B.2.b;

(c) Re-evaluate the identification of MS4 sources of pollutants and/or stressors in accordance with Provision B.2.d;

~~(1)~~
(d) Identify ~~B~~beneficial uses of the receiving waters that are protected or must be restored in accordance with Provision D.4.a;

(e) Evaluate the progress toward achieving the interim and final numeric goals for restoring impacted beneficial uses in the receiving waters.

(2) The Copermittees must re-evaluate the water quality improvement strategies for the Watershed Management Area, as needed, during the term of this Order pursuant to Provision B.5.b. The re-evaluation and recommendations for modifications to the water quality improvement strategies and schedules must be provided in the Annual Reports required pursuant to Provision F.3.b, and provided in the Report of Waste Discharge pursuant to Provision F.5.b. The water quality improvement strategies for the Watershed Management Area must be re-evaluated as follows:

(a) Identify the non-storm water and storm water pollutant loads from the Copermittees' MS4 outfalls in the Watershed Management Area, calculated or estimated pursuant to Provisions D.4.b;

~~(2) Appropriateness of final dry weather and wet weather numeric targets for the highest water quality priorities that will restore the impacted beneficial uses in the receiving waters;~~

~~(3)~~
(b) Identify the ~~N~~non-storm water and storm water pollutant load reductions, or other improvements to receiving water or water quality conditions, that are necessary to attain the interim and final numeric ~~targets~~ goals for restoring impacted beneficial uses in the receiving waters;

~~(4)~~
(c) Identify the ~~N~~non-storm water and storm water pollutant load reductions necessary for the Copermittees to demonstrate that non-storm water and storm water discharges from their MS4s are not causing or contributing to exceedances of ~~water quality objectives or impacts to beneficial uses in~~ receiving water limitations;

~~(5) Non-storm water and storm water pollutant loads from their MS4s and/or receiving water flows that may be attributed to sources or potential sources not within the authority of the Copermittee to control and other non-anthropogenic sources identified by the Copermittees;~~

~~(6) Progress of the water quality improvement strategies toward attaining non-~~

~~storm water and storm water pollutant load reductions or improvements to water quality conditions; and~~

~~(7)~~

(d) Evaluate the ~~P~~progress of the water quality improvement strategies toward achieving the interim and final numeric ~~targets~~ goals for restoring impacted beneficial uses in the receiving waters.

(3) The Copermittees must re-evaluate and adapt the water quality monitoring and assessment program for the Watershed Management Area when new information becomes available to improve the monitoring and assessment program pursuant to Provision B.5.c. The re-evaluation and recommendations for modifications to the monitoring and assessment program may be provided in the Annual Reports required pursuant to Provision F.3.b, but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. Modifications to the water quality monitoring and assessment program must be consistent with the requirements of Provision D.1-D.3. The re-evaluation of the water quality monitoring and assessment program for the Watershed Management Area must consider the data gaps identified by the assessments required pursuant to Provisions D.4.a-b, and results of the special studies implemented pursuant to Provision D.4.c.

5. Monitoring Provisions

Each Copermittee must comply with all the monitoring, reporting, and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

E. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS

The purpose of this provision is for each Copermittee to implement a program to control the contribution of pollutants to and the discharges from the MS4 with its jurisdiction. The goal of this provision is to require each Copermittee to implement a program that effectively prohibits non-storm water discharges to the MS4 and reduces the discharge of pollutants in storm water to the MEP ~~and effectively prohibit non-storm water discharges to provide the reasonable protection, preservation, enhancement, and restoration of water quality and designated beneficial uses of waters of the state~~. This goal will be accomplished through ~~compliance with~~ implementing the jurisdictional runoff management programs in accordance with the strategies identified in the Water Quality Improvement Plans ~~requirements~~.

~~Each Copermittee must implement all the requirements of Provision E no later than 12 months after the adoption of this Order, or in accordance with Provision F.5.a.~~ Each Copermittee must update its jurisdictional runoff management program document, in accordance with Provision F.2.a, to ~~include~~ incorporate all the requirements of Provision E. ~~The jurisdictional runoff management programs implemented by each Copermittee must be consistent with the Water Quality Improvement Plan for the applicable Watershed Management Area required by Provision B.~~ Until the Copermittee has updated its jurisdictional runoff management program document with the requirements of Provision E, the Copermittee must continue implementing its current jurisdictional runoff management program.

1. Legal Authority Establishment and Enforcement

a. Each Copermittee must establish, maintain, and enforce adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 through statute, ordinance, permit, contract, order, or similar means. This legal authority must, at a minimum, authorize the Copermittee to:

(1) Prohibit and eliminate all illicit discharges and illicit connections to its MS4;

(2) Control the contribution of pollutants in discharges of runoff associated with industrial and construction activity to its MS4 and control the quality of runoff from industrial and construction sites, including industrial and construction sites which have coverage under the statewide General Permit for Discharges of Storm Water Associated with Industrial Activities (Industrial General Permit) or General Permit for Discharges of Storm Water Associated with Construction Activities (Construction General Permit), as well as to those sites which do not;

(3) Control the discharge of spills, dumping, or disposal of materials other than storm water into its MS4;

(4) Control through interagency agreements among Copermittees the contribution of pollutants from one portion of the MS4 to another portion of the MS4;

(5) Control, ~~through interagency agreements~~ by coordinating and cooperating with other owners of the MS4 such as Caltrans, the U.S. federal government, or sovereign Native American Tribes~~,~~ through interagency agreements, where possible, the contribution of pollutants from ~~one~~ their portion of the MS4 to ~~another~~ the portion of the MS4 within the Copermittee's jurisdiction;

(6) Require compliance with conditions in its statutes, ordinances, permits, contracts, orders, or similar means to hold dischargers to its MS4 accountable for their contributions of pollutants and flows;

(7) Require the use of BMPs to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(8) Require documentation on the effectiveness of BMPs implemented to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(9) Utilize enforcement mechanisms to require compliance with its statutes, ordinances, permits, contracts, orders, or similar means; and

(10) Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with its statutes, ordinances, permits, contracts, orders, or similar means and with the requirements of this Order, including the prohibition of illicit discharges and connections to its MS4; the Copermittee must also have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from industrial facilities, including construction sites, discharging into its MS4.

b. With the first Annual Report required ~~by~~ pursuant to Provision F.3.b, each Copermittee must submit a statement certified by its Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative that the Copermittee has taken the necessary steps to obtain and maintain full legal authority within its jurisdiction to implement and enforce each of the requirements contained in this Order.

2. Illicit Discharge Detection and Elimination

Each Copermittee must implement a program to actively detect and eliminate illicit discharges and improper disposal into the MS4, or otherwise require the discharger to apply for and obtain a separate NPDES permit. The illicit discharge detection and elimination program must be implemented in accordance with the strategies identified in the Water Quality Improvement Plan and include, at a minimum, the following requirements:

a. NON-STORM WATER DISCHARGES

Each Copermittee must address all non-storm water discharges as illicit discharges, unless a non-storm water discharge is either identified as a discharge authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to the following requirements:

(1) Discharges of non-storm water to the MS4 from the following categories must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG919001 (Order No. R9-2007-0034, or subsequent order) for discharges to San Diego Bay, or NPDES Permit No. CAG919002 (Order No. R9-2008-0002, or subsequent order) for discharges to surface waters other than San Diego Bay:

(a) Uncontaminated pumped ground water;

(b) Discharges from foundation drains;[22]

(c) Water from crawl space pumps; and

(d) Water from footing drains.[22]

(2) Discharges of non-storm water from water line flushing and water main breaks to the MS4 must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG 679001 (Order No. R9-2010-0003, or subsequent order). This includes water line flushing and water main break discharges from water purveyors issued a water supply permit by the California Department of Public Health or federal military installations. Discharges from recycled or reclaimed water lines to the MS4 must be addressed as illicit discharges, unless the discharges have coverage under a separate NPDES permit.

(3) Discharges of non-storm water to the MS4 from the following categories must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a source of pollutants to receiving waters:

(a) Diverted stream flows;

(b) Rising ground waters;

(c) Uncontaminated ground water infiltration to MS4s;

[22] Provision E.2.a.(1) only applies to this category on non-storm water if the system is designed to be located at or below the highest historical groundwater table to actively or passively extract groundwater during any part of the year.

(d) Springs;

(e) Flows from riparian habitats and wetlands; ~~and~~

(f) Discharges from potable water sources; ~~.~~

(g) Discharges from foundation drains;[23] and

(h) Discharges from footing drains. [23]

(4) Discharges of non-storm water to the MS4 from the following categories must be controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means. Discharges of non-storm water to the MS4 from the following categories not controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means must be addressed by the Copermittee as illicit discharges.

(a) Air conditioning condensation

The discharge of air conditioning condensation must be directed to landscaped areas or other pervious surfaces where feasible;

(b) Individual residential vehicle washing

(i) The discharge of wash water must be directed to landscaped areas or other pervious surfaces where feasible, and

(ii) Minimize the use of water for vehicle washing, use as little washing detergent and other vehicle wash products as possible, wash vehicles at commercial wash facilities, and implement other practices or behaviors that will prevent the discharge of pollutants associated with individual residential vehicle washing from entering the MS4; and

(c) Dechlorinated swimming pool discharges

(i) Eliminate residual chlorine, algaecide, filter backwash, or other pollutants from swimming pools prior to discharging to the MS4, and

(ii) The discharge of saline swimming pool water ~~to the MS4~~ must be directed to the sanitary sewer, landscaped areas, or other pervious surfaces that can accommodate the volume of water, unless the saline swimming pool water can be discharged via a pipe or concrete channel directly to a naturally saline water body (e.g. Pacific Ocean).

[23] Provision E.2.a.(3) only applies to this category of non-storm water discharge if the system is designed to be located above the highest historical groundwater table at all times of the year, and the system is only expected to discharge non-storm water under unusual circumstances.

(5) Firefighting discharges to the MS4 must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a significant source of pollutants to receiving waters. Firefighting discharges to the MS4 not identified as a significant source of pollutants to receiving waters, must be addressed, at a minimum, as follows:

(a) Non-emergency firefighting discharges

(i) Building fire suppression system maintenance discharges (e.g. sprinkler line flushing) to the MS4 must be addressed as illicit discharges.

(ii) Non-emergency firefighting discharges (i.e., discharges from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems) must be addressed by a program, to be developed and implemented by the Copermittee, to reduce or eliminate pollutants in such discharges from entering the MS4.

(b) Emergency firefighting discharges

Each Copermittee ~~must~~ should develop and encourage implementation of BMPs to reduce or eliminate pollutants in emergency firefighting discharges to the MS4s and receiving waters within its jurisdiction. During emergency situations, priority of efforts should be directed toward life, property, and the environment (in descending order). BMPs should not interfere with immediate emergency response operations or impact public health and safety.

(6) If the Copermittee or San Diego Water Board identifies any category of non-storm water discharges listed under Provisions E.2.a.(1)-(4) as a source of pollutants to receiving waters, the category must be prohibited through ordinance, order, or similar means and addressed as an illicit discharge.

(7) Each Copermittee must, where feasible, reduce or eliminate non-storm water discharges listed under Provisions E.2.a.(1)-(4) into its MS4 whether or not the non-storm water discharge has been identified as an illicit discharge, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit.

b. PREVENT AND DETECT ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to prevent and detect illicit discharges to the MS4:

(1) Each Copermittee must maintain an updated map of its entire MS4 and the corresponding drainage areas. The accuracy of the MS4 map must be

confirmed during ~~non-storm water MS4 monitoring events~~ the field screening required pursuant to Provision E.2.c. The MS4 map must be included as part of the jurisdictional runoff management program document. Any geographic information system (GIS) layers or files used by the Copermittee to maintain the MS4 map must be made available to the San Diego Water Board upon request. The MS4 map must identify the following:

(a) All segments of the MS4 owned, operated, and maintained by the Copermittee,

(b) All known locations of inlets that discharge and/or collect runoff into the Copermittee's MS4,

(c) All known locations of connections with other MS4s not owned or operated by the Copermittee (e.g. Caltrans MS4s),

(d) All known locations of MS4 outfalls and private outfalls that discharge runoff collected from areas within the Copermittee's jurisdiction,

(e) All segments of receiving waters within the Copermittee's jurisdiction that receive and convey runoff discharged from the Copermittee's MS4 outfalls ~~(i.e., receiving water segments that are both a receiving water and part of the MS4)~~, ~~and~~

(f) Locations of the ~~non-storm water~~ MS4 outfalls ~~monitoring stations~~, identified pursuant to Provision D.2.a.(1)~~1.a.(1)(a)~~, within its jurisdiction, and~~;~~

(g) Locations of the non-storm water persistent flow MS4 outfall discharge monitoring stations, identified pursuant to Provision D.2.b.(2)(b), within its jurisdiction;

(2) Each Copermittee must use Copermittee personnel and contractors to assist in identifying and reporting illicit discharges and connections during their daily employment activities;

(3) Each Copermittee must promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges to or from the MS4, including the following methods for public reporting~~.~~:

(a) ~~Each Copermittee must facilitate public reporting through development and o~~Operate~~ion of~~ a public hotline,~~. Public hotlines~~ which can be Copermittee-specific or shared by the Copermittees,~~. All public hotlines~~ and must be capable of receiving reports in both English and Spanish 24 hours per day and seven days per week, and

(b) Designate an e-mail address for receiving electronic reports from the public, which can be Copermittee-specific or shared by the Copermittees, and must be prominently displayed on the Copermittee's webpage and the Regional Clearinghouse required pursuant to Provision F.4;

(4) Each Copermittee must implement practices and procedures (including a notification mechanism) to prevent, respond to, contain, and clean up any spills that may discharge into the MS4 within its jurisdiction from any source. The Copermittee must coordinate, to the extent possible, with spill response teams to prevent entry of spills into the MS4, and prevent contamination of surface water, ground water, and soil. The Copermittee must coordinate spill prevention, containment, and response activities throughout all appropriate Copermittee departments, programs, and agencies; ~~and~~

(5) Each Copermittee must implement practices and procedures to prevent and limit infiltration of seepage from sanitary sewers (including private laterals and failing septic systems) to the MS4, ~~.~~ and

(6) Each Copermittee must coordinate, when necessary, with upstream Copermittees and/or entities to prevent illicit discharges from upstream sources into the MS4 within its jurisdiction.

c. FIELD SCREENING ~~AND MONITORING~~

Each Copermittee must conduct field screening (i.e. visual observations, field testing, and/or analytical testing) ~~and monitoring~~ of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4 in accordance with the ~~jurisdictional non-storm water~~ dry weather MS4 outfall discharge monitoring ~~program~~ requirements in Provisions D.2.a.(2) and D.2.b.(1) ~~D.1.a.(1)~~.

d. INVESTIGATE AND ELIMINATE ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to investigate and eliminate illicit discharges to the MS4:

(1) Each Copermittee must prioritize and determine when follow-up investigations will be performed in response to visual observations and/or water quality monitoring data collected during an investigation of a detected non-storm water or illicit discharge to or from the MS4. The criteria for ~~follow-up~~ prioritizing investigations must ~~include~~ consider the following:

(a) Pollutants identified as causing or contributing to the highest water quality priorities identified in the Water Quality Improvement Plan;

(b) Pollutants identified as causing or contributing, or threatening to cause or contribute to impairments in water bodies on the 303(d) List and/or in environmentally sensitive areas (ESAs), located within its jurisdiction;

(c) Pollutants identified from sources or land uses known to exist within the area, drainage basin, or watershed that discharges to the portion of the MS4 within its jurisdiction included in the investigation;

(d) Pollutants identified as causing or contributing to an~~d~~ exceedance of a~~n~~ NAL in the Water Quality Improvement Plan ~~described in Provision C.1~~; and

(e) Pollutants identified as a threat to human health or the environment.

(2) Each Copermittee must implement procedures to investigate and inspect portions of its MS4 that, based on reports or notifications, field screening ~~and monitoring~~, or other appropriate information, indicate a reasonable potential of receiving, containing, or discharging pollutants due to illicit discharges, illicit connections, or other sources of non-storm water. The procedures must include the following:

(a) Each Copermittee must develop criteria to:

(i) Assess the validity of each report or notification received, and

(ii) Prioritize the response to each report or notification received;

(b) Each Copermittee must prioritize and respond to each valid report or notification (e.g., public ~~hotline~~ reports, staff or contractor reports and notifications, etc.) of an incident in a timely manner~~. The Copermittee may develop criteria to assess the validity of, and prioritize the response to, each report or notification received~~;

(c) Each Copermittee must ~~immediately~~ investigate and seek to identify the source(s) of discharges of non-storm water where flows are observed in and from the MS4 during the field screening ~~and monitoring~~ required pursuant to Provision D.2.b.(1) ~~D.1.a.(1).~~ as follows:

(i) Obvious illicit discharges must be immediately investigated to identify the source(s) of non-storm water discharges,

(ii) The investigation must include field investigations to identify sources or potential sources for the discharge, unless the source or potential source has already been identified during previous investigations,~~;~~ and

(iii) The investigation may include follow-up field investigations and/or reviewing Copermittee inventories and other land use data to identify potential sources of the discharge;

~~(b) Each Copermittee must investigate and seek to identify the source(s) of non-storm water discharges from the MS4 where there is evidence of non-storm water having been discharged into or from the MS4 (e.g., pooled water) through field investigations and/or reviewing Copermittee inventories and other land use data to identify potential sources of the discharge; and~~

(d) Each Copermittee must maintain records and a database of the ~~investigations, including the~~ following information:

(i) Location of incident, including hydrologic subarea, portion of MS4 receiving the non-storm water or illicit discharge, and point of discharge or potential discharge from MS4 to receiving water,

(ii) Source of information initiating the investigation (e.g., public ~~hotline~~ reports, staff or contractor reports and notifications, field screening ~~monitoring data~~, etc.),

(iii) Date the information used to initiate the investigation was received,

(iv) Date the investigation was initiated,

(v) Dates of follow-up investigations,

(vi) Identified or suspected source of the illicit discharge or connection, if determined,

(vii) Known or suspected related incidents, if any,

(viii) Result of the investigation,

(ix) If a source cannot be identified and the investigation is not continued, a rationale for why a discharge does not pose a threat to water quality and/or does not require additional investigation.

(e) Each Copermittee must track and seek to identify the source(s) of non-storm water discharges from the MS4 where there is evidence of non-storm water having been discharged into or from the MS4 (e.g., pooled water), in accordance with MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.

(3) Each Copermittee must initiate the implementation of procedures, in a timely manner, to eliminate all detected and identified illicit discharges and connections within its jurisdiction. The procedures must include the following responses:

(a) Each Copermittee must enforce its legal authority, as required under Provision E.1, to eliminate illicit discharges and connections to ~~its~~ the MS4;~~.~~

(b) If the Copermittee identifies the source as a controllable source of non-storm water or illicit discharge or connection, the Copermittee must implement its Enforcement Response Plan pursuant to Provision E.6 and enforce its legal authority to prohibit and eliminate illicit discharges and connections to its MS4;

(c) If the Copermittee identifies the source of the discharge as a category of non-storm water discharges in Provision E.2.a, and the discharge ~~to or from the MS4~~ is in exceedance of NALs in the Water Quality Improvement Plan ~~developed under Provision C.1~~, then the Copermittee~~s~~ must determine if: (1) this is an isolated incident or set of circumstances that will be addressed through its Enforcement Response Plan pursuant to Provision E.6, or ~~if~~ (2) the category of discharge must be addressed through the prohibition of that category of discharge as an illicit discharge pursuant to Provision E.2.a.(6);

(d) If the Copermittee suspects the source of the non-storm water discharge as natural in origin (i.e. non-anthropogenically influenced) and in conveyance into the MS4, then the Copermittee must ~~collect~~ document and provide the data and evidence necessary to demonstrate to the San Diego Water Board that it is natural in origin and does not require further investigation; and

(e) If the Copermittee is unable to identify and document the source of a recurring non-storm water discharge to or from the MS4, then the Copermittee must address the discharge as an illicit discharge and update its jurisdictional runoff management program to address the common and suspected sources of the non-storm water discharge within its jurisdiction in accordance with the Copermittee's priorities.

(4) Each Copermittee must submit a summary of the non-storm water discharges and illicit discharges and connections investigated and eliminated within its jurisdiction with each Annual Report required under Provision F.3.b of this Order.

e. STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the illicit discharge detection and elimination program to address non-storm water and illicit discharges and connections that the Copermittee has identified as potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, and/or increase/decrease frequency of inspections in specific areas), and

(2) The strategies and/or activities must be consistent with the requirements of Provisions E.2.a-d and the strategies identified in the Water Quality Improvement Plan.

3. Development Planning

Each Copermittee must use their land use~~/~~ and planning authorities to implement a development planning program ~~that~~ in accordance with the strategies identified in the Water Quality Improvement Plan and includes, at a minimum, the following requirements~~.~~:

a. ~~PERMANENT~~ BMP REQUIREMENTS FOR ALL DEVELOPMENT PROJECTS

Each Copermittee~~-~~ must prescribe the following BMP requirements during the planning process (i.e. prior to project approval and issuance of ~~grading or building~~ local permits) for all development projects (regardless of project type or size), where local permits are issued, including unpaved roads and flood management projects:

(1) General Requirements

(a) ~~All~~ Onsite BMPs must be located so as to remove pollutants from runoff prior to its discharge to any receiving waters, and as close to the source as possible; and

(b) Structural BMPs must not be constructed within a waters of the U.S. or waters of the state.

~~(b) Multiple development projects may use shared permanent BMPs as long as construction of any shared BMP is completed prior to the use or occupation of any development project from which the BMP will receive runoff; and~~

~~(c) Permanent BMPs must not be constructed within a waters of the U.S. or waters of the state.~~

(2) Source Control BMP Requirements

The following source control BMPs must be implemented at all development projects where applicable and feasible:

(a) Prevention of illicit discharges into the MS4;

(b) Storm drain system stenciling or signage;

(c) Properly designed outdoor material storage areas;

(d) Properly designed outdoor work areas;

(e) Properly designed trash storage areas; and

(f) Any additional BMPs necessary to minimize pollutant generation at each project.

(3) Low Impact Development (LID) BMP Requirements

The following LID BMPs must be implemented at all development projects where applicable and feasible:

(a) Maintenance or restoration of natural storage reservoirs and drainage corridors (including topographic depressions, areas of permeable soils, natural swales, and ephemeral and intermittent streams);[24]

(b) Buffer zones for natural water bodies (where buffer zones are technically infeasible, require project applicant to include other buffers such as trees, access restrictions, etc.);

(c) Conservation of natural areas within the project footprint including existing trees, other vegetation, and soils;

(d) Construction of streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided public safety is not compromised;

(e) Minimization of the impervious footprint of the project;

(f) Minimization of soil compaction to landscaped areas;

(g) Disconnection of impervious surfaces through distributed pervious areas;

(h) Landscaped or other pervious areas designed and constructed to effectively receive and infiltrate, retain and/or treat runoff from impervious areas, prior to discharging~~e~~ to the MS4;

(i) Small collection strategies located at, or as close as possible to, the source (i.e. the point where storm water initially meets the ground) to minimize the transport of runoff and pollutants to the MS4 and receiving waters;

(j) Use of permeable materials for projects with low traffic areas and appropriate soil conditions;

[24] Development projects proposing to dredge or fill materials in waters of the U.S. must obtain a CWA Section 401 Water Quality Certification. Projects proposing to dredge or fill waters of the State must obtain Waste Discharge Requirements.

(k) Landscaping with native or drought tolerant species; and

(l) Harvesting and using precipitation.

~~(4) Long-Term Permanent BMP Maintenance~~

~~Each Copermittee must require the project applicant to submit proof of the mechanism under which ongoing long-term maintenance of all permanent BMPs will be conducted.~~

~~(5) Infiltration and Groundwater Protection~~

~~(a) Infiltration and treatment control BMPs designed to primarily function as large, centralized infiltration devices (such as large infiltration trenches and infiltration basins) must not cause or contribute to an exceedance of an applicable groundwater quality objective. At a minimum, such infiltration and treatment control BMPs must be in conformance with the design criteria listed below, unless the development project applicant demonstrates to the Copermittee that one or more of the specific design criteria listed below are not necessary to protect groundwater quality. The design criteria listed below do not apply to small infiltration systems dispersed throughout a development project.~~

~~(i) Runoff must undergo pretreatment such as sedimentation or filtration prior to infiltration;~~

~~(ii) Pollution prevention and source control BMPs must be implemented at a level appropriate to protect groundwater quality at sites where infiltration treatment control BMPs are to be used;~~

~~(iii) Infiltration treatment control BMPs must be adequately maintained to remove pollutants in storm water to the MEP;~~

~~(iv) The vertical distance from the base of any infiltration treatment control BMP to the seasonal high groundwater mark must be at least 10 feet. Where groundwater basins do not support beneficial uses, this vertical distance criteria may be reduced, provided groundwater quality is maintained;~~

~~(v) The soil through which infiltration is to occur must have physical and chemical characteristics (e.g., appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses;~~

~~(vi) Infiltration treatment control BMPs must not be used for areas of industrial or light industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee,~~

~~unless first treated or filtered to remove pollutants prior to infiltration; and~~

~~(vii) Infiltration treatment control BMPs must be located a minimum of 100 feet horizontally from any water supply wells.~~

~~(b) The Copermittees may collectively or individually develop alternative mandatory design criteria to that listed above for infiltration and treatment control BMPs which are designed to primarily function as centralized infiltration devices. Before implementing the alternative design criteria in the development planning process the Copermitee(s) must:~~

~~(i) Notify the San Diego Water Board of the intent to implement the alternative design criteria submitted; and~~

~~(ii) Comply with any conditions set by the San Diego Water Board.~~

b. PRIORITY DEVELOPMENT PROJECTS

(1) Definition of Priority Development Project

Priority Development Projects include the following:

(a) All new development projects that fall under the Priority Development Project categories listed under Provision E.3.b.(2). Where a new development project feature, such as a parking lot, falls into a Priority Development Project category, the entire project footprint is subject to Priority Development Project requirements; and

(b) Those redevelopment projects that create, add, or replace at least 5,000 square feet of impervious surfaces on an already developed site, or the redevelopment project is a Priority Development Project category listed under Provision E.3.b.(2). Where redevelopment results in an increase of less than fifty percent of the impervious surfaces of a previously existing development, and the existing development was not subject to Priority Development Project requirements, the performance ~~and sizing~~ requirements ~~discussed in~~ of Provisions E.3.c.(1~~2~~) and E.3.c.(2~~3~~) apply only to the addition or replacement, and not to the entire development. Where redevelopment results in an increase of more than fifty percent of the impervious surfaces of a previously existing development, the performance ~~and sizing~~ requirements of Provisions E.3.c.(1) and E.3.c.(2) apply to the entire development.

(2) Priority Development Project Categories

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This

category includes commercial, industrial, residential, mixed-use, and public development projects on public or private land which fall under the planning and building authority of the Copermittee.

(b) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

(c) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812), where the land area for development is 5,000 square feet or more.

(d) Hillside development projects. This category includes any development which creates 5,000 square feet or more of impervious surface which is located in an area with known erosive soil conditions, where the development will grade on any natural slope that is twenty-five percent or greater.

(e) Environmentally sensitive areas (ESAs). This category includes any development located within, directly adjacent to, or discharging directly to an ESA, which either creates 2,500 square feet of impervious surface on a proposed project site or increases the area of imperviousness of a proposed project site to 10 percent or more of its naturally occurring condition. "Directly adjacent to" means situated within 200 feet of the ESA. "Discharging directly to" means outflow from a drainage conveyance system that collects runoff from the subject development or redevelopment site and terminates at or in receiving waters within the ESA.

(f) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce that has 5,000 square feet or more of impervious surface.

(g) Streets, roads, highways, freeways, and ~~residential~~ driveways. This category is defined as any paved impervious surface that is 5,000 square feet or more used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

(h) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

(i) Large development projects. This category includes any post-construction pollutant-generating new development projects that result in the disturbance of one acre or more of land.

(3) Priority Development Project Exemptions

Each Copermittee has the discretion to exempt the following projects from being defined as Priority Development Projects:

(a) New paved sidewalks, bicycle lanes, or trails that meet the following criteria:

(i) Designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas; OR

(ii) Designed and constructed to be hydraulically disconnected from paved streets or roads; OR

(iii) Designed and constructed with permeable pavements or surfaces in accordance with USEPA Green Streets guidance.[25]

(b) Retrofitting of existing paved alleys, streets or roads that meet the following criteria:

(i) Must be two lanes or less; AND

(ii) Must be a retrofitting project implemented as part of an alternative compliance project option under Provision E.3.c.(3)(b)(v) to achieve the performance requirements of Provisions E.3.c.(1) and/or E.3.c.(2) for a Priority Development Project; AND

(iii) Designed and constructed in accordance with the USEPA Green Streets guidance.[26]

(c) New single family residences that meet the following criteria:

(i) Must not be constructed as part of a larger development or proposed subdivision; AND

(ii) Designed and constructed to be certified under the U.S. Green Building Council (USGCB) Leadership in Energy and Environmental Design (LEED) for Homes green building certification program, receiving at least four (4) Surface Water Management credits under the Sustainable Sites category;[27] OR

[25] See "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).
[26] Ibid.
[27] See LEED for Homes rating system at http://www.usgbc.org

(iii) Designed and constructed with structural BMPs that will achieve the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite.

(d) Redevelopment of existing single family residences that meet the following criteria:

(i) Designed and constructed to be certified under the USGCB LEED for Homes green building certification program, receiving at least four (4) Surface Water Management credits under the Sustainable Sites category; [28] OR

(ii) Designed and constructed with structural BMPs that will achieve the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite.

~~(a) Sidewalks constructed as part of new streets or roads and designed to direct storm water runoff to adjacent vegetated areas;~~

~~(b) Bicycle lanes that are constructed as part of new streets or roads but are not hydraulically connected to the new streets or roads and designed to direct storm water runoff to adjacent vegetated areas;~~

~~(c) Impervious trails constructed and designed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas;~~

~~(d) Sidewalks, bicycle lanes, or trails constructed with permeable surfaces.~~

c. PRIORITY DEVELOPMENT PROJECT ~~PERMANENT~~ STRUCTURAL BMP PERFORMANCE ~~AND SIZING~~ REQUIREMENTS

In addition to the BMP requirements listed for all development projects under Provision E.3.a, Priority Development Projects must also implement ~~permanent~~ structural BMPs that conform to performance ~~and sizing~~ requirements below.

~~(1) Source Control BMP Requirements~~

~~Each Copermittee must require each Priority Development Project to implement applicable source control BMPs listed under Provision E.3.a.(2).~~

(1) Storm Water Pollutant ~~Retention and Treatment~~ Control BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite structural BMPs to control ~~retain and treat~~ storm water pollutants that may be discharged from a project as follows ~~onsite in the following order~~:

[28] See LEED for Homes rating system at http://www.usgbc.org

(a) Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite the pollutants contained in the design capture volume. The design capture volume is equivalent to:

(i) The volume of storm water produced from a 24-hour 85th percentile storm event;[29] OR

(ii) The volume of storm water that would be retained onsite if the site was fully undeveloped and naturally vegetated, as determined using continuous simulation modeling techniques based on site-specific soil conditions and typical native vegetative cover.

(b) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) to comply with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1)(a).

~~(a) Each Priority Development Project must be required to implement LID BMPs as described in Provision E.3.a.(3);~~

~~(b) Each Priority Development Project must be required to implement LID BMPs that are sized and designed to retain the volume equivalent to runoff produced from a 24-hour 85th percentile storm event[30] ("design capture volume");~~

(c) ~~If onsite retention using LID BMPs is technically infeasible per Provision E.3.c.(4), f~~Flow-thru ~~LID and/or~~ conventional treatment control BMPs must be implemented to treat the portion of the design capture volume that is not retained onsite. ~~Flow-thru LID treatment control BMPs must be designed for an appropriate surface loading rate to prevent erosion, scour and channeling within the BMP.~~ Additionally, project applicants must ~~perform mitigation~~ mitigate for the portion of the pollutant load in the

[29] This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals.

~~[30] This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals.~~

design capture volume that is not retained onsite~~, as described in~~ through one or more alternative compliance options under Provision E.3.c.(3)~~(4)(c)~~. Conventional treatment control BMPs must be sized and designed to:

~~(d) All onsite treatment control BMPs must:~~

(i) ~~Be correctly sized and designed so as to r~~Remove pollutants from storm water to the MEP;

(ii) ~~Be sized to comply with the following numeric sizing criteria:~~Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;

~~[a] Volume-based treatment control BMPs must be designed to mitigate (infiltrate, filter, or treat) the remaining portion of the design capture volume that was not retained onsite; or~~

~~[b] Flow-based treatment control BMPs must be designed to mitigate (filter or treat) either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event; or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two.~~

(iii) Be ranked with high or medium pollutant removal efficiency for the Priority Development ~~p~~Project's most significant pollutants of concern. Conventional ~~T~~treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of conventional treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

(2) Hydromodification Management BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite structural BMPs to manage hydromodification that may be caused by storm water runoff from a project as follows~~ management BMPs so that~~:

(a) Post-project runoff flow rates and durations ~~do~~ must not exceed pre-development (naturally occurring) runoff flow rates and durations by more than 10 percent (for the range of flows that result in increased potential for

erosion, or degraded ~~channel~~ instream habitat conditions downstream of Priority Development Projects).

(i) In evaluating the range of flows that results in increased potential for erosion of natural (non-hardened) channels, the lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks.

(ii) For artificially hardened channels, analysis to identify the lower boundary must use characteristics of a natural stream segment similar to that found in the watershed. The lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or erodes the toe of the channel banks.

(iii) The Copermittees may use monitoring results collected pursuant to Provision D.1.a.(2) ~~D.2.b.(6)~~ to re-define the range of flows resulting in increased potential for erosion, or degraded instream habitat conditions, as warranted by the data.

(b) Post-project runoff flow rates and durations must compensate for the loss of sediment supply due to the development project, should loss of sediment supply occur as a result of the development project.

(c) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) to comply with the performance requirements of Provisions E.3.c.(2)(a)-(b). ~~If hydromodification management BMPs are technically infeasible per Provision E.3.c.(4), project applicants must perform mitigation for the portion of the runoff volume that is not controlled and will cause or contribute to increased potential for erosion of receiving waters downstream of the Priority Development Project, as described in Provision E.3.c.(4)(c).~~

(d) Exemptions

Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provisions E.3.c.(2)(a)-(b) where the project:

(i) Discharges storm water runoff into existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;

(ii) Is a redevelopment Priority Development Project that meets the alternative compliance requirements of Provision E.3.c.(3)(b)(ii); ~~Discharges storm water runoff into conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to~~

~~water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;~~ or

(iii) Discharges storm water runoff into other areas identified by the San Diego Water Board as exempt from the requirements of Provisions E.3.c.(3)(a)-(b~~c~~).

(3) Alternative Compliance to Onsite Structural BMP Performance Requirements ~~for Technical Infeasibility~~

~~At the discretion of each Copermittee, alternative compliance may be allowed for certain Priority Development Projects to comply with Provisions E.3.c.(2) and E.3.c.(3), subject to the following requirements:~~

(a) Applicability

At the discretion of each Copermittee, Priority Development Projects may be allowed to utilize an alternative option ~~compliance if~~ to comply with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) under the following conditions:

(i) The Copermittee must determine that implementation of the alternative compliance option will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite;

(ii) The alternative compliance options must be designed by a registered professional engineer, geologist, architect, or landscape architect;

(iii) The alternative compliance options must be implemented within the same hydrologic unit as the Priority Development Project, and preferably within the same hydrologic subarea;

(iv) Receiving waters must not be utilized to convey storm water runoff to the alternative compliance options;

(v) The pollutants in storm water runoff from the Priority Development Project must be treated to the MEP by the alternative compliance options prior to being discharged to receiving waters;

(vi) Unless otherwise allowed by Provision E.3.c.(3)(b), the alternative compliance options must have a net result of at least the same level of pollutant removal as would have been achieved if the Priority Development Project had fully complied with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1) onsite;

(vii) Unless otherwise allowed by Provision E.3.c.(3)(b), the alternative compliance options must have a net result of at least the same level of protection from potential downstream and upstream erosion in the

receiving water as would have been achieved if the Priority Development Project had fully complied with the hydromodification management BMP performance requirements of Provision E.3.c.(2) onsite; and

(viii) The alternative compliance options utilized by the Priority Development Project to comply with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) must have reliable sources of funding for operation and maintenance.

~~(i) The Copermittee reviews and approves site-specific hydrologic and/or design analysis performed by a registered professional engineer, geologist, architect, or landscape architect;~~

~~(ii) The project applicant demonstrates, and the Copermittee determines and documents, that retention LID and/or hydromodification management BMPs per Provisions E.3.c.(2) and E.3.c.(3) were incorporated into the project design to the maximum extent technically feasible given the project site conditions;~~

~~(iii) The project applicant is required to perform mitigation described in Provision E.3.c.(4)(c) with a net result of at least the same level of water quality protection as would have been achieved if the Priority Development Project had fully implemented the retention LID and hydromodification management BMP requirements under Provisions E.3.c.(2) and E.3.c.(3) onsite.~~

(b) Alternative Compliance Project Options

The Copermittee may allow implementation of one or more of the following project options as part of an alternative approach to complying with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2):

(i) *Onsite LID Biofiltration Treatment Control BMPs*

The Copermittee may allow Priority Development Projects to utilize onsite LID biofiltration treatment control BMPs to comply with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1). Onsite LID biofiltration treatment control BMPs must be sized and designed to:

[a] Remove pollutants from storm water to the MEP; AND
[b] Have an appropriate surface loading rate to prevent erosion, scour and channeling within the BMP; AND
[c] Biofilter at least 1.5 times the design capture volume that is not reliably retained onsite; OR
[d] Biofilter up to the design capture volume that is not reliably retained onsite, AND 1) treat the remaining portion of the design

capture volume not retained onsite with conventional treatment control BMPs in accordance with Provision E.3.c.(1)(c), and 2) if necessary, mitigate for the portion of the pollutant load in the design capture volume not retained onsite through one or more alternative compliance project, in-lieu fee and/or water quality credit system options below.

(ii) *LEED Certified Redevelopment Projects*

The Copermittee may allow redevelopment Priority Development Projects to comply with the hydromodification management BMP performance requirements of Provision E.3.c.(2) where the project is designed and constructed to be certified under the USGCB LEED for New Construction and Major Renovations green building certification program. The Priority Development Project must receive at least one (1) Site Design credit and two (2) Stormwater Design credits under the Sustainable Sites category.[31] In addition, the existing and future configuration of the receiving water must not be unnaturally altered or adversely impacted by storm water flow rates and durations discharged from the site.

(iii) *Watershed-Based Planned Development Projects*

The Copermittee may allow Priority Development Projects greater than 100 acres in total project size (or smaller than 100 acres in size yet part of a larger common plan of development that is over 100 acres) to comply with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2). The Priority Development Project must comply with the following conditions:

[a] The Priority Development Project was planned utilizing watershed and/or subwatershed based water quality, hydrologic, and fluvial geomorphologic planning principles that implement regional LID BMPs in accordance with the performance and location criteria of this Order and acceptable to the San Diego Water Board;
[b] Regional LID BMPs may be used provided that the BMPs capture and retain the volume of runoff produced from the design capture volume defined in Provision E.3.c.(1)(a)(i) and that such controls are located upstream of receiving waters;
[c] Regional LID BMPs must clearly exhibit that they will not result in a net impact from pollutant loadings over and above the impact caused by capture and retention of the design capture volume;
[d] Any portion of the design capture volume that is not retained by the regional LID BMPs must be treated using biofiltration BMPs; and
[e] Where regional LID BMPs are demonstrated to the Copermittee as technically infeasible to retain the entire design capture

[31] See LEED for New Construction and Major Renovations rating system at http://www.usgbc.org

volume, any volume up to and including the design capture volume not retained by regional LID BMPs, nor treated by biofiltration BMPs, must be treated using conventional treatment control BMPs and the project applicant must implement additional alternative compliance project options, in-lieu fee and/or water quality credit system options below.

(iv) *Offsite Regional BMPs*

[a] The Copermittee may allow Priority Development Projects to utilize offsite regional BMPs to comply with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1) if the offsite regional BMPs have the capacity to receive and retain at least 1.1 times the design capture volume that is not reliably retained onsite.

[b] The Copermittee may allow Priority Development Projects to utilize offsite regional BMPs to comply with the hydromodification management BMP performance requirements of Provision E.3.c.(2) if the offsite regional BMPs have the capacity to manage the storm water flows rates and durations from the site such that the receiving waters are protected from the potential for increased erosion that would be caused if the unmanaged portion of the runoff was discharged from the site.

(v) *Offsite Retrofitting Projects*

The Copermittee may allow Priority Development Projects to utilize offsite retrofitting projects to comply with the storm water pollutant control and hydromodification management BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) if the retrofitting projects have been identified within the strategies included in the Water Quality Improvement Plan, or identified as potential retrofitting projects by the Copermittee pursuant to Provision E.5.

(vi) *Offsite Channel, Stream, or Habitat Rehabilitation Projects*

The Copermittee may allow Priority Development Projects to utilize offsite channel, stream, or habitat rehabilitation projects to comply with the hydromodification management BMP performance requirements of Provision E.3.c.(2) if the rehabilitation projects have been identified within the strategies included in the Water Quality Improvement Plan, or identified as potential channel rehabilitation projects by the Copermittee pursuant to Provision E.5. The channel, stream, or habitat rehabilitation project cannot be utilized for pollutant treatment except where artificial wetlands are constructed and located upstream of receiving waters.

(vii) *Offsite Regional Water Supply Augmentation Projects*

The Copermittee may allow Priority Development Projects to utilize offsite regional water supply augmentation projects (i.e. groundwater recharge, recycled water, storm water harvesting) to comply with the storm water pollutant control and hydromodification management BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) if the projects have been identified within the strategies included in the Water Quality Improvement Plan.

(viii) *Project Applicant Proposed Alternative Compliance Projects*

The Copermittee may allow one or more Priority Development Project applicant(s) to propose and implement alternative compliance projects to comply with the storm water pollutant control and hydromodification management BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) if the alternative compliance projects are consistent with, and will address the highest water quality priorities of the Water Quality Improvement Plan, and comply with the requirements of Provision E.3.c.(3)(a).

(c) Alternative Compliance In-Lieu Fee Option

The Copermittee may develop and implement an alternative compliance in-lieu fee option, individually or with other Copermittees and/or entities, as a means for designing, developing, constructing, operating and maintaining offsite alternative compliance projects under Provision E.3.c.(3)(b). Priority Development Projects allowed to utilize the alternative compliance in-lieu fee option must comply with the following conditions:

(i) The in-lieu fee must be transferred to the Copermittee (for public projects) or an escrow account (for private projects) prior to the date construction of the Priority Development Project is initiated.

(ii) If the in-lieu fee is applied to the development, design and construction of offsite alternative compliance projects, the following conditions must be met:

[a] The offsite alternative compliance projects must allow the Priority Development Project to comply with the onsite BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2);

[b] The offsite alternative compliance projects must be constructed as soon as possible, but no later than 4 years after the certificate of occupancy is granted for the first Priority Development Project that contributed funds toward the construction of the offsite alternative compliance projects, unless a longer period of time is authorized by the San Diego Water Board Executive Officer; and

[c] The in-lieu fee for the Priority Development Project must include mitigation of the pollutant loads and increased storm water flow rates and durations that are allowed to discharge from the site before the offsite alternative compliance projects are constructed.

[d] The in-lieu fee must also include the cost to operate and maintain the offsite alternative compliance projects.

(iii) If the in-lieu fee is applied to the operation and maintenance of offsite alternative compliance projects that have already been constructed, the offsite alternative compliance projects must allow the Priority Development Project to comply with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2).

(d) Alternative Compliance Water Quality Credit System Option

The Copermittee may develop and implement an alternative compliance water quality credit system option, individually or with other Copermittees and/or entities, provided that such a credit system clearly exhibits that it will not allow discharges from Priority Development Projects to cause or contribute to a net impact over and above the impact caused by projects meeting the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2). Any credit system that a Copermittee chooses to implement must be submitted to the San Diego Water Board Executive Officer for review and acceptance as part of the Water Quality Improvement Plan.

~~(b) Criteria For Technical Infeasibility~~

~~Each Copermittee must develop, or develop in collaboration with the other Copermittees, criteria to determine technical infeasibility for fully implementing the retention LID and hydromodification management BMP requirements under Provisions E.3.c.(2) and E.3.c.(3) and include these requirements in the Permanent BMP Sizing Criteria Design Manual pursuant to Provision E.3.d. Technical infeasibility may result from conditions including, but not limited to:~~

~~(i) Locations that cannot meet the infiltration and groundwater protection requirements in Provision E.3.a.(5) due to the presence of shallow bedrock, contaminated soils, near surface groundwater, underground facilities, or utilities;~~

~~(ii) Brownfield development sites or other locations where pollutant mobilization is a documented concern;~~

~~(iii) The design of the site precludes the use of soil amendments, plantings of vegetation, or other designs that can be used to infiltrate and evapotranspirate runoff;~~

~~(iv) Soils cannot be sufficiently amended to provide for the requisite infiltration rates;~~

~~(v) Locations with geotechnical hazards;~~

~~(vi) Insufficient onsite and/or offsite demand for storm water use;~~

~~(vii) Modifications to an existing building to manage storm water are not feasible due to structural or plumbing constraints; and~~

~~(viii) Smart growth and infill or redevelopment locations where the density and/or nature of the project would create significant difficulty for compliance with Provisions E.3.c.(2) and E.3.c.(3) onsite.~~

~~(c) Mitigation~~

~~Priority Development Projects that meet the Copermittee's technical infeasibility criteria developed pursuant to Provision E.3.c.(4)(b) must be required to mitigate for the increased flow rates, increased flow durations, and/or increased pollutant loads expected to be discharged from the site. For the pollutant load in the volume of storm water not retained onsite with retention LID BMPs, or increased potential erosion of downstream receiving waters not fully controlled onsite with hydromodification management BMPs, the Copermittee must require the project applicant to either 1) implement an offsite mitigation project, and/or 2) provide sufficient funding for a public or private offsite mitigation project via a mitigation fund.~~

~~(i) *Mitigation Project Locations*~~

~~Offsite mitigation projects must be implemented within the same hydrologic unit as the Priority Development Project, and preferably within the same hydrologic subarea. Mitigation projects outside of the hydrologic subarea but within the same hydrologic unit may be approved provided that the project applicant demonstrates that mitigation projects within the same hydrologic subarea are infeasible and that the mitigation project will address similar potential impacts expected from the Priority Development Project.~~

~~(ii) *Mitigation Project Types*~~

~~Offsite mitigation projects must include, where applicable and feasible, retrofitting opportunities and stream and/or habitat rehabilitation or restoration opportunities identified in the Water Quality Improvement Plans, identified pursuant to Provision B.3.a. Other offsite mitigation projects may include green streets or infrastructure projects, or regional BMPs upstream of receiving waters. In-stream rehabilitation or restoration measures to protect or prevent adverse physical changes to creek bed and banks must not include the use of non-naturally occurring hardscape material such~~

~~as concrete, riprap, or gabions. Project applicants seeking to utilize these alternative compliance provisions may propose other offsite mitigation projects, which the Copermittees may approve if they meet the requirements of Provision E.3.c.(4)(a).~~

~~(iii) *Mitigation Project Timing*~~

~~The Copermittee and/or project applicant must develop a schedule for the completion of offsite mitigation projects, including milestone dates to identify, fund, design, and construct the projects. Offsite mitigation projects must be completed upon the granting of occupancy for the first project that contributed funds toward the offsite mitigation project, unless a longer period is authorized by the San Diego Water Board.~~

~~(iv) *Mitigation Fund*~~

~~A Copermittee may choose to implement additional mitigation programs (e.g., pollutant credit system, mitigation fund) as a means for developing and implementing offsite mitigation projects, provided the projects conform to the requirements for project locations, types, and timing described above.~~

(4) Long-Term Structural BMP Maintenance

Each Copermittee must require the project applicant to submit proof of the mechanism under which ongoing long-term maintenance of all structural BMPs will be conducted.

(5) Infiltration and Groundwater Protection

(a) Structural BMPs designed to primarily function as large, centralized infiltration devices (such as large infiltration trenches and infiltration basins) must not cause or contribute to an exceedance of an applicable groundwater quality objective. At a minimum, such infiltration BMPs must be in conformance with the design criteria listed below, unless the development project applicant demonstrates to the Copermittee that one or more of the specific design criteria listed below are not necessary to protect groundwater quality. The design criteria listed below do not apply to small infiltration systems dispersed throughout a development project.

(i) Runoff must undergo pretreatment such as sedimentation or filtration prior to infiltration;

(ii) Pollution prevention and source control BMPs must be implemented at a level appropriate to protect groundwater quality at sites where infiltration BMPs are to be used;

(iii) Infiltration BMPs must be adequately maintained to remove pollutants in storm water to the MEP;

(iv) The vertical distance from the base of any infiltration BMP to the seasonal high groundwater mark must be at least 10 feet. Where groundwater basins do not support beneficial uses, this vertical distance criteria may be reduced, provided groundwater quality is maintained;

(v) The soil through which infiltration is to occur must have physical and chemical characteristics (e.g., appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses;

(vi) Infiltration BMPs must not be used for areas of industrial or light industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee, unless first treated or filtered to remove pollutants prior to infiltration; and

(vii) Infiltration BMPs must be located a minimum of 100 feet horizontally from any water supply wells.

(b) The Copermittee may develop, individually or with other Copermittees, alternative mandatory design criteria to that listed above for infiltration BMPs which are designed to primarily function as centralized infiltration devices. Before implementing the alternative design criteria in the development planning process the Copermitee(s) must:

(i) Notify the San Diego Water Board of the intent to implement the alternative design criteria submitted; and

(ii) Comply with any conditions set by the San Diego Water Board.

d. ~~UPDATE PERMANENT~~ BMP ~~SIZING CRITERIA~~ DESIGN MANUAL UPDATE ~~(BMP DESIGN MANUAL)~~

Each Copermittee must update its ~~Permanent~~ BMP ~~Sizing Criteria~~ Design Manual ~~(BMP Design Manual)~~[32] pursuant to Provision F.2.b ~~or Provision F.5.a~~. Until the Copermittee has updated its BMP Design Manual with the requirements of Provisions E.3.a-c, the Copermittee must continue implementing its current BMP Design Manual. Unless directed otherwise by the San Diego Water Board, the Copermittee must implement the BMP Design Manual within 180 days of completing the update. The update of the BMP Design Manual must include the following:

(1) Updated procedures to determine the nature and extent of storm water requirements applicable to a potential development or redevelopment project. These procedures must inform project applicants of the storm water management requirements applicable to their project including, but not limited

[32] The ~~Permanent~~ BMP ~~Sizing Criteria~~ Design Manual was formerly known as the Standard Storm Water Mitigation Plan under Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016.

to, general requirements for all development projects, ~~LID and conventional~~ structural BMP design procedures and requirements, hydromodification management requirements, requirements specific to phased projects, and procedures specific to private developments and public improvement projects;

(2) Updated procedures to identify pollutants and conditions of concern for selecting the most appropriate ~~permanent~~ structural BMPs that consider, at a minimum, the following:

(a) Receiving water quality (including pollutants for which receiving waters are listed as impaired under the CWA section 303(d) List);

(b) ~~Priority p~~Pollutants, stressors, and/or receiving water conditions that cause or contribute~~ing~~ to the highest priority water quality conditions ~~priorities~~ identified in the Water Quality Improvement Plan;

(c) Land use type of the project and pollutants associated with that land use type; and

(d) Pollutants expected to be present onsite.

(3) Updated procedures for designing ~~permanent~~ structural BMPs, including any updated performance ~~and sizing~~ requirements to be consistent with the requirements of Provision E.3.c for all structural BMPs listed in the BMP Design Manual;

(4) Long-term maintenance criteria for each structural BMP listed in the BMP Design Manual; and

(5) Alternative compliance ~~C~~criteria ~~and mitigation requirements~~, in accordance with the requirements under Provision E.3.c.(3~~4~~), if the Copermittee elects to allow ~~alternative compliance for technical infeasibility~~ Priority Development Projects within its jurisdiction to utilize alternative compliance.

e. PRIORITY DEVELOPMENT PROJECT BMP IMPLEMENTATION AND OVERSIGHT

Each Copermittee must implement a program that requires and confirms ~~to ensure permanent~~ structural BMPs on all Priority Development Projects are designed, constructed, and maintained to remove pollutants in storm water to the MEP.

(1) ~~Permanent~~ Structural BMP Approval and Verification Process

(a) Each Copermittee must ~~ensure~~ require and confirm that for all Priority Development Project applications that have not received prior lawful approval by the Copermittee by 18 ~~12~~ months after the ~~adoption of~~ commencement of coverage under this Order~~, or pursuant to Provision F.5.a~~, the requirements of Provision E.3 are implemented. For project

applications that have received prior lawful approval by 18 ~~12~~ months after the ~~adoption of~~ commencement of coverage under this Order~~, or pursuant to Provision F.5.a~~, the Copermittee may allow previous land development requirements to apply.

(b) Each Copermittee must identify the roles and responsibilities of various municipal departments in implementing the ~~permanent~~ structural BMP requirements, including each stage of a project from application review and approval through BMP maintenance and inspections.

(c) Each Copermittee must ~~ensure~~ require and confirm that appropriate easements and ownerships are properly recorded in public records and the information is conveyed to all appropriate parties when there is a change in project or site ownership.

(d) Each Copermittee must ~~ensure~~ require and confirm that prior to occupancy and/or intended use of any portion of the Priority Development Project, each ~~permanent~~ structural BMP ~~must be~~ is inspected to verify that ~~they have~~ it has been constructed and ~~are~~ is operating in compliance with all of its specifications, plans, permits, ordinances, and the requirements of this Order.

(2) Priority Development Project Inventory and Prioritization

(a) Each Copermittee must develop and ~~continuously~~ annually maintain a watershed-based database to track and inventory all Priority Development Projects and associated ~~permanent~~ structural BMPs within its jurisdiction. Inventories must be accurate and complete beginning from January 2002 for the San Diego County Copermittees, February 2003 for the Orange County Copermittees, and July 2005 for the Riverside County Copermittees. The use of an automated database system, such as GIS, is highly recommended. The database must include, at a minimum, the following information:

(i) Priority Development Project location (address and hydrologic subarea);

(ii) Descriptions of structural BMP type(s);

(iii) Date(s) of construction;

(iv) Party responsible for ~~permanent~~ structural BMP maintenance;

(v) Dates and findings of ~~permanent~~ structural BMP maintenance verifications; and

(vi) Corrective actions and/or resolutions.

(b) Each Copermittee must prioritize the Priority Development Projects with ~~permanent~~ structural BMPs within its jurisdiction. The designation of Priority Development Projects as high priority must consider the following:

(i) The highest water quality priorities identified in the Water Quality Improvement Plan;

(ii) Receiving water quality;

(iii) Number and sizes of ~~permanent~~ structural BMPs;

(iv) Recommended maintenance frequency of ~~permanent~~ structural BMPs;

(v) Likelihood of operation and maintenance issues of ~~permanent~~ structural BMPs;

(vi) Land use and expected pollutants generated; and

(vii) Compliance record.

(3) ~~Permanent~~ Structural BMP Maintenance Verifications and Inspections

Each Copermittee is required to verify that ~~permanent~~ structural BMPs on each Priority Development Project are adequately maintained, and continue to operate effectively to remove pollutants in storm water to the MEP through inspections, self-certifications, surveys, or other equally effective approaches.

(a) All (100 percent) of the ~~permanent~~ structural BMPs at Priority Development Projects that are designated as high priority must be inspected directly by the Copermittee annually prior to each rainy season;

(b) For verifications performed through a means other than direct Copermittee inspection, adequate documentation must be required by the Copermittee to provide assurance that the required maintenance of ~~permanent~~ structural BMPs at each Priority Development Project has been completed; and

(c) Appropriate follow-up measures (including re-inspections, enforcement, etc.) must be conducted to ensure that ~~permanent~~ structural BMPs at each Priority Development Project continue to reduce pollutants in storm water to the MEP as originally designed.

f. DEVELOPMENT PROJECT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all development projects, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

g. STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the development planning program to address development and redevelopment projects that may become sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, increase frequency of verifications and/or inspections, alternative compliance options);

(2) Each Copermittee must identify areas within its jurisdiction where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting and/or stream, channel, or habitat rehabilitation projects;

(3) Each Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify regional alternative compliance projects that Priority Development Projects may be allowed or should be encouraged to implement or participate in implementing; and

(4) The strategies and/or activities must be consistent with the requirements of Provisions E.3.a-c and E.3.e-f and the strategies identified in the Water Quality Improvement Plan.

4. Construction Management

Each Copermittee must implement a construction management program ~~that~~ in accordance with the strategies identified in the Water Quality Improvement Plan and includes, at a minimum, the following requirements:

a. PROJECT APPROVAL PROCESS

Prior to ~~approval and~~ issuance of any local permit(s) that allows the commencement of construction projects that involve ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff, ~~grading, or building permits for a project~~ each Copermittee must:

(1) Require a ~~project~~site-specific pollution control ~~storm water pollution prevention plan (SWPPP)~~, ~~or equivalent~~ construction BMP, and/or erosion and sediment control plan, to be submitted by the project applicant ~~for~~ to the Copermittee~~'s approval~~;

(2) ~~Ensure~~ Confirm the pollution control ~~SWPPP~~, ~~or equivalent~~ construction BMP, and/or erosion and sediment control plan, complies with the local grading

ordinance, other applicable local ordinances, and the requirements of this Order;

(3) ~~Ensure~~ Confirm the pollution control ~~SWPPP~~, ~~or equivalent~~ construction BMP, and/or erosion and sediment control plan, includes seasonally appropriate and effective BMPs and management measures described in Provision E.4.c~~bc~~, as applicable to the project; and

(4) Verify that the project applicant has obtained coverage under applicable permits, including, but not limited to the Construction General Permit, Clean Water Act Section 401 Water Quality Certification and Section 404 Permit, and California Department of Fish and Game Streambed Alteration Agreement.

b. CONSTRUCTION SITE INVENTORY AND TRACKING

(1) Each Copermittee must maintain~~,~~ and update at least monthly, a watershed-based inventory of all construction projects issued a local permit that allows ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff ~~sites requiring construction, grading, or building permits within its jurisdiction~~. The use of an automated database system, such as GIS, is highly recommended. The inventory must include:

(a) Relevant contact information for each site (e.g., name, address, phone, and email for the owner and contractor);

(b) The basic site information including location (address and hydrologic subarea), Waste Discharge Identification (WDID) number (if applicable), size of the site, and approximate area of disturbance;

(c) Whether or not the site is considered a high threat to water quality, as defined in Provision E.4.b.(2) below;

(d) The project start and anticipated completion dates;

(e) Current construction phase;

(f) The required inspection frequency, as defined in the Copermittee's jurisdictional runoff management program document;

(g) The date the Copermittee accepted and/or approved the ~~project~~site-specific pollution control ~~SWPPP~~, ~~or equivalent~~ construction BMP, and/or erosion and sediment control plan; and

(h) Whether or not there are ongoing enforcement actions administered to the site.

(2) Each Copermittee must identify all construction sites within its jurisdiction that represent a high threat to downstream surface water quality. The designation of construction sites as high threat to water quality must consider the following~~At a minimum, high threat to water quality sites must include~~:

(a) Sites located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions ~~priorities~~ identified in the Water Quality Improvement Plan;

(b) Sites located within the same hydrologic subarea and tributary to a ~~CWA section 303(d)~~ water body segment listed as impaired for sediment on the CWA section 303(d) List;

(c) Sites located within, directly adjacent to, or discharging directly to a receiving water within an ESA; and

(d) Other sites determined by the Copermittees or the San Diego Water Board as a high threat to water quality.

c. CONSTRUCTION SITE BMP ~~AND MANAGEMENT MEASURE~~ IMPLEMENTATION

Each Copermittee must implement, or require the implementation of effective BMPs to reduce discharges of pollutants in storm water from construction sites to the MEP, and prevent non-storm water discharges into the MS4. These BMPs must be site specific, seasonally appropriate, and construction phase appropriate. BMPs ~~and management measures~~ must be implemented at each construction site year round. Dry season BMP implementation must plan for and address unseasonal rain events that may occur during the dry season (May 1 through September 30). Copermittees must implement, or require the implementation of, BMPs ~~and management measures~~ in the following categories:

(1) Project Planning;

(2) Good Site Management “Housekeeping”, including waste management;

(3) Non-storm Water Management;

(4) Erosion Control;

(5) Sediment Control;

(6) Run-on and Run-off Control; and

(7) Active/Passive Sediment Treatment Systems, where applicable.

d. CONSTRUCTION SITE INSPECTIONS

Each Copermittee must conduct construction site inspections to ~~ensure~~ require and confirm compliance with its local permits and applicable local ordinances, and the requirements of this Order. Priority for site inspections must consider threat to water quality pursuant to Provision E.4.b as well as the nature of the construction activity, topography, and the characteristics of soils and receiving water quality.

(1) Inspection Frequency

(a) Each Copermittee must conduct inspections at all inventoried sites, including high threat to water quality sites, at an appropriate frequency for each phase of construction to ensure the site reduces the discharge of pollutants in storm water from construction sites to the MEP, and prevents non-storm water discharges from entering the MS4.

(b) Each Copermittee must establish appropriate inspection frequencies for high threat to water quality sites, and all other sites, for each phase of construction. Inspection frequencies appropriate for addressing the highest water quality priorities identified in the Water Quality Improvement Plan, and for complying with the requirements of this Order must be identified in each Copermittee's jurisdictional runoff management program document.

(c) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e., re-inspection, enforcement) necessary to ~~ensure~~ require and confirm site compliance with its local permits and applicable local ordinances, and the requirements of this Order.

(2) Inspection Content

Inspections of construction sites by the Copermittee must include, at a minimum:

(a) Verification of coverage under the Construction General Permit (Notice of Intent (NOI) and/or WDID number) during initial inspections, when applicable;

(b) Assessment of compliance with its local permits and applicable local ordinances related to pollution prevention, including the implementation and maintenance of applicable BMPs;

(c) Assessment of BMP adequacy and effectiveness;

(d) Visual observations of actual non-storm water discharges;

(e) Visual observations of actual or potential discharge of sediment and/or construction related materials from the site;

(f) Visual observations of actual or potential illicit connections; and

(g) If any violations are found and BMP ~~enhancements~~ corrections are needed, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried construction sites. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Site name, location (address and hydrologic subarea), and WDID number (if applicable);

(b) Inspection date;

~~(c) Weather conditions during inspection;~~

(c) Approximate amount of rainfall since last inspection;

(d) Description ~~and photo documentation~~ of problems observed with BMPs and indication of need for BMP addition/repair/replacement and any scheduled re-inspection, and date of re-inspection;

(e) Descriptions of any other specific inspection comments which must, at a minimum, include rationales for longer compliance time;

(f) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(g) Resolution of problems noted and date problems fixed.

e. CONSTRUCTION SITE ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried construction sites, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

f. STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the construction management program to address construction sites that the Copermittee has identified as potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, and/or increase/decrease frequency of inspections for specific types of sites and/or activities), and

(2) The strategies and/or activities must be consistent with the requirements of Provisions E.4.c-e and the strategies identified in the Water Quality Improvement Plan.

5. Existing Development Management

Each Copermittee must implement an existing development management program ~~that~~ in accordance with the strategies identified in the Water Quality Improvement Plan and includes, at a minimum, the following requirements:

a. EXISTING DEVELOPMENT INVENTORY AND TRACKING

Each Copermittee must maintain an annually updated watershed-based inventory of ~~all its~~ the existing development within its jurisdiction that may ~~potentially generate~~ discharge a pollutant load to and from the MS4. The use of an automated database system, such as GIS, is highly recommended. The inventory must, at a minimum, include:

(1) Name, location (~~address and~~ hydrological subarea and address, if applicable) ~~of each facility, area, and/or activity~~ of the following types of existing development with its jurisdiction:~~;~~

(a) Commercial facilities or areas,

(b) Industrial facilities,

(c) Municipal facilities, including:

(i) MS4 and related structures,[33]

(ii) Roads, streets, and highways,

[33] The inventory may refer to the MS4 map required to be maintained pursuant to Provision E.2.b.(1).

(iii) Parking facilities,

(iv) Municipal airfields,

(v) Parks and recreation facilities,

(vi) Flood management and flood control devices and structures,

(vii) Operating or closed municipal landfills,

(viii) Publicly owned treatment works (including water and wastewater treatment plants) and sanitary sewer collection systems,

(ix) Corporate yards, including maintenance and storage yards for materials, waste, equipment, and vehicles,

(x) Hazardous waste collection facilities,

(xi) Other treatment, storage or disposal facilities for municipal waste, and

(xii) Other municipal facilities that the Copermittee determines may contribute a significant pollutant load to the MS4; and

(d) Residential areas, which may be designated by one or more of the following:

(i) Residential management area,

(ii) Drainage basin or area,

(iii) Land use (e.g., single family, multi-family, rural),

(iv) Neighborhood,

(v) Common Interest Area,

(vi) Home Owner Association,

(vii) Mobile home park, and/or

(viii) Other designations accepted by the San Diego Water Board Executive Officer.

(2) A description of the facility~~,~~ or area~~, and/or activity~~, including the following information:

(a) ~~c~~Classification as ~~municipal,~~ commercial, industrial, municipal, or residential,~~;~~

(b) Status of facility or area as active or inactive,

(c) Identification if a business is a mobile business,

(d) SIC Code or NAICS Code, if applicable,

(e) Industrial General Permit NOI and/or WDID number, if applicable,

(f) Identification if a residential area is or includes a Common Interest Area / Home Owner Association, or mobile home park,

(g) Identification of pollutants generated and potentially generated by the facility or area,

(h) Whether the facility or area is adjacent to an ESA,

(i) Whether the facility or area is tributary to and within the same hydrologic subarea as a water body segment listed as impaired on the CWA section 303(d) List and generates pollutants for which the water body segment is impaired, and

(j) Whether the facility or area contributes or potentially contributes to the highest priority water quality conditions ~~priorities~~ identified in the Water Quality Improvement Plan.~~; and~~

(3) An ~~regularly~~ annually updated map showing the location of inventoried existing development, watershed boundaries, and water bodies.

~~(2) The following municipal facilities:~~

~~(a) Flood management and flood control devices and structures,~~

~~(b) Operating or closed municipal landfills,~~

~~(c) Publicly owned treatment works (including water and wastewater treatment plants) and sanitary sewer collection systems,~~

~~(d) Corporate yards, including maintenance and storage yards for materials, waste, equipment, and vehicles,~~

~~(e) Hazardous waste collection facilities, and~~

~~(f) Other treatment, storage or disposal facilities for municipal waste;~~

~~(3) Identification if a business is a mobile business;~~

~~(4) SIC Code, if applicable;~~

~~(5) Industrial General Permit NOI and/or WDID number, if applicable;~~

~~(6) Identification if an area is a Common Interest Area (CIA) / Home Owner Association (HOA), or mobile home park;~~

~~(7) Identification of pollutants generated and potentially generated by the facility, area, and/or activity;~~

~~(8) Status of facility, area, and/or activity as active or inactive;~~

~~(9) Whether the facility, area, and/or activity is adjacent to an ESA;~~

~~(10) Whether the facility, area, and/or activity is tributary to and within the same hydrologic subarea as a CWA section 303(d) water body segment and generates pollutants for which the water body segment is impaired;~~

~~(11) Whether the facility, area, and/or activity contributes or potentially contributes to the highest water quality priorities identified in the Water Quality Improvement Plan; and~~

~~(12) A continually updated map showing the location of inventoried existing development, watershed boundaries, water bodies, and pollutants generated at the inventoried existing development.~~

~~**b. RETROFITTING AND CHANNEL REHABILITATION IN AREAS OF EXISTING DEVELOPMENT**~~

~~Each Copermittee must develop and implement a program to retrofit areas of existing development to reduce the discharge of pollutants in storm water from the MS4 to the MEP and effectively prohibit non-storm water discharges into its MS4, and rehabilitate channels to restore impaired beneficial uses of streams within its jurisdiction.~~

~~(1) Each Copermittee must identify areas of existing development as candidates for retrofitting, and channels in areas of existing development as candidates for rehabilitation within its jurisdiction. Areas of existing development must be selected based on a likelihood that retrofitting and channel rehabilitation will address the highest water quality priorities identified in the Water Quality Improvement Plan prepared pursuant to Provision B.~~

~~(2) Each Copermittee must evaluate and rank the areas of existing development identified pursuant to Provisions E.5.a and E.5.b.(1) for retrofitting and channel rehabilitation. The evaluation must include an assessment of those areas where pollutant removal from storm water and effective prohibition of non-storm water discharges through retrofitting existing development will provide the most benefit to water quality. The evaluation must also include an assessment of the channels within its jurisdiction where channel rehabilitation will improve beneficial uses of streams within the Copermittee's jurisdiction. Data collected during the implementation of the Water Quality Improvement Plan must be used to inform each area assessment and rank determination.~~

~~(3) Each Copermittee must implement retrofit and channel rehabilitation projects that address the highest water quality priorities identified in the Water Quality Improvement Plan pursuant to Provision B.3.a. The Copermittee must encourage private landowners to implement retrofit and channel rehabilitation projects whenever practical. Private landowners should be encouraged through the Copermittee's use of subsidies, penalties, or other incentives.~~

~~(4) Each Copermittee must evaluate the flood management and flood control devices and structures in its inventory to determine if it is feasible to retrofit the device or structure, to provide additional pollutant removal from storm water. A Copermittee must consider the highest water quality priorities identified in their Water Quality Improvement Plan as part of each assessment.~~

~~(5) Where retrofitting and channel rehabilitation within specific areas of existing development are determined to be infeasible to restore and protect receiving waters from the highest water quality priorities identified in the Water Quality Improvement Plan, each Copermittee must identify, develop, and implement regional retrofitting and channel rehabilitation projects (i.e. projects that can receive and/or treat storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment) adjacent to and/or downstream of the areas of existing development. The Copermittees may collaborate and cooperate with each other to develop regional retrofitting and channel rehabilitation projects. The Copermittees are also encouraged to partner with existing efforts in other Watershed Management Areas, and the Integrated Regional Water Management (IRWM) Groups in San Diego County, South Orange County, and Southwest Riverside County.~~

b. EXISTING DEVELOPMENT BMP IMPLEMENTATION AND MAINTENANCE

Each Copermittee must designate a minimum set of BMPs required for all inventoried existing development, including special event venues. The designated minimum BMPs must be specific to facility or area types and pollutant generating activities, as appropriate.

(1) Commercial, Industrial, and Municipal Facilities and Areas

~~(1)~~

(a) Pollution Prevention

Each Copermittee must require the use of pollution prevention methods by the commercial, industrial, and municipal facilities and areas in its inventoried existing development.

~~(2) Designate BMPs~~

~~Each Copermittee must designate a minimum set of BMPs required for all inventoried existing development, including special event venues, that have the potential to generate pollutants. The designated minimum BMPs must be specific to facility types and pollutant-generating activities, as appropriate.~~

~~(3)~~

(b) BMP Implementation

Each Copermittee must implement, or require the implementation of, designated BMPs at commercial, industrial, and municipal facilities and areas in its inventoried existing development~~that have the potential to generate pollutants. A Copermittee must require additional pollution prevention measures and enhanced BMPs at inventoried existing development that discharges pollutants identified as contributing to the highest water quality priorities in the Water Quality Improvement Plan~~.

~~(4)~~

(c) BMP Operation and Maintenance

(i) Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at ~~all~~ commercial, industrial, and municipal facilities and areas in its inventoried existing development.

~~(a)~~

(ii) Each Copermittee must implement a schedule of operation and maintenance activities for its MS4 and related structures (including but not limited to catch basins, storm drain inlets, detention basins, etc.), and verify proper operation of all its municipal structural treatment controls designed to reduce pollutants (including floatables) in storm water discharges to or from its MS4s and related drainage structures. Operation and maintenance activities may include, but is not limited to, the following:

[a] Inspections of the MS4 and related structures;
[b] Cleaning of the MS4 and related structures; and
[c] Proper disposal of materials removed from cleaning of the MS4 and related structures.

~~(b)~~

(iii) Each Copermittee must implement ~~procedures during the~~ a schedule of operation and maintenance ~~of~~ for public streets, unpaved roads, paved roads, and paved highways and freeways within its jurisdiction to minimize pollutants that can be discharged in storm water.~~that will reduce the contribution of storm water pollutants to the MEP and effectively prohibit non-storm water pollutants from the MS4 to receiving water bodies. During maintenance of unpaved roads, each Copermittee must examine the feasibility of replacing existing~~

~~culverts or designing new culverts/bridge crossings to maintain natural stream geomorphology.~~

~~(c)~~

(iv) Each Copermittee must implement controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers. Copermittees that operate both a municipal sanitary sewer system and a MS4 must implement controls and measures to prevent and eliminate seeping sewage from infiltrating the MS4. Copermittees that do not operate both a municipal sanitary sewer system and a MS4 must coordinate with sewering agencies to keep themselves informed of relevant and appropriate maintenance activities and sanitary sewage projects in their jurisdiction that may cause or contribute to seepage of sewage into the MS4.

~~(5)~~

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must implement BMPs ~~procedures~~, or require the implementation of BMPs ~~procedures~~, to reduce ~~the contribution of~~ pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from commercial, industrial, and municipal facilities and areas in its inventoried existing development ~~into and from the MS4s~~. ~~The Copermittee must require additional pollution prevention measures and enhanced BMPs at inventoried existing development that discharges pesticides, herbicides, or fertilizers identified as contributing to the highest water quality priorities in the Water Quality Improvement Plan.~~ Such BMPs must include, as appropriate, educational activities, permits, certifications and other measures for applicators and distributors.

(2) Residential Areas

(a) Pollution Prevention

Each Copermittee must promote and encourage the use of pollution prevention methods, where appropriate, by the residential areas in its inventoried existing development.

(b) BMP Implementation

Each Copermittee must promote and encourage the implementation of designated BMPs at residential areas in its inventoried existing development.

(c) BMP Operation and Maintenance

Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at residential areas in its inventoried existing development.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must promote and encourage the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from residential areas in its inventoried existing development.

c. EXISTING DEVELOPMENT INSPECTIONS

Each Copermittee must conduct inspections of inventoried existing development to ensure compliance with applicable local ordinances and permits, and the requirements of this Order.

(1) Inspection Frequency

(a) Each Copermittee must establish appropriate inspection frequencies for inventoried existing development ~~based on the priorities set forth in the Water Quality Improvement Plan, and the potential for discharging pollutants via storm water and non-storm water runoff.~~ in accordance with the following requirements:

(i) At a minimum, inventoried existing development must be inspected once every five years~~. Inventoried existing development must also be inspected within six months of any change in property ownership or change in pollutant generating activity.~~ utilizing one or more of the following methods:

[a] Drive-by inspections by Copermittee municipal and contract staff,
[b] Onsite inspections by Copermittee municipal and contract staff, and/or
[c] Onsite inspections by volunteer monitoring or patrol programs trained by the Copermittee;

(ii) The frequency of inspection ~~at inventoried existing development~~ must be appropriate to ~~ensure~~ confirm that ~~applied~~ BMPs ~~are sufficient to~~ are being implemented to reduce the discharge of pollutants in storm water from the MS4 to the MEP and effectively prohibit non-storm water discharges to the MS4;~~.~~

(iii) The frequency of inspection must be based on the potential for a facility or area to discharge non-storm water and pollutants in storm

water, and should reflect the priorities set forth in the Water Quality Improvement Plan;

(iv) Each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial, industrial, and municipal facilities and areas in its inventoried existing development;[34] and

(v) Inventoried existing development must be inspected by the Copermittee, as needed, in response to valid public complaints and findings from the Copermittee's municipal and contract staff or volunteer monitoring or patrol program inspections.

~~(a) Inventoried existing development must be inspected, as needed, in response to valid public complaints and findings from the Copermittee's municipal and contract staff inspections.~~

(b) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e. education and outreach, re-inspection, enforcement) necessary to ~~ensure~~ require and confirm compliance with its applicable local ordinances and permits~~, the most current jurisdictional runoff management program document, the Water Quality Improvement Plan,~~ and the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

(2) Inspection Content

(a) Inspections of existing development by the Copermittee or volunteer monitoring or patrol programs must include, at a minimum:

(i) Visual inspections for actual non-storm water discharges,

(ii) Visual inspections for actual or potential discharge of pollutants,

(iii) Visual inspections for actual or potential illicit connections, and

(iv) Verification that the description of the facility or area in the inventory, required pursuant to Provision E.5.a.(2), has not changed.

(b) Onsite inspections of existing development by the Copermittee must include, at a minimum:

~~(a)~~

(i) Assessment of compliance with its applicable local ordinances and permits related to non-storm water and storm water discharges and runoff;

[34] If any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspection may count toward the total annual inspection requirement. This requirement excludes linear municipal facilities (i.e., MS4, streets, roads and highways).

~~(b)~~

(ii) Assessment of the implementation~~, maintenance and effectiveness~~ of the designated ~~minimum and/or enhanced~~ BMPs;

~~(c)~~

(iii) Verification of coverage under the Industrial General Permit ~~(NOI and/or WDID number)~~, when applicable;

~~(d) Visual observations of actual non-storm water discharges;~~

~~(e) Visual observations of actual or potential discharge of pollutants;~~

~~(f) Visual observations of actual or potential illicit connections; and~~

~~(g)~~

(iv) If any problems or violations are found ~~and BMP enhancements are needed~~, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried existing development. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. ~~Inspection records must be sufficiently detailed in order to determine compliance with the requirements of this Order and any progress made towards addressing the highest water quality priorities identified in the Water Quality Improvement Plan.~~ Inspection records must include, at a minimum:

(a) ~~Existing development n~~Name and location of facility or area (address and hydrologic subarea) consistent with the inventory name and location, pursuant to Provision E.5.a.(1);

(b) Inspection and re-inspection date(s);

(c) Inspection method(s) (i.e. drive-by, onsite)~~Weather conditions during inspection~~;

(d) Observations and findings from the inspection(s);

(e) For onsite inspections of existing development by Copermittee municipal or contract staff, the records must also include, as applicable:

~~(d) Description and photo documentation of problems observed with BMPs and indication of need for BMP addition/repair/replacement and any scheduled re-inspection, and date of re-inspection;~~

~~(e) Description of actions to reduce pollutants in storm water runoff to the MEP and actions to effectively prohibit non-storm discharges into the MS4 at the inventoried existing development;~~

~~(f) Photo documentation of observed actions or BMPs to reduce pollutants in storm water runoff to the MEP and actions to effectively prohibit non-storm discharges into the storm drain;~~

~~(g) If the facility, area, and/or activity has been designated or identified as a contributor to the highest water quality priorities identified in the Water Quality Improvement Plan, then the inspection report must include a description of any specific or additional actions taken to reduce or eliminate the contribution of the facility, area, and/or activity to the highest water quality priorities;~~

~~(h) Descriptions of any other specific inspection comments which must, at a minimum, include rationales for longer compliance time;~~

(i) Description of any problems or violations found during the inspection(s),

~~(i)~~

(ii) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6,~~;~~ and

~~(j)~~

(iii) ~~Resolution of problems noted and~~ The date problems or violations were ~~fixed~~ resolved.

d. EXISTING DEVELOPMENT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried existing development, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

e. STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Each Copermittee must implement the water quality improvement strategies, where necessary, to address areas of existing development within its jurisdiction that are identified as sources of pollutants and/or stressors contributing to the highest priority water quality conditions in the Watershed Management Area. For the existing development management program, the following strategies must be implemented:

(1) Specific Existing Development Management Program Strategies

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented within its jurisdiction to address areas of existing development that the Copermittee has identified as sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(a) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, and/or increase/decrease frequency of inspections for specific types of facilities, areas and/or activities),

(b) The facilities and/or areas within the Copermittee's jurisdiction where the strategies and/or activities will be implemented; and

(c) The strategies and/or activities must be consistent with the requirements of Provisions E.5.b-d and the strategies identified in the Water Quality Improvement Plan.

(2) Retrofitting Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to retrofit areas of existing development within its jurisdiction to address identified sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify areas of existing development as candidates for retrofitting, focusing on areas where retrofitting will address pollutants and/or stressors that contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for retrofitting projects may be utilized to reduce pollutants that may be discharged in storm water from areas of existing development, and/or address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of retrofitting projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to

implement or contribute toward the implementation of alternative compliance retrofitting projects; and

(e) Where retrofitting projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional retrofitting projects (i.e. projects that can receive and/or treat storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment) adjacent to and/or downstream of the areas of existing development.

(3) Stream, Channel and/or Habitat Rehabilitation in Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to rehabilitate streams, channels, and/or habitats in areas of existing development within its jurisdiction to address the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify streams, channels, and/or habitats in areas of existing development as candidates for rehabilitation, focusing on areas where stream, channel, and/or habitat rehabilitation projects will address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for stream, channel, and/or habitat rehabilitation projects may be utilized to address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters, rehabilitate channelized or hydromodified streams, restore wetland and riparian habitat, restore watershed functions, and/or restore beneficial uses of receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of stream, channel, and/or habitat rehabilitation projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance stream, channel, and/or habitat rehabilitation projects projects; and

(e) Where stream, channel, and/or habitat rehabilitation projects within specific areas of existing development are determined to be infeasible to

address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional stream, channel, and/or habitat rehabilitation projects (i.e. projects that can receive storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment).

6. Enforcement Response Plans

Each Copermittee must develop and implement an Enforcement Response Plan ~~-~~as part of its jurisdictional runoff management program document. The Enforcement Response Plan must describe the applicable approaches and options to enforce its legal authority established pursuant to Provision E.1, as necessary, to achieve compliance with the requirements of this Order~~ include the protocols for progressively stricter responses, including timeframes allowed for corrections of problems, and for various field violation scenarios~~. The Enforcement Response Plan must include~~, at a minimum,~~ the following~~ requirements~~:

~~a. ILLICIT DISCHARGE DETECTION AND ELIMINATION ENFORCEMENT COMPONENT~~

a. ENFORCEMENT RESPONSE PLAN COMPONENTS

The Enforcement Response Plan must include the following individual components:

(1) Illicit Discharge Detection and Elimination Enforcement Component;

(2) Development Planning Enforcement Component;

(3) Construction Management Enforcement Component; and

(4) Existing Development Enforcement Component.

~~The Enforcement Response Plan must describe required enforcement actions to eliminate non-storm water discharges and illicit discharges or connections to the Copermittee's MS4.~~

~~(1) The Enforcement Response Plan must include a definition of "high level enforcement" for non-storm water discharges and illicit discharges or connections. "High level enforcement" for non-storm water discharges and illicit discharges or connections may be defined differently for construction sites, municipal, commercial, industrial, and residential areas of existing development.~~

~~(2) Non-storm water discharges and illicit discharges or connections must be addressed with an escalating series of enforcement actions as follows:~~

~~(a) If the non-storm water discharge and illicit discharge or connection is a source of pollutants contributing to the highest water quality priorities identified in the Water Quality Improvement Plan, then high level enforcement actions must be immediately issued, and subsequent high level enforcement actions must continue to escalate, as necessary, to compel the elimination of the discharge or connection as soon as possible; or~~

~~(b) If the non-storm water discharge and illicit discharge or connection is not a source of pollutants contributing to the highest water quality priorities identified in the Water Quality Improvement Plan, then escalating enforcement actions must be issued, and enforcement actions must result in the elimination of the discharge or connection as quickly as the Copermittee's available resources allow.~~

~~(3) If the Copermittee identifies the source, and the source is a controllable non-storm water discharge (i.e. anthropogenically influenced) or a controllable illicit discharge or connection, then the Copermittee must implement the following:~~

~~(a) Immediately enforce its legal authority to eliminate controllable sources of non-storm water and illicit discharges or connections upon identifying the source; and~~

~~(b) For controllable sources of non-storm water discharges and illicit discharges or connections that cannot be eliminated immediately upon identification, the discharge or connection must be eliminated in a timely manner with the goal of eliminating the discharge or connection within 10 business days after the source is identified. If more than 10 business days are required to eliminate the discharge or connection, a rationale must be recorded in the electronic database or equivalent tabular system used to track the investigations of non-storm water and illicit discharges and connections.~~

~~(4) If the Copermittee identifies the source as a non-storm water discharge to or from the MS4 that is in exceedance of NALs developed pursuant to Provision C.1, and in violation or threatened violation of an existing separate NPDES permit (e.g. the groundwater dewatering NPDES permit), then the Copermittee must report, within three business days, the findings to the San Diego Water Board including all pertinent information regarding the discharger and discharge characteristics.~~

~~b. Development Projects Enforcement Component~~

~~The Enforcement Response Plan must describe required enforcement actions to~~

~~compel compliance with the Copermittee's BMP Design Manual requirements for development projects.~~

~~(1) The Enforcement Response Plan must include a definition of "high level enforcement" for development projects.~~

~~(2) The enforcement process must include appropriate sanctions to compel compliance with requirements of the Copermittee's BMP Design Manual or this Order. Sanctions must include, at a minimum, the following tools or their equivalent:~~

~~(a) Non-monetary penalties;~~

~~(b) Fines;~~

~~(c) Bonding requirements;~~

~~(d) Administrative and criminal penalties;~~

~~(e) Liens; and~~

~~(f) Permit or occupancy denials.~~

~~(3) Occupancy must be denied until a development project is in full compliance with the Copermittee's BMP Design Manual requirements. Documentation of full compliance with the Copermittee's BMP Design Manual requirements must be recorded in the electronic database or equivalent tabular system used to track development projects.~~

~~(4) Violations or other non-compliance that contribute or potentially contribute to the highest water quality priorities identified in the Water Quality Improvement Plan must be issued high level enforcement actions. High level enforcement actions must continue to escalate, as necessary, to compel compliance as soon as possible.~~

~~(5) For violations of permanent BMP maintenance requirements, all violations must be corrected in a timely manner with the goal of correcting them before the next rain event but no longer than 10 business days after the violations are discovered. If more than 10 business days are required for compliance, a rationale must be recorded in the electronic database or equivalent tabular system used to track permanent BMP inspections.~~

~~c. Construction / Existing Development Enforcement Component~~

~~The Enforcement Response Plan must describe required enforcement actions to compel compliance with its permits and applicable local ordinances, and the requirements of this Order, at construction sites and areas of existing development.~~

~~(1) The Enforcement Response Plan must include a definition of "high level enforcement" for construction sites and areas of existing development. "High level enforcement" may be defined differently for construction sites, municipal, commercial, industrial, and residential areas of existing development.~~

~~(2) The enforcement process must include, at a minimum, appropriate sanctions to compel compliance, such as:~~

~~(a) Verbal and written notices of violation;~~

~~(b) Cleanup requirements;~~

~~(c) Fines;~~

~~(d) Bonding requirements;~~

~~(e) Administrative and criminal penalties;~~

~~(f) Liens;~~

~~(g) Stop work orders; and~~

~~(h) Permit and occupancy denials.~~

~~(3) Violations or other non-compliance that contribute or potentially contribute to the highest water quality priorities identified in the Water Quality Improvement Plan must be issued high level enforcement actions. High level enforcement actions must continue to escalate, as necessary, to compel compliance as soon as possible.~~

~~(4) All violations must be corrected in a timely manner with the goal of correcting them before the next rain event but no longer than 10 business days after the violations are discovered. If more than 10 business days are required for compliance, then a rationale must be recorded in the electronic database or equivalent tabular system used to track construction site and existing development inspections.~~

b. Enforcement Response Approaches and Options

Each component of the Enforcement Response Plan must describe the enforcement response approaches that the Copermittee will implement to compel compliance with its statutes, ordinances, permits, contracts, orders, or similar means, and the requirements of this Order. The description must include the protocols for implementing progressively stricter enforcement responses. The enforcement response approaches must include appropriate sanctions to compel compliance, including, at a minimum, the following tools or their equivalent:

(1) Verbal and written notices of violation;

(2) Cleanup requirements;

(3) Fines;

(4) Bonding requirements;

(5) Administrative and criminal penalties;

(6) Liens;

(7) Stop work orders; and

(8) Permit and occupancy denials.

c. CORRECTION OF VIOLATIONS

(1) Violations must be corrected in a timely manner with the goal of correcting the violations within 30 calendar days after the violations are discovered, or prior to the next predicted rain event, whichever is sooner.

(2) If more than 30 calendar days are required to achieve compliance, then a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

d. ESCALATED ENFORCEMENT

(1) The Enforcement Response Plan must include a definition of "escalated enforcement". Escalated enforcement must include any enforcement scenario where a violation or other non-compliance is determined to cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan. Escalated enforcement may be defined differently for development planning, construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas.

(2) Where the Copermittee determines escalated enforcement is not required, a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

(3) Escalated enforcement actions must continue to increase in severity, as necessary, to compel compliance as soon as possible.

e. REPORTING OF NON-COMPLIANT SITES

(1) Each Copermittee must notify the San Diego Water Board in writing within ~~48 hours~~ 2 working days of issuing ~~high level~~ escalated enforcement (as defined in the Copermittee's Enforcement Response Plan) to a construction site that

poses a significant threat to water quality as a result of violations or other non-compliance with its permits and applicable local ordinances, and the requirements of this Order. Written notification may be provided electronically by email.

(2) Each Copermittee must notify the San Diego Water Board of non-filers under the Industrial General Permit and Construction General Permit by email to Nonfilers_R9@waterboards.ca.gov.

7. Public Education and Participation

Each Copermittee must implement, individually or with other Copermittees, a public education and participation program in accordance with the strategies identified in the Water Quality Improvement Plan to promote and encourage the development of programs, management practices, and behaviors that reduce the discharge of pollutants in storm water to the MEP, prevent controllable non-storm water discharges from entering the MS4, and protect water quality standards in receiving waters.

a. PUBLIC EDUCATION

~~Each Copermittee must implement a public education program, as appropriate, to promote and encourage management practices, control techniques and systems, design and engineering methods, and behaviors that reduce the discharge of pollutants in storm water to the MEP, prevent controllable non-storm water discharges from entering the MS4, and protect water quality standards in receiving waters.~~ The public education program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) Educational activities, public information activities, and other appropriate outreach activities intended to reduce pollutants associated with the application of pesticides, herbicides and fertilizer and other pollutants of concern in storm water discharges to and from its MS4 to the MEP, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed to address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(2) Educational activities, public information activities, and other appropriate outreach activities to facilitate the proper management and disposal of used oil and toxic materials; and

(3) Appropriate education and training measures for ~~construction site operators and other~~ specific target audiences, such as construction site operators, residents, underserved target audiences and school-aged children, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed, based on high risk behaviors and pollutants of concern.

b. PUBLIC PARTICIPATION

The public participation program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following: ~~Each Copermittee must incorporate a mechanism for public participation and where necessary intergovernmental coordination in updating, developing, and implementing its jurisdictional runoff management program.~~

(1) A process for members of the public to participate in updating the highest priority water quality conditions, numeric goals, and water quality improvement strategies in the Water Quality Improvement Plan.

(2) Opportunities for members of the public to participate in providing the Copermittee recommendations for improving the effectiveness of the water quality improvement strategies implemented within its jurisdiction.

(3) Opportunities for members of the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or restoration and protection of the quality of receiving waters.

c. STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented within its jurisdiction, as applicable, to educate the public and encourage public participation to address potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) The target audiences and/or areas within the Copermittee's jurisdiction where the strategies and/or activities will be implemented;

(2) Provide specific details about how the strategies and/or activities will be implemented (e.g. educational topics, materials and/or activities, public outreach and participation programs and/or opportunities);

(3) Each Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify and implement regional public education and participation activities, programs and opportunities;

(4) Each Copermittee must incorporate a mechanism for evaluating and assessing educational and other public outreach activities, as needed, to identify progress and incorporate modifications necessary to increase the effectiveness of the public education and participation program.

8. Fiscal Analysis

a. Each Copermittee must secure the resources necessary to meet all the requirements of this Order.

b. Each Copermittee must conduct an annual fiscal analysis of its jurisdictional runoff management program in its entirety. The fiscal analysis must include the following:

(1) Identification of the various categories of expenditures ~~The capital and operation and maintenance expenditures~~ necessary to implement the requirements of this Order, including a description of the specific capital, operation and maintenance, and other expenditure items to be accounted for in each category of expenditures;

(2) The staff resources needed and allocated to meet the requirements of this Order, including any development, implementation, and enforcement activities required;

(3) The estimated expenditures for Provisions E.8.b.(1) and E.8.b.(2) ~~during~~ for the current fiscal year ~~reporting period, the preceding reporting period, and the next reporting period~~; and

(4) The source(s) of funds that are proposed to meet the necessary expenditures described in Provisions E.8.b.(1) and E.8.b.(2), including legal restrictions on the use of such funds, for the current fiscal year and next fiscal year.

c. Each Copermittee must submit a summary of the annual fiscal analysis with each Annual Report required pursuant to Provision F.3.b.

d. Each Copermittee must provide the documentation used to develop the summary of the annual fiscal analysis upon request by the San Diego Water Board.

F. REPORTING

The purpose of this provision is to determine and document compliance with the requirements set forth in this Order. The goal of this provision is to communicate to the San Diego Water Board and the people of the State of California the implementation status of each jurisdictional runoff management program and compliance with the requirements of this Order. This goal is to be accomplished through the submittal of specific deliverables to the San Diego Water Board by the Copermittees.

1. Water Quality Improvement Plans

The Copermittees for each Watershed Management Area must develop and submit ~~a complete~~ the Water Quality Improvement Plan in accordance with the following requirements:

a. WATER QUALITY IMPROVEMENT PLAN DEVELOPMENT

Each Water Quality Improvement Plan must be developed in accordance with the following process:

(1) Priority Water Quality Conditions and Numeric Goals

(a) The Copermittees must implement a public participation process to solicit data and information to be utilized in the development and identification of the priority water quality conditions for the Watershed Management Area.

(b) The Copermittees are encouraged to involve the public and key stakeholders as early and often as possible during the development of the priority water quality conditions and numeric goals to be included in the Water Quality Improvement Plan.

(c) Within 6 months after the commencement of coverage under this Order, the Copermittees must develop and submit the Water Quality Improvement Plan requirements of Provision B.2 to the San Diego Water Board. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of 60 days.

(d) The Copermittees must revise the priority water quality conditions and numeric goals based on comments received and/or recommendations or direction from the San Diego Water Board Executive Officer.

(2) Water Quality Improvement Strategies and Schedules

(a) The Copermittees are encouraged to involve the public and key stakeholders as early and often as possible during the development of the water quality improvement strategies and schedules to be included in the Water Quality Improvement Plan.

(b) Within 9 months after the commencement of coverage under this Order, the Copermittees must develop and submit the Water Quality Improvement Plan requirements of Provision B.3 to the San Diego Water Board. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of 60 days.

(c) The Copermittees must revise the water quality improvement strategies and schedules based on comments received and/or recommendations or direction from the San Diego Water Board Executive Officer.

b. WATER QUALITY IMPROVEMENT PLAN SUBMITTAL

(1) Within ~~of Provision B, no later than~~ 18 ~~12~~ months after the ~~adoption of~~ commencement of coverage under this Order, the Copermittees for each Watershed Management Area must submit a complete Water Quality Improvement Plan in accordance with the requirements of Provision B to the San Diego Water Board~~for a 30-day public review and comment period~~. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of 30 days.

(2) Based on the comments received, the San Diego Water Board will determine whether to hold a public hearing or to limit public input to submittal of written comments. If no hearing is held the San Diego Water Board will notify the Copermittees within 6 months that the Water Quality Improvement Plan has been accepted as complete following its review and determination that the Water Quality Improvement Plan meets the requirements of this Order.

(3) The Copermittees must revise the Water Quality Improvement Plan based on comments received and/or recommendations or direction from the San Diego Water Board Executive Officer.

(4) The Water Quality Improvement Plan~~s~~ must be made available on the Regional Clearinghouse required pursuant to Provision F.4~~.~~ within 30 days of acceptance by the San Diego Water Board.

2. Updates

a. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATES

Each Copermittee must update its jurisdictional runoff management program document in accordance with the following requirements:

(1) Each Copermittee is encouraged to involve the public and key stakeholders as early and often as possible to solicit recommendations for updates to its jurisdictional runoff management program document.

(2) Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E~~. The update must be completed~~ no later than 18 ~~12~~ months after the ~~adoption of~~ commencement of coverage under this Order. ~~Updated jurisdictional runoff management program documents must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Subsequent updates may be submitted as part of the Annual Reports, and updated jurisdictional runoff management program documents must be made available on the Regional Clearinghouse.~~

(3) Each Copermittee must submit updates to its jurisdictional runoff management program, with a rationale for the modifications, either in the Annual Report required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge required pursuant to Provision F.5.b.

(4) The Copermittee must revise the modifications as directed by the San Diego Water Board Executive Officer.

(5) Updated jurisdictional runoff management program documents must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of submitting the Annual Report.

b. ~~PERMANENT~~ BMP ~~SIZING CRITERIA~~ DESIGN MANUAL UPDATES

Each Copermittee must update its BMP Design Manual in accordance with the following requirements:

(1) Each Copermittee must update its BMP Design Manual to incorporate the requirements of Provisions E.3.a-d~~. The update must be completed~~ no later than 18 ~~12~~ months after the ~~adoption of~~ commencement of coverage under this Order. ~~Updated BMP Design Manuals must be made available on the Regional Clearinghouse required pursuant to Provision F.4.~~

(2) Subsequent updates must be consistent with the requirements of Provisions E.3.a-d and ~~may~~ must be submitted as part of the Annual Reports required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge required pursuant to Provision F.5.b.

(3) Updated BMP Design Manuals must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of completing the update.

c. WATER QUALITY IMPROVEMENT PLAN UPDATES

The Water Quality Improvement Plans must be updated in accordance with the following process:

(1) The Copermittees must implement a public participation process to solicit data and information to be utilized in updating the Water Quality Improvement Plan.

(2) The Copermittees are encouraged to involve the public and key stakeholders as early and often as possible during the updates to the Water Quality Improvement Plan.

(3) The Copermittees for each Watershed Management Area must submit requested updates to the Water Quality Improvement Plan ~~as part of the Annual Reports~~, with the public input received and the rationale for the requested updates, either in the Annual Reports required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The requested updates are considered accepted by the San Diego Water Board if no response is provided to the Copermittee after 3 months of submitting the request.

(4) The Copermittees must revise the requested updates as directed by the San Diego Water Board Executive Officer.

(5) Updated Water Quality Improvement Plans must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance of the requested updates by the San Diego Water Board.

3. Progress Reporting

a. Progress Report Presentations

The Copermittees for each Watershed Management Area must appear before the San Diego Water Board, as requested by the San Diego Water Board, to provide progress reports on the implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs.

b. Annual Reports

(1) The Copermittees for each Watershed Management Area must submit an Annual Report for each reporting period~~, which begins July 1 and ends June 30 in the following year,~~ no later than ~~October 31~~ January 31 of the following year ~~the end of the reporting period~~. The annual reporting period consists of two periods: 1) July 1 to June 30 of the following year for the jurisdictional runoff management programs, 2) October 1 to September 30 of the following year for the monitoring and assessment programs. The first Annual Report must be prepared for the reporting period beginning July 1 after commencement of coverage under this Order, and ~~from the date the~~ upon San Diego Water Board ~~determines~~ determination that the Water

Quality Improvement Plan meets the requirements of this Order to June 30 in the following year for the jurisdictional runoff management programs, and September 30 in the following year for the monitoring and assessment programs. Annual Reports must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Each Annual Report must include the following:

(a) The ~~jurisdictional and watershed~~ receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, summarized and presented in tabular and graphical form;

(b) Progress of the special studies required pursuant to Provision~~s D.2 and~~ D.3, and the results or findings when a special study, or each phase of a special study, is completed;

(c) The findings from the assessments required pursuant to Provision D.4;

(d) The progress of implementing the Water Quality Improvement Plan, including, but not limited to, the following:

(i) The progress toward achieving the interim and final numeric ~~targets~~ goals for the highest water quality priorities for the Watershed Management Area,

(ii) The water quality improvement strategies that were implemented and/or no longer implemented by each of the Copermittees during the reporting period and previous reporting periods, and are planned to be implemented during the next reporting period,

(iii) Proposed modifications to the water quality improvement strategies, with public input received and rationale for the proposed modifications,

(iv) Previously proposed modifications or updates incorporated into the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document and implemented by the Copermittees in the Watershed Management Area, and

(v) Proposed modifications or updates to the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document;

(e) A completed Jurisdictional Runoff Management Program Annual Report Form (Attachment D or accepted revision) for each Copermittee in the Watershed Management Area, certified by a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative.

(2) Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (Attachment D or accepted revision) no later than October 31 of each year until the first Annual Report is required to be submitted. Each Copermittee must submit the information on the Jurisdictional Runoff Management Program Annual Report Form specific to area within its jurisdiction in each Watershed Management Area.

(3) Each Copermittee must provide any data or documentation utilized in developing the Annual Report upon request by the San Diego Water Board. Any monitoring data utilized in developing the Annual Report must be uploaded to the California Environmental Data Exchange Network (CEDEN).[35] Any monitoring and assessment data utilized in developing the Annual Report must be provided on the Regional Clearinghouse required pursuant to Provision F.4.

c. Regional Monitoring and Assessment Report

(1) The Copermittees must submit a Regional Monitoring and Assessment Report no later than 180 days in advance of the expiration date of this Order. The Regional Monitoring and Assessment Report may be submitted as part of the Report ~~O~~of Waste Discharge required pursuant to Provision F.5.b. The Copermittees must review the receiving water and MS4 outfall discharge ~~jurisdictional and watershed~~ monitoring data collected pursuant to Provisions D.1 and D.2, ~~data analyses,~~ and findings from the assessments required pursuant to Provision D.4, to assess the following:

(a) The beneficial uses of the receiving waters within the San Diego Region that are protected or must be restored;

(b) The progress toward restoring impacted beneficial uses in the receiving waters within the San Diego Region; and

(c) Pollutants or conditions of emerging concern that may impact beneficial uses in the receiving waters within the San Diego Region.

(2) The Regional Monitoring and Assessment Report must include recommendations for improving the implementation and assessment of the Water Quality Improvement Plans and jurisdictional runoff management programs.

(3) Each Copermittee must provide any data or documentation utilized in developing the Regional Monitoring and Assessment Report upon request by the San Diego Water Board. Any monitoring and assessment data utilized in developing the Regional Monitoring and Assessment Report must be provided on the Regional Clearinghouse required pursuant to Provision F.4.

[35] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

4. Regional Clearinghouse

The Copermittees must develop, update, and maintain an internet-based Regional Clearinghouse that ~~can be used to store, disseminate, and share the Copermittees' Water Quality Improvement Plans, Annual Reports, jurisdictional runoff management program documents, monitoring data, special studies, and any other data or information generated by the Copermittees during the implementation of this Order.~~ is made available to the public no later than 18 months after the adoption of this Order.

a. The Copermittees, through the Regional Clearinghouse, must make the following documents and data available, organized by Watershed Management Area, which may be linked to other internet-based data portals and databases where the original documents are stored:

(1) Water Quality Improvement Plan for the Watershed Management Area, and all updated versions with date of update;

(2) Annual Reports for the Watershed Management Area;

(3) Jurisdictional Runoff Management Program document for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(4) BMP Design Manual for each Copermittee within the Watershed Management Area, and all updated versions with date of update; and

(5) Reports from special studies (e.g. source identification, BMP effectiveness assessment) conducted in the Watershed Management Area;

(6) Monitoring data collected pursuant to Provision D for each Watershed Management Area must be uploaded to CEDEN,[36] with links to the uploaded data ~~on the Regional Clearinghouse. The Regional Clearinghouse may be linked to other internet-based data portals and databases where the original documents and data are stored. The Regional Clearinghouse must be available and accessible to members of the public. The Regional Clearinghouse must be developed and made available to the public no later than 12 months after the adoption of this Order.~~; and

(7) Available GIS data, layers, and/or shapefiles used to develop the maps generated and maintained by the Copermittees for the Water Quality Improvement Plans, Annual Reports, and jurisdictional runoff management program documents.

[36] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

b. The Copermittees, through the Regional Clearinghouse, must make the following information and documents available:

(1) Contact information (point of contact, phone number, email address, and mailing address) for each Copermittee;

(2) Public hotline number for reporting non-storm water and illicit discharges for each Copermittee;

(3) Email address for reporting non-storm water and illicit discharges for each Copermittee;

(4) Link to each Copermittee's website, if available, where the public may find additional information about the Copermittee's storm water management program and for requesting records for the implementation of its program;

(5) Information about opportunities for the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or restoration and protection of the quality of receiving waters; and

(6) Reports from regional monitoring programs in which the Copermittees participate (e.g. Southern California Monitoring Coalition, Southern California Coastal Water Research Project Bight Monitoring);

(7) Regional Monitoring and Assessment Reports; and

(8) Any other information, data, and documents the Copermittees determine as appropriate for making available to the public.

5. Report of Waste Discharge

a. The Orange County Copermittees and the Riverside County Copermittees~~,~~ are required to submit a complete Report ~~O~~of Waste Discharge pursuant to the requirements of their current Orders. The San Diego Water Board will review and consider the Reports of Waste Discharge to determine whether modification to this Order, pursuant to the requirements of Provision H, will be required prior the Orange County Copermittees and/or Riverside County Copermittees becoming covered under this Order. ~~and are enrolled under this Order upon expiration of their current Orders. Upon expiration of their current Orders, the Copermittees in each county must comply with the requirements of this Order by July 1 after enrollment under this Order, unless early enrollment is granted pursuant to Provision F.6 of this Order.~~ The current Orders for the Orange County Copermittees and Riverside County Copermittees are rescinded upon ~~their expiration date~~ noticification of coverage under this Order except for enforcement purposes.

b. The Copermittees subject to the requirements of this Order must submit to the San Diego Water Board a complete Report of Waste Discharge ~~ROWD~~ as an application for the re-issuance of this Order and NPDES permit. The Report of Waste Discharge ~~ROWD~~ must be submitted no later than 180 days in advance of the expiration date of this Order. The Report of Waste Discharge ~~ROWD~~ must contain the following minimum information:

(1) Names and addresses of the Copermittees;

(2) Names and titles of the primary contacts of the Copermittees;

(3) Proposed changes to the Copermittees' Water Quality Improvement Plans and the supporting justification;

(4) Proposed changes to the Copermittees' jurisdictional runoff management programs and the supporting justification;

(5) Any other information necessary for the re-issuance of this Order; and

(6) Any information to be included as part of the Report of Waste Discharge pursuant to the requirements of this Order; and

(7) Any other information required by federal regulations for NPDES permit reissuance.

6. Application for Early Coverage ~~Enrollment~~

a. The Orange County Copermittees, collectively, or Riverside County Copermittees, collectively, may apply for early ~~enrollment~~ coverage under this Order by submitting a Report of Waste Discharge Form 200 ~~for each individual Copermittee in the respective county~~, with a written request for early ~~enrollment~~ coverage under this Order. ~~that certifies the following conditions have been met:~~

~~(1) A Water Quality Improvement Plan has been developed in accordance with the requirements of Provision B, which can and will be implemented immediately upon enrollment under this Order;~~

~~(2) Each Copermittee in the county has updated its jurisdictional runoff management program document to incorporate the requirements of Provision E, which can and will be implemented immediately upon enrollment under this Order; and~~

~~(3) Each Copermittee in the county has updated its BMP Design Manual to incorporate the requirements of Provision E.3.d, which can and will be implemented immediately upon enrollment under this Order.~~

b. The San Diego Water Board will review the application for early coverage ~~enrollment and associated documents for completeness~~. A ~~Notice~~ notification of coverage ~~Enrollment (NOE)~~ under this Order will be issued to the Copermittees in the respective county by the San Diego Water Board upon completion of the early coverage ~~enrollment~~ application requirements. The effective coverage ~~enrollment~~ date will be specified in the notification of coverage ~~NOE~~ and the Copermittees in the respective county are authorized to have MS4 discharges pursuant to the requirements of this Order starting on the date specified in the notification of coverage ~~NOE~~. The existing Order for ~~that~~ the respective county is rescinded upon the effective ~~enrollment~~ coverage date specified in the notification of coverage ~~NOE~~ except for enforcement purposes.

7. Reporting Provisions

Each Copermittee must comply with all the reporting and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

G. PRINCIPAL WATERSHED COPERMITTEE RESPONSIBILITIES

1. The Copermittees within each Watershed Management Area must designate a Principal Watershed Copermittee and notify the San Diego Water Board of the name of the Principal Watershed Copermittee. An individual Copermittee should not be designated a Principal Watershed Copermittee for more than two Watershed Management Areas. The notification may be submitted with the Water Quality Improvement Plan required pursuant to Provision F.1 of this Order.

2. The Principal Watershed Copermittee is responsible for, at a minimum, the following:

a. Serving as liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues, and when necessary and appropriate, representing the Copermittees in the Watershed Management Area before the San Diego Water Board.

b. Facilitating the development of the Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order

c. Coordinating the submittal of the deliverables required by Provisions F.1, F.2, F.3.a, and F.3.b of this Order.

d. Coordinating and developing, with the other Principal Watershed Copermittees, the requirements of Provisions F.3.c, F.4, and F.5.b of this Order.

H. MODIFICATION OF PROGRAMS

1. Modifications of the Order may be initiated by the San Diego Water Board or by the Copermittees. Requests by Copermittees must be made to the San Diego Water Board.

2. Minor modifications to the Order may be made by the San Diego Water Board where the proposed modification complies with all the prohibitions and limitations, and other requirements of this Order.

3. Proposed modifications to the Order that are not minor require amendment of this Order in accordance with this Order's rules, policies, and procedures.

4. The San Diego Water Board may re-open and modify this Order at any time prior to its expiration, after opportunity for public comment and a public hearing, if the State Water Board determines that revisions are warranted to those provisions of the Order addressing compliance with water quality standards in the receiving water and/or those provisions of the Order establishing an iterative process for implementation of management practices to assure compliance with water quality standards in the receiving water.

I. STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

Each Copermittee must comply with all the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

ADMINISTRATIVE DRAFT

ATTACHMENT A

DISCHARGE PROHIBITIONS AND SPECIAL PROTECTIONS

1. Basin Plan Waste Discharge Prohibitions

California Water Code Section 13243 provides that a Regional Water Board, in a water quality control plan, may specify certain conditions or areas where the discharge of waste or certain types of waste is not permitted. The following waste discharge prohibitions in the Water Quality Control Plan for the San Diego Basin (Basin Plan) are applicable to any person, as defined by Section 13050(c) of the California Water Code, who is a citizen, domiciliary, or political agency or entity of California whose activities in California could affect the quality of waters of the state within the boundaries of the San Diego Region.

1. The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in California Water Code Section 13050, is prohibited.

2. The discharge of waste to land, except as authorized by waste discharge requirements or the terms described in California Water Code Section 13264 is prohibited.

3. The discharge of pollutants or dredged or fill material to waters of the United States except as authorized by a National Pollutant Discharge Elimination System (NPDES) permit or a dredged or fill material permit (subject to the exemption described in California Water Code Section 13376) is prohibited.

4. Discharges of recycled water to lakes or reservoirs used for municipal water supply or to inland surface water tributaries thereto are prohibited, unless this San Diego Water Board issues a NPDES permit authorizing such a discharge; the proposed discharge has been approved by the State Department of Health Services (DHS) and the operating agency of the impacted reservoir; and the discharger has an approved fail-safe long-term disposal alternative.

5. The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the San Diego Water Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

6. The discharge of waste in a manner causing flow, ponding, or surfacing on lands not owned or under the control of the discharger is prohibited, unless the discharge is authorized by the San Diego Water Board.

7. The dumping, deposition, or discharge of waste directly into waters of the state, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the San Diego Water Board.

8. Any discharge to a storm water conveyance system that is not composed entirely of "*storm water*" is prohibited unless authorized by the San Diego Water Board. [The federal regulations, 40 CFR 122.26(b)(13), define storm water as storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from fire fighting activities.] [§122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

9. The unauthorized discharge of treated or untreated sewage to waters of the state or to a storm water conveyance system is prohibited.

10. The discharge of industrial wastes to conventional septic tank/subsurface disposal systems, except as authorized by the terms described in California Water Code Section 13264, is prohibited.

11. The discharge of radioactive wastes amenable to alternative methods of disposal into the waters of the state is prohibited.

12. The discharge of any radiological, chemical, or biological warfare agent into waters of the state is prohibited.

13. The discharge of waste into a natural or excavated site below historic water levels is prohibited unless the discharge is authorized by the San Diego Water Board.

14. The discharge of sand, silt, clay, or other earthen materials from any activity, including land grading and construction, in quantities which cause deleterious bottom deposits, turbidity or discoloration in waters of the state or which unreasonably affect, or threaten to affect, beneficial uses of such waters is prohibited.

15. The discharge of treated or untreated sewage from vessels to Mission Bay, Oceanside Harbor, Dana Point Harbor, or other small boat harbors is prohibited.

16. The discharge of untreated sewage from vessels to San Diego Bay is prohibited.

17. The discharge of treated sewage from vessels to portions of San Diego Bay that are less than 30 feet deep at mean lower low water (MLLW) is prohibited.

18. The discharge of treated sewage from vessels, which do not have a properly functioning US Coast Guard certified Type I or Type II marine sanitation device, to portions of San Diego Bay that are greater than 30 feet deep at mean lower low water (MLLW) is prohibited.

2. Attachment B to State Water Board Resolution 2012-0012~~X~~

Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges

I. PROVISIONS FOR POINT SOURCE DISCHARGES OF STORM WATER AND NONPOINT SOURCE WASTE DISCHARGES

The following terms, prohibitions, and special conditions (hereafter collectively referred to as special conditions) are established as limitations on point source storm water and nonpoint source discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in Areas of Special Biological Significance (ASBS), as required for State Water Quality Protection Areas pursuant to California Public Resources Code Sections 36700(f) and 36710(f). These Special Protections are adopted by the State Water Board as part of the California Ocean Plan (Ocean Plan) General Exception.

The special conditions are organized by category of discharge. The State Water Resources Control Board (State Water Board) and Regional Water Quality Control Boards (Regional Water Boards) will determine categories and the means of regulation for those categories [e.g., Point Source Storm Water National Pollutant Discharge Elimination System (NPDES) or Nonpoint Source].

A. PERMITTED POINT SOURCE DISCHARGES OF STORM WATER

1. General Provisions for Permitted Point Source Discharges of Storm Water

   a. Existing storm water discharges into an ASBS are allowed only under the following conditions:

      (1) The discharges are authorized by an NPDES permit issued by the State Water Board or Regional Water Board;

      (2) The discharges comply with all of the applicable terms, prohibitions, and special conditions contained in these Special Protections; and

      (3) The discharges:

         (i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

         (ii) Are designed to prevent soil erosion;

         (iii) Occur only during wet weather;

         (iv) Are composed of only storm water runoff.

   b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

   c. The discharge of trash is prohibited.

d. Only discharges from existing storm water outfalls are allowed. Any proposed or new storm water runoff discharge shall be routed to existing storm water discharge outfalls and shall not result in any new contribution of waste to an ASBS (i.e., no additional pollutant loading). "Existing storm water outfalls" are those that were constructed or under construction prior to January 1, 2005. "New contribution of waste" is defined as any addition of waste beyond what would have occurred as of January 1, 2005. A change to an existing storm water outfall, in terms of re-location or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges are prohibited except as provided below:

(1) The term "non-storm water discharges" means any waste discharges from a municipal separate storm sewer system (MS4) or other NPDES permitted storm drain system to an ASBS that are not composed entirely of storm water.

(2) (i) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability or occur naturally:

(a)~~(i)~~ Discharges associated with emergency fire fighting operations.

(b)~~(ii)~~ Foundation and footing drains.

(c)~~(iii)~~ Water from crawl space or basement pumps.

(d)~~(iv)~~ Hillside dewatering.

(e)~~(v)~~ Naturally occurring groundwater seepage via a storm drain.

(f)~~(vi)~~ Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(ii) An NPDES permitting authority may authorize non-storm water discharges to an MS4 with a direct discharge to an ASBS only to the extent the NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

2. Compliance Plans for Inclusion in Storm Water Management Plans (SWMP) and Storm Water Pollution Prevention Plans (SWPPP).

The discharger shall specifically address the prohibition of non-storm water runoff and the requirement to maintain natural water quality for storm water discharges to an ASBS in an ASBS Compliance Plan to be included in its SWMP or a SWPPP, as appropriate to permit type. If a statewide permit includes a SWMP, then the discharger shall prepare a stand-alone compliance plan for ASBS discharges. The ASBS Compliance Plan is subject to approval by the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (for permits issued by Regional Water Boards).

a. The Compliance Plan shall include a map of surface drainage of storm water runoff, showing areas of sheet runoff, prioritize discharges, and describe any structural Best Management Practices (BMPs) already employed and/or BMPs to be employed in the future. Priority discharges are those that pose the greatest water quality threat and which are identified to require installation of structural BMPs. The map shall also show the storm water conveyances in relation to other features such as service areas, sewage conveyances and treatment facilities, landslides, areas prone to erosion, and waste and hazardous material storage areas, if applicable. The SWMP or SWPPP shall also include a procedure for updating the map and plan when changes are made to the storm water conveyance facilities.

b. The ASBS Compliance Plan shall describe the measures by which all non-authorized non-storm water runoff (e.g., dry weather flows) has been eliminated, how these measures will be maintained over time, and how these measures are monitored and documented.

c. For Municipal Separate Storm Sewer System (MS4s), the ASBS Compliance Plan shall require minimum inspection frequencies as follows:

   (1) The minimum inspection frequency for construction sites shall be weekly during rainy season;

   (2) The minimum inspection frequency for industrial facilities shall be monthly during the rainy season;

   (3) The minimum inspection frequency for commercial facilities (e.g., restaurants) shall be twice during the rainy season; and

   (4) Storm water outfall drains equal to or greater than 18 inches (457 mm) in diameter or width shall be inspected once prior to the beginning of the rainy season and once during the rainy season and maintained to remove trash and other anthropogenic debris.

d. The ASBS Compliance Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff, that are necessary to comply with these special conditions, will be achieved through BMPs. Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that such installation would pose a threat to health or safety. BMPs to control storm water runoff discharges (at the end-of-pipe) during a design storm shall be designed to achieve on average the following target levels:

   (1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

   (2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges. The baseline for the reduction is the effective date of the Exception. The baseline for these determinations is the effective date of the Exception, and the

reductions must be achieved and documented within four (4) years of the effective date.

e. The ASBS Compliance Plan shall address erosion control and the prevention of anthropogenic sedimentation in ASBS. The natural habitat conditions in the ASBS shall not be altered as a result of anthropogenic sedimentation.

f. The ASBS Compliance Plan shall describe the non-structural BMPs currently employed and planned in the future (including those for construction activities), and include an implementation schedule. The ASBS Compliance Plan shall include non-structural BMPs that address public education and outreach. Education and outreach efforts must adequately inform the public that direct discharges of pollutants from private property not entering an MS4 are prohibited. The ASBS Compliance Plan shall also describe the structural BMPs, including any low impact development (LID) measures, currently employed and planned for higher threat discharges and include an implementation schedule. To control storm water runoff discharges (at the end-of-pipe) during a design storm, permittees must first consider using LID practices to infiltrate, use, or evapotranspirate storm water runoff on-site.

g. The BMPs and implementation schedule shall be designed to ensure that natural water quality conditions in the receiving water are achieved and maintained by either reducing flows from impervious surfaces or reducing pollutant loading, or some combination thereof.

h. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents in storm water runoff that alter natural ocean water quality and the sources of these constituents.

(2) The report shall describe BMPs that are currently being implemented, BMPs that are identified in the SWMP or SWPPP for future implementation, and any additional BMPs that may be added to the SWMP or SWPPP to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the BMPs.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits), the discharger shall revise its ASBS Compliance Plan to incorporate any new or modified BMPs that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised SWMP or SWPPP, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural ocean water quality conditions due to the same constituent.

(5) Compliance with this section does not excuse violations of any term, prohibition, or condition contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within one year from the effective date of the Exception, the discharger shall submit a written ASBS Compliance Plan to the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that describes its strategy to comply with these special conditions, including the requirement to maintain natural water quality in the affected ASBS. The ASBS Compliance Plan shall include a time schedule to implement appropriate non-structural and structural controls (implementation schedule) to comply with these special conditions for inclusion in the discharger's SWMP or SWPPP, as appropriate to permit type.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these special conditions shall be implemented.

d. Within four (4) years of the effective date of the Exception, any structural controls identified in the ASBS Compliance Plan that are necessary to comply with these special conditions shall be operational.

e. Within four (4) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water, pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data, and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

(1) for municipalities, a demonstration of significant hardship to discharger ratepayers, by showing the relationship of storm water fees to annual household income for residents within the discharger's jurisdictional area, and the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or
(2) for other governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process.

B. NONPOINT SOURCE DISCHARGES

[NOT INCLUDED]
[PROVISIONS FOR NONPOINT SOURCE DISCHARGES NOT APPLICABLE]

II. ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES

[NOT INCLUDED]
[ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES NOT APPLICABLE]

III. ADDITIONAL REQUIREMENTS – WATERFRONT AND MARINE OPERATIONS

[NOT INCLUDED]
[ADDITIONAL REQUIREMENTS FOR WATERFRONT AND MARINE OPERATIONS NOT APPLICABLE]

IV. MONITORING REQUIREMENTS

Monitoring is mandatory for all dischargers to assure compliance with the Ocean Plan. Monitoring requirements include both: (A) core discharge monitoring, and (B) ocean receiving water monitoring. The State and Regional Water Boards must approve sampling site locations and any adjustments to the monitoring programs. All ocean receiving water and reference area monitoring must be comparable with the Water Boards' Surface Water Ambient Monitoring Program (SWAMP).

Safety concerns: Sample locations and sampling periods must be determined considering safety issues. Sampling may be postponed upon notification to the State and Regional Water Boards if hazardous conditions prevail.

Analytical Chemistry Methods: All constituents must be analyzed using the lowest minimum detection limits comparable to the Ocean Plan water quality objectives. For metal analysis, all samples, including storm water effluent, reference samples, and ocean receiving water samples, must be analyzed by the approved analytical method with the lowest minimum detection limits (currently Inductively Coupled Plasma/Mass Spectrometry) described in the Ocean Plan.

A. CORE DISCHARGE MONITORING PROGRAM

1. General sampling requirements for timing and storm size:

   Runoff must be collected during a storm event that is greater than 0.1 inch and generates runoff, and at least 72 hours from the previously measurable storm event. Runoff samples shall be collected when post-storm receiving water is sampled, and analyzed for the same constituents as receiving water and reference site samples (see section IV B) as described below.

2. Runoff flow measurements

   a. For municipal/industrial storm water outfalls in existence as of December 31, 2007, 18 inches (457mm) or greater in diameter/width (including multiple outfall pipes in combination having a width of 18 inches, runoff flows must be measured or calculated, using a method acceptable to and approved by the State and Regional Water Boards.
   b. This will be reported annually for each precipitation season to the State and Regional Water Boards.

3. Runoff samples – storm events

   a. For outfalls equal to or greater than 18 inches (0.46m) in diameter or width:

      (1) samples of storm water runoff shall be analyzed during the same storm as receiving water samples for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination, ; and

      (2) samples of storm water runoff shall be analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS

      (3) If an applicant has no outfall greater than 36 inches, then storm water runoff from the applicant's largest outfall shall be further analyzed during the same storm as receiving water samples for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates).

   b. For outfalls equal to or greater than 36 inches (0.91m) in diameter or width:

      (1) samples of storm water runoff shall be analyzed during the same storm as receiving water samples for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

      (2) samples of storm water runoff shall be further analyzed during the same storm as receiving water samples for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates) and

(3) samples of storm water runoff shall be analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

c. For an applicant not participating in a regional monitoring program [see below in Section IV (B)] in addition to (a.) and (b.) above, a minimum of the two largest outfalls or 20 percent of the larger outfalls, whichever is greater, shall be sampled (flow weighted composite samples) at least three times annually during wet weather (storm event) and analyzed for all Ocean Plan Table A constituents, Table B constituents for marine aquatic life protection (except for toxicity, only chronic toxicity for three species shall be required), DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, and Ocean Plan indicator bacteria. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one (the largest) such discharge shall be sampled annually in each Region.

4. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may reduce or suspend core monitoring once the storm runoff is fully characterized. This determination may be made at any point after the discharge is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

B. OCEAN RECEIVING WATER AND REFERENCE AREA MONITORING PROGRAM

In addition to performing the Core Discharge Monitoring Program in Section II.A above, all applicants having authorized discharges must perform ocean receiving water monitoring. In order to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS, dischargers may choose either (1) an individual monitoring program, or (2) participation in a regional integrated monitoring program.

1. Individual Monitoring Program: The requirements listed below are for those dischargers who elect to perform an individual monitoring program to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within the affected ASBS. In addition to Core Discharge Monitoring, the following additional monitoring requirements shall be met:

   a. Three times annually, during wet weather (storm events), the receiving water at the point of discharge from the outfalls described in section (IV)(A)(3)(c) above shall be sampled and analyzed for Ocean Plan Table A constituents, Table B constituents for marine aquatic life, DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, salinity, chronic toxicity (three species), and Ocean Plan indicator bacteria.

      The sample location for the ocean receiving water shall be in the surf zone at the point of discharges; this must be at the same location where storm water runoff is sampled. Receiving water shall be sampled at approximately the same time prior to (pre-storm) and during (or immediately after) the same storm (post storm). Reference water quality shall also be sampled and analyzed for the same constituents pre-storm and post-storm, during the same storms when receiving water is sampled. Reference stations will be determined by the State Water Board's Division of Water Quality and the applicable Regional Water Board(s).

b. Sediment sampling shall occur at least three times during every five (5) year period. The subtidal sediment (sand or finer, if present) at the discharge shall be sampled and analyzed for Ocean Plan Table B constituents for marine aquatic life, DDT, PCBs, PAHs, pyrethroids, and OP pesticides. For sediment toxicity testing, only an acute toxicity test using the amphipod Eohaustorius estuarius must be performed.

c. A quantitative survey of intertidal benthic marine life shall be performed at the discharge and at a reference site. The survey shall be performed at least once every five (5) year period. The survey design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The results of the survey shall be completed and submitted to the State Water Board and Regional Water Board at least six months prior to the end of the permit cycle.

d. Once during each five (5) year period, a bioaccumulation study shall be conducted to determine the concentrations of metals and synthetic organic pollutants at representative discharge sites and at representative reference sites. The study design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The bioaccumulation study may include California mussels (Mytilus californianus) and/or sand crabs (Emerita analoga or Blepharipoda occidentalis). Based on the study results, the Regional Water Board and the State Water Board's Division of Water Quality, may adjust the study design in subsequent permits, or add or modify additional test organisms (such as shore crabs or fish), or modify the study design appropriate for the area and best available sensitive measures of contaminant exposure.

e. Marine Debris: Representative quantitative observations for trash by type and source shall be performed along the coast of the ASBS within the influence of the discharger's outfalls. The design, including locations and frequency, of the marine debris observations is subject to approval by the Regional Water Board and State Water Board's Division of Water Quality.

f. The monitoring requirements of the Individual Monitoring Program in this section are minimum requirements. After a minimum of one (1) year of continuous water quality monitoring of the discharges and ocean receiving waters, the Executive Director of the State Water Board (statewide permits) or Executive officer of the Regional Water Board (Regional Water Board permits) may require additional monitoring, or adjust, reduce or suspend receiving water and reference station monitoring. This determination may be made at any point after the discharge and receiving water is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

2. Regional Integrated Monitoring Program: Dischargers may elect to participate in a regional integrated monitoring program, in lieu of an individual monitoring program, to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS. This regional approach shall characterize natural water quality, pre- and post-storm, in ocean reference areas near the mouths of identified open space watersheds and the effects of the discharges on natural water quality (physical, chemical, and toxicity) in the ASBS receiving waters, and should include benthic marine aquatic life and bioaccumulation components. The design of the ASBS stratum of a regional integrated monitoring program may deviate from the otherwise prescribed individual monitoring approach (in Section IV.B.1) if approved by the State Water Board's Division of Water Quality and the Regional Water Boards.

a. Ocean reference areas shall be located at the drainages of flowing watersheds with minimal development (in no instance more than 10% development), and shall not be located in CWA Section 303(d) listed waterbodies or have tributaries that are 303(d) listed. Reference areas shall be free of wastewater discharges and anthropogenic non-storm water runoff. A minimum of low threat storm runoff discharges (e.g. stream highway overpasses and campgrounds) may be allowed on a case-by-case basis. Reference areas shall be located in the same region as the ASBS receiving water monitoring occurs. The reference areas for each Region are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean reference water samples must be collected from each station, each from a separate storm. A minimum of one reference location shall be sampled for each ASBS receiving water site sampled per responsible party. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

b. ASBS ocean receiving water must be sampled in the surf zone at the location where the runoff makes contact with ocean water (i.e. at "point zero"). Ocean receiving water stations must be representative of worst-case discharge conditions (i.e. co-located at a large drain greater than 36 inches, or if drains greater than 36 inches are not present in the ASBS then the largest drain greater than18 inches.) Ocean receiving water stations are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean receiving water samples must be collected during each storm season from each station, each from a separate storm. A minimum of one receiving water location shall be sampled in each ASBS per responsible party in that ASBS. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

c. Reference and receiving water sampling shall commence during the first full storm season following the adoption of these special conditions, and post-storm samples shall be collected when annual storm water runoff is sampled. Sampling shall occur in a minimum of two storm seasons. For those ASBS dischargers that have already participated in the Southern California Bight 2008 ASBS regional monitoring effort, sampling may be limited to only one storm season.

d. Receiving water and reference samples shall be analyzed for the same constituents as storm water runoff samples. At a minimum, constituents to be sampled and analyzed in reference and discharge receiving waters must include oil and grease, total suspended solids, Ocean Plan Table B metals for protection of marine life, Ocean Plan PAHs, pyrethroids, OP pesticides, ammonia, nitrate, phosphates, and critical life stage chronic toxicity for three species. In addition, within the range of the southern sea otter, indicator bacteria or some other measure of fecal contamination shall be analyzed.

3. Waterfront and Marine Operations: In addition to the above requirements for ocean receiving water monitoring, additional monitoring must be performed for marinas and boat launch and pier facilities:

a. For all marina or mooring field operators, in mooring fields with 10 or more occupied moorings, the ocean receiving water must be sampled for Ocean Plan indicator bacteria,

residual chlorine, copper, zinc, grease and oil, methylene blue active substances (MBAS), and ammonia nitrogen.

(1) For mooring field operators opting for an individual monitoring program (Section IV.B.1 above), this sampling must occur weekly (on the weekend) from May through October.

(2) For mooring field operators opting to participate in a regional integrated monitoring program (Section IV.B.2 above), this sampling must occur monthly from May through October on a high use weekend in each month. The Water Boards may allow a reduction in the frequency of sampling, through the regional monitoring program, after the first year of monitoring.

b. For all mooring field operators, the subtidal sediment (sand or finer, if present) within mooring fields and below piers shall be sampled and analyzed for Ocean Plan Table B metals (for marine aquatic life beneficial use), acute toxicity, PAHs, and tributyltin. For sediment toxicity testing, only an acute toxicity test using the amphipod Eohaustorius estuarius must be performed. This sampling shall occur at least three times during a five (5) year period. For mooring field operators opting to participate in a regional integrated monitoring program, the Water Boards may allow a reduction in the frequency of sampling after the first sampling effort's results are assessed.

ADMINISTRATIVE DRAFT

ATTACHMENT B

STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

1. Standard Permit Provisions

Code of Federal Regulations Title 40 Section 122.41 (40 CFR 122.41) includes conditions, or provisions, that apply to all National Pollutant Discharge Elimination System (NPDES) permits. Additional provisions applicable to NPDES permits are in 40 CFR 122.42. All applicable provisions in 40 CFR 122.41 and 40 CFR 122.42 must be incorporated into this Order and NPDES permit. The applicable 40 CFR 122.41 and 40 CFR 122.42 provisions are as follows:

a. DUTY TO COMPLY [40 CFR 122.41(a)]

The Copermittee must comply with all of the provisions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

(1) The Copermittee must comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement. [40 CFR 122.41(a)(1)]

(2) The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to a civil penalty not to exceed $25,000 per day for each violation. The CWA provides that any person who *negligently* violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than 2 years, or both. Any person who *knowingly* violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both. Any person who knowingly violates Section 301, 302, 303, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, and who knows at that time that he thereby places another person in imminent danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of

not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.
[40 CFR 122.41(a)(2)]

(3) Any person may be assessed an administrative penalty by the San Diego Regional Water Quality Control Board (San Diego Water Board), State Water Resources Control Board (State Water Board), or United States Environmental Protection Agency (USEPA) for violating Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.
[40 CFR 122.41(a)(3)]

b. DUTY TO REAPPLY [40 CFR 122.41(b)]

If a Copermittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Copermittee must apply for and obtain a new permit.

c. NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE [40 CFR 122.41(c)]

It shall not be a defense for a Copermittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

d. DUTY TO MITIGATE [40 CFR 122.41(d)]

The Copermittee must take all reasonable steps to minimize or prevent any discharge or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

e. PROPER OPERATION AND MAINTENANCE [40 CFR 122.41(e)]

The Copermittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Copermittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by a Copermittee only when the operation is necessary to achieve compliance with the conditions of this permit.

f. PERMIT ACTIONS [40 CFR 122.41(f)]

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Copermittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

g. PROPERTY RIGHTS [40 CFR 122.41(g)]

This permit does not convey any property rights of any sort, or any exclusive privilege.

h. DUTY TO PROVIDE INFORMATION [40 CFR 122.41(h)]

The Copermittee must furnish to the San Diego Water Board, State Water Board, or USEPA within a reasonable time, any information which the San Diego Water Board, State Water Board, or USPEA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Copermittee must also furnish to the San Diego Water Board, State Water Board, or USPEA upon request, copies of records required to be kept by this permit.

i. INSPECTION AND ENTRY [40 CFR 122.41(i)]

The Copermittee must allow the San Diego Water Board, State Water Board, USEPA, and/or their authorized representative (including an authorized contractor acting as their representative), upon presentation of credentials and other documents as may be required by law, to:

(1) Enter upon the Copermittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit; [40 CFR 122.41(i)(1)]

(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit; [40 CFR 122.41(i)(2)]

(3) Inspect and photograph at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; [40 CFR 122.41(i)(3)] and

(4) Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location. [40 CFR 122.41(i)(4)]

j. MONITORING AND RECORDS [40 CFR 122.41(j)]

(1) Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity. [40 CFR 122.41(j)(1)]

(2) Except for records of monitoring information required by this permit related to the Copermittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five (5) years (or longer as required by 40 CFR Part 503), the

Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time. [40 CFR 122.41(j)(2)]

(3) Records for monitoring information must include: [40 CFR 122.41(j)(3)]

(a) The date, exact place, and time of sampling or measurements; [40 CFR 122.41(j)(3)(i)]
(b) The individual(s) who performed the sampling or measurements; [40 CFR 122.41(j)(3)(ii)]
(c) The date(s) analyses were performed; [40 CFR 122.41(j)(3)(iii)]
(d) The individual(s) who performed the analyses; [40 CFR 122.41(j)(3)(iv)]
(e) The analytical techniques or methods used; [40 CFR 122.41(j)(3)(v)] and
(f) The results of such analyses. [40 CFR 122.41(j)(3)(vi)]

(4) Monitoring must be conducted according to test procedures under 40 CFR Part 136 unless another method is required under 40 CFR Subchapters N or O. [40 CFR 122.41(j)(4)]

In the case of pollutants for which there are no approved methods under 40 CFR Part 136 or otherwise required under 40 CFR Subchapters N and O, monitoring must be conducted according to a test procedure specified in the permit for such pollutants. [40 CFR 122.44(i)(1)(iv)]

(5) The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. [40 CFR 122.41(j)(5)]

k. SIGNATORY REQUIREMENT [40 CFR 122.41(k)]

(1) All applications, reports, or information submitted to the San Diego Water Board, State Water Board, or USEPA must be signed and certified. (See 40 CFR 122.22) [40 CFR 122.41(k)(1)]

(a) *For a municipality, State, Federal, or other public agency.* [All applications must be signed] [b]y either a principal executive officer or ranking elected official. [40 CFR 122.22(a)(3)]

(b) All reports required by permits, and other information requested by the San Diego Water Board, State Water Board, or USEPA must be signed by a person described in paragraph (a) of this section, or by a duly authorized representative of that person. A person is a duly authorized representative only if: [40 CFR 122.22(b)]

(i) The authorization is made in writing by a person described in paragraph (a) of this section; [40 CFR 122.22(b)(1)]

(ii) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company, (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) [40 CFR 122.22(b)(2)] and,

(iii) The written authorization is submitted to the San Diego Water Board and State Water Board. [40 CFR 122.22(b)(3)]

(c) *Changes to authorization.* If an authorization under paragraph (b) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (b) of this section must be submitted to the San Diego Water Board prior to or together with any reports, information, or applications to be signed by an authorized representative. [40 CFR 122.22(c)]

(d) *Certification.* Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." [40 CFR 122.22(d)]

(2) The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both. [40 CFR 122.41(k)(2)]

I. REPORTING REQUIREMENTS [40 CFR 122.41(l)]

(1) *Planned changes.* The Copermittee must give notice to the San Diego Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when: [40 CFR 122.41(l)(1)]

(a) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); [40 CFR 122.41(l)(1)(i)] or

(b) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which

are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1). [40 CFR 122.41(l)(1)(ii)]

(c) The alteration or addition results in a significant change in the Copermittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. [40 CFR 122.41(l)(1)(iii)]

(2) *Anticipated noncompliance*. The Copermittee must give advance notice to the San Diego Water Board or State Water Board of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements. [40 CFR 122.41(l)(2)]

(3) *Transfers*. This permit is not transferable to any person except after notice to the San Diego Water Board. The San Diego Water Board may require modification or revocation and reissuance of the permit to change the name of the Copermittee and incorporate such other requirements as may be necessary under the CWA. [40 CFR 122.41(l)(3)]

(4) *Monitoring reports.* Monitoring results must be reported at the intervals specified elsewhere in this permit. [40 CFR 122.41(l)(4)]

(a) Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the San Diego Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices. [40 CFR 122.41(l)(4)(i)]

(b) If the Copermittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or another method required for an industry-specific waste stream under 40 CFR Subchapters N or O, the results of this monitoring must be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the San Diego Water Board or State Water Board. [40 CFR 122.41(l)(4)(ii)]

(c) Calculations for all limitations which require averaging of measurements must utilize an arithmetic mean unless otherwise specified in the permit. [40 CFR 122.41(l)(4)(iii)]

(5) *Compliance schedules*. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date. [40 CFR 122.41(l)(5)]

(6) *Twenty-four hour reporting.*

(a) The Copermittee must report any noncompliance that may endanger health or the environment. Any information must be provided orally within 24 hours from

the time the Copermittee becomes aware of the circumstances. A written submission must also be provided within five (5) days of the time the Copermittee becomes aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6)(i)]

(b) The following must be included as information which must be reported within 24 hours under this paragraph: [40 CFR 122.41(l)(6)(ii)]

(i) Any unanticipated bypass that exceeds any effluent limitation in the permit (See 40 CFR 122.41(g)). [40 CFR 122.41(l)(6)(ii)(A)]
(ii) Any upset which exceeds any effluent limitation in the permit. [40 CFR 122.41(l)(6)(ii)(B)] and,
(iii) Violation of a maximum daily discharge limitation for any of the pollutants listed by the San Diego Water Board in the permit to be reported within 24 hours. (See 40 CFR 122.44(g)) [40 CFR 122.41(l)(6)(ii)(C)]

(c) The San Diego Water Board may waive the above-required written report on a case-by-case basis if the oral report has been received within 24 hours. [40 CFR 122.41(l)(6)(iii)]

(7) *Other noncompliance.* The Copermittee must report all instances of noncompliance not reported in accordance with the standard provisions required under 40 CFR 122.41(l)(4), (5), and (6), at the time monitoring reports are submitted. The reports must contain the information listed in the standard provisions required under 40 CFR 122.41(l)(6). [40 CFR 122.41(l)(7))]

(8) *Other information.* When the Copermittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the San Diego Water Board, State Water Board, or USEPA, the Copermittee must promptly submit such facts or information. [40 CFR 122.41(l)(8)]

m. BYPASS [40 CFR 122.41(m)]

(1) *Definitions.*

(a) "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. [40 CFR 122.41(m)(1)(i)] or

(b) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production. [40 CFR 122.41(m)(1)(ii)]

(2) *Bypass not exceeding limitations*. The Copermittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the standard provisions required under 40 CFR 122.41(m)(3) and (4). [40 CFR 122.41(m)(2)]

(3) *Notice.*

(a) *Anticipated bypass*. If the Copermittee knows in advance of the need for a bypass, it must submit a notice, if possible at least ten days before the date of the bypass. [40 CFR 122.41(m)(3)(i)] or

(b) *Unanticipated bypass*. The Copermittee must submit notice of an unanticipated bypass in accordance with the standard provisions required under 40 CFR 122.41(l)(6) (24-hour notice). [40 CFR 122.41(m)(3)(ii)]

(4) *Prohibition of Bypass.*

(a) Bypass is prohibited, and the San Diego Water Board may take enforcement action against a Copermittee for bypass, unless: [40 CFR 122.41(m)(4)(i)]

(i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; [40 CFR 122.41(m)(4)(i)(A)]

(ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; [40 CFR 122.41(m)(4)(i)(B)] and,

(iii) The Copermittee submitted notice in accordance with the standard provisions required under 40 CFR 122.41(m)(3). [40 CFR 122.41(m)(4)(i)(C)]

(b) The San Diego Water Board may approve an anticipated bypass, after considering its adverse effects, if the San Diego Water Board determines that it will meet the three conditions listed above. [40 CFR 122.41(m)(4)(ii)]

n. UPSET [40 CFR 122.41(n)]

(1) *Definition.* "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Copermittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. [40 CFR 122.41(n)(1)]

(2) *Effect of an upset*. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the standard provisions required under 40 CFR 122.41(n)(3) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. [40 CFR 122.41(n)(2)]

(3) *Conditions necessary for a demonstration of upset*. A Copermittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that: [40 CFR 122.41(n)(3)]

(a) An upset occurred and that the Copermittee can identify the cause(s) of the upset; [40 CFR 122.41(n)(3)(i)]
(b) The permitted facility was at the time being properly operated; [40 CFR 122.41(n)(3)(ii)] and
(c) The Copermittee submitted notice of the upset in accordance with the standard provisions required under 40 CFR 122.41(l)(6)(ii)(B) (24-hour notice). [40 CFR 122.41(n)(3)(iii)]
(d) The Copermittee complied with any remedial measures pursuant to the standard provisions required under 40 CFR 122.41(d). [40 CFR 122.41(n)(3)(iii)]

(4) *Burden of proof*. In any enforcement proceeding, the Copermittee seeking to establish the occurrence of an upset has the burden of proof. [40 CFR 122.41(n)(4)]

O. STANDARD PERMIT PROVISIONS FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS [40 CFR 122.42(c)]

The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the San Diego Water Board or State Water Board under 40 CFR 122.26(a)(1)(v) must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report must include:

(1) The status of implementing the components of the storm water management program that are established as permit conditions; [40 CFR 122.42(c)(1)]

(2) Proposed changes to the storm water management programs that are established as permit conditions. Such proposed changes must be consistent with 40 CFR 122.26(d)(2)(iii); [40 CFR 122.42(c)(2)] and

(3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under 40 CFR 122.26(d)(2)(iv) and (v); [40 CFR 122.42(c)(3)]

(4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; [40 CFR 122.42(c)(4)]

(5) Annual expenditures and budget for year following each annual report; [40 CFR 122.42(c)(5)]

(6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; [40 CFR 122.42(c)(6)]

(7) Identification of water quality improvements or degradation. [40 CFR 122.42(c)(7)]

p. STANDARD PERMIT PROVISIONS FOR STORM WATER DISCHARGES [40 CFR 122.42(d)]

The initial permits for discharges composed entirely of storm water issued pursuant to 40 CFR 122.26(e)(7) must require compliance with the conditions of the permit as expeditiously as practicable, but in no event later than three years after the date of issuance of the permit.

2. General Provisions

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. The general provisions applicable to this Order and NPDES permit are as follows:

a. DISCHARGE OF WASTE IS A PRIVILEGE

No discharge of waste into the waters of the State, whether or not such discharge is made pursuant to waste discharge requirements, shall create a vested right to continue such discharge. All discharges of waste into waters of the State are privileges, not rights. [CWC Section 13263(g)]

b. DURATION OF ORDER AND NPDES PERMIT

(1) *Effective date*. This Order and NPDES permit becomes effective on the date of its adoption provided the USEPA has no objection. If the USEPA objects to its issuance, this Order shall not become effective until such objection is withdrawn. This Order supersedes Order No. R9-2007-0001 upon the effective date of this Order, and supercedes Order Nos. R9-2009-0002 and R9-2010-0016 upon their expiration.

(2) *Expiration*. This Order and NPDES permit expires five years after adoption. [40 CFR 122.46(a)]

(3) *Continuation of expired order*. After this Order and NPDES permit expires, the terms and conditions of this Order and NPDES permit are automatically continued pending issuance of a new permit if all requirements of the federal NPDES regulations on the continuation of expired permits (40 CFR 122.6) are complied with.

c. AVAILABILITY

A copy of this Order must be kept at a readily accessible location and must be available to on-site personnel at all times.

d. CONFIDENTIALITY OF INFORMATION

Except as provided for in 40 CFR 122.7, no information or documents submitted in accordance with or in application for this Order will be considered confidential, and all such information and documents shall be available for review by the public at the San Diego Water Board office.

Claims of confidentiality for the following information will be denied: [40 CFR 122.7(b)]

(1) The name and address of any permit applicant or Copermittee; [40 CFR 122.7(b)(1)] and

(2) Permit applications and attachments, permits, and effluent data. [40 CFR 122.7(b)(2)]

e. EFFLUENT LIMITATIONS

(1) *Interim effluent limitations*. The Copermittee must comply with any interim effluent limitations as established by addendum, enforcement action, or revised waste discharge requirements which have been, or may be, adopted by the San Diego Water Board.

(2) *Other effluent limitations and standards*. If any applicable toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant and that standard or prohibition is more stringent than any limitation on the pollutant in the permit, the San Diego Water Board shall institute proceedings under these regulations to modify or revoke and reissue the permit to conform to the toxic effluent standard or prohibition. [40 CFR 122.44(b)(1)]

f. DUTY TO MINIMIZE OR CORRECT ADVERSE IMPACTS

The Copermittee must take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this Order, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the noncompliance.

g. PERMIT ACTIONS

The filing of a request by the Copermittee for modification, revocation and reissuance, or termination of this Order, or a notification of planned change in or anticipated noncompliance with this Order does not stay any condition of this Order. (See 40 CFR 122.41(f)) In addition, the following provisions apply to this Order:

(1) Upon application by any affected person, or on its own motion, the San Diego Water Board may review and revise the requirements in this Order. All requirements must be reviewed periodically. [CWC Section 13263(e)]

(2) This Order may be terminated or modified for cause, including, but not limited to, all of the following: [CWC Section 13381]

(a) Violation of any condition contained in the requirements of this Order. [CWC Section 13381(a)]

(b) Obtaining the requirements in this Order by misrepresentation, or failure to disclose fully all relevant facts. [CWC Section 13381(b)]

(c) A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge. [CWC Section 13381(c)]

(3) When this Order is transferred to a new owner or operator, such requirements as may be necessary under the CWC may be incorporated into this Order.

h. NPDES Permitted Non-Storm Water Discharges

The San Diego Water Board has, in prior years, issued a limited number of individual NPDES permits for non-storm water discharges to MS4s. The San Diego Water Board or State Water Board may in the future, upon prior notice to the Copermittee(s), issue an NPDES permit for any non-storm water discharge (or class of non-storm water discharges) to an MS4.

i. Monitoring

In addition to the standard provisions required under 40 CFR 122.41(j) and (l)(4), the following general monitoring provisions apply to this Order:

(1) Where procedures are not otherwise specified in Order, sampling, analysis and quality assurance/quality control must be conducted in accordance with the Quality Assurance Management Plan (QAMP) for the State of California's Surface Water Ambient Monitoring Program (SWAMP), adopted by the State Water Resources Control Board (State Water Board).

(2) Pursuant to 40 CFR 122.41(j)(2) and CWC Section 13383(a), each Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five (5) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time.

(3) All chemical, bacteriological, and toxicity analyses must be conducted at a laboratory certified for such analyses by the California Department of Public Health or a laboratory approved by the San Diego Water Board.

(4) For priority toxic pollutants that are identified in the California Toxics Rule (CTR) (65 Fed. Reg. 31682), the Copermittees must instruct their laboratories to establish calibration standards that are equivalent to or lower than the Minimum Levels (MLs) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP). If a Copermittee can demonstrate that a particular ML is not attainable, in accordance

with procedures set forth in 40 CFR Part 136, the lowest quantifiable concentration of the lowest calibration standard analyzed by a specific analytical procedure (assuming that all the method specified sample weights, volumes, and processing steps have been followed) may be used instead of the ML listed in Appendix 4 of the SIP. The Copermittee must submit documentation from the laboratory to the San Diego Water Board for approval prior to raising the ML for any priority toxic pollutant.

j. ENFORCEMENT

(1) The San Diego Water Board is authorized to enforce the terms of this Order under several provisions of the CWC, including, but not limited to, CWC Sections 13385, 13386, and 13387.

(2) Nothing in this Order shall be construed to protect the Copermittee from its liabilities under federal, state, or local laws.

(3) The CWC provides for civil and criminal penalties comparable to, and in some cases greater than, those provided for under the CWA.

(4) Except as provided in the standard conditions required under 40 CFR 122.41(m) and (n), nothing in this Order shall be construed to relieve the Copermittee from civil or criminal penalties for noncompliance.

(5) Nothing in this Order shall be construed to preclude the institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties to which the Copermittee is or may be subject to under Section 311 of the CWA.

(6) Nothing in this Order shall be construed to preclude institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authoring preserved by Section 510 of the CWA.

k. SEVERABILITY

The provisions of this Order are severable, and if any provision of this Order, or the application of any provisions of this Order to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this Order shall not be affected thereby.

l. APPLICATIONS

Any application submitted by a Copermittee for reissuance or modification of this Order must satisfy all applicable requirements specified in federal regulations as well as any additional requirements for submittal of a Report of Waste Discharge specified in the CWC and the California Code of Regulations.

m. IMPLEMENTATION

All plans, reports and subsequent amendments submitted in compliance with this Order must be implemented immediately (or as otherwise specified). All submittals by Copermittees must be adequate to implement the requirements of this Order.

n. REPORT SUBMITTALS

(1) All report submittals must include an executive summary, introduction, conclusion, recommendations, and signed certified statement.

(2) Each Copermittee must submit a signed certified statement covering its responsibilities for each applicable submittal.

(3) The Principal Watershed Copermittee(s) must submit a signed certified statement covering its responsibilities for each applicable submittal and the sections of the submittals for which it is responsible.

(4) Unless otherwise directed, the Copermittees must submit one hard copy and one electronic copy of each report required under this Order to the San Diego Water Board, and one electronic copy to the USEPA.

(5) The Copermittees must submit reports and provide notifications as required by this Order to the following:

EXECUTIVE OFFICER
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
9174 SKY PARK COURT, SUITE 100
SAN DIEGO CA 92123-4340
Telephone: (858) 467-2952 Fax: (858) 571-6972

EUGENE BROMLEY
US ENVIRONMENTAL PROTECTION AGENCY
REGION IX
PERMITS ISSUANCE SECTION (W-5-1)
75 HAWTHORNE STREET
SAN FRANCISCO CA 94105

ADMINISTRATIVE DRAFT

ATTACHMENT C

ACRONYMS AND ABBREVIATIONS

AMAL	Average Monthly Action Level
ASBS	Area(s) of Special Biological Significance
BMP	Best Management Practice
~~BMP Design Manual~~	~~Permanent BMP Sizing Criteria Design Manual~~
Basin Plan	Water Quality Control Plan for the San Diego Basin
CEQA	California Environmental Quality Act
CCR	California Code of Regulations
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWC	California Water Code
CZARA	Coastal Zone Act Reauthorization Amendments of 1990
~~ERP~~	~~Enforcement Response Plan~~
ESAs	Environmentally Sensitive Areas
GIS	Geographic Information System
IBI	Index of Biotic Integrity
LID	Low Impact Development
MDAL	Maximum Daily Action Level
MEP	Maximum Extent Practicable
~~ML~~	~~Minimum Level~~
MS4	Municipal Separate Storm Sewer System
NAL	Non-Storm Water Action Level
NAICS	North American Industry Classification System
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
ROWD	Report of Waste Discharge (application for NPDES reissuance)
SAL	Storm Water Action Level
San Diego Water Board	California Regional Water Quality Control Board, San Diego Region
SIC	Standard Industrial Classification Code
State Water Board	State Water Resources Control Board
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
WDID	Waste Discharge Identification Number
WLA	Waste Load Allocation
WQBEL	Water Quality Based Effluent Limitation

ADMINISTRATIVE DRAFT

DEFINITIONS

Active/Passive Sediment Treatment - Using mechanical, electrical or chemical means to flocculate or coagulate suspended sediment for removal from runoff from construction sites prior to discharge.

Anthropogenic Litter – Trash generated from human activities, not including sediment.

Average Monthly Action Level – The highest allowable average of daily discharges over a calendar month~~, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month~~.

Beneficial Uses - The uses of water necessary for the survival or well being of man, plants, and wildlife. These uses of water serve to promote tangible and intangible economic, social, and environmental goals. "Beneficial Uses" of the waters of the State that may be protected include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. Existing beneficial uses are uses that were attained in the surface or ground water on or after November 28, 1975; and potential beneficial uses are uses that would probably develop in future years through the implementation of various control measures. "Beneficial Uses" are equivalent to "Designated Uses" under federal law. [California Water Code Section 13050(f)].

Best Management Practices (BMPs) - Defined in 40 CFR 122.2 as schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. ~~In the case of municipal storm water permits, BMPs may be used in place of numeric effluent limits.~~

Bioassessment - The use of biological community information to evaluate the biological integrity of a water body and its watershed. With respect to aquatic ecosystems, bioassessment is the collection and analysis of samples of the benthic macroinvertebrate community together with physical/habitat quality measurements associated with the sampling site and the watershed to evaluate the biological condition (i.e. biotic integrity) of a water body.

~~**Biocriteria** - Under the CWA, numerical values or narrative expressions that define a desired biological condition for a water body that are legally enforceable. The USEPA defines biocriteria as: "numerical values or narrative expressions that describe the reference biological integrity of aquatic communities inhabiting waters of a given designated aquatic life use… (that)…describe the characteristics of water body segments least impaired by human activities."~~

Biofiltration - Practices that use vegetation and amended soils to detain and treat runoff from impervious areas. Treatment is through filtration, infiltration, adsorption, ion exchange, and biological uptake of pollutants.

Biological Integrity - Defined in Karr J.R. and D.R. Dudley. 1981. Ecological perspective on water quality goals. *Environmental Management* 5:55-68 as: "A balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitat of the region." Also referred to as ecosystem health.

BMP Design Manual – A plan developed to eliminate, reduce, or mitigate the impacts of runoff from development projects, including Priority Development Projects.

Clean Water Act Section 303(d) Water Body - An impaired water body in which water quality does not meet applicable water quality standards and/or is not expected to meet water quality standards, even after the application of technology based pollution controls required by the CWA. The discharge of runoff to these water bodies by the Copermittees is significant because these discharges can cause or contribute to violations of applicable water quality standards.

Construction Site – Any project, including projects requiring coverage under the Construction General Permit, that involves soil disturbing activities including, but not limited to, clearing, grading, disturbances to ground such as stockpiling, and excavation.

Contamination - As defined in the Porter-Cologne Water Quality Control Act, contamination is "an impairment of the quality of waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste whether or not waters of the State are affected."

Copermittee – An incorporated city within the County of Orange, County of Riverside, or County of San Diego in the San Diego Region, the County of Orange, the County of Riverside, the County of San Diego, the Orange County Flood Control District, the Riverside County Water Conservation and Flood Control District, the San Diego Regional Airport Authority, or the San Diego Unified Port District ~~of San Diego~~.

Copermittees – All of the individual Copermittees, collectively.

Critical Channel Flow (Qc) – The channel flow that produces the critical shear stress that initiates bed movement or that erodes the toe of channel banks. When measuring Qc, it should be based on the weakest boundary material – either bed or bank.

Daily Discharge – Defined as either: (1) the total mass of the constituent discharged over the calendar day or any 24 hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g. concentration.)

The Daily Discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day, or other 24 hour period other than a day), or by the arithmetic mean of analytical results from one or more grab samples taken over the course of a day.

Development Projects - Construction, rehabilitation, redevelopment, or reconstruction of any public or private residential project, industrial, commercial, or any other projects.

Dry Season – ~~The period of time from~~ May 1 to September 30 ~~when rainfall is not expected to occur the San Diego~~.

Dry Weather – Weather is considered dry if the preceding 72 hours has been without measurable precipitation (>0.1 inch).

Enclosed Bays – Enclosed bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost bay works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays do not include inland surface waters or ocean waters.

Erosion – When land is diminished or worn away due to wind, water, or glacial ice. Often the eroded debris (silt or sediment) becomes a pollutant via storm water runoff. Erosion occurs naturally but can be intensified by land clearing activities such as farming, development, road building, and timber harvesting.

Environmentally Sensitive Areas (ESAs) - Areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; areas designated as preserves or their equivalent under the Natural Communities Conservation Program within the Cities and County of Orange; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.

Estuaries – Waters, including coastal lagoons, located at the mouth of streams that serve as areas of mixing fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and ocean water. Estuaries do not include inland surface waters or ocean waters.

Existing Development – Any area that has been developed and exists for municipal, commercial, industrial, or residential purposes, uses, or activities. May include areas that are not actively used for its originally developed purpose, but may be re-purposed or redeveloped for another use or activity.

Flow Duration – The long-term period of time that flows occur above a threshold that causes significant sediment transport and may cause excessive erosion damage to creeks and streams (not a single storm event duration). The simplest way to visualize this is to consider a histogram of pre- and post-project flows using long-term records of hourly data. To maintain pre-development flow duration means that the total number of hours (counts) within each range of flows in a flow-duration histogram cannot increase between the pre- and post-development condition. Flow duration within the range of geomorphologically significant flows is important for managing erosion.

Grading - The cutting and/or filling of the land surface to a desired slope or elevation.

Hazardous Material – Any substance that poses a threat to human health or the environment due to its toxicity, corrosiveness, ignitability, explosive nature or chemical reactivity. These also include materials named by the USEPA in 40 CFR 116 to be reported if a designated quantity of the material is spilled into the waters of the U.S. or emitted into the environment.

Hazardous Waste - Hazardous waste is defined as “any waste which, under Section 600 of Title 22 of this code, is required to be managed according to Chapter 30 of Division 4.5 of Title 22 of this code” [CCR Title 22, Division 4.5, Chapter 11, Article 1].

Household Hazardous Waste – Paints, cleaning products, and other wastes generated during home improvement or maintenance activities.

Hydromodification – The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, interflow and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

Illicit Connection – Any connection to the MS4 that conveys an illicit discharge.

Illicit Discharge - Any discharge to the MS4 that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from fire fighting activities [40 CFR 122.26(b)(2)].

Inactive Areas – Areas of construction activity that are not active and those that have been active and are not scheduled to be re-disturbed for at least 14 days.

Infiltration – Water other than wastewater that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow [40 CFR 35.2005(20)].

Inland Surface Waters – Includes all surface waters of the State that do not include the ocean, enclosed bays, or estuaries.

Jurisdictional Runoff Management Program Document – A written description of the specific jurisdictional runoff management measures and programs that each Copermittee will implement to comply with this Order and ensure that storm water pollutant discharges in runoff are reduced to the MEP and do not cause or contribute to a violation of water quality standards.

Low Impact Development (LID) – A storm water management and land development strategy that emphasizes conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions.

Low Impact Development Best Management Practices (LID BMPs) – LID BMPs include schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States through storm water management and land development strategies that emphasize conservation sand the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions. LID BMPs include retention practices that do not allow runoff, such as infiltration, rain water harvesting and reuse, and evapotranspiration. LID BMPs also include flow-through practices such as biofiltration that may have some discharge of storm water following pollutant reduction.

Major Outfall – As defined in the Code of Federal Regulations, a major outfall is a MS4 outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent

(i.e. discharge from a single conveyance other than a circular pipe which is associated with a drainage are of more than 50 acres); or, for MS4s that receive storm water from lands zoned for industrial activity (based on comprehensive zoning plans or equivalent), a MS4 outfall that discharges from a single pipe with an inside diameter of 12 inches or more or from its equivalent (i.e. discharge from other than a circular pipe associated with a drainage area of 2 acres or more).

Maximum Daily Action Level (MDAL) –The highest allowable daily discharge of a pollutant, over a calendar day (or 24 hour period). For pollutants with action levels expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with action levels expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

Maximum Extent Practicable (MEP) – The technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) for storm water that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) in combination with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than BAT. A definition for MEP is not provided either in the statute or in the regulations. Instead the definition of MEP is dynamic and will be defined by the following process over time: municipalities propose their definition of MEP by way of their runoff management programs. Their total collective and individual activities conducted pursuant to the runoff management programs becomes their proposal for MEP as it applies both to their overall effort, as well as to specific activities (e.g., MEP for street sweeping, or MEP for MS4 maintenance). In the absence of a proposal acceptable to the San Diego Water Board, the San Diego Water Board defines MEP.

In a memo dated February 11, 1993, entitled "Definition of Maximum Extent Practicable," Elizabeth Jennings, Senior Staff Counsel, SWRCB addressed the achievement of the MEP standard as follows:

> "*To achieve the MEP standard, municipalities must employ whatever Best Management Practices (BMPs) are technically feasible (i.e., are likely to be effective) and are not cost prohibitive. The major emphasis is on technical feasibility. Reducing pollutants to the MEP means choosing effective BMPs, and rejecting applicable BMPs only where other effective BMPs will serve the same purpose, or the BMPs would not be technically feasible, or the cost would be prohibitive. In selecting BMPs to achieve the MEP standard, the following factors may be useful to consider:*
>
> *a. Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?*
> *b. Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?*
> *c. Public Acceptance: Does the BMP have public support?*
> *d. Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?*
> *e. Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc.?*
>
> *The final determination regarding whether a municipality has reduced pollutants to the maximum extent practicable can only be made by the Regional or State Water Boards, and*

not by the municipal discharger. If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit derived, it would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs that would address a pollutant source, or to pick a BMP based solely on cost, which would be clearly less effective. In selecting BMPs the municipality must make a serious attempt to comply and practical solutions may not be lightly rejected. In any case, the burden would be on the municipal discharger to show compliance with its permit. After selecting a menu of BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented."

Monitoring Year – October 1 to September 30 ~~The monitoring year begins annually on July 1st and ends on June 30th.~~

Municipal Separate Storm Sewer System (MS4) – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designated or used for collecting or conveying storm water; (iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.26.

National Pollutant Discharge Elimination System (NPDES) - The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the CWA.

Non-Storm Water - All discharges to and from a MS4 that do not originate from precipitation events (i.e., all discharges from a MS4 other than storm water). Non-storm water includes illicit discharges and NPDES permitted discharges.

Nuisance - As defined in the Porter-Cologne Water Quality Control Act, a nuisance is "anything which meets all of the following requirements: 1) Is injurious to health, or is indecent, or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. 2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. 3) Occurs during, or as a result of, the treatment or disposal of wastes."

Ocean Waters – the territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the State Board's California Ocean Plan.

Order – Unless otherwise specified, refers to this Order, Order No. R9-2013-0001 ~~2012-0011~~ (NPDES No. CAS0109266)

~~**Permanent BMP Sizing Criteria Design Manual** – A plan developed to eliminate, reduce, or mitigate the impacts of runoff from development projects, including Priority Development Projects.~~

Persistent Flow - Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

Person - A person is defined as an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof [40 CFR 122.2].

Point Source - Any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, landfill leachate collection systems, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

Pollutant - Any agent that may cause or contribute to the degradation of water quality such that a condition of pollution or contamination is created or aggravated.

Pollution - As defined in the Porter-Cologne Water Quality Control Act, pollution is "the alteration of the quality of the waters of the State by waste, to a degree that unreasonably affects the either of the following: 1) The waters for beneficial uses; or 2) Facilities that serve these beneficial uses." Pollution may include contamination.

Pollution Prevention - Pollution prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control BMPs, treatment control BMPs, or disposal.

~~**Permanent BMPs** - A subset of BMPs including structural and non-structural controls which detain, retain, filter, remove, or educate to prevent the release of pollutants to surface waters from development projects in perpetuity, after construction of a project is completed.~~

Pre-Development Runoff Conditions ~~**(Discharge Rates, Durations, Etc.)**~~ – Runoff conditions that existed onsite before the existing development was constructed, or exists onsite before planned development activities occur. ~~This definition includes natural watershed hydrology before any human induced land alterations.~~

Priority Development Projects - New development and redevelopment projects defined under Provision E.3.b of Order No. R9-2012-0011.

Rainy Season (aka Wet Season) – ~~The period of time from~~ October 1 to April 30 ~~when the San Diego Region experiences the most rainfall.~~

Receiving Waters – Waters of the United States.

Receiving Water Limitations - Waste discharge requirements issued by the San Diego Water Board typically include both: (1) "Effluent Limitations" (or "Discharge Limitations") that specify the technology-based or water-quality-based effluent limitations; and (2) "Receiving Water Limitations" that specify the water quality objectives in the Basin Plan as well as any other limitations necessary to attain those objectives. In summary, the "Receiving Water Limitations" provision is the provision used to implement the requirement of CWA section 301(b)(1)(C) that NPDES permits must include any more stringent limitations necessary to meet water quality standards.

Redevelopment - The creation, addition, and or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include trenching and resurfacing associated with utility work; resurfacing existing roadways; new sidewalk construction, pedestrian ramps, or bike lane on existing roads; and routine replacement of damaged pavement, such as pothole repair.

Reporting Period – The period of information that is reported in the Annual Report. The reporting period consists of two components: 1) July 1 to June 30, consistent with the fiscal year, for the implementation of the jurisdictional runoff management programs, and 2) October 1 to September 30, consistent with the monitoring year for the monitoring and assessment programs. Together, these two time periods constitute the reporting year for the Annual Report due January 31 following the end of the monitoring year.

Retain –Keep or hold in a particular place, condition, or position without discharge to surface waters.

Retrofitting – Storm water management practice put into place after development has occurred in watersheds where the practices previously did not exist. Retrofitting of developed areas is intended to improve water quality, protect downstream channels, reduce flooding, or meet other specific objectives. Retrofitting developed areas may include, but is not limited to replacing roofs with green roofs, disconnecting downspouts or impervious surfaces to drain to pervious surfaces, replacing impervious surfaces with pervious surfaces, installing rain barrels, installing rain gardens, and trash area enclosures.

Runoff - All flows in a storm water conveyance system that consists of the following components: (1) storm water (wet weather flows) and (2) non-storm water including dry weather flows.

San Diego Water Board – As used in this document the term "San Diego Water Board" is synonymous with the term "Regional Board" as defined in Water Code section 13050(b) and is intended to refer to the California Regional Water Quality Control Board for the San Diego Region as specified in Water Code Section 13200.

Sediment - Soil, sand, and minerals washed from land into water. Sediment resulting from anthropogenic sources (i.e. human induced land disturbance activities) is considered a pollutant. This Order regulates only the discharges of sediment from anthropogenic sources and does not regulate naturally occurring sources of sediment. Sediment can destroy fish-nesting areas, clog animal habitats, and cloud waters so that sunlight does not reach aquatic plants.

~~**Shared Treatment Control BMP** - BMPs used by multiple developments to infiltrate, filter, or treat the required volume or flow prior to discharge to a receiving water. This could include, for example, a treatment BMP at the end of an enclosed storm drain that collects runoff from several commercial developments.~~

Source Control BMP – Land use or site planning practices, or structural or nonstructural measures that aim to prevent runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between pollutants and runoff.

~~**State Water Quality Protection Area –** A nonterrestrial marine or estuarine area designated to protect marine species or biological communities from an undesirable alteration in natural water quality, including, but not limited to, areas of special biological significance that have been designated by the State Water Board through its water quality control planning process. Areas of special biological significance are a subset of State Water Quality Protection Areas, and require special protection as determined by the State Water Resources Control Board pursuant to the California Ocean Plan adopted and reviewed pursuant to Article 4 (commencing with Section 13160) of Chapter 3 of Division 7 of the California Water Code and pursuant to the Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California (California Thermal Plan) adopted by the State Water Board.~~

Storm Water – Per 40 CFR 122.26(b)(13), means storm water runoff, snowmelt runoff and surface runoff and drainage. Surface runoff and drainage pertains to runoff and drainage resulting from precipitation events.

Stream, Channel, or Habitat Rehabilitation – Measures or activities for the purpose of improving or restoring the environmental health (i.e. physical, chemical and biological integrity) of streams, channels, or river systems. Rehabilitation techniques may include, but are not limited to, riparian zone restoration, constructed wetlands, bank stabilization, channel reconfiguration, and daylighting drainage systems.

Structural BMPs - A subset of BMPs which detains, retains, filters, removes, or prevents the release of pollutants to surface waters from development projects in perpetuity, after construction of a project is completed.

Total Maximum Daily Load (TMDL) - The maximum amount of a pollutant that can be discharged into a water body from all sources (point and non-point) and still maintain water quality standards. Under CWA section 303(d), TMDLs must be developed for all water bodies that do not meet water quality standards after application of technology-based controls.

Toxicity - Adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies). The water quality objectives for toxicity provided in the Basin Plan, state in part…"All waters shall be free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life….The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge".

Treatment Control BMP – Any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media absorption or any other physical, biological, or chemical process.

Unpaved Road – Any long, narrow stretch without pavement used for traveling by motor passenger vehicles between two or more points. Unpaved roads are generally constructed of dirt, gravel, aggregate or macadam and may be improved or unimproved.

Waste - As defined in CWC Section 13050(d), "waste includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal."

Article 2 of CCR Title 23, Chapter 15 (Chapter 15) contains a waste classification system that applies to solid and semi-solid waste, which cannot be discharged directly or indirectly to water of the state and which therefore must be discharged to land for treatment, storage, or disposal in accordance with Chapter 15. There are four classifications of waste (listed in order of highest to lowest threat to water quality): hazardous waste, designated waste, non-hazardous solid waste, and inert waste.

Water Quality Objective - Numerical or narrative limits on constituents or characteristics of water designated to protect designated beneficial uses of the water. [California Water Code Section 13050 (h)]. California's water quality objectives are established by the State and Regional Water Boards in the Water Quality Control Plans. Numeric or narrative limits for pollutants or characteristics of water designed to protect the beneficial uses of the water. In other words, a water quality objective is the maximum concentration of a pollutant that can exist in a receiving water and still generally ensure that the beneficial uses of the receiving water remain protected (i.e., not impaired). Since water quality objectives are designed specifically to protect the beneficial uses, when the objectives are violated the beneficial uses are, by definition, no longer protected and become impaired. This is a fundamental concept under the Porter Cologne Act. Equally fundamental is Porter Cologne's definition of pollution. A condition of pollution exists when the water quality needed to support designated beneficial uses has become unreasonably affected or impaired; in other words, when the water quality objectives have been violated. These underlying definitions (regarding beneficial use protection) are the reason why all waste discharge requirements implementing the federal NPDES regulations require compliance with water quality objectives. (Water quality objectives are also called water quality criteria in the CWA.)

Water Quality Standards - Water quality standards, as defined in Clean Water Act section 303(c) consist of the beneficial uses (e.g., swimming, fishing, municipal drinking water supply, etc.,) of a water body and criteria (referred to as water quality objectives in the California Water Code) necessary to protect those uses. Under the Water Code, the water boards establish beneficial uses and water quality objectives in water quality control or basin plans. Together with an anti-degradation policy, these beneficial uses and water quality objectives serve as water quality standards under the Clean Water Act. In Clean Water Act parlance, state beneficial uses are called "designated uses" and state water quality objectives are called "criteria." Throughout this Order, the relevant term is used depending on the statutory scheme.

Waters of the State - Any water, surface or underground, including saline waters within the boundaries of the State [CWC section 13050 (e)]. The definition of the Waters of the State is broader than that for the Waters of the United States in that all water in the State is considered to be a Waters of the State regardless of circumstances or condition. Under this definition, a MS4 is always considered to be a Waters of the State.

Waters of the United States - As defined in the 40 CFR 122.2, the Waters of the U.S. are defined as: "(a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate "wetlands;" (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters otherwise defined as waters of the United States under this definition: (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial seas; and (g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA."

Watershed - That geographical area which drains to a specified point on a water course, usually a confluence of streams or rivers (also known as drainage area, catchment, or river basin).

Wet Season (aka Rainy Season) – ~~The period of time from~~ October 1 to April 30 ~~when the San Diego Region experiences the most rainfall.~~

Wet Weather – Weather is considered wet if there is a storm event of 0.1 inches and greater and the following 72 hours, unless otherwise defined by another regulatory mechanism.

ATTACHMENT D

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

FY _____

I. COPERMITTEE INFORMATION

Copermittee Name:

Copermittee Primary Contact Name:

Copermittee Primary Contact Information:
Address:
City: County: State: Zip:
Telephone: Fax: Email:

II. LEGAL AUTHORITY

Has the Copermittee established adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 that complies with Order No. R9-2013~~2~~-000~~1~~1?	**YES**	☐
	NO	☐
A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority?	**YES**	☐
	NO	☐

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

Was an update of the jurisdictional runoff management program document required or recommended by the San Diego Water Board?	**YES**	☐
	NO	☐
If YES to the question above, did the Copermittee update its jurisdictional runoff management program document and make it available on the Regional Clearinghouse?	**YES**	☐
	NO	☐

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

Has the Copermittee implemented a program to actively detect and eliminate illicit discharges and connections to its MS4 that complies with Order No. R9-2013~~2~~-000~~1~~1?	**YES**	☐
	NO	☐

Number of non-storm water discharges reported by the public	
Number of non-storm water discharges detected by Copermittee staff or contractors	
Number of non-storm water discharges investigated by the Copermittee	
Number of sources of non-storm water discharges identified	
Number of non-storm water discharges eliminated	
Number of sources of illicit discharges or connections identified	
Number of illicit discharges or connections eliminated	
Number of enforcement actions issued	
Number of ~~high level~~ escalated enforcement actions issued	

V. DEVELOPMENT PLANNING PROGRAM

Has the Copermittee implemented a development planning program that complies with Order No. R9-2013~~2~~-000~~1~~1?	**YES**	☐
	NO	☐
Was an update to the ~~Permanent~~ BMP ~~Sizing Criteria~~ Design Manual required or recommended by the San Diego Water Board?	**YES**	☐
	NO	☐
If YES to the question above, did the Copermittee update its ~~Permanent~~ BMP ~~Sizing Criteria~~ Design Manual and make it available on the Regional Clearinghouse?	**YES**	☐
	NO	☐

Number of proposed development projects in review	
Number of Priority Development Projects in review	
Number of Priority Development Projects approved	
Number of approved Priority Development Projects exempt from any BMP requirements	
Number of approved Priority Development Projects allowed alternative compliance ~~requiring mitigation~~	
Number of Priority Development Projects granted occupancy	

Number of completed Priority Development Projects in inventory	
Number of high priority Priority Development Project ~~permanent~~ structural BMP inspections	
Number of Priority Development Project ~~permanent~~ structural BMP violations	

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
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Number of enforcement actions issued	
Number of ~~high level~~ escalated enforcement actions issued	

FY _____

VI. CONSTRUCTION MANAGEMENT PROGRAM

Has the Copermittee implemented a construction management program that complies with Order No. R9-2013~~2~~-000~~1~~1?	**YES**	☐
	NO	☐

Number of construction sites in inventory	
Number of active construction sites in inventory	
Number of inactive construction sites in inventory	
Number of construction sites closed/completed during reporting period	
Number of construction site inspections	
Number of construction site violations	
Number of enforcement actions issued	
Number of ~~high level~~ escalated enforcement actions issued	

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

Has the Copermittee implemented an existing development management program that complies with Order No. R9-2013~~2~~-000~~1~~1?	**YES**	☐
	NO	☐

	Municipal	Commercial	Industrial	Residential
Number of ~~existing developments~~ facilities or areas in inventory				
Number of existing development inspections				
Number of follow-up inspections				
Number of ~~existing development~~ violations				
Number of enforcement actions issued				
Number of ~~high level~~ escalated enforcement actions issued				

VIII. PUBLIC EDUCATION AND PARTICIPATION

Has the Copermittee implemented a public education program component that complies with Order No. R9-2013~~2~~-000~~1~~1?	**YES**	☐
	NO	☐
Has the Copermittee implemented a ~~mechanism for~~ public participation program component ~~and where necessary intergovernmental coordination~~ that complies with Order No. R9-2013~~2~~-000~~1~~1?	**YES**	☐
	NO	☐

IX. FISCAL ANALYSIS

Has the Copermittee attached to this form a summary of its fiscal analysis that complies with Order No. R9-2013~~2~~-000~~1~~1?	**YES**	☐
	NO	☐

X. CERTIFICATION

I [☐ Principal Executive Officer ☐ Ranking Elected Official ☐ Duly Authorized Representative] certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

_____ _____
Signature Date

_____ _____

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM

Print Name	Title
Telephone Number	Email

ADMINISTRATIVE DRAFT

ATTACHMENT E

SPECIFIC PROVISIONS FOR TOTAL MAXIMUM DAILY LOADS APPLICABLE TO ORDER NO. R9-2013-0001~~-2012-0011~~

These provisions implement Total Maximum Daily Loads (TMDLs), adopted by the San Diego Water Board and approved by USEPA under Clean Water Act section 303(c), which are applicable to discharges regulated under this Order. The provisions and schedules for implementation of the TMDLs described below must be incorporated into the Water Quality Improvement Plans, required pursuant to Provision B of this Order, for the specified Watershed Management Areas.

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed
2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin
3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed
4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek
5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay
6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2002-0123

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	August 14, 2002
State Water Board Approval Date:	July 16, 2003
Office of Administrative Law Approval Date:	September 11, 2003
US EPA Approval Date:	November 3, 2003

(3) TMDL Effective Date: September 11, 2003

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District ~~of San Diego~~

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for Chollas Creek consist of the following:

(1) Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedule under Specific Provision 1.c:

Table 1.1
Receiving Water Limitations as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Diazinon	Acute	0.08 µg/L	1 hour
	Chronic	0.05 µg/L	4 days

(2) Effluent Limitations

Discharges from the MS4s must not contain concentrations that exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 1.c:

Table 1.2
Effluent Limitations as Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation	Averaging Period
Diazinon	Acute	0.072 µg/L	1 hour
	Chronic	0.045 µg/L	4 days

(3) Best Management Practices

The following BMPs for Chollas Creek must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area and implemented by the Responsible Copermittees:

(a) The Responsible Copermittees must implement BMPs ~~capable of achieving~~ to support the achievement of the WQBELs under Specific Provision 1.b for Chollas Creek.

(b) The Responsible Copermittees must implement the Diazinon Toxicity Control Plan and Diazinon Public Outreach/Education Program as described in the report titled, *Technical Report for Total Maximum Daily Load for Diazinon in Chollas Creek Watershed, San Diego County*, dated August 14, 2002, including subsequent modifications, in order to achieve the WQBELs under Specific Provision 1.b.

(c) The Responsible Copermittees should coordinate ~~the~~ any BMPs implemented to address this TMDL with Caltrans ~~wherever and whenever~~ as possible.

c. COMPLIANCE SCHEDULE

The Responsible Copermittees ~~were~~ are required to achieve their respective WLAs by December 31, 2010. The Responsible Copermittees must be in compliance with the WQBELs under Specific Provision 1.b.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls for diazinon within the Chollas Creek watershed, and calculate or estimate the ~~monthly and~~ annual diazinon loads, in accordance with the requirements of Provisions D.2 ~~D.1~~, D.4.b.(1) ~~D.4.a.(1)(b)~~, and D.4.b.(2) ~~D.4.a.(3)(b)~~ of this Order. The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

e. COMPLIANCE DETERMINATION

Compliance with WQBELs of Specific Provision 1.b may be demonstrated via one of the following methods:

(1) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;

(2) There are no exceedances of the applicable receiving water limitations under Specific Provision 1.b.(1) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(3) There are no violations of the applicable effluent limitations under Specific Provision 1.b.(2) at the Responsible Copermittees' MS4 outfalls.

2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0019

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	September 22, 2005
Office of Administrative Law Approval Date:	December 2, 2005
US EPA Approval Date:	February 8, 2006

(3) TMDL Effective Date: December 2, 2005

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Shelter Island Yacht Basin

(6) Responsible Copermittees: City of San Diego, San Diego Unified Port District

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for Shelter Island Shoreline Park consist of the following:

(1) Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedule under Specific Provision 2.c:

Table 2.1
Receiving Water Limitations as Concentrations in Shelter Island Yacht Basin

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Dissolved Copper	Acute	4.8 µg/L	1 hour
	Chronic	3.1 µg/L	4 days

(2) Effluent Limitations

Discharges from the MS4s must not contain pollutant loads that exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 2.c:

Table 2.2
Effluent Limitations as Annual Loads in MS4 Discharges to Shelter Island Yacht Basin

Constituent	Effluent Limitation
Dissolved Copper	30 kg/yr

(3) Best Management Practices

The Responsible Copermittees must implement BMPs ~~capable of achieving~~ to support the achievement of the WQBELs under Specific Provision 2.b for Shelter Island Yacht Basin

c. Compliance Schedule

The Responsible Copermittees ~~was~~ are required to achieve ~~its~~ the MS4 WLA ~~upon the effective date of the TMDL,~~ by December 2, 2005. The Responsible Copermittee must be in compliance with the WQBELs under Specific Provision 2.b.

d. Specific Monitoring and Assessment Requirements

The Responsible Copermittees must monitor the effluent of its MS4 outfalls for dissolved copper, and calculate or estimate the monthly and annual dissolved copper loads, in accordance with the requirements of Provisions D.2 ~~D.1~~, D.4.b.(1) ~~D.4.a.(1)(b)~~, and D.4.(b)(2) ~~D.4.a.(3)(b)~~ of this Order. The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

e. Compliance Determination

Compliance with WQBELs of Specific Provision 2.b may be demonstrated via one of the following methods:

(1) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;

(2) There are no exceedances of the applicable receiving water limitations under Specific Provision 2.b.(1) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(3) There are no violations of the applicable effluent limitations under Specific Provision 2.b.(2) at the Responsible Copermittees' MS4 outfalls.

3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0036

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	November 16, 2005
Office of Administrative Law Approval Date:	February 1, 2006
US EPA Approval Date:	March 22, 2006

(3) TMDL Effective Date: February 1, 2006

(4) Watershed Management Area: Santa Margarita River

(5) Water Body: Rainbow Creek

(6) Responsible Copermittee: County of San Diego

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for Rainbow Creek consist of the following

(1) Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedule under Specific Provision 3.c.(1):

Table 3.1
Receiving Water Limitations as Concentrations in Rainbow Creek

Constituent	Receiving Water Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(2) Effluent Limitations

(a) Discharges from the MS4s must not contain concentrations that exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 3.c.(1):

Table 3.2
Effluent Limitations as Concentrations in MS4 Discharges to Rainbow Creek

Constituent	Effluent Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(b) Pollutant loads from given land uses discharging to and from the MS4s must not exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 3.c.(1):

Table 3.3
Effluent Limitations as Annual Loads in MS4 Discharges to Rainbow Creek

Land Use	Total N	Total P
Commercial nurseries	116 kg/yr	3 kg/yr
Park	3 kg/yr	0.1 kg/yr
Residential areas	149 kg/yr	12 kg/yr
Urban areas	27 kg/yr	6 kg/yr

Interim effluent limitations expressed as pollutant loads are given in the compliance schedule under Specific Provision 3.0.

(3) Best Management Practices

(a) The Responsible Copermittee must implement BMPs ~~capable of achieving~~ to support the achievement of the WQBELs under Specific Provision 3.b for Rainbow Creek.

(b) The Responsible Copermittee should coordinate the any BMPs implemented to address this TMDL with Caltrans and other sources ~~wherever and whenever~~ as possible.

c. Compliance Schedule

(1) ~~WLA~~ Compliance Date

The Responsible Copermittee ~~is required to achieve its WLAs, thus~~ must be in compliance with the WQBELs under Specific Provision 3.b, by December 31, 2021.

(2) Interim Compliance Requirements

Table 3.4
Interim Effluent Limitations as Annual Loads in MS4 Discharges from Specific Land Uses to Rainbow Creek

	Total N Interim Effluent Limitations (kg/yr)			Total P Interim Effluent Limitations (kg/yr)		
	Interim Compliance Date			Interim Compliance Date		
Land Use	**2009**	**2013**	**2017**	**2009**	**2013**	**2017**
Commercial nurseries	3909	299	196	20	16	10
Park	5	3	3	0.15	0.10	0.10
Residential areas	507	390	260	99	74	47
Urban areas	40	27	27	9	6	6

d. Specific Monitoring and Assessment Requirements

The Responsible Copermittee must implement the Sampling and Analysis Plan for Rainbow Creek Nutrient Reduction TMDL Implementation Water Quality Monitoring, dated January 2010. The results of any monitoring conducted during the reporting period, and assessment of whether the interim and final WQBELs have been achieved must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

e. Compliance Determination

(1) Compliance with interim compliance requirements of Specific Provision 3.c.(2) may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water;

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 3.b.(1) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls;

(c) There are no violations of the applicable effluent limitations under Specific Provision 3.b.(2)(a) at the Responsible Copermittee's MS4 outfalls;

(d) The pollutant loads from given land uses discharging to and from the MS4s do not exceed the applicable effluent limitations under Specific Provision 3.b.(2)(b); OR

(e) The Responsible Copermittee has submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim compliance requirements will be achieved by the interim compliance dates.

(2) Compliance with WQBELs of Specific Provision 3.b may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water;

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 3.b.(1) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls;

(c) There are no violations of the applicable effluent limitations under Specific Provision 3.b.(2)(a) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant loads from given land uses discharging to and from the MS4s do not exceed the applicable effluent limitations under Specific Provision 3.b.(2)(b).

4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2007-0043

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2007
State Water Board Approval Date:	July 15, 2008
Office of Administrative Law Approval Date:	October 22, 2008
US EPA Approval Date:	December 18, 2008

(3) TMDL Effective Date: October 22, 2008

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District ~~of San Diego~~

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for Chollas Creek consist of the following:

(1) Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedule under Specific Provision 4.c.(1):

Table 4.1
Receiving Water Limitations as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$(0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$(0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$(0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$(0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER.

(2) Effluent Limitations

Discharges from the MS4s must not contain pollutant loads that exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 4.c.(1):

Table 4.2
Effluent Limitations as Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER.

(3) Best Management Practices

(a) The Responsible Copermittees must implement BMPs ~~capable of achieving~~ to support the achievement of the WQBELs under Specific Provision 4.b for Chollas Creek.

(b) The Responsible Copermittees should coordinate ~~the~~ any BMPs implemented to address this TMDL with Caltrans and the U.S. Navy ~~wherever and whenever~~ as possible.

c. Compliance Schedule

(1) WLA Compliance Date

The Responsible Copermittees ~~is~~ are required to achieve the WLA, thus must be in compliance with the WQBELs under Specific Provision 4.b, by October 22, 2028.

(2) Interim Compliance Requirements

The Responsible Copermittee must comply with the following interim WQBELs by the interim compliance date:

Table 4.3
Interim Effluent Limitations as Concentrations in MS4 Discharges to Chollas Creek

Interim Compliance Date	Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
October 22, 2018	Dissolved Copper	Acute	1.2 x 90% x (0.96) x $e^{[0.9422 \times \ln(\text{hardness}) - 1.700]}$ x WER*	1 hour
		Chronic	1.2 x 90% x (0.96) x $e^{[0.8545 \times \ln(\text{hardness}) - 1.702]}$ x WER*	4 days
	Dissolved Lead	Acute	1.2 x 90% x [1.46203 – 0.145712 x ln(hardness)] x $e^{[1.273 \times \ln(\text{hardness}) - 1.460]}$ x WER*	1 hour
		Chronic	1.2 x 90% x [1.46203 – 0.145712 x ln(hardness)] x $e^{[1.273 \times \ln(\text{hardness}) - 4.705]}$ x WER*	4 days
	Dissolved Zinc	Acute	1.2 x 90% x (0.978) x $e^{[0.8473 \times \ln(\text{hardness}) + 0.884]}$ x WER*	1 hour
		Chronic	1.2 x 90% x (0.986) x $e^{[0.8473 \times \ln(\text{hardness}) + 0.884]}$ x WER*	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER.

d. Specific Monitoring and Assessment Requirements

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*, when it is amended to include monitoring requirements for the Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls discharging to Chollas Creek for dissolved copper, lead, and zinc, and calculate or estimate the monthly and annual dissolved copper, lead, and zinc loads, in accordance with the requirements of Provisions D.2 ~~D.1~~, D.4.b.(1) ~~D.4.a.(1)(b)~~, and D.4.b.(2) ~~D.4.a.(3)(b)~~ of this Order. The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

e. COMPLIANCE DETERMINATION

(1) Compliance with interim compliance requirements of Specific Provision 4.c.(2) may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 4.b.(1) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls;

(c) There are no violations of the applicable effluent limitations under Specific Provision 4.b.(2) at the Responsible Copermittees' MS4 outfalls; OR

(d) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim compliance requirements will be achieved by the interim compliance dates.

(2) Compliance with WQBELs of Specific Provision 4.b may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 4.b.(1) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(c) There are no violations of the applicable effluent limitations under Specific Provision 4.b.(2) at the Responsible Copermittees' MS4 outfalls.

5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2008-0027

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 11, 2008
State Water Board Approval Date:	June 16, 2009
Office of Administrative Law Approval Date:	September 15, 2009
US EPA Approval Date:	October 26, 2009

(3) TMDL Effective Date: September 15, 2009

(4) Watershed Management Areas: See Table 5.0

(5) Water Bodies: See Table 5.0

(6) Responsible Copermittees: See Table 5.0

Table 5.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County	Dana Point Harbor	Baby Beach	-City of Dana Point -County of Orange
San Diego Bay	San Diego Bay	Shelter Island Shoreline Park	- San Diego Unified Port District ~~of San Diego~~

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Receiving Water Limitations

(a) Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedules under Specific Provisions 5.c.(1)(a) and 5.c.(2):

Table 5.1
Receiving Water Limitations as Bacteria Densities in the Water Body

	Receiving Water Limitations	
Constituent	**Single Sample Maximum[1,2]**	**30-Day Geometric Mean[2]**
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.

(b) If the above receiving water limitations are not met in the receiving water, the Responsible Copermittees must demonstrate that the discharges from the MS4s are not causing or contributing to the ~~violation~~ exceedance of receiving water limitations. ~~The Copermittee must provide data that demonstrate the discharges from the MS4s are meeting the effluent limitations under Specific Provision 5.b.(2).~~

(2) Effluent Limitations

Discharges from the MS4s must not contain densities that exceed the following effluent limitations by the end of the compliance schedules under Specific Provisions 5.c.(1)(a) and 5.c.(2) to demonstrate the discharge is not causing or contributing to a violation of receiving water quality standards:

Table 5.2
Effluent Limitations as Bacteria Densities in MS4 Discharges to the Water Body

	Effluent Limitations	
Constituent	**Single Sample Maximum[1,2]**	**30-Day Geometric Mean[2]**
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.

Interim effluent limitations expressed as pollutant loads are given in the compliance schedule under Specific Provision 5.c.

(3) Best Management Practices

(a) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 5.0 ~~fulfill~~ must incorporate the Bacteria Load Reduction Plan (BLRP) ~~requirements in~~ required to be developed pursuant to Resolution No. R9-2008-0027.

(b) The Responsible Copermittee must implement BMPs ~~capable of achieving~~ to support the achievement of the WQBELs under Specific Provision 5.0 for the segments or areas of the water bodies listed in Table 5.0

c. COMPLIANCE SCHEDULE

(1) Baby Beach in Dana Point Harbor

(a) WLA Compliance Dates

The Responsible Copermittees for MS4 discharges to Baby Beach are required to achieve the WLA, thus must be in compliance with the WQBELs under Specific Provision 5.0, according to the following compliance schedule:

Table 5.3
Compliance Schedule Dates to Achieve Baby Beach WLAs

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform	September 15, 2014	September 15, 2009
Fecal Coliform		September 15, 2009
Enterococcus		September 15, 2019

(b) Interim Compliance Requirements

The Responsible Copermittees for MS4 discharges to Baby Beach must comply with the following interim WQBELs by the interim compliance date:

Table 5.4
Interim Effluent Limitations as Loads in MS4 Discharges to Baby Beach

Constituent	Interim Compliance Date	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	4.93~~5.32~~x10^9 MPN/day	NA*
Fecal Coliform	September 15, 2012	0.59x10^9 MPN/day	NA*
Enterococcus	September 15, 2012	0.42x10^9 MPN/day	NA**
	September 15, 2016	NA*	207x10^9 MPN/30days

Notes:
* The WQBELs under Specific Provision 5.b must already be achieved by the given interim compliance date.
** There is no corresponding interim WQBEL for the given interim compliance date.

(2) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park is required to achieve the WLA, thus must be in compliance with the WQBELs under Specific Provision 5.0, by December 31, 2012.

d. Specific Monitoring and Assessment Requirements

(1) Monitoring Stations

Monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[37] If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

~~(a) The Responsible Copermittees must designate the MS4 outfalls within their jurisdiction discharging to the segments or areas of the water bodies listed in Table 5.0 as high priority non-storm water MS4 monitoring stations, in accordance with the requirements of Provision D.1.~~

~~(b) The Responsible Copermittees must establish at least one monitoring station within the receiving water body.~~

(2) Monitoring Procedures

(a) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters. ~~monitor the effluent of the designated MS4 outfalls within their jurisdiction discharging during dry weather conditions to the segments or areas of the water bodies listed in Table 5.0 in accordance with the dry weather jurisdictional monitoring requirements of Provision D.1.a.(1)(b). Samples required to be submitted to a laboratory for analysis must include analysis for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.~~

(b) The Responsible Copermittees must ~~monitor,~~ collect wet weather monitoring samples within the first 24 hours of ~~each~~ the first storm event~~,~~[38]

[37] Commonly referred to as AB 411 monitoring

[38] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

of the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters. ~~the effluent of the designated MS4 outfalls within their jurisdiction discharging to the segments or areas of the water bodies listed in Table 5.0 in accordance with the wet weather jurisdictional monitoring requirements of Provision D.1.b.(1)(b) of this Order. Samples required to be submitted to a laboratory for analysis must include analysis for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.~~

(c) ~~The Responsible Copermittees must collect samples from the monitoring stations within the receiving water body for each dry weather and wet weather MS4 outfall monitoring event.~~ Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs have been achieved.

(b) The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

e. COMPLIANCE DETERMINATION

(1) Compliance with interim compliance requirements of Specific Provision 5.c.(1)(b) may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 5.b.(1)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls;

(c) There are no violations of the applicable effluent limitations under Specific Provision 5.b.(2) at the Responsible Copermittees' MS4 outfalls;

(d) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the applicable effluent limitations under Specific Provision 5.c.(1)(b);

(e) The Responsible Copermittees can demonstrate that exceedances of the applicable receiving water limitations under Specific Provision 5.b.(1)(a) in

the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4 are not causing or contributing to the exceedances; OR

(f) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim compliance requirements will be achieved by the interim compliance dates.

(2) Compliance with WQBELs of Specific Provision 5.b may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 5.b.(1)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls;

(c) There are no violations of the applicable effluent limitations under Specific Provision 5.b.(2) at the Responsible Copermittees' MS4 outfalls;

(d) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the applicable effluent limitations under Specific Provision 5.c.(1)(b); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the applicable receiving water limitations under Specific Provision 5.b.(1)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4 are not causing or contributing to the exceedances.

6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2010-0001

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 10, 2010
State Water Board Approval Date:	December 14, 2010
Office of Administrative Law Approval Date:	April 4, 2011
US EPA Approval Date:	June 22, 2011

(3) TMDL Effective Date: April 4, 2011

(4) Watershed Management Areas: See Table 6.0

(5) Water Bodies: See Table 6.0

(6) Responsible Copermittees: See Table 6.0

Table 6.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	-City of Laguna Beach -County of Orange -Orange County Flood Control District
		at Heisler Park - North	
	Pacific Ocean Shoreline	at Main Laguna Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Woods -County of Orange -Orange County Flood Control District
		Laguna Beach at Ocean Avenue	
		Laguna Beach at Cleo Street	
		Arch Cove at Bluebird Canyon Road	
		Laguna Beach at Dumond Drive	
	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Hills -City of Laguna Niguel -City of Laguna Woods -City of Lake Forest -City of Mission Viejo -County of Orange -Orange County Flood Control District
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	
	Aliso Creek Mouth	at mouth	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County (cont'd)	Pacific Ocean Shoreline	Aliso Beach at West Street	-City of Dana Point -City of Laguna Beach -City of Laguna Niguel -County of Orange -Orange County Flood Control District
		Aliso Beach at Table Rock Drive	
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)	
		at Salt Creek (large outlet)	
		Salt Creek Beach at Salt Creek service road	
		Salt Creek Beach at Strand Road	
	Pacific Ocean Shoreline	at San Juan Creek	-City of Dana Point -City of Laguna Hills -City of Laguna Niguel -City of Mission Viejo -City of Rancho Santa Margarita -City of San Juan Capistrano -County of Orange -Orange County Flood Control District
	San Juan Creek	lower 1 mile	
	San Juan Creek Mouth	at mouth	
	Pacific Ocean Shoreline	at Poche Beach	-City of Dana Point -City of San Clemente -County of Orange -Orange County Flood Control District
		Ole Hanson Beach Club Beach at Pico Drain	
		San Clemente City Beach at El Portal Street Stairs	
		San Clemente City Beach at Mariposa Street	
		San Clemente City Beach at Linda Lane	
		San Clemente City Beach at South Linda Lane	
		San Clemente City Beach at Lifeguard Headquarters	
		under San Clemente Municipal Pier	
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	
		San Clemente State Beach at Riviera Beach	
		Can Clemente State Beach at Cypress Shores	
San Luis Rey River	Pacific Ocean Shoreline	at San Luis Rey River mouth	-City of Oceanside -City of Vista -County of San Diego

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
Carlsbad	Pacific Ocean Shoreline	at Moonlight State Beach	-City of Carlsbad -City of Encinitas -City of Escondido -City of Oceanside -City of San Marcos -City of Solana Beach ~~-City of Vista~~ -County of San Diego
San Dieguito River	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	-City of Del Mar -City of Escondido -City of Poway -City of San Diego -City of Solana Beach -County of San Diego
Penasquitos	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	-City of Del Mar -City of Poway -City of San Diego -County of San Diego
Mission Bay	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	-City of San Diego
		La Jolla Shores Beach at Caminito del Oro	
		La Jolla Shores Beach at Vallecitos	
		La Jolla Shores Beach at Avenida de la Playa	
		at Casa Beach, Children's Pool	
		South Casa Beach at Coast Boulevard	
		Whispering Sands Beach at Ravina Street	
		Windansea Beach at Vista de la Playa	
		Windansea Beach at Bonair Street	
		Windansea Beach at Playa del Norte	
		Windansea Beach at Palomar Avenue	
		at Tourmaline Surf Park	
		Pacific Beach at Grand Avenue	
	Tecolote Creek	Entire reach and tributaries	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I- Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
San Diego River	Forrester Creek	lower 1 mile	-City of El Cajon ~~-City of La Mesa~~ -City of Santee -County of San Diego
	San Diego River	lower 6 miles	-City of El Cajon -City of La Mesa -City of San Diego -City of Santee -County of San Diego
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	
San Diego Bay	Chollas Creek	lower 1.2 miles	-City of La Mesa -City of Lemon Grove -City of San Diego -County of San Diego - San Diego Unified Port District

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for segments or areas of the water bodies listed in Table 6.0 consist of the following:

(1) Receiving Water Limitations

(a) Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedules under Specific Provision 6.c.(1):

Table 6.1
Receiving Water Limitations as Bacteria Densities and Allowable Exceedance Frequencies in the Water Body

Receiving Water Limitations				
Constituent	Single Sample Maximum[1,2] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[3]	30-Day Geometric Mean[2] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform	10,000	22% / 0%	1,000	0%
Fecal Coliform	400	22% / 0%	200	0%
Enterococcus	104[4] / 61[5]	22% / 0%	35[4] / 33[5]	0%

Notes:
1. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
3. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. The 0% single sample maximum allowable exceedance frequency applies to dry weather days.
4. This *Enterococcus* receiving water limitation applies to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
5. This *Enterococcus* receiving water limitations applies to segments or areas of creeks or creek mouths listed in Table 6.0.

Interim receiving water limitations expressed as allowable exceedance frequencies are given in the compliance schedule under Specific Provision 6.c.

(b) If the above receiving water limitations are not met in the receiving water, the Responsible Copermittees must demonstrate that the discharges from the MS4s are not causing or contributing to the violation of receiving water limitations. The Copermittee must provide data that demonstrate the discharges from the MS4s are meeting the effluent limitations under Specific Provision 6.b.(2).

(2) Effluent Limitations

Discharges from the MS4s must not contain densities that exceed the following effluent limitations by the end of the compliance schedules under Specific Provision 6.c.(1) to demonstrate the discharge is not causing or contributing to a violation of receiving water quality standards:

Table 6.2
Effluent Limitations as Bacteria Densities and Allowable Exceedance Frequencies in MS4 Discharges to the Water Body

	Effluent Limitations			
Constituent	**Single Sample Maximum[1,2] (MPN/100mL)**	**Single Sample Maximum Allowable Exceedance Frequency[3]**	**30-Day Geometric Mean[2] (MPN/100mL)**	**30-Day Geometric Mean Allowable Exceedance Frequency**
Total Coliform	10,000	22% / 0%	1,000	0%
Fecal Coliform	400	22% / 0%	200	0%
Enterococcus	104[4] / 61[5]	22% / 0%	35[4] / 33[5]	0%

Notes:
1. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.
3. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. The 0% single sample maximum allowable exceedance frequency applies to dry weather days
4. This *Enterococcus* effluent limitation applies to MS4 discharges to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
5. This *Enterococcus* effluent limitation applies to MS4 discharges to segments or areas of creeks or creek mouths listed in Table 6.0.

Interim effluent limitations expressed as allowable exceedance frequencies are given in the compliance schedule under Specific Provision 6.c.

(3) Best Management Practices

(a) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 6.0 ~~fulfill~~ must incorporate the Comprehensive Load Reduction Plans (CLRPs) ~~requirements in~~ required to be developed pursuant to Resolution No. R9-2010-0001. For segments or areas in Table 6.0 that have been delisted from the Clean Water Act Section 303(d) List of Water Quality Limited Segments, a CLRP is not required.

(b) The Responsible Copermittee must implement BMPs ~~capable of achieving~~ to support the achievement of the WQBELs under Specific Provision 6.b for the segments or areas of the water bodies listed in Table 6.0.

(c) The Responsible Copermittees should coordinate ~~the~~ any BMPs implemented to address this TMDL with Caltrans and owners/operators of small MS4s ~~wherever and whenever~~ as possible.

c. COMPLIANCE SCHEDULE

(1) WLA Compliance Dates

The Responsible Copermittees for MS4 discharges to a segment or area of the water bodies listed in Table 6.0 are required to achieve the WLA, thus must be in compliance with the WQBELs under Specific Provision 6.b, according to the following compliance schedule:

Table 6.3
Compliance Schedule Dates to Achieve Indicator Bacteria WLAs

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform*	April 4, 2021	April 4, 2031
Fecal Coliform		
Enterococcus		

* Total coliform receiving water limitations only apply to segments or areas of Pacific Ocean Shoreline listed in Table 6.0.

(2) Interim Compliance Requirements

The Responsible Copermittees must comply with the following interim WQBELs by the interim compliance dates:

(a) Interim Dry Weather ~~WQBELs~~ Receiving Water Limitations

The Responsible Copermittee must calculate the "existing" exceedance frequencies of the 30-day geometric mean water quality objectives for each of the indicator bacteria by analyzing the monitoring data collected between January 1, 2002 and April 4, 2011. "Existing" exceedance frequencies may be calculated by segment or area of a water body, or by water body, and/or by Watershed Management Area listed in Table 6.0. Separate "existing" exceedance frequencies must be calculated for beaches and creeks/creek mouths.

The Responsible Copermittees must achieve a 50 percent reduction in the "existing" exceedance frequency of the 30-day geometric mean WQBELs for the segments or areas of the water bodies listed in Table 6.0 by the interim compliance dates for achieving the interim dry weather WQBELs given in Table 6.5. A 50 percent reduction in the "existing" exceedance frequency is equivalent to half of the "existing" exceedance frequency of the 30-day geometric mean WQBELs.

The "existing" exceedance frequencies and the interim dry weather allowable exceedance frequencies (i.e. interim dry weather WQBELs) calculated by the Responsible Copermittees must be included in the Water Quality Improvement Plans for the applicable Watershed Management Areas.

(b) Interim Wet Weather ~~WQBELs~~ Receiving Water Limitations

The Responsible Copermittees must achieve the interim wet weather ~~WQBELs~~ receiving water limitations in Table 6.4, expressed as interim allowable exceedance frequencies, by the interim compliance dates for achieving the interim wet weather WQBELs given in Table 6.5.

Table 6.4
Interim Wet Weather ~~WQBELs~~ Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	38%	37%	39%
		at Heisler Park - North			
	Pacific Ocean Shoreline	at Main Laguna Beach			
		Laguna Beach at Ocean Avenue			
		Laguna Beach at Cleo Street			
		Arch Cove at Bluebird Canyon Road			
		Laguna Beach at Dumond Drive			
	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	41%	41%	42%
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	41%	41%	42%
	Aliso Creek Mouth	at mouth	41%	41%	42%
	Pacific Ocean Shoreline	Aliso Beach at West Street	36%	36%	36%
		Aliso Beach at Table Rock Drive			
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)			
		at Salt Creek (large outlet)			
		Salt Creek Beach at Salt Creek service road			
		Salt Creek Beach at Strand Road			

Table 6.4 (Cont'd)
Interim Wet Weather ~~WQBELs~~ Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County (cont'd)	Pacific Ocean Shoreline	at San Juan Creek	44%	44%	48%
	San Juan Creek	lower 1 mile	44%	44%	47%
	San Juan Creek Mouth	at mouth	44%	44%	47%
	Pacific Ocean Shoreline	at Poche Beach	35%	35%	36%
		Ole Hanson Beach Club Beach at Pico Drain			
		San Clemente City Beach at El Portal Street Stairs			
		San Clemente City Beach at Mariposa Street			
		San Clemente City Beach at Linda Lane			
		San Clemente City Beach at South Linda Lane			
		San Clemente City Beach at Lifeguard Headquarters			
		under San Clemente Municipal Pier			
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)			
		San Clemente State Beach at Riviera Beach			
		Can Clemente State Beach at Cypress Shores			
San Luis Rey River	Pacific Ocean Shoreline	at San Luis Rey River mouth	45%	44%	47%
Carlsbad	Pacific Ocean Shoreline	at Moonlight State Beach	40%	40%	41%
San Dieguito River	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	33%	33%	36%

Table 6.4 (Cont'd)
Interim Wet Weather ~~WQBELs~~ Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
Penasquitos	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	26%	26%	26%
Mission Bay	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	37%	37%	37%
		La Jolla Shores Beach at Caminito del Oro			
		La Jolla Shores Beach at Vallecitos			
		La Jolla Shores Beach at Avenida de la Playa			
		at Casa Beach, Children's Pool			
		South Casa Beach at Coast Boulevard			
		Whispering Sands Beach at Ravina Street			
		Windansea Beach at Vista de la Playa			
		Windansea Beach at Bonair Street			
		Windansea Beach at Playa del Norte			
		Windansea Beach at Palomar Avenue			
		at Tourmaline Surf Park			
		Pacific Beach at Grand Avenue			
	Tecolote Creek	Entire reach and tributaries	49%	49%	51%
San Diego River	Forrester Creek	lower 1 mile	46%	43%	49%
	San Diego River	lower 6 miles	46%	43%	49%
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	46%	43%	51%
San Diego Bay	Chollas Creek	lower 1.2 miles	41%	41%	43%

(c) Interim ~~WQBEL~~ Compliance Dates

The Responsible Copermittees must achieve the interim ~~WQBELs~~ receiving water limitations under Specific Provisions 6.c.(2)(a) and 6.c.(2)(b) by the interim compliance dates given in Table 6.5.

Table 6.5
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs
South Orange County	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	April 4, 2016	April 4, 2021
		at Heisler Park - North		
	Pacific Ocean Shoreline	at Main Laguna Beach	April 4, 2016	April 4, 2021
		Laguna Beach at Ocean Avenue		
		Laguna Beach at Cleo Street		
		Arch Cove at Bluebird Canyon Road		
		Laguna Beach at Dumond Drive		
	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	April 4, 2016	April 4, 2021
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	April 4, 2018	April 4, 2021
	Aliso Creek Mouth	at mouth	April 4, 2018	April 4, 2021
	Pacific Ocean Shoreline	Aliso Beach at West Street	April 4, 2016	April 4, 2021
		Aliso Beach at Table Rock Drive		
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)		
		at Salt Creek (large outlet)		
		Salt Creek Beach at Salt Creek service road	April 4, 2017	April 4, 2021
		Salt Creek Beach at Strand Road	April 4, 2017	April 4, 2021

Table 6.5 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs
South Orange County (cont'd)	Pacific Ocean Shoreline	at San Juan Creek	April 4, 2016	April 4, 2021
	San Juan Creek	lower 1 mile	April 4, 2018	April 4, 2021
	San Juan Creek Mouth	at mouth	April 4, 2016	April 4, 2021
	Pacific Ocean Shoreline	at Poche Beach	April 4, 2016	April 4, 2021
		Ole Hanson Beach Club Beach at Pico Drain	April 4, 2016	April 4, 2021
		San Clemente City Beach at El Portal Street Stairs	April 4, 2017	April 4, 2021
		San Clemente City Beach at Mariposa Street		
		San Clemente City Beach at Linda Lane	April 4, 2016	April 4, 2021
		San Clemente City Beach at South Linda Lane	April 4, 2018	April 4, 2021
		San Clemente City Beach at Lifeguard Headquarters	April 4, 2017	April 4, 2021
		under San Clemente Municipal Pier		
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	April 4, 2018	April 4, 2021
		San Clemente State Beach at Riviera Beach	April 4, 2016	April 4, 2021
		Can Clemente State Beach at Cypress Shores	April 4, 2017	April 4, 2021
San Luis Rey River	Pacific Ocean Shoreline	at San Luis Rey River mouth	April 4, 2017	April 4, 2021
Carlsbad	Pacific Ocean Shoreline	at Moonlight State Beach	April 4, 2016	April 4, 2021
San Dieguito River	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	April 4, 2016	April 4, 2021

Table 6.5 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs
Penasquitos	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	April 4, 2016	April 4, 2021
Mission Bay	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	April 4, 2016	April 4, 2021
		La Jolla Shores Beach at Caminito del Oro		
		La Jolla Shores Beach at Vallecitos		
		La Jolla Shores Beach at Avenida de la Playa		
		at Casa Beach, Children's Pool		
		South Casa Beach at Coast Boulevard		
		Whispering Sands Beach at Ravina Street		
		Windansea Beach at Vista de la Playa		
		Windansea Beach at Bonair Street		
		Windansea Beach at Playa del Norte		
		Windansea Beach at Palomar Avenue		
		at Tourmaline Surf Park		
		Pacific Beach at Grand Avenue		
	Tecolote Creek	Entire reach and tributaries		
San Diego River	Forrester Creek	lower 1 mile	April 4, 2018	April 4, 2021
	San Diego River	lower 6 miles		
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach		
San Diego Bay	Chollas Creek	lower 1.2 miles	April 4, 2018	April 4, 2021

d. Specific Monitoring and Assessment Requirements

(1) Monitoring and Assessment Requirements for Beaches

(a) Monitoring Stations

For beaches addressed by the TMDL, monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[39] If exceedances

[39] Commonly referred to as AB 411 monitoring

of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

~~(i) The Responsible Copermittees must designate the MS4 outfalls within their jurisdiction discharging to the Pacific Ocean Shoreline segments or areas listed in Table 6.0 as high priority non-storm water MS4 monitoring stations, in accordance with the requirements of Provision D.1 of this Order.~~

~~(ii) For the Pacific Ocean Shoreline segments or areas listed in Table 6.0 with MS4 outfalls, the Responsible Copermittees must establish at least one monitoring station within the receiving water.~~

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly ~~monitor the effluent of the designated MS4 outfalls within their jurisdiction discharging during dry weather to the Pacific Ocean Shoreline segments or areas listed in Table 6.0 in accordance with the dry weather jurisdictional monitoring requirements of Provision D.1.a.(1)(b) of this Order~~. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters. ~~Samples required to be submitted to a laboratory for analysis must include analysis for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.~~

(ii) The Responsible Copermittees must ~~monitor~~ collect wet weather monitoring samples from the receiving water monitoring stations at least once~~,~~ within the first 24 hours of ~~each~~ the first storm event~~,~~[40] of the rainy season (i.e. October 1 through April 30) ~~the effluent of the designated MS4 outfalls within their jurisdiction discharging to the Pacific Ocean Shoreline segments or areas listed in Table 6.0 in accordance with the wet weather jurisdictional monitoring requirements of Provision D.1.b.(1)(b) of this Order~~. Wet weather

[40] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer in exceedance of the allowable exceedance frequencies in the receiving waters. ~~Samples required to be submitted to a laboratory for analysis must include analysis for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.~~

(iii) ~~The Responsible Copermittees must collect samples from the monitoring stations within the receiving water body for each dry weather and wet weather MS4 outfall monitoring event.~~ Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs for the Pacific Ocean Shoreline segments or areas listed in Table 6.0 have been achieved.

(ii) The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

(2) Monitoring and Assessment Requirements for Creeks and Creek Mouths

(a) Monitoring Stations

For creeks addressed by the TMDL, monitoring locations should consist of, at a minimum, a location at or near the mouth of the creek (e.g. Mass Loading Station or Mass Emission Station) and one or more locations upstream of the mouth (e.g. Watershed Assessment Station). If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

~~(i) The Responsible Copermittees must establish at least one receiving water monitoring station at or near the mouth of the creeks listed in Table 6.0.~~

~~(ii) The Responsible Copermittees must establish at least one receiving water monitoring station upstream of the station established for Specific Provision 6.d.(2)(a)(i). At least one monitoring station must be established for each Responsible Copermittee at the most~~

~~downstream location within its jurisdiction, and one monitoring station at the most upstream location within its jurisdiction.~~

~~(iii) The Responsible Copermittees must identify the MS4 outfalls discharging to the segments or areas of the creeks and creek mouths listed in Table 6.0. The Responsible Copermittees must identify the MS4 outfalls that are monitored in accordance with the dry weather jurisdictional monitoring requirements of Provision D.1.a.(1)(b) of this Order and the wet weather jurisdictional monitoring requirements of Provision D.1.b.(1)(a) of this Order.~~

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations ~~at least monthly~~ in accordance with the requirements of Provision D.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations within the first 24 hours of ~~each~~ the first storm event~~.~~[41] of the rainy season (i.e. October 1 through April 30).

(iii) Samples collected from receiving water monitoring stations must be analyzed for ~~total coliform,~~ fecal coliform~~,~~ and *Enterococcus* indicator bacteria.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the receiving water monitoring data to assess whether the interim and final receiving water WQBELs for the creeks and creek mouths listed in Table 6.0 have been achieved.

~~(ii) If the receiving water WQBELs for the creeks and creek mouths listed in Table 6.0 have not been achieved, the Responsible Copermittees must review the MS4 outfall monitoring data to assess whether the interim and final effluent WQBELs have been achieved.~~

(ii) The Responsible Copermittee must identify and incorporate additional MS4 outfall and receiving water monitoring stations and/or adjust monitoring frequencies to identify sources causing exceedances of the receiving water WQBELs.

(iii) The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

[41] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

e. COMPLIANCE DETERMINATION

(1) Compliance with interim compliance requirements of Specific Provision 6.c.(2) may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 6.b.(1) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls;

(c) There are no violations of the applicable effluent limitations under Specific Provision 6.b.(2) at the Responsible Copermittees' MS4 outfalls;

(d) There are no exceedances of the applicable interim receiving water limitations under Specific Provision 6.c.(2) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls;

(e) The Responsible Copermittees can demonstrate that exceedances of the applicable interim or final receiving water limitations under Specific Provision 6.b.(1)(a) or 6.c.(2) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4 are not causing or contributing to the exceedances; OR

(f) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim compliance requirements will be achieved by the interim compliance dates.

(2) Compliance with WQBELs of Specific Provision 6.b may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 6.b.(1) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls;

(c) There are no violations of the applicable effluent limitations under Specific Provision 6.b.(2) at the Responsible Copermittees' MS4 outfalls; OR

(d) The Responsible Copermittees can demonstrate that exceedances of the applicable final receiving water limitations under Specific Provision 6.b.(1)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4 are not causing or contributing to the exceedances.

ADMINISTRATIVE DRAFT

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

TENTATIVE
ORDER NO. R9-2013-0001
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The San Diego County Copermittees in Table 1a are subject to waste discharge requirements set forth in this Order.

Table 1a. San Diego County Copermittees

City of Carlsbad	City of Oceanside
City of Chula Vista	City of Poway
City of Coronado	City of San Diego
City of Del Mar	City of San Marcos
City of El Cajon	City of Santee
City of Encinitas	City of Solana Beach
City of Escondido	City of Vista
City of Imperial Beach	County of San Diego
City of La Mesa	San Diego County Regional Airport Authority
City of Lemon Grove	San Diego Unified Port District
City of National City	

After the San Diego Water Board receives and considers the Orange County Copermittees' Report of Waste Discharge and makes any necessary changes to the Order, the Orange County Copermittees in Table 1b will become subject to waste discharge requirements set forth in this Order after expiration of Order No. R9-2009-0002, NPDES No. CAS0108740 on or after December 16, 2014.

Table 1b. Orange County Copermittees

City of Aliso Viejo	City of Ranch Santa Margarita
City of Dana Point	City of San Clemente
City of Laguna Beach	City of San Juan Capistrano
City of Laguna Hills	City of Laguna Woods
City of Laguna Niguel	County of Orange
City of Lake Forest	Orange County Flood Control District
City of Mission Viejo	

After the San Diego Water Board receives and considers the Riverside County Copermittees' Report of Waste Discharge and makes any necessary changes to this Order, the Riverside County Copermittees in Table 1c will become subject to waste discharge requirements set forth in this Order after expiration of Order No. R9-2010-0016, NPDES No. CAS0108766 on or after November 10, 2015.

Table 1c. Riverside County Copermittees

City of Murrieta	County of Riverside
City of Temecula	Riverside County Flood Control and Water Conservation District
City of Wildomar	

The Orange County Copermittees and Riverside County Copermittees may become subject to the requirements of this Order at a date earlier than the expiration date of their current Orders subject to the conditions described in Provision F.6 of this Order if the Copermittees in the respective county receive a notification of coverage from the San Diego Water Board.

The term Copermittee in this Order refers to any San Diego County, Orange County, or Riverside County Copermittee covered under this Order, unless specified otherwise.

This Order provides permit coverage for the Copermittee discharges described in Table 2.

Table 2. Discharge Locations and Receiving Waters

Discharge Points	Locations throughout San Diego Region
Discharge Description	Municipal Separate Storm Sewer System (MS4) Discharges
Receiving Waters	Inland Surface Waters, Enclosed Bays and Estuaries, and Coastal Ocean Waters of the San Diego Region

Table 3. Administrative Information

This Order was adopted by the San Diego Water Board on:	**Month Day, 2013**
This Order will become effective on:	**Month Day, 2013**
This Order will expire on:	**Month Day, 2018**
The Copermittees must file a Report of Waste Discharge in accordance with Title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than 180 days in advance of the Order expiration date.	

I, David W. Gibson, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on Month Day, 2013.

TENTATIVE

David W. Gibson
Executive Officer

ADMINISTRATIVE DRAFT

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ATTACHMENTS

Attachment A - Discharge Prohibitions and Special Protections A-1
Attachment B - Standard Permit Provisions and General Provisions B-1
Attachment C - Acronyms, Abbreviations and Definitions C-1
Attachment D - Jurisdictional Runoff Management Program Annual Report Form D-1
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I. FINDINGS

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), finds that:

JURISDICTION

1. **MS4 Ownership or Operation.** Each of the Copermittees owns or operates an MS4, through which it discharges storm water and non-storm water into waters of the U.S. within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the U.S.

2. **Legal and Regulatory Authority.** This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]) adopted by the United States Environmental Protection Agency (USEPA), and chapter 5.5, division 7 of the California Water Code (CWC) (commencing with section 13370). This Order serves as an NPDES permit for discharges from MS4s to surface waters. This Order also serves as waste discharge requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

   The San Diego Water Board has the legal authority to issue a regional MS4 permit pursuant to its authority under CWA section 402(p)(3)(B) and 40 CFR 122.26(a)(1)(v). The USEPA also made it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide permits. (See 55 Federal Register 47990, 48039-48042.)

   The federal regulations make it clear that the Copermittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators. (40 CFR 122.26(a)(3)(vi).) This Order does not require the Copermittees to manage storm water outside of their jurisdictional boundaries, but rather to work collectively to improve storm water management within watersheds.

3. **CWA Technology Based Standards and Prohibitions.** Pursuant to CWA section 402(p)(3)(B), NPDES permits for storm water discharges from MS4s must include requirements to effectively prohibit non-storm water discharges into MS4s, and require controls to reduce the discharge of pollutants in storm water to the maximum extent practicable (MEP).

4. **CWA NPDES Permit Conditions.** Pursuant to CWA section 402(a)(2), NPDES permits must prescribe conditions, including conditions on data and information

collection, reporting, and other requirements as the San Diego Water Board deems appropriate, to assure compliance with CWA section 402(p)(3)(B) and 40 CFR 122.26(d)(2)(iv). This Order prescribes conditions to assure compliance with the CWA requirements for owners and operators of MS4s to effectively prohibit non-storm water discharges in to the MS4s, and require controls to reduce the discharge of pollutants in storm water from the MS4s to the MEP.

5. **CWA and CWC Monitoring Requirements.** Pursuant to 40 CFR 122.48, NPDES permits must specify requirements for recording and reporting monitoring results. In addition, CWC sections 13267 and 13383 authorize the San Diego Water Board to require technical and monitoring reports. This Order establishes monitoring and reporting requirements to implement federal and State requirements.

6. **Total Maximum Daily Loads.** CWA section 303(d)(1)(A) requires that "[e]ach state shall identify those waters within its boundaries for which the effluent limitations…are not stringent enough to implement any water quality standard applicable to such waters." The CWA also requires states to establish a priority ranking of impaired water bodies known as Water Quality Limited Segments and to establish Total Maximum Daily Loads (TMDLs) for such waters. This priority list of impaired water bodies is called the Clean Water Act Section 303(d) List of Water Quality Limited Segments, commonly referred to as the 303(d) List. The CWA requires the 303(d) List to be updated every two years. Requirements of this Order implement the TMDLs adopted by the San Diego Water Board and approved by USEPA.

7. **Non-Storm Water Discharges.** Pursuant to CWA section 402(p)(3)(B)(ii), this Order requires each Copermittee to effectively prohibit discharges of non-storm water into its MS4. Nevertheless, non-storm water discharges into and from the MS4s continue to be reported to the San Diego Water Board by the Copermittees and other persons. Monitoring conducted by the Copermittees, as well as the 303(d) List, have identified dry weather, non-storm water discharges from the MS4s as a source of pollutants causing or contributing to receiving water quality impairments in the San Diego Region. The federal regulations [40 CFR 122.26(d)(2)(iv)(B)(1)] require the Copermittees to have a program to prevent illicit discharges to the MS4. The federal regulations, however, allow for specific categories of non-storm water discharges or flows to be addressed as illicit discharges only where such discharges are identified as sources of pollutants to waters of the U.S.

8. **In-Stream Treatment Systems.** Pursuant to federal regulations [40 CFR 131.10(a)], in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S. Authorizing the construction of a runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to accepting waste assimilation as an appropriate use for that water body. Runoff treatment must occur prior to the discharge of runoff into receiving waters. Treatment control best management practices (BMPs) must not be constructed in waters of the U.S. Construction, operation, and maintenance of a pollution control

facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body.

DISCHARGE CHARACTERISTICS AND RUNOFF MANAGEMENT

9. **Point Source Discharges of Pollutants.** Discharges from the MS4s contain waste, as defined in the CWC, and pollutants that adversely affect the quality of the waters of the state. A discharge from an MS4 is a "discharge of pollutants from a point source" into waters of the U.S. as defined in the CWA. Storm water and non-storm water discharges from the MS4s contain pollutants that cause or threaten to cause a violation of surface water quality standards, as outlined in the Basin Plan. Storm water and non-storm water discharges from the MS4s are subject to the conditions and requirements established in the Basin Plan for point source discharges.

10. **Potential Beneficial Use Impairment.** The discharge of pollutants and/or increased flows from MS4s may cause or threaten to cause the concentration of pollutants to exceed applicable receiving water quality objectives and impair or threaten to impair designated beneficial uses resulting in a condition of pollution, contamination, or nuisance.

11. **Pollutants Generated by Land Development.** Land development has created and continues to create new sources of non-storm water discharges and pollutants in storm water discharges as human population density increases. This brings higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash. Pollutants from these sources are dumped or washed off the surface by non-storm water or storm water flows into and from the MS4s. When development converts natural vegetated pervious ground cover to impervious surfaces such as paved highways, streets, rooftops, and parking lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving a developed area without BMPs that can maintain pre-development conditions will contain greater pollutant loads and have significantly greater runoff volume, velocity, and peak flow rate than pre-development runoff from the same area.

12. **Runoff Discharges to Receiving Waters.** The MS4s discharge runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within the eleven hydrologic units comprising the San Diego Region. Historic and current development makes use of natural drainage patterns and features as conveyances for runoff. Rivers, streams and creeks in developed areas used in this manner are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and receiving water. Numerous receiving water bodies and water body segments have been designated as impaired by the San Diego Water Board pursuant to CWA section 303(d).

13. **Pollutants in Runoff.** The most common pollutants in runoff discharged from the MS4s include total suspended solids, sediment, pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., cadmium, copper, lead, and zinc), petroleum products and polynuclear aromatic hydrocarbons, synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus), oxygen-demanding substances (decaying vegetation, animal waste), detergents, and trash. As operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not prohibit or otherwise control. These discharges may cause or contribute to a condition of contamination or a violation of water quality standards.

14. **Human Health and Aquatic Life Impairment.** Pollutants in runoff discharged from the MS4s can threaten and adversely affect human health and aquatic organisms. Adverse responses of organisms to chemicals or physical agents in runoff range from physiological responses such as impaired reproduction or growth anomalies to mortality. Increased volume, velocity, rate, and duration of storm water runoff greatly accelerate the erosion of downstream natural channels. This alters stream channels and habitats and can adversely affect aquatic and terrestrial organisms.

15. **Water Quality Effects.** The Copermittees' water quality monitoring data submitted to date documents persistent exceedances of Basin Plan water quality objectives for runoff-related pollutants at various watershed monitoring stations. Persistent toxicity has also been observed at several watershed monitoring stations. In addition, bioassessment data indicate that the majority of the monitored receiving waters have Poor to Very Poor Index of Biological Integrity (IBI) ratings. These findings indicate that runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in the San Diego Region. Non-storm water discharges from the MS4s have been shown to contribute significant levels of pollutants and flow in arid, developed Southern California watersheds, and contribute significantly to exceedances of applicable receiving water quality objectives.

16. **Non-Storm Water Discharges.** Non-storm water discharges from the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard of CWA section 402(p)(3)(B)(iii), which is explicitly for "Municipal … *Stormwater Discharges* (emphasis added)" from the MS4s. Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s must be effectively prohibited.

17. **Best Management Practices.** Waste and pollutants which are deposited and accumulate in MS4 drainage structures will be discharged from these structures to waters of the U.S. unless they are removed. These discharges may cause or contribute to, or threaten to cause or contribute to, a condition of pollution in receiving waters. For this reason, pollutants in storm water discharges from the

MS4s can be and must be effectively reduced in runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Pollution prevention is the reduction or elimination of pollutant generation at its source and is the best "first line of defense". Source control BMPs (both structural and non-structural) minimize the contact between pollutants and runoff, therefore keeping pollutants onsite and out of receiving waters. Treatment control BMPs remove pollutants that have been mobilized by storm water or non-storm water flows.

18. **BMP Implementation.** Runoff needs to be addressed during the three major phases of development (planning, construction, and use) in order to reduce the discharge of storm water pollutants to the MEP, effectively prohibit non-storm water discharges, and protect receiving waters. Development which is not guided by water quality planning policies and principles can result in increased pollutant load discharges, flow rates, and flow durations which can negatively affect receiving water beneficial uses. Construction sites without adequate BMP implementation result in sediment runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. Existing development can generate substantial pollutant loads which are discharged in runoff to receiving waters. Retrofitting areas of existing development with storm water pollutant control and hydromodification management BMPs is necessary to address storm water discharges from existing development that may cause or contribute to a condition of pollution or a violation of water quality standards.

19. **Long Term Planning and Implementation.** Federal regulations require municipal storm water permits to expire 5 years from adoption, after which the permit must be renewed and reissued. The San Diego Water Board recognizes that the degradation of water quality and impacts to beneficial uses of the waters in the San Diego Region occurred over several decades. The San Diego Water Board further recognizes that a decade or more may be necessary to realize demonstrable improvement to the quality of waters in the Region. This Order includes a long term planning and implementation approach that will require more than a single permit term to complete.

WATER QUALITY STANDARDS

20. **Basin Plan.** The San Diego Water Board adopted a Water Quality Control Plan for the San Diego Basin (Basin Plan) on September 8, 1994 that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for receiving waters addressed through the plan. The Basin Plan was subsequently approved by the State Water Resources Control Board (State Water Board) on December 13, 1994. Subsequent revisions to the Basin Plan have also been adopted by the San Diego Water Board and approved by the State Water Board. Requirements of this Order implement the Basin Plan.

The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Process Supply (PROC), Industrial Service Supply (IND), Ground Water Recharge (GWR), Contact Water Recreation (REC1), Non-contact Water Recreation (REC2), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Freshwater Replenishment (FRSH), Hydropower Generation (POW), and Preservation of Biological Habitats of Special Significance (BIOL). The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region: Navigation (NAV), Commercial and Sport Fishing (COMM), Estuarine Habitat (EST), Marine Habitat (MAR), Aquaculture (AQUA), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN), and Shellfish Harvesting (SHELL).

21. **Ocean Plan.** The State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, and 2005. The State Water Board adopted the latest amendment on April 21, 2005 and it became effective on February 14, 2006. The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean. Requirements of this Order implement the Ocean Plan.

    The Ocean Plan identifies the following beneficial uses of ocean waters of the state to be protected: Industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture; preservation and enhancement of designated Areas of Special Biological Significance; rare and endangered species; marine habitat; fish spawning and shellfish harvesting

22. **Sediment Quality Control Plan**. On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

23. **National Toxics Rule and California Toxics Rule.** USEPA adopted the NTR on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the National toxics Rule (NTR) applied in California. On May 18, 2000, USEPA adopted the California Toxics Rule (CTR). The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants.

24. **Antidegradation Policy.** This Order is in conformance with the federal Antidegradation Policy described in 40 CFR 131.12, and State Water Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality Waters in California*. Federal regulations at 40 CFR 131.12 require that the State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The San Diego Water Board's Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies.

CONSIDERATIONS UNDER FEDERAL LAW

25. **Coastal Zone Act Reauthorization Amendments.** Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states with approved coastal zone management programs to address non-point pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point pollution: agriculture, silviculture, urban, marinas, and hydromodification. This Order addresses the management measures required for the urban category, with the exception of septic systems. The runoff management programs developed pursuant to this Order fulfill the need for coastal cities to develop a runoff non-point source plan identified in the Non-Point Source Program Strategy and Implementation Plan. The San Diego Water Board addresses septic systems through the administration of other programs.

26. **Endangered Species Act.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 USC sections 1531 to 1544). This Order requires compliance with receiving water limits, and other requirements to protect the beneficial uses of waters of the State. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

27. **Report of Waste Discharge Process.** The waste discharge requirements set forth in this Order are based upon the Report of Waste Discharge submitted by the San Diego County Copermittees prior to the expiration of Order No. R9-2007-0001 (NPDES No. CAS0109266). The Orange County and Riverside County Copermittees are not immediately covered by the waste discharge requirements in this Order. The San Diego Water Board understands that each municipality is unique although the Counties share watersheds and geographical boundaries. The Order will continue to use the Report of Waste Discharge process prior to initially making Orange County or Riverside County Copermittees subject to the requirements of this Order.

The federal regulations (40 CFR 122.21(d)(2)) and the Water Code (CWC 13376) impose a duty on the Copermittees to reapply for continued coverage through submittal of a Report of Waste Discharge no later than 180 days prior to expiration of a currently effective permit. This requirement is set forth in the Orange County Copermittees' and Riverside County Copermittees' currently effective permits at Provisions K.2.b and K.2.c, respectively. The Orange County Permit, Order No. R9-2009-0002 (NPDES No. CAs0108740) expires on December 16, 2014 and the Riverside County MS4 Permit, Order No. R9-2010-0016 (NPDES No. CAS0108766) expires on November 10, 2015.

Unless the Orange County or Riverside County Copermittees apply for and receive early coverage under this Order, the Orange County Copermittees' and the Riverside County Copermittees' respective permits will be superseded by this Order upon expiration of their respective permits, subject to any necessary revisions to the requirements of this Order made after the San Diego Water Board considers their respective Reports of Waste Discharge through the public process provided in 40 CFR 124.

CONSIDERATIONS UNDER STATE LAW

28. Unfunded Mandates. This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following:

a. This Order implements federally mandated requirements under CWA section 402. (33 USC 1342(p)(3)(B).)

b. The local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental and new dischargers who are issued NPDES permits for storm water and non-storm water discharges.

c. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order.

d. The Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC 1311(a)) and in lieu of numeric restrictions on their MS4 discharges (i.e. effluent limitations).

e. The local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under State law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

f. The provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards. (33 USC 1313(d).) Once the USEPA or a state develops a TMDL, federal law requires that permits must contain water quality

based effluent limitations consistent with the assumptions and requirements of any applicable wasteload allocation. (40 CFR 122.44(d)(1)(vii)(B).)

29. **California Environmental Quality Act.** The issuance of WDRs and an NPDES permit for the discharge of runoff from MS4s to waters of the U.S. is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 et seq.) in accordance with CWC section 13389.

STATE WATER BOARD DECISIONS

30. **Compliance with Prohibitions and Limitations.** The receiving water limitation language specified in this Order is consistent with language recommended by the USEPA and established in State Water Board Order WQ-99-05, *Own Motion Review of the Petition of Environmental Health Coalition to Review Waste Discharge Requirements Order No. 96-03, NPDES Permit No. CAS0108740*, adopted by the State Water Board on June 17, 1999. The receiving water limitation language in this Order requires storm water discharges from MS4s to not cause or contribute to a violation of water quality standards, which is to be achieved through an iterative approach requiring the implementation of improved and better-tailored BMPs over time. Implementation of the iterative approach to comply with receiving water limitations based on applicable water quality standards is necessary to ensure that storm water discharges from the MS4 ultimately will not cause or contribute to violations of water quality standards and the creation of conditions of pollution, contamination, or nuisance.

31. **Special Conditions for Areas of Special Biological Significance.** On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving an exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges. The Resolution requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBSs. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject terms and conditions of the Resolution. The Special Protections contained in Attachment B to the Resolution applicable to these discharges are hereby incorporated in this Order as if fully set forth herein.

ADMINISTRATIVE FINDINGS

32. **Executive Officer Delegation of Authority.** The San Diego Water Board by prior resolution has delegated all matters that may legally be delegated to its Executive Officer to act on its behalf pursuant to CWC section 13223. Therefore, the

Executive Officer is authorized to act on the San Diego Water Board's behalf on any matter within this Order unless such delegation is unlawful under CWC section 13223 or this Order explicitly states otherwise.

33. **Standard Provisions.** Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR 122.42, are provided in Attachment B to this Order.

34. **Fact Sheet.** The Fact Sheet for this Order contains background information, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of this Order. The Fact Sheet is hereby incorporated into this Order and constitutes part of the Findings of this Order.

35. **Public Notice.** The San Diego Water Board notified the Copermittees, and interested agencies and persons of its intent to prescribe WDRs for MS4 discharges of pollutants to waters of the U.S. and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet.

36. **Public Hearing.** The San Diego Water Board held a public hearing on Month Day, 2013 and heard and considered all comments pertaining to the terms and conditions of this Order. Details of the public hearing are provided in the Fact Sheet.

II. PROVISIONS

THEREFORE, IT IS HEREBY ORDERED that the Copermittees, in order to meet the provisions contained in division 7 of the CWC and regulations adopted thereunder, and the provisions of the CWA and regulations adopted thereunder, must each comply with the following:

A. PROHIBITIONS AND LIMITATIONS

The purpose of this provision is to describe the conditions under which storm water and non-storm water discharges into and from MS4s are prohibited or limited. The goal of this provision is to protect the water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through the implementation of water quality improvement strategies and runoff management programs that effectively prohibit non-storm water discharges into the Copermittees' MS4s, and reduce pollutants in storm water discharges from the Copermittees' MS4s to the MEP.

1. Discharge Prohibitions

a. Discharges from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the state are prohibited.

b. Non-storm water discharges into MS4s are to be effectively prohibited, unless such discharges are either authorized by a separate NPDES permit, or the discharge is a category of non-storm water discharges or flows that must be addressed pursuant to Provisions E.2.a.(1)-(5) of this Order.

c. Discharges from MS4s are subject to all waste discharge prohibitions in the Basin Plan, included in Attachment A to this Order.

d. Storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 applicable to these discharges, included in Attachment A to this Order. All other discharges from the Copermittees' MS4s to ASBS are prohibited.

2. Receiving Water Limitations

a. Discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters, including but not limited to all applicable provisions contained in:

(1) The San Diego Water Board's Basin Plan, including beneficial uses, water quality objectives, and implementation plans;

(2) State Water Board plans for water quality control including the following:

(a) Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries (Thermal Plan), and

(b) The Ocean Plan, including beneficial uses, water quality objectives, and implementation plans;

(3) State Water Board policies for water and sediment quality control including the following:

(a) Water Quality Control Policy for the Enclosed Bays and Estuaries of California,

(b) Sediment Quality Control Plan which includes the following narrative objectives for bays and estuaries:

(i) Pollutants in sediments shall not be present in quantities that, alone or in combination, are toxic to benthic communities, and

(ii) Pollutants shall not be present in sediments at levels that will bioaccumulate in aquatic life to levels that are harmful to human health,

(c) The Statement of Policy with Respect to Maintaining High Quality of Waters in California.[1]

(4) Priority pollutant criteria promulgated by the USEPA through the following:

(a) National Toxics Rule (NTR)[2] (promulgated on December 22, 1992 and amended on May 4, 1995), and

(b) California Toxics Rule (CTR)[3,4]

b. Discharges from MS4s composed of storm water runoff must not alter natural ocean water quality in an ASBS.

[1] State Water Board Resolution No. 68-16
[2] 40 CFR 131.36
[3] 65 Federal Register 31682-31719 (May 18, 2000), adding Section 131.38 to 40 CFR
[4] If a water quality objective and a CTR criterion are in effect for the same priority pollutant, the more stringent of the two applies.

3. Effluent Limitations

a. TECHNOLOGY BASED EFFLUENT LIMITATIONS

Pollutants in storm water discharges from MS4s must be reduced to the MEP.[5]

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

Discharges from MS4s must comply with any water quality based effluent limitations (WQBELs) established for the TMDLs in Attachment E to this Order, pursuant to the applicable TMDL compliance schedules.

4. Compliance with Discharge Prohibitions and Receiving Water Limitations

Each Copermittee must achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order through timely implementation of control measures and other actions as specified in Provisions B and E of this Order, including any modifications. The Water Quality Improvement Plans required under Provision B must be designed and adapted to ultimately achieve compliance with Provisions A.1.a, A.1.c and A.2.a.

a. If exceedance(s) of water quality standards persist in receiving waters notwithstanding implementation of this Order, the Copermittees must comply with the following procedures:

(1) For exceedance(s) of a water quality standard in the process of being addressed by the Water Quality Improvement Plan, the Copermittee(s) must implement the Water Quality Improvement Plan as accepted by the San Diego Water Board, and update the Water Quality Improvement Plan, as necessary, pursuant to Provision F.2.c;

(2) Upon a determination by either the Copermittees or the San Diego Water Board that discharges from the MS4 are causing or contributing to a new exceedance of an applicable water quality standard not addressed by the Water Quality Improvement Plan, the Copermittees must submit the following updates to the Water Quality Improvement Plan pursuant to Provision F.2.c or as part of the Annual Report required under Provision F.3.b, unless the San Diego Water Board directs an earlier submittal:

(a) The water quality improvement strategies being implemented that are effective and will continue to be implemented,

[5] This does not apply to MS4 discharges which receive subsequent treatment to reduce pollutants in storm water discharges to the MEP prior to entering receiving waters (e.g., low flow diversions to the sanitary sewer). Runoff treatment must occur prior to the discharge of runoff into receiving waters per Finding 8.

(b) Water quality improvement strategies (i.e. BMPs, retrofitting projects, stream and/or habitat rehabilitation or restoration projects adjustments to jurisdictional runoff management programs, etc.) that will be implemented to reduce or eliminate any pollutants or conditions that are causing or contributing to the exceedance of water quality standards,

(c) Updates to the schedule for implementation of the existing and additional water quality improvement strategies, and

(d) Updates to the monitoring and assessment program to track progress toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a of this Order;

(3) The San Diego Water Board may require the incorporation of additional modifications to the Water Quality Improvement Plan required under Provision B. The applicable Copermittees must submit any modifications to the update to the Water Quality Improvement Plan within 90 days of notification that additional modifications are required by the San Diego Water Board, or as otherwise directed;

(4) Within 90 days of the San Diego Water Board determination that the update to the Water Quality Improvement Plan meets the requirements of this Order, the applicable Copermittees must revise the jurisdictional runoff management program documents to incorporate the updated water quality improvement strategies that have been and will be implemented, the implementation schedule, and any additional monitoring required; and

(5) Each Copermittee must implement the updated Water Quality Improvement Plan.

b. The procedure set forth above to achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order do not have to be repeated for continuing or recurring exceedances of the same water quality standard(s) following implementation of scheduled actions unless directed to do otherwise by the San Diego Water Board.

c. Nothing in Provisions A.4.a and A.4.b prevents the San Diego Water Board from enforcing any provision of this Order while the applicable Copermittees prepare and implement the above update to the Water Quality Improvement Plan and jurisdictional runoff management programs.

B. WATER QUALITY IMPROVEMENT PLANS

The purpose of this provision is to develop Water Quality Improvement Plans that guide the Copermittees' jurisdictional runoff management programs towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plans is to protect, preserve, enhance, and restore the water quality and designated beneficial uses of waters of the state. This goal will be accomplished through an adaptive planning and management process that identifies the highest priority water quality conditions within a watershed and implements strategies through the jurisdictional runoff management programs to achieve improvements in the quality of discharges from the MS4s and receiving waters.

1. Watershed Management Areas

The Copermittees must develop a Water Quality Improvement Plan for each of the Watershed Management Areas in Table B-1. A total of ten Water Quality Improvement Plans must be developed for the San Diego Region.

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
San Juan (901.00)	South Orange County	- Aliso Creek - San Juan Creek - San Mateo Creek - Pacific Ocean - Heisler Park ASBS	- City of Aliso Viejo[1] - City of Dana Point[1] - City of Laguna Beach[1] - City of Laguna Hills[1] - City of Laguna Niguel[1] - City of Laguna Woods[1] - City of Lake Forest[1] - City of Mission Viejo[1] - City of Rancho Santa Margarita[1] - City of San Clemente[1] - City of San Juan Capistrano[1] - County of Orange[1] - Orange County Flood Control District[1]
Santa Margarita (902.00)	Santa Margarita River	- Murrieta Creek - Temecula Creek - Santa Margarita River - Santa Margarita Lagoon - Pacific Ocean	- City of Murrieta[2] - City of Temecula[2] - City of Wildomar[2] - County of Riverside[2] - County of San Diego[3] - Riverside County Flood Control and Water Conservation District[2]
San Luis Rey (903.00)	San Luis Rey River	- San Luis Rey River - San Luis Rey Estuary - Pacific Ocean	- City of Oceanside - City of Vista - County of San Diego

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
Carlsbad (904.00)	Carlsbad	- Loma Alta Slough - Buena Vista Lagoon - Agua Hedionda Lagoon - Batiquitos Lagoon - San Elijo Lagoon - Pacific Ocean	- City of Carlsbad - City of Encinitas - City of Escondido - City of Oceanside - City of San Marcos - City of Solana Beach - City of Vista - County of San Diego
San Dieguito (905.00)	San Dieguito River	- San Dieguito River - San Dieguito Lagoon - Pacific Ocean	- City of Del Mar - City of Escondido - City of Poway - City of San Diego - City of Solana Beach - County of San Diego
Penasquitos (906.00)	Penasquitos	- Los Penasquitos Lagoon - Pacific Ocean	- City of Del Mar - City of Poway - City of San Diego - County of San Diego
	Mission Bay	- Mission Bay - Pacific Ocean - San Diego Marine Life Refuge ASBS	- City of San Diego
San Diego (907.00)	San Diego River	- San Diego River - Pacific Ocean	- City of El Cajon - City of La Mesa - City of San Diego - City of Santee - County of San Diego
Pueblo San Diego (908.00) Sweetwater (909.00) Otay (910.00)	San Diego Bay	- Sweetwater River - Otay River - San Diego Bay - Pacific Ocean	- City of Chula Vista - City of Coronado - City of Imperial Beach - City of La Mesa - City of Lemon Grove - City of National City - City of San Diego - County of San Diego - San Diego County Regional Airport Authority - San Diego Unified Port District
Tijuana (911.00)	Tijuana River	- Tijuana River - Tijuana Estuary - Pacific Ocean	- City of Imperial Beach - City of San Diego - County of San Diego

Notes:
1. The Orange County Copermittees will be covered under this Order after expiration of Order No. R9-2009-0002, or earlier if the Orange County Copermittees meet the conditions in Provision F.6.
2. The Riverside County Copermittees will be covered under this Order after expiration of Order No. R9-2010-0016, or earlier if the Riverside County Copermittees meet the conditions in Provision F.6.
3. The County of San Diego is required to implement the requirements of Provision B for its jurisdiction within the Santa Margarita River Watershed Management Area until the Riverside County Copermittees have been notified of coverage under this Order.

2. Priority Water Quality Conditions

The Copermittees must identify the water quality priorities within each Watershed Management Area that will be addressed by the Water Quality Improvement Plan. Where appropriate, Watershed Management Areas may be separated into subwatersheds to focus water quality prioritization and jurisdictional runoff management program implementation efforts by receiving water.

a. Assessment of Receiving Water Conditions

The Copermittees must consider the following, at a minimum, to identify water quality priorities based on impacts of MS4 discharges on receiving water beneficial uses:

(1) Receiving waters listed as impaired on the CWA Section 303(d) List of Water Quality Limited Segments (303(d) List);

(2) TMDLs adopted and under development by the San Diego Water Board;

(3) Receiving waters recognized as sensitive or highly valued by the Copermittees, including estuaries designated under the National Estuary Program under CWA section 320, wetlands defined by the State or U.S. Fish and Wildlife Service's National Wetlands Inventory as wetlands, and receiving waters identified as ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (Attachment A);

(4) The receiving water limitations of Provision A.2;

(5) Known historical versus current physical, chemical, and biological water quality conditions;

(6) Available, relevant, and appropriately collected and analyzed physical, chemical, and biological receiving water monitoring data, including, but not limited to, data describing:

(a) Chemical constituents,

(b) Water quality parameters (i.e. pH, temperature, conductivity, etc.),

(c) Toxicity Identification Evaluations for both receiving water column and sediment,

(d) Trash impacts,

(e) Bioassessments, and

(f) Physical habitat;

(7) Available evidence of erosional impacts in receiving waters due to accelerated flows (i.e. hydromodification);

(8) Available evidence of adverse impacts to the chemical, physical, and biological integrity of receiving waters; and

(9) The potential improvements in the overall condition of the Watershed Management Area that can be achieved.

b. ASSESSMENT OF IMPACTS FROM MS4 DISCHARGES

The Copermittees must consider the following, at a minimum, to identify the potential impacts to receiving waters that may be caused or contributed to by discharges from the Copermittees' MS4s:

(1) The discharge prohibitions of Provision A.1 and effluent limitations of Provision A.3; and

(2) Available, relevant, and appropriately collected and analyzed storm water and non-storm water monitoring data from the Copermittees' MS4 outfalls;

(3) Locations of each Copermittee's MS4 outfalls that discharge to receiving waters;

(4) Locations of MS4 outfalls that are known to persistently discharge non-storm water to receiving waters likely causing or contributing to impacts on receiving water beneficial uses;

(5) Locations of MS4 outfalls that are known to discharge pollutants in storm water causing or contributing to impacts on receiving water beneficial uses; and

(6) The potential improvements in the quality of discharges from the MS4 that can be achieved.

c. IDENTIFICATION OF PRIORITY WATER QUALITY CONDITIONS

(1) The Copermittees must use the information gathered for Provisions B.2.a and B.2.b to develop a list of priority water quality conditions as pollutants, stressors and/or receiving water conditions that are the highest threat to receiving water quality or that most adversely affect the physical, chemical, and biological integrity of receiving waters. The list must include the following information for each priority water quality condition:

(a) The beneficial use(s) associated with the priority water quality condition;

(b) The geographic extent of the priority water quality condition within the Watershed Management Area, if known;

(c) The temporal extent of the priority water quality condition (e.g., dry weather and/or wet weather);

(d) The Copermittees with MS4s discharges that may cause or contribute to the priority water quality condition; and

(e) An assessment of the adequacy of and data gaps in the monitoring data to characterize the conditions causing or contributing to the priority water quality condition, including a consideration of spatial and temporal variation.

(2) The Copermittees must identify the highest priority water quality conditions to be addressed by the Water Quality Improvement Plan, and provide a rationale for selecting a subset of the water quality conditions identified pursuant to Provision B.2.c.(1) as the highest priorities.

d. IDENTIFICATION OF MS4 SOURCES OF POLLUTANTS AND/OR STRESSORS

The Copermittees must identify and prioritize known and suspected sources of storm water and non-storm water pollutants and/or other stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c. The identification of known and suspected sources of pollutants and/or stressors that cause or contribute to the highest priority water quality conditions as identified for Provision B.2.c must consider the following:

(1) Pollutant generating facilities, areas, and/or activities within the Watershed Management Area, including:

(a) Each Copermittee's inventory of construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas,

(b) Publicly owned parks and/or recreational areas,

(c) Open space areas,

(d) All currently operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste, and

(e) Areas not within the Copermittees' jurisdictions (e.g., Phase II MS4s, tribal lands, state lands, federal lands) that are known or suspected to be discharging to the Copermittees' MS4s;

(2) Locations of the Copermittees' MS4s, including the following:

(a) All MS4 outfalls that discharge to receiving waters, and

(b) Locations of major structural controls for storm water and non-storm water (e.g., retention basins, detention basins, major infiltration devices, etc.);

(3) Other known and suspected sources of non-storm water or pollutants in storm water discharges to receiving waters within the Watershed Management Area, including the following:

(a) Other MS4 outfalls (e.g., Phase II Municipal and Caltrans),

(b) Other NPDES permitted discharges,

(c) Any other discharges that may be considered point sources (e.g., private outfalls), and

(d) Any other discharges that may be considered non-point sources (e.g., agriculture, wildlife or other natural sources);

(4) Review of available data, including but not limited to:

(a) Findings from the Copermittees' illicit discharge detection and elimination programs,

(b) Findings from the Copermittees' MS4 outfall discharge monitoring,

(c) Findings from the Copermittees' receiving water monitoring,

(d) Findings from the Copermittees' MS4 outfall discharge and receiving water assessments, and

(e) Other available, relevant, and appropriately collected data, information, or studies related to pollutant sources and/or stressors that contribute to the highest priority water quality conditions as identified for Provision B.2.c.

(5) The adequacy of the available data to identify and prioritize sources and/or stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c.

e. NUMERIC GOALS AND SCHEDULES

The Copermittees must develop and incorporate interim and final numeric goals[6] and schedules into the Water Quality Improvement Plan. Numeric goals must be used to support Water Quality Improvement Plan implementation and measure progress towards addressing the highest priority water quality conditions identified under Provision B.2.c. When establishing numeric goals and corresponding schedules, the Copermittees must consider the following:

(1) Final numeric goals must be based on measureable criteria or indicators, to be achieved in the receiving waters and/or MS4 discharges for the highest priority water quality conditions which will be capable of demonstrating the achievement of the restoration and/or protection of water quality standards in receiving waters;

(2) Interim numeric goals must be based on measureable criteria or indicators that can demonstrate incremental progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges; and

(3) Schedules must be adequate for measuring progress toward achieving the interim and final numeric goals required for Provisions B.2.e.(1) and B.2.e.(2). Schedules must incorporate the following:

(a) Interim dates for achieving the interim numeric goals,

(b) Compliance schedules for any applicable TMDLs in Attachment E to this Order,

(c) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A),

(d) Achievement of the final numeric goals in the receiving waters and/or MS4 discharges for the highest water quality priorities must be as soon as possible, and

(e) Final dates for achieving the final numeric goals must not initially extend more than 10 years beyond the date this Order is adopted, unless a longer period of time is authorized by the San Diego Water Board Executive Officer or the schedule includes an applicable TMDL in Attachment E to this Order.

[6] Interim and final numeric goals may take a variety of forms such as TMDL established WQBELs, action levels, pollutant concentration, load reductions, number of impaired water bodies delisted from the List of Water Quality Impaired Segments, Index of Biotic Integrity (IBI) scores, or other appropriate metrics. Interim and final numeric goals are not necessarily limited to one criterion or indicator, but may include multiple criteria and/or indicators. Except for TMDL established WQBELs, interim and final numeric goals and corresponding schedules may be revised through the adaptive management process under Provision B.5.

3. Water Quality Improvement Strategies and Schedules

The Copermittees must develop specific water quality improvement strategies to address the highest priority water quality conditions identified within a Watershed Management Area. The water quality improvement strategies must address the highest priority water quality conditions by preventing or eliminating non-storm water discharges to and from the MS4, reducing pollutants in storm water discharges from the MS4 to the MEP, and restoring and/or protecting the water quality standards of receiving waters.

a. WATER QUALITY IMPROVEMENT STRATEGIES

The Copermittees must identify and prioritize water quality improvement strategies based on their likely effectiveness and efficiency, and implement strategies to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, improve the physical, chemical, and biological receiving water conditions, and achieve the interim and final numeric goals in accordance with the schedules required for Provision B.2.e.(3). The following water quality improvement strategies must be included and described in the Water Quality Improvement Plan:

(1) Specific strategies and/or activities that may be implemented by one or more Copermittees within their jurisdictions through the jurisdictional runoff management programs that will address the highest priority water quality conditions within the Watershed Management Area, in accordance with the following requirements:

(a) Strategies and/or activities must, at a minimum, be described for each jurisdictional runoff management program component where strategies to address the highest priority water quality conditions are required under Provision E;

(b) The Water Quality Improvement Plan must describe the circumstances or conditions when and where the strategies or/activities should be or will be implemented, but specific details about how each Copermittee will implement the strategies and/or activities within its jurisdiction are not required; and

(c) Descriptions of strategies and/or activities must include any monitoring, information collection, special studies, and/or data analysis that is necessary to assess the effectiveness of the strategy and/or activity toward addressing the highest priority water quality conditions.

(2) Additional strategies and/or activities that may be implemented within the Watershed Management Area on a jurisdictional, sub-watershed, or watershed scale by one or more Copermittees, not specifically required under Provision E, which are designed to achieve the interim and final numeric goals identified in Provisions B.2.e.(1) and B.2.e.(2);

b. IMPLEMENTATION SCHEDULES

(1) The Copermittees must develop schedules for implementing the water quality improvement strategies identified under Provision B.3.a to achieve the interim and final numeric goals identified under Provision B.2.e.(1) and B.2.e.(2). Schedules must be developed for both the water quality improvement strategies implemented by each Copermittee within its jurisdiction and for strategies that the Copermittees choose to implement on a collaborative basis.

(2) The Copermittees must incorporate the implementation compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

4. Water Quality Improvement Monitoring and Assessment Program

a. The Copermittees in each Watershed Management Area must develop and incorporate an integrated monitoring and assessment program into the Water Quality Improvement Plan that assesses: 1) the progress toward achieving the numeric goals and schedules, 2) the progress toward addressing the highest priority water quality conditions for each Watershed Management Area, and 3) each Copermittee's overall efforts to implement the Water Quality Improvement Plan.

b. The monitoring and assessment program must incorporate the monitoring and assessment requirements of Provision D, which may allow the Copermittees to modify the program to be consistent with and focus on the highest priority water quality conditions for each Watershed Management Area.

c. For Watershed Management Areas with applicable TMDLs, the monitoring and assessment program must incorporate the specific monitoring and assessment requirements of Attachment E.

d. For Watershed Management Areas with any ASBS, the water quality monitoring and assessment program must also incorporate the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

5. Iterative Approach and Adaptive Management Process

The Copermittees in each Watershed Management Area must implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a, and must consider the following:

a. Re-Evaluation of Priority Water Quality Conditions

The priority water quality conditions, and numeric goals and corresponding schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.2.c and B.2.e, may be re-evaluated by the Copermittees as needed during the term of this Order as part of the Annual Report. Re-evaluation and recommendations for modifications to the priority water quality conditions, and numeric goals and corresponding schedules must be provided in the Report of Waste Discharge, and must consider the following:

(1) Achieving the outcome of improved water quality in MS4 discharges and receiving waters through implementation of the water quality improvement strategies identified in the Water Quality Improvement Plan;

(2) Progress toward achieving interim and final numeric goals in receiving waters and/or MS4 discharges for the highest priority water quality conditions in the Watershed Management Area,

(3) Progress toward achieving outcomes according to established schedules;

(4) New information developed when the requirements of Provisions B.2.a-c have been re-evaluated;

(5) New policies or regulations that may affect identified numeric goals;

(6) Spatial and temporal accuracy of monitoring data collected to inform prioritization of water quality conditions and implementation strategies to address the highest priority water quality conditions;

(7) Availability of new information and data from sources other than the jurisdictional runoff management programs within the Watershed Management Area that informs the effectiveness of the actions implemented by the Copermittees;

(8) San Diego Water Board recommendations; and

(9) Recommendations for modifications solicited through a public participation process.

b. Adaptation of Strategies and Schedules

The water quality improvement strategies and schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.3, must be re-evaluated and adapted as new information becomes available to result in more effective and efficient measures to achieve the numeric goals established pursuant to Provision B.2.e. Re-evaluation of and modifications to the water quality improvement strategies must be provided in the Annual Report, and must consider the following:

(1) Modifications to the priority water quality conditions, and numeric goals and corresponding schedules based on Provision B.5.a;

(2) Measurable or demonstrable reductions of non-storm water discharges to and from each Copermittee's MS4;

(3) Measurable or demonstrable reductions of pollutants in storm water discharges from each Copermittee's MS4 to the MEP;

(4) New information developed when the requirements of Provisions B.2.b and B.2.d have been re-evaluated;

(5) Efficiency in implementing the Water Quality Improvement Plan;

(6) San Diego Water Board recommendations; and

(7) Recommendations for modifications solicited through a public participation process.

c. ADAPTATION OF MONITORING AND ASSESSMENT PROGRAM

The water quality improvement monitoring and assessment program, included in the Water Quality Improvement Plan pursuant to Provisions B.4, must be re-evaluated and adapted when new information becomes available. Re-evaluation and recommendations for modifications to the monitoring and assessment program, pursuant to the requirements of Provision D, may be provided in the Annual Report, but must be provided in the Report of Waste Discharge.

6. Water Quality Improvement Plan Submittal, Updates, and Implementation

a. The Copermittees must submit the Water Quality Improvement Plans in accordance with the requirements of Provision F.1.

b. The Copermittees must submit proposed updates to the Water Quality Improvement Plan for acceptance by the San Diego Water Board Executive Officer in accordance with the requirements of Provision F.2.c.

c. The Copermittees must commence with implementation of the Water Quality Improvement Plans immediately after acceptance by the San Diego Water Board, in accordance with the schedules, or subsequently updated schedules, within the Water Quality Improvement Plan.

C. ACTION LEVELS

The purpose of this provision is for the Copermittees to incorporate numeric action levels in the Water Quality Improvement Plans. The action levels will be used to guide Water Quality Improvement Plan implementation efforts and measure progress towards the protection of water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through monitoring and assessing the quality of the MS4 discharges prior to and during the implementation of the Water Quality Improvement Plans.

1. Non-Storm Water Action Levels[7]

The Copermittees must develop and incorporate numeric non-storm water action levels (NALs) into the Water Quality Improvement Plan to: 1) support the development and prioritization of water quality improvement strategies for addressing non-storm water discharges to and from the MS4s, 2) assess the effectiveness of the water quality improvement strategies toward addressing MS4 non-storm water discharges, required pursuant to Provision D.4.b.(1), and 3) support the detection and elimination of non-storm water and illicit discharges to and from the MS4, required pursuant to Provision E.2.[8]

a. The following NALs must be incorporated:

(1) Non-Storm Water Discharges from MS4s to Ocean Surf Zone

Table C-1. Non-Storm Water Action Levels for Discharges from MS4s to Ocean Surf Zone

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Total Coliform	MPN/100 ml	1,000	-	10,000/1,000[1]	OP
Fecal Coliform	MPN/100 ml	200[2]	-	400	OP
Enterococci	MPN/100 ml	35	-	104[3]	OP

Abbreviations/Acronyms
AMAL – average monthly action level
MDAL – maximum daily action level
OP – Ocean Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Total coliform density NAL is 1,000 MPN/100 ml when the fecal/total coliform ratio exceeds 0.1
2. Fecal coliform density NAL is 200 MPN per 100 ml during any 30 day period
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas"

[7] NALs are not considered by the San Diego Water Board to be enforceable limitations.
[8] The Copermittees may utilize NALs or other benchmarks currently established by the Copermittees as interim NALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

(2) Non-Storm Water Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Table C-2. Non-Storm Water Action Levels for Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Turbidity	NTU	75	-	225	OP
pH	Units	Within limit of 6.0 to 9.0 at all times			OP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	35	-	104[3]	BP
Priority Pollutants	ug/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
OP – Ocean Plan water quality objective
NTU – Nephelometric Turbidity Units
ug/L – micrograms per liter
MDAL – maximum daily action level
BP – Basin Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Based on a minimum of not less than five samples for any 30-day period
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas" and is not applicable to waterbodies that are not designated with the water contact recreation (REC-1) beneficial use

Table C-3. Non-Storm Water Action Levels for Priority Pollutants

Parameter	Units	Freshwater (CTR)		Saltwater (CTR)	
		MDAL	AMAL	MDAL	AMAL
Cadmium	ug/L	**	**	16	8
Copper	ug/L	*	*	5.8	2.9
Chromium III	ug/L	**	**	-	-
Chromium VI	ug/L	16	8.1	83	41
Lead	ug/L	*	*	14	2.9
Nickel	ug/L	**	**	14	6.8
Silver	ug/L	*	*	2.2	1.1
Zinc	ug/L	*	*	95	47

Abbreviations/Acronyms:
CTR – California Toxic Rule
AMAL – average monthly action level
ug/L – micrograms per liter
MDAL – maximum daily action level

Notes:
* Action levels developed on a case-by-case basis (see below)
** Action levels developed on a case-by-case basis (see below), but calculated criteria are not to exceed Maximum Contaminant Levels (MCLs) under the California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64431

The Cadmium, Copper, Chromium (III), Lead, Nickel, Silver and Zinc NALs for MS4 discharges to freshwater receiving waters will be developed on a case-by-case basis because the freshwater criteria are based on site-specific water quality data (receiving water hardness). For these priority pollutants, the following equations (40 CFR 131.38.b.2) will be required:

Cadmium (Total Recoverable) = exp(0.7852[ln(hardness)] - 2.715)
Chromium III (Total Recoverable) = exp(0.8190[ln(hardness)] + 0.6848)
Copper (Total Recoverable) = exp(0.8545[ln(hardness)] - 1.702)
Lead (Total Recoverable) = exp(1.273[ln(hardness)] - 4.705)
Nickel (Total Recoverable) = exp(.8460[ln(hardness)] + 0.0584)
Silver (Total Recoverable) = exp(1.72[ln(hardness)] - 6.52)
Zinc (Total Recoverable) = exp(0.8473[ln(hardness)] + 0.884)

(3) Non-Storm Water Discharges from MS4s to Inland Surface Waters

Table C-4. Non-Storm Water Action Levels for Discharges from MS4s to Inland Surface Waters

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Dissolved Oxygen	mg/L	Not less than 5.0 in WARM waters and not less than 6.0 in COLD waters			BP
Turbidity	NTU	-	20	See MDAL	BP
pH	Units	Within limit of 6.5 to 8.5 at all times			BP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	33	-	61[3]	BP
Total Nitrogen	mg/L	-	1.0	See MDAL	BP
Total Phosphorus	mg/L	-	0.1	See MDAL	BP
MBAS	mg/L	-	0.5	See MDAL	BP
Iron	mg/L	-	0.3	See MDAL	BP
Manganese	mg/L	-	0.05	See MDAL	BP
Priority Pollutants	ug/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
BP – Basin Plan water quality objective
COLD – cold freshwater habitat beneficial use
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
MDAL – maximum daily action level
WARM – warm freshwater habitat beneficial use
MBAS – Methylene Blue Active Substances
MPN/100 ml – most probable number per 100 milliliters
ug/L – micrograms per liter

Notes:
1. Based on a minimum of not less than five samples for any 30-day period
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period
3. This value has been set to the Basin Plan water quality objective for freshwater "designated beach areas" and is not applicable to waterbodies that are not designated with the water contact recreation (REC-1) beneficial use

b. If not identified in Provision C.1.a, NALs must be identified, developed and incorporated in the Water Quality Improvement Plan for any pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in waters of the state associated with the highest priority water quality conditions related to non-storm water discharges from the MS4s. NALs must be based on:

(1) Applicable water quality standards which may be dependent upon site-specific or receiving water-specific conditions or assumptions to be identified by the Copermittees; or

(2) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the NALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary NALs specific to the Watershed Management Area at levels greater than the NALs required by Provisions C.1.a and C.1.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for addressing non-storm water discharges to and from the MS4s, as well as the detection and

elimination of non-storm water and illicit discharges to and from the MS4. The secondary NALs may be developed using an approach acceptable to the San Diego Water Board.

d. Dry weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.b may be utilized to develop or revise NALs based on watershed-specific data, subject to San Diego Water Board Executive Officer approval.

2. Storm Water Action Levels[9]

The Copermittees must develop and incorporate numeric storm water action levels (SALs) in the Water Quality Improvement Plans to: 1) support the development and prioritization of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s, and 2) assess the effectiveness of the water quality improvement strategies toward reducing pollutants in storm water discharges, required pursuant to Provision D.4.b.(2).[10]

a. The following SALs for discharges of storm water from the MS4 must be incorporated:

Table C-5. Storm Water Action Levels for Discharges from MS4s to Receiving Waters

Parameter	Units	Action Level
Turbidity	NTU	126
Nitrate & Nitrite (Total)	mg/L	2.6
Phosphorus (Total P)	mg/L	1.46
Cadmium (Total Cd)*	µg/L	3.0
Copper (Total Cu)*	µg/L	127
Lead (Total Pb)*	µg/L	250
Zinc (Total Zn)*	µg/L	976

Abbreviations/Acronyms:
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
ug/L – micrograms per liter

Notes:
* The sampling must include a measure of receiving water hardness at each MS4 outfall. If a total metal concentration exceeds the corresponding metals SAL in Table C-5, that concentration must be compared to the California Toxics Rule criteria and the USEPA 1-hour maximum concentration for the detected level of receiving water hardness associated with that sample. If it is determined that the sample's total metal concentration for that specific metal exceeds that SAL, but does not exceed the applicable USEPA 1-hour maximum concentration criterion for the measured level of hardness, then the sample result will not be considered above the SAL for that measurement.

b. If not identified in Provision C.2.a, SALs must be identified, developed and incorporated in the Water Quality Improvement Plan for pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in waters of the state associated with the

[9] SALs are not considered by the San Diego Water Board to be enforceable limitations.
[10] The Copermittees may utilize SALs or other benchmarks currently established by the Copermittees as interim SALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

highest water quality priorities related to storm water discharges from the MS4s. SALs must be based on:

(1) Federal and State water quality guidance and/or water quality standards; and

(2) Site-specific or receiving water-specific conditions; or

(3) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the SALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary SALs specific to the Watershed Management Area at levels greater than the SALs required by Provisions C.2.a and C.2.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s. The secondary SALs may be developed based on the approaches recommended by the State Water Board's Storm Water Panel[11] or using an approach acceptable to the San Diego Water Board.

d. Wet weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.c may be used to develop or revise SALs based upon watershed-specific data, subject to San Diego Water Board Executive Officer approval.

[11] Storm Water Panel Recommendations to the California State Water Resources Control Board: The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities (June 2006)

D. MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS

The purpose of this provision is for the Copermittees to monitor and assess the impact on the chemical, physical, and biological conditions of receiving waters caused by discharges from the Copermittees' MS4s under wet weather and dry weather conditions. The goal of this provision is to inform the Copermittees about the nexus between the health of receiving waters and the water quality condition of the discharges from their MS4s. This goal will be accomplished through monitoring and assessing the conditions of the receiving waters, discharges from the MS4s, pollutant sources and/or stressors, and effectiveness of the water quality improvement strategies implemented as part of the Water Quality Improvement Plans.

The Copermittees must incorporate and implement the following minimum monitoring and assessment program requirements into each Water Quality Improvement Plan.

1. Receiving Water Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the condition of the receiving waters in each Watershed Management Area during dry weather and wet weather. Following acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct long-term receiving water monitoring during implementation of the Water Quality Improvement Plan to assess the long term trends and determine if conditions in receiving waters are improving. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must develop and/or update its written dry weather and wet weather receiving water monitoring procedures to be consistent with the following criteria:

a. TRANSITIONAL RECEIVING WATER MONITORING

Until the monitoring requirements of Provisions D.1.b-e are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following receiving water monitoring in the Watershed Management Area:

(1) Continue the receiving water monitoring programs required in Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016;

(2) Continue the monitoring in the Hydromodification Management Plans approved by the San Diego Water Board;

(3) Participate in the following regional receiving water monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring,

(b) Southern California Bight Regional Monitoring, and

(c) Sediment Quality Monitoring;

(4) Implement the monitoring programs developed as part of any implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) for the TMDLs in Attachment E to this Order; and

(5) For Watershed Management Areas with ASBS, implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

b. LONG-TERM RECEIVING WATER MONITORING STATIONS

The Copermittees must select at least one long-term receiving water monitoring station from among the existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees to be representative of the receiving water quality in the Watershed Management Area. Additional long-term receiving water monitoring stations must be selected where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

c. DRY WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three dry weather monitoring events at each of the long-term receiving water monitoring stations. At least one monitoring event must be conducted during the dry season (May 1 – September 30) and at least one monitoring event must be conducted during a dry weather period during the wet season (October 1 – April 30), after the first wet weather event of the season, with an antecedent dry period of at least 72 hours following a storm event producing measureable rainfall of greater than 0.1 inch.

(1) Dry Weather Receiving Water Field Observations

For each dry weather monitoring event, the Copermittees must record field observations consistent with Table D-1 at each long-term receiving water monitoring station.

Table D-1. Field Observations for Receiving Water Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, or sheens, odor, color) • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, or sheens, odor, color) • Station description (i.e. deposits or stains, vegetation condition, structural condition, and observable biology) • Presence and assessment of trash in and around station

(2) Dry Weather Receiving Water Field Monitoring

For each dry weather monitoring event, if conditions allow the collection of the data, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

Table D-2. Field Monitoring Parameters for Receiving Water Monitoring Stations

Parameters
• pH • Temperature • Specific conductivity • Dissolved oxygen • Turbidity

(3) Dry Weather Receiving Water Analytical Monitoring

For each dry weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, or

(ii) Flow-weighted composites collected over a typical 24-hour period;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable NAL constituents, and

(v) Constituents listed in Table D-3.

Table D-3. Analytical Monitoring Constituents for Receiving Water Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Pesticides	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Mercury • Nickel • Selenium • Thallium • Zinc	• Organophosphate Pesticides • Pyrethroid Pesticides	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(4) Dry Weather Receiving Water Toxicity Monitoring

For each dry weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for toxicity in accordance with Table D-4:

Table D-4. Dry Weather Toxicity Testing for Receiving Water Monitoring Stations

Freshwater Organism	Test Approach	EPA Protocol[2]
Pimephales promelas	1 acute 1 chronic[1]	EPA-821-R-02-012
Hyalella Azteca	1 acute 1 chronic[1]	EPA-821-R-02-012
Psuedokirchneriella subcapitata	1 acute 1 chronic[1]	EPA-821-R-02-013

Notes:
1. Chronic toxicity testing is not required at receiving water monitoring stations located at mass loading stations if the channel flows are diverted year-round during dry weather conditions to the sanitary sewer for treatment.
2. EPA protocols must be utilized for toxicity testing unless alternate toxicity testing protocols have been approved by the San Diego Water Board.

(5) Dry Weather Receiving Water Bioassessment Monitoring

Bioassessment monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must conduct bioassessment monitoring during at least one dry weather monitoring event at each long-term receiving water monitoring station as follows:

(a) The following bioassessment samples and measurements must be collected:

(i) Macroinvertebrate samples must be collected in accordance with the "Reachwide Benthos (Multihabitat) Procedure" in the most current Surface Water Ambient Monitoring Program (SWAMP) Bioassessment Standard Operating Procedures (SOP), and amendments, as applicable;[12]

(ii) The "Full" suite of physical habitat characterization measurements must be collected in accordance with the most current SWAMP Bioassessment SOP, and as summarized in the SWAMP Stream Habitat Characterization Form – Full Version;[13] and

(iii) Freshwater algae samples must be collected in accordance with the SWAMP Standard Operating Procedures for Collecting Algae

[12] Ode, P.R.. 2007. Standard operating procedures for collecting macroinvertebrate samples and associated physical and chemical data for ambient bioassessments in California. California State Water Resources Control Board Surface Water Ambient Monitoring Program (SWAMP) Bioassessment SOP 001. http://www.swrcb.ca.gov/water_issues/programs/swamp/tools.shtml#monitoring
[13] Available at: http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/reports/fieldforms_fullversion052908.pdf

Samples.[14] Analysis of samples must include algal taxonomic composition (diatoms and soft algae) and algal biomass.

(b) The bioassessment samples, measurements, and appropriate water chemistry data must be used to calculate the following:

(i) An Index of Biological Integrity (IBI) for macroinvertebrates for each monitoring station where bioassessment monitoring was conducted, based on the most current calculation method;[15] and

(ii) An IBI for algae for each monitoring station where bioassessment monitoring was conducted, when a calculation method is developed.[16]

(c) In lieu of the requirements of Provision D.1.c.(5)(a), the Copermittees may conduct the bioassessment monitoring in accordance with the "Triad" assessment approach[17] to calculate the IBIs required for Provision D.1.c.(5)(b). The Copermittees must conduct sampling, analysis, and reporting of specified in-stream biological and habitat data according to the protocols specified in the SCCWRP Technical Report No. 539, or subsequent protocols, if developed.

(6) Dry Weather Receiving Water Hydromodification Monitoring

In addition to the hydromodification monitoring conducted as part of the Copermittees' Hydromodification Management Plans, hydromodification monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must collect the following hydromodification monitoring observations and measurements within an appropriate domain of analysis during at least one dry weather monitoring event for each long-term receiving water monitoring station:

(a) Channel conditions, including:

(i) Channel dimensions,

[14] Fetscher et al. 2009. Standard Operating Procedures for Collecting Stream Algae Samples and Associated Physical Habitat and Chemical Data for Ambient Bioassessments in California.
[15] The most current calculation method at the time the Order was adopted is outlined in "A Quantitative Tool for Assessing the Integrity of Southern California Coastal Streams" (Ode, et al. 2005. Environmental Management. Vol. 35, No. 1, pp. 1-13). If an updated or new calculation method is developed, either both (i.e. current and updated/new) methods must be used, or historical IBIs must be recalculated with the updated or new calculation method.
[16] When a calculation method is developed, IBIs must be calculated for all available and appropriate historical data.
[17] Stormwater Monitoring Coalition Model Monitoring Technical Committee, 2004. Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California. Technical Report #419. August 2004.

(ii) Hydrologic and geomorphic conditions, and

(iii) Presence and condition of vegetation and habitat;

(b) Location of discharge points;

(c) Habitat integrity;

(d) Photo documentation of existing erosion and habitat impacts, with location (i.e. latitude and longitude coordinates) where photos were taken;

(e) Measurement or estimate of dimensions of any existing channel bed or bank eroded areas, including length, width, and depth of any incisions; and

(f) Known or suspected cause(s) of existing downstream erosion or habitat impact, including flow, soil, slope, and vegetation conditions, as well as upstream land uses and contributing new and existing development.

d. WET WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three wet weather monitoring events at each long-term receiving water monitoring station. At least one wet weather monitoring event must be conducted during the first wet weather event of the wet season (October 1 – April 30), and at least one wet weather monitoring event during a wet weather event that occurs after February 1.

(1) Wet Weather Receiving Water Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each long-term receiving water monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event;

(b) The flow rates and volumes measured or estimated. Data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board;

(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(d) Presence and assessment of trash in and around station.

(2) Wet Weather Receiving Water Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

(3) Wet Weather Receiving Water Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) Constituents listed in Table D-3.

(4) Wet Weather Receiving Water Toxicity Monitoring

For each wet weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for toxicity in accordance with Table D-5:

Table D-5. Wet Weather Toxicity Testing for Receiving Water Monitoring Stations

Freshwater Organism	Test Approach	EPA Protocol[1]
Pimephales promelas	1 acute	EPA-821-R-02-012
Hyalella Azteca	1 acute	EPA-821-R-02-012
Psuedokirchneriella subcapitata	1 acute	EPA-821-R-02-013

Notes:
1. EPA protocols must be utilized for toxicity testing unless alternate toxicity testing protocols have been approved by the San Diego Water Board.

e. Other Receiving Water Monitoring Requirements

(1) Regional Monitoring

The Copermittees must participate in the following regional receiving waters monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring; and

(b) Southern California Bight Regional Monitoring.

(2) Sediment Quality Monitoring

The Copermittees must perform sediment monitoring to assess compliance with sediment quality receiving water limits applicable to MS4 discharges to enclosed bays and estuaries. The monitoring may be performed either by individual or multiple Copermittees to assess compliance with receiving water limits, or through participation in a water body monitoring coalition. The Copermittees must identify sediment sampling stations that are spatially representative of the sediment within the water body segment or region of interest. Sediment quality monitoring must be conducted in conformance with the monitoring requirements set forth in the State Water Board Sediment Quality Control Plan.

(3) ASBS Monitoring

For Watershed Management Areas with ASBS, the Copermittees must implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

f. ALTERNATIVE WATERSHED MONITORING REQUIREMENTS

The San Diego Water Board may modify the long-term receiving water monitoring requirements directing the Copermittees to participate in an alternative watershed monitoring effort with other regulated entities, other interested parties, and the San Diego Water Board in the development, refinement, implementation, and coordination of regional monitoring and assessment programs to determine the status and trends of water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams.

2. MS4 Outfall Discharge Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the discharges from the MS4 outfalls in each Watershed Management Area during dry weather and wet weather. Following acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct MS4 outfall discharge monitoring during implementation of the Water Quality Improvement Plan to assess the effectiveness of their jurisdictional runoff management programs toward effectively prohibiting non-storm water discharges and reducing pollutants in storm water discharges to and from their MS4s. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must develop and/or update its written dry weather and wet weather MS4 outfall monitoring procedures to be consistent with the following criteria:

a. TRANSITIONAL MS4 OUTFALL DISCHARGE MONITORING

Until the monitoring requirements of Provisions D.2.b-c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following MS4 outfall discharge monitoring in the Watershed Management Area:

(1) MS4 Outfall Discharge Monitoring Station Inventory

Each Copermittee must identify all major MS4 outfalls that discharge directly to receiving waters within its jurisdiction and geo-locate those outfalls on a map of the MS4 pursuant to Provision E.2.b.(1). This information must be

compiled into a MS4 outfall discharge monitoring station inventory, and must include the following information:

(a) Watershed Management Area;

(b) Hydrologic subarea;

(c) Outlet size;

(d) Accessibility (i.e. safety and without disturbance of critical habitat);

(e) Approximate drainage area; and

(f) Classification of whether the MS4 outfall is known to have persistent dry weather flows, transient dry weather flows, no dry weather flows, or unknown dry weather flows.

(2) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Until the monitoring requirements of Provision D.2.b are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, each Copermittee must perform dry weather MS4 outfall field screening monitoring to identify non-storm water and illicit discharges within its jurisdiction in accordance with Provision E.2.c, to determine which discharges are transient flows and which are persistent flows, and prioritize the dry weather MS4 discharges that will be investigated and eliminated in accordance with Provision E.2.d. Each Copermittee must conduct the following dry weather MS4 outfall discharge field screening monitoring within its jurisdiction:

(a) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Frequency

Each Copermittee must field screen the MS4 outfalls in its inventory developed pursuant to Provision D.2.a.(1) as follows:

(i) For Copermittees with less than 125 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 80 percent of the outfalls must be visually inspected two times per year during dry weather conditions.

(ii) For Copermittees with 125 major MS4 outfalls or more, but less than or equal to 500, that discharge to receiving waters within a Watershed Management Area all the outfalls must be visually inspected at least annually during dry weather conditions.

(iii) For Copermittees with more than 500 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 500 outfalls must be visually inspected at least annually during dry weather conditions. Copermittees with more than 500 major MS4 outfalls within a Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(iv) For Copermittees with more than 500 major MS4 outfalls within its jurisdiction that are located in more than one Watershed Management Area, at least 500 major MS4 outfalls within its inventory must be visually inspected at least annually during dry weather conditions. Copermittees with more than 500 major MS4 outfalls in more than one Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(v) Inspections of major MS4 outfalls conducted in response to public reports and staff or contractor reports and notifications may count toward the required visual inspections of MS4 outfall discharge monitoring stations.

(b) Transitional Dry Weather MS4 Outfall Discharge Field Screening Visual Observations

(i) An antecedent dry period of at least 72 hours following any storm event producing measurable rainfall greater than 0.1 inch is required prior to conducting field screening visual observations during a field screening monitoring event.

(ii) During the field screening monitoring event, each Copermittee must record visual observations consistent with Table D-6 at each MS4 outfall discharge monitoring station inspected.

Table D-6. Field Screening Visual Observations for MS4 Outfall Discharge Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, or sheens, odor, color) - Flow source(s) suspected or identified from non-storm water source investigation - Flow source(s) eliminated during non-storm water source identification • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, or sheens, odor, color) - Known or suspected source(s) of pooled or ponded water • Station description (i.e. deposits or stains, vegetation condition, structural condition, observable biology) • Presence and assessment of trash in and around station • Evidence or signs of illicit connections or illegal dumping

(iii) Each Copermittee must implement the requirements of Provisions E.2.d.(2)(c)-(e) based on the field observations.

(iv) Each Copermittee must evaluate field observations together with existing information available from prior reports, inspections and monitoring results to determine whether any observed flowing, pooled, or ponded waters are likely to be transient or persistent flow.[18]

(c) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Records

Based upon the results of the transitional dry weather MS4 outfall discharge field screening monitoring conducted pursuant to Provisions D.2.a.(2)(a)-(b), each Copermittee must update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow.

[18] Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

(3) Transitional Wet Weather MS4 Outfall Discharge Monitoring

Until the monitoring requirements of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(a) Transitional Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees must select at least five wet weather MS4 outfall discharge monitoring stations from the inventories developed pursuant to Provision D.2.a.(1) that are representative of storm water discharges from areas consisting primarily of residential, commercial, industrial, and typical mixed-use land uses present within the Watershed Management Area.

(b) Transitional Wet Weather MS4 Outfall Discharge Monitoring Frequency

Each wet weather MS4 outfall discharge monitoring station selected pursuant to Provision D.2.a.(3)(a) must be monitored twice during the wet season (October 1 – April 30). One wet weather monitoring event must be conducted during the first wet weather event of the wet season, and one wet weather monitoring event at least a month after the first wet weather event of the wet season.

(c) Transitional Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(i) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(ii) The flow rates and volumes measured or estimated. Data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board.

(iii) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(iv) Presence and assessment of trash in and around station.

(d) Transitional Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(e) Transitional Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, and indicator bacteria;

(iv) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

[a] Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or
[b] Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment.
[c] If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours.

(v) Only one analysis of the composite of aliquots is required;

(vi) The samples must be analyzed for the following constituents:

[a] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,
[b] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and
[c] Constituents listed in in Table D-7.

Table D-7. Analytical Monitoring Constituents for Wet Weather MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Nickel • Selenium • Thallium • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(f) Other Transitional Wet Weather MS4 Outfall Discharge Monitoring

The San Diego County Copermittees must continue the wet weather MS4 outfall monitoring program developed under Order No. R9-2007-0001, as approved by the San Diego Water Board, through its planned completion.

b. DRY WEATHER MS4 OUTFALL DISCHARGE MONITORING

Each Copermittee must perform dry weather MS4 outfall monitoring to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. Each Copermittee must conduct the following dry weather MS4 outfall discharge monitoring within its jurisdiction:

(1) Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Each Copermittee must continue to perform the dry weather MS4 outfall discharge field screening monitoring in accordance with the requirements of Provision D.2.a.(2). The Copermittee may adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of persistent flow non-storm water discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of visual inspections performed is equivalent to the number of visual inspections required under Provision D.2.a.(2)(a).

(2) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring

Each Copermittee must perform non-storm water persistent flow MS4 outfall discharge monitoring to determine which persistent non-storm water discharges contain concentrations of pollutants below NALs, and which persistent non-storm water discharges impact receiving water quality during dry weather. Each Copermittee must conduct the following non-storm water persistent flow MS4 outfall discharge monitoring within its jurisdiction:

(a) Prioritization of Non-Storm Water Persistent Flow MS4 Outfalls

Based upon the dry weather MS4 outfall discharge field screening monitoring records developed pursuant to Provision D.2.a.(2)(c), each Copermittee must identify and prioritize the MS4 outfalls with persistent flows based on the highest priority water quality conditions identified in the Water Quality Improvement Plan and any additional criteria developed by the Copermittee, which may include historical data and data from sources other what the Copermittee collects.

(b) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring Frequency

(i) Based on the prioritization of major MS4 outfalls developed under Provision D.2.b.(2)(a), each Copermittee must identify, at a minimum, the 10 highest priority major MS4 outfalls with non-storm water persistent flows that the Copermittee will monitor within each Watershed Management Area within its jurisdiction. The location of the highest priority non-storm water persistent flow MS4 outfall monitoring stations must be identified on the map required pursuant to Provision E.2.b.(1).

(ii) Each of the highest priority non-storm water persistent flow MS4 outfall monitoring stations identified pursuant to Provision D.2.b.(2)(b)(i) must be monitored under dry weather conditions at least semi-annually until one of the following occurs:

[a] The non-storm water discharges have been effectively eliminated (i.e. no flowing, pooled, or ponded water) for three consecutive dry weather monitoring events; or

[b] The source(s) of the persistent flows has been identified as a category of non-storm water discharges that does not require an NPDES permit and does not have to be addressed as an illicit discharge because it was not identified as a source of pollutants (i.e. constituents in non-storm water discharge do not exceed NALs), and the persistent flow can be re-prioritized to a lower priority; or

[c] The constituents in the persistent flow non-storm water discharge do not exceed NALs, and the persistent flow can be re-prioritized to a lower priority; or

[d] The source(s) of the persistent flows has been identified as a non-storm water discharge authorized by a separate NPDES permit.

(iii) Where the criteria under Provision D.2.b.(2)(c)(ii) are not met, but the threat to water quality has been reduced by the Copermittee, the highest priority persistent flow MS4 outfall monitoring stations may be reprioritized accordingly for continued dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1).

(iv) Each Copermittee must document removal or re-prioritization of the highest priority persistent flow MS4 outfall monitoring stations identified under Provision D.2.b.(2)(b) in the Annual Report. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized MS4 major outfall in the Watershed Management Area within its jurisdiction, unless there are no remaining qualifying major MS4 outfalls within the Copermittee's jurisdiction in the Watershed Management Area.

(c) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Observations

During each semi-annual monitoring event, each Copermittee must record field observations consistent with Table D-6 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(d) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Monitoring

During each semi-annual monitoring event, if conditions allow the collection of the data, each Copermittee must monitor and record the parameters in Table D-2 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(e) Non-Storm Water Persistent Flow MS4 Outfall Discharge Analytical Monitoring

During each semi-annual monitoring event in which measurable flow is present, each Copermittee must collect and analyze samples from each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Collect grab or composite samples to be analyzed for the following constituents:

[a] Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,
[b] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,
[c] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,
[d] Applicable NAL constituents, and
[e] Constituents listed in Table D-8, unless the Copermittee has historical data that can demonstrate or provide justification that the analysis of the constituent is not necessary.

Table D-8. Analytical Monitoring Constituents for Persistent Flow MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Total Hardness • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Cadmium • Copper • Lead • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(iv) If the Copermittee identifies and eliminates the source of the persistent flow non-storm water discharge, analysis of the sample is not required.

c. WET WEATHER MS4 OUTFALL DISCHARGE MONITORING

The Copermittees must perform wet weather MS4 outfall monitoring to identify sources of pollutants in storm water discharges from the MS4s in the Watershed Management Area. The Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(1) Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees may adjust the wet weather MS4 outfall discharge monitoring locations and frequencies in the Watershed Management Area, as needed, to identify sources of pollutants in storm water discharges from MS4s in the Watershed Management Area in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of stations is at least equivalent to the number of stations required under Provision D.2.a.(3)(a).

(2) Wet Weather MS4 Outfall Discharge Monitoring Frequency

The Copermittees must monitor the wet weather MS4 outfall discharge monitoring stations in the Watershed Management Area at an appropriate frequency to identify sources of pollutants in storm water discharges from the MS4s causing or contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan.

(3) Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(b) The flow rates and volumes measured or estimated. Data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board.

(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(d) Presence and assessment of trash in and around station.

(4) Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(5) Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment.

(iii) If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours.

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and

(iv) Applicable SAL constituents.

3. Special Studies

a. Within the term of this Order, the Copermittees must develop and implement the following special studies:

(1) At least three special studies in each Watershed Management Area to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that cause or contribute to highest priority water quality conditions identified in the Water Quality Improvement Plan.

(2) At least two special studies for the San Diego Region to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that are impacting receiving waters on a regional basis in the San Diego Region.

(3) One of the three special studies in each Watershed Management Area may be replaced by a special study implemented pursuant to Provision D.3.a.(2).

b. The special studies must, at a minimum, be in conformance with the following criteria:

(1) The special studies must be related to the highest priority water quality conditions identified by the Copermittees in the Watershed Management Area and/or for the entire San Diego Region;

(2) The special studies developed pursuant to Provision D.3.a.(1) must:

(a) Be implemented within the applicable Watershed Management Area, and

(b) Require some form of participation by all the Copermittees within the Watershed Management Area;

(3) The special studies developed pursuant to Provision D.3.a.(2) must:

(a) Be implemented within the San Diego Region, and

(b) Require some form of participation by all Copermittees covered under the requirements of this Order.

c. Special studies developed to identify sources of pollutants and/or stressors should be pollutant and/or stressor specific and based on historical monitoring data and monitoring performed pursuant to Provisions D.1 and D.2. Development of source identification special studies should include the following:

(1) A compilation of known information on the specific pollutant and/or stressor, including data on potential sources and movement of the pollutant and/or stressor within the watershed. Data generated by the Copermittees and others, as well as information available from a literature research on the pollutant and/or stressor should be compiled and analyzed as appropriate.

(2) An identification of data gaps, based on the compiled information generated on the specific pollutant and/or stressor in Provision D.3.d.(1). Source identification special studies should be developed to fill identified data gaps.

(3) A monitoring plan that will collect and provide data the Copermittees can utilize to do the following:

(a) Quantify the relative loading or impact of a pollutant and/or stressor from a particular source or pollutant generating activity;

(b) Improve understanding of the fate of a pollutant and/or stressor in the environment;

(c) Develop an inventory of known and suspected sources of a pollutant and/or stressor in the Watershed Management Area; and/or

(d) Prioritize known and suspected sources of a pollutant and/or stressor based on relative magnitude in discharges, geographical distribution (i.e., regional or localized), frequency of occurrence in discharges, human health risk, and controllability.

d. Special studies initiated prior to the acceptance of the Water Quality Improvement Plan that meet the requirements of Provision D.3.b and are completed during the term of this Order may be utilized to fulfill the special study requirements of Provision D.3.a.

e. The Copermittees must submit the monitoring plans for the special studies in the Water Quality Improvement Plans required pursuant to Provision F.1.

f. The Copermittees are encouraged to share the results of the special studies regionally among the Copermittees to provide information useful in improving and adapting the management of non-storm water and storm water runoff through the implementation of the Water Quality Improvement Plans.

4. Assessment Requirements

Each Copermittee must evaluate the data collected pursuant to Provisions D.1, D.2 and D.3, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E, to assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a. Assessments must be performed as described in the following provisions:

a. Receiving Waters Assessments

(1) The Copermittees must assess and report the conditions of the receiving waters in the Watershed Management Area as follows:

(a) Based on data collected pursuant to Provision D.1.a, the assessments under Provision D.4.a.(2) must be included in the first Annual Report required pursuant to Provision F.3.b.(1).

(b) Based on the data collected pursuant to Provisions D.1.a-e, the assessments required under Provision D.4.a.(2) must be included in the Report of Waste Discharge required pursuant to Provision F.5.b.

(2) The Copermittees must assess the status and trends of receiving water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under dry weather and wet weather conditions. For each of the three types of receiving waters in each Watershed Management Area the Copermittees must:

(a) Determine whether or not the conditions of the receiving waters are protective of the designated beneficial uses;

(b) Identify the most critical beneficial uses that must be protected or restored to ensure overall health of the receiving water;

(c) Determine whether or not those critical beneficial uses are being protected and where those beneficial used must be restored;

(d) Identify short-term and/or long-term improvements or degradation of those critical beneficial uses;

(e) Identify data gaps in the monitoring data necessary to assess Provisions D.4.a.(2)(a)-(d).

b. MS4 OUTFALL DISCHARGES ASSESSMENTS

(1) Non-Storm Water Discharges Reduction Assessments

(a) Each Copermittee must assess and report the progress of its illicit discharge detection and elimination program, required to be implemented pursuant to Provision E.2, toward reducing and effectively prohibiting non-storm water and illicit discharges into the MS4 within its jurisdiction as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(2), the assessments under Provision D.4.b.(1)(b) must be included in the first Annual Report required pursuant to Provision F.3.b.(1).

(ii) Based on the data collected pursuant to Provisions D.2.b, the assessments required under Provision D.4.b.(1)(c) must be included in the first Annual Report required pursuant to Provision F.3.b.(1), and annually thereafter.

(iii) Based on the data collected pursuant to Provisions D.2.b, the assessment required under Provision D.4.b.(1)(c) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.a.(2), each Copermittee must assess and report the following:

(i) Identify the known and suspected controllable sources (e.g. facilities, areas, land uses, pollutant generating activities) of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area;

(ii) Identify sources of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area that have been reduced or eliminated during the transitional monitoring period; and

(iii) Identify modifications to the field screening monitoring locations and frequencies for the MS4 outfalls in its inventory necessary to identify and eliminate sources of persistent flow non-storm water discharges pursuant to Provision D.2.b.(1).

(c) Based on the dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b, each Copermittee must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(1)(b);

(ii) Based on the data collected and applicable NALs in the Water Quality Improvement Plan, rank the MS4 outfalls in the Copermittee's jurisdiction according to potential threat to receiving water quality, and produce a prioritized list of major MS4 outfalls for follow-up action to update the Water Quality Improvement Plan, with the goal of eliminating persistent flow non-storm water discharges and/or pollutant loads in order of the ranked priority list through targeted programmatic actions and source investigations;

(iii) For the highest priority major MS4 outfalls with persistent flows that are in exceedance of NALs, identify the known and suspected sources within the Copermittee's jurisdiction in the Watershed Management Area that may cause or contribute to the NAL exceedances;

(iv) Each Copermittee must analyze the data collected pursuant to Provision D.2.b, and utilize a model or other method, to calculate or estimate the non-storm water volumes and pollutant loads discharged from all the major MS4s outfalls in its jurisdiction identified as having persistent dry weather flows during the monitoring year. These calculations or estimates must be updated annually. Each Copermittee must calculate or estimate:

[a] Annual non-storm water volumes and pollutant loads discharged from the Copermittee's major MS4 outfalls to receiving waters within the Copermittee's jurisdiction, with an estimate of the percent contribution from each known and suspected source for each MS4 outfall;

[b] Annual non-storm water volumes and pollutant loads from areas or facilities subject to the Copermittee's legal authority that are discharged from the Copermittee's major MS4 outfalls to downstream receiving waters.

(v) Each Copermittee must review the data collected pursuant to Provision D.2.b and findings from the assessments required pursuant to Provision D.4.b.(1)(c)(i)-(iv) on an annual basis to:

[a] Identify reductions and progress in achieving reductions in non-storm water and illicit discharges to the Copermittee's MS4 in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing or eliminating of non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction, with an estimate, if possible, of the non-storm water volume and/or pollutant load reductions attributable to specific water quality strategies implemented by the Copermittee; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittee in the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction.

(vi) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(v).

(2) Storm Water Pollutant Discharges Reduction Assessments

(a) The Copermittees must assess and report the progress of the water quality improvement strategies, required to be implemented pursuant to Provisions B and E, toward reducing pollutants in storm water discharges from the MS4s within the Watershed Management Area as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(3), the assessments under Provision D.4.b.(2)(b) must be included in the first Annual Report required pursuant to Provision F.3.b.(1).

(ii) Based on the data collected pursuant to Provisions D.2.c, the assessments required under Provision D.4.b.(2)(c) must be included in the first Annual Report required pursuant to Provision F.3.b.(1), and annually thereafter.

(iii) Based on the data collected pursuant to Provisions D.2.c, the assessment required under Provisions D.4.b.(2)(c)-(d) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.a.(3) the Copermittee must assess and report the following:

(i) The Copermittees must analyze the monitoring data collected pursuant to Provision D.2.a.(3), and utilize a watershed model or other method, to calculate or estimate storm water volumes and pollutant loads discharged from the MS4s in each Copermittee's jurisdiction within the Watershed Management Area. The Copermittees must calculate or estimate the following for each monitoring year:

[a] The average storm water runoff coefficient for each land use type within the Watershed Management Area;

[b] The volume of storm water discharged from each of the Copermittee's major MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch;

[c] The pollutant loads discharged from each of the Copermittee's major MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch; and

[d] The percent contribution of storm water volumes and pollutant loads discharged from each land use type within the drainage basin to each of the Copermittee's major MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch.

(ii) Identify modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify sources pollutants in storm water discharges from the MS4s in the Watershed Management Area pursuant to Provision D.2.c.(1).

(c) Based on the wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.c the Copermittee must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(2)(b);

(ii) Based on the data collected and applicable SALs in the Water Quality Improvement Plan, rank the MS4 outfalls in the Watershed Management Area according to potential threat to receiving water quality, and produce a prioritized list of major MS4 outfalls for follow-up action to update the Water Quality Improvement Plan;

(iii) The Copermittee must review the data collected pursuant to Provision D.2.c and findings from the assessments required pursuant to Provisions D.4.b.(2)(c)(i)-(ii) on an annual basis to:

[a] Identify reductions and progress in achieving reductions in pollutant concentrations and/or pollutant loads from different land uses and/or drainage areas discharging from the Copermittees' MS4s in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters within the Watershed Management Area to the MEP, with an estimate, if possible, of the pollutant load reductions attributable to specific water quality strategies implemented by the Copermittees; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittees in the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters in the Watershed Management Area to the MEP.

(iv) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(iii).

(d) The Copermittees must evaluate all the data collected pursuant to Provision D.2.c, and incorporate new outfall monitoring data into time series plots for each long-term monitoring constituent for the Watershed Management Area, and perform statistical trends analysis on the cumulative long-term wet weather MS4 outfall discharge water quality data set.

c. Special Studies Assessments

The Copermittees must annually evaluate the results and findings from the special studies developed and implemented pursuant to Provision D.3, and assess their relevance to the Copermittees' efforts to characterize receiving water conditions, understand sources of pollutants and/or stressors, and control and reduce the discharges of pollutants from the MS4 outfalls to receiving waters in the Watershed Management Area. The Copermittees must report the results of the special studies assessments applicable to the Watershed Management Area, and identify any necessary modifications or updates to the Water Quality Improvement Plan based on the results in the Annual Reports required pursuant to Provision F.3.b.

d. Integrated Assessment of Water Quality Improvement Plan

As part of the iterative approach and adaptive management process required for the Water Quality Improvement Plan pursuant to Provision B.5, the Copermittees in each Watershed Management Area must integrate the data collected pursuant to Provisions D.1-D.3, the findings from the assessments required pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to assess the effectiveness of, and identify necessary modifications to, the Water Quality Improvement Plan as follows:

(1) The Copermittees must re-evaluate the priority water quality conditions and numeric goals for the Watershed Management Area, as needed, during the term of this Order pursuant to Provision B.5.a. The re-evaluation and recommendations for modifications to the priority water quality conditions, and/or numeric goals and corresponding schedules may be provided in the Annual Reports required pursuant to Provision F.3.b, but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The priority water quality conditions and numeric goals for the Watershed Management Area must be re-evaluated as follows:

(a) Re-evaluate the receiving water conditions in the Watershed Management Area in accordance with Provision B.2.a;

(b) Re-evaluate the impacts on receiving waters in the Watershed Management Area from MS4 discharges in accordance with Provision B.2.b;

(c) Re-evaluate the identification of MS4 sources of pollutants and/or stressors in accordance with Provision B.2.d;

(d) Identify beneficial uses of the receiving waters that are protected or must be restored in accordance with Provision D.4.a;

(e) Evaluate the progress toward achieving the interim and final numeric goals for restoring impacted beneficial uses in the receiving waters.

(2) The Copermittees must re-evaluate the water quality improvement strategies for the Watershed Management Area, as needed, during the term of this Order pursuant to Provision B.5.b. The re-evaluation and recommendations for modifications to the water quality improvement strategies and schedules must be provided in the Annual Reports required pursuant to Provision F.3.b, and provided in the Report of Waste Discharge pursuant to Provision F.5.b. The water quality improvement strategies for the Watershed Management Area must be re-evaluated as follows:

(a) Identify the non-storm water and storm water pollutant loads from the Copermittees' MS4 outfalls in the Watershed Management Area, calculated or estimated pursuant to Provisions D.4.b;

(b) Identify the non-storm water and storm water pollutant load reductions, or other improvements to receiving water or water quality conditions, that are necessary to attain the interim and final numeric goals for restoring impacted beneficial uses in the receiving waters;

(c) Identify the non-storm water and storm water pollutant load reductions necessary for the Copermittees to demonstrate that non-storm water and storm water discharges from their MS4s are not causing or contributing to exceedances of receiving water limitations;

(d) Evaluate the progress of the water quality improvement strategies toward achieving the interim and final numeric goals for restoring impacted beneficial uses in the receiving waters.

(3) The Copermittees must re-evaluate and adapt the water quality monitoring and assessment program for the Watershed Management Area when new information becomes available to improve the monitoring and assessment program pursuant to Provision B.5.c. The re-evaluation and recommendations for modifications to the monitoring and assessment program may be provided in the Annual Reports required pursuant to Provision F.3.b, but must at least be provided in the Report of Waste

Discharge pursuant to Provision F.5.b. Modifications to the water quality monitoring and assessment program must be consistent with the requirements of Provision D.1-D.3. The re-evaluation of the water quality monitoring and assessment program for the Watershed Management Area must consider the data gaps identified by the assessments required pursuant to Provisions D.4.a-b, and results of the special studies implemented pursuant to Provision D.4.c.

5. Monitoring Provisions

Each Copermittee must comply with all the monitoring, reporting, and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

E. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS

The purpose of this provision is for each Copermittee to implement a program to control the contribution of pollutants to and the discharges from the MS4 with its jurisdiction. The goal of this provision is to require each Copermittee to implement a program that effectively prohibits non-storm water discharges to the MS4 and reduces the discharge of pollutants in storm water to the MEP. This goal will be accomplished through implementing the jurisdictional runoff management programs in accordance with the strategies identified in the Water Quality Improvement Plans.

Each Copermittee must update its jurisdictional runoff management program document, in accordance with Provision F.2.a, to incorporate all the requirements of Provision E. Until the Copermittee has updated its jurisdictional runoff management program document with the requirements of Provision E, the Copermittee must continue implementing its current jurisdictional runoff management program.

1. Legal Authority Establishment and Enforcement

a. Each Copermittee must establish, maintain, and enforce adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 through statute, ordinance, permit, contract, order, or similar means. This legal authority must, at a minimum, authorize the Copermittee to:

(1) Prohibit and eliminate all illicit discharges and illicit connections to its MS4;

(2) Control the contribution of pollutants in discharges of runoff associated with industrial and construction activity to its MS4 and control the quality of runoff from industrial and construction sites, including industrial and construction sites which have coverage under the statewide General Permit for Discharges of Storm Water Associated with Industrial Activities (Industrial General Permit) or General Permit for Discharges of Storm Water Associated with Construction Activities (Construction General Permit), as well as to those sites which do not;

(3) Control the discharge of spills, dumping, or disposal of materials other than storm water into its MS4;

(4) Control through interagency agreements among Copermittees the contribution of pollutants from one portion of the MS4 to another portion of the MS4;

(5) Control, by coordinating and cooperating with other owners of the MS4 such as Caltrans, the U.S. federal government, or sovereign Native American Tribes through interagency agreements, where possible, the contribution of pollutants from their portion of the MS4 to the portion of the MS4 within the Copermittee's jurisdiction;

(6) Require compliance with conditions in its statutes, ordinances, permits, contracts, orders, or similar means to hold dischargers to its MS4 accountable for their contributions of pollutants and flows;

(7) Require the use of BMPs to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(8) Require documentation on the effectiveness of BMPs implemented to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(9) Utilize enforcement mechanisms to require compliance with its statutes, ordinances, permits, contracts, orders, or similar means; and

(10) Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with its statutes, ordinances, permits, contracts, orders, or similar means and with the requirements of this Order, including the prohibition of illicit discharges and connections to its MS4; the Copermittee must also have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from industrial facilities, including construction sites, discharging into its MS4.

b. With the first Annual Report required pursuant to Provision F.3.b, each Copermittee must submit a statement certified by its Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative that the Copermittee has taken the necessary steps to obtain and maintain full legal authority within its jurisdiction to implement and enforce each of the requirements contained in this Order.

2. Illicit Discharge Detection and Elimination

Each Copermittee must implement a program to actively detect and eliminate illicit discharges and improper disposal into the MS4, or otherwise require the discharger to apply for and obtain a separate NPDES permit. The illicit discharge detection and elimination program must be implemented in accordance with the strategies identified in the Water Quality Improvement Plan and include, at a minimum, the following requirements:

a. NON-STORM WATER DISCHARGES

Each Copermittee must address all non-storm water discharges as illicit discharges, unless a non-storm water discharge is either identified as a discharge authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to the following requirements:

(1) Discharges of non-storm water to the MS4 from the following categories must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG919001 (Order No. R9-2007-0034, or subsequent order) for discharges to San Diego Bay, or NPDES Permit No. CAG919002 (Order No. R9-2008-0002, or subsequent order) for discharges to surface waters other than San Diego Bay:

(a) Uncontaminated pumped ground water;

(b) Discharges from foundation drains;[19]

(c) Water from crawl space pumps; and

(d) Water from footing drains. [19]

(2) Discharges of non-storm water from water line flushing and water main breaks to the MS4 must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG 679001 (Order No. R9-2010-0003, or subsequent order). This includes water line flushing and water main break discharges from water purveyors issued a water supply permit by the California Department of Public Health or federal military installations. Discharges from recycled or reclaimed water lines to the MS4 must be addressed as illicit discharges, unless the discharges have coverage under a separate NPDES permit.

(3) Discharges of non-storm water to the MS4 from the following categories must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a source of pollutants to receiving waters:

(a) Diverted stream flows;

(b) Rising ground waters;

(c) Uncontaminated ground water infiltration to MS4s;

(d) Springs;

(e) Flows from riparian habitats and wetlands;

(f) Discharges from potable water sources;

(g) Discharges from foundation drains;[20] and

[19] Provision E.2.a.(1) only applies to this category on non-storm water if the system is designed to be located at or below the highest historical groundwater table to actively or passively extract groundwater during any part of the year.

(h) Discharges from footing drains.[20]

(4) Discharges of non-storm water to the MS4 from the following categories must be controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means. Discharges of non-storm water to the MS4 from the following categories not controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means must be addressed by the Copermittee as illicit discharges.

(a) Air conditioning condensation

The discharge of air conditioning condensation must be directed to landscaped areas or other pervious surfaces where feasible;

(b) Individual residential vehicle washing

(i) The discharge of wash water must be directed to landscaped areas or other pervious surfaces where feasible, and

(ii) Minimize the use of water for vehicle washing, use as little washing detergent and other vehicle wash products as possible, wash vehicles at commercial wash facilities, and implement other practices or behaviors that will prevent the discharge of pollutants associated with individual residential vehicle washing from entering the MS4; and

(c) Dechlorinated swimming pool discharges

(i) Eliminate residual chlorine, algaecide, filter backwash, or other pollutants from swimming pools prior to discharging to the MS4, and

(ii) The discharge of saline swimming pool water must be directed to the sanitary sewer, landscaped areas, or other pervious surfaces that can accommodate the volume of water, unless the saline swimming pool water can be discharged via a pipe or concrete channel directly to a naturally saline water body (e.g. Pacific Ocean).

(5) Firefighting discharges to the MS4 must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a significant source of pollutants to receiving waters. Firefighting discharges to the MS4 not identified as a significant source of pollutants to receiving waters, must be addressed, at a minimum, as follows:

[20] Provision E.2.a.(3) only applies to this category of non-storm water discharge if the system is designed to be located above the highest historical groundwater table at all times of the year, and the system is only expected to discharge non-storm water under unusual circumstances.

(a) Non-emergency firefighting discharges

(i) Building fire suppression system maintenance discharges (e.g. sprinkler line flushing) to the MS4 must be addressed as illicit discharges.

(ii) Non-emergency firefighting discharges (i.e., discharges from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems) must be addressed by a program, to be developed and implemented by the Copermittee, to reduce or eliminate pollutants in such discharges from entering the MS4.

(b) Emergency firefighting discharges

Each Copermittee should develop and encourage implementation of BMPs to reduce or eliminate pollutants in emergency firefighting discharges to the MS4s and receiving waters within its jurisdiction. During emergency situations, priority of efforts should be directed toward life, property, and the environment (in descending order). BMPs should not interfere with immediate emergency response operations or impact public health and safety.

(6) If the Copermittee or San Diego Water Board identifies any category of non-storm water discharges listed under Provisions E.2.a.(1)-(4) as a source of pollutants to receiving waters, the category must be prohibited through ordinance, order, or similar means and addressed as an illicit discharge.

(7) Each Copermittee must, where feasible, reduce or eliminate non-storm water discharges listed under Provisions E.2.a.(1)-(4) into its MS4 whether or not the non-storm water discharge has been identified as an illicit discharge, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit.

b. PREVENT AND DETECT ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to prevent and detect illicit discharges to the MS4:

(1) Each Copermittee must maintain an updated map of its entire MS4 and the corresponding drainage areas. The accuracy of the MS4 map must be confirmed during the field screening required pursuant to Provision E.2.c. The MS4 map must be included as part of the jurisdictional runoff management program document. Any geographic information system (GIS) layers or files used by the Copermittee to maintain the MS4 map must be made available to the San Diego Water Board upon request. The MS4 map must identify the following:

(a) All segments of the MS4 owned, operated, and maintained by the Copermittee,

(b) All known locations of inlets that discharge and/or collect runoff into the Copermittee's MS4,

(c) All known locations of connections with other MS4s not owned or operated by the Copermittee (e.g. Caltrans MS4s),

(d) All known locations of MS4 outfalls and private outfalls that discharge runoff collected from areas within the Copermittee's jurisdiction,

(e) All segments of receiving waters within the Copermittee's jurisdiction that receive and convey runoff discharged from the Copermittee's MS4 outfalls,

(f) Locations of the MS4 outfalls, identified pursuant to Provision D.2.a.(1), within its jurisdiction, and

(g) Locations of the non-storm water persistent flow MS4 outfall discharge monitoring stations, identified pursuant to Provision D.2.b.(2)(b), within its jurisdiction;

(2) Each Copermittee must use Copermittee personnel and contractors to assist in identifying and reporting illicit discharges and connections during their daily employment activities;

(3) Each Copermittee must promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges to or from the MS4, including the following methods for public reporting:

(a) Operate a public hotline, which can be Copermittee-specific or shared by the Copermittees, and must be capable of receiving reports in both English and Spanish 24 hours per day and seven days per week, and

(b) Designate an e-mail address for receiving electronic reports from the public, which can be Copermittee-specific or shared by the Copermittees, and must be prominently displayed on the Copermittee's webpage and the Regional Clearinghouse required pursuant to Provision F.4;

(4) Each Copermittee must implement practices and procedures (including a notification mechanism) to prevent, respond to, contain, and clean up any spills that may discharge into the MS4 within its jurisdiction from any source. The Copermittee must coordinate, to the extent possible, with spill response teams to prevent entry of spills into the MS4, and prevent contamination of

surface water, ground water, and soil. The Copermittee must coordinate spill prevention, containment, and response activities throughout all appropriate Copermittee departments, programs, and agencies;

(5) Each Copermittee must implement practices and procedures to prevent and limit infiltration of seepage from sanitary sewers (including private laterals and failing septic systems) to the MS4, and

(6) Each Copermittee must coordinate, when necessary, with upstream Copermittees and/or entities to prevent illicit discharges from upstream sources into the MS4 within its jurisdiction.

c. FIELD SCREENING

Each Copermittee must conduct field screening (i.e. visual observations, field testing, and/or analytical testing) of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4 in accordance with the dry weather MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

d. INVESTIGATE AND ELIMINATE ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to investigate and eliminate illicit discharges to the MS4:

(1) Each Copermittee must prioritize and determine when follow-up investigations will be performed in response to visual observations and/or water quality monitoring data collected during an investigation of a detected non-storm water or illicit discharge to or from the MS4. The criteria for prioritizing investigations must consider the following:

(a) Pollutants identified as causing or contributing to the highest water quality priorities identified in the Water Quality Improvement Plan;

(b) Pollutants identified as causing or contributing, or threatening to cause or contribute to impairments in water bodies on the 303(d) List and/or in environmentally sensitive areas (ESAs), located within its jurisdiction;

(c) Pollutants identified from sources or land uses known to exist within the area, drainage basin, or watershed that discharges to the portion of the MS4 within its jurisdiction included in the investigation;

(d) Pollutants identified as causing or contributing to an exceedance of a NAL in the Water Quality Improvement Plan; and

(e) Pollutants identified as a threat to human health or the environment.

(2) Each Copermittee must implement procedures to investigate and inspect portions of its MS4 that, based on reports or notifications, field screening, or other appropriate information, indicate a reasonable potential of receiving, containing, or discharging pollutants due to illicit discharges, illicit connections, or other sources of non-storm water. The procedures must include the following:

(a) Each Copermittee must develop criteria to:

(i) Assess the validity of each report or notification received, and

(ii) Prioritize the response to each report or notification received;

(b) Each Copermittee must prioritize and respond to each valid report or notification (e.g., public reports, staff or contractor reports and notifications, etc.) of an incident in a timely manner;

(c) Each Copermittee must investigate and seek to identify the source(s) of discharges of non-storm water where flows are observed in and from the MS4 during the field screening required pursuant to Provision D.2.b.(1) as follows:

(i) Obvious illicit discharges must be immediately investigated to identify the source(s) of non-storm water discharges,

(ii) The investigation must include field investigations to identify sources or potential sources for the discharge, unless the source or potential source has already been identified during previous investigations, and

(iii) The investigation may include follow-up field investigations and/or reviewing Copermittee inventories and other land use data to identify potential sources of the discharge;

(d) Each Copermittee must maintain records and a database of the following information:

(i) Location of incident, including hydrologic subarea, portion of MS4 receiving the non-storm water or illicit discharge, and point of discharge or potential discharge from MS4 to receiving water,

(ii) Source of information initiating the investigation (e.g., public reports, staff or contractor reports and notifications, field screening, etc.),

(iii) Date the information used to initiate the investigation was received,

(iv) Date the investigation was initiated,

(v) Dates of follow-up investigations,

(vi) Identified or suspected source of the illicit discharge or connection, if determined,

(vii) Known or suspected related incidents, if any,

(viii) Result of the investigation,

(ix) If a source cannot be identified and the investigation is not continued, a rationale for why a discharge does not pose a threat to water quality and/or does not require additional investigation.

(e) Each Copermittee must track and seek to identify the source(s) of non-storm water discharges from the MS4 where there is evidence of non-storm water having been discharged into or from the MS4 (e.g., pooled water), in accordance with MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.

(3) Each Copermittee must initiate the implementation of procedures, in a timely manner, to eliminate all detected and identified illicit discharges and connections within its jurisdiction. The procedures must include the following responses:

(a) Each Copermittee must enforce its legal authority, as required under Provision E.1, to eliminate illicit discharges and connections to the MS4;

(b) If the Copermittee identifies the source as a controllable source of non-storm water or illicit discharge or connection, the Copermittee must implement its Enforcement Response Plan pursuant to Provision E.6 and enforce its legal authority to prohibit and eliminate illicit discharges and connections to its MS4;

(c) If the Copermittee identifies the source of the discharge as a category of non-storm water discharges in Provision E.2.a, and the discharge is in exceedance of NALs in the Water Quality Improvement Plan, then the Copermittee must determine if: (1) this is an isolated incident or set of circumstances that will be addressed through its Enforcement Response Plan pursuant to Provision E.6, or (2) the category of discharge must be addressed through the prohibition of that category of discharge as an illicit discharge pursuant to Provision E.2.a.(6);

(d) If the Copermittee suspects the source of the non-storm water discharge as natural in origin (i.e. non-anthropogenically influenced) and in conveyance into the MS4, then the Copermittee must document and provide the data and evidence necessary to demonstrate to the San Diego Water Board that it is natural in origin and does not require further investigation; and

(e) If the Copermittee is unable to identify and document the source of a recurring non-storm water discharge to or from the MS4, then the

Copermittee must address the discharge as an illicit discharge and update its jurisdictional runoff management program to address the common and suspected sources of the non-storm water discharge within its jurisdiction in accordance with the Copermittee's priorities.

(4) Each Copermittee must submit a summary of the non-storm water discharges and illicit discharges and connections investigated and eliminated within its jurisdiction with each Annual Report required under Provision F.3.b of this Order.

e. STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the illicit discharge detection and elimination program to address non-storm water and illicit discharges and connections that the Copermittee has identified as potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, and/or increase/decrease frequency of inspections in specific areas), and

(2) The strategies and/or activities must be consistent with the requirements of Provisions E.2.a-d and the strategies identified in the Water Quality Improvement Plan.

3. Development Planning

Each Copermittee must use their land use and planning authorities to implement a development planning program in accordance with the strategies identified in the Water Quality Improvement Plan and includes, at a minimum, the following requirements:

a. BMP REQUIREMENTS FOR ALL DEVELOPMENT PROJECTS

Each Copermittee must prescribe the following BMP requirements during the planning process (i.e. prior to project approval and issuance of local permits) for all development projects (regardless of project type or size), where local permits are issued, including unpaved roads and flood management projects:

(1) General Requirements

(a) Onsite BMPs must be located so as to remove pollutants from runoff prior to its discharge to any receiving waters, and as close to the source as possible; and

(b) Structural BMPs must not be constructed within a waters of the U.S. or waters of the state.

(2) Source Control BMP Requirements

The following source control BMPs must be implemented at all development projects where applicable and feasible:

(a) Prevention of illicit discharges into the MS4;

(b) Storm drain system stenciling or signage;

(c) Properly designed outdoor material storage areas;

(d) Properly designed outdoor work areas;

(e) Properly designed trash storage areas; and

(f) Any additional BMPs necessary to minimize pollutant generation at each project.

(3) Low Impact Development (LID) BMP Requirements

The following LID BMPs must be implemented at all development projects where applicable and feasible:

(a) Maintenance or restoration of natural storage reservoirs and drainage corridors (including topographic depressions, areas of permeable soils, natural swales, and ephemeral and intermittent streams);[21]

(b) Buffer zones for natural water bodies (where buffer zones are technically infeasible, require project applicant to include other buffers such as trees, access restrictions, etc.);

(c) Conservation of natural areas within the project footprint including existing trees, other vegetation, and soils;

(d) Construction of streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided public safety is not compromised;

(e) Minimization of the impervious footprint of the project;

(f) Minimization of soil compaction to landscaped areas;

[21] Development projects proposing to dredge or fill materials in waters of the U.S. must obtain a CWA Section 401 Water Quality Certification. Projects proposing to dredge or fill waters of the State must obtain Waste Discharge Requirements.

(g) Disconnection of impervious surfaces through distributed pervious areas;

(h) Landscaped or other pervious areas designed and constructed to effectively receive and infiltrate, retain and/or treat runoff from impervious areas, prior to discharging to the MS4;

(i) Small collection strategies located at, or as close as possible to, the source (i.e. the point where storm water initially meets the ground) to minimize the transport of runoff and pollutants to the MS4 and receiving waters;

(j) Use of permeable materials for projects with low traffic areas and appropriate soil conditions;

(k) Landscaping with native or drought tolerant species; and

(l) Harvesting and using precipitation.

b. PRIORITY DEVELOPMENT PROJECTS

(1) Definition of Priority Development Project

Priority Development Projects include the following:

(a) All new development projects that fall under the Priority Development Project categories listed under Provision E.3.b.(2). Where a new development project feature, such as a parking lot, falls into a Priority Development Project category, the entire project footprint is subject to Priority Development Project requirements; and

(b) Those redevelopment projects that create, add, or replace at least 5,000 square feet of impervious surfaces on an already developed site, or the redevelopment project is a Priority Development Project category listed under Provision E.3.b.(2). Where redevelopment results in an increase of less than fifty percent of the impervious surfaces of a previously existing development, and the existing development was not subject to Priority Development Project requirements, the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) apply only to the addition or replacement, and not to the entire development. Where redevelopment results in an increase of more than fifty percent of the impervious surfaces of a previously existing development, the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) apply to the entire development.

(2) Priority Development Project Categories

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This

category includes commercial, industrial, residential, mixed-use, and public development projects on public or private land which fall under the planning and building authority of the Copermittee.

(b) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

(c) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812), where the land area for development is 5,000 square feet or more.

(d) Hillside development projects. This category includes any development which creates 5,000 square feet or more of impervious surface which is located in an area with known erosive soil conditions, where the development will grade on any natural slope that is twenty-five percent or greater.

(e) Environmentally sensitive areas (ESAs). This category includes any development located within, directly adjacent to, or discharging directly to an ESA, which either creates 2,500 square feet of impervious surface on a proposed project site or increases the area of imperviousness of a proposed project site to 10 percent or more of its naturally occurring condition. "Directly adjacent to" means situated within 200 feet of the ESA. "Discharging directly to" means outflow from a drainage conveyance system that collects runoff from the subject development or redevelopment site and terminates at or in receiving waters within the ESA.

(f) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce that has 5,000 square feet or more of impervious surface.

(g) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface that is 5,000 square feet or more used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

(h) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

(i) Large development projects. This category includes any post-construction pollutant-generating new development projects that result in the disturbance of one acre or more of land.

(3) Priority Development Project Exemptions

Each Copermittee has the discretion to exempt the following projects from being defined as Priority Development Projects:

(a) New paved sidewalks, bicycle lanes, or trails that meet the following criteria:

(i) Designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas; OR

(ii) Designed and constructed to be hydraulically disconnected from paved streets or roads; OR

(iii) Designed and constructed with permeable pavements or surfaces in accordance with USEPA Green Streets guidance.[22]

(b) Retrofitting of existing paved alleys, streets or roads that meet the following criteria:

(i) Must be two lanes or less; AND

(ii) Must be a retrofitting project implemented as part of an alternative compliance project option under Provision E.3.c.(3)(b)(v) to achieve the performance requirements of Provisions E.3.c.(1) and/or E.3.c.(2) for a Priority Development Project; AND

(iii) Designed and constructed in accordance with the USEPA Green Streets guidance.[23]

(c) New single family residences that meet the following criteria:

(i) Must not be constructed as part of a larger development or proposed subdivision; AND

(ii) Designed and constructed to be certified under the U.S. Green Building Council (USGCB) Leadership in Energy and Environmental Design (LEED) for Homes green building certification program, receiving at least four (4) Surface Water Management credits under the Sustainable Sites category;[24] OR

[22] See "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).
[23] Ibid.
[24] See LEED for Homes rating system at http://www.usgbc.org

(iii) Designed and constructed with structural BMPs that will achieve the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite.

(d) Redevelopment of existing single family residences that meet the following criteria:

(i) Designed and constructed to be certified under the USGCB LEED for Homes green building certification program, receiving at least four (4) Surface Water Management credits under the Sustainable Sites category; [25] OR

(ii) Designed and constructed with structural BMPs that will achieve the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite.

c. PRIORITY DEVELOPMENT PROJECT STRUCTURAL BMP PERFORMANCE REQUIREMENTS

In addition to the BMP requirements listed for all development projects under Provision E.3.a, Priority Development Projects must also implement structural BMPs that conform to performance requirements below.

(1) Storm Water Pollutant Control BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite structural BMPs to control storm water pollutants that may be discharged from a project as follows:

(a) Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite the pollutants contained in the design capture volume. The design capture volume is equivalent to:

(i) The volume of storm water produced from a 24-hour 85th percentile storm event;[26] OR

(ii) The volume of storm water that would be retained onsite if the site was fully undeveloped and naturally vegetated, as determined using continuous simulation modeling techniques based on site-specific soil conditions and typical native vegetative cover.

[25] See LEED for Homes rating system at http://www.usgbc.org

[26] This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals.

(b) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) to comply with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1)(a).

(c) Flow-thru conventional treatment control BMPs must be implemented to treat the portion of the design capture volume that is not retained onsite. Additionally, project applicants must mitigate for the portion of the pollutant load in the design capture volume that is not retained onsite through one or more alternative compliance options under Provision E.3.c.(3). Conventional treatment control BMPs must be sized and designed to:

(i) Remove pollutants from storm water to the MEP;

(ii) Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;

(iii) Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Conventional treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of conventional treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

(2) Hydromodification Management BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite structural BMPs to manage hydromodification that may be caused by storm water runoff from a project as follows:

(a) Post-project runoff flow rates and durations must not exceed pre-development (naturally occurring) runoff flow rates and durations by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat conditions downstream of Priority Development Projects).

(i) In evaluating the range of flows that results in increased potential for erosion of natural (non-hardened) channels, the lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks.

(ii) For artificially hardened channels, analysis to identify the lower boundary must use characteristics of a natural stream segment similar to that found in the watershed. The lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or erodes the toe of the channel banks.

(iii) The Copermittees may use monitoring results collected pursuant to Provision D.1.a.(2) to re-define the range of flows resulting in increased potential for erosion, or degraded instream habitat conditions, as warranted by the data.

(b) Post-project runoff flow rates and durations must compensate for the loss of sediment supply due to the development project, should loss of sediment supply occur as a result of the development project.

(c) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) to comply with the performance requirements of Provisions E.3.c.(2)(a)-(b).

(d) Exemptions

Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provisions E.3.c.(2)(a)-(b) where the project:

(i) Discharges storm water runoff into existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;

(ii) Is a redevelopment Priority Development Project that meets the alternative compliance requirements of Provision E.3.c.(3)(b)(ii); or

(iii) Discharges storm water runoff into other areas identified by the San Diego Water Board as exempt from the requirements of Provisions E.3.c.(3)(a)-(b).

(3) <u>Alternative Compliance to Onsite Structural BMP Performance Requirements</u>

(a) Applicability

At the discretion of each Copermittee, Priority Development Projects may be allowed to utilize an alternative option to comply with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) under the following conditions:

(i) The Copermittee must determine that implementation of the alternative compliance option will have a greater overall water quality benefit for the Watershed Management Area than fully complying

with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite;

(ii) The alternative compliance options must be designed by a registered professional engineer, geologist, architect, or landscape architect;

(iii) The alternative compliance options must be implemented within the same hydrologic unit as the Priority Development Project, and preferably within the same hydrologic subarea;

(iv) Receiving waters must not be utilized to convey storm water runoff to the alternative compliance options;

(v) The pollutants in storm water runoff from the Priority Development Project must be treated to the MEP by the alternative compliance options prior to being discharged to receiving waters;

(vi) Unless otherwise allowed by Provision E.3.c.(3)(b), the alternative compliance options must have a net result of at least the same level of pollutant removal as would have been achieved if the Priority Development Project had fully complied with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1) onsite;

(vii) Unless otherwise allowed by Provision E.3.c.(3)(b), the alternative compliance options must have a net result of at least the same level of protection from potential downstream and upstream erosion in the receiving water as would have been achieved if the Priority Development Project had fully complied with the hydromodification management BMP performance requirements of Provision E.3.c.(2) onsite; and

(viii) The alternative compliance options utilized by the Priority Development Project to comply with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) must have reliable sources of funding for operation and maintenance.

(b) Alternative Compliance Project Options

The Copermittee may allow implementation of one or more of the following project options as part of an alternative approach to complying with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2):

(i) *Onsite LID Biofiltration Treatment Control BMPs*

The Copermittee may allow Priority Development Projects to utilize onsite LID biofiltration treatment control BMPs to comply with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1). Onsite LID biofiltration treatment control BMPs must be sized and designed to:

[a] Remove pollutants from storm water to the MEP; AND
[b] Have an appropriate surface loading rate to prevent erosion, scour and channeling within the BMP; AND
[c] Biofilter at least 1.5 times the design capture volume that is not reliably retained onsite; OR
[d] Biofilter up to the design capture volume that is not reliably retained onsite, AND 1) treat the remaining portion of the design capture volume not retained onsite with conventional treatment control BMPs in accordance with Provision E.3.c.(1)(c), and 2) if necessary, mitigate for the portion of the pollutant load in the design capture volume not retained onsite through one or more alternative compliance project, in-lieu fee and/or water quality credit system options below.

(ii) *LEED Certified Redevelopment Projects*

The Copermittee may allow redevelopment Priority Development Projects to comply with the hydromodification management BMP performance requirements of Provision E.3.c.(2) where the project is designed and constructed to be certified under the USGCB LEED for New Construction and Major Renovations green building certification program. The Priority Development Project must receive at least one (1) Site Design credit and two (2) Stormwater Design credits under the Sustainable Sites category.[27] In addition, the existing and future configuration of the receiving water must not be unnaturally altered or adversely impacted by storm water flow rates and durations discharged from the site.

(iii) *Watershed-Based Planned Development Projects*

The Copermittee may allow Priority Development Projects greater than 100 acres in total project size (or smaller than 100 acres in size yet part of a larger common plan of development that is over 100 acres) to comply with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2). The Priority Development Project must comply with the following conditions:

[a] The Priority Development Project was planned utilizing watershed and/or subwatershed based water quality, hydrologic, and fluvial geomorphologic planning principles that implement regional LID BMPs in accordance with the performance and location criteria of this Order and acceptable to the San Diego Water Board;
[b] Regional LID BMPs may be used provided that the BMPs capture and retain the volume of runoff produced from the design capture volume defined in Provision E.3.c.(1)(a)(i) and that such controls are located upstream of receiving waters;

[27] See LEED for New Construction and Major Renovations rating system at http://www.usgbc.org

[c] Regional LID BMPs must clearly exhibit that they will not result in a net impact from pollutant loadings over and above the impact caused by capture and retention of the design capture volume;

[d] Any portion of the design capture volume that is not retained by the regional LID BMPs must be treated using biofiltration BMPs; and

[e] Where regional LID BMPs are demonstrated to the Copermittee as technically infeasible to retain the entire design capture volume, any volume up to and including the design capture volume not retained by regional LID BMPs, nor treated by biofiltration BMPs, must be treated using conventional treatment control BMPs and the project applicant must implement additional alternative compliance project options, in-lieu fee and/or water quality credit system options below.

(iv) *Offsite Regional BMPs*

[a] The Copermittee may allow Priority Development Projects to utilize offsite regional BMPs to comply with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1) if the offsite regional BMPs have the capacity to receive and retain at least 1.1 times the design capture volume that is not reliably retained onsite.

[b] The Copermittee may allow Priority Development Projects to utilize offsite regional BMPs to comply with the hydromodification management BMP performance requirements of Provision E.3.c.(2) if the offsite regional BMPs have the capacity to manage the storm water flows rates and durations from the site such that the receiving waters are protected from the potential for increased erosion that would be caused if the unmanaged portion of the runoff was discharged from the site.

(v) *Offsite Retrofitting Projects*

The Copermittee may allow Priority Development Projects to utilize offsite retrofitting projects to comply with the storm water pollutant control and hydromodification management BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) if the retrofitting projects have been identified within the strategies included in the Water Quality Improvement Plan, or identified as potential retrofitting projects by the Copermittee pursuant to Provision E.5.

(vi) *Offsite Channel, Stream, or Habitat Rehabilitation Projects*

The Copermittee may allow Priority Development Projects to utilize offsite channel, stream, or habitat rehabilitation projects to comply with the hydromodification management BMP performance requirements of Provision E.3.c.(2) if the rehabilitation projects have

been identified within the strategies included in the Water Quality Improvement Plan, or identified as potential channel rehabilitation projects by the Copermittee pursuant to Provision E.5. The channel, stream, or habitat rehabilitation project cannot be utilized for pollutant treatment except where artificial wetlands are constructed and located upstream of receiving waters.

(vii) *Offsite Regional Water Supply Augmentation Projects*

The Copermittee may allow Priority Development Projects to utilize offsite regional water supply augmentation projects (i.e. groundwater recharge, recycled water, storm water harvesting) to comply with the storm water pollutant control and hydromodification management BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) if the projects have been identified within the strategies included in the Water Quality Improvement Plan.

(viii) *Project Applicant Proposed Alternative Compliance Projects*

The Copermittee may allow one or more Priority Development Project applicant(s) to propose and implement alternative compliance projects to comply with the storm water pollutant control and hydromodification management BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) if the alternative compliance projects are consistent with, and will address the highest water quality priorities of the Water Quality Improvement Plan, and comply with the requirements of Provision E.3.c.(3)(a).

(c) Alternative Compliance In-Lieu Fee Option

The Copermittee may develop and implement an alternative compliance in-lieu fee option, individually or with other Copermittees and/or entities, as a means for designing, developing, constructing, operating and maintaining offsite alternative compliance projects under Provision E.3.c.(3)(b). Priority Development Projects allowed to utilize the alternative compliance in-lieu fee option must comply with the following conditions:

(i) The in-lieu fee must be transferred to the Copermittee (for public projects) or an escrow account (for private projects) prior to the date construction of the Priority Development Project is initiated.

(ii) If the in-lieu fee is applied to the development, design and construction of offsite alternative compliance projects, the following conditions must be met:

[a] The offsite alternative compliance projects must allow the Priority Development Project to comply with the onsite BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2);

[b] The offsite alternative compliance projects must be constructed as soon as possible, but no later than 4 years after the certificate of occupancy is granted for the first Priority Development Project that contributed funds toward the construction of the offsite alternative compliance projects, unless a longer period of time is authorized by the San Diego Water Board Executive Officer; and

[c] The in-lieu fee for the Priority Development Project must include mitigation of the pollutant loads and increased storm water flow rates and durations that are allowed to discharge from the site before the offsite alternative compliance projects are constructed.

[d] The in-lieu fee must also include the cost to operate and maintain the offsite alternative compliance projects.

(iii) If the in-lieu fee is applied to the operation and maintenance of offsite alternative compliance projects that have already been constructed, the offsite alternative compliance projects must allow the Priority Development Project to comply with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2).

(d) Alternative Compliance Water Quality Credit System Option

The Copermittee may develop and implement an alternative compliance water quality credit system option, individually or with other Copermittees and/or entities, provided that such a credit system clearly exhibits that it will not allow discharges from Priority Development Projects to cause or contribute to a net impact over and above the impact caused by projects meeting the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2). Any credit system that a Copermittee chooses to implement must be submitted to the San Diego Water Board Executive Officer for review and acceptance as part of the Water Quality Improvement Plan.

(4) Long-Term Structural BMP Maintenance

Each Copermittee must require the project applicant to submit proof of the mechanism under which ongoing long-term maintenance of all structural BMPs will be conducted.

(5) Infiltration and Groundwater Protection

(a) Structural BMPs designed to primarily function as large, centralized infiltration devices (such as large infiltration trenches and infiltration basins) must not cause or contribute to an exceedance of an applicable groundwater quality objective. At a minimum, such infiltration BMPs must be in conformance with the design criteria listed below, unless the development project applicant demonstrates to the Copermittee that one or more of the specific design criteria listed below are not necessary to

protect groundwater quality. The design criteria listed below do not apply to small infiltration systems dispersed throughout a development project.

(i) Runoff must undergo pretreatment such as sedimentation or filtration prior to infiltration;

(ii) Pollution prevention and source control BMPs must be implemented at a level appropriate to protect groundwater quality at sites where infiltration BMPs are to be used;

(iii) Infiltration BMPs must be adequately maintained to remove pollutants in storm water to the MEP;

(iv) The vertical distance from the base of any infiltration BMP to the seasonal high groundwater mark must be at least 10 feet. Where groundwater basins do not support beneficial uses, this vertical distance criteria may be reduced, provided groundwater quality is maintained;

(v) The soil through which infiltration is to occur must have physical and chemical characteristics (e.g., appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses;

(vi) Infiltration BMPs must not be used for areas of industrial or light industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee, unless first treated or filtered to remove pollutants prior to infiltration; and

(vii) Infiltration BMPs must be located a minimum of 100 feet horizontally from any water supply wells.

(b) The Copermittee may develop, individually or with other Copermittees, alternative mandatory design criteria to that listed above for infiltration BMPs which are designed to primarily function as centralized infiltration devices. Before implementing the alternative design criteria in the development planning process the Copermitee(s) must:

(i) Notify the San Diego Water Board of the intent to implement the alternative design criteria submitted; and

(ii) Comply with any conditions set by the San Diego Water Board.

d. BMP DESIGN MANUAL UPDATE

Each Copermittee must update its BMP Design Manual[28] pursuant to Provision F.2.b. Until the Copermittee has updated its BMP Design Manual with the requirements of Provisions E.3.a-c, the Copermittee must continue implementing

[28] The BMP Design Manual was formerly known as the Standard Storm Water Mitigation Plan under Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016.

its current BMP Design Manual. Unless directed otherwise by the San Diego Water Board, the Copermittee must implement the BMP Design Manual within 180 days of completing the update. The update of the BMP Design Manual must include the following:

(1) Updated procedures to determine the nature and extent of storm water requirements applicable to a potential development or redevelopment project. These procedures must inform project applicants of the storm water management requirements applicable to their project including, but not limited to, general requirements for all development projects, structural BMP design procedures and requirements, hydromodification management requirements, requirements specific to phased projects, and procedures specific to private developments and public improvement projects;

(2) Updated procedures to identify pollutants and conditions of concern for selecting the most appropriate structural BMPs that consider, at a minimum, the following:

(a) Receiving water quality (including pollutants for which receiving waters are listed as impaired under the CWA section 303(d) List);

(b) Pollutants, stressors, and/or receiving water conditions that cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(c) Land use type of the project and pollutants associated with that land use type; and

(d) Pollutants expected to be present onsite.

(3) Updated procedures for designing structural BMPs, including any updated performance requirements to be consistent with the requirements of Provision E.3.c for all structural BMPs listed in the BMP Design Manual;

(4) Long-term maintenance criteria for each structural BMP listed in the BMP Design Manual; and

(5) Alternative compliance criteria, in accordance with the requirements under Provision E.3.c.(3), if the Copermittee elects to allow Priority Development Projects within its jurisdiction to utilize alternative compliance.

e. PRIORITY DEVELOPMENT PROJECT BMP IMPLEMENTATION AND OVERSIGHT

Each Copermittee must implement a program that requires and confirms structural BMPs on all Priority Development Projects are designed, constructed, and maintained to remove pollutants in storm water to the MEP.

(1) Structural BMP Approval and Verification Process

(a) Each Copermittee must require and confirm that for all Priority Development Project applications that have not received prior lawful approval by the Copermittee by 18 months after the commencement of coverage under this Order, the requirements of Provision E.3 are implemented. For project applications that have received prior lawful approval by 18 months after the commencement of coverage under this Order, the Copermittee may allow previous land development requirements to apply.

(b) Each Copermittee must identify the roles and responsibilities of various municipal departments in implementing the structural BMP requirements, including each stage of a project from application review and approval through BMP maintenance and inspections.

(c) Each Copermittee must require and confirm that appropriate easements and ownerships are properly recorded in public records and the information is conveyed to all appropriate parties when there is a change in project or site ownership.

(d) Each Copermittee must require and confirm that prior to occupancy and/or intended use of any portion of the Priority Development Project, each structural BMP is inspected to verify that it has been constructed and is operating in compliance with all of its specifications, plans, permits, ordinances, and the requirements of this Order.

(2) Priority Development Project Inventory and Prioritization

(a) Each Copermittee must develop and annually maintain a watershed-based database to track and inventory all Priority Development Projects and associated structural BMPs within its jurisdiction. Inventories must be accurate and complete beginning from January 2002 for the San Diego County Copermittees, February 2003 for the Orange County Copermittees, and July 2005 for the Riverside County Copermittees. The use of an automated database system, such as GIS, is highly recommended. The database must include, at a minimum, the following information:

(i) Priority Development Project location (address and hydrologic subarea);

(ii) Descriptions of structural BMP type(s);

(iii) Date(s) of construction;

(iv) Party responsible for structural BMP maintenance;

(v) Dates and findings of structural BMP maintenance verifications; and

(vi) Corrective actions and/or resolutions.

(b) Each Copermittee must prioritize the Priority Development Projects with structural BMPs within its jurisdiction. The designation of Priority Development Projects as high priority must consider the following:

(i) The highest water quality priorities identified in the Water Quality Improvement Plan;

(ii) Receiving water quality;

(iii) Number and sizes of structural BMPs;

(iv) Recommended maintenance frequency of structural BMPs;

(v) Likelihood of operation and maintenance issues of structural BMPs;

(vi) Land use and expected pollutants generated; and

(vii) Compliance record.

(3) Structural BMP Maintenance Verifications and Inspections

Each Copermittee is required to verify that structural BMPs on each Priority Development Project are adequately maintained, and continue to operate effectively to remove pollutants in storm water to the MEP through inspections, self-certifications, surveys, or other equally effective approaches.

(a) All (100 percent) of the structural BMPs at Priority Development Projects that are designated as high priority must be inspected directly by the Copermittee annually prior to each rainy season;

(b) For verifications performed through a means other than direct Copermittee inspection, adequate documentation must be required by the Copermittee to provide assurance that the required maintenance of structural BMPs at each Priority Development Project has been completed; and

(c) Appropriate follow-up measures (including re-inspections, enforcement, etc.) must be conducted to ensure that structural BMPs at each Priority Development Project continue to reduce pollutants in storm water to the MEP as originally designed.

f. DEVELOPMENT PROJECT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all development projects, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

g. STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the development planning program to address development and redevelopment projects that may become sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, increase frequency of verifications and/or inspections, alternative compliance options);

(2) Each Copermittee must identify areas within its jurisdiction where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting and/or stream, channel, or habitat rehabilitation projects;

(3) Each Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify regional alternative compliance projects that Priority Development Projects may be allowed or should be encouraged to implement or participate in implementing; and

(4) The strategies and/or activities must be consistent with the requirements of Provisions E.3.a-c and E.3.e-f and the strategies identified in the Water Quality Improvement Plan.

4. Construction Management

Each Copermittee must implement a construction management program in accordance with the strategies identified in the Water Quality Improvement Plan and includes, at a minimum, the following requirements:

a. PROJECT APPROVAL PROCESS

Prior to issuance of any local permit(s) that allows the commencement of construction projects that involve ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff, each Copermittee must:

(1) Require a site-specific pollution control, construction BMP, and/or erosion and sediment control plan, to be submitted by the project applicant to the Copermittee;

(2) Confirm the pollution control, construction BMP, and/or erosion and sediment control plan, complies with the local grading ordinance, other applicable local

ordinances, and the requirements of this Order;

(3) Confirm the pollution control, construction BMP, and/or erosion and sediment control plan, includes seasonally appropriate and effective BMPs and management measures described in Provision E.4.c, as applicable to the project; and

(4) Verify that the project applicant has obtained coverage under applicable permits, including, but not limited to the Construction General Permit, Clean Water Act Section 401 Water Quality Certification and Section 404 Permit, and California Department of Fish and Game Streambed Alteration Agreement.

b. CONSTRUCTION SITE INVENTORY AND TRACKING

(1) Each Copermittee must maintain and update at least monthly, a watershed-based inventory of all construction projects issued a local permit that allows ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff. The use of an automated database system, such as GIS, is highly recommended. The inventory must include:

(a) Relevant contact information for each site (e.g., name, address, phone, and email for the owner and contractor);

(b) The basic site information including location (address and hydrologic subarea), Waste Discharge Identification (WDID) number (if applicable), size of the site, and approximate area of disturbance;

(c) Whether or not the site is considered a high threat to water quality, as defined in Provision E.4.b.(2) below;

(d) The project start and anticipated completion dates;

(e) Current construction phase;

(f) The required inspection frequency, as defined in the Copermittee's jurisdictional runoff management program document;

(g) The date the Copermittee accepted and/or approved the site-specific pollution control, construction BMP, and/or erosion and sediment control plan; and

(h) Whether or not there are ongoing enforcement actions administered to the site.

(2) Each Copermittee must identify all construction sites within its jurisdiction that represent a high threat to downstream surface water quality. The designation

of construction sites as high threat to water quality must consider the following:

(a) Sites located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Sites located within the same hydrologic subarea and tributary to a water body segment listed as impaired for sediment on the CWA section 303(d) List;

(c) Sites located within, directly adjacent to, or discharging directly to a receiving water within an ESA; and

(d) Other sites determined by the Copermittees or the San Diego Water Board as a high threat to water quality.

c. CONSTRUCTION SITE BMP IMPLEMENTATION

Each Copermittee must implement, or require the implementation of effective BMPs to reduce discharges of pollutants in storm water from construction sites to the MEP, and prevent non-storm water discharges into the MS4. These BMPs must be site specific, seasonally appropriate, and construction phase appropriate. BMPs must be implemented at each construction site year round. Dry season BMP implementation must plan for and address unseasonal rain events that may occur during the dry season (May 1 through September 30). Copermittees must implement, or require the implementation of, BMPs in the following categories:

(1) Project Planning;

(2) Good Site Management “Housekeeping”, including waste management;

(3) Non-storm Water Management;

(4) Erosion Control;

(5) Sediment Control;

(6) Run-on and Run-off Control; and

(7) Active/Passive Sediment Treatment Systems, where applicable.

d. CONSTRUCTION SITE INSPECTIONS

Each Copermittee must conduct construction site inspections to require and confirm compliance with its local permits and applicable local ordinances, and the

requirements of this Order. Priority for site inspections must consider threat to water quality pursuant to Provision E.4.b as well as the nature of the construction activity, topography, and the characteristics of soils and receiving water quality.

(1) Inspection Frequency

(a) Each Copermittee must conduct inspections at all inventoried sites, including high threat to water quality sites, at an appropriate frequency for each phase of construction to ensure the site reduces the discharge of pollutants in storm water from construction sites to the MEP, and prevents non-storm water discharges from entering the MS4.

(b) Each Copermittee must establish appropriate inspection frequencies for high threat to water quality sites, and all other sites, for each phase of construction. Inspection frequencies appropriate for addressing the highest water quality priorities identified in the Water Quality Improvement Plan, and for complying with the requirements of this Order must be identified in each Copermittee's jurisdictional runoff management program document.

(c) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e., re-inspection, enforcement) necessary to require and confirm site compliance with its local permits and applicable local ordinances, and the requirements of this Order.

(2) Inspection Content

Inspections of construction sites by the Copermittee must include, at a minimum:

(a) Verification of coverage under the Construction General Permit (Notice of Intent (NOI) and/or WDID number) during initial inspections, when applicable;

(b) Assessment of compliance with its local permits and applicable local ordinances related to pollution prevention, including the implementation and maintenance of applicable BMPs;

(c) Assessment of BMP adequacy and effectiveness;

(d) Visual observations of actual non-storm water discharges;

(e) Visual observations of actual or potential discharge of sediment and/or construction related materials from the site;

(f) Visual observations of actual or potential illicit connections; and

(g) If any violations are found and BMP corrections are needed, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried construction sites. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Site name, location (address and hydrologic subarea), and WDID number (if applicable);

(b) Inspection date;

(c) Approximate amount of rainfall since last inspection;

(d) Description of problems observed with BMPs and indication of need for BMP addition/repair/replacement and any scheduled re-inspection, and date of re-inspection;

(e) Descriptions of any other specific inspection comments which must, at a minimum, include rationales for longer compliance time;

(f) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(g) Resolution of problems noted and date problems fixed.

e. CONSTRUCTION SITE ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried construction sites, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

f. STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the construction management program to address construction sites that the Copermittee has identified as potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, and/or increase/decrease frequency of inspections for specific types of sites and/or activities), and

(2) The strategies and/or activities must be consistent with the requirements of Provisions E.4.c-e and the strategies identified in the Water Quality Improvement Plan.

5. Existing Development Management

Each Copermittee must implement an existing development management program in accordance with the strategies identified in the Water Quality Improvement Plan and includes, at a minimum, the following requirements:

a. Existing Development Inventory and Tracking

Each Copermittee must maintain an annually updated watershed-based inventory of the existing development within its jurisdiction that may discharge a pollutant load to and from the MS4. The use of an automated database system, such as GIS, is highly recommended. The inventory must, at a minimum, include:

(1) Name, location (hydrological subarea and address, if applicable) of the following types of existing development with its jurisdiction:

(a) Commercial facilities or areas,

(b) Industrial facilities,

(c) Municipal facilities, including:

(i) MS4 and related structures,[29]

(ii) Roads, streets, and highways,

(iii) Parking facilities,

(iv) Municipal airfields,

(v) Parks and recreation facilities,

(vi) Flood management and flood control devices and structures,

(vii) Operating or closed municipal landfills,

(viii) Publicly owned treatment works (including water and wastewater treatment plants) and sanitary sewer collection systems,

[29] The inventory may refer to the MS4 map required to be maintained pursuant to Provision E.2.b.(1).

(ix) Corporate yards, including maintenance and storage yards for materials, waste, equipment, and vehicles,

(x) Hazardous waste collection facilities,

(xi) Other treatment, storage or disposal facilities for municipal waste, and

(xii) Other municipal facilities that the Copermittee determines may contribute a significant pollutant load to the MS4; and

(d) Residential areas, which may be designated by one or more of the following:

(i) Residential management area,

(ii) Drainage basin or area,

(iii) Land use (e.g., single family, multi-family, rural),

(iv) Neighborhood,

(v) Common Interest Area,

(vi) Home Owner Association,

(vii) Mobile home park, and/or

(viii) Other designations accepted by the San Diego Water Board Executive Officer.

(2) A description of the facility or area, including the following information:

(a) Classification as commercial, industrial, municipal, or residential,

(b) Status of facility or area as active or inactive,

(c) Identification if a business is a mobile business,

(d) SIC Code or NAICS Code, if applicable,

(e) Industrial General Permit NOI and/or WDID number, if applicable,

(f) Identification if a residential area is or includes a Common Interest Area / Home Owner Association, or mobile home park,

(g) Identification of pollutants generated and potentially generated by the facility or area,

(h) Whether the facility or area is adjacent to an ESA,

(i) Whether the facility or area is tributary to and within the same hydrologic subarea as a water body segment listed as impaired on the CWA section 303(d) List and generates pollutants for which the water body segment is impaired, and

(j) Whether the facility or area contributes or potentially contributes to the highest priority water quality conditions identified in the Water Quality Improvement Plan.

(3) An annually updated map showing the location of inventoried existing development, watershed boundaries, and water bodies.

b. EXISTING DEVELOPMENT BMP IMPLEMENTATION AND MAINTENANCE

Each Copermittee must designate a minimum set of BMPs required for all inventoried existing development, including special event venues. The designated minimum BMPs must be specific to facility or area types and pollutant generating activities, as appropriate.

(1) Commercial, Industrial, and Municipal Facilities and Areas

(a) Pollution Prevention

Each Copermittee must require the use of pollution prevention methods by the commercial, industrial, and municipal facilities and areas in its inventoried existing development.

(b) BMP Implementation

Each Copermittee must implement, or require the implementation of, designated BMPs at commercial, industrial, and municipal facilities and areas in its inventoried existing development.

(c) BMP Operation and Maintenance

(i) Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at commercial, industrial, and municipal facilities and areas in its inventoried existing development.

(ii) Each Copermittee must implement a schedule of operation and maintenance activities for its MS4 and related structures (including but not limited to catch basins, storm drain inlets, detention basins, etc.), and verify proper operation of all its municipal structural treatment controls designed to reduce pollutants (including floatables) in storm water discharges to or from its MS4s and related drainage structures. Operation and maintenance activities may include, but is not limited to, the following:

[a] Inspections of the MS4 and related structures;
[b] Cleaning of the MS4 and related structures; and
[c] Proper disposal of materials removed from cleaning of the MS4 and related structures.

(iii) Each Copermittee must implement a schedule of operation and maintenance for public streets, unpaved roads, paved roads, and paved highways and freeways within its jurisdiction to minimize pollutants that can be discharged in storm water.

(iv) Each Copermittee must implement controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers. Copermittees that operate both a municipal sanitary sewer system and a MS4 must implement controls and measures to prevent and eliminate seeping sewage from infiltrating the MS4. Copermittees that do not operate both a municipal sanitary sewer system and a MS4 must coordinate with sewering agencies to keep themselves informed of relevant and appropriate maintenance activities and sanitary sewage projects in their jurisdiction that may cause or contribute to seepage of sewage into the MS4.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must implement BMPs, or require the implementation of BMPs, to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from commercial, industrial, and municipal facilities and areas in its inventoried existing development. Such BMPs must include, as appropriate, educational activities, permits, certifications and other measures for applicators and distributors.

(2) <u>Residential Areas</u>

(a) Pollution Prevention

Each Copermittee must promote and encourage the use of pollution prevention methods, where appropriate, by the residential areas in its inventoried existing development.

(b) BMP Implementation

Each Copermittee must promote and encourage the implementation of designated BMPs at residential areas in its inventoried existing development.

(c) BMP Operation and Maintenance

Each Copermittee must properly operate and maintain, or require the

proper operation and maintenance of designated BMPs at residential areas in its inventoried existing development.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must promote and encourage the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from residential areas in its inventoried existing development.

c. EXISTING DEVELOPMENT INSPECTIONS

Each Copermittee must conduct inspections of inventoried existing development to ensure compliance with applicable local ordinances and permits, and the requirements of this Order.

(1) Inspection Frequency

(a) Each Copermittee must establish appropriate inspection frequencies for inventoried existing development in accordance with the following requirements:

(i) At a minimum, inventoried existing development must be inspected once every five years utilizing one or more of the following methods:

[a] Drive-by inspections by Copermittee municipal and contract staff,
[b] Onsite inspections by Copermittee municipal and contract staff, and/or
[c] Onsite inspections by volunteer monitoring or patrol programs trained by the Copermittee;

(ii) The frequency of inspection must be appropriate to confirm that BMPs are being implemented to reduce the discharge of pollutants in storm water from the MS4 to the MEP and effectively prohibit non-storm water discharges to the MS4;

(iii) The frequency of inspection must be based on the potential for a facility or area to discharge non-storm water and pollutants in storm water, and should reflect the priorities set forth in the Water Quality Improvement Plan;

(iv) Each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial, industrial, and municipal facilities and areas in its inventoried existing development;[30] and

[30] If any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspection may count toward the total annual inspection requirement. This requirement excludes linear municipal facilities (i.e., MS4, streets, roads and highways).

(v) Inventoried existing development must be inspected by the Copermittee, as needed, in response to valid public complaints and findings from the Copermittee's municipal and contract staff or volunteer monitoring or patrol program inspections.

(b) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e. education and outreach, re-inspection, enforcement) necessary to require and confirm compliance with its applicable local ordinances and permits and the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

(2) Inspection Content

(a) Inspections of existing development by the Copermittee or volunteer monitoring or patrol programs must include, at a minimum:

(i) Visual inspections for actual non-storm water discharges,

(ii) Visual inspections for actual or potential discharge of pollutants,

(iii) Visual inspections for actual or potential illicit connections, and

(iv) Verification that the description of the facility or area in the inventory, required pursuant to Provision E.5.a.(2), has not changed.

(b) Onsite inspections of existing development by the Copermittee must include, at a minimum:

(i) Assessment of compliance with its applicable local ordinances and permits related to non-storm water and storm water discharges and runoff;

(ii) Assessment of the implementation of the designated BMPs;

(iii) Verification of coverage under the Industrial General Permit, when applicable;

(iv) If any problems or violations are found, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried existing development. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Name and location of facility or area (address and hydrologic subarea) consistent with the inventory name and location, pursuant to Provision E.5.a.(1);

(b) Inspection and re-inspection date(s);

(c) Inspection method(s) (i.e. drive-by, onsite);

(d) Observations and findings from the inspection(s);

(e) For onsite inspections of existing development by Copermittee municipal or contract staff, the records must also include, as applicable:

(i) Description of any problems or violations found during the inspection(s),

(ii) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6, and

(iii) The date problems or violations were resolved.

d. EXISTING DEVELOPMENT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried existing development, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

e. STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Each Copermittee must implement the water quality improvement strategies, where necessary, to address areas of existing development within its jurisdiction that are identified as sources of pollutants and/or stressors contributing to the highest priority water quality conditions in the Watershed Management Area. For the existing development management program, the following strategies must be implemented:

(1) Specific Existing Development Management Program Strategies

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented within its jurisdiction to address areas of existing development that the Copermittee has identified as sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(a) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, and/or

increase/decrease frequency of inspections for specific types of facilities, areas and/or activities),

(b) The facilities and/or areas within the Copermittee's jurisdiction where the strategies and/or activities will be implemented; and

(c) The strategies and/or activities must be consistent with the requirements of Provisions E.5.b-d and the strategies identified in the Water Quality Improvement Plan.

(2) Retrofitting Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to retrofit areas of existing development within its jurisdiction to address identified sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify areas of existing development as candidates for retrofitting, focusing on areas where retrofitting will address pollutants and/or stressors that contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for retrofitting projects may be utilized to reduce pollutants that may be discharged in storm water from areas of existing development, and/or address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of retrofitting projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting projects; and

(e) Where retrofitting projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional retrofitting projects (i.e. projects that can receive and/or treat storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment) adjacent to and/or downstream of the areas of existing development.

(3) Stream, Channel and/or Habitat Rehabilitation in Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to rehabilitate streams, channels, and/or habitats in areas of existing development within its jurisdiction to address the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify streams, channels, and/or habitats in areas of existing development as candidates for rehabilitation, focusing on areas where stream, channel, and/or habitat rehabilitation projects will address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for stream, channel, and/or habitat rehabilitation projects may be utilized to address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters, rehabilitate channelized or hydromodified streams, restore wetland and riparian habitat, restore watershed functions, and/or restore beneficial uses of receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of stream, channel, and/or habitat rehabilitation projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance stream, channel, and/or habitat rehabilitation projects projects; and

(e) Where stream, channel, and/or habitat rehabilitation projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional stream, channel, and/or habitat rehabilitation projects (i.e. projects that can receive storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment).

6. Enforcement Response Plans

Each Copermittee must develop and implement an Enforcement Response Plan as part of its jurisdictional runoff management program document. The Enforcement Response Plan must describe the applicable approaches and options to enforce its legal authority established pursuant to Provision E.1, as necessary, to achieve compliance with the requirements of this Order. The Enforcement Response Plan must include the following:

a. Enforcement Response Plan Components

The Enforcement Response Plan must include the following individual components:

(1) Illicit Discharge Detection and Elimination Enforcement Component;

(2) Development Planning Enforcement Component;

(3) Construction Management Enforcement Component; and

(4) Existing Development Enforcement Component.

b. Enforcement Response Approaches and Options

Each component of the Enforcement Response Plan must describe the enforcement response approaches that the Copermittee will implement to compel compliance with its statutes, ordinances, permits, contracts, orders, or similar means, and the requirements of this Order. The description must include the protocols for implementing progressively stricter enforcement responses. The enforcement response approaches must include appropriate sanctions to compel compliance, including, at a minimum, the following tools or their equivalent:

(1) Verbal and written notices of violation;

(2) Cleanup requirements;

(3) Fines;

(4) Bonding requirements;

(5) Administrative and criminal penalties;

(6) Liens;

(7) Stop work orders; and

(8) Permit and occupancy denials.

c. Correction of Violations

(1) Violations must be corrected in a timely manner with the goal of correcting the violations within 30 calendar days after the violations are discovered, or prior to the next predicted rain event, whichever is sooner.

(2) If more than 30 calendar days are required to achieve compliance, then a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

d. Escalated Enforcement

(1) The Enforcement Response Plan must include a definition of "escalated enforcement". Escalated enforcement must include any enforcement scenario where a violation or other non-compliance is determined to cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan. Escalated enforcement may be defined differently for development planning, construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas.

(2) Where the Copermittee determines escalated enforcement is not required, a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

(3) Escalated enforcement actions must continue to increase in severity, as necessary, to compel compliance as soon as possible.

e. Reporting of Non-Compliant Sites

(1) Each Copermittee must notify the San Diego Water Board in writing within 2 working days of issuing escalated enforcement (as defined in the Copermittee's Enforcement Response Plan) to a construction site that poses a significant threat to water quality as a result of violations or other non-compliance with its permits and applicable local ordinances, and the requirements of this Order. Written notification may be provided electronically by email.

(2) Each Copermittee must notify the San Diego Water Board of non-filers under the Industrial General Permit and Construction General Permit by email to Nonfilers_R9@waterboards.ca.gov.

7. Public Education and Participation

Each Copermittee must implement, individually or with other Copermittees, a public education and participation program in accordance with the strategies identified in the Water Quality Improvement Plan to promote and encourage the development of programs, management practices, and behaviors that reduce the discharge of pollutants in storm water to the MEP, prevent controllable non-storm water discharges from entering the MS4, and protect water quality standards in receiving waters.

a. PUBLIC EDUCATION

The public education program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) Educational activities, public information activities, and other appropriate outreach activities intended to reduce pollutants associated with the application of pesticides, herbicides and fertilizer and other pollutants of concern in storm water discharges to and from its MS4 to the MEP, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed to address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(2) Educational activities, public information activities, and other appropriate outreach activities to facilitate the proper management and disposal of used oil and toxic materials; and

(3) Appropriate education and training measures for specific target audiences, such as construction site operators, residents, underserved target audiences and school-aged children, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed, based on high risk behaviors and pollutants of concern.

b. PUBLIC PARTICIPATION

The public participation program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) A process for members of the public to participate in updating the highest priority water quality conditions, numeric goals, and water quality improvement strategies in the Water Quality Improvement Plan.

(2) Opportunities for members of the public to participate in providing the Copermittee recommendations for improving the effectiveness of the water quality improvement strategies implemented within its jurisdiction.

(3) Opportunities for members of the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or restoration and protection of the quality of receiving waters.

c. STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented within its jurisdiction, as applicable, to educate the public and encourage public participation to address potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) The target audiences and/or areas within the Copermittee's jurisdiction where the strategies and/or activities will be implemented;

(2) Provide specific details about how the strategies and/or activities will be implemented (e.g. educational topics, materials and/or activities, public outreach and participation programs and/or opportunities);

(3) Each Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify and implement regional public education and participation activities, programs and opportunities;

(4) Each Copermittee must incorporate a mechanism for evaluating and assessing educational and other public outreach activities, as needed, to identify progress and incorporate modifications necessary to increase the effectiveness of the public education and participation program.

8. Fiscal Analysis

a. Each Copermittee must secure the resources necessary to meet all the requirements of this Order.

b. Each Copermittee must conduct an annual fiscal analysis of its jurisdictional runoff management program in its entirety. The fiscal analysis must include the following:

(1) Identification of the various categories of expenditures necessary to implement the requirements of this Order, including a description of the specific capital, operation and maintenance, and other expenditure items to be accounted for in each category of expenditures;

(2) The staff resources needed and allocated to meet the requirements of this Order, including any development, implementation, and enforcement activities required;

(3) The estimated expenditures for Provisions E.8.b.(1) and E.8.b.(2) for the current fiscal year; and

(4) The source(s) of funds that are proposed to meet the necessary expenditures described in Provisions E.8.b.(1) and E.8.b.(2), including legal restrictions on the use of such funds, for the current fiscal year and next fiscal year.

c. Each Copermittee must submit a summary of the annual fiscal analysis with each Annual Report required pursuant to Provision F.3.b.

d. Each Copermittee must provide the documentation used to develop the summary of the annual fiscal analysis upon request by the San Diego Water Board.

F. REPORTING

The purpose of this provision is to determine and document compliance with the requirements set forth in this Order. The goal of this provision is to communicate to the San Diego Water Board and the people of the State of California the implementation status of each jurisdictional runoff management program and compliance with the requirements of this Order. This goal is to be accomplished through the submittal of specific deliverables to the San Diego Water Board by the Copermittees.

1. Water Quality Improvement Plans

The Copermittees for each Watershed Management Area must develop and submit the Water Quality Improvement Plan in accordance with the following requirements:

a. WATER QUALITY IMPROVEMENT PLAN DEVELOPMENT

Each Water Quality Improvement Plan must be developed in accordance with the following process:

(1) Priority Water Quality Conditions and Numeric Goals

(a) The Copermittees must implement a public participation process to solicit data and information to be utilized in the development and identification of the priority water quality conditions for the Watershed Management Area.

(b) The Copermittees are encouraged to involve the public and key stakeholders as early and often as possible during the development of the priority water quality conditions and numeric goals to be included in the Water Quality Improvement Plan.

(c) Within 6 months after the commencement of coverage under this Order, the Copermittees must develop and submit the Water Quality Improvement Plan requirements of Provision B.2 to the San Diego Water Board. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of 60 days.

(d) The Copermittees must revise the priority water quality conditions and numeric goals based on comments received and/or recommendations or direction from the San Diego Water Board Executive Officer.

(2) Water Quality Improvement Strategies and Schedules

(a) The Copermittees are encouraged to involve the public and key stakeholders as early and often as possible during the development of the water quality improvement strategies and schedules to be included in the Water Quality Improvement Plan.

(b) Within 9 months after the commencement of coverage under this Order, the Copermittees must develop and submit the Water Quality Improvement Plan requirements of Provision B.3 to the San Diego Water Board. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of 60 days.

(c) The Copermittees must revise the water quality improvement strategies and schedules based on comments received and/or recommendations or direction from the San Diego Water Board Executive Officer.

b. WATER QUALITY IMPROVEMENT PLAN SUBMITTAL

(1) Within 18 months after the commencement of coverage under this Order, the Copermittees for each Watershed Management Area must submit a complete Water Quality Improvement Plan in accordance with the requirements of Provision B to the San Diego Water Board. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of 30 days.

(2) Based on the comments received, the San Diego Water Board will determine whether to hold a public hearing or to limit public input to submittal of written comments. If no hearing is held the San Diego Water Board will notify the Copermittees within 6 months that the Water Quality Improvement Plan has been accepted as complete following its review and determination that the Water Quality Improvement Plan meets the requirements of this Order.

(3) The Copermittees must revise the Water Quality Improvement Plan based on comments received and/or recommendations or direction from the San Diego Water Board Executive Officer.

(4) The Water Quality Improvement Plan must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance by the San Diego Water Board.

2. Updates

a. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATES

Each Copermittee must update its jurisdictional runoff management program document in accordance with the following requirements:

(1) Each Copermittee is encouraged to involve the public and key stakeholders as early and often as possible to solicit recommendations for updates to its jurisdictional runoff management program document.

(2) Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E no later than 18 months after the commencement of coverage under this Order.

(3) Each Copermittee must submit updates to its jurisdictional runoff management program, with a rationale for the modifications, either in the Annual Report required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge required pursuant to Provision F.5.b.

(4) The Copermittee must revise the modifications as directed by the San Diego Water Board Executive Officer.

(5) Updated jurisdictional runoff management program documents must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of submitting the Annual Report.

b. BMP DESIGN MANUAL UPDATES

Each Copermittee must update its BMP Design Manual in accordance with the following requirements:

(1) Each Copermittee must update its BMP Design Manual to incorporate the requirements of Provisions E.3.a-d no later than 18 months after the commencement of coverage under this Order.

(2) Subsequent updates must be consistent with the requirements of Provisions E.3.a-d and must be submitted as part of the Annual Reports required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge required pursuant to Provision F.5.b.

(3) Updated BMP Design Manuals must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of completing the update.

c. WATER QUALITY IMPROVEMENT PLAN UPDATES

The Water Quality Improvement Plans must be updated in accordance with the following process:

(1) The Copermittees must implement a public participation process to solicit data and information to be utilized in updating the Water Quality Improvement Plan.

(2) The Copermittees are encouraged to involve the public and key stakeholders as early and often as possible during the updates to the Water Quality Improvement Plan.

(3) The Copermittees for each Watershed Management Area must submit requested updates to the Water Quality Improvement Plan, with the public input received and the rationale for the requested updates, either in the Annual Reports required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The requested updates are considered accepted by the San Diego Water Board if no response is provided to the Copermittee after 3 months of submitting the request.

(4) The Copermittees must revise the requested updates as directed by the San Diego Water Board Executive Officer.

(5) Updated Water Quality Improvement Plans must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance of the requested updates by the San Diego Water Board.

3. Progress Reporting

a. Progress Report Presentations

The Copermittees for each Watershed Management Area must appear before the San Diego Water Board, as requested by the San Diego Water Board, to provide progress reports on the implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs.

b. Annual Reports

(1) The Copermittees for each Watershed Management Area must submit an Annual Report for each reporting period no later than January 31 of the following year. The annual reporting period consists of two periods: 1) July 1 to June 30 of the following year for the jurisdictional runoff management programs, 2) October 1 to September 30 of the following year for the monitoring and assessment programs. The first Annual Report must be prepared for the reporting period beginning July 1 after commencement of coverage under this Order, and upon San Diego Water Board determination that the Water Quality Improvement Plan meets the requirements of this Order to June 30 in the following year for the jurisdictional runoff management programs, and September 30 in the following year for the monitoring and assessment programs. Annual Reports must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Each Annual Report must include the following:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, summarized and presented in tabular and graphical form;

(b) Progress of the special studies required pursuant to Provision D.3, and the results or findings when a special study, or each phase of a special study, is completed;

(c) The findings from the assessments required pursuant to Provision D.4;

(d) The progress of implementing the Water Quality Improvement Plan, including, but not limited to, the following:

(i) The progress toward achieving the interim and final numeric goals for the highest water quality priorities for the Watershed Management Area,

(ii) The water quality improvement strategies that were implemented and/or no longer implemented by each of the Copermittees during the reporting period and previous reporting periods, and are planned to be implemented during the next reporting period,

(iii) Proposed modifications to the water quality improvement strategies, with public input received and rationale for the proposed modifications,

(iv) Previously proposed modifications or updates incorporated into the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document and implemented by the Copermittees in the Watershed Management Area, and

(v) Proposed modifications or updates to the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document;

(e) A completed Jurisdictional Runoff Management Program Annual Report Form (Attachment D or accepted revision) for each Copermittee in the Watershed Management Area, certified by a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative.

(2) Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (Attachment D or accepted revision) no later than October 31 of each year until the first Annual Report is required to be submitted. Each Copermittee must submit the information on the Jurisdictional Runoff Management Program Annual Report Form specific to area within its jurisdiction in each Watershed Management Area.

(3) Each Copermittee must provide any data or documentation utilized in developing the Annual Report upon request by the San Diego Water Board. Any monitoring data utilized in developing the Annual Report must be

uploaded to the California Environmental Data Exchange Network (CEDEN).[31] Any monitoring and assessment data utilized in developing the Annual Report must be provided on the Regional Clearinghouse required pursuant to Provision F.4.

c. Regional Monitoring and Assessment Report

(1) The Copermittees must submit a Regional Monitoring and Assessment Report no later than 180 days in advance of the expiration date of this Order. The Regional Monitoring and Assessment Report may be submitted as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The Copermittees must review the receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, and findings from the assessments required pursuant to Provision D.4, to assess the following:

(a) The beneficial uses of the receiving waters within the San Diego Region that are protected or must be restored;

(b) The progress toward restoring impacted beneficial uses in the receiving waters within the San Diego Region; and

(c) Pollutants or conditions of emerging concern that may impact beneficial uses in the receiving waters within the San Diego Region.

(2) The Regional Monitoring and Assessment Report must include recommendations for improving the implementation and assessment of the Water Quality Improvement Plans and jurisdictional runoff management programs.

(3) Each Copermittee must provide any data or documentation utilized in developing the Regional Monitoring and Assessment Report upon request by the San Diego Water Board. Any monitoring and assessment data utilized in developing the Regional Monitoring and Assessment Report must be provided on the Regional Clearinghouse required pursuant to Provision F.4.

[31] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

4. Regional Clearinghouse

The Copermittees must develop, update, and maintain an internet-based Regional Clearinghouse that is made available to the public no later than 18 months after the adoption of this Order.

a. The Copermittees, through the Regional Clearinghouse, must make the following documents and data available, organized by Watershed Management Area, which may be linked to other internet-based data portals and databases where the original documents are stored:

(1) Water Quality Improvement Plan for the Watershed Management Area, and all updated versions with date of update;

(2) Annual Reports for the Watershed Management Area;

(3) Jurisdictional Runoff Management Program document for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(4) BMP Design Manual for each Copermittee within the Watershed Management Area, and all updated versions with date of update; and

(5) Reports from special studies (e.g. source identification, BMP effectiveness assessment) conducted in the Watershed Management Area;

(6) Monitoring data collected pursuant to Provision D for each Watershed Management Area must be uploaded to CEDEN,[32] with links to the uploaded data; and

(7) Available GIS data, layers, and/or shapefiles used to develop the maps generated and maintained by the Copermittees for the Water Quality Improvement Plans, Annual Reports, and jurisdictional runoff management program documents.

b. The Copermittees, through the Regional Clearinghouse, must make the following information and documents available:

(1) Contact information (point of contact, phone number, email address, and mailing address) for each Copermittee;

(2) Public hotline number for reporting non-storm water and illicit discharges for each Copermittee;

[32] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

(3) Email address for reporting non-storm water and illicit discharges for each Copermittee;

(4) Link to each Copermittee's website, if available, where the public may find additional information about the Copermittee's storm water management program and for requesting records for the implementation of its program;

(5) Information about opportunities for the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or restoration and protection of the quality of receiving waters; and

(6) Reports from regional monitoring programs in which the Copermittees participate (e.g. Southern California Monitoring Coalition, Southern California Coastal Water Research Project Bight Monitoring);

(7) Regional Monitoring and Assessment Reports; and

(8) Any other information, data, and documents the Copermittees determine as appropriate for making available to the public.

5. Report of Waste Discharge

a. The Orange County Copermittees and the Riverside County Copermittees are required to submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders. The San Diego Water Board will review and consider the Reports of Waste Discharge to determine whether modification to this Order, pursuant to the requirements of Provision H, will be required prior the Orange County Copermittees and/or Riverside County Copermittees becoming covered under this Order. The current Orders for the Orange County Copermittees and Riverside County Copermittees are rescinded upon noticification of coverage under this Order except for enforcement purposes.

b. The Copermittees subject to the requirements of this Order must submit to the San Diego Water Board a complete Report of Waste Discharge as an application for the re-issuance of this Order and NPDES permit. The Report of Waste Discharge must be submitted no later than 180 days in advance of the expiration date of this Order. The Report of Waste Discharge must contain the following minimum information:

(1) Names and addresses of the Copermittees;

(2) Names and titles of the primary contacts of the Copermittees;

(3) Proposed changes to the Copermittees' Water Quality Improvement Plans and the supporting justification;

(4) Proposed changes to the Copermittees' jurisdictional runoff management programs and the supporting justification;

(5) Any other information necessary for the re-issuance of this Order; and

(6) Any information to be included as part of the Report of Waste Discharge pursuant to the requirements of this Order; and

(7) Any other information required by federal regulations for NPDES permit reissuance.

6. Application for Early Coverage

a. The Orange County Copermittees, collectively, or Riverside County Copermittees, collectively, may apply for early coverage under this Order by submitting a Report of Waste Discharge Form 200, with a written request for early coverage under this Order.

b. The San Diego Water Board will review the application for early coverage. A notification of coverage under this Order will be issued to the Copermittees in the respective county by the San Diego Water Board upon completion of the early coverage application requirements. The effective coverage date will be specified in the notification of coverage and the Copermittees in the respective county are authorized to have MS4 discharges pursuant to the requirements of this Order starting on the date specified in the notification of coverage. The existing Order for the respective county is rescinded upon the effective coverage date specified in the notification of coverage except for enforcement purposes.

7. Reporting Provisions

Each Copermittee must comply with all the reporting and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

G. PRINCIPAL WATERSHED COPERMITTEE RESPONSIBILITIES

1. The Copermittees within each Watershed Management Area must designate a Principal Watershed Copermittee and notify the San Diego Water Board of the name of the Principal Watershed Copermittee. An individual Copermittee should not be designated a Principal Watershed Copermittee for more than two Watershed Management Areas. The notification may be submitted with the Water Quality Improvement Plan required pursuant to Provision F.1 of this Order.

2. The Principal Watershed Copermittee is responsible for, at a minimum, the following:

a. Serving as liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues, and when necessary and appropriate, representing the Copermittees in the Watershed Management Area before the San Diego Water Board.

b. Facilitating the development of the Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order

c. Coordinating the submittal of the deliverables required by Provisions F.1, F.2, F.3.a, and F.3.b of this Order.

d. Coordinating and developing, with the other Principal Watershed Copermittees, the requirements of Provisions F.3.c, F.4, and F.5.b of this Order.

H. MODIFICATION OF PROGRAMS

1. Modifications of the Order may be initiated by the San Diego Water Board or by the Copermittees. Requests by Copermittees must be made to the San Diego Water Board.

2. Minor modifications to the Order may be made by the San Diego Water Board where the proposed modification complies with all the prohibitions and limitations, and other requirements of this Order.

3. Proposed modifications to the Order that are not minor require amendment of this Order in accordance with this Order's rules, policies, and procedures.

4. The San Diego Water Board may re-open and modify this Order at any time prior to its expiration, after opportunity for public comment and a public hearing, if the State Water Board determines that revisions are warranted to those provisions of the Order addressing compliance with water quality standards in the receiving water and/or those provisions of the Order establishing an iterative process for implementation of management practices to assure compliance with water quality standards in the receiving water.

I. STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

Each Copermittee must comply with all the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

ADMINISTRATIVE DRAFT

ATTACHMENT A

DISCHARGE PROHIBITIONS AND SPECIAL PROTECTIONS

1. Basin Plan Waste Discharge Prohibitions

California Water Code Section 13243 provides that a Regional Water Board, in a water quality control plan, may specify certain conditions or areas where the discharge of waste or certain types of waste is not permitted. The following waste discharge prohibitions in the Water Quality Control Plan for the San Diego Basin (Basin Plan) are applicable to any person, as defined by Section 13050(c) of the California Water Code, who is a citizen, domiciliary, or political agency or entity of California whose activities in California could affect the quality of waters of the state within the boundaries of the San Diego Region.

1. The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in California Water Code Section 13050, is prohibited.

2. The discharge of waste to land, except as authorized by waste discharge requirements or the terms described in California Water Code Section 13264 is prohibited.

3. The discharge of pollutants or dredged or fill material to waters of the United States except as authorized by a National Pollutant Discharge Elimination System (NPDES) permit or a dredged or fill material permit (subject to the exemption described in California Water Code Section 13376) is prohibited.

4. Discharges of recycled water to lakes or reservoirs used for municipal water supply or to inland surface water tributaries thereto are prohibited, unless this San Diego Water Board issues a NPDES permit authorizing such a discharge; the proposed discharge has been approved by the State Department of Health Services (DHS) and the operating agency of the impacted reservoir; and the discharger has an approved fail-safe long-term disposal alternative.

5. The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the San Diego Water Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

6. The discharge of waste in a manner causing flow, ponding, or surfacing on lands not owned or under the control of the discharger is prohibited, unless the discharge is authorized by the San Diego Water Board.

7. The dumping, deposition, or discharge of waste directly into waters of the state, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the San Diego Water Board.

8. Any discharge to a storm water conveyance system that is not composed entirely of "*storm water*" is prohibited unless authorized by the San Diego Water Board. [The federal regulations, 40 CFR 122.26(b)(13), define storm water as storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from fire fighting activities.] [§122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

9. The unauthorized discharge of treated or untreated sewage to waters of the state or to a storm water conveyance system is prohibited.

10. The discharge of industrial wastes to conventional septic tank/subsurface disposal systems, except as authorized by the terms described in California Water Code Section 13264, is prohibited.

11. The discharge of radioactive wastes amenable to alternative methods of disposal into the waters of the state is prohibited.

12. The discharge of any radiological, chemical, or biological warfare agent into waters of the state is prohibited.

13. The discharge of waste into a natural or excavated site below historic water levels is prohibited unless the discharge is authorized by the San Diego Water Board.

14. The discharge of sand, silt, clay, or other earthen materials from any activity, including land grading and construction, in quantities which cause deleterious bottom deposits, turbidity or discoloration in waters of the state or which unreasonably affect, or threaten to affect, beneficial uses of such waters is prohibited.

15. The discharge of treated or untreated sewage from vessels to Mission Bay, Oceanside Harbor, Dana Point Harbor, or other small boat harbors is prohibited.

16. The discharge of untreated sewage from vessels to San Diego Bay is prohibited.

17. The discharge of treated sewage from vessels to portions of San Diego Bay that are less than 30 feet deep at mean lower low water (MLLW) is prohibited.

18. The discharge of treated sewage from vessels, which do not have a properly functioning US Coast Guard certified Type I or Type II marine sanitation device, to portions of San Diego Bay that are greater than 30 feet deep at mean lower low water (MLLW) is prohibited.

2. Attachment B to State Water Board Resolution 2012-0012

Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges

I. PROVISIONS FOR POINT SOURCE DISCHARGES OF STORM WATER AND NONPOINT SOURCE WASTE DISCHARGES

The following terms, prohibitions, and special conditions (hereafter collectively referred to as special conditions) are established as limitations on point source storm water and nonpoint source discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in Areas of Special Biological Significance (ASBS), as required for State Water Quality Protection Areas pursuant to California Public Resources Code Sections 36700(f) and 36710(f). These Special Protections are adopted by the State Water Board as part of the California Ocean Plan (Ocean Plan) General Exception.

The special conditions are organized by category of discharge. The State Water Resources Control Board (State Water Board) and Regional Water Quality Control Boards (Regional Water Boards) will determine categories and the means of regulation for those categories [e.g., Point Source Storm Water National Pollutant Discharge Elimination System (NPDES) or Nonpoint Source].

A. PERMITTED POINT SOURCE DISCHARGES OF STORM WATER

1. General Provisions for Permitted Point Source Discharges of Storm Water

   a. Existing storm water discharges into an ASBS are allowed only under the following conditions:

      (1) The discharges are authorized by an NPDES permit issued by the State Water Board or Regional Water Board;

      (2) The discharges comply with all of the applicable terms, prohibitions, and special conditions contained in these Special Protections; and

      (3) The discharges:

         (i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

         (ii) Are designed to prevent soil erosion;

         (iii) Occur only during wet weather;

         (iv) Are composed of only storm water runoff.

   b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

   c. The discharge of trash is prohibited.

d. Only discharges from existing storm water outfalls are allowed. Any proposed or new storm water runoff discharge shall be routed to existing storm water discharge outfalls and shall not result in any new contribution of waste to an ASBS (i.e., no additional pollutant loading). “Existing storm water outfalls” are those that were constructed or under construction prior to January 1, 2005. “New contribution of waste” is defined as any addition of waste beyond what would have occurred as of January 1, 2005. A change to an existing storm water outfall, in terms of re-location or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges are prohibited except as provided below:

(1) The term “non-storm water discharges” means any waste discharges from a municipal separate storm sewer system (MS4) or other NPDES permitted storm drain system to an ASBS that are not composed entirely of storm water.

(2) (i) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability or occur naturally:

(a) Discharges associated with emergency fire fighting operations.

(b) Foundation and footing drains.

(c) Water from crawl space or basement pumps.

(d) Hillside dewatering.

(e) Naturally occurring groundwater seepage via a storm drain.

(f) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(ii) An NPDES permitting authority may authorize non-storm water discharges to an MS4 with a direct discharge to an ASBS only to the extent the NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

2. Compliance Plans for Inclusion in Storm Water Management Plans (SWMP) and Storm Water Pollution Prevention Plans (SWPPP).

The discharger shall specifically address the prohibition of non-storm water runoff and the requirement to maintain natural water quality for storm water discharges to an ASBS in an ASBS Compliance Plan to be included in its SWMP or a SWPPP, as appropriate to permit type. If a statewide permit includes a SWMP, then the discharger shall prepare a stand-alone compliance plan for ASBS discharges. The ASBS Compliance Plan is subject to approval by the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (for permits issued by Regional Water Boards).

a. The Compliance Plan shall include a map of surface drainage of storm water runoff, showing areas of sheet runoff, prioritize discharges, and describe any structural Best Management Practices (BMPs) already employed and/or BMPs to be employed in the future. Priority discharges are those that pose the greatest water quality threat and which are identified to require installation of structural BMPs. The map shall also show the storm water conveyances in relation to other features such as service areas, sewage conveyances and treatment facilities, landslides, areas prone to erosion, and waste and hazardous material storage areas, if applicable. The SWMP or SWPPP shall also include a procedure for updating the map and plan when changes are made to the storm water conveyance facilities.

b. The ASBS Compliance Plan shall describe the measures by which all non-authorized non-storm water runoff (e.g., dry weather flows) has been eliminated, how these measures will be maintained over time, and how these measures are monitored and documented.

c. For Municipal Separate Storm Sewer System (MS4s), the ASBS Compliance Plan shall require minimum inspection frequencies as follows:

   (1) The minimum inspection frequency for construction sites shall be weekly during rainy season;

   (2) The minimum inspection frequency for industrial facilities shall be monthly during the rainy season;

   (3) The minimum inspection frequency for commercial facilities (e.g., restaurants) shall be twice during the rainy season; and

   (4) Storm water outfall drains equal to or greater than 18 inches (457 mm) in diameter or width shall be inspected once prior to the beginning of the rainy season and once during the rainy season and maintained to remove trash and other anthropogenic debris.

d. The ASBS Compliance Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff, that are necessary to comply with these special conditions, will be achieved through BMPs. Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that such installation would pose a threat to health or safety. BMPs to control storm water runoff discharges (at the end-of-pipe) during a design storm shall be designed to achieve on average the following target levels:

   (1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

   (2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges. The baseline for the reduction is the effective date of the Exception. The baseline for these determinations is the effective date of the Exception, and the

reductions must be achieved and documented within four (4) years of the effective date.

e. The ASBS Compliance Plan shall address erosion control and the prevention of anthropogenic sedimentation in ASBS. The natural habitat conditions in the ASBS shall not be altered as a result of anthropogenic sedimentation.

f. The ASBS Compliance Plan shall describe the non-structural BMPs currently employed and planned in the future (including those for construction activities), and include an implementation schedule. The ASBS Compliance Plan shall include non-structural BMPs that address public education and outreach. Education and outreach efforts must adequately inform the public that direct discharges of pollutants from private property not entering an MS4 are prohibited. The ASBS Compliance Plan shall also describe the structural BMPs, including any low impact development (LID) measures, currently employed and planned for higher threat discharges and include an implementation schedule. To control storm water runoff discharges (at the end-of-pipe) during a design storm, permittees must first consider using LID practices to infiltrate, use, or evapotranspirate storm water runoff on-site.

g. The BMPs and implementation schedule shall be designed to ensure that natural water quality conditions in the receiving water are achieved and maintained by either reducing flows from impervious surfaces or reducing pollutant loading, or some combination thereof.

h. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents in storm water runoff that alter natural ocean water quality and the sources of these constituents.

(2) The report shall describe BMPs that are currently being implemented, BMPs that are identified in the SWMP or SWPPP for future implementation, and any additional BMPs that may be added to the SWMP or SWPPP to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the BMPs.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits), the discharger shall revise its ASBS Compliance Plan to incorporate any new or modified BMPs that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised SWMP or SWPPP, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural ocean water quality conditions due to the same constituent.

(5) Compliance with this section does not excuse violations of any term, prohibition, or condition contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within one year from the effective date of the Exception, the discharger shall submit a written ASBS Compliance Plan to the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that describes its strategy to comply with these special conditions, including the requirement to maintain natural water quality in the affected ASBS. The ASBS Compliance Plan shall include a time schedule to implement appropriate non-structural and structural controls (implementation schedule) to comply with these special conditions for inclusion in the discharger's SWMP or SWPPP, as appropriate to permit type.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these special conditions shall be implemented.

d. Within four (4) years of the effective date of the Exception, any structural controls identified in the ASBS Compliance Plan that are necessary to comply with these special conditions shall be operational.

e. Within four (4) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water, pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data, and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

   If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

   The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

(1) for municipalities, a demonstration of significant hardship to discharger ratepayers, by showing the relationship of storm water fees to annual household income for residents within the discharger's jurisdictional area, and the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or
(2) for other governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process.

B. NONPOINT SOURCE DISCHARGES

[NOT INCLUDED]
[PROVISIONS FOR NONPOINT SOURCE DISCHARGES NOT APPLICABLE]

II. ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES

[NOT INCLUDED]
[ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES NOT APPLICABLE]

III. ADDITIONAL REQUIREMENTS – WATERFRONT AND MARINE OPERATIONS

[NOT INCLUDED]
[ADDITIONAL REQUIREMENTS FOR WATERFRONT AND MARINE OPERATIONS NOT APPLICABLE]

IV. MONITORING REQUIREMENTS

Monitoring is mandatory for all dischargers to assure compliance with the Ocean Plan. Monitoring requirements include both: (A) core discharge monitoring, and (B) ocean receiving water monitoring. The State and Regional Water Boards must approve sampling site locations and any adjustments to the monitoring programs. All ocean receiving water and reference area monitoring must be comparable with the Water Boards' Surface Water Ambient Monitoring Program (SWAMP).

Safety concerns: Sample locations and sampling periods must be determined considering safety issues. Sampling may be postponed upon notification to the State and Regional Water Boards if hazardous conditions prevail.

Analytical Chemistry Methods: All constituents must be analyzed using the lowest minimum detection limits comparable to the Ocean Plan water quality objectives. For metal analysis, all samples, including storm water effluent, reference samples, and ocean receiving water samples, must be analyzed by the approved analytical method with the lowest minimum detection limits (currently Inductively Coupled Plasma/Mass Spectrometry) described in the Ocean Plan.

A. CORE DISCHARGE MONITORING PROGRAM

1. General sampling requirements for timing and storm size:

   Runoff must be collected during a storm event that is greater than 0.1 inch and generates runoff, and at least 72 hours from the previously measurable storm event. Runoff samples shall be collected when post-storm receiving water is sampled, and analyzed for the same constituents as receiving water and reference site samples (see section IV B) as described below.

2. Runoff flow measurements

   a. For municipal/industrial storm water outfalls in existence as of December 31, 2007, 18 inches (457mm) or greater in diameter/width (including multiple outfall pipes in combination having a width of 18 inches, runoff flows must be measured or calculated, using a method acceptable to and approved by the State and Regional Water Boards.
   b. This will be reported annually for each precipitation season to the State and Regional Water Boards.

3. Runoff samples – storm events

   a. For outfalls equal to or greater than 18 inches (0.46m) in diameter or width:

      (1) samples of storm water runoff shall be analyzed during the same storm as receiving water samples for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination, ; and

      (2) samples of storm water runoff shall be analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS

      (3) If an applicant has no outfall greater than 36 inches, then storm water runoff from the applicant's largest outfall shall be further analyzed during the same storm as receiving water samples for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates).

   b. For outfalls equal to or greater than 36 inches (0.91m) in diameter or width:

      (1) samples of storm water runoff shall be analyzed during the same storm as receiving water samples for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

      (2) samples of storm water runoff shall be further analyzed during the same storm as receiving water samples for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates) and

(3) samples of storm water runoff shall be analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

c. For an applicant not participating in a regional monitoring program [see below in Section IV (B)] in addition to (a.) and (b.) above, a minimum of the two largest outfalls or 20 percent of the larger outfalls, whichever is greater, shall be sampled (flow weighted composite samples) at least three times annually during wet weather (storm event) and analyzed for all Ocean Plan Table A constituents, Table B constituents for marine aquatic life protection (except for toxicity, only chronic toxicity for three species shall be required), DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, and Ocean Plan indicator bacteria. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one (the largest) such discharge shall be sampled annually in each Region.

4. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may reduce or suspend core monitoring once the storm runoff is fully characterized. This determination may be made at any point after the discharge is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

B. OCEAN RECEIVING WATER AND REFERENCE AREA MONITORING PROGRAM

In addition to performing the Core Discharge Monitoring Program in Section II.A above, all applicants having authorized discharges must perform ocean receiving water monitoring. In order to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS, dischargers may choose either (1) an individual monitoring program, or (2) participation in a regional integrated monitoring program.

1. Individual Monitoring Program: The requirements listed below are for those dischargers who elect to perform an individual monitoring program to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within the affected ASBS. In addition to Core Discharge Monitoring, the following additional monitoring requirements shall be met:

   a. Three times annually, during wet weather (storm events), the receiving water at the point of discharge from the outfalls described in section (IV)(A)(3)(c) above shall be sampled and analyzed for Ocean Plan Table A constituents, Table B constituents for marine aquatic life, DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, salinity, chronic toxicity (three species), and Ocean Plan indicator bacteria.

      The sample location for the ocean receiving water shall be in the surf zone at the point of discharges; this must be at the same location where storm water runoff is sampled. Receiving water shall be sampled at approximately the same time prior to (pre-storm) and during (or immediately after) the same storm (post storm). Reference water quality shall also be sampled and analyzed for the same constituents pre-storm and post-storm, during the same storms when receiving water is sampled. Reference stations will be determined by the State Water Board's Division of Water Quality and the applicable Regional Water Board(s).

b. Sediment sampling shall occur at least three times during every five (5) year period. The subtidal sediment (sand or finer, if present) at the discharge shall be sampled and analyzed for Ocean Plan Table B constituents for marine aquatic life, DDT, PCBs, PAHs, pyrethroids, and OP pesticides. For sediment toxicity testing, only an acute toxicity test using the amphipod Eohaustorius estuarius must be performed.

c. A quantitative survey of intertidal benthic marine life shall be performed at the discharge and at a reference site. The survey shall be performed at least once every five (5) year period. The survey design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The results of the survey shall be completed and submitted to the State Water Board and Regional Water Board at least six months prior to the end of the permit cycle.

d. Once during each five (5) year period, a bioaccumulation study shall be conducted to determine the concentrations of metals and synthetic organic pollutants at representative discharge sites and at representative reference sites. The study design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The bioaccumulation study may include California mussels (Mytilus californianus) and/or sand crabs (Emerita analoga or Blepharipoda occidentalis). Based on the study results, the Regional Water Board and the State Water Board's Division of Water Quality, may adjust the study design in subsequent permits, or add or modify additional test organisms (such as shore crabs or fish), or modify the study design appropriate for the area and best available sensitive measures of contaminant exposure.

e. Marine Debris: Representative quantitative observations for trash by type and source shall be performed along the coast of the ASBS within the influence of the discharger's outfalls. The design, including locations and frequency, of the marine debris observations is subject to approval by the Regional Water Board and State Water Board's Division of Water Quality.

f. The monitoring requirements of the Individual Monitoring Program in this section are minimum requirements. After a minimum of one (1) year of continuous water quality monitoring of the discharges and ocean receiving waters, the Executive Director of the State Water Board (statewide permits) or Executive officer of the Regional Water Board (Regional Water Board permits) may require additional monitoring, or adjust, reduce or suspend receiving water and reference station monitoring. This determination may be made at any point after the discharge and receiving water is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

2. Regional Integrated Monitoring Program: Dischargers may elect to participate in a regional integrated monitoring program, in lieu of an individual monitoring program, to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS. This regional approach shall characterize natural water quality, pre- and post-storm, in ocean reference areas near the mouths of identified open space watersheds and the effects of the discharges on natural water quality (physical, chemical, and toxicity) in the ASBS receiving waters, and should include benthic marine aquatic life and bioaccumulation components. The design of the ASBS stratum of a regional integrated monitoring program may deviate from the otherwise prescribed individual monitoring approach (in Section IV.B.1) if approved by the State Water Board's Division of Water Quality and the Regional Water Boards.

a. Ocean reference areas shall be located at the drainages of flowing watersheds with minimal development (in no instance more than 10% development), and shall not be located in CWA Section 303(d) listed waterbodies or have tributaries that are 303(d) listed. Reference areas shall be free of wastewater discharges and anthropogenic non-storm water runoff. A minimum of low threat storm runoff discharges (e.g. stream highway overpasses and campgrounds) may be allowed on a case-by-case basis. Reference areas shall be located in the same region as the ASBS receiving water monitoring occurs. The reference areas for each Region are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean reference water samples must be collected from each station, each from a separate storm. A minimum of one reference location shall be sampled for each ASBS receiving water site sampled per responsible party. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

b. ASBS ocean receiving water must be sampled in the surf zone at the location where the runoff makes contact with ocean water (i.e. at "point zero"). Ocean receiving water stations must be representative of worst-case discharge conditions (i.e. co-located at a large drain greater than 36 inches, or if drains greater than 36 inches are not present in the ASBS then the largest drain greater than18 inches.) Ocean receiving water stations are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean receiving water samples must be collected during each storm season from each station, each from a separate storm. A minimum of one receiving water location shall be sampled in each ASBS per responsible party in that ASBS. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

c. Reference and receiving water sampling shall commence during the first full storm season following the adoption of these special conditions, and post-storm samples shall be collected when annual storm water runoff is sampled. Sampling shall occur in a minimum of two storm seasons. For those ASBS dischargers that have already participated in the Southern California Bight 2008 ASBS regional monitoring effort, sampling may be limited to only one storm season.

d. Receiving water and reference samples shall be analyzed for the same constituents as storm water runoff samples. At a minimum, constituents to be sampled and analyzed in reference and discharge receiving waters must include oil and grease, total suspended solids, Ocean Plan Table B metals for protection of marine life, Ocean Plan PAHs, pyrethroids, OP pesticides, ammonia, nitrate, phosphates, and critical life stage chronic toxicity for three species. In addition, within the range of the southern sea otter, indicator bacteria or some other measure of fecal contamination shall be analyzed.

3. Waterfront and Marine Operations: In addition to the above requirements for ocean receiving water monitoring, additional monitoring must be performed for marinas and boat launch and pier facilities:

a. For all marina or mooring field operators, in mooring fields with 10 or more occupied moorings, the ocean receiving water must be sampled for Ocean Plan indicator bacteria,

residual chlorine, copper, zinc, grease and oil, methylene blue active substances (MBAS), and ammonia nitrogen.

(1) For mooring field operators opting for an individual monitoring program (Section IV.B.1 above), this sampling must occur weekly (on the weekend) from May through October.

(2) For mooring field operators opting to participate in a regional integrated monitoring program (Section IV.B.2 above), this sampling must occur monthly from May through October on a high use weekend in each month. The Water Boards may allow a reduction in the frequency of sampling, through the regional monitoring program, after the first year of monitoring.

b. For all mooring field operators, the subtidal sediment (sand or finer, if present) within mooring fields and below piers shall be sampled and analyzed for Ocean Plan Table B metals (for marine aquatic life beneficial use), acute toxicity, PAHs, and tributyltin. For sediment toxicity testing, only an acute toxicity test using the amphipod Eohaustorius estuarius must be performed. This sampling shall occur at least three times during a five (5) year period. For mooring field operators opting to participate in a regional integrated monitoring program, the Water Boards may allow a reduction in the frequency of sampling after the first sampling effort's results are assessed.

ADMINISTRATIVE DRAFT

ATTACHMENT B

STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

1. Standard Permit Provisions

Code of Federal Regulations Title 40 Section 122.41 (40 CFR 122.41) includes conditions, or provisions, that apply to all National Pollutant Discharge Elimination System (NPDES) permits. Additional provisions applicable to NPDES permits are in 40 CFR 122.42. All applicable provisions in 40 CFR 122.41 and 40 CFR 122.42 must be incorporated into this Order and NPDES permit. The applicable 40 CFR 122.41 and 40 CFR 122.42 provisions are as follows:

a. DUTY TO COMPLY [40 CFR 122.41(a)]

The Copermittee must comply with all of the provisions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

(1) The Copermittee must comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement. [40 CFR 122.41(a)(1)]

(2) The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to a civil penalty not to exceed $25,000 per day for each violation. The CWA provides that any person who *negligently* violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than 2 years, or both. Any person who *knowingly* violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both. Any person who knowingly violates Section 301, 302, 303, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, and who knows at that time that he thereby places another person in imminent danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of

not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.
[40 CFR 122.41(a)(2)]

(3) Any person may be assessed an administrative penalty by the San Diego Regional Water Quality Control Board (San Diego Water Board), State Water Resources Control Board (State Water Board), or United States Environmental Protection Agency (USEPA) for violating Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.
[40 CFR 122.41(a)(3)]

b. DUTY TO REAPPLY [40 CFR 122.41(b)]

If a Copermittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Copermittee must apply for and obtain a new permit.

c. NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE [40 CFR 122.41(c)]

It shall not be a defense for a Copermittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

d. DUTY TO MITIGATE [40 CFR 122.41(d)]

The Copermittee must take all reasonable steps to minimize or prevent any discharge or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

e. PROPER OPERATION AND MAINTENANCE [40 CFR 122.41(e)]

The Copermittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Copermittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by a Copermittee only when the operation is necessary to achieve compliance with the conditions of this permit.

f. PERMIT ACTIONS [40 CFR 122.41(f)]

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Copermittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

g. PROPERTY RIGHTS [40 CFR 122.41(g)]

This permit does not convey any property rights of any sort, or any exclusive privilege.

h. DUTY TO PROVIDE INFORMATION [40 CFR 122.41(h)]

The Copermittee must furnish to the San Diego Water Board, State Water Board, or USEPA within a reasonable time, any information which the San Diego Water Board, State Water Board, or USPEA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Copermittee must also furnish to the San Diego Water Board, State Water Board, or USPEA upon request, copies of records required to be kept by this permit.

i. INSPECTION AND ENTRY [40 CFR 122.41(i)]

The Copermittee must allow the San Diego Water Board, State Water Board, USEPA, and/or their authorized representative (including an authorized contractor acting as their representative), upon presentation of credentials and other documents as may be required by law, to:

(1) Enter upon the Copermittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit; [40 CFR 122.41(i)(1)]

(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit; [40 CFR 122.41(i)(2)]

(3) Inspect and photograph at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; [40 CFR 122.41(i)(3)] and

(4) Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location. [40 CFR 122.41(i)(4)]

j. MONITORING AND RECORDS [40 CFR 122.41(j)]

(1) Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity. [40 CFR 122.41(j)(1)]

(2) Except for records of monitoring information required by this permit related to the Copermittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five (5) years (or longer as required by 40 CFR Part 503), the

Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time. [40 CFR 122.41(j)(2)]

(3) Records for monitoring information must include: [40 CFR 122.41(j)(3)]

(a) The date, exact place, and time of sampling or measurements; [40 CFR 122.41(j)(3)(i)]
(b) The individual(s) who performed the sampling or measurements; [40 CFR 122.41(j)(3)(ii)]
(c) The date(s) analyses were performed; [40 CFR 122.41(j)(3)(iii)]
(d) The individual(s) who performed the analyses; [40 CFR 122.41(j)(3)(iv)]
(e) The analytical techniques or methods used; [40 CFR 122.41(j)(3)(v)] and
(f) The results of such analyses. [40 CFR 122.41(j)(3)(vi)]

(4) Monitoring must be conducted according to test procedures under 40 CFR Part 136 unless another method is required under 40 CFR Subchapters N or O. [40 CFR 122.41(j)(4)]

In the case of pollutants for which there are no approved methods under 40 CFR Part 136 or otherwise required under 40 CFR Subchapters N and O, monitoring must be conducted according to a test procedure specified in the permit for such pollutants. [40 CFR 122.44(i)(1)(iv)]

(5) The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. [40 CFR 122.41(j)(5)]

k. SIGNATORY REQUIREMENT [40 CFR 122.41(k)]

(1) All applications, reports, or information submitted to the San Diego Water Board, State Water Board, or USEPA must be signed and certified. (See 40 CFR 122.22) [40 CFR 122.41(k)(1)]

(a) *For a municipality, State, Federal, or other public agency.* [All applications must be signed] [b]y either a principal executive officer or ranking elected official. [40 CFR 122.22(a)(3)]

(b) All reports required by permits, and other information requested by the San Diego Water Board, State Water Board, or USEPA must be signed by a person described in paragraph (a) of this section, or by a duly authorized representative of that person. A person is a duly authorized representative only if: [40 CFR 122.22(b)]

(i) The authorization is made in writing by a person described in paragraph (a) of this section; [40 CFR 122.22(b)(1)]

(ii) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company, (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) [40 CFR 122.22(b)(2)] and,

(iii) The written authorization is submitted to the San Diego Water Board and State Water Board. [40 CFR 122.22(b)(3)]

(c) *Changes to authorization.* If an authorization under paragraph (b) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (b) of this section must be submitted to the San Diego Water Board prior to or together with any reports, information, or applications to be signed by an authorized representative. [40 CFR 122.22(c)]

(d) *Certification.* Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." [40 CFR 122.22(d)]

(2) The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both. [40 CFR 122.41(k)(2)]

I. REPORTING REQUIREMENTS [40 CFR 122.41(l)]

(1) *Planned changes.* The Copermittee must give notice to the San Diego Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when: [40 CFR 122.41(l)(1)]

(a) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); [40 CFR 122.41(l)(1)(i)] or

(b) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which

are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1). [40 CFR 122.41(l)(1)(ii)]

(c) The alteration or addition results in a significant change in the Copermittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. [40 CFR 122.41(l)(1)(iii)]

(2) *Anticipated noncompliance*. The Copermittee must give advance notice to the San Diego Water Board or State Water Board of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements. [40 CFR 122.41(l)(2)]

(3) *Transfers*. This permit is not transferable to any person except after notice to the San Diego Water Board. The San Diego Water Board may require modification or revocation and reissuance of the permit to change the name of the Copermittee and incorporate such other requirements as may be necessary under the CWA. [40 CFR 122.41(l)(3)]

(4) *Monitoring reports.* Monitoring results must be reported at the intervals specified elsewhere in this permit. [40 CFR 122.41(l)(4)]

(a) Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the San Diego Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices. [40 CFR 122.41(l)(4)(i)]

(b) If the Copermittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or another method required for an industry-specific waste stream under 40 CFR Subchapters N or O, the results of this monitoring must be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the San Diego Water Board or State Water Board. [40 CFR 122.41(l)(4)(ii)]

(c) Calculations for all limitations which require averaging of measurements must utilize an arithmetic mean unless otherwise specified in the permit. [40 CFR 122.41(l)(4)(iii)]

(5) *Compliance schedules*. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date. [40 CFR 122.41(l)(5)]

(6) *Twenty-four hour reporting.*

(a) The Copermittee must report any noncompliance that may endanger health or the environment. Any information must be provided orally within 24 hours from

the time the Copermittee becomes aware of the circumstances. A written submission must also be provided within five (5) days of the time the Copermittee becomes aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6)(i)]

(b) The following must be included as information which must be reported within 24 hours under this paragraph: [40 CFR 122.41(l)(6)(ii)]

(i) Any unanticipated bypass that exceeds any effluent limitation in the permit (See 40 CFR 122.41(g)). [40 CFR 122.41(l)(6)(ii)(A)]
(ii) Any upset which exceeds any effluent limitation in the permit. [40 CFR 122.41(l)(6)(ii)(B)] and,
(iii) Violation of a maximum daily discharge limitation for any of the pollutants listed by the San Diego Water Board in the permit to be reported within 24 hours. (See 40 CFR 122.44(g)) [40 CFR 122.41(l)(6)(ii)(C)]

(c) The San Diego Water Board may waive the above-required written report on a case-by-case basis if the oral report has been received within 24 hours. [40 CFR 122.41(l)(6)(iii)]

(7) *Other noncompliance.* The Copermittee must report all instances of noncompliance not reported in accordance with the standard provisions required under 40 CFR 122.41(l)(4), (5), and (6), at the time monitoring reports are submitted. The reports must contain the information listed in the standard provisions required under 40 CFR 122.41(l)(6). [40 CFR 122.41(l)(7))]

(8) *Other information.* When the Copermittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the San Diego Water Board, State Water Board, or USEPA, the Copermittee must promptly submit such facts or information. [40 CFR 122.41(l)(8)]

m. BYPASS [40 CFR 122.41(m)]

(1) *Definitions.*

(a) "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. [40 CFR 122.41(m)(1)(i)] or

(b) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production. [40 CFR 122.41(m)(1)(ii)]

(2) *Bypass not exceeding limitations*. The Copermittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the standard provisions required under 40 CFR 122.41(m)(3) and (4). [40 CFR 122.41(m)(2)]

(3) *Notice.*

(a) *Anticipated bypass*. If the Copermittee knows in advance of the need for a bypass, it must submit a notice, if possible at least ten days before the date of the bypass. [40 CFR 122.41(m)(3)(i)] or

(b) *Unanticipated bypass*. The Copermittee must submit notice of an unanticipated bypass in accordance with the standard provisions required under 40 CFR 122.41(l)(6) (24-hour notice). [40 CFR 122.41(m)(3)(ii)]

(4) *Prohibition of Bypass.*

(a) Bypass is prohibited, and the San Diego Water Board may take enforcement action against a Copermittee for bypass, unless: [40 CFR 122.41(m)(4)(i)]

(i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; [40 CFR 122.41(m)(4)(i)(A)]

(ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; [40 CFR 122.41(m)(4)(i)(B)] and,

(iii) The Copermittee submitted notice in accordance with the standard provisions required under 40 CFR 122.41(m)(3). [40 CFR 122.41(m)(4)(i)(C)]

(b) The San Diego Water Board may approve an anticipated bypass, after considering its adverse effects, if the San Diego Water Board determines that it will meet the three conditions listed above. [40 CFR 122.41(m)(4)(ii)]

n. UPSET [40 CFR 122.41(n)]

(1) *Definition.* "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Copermittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. [40 CFR 122.41(n)(1)]

(2) *Effect of an upset*. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the standard provisions required under 40 CFR 122.41(n)(3) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. [40 CFR 122.41(n)(2)]

(3) *Conditions necessary for a demonstration of upset*. A Copermittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that: [40 CFR 122.41(n)(3)]

(a) An upset occurred and that the Copermittee can identify the cause(s) of the upset; [40 CFR 122.41(n)(3)(i)]
(b) The permitted facility was at the time being properly operated; [40 CFR 122.41(n)(3)(ii)] and
(c) The Copermittee submitted notice of the upset in accordance with the standard provisions required under 40 CFR 122.41(l)(6)(ii)(B) (24-hour notice). [40 CFR 122.41(n)(3)(iii)]
(d) The Copermittee complied with any remedial measures pursuant to the standard provisions required under 40 CFR 122.41(d). [40 CFR 122.41(n)(3)(iii)]

(4) *Burden of proof*. In any enforcement proceeding, the Copermittee seeking to establish the occurrence of an upset has the burden of proof. [40 CFR 122.41(n)(4)]

O. STANDARD PERMIT PROVISIONS FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS [40 CFR 122.42(c)]

The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the San Diego Water Board or State Water Board under 40 CFR 122.26(a)(1)(v) must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report must include:

(1) The status of implementing the components of the storm water management program that are established as permit conditions; [40 CFR 122.42(c)(1)]

(2) Proposed changes to the storm water management programs that are established as permit conditions. Such proposed changes must be consistent with 40 CFR 122.26(d)(2)(iii); [40 CFR 122.42(c)(2)] and

(3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under 40 CFR 122.26(d)(2)(iv) and (v); [40 CFR 122.42(c)(3)]

(4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; [40 CFR 122.42(c)(4)]

(5) Annual expenditures and budget for year following each annual report; [40 CFR 122.42(c)(5)]

(6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; [40 CFR 122.42(c)(6)]

(7) Identification of water quality improvements or degradation. [40 CFR 122.42(c)(7)]

p. STANDARD PERMIT PROVISIONS FOR STORM WATER DISCHARGES [40 CFR 122.42(d)]

The initial permits for discharges composed entirely of storm water issued pursuant to 40 CFR 122.26(e)(7) must require compliance with the conditions of the permit as expeditiously as practicable, but in no event later than three years after the date of issuance of the permit.

2. General Provisions

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. The general provisions applicable to this Order and NPDES permit are as follows:

a. DISCHARGE OF WASTE IS A PRIVILEGE

No discharge of waste into the waters of the State, whether or not such discharge is made pursuant to waste discharge requirements, shall create a vested right to continue such discharge. All discharges of waste into waters of the State are privileges, not rights. [CWC Section 13263(g)]

b. DURATION OF ORDER AND NPDES PERMIT

(1) *Effective date*. This Order and NPDES permit becomes effective on the date of its adoption provided the USEPA has no objection. If the USEPA objects to its issuance, this Order shall not become effective until such objection is withdrawn. This Order supersedes Order No. R9-2007-0001 upon the effective date of this Order, and supercedes Order Nos. R9-2009-0002 and R9-2010-0016 upon their expiration.

(2) *Expiration*. This Order and NPDES permit expires five years after adoption. [40 CFR 122.46(a)]

(3) *Continuation of expired order*. After this Order and NPDES permit expires, the terms and conditions of this Order and NPDES permit are automatically continued pending issuance of a new permit if all requirements of the federal NPDES regulations on the continuation of expired permits (40 CFR 122.6) are complied with.

c. AVAILABILITY

A copy of this Order must be kept at a readily accessible location and must be available to on-site personnel at all times.

d. CONFIDENTIALITY OF INFORMATION

Except as provided for in 40 CFR 122.7, no information or documents submitted in accordance with or in application for this Order will be considered confidential, and all such information and documents shall be available for review by the public at the San Diego Water Board office.

Claims of confidentiality for the following information will be denied: [40 CFR 122.7(b)]

(1) The name and address of any permit applicant or Copermittee; [40 CFR 122.7(b)(1)] and

(2) Permit applications and attachments, permits, and effluent data. [40 CFR 122.7(b)(2)]

e. EFFLUENT LIMITATIONS

(1) *Interim effluent limitations*. The Copermittee must comply with any interim effluent limitations as established by addendum, enforcement action, or revised waste discharge requirements which have been, or may be, adopted by the San Diego Water Board.

(2) *Other effluent limitations and standards*. If any applicable toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant and that standard or prohibition is more stringent than any limitation on the pollutant in the permit, the San Diego Water Board shall institute proceedings under these regulations to modify or revoke and reissue the permit to conform to the toxic effluent standard or prohibition. [40 CFR 122.44(b)(1)]

f. DUTY TO MINIMIZE OR CORRECT ADVERSE IMPACTS

The Copermittee must take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this Order, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the noncompliance.

g. PERMIT ACTIONS

The filing of a request by the Copermittee for modification, revocation and reissuance, or termination of this Order, or a notification of planned change in or anticipated noncompliance with this Order does not stay any condition of this Order. (See 40 CFR 122.41(f)) In addition, the following provisions apply to this Order:

(1) Upon application by any affected person, or on its own motion, the San Diego Water Board may review and revise the requirements in this Order. All requirements must be reviewed periodically. [CWC Section 13263(e)]

(2) This Order may be terminated or modified for cause, including, but not limited to, all of the following: [CWC Section 13381]

(a) Violation of any condition contained in the requirements of this Order. [CWC Section 13381(a)]

(b) Obtaining the requirements in this Order by misrepresentation, or failure to disclose fully all relevant facts. [CWC Section 13381(b)]

(c) A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge. [CWC Section 13381(c)]

(3) When this Order is transferred to a new owner or operator, such requirements as may be necessary under the CWC may be incorporated into this Order.

h. NPDES PERMITTED NON-STORM WATER DISCHARGES

The San Diego Water Board has, in prior years, issued a limited number of individual NPDES permits for non-storm water discharges to MS4s. The San Diego Water Board or State Water Board may in the future, upon prior notice to the Copermittee(s), issue an NPDES permit for any non-storm water discharge (or class of non-storm water discharges) to an MS4.

i. MONITORING

In addition to the standard provisions required under 40 CFR 122.41(j) and (l)(4), the following general monitoring provisions apply to this Order:

(1) Where procedures are not otherwise specified in Order, sampling, analysis and quality assurance/quality control must be conducted in accordance with the Quality Assurance Management Plan (QAMP) for the State of California's Surface Water Ambient Monitoring Program (SWAMP), adopted by the State Water Resources Control Board (State Water Board).

(2) Pursuant to 40 CFR 122.41(j)(2) and CWC Section 13383(a), each Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five (5) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time.

(3) All chemical, bacteriological, and toxicity analyses must be conducted at a laboratory certified for such analyses by the California Department of Public Health or a laboratory approved by the San Diego Water Board.

(4) For priority toxic pollutants that are identified in the California Toxics Rule (CTR) (65 Fed. Reg. 31682), the Copermittees must instruct their laboratories to establish calibration standards that are equivalent to or lower than the Minimum Levels (MLs) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP). If a Copermittee can demonstrate that a particular ML is not attainable, in accordance

with procedures set forth in 40 CFR Part 136, the lowest quantifiable concentration of the lowest calibration standard analyzed by a specific analytical procedure (assuming that all the method specified sample weights, volumes, and processing steps have been followed) may be used instead of the ML listed in Appendix 4 of the SIP. The Copermittee must submit documentation from the laboratory to the San Diego Water Board for approval prior to raising the ML for any priority toxic pollutant.

j. ENFORCEMENT

(1) The San Diego Water Board is authorized to enforce the terms of this Order under several provisions of the CWC, including, but not limited to, CWC Sections 13385, 13386, and 13387.

(2) Nothing in this Order shall be construed to protect the Copermittee from its liabilities under federal, state, or local laws.

(3) The CWC provides for civil and criminal penalties comparable to, and in some cases greater than, those provided for under the CWA.

(4) Except as provided in the standard conditions required under 40 CFR 122.41(m) and (n), nothing in this Order shall be construed to relieve the Copermittee from civil or criminal penalties for noncompliance.

(5) Nothing in this Order shall be construed to preclude the institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties to which the Copermittee is or may be subject to under Section 311 of the CWA.

(6) Nothing in this Order shall be construed to preclude institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authoring preserved by Section 510 of the CWA.

k. SEVERABILITY

The provisions of this Order are severable, and if any provision of this Order, or the application of any provisions of this Order to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this Order shall not be affected thereby.

l. APPLICATIONS

Any application submitted by a Copermittee for reissuance or modification of this Order must satisfy all applicable requirements specified in federal regulations as well as any additional requirements for submittal of a Report of Waste Discharge specified in the CWC and the California Code of Regulations.

m. IMPLEMENTATION

All plans, reports and subsequent amendments submitted in compliance with this Order must be implemented immediately (or as otherwise specified). All submittals by Copermittees must be adequate to implement the requirements of this Order.

n. REPORT SUBMITTALS

(1) All report submittals must include an executive summary, introduction, conclusion, recommendations, and signed certified statement.

(2) Each Copermittee must submit a signed certified statement covering its responsibilities for each applicable submittal.

(3) The Principal Watershed Copermittee(s) must submit a signed certified statement covering its responsibilities for each applicable submittal and the sections of the submittals for which it is responsible.

(4) Unless otherwise directed, the Copermittees must submit one hard copy and one electronic copy of each report required under this Order to the San Diego Water Board, and one electronic copy to the USEPA.

(5) The Copermittees must submit reports and provide notifications as required by this Order to the following:

EXECUTIVE OFFICER
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
9174 SKY PARK COURT, SUITE 100
SAN DIEGO CA 92123-4340
Telephone: (858) 467-2952 Fax: (858) 571-6972

EUGENE BROMLEY
US ENVIRONMENTAL PROTECTION AGENCY
REGION IX
PERMITS ISSUANCE SECTION (W-5-1)
75 HAWTHORNE STREET
SAN FRANCISCO CA 94105

ADMINISTRATIVE DRAFT

ATTACHMENT C

ACRONYMS AND ABBREVIATIONS

AMAL	Average Monthly Action Level
ASBS	Area(s) of Special Biological Significance
BMP	Best Management Practice
Basin Plan	Water Quality Control Plan for the San Diego Basin
CEQA	California Environmental Quality Act
CCR	California Code of Regulations
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWC	California Water Code
CZARA	Coastal Zone Act Reauthorization Amendments of 1990
ESAs	Environmentally Sensitive Areas
GIS	Geographic Information System
IBI	Index of Biotic Integrity
LID	Low Impact Development
MDAL	Maximum Daily Action Level
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
NAL	Non-Storm Water Action Level
NAICS	North American Industry Classification System
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
ROWD	Report of Waste Discharge (application for NPDES reissuance)
SAL	Storm Water Action Level
San Diego Water Board	California Regional Water Quality Control Board, San Diego Region
SIC	Standard Industrial Classification Code
State Water Board	State Water Resources Control Board
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
WDID	Waste Discharge Identification Number
WLA	Waste Load Allocation
WQBEL	Water Quality Based Effluent Limitation

DEFINITIONS

Active/Passive Sediment Treatment - Using mechanical, electrical or chemical means to flocculate or coagulate suspended sediment for removal from runoff from construction sites prior to discharge.

Anthropogenic Litter – Trash generated from human activities, not including sediment.

Average Monthly Action Level – The highest allowable average of daily discharges over a calendar month.

Beneficial Uses - The uses of water necessary for the survival or well being of man, plants, and wildlife. These uses of water serve to promote tangible and intangible economic, social, and environmental goals. "Beneficial Uses" of the waters of the State that may be protected include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. Existing beneficial uses are uses that were attained in the surface or ground water on or after November 28, 1975; and potential beneficial uses are uses that would probably develop in future years through the implementation of various control measures. "Beneficial Uses" are equivalent to "Designated Uses" under federal law. [California Water Code Section 13050(f)].

Best Management Practices (BMPs) - Defined in 40 CFR 122.2 as schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Bioassessment - The use of biological community information to evaluate the biological integrity of a water body and its watershed. With respect to aquatic ecosystems, bioassessment is the collection and analysis of samples of the benthic macroinvertebrate community together with physical/habitat quality measurements associated with the sampling site and the watershed to evaluate the biological condition (i.e. biotic integrity) of a water body.

Biofiltration - Practices that use vegetation and amended soils to detain and treat runoff from impervious areas. Treatment is through filtration, infiltration, adsorption, ion exchange, and biological uptake of pollutants.

Biological Integrity - Defined in Karr J.R. and D.R. Dudley. 1981. Ecological perspective on water quality goals. *Environmental Management* 5:55-68 as: "A balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitat of the region." Also referred to as ecosystem health.

BMP Design Manual – A plan developed to eliminate, reduce, or mitigate the impacts of runoff from development projects, including Priority Development Projects.

Clean Water Act Section 303(d) Water Body - An impaired water body in which water quality does not meet applicable water quality standards and/or is not expected to meet water quality standards, even after the application of technology based pollution controls required by the CWA. The discharge of runoff to these water bodies by the Copermittees is significant because these discharges can cause or contribute to violations of applicable water quality standards.

Construction Site – Any project, including projects requiring coverage under the Construction General Permit, that involves soil disturbing activities including, but not limited to, clearing, grading, disturbances to ground such as stockpiling, and excavation.

Contamination - As defined in the Porter-Cologne Water Quality Control Act, contamination is "an impairment of the quality of waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste whether or not waters of the State are affected."

Copermittee – An incorporated city within the County of Orange, County of Riverside, or County of San Diego in the San Diego Region, the County of Orange, the County of Riverside, the County of San Diego, the Orange County Flood Control District, the Riverside County Water Conservation and Flood Control District, the San Diego Regional Airport Authority, or the San Diego Unified Port District.

Copermittees – All of the individual Copermittees, collectively.

Critical Channel Flow (Qc) – The channel flow that produces the critical shear stress that initiates bed movement or that erodes the toe of channel banks. When measuring Qc, it should be based on the weakest boundary material – either bed or bank.

Daily Discharge – Defined as either: (1) the total mass of the constituent discharged over the calendar day or any 24 hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g. concentration.)

The Daily Discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day, or other 24 hour period other than a day), or by the arithmetic mean of analytical results from one or more grab samples taken over the course of a day.

Development Projects - Construction, rehabilitation, redevelopment, or reconstruction of any public or private residential project, industrial, commercial, or any other projects.

Dry Season –May 1 to September 30.

Dry Weather – Weather is considered dry if the preceding 72 hours has been without measurable precipitation (>0.1 inch).

Enclosed Bays – Enclosed bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost bay works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays do not include inland surface waters or ocean waters.

Erosion – When land is diminished or worn away due to wind, water, or glacial ice. Often the eroded debris (silt or sediment) becomes a pollutant via storm water runoff. Erosion occurs naturally but can be intensified by land clearing activities such as farming, development, road

building, and timber harvesting.

Environmentally Sensitive Areas (ESAs) - Areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; areas designated as preserves or their equivalent under the Natural Communities Conservation Program within the Cities and County of Orange; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.

Estuaries – Waters, including coastal lagoons, located at the mouth of streams that serve as areas of mixing fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and ocean water. Estuaries do not include inland surface waters or ocean waters.

Existing Development – Any area that has been developed and exists for municipal, commercial, industrial, or residential purposes, uses, or activities. May include areas that are not actively used for its originally developed purpose, but may be re-purposed or redeveloped for another use or activity.

Flow Duration – The long-term period of time that flows occur above a threshold that causes significant sediment transport and may cause excessive erosion damage to creeks and streams (not a single storm event duration). The simplest way to visualize this is to consider a histogram of pre- and post-project flows using long-term records of hourly data. To maintain pre-development flow duration means that the total number of hours (counts) within each range of flows in a flow-duration histogram cannot increase between the pre- and post-development condition. Flow duration within the range of geomorphologically significant flows is important for managing erosion.

Grading - The cutting and/or filling of the land surface to a desired slope or elevation.

Hazardous Material – Any substance that poses a threat to human health or the environment due to its toxicity, corrosiveness, ignitability, explosive nature or chemical reactivity. These also include materials named by the USEPA in 40 CFR 116 to be reported if a designated quantity of the material is spilled into the waters of the U.S. or emitted into the environment.

Hazardous Waste - Hazardous waste is defined as “any waste which, under Section 600 of Title 22 of this code, is required to be managed according to Chapter 30 of Division 4.5 of Title 22 of this code” [CCR Title 22, Division 4.5, Chapter 11, Article 1].

Household Hazardous Waste – Paints, cleaning products, and other wastes generated during home improvement or maintenance activities.

Hydromodification – The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, interflow and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive

streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

Illicit Connection – Any connection to the MS4 that conveys an illicit discharge.

Illicit Discharge - Any discharge to the MS4 that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from fire fighting activities [40 CFR 122.26(b)(2)].

Inactive Areas – Areas of construction activity that are not active and those that have been active and are not scheduled to be re-disturbed for at least 14 days.

Infiltration – Water other than wastewater that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow [40 CFR 35.2005(20)].

Inland Surface Waters – Includes all surface waters of the State that do not include the ocean, enclosed bays, or estuaries.

Jurisdictional Runoff Management Program Document – A written description of the specific jurisdictional runoff management measures and programs that each Copermittee will implement to comply with this Order and ensure that storm water pollutant discharges in runoff are reduced to the MEP and do not cause or contribute to a violation of water quality standards.

Low Impact Development (LID) – A storm water management and land development strategy that emphasizes conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions.

Low Impact Development Best Management Practices (LID BMPs) – LID BMPs include schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States through storm water management and land development strategies that emphasize conservation sand the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions. LID BMPs include retention practices that do not allow runoff, such as infiltration, rain water harvesting and reuse, and evapotranspiration. LID BMPs also include flow-through practices such as biofiltration that may have some discharge of storm water following pollutant reduction.

Major Outfall – As defined in the Code of Federal Regulations, a major outfall is a MS4 outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (i.e. discharge from a single conveyance other than a circular pipe which is associated with a drainage are of more than 50 acres); or, for MS4s that receive storm water from lands zoned for industrial activity (based on comprehensive zoning plans or equivalent), a MS4 outfall that discharges from a single pipe with an inside diameter of 12 inches or more or from its equivalent (i.e. discharge from other than a circular pipe associated with a drainage area of 2 acres or more).

Maximum Daily Action Level (MDAL) –The highest allowable daily discharge of a pollutant, over a calendar day (or 24 hour period). For pollutants with action levels expressed in units of

mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with action levels expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

Maximum Extent Practicable (MEP) – The technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) for storm water that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) in combination with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than BAT. A definition for MEP is not provided either in the statute or in the regulations. Instead the definition of MEP is dynamic and will be defined by the following process over time: municipalities propose their definition of MEP by way of their runoff management programs. Their total collective and individual activities conducted pursuant to the runoff management programs becomes their proposal for MEP as it applies both to their overall effort, as well as to specific activities (e.g., MEP for street sweeping, or MEP for MS4 maintenance). In the absence of a proposal acceptable to the San Diego Water Board, the San Diego Water Board defines MEP.

In a memo dated February 11, 1993, entitled "Definition of Maximum Extent Practicable," Elizabeth Jennings, Senior Staff Counsel, SWRCB addressed the achievement of the MEP standard as follows:

> "*To achieve the MEP standard, municipalities must employ whatever Best Management Practices (BMPs) are technically feasible (i.e., are likely to be effective) and are not cost prohibitive. The major emphasis is on technical feasibility. Reducing pollutants to the MEP means choosing effective BMPs, and rejecting applicable BMPs only where other effective BMPs will serve the same purpose, or the BMPs would not be technically feasible, or the cost would be prohibitive. In selecting BMPs to achieve the MEP standard, the following factors may be useful to consider:*
>
> *a. Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?*
> *b. Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?*
> *c. Public Acceptance: Does the BMP have public support?*
> *d. Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?*
> *e. Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc.?*
>
> *The final determination regarding whether a municipality has reduced pollutants to the maximum extent practicable can only be made by the Regional or State Water Boards, and not by the municipal discharger. If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit derived, it would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs that would address a pollutant source, or to pick a BMP based solely on cost, which would be clearly less effective. In*

selecting BMPs the municipality must make a serious attempt to comply and practical solutions may not be lightly rejected. In any case, the burden would be on the municipal discharger to show compliance with its permit. After selecting a menu of BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented."

Monitoring Year – October 1 to September 30

Municipal Separate Storm Sewer System (MS4) – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designated or used for collecting or conveying storm water; (iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.26.

National Pollutant Discharge Elimination System (NPDES) - The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the CWA.

Non-Storm Water - All discharges to and from a MS4 that do not originate from precipitation events (i.e., all discharges from a MS4 other than storm water). Non-storm water includes illicit discharges and NPDES permitted discharges.

Nuisance - As defined in the Porter-Cologne Water Quality Control Act, a nuisance is "anything which meets all of the following requirements: 1) Is injurious to health, or is indecent, or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. 2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. 3) Occurs during, or as a result of, the treatment or disposal of wastes."

Ocean Waters – the territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the State Board's California Ocean Plan.

Order – Unless otherwise specified, refers to this Order, Order No. R9-2013-0001 (NPDES No. CAS0109266)

Persistent Flow - Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

Person - A person is defined as an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof [40 CFR 122.2].

Point Source - Any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, landfill leachate collection systems, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

Pollutant - Any agent that may cause or contribute to the degradation of water quality such that a condition of pollution or contamination is created or aggravated.

Pollution - As defined in the Porter-Cologne Water Quality Control Act, pollution is "the alteration of the quality of the waters of the State by waste, to a degree that unreasonably affects the either of the following: 1) The waters for beneficial uses; or 2) Facilities that serve these beneficial uses." Pollution may include contamination.

Pollution Prevention - Pollution prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control BMPs, treatment control BMPs, or disposal.

Pre-Development Runoff Conditions – Runoff conditions that existed onsite before the existing development was constructed, or exists onsite before planned development activities occur.

Priority Development Projects - New development and redevelopment projects defined under Provision E.3.b of Order No. R9-2012-0011.

Rainy Season (aka Wet Season) –October 1 to April 30

Receiving Waters – Waters of the United States.

Receiving Water Limitations - Waste discharge requirements issued by the San Diego Water Board typically include both: (1) "Effluent Limitations" (or "Discharge Limitations") that specify the technology-based or water-quality-based effluent limitations; and (2) "Receiving Water Limitations" that specify the water quality objectives in the Basin Plan as well as any other limitations necessary to attain those objectives. In summary, the "Receiving Water Limitations" provision is the provision used to implement the requirement of CWA section 301(b)(1)(C) that NPDES permits must include any more stringent limitations necessary to meet water quality standards.

Redevelopment - The creation, addition, and or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include trenching and resurfacing associated with utility work; resurfacing existing roadways; new sidewalk construction, pedestrian ramps, or bike lane on existing roads; and routine replacement of damaged pavement, such as pothole repair.

Reporting Period – The period of information that is reported in the Annual Report. The reporting period consists of two components: 1) July 1 to June 30, consistent with the fiscal

year, for the implementation of the jurisdictional runoff management programs, and 2) October 1 to September 30, consistent with the monitoring year for the monitoring and assessment programs. Together, these two time periods constitute the reporting year for the Annual Report due January 31 following the end of the monitoring year.

Retain –Keep or hold in a particular place, condition, or position without discharge to surface waters.

Retrofitting – Storm water management practice put into place after development has occurred in watersheds where the practices previously did not exist. Retrofitting of developed areas is intended to improve water quality, protect downstream channels, reduce flooding, or meet other specific objectives. Retrofitting developed areas may include, but is not limited to replacing roofs with green roofs, disconnecting downspouts or impervious surfaces to drain to pervious surfaces, replacing impervious surfaces with pervious surfaces, installing rain barrels, installing rain gardens, and trash area enclosures.

Runoff - All flows in a storm water conveyance system that consists of the following components: (1) storm water (wet weather flows) and (2) non-storm water including dry weather flows.

San Diego Water Board – As used in this document the term "San Diego Water Board" is synonymous with the term "Regional Board" as defined in Water Code section 13050(b) and is intended to refer to the California Regional Water Quality Control Board for the San Diego Region as specified in Water Code Section 13200.

Sediment - Soil, sand, and minerals washed from land into water. Sediment resulting from anthropogenic sources (i.e. human induced land disturbance activities) is considered a pollutant. This Order regulates only the discharges of sediment from anthropogenic sources and does not regulate naturally occurring sources of sediment. Sediment can destroy fish-nesting areas, clog animal habitats, and cloud waters so that sunlight does not reach aquatic plants.

Source Control BMP – Land use or site planning practices, or structural or nonstructural measures that aim to prevent runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between pollutants and runoff.

Storm Water – Per 40 CFR 122.26(b)(13), means storm water runoff, snowmelt runoff and surface runoff and drainage. Surface runoff and drainage pertains to runoff and drainage resulting from precipitation events.

Stream, Channel, or Habitat Rehabilitation – Measures or activities for the purpose of improving or restoring the environmental health (i.e. physical, chemical and biological integrity) of streams, channels, or river systems. Rehabilitation techniques may include, but are not limited to, riparian zone restoration, constructed wetlands, bank stabilization, channel reconfiguration, and daylighting drainage systems.

Structural BMPs - A subset of BMPs which detains, retains, filters, removes, or prevents the release of pollutants to surface waters from development projects in perpetuity, after construction of a project is completed.

Total Maximum Daily Load (TMDL) - The maximum amount of a pollutant that can be

discharged into a water body from all sources (point and non-point) and still maintain water quality standards. Under CWA section 303(d), TMDLs must be developed for all water bodies that do not meet water quality standards after application of technology-based controls.

Toxicity - Adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies). The water quality objectives for toxicity provided in the Basin Plan, state in part…"All waters shall be free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life….The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge".

Treatment Control BMP – Any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media absorption or any other physical, biological, or chemical process.

Unpaved Road – Any long, narrow stretch without pavement used for traveling by motor passenger vehicles between two or more points. Unpaved roads are generally constructed of dirt, gravel, aggregate or macadam and may be improved or unimproved.

Waste - As defined in CWC Section 13050(d), "waste includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal."

Article 2 of CCR Title 23, Chapter 15 (Chapter 15) contains a waste classification system that applies to solid and semi-solid waste, which cannot be discharged directly or indirectly to water of the state and which therefore must be discharged to land for treatment, storage, or disposal in accordance with Chapter 15. There are four classifications of waste (listed in order of highest to lowest threat to water quality): hazardous waste, designated waste, non-hazardous solid waste, and inert waste.

Water Quality Objective - Numerical or narrative limits on constituents or characteristics of water designated to protect designated beneficial uses of the water. [California Water Code Section 13050 (h)]. California's water quality objectives are established by the State and Regional Water Boards in the Water Quality Control Plans. Numeric or narrative limits for pollutants or characteristics of water designed to protect the beneficial uses of the water. In other words, a water quality objective is the maximum concentration of a pollutant that can exist in a receiving water and still generally ensure that the beneficial uses of the receiving water remain protected (i.e., not impaired). Since water quality objectives are designed specifically to protect the beneficial uses, when the objectives are violated the beneficial uses are, by definition, no longer protected and become impaired. This is a fundamental concept under the Porter Cologne Act. Equally fundamental is Porter Cologne's definition of pollution. A condition of pollution exists when the water quality needed to support designated beneficial uses has become unreasonably affected or impaired; in other words, when the water quality objectives have been violated. These underlying definitions (regarding beneficial use protection) are the reason why all waste discharge requirements implementing the federal NPDES regulations require compliance with water quality objectives. (Water quality objectives are also called water quality criteria in the CWA.)

Water Quality Standards - Water quality standards, as defined in Clean Water Act section

303(c) consist of the beneficial uses (e.g., swimming, fishing, municipal drinking water supply, etc.,) of a water body and criteria (referred to as water quality objectives in the California Water Code) necessary to protect those uses. Under the Water Code, the water boards establish beneficial uses and water quality objectives in water quality control or basin plans. Together with an anti-degradation policy, these beneficial uses and water quality objectives serve as water quality standards under the Clean Water Act. In Clean Water Act parlance, state beneficial uses are called "designated uses" and state water quality objectives are called "criteria." Throughout this Order, the relevant term is used depending on the statutory scheme.

Waters of the State - Any water, surface or underground, including saline waters within the boundaries of the State [CWC section 13050 (e)]. The definition of the Waters of the State is broader than that for the Waters of the United States in that all water in the State is considered to be a Waters of the State regardless of circumstances or condition. Under this definition, a MS4 is always considered to be a Waters of the State.

Waters of the United States - As defined in the 40 CFR 122.2, the Waters of the U.S. are defined as: "(a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate "wetlands;" (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters otherwise defined as waters of the United States under this definition: (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial seas; and (g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA."

Watershed - That geographical area which drains to a specified point on a water course, usually a confluence of streams or rivers (also known as drainage area, catchment, or river basin).

Wet Season (aka Rainy Season) –October 1 to April 30

Wet Weather – Weather is considered wet if there is a storm event of 0.1 inches and greater and the following 72 hours, unless otherwise defined by another regulatory mechanism.

ATTACHMENT D

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

FY _____

I. COPERMITTEE INFORMATION

Copermittee Name:

Copermittee Primary Contact Name:

Copermittee Primary Contact Information:
Address:
City: County: State: Zip:
Telephone: Fax: Email:

II. LEGAL AUTHORITY

Has the Copermittee established adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐
A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority?	**YES**	☐
	NO	☐

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

Was an update of the jurisdictional runoff management program document required or recommended by the San Diego Water Board?	**YES**	☐
	NO	☐
If YES to the question above, did the Copermittee update its jurisdictional runoff management program document and make it available on the Regional Clearinghouse?	**YES**	☐
	NO	☐

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

Has the Copermittee implemented a program to actively detect and eliminate illicit discharges and connections to its MS4 that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

Number of non-storm water discharges reported by the public	
Number of non-storm water discharges detected by Copermittee staff or contractors	
Number of non-storm water discharges investigated by the Copermittee	
Number of sources of non-storm water discharges identified	
Number of non-storm water discharges eliminated	
Number of sources of illicit discharges or connections identified	
Number of illicit discharges or connections eliminated	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

V. DEVELOPMENT PLANNING PROGRAM

Has the Copermittee implemented a development planning program that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐
Was an update to the BMP Design Manual required or recommended by the San Diego Water Board?	**YES**	☐
	NO	☐
If YES to the question above, did the Copermittee update its BMP Design Manual and make it available on the Regional Clearinghouse?	**YES**	☐
	NO	☐

Number of proposed development projects in review	
Number of Priority Development Projects in review	
Number of Priority Development Projects approved	
Number of approved Priority Development Projects exempt from any BMP requirements	
Number of approved Priority Development Projects allowed alternative compliance	
Number of Priority Development Projects granted occupancy	

Number of completed Priority Development Projects in inventory	
Number of high priority Priority Development Project structural BMP inspections	
Number of Priority Development Project structural BMP violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM
FY _____

VI. CONSTRUCTION MANAGEMENT PROGRAM

Has the Copermittee implemented a construction management program that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

Number of construction sites in inventory	
Number of active construction sites in inventory	
Number of inactive construction sites in inventory	
Number of construction sites closed/completed during reporting period	
Number of construction site inspections	
Number of construction site violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

Has the Copermittee implemented an existing development management program that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

	Municipal	Commercial	Industrial	Residential
Number of facilities or areas in inventory				
Number of existing development inspections				
Number of follow-up inspections				
Number of violations				
Number of enforcement actions issued				
Number of escalated enforcement actions issued				

VIII. PUBLIC EDUCATION AND PARTICIPATION

Has the Copermittee implemented a public education program component that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐
Has the Copermittee implemented a public participation program component that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

IX. FISCAL ANALYSIS

Has the Copermittee attached to this form a summary of its fiscal analysis that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

X. CERTIFICATION

I [☐ Principal Executive Officer ☐ Ranking Elected Official ☐ Duly Authorized Representative] certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature	Date
Print Name	Title
Telephone Number	Email

ADMINISTRATIVE DRAFT

ATTACHMENT E

SPECIFIC PROVISIONS FOR TOTAL MAXIMUM DAILY LOADS APPLICABLE TO ORDER NO. R9-2013-0001

These provisions implement Total Maximum Daily Loads (TMDLs), adopted by the San Diego Water Board and approved by USEPA under Clean Water Act section 303(c), which are applicable to discharges regulated under this Order. The provisions and schedules for implementation of the TMDLs described below must be incorporated into the Water Quality Improvement Plans, required pursuant to Provision B of this Order, for the specified Watershed Management Areas.

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed
2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin
3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed
4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek
5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay
6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2002-0123

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	August 14, 2002
State Water Board Approval Date:	July 16, 2003
Office of Administrative Law Approval Date:	September 11, 2003
US EPA Approval Date:	November 3, 2003

(3) TMDL Effective Date: September 11, 2003

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for Chollas Creek consist of the following:

(1) Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedule under Specific Provision 1.c:

Table 1.1
Receiving Water Limitations as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Diazinon	Acute	0.08 µg/L	1 hour
	Chronic	0.05 µg/L	4 days

(2) Effluent Limitations

Discharges from the MS4s must not contain concentrations that exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 1.c:

Table 1.2
Effluent Limitations as Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation	Averaging Period
Diazinon	Acute	0.072 µg/L	1 hour
	Chronic	0.045 µg/L	4 days

(3) Best Management Practices

The following BMPs for Chollas Creek must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area and implemented by the Responsible Copermittees:

(a) The Responsible Copermittees must implement BMPs to support the achievement of the WQBELs under Specific Provision 1.b for Chollas Creek.

(b) The Responsible Copermittees must implement the Diazinon Toxicity Control Plan and Diazinon Public Outreach/Education Program as described in the report titled, *Technical Report for Total Maximum Daily Load for Diazinon in Chollas Creek Watershed, San Diego County*, dated August 14, 2002, including subsequent modifications, in order to achieve the WQBELs under Specific Provision 1.b.

(c) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans as possible.

c. Compliance Schedule

The Responsible Copermittees are required to achieve their respective WLAs by December 31, 2010. The Responsible Copermittees must be in compliance with the WQBELs under Specific Provision 1.b.

d. Specific Monitoring and Assessment Requirements

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls for diazinon within the Chollas Creek watershed, and calculate or estimate the annual diazinon loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

e. COMPLIANCE DETERMINATION

Compliance with WQBELs of Specific Provision 1.b may be demonstrated via one of the following methods:

(1) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;

(2) There are no exceedances of the applicable receiving water limitations under Specific Provision 1.b.(1) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(3) There are no violations of the applicable effluent limitations under Specific Provision 1.b.(2) at the Responsible Copermittees' MS4 outfalls.

2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0019

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	September 22, 2005
Office of Administrative Law Approval Date:	December 2, 2005
US EPA Approval Date:	February 8, 2006

(3) TMDL Effective Date: December 2, 2005

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Shelter Island Yacht Basin

(6) Responsible Copermittees: City of San Diego, San Diego Unified Port District

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for Shelter Island Shoreline Park consist of the following:

(1) Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedule under Specific Provision 2.c:

Table 2.1
Receiving Water Limitations as Concentrations in Shelter Island Yacht Basin

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Dissolved Copper	Acute	4.8 µg/L	1 hour
	Chronic	3.1 µg/L	4 days

(2) Effluent Limitations

Discharges from the MS4s must not contain pollutant loads that exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 2.c:

Table 2.2
Effluent Limitations as Annual Loads in MS4 Discharges to Shelter Island Yacht Basin

Constituent	Effluent Limitation
Dissolved Copper	30 kg/yr

(3) Best Management Practices

The Responsible Copermittees must implement BMPs to support the achievement of the WQBELs under Specific Provision 2.b for Shelter Island Yacht Basin

c. Compliance Schedule

The Responsible Copermittees are required to achieve the MS4 WLA by December 2, 2005. The Responsible Copermittee must be in compliance with the WQBELs under Specific Provision 2.b.

d. Specific Monitoring and Assessment Requirements

The Responsible Copermittees must monitor the effluent of its MS4 outfalls for dissolved copper, and calculate or estimate the monthly and annual dissolved copper loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.(b)(2)of this Order. The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

e. Compliance Determination

Compliance with WQBELs of Specific Provision 2.b may be demonstrated via one of the following methods:

(1) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;

(2) There are no exceedances of the applicable receiving water limitations under Specific Provision 2.b.(1) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(3) There are no violations of the applicable effluent limitations under Specific Provision 2.b.(2) at the Responsible Copermittees' MS4 outfalls.

3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0036

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	November 16, 2005
Office of Administrative Law Approval Date:	February 1, 2006
US EPA Approval Date:	March 22, 2006

(3) TMDL Effective Date: February 1, 2006

(4) Watershed Management Area: Santa Margarita River

(5) Water Body: Rainbow Creek

(6) Responsible Copermittee: County of San Diego

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for Rainbow Creek consist of the following

(1) Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedule under Specific Provision 3.c.(1):

Table 3.1
Receiving Water Limitations as Concentrations in Rainbow Creek

Constituent	Receiving Water Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(2) Effluent Limitations

(a) Discharges from the MS4s must not contain concentrations that exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 3.c.(1):

Table 3.2
Effluent Limitations as Concentrations in MS4 Discharges to Rainbow Creek

Constituent	Effluent Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(b) Pollutant loads from given land uses discharging to and from the MS4s must not exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 3.c.(1):

Table 3.3
Effluent Limitations as Annual Loads in MS4 Discharges to Rainbow Creek

Land Use	Total N	Total P
Commercial nurseries	116 kg/yr	3 kg/yr
Park	3 kg/yr	0.1 kg/yr
Residential areas	149 kg/yr	12 kg/yr
Urban areas	27 kg/yr	6 kg/yr

Interim effluent limitations expressed as pollutant loads are given in the compliance schedule under Specific Provision 3.0.

(3) Best Management Practices

(a) The Responsible Copermittee must implement BMPs to support the achievement of the WQBELs under Specific Provision 3.b for Rainbow Creek.

(b) The Responsible Copermittee should coordinate the any BMPs implemented to address this TMDL with Caltrans and other sources as possible.

c. COMPLIANCE SCHEDULE

(1) Compliance Date

The Responsible Copermittee must be in compliance with the WQBELs under Specific Provision 3.b, by December 31, 2021.

(2) Interim Compliance Requirements

Table 3.4
Interim Effluent Limitations as Annual Loads in MS4 Discharges from Specific Land Uses to Rainbow Creek

	Total N Interim Effluent Limitations (kg/yr)			Total P Interim Effluent Limitations (kg/yr)		
	Interim Compliance Date			Interim Compliance Date		
Land Use	**2009**	**2013**	**2017**	**2009**	**2013**	**2017**
Commercial nurseries	390	299	196	20	16	10
Park	5	3	3	0.15	0.10	0.10
Residential areas	507	390	260	99	74	47
Urban areas	40	27	27	9	6	6

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

The Responsible Copermittee must implement the Sampling and Analysis Plan for Rainbow Creek Nutrient Reduction TMDL Implementation Water Quality Monitoring, dated January 2010. The results of any monitoring conducted during the reporting period, and assessment of whether the interim and final WQBELs have been achieved must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

e. COMPLIANCE DETERMINATION

(1) Compliance with interim compliance requirements of Specific Provision 3.c.(2) may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water;

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 3.b.(1) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls;

(c) There are no violations of the applicable effluent limitations under Specific Provision 3.b.(2)(a) at the Responsible Copermittee's MS4 outfalls;

(d) The pollutant loads from given land uses discharging to and from the MS4s do not exceed the applicable effluent limitations under Specific Provision 3.b.(2)(b); OR

(e) The Responsible Copermittee has submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim compliance requirements will be achieved by the interim compliance dates.

(2) Compliance with WQBELs of Specific Provision 3.b may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water;

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 3.b.(1) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls;

(c) There are no violations of the applicable effluent limitations under Specific Provision 3.b.(2)(a) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant loads from given land uses discharging to and from the MS4s do not exceed the applicable effluent limitations under Specific Provision 3.b.(2)(b).

4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2007-0043

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2007
State Water Board Approval Date:	July 15, 2008
Office of Administrative Law Approval Date:	October 22, 2008
US EPA Approval Date:	December 18, 2008

(3) TMDL Effective Date: October 22, 2008

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for Chollas Creek consist of the following:

(1) Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedule under Specific Provision 4.c.(1):

Table 4.1
Receiving Water Limitations as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$(0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$(0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$(0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$(0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER.

(2) Effluent Limitations

Discharges from the MS4s must not contain pollutant loads that exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 4.c.(1):

Table 4.2
Effluent Limitations as Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER.

(3) Best Management Practices

(a) The Responsible Copermittees must implement BMPs to support the achievement of the WQBELs under Specific Provision 4.b for Chollas Creek.

(b) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans and the U.S. Navy as possible.

c. Compliance Schedule

(1) WLA Compliance Date

The Responsible Copermittees are required to achieve the WLA, thus must be in compliance with the WQBELs under Specific Provision 4.b, by October 22, 2028.

(2) Interim Compliance Requirements

The Responsible Copermittee must comply with the following interim WQBELs by the interim compliance date:

Table 4.3
Interim Effluent Limitations as Concentrations in MS4 Discharges to Chollas Creek

Interim Compliance Date	Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
October 22, 2018	Dissolved Copper	Acute	1.2 x 90% x (0.96) x $e^{[0.9422 \times \ln(\text{hardness}) - 1.700]}$ x WER*	1 hour
		Chronic	1.2 x 90% x (0.96) x $e^{[0.8545 \times \ln(\text{hardness}) - 1.702]}$ x WER*	4 days
	Dissolved Lead	Acute	1.2 x 90% x [1.46203 – 0.145712 x ln(hardness)] x $e^{[1.273 \times \ln(\text{hardness}) - 1.460]}$ x WER*	1 hour
		Chronic	1.2 x 90% x [1.46203 – 0.145712 x ln(hardness)] x $e^{[1.273 \times \ln(\text{hardness}) - 4.705]}$ x WER*	4 days
	Dissolved Zinc	Acute	1.2 x 90% x (0.978) x $e^{[0.8473 \times \ln(\text{hardness}) + 0.884]}$ x WER*	1 hour
		Chronic	1.2 x 90% x (0.986) x $e^{[0.8473 \times \ln(\text{hardness}) + 0.884]}$ x WER*	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER.

d. Specific Monitoring and Assessment Requirements

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*, when it is amended to include monitoring requirements for the Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls discharging to Chollas Creek for dissolved copper, lead, and zinc, and calculate or estimate the monthly and annual dissolved copper, lead, and zinc loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2)of this Order. The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

e. COMPLIANCE DETERMINATION

(1) Compliance with interim compliance requirements of Specific Provision 4.c.(2) may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 4.b.(1) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls;

(c) There are no violations of the applicable effluent limitations under Specific Provision 4.b.(2) at the Responsible Copermittees' MS4 outfalls; OR

(d) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim compliance requirements will be achieved by the interim compliance dates.

(2) Compliance with WQBELs of Specific Provision 4.b may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 4.b.(1) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(c) There are no violations of the applicable effluent limitations under Specific Provision 4.b.(2) at the Responsible Copermittees' MS4 outfalls.

5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2008-0027

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 11, 2008
State Water Board Approval Date:	June 16, 2009
Office of Administrative Law Approval Date:	September 15, 2009
US EPA Approval Date:	October 26, 2009

(3) TMDL Effective Date: September 15, 2009

(4) Watershed Management Areas: See Table 5.0

(5) Water Bodies: See Table 5.0

(6) Responsible Copermittees: See Table 5.0

Table 5.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County	Dana Point Harbor	Baby Beach	-City of Dana Point -County of Orange
San Diego Bay	San Diego Bay	Shelter Island Shoreline Park	- San Diego Unified Port District

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Receiving Water Limitations

(a) Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedules under Specific Provisions 5.c.(1)(a) and 5.c.(2):

Table 5.1
Receiving Water Limitations as Bacteria Densities in the Water Body

	Receiving Water Limitations	
Constituent	**Single Sample Maximum[1,2]**	**30-Day Geometric Mean[2]**
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.

(b) If the above receiving water limitations are not met in the receiving water, the Responsible Copermittees must demonstrate that the discharges from the MS4s are not causing or contributing to the exceedance of receiving water limitations.

(2) Effluent Limitations

Discharges from the MS4s must not contain densities that exceed the following effluent limitations by the end of the compliance schedules under Specific Provisions 5.c.(1)(a) and 5.c.(2) to demonstrate the discharge is not causing or contributing to a violation of receiving water quality standards:

Table 5.2
Effluent Limitations as Bacteria Densities in MS4 Discharges to the Water Body

	Effluent Limitations	
Constituent	**Single Sample Maximum[1,2]**	**30-Day Geometric Mean[2]**
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.

Interim effluent limitations expressed as pollutant loads are given in the compliance schedule under Specific Provision 5.c.

(3) Best Management Practices

(a) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 5.0 must incorporate the Bacteria Load Reduction Plan (BLRP) required to be developed pursuant to Resolution No. R9-2008-0027.

(b) The Responsible Copermittee must implement BMPs to support the achievement of the WQBELs under Specific Provision 5.0 for the segments or areas of the water bodies listed in Table 5.0

c. COMPLIANCE SCHEDULE

(1) Baby Beach in Dana Point Harbor

(a) WLA Compliance Dates

The Responsible Copermittees for MS4 discharges to Baby Beach are required to achieve the WLA, thus must be in compliance with the WQBELs under Specific Provision 5.0, according to the following compliance schedule:

Table 5.3
Compliance Schedule Dates to Achieve Baby Beach WLAs

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform	September 15, 2014	September 15, 2009
Fecal Coliform		September 15, 2009
Enterococcus		September 15, 2019

(b) Interim Compliance Requirements

The Responsible Copermittees for MS4 discharges to Baby Beach must comply with the following interim WQBELs by the interim compliance date:

Table 5.4
Interim Effluent Limitations as Loads in MS4 Discharges to Baby Beach

Constituent	Interim Compliance Date	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	4.93×10^9 MPN/day	NA*
Fecal Coliform	September 15, 2012	0.59×10^9 MPN/day	NA*
Enterococcus	September 15, 2012	0.42×10^9 MPN/day	NA**
	September 15, 2016	NA*	207×10^9 MPN/30days

Notes:
* The WQBELs under Specific Provision 5.b must already be achieved by the given interim compliance date.
** There is no corresponding interim WQBEL for the given interim compliance date.

(2) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park is required to achieve the WLA, thus must be in compliance with the WQBELs under Specific Provision 5.0, by December 31, 2012.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) Monitoring Stations

Monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[33] If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(2) Monitoring Procedures

(a) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) The Responsible Copermittees must collect wet weather monitoring samples within the first 24 hours of the first storm event[34] of the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(c) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs have been achieved.

[33] Commonly referred to as AB 411 monitoring

[34] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(b) The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

e. COMPLIANCE DETERMINATION

(1) Compliance with interim compliance requirements of Specific Provision 5.c.(1)(b) may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 5.b.(1)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls;

(c) There are no violations of the applicable effluent limitations under Specific Provision 5.b.(2) at the Responsible Copermittees' MS4 outfalls;

(d) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the applicable effluent limitations under Specific Provision 5.c.(1)(b);

(e) The Responsible Copermittees can demonstrate that exceedances of the applicable receiving water limitations under Specific Provision 5.b.(1)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4 are not causing or contributing to the exceedances; OR

(f) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim compliance requirements will be achieved by the interim compliance dates.

(2) Compliance with WQBELs of Specific Provision 5.b may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 5.b.(1)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls;

(c) There are no violations of the applicable effluent limitations under Specific Provision 5.b.(2) at the Responsible Copermittees' MS4 outfalls;

(d) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the applicable effluent limitations under Specific Provision 5.c.(1)(b); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the applicable receiving water limitations under Specific Provision 5.b.(1)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4 are not causing or contributing to the exceedances.

6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2010-0001

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 10, 2010
State Water Board Approval Date:	December 14, 2010
Office of Administrative Law Approval Date:	April 4, 2011
US EPA Approval Date:	June 22, 2011

(3) TMDL Effective Date: April 4, 2011

(4) Watershed Management Areas: See Table 6.0

(5) Water Bodies: See Table 6.0

(6) Responsible Copermittees: See Table 6.0

Table 6.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	-City of Laguna Beach -County of Orange -Orange County Flood Control District
		at Heisler Park - North	
	Pacific Ocean Shoreline	at Main Laguna Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Woods -County of Orange -Orange County Flood Control District
		Laguna Beach at Ocean Avenue	
		Laguna Beach at Cleo Street	
		Arch Cove at Bluebird Canyon Road	
		Laguna Beach at Dumond Drive	
	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Hills -City of Laguna Niguel -City of Laguna Woods -City of Lake Forest -City of Mission Viejo -County of Orange -Orange County Flood Control District
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	
	Aliso Creek Mouth	at mouth	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County (cont'd)	Pacific Ocean Shoreline	Aliso Beach at West Street	-City of Dana Point -City of Laguna Beach -City of Laguna Niguel -County of Orange -Orange County Flood Control District
		Aliso Beach at Table Rock Drive	
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)	
		at Salt Creek (large outlet)	
		Salt Creek Beach at Salt Creek service road	
		Salt Creek Beach at Strand Road	
	Pacific Ocean Shoreline	at San Juan Creek	-City of Dana Point -City of Laguna Hills -City of Laguna Niguel -City of Mission Viejo -City of Rancho Santa Margarita -City of San Juan Capistrano -County of Orange -Orange County Flood Control District
	San Juan Creek	lower 1 mile	
	San Juan Creek Mouth	at mouth	
	Pacific Ocean Shoreline	at Poche Beach	-City of Dana Point -City of San Clemente -County of Orange -Orange County Flood Control District
		Ole Hanson Beach Club Beach at Pico Drain	
		San Clemente City Beach at El Portal Street Stairs	
		San Clemente City Beach at Mariposa Street	
		San Clemente City Beach at Linda Lane	
		San Clemente City Beach at South Linda Lane	
		San Clemente City Beach at Lifeguard Headquarters	
		under San Clemente Municipal Pier	
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	
		San Clemente State Beach at Riviera Beach	
		Can Clemente State Beach at Cypress Shores	
San Luis Rey River	Pacific Ocean Shoreline	at San Luis Rey River mouth	-City of Oceanside -City of Vista -County of San Diego

Carlsbad	Pacific Ocean Shoreline	at Moonlight State Beach	-City of Carlsbad -City of Encinitas -City of Escondido -City of Oceanside -City of San Marcos -City of Solana Beach -County of San Diego
San Dieguito River	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	-City of Del Mar -City of Escondido -City of Poway -City of San Diego -City of Solana Beach -County of San Diego
Penasquitos	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	-City of Del Mar -City of Poway -City of San Diego -County of San Diego
Mission Bay	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	-City of San Diego
		La Jolla Shores Beach at Caminito del Oro	
		La Jolla Shores Beach at Vallecitos	
		La Jolla Shores Beach at Avenida de la Playa	
		at Casa Beach, Children's Pool	
		South Casa Beach at Coast Boulevard	
		Whispering Sands Beach at Ravina Street	
		Windansea Beach at Vista de la Playa	
		Windansea Beach at Bonair Street	
		Windansea Beach at Playa del Norte	
		Windansea Beach at Palomar Avenue	
		at Tourmaline Surf Park	
		Pacific Beach at Grand Avenue	
	Tecolote Creek	Entire reach and tributaries	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I- Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
San Diego River	Forrester Creek	lower 1 mile	-City of El Cajon -City of Santee -County of San Diego
	San Diego River	lower 6 miles	-City of El Cajon -City of La Mesa -City of San Diego -City of Santee -County of San Diego
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	
San Diego Bay	Chollas Creek	lower 1.2 miles	-City of La Mesa -City of Lemon Grove -City of San Diego -County of San Diego - San Diego Unified Port District

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for segments or areas of the water bodies listed in Table 6.0 consist of the following:

(1) Receiving Water Limitations

(a) Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedules under Specific Provision 6.c.(1):

Table 6.1
Receiving Water Limitations as Bacteria Densities and Allowable Exceedance Frequencies in the Water Body

	Receiving Water Limitations			
Constituent	Single Sample Maximum[1,2] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[3]	30-Day Geometric Mean[2] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform	10,000	22% / 0%	1,000	0%
Fecal Coliform	400	22% / 0%	200	0%
Enterococcus	104[4] / 61[5]	22% / 0%	35[4] / 33[5]	0%

Notes:
1. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
3. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. The 0% single sample maximum allowable exceedance frequency applies to dry weather days.
4. This *Enterococcus* receiving water limitation applies to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
5. This *Enterococcus* receiving water limitations applies to segments or areas of creeks or creek mouths listed in Table 6.0.

Interim receiving water limitations expressed as allowable exceedance frequencies are given in the compliance schedule under Specific Provision 6.c.

(b) If the above receiving water limitations are not met in the receiving water, the Responsible Copermittees must demonstrate that the discharges from the MS4s are not causing or contributing to the violation of receiving water limitations. The Copermittee must provide data that demonstrate the discharges from the MS4s are meeting the effluent limitations under Specific Provision 6.b.(2).

(2) Effluent Limitations

Discharges from the MS4s must not contain densities that exceed the following effluent limitations by the end of the compliance schedules under Specific Provision 6.c.(1) to demonstrate the discharge is not causing or contributing to a violation of receiving water quality standards:

Table 6.2
Effluent Limitations as Bacteria Densities and Allowable Exceedance Frequencies in MS4 Discharges to the Water Body

	Effluent Limitations			
Constituent	Single Sample Maximum[1,2] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[3]	30-Day Geometric Mean[2] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform	10,000	22% / 0%	1,000	0%
Fecal Coliform	400	22% / 0%	200	0%
Enterococcus	104[4] / 61[5]	22% / 0%	35[4] / 33[5]	0%

Notes:
1. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.
3. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. The 0% single sample maximum allowable exceedance frequency applies to dry weather days
4. This *Enterococcus* effluent limitation applies to MS4 discharges to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
5. This *Enterococcus* effluent limitation applies to MS4 discharges to segments or areas of creeks or creek mouths listed in Table 6.0.

Interim effluent limitations expressed as allowable exceedance frequencies are given in the compliance schedule under Specific Provision 6.c.

(3) Best Management Practices

(a) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 6.0 must incorporate the Comprehensive Load Reduction Plans (CLRPs) required to be developed pursuant to Resolution No. R9-2010-0001. For segments or areas in Table 6.0 that have been delisted from the Clean Water Act Section 303(d) List of Water Quality Limited Segments, a CLRP is not required.

(b) The Responsible Copermittee must implement BMPs to support the achievement of the WQBELs under Specific Provision 6.b for the segments or areas of the water bodies listed in Table 6.0.

(c) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans and owners/operators of small MS4s

as possible.

c. COMPLIANCE SCHEDULE

(1) WLA Compliance Dates

The Responsible Copermittees for MS4 discharges to a segment or area of the water bodies listed in Table 6.0 are required to achieve the WLA, thus must be in compliance with the WQBELs under Specific Provision 6.b, according to the following compliance schedule:

Table 6.3
Compliance Schedule Dates to Achieve Indicator Bacteria WLAs

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform*	April 4, 2021	April 4, 2031
Fecal Coliform		
Enterococcus		

* Total coliform receiving water limitations only apply to segments or areas of Pacific Ocean Shoreline listed in Table 6.0.

(2) Interim Compliance Requirements

The Responsible Copermittees must comply with the following interim WQBELs by the interim compliance dates:

(a) Interim Dry Weather Receiving Water Limitations

The Responsible Copermittee must calculate the "existing" exceedance frequencies of the 30-day geometric mean water quality objectives for each of the indicator bacteria by analyzing the monitoring data collected between January 1, 2002 and April 4, 2011. "Existing" exceedance frequencies may be calculated by segment or area of a water body, or by water body, and/or by Watershed Management Area listed in Table 6.0. Separate "existing" exceedance frequencies must be calculated for beaches and creeks/creek mouths.

The Responsible Copermittees must achieve a 50 percent reduction in the "existing" exceedance frequency of the 30-day geometric mean WQBELs for the segments or areas of the water bodies listed in Table 6.0 by the interim compliance dates for achieving the interim dry weather WQBELs given in Table 6.5. A 50 percent reduction in the "existing" exceedance frequency is equivalent to half of the "existing" exceedance frequency of the 30-day geometric mean WQBELs.

The "existing" exceedance frequencies and the interim dry weather allowable exceedance frequencies (i.e. interim dry weather WQBELs) calculated by the Responsible Copermittees must be included in the Water Quality Improvement Plans for the applicable Watershed Management Areas.

(b) Interim Wet Weather Receiving Water Limitations

The Responsible Copermittees must achieve the interim wet weather

receiving water limitations in Table 6.4, expressed as interim allowable exceedance frequencies, by the interim compliance dates for achieving the interim wet weather WQBELs given in Table 6.5.

Table 6.4
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	38%	37%	39%
		at Heisler Park - North			
	Pacific Ocean Shoreline	at Main Laguna Beach			
		Laguna Beach at Ocean Avenue			
		Laguna Beach at Cleo Street			
		Arch Cove at Bluebird Canyon Road			
		Laguna Beach at Dumond Drive			
	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	41%	41%	42%
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	41%	41%	42%
	Aliso Creek Mouth	at mouth	41%	41%	42%
	Pacific Ocean Shoreline	Aliso Beach at West Street	36%	36%	36%
		Aliso Beach at Table Rock Drive			
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)			
		at Salt Creek (large outlet)			
		Salt Creek Beach at Salt Creek service road			
		Salt Creek Beach at Strand Road			

Table 6.4 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County (cont'd)	Pacific Ocean Shoreline	at San Juan Creek	44%	44%	48%
	San Juan Creek	lower 1 mile	44%	44%	47%
	San Juan Creek Mouth	at mouth	44%	44%	47%
	Pacific Ocean Shoreline	at Poche Beach	35%	35%	36%
		Ole Hanson Beach Club Beach at Pico Drain			
		San Clemente City Beach at El Portal Street Stairs			
		San Clemente City Beach at Mariposa Street			
		San Clemente City Beach at Linda Lane			
		San Clemente City Beach at South Linda Lane			
		San Clemente City Beach at Lifeguard Headquarters			
		under San Clemente Municipal Pier			
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)			
		San Clemente State Beach at Riviera Beach			
		Can Clemente State Beach at Cypress Shores			
San Luis Rey River	Pacific Ocean Shoreline	at San Luis Rey River mouth	45%	44%	47%
Carlsbad	Pacific Ocean Shoreline	at Moonlight State Beach	40%	40%	41%
San Dieguito River	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	33%	33%	36%

Table 6.4 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
Penasquitos	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	26%	26%	26%
Mission Bay	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	37%	37%	37%
		La Jolla Shores Beach at Caminito del Oro			
		La Jolla Shores Beach at Vallecitos			
		La Jolla Shores Beach at Avenida de la Playa			
		at Casa Beach, Children's Pool			
		South Casa Beach at Coast Boulevard			
		Whispering Sands Beach at Ravina Street			
		Windansea Beach at Vista de la Playa			
		Windansea Beach at Bonair Street			
		Windansea Beach at Playa del Norte			
		Windansea Beach at Palomar Avenue			
		at Tourmaline Surf Park			
		Pacific Beach at Grand Avenue			
	Tecolote Creek	Entire reach and tributaries	49%	49%	51%
San Diego River	Forrester Creek	lower 1 mile	46%	43%	49%
	San Diego River	lower 6 miles	46%	43%	49%
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	46%	43%	51%
San Diego Bay	Chollas Creek	lower 1.2 miles	41%	41%	43%

(c) Interim Compliance Dates

The Responsible Copermittees must achieve the interim receiving water limitations under Specific Provisions 6.c.(2)(a) and 6.c.(2)(b) by the interim compliance dates given in Table 6.5.

Table 6.5
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs
South Orange County	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	April 4, 2016	April 4, 2021
		at Heisler Park - North		
	Pacific Ocean Shoreline	at Main Laguna Beach	April 4, 2016	April 4, 2021
		Laguna Beach at Ocean Avenue		
		Laguna Beach at Cleo Street		
		Arch Cove at Bluebird Canyon Road		
		Laguna Beach at Dumond Drive		
	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	April 4, 2016	April 4, 2021
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	April 4, 2018	April 4, 2021
	Aliso Creek Mouth	at mouth	April 4, 2018	April 4, 2021
	Pacific Ocean Shoreline	Aliso Beach at West Street	April 4, 2016	April 4, 2021
		Aliso Beach at Table Rock Drive		
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)		
		at Salt Creek (large outlet)		
		Salt Creek Beach at Salt Creek service road	April 4, 2017	April 4, 2021
		Salt Creek Beach at Strand Road	April 4, 2017	April 4, 2021

Table 6.5 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs
South Orange County (cont'd)	Pacific Ocean Shoreline	at San Juan Creek	April 4, 2016	April 4, 2021
	San Juan Creek	lower 1 mile	April 4, 2018	April 4, 2021
	San Juan Creek Mouth	at mouth	April 4, 2016	April 4, 2021
	Pacific Ocean Shoreline	at Poche Beach	April 4, 2016	April 4, 2021
		Ole Hanson Beach Club Beach at Pico Drain	April 4, 2016	April 4, 2021
		San Clemente City Beach at El Portal Street Stairs	April 4, 2017	April 4, 2021
		San Clemente City Beach at Mariposa Street		
		San Clemente City Beach at Linda Lane	April 4, 2016	April 4, 2021
		San Clemente City Beach at South Linda Lane	April 4, 2018	April 4, 2021
		San Clemente City Beach at Lifeguard Headquarters	April 4, 2017	April 4, 2021
		under San Clemente Municipal Pier		
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	April 4, 2018	April 4, 2021
		San Clemente State Beach at Riviera Beach	April 4, 2016	April 4, 2021
		Can Clemente State Beach at Cypress Shores	April 4, 2017	April 4, 2021
San Luis Rey River	Pacific Ocean Shoreline	at San Luis Rey River mouth	April 4, 2017	April 4, 2021
Carlsbad	Pacific Ocean Shoreline	at Moonlight State Beach	April 4, 2016	April 4, 2021
San Dieguito River	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	April 4, 2016	April 4, 2021

Table 6.5 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs
Penasquitos	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	April 4, 2016	April 4, 2021
Mission Bay	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	April 4, 2016	April 4, 2021
		La Jolla Shores Beach at Caminito del Oro		
		La Jolla Shores Beach at Vallecitos		
		La Jolla Shores Beach at Avenida de la Playa		
		at Casa Beach, Children's Pool		
		South Casa Beach at Coast Boulevard		
		Whispering Sands Beach at Ravina Street		
		Windansea Beach at Vista de la Playa		
		Windansea Beach at Bonair Street		
		Windansea Beach at Playa del Norte		
		Windansea Beach at Palomar Avenue		
		at Tourmaline Surf Park		
		Pacific Beach at Grand Avenue		
	Tecolote Creek	Entire reach and tributaries		
San Diego River	Forrester Creek	lower 1 mile	April 4, 2018	April 4, 2021
	San Diego River	lower 6 miles		
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach		
San Diego Bay	Chollas Creek	lower 1.2 miles	April 4, 2018	April 4, 2021

d. Specific Monitoring and Assessment Requirements

(1) Monitoring and Assessment Requirements for Beaches

(a) Monitoring Stations

For beaches addressed by the TMDL, monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[35] If exceedances

[35] Commonly referred to as AB 411 monitoring

of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations at least once within the first 24 hours of the first storm event[36] of the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer in exceedance of the allowable exceedance frequencies in the receiving waters.

(iii) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs for the Pacific Ocean Shoreline segments or areas listed in Table 6.0 have been achieved.

(ii) The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

(2) <u>Monitoring and Assessment Requirements for Creeks and Creek Mouths</u>

(a) Monitoring Stations

[36] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

For creeks addressed by the TMDL, monitoring locations should consist of, at a minimum, a location at or near the mouth of the creek (e.g. Mass Loading Station or Mass Emission Station) and one or more locations upstream of the mouth (e.g. Watershed Assessment Station). If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations in accordance with the requirements of Provision D.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations within the first 24 hours of the first storm event[37] of the rainy season (i.e. October 1 through April 30).

(iii) Samples collected from receiving water monitoring stations must be analyzed for fecal coliform and *Enterococcus* indicator bacteria.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the receiving water monitoring data to assess whether the interim and final receiving water WQBELs for the creeks and creek mouths listed in Table 6.0 have been achieved.

(ii) The Responsible Copermittee must identify and incorporate additional MS4 outfall and receiving water monitoring stations and/or adjust monitoring frequencies to identify sources causing exceedances of the receiving water WQBELs.

(iii) The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

e. COMPLIANCE DETERMINATION

(1) Compliance with interim compliance requirements of Specific Provision 6.c.(2)

[37] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 6.b.(1) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls;

(c) There are no violations of the applicable effluent limitations under Specific Provision 6.b.(2) at the Responsible Copermittees' MS4 outfalls;

(d) There are no exceedances of the applicable interim receiving water limitations under Specific Provision 6.c.(2) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls;

(e) The Responsible Copermittees can demonstrate that exceedances of the applicable interim or final receiving water limitations under Specific Provision 6.b.(1)(a) or 6.c.(2) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4 are not causing or contributing to the exceedances; OR

(f) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim compliance requirements will be achieved by the interim compliance dates.

(2) Compliance with WQBELs of Specific Provision 6.b may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 6.b.(1) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls;

(c) There are no violations of the applicable effluent limitations under Specific Provision 6.b.(2) at the Responsible Copermittees' MS4 outfalls; OR

(d) The Responsible Copermittees can demonstrate that exceedances of the applicable final receiving water limitations under Specific Provision 6.b.(1)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4 are not causing or contributing to the exceedances.

From: lyris@swrcb18.waterboards.ca.gov
To: Chiu, Wayne@Waterboards
Subject: REVISED Administrative Draft Regional MS4 Permit -Clean Version
Date: Monday, October 22, 2012 3:55:08 PM

In addition to the redline/strikeout version of the Administrative Draft Regional MS4 Permit, a clean version was posted on the San Diego Water Boards website on October 19, 2012.

The clean version can also be accessed here:
http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/docs/updates101912/2012-1012_Tentative_Order_Clean.pdf

We look forward to seeing all interested parties at this Wednesdays Final Focused Meeting, held at the City of Vista Community Room at 9:30 am.

Laurie Walsh P.E.
San Diego Water Board
858-467-2970
lwalsh@waterboards.ca.gov

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or send a blank email to leave-401638-508208.cee2a373662e566393e62f0af18d11cf@swrcb18.waterboards.ca.gov

From: lyris@swrcb18.waterboards.ca.gov
To: Chiu, Wayne@Waterboards
Subject: Final Focused Meeting on the Administrative Draft Regional MS4 Permit
Date: Friday, September 28, 2012 10:52:51 AM

Regional Copermittees and other Interested Parties,

The San Diego Water Board will host a final Focused Meeting on the Administrative Draft Regional MS4 Permit to review proposed changes to the Administrative Draft Permit based on the comments we received by September 14, 2012. The Permit Team will send out a meeting agenda and a redlined strike-out version of the Administrative Draft Permit prior to the meeting.

The meeting will be held at the City of Vista Civic Center on Wednesday, October 24, 2012 from 9:30 a.m. to 3:00 p.m.

Laurie Walsh P.E.
San Diego Water Board
858-467-2970
lwalsh@waterboards.ca.gov

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From: lyris@swrcb18.waterboards.ca.gov
To: Chiu, Wayne@Waterboards
Subject: Agenda for the October 24, 2012 Final Focused Meeting on the Adminstrative Draft Regional MS4 Permit
Date: Friday, October 05, 2012 1:00:44 PM
Attachments: FOCUSED MEETING October 24 AGENDA.pdf

Regional Copermittees and other Interested Parties,

Attached is the Agenda for the San Diego Water Boards final Focused Meeting on the Administrative Draft Regional MS4 Permit. This Focused Meeting is our opportunity to review the proposed changes to the Administrative Draft Permit based on the comments we received by September 14, 2012. The Permit Team will send out a redlined strike-out version of the Administrative Draft Permit prior to the meeting.

This focused meeting will be facilitated by Lewis Michaelson with Katz and Associates and conducted in accordance with the existing procedures outlined in the Notice of Revised Administrative Draft MS4 Permit Focused Meeting Procedures and Schedule posted on the San Diego Water Boards website on June 21, 2012.

The Focused Meeting is scheduled for Wednesday, October 24, 2012 at the City of Vista Civic Center from 9:30 a.m. to 3:00 p.m.

Laurie Walsh, PE
San Diego Water Board
Lwalsh@waterboards.ca.gov
858-467-2970

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FOCUSED MEETING AGENDA

Administrative Draft of
Tentative Order No. R9-2012-0011, NPDES No. CAS0109266
Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region

Wednesday, October 24, 2012
9:30 a.m. - 3:00 p.m.

City of Vista
Community Room
200 Civic Center Drive
Vista, CA 92084

9:30 a.m. - 9:40 a.m.	Introductions Table Participants
9:40 a.m. - 9:50 a.m.	Meeting Recap & Feedback Lewis Michaelson, Katz & Associates
9:50 a.m. - 10:00 a.m.	Public Draft Process David Barker, San Diego Water Board
10:00 a.m. - 10:45 a.m.	Discharge Prohibitions & Limitations Table Participants
10:45 a.m. - 11:30 a.m.	Development Standards/Existing Development Table Participants
11:30 a.m. - 12:30 p.m.	Lunch
12:30 p.m. - 1:15 p.m.	TMDL Implementation Table Participants
1:15 p.m. - 2:15 p.m.	Monitoring Table Participants
2:15 p.m. - 3:00 p.m.	Other Topics & Questions All

FOCUSED MEETING AGENDA

Administrative Draft of
Tentative Order No. R9-2012-0011, NPDES No. CAS0109266
Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region

Wednesday, October 24, 2012
9:30 a.m. - 3:00 p.m.

City of Vista
Community Room
200 Civic Center Drive
Vista, CA 92084

9:30 a.m. - 9:40 a.m.	Introductions Table Participants
9:40 a.m. - 9:50 a.m.	Meeting Recap & Feedback Lewis Michaelson, Katz & Associates
9:50 a.m. - 10:00 a.m.	Public Draft Process David Barker, San Diego Water Board
10:00 a.m. - 10:45 a.m.	Discharge Prohibitions & Limitations Table Participants
10:45 a.m. - 11:30 a.m.	Development Standards/Existing Development Table Participants
11:30 a.m. - 12:30 p.m.	Lunch
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1:15 p.m. - 2:15 p.m.	Monitoring Table Participants
2:15 p.m. - 3:00 p.m.	Other Topics & Questions All

FOCUSED MEETING
Revised Administrative Draft
Tentative Order No. R9-2013-0001
October 24, 2012

Name	Agency/ Affiliation	Telephone	E-mail Address
Bryn Evans	VRS IEA	858 8129292	bryn.evans@vrs.com
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RICHARD BOON	OCPW	714 955 0670	richard.boon@ocpw.ocgov.com
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Christine Sloan	County SD		
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ALLISON VOSSKUHLER	Port of SD	619 686 6434	avosskuhler@portofsandiego.org
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Mark Grey	BIASC/CICWQ	909-525-0623	mgrey@biasc.org

FOCUSED MEETING
Revised Administrative Draft
Tentative Order No. R9-2013-0001
October 24, 2012

Name	Agency/ Affiliation	Telephone	E-mail Address
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Chandra Thomas	County of Riverside	951 955 5996	CThomas@RCTLMA.org
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Devin Slaven	City of Lake Forest	949-461-3436	DSLAVEN@LAKEFORESTCA.GOV
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FOCUSED MEETING
Revised Administrative Draft
Tentative Order No. R9-2013-0001
October 24, 2012

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FOCUSED MEETING
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California Regional Water Quality Control Board, San Diego Region
Regional MS4 Permit Focused Meeting

Meeting Notes

Date	Location	Agenda Topics
10/24/2012 Start time: 9:30 AM End time: 2:40 PM	City of Vista Community Room 200 Civic Center Drive Vista, CA 92084	• Introductions • Announcements / Acknowledgements • Meeting Recap / Feedback / Ground Rules • Public Draft Process • Discharge Prohibitions and Limitations • Development Standards / Existing Development • TMDL Implementation • Monitoring • Other Topics and Questions • Closing

I. Introductions

Table participants introduced themselves. Lewis Michaelson (Facilitator) ensured the appropriate representatives were at the table, per the June 20, 2012, San Diego Regional Water Quality Control Board (SD RWQCB) Notice.

San Diego County Copermittees (5 allowed): Todd Snyder (County of San Diego), Elaine Lukey (City of Carlsbad), Mikhail Ogawa (City of Del Mar), Heather Stroud (City of San Diego), Jon Van Rhyn (County of San Diego), Sumer Hasenin* (City of San Diego), Julie Procopio* (City of Santee), Christine Sloan* (County of San Diego), Billy Walker* (City of Oceanside), Allison Witheridge* (City of Oceanside), Jo Ann Weber* (County of San Diego), Karen Holman* (Port of San Diego), Paul Hartman* (City of Vista), Andre Sonksen* (City of San Diego) **Indicates representatives rotated during the meeting.*

Orange County Copermittees (5 allowed): Grant Sharp (Orange County Flood Control District), Richard Boon (County of Orange), Ziad Mazboudi (City of San Juan Capistrano), Brad Fowler (City of Dana Point)

Riverside County Copermittees (3 allowed): Claudio Padres (Riverside County Flood Control District), Aldo Licitra (City of Temecula), Mike Shetler (County of Riverside, Board of Supervisors)

Environmental Community (3 allowed): Sara Rogers (San Diego Coastkeeper), Roger Butow (Clean Water Now! Coalition), Mike Beanan (South Laguna Civic Association and

Laguna Bluebelt), Nick Doenges* (San Diego Coastkeeper), David Vincent* (San Diego Coastkeeper) **Indicates representatives rotated during the meeting.*

Development/Business Community (3 allowed): Dennis Bowling (American Public Works Association (APWA)), Bryn Evans (Industrial Environmental Association(IEA)), Mike McSweeney (Building Industry Association (BIA)), Tory Walker* (BIA/Vista Chamber of Commerce), Wayne Rosenbaum* (BIA), Mark Grey* (BIA-Southern California / Construction Industry Coalition on Water Quality (CICWQ)) **Indicates representatives rotated during the meeting.*

U.S. Environmental Protection Agency (US EPA) (1 allowed): Cindy Lin

San Diego Water Board Permit Team: David Barker, Wayne Chiu, Laurie Walsh, Eric Becker, Christina Arias

II. Announcements / Acknowledgements

The City of Vista was thanked for providing the room and snacks for the meeting. Mike McSweeney was thanked for providing the sound system and microphones.

Mike McSweeney (BIA) noted that it has been beneficial for all stakeholders to work together and learn together, which has been accomplished at the six focused meetings that have been held. RWQCB Staff has now essentially rewritten the entire permit and is only allowing for one focused meeting to interact directly with multiple stakeholders at one time. Mike appreciated that RWQCB Staff has been and is continuing to be open to meeting with stakeholders individually; however, it is more beneficial to everyone to have these group meetings. Mike submitted a letter to RWQCB Staff requesting push back of the draft permit release date and scheduling of another focused meeting prior to release of the draft permit. He expressed his disappointment that RWQCB Staff could not find a way to push back the release date and hold another focused meeting.

Richard Boon (County of Orange) shared that the final paper from the Hydromodification Workshop, authored by the expert panel, is now available. The paper was sent to the County of Orange, County of Riverside, County of San Diego, City of San Diego, and RWQCB Staff. The request was made for the paper to be added to the RWQCB website for the MS4 permit reissuance.

III. Meeting Recap / Feedback / Ground Rules

Lewis Michaelson (Facilitator) recognized the time and effort that all interested parties have put into the previous focused meetings. He also recognized there have been several other meetings held among stakeholders, by Copermittees, across counties, within counties, and with the San Diego Regional Water Quality Control Board (RWQCB) Staff.

Lewis Michaelson (Facilitator) reviewed the collaborative dialogue principles to be used during the focused meeting: everyone's perspective is valued; listen to understand, not to

debate; be hard on the issues but soft on the people; avoid right and wrong paradigms; ensure equal participation; and, what's past is past, focus on the future.

Lewis Michaelson (Facilitator) explained the purpose of the focused meeting is not to go line by line through the large permit. This is an opportunity for RWQCB Staff to explain the thinking behind what was or was not changed and help interested parties prepare for the upcoming formal workshop and public commenting process that will take place. RWQCB management decided that because of the many changes made to the first draft of the administrative permit, that stakeholders needed an opportunity with RWQCB Staff to understand the changes.

IV. Public Draft Process

David Barker (RWQCB) stated the purpose of the focused meeting today is to provide a forum to discuss the most recent version of the administrative draft permit, which was released by the RWQCB on October 12, 2012. This version of the administrative draft permit essentially contains all of the changes made by RWQCB Staff as a result of comments received at the various focused meetings and workshops held in the June through September time period, as well as the 31 comment letters received. All the comments were reviewed, closely considered, and resulted in significant changes to the administrative draft permit. The RWQCB released the October 12 version of the administrative draft permit in tracked changes format to facilitate review to easily see where change were and were not made. RWQCB Staff is here to give an overview of the changes made and to respond to any questions or comments on changes made.

Today's focused meeting will conclude the focused meetings on the administrative draft version of the permit. After today's meeting, RWQCB Staff will continue to make minor revisions to the administrative draft permit and will produce a fact sheet for the permit. The finalized draft permit will be referred to as the Tentative Order. The Tentative Order will be released for public review on October 31, 2012. This will begin the public comment period on the Tentative Order as required by the Code of Federal Regulations (CFR) and the State Water Code. The public notice of release of the Tentative Order for public review and comment will establish a deadline for submission of comments on the Tentative Order, the date for the public hearing, and procedures that the RWQCB will follow at the public hearing to consider adoption. The deadline for submission of comments is expected to be mid-January 2013. The public hearing to consider adoption of the Tentative Order will be in the March to April 2013 time period.

In addition to the required public review process and public hearing, a public workshop is planned for November 13, 2012 to provide the San Diego RWQCB Board Members with information about the Tentative Order and to facilitate discussion between the Board Members, RWQCB Staff, and interested persons on the Tentative Order. At this workshop, RWQCB Staff will explain the development process of the Tentative Order and summarize significant elements of the Tentative Order. Interested persons will also have the opportunity to provide comments to Board Members on any issue. Notice for this workshop

has already been posted and circulated. David Barker (RWQCB) indicated that this forum would be a good opportunity for Mike McSweeney (BIA) to present his request to the Board Members for additional focused meetings to be held; RWQCB Staff will not be scheduling any additional focused meetings prior to the November 13 workshop.

Richard Boon (County of Orange) asked if blocks of time would be allocated to the municipal programs at the November 13 workshop. David Barker (RWQCB) explained that some details of that were provided in the notice for the workshop. The workshop is being held at a regularly scheduled RWQCB Board Meeting, and the Board Members will have to carefully meter out the time to ensure everyone gets a chance to speak. Eric Becker (RWQCB) requested that if any stakeholders have a request for allotted time at the November 13 workshop, they should notify RWQCB Staff of their request with an estimated amount of time they would require. The RWQCB may or may not be able to accommodate requested estimated times; however, it would assist in planning for the workshop.

V. Discharge Prohibitions and Limitations

Laurie Walsh (RWQCB) recognized that this portion of the permit is a significant topic and that all stakeholders probably wanted more changes than were done. RWQCB Staff did make small changes in this section of the permit to try to address issues raised in the previous focused meetings and the written comments, including compliance issues. Laurie indicated that the San Diego RWQCB Staff is involved in the statewide effort regarding this section of the permit. RWQCB Executive Management has directed the permit writing team to be very involved in the State Water Resources Control Board (SWRCB) process by participating in the process and providing comments to the SWRCB. Should language be passed down from the SWRCB, RWQCB Staff did add reopener language in Provision H specific to the receiving water language in Provision A so that Provision A can be modified once direction is provided from the SWRCB.

Claudio Padres (County of Riverside) expressed appreciation for the update and asked if RWQCB Staff could provide an indication of where they stand on the issue at this time or any comments they expect to make to the SWRCB on the issue. David Barker (RWQCB) stated that RWQCB Staff is still formulating their comments and their position on the issue. He encouraged stakeholders to read the issue paper posted on the SWRCB website, which frames the issue and provides various alternatives to the receiving water limitations language. RWQCB Staff is reviewing that issue paper and evaluating the presented alternatives. San Diego RWQCB staff is also working with staff from other RWQCBs (Regions 2, 4, and 5) to form an RWQCB position on the issue.

Heather Stroud (City of San Diego) thanked the RWQCB for addressing this issue; however, the San Diego County Copermittees were disappointed to see the lack of changes made in Provision A. She stated that it is important to the San Diego County Copermittees to know what the compliance points are, and that the current administrative draft permit is disjointed. One part of the administrative draft permit has a robust, expensive, and resource intensive Water Quality Improvement Plan process, yet it is not connected to Copermittee

compliance. The San Diego County Copermittees believe this was a lost opportunity to get in front of the receiving water limitations issue and make this a comprehensive, cohesive permit. Heather also indicated that the San Diego County Copermittees will also be involved in the statewide process regarding this issue and look forward to working with the RWQCB.

Mikhail Ogawa (City of Del Mar) explained that many jurisdictions and their elected officials may struggle with the permit as it is written. The receiving waters limitation language is a significant issue. He reinforced Heather Stroud's indication that the San Diego County Copermittees will be involved in the statewide process on this issue. Mikhail urged RWQCB Staff to be open to making changes and, through further meetings with Copermittees, perhaps even supporting the Copermittees' point of view on this issue.

Wayne Chiu (RWQCB) stated that RWQCB Staff understands the concerns and issues that are involved with the Provision A language. RWQCB Staff has made some changes to try to provide a closer linkage between what the RWQCB would consider as compliance with those requirements. With the revisions, RWQCB Staff tried to include linkages in Provision A.4 as well as where the permit discusses iterative/adaptive management for the Water Quality Improvement Plans. RWQCB Staff, however, has been directed to hold off on making any significant changes to the other portions of Provision A because of the statewide effort on that language. For now, the language will remain as-is. If new language is provided by the SWRCB in the future, then changes to the permit may be made at that time. It is for that reason the reopener was included in Provision H of the administrative draft permit.

Wayne Chiu (RWQCB) continued that if Copermittees would like the RWQCB to support the Copermittees' position on the language, then the November 13 workshop is the appropriate time to make the case to the Board Members and that may inform how RWQCB Staff may approach the SWRCB with their position.

Claudio Padres (County of Riverside) noted that the recommendation from Wayne was to present opinions to influence Board Members at the November 13 workshop; however, November 13 is the cutoff for public comments for the SWRCB November 20 workshop on this issue. Claudio questioned if the RWQCBs had the same cutoff date to provide input. David Barker (RWQCB) responded that he is fairly certain the November 13 deadline for comments for the November 20 workshop is not being applied to input from the RWQCBs. David reminded the stakeholders that the November 20 workshop is just the start of the process to address this issue; there has not been a schedule posted or announced for a decision on the issue.

Heather Stroud (City of San Diego) expressed concern about potentially pasting language from the SWRCB into the permit when that language is provided and that it may result in something that does not make sense with the rest of the permit. As this permit is trying the new watershed-based approach, this may be an opportunity to support different language for revisions to the receiving water limitations language. The San Diego County Copermittees would be happy to work with the RWQCB as this continues.

Cindy Lin (Environmental Protection Agency (EPA)) explained that the EPA has been conferring with the SWRCB on these issues and four RWQCBs have been working with the SWRCB as well. As a result, there is definitely a recommendation that a singular version of

the language will not work for all permits. They are currently working on what would make sense for different RWQCBs. Regarding pasting in of SWRCB language, Cindy does not see that being the method for implementation of the SWRCB language. There is recognition at all levels that there will have to be an effort to figure out what will work for different areas. Cindy acknowledged that it is challenging at this point because the process is moving forward at different levels and all levels are trying to work within the law and interpret the law. Cindy recommended focusing at this time on other sections and including the reopener.

Richard Boon (County of Orange) stated that the discussion at this time is obviously based on the Ninth Circuit Court decision. He raised the issue that there is a piece of the decision that is not being addressed, and that issue is being heard by the United States Supreme Court on December 4. The U.S. Supreme Court will be hearing arguments on whether, in the Los Angeles River, the passage of water from modified segments to natural segments back to modified segments constitutes a discharge under the Clean Water Act (CWA). Richard questioned if the SWRCB and RWQCBs are tuned in to that decision, which is potentially profound for the stormwater mandate. He asked if there is a contingency if the whole framework disintegrates.

David Barker (RWQCB) agreed that the discussion has been centering in on the receiving water limitations language and has not included the issue raised by Richard. David is familiar with the part that was appealed to the U.S. Supreme Court, but that has not been brought up in conversations with other RWQCBs. David will find out more about that issue and communicate his findings to the interested parties.

Wayne Chiu (RWQCB) also mentioned RWQCB Staff is currently working on the Fact Sheet to go along with the Tentative Order. The Fact Sheet will have a fairly lengthy discussion about Provision A requirements and also include at least how the RWQCB might interpret compliance with the requirements of Provision A through the development and implementation of the Water Quality Improvement Plans. The Fact Sheet will include explanation from the RWQCB's perspective as to how the RWQCB would enforce the requirements of Provision A. The Fact Sheet is one area where the RWQCB can provide more clarity as to how they might interpret some of the requirements. Inclusion of this information in the Fact Sheet does not protect Copermittees from third party liability, but it does at least provide clarity as to how the RWQCB is viewing the requirements.

Todd Snyder (County of San Diego) summarized that the discussion has been about what is required by law versus what is included by policy decisions. His understanding is that some of the causing and contributing language was put into the permit at the discretion of the RWQCB. The Ninth Circuit Court has interpreted that language literally. Todd questioned if there is anything in the law that requires those provisions to be included in Provision A.

Wayne Chiu (RWQCB) responded that the State Water Code does include the cause and contribute language.

Cindy Lin (EPA) added that the language is reflected in the CWA. She supposed that Todd was referring to the SWRCB 99-05 guidance which includes an interpretation of the receiving water limits. The EPA supports that language very strongly as a correct interpretation of the CWA.

Heather Stroud (City of San Diego) clarified that the RWQCB and SWRCB does have discretion to require strict compliance with the receiving water limitations or not. It is a policy issue, not a legal issue. The SWRCB may decide that is what they want, but they need to understand the legal implication of that decision is that the Copermittees are in immediate noncompliance with regard to receiving water limitations.

Wayne Chiu (RWQCB) agreed with Heather's statement. The Copermittees are in immediate noncompliance; however, it is at the discretion of the RWQCB not to enforce that requirement at this time. He suggested the RWQCB may be able to provide some language that would allow the RWQCB to make the determination that Copermittees are implementing programs or actions to try to achieve compliance.

Cindy Lin (EPA) explained that EPA's position is that the goal is to ensure protection of water quality in the waterbody. There is room for interpretation of where that waterbody is. The EPA's interpretation is that the waterbody is the receiving water. Another interpretation is it could be at the outfall. This interpretation has significant impacts to stormwater permits. Cindy encouraged stakeholders to recognize the efforts at the State and Federal level that are attempting to move forward on this issue. Until the EPA or SWRCB develops a policy decision on the issue, it is difficult to move forward.

Ziad Mazboudi (City of San Juan Capistrano) requested clarification as this permit defines the MS4 outfall as the point of compliance, as well as the receiving water body.

Cindy Lin (EPA) responded in agreement, with the MS4 outfall being a point of compliance with regard to WQBELs and the receiving water body subject to receiving water limitations.

Lewis Michaelson (Facilitator) summarized there has been a lot of discussion on what constitutes compliance. The point of this new permit is not to make everyone in compliance by definition; the point is to provide a means to come into compliance with implementation. It seems there needs to be discussions at the State and EPA level before the RWQCB can make changes; therefore, it sounds like there are policymakers, not RWQCB Staff, who need to be approached and influenced.

Richard Boon (County of Orange) appreciated the efforts from the RWQCB. He recommended holding up the Water Quality Improvement Plans as the model for bringing the rigors of the iterative process as the compliance measure. He expects the RWQCB Board Members will hear encouragement from the Orange County Copermittees at the November 13 Workshop to have the iterative process as the compliance point.

Richard Boon (County of Orange) shared that the U.S. EPA did issue the Washington, D.C. permit without receiving water limitations language; therefore, it is a policy issue and not a legal requirement from the CWA.

VI. Development Standards / Existing Development

Wayne Chiu (RWQCB) explained that these sections are where there were fairly significant changes made. The changes were made as a result of what was heard during the focused meetings as well as meetings with individual groups, including the BIA, the San Diego County Copermittees' Land Development Workgroup, the County of Orange, and

others. There were different ideas presented during the meetings and provided in the written comments. The ideas did not line up exactly; therefore, the RWQCB attempted to find the middle ground to include a little bit of everyone's input. The RWQCB strived to take into consideration all the comments and express through the new requirements what they heard.

Wayne Chiu (RWQCB) continued that with development planning requirements, there were significant changes made in terms of how the structural BMP control requirements were shaped. The basic performance requirements are still there; they were not changed. As stated several time before, the issue is not changing the performance requirements; it is changing how those requirements are used and how they are implemented by projects. RWQCB Staff removed the entire concept of technical infeasibility, making the permit language based on what achieves the most water quality benefit through project implementation. As requested by many stakeholders, RWQCB Staff did include tiers and expanded alternative compliance options. RWQCB Staff also provided some exemptions from Priority Development Projects (PDPs), especially for Single Family Residences (SFRs), and included language to promote the concept of Green Streets. RWQCB Staff was not able to fully incorporate everyone's comments, but did incorporate most of the significant items that were suggested.

Wayne Chiu (RWQCB) continued that the existing development section was re-shaped. RWQCB Staff separated out residential areas and requirements and also changed the terms of how inspections might be done. While inspections are still required within the permit term for everything in a Copermittee's inventory, there are now options provided for completing those inspections. RWQCB Staff also included ways for the environmental community to become involved with helping Copermittees and performing some inspections. Overall, RWQCB Staff made significant changes that addressed most of the feedback and comments received.

Wayne Chiu (RWQCB) explained that the revised administrative draft permit also provides links between requirements of the Water Quality Improvement Plans and the program elements required for the jurisdictional programs. While there may still be questions about how things may be shaped between the Water Quality Improvement Plans and Jurisdictional Runoff Management Plans (JRMPs), the revised administrative draft permit provides more clear guidance and expectations. Wayne explained that, in general, RWQCB Staff expects in the Water Quality Improvement Plans the Copermittees would lay out the suite or menu of strategies they might implement within their jurisdiction that would not necessarily specify what each Copermittee must do, but may specify what strategies would be implemented under specific conditions. The Copermittees then would describe in the JRMPs the details of how and under what conditions they would implement those strategies. The Water Quality Improvement Plans are meant to be planning documents; the JRMPs are the implementation documents. Wayne Chiu (RWQCB) stated the Fact Sheet will include a better description about what the expectations are and how they would be incorporated within a Water Quality Improvement Plan versus the JRMPs and provide rationale for how the requirements are in the permit.

Wayne Chiu (RWQCB) noted that the concept of retrofitting and stream rehabilitation are now embedded within the jurisdictional program requirements, under alternative compliance options, and are strategies required under existing development requirements.

Claudio Padres (County of Riverside) asked for an example scenario or clarification of how the Water Quality Improvement Plans and the strategies within it would interplay with the elements of the permit required in the JRMPs. Specifically, how to handle the case where the Water Quality Improvement Plans do not include an element that is required in the JRMPs per the permit.

Wayne Chiu (RWQCB) responded that the Water Quality Improvement Plans have two sets of strategies required for inclusion: one is spelled out in the permit (the jurisdictional requirements); the other is for additional strategies outside the minimum jurisdictional requirements. For example, if Copermittees want to implement a program that is not within the jurisdictional requirements but several Copermittees could implement the program, then the program would be laid out in the Water Quality Improvement Plan and the JRMPs would speak to that additional strategy as a strategy that might be implemented in addition to the minimum requirements. The additional strategy can still be included in the JRMP, but it would be its own discrete description.

Claudio Padres (County of Riverside) requested further clarification that the strategies in the Water Quality Improvement Plans are above the minimum requirements in the JRMP sections of the permit. He proposed an example scenario where to address priorities for a watershed there was no need to do stream rehabilitations. In that scenario, he questioned if stream rehabilitation as described in the permit would have to be included in the Water Quality Improvement Plan for that watershed even if it is not needed to address priority issues.

Wayne Chiu (RWQCB) responded that there are always going to be opportunities for doing stream rehabilitation projects or identifying where stream rehabilitation could be implemented. Whether or not stream rehabilitation is immediately implemented is determined in the Water Quality Improvement Plans. The language in the permit regarding stream rehabilitation states that Copermittees must identify areas where rehabilitation could take place and then determine, through the strategies in the Water Quality Improvement Plans, at what point the rehabilitation will occur. Wayne explained that a majority of the way RWQCB Staff laid out this section was inspired by the HMP Workshop. A primary take-away from the HMP Workshop was that everything that goes into the watershed has an impact on the watershed, and everything that goes into the watershed can have beneficial outcomes as a result of those projects. It is just a matter of finding where and at what point those opportunities can be implemented.

Christina Arias (RWQCB) explained that the section of the administrative draft permit covering land development has a range of options to reach the desired endpoint. The Copermittees are in the driver's seat. If it is easier or more effective to run a program where structural BMPs are required to be implemented on each and every PDP, following the strict letter of the law with design standards, then Copermittees can do that. The RWQCB, in

response to input from the building community and the Copermittees that site-by-site structural BMPs is not the best method, is trying to provide a range of options to reach the end goal.

Wayne Chiu (RWQCB) provided another possible scenario describing the link between the Water Quality Improvement Plans and the JRMPs. For example, nutrients may be a priority in a watershed. In the Water Quality Improvement Plan, pollutant generating activities (PGAs) that generate nutrients and discharge within the watershed would be identified. The menu or suite of options for addressing these PGAs may include the Illicit Connection / Illegal Discharge (IC/ID) program targeting these PGAs, a public education component targeting the audience linked to these PGAs, development planning including requirements for certain types of integrated pest management (IPM) to be implemented at certain types of facilities that conduct these PGAs, etc. Within the JRMPs, the jurisdictions would select activities from the menu or suite of options in the Water Quality Improvement Plan. They would be brought to the jurisdictional level by perhaps stating that more inspections would be conducted for certain PGAs, or increased public outreach would be focused on identified sources or audiences within the jurisdiction.

Lewis Michaelson (Facilitator) summarized that his understanding is the priorities in the Water Quality Improvement Plans do not release the Copermittees from the minimum JRMP requirements, but the administrative draft permit does give flexibility in application of resources. In the efficient application of resources, there are three levers that can be adjusted: timing, level of effort, and location. There seems to be room in the administrative draft permit for a strategic approach to the use of resources in achieving the permit objectives.

Sumer Hasenin (City of San Diego) noted that one area that has changed significantly from the previous draft is the hydromodification management BMP performance requirements exemptions. In the previous draft, there was an exemption for projects discharging directly to concrete-lined channels. That exemption was deleted in this latest draft. Per a phone discussion with Wayne Chiu (RWQCB), Wayne mentioned that the purpose of this is to support the holistic approach of evaluating and assessing the watershed, which would encourage stream restoration. Sumer stated that another take-away from the HMP Workshop was that site-by-site evaluation would never supply an adequate basis for hydromodification impacts; the watershed needs to be evaluated as a whole, looking at opportunities and constraints on a watershed basis. The administrative draft permit as written now, however, will require site-by-site evaluation by applying to every single project. Sumer understands that stream rehabilitation and channel restoration is encouraged, both under the alternative compliance and existing development sections of the permit, but site-by-site hydromodification management BMP requirements will not help.

Dennis Bowling (APWA) agreed with Sumer's comment. He served as chairman of the Hydromodification Plan (HMP) Technical Advisory Committee (TAC). The permit as currently written would throw out some of the exemptions provided in the current HMP. The HMP TAC worked very diligently on the HMP to determine where those HMP exemptions should

be. The Copermittees have not had an opportunity to implement the plan and should be given the opportunity to use that plan. Dennis would like to see language in the permit that includes exemptions developed as part of Hydromodification Plans.

Mark Grey (BIA) also agreed with Sumer's comment. More explanation is needed on how the link was made from hydromodification exemption to the Leadership in Energy and Environmental Design (LEED) program. Mark expressed concern with tying compliance requirements to certification programs that are more fluid and could have significant changes during the permit term. Mark does not support limiting compliance to one certification program.

Ziad Mazboudi (City of San Juan Capistrano) agreed with Mark regarding limiting compliance to one certification program. Ziad is a LEED professional but recognizes there are other certification programs available, and the language should be revised to provide for wider certification options.

Tory Walker (BIA/Vista Chamber of Commerce) noted that, related to this discussion, we, as a society, are moving toward integrated water resources management. There are several obstacles to this within the administrative draft permit with respect to stream rehabilitation and structural BMPs that are hydromodification facilities as opposed to water quality BMPs. In addition, there is a prohibition against structural BMPs within waters of the U.S. or waters of the State which does not make any distinction between a hydromodification facility or a water quality facility. Tory understands where this prohibition may be applied for water quality; however, hydromodification is relatively new to the permit. Tory believes there have been many opportunities lost to implement stream rehabilitation as a BMP in itself. When the permit states that structural BMPs must not be constructed within waters of the U.S. or waters of the State, there is a lost opportunity moving towards integrated water resources management. There needs to be some clarification.

Wayne Chiu (RWQCB) stated that RWQCB Staff did not expect everyone to be satisfied with all of the changes made to the administrative draft permit. He agreed with Sumer that things should not be done on a site-by-site basis to get the best result for the watershed. He learned from the HMP Workshop that things need to be viewed at a holistic level, on a watershed level. He also learned that everybody is responsible for taking care of something, whether they are at the top or the bottom of the watershed. Wayne continued that the changes have been made so that hydromodification requirements would apply to every project. This is based on the lessons learned from the HMP Workshop, where it was stated that every site should be responsible for mitigating for their hydromodification impacts. Those concrete-lined channels, however, will remain concrete-lined in perpetuity if discharges are continued to be allowed without mitigating for hydromodification. Hydromodification will have to be accounted for going forward on all projects; however, the administrative draft permit does provide an exemption for redevelopment projects that receive a LEED certification for credits under the sustainable sites category for surface water management. Including the LEED certification was inspired by a meeting with the San Diego Chapter of the U.S. Green Building Council (USGBC), made possible by a connection through

San Diego Coastkeeper. Through this meeting, RWQCB Staff was convinced that LEED certification assists in reaching the end goal and provides additional environmental benefits. With these revisions, RWQCB Staff was trying to provide incentives without fully removing the benefits that are achieved through performance requirements.

Wayne Chiu (RWQCB) responded to Dennis Bowling's comments regarding exemptions from the hydromodification management BMP performance requirements. Wayne understands that the San Diego HMP includes exemptions, but those have not been extended to Orange County. If data is provided in the future that would support those exemptions, then RWQCB Staff can include those as exemptions.

Julie Procopio (City of Santee) rebutted that the San Diego County Copermittees spend one million dollars to prepare their HMP. The HMP has been cited by the SWRCB, which was impressed with the work that was done. There was very rigorous scientific justification for each of the exemptions, including modeling and a great deal of calculations. Those exemptions were fully vetted in front of the RWQCB and the RWQCB chose to support the urban infill exemption. In exchange for that, the San Diego County Copermittees agreed to do additional monitoring. The San Diego County Copermittees are in the process of monitoring for those exemptions. To say that there is no data to support those exemptions does not reflect what the San Diego County Copermittees have done.

Sumer Hasenin (City of San Diego) explained that it is a 5-year monitoring plan with 10 locations that are being monitored for the infill exemption. The San Diego County Copermittees would like the opportunity to implement the HMP criteria that was adopted less than two years ago. They have an extensive and expensive monitoring plan from which they hope to learn when it concludes in 2016. At this point it would be more effective to continue down the existing path, including the HMP exemptions, until additional monitoring data is available and interpreted in 2016. The consequence of not including these exemptions is that hydromodification requirements would apply to every single PDP. This would impact the small projects and be an unfair application to make projects comply with the requirements when they are not making an impact.

Christine Sloan (County of San Diego) supported Sumer by stating that the San Diego County Copermittees have a one million dollar HMP and are now embarking on a 1.5 million dollar HMP Monitoring Plan, per the 2010 resolution. Development of the HMP included experts on the HMP TAC; therefore, the San Diego HMP is scientifically sound. With the new permit language, Christine questions how that affects the 2010 resolution and the monitoring currently being done.

Tory Walker (San Diego BIA) also served on the HMP TAC, along with expert Dr. Luis Parra, and he attended the HMP Workshop. At the HMP Workshop, he heard policy statements coming from the expert panel, but did not hear any consistency in the messages.

Ziad Mazboudi (City of San Juan Capistrano) revisited the concrete-line channel issue. If discharges go into a concrete-lined channel or pipe that discharges straight to the ocean, then there is no benefit to implementing hydromodification controls. By adding that additional cost of implementing hydromodification controls, it does not have a benefit or

impact downstream. It does not make sense. The City has no problem implementing controls that make sense, but this one does not.

Brad Fowler (City of Dana Point) supported Ziad's comment and added that it is difficult to explain to developers or homeowners how they are required to implement hydromodification BMPs when they do not have an impact. Hydromodification is an expensive endeavor for developers. Brad does not disagree with the concept that there are holistic reasons to contribute for improvements; however, there is a lack of nexus between whether a government agency may do a stream rehabilitation in the future and requiring a developer or homeowner to pay for it upfront. Projects will already retain water onsite through Low Impact Development (LID) practices; hydromodification will only increase that requirement. As the majority of projects at this point are expected to be infill projects, Brad expects that instead of getting the most reward for the amount of effort and funds required, all that will be achieved is a lot of upset project applicants.

Laurie Walsh (RWQCB) commented that at the HMP Workshop, which was presented to help RWQCB Staff understand hydromodification better through an expert panel discussion, RWQCB Staff understood clearly that even if discharges are at the bottom of the watershed and discharge to a concrete channel, there are benefits to be had elsewhere in the watershed. This was a big lesson learned from the HMP Workshop.

Sumer Hasenin (City of San Diego) appreciated the flexibility now included in the revised administrative draft permit for doing offsite mitigation and having options for alternative compliance. At the same time, however, the application of the hydromodification requirements should be looked at it in terms of reasonability. The San Diego County Copermittees support the overall idea of a watershed-based strategy but recommend re-evaluation of the hydromodification requirements. The purpose of the permit is the reduction of pollution and erosion. If projects are not causing an increase of erosion by discharging to a concrete channel, then they should not be required to implement hydromodification BMPs.

Grant Sharp (Orange County Flood Control District (OCFCD)) explained that, as he understands it, hydromodification is such an evolving science that each permit that gets adopted as evolving requirements with regard to hydromodification. At the HMP Workshop, the panel included experts from across the State, and everyone in attendance took slightly different messages away from that workshop. Some of the same panelists at that workshop, including Dr. Eric Stein, Chris Bowles, and Derik Booth, were also authors on a technical report on hydromodification assessment and management. That report was released last week and an SWRCB workshop is schedule for November 28 for the authors to present their findings and have discussion on how those findings could be used throughout the State. This seems to put the permit process in the same predicament as it has with Provision A language for receiving waters limitation. There is movement happening at the State level and there may be a recommendation coming out of the November 28 workshop. At this time, the Copermittees should not be locked into what is currently in the administrative draft permit. Grant hopes that the door will be left open to include recommendations that come from the State level.

Richard Boon (County of Orange) requested clarification on the PDP exemptions. It seems that certain categories of projects (retrofitting streets/roads, SFRs) are exempt so long as they comply with the basic performance standards being set for land development. This would mean that they are exempt only if they are complying with the requirements they are seeking to be exempt from.

Wayne Chiu (RWQCB) responded that those projects would be exempt from being a PDP, as long as they meet the performance requirements of a PDP. Other projects, even if they meet the basic performance standards of a PDP, would still be considered PDPs.

Sumer Hasenin (City of San Diego) supported Wayne's response. Per a phone conversation with Wayne, these potentially exempt projects are allowed to comply with the PDP performance requirements using other types of BMPs. The BMPs are a suite of BMPs that San Diego Copermittees suggested to the RWQCB. This provides relief for the SFRs as they can implement a suite of BMPs to meet the requirements to get equivalent pollutant removal. This also provides relief for the jurisdictions because they do not have to include those exempt projects in the PDP inventory.

Ziad Mazboudi (City of San Juan Capistrano) questioned if the BMPs being implemented by the SFRs to claim the exemption would require maintenance. He voiced concern that there needs to be a way to ensure maintenance is being done on the SFRs even if they are exempt from being PDPs. The point of inventorying, inspecting, and tracking is to ensure BMPs are maintained and remain effective. The point of not including SFRs in the inventory is because there is not much impact from an SFR itself.

Sumer Hasenin (City of San Diego) responded that they may require maintenance, but the Copermittees would not be required to track them. The applicants would be treated like standard projects are now, where they have to implement site design and minimum BMPs, but they would not be required to complete Water Quality Management Plans.

Wayne Chiu (RWQCB) recommended the existing development residential inspection program would cover ensuring maintenance of BMPs on SFRs. He also clarified that the SFRs would still have to deal with hydromodification.

Wayne (RWQCB) reminded the stakeholders that RWQCB Staff is explaining today how they developed the middle ground based on feedback received from all parties. The revised administrative draft permit provides a little bit of everyone's comments. If stakeholders would like additional revisions, then there is a public review comment process starting on October 31 through which additional comments can be made.

Christina Arias (RWQCB) stated that it would be helpful to review the technical report mentioned previously by Richard Boon, regarding hydromodification assessment and management. The framework is about approaching this on a watershed level. What is written in the revised administrative draft permit is an attempt to get at that approach. Christina looks forward to the comments from stakeholders on this issue during the public review comment process.

Jon Van Rhyn (County of San Diego) appreciated the revised language with regard to inspection options but raised a concern with the third option (E.5.c.(1)(a)(iii) "Onsite inspections by volunteer monitoring or patrol programs trained by the Copermittee").

Having onsite inspections by volunteers or patrol programs may be an issue. Jon suggested opening up the types of inspections to be done by volunteers or patrol programs to include drive-bys and not specify onsite inspections.

Bryn Evans (Industrial Environmental Association (IEA)) agreed with Jon's comment regarding onsite inspections being done by volunteer monitors or pollution patrol programs. There is some trepidation in allowing volunteers onsite to inspect facilities. He understands where the language came from but is concerned that it needs to be practical from an implementation perspective. The wording in this section of the permit needs clarification.

Representatives from San Diego Coastkeeper agreed. Their involvement would be limited and would prefer to include visual inspections, not detailed onsite inspections.

Wayne Chiu (RWQCB) clarified that there is nothing in the permit that would allow someone not authorized or trained by the Copermittees to complete an inspection, onsite or otherwise. It is up to the Copermittees to provide the training for volunteers or pollution patrol programs and specify where they can do inspections, how to fill out forms, make observations, etc. The intent behind that language was to give Copermittees a way to utilize volunteers or other pollution patrols.

Jon Van Rhyn (County of San Diego) responded that the language as currently written appears to try to open up an avenue to potentially have volunteers conducting onsite inspections, which is not a realistic option. He noted that specifically using the word "onsite" may be counterproductive to the intent of the language.

Claudio Padres (County of Riverside) requested clarification on section E.3.c.(3)(b) which covers priority project exemptions for retrofit of existing paved alleys, streets, or roads that meet certain criteria.

Wayne Chiu (RWQCB) provided a walkthrough of the criteria. The retrofit must be done on a road that is two lanes or less and has to be a retrofitting project associated with some other development or redevelopment project that is utilizing the retrofit as an alternative compliance option. For example, if a PDP could not meet the structural BMP performance criteria onsite, they may participate, contribute toward, or implement a retrofit project on a road that is two lanes or less. The retrofit project must meet Green Street requirements and would not be considered a PDP and, therefore, would not be required to implement structural BMP performance criteria on the road retrofit.

Wayne Rosenbaum (BIA) compliments the RWQCB on providing creative off ramps for project applicants; however, it seems that to reach the alternative compliance options, the Water Quality Improvement Plans must be completed first. Wayne asked what happens for projects between permit adoption and RWQCB approval of Water Quality Improvement Plans.

Wayne Chiu (RWQCB) responded that until Water Quality Improvement Plans are approved by the RWQCB, Copermittees are to continue their current programs and processes. Per the current version of the administrative draft permit, the Water Quality Improvement Plans, JRMPs, and BMP Manuals are all supposed to be done at the same time; therefore, at that point, the new requirements would come into effect.

Julie Procopio (City of Santee) asked for explanation of removing the comingled flows language, which is in the current active San Diego permit. This is in reference to the description of the Priority Development Project Categories. The current active San Diego permit (Provision D.1.d.(2)(g)) defines "Discharging directly to" (an ESA) as outflow from a drainage conveyance system that is composed entirely of flows from the subject development or redevelopment site, and not commingled with flows from adjacent lands. In the revised administrative draft permit (Provision E.3.b.(2)(e)), there is a small change in the definition of projects that drain to Environmentally Sensitive Areas (ESAs). The revised administrative draft permit language says "Discharging directly to" (an ESA) means outflow from a drainage conveyance system that collects runoff from the subject development or redevelopment site and terminates at or in receiving waters within the ESA. The comingling language was removed. By removing the comingling language, any project that adds 10% impervious area and drains to an ESA, whether through comingled channels or not, would be a PDP.

Wayne Chiu (RWQCB) explained that RWQCB Staff is trying to make sure that if there are PDPs that discharge directly to or are adjacent to an ESA that they implement the structural control BMP requirements. There may be situations where a project discharges to a pipe that then directly discharges to an ESA with or without additional contributions (comingled flows). That situation would be a direct discharge to an ESA and would make the project a PDP. If, however, a project discharges to a pipe that then discharges to another pipe prior to discharging to an ESA, that project would not be a PDP.

Eric Becker (RWQCB) indicated this language is consistent with language from the Orange County and Riverside County permits. The intent is for it to be very specific and not overly used. RWQCB Staff will review the language to ensure the language matches the intent.

VII. TMDL Implementation

Wayne Chiu (RWQCB) introduced the topic, indicating that this subject was not discussed in detail during the focused meetings; however, there were significant comments received with regard to making changes to these requirements. RWQCB Staff did not make a significant amount of changes to the Total Maximum Daily Load (TMDL) requirements other than minor wording and the addition of a Compliance Determination section, as recommended by the Copermittees. RWQCB Staff based the language in the Compliance Determination section partially on the way the Los Angeles County permit crafted compliance determination for TMDLs. No significant changes were made to the TMDL requirements because it is basically required that the RWQCB implement the TMDLs through this permit; therefore, the language included in the revised administrative draft permit is simply implementing the requirements of the TMDLs.

Todd Snyder (County of San Diego) expressed that he thought he liked some of the language added under the Compliance Determination section for the interim targets, but upon further review discovered that it does not go as far as he would prefer. There is some

language that states if the Copermittees are implementing an RWQCB-approved Water Quality Improvement Plan then the Copermittees would be in compliance with the interim targets up until the date when those targets would take effect. Todd would like clarification from RWQCB Staff that once the interim target dates hit, it is the numbers that matter. He also stated that in terms of what RWQCB Staff has discretion to do, they do have discretion not to incorporate effluent limitations as numerics. Todd would like the RWQCB to use its discretion to incorporate the effluent limitations not as numerics, but as BMP or action based.

Wayne Chiu (RWQCB) responded that in terms of RWQCB discretion as to how the RWQCB might require implementation or achieving the interim compliance requirements, RWQCB Staff believes that it is necessary to include the effluent limitations as numerics at this point. They have been included in the TMDL in numeric form; however, that is not to say that RWQCB Staff would not be open to considering putting BMP-based requirements in the permit so long as they provide reasonable assurance that the interim targets are being met.

Heather Stroud (City of San Diego) thanked the RWQCB for some of the changes made to compliance determination; however, she explained that this is one area where the disjointedness of the permit is highly apparent. There is compliance language in Attachment E that recognizes implementation of Water Quality Improvement Plans as compliance, but then there is still the Provision A language stating thou shalt not cause or contribute to the violation of water quality in any receiving waters. The Provision A language could be read separately to override the compliance language in Attachment E. There is a paragraph in Provision A that was stricken that would seem to address this disjointedness. The San Diego County Copermittees would like that paragraph put back into the permit.

Wayne Chiu (RWQCB) responded that when talking about Provision A requirements as they apply to Attachment E, Heather's interpretation is correct. The receiving waters language is still in there that Copermittees must not cause or contribute to the violation of water quality in any receiving waters. Wayne noted that the language in Provision A has been more clearly defined to indicate that where there are TMDLs with associate WQBELs that those WQBELs need to be complied with in accordance with the TMDL schedule. That does not remove the legal requirements for discharges from the MS4 to not cause or contribute to the violation of water quality in any receiving waters. Wayne admitted there is a disconnect between Provision A, the Water Quality Improvement Plans, and the TMDL requirements. There is overlap here with what the SWRCB has within their position or issue paper where they specifically call out some of the TMDL issues. Given current circumstances, this is the best that RWQCB Staff can work with right now.

Heather Stroud (City of San Diego) asked for the reasoning for deleting Provision A.2.c, which states "Discharges from MS4s must not cause or contribute to the violation of any receiving water limitations expressed as water quality based effluent limitations (WQBELs) required to meet the WLAs established for the TMDLs in Attachment E to this Order, pursuant to the applicable TMDL compliance schedule."

Wayne Chiu (RWQCB) responded that RWQCB Staff essentially consolidated all the TMDL WQBELs. The WQBELs within the TMDL requirements in Attachment E are expressed in a combination of three ways: effluent limitations, receiving water limitations, and BMP requirements. This format was set up so that future TMDLs can include one or more of those requirements. Those WQBELs as expressed now within Provision A fully capture that concept.

Heather Stroud (City of San Diego) expressed that having the language previously included as Provision A.2.c provided a linkage between Provision A and Attachment E. She suggested perhaps the language should be included but re-worded to allow for other compliance pathways.

Richard Boon (County of Orange) noted that there are some things in the Los Angeles County permit, scheduled for adoption this year, that are attractive in terms of TMDL compliance, including recognition of BMP-based compliance and a reopener provision prior to the final Waste Load Allocations (WLAs) being achieved. Going forward, the Orange County Copermittees will be recommending those options to the RWQCB.

Elaine Lukey (City of Carlsbad) is pleased that RWQCB Staff has tried something different in this permit reissuance and appreciated the opportunity for discussion provided over these past six months. Elaine commented that the bacteria beaches and creeks TMDL is based on support for the REC-1 standard, yet there are three watersheds in Table 6 in Attachment E that are listed based on the SHELL beneficial use (Penasquitos, San Dieguito, and Carlsbad Watershed Management Areas). The San Diego County Copermittees would like those three watersheds removed because they are based on the SHELL beneficial use while the TMDL was developed for the REC-1 beneficial use standard.

Mikhail Ogawa (City of Del Mar) requested explicit reopener language be included for TMDLs. There is concern that if the Basin Plan is amended for the bacteria TMDL, then there could be inconsistencies between the permit and the Basin Plan. Without having a reopener explicitly included in the permit, it makes it more difficult for Copermittees to get funding to perform special studies necessary to re-evaluate the TMDL itself.

Eric Becker (RWQCB) responded that changing the TMDL is a different process; therefore, there is no need for an explicit reopener clause in the permit. If there are changes in the TMDL, then the RWQCB does have the authority to make changes to the permit. It does not make sense to have inclusions in the permit to reopen the TMDL.

Wayne Chiu (RWQCB) explained that part of the reason special studies were included within the monitoring and assessment portion of the revised administrative draft permit was to leave it to the Copermittees' discretion on how to use the special studies. Ideally, the special studies would be used to further the effectiveness of programs to address the TMDLs; however, if Copermittees would rather use the special studies to develop data to modify the TMDLs, then that is permissible. If Mikhail's request was to provide requirements to reopen the TMDL once certain special studies are completed, that language does not belong in this permit. Wayne reminded the stakeholders that the permit contains requirements for the Copermittees, not requirements for the RWQCB.

Mikhail Ogawa (City of Del Mar) noted that if the Basin Plan changes and the MS4 Permit cannot be reopened, there may be compliance issues.

Wayne Chiu (RWQCB) guaranteed that if there is a change in the Basin Plan and a change to a TMDL, the RWQCB will make changes to the TMDL requirements in this permit in a very timely manner. He further explained that it is up to the Copermittees to provide data to the RWQCB as evidence and information necessary to reopen TMDLs. That process will take quite a while.

Mikhail Ogawa (City of Del Mar) appreciated Wayne's commitment, but noted that sometimes management may not view it in the same manner. The challenge is trying to meet compliance points and build programs to be more effective. The issue is being able to present materials to RWQCB Staff and have enough commitment that the materials will be evaluated and considered for reopening TMDLs. Mikhail concluded by echoing Elaine's comments, showing appreciation for the tremendous amount of work that has been put in by RWQCB Staff in a compressed amount of time.

Eric Becker (RWQCB) explained that changing the TMDL is a difficult process; changing the permit is easier. To revise the permit, it is simply a matter of getting in front of the Board and requesting the change.

Cindy Lin (EPA) clarified that a reopener of a TMDL can be requested at any time with the RWQCB. It has happened before in Los Angeles County with a simple request made to the Board with data to support it.

Todd Snyder (County of San Diego) raised the discussion of the Rainbow Creek TMDL. When this TMDL was adopted back in 2005/2006, there were no WLAs assigned to any Copermittees, only Load Allocations. The only party to receive WLAs was the California Department of Transportation (Caltrans). Todd does not see any legal justification for including a TMDL that does not have WLAs for any Copermittee included in the permit. The use of the MS4 permit was never contemplated for the Rainbow Creek TMDL.

Wayne Chiu (RWQCB) agreed that federal regulations and the CWA only speak to WLAs being included in NPDES permits; however, that does not mean that RWQCBs do not have the ability to include requirements in the permit to address a TMDL if it is known that there is a source associated with the MS4. Within the Rainbow Creek TMDL, it identified several land uses that are associated with the MS4. While the Basin Plan Amendment itself did not specifically focus on using the MS4 permit, the Staff Report did discuss the role of the MS4 permit and how it would be used to implement the requirements. The section is not very specific, but it does reference the discharge prohibitions and receiving water limitations language as being the mechanism for the MS4 permit to implement the requirements of the TMDL.

Todd Snyder (County of San Diego) stated that the San Diego County Copermittees disagree with the decision to include the Rainbow Creek TMDL in this permit; however, if it must be included, the San Diego County Copermittees would like it recognized that agriculture is a major part of the loading for Rainbow Creek and this should be addressed in the agriculture waiver.

Wayne Chiu (RWQCB) agreed that if he were working on the agriculture waiver, he would put the load allocations for agricultural uses in that waiver. He strongly recommended that when the agriculture waiver process begins or calls for comments, the County of San Diego should specifically discuss this issue. Wayne agreed that agricultural sources are one of the more significant contributors to the Rainbow Creek TMDL.

Todd Snyder (County of San Diego) suggested that by including the Rainbow Creek TMDL in the permit, it puts the entirety of TMDL compliance on the Copermittees; it does not allow sharing the responsibility with the agricultural sources or other parties. Todd explained that a TMDL allocates the load to different parties that go beyond just the MS4; however, the way the Rainbow TMDL reads, it is concentration-based compliance in the receiving water. The concentration-based compliance could potentially not be achieved, but at no fault of the MS4. When it is brought into the MS4 permit, then potentially the MS4 dischargers are wholly responsible for it.

David Barker (RWQCB) stated that, assuming the agricultural contributions are listed as load allocations in the Rainbow Creek TMDL, in order to require those load allocations be complied with, the RWQCB has to have a regulatory vehicle to implement them. The agriculture waiver is one process that could be used for that. David noted that the Rainbow Creek TMDL was one of the first TMDLs completed by the RWQCB, so there may be items in it that are vague. The RWQCB has not moved aggressively with implementing that TMDL, but there is the agriculture waiver coming up and that would be an opportunity to follow through on this issue.

Wayne Chiu (RWQCB) explained the intent of the way the RWQCB was trying to include the requirements of this TMDL was to limit it to what the MS4 is responsible for. The receiving water may be exceeding the limitations, but it is up to the Copermittees to demonstrate that the Copermittees are not contributing or causing the receiving water limitation exceedance. There may be another compliance option that is BMP-based but still demonstrates that the MS4 is meeting the numeric effluent limitations or achieving a receiving water limitation somehow. The RWQCB can consider putting that into the compliance options. What the RWQCB needs is some assurance that the receiving water limitations will be met or that the discharge(s) from the MS4 are not causing or contributing to the exceedances.

VIII. Monitoring

Laurie Walsh (RWQCB) stated that this is an area of the revised administrative draft permit where the RWQCB took a large percentage of what the Copermittees presented and incorporated it directly. It was changed slightly to fit the permit format, but in general the RWQCB was very satisfied with the program and did incorporate almost everything. It does have in it a transitional component which allows the Copermittees some time to continue current monitoring but also participate in the receiving water portion and regional programs that already exist. For the MS4 outfall monitoring, Copermittees will be required to go through some screenings and visual assessments to determine what is considered persistent versus transient flow. The monitoring program does still include special studies and an

assessment section. There are also a few specifics included in the outfall monitoring program to ensure the RWQCB had addressed the environmental community's concerns with regard to potential orphan sites. In the dry weather program, the objective of the RWQCB was to eliminate non-storm water flows; therefore, some specificity was added in that component to address the objectives.

Jo Ann Weber (County of San Diego) acknowledged the productiveness of the process taken over the past six months, including the focused meetings and follow up meetings with RWQCB Staff. The San Diego County Copermittees appreciate how open the RWQCB was to looking at different options for the monitoring program and are impressed by the hard work, diligence, and attention to detail the RWQCB has done in record time. The San Diego County Copermittees look forward to continuing discussions during this next phase of the permit reissuance process.

Jo Ann Weber (County of San Diego) concurred that the revised administrative draft permit language does provide reasonable balance on the receiving water side; however, the San Diego County Copermittees do have additional input and hope to provide some language recommendations in the next round of comments. There are also three main issues the San Diego County Copermittees would like to work on further with RWQCB Staff: MS4 discharge programs, follow up requirements of Provision E, and Assessment Section D.4.

Roger Butow (Clean Water Now! Coalition) expressed appreciation of the monitoring program in the revised administrative draft permit and raised a question with regard to the 13225 for Aliso Creek. The monitoring in the revised administrative draft permit seems to match the monitoring being done under the 13225. He questioned if the 13225 was going to be rescinded with this new monitoring program going into effect.

David Barker (RWQCB) stated that to the extent the permit does cover the same requirements of the 13225, then the RWQCB may consider rescinding the 13225.

Grant Sharp (Orange County Flood Control District) requested more clarification on the elements of the monitoring provision with respect to the transitional dry weather MS4 outfall monitoring program. His understanding is that Copermittees would start by doing an inventory of all MS4 outfalls. Then, each Copermittee would, based on the number of outfalls within their jurisdiction and the permit specifications, conduct visual monitoring and record observations at a specified number of MS4 outfalls. The visual monitoring and observations would follow the requirements of Table D-6. Grant requested more clarification on the language just below Table D-6 where it states the Copermittees must then implement Provisions E.2.d.(2)(c)-(e) based on the field observations. Provision E.2.d.(2)(c)-(e) refers to the IDDE section of the permit. Grant questioned if it is a correct interpretation that as Copermittees are making field observations, if a potential IC/ID is identified, then Copermittees must follow through with the provisions in E.2.d.(2)(c)-(e), which may include grab sampling.

Laurie Walsh (RWQCB) provided clarification. If, during field observations for MS4 outfall monitoring, an IC/ID is discovered, then the Copermittee must attempt to identify the source. If the Copermittee can identify the source, then it should be tracked, captured,

and eliminated at that time. If the source cannot be identified, then it goes back to whether it is a persistent or transient discharge. If it is determined to be a persistent flow, then sampling should be done at that time.

Grant Sharp (Orange County Flood Control District) hypothesized that Copermittees could then go through more than one round of visual observations, complete their prioritization, and begin field screening before following up on IC/ID's whose sources could not immediately be identified.

Wayne Chiu (RWQCB) agreed with Grant's hypothetical situation. The field observation portion includes doing visual inspections during the transitional period. Provisions C through E of the IC/ID requirements are field screening, then investigate, then eliminate. Those are based on visual observations. Where there are obvious IC/ID with sources that can be identified, then they should be immediately addressed and eliminated. This is not any different than what is required now. It is not until the Copermittees reach persistent flow monitoring that any sampling is required.

Mike Beanan (South Laguna Civic Association and Laguna Bluebelt) recommended the creation of plume maps to better communicate the impact that all areas, inland and coastal, are making on the coastal receiving waters. Tables can be confusing to the general public. Plume maps with communities outlined in red, yellow, or green, depending on their contributions to the coastal receiving waters would be advantageous to public outreach and would incentivize inland cities to be more proactive. Mike also recommended for monitoring to use chemical fingerprinting to identify the sources of IC/ID or persistent flows.

Mike Beanan (South Laguna Civic Association and Laguna Bluebelt) continued that the Copermittees are legally responsible for coastal receiving waters and impacts to those waters.

Roger Butow (Clean Water Now! Coalition) advocated for steelhead trout, indicating that all of the creek mouths and river mouths of the steelhead trout runs should be Areas of Special Biological Significance (ASBS).

Laurie Walsh (RWQCB) applauded Roger's passion and information behind this, but indicated that this is not the appropriate forum for ASBS listing discussions. There are ASBS groups statewide that address that issue as well as the Basin Plan process.

David Barker (RWQCB) noted that the ASBS are designated by the SWRCB, not the RWQCBs.

Karen Holman (Port of San Diego) echoed Jo Ann's appreciation to RWQCB Staff. At this time, the San Diego County Copermittees would like to continue working with RWQCB Staff to review the new language and ensure that it is practical, connected, and clear. Karen also expressed the San Diego County Copermittees' desire to make sure that monitoring helps to inform the Water Quality Improvement Plan and the iterative process.

IX. Other Topics and Questions

Ziad Mazboudi (City of San Juan Capistrano) directed attention to Provision E.5.b.(2)(d) – Pesticides, Herbicides, and Fertilizers BMPs for residential areas. He voiced concern with

how the language states that Copermittees must effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides, and fertilizers from residential areas in its inventoried existing development. He questioned how the RWQCB anticipated that being accomplished, specifically the storage portion of the requirement.

Wayne Chiu (RWQCB) responded that there are two basic requirements for MS4 permits in the CWA: effectively prohibit non-stormwater discharges to the MS4 and implement controls to reduce pollutants in stormwater discharges to the MEP. Provision E.5.b.(2)(d) states that Copermittees "must encourage and promote the implementation of BMPs." By doing that, the Copermittees will reach the MEP standard and effectively prohibit the discharges. RWQCB Staff assumes Copermittees will use public education and outreach as well as the IC/ID program to satisfy this requirement. Copermittees may also use persistent flow monitoring if pesticides are a priority in the watershed. The key to this language is that Copermittees must promote and encourage. For industrial, commercial, and municipal developments, the language states Copermittees must implement BMPs or must require implementation of BMPs. For residential areas, the revised administrative draft permit basically suggests using education or other tools, such as data points or complaints.

Mike Beanan (South Laguna Civic Association and Laguna Bluebelt) explained that stakeholders know that what mobilizes these contaminants is flow. If overwatering is not present and application is not done just prior to a storm event, then the contaminants stay on the property. He supports fines and penalties to motivate people to stop dumping. Mike believes that residential development in itself is an industry and should not be relieved of requirements that are applicable to industrial, commercial, and municipal facilities and activities. Any person intentionally putting poison into the environment should be held to the standards and enforcement should be taken.

Mike Beanan (South Laguna Civic Association and Laguna Bluebelt) continued that chemical fingerprinting is a way to determine the nature, type, and location of contaminants. He encouraged Copermittees to put that technology and tactics into play. He also encouraged Copermittees to consider pilot demonstration projects to inspire others and move forward with technology with regard to storm water.

Ruth Kolb (City of San Diego) responded to dealing with pesticides from the City's perspective. Ruth is the head enforcement officer for the City of San Diego, which does enforce against dumping. She stated that in California, however, the only people that can enforce pesticide application regulations are the U.S. EPA Office of Pesticide Programs and the Department of Pesticide Regulation (DPR). The RWQCB cannot and the cities cannot. Cities have been sued by the State and the cities have lost when they have tried to enforce pesticide regulations in the State of California. Ruth commends the RWQCB with the way it is included in the revised administrative draft permit so that Copermittees can do public outreach and work with the County Department of Agriculture which represents the DPR.

Ruth Kolb (City of San Diego) raised a question with regard to the bacteria TMDL, referencing page E-26, (2)(a) Interim Dry Weather Receiving Water Limitations. That section states: "The Responsible Copermittee must calculate the "existing" exceedance for

frequencies of the 30-day geometric mean water quality objectives for each of the indicator bacteria by analyzing the monitoring data collected between January 1, 2002 and April 4, 2011." Ruth stated that the intent of this language in the TMDL was that the data used initially was the baseline; the data collected between January 1, 2002 and April 4, 2011 was not the baseline. By setting the January 1, 2002 to April 4, 2011 data as the baseline, the RWQCB is penalizing those municipalities that have been active participants in finding their sources and eliminating them. Ruth explained that the City of San Diego feels irritated that they have been proactive, have started finding the bacteria sources starting in 2002, and have eliminated their beach postings and closures by 78 percent; however, they feel they are being penalized for those efforts.

Wayne Chiu (RWQCB) responded that the way the language was included in the revised administrative draft permit was based on the language in the TMDL. If that language was misquoted or mis-cited, he welcomed Ruth to provide the correct language and the correction can be made. If it is in the TMDL to use the January 1, 2001 to April 4, 2011 data as the baseline, then the permit language will remain as-is.

Ruth Kolb (City of San Diego) referred RWQCB Staff to page A-55 of the bacteria TMDL where it states the data to be used as a baseline is that collected between 1996 and 2002. She will provide a copy of that to Wayne Chiu (RWQCB) to have the language in the permit revised.

Jennifer Nichols Kearns (City of San Diego) thanked RWQCB Staff for accepting the Copermittees' comments and feedback. She requested clarification in the public participation section (Provision E.7), which is similarly worded in other sections. The language seems to present rigorous requirements for public participation. The Copermittees are not opposed to having public participation, but would like clarification from the RWQCB on how it is expected to be accomplished. The language is very specific that the Copermittees must incorporate RWQCB feedback but is not specific about feedback from others. If feedback is received from others regarding the Copermittees' strategies, processes, etc., Jennifer questioned how much of that feedback must be incorporated by the Copermittees, especially if the feedback is determined to be infeasible.

Wayne Chiu (RWQCB) indicated that the public participation portions came from what was heard during the focused meetings and from comments of the environmental community. RWQCB Staff does want those opportunities to be fairly explicit. In terms of what the Copermittees must do with the comments, RWQCB Staff would hope that the Copermittees are informed by those comments when developing the Water Quality Improvement Plans. The redline administrative draft permit does not require the Copermittees to do anything more than consider the comments. RWQCB Staff may read something in the public comments that is valid while the Copermittees may not consider it valid. In that case, RWQCB Staff would strongly recommend or direct incorporation of modifications in response to certain public comments.

Roger Butow (Clean Water Now! Coalition) revisited the LEED topic. He questioned if RWQCB Staff has considered instead of using LEED to use CalGreen, which are State

guidelines. He suggested the permit may be on more solid ground by either using CalGreen or including a more generic phrase.

Wayne Chiu (RWQCB) stated that RWQCB Staff welcomes a comment letter that proposes some language that would promote that kind of alternative. The LEED certification was included because RWQCB Staff was approached by the USGBC who pitched how LEED is working toward what the RWQCB is trying to achieve as well. The RWQCB is not opposed to having other methods incorporated as alternatives. Based on the feedback and comments received, RWQCB Staff incorporated what was appropriate at the time; however, they are not opposed to revising that language.

Rosanna Lacarra (City of Coronado) requested clarification on language that appears in the existing development section, that reads each Copermittee must implement or require the implementation of designated BMPs at industrial, commercial, and municipal areas. She asked for reassurance that "must implement" refers to municipal areas and "require the implementation of" applies to industrial and commercial areas.

Wayne Chiu (RWQCB) agreed with Rosanna's interpretation. The "or" between "must implement" and "require the implementation of" allows for that interpretation.

Todd Snyder (County of San Diego) addressed the phasing of the deliverables under the revised administrative draft permit. The revised administrative draft permit has broken up the submittals into phases. From the San Diego County Copermittees' perspective, they would like to continue dialogue with RWQCB Staff on this issue. If the permit is adopted as scheduled in March or April 2013, the first deliverable, at six months after permit adoption, would be due September / October 2013, only three to four months into the new fiscal year. The Copermittees have already budgeted for this fiscal year; they will not be receiving any more funds to develop the first portion of the Water Quality Improvement Plans during this fiscal year. The Copermittees, therefore, would be forced to complete a six-month process in about three months. Todd stated that the Copermittees are still grappling with how much detail is to be included in the Water Quality Improvement Plans and how much detail is to be included in the jurisdictional documents. They also must consider timing for approval and adoption of plans within their municipal requirements. Depending on answers to their questions, the Copermittees may suggest different submittal schedules. The Copermittees would like to continue to work with the RWQCB on this issue.

Vaikko Allen (Contech) raised a question regarding PDPs and LID BMPs. There is a definition of LID BMPs in the revised administrative draft permit that includes retention and bioretention and systems that have flow-through that release some water. The language in the section for compliance, however, seems only to include retention BMPs and exclude other flow-through treatment BMPs. If that is the intent, it would be helpful to clean up that language a bit. Vaikko questioned if it is correct that projects must retain runoff unless they are in the alternative compliance path.

Wayne Chiu (RWQCB) agreed with Vaikko's interpretation and also stated that alternative compliance does allow for biofiltration onsite.

Vaikko Allen (Contech) recommended cleaning up the language since LID BMPs do include flow-through devices while the revised administrative draft permit is only allowing for LID BMPs that provide retention, unless projects utilize the alternative compliance path.

Vaikko Allen (Contech) referred to language in the revised administrative draft permit that requires treatment control BMPs used to be ranked with high or medium removal efficiency for the PDP's most significant pollutants of concern. He questioned what demonstrates that level of performance, understanding that the Copermittees have been making that determination up to this point. He asked what the RWQCB's view is as far as appropriate level of documentation to support that removal efficiency determination. Vaikko suggested finding a way to evaluate the many programs available that would help the Copermittees make those determinations in a more consistent way.

Wayne Chiu (RWQCB) stated that the RWQCB is relying and will continue to rely on the Copermittees to make that determination. There is not, however, any reason why the Copermittees and RWQCB Staff could not meet after permit adoption to address that issue.

Christine Sloan (County of San Diego) addressed the Alternative Compliance In-Lieu Fee Option included in the revised administrative draft permit. She thanked RWQCB Staff for consideration of the prior to occupancy timeline. Christine also requested the 4-year limit in Provision E.3.c.(3)(c)(ii)[b] be expanded to allow for the attainment of permits and maximized use of alternative compliance.

Wayne Chiu (RWQCB) responded that the RWQCB can consider extending that time limit. He explained the 4-year timeline was borrowed from the Los Angeles County permit. The main concern of the RWQCB is the achievement of those pollutant reduction requirements for the BMPs and mitigation for the hydromodification effects. Wayne is not sure how extending the timeline would affect the developed projects in the meantime as they would not be benefitting from those BMPs. Wayne requested the San Diego County Copermittees submit the recommendation in written comments along with rationale for the timeline extension request.

Mike Beanan (South Laguna Civic Association and Laguna Bluebelt) suggested habitat restoration as the best strategy. If that route is taken, then it could be incentivized with cap and trade. He shared that Aliso Creek has a small urban runoff harvesting project where runoff is collected than put back into the recycled water system, saving money for the water district and reducing the impact to the coastal waters. This was done as a demonstration project; however, Mike believes that monetizing water is the next threshold.

Roger Butow (Clean Water Now! Coalition) referred to the two-page decree or edict issued by former San Diego RWQCB Executive Officer John Robertus around 2001. The issue was diversions of MS4 runoff to wastewater treatment. At that time, Robertus described it as a band-aid, but throughout the revised administrative draft permit, Roger interprets a reference to MS4 runoff diversion to wastewater. Roger questioned when that became acceptable as a priority device for RWQCB Staff and the permits themselves.

Wayne Chiu (RWQCB) replied that he does not believe that there is a thread throughout the revised administrative draft permit that it is acceptable to divert MS4 runoff to waterwater. Wayne would be open to meeting with Roger offline and discussing the issue.

X. Closing

David Barker (RWQCB), in closing, thanked everyone for the efforts made in attending and participating at the meetings. When the RWQCB started the meetings, they were looking for input to improve the administrative draft permit, and they feel they have achieved that goal. The RWQCB thanks all the stakeholders for their input and looks forward to continuing meetings with stakeholders throughout the adoption process.

XI. Meeting Adjourned

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

TENTATIVE
ORDER NO. R9-2013-0001
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The San Diego County Copermittees in Table 1a are subject to waste discharge requirements set forth in this Order.

Table 1a. San Diego County Copermittees

City of Carlsbad	City of Oceanside
City of Chula Vista	City of Poway
City of Coronado	City of San Diego
City of Del Mar	City of San Marcos
City of El Cajon	City of Santee
City of Encinitas	City of Solana Beach
City of Escondido	City of Vista
City of Imperial Beach	County of San Diego
City of La Mesa	San Diego County Regional Airport Authority
City of Lemon Grove	San Diego Unified Port District
City of National City	

After the San Diego Water Board receives and considers the Orange County Copermittees' Report of Waste Discharge and makes any necessary changes to the Order, the Orange County Copermittees in Table 1b will become subject to waste discharge requirements set forth in this Order after expiration of Order No. R9-2009-0002, NPDES No. CAS0108740 on or after December 16, 2014.

Table 1b. Orange County Copermittees

City of Aliso Viejo	City of Rancho Santa Margarita
City of Dana Point	City of San Clemente
City of Laguna Beach	City of San Juan Capistrano
City of Laguna Hills	City of Laguna Woods
City of Laguna Niguel	County of Orange
City of Lake Forest	Orange County Flood Control District
City of Mission Viejo	

After the San Diego Water Board receives and considers the Riverside County Copermittees' Report of Waste Discharge and makes any necessary changes to this Order, the Riverside County Copermittees in Table 1c will become subject to waste discharge requirements set forth in this Order after expiration of Order No. R9-2010-0016, NPDES No. CAS0108766 on or after November 10, 2015.

Table 1c. Riverside County Copermittees

City of Murrieta	County of Riverside
City of Temecula	Riverside County Flood Control and Water Conservation District
City of Wildomar	

The Orange County Copermittees and Riverside County Copermittees may become subject to the requirements of this Order at a date earlier than the expiration date of their current Orders subject to the conditions described in Provision F.6 of this Order if the Copermittees in the respective county receive a notification of coverage from the San Diego Water Board.

The term Copermittee in this Order refers to any San Diego County, Orange County, or Riverside County Copermittee covered under this Order, unless specified otherwise.

This Order provides permit coverage for the Copermittee discharges described in Table 2.

Table 2. Discharge Locations and Receiving Waters

Discharge Points	Locations throughout San Diego Region
Discharge Description	Municipal Separate Storm Sewer System (MS4) Discharges
Receiving Waters	Inland Surface Waters, Enclosed Bays and Estuaries, and Coastal Ocean Waters of the San Diego Region

Table 3. Administrative Information

This Order was adopted by the San Diego Water Board on:	**Month Day, 2013**
This Order will become effective on:	**Month Day, 2013**
This Order will expire on:	**Month Day, 2018**
The Copermittees must file a Report of Waste Discharge in accordance with Title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than 180 days in advance of the Order expiration date.	

I, David W. Gibson, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on Month Day, 2013.

TENTATIVE

David W. Gibson
Executive Officer

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ATTACHMENTS

Attachment A - Discharge Prohibitions and Special Protections A-1
Attachment B - Standard Permit Provisions and General Provisions B-1
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I. FINDINGS

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), finds that:

JURISDICTION

1. **MS4 Ownership or Operation.** Each of the Copermittees owns or operates an MS4, through which it discharges storm water and non-storm water into waters of the U.S. within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the U.S.

2. **Legal and Regulatory Authority.** This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]) adopted by the United States Environmental Protection Agency (USEPA), and chapter 5.5, division 7 of the California Water Code (CWC) (commencing with section 13370). This Order serves as an NPDES permit for discharges from MS4s to surface waters. This Order also serves as waste discharge requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

   The San Diego Water Board has the legal authority to issue a regional MS4 permit pursuant to its authority under CWA section 402(p)(3)(B) and 40 CFR 122.26(a)(1)(v). The USEPA also made it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide permits (55 Federal Register [FR] 47990, 48039-48042). The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees and San Diego Water Board.

   The federal regulations make it clear that the Copermittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators (40 CFR 122.26(a)(3)(vi)). This Order does not require the Copermittees to manage storm water outside of their jurisdictional boundaries, but rather to work collectively to improve storm water management within watersheds.

3. **CWA NPDES Permit Conditions.** Pursuant to CWA section 402(p)(3)(B), NPDES permits for storm water discharges from MS4s must include requirements to effectively prohibit non-storm water discharges into MS4s, and require controls to reduce the discharge of pollutants in storm water to the maximum extent practicable (MEP), and to require other provisions as the San Diego Water Board determines are appropriate to control such pollutants. This Order prescribes conditions to assure

compliance with the CWA requirements for owners and operators of MS4s to effectively prohibit non-storm water discharges in to the MS4s, and require controls to reduce the discharge of pollutants in storm water from the MS4s to the MEP.

4. **CWA and CWC Monitoring Requirements.** CWA section 308(a) and 40 CFR 122.41(h),(j)-(l) and 122.48 require that NPDES permits must specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s also specify additional monitoring and reporting requirements in 40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c). CWC section 13383 authorizes the San Diego Water Board to establish monitoring, inspection, entry, reporting and recordkeeping requirements. This Order establishes monitoring and reporting requirements to implement federal and State requirements.

5. **Total Maximum Daily Loads.** CWA section 303(d)(1)(A) requires that "[e]ach state shall identify those waters within its boundaries for which the effluent limitations…are not stringent enough to implement any water quality standard applicable to such waters." The CWA also requires states to establish a priority ranking of impaired water bodies known as Water Quality Limited Segments and to establish Total Maximum Daily Loads (TMDLs) for such waters. This priority list of impaired water bodies is called the Clean Water Act Section 303(d) List of Water Quality Limited Segments, commonly referred to as the 303(d) List. The CWA requires the 303(d) List to be updated every two years.

   TMDLs are numerical calculations of the maximum amount of a pollutant that a water body can assimilate and still meet water quality standards. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point sources (waste load allocations or WLAs) and non-point sources (load allocations or LAs), background contribution, plus a margin of safety. Discharges from MS4s are point source discharges. The federal regulations (40 CFR 122.44(d)(1)(vii)(B)) require that NPDES permits to incorporate water quality based effluent limitations (WQBELs) developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, consistent with the assumptions and requirements of any available WLA for the discharge. Requirements of this Order implement the TMDLs adopted by the San Diego Water Board and approved by USEPA.

6. **Non-Storm Water Discharges.** Pursuant to CWA section 402(p)(3)(B)(ii), this Order requires each Copermittee to effectively prohibit discharges of non-storm water into its MS4. Nevertheless, non-storm water discharges into and from the MS4s continue to be reported to the San Diego Water Board by the Copermittees and other persons. Monitoring conducted by the Copermittees, as well as the 303(d) List, have identified dry weather, non-storm water discharges from the MS4s as a source of pollutants causing or contributing to receiving water quality impairments in the San Diego Region. The federal regulations (40 CFR 122.26(d)(2)(iv)(B)(1)) require the Copermittees to have a program to prevent illicit discharges to the MS4. The federal regulations, however, allow for specific categories of non-storm water discharges or flows to be addressed as illicit discharges only where such discharges

are identified as sources of pollutants to waters of the U.S.

7. **In-Stream Treatment Systems.** Pursuant to federal regulations (40 CFR 131.10(a)), in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S. Authorizing the construction of a runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to accepting waste assimilation as an appropriate use for that water body. Runoff treatment must occur prior to the discharge of runoff into receiving waters. Treatment control best management practices (BMPs) must not be constructed in waters of the U.S. Construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body.

DISCHARGE CHARACTERISTICS AND RUNOFF MANAGEMENT

8. **Point Source Discharges of Pollutants.** Discharges from the MS4s contain waste, as defined in the CWC, and pollutants that adversely affect the quality of the waters of the state. A discharge from an MS4 is a “discharge of pollutants from a point source” into waters of the U.S. as defined in the CWA. Storm water and non-storm water discharges from the MS4s contain pollutants that cause or threaten to cause a violation of surface water quality standards, as outlined in the Water Quality Control Plan for the San Diego Basin (Basin Plan). Storm water and non-storm water discharges from the MS4s are subject to the conditions and requirements established in the Basin Plan for point source discharges.

9. **Potential Beneficial Use Impairment.** The discharge of pollutants and/or increased flows from MS4s may cause or threaten to cause the concentration of pollutants to exceed applicable receiving water quality objectives and impair or threaten to impair designated beneficial uses resulting in a condition of pollution, contamination, or nuisance.

10. **Pollutants Generated by Land Development.** Land development has created and continues to create new sources of non-storm water discharges and pollutants in storm water discharges as human population density increases. This brings higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash. Pollutants from these sources are dumped or washed off the surface by non-storm water or storm water flows into and from the MS4s. When development converts natural vegetated pervious ground cover to impervious surfaces such as paved highways, streets, rooftops, and parking lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving a developed area without BMPs that can maintain pre-development conditions will contain greater pollutant loads and have significantly greater runoff volume, velocity, and peak flow rate than pre-development runoff from the same area.

11. **Runoff Discharges to Receiving Waters.** The MS4s discharge runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within the eleven hydrologic units comprising the San Diego Region. Historic and current development makes use of natural drainage patterns and features as conveyances for runoff. Rivers, streams and creeks in developed areas used in this manner are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and receiving water. Numerous receiving water bodies and water body segments have been designated as impaired by the San Diego Water Board pursuant to CWA section 303(d).

12. **Pollutants in Runoff.** The most common pollutants in runoff discharged from the MS4s include total suspended solids, sediment, pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., cadmium, copper, lead, and zinc), petroleum products and polynuclear aromatic hydrocarbons, synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus), oxygen-demanding substances (e.g., decaying vegetation, animal waste), detergents, and trash. As operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not prohibit or otherwise control. These discharges may cause or contribute to a condition of pollution or a violation of water quality standards.

13. **Human Health and Aquatic Life Impairment.** Pollutants in runoff discharged from the MS4s can threaten and adversely affect human health and aquatic organisms. Adverse responses of organisms to chemicals or physical agents in runoff range from physiological responses such as impaired reproduction or growth anomalies to mortality. Increased volume, velocity, rate, and duration of storm water runoff greatly accelerate the erosion of downstream natural channels. This alters stream channels and habitats and can adversely affect aquatic and terrestrial organisms.

14. **Water Quality Effects.** The Copermittees' water quality monitoring data submitted to date documents persistent exceedances of Basin Plan water quality objectives for runoff-related pollutants at various watershed monitoring stations. Persistent toxicity has also been observed at several watershed monitoring stations. In addition, bioassessment data indicate that the majority of the monitored receiving waters have Poor to Very Poor Index of Biological Integrity (IBI) ratings. These findings indicate that runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in the San Diego Region. Non-storm water discharges from the MS4s have been shown to contribute significant levels of pollutants and flow in arid, developed Southern California watersheds, and contribute significantly to exceedances of applicable receiving water quality objectives.

15. **Non-Storm Water and Storm Water Discharges.** Non-storm water discharges from the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard of CWA section 402(p)(3)(B)(iii), which is explicitly for "Municipal … *Stormwater Discharges* (emphasis added)" from the MS4s. Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s must be effectively prohibited.

16. **Best Management Practices.** Waste and pollutants which are deposited and accumulate in MS4 drainage structures will be discharged from these structures to waters of the U.S. unless they are removed. These discharges may cause or contribute to, or threaten to cause or contribute to, a condition of pollution in receiving waters. For this reason, pollutants in storm water discharges from the MS4s can be and must be effectively reduced in runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Pollution prevention is the reduction or elimination of pollutant generation at its source and is the best "first line of defense". Source control BMPs (both structural and non-structural) minimize the contact between pollutants and runoff, therefore keeping pollutants onsite and out of receiving waters. Treatment control BMPs remove pollutants that have been mobilized by storm water or non-storm water flows.

17. **BMP Implementation.** Runoff needs to be addressed during the three major phases of development (planning, construction, and use) in order to reduce the discharge of storm water pollutants to the MEP, effectively prohibit non-storm water discharges, and protect receiving waters. Development which is not guided by water quality planning policies and principles can result in increased pollutant load discharges, flow rates, and flow durations which can negatively affect receiving water beneficial uses. Construction sites without adequate BMP implementation result in sediment runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. Existing development can generate substantial pollutant loads which are discharged in runoff to receiving waters. Retrofitting areas of existing development with storm water pollutant control and hydromodification management BMPs is necessary to address storm water discharges from existing development that may cause or contribute to a condition of pollution or a violation of water quality standards.

18. **Long Term Planning and Implementation.** Federal regulations require municipal storm water permits to expire 5 years from adoption, after which the permit must be renewed and reissued. The San Diego Water Board recognizes that the degradation of water quality and impacts to beneficial uses of the waters in the San Diego Region occurred over several decades. The San Diego Water Board further recognizes that a decade or more may be necessary to realize demonstrable improvement to the quality of waters in the Region. This Order includes a long term planning and implementation approach that will require more than a single permit term to complete.

WATER QUALITY STANDARDS

19. **Basin Plan.** The San Diego Water Board adopted the Water Quality Control Plan for the San Diego Basin (Basin Plan) on September 8, 1994 that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for receiving waters addressed through the plan. The Basin Plan was subsequently approved by the State Water Resources Control Board (State Water Board) on December 13, 1994. Subsequent revisions to the Basin Plan have also been adopted by the San Diego Water Board and approved by the State Water Board. Requirements of this Order implement the Basin Plan.

    The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Process Supply (PROC), Industrial Service Supply (IND), Ground Water Recharge (GWR), Contact Water Recreation (REC1), Non-contact Water Recreation (REC2), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Freshwater Replenishment (FRSH), Hydropower Generation (POW), and Preservation of Biological Habitats of Special Significance (BIOL). The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region: Navigation (NAV), Commercial and Sport Fishing (COMM), Estuarine Habitat (EST), Marine Habitat (MAR), Aquaculture (AQUA), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN), and Shellfish Harvesting (SHELL).

20. **Ocean Plan.** The State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, and 2005. The State Water Board adopted the latest amendment on April 21, 2005 and it became effective on February 14, 2006. The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean. Requirements of this Order implement the Ocean Plan.

    The Ocean Plan identifies the following beneficial uses of ocean waters of the state to be protected: Industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture; preservation and enhancement of designated Areas of Special Biological Significance; rare and endangered species; marine habitat; fish spawning and shellfish harvesting

21. **Sediment Quality Control Plan**. On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes: 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health,

and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

22. **National Toxics Rule and California Toxics Rule.** USEPA adopted the National Toxics Rule (NTR) on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the NTR applied in California. On May 18, 2000, USEPA adopted the California Toxics Rule (CTR). The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants.

23. **Antidegradation Policy.** This Order is in conformance with the federal Antidegradation Policy described in 40 CFR 131.12, and State Water Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality Waters in California*. Federal regulations at 40 CFR 131.12 require that the State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. State Water Board Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies.

CONSIDERATIONS UNDER FEDERAL AND STATE LAW

24. **Coastal Zone Act Reauthorization Amendments.** Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states with approved coastal zone management programs to address non-point source pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point source pollution: agriculture, silviculture, urban, marinas, and hydromodification. This Order addresses the management measures required for the urban category, with the exception of septic systems. The runoff management programs developed pursuant to this Order fulfills the need for coastal cities to develop a runoff non-point source plan identified in the Non-Point Source Program Strategy and Implementation Plan. The San Diego Water Board addresses septic systems through the administration of other programs.

25. **Endangered Species Act.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 USC sections 1531 to 1544). This Order requires compliance with receiving water limits, and other requirements to protect the beneficial uses of waters of the State. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

26. **Report of Waste Discharge Process.** The waste discharge requirements set forth in this Order are based upon the Report of Waste Discharge submitted by the San Diego County Copermittees prior to the expiration of Order No. R9-2007-0001 (NPDES No. CAS0109266). The Orange County and Riverside County Copermittees are not immediately covered by the waste discharge requirements in this Order. The San Diego Water Board understands that each municipality is unique although the Counties share watersheds and geographical boundaries. The Order will continue to use the Report of Waste Discharge process prior to initially making Orange County or Riverside County Copermittees subject to the requirements of this Order.

    The federal regulations (40 CFR 122.21(d)(2)) and CWC section 13376 impose a duty on the Copermittees to reapply for continued coverage through submittal of a Report of Waste Discharge no later than 180 days prior to expiration of a currently effective permit. This requirement is set forth in the Orange County Copermittees' and Riverside County Copermittees' currently effective permits at Provisions K.2.b and K.2.c, respectively. The Orange County Permit, Order No. R9-2009-0002 (NPDES No. CAS0108740) expires on December 16, 2014 and the Riverside County MS4 Permit, Order No. R9-2010-0016 (NPDES No. CAS0108766) expires on November 10, 2015.

    Unless the Orange County or Riverside County Copermittees apply for and receive early coverage under this Order, the Orange County Copermittees' and the Riverside County Copermittees' respective permits will be superseded by this Order upon expiration of their respective permits, subject to any necessary revisions to the requirements of this Order made after the San Diego Water Board considers their respective Reports of Waste Discharge through the public process provided in 40 CFR 124.

27. **Integrated Report and Clean Water Act Section 303(d) List.** The San Diego Water Board and State Water Board submit an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. USEPA issued its *Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act* on July 29, 2005, which advocates the use of a five category approach for classifying the attainment status of water quality standards for water bodies in the Integrated Report. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 in the Integrated Report are placed on the 303(d) List.

    Water bodies with available data and/or information that indicate at least one beneficial use is not being supported or is threatened, but a TMDL is not required, are included in Category 4 in the Integrated Report. Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal

authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

Implementation of the requirements of this Order may allow the San Diego Water Board to include surface waters impaired by discharges from the Copermittees' MS4s in Category 4 in the Integrated Report for consideration during the next 303(d) List submittal by the State to USEPA.

28. **Economic Considerations.** The California Supreme Court has ruled that although CWC section 13263 requires the State and Regional Water Boards (collectively Water Boards) to consider factors set forth in CWC section 13241 when issuing an NPDES permit, the Water Board may not consider the factors to justify imposing pollutant restrictions that are less stringent than the applicable federal regulations require. (*City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 618, 626-627.) However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

    As noted in the following finding, the San Diego Water Board finds that the requirements in this permit are not more stringent than the minimum federal requirements. Therefore, a CWC section 13241 analysis is not required for permit requirements that implement the effective prohibition on the discharge of non-storm water into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determined appropriate to control such pollutants, as those requirements are mandated by federal law. Notwithstanding the above, the San Diego Water Board has developed an economic analysis of the requirements in this Order. The economic analysis is provided in the Fact Sheet.

29. **Unfunded Mandates.** This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following:

    a. This Order implements federally mandated requirements under CWA section 402 (33 USC section 1342(p)(3)(B)).

    b. The local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental and new dischargers who are issued NPDES permits for storm water and non-storm water discharges.

    c. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order.

    d. The Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)) and in lieu of numeric restrictions on

their MS4 discharges (i.e. effluent limitations).

e. The local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under State law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

f. The provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state develops a TMDL, federal law requires that permits must contain water quality based effluent limitations consistent with the assumptions and requirements of any applicable wasteload allocation (40 CFR 122.44(d)(1)(vii)(B)).

See the Fact Sheet for further discussion of unfunded mandates.

30. California Environmental Quality Act. The issuance of waste discharge requirements and an NPDES permit for the discharge of runoff from MS4s to waters of the U.S. is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 et seq.) in accordance with CWC section 13389.

STATE WATER BOARD DECISIONS

31. Compliance with Prohibitions and Limitations. The receiving water limitation language specified in this Order is consistent with language recommended by the USEPA and established in State Water Board Order WQ 99-05, *Own Motion Review of the Petition of Environmental Health Coalition to Review Waste Discharge Requirements Order No. 96-03, NPDES Permit No. CAS0108740*, adopted by the State Water Board on June 17, 1999. The receiving water limitation language in this Order requires storm water discharges from MS4s to not cause or contribute to a violation of water quality standards, which is to be achieved through an iterative approach requiring the implementation of improved and better-tailored BMPs over time. Implementation of the iterative approach to comply with receiving water limitations based on applicable water quality standards is necessary to ensure that storm water discharges from the MS4 will not ultimately cause or contribute to violations of water quality standards and will not create conditions of pollution, contamination, or nuisance.

32. Special Conditions for Areas of Special Biological Significance. On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving an exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges. State Water Board Resolution No. 2012-0012 requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions

were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject terms and conditions of State Water Board Resolution No. 2012-0012. The Special Protections contained in Attachment B to Resolution No. 2012-0012, applicable to these discharges, are hereby incorporated into this Order as if fully set forth herein.

ADMINISTRATIVE FINDINGS

33. **Executive Officer Delegation of Authority.** The San Diego Water Board by prior resolution has delegated all matters that may legally be delegated to its Executive Officer to act on its behalf pursuant to CWC section 13223. Therefore, the Executive Officer is authorized to act on the San Diego Water Board's behalf on any matter within this Order unless such delegation is unlawful under CWC section 13223 or this Order explicitly states otherwise.

34. **Standard Provisions.** Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR 122.42, are provided in Attachment B to this Order.

35. **Fact Sheet.** The Fact Sheet for this Order contains background information, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of this Order. The Fact Sheet is hereby incorporated into this Order and constitutes part of the Findings of this Order.

36. **Public Notice.** In accordance with State and federal laws and regulations, the San Diego Water Board notified the Copermittees, and interested agencies and persons of its intent to prescribe waste discharge requirements for the control of discharges into and from the MS4s to waters of the U.S. and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet.

37. **Public Hearing.** The San Diego Water Board held a public hearing on Month Day, 2013 and heard and considered all comments pertaining to the terms and conditions of this Order. Details of the public hearing are provided in the Fact Sheet.

38. **Effective Date.** This Order serves as an NPDES permit pursuant to CWA section 401 or amendments thereto, and becomes effective fifty (50) days after the date of its adoption, provided that the Regional Administrator, USEPA, Region IX, does not object to this Order.

39. **Review by the State Water Board.** Any person aggrieved by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with CWC section 13320 and California Code of Regulations, title 23,

sections 2050, et seq. The State Water Board must receive the petition by 5:00 p.m., 30 days after the San Diego Water Board action, except that if the thirtieth day following the action falls on a Saturday, Sunday or State holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

THEREFORE, IT IS HEREBY ORDERED that the Copermittees, in order to meet the provisions contained in division 7 of the CWC and regulations adopted thereunder, and the provisions of the CWA and regulations adopted thereunder, must each comply with the following:

II. PROVISIONS

A. PROHIBITIONS AND LIMITATIONS

The purpose of this provision is to describe the conditions under which storm water and non-storm water discharges into and from MS4s are prohibited or limited. The goal of the prohibitions and limitations is to protect the water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through the implementation of water quality improvement strategies and runoff management programs that effectively prohibit non-storm water discharges into the Copermittees' MS4s, and reduce pollutants in storm water discharges from the Copermittees' MS4s to the MEP.

1. Discharge Prohibitions

a. Discharges from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the state are prohibited.

b. Non-storm water discharges into MS4s are to be effectively prohibited, unless such discharges are either authorized by a separate NPDES permit, or the discharge is a category of non-storm water discharges or flows that must be addressed pursuant to Provisions E.2.a.(1)-(5) of this Order.

c. Discharges from MS4s are subject to all waste discharge prohibitions in the Basin Plan, included in Attachment A to this Order.

d. Storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 applicable to these discharges, included in Attachment A to this Order. All other discharges from the Copermittees' MS4s to ASBS are prohibited.

2. Receiving Water Limitations

a. Discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters, including but not limited to all applicable provisions contained in:

(1) The San Diego Water Board's Basin Plan, including beneficial uses, water quality objectives, and implementation plans;

(2) State Water Board plans for water quality control including the following:

(a) Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries (Thermal Plan), and

(b) The Ocean Plan, including beneficial uses, water quality objectives, and implementation plans;

(3) State Water Board policies for water and sediment quality control including the following:

(a) Water Quality Control Policy for the Enclosed Bays and Estuaries of California,

(b) Sediment Quality Control Plan which includes the following narrative objectives for bays and estuaries:

(i) Pollutants in sediments shall not be present in quantities that, alone or in combination, are toxic to benthic communities, and

(ii) Pollutants shall not be present in sediments at levels that will bioaccumulate in aquatic life to levels that are harmful to human health,

(c) The Statement of Policy with Respect to Maintaining High Quality of Waters in California;[1]

(4) Priority pollutant criteria promulgated by the USEPA through the following:

(a) National Toxics Rule (NTR)[2] (promulgated on December 22, 1992 and amended on May 4, 1995), and

(b) California Toxics Rule (CTR).[3,4]

b. Discharges from MS4s composed of storm water runoff must not alter natural ocean water quality in an ASBS.

[1] State Water Board Resolution No. 68-16
[2] 40 CFR 131.36
[3] 65 Federal Register 31682-31719 (May 18, 2000), adding Section 131.38 to 40 CFR
[4] If a water quality objective and a CTR criterion are in effect for the same priority pollutant, the more stringent of the two applies.

3. Effluent Limitations

a. TECHNOLOGY BASED EFFLUENT LIMITATIONS

Pollutants in storm water discharges from MS4s must be reduced to the MEP.[5]

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

This Order establishes water quality based effluent limitations (WQBELs) consistent with the assumptions and requirements of all available TMDL waste load allocations (WLAs) assigned to discharges from the Copermittees' MS4s. Each Copermittee must comply with applicable WQBELs established for the TMDLs in Attachment E to this Order, pursuant to the applicable TMDL compliance schedules.

4. Compliance with Discharge Prohibitions and Receiving Water Limitations

Each Copermittee must achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order through timely implementation of control measures and other actions as specified in Provisions B and E of this Order, including any modifications. The Water Quality Improvement Plans required under Provision B must be designed and adapted to ultimately achieve compliance with Provisions A.1.a, A.1.c and A.2.a.

a. If exceedance(s) of water quality standards persist in receiving waters notwithstanding implementation of this Order, the Copermittees must comply with the following procedures:

(1) For exceedance(s) of a water quality standard in the process of being addressed by the Water Quality Improvement Plan, the Copermittee(s) must implement the Water Quality Improvement Plan as accepted by the San Diego Water Board, and update the Water Quality Improvement Plan, as necessary, pursuant to Provision F.2.c;

(2) Upon a determination by either the Copermittees or the San Diego Water Board that discharges from the MS4 are causing or contributing to a new exceedance of an applicable water quality standard not addressed by the Water Quality Improvement Plan, the Copermittees must submit the following updates to the Water Quality Improvement Plan pursuant to Provision F.2.c or as part of the Annual Report required under Provision F.3.b, unless the San Diego Water Board directs an earlier submittal:

[5] This does not apply to MS4 discharges which receive subsequent treatment to reduce pollutants in storm water discharges to the MEP prior to entering receiving waters (e.g., low flow diversions to the sanitary sewer). Runoff treatment must occur prior to the discharge of runoff into receiving waters per Finding 7.

(a) The water quality improvement strategies being implemented that are effective and will continue to be implemented,

(b) Water quality improvement strategies (i.e. BMPs, retrofitting projects, stream and/or habitat rehabilitation or restoration projects, adjustments to jurisdictional runoff management programs, etc.) that will be implemented to reduce or eliminate any pollutants or conditions that are causing or contributing to the exceedance of water quality standards,

(c) Updates to the schedule for implementation of the existing and additional water quality improvement strategies, and

(d) Updates to the monitoring and assessment program to track progress toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a of this Order;

(3) The San Diego Water Board may require the incorporation of additional modifications to the Water Quality Improvement Plan required under Provision B. The applicable Copermittees must submit any modifications to the update to the Water Quality Improvement Plan within 90 days of notification that additional modifications are required by the San Diego Water Board, or as otherwise directed;

(4) Within 90 days of the San Diego Water Board determination that the update to the Water Quality Improvement Plan meets the requirements of this Order, the applicable Copermittees must revise the jurisdictional runoff management program documents to incorporate the updated water quality improvement strategies that have been and will be implemented, the implementation schedule, and any additional monitoring required; and

(5) Each Copermittee must implement the updated Water Quality Improvement Plan.

b. The procedure set forth above to achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order do not have to be repeated for continuing or recurring exceedances of the same water quality standard(s) following implementation of scheduled actions unless directed to do otherwise by the San Diego Water Board.

c. Nothing in Provisions A.4.a and A.4.b prevents the San Diego Water Board from enforcing any provision of this Order while the applicable Copermittees prepare and implement the above update to the Water Quality Improvement Plan and jurisdictional runoff management programs.

B. WATER QUALITY IMPROVEMENT PLANS

The purpose of this provision is to develop Water Quality Improvement Plans that guide the Copermittees' jurisdictional runoff management programs towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plans is to protect, preserve, enhance, and restore the water quality and designated beneficial uses of waters of the state. This goal will be accomplished through an adaptive planning and management process that identifies the highest priority water quality conditions within a watershed and implements strategies through the jurisdictional runoff management programs to achieve improvements in the quality of discharges from the MS4s and receiving waters.

1. Watershed Management Areas

The Copermittees must develop a Water Quality Improvement Plan for each of the Watershed Management Areas in Table B-1. A total of ten Water Quality Improvement Plans must be developed for the San Diego Region.

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
San Juan (901.00)	South Orange County	- Aliso Creek - San Juan Creek - San Mateo Creek - Pacific Ocean - Heisler Park ASBS	- City of Aliso Viejo[1] - City of Dana Point[1] - City of Laguna Beach[1] - City of Laguna Hills[1] - City of Laguna Niguel[1] - City of Laguna Woods[1] - City of Lake Forest[1] - City of Mission Viejo[1] - City of Rancho Santa Margarita[1] - City of San Clemente[1] - City of San Juan Capistrano[1] - County of Orange[1] - Orange County Flood Control District[1]
Santa Margarita (902.00)	Santa Margarita River	- Murrieta Creek - Temecula Creek - Santa Margarita River - Santa Margarita Lagoon - Pacific Ocean	- City of Murrieta[2] - City of Temecula[2] - City of Wildomar[2] - County of Riverside[2] - County of San Diego[3] - Riverside County Flood Control and Water Conservation District[2]
San Luis Rey (903.00)	San Luis Rey River	- San Luis Rey River - San Luis Rey Estuary - Pacific Ocean	- City of Oceanside - City of Vista - County of San Diego

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
Carlsbad (904.00)	Carlsbad	- Loma Alta Slough - Buena Vista Lagoon - Agua Hedionda Lagoon - Batiquitos Lagoon - San Elijo Lagoon - Pacific Ocean	- City of Carlsbad - City of Encinitas - City of Escondido - City of Oceanside - City of San Marcos - City of Solana Beach - City of Vista - County of San Diego
San Dieguito (905.00)	San Dieguito River	- San Dieguito River - San Dieguito Lagoon - Pacific Ocean	- City of Del Mar - City of Escondido - City of Poway - City of San Diego - City of Solana Beach - County of San Diego
Penasquitos (906.00)	Penasquitos	- Los Penasquitos Lagoon - Pacific Ocean	- City of Del Mar - City of Poway - City of San Diego - County of San Diego
	Mission Bay	- Mission Bay - Pacific Ocean - San Diego Marine Life Refuge ASBS	- City of San Diego
San Diego (907.00)	San Diego River	- San Diego River - Pacific Ocean	- City of El Cajon - City of La Mesa - City of San Diego - City of Santee - County of San Diego
Pueblo San Diego (908.00) Sweetwater (909.00) Otay (910.00)	San Diego Bay	- Sweetwater River - Otay River - San Diego Bay - Pacific Ocean	- City of Chula Vista - City of Coronado - City of Imperial Beach - City of La Mesa - City of Lemon Grove - City of National City - City of San Diego - County of San Diego - San Diego County Regional Airport Authority - San Diego Unified Port District
Tijuana (911.00)	Tijuana River	- Tijuana River - Tijuana Estuary - Pacific Ocean	- City of Imperial Beach - City of San Diego - County of San Diego

Notes:
1. The Orange County Copermittees will be covered under this Order after expiration of Order No. R9-2009-0002, or earlier if the Orange County Copermittees meet the conditions in Provision F.6.
2. The Riverside County Copermittees will be covered under this Order after expiration of Order No. R9-2010-0016, or earlier if the Riverside County Copermittees meet the conditions in Provision F.6.
3. The County of San Diego is required to implement the requirements of Provision B for its jurisdiction within the Santa Margarita River Watershed Management Area until the Riverside County Copermittees have been notified of coverage under this Order.

2. Priority Water Quality Conditions

The Copermittees must identify the water quality priorities within each Watershed Management Area that will be addressed by the Water Quality Improvement Plan. Where appropriate, Watershed Management Areas may be separated into subwatersheds to focus water quality prioritization and jurisdictional runoff management program implementation efforts by receiving water.

a. Assessment of Receiving Water Conditions

The Copermittees must consider the following, at a minimum, to identify water quality priorities based on impacts of MS4 discharges on receiving water beneficial uses:

(1) Receiving waters listed as impaired on the CWA Section 303(d) List of Water Quality Limited Segments (303(d) List);

(2) TMDLs adopted and under development by the San Diego Water Board;

(3) Receiving waters recognized as sensitive or highly valued by the Copermittees, including estuaries designated under the National Estuary Program under CWA section 320, wetlands defined by the State or U.S. Fish and Wildlife Service's National Wetlands Inventory as wetlands, and receiving waters identified as ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (Attachment A);

(4) The receiving water limitations of Provision A.2;

(5) Known historical versus current physical, chemical, and biological water quality conditions;

(6) Available, relevant, and appropriately collected and analyzed physical, chemical, and biological receiving water monitoring data, including, but not limited to, data describing:

(a) Chemical constituents,

(b) Water quality parameters (i.e. pH, temperature, conductivity, etc.),

(c) Toxicity Identification Evaluations for both receiving water column and sediment,

(d) Trash impacts,

(e) Bioassessments, and

(f) Physical habitat;

(7) Available evidence of erosional impacts in receiving waters due to accelerated flows (i.e. hydromodification);

(8) Available evidence of adverse impacts to the chemical, physical, and biological integrity of receiving waters; and

(9) The potential improvements in the overall condition of the Watershed Management Area that can be achieved.

b. ASSESSMENT OF IMPACTS FROM MS4 DISCHARGES

The Copermittees must consider the following, at a minimum, to identify the potential impacts to receiving waters that may be caused or contributed to by discharges from the Copermittees' MS4s:

(1) The discharge prohibitions of Provision A.1 and effluent limitations of Provision A.3; and

(2) Available, relevant, and appropriately collected and analyzed storm water and non-storm water monitoring data from the Copermittees' MS4 outfalls;

(3) Locations of each Copermittee's MS4 outfalls that discharge to receiving waters;

(4) Locations of MS4 outfalls that are known to persistently discharge non-storm water to receiving waters likely causing or contributing to impacts on receiving water beneficial uses;

(5) Locations of MS4 outfalls that are known to discharge pollutants in storm water causing or contributing to impacts on receiving water beneficial uses; and

(6) The potential improvements in the quality of discharges from the MS4 that can be achieved.

c. IDENTIFICATION OF PRIORITY WATER QUALITY CONDITIONS

(1) The Copermittees must use the information gathered for Provisions B.2.a and B.2.b to develop a list of priority water quality conditions as pollutants, stressors and/or receiving water conditions that are the highest threat to receiving water quality or that most adversely affect the physical, chemical, and biological integrity of receiving waters. The list must include the following information for each priority water quality condition:

(a) The beneficial use(s) associated with the priority water quality condition;

(b) The geographic extent of the priority water quality condition within the Watershed Management Area, if known;

(c) The temporal extent of the priority water quality condition (e.g., dry weather and/or wet weather);

(d) The Copermittees with MS4s discharges that may cause or contribute to the priority water quality condition; and

(e) An assessment of the adequacy of and data gaps in the monitoring data to characterize the conditions causing or contributing to the priority water quality condition, including a consideration of spatial and temporal variation.

(2) The Copermittees must identify the highest priority water quality conditions to be addressed by the Water Quality Improvement Plan, and provide a rationale for selecting a subset of the water quality conditions identified pursuant to Provision B.2.c.(1) as the highest priorities.

d. IDENTIFICATION OF MS4 SOURCES OF POLLUTANTS AND/OR STRESSORS

The Copermittees must identify and prioritize known and suspected sources of storm water and non-storm water pollutants and/or other stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c. The identification of known and suspected sources of pollutants and/or stressors that cause or contribute to the highest priority water quality conditions as identified for Provision B.2.c must consider the following:

(1) Pollutant generating facilities, areas, and/or activities within the Watershed Management Area, including:

(a) Each Copermittee's inventory of construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas,

(b) Publicly owned parks and/or recreational areas,

(c) Open space areas,

(d) All currently operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste, and

(e) Areas not within the Copermittees' jurisdictions (e.g., Phase II MS4s, tribal lands, state lands, federal lands) that are known or suspected to be discharging to the Copermittees' MS4s;

(2) Locations of the Copermittees' MS4s, including the following:

(a) All MS4 outfalls that discharge to receiving waters, and

(b) Locations of major structural controls for storm water and non-storm water (e.g., retention basins, detention basins, major infiltration devices, etc.);

(3) Other known and suspected sources of non-storm water or pollutants in storm water discharges to receiving waters within the Watershed Management Area, including the following:

(a) Other MS4 outfalls (e.g., Phase II Municipal and Caltrans),

(b) Other NPDES permitted discharges,

(c) Any other discharges that may be considered point sources (e.g., private outfalls), and

(d) Any other discharges that may be considered non-point sources (e.g., agriculture, wildlife or other natural sources);

(4) Review of available data, including but not limited to:

(a) Findings from the Copermittees' illicit discharge detection and elimination programs,

(b) Findings from the Copermittees' MS4 outfall discharge monitoring,

(c) Findings from the Copermittees' receiving water monitoring,

(d) Findings from the Copermittees' MS4 outfall discharge and receiving water assessments, and

(e) Other available, relevant, and appropriately collected data, information, or studies related to pollutant sources and/or stressors that contribute to the highest priority water quality conditions as identified for Provision B.2.c.

(5) The adequacy of the available data to identify and prioritize sources and/or stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c.

e. NUMERIC GOALS AND SCHEDULES

The Copermittees must develop and incorporate interim and final numeric goals[6] and schedules into the Water Quality Improvement Plan. Numeric goals must be used to support Water Quality Improvement Plan implementation and measure progress towards addressing the highest priority water quality conditions identified under Provision B.2.c. When establishing numeric goals and corresponding schedules, the Copermittees must consider the following:

(1) Final numeric goals must be based on measureable criteria or indicators, to be achieved in the receiving waters and/or MS4 discharges for the highest priority water quality conditions which will be capable of demonstrating the achievement of the restoration and/or protection of water quality standards in receiving waters;

(2) Interim numeric goals must be based on measureable criteria or indicators capable of demonstrating incremental progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges; and

(3) Schedules must be adequate for measuring progress toward achieving the interim and final numeric goals required for Provisions B.2.e.(1) and B.2.e.(2). Schedules must incorporate the following:

(a) Interim dates for achieving the interim numeric goals,

(b) Compliance schedules for any applicable TMDLs in Attachment E to this Order,

(c) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A),

(d) Achievement of the final numeric goals in the receiving waters and/or MS4 discharges for the highest water quality priorities must be as soon as possible, and

(e) Final dates for achieving the final numeric goals must not initially extend more than 10 years beyond the effective date of this Order, unless a longer period of time is authorized by the San Diego Water Board Executive Officer or the schedule includes an applicable TMDL in Attachment E to this Order.

[6] Interim and final numeric goals may take a variety of forms such as TMDL established WQBELs, action levels, pollutant concentration, load reductions, number of impaired water bodies delisted from the List of Water Quality Impaired Segments, Index of Biotic Integrity (IBI) scores, or other appropriate metrics. Interim and final numeric goals are not necessarily limited to one criterion or indicator, but may include multiple criteria and/or indicators. Except for TMDL established WQBELs, interim and final numeric goals and corresponding schedules may be revised through the adaptive management process under Provision B.5.

3. Water Quality Improvement Strategies and Schedules

The Copermittees must develop specific water quality improvement strategies to address the highest priority water quality conditions identified within a Watershed Management Area. The water quality improvement strategies must address the highest priority water quality conditions by preventing or eliminating non-storm water discharges to and from the MS4, reducing pollutants in storm water discharges from the MS4 to the MEP, and restoring and/or protecting the water quality standards of receiving waters.

a. WATER QUALITY IMPROVEMENT STRATEGIES

The Copermittees must identify and prioritize water quality improvement strategies based on their likely effectiveness and efficiency, and implement strategies to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, improve the physical, chemical, and biological receiving water conditions, and achieve the interim and final numeric goals in accordance with the schedules required for Provision B.2.e.(3). The following water quality improvement strategies must be included and described in the Water Quality Improvement Plan:

(1) Specific strategies and/or activities that may be implemented by one or more Copermittees within their jurisdictions through the jurisdictional runoff management programs that will address the highest priority water quality conditions within the Watershed Management Area, in accordance with the following requirements:

(a) Strategies and/or activities must, at a minimum, be described for each jurisdictional runoff management program component where strategies to address the highest priority water quality conditions are required under Provision E;

(b) The Water Quality Improvement Plan must describe the circumstances or conditions when and where the strategies or/activities should be or will be implemented, but specific details about how each Copermittee will implement the strategies and/or activities within its jurisdiction are not required; and

(c) Descriptions of strategies and/or activities must include any monitoring, information collection, special studies, and/or data analysis that is necessary to assess the effectiveness of the strategy and/or activity toward addressing the highest priority water quality conditions.

(2) Additional strategies and/or activities that may be implemented within the Watershed Management Area on a jurisdictional, sub-watershed, or watershed scale by one or more Copermittees, not specifically required under Provision E, which are designed to achieve the interim and final numeric goals identified in Provisions B.2.e.(1) and B.2.e.(2);

b. IMPLEMENTATION SCHEDULES

(1) The Copermittees must develop schedules for implementing the water quality improvement strategies identified under Provision B.3.a to achieve the interim and final numeric goals identified under Provision B.2.e.(1) and B.2.e.(2). Schedules must be developed for both the water quality improvement strategies implemented by each Copermittee within its jurisdiction and for strategies that the Copermittees choose to implement on a collaborative basis.

(2) The Copermittees must incorporate the implementation compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

4. Water Quality Improvement Monitoring and Assessment Program

a. The Copermittees in each Watershed Management Area must develop and incorporate an integrated monitoring and assessment program into the Water Quality Improvement Plan that assesses: 1) the progress toward achieving the numeric goals and schedules, 2) the progress toward addressing the highest priority water quality conditions for each Watershed Management Area, and 3) each Copermittee's overall efforts to implement the Water Quality Improvement Plan.

b. The monitoring and assessment program must incorporate the monitoring and assessment requirements of Provision D, which may allow the Copermittees to modify the program to be consistent with and focus on the highest priority water quality conditions for each Watershed Management Area.

c. For Watershed Management Areas with applicable TMDLs, the monitoring and assessment program must incorporate the specific monitoring and assessment requirements of Attachment E.

d. For Watershed Management Areas with any ASBS, the water quality monitoring and assessment program must incorporate the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

5. Iterative Approach and Adaptive Management Process

The Copermittees in each Watershed Management Area must implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a, and must include the following:

a. Re-Evaluation of Priority Water Quality Conditions

The priority water quality conditions, and numeric goals and corresponding schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.2.c and B.2.e, may be re-evaluated by the Copermittees as needed during the term of this Order as part of the Annual Report. Re-evaluation and recommendations for modifications to the priority water quality conditions, and numeric goals and corresponding schedules must be provided in the Report of Waste Discharge, and must consider the following:

(1) Achieving the outcome of improved water quality in MS4 discharges and receiving waters through implementation of the water quality improvement strategies identified in the Water Quality Improvement Plan;

(2) Progress toward achieving interim and final numeric goals in receiving waters and/or MS4 discharges for the highest priority water quality conditions in the Watershed Management Area,

(3) Progress toward achieving outcomes according to established schedules;

(4) New information developed when the requirements of Provisions B.2.a-c have been re-evaluated;

(5) New policies or regulations that may affect identified numeric goals;

(6) Spatial and temporal accuracy of monitoring data collected to inform prioritization of water quality conditions and implementation strategies to address the highest priority water quality conditions;

(7) Availability of new information and data from sources other than the jurisdictional runoff management programs within the Watershed Management Area that informs the effectiveness of the actions implemented by the Copermittees;

(8) San Diego Water Board recommendations; and

(9) Recommendations for modifications solicited through a public participation process.

b. Adaptation of Strategies and Schedules

The water quality improvement strategies and schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.3, must be re-evaluated and adapted as new information becomes available to result in more effective and efficient measures to achieve the numeric goals established pursuant to Provision B.2.e. Re-evaluation of and modifications to the water quality improvement strategies must be provided in the Annual Report, and must consider the following:

(1) Modifications to the priority water quality conditions, and numeric goals and corresponding schedules based on Provision B.5.a;

(2) Measurable or demonstrable reductions of non-storm water discharges to and from each Copermittee's MS4;

(3) Measurable or demonstrable reductions of pollutants in storm water discharges from each Copermittee's MS4 to the MEP;

(4) New information developed when the requirements of Provisions B.2.b and B.2.d have been re-evaluated;

(5) Efficiency in implementing the Water Quality Improvement Plan;

(6) San Diego Water Board recommendations; and

(7) Recommendations for modifications solicited through a public participation process.

c. ADAPTATION OF MONITORING AND ASSESSMENT PROGRAM

The water quality improvement monitoring and assessment program, included in the Water Quality Improvement Plan pursuant to Provisions B.4, must be re-evaluated and adapted when new information becomes available. Re-evaluation and recommendations for modifications to the monitoring and assessment program, pursuant to the requirements of Provision D, may be provided in the Annual Report, but must be provided in the Report of Waste Discharge.

6. Water Quality Improvement Plan Submittal, Updates, and Implementation

a. The Copermittees must submit the Water Quality Improvement Plans in accordance with the requirements of Provision F.1.

b. The Copermittees must submit proposed updates to the Water Quality Improvement Plan for acceptance by the San Diego Water Board Executive Officer in accordance with the requirements of Provision F.2.c.

c. The Copermittees must commence with implementation of the Water Quality Improvement Plans immediately after acceptance by the San Diego Water Board, in accordance with the schedules, or subsequently updated schedules, within the Water Quality Improvement Plan.

C. ACTION LEVELS

The purpose of this provision is for the Copermittees to incorporate numeric action levels in the Water Quality Improvement Plans. The goal of the action levels is to guide Water Quality Improvement Plan implementation efforts and measure progress towards the protection of water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through monitoring and assessing the quality of the MS4 discharges during the implementation of the Water Quality Improvement Plans.

1. Non-Storm Water Action Levels[7]

The Copermittees must develop and incorporate numeric non-storm water action levels (NALs) into the Water Quality Improvement Plan to: 1) support the development and prioritization of water quality improvement strategies for addressing non-storm water discharges to and from the MS4s, 2) assess the effectiveness of the water quality improvement strategies toward addressing MS4 non-storm water discharges, required pursuant to Provision D.4.b.(1), and 3) support the detection and elimination of non-storm water and illicit discharges to and from the MS4, required pursuant to Provision E.2.[8]

a. The following NALs must be incorporated:

(1) Non-Storm Water Discharges from MS4s to Ocean Surf Zone

Table C-1. Non-Storm Water Action Levels for Discharges from MS4s to Ocean Surf Zone

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Total Coliform	MPN/100 ml	1,000	-	10,000/1,000[1]	OP
Fecal Coliform	MPN/100 ml	200[2]	-	400	OP
Enterococci	MPN/100 ml	35	-	104[3]	OP

Abbreviations/Acronyms
AMAL – average monthly action level
MDAL – maximum daily action level
OP – Ocean Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Total coliform density NAL is 1,000 MPN/100 ml when the fecal/total coliform ratio exceeds 0.1.
2. Fecal coliform density NAL is 200 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas."

[7] NALs are not considered by the San Diego Water Board to be enforceable limitations.
[8] The Copermittees may utilize NALs or other benchmarks currently established by the Copermittees as interim NALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

(2) Non-Storm Water Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Table C-2. Non-Storm Water Action Levels for Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Turbidity	NTU	75	-	225	OP
pH	Units	Within limit of 6.0 to 9.0 at all times			OP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	35	-	104[3]	BP
Priority Pollutants	ug/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
OP – Ocean Plan water quality objective
NTU – Nephelometric Turbidity Units
ug/L – micrograms per liter
MDAL – maximum daily action level
BP – Basin Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas" and is not applicable to waterbodies that are not designated with the water contact recreation (REC-1) beneficial use.

Table C-3. Non-Storm Water Action Levels for Priority Pollutants

Parameter	Units	Freshwater (CTR)		Saltwater (CTR)	
		MDAL	AMAL	MDAL	AMAL
Cadmium	ug/L	**	**	16	8
Copper	ug/L	*	*	5.8	2.9
Chromium III	ug/L	**	**	-	-
Chromium VI	ug/L	16	8.1	83	41
Lead	ug/L	*	*	14	2.9
Nickel	ug/L	**	**	14	6.8
Silver	ug/L	*	*	2.2	1.1
Zinc	ug/L	*	*	95	47

Abbreviations/Acronyms:
CTR – California Toxic Rule
AMAL – average monthly action level
ug/L – micrograms per liter
MDAL – maximum daily action level

Notes:
* Action levels developed on a case-by-case basis (see below)
** Action levels developed on a case-by-case basis (see below), but calculated criteria are not to exceed Maximum Contaminant Levels (MCLs) under the California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64431

The Cadmium, Copper, Chromium (III), Lead, Nickel, Silver and Zinc NALs for MS4 discharges to freshwater receiving waters will be developed on a case-by-case basis because the freshwater criteria are based on site-specific water quality data (receiving water hardness). For these priority pollutants, the following equations (40 CFR 131.38.b.2) will be required:

Cadmium (Total Recoverable) = exp(0.7852[ln(hardness)] - 2.715)
Chromium III (Total Recoverable) = exp(0.8190[ln(hardness)] + 0.6848)
Copper (Total Recoverable) = exp(0.8545[ln(hardness)] - 1.702)
Lead (Total Recoverable) = exp(1.273[ln(hardness)] - 4.705)
Nickel (Total Recoverable) = exp(.8460[ln(hardness)] + 0.0584)
Silver (Total Recoverable) = exp(1.72[ln(hardness)] - 6.52)
Zinc (Total Recoverable) = exp(0.8473[ln(hardness)] + 0.884)

(3) Non-Storm Water Discharges from MS4s to Inland Surface Waters

Table C-4. Non-Storm Water Action Levels for Discharges from MS4s to Inland Surface Waters

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Dissolved Oxygen	mg/L	Not less than 5.0 in WARM waters and not less than 6.0 in COLD waters			BP
Turbidity	NTU	-	20	See MDAL	BP
pH	Units	Within limit of 6.5 to 8.5 at all times			BP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	33	-	61[3]	BP
Total Nitrogen	mg/L	-	1.0	See MDAL	BP
Total Phosphorus	mg/L	-	0.1	See MDAL	BP
MBAS	mg/L	-	0.5	See MDAL	BP
Iron	mg/L	-	0.3	See MDAL	BP
Manganese	mg/L	-	0.05	See MDAL	BP
Priority Pollutants	ug/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
BP – Basin Plan water quality objective
COLD – cold freshwater habitat beneficial use
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
MDAL – maximum daily action level
WARM – warm freshwater habitat beneficial use
MBAS – Methylene Blue Active Substances
MPN/100 ml – most probable number per 100 milliliters
ug/L – micrograms per liter

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for freshwater "designated beach areas" and is not applicable to waterbodies that are not designated with the water contact recreation (REC-1) beneficial use.

b. If not identified in Provision C.1.a, NALs must be identified, developed and incorporated in the Water Quality Improvement Plan for any pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in waters of the state associated with the highest priority water quality conditions related to non-storm water discharges from the MS4s. NALs must be based on:

(1) Applicable water quality standards which may be dependent upon site-specific or receiving water-specific conditions or assumptions to be identified by the Copermittees; or

(2) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the NALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary NALs specific to the Watershed Management Area at levels greater than the NALs required by Provisions C.1.a and C.1.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for addressing non-storm water discharges to and from the MS4s, as well as the detection and

elimination of non-storm water and illicit discharges to and from the MS4. The secondary NALs may be developed using an approach acceptable to the San Diego Water Board.

d. Dry weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.b may be utilized to develop or revise NALs based on watershed-specific data, subject to San Diego Water Board Executive Officer approval.

2. Storm Water Action Levels[9]

The Copermittees must develop and incorporate numeric storm water action levels (SALs) in the Water Quality Improvement Plans to: 1) support the development and prioritization of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s, and 2) assess the effectiveness of the water quality improvement strategies toward reducing pollutants in storm water discharges, required pursuant to Provision D.4.b.(2).[10]

a. The following SALs for discharges of storm water from the MS4 must be incorporated:

Table C-5. Storm Water Action Levels for Discharges from MS4s to Receiving Waters

Parameter	Units	Action Level
Turbidity	NTU	126
Nitrate & Nitrite (Total)	mg/L	2.6
Phosphorus (Total P)	mg/L	1.46
Cadmium (Total Cd)*	µg/L	3.0
Copper (Total Cu)*	µg/L	127
Lead (Total Pb)*	µg/L	250
Zinc (Total Zn)*	µg/L	976

Abbreviations/Acronyms:
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
ug/L – micrograms per liter

Notes:
* The sampling must include a measure of receiving water hardness at each MS4 outfall. If a total metal concentration exceeds the corresponding metals SAL in Table C-5, that concentration must be compared to the California Toxics Rule criteria and the USEPA 1-hour maximum concentration for the detected level of receiving water hardness associated with that sample. If it is determined that the sample's total metal concentration for that specific metal exceeds that SAL, but does not exceed the applicable USEPA 1-hour maximum concentration criterion for the measured level of hardness, then the sample result will not be considered above the SAL for that measurement.

[9] SALs are not considered by the San Diego Water Board to be enforceable limitations.
[10] The Copermittees may utilize SALs or other benchmarks currently established by the Copermittees as interim SALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

b. If not identified in Provision C.2.a, SALs must be identified, developed and incorporated in the Water Quality Improvement Plan for pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in waters of the state associated with the highest water quality priorities related to storm water discharges from the MS4s. SALs must be based on:

(1) Federal and State water quality guidance and/or water quality standards; and

(2) Site-specific or receiving water-specific conditions; or

(3) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the SALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary SALs specific to the Watershed Management Area at levels greater than the SALs required by Provisions C.2.a and C.2.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s. The secondary SALs may be developed based on the approaches recommended by the State Water Board's Storm Water Panel[11] or using an approach acceptable to the San Diego Water Board.

d. Wet weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.c may be used to develop or revise SALs based upon watershed-specific data, subject to San Diego Water Board Executive Officer approval.

[11] Storm Water Panel Recommendations to the California State Water Resources Control Board: The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities (June 2006)

D. MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS

The purpose of this provision is for the Copermittees to monitor and assess the impact on the chemical, physical, and biological conditions of receiving waters caused by discharges from the Copermittees' MS4s under wet weather and dry weather conditions. The goal of the monitoring and assessment program is to inform the Copermittees about the nexus between the health of receiving waters and the water quality condition of the discharges from their MS4s. This goal will be accomplished through monitoring and assessing the conditions of the receiving waters, discharges from the MS4s, pollutant sources and/or stressors, and effectiveness of the water quality improvement strategies implemented as part of the Water Quality Improvement Plans.

1. Receiving Water Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the condition of the receiving waters in each Watershed Management Area during dry weather and wet weather. Following acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct long-term receiving water monitoring during implementation of the Water Quality Improvement Plan to assess the long term trends and determine if conditions in receiving waters are improving. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following receiving water monitoring procedures:

a. TRANSITIONAL RECEIVING WATER MONITORING

Until the monitoring requirements of Provisions D.1.b-e are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following receiving water monitoring in the Watershed Management Area:

(1) Continue the receiving water monitoring programs required in Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016;

(2) Continue the monitoring in the Hydromodification Management Plans approved by the San Diego Water Board;

(3) Participate in the following regional receiving water monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring,

(b) Southern California Bight Regional Monitoring, and

(c) Sediment Quality Monitoring;

(4) Implement the monitoring programs developed as part of any implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) for the TMDLs in Attachment E to this Order; and

(5) For Watershed Management Areas with ASBS, implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

b. LONG-TERM RECEIVING WATER MONITORING STATIONS

The Copermittees must select at least one long-term receiving water monitoring station from among the existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees to be representative of the receiving water quality in the Watershed Management Area. Additional long-term receiving water monitoring stations must be selected where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

c. DRY WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three dry weather monitoring events at each of the long-term receiving water monitoring stations. At least one monitoring event must be conducted during the dry season (May 1 – September 30) and at least one monitoring event must be conducted during a dry weather period during the wet season (October 1 – April 30), after the first wet weather event of the season, with an antecedent dry period of at least 72 hours following a storm event producing measureable rainfall of greater than 0.1 inch.

(1) Dry Weather Receiving Water Field Observations

For each dry weather monitoring event, the Copermittees must record field observations consistent with Table D-1 at each long-term receiving water monitoring station.

Table D-1. Field Observations for Receiving Water Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) • Station description (i.e. deposits or stains, vegetation condition, structural condition, and observable biology) • Presence and assessment of trash in and around station

(2) Dry Weather Receiving Water Field Monitoring

For each dry weather monitoring event, if conditions allow the collection of the data, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

Table D-2. Field Monitoring Parameters for Receiving Water Monitoring Stations

Parameters
• pH • Temperature • Specific conductivity • Dissolved oxygen • Turbidity

(3) Dry Weather Receiving Water Analytical Monitoring

For each dry weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable NAL constituents, and

(v) Constituents listed in Table D-3.

Table D-3. Analytical Monitoring Constituents for Receiving Water Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Pesticides	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Mercury • Nickel • Selenium • Thallium • Zinc	• Organophosphate Pesticides • Pyrethroid Pesticides	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(4) Dry Weather Receiving Water Toxicity Monitoring

For each dry weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for toxicity in accordance with Table D-4:

Table D-4. Dry Weather Toxicity Testing for Receiving Water Monitoring Stations

Freshwater Organism	Test Approach	USEPA Protocol[2]
Pimephales promelas	1 acute 1 chronic[1]	EPA-821-R-02-012
Hyalella Azteca	1 acute 1 chronic[1]	EPA-821-R-02-012
Psuedokirchneriella subcapitata	1 acute 1 chronic[1]	EPA-821-R-02-013

Notes:
1. Chronic toxicity testing is not required at receiving water monitoring stations located at mass loading stations if the channel flows are diverted year-round during dry weather conditions to the sanitary sewer for treatment.
2. USEPA protocols must be utilized for toxicity testing unless alternate toxicity testing protocols have been approved by the San Diego Water Board.

(5) Dry Weather Receiving Water Bioassessment Monitoring

Bioassessment monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must conduct bioassessment monitoring during at least one dry weather monitoring event at each long-term receiving water monitoring station as follows:

(a) The following bioassessment samples and measurements must be collected:

(i) Macroinvertebrate samples must be collected in accordance with the "Reachwide Benthos (Multihabitat) Procedure" in the most current Surface Water Ambient Monitoring Program (SWAMP) Bioassessment Standard Operating Procedures (SOP), and amendments, as applicable;[12]

(ii) The "Full" suite of physical habitat characterization measurements must be collected in accordance with the most current SWAMP Bioassessment SOP, and as summarized in the SWAMP Stream Habitat Characterization Form – Full Version;[13] and

(iii) Freshwater algae samples must be collected in accordance with the SWAMP Standard Operating Procedures for Collecting Algae

[12] Ode, P.R.. 2007. Standard operating procedures for collecting macroinvertebrate samples and associated physical and chemical data for ambient bioassessments in California. California State Water Resources Control Board Surface Water Ambient Monitoring Program (SWAMP) Bioassessment SOP 001. http://www.swrcb.ca.gov/water_issues/programs/swamp/tools.shtml#monitoring
[13] Available at: http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/reports/fieldforms_fullversion052908.pdf

Samples.[14] Analysis of samples must include algal taxonomic composition (diatoms and soft algae) and algal biomass.

(b) The bioassessment samples, measurements, and appropriate water chemistry data must be used to calculate the following:

(i) An Index of Biological Integrity (IBI) for macroinvertebrates for each monitoring station where bioassessment monitoring was conducted, based on the most current calculation method;[15] and

(ii) An IBI for algae for each monitoring station where bioassessment monitoring was conducted, when a calculation method is developed.[16]

(c) In lieu of the requirements of Provision D.1.c.(5)(a), the Copermittees may conduct the bioassessment monitoring in accordance with the "Triad" assessment approach[17] to calculate the IBIs required for Provision D.1.c.(5)(b). The Copermittees must conduct sampling, analysis, and reporting of specified in-stream biological and habitat data according to the protocols specified in the SCCWRP Technical Report No. 539, or subsequent protocols, if developed.

(6) Dry Weather Receiving Water Hydromodification Monitoring

In addition to the hydromodification monitoring conducted as part of the Copermittees' Hydromodification Management Plans, hydromodification monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must collect the following hydromodification monitoring observations and measurements within an appropriate domain of analysis during at least one dry weather monitoring event for each long-term receiving water monitoring station:

(a) Channel conditions, including:

(i) Channel dimensions,

[14] Fetscher et al. 2009. Standard Operating Procedures for Collecting Stream Algae Samples and Associated Physical Habitat and Chemical Data for Ambient Bioassessments in California.
[15] The most current calculation method at the time the Order was adopted is outlined in "A Quantitative Tool for Assessing the Integrity of Southern California Coastal Streams" (Ode, et al. 2005. Environmental Management. Vol. 35, No. 1, pp. 1-13). If an updated or new calculation method is developed, either both (i.e. current and updated/new) methods must be used, or historical IBIs must be recalculated with the updated or new calculation method.
[16] When a calculation method is developed, IBIs must be calculated for all available and appropriate historical data.
[17] Stormwater Monitoring Coalition Model Monitoring Technical Committee, 2004. Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California. Technical Report #419. August 2004.

(ii) Hydrologic and geomorphic conditions, and

(iii) Presence and condition of vegetation and habitat;

(b) Location of discharge points;

(c) Habitat integrity;

(d) Photo documentation of existing erosion and habitat impacts, with location (i.e. latitude and longitude coordinates) where photos were taken;

(e) Measurement or estimate of dimensions of any existing channel bed or bank eroded areas, including length, width, and depth of any incisions; and

(f) Known or suspected cause(s) of existing downstream erosion or habitat impact, including flow, soil, slope, and vegetation conditions, as well as upstream land uses and contributing new and existing development.

d. WET WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three wet weather monitoring events at each long-term receiving water monitoring station. At least one wet weather monitoring event must be conducted during the first wet weather event of the wet season (October 1 – April 30), and at least one wet weather monitoring event during a wet weather event that occurs after February 1.

(1) Wet Weather Receiving Water Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each long-term receiving water monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event;

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(d) Presence and assessment of trash in and around station.

(2) Wet Weather Receiving Water Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

(3) Wet Weather Receiving Water Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) Constituents listed in Table D-3.

(4) Wet Weather Receiving Water Toxicity Monitoring

For each wet weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for toxicity in accordance with Table D-5:

Table D-5. Wet Weather Toxicity Testing for Receiving Water Monitoring Stations

Freshwater Organism	Test Approach	USEPA Protocol[1]
Pimephales promelas	1 acute	EPA-821-R-02-012
Hyalella Azteca	1 acute	EPA-821-R-02-012
Psuedokirchneriella subcapitata	1 acute	EPA-821-R-02-013

Notes:
1. USEPA protocols must be utilized for toxicity testing unless alternate toxicity testing protocols have been approved by the San Diego Water Board.

e. Other Receiving Water Monitoring Requirements

(1) Regional Monitoring

The Copermittees must participate in the following regional receiving waters monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring; and

(b) Southern California Bight Regional Monitoring.

(2) Sediment Quality Monitoring

The Copermittees must perform sediment monitoring to assess compliance with sediment quality receiving water limits applicable to MS4 discharges to enclosed bays and estuaries. The monitoring may be performed either by individual or multiple Copermittees to assess compliance with receiving water limits, or through participation in a water body monitoring coalition. The Copermittees must identify sediment sampling stations that are spatially representative of the sediment within the water body segment or region of interest. Sediment quality monitoring must be conducted in conformance with the monitoring requirements set forth in the State Water Board Sediment Quality Control Plan.

(3) ASBS Monitoring

For Watershed Management Areas with ASBS, the Copermittees must implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

f. ALTERNATIVE WATERSHED MONITORING REQUIREMENTS

The San Diego Water Board may direct the Copermittees to participate in an effort to develop alternative watershed monitoring with other regulated entities, other interested parties, and the San Diego Water Board to refine, coordinate, and implement regional monitoring and assessment programs to determine the status and trends of water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams.

2. MS4 Outfall Discharge Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the discharges from the MS4 outfalls in each Watershed Management Area during dry weather and wet weather. Following acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct MS4 outfall discharge monitoring during implementation of the Water Quality Improvement Plan to assess the effectiveness of their jurisdictional runoff management programs toward effectively prohibiting non-storm water discharges and reducing pollutants in storm water discharges to and from their MS4s. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following MS4 outfall monitoring procedures:

a. TRANSITIONAL MS4 OUTFALL DISCHARGE MONITORING

Until the monitoring requirements of Provisions D.2.b-c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following MS4 outfall discharge monitoring in the Watershed Management Area:

(1) MS4 Outfall Discharge Monitoring Station Inventory

Each Copermittee must identify all major MS4 outfalls that discharge directly to receiving waters within its jurisdiction and geo-locate those outfalls on a map of the MS4 pursuant to Provision E.2.b.(1). This information must be compiled into a MS4 outfall discharge monitoring station inventory, and must include the following information:

(a) Latitude and longitude of MS4 outfall point of discharge;

(b) Watershed Management Area;

(c) Hydrologic subarea;

(d) Outlet size;

(e) Accessibility (i.e. safety and without disturbance of critical habitat);

(f) Approximate drainage area; and

(g) Classification of whether the MS4 outfall is known to have persistent dry weather flows, transient dry weather flows, no dry weather flows, or unknown dry weather flows.

(2) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Until the monitoring requirements of Provision D.2.b are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, each Copermittee must perform dry weather MS4 outfall field screening monitoring to identify non-storm water and illicit discharges within its jurisdiction in accordance with Provision E.2.c, to determine which discharges are transient flows and which are persistent flows, and prioritize the dry weather MS4 discharges that will be investigated and eliminated in accordance with Provision E.2.d. Each Copermittee must conduct the following dry weather MS4 outfall discharge field screening monitoring within its jurisdiction:

(a) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Frequency

Each Copermittee must field screen the MS4 outfalls in its inventory developed pursuant to Provision D.2.a.(1) as follows:

(i) For Copermittees with less than 125 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 80 percent of the outfalls must be visually inspected two times per year during dry weather conditions.

(ii) For Copermittees with 125 major MS4 outfalls or more, but less than or equal to 500, that discharge to receiving waters within a Watershed Management Area all the outfalls must be visually inspected at least annually during dry weather conditions.

(iii) For Copermittees with more than 500 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 500 outfalls must be visually inspected at least annually

during dry weather conditions. Copermittees with more than 500 major MS4 outfalls within a Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(iv) For Copermittees with more than 500 major MS4 outfalls within its jurisdiction that are located in more than one Watershed Management Area, at least 500 major MS4 outfalls within its inventory must be visually inspected at least annually during dry weather conditions. Copermittees with more than 500 major MS4 outfalls in more than one Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(v) Inspections of major MS4 outfalls conducted in response to public reports and staff or contractor reports and notifications may count toward the required visual inspections of MS4 outfall discharge monitoring stations.

(b) Transitional Dry Weather MS4 Outfall Discharge Field Screening Visual Observations

(i) An antecedent dry period of at least 72 hours following any storm event producing measurable rainfall greater than 0.1 inch is required prior to conducting field screening visual observations during a field screening monitoring event.

(ii) During the field screening monitoring event, each Copermittee must record visual observations consistent with Table D-6 at each MS4 outfall discharge monitoring station inspected.

Table D-6. Field Screening Visual Observations for MS4 Outfall Discharge Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) - Flow source(s) suspected or identified from non-storm water source investigation - Flow source(s) eliminated during non-storm water source identification • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) - Known or suspected source(s) of pooled or ponded water • Station description (i.e. deposits or stains, vegetation condition, structural condition, observable biology) • Presence and assessment of trash in and around station • Evidence or signs of illicit connections or illegal dumping

(iii) Each Copermittee must implement the requirements of Provisions E.2.d.(2)(c)-(e) based on the field observations.

(iv) Each Copermittee must evaluate field observations together with existing information available from prior reports, inspections and monitoring results to determine whether any observed flowing, pooled, or ponded waters are likely to be transient or persistent flow.[18]

(c) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Records

Based upon the results of the transitional dry weather MS4 outfall discharge field screening monitoring conducted pursuant to Provisions D.2.a.(2)(a)-(b), each Copermittee must update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow.

(3) Transitional Wet Weather MS4 Outfall Discharge Monitoring

Until the monitoring requirements of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following

[18] Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(a) Transitional Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees must select at least five wet weather MS4 outfall discharge monitoring stations from the inventories developed pursuant to Provision D.2.a.(1) that are representative of storm water discharges from areas consisting primarily of residential, commercial, industrial, and typical mixed-use land uses present within the Watershed Management Area.

(b) Transitional Wet Weather MS4 Outfall Discharge Monitoring Frequency

Each wet weather MS4 outfall discharge monitoring station selected pursuant to Provision D.2.a.(3)(a) must be monitored twice during the wet season (October 1 – April 30). One wet weather monitoring event must be conducted during the first wet weather event of the wet season, and one wet weather monitoring event at least a month after the first wet weather event of the wet season.

(c) Transitional Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(i) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(ii) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(iii) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(iv) Presence and assessment of trash in and around station.

(d) Transitional Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(e) Transitional Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, and indicator bacteria;

(iv) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

[a] Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or
[b] Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or
[c] If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours;

(v) Only one analysis of the composite of aliquots is required;

(vi) The samples must be analyzed for the following constituents:

[a] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,
[b] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and
[c] Constituents listed in in Table D-7.

Table D-7. Analytical Monitoring Constituents for Wet Weather MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Nickel • Selenium • Thallium • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(f) Other Transitional Wet Weather MS4 Outfall Discharge Monitoring

The San Diego County Copermittees must continue the wet weather MS4 outfall monitoring program developed under Order No. R9-2007-0001, as approved by the San Diego Water Board, through its planned completion.

b. Dry Weather MS4 Outfall Discharge Monitoring

Each Copermittee must perform dry weather MS4 outfall monitoring to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. Each Copermittee must conduct the following dry weather MS4 outfall discharge monitoring within its jurisdiction:

(1) Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Each Copermittee must continue to perform the dry weather MS4 outfall discharge field screening monitoring in accordance with the requirements of Provision D.2.a.(2). The Copermittee may adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of persistent flow non-storm water discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of visual inspections performed is equivalent to the number of visual inspections required under Provision D.2.a.(2)(a).

(2) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring

Each Copermittee must perform non-storm water persistent flow MS4 outfall discharge monitoring to determine which persistent non-storm water discharges contain concentrations of pollutants below NALs, and which persistent non-storm water discharges impact receiving water quality during dry weather. Each Copermittee must conduct the following non-storm water persistent flow MS4 outfall discharge monitoring within its jurisdiction:

(a) Prioritization of Non-Storm Water Persistent Flow MS4 Outfalls

Based upon the dry weather MS4 outfall discharge field screening monitoring records developed pursuant to Provision D.2.a.(2)(c), each Copermittee must identify and prioritize the MS4 outfalls with persistent flows based on the highest priority water quality conditions identified in the Water Quality Improvement Plan and any additional criteria developed by the Copermittee, which may include historical data and data from sources other than what the Copermittee collects.

(b) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring Frequency

(i) Based on the prioritization of major MS4 outfalls developed under Provision D.2.b.(2)(a), each Copermittee must identify, at a minimum, the 10 highest priority major MS4 outfalls with non-storm water persistent flows that the Copermittee will monitor within each Watershed Management Area within its jurisdiction. The location of the highest priority non-storm water persistent flow MS4 outfall monitoring stations must be identified on the map required pursuant to Provision E.2.b.(1).

(ii) Each of the highest priority non-storm water persistent flow MS4 outfall monitoring stations identified pursuant to Provision D.2.b.(2)(b)(i) must be monitored under dry weather conditions at least semi-annually until one of the following occurs:

[a] The non-storm water discharges have been effectively eliminated (i.e. no flowing, pooled, or ponded water) for three consecutive dry weather monitoring events; or

[b] The source(s) of the persistent flows has been identified as a category of non-storm water discharges that does not require an NPDES permit and does not have to be addressed as an illicit discharge because it was not identified as a source of pollutants (i.e. constituents in non-storm water discharge do not exceed NALs), and the persistent flow can be re-prioritized to a lower priority; or

[c] The constituents in the persistent flow non-storm water discharge do not exceed NALs, and the persistent flow can be re-prioritized to a lower priority; or

[d] The source(s) of the persistent flows has been identified as a non-storm water discharge authorized by a separate NPDES permit.

(iii) Where the criteria under Provision D.2.b.(2)(c)(ii) are not met, but the threat to water quality has been reduced by the Copermittee, the highest priority persistent flow MS4 outfall monitoring stations may be reprioritized accordingly for continued dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1).

(iv) Each Copermittee must document removal or re-prioritization of the highest priority persistent flow MS4 outfall monitoring stations identified under Provision D.2.b.(2)(b) in the Annual Report. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized MS4 major outfall in the Watershed Management Area within its jurisdiction, unless there are no remaining qualifying major MS4 outfalls within the Copermittee's jurisdiction in the Watershed Management Area.

(c) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Observations

During each semi-annual monitoring event, each Copermittee must record field observations consistent with Table D-6 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(d) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Monitoring

During each semi-annual monitoring event, if conditions allow the collection of the data, each Copermittee must monitor and record the parameters in Table D-2 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(e) Non-Storm Water Persistent Flow MS4 Outfall Discharge Analytical Monitoring

During each semi-annual monitoring event in which measurable flow is present, each Copermittee must collect and analyze samples from each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Collect grab or composite samples to be analyzed for the following constituents:

[a] Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,
[b] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,
[c] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,
[d] Applicable NAL constituents, and
[e] Constituents listed in Table D-8, unless the Copermittee has historical data that can demonstrate or provide justification that the analysis of the constituent is not necessary.

Table D-8. Analytical Monitoring Constituents for Persistent Flow MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Total Hardness • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Cadmium • Copper • Lead • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(iv) If the Copermittee identifies and eliminates the source of the persistent flow non-storm water discharge, analysis of the sample is not required.

c. Wet Weather MS4 Outfall Discharge Monitoring

The Copermittees must perform wet weather MS4 outfall monitoring to identify sources of pollutants in storm water discharges from the MS4s in the Watershed Management Area. The Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(1) Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees may adjust the wet weather MS4 outfall discharge monitoring locations and frequencies in the Watershed Management Area, as needed, to identify sources of pollutants in storm water discharges from MS4s in the Watershed Management Area in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of stations is at least equivalent to the number of stations required under Provision D.2.a.(3)(a).

(2) Wet Weather MS4 Outfall Discharge Monitoring Frequency

The Copermittees must monitor the wet weather MS4 outfall discharge monitoring stations in the Watershed Management Area at an appropriate frequency to identify sources of pollutants in storm water discharges from the MS4s causing or contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan.

(3) Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(d) Presence and assessment of trash in and around station.

(4) Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(5) Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

(iii) If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours.

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and

(iv) Applicable SAL constituents.

3. Special Studies

a. Within the term of this Order, the Copermittees must develop and implement the following special studies:

(1) At least three special studies in each Watershed Management Area to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that cause or contribute to highest priority water quality conditions identified in the Water Quality Improvement Plan.

(2) At least two special studies for the San Diego Region to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that are impacting receiving waters on a regional basis in the San Diego Region.

(3) One of the three special studies in each Watershed Management Area may be replaced by a special study implemented pursuant to Provision D.3.a.(2).

b. The special studies must, at a minimum, be in conformance with the following criteria:

(1) The special studies must be related to the highest priority water quality conditions identified by the Copermittees in the Watershed Management Area and/or for the entire San Diego Region;

(2) The special studies developed pursuant to Provision D.3.a.(1) must:

(a) Be implemented within the applicable Watershed Management Area, and

(b) Require some form of participation by all the Copermittees within the Watershed Management Area;

(3) The special studies developed pursuant to Provision D.3.a.(2) must:

(a) Be implemented within the San Diego Region, and

(b) Require some form of participation by all Copermittees covered under the requirements of this Order.

c. Special studies developed to identify sources of pollutants and/or stressors should be pollutant and/or stressor specific and based on historical monitoring data and monitoring performed pursuant to Provisions D.1 and D.2. Development of source identification special studies should include the following:

(1) A compilation of known information on the specific pollutant and/or stressor, including data on potential sources and movement of the pollutant and/or stressor within the watershed. Data generated by the Copermittees and others, as well as information available from a literature research on the pollutant and/or stressor should be compiled and analyzed as appropriate.

(2) An identification of data gaps, based on the compiled information generated on the specific pollutant and/or stressor in Provision D.3.d.(1). Source identification special studies should be developed to fill identified data gaps.

(3) A monitoring plan that will collect and provide data the Copermittees can utilize to do the following:

(a) Quantify the relative loading or impact of a pollutant and/or stressor from a particular source or pollutant generating activity;

(b) Improve understanding of the fate of a pollutant and/or stressor in the environment;

(c) Develop an inventory of known and suspected sources of a pollutant and/or stressor in the Watershed Management Area; and/or

(d) Prioritize known and suspected sources of a pollutant and/or stressor based on relative magnitude in discharges, geographical distribution (i.e., regional or localized), frequency of occurrence in discharges, human health risk, and controllability.

d. Special studies initiated prior to the acceptance of the Water Quality Improvement Plan that meet the requirements of Provision D.3.b and are completed during the term of this Order may be utilized to fulfill the special study requirements of Provision D.3.a.

e. The Copermittees must submit the monitoring plans for the special studies in the Water Quality Improvement Plans required pursuant to Provision F.1.

f. The Copermittees are encouraged to share the results of the special studies regionally among the Copermittees to provide information useful in improving and adapting the management of non-storm water and storm water runoff through the implementation of the Water Quality Improvement Plans.

4. Assessment Requirements

Each Copermittee must evaluate the data collected pursuant to Provisions D.1, D.2 and D.3, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E, to assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a. Assessments must be performed as described in the following provisions:

a. Receiving Waters Assessments

(1) The Copermittees must assess and report the conditions of the receiving waters in the Watershed Management Area as follows:

(a) Based on data collected pursuant to Provision D.1.a, the assessments under Provision D.4.a.(2) must be included in the first Annual Report required pursuant to Provision F.3.b.(1).

(b) Based on the data collected pursuant to Provisions D.1.a-e, the assessments required under Provision D.4.a.(2) must be included in the Report of Waste Discharge required pursuant to Provision F.5.b.

(2) The Copermittees must assess the status and trends of receiving water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under dry weather and wet weather conditions. For each of the three types of receiving waters in each Watershed Management Area the Copermittees must:

(a) Determine whether or not the conditions of the receiving waters are protective of the designated beneficial uses;

(b) Identify the most critical beneficial uses that must be protected or restored to ensure overall health of the receiving water;

(c) Determine whether or not those critical beneficial uses are being protected and where those beneficial used must be restored;

(d) Identify short-term and/or long-term improvements or degradation of those critical beneficial uses;

(e) Identify data gaps in the monitoring data necessary to assess Provisions D.4.a.(2)(a)-(d).

b. MS4 OUTFALL DISCHARGES ASSESSMENTS

(1) Non-Storm Water Discharges Reduction Assessments

(a) Each Copermittee must assess and report the progress of its illicit discharge detection and elimination program, required to be implemented pursuant to Provision E.2, toward reducing and effectively prohibiting non-storm water and illicit discharges into the MS4 within its jurisdiction as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(2), the assessments under Provision D.4.b.(1)(b) must be included in the first Annual Report required pursuant to Provision F.3.b.(1).

(ii) Based on the data collected pursuant to Provisions D.2.b, the assessments required under Provision D.4.b.(1)(c) must be included in the first Annual Report required pursuant to Provision F.3.b.(1), and annually thereafter.

(iii) Based on the data collected pursuant to Provisions D.2.b, the assessment required under Provision D.4.b.(1)(c) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.a.(2), each Copermittee must assess and report the following:

(i) Identify the known and suspected controllable sources (e.g. facilities, areas, land uses, pollutant generating activities) of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area;

(ii) Identify sources of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area that have been reduced or eliminated; and

(iii) Identify modifications to the field screening monitoring locations and frequencies for the MS4 outfalls in its inventory necessary to identify and eliminate sources of persistent flow non-storm water discharges pursuant to Provision D.2.b.(1).

(c) Based on the dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b, each Copermittee must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(1)(b);

(ii) Based on the data collected and applicable NALs in the Water Quality Improvement Plan, rank the MS4 outfalls in the Copermittee's

jurisdiction according to potential threat to receiving water quality, and produce a prioritized list of major MS4 outfalls for follow-up action to update the Water Quality Improvement Plan, with the goal of eliminating persistent flow non-storm water discharges and/or pollutant loads in order of the ranked priority list through targeted programmatic actions and source investigations;

(iii) For the highest priority major MS4 outfalls with persistent flows that are in exceedance of NALs, identify the known and suspected sources within the Copermittee's jurisdiction in the Watershed Management Area that may cause or contribute to the NAL exceedances;

(iv) Each Copermittee must analyze the data collected pursuant to Provision D.2.b, and utilize a model or other method, to calculate or estimate the non-storm water volumes and pollutant loads discharged from all the major MS4s outfalls in its jurisdiction identified as having persistent dry weather flows during the monitoring year. These calculations or estimates must be updated annually. Each Copermittee must calculate or estimate:

[a] Annual non-storm water volumes and pollutant loads discharged from the Copermittee's major MS4 outfalls to receiving waters within the Copermittee's jurisdiction, with an estimate of the percent contribution from each known and suspected source for each MS4 outfall;

[b] Annual non-storm water volumes and pollutant loads from areas or facilities subject to the Copermittee's legal authority that are discharged from the Copermittee's major MS4 outfalls to downstream receiving waters.

(v) Each Copermittee must review the data collected pursuant to Provision D.2.b and findings from the assessments required pursuant to Provision D.4.b.(1)(c)(i)-(iv) on an annual basis to:

[a] Identify reductions and progress in achieving reductions in non-storm water and illicit discharges to the Copermittee's MS4 in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction, with an estimate, if possible, of the non-storm water volume and/or pollutant load reductions attributable to specific water quality strategies implemented by the Copermittee; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittee in the Watershed Management Area toward reducing

or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction.

(vi) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(v).

(2) Storm Water Pollutant Discharges Reduction Assessments

(a) The Copermittees must assess and report the progress of the water quality improvement strategies, required to be implemented pursuant to Provisions B and E, toward reducing pollutants in storm water discharges from the MS4s within the Watershed Management Area as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(3), the assessments under Provision D.4.b.(2)(b) must be included in the first Annual Report required pursuant to Provision F.3.b.(1).

(ii) Based on the data collected pursuant to Provisions D.2.c, the assessments required under Provision D.4.b.(2)(c) must be included in the first Annual Report required pursuant to Provision F.3.b.(1), and annually thereafter.

(iii) Based on the data collected pursuant to Provisions D.2.c, the assessment required under Provisions D.4.b.(2)(c)-(d) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.a.(3) the Copermittees must assess and report the following:

(i) The Copermittees must analyze the monitoring data collected pursuant to Provision D.2.a.(3), and utilize a watershed model or other method, to calculate or estimate storm water volumes and pollutant loads discharged from the MS4s in each Copermittee's jurisdiction within the Watershed Management Area. The Copermittees must calculate or estimate the following for each monitoring year:

[a] The average storm water runoff coefficient for each land use type within the Watershed Management Area;
[b] The volume of storm water discharged from each of the Copermittee's major MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch;
[c] The pollutant loads discharged from each of the Copermittee's major MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch; and

[d] The percent contribution of storm water volumes and pollutant loads discharged from each land use type within the drainage basin to each of the Copermittee's major MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch.

(ii) Identify modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify sources pollutants in storm water discharges from the MS4s in the Watershed Management Area pursuant to Provision D.2.c.(1).

(c) Based on the wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.c the Copermittees must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(2)(b);

(ii) Based on the data collected and applicable SALs in the Water Quality Improvement Plan, rank the MS4 outfalls in the Watershed Management Area according to potential threat to receiving water quality, and produce a prioritized list of major MS4 outfalls for follow-up action to update the Water Quality Improvement Plan;

(iii) The Copermittees must review the data collected pursuant to Provision D.2.c and findings from the assessments required pursuant to Provisions D.4.b.(2)(c)(i)-(ii) on an annual basis to:

[a] Identify reductions and progress in achieving reductions in pollutant concentrations and/or pollutant loads from different land uses and/or drainage areas discharging from the Copermittees' MS4s in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters within the Watershed Management Area to the MEP, with an estimate, if possible, of the pollutant load reductions attributable to specific water quality strategies implemented by the Copermittees; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittees in the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters in the Watershed Management Area to the MEP.

(iv) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(iii).

(d) The Copermittees must evaluate all the data collected pursuant to Provision D.2.c, and incorporate new outfall monitoring data into time series plots for each long-term monitoring constituent for the Watershed Management Area, and perform statistical trends analysis on the cumulative long-term wet weather MS4 outfall discharge water quality data set.

c. Special Studies Assessments

The Copermittees must annually evaluate the results and findings from the special studies developed and implemented pursuant to Provision D.3, and assess their relevance to the Copermittees' efforts to characterize receiving water conditions, understand sources of pollutants and/or stressors, and control and reduce the discharges of pollutants from the MS4 outfalls to receiving waters in the Watershed Management Area. The Copermittees must report the results of the special studies assessments applicable to the Watershed Management Area, and identify any necessary modifications or updates to the Water Quality Improvement Plan based on the results in the Annual Reports required pursuant to Provision F.3.b.

d. Integrated Assessment of Water Quality Improvement Plan

As part of the iterative approach and adaptive management process required for the Water Quality Improvement Plan pursuant to Provision B.5, the Copermittees in each Watershed Management Area must integrate the data collected pursuant to Provisions D.1-D.3, the findings from the assessments required pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to assess the effectiveness of, and identify necessary modifications to, the Water Quality Improvement Plan as follows:

(1) The Copermittees must re-evaluate the priority water quality conditions and numeric goals for the Watershed Management Area, as needed, during the term of this Order pursuant to Provision B.5.a. The re-evaluation and recommendations for modifications to the priority water quality conditions, and/or numeric goals and corresponding schedules may be provided in the Annual Reports required pursuant to Provision F.3.b, but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The priority water quality conditions and numeric goals for the Watershed Management Area must be re-evaluated as follows:

(a) Re-evaluate the receiving water conditions in the Watershed Management Area in accordance with Provision B.2.a;

(b) Re-evaluate the impacts on receiving waters in the Watershed Management Area from MS4 discharges in accordance with Provision B.2.b;

(c) Re-evaluate the identification of MS4 sources of pollutants and/or stressors in accordance with Provision B.2.d;

(d) Identify beneficial uses of the receiving waters that are protected or must be restored in accordance with Provision D.4.a;

(e) Evaluate the progress toward achieving the interim and final numeric goals for restoring impacted beneficial uses in the receiving waters.

(2) The Copermittees must re-evaluate the water quality improvement strategies for the Watershed Management Area during the term of this Order pursuant to Provision B.5.b. The re-evaluation and recommendations for modifications to the water quality improvement strategies and schedules must be provided in the Annual Reports required pursuant to Provision F.3.b, and provided in the Report of Waste Discharge pursuant to Provision F.5.b. The water quality improvement strategies for the Watershed Management Area must be re-evaluated as follows:

(a) Identify the non-storm water and storm water pollutant loads from the Copermittees' MS4 outfalls in the Watershed Management Area, calculated or estimated pursuant to Provisions D.4.b;

(b) Identify the non-storm water and storm water pollutant load reductions, or other improvements to receiving water or water quality conditions, that are necessary to attain the interim and final numeric goals for restoring impacted beneficial uses in the receiving waters;

(c) Identify the non-storm water and storm water pollutant load reductions, or other improvements to the quality of MS4 discharges, that are necessary for the Copermittees to demonstrate that non-storm water and storm water discharges from their MS4s are not causing or contributing to exceedances of receiving water limitations;

(d) Evaluate the progress of the water quality improvement strategies toward achieving the interim and final numeric goals for restoring impacted beneficial uses in the receiving waters.

(3) The Copermittees must re-evaluate and adapt the water quality monitoring and assessment program for the Watershed Management Area when new information becomes available to improve the monitoring and assessment program pursuant to Provision B.5.c. The re-evaluation and recommendations for modifications to the monitoring and assessment program may be provided in the Annual Reports required pursuant to Provision F.3.b, but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. Modifications to the water quality monitoring and assessment program must be consistent with the

requirements of Provision D.1-D.3. The re-evaluation of the water quality monitoring and assessment program for the Watershed Management Area must consider the data gaps identified by the assessments required pursuant to Provisions D.4.a-b, and results of the special studies implemented pursuant to Provision D.4.c.

5. Monitoring Provisions

Each Copermittee must comply with all the monitoring, reporting, and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

E. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS

The purpose of this provision is for each Copermittee to implement a program to control the contribution of pollutants to and the discharges from the MS4 with its jurisdiction. The goal of the jurisdictional runoff management programs is to implement strategies that effectively prohibit non-storm water discharges to the MS4 and reduce the discharge of pollutants in storm water to the MEP. This goal will be accomplished through implementing the jurisdictional runoff management programs in accordance with the strategies identified in the Water Quality Improvement Plans.

Each Copermittee must update its jurisdictional runoff management program document, in accordance with Provision F.2.a, to incorporate all the requirements of Provision E. Until the Copermittee has updated its jurisdictional runoff management program document with the requirements of Provision E, the Copermittee must continue implementing its current jurisdictional runoff management program.

1. Legal Authority Establishment and Enforcement

a. Each Copermittee must establish, maintain, and enforce adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 through statute, ordinance, permit, contract, order, or similar means. This legal authority must, at a minimum, authorize the Copermittee to:

(1) Prohibit and eliminate all illicit discharges and illicit connections to its MS4;

(2) Control the contribution of pollutants in discharges of runoff associated with industrial and construction activity to its MS4 and control the quality of runoff from industrial and construction sites, including industrial and construction sites which have coverage under the statewide General Permit for Discharges of Storm Water Associated with Industrial Activities (Industrial General Permit) or General Permit for Discharges of Storm Water Associated with Construction Activities (Construction General Permit), as well as to those sites which do not;

(3) Control the discharge of spills, dumping, or disposal of materials other than storm water into its MS4;

(4) Control through interagency agreements among Copermittees the contribution of pollutants from one portion of the MS4 to another portion of the MS4;

(5) Control, by coordinating and cooperating with other owners of the MS4 such as Caltrans, the U.S. federal government, or sovereign Native American Tribes through interagency agreements, where possible, the contribution of pollutants from their portion of the MS4 to the portion of the MS4 within the Copermittee's jurisdiction;

(6) Require compliance with conditions in its statutes, ordinances, permits, contracts, orders, or similar means to hold dischargers to its MS4 accountable for their contributions of pollutants and flows;

(7) Require the use of BMPs to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(8) Require documentation on the effectiveness of BMPs implemented to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(9) Utilize enforcement mechanisms to require compliance with its statutes, ordinances, permits, contracts, orders, or similar means; and

(10) Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with its statutes, ordinances, permits, contracts, orders, or similar means and with the requirements of this Order, including the prohibition of illicit discharges and connections to its MS4; the Copermittee must also have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from industrial facilities, including construction sites, discharging into its MS4.

b. With the first Annual Report required pursuant to Provision F.3.b, each Copermittee must submit a statement certified by its Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative that the Copermittee has taken the necessary steps to obtain and maintain full legal authority within its jurisdiction to implement and enforce each of the requirements contained in this Order.

2. Illicit Discharge Detection and Elimination

Each Copermittee must implement a program to actively detect and eliminate illicit discharges and improper disposal into the MS4, or otherwise require the discharger to apply for and obtain a separate NPDES permit. The illicit discharge detection and elimination program must be implemented in accordance with the strategies identified in the Water Quality Improvement Plan and include, at a minimum, the following requirements:

a. Non-Storm Water Discharges

Each Copermittee must address all non-storm water discharges as illicit discharges, unless a non-storm water discharge is either identified as a discharge authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to the following requirements:

(1) Discharges of non-storm water to the MS4 from the following categories must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG919001 (Order No. R9-2007-0034, or subsequent order) for discharges to San Diego Bay, or NPDES Permit No. CAG919002 (Order No. R9-2008-0002, or subsequent order) for discharges to surface waters other than San Diego Bay:

(a) Uncontaminated pumped ground water;

(b) Discharges from foundation drains;[19]

(c) Water from crawl space pumps; and

(d) Water from footing drains.[19]

(2) Discharges of non-storm water from water line flushing and water main breaks to the MS4 must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG 679001 (Order No. R9-2010-0003, or subsequent order). This category includes water line flushing and water main break discharges from water purveyors issued a water supply permit by the California Department of Public Health or federal military installations. Discharges from recycled or reclaimed water lines to the MS4 must be addressed as illicit discharges, unless the discharges have coverage under a separate NPDES permit.

(3) Discharges of non-storm water to the MS4 from the following categories must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a source of pollutants to receiving waters:

(a) Diverted stream flows;

(b) Rising ground waters;

(c) Uncontaminated ground water infiltration to MS4s;

(d) Springs;

(e) Flows from riparian habitats and wetlands;

(f) Discharges from potable water sources;

[19] Provision E.2.a.(1) only applies to this category on non-storm water if the system is designed to be located at or below the highest historical groundwater table to actively or passively extract groundwater during any part of the year.

(g) Discharges from foundation drains;[20] and

(h) Discharges from footing drains.[20]

(4) Discharges of non-storm water to the MS4 from the following categories must be controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means. Discharges of non-storm water to the MS4 from the following categories not controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means must be addressed by the Copermittee as illicit discharges.

(a) Air conditioning condensation

The discharge of air conditioning condensation must be directed to landscaped areas or other pervious surfaces where feasible.

(b) Individual residential vehicle washing

(i) The discharge of wash water must be directed to landscaped areas or other pervious surfaces where feasible; and

(ii) Minimize the use of water for vehicle washing, use as little washing detergent and other vehicle wash products as possible, wash vehicles at commercial wash facilities, and implement other practices or behaviors that will prevent the discharge of pollutants associated with individual residential vehicle washing from entering the MS4.

(c) Dechlorinated swimming pool discharges

(i) Eliminate residual chlorine, algaecide, filter backwash, or other pollutants from swimming pools prior to discharging to the MS4; and

(ii) The discharge of saline swimming pool water must be directed to the sanitary sewer, landscaped areas, or other pervious surfaces that can accommodate the volume of water, unless the saline swimming pool water can be discharged via a pipe or concrete channel directly to a naturally saline water body (e.g. Pacific Ocean).

(5) Firefighting discharges to the MS4 must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a significant source of pollutants to receiving waters. Firefighting discharges to the MS4 not identified as a significant source of pollutants to receiving waters, must be addressed, at a minimum, as follows:

[20] Provision E.2.a.(3) only applies to this category of non-storm water discharge if the system is designed to be located above the highest historical groundwater table at all times of the year, and the system is only expected to discharge non-storm water under unusual circumstances.

(a) Non-emergency firefighting discharges

(i) Building fire suppression system maintenance discharges (e.g. sprinkler line flushing) to the MS4 must be addressed as illicit discharges.

(ii) Non-emergency firefighting discharges (i.e., discharges from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems) must be addressed by a program, to be developed and implemented by the Copermittee, to reduce or eliminate pollutants in such discharges from entering the MS4.

(b) Emergency firefighting discharges

Each Copermittee should develop and encourage implementation of BMPs to reduce or eliminate pollutants in emergency firefighting discharges to the MS4s and receiving waters within its jurisdiction. During emergency situations, priority of efforts should be directed toward life, property, and the environment (in descending order). BMPs should not interfere with immediate emergency response operations or impact public health and safety.

(6) If the Copermittee or San Diego Water Board identifies any category of non-storm water discharges listed under Provisions E.2.a.(1)-(4) as a source of pollutants to receiving waters, the category must be prohibited through ordinance, order, or similar means and addressed as an illicit discharge.

(7) Each Copermittee must, where feasible, reduce or eliminate non-storm water discharges listed under Provisions E.2.a.(1)-(4) into its MS4 whether or not the non-storm water discharge has been identified as an illicit discharge, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit.

b. PREVENT AND DETECT ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to prevent and detect illicit discharges to the MS4:

(1) Each Copermittee must maintain an updated map of its entire MS4 and the corresponding drainage areas. The accuracy of the MS4 map must be confirmed during the field screening required pursuant to Provision E.2.c. The MS4 map must be included as part of the jurisdictional runoff management program document. Any geographic information system (GIS) layers or files used by the Copermittee to maintain the MS4 map must be made available to the San Diego Water Board upon request. The MS4 map must identify the following:

(a) All segments of the MS4 owned, operated, and maintained by the Copermittee;

(b) All known locations of inlets that discharge and/or collect runoff into the Copermittee's MS4;

(c) All known locations of connections with other MS4s not owned or operated by the Copermittee (e.g. Caltrans MS4s);

(d) All known locations of MS4 outfalls and private outfalls that discharge runoff collected from areas within the Copermittee's jurisdiction;

(e) All segments of receiving waters within the Copermittee's jurisdiction that receive and convey runoff discharged from the Copermittee's MS4 outfalls;

(f) Locations of the MS4 outfalls, identified pursuant to Provision D.2.a.(1), within its jurisdiction; and

(g) Locations of the non-storm water persistent flow MS4 outfall discharge monitoring stations, identified pursuant to Provision D.2.b.(2)(b), within its jurisdiction.

(2) Each Copermittee must use Copermittee personnel and contractors to assist in identifying and reporting illicit discharges and connections during their daily employment activities.

(3) Each Copermittee must promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges to or from the MS4, including the following methods for public reporting:

(a) Operate a public hotline, which can be Copermittee-specific or shared by the Copermittees, and must be capable of receiving reports in both English and Spanish 24 hours per day and seven days per week; and

(b) Designate an e-mail address for receiving electronic reports from the public, which can be Copermittee-specific or shared by the Copermittees, and must be prominently displayed on the Copermittee's webpage and the Regional Clearinghouse required pursuant to Provision F.4.

(4) Each Copermittee must implement practices and procedures (including a notification mechanism) to prevent, respond to, contain, and clean up any spills that may discharge into the MS4 within its jurisdiction from any source. The Copermittee must coordinate, to the extent possible, with spill response teams to prevent entry of spills into the MS4, and prevent contamination of surface water, ground water, and soil. The Copermittee must coordinate spill

prevention, containment, and response activities throughout all appropriate Copermittee departments, programs, and agencies.

(5) Each Copermittee must implement practices and procedures to prevent and limit infiltration of seepage from sanitary sewers (including private laterals and failing septic systems) to the MS4.

(6) Each Copermittee must coordinate, when necessary, with upstream Copermittees and/or entities to prevent illicit discharges from upstream sources into the MS4 within its jurisdiction.

c. FIELD SCREENING

Each Copermittee must conduct field screening (i.e. visual observations, field testing, and/or analytical testing) of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4 in accordance with the dry weather MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

d. INVESTIGATE AND ELIMINATE ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to investigate and eliminate illicit discharges to the MS4:

(1) Each Copermittee must prioritize and determine when follow-up investigations will be performed in response to visual observations and/or water quality monitoring data collected during an investigation of a detected non-storm water or illicit discharge to or from the MS4. The criteria for prioritizing investigations must consider the following:

(a) Pollutants identified as causing or contributing to the highest water quality priorities identified in the Water Quality Improvement Plan;

(b) Pollutants identified as causing or contributing, or threatening to cause or contribute to impairments in water bodies on the 303(d) List and/or in environmentally sensitive areas (ESAs), located within its jurisdiction;

(c) Pollutants identified from sources or land uses known to exist within the area, drainage basin, or watershed that discharges to the portion of the MS4 within its jurisdiction included in the investigation;

(d) Pollutants identified as causing or contributing to an exceedance of a NAL in the Water Quality Improvement Plan; and

(e) Pollutants identified as a threat to human health or the environment.

(2) Each Copermittee must implement procedures to investigate and inspect portions of its MS4 that, based on reports or notifications, field screening, or other appropriate information, indicate a reasonable potential of receiving, containing, or discharging pollutants due to illicit discharges, illicit connections, or other sources of non-storm water. The procedures must include the following:

(a) Each Copermittee must develop criteria to:

(i) Assess the validity of each report or notification received; and

(ii) Prioritize the response to each report or notification received.

(b) Each Copermittee must prioritize and respond to each valid report or notification (e.g., public reports, staff or contractor reports and notifications, etc.) of an incident in a timely manner.

(c) Each Copermittee must investigate and seek to identify the source(s) of discharges of non-storm water where flows are observed in and from the MS4 during the field screening required pursuant to Provision D.2.b.(1) as follows:

(i) Obvious illicit discharges must be immediately investigated to identify the source(s) of non-storm water discharges;

(ii) The investigation must include field investigations to identify sources or potential sources for the discharge, unless the source or potential source has already been identified during previous investigations; and

(iii) The investigation may include follow-up field investigations and/or reviewing Copermittee inventories and other land use data to identify potential sources of the discharge.

(d) Each Copermittee must maintain records and a database of the following information:

(i) Location of incident, including hydrologic subarea, portion of MS4 receiving the non-storm water or illicit discharge, and point of discharge or potential discharge from MS4 to receiving water;

(ii) Source of information initiating the investigation (e.g., public reports, staff or contractor reports and notifications, field screening, etc.);

(iii) Date the information used to initiate the investigation was received;

(iv) Date the investigation was initiated;

(v) Dates of follow-up investigations;

(vi) Identified or suspected source of the illicit discharge or connection, if

determined;

(vii) Known or suspected related incidents, if any;

(viii) Result of the investigation; and

(ix) If a source cannot be identified and the investigation is not continued, a rationale for why a discharge does not pose a threat to water quality and/or does not require additional investigation.

(e) Each Copermittee must track and seek to identify the source(s) of non-storm water discharges from the MS4 where there is evidence of non-storm water having been discharged into or from the MS4 (e.g., pooled water), in accordance with MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.

(3) Each Copermittee must initiate the implementation of procedures, in a timely manner, to eliminate all detected and identified illicit discharges and connections within its jurisdiction. The procedures must include the following responses:

(a) Each Copermittee must enforce its legal authority, as required under Provision E.1, to eliminate illicit discharges and connections to the MS4.

(b) If the Copermittee identifies the source as a controllable source of non-storm water or illicit discharge or connection, the Copermittee must implement its Enforcement Response Plan pursuant to Provision E.6 and enforce its legal authority to prohibit and eliminate illicit discharges and connections to its MS4.

(c) If the Copermittee identifies the source of the discharge as a category of non-storm water discharges in Provision E.2.a, and the discharge is in exceedance of NALs in the Water Quality Improvement Plan, then the Copermittee must determine if: (1) this is an isolated incident or set of circumstances that will be addressed through its Enforcement Response Plan pursuant to Provision E.6, or (2) the category of discharge must be addressed through the prohibition of that category of discharge as an illicit discharge pursuant to Provision E.2.a.(6).

(d) If the Copermittee suspects the source of the non-storm water discharge as natural in origin (i.e. non-anthropogenically influenced) and in conveyance into the MS4, then the Copermittee must document and provide the data and evidence necessary to demonstrate to the San Diego Water Board that it is natural in origin and does not require further investigation.

(e) If the Copermittee is unable to identify and document the source of a recurring non-storm water discharge to or from the MS4, then the Copermittee must address the discharge as an illicit discharge and update

its jurisdictional runoff management program to address the common and suspected sources of the non-storm water discharge within its jurisdiction in accordance with the Copermittee's priorities.

(4) Each Copermittee must submit a summary of the non-storm water discharges and illicit discharges and connections investigated and eliminated within its jurisdiction with each Annual Report required under Provision F.3.b of this Order.

e. STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the illicit discharge detection and elimination program to address non-storm water and illicit discharges and connections that the Copermittee has identified as potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, and/or increase/decrease frequency of inspections in specific areas); and

(2) The strategies and/or activities must be consistent with the requirements of Provisions E.2.a-d and the strategies identified in the Water Quality Improvement Plan.

3. Development Planning

Each Copermittee must use their land use and planning authorities to implement a development planning program in accordance with the strategies identified in the Water Quality Improvement Plan and includes, at a minimum, the following requirements:

a. BMP REQUIREMENTS FOR ALL DEVELOPMENT PROJECTS

Each Copermittee must prescribe the following BMP requirements during the planning process (i.e. prior to project approval and issuance of local permits) for all development projects (regardless of project type or size), where local permits are issued, including unpaved roads and flood management projects:

(1) <u>General Requirements</u>

(a) Onsite BMPs must be located so as to remove pollutants from runoff prior to its discharge to any receiving waters, and as close to the source as possible; and

(b) Structural BMPs must not be constructed within a waters of the U.S. or waters of the state.

(2) Source Control BMP Requirements

The following source control BMPs must be implemented at all development projects where applicable and feasible:

(a) Prevention of illicit discharges into the MS4;

(b) Storm drain system stenciling or signage;

(c) Properly designed outdoor material storage areas;

(d) Properly designed outdoor work areas;

(e) Properly designed trash storage areas; and

(f) Any additional BMPs necessary to minimize pollutant generation at each project.

(3) Low Impact Development (LID) BMP Requirements

The following LID BMPs must be implemented at all development projects where applicable and feasible:

(a) Maintenance or restoration of natural storage reservoirs and drainage corridors (including topographic depressions, areas of permeable soils, natural swales, and ephemeral and intermittent streams);[21]

(b) Buffer zones for natural water bodies (where buffer zones are technically infeasible, require project applicant to include other buffers such as trees, access restrictions, etc.);

(c) Conservation of natural areas within the project footprint including existing trees, other vegetation, and soils;

(d) Construction of streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided public safety is not compromised;

(e) Minimization of the impervious footprint of the project;

(f) Minimization of soil compaction to landscaped areas;

[21] Development projects proposing to dredge or fill materials in waters of the U.S. must obtain a CWA Section 401 Water Quality Certification. Projects proposing to dredge or fill waters of the state must obtain waste discharge requirements.

(g) Disconnection of impervious surfaces through distributed pervious areas;

(h) Landscaped or other pervious areas designed and constructed to effectively receive and infiltrate, retain and/or treat runoff from impervious areas, prior to discharging to the MS4;

(i) Small collection strategies located at, or as close as possible to, the source (i.e. the point where storm water initially meets the ground) to minimize the transport of runoff and pollutants to the MS4 and receiving waters;

(j) Use of permeable materials for projects with low traffic areas and appropriate soil conditions;

(k) Landscaping with native or drought tolerant species; and

(l) Harvesting and using precipitation.

b. PRIORITY DEVELOPMENT PROJECTS

(1) Definition of Priority Development Project

Priority Development Projects include the following:

(a) All new development projects that fall under the Priority Development Project categories listed under Provision E.3.b.(2) (where a new development project feature, such as a parking lot, falls into a Priority Development Project category, the entire project footprint is subject to Priority Development Project requirements); and

(b) Those redevelopment projects that create, add, or replace at least 5,000 square feet of impervious surfaces on an already developed site, and the redevelopment project is a Priority Development Project category listed under Provision E.3.b.(2) (where redevelopment results in an increase of less than fifty percent of the impervious surfaces of a previously existing development, and the existing development was not subject to Priority Development Project requirements, the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) apply only to the addition or replacement, and not to the entire development; where redevelopment results in an increase of more than fifty percent of the impervious surfaces of a previously existing development, the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) apply to the entire development).

(2) Priority Development Project Categories

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This category includes commercial, industrial, residential, mixed-use, and public development projects on public or private land which fall under the planning and building authority of the Copermittee.

(b) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

(c) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812), where the land area for development is 5,000 square feet or more.

(d) Hillside development projects. This category includes any development which creates 5,000 square feet or more of impervious surface which is located in an area with known erosive soil conditions, where the development will grade on any natural slope that is twenty-five percent or greater.

(e) Environmentally sensitive areas (ESAs). This category includes any development located within, directly adjacent to, or discharging directly to an ESA, which either creates 2,500 square feet of impervious surface on a proposed project site or increases the area of imperviousness of a proposed project site to 10 percent or more of its naturally occurring condition. “Directly adjacent to” means situated within 200 feet of the ESA. “Discharging directly to” means outflow from a drainage conveyance system that collects runoff from the subject development or redevelopment site and terminates at or in receiving waters within the ESA.

(f) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce that has 5,000 square feet or more of impervious surface.

(g) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface that is 5,000 square feet or more used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

(h) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

(i) Large development projects. This category includes any post-construction pollutant-generating new development projects that result in the disturbance of one acre or more of land.

(3) Priority Development Project Exemptions

Each Copermittee has the discretion to exempt the following projects from being defined as Priority Development Projects:

(a) New paved sidewalks, bicycle lanes, or trails that meet the following criteria:

(i) Designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas; OR

(ii) Designed and constructed to be hydraulically disconnected from paved streets or roads; OR

(iii) Designed and constructed with permeable pavements or surfaces in accordance with USEPA Green Streets guidance.[22]

(b) Retrofitting of existing paved alleys, streets or roads that meet the following criteria:

(i) Must be two lanes or less; AND

(ii) Must be a retrofitting project implemented as part of an alternative compliance project option under Provision E.3.c.(3)(b)(v) to achieve the performance requirements of Provisions E.3.c.(1) and/or E.3.c.(2) for a Priority Development Project; AND

(iii) Designed and constructed in accordance with the USEPA Green Streets guidance.[23]

(c) New single family residences that meet the following criteria:

(i) Must not be constructed as part of a larger development or proposed subdivision; AND

(ii) Designed and constructed to be certified under the U.S. Green Building Council (USGCB) Leadership in Energy and Environmental Design (LEED) for Homes green building certification program, receiving at least four (4) Surface Water Management credits under the Sustainable Sites category;[24] OR

[22] See "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).
[23] Ibid.
[24] See LEED for Homes rating system at http://www.usgbc.org

(iii) Designed and constructed with structural BMPs that will achieve the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite.

(d) Redevelopment of existing single family residences that meet the following criteria:

(i) Designed and constructed to be certified under the USGCB LEED for Homes green building certification program, receiving at least four (4) Surface Water Management credits under the Sustainable Sites category; [25] OR

(ii) Designed and constructed with structural BMPs that will achieve the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite.

c. Priority Development Project Structural BMP Performance Requirements

In addition to the BMP requirements listed for all development projects under Provision E.3.a, Priority Development Projects must also implement structural BMPs that conform to performance requirements below.

(1) Storm Water Pollutant Control BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite structural BMPs to control pollutants in storm water that may be discharged from a project as follows:

(a) Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite the pollutants contained in the design capture volume. The design capture volume is equivalent to:

(i) The volume of storm water produced from a 24-hour 85th percentile storm event;[26] OR

(ii) The volume of storm water that would be retained onsite if the site was fully undeveloped and naturally vegetated, as determined using continuous simulation modeling techniques based on site-specific soil conditions and typical native vegetative cover.

[25] See LEED for Homes rating system at http://www.usgbc.org

[26] This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals.

(b) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) to comply with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1)(a).

(c) If a Priority Development project is allowed to utilize alternative compliance pursuant to Provisions E.3.c.(1)(b), flow-thru conventional treatment control BMPs must be implemented to treat the portion of the design capture volume that is not retained onsite. Additionally, project applicants must mitigate for the portion of the pollutant load in the design capture volume that is not retained onsite through one or more alternative compliance options under Provision E.3.c.(3). Conventional treatment control BMPs must be sized and designed to:

(i) Remove pollutants from storm water to the MEP;

(ii) Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;

(iii) Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Conventional treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of conventional treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

(2) <u>Hydromodification Management BMP Requirements</u>

Each Copermittee must require each Priority Development Project to implement onsite structural BMPs to manage hydromodification that may be caused by storm water runoff discharged from a project as follows:

(a) Post-project runoff flow rates and durations must not exceed pre-development (naturally occurring) runoff flow rates and durations by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat conditions downstream of Priority Development Projects).

(i) In evaluating the range of flows that results in increased potential for erosion of natural (non-hardened) channels, the lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks.

(ii) For artificially hardened channels, analysis to identify the lower boundary must use characteristics of a natural stream segment similar to that found in the watershed. The lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or erodes the toe of the channel banks.

(iii) The Copermittees may use monitoring results collected pursuant to Provision D.1.a.(2) to re-define the range of flows resulting in increased potential for erosion, or degraded instream habitat conditions, as warranted by the data.

(b) Post-project runoff flow rates and durations must compensate for the loss of sediment supply due to the development project, should loss of sediment supply occur as a result of the development project.

(c) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) to comply with the performance requirements of Provisions E.3.c.(2)(a)-(b).

(d) Exemptions

Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provisions E.3.c.(2)(a)-(b) where the project:

(i) Discharges storm water runoff into existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;

(ii) Is a redevelopment Priority Development Project that meets the alternative compliance requirements of Provision E.3.c.(3)(b)(ii); or

(iii) Discharges storm water runoff into other areas identified by the San Diego Water Board as exempt from the requirements of Provisions E.3.c.(2)(a)-(b).

(3) <u>Alternative Compliance to Onsite Structural BMP Performance Requirements</u>

(a) Applicability

At the discretion of each Copermittee, Priority Development Projects may be allowed to utilize an alternative option to comply with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) under the following conditions:

(i) The Copermittee must determine that implementation of the alternative compliance option will have a greater overall water quality

benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite;

(ii) The alternative compliance options must be designed by a registered professional engineer, geologist, architect, or landscape architect;

(iii) The alternative compliance options must be implemented within the same hydrologic unit as the Priority Development Project, and preferably within the same hydrologic subarea;

(iv) Receiving waters must not be utilized to convey storm water runoff to the alternative compliance options;

(v) The pollutants in storm water runoff from the Priority Development Project must be treated to the MEP by the alternative compliance options prior to being discharged to receiving waters;

(vi) Unless otherwise allowed by Provision E.3.c.(3)(b), the alternative compliance options must have a net result of at least the same level of pollutant removal as would have been achieved if the Priority Development Project had fully complied with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1) onsite;

(vii) Unless otherwise allowed by Provision E.3.c.(3)(b), the alternative compliance options must have a net result of at least the same level of protection from potential downstream and upstream erosion in the receiving water as would have been achieved if the Priority Development Project had fully complied with the hydromodification management BMP performance requirements of Provision E.3.c.(2) onsite; and

(viii) The alternative compliance options utilized by the Priority Development Project to comply with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) must have reliable sources of funding for operation and maintenance.

(b) Alternative Compliance Project Options

The Copermittee may allow implementation of one or more of the following project options as part of an alternative approach to complying with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2):

(i) *Onsite LID Biofiltration Treatment Control BMPs*

The Copermittee may allow Priority Development Projects to utilize onsite LID biofiltration treatment control BMPs to comply with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1). Onsite LID biofiltration treatment control BMPs must be sized and designed to:

[a] Remove pollutants from storm water to the MEP; AND
[b] Have an appropriate surface loading rate to prevent erosion, scour and channeling within the BMP; AND
[c] Biofilter at least 1.5 times the design capture volume that is not reliably retained onsite; OR
[d] Biofilter up to the design capture volume that is not reliably retained onsite, AND 1) treat the remaining portion of the design capture volume not retained onsite with conventional treatment control BMPs in accordance with Provision E.3.c.(1)(c), and 2) if necessary, mitigate for the portion of the pollutant load in the design capture volume not retained onsite through one or more alternative compliance project, in-lieu fee and/or water quality credit system options below.

(ii) *LEED Certified Redevelopment Projects*

The Copermittee may allow redevelopment Priority Development Projects to comply with the hydromodification management BMP performance requirements of Provision E.3.c.(2) where the project is designed and constructed to be certified under the USGCB LEED for New Construction and Major Renovations green building certification program. The Priority Development Project must receive at least one (1) Site Design credit and two (2) Stormwater Design credits under the Sustainable Sites category.[27] In addition, the existing and future configuration of the receiving water must not be unnaturally altered or adversely impacted by storm water flow rates and durations discharged from the site.

(iii) *Watershed-Based Planned Development Projects*

The Copermittee may allow Priority Development Projects greater than 100 acres in total project size (or smaller than 100 acres in size yet part of a larger common plan of development that is over 100 acres) to comply with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2). The Priority Development Project must comply with the following conditions:

[a] The Priority Development Project was planned utilizing watershed and/or subwatershed based water quality, hydrologic, and fluvial geomorphologic planning principles that implement regional LID BMPs in accordance with the performance and location criteria of this Order and acceptable to the San Diego Water Board;
[b] Regional LID BMPs may be used provided that the BMPs capture and retain the volume of runoff produced from the design capture volume defined in Provision E.3.c.(1)(a)(i) and that such controls are located upstream of receiving waters;

[27] See LEED for New Construction and Major Renovations rating system at http://www.usgbc.org

[c] Regional LID BMPs must clearly exhibit that they will not result in a net impact from pollutant loadings over and above the impact caused by capture and retention of the design capture volume;

[d] Any portion of the design capture volume that is not retained by the regional LID BMPs must be treated using biofiltration BMPs; and

[e] Where regional LID BMPs are demonstrated to the Copermittee as technically infeasible to retain the entire design capture volume, any volume up to and including the design capture volume not retained by regional LID BMPs, nor treated by biofiltration BMPs, must be treated using conventional treatment control BMPs and the project applicant must implement additional alternative compliance project, in-lieu fee and/or water quality credit system options below.

(iv) *Offsite Regional BMPs*

[a] The Copermittee may allow Priority Development Projects to utilize offsite regional BMPs to comply with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1) if the offsite regional BMPs have the capacity to receive and retain at least 1.1 times the design capture volume that is not reliably retained onsite.

[b] The Copermittee may allow Priority Development Projects to utilize offsite regional BMPs to comply with the hydromodification management BMP performance requirements of Provision E.3.c.(2) if the offsite regional BMPs have the capacity to manage the storm water flows rates and durations from the site such that the receiving waters are protected from the potential for increased erosion that would be caused if the unmanaged portion of the runoff was discharged from the site.

(v) *Offsite Retrofitting Projects*

The Copermittee may allow Priority Development Projects to utilize offsite retrofitting projects to comply with the storm water pollutant control and hydromodification management BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) if the retrofitting projects have been identified within the strategies included in the Water Quality Improvement Plan, or identified as potential retrofitting projects by the Copermittee pursuant to Provision E.5.

(vi) *Offsite Channel, Stream, or Habitat Rehabilitation Projects*

The Copermittee may allow Priority Development Projects to utilize offsite channel, stream, or habitat rehabilitation projects to comply with the hydromodification management BMP performance requirements of Provision E.3.c.(2) if the rehabilitation projects have been identified within the strategies included in the Water Quality

Improvement Plan, or identified as potential channel rehabilitation projects by the Copermittee pursuant to Provision E.5. The channel, stream, or habitat rehabilitation project cannot be utilized for pollutant treatment except where artificial wetlands are constructed and located upstream of receiving waters.

(vii) *Offsite Regional Water Supply Augmentation Projects*

The Copermittee may allow Priority Development Projects to utilize offsite regional water supply augmentation projects (i.e. groundwater recharge, recycled water, storm water harvesting) to comply with the storm water pollutant control and hydromodification management BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) if the projects have been identified within the strategies included in the Water Quality Improvement Plan.

(viii) *Project Applicant Proposed Alternative Compliance Projects*

The Copermittee may allow one or more Priority Development Project applicant(s) to propose and implement alternative compliance projects to comply with the storm water pollutant control and hydromodification management BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) if the alternative compliance projects are consistent with, and will address the highest water quality priorities of the Water Quality Improvement Plan, and comply with the requirements of Provision E.3.c.(3)(a).

(c) Alternative Compliance In-Lieu Fee Option

The Copermittee may develop and implement an alternative compliance in-lieu fee option, individually or with other Copermittees and/or entities, as a means for designing, developing, constructing, operating and maintaining offsite alternative compliance projects under Provision E.3.c.(3)(b). Priority Development Projects allowed to utilize the alternative compliance in-lieu fee option must comply with the following conditions:

(i) The in-lieu fee must be transferred to the Copermittee (for public projects) or an escrow account (for private projects) prior to the date construction of the Priority Development Project is initiated.

(ii) If the in-lieu fee is applied to the development, design and construction of offsite alternative compliance projects, the following conditions must be met:

[a] The offsite alternative compliance projects must allow the Priority Development Project to comply with the onsite BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2);

[b] The offsite alternative compliance projects must be constructed as soon as possible, but no later than 4 years after the certificate of occupancy is granted for the first Priority Development Project that contributed funds toward the construction of the offsite alternative compliance projects, unless a longer period of time is authorized by the San Diego Water Board Executive Officer;

[c] The in-lieu fee for the Priority Development Project must include mitigation of the pollutant loads and increased storm water flow rates and durations that are allowed to discharge from the site before the offsite alternative compliance projects are constructed; and

[d] The in-lieu fee must also include the cost to operate and maintain the offsite alternative compliance projects.

(iii) If the in-lieu fee is applied to the operation and maintenance of offsite alternative compliance projects that have already been constructed, the offsite alternative compliance projects must allow the Priority Development Project to comply with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2).

(d) Alternative Compliance Water Quality Credit System Option

The Copermittee may develop and implement an alternative compliance water quality credit system option, individually or with other Copermittees and/or entities, provided that such a credit system clearly exhibits that it will not allow discharges from Priority Development Projects to cause or contribute to a net impact over and above the impact caused by projects meeting the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2). Any credit system that a Copermittee chooses to implement must be submitted to the San Diego Water Board Executive Officer for review and acceptance as part of the Water Quality Improvement Plan.

(4) Long-Term Structural BMP Maintenance

Each Copermittee must require the project applicant to submit proof of the mechanism under which ongoing long-term maintenance of all structural BMPs will be conducted.

(5) Infiltration and Groundwater Protection

(a) Structural BMPs designed to primarily function as large, centralized infiltration devices (such as large infiltration trenches and infiltration basins) must not cause or contribute to an exceedance of an applicable groundwater quality objective. At a minimum, such infiltration BMPs must be in conformance with the design criteria listed below, unless the development project applicant demonstrates to the Copermittee that one

or more of the specific design criteria listed below are not necessary to protect groundwater quality. The design criteria listed below do not apply to small infiltration systems dispersed throughout a development project.

(i) Runoff must undergo pretreatment such as sedimentation or filtration prior to infiltration;

(ii) Pollution prevention and source control BMPs must be implemented at a level appropriate to protect groundwater quality at sites where infiltration BMPs are to be used;

(iii) Infiltration BMPs must be adequately maintained to remove pollutants in storm water to the MEP;

(iv) The vertical distance from the base of any infiltration BMP to the seasonal high groundwater mark must be at least 10 feet. Where groundwater basins do not support beneficial uses, this vertical distance criteria may be reduced, provided groundwater quality is maintained;

(v) The soil through which infiltration is to occur must have physical and chemical characteristics (e.g., appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses;

(vi) Infiltration BMPs must not be used for areas of industrial or light industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee, unless first treated or filtered to remove pollutants prior to infiltration; and

(vii) Infiltration BMPs must be located a minimum of 100 feet horizontally from any water supply wells.

(b) The Copermittee may develop, individually or with other Copermittees, alternative mandatory design criteria to that listed above for infiltration BMPs which are designed to primarily function as centralized infiltration devices. Before implementing the alternative design criteria in the development planning process the Copermitee(s) must:

(i) Notify the San Diego Water Board of the intent to implement the alternative design criteria submitted; and

(ii) Comply with any conditions set by the San Diego Water Board.

d. BMP DESIGN MANUAL UPDATE

Each Copermittee must update its BMP Design Manual[28] pursuant to Provision F.2.b. Until the Copermittee has updated its BMP Design Manual with the

[28] The BMP Design Manual was formerly known as the Standard Storm Water Mitigation Plan under Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016.

requirements of Provisions E.3.a-c, the Copermittee must continue implementing its current BMP Design Manual. Unless directed otherwise by the San Diego Water Board, the Copermittee must implement the BMP Design Manual within 180 days of completing the update. The update of the BMP Design Manual must include the following:

(1) Updated procedures to determine the nature and extent of storm water requirements applicable to a potential development or redevelopment projects. These procedures must inform project applicants of the storm water management requirements applicable to their project including, but not limited to, general requirements for all development projects, structural BMP design procedures and requirements, hydromodification management requirements, requirements specific to phased projects, and procedures specific to private developments and public improvement projects;

(2) Updated procedures to identify pollutants and conditions of concern for selecting the most appropriate structural BMPs that consider, at a minimum, the following:

(a) Receiving water quality (including pollutants for which receiving waters are listed as impaired under the CWA section 303(d) List);

(b) Pollutants, stressors, and/or receiving water conditions that cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(c) Land use type of the project and pollutants associated with that land use type; and

(d) Pollutants expected to be present onsite.

(3) Updated procedures for designing structural BMPs, including any updated performance requirements to be consistent with the requirements of Provision E.3.c for all structural BMPs listed in the BMP Design Manual;

(4) Long-term maintenance criteria for each structural BMP listed in the BMP Design Manual; and

(5) Alternative compliance criteria, in accordance with the requirements under Provision E.3.c.(3), if the Copermittee elects to allow Priority Development Projects within its jurisdiction to utilize alternative compliance.

e. Priority Development Project BMP Implementation and Oversight

Each Copermittee must implement a program that requires and confirms structural BMPs on all Priority Development Projects are designed, constructed, and maintained to remove pollutants in storm water to the MEP.

(1) Structural BMP Approval and Verification Process

(a) Each Copermittee must require and confirm that for all Priority Development Project applications that have not received prior lawful approval by the Copermittee by 18 months after the commencement of coverage under this Order, the requirements of Provision E.3 are implemented. For project applications that have received prior lawful approval by 18 months after the commencement of coverage under this Order, the Copermittee may allow previous land development requirements to apply.

(b) Each Copermittee must identify the roles and responsibilities of various municipal departments in implementing the structural BMP requirements, including each stage of a project from application review and approval through BMP maintenance and inspections.

(c) Each Copermittee must require and confirm that appropriate easements and ownerships are properly recorded in public records and the information is conveyed to all appropriate parties when there is a change in project or site ownership.

(d) Each Copermittee must require and confirm that prior to occupancy and/or intended use of any portion of the Priority Development Project, each structural BMP is inspected to verify that it has been constructed and is operating in compliance with all of its specifications, plans, permits, ordinances, and the requirements of this Order.

(2) Priority Development Project Inventory and Prioritization

(a) Each Copermittee must develop, maintain, and update at least annually, a watershed-based database to track and inventory all Priority Development Projects and associated structural BMPs within its jurisdiction. Inventories must be accurate and complete beginning from January 2002 for the San Diego County Copermittees, February 2003 for the Orange County Copermittees, and July 2005 for the Riverside County Copermittees. The use of an automated database system, such as GIS, is highly recommended. The database must include, at a minimum, the following information:

(i) Priority Development Project location (address and hydrologic subarea);

(ii) Descriptions of structural BMP type(s);

(iii) Date(s) of construction;

(iv) Party responsible for structural BMP maintenance;

(v) Dates and findings of structural BMP maintenance verifications; and

(vi) Corrective actions and/or resolutions.

(b) Each Copermittee must prioritize the Priority Development Projects with structural BMPs within its jurisdiction. The designation of Priority Development Projects as high priority must consider the following:

(i) The highest water quality priorities identified in the Water Quality Improvement Plan;

(ii) Receiving water quality;

(iii) Number and sizes of structural BMPs;

(iv) Recommended maintenance frequency of structural BMPs;

(v) Likelihood of operation and maintenance issues of structural BMPs;

(vi) Land use and expected pollutants generated; and

(vii) Compliance record.

(3) Structural BMP Maintenance Verifications and Inspections

Each Copermittee is required to verify that structural BMPs on each Priority Development Project are adequately maintained, and continue to operate effectively to remove pollutants in storm water to the MEP through inspections, self-certifications, surveys, or other equally effective approaches.

(a) All (100 percent) of the structural BMPs at Priority Development Projects that are designated as high priority must be inspected directly by the Copermittee annually prior to each rainy season;

(b) For verifications performed through a means other than direct Copermittee inspection, adequate documentation must be required by the Copermittee to provide assurance that the required maintenance of structural BMPs at each Priority Development Project has been completed; and

(c) Appropriate follow-up measures (including re-inspections, enforcement, etc.) must be conducted to ensure that structural BMPs at each Priority Development Project continue to reduce pollutants in storm water to the MEP as originally designed.

f. DEVELOPMENT PROJECT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all development projects, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

g. Strategies to Address the Highest Priority Water Quality Conditions

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the development planning program to address development and redevelopment projects that may become sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, increase frequency of verifications and/or inspections, alternative compliance options);

(2) Each Copermittee must identify areas within its jurisdiction where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting and/or stream, channel, or habitat rehabilitation projects;

(3) Each Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify regional alternative compliance projects that Priority Development Projects may be allowed or should be encouraged to implement or participate in implementing; and

(4) The strategies and/or activities must be consistent with the requirements of Provisions E.3.a-c and E.3.e-f and the strategies identified in the Water Quality Improvement Plan.

4. Construction Management

Each Copermittee must implement a construction management program in accordance with the strategies identified in the Water Quality Improvement Plan and includes, at a minimum, the following requirements:

a. Project Approval Process

Prior to issuance of any local permit(s) that allows the commencement of construction projects that involve ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff, each Copermittee must:

(1) Require a site-specific pollution control, construction BMP, and/or erosion and sediment control plan, to be submitted by the project applicant to the Copermittee;

(2) Confirm the pollution control, construction BMP, and/or erosion and sediment control plan, complies with the local grading ordinance, other applicable local ordinances, and the requirements of this Order;

(3) Confirm the pollution control, construction BMP, and/or erosion and sediment control plan, includes seasonally appropriate and effective BMPs and management measures described in Provision E.4.c, as applicable to the project; and

(4) Verify that the project applicant has obtained coverage under applicable permits, including, but not limited to the Construction General Permit, Clean Water Act Section 401 Water Quality Certification and Section 404 Permit, and California Department of Fish and Game Streambed Alteration Agreement.

b. CONSTRUCTION SITE INVENTORY AND TRACKING

(1) Each Copermittee must maintain, and update at least monthly, a watershed-based inventory of all construction projects issued a local permit that allows ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff. The use of an automated database system, such as GIS, is highly recommended. The inventory must include:

(a) Relevant contact information for each site (e.g., name, address, phone, and email for the owner and contractor);

(b) The basic site information including location (address and hydrologic subarea), Waste Discharge Identification (WDID) number (if applicable), size of the site, and approximate area of disturbance;

(c) Whether or not the site is considered a high threat to water quality, as defined in Provision E.4.b.(2) below;

(d) The project start and anticipated completion dates;

(e) Current construction phase;

(f) The required inspection frequency, as defined in the Copermittee's jurisdictional runoff management program document;

(g) The date the Copermittee accepted and/or approved the site-specific pollution control, construction BMP, and/or erosion and sediment control plan; and

(h) Whether or not there are ongoing enforcement actions administered to the site.

(2) Each Copermittee must identify all construction sites within its jurisdiction that represent a high threat to downstream surface water quality. The designation of construction sites as high threat to water quality must consider the following:

(a) Sites located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Sites located within the same hydrologic subarea and tributary to a water body segment listed as impaired for sediment on the CWA section 303(d) List;

(c) Sites located within, directly adjacent to, or discharging directly to a receiving water within an ESA; and

(d) Other sites determined by the Copermittees or the San Diego Water Board as a high threat to water quality.

c. CONSTRUCTION SITE BMP IMPLEMENTATION

Each Copermittee must implement, or require the implementation of effective BMPs to reduce discharges of pollutants in storm water from construction sites to the MEP, and prevent non-storm water discharges from construction sites into the MS4. These BMPs must be site specific, seasonally appropriate, and construction phase appropriate. BMPs must be implemented at each construction site year round. Dry season BMP implementation must plan for and address unseasonal rain events that may occur during the dry season (May 1 through September 30). Copermittees must implement, or require the implementation of, BMPs in the following categories:

(1) Project Planning;

(2) Good Site Management “Housekeeping”, including waste management;

(3) Non-storm Water Management;

(4) Erosion Control;

(5) Sediment Control;

(6) Run-on and Run-off Control; and

(7) Active/Passive Sediment Treatment Systems, where applicable.

d. CONSTRUCTION SITE INSPECTIONS

Each Copermittee must conduct construction site inspections to require and confirm compliance with its local permits and applicable local ordinances, and the requirements of this Order. Priority for site inspections must consider threat to water quality pursuant to Provision E.4.b as well as the nature of the construction activity, topography, and the characteristics of soils and receiving water quality.

(1) Inspection Frequency

(a) Each Copermittee must conduct inspections at all inventoried sites, including high threat to water quality sites, at an appropriate frequency for each phase of construction to ensure the site reduces the discharge of pollutants in storm water from construction sites to the MEP, and prevents non-storm water discharges from entering the MS4.

(b) Each Copermittee must establish appropriate inspection frequencies for high threat to water quality sites, and all other sites, for each phase of construction. Inspection frequencies appropriate for addressing the highest water quality priorities identified in the Water Quality Improvement Plan, and for complying with the requirements of this Order must be identified in each Copermittee's jurisdictional runoff management program document.

(c) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e., re-inspection, enforcement) necessary to require and confirm site compliance with its local permits and applicable local ordinances, and the requirements of this Order.

(2) Inspection Content

Inspections of construction sites by the Copermittee must include, at a minimum:

(a) Verification of coverage under the Construction General Permit (Notice of Intent (NOI) and/or WDID number) during initial inspections, when applicable;

(b) Assessment of compliance with its local permits and applicable local ordinances related to pollution prevention, including the implementation and maintenance of applicable BMPs;

(c) Assessment of BMP adequacy and effectiveness;

(d) Visual observations of actual non-storm water discharges;

(e) Visual observations of actual or potential discharge of sediment and/or construction related materials from the site;

(f) Visual observations of actual or potential illicit connections; and

(g) If any violations are found and BMP corrections are needed, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried construction sites. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Site name, location (address and hydrologic subarea), and WDID number (if applicable);

(b) Inspection date;

(c) Approximate amount of rainfall since last inspection;

(d) Description of problems observed with BMPs and indication of need for BMP addition/repair/replacement and any scheduled re-inspection, and date of re-inspection;

(e) Descriptions of any other specific inspection comments which must, at a minimum, include rationales for longer compliance time;

(f) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(g) Resolution of problems noted and date problems fixed.

e. CONSTRUCTION SITE ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried construction sites, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

f. STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the construction management program to address construction sites that the Copermittee has identified as potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, and/or increase/decrease frequency of inspections for specific types of sites and/or activities); and

(2) The strategies and/or activities must be consistent with the requirements of Provisions E.4.c-e and the strategies identified in the Water Quality Improvement Plan.

5. Existing Development Management

Each Copermittee must implement an existing development management program in accordance with the strategies identified in the Water Quality Improvement Plan and includes, at a minimum, the following requirements:

a. Existing Development Inventory and Tracking

Each Copermittee must maintain, and update at least annually, a watershed-based inventory of the existing development within its jurisdiction that may discharge a pollutant load to and from the MS4. The use of an automated database system, such as GIS, is highly recommended. The inventory must, at a minimum, include:

(1) Name, location (hydrological subarea and address, if applicable) of the following types of existing development with its jurisdiction:

(a) Commercial facilities or areas;

(b) Industrial facilities;

(c) Municipal facilities, including:

(i) MS4 and related structures,[29]

(ii) Roads, streets, and highways,

(iii) Parking facilities,

(iv) Municipal airfields,

(v) Parks and recreation facilities,

(vi) Flood management and flood control devices and structures,

(vii) Operating or closed municipal landfills,

(viii) Publicly owned treatment works (including water and wastewater treatment plants) and sanitary sewer collection systems,

(ix) Corporate yards, including maintenance and storage yards for materials, waste, equipment, and vehicles,

(x) Hazardous waste collection facilities,

[29] The inventory may refer to the MS4 map required to be maintained pursuant to Provision E.2.b.(1).

(xi) Other treatment, storage or disposal facilities for municipal waste, and

(xii) Other municipal facilities that the Copermittee determines may contribute a significant pollutant load to the MS4; and

(d) Residential areas, which may be designated by one or more of the following:

(i) Residential management area,

(ii) Drainage basin or area,

(iii) Land use (e.g., single family, multi-family, rural),

(iv) Neighborhood,

(v) Common Interest Area,

(vi) Home Owner Association,

(vii) Mobile home park, and/or

(viii) Other designations accepted by the San Diego Water Board Executive Officer.

(2) A description of the facility or area, including the following information:

(a) Classification as commercial, industrial, municipal, or residential;

(b) Status of facility or area as active or inactive;

(c) Identification if a business is a mobile business;

(d) SIC Code or NAICS Code, if applicable;

(e) Industrial General Permit NOI and/or WDID number, if applicable;

(f) Identification if a residential area is or includes a Common Interest Area / Home Owner Association, or mobile home park;

(g) Identification of pollutants generated and potentially generated by the facility or area;

(h) Whether the facility or area is adjacent to an ESA;

(i) Whether the facility or area is tributary to and within the same hydrologic subarea as a water body segment listed as impaired on the CWA section 303(d) List and generates pollutants for which the water body segment is impaired; and

(j) Whether the facility or area contributes or potentially contributes to the highest priority water quality conditions identified in the Water Quality Improvement Plan.

(3) An annually updated map showing the location of inventoried existing development, watershed boundaries, and water bodies.

b. EXISTING DEVELOPMENT BMP IMPLEMENTATION AND MAINTENANCE

Each Copermittee must designate a minimum set of BMPs required for all inventoried existing development, including special event venues. The designated minimum BMPs must be specific to facility or area types and pollutant generating activities, as appropriate.

(1) Commercial, Industrial, and Municipal Facilities and Areas

(a) Pollution Prevention

Each Copermittee must require the use of pollution prevention methods by the commercial, industrial, and municipal facilities and areas in its inventoried existing development.

(b) BMP Implementation

Each Copermittee must implement, or require the implementation of, designated BMPs at commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development.

(c) BMP Operation and Maintenance

(i) Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development.

(ii) Each Copermittee must implement a schedule of operation and maintenance activities for its MS4 and related structures (including but not limited to catch basins, storm drain inlets, detention basins, etc.), and verify proper operation of all its municipal structural treatment controls designed to reduce pollutants (including floatables) in storm water discharges to or from its MS4s and related drainage structures. Operation and maintenance activities may include, but is not limited to, the following:

[a] Inspections of the MS4 and related structures;
[b] Cleaning of the MS4 and related structures; and
[c] Proper disposal of materials removed from cleaning of the MS4 and related structures.

(iii) Each Copermittee must implement a schedule of operation and maintenance for public streets, unpaved roads, paved roads, and paved highways and freeways within its jurisdiction to minimize pollutants that can be discharged in storm water.

(iv) Each Copermittee must implement controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers. Copermittees that operate both a municipal sanitary sewer system and a MS4 must implement controls and measures to prevent and eliminate seeping sewage from infiltrating the MS4. Copermittees that do not operate both a municipal sanitary sewer system and a MS4 must coordinate with sewering agencies to keep themselves informed of relevant and appropriate maintenance activities and sanitary sewage projects in their jurisdiction that may cause or contribute to seepage of sewage into the MS4.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must implement BMPs, or require the implementation of BMPs, to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development. Such BMPs must include, as appropriate, educational activities, permits, certifications and other measures for applicators and distributors.

(2) <u>Residential Areas</u>

(a) Pollution Prevention

Each Copermittee must promote and encourage the use of pollution prevention methods, where appropriate, by the residential areas in its inventoried existing development.

(b) BMP Implementation

Each Copermittee must promote and encourage the implementation of designated BMPs at residential areas in its inventoried existing development.

(c) BMP Operation and Maintenance

Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at residential areas in its inventoried existing development.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must promote and encourage the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from residential areas in its inventoried existing development.

c. EXISTING DEVELOPMENT INSPECTIONS

Each Copermittee must conduct inspections of inventoried existing development to ensure compliance with applicable local ordinances and permits, and the requirements of this Order.

(1) Inspection Frequency

(a) Each Copermittee must establish appropriate inspection frequencies for inventoried existing development in accordance with the following requirements:

(i) At a minimum, inventoried existing development must be inspected once every five years utilizing one or more of the following methods:

[a] Drive-by inspections by Copermittee municipal and contract staff,
[b] Onsite inspections by Copermittee municipal and contract staff, and/or
[c] Inspections by volunteer monitoring or patrol programs trained by the Copermittee;

(ii) The frequency of inspections must be appropriate to confirm that BMPs are being implemented to reduce the discharge of pollutants in storm water from the MS4 to the MEP and effectively prohibit non-storm water discharges to the MS4;

(iii) The frequency of inspections must be based on the potential for a facility or area to discharge non-storm water and pollutants in storm water, and should reflect the priorities set forth in the Water Quality Improvement Plan;

(iv) Each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development;[30] and

(v) Inventoried existing development must be inspected by the Copermittee, as needed, in response to valid public complaints and

[30] If any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspection may count toward the total annual inspection requirement. This requirement excludes linear municipal facilities (i.e., MS4, streets, roads and highways).

findings from the Copermittee's municipal and contract staff or volunteer monitoring or patrol program inspections.

(b) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e. education and outreach, re-inspection, enforcement) necessary to require and confirm compliance with its applicable local ordinances and permits and the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

(2) Inspection Content

(a) Inspections of existing development by the Copermittee or volunteer monitoring or patrol programs must include, at a minimum:

(i) Visual inspections for actual non-storm water discharges;

(ii) Visual inspections for actual or potential discharge of pollutants;

(iii) Visual inspections for actual or potential illicit connections; and

(iv) Verification that the description of the facility or area in the inventory, required pursuant to Provision E.5.a.(2), has not changed.

(b) Onsite inspections of existing development by the Copermittee must include, at a minimum:

(i) Assessment of compliance with its applicable local ordinances and permits related to non-storm water and storm water discharges and runoff;

(ii) Assessment of the implementation of the designated BMPs;

(iii) Verification of coverage under the Industrial General Permit, when applicable; and

(iv) If any problems or violations are found, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried existing development. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Name and location of facility or area (address and hydrologic subarea) consistent with the inventory name and location, pursuant to Provision E.5.a.(1);

(b) Inspection and re-inspection date(s);

(c) Inspection method(s) (i.e. drive-by, onsite);

(d) Observations and findings from the inspection(s);

(e) For onsite inspections of existing development by Copermittee municipal or contract staff, the records must also include, as applicable:

(i) Description of any problems or violations found during the inspection(s),

(ii) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6, and

(iii) The date problems or violations were resolved.

d. EXISTING DEVELOPMENT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried existing development, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

e. STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Each Copermittee must implement the water quality improvement strategies, where necessary, to address areas of existing development within its jurisdiction that are identified as sources of pollutants and/or stressors contributing to the highest priority water quality conditions in the Watershed Management Area. For the existing development management program, the following strategies must be implemented:

(1) <u>Specific Existing Development Management Program Strategies</u>

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented within its jurisdiction to address areas of existing development that the Copermittee has identified as sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(a) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, and/or increase/decrease frequency of inspections for specific types of facilities, areas and/or activities);

(b) The facilities and/or areas within the Copermittee's jurisdiction where the strategies and/or activities will be implemented; and

(c) The strategies and/or activities must be consistent with the requirements of Provisions E.5.b-d and the strategies identified in the Water Quality Improvement Plan.

(2) Retrofitting Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to retrofit areas of existing development within its jurisdiction to address identified sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify areas of existing development as candidates for retrofitting, focusing on areas where retrofitting will address pollutants and/or stressors that contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for retrofitting projects may be utilized to reduce pollutants that may be discharged in storm water from areas of existing development, and/or address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of retrofitting projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting projects; and

(e) Where retrofitting projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional retrofitting projects (i.e. projects that can receive and/or treat storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment) adjacent to and/or downstream of the areas of existing development.

(3) Stream, Channel and/or Habitat Rehabilitation in Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to rehabilitate streams, channels, and/or habitats in areas of existing development within its jurisdiction to address the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify streams, channels, and/or habitats in areas of existing development as candidates for rehabilitation, focusing on areas where stream, channel, and/or habitat rehabilitation projects will address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for stream, channel, and/or habitat rehabilitation projects may be utilized to address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters, rehabilitate channelized or hydromodified streams, restore wetland and riparian habitat, restore watershed functions, and/or restore beneficial uses of receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of stream, channel, and/or habitat rehabilitation projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance stream, channel, and/or habitat rehabilitation projects; and

(e) Where stream, channel, and/or habitat rehabilitation projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional stream, channel, and/or habitat rehabilitation projects (i.e. projects that can receive storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment).

6. Enforcement Response Plans

Each Copermittee must develop and implement an Enforcement Response Plan as part of its jurisdictional runoff management program document. The Enforcement Response Plan must describe the applicable approaches and options to enforce its legal authority established pursuant to Provision E.1, as necessary, to achieve compliance with the requirements of this Order. The Enforcement Response Plan must include the following:

a. Enforcement Response Plan Components

The Enforcement Response Plan must include the following individual components:

(1) Illicit Discharge Detection and Elimination Enforcement Component;

(2) Development Planning Enforcement Component;

(3) Construction Management Enforcement Component; and

(4) Existing Development Enforcement Component.

b. Enforcement Response Approaches and Options

Each component of the Enforcement Response Plan must describe the enforcement response approaches that the Copermittee will implement to compel compliance with its statutes, ordinances, permits, contracts, orders, or similar means, and the requirements of this Order. The description must include the protocols for implementing progressively stricter enforcement responses. The enforcement response approaches must include appropriate sanctions to compel compliance, including, at a minimum, the following tools or their equivalent:

(1) Verbal and written notices of violation;

(2) Cleanup requirements;

(3) Fines;

(4) Bonding requirements;

(5) Administrative and criminal penalties;

(6) Liens;

(7) Stop work orders; and

(8) Permit and occupancy denials.

c. Correction of Violations

(1) Violations must be corrected in a timely manner with the goal of correcting the violations within 30 calendar days after the violations are discovered, or prior to the next predicted rain event, whichever is sooner.

(2) If more than 30 calendar days are required to achieve compliance, then a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

d. Escalated Enforcement

(1) The Enforcement Response Plan must include a definition of "escalated enforcement." Escalated enforcement must include any enforcement scenario where a violation or other non-compliance is determined to cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan. Escalated enforcement may be defined differently for development planning, construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas.

(2) Where the Copermittee determines escalated enforcement is not required, a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

(3) Escalated enforcement actions must continue to increase in severity, as necessary, to compel compliance as soon as possible.

e. Reporting of Non-Compliant Sites

(1) Each Copermittee must notify the San Diego Water Board in writing within 2 working days of issuing escalated enforcement (as defined in the Copermittee's Enforcement Response Plan) to a construction site that poses a significant threat to water quality as a result of violations or other non-compliance with its permits and applicable local ordinances, and the requirements of this Order. Written notification may be provided electronically by email.

(2) Each Copermittee must notify the San Diego Water Board of non-filers under the Industrial General Permit and Construction General Permit by email to Nonfilers_R9@waterboards.ca.gov.

7. Public Education and Participation

Each Copermittee must implement, individually or with other Copermittees, a public education and participation program in accordance with the strategies identified in the Water Quality Improvement Plan to promote and encourage the development of programs, management practices, and behaviors that reduce the discharge of pollutants in storm water to the MEP, prevent controllable non-storm water discharges from entering the MS4, and protect water quality standards in receiving waters.

a. PUBLIC EDUCATION

The public education program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) Educational activities, public information activities, and other appropriate outreach activities intended to reduce pollutants associated with the application of pesticides, herbicides and fertilizer and other pollutants of concern in storm water discharges to and from its MS4 to the MEP, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed to address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(2) Educational activities, public information activities, and other appropriate outreach activities to facilitate the proper management and disposal of used oil and toxic materials; and

(3) Appropriate education and training measures for specific target audiences, such as construction site operators, residents, underserved target audiences and school-aged children, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed, based on high risk behaviors and pollutants of concern.

b. PUBLIC PARTICIPATION

The public participation program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) A process for members of the public to participate in updating the highest priority water quality conditions, numeric goals, and water quality improvement strategies in the Water Quality Improvement Plan.

(2) Opportunities for members of the public to participate in providing the Copermittee recommendations for improving the effectiveness of the water quality improvement strategies implemented within its jurisdiction.

(3) Opportunities for members of the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or restoration and protection of the quality of receiving waters.

c. STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented within its jurisdiction, as applicable, to educate the public and encourage public participation to address potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) The target audiences and/or areas within the Copermittee's jurisdiction where the strategies and/or activities will be implemented;

(2) Provide specific details about how the strategies and/or activities will be implemented (e.g. educational topics, materials and/or activities, public outreach and participation programs and/or opportunities);

(3) Each Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify and implement regional public education and participation activities, programs and opportunities;

(4) Each Copermittee must incorporate a mechanism for evaluating and assessing educational and other public outreach activities, as needed, to identify progress and incorporate modifications necessary to increase the effectiveness of the public education and participation program.

8. Fiscal Analysis

a. Each Copermittee must secure the resources necessary to meet all the requirements of this Order.

b. Each Copermittee must conduct an annual fiscal analysis of its jurisdictional runoff management program in its entirety. The fiscal analysis must include the following:

(1) Identification of the various categories of expenditures necessary to implement the requirements of this Order, including a description of the specific capital, operation and maintenance, and other expenditure items to be accounted for in each category of expenditures;

(2) The staff resources needed and allocated to meet the requirements of this Order, including any development, implementation, and enforcement activities required;

(3) The estimated expenditures for Provisions E.8.b.(1) and E.8.b.(2) for the current fiscal year; and

(4) The source(s) of funds that are proposed to meet the necessary expenditures described in Provisions E.8.b.(1) and E.8.b.(2), including legal restrictions on the use of such funds, for the current fiscal year and next fiscal year.

c. Each Copermittee must submit a summary of the annual fiscal analysis with each Annual Report required pursuant to Provision F.3.b.

d. Each Copermittee must provide the documentation used to develop the summary of the annual fiscal analysis upon request by the San Diego Water Board.

F. REPORTING

The purpose of this provision is to determine and document compliance with the requirements set forth in this Order. The goal of reporting is to communicate to the San Diego Water Board and the people of the State of California the implementation status of each jurisdictional runoff management program and compliance with the requirements of this Order. This goal is to be accomplished through the submittal of specific deliverables to the San Diego Water Board by the Copermittees.

1. Water Quality Improvement Plans

The Copermittees for each Watershed Management Area must develop and submit the Water Quality Improvement Plan in accordance with the following requirements:

a. WATER QUALITY IMPROVEMENT PLAN DEVELOPMENT

Each Water Quality Improvement Plan must be developed in accordance with the following process:

(1) Priority Water Quality Conditions and Numeric Goals

(a) The Copermittees must implement a public participation process to solicit data and information to be utilized in the development and identification of the priority water quality conditions for the Watershed Management Area.

(b) The Copermittees are encouraged to involve the public and key stakeholders as early and often as possible during the development of the priority water quality conditions and numeric goals to be included in the Water Quality Improvement Plan.

(c) Within 6 months after the commencement of coverage under this Order, the Copermittees must develop and submit the Water Quality Improvement Plan requirements of Provision B.2 to the San Diego Water Board. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of 60 days.

(d) The Copermittees must revise the priority water quality conditions and numeric goals based on comments received and/or recommendations or direction from the San Diego Water Board Executive Officer.

(2) Water Quality Improvement Strategies and Schedules

(a) The Copermittees are encouraged to involve the public and key stakeholders as early and often as possible during the development of the water quality improvement strategies and schedules to be included in the Water Quality Improvement Plan.

(b) Within 9 months after the commencement of coverage under this Order, the Copermittees must develop and submit the Water Quality Improvement Plan requirements of Provision B.3 to the San Diego Water Board. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of 60 days.

(c) The Copermittees must revise the water quality improvement strategies and schedules based on comments received and/or recommendations or direction from the San Diego Water Board Executive Officer.

b. WATER QUALITY IMPROVEMENT PLAN SUBMITTAL

(1) Within 18 months after the commencement of coverage under this Order, the Copermittees for each Watershed Management Area must submit a complete Water Quality Improvement Plan in accordance with the requirements of Provision B to the San Diego Water Board. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of 30 days.

(2) Based on the comments received, the San Diego Water Board will determine whether to hold a public hearing or to limit public input to submittal of written comments. If no hearing is held the San Diego Water Board will notify the Copermittees within 6 months that the Water Quality Improvement Plan has been accepted as complete following its review and determination that the Water Quality Improvement Plan meets the requirements of this Order.

(3) The Copermittees must revise the Water Quality Improvement Plan based on comments received and/or recommendations or direction from the San Diego Water Board Executive Officer.

(4) The Water Quality Improvement Plan must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance by the San Diego Water Board.

2. Updates

a. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATES

Each Copermittee must update its jurisdictional runoff management program document in accordance with the following requirements:

(1) Each Copermittee is encouraged to involve the public and key stakeholders as early and often as possible to solicit recommendations for updates to its jurisdictional runoff management program document.

(2) Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E no later than 18 months after the commencement of coverage under this Order.

(3) Each Copermittee must submit updates to its jurisdictional runoff management program, with a rationale for the modifications, either in the Annual Report required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge required pursuant to Provision F.5.b.

(4) The Copermittee must revise the modifications as directed by the San Diego Water Board Executive Officer.

(5) Updated jurisdictional runoff management program documents must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of submitting the Annual Report.

b. BMP DESIGN MANUAL UPDATES

Each Copermittee must update its BMP Design Manual in accordance with the following requirements:

(1) Each Copermittee must update its BMP Design Manual to incorporate the requirements of Provisions E.3.a-d no later than 18 months after the commencement of coverage under this Order.

(2) Subsequent updates must be consistent with the requirements of Provisions E.3.a-d and must be submitted as part of the Annual Reports required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge required pursuant to Provision F.5.b.

(3) Updated BMP Design Manuals must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of completing the update.

c. WATER QUALITY IMPROVEMENT PLAN UPDATES

The Water Quality Improvement Plans must be updated in accordance with the following process:

(1) The Copermittees must implement a public participation process to solicit data and information to be utilized in updating the Water Quality Improvement Plan.

(2) The Copermittees are encouraged to involve the public and key stakeholders as early and often as possible during the updates to the Water Quality Improvement Plan.

(3) The Copermittees for each Watershed Management Area must submit requested updates to the Water Quality Improvement Plan, with the public input received and the rationale for the requested updates, either in the Annual Reports required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The requested updates are considered accepted by the San Diego Water Board if no response is provided to the Copermittee after 3 months of submitting the request.

(4) The Copermittees must revise the requested updates as directed by the San Diego Water Board Executive Officer.

(5) Updated Water Quality Improvement Plans must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance of the requested updates by the San Diego Water Board.

3. Progress Reporting

a. Progress Report Presentations

The Copermittees for each Watershed Management Area must appear before the San Diego Water Board, as requested by the San Diego Water Board, to provide progress reports on the implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs.

b. Annual Reports

(1) The Copermittees for each Watershed Management Area must submit an Annual Report for each reporting period no later than January 31 of the following year. The annual reporting period consists of two periods: 1) July 1 to June 30 of the following year for the jurisdictional runoff management programs, 2) October 1 to September 30 of the following year for the monitoring and assessment programs. The first Annual Report must be prepared for the reporting period beginning July 1 after commencement of coverage under this Order, and upon San Diego Water Board determination that the Water Quality Improvement Plan meets the requirements of this Order to June 30 in the following year for the jurisdictional runoff management programs, and September 30 in the following year for the monitoring and assessment programs. Annual Reports must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Each Annual Report must include the following:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, summarized and presented in tabular and graphical form;

(b) Progress of the special studies required pursuant to Provision D.3, and the results or findings when a special study, or each phase of a special study, is completed;

(c) The findings from the assessments required pursuant to Provision D.4;

(d) The progress of implementing the Water Quality Improvement Plan, including, but not limited to, the following:

(i) The progress toward achieving the interim and final numeric goals for the highest water quality priorities for the Watershed Management Area,

(ii) The water quality improvement strategies that were implemented and/or no longer implemented by each of the Copermittees during the reporting period and previous reporting periods, and are planned to be implemented during the next reporting period,

(iii) Proposed modifications to the water quality improvement strategies, with public input received and rationale for the proposed modifications,

(iv) Previously proposed modifications or updates incorporated into the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document and implemented by the Copermittees in the Watershed Management Area, and

(v) Proposed modifications or updates to the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document;

(e) A completed Jurisdictional Runoff Management Program Annual Report Form (Attachment D or accepted revision) for each Copermittee in the Watershed Management Area, certified by a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative.

(2) Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (Attachment D or accepted revision) no later than October 31 of each year until the first Annual Report is required to be submitted. Each Copermittee must submit the information on the Jurisdictional Runoff Management Program Annual Report Form specific to the area within its jurisdiction in each Watershed Management Area.

(3) Each Copermittee must provide any data or documentation utilized in developing the Annual Report upon request by the San Diego Water Board. Any monitoring data utilized in developing the Annual Report must be

uploaded to the California Environmental Data Exchange Network (CEDEN).[31] Any monitoring and assessment data utilized in developing the Annual Report must be provided on the Regional Clearinghouse required pursuant to Provision F.4.

c. Regional Monitoring and Assessment Report

(1) The Copermittees must submit a Regional Monitoring and Assessment Report no later than 180 days in advance of the expiration date of this Order. The Regional Monitoring and Assessment Report may be submitted as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The Copermittees must review the receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, and findings from the assessments required pursuant to Provision D.4, to assess the following:

(a) The beneficial uses of the receiving waters within the San Diego Region that are protected or must be restored;

(b) The progress toward restoring impacted beneficial uses in the receiving waters within the San Diego Region; and

(c) Pollutants or conditions of emerging concern that may impact beneficial uses in the receiving waters within the San Diego Region.

(2) The Regional Monitoring and Assessment Report must include recommendations for improving the implementation and assessment of the Water Quality Improvement Plans and jurisdictional runoff management programs.

(3) Each Copermittee must provide any data or documentation utilized in developing the Regional Monitoring and Assessment Report upon request by the San Diego Water Board. Any monitoring and assessment data utilized in developing the Regional Monitoring and Assessment Report must be provided on the Regional Clearinghouse required pursuant to Provision F.4.

[31] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

4. Regional Clearinghouse

The Copermittees must develop, update, and maintain an internet-based Regional Clearinghouse that is made available to the public no later than 18 months after the effective date of this Order.

a. The Copermittees, through the Regional Clearinghouse, must make the following documents and data available, organized by Watershed Management Area, which may be linked to other internet-based data portals and databases where the original documents are stored:

(1) Water Quality Improvement Plan for the Watershed Management Area, and all updated versions with date of update;

(2) Annual Reports for the Watershed Management Area;

(3) Jurisdictional Runoff Management Program document for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(4) BMP Design Manual for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(5) Reports from special studies (e.g. source identification, BMP effectiveness assessment) conducted in the Watershed Management Area;

(6) Monitoring data collected pursuant to Provision D for each Watershed Management Area must be uploaded to CEDEN,[32] with links to the uploaded data; and

(7) Available GIS data, layers, and/or shapefiles used to develop the maps generated and maintained by the Copermittees for the Water Quality Improvement Plans, Annual Reports, and jurisdictional runoff management program documents.

b. The Copermittees, through the Regional Clearinghouse, must make the following information and documents available:

(1) Contact information (point of contact, phone number, email address, and mailing address) for each Copermittee;

(2) Public hotline number for reporting non-storm water and illicit discharges for each Copermittee;

[32] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

(3) Email address for reporting non-storm water and illicit discharges for each Copermittee;

(4) Link to each Copermittee's website, if available, where the public may find additional information about the Copermittee's storm water management program and for requesting records for the implementation of its program;

(5) Information about opportunities for the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or restoration and protection of the quality of receiving waters; and

(6) Reports from regional monitoring programs in which the Copermittees participate (e.g. Southern California Monitoring Coalition, Southern California Coastal Water Research Project Bight Monitoring);

(7) Regional Monitoring and Assessment Reports; and

(8) Any other information, data, and documents the Copermittees determine as appropriate for making available to the public.

5. Report of Waste Discharge

a. The Orange County Copermittees and the Riverside County Copermittees are required to submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders. The San Diego Water Board will review and consider the Reports of Waste Discharge to determine whether modification to this Order, pursuant to the requirements of Provision H, will be required prior the Orange County Copermittees and/or Riverside County Copermittees becoming covered under this Order. The current Orders for the Orange County Copermittees and Riverside County Copermittees are rescinded upon notification of coverage under this Order except for enforcement purposes.

b. The Copermittees subject to the requirements of this Order must submit to the San Diego Water Board a complete Report of Waste Discharge as an application for the re-issuance of this Order and NPDES permit. The Report of Waste Discharge must be submitted no later than 180 days in advance of the expiration date of this Order. The Report of Waste Discharge must contain the following minimum information:

(1) Names and addresses of the Copermittees;

(2) Names and titles of the primary contacts of the Copermittees;

(3) Proposed changes to the Copermittees' Water Quality Improvement Plans and the supporting justification;

(4) Proposed changes to the Copermittees' jurisdictional runoff management programs and the supporting justification;

(5) Any other information necessary for the re-issuance of this Order;

(6) Any information to be included as part of the Report of Waste Discharge pursuant to the requirements of this Order; and

(7) Any other information required by federal regulations for NPDES permit reissuance.

6. Application for Early Coverage

a. The Orange County Copermittees, collectively, or Riverside County Copermittees, collectively, may apply for early coverage under this Order by submitting a Report of Waste Discharge Form 200, with a written request for early coverage under this Order.

b. The San Diego Water Board will review the application for early coverage. A notification of coverage under this Order will be issued to the Copermittees in the respective county by the San Diego Water Board upon completion of the early coverage application requirements. The effective coverage date will be specified in the notification of coverage. The Copermittees in the respective county are authorized to have MS4 discharges pursuant to the requirements of this Order starting on the effective coverage date specified in the notification of coverage. The existing Order for the respective county is rescinded upon the effective coverage date specified in the notification of coverage except for enforcement purposes.

7. Reporting Provisions

Each Copermittee must comply with all the reporting and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

G. PRINCIPAL WATERSHED COPERMITTEE RESPONSIBILITIES

1. The Copermittees within each Watershed Management Area must designate a Principal Watershed Copermittee and notify the San Diego Water Board of the name of the Principal Watershed Copermittee. An individual Copermittee should not be designated a Principal Watershed Copermittee for more than two Watershed Management Areas. The notification may be submitted with the Water Quality Improvement Plan required pursuant to Provision F.1 of this Order.

2. The Principal Watershed Copermittee is responsible for, at a minimum, the following:

a. Serving as liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues, and when necessary and appropriate, representing the Copermittees in the Watershed Management Area before the San Diego Water Board.

b. Facilitating the development of the Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order

c. Coordinating the submittal of the deliverables required by Provisions F.1, F.2, F.3.a, and F.3.b of this Order.

d. Coordinating and developing, with the other Principal Watershed Copermittees, the requirements of Provisions F.3.c, F.4, and F.5.b of this Order.

H. MODIFICATION OF PROGRAMS

1. Modifications of the Order may be initiated by the San Diego Water Board or by the Copermittees. Requests by Copermittees must be made to the San Diego Water Board.

2. Minor modifications to the Order may be made by the San Diego Water Board where the proposed modification complies with all the prohibitions and limitations, and other requirements of this Order.

3. Proposed modifications to the Order that are not minor require amendment of this Order in accordance with this Order's rules, policies, and procedures.

4. The San Diego Water Board may re-open and modify this Order at any time prior to its expiration, after opportunity for public comment and a public hearing, if the State Water Board determines that revisions are warranted to those provisions of the Order addressing compliance with water quality standards in the receiving water and/or those provisions of the Order establishing an iterative process for implementation of management practices to assure compliance with water quality standards in the receiving water.

I. STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

Each Copermittee must comply with all the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

ATTACHMENT A

DISCHARGE PROHIBITIONS AND SPECIAL PROTECTIONS

1. Basin Plan Waste Discharge Prohibitions

California Water Code Section 13243 provides that a Regional Water Board, in a water quality control plan, may specify certain conditions or areas where the discharge of waste or certain types of waste is not permitted. The following waste discharge prohibitions in the Water Quality Control Plan for the San Diego Basin (Basin Plan) are applicable to any person, as defined by Section 13050(c) of the California Water Code, who is a citizen, domiciliary, or political agency or entity of California whose activities in California could affect the quality of waters of the state within the boundaries of the San Diego Region.

1. The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in California Water Code Section 13050, is prohibited.

2. The discharge of waste to land, except as authorized by waste discharge requirements or the terms described in California Water Code Section 13264 is prohibited.

3. The discharge of pollutants or dredged or fill material to waters of the United States except as authorized by a National Pollutant Discharge Elimination System (NPDES) permit or a dredged or fill material permit (subject to the exemption described in California Water Code Section 13376) is prohibited.

4. Discharges of recycled water to lakes or reservoirs used for municipal water supply or to inland surface water tributaries thereto are prohibited, unless this San Diego Water Board issues a NPDES permit authorizing such a discharge; the proposed discharge has been approved by the State Department of Health Services (DHS) and the operating agency of the impacted reservoir; and the discharger has an approved fail-safe long-term disposal alternative.

5. The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the San Diego Water Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

6. The discharge of waste in a manner causing flow, ponding, or surfacing on lands not owned or under the control of the discharger is prohibited, unless the discharge is authorized by the San Diego Water Board.

7. The dumping, deposition, or discharge of waste directly into waters of the state, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the San Diego Water Board.

8. Any discharge to a storm water conveyance system that is not composed entirely of "*storm water*" is prohibited unless authorized by the San Diego Water Board. [The federal regulations, 40 CFR 122.26(b)(13), define storm water as storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from fire fighting activities.] [§122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

9. The unauthorized discharge of treated or untreated sewage to waters of the state or to a storm water conveyance system is prohibited.

10. The discharge of industrial wastes to conventional septic tank/subsurface disposal systems, except as authorized by the terms described in California Water Code Section 13264, is prohibited.

11. The discharge of radioactive wastes amenable to alternative methods of disposal into the waters of the state is prohibited.

12. The discharge of any radiological, chemical, or biological warfare agent into waters of the state is prohibited.

13. The discharge of waste into a natural or excavated site below historic water levels is prohibited unless the discharge is authorized by the San Diego Water Board.

14. The discharge of sand, silt, clay, or other earthen materials from any activity, including land grading and construction, in quantities which cause deleterious bottom deposits, turbidity or discoloration in waters of the state or which unreasonably affect, or threaten to affect, beneficial uses of such waters is prohibited.

15. The discharge of treated or untreated sewage from vessels to Mission Bay, Oceanside Harbor, Dana Point Harbor, or other small boat harbors is prohibited.

16. The discharge of untreated sewage from vessels to San Diego Bay is prohibited.

17. The discharge of treated sewage from vessels to portions of San Diego Bay that are less than 30 feet deep at mean lower low water (MLLW) is prohibited.

18. The discharge of treated sewage from vessels, which do not have a properly functioning US Coast Guard certified Type I or Type II marine sanitation device, to portions of San Diego Bay that are greater than 30 feet deep at mean lower low water (MLLW) is prohibited.

2. Attachment B to State Water Board Resolution 2012-0012

Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges

I. PROVISIONS FOR POINT SOURCE DISCHARGES OF STORM WATER AND NONPOINT SOURCE WASTE DISCHARGES

The following terms, prohibitions, and special conditions (hereafter collectively referred to as special conditions) are established as limitations on point source storm water and nonpoint source discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in Areas of Special Biological Significance (ASBS), as required for State Water Quality Protection Areas pursuant to California Public Resources Code Sections 36700(f) and 36710(f). These Special Protections are adopted by the State Water Board as part of the California Ocean Plan (Ocean Plan) General Exception.

The special conditions are organized by category of discharge. The State Water Resources Control Board (State Water Board) and Regional Water Quality Control Boards (Regional Water Boards) will determine categories and the means of regulation for those categories [e.g., Point Source Storm Water National Pollutant Discharge Elimination System (NPDES) or Nonpoint Source].

A. PERMITTED POINT SOURCE DISCHARGES OF STORM WATER

1. General Provisions for Permitted Point Source Discharges of Storm Water

   a. Existing storm water discharges into an ASBS are allowed only under the following conditions:

      (1) The discharges are authorized by an NPDES permit issued by the State Water Board or Regional Water Board;

      (2) The discharges comply with all of the applicable terms, prohibitions, and special conditions contained in these Special Protections; and

      (3) The discharges:

         (i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

         (ii) Are designed to prevent soil erosion;

         (iii) Occur only during wet weather;

         (iv) Are composed of only storm water runoff.

   b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

   c. The discharge of trash is prohibited.

d. Only discharges from existing storm water outfalls are allowed. Any proposed or new storm water runoff discharge shall be routed to existing storm water discharge outfalls and shall not result in any new contribution of waste to an ASBS (i.e., no additional pollutant loading). “Existing storm water outfalls” are those that were constructed or under construction prior to January 1, 2005. “New contribution of waste” is defined as any addition of waste beyond what would have occurred as of January 1, 2005. A change to an existing storm water outfall, in terms of re-location or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges are prohibited except as provided below:

(1) The term “non-storm water discharges” means any waste discharges from a municipal separate storm sewer system (MS4) or other NPDES permitted storm drain system to an ASBS that are not composed entirely of storm water.

(2) (i) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability or occur naturally:

(a) Discharges associated with emergency fire fighting operations.

(b) Foundation and footing drains.

(c) Water from crawl space or basement pumps.

(d) Hillside dewatering.

(e) Naturally occurring groundwater seepage via a storm drain.

(f) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(ii) An NPDES permitting authority may authorize non-storm water discharges to an MS4 with a direct discharge to an ASBS only to the extent the NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

2. Compliance Plans for Inclusion in Storm Water Management Plans (SWMP) and Storm Water Pollution Prevention Plans (SWPPP).

The discharger shall specifically address the prohibition of non-storm water runoff and the requirement to maintain natural water quality for storm water discharges to an ASBS in an ASBS Compliance Plan to be included in its SWMP or a SWPPP, as appropriate to permit type. If a statewide permit includes a SWMP, then the discharger shall prepare a stand-alone compliance plan for ASBS discharges. The ASBS Compliance Plan is subject to approval by the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (for permits issued by Regional Water Boards).

a. The Compliance Plan shall include a map of surface drainage of storm water runoff, showing areas of sheet runoff, prioritize discharges, and describe any structural Best Management Practices (BMPs) already employed and/or BMPs to be employed in the future. Priority discharges are those that pose the greatest water quality threat and which are identified to require installation of structural BMPs. The map shall also show the storm water conveyances in relation to other features such as service areas, sewage conveyances and treatment facilities, landslides, areas prone to erosion, and waste and hazardous material storage areas, if applicable. The SWMP or SWPPP shall also include a procedure for updating the map and plan when changes are made to the storm water conveyance facilities.

b. The ASBS Compliance Plan shall describe the measures by which all non-authorized non-storm water runoff (e.g., dry weather flows) has been eliminated, how these measures will be maintained over time, and how these measures are monitored and documented.

c. For Municipal Separate Storm Sewer System (MS4s), the ASBS Compliance Plan shall require minimum inspection frequencies as follows:

   (1) The minimum inspection frequency for construction sites shall be weekly during rainy season;

   (2) The minimum inspection frequency for industrial facilities shall be monthly during the rainy season;

   (3) The minimum inspection frequency for commercial facilities (e.g., restaurants) shall be twice during the rainy season; and

   (4) Storm water outfall drains equal to or greater than 18 inches (457 mm) in diameter or width shall be inspected once prior to the beginning of the rainy season and once during the rainy season and maintained to remove trash and other anthropogenic debris.

d. The ASBS Compliance Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff, that are necessary to comply with these special conditions, will be achieved through BMPs. Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that such installation would pose a threat to health or safety. BMPs to control storm water runoff discharges (at the end-of-pipe) during a design storm shall be designed to achieve on average the following target levels:

   (1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

   (2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges. The baseline for the reduction is the effective date of the Exception. The baseline for these determinations is the effective date of the Exception, and the

reductions must be achieved and documented within four (4) years of the effective date.

e. The ASBS Compliance Plan shall address erosion control and the prevention of anthropogenic sedimentation in ASBS. The natural habitat conditions in the ASBS shall not be altered as a result of anthropogenic sedimentation.

f. The ASBS Compliance Plan shall describe the non-structural BMPs currently employed and planned in the future (including those for construction activities), and include an implementation schedule. The ASBS Compliance Plan shall include non-structural BMPs that address public education and outreach. Education and outreach efforts must adequately inform the public that direct discharges of pollutants from private property not entering an MS4 are prohibited. The ASBS Compliance Plan shall also describe the structural BMPs, including any low impact development (LID) measures, currently employed and planned for higher threat discharges and include an implementation schedule. To control storm water runoff discharges (at the end-of-pipe) during a design storm, permittees must first consider using LID practices to infiltrate, use, or evapotranspirate storm water runoff on-site.

g. The BMPs and implementation schedule shall be designed to ensure that natural water quality conditions in the receiving water are achieved and maintained by either reducing flows from impervious surfaces or reducing pollutant loading, or some combination thereof.

h. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents in storm water runoff that alter natural ocean water quality and the sources of these constituents.

(2) The report shall describe BMPs that are currently being implemented, BMPs that are identified in the SWMP or SWPPP for future implementation, and any additional BMPs that may be added to the SWMP or SWPPP to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the BMPs.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits), the discharger shall revise its ASBS Compliance Plan to incorporate any new or modified BMPs that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised SWMP or SWPPP, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural ocean water quality conditions due to the same constituent.

(5) Compliance with this section does not excuse violations of any term, prohibition, or condition contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within one year from the effective date of the Exception, the discharger shall submit a written ASBS Compliance Plan to the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that describes its strategy to comply with these special conditions, including the requirement to maintain natural water quality in the affected ASBS. The ASBS Compliance Plan shall include a time schedule to implement appropriate non-structural and structural controls (implementation schedule) to comply with these special conditions for inclusion in the discharger's SWMP or SWPPP, as appropriate to permit type.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these special conditions shall be implemented.

d. Within four (4) years of the effective date of the Exception, any structural controls identified in the ASBS Compliance Plan that are necessary to comply with these special conditions shall be operational.

e. Within four (4) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water, pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data, and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

   If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

   The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

(1) for municipalities, a demonstration of significant hardship to discharger ratepayers, by showing the relationship of storm water fees to annual household income for residents within the discharger's jurisdictional area, and the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or
(2) for other governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process.

B. NONPOINT SOURCE DISCHARGES

[NOT INCLUDED]
[PROVISIONS FOR NONPOINT SOURCE DISCHARGES NOT APPLICABLE]

II. ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES

[NOT INCLUDED]
[ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES NOT APPLICABLE]

III. ADDITIONAL REQUIREMENTS – WATERFRONT AND MARINE OPERATIONS

[NOT INCLUDED]
[ADDITIONAL REQUIREMENTS FOR WATERFRONT AND MARINE OPERATIONS NOT APPLICABLE]

IV. MONITORING REQUIREMENTS

Monitoring is mandatory for all dischargers to assure compliance with the Ocean Plan. Monitoring requirements include both: (A) core discharge monitoring, and (B) ocean receiving water monitoring. The State and Regional Water Boards must approve sampling site locations and any adjustments to the monitoring programs. All ocean receiving water and reference area monitoring must be comparable with the Water Boards' Surface Water Ambient Monitoring Program (SWAMP).

Safety concerns: Sample locations and sampling periods must be determined considering safety issues. Sampling may be postponed upon notification to the State and Regional Water Boards if hazardous conditions prevail.

Analytical Chemistry Methods: All constituents must be analyzed using the lowest minimum detection limits comparable to the Ocean Plan water quality objectives. For metal analysis, all samples, including storm water effluent, reference samples, and ocean receiving water samples, must be analyzed by the approved analytical method with the lowest minimum detection limits (currently Inductively Coupled Plasma/Mass Spectrometry) described in the Ocean Plan.

A. CORE DISCHARGE MONITORING PROGRAM

1. General sampling requirements for timing and storm size:

   Runoff must be collected during a storm event that is greater than 0.1 inch and generates runoff, and at least 72 hours from the previously measurable storm event. Runoff samples shall be collected when post-storm receiving water is sampled, and analyzed for the same constituents as receiving water and reference site samples (see section IV B) as described below.

2. Runoff flow measurements

   a. For municipal/industrial storm water outfalls in existence as of December 31, 2007, 18 inches (457mm) or greater in diameter/width (including multiple outfall pipes in combination having a width of 18 inches, runoff flows must be measured or calculated, using a method acceptable to and approved by the State and Regional Water Boards.
   b. This will be reported annually for each precipitation season to the State and Regional Water Boards.

3. Runoff samples – storm events

   a. For outfalls equal to or greater than 18 inches (0.46m) in diameter or width:

      (1) samples of storm water runoff shall be analyzed during the same storm as receiving water samples for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination, ; and

      (2) samples of storm water runoff shall be analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS

      (3) If an applicant has no outfall greater than 36 inches, then storm water runoff from the applicant's largest outfall shall be further analyzed during the same storm as receiving water samples for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates).

   b. For outfalls equal to or greater than 36 inches (0.91m) in diameter or width:

      (1) samples of storm water runoff shall be analyzed during the same storm as receiving water samples for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

      (2) samples of storm water runoff shall be further analyzed during the same storm as receiving water samples for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates) and

(3) samples of storm water runoff shall be analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

c. For an applicant not participating in a regional monitoring program [see below in Section IV (B)] in addition to (a.) and (b.) above, a minimum of the two largest outfalls or 20 percent of the larger outfalls, whichever is greater, shall be sampled (flow weighted composite samples) at least three times annually during wet weather (storm event) and analyzed for all Ocean Plan Table A constituents, Table B constituents for marine aquatic life protection (except for toxicity, only chronic toxicity for three species shall be required), DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, and Ocean Plan indicator bacteria. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one (the largest) such discharge shall be sampled annually in each Region.

4. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may reduce or suspend core monitoring once the storm runoff is fully characterized. This determination may be made at any point after the discharge is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

B. OCEAN RECEIVING WATER AND REFERENCE AREA MONITORING PROGRAM

In addition to performing the Core Discharge Monitoring Program in Section II.A above, all applicants having authorized discharges must perform ocean receiving water monitoring. In order to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS, dischargers may choose either (1) an individual monitoring program, or (2) participation in a regional integrated monitoring program.

1. Individual Monitoring Program: The requirements listed below are for those dischargers who elect to perform an individual monitoring program to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within the affected ASBS. In addition to Core Discharge Monitoring, the following additional monitoring requirements shall be met:

   a. Three times annually, during wet weather (storm events), the receiving water at the point of discharge from the outfalls described in section (IV)(A)(3)(c) above shall be sampled and analyzed for Ocean Plan Table A constituents, Table B constituents for marine aquatic life, DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, salinity, chronic toxicity (three species), and Ocean Plan indicator bacteria.

      The sample location for the ocean receiving water shall be in the surf zone at the point of discharges; this must be at the same location where storm water runoff is sampled. Receiving water shall be sampled at approximately the same time prior to (pre-storm) and during (or immediately after) the same storm (post storm). Reference water quality shall also be sampled and analyzed for the same constituents pre-storm and post-storm, during the same storms when receiving water is sampled. Reference stations will be determined by the State Water Board's Division of Water Quality and the applicable Regional Water Board(s).

b. Sediment sampling shall occur at least three times during every five (5) year period. The subtidal sediment (sand or finer, if present) at the discharge shall be sampled and analyzed for Ocean Plan Table B constituents for marine aquatic life, DDT, PCBs, PAHs, pyrethroids, and OP pesticides. For sediment toxicity testing, only an acute toxicity test using the amphipod Eohaustorius estuarius must be performed.

c. A quantitative survey of intertidal benthic marine life shall be performed at the discharge and at a reference site. The survey shall be performed at least once every five (5) year period. The survey design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The results of the survey shall be completed and submitted to the State Water Board and Regional Water Board at least six months prior to the end of the permit cycle.

d. Once during each five (5) year period, a bioaccumulation study shall be conducted to determine the concentrations of metals and synthetic organic pollutants at representative discharge sites and at representative reference sites. The study design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The bioaccumulation study may include California mussels (Mytilus californianus) and/or sand crabs (Emerita analoga or Blepharipoda occidentalis). Based on the study results, the Regional Water Board and the State Water Board's Division of Water Quality, may adjust the study design in subsequent permits, or add or modify additional test organisms (such as shore crabs or fish), or modify the study design appropriate for the area and best available sensitive measures of contaminant exposure.

e. Marine Debris: Representative quantitative observations for trash by type and source shall be performed along the coast of the ASBS within the influence of the discharger's outfalls. The design, including locations and frequency, of the marine debris observations is subject to approval by the Regional Water Board and State Water Board's Division of Water Quality.

f. The monitoring requirements of the Individual Monitoring Program in this section are minimum requirements. After a minimum of one (1) year of continuous water quality monitoring of the discharges and ocean receiving waters, the Executive Director of the State Water Board (statewide permits) or Executive officer of the Regional Water Board (Regional Water Board permits) may require additional monitoring, or adjust, reduce or suspend receiving water and reference station monitoring. This determination may be made at any point after the discharge and receiving water is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

2. Regional Integrated Monitoring Program: Dischargers may elect to participate in a regional integrated monitoring program, in lieu of an individual monitoring program, to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS. This regional approach shall characterize natural water quality, pre- and post-storm, in ocean reference areas near the mouths of identified open space watersheds and the effects of the discharges on natural water quality (physical, chemical, and toxicity) in the ASBS receiving waters, and should include benthic marine aquatic life and bioaccumulation components. The design of the ASBS stratum of a regional integrated monitoring program may deviate from the otherwise prescribed individual monitoring approach (in Section IV.B.1) if approved by the State Water Board's Division of Water Quality and the Regional Water Boards.

a. Ocean reference areas shall be located at the drainages of flowing watersheds with minimal development (in no instance more than 10% development), and shall not be located in CWA Section 303(d) listed waterbodies or have tributaries that are 303(d) listed. Reference areas shall be free of wastewater discharges and anthropogenic non-storm water runoff. A minimum of low threat storm runoff discharges (e.g. stream highway overpasses and campgrounds) may be allowed on a case-by-case basis. Reference areas shall be located in the same region as the ASBS receiving water monitoring occurs. The reference areas for each Region are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean reference water samples must be collected from each station, each from a separate storm. A minimum of one reference location shall be sampled for each ASBS receiving water site sampled per responsible party. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

b. ASBS ocean receiving water must be sampled in the surf zone at the location where the runoff makes contact with ocean water (i.e. at "point zero"). Ocean receiving water stations must be representative of worst-case discharge conditions (i.e. co-located at a large drain greater than 36 inches, or if drains greater than 36 inches are not present in the ASBS then the largest drain greater than18 inches.) Ocean receiving water stations are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean receiving water samples must be collected during each storm season from each station, each from a separate storm. A minimum of one receiving water location shall be sampled in each ASBS per responsible party in that ASBS. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

c. Reference and receiving water sampling shall commence during the first full storm season following the adoption of these special conditions, and post-storm samples shall be collected when annual storm water runoff is sampled. Sampling shall occur in a minimum of two storm seasons. For those ASBS dischargers that have already participated in the Southern California Bight 2008 ASBS regional monitoring effort, sampling may be limited to only one storm season.

d. Receiving water and reference samples shall be analyzed for the same constituents as storm water runoff samples. At a minimum, constituents to be sampled and analyzed in reference and discharge receiving waters must include oil and grease, total suspended solids, Ocean Plan Table B metals for protection of marine life, Ocean Plan PAHs, pyrethroids, OP pesticides, ammonia, nitrate, phosphates, and critical life stage chronic toxicity for three species. In addition, within the range of the southern sea otter, indicator bacteria or some other measure of fecal contamination shall be analyzed.

3. Waterfront and Marine Operations: In addition to the above requirements for ocean receiving water monitoring, additional monitoring must be performed for marinas and boat launch and pier facilities:

a. For all marina or mooring field operators, in mooring fields with 10 or more occupied moorings, the ocean receiving water must be sampled for Ocean Plan indicator bacteria,

residual chlorine, copper, zinc, grease and oil, methylene blue active substances (MBAS), and ammonia nitrogen.

(1) For mooring field operators opting for an individual monitoring program (Section IV.B.1 above), this sampling must occur weekly (on the weekend) from May through October.

(2) For mooring field operators opting to participate in a regional integrated monitoring program (Section IV.B.2 above), this sampling must occur monthly from May through October on a high use weekend in each month. The Water Boards may allow a reduction in the frequency of sampling, through the regional monitoring program, after the first year of monitoring.

b. For all mooring field operators, the subtidal sediment (sand or finer, if present) within mooring fields and below piers shall be sampled and analyzed for Ocean Plan Table B metals (for marine aquatic life beneficial use), acute toxicity, PAHs, and tributyltin. For sediment toxicity testing, only an acute toxicity test using the amphipod Eohaustorius estuarius must be performed. This sampling shall occur at least three times during a five (5) year period. For mooring field operators opting to participate in a regional integrated monitoring program, the Water Boards may allow a reduction in the frequency of sampling after the first sampling effort's results are assessed.

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ATTACHMENT B

STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

1. Standard Permit Provisions

Code of Federal Regulations Title 40 Section 122.41 (40 CFR 122.41) includes conditions, or provisions, that apply to all National Pollutant Discharge Elimination System (NPDES) permits. Additional provisions applicable to NPDES permits are in 40 CFR 122.42. All applicable provisions in 40 CFR 122.41 and 40 CFR 122.42 must be incorporated into this Order and NPDES permit. The applicable 40 CFR 122.41 and 40 CFR 122.42 provisions are as follows:

a. DUTY TO COMPLY [40 CFR 122.41(a)]

The Copermittee must comply with all of the provisions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

(1) The Copermittee must comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement. [40 CFR 122.41(a)(1)]

(2) The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to a civil penalty not to exceed $25,000 per day for each violation. The CWA provides that any person who *negligently* violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than 2 years, or both. Any person who *knowingly* violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both. Any person who knowingly violates Section 301, 302, 303, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, and who knows at that time that he thereby places another person in imminent danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of

not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.
[40 CFR 122.41(a)(2)]

(3) Any person may be assessed an administrative penalty by the San Diego Regional Water Quality Control Board (San Diego Water Board), State Water Resources Control Board (State Water Board), or United States Environmental Protection Agency (USEPA) for violating Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.
[40 CFR 122.41(a)(3)]

b. DUTY TO REAPPLY [40 CFR 122.41(b)]

If a Copermittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Copermittee must apply for and obtain a new permit.

c. NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE [40 CFR 122.41(c)]

It shall not be a defense for a Copermittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

d. DUTY TO MITIGATE [40 CFR 122.41(d)]

The Copermittee must take all reasonable steps to minimize or prevent any discharge or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

e. PROPER OPERATION AND MAINTENANCE [40 CFR 122.41(e)]

The Copermittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Copermittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by a Copermittee only when the operation is necessary to achieve compliance with the conditions of this permit.

f. PERMIT ACTIONS [40 CFR 122.41(f)]

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Copermittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

g. PROPERTY RIGHTS [40 CFR 122.41(g)]

This permit does not convey any property rights of any sort, or any exclusive privilege.

h. DUTY TO PROVIDE INFORMATION [40 CFR 122.41(h)]

The Copermittee must furnish to the San Diego Water Board, State Water Board, or USEPA within a reasonable time, any information which the San Diego Water Board, State Water Board, or USPEA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Copermittee must also furnish to the San Diego Water Board, State Water Board, or USPEA upon request, copies of records required to be kept by this permit.

i. INSPECTION AND ENTRY [40 CFR 122.41(i)]

The Copermittee must allow the San Diego Water Board, State Water Board, USEPA, and/or their authorized representative (including an authorized contractor acting as their representative), upon presentation of credentials and other documents as may be required by law, to:

(1) Enter upon the Copermittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit; [40 CFR 122.41(i)(1)]

(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit; [40 CFR 122.41(i)(2)]

(3) Inspect and photograph at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; [40 CFR 122.41(i)(3)] and

(4) Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location. [40 CFR 122.41(i)(4)]

j. MONITORING AND RECORDS [40 CFR 122.41(j)]

(1) Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity. [40 CFR 122.41(j)(1)]

(2) Except for records of monitoring information required by this permit related to the Copermittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five (5) years (or longer as required by 40 CFR Part 503), the

Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time. [40 CFR 122.41(j)(2)]

(3) Records for monitoring information must include: [40 CFR 122.41(j)(3)]

(a) The date, exact place, and time of sampling or measurements; [40 CFR 122.41(j)(3)(i)]
(b) The individual(s) who performed the sampling or measurements; [40 CFR 122.41(j)(3)(ii)]
(c) The date(s) analyses were performed; [40 CFR 122.41(j)(3)(iii)]
(d) The individual(s) who performed the analyses; [40 CFR 122.41(j)(3)(iv)]
(e) The analytical techniques or methods used; [40 CFR 122.41(j)(3)(v)] and
(f) The results of such analyses. [40 CFR 122.41(j)(3)(vi)]

(4) Monitoring must be conducted according to test procedures under 40 CFR Part 136 unless another method is required under 40 CFR Subchapters N or O. [40 CFR 122.41(j)(4)]

In the case of pollutants for which there are no approved methods under 40 CFR Part 136 or otherwise required under 40 CFR Subchapters N and O, monitoring must be conducted according to a test procedure specified in the permit for such pollutants. [40 CFR 122.44(i)(1)(iv)]

(5) The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. [40 CFR 122.41(j)(5)]

k. SIGNATORY REQUIREMENT [40 CFR 122.41(k)]

(1) All applications, reports, or information submitted to the San Diego Water Board, State Water Board, or USEPA must be signed and certified. (See 40 CFR 122.22) [40 CFR 122.41(k)(1)]

(a) *For a municipality, State, Federal, or other public agency.* [All applications must be signed] [b]y either a principal executive officer or ranking elected official. [40 CFR 122.22(a)(3)]

(b) All reports required by permits, and other information requested by the San Diego Water Board, State Water Board, or USEPA must be signed by a person described in paragraph (a) of this section, or by a duly authorized representative of that person. A person is a duly authorized representative only if: [40 CFR 122.22(b)]

(i) The authorization is made in writing by a person described in paragraph (a) of this section; [40 CFR 122.22(b)(1)]

(ii) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company, (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) [40 CFR 122.22(b)(2)] and,

(iii) The written authorization is submitted to the San Diego Water Board and State Water Board. [40 CFR 122.22(b)(3)]

(c) *Changes to authorization.* If an authorization under paragraph (b) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (b) of this section must be submitted to the San Diego Water Board prior to or together with any reports, information, or applications to be signed by an authorized representative. [40 CFR 122.22(c)]

(d) *Certification.* Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." [40 CFR 122.22(d)]

(2) The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both. [40 CFR 122.41(k)(2)]

I. REPORTING REQUIREMENTS [40 CFR 122.41(l)]

(1) *Planned changes.* The Copermittee must give notice to the San Diego Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when: [40 CFR 122.41(l)(1)]

(a) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); [40 CFR 122.41(l)(1)(i)] or

(b) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which

are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1).
[40 CFR 122.41(l)(1)(ii)]

(c) The alteration or addition results in a significant change in the Copermittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. [40 CFR 122.41(l)(1)(iii)]

(2) *Anticipated noncompliance*. The Copermittee must give advance notice to the San Diego Water Board or State Water Board of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.
[40 CFR 122.41(l)(2)]

(3) *Transfers*. This permit is not transferable to any person except after notice to the San Diego Water Board. The San Diego Water Board may require modification or revocation and reissuance of the permit to change the name of the Copermittee and incorporate such other requirements as may be necessary under the CWA.
[40 CFR 122.41(l)(3)]

(4) *Monitoring reports.* Monitoring results must be reported at the intervals specified elsewhere in this permit. [40 CFR 122.41(l)(4)]

(a) Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the San Diego Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices. [40 CFR 122.41(l)(4)(i)]

(b) If the Copermittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or another method required for an industry-specific waste stream under 40 CFR Subchapters N or O, the results of this monitoring must be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the San Diego Water Board or State Water Board.
[40 CFR 122.41(l)(4)(ii)]

(c) Calculations for all limitations which require averaging of measurements must utilize an arithmetic mean unless otherwise specified in the permit.
[40 CFR 122.41(l)(4)(iii)]

(5) *Compliance schedules*. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date. [40 CFR 122.41(l)(5)]

(6) *Twenty-four hour reporting.*

(a) The Copermittee must report any noncompliance that may endanger health or the environment. Any information must be provided orally within 24 hours from the time the Copermittee becomes aware of the circumstances. A written submission must also be provided within five (5) days of the time the Copermittee becomes aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6)(i)]

(b) The following must be included as information which must be reported within 24 hours under this paragraph: [40 CFR 122.41(l)(6)(ii)]

(i) Any unanticipated bypass that exceeds any effluent limitation in the permit (See 40 CFR 122.41(g)). [40 CFR 122.41(l)(6)(ii)(A)]
(ii) Any upset which exceeds any effluent limitation in the permit. [40 CFR 122.41(l)(6)(ii)(B)] and,
(iii) Violation of a maximum daily discharge limitation for any of the pollutants listed by the San Diego Water Board in the permit to be reported within 24 hours. (See 40 CFR 122.44(g)) [40 CFR 122.41(l)(6)(ii)(C)]

(c) The San Diego Water Board may waive the above-required written report on a case-by-case basis if the oral report has been received within 24 hours. [40 CFR 122.41(l)(6)(iii)]

(7) *Other noncompliance.* The Copermittee must report all instances of noncompliance not reported in accordance with the standard provisions required under 40 CFR 122.41(l)(4), (5), and (6), at the time monitoring reports are submitted. The reports must contain the information listed in the standard provisions required under 40 CFR 122.41(l)(6). [40 CFR 122.41(l)(7))]

(8) *Other information.* When the Copermittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the San Diego Water Board, State Water Board, or USEPA, the Copermittee must promptly submit such facts or information. [40 CFR 122.41(l)(8)]

m. BYPASS [40 CFR 122.41(m)]

(1) *Definitions.*

(a) "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. [40 CFR 122.41(m)(1)(i)] or

(b) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be

expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
[40 CFR 122.41(m)(1)(ii)]

(2) *Bypass not exceeding limitations*. The Copermittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the standard provisions required under 40 CFR 122.41(m)(3) and (4).
[40 CFR 122.41(m)(2)]

(3) *Notice.*

(a) *Anticipated bypass*. If the Copermittee knows in advance of the need for a bypass, it must submit a notice, if possible at least ten days before the date of the bypass. [40 CFR 122.41(m)(3)(i)] or

(b) *Unanticipated bypass*. The Copermittee must submit notice of an unanticipated bypass in accordance with the standard provisions required under 40 CFR 122.41(l)(6) (24-hour notice).
[40 CFR 122.41(m)(3)(ii)]

(4) *Prohibition of Bypass.*

(a) Bypass is prohibited, and the San Diego Water Board may take enforcement action against a Copermittee for bypass, unless:
[40 CFR 122.41(m)(4)(i)]

(i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; [40 CFR 122.41(m)(4)(i)(A)]
(ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance;
[40 CFR 122.41(m)(4)(i)(B)] and,
(iii) The Copermittee submitted notice in accordance with the standard provisions required under 40 CFR 122.41(m)(3).
[40 CFR 122.41(m)(4)(i)(C)]

(b) The San Diego Water Board may approve an anticipated bypass, after considering its adverse effects, if the San Diego Water Board determines that it will meet the three conditions listed above.
[40 CFR 122.41(m)(4)(ii)]

n. UPSET [40 CFR 122.41(n)]

(1) *Definition.* "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Copermittee. An upset does not

include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. [40 CFR 122.41(n)(1)]

(2) *Effect of an upset*. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the standard provisions required under 40 CFR 122.41(n)(3) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. [40 CFR 122.41(n)(2)]

(3) *Conditions necessary for a demonstration of upset*. A Copermittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that: [40 CFR 122.41(n)(3)]

(a) An upset occurred and that the Copermittee can identify the cause(s) of the upset; [40 CFR 122.41(n)(3)(i)]
(b) The permitted facility was at the time being properly operated; [40 CFR 122.41(n)(3)(ii)] and
(c) The Copermittee submitted notice of the upset in accordance with the standard provisions required under 40 CFR 122.41(l)(6)(ii)(B) (24-hour notice). [40 CFR 122.41(n)(3)(iii)]
(d) The Copermittee complied with any remedial measures pursuant to the standard provisions required under 40 CFR 122.41(d). [40 CFR 122.41(n)(3)(iii)]

(4) *Burden of proof*. In any enforcement proceeding, the Copermittee seeking to establish the occurrence of an upset has the burden of proof. [40 CFR 122.41(n)(4)]

o. STANDARD PERMIT PROVISIONS FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS [40 CFR 122.42(c)]

The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the San Diego Water Board or State Water Board under 40 CFR 122.26(a)(1)(v) must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report must include:

(1) The status of implementing the components of the storm water management program that are established as permit conditions; [40 CFR 122.42(c)(1)]

(2) Proposed changes to the storm water management programs that are established as permit conditions. Such proposed changes must be consistent with 40 CFR 122.26(d)(2)(iii); [40 CFR 122.42(c)(2)] and

(3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under 40 CFR 122.26(d)(2)(iv) and (v); [40 CFR 122.42(c)(3)]

(4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; [40 CFR 122.42(c)(4)]

(5) Annual expenditures and budget for year following each annual report; [40 CFR 122.42(c)(5)]

(6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; [40 CFR 122.42(c)(6)]

(7) Identification of water quality improvements or degradation. [40 CFR 122.42(c)(7)]

p. STANDARD PERMIT PROVISIONS FOR STORM WATER DISCHARGES [40 CFR 122.42(d)]

The initial permits for discharges composed entirely of storm water issued pursuant to 40 CFR 122.26(e)(7) must require compliance with the conditions of the permit as expeditiously as practicable, but in no event later than three years after the date of issuance of the permit.

2. General Provisions

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. The general provisions applicable to this Order and NPDES permit are as follows:

a. DISCHARGE OF WASTE IS A PRIVILEGE

No discharge of waste into the waters of the State, whether or not such discharge is made pursuant to waste discharge requirements, shall create a vested right to continue such discharge. All discharges of waste into waters of the State are privileges, not rights. [CWC Section 13263(g)]

b. DURATION OF ORDER AND NPDES PERMIT

(1) *Effective date*. This Order and NPDES permit becomes effective on the 50th day after its adoption provided the USEPA has no objection. If the USEPA objects to its issuance, this Order shall not become effective until such objection is withdrawn. This Order supersedes Order No. R9-2007-0001 upon the effective date of this Order, and supersedes Order Nos. R9-2009-0002 and R9-2010-0016 upon their expiration or earlier notice of coverage.

(2) *Expiration*. This Order and NPDES permit expires five years after its effective date. [40 CFR 122.46(a)]

(3) *Continuation of expired order*. After this Order and NPDES permit expires, the terms and conditions of this Order and NPDES permit are automatically continued pending issuance of a new permit if all requirements of the federal NPDES regulations on the continuation of expired permits (40 CFR 122.6) are complied with.

c. AVAILABILITY

A copy of this Order must be kept at a readily accessible location and must be available to on-site personnel at all times.

d. CONFIDENTIALITY OF INFORMATION

Except as provided for in 40 CFR 122.7, no information or documents submitted in accordance with or in application for this Order will be considered confidential, and all such information and documents shall be available for review by the public at the San Diego Water Board office.

Claims of confidentiality for the following information will be denied:
[40 CFR 122.7(b)]

(1) The name and address of any permit applicant or Copermittee; [40 CFR 122.7(b)(1)] and

(2) Permit applications and attachments, permits, and effluent data. [40 CFR 122.7(b)(2)]

e. EFFLUENT LIMITATIONS

(1) *Interim effluent limitations*. The Copermittee must comply with any interim effluent limitations as established by addendum, enforcement action, or revised waste discharge requirements which have been, or may be, adopted by the San Diego Water Board.

(2) *Other effluent limitations and standards*. If any applicable toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant and that standard or prohibition is more stringent than any limitation on the pollutant in the permit, the San Diego Water Board shall institute proceedings under these regulations to modify or revoke and reissue the permit to conform to the toxic effluent standard or prohibition. [40 CFR 122.44(b)(1)]

f. DUTY TO MINIMIZE OR CORRECT ADVERSE IMPACTS

The Copermittee must take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this Order, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the noncompliance.

g. PERMIT ACTIONS

The filing of a request by the Copermittee for modification, revocation and reissuance, or termination of this Order, or a notification of planned change in or anticipated noncompliance with this Order does not stay any condition of this Order. (See 40 CFR 122.41(f)) In addition, the following provisions apply to this Order:

(1) Upon application by any affected person, or on its own motion, the San Diego Water Board may review and revise the requirements in this Order. All requirements must be reviewed periodically. [CWC Section 13263(e)]

(2) This Order may be terminated or modified for cause, including, but not limited to, all of the following: [CWC Section 13381]

(a) Violation of any condition contained in the requirements of this Order. [CWC Section 13381(a)]

(b) Obtaining the requirements in this Order by misrepresentation, or failure to disclose fully all relevant facts. [CWC Section 13381(b)]

(c) A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge. [CWC Section 13381(c)]

(3) When this Order is transferred to a new owner or operator, such requirements as may be necessary under the CWC may be incorporated into this Order.

h. NPDES Permitted Non-Storm Water Discharges

The San Diego Water Board has, in prior years, issued a limited number of individual NPDES permits for non-storm water discharges to MS4s. The San Diego Water Board or State Water Board may in the future, upon prior notice to the Copermittee(s), issue an NPDES permit for any non-storm water discharge (or class of non-storm water discharges) to an MS4.

i. Monitoring

In addition to the standard provisions required under 40 CFR 122.41(j) and (l)(4), the following general monitoring provisions apply to this Order:

(1) Where procedures are not otherwise specified in Order, sampling, analysis and quality assurance/quality control must be conducted in accordance with the Quality Assurance Management Plan (QAMP) for the State of California's Surface Water Ambient Monitoring Program (SWAMP), adopted by the State Water Resources Control Board (State Water Board).

(2) Pursuant to 40 CFR 122.41(j)(2) and CWC Section 13383(a), each Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five (5) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time.

(3) All chemical, bacteriological, and toxicity analyses must be conducted at a laboratory certified for such analyses by the California Department of Public Health or a laboratory approved by the San Diego Water Board.

(4) For priority toxic pollutants that are identified in the California Toxics Rule (CTR) (65 Fed. Reg. 31682), the Copermittees must instruct their laboratories to establish calibration standards that are equivalent to or lower than the Minimum Levels (MLs) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP). If a Copermittee can demonstrate that a particular ML is not attainable, in accordance with procedures set forth in 40 CFR Part 136, the lowest quantifiable concentration of the lowest calibration standard analyzed by a specific analytical procedure (assuming that all the method specified sample weights, volumes, and processing steps have been followed) may be used instead of the ML listed in Appendix 4 of the SIP. The Copermittee must submit documentation from the laboratory to the San Diego Water Board for approval prior to raising the ML for any priority toxic pollutant.

j. ENFORCEMENT

(1) The San Diego Water Board is authorized to enforce the terms of this Order under several provisions of the CWC, including, but not limited to, CWC Sections 13385, 13386, and 13387.

(2) Nothing in this Order shall be construed to protect the Copermittee from its liabilities under federal, state, or local laws.

(3) The CWC provides for civil and criminal penalties comparable to, and in some cases greater than, those provided for under the CWA.

(4) Except as provided in the standard conditions required under 40 CFR 122.41(m) and (n), nothing in this Order shall be construed to relieve the Copermittee from civil or criminal penalties for noncompliance.

(5) Nothing in this Order shall be construed to preclude the institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties to which the Copermittee is or may be subject to under Section 311 of the CWA.

(6) Nothing in this Order shall be construed to preclude institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authoring preserved by Section 510 of the CWA.

k. SEVERABILITY

The provisions of this Order are severable, and if any provision of this Order, or the application of any provisions of this Order to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this Order shall not be affected thereby.

l. APPLICATIONS

Any application submitted by a Copermittee for reissuance or modification of this Order must satisfy all applicable requirements specified in federal regulations as well as any additional requirements for submittal of a Report of Waste Discharge specified in the CWC and the California Code of Regulations.

m. IMPLEMENTATION

All plans, reports and subsequent amendments submitted in compliance with this Order must be implemented immediately (or as otherwise specified). All submittals by Copermittees must be adequate to implement the requirements of this Order.

n. REPORT SUBMITTALS

(1) All report submittals must include an executive summary, introduction, conclusion, recommendations, and signed certified statement.

(2) Each Copermittee must submit a signed certified statement covering its responsibilities for each applicable submittal.

(3) The Principal Watershed Copermittee(s) must submit a signed certified statement covering its responsibilities for each applicable submittal and the sections of the submittals for which it is responsible.

(4) Unless otherwise directed, the Copermittees must submit one hard copy and one electronic copy of each report required under this Order to the San Diego Water Board, and one electronic copy to the USEPA.

(5) The Copermittees must submit reports and provide notifications as required by this Order to the following:

EXECUTIVE OFFICER
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
9174 SKY PARK COURT, SUITE 100
SAN DIEGO CA 92123-4340
Telephone: (858) 467-2952 Fax: (858) 571-6972

EUGENE BROMLEY
US ENVIRONMENTAL PROTECTION AGENCY
REGION IX
PERMITS ISSUANCE SECTION (W-5-1)
75 HAWTHORNE STREET
SAN FRANCISCO CA 94105

ATTACHMENT C

ACRONYMS AND ABBREVIATIONS

AMAL	Average Monthly Action Level
ASBS	Area(s) of Special Biological Significance
BMP	Best Management Practice
Basin Plan	Water Quality Control Plan for the San Diego Basin
CEQA	California Environmental Quality Act
CCR	California Code of Regulations
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWC	California Water Code
CZARA	Coastal Zone Act Reauthorization Amendments of 1990
ESAs	Environmentally Sensitive Areas
GIS	Geographic Information System
IBI	Index of Biological Integrity
LID	Low Impact Development
MDAL	Maximum Daily Action Level
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
NAL	Non-Storm Water Action Level
NAICS	North American Industry Classification System
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
ROWD	Report of Waste Discharge (application for NPDES reissuance)
SAL	Storm Water Action Level
San Diego Water Board	California Regional Water Quality Control Board, San Diego Region
SIC	Standard Industrial Classification Code
State Water Board	State Water Resources Control Board
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
WDID	Waste Discharge Identification Number
WLA	Waste Load Allocation
WQBEL	Water Quality Based Effluent Limitation

DEFINITIONS

Active/Passive Sediment Treatment - Using mechanical, electrical or chemical means to flocculate or coagulate suspended sediment for removal from runoff from construction sites prior to discharge.

Anthropogenic Litter – Trash generated from human activities, not including sediment.

Average Monthly Action Level – The highest allowable average of daily discharges over a calendar month.

Beneficial Uses - The uses of water necessary for the survival or wellbeing of man, plants, and wildlife. These uses of water serve to promote tangible and intangible economic, social, and environmental goals. "Beneficial Uses" of the waters of the State that may be protected include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. Existing beneficial uses are uses that were attained in the surface or ground water on or after November 28, 1975; and potential beneficial uses are uses that would probably develop in future years through the implementation of various control measures. "Beneficial Uses" are equivalent to "Designated Uses" under federal law. [California Water Code Section 13050(f)].

Best Management Practices (BMPs) - Defined in 40 CFR 122.2 as schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Bioassessment - The use of biological community information to evaluate the biological integrity of a water body and its watershed. With respect to aquatic ecosystems, bioassessment is the collection and analysis of samples of the benthic macroinvertebrate community together with physical/habitat quality measurements associated with the sampling site and the watershed to evaluate the biological condition (i.e. biotic integrity) of a water body.

Biofiltration - Practices that use vegetation and amended soils to detain and treat runoff from impervious areas. Treatment is through filtration, infiltration, adsorption, ion exchange, and biological uptake of pollutants.

Biological Integrity - Defined in Karr J.R. and D.R. Dudley. 1981. Ecological perspective on water quality goals. *Environmental Management* 5:55-68 as: "A balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitat of the region." Also referred to as ecosystem health.

BMP Design Manual – A plan developed to eliminate, reduce, or mitigate the impacts of runoff from development projects, including Priority Development Projects.

Clean Water Act Section 303(d) Water Body - An impaired water body in which water quality does not meet applicable water quality standards and/or is not expected to meet water quality standards, even after the application of technology based pollution controls required by the

CWA. The discharge of runoff to these water bodies by the Copermittees is significant because these discharges can cause or contribute to violations of applicable water quality standards.

Construction Site – Any project, including projects requiring coverage under the Construction General Permit, that involves soil disturbing activities including, but not limited to, clearing, grading, disturbances to ground such as stockpiling, and excavation.

Contamination - As defined in the Porter-Cologne Water Quality Control Act, contamination is "an impairment of the quality of waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste whether or not waters of the State are affected."

Copermittee – An incorporated city within the County of Orange, County of Riverside, or County of San Diego in the San Diego Region, the County of Orange, the County of Riverside, the County of San Diego, the Orange County Flood Control District, the Riverside County Water Conservation and Flood Control District, the San Diego Regional Airport Authority, or the San Diego Unified Port District.

Copermittees – All of the individual Copermittees, collectively.

Critical Channel Flow (Qc) – The channel flow that produces the critical shear stress that initiates bed movement or that erodes the toe of channel banks. When measuring Qc, it should be based on the weakest boundary material – either bed or bank.

Daily Discharge – Defined as either: (1) the total mass of the constituent discharged over the calendar day or any 24 hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g. concentration.)

The Daily Discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day, or other 24 hour period other than a day), or by the arithmetic mean of analytical results from one or more grab samples taken over the course of a day.

Development Projects - Construction, rehabilitation, redevelopment, or reconstruction of any public or private residential project, industrial, commercial, or any other projects.

Dry Season –May 1 to September 30.

Dry Weather – Weather is considered dry if the preceding 72 hours has been without measurable precipitation (>0.1 inch).

Enclosed Bays – Enclosed bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost bay works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays do not include inland surface waters or ocean waters.

Erosion – When land is diminished or worn away due to wind, water, or glacial ice. Often the eroded debris (silt or sediment) becomes a pollutant via storm water runoff. Erosion occurs naturally but can be intensified by land clearing activities such as farming, development, road building, and timber harvesting.

Environmentally Sensitive Areas (ESAs) - Areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; areas designated as preserves or their equivalent under the Natural Communities Conservation Program within the Cities and County of Orange; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.

Estuaries – Waters, including coastal lagoons, located at the mouth of streams that serve as areas of mixing fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and ocean water. Estuaries do not include inland surface waters or ocean waters.

Existing Development – Any area that has been developed and exists for municipal, commercial, industrial, or residential purposes, uses, or activities. May include areas that are not actively used for its originally developed purpose, but may be re-purposed or redeveloped for another use or activity.

Flow Duration – The long-term period of time that flows occur above a threshold that causes significant sediment transport and may cause excessive erosion damage to creeks and streams (not a single storm event duration). The simplest way to visualize this is to consider a histogram of pre- and post-project flows using long-term records of hourly data. To maintain pre-development flow duration means that the total number of hours (counts) within each range of flows in a flow-duration histogram cannot increase between the pre- and post-development condition. Flow duration within the range of geomorphologically significant flows is important for managing erosion.

Grading - The cutting and/or filling of the land surface to a desired slope or elevation.

Hazardous Material – Any substance that poses a threat to human health or the environment due to its toxicity, corrosiveness, ignitability, explosive nature or chemical reactivity. These also include materials named by the USEPA in 40 CFR 116 to be reported if a designated quantity of the material is spilled into the waters of the U.S. or emitted into the environment.

Hazardous Waste - Hazardous waste is defined as “any waste which, under Section 600 of Title 22 of this code, is required to be managed according to Chapter 30 of Division 4.5 of Title 22 of this code” [CCR Title 22, Division 4.5, Chapter 11, Article 1].

Household Hazardous Waste – Paints, cleaning products, and other wastes generated during home improvement or maintenance activities.

Hydromodification – The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

Illicit Connection – Any connection to the MS4 that conveys an illicit discharge.

Illicit Discharge - Any discharge to the MS4 that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from fire fighting activities [40 CFR 122.26(b)(2)].

Inactive Areas – Areas of construction activity that are not active and those that have been active and are not scheduled to be re-disturbed for at least 14 days.

Infiltration – Water other than wastewater that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow [40 CFR 35.2005(20)].

Inland Surface Waters – Includes all surface waters of the State that do not include the ocean, enclosed bays, or estuaries.

Jurisdictional Runoff Management Program Document – A written description of the specific jurisdictional runoff management measures and programs that each Copermittee will implement to comply with this Order and ensure that storm water pollutant discharges in runoff are reduced to the MEP and do not cause or contribute to a violation of water quality standards.

Low Impact Development (LID) – A storm water management and land development strategy that emphasizes conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions.

Low Impact Development Best Management Practices (LID BMPs) – LID BMPs include schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States through storm water management and land development strategies that emphasize conservation sand the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions. LID BMPs include retention practices that do not allow runoff, such as infiltration, rain water harvesting and reuse, and evapotranspiration. LID BMPs also include flow-through practices such as biofiltration that may have some discharge of storm water following pollutant reduction.

Major Outfall – As defined in the Code of Federal Regulations, a major outfall is a MS4 outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (i.e. discharge from a single conveyance other than a circular pipe which is associated with a drainage are of more than 50 acres); or, for MS4s that receive storm water from lands zoned for industrial activity (based on comprehensive zoning plans or equivalent), a MS4 outfall that discharges from a single pipe with an inside diameter of 12 inches or more or from its equivalent

(i.e. discharge from other than a circular pipe associated with a drainage area of 2 acres or more).

Maximum Daily Action Level (MDAL) –The highest allowable daily discharge of a pollutant, over a calendar day (or 24 hour period). For pollutants with action levels expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with action levels expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

Maximum Extent Practicable (MEP) – The technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) for storm water that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) in combination with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than BAT. A definition for MEP is not provided either in the statute or in the regulations. Instead the definition of MEP is dynamic and will be defined by the following process over time: municipalities propose their definition of MEP by way of their runoff management programs. Their total collective and individual activities conducted pursuant to the runoff management programs becomes their proposal for MEP as it applies both to their overall effort, as well as to specific activities (e.g., MEP for street sweeping, or MEP for MS4 maintenance). In the absence of a proposal acceptable to the San Diego Water Board, the San Diego Water Board defines MEP.

In a memo dated February 11, 1993, entitled "Definition of Maximum Extent Practicable," Elizabeth Jennings, Senior Staff Counsel, SWRCB addressed the achievement of the MEP standard as follows:

> "*To achieve the MEP standard, municipalities must employ whatever Best Management Practices (BMPs) are technically feasible (i.e., are likely to be effective) and are not cost prohibitive. The major emphasis is on technical feasibility. Reducing pollutants to the MEP means choosing effective BMPs, and rejecting applicable BMPs only where other effective BMPs will serve the same purpose, or the BMPs would not be technically feasible, or the cost would be prohibitive. In selecting BMPs to achieve the MEP standard, the following factors may be useful to consider:*
>
> *a. Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?*
> *b. Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?*
> *c. Public Acceptance: Does the BMP have public support?*
> *d. Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?*
> *e. Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc.?*
>
> *The final determination regarding whether a municipality has reduced pollutants to the maximum extent practicable can only be made by the Regional or State Water Boards, and not by the municipal discharger. If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would*

exceed any benefit derived, it would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs that would address a pollutant source, or to pick a BMP based solely on cost, which would be clearly less effective. In selecting BMPs the municipality must make a serious attempt to comply and practical solutions may not be lightly rejected. In any case, the burden would be on the municipal discharger to show compliance with its permit. After selecting a menu of BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented."

Monitoring Year – October 1 to September 30

Municipal Separate Storm Sewer System (MS4) – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designated or used for collecting or conveying storm water; (iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.26.

National Pollutant Discharge Elimination System (NPDES) - The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the CWA.

Non-Storm Water - All discharges to and from a MS4 that do not originate from precipitation events (i.e., all discharges from a MS4 other than storm water). Non-storm water includes illicit discharges and NPDES permitted discharges.

Nuisance - As defined in the Porter-Cologne Water Quality Control Act, a nuisance is "anything which meets all of the following requirements: 1) Is injurious to health, or is indecent, or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. 2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. 3) Occurs during, or as a result of, the treatment or disposal of wastes."

Ocean Waters – the territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the State Board's California Ocean Plan.

Order – Unless otherwise specified, refers to this Order, Order No. R9-2013-0001 (NPDES No. CAS0109266)

Persistent Flow - Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

Person - A person is defined as an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof [40 CFR 122.2].

Point Source - Any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, landfill leachate collection systems, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

Pollutant - Any agent that may cause or contribute to the degradation of water quality such that a condition of pollution or contamination is created or aggravated.

Pollution - As defined in the Porter-Cologne Water Quality Control Act, pollution is "the alteration of the quality of the waters of the State by waste, to a degree that unreasonably affects the either of the following: 1) The waters for beneficial uses; or 2) Facilities that serve these beneficial uses." Pollution may include contamination.

Pollution Prevention - Pollution prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control BMPs, treatment control BMPs, or disposal.

Pre-Development Runoff Conditions – Runoff conditions that existed onsite before the existing development was constructed, or exists onsite before planned development activities occur.

Priority Development Projects - New development and redevelopment projects defined under Provision E.3.b of Order No. R9-2012-0011.

Rainy Season (aka Wet Season) –October 1 to April 30

Receiving Waters – Waters of the United States.

Receiving Water Limitations - Waste discharge requirements issued by the San Diego Water Board typically include both: (1) "Effluent Limitations" (or "Discharge Limitations") that specify the technology-based or water-quality-based effluent limitations; and (2) "Receiving Water Limitations" that specify the water quality objectives in the Basin Plan as well as any other limitations necessary to attain those objectives. In summary, the "Receiving Water Limitations" provision is the provision used to implement the requirements of CWA section 402(p)(3)(B).

Redevelopment - The creation, addition, and or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include trenching and resurfacing associated with utility work; resurfacing existing roadways; new sidewalk construction, pedestrian ramps, or bike lane on existing roads; and routine replacement of damaged pavement, such as pothole repair.

Reporting Period – The period of information that is reported in the Annual Report. The reporting period consists of two components: 1) July 1 to June 30, consistent with the fiscal year, for the implementation of the jurisdictional runoff management programs, and 2) October 1 to September 30, consistent with the monitoring year for the monitoring and assessment programs. Together, these two time periods constitute the reporting year for the Annual Report due January 31 following the end of the monitoring year.

Retain –Keep or hold in a particular place, condition, or position without discharge to surface waters.

Retrofitting – Storm water management practice put into place after development has occurred in watersheds where the practices previously did not exist. Retrofitting of developed areas is intended to improve water quality, protect downstream channels, reduce flooding, or meet other specific objectives. Retrofitting developed areas may include, but is not limited to replacing roofs with green roofs, disconnecting downspouts or impervious surfaces to drain to pervious surfaces, replacing impervious surfaces with pervious surfaces, installing rain barrels, installing rain gardens, and trash area enclosures.

Runoff - All flows in a storm water conveyance system that consists of the following components: (1) storm water (wet weather flows) and (2) non-storm water including dry weather flows.

San Diego Water Board – As used in this document the term "San Diego Water Board" is synonymous with the term "Regional Board" as defined in Water Code section 13050(b) and is intended to refer to the California Regional Water Quality Control Board for the San Diego Region as specified in Water Code Section 13200.

Sediment - Soil, sand, and minerals washed from land into water. Sediment resulting from anthropogenic sources (i.e. human induced land disturbance activities) is considered a pollutant. This Order regulates only the discharges of sediment from anthropogenic sources and does not regulate naturally occurring sources of sediment. Sediment can destroy fish-nesting areas, clog animal habitats, and cloud waters so that sunlight does not reach aquatic plants.

Source Control BMP – Land use or site planning practices, or structural or nonstructural measures that aim to prevent runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between pollutants and runoff.

Storm Water – Per 40 CFR 122.26(b)(13), means storm water runoff, snowmelt runoff and surface runoff and drainage. Surface runoff and drainage pertains to runoff and drainage resulting from precipitation events.

Stream, Channel, or Habitat Rehabilitation – Measures or activities for the purpose of improving or restoring the environmental health (i.e. physical, chemical and biological integrity) of streams, channels, or river systems. Rehabilitation techniques may include, but are not limited to, riparian zone restoration, constructed wetlands, bank stabilization, channel reconfiguration, and daylighting drainage systems.

Structural BMPs - A subset of BMPs which detains, retains, filters, removes, or prevents the release of pollutants to surface waters from development projects in perpetuity, after construction of a project is completed.

Total Maximum Daily Load (TMDL) - The maximum amount of a pollutant that can be discharged into a water body from all sources (point and non-point) and still maintain water quality standards. Under CWA section 303(d), TMDLs must be developed for all water bodies that do not meet water quality standards after application of technology-based controls.

Toxicity - Adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies). The water quality objectives for toxicity provided in the Basin Plan, state in part…"All waters shall be free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life….The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge".

Treatment Control BMP – Any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media absorption or any other physical, biological, or chemical process.

Unpaved Road – Any long, narrow stretch without pavement used for traveling by motor passenger vehicles between two or more points. Unpaved roads are generally constructed of dirt, gravel, aggregate or macadam and may be improved or unimproved.

Waste - As defined in CWC Section 13050(d), "waste includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal."

Article 2 of CCR Title 23, Chapter 15 (Chapter 15) contains a waste classification system that applies to solid and semi-solid waste, which cannot be discharged directly or indirectly to water of the state and which therefore must be discharged to land for treatment, storage, or disposal in accordance with Chapter 15. There are four classifications of waste (listed in order of highest to lowest threat to water quality): hazardous waste, designated waste, non-hazardous solid waste, and inert waste.

Water Quality Objective - Numerical or narrative limits on constituents or characteristics of water designated to protect designated beneficial uses of the water. [California Water Code Section 13050 (h)]. California's water quality objectives are established by the State and Regional Water Boards in the Water Quality Control Plans. Numeric or narrative limits for pollutants or characteristics of water designed to protect the beneficial uses of the water. In other words, a water quality objective is the maximum concentration of a pollutant that can exist in a receiving water and still generally ensure that the beneficial uses of the receiving water remain protected (i.e., not impaired). Since water quality objectives are designed specifically to protect the beneficial uses, when the objectives are violated the beneficial uses are, by definition, no longer protected and become impaired. This is a fundamental concept under the Porter Cologne Act. Equally fundamental is Porter Cologne's definition of pollution. A condition of pollution exists when the water quality needed to support designated beneficial uses has become unreasonably affected or impaired; in other words, when the water quality objectives

have been violated. These underlying definitions (regarding beneficial use protection) are the reason why all waste discharge requirements implementing the federal NPDES regulations require compliance with water quality objectives. (Water quality objectives are also called water quality criteria in the CWA.)

Water Quality Standards - Water quality standards, as defined in Clean Water Act section 303(c) consist of the beneficial uses (e.g., swimming, fishing, municipal drinking water supply, etc.,) of a water body and criteria (referred to as water quality objectives in the California Water Code) necessary to protect those uses. Under the Water Code, the water boards establish beneficial uses and water quality objectives in water quality control or basin plans. Together with an anti-degradation policy, these beneficial uses and water quality objectives serve as water quality standards under the Clean Water Act. In Clean Water Act parlance, state beneficial uses are called “designated uses” and state water quality objectives are called “criteria.” Throughout this Order, the relevant term is used depending on the statutory scheme.

Waters of the State - Any water, surface or underground, including saline waters within the boundaries of the State [CWC section 13050 (e)]. The definition of the Waters of the State is broader than that for the Waters of the United States in that all water in the State is considered to be a Waters of the State regardless of circumstances or condition.

Waters of the United States - As defined in the 40 CFR 122.2, the Waters of the U.S. are defined as: “(a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate “wetlands;” (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, “wetlands,” sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters otherwise defined as waters of the United States under this definition: (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial seas; and (g) “Wetlands” adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area’s status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA.”

Watershed - That geographical area which drains to a specified point on a water course, usually a confluence of streams or rivers (also known as drainage area, catchment, or river basin).

Wet Season (aka Rainy Season) –October 1 to April 30

Wet Weather – Weather is considered wet if there is a storm event of 0.1 inches and greater and the following 72 hours, unless otherwise defined by another regulatory mechanism.

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ATTACHMENT D

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

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JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

FY _____

I. COPERMITTEE INFORMATION

Copermittee Name:

Copermittee Primary Contact Name:

Copermittee Primary Contact Information:
Address:
City: County: State: Zip:
Telephone: Fax: Email:

II. LEGAL AUTHORITY

Has the Copermittee established adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐
A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority?	**YES**	☐
	NO	☐

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

Was an update of the jurisdictional runoff management program document required or recommended by the San Diego Water Board?	**YES**	☐
	NO	☐
If YES to the question above, did the Copermittee update its jurisdictional runoff management program document and make it available on the Regional Clearinghouse?	**YES**	☐
	NO	☐

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

Has the Copermittee implemented a program to actively detect and eliminate illicit discharges and connections to its MS4 that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

Number of non-storm water discharges reported by the public	
Number of non-storm water discharges detected by Copermittee staff or contractors	
Number of non-storm water discharges investigated by the Copermittee	
Number of sources of non-storm water discharges identified	
Number of non-storm water discharges eliminated	
Number of sources of illicit discharges or connections identified	
Number of illicit discharges or connections eliminated	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

V. DEVELOPMENT PLANNING PROGRAM

Has the Copermittee implemented a development planning program that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐
Was an update to the BMP Design Manual required or recommended by the San Diego Water Board?	**YES**	☐
	NO	☐
If YES to the question above, did the Copermittee update its BMP Design Manual and make it available on the Regional Clearinghouse?	**YES**	☐
	NO	☐

Number of proposed development projects in review	
Number of Priority Development Projects in review	
Number of Priority Development Projects approved	
Number of approved Priority Development Projects exempt from any BMP requirements	
Number of approved Priority Development Projects allowed alternative compliance	
Number of Priority Development Projects granted occupancy	

Number of completed Priority Development Projects in inventory	
Number of high priority Priority Development Project structural BMP inspections	
Number of Priority Development Project structural BMP violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM
FY _____

VI. CONSTRUCTION MANAGEMENT PROGRAM

Has the Copermittee implemented a construction management program that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

Number of construction sites in inventory	
Number of active construction sites in inventory	
Number of inactive construction sites in inventory	
Number of construction sites closed/completed during reporting period	
Number of construction site inspections	
Number of construction site violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

Has the Copermittee implemented an existing development management program that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

	Municipal	Commercial	Industrial	Residential
Number of facilities or areas in inventory				
Number of existing development inspections				
Number of follow-up inspections				
Number of violations				
Number of enforcement actions issued				
Number of escalated enforcement actions issued				

VIII. PUBLIC EDUCATION AND PARTICIPATION

Has the Copermittee implemented a public education program component that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐
Has the Copermittee implemented a public participation program component that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

IX. FISCAL ANALYSIS

Has the Copermittee attached to this form a summary of its fiscal analysis that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

X. CERTIFICATION

I [☐ Principal Executive Officer ☐ Ranking Elected Official ☐ Duly Authorized Representative] certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature	Date
Print Name	Title
Telephone Number	Email

ATTACHMENT E

SPECIFIC PROVISIONS FOR TOTAL MAXIMUM DAILY LOADS APPLICABLE TO ORDER NO. R9-2013-0001

These provisions implement Total Maximum Daily Loads (TMDLs), adopted by the San Diego Water Board and approved by USEPA under Clean Water Act section 303(c), which are applicable to discharges regulated under this Order. The provisions and schedules for implementation of the TMDLs described below must be incorporated into the Water Quality Improvement Plans, required pursuant to Provision B of this Order, for the specified Watershed Management Areas.

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed
2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin
3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed
4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek
5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay
6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2002-0123

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	August 14, 2002
State Water Board Approval Date:	July 16, 2003
Office of Administrative Law Approval Date:	September 11, 2003
US EPA Approval Date:	November 3, 2003

(3) TMDL Effective Date: September 11, 2003

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for Chollas Creek consist of the following:

(1) Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedule under Specific Provision 1.c:

Table 1.1
Receiving Water Limitations as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Diazinon	Acute	0.08 µg/L	1 hour
	Chronic	0.05 µg/L	4 days

(2) Effluent Limitations

Discharges from the MS4s must not contain concentrations that exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 1.c:

Table 1.2
Effluent Limitations as Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation	Averaging Period
Diazinon	Acute	0.072 µg/L	1 hour
	Chronic	0.045 µg/L	4 days

(3) Best Management Practices

The following BMPs for Chollas Creek must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area and implemented by the Responsible Copermittees:

(a) The Responsible Copermittees must implement BMPs to support the achievement of the WQBELs under Specific Provision 1.b for Chollas Creek.

(b) The Responsible Copermittees must implement the Diazinon Toxicity Control Plan and Diazinon Public Outreach/Education Program as described in the report titled, *Technical Report for Total Maximum Daily Load for Diazinon in Chollas Creek Watershed, San Diego County*, dated August 14, 2002, including subsequent modifications, in order to achieve the WQBELs under Specific Provision 1.b.

(c) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans as possible.

c. COMPLIANCE SCHEDULE

The Responsible Copermittees are required to achieve their respective WLAs by December 31, 2010. The Responsible Copermittees must be in compliance with the WQBELs under Specific Provision 1.b.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls for diazinon within the Chollas Creek watershed, and calculate or estimate the annual diazinon loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

e. COMPLIANCE DETERMINATION

Compliance with WQBELs of Specific Provision 1.b may be demonstrated via one of the following methods:

(1) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;

(2) There are no exceedances of the applicable receiving water limitations under Specific Provision 1.b.(1) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(3) There are no violations of the applicable effluent limitations under Specific Provision 1.b.(2) at the Responsible Copermittees' MS4 outfalls.

2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0019

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	September 22, 2005
Office of Administrative Law Approval Date:	December 2, 2005
US EPA Approval Date:	February 8, 2006

(3) TMDL Effective Date: December 2, 2005

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Shelter Island Yacht Basin

(6) Responsible Copermittee: City of San Diegot

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for Shelter Island Yacht Basin consist of the following:

(1) Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedule under Specific Provision 2.c:

Table 2.1
Receiving Water Limitations as Concentrations in Shelter Island Yacht Basin

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Dissolved Copper	Acute	4.8 µg/L	1 hour
	Chronic	3.1 µg/L	4 days

(2) Effluent Limitations

Discharges from the MS4s must not contain pollutant loads that exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 2.c:

Table 2.2
Effluent Limitations as Annual Loads in MS4 Discharges to Shelter Island Yacht Basin

Constituent	Effluent Limitation
Dissolved Copper	30 kg/yr

(3) Best Management Practices

The Responsible Copermittee must implement BMPs to support the achievement of the WQBELs under Specific Provision 2.b for Shelter Island Yacht Basin

c. Compliance Schedule

The Responsible Copermittee is required to achieve the MS4 WLA by December 2, 2005. The Responsible Copermittee must be in compliance with the WQBELs under Specific Provision 2.b.

d. Specific Monitoring and Assessment Requirements

The Responsible Copermittee must monitor the effluent of its MS4 outfalls for dissolved copper, and calculate or estimate the monthly and annual dissolved copper loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.(b)(2)of this Order. The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

e. Compliance Determination

Compliance with WQBELs of Specific Provision 2.b may be demonstrated via one of the following methods:

(1) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water;

(2) There are no exceedances of the applicable receiving water limitations under Specific Provision 2.b.(1) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(3) There are no violations of the applicable effluent limitations under Specific Provision 2.b.(2) at the Responsible Copermittee's MS4 outfalls.

3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0036

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	November 16, 2005
Office of Administrative Law Approval Date:	February 1, 2006
US EPA Approval Date:	March 22, 2006

(3) TMDL Effective Date: February 1, 2006

(4) Watershed Management Area: Santa Margarita River

(5) Water Body: Rainbow Creek

(6) Responsible Copermittee: County of San Diego

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for Rainbow Creek consist of the following

(1) Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedule under Specific Provision 3.c.(1):

Table 3.1
Receiving Water Limitations as Concentrations in Rainbow Creek

Constituent	Receiving Water Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(2) Effluent Limitations

(a) Discharges from the MS4s must not contain concentrations that exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 3.c.(1):

Table 3.2
Effluent Limitations as Concentrations in MS4 Discharges to Rainbow Creek

Constituent	Effluent Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(b) Pollutant loads from given land uses discharging to and from the MS4s must not exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 3.c.(1):

Table 3.3
Effluent Limitations as Annual Loads in MS4 Discharges to Rainbow Creek

Land Use	Total N	Total P
Commercial nurseries	116 kg/yr	3 kg/yr
Park	3 kg/yr	0.1 kg/yr
Residential areas	149 kg/yr	12 kg/yr
Urban areas	27 kg/yr	6 kg/yr

Interim effluent limitations expressed as pollutant loads are given in the compliance schedule under Specific Provision 3.0.

(3) Best Management Practices

(a) The Responsible Copermittee must implement BMPs to support the achievement of the WQBELs under Specific Provision 3.b for Rainbow Creek.

(b) The Responsible Copermittee should coordinate any BMPs implemented to address this TMDL with Caltrans and other sources as possible.

c. Compliance Schedule

(1) Compliance Date

The Responsible Copermittee must be in compliance with the WQBELs under Specific Provision 3.b, by December 31, 2021.

(2) Interim Compliance Requirements

Table 3.4
Interim Effluent Limitations as Annual Loads in MS4 Discharges from Specific Land Uses to Rainbow Creek

	Total N Interim Effluent Limitations (kg/yr)			Total P Interim Effluent Limitations (kg/yr)		
	Interim Compliance Date			Interim Compliance Date		
Land Use	**2009**	**2013**	**2017**	**2009**	**2013**	**2017**
Commercial nurseries	390	299	196	20	16	10
Park	5	3	3	0.15	0.10	0.10
Residential areas	507	390	260	99	74	47
Urban areas	40	27	27	9	6	6

d. Specific Monitoring and Assessment Requirements

The Responsible Copermittee must implement the Sampling and Analysis Plan for Rainbow Creek Nutrient Reduction TMDL Implementation Water Quality Monitoring, dated January 2010. The results of any monitoring conducted during the reporting period, and assessment of whether the interim and final WQBELs have been achieved must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

e. Compliance Determination

(1) Compliance with interim compliance requirements of Specific Provision 3.c.(2) may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water;

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 3.b.(1) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls;

(c) There are no violations of the applicable effluent limitations under Specific Provision 3.b.(2)(a) at the Responsible Copermittee's MS4 outfalls;

(d) The pollutant loads from given land uses discharging to and from the MS4s do not exceed the applicable effluent limitations under Specific Provision 3.b.(2)(b); OR

(e) The Responsible Copermittee has submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim compliance requirements will be achieved by the interim compliance dates.

(2) Compliance with WQBELs of Specific Provision 3.b may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water;

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 3.b.(1) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls;

(c) There are no violations of the applicable effluent limitations under Specific Provision 3.b.(2)(a) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant loads from given land uses discharging to and from the MS4s do not exceed the applicable effluent limitations under Specific Provision 3.b.(2)(b).

4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2007-0043

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2007
State Water Board Approval Date:	July 15, 2008
Office of Administrative Law Approval Date:	October 22, 2008
US EPA Approval Date:	December 18, 2008

(3) TMDL Effective Date: October 22, 2008

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for Chollas Creek consist of the following:

(1) Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedule under Specific Provision 4.c.(1):

Table 4.1
Receiving Water Limitations as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$(0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$(0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$(0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$(0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER.

(2) Effluent Limitations

Discharges from the MS4s must not contain pollutant loads that exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 4.c.(1):

Table 4.2
Effluent Limitations as Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER.

(3) Best Management Practices

(a) The Responsible Copermittees must implement BMPs to support the achievement of the WQBELs under Specific Provision 4.b for Chollas Creek.

(b) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans and the U.S. Navy as possible.

c. Compliance Schedule

(1) WLA Compliance Date

The Responsible Copermittees are required to achieve the WLA, thus must be in compliance with the WQBELs under Specific Provision 4.b, by October 22, 2028.

(2) Interim Compliance Requirements

The Responsible Copermittee must comply with the following interim WQBELs by the interim compliance date:

Table 4.3
Interim Effluent Limitations as Concentrations in MS4 Discharges to Chollas Creek

Interim Compliance Date	Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
October 22, 2018	Dissolved Copper	Acute	$1.2 \times 90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
	Dissolved Lead	Acute	$1.2 \times 90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
	Dissolved Zinc	Acute	$1.2 \times 90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER.

d. Specific Monitoring and Assessment Requirements

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*, when it is amended to include monitoring requirements for the Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls discharging to Chollas Creek for dissolved copper, lead, and zinc, and calculate or estimate the monthly and annual dissolved copper, lead, and zinc loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2)of this Order. The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

e. COMPLIANCE DETERMINATION

(1) Compliance with interim compliance requirements of Specific Provision 4.c.(2) may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 4.b.(1) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls;

(c) There are no violations of the applicable effluent limitations under Specific Provision 4.b.(2) at the Responsible Copermittees' MS4 outfalls; OR

(d) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim compliance requirements will be achieved by the interim compliance dates.

(2) Compliance with WQBELs of Specific Provision 4.b may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 4.b.(1) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(c) There are no violations of the applicable effluent limitations under Specific Provision 4.b.(2) at the Responsible Copermittees' MS4 outfalls.

5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2008-0027

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 11, 2008
State Water Board Approval Date:	June 16, 2009
Office of Administrative Law Approval Date:	September 15, 2009
US EPA Approval Date:	October 26, 2009

(3) TMDL Effective Date: September 15, 2009

(4) Watershed Management Areas: See Table 5.0

(5) Water Bodies: See Table 5.0

(6) Responsible Copermittees: See Table 5.0

Table 5.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County	Dana Point Harbor	Baby Beach	-City of Dana Point -County of Orange
San Diego Bay	San Diego Bay	Shelter Island Shoreline Park	- San Diego Unified Port District

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Receiving Water Limitations

(a) Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedules under Specific Provisions 5.c.(1)(a) and 5.c.(2):

Table 5.1
Receiving Water Limitations as Bacteria Densities in the Water Body

	Receiving Water Limitations	
Constituent	**Single Sample Maximum[1,2]**	**30-Day Geometric Mean[2]**
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.

(b) If the above receiving water limitations are not met in the receiving water, the Responsible Copermittees must demonstrate that the discharges from the MS4s are not causing or contributing to the exceedance of receiving water limitations.

(2) Effluent Limitations

Discharges from the MS4s must not contain densities that exceed the following effluent limitations by the end of the compliance schedules under Specific Provisions 5.c.(1)(a) and 5.c.(2) to demonstrate the discharge is not causing or contributing to a violation of receiving water quality standards:

Table 5.2
Effluent Limitations as Bacteria Densities in MS4 Discharges to the Water Body

	Effluent Limitations	
Constituent	**Single Sample Maximum[1,2]**	**30-Day Geometric Mean[2]**
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.

Interim effluent limitations expressed as pollutant loads are given in the compliance schedule under Specific Provision 5.c.

(3) Best Management Practices

(a) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 5.0 must incorporate the Bacteria Load Reduction Plan (BLRP) required to be developed pursuant to Resolution No. R9-2008-0027.

(b) The Responsible Copermittee must implement BMPs to support the achievement of the WQBELs under Specific Provision 5.0 for the segments or areas of the water bodies listed in Table 5.0

c. COMPLIANCE SCHEDULE

(1) Baby Beach in Dana Point Harbor

(a) WLA Compliance Dates

The Responsible Copermittees for MS4 discharges to Baby Beach are required to achieve the WLA, thus must be in compliance with the WQBELs under Specific Provision 5.0, according to the following compliance schedule:

Table 5.3
Compliance Schedule Dates to Achieve Baby Beach WLAs

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform	September 15, 2014	September 15, 2009
Fecal Coliform		September 15, 2009
Enterococcus		September 15, 2019

(b) Interim Compliance Requirements

The Responsible Copermittees for MS4 discharges to Baby Beach must comply with the following interim WQBELs by the interim compliance date:

Table 5.4
Interim Effluent Limitations as Loads in MS4 Discharges to Baby Beach

Constituent	Interim Compliance Date	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	4.93×10^9 MPN/day	NA*
Fecal Coliform	September 15, 2012	0.59×10^9 MPN/day	NA*
Enterococcus	September 15, 2012	0.42×10^9 MPN/day	NA**
	September 15, 2016	NA*	207×10^9 MPN/30days

Notes:
* The WQBELs under Specific Provision 5.b must already be achieved by the given interim compliance date.
** There is no corresponding interim WQBEL for the given interim compliance date.

(2) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park is required to achieve the WLA, thus must be in compliance with the WQBELs under Specific Provision 5.0, by December 31, 2012.

d. Specific Monitoring and Assessment Requirements

(1) Monitoring Stations

Monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[33] If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(2) Monitoring Procedures

(a) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) The Responsible Copermittees must collect wet weather monitoring samples within the first 24 hours of the first storm event[34] of the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(c) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs have been achieved.

[33] Commonly referred to as AB 411 monitoring

[34] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(b) The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

e. COMPLIANCE DETERMINATION

(1) Compliance with interim compliance requirements of Specific Provision 5.c.(1)(b) may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 5.b.(1)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls;

(c) There are no violations of the applicable effluent limitations under Specific Provision 5.b.(2) at the Responsible Copermittees' MS4 outfalls;

(d) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the applicable effluent limitations under Specific Provision 5.c.(1)(b);

(e) The Responsible Copermittees can demonstrate that exceedances of the applicable receiving water limitations under Specific Provision 5.b.(1)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4 are not causing or contributing to the exceedances; OR

(f) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim compliance requirements will be achieved by the interim compliance dates.

(2) Compliance with WQBELs of Specific Provision 5.b may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 5.b.(1)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls;

(c) There are no violations of the applicable effluent limitations under Specific Provision 5.b.(2) at the Responsible Copermittees' MS4 outfalls;

(d) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the applicable effluent limitations under Specific Provision 5.c.(1)(b); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the applicable receiving water limitations under Specific Provision 5.b.(1)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4 are not causing or contributing to the exceedances.

6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2010-0001

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 10, 2010
State Water Board Approval Date:	December 14, 2010
Office of Administrative Law Approval Date:	April 4, 2011
US EPA Approval Date:	June 22, 2011

(3) TMDL Effective Date: April 4, 2011

(4) Watershed Management Areas: See Table 6.0

(5) Water Bodies: See Table 6.0

(6) Responsible Copermittees: See Table 6.0

Table 6.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	-City of Laguna Beach -County of Orange -Orange County Flood Control District
		at Heisler Park - North	
	Pacific Ocean Shoreline	at Main Laguna Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Woods -County of Orange -Orange County Flood Control District
		Laguna Beach at Ocean Avenue	
		Laguna Beach at Cleo Street	
		Arch Cove at Bluebird Canyon Road	
		Laguna Beach at Dumond Drive	
	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Hills -City of Laguna Niguel -City of Laguna Woods -City of Lake Forest -City of Mission Viejo -County of Orange -Orange County Flood Control District
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	
	Aliso Creek Mouth	at mouth	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County (cont'd)	Pacific Ocean Shoreline	Aliso Beach at West Street	-City of Dana Point -City of Laguna Beach -City of Laguna Niguel -County of Orange -Orange County Flood Control District
		Aliso Beach at Table Rock Drive	
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)	
		at Salt Creek (large outlet)	
		Salt Creek Beach at Salt Creek service road	
		Salt Creek Beach at Strand Road	
	Pacific Ocean Shoreline	at San Juan Creek	-City of Dana Point -City of Laguna Hills -City of Laguna Niguel -City of Mission Viejo -City of Rancho Santa Margarita -City of San Juan Capistrano -County of Orange -Orange County Flood Control District
	San Juan Creek	lower 1 mile	
	San Juan Creek Mouth	at mouth	
	Pacific Ocean Shoreline	at Poche Beach	-City of Dana Point -City of San Clemente -County of Orange -Orange County Flood Control District
		Ole Hanson Beach Club Beach at Pico Drain	
		San Clemente City Beach at El Portal Street Stairs	
		San Clemente City Beach at Mariposa Street	
		San Clemente City Beach at Linda Lane	
		San Clemente City Beach at South Linda Lane	
		San Clemente City Beach at Lifeguard Headquarters	
		under San Clemente Municipal Pier	
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	
		San Clemente State Beach at Riviera Beach	
		Can Clemente State Beach at Cypress Shores	
San Luis Rey River	Pacific Ocean Shoreline	at San Luis Rey River mouth	-City of Oceanside -City of Vista -County of San Diego

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
Carlsbad	Pacific Ocean Shoreline	at Moonlight State Beach	-City of Carlsbad -City of Encinitas -City of Escondido -City of San Marcos -County of San Diego
San Dieguito River	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	-City of Del Mar -City of Escondido -City of Poway -City of San Diego -City of Solana Beach -County of San Diego
Penasquitos	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	-City of Del Mar -City of Poway -City of San Diego -County of San Diego
Mission Bay	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	-City of San Diego
		La Jolla Shores Beach at Caminito del Oro	
		La Jolla Shores Beach at Vallecitos	
		La Jolla Shores Beach at Avenida de la Playa	
		at Casa Beach, Children's Pool	
		South Casa Beach at Coast Boulevard	
		Whispering Sands Beach at Ravina Street	
		Windansea Beach at Vista de la Playa	
		Windansea Beach at Bonair Street	
		Windansea Beach at Playa del Norte	
		Windansea Beach at Palomar Avenue	
		at Tourmaline Surf Park	
		Pacific Beach at Grand Avenue	
	Tecolote Creek	Entire reach and tributaries	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I- Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
San Diego River	Forrester Creek	lower 1 mile	-City of El Cajon -City of Santee -County of San Diego
	San Diego River	lower 6 miles	-City of El Cajon -City of La Mesa -City of San Diego -City of Santee -County of San Diego
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	
San Diego Bay	Chollas Creek	lower 1.2 miles	-City of La Mesa -City of Lemon Grove -City of San Diego -County of San Diego - San Diego Unified Port District

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for segments or areas of the water bodies listed in Table 6.0 consist of the following:

(1) Receiving Water Limitations

(a) Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedules under Specific Provision 6.c.(1):

Table 6.1
Receiving Water Limitations as Bacteria Densities and Allowable Exceedance Frequencies in the Water Body

	Receiving Water Limitations			
Constituent	Single Sample Maximum[1,2] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[3]	30-Day Geometric Mean[2] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform	10,000	22% / 0%	1,000	0%
Fecal Coliform	400	22% / 0%	200	0%
Enterococcus	104[4] / 61[5]	22% / 0%	35[4] / 33[5]	0%

Notes:
1. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
3. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. The 0% single sample maximum allowable exceedance frequency applies to dry weather days.
4. This *Enterococcus* receiving water limitation applies to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
5. This *Enterococcus* receiving water limitations applies to segments or areas of creeks or creek mouths listed in Table 6.0.

Interim receiving water limitations expressed as allowable exceedance frequencies are given in the compliance schedule under Specific Provision 6.c.

(b) If the above receiving water limitations are not met in the receiving water, the Responsible Copermittees must demonstrate that the discharges from the MS4s are not causing or contributing to the violation of receiving water limitations. The Copermittee must provide data that demonstrate the discharges from the MS4s are meeting the effluent limitations under Specific Provision 6.b.(2).

(2) Effluent Limitations

Discharges from the MS4s must not contain densities that exceed the following effluent limitations by the end of the compliance schedules under Specific Provision 6.c.(1) to demonstrate the discharge is not causing or contributing to a violation of receiving water quality standards:

Table 6.2
Effluent Limitations as Bacteria Densities and Allowable Exceedance Frequencies in MS4 Discharges to the Water Body

	Effluent Limitations			
Constituent	**Single Sample Maximum[1,2] (MPN/100mL)**	**Single Sample Maximum Allowable Exceedance Frequency[3]**	**30-Day Geometric Mean[2] (MPN/100mL)**	**30-Day Geometric Mean Allowable Exceedance Frequency**
Total Coliform	10,000	22% / 0%	1,000	0%
Fecal Coliform	400	22% / 0%	200	0%
Enterococcus	104[4] / 61[5]	22% / 0%	35[4] / 33[5]	0%

Notes:
1. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.
3. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. The 0% single sample maximum allowable exceedance frequency applies to dry weather days
4. This *Enterococcus* effluent limitation applies to MS4 discharges to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
5. This *Enterococcus* effluent limitation applies to MS4 discharges to segments or areas of creeks or creek mouths listed in Table 6.0.

Interim effluent limitations expressed as allowable exceedance frequencies are given in the compliance schedule under Specific Provision 6.c.

(3) Best Management Practices

(a) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 6.0 must incorporate the Comprehensive Load Reduction Plans (CLRPs) required to be developed pursuant to Resolution No. R9-2010-0001. For segments or areas in Table 6.0 that have been delisted from the Clean Water Act Section 303(d) List of Water Quality Limited Segments, a CLRP is not required.

(b) The Responsible Copermittee must implement BMPs to support the achievement of the WQBELs under Specific Provision 6.b for the segments or areas of the water bodies listed in Table 6.0.

(c) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans and owners/operators of small MS4s as possible.

c. Compliance Schedule

(1) WLA Compliance Dates

The Responsible Copermittees for MS4 discharges to a segment or area of the water bodies listed in Table 6.0 are required to achieve the WLA, thus must be in compliance with the WQBELs under Specific Provision 6.b, according to the following compliance schedule:

Table 6.3
Compliance Schedule Dates to Achieve Indicator Bacteria WLAs

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform*	April 4, 2021	April 4, 2031
Fecal Coliform		
Enterococcus		

* Total coliform receiving water limitations only apply to segments or areas of Pacific Ocean Shoreline listed in Table 6.0.

(2) Interim Compliance Requirements

The Responsible Copermittees must comply with the following interim WQBELs by the interim compliance dates:

(a) Interim Dry Weather Receiving Water Limitations

The Responsible Copermittee must calculate the "existing" exceedance frequencies of the 30-day geometric mean water quality objectives for each of the indicator bacteria by analyzing the available monitoring data collected between January 1, 1996 and December 31, 2002. "Existing" exceedance frequencies may be calculated by segment or area of a water body, or by water body, and/or by Watershed Management Area listed in Table 6.0. Separate "existing" exceedance frequencies must be calculated for beaches and creeks/creek mouths.

The Responsible Copermittees must achieve a 50 percent reduction in the "existing" exceedance frequency of the 30-day geometric mean WQBELs for the segments or areas of the water bodies listed in Table 6.0 by the interim compliance dates for achieving the interim dry weather WQBELs given in Table 6.5. A 50 percent reduction in the "existing" exceedance frequency is equivalent to half of the "existing" exceedance frequency of the 30-day geometric mean WQBELs.

The "existing" exceedance frequencies and the interim dry weather allowable exceedance frequencies (i.e. interim dry weather WQBELs) calculated by the Responsible Copermittees must be included in the Water Quality Improvement Plans for the applicable Watershed Management Areas.

(b) Interim Wet Weather Receiving Water Limitations

The Responsible Copermittees must achieve the interim wet weather receiving water limitations in Table 6.4, expressed as interim allowable exceedance frequencies, by the interim compliance dates for achieving the interim wet weather WQBELs given in Table 6.5.

Table 6.4
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	38%	37%	39%
		at Heisler Park - North			
	Pacific Ocean Shoreline	at Main Laguna Beach			
		Laguna Beach at Ocean Avenue			
		Laguna Beach at Cleo Street			
		Arch Cove at Bluebird Canyon Road			
		Laguna Beach at Dumond Drive			
	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	41%	41%	42%
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	41%	41%	42%
	Aliso Creek Mouth	at mouth	41%	41%	42%
	Pacific Ocean Shoreline	Aliso Beach at West Street	36%	36%	36%
		Aliso Beach at Table Rock Drive			
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)			
		at Salt Creek (large outlet)			
		Salt Creek Beach at Salt Creek service road			
		Salt Creek Beach at Strand Road			

Table 6.4 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County (cont'd)	Pacific Ocean Shoreline	at San Juan Creek	44%	44%	48%
	San Juan Creek	lower 1 mile	44%	44%	47%
	San Juan Creek Mouth	at mouth	44%	44%	47%
	Pacific Ocean Shoreline	at Poche Beach	35%	35%	36%
		Ole Hanson Beach Club Beach at Pico Drain			
		San Clemente City Beach at El Portal Street Stairs			
		San Clemente City Beach at Mariposa Street			
		San Clemente City Beach at Linda Lane			
		San Clemente City Beach at South Linda Lane			
		San Clemente City Beach at Lifeguard Headquarters			
		under San Clemente Municipal Pier			
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)			
		San Clemente State Beach at Riviera Beach			
		Can Clemente State Beach at Cypress Shores			
San Luis Rey River	Pacific Ocean Shoreline	at San Luis Rey River mouth	45%	44%	47%
Carlsbad	Pacific Ocean Shoreline	at Moonlight State Beach	40%	40%	41%
San Dieguito River	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	33%	33%	36%

Table 6.4 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
Penasquitos	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	26%	26%	26%
Mission Bay	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	37%	37%	37%
		La Jolla Shores Beach at Caminito del Oro			
		La Jolla Shores Beach at Vallecitos			
		La Jolla Shores Beach at Avenida de la Playa			
		at Casa Beach, Children's Pool			
		South Casa Beach at Coast Boulevard			
		Whispering Sands Beach at Ravina Street			
		Windansea Beach at Vista de la Playa			
		Windansea Beach at Bonair Street			
		Windansea Beach at Playa del Norte			
		Windansea Beach at Palomar Avenue			
		at Tourmaline Surf Park			
		Pacific Beach at Grand Avenue			
	Tecolote Creek	Entire reach and tributaries	49%	49%	51%
San Diego River	Forrester Creek	lower 1 mile	46%	43%	49%
	San Diego River	lower 6 miles	46%	43%	49%
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	46%	43%	51%
San Diego Bay	Chollas Creek	lower 1.2 miles	41%	41%	43%

(c) Interim Compliance Dates

The Responsible Copermittees must achieve the interim receiving water limitations under Specific Provisions 6.c.(2)(a) and 6.c.(2)(b) by the interim compliance dates given in Table 6.5.

Table 6.5
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs
South Orange County	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	April 4, 2016	April 4, 2021
		at Heisler Park - North		
	Pacific Ocean Shoreline	at Main Laguna Beach	April 4, 2016	April 4, 2021
		Laguna Beach at Ocean Avenue		
		Laguna Beach at Cleo Street		
		Arch Cove at Bluebird Canyon Road		
		Laguna Beach at Dumond Drive		
	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	April 4, 2016	April 4, 2021
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	April 4, 2018	April 4, 2021
	Aliso Creek Mouth	at mouth	April 4, 2018	April 4, 2021
	Pacific Ocean Shoreline	Aliso Beach at West Street	April 4, 2016	April 4, 2021
		Aliso Beach at Table Rock Drive		
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)		
		at Salt Creek (large outlet)		
		Salt Creek Beach at Salt Creek service road	April 4, 2017	April 4, 2021
		Salt Creek Beach at Strand Road	April 4, 2017	April 4, 2021

Table 6.5 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area	Water Body	Segment or Area	Interim Compliance Dates	
			Interim Dry Weather WQBELs	Interim Wet Weather WQBELs
South Orange County (cont'd)	Pacific Ocean Shoreline	at San Juan Creek	April 4, 2016	April 4, 2021
	San Juan Creek	lower 1 mile	April 4, 2018	April 4, 2021
	San Juan Creek Mouth	at mouth	April 4, 2016	April 4, 2021
	Pacific Ocean Shoreline	at Poche Beach	April 4, 2016	April 4, 2021
		Ole Hanson Beach Club Beach at Pico Drain	April 4, 2016	April 4, 2021
		San Clemente City Beach at El Portal Street Stairs	April 4, 2017	April 4, 2021
		San Clemente City Beach at Mariposa Street		
		San Clemente City Beach at Linda Lane	April 4, 2016	April 4, 2021
		San Clemente City Beach at South Linda Lane	April 4, 2018	April 4, 2021
		San Clemente City Beach at Lifeguard Headquarters	April 4, 2017	April 4, 2021
		under San Clemente Municipal Pier		
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	April 4, 2018	April 4, 2021
		San Clemente State Beach at Riviera Beach	April 4, 2016	April 4, 2021
		Can Clemente State Beach at Cypress Shores	April 4, 2017	April 4, 2021
San Luis Rey River	Pacific Ocean Shoreline	at San Luis Rey River mouth	April 4, 2017	April 4, 2021
Carlsbad	Pacific Ocean Shoreline	at Moonlight State Beach	April 4, 2016	April 4, 2021
San Dieguito River	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	April 4, 2016	April 4, 2021

Table 6.5 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs
Penasquitos	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	April 4, 2016	April 4, 2021
Mission Bay	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	April 4, 2016	April 4, 2021
		La Jolla Shores Beach at Caminito del Oro		
		La Jolla Shores Beach at Vallecitos		
		La Jolla Shores Beach at Avenida de la Playa		
		at Casa Beach, Children's Pool		
		South Casa Beach at Coast Boulevard		
		Whispering Sands Beach at Ravina Street		
		Windansea Beach at Vista de la Playa		
		Windansea Beach at Bonair Street		
		Windansea Beach at Playa del Norte		
		Windansea Beach at Palomar Avenue		
		at Tourmaline Surf Park		
		Pacific Beach at Grand Avenue		
	Tecolote Creek	Entire reach and tributaries		
San Diego River	Forrester Creek	lower 1 mile	April 4, 2018	April 4, 2021
	San Diego River	lower 6 miles		
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach		
San Diego Bay	Chollas Creek	lower 1.2 miles	April 4, 2018	April 4, 2021

d. Specific Monitoring and Assessment Requirements

(1) Monitoring and Assessment Requirements for Beaches

(a) Monitoring Stations

For beaches addressed by the TMDL, monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[35] If exceedances

[35] Commonly referred to as AB 411 monitoring

of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations at least once within the first 24 hours of the first storm event[36] of the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer in exceedance of the allowable exceedance frequencies in the receiving waters.

(iii) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs for the Pacific Ocean Shoreline segments or areas listed in Table 6.0 have been achieved.

(ii) The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

[36] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(2) Monitoring and Assessment Requirements for Creeks and Creek Mouths

(a) Monitoring Stations

For creeks addressed by the TMDL, monitoring locations should consist of, at a minimum, a location at or near the mouth of the creek (e.g. Mass Loading Station or Mass Emission Station) and one or more locations upstream of the mouth (e.g. Watershed Assessment Station). If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations in accordance with the requirements of Provision D.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations within the first 24 hours of the first storm event[37] of the rainy season (i.e. October 1 through April 30).

(iii) Samples collected from receiving water monitoring stations must be analyzed for fecal coliform and *Enterococcus* indicator bacteria.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the receiving water monitoring data to assess whether the interim and final receiving water WQBELs for the creeks and creek mouths listed in Table 6.0 have been achieved.

(ii) The Responsible Copermittee must identify and incorporate additional MS4 outfall and receiving water monitoring stations and/or adjust monitoring frequencies to identify sources causing exceedances of the receiving water WQBELs.

(iii) The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

[37] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

e. COMPLIANCE DETERMINATION

(1) Compliance with interim compliance requirements of Specific Provision 6.c.(2) may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 6.b.(1) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls;

(c) There are no violations of the applicable effluent limitations under Specific Provision 6.b.(2) at the Responsible Copermittees' MS4 outfalls;

(d) There are no exceedances of the applicable interim receiving water limitations under Specific Provision 6.c.(2) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls;

(e) The Responsible Copermittees can demonstrate that exceedances of the applicable interim or final receiving water limitations under Specific Provision 6.b.(1)(a) or 6.c.(2) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4 are not causing or contributing to the exceedances; OR

(f) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim compliance requirements will be achieved by the interim compliance dates.

(2) Compliance with WQBELs of Specific Provision 6.b may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 6.b.(1) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls;

(c) There are no violations of the applicable effluent limitations under Specific Provision 6.b.(2) at the Responsible Copermittees' MS4 outfalls; OR

(d) The Responsible Copermittees can demonstrate that exceedances of the applicable final receiving water limitations under Specific Provision 6.b.(1)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4 are not causing or contributing to the exceedances.

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ATTACHMENT F

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

DRAFT
FACT SHEET / TECHNICAL REPORT

FOR

TENTATIVE
ORDER NO. R9-2013-0001
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

MONTH DAY, 2013

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I. FACT SHEET FORMAT

This Fact Sheet briefly sets forth the principal facts and the significant factual, legal, methodological, and policy questions that the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) considered in preparing Order No. R9-2013-0001 (Order). In accordance with the Code of Federal Regulations (CFR) Title 40 Parts 124.8 and 124.56 (40 CFR 124.8 and 40 CFR 124.56), this Fact Sheet includes, but is not limited to, the following information:

1. Contact information
2. Public process and notification procedures
3. Background of municipal storm water permits
4. Regional MS4 Permit approach
5. Economic considerations
6. Applicable statutes, regulations, plans and policies
7. Discussion of the provisions in the Order

Tentative Order No. R9-2013-0001 was distributed for public review on October 31, 2012. The San Diego Water Board accepted written comments on the Tentative Order until January 11, 2013. A public hearing was subsequently held on Month Day, 2013 to receive oral comments from interested persons.

The San Diego Water Board files applicable to the issuance of Order No. R9-2013-0001 are incorporated into the administrative record in support of the findings and requirements of the Order.

II. CONTACT INFORMATION

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The Order and other related documents can be downloaded from the San Diego Water Board website at

http://www.swrcb.ca.gov/rwqcb9/water_issues/programs/stormwater/index.shtml

The documents referenced in this Fact Sheet and in Order No. R9-2013-0001 are available for public review at the San Diego Water Board office, located at the address listed above. Public records are available for inspection during regular business hours, from 8:00 am to 5:00 pm Monday through Friday. To schedule an appointment to inspect public records, contact the San Diego Water Board Records Management Officer at 858-467-2952.

COPERMITTEES

Orange County Copermittees

- County of Orange
  - City of Aliso Viejo
  - City of Dana Point
  - City of Laguna Beach
  - City of Laguna Hills
  - City of Laguna Niguel
  - City of Laguna Woods
  - City of Lake Forest
  - City of Mission Viejo
  - City of Ranch Santa Margarita
  - City of San Clemente
  - City of San Juan Capistrano
  - Orange County Flood Control District

Riverside County Copermittees

- County of Riverside
  - City of Murrieta
  - City of Temecula
  - City of Wildomar
  - Riverside County Flood Control and Water Conservation District

San Diego County Copermittees

- County of San Diego
  - City of Carlsbad
  - City of Chula Vista
  - City of Coronado
  - City of Del Mar
  - City of El Cajon
  - City of Encinitas
  - City of Escondido
  - City of Imperial Beach
  - City of La Mesa
  - City of Lemon Grove
  - City of National City
  - City of Oceanside
  - City of Poway
  - City of San Diego
  - City of San Marcos
  - City of Santee
  - City of Solana Beach
  - City of Vista
  - San Diego County Regional Airport Authority
  - San Diego Unified Port District

III. PUBLIC PROCESS AND NOTIFICATION PROCEDURES

The San Diego Water Board followed the schedule listed below for the preparation of Order No. R9-2013-0001:

1. On February 8, 2011, the San Diego Water Board met with the San Diego County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No. R9-2007-0001.

2. Between February and May 2011, the San Diego Water Board met with select San Diego County, Orange County, and Riverside County Copermittees, as well as representatives of the environmental community to discuss concepts and receive recommendations for elements to be incorporated in a Regional Municipal Separate Storm Sewer System Permit (Regional MS4 Permit).

3. On June 27, 2011 the San Diego Water Board received the Report of Waste Discharge from the San Diego County Copermittees for the renewal of their NPDES permit, Order No. R9-2007-0001.

4. On April 9, 2012, the San Diego Water Board released an administrative draft of Tentative Order No. R9-2013-0001 for preliminary informal comments and feedback.

5. On April 25, 2012, the San Diego Water Board held an informal public workshop to present the administrative draft of Tentative Order No. R9-2013-0001 and receive verbal comments.

6. Between June and August 2012, the San Diego Water Board held four (4) focused meetings with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community, and USEPA) to discuss and receive preliminary comments and feedback about specific elements in the administrative draft of Tentative Order No. R9-2013-0001.

7. On September 5, 2012, the San Diego Water Board held an informal public workshop to present the modifications that were expected to be incorporated into the Tentative Order based on the preliminary comments and feedback received during the focused meetings held between June and August 2012.

8. Informal written comments on the administrative draft of Tentative Order No. R9-2013-0001 were accepted until September 14, 2012.

9. On October 12, 2012, the San Diego Water Board released a revised administrative draft of Tentative Order No. R9-2013-0001.

10. On October 24, 2012, the San Diego Water Board held a focused meeting with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community, and USEPA) to discuss modifications incorporated into the administrative draft of Tentative Order No. R9-2013-0001.

11. On October 31, 2012, the San Diego Water Board released Tentative Order No. R9-2013-0001 for formal public review and comment.

12. On November 13, 2012, the San Diego Water Board held a formal public Board workshop to present the public draft of Tentative Order No. R9-2013-0001 and receive verbal comments.

13. Formal written comments on the public draft of Tentative Order No. R9-2013-0001 were accepted until January 11, 2013.

14. A public hearing of Tentative Order No. R9-2013-0001 was conducted on Month Day, 2013.

IV. BACKGROUND OF THE SAN DIEGO REGION MUNICIPAL STORM WATER PERMITS

In developed and developing areas, storm water runoff is commonly transported through municipal separate storm sewer systems (MS4s) and discharged into local receiving water bodies. As the storm water runs off and flows over the land or impervious surfaces (e.g., paved streets, parking lots, and building rooftops), it accumulates debris, chemicals, sediment, and other pollutants that can adversely affect receiving water quality if discharged untreated. The United States Environmental Protection Agency (USEPA) recognizes wet weather flows from urban areas as the number one source of estuarine pollution in coastal communities,[1] such as those within the San Diego Region.

The federal Clean Water Act (CWA) was amended in 1987 to address and regulate discharges of storm water associated with industrial activities and from municipal storm sewers. With the amendments, many municipalities throughout the United States were obligated for the first time to obtain National Pollutant Discharge Elimination System (NPDES) permits for discharges of storm water from their MS4s.

In response to the CWA 1987 amendment, as well as the pending federal NPDES regulations which would implement the amendment, the San Diego Water Board issued "early" MS4 permits. The San Diego Water Board adopted and issued Order Nos. 90-38, 90-42, and 90-46 to regulate storm water discharges from the MS4s in Orange County, San Diego County, and Riverside County, respectively, within the San Diego Region on July 16, 1990.

The "early" MS4 permits, or First Term Permits, were issued prior to the November 1990 promulgation of the final federal NPDES storm water regulations. By issuing these First Term Permits before the federal regulations took effect, the San Diego Water Board was able to provide the Copermittees additional flexibility in addressing and managing storm water discharges. The First Term Permits contained the essentials of the 1990 regulations, and required the Copermittees to develop and implement runoff management programs, but provided little specificity about what was required to be included in or actually achieved by those programs.

The flexibility provided in the First Term Permits was generally continued through the Second Term Permits. The combination of the lack of specificity in the First and Second Term Permits, a general lack of meaningful action by the Copermittees and a general lack of corresponding reaction (i.e. enforcement) by the San Diego Water Board during the first ten years of the storm water program, resulted in few substantive steps towards achieving improvements in the quality of receiving waters or storm water discharges from the MS4s.

[1] US EPA. 1999. 40 CFR Parts 9, 122, 123, and 124. National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. 64 FR 68727.

From 2001, the regulatory approach incorporated into Third Term Permits was a significant departure from the regulatory approach of the First and Second Term Permits. The Third Term Permits issued by the San Diego Water Board included more detailed requirements that outlined the minimum level of implementation required for the Copermittees' programs to meet the maximum extent practicable (MEP) standard for storm water. The Third Term Permits included more detail to emphasize and enhance the jurisdictional runoff management programs developed by the Copermittees and introduced requirements for developing and implementing watershed-based programs.

The Third Term Permits also incorporated two precedent setting decisions by the State Water Board. In Order WQ 99-05, the State Water Board established receiving water limitation language to be included in all MS4 permits. The State Water Board's precedential language clarified that municipal storm water permits must include provisions requiring discharges to be controlled to attain water quality standards in receiving waters. Unlike previously adopted versions of the receiving water limitation language in the First and Second Term Permits, the language no longer stated that "*violations of water quality standards are not violations of the municipal storm water permit under certain conditions*." In addition, the receiving water limitation language no longer indicated that the "*implementation of best management practices is the 'functional equivalent' of meeting water quality standards*." State Water Board Order WQ 99-05 specifically requires language in MS4 permits for the Copermittees to comply with water quality standards based discharge prohibitions and receiving water limitations through timely implementation of control measures and other actions to reduce pollutants in discharges. (See State Water Board Order WQ 99-05 (*Environmental Health Coalition*)).

In Order WQ 2000-11, also a precedential decision, the State Water Board addressed design standards for structural post-construction best management practices (BMPs) for new development and significant redevelopment. The State Water Board found that the design standards, which require that runoff generated by 85 percent of storm events from specific development categories be infiltrated or treated, reflect the MEP standard. State Water Board Order WQ 2000-11 also found that the post-construction BMP provisions, or Standard Storm Water Mitigation Plan (SSMP) provisions, constitute MEP for addressing storm water pollutant discharges resulting from specific development categories.

The Third Term San Diego County and Orange County Permits (Order Nos. 2001-01 and R9-2002-0001, respectively) were appealed to the State Water Board. Minor modifications were made by the State Water Board, but the requirements were largely upheld. In State Water Board Order WQ 2001-15, the State Water Board upheld the Third Term San Diego County Permit requirements with certain modifications. The State Water Board removed the prohibition of storm water discharges *into* the MS4 that cause or contribute to exceedances of water quality objectives. The revision allows for treatment of pollutants in storm water runoff after the pollutants have entered the MS4. State Water Board Order WQ 2001-15 otherwise upheld all the other requirements of the permit.

In addition to the modification to the discharge prohibition in Order WQ 2001-15, the State Water Board refined Order WQ 99-05 by making clear that the Copermittees may use an iterative approach to achieving compliance with water quality standards that involves ongoing assessments and revisions. Thus, the language for the discharge prohibitions and receiving water limitations was revised to explicitly require the Copermittees to implement an iterative process of assessments and revisions to comply with the discharge prohibitions and receiving water limitations. The San Diego Water Board retained the authority to enforce receiving water limitations and discharge prohibitions even if the Copermittee is engaged in the iterative process.

The Third Term San Diego County Permit was subsequently challenged in the Superior Court of the State of California and the Court of Appeal, Fourth Appellate District. The Court of Appeals, Fourth Appellate District, found that the approach of the Third Term San Diego County Permit to regulating discharges into the MS4 was appropriate (*Building Industry Ass'n. v. State Water Resources Control Bd., et al.,* 124 Cal.App.4th 866 (2004)). The State of California Supreme Court denied review sought by the Building Industry Association in March 2005.

The Fourth Term Permits, or current MS4 permits, began with the adoption of Order No. R9-2007-0001 issued to the Copermittees of San Diego County in January 2007. Order Nos. R9-2009-0002 and R9-2010-0016 were subsequently issued to the Copermittees of Orange County and Riverside County. The Fourth Term Permits continued to include more detailed requirements to be implemented by each Copermittee's jurisdictional runoff management program. The Fourth Term Permits also include requirements to further emphasize a watershed management approach and for more coordination among jurisdictional runoff management programs. In addition, the Fourth Term Permits included more requirements for assessing the effectiveness of the runoff management programs being implemented by the Copermittees. The intent of the inclusion of additional requirements was to enhance and better define elements of the permit that were expected to be incorporated into the iterative process for managing runoff from each Copermittee's jurisdiction and within the watersheds of the San Diego Region.

The Fourth Term Permits include several new and emerging approaches for managing storm water runoff and discharges. Low impact development (LID) requirements are included for development and significant redevelopment to reduce pollutants in storm water runoff from sites through more natural processes such as infiltration and biofiltration closer to the source, rather than utilizing conventional mechanical end-of-pipe treatment systems. Hydrograph modification (hydromodification) management requirements also are included to mitigate the potential for increased erosion in receiving waters due to increased runoff rates and durations often caused by development and increased impervious surfaces. The Fourth Term Orange County and Riverside County Permits introduced requirements to identify areas of existing development where retrofitting with LID projects would be feasible and could be implemented to reduce storm water runoff and pollutants in storm water discharges.

The Fourth Term Orange County and Riverside County Permits included a clearer distinction between storm water and non-storm water discharges. The term "urban runoff" was completely removed, and a distinction between storm water (wet weather) runoff and non-storm water (dry weather) runoff was emphasized. This clarification was made to prevent any potential misunderstanding that regulation under the MS4 permits is limited only to urbanized areas, and to prevent non-storm water runoff from being managed in the same manner as storm water runoff. The term "urban runoff" is not defined in the Code of Federal Regulations (CFR) or Federal Register (FR) in the regulation of MS4 discharges. According to the CWA 402(p)(3)(B)(ii), MS4 permits must include a requirement to effectively prohibit non-storm water discharges into the MS4s.

Finally, for the Fourth Term Orange County and Riverside County Permits the San Diego Water Board found that non-storm water discharges to the MS4 from over application of irrigation water are sources of pollutants. The San Diego Water Board found that non-storm water discharges resulting from over-irrigation must be prohibited from entering the MS4 in accordance with the requirements of the CWA and pursuant to 40 CFR 122.26(d)(2)(iv)(B)(1).

The requirements of the Fourth Term Permits issued to the Copermittees in each county within the San Diego Region now have substantively the same core requirements such as discharge prohibitions, receiving water limitations, jurisdictional runoff management program components, and monitoring program requirements. There are, however, several inconsistencies that exist among the three Fourth Term Permits which complicate oversight and implementation of the permits by the San Diego Water Board.

The Fourth Term San Diego County Permit expired in January 2012. The Fourth Term Orange County and Riverside County Permits will expire in December 2014 and November 2015, respectively. Issuing the Fifth Term Permits within five years for three counties under three different permits would require the San Diego Water Board to expend significant time and resources for the issuance of the permits through three separate public proceedings, thereby greatly reducing the time and resources available to oversee implementation and compliance. Multiple permits also create confusion for determining compliance among regulated entities, especially for the land development community.

The San Diego Water Board has acknowledged that issuing a single MS4 permit for all the Copermittees in the San Diego Region can and is expected to result in more consistent implementation, improve communication among agencies within watersheds crossing multiple jurisdictions, and minimize resources spent with each permit renewal process. Within the findings of the Fourth Term Riverside County Permit issued in November 2010, the San Diego Water Board notified the public of its intent to develop and issue a single Regional MS4 Permit.

V. REGIONAL MS4 PERMIT APPROACH

The Fifth Term Permit, or Regional MS4 Permit, shifts the focus of the permit requirements from a minimum level of actions to be implemented by the Copermittees to identifying outcomes to be achieved by those actions. Order No. R9-2013-0001 represents an important paradigm shift in the approach for MS4 permits within the San Diego Region.

Historical Permitting Approach

The First and Second Term Permits were very broad and provided little specificity about what was required to be developed and implemented by the Copermittees. The Third Term Permits began to become more specific about the minimum level of implementation required by the Copermittees. The Fourth Term Permits, or current permits, subsequently increased in specificity. The MS4 permits have progressively become more detailed and focused on specifying the minimum level of actions expected to be implemented by the Copermittees. As detailed and specific as the MS4 permits have become, however, they include very little detail about what the desired outcomes of the required actions are expected to achieve. Compliance with the permit requirements has essentially been tracking numbers of actions and reporting, not tracking progress or actual improvements in the quality of receiving waters or discharges from the MS4s. The result has been an increase in actions being implemented by the Copermittees with little or no ability or expectations to determine whether or not improvements in water quality are being achieved.

The Fourth Term Permits result in significant resource expenditure by the Copermittees to report permit compliance information to the San Diego Water Board in the form of annual jurisdictional runoff management program, watershed program, and monitoring program reports. The San Diego Water Board must then expend much of its limited resources on reviewing more than 50 voluminous reports submitted annually by the Copermittees. The information currently reported by the Copermittees is of limited value when trying to measure progress toward achieving improvements in the quality of receiving waters or discharges from the MS4s. Oversight of the MS4 permits is further complicated by the inconsistencies among the requirements issued to the Orange County, San Diego County, and Riverside County Copermittees under three separate MS4 permits.

Under the Fourth Term Permits, the Copermittees must expend a significant portion of their limited resources collecting data of limited value, and putting together reports to submit that information to the San Diego Water Board. Likewise, the San Diego Water Board must expend most of its limited resources reviewing reports, and developing permits instead of working directly with the Copermittees to identify solutions to problems causing impacts to water quality. This is an unsustainable course that will continue to demand more resources from the Copermittees and the San Diego Water Board, and would continue to result in unknown water quality benefits.

New Permitting Approach

The goal of the Regional MS4 Permit is twofold: 1) bring a consistent set of MS4 permit requirements to all of the Copermittees within the San Diego Region; and, 2) provide a MS4 permit with requirements that will allow the Copermittees to focus their efforts and resources on achieving goals and desired outcomes toward the improvement of water quality rather than completing specific actions.

The overall approach included in the Regional MS4 Permit with respect to the jurisdictional runoff management programs will not differ significantly from the current permits. The general requirements for the jurisdictional runoff management program components and compliance with those requirements will remain and be applied consistently throughout the San Diego Region under the Regional MS4 Permit.

The most significant difference in the new permitting approach is the specific manner of implementation for those jurisdictional runoff management programs. Implementation will be based on decisions made by the Copermittees in accordance with what they have identified as their highest priority water quality conditions. In other words, the Copermittees will have significant control in how to implement the jurisdictional runoff management programs to best utilize their available resources in addressing a specific set of priorities effectively, instead of trying to address all the water quality priorities ineffectively.

The Copermittees are given the responsibility of identifying their highest priority water quality conditions that they intend to address. The Copermittees will develop goals that can be used to measure and demonstrate progress or improvements toward addressing those priorities. In addition to the goals, the Copermittees will provide a schedule for achieving the goals for those highest priorities. The measurement of progress toward achieving the goals for those highest priorities requires a better defined and more focused program of monitoring and assessment than under the Fourth Term Permits.

The monitoring and assessment program must be designed to inform the Copermittees of their progress, and the need for modifications in their jurisdictional runoff management programs and schedules to achieve their goals to improve water quality. The monitoring and assessment program requirements will have a more central role in the Regional MS4 Permit than in earlier permits. The monitoring and assessment requirements must also be designed to enable the Copermittees to focus and direct their efforts in implementing their jurisdictional runoff management programs toward their stated desired outcomes to improve the quality of receiving waters and/or discharges from the MS4s.

By providing a MS4 permit that allows the Copermittees to make more decisions about how to utilize and focus their resources, along with a better defined monitoring and assessment program to inform their water quality management decisions, the Copermittees will have the opportunity to:

1) *Plan strategically*. The Copermittees must have the ability to identify their available resources and develop and implement long term plans that can organize, collect, and use those resources in the most strategically advantageous and efficient manner possible. This ability to develop long term plans will allow the Copermittees to focus and utilize their resources in a more concerted way over the short term and long term to address specific water quality priorities through stated desired outcomes.

2) *Manage adaptively*. The Copermittees must be given the ability to modify their plans as additional information and data are collected from the monitoring and assessment programs. The Copermittees' plans may require modifications to the programs, priorities, goals, strategies, and/or schedules in order for the Copermittees to achieve a stated desired outcome.

3) *Identify synergies*. The Copermittees must be given more flexibility to identify efficiencies within and among their jurisdictional runoff management programs as the strategies are developed and implemented to increase the Copermittees' collective effectiveness. The Copermittees must also be able to identify and utilize resources available from other agencies and entities to further augment and enhance their jurisdictional runoff management programs and/or to collectively work with those other agencies and entities toward achieving a stated desired outcome.

The Regional MS4 Permit requirements will provide the Copermittees the flexibility and responsibility to decide what actions will be necessary to achieve an outcome that is tailored and designed by the Copermittees to improve specific prioritized water quality conditions. The San Diego Water Board expects the approach of the Regional MS4 Permit to give the Copermittees a greater sense of ownership for restoring the quality of receiving waters in the San Diego Region by becoming an integral part of the decision making process in identifying water quality conditions to be addressed, as well as determining the best use of their resources.

VI. ECONOMIC CONSIDERATIONS

Statutory Considerations

California Water Code (CWC) section 13241 requires the San Diego Water Board to consider certain factors, including economic considerations, in the adoption of water quality objectives. CWC section 13263 requires the San Diego Water Board to take into consideration the provisions of CWC section 13241 in adopting waste discharge requirements.

In *City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, the California Supreme Court considered whether Regional Water Boards must comply with CWC section 13241 when issuing waste discharge requirements under CWC section 13263(a) by taking into account the costs a permittee will incur in complying with the permit requirements. The Court concluded that whether it is necessary to consider such cost information "*depends on whether those restrictions meet or exceed the requirements of the federal Clean Water Act.*" (*Id.* at p. 627.) The Court ruled that Regional Water Boards may not consider the factors in CWC section 13241, including economics, to justify imposing pollutant restrictions that are less stringent than applicable federal law requires. (*Id.* At pp. 618, 626-627 ["*[Water Code section 13377 specifies that [] discharge permits issued by California's regional boards must meet the federal standards set by federal law. In effect, section 13377 forbids a regional board's consideration of any economic hardship on the part of the permit holder if doing so would result in the dilution of the requirements set by Congress in the Clean Water Act...Because CWC section 13263 cannot authorize what federal law forbids, it cannot authorize a regional board, when issuing a [] discharge permit, to use compliance costs to justify pollutant restrictions that do not comply with federal clean water standards*."]). However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Regional Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

As discussed in Section VII.F, Unfunded State Mandates, the San Diego Water Board finds that the requirements in this Order are not more stringent than the minimum federal requirements. Among other requirements, federal law requires MS4 permits to include requirements to effectively prohibit non-storm water discharges into the MS4s, in addition to requiring controls to reduce the discharge of pollutants in storm water to the MEP, and other provisions as USEPA or the State determines are appropriate for the control of pollutants in MS4 discharges.

The requirements in this Order may be more specific or detailed than those enumerated in federal regulations under 40 CFR 122.26 or in the USEPA guidance. However, the requirements have been designed to be consistent with and within the federal statutory mandates described in CWA section 402(p)(3)(B)(ii) and (iii) and the related federal regulations and guidance. Consistent with federal law, all of the

conditions in this Order could have been included in a permit adopted by USEPA in the absence of the in lieu authority of California to issue NPDES permits.

Moreover, the inclusion of numeric WQBELs in this Order does not cause this Order to be more stringent than federal law. Federal law authorizes both narrative and numeric effluent limitations to meet state water quality standards. The inclusion of WQBELs as discharge specifications in an NPDES permit in order to achieve compliance with water quality standards is not a more stringent requirement than the inclusion of BMP based permit limitations to achieve water quality standards (State Water Board Order No. WQ 2006-0012 (*Boeing*)). Therefore, consideration of the factors set forth in CWC section 13241 is not required for permit requirements to implement the effective prohibition on the discharge of non-storm water discharges into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determine appropriate to control such pollutants, as those requirements are mandated by federal law.

Included in the provisions of the Order are monitoring and reporting requirements that are designed to demonstrate that the Copermittees are implementing programs to comply with the CWA municipal storm water requirements. CWA section 308(a) and 40 CFR 122.41(h), (j)-(l), 122.44(i) and 122.48 require that all NPDES permits specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s (40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c)) also specify additional monitoring and reporting requirements. In addition to the federal requirements of the CWA, the San Diego Water Board also has the authority in CWC 13383 to establish monitoring, reporting, and recordkeeping requirements that implement federal and state laws and regulations through NPDES permits. .

The monitoring and assessment information that will be reported to the San Diego Water Board is necessary to determine if the Copermittees are making progress toward achieving compliance with the discharge prohibitions, receiving water limitations, and effluent limitations under Provision A of the Order. The monitoring and assessment information that will be reported is also expected to be key to the iterative approach and adaptive management process that is required to be implemented by the Copermittees if they cannot meet the discharge prohibitions and receiving water limitations under the present conditions, which is also part of the requirements under Provision A of the Order.

Notwithstanding the above, the San Diego Water Board has considered cost information in issuing this Order, as discussed below. The San Diego Water Board has also considered all of the evidence that has been presented to the San Diego Water Board regarding the CWC section 13241 factors in adopting this Order. The San Diego Water Board finds that the requirements in this Order are reasonably necessary to protect beneficial uses identified in the Basin Plan and the economic information related to costs of compliance and other CWC section 13241 factors are not sufficient to justify failing to protect those beneficial uses. Where appropriate, the

San Diego Water Board has provided or will consider providing the Copermittees with additional time to implement control measures to achieve final WQBELs and/or water quality standards.

Cost Information

Discussions of the financial and economic ramifications of municipal storm water management programs tend to focus on the significant costs incurred by municipalities in developing and implementing the programs. When considering the cost of implementing the programs, however, it is also important to consider the alternative costs that are incurred when programs are not fully implemented, as well as the economic benefits which result from effective program implementation.

The recent financial and economic conditions have amplified the concerns about the costs incurred by the municipalities in developing and implementing their programs. The reduction in resources resulting from the recent financial and economic conditions has been cited by many of the Copermittees as a justification for reducing the requirements that must be met by their programs. While the recent conditions are a cause for concern in the short term, these programs also have an opportunity to identify and implement improvements and efficiencies before the next period of growth and development, resulting in more effective and sustainable programs over the long term.

In addition, it is very difficult to ascertain the true cost of implementation of the Copermittees' management programs because of inconsistencies in reporting by the Copermittees. Reported costs of compliance for the same program element can vary widely from city to city, often by a very wide margin that is not easily explained.[2] Despite these problems, efforts have been made to identify management program costs, which can be helpful in understanding the costs of program implementation.

The San Diego Water Board recognizes that the Copermittees will incur costs in implementing this Order, potentially above and beyond the costs from the Copermittees' prior permits. The San Diego Water Board also recognizes that, due to California's current economic condition, many Copermittees currently have limited staff and resources to implement actions to address its MS4 discharges. Based on the economic considerations below, the San Diego Water Board has provided the Copermittees a significant amount of flexibility to choose how to implement the requirements of the Order.

The Order also allows the Copermittees to customize their plans, programs, and monitoring requirements. In the end, it is up to the Copermittees to determine the effective BMPs and measures necessary to comply with this Order. The Copermittees can choose to implement the least expensive measures that are effective in meeting the requirements of this Order. This Order also does not require the Copermittees to

[2] LARWQCB, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.

fully implement all requirements within a single permit term. Where appropriate, the Board has provided the Copermittees with additional time outside of the permit term to implement control measures to achieve final WQBELs and/or water quality standards.

The San Diego Water Board has considered cost information associated with compliance with this Order. It is not possible to predict accurately the cost impact of the requirements that involve an unknown level of implementation or that depend on environmental variables that are as yet undefined. Only general conclusions can be drawn from this information.

Estimated Municipal Storm Water Program Implementation Costs

The USEPA, the State Water Board, and the California Regional Water Quality Control Boards (Regional Water Boards) have attempted to evaluate the costs of implementing municipal storm water programs. The assessments have demonstrated that the true costs are difficult to ascertain and reported costs vary widely. In addition, reported fiscal analyses tend to neglect the costs incurred to municipalities when storm water and non-storm water runoff is not effectively managed, which are incurred as a result of pollution, contamination, nuisance, and damage to ecosystems, property, and human health. Nonetheless, they provide a useful context for considering the costs of requirements within Order No. R9-2013-0001.

In 1999, the USEPA reported on multiple studies it conducted to determine the cost of management programs. A study of Phase II municipalities determined that the annual cost of the Phase II program was expected to be $9.16 per household. The USEPA also studied 35 Phase I municipalities, finding costs to be $9.08 per household annually, similar to those anticipated for Phase II municipalities.[3]

The State Water Board commissioned a study by the California State University, Sacramento to assess costs of the Phase I MS4 program. This study includes an assessment of costs incurred by Phase I MS4s throughout the state to implement their programs. Annual cost per household in the study ranged from $18 to $46, with the Fresno-Clovis Metropolitan Area representing the lower end of the range, and the City of Encinitas (in San Diego County) representing the upper end of the range.[4]

A study on Phase I MS4 program costs was also conducted by the California Regional Water Quality Control Board, Los Angeles Region (Los Angeles Water Board), where program costs reported in the municipalities' annual reports were assessed. The Los Angeles Water Board estimated that average per household cost to implement the MS4 program in Los Angeles County was $12.50. [5]

[3] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791-68792.
[4] State Water Board, 2005. NPDES Stormwater Cost Survey. P. ii.
[5] Los Angeles Water Board, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.

It is important to note that reported program costs are not all attributable to solely complying with MS4 permits. Many program components, and their associated costs, existed before any MS4 permits were ever issued. For example, street sweeping and trash collection costs cannot be solely or even principally attributable to MS4 permit compliance, since these practices have long been expected from and implemented by municipalities.

Therefore, true program cost resulting from MS4 permit requirements is some fraction of reported costs. The California State University, Sacramento study found that only 38 percent of program costs are new costs fully attributable to MS4 permits. The remainder of the program costs was either pre-existing or resulted from enhancement of pre-existing programs.[6] In 2000, the County of Orange found that even lower amounts of program costs are solely attributable to MS4 permit compliance, reporting that the amount attributable to implement the County or Orange Drainage Area Management Plan (DAMP), was less than 20 percent of the total budget. The remaining 80 percent was attributable to pre-existing programs.[7] More current data from the County of Orange is not used in this discussion because the County of Orange no longer reports such information.

Estimated Value of Healthy Water Quality

Economic considerations of municipal storm water management programs cannot be limited only to program costs. Evaluation of programs must also consider information on the benefits derived from environmental protection and improvement.[8] Attention is often focused on municipal storm water management program costs, but the programs must also be viewed in terms of their value to the public.

Placing a value on healthy receiving waters is very difficult. Often the value of receiving waters with good water quality manifests in other forms, such as tourism, recreational opportunities, and/or increased property values. When surface water bodies are degraded, thereby degrading the habitat within and adjacent to the water bodies, the public loses the value and benefits associated with being able to use the area in and around the water bodies. Surface waters that are able to support the beneficial uses designated in the Basin Plan can sustain plants and wildlife that can attract visitors and residents, providing aesthetic, recreational, as well as monetary value to the public. At this time, however, there have been no studies for the San Diego Region to quantify the added value that surface waters with healthy water quality can provide.

USEPA has estimated that household willingness to pay for improvements in fresh water quality for fishing and boating is approximately $158-$210.[9] This estimate can be considered conservative, since it does not include important considerations such as

[6] State Water Board, 2005. NPDES Stormwater Cost Survey. P. 58.
[7] County of Orange, 2000. A NPDES Annual Progress Report. P. 60.
[8] Ribaudo M.O. and D. Heelerstein. 1992, *Estimating Water Quality Benefits: Theoretical and Methodological Issues.* U.S. Department of Agriculture. Technical Bulletin No. 1808.
[9] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68793.

marine waters benefits, wildlife benefits, or flood control benefits. Another study conducted by California State University, Sacramento reported that the annual household willingness to pay for statewide clean water is approximately $180.[10]

A study conducted by the University of Southern California and University of California, Los Angeles assessed the costs and benefits of implementing various approaches for achieving compliance with the MS4 permits in the Los Angeles region. The study found that non-structural systems would cost $2.8 billion but provide $5.6 billion in benefit. If structural systems were determined to be needed, the study found that total costs would be $5.7 to $7.4 billion, while benefits could reach $18 billion.[11] Costs are anticipated to be borne over many years, probably at least ten years.

As can be seen, the benefits of the municipal storm water management programs are expected to considerably exceed their costs. Such findings are corroborated by USEPA, which found that the benefits of implementation of its Phase II storm water rule would also outweigh the costs.[12]

[10] State Water Board, 2005. NPDES Stormwater Cost Survey. P. iv.
[11] Los Angeles Water Board, 2004. Alternative Approaches to Stormwater Control.
[12] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791.

VII. APPLICABLE STATUTES, REGULATIONS, PLANS AND POLICIES

A. Legal Authorities – Federal Clean Water Act and California Water Code

This Order is issued pursuant to section 402 of the CWA and implementing regulations adopted by the USEPA and chapter 5.5, division 7 of the CWC (commencing with section 13370). This Order serves as an NPDES permit for point source discharges to surface waters. This Order also serves as waste discharge requirements pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

The objective of the CWA is "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*." To carry out this objective, the CWA requires the implementation of permit programs to regulate the discharge of pollutants and dredged or fill material to the navigable waters of the U.S. and to regulate the use and disposal of sewage sludge. CWA section 402 provides the legal authority to issue a permit for the discharge of pollutants to waters of the U.S. under the NPDES. The CWA provides that NPDES permits may be issued by states which are authorized to implement the provisions of that act. California became authorized to implement the NPDES permit program on May 14, 1973.

The Porter-Cologne Water Quality Control Act (Division 7, commencing with CWC section 13000) established the State Water Resources Control Board (State Water Board) and nine Regional Water Quality Control Boards (Regional Water Boards) as the principal state agencies with primary responsibility for the coordination and control of water quality. CWC section 13200(f) established the San Diego Water Board, which has the primary responsibility for the coordination and control of water quality in the San Diego Region, which includes all the basins draining into the Pacific Ocean between the southern boundary of the Santa Ana Region and the California-Mexico boundary. The San Diego Water Board implements the CWA through Chapter 5.5 of the CWC, commencing with section 13370. CWC section 13377 provides the San Diego Water Board the legal authority to issue waste discharge requirements to ensure compliance with all applicable provisions of the CWA and acts amendatory thereof or supplementary, thereto, to implement water quality control plans, or for the protection of beneficial uses, or to prevent nuisance.

CWA section 402(p) requires the USEPA or authorized state to issue NPDES permits for storm water discharges from municipal separate storm sewer systems (MS4s) to waters of the U.S. CWA section 402(p)(3)(B)(ii) requires that NPDES permits for storm water discharges from MS4s "*effectively prohibit non-storm water discharges*" into the MS4s. CWA section 402(p)(3)(B)(iii) requires that NPDES permits for storm water discharges from MS4s to "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable* [MEP], *including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control*

of such pollutants."

The USEPA published implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]), which prescribe permit application requirements for storm water discharges from MS4s pursuant to CWA 402(p), on November 16, 1990. The USEPA published an Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems, which provided guidance on permit application requirements for regulated MS4s, on May 17, 1996. The federal regulations in 40 CFR 122 and guidance issued by USEPA serve as the foundation for the provisions of Order No. R9-2013-0001. The legal authorities provided by the above statutes and regulations are included as part of the discussions in Section VIII of this Fact Sheet.

B. Legal Authority for the Permit Issued on a Region-wide Basis

CWA section 402(p)(3)(B) provides the San Diego Water Board the legal authority to issue an NPDES permit for the San Diego Region as compared to separate MS4 permits based upon County- and partial County-wide boundaries as they exist within the San Diego Region. CWA section 402(p)(3)(B) states that "*Permits for discharges from municipal storm sewers- (i) may be issued on a system- or jurisdiction-wide basis ....*" The federal regulations in 40 CFR 122.26(a)(1)(v) also state that the San Diego Water Board "*may designate dischargers from municipal separate storm sewers on a system-wide or jurisdiction-wide basis. In making this determination, the [San Diego Water Board] may consider the following factors: (A) the location of the discharge with respect to waters of the United States; (B) the size of the discharge; (C) the quantity and nature of the pollutants discharged to waters of the United States; and (D) other relevant factors*."

More specifically, the federal regulations provide that for large and medium MS4 systems, the San Diego Water Board may issue a regional permit. Specifically, the federal regulation in 40 CFR 122.26(a)(3) provide:

"*(ii) The Director may either issue one system-wide permit covering all discharges from municipal separate storm sewers within a large or medium municipal storm sewer system or issue distinct permits for appropriate categories of discharges within a large or municipal separate storm sewer system including, but not limited to: all discharges owned or operated by the same municipality; located within the same jurisdiction; all discharges within a system that discharge to the same watershed; discharges within a system that are similar in nature; or for individual discharges from municipal separate storm sewers within the system.*

(iii) The operator of a discharge from a municipal separate storm sewer which is part of a large or medium municipal separate storm sewer system must either: (A) Participate in a permit application (to be a permittee or a co-permittee) with one or more other operator of discharges from the large or medium municipal storm sewer system which covers all, or a portion of all, discharges from the

municipal separate storm sewer system; (B) Submit a distinct permit application which only covers discharges from the municipal separate storm sewers for which the operator is responsible; or (C) A regional authority may be responsible for submitting a permit application under the following guidelines....

(iv) One permit application may be submitted for all or a portion of all municipal separate storm sewers within adjacent or interconnected large or medium municipal separate storm sewer systems. The Director may issue one systemwide permit covering all, or a portion of all municipal separate storm sewers in adjacent or interconnected large or medium municipal separate storm sewer systems.

(v) Permits for all or a portion of all discharges from large or medium municipal separate storm sewer systems that are issued on a system-wide, jurisdiction-wide, watershed or other basis may specify different conditions relating to different discharges covered by the permit, including different management programs for different drainage areas which contribute storm water to the system."

Based on these regulations, the San Diego Water Board may issue a region-wide MS4 permit. The regulations also clarify that the permit may include different conditions for separate discharges covered by the permit. This allows the San Diego Water Board to ensure that suitable water quality conditions and provisions are identified for each watershed.

The USEPA's responses to comments in the Final Rule for the above-mentioned regulations also make it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide, permits. In the Final Rule published in the Federal Register and containing the responses to comments, USEPA notes that 40 CFR 122.26(a)(3)(iv) would allow an entire system in a geographical region under the purview of a State agency to be designated under a permit.[13] USEPA also states that many commenters wanted to allow the permitting authority broad discretion to establish system-wide permits, and that EPA believes that paragraphs 40 CFR 122.26 (a)(1)(v) and (a)(3)(ii) allow for such broad discretion.[14]

This Order creates watershed requirements that apply to multiple counties. The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees. Managing storm water on a regional and watershed basis is expected to result in improved water quality, as the Order focuses on monitoring and management practices necessary to improve each watershed rather than political boundaries. A single permit also allows the San Diego Water Board staff to expend fewer resources developing successive multiple permits and allows more resources to be devoted to working cooperatively with all three current groups of Copermittees to ensure implementation of this Order results in improved water quality.

[13] 55 Federal Register 47990-01, 48042
[14] Ibid

C. Federal and California Endangered Species Acts

This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2115.5) or the Federal Endangered Species Act (16 United States Code [USC] sections 1531 to 1544). This Order requires compliance with requirements to protect the beneficial uses of waters of the U.S. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

D. California Environmental Quality Act

The action to adopt an NPDES Permit is exempt from the provisions of Chapter 3 of the California Environmental Quality Act (CEQA) (Public Resources Code section 21100, et seq.) pursuant to CWC section 13389. (*County of Los Angeles v. Cal. Water Boards* (2006) 143 Cal.App.4th 985.)

E. State and Federal Regulations, Plans and Policies

The legal authority provided by the following regulations, plans, and policies are also included as part of the discussions in Section VIII of this Fact Sheet.

Water Quality Control Plan for the San Diego Basin

The CWA requires the San Diego Water Board to establish water quality standards for each water body in its region. Water quality standards include beneficial uses, water quality objectives and criteria that are established at levels sufficient to protect beneficial uses, and an antidegradation policy to prevent degrading of waters. On September 8, 1994, the San Diego Water Board adopted the *Water Quality Control Plan for the San Diego Basin (*Basin Plan). The Basin Plan designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters in the San Diego Region. The San Diego Water Board has amended the Basin Plan on multiple occasions since 1994. In addition, the Basin Plan implements State Water Water Board Resolution No. 88-63, which established state policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply. Beneficial uses applicable to the surface water bodies that receive discharges from the MS4s within the San Diego Region generally include those listed below:

The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region:

- Municipal and Domestic Supply (MUN)
- Agricultural Supply (AGR)
- Industrial Process Supply (PROC)
- Industrial Service Supply (IND)
- Ground Water Recharge (GWR)
- Contact Water Recreation (REC1)
- Non-contact Water Recreation (REC2)
- Warm Freshwater Habitat (WARM)
- Cold Freshwater Habitat (COLD)
- Wildlife Habitat (WILD)
- Rare, Threatened, or Endangered Species (RARE)
- Freshwater Replenishment (FRSH)
- Hydropower Generation (POW)
- Preservation of Biological Habitats of Special Significance (BIOL)

The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region:

- Navigation (NAV)
- Commercial and Sport Fishing (COMM)
- Estuarine Habitat (EST)
- Marine Habitat (MAR)
- Aquaculture (AQUA)
- Migration of Aquatic Organisms (MIGR)
- Spawning, Reproduction, and/or Early Development (SPWN)
- Shellfish Harvesting (SHELL)

Pursuant to Water Code sections 13263 and 13377, the requirements of this Order implement the Basin Plan.

Water Quality Control Plan for Ocean Waters of California, California Ocean Plan

In 1972, the State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan). The State Water Board adopted the most recent amended Ocean Plan on September 15, 2009. The Office of Administrative Law approved it on March 10, 2010. On October 8, 2010, USEPA approved the 2009 Ocean Plan. The Ocean Plan is applicable, in its entirety, to ocean waters of the State. In order to protect beneficial uses, the Ocean Plan establishes water quality objectives and a program of implementation. Pursuant to Water Code sections 13263 and 13377, the requirements of this Order implement the Ocean Plan. The Ocean Plan identifies the beneficial uses of ocean waters of the State to be protected as summarized below:

- Industrial water supply
- Water contact and non-contact recreation, including aesthetic enjoyment;

navigation
- Commercial and sport fishing
- Mariculture
- Preservation and enhancement of designated Areas of Special Biological Significance
- Rare and endangered species
- Marine habitat
- Fish spawning and shellfish harvesting

On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving an exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges. The State Water Board Resolution No. 2012-0012 requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject terms and conditions of State Water Board Resolution No. 2012-0012. The Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 applicable to these discharges are hereby incorporated in this Order as if fully set forth herein. Requirements of this Order implement the Ocean Plan.

Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality

On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

Antidegradation Policy

Federal regulations (40 CFR 131.12) require that the state water quality standards include an antidegradation policy consistent with the federal antidegradation policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16 ("Statement of Policy with Respect to Maintaining the Quality of the Waters of the State"). State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law.

The San Diego Water Board's Basin Plan implements and incorporates by reference

both the State and federal antidegradation policies. State Water Board Resolution No. 68-16 and 40 CFR 131.12 require the San Diego Water Board to maintain high quality waters of the State until it is demonstrated that any change in quality will be consistent with maximum benefit to the people of the State, will not unreasonably affect beneficial uses, and will not result in water quality less than that described in the San Diego Water Boards' policies. State Water Board Resolution No. 68-16 requires that discharges of waste be regulated to meet best practicable treatment or control to assure that pollution or nuisance will not occur and the highest water quality consistent with the maximum benefit to the people of the State be maintained.

The discharges permitted in this Order are consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Board Resolution No. 68-16. Many of the water bodies within the area covered by this Order are of high quality. The Order requires the Copermittees to meet best practicable treatment or control to meet water quality standards. As required by 40 CFR 122.44(a), the Copermittees must comply with the "maximum extent practicable" technology-based standard set forth in CWA section 402(p) for discharges of pollutants in storm water from the MS4s.

Many of the waters within the area covered by this Order are impaired and listed on the State's CWA Section 303(d) List and the San Diego Water Board has established TMDLs to address the impairments. This Order requires the Copermittees to comply with permit provisions to implement the WLAs set forth in the TMDLs in order to restore the beneficial uses of the impaired water bodies consistent with the assumptions and requirements of the TMDLs. This Order includes requirements to develop and implement storm water management programs, achieve WQBELs, and effectively prohibit non-storm water discharges into the MS4. The issuance of this Order does not authorize an increase in the amount of discharge of waste.

Anti-Backsliding Requirements

CWA sections 402(o) and 303(d)(4) and 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations or conditions may be relaxed. All effluent limitations and other conditions in this Order are at least as stringent as the effluent limitations in the previous permits issued to the San Diego County Copermittees, the Orange County Copermittees and the Riverside County Copermittees.

Clean Water Act Section 303(d) List

CWA section 303(d)(1) requires each State to identify specific water bodies within its boundaries where water quality standards are not being met or are not expected to be met after implementation of technology-based effluent limitations on point sources. Water bodies that do not meet water quality standards are considered impaired and are placed on the state's "303(d) List." Periodically, USEPA approves the State's 303(d) List.

Most recently, USEPA approved the State's 2010 303(d) List of impaired water bodies on October 11, 2011, which includes certain receiving waters in the San Diego Region. For each listed water body, the state or USEPA is required to establish a TMDL of each pollutant impairing the water quality standards in that water body. A TMDL is a tool for implementing water quality standards and is based on the relationship between pollution sources and in-stream water quality conditions. The TMDL establishes the allowable pollutant loadings for a water body and thereby provides the basis to establish water quality-based controls. These controls should provide the pollution reduction necessary for a water body to meet water quality standards.

A TMDL is the sum of the allowable pollutant loads of a single pollutant from all contributing point sources (the waste load allocations or WLAs) and non-point sources (load allocations of LAs) plus the contribution from background sources and a margin of safety (40 CFR 130.2(i)). MS4 discharges are considered point source discharges. For 303(d)-listed water bodies and pollutants in the San Diego Region, the San Diego Water Board or USEPA develops and adopts TMDLs that specify these requirements.

Since 2002, the San Diego Water Board has established six (6) TMDLs to remedy water quality impairments in various water bodies within the San Diego Region (see Attachment E to the Order). These TMDLs identify MS4 discharges as a source of pollutants to these water bodies, and, as required, establish WLAs for MS4 discharges to reduce the amount of pollutant discharged to receiving waters. CWA section 402(p)(3)(B)(iii) requires the San Diego Water Board to impose permit conditions, including: "management practices, control techniques and system, design and engineering methods, and *such other provisions as the Administrator or the State determines appropriate for the control of such pollutants."* (Emphasis added.) CWA section 402(a)(1) also requires states to issue permits with conditions necessary to carry out the provisions of the CWA. Federal regulations also require that NDPES permits contain WQBELs consistent with the assumptions and requirements of all available WLAs (40 CFR 122.44(d)(1)(vii)(B)). CWC section 13377 also requires that NPDES permits include limitations necessary to implement water quality control plans. Therefore, this Order includes WQBELs and other provisions to implement the TMDL WLAs assigned to Copermittees regulated by this Order.

Other Regulations, Plans and Policies

This Order implements all other applicable federal regulations and State regulations, plans and policies, including the California Toxics Rule at 40 CFR 131.38 (Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California Rule [California Toxics Rule or CTR]), and State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP).

F. Unfunded State Mandates

Article XIII B, Section 6(a) of the California Constitution provides that whenever "*any state agency mandates a new program or higher level of service on any local government, the state shall provide a subvention of funds to reimburse that local government for the costs of the program or increased level of service*." The requirements of this Order do not constitute state mandates that are subject to a subvention of funds for several reasons, including, but not limited to, the following.

First, the requirements of this Order do not constitute a new program or a higher level of service as compared to the requirements contained in the previous Fourth Term Permits. The overarching requirement to impose controls to reduce the pollutants in discharges from MS4s is dictated by the CWA and is not new to this permit cycle (33 USC section 1342(p)(3)(B)). The inclusion of new and advanced measures as the MS4 programs evolve and mature over time is anticipated under the CWA (55 FR 47990, 48052 (Nov. 16, 1990)), and to the extent requirements in this Order are interpreted as new advanced measures, they do not constitute a new program or higher level of service.

Second, and more broadly, mandates imposed by federal law, rather than by a state agency, are exempt from the requirement that the local agency's expenditures be reimbursed (Cal. Const., art. XIII B, section 9, subd. (b)). This Order implements federally mandated requirements under the CWA and its requirements are therefore not subject to subvention of funds. This includes federal requirements to effectively prohibit non-storm water discharges, to reduce the discharge of pollutants in storm water to the MEP, and to include such other provisions as the Administrator or the State determines appropriate for the control of such pollutants (33 USC section 1342(p)(3)(B)). Federal cases have held these provisions require the development of permits and permit provisions on a case-by-case basis to satisfy federal requirements. (*Natural Resources Defense Council, Inc., v. USEPA* (9th Cir. 1992) 966 F.2d 1292, 1308, fn. 17.)

The authority exercised under this Order is not reserved state authority under the CWA's savings clause (cf. *Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 627-628 [relying on 33 USC section 1370, which allows a state to develop requirements which are not "less stringent" than federal requirements]), but instead is part of a federal mandate to develop pollutant reduction requirements for municipal separate storm sewer systems. To this extent, it is entirely federal authority that forms the legal basis to establish the permit provisions. (See, *City of Rancho Cucamonga v. Regional Water Quality Control Board, Santa Ana Region* (2006) 135 Cal.App.4th 1377, 1389; *Building Industry Ass'n of San Diego Co. v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 882-883.)

The MEP standard is a flexible standard that balances a number of considerations, including technical feasibility, cost, public acceptance, regulatory compliance, and effectiveness. (*Building Ind. Ass'n., supra,* 124 Cal.App.4th at pp. 873-874, 889.) Such considerations change over time with advances in technology and with experience

gained in storm water management (55 FR 47990, 48052 (Nov. 16, 1990)). Accordingly, a determination of whether the conditions contained in this Order exceed the requirements of federal law cannot be based on a point by point comparison of the permit conditions and the sic minimum control measures that are required "at a minimum" to reduce pollutants to the maximum extent practicable and to protect water quality (40 CFR 122.34). Rather, the appropriate focus is whether the permit conditions, as a whole, exceed the MEP standard.

In recent months, the County of Los Angeles and County of Sacramento Superior Courts have granted writs setting aside decisions of the Commission on State Mandates that held certain requirements in Phase I permits constituted unfunded mandates. In both cases, the courts have found that the correct analysis in determining whether an MS4 permit constituted a state mandate was to evaluate whether the permit as a whole – and not a specific permit provision – exceeds the MEP standard. (*State of Cal. V. Comm. on State Mandates* (Super. Ct. Sacramento County, 2012, No. 34-2010-80000604), *State of California v. County of Los Angeles* (Super. Ct. Los Angeles County, 2011, No. BS130730.) Both cases are currently pending appeal.

The requirements of the Order, taken as a whole rather than individually, are necessary to reduce the discharge of pollutants to the MEP and to protect water quality. The San Diego Water Board finds that the requirements of the Order are practicable, do not exceed federal law, and thus do not constitute an unfunded mandate. These findings are the expert conclusions of the principal state agency charged with implementing the NPDES program in California (CWC sections 13001, 13370).

It should also be noted that the provisions in this Order to effectively prohibit non-storm water discharges are also mandated by the CWA (33 USC section 1342(p)(3)(B)(ii)). Likewise, the provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state establishes or adopts a TMDL, federal law requires that permits must contain effluent limitations consistent with the assumptions and requirements of any applicable waste load allocation in a TMDL (40 CFR 122.44(d)(1)(vii)(B)).

Third, the local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental dischargers who are issued NPDES permits for storm water discharges. With a few inapplicable exceptions, the CWA regulates the discharge of pollutants from point sources (33 USC section 1342) and the Porter-Cologne Act regulates the discharge of waste (CWC section 13263), both without regard to the source of the pollutant or waste. As a result, the "costs incurred by local agencies" to protect water quality reflect an overarching regulatory scheme that places similar requirements on governmental and non-governmental dischargers. (See *County of Los Angeles v. State of California* (1987) 43 Cal.3d 46, 57-58 [finding comprehensive workers' compensation scheme did not create a cost for local agencies that was subject to state subvention].)

The CWA and the Porter-Cologne Act largely regulate storm water with an even hand, but to the extent there is any relaxation of this even-handed regulation, it is in favor of the local agencies. Generally, the CWA requires point source dischargers, including dischargers of storm water associated with industrial or construction activity, to comply strictly with water quality standards (33 USC section 1311(b)(1)(C); *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159, 1164-1165 [noting that industrial discharges must strictly comply with water quality standards]). As discussed in prior State Water Board decisions, certain provisions of this Order do not require strict compliance with water quality standards (State Water Board Order No. WQ 2001-0015, p. 7). Those provisions of this Order regulate the discharge of waste in municipal storm water under the CWA's MEP standard, not the BAT/BCT standard that applies to other types of discharges. These provisions, therefore, regulate the discharge of waste in municipal storm water more leniently than the discharge of waste from non-governmental sources.

Fourth, the Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)). To the extent that the local agency Copermittees have voluntarily availed themselves of the permit, the program is not a state mandate. (Accord, *County of San Diego v. State of California* (1997) 15 Cal.4th 68, 107-108.)

Fifth, the local agency Copermittees' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under state law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

Finally, even if any of the permit provisions could be considered unfunded mandates, under Government Code section 17556, subdivision (d), a state mandate is not subject to reimbursement if the local agency has the authority to charge a fee. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order, subject to certain voting requirements contained in the California Constitution. (See Cal. Const., Art. XIII D, section 6, subd. (c); see also *Howard Jarvis Taxpayers Ass'n v. City of Salinas* (2002) 98 Cal.App.4th 1351, 1358-1359.) The Fact Sheet demonstrates that numerous activities contribute to the pollutant loading in the MS4. Local agencies can levy service charges, fees, or assessments on these activities, independent of real property ownership. (See, e.g., *Apartment Ass'n of Los Angeles County, Inc., v. City of Los Angeles* (2001(24 Cal.4th 830, 842 [upholding inspection fees associated with renting property].) The authority and ability of a local agency to defray the cost of a program without raising taxes indicates that a program does not entail a cost subject to subvention. (*Clovis Unified School Dist. V. Chiang* (2010) 188 Cal.App.4th 794, 812, citing *Connell v. Sup. Ct.* (1997) 59 Cal.App.4th 382, 401; *County of Fresno v. State of California* (1991) 53 Cal. 3d. 482, 487-488.)

VIII. PROVISIONS

The provisions (i.e. NPDES permit requirements) of the Order are discussed below.

A. Prohibitions and Limitations

Purpose: Provision A includes the prohibitions and limitations requirements that are the foundation of all the subsequent requirements included in the Order. Compliance with the prohibitions and limitations will restore and protect receiving waters from impacts that may be caused by discharges into and from the Copermittees' MS4s and ultimately achieve the objective of the CWA.

In meeting the requirements set forth in the Order, the Copermittees must be cognizant that the prohibitions and limitations exist and will be the standard by which the San Diego Water Board will be measuring the progress and success of their implementation of the NPDES permit requirements.

***Discussion*:** The objective of the CWA is to "*restore and maintain the chemical, physical, and biological integrity of the Nation's waters*." The CWA requires the implementation of NPDES permit programs to regulate discharges of pollutants and dredged or fill material to the navigable waters of the U.S. For discharges into and from MS4s, the CWA requires the NPDES permits to "*effectively prohibit non-stormwater discharges into the storm sewers*" and "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable.*"

Provision A includes limitations, consistent with the requirements of the CWA for discharges from MS4s. Provision A expresses these limitations as discharge prohibitions, receiving water limitations, and effluent limitations. Compliance with the discharge prohibitions and receiving water limitations is also explicitly described, in conformance with precedential State Water Board Orders.

More specific and detailed discussions of the requirements of Provision A are provided below.

Provision A.1 (Discharge Prohibitions) prohibits the discharge of specific types of waste into and/or from the Copermittees' MS4s.

Provision A.1.a restates and reiterates Basin Plan Waste Discharge Prohibition 1, by prohibiting discharges into and from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the

state. The terms pollution,[15] contamination,[16] and nuisance[17] are defined under CWC 13050. Provision A.1.c incorporates all the waste discharge prohibitions of the Basin Plan into the requirements of the Order. The waste discharge prohibitions from the Basin Plan have been reproduced and provided in Attachment A to the Order.

Provision A.1.b requires non-storm water discharges into the MS4s to be effectively prohibited, consistent with the requirements of the CWA for MS4 permits to "*effectively prohibit non-stormwater discharges into the storm sewers*." The prohibition does not apply to NPDES permitted discharges into the Copermittees' MS4s. The prohibition also refers to the requirements of Provisions E.2.a.(1)-(5), which has specific requirements for the Copermittees to address certain types of non-storm water discharges if they enter the MS4.

The CWA employs the strategy of prohibiting the discharge of any pollutant from a point source into waters of the United States unless the discharger of the pollutant(s) obtains an NPDES permit pursuant to CWA Section 402. The 1987 amendment to the CWA includes provision 402(p) that specifically addresses NPDES permitting requirements for storm water discharges from MS4s. CWA section 402(p) prohibits the discharge of pollutants from specified MS4s to waters of the U.S. except as authorized by an NPDES permit and identifies two substantive standards for MS4 storm water permits. MS4 permits (1) "*shall include a requirement to effectively prohibit nonstormwater discharges into the storm sewers*" and (2) "*shall require controls to reduce the discharge of pollutants to,the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or State determines appropriate for the control of such pollutants*." (CWA section 402(p)(3)(B)(ii-iii).)

In November 1990, the USEPA published regulations addressing storm water discharges from MS4s (55 FR 47990 and following (Nov. 16, 1990) (Phase I Final Rule)). The regulations establish minimum requirements for MS4 permits, and generally focus on the requirement that MS4s implement programs to reduce the amount of pollutants found in storm water discharges to the MEP. The CWA's municipal storm water MEP standard does not require storm water discharges to strictly meet water quality standards, as is required for other NPDES permitted discharges. Compliance is achieved through an iterative approach of continuous implementation of improved BMPs. This distinction reflects Congress's recognition that

[15] CWC 13050(l): "(1) 'Pollution' means an alteration of the quality of waters of the state by waste to a degree which unreasonably affects either of the following: (A) The water for beneficial uses. (B) Facilities which serve beneficial uses. (2) 'Pollution' may include "contamination.
[16] CWC 13050(k): "Contamination' means an impairment of the quality of waters of the state by waste to a degree which creates a hazard to public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste, whether or not waters of the state are affected."
[17] CWC 13050(m): "Nuisance' means anything which meets all of the following requirements: (1) Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. (2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. (3) Occurs during, or as a result of, the treatment or disposal of wastes."

variability in flow and intensity of storm events render difficult strict compliance with water quality standards by MS4 permittees. In describing the controls that permits must include to reduce pollutants in storm water discharges to the MEP, the statute (CWA section 402(p)(3)(B)(iii)) states that the controls shall include: "*management practices, control techniques and system, design and engineering methods, and such other provisions as the [permit writer] determines appropriate for the control of such pollutants*."

In contrast, non-storm water discharges from the MS4 that are not authorized by separate NPDES permits, nor specifically included in a category of non-storm water discharges only required to be addressed if identified as a source of pollutants (see 40 CFR 122.26(d)(2)(iv)(B)), are subject to requirements under the NPDES program, including discharge prohibitions, technology based effluent limitations and water quality-based.effluent limitations (40 CFR 122.44). The regulations also require the Copermittee's program to include an element to detect and remove illicit discharges and improper disposal into the storm sewer (40 CFR 122.26(d)(2)(iv)(B)).

While "non-storm water" is not defined in the CWA or federal regulations, the federal regulations (at 40 CFR 122.26(b)(2)) define "*illicit discharge*" as *"any discharge to a municipal separate storm sewer that is not composed entirely of storm water and that is not covered by an NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer and discharges resulting from fire fighting activities)*." This definition is the most closely applicable definition of "non-storm water" contained in federal law. As stated in the Phase I Final Rule, USEPA added the illicit discharge program requirement to begin implementation of the 'effective prohibition' requirement to detect and control non-storm water discharges to their municipal system.

Thus, federal law mandates that permits issued to MS4s must require management practices that will result in reducing storm water pollutants to the MEP yet at the same time requires that non-storm water discharges be effectively prohibited from entering the MS4. "Effectively" prohibit does not mean that non-storm water discharges are authorized to be discharged into and from the Copermittees' MS4s. The Phase I Final Rule clarifies what "effectively prohibit" means (55 FR 47995):

> "*Section 402(p)(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit (other than the permit for the discharge from the municipal separate storm sewer)*."

Consistent with federal law, unless non-storm water discharges to the MS4 are authorized by a separate NPDES permit or are specifically included in a category of non-storm water discharges only required to be addressed if identified as a source of pollutants under federal regulations, non-storm water discharges are appropriately

subject to the effective prohibition requirement in the CWA and Regional Water Boards are not limited by the iterative MEP approach to storm water regulation in crafting appropriate regulations for non-storm water discharges.

The federal regulations (40 CFR 122.26(d)(vi)(B)(1)) require the Copermittees to "*implement and enforce an ordinance, order or similar means*" to prevent non-storm water discharges to their MS4s. Thus, the Copermittees are required to "*effectively*" prohibit non-storm water discharges to their MS4s through enforcing their "*ordinance, order or similar means*" and remove those discharges to their MS4s, or require those discharges to obtain coverage under a separate NPDES permit. More detail about the program that must be implemented to "*effectively*" prohibit non-storm water discharges to the Copermittees' MS4s is provided under the discussion for Provision E.2.

Provision A.1.d was included to be consistent Resolution No. 2012-0012, adopted by the State Water Board on March 20, 2012. Provision A.1.d prohibits discharges from MS4s to Areas of Special Biological Significance (ASBS), except for storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach to the Heisler Park ASBS subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012. The pertinent Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 are provided in Attachment A to the Order.

Provision A.2 (Receiving Water Limitations) specifies the condition of the receiving waters that must be achieved when there are discharges from the Copermittees' MS4s. Receiving water limitations are included in all NPDES permits issued pursuant to the CWA section 402. CWA section 402(p)(3)(B)(iii) authorizes the inclusion of "*such other provisions as the Administrator or the State determines appropriate for the control of [] pollutants*." This requirement gives USEPA or the State permitting authority, in this case the San Diego Water Board, discretion to determine what permit conditions are necessary to control pollutants.

In its Phase I Final Rule (see 55 FR 47990, 47994 (Nov. 16, 1990)), USEPA elaborated on these requirements, stating that, "*permits for discharges from municipal separate storm sewer systems must require controls to reduce the discharge of pollutants to the maximum extent practicable, and where necessary water quality-based controls*." USEPA reiterated in its Phase II Final Rule (64 FR 68722, 68737), that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL*." CWC section 13377 also requires that NPDES permits include limitations necessary to implement water quality control plans. Both the State Water Board and the San Diego Water Board have previously concluded that discharges from the MS4 contain pollutants that have the reasonable potential to cause or contribute to excursions above water quality standards. As such, inclusion of receiving water limitations is appropriate to control MS4 discharges.

The inclusion of receiving water limitations is also consistent with the Ninth Circuit Court of Appeals' ruling in *Defenders of Wildlife v. Browner* (191 F.3d 1159, 1166 (1999)) that the permitting authority has discretion regarding the nature and timing of requirements that it includes as MS4 permit conditions to attain water quality standards. The Ninth Circuit Court of Appeals recently explained that, "*[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*" (*Natural Resources Defense Council v. County of Los Angeles* (9th Cir. 2011) 673 F.3d 880, 886 (review granted by the Supreme Court on other grounds).)

The receiving water limitations included in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan or in water quality control plans or policies adopted by the State Water Board, including State Water Board Resolution No. 68-16, or in federal regulations, including but not limited to 40 CFR 131.12 and 131.38. The water quality objectives in the Basin Plan and other State Water Board plans and policies have been approved by USEPA and combined with designated beneficial uses constitute the water quality standards required under federal law.

Provision A.2.a requires that discharges from the Copermittees' MS4s must not cause or contribute to the violation of water quality standards in receiving waters. The water quality standards of the receiving waters must be protected from the impacts that may be caused by the Copermittees' MS4 discharges. Water quality standards applicable to the surface waters in the San Diego Region must be achieved through meeting the technology based standard of MEP through an iterative process of improved management actions. Provision A.2.a is also consistent with State Water Board Order WQ 99-05 precedent-setting language requiring discharges from MS4s to attain receiving water quality standards. The water quality control plans and policies with water quality standards applicable to the waters in the San Diego Region are included under Provision A.2.a.

Provisions A.2.b was included to be consistent with the requirements of State Water Board Resolution No. 2012-0012, adopted on March 20, 2012.

<u>Provision A.3 (Effluent Limitations)</u> specifies the condition of the discharges from the Copermittees' MS4s that must be achieved if and when there are discharges.

Consistent with CWA section 301(b)(1)(A) and 40 CFR 122.44(a), Provision A.3.a includes the technology-based effluent limitations that must be included in the Order. The technology-based effluent limits, representing the minimum level of control that must be imposed in a permit under CWA section 402, requires that pollutants in discharges of storm water from the Copermittees' MS4s be reduced to the MEP. This provision applies specifically to storm water discharges. Non-storm water discharges

must be effectively prohibited, as required under Provision A.1.b. Non-storm water (dry weather) discharges from the MS4 are not considered storm water (wet weather) discharges and therefore are not subject to the MEP standard.

The technology-based MEP standard is an ever-evolving, flexible, and advancing concept. Neither Congress nor USEPA has specifically defined the term "maximum extent practicable." Congress established this flexible MEP standard so that the administrative bodies would have "*the tools to meet the fundamental goals of the Clean Water Act in the context of storm water pollution*." (*Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 884.) As knowledge about controlling storm water runoff and discharges continues to evolve, so does the knowledge which constitutes MEP. Reducing the discharge of pollutants in storm water from the MS4 to the MEP requires the Copermittees to assess each program component and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP.

The San Diego Water Board or the State Water Board ultimately define MEP, and may include requirements that provide specific guidance on what is expected to demonstrate MEP. It is the responsibility of the Copermittees to propose actions that implement BMPs to reduce storm water pollution to the MEP. In other words, the Copermittees' runoff management programs developed and implemented under the Order are the Copermittees' proposals of achieving MEP. Their total collective and individual activities conducted pursuant to their runoff management programs become their proposal for achieving MEP as it applies both to their overall effort, as well as to specific activities. Provisions B through E of the Order provides a minimum framework to guide the Copermittees in achieving the MEP standard for discharges of pollutants in storm water.

Provision A.3.b incorporates any water quality based effluent limitations (WQBELs) applicable to the MS4s established for TMDLs adopted and approved for the San Diego Region and requires the Copermittees to comply with those WQBELs. This is consistent with 40 CFR 122.44(d)(1)(vii)(B), which requires that NPDES permits to incorporate WQBELs "*developed to protect a narrative water quality criterion, a numeric water quality criterion, or both…consistent with the assumptions and requirements of any available wasteload allocation for the discharge...*"

Pursuant to CWA section 303(d), for surface water bodies identified as impaired by one or more pollutants, the San Diego Water Board is required to establish TMDLs "*at a level necessary to implement the applicable water quality standards with seasonal variations and a margin of safety which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality*." The TMDLs identify sources of the pollutants causing the impairments and assign portions of the TMDL as WLAs to point sources, which include MS4s.

WLAs must be expressed in NPDES permits as WQBELs, which may include one or more numeric components such as numeric effluent limits, and/or receiving water

limitations, and/or BMP requirements. Because numeric targets for TMDLs typically include a component that will be protective of water quality standards, a TMDL will likely include one or more numeric receiving water limitations and/or effluent limitations as part of the assumptions or requirements of the TMDL. Any numeric receiving water limitations and/or effluent limitations developed as part of the assumptions or requirements of a TMDL must be incorporated and included as part of a WQBELs for the MS4s.

Because the development and approval of new TMDLs, or modification of existing TMDLs, may occur during the term of this Order, the specific provisions of those TMDLs, including effluent limitations applicable to MS4s are provided within Attachment E to the Order. Attachment E will be updated with new TMDLs and modifications to existing TMDLs in a timely manner as they occur.

Provision A.4 (Compliance with Discharge Prohibitions and Receiving Water Limitations) describes the process required to be implemented by the Copermittees if compliance with the discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a are not being achieved under current conditions.

In its Phase II Stormwater Regulations, Final Rule, USEPA states that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL.*"[18] In a series of comment letters on MS4 permits issued by various Regional Water Boards, USEPA has also reiterated that MS4 discharges must meet water quality standards.[19] In addition, the Ninth Circuit Court of Appeals explained in a recent ruling that, *"[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*"[20]

Water quality standards for the San Diego Region are established in the Basin Plan. The water quality standards of the Basin Plan are incorporated into this Order as the discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a. The discharge prohibitions and receiving water limitations in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations or prohibitions to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan, water quality control plans or policies adopted by the State Water Board, including Resolution No.

[18] Phase II Stormwater Regulations, Final Rule, 64 Fed. Reg. 68722, 68737.
[19] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.
[20] NRDC v. County of Los Angeles (9th Cir. 2011), 673 F.3d 880, 886. On July 13, 2012, the United States Supreme Court granted review of this case on other grounds. See also, *Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 884-886, citing *Defenders of Wildlife v. Browning,* (9th Cir. 1999) 191 F.3d 1159.)

68-16, or federal regulations, including but not limited to, 40 CFR 131.12 and 131.38. The waste discharge prohibitions and water quality objectives in the Basin Plan have been approved by USEPA and combined with the designated beneficial uses constitute the water quality standards required under federal law.

Under federal law (CWA section 402(p)(3)(B)(iii)), an MS4 permit must include "*controls to reduce the discharge of pollutants to the maximum extent practicable...and such other provision as...the State determines appropriate for control of such pollutants*." The State Water Board has previously determined that limitations necessary to meet water quality standards are appropriate for the control of pollutants discharged by MS4s and must be included in MS4 permits. (State Water Board Orders WQ 91-03, 98-01, 99-05, 2001-15; see also *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159.) This Order prohibits discharges that case or contribute to violations of water quality standards.

The discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a are included in this Order to ensure that discharges from the MS4s do not cause or contribute to exceedances of water quality objectives necessary to protect the beneficial uses of the receiving waters.

Provision A.4 is consistent with the precedent-setting language in State Water Board Order WQ 99-05 required to be included in municipal storm water permits. State Water Board Order WQ 2001-15 refined Order WQ 99-05 by requiring an iterative approach to compliance with water quality standards involving ongoing assessments and revisions, as referred to as the "iterative process." The "iterative process" is a fundamental NPDES requirement for municipal storm water permits to achieve the objectives of the CWA.

The State Water Board and Regional Water Boards have stated that the provisions under Provisions A.1.a, A.1.c, A.2.a, and A.4 are independently applicable, meaning that compliance with one provision does not provide a "safe harbor" where there is non-compliance with another provision (i.e., compliance with the Provision A.4 does not shield a Copermittee who may have violated Provision A.1.a, A.1.c, or A.2.a from an enforcement action). The intent of Provision A.4 is to ensure that the Copermittees have the necessary storm water management programs and controls in place, and that they are modified by the Copermittees in a timely fashion when necessary, so that compliance with Provisions A.1.a, A.1.c, and/or A.2.a is achieved as soon as possible. USEPA expressed the importance of this independent applicability in a series of comment letters on MS4 permits proposed by various Regional Water Boards. At that time, USEPA expressly objected to certain MS4 permits that included language stating, *"permittees will not be in violation of this [receiving water limitation] provision … [if certain steps are taken to evaluate and improve the effectiveness of the*

jurisdictional runoff management programs]," concluding that this phrase would not comply with the CWA.[21]

The Ninth Circuit held in *Natural Resources Defense Council v. County of Los Angeles* (2011) 673 F3d. 880, 886 (certiorari granted on other grounds) that engagement in the iterative process does not provide a safe harbor from liability for violations of permit terms prohibiting exceedances of water quality standards. The Ninth Circuit holding is consistent with the position of the State and Regional Water Boards that exceedances of water quality standards in an MS4 permit constitute violations of permit terms subject to enforcement by the Water Boards or through a citizen suit. While the Water Boards have generally directed dischargers to achieve compliance by improving control measures through the iterative process, the San Diego Water Board retains the discretion to take other appropriate enforcement and the iterative process does not shield dischargers from citizen suits under the CWA.

The requirements of Provision A.4, therefore, are required to be implemented until the water quality standards expressed under Provisions A.1.a, A.1.c, and A.2.a are achieved. The CWA requires MS4 permits to "*require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." The requirements of this Order have been deemed or determined to be "appropriate" to achieve water quality standards in receiving waters.

Part of the "*controls*" required by the Order is the process described in Provision A.4. Provision A.4 includes the process that is ultimately expected to achieve compliance with the requirement that discharges from the MS4 do not cause or contribute to violations of water quality standards in the receiving waters. The implementation of Provision A.4 is required when the Copermittees or the San Diego Water Board have determined that discharges from the MS4 are causing or contributing to violations of water quality standards in the receiving waters.

The Copermittees must effectively prohibit non-storm water discharges into the MS4s, reduce the discharge of pollutants in storm water from the MS4s to the MEP, and ensure that their MS4 discharges do not cause or contribute to violations of water quality standards. If the Copermittees have effectively prohibited non-storm water discharges and reduced storm water pollutant discharges to the MEP, but their discharges are still causing or contributing to violations of water quality standards, Provision A.4 provides a clear "iterative process" for the Copermittees to follow.

Provision A.4 essentially requires the Copermittees to implement additional BMPs until MS4 discharges no longer cause or contribute to a violation of water quality standards.

[21] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.

In assessing compliance and potential enforcement actions, the San Diego Water Board looks at the Copermittees' efforts in total to meet the requirements of Provisions A.1.a, A.1.c, A.2.a and Provision A.4. The Copermittees need to demonstrate that they are making improvements to their programs and making progress toward achieving the discharge prohibitions and receiving water limitations in Provisions A.1.a, A.1.c, and A.2.a by implementing the requirements of Provision A.4. The San Diego Water Board would consider these efforts prior to strictly enforcing the requirements of Provisions A.1.a, A.1.c, and A.2.a. Causes of exceedances of the receiving water limitations can often be more difficult to identify and attribute solely to the Copermittees' MS4s. The intent of the Order is to provide the Copermittees more clarity and flexibility in addressing these exceedances through the iterative approach and adaptive management process until the requirements under Provisions A.1.a, A.1.c, and A.2.a are fully achieved.

An exception to the iterative approach and adaptive management process would be in receiving waters subject to adopted and approved TMDLs. For TMDLs that are incorporated into the Order, there is a specific date for compliance to be achieved, after which the iterative approach and adaptive management process required under Provision A.4 no longer provides the flexibility to achieve compliance. Where compliance dates for a TMDL have passed, compliance with the WQBELs incorporated into the Order to be consistent with the assumptions and requirements of a WLA established by a TMDL to protect water quality standards is required. Thus, after the interim or final compliance dates for a TMDL have passed, if the discharges from the Copermittees' MS4s are causing or contributing to a violation of WQBELs, exceedances of WQBELs must be strictly enforced by the San Diego Water Board.

B. Water Quality Improvement Plans

Purpose: Provision B includes requirements for the Copermittees to develop and implement Water Quality Improvement Plans to ultimately comply with the prohibitions and limitations under Provision A. The Water Quality Improvement Plans will provide the Copermittees a comprehensive program that can achieve the requirements of the CWA. Implementation of the Water Quality Improvement Plans will also improve the quality of the receiving waters in the San Diego Region.

The Water Quality Improvement Plan is the backbone of the Regional MS4 Permit requirements. Provision B provides the guidance, criteria, and minimum expectations and requirements for the elements of the Water Quality Improvement Plan to be developed and implemented by the Copermittees. The Water Quality Improvement Plans will be implemented in the Watershed Management Area by the Copermittees within their jurisdictions through their jurisdictional runoff management programs.

The Water Quality Improvement Plan also incorporates a program to monitor and assess the progress of the Copermittees' jurisdictional runoff management programs toward improving the quality of discharges from the MS4s, as well as tracking improvements to the quality of receiving waters. A process to adapt and improve the effectiveness of the Water Quality Improvement Plans has also been incorporated into the requirements of Provision B to be consistent with the "iterative approach" required to achieve compliance with discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a, pursuant to the requirements of Provision A.4.

The Water Quality Improvement Plans have also been structured to incorporate the requirements of any TMDLs that have been adopted for the San Diego Region. Incorporating the requirements of the TMDLs into the requirements of Provision B allows the Copermittees to develop a single plan, instead of separate plans, to coordinate their non-storm water and storm water runoff management programs. The Water Quality Improvement Plans allow the Copermittees to meet the requirements of this Order, as well as fulfill the requirements of the WLAs that have been assigned to discharges from the MS4s.

As an added benefit, if the Copermittees demonstrate that impaired water bodies within the Watershed Management Area listed on the 303(d) List will be addressed with their Water Quality Improvement Plans in a reasonable period of time, the San Diego Water Board may be able to remove the water bodies from the 303(d) List, which would greatly reduce the need for the San Diego Water Board to develop additional TMDLs that would have to be incorporated into the Order.

***Discussion*:** The federal NPDES regulations require the Copermittees to develop a proposed management program (40 CFR 122.26(d)(2)(iv)). The proposed management program must include "*a comprehensive planning process*" and "*where*

necessary intergovernmental coordination" for the "*duration of the permit.*" The Water Quality Improvement Plan is the Copermittees' "*comprehensive planning process*" document for the proposed management program that will be implemented within a Watershed Management Area. Implementation of the Water Quality Improvement Plan requires "*intergovernmental coordination*" among the Copermittees for at least the "*duration of the permit*," and likely into and beyond the next iteration of the permit.

Developing Water Quality Improvement Plans based upon watersheds is consistent with federal regulations that support the development of permit conditions, as well as implementation of storm water management programs, at a watershed scale (40 CFR 122.26(a)(3)(ii), 122.26(a)(3)(v), and 122.26(d)(2)(iv)). In 2003, USEPA issued a Watershed-Based NPDES Permitting Policy Statement (USEPA, 2003) that defines watershed-based permitting as an approach that produces NPDES permits that are issued to point sources on a geographic or watershed basis. In this policy statement, USEPA explains that "*[t]he utility of this tool relies heavily on a detailed, integrated, and inclusive watershed planning process*." USEPA identifies a number of important benefits of watershed permitting, including more environmentally effective results, the ability to emphasize measuring the effectiveness of targeted actions on improvements in water quality, reduced cost of improving the quality of the nation's waters and more effective implementation of watershed plans, including TMDLs, among others.

An emphasis on watersheds is appropriate at this stage in the San Diego Region's MS4 program to shift the focus to more targeted, water quality driven planning and implementation. Addressing discharges on a watershed scale focuses on water quality results by emphasizing the receiving waters in the watershed. The conditions of the receiving waters drive management actions, which in turn focus measures to address pollutant contributions from MS4 discharges.

The Water Quality Improvement Plan gives the Copermittees the responsibility of developing a comprehensive plan to coordinate the efforts of their jurisdictional runoff management programs for addressing the problems related to MS4 discharges causing impacts to water quality in the Watershed Management Area. The development of the plan provides the Copermittees the opportunity to provide significant input on how to implement their jurisdictional runoff management programs, and how to best utilize their available resources in addressing a focused set of priorities that they believe will result in measureable improvements to water quality within the Watershed Management Area.

The Copermittees are encouraged to separate the Watershed Management Area into subwatersheds, as appropriate. This allows the Copermittees to identify priorities applicable to a subset of the Copermittees or specific water bodies or areas within the Watershed Management Area.

Included in the requirements for the elements to be included in the Water Quality Improvement Plan are monitoring and assessment requirements that are necessary to implement, as well as ensure the Copermittees are in compliance with, the

requirements of the Order. In addition to the federal requirements of the CWA section 308(a) and 40 CFR 122.26(d), the San Diego Water Board has the authority to establish monitoring, reporting, and recordkeeping requirements for NPDES permits under CWC 13383.

More specific and detailed discussions of the requirements of Provision B are provided below.

Provision B.1 (Watershed Management Areas) requires the Copermittees to develop a Water Quality Improvement Plan for each of the Watershed Management Areas defined by the San Diego Water Board.

Pursuant to 40 CFR 122.26(d)(2)(iv), proposed management programs "*may impose controls on a…watershed basis…*" The Water Quality Improvement Plan is the Copermittees' proposed management program. A Water Quality Improvement Plan must be developed for each Watershed Management Area identified in the Order.

The Watershed Management Areas are identified in Table B-1. Table B-1 establishes ten (10) Watershed Management Areas, and identifies the Copermittees that are responsible for developing and implementing the Water Quality Improvement Plan for each Watershed Management Area.

The Copermittees from each of the three counties within the San Diego Region are expected to be phased in as their respective NPDES municipal storm water permits expire. Because Order No. R9-2007-0001 expired in January 2012, the San Diego County Copermittees are covered under the Regional MS4 Permit on the effective date of the Order.

After San Diego Water Board receives and considers the Reports of Waste Discharge required to be submitted by the Orange County Copermittees and Riverside County Copermittees pursuant to the requirements of their current permits, and make any necessary changes to the Order, the Orange County Copermittees and Riverside County Copermittees will be covered under the Regional MS4 Permit after Order No. R9-2009-0002 expires in November 2014, and Order No. R9-2010-0016 expires in December 2015, respectively.

The Orange County Copermittees and Riverside County Copermittees also have the option to obtain coverage under the Regional MS4 Permit earlier than their respective permit expiration dates. The process to apply for early coverage is described Provision F.6.

Because the Santa Margarita River Watershed Management Area includes Copermittees from both San Diego County and Riverside County, a footnote to Table B-1 has been included to specify that the requirements of Provision B must be implemented by the County of San Diego until the Riverside County Copermittees have received a notice of coverage under the Regional MS4 Permit.

Provision B.2 (Priority Water Quality Conditions) requires the Copermittees in each Watershed Management Area to identify the highest priority water quality conditions which will be the focus of the Water Quality Improvement Plan implementation.

Provisions B.2.a and B.2.b provide the criteria that must be assessed when characterizing the receiving water quality and potential impacts from MS4 discharges of the receiving waters within the Watershed Management Area. The criteria are based primarily on the requirements in 40 CFR 122.26(d)(1)(iv)(C) and (C)(1)-(9). Characterizing the receiving water quality and identifying the potential impacts caused by MS4 discharges to receiving waters in the Watershed Management Area is necessary to identify the impacts to receiving waters associated with MS4 discharges that are of the most concern to the Copermittees.

Based on the information required to be considered under Provisions B.2.a and B.2.b, Provision B.2.c requires to Copermittees to identify the highest priority water quality conditions related to discharges from the MS4s that will be the primary focus of the Water Quality Improvement Plan in the Watershed Management Area. Addressing and improving these highest priority water quality conditions will become the focus of each Copermittee's jurisdictional runoff management program as the Water Quality Improvement Plan is implemented in the Watershed Management Area. The highest priority water quality conditions are expected to include source of pollutants and/or stressors, and/or receiving water conditions, that the Copermittees consider the highest threats or most likely to have adverse impacts on the physical, chemical, and biological integrity of receiving waters. Addressing these threats and/or adverse impacts should restore the physical, chemical, and biological integrity of receiving waters, and result in the restoration and protection of the beneficial uses of the receiving waters in the Watershed Management Area.

Provision B.2.d requires the Copermittees to identify known and suspected sources of pollutants and/or stressors contributing to the highest priority water quality conditions. The requirements of Provision B.2.d are based primarily on the requirements in 40 CFR 122.26(d)(1)(iii)(B)(1)-(6). The Copermittees are required to evaluate several factors in the identification of those sources. The Copermittees must consider and evaluate the following: (1) the land uses that may contribute toward impacts to receiving waters, (2) the locations of the Copermittees' MS4s that can convey and discharge runoff and pollutants to receiving waters, (3) other sources that discharge into the Copermittees' MS4s and receiving waters, and (4) other information and data that can help the Copermittees to evaluate the relative importance of or contribution from those sources toward the highest priority water quality conditions. Identifying the known and suspected sources, and their relative contribution toward the highest priority water quality conditions, will help the Copermittees to focus, direct, and prioritize their resources and implementation efforts within their jurisdictions.

Provision B.2.e requires the Copermittees to identify interim and final numeric goals, and schedules to achieve those goals as part of the Water Quality Improvement Plans.

Provision B.2.e requires the Copermittees to identify two types of numeric goals to be achieved:

(1) Final numeric goals in the receiving waters and/or MS4 discharges that will be able to restore and protect the water quality standards of the receiving waters for the highest priority water quality conditions identified by the Copermittees for Provision B.2.c. These final numeric goals are the ultimate goals for the Water Quality Improvement Plan, and the achievement and maintenance of these final numeric goals will indicate that one or more beneficial uses have been successfully restored and/or protected.

(2) Interim numeric goals that can be used by the Copermittees to demonstrate progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges for the highest priority water quality conditions in the Watershed Management Area. Achievement of the interim numeric goals will demonstrate to the San Diego Water Board that the Copermittees' implementation efforts are progressing toward achieving the final numeric goals.

Provision B.2.e does not specify what the interim and final numeric goals must be based on. The numeric goals must be designed to achieve compliance with water quality standards in the receiving waters. To that end, the interim goals must be based on measureable criteria or indicators capable of demonstrating progress toward achieving the numeric goals."

The interim and final numeric goals can be based on the water quality objectives in the Basin Plan. The water quality objectives in the Basin Plan, however, consist of numeric and narrative water quality objectives. Numeric water quality objectives can be directly used as numeric goals. Narrative water quality objectives, on the other hand, will require some interpretation to identify numeric goals. The achievement of multiple numeric goals based on the water quality objectives, used in combination, may be necessary to demonstrate that beneficial uses have been restored and/or protected.

The Copermittees could also propose other numeric goals that are not necessarily water quality objectives from the Basin Plan. For example, the Copermittees could propose a numeric goal that consists of achieving some percent improvement of a measureable indicator, such as acreage of a specific habitat or increase in a specific plant or animal species population. Other examples may include pollutant load reductions, number of impaired waterbodies delisted from the List of Water Quality Impaired Segments, Index of Biological Integrity (IBI) scores, etc.

The Copermittees may choose to develop interim numeric goals based on the final numeric goals they develop, such as incremental steps toward ultimately achieving the final numeric goals. The Copermittees may also choose to develop interim numeric goals that are based on other measureable indicators that can indirectly indicate improvements and progress toward the final numeric goals.

There are no limits to the types of interim numeric goals that could be proposed by the Copermittees, other than the goals must be based on measureable criteria or indicators capable of demonstrating progress toward achieving the numeric goals. Likewise, there are no limits to the types of final numeric goals that could be proposed by the Copermittees, other than the goals must "*restore and protect the water quality standards of the receiving waters.*"

Finally, Provision B.2.e also requires the Copermittees to develop schedules for measuring progress and achieving the interim and final numeric goals. Several criteria are included for the development of the schedules, but the Copermittees are required to achieve the numeric goals as soon as possible, consistent with federal NPDES regulations (40 CFR 122.47(a)(1)).

The Copermittees are also required by to incorporate any compliance schedules that are included in any applicable TMDLs. Applicable TMDL compliance schedules are set forth in Attachment E to the Order. The information provided by the Copermittees under Provision B.2.e will be used by the Copermittees and the San Diego Water Board to gauge and track the progress of the Copermittees' efforts in addressing the highest priority water quality conditions identified in the Water Quality Improvement Plan.

Provision B.3 (Water Quality Improvement Strategies) requires the Copermittees in each Watershed Management Area to identify the strategies which will be implemented by the Copermittees' jurisdictional runoff management programs to address and improve the highest priority water quality conditions identified under Provision B.2. The element of the Water Quality Improvement Plan required under Provision B.3 is where the "*comprehensive planning*" and "*intergovernmental coordination*" [40 CFR 122.26(d)(2)(iv)] of the Copermittees' actions for the proposed management programs within the Watershed Management Area is expected to be described.

Provision B.3 requires the Copermittees to identify the water quality improvement strategies that will be implemented within the Watershed Management Area to 1) reduce of pollutants in storm water discharged from the MS4 to the MEP, 2) prevent or eliminate controllable non-storm water discharges from entering the MS4, 3) achieve of demonstrable improvements in the physical, chemical, and biological receiving water conditions, 4) restore and protect water quality standards in receiving waters by controlling discharges so that they do not cause or contribute to exceedances of receiving water limitations, and 5) achieve applicable WQBELs that implement TMDLs.

The Copermittees are expected to provide a description of all the actions and potential actions that they will implement over the course of a schedule that they develop. The implementation actions may include, but are not limited to, inspection and enforcement strategies, resource identification and development efforts, non-structural and structural controls, retrofitting projects, stream and habitat rehabilitation/restoration

projects, and agency and department coordination efforts. Water quality improvement strategies that will be implemented within the Watershed Management Area may need to be different within each Copermittees' jurisdiction. The descriptions in the Water Quality Improvement Plan are not expected to specify exactly what strategies each Copermittee will implement within its jurisdiction, but enough information to allow the San Diego Water Board to determine when and where the strategies may be or should be implemented. Specific information about how those strategies will be implemented will be provided in each Copermittee's jurisdictional runoff management program document.

The Copermittees must also develop and include schedules in the Water Quality Improvement Plan for implementing the water quality improvement strategies. The schedule for implementing the water quality improvement strategies will be used by the Copermittees and San Diego Water Board to measure and demonstrate the progress of the Copermittees' implementation efforts toward reducing pollutants in storm water discharged from the MS4 to the MEP, and eliminating non-storm water discharges from entering the MS4.

Provision B.4 (Water Quality Improvement Monitoring and Assessment) requires the Copermittees to develop an integrated monitoring and assessment program to track the progress of the Water Quality Improvement Plan toward meeting the implementation goals and schedules, and improving the water quality of the Watershed Management Area. Provision B.4 is the part of the Water Quality Improvement Plan where the Copermittees describe the monitoring data that will be collected, which is not only necessary to implement the "iterative approach" required by Provision A.4, but inform the adaptive management and "*comprehensive planning process*" that allows the Copermittees to make adjustments and modifications to the Water Quality Improvement Plans and the jurisdictional runoff management programs.

Provision B.4 requires the Copermittees, at a minimum, to include the requirements of Provision D as part of the water quality improvement monitoring and assessment program for the Water Quality Improvement Plan. The Copermittees, however, are not limited to the requirements of Provision D and may include additional monitoring and assessment methods to track progress toward improving water quality in the Watershed Management Area.

In addition to incorporating the requirements of Provision D, the water quality improvement monitoring and assessment program must incorporate any monitoring and assessment requirements specified for any applicable TMDLs included in Attachment E to the Order, and the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 for Watershed Management Areas with ASBS.

The monitoring and assessments required to be incorporated into the Water Quality Improvement Plan are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order.

Provision B.5 (Iterative Approach and Adaptive Management Process) requires the Copermittees to implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a.

Provision B.5 requires the Copermittees in each Watershed Management Area to re-evaluate the highest priority water quality conditions and numeric goals, the water quality improvement strategies, and the water quality improvement monitoring and assessment program and provide recommendations for modifying those elements to improve the effectiveness of the Water Quality Improvement Plan. The re-evaluation of the Water Quality Improvement Plan is part of the assessment requirements of Provision D.

Provision B.6 (Water Quality Improvement Plan Submittal, Updates, and Implementation) requires to Copermittees to submit, update, and implement the Water Quality Improvement Plans.

The requirements for the process to develop and submit the Water Quality Improvement Plans is described in more detail under the discussion for Provision F.1. The process will include several opportunities for the public to provide input during the development of the Water Quality Improvement Plans. The process for updating the Water Quality Improvement Plans is described in more detail under the discussion for Provision F.3.c. Upon acceptance of the Water Quality Improvement Plan and updates, the Copermittees are required to immediately begin implementing the Water Quality Improvement Plan and subsequent updates.

The Water Quality Improvement Plan is expected to be a dynamic document that will evolve over time. The Water Quality Improvement Plan is also expected to be a long term plan that focuses the Copermittees' efforts and resources on a limited set of priority water quality conditions, with the ultimate goal of protecting all the beneficial uses of the receiving waters within the Watershed Management Area from impacts that may be caused or contributed to by MS4 discharges. As the Copermittees collect data, implement their jurisdictional runoff management programs, and review the results from their water quality improvement monitoring and assessment program, the Water Quality Improvement Plan is expected to be continually reviewed and updated until compliance with Provisions A.1.a, A.1.b, and A.2.a is achieved.

Implementation of the Water Quality Improvement Plans may also demonstrate that TMDLs are not required for impaired water bodies within the Watershed Management Area. Impaired water bodies are not required to be placed on the 303(d) List, thus do not require a TMDL, if technology-based effluent limitations required by the CWA, more stringent effluent limitations required by state, local, or federal authority, or other pollution control requirements (e.g., best management practices) required by local, state or federal authority are stringent enough to implement applicable water quality

standards within a reasonable period of time.[22]

The San Diego Water Board submits an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. According to USEPA guidance for the Integrated Report,[23] water bodies are placed in one of five categories. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 are placed on the 303(d) List.

Category 4 in the Integrated Report is for water bodies where available data and/or information indicate that at least one beneficial use is not being supported or is threatened, but a TMDL is not needed.[24] Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

Impaired water bodies can be included in Category 4a if a TMDL has been adopted and approved. The TMDLs in Attachment E to the Order implement the requirements of the TMDLs adopted by the San Diego Water Board, and approved by the State Water Board and USEPA. The water bodies in Attachment E will be included in Category 4a in the Integrated Report and removed from the 303(d) List.

Impaired water bodies can be included in Category 4b if there are *acceptable* "pollution control requirements" required by a local, state or federal authority stringent enough to implement applicable water quality standards within a reasonable period of time (e.g., a compliance date is set). When evaluating whether a particular set of pollution controls are "requirements," the USEPA considers a number of factors, including: (1) the authority (local, state, federal) under which the controls are required and will be implemented with respect to sources contributing to the water quality impairment (examples may include: self-executing state or local regulations, permits, and contracts and grant/funding agreements that require implementation of necessary controls), (2) existing commitments made by the sources and completion or soon to be completed implementation of the controls (including an analysis of the amount of actual implementation that has already occurred), (3) the certainty of dedicated funding for the implementation of the controls, and (4) other relevant factors as determined by USEPA depending on case-specific circumstances.[25]

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[22] 40 CFR 130.7(b)(1)
[23] USEPA, 2005. *Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act*
[24] Ibid
[25] Ibid

Impaired water bodies can be included in Category 4c if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution. Pollution, as defined by the CWA is "the man-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of water."[26] In other cases, pollution does not result from a pollutant and a TMDL is not required. Examples of circumstances where an impaired segment may be placed in Category 4c include segments impaired solely due to lack of adequate flow, stream channelization, or hydromodification. In these situations, there may be water quality management actions that can address the cause(s) of the impairment, but a TMDL may not be required to implement the actions.

The Water Quality Improvement Plans will require the implementation of pollution controls and water quality management actions (i.e. water quality improvement strategies) which can result in the attainment of water quality standards in water bodies impaired by discharges from the Copermittees' MS4s. The Water Quality Improvement Plans also include requirements that are expected to attain water quality standards in a reasonable period of time. The San Diego Water Board considers the Water Quality Improvement Plans to be a commitment by the Copermittees to develop, plan, budget for, and implement pollution controls that will attain water quality standards in receiving waters in a reasonable period of time, or as soon as possible. The results of the Copermittees' efforts in implementing the Water Quality Improvement Plans can be used to re-evaluate the condition of the impaired water bodies during the next update to the 303(d) List.

After the Copermittees submit the Water Quality Improvement Plans and demonstrate that water quality standards are being attained or will be attained in a reasonable period of time, the San Diego Water Board may re-evaluate the water bodies on the 303(d) List. These water bodies on the 303(d) List may be re-evaluated and placed into Category 4b or Category 4c in the Integrated Report. The water bodies placed in Category 4b or Category 4c in the Integrated Report must show a record that the water bodies are attaining water quality standards or supporting the identified beneficial uses, or will attain water quality standards or support identified beneficial uses in a reasonable period of time, in order for the water bodies to be appropriately removed from the 303(d) List.

[26] CWA section 502(19)

C. Action Levels

Purpose: Provision C includes requirements for the Copermittees to identify and include numeric action levels in the Water Quality Improvement Plan to direct and focus the Copermittees' jurisdictional runoff management program implementation efforts for controlling MS4 discharges to receiving waters.

***Discussion*:** Under Provision C, the numeric action levels required are for non-storm water discharges and storm water discharges. The non-storm water action levels (NALs) are applicable to non-storm water discharges from the Copermittees' MS4s, which can occur year-round. The storm water action levels (SALs) are applicable to storm water discharges from the Copermittees' MS4s, which occur during the rainy season defined as the period between October 1 and April 30.

The action levels required by Provision C are based on the action level requirements that were developed and incorporated into Order Nos. R9-2009-0002 and R9-2010-0016, the Orange County and Riverside County MS4 Permits, respectively. The Fact Sheets for these Orders provide detailed discussions about the development of the numeric NALs and SALs included in this Order.

Order Nos. R9-2009-0002 and R9-2010-0016 required the Copermittees to perform prescribed actions if the NALs or SALs are exceeded. The actions required under Order Nos. R9-2009-0002 and R9-2010-0016 generally included conducting additional monitoring and source investigations when a discharge from the MS4 is observed to exceed one or more NALs and/or SALs.

For this Order, however, the action levels of Provision C are to be used by the Copermittees to prioritize the actions to be implemented as part of the Water Quality Improvement Plan. Monitoring data collected by the Copermittees from MS4 outfalls will be compared with the NALs and SALs. Exceedances of the NALs and SALs will not require the Copermittees to immediately identify sources causing exceedances, but will provide some numeric indicator levels that can give the Copermittees a way to measure the relative severity of a pollutant contributing to receiving water quality impacts.

NALs and SALs must be included in the Water Quality Improvement Plans to be used by the Copermittees in directing and focusing their water quality improvement strategies. The Copermittees are expected to utilize the NALs and SALs to help focus their implementation efforts on addressing pollutants that have the most significant potential or observed impacts to receiving waters. The NALs and SALs will be used as part of the MS4 discharges assessments required under Provision D.4.b. The NALs and SALs may also be used by the Copermittees as the numeric goals to be achieved in MS4 discharges and/or receiving waters as the Water Quality Improvement Plans are implemented.

More specific and detailed discussions of the requirements of Provision C are provided below.

Provision C.1 (Non-storm Water Action Levels) requires the Copermittees to incorporate NALs into the Water Quality Improvement Plan for pollutants and/or constituents that are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions identified in the Water Quality Improvement Plan related to non-storm water discharges from the MS4s. NALs generally must be consistent with the water quality objectives found within the Basin Plan.

The NALs have been included to ensure that the Copermittees are implementing and complying with several requirements of the MS4 permit. The federal CWA requires permits for municipal storm sewer systems to "*effectively prohibit non-storm water discharges into the storm sewers*." The federal NPDES regulations, which were promulgated to implement the CWA requirements for discharges from municipal storm sewers, require a program to address illicit discharges, which are non-storm water discharges. Provision A.1.b prohibits "*[n]on-storm water discharges into MS4s*" unless the non-storm water discharge authorized by a separate NPDES permit, or is a category of non-storm water specified in Provisions E.2.a.(1)-(5) that does not need to be addressed through ordinance, order or similar means and is not a source of pollutants. The NALs will be used as part of the illicit discharge detection and elimination program required pursuant to Provision E.2, as well as part of the MS4 discharges assessments required pursuant to Provision D.4.b.

Provision A.1.a prohibits non-storm water discharges from the MS4 from "*causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state.*" In addition, pursuant to Provision A.2.a, non-storm water discharges "*must not cause or contribute to the violation of water quality standards in any receiving waters*."

Ideally, the Copermittees' jurisdictional runoff management programs will eliminate all non-storm water discharges entering the MS4s within their jurisdictions. The complete elimination of non-storm water discharges to the Copermittees' MS4s would be in compliance with the CWA requirements for non-storm water discharges, as well as the prohibitions and limitations of Provisions A.1.a and A.2.a.

The federal regulations, however, also refer to several non-storm water discharge categories that must be addressed as illicit discharges if they are found to be a source of pollutants. The federal regulations thus identify some non-storm water discharges that are not required to be addressed as illicit discharges if they are not a source of pollutants (e.g. non-storm water discharges specified in Provisions E.2.a.(1)-(5)). Thus, these regulations imply that some non-storm water discharges into and from the MS4 may occur even if non-storm water discharges are "effectively" prohibited by the Copermittees.

If the source of a non-storm water discharge is identified as a category of non-storm water specified in Provisions E.2.a.(1)-(5), the NALs can be used to determine the category of non-storm water discharges is a source of pollutants. For other non-storm water discharges not specified in Provisions E.2.a.(1)-(5), the CWA requires those discharges to be "*effectively"* prohibited by removing the discharge to the MS4 through enforcement of "*ordinance, order or similar means*."

If there are non-storm water discharges, however, those discharges must comply, at a minimum, with the discharge prohibitions and receiving water limitations of Provision A. Thus, the non-storm water discharges from the MS4 must be at levels that will not cause or contribute to a condition of pollution, contamination, or nuisance (Provision A.1.a), and must not cause or contribute to a violation of water quality standards in receiving waters (Provision A.2.a) to be consistent with the discharge prohibitions and receiving water limitations of Provisions A.1.a and A.2.a.

Furthermore, the San Diego Region has predominantly intermittent and ephemeral rivers and streams which vary in flow volume and duration at spatial and temporal scales. For most of these river and stream systems, non-storm water discharges from the MS4 are likely to be the most significant or the only source contributing to surface flows present within the receiving water, especially during the dry season.

Therefore, because of the prohibitions and limitations of Provision A.1.a and A.2.a, and the likelihood that non-storm water discharges from the MS4 are the most significant or only source contributing to surface flows present within the receiving water, NALs generally must be consistent with the water quality objectives found within the Basin Plan. Non-storm water discharges that are meeting the NALs would not be expected to cause or contribute to an exceedance of water quality objectives in receiving waters, which would be consistent with the discharge prohibitions and receiving water limitations of Provisions A.1.a and A.2.a.

Exceedances of the NALs would then provide an indication of the relative severity of a pollutant in non-storm water discharges from the MS4 contributing to potential or observed receiving water quality impacts. The relative severity or significance of a pollutant in non-storm water discharges from the MS4 will provide the Copermittees a valuable source of information that can be used to identify priority water quality conditions within a Watershed Management Area and within each Copermittee's jurisdiction.

Tables C-1 through C-4 under Provision C.1.a specify numeric NALs for several parameters or pollutant constituents for non-storm water discharges from the MS4 to several water body types. The NALs for MS4 discharges given under Provision C.1.a are based on the water quality objectives for inland surface waters in the Basin Plan, and the water quality objectives for ocean waters in the Ocean Plan. The NALs for most of the metals were calculated based on the State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP). The NALs provided in Tables C-1

through C-4 must be included in the Water Quality Improvement Plans required to be developed pursuant to Provision B.

Provision C.1.b requires the Copermittees to identify NALs for pollutants and/or constituents, not specified in Provision C.1.a, which are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions of the Watershed Management Area related to non-storm water discharges from the MS4s. The NALs must be based on the water quality objectives in the Basin Plan. The NALs identified under Provision C.1.b must be included in the Water Quality Improvement Plan.

The San Diego Water Board recognizes that some of the NALs required pursuant to Provisions C.1.a and C.1.b may be exceeded more frequently than not. Thus, Provision C.1.c has been included in the Order to provide the Copermittees the option to develop secondary NALs that are set at levels greater than the levels required pursuant to Provisions C.1.a and C.1.b to further refine the prioritization and assessment of water quality improvement strategies for addressing non-storm water discharges to and from the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and from the MS4.

Provision C.2 (Storm Water Action Levels) requires the Copermittees to incorporate SALs into the Water Quality Improvement Plan for pollutants and/or constituents causing or contributing, or may be causing or contributing, to the highest priority water quality conditions identified in the Water Quality Improvement Plan related to storm water discharges from the MS4s.

The SALs have been included to ensure that the Copermittees are implementing and complying with several requirements of the MS4 permit. Provision A.1.a prohibits storm water discharges from the MS4 from "*causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state.*" In addition, pursuant to Provision A.2.a, storm water discharges "*must not cause or contribute to the violation of water quality standards in any receiving waters*."

Provision A.3.a, however, implicitly acknowledges that compliance with Provisions A.1.a and A.2.a cannot be achieved immediately for discharges of storm water from the MS4 by applying the MEP standard. Thus, Provision A.4 requires the Copermittees to implement an iterative approach to demonstrate that MEP is being achieved. This approach is supported by USEPA.

The federal CWA requires permits for municipal storm sewer systems to "*require controls to reduce the discharge of pollutants [in storm water] to the maximum extent practicable*, *including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants.*" MEP is an ever-evolving, flexible, and advancing concept. As knowledge about controlling storm water runoff

and discharges evolves, so does the knowledge which constitutes MEP. Reducing the discharge of storm water pollutants from the MS4 to the MEP requires the Copermittees to assess their jurisdictional runoff management programs and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP. The SALs provide the Copermittees measureable goals that may be used to demonstrate the achievement of MEP for reducing pollutants in storm water discharges from the MS4. The SALs will be used as part of the MS4 discharges assessments required under Provision D.4.a.

In June of 2006, the State Water Board's Blue Ribbon Storm Water Panel released its report titled "*The Feasibility of Numerical Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities*." In the recommendations, the Blue Ribbon panel proposed storm water effluent limitations which are computed using statistical based population approaches. The SALs specified in Table C-5 under Provision C.2.a were developed from a regional subset of nationwide Phase I MS4 data by using USEPA Rain Zone 6 (arid west) data.[27] Additionally, utilization of regional data is appropriate due to the addition of data into the nationwide Phase I MS4 monitoring dataset in February 2008. This additional data increased the number of USEPA Rain Zone 6 samples to more than 400, and included additional monitoring events within Southern California.

Utilizing data from USEPA Rain Zone 6 resulted in SALs which closely reflect the environmental conditions experienced in the San Diego Region. The localized subset of data includes sampling events from multiple Southern California locations including Orange, San Diego, Riverside, Los Angeles, and San Bernardino Counties. The dataset includes samples taken from highly built-out impervious areas and from storm events representative of Southern California conditions.

The SALs for cadmium, copper, lead and zinc require the measurement of hardness and to provide more specificity in the assessment of samples with SALs for total metal concentrations. While USEPA Rain Zone 6 data include a large sample size for concentrations of total metals, the impact the concentration will have on receiving waters will vary with receiving water hardness. Since it is the goal of the SALs, through the iterative process and MEP standard, to have MS4 storm water discharges meet all applicable water quality objectives, the hardness of the receiving water should be used when assessing the total metal concentration of a sample.

Thus, when there is an exceedance of a SAL for a metal, the Copermittee must determine if that exceedance is above the existing applicable water quality objectives based upon the hardness of the receiving water. The water quality objectives Copermittees must use to assess total metal SAL exceedances are the California Toxic Rule (CTR) and USEPA National Recommended Water Quality Criteria for Freshwater Aquatic Life 1 hour maximum concentrations. The 1 hour maximum

[27] Data used to develop SAL were obtained from http://rpitt.eng.ua.edu/Research/ms4/mainms4.shtml

concentration is to be used for comparison since it is expected to most replicate the impacts to waters of the State from the first flush following a precipitation event.

The statistically calculated SALs given in Table C-5 are at levels greater than the water quality objectives in the Basin Plan or Ocean Plan. Because the objective of the CWA is to "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*", meaning eventually pollutants in storm water discharges must be reduced to a level that cannot cause or contribute to an exceedance of water quality objectives in receiving waters, over time the SALs are expected to be reduced to a level that is based on the water quality objectives rather than statistical calculations. The San Diego Water Board will review the SALs as more data for discharges of storm water from the MS4s are collected, and revise them as conditions improve and the MEP standard advances. For the Water Quality Improvement Plans required under this Order, the SALs identified under Provision C.2.a must be included.

Provision C.2.b requires the Copermittees to identify SALs for pollutants and/or constituents, not specified in Provision C.2.a, which are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions of the Watershed Management Area related to storm water discharges from the MS4s. The SALs identified under Provision C.2.b must be included in the Water Quality Improvement Plan.

The San Diego Water Board recognizes that some of the SALs required pursuant to Provisions C.2.a and C.2.b may be exceeded more frequently than not. Thus, Provision C.2.c has been included in the Order to provide the Copermittees the option to develop secondary SALs that are set at levels greater than the levels required pursuant to Provisions C.2.a and C.2.b to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s.

D. Monitoring and Assessment Program Requirements

Purpose: Provision D includes minimum monitoring and assessment requirements that must be developed and implemented by the Copermittees as part of the Water Quality Improvement Plans. Implementation of the monitoring and assessment requirements of Provision D will allow the Copermittees to demonstrate that the requirements of the CWA to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP are being achieved. Implementation of the monitoring and assessment requirements of Provision D will also allow the Copermittees and the San Diego Water Board to track improvements to the water quality in the San Diego Region. The monitoring and assessment program requirements are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order.

***Discussion*:** The San Diego Water Board recognized that changes to the monitoring and assessment requirements of the Fourth Term Permit were necessary to improve the usefulness and usability of monitoring data collected by the Copermittees to support their jurisdictional storm water programs more efficiently and with increased effectiveness. The data collected are needed to better inform the Copermittees' understanding of the physical, chemical, and biological condition of the receiving waters and the quality of the MS4 discharges. The monitoring program needs to provide opportunities for the Copermittees to integrate regional monitoring efforts into municipal storm water monitoring requirements to provide a cost-effective approach to monitoring and avoid duplication of efforts.

The requirements in Provision D were largely recommended by the Copermittees as an outcome of the San Diego Water Boards Focused Meeting process. The monitoring and assessment program requirements now require collection of more specific information necessary for each Copermittee to adapt its jurisdictional runoff management program in such a way that focuses resources on a watershed's highest priority water quality conditions. The monitoring and assessment program will require the Copermittees to collect data that can be utilized to answer both watershed level management questions (e.g. Are the chemical, physical, and biological conditions of a receiving water protective, or likely protective of beneficial uses?), and specific jurisdictional runoff management program activity questions (e.g. Are the water quality improvement strategies of the jurisdictional program effectively eliminating non-storm water discharges to the MS4?).

The monitoring data collected and assessment information that will be reported to the San Diego Water Board are necessary to determine if the Copermittees are complying with the prohibitions and limitations of Provision A. The required monitoring and assessments that must be reported to the San Diego Water Board will be utilized for three purposes:

(1) Inform the Copermittees, San Diego Water Board, and the public on the progress

of the Copermittees' efforts to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP;

(2) Inform the Copermittees, San Diego Water Board, and the public on the condition of water bodies receiving discharges from the Copermittees' MS4, and the progress of the Copermittees' water quality improvement implementation efforts toward improving the receiving water quality; and

(3) Inform the Copermittees, the San Diego Water Board, and the public on the effectiveness of the Water Quality Improvement Plan toward achieving (1) and (2).

The monitoring and assessment information reported pursuant to Provision F is also expected to be key to the iterative approach and adaptive management process required under Provision A.4 and implemented through the Water Quality Improvement Plan required under Provision B. As required by Provision A.4, the iterative approach and adaptive management process is required if the Copermittees cannot meet the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c, and/or A.2.a under the present conditions.

Provision D provides the minimum monitoring and assessment requirements that must be included in each Water Quality Improvement Plan to be developed and implemented by the Copermittees. The Copermittees, however, are not limited to the requirements of Provision D and may include additional methods to track progress toward improving water quality in a Watershed Management Area.

More specific and detailed discussions of the requirements of Provision D are provided below.

<u>Provision D.1 (Receiving Water Monitoring Requirements)</u> specifies the minimum receiving water monitoring that the Copermittees must conduct within the Watershed Management Area and include as part of the Water Quality Improvement Plan.

Provision D.1 establishes minimum monitoring requirements that must be conducted by the Copermittees within each Watershed Management Area. Provision D.1 requires the Copermittees to collect and develop the data and information necessary to determine potential impacts to the beneficial uses in the receiving waters due to discharges from the MS4s. The monitoring required under Provision D.1 will also provide the data that will allow the Copermittees to gauge the effectiveness and progress of its Water Quality Improvement Plan implementation efforts toward improving the quality of receiving waters.

The receiving water monitoring requirements of Provision D.1 are focused primarily on monitoring the conditions and response of the receiving waters to the Copermittees' collective implementation efforts to reduce receiving water impacts that may be

caused by the discharges from the MS4s. The preference of the San Diego Water Board is for the Copermittees to spend their resources achieving tangible and observable improvements in receiving water conditions instead of collecting samples and analyzing data that has consistently indicated that receiving water conditions are degraded and require improvement. In general, the ability to measure potential improvements in receiving water conditions due to any actions implemented by the Copermittees as part of the Water Quality Improvement Plan may require several years before a response can be observed. Thus, the frequency of collecting receiving water monitoring data has been kept to a minimum.

During the transitional period between adoption of this Order and San Diego Water Board acceptance of a Water Quality Improvement Plan, the Copermittees must conduct receiving water monitoring in accordance with Provision D.1.a. This approach to collecting receiving water data is different from what was required in the Fourth Term Permits, but one that truly embraces the concept of an integrated, cost-effective, streamlined receiving water monitoring approach.

Provision D.1.a requires Copermittees to continue performing the receiving water monitoring programs required in Order Nos. R-2007-0001, R9-2009-002, and R9-2010-0016; plus participation in: hydromodification management plan monitoring approved by the San Diego Water Board, monitoring plans as part of load reduction plans (either Bacteria Load Reduction Plans or Comprehensive Load Reduction Plans) for TMDLs in Attachment E of the Order, Storm Water Monitoring Coalition Regional Monitoring, Southern California Bight Regional Monitoring, Sediment Quality Monitoring, and ASBS Monitoring as applicable to a Watershed Management Area.

Provision D.1.a also provides an opportunity for the Copermittees to use third party data to meet receiving water monitoring requirements where feasible. Allowing the Copermittees to use the data currently collected through its participation in existing regional receiving water programs and that of third parties provides an efficiency of resources in obtaining the data necessary to inform the Copermittees and the San Diego Water Board about the physical, chemical, and biological conditions of the receiving waters, which can also help to focus the receiving water monitoring during the implementation of the Water Quality Improvement Plan. Once a Water Quality Improvement Plan is developed for a Watershed Management Area in compliance with Provision B of this Order, the transitional period is over and Copermittees are required to conduct receiving water monitoring according to the requirements of Provision D.1.b-e.

Provision D.1.b requires each Copermittee to identify at least one long term receiving water monitoring station to be representative of receiving water quality within each Watershed Management Area. Long term receiving water monitoring stations can be located at any existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees. The requirements under Provision D.1.b. are consistent with 40 CFR 122.26(d)(2)(iii)(D), which specifies that a "*monitoring program*

for representative data collection for the term of the permit" may include "*instream locations.*" For each Watershed Management Area, at least one long term watershed monitoring station is required to be established and monitored. The Copermittees may choose to establish additional long term monitoring stations where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

Provision D.1.b. requires the Copermittees to locate the long term receiving water monitoring station at one of these existing receiving water monitoring stations to provide the Copermittees an opportunity to experience monitoring cost savings while continuing to collect the necessary data to assess the status and trends of receiving water quality conditions in 1) coastal water, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under both dry weather and wet weather conditions. Ideally these stations will continue to be monitored as part of the receiving water monitoring for each Watershed Management Area to maintain a consistent set of locations and a period of data that can be built upon with the monitoring required under this Order.

The receiving water monitoring requirements are separated into monitoring required during dry weather conditions pursuant to Provision D.1.c, and wet weather conditions pursuant to Provision D.1.d.

At each long term monitoring station the Copermittees must conduct at least three dry weather monitoring events as required pursuant to Provision D.1.c and at least three wet weather monitoring events as required pursuant to Provision D.1.d per permit term. Provision D.1.c and D.1.d require the Copermittees to monitor priority water quality conditions identified in the Water Quality Improvement Plan, constituents listed as causing impairment of receiving waters in the Watershed Management Area, applicable NALs, constituents listed in Tables D-2 and D-3, and constituents for implementation plans (e.g. Bacteria Load Reduction Plans and Comprehensive Load Reduction Plans). Receiving water monitoring efforts in this Order have been streamlined to redirect resources to monitoring efforts that better support pollutant reduction solutions with an increasing emphasis on MS4 outfall monitoring, source identification and source abatement activities.

In addition to the receiving water monitoring requirements under Provisions D.1.b-d, Provision D.1.e requires the Copermittees participate in and/or conduct other types of receiving water monitoring. As recommended and requested by the Copermittees, Provision D.1.e.(1) requires the Copermittees to participate in existing regional monitoring, as applicable to each Watershed Management Area. Existing regional monitoring includes monitoring conducted by the Storm Water Monitoring Coalition and for the Southern California Bight. Participation in and use of monitoring data collected from these existing regional water quality monitoring programs provide the Copermittees a greater opportunity for efficiency in the use of their resources to manage their storm water programs and those controllable discharges under their authority.

The State Water Resources Control Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part 1 Sediment Quality which became effective August 25, 2009 (Sediment Quality Monitoring Policy). Provision D.1.e.(2) requires any Copermittees with MS4 discharges to an enclosed bay or estuary to monitoring the sediments in the enclosed bay or estuary receiving water in accordance with the sediment quality monitoring procedures as prescribed in the Sediment Quality Monitoring Policy.

The State Water Board adopted Resolution No. 2012-0012 which approved exceptions to the California Ocean Plan for selected discharges into Areas of Special Biological Significance (ASBS), including special protections for beneficial uses. State Board Resolution No. 2012-0012 became effective on March 20, 2012, and Attachment B to the Resolution established limitations on point source storm water discharges to ASBS. Copermittees with MS4s that discharge to an ASBS must monitor its discharge to assure compliance with State Board Resolution No. 2012-0012 as required pursuant to Provision D.1.e.(3).

The San Diego Water Board is currently developing a regional monitoring strategy to assess the conditions of receiving waters in the San Diego Region. The monitoring requirements of Provision D.1 are expected to be incorporated or serve as a foundation of this regional monitoring strategy, but may require some modifications. When the San Diego Water Board develops an alternative regional monitoring strategy, the Copermittees will be required to participate in the development and implementation of the alternative regional monitoring program pursuant to Provision D.1.f.

Provision D.2 (MS4 Outfall Discharge Monitoring Requirements) specifies the minimum MS4 outfall discharge monitoring requirements that the Copermittees must incorporate and implement as part of the Water Quality Improvement Plan.

The dry weather MS4 outfall discharge monitoring requirements are included under Provisions D.2.a.(2) and D.2.b. The dry weather MS4 outfall discharge monitoring requirements are part of the "*program, including a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer*" required by 40 CFR 122.26(d)(2)(iv)(B), which is expected to achieve compliance with the CWA section 402(p)(3)(B)(ii) statutory requirement for municipal storm water permits to require the Copermittees to "*effectively prohibit non-storm water discharges into the storm sewers*." The dry weather MS4 outfall discharge monitoring data collection requirements are based on requirements under 40 CFR 122.26(d)(1)(iv)(D) and 122.26(d)(2)(iv)(B)(3).

The dry weather MS4 outfall discharge monitoring requirements are designed to provide wide spatial and temporal coverage of each jurisdiction to better understand the extent and magnitude of non-storm water discharges to receiving waters, and make a distinction between persistent and transient non-storm water flows. This

information is expected to allow each Copermittee to focus its resources on eliminating and controlling the highest priority threats to receiving water quality, as well as integrating other elements of the storm water programs (e.g. complaint call response) and third party data to efficiently and effectively assist in efforts to eliminate non-storm water discharges.

The dry weather MS4 outfall discharge monitoring requirements of Provision D.2.a.(2) and D.2.b are separated into monitoring required before and after the San Diego Water Board accepts the Copemittees' Water Quality Improvement Plan. Outfall monitoring conducted prior to acceptance of the Water Quality Improvement Plan is referred to in the Order as Transitional MS4 Outfall Discharge Monitoring. Provision D.2.a.(2) includes the transitional dry weather MS4 outfall discharge monitoring requirements.

The requirements under Provision D.2.a.(2) are based on the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B), which include the requirements for a monitoring program to identify, detect, and eliminate illicit connections and illegal discharges to the MS4s. The federal regulations (40 CFR 122.26(d)(1)(iv)(D)) require the monitoring program to include "*a field screening analysis for illicit connections and illegal dumping [that]…[a]t a minimum, include[s] a narrative description, for either each field screening point or major outfall, of visual observations made during dry weather periods.*" The federal regulations (40 CFR 122.26(d)(1)(v)(B)) require the monitoring program to include "*inspection procedures and methods for detecting and preventing illicit discharges, and describe areas where this program has been implemented.*" Furthermore, the monitoring program is required by federal regulations (40 CFR 122.26(d)(2)(iv)(B)) to include "*a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer.*"

Dry weather transitional MS4 outfall discharge monitoring requires each Copermittee to field screen (inspect) its major MS4 outfalls to classify the MS4 outfall locations as having persistent dry weather flows, transient dry weather flows, or no dry weather flows. To account for the variance in size of the 39 jurisdictions covered under this Order, the Copermittees recommended a tiered approach to the number of major MS4 outfalls that must be inspected. Provision D.2.a.(2)(a) provides a tiered approach to the number of major MS4 outfalls that must be visually inspected per jurisdiction as well as a minimum frequency each Copermittee must inspect each major MS4 outfall per year. This tiered approach is based on the total number of major MS4 outfalls within a Copermittees jurisdiction within each Watershed Management Area.

Based on the field screening, each Copermittee is required to make a determination whether any observed flowing, pooled, or ponded waters are transient or persistent flows. Based on this field screening information, other jurisdictional program information, and third party information, each Copermittee is required to prioritize the MS4 outfalls within its jurisdiction for follow up investigation and elimination of the non-storm water discharge, as part of its illicit discharge detection and elimination program

required pursuant to Provision E.2. In accordance with the requirements of Provision E.2, each Copermittee is required to immediately investigate obvious illicit discharges (e.g. outfall discharges with unusual color, unusual odor, or high flows).

This approach allows a Copermittee to use all of its resources, as well as leverage resources and information provided by third parties, to effectively eliminate non-storm water discharges from its MS4 outfalls. If the source of the non-storm water discharge cannot be immediately eliminated, the Copermittee uses the persistent flow or transient flow classification along with other programmatic implementation data to prioritize the MS4 outfalls for future investigation. In accordance with the adaptive management approach deployed throughout this Order, Provision D.2.a.(2)(c) requires each Copermittee to update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow. The requirement of Provision D.2.a.(2)(c) assures that each Copermittee is collecting data that can be used to demonstrate compliance with the CWA requirement that each Copermittee must implement a program to "*effectively prohibit non-storm water discharges into the [MS4]*" and with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

Provision D.2.b describes the dry weather MS4 outfall discharge monitoring required to be incorporated and implemented as part of the Water Quality Improvement Plan. Dry weather MS4 outfall discharge monitoring must be performed by each Copermittee to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to E.3. The emphasis of the dry weather MS4 outfall discharge monitoring required pursuant to Provision D.2.b is consistent with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

Provision D.2.b.(1) requires each Copermittee to continue field screening its major MS4 outfalls and identifying those with persistent flows and transient flows, as conducted during the transitional period (i.e. before the Water Quality Improvement Plan was developed). However, each Copermittee now has the flexibility to adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of non-storm water persistent flow discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan. In order to ensure a minimum number of outfalls are inspected, Provision D.2.b.(1) requires the number of visual inspections be equal to the number of visual inspections required in the tiered inspection program pursuant to Provision D.2.a.(2)(a).

Provision D.2.b.(2)(b) requires each Copermittee to monitor a minimum of 10 major MS4 outfalls with persistent flows identified as the highest priorities within a Copermittee's jurisdiction, and within each Watershed Management Area. In other words, Copermittees located in more than one Watershed Management Area must identify at least 10 major MS4 outfalls with persistent flows per Watershed

Management Area. If a Copermittee is located in more than one Watershed Management Area, but there are less than 10 major MS4 outfalls with persistent flows within the area of its jurisdiction located in the Watershed Management Area, all the those major MS4 outfalls must be identified as the highest priority dry weather persistent flow MS4 outfalls.

Monitoring must occur at the highest priority outfall locations at least semi-annually until the non-storm water discharges have been eliminated for three consecutive dry weather monitoring events; identified to be authorized by a separate NPDES Permit; or reprioritized to a lower priority. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized MS4 major outfall in the Copermittee's jurisdiction within the Watershed Management Area, unless there are no remaining qualifying major MS4 outfalls within the Copermittees jurisdiction. The Copermittees must continually update their dry weather persistent flow MS4 outfall discharge monitoring locations with the next highest priority non-storm water flow that have yet to be eliminated until all persistent and transient flows are eliminated or its threat reduced.

Non-storm water persistent flow MS4 outfall discharge monitoring data collected during each semi-annual monitoring event, must be collected and analyzed according to the requirements of Provision D.2.b.(2)(b)–(e). These monitoring requirements are consistent with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

The wet weather MS4 outfall discharge monitoring requirements are included under Provisions D.2.a.(3) and D.2.c. The wet weather MS4 outfall discharge monitoring requirements are necessary for the Copermittees to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable, using management practices, control techniques and system, design and engineering methods, and such other provisions which are appropriate*" required by 40CFR 122.26(d)(2)(iv), which is expected to achieve compliance with the CWA section 402(p)(3)(B)(iii) statutory requirement for municipal storm water permits to require "*controls to reduce the discharge of pollutants [in storm water] to the maximum extent practicable*." The wet weather MS4 outfall discharge monitoring data collection requirements are based on requirements under 40 CFR 122.26(d)(2)(iii), 122.26(d)(2)(iii)(A) and 122.26(d)(2)(iii)(A)(1)-(4), and 40 CFR 122.21(g)(7)(i)-(ii).

The wet weather MS4 outfall discharge monitoring requirements of Provision D.2.a.(3) and D.2.c are separated into monitoring required before and after the San Diego Water Board accepts the Copemittees' Water Quality Improvement Plan. Outfall monitoring conducted prior to acceptance of the Water Quality Improvement Plan is referred to in the Order as Transitional MS4 Outfall Discharge Monitoring. Provision D.2.a.(3) includes the transitional wet weather MS4 outfall discharge monitoring requirements.

Until the wet weather MS4 outfall discharge monitoring requirements of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board, the Copermittees must comply with the requirements of transitional wet weather MS4 outfall monitoring requirements pursuant to Provision D.2.a.(3). Provision D.2.a.(3) requires each Copermittee to sample, at least five of the major MS4 outfalls inventoried pursuant to Provision D.2.a.(1) twice per wet season for the monitoring data required to be collected pursuant to Provision D.2.a.(3)(c)-(e).

At a minimum, the five sampling locations chosen must be representative of storm water discharges from residential, commercial, industrial, and typical mixed-use land uses present within a Watershed Management Area. The San Diego Water Board expects the Copermittees to extrapolate from these data to similar land uses throughout the Watershed Management Area to better inform the Water Quality Improvement Plan development process by prioritizing drainages for implementation efforts required pursuant to Provision E.

Provision D.2.c describes the wet weather MS4 outfall discharge monitoring required to be included and implemented as part of the Water Quality Improvement Plan. Provision D.2.c provides the Copermittees the flexibility to adjust the wet weather MS4 outfall discharge monitoring locations and frequencies in the Watershed Management Area, as needed, to identify sources of pollutants in storm water discharges from MS4s in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan.

Although Provision D.2.c.(1) allows the Copermittees to adaptively manage the wet weather MS4 outfall discharge monitoring locations and frequencies, the provision requires a minimum of at least five wet weather outfall stations to be monitored. Provision D.2.c.(2) further requires the Copermittees to modify the monitoring frequency at each wet weather MS4 outfall station at an appropriate frequency to identify sources of pollutants in storm water discharges.

The wet weather MS4 outfall discharge monitoring requirements of Provisions D.2.c.(3) and D.2.c.(4) are the same as the transitional wet weather MS4 outfall discharge monitoring. In contrast, the requirements of Provision D.2.c.(5) are focused on collecting analytical data specific to the highest priority water quality conditions in the Watershed Management Area identified in the Water Quality Improvement Plan. The wet weather MS4 outfall discharge monitoring data collection requirements are consistent with the requirements under 40 CFR 122.26(d)(2)(iii), 122.26(d)(2)(iii)(A) and 122.26(d)(2)(iii)(A)(1)-(4), and 40 CFR 122.21(g)(7)(i)-(ii).

<u>Provision D.3 (Special Studies)</u> requires the Copermittees to develop special studies that will be conducted for each Watershed Management Area and the entire San Diego Region. Data collected pursuant to Provision D.3 is to be used by the Copermittees to improve the effectiveness of the strategies implemented by the jurisdictional runoff management programs toward achieving the numeric goals identified in the Water Quality Improvement Plans and ultimately achieve compliance

with the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c, and A.2.a, which is consistent with the requirements of Provision A.4.

Special studies are often necessary to fill data gaps or provide more refined information that allow the Copermittees to better manage the generation or elimination of pollutants and discharges to and from the MS4. In the Fourth Term Permits, the Copermittees have been required to implement special studies as directed by the San Diego Water Board. The special studies required by this Order provide the Copermittees more flexibility to identify and implement special studies that will be most useful to improving the effectiveness of their jurisdictional runoff management programs.

Provision D.3.a.(1) requires the Copermittees to develop and conduct at least three special studies per Watershed Management Area, to be determined by the Copermittees. One of the three special studies may be accomplished through participation in a Regional Special Study required under Provision D.3.a.(2). The requirements provide the Copermittees great latitude in identifying and developing the special studies. Watershed Management Area special studies are required, at a minimum, to: (a) relate in some way to the highest water quality priorities identified by the Copermittees in the Water Quality Improvement Plan, (b) be conducted within the Watershed Management Area, and (c) include some form of participation (e.g. contribution of funds, personnel services, project management) by all the responsible Copermittees within the Watershed Management Area.

Examples of Watershed Management Area special studies might include, but are not limited to: (1) focused pollutant source identification studies, (2) BMP effectiveness and/or comparison studies, (3) pilot tests for new or emerging pollutant control methods, (4) receiving water pollutant or stressor source identification and/or mitigation studies, or (5) pollutant fate and transport studies. The Watershed Management Area special studies are expected to provide data that can be utilized by the Copermittees to improve the Water Quality Improvement Plan or implementation of the Copermittees' jurisdictional runoff management programs to address the highest priority water quality conditions.

Provision D.3.a.(2) requires the Copermittees to develop special studies that will be conducted for the entire San Diego region. The regional special studies are expected to provide data that can be utilized by the Copermittees to improve the Water Quality Improvement Plan or implementation of the Copermittees' jurisdictional runoff management programs to identify or address regional water quality concerns and priorities.

An example of a regional special study would be to develop and establish allowable exceedance frequencies of the bacteria water quality objectives for several types of water bodies, during different wet and dry weather conditions the San Diego region. The special study would be related to bacteria, which is a priority for the San Diego region due to the adoption of "*Bacteria TMDL Project I – Beaches and Creeks in the*

San Diego Region." The study results could be used to inform the Copermittees and the San Diego Water Board about the indictor bacteria water quality objective exceedance frequencies that occur in natural or reference watersheds.

Provision D.4 (Assessment Requirements) specifies the assessments that the Copermittees are required to perform, based on the monitoring data collected, and will be reported as part of the Annual Report for the Water Quality Improvement Plan implementation. Provision D.4 requires the Copermittees assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c, and A.2.a.

Provision D.4 specifies the assessments that Copermittees must perform for each Watershed Management Area to assess the effectiveness of each Copermittee's jurisdictional runoff management program and the Water Quality Improvement Plan. The effectiveness of each Copermittee's jurisdictional runoff management program and Water Quality Improvement Plan is measured through these types of assessments: (a) Receiving Waters Assessments (b) MS4 Outfall Discharges Assessments, (c) Special Studies Assessments, and (d) Integrated Assessment of Water Quality Improvement Plan.

Provision D.4.a requires the Copermittees to assess the status of receiving water conditions. The monitoring data collected pursuant to Provision D.1 will be evaluated, among other information, to assess the condition of a Watershed Management Area's streams, coastal waters, enclosed bays, harbors, estuaries, and lagoons. The focus of the receiving waters assessments is to measure progress toward the objective of the CWA to "*restore and maintain the chemical, physical, and biological integrity of the Nation's waters*" as the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program are implemented within a Watershed Management Area. Provision D.4.a is consistent with 40 CFR 122.42(c)(7) which requires the Copermittees to annually report the *"[i]dentification of water quality improvements or degradation."*

Provision D.4.b includes the MS4 outfall discharges assessment requirements. The focus of MS4 outfall discharges assessments is to determine if the Copermittees' are implementing programs that comply with the requirements of the CWA for MS4 permits to "*effectively prohibit non-stormwater discharges into the storm sewers*" and "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable.*" The monitoring data collected pursuant to Provisions D.2 will be evaluated, among other information, to assess the effectiveness of the implementation of the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program. The MS4 outfall discharge assessments consist of Non-Storm Water Discharges Reduction Assessments and Storm Water Pollutant Discharges Reduction Assessments.

The Non-Storm Water Discharges Reduction Assessments are how each Copermittee will demonstrate that its jurisdictional runoff management program implementation

efforts are achieving the CWA requirement to "*effectively prohibit non-stormwater discharges into the storm sewers.*" Provision D.4.b.(1) requires each Copermittee to assess and report on its illicit discharge detection and elimination program required pursuant to Provision E.2 to reduce and effectively prohibit non-storm water and illicit discharges into the MS4 within its jurisdiction. The Non-Storm Water Discharges Reduction Assessments include specific assessment requirements applicable to each Copermittee.

As each Copermittee collects and analyzes the data collected pursuant to dry weather MS4 outfall discharges monitoring requirements of Provisions D.2.a.(2) and D.2.b, Provision D.4.b.(1) requires each Copermittee to assess the progress, assess the effectiveness of its current actions, and identify modifications necessary to increase the effectiveness of its actions toward reducing and eliminating non-storm water and illicit discharges to its MS4. The findings from these assessments are expected to be utilized by the Copermittee as part of its procedures to prioritize the non-storm water discharges that will be addressed by its Illicit Discharge Detection and Elimination program required pursuant to Provision E.2.

The assessment requirements of Provision D.4.a.(1) are consistent with 40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(3) which require "*procedures…to investigate portions of the separate storm sewer system that, <u>based on the results of the field screen, or other appropriate information</u> [emphasis added], indicate a reasonable potential of contain illicit discharges or other sources of non-storm water*" as part of a "*program…to detect and remove…illicit discharges and improper disposal into the storm sewer.*" The assessment requirements of Provision D.4.a.(1) are also consistent with 40 CFR122.42(c)(1) requires the Copermittees to annually report the "*status of implementing the components of the storm water management program that are established as permit conditions.*"

The Storm Water Pollutant Discharges Reduction Assessment is how the Copermittees in each Watershed Management Area will demonstrate that their jurisdictional runoff management program implementation efforts are achieving the CWA requirement to "*reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable*." Provision D.4.b.(2) requires the Copermittees in each Watershed Management Area to assess and report the progress of the Copermittees' efforts to reduce pollutants in storm water discharges from the MS4s to the MEP. The Storm Water Pollutant Discharges Reduction Assessments include specific assessment requirements applicable to the Watershed Management Area and each Copermittee.

As the Copermittees collect and analyze the data collected pursuant to wet weather MS4 outfall discharges monitoring requirements of Provisions D.2.a.(3) and D.2.c, Provision D.4.b.(2) requires the Copermittees to assess the progress of the Water Quality Improvement Plan strategies toward reducing pollutants in storm water from the MS4 to the MEP. The findings from these assessments are expected to be utilized by the Copermittees to identify any modifications to the wet weather MS4 outfall

discharge monitoring locations and frequencies necessary to identify sources of pollutants in storm water discharges from the MS4s, as well as focus, modify, and improve the water quality improvement strategies implemented by each Copermittee within its jurisdiction to reduce pollutants in storm water discharges to the MEP.

The assessment requirements of Provision D.4.a.(1) are consistent with 40 CFR 122.26(d)(2)(iii)(B) which requires "*[e]stimates of the annual pollutant load of the cumulative discharges to waters of the United States from all identified municipal outfalls…during a storm event…accompanied by a description of the procedures for estimating constituent loads and concentrations, including any modeling, data analysis, and calculation methods.*" The assessment requirements of Provision D.4.a.(2) are consistent with 40 CFR 122.26(d)(2)(v) which requires that each Copermittee assesses the *"estimated reductions in loadings of pollutants from discharges of municipal storm sewer constituents from municipal storm sewer systems expected as the result of the municipal storm water quality management program."* The assessment requirements of Provision D.4.a.(2) are also consistent with 40 CFR122.42(c)(1) requires the Copermittees to annually report the "*status of implementing the components of the storm water management program that are established as permit conditions.*"

Provision D.4.c includes the special studies assessment requirements. Performing special studies are how the Copermittees will address data gaps identified during the development of and updates to the Water Quality Improvement Plan The relevant findings from the special studies assessments are expected to be incorporated as part of the applicable receiving water assessments, MS4 outfall discharge assessments, and integrated water quality improvement assessments required in Provision D.4.a, D.4.b, and D.4.d, respectively.

The assessment requirements in Provision D.4.d are part of the iterative approach and adaptive management process required by Provision A.4. The Copermittees are required to integrate the data collected pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision D to re-evaluate the Water Quality Improvement Plan.

The monitoring data collected pursuant to Provisions D.1 and D.2, and the results of the assessment required pursuant to Provisions D.4.a-c, will be used to determine whether the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program are effective, or require modifications or improvements to become more effective to achieve the requirements of the CWA. The assessments required by Provision D.4.d are consistent with 40 CFR 122.42(c)(1) which requires that the Copermittees to report the *"[t]he status of implementing the components of the storm water management program that are established as permit conditions."*

E. Jurisdictional Runoff Management Programs

Purpose: Provision E includes the requirements for the jurisdictional runoff management programs to be implemented by each of the Copermittees. Compliance with the requirements for the jurisdictional runoff management programs will allow the Copermittees to demonstrate that they are implementing programs to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP. The jurisdictional runoff management program document prepared by each Copermittee will also provide the details for implementing the water quality improvement strategies identified in the Water Quality Improvement Plan specifically within its jurisdiction.

***Discussion*:** Implementation of the jurisdictional runoff management program requirements under Provision E is how the Copermittees "*effectively prohibit non-stormwater discharges into the storm sewers*", and outlines the "*controls to reduce the discharge of pollutants to the maximum extent practicable"* consistent with the federal regulations under 40 CFR 122.26. The jurisdictional runoff management program is part of the "*comprehensive planning process*" that is required pursuant to 40 CFR 122.26(d)(2)(iv). Where the Water Quality Improvement Plan is the "*comprehensive planning process*" on a Watershed Management Area scale, requiring "*intergovernmental coordination*", the jurisdictional runoff management program document is the "*comprehensive planning process*" on a jurisdictional scale that should be coordinated with the other Copermittees in the Watershed Management Area to achieve the goals of the Water Quality Improvement Plan.

The jurisdictional runoff management program requirements are included to provide each Copermittee criteria that can be used to demonstrate that its storm water management program is implementing the "*comprehensive planning process*" within its jurisdiction to "*effectively prohibit non-stormwater discharges into the storm sewers*", and to identify and implement the most effective "*controls to reduce the discharge of pollutants to the maximum extent practicable"* in accordance with the performance standards given in the CWA.

Provision E includes the requirements for each of the components that must be included in the Copermittee's jurisdictional runoff management program document that will be implemented by the Copermittee within its jurisdiction. Implementation of the components of each Copermittee's jurisdictional runoff management program must be consistent with the water quality improvement strategies identified in the Water Quality Improvement Plans.

More specific and detailed discussions of the requirements of Provision E are provided below.

Provision E.1 (Legal Authority Establishment and Enforcement) requires to each Copermittee to establish and enforce sufficient legal authority to control discharges to the MS4 within its jurisdiction.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system*" and be able to demonstrate that it can "*operate pursuant to legal authority established by statute, ordinance or series of contracts.*" Provision E.1.a describes the minimum legal authorities each Copermittee must establish for itself within its jurisdiction to control discharges to its MS4 The requirements of Provision E.1.a are consistent with the requirements set forth in 40 CFR 122.26(d)(2)(i)(A)-(F).

The certification statement required from each Copermittee by Provision E.1.b is included to provide the San Diego Water Board additional documentation that each Copermittee has established the legal authorities consistent with Provision E.1.a and 40 CFR 122.26(d)(2)(i)(A)-(F), and the Copermittee can "*operate pursuant to legal authority established by statute, ordinance or series of contracts.*"

Provision E.2 (Illicit Discharge Detection and Elimination) requires each to Copermittee to implement an illicit discharge detection and elimination program to effectively prohibit non-storm water discharges to the MS4 by actively detecting and eliminating illicit discharges and disposal into its MS4.

Provision E.2 establishes the minimum requirements that each Copermittee must implement within its jurisdiction to prevent and eliminate illicit discharges, and effectively prohibit non-storm water discharges, from entering its MS4. The federal CWA requires permits for municipal storm sewer systems to "*effectively prohibit non-storm water discharges into the storm sewers*." Under 40 CFR 122.26(d)(2)(iv)(B), each Copermittee must implement a "*program…to detect and remove…illicit discharges and improper disposal into the storm sewer.*" The federal NPDES regulations, under 40 CFR 122.26(b)(2), define illicit discharges as "*any discharge to a municipal separate storm sewer that is not composed entirely of storm water*. Thus, non-storm water discharges are not authorized to enter the MS4 and are considered to be illicit discharges, unless authorized by a separate NPDES permit.

The Phase I Final Rule clarifies that non-storm water discharges through an MS4 are not authorized under the CWA (55 FR 47995):

> "*Today's rule defines the term "illicit discharge" to describe any discharge through a municipal separate storm sewer system that is not composed entirely of storm water and that is not covered by an NPDES permit. Such illicit discharges are not authorized under the Clean Water Act. Section 402(p(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…Ultimately, such non-storm water discharges through a municipal separate*

> *storm sewer must either be removed from the system or become subject to an NPDES permit*."

The federal NPDES requirements for the program to address illicit discharges must include "*inspections, to implement and enforce an ordinance, orders, or other similar means to prevent illicit discharges to the MS4*." The federal NPDES regulations also reference several categories of "*non-storm water discharges or flows* [which] *shall be addressed where such discharges are identified…as sources of pollutants to waters of the United States*." The Phase I Final Rule (55 FR 48037) further clarified the requirements of 40 CFR 122.26(d)(2)(iv)(B)(1) as follows:

> "*EPA is clarifying that section 402(p)(3)(B) of the CWA (which requires permits for municipal separate storm sewers to 'effectively' prohibit non-storm water discharges) does not require permits for municipalities to prohibit certain discharges or flows of nonstorm water to waters of the United States through municipal separate storm sewers in all cases*."

In previous iterations of the municipal storm water permits for the San Diego Region, these categories were simply listed and referred to as categories of non-storm water discharges "not prohibited" unless identified as a source of pollutants. The Copermittees have often referred to these categories as "exempt" discharges. In both cases, however, the language is inconsistent with the federal CWA and NPDES regulations. And, the clarification provided in the Phase I Final Rule does not specifically state that such discharges are "not prohibited" or "exempt" or in any way authorized. The federal NPDES regulations do, however, state that specific categories of non-storm water discharges must be "*addressed*" if identified as "*sources of pollutants to waters of the United States*."

The language of Provision E.2.a has been revised to be fully consistent with the language of the CWA and the requirements of the federal regulations under 40 CFR 122.26(d)(2)(iv)(B)(1). Provision E.2.a requires each Copermittee to address <u>all</u> types of non-storm water discharges into its MS4 as illicit discharges, <u>unless</u> the discharge is authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to Provisions E.2.a.(1) through E.2.a.(5). Only non-NPDES-permitted non-storm water discharges identified as a category of non-storm water discharges under Provisions E.2.a.(1) through E.2.a.(5) <u>and</u> *not identified as a source of pollutants* do not have to be addressed as illicit discharges.

Several of the non-storm water categories listed in 40 CFR 122.26(d)(2)(iv)(B)(1) have not been included in Provisions E.2.a.(1) through E.2.a.(5), including: street wash water, landscape irrigation, irrigation water, and lawn watering. Because these are no longer included within the categories listed under Provisions E.2.a.(1) through E.2.a.(5), the Copermittees must prohibit these types of non-storm water discharges from entering the MS4. This is consistent with the clarification of 40 CFR 122.26(d)(2)(iv)(B)(1) in the Phase I Final Rule (55 FR 48037), which states:

"*[T]he Director may include permit conditions that either require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*."

Street wash water is a category of non-storm water discharges that was removed when the Third Term Permits were issued. Street wash water is a source of several pollutants (e.g., metals, oil and grease, petroleum hydrocarbons, chlorinated solvents, sediment) which are generated during the street washing process. The removal of this category requires the Copermittees to prohibit this type of non-storm water discharge from entering the MS4.

The landscape irrigation, irrigation water, and lawn watering categories, collectively referred to hereafter as "over-irrigation" discharges, were removed from the list of non-storm water discharge categories in the Fourth Term Orange County and Riverside County Permits. Non-storm water discharges resulting from over-irrigation have been found to be a source of several types of pollutants (e.g., nutrients, bacteria, pesticides, sediment) in receiving waters. The San Diego Water Board and the Copermittees have identified categories of non-storm water discharges associated with over-irrigation as a source of pollutants and conveyance of pollutants to the MS4 and waters of the United States in the following documents:

- **SmartTimer/Edgescape Evaluation Program (SEEP) Grant Application**

  The State Water Board allocated grant funding to the SEEP project grant application submitted in 2006, which targeted irrigation runoff by retrofitting areas of existing development and documenting the conservation and runoff improvements. The basis of this grant project is that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 is a source and conveyance of pollutants. In addition, the grant application indicated that this alteration of natural flows is impacting the beneficial uses of waters of the state and U.S. Results from the study indicate that that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 *is* a source and conveyance of pollutants. The results of this study can be applied broadly to any area where over-irrigation takes place. The grant application included the following statements:

  "*Irrigation runoff contributes flow & pollutant loads to creeks and beaches that are 303(d) listed for bacteria indicators.*"

  "*Regional program managers agree that the reduction and/or elimination of irrigation-related urban flows and associated pollutant loads may be key to successful attainment of water quality and beneficial use goals as outlined in the San Diego Basin Plan and Bacteria TMDL over the long term.*"

  "*Elevated dry-weather storm drain flows, composed primarily … of landscape irrigation water wasted as runoff, carry pollutants that impair recreational use and aquatic habitats all along Southern California's urbanized coastline. Storm*

drain systems carry the wasted water, along with landscape derived pollutants such as bacteria, nutrients and pesticides, to local creeks and the ocean. Given the local Mediterranean climate, excessive perennial dry season stream flows are an unnatural hydrologic pattern, causing species shifts in local riparian communities and warm, unseasonal contaminated freshwater plumes in the near-shore marine environment."

- **2006-2007 Orange County Watershed Action Plan Annual Reports**

The Watershed Action Plan Annual Reports for the 2006-2007 reporting period were submitted by the County of Orange, Orange County Flood Control District and Copermittees within the San Juan Creek, Laguna Coastal Streams, Aliso Creek, and Dana Point Coastal Streams Watersheds. San Juan Creek, Laguna Coastal Streams, Aliso Creek and Dana Point Coastal Streams are all currently 303(d) listed as impaired for indicator bacteria within their watersheds and/or in the Pacific Ocean at the discharge points of their watersheds. The Orange County Copermittees, within their Watershed Action Strategy Table for fecal indicator bacteria included the following:

"*Support programs to reduce or eliminate the discharge of anthropogenic dry weather nuisance flow throughout the…watershed. Dry weather flow is the transport medium for bacteria and other 303(d) constituents of concern.*"

Additionally, they state that "*conditions in the MS4 contribute to high seasonal bacteria propagation in-pipe during warm weather. Landscape irrigation is a major contributor to dry weather flow, both as surface runoff due to over-irrigation and overspray onto pavements; and as subsurface seepage that finds its way into the MS4*."

- **Fiscal Year 2008 Carlsbad Watershed Urban Runoff Management Program Annual Report**

The Carlsbad Watershed Urban Runoff Management Program Annual Report for Fiscal Year 2008 was submitted by the Carlsbad Watershed Copermittees (Cities of Carlsbad, Encinitas, Escondido, Oceanside, San Marcos, Solana Beach, and Vista, and the County of San Diego). In the Annual Report, the Carlsbad Watershed Copermittees stated the following:

"The Carlsbad Watershed Management Area (WMA) collective watershed strategy identifies bacteria, sediment, and nutrients as high priority water quality pollutants in the Agua Hedionda (904.3 – bacteria and sediment), Buena Vista (904.2 – bacteria), and San Marcos Creek (904.5 – nutrients) Hydrologic Areas. Bacteria, sediment, and nutrients have been identified as potential discharges from over-irrigation."

- **2007-2008 San Diego Bay Watershed Urban Runoff Management Program Annual Report**

  The San Diego Bay Watershed Urban Runoff Management Program 2007-2008 Annual Report was submitted by the San Diego Bay Watershed Copermittees (Cities of Chula Vista, Coronado, Imperial Beach, La Mesa, Lemon Grove, National City, and San Diego, the County of San Diego, the Port of San Diego, and the San Diego County Airport Authority). In Appendix D of the Annual Report, titled "Likely Sources of Pollutants", the San Diego Bay Watershed Copermittees identified over-irrigation of lawns as a pollutant generating activity from business and/or residential land uses for bacteria, pesticides, and sediment.

- **Copermittee Public Education Materials**

  The Orange County Public Works *Tips for Landscape & Gardening* public education brochure states: "*Fertilizers, pesticides and other chemicals that are left on yards or driveways can be blown or washed into storm drains that flow to the ocean. Overwatering lawns can also send materials into storm drains*."

  The Riverside County Flood Control and Water Conservation District *Landscape and Garden* public education brochure states: *"Soil, yard wastes, over-watering and garden chemicals become part of the urban runoff mix that winds it way through streets, gutters and storm drains before entering lakes, rivers, streams, etc. Urban runoff pollution contaminates water and harms aquatic life!"*

- **Los Penasquitos Lagoon Sedimentation/Siltation TMDL Technical Report**

  The Los Penasquitos Lagoon Sedimentation/Siltation TMDL technical report was prepared for the City of San Diego and USEPA in October 2010. The technical report was included as a technical supporting document attached to the Sediment TMDL for Los Penasquitos Lagoon staff report prepared by the San Diego Water Board, dated June 13, 2012. Under the Source Assessment section, the technical report states the following:

  > "*Dry weather loading is dominated by nuisance flows from urban land use activities such as car washing, sidewalk washing, and lawn over-irrigation, which pick up and transport sediment into receiving waters.*"

These documents confirm that non-storm water discharges associated with over-irrigation are a source of pollutants and should be addressed as illicit discharges to the MS4. Prohibiting non-storm water discharges associated with over-irrigation, however, is not a new requirement for the Copermittees because it is also consistent with and required by the Water Conservation in Landscaping Act (AB 1881, Laird).

The Water Conservation in Landscaping Act required the Department of Water Resources (DWR) to prepare a Model Water Efficient Landscape Ordinance for use by local agencies (e.g. the Copermittees). All local agencies were required to adopt a water efficient landscape ordinance by January 1, 2010. Local agencies could adopt the Water Efficient Landscape Ordinance developed by DWR, or an ordinance considered at least as effective as the Model Ordinance. The Water Efficient Landscape Ordinance includes a requirement that local agencies prohibit runoff from irrigation (§ 493.2):

> "*Local agencies shall prevent water waste resulting from inefficient landscape irrigation by* <u>*prohibiting runoff from leaving the target landscape*</u> *[emphasis added] due to low head drainage, overspray, or other similar conditions where water flows onto adjacent property, non-irrigated areas, walks, roadways, parking lots, or structures. Penalties for violation of these prohibitions shall be established locally*."

Furthermore, non-storm water discharges from over-irrigation not only transport and discharge pollutants to receiving waters, but are also a likely source of the dry weather flows causing changes to habitat within and along the receiving water bodies. Examples of habitat changes from the dry weather flows include perennialization of ephemeral streams, and conversion of saltwater and brackish water marsh habitats to freshwater marsh habitats (e.g. Los Penasquitos Lagoon). Both of these examples have resulted in the promotion of invasive species in several areas of the San Diego Region.

The removal of the over-irrigation discharges categories does not require the Copermittees to strictly prohibit lawn and landscape irrigation, but does require the prohibition of excessive irrigation water that results in non-storm water discharges to the MS4. Non-storm water discharges to the MS4 from over-irrigation must be addressed as illicit discharges by the Copermittees pursuant to the requirements of Provision E.2.

The remaining non-storm water categories listed in 40 CFR 122.26(d)(2)(iv)(B)(1) are listed under Provisions E.2.a.(1) through E.2.a.(5) and generally fall into four categories: (1) non-storm water discharges subject to existing San Diego Water Board waste discharge requirements and NPDES permits; (2) non-storm water discharges generally not expected to be a source of pollutants to receiving waters; (3) non-storm water discharges likely to contain pollutants requiring some form of control to address the pollutants prior to discharging to the MS4; and (4) non-storm water discharges or flows associated with firefighting.

Provisions E.2.a.(1) and E.2.a.(2) include several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) for which the San Diego Water Board already has developed general waste discharge requirements and NPDES permits to address the discharges. The Copermittees are only required to address these types of non-storm water discharges as illicit discharges if the Copermittees or the San Diego Water Board identifies these non-storm water discharges not having

coverage under the applicable NPDES permit or as a source of pollutants to receiving waters. Generally, if these types of non-storm water discharges have coverage under an NPDES permit and are identified as a source of pollutants to receiving waters, the Copermittees would be expected to identify the responsible dischargers and report their identities to the San Diego Water Board. The San Diego Water Board would then have the responsibility to enforce the NPDES permit and/or waste discharge requirements.

Provision E.2.a.(3) includes several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) which are generally not expected to be a source of pollutants to receiving waters, many of which originate from what are typically natural, uncontrollable sources. The Copermittees are only required to address these types of non-storm water discharges as illicit discharges if the Copermittees or the San Diego Water Board identifies these non-storm water discharges as a source of pollutants to receiving waters. Because many of these sources are generally uncontrollable, enforcing a prohibition may not be a possibility for the Copermittees. The Copermittees would be able to address these non-storm water discharges by preventing these non-storm water discharges from entering the MS4. This could potentially be achieved by sealing their MS4 structures so the discharges cannot enter the MS4.

Provision E.2.a.(4) includes several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) that are likely to contain pollutants requiring some form of control to address the pollutants prior to discharging to the MS4. At this time, an outright prohibition of these types of non-storm water discharges does not yet appear to be warranted. Thus, Provision E.2.a.(4) has includes several requirements for the Copermittees to control the pollutants from these types of non-storm water discharges. This is consistent with the clarification of the federal regulations in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board has the authority to require the Copermittees to "*control any of these types of discharges where appropriate*."

Unlike non-storm water discharges from over-irrigation, these types of non-storm water discharges are not expected to occur in close proximity to each other or very frequently. Provided these types of non-storm water discharges are controlled as required in Provision E.2.a.(4), the Copermittees would only be required to address these types of non-storm water discharges as illicit discharges if the Copermittee or the San Diego Water Board identifies these non-storm water discharges as a source of pollutants to receiving waters.

Provision E.2.a.(5) includes specific requirements for fire fighting discharges and flows. The requirements for non-storm water discharges and flows associated with fire fighting have been separated into requirements for: a) non-emergency fire fighting discharges and flows, and b) emergency fire fighting discharges and flows.

The San Diego Water Board has found that discharges from building fire suppression system maintenance (e.g. fire sprinklers) contain waste and potentially a significant source of pollutants to receiving waters. As such, the San Diego Water Board is requiring these discharges be addressed as illicit discharges by the Copermittees. Thus, the discharges to the MS4 are to be prohibited via ordinance, order or similar means. For other non-emergency fire fighting discharges and flows (i.e., flows from controlled or practice blazes, fire fighting training, and maintenance activities not associated with building fire suppression systems), the Copermittees are required to develop and implement a program to address pollutants in these non-storm water discharges and flows. This is consistent with the clarification of the federal regulations in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board has the authority to require the Copermittees to "*control any of these types of discharges where appropriate*."

For emergency fire fighting discharges and flows, the Phase I Final Rule (55 FR 48037) has clarified the requirements of 40 CFR 122.26(d)(2)(iv)(B)(1) pertaining to emergency fire fighting flows and discharges, which states:

> "*In the case of fire fighting it is not the intention of these rules to prohibit in any circumstances the protection of life and public or private property through the use of water or other fire retardants that flow into separate storm sewers*."

Thus, the requirements have been made to be consistent with the guidance provided by the Phase I Final Rule. The Order recommends that the Copermittees develop and encourage implementation of BMPs to reduce or eliminate the discharge of pollutants from emergency fire fighting flows to the MS4s and receiving waters.

The Copermittees are expected to review the dry weather MS4 outfall discharge monitoring data they collect to determine if and when there are non-storm water discharges to or from their MS4s that are a source of pollutants to receiving waters. If the Copermittees identify one of the types of non-storm water discharges listed in Provisions E.2.a.(1) through E.2.a.(4) as a source of pollutants to receiving waters based on the review and evaluation of monitoring data, Provision E.2.a.(6) requires the Copermittees to prohibit those categories of discharges from entering the MS4 through ordinance, order or similar means.

Provision E.2.a.(6) also clarifies that the San Diego Water Board may identify categories of non-storm water discharges or flows listed under Provisions E.2.a.(1) through E.2.a.(4) that must be prohibited. This is consistent with the clarification of 40 CFR 122.26(d)(2)(iv)(B)(1) in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board may "*require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*."

Finally, Provision E.2.a.(7) has been included in the requirements for non-storm water discharges to clarify that any non-storm water discharges to the Copermittee's MS4, even those identified pursuant to Provisions E.2.a.(1) through E.2.a.(4), must be

reduced or eliminated. Provision E.2.a.(7) is consistent with the requirements of CWA section 402(p)(3)(B)(ii) and 40 CFR 122.26(d)(1)(v)(B), as clarified in the Phase I Final Rule (55 FR 47995) that "*[u]ltimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit*."

Consistent with 40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(1), each Copermittee must implement a "*program…to prevent illicit discharges to the municipal storm sewer system*" and "*detect…illicit discharges and improper disposal into the storm sewer.*" Provision E.2.b requires each Copermittee to implement measures to prevent and detect illicit discharges and connections to its MS4 as part of its illicit discharge detection and elimination program.

As part of the program to prevent and detect illicit discharges to the MS4, 40 CFR 122.26(d)(2)(iv)(B)(2) requires "*procedures to conduct on-going field screening activities during the life of the permit, including areas or locations that will be evaluated by such field screens*." As part of the procedures, each Copermittee is required to maintain an updated map of its entire MS4 and the corresponding drainage areas within its jurisdiction. Having knowledge about where inlets, access points, connections with other MS4s, and outfalls are located is necessary for each Copermittees to track, identify, and eliminate illicit discharges and connections. Thus, Provision E.2.b.(1) of the Order specifies that the map must include the segments of the storm sewer system owned, operated, and maintained by the Copermittee, and include locations of all known inlets, connections with other MS4s, and outfalls to the Copermittee's MS4. The remaining requirements of Provision E.2.b are consistent with the requirements of 40 CFR 122.26(d)(2)(iv)(B)(3)-(7) related to implementing measures to prevent and detect illicit discharges and connections to the MS4.

Provision E.2.c requires each Copermittee to conduct field screening and monitoring of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4. Field screening is a required element of the program to detect and eliminate illicit discharges and connections to the MS4, pursuant to 40 CFR 122.26(d)(2)(iv)(B)(2). The field screening requirement will be implemented through the dry weather MS4 outfall discharge monitoring required under Provisions D.2.a.(2) and D.2.b.(1).

Provision E.2.d specifies the measures each Copermittee must implement to eliminate illicit discharges and connections to its MS4. Elimination of illicit discharges and connections to the MS4 is consistent with the requirement of 40 CFR 122.26(d)(2)(iv)(B) "*to detect and <u>remove</u> [emphasis added]…illicit discharges and improper disposal into the storm sewer*" and will achieve the CWA requirement for MS4 permits to "*effectively prohibit non-storm water discharges into the storm sewers*."

Generally, each Copermittee is responsible for prioritizing its efforts to eliminate non-storm water and illicit discharges or connections to its MS4 based on field screening and monitoring data, NALs, illicit discharge investigation records, and the known or

suspected sources. Sources of non-storm water and illicit discharges or connections must be eliminated by enforcing the legal authority established by each Copermittee pursuant to Provision E.1.

Finally, Provision E.2.e requires the Copermittee to include the strategies and/or activities identified in the Water Quality Improvement Plan that the Copermittee will implement as part of the illicit discharge detection and elimination program within its jurisdiction. The Water Quality Improvement Plan is expected to include several strategies and options that the Copermittee can and should implement within its jurisdiction. The Copermittee is expected to describe and provide the details of when, where, and how those strategies will be implemented within its jurisdiction.

The San Diego Water Board will utilize the information provided in the jurisdictional runoff management program document pursuant to Provision E.2.e to gauge and assess the Copermittee's efforts in trying to address the highest priority water quality conditions identified in the Water Quality Improvement Plan within its jurisdiction.

Provision E.3 (Development Planning) requires each Copermittee to use its land use and planning authority to implement a development planning program to control and reduce the discharge of pollutants in storm water from new development and significant redevelopment to the MEP. Proper implementation of the development planning program will also contribute toward effectively prohibiting non-storm water discharges from development projects to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." As part of the management program, 40 CFR 122.26(d)(2)(iv)(A)(2) requires "*planning procedures including a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment*."

Development typically includes the construction of impervious surfaces such as sidewalks, driveways, roads, and rooftops. These impervious surfaces generate and concentrate pollutants (such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not found in high concentrations in the natural environment. Pollutants that accumulate on impervious surfaces are not easily biodegraded or not subject to natural treatment processes. When it rains, these pollutants are transported in storm water runoff from these impervious surfaces into receiving waters, resulting in poor water quality and degradation of beneficial uses.

In addition to the generation of pollutants, development generally alters the natural conditions of the land by removing vegetative cover, reducing the perviousness of the surface, and reducing the capacity of storm water that can be intercepted, captured, stored, infiltrated, evaporated, and/or evapotranspired. The alteration of the natural

conditions and addition of impervious surfaces associated with development causes water quality problems. Hydrograph modification, or hydromodification, is the change in the natural watershed hydrologic processes and runoff characteristics caused by development or other land use changes that result in increased stream flows, altered sediment transport, and morphological changes to channels receiving the runoff.

This is consistent with what USEPA has noted, that "*[m]ost stormwater runoff is the result of the man-made hydrologic modifications that normally accompany development. The addition of impervious surfaces, soil compaction, and tree and vegetation removal result in alterations to the movement of water through the environment. As interception, evapotranspiration, and infiltration are reduced and precipitation is converted to overland flow, these modifications affect not only the characteristics of the developed site but also the watershed in which the development is located. Stormwater has been identified as one of the leading sources of pollution for all waterbody types in the United States. Furthermore, the impacts of stormwater pollution are not static; they usually increase with more development and urbanization*."[28]

Reducing the impact from the increased pollutant loads and flows generated by impervious surfaces added to a watershed is essential to protecting and restoring the integrity of the receiving waters. Provision E.3 includes the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment*." The requirements of Provision E.3 will 1) minimize the generation and discharge of pollutants in storm water from the MS4, and 2) minimize the potential of storm water discharges from causing altered flow regimes and excessive downstream erosion in receiving waters.

Provision E.3 is based on the requirements of the Fourth Term Permits for Orange County and Riverside County, and do not differ significantly from the Fourth Term Permit for San Diego County. Provision E.3 has been modified to allow the more holistic, long-term planning approach of the Water Quality Improvement Plan to be incorporated into each Copermitee's development planning. The result will be greater pollutant removal from storm water runoff, and improvements and/or rehabilitation of the functionality and hydrologic regimes of a Watershed Management Area. Alternative compliance options have been included in Provision E.3, which will result in multiple beneficial outcomes within a jurisdiction, a subwatershed, a receiving water body, and/or a Watershed Management Area.

Incorporating a holistic and long-term planning approach into each Copermittee's development planning program is essential to reducing the impact of development on receiving waters. Development projects that convert natural open space areas into

[28] USEPA, 2007. Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices, December 2007.

urbanized areas result in the generation and discharge of pollutants associated with anthropogenic activities, and significant modifications to the hydrologic flow regimes. Both adversely affect the chemical, physical, and biological conditions of receiving waters. Redevelopment projects, on the other hand, are opportunities to reduce the generation of pollutants and restore more natural hydrologic flow regimes in areas of existing development, which can contribute toward restoring or rehabilitating the chemical, physical, and biological conditions of impacted and/or impaired receiving waters.

To improve the health and functionality of the receiving waters in a Watershed Management Area, planning and land use practices must change to reduce the various impacts due to hydromodification and pollutants associated with storm water runoff from developing and developed areas. Planning principles to preserve, enhance, and restore the functionality and hydrologic regimes were incorporated into the development planning provisions of all the Third and Fourth Term Permits within the San Diego Region. Provision E.3 of this Order focuses on mitigating the effects of development by continuing to include these principles, as well as promote the concept of utilizing storm water as a resource. By doing so, pollutants in storm water runoff generated within developing and developed areas will be treated more naturally, and storm water will be discharged to receiving waters at discharge rates that are not unnaturally erosive, thereby resulting in conditions that are more supportive of healthy and sustainable water bodies.

The requirements of Provision E.3.a are the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment*" applicable to all development projects, regardless of size or purpose of development. These requirements are based on and consistent with the requirements for all development projects in the Fourth Term Permits for San Diego, Orange, and Riverside Counties (Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016, respectively). All development projects are required to implement source control BMPs that will minimize the generation of pollutants. Additionally, each development project must implement, where applicable and feasible, LID BMPs to mimic the natural hydrology of the site and retain and/or treat pollutants in storm water runoff prior to discharging to and from the MS4.

The LID Center defines LID as "*a comprehensive land planning and engineering design approach with a goal of maintaining and enhancing the pre-development hydrologic regime of urban and developing watersheds.*"[29] LID designs seek to control storm water at the source, using small-scale integrated site design and management practices to mimic the natural hydrology of a site, retain storm water runoff by

[29] www.lowimpactdevelopment.org

minimizing soil compaction and impervious surfaces, and disconnect storm water runoff from conveyances to the storm drain system.

LID BMPs may utilize interception, storage, evaporation, evapotranspiration, infiltration, and filtration processes to retain and/or treat pollutants in storm water before it is discharged from a site. Because of these numerous options, the San Diego Water Board expects that every development project will be able to implement some form of LID BMPs. Examples of LID BMPs include using permeable pavements, rain gardens, rain barrels, grassy swales, soil amendments, and native plants.

Provision E.3.a also includes requirements for all development projects to, where feasible, landscape with native and/or low water use plants to minimize the discharge of non-storm water discharges associated with excessive irrigation, as well as harvest (i.e., storage) and use precipitation to promote the concept of utilizing storm water as a resource.

While all development projects are subject to the requirements of Provision E.3.a, Provision E.3.b identifies Priority Development Projects that exceed given size thresholds and/or fit under specific use categories. Priority Development Projects are required to incorporate specific performance criteria for structural BMPs incorporated into the project plan to reduce the generation of pollutants, and address potential impacts from hydromodfication.

The Priority Development Project categories are based on the requirements of the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), and do not differ significantly from the Fourth Term Permit for San Diego County. Furthermore, the Priority Development Project categories are consistent with Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), and Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit).

Priority Development Projects generally include new development and significant redevelopment projects that can generate large amounts of pollutants, or have large areas of impervious surface that will contribute to adverse impacts in receiving waters. Placement of impervious surfaces within the environment not only generates and accumulates significant amounts of pollutants that will be transported in storm water runoff, but also drastically modifies the natural hydrologic processes within the watersheds.

Impervious surfaces do not allow natural infiltration and treatment of storm water runoff to take place. Instead, storm water runoff from impervious surfaces have typically been directed through pipes, curbs, gutters, and other hardscape into receiving waters, with little treatment at significantly increased volumes and accelerated flow rates over what would occur naturally. The increased pollutant loads, storm water volume, discharge rates and velocities, and discharge durations discharged from the MS4 adversely impacts the flora and fauna of receiving waters, and causes increased,

unnatural erosion and scouring within creek bed and banks. Placement of impervious surfaces also encapsulates "good" sediment (such as sand, gravel, rocks and cobbles) that would normally replenish creek beds and banks to help stabilize them.

This increased and unnatural erosion, which is caused by both altered storm water flow and altered sediment flow regimes, is largely responsible for degradation of creeks, streams, and associated habitats in the San Diego Region. In an ongoing study by the Stormwater Monitoring Coalition to assess the health of streams throughout Southern California, researchers found that three of the four highest risk stressors to creeks (percent sands and fines present, channel alteration, and riparian disturbance) were related to physical habitat.[30] Researchers studying flood frequencies in Riverside County have found that increases in watershed imperviousness of only 9-22 percent can result in increases in peak flow rates for the two-year storm event of up to 100 percent.[31] Such changes in runoff have significant impacts on channel morphology.

In addition, a technical report issued by the Southern California Coastal Water Research Project (SCCWRP) stated that "*[r]ecent studies indicate that California's intermittent and ephemeral streams are more susceptible to the effects of hydromodification than streams from other parts of the United States. Physical degradation of stream channels in the central and eastern United States can initially be detected when watershed impervious cover approaches 10 percent, although biological effects (which may be more difficult to detect) may occur at lower levels. In contrast, initial response of streams in the semi-arid portions of California appears to occur between 3 and 5 percent impervious cover*."[32] These studies highlight the extent to which impacts originating from impervious surfaces created by development are responsible for the degradation and hydromodification of creeks and streams.

Because the impact relatively small increases in impervious surfaces in a watershed can have on receiving waters, Provision E.3.b.(2)(g) has been updated to include large driveways. Although they generally do not carry heavy traffic, paved, impervious driveways that are 5,000 square feet or more create significant areas of impervious surface that contribute to altered flow regimes, and are also sometimes used for storage of motor vehicles that can generate significant amounts of pollutants.

The Copermittees have identified several types of projects that they assert would be cost prohibitive if they were categorized as Priority Development Projects, and would discourage development or redevelopment within their jurisdictions. Many of these types of projects may not pose a threat when considered individually. However, collectively and cumulatively, several of these projects would likely cause significant impacts to receiving waters if they were all located within a subwatershed, watershed,

[30] Assessing the Health of Southern California Streams, Stormwater Monitoring Coalition, Fact Sheet
[31] Schueler and Holland, 2000. Storm Water Strategies for Arid and Semi-Arid Watersheds (Article 66). The Practice of Watershed Protection.
[32] Stein, E. and Zaleski, S., 2005. Technical Report 475, Managing Runoff to Protect Natural Streams: The Latest Development on Investigation and Management of Hydromodification in California. December 30, 2005.

and/or Watershed Management Area. Thus, these types of development projects should be required to implement structural BMPs that Priority Development Projects are required to implement to be protective of water quality.

Provision E.3.b.(3), however, does provide exemptions for several of these types of development projects identified by the Copermittees from being defined as Priority Development Projects. Development projects that are not Priority Development Projects are not required to be included in the inventory of Priority Development Projects that must be maintained by each Copermittee pursuant to Provision E.3.e.(2). In addition, structural BMPs on development projects that are not Priority Development Projects are not required to be inspected pursuant to Provision E.3.e.(3). Inspections of development projects that are not Priority Development Projects, however, will be performed as part of the existing development inspections required pursuant to Provision E.5.c.

The exemptions under Provision E.3.b.(3) are provided for development projects that meet certain conditions. The exemptions have been provided as an incentive for the Copermittees to encourage and promote the implementation of LID design concepts and green infrastructure and building principles. The conditions for allowing those exemptions have been included to provide an incentive for developers to implement LID design concepts and green infrastructure and building principles. Development projects that meet the conditions of Provision E.3.b.(3) are not expected to be cost prohibitive and also expected to be protective of water quality.

For development projects identified as Priority Development Projects, the requirements of Provision E.3.c are the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment.*" Provisions E.3.c.(1)-(3) describe the performance criteria for the structural BMPs that must be implemented for each Priority Development Project defined by Provision E.3.b.

Provisions E.3.c.(1)-(3) and emphasize preserving natural watershed hydrology by requiring retention of storm water and management of flows to maintain or mimic the natural hydrology of a site. The holistic and long-term planning approach of the Water Quality Improvement Plans is incorporated into Provisions E.3.c.(1)-(3) by encouraging the Copermittees to improve or rehabilitate watershed functionality and flow regimes with a combination of strategies.

Provision E.3.c.(1) describes the storm water pollutant control BMP requirements that must be implemented by all Priority Development Projects. The purpose of Provision E.3.c.(1) is to reduce pollutants in storm water runoff to the MEP from Priority Development Projects before it is discharged to the MS4. Of all the available treatment processes available, retention of storm water, and therefore capture of the pollutants in the storm water, will achieve 100 percent pollutant removal efficiency for

the volume of storm water retained. No other method of treatment can achieve 100 percent pollutant removal efficiency. Thus, retention of as much storm water onsite is the most effective way to reduce pollutants in storm water discharges to and from the MS4, and controls pollutants in storm water discharges from a site to the MEP.

Under Provision E.3.c.(1)(a)(i), retention of the 85th percentile storm event is the default design standard that Priority Development Projects must use to implement to mimic the pre-development retention volume ("design capture volume"). Since the 85th percentile storm event has previously been used as the numeric design standard for treatment control BMPs, the same size storm event has been applied as the numeric design standard for the storm water pollutant control BMP requirements. This is consistent with the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), as well as Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), and Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit).

The 85th percentile storm event is the event that has a precipitation total greater than or equal to 85 percent of all storm events over a given period of record in a specific area or location. For example, to determine what the 85th percentile storm event is in a specific location, all 24 hour storms that have recorded values over a 30 year period would be tabulated and a 85th percentile storm would be determined from this record (i.e., 15 percent of the storms would be greater than the number determined to be the 85th percentile storm). Most jurisdictions in the San Diego Region have already developed isopluvial maps that can provide this type of information. The 85th percentile storm might be determined to be a number such as 1.0 inch, and this would be multiplied by the total area of the project footprint to calculate the design capture volume. The Priority Development Project designer would then select a system of BMPs that would retain (i.e. intercept, infiltrate, store, evaporate, evapotranspire, or harvest and use) the design capture volume, based on the 85th percentile storm event, onsite.

Retention of all storm water and all pollutants in storm water onsite for the 85th percentile storm event, however, may not always mimic the natural pre-development retention volume. Retention of the volume generated by the 85th percentile storm event also may not be practical, nor desirable, as storm water flows are a necessary component of the natural hydrologic processes in a watershed.

The optimum amount of storm water retained onsite would mimic the pre-development retention volume of the project site. Mimicking the pre-development retention volume is an approach USEPA allows for federal development projects. USEPA issued guidance on implementing storm water runoff requirements for federal projects that requires the retention of the 95th percentile storm event as the default design standard

to mimic the pre-development hydrology of a project site.[33] The USEPA guidance also provided an option to develop a site-specific design standard. Similar to the USEPA guidance for federal facilities, Provision E.3.c.(1)(a)(ii) provides an option to develop a site specific design capture volume that would mimic the pre-development retention volume of the project site.

Retention BMPs will be designed to capture a specific volume, and may take some time for the intercepted or captured storm water to infiltrate, evaporate, evapotranspire, or be used. Retention of the design capture volume, however, will capture and retain a significant portion of the pollutants generated and accumulated on a Priority Development Project. In a recent study performed by SCCWRP in the Los Angeles Region, they found "*that the magnitude of constituent load associated with storm water runoff depends, at least in part, on the amount of time available for pollutant build-up on land surfaces. The extended dry period that typically occurs in arid climates such as southern California maximizes the time for constituents to build-up on land surfaces, resulting in proportionally higher concentrations and loads during initial storms of the season*."[34] This implies that the "first flush" of a rainy season and the first storm events after long antecedent dry periods tend to have the highest pollutant loads. Capturing and retaining the pollutant loads of the "first flush" of a rainy season and the first storm events after long antecedent dry periods will reduce a significant portion of the pollutants in storm water discharged to and from the MS4.

The San Diego Water Board, however, acknowledges that in some situations retaining the design capture volume fully onsite may not be technically feasible, may be cost prohibitive, or may not provide any overall water quality benefits to the Watershed Management Area. Thus, Provision E.3.c.(1)(b) allows for the use of a combination of onsite retention BMPs, and alternative compliance options described in Provision E.3.c.(3). Provision E.3.c.(3) is discussed in more detail below.

If the design capture volume is not retained onsite because the Priority Development Project is allowed to implement alternative compliance options, the pollutants in the portion of the design capture volume not reliably retained onsite must still be reduced to the MEP. Thus, flow-thru conventional treatment control BMPs are required to be implemented on Priority Development Projects in addition to the retention BMPs and/or biofiltration BMPs. The requirements of Provision E.3.c.(1)(c) include the performance standards for flow-thru conventional treatment control BMPs, consistent with the Fourth Term Permits in the San Diego Region.

Where the purpose of the requirements under Provision E.3.c.(1) is to reduce pollutants in storm water runoff to the MEP, the purpose of the requirements under Provision E.3.c.(2) is to maintain or restore more natural hydrologic flow regimes to

[33] USEPA, 2009. Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act, EPA 841-B-09-001. December 2009.
[34] Stein, E.D., Tiefenthaler, L.L., and Schiff, K.C., 2007. Technical Report 510, Sources, Patterns and Mechanisms of Storm Water Pollutant Loading from Watershed and Land Uses of the Greater Los Angeles Area, California, USA. March 20, 2007.

prevent increased, unnatural erosion in downstream receiving waters to the MEP. Provision E.3.c.(2) describes hydromodification management BMP requirements that must be implemented by all Priority Development Projects.

The development planning requirements under the Fourth Term Permits required the Copermittees in San Diego County, Orange County, and Riverside County to develop Hydromodification Management Plans (HMPs). Because the Copermittees have already developed HMPs, there is no longer a requirement to develop these plans. The Copermittees in each county, however, must update to their respective HMPs, as needed, to incorporate the hydromodification management BMP requirements of Provision E.3.c.(2).

The performance criteria for the implementation of hydromodification management BMPs on Priority Development Projects are consistent with the requirements in the Fourth Term Permits for Orange and Riverside Counties (Order Nos. R9-2009-0002 and R9-2010-0016, respectively). Modifications to the Orange County and Riverside County HMPs will likely be minor, or may not be necessary. The HMP for San Diego County, however, will likely require some modifications to incorporate the requirements of Provision E.3.c.(2) and become consistent with the Orange County and Riverside County HMPs. The San Diego Water Board does not, however, expect that it will be necessary for the San Diego County Copermittees to develop a new approach or significantly re-write the San Diego County HMP.

Provision E.3.c.(2)(a) requires that post-project flow rates and durations mimic the *pre-development* condition, and not the *pre-project* condition of the Fourth Term San Diego County Permit. This includes assuming artificially hardened channels receiving storm water discharges from a Priority Development Project have the characteristics of a natural stream segment similar to that found in the watershed. Provision E.3.c.(2)(a) will primarily apply to redevelopment projects and artificially hardened channels, whose pre-project conditions have already significantly altered the natural hydrologic regime. This will allow more natural hydrologic flow regimes to eventually be restored in the developed areas of the Watershed Management Areas, which can in turn allow hydromodified streams and creeks to eventually be restored or rehabilitated.

Provision E.3.c.(2)(b) requires hydromodification management BMPs to compensate for sediment loss in cases where the development would cause loss of sediment supply as a result of the project. Maintaining the pre-development flows and durations from a Priority Development Project will significantly reduce the potential for increased erosion caused by development. Loss of natural sediment because pervious areas covered by the impervious surfaces on the Priority Development Project, however, can still cause increased, unnatural erosion in receiving waters. Runoff that is discharged from a Priority Development Project that lacks sediment becomes “sediment hungry” and can result in increased erosion upstream and downstream from the point of discharge.

The San Diego Water Board recognizes that in some situations implementing the hydromodification management BMP requirements fully onsite may not be technically feasible, may be cost prohibitive, or may not provide any overall water quality benefits to the Watershed Management Area. Thus, Provision E.3.c.(2)(c) allows for the use of a combination of onsite hydromodification management BMPs and alternative compliance options described in Provision E.3.c.(3). The San Diego County Copermittees may incorporate the alternative compliance options into their HMP. Provision E.3.c.(3) is discussed in more detail below.

Finally, Provision E.3.c.(2)(d) allows Priority Development Projects to be exempt from the hydromodification management BMP requirements under Provisions E.3.c.(3)(a)-(b) if a limited set of conditions are met.

Provision E.3.c.(3) describes the alternative compliance options that each Copermittee may allow Priority Development Projects within its jurisdiction to utilize to meet the structural BMP performance criteria of Provisions E.3.c.(1) and E.3.c.(2). Such allowances are not required and are at the discretion of each Copermittee. Provision E.3.c.(3) was included because the San Diego Water Board recognizes that various site specific conditions can make complying with the structural BMP performance criteria requirements fully onsite difficult or impractical, and implementing the alternative compliance options can potentially realize or achieve greater water quality benefits for the Watershed Management Area.

Provision E.3.c.(3)(a) includes the conditions that must be met for a Copermittee to allow a Priority Development Project to utilize the alternative compliance options to comply with the structural BMP performance criteria of Provisions E.3.c.(1) and E.3.c.(2). Priority Development Projects that cannot comply with the requirements of Provision E.3.c.(3)(a) must be required by the Copermittee to comply with the requirements of Provisions E.3.c.(1) and E.3.c.(2) fully onsite.

Provisions E.3.c.(3)(b)-(d) describe the alternative compliance options that the Copermittee may develop and/or allow to be implemented by Priority Development Projects. The descriptions include the conditions that must be met for the alternative compliance option to be allowed to be utilized by a Priority Development Project. For the alternative compliance project options under Provision E.3.c.(3)(b), the descriptions also specify if the alternative compliance options may only be implemented to comply with the storm water pollutant control BMP requirements of Provision E.3.c.(1), hydromodification management BMP requirements of Provision E.3.c.(2), or both.

Provisions E.3.c.(4) and E.3.c.(5) were included under the BMP requirements applicable to all development projects in the Fourth Term Permits for San Diego, Orange, and Riverside Counties (Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016, respectively). In this Order, the long-term BMP maintenance and infiltration and groundwater protection requirements were move under the structural

BMP performance requirements of Provision E.3.c and only apply to structural BMPs implemented by Priority Development Projects.

Provision E.3.d requires the Copermittees to update their BMP Design Manual as needed to incorporate the requirements of Provision E.3. The BMP Design Manual is formerly known as the Standard Storm Water Mitigation Plan, or SSMP, and was renamed so that the title has a more accurate description of the document content. The contents of the BMP Design Manual are largely unchanged from the previous Standard Storm Water Mitigation Plans required under the Fourth Term Permits. The BMP Design Manual fulfills the 40 CFR 122.26(d)(2)(iv)(A)(2) requirement that the Copermittee's development planning program includes "*a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment*."

As part of the "*planning procedures*", 40 CFR 122.26(d)(2)(iv)(A)(2) requires the procedures to "*address controls to reduce pollutants in discharges from municipal separate storm sewers after construction is completed*." The requirements applicable to the implementation and oversight of structural BMPs at Priority Development Projects are provided under Provision E.3.e.

Proper installation of the structural BMPs approved for a Priority Development Project is necessary to ensure that pollutants in storm water discharges will be reduced to the MEP after the project is completed. In addition to the proper installation of structural BMPs, the maintenance of structural BMPs on Priority Development Projects is necessary to ensure that pollutants in storm water discharges will continue to be reduced to the MEP. Provision E.3.e.(1) includes the minimum requirements that each Copermittee must implement to ensure structural BMPs are properly installed and will be properly maintained.

The requirements under Provision E.3.e.(2)-(3) are necessary to demonstrate each Copermittee is implementing a program that complies with Provisions E.3.b-c and E.3.e.(1), and ensure structural BMPs at Priority Development Project will continue to be able to reduce pollutants in storm water discharges to the MEP.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary for any development projects to compel compliance with the requirements of Provision E.3 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.3.f requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Finally, Provision E.3.g requires the Copermittee to include the strategies and/or activities identified in the Water Quality Improvement Plan that the Copermittee will

implement as part of the development planning program within its jurisdiction. The Water Quality Improvement Plan is expected to include several strategies and options that the Copermittee can and should implement within its jurisdiction. The Copermittee is expected to describe and provide the details of when, where, and how those strategies will be implemented within its jurisdiction.

Provision E.3.g specifically requires the Copermittee to identify areas within its jurisdiction where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting and/or stream, channel, or habitat rehabilitation projects. This requirement has been included to promote and encourage cooperation between the Copermittees and the development community to implement projects that can reduce pollutants in storm water runoff from areas of existing development, and stabilize or rehabilitate channels, stream and/or habitats that have been hydromodified because of existing development.

Furthermore, Provision E.3.g encourages the Copermittee to collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify regional alternative compliance projects that Priority Development Projects may be allowed or should be encouraged to implement or participate in implementing. This requirement has been included to promote and encourage more collaboration and coordination, as well as long term planning, among Copermittees and other entities in the Watershed Management Area.

The San Diego Water Board will utilize the information provided in the jurisdictional runoff management program document pursuant to Provision E.3.g to gauge and assess the Copermittee's efforts in trying to address the highest priority water quality conditions identified in the Water Quality Improvement Plan within its jurisdiction.

Provision E.4 (Construction Management) requires each Copermittee to implement a construction management program to control and reduce the discharge of pollutants in storm water from construction sites to the MEP. Proper implementation of the construction management program will also contribute toward effectively prohibiting non-storm water discharges from construction sites to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." As part of the management program, 40 CFR 122.26(d)(2)(iv)(D) requires "*a program to implement and maintain structural and non-structural best management practices to reduce pollutants in storm water runoff from construction sites to the municipal storm sewer system.*"

Construction sites can be significant sources of sediment, trash, and other pollutants to receiving waters. Although sediment is naturally occurring in the natural

environment, the discharge of sediment under unnatural conditions is problematic to receiving waters. Fine sediment in creeks causes high turbidity that interferes with the functionality of native flora and fauna in local creeks. For example, turbidity interferes with both photosynthesis of water-philic plants, as well as successful foraging and reproduction of benthic macroinvertebrates. Sediment can also make it difficult for fish to breathe because it clogs fish gills. Other pollutants such as heavy metals or pesticides can adhere to sediment and are transported to receiving waters during storm events, where they dissolve in the water column and become bioavailable to aquatic organisms. Sediment is recognized as a major stressor to surface waters and is responsible for the impairment of several lagoons and creeks in the San Diego Region.

Provision E.4 includes requirements that each Copermittee must implement to minimize the discharge of sediment and other pollutants from construction sites to the MS4 within its jurisdiction. The requirements under Provision E.4 are consistent with the Fourth Term Permits for San Diego, Orange, and Riverside Counties. Therefore, Copermittees are expected to implement the requirements seamlessly, with minimal changes to their existing construction management programs. The Copermittees, however, are given more flexibility to run their programs as needed to maximize efficiency, and also to be consistent with the Water Quality Improvement Plan for the Watershed Management Area.

As part of the construction management program, 40 CFR 122.26(d)(2)(iv)(D)(1) requires "*procedures for site planning which incorporate consideration of potential water quality impacts.*" Provision E.4.a describes the minimum elements each Copermittee is required to include as part of the construction site planning and project approval process. The construction site planning and approval process is based primarily on ensuring each project had an adequate site-specific pollution control, construction BMP, and/or erosion and sediment control plan that will be implemented to minimize the discharge of pollutants in storm water to the MEP, and minimize impacts to receiving waters.

The requirements under Provision E.4.b provide the data and information necessary to identify "*priorities for inspecting sites and enforcing control measures*" required pursuant to 40 CFR 122.26(d)(2)(iv)(D)(3). Under Provision E.4.b, each Copermittee must identify construction sites that are considered a high threat to downstream surface waters. Designation of "high threat to water quality" construction sites will necessitate the Copermittees to develop criteria to identify such sites. Provision E.4.b.(2) describes a list of factors that must be considered when the Copermittee considers threat to water quality. For example, a Copermittee must identify sites as "high threat to water quality" if it is located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions, according to the Water Quality Improvement Plan. This ensures that construction management program implementation is compatible with the Copermittee's identified highest priority water quality conditions.

Pursuant to 40 CFR 122.26(d)(2)(iv)(D)(2) each Copermittee is required describe "*requirements for nonstructural and structural best management practices*" at construction sites. Provision E.4.c includes the types of construction site BMPs that the Copermittees must implement, or require the implementation of, at each construction site to reduce pollutants in storm water discharges to the MEP.

Each Copermittee is expected to require the implementation of appropriate BMPs given specific site conditions, the season and likelihood of rain events, and construction phase (i.e. grading vs. vertical construction). This means that throughout the life of the project construction, the appropriate BMPs will vary, especially if the construction of the project spans multiple wet seasons. As opposed to describing specific minimum BMPs that must be implemented, the Order describes major BMP categories that should be considered for each site.

Each Copermittee is expected to use its 20 years of storm water experience and knowledge to require implementation of appropriate BMPs from the various categories at each construction site within its jurisdiction. For example, the San Diego Water Board expects that each site will be required to implement erosion control and sediment control at each construction site. The San Diego Water Board also expects each Copermittee to require implementation of active/passive sediment treatment systems at sites where other BMPs have been tried and are known to be inadequate, and discharges of sediment are causing or contributing to water quality impairment downstream. Each Copermittee is granted flexibility in specifying the minimum level of BMP requirements at each site, but the San Diego Water Board expects each site to be capable of controlling pollutants in storm water discharges to the MEP and preventing illicit discharges.

The requirements under Provision E.4.d are necessary to demonstrate that each Copermittee is implementing a program that complies with Provisions E.4.a and E.4.c and ensure BMPs at construction sites will reduce pollutants in storm water discharges to the MEP.

Provision E.4.d does not include minimum required inspection frequencies for construction sites. Each Copermittee must use its experience and knowledge to specify an appropriate inspection frequency for both high priority and lower priority sites in their jurisdictional runoff management program documents, and in accordance with the Water Quality Improvement Plan. Appropriate inspection frequencies may vary by Copermittee, but the San Diego Water Board expects that the stated frequency will be adequate for each Copermittee to properly oversee the construction sites within its jurisdiction, confirm BMPs are implemented to reduce pollutants in storm water discharges from constructions sites to the MEP, and make needed changes to its program on an ongoing basis as necessary.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary for any development projects

to compel compliance with the requirements of Provision E.4 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.4.e requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Finally, Provision E.4.f requires the Copermittee to include the strategies and/or activities identified in the Water Quality Improvement Plan that the Copermittee will implement as part of the construction management program within its jurisdiction. The Water Quality Improvement Plan is expected to include several strategies and options that the Copermittee can and should implement within its jurisdiction. The Copermittee is expected to describe and provide the details of when, where, and how those strategies will be implemented within its jurisdiction.

The San Diego Water Board will utilize the information provided in the jurisdictional runoff management program document pursuant to Provision E.4.f to gauge and assess the Copermittee's efforts in trying to address the highest priority water quality conditions identified in the Water Quality Improvement Plan within its jurisdiction.

Provision E.5 (Existing Development Management) requires each Copermittee to implement an existing development management program to control and reduce the discharge of pollutants in storm water from areas of existing development to the MEP. Proper implementation of the existing development management program will also contribute toward effectively prohibiting non-storm water discharges from areas of existing development to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." Within 40 CFR 122.26(d)(2)(iv)(A) and (C), the management program is required to reduce impacts on receiving waters and reduce pollutants in storm water discharges to the MEP from commercial and residential areas, industrial facilities, and municipal facilities.

Commercial and residential areas, industrial facilities, and municipal facilities must be addressed by each Copermittee with the existing development management program required under Provision E.5. All other areas within each Copermittee's jurisdiction should be either undeveloped open space, or areas that are being developed or under construction. Areas being developed or under construction will be addressed by the Copermittee under the requirements of Provision E.3 (Development Planning) or Provision E.4 (Construction Management).

Areas of existing development typically include impervious surfaces such as sidewalks, driveways, roads, and rooftops, which generate and concentrate pollutants (such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not found in high concentrations in the natural environment. Pollutants that

accumulate on impervious surfaces are not easily biodegraded or not subject to natural treatment processes. When it rains, these pollutants are transported in storm water runoff from these impervious surfaces into receiving waters, resulting in poor water quality and degradation of beneficial uses.

In addition to the generation of pollutants, areas of existing development have generally altered the natural conditions of the land and removed vegetative cover, reduced the perviousness of the surface, and reduced the capacity of storm water that can be intercepted, captured, stored, infiltrated, evaporated, and/or evapotranspired. The alteration of the natural conditions and the impervious surfaces associated with areas of existing development causes water quality problems due to the alteration of natural flow regimes within the watersheds, resulting in hydromodification of channels, streams and habitats that exist within or adjacent to areas of existing development.

Thus, storm water discharges from areas of existing development are responsible for poor water quality, degraded habitats, and hydromodified channels throughout the developed portions of the watersheds in the San Diego Region. To improve the health and functionality of the receiving waters in a Watershed Management Area, land use practices and the amount of impervious surfaces in areas of existing development must change to reduce the various impacts caused by hydromodification and pollutants from storm water runoff generated in developed areas. Each Copermittee must be aggressive in tackling pollutant sources and runoff from areas of existing development to be able to reduce pollutants in storm water discharges from the MS4 to the MEP.

There is some overlap in the requirements under Provision E.5 with the requirements under Provisions E.2 (Illicit Discharge Detection and Elimination), E.3 (Development Planning), and E.4 (Construction Management). Illicit discharges frequently originate from areas of existing development. New development projects, when completed will become some type of residential, commercial, industrial or municipal existing development. Redevelopment projects are, by definition, redeveloping areas of existing development. And, redevelopment projects become construction sites located in areas of existing development. Much of the data and information collected, inspections performed, and enforcement actions taken for the requirements under Provisions E.2 to E.4 may also be utilized by the existing development management program. The requirements under Provision E.5, however, are focused primarily on reducing pollutants generated in areas of existing development that can be transported in storm water runoff and discharged to and from the MS4.

The requirements under Provision E.5 build upon existing program elements being implemented by the Copermittees. Provision E.5 is generally consistent with the existing development requirements of the Fourth Term Permits for Orange and Riverside Counties (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), but modified to provide more flexibility to implement the programs so resources can be better focused toward addressing the highest priority water quality conditions identified in the Water Quality Improvement Plans.

For a Copermittee to properly manage areas of existing development, having knowledge of what development exists within its jurisdiction is essential. The requirements under Provision E.5.a for each Copermittee to maintain a watershed-based inventory of all the existing development within its jurisdiction are necessary for each Copermittee to implement the requirements of Provision E.5.b-e.

As opposed to just maintaining separate inventories based on the type of site, each Copermittee must maintain a watershed-based inventory that includes all types of existing development within its jurisdiction. By utilizing a watershed-based inventory, the Copermittees within a Watershed Management Area can combine their inventories and review the inventories by watershed in addition to by jurisdiction. Pollutant sources and strategies for abatement can then be evaluated on a watershed level, as opposed to evaluating sources and strategies strictly by type of site.

Provision E.5.a includes the information that must be included in the inventory. Provision E.5.a.(1) specifies what facilities or areas must be included in the inventory. A commercial type of existing development may be identified in the inventory as a facility (e.g. individual building, individual business) or an area (e.g. shopping center, commercial zone). An industrial type of existing development must be identified in the inventory by facility (e.g. individual industrial entity). A municipal type of existing development must be identified in the inventory by facility, with a list of specific municipal facilities that must be included in the inventory. A residential type of existing development must be identified by areas to be designated by the Copermittee. For each of the facilities and areas identified in the Copermittee's inventory developed pursuant to Provision E.5.a.(1), Provision E.5.a.(2) specifies the information that must be included in the description for the facility or area.

Provision E.5.a.(3) requires each Copermittee to maintain an updated map showing the location of inventoried existing development, watershed boundaries, and water bodies. This requirement was included because this information is expected to help the Copermittees in a Watershed Management Area identify and prioritize sources of pollutants and/or stressors in areas of existing development that contribute toward the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Knowledge of the sources of existing development likely contributing to the highest priority water quality conditions is expected to be a key element in the Copermittees' development of the water quality improvement strategies that will be included in the Water Quality Improvement Plans. The strategies described in the Water Quality Improvement Plans will direct the existing development management programs implemented by each Copermittee.

Pursuant to 40 CFR 122.26(d)(2)(iv)(A) each Copermittee is required describe "*structural and source control measures to reduce pollutants*" in storm water runoff discharged from areas of existing development. Provision E.5.b includes the BMP

implementation and maintenance requirements that the each Copermittee must require at areas of existing development to reduce pollutants in storm water discharges to the MEP. The San Diego Water Board, however, recognizes that BMP implementation and maintenance for residential areas will require much more education and encouragement through less authoritative measures than for commercial, industrial and municipal facilities and areas. Thus, the BMP implementation and maintenance requirements have been separated between requirements under Provision E.5.b.(1) for commercial, industrial and municipal facilities and areas, and Provision E.5.b.(2) for residential areas.

Most of the requirements in Provision E.5.b are consistent with the related requirements in the Fourth Term Permits. The level of specificity, however, has been changed to allow each Copermittee the flexibility to implement its program to achieve maximum efficiency, and to perform functions that will address the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Each Copermittee is expected to require the implementation of appropriate BMPs to address the expected pollutants from each facility or area. The Third and Fourth Term Permits described specific minimum BMPs that must be implemented at various sites. This Order, however, requires each Copermittee to designate minimum BMPs themselves and require implementation. Consistent with the Fourth Term Permits, each Copermittee is required to maintain, or require the maintenance of, all BMPs as needed.

The BMP implementation and maintenance requirements include a schedule of operation and maintenance activities for the MS4 and related structures (such as catch basins, storm drain inlets, and detention basins), as well as public streets and roads. Public streets and roads specifically include public unpaved roads. The San Diego Water Board identified, through investigations and complaints, sediment discharges from unpaved roads as a significant source of water quality problems in the San Diego Region. Enforcement and inspection activities conducted by the San Diego Water Board since the Third Term Permits were issued have found a lack of source control for many unpaved roads within the jurisdiction of the Copermittees.

Unpaved roads are a source of sediment that can be discharged in runoff to receiving waters, especially during storm events. Erosion of unpaved roadways occurs when soil particles are loosened and carried away from the roadway base, ditch, or road bank by water, wind, traffic, or other transport means. Exposed soils, high runoff velocities and volumes, sandy or silty soil types, and poor compaction increase the potential for erosion.

Road construction, culvert installation, and other maintenance activities can disturb the soil and drainage patterns to streams in undeveloped areas, causing excess runoff and thereby erosion and the release of sediment. Poorly designed unpaved roads can act as preferential drainage pathways that carry runoff and sediment into natural streams, impacting water quality. In addition, other public works activities along

unpaved roads have the potential to significantly affect sediment discharge and transport within streams and other waterways, which can degrade the beneficial uses of those waterways.

USEPA also recognizes that discharges from unpaved roads pose a significant potential threat to water quality. USEPA guidance[35] emphasizes the threat of unpaved roads to water quality:

> "*Dirt and gravel roads are a major potential source of these pollutants [sediment] and pollutants that bind to sediment such as oils, nutrients, pesticides, herbicides, and other toxic substances. Many roads have unstable surfaces and bases. Roads act like dams, concentrating flows that accelerate erosion of road materials and roadsides. Both unstable surfaces and accelerated erosion then lead to sediment and dust.*"

There are several guidance documents, developed by the USEPA,[36] the US Forest ervice,[37] the University of California,[38] and others, that include design and construction specifications and BMPs that are readily available for implementation by public entities. Implementing design and other source control BMPs for unpaved roads in the region is necessary to reduce and minimize the impacts of sediment discharged during storm events from unpaved roads to the MS4s and receiving waters.

Provision E.5.c describes existing development site inspection frequency, content, and tracking that each Copermittee must incorporate into their existing development management programs. The requirements under Provision E.5.c are necessary to demonstrate each Copermittee is implementing a program that complies with Provision E.5.b and ensure BMPs implemented in areas of existing development will reduce pollutants in storm water discharges to the MEP. Provision E.5.c has been modified to include a minimum of once every 5 years for all inventoried facilities and areas of existing development, utilizing one or more methods of inspection.

In addition to onsite inspections, the methods of inspection have been expanded to include drive-by inspections. Inspections may be performed by the Copermittee's municipal and contract staff, or by volunteer monitoring or patrol programs. Volunteer monitoring or patrol programs are not expected to enforce the Copermittee's ordinances, or to inspect areas or facilities where members of the public are not allowed access. Volunteer monitoring or patrol programs must be trained by the Copermittee, and are only expected to collect visual observations. By utilizing drive-by inspections and volunteer monitoring or patrol programs, the Copermittees will be able

[35] USEPA, 2006. Environmentally Sensitive Maintenance for Dirt and Gravel Roads. Gesford and Anderson, USEPA-PA-2005.
[36] Ibid
[37] US Forest Service, 1996. Forest Service Specifications for Construction of Roads & Bridges. EM-7720-100. Revised August 1996.
[38] University of California Division of Agriculture and Natural Resources, 2007. Rural Roads: A Construction and Maintenance Guide of California Landowners. Publication 8262.

to maximize and efficiently use their resources to identify and address sources of pollutants in areas of existing development.

The municipal and contract staff of each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial, industrial, and municipal facilities and areas in its inventoried existing development pursuant to Provision E.5.c.(1)(a)(iv). An "equivalent" of at least 20 percent means if any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspection may count toward the total annual inspection requirement. Linear municipal facilities (i.e., MS4, streets, roads and highways) in the Copermittee's existing development inventory are not subject to the inspection frequency requirement of Provision E.5.c.(1)(a)(iv).

The inspection content specified in Provision E.5.c.(2)(a) includes the information required to be collected during an inspection by any method. The inspection content specified in Provision E.5.c.(2)(a) includes additional information that must be collected when a Copermittee's municipal or contract staff perform an onsite inspection. Provision E.5.c.(3) specifies the information that each Copermittee must maintain in its existing development inspection records.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary to compel compliance with the requirements of Provision E.5 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.5.d requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Finally, Provision E.5.e requires the Copermittee to include the strategies and/or activities identified in the Water Quality Improvement Plan that the Copermittee will implement as part of the existing development management program within its jurisdiction. The Water Quality Improvement Plan is expected to include several strategies and options that the Copermittee can and should implement within its jurisdiction. The Copermittee is expected to describe and provide the details of when, where, and how those strategies will be implemented within its jurisdiction.

Provisions E.5.e.(2)-(3) specifically require the Copermittee to identify areas of existing development as candidates for retrofitting, and streams, channels, and/or habitats as candidates for rehabilitation. Provisions E.5.e.(2)-(3) are based on the retrofitting requirements of the Fourth Term Permits for Orange and Riverside Counties, but modified to also include identifying projects to rehabilitate channels within areas of existing development. The requirements have also been modified to be more focused on utilizing these types of projects for addressing the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Interest and opportunity to retrofit areas of existing development and rehabilitate channels located in areas of existing development has been observed in several programs the San Diego Water Board oversees (e.g., CWA Section 401 Water Quality Certification program, supplemental environmental projects, and grant programs). Each jurisdiction has miles and miles of streets that could be retrofitted to become green streets. Reshaping landscaped areas from convex to concave configurations can detain storm water instead of directing runoff as quickly as possible to the MS4. Retrofit projects could also include simply replacing impervious surfaces with permeable surfaces.

Retrofitting projects do not necessarily have to be expensive. Retrofitting projects could be as simple as redirecting downspouts from roofs to pervious or landscaped areas instead of to hardscaped areas discharging directly to the MS4, providing rain barrels to harvest storm water from downspouts for use at a later time, or planting more trees in areas with little vegetation to provide canopy that can intercept storm water. The San Diego Water Board encourages the Copermittees to identify simple, low-cost retrofitting opportunities that can be easily implemented, in addition to other more expensive retrofitting and channel rehabilitation projects.

Rehabilitation of channels, streams, and/or habitat will require more significant planning and resources to implement. There are, however, also abundant opportunities to rehabilitate channels, streams and/or habitats in or adjacent to areas of existing development. Each Watershed Management Area likely has several creeks and stream reaches that have been undergrounded, artificially hardened, or hydromodified that could be rehabilitated to be more sustainably configured, which would slow down storm water flows and potentially have more assimilative capacity for pollutants while still being supportive of designated beneficial uses.

The San Diego Water Board recognizes that it may be infeasible to implement retrofitting or channel rehabilitation projects within certain areas of a Copermittee's jurisdictions. For such areas, the Copermittee must instead identify, develop, and implement regional retrofitting and channel rehabilitation projects (i.e. projects that can retain and/or treat storm water from one or more areas of existing development) adjacent to and/or downstream of the areas of existing development.

Provisions E.5.e.(2)-(3) do not require the implementation of retrofitting and rehabilitation projects, but do require the Copermittee to develop a strategy to facilitate the implementation of these types of projects in areas of existing development. The strategy is expected to include allowing and encouraging Priority Development Projects to implement these types of projects to comply with the structural BMP performance criteria requirements of Provisions E.3.c.(1) and E.3.c.(2).

The San Diego Water Board will utilize the information provided in the jurisdictional runoff management program document pursuant to Provision E.5.e to gauge and assess the Copermittee's efforts in trying to address the highest priority water quality conditions identified in the Water Quality Improvement Plan within its jurisdiction.

Provision E.6 (Enforcement Response Plans) requires each Copermittee to develop an Enforcement Response Plan as part of its jurisdictional runoff management program document. Proper implementation of the Enforcement Response Plans is necessary to effectively prohibit non-storm water discharges to the MS4, and reduce the discharge of pollutants in storm water from the MS4 to the MEP.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system*" and be able to demonstrate that it can "*operate pursuant to legal authority established by statute, ordinance or series of contracts*" to control the discharge of non-storm water and pollutants in storm water to and from its MS4. Pursuant to 40 CFR 122.26(d)(2)(i)(E) each Copermittee is specifically required to have the legal authority to "*[r]equire compliance with conditions in ordinances, permits, contracts or order*s."

The requirements under Provision E.6 are necessary to demonstrate that each Copermittee can enforce its legal authority to *"effectively prohibit non-stormwater discharges"* and "*reduce the discharge of pollutants to the maximum extent practicable*" as well as "*[r]equire compliance with conditions in ordinances, permits, contracts or order*."

The Enforcement Response Plan required under Provision E.6 will serve as a reference for the Copermittee and the San Diego Water Board to determine if consistent enforcement actions are being implemented to achieve timely and effective compliance from all public and private entities that are not in compliance with the Copermittee's ordinances, permits, or other requirements. The Enforcement Response Plan must contain clear direction for the Copermittee to take immediate enforcement action, when appropriate and necessary, in their illicit discharge detection and elimination, development planning, construction management, and existing development management programs.

If the entities subject to the Copermittee's legal authority do not implement appropriate corrective actions in a timely manner, or if violations repeat, the Copermittee must take progressively stricter responses to enforce its legal authority and achieve compliance with its ordinances, permits, or other requirements to *"effectively prohibit non-stormwater discharges"* and "*reduce the discharge of pollutants to the maximum extent practicable.*"

Provision E.7 (Public Education and Participation) requires each Copermittee to implement a public education and participation program. Proper implementation of the public education and participation program as part of its jurisdictional runoff management program will contribute toward effectively prohibiting non-storm water discharges to the MS4, and toward the reduction of pollutants in storm water from the MS4 to the MEP.

Provision E.7 establishes the minimum requirements that each Copermittee must implement to engage members of the public as part of its jurisdictional runoff management program. In the Fourth Term Permits, the public education program requirements and the public participation requirements were included as separate jurisdictional runoff management program components. In this Order, the public education requirements have been consolidated with the public participation requirements, as both sets of requirements are related to the engagement of the public by each Copermittee. Engagement of the public is critical for the success of each Copermittee's jurisdictional runoff management program.

The Copermittees have been implementing public education programs for the last 20 years, which are now well established. The specificity of expected public education program elements of the Fourth Term Permits has been removed. For the most part, the public education program requirements in Provision E.7.a have been reduced to a set of requirements that are specifically included in the federal regulations under 40 CFR 122.26(d)(2)(iv)(A)(6), 122.26(d)(2)(B)(6) and 122.26(d)(2)(D)(4), which should already be incorporated into each Copermittee's existing public education program. Each Copermittee is expected to utilize the information and data collected from the monitoring and assessments conducted within the Watershed Management Area, and from its inventories and inspections to best direct its public education program resources toward addressing the highest priority water quality conditions identified within the Water Quality Improvement Plan.

According to 40 CFR 122.26(d)(2)(iv), public participation is required to be included as part of the "*comprehensive planning process*", which includes the development and implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs. The requirements under Provision E.7.b specify the opportunities that the public must be provided to be involved in the "*comprehensive planning process*", as required by to 40 CFR 122.26(d)(2)(iv).

<u>Provision E.8 (Fiscal Analysis)</u> requires each Copermittee to secure the resources and provide an analysis of the resources that will be necessary to implement the requirements of the Order. Adequate fiscal resources are necessary for a jurisdictional runoff management program to effectively prohibit non-storm water discharges to the MS4, and reduce pollutants in storm water from the MS4 to the MEP.

According to 40 CFR 122.26(d)(2)(vi), each Copermittee is responsible for providing "*a fiscal analysis of the necessary capital and operation and maintenance expenditures necessary to accomplish the activities*" required by this Order, including "*a description of the source of funds that are proposed to meet the necessary expenditures, including legal restrictions on the use of such funds.*" The fiscal analysis requirements of Provision E.8 are consistent with 40 CFR 122.26(d)(2)(vi).

The San Diego Water Board has chosen not to require a description of fiscal benefits realized from implementation of the jurisdictional runoff management programs. This

is a recommendation from the National Association of Flood and Stormwater Management Agencies.[39] For instance, the fiscal analysis requirements do not address city-wide fiscal benefits of protection (e.g., public health, tourism, property values, economic activity, beneficial uses, etc.), even though many costs currently reported to the San Diego Water Board are for related activities. This type of assessment may help Copermittees improve the allocation of resources and it may help the Copermittees secure adequate funding for the program. Qualitative assessments, however, could be overly subjective and most Copermittees likely lack the ability to provide accurate quantitative assessments. The San Diego Water Board encourages the Copermittees to consider means for conducting assessments of fiscal benefits derived from the programs. Such assessments could be conducted on a regional scale similar to studies of program costs conducted by the State Water Board.[40]

[39] National Association of Flood and Stormwater Management Agencies. 2006. *Guidance for Municipal Stormwater Funding.* Prepared under a grant provided by the USEPA.
[40] State Water Board, 2005. NPDES Stormwater Cost Survey.

F. Reporting

Purpose: Provision F includes the requirements for the documents and reports that the Copermittees must prepare and provide to the San Diego Water Board. The documents prepared by the Copermittees and provided to the San Diego Water Board and made available to the public will provide the documentation that the Copermittees are complying with the requirements of the Order.

***Discussion*:** Provision F requires the Copermittees to prepare several documents and reports that must be provided to the San Diego Water Board and made available to the public. The reporting requirements have been significantly reduced compared to the Fourth Term Permit reporting requirements. The reduction in reporting requirements was recommended by the San Diego County Copermittees in the Report of Water Discharge submitted in June 2011.

More specific and detailed discussions of the requirements of Provision F are provided below.

Provision F.1 (Water Quality Improvement Plans) requires the Copermittees in each Watershed Management Area to develop and submit a Water Quality Improvement Plan in accordance with the requirements of Provision B.

Of all the requirements of Provision F, the Water Quality Improvement Plans will likely be the documents requiring the most significant effort to develop. The content of the Water Quality Improvement Plans, however, is expected to include content that should already have been developed for the Watershed Plans and several elements that are included in the Monitoring and Reporting Programs required under the Fourth Term Permits.

Because the Water Quality Improvement Plan is part of the "*comprehensive planning process*" requiring public participation, Provision F.1 includes requirements to give multiple opportunities to the public to provide input on the content of the plans. The Water Quality Improvement Plans are required to be submitted by the Copermittees within 18 months after adoption of this Order.

Provision F.2 (Updates) requires the Copermittees to update specific documents that the Copermittees will utilize to implement the requirements of this Order.

Each Copermittee is required to continue implementing a jurisdictional runoff management program, as required under Provision E. Implementation of each Copermittee's jurisdictional runoff management program is directed by its jurisdictional runoff management program document. Provision F.2.a requires each Copermittee to update its jurisdictional runoff management program document to be consistent with the requirements of Provision E within 18 months after the adoption of this Order.

Likewise, each Copermittee must continue to require new development and redevelopment projects to implement BMPs to control pollutants in storm water runoff. The control of pollutants in storm water runoff from development and redevelopment projects within each Copermittee's jurisdiction is guided and directed by its BMP Design Manual, formerly known as a Standard Storm Water Mitigation Plan (SSMP). Provision F.2.b requires each Copermittee to update its BMP Design Manual to be consistent with the requirements of Provision E.3 within 18 months after the adoption of this Order.

In general, the requirements of the Order should not necessitate a complete rewrite of each Copermittee's jurisdictional runoff management program document or BMP Design Manual, as was required by the Third Term Permits. The jurisdictional runoff management program and BMP Design Manual requirements of this Order are not significantly different than the requirements of the Fourth Term Permits. Thus, only sections of the Order which are new or have been significantly changed should warrant revisions to specific sections of the Copermittee's jurisdictional runoff management program document and BMP Design Manual.

Finally, the Water Quality Improvement Plans are expected to require updates as the iterative approach and adaptive management process included in the Water Quality Improvement Plan, as required under Provision B.5, is implemented by the Copermittees. Provision F.2.c requires the Copermittees to submit the updates to the Water Quality Improvement Plan as part of the Annual Reports required under Provision F.3.b.

Provision F.3 (Progress Reporting) requires the Copermittees to report on the progress of implementing the Water Quality Improvement Plans.

The requirements of Provision F.3 are to report the progress toward improving water quality that the Copermittees are achieving with the implementation of the Water Quality Improvement Plans and each Copermittee's jurisdictional runoff management program. The Progress Report Presentations required under Provision F.3.a are included to provide the Copermittees an opportunity to communicate directly with the San Diego Water Board and the public. The Progress Report Presentations will also provide the members of the San Diego Water Board and members of the public an opportunity to become more acquainted with the Copermittees and their projects and programs to address non-storm water and storm water discharges into and from their MS4s.

The Annual Report requirements of Provision F.3.b are a consolidation of several reporting requirements from the Fourth Term Permits, including the Jurisdictional Runoff Management Program Annual Reports, the Watershed Annual Reports, and the Monitoring and Reporting Program Annual Reports. Furthermore, the Annual Report requirements are consistent with the requirements under 40 CFR 122.42(c).

Pursuant to 40 CFR 122.42(c), "*[t]he operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the Director…must submit an annual report*", which must include the following:

(1) *The status of implementing the components of the storm water management program that are established as permit conditions* [40 CFR 122.42(c)(1)];

(2) *Proposed changes to the storm water management programs that are established as permit conditions* [40 CFR 122.42(c)(2)];

(3) *Revisions, if necessary, to the assessment of controls and fiscal analysis* [40 CFR 122.42(c)(3)];

(4) *A summary of data, including monitoring data, that is accumulated throughout the reporting year* [40 CFR 122.42(c)(4)];

(5) *Annual expenditures and budget for year following each annual report* [40 CFR 122.42(c)(5)];

(6) *A summary describing the number and nature of enforcement actions, inspections, and public education programs* [40 CFR 122.42(c)(6)];

(7) *Identification of water quality improvements or degradation* [40 CFR 122.42(c)(7)].

Under the Fourth Term Permits, each Copermittee is responsible for submitting a Jurisdictional Runoff Management Program Annual Report; the Copermittees in each designated watershed are responsible for submitting a Watershed Annual Report; and the Copermittees from each county are responsible for submitting a Monitoring and Reporting Program Annual Report.

There are 39 Copermittees in the San Diego Region, each required to prepare and submit a Jurisdictional Runoff Management Program Annual Report. There are 9 designated watersheds in San Diego County, 6 designated watersheds in Orange County, and 1 designated watershed in Riverside County for a total of 16 designated watersheds, each requiring a Watershed Annual Report. There are 3 sets of Copermittees in 3 counties in the San Diego Region, requiring Copermittees from each county to prepare and submit a Monitoring and Reporting Program Annual Report. Thus each Copermittee is currently required to prepare, or participate in the preparation of at least 3 annual reports. In addition, the San Diego County Copermittees are required to prepare and submit a Regional Urban Runoff Management Plan Annual Report.

In total, there are 59 annual reports that are prepared by the Copermittees and submitted to the San Diego Water Board for the Fourth Term Permits. The preparation of these annual reports requires significant time and resources from each Copermittee, which could otherwise be expended on actions that could improve water

quality within its jurisdiction. In turn, significant time and resources are required from the San Diego Water Board staff to review these reports, which could otherwise be expended on working directly with the Copermittees to improve their implementation efforts toward restoring and protecting water quality.

Provision F.3.b only requires one Annual Report for each of the 10 Watershed Management Areas designated under Provision B.1, which is a significant reduction in the number of annual reports required to be prepared and submitted by the Copermittees. The Annual Report will document the Copermittees' efforts to implement the Water Quality Improvement Plan. Each Annual Report will be focused primarily on reporting the analysis of the monitoring data collected pursuant to Provisions D.1-D.3 during the reporting period, and the assessments that are required pursuant to Provision D.4 based on the data. The monitoring data analyses and the assessments that are provided in the Annual Report will be the core of the report. The reporting of the jurisdictional runoff management program implementation efforts have been reduced to a single 2-page form, and will no longer be the primary focus of the reporting requirements as in the Third and Fourth Term Permits.

The Jurisdictional Runoff Management Program Annual Report Form (see Attachment D to the Order) will certify that each Copermittee has implemented its jurisdictional runoff management program in accordance with the requirements of Provision E. Instead of reviewing a voluminous report from each Copermittee, as was required under the Third and Fourth Term Permits, the San Diego Water Board will conduct audits of each Copermittee's jurisdictional runoff management program to investigate and confirm the information provided by each Copermittee on its Jurisdictional Runoff Management Program Annual Report Form. The audits will allow the San Diego Water Board to become more familiar with the each Copermittee's jurisdictional runoff management program, and each Copermittee will become more informed about the expectations of the San Diego Water Board.

The reduction in the number and content of the Annual Reports should result in significant time, cost and resource savings for the Copermittees, as well as the San Diego Water Board. Those savings should offset a significant portion of any additional costs that may be incurred to develop the Water Quality Improvement Plans and to implement the monitoring and assessment program requirements of Provision D.

The reporting period for the Annual Reports consists of two periods. Because the jurisdictional runoff management programs are typically budgeted and implemented during a fiscal year, the information provided on the Jurisdictional Runoff Management Program Annual Report Forms will cover the period from July 1 to June 30 of the following year.

The Annual Reports, however, are focused primarily on the monitoring data and the assessments based on the monitoring data. The monitoring data is collected during the monitoring year, which begins October 1 and ends September 30 of the following year. The monitoring year begins after the beginning of the fiscal year and ends after

the end of the fiscal year. Therefore, to accommodate and capture the information collected during the fiscal year and the monitoring year, the Annual Report reporting period incorporates both periods.

Finally, Provision F.3.c requires the Copermittees to develop and submit a Regional Monitoring and Assessment Report. The Regional Monitoring and Assessment Report is similar to the Long Term Effectiveness Assessment required under the Fourth Term San Diego County Permit. The Regional Monitoring and Assessment Report is expected to utilize the entire body of data and information collected by the Copermittees during the term of this Order to assess improvements to water quality on a regional scale.

Provision F.4 (Regional Clearinghouse) requires the Copermittees to develop, update, and maintain an internet-based Regional Clearinghouse that can be used to store, disseminate, and share the Copermittees' documents, monitoring data, special studies, and any other data or information.

Most of the documents and data that are generated by the Copermittees can be provided in electronic format, and made available to the San Diego Water Board and the public on the internet. The San Diego Water Board has been gradually transitioning its document submittal requirements to electronic submittals. Provision F.4 has been included to further these efforts.

Provision F.4 has also been included to improve the exchange and availability of information among the Copermittees, as well as between the Copermittees and the San Diego Water Board. Provision F.4 will also make the information generated during the implementation of the Order more accessible to the public.

Provision F.5 (Report of Waste Discharge) requires the Copermittees to submit a Report of Waste Discharge to reapply for renewal of the Order prior to its expiration, in accordance with 40 CFR 122.21(d)(2) and CWC section 13376.

Because the Orange County and Riverside County Copermittees will not be subject to the requirements of this Order until they are notified of coverage, Provision F.5.a describes the process of submitting their Reports of Waste Discharge pursuant to the requirements of their current permits to obtain coverage under this Order.

For the Copermittees subject to the requirements of this Order, Provision F.5.b requires the Copermittees to submit a Report of Waste Discharge 180 days in advance of the expiration of this Order Provision F.5.b also describes the minimum information to be included in the Report of Waste Discharge, based on USEPA guidance "Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems", dated May 17, 1996.

Provision F.6 (Application for Early Coverage) describes the process that would allow the Orange County and/or Riverside County Copermittees to obtain coverage under this Order earlier than the expiration of their current Orders.

If the Orange County and/or Riverside County Copermittees choose to obtain coverage under this Order earlier than the expiration of their current Orders, the preparation and submittal of a Report of Waste Discharge, as required by the Fourth Term Permits, will not be necessary. The existing Order for the respective county will be rescinded upon the effective coverage date under this Order, except for enforcement purposes.

G. Principal Watershed Copermittee Responsibilities

Purpose: Provision G includes the requirements for the Principal Watershed Copermittee designated by the Copermittees in each Watershed Management Area.

***Discussion*:** Unlike previous NPDES requirements, there will no longer be a single Principal Copermittee. Provision G.1 requires the Copermittees to designate a Principal Watershed Copermittee for each Watershed Management Area. There are ten (10) Watershed Management Areas in the San Diego Region, as defined in Table B-1 under Provision B.1 of the Order. An individual Copermittee should not be the Principal Watershed Copermittee for more than two (2) Watershed Management Areas. There could be up to 10 Principal Water Copermittees designated for the Watershed Management Areas in the San Diego Region.

Provision G.2 describes the minimum responsibilities of each Principal Watershed Copermittee. The primary responsibility of the Principal Watershed Copermittees is to serve as the liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues. Ideally, the Principal Watershed Copermittee can represent the interests of all the Copermittees within a Watershed Management Area during discussions or meetings to facilitate communication with the San Diego Water Board. The Principal Watershed Copermittees are also responsible for facilitating and coordinating the implementation efforts of the Copermittees and submittals of required documents and reports.

The Principal Watershed Copermittee is responsible for facilitating the efforts of the Copermittees within the Watershed Management Area to develop the Water Quality Improvement Plan required under Provision B, and submit it for approval in accordance with Provision F.1. The Principal Watershed Copermittee is also responsible for coordinating the submittal of the document updates, Progress Report Presentations, and Annual Reports required from the Copermittees within each Watershed Management Area under Provisions F.2, F.3.a, and F.3.b. The Principal Watershed Copermittees are responsible for coordinating with each other to develop and submit the Regional Clearinghouse, Regional Monitoring and Assessment Report, and the Report of Waste Discharge required under Provisions F.3.c, F.4, and F.5.

The designated Principal Watershed Copermittee for each Watershed Management Area does not necessarily have to serve as the Principal Watershed Copermittee for the entire term of the Order. If the Copermittees in a Watershed Management Area choose to designate a new Principal Watershed Copermittee, the change may be submitted as part of the Annual Report required under Provision F.3.b, with an update to the Water Quality Improvement Plan in accordance with Provision F.2.c.

H. Modification of Programs

Purpose: Provision H provides the conditions under which modifications to Order No. R9-2013-0001 may occur.

***Discussion*:** Provision H allows for modifications to Order No. R9-2013-0001. Minor modifications may be made by the San Diego Water Board Executive Officer without a public notice or public hearing. Minor modifications are defined under 40 CFR 122.63. Minor modifications under 40 CFR 122.63 potentially applicable to this Order are the following:

- Correcting typographical errors;
- Requiring more frequent monitoring or reporting by the Copermittees;
- Changing an interim compliance date in a schedule of compliance, provided the new date is not more than 120 days after the date specified in the existing permit and does not interfere with attainment of the final compliance date requirement.

Modifications that are not one of the above minor modifications will require re-opening the Order, subject to the requirements of 40 CFR 122.62 and 124.5(c)(1)-(3), but only for the specific provisions subject to the modification. Modifications of the Order that are not minor require a draft Order with the proposed modifications made available for public review, a public notice and comment period, and a public hearing. Comments on the provisions not subject to the proposed modifications are not required to be considered in the San Diego Water Board's responses to comments or during the public hearing.

Provision H.4 was included specifically to allow for the Order to be re-opened to make modifications to the requirements of Provision A should new language addressing compliance with water quality standards in the receiving waters be developed and issued by the State Water Board.

I. Standard Permit Provisions and General Provisions

Purpose: Provision I incorporates the standard permit provisions required to be included in all NPDES permits, as well as several other general provisions.

***Discussion*:** Provision I refers to Attachment B to the Order. Attachment B expressly incorporates the conditions applicable to all NPDES permits as provided under 40 CFR 122.41(a)-(n), as well as the applicable conditions for MS4s and storm water discharges provided under 40 CFR 122.42(c) and 40 CFR 122.42(d), respectively. Attachment B also includes several general provisions that are typically included in or applicable to waste discharge requirements issued by the San Diego Water Board.

IX. ATTACHMENTS

The attachments to the Order are discussed below. The discussions describe the content of the attachments.

Attachment A – Discharge Prohibitions and Special Protections

Section 1 of Attachment A includes the Waste Discharge Prohibitions from the Basin Plan. They have been provided verbatim in their entirety.

Section 2 of Attachment A includes the "*Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges*" applicable to permitted point source discharges of storm water, adopted under State Water Board Resolution No. 2012-0012. The terms, prohibitions, and special conditions (collectively referred to as special conditions) are established as limitations on point source storm water discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in ASBS, as required for State Water Quality Protection Areas pursuant to California Public Resources Code sections 36700(f) and 36710(f). These Special Protections were adopted by the State Water Board as part of the Ocean Plan General Exception.

Attachment B – Standard Permit Provisions and General Provisions

Conditions applicable to all NPDES permits, as required under 40 CFR 122.41, and conditions applicable to MS4s and storm water discharges, as required under 40 CFR 122.42(c) and 122.42(d), respectively are provided in Attachment B to the Order. They have been provided expressly in their entirety.

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. These general provisions are typically included in or applicable to waste discharge requirements issued by the San Diego Water Board. Many of the general provisions were developed by the State Water Board. Where a general provision is derived from statute or regulation, a citation of the statute or regulation section is provided. General provisions that do not provide a citation are included under the authority provided CWC 13377.

Attachment C – Acronyms, Abbreviations and Definitions

The acronyms and abbreviations that are used in the Order are provided in Attachment C. Attachment C also includes definitions that may provide an explanation or description of the meaning or intent of specific terms or phrases included in the Order.

Attachment D – Jurisdictional Runoff Management Program Annual Report Form

An example of the Jurisdictional Runoff Management Program Annual Report Form required to be submitted by each Copermittee as part of the Annual Reports required under Provision F.3.b.(1)(e) is provided as Attachment D to the Order. An electronic version of the form will be available from the San Diego Water Board after the adoption of the Order.

The Jurisdictional Runoff Management Program Annual Report Form includes the minimum information necessary to demonstrate that the Copermittee is implementing and in compliance with the requirements of Provision E, and includes much of the information required to be reported pursuant to 40 CFR 122.42(c).

The information that must be provided on the Jurisdictional Runoff Management Program Annual Report Form is limited to the fiscal year, which begins July 1 and ends June 30 of the following year. The information expected to be provided by the Copermittees in each section of the Jurisdictional Runoff Management Program Annual Report Form is discussed below.

I. COPERMITTEE INFORMATION

The name of the Copermittee (e.g. name of city, county, or special district) and the contact information for the storm water program manager are provided under this section.

II. LEGAL AUTHORITY

The Copermittee must confirm whether or not the legal authorities under Provision E.1.a have been established for itself within its jurisdiction.

The Copermittee must also confirm whether or not a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority, as required under Provision E.1.b. The certification statement required by Provision E.1.b is only required to be submitted with the first Annual Report required under Provision F.3.b.

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

The Copermittee must inform the San Diego Water Board whether or not an update to its jurisdictional runoff management program document was required or recommended by the San Diego Water Board during the reporting period. An update to the jurisdictional runoff management program is required under Provision F.2.a. The San Diego Water Board may recommend modifications to the jurisdictional runoff management program as part of the iterative approach and adaptive management process required under Provision B.5, which may result in an update that is necessary for the Copermittee's jurisdictional runoff management document.

If an update was required or recommended, the Copermittee must confirm whether or not the update was completed and made available on the Regional Clearinghouse within the reporting period. If no update was required or recommended, an answer is not required. If the answer is NO, meaning the required or recommended update was not completed and/or made available on the Regional Clearinghouse, the Copermittee must attach a schedule for the completion of the update and/or posting of the updated document on the Regional Clearinghouse.

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

The Copermittee must confirm whether or not a program was implemented during the fiscal year to actively detect and eliminate illicit discharges and connections in accordance with the requirements under Provision E.2.

In addition to confirming that a program to detect and eliminate illicit discharges was implemented during the reporting period, the Copermittee is also required to report on several items related to the program. The information that must be reported is limited to the fiscal year for the Annual Report.

All non-storm water discharges are considered illicit discharges unless the source is identified as one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5). If a non-storm water discharge is identified as one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5), the discharge is a non-storm water discharge, but not an illicit discharge. If a non-storm water discharge is identified but in not one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5), the discharge is both a non-storm water discharge and an illicit discharge.

V. DEVELOPMENT PLANNING PROGRAM

The Copermittee must confirm whether or not a development planning program was implemented during the fiscal year in accordance with the requirements under Provision E.3.

The Copermittee must also inform the San Diego Water Board whether or not an update to its BMP Design Manual was required or recommended by the San Diego Water Board during the fiscal year. An update to the BMP Design Manual is required under Provision F.2.b. The San Diego Water Board may recommend modifications to the BMP Design Manual, which may result in an update that is necessary for Copermittee's the BMP Design Manual.

If an update was required or recommended, the Copermittee must confirm whether or not the update was completed and made available on the Regional Clearinghouse within the reporting period. If no update was required or recommended, an answer is not required. If the answer is NO, meaning the required or recommended update was not completed and/or made available on the Regional Clearinghouse, the Copermittee must attach a schedule for the completion of the update and/or posting of the updated document on the Regional Clearinghouse.

The Copermittee is also required to report on several items related to the program. For the development and redevelopment projects that are reviewed under the program, the Copermittee must report the total number projects submitted for review during the fiscal year. Of those projects, the Copermittee must report the number that are Priority Development Projects, as defined under Provision E.3.b.(1). The Copermittee must also report the number of Priority Development Projects that were approved and/or granted occupancy during the fiscal year, regardless of when the project was originally submitted for review. Any projects that were approved during the fiscal year and granted any exemptions from the BMP Design Manual requirements and/or allowed to implement alternative compliance options in accordance with Provision E.3.c.(3) must be reported.

Finally, the Copermittee must also report on several items related to its oversight of permanent BMPs on Priority Development Projects within its jurisdiction, as required under Provision E.3.e. The information that must be reported is limited to the fiscal year for the Annual Report.

VI. CONSTRUCTION MANAGEMENT PROGRAM

The Copermittee must confirm whether or not a construction management program was implemented during the fiscal year in accordance with the requirements under Provision E.4.

The Copermittee is also required to report on several items related to its oversight construction projects within its jurisdiction. The information that must be reported is limited to the fiscal year for the Annual Report.

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

The Copermittee must confirm whether or not an existing development management program was implemented during the fiscal year in accordance with the requirements under Provision E.5.

The Copermittee is also required to report on several items related to its oversight in areas of existing development within its jurisdiction. The information that must be reported is limited to the fiscal year for the Annual Report. The information must also be separated into four categories of existing development: municipal, commercial, industrial, and residential.

VIII. PUBLIC EDUCATION AND PARTICIPATION

The Copermittee must confirm whether or not a public education program component was implemented during the fiscal year in accordance with the requirements under Provision E.7.a.

The Copermittee must also confirm whether or not a public participation program component was implemented during the fiscal year in accordance with the requirements under Provision E.7.b.

IX. FISCAL ANALYSIS

The Copermittee must confirm a summary of its fiscal analysis, conducted in accordance with the requirements under Provision E.8, has been attached to the form.

X. CERTIFICATION

A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative must sign and certify the Jurisdictional Runoff Management Program Annual Report Form. The appropriate box must be checked to indicate the whether the a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative is signing the form.

Attachment E – Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2013-0001

Attachment E provides specific provisions for implementing the Total Maximum Daily Loads (TMDLs) adopted by the San Diego Water Board and approved by USEPA in which the Copermittees are identified as responsible for meeting an assigned wasteload allocation (WLA). Federal regulations require that NPDES requirements incorporate water quality based effluent limitations (WQBELs) that must be consistent with the requirements and assumptions of any available WLAs,[41] which may be expressed as numeric effluent limitations, when feasible, and/or as a best management practice (BMP) program of expanded or better-tailored BMPs.[42] Where the TMDL includes WLAs that provide numeric pollutant load or pollutant parameter objectives, the WLA has been, where feasible, translated into numeric WQBELs.[43]

For each TMDL in Attachment E, five sections are included:

1) Applicability: This section provides the resolution under which the TMDL Basin Plan amendment was adopted and approved, with the applicable adoption and approval dates. This section also gives the effective date of the TMDL and where the TMDL is applicable (i.e. Watershed Management Area and water body). The Copermittees that are responsible for implementing the specific provisions are also given in this section.

2) Water Quality Based Effluent Limitations: For each TMDL, the WQBELs are expressed in terms of receiving water limitations, effluent limitations, and/or best management practices (BMPs). The WQBELs for the TMDLs are incorporated by reference into Provision A of the Order. The WQBELs when the compliance dates have passed. Applicable BMPs within the WQBELs must be incorporated into the Water Quality Improvement Plans.

3) Compliance Schedule: The final date for compliance with the WLA assigned to the Copermittees is provided in this section. If there are interim compliance requirements, they are included in this section as well. The WQBELs become enforceable when the final compliance date has passed. If there are interim WQBELs with interim compliance dates, the interim WQBELs become enforceable when the corresponding interim compliance dates have passed.

4) Specific Monitoring and Assessment Requirements: If there are specific monitoring and assessment requirements that cannot be met with the monitoring and assessment program requirements under Provision D of the Order, the additional requirements are included in this section.

5) Compliance Determination: There may be several options to demonstrate compliance with the WQBELs. If there is more than one option to demonstrate compliance with the WQBELs, the options are provided in this section.

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[41] 40 CFR 122.44(d)(1)(vii)(B)
[42] 40 CFR 122.44(k)(2) and 40 CFR 122.44(k)(3)
[43] November 12, 2010 Memorandum from the USEPA, Revisions to the November 22, 2002 Memorandum "Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLA""

The requirements of the TMDLs are based on the assumptions and requirements of any available WLAs for adopted and approved TMDLs that have been incorporated into the Basin Plan. Modifications to the requirements for the TMDLs in Attachment E cannot be made unless the TMDLs are modified in the Basin Plan.

A modification to any aspect of a TMDL in the Basin Plan requires a Basin Plan amendment. A Basin Plan amendment to modify a TMDL will require the San Diego Water Board to adopt a resolution to amend the Basin Plan, which includes a separate public process. When the San Diego Water Board adopts a Basin Plan amendment, it subsequently requires approval from the State Water Board, the Office of Administrative Law, and the USEPA before it becomes effective.

If and when the TMDLs are a modified in the Basin Plan, the San Diego Water Board will revise the requirements of the TMDL in accordance with the Basin Plan amendment. When a Basin Plan amendment to modify a TMDL becomes effective, the San Diego Water Board will modify the requirements of the TMDL pursuant to the requirements of Provision H of the Order as soon as possible.

CALIFORNIA Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

October 31, 2012

San Diego County Copermittees
Orange County Copermittees
Riverside County Copermittees

In reply refer to / attn:
Place ID: 786088Wchiu

Subject: Tentative Order No. R9-2013-0001
San Diego Region MS4 Permit Reissuance

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) is pleased to release for public review and comment Tentative Order No. R9-2013-0001, NPDES No. CAS0109266, *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Tentative Order). Notice is hereby given that the San Diego Water Board will receive written comments on the Tentative Order in accordance with title 40 Code of Federal Regulations section 124.10 and Water Code section 13167.5.

The Tentative Order is a regional MS4 permit that proposes to jointly cover all 39 Copermittees within the San Diego Region (i.e., South Orange County, Southwestern Riverside County, and San Diego County), in a phased manner as their current MS4 permits expire or upon request for earlier coverage prior to permit expiration. The Tentative Order covers multiple discharge points to multiple receiving waters throughout the San Diego Water Board Region. All MS4 Copermittees in the San Diego Region are therefore on notice that they may ultimately be regulated under the Tentative Order, if adopted. Copermittees covered by the San Diego County MS4 permit (Order No. R9-2007-0001) must submit any written comments on the Tentative Order during the comment period described below. Copermittees covered by the Orange County and Riverside County MS4 permits (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), for which Reports of Waste Discharge have not yet been filed, are strongly encouraged to submit written comments on the Tentative Order during the comment period described below.

The Tentative Order includes in Attachment F, a Fact Sheet pursuant to title 40 code of Federal Regulations section 124.8 (a) that sets forth the principal background information and facts, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of the Tentative Order.

Document Availability
The Tentative Order, and attachments thereto, are available on the San Diego Water Board website at:
http://www.waterboards.ca.gov/rwqcb9/water_issues/programs/stormwater/index.shtml

You may also receive a copy of the Tentative Order by contacting Wayne Chiu at (858) 637-5558 or wchiu@waterboards.ca.gov or by visiting the San Diego Water Board's office at 9174 Sky Park Court, Suite 100, San Diego, California 92123-4340, weekdays between 8:00 a.m. and 5:00 p.m., telephone 858-467-2952.

Submission of Written Comments
Copermittees or interested persons wishing to submit comments on the Tentative Order must submit them so that they are received no later than **5:00 p.m. on Friday, January 11, 2013.** Written comments should be submitted to:

Wayne Chiu, P.E.
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego California 92123-4340

The early submission of written comments on the Tentative Order is encouraged. Electronic written comments are acceptable and should be submitted via e-mail to the attention of Wayne Chiu at wchiu@waterboards.ca.gov.

Please indicate in the subject line of all written comments "Comment – Tentative Order No. R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu." If the submitted written comments exceed five pages in length or contain foldouts, color graphics, or maps, 15 hard copies must be submitted for distribution to the San Diego Water Board members and staff.

The submission of written comments is the opportunity for Copermittees and interested persons to raise and comment on issues pertaining to the terms and conditions of the Tentative Order. All written comments including testimony, technical documentation and factual information pertaining to the terms and conditions of the Tentative Order to be considered by the San Diego Water Board at the as yet unscheduled public hearing must be received by 5:00 pm on January 11, 2013. At a later date following submittal of written comments, the San Diego Water Board will convene a public hearing to hear testimony and policy statements from the Copermittees and interested persons summarizing their written comments and to consider adoption of the Tentative Order. The scope of oral testimony at the public hearing will be strictly limited to summarizing the previously submitted written comments and making policy statements. No new issues may be raised at the hearing.

Consistent with State Water Board regulations that apply to this proceeding, written comments received after the close of the comment period will not be accepted and will not be incorporated into the administrative record if doing so would prejudice any party. Written comments received by the close of the comment period will be provided to the San Diego

Water Board members for their review in advance of a public hearing to consider adoption of the Tentative Order. All timely written comments will also be posted as they are received on the San Diego Water Board website at:

http://www.waterboards.ca.gov/rwqcb9/water_issues/programs/stormwater/index.shtml

Public Hearing for Consideration of Tentative Order Adoption
The San Diego Water Board will issue a separate notice announcing a public hearing to receive oral comments and consider adoption of the Tentative Order at a later date. Notice of the public hearing will be provided to the Copermittees and interested persons at least thirty (30) days in advance of the hearing. Participants will have an opportunity to address the San Diego Water Board members subject to reasonable limitations prior to the Board taking action on the Tentative Order.

The public notice providing the specific date for the San Diego Water Board adoption meeting and any other public notices related to the Tentative Order will be distributed through the Lyris e-mail list server and posted on the San Diego Water Board website at:

http://www.waterboards.ca.gov/rwqcb9/water_issues/programs/stormwater/index.shtml

Any person desiring to receive future public notices regarding this Tentative Order can subscribe to one of the electronic mail lists (i.e. Lyris List) titled "Orange County MS4 Permit", "Riverside County MS4 Permit", or "San Diego MS4 Permit ", located on the San Diego Water Board website at:

http://www.waterboards.ca.gov/resources/email_subscriptions/reg9_subscribe.shtml

Contact for further Information
For questions or comments concerning this notice, please contact Wayne Chiu by phone at (858) 637-5558, or by email at wchiu@waterboards.ca.gov.

Respectfully,

James G. Smith, AEO
for David W. Gibson
Executive Officer
San Diego Regional Water Quality Control Board

DWG:dtb esb:law:wc

cc:

Distribution via US Mail and email: (see attached address list)	San Diego County Copermittees Orange County Copermittees Riverside County Copermittees Resource Agencies
Distribution list via email:	San Diego County MS4 Permit Lyris List Riverside County MS4 Permit Lyris List Orange County MS4 Permit Lyris List San Diego Water Board Agenda Lyris List

Tech Staff Info & Use	
Order No.	R9-2013-0001
Party (GT/CIWQS) ID	536787
File No.	n/a
WDID	n/a
NPDES No.	CAS0109266
Reg. Measure ID	387335
Place ID	786088
Person ID	n/a
Inspection ID	n/a

San Diego County Copermittees

San Diego Co. Reg. Airport Authority
Richard Gilb
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City of Coronado
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Claudio Padres
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Aldo Licitra
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aldo.licitra@cityoftemecula.org

Tim D'Zmura
City of Wildomar
23873 Clinton Keith Rd., Suite 201
Wildomar, CA 92595
tdzmura@cityofwildomar.org

From: lyris@swrcb18.waterboards.ca.gov
To: Chiu, Wayne@Waterboards
Subject: Notice - Release of San Diego Region MS4 Permit, Tentative Order R9-2013-0001 for Public Review and Comment
Date: Wednesday, October 31, 2012 7:40:00 PM

Copermittees and Interested Persons,
The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) is pleased to release for public review and comment Tentative Order No. R9-2013-0001 *National Pollutant Discharge Elimination System (*NPDES*) Permit* (NPDES No. CAS0109266) *and Waste Discharge Requirements for Discharges* of *Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Tentative Order).

Copermittees covered by the San Diego County MS4 permit (Order No. R9-2007-0001) must submit any written comments on the Tentative Order during the comment period described in the Notice. The Notice can be found on the San Diego Water Boards Website
at: http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

Copermittees covered by the Orange County and Riverside County MS4 permits (Order Nos. R9-2009-0002 and R9-20100016, respectively), for which Reports of Waste Discharge have not yet been filed, are strongly encouraged to submit written comments on the Tentative Order during the comment period described in the Notice.

For complete information on the public process, submittal of comments, and to retrieve copies of the Tentative Order and its attachments visit the San Diego Water Board's website:
http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

Laurie Walsh P.E.
San Diego Water Board
858-467-2970
lwalsh@waterboards.ca.gov

You are currently subscribed to reg9_sandiegoco_ms4permit as: wchiu@waterboards.ca.gov.
To unsubscribe click here: http://swrcb18.waterboards.ca.gov/u?id=508208.cee2a373662e566393e62f0af18d11cf&n=T&l=reg9_sandiegoco_ms4permit&o=404703
(It may be necessary to cut and paste the above URL if the line is broken)
or send a blank email to leave-404703-508208.cee2a373662e566393e62f0af18d11cf@swrcb18.waterboards.ca.gov

U-T San Diego

P.O. Box 120191, San Diego, CA 92112-0191

AFFIDAVIT OF PUBLICATION

CALIFORNIA NEWSPAPER SERVICE
P.O. BOX 60460
LOS ANGELES, CA 90060

STATE OF CALIFORNIA} ss.
County of San Diego}

The Undersigned, declares under penalty of perjury under the laws of the State of California: That she is a resident of the County of San Diego. That she is and at all times herein mentioned was a citizen of the United States, over the age of twenty-one years, and that she is not a party to, nor interested in the above entitled matter; that she is Chief Clerk for the publisher of

The San Diego Union-Tribune

a newspaper of general circulation , printed and published daily in the City of San Diego, County of San Diego, and which newspaper is published for the dissemination of local news and intelligence of a general character, and which newspaper at all the times herein mentioned had and still has a bona fide subscription list of paying subscribers, and which newspaper has been established, printed and published at regular intervals in the said City of San Diego, County of San Diego, for a period exceeding one year next preceding the date of publication of the notice hereinafter referred to, and which newspaper is not devoted to nor published for the interests, entertainment or instruction of a particular class, profession, trade, calling, race, or denomination, or any number of same; that the notice of which the annexed is a printed copy, has been published in said newspaper in accordance with the instructions of the person(s) requesting publication, and not in any supplement thereof on the following dates, to wit:

Nov 21, 2012

Chief Clerk for the Publisher

11/21/12

Date

Affidavit of Publication of

Legal Advertisement
Ad # 0010688587#
ORDERED BY: IRENE

NOTICEPUBLIC COMMENT PERIOD CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD - SAN DIEGO REGION TENTATIVE ORDER

R9-2013-0001
Regional MS4 Municipal Storm Water Permit

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) is pleased to release for public review and comment Tentative Order No. R9-2013-0001, NPDES No. CAS0109266, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges of Runoff from the Municipal Separate Storm Sewer Systems (MS4s) *Draining the Watersheds within the San Diego Region (Tentative Order).*

The Tentative Order is a regional MS4 permit that proposes to jointly cover all 39 Copermittees within the San Diego Region (i.e., South Orange County, Southwestern Riverside County, and San Diego County), in a phased manner as their current MS4 permits expire or upon request for earlier coverage prior to permit expiration. The Tentative Order covers multiple discharge points to multiple receiving waters throughout the San Diego Water Board Region. All MS4 Copermittees in the San Diego Region are therefore on notice that they may ultimately be regulated under the Tentative Order, if adopted. Copermittees covered by the San Diego County MS4 permit (Order No. R9-2007-0001) must submit any written comments on the Tentative Order during the comment period described below. Copermittees covered by the Orange County and Riverside County MS4 permits (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), for which Reports of Waste Discharge have not yet been filed, are strongly encouraged to submit written comments on the Tentative Order during the comment period described below.

The Tentative Order includes in Attachment F, a Fact Sheet pursuant to title 40 code of Federal Regulations section 124.8 (a) that sets forth the principal background information and facts, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of the Tentative Order.

Document Availability

The Tentative Order, and attachments thereto, are available on the San Diego Water Board website at: http://www.waterboards.ca.gov/rwqcb9/water_issues/programs/stormwater/index.shtml

You may also receive a copy of the Tentative Order by contacting Wayne Chiu at (858) 637-5558 or wchiu@waterboards.ca.gov or by visiting the San Diego Water Board's office at 9174 Sky Park Court, Suite 100, San Diego, California 92123-4340, weekdays between 8:00 a.m. and 5:00 p.m., telephone 858-467-2952.

Submission of Written Comments

Copermittees or interested persons wishing to submit comments on the Tentative Order must submit them so that they are received no later than **5:00 p.m. on Friday, January 11, 2013.** Written comments should be submitted to:

Wayne Chiu, P.E.
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego California 92123-4340

The early submission of written comments on the Tentative Order is encouraged. Electronic written comments are acceptable and should be submitted via e-mail to the attention of Wayne Chiu at wchiu@waterboards.ca.gov. Please indicate in the subject line of all written comments Comment - Tentative Order No. R9-2013-0001, Regional MS4 Permit, Place ID: 786038Wchiu. If the submitted written comments exceed five pages in length or contain foldouts, color graphics, or maps, 15 hard copies must be submitted for distribution to the San Diego Water Board members and staff.

The submission of written comments is the opportunity for Copermittees and interested persons to raise and comment on issues pertaining to the terms and conditions of the Tentative Order. All written comments including testimony, technical documentation and factual information pertaining to the terms and conditions of the Tentative Order to be considered by the San Diego Water Board at the as yet unscheduled public hearing must be received by 5:00 pm on January 11, 2013. At a later date following submittal of written comments, the San Diego Water Board will convene a public hearing to hear testimony and policy statements from the Copermittees and interested persons summarizing their written comments and to consider adoption of the Tentative Order. The scope of oral testimony at the public hearing will be strictly limited to summarizing the previously submitted written comments and making policy statements. No new issues may be raised at the hearing.

Consistent with State Water Board regulations that apply to this proceeding, written comments received after the close of the comment period will not be accepted and will not be incorporated into the administrative record if doing so would prejudice any party. Written comments received by the close of the comment period will be provided to the San Diego Water Board members for their review in advance of a public hearing to consider adoption of the Tentative Order. All timely written comments will also be posted as they are received on the San Diego Water Board website (cited above).

Public Hearing for Consideration of Tentative Order Adoption

The San Diego Water Board will issue a separate notice announcing a public hearing to receive oral comments and consider adoption of the Tentative Order at a later date. Notice of the public hearing will be provided to the Copermittees and interested persons at least thirty (30) days in advance of the hearing. Participants will have an opportunity to address the San Diego Water Board members subject to reasonable limitations prior to the Board taking action on the Tentative Order.

The public notice providing the specific date for the San Diego Water Board adoption meeting and any other public notices related to the Tentative Order will be distributed through the Lyris e-mail list server and posted on the San Diego Water Board website (cited above).

11/21/12
CNS-2410070#

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THE PRESS-ENTERPRISE

3450 Fourteenth Street
Riverside, CA 92501-3878
951-684-1200
951-368-9018 FAX

PROOF OF PUBLICATION
(2010, 2015.5 C.C.P)

Publication(s): The Press-Enterprise

PROOF OF PUBLICATION OF

Ad Desc.: / 2410069

I am a citizen of the United States. I am over the age of eighteen years and not a party to or interested in the above entitled matter. I am an authorized representative of THE PRESS-ENTERPRISE, a newspaper in general circulation, printed and published daily in the County of Riverside, and which newspaper has been adjudicated a newspaper of general circulation by the Superior Court of the County of Riverside, State of California, under date of April 25, 1952, Case Number 54446, under date of March 29, 1957, Case Number 65673, and under date of August 25, 1995, Case Number 267864; that the notice, of which the annexed is a printed copy, has been published in said newspaper in accordance with the instructions of the person(s) requesting publication, and not in any supplement thereof on the following dates, to wit:

11/21/2012

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Date: November 21, 2012
At: Riverside, California

CALIF NEWSPAPER SERV BUREAU, LGL AGENCY
PO BOX 60460
LOS ANGELES, CA 90060

Ad Number: 0000935606-01

P.O. Number: 2410069

Ad Copy:

004813

NOTICEPUBLIC COMMENT PERIOD CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD - SAN DIEGO REGION TENTATIVE ORDER
R9-2013-0001
Regional MS4 Municipal Storm Water Permit

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) is pleased to release for public review and comment Tentative Order No. R9-2013-0001, NPDES No. CAS0109266, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges of Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region (Tentative Order).

The Tentative Order is a regional MS4 permit that proposes to jointly cover all 39 Copermittees within the San Diego Region (i.e., South Orange County, *Southwestern Riverside* County, and San Diego County), in a phased manner as their current MS4 permits expire or upon request for earlier coverage prior to permit expiration. The Tentative Order covers multiple discharge points to multiple receiving waters throughout the San Diego Water Board Region. All MS4 Copermittees in the San Diego Region are therefore on notice that they may ultimately be regulated under the Tentative Order, if adopted. Copermittees covered by the San Diego County MS4 permit (Order No. R9-2007-0001) must submit any written comments on the Tentative Order during the comment period described below. Copermittees covered by the Orange County and Riverside County MS4 permits (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), for which Reports of Waste Discharge have not yet been filed, are strongly encouraged to submit written comments on the Tentative Order during the comment period described below.

The Tentative Order includes in Attachment F, a Fact Sheet pursuant to title 40 code of Federal Regulations section 124.8 (a) that sets forth the principal background information and facts, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of the Tentative Order.

Document Availability
The Tentative Order, and attachments thereto, are available on the San Diego Water Board website at: *http://www.waterboards.ca.gov/rwqcb9/water_issues/programs/stormwater/index.shtml*

You may also receive a copy of the Tentative Order by contacting Wayne Chiu at (858) 637-5558 or wchiu@waterboards.ca.gov or by visiting the San Diego Water Board's office at 9174 Sky Park Court, *Suite 100, San Diego, California* 92123-4340, weekdays between 8:00 a.m. and 5:00 p.m., telephone 858-467-2952.

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Copermittees or interested persons wishing to submit comments on the Tentative Order must submit them so that they are received no later than **5:00 p.m. on Friday, January 11, 2013.** Written comments should be submitted to:
Wayne Chiu, P.E.
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego California 92123-4340

The early submission of written comments on the Tentative Order is encouraged. Electronic written

A000002898239

ages. Electronic written comments are acceptable and should be submitted via e-mail to the attention of Wayne Chiu at wchiu@waterboards.ca.gov.
Please indicate in the subject line of all written comments "Comment - Tentative Order No. R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu." If the submitted written comments exceed five pages in length or contain foldouts, color graphics, or maps, 15 hard copies must be submitted for distribution to the San Diego Water Board members and staff.
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11/21/12
CNS-2410069#
THE PRESS ENTERPRISE

THE REGISTER

625 N GRAND AVE, SANTA ANA, CA 92701
Telephone (714) 796-7000 / Fax (714) 796-6059

This space for filing stamp only

PROOF OF PUBLICATION

(2015.5 C.C.P.)

State of California)
County of ORANGE) ss

Notice Type: GPN - GOVT PUBLIC NOTICE

Ad Description:
Public Comment Period on Tentative Order R9-2013-0001

I am a citizen of the United States and a resident of the State of California; I am over the age of eighteen years, and not a party to or interested in the above entitled matter. I am the principal clerk of the printer and publisher of the THE REGISTER, a newspaper published in the English language in the city of SANTA ANA, county of ORANGE, and adjudged a newspaper of general *circulation as defined by the laws of the State of California by the Superior* Court of the County of ORANGE, State of California, under date 11/19/1905, Case No. A21046. That the notice, of which the annexed is a printed copy, has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to-wit:

11/23/2012

Executed on: 11/23/2012
At SANTA ANA, California

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Signature

* A 0 0 0 0 0 2 8 8 8 3 5 2 *

CNS#: 2410071

NOTICEPUBLIC COMMENT PERIOD CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD - SAN DIEGO REGION TENTATIVE ORDER
R9-2013-0001
Regional MS4 Municipal Storm Water Permit

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) is pleased to release for public review and comment Tentative Order No. R9-2013-0001, NPDES No. CAS0109266, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges of Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region (Tentatve Order).

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The Tentative Order, and attachments thereto, are available on the San Diego Water Board website at:
http://www.waterboards.ca.gov/rwqcb9/water_issues/programs/stormwater/index.shtml

You may also receive a copy of the Tentative Order by contacting Wayne Chiu at (858) 637-5558 or wchiu@waterboards.ca.gov or by visiting the San Diego Water Board's office at 9174 Sky Park Court, Suite 100, San Diego, California 92123-4340, weekdays between 8:00 a.m. and 5:00 p.m., telephone 858-467-2952.

Submission of Written Comments
Copermittees or interested persons wishing to submit comments on the Tentative Order must submit them so that they are received no later than **5:00 p.m. on Friday, January 11, 2013.**

Written comments should be submitted to:
Wayne Chiu, P.E.
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego California 92123-4340

The early submission of written comments on the Tentative Order is encouraged. Electronic written comments are acceptable and should be submitted via e-mail to the attention of Wayne Chiu at wchiu@waterboards.ca.gov. Please indicate in the subject line of all written comments "Comment - Tentative Order No. R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu." If the submitted written comments exceed five pages in length or contain foldouts, color graphics, or maps, 15 hard copies must be submitted for distribution to the San Diego Water Board members and staff.

The submission of written comments is the opportunity for Copermittees and interested persons to raise and comment on issues pertaining to the terms and conditions of the Tentative Order. All written comments including testimony, technical documentation and factual information pertaining to the terms and conditions of the Tentative Order to be considered by the San Diego Water Board at the as yet unscheduled public hearing must be received by 5:00 pm on January 11, 2013. At a later date following submittal of written comments, the San Diego Water Board will convene a public hearing to hear testimony and policy statements from the Copermittees and interested persons summarizing their written comments and to consider adoption of the Tentative Order. The scope of oral testimony at the public hearing will be strictly limited to summarizing the previously submitted written comments and making policy statements. No new issues may be raised at the hearing.

Consistent with State Water Board regulations that apply

I am a citizen of the United States and a resident of the State of California; I am over the age of eighteen years, and not a party to or interested in the above entitled matter. I am the principal clerk of the printer and publisher of the THE REGISTER, a newspaper published in the English language in the city of SANTA ANA, county of ORANGE, and adjudged a newspaper of general circulation as defined by the laws of the State of California by the Superior Court of the County of ORANGE, State of California, under date 11/19/1905, Case No. A21046. That the notice, of which the annexed is a printed copy, has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to-wit:

11/23/2012

Executed on: 11/23/2012
At SANTA ANA, California

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Signature

Diego Region (i.e., South Orange County, Southwestern Riverside County, and San Diego County), in a phased manner as their current MS4 permits expire or upon request for earlier coverage prior to permit expiration. The Tentative Order covers multiple discharge points to multiple receiving waters throughout the San Diego Water Board Region. All MS4 Copermittees in the San Diego Region are therefore on notice that they may ultimately be regulated under the Tentative Order, if adopted. Copermittees covered by the San Diego County MS4 permit (Order No. R9-2007-0001) must submit any written comments on the Tentative Order during the comment period described below. Copermittees covered by the Orange County and Riverside County MS4 permits (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), for which Reports of Waste Discharge have not yet been filed, are strongly encouraged to submit written comments on the Tentative Order during the comment period described below

The Tentative Order includes in Attachment F, a Fact Sheet pursuant to title 40 code of Federal Regulations section 124.8 (a) that sets forth the principal background information and facts, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of the Tentative Order.

California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego California 92123-4340

004816

The early submission of written comments on the Tentative Order is encouraged. Electronic written comments are acceptable and should be submitted via e-mail to the attention of Wayne Chiu at wchiu@waterboards.ca.gov. Please indicate in the subject line of all written comments "Comment - Tentative Order No. R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu." If the submitted written comments exceed five pages in length or contain foldouts, color graphics, or maps, 15 hard copies must be submitted for distribution to the San Diego Water Board members and staff.

The submission of written comments is the opportunity for Copermittees and interested persons to raise and comment on issues pertaining to the terms and conditions of the Tentative Order. All written comments including testimony, technical documentation and factual information pertaining to the terms and conditions of the Tentative Order to be considered by the San Diego Water Board at the as yet unscheduled public hearing must be received by 5:00 pm on January 11, 2013. At a later date following submittal of written comments, the San Diego Water Board will convene a public hearing to hear testimony and policy statements from the Copermittees and interested persons summarizing their written comments and to consider adoption of the Tentative Order. The scope of oral testimony at the public hearing will be strictly limited to summarizing the previously submitted written comments and making policy statements. No new issues may be raised at the hearing.

Consistent with State Water Board regulations that apply to this proceeding, written comments received after the close of the comment period will not be accepted and will not be incorporated into the administrative record if doing so would prejudice any party. Written comments received by the close of the comment period will be provided to the San Diego Water Board members for their review in advance of a public hearing to consider adoption of the Tentative Order. All timely written comments will also be posted as they are received on the San Diego Water Board website (cited above).

Public Hearing for Consideration of Tentative Order Adoption

The San Diego Water Board will issue a separate notice announcing a public hearing to receive oral comments and consider adoption of the Tentative Order at a later date. Notice of the public hearing will be provided to the Copermittees and interested persons at least thirty (30) days in advance of the hearing. Participants will have an opportunity to address the San Diego Water Board members subject to reasonable limitations prior to the Board taking action on the Tentative Order.

The public notice providing the specific date for the San Diego Water Board adoption meeting and any other public notices related to the Tentative Order will be distributed through the Lyris e-mail list server and posted on the San Diego Water Board website (cited above).

11/23/12

CNS-2410071#
THE REGISTER
R-1850 9536194

From: lyris@swrcb18.waterboards.ca.gov
To: Chiu, Wayne@Waterboards
Subject: Notice of November 13, 2012 Public Workshop on Regional MS4 Permit
Date: Friday, October 12, 2012 9:47:46 AM
Attachments: Final_Workshop_Notice.pdf

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) will hold an informational public workshop at its regularly scheduled public meeting to receive information and discuss requirements in the public draft of a Regional NPDES Permit for Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region (Regional MS4 Permit) (Tentative Order No. R9-2013-0001). The November 13, 2012 public workshop will be informal and conducted to provide San Diego Water Board members with information about the Regional MS4 Permit.

Attached is the Public Notice for the November 13, 2012 Workshop. The Workshop Notice can also be accessed from the San Diego Water Boards website at: http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml. The Workshop will be held at the:

City of San Diego Public Utilities Department
Wastewater Branch Auditorium
9192 Topaz Way, San Diego, California
San Diego, CA 92123

The Tentative Order will be available **on or before October 31, 2012** and will be accessible electronically at: http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

If you have any questions or wish to receive a hard copy of the Tentative Order when it is released, please contact Wayne Chiu at (858) 637-5558 or via e-mail at wchiu@waterboards.ca.gov or me (858) 467-2970 or via e-mail at lwalsh@waterboards.ca.gov.

Laurie Walsh P.E.
San Diego Water Board
858-467-2970
lwalsh@waterboards.ca.gov

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California Regional Water Quality Control Board

San Diego Region

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http:// www.waterboards.ca.gov/sandiego

NOTICE OF PUBLIC WORKSHOP

A workshop will be held to discuss
Tentative Order No. R9-2013-0001, NPDES No. CAS0109266
Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region

Tuesday, November 13, 2012
9:00 a.m.
City of San Diego Public Utilities Department
Wastewater Branch Auditorium
9192 Topaz Way, San Diego, California
San Diego, CA 92123

SUBJECT OF WORKSHOP

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) will hold an informational public workshop at its regularly scheduled public meeting to receive information and discuss requirements in the public draft of a Regional NPDES Permit for Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region (Regional MS4 Permit) (Tentative Order No. R9-2013-0001). The Tentative Order will be available **on or before October 31, 2012** and will be accessible electronically at:

http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

BACKGROUND

The San Diego Water Board is considering the adoption of a Regional MS4 Permit that will be issued to municipal Copermittees in San Diego County, Southern Orange County and Southwest Riverside County. Currently, each of these counties within the San Diego Region has its own MS4 Storm Water Permit. In order to better achieve regulatory consistency as well as maximum efficiency and economy of resources, the San Diego Water Board has drafted a single MS4 Permit based on the boundaries of the San Diego Region instead of county political boundaries. Under this approach, the Regional MS4 Permit will uniformly regulate all three counties within the San Diego Region once it becomes effective for all Copermittees. The Regional MS4 Permit will also provide opportunities for a comprehensive monitoring framework, incentive for a regional collaborative approach, and opportunities for regional cost efficiencies among Copermittees. Upon adoption by the San Diego Water Board, this Regional MS4 Permit will be issued to all 39 Copermittees in a phased manner according to the expiration dates of their current MS4 Storm Water Permits and after consideration of Reports of Waste Discharge filed by the Orange County and Riverside County Copermittees.

PROCEDURAL MATTERS
The November 13, 2012 public workshop will be informal and conducted to provide San Diego Water Board members with information about the Regional MS4 Permit and to facilitate discussion. There will be no sworn testimony or cross-examination of participants. San Diego Water Board staff will explain the permit development process and summarize significant elements of the Regional MS4 Permit for the San Diego Water Board and the public. Copermittees, interested stakeholders, and the public will also have an opportunity to provide oral comments as set forth below. The San Diego Water Board may provide general feedback to staff on development of the permit; however, no action or voting will take place at this workshop.

To ensure a productive and efficient Workshop, and to ensure that all attending have an opportunity to participate, oral presentations from Copermittees, stakeholders, and any interested persons may be limited at the discretion of the Chair. This item has significant interest and to provide enough time for all interested parties to participate, participants with similar comments are requested to make joint presentations.

The San Diego Water Board will issue a separate public hearing notice announcing the release of the draft Regional MS4 Permit as a Tentative Order for public review and comment at a later date. The public hearing notice will establish the deadline for submission of comments, the date of the public hearing, and the procedures that the San Diego Water Board will follow at the public hearing to consider adoption of the Tentative Order. Once released, the Tentative Order will serve as the public comment draft permit for purposes of applicable public notice requirements under the Code of Federal Regulations (40 C.F.R. § 124.10) and Water Code section 13167.5, subdivision (b).

ELECTRONIC MAIL LIST SUBSCRIPTION
The San Diego Water Board has established an electronic mail list specifically for information and notices on the development of a Regional MS4 Permit. The San Diego Water Board will use the email list to notify interested persons of upcoming important events and the availability of on-line documents. Persons interested in receiving future notices and information on this specific project can subscribe to one of the electronic mail lists titled “Orange County MS4 Permit,“ “Riverside County MS4 Permit, or “San Diego MS4 Permit” located on the San Diego Water Board website at:

http://www.waterboards.ca.gov/resources/email_subscriptions/reg9_subscribe.shtml

Persons who wish to receive hard copy notices of future notices or meetings on the Regional MS4 Storm Water Permit in lieu of electronic notices should submit a request to Mr. Wayne Chiu, Water Resource Control Engineer, 9174 Sky Park Court, Suite 100, San Diego, CA 92123.

Please bring this matter to the attention of any person known to you who may be affected by the Regional MS4 Permit.

INFORMATION REGARDING WORKSHOP
If you have any questions or wish to receive a hard copy of the Tentative Order when it is released, please contact Wayne Chiu at (858) 637-5558 or via e-mail at wchiu@waterboards.ca.gov or Laurie Walsh at (858) 467-2970 or via e-mail at lwalsh@waterboards.ca.gov.

From: lyris@swrcb18.waterboards.ca.gov
To: Chiu, Wayne@Waterboards
Subject: REMINDER - Tentative Order No. R9-2013-0001 Public Workshop
Date: Thursday, November 08, 2012 6:55:42 AM

I want to remind everyone that the Public Workshop on Tentative Order R9-2013-0001, NPDES Permit for Discharges from Municipal Separate Storm Sewer Systems Draining the Watersheds within the San Diego Region is coming up next week. The meeting will be held on:

TUESDAY, NOVEMBER 13, 2012

At the…

City of San Diego Public Utilities Department
Wastewater Branch Auditorium
9192 Topaz Way
San Diego, CA 92123

The meeting **Begins at 9:00 a.m.**

If you have any questions please contact me. For more information and to get a copy of the Notice please visit our website http://www.waterboards.ca.gov/rwqcb9/water_issues/programs/stormwater/index.shtml

Laurie Walsh, PE
San Diego Water Board
Lwalsh@waterboards.ca.gov
858-467-2970

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STATE OF CALIFORNIA
REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

MEETING NOTICE AND AGENDA

Tuesday, November 13, 2012
9:00 a.m.

City of San Diego
Public Utilities Department
Wastewater Branch
Auditorium
9192 Topaz Way
San Diego, California

The purpose of this meeting is for the San Diego Water Board to obtain testimony and information from concerned and affected persons and to make decisions based on the information received. Persons who want to submit written comments or evidence on any agenda item must comply with the procedures described in the agenda and agenda notes. Persons wishing to speak at the meeting should complete an attendance card (see Note F, attached to this Notice). The San Diego Water Board requests that all lengthy comments be submitted in writing in advance of the meeting date. To ensure that the San Diego Water Board members and staff have the opportunity to review and consider written material, comments should be received in the San Diego Water Board's office no later than noon on Monday, October 29, 2012* and should indicate the agenda item to which it is applicable. If the submitted written material is more than 5 pages or contains foldouts, color graphics, maps, etc., 15 copies must be submitted for distribution to the Board members and staff. Written material submitted after 5:00 P.M. on Monday, November 5, 2012, will not be provided to the Board members and may not be considered by the San Diego Water Board (See Note D, attached to this Notice).

****PLEASE NOTE THAT SOME ITEMS ON THE AGENDA MAY HAVE BEEN PREVIOUSLY NOTICED WITH EARLIER DEADLINES FOR SUBMITTING WRITTEN COMMENTS OR MAY HAVE A SEPARATE HEARING PROCEDURES DOCUMENT THAT ESTABLISHES DIFFERENT DEADLINES OR PROCEDURES FOR SUBMITTING WRITTEN MATERIALS. IN THOSE CASES THE DIFFERENT DEADLINES OR PROCEDURES APPLY.***

Comments on agenda items will be accepted by E-mail subject to the same conditions set forth for other written submissions as long as the total submittal (including attachments) does not exceed five printed pages in length. E-mail must be submitted to: rb9agenda@waterboards.ca.gov. Type the word “Agenda” in the subject line.

Pursuant to Title 23, California Code of Regulations, section 648.4, the San Diego Water Board may refuse to admit written testimony or evidence into the record if it is not submitted to the San Diego Water Board in a timely manner and shall refuse to do so if admitting it would prejudice any party or the board, unless the proponent demonstrates that compliance with the deadline would create an unreasonable hardship.

NOTE D, attached to this Notice, refers to the procedures that will be followed by the San Diego Water Board in contested adjudicatory matters if a separate Hearing Procedures Document has not been issued for a particular agenda item. Parties requesting an alternate hearing process must do so in accord with the directions in NOTE D. Any such request, together with supporting material, must be received in the San Diego Water Board's office no later than noon on Monday, October 29, 2012.

Copies of the agenda items to be considered by the San Diego Water Board are posted on the San Diego Water Board's website at http://www.waterboards.ca.gov/sandiego/board_info/agendas

Except for items designated as time certain, there are no set times for agenda items. Items may be taken out of order at the discretion of the Chairman.

1. Roll Call and Introductions

2. PUBLIC FORUM: Any person may address the Board regarding a matter within the Board's jurisdiction that is not related to an item on this Meeting agenda and is not scheduled for a future Meeting. **Comments will generally be limited to three minutes, unless otherwise directed by the Board Chairperson**. Any person wishing to make a longer presentation should contact the Executive Officer at least ten days prior to the meeting.

3. Minutes of Board Meeting: October 10, 2012

4. Chairman's, Board Members', State Board liaison's and Executive Officer's Reports: These items are for Board discussion only. No public testimony will be allowed, and the Board will take no formal action.

5. Approval of 2013 Meeting Schedule (*David Gibson*)

Consent Calendar: Items 6 through 9 are considered non-controversial issues. (NOTE: If there is public interest, concern or discussion regarding any consent calendar item or a request for a public hearing, then the item(s) will be removed from the consent calendar and considered after all other agenda items have been completed.)

6. Waste Discharge Requirements: Harmony Grove Water Reclamation Plant, San Diego County Sanitation District, San Diego County, Tentative Order No. R9-2012-0054 (*Fisayo Osibodu*)

7. Water Reclamation Requirements: Rincon Del Diablo Water District, San Diego County, Tentative Order No. R9-2012-0055 (*Fisayo Osibodu*)

8. Waste Discharge Requirements Addendum: Modification of Waste Discharge Requirements and Water Recycling Requirements for the Production and Purveyance of Recycled Water for Padre Dam Municipal Water District, San Diego County, Tentative Addendum No. 1 to Order No. R9-1997-49 (*Fisayo Osibodu*)

9. NPDES Permit Addendum: City of Oceanside Pretreatment Program, Approval of Local Limits (Tentative Order No. R9-2012-0060) (*Joann Lim*)

Remainder of the Agenda (Non-Consent Items):

10. Public Workshop: The San Diego Water Board will hold a public workshop to receive information and discuss proposed requirements in the public draft of a Regional NPDES Permit for Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region (Tentative Order No. R9-2013-0001, NPDES No. CAS0109266). The San Diego Water Board will not take any formal action on this item at the workshop. (*Christina Arias and Laurie Walsh*)

11. *Closed Session* - Discussion of Ongoing Litigation [Authorized under Government Code Section 11126, subd. (e)]. The San Diego Water Board may meet in closed session to discuss ongoing litigation for the following cases:

    Civil Actions (Judicial and Administrative, other than Petitions for Review filed with the State Water Board)

    a. *People of the State of California Ex Rel. the Regional Water Quality Control Board, San Diego Region v. Edward Drusina, an individual in his capacity as Commissioner of the International Boundary and Water Commission, United States Section, et al.,* Complaint for Violations of the Clean Water Act and Related State Law Claims. United States District Court, Southern District of California, Case No. 01-CV-027BTM(JFS) (filed February 2001). *(David Gibson).*

    b. *In re: Test Claim on California Regional Water Quality Control Board, San Diego Region, Order No. R9-2007-001, (NPDES No. CAS0108758) Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego County, the San Diego Unified Port District, and the San Diego County Regional Airport Authority adopted on January 24, 2007. Test Claim filed by San Diego County, et al., with Commission on State Mandates, No. 07-TC-09* (filed June 2008). *(Catherine George Hagan)*

    c. *Surfrider Foundation v. California Regional Water Quality Control Board, San Diego Region,* Petition for Writ of Mandate [re: San Diego Water Board's adoption of Order No. R9-2009-0038 amending Order No. R9-2006-0065 for Poseidon Resources (Channelside), LLC, NPDES Permit No.

CA0109223, approval of a Flow, Entrainment and Impingement Minimization Plan under the California Water Code]. San Diego County Superior Court, Case No. 37-2010-0009-436-CU-WM-CTL (filed April 2010). *(Brian Kelley)*

d. *California Regional Water Quality Control Board, San Diego Region v. Bill and Heidi Dickerson, Larry and Penelope Gunning and Perry & Papenhausen, Inc.* Complaint for Damages for Breach of Contract and for Specific Performance. San Diego County Superior Court, Case No. 37-2010-00096011-CU-CO-CTL (filed July 2010) *(Jeremy Haas)*

e. *State of California Department of Finance, State Water Resources Control Board, And California Regional Water Quality Control Board, San Diego Region v. Commission on State Mandates.* Petition for Writ of Administrative Mandamus. Sacramento County Superior Court, Case No. 34-2010-80000604 (filed July 2010) *(Catherine George Hagan)*

f. *In re: Citizens Development Corporation, Debtor and Debtor in Possession*, Case No. 10-15142-LT11. United States Bankruptcy Court, Southern District of California. (San Diego Water Board Claim in Bankruptcy) (filed June 2011) (*Catherine George Hagan*)

g. *Test Claim on California Regional Water Quality Control Board, San Diego Region, Order No. R9-2009-0002, (NPDES No. CAS0108740) Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of Orange, the Incorporated Cities of the County of Orange, and the Orange County Flood Control District adopted on December 16, 2009. Test Claim filed by County of Orange, et al., with Commission on State Mandates, No. 10-TC-11* (filed June 2011). *(Jessica Jahr)*

h. *Test Claim on California Regional Water Quality Control Board, San Diego Region, Order No. R9-2010-0016 (NPDES No. CAS0108766) adopted November 10, 2010, County of Riverside, Riverside County Flood Control and Water Conservation District, and the Cities of Murrieta, Temecula and Wildomar, Co-Claimants, filed with Commission on State Mandates, No. 11-TC-03 (filed November 2011).* (*Catherine George Hagan*)

Petitions for Review Pending Before State Water Resources Control Board[1]

i. Petitions of the National Fireworks Association and Fireworks & Stage FX America Inc., Coastal Environmental Rights Foundation, and San Diego Coastkeeper (General National Pollutant Discharge Elimination System (NPDES) Permit Order No. R9-2011-0022 (NPDES No. CAG999002) for

[1] Petitions for review of San Diego Water Board actions or inactions filed with the State Water Board being held in abeyance by the State Water Board are not listed in the agenda. The titles of these matters are available at the San Diego Water Board. Please contact Catherine George Hagan at chagan@waterboards.ca.gov or 858-467-2958 for more information.

Residual Firework Pollutant Waste Discharges to Waters of the United States in the San Diego Region from the Public Display of Fireworks), SWRCB/OCC Files A-2164(a)-(c), filed June and July 2011. *(Michelle Mata)*

j. Petition of Citizens Development Corporation (Water Code Section 13267 Investigative Order No. R9-2011-0033 dated September 14, 2011, Requiring Submission of Technical Reports Pertaining to Investigation of Lake San Marcos Nutrient Impairment, San Diego County), SWRCB/OCC File A-2185, filed October 2011. (*Laurie Walsh*)

k. Petition of City of San Diego (Time Schedule Order No. R9-2011-0052 dated September 14, 2011, for the Kinder Morgan Energy Partners, Mission Valley Terminal Remediation Dewatering Discharge to Murphy Canyon Creek, San Diego County), SWRCB/OCC File A-2186, filed October 2011. (*Ben Neill*)

l. Petition of Jack Eitzen (Administrative Assessment of Civil Liability Order Nos. R9-2011-0048 and R9-2011-0049 against Jack Eitzen for 38175 and 38155 Via Vista Grande, Murrieta, Riverside County), issued October 12, 2011), SWRCB/OCC File A-2193, filed November 2011. (*Rebecca Stewart*)

m. Petitions for Review of San Diego Bay Shipyard Sediment Cleanup and Abatement Order No. R9-2012-0024 for National Steel and Shipbuilding Company (NASSCO), BAE Systems, San Diego Ship Repair (BAE Systems), Campbell Industries, City of San Diego, San Diego Gas & Electric (SDG&E) and San Diego Unified Port District (Port District) issued March 14, 2012. Petitions for Review and Requests for Stay filed by NASSCO, BAE Systems and City of San Diego. Petitions for Review w/o requests for stay filed by SDG&E, Star & Crescent Boat Company and Port District. SWRCB/OCC File A-XXXX, filed April 2012. (*Frank Melbourn)*

n. Petition of NASSCO for Review of Resolution No. R9-2012-0025 (Certifying Final Environmental Impact Report for San Diego Bay Shipyard Sediment Cleanup and Abatement Order No. R9-2012-0024), adopted March 14, 2012, SWRCB/OCC File A-XXXX, filed April 2012. (*Frank Melbourn)*

o. Petition of South Laguna Civic Association for Review of Order No. R9-2012-0013, NPDES No. CA0107611, NPDES Permit Reissuance: South Orange County Waste Authority, Discharges to the Pacific Ocean via Aliso Creek Ocean Outfall, adopted April 11, 2012, SWRCB/OCC File A-2211, filed May 2012. (*Joann Lim*)

p. Petition of City of San Diego for Review of Resolution No. R9-2012-0045, re NPDES Permit Notice of Enrollment Amendment for Kinder Morgan Energy Partners, June 13, 2012, SWRCB/OCC File A-XXXX, filed July 2012. (*Ben Neill*)

12. *Closed Session* - Consideration of Initiation of Litigation or Discussion of Significant Exposure to Litigation. The San Diego Water Board may meet in

closed session to initiate or consider initiating litigation concerning matters within its jurisdiction or to discuss significant exposure to litigation [Authorized under Government Code Section 11126(e)] *(David Gibson).*

13. *Closed Session* - Deliberation on a Decision to be Reached Based on Evidence Introduced in a Hearing. The San Diego Water Board may meet in closed session to consider evidence received in an adjudicative hearing and to deliberate on a decision to be reached based upon that evidence [Authorized under Government Code Section 11126(c)(3)].

14. *Closed Session* – Personnel. The San Diego Water Board may meet in closed session to consider the appointment, employment, evaluation of performance, or dismissal of a public employee or to hear complaints or charges brought against that employee by another person or employee unless the employee requests a public hearing [Authorized under Government Code Section 11126(a)].

15. Arrangements for Next Meeting and Adjournment:
    Wednesday, December 12, 2012 - 9:00 a.m.
    Water Quality Control Board
    Regional Board Meeting Room
    9174 Sky Park Court
    San Diego, California

NOTIFICATIONS

A. **Completed Cleanup Action – 30 Day Public Notice.** The San Diego Water Board intends to issue a no further action letter for completion of cleanup of pollutants from Installation Restoration Program Site 18 (former Torpedo Site) at Naval Munitions Command West Detachment located on Naval Base Point Loma, California. This notification fulfills the San Diego Water Board's obligation to inform the public of the proposed actions pursuant to the State and Regional Water Quality Control Boards' Public Participation guidance document. The residual concentrations of waste constituents in soil do not appear to pose a threat to human health or the environment and the unauthorized release case may be closed. Additional details about the case are available from the GeoTracker website at: https://geotracker.waterboards.ca.gov/profile_report.asp?global_id=DOD100335300. Provided no significant issues arise during the public notification period, the San Diego Water Board will issue a no further action letter in November 2012. (*Brian McDaniel*)

B. **Completed Cleanup Action - 30-day Notice.** The San Diego Water Board intends to issue a no further action letter for completion of cleanup of pollutants from a leaking underground storage tank (UST) at Building 22141 at Marine Corps Base Camp Pendleton, California. This notification is made pursuant to California Code of Regulations, Title 23, section 2728. The residual concentrations of fuel constituents in soil do not appear to pose a threat to

human health and the environment and the unauthorized release case may be closed. Additional details about this case are available on the GeoTracker website at: https://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T10000003565. Provided no significant issues arise during the public notification period, the San Diego Water Board will issue a no further action letter in December 2012. (*Cheryl Prowell*)

C. **Completed Cleanup Action - 30-day Notice.** The San Diego Water Board intends to issue a no further action letter for completion of cleanup of pollutants from a leaking underground storage tank (UST) at Building 1534 at Marine Corps Base Camp Pendleton, California. This notification is made pursuant to California Code of Regulations, Title 23, section 2728. The residual concentrations of fuel constituents in soil and groundwater do not appear to pose a threat to human health and the environment and the unauthorized release case may be closed. Additional details about this case are available on the GeoTracker website at: http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T0607302896. Provided no significant issues arise during the public notification period, the San Diego Water Board will issue a no further action letter in February 2013 . (*Benjamin Tobler*).

D. **Follow the Board Meeting on Twitter**: Updates on the progress of the San Diego Water Board meeting will be posted on Twitter at www.twitter.com/SDWaterBoard. The San Diego Water Board's use of Twitter is a courtesy and is for informational purposes only. It is not always reliable, and is not a substitute for personal attendance at a Board meeting.

DIRECTIONS TO MEETING

From Downtown: I-15 north - take the Clairemont Mesa Blvd. exit, turn and head west. Follow the signs for Kearny Villa Road North and turn right onto Kearny Villa Road. Turn right onto Topaz Way. The Metropolitan Wastewater Department is on the left.

From the North: I-15 south - take the Clairemont Mesa Blvd. exit - turn right (west). Turn right onto Kearny Villa Road. Turn right onto Topaz Way. The Metropolitan Wastewater Department is on the left.

State of California
Regional Water Quality Control Board
San Diego Region

EXECUTIVE OFFICER SUMMARY REPORT
November 13, 2012

ITEM: 10

SUBJECT: Public Workshop: The San Diego Water Board will hold a public workshop to receive information and discuss proposed requirements in the public draft of a Regional NPDES Permit for Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region (Tentative Order No. R9-2013-0001, NPDES No. CAS0109266). The San Diego Water Board will not take any formal action on this item at the workshop. (*Christina Arias and Laurie Walsh*).

PURPOSE: The purpose of this workshop is for the San Diego Water Board to receive information and discuss proposed requirements in the public draft of Tentative Order No. R9-2013-0001 (Tentative Order). The Tentative Order was released for public review and comment on October 31, 2012 (Supporting Document 1).

RECOMMENDATION: There is no recommendation as this is a public workshop and the San Diego Water Board will take no action.

KEY ISSUES:

1. The Tentative Order includes discharge prohibitions and receiving water limitations (Provision A) language that is consistent with State Water Board Order WQ 99-05. This precedential Order directed that MS4 permits contain separately enforceable receiving water limitation provisions requiring discharges to be controlled so as not to cause or contribute to exceedances of water quality standards in receiving waters. The municipal entities regulated under the Tentative Order (Copermittees) assert that they are increasingly vulnerable to San Diego Water Board enforcement action(s) and citizen suits if they are shown to be causing or contributing to an exceedance of water quality standards in violation of the permit provisions.

2. Provision E.3 of the Tentative Order describes design standards for post-construction structural best

management practices (BMPs) that are required to be implemented by Priority Development Projects. The Tentative Order provides the Copermittees with considerable flexibility in complying with the design standards. The Copermittees have the discretion to authorize Priority Development Projects to use an alternative option meeting specified criteria to comply with the BMP performance requirements stipulated by the design standards. Some stakeholders object to allowing this alternative option to achieve compliance with the BMP performance requirements unless on-site technical infeasibility for meeting the design standards can be established. The Tentative Order does not mandate that the alternative option must be used, but allows the Copermittees to specify it for a Priority Development Project if it provides a greater overall water quality benefit for a Watershed Management Area.

3. Provision E.5 of the Tentative Order describes requirements related to existing development, including implementation of programs for commercial facilities or areas, industrial facilities, municipal facilities, and residential areas. The Tentative Order provides the Copermittees with considerable flexibility to focus their efforts and resources on addressing priority water quality conditions. Some stakeholders are concerned about the reduction in minimum inspection frequencies and the expanded definition of allowable methods of inspection for existing development. The Copermittees have questions on how the retrofitting and stream habitat rehabilitation requirements will fit within their programs. The Tentative Order ties existing development inspections, retrofitting, and stream habitat rehabilitation to watershed planning and addressing priority water quality conditions.

4. Pursuant to the federal Clean Water Act (CWA) and regulations adopted thereunder, the Tentative Order incorporates water quality based effluent limitations (WQBELs) derived from Total Maximum Daily Loads (TMDLs). WQBELs must be met for certain pollutants in receiving waters in accordance with specified compliance schedules.

5. Provision D of the Tentative Order describes requirements for wet weather and dry weather monitoring

and assessment. Many stakeholders objected to the original monitoring and assessment requirements proposed in an Administrative Draft of the Tentative Order. The requirements for wet weather and dry weather monitoring and assessment in the Tentative Order have been significantly revised to include most of the recommended changes proposed by the stakeholders.

DISCUSSION:

Need for Innovative Permitting Approach

Since 1990, the San Diego Water Board has issued four iterations of MS4 permits to the Copermittees in each county within the San Diego Region. The MS4 permit requirements have progressively become more prescriptive and specific. As prescriptive and specific as the MS4 permits have become, however, they include very little detail about what the desired outcomes of the required actions are expected to achieve. Compliance with the MS4 permit requirements has essentially been reduced to tracking numbers of actions rather than tracking progress towards actual improvements in the quality of receiving waters or discharges from the MS4s. The result has been an increase in actions being implemented by the Copermittees, with little or no ability or expectations to determine whether or not improvements in water quality are being achieved.

New Permitting Approach

The Tentative Order incorporates a new approach to regulating storm water discharges from MS4s that is a significant departure from the approach used in current MS4 permits. The Tentative Order is predicated on a new emphasis on outcomes (i.e., restoration or protection of water quality and beneficial uses) instead of actions (e.g., number of facility inspections). The Tentative Order will be implemented on a regional scale by the Copermittees in San Diego County, Southern Orange County, and Southwestern Riverside County in a phased manner as the current MS4 permits expire. The Tentative Order provides the Copermittees with the flexibility to use their limited resources in the most effective and efficient manner in restoring and protecting the quality of the San Diego Region's receiving waters.

The Tentative Order places a heavy emphasis on defining desired outcomes and the use of watershed planning as a mechanism to achieve those outcomes. Since the

Copermittees cannot effectively address all water quality issues simultaneously, the Tentative Order requires Copermittees to jointly set watershed priorities through the development of Water Quality Improvement Plans. Additionally, the Tentative Order presents requirements in a flexible manner that allows Copermittees to use their discretion in determining how to most effectively and efficiently conduct their jurisdictional runoff management programs to best protect receiving waters. Finally, the Tentative Order requires the Copermittees to monitor and assess the conditions and quality of receiving waters and MS4 discharges to determine whether or not actions to comply with permit terms are resulting in water quality improvements. The Tentative Order provides the Copermittees with considerably more flexibility to manage their storm water programs and deploy resources to achieve goals that will yield the greatest water quality improvements. This approach will require that the San Diego Water Board increase interactions with the Copermittees to assess compliance. This will include an increased emphasis on conducting field inspections, audits, and closely evaluating monitoring data.

The San Diego Water Board expects to achieve efficiencies and economy of resources with the issuance of the Tentative Order. The reissuance of MS4 permits requires significant San Diego Water Board staff time. The San Diego Water Board has spent a significant portion of its time in past years developing and reissuing MS4 permits, with little time for program oversight and enforcement. With the issuance of the Tentative Order, the San Diego Water Board will have more time to oversee and enforce the MS4 permit requirements.

Activities to Date

Since February 2011, San Diego Water Board has consulted with numerous stakeholders (i.e. United States Environmental Protection Agency, environmental organizations, business groups, the building industry, and Copermittees) in the development of the Tentative Order via meetings, presentations, and written comments (See Supporting Document 2).

On April 9, 2012, an Administrative Draft of the Tentative Order was released to interested persons to facilitate discussion and give an opportunity for stakeholders to

provide feedback on the proposed MS4 permit terms and conditions. A follow-up workshop was held on April 25, 2012 to introduce the Administrative Draft of the Tentative Order to a large diverse group of stakeholders. Following the workshop, the San Diego Water Board held a series of Focused Meetings to ensure an orderly, efficient, and open process to review and discuss the Administrative Draft of the Tentative Order and to provide a fair opportunity for representatives of Copermittees, environmental non-governmental organizations, and the development community to participate in the meetings. The San Diego Water Board also selected a professional facilitator, as requested by the Copermittees, to assist in conducting the Focused Meetings. These Focused Meetings gave stakeholders access to key staff and opportunity for direct input into the permit development process. This uniquely collaborative approach resulted in significant changes and improvements to the Tentative Order.

Between June 27, 2012, and August 22, 2012, four Focused Meetings were held to review the intent of the MS4 permit provisions, discuss specific MS4 permit requirements, and receive feedback and questions from the stakeholders. The San Diego Water Board held a workshop on September 5, 2012 to inform the stakeholders of the significant concepts received during the Focused Meetings that would be incorporated into a revised Administrative Draft of the Tentative Order.

Written comments on the Administrative Draft of the Tentative Order were accepted until September 14, 2012. Thirty–one (31) comment letters were received, reviewed and closely considered by staff. Significant changes were made and a revised Administrative Draft of the Tentative Order was released on October 12, 2012. A final Focused Meeting was held on October 24, 2012 to discuss the many significant changes made to the Administrative Draft of the Tentative Order in response to the stakeholder comments and concerns received during the previous Focused Meetings and in subsequent comment letters.

On October 31, 2012, the finalized Tentative Order was released for formal public review and comment.

LEGAL CONCERNS: Legal concerns were raised in a May 10, 2012 letter from County of Orange, County Counsel and in a May 21, 2012

letter from County of Riverside, County Counsel. Both letters question whether legal authority exists to support a regional MS4 permit such as proposed in the Tentative Order. By letter dated September 7, 2012, San Diego Water Board counsel responded to the concerns and concluded that the Board has the legal authority to issue a regional MS4 permit through its authority in the Clean Water Act (Supporting Document 3).

SUPPORTING DOCUMENTS:

1. Tentative Order No. R9-2013-0001
2. Regional MS4 Permit Timeline
3. Response from San Diego Water Board Counsel to Orange County Counsel and Riverside County Counsel (September 7, 2012)
4. Notice of Public Workshop

PUBLIC NOTICE: Notice of this item was provided to interested persons via e-mail on October 12, 2012 (Supporting Document 4). Notice was also provided in the Meeting Notice and Agenda for the November 13, 2012 Board meeting, which is posted on the San Diego Water Board website.

November 13, 2012
Item No. 10
Supporting Document No. 1

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD SAN DIEGO REGION

TENTATIVE
ORDER NO. R9-2013-0001
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The San Diego County Copermittees in Table 1a are subject to waste discharge requirements set forth in this Order.

Table 1a. San Diego County Copermittees

City of Carlsbad	City of Oceanside
City of Chula Vista	City of Poway
City of Coronado	City of San Diego
City of Del Mar	City of San Marcos
City of El Cajon	City of Santee
City of Encinitas	City of Solana Beach
City of Escondido	City of Vista
City of Imperial Beach	County of San Diego
City of La Mesa	San Diego County Regional Airport Authority
City of Lemon Grove	San Diego Unified Port District
City of National City	

After the San Diego Water Board receives and considers the Orange County Copermittees' Report of Waste Discharge and makes any necessary changes to the Order, the Orange County Copermittees in Table 1b will become subject to waste discharge requirements set forth in this Order after expiration of Order No. R9-2009-0002, NPDES No. CAS0108740 on or after December 16, 2014.

Table 1b. Orange County Copermittees

City of Aliso Viejo	City of Rancho Santa Margarita
City of Dana Point	City of San Clemente
City of Laguna Beach	City of San Juan Capistrano
City of Laguna Hills	City of Laguna Woods
City of Laguna Niguel	County of Orange
City of Lake Forest	Orange County Flood Control District
City of Mission Viejo	

After the San Diego Water Board receives and considers the Riverside County Copermittees' Report of Waste Discharge and makes any necessary changes to this Order, the Riverside County Copermittees in Table 1c will become subject to waste discharge requirements set forth in this Order after expiration of Order No. R9-2010-0016, NPDES No. CAS0108766 on or after November 10, 2015.

Table 1c. Riverside County Copermittees

City of Murrieta	County of Riverside
City of Temecula	Riverside County Flood Control and Water Conservation District
City of Wildomar	

The Orange County Copermittees and Riverside County Copermittees may become subject to the requirements of this Order at a date earlier than the expiration date of their current Orders subject to the conditions described in Provision F.6 of this Order if the Copermittees in the respective county receive a notification of coverage from the San Diego Water Board.

The term Copermittee in this Order refers to any San Diego County, Orange County, or Riverside County Copermittee covered under this Order, unless specified otherwise.

This Order provides permit coverage for the Copermittee discharges described in Table 2.

Table 2. Discharge Locations and Receiving Waters

Discharge Points	Locations throughout San Diego Region
Discharge Description	Municipal Separate Storm Sewer System (MS4) Discharges
Receiving Waters	Inland Surface Waters, Enclosed Bays and Estuaries, and Coastal Ocean Waters of the San Diego Region

Table 3. Administrative Information

This Order was adopted by the San Diego Water Board on:	**Month Day, 2013**
This Order will become effective on:	**Month Day, 2013**
This Order will expire on:	**Month Day, 2018**
The Copermittees must file a Report of Waste Discharge in accordance with Title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than 180 days in advance of the Order expiration date.	

I, David W. Gibson, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on Month Day, 2013.

TENTATIVE

David W. Gibson
Executive Officer

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Attachment C - Acronyms, Abbreviations and Definitions C-1
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Attachment F - Fact Sheet / Technical Report for Order No. R9-2013-0001 ..... F-1

I. FINDINGS

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), finds that:

JURISDICTION

1. **MS4 Ownership or Operation.** Each of the Copermittees owns or operates an MS4, through which it discharges storm water and non-storm water into waters of the U.S. within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the U.S.

2. **Legal and Regulatory Authority.** This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]) adopted by the United States Environmental Protection Agency (USEPA), and chapter 5.5, division 7 of the California Water Code (CWC) (commencing with section 13370). This Order serves as an NPDES permit for discharges from MS4s to surface waters. This Order also serves as waste discharge requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

   The San Diego Water Board has the legal authority to issue a regional MS4 permit pursuant to its authority under CWA section 402(p)(3)(B) and 40 CFR 122.26(a)(1)(v). The USEPA also made it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide permits (55 Federal Register [FR] 47990, 48039-48042). The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees and San Diego Water Board.

   The federal regulations make it clear that the Copermittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators (40 CFR 122.26(a)(3)(vi)). This Order does not require the Copermittees to manage storm water outside of their jurisdictional boundaries, but rather to work collectively to improve storm water management within watersheds.

3. **CWA NPDES Permit Conditions.** Pursuant to CWA section 402(p)(3)(B), NPDES permits for storm water discharges from MS4s must include requirements to effectively prohibit non-storm water discharges into MS4s, and require controls to reduce the discharge of pollutants in storm water to the maximum extent practicable (MEP), and to require other provisions as the San Diego Water Board determines are appropriate to control such pollutants. This Order prescribes conditions to assure

compliance with the CWA requirements for owners and operators of MS4s to effectively prohibit non-storm water discharges in to the MS4s, and require controls to reduce the discharge of pollutants in storm water from the MS4s to the MEP.

4. **CWA and CWC Monitoring Requirements.** CWA section 308(a) and 40 CFR 122.41(h),(j)-(l) and 122.48 require that NPDES permits must specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s also specify additional monitoring and reporting requirements in 40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c). CWC section 13383 authorizes the San Diego Water Board to establish monitoring, inspection, entry, reporting and recordkeeping requirements. This Order establishes monitoring and reporting requirements to implement federal and State requirements.

5. **Total Maximum Daily Loads.** CWA section 303(d)(1)(A) requires that "[e]ach state shall identify those waters within its boundaries for which the effluent limitations…are not stringent enough to implement any water quality standard applicable to such waters." The CWA also requires states to establish a priority ranking of impaired water bodies known as Water Quality Limited Segments and to establish Total Maximum Daily Loads (TMDLs) for such waters. This priority list of impaired water bodies is called the Clean Water Act Section 303(d) List of Water Quality Limited Segments, commonly referred to as the 303(d) List. The CWA requires the 303(d) List to be updated every two years.

   TMDLs are numerical calculations of the maximum amount of a pollutant that a water body can assimilate and still meet water quality standards. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point sources (waste load allocations or WLAs) and non-point sources (load allocations or LAs), background contribution, plus a margin of safety. Discharges from MS4s are point source discharges. The federal regulations (40 CFR 122.44(d)(1)(vii)(B)) require that NPDES permits to incorporate water quality based effluent limitations (WQBELs) developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, consistent with the assumptions and requirements of any available WLA for the discharge. Requirements of this Order implement the TMDLs adopted by the San Diego Water Board and approved by USEPA.

6. **Non-Storm Water Discharges.** Pursuant to CWA section 402(p)(3)(B)(ii), this Order requires each Copermittee to effectively prohibit discharges of non-storm water into its MS4. Nevertheless, non-storm water discharges into and from the MS4s continue to be reported to the San Diego Water Board by the Copermittees and other persons. Monitoring conducted by the Copermittees, as well as the 303(d) List, have identified dry weather, non-storm water discharges from the MS4s as a source of pollutants causing or contributing to receiving water quality impairments in the San Diego Region. The federal regulations (40 CFR 122.26(d)(2)(iv)(B)(1)) require the Copermittees to have a program to prevent illicit discharges to the MS4. The federal regulations, however, allow for specific categories of non-storm water discharges or flows to be addressed as illicit discharges only where such discharges

are identified as sources of pollutants to waters of the U.S.

7. **In-Stream Treatment Systems.** Pursuant to federal regulations (40 CFR 131.10(a)), in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S. Authorizing the construction of a runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to accepting waste assimilation as an appropriate use for that water body. Runoff treatment must occur prior to the discharge of runoff into receiving waters. Treatment control best management practices (BMPs) must not be constructed in waters of the U.S. Construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body.

DISCHARGE CHARACTERISTICS AND RUNOFF MANAGEMENT

8. **Point Source Discharges of Pollutants.** Discharges from the MS4s contain waste, as defined in the CWC, and pollutants that adversely affect the quality of the waters of the state. A discharge from an MS4 is a "discharge of pollutants from a point source" into waters of the U.S. as defined in the CWA. Storm water and non-storm water discharges from the MS4s contain pollutants that cause or threaten to cause a violation of surface water quality standards, as outlined in the Water Quality Control Plan for the San Diego Basin (Basin Plan). Storm water and non-storm water discharges from the MS4s are subject to the conditions and requirements established in the Basin Plan for point source discharges.

9. **Potential Beneficial Use Impairment.** The discharge of pollutants and/or increased flows from MS4s may cause or threaten to cause the concentration of pollutants to exceed applicable receiving water quality objectives and impair or threaten to impair designated beneficial uses resulting in a condition of pollution, contamination, or nuisance.

10. **Pollutants Generated by Land Development.** Land development has created and continues to create new sources of non-storm water discharges and pollutants in storm water discharges as human population density increases. This brings higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash. Pollutants from these sources are dumped or washed off the surface by non-storm water or storm water flows into and from the MS4s. When development converts natural vegetated pervious ground cover to impervious surfaces such as paved highways, streets, rooftops, and parking lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving a developed area without BMPs that can maintain pre-development conditions will contain greater pollutant loads and have significantly greater runoff volume, velocity, and peak flow rate than pre-development runoff from the same area.

11. **Runoff Discharges to Receiving Waters.** The MS4s discharge runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within the eleven hydrologic units comprising the San Diego Region. Historic and current development makes use of natural drainage patterns and features as conveyances for runoff. Rivers, streams and creeks in developed areas used in this manner are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and receiving water. Numerous receiving water bodies and water body segments have been designated as impaired by the San Diego Water Board pursuant to CWA section 303(d).

12. **Pollutants in Runoff.** The most common pollutants in runoff discharged from the MS4s include total suspended solids, sediment, pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., cadmium, copper, lead, and zinc), petroleum products and polynuclear aromatic hydrocarbons, synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus), oxygen-demanding substances (e.g., decaying vegetation, animal waste), detergents, and trash. As operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not prohibit or otherwise control. These discharges may cause or contribute to a condition of pollution or a violation of water quality standards.

13. **Human Health and Aquatic Life Impairment.** Pollutants in runoff discharged from the MS4s can threaten and adversely affect human health and aquatic organisms. Adverse responses of organisms to chemicals or physical agents in runoff range from physiological responses such as impaired reproduction or growth anomalies to mortality. Increased volume, velocity, rate, and duration of storm water runoff greatly accelerate the erosion of downstream natural channels. This alters stream channels and habitats and can adversely affect aquatic and terrestrial organisms.

14. **Water Quality Effects.** The Copermittees' water quality monitoring data submitted to date documents persistent exceedances of Basin Plan water quality objectives for runoff-related pollutants at various watershed monitoring stations. Persistent toxicity has also been observed at several watershed monitoring stations. In addition, bioassessment data indicate that the majority of the monitored receiving waters have Poor to Very Poor Index of Biological Integrity (IBI) ratings. These findings indicate that runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in the San Diego Region. Non-storm water discharges from the MS4s have been shown to contribute significant levels of pollutants and flow in arid, developed Southern California watersheds, and contribute significantly to exceedances of applicable receiving water quality objectives.

15. **Non-Storm Water and Storm Water Discharges.** Non-storm water discharges from the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard of CWA section 402(p)(3)(B)(iii), which is explicitly for "Municipal … *Stormwater Discharges* (emphasis added)" from the MS4s. Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s must be effectively prohibited.

16. **Best Management Practices.** Waste and pollutants which are deposited and accumulate in MS4 drainage structures will be discharged from these structures to waters of the U.S. unless they are removed. These discharges may cause or contribute to, or threaten to cause or contribute to, a condition of pollution in receiving waters. For this reason, pollutants in storm water discharges from the MS4s can be and must be effectively reduced in runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Pollution prevention is the reduction or elimination of pollutant generation at its source and is the best "first line of defense". Source control BMPs (both structural and non-structural) minimize the contact between pollutants and runoff, therefore keeping pollutants onsite and out of receiving waters. Treatment control BMPs remove pollutants that have been mobilized by storm water or non-storm water flows.

17. **BMP Implementation.** Runoff needs to be addressed during the three major phases of development (planning, construction, and use) in order to reduce the discharge of storm water pollutants to the MEP, effectively prohibit non-storm water discharges, and protect receiving waters. Development which is not guided by water quality planning policies and principles can result in increased pollutant load discharges, flow rates, and flow durations which can negatively affect receiving water beneficial uses. Construction sites without adequate BMP implementation result in sediment runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. Existing development can generate substantial pollutant loads which are discharged in runoff to receiving waters. Retrofitting areas of existing development with storm water pollutant control and hydromodification management BMPs is necessary to address storm water discharges from existing development that may cause or contribute to a condition of pollution or a violation of water quality standards.

18. **Long Term Planning and Implementation.** Federal regulations require municipal storm water permits to expire 5 years from adoption, after which the permit must be renewed and reissued. The San Diego Water Board recognizes that the degradation of water quality and impacts to beneficial uses of the waters in the San Diego Region occurred over several decades. The San Diego Water Board further recognizes that a decade or more may be necessary to realize demonstrable improvement to the quality of waters in the Region. This Order includes a long term planning and implementation approach that will require more than a single permit term to complete.

WATER QUALITY STANDARDS

19. **Basin Plan.** The San Diego Water Board adopted the Water Quality Control Plan for the San Diego Basin (Basin Plan) on September 8, 1994 that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for receiving waters addressed through the plan. The Basin Plan was subsequently approved by the State Water Resources Control Board (State Water Board) on December 13, 1994. Subsequent revisions to the Basin Plan have also been adopted by the San Diego Water Board and approved by the State Water Board. Requirements of this Order implement the Basin Plan.

    The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Process Supply (PROC), Industrial Service Supply (IND), Ground Water Recharge (GWR), Contact Water Recreation (REC1), Non-contact Water Recreation (REC2), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Freshwater Replenishment (FRSH), Hydropower Generation (POW), and Preservation of Biological Habitats of Special Significance (BIOL). The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region: Navigation (NAV), Commercial and Sport Fishing (COMM), Estuarine Habitat (EST), Marine Habitat (MAR), Aquaculture (AQUA), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN), and Shellfish Harvesting (SHELL).

20. **Ocean Plan.** The State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, and 2005. The State Water Board adopted the latest amendment on April 21, 2005 and it became effective on February 14, 2006. The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean. Requirements of this Order implement the Ocean Plan.

    The Ocean Plan identifies the following beneficial uses of ocean waters of the state to be protected: Industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture; preservation and enhancement of designated Areas of Special Biological Significance; rare and endangered species; marine habitat; fish spawning and shellfish harvesting

21. **Sediment Quality Control Plan**. On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes: 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health,

and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

22. **National Toxics Rule and California Toxics Rule.** USEPA adopted the National Toxics Rule (NTR) on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the NTR applied in California. On May 18, 2000, USEPA adopted the California Toxics Rule (CTR). The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants.

23. **Antidegradation Policy.** This Order is in conformance with the federal Antidegradation Policy described in 40 CFR 131.12, and State Water Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality Waters in California*. Federal regulations at 40 CFR 131.12 require that the State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. State Water Board Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies.

CONSIDERATIONS UNDER FEDERAL AND STATE LAW

24. **Coastal Zone Act Reauthorization Amendments.** Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states with approved coastal zone management programs to address non-point source pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point source pollution: agriculture, silviculture, urban, marinas, and hydromodification. This Order addresses the management measures required for the urban category, with the exception of septic systems. The runoff management programs developed pursuant to this Order fulfills the need for coastal cities to develop a runoff non-point source plan identified in the Non-Point Source Program Strategy and Implementation Plan. The San Diego Water Board addresses septic systems through the administration of other programs.

25. **Endangered Species Act.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 USC sections 1531 to 1544). This Order requires compliance with receiving water limits, and other requirements to protect the beneficial uses of waters of the State. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

26. **Report of Waste Discharge Process.** The waste discharge requirements set forth in this Order are based upon the Report of Waste Discharge submitted by the San Diego County Copermittees prior to the expiration of Order No. R9-2007-0001 (NPDES No. CAS0109266). The Orange County and Riverside County Copermittees are not immediately covered by the waste discharge requirements in this Order. The San Diego Water Board understands that each municipality is unique although the Counties share watersheds and geographical boundaries. The Order will continue to use the Report of Waste Discharge process prior to initially making Orange County or Riverside County Copermittees subject to the requirements of this Order.

    The federal regulations (40 CFR 122.21(d)(2)) and CWC section 13376 impose a duty on the Copermittees to reapply for continued coverage through submittal of a Report of Waste Discharge no later than 180 days prior to expiration of a currently effective permit. This requirement is set forth in the Orange County Copermittees' and Riverside County Copermittees' currently effective permits at Provisions K.2.b and K.2.c, respectively. The Orange County Permit, Order No. R9-2009-0002 (NPDES No. CAS0108740) expires on December 16, 2014 and the Riverside County MS4 Permit, Order No. R9-2010-0016 (NPDES No. CAS0108766) expires on November 10, 2015.

    Unless the Orange County or Riverside County Copermittees apply for and receive early coverage under this Order, the Orange County Copermittees' and the Riverside County Copermittees' respective permits will be superseded by this Order upon expiration of their respective permits, subject to any necessary revisions to the requirements of this Order made after the San Diego Water Board considers their respective Reports of Waste Discharge through the public process provided in 40 CFR 124.

27. **Integrated Report and Clean Water Act Section 303(d) List.** The San Diego Water Board and State Water Board submit an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. USEPA issued its *Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act* on July 29, 2005, which advocates the use of a five category approach for classifying the attainment status of water quality standards for water bodies in the Integrated Report. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 in the Integrated Report are placed on the 303(d) List.

    Water bodies with available data and/or information that indicate at least one beneficial use is not being supported or is threatened, but a TMDL is not required, are included in Category 4 in the Integrated Report. Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal

authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

Implementation of the requirements of this Order may allow the San Diego Water Board to include surface waters impaired by discharges from the Copermittees' MS4s in Category 4 in the Integrated Report for consideration during the next 303(d) List submittal by the State to USEPA.

28. **Economic Considerations.** The California Supreme Court has ruled that although CWC section 13263 requires the State and Regional Water Boards (collectively Water Boards) to consider factors set forth in CWC section 13241 when issuing an NPDES permit, the Water Board may not consider the factors to justify imposing pollutant restrictions that are less stringent than the applicable federal regulations require. (*City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 618, 626-627.) However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

    As noted in the following finding, the San Diego Water Board finds that the requirements in this permit are not more stringent than the minimum federal requirements. Therefore, a CWC section 13241 analysis is not required for permit requirements that implement the effective prohibition on the discharge of non-storm water into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determined appropriate to control such pollutants, as those requirements are mandated by federal law. Notwithstanding the above, the San Diego Water Board has developed an economic analysis of the requirements in this Order. The economic analysis is provided in the Fact Sheet.

29. **Unfunded Mandates.** This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following:

    a. This Order implements federally mandated requirements under CWA section 402 (33 USC section 1342(p)(3)(B)).

    b. The local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental and new dischargers who are issued NPDES permits for storm water and non-storm water discharges.

    c. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order.

    d. The Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)) and in lieu of numeric restrictions on

their MS4 discharges (i.e. effluent limitations).

e. The local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under State law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

f. The provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state develops a TMDL, federal law requires that permits must contain water quality based effluent limitations consistent with the assumptions and requirements of any applicable wasteload allocation (40 CFR 122.44(d)(1)(vii)(B)).

See the Fact Sheet for further discussion of unfunded mandates.

30. California Environmental Quality Act. The issuance of waste discharge requirements and an NPDES permit for the discharge of runoff from MS4s to waters of the U.S. is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 et seq.) in accordance with CWC section 13389.

STATE WATER BOARD DECISIONS

31. Compliance with Prohibitions and Limitations. The receiving water limitation language specified in this Order is consistent with language recommended by the USEPA and established in State Water Board Order WQ 99-05, *Own Motion Review of the Petition of Environmental Health Coalition to Review Waste Discharge Requirements Order No. 96-03, NPDES Permit No. CAS0108740*, adopted by the State Water Board on June 17, 1999. The receiving water limitation language in this Order requires storm water discharges from MS4s to not cause or contribute to a violation of water quality standards, which is to be achieved through an iterative approach requiring the implementation of improved and better-tailored BMPs over time. Implementation of the iterative approach to comply with receiving water limitations based on applicable water quality standards is necessary to ensure that storm water discharges from the MS4 will not ultimately cause or contribute to violations of water quality standards and will not create conditions of pollution, contamination, or nuisance.

32. Special Conditions for Areas of Special Biological Significance. On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving an exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges. State Water Board Resolution No. 2012-0012 requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions

were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject terms and conditions of State Water Board Resolution No. 2012-0012. The Special Protections contained in Attachment B to Resolution No. 2012-0012, applicable to these discharges, are hereby incorporated into this Order as if fully set forth herein.

ADMINISTRATIVE FINDINGS

33. **Executive Officer Delegation of Authority.** The San Diego Water Board by prior resolution has delegated all matters that may legally be delegated to its Executive Officer to act on its behalf pursuant to CWC section 13223. Therefore, the Executive Officer is authorized to act on the San Diego Water Board's behalf on any matter within this Order unless such delegation is unlawful under CWC section 13223 or this Order explicitly states otherwise.

34. **Standard Provisions.** Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR 122.42, are provided in Attachment B to this Order.

35. **Fact Sheet.** The Fact Sheet for this Order contains background information, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of this Order. The Fact Sheet is hereby incorporated into this Order and constitutes part of the Findings of this Order.

36. **Public Notice.** In accordance with State and federal laws and regulations, the San Diego Water Board notified the Copermittees, and interested agencies and persons of its intent to prescribe waste discharge requirements for the control of discharges into and from the MS4s to waters of the U.S. and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet.

37. **Public Hearing.** The San Diego Water Board held a public hearing on Month Day, 2013 and heard and considered all comments pertaining to the terms and conditions of this Order. Details of the public hearing are provided in the Fact Sheet.

38. **Effective Date.** This Order serves as an NPDES permit pursuant to CWA section 401 or amendments thereto, and becomes effective fifty (50) days after the date of its adoption, provided that the Regional Administrator, USEPA, Region IX, does not object to this Order.

39. **Review by the State Water Board.** Any person aggrieved by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with CWC section 13320 and California Code of Regulations, title 23,

sections 2050, et seq. The State Water Board must receive the petition by 5:00 p.m., 30 days after the San Diego Water Board action, except that if the thirtieth day following the action falls on a Saturday, Sunday or State holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

THEREFORE, IT IS HEREBY ORDERED that the Copermittees, in order to meet the provisions contained in division 7 of the CWC and regulations adopted thereunder, and the provisions of the CWA and regulations adopted thereunder, must each comply with the following:

II. PROVISIONS

A. PROHIBITIONS AND LIMITATIONS

The purpose of this provision is to describe the conditions under which storm water and non-storm water discharges into and from MS4s are prohibited or limited. The goal of the prohibitions and limitations is to protect the water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through the implementation of water quality improvement strategies and runoff management programs that effectively prohibit non-storm water discharges into the Copermittees' MS4s, and reduce pollutants in storm water discharges from the Copermittees' MS4s to the MEP.

1. Discharge Prohibitions

a. Discharges from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the state are prohibited.

b. Non-storm water discharges into MS4s are to be effectively prohibited, unless such discharges are either authorized by a separate NPDES permit, or the discharge is a category of non-storm water discharges or flows that must be addressed pursuant to Provisions E.2.a.(1)-(5) of this Order.

c. Discharges from MS4s are subject to all waste discharge prohibitions in the Basin Plan, included in Attachment A to this Order.

d. Storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 applicable to these discharges, included in Attachment A to this Order. All other discharges from the Copermittees' MS4s to ASBS are prohibited.

2. Receiving Water Limitations

a. Discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters, including but not limited to all applicable provisions contained in:

(1) The San Diego Water Board's Basin Plan, including beneficial uses, water quality objectives, and implementation plans;

(2) State Water Board plans for water quality control including the following:

(a) Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries (Thermal Plan), and

(b) The Ocean Plan, including beneficial uses, water quality objectives, and implementation plans;

(3) State Water Board policies for water and sediment quality control including the following:

(a) Water Quality Control Policy for the Enclosed Bays and Estuaries of California,

(b) Sediment Quality Control Plan which includes the following narrative objectives for bays and estuaries:

(i) Pollutants in sediments shall not be present in quantities that, alone or in combination, are toxic to benthic communities, and

(ii) Pollutants shall not be present in sediments at levels that will bioaccumulate in aquatic life to levels that are harmful to human health,

(c) The Statement of Policy with Respect to Maintaining High Quality of Waters in California;[1]

(4) Priority pollutant criteria promulgated by the USEPA through the following:

(a) National Toxics Rule (NTR)[2] (promulgated on December 22, 1992 and amended on May 4, 1995), and

(b) California Toxics Rule (CTR).[3,4]

b. Discharges from MS4s composed of storm water runoff must not alter natural ocean water quality in an ASBS.

[1] State Water Board Resolution No. 68-16
[2] 40 CFR 131.36
[3] 65 Federal Register 31682-31719 (May 18, 2000), adding Section 131.38 to 40 CFR
[4] If a water quality objective and a CTR criterion are in effect for the same priority pollutant, the more stringent of the two applies.

3. Effluent Limitations

a. TECHNOLOGY BASED EFFLUENT LIMITATIONS

Pollutants in storm water discharges from MS4s must be reduced to the MEP.[5]

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

This Order establishes water quality based effluent limitations (WQBELs) consistent with the assumptions and requirements of all available TMDL waste load allocations (WLAs) assigned to discharges from the Copermittees' MS4s. Each Copermittee must comply with applicable WQBELs established for the TMDLs in Attachment E to this Order, pursuant to the applicable TMDL compliance schedules.

4. Compliance with Discharge Prohibitions and Receiving Water Limitations

Each Copermittee must achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order through timely implementation of control measures and other actions as specified in Provisions B and E of this Order, including any modifications. The Water Quality Improvement Plans required under Provision B must be designed and adapted to ultimately achieve compliance with Provisions A.1.a, A.1.c and A.2.a.

a. If exceedance(s) of water quality standards persist in receiving waters notwithstanding implementation of this Order, the Copermittees must comply with the following procedures:

(1) For exceedance(s) of a water quality standard in the process of being addressed by the Water Quality Improvement Plan, the Copermittee(s) must implement the Water Quality Improvement Plan as accepted by the San Diego Water Board, and update the Water Quality Improvement Plan, as necessary, pursuant to Provision F.2.c;

(2) Upon a determination by either the Copermittees or the San Diego Water Board that discharges from the MS4 are causing or contributing to a new exceedance of an applicable water quality standard not addressed by the Water Quality Improvement Plan, the Copermittees must submit the following updates to the Water Quality Improvement Plan pursuant to Provision F.2.c or as part of the Annual Report required under Provision F.3.b, unless the San Diego Water Board directs an earlier submittal:

[5] This does not apply to MS4 discharges which receive subsequent treatment to reduce pollutants in storm water discharges to the MEP prior to entering receiving waters (e.g., low flow diversions to the sanitary sewer). Runoff treatment must occur prior to the discharge of runoff into receiving waters per Finding 7.

(a) The water quality improvement strategies being implemented that are effective and will continue to be implemented,

(b) Water quality improvement strategies (i.e. BMPs, retrofitting projects, stream and/or habitat rehabilitation or restoration projects, adjustments to jurisdictional runoff management programs, etc.) that will be implemented to reduce or eliminate any pollutants or conditions that are causing or contributing to the exceedance of water quality standards,

(c) Updates to the schedule for implementation of the existing and additional water quality improvement strategies, and

(d) Updates to the monitoring and assessment program to track progress toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a of this Order;

(3) The San Diego Water Board may require the incorporation of additional modifications to the Water Quality Improvement Plan required under Provision B. The applicable Copermittees must submit any modifications to the update to the Water Quality Improvement Plan within 90 days of notification that additional modifications are required by the San Diego Water Board, or as otherwise directed;

(4) Within 90 days of the San Diego Water Board determination that the update to the Water Quality Improvement Plan meets the requirements of this Order, the applicable Copermittees must revise the jurisdictional runoff management program documents to incorporate the updated water quality improvement strategies that have been and will be implemented, the implementation schedule, and any additional monitoring required; and

(5) Each Copermittee must implement the updated Water Quality Improvement Plan.

b. The procedure set forth above to achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order do not have to be repeated for continuing or recurring exceedances of the same water quality standard(s) following implementation of scheduled actions unless directed to do otherwise by the San Diego Water Board.

c. Nothing in Provisions A.4.a and A.4.b prevents the San Diego Water Board from enforcing any provision of this Order while the applicable Copermittees prepare and implement the above update to the Water Quality Improvement Plan and jurisdictional runoff management programs.

B. WATER QUALITY IMPROVEMENT PLANS

The purpose of this provision is to develop Water Quality Improvement Plans that guide the Copermittees' jurisdictional runoff management programs towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plans is to protect, preserve, enhance, and restore the water quality and designated beneficial uses of waters of the state. This goal will be accomplished through an adaptive planning and management process that identifies the highest priority water quality conditions within a watershed and implements strategies through the jurisdictional runoff management programs to achieve improvements in the quality of discharges from the MS4s and receiving waters.

1. Watershed Management Areas

The Copermittees must develop a Water Quality Improvement Plan for each of the Watershed Management Areas in Table B-1. A total of ten Water Quality Improvement Plans must be developed for the San Diego Region.

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
San Juan (901.00)	South Orange County	- Aliso Creek - San Juan Creek - San Mateo Creek - Pacific Ocean - Heisler Park ASBS	- City of Aliso Viejo[1] - City of Dana Point[1] - City of Laguna Beach[1] - City of Laguna Hills[1] - City of Laguna Niguel[1] - City of Laguna Woods[1] - City of Lake Forest[1] - City of Mission Viejo[1] - City of Rancho Santa Margarita[1] - City of San Clemente[1] - City of San Juan Capistrano[1] - County of Orange[1] - Orange County Flood Control District[1]
Santa Margarita (902.00)	Santa Margarita River	- Murrieta Creek - Temecula Creek - Santa Margarita River - Santa Margarita Lagoon - Pacific Ocean	- City of Murrieta[2] - City of Temecula[2] - City of Wildomar[2] - County of Riverside[2] - County of San Diego[3] - Riverside County Flood Control and Water Conservation District[2]
San Luis Rey (903.00)	San Luis Rey River	- San Luis Rey River - San Luis Rey Estuary - Pacific Ocean	- City of Oceanside - City of Vista - County of San Diego

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
Carlsbad (904.00)	Carlsbad	- Loma Alta Slough - Buena Vista Lagoon - Agua Hedionda Lagoon - Batiquitos Lagoon - San Elijo Lagoon - Pacific Ocean	- City of Carlsbad - City of Encinitas - City of Escondido - City of Oceanside - City of San Marcos - City of Solana Beach - City of Vista - County of San Diego
San Dieguito (905.00)	San Dieguito River	- San Dieguito River - San Dieguito Lagoon - Pacific Ocean	- City of Del Mar - City of Escondido - City of Poway - City of San Diego - City of Solana Beach - County of San Diego
Penasquitos (906.00)	Penasquitos	- Los Penasquitos Lagoon - Pacific Ocean	- City of Del Mar - City of Poway - City of San Diego - County of San Diego
	Mission Bay	- Mission Bay - Pacific Ocean - San Diego Marine Life Refuge ASBS	- City of San Diego
San Diego (907.00)	San Diego River	- San Diego River - Pacific Ocean	- City of El Cajon - City of La Mesa - City of San Diego - City of Santee - County of San Diego
Pueblo San Diego (908.00) Sweetwater (909.00) Otay (910.00)	San Diego Bay	- Sweetwater River - Otay River - San Diego Bay - Pacific Ocean	- City of Chula Vista - City of Coronado - City of Imperial Beach - City of La Mesa - City of Lemon Grove - City of National City - City of San Diego - County of San Diego - San Diego County Regional Airport Authority - San Diego Unified Port District
Tijuana (911.00)	Tijuana River	- Tijuana River - Tijuana Estuary - Pacific Ocean	- City of Imperial Beach - City of San Diego - County of San Diego

Notes:
1. The Orange County Copermittees will be covered under this Order after expiration of Order No. R9-2009-0002, or earlier if the Orange County Copermittees meet the conditions in Provision F.6.
2. The Riverside County Copermittees will be covered under this Order after expiration of Order No. R9-2010-0016, or earlier if the Riverside County Copermittees meet the conditions in Provision F.6.
3. The County of San Diego is required to implement the requirements of Provision B for its jurisdiction within the Santa Margarita River Watershed Management Area until the Riverside County Copermittees have been notified of coverage under this Order.

2. Priority Water Quality Conditions

The Copermittees must identify the water quality priorities within each Watershed Management Area that will be addressed by the Water Quality Improvement Plan. Where appropriate, Watershed Management Areas may be separated into subwatersheds to focus water quality prioritization and jurisdictional runoff management program implementation efforts by receiving water.

a. ASSESSMENT OF RECEIVING WATER CONDITIONS

The Copermittees must consider the following, at a minimum, to identify water quality priorities based on impacts of MS4 discharges on receiving water beneficial uses:

(1) Receiving waters listed as impaired on the CWA Section 303(d) List of Water Quality Limited Segments (303(d) List);

(2) TMDLs adopted and under development by the San Diego Water Board;

(3) Receiving waters recognized as sensitive or highly valued by the Copermittees, including estuaries designated under the National Estuary Program under CWA section 320, wetlands defined by the State or U.S. Fish and Wildlife Service's National Wetlands Inventory as wetlands, and receiving waters identified as ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (Attachment A);

(4) The receiving water limitations of Provision A.2;

(5) Known historical versus current physical, chemical, and biological water quality conditions;

(6) Available, relevant, and appropriately collected and analyzed physical, chemical, and biological receiving water monitoring data, including, but not limited to, data describing:

(a) Chemical constituents,

(b) Water quality parameters (i.e. pH, temperature, conductivity, etc.),

(c) Toxicity Identification Evaluations for both receiving water column and sediment,

(d) Trash impacts,

(e) Bioassessments, and

(f) Physical habitat;

(7) Available evidence of erosional impacts in receiving waters due to accelerated flows (i.e. hydromodification);

(8) Available evidence of adverse impacts to the chemical, physical, and biological integrity of receiving waters; and

(9) The potential improvements in the overall condition of the Watershed Management Area that can be achieved.

b. ASSESSMENT OF IMPACTS FROM MS4 DISCHARGES

The Copermittees must consider the following, at a minimum, to identify the potential impacts to receiving waters that may be caused or contributed to by discharges from the Copermittees' MS4s:

(1) The discharge prohibitions of Provision A.1 and effluent limitations of Provision A.3; and

(2) Available, relevant, and appropriately collected and analyzed storm water and non-storm water monitoring data from the Copermittees' MS4 outfalls;

(3) Locations of each Copermittee's MS4 outfalls that discharge to receiving waters;

(4) Locations of MS4 outfalls that are known to persistently discharge non-storm water to receiving waters likely causing or contributing to impacts on receiving water beneficial uses;

(5) Locations of MS4 outfalls that are known to discharge pollutants in storm water causing or contributing to impacts on receiving water beneficial uses; and

(6) The potential improvements in the quality of discharges from the MS4 that can be achieved.

c. IDENTIFICATION OF PRIORITY WATER QUALITY CONDITIONS

(1) The Copermittees must use the information gathered for Provisions B.2.a and B.2.b to develop a list of priority water quality conditions as pollutants, stressors and/or receiving water conditions that are the highest threat to receiving water quality or that most adversely affect the physical, chemical, and biological integrity of receiving waters. The list must include the following information for each priority water quality condition:

(a) The beneficial use(s) associated with the priority water quality condition;

(b) The geographic extent of the priority water quality condition within the Watershed Management Area, if known;

(c) The temporal extent of the priority water quality condition (e.g., dry weather and/or wet weather);

(d) The Copermittees with MS4s discharges that may cause or contribute to the priority water quality condition; and

(e) An assessment of the adequacy of and data gaps in the monitoring data to characterize the conditions causing or contributing to the priority water quality condition, including a consideration of spatial and temporal variation.

(2) The Copermittees must identify the highest priority water quality conditions to be addressed by the Water Quality Improvement Plan, and provide a rationale for selecting a subset of the water quality conditions identified pursuant to Provision B.2.c.(1) as the highest priorities.

d. IDENTIFICATION OF MS4 SOURCES OF POLLUTANTS AND/OR STRESSORS

The Copermittees must identify and prioritize known and suspected sources of storm water and non-storm water pollutants and/or other stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c. The identification of known and suspected sources of pollutants and/or stressors that cause or contribute to the highest priority water quality conditions as identified for Provision B.2.c must consider the following:

(1) Pollutant generating facilities, areas, and/or activities within the Watershed Management Area, including:

(a) Each Copermittee's inventory of construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas,

(b) Publicly owned parks and/or recreational areas,

(c) Open space areas,

(d) All currently operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste, and

(e) Areas not within the Copermittees' jurisdictions (e.g., Phase II MS4s, tribal lands, state lands, federal lands) that are known or suspected to be discharging to the Copermittees' MS4s;

(2) Locations of the Copermittees' MS4s, including the following:

(a) All MS4 outfalls that discharge to receiving waters, and

(b) Locations of major structural controls for storm water and non-storm water (e.g., retention basins, detention basins, major infiltration devices, etc.);

(3) Other known and suspected sources of non-storm water or pollutants in storm water discharges to receiving waters within the Watershed Management Area, including the following:

(a) Other MS4 outfalls (e.g., Phase II Municipal and Caltrans),

(b) Other NPDES permitted discharges,

(c) Any other discharges that may be considered point sources (e.g., private outfalls), and

(d) Any other discharges that may be considered non-point sources (e.g., agriculture, wildlife or other natural sources);

(4) Review of available data, including but not limited to:

(a) Findings from the Copermittees' illicit discharge detection and elimination programs,

(b) Findings from the Copermittees' MS4 outfall discharge monitoring,

(c) Findings from the Copermittees' receiving water monitoring,

(d) Findings from the Copermittees' MS4 outfall discharge and receiving water assessments, and

(e) Other available, relevant, and appropriately collected data, information, or studies related to pollutant sources and/or stressors that contribute to the highest priority water quality conditions as identified for Provision B.2.c.

(5) The adequacy of the available data to identify and prioritize sources and/or stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c.

e. NUMERIC GOALS AND SCHEDULES

The Copermittees must develop and incorporate interim and final numeric goals[6] and schedules into the Water Quality Improvement Plan. Numeric goals must be used to support Water Quality Improvement Plan implementation and measure progress towards addressing the highest priority water quality conditions identified under Provision B.2.c. When establishing numeric goals and corresponding schedules, the Copermittees must consider the following:

(1) Final numeric goals must be based on measureable criteria or indicators, to be achieved in the receiving waters and/or MS4 discharges for the highest priority water quality conditions which will be capable of demonstrating the achievement of the restoration and/or protection of water quality standards in receiving waters;

(2) Interim numeric goals must be based on measureable criteria or indicators capable of demonstrating incremental progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges; and

(3) Schedules must be adequate for measuring progress toward achieving the interim and final numeric goals required for Provisions B.2.e.(1) and B.2.e.(2). Schedules must incorporate the following:

(a) Interim dates for achieving the interim numeric goals,

(b) Compliance schedules for any applicable TMDLs in Attachment E to this Order,

(c) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A),

(d) Achievement of the final numeric goals in the receiving waters and/or MS4 discharges for the highest water quality priorities must be as soon as possible, and

(e) Final dates for achieving the final numeric goals must not initially extend more than 10 years beyond the effective date of this Order, unless a longer period of time is authorized by the San Diego Water Board Executive Officer or the schedule includes an applicable TMDL in Attachment E to this Order.

[6] Interim and final numeric goals may take a variety of forms such as TMDL established WQBELs, action levels, pollutant concentration, load reductions, number of impaired water bodies delisted from the List of Water Quality Impaired Segments, Index of Biotic Integrity (IBI) scores, or other appropriate metrics. Interim and final numeric goals are not necessarily limited to one criterion or indicator, but may include multiple criteria and/or indicators. Except for TMDL established WQBELs, interim and final numeric goals and corresponding schedules may be revised through the adaptive management process under Provision B.5.

3. Water Quality Improvement Strategies and Schedules

The Copermittees must develop specific water quality improvement strategies to address the highest priority water quality conditions identified within a Watershed Management Area. The water quality improvement strategies must address the highest priority water quality conditions by preventing or eliminating non-storm water discharges to and from the MS4, reducing pollutants in storm water discharges from the MS4 to the MEP, and restoring and/or protecting the water quality standards of receiving waters.

a. WATER QUALITY IMPROVEMENT STRATEGIES

The Copermittees must identify and prioritize water quality improvement strategies based on their likely effectiveness and efficiency, and implement strategies to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, improve the physical, chemical, and biological receiving water conditions, and achieve the interim and final numeric goals in accordance with the schedules required for Provision B.2.e.(3). The following water quality improvement strategies must be included and described in the Water Quality Improvement Plan:

(1) Specific strategies and/or activities that may be implemented by one or more Copermittees within their jurisdictions through the jurisdictional runoff management programs that will address the highest priority water quality conditions within the Watershed Management Area, in accordance with the following requirements:

(a) Strategies and/or activities must, at a minimum, be described for each jurisdictional runoff management program component where strategies to address the highest priority water quality conditions are required under Provision E;

(b) The Water Quality Improvement Plan must describe the circumstances or conditions when and where the strategies or/activities should be or will be implemented, but specific details about how each Copermittee will implement the strategies and/or activities within its jurisdiction are not required; and

(c) Descriptions of strategies and/or activities must include any monitoring, information collection, special studies, and/or data analysis that is necessary to assess the effectiveness of the strategy and/or activity toward addressing the highest priority water quality conditions.

(2) Additional strategies and/or activities that may be implemented within the Watershed Management Area on a jurisdictional, sub-watershed, or watershed scale by one or more Copermittees, not specifically required under Provision E, which are designed to achieve the interim and final numeric goals identified in Provisions B.2.e.(1) and B.2.e.(2);

b. IMPLEMENTATION SCHEDULES

(1) The Copermittees must develop schedules for implementing the water quality improvement strategies identified under Provision B.3.a to achieve the interim and final numeric goals identified under Provision B.2.e.(1) and B.2.e.(2). Schedules must be developed for both the water quality improvement strategies implemented by each Copermittee within its jurisdiction and for strategies that the Copermittees choose to implement on a collaborative basis.

(2) The Copermittees must incorporate the implementation compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

4. Water Quality Improvement Monitoring and Assessment Program

a. The Copermittees in each Watershed Management Area must develop and incorporate an integrated monitoring and assessment program into the Water Quality Improvement Plan that assesses: 1) the progress toward achieving the numeric goals and schedules, 2) the progress toward addressing the highest priority water quality conditions for each Watershed Management Area, and 3) each Copermittee's overall efforts to implement the Water Quality Improvement Plan.

b. The monitoring and assessment program must incorporate the monitoring and assessment requirements of Provision D, which may allow the Copermittees to modify the program to be consistent with and focus on the highest priority water quality conditions for each Watershed Management Area.

c. For Watershed Management Areas with applicable TMDLs, the monitoring and assessment program must incorporate the specific monitoring and assessment requirements of Attachment E.

d. For Watershed Management Areas with any ASBS, the water quality monitoring and assessment program must incorporate the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

5. Iterative Approach and Adaptive Management Process

The Copermittees in each Watershed Management Area must implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a, and must include the following:

a. RE-EVALUATION OF PRIORITY WATER QUALITY CONDITIONS

The priority water quality conditions, and numeric goals and corresponding schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.2.c and B.2.e, may be re-evaluated by the Copermittees as needed during the term of this Order as part of the Annual Report. Re-evaluation and recommendations for modifications to the priority water quality conditions, and numeric goals and corresponding schedules must be provided in the Report of Waste Discharge, and must consider the following:

(1) Achieving the outcome of improved water quality in MS4 discharges and receiving waters through implementation of the water quality improvement strategies identified in the Water Quality Improvement Plan;

(2) Progress toward achieving interim and final numeric goals in receiving waters and/or MS4 discharges for the highest priority water quality conditions in the Watershed Management Area,

(3) Progress toward achieving outcomes according to established schedules;

(4) New information developed when the requirements of Provisions B.2.a-c have been re-evaluated;

(5) New policies or regulations that may affect identified numeric goals;

(6) Spatial and temporal accuracy of monitoring data collected to inform prioritization of water quality conditions and implementation strategies to address the highest priority water quality conditions;

(7) Availability of new information and data from sources other than the jurisdictional runoff management programs within the Watershed Management Area that informs the effectiveness of the actions implemented by the Copermittees;

(8) San Diego Water Board recommendations; and

(9) Recommendations for modifications solicited through a public participation process.

b. ADAPTATION OF STRATEGIES AND SCHEDULES

The water quality improvement strategies and schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.3, must be re-evaluated and adapted as new information becomes available to result in more effective and efficient measures to achieve the numeric goals established pursuant to Provision B.2.e. Re-evaluation of and modifications to the water quality improvement strategies must be provided in the Annual Report, and must consider the following:

(1) Modifications to the priority water quality conditions, and numeric goals and corresponding schedules based on Provision B.5.a;

(2) Measurable or demonstrable reductions of non-storm water discharges to and from each Copermittee's MS4;

(3) Measurable or demonstrable reductions of pollutants in storm water discharges from each Copermittee's MS4 to the MEP;

(4) New information developed when the requirements of Provisions B.2.b and B.2.d have been re-evaluated;

(5) Efficiency in implementing the Water Quality Improvement Plan;

(6) San Diego Water Board recommendations; and

(7) Recommendations for modifications solicited through a public participation process.

c. ADAPTATION OF MONITORING AND ASSESSMENT PROGRAM

The water quality improvement monitoring and assessment program, included in the Water Quality Improvement Plan pursuant to Provisions B.4, must be re-evaluated and adapted when new information becomes available. Re-evaluation and recommendations for modifications to the monitoring and assessment program, pursuant to the requirements of Provision D, may be provided in the Annual Report, but must be provided in the Report of Waste Discharge.

6. Water Quality Improvement Plan Submittal, Updates, and Implementation

a. The Copermittees must submit the Water Quality Improvement Plans in accordance with the requirements of Provision F.1.

b. The Copermittees must submit proposed updates to the Water Quality Improvement Plan for acceptance by the San Diego Water Board Executive Officer in accordance with the requirements of Provision F.2.c.

c. The Copermittees must commence with implementation of the Water Quality Improvement Plans immediately after acceptance by the San Diego Water Board, in accordance with the schedules, or subsequently updated schedules, within the Water Quality Improvement Plan.

C. ACTION LEVELS

The purpose of this provision is for the Copermittees to incorporate numeric action levels in the Water Quality Improvement Plans. The goal of the action levels is to guide Water Quality Improvement Plan implementation efforts and measure progress towards the protection of water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through monitoring and assessing the quality of the MS4 discharges during the implementation of the Water Quality Improvement Plans.

1. Non-Storm Water Action Levels[7]

The Copermittees must develop and incorporate numeric non-storm water action levels (NALs) into the Water Quality Improvement Plan to: 1) support the development and prioritization of water quality improvement strategies for addressing non-storm water discharges to and from the MS4s, 2) assess the effectiveness of the water quality improvement strategies toward addressing MS4 non-storm water discharges, required pursuant to Provision D.4.b.(1), and 3) support the detection and elimination of non-storm water and illicit discharges to and from the MS4, required pursuant to Provision E.2.[8]

a. The following NALs must be incorporated:

(1) Non-Storm Water Discharges from MS4s to Ocean Surf Zone

Table C-1. Non-Storm Water Action Levels for Discharges from MS4s to Ocean Surf Zone

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Total Coliform	MPN/100 ml	1,000	-	10,000/1,000[1]	OP
Fecal Coliform	MPN/100 ml	200[2]	-	400	OP
Enterococci	MPN/100 ml	35	-	104[3]	OP

Abbreviations/Acronyms
AMAL – average monthly action level
OP – Ocean Plan water quality objective
MDAL – maximum daily action level
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Total coliform density NAL is 1,000 MPN/100 ml when the fecal/total coliform ratio exceeds 0.1.
2. Fecal coliform density NAL is 200 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas."

[7] NALs are not considered by the San Diego Water Board to be enforceable limitations.
[8] The Copermittees may utilize NALs or other benchmarks currently established by the Copermittees as interim NALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

(2) Non-Storm Water Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Table C-2. Non-Storm Water Action Levels for Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Turbidity	NTU	75	-	225	OP
pH	Units	Within limit of 6.0 to 9.0 at all times			OP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	35	-	104[3]	BP
Priority Pollutants	ug/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
OP – Ocean Plan water quality objective
NTU – Nephelometric Turbidity Units
ug/L – micrograms per liter
MDAL – maximum daily action level
BP – Basin Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas" and is not applicable to waterbodies that are not designated with the water contact recreation (REC-1) beneficial use.

Table C-3. Non-Storm Water Action Levels for Priority Pollutants

Parameter	Units	Freshwater (CTR)		Saltwater (CTR)	
		MDAL	AMAL	MDAL	AMAL
Cadmium	ug/L	**	**	16	8
Copper	ug/L	*	*	5.8	2.9
Chromium III	ug/L	**	**	-	-
Chromium VI	ug/L	16	8.1	83	41
Lead	ug/L	*	*	14	2.9
Nickel	ug/L	**	**	14	6.8
Silver	ug/L	*	*	2.2	1.1
Zinc	ug/L	*	*	95	47

Abbreviations/Acronyms:
CTR – California Toxic Rule
AMAL – average monthly action level
ug/L – micrograms per liter
MDAL – maximum daily action level

Notes:
* Action levels developed on a case-by-case basis (see below)
** Action levels developed on a case-by-case basis (see below), but calculated criteria are not to exceed Maximum Contaminant Levels (MCLs) under the California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64431

The Cadmium, Copper, Chromium (III), Lead, Nickel, Silver and Zinc NALs for MS4 discharges to freshwater receiving waters will be developed on a case-by-case basis because the freshwater criteria are based on site-specific water quality data (receiving water hardness). For these priority pollutants, the following equations (40 CFR 131.38.b.2) will be required:

Cadmium (Total Recoverable) = exp(0.7852[ln(hardness)] - 2.715)
Chromium III (Total Recoverable) = exp(0.8190[ln(hardness)] + 0.6848)
Copper (Total Recoverable) = exp(0.8545[ln(hardness)] - 1.702)
Lead (Total Recoverable) = exp(1.273[ln(hardness)] - 4.705)
Nickel (Total Recoverable) = exp(.8460[ln(hardness)] + 0.0584)
Silver (Total Recoverable) = exp(1.72[ln(hardness)] - 6.52)
Zinc (Total Recoverable) = exp(0.8473[ln(hardness)] + 0.884)

(3) Non-Storm Water Discharges from MS4s to Inland Surface Waters

Table C-4. Non-Storm Water Action Levels for Discharges from MS4s to Inland Surface Waters

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Dissolved Oxygen	mg/L	Not less than 5.0 in WARM waters and not less than 6.0 in COLD waters			BP
Turbidity	NTU	-	20	See MDAL	BP
pH	Units	Within limit of 6.5 to 8.5 at all times			BP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	33	-	61[3]	BP
Total Nitrogen	mg/L	-	1.0	See MDAL	BP
Total Phosphorus	mg/L	-	0.1	See MDAL	BP
MBAS	mg/L	-	0.5	See MDAL	BP
Iron	mg/L	-	0.3	See MDAL	BP
Manganese	mg/L	-	0.05	See MDAL	BP
Priority Pollutants	ug/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
BP – Basin Plan water quality objective
COLD – cold freshwater habitat beneficial use
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
MDAL – maximum daily action level
WARM – warm freshwater habitat beneficial use
MBAS – Methylene Blue Active Substances
MPN/100 ml – most probable number per 100 milliliters
ug/L – micrograms per liter

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for freshwater "designated beach areas" and is not applicable to waterbodies that are not designated with the water contact recreation (REC-1) beneficial use.

b. If not identified in Provision C.1.a, NALs must be identified, developed and incorporated in the Water Quality Improvement Plan for any pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in waters of the state associated with the highest priority water quality conditions related to non-storm water discharges from the MS4s. NALs must be based on:

(1) Applicable water quality standards which may be dependent upon site-specific or receiving water-specific conditions or assumptions to be identified by the Copermittees; or

(2) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the NALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary NALs specific to the Watershed Management Area at levels greater than the NALs required by Provisions C.1.a and C.1.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for addressing non-storm water discharges to and from the MS4s, as well as the detection and

elimination of non-storm water and illicit discharges to and from the MS4. The secondary NALs may be developed using an approach acceptable to the San Diego Water Board.

d. Dry weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.b may be utilized to develop or revise NALs based on watershed-specific data, subject to San Diego Water Board Executive Officer approval.

2. Storm Water Action Levels[9]

The Copermittees must develop and incorporate numeric storm water action levels (SALs) in the Water Quality Improvement Plans to: 1) support the development and prioritization of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s, and 2) assess the effectiveness of the water quality improvement strategies toward reducing pollutants in storm water discharges, required pursuant to Provision D.4.b.(2).[10]

a. The following SALs for discharges of storm water from the MS4 must be incorporated:

Table C-5. Storm Water Action Levels for Discharges from MS4s to Receiving Waters

Parameter	Units	Action Level
Turbidity	NTU	126
Nitrate & Nitrite (Total)	mg/L	2.6
Phosphorus (Total P)	mg/L	1.46
Cadmium (Total Cd)*	µg/L	3.0
Copper (Total Cu)*	µg/L	127
Lead (Total Pb)*	µg/L	250
Zinc (Total Zn)*	µg/L	976

Abbreviations/Acronyms:
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
ug/L – micrograms per liter

Notes:
* The sampling must include a measure of receiving water hardness at each MS4 outfall. If a total metal concentration exceeds the corresponding metals SAL in Table C-5, that concentration must be compared to the California Toxics Rule criteria and the USEPA 1-hour maximum concentration for the detected level of receiving water hardness associated with that sample. If it is determined that the sample's total metal concentration for that specific metal exceeds that SAL, but does not exceed the applicable USEPA 1-hour maximum concentration criterion for the measured level of hardness, then the sample result will not be considered above the SAL for that measurement.

[9] SALs are not considered by the San Diego Water Board to be enforceable limitations.
[10] The Copermittees may utilize SALs or other benchmarks currently established by the Copermittees as interim SALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

b. If not identified in Provision C.2.a, SALs must be identified, developed and incorporated in the Water Quality Improvement Plan for pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in waters of the state associated with the highest water quality priorities related to storm water discharges from the MS4s. SALs must be based on:

(1) Federal and State water quality guidance and/or water quality standards; and

(2) Site-specific or receiving water-specific conditions; or

(3) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the SALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary SALs specific to the Watershed Management Area at levels greater than the SALs required by Provisions C.2.a and C.2.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s. The secondary SALs may be developed based on the approaches recommended by the State Water Board's Storm Water Panel[11] or using an approach acceptable to the San Diego Water Board.

d. Wet weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.c may be used to develop or revise SALs based upon watershed-specific data, subject to San Diego Water Board Executive Officer approval.

[11] Storm Water Panel Recommendations to the California State Water Resources Control Board: The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities (June 2006)

D. MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS

The purpose of this provision is for the Copermittees to monitor and assess the impact on the chemical, physical, and biological conditions of receiving waters caused by discharges from the Copermittees' MS4s under wet weather and dry weather conditions. The goal of the monitoring and assessment program is to inform the Copermittees about the nexus between the health of receiving waters and the water quality condition of the discharges from their MS4s. This goal will be accomplished through monitoring and assessing the conditions of the receiving waters, discharges from the MS4s, pollutant sources and/or stressors, and effectiveness of the water quality improvement strategies implemented as part of the Water Quality Improvement Plans.

1. Receiving Water Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the condition of the receiving waters in each Watershed Management Area during dry weather and wet weather. Following acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct long-term receiving water monitoring during implementation of the Water Quality Improvement Plan to assess the long term trends and determine if conditions in receiving waters are improving. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following receiving water monitoring procedures:

a. TRANSITIONAL RECEIVING WATER MONITORING

Until the monitoring requirements of Provisions D.1.b-e are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following receiving water monitoring in the Watershed Management Area:

(1) Continue the receiving water monitoring programs required in Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016;

(2) Continue the monitoring in the Hydromodification Management Plans approved by the San Diego Water Board;

(3) Participate in the following regional receiving water monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring,

(b) Southern California Bight Regional Monitoring, and

(c) Sediment Quality Monitoring;

(4) Implement the monitoring programs developed as part of any implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) for the TMDLs in Attachment E to this Order; and

(5) For Watershed Management Areas with ASBS, implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

b. LONG-TERM RECEIVING WATER MONITORING STATIONS

The Copermittees must select at least one long-term receiving water monitoring station from among the existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees to be representative of the receiving water quality in the Watershed Management Area. Additional long-term receiving water monitoring stations must be selected where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

c. DRY WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three dry weather monitoring events at each of the long-term receiving water monitoring stations. At least one monitoring event must be conducted during the dry season (May 1 – September 30) and at least one monitoring event must be conducted during a dry weather period during the wet season (October 1 – April 30), after the first wet weather event of the season, with an antecedent dry period of at least 72 hours following a storm event producing measureable rainfall of greater than 0.1 inch.

(1) Dry Weather Receiving Water Field Observations

For each dry weather monitoring event, the Copermittees must record field observations consistent with Table D-1 at each long-term receiving water monitoring station.

Table D-1. Field Observations for Receiving Water Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) • Station description (i.e. deposits or stains, vegetation condition, structural condition, and observable biology) • Presence and assessment of trash in and around station

(2) Dry Weather Receiving Water Field Monitoring

For each dry weather monitoring event, if conditions allow the collection of the data, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

Table D-2. Field Monitoring Parameters for Receiving Water Monitoring Stations

Parameters
• pH • Temperature • Specific conductivity • Dissolved oxygen • Turbidity

(3) Dry Weather Receiving Water Analytical Monitoring

For each dry weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable NAL constituents, and

(v) Constituents listed in Table D-3.

Table D-3. Analytical Monitoring Constituents for Receiving Water Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Pesticides	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Mercury • Nickel • Selenium • Thallium • Zinc	• Organophosphate Pesticides • Pyrethroid Pesticides	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(4) Dry Weather Receiving Water Toxicity Monitoring

For each dry weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for toxicity in accordance with Table D-4:

Table D-4. Dry Weather Toxicity Testing for Receiving Water Monitoring Stations

Freshwater Organism	Test Approach	USEPA Protocol[2]
Pimephales promelas	1 acute 1 chronic[1]	EPA-821-R-02-012
Hyalella Azteca	1 acute 1 chronic[1]	EPA-821-R-02-012
Psuedokirchneriella subcapitata	1 acute 1 chronic[1]	EPA-821-R-02-013

Notes:
1. Chronic toxicity testing is not required at receiving water monitoring stations located at mass loading stations if the channel flows are diverted year-round during dry weather conditions to the sanitary sewer for treatment.
2. USEPA protocols must be utilized for toxicity testing unless alternate toxicity testing protocols have been approved by the San Diego Water Board.

(5) Dry Weather Receiving Water Bioassessment Monitoring

Bioassessment monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must conduct bioassessment monitoring during at least one dry weather monitoring event at each long-term receiving water monitoring station as follows:

(a) The following bioassessment samples and measurements must be collected:

(i) Macroinvertebrate samples must be collected in accordance with the "Reachwide Benthos (Multihabitat) Procedure" in the most current Surface Water Ambient Monitoring Program (SWAMP) Bioassessment Standard Operating Procedures (SOP), and amendments, as applicable;[12]

(ii) The "Full" suite of physical habitat characterization measurements must be collected in accordance with the most current SWAMP Bioassessment SOP, and as summarized in the SWAMP Stream Habitat Characterization Form – Full Version;[13] and

(iii) Freshwater algae samples must be collected in accordance with the SWAMP Standard Operating Procedures for Collecting Algae

[12] Ode, P.R.. 2007. Standard operating procedures for collecting macroinvertebrate samples and associated physical and chemical data for ambient bioassessments in California. California State Water Resources Control Board Surface Water Ambient Monitoring Program (SWAMP) Bioassessment SOP 001. http://www.swrcb.ca.gov/water_issues/programs/swamp/tools.shtml#monitoring
[13] Available at: http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/reports/fieldforms_fullversion052908.pdf

Samples.[14] Analysis of samples must include algal taxonomic composition (diatoms and soft algae) and algal biomass.

(b) The bioassessment samples, measurements, and appropriate water chemistry data must be used to calculate the following:

(i) An Index of Biological Integrity (IBI) for macroinvertebrates for each monitoring station where bioassessment monitoring was conducted, based on the most current calculation method;[15] and

(ii) An IBI for algae for each monitoring station where bioassessment monitoring was conducted, when a calculation method is developed.[16]

(c) In lieu of the requirements of Provision D.1.c.(5)(a), the Copermittees may conduct the bioassessment monitoring in accordance with the "Triad" assessment approach[17] to calculate the IBIs required for Provision D.1.c.(5)(b). The Copermittees must conduct sampling, analysis, and reporting of specified in-stream biological and habitat data according to the protocols specified in the SCCWRP Technical Report No. 539, or subsequent protocols, if developed.

(6) Dry Weather Receiving Water Hydromodification Monitoring

In addition to the hydromodification monitoring conducted as part of the Copermittees' Hydromodification Management Plans, hydromodification monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must collect the following hydromodification monitoring observations and measurements within an appropriate domain of analysis during at least one dry weather monitoring event for each long-term receiving water monitoring station:

(a) Channel conditions, including:

(i) Channel dimensions,

[14] Fetscher et al. 2009. Standard Operating Procedures for Collecting Stream Algae Samples and Associated Physical Habitat and Chemical Data for Ambient Bioassessments in California.
[15] The most current calculation method at the time the Order was adopted is outlined in "A Quantitative Tool for Assessing the Integrity of Southern California Coastal Streams" (Ode, et al. 2005. Environmental Management. Vol. 35, No. 1, pp. 1-13). If an updated or new calculation method is developed, either both (i.e. current and updated/new) methods must be used, or historical IBIs must be recalculated with the updated or new calculation method.
[16] When a calculation method is developed, IBIs must be calculated for all available and appropriate historical data.
[17] Stormwater Monitoring Coalition Model Monitoring Technical Committee, 2004. Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California. Technical Report #419. August 2004.

(ii) Hydrologic and geomorphic conditions, and

(iii) Presence and condition of vegetation and habitat;

(b) Location of discharge points;

(c) Habitat integrity;

(d) Photo documentation of existing erosion and habitat impacts, with location (i.e. latitude and longitude coordinates) where photos were taken;

(e) Measurement or estimate of dimensions of any existing channel bed or bank eroded areas, including length, width, and depth of any incisions; and

(f) Known or suspected cause(s) of existing downstream erosion or habitat impact, including flow, soil, slope, and vegetation conditions, as well as upstream land uses and contributing new and existing development.

d. WET WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three wet weather monitoring events at each long-term receiving water monitoring station. At least one wet weather monitoring event must be conducted during the first wet weather event of the wet season (October 1 – April 30), and at least one wet weather monitoring event during a wet weather event that occurs after February 1.

(1) Wet Weather Receiving Water Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each long-term receiving water monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event;

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(d) Presence and assessment of trash in and around station.

(2) Wet Weather Receiving Water Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

(3) Wet Weather Receiving Water Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) Constituents listed in Table D-3.

(4) Wet Weather Receiving Water Toxicity Monitoring

For each wet weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for toxicity in accordance with Table D-5:

Table D-5. Wet Weather Toxicity Testing for Receiving Water Monitoring Stations

Freshwater Organism	Test Approach	USEPA Protocol[1]
Pimephales promelas	1 acute	EPA-821-R-02-012
Hyalella Azteca	1 acute	EPA-821-R-02-012
Psuedokirchneriella subcapitata	1 acute	EPA-821-R-02-013

Notes:
1. USEPA protocols must be utilized for toxicity testing unless alternate toxicity testing protocols have been approved by the San Diego Water Board.

e. OTHER RECEIVING WATER MONITORING REQUIREMENTS

(1) Regional Monitoring

The Copermittees must participate in the following regional receiving waters monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring; and

(b) Southern California Bight Regional Monitoring.

(2) Sediment Quality Monitoring

The Copermittees must perform sediment monitoring to assess compliance with sediment quality receiving water limits applicable to MS4 discharges to enclosed bays and estuaries. The monitoring may be performed either by individual or multiple Copermittees to assess compliance with receiving water limits, or through participation in a water body monitoring coalition. The Copermittees must identify sediment sampling stations that are spatially representative of the sediment within the water body segment or region of interest. Sediment quality monitoring must be conducted in conformance with the monitoring requirements set forth in the State Water Board Sediment Quality Control Plan.

(3) ASBS Monitoring

For Watershed Management Areas with ASBS, the Copermittees must implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

f. ALTERNATIVE WATERSHED MONITORING REQUIREMENTS

The San Diego Water Board may direct the Copermittees to participate in an effort to develop alternative watershed monitoring with other regulated entities, other interested parties, and the San Diego Water Board to refine, coordinate, and implement regional monitoring and assessment programs to determine the status and trends of water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams.

2. MS4 Outfall Discharge Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the discharges from the MS4 outfalls in each Watershed Management Area during dry weather and wet weather. Following acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct MS4 outfall discharge monitoring during implementation of the Water Quality Improvement Plan to assess the effectiveness of their jurisdictional runoff management programs toward effectively prohibiting non-storm water discharges and reducing pollutants in storm water discharges to and from their MS4s. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following MS4 outfall monitoring procedures:

a. TRANSITIONAL MS4 OUTFALL DISCHARGE MONITORING

Until the monitoring requirements of Provisions D.2.b-c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following MS4 outfall discharge monitoring in the Watershed Management Area:

(1) MS4 Outfall Discharge Monitoring Station Inventory

Each Copermittee must identify all major MS4 outfalls that discharge directly to receiving waters within its jurisdiction and geo-locate those outfalls on a map of the MS4 pursuant to Provision E.2.b.(1). This information must be compiled into a MS4 outfall discharge monitoring station inventory, and must include the following information:

(a) Latitude and longitude of MS4 outfall point of discharge;

(b) Watershed Management Area;

(c) Hydrologic subarea;

(d) Outlet size;

(e) Accessibility (i.e. safety and without disturbance of critical habitat);

(f) Approximate drainage area; and

(g) Classification of whether the MS4 outfall is known to have persistent dry weather flows, transient dry weather flows, no dry weather flows, or unknown dry weather flows.

(2) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Until the monitoring requirements of Provision D.2.b are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, each Copermittee must perform dry weather MS4 outfall field screening monitoring to identify non-storm water and illicit discharges within its jurisdiction in accordance with Provision E.2.c, to determine which discharges are transient flows and which are persistent flows, and prioritize the dry weather MS4 discharges that will be investigated and eliminated in accordance with Provision E.2.d. Each Copermittee must conduct the following dry weather MS4 outfall discharge field screening monitoring within its jurisdiction:

(a) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Frequency

Each Copermittee must field screen the MS4 outfalls in its inventory developed pursuant to Provision D.2.a.(1) as follows:

(i) For Copermittees with less than 125 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 80 percent of the outfalls must be visually inspected two times per year during dry weather conditions.

(ii) For Copermittees with 125 major MS4 outfalls or more, but less than or equal to 500, that discharge to receiving waters within a Watershed Management Area all the outfalls must be visually inspected at least annually during dry weather conditions.

(iii) For Copermittees with more than 500 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 500 outfalls must be visually inspected at least annually

during dry weather conditions. Copermittees with more than 500 major MS4 outfalls within a Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(iv) For Copermittees with more than 500 major MS4 outfalls within its jurisdiction that are located in more than one Watershed Management Area, at least 500 major MS4 outfalls within its inventory must be visually inspected at least annually during dry weather conditions. Copermittees with more than 500 major MS4 outfalls in more than one Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(v) Inspections of major MS4 outfalls conducted in response to public reports and staff or contractor reports and notifications may count toward the required visual inspections of MS4 outfall discharge monitoring stations.

(b) Transitional Dry Weather MS4 Outfall Discharge Field Screening Visual Observations

(i) An antecedent dry period of at least 72 hours following any storm event producing measurable rainfall greater than 0.1 inch is required prior to conducting field screening visual observations during a field screening monitoring event.

(ii) During the field screening monitoring event, each Copermittee must record visual observations consistent with Table D-6 at each MS4 outfall discharge monitoring station inspected.

Table D-6. Field Screening Visual Observations for MS4 Outfall Discharge Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) - Flow source(s) suspected or identified from non-storm water source investigation - Flow source(s) eliminated during non-storm water source identification • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) - Known or suspected source(s) of pooled or ponded water • Station description (i.e. deposits or stains, vegetation condition, structural condition, observable biology) • Presence and assessment of trash in and around station • Evidence or signs of illicit connections or illegal dumping

(iii) Each Copermittee must implement the requirements of Provisions E.2.d.(2)(c)-(e) based on the field observations.

(iv) Each Copermittee must evaluate field observations together with existing information available from prior reports, inspections and monitoring results to determine whether any observed flowing, pooled, or ponded waters are likely to be transient or persistent flow.[18]

(c) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Records

Based upon the results of the transitional dry weather MS4 outfall discharge field screening monitoring conducted pursuant to Provisions D.2.a.(2)(a)-(b), each Copermittee must update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow.

(3) Transitional Wet Weather MS4 Outfall Discharge Monitoring

Until the monitoring requirements of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following

[18] Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(a) Transitional Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees must select at least five wet weather MS4 outfall discharge monitoring stations from the inventories developed pursuant to Provision D.2.a.(1) that are representative of storm water discharges from areas consisting primarily of residential, commercial, industrial, and typical mixed-use land uses present within the Watershed Management Area.

(b) Transitional Wet Weather MS4 Outfall Discharge Monitoring Frequency

Each wet weather MS4 outfall discharge monitoring station selected pursuant to Provision D.2.a.(3)(a) must be monitored twice during the wet season (October 1 – April 30). One wet weather monitoring event must be conducted during the first wet weather event of the wet season, and one wet weather monitoring event at least a month after the first wet weather event of the wet season.

(c) Transitional Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(i) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(ii) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(iii) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(iv) Presence and assessment of trash in and around station.

(d) Transitional Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(e) Transitional Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, and indicator bacteria;

(iv) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

[a] Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or
[b] Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or
[c] If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours;

(v) Only one analysis of the composite of aliquots is required;

(vi) The samples must be analyzed for the following constituents:

[a] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,
[b] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and
[c] Constituents listed in in Table D-7.

Table D-7. Analytical Monitoring Constituents for Wet Weather MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Nickel • Selenium • Thallium • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(f) Other Transitional Wet Weather MS4 Outfall Discharge Monitoring

The San Diego County Copermittees must continue the wet weather MS4 outfall monitoring program developed under Order No. R9-2007-0001, as approved by the San Diego Water Board, through its planned completion.

b. DRY WEATHER MS4 OUTFALL DISCHARGE MONITORING

Each Copermittee must perform dry weather MS4 outfall monitoring to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. Each Copermittee must conduct the following dry weather MS4 outfall discharge monitoring within its jurisdiction:

(1) Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Each Copermittee must continue to perform the dry weather MS4 outfall discharge field screening monitoring in accordance with the requirements of Provision D.2.a.(2). The Copermittee may adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of persistent flow non-storm water discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of visual inspections performed is equivalent to the number of visual inspections required under Provision D.2.a.(2)(a).

(2) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring

Each Copermittee must perform non-storm water persistent flow MS4 outfall discharge monitoring to determine which persistent non-storm water discharges contain concentrations of pollutants below NALs, and which persistent non-storm water discharges impact receiving water quality during dry weather. Each Copermittee must conduct the following non-storm water persistent flow MS4 outfall discharge monitoring within its jurisdiction:

(a) Prioritization of Non-Storm Water Persistent Flow MS4 Outfalls

Based upon the dry weather MS4 outfall discharge field screening monitoring records developed pursuant to Provision D.2.a.(2)(c), each Copermittee must identify and prioritize the MS4 outfalls with persistent flows based on the highest priority water quality conditions identified in the Water Quality Improvement Plan and any additional criteria developed by the Copermittee, which may include historical data and data from sources other than what the Copermittee collects.

(b) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring Frequency

(i) Based on the prioritization of major MS4 outfalls developed under Provision D.2.b.(2)(a), each Copermittee must identify, at a minimum, the 10 highest priority major MS4 outfalls with non-storm water persistent flows that the Copermittee will monitor within each Watershed Management Area within its jurisdiction. The location of the highest priority non-storm water persistent flow MS4 outfall monitoring stations must be identified on the map required pursuant to Provision E.2.b.(1).

(ii) Each of the highest priority non-storm water persistent flow MS4 outfall monitoring stations identified pursuant to Provision D.2.b.(2)(b)(i) must be monitored under dry weather conditions at least semi-annually until one of the following occurs:

[a] The non-storm water discharges have been effectively eliminated (i.e. no flowing, pooled, or ponded water) for three consecutive dry weather monitoring events; or

[b] The source(s) of the persistent flows has been identified as a category of non-storm water discharges that does not require an NPDES permit and does not have to be addressed as an illicit discharge because it was not identified as a source of pollutants (i.e. constituents in non-storm water discharge do not exceed NALs), and the persistent flow can be re-prioritized to a lower priority; or

[c] The constituents in the persistent flow non-storm water discharge do not exceed NALs, and the persistent flow can be re-prioritized to a lower priority; or

[d] The source(s) of the persistent flows has been identified as a non-storm water discharge authorized by a separate NPDES permit.

(iii) Where the criteria under Provision D.2.b.(2)(c)(ii) are not met, but the threat to water quality has been reduced by the Copermittee, the highest priority persistent flow MS4 outfall monitoring stations may be reprioritized accordingly for continued dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1).

(iv) Each Copermittee must document removal or re-prioritization of the highest priority persistent flow MS4 outfall monitoring stations identified under Provision D.2.b.(2)(b) in the Annual Report. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized MS4 major outfall in the Watershed Management Area within its jurisdiction, unless there are no remaining qualifying major MS4 outfalls within the Copermittee's jurisdiction in the Watershed Management Area.

(c) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Observations

During each semi-annual monitoring event, each Copermittee must record field observations consistent with Table D-6 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(d) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Monitoring

During each semi-annual monitoring event, if conditions allow the collection of the data, each Copermittee must monitor and record the parameters in Table D-2 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(e) Non-Storm Water Persistent Flow MS4 Outfall Discharge Analytical Monitoring

During each semi-annual monitoring event in which measurable flow is present, each Copermittee must collect and analyze samples from each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Collect grab or composite samples to be analyzed for the following constituents:

[a] Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,
[b] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,
[c] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,
[d] Applicable NAL constituents, and
[e] Constituents listed in Table D-8, unless the Copermittee has historical data that can demonstrate or provide justification that the analysis of the constituent is not necessary.

Table D-8. Analytical Monitoring Constituents for Persistent Flow MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Total Hardness • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Cadmium • Copper • Lead • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(iv) If the Copermittee identifies and eliminates the source of the persistent flow non-storm water discharge, analysis of the sample is not required.

c. Wet Weather MS4 Outfall Discharge Monitoring

The Copermittees must perform wet weather MS4 outfall monitoring to identify sources of pollutants in storm water discharges from the MS4s in the Watershed Management Area. The Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(1) Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees may adjust the wet weather MS4 outfall discharge monitoring locations and frequencies in the Watershed Management Area, as needed, to identify sources of pollutants in storm water discharges from MS4s in the Watershed Management Area in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of stations is at least equivalent to the number of stations required under Provision D.2.a.(3)(a).

(2) Wet Weather MS4 Outfall Discharge Monitoring Frequency

The Copermittees must monitor the wet weather MS4 outfall discharge monitoring stations in the Watershed Management Area at an appropriate frequency to identify sources of pollutants in storm water discharges from the MS4s causing or contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan.

(3) Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(d) Presence and assessment of trash in and around station.

(4) Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(5) Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

(iii) If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours.

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and

(iv) Applicable SAL constituents.

3. Special Studies

a. Within the term of this Order, the Copermittees must develop and implement the following special studies:

(1) At least three special studies in each Watershed Management Area to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that cause or contribute to highest priority water quality conditions identified in the Water Quality Improvement Plan.

(2) At least two special studies for the San Diego Region to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that are impacting receiving waters on a regional basis in the San Diego Region.

(3) One of the three special studies in each Watershed Management Area may be replaced by a special study implemented pursuant to Provision D.3.a.(2).

b. The special studies must, at a minimum, be in conformance with the following criteria:

(1) The special studies must be related to the highest priority water quality conditions identified by the Copermittees in the Watershed Management Area and/or for the entire San Diego Region;

(2) The special studies developed pursuant to Provision D.3.a.(1) must:

(a) Be implemented within the applicable Watershed Management Area, and

(b) Require some form of participation by all the Copermittees within the Watershed Management Area;

(3) The special studies developed pursuant to Provision D.3.a.(2) must:

(a) Be implemented within the San Diego Region, and

(b) Require some form of participation by all Copermittees covered under the requirements of this Order.

c. Special studies developed to identify sources of pollutants and/or stressors should be pollutant and/or stressor specific and based on historical monitoring data and monitoring performed pursuant to Provisions D.1 and D.2. Development of source identification special studies should include the following:

(1) A compilation of known information on the specific pollutant and/or stressor, including data on potential sources and movement of the pollutant and/or stressor within the watershed. Data generated by the Copermittees and others, as well as information available from a literature research on the pollutant and/or stressor should be compiled and analyzed as appropriate.

(2) An identification of data gaps, based on the compiled information generated on the specific pollutant and/or stressor in Provision D.3.d.(1). Source identification special studies should be developed to fill identified data gaps.

(3) A monitoring plan that will collect and provide data the Copermittees can utilize to do the following:

(a) Quantify the relative loading or impact of a pollutant and/or stressor from a particular source or pollutant generating activity;

(b) Improve understanding of the fate of a pollutant and/or stressor in the environment;

(c) Develop an inventory of known and suspected sources of a pollutant and/or stressor in the Watershed Management Area; and/or

(d) Prioritize known and suspected sources of a pollutant and/or stressor based on relative magnitude in discharges, geographical distribution (i.e., regional or localized), frequency of occurrence in discharges, human health risk, and controllability.

d. Special studies initiated prior to the acceptance of the Water Quality Improvement Plan that meet the requirements of Provision D.3.b and are completed during the term of this Order may be utilized to fulfill the special study requirements of Provision D.3.a.

e. The Copermittees must submit the monitoring plans for the special studies in the Water Quality Improvement Plans required pursuant to Provision F.1.

f. The Copermittees are encouraged to share the results of the special studies regionally among the Copermittees to provide information useful in improving and adapting the management of non-storm water and storm water runoff through the implementation of the Water Quality Improvement Plans.

4. Assessment Requirements

Each Copermittee must evaluate the data collected pursuant to Provisions D.1, D.2 and D.3, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E, to assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a. Assessments must be performed as described in the following provisions:

a. Receiving Waters Assessments

(1) The Copermittees must assess and report the conditions of the receiving waters in the Watershed Management Area as follows:

(a) Based on data collected pursuant to Provision D.1.a, the assessments under Provision D.4.a.(2) must be included in the first Annual Report required pursuant to Provision F.3.b.(1).

(b) Based on the data collected pursuant to Provisions D.1.a-e, the assessments required under Provision D.4.a.(2) must be included in the Report of Waste Discharge required pursuant to Provision F.5.b.

(2) The Copermittees must assess the status and trends of receiving water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under dry weather and wet weather conditions. For each of the three types of receiving waters in each Watershed Management Area the Copermittees must:

(a) Determine whether or not the conditions of the receiving waters are protective of the designated beneficial uses;

(b) Identify the most critical beneficial uses that must be protected or restored to ensure overall health of the receiving water;

(c) Determine whether or not those critical beneficial uses are being protected and where those beneficial used must be restored;

(d) Identify short-term and/or long-term improvements or degradation of those critical beneficial uses;

(e) Identify data gaps in the monitoring data necessary to assess Provisions D.4.a.(2)(a)-(d).

b. MS4 OUTFALL DISCHARGES ASSESSMENTS

(1) Non-Storm Water Discharges Reduction Assessments

(a) Each Copermittee must assess and report the progress of its illicit discharge detection and elimination program, required to be implemented pursuant to Provision E.2, toward reducing and effectively prohibiting non-storm water and illicit discharges into the MS4 within its jurisdiction as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(2), the assessments under Provision D.4.b.(1)(b) must be included in the first Annual Report required pursuant to Provision F.3.b.(1).

(ii) Based on the data collected pursuant to Provisions D.2.b, the assessments required under Provision D.4.b.(1)(c) must be included in the first Annual Report required pursuant to Provision F.3.b.(1), and annually thereafter.

(iii) Based on the data collected pursuant to Provisions D.2.b, the assessment required under Provision D.4.b.(1)(c) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.a.(2), each Copermittee must assess and report the following:

(i) Identify the known and suspected controllable sources (e.g. facilities, areas, land uses, pollutant generating activities) of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area;

(ii) Identify sources of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area that have been reduced or eliminated; and

(iii) Identify modifications to the field screening monitoring locations and frequencies for the MS4 outfalls in its inventory necessary to identify and eliminate sources of persistent flow non-storm water discharges pursuant to Provision D.2.b.(1).

(c) Based on the dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b, each Copermittee must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(1)(b);

(ii) Based on the data collected and applicable NALs in the Water Quality Improvement Plan, rank the MS4 outfalls in the Copermittee's

jurisdiction according to potential threat to receiving water quality, and produce a prioritized list of major MS4 outfalls for follow-up action to update the Water Quality Improvement Plan, with the goal of eliminating persistent flow non-storm water discharges and/or pollutant loads in order of the ranked priority list through targeted programmatic actions and source investigations;

(iii) For the highest priority major MS4 outfalls with persistent flows that are in exceedance of NALs, identify the known and suspected sources within the Copermittee's jurisdiction in the Watershed Management Area that may cause or contribute to the NAL exceedances;

(iv) Each Copermittee must analyze the data collected pursuant to Provision D.2.b, and utilize a model or other method, to calculate or estimate the non-storm water volumes and pollutant loads discharged from all the major MS4s outfalls in its jurisdiction identified as having persistent dry weather flows during the monitoring year. These calculations or estimates must be updated annually. Each Copermittee must calculate or estimate:

[a] Annual non-storm water volumes and pollutant loads discharged from the Copermittee's major MS4 outfalls to receiving waters within the Copermittee's jurisdiction, with an estimate of the percent contribution from each known and suspected source for each MS4 outfall;

[b] Annual non-storm water volumes and pollutant loads from areas or facilities subject to the Copermittee's legal authority that are discharged from the Copermittee's major MS4 outfalls to downstream receiving waters.

(v) Each Copermittee must review the data collected pursuant to Provision D.2.b and findings from the assessments required pursuant to Provision D.4.b.(1)(c)(i)-(iv) on an annual basis to:

[a] Identify reductions and progress in achieving reductions in non-storm water and illicit discharges to the Copermittee's MS4 in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction, with an estimate, if possible, of the non-storm water volume and/or pollutant load reductions attributable to specific water quality strategies implemented by the Copermittee; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittee in the Watershed Management Area toward reducing

or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction.

(vi) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(v).

(2) Storm Water Pollutant Discharges Reduction Assessments

(a) The Copermittees must assess and report the progress of the water quality improvement strategies, required to be implemented pursuant to Provisions B and E, toward reducing pollutants in storm water discharges from the MS4s within the Watershed Management Area as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(3), the assessments under Provision D.4.b.(2)(b) must be included in the first Annual Report required pursuant to Provision F.3.b.(1).

(ii) Based on the data collected pursuant to Provisions D.2.c, the assessments required under Provision D.4.b.(2)(c) must be included in the first Annual Report required pursuant to Provision F.3.b.(1), and annually thereafter.

(iii) Based on the data collected pursuant to Provisions D.2.c, the assessment required under Provisions D.4.b.(2)(c)-(d) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.a.(3) the Copermittees must assess and report the following:

(i) The Copermittees must analyze the monitoring data collected pursuant to Provision D.2.a.(3), and utilize a watershed model or other method, to calculate or estimate storm water volumes and pollutant loads discharged from the MS4s in each Copermittee's jurisdiction within the Watershed Management Area. The Copermittees must calculate or estimate the following for each monitoring year:

[a] The average storm water runoff coefficient for each land use type within the Watershed Management Area;
[b] The volume of storm water discharged from each of the Copermittee's major MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch;
[c] The pollutant loads discharged from each of the Copermittee's major MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch; and

[d] The percent contribution of storm water volumes and pollutant loads discharged from each land use type within the drainage basin to each of the Copermittee's major MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch.

(ii) Identify modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify sources pollutants in storm water discharges from the MS4s in the Watershed Management Area pursuant to Provision D.2.c.(1).

(c) Based on the wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.c the Copermittees must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(2)(b);

(ii) Based on the data collected and applicable SALs in the Water Quality Improvement Plan, rank the MS4 outfalls in the Watershed Management Area according to potential threat to receiving water quality, and produce a prioritized list of major MS4 outfalls for follow-up action to update the Water Quality Improvement Plan;

(iii) The Copermittees must review the data collected pursuant to Provision D.2.c and findings from the assessments required pursuant to Provisions D.4.b.(2)(c)(i)-(ii) on an annual basis to:

[a] Identify reductions and progress in achieving reductions in pollutant concentrations and/or pollutant loads from different land uses and/or drainage areas discharging from the Copermittees' MS4s in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters within the Watershed Management Area to the MEP, with an estimate, if possible, of the pollutant load reductions attributable to specific water quality strategies implemented by the Copermittees; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittees in the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters in the Watershed Management Area to the MEP.

(iv) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(iii).

(d) The Copermittees must evaluate all the data collected pursuant to Provision D.2.c, and incorporate new outfall monitoring data into time series plots for each long-term monitoring constituent for the Watershed Management Area, and perform statistical trends analysis on the cumulative long-term wet weather MS4 outfall discharge water quality data set.

c. Special Studies Assessments

The Copermittees must annually evaluate the results and findings from the special studies developed and implemented pursuant to Provision D.3, and assess their relevance to the Copermittees' efforts to characterize receiving water conditions, understand sources of pollutants and/or stressors, and control and reduce the discharges of pollutants from the MS4 outfalls to receiving waters in the Watershed Management Area. The Copermittees must report the results of the special studies assessments applicable to the Watershed Management Area, and identify any necessary modifications or updates to the Water Quality Improvement Plan based on the results in the Annual Reports required pursuant to Provision F.3.b.

d. Integrated Assessment of Water Quality Improvement Plan

As part of the iterative approach and adaptive management process required for the Water Quality Improvement Plan pursuant to Provision B.5, the Copermittees in each Watershed Management Area must integrate the data collected pursuant to Provisions D.1-D.3, the findings from the assessments required pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to assess the effectiveness of, and identify necessary modifications to, the Water Quality Improvement Plan as follows:

(1) The Copermittees must re-evaluate the priority water quality conditions and numeric goals for the Watershed Management Area, as needed, during the term of this Order pursuant to Provision B.5.a. The re-evaluation and recommendations for modifications to the priority water quality conditions, and/or numeric goals and corresponding schedules may be provided in the Annual Reports required pursuant to Provision F.3.b, but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The priority water quality conditions and numeric goals for the Watershed Management Area must be re-evaluated as follows:

(a) Re-evaluate the receiving water conditions in the Watershed Management Area in accordance with Provision B.2.a;

(b) Re-evaluate the impacts on receiving waters in the Watershed Management Area from MS4 discharges in accordance with Provision B.2.b;

(c) Re-evaluate the identification of MS4 sources of pollutants and/or stressors in accordance with Provision B.2.d;

(d) Identify beneficial uses of the receiving waters that are protected or must be restored in accordance with Provision D.4.a;

(e) Evaluate the progress toward achieving the interim and final numeric goals for restoring impacted beneficial uses in the receiving waters.

(2) The Copermittees must re-evaluate the water quality improvement strategies for the Watershed Management Area during the term of this Order pursuant to Provision B.5.b. The re-evaluation and recommendations for modifications to the water quality improvement strategies and schedules must be provided in the Annual Reports required pursuant to Provision F.3.b, and provided in the Report of Waste Discharge pursuant to Provision F.5.b. The water quality improvement strategies for the Watershed Management Area must be re-evaluated as follows:

(a) Identify the non-storm water and storm water pollutant loads from the Copermittees' MS4 outfalls in the Watershed Management Area, calculated or estimated pursuant to Provisions D.4.b;

(b) Identify the non-storm water and storm water pollutant load reductions, or other improvements to receiving water or water quality conditions, that are necessary to attain the interim and final numeric goals for restoring impacted beneficial uses in the receiving waters;

(c) Identify the non-storm water and storm water pollutant load reductions, or other improvements to the quality of MS4 discharges, that are necessary for the Copermittees to demonstrate that non-storm water and storm water discharges from their MS4s are not causing or contributing to exceedances of receiving water limitations;

(d) Evaluate the progress of the water quality improvement strategies toward achieving the interim and final numeric goals for restoring impacted beneficial uses in the receiving waters.

(3) The Copermittees must re-evaluate and adapt the water quality monitoring and assessment program for the Watershed Management Area when new information becomes available to improve the monitoring and assessment program pursuant to Provision B.5.c. The re-evaluation and recommendations for modifications to the monitoring and assessment program may be provided in the Annual Reports required pursuant to Provision F.3.b, but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. Modifications to the water quality monitoring and assessment program must be consistent with the

requirements of Provision D.1-D.3. The re-evaluation of the water quality monitoring and assessment program for the Watershed Management Area must consider the data gaps identified by the assessments required pursuant to Provisions D.4.a-b, and results of the special studies implemented pursuant to Provision D.4.c.

5. Monitoring Provisions

Each Copermittee must comply with all the monitoring, reporting, and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

E. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS

The purpose of this provision is for each Copermittee to implement a program to control the contribution of pollutants to and the discharges from the MS4 with its jurisdiction. The goal of the jurisdictional runoff management programs is to implement strategies that effectively prohibit non-storm water discharges to the MS4 and reduce the discharge of pollutants in storm water to the MEP. This goal will be accomplished through implementing the jurisdictional runoff management programs in accordance with the strategies identified in the Water Quality Improvement Plans.

Each Copermittee must update its jurisdictional runoff management program document, in accordance with Provision F.2.a, to incorporate all the requirements of Provision E. Until the Copermittee has updated its jurisdictional runoff management program document with the requirements of Provision E, the Copermittee must continue implementing its current jurisdictional runoff management program.

1. Legal Authority Establishment and Enforcement

a. Each Copermittee must establish, maintain, and enforce adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 through statute, ordinance, permit, contract, order, or similar means. This legal authority must, at a minimum, authorize the Copermittee to:

(1) Prohibit and eliminate all illicit discharges and illicit connections to its MS4;

(2) Control the contribution of pollutants in discharges of runoff associated with industrial and construction activity to its MS4 and control the quality of runoff from industrial and construction sites, including industrial and construction sites which have coverage under the statewide General Permit for Discharges of Storm Water Associated with Industrial Activities (Industrial General Permit) or General Permit for Discharges of Storm Water Associated with Construction Activities (Construction General Permit), as well as to those sites which do not;

(3) Control the discharge of spills, dumping, or disposal of materials other than storm water into its MS4;

(4) Control through interagency agreements among Copermittees the contribution of pollutants from one portion of the MS4 to another portion of the MS4;

(5) Control, by coordinating and cooperating with other owners of the MS4 such as Caltrans, the U.S. federal government, or sovereign Native American Tribes through interagency agreements, where possible, the contribution of pollutants from their portion of the MS4 to the portion of the MS4 within the Copermittee's jurisdiction;

(6) Require compliance with conditions in its statutes, ordinances, permits, contracts, orders, or similar means to hold dischargers to its MS4 accountable for their contributions of pollutants and flows;

(7) Require the use of BMPs to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(8) Require documentation on the effectiveness of BMPs implemented to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(9) Utilize enforcement mechanisms to require compliance with its statutes, ordinances, permits, contracts, orders, or similar means; and

(10) Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with its statutes, ordinances, permits, contracts, orders, or similar means and with the requirements of this Order, including the prohibition of illicit discharges and connections to its MS4; the Copermittee must also have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from industrial facilities, including construction sites, discharging into its MS4.

b. With the first Annual Report required pursuant to Provision F.3.b, each Copermittee must submit a statement certified by its Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative that the Copermittee has taken the necessary steps to obtain and maintain full legal authority within its jurisdiction to implement and enforce each of the requirements contained in this Order.

2. Illicit Discharge Detection and Elimination

Each Copermittee must implement a program to actively detect and eliminate illicit discharges and improper disposal into the MS4, or otherwise require the discharger to apply for and obtain a separate NPDES permit. The illicit discharge detection and elimination program must be implemented in accordance with the strategies identified in the Water Quality Improvement Plan and include, at a minimum, the following requirements:

a. NON-STORM WATER DISCHARGES

Each Copermittee must address all non-storm water discharges as illicit discharges, unless a non-storm water discharge is either identified as a discharge authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to the following requirements:

(1) Discharges of non-storm water to the MS4 from the following categories must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG919001 (Order No. R9-2007-0034, or subsequent order) for discharges to San Diego Bay, or NPDES Permit No. CAG919002 (Order No. R9-2008-0002, or subsequent order) for discharges to surface waters other than San Diego Bay:

(a) Uncontaminated pumped ground water;

(b) Discharges from foundation drains;[19]

(c) Water from crawl space pumps; and

(d) Water from footing drains.[19]

(2) Discharges of non-storm water from water line flushing and water main breaks to the MS4 must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG 679001 (Order No. R9-2010-0003, or subsequent order). This category includes water line flushing and water main break discharges from water purveyors issued a water supply permit by the California Department of Public Health or federal military installations. Discharges from recycled or reclaimed water lines to the MS4 must be addressed as illicit discharges, unless the discharges have coverage under a separate NPDES permit.

(3) Discharges of non-storm water to the MS4 from the following categories must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a source of pollutants to receiving waters:

(a) Diverted stream flows;

(b) Rising ground waters;

(c) Uncontaminated ground water infiltration to MS4s;

(d) Springs;

(e) Flows from riparian habitats and wetlands;

(f) Discharges from potable water sources;

[19] Provision E.2.a.(1) only applies to this category on non-storm water if the system is designed to be located at or below the highest historical groundwater table to actively or passively extract groundwater during any part of the year.

(g) Discharges from foundation drains;[20] and

(h) Discharges from footing drains.[20]

(4) Discharges of non-storm water to the MS4 from the following categories must be controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means. Discharges of non-storm water to the MS4 from the following categories not controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means must be addressed by the Copermittee as illicit discharges.

(a) Air conditioning condensation

The discharge of air conditioning condensation must be directed to landscaped areas or other pervious surfaces where feasible.

(b) Individual residential vehicle washing

(i) The discharge of wash water must be directed to landscaped areas or other pervious surfaces where feasible; and

(ii) Minimize the use of water for vehicle washing, use as little washing detergent and other vehicle wash products as possible, wash vehicles at commercial wash facilities, and implement other practices or behaviors that will prevent the discharge of pollutants associated with individual residential vehicle washing from entering the MS4.

(c) Dechlorinated swimming pool discharges

(i) Eliminate residual chlorine, algaecide, filter backwash, or other pollutants from swimming pools prior to discharging to the MS4; and

(ii) The discharge of saline swimming pool water must be directed to the sanitary sewer, landscaped areas, or other pervious surfaces that can accommodate the volume of water, unless the saline swimming pool water can be discharged via a pipe or concrete channel directly to a naturally saline water body (e.g. Pacific Ocean).

(5) Firefighting discharges to the MS4 must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a significant source of pollutants to receiving waters. Firefighting discharges to the MS4 not identified as a significant source of pollutants to receiving waters, must be addressed, at a minimum, as follows:

[20] Provision E.2.a.(3) only applies to this category of non-storm water discharge if the system is designed to be located above the highest historical groundwater table at all times of the year, and the system is only expected to discharge non-storm water under unusual circumstances.

(a) Non-emergency firefighting discharges

(i) Building fire suppression system maintenance discharges (e.g. sprinkler line flushing) to the MS4 must be addressed as illicit discharges.

(ii) Non-emergency firefighting discharges (i.e., discharges from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems) must be addressed by a program, to be developed and implemented by the Copermittee, to reduce or eliminate pollutants in such discharges from entering the MS4.

(b) Emergency firefighting discharges

Each Copermittee should develop and encourage implementation of BMPs to reduce or eliminate pollutants in emergency firefighting discharges to the MS4s and receiving waters within its jurisdiction. During emergency situations, priority of efforts should be directed toward life, property, and the environment (in descending order). BMPs should not interfere with immediate emergency response operations or impact public health and safety.

(6) If the Copermittee or San Diego Water Board identifies any category of non-storm water discharges listed under Provisions E.2.a.(1)-(4) as a source of pollutants to receiving waters, the category must be prohibited through ordinance, order, or similar means and addressed as an illicit discharge.

(7) Each Copermittee must, where feasible, reduce or eliminate non-storm water discharges listed under Provisions E.2.a.(1)-(4) into its MS4 whether or not the non-storm water discharge has been identified as an illicit discharge, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit.

b. PREVENT AND DETECT ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to prevent and detect illicit discharges to the MS4:

(1) Each Copermittee must maintain an updated map of its entire MS4 and the corresponding drainage areas. The accuracy of the MS4 map must be confirmed during the field screening required pursuant to Provision E.2.c. The MS4 map must be included as part of the jurisdictional runoff management program document. Any geographic information system (GIS) layers or files used by the Copermittee to maintain the MS4 map must be made available to the San Diego Water Board upon request. The MS4 map must identify the following:

(a) All segments of the MS4 owned, operated, and maintained by the Copermittee;

(b) All known locations of inlets that discharge and/or collect runoff into the Copermittee's MS4;

(c) All known locations of connections with other MS4s not owned or operated by the Copermittee (e.g. Caltrans MS4s);

(d) All known locations of MS4 outfalls and private outfalls that discharge runoff collected from areas within the Copermittee's jurisdiction;

(e) All segments of receiving waters within the Copermittee's jurisdiction that receive and convey runoff discharged from the Copermittee's MS4 outfalls;

(f) Locations of the MS4 outfalls, identified pursuant to Provision D.2.a.(1), within its jurisdiction; and

(g) Locations of the non-storm water persistent flow MS4 outfall discharge monitoring stations, identified pursuant to Provision D.2.b.(2)(b), within its jurisdiction.

(2) Each Copermittee must use Copermittee personnel and contractors to assist in identifying and reporting illicit discharges and connections during their daily employment activities.

(3) Each Copermittee must promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges to or from the MS4, including the following methods for public reporting:

(a) Operate a public hotline, which can be Copermittee-specific or shared by the Copermittees, and must be capable of receiving reports in both English and Spanish 24 hours per day and seven days per week; and

(b) Designate an e-mail address for receiving electronic reports from the public, which can be Copermittee-specific or shared by the Copermittees, and must be prominently displayed on the Copermittee's webpage and the Regional Clearinghouse required pursuant to Provision F.4.

(4) Each Copermittee must implement practices and procedures (including a notification mechanism) to prevent, respond to, contain, and clean up any spills that may discharge into the MS4 within its jurisdiction from any source. The Copermittee must coordinate, to the extent possible, with spill response teams to prevent entry of spills into the MS4, and prevent contamination of surface water, ground water, and soil. The Copermittee must coordinate spill

prevention, containment, and response activities throughout all appropriate Copermittee departments, programs, and agencies.

(5) Each Copermittee must implement practices and procedures to prevent and limit infiltration of seepage from sanitary sewers (including private laterals and failing septic systems) to the MS4.

(6) Each Copermittee must coordinate, when necessary, with upstream Copermittees and/or entities to prevent illicit discharges from upstream sources into the MS4 within its jurisdiction.

c. FIELD SCREENING

Each Copermittee must conduct field screening (i.e. visual observations, field testing, and/or analytical testing) of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4 in accordance with the dry weather MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

d. INVESTIGATE AND ELIMINATE ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to investigate and eliminate illicit discharges to the MS4:

(1) Each Copermittee must prioritize and determine when follow-up investigations will be performed in response to visual observations and/or water quality monitoring data collected during an investigation of a detected non-storm water or illicit discharge to or from the MS4. The criteria for prioritizing investigations must consider the following:

(a) Pollutants identified as causing or contributing to the highest water quality priorities identified in the Water Quality Improvement Plan;

(b) Pollutants identified as causing or contributing, or threatening to cause or contribute to impairments in water bodies on the 303(d) List and/or in environmentally sensitive areas (ESAs), located within its jurisdiction;

(c) Pollutants identified from sources or land uses known to exist within the area, drainage basin, or watershed that discharges to the portion of the MS4 within its jurisdiction included in the investigation;

(d) Pollutants identified as causing or contributing to an exceedance of a NAL in the Water Quality Improvement Plan; and

(e) Pollutants identified as a threat to human health or the environment.

(2) Each Copermittee must implement procedures to investigate and inspect portions of its MS4 that, based on reports or notifications, field screening, or other appropriate information, indicate a reasonable potential of receiving, containing, or discharging pollutants due to illicit discharges, illicit connections, or other sources of non-storm water. The procedures must include the following:

(a) Each Copermittee must develop criteria to:

(i) Assess the validity of each report or notification received; and

(ii) Prioritize the response to each report or notification received.

(b) Each Copermittee must prioritize and respond to each valid report or notification (e.g., public reports, staff or contractor reports and notifications, etc.) of an incident in a timely manner.

(c) Each Copermittee must investigate and seek to identify the source(s) of discharges of non-storm water where flows are observed in and from the MS4 during the field screening required pursuant to Provision D.2.b.(1) as follows:

(i) Obvious illicit discharges must be immediately investigated to identify the source(s) of non-storm water discharges;

(ii) The investigation must include field investigations to identify sources or potential sources for the discharge, unless the source or potential source has already been identified during previous investigations; and

(iii) The investigation may include follow-up field investigations and/or reviewing Copermittee inventories and other land use data to identify potential sources of the discharge.

(d) Each Copermittee must maintain records and a database of the following information:

(i) Location of incident, including hydrologic subarea, portion of MS4 receiving the non-storm water or illicit discharge, and point of discharge or potential discharge from MS4 to receiving water;

(ii) Source of information initiating the investigation (e.g., public reports, staff or contractor reports and notifications, field screening, etc.);

(iii) Date the information used to initiate the investigation was received;

(iv) Date the investigation was initiated;

(v) Dates of follow-up investigations;

(vi) Identified or suspected source of the illicit discharge or connection, if

determined;

(vii) Known or suspected related incidents, if any;

(viii) Result of the investigation; and

(ix) If a source cannot be identified and the investigation is not continued, a rationale for why a discharge does not pose a threat to water quality and/or does not require additional investigation.

(e) Each Copermittee must track and seek to identify the source(s) of non-storm water discharges from the MS4 where there is evidence of non-storm water having been discharged into or from the MS4 (e.g., pooled water), in accordance with MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.

(3) Each Copermittee must initiate the implementation of procedures, in a timely manner, to eliminate all detected and identified illicit discharges and connections within its jurisdiction. The procedures must include the following responses:

(a) Each Copermittee must enforce its legal authority, as required under Provision E.1, to eliminate illicit discharges and connections to the MS4.

(b) If the Copermittee identifies the source as a controllable source of non-storm water or illicit discharge or connection, the Copermittee must implement its Enforcement Response Plan pursuant to Provision E.6 and enforce its legal authority to prohibit and eliminate illicit discharges and connections to its MS4.

(c) If the Copermittee identifies the source of the discharge as a category of non-storm water discharges in Provision E.2.a, and the discharge is in exceedance of NALs in the Water Quality Improvement Plan, then the Copermittee must determine if: (1) this is an isolated incident or set of circumstances that will be addressed through its Enforcement Response Plan pursuant to Provision E.6, or (2) the category of discharge must be addressed through the prohibition of that category of discharge as an illicit discharge pursuant to Provision E.2.a.(6).

(d) If the Copermittee suspects the source of the non-storm water discharge as natural in origin (i.e. non-anthropogenically influenced) and in conveyance into the MS4, then the Copermittee must document and provide the data and evidence necessary to demonstrate to the San Diego Water Board that it is natural in origin and does not require further investigation.

(e) If the Copermittee is unable to identify and document the source of a recurring non-storm water discharge to or from the MS4, then the Copermittee must address the discharge as an illicit discharge and update

its jurisdictional runoff management program to address the common and suspected sources of the non-storm water discharge within its jurisdiction in accordance with the Copermittee's priorities.

(4) Each Copermittee must submit a summary of the non-storm water discharges and illicit discharges and connections investigated and eliminated within its jurisdiction with each Annual Report required under Provision F.3.b of this Order.

e. STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the illicit discharge detection and elimination program to address non-storm water and illicit discharges and connections that the Copermittee has identified as potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, and/or increase/decrease frequency of inspections in specific areas); and

(2) The strategies and/or activities must be consistent with the requirements of Provisions E.2.a-d and the strategies identified in the Water Quality Improvement Plan.

3. Development Planning

Each Copermittee must use their land use and planning authorities to implement a development planning program in accordance with the strategies identified in the Water Quality Improvement Plan and includes, at a minimum, the following requirements:

a. BMP REQUIREMENTS FOR ALL DEVELOPMENT PROJECTS

Each Copermittee must prescribe the following BMP requirements during the planning process (i.e. prior to project approval and issuance of local permits) for all development projects (regardless of project type or size), where local permits are issued, including unpaved roads and flood management projects:

(1) <u>General Requirements</u>

(a) Onsite BMPs must be located so as to remove pollutants from runoff prior to its discharge to any receiving waters, and as close to the source as possible; and

(b) Structural BMPs must not be constructed within a waters of the U.S. or waters of the state.

(2) Source Control BMP Requirements

The following source control BMPs must be implemented at all development projects where applicable and feasible:

(a) Prevention of illicit discharges into the MS4;

(b) Storm drain system stenciling or signage;

(c) Properly designed outdoor material storage areas;

(d) Properly designed outdoor work areas;

(e) Properly designed trash storage areas; and

(f) Any additional BMPs necessary to minimize pollutant generation at each project.

(3) Low Impact Development (LID) BMP Requirements

The following LID BMPs must be implemented at all development projects where applicable and feasible:

(a) Maintenance or restoration of natural storage reservoirs and drainage corridors (including topographic depressions, areas of permeable soils, natural swales, and ephemeral and intermittent streams);[21]

(b) Buffer zones for natural water bodies (where buffer zones are technically infeasible, require project applicant to include other buffers such as trees, access restrictions, etc.);

(c) Conservation of natural areas within the project footprint including existing trees, other vegetation, and soils;

(d) Construction of streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided public safety is not compromised;

(e) Minimization of the impervious footprint of the project;

(f) Minimization of soil compaction to landscaped areas;

[21] Development projects proposing to dredge or fill materials in waters of the U.S. must obtain a CWA Section 401 Water Quality Certification. Projects proposing to dredge or fill waters of the state must obtain waste discharge requirements.

(g) Disconnection of impervious surfaces through distributed pervious areas;

(h) Landscaped or other pervious areas designed and constructed to effectively receive and infiltrate, retain and/or treat runoff from impervious areas, prior to discharging to the MS4;

(i) Small collection strategies located at, or as close as possible to, the source (i.e. the point where storm water initially meets the ground) to minimize the transport of runoff and pollutants to the MS4 and receiving waters;

(j) Use of permeable materials for projects with low traffic areas and appropriate soil conditions;

(k) Landscaping with native or drought tolerant species; and

(l) Harvesting and using precipitation.

b. PRIORITY DEVELOPMENT PROJECTS

(1) Definition of Priority Development Project

Priority Development Projects include the following:

(a) All new development projects that fall under the Priority Development Project categories listed under Provision E.3.b.(2) (where a new development project feature, such as a parking lot, falls into a Priority Development Project category, the entire project footprint is subject to Priority Development Project requirements); and

(b) Those redevelopment projects that create, add, or replace at least 5,000 square feet of impervious surfaces on an already developed site, and the redevelopment project is a Priority Development Project category listed under Provision E.3.b.(2) (where redevelopment results in an increase of less than fifty percent of the impervious surfaces of a previously existing development, and the existing development was not subject to Priority Development Project requirements, the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) apply only to the addition or replacement, and not to the entire development; where redevelopment results in an increase of more than fifty percent of the impervious surfaces of a previously existing development, the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) apply to the entire development).

(2) Priority Development Project Categories

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This category includes commercial, industrial, residential, mixed-use, and public development projects on public or private land which fall under the planning and building authority of the Copermittee.

(b) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

(c) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812), where the land area for development is 5,000 square feet or more.

(d) Hillside development projects. This category includes any development which creates 5,000 square feet or more of impervious surface which is located in an area with known erosive soil conditions, where the development will grade on any natural slope that is twenty-five percent or greater.

(e) Environmentally sensitive areas (ESAs). This category includes any development located within, directly adjacent to, or discharging directly to an ESA, which either creates 2,500 square feet of impervious surface on a proposed project site or increases the area of imperviousness of a proposed project site to 10 percent or more of its naturally occurring condition. “Directly adjacent to” means situated within 200 feet of the ESA. “Discharging directly to” means outflow from a drainage conveyance system that collects runoff from the subject development or redevelopment site and terminates at or in receiving waters within the ESA.

(f) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce that has 5,000 square feet or more of impervious surface.

(g) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface that is 5,000 square feet or more used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

(h) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

(i) Large development projects. This category includes any post-construction pollutant-generating new development projects that result in the disturbance of one acre or more of land.

(3) Priority Development Project Exemptions

Each Copermittee has the discretion to exempt the following projects from being defined as Priority Development Projects:

(a) New paved sidewalks, bicycle lanes, or trails that meet the following criteria:

(i) Designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas; OR

(ii) Designed and constructed to be hydraulically disconnected from paved streets or roads; OR

(iii) Designed and constructed with permeable pavements or surfaces in accordance with USEPA Green Streets guidance.[22]

(b) Retrofitting of existing paved alleys, streets or roads that meet the following criteria:

(i) Must be two lanes or less; AND

(ii) Must be a retrofitting project implemented as part of an alternative compliance project option under Provision E.3.c.(3)(b)(v) to achieve the performance requirements of Provisions E.3.c.(1) and/or E.3.c.(2) for a Priority Development Project; AND

(iii) Designed and constructed in accordance with the USEPA Green Streets guidance.[23]

(c) New single family residences that meet the following criteria:

(i) Must not be constructed as part of a larger development or proposed subdivision; AND

(ii) Designed and constructed to be certified under the U.S. Green Building Council (USGCB) Leadership in Energy and Environmental Design (LEED) for Homes green building certification program, receiving at least four (4) Surface Water Management credits under the Sustainable Sites category;[24] OR

[22] See "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).
[23] Ibid.
[24] See LEED for Homes rating system at http://www.usgbc.org

(iii) Designed and constructed with structural BMPs that will achieve the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite.

(d) Redevelopment of existing single family residences that meet the following criteria:

(i) Designed and constructed to be certified under the USGCB LEED for Homes green building certification program, receiving at least four (4) Surface Water Management credits under the Sustainable Sites category; [25] OR

(ii) Designed and constructed with structural BMPs that will achieve the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite.

c. PRIORITY DEVELOPMENT PROJECT STRUCTURAL BMP PERFORMANCE REQUIREMENTS

In addition to the BMP requirements listed for all development projects under Provision E.3.a, Priority Development Projects must also implement structural BMPs that conform to performance requirements below.

(1) Storm Water Pollutant Control BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite structural BMPs to control pollutants in storm water that may be discharged from a project as follows:

(a) Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite the pollutants contained in the design capture volume. The design capture volume is equivalent to:

(i) The volume of storm water produced from a 24-hour 85th percentile storm event;[26] OR

(ii) The volume of storm water that would be retained onsite if the site was fully undeveloped and naturally vegetated, as determined using continuous simulation modeling techniques based on site-specific soil conditions and typical native vegetative cover.

[25] See LEED for Homes rating system at http://www.usgbc.org

[26] This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals.

(b) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) to comply with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1)(a).

(c) If a Priority Development project is allowed to utilize alternative compliance pursuant to Provisions E.3.c.(1)(b), flow-thru conventional treatment control BMPs must be implemented to treat the portion of the design capture volume that is not retained onsite. Additionally, project applicants must mitigate for the portion of the pollutant load in the design capture volume that is not retained onsite through one or more alternative compliance options under Provision E.3.c.(3). Conventional treatment control BMPs must be sized and designed to:

(i) Remove pollutants from storm water to the MEP;

(ii) Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;

(iii) Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Conventional treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of conventional treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

(2) <u>Hydromodification Management BMP Requirements</u>

Each Copermittee must require each Priority Development Project to implement onsite structural BMPs to manage hydromodification that may be caused by storm water runoff discharged from a project as follows:

(a) Post-project runoff flow rates and durations must not exceed pre-development (naturally occurring) runoff flow rates and durations by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat conditions downstream of Priority Development Projects).

(i) In evaluating the range of flows that results in increased potential for erosion of natural (non-hardened) channels, the lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks.

(ii) For artificially hardened channels, analysis to identify the lower boundary must use characteristics of a natural stream segment similar to that found in the watershed. The lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or erodes the toe of the channel banks.

(iii) The Copermittees may use monitoring results collected pursuant to Provision D.1.a.(2) to re-define the range of flows resulting in increased potential for erosion, or degraded instream habitat conditions, as warranted by the data.

(b) Post-project runoff flow rates and durations must compensate for the loss of sediment supply due to the development project, should loss of sediment supply occur as a result of the development project.

(c) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) to comply with the performance requirements of Provisions E.3.c.(2)(a)-(b).

(d) Exemptions

Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provisions E.3.c.(2)(a)-(b) where the project:

(i) Discharges storm water runoff into existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;

(ii) Is a redevelopment Priority Development Project that meets the alternative compliance requirements of Provision E.3.c.(3)(b)(ii); or

(iii) Discharges storm water runoff into other areas identified by the San Diego Water Board as exempt from the requirements of Provisions E.3.c.(2)(a)-(b).

(3) <u>Alternative Compliance to Onsite Structural BMP Performance Requirements</u>

(a) Applicability

At the discretion of each Copermittee, Priority Development Projects may be allowed to utilize an alternative option to comply with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) under the following conditions:

(i) The Copermittee must determine that implementation of the alternative compliance option will have a greater overall water quality

benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite;

(ii) The alternative compliance options must be designed by a registered professional engineer, geologist, architect, or landscape architect;

(iii) The alternative compliance options must be implemented within the same hydrologic unit as the Priority Development Project, and preferably within the same hydrologic subarea;

(iv) Receiving waters must not be utilized to convey storm water runoff to the alternative compliance options;

(v) The pollutants in storm water runoff from the Priority Development Project must be treated to the MEP by the alternative compliance options prior to being discharged to receiving waters;

(vi) Unless otherwise allowed by Provision E.3.c.(3)(b), the alternative compliance options must have a net result of at least the same level of pollutant removal as would have been achieved if the Priority Development Project had fully complied with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1) onsite;

(vii) Unless otherwise allowed by Provision E.3.c.(3)(b), the alternative compliance options must have a net result of at least the same level of protection from potential downstream and upstream erosion in the receiving water as would have been achieved if the Priority Development Project had fully complied with the hydromodification management BMP performance requirements of Provision E.3.c.(2) onsite; and

(viii) The alternative compliance options utilized by the Priority Development Project to comply with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) must have reliable sources of funding for operation and maintenance.

(b) Alternative Compliance Project Options

The Copermittee may allow implementation of one or more of the following project options as part of an alternative approach to complying with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2):

(i) *Onsite LID Biofiltration Treatment Control BMPs*

The Copermittee may allow Priority Development Projects to utilize onsite LID biofiltration treatment control BMPs to comply with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1). Onsite LID biofiltration treatment control BMPs must be sized and designed to:

[a] Remove pollutants from storm water to the MEP; AND
[b] Have an appropriate surface loading rate to prevent erosion, scour and channeling within the BMP; AND
[c] Biofilter at least 1.5 times the design capture volume that is not reliably retained onsite; OR
[d] Biofilter up to the design capture volume that is not reliably retained onsite, AND 1) treat the remaining portion of the design capture volume not retained onsite with conventional treatment control BMPs in accordance with Provision E.3.c.(1)(c), and 2) if necessary, mitigate for the portion of the pollutant load in the design capture volume not retained onsite through one or more alternative compliance project, in-lieu fee and/or water quality credit system options below.

(ii) *LEED Certified Redevelopment Projects*

The Copermittee may allow redevelopment Priority Development Projects to comply with the hydromodification management BMP performance requirements of Provision E.3.c.(2) where the project is designed and constructed to be certified under the USGCB LEED for New Construction and Major Renovations green building certification program. The Priority Development Project must receive at least one (1) Site Design credit and two (2) Stormwater Design credits under the Sustainable Sites category.[27] In addition, the existing and future configuration of the receiving water must not be unnaturally altered or adversely impacted by storm water flow rates and durations discharged from the site.

(iii) *Watershed-Based Planned Development Projects*

The Copermittee may allow Priority Development Projects greater than 100 acres in total project size (or smaller than 100 acres in size yet part of a larger common plan of development that is over 100 acres) to comply with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2). The Priority Development Project must comply with the following conditions:

[a] The Priority Development Project was planned utilizing watershed and/or subwatershed based water quality, hydrologic, and fluvial geomorphologic planning principles that implement regional LID BMPs in accordance with the performance and location criteria of this Order and acceptable to the San Diego Water Board;
[b] Regional LID BMPs may be used provided that the BMPs capture and retain the volume of runoff produced from the design capture volume defined in Provision E.3.c.(1)(a)(i) and that such controls are located upstream of receiving waters;

[27] See LEED for New Construction and Major Renovations rating system at http://www.usgbc.org

[c] Regional LID BMPs must clearly exhibit that they will not result in a net impact from pollutant loadings over and above the impact caused by capture and retention of the design capture volume;

[d] Any portion of the design capture volume that is not retained by the regional LID BMPs must be treated using biofiltration BMPs; and

[e] Where regional LID BMPs are demonstrated to the Copermittee as technically infeasible to retain the entire design capture volume, any volume up to and including the design capture volume not retained by regional LID BMPs, nor treated by biofiltration BMPs, must be treated using conventional treatment control BMPs and the project applicant must implement additional alternative compliance project, in-lieu fee and/or water quality credit system options below.

(iv) *Offsite Regional BMPs*

[a] The Copermittee may allow Priority Development Projects to utilize offsite regional BMPs to comply with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1) if the offsite regional BMPs have the capacity to receive and retain at least 1.1 times the design capture volume that is not reliably retained onsite.

[b] The Copermittee may allow Priority Development Projects to utilize offsite regional BMPs to comply with the hydromodification management BMP performance requirements of Provision E.3.c.(2) if the offsite regional BMPs have the capacity to manage the storm water flows rates and durations from the site such that the receiving waters are protected from the potential for increased erosion that would be caused if the unmanaged portion of the runoff was discharged from the site.

(v) *Offsite Retrofitting Projects*

The Copermittee may allow Priority Development Projects to utilize offsite retrofitting projects to comply with the storm water pollutant control and hydromodification management BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) if the retrofitting projects have been identified within the strategies included in the Water Quality Improvement Plan, or identified as potential retrofitting projects by the Copermittee pursuant to Provision E.5.

(vi) *Offsite Channel, Stream, or Habitat Rehabilitation Projects*

The Copermittee may allow Priority Development Projects to utilize offsite channel, stream, or habitat rehabilitation projects to comply with the hydromodification management BMP performance requirements of Provision E.3.c.(2) if the rehabilitation projects have been identified within the strategies included in the Water Quality

Improvement Plan, or identified as potential channel rehabilitation projects by the Copermittee pursuant to Provision E.5. The channel, stream, or habitat rehabilitation project cannot be utilized for pollutant treatment except where artificial wetlands are constructed and located upstream of receiving waters.

(vii) *Offsite Regional Water Supply Augmentation Projects*

The Copermittee may allow Priority Development Projects to utilize offsite regional water supply augmentation projects (i.e. groundwater recharge, recycled water, storm water harvesting) to comply with the storm water pollutant control and hydromodification management BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) if the projects have been identified within the strategies included in the Water Quality Improvement Plan.

(viii) *Project Applicant Proposed Alternative Compliance Projects*

The Copermittee may allow one or more Priority Development Project applicant(s) to propose and implement alternative compliance projects to comply with the storm water pollutant control and hydromodification management BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) if the alternative compliance projects are consistent with, and will address the highest water quality priorities of the Water Quality Improvement Plan, and comply with the requirements of Provision E.3.c.(3)(a).

(c) Alternative Compliance In-Lieu Fee Option

The Copermittee may develop and implement an alternative compliance in-lieu fee option, individually or with other Copermittees and/or entities, as a means for designing, developing, constructing, operating and maintaining offsite alternative compliance projects under Provision E.3.c.(3)(b). Priority Development Projects allowed to utilize the alternative compliance in-lieu fee option must comply with the following conditions:

(i) The in-lieu fee must be transferred to the Copermittee (for public projects) or an escrow account (for private projects) prior to the date construction of the Priority Development Project is initiated.

(ii) If the in-lieu fee is applied to the development, design and construction of offsite alternative compliance projects, the following conditions must be met:

[a] The offsite alternative compliance projects must allow the Priority Development Project to comply with the onsite BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2);

[b] The offsite alternative compliance projects must be constructed as soon as possible, but no later than 4 years after the certificate of occupancy is granted for the first Priority Development Project that contributed funds toward the construction of the offsite alternative compliance projects, unless a longer period of time is authorized by the San Diego Water Board Executive Officer;

[c] The in-lieu fee for the Priority Development Project must include mitigation of the pollutant loads and increased storm water flow rates and durations that are allowed to discharge from the site before the offsite alternative compliance projects are constructed; and

[d] The in-lieu fee must also include the cost to operate and maintain the offsite alternative compliance projects.

(iii) If the in-lieu fee is applied to the operation and maintenance of offsite alternative compliance projects that have already been constructed, the offsite alternative compliance projects must allow the Priority Development Project to comply with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2).

(d) Alternative Compliance Water Quality Credit System Option

The Copermittee may develop and implement an alternative compliance water quality credit system option, individually or with other Copermittees and/or entities, provided that such a credit system clearly exhibits that it will not allow discharges from Priority Development Projects to cause or contribute to a net impact over and above the impact caused by projects meeting the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2). Any credit system that a Copermittee chooses to implement must be submitted to the San Diego Water Board Executive Officer for review and acceptance as part of the Water Quality Improvement Plan.

(4) Long-Term Structural BMP Maintenance

Each Copermittee must require the project applicant to submit proof of the mechanism under which ongoing long-term maintenance of all structural BMPs will be conducted.

(5) Infiltration and Groundwater Protection

(a) Structural BMPs designed to primarily function as large, centralized infiltration devices (such as large infiltration trenches and infiltration basins) must not cause or contribute to an exceedance of an applicable groundwater quality objective. At a minimum, such infiltration BMPs must be in conformance with the design criteria listed below, unless the development project applicant demonstrates to the Copermittee that one

or more of the specific design criteria listed below are not necessary to protect groundwater quality. The design criteria listed below do not apply to small infiltration systems dispersed throughout a development project.

(i) Runoff must undergo pretreatment such as sedimentation or filtration prior to infiltration;

(ii) Pollution prevention and source control BMPs must be implemented at a level appropriate to protect groundwater quality at sites where infiltration BMPs are to be used;

(iii) Infiltration BMPs must be adequately maintained to remove pollutants in storm water to the MEP;

(iv) The vertical distance from the base of any infiltration BMP to the seasonal high groundwater mark must be at least 10 feet. Where groundwater basins do not support beneficial uses, this vertical distance criteria may be reduced, provided groundwater quality is maintained;

(v) The soil through which infiltration is to occur must have physical and chemical characteristics (e.g., appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses;

(vi) Infiltration BMPs must not be used for areas of industrial or light industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee, unless first treated or filtered to remove pollutants prior to infiltration; and

(vii) Infiltration BMPs must be located a minimum of 100 feet horizontally from any water supply wells.

(b) The Copermittee may develop, individually or with other Copermittees, alternative mandatory design criteria to that listed above for infiltration BMPs which are designed to primarily function as centralized infiltration devices. Before implementing the alternative design criteria in the development planning process the Copermitee(s) must:

(i) Notify the San Diego Water Board of the intent to implement the alternative design criteria submitted; and

(ii) Comply with any conditions set by the San Diego Water Board.

d. BMP DESIGN MANUAL UPDATE

Each Copermittee must update its BMP Design Manual[28] pursuant to Provision F.2.b. Until the Copermittee has updated its BMP Design Manual with the

[28] The BMP Design Manual was formerly known as the Standard Storm Water Mitigation Plan under Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016.

requirements of Provisions E.3.a-c, the Copermittee must continue implementing its current BMP Design Manual. Unless directed otherwise by the San Diego Water Board, the Copermittee must implement the BMP Design Manual within 180 days of completing the update. The update of the BMP Design Manual must include the following:

(1) Updated procedures to determine the nature and extent of storm water requirements applicable to a potential development or redevelopment projects. These procedures must inform project applicants of the storm water management requirements applicable to their project including, but not limited to, general requirements for all development projects, structural BMP design procedures and requirements, hydromodification management requirements, requirements specific to phased projects, and procedures specific to private developments and public improvement projects;

(2) Updated procedures to identify pollutants and conditions of concern for selecting the most appropriate structural BMPs that consider, at a minimum, the following:

(a) Receiving water quality (including pollutants for which receiving waters are listed as impaired under the CWA section 303(d) List);

(b) Pollutants, stressors, and/or receiving water conditions that cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(c) Land use type of the project and pollutants associated with that land use type; and

(d) Pollutants expected to be present onsite.

(3) Updated procedures for designing structural BMPs, including any updated performance requirements to be consistent with the requirements of Provision E.3.c for all structural BMPs listed in the BMP Design Manual;

(4) Long-term maintenance criteria for each structural BMP listed in the BMP Design Manual; and

(5) Alternative compliance criteria, in accordance with the requirements under Provision E.3.c.(3), if the Copermittee elects to allow Priority Development Projects within its jurisdiction to utilize alternative compliance.

e. PRIORITY DEVELOPMENT PROJECT BMP IMPLEMENTATION AND OVERSIGHT

Each Copermittee must implement a program that requires and confirms structural BMPs on all Priority Development Projects are designed, constructed, and maintained to remove pollutants in storm water to the MEP.

(1) Structural BMP Approval and Verification Process

(a) Each Copermittee must require and confirm that for all Priority Development Project applications that have not received prior lawful approval by the Copermittee by 18 months after the commencement of coverage under this Order, the requirements of Provision E.3 are implemented. For project applications that have received prior lawful approval by 18 months after the commencement of coverage under this Order, the Copermittee may allow previous land development requirements to apply.

(b) Each Copermittee must identify the roles and responsibilities of various municipal departments in implementing the structural BMP requirements, including each stage of a project from application review and approval through BMP maintenance and inspections.

(c) Each Copermittee must require and confirm that appropriate easements and ownerships are properly recorded in public records and the information is conveyed to all appropriate parties when there is a change in project or site ownership.

(d) Each Copermittee must require and confirm that prior to occupancy and/or intended use of any portion of the Priority Development Project, each structural BMP is inspected to verify that it has been constructed and is operating in compliance with all of its specifications, plans, permits, ordinances, and the requirements of this Order.

(2) Priority Development Project Inventory and Prioritization

(a) Each Copermittee must develop, maintain, and update at least annually, a watershed-based database to track and inventory all Priority Development Projects and associated structural BMPs within its jurisdiction. Inventories must be accurate and complete beginning from January 2002 for the San Diego County Copermittees, February 2003 for the Orange County Copermittees, and July 2005 for the Riverside County Copermittees. The use of an automated database system, such as GIS, is highly recommended. The database must include, at a minimum, the following information:

(i) Priority Development Project location (address and hydrologic subarea);

(ii) Descriptions of structural BMP type(s);

(iii) Date(s) of construction;

(iv) Party responsible for structural BMP maintenance;

(v) Dates and findings of structural BMP maintenance verifications; and

(vi) Corrective actions and/or resolutions.

(b) Each Copermittee must prioritize the Priority Development Projects with structural BMPs within its jurisdiction. The designation of Priority Development Projects as high priority must consider the following:

(i) The highest water quality priorities identified in the Water Quality Improvement Plan;

(ii) Receiving water quality;

(iii) Number and sizes of structural BMPs;

(iv) Recommended maintenance frequency of structural BMPs;

(v) Likelihood of operation and maintenance issues of structural BMPs;

(vi) Land use and expected pollutants generated; and

(vii) Compliance record.

(3) Structural BMP Maintenance Verifications and Inspections

Each Copermittee is required to verify that structural BMPs on each Priority Development Project are adequately maintained, and continue to operate effectively to remove pollutants in storm water to the MEP through inspections, self-certifications, surveys, or other equally effective approaches.

(a) All (100 percent) of the structural BMPs at Priority Development Projects that are designated as high priority must be inspected directly by the Copermittee annually prior to each rainy season;

(b) For verifications performed through a means other than direct Copermittee inspection, adequate documentation must be required by the Copermittee to provide assurance that the required maintenance of structural BMPs at each Priority Development Project has been completed; and

(c) Appropriate follow-up measures (including re-inspections, enforcement, etc.) must be conducted to ensure that structural BMPs at each Priority Development Project continue to reduce pollutants in storm water to the MEP as originally designed.

f. DEVELOPMENT PROJECT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all development projects, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

g. Strategies to Address the Highest Priority Water Quality Conditions

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the development planning program to address development and redevelopment projects that may become sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, increase frequency of verifications and/or inspections, alternative compliance options);

(2) Each Copermittee must identify areas within its jurisdiction where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting and/or stream, channel, or habitat rehabilitation projects;

(3) Each Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify regional alternative compliance projects that Priority Development Projects may be allowed or should be encouraged to implement or participate in implementing; and

(4) The strategies and/or activities must be consistent with the requirements of Provisions E.3.a-c and E.3.e-f and the strategies identified in the Water Quality Improvement Plan.

4. Construction Management

Each Copermittee must implement a construction management program in accordance with the strategies identified in the Water Quality Improvement Plan and includes, at a minimum, the following requirements:

a. Project Approval Process

Prior to issuance of any local permit(s) that allows the commencement of construction projects that involve ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff, each Copermittee must:

(1) Require a site-specific pollution control, construction BMP, and/or erosion and sediment control plan, to be submitted by the project applicant to the Copermittee;

(2) Confirm the pollution control, construction BMP, and/or erosion and sediment control plan, complies with the local grading ordinance, other applicable local ordinances, and the requirements of this Order;

(3) Confirm the pollution control, construction BMP, and/or erosion and sediment control plan, includes seasonally appropriate and effective BMPs and management measures described in Provision E.4.c, as applicable to the project; and

(4) Verify that the project applicant has obtained coverage under applicable permits, including, but not limited to the Construction General Permit, Clean Water Act Section 401 Water Quality Certification and Section 404 Permit, and California Department of Fish and Game Streambed Alteration Agreement.

b. CONSTRUCTION SITE INVENTORY AND TRACKING

(1) Each Copermittee must maintain, and update at least monthly, a watershed-based inventory of all construction projects issued a local permit that allows ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff. The use of an automated database system, such as GIS, is highly recommended. The inventory must include:

(a) Relevant contact information for each site (e.g., name, address, phone, and email for the owner and contractor);

(b) The basic site information including location (address and hydrologic subarea), Waste Discharge Identification (WDID) number (if applicable), size of the site, and approximate area of disturbance;

(c) Whether or not the site is considered a high threat to water quality, as defined in Provision E.4.b.(2) below;

(d) The project start and anticipated completion dates;

(e) Current construction phase;

(f) The required inspection frequency, as defined in the Copermittee's jurisdictional runoff management program document;

(g) The date the Copermittee accepted and/or approved the site-specific pollution control, construction BMP, and/or erosion and sediment control plan; and

(h) Whether or not there are ongoing enforcement actions administered to the site.

(2) Each Copermittee must identify all construction sites within its jurisdiction that represent a high threat to downstream surface water quality. The designation of construction sites as high threat to water quality must consider the following:

(a) Sites located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Sites located within the same hydrologic subarea and tributary to a water body segment listed as impaired for sediment on the CWA section 303(d) List;

(c) Sites located within, directly adjacent to, or discharging directly to a receiving water within an ESA; and

(d) Other sites determined by the Copermittees or the San Diego Water Board as a high threat to water quality.

c. CONSTRUCTION SITE BMP IMPLEMENTATION

Each Copermittee must implement, or require the implementation of effective BMPs to reduce discharges of pollutants in storm water from construction sites to the MEP, and prevent non-storm water discharges from construction sites into the MS4. These BMPs must be site specific, seasonally appropriate, and construction phase appropriate. BMPs must be implemented at each construction site year round. Dry season BMP implementation must plan for and address unseasonal rain events that may occur during the dry season (May 1 through September 30). Copermittees must implement, or require the implementation of, BMPs in the following categories:

(1) Project Planning;

(2) Good Site Management "Housekeeping", including waste management;

(3) Non-storm Water Management;

(4) Erosion Control;

(5) Sediment Control;

(6) Run-on and Run-off Control; and

(7) Active/Passive Sediment Treatment Systems, where applicable.

d. CONSTRUCTION SITE INSPECTIONS

Each Copermittee must conduct construction site inspections to require and confirm compliance with its local permits and applicable local ordinances, and the requirements of this Order. Priority for site inspections must consider threat to water quality pursuant to Provision E.4.b as well as the nature of the construction activity, topography, and the characteristics of soils and receiving water quality.

(1) Inspection Frequency

(a) Each Copermittee must conduct inspections at all inventoried sites, including high threat to water quality sites, at an appropriate frequency for each phase of construction to ensure the site reduces the discharge of pollutants in storm water from construction sites to the MEP, and prevents non-storm water discharges from entering the MS4.

(b) Each Copermittee must establish appropriate inspection frequencies for high threat to water quality sites, and all other sites, for each phase of construction. Inspection frequencies appropriate for addressing the highest water quality priorities identified in the Water Quality Improvement Plan, and for complying with the requirements of this Order must be identified in each Copermittee's jurisdictional runoff management program document.

(c) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e., re-inspection, enforcement) necessary to require and confirm site compliance with its local permits and applicable local ordinances, and the requirements of this Order.

(2) Inspection Content

Inspections of construction sites by the Copermittee must include, at a minimum:

(a) Verification of coverage under the Construction General Permit (Notice of Intent (NOI) and/or WDID number) during initial inspections, when applicable;

(b) Assessment of compliance with its local permits and applicable local ordinances related to pollution prevention, including the implementation and maintenance of applicable BMPs;

(c) Assessment of BMP adequacy and effectiveness;

(d) Visual observations of actual non-storm water discharges;

(e) Visual observations of actual or potential discharge of sediment and/or construction related materials from the site;

(f) Visual observations of actual or potential illicit connections; and

(g) If any violations are found and BMP corrections are needed, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried construction sites. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Site name, location (address and hydrologic subarea), and WDID number (if applicable);

(b) Inspection date;

(c) Approximate amount of rainfall since last inspection;

(d) Description of problems observed with BMPs and indication of need for BMP addition/repair/replacement and any scheduled re-inspection, and date of re-inspection;

(e) Descriptions of any other specific inspection comments which must, at a minimum, include rationales for longer compliance time;

(f) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(g) Resolution of problems noted and date problems fixed.

e. CONSTRUCTION SITE ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried construction sites, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

f. STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the construction management program to address construction sites that the Copermittee has identified as potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, and/or increase/decrease frequency of inspections for specific types of sites and/or activities); and

(2) The strategies and/or activities must be consistent with the requirements of Provisions E.4.c-e and the strategies identified in the Water Quality Improvement Plan.

5. Existing Development Management

Each Copermittee must implement an existing development management program in accordance with the strategies identified in the Water Quality Improvement Plan and includes, at a minimum, the following requirements:

a. EXISTING DEVELOPMENT INVENTORY AND TRACKING

Each Copermittee must maintain, and update at least annually, a watershed-based inventory of the existing development within its jurisdiction that may discharge a pollutant load to and from the MS4. The use of an automated database system, such as GIS, is highly recommended. The inventory must, at a minimum, include:

(1) Name, location (hydrological subarea and address, if applicable) of the following types of existing development with its jurisdiction:

(a) Commercial facilities or areas;

(b) Industrial facilities;

(c) Municipal facilities, including:

(i) MS4 and related structures,[29]

(ii) Roads, streets, and highways,

(iii) Parking facilities,

(iv) Municipal airfields,

(v) Parks and recreation facilities,

(vi) Flood management and flood control devices and structures,

(vii) Operating or closed municipal landfills,

(viii) Publicly owned treatment works (including water and wastewater treatment plants) and sanitary sewer collection systems,

(ix) Corporate yards, including maintenance and storage yards for materials, waste, equipment, and vehicles,

(x) Hazardous waste collection facilities,

[29] The inventory may refer to the MS4 map required to be maintained pursuant to Provision E.2.b.(1).

(xi) Other treatment, storage or disposal facilities for municipal waste, and

(xii) Other municipal facilities that the Copermittee determines may contribute a significant pollutant load to the MS4; and

(d) Residential areas, which may be designated by one or more of the following:

(i) Residential management area,

(ii) Drainage basin or area,

(iii) Land use (e.g., single family, multi-family, rural),

(iv) Neighborhood,

(v) Common Interest Area,

(vi) Home Owner Association,

(vii) Mobile home park, and/or

(viii) Other designations accepted by the San Diego Water Board Executive Officer.

(2) A description of the facility or area, including the following information:

(a) Classification as commercial, industrial, municipal, or residential;

(b) Status of facility or area as active or inactive;

(c) Identification if a business is a mobile business;

(d) SIC Code or NAICS Code, if applicable;

(e) Industrial General Permit NOI and/or WDID number, if applicable;

(f) Identification if a residential area is or includes a Common Interest Area / Home Owner Association, or mobile home park;

(g) Identification of pollutants generated and potentially generated by the facility or area;

(h) Whether the facility or area is adjacent to an ESA;

(i) Whether the facility or area is tributary to and within the same hydrologic subarea as a water body segment listed as impaired on the CWA section 303(d) List and generates pollutants for which the water body segment is impaired; and

(j) Whether the facility or area contributes or potentially contributes to the highest priority water quality conditions identified in the Water Quality Improvement Plan.

(3) An annually updated map showing the location of inventoried existing development, watershed boundaries, and water bodies.

b. EXISTING DEVELOPMENT BMP IMPLEMENTATION AND MAINTENANCE

Each Copermittee must designate a minimum set of BMPs required for all inventoried existing development, including special event venues. The designated minimum BMPs must be specific to facility or area types and pollutant generating activities, as appropriate.

(1) Commercial, Industrial, and Municipal Facilities and Areas

(a) Pollution Prevention

Each Copermittee must require the use of pollution prevention methods by the commercial, industrial, and municipal facilities and areas in its inventoried existing development.

(b) BMP Implementation

Each Copermittee must implement, or require the implementation of, designated BMPs at commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development.

(c) BMP Operation and Maintenance

(i) Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development.

(ii) Each Copermittee must implement a schedule of operation and maintenance activities for its MS4 and related structures (including but not limited to catch basins, storm drain inlets, detention basins, etc.), and verify proper operation of all its municipal structural treatment controls designed to reduce pollutants (including floatables) in storm water discharges to or from its MS4s and related drainage structures. Operation and maintenance activities may include, but is not limited to, the following:

[a] Inspections of the MS4 and related structures;
[b] Cleaning of the MS4 and related structures; and
[c] Proper disposal of materials removed from cleaning of the MS4 and related structures.

(iii) Each Copermittee must implement a schedule of operation and maintenance for public streets, unpaved roads, paved roads, and paved highways and freeways within its jurisdiction to minimize pollutants that can be discharged in storm water.

(iv) Each Copermittee must implement controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers. Copermittees that operate both a municipal sanitary sewer system and a MS4 must implement controls and measures to prevent and eliminate seeping sewage from infiltrating the MS4. Copermittees that do not operate both a municipal sanitary sewer system and a MS4 must coordinate with sewering agencies to keep themselves informed of relevant and appropriate maintenance activities and sanitary sewage projects in their jurisdiction that may cause or contribute to seepage of sewage into the MS4.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must implement BMPs, or require the implementation of BMPs, to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development. Such BMPs must include, as appropriate, educational activities, permits, certifications and other measures for applicators and distributors.

(2) <u>Residential Areas</u>

(a) Pollution Prevention

Each Copermittee must promote and encourage the use of pollution prevention methods, where appropriate, by the residential areas in its inventoried existing development.

(b) BMP Implementation

Each Copermittee must promote and encourage the implementation of designated BMPs at residential areas in its inventoried existing development.

(c) BMP Operation and Maintenance

Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at residential areas in its inventoried existing development.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must promote and encourage the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from residential areas in its inventoried existing development.

c. EXISTING DEVELOPMENT INSPECTIONS

Each Copermittee must conduct inspections of inventoried existing development to ensure compliance with applicable local ordinances and permits, and the requirements of this Order.

(1) Inspection Frequency

(a) Each Copermittee must establish appropriate inspection frequencies for inventoried existing development in accordance with the following requirements:

(i) At a minimum, inventoried existing development must be inspected once every five years utilizing one or more of the following methods:

[a] Drive-by inspections by Copermittee municipal and contract staff,
[b] Onsite inspections by Copermittee municipal and contract staff, and/or
[c] Inspections by volunteer monitoring or patrol programs trained by the Copermittee;

(ii) The frequency of inspections must be appropriate to confirm that BMPs are being implemented to reduce the discharge of pollutants in storm water from the MS4 to the MEP and effectively prohibit non-storm water discharges to the MS4;

(iii) The frequency of inspections must be based on the potential for a facility or area to discharge non-storm water and pollutants in storm water, and should reflect the priorities set forth in the Water Quality Improvement Plan;

(iv) Each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development;[30] and

(v) Inventoried existing development must be inspected by the Copermittee, as needed, in response to valid public complaints and

[30] If any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspection may count toward the total annual inspection requirement. This requirement excludes linear municipal facilities (i.e., MS4, streets, roads and highways).

findings from the Copermittee's municipal and contract staff or volunteer monitoring or patrol program inspections.

(b) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e. education and outreach, re-inspection, enforcement) necessary to require and confirm compliance with its applicable local ordinances and permits and the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

(2) Inspection Content

(a) Inspections of existing development by the Copermittee or volunteer monitoring or patrol programs must include, at a minimum:

(i) Visual inspections for actual non-storm water discharges;

(ii) Visual inspections for actual or potential discharge of pollutants;

(iii) Visual inspections for actual or potential illicit connections; and

(iv) Verification that the description of the facility or area in the inventory, required pursuant to Provision E.5.a.(2), has not changed.

(b) Onsite inspections of existing development by the Copermittee must include, at a minimum:

(i) Assessment of compliance with its applicable local ordinances and permits related to non-storm water and storm water discharges and runoff;

(ii) Assessment of the implementation of the designated BMPs;

(iii) Verification of coverage under the Industrial General Permit, when applicable; and

(iv) If any problems or violations are found, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried existing development. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Name and location of facility or area (address and hydrologic subarea) consistent with the inventory name and location, pursuant to Provision E.5.a.(1);

(b) Inspection and re-inspection date(s);

(c) Inspection method(s) (i.e. drive-by, onsite);

(d) Observations and findings from the inspection(s);

(e) For onsite inspections of existing development by Copermittee municipal or contract staff, the records must also include, as applicable:

(i) Description of any problems or violations found during the inspection(s),

(ii) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6, and

(iii) The date problems or violations were resolved.

d. EXISTING DEVELOPMENT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried existing development, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

e. STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Each Copermittee must implement the water quality improvement strategies, where necessary, to address areas of existing development within its jurisdiction that are identified as sources of pollutants and/or stressors contributing to the highest priority water quality conditions in the Watershed Management Area. For the existing development management program, the following strategies must be implemented:

(1) Specific Existing Development Management Program Strategies

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented within its jurisdiction to address areas of existing development that the Copermittee has identified as sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(a) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, and/or increase/decrease frequency of inspections for specific types of facilities, areas and/or activities);

(b) The facilities and/or areas within the Copermittee's jurisdiction where the strategies and/or activities will be implemented; and

(c) The strategies and/or activities must be consistent with the requirements of Provisions E.5.b-d and the strategies identified in the Water Quality Improvement Plan.

(2) Retrofitting Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to retrofit areas of existing development within its jurisdiction to address identified sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify areas of existing development as candidates for retrofitting, focusing on areas where retrofitting will address pollutants and/or stressors that contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for retrofitting projects may be utilized to reduce pollutants that may be discharged in storm water from areas of existing development, and/or address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of retrofitting projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting projects; and

(e) Where retrofitting projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional retrofitting projects (i.e. projects that can receive and/or treat storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment) adjacent to and/or downstream of the areas of existing development.

(3) Stream, Channel and/or Habitat Rehabilitation in Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to rehabilitate streams, channels, and/or habitats in areas of existing development within its jurisdiction to address the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify streams, channels, and/or habitats in areas of existing development as candidates for rehabilitation, focusing on areas where stream, channel, and/or habitat rehabilitation projects will address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for stream, channel, and/or habitat rehabilitation projects may be utilized to address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters, rehabilitate channelized or hydromodified streams, restore wetland and riparian habitat, restore watershed functions, and/or restore beneficial uses of receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of stream, channel, and/or habitat rehabilitation projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance stream, channel, and/or habitat rehabilitation projects; and

(e) Where stream, channel, and/or habitat rehabilitation projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional stream, channel, and/or habitat rehabilitation projects (i.e. projects that can receive storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment).

6. Enforcement Response Plans

Each Copermittee must develop and implement an Enforcement Response Plan as part of its jurisdictional runoff management program document. The Enforcement Response Plan must describe the applicable approaches and options to enforce its legal authority established pursuant to Provision E.1, as necessary, to achieve compliance with the requirements of this Order. The Enforcement Response Plan must include the following:

a. Enforcement Response Plan Components

The Enforcement Response Plan must include the following individual components:

(1) Illicit Discharge Detection and Elimination Enforcement Component;

(2) Development Planning Enforcement Component;

(3) Construction Management Enforcement Component; and

(4) Existing Development Enforcement Component.

b. Enforcement Response Approaches and Options

Each component of the Enforcement Response Plan must describe the enforcement response approaches that the Copermittee will implement to compel compliance with its statutes, ordinances, permits, contracts, orders, or similar means, and the requirements of this Order. The description must include the protocols for implementing progressively stricter enforcement responses. The enforcement response approaches must include appropriate sanctions to compel compliance, including, at a minimum, the following tools or their equivalent:

(1) Verbal and written notices of violation;

(2) Cleanup requirements;

(3) Fines;

(4) Bonding requirements;

(5) Administrative and criminal penalties;

(6) Liens;

(7) Stop work orders; and

(8) Permit and occupancy denials.

c. CORRECTION OF VIOLATIONS

(1) Violations must be corrected in a timely manner with the goal of correcting the violations within 30 calendar days after the violations are discovered, or prior to the next predicted rain event, whichever is sooner.

(2) If more than 30 calendar days are required to achieve compliance, then a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

d. ESCALATED ENFORCEMENT

(1) The Enforcement Response Plan must include a definition of "escalated enforcement." Escalated enforcement must include any enforcement scenario where a violation or other non-compliance is determined to cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan. Escalated enforcement may be defined differently for development planning, construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas.

(2) Where the Copermittee determines escalated enforcement is not required, a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

(3) Escalated enforcement actions must continue to increase in severity, as necessary, to compel compliance as soon as possible.

e. REPORTING OF NON-COMPLIANT SITES

(1) Each Copermittee must notify the San Diego Water Board in writing within 2 working days of issuing escalated enforcement (as defined in the Copermittee's Enforcement Response Plan) to a construction site that poses a significant threat to water quality as a result of violations or other non-compliance with its permits and applicable local ordinances, and the requirements of this Order. Written notification may be provided electronically by email.

(2) Each Copermittee must notify the San Diego Water Board of non-filers under the Industrial General Permit and Construction General Permit by email to Nonfilers_R9@waterboards.ca.gov.

7. Public Education and Participation

Each Copermittee must implement, individually or with other Copermittees, a public education and participation program in accordance with the strategies identified in the Water Quality Improvement Plan to promote and encourage the development of programs, management practices, and behaviors that reduce the discharge of pollutants in storm water to the MEP, prevent controllable non-storm water discharges from entering the MS4, and protect water quality standards in receiving waters.

a. PUBLIC EDUCATION

The public education program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) Educational activities, public information activities, and other appropriate outreach activities intended to reduce pollutants associated with the application of pesticides, herbicides and fertilizer and other pollutants of concern in storm water discharges to and from its MS4 to the MEP, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed to address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(2) Educational activities, public information activities, and other appropriate outreach activities to facilitate the proper management and disposal of used oil and toxic materials; and

(3) Appropriate education and training measures for specific target audiences, such as construction site operators, residents, underserved target audiences and school-aged children, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed, based on high risk behaviors and pollutants of concern.

b. PUBLIC PARTICIPATION

The public participation program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) A process for members of the public to participate in updating the highest priority water quality conditions, numeric goals, and water quality improvement strategies in the Water Quality Improvement Plan.

(2) Opportunities for members of the public to participate in providing the Copermittee recommendations for improving the effectiveness of the water quality improvement strategies implemented within its jurisdiction.

(3) Opportunities for members of the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or restoration and protection of the quality of receiving waters.

c. STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented within its jurisdiction, as applicable, to educate the public and encourage public participation to address potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) The target audiences and/or areas within the Copermittee's jurisdiction where the strategies and/or activities will be implemented;

(2) Provide specific details about how the strategies and/or activities will be implemented (e.g. educational topics, materials and/or activities, public outreach and participation programs and/or opportunities);

(3) Each Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify and implement regional public education and participation activities, programs and opportunities;

(4) Each Copermittee must incorporate a mechanism for evaluating and assessing educational and other public outreach activities, as needed, to identify progress and incorporate modifications necessary to increase the effectiveness of the public education and participation program.

8. Fiscal Analysis

a. Each Copermittee must secure the resources necessary to meet all the requirements of this Order.

b. Each Copermittee must conduct an annual fiscal analysis of its jurisdictional runoff management program in its entirety. The fiscal analysis must include the following:

(1) Identification of the various categories of expenditures necessary to implement the requirements of this Order, including a description of the specific capital, operation and maintenance, and other expenditure items to be accounted for in each category of expenditures;

(2) The staff resources needed and allocated to meet the requirements of this Order, including any development, implementation, and enforcement activities required;

(3) The estimated expenditures for Provisions E.8.b.(1) and E.8.b.(2) for the current fiscal year; and

(4) The source(s) of funds that are proposed to meet the necessary expenditures described in Provisions E.8.b.(1) and E.8.b.(2), including legal restrictions on the use of such funds, for the current fiscal year and next fiscal year.

c. Each Copermittee must submit a summary of the annual fiscal analysis with each Annual Report required pursuant to Provision F.3.b.

d. Each Copermittee must provide the documentation used to develop the summary of the annual fiscal analysis upon request by the San Diego Water Board.

F. REPORTING

The purpose of this provision is to determine and document compliance with the requirements set forth in this Order. The goal of reporting is to communicate to the San Diego Water Board and the people of the State of California the implementation status of each jurisdictional runoff management program and compliance with the requirements of this Order. This goal is to be accomplished through the submittal of specific deliverables to the San Diego Water Board by the Copermittees.

1. Water Quality Improvement Plans

The Copermittees for each Watershed Management Area must develop and submit the Water Quality Improvement Plan in accordance with the following requirements:

a. WATER QUALITY IMPROVEMENT PLAN DEVELOPMENT

Each Water Quality Improvement Plan must be developed in accordance with the following process:

(1) Priority Water Quality Conditions and Numeric Goals

(a) The Copermittees must implement a public participation process to solicit data and information to be utilized in the development and identification of the priority water quality conditions for the Watershed Management Area.

(b) The Copermittees are encouraged to involve the public and key stakeholders as early and often as possible during the development of the priority water quality conditions and numeric goals to be included in the Water Quality Improvement Plan.

(c) Within 6 months after the commencement of coverage under this Order, the Copermittees must develop and submit the Water Quality Improvement Plan requirements of Provision B.2 to the San Diego Water Board. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of 60 days.

(d) The Copermittees must revise the priority water quality conditions and numeric goals based on comments received and/or recommendations or direction from the San Diego Water Board Executive Officer.

(2) Water Quality Improvement Strategies and Schedules

(a) The Copermittees are encouraged to involve the public and key stakeholders as early and often as possible during the development of the water quality improvement strategies and schedules to be included in the Water Quality Improvement Plan.

(b) Within 9 months after the commencement of coverage under this Order, the Copermittees must develop and submit the Water Quality Improvement Plan requirements of Provision B.3 to the San Diego Water Board. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of 60 days.

(c) The Copermittees must revise the water quality improvement strategies and schedules based on comments received and/or recommendations or direction from the San Diego Water Board Executive Officer.

b. WATER QUALITY IMPROVEMENT PLAN SUBMITTAL

(1) Within 18 months after the commencement of coverage under this Order, the Copermittees for each Watershed Management Area must submit a complete Water Quality Improvement Plan in accordance with the requirements of Provision B to the San Diego Water Board. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of 30 days.

(2) Based on the comments received, the San Diego Water Board will determine whether to hold a public hearing or to limit public input to submittal of written comments. If no hearing is held the San Diego Water Board will notify the Copermittees within 6 months that the Water Quality Improvement Plan has been accepted as complete following its review and determination that the Water Quality Improvement Plan meets the requirements of this Order.

(3) The Copermittees must revise the Water Quality Improvement Plan based on comments received and/or recommendations or direction from the San Diego Water Board Executive Officer.

(4) The Water Quality Improvement Plan must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance by the San Diego Water Board.

2. Updates

a. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATES

Each Copermittee must update its jurisdictional runoff management program document in accordance with the following requirements:

(1) Each Copermittee is encouraged to involve the public and key stakeholders as early and often as possible to solicit recommendations for updates to its jurisdictional runoff management program document.

(2) Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E no later than 18 months after the commencement of coverage under this Order.

(3) Each Copermittee must submit updates to its jurisdictional runoff management program, with a rationale for the modifications, either in the Annual Report required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge required pursuant to Provision F.5.b.

(4) The Copermittee must revise the modifications as directed by the San Diego Water Board Executive Officer.

(5) Updated jurisdictional runoff management program documents must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of submitting the Annual Report.

b. BMP DESIGN MANUAL UPDATES

Each Copermittee must update its BMP Design Manual in accordance with the following requirements:

(1) Each Copermittee must update its BMP Design Manual to incorporate the requirements of Provisions E.3.a-d no later than 18 months after the commencement of coverage under this Order.

(2) Subsequent updates must be consistent with the requirements of Provisions E.3.a-d and must be submitted as part of the Annual Reports required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge required pursuant to Provision F.5.b.

(3) Updated BMP Design Manuals must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of completing the update.

c. WATER QUALITY IMPROVEMENT PLAN UPDATES

The Water Quality Improvement Plans must be updated in accordance with the following process:

(1) The Copermittees must implement a public participation process to solicit data and information to be utilized in updating the Water Quality Improvement Plan.

(2) The Copermittees are encouraged to involve the public and key stakeholders as early and often as possible during the updates to the Water Quality Improvement Plan.

(3) The Copermittees for each Watershed Management Area must submit requested updates to the Water Quality Improvement Plan, with the public input received and the rationale for the requested updates, either in the Annual Reports required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The requested updates are considered accepted by the San Diego Water Board if no response is provided to the Copermittee after 3 months of submitting the request.

(4) The Copermittees must revise the requested updates as directed by the San Diego Water Board Executive Officer.

(5) Updated Water Quality Improvement Plans must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance of the requested updates by the San Diego Water Board.

3. Progress Reporting

a. Progress Report Presentations

The Copermittees for each Watershed Management Area must appear before the San Diego Water Board, as requested by the San Diego Water Board, to provide progress reports on the implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs.

b. Annual Reports

(1) The Copermittees for each Watershed Management Area must submit an Annual Report for each reporting period no later than January 31 of the following year. The annual reporting period consists of two periods: 1) July 1 to June 30 of the following year for the jurisdictional runoff management programs, 2) October 1 to September 30 of the following year for the monitoring and assessment programs. The first Annual Report must be prepared for the reporting period beginning July 1 after commencement of coverage under this Order, and upon San Diego Water Board determination that the Water Quality Improvement Plan meets the requirements of this Order to June 30 in the following year for the jurisdictional runoff management programs, and September 30 in the following year for the monitoring and assessment programs. Annual Reports must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Each Annual Report must include the following:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, summarized and presented in tabular and graphical form;

(b) Progress of the special studies required pursuant to Provision D.3, and the results or findings when a special study, or each phase of a special study, is completed;

(c) The findings from the assessments required pursuant to Provision D.4;

(d) The progress of implementing the Water Quality Improvement Plan, including, but not limited to, the following:

(i) The progress toward achieving the interim and final numeric goals for the highest water quality priorities for the Watershed Management Area,

(ii) The water quality improvement strategies that were implemented and/or no longer implemented by each of the Copermittees during the reporting period and previous reporting periods, and are planned to be implemented during the next reporting period,

(iii) Proposed modifications to the water quality improvement strategies, with public input received and rationale for the proposed modifications,

(iv) Previously proposed modifications or updates incorporated into the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document and implemented by the Copermittees in the Watershed Management Area, and

(v) Proposed modifications or updates to the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document;

(e) A completed Jurisdictional Runoff Management Program Annual Report Form (Attachment D or accepted revision) for each Copermittee in the Watershed Management Area, certified by a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative.

(2) Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (Attachment D or accepted revision) no later than October 31 of each year until the first Annual Report is required to be submitted. Each Copermittee must submit the information on the Jurisdictional Runoff Management Program Annual Report Form specific to the area within its jurisdiction in each Watershed Management Area.

(3) Each Copermittee must provide any data or documentation utilized in developing the Annual Report upon request by the San Diego Water Board. Any monitoring data utilized in developing the Annual Report must be

uploaded to the California Environmental Data Exchange Network (CEDEN).[31] Any monitoring and assessment data utilized in developing the Annual Report must be provided on the Regional Clearinghouse required pursuant to Provision F.4.

c. Regional Monitoring and Assessment Report

(1) The Copermittees must submit a Regional Monitoring and Assessment Report no later than 180 days in advance of the expiration date of this Order. The Regional Monitoring and Assessment Report may be submitted as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The Copermittees must review the receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, and findings from the assessments required pursuant to Provision D.4, to assess the following:

(a) The beneficial uses of the receiving waters within the San Diego Region that are protected or must be restored;

(b) The progress toward restoring impacted beneficial uses in the receiving waters within the San Diego Region; and

(c) Pollutants or conditions of emerging concern that may impact beneficial uses in the receiving waters within the San Diego Region.

(2) The Regional Monitoring and Assessment Report must include recommendations for improving the implementation and assessment of the Water Quality Improvement Plans and jurisdictional runoff management programs.

(3) Each Copermittee must provide any data or documentation utilized in developing the Regional Monitoring and Assessment Report upon request by the San Diego Water Board. Any monitoring and assessment data utilized in developing the Regional Monitoring and Assessment Report must be provided on the Regional Clearinghouse required pursuant to Provision F.4.

[31] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

4. Regional Clearinghouse

The Copermittees must develop, update, and maintain an internet-based Regional Clearinghouse that is made available to the public no later than 18 months after the effective date of this Order.

a. The Copermittees, through the Regional Clearinghouse, must make the following documents and data available, organized by Watershed Management Area, which may be linked to other internet-based data portals and databases where the original documents are stored:

(1) Water Quality Improvement Plan for the Watershed Management Area, and all updated versions with date of update;

(2) Annual Reports for the Watershed Management Area;

(3) Jurisdictional Runoff Management Program document for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(4) BMP Design Manual for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(5) Reports from special studies (e.g. source identification, BMP effectiveness assessment) conducted in the Watershed Management Area;

(6) Monitoring data collected pursuant to Provision D for each Watershed Management Area must be uploaded to CEDEN,[32] with links to the uploaded data; and

(7) Available GIS data, layers, and/or shapefiles used to develop the maps generated and maintained by the Copermittees for the Water Quality Improvement Plans, Annual Reports, and jurisdictional runoff management program documents.

b. The Copermittees, through the Regional Clearinghouse, must make the following information and documents available:

(1) Contact information (point of contact, phone number, email address, and mailing address) for each Copermittee;

(2) Public hotline number for reporting non-storm water and illicit discharges for each Copermittee;

[32] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

(3) Email address for reporting non-storm water and illicit discharges for each Copermittee;

(4) Link to each Copermittee's website, if available, where the public may find additional information about the Copermittee's storm water management program and for requesting records for the implementation of its program;

(5) Information about opportunities for the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or restoration and protection of the quality of receiving waters; and

(6) Reports from regional monitoring programs in which the Copermittees participate (e.g. Southern California Monitoring Coalition, Southern California Coastal Water Research Project Bight Monitoring);

(7) Regional Monitoring and Assessment Reports; and

(8) Any other information, data, and documents the Copermittees determine as appropriate for making available to the public.

5. Report of Waste Discharge

a. The Orange County Copermittees and the Riverside County Copermittees are required to submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders. The San Diego Water Board will review and consider the Reports of Waste Discharge to determine whether modification to this Order, pursuant to the requirements of Provision H, will be required prior the Orange County Copermittees and/or Riverside County Copermittees becoming covered under this Order. The current Orders for the Orange County Copermittees and Riverside County Copermittees are rescinded upon notification of coverage under this Order except for enforcement purposes.

b. The Copermittees subject to the requirements of this Order must submit to the San Diego Water Board a complete Report of Waste Discharge as an application for the re-issuance of this Order and NPDES permit. The Report of Waste Discharge must be submitted no later than 180 days in advance of the expiration date of this Order. The Report of Waste Discharge must contain the following minimum information:

(1) Names and addresses of the Copermittees;

(2) Names and titles of the primary contacts of the Copermittees;

(3) Proposed changes to the Copermittees' Water Quality Improvement Plans and the supporting justification;

(4) Proposed changes to the Copermittees' jurisdictional runoff management programs and the supporting justification;

(5) Any other information necessary for the re-issuance of this Order;

(6) Any information to be included as part of the Report of Waste Discharge pursuant to the requirements of this Order; and

(7) Any other information required by federal regulations for NPDES permit reissuance.

6. Application for Early Coverage

a. The Orange County Copermittees, collectively, or Riverside County Copermittees, collectively, may apply for early coverage under this Order by submitting a Report of Waste Discharge Form 200, with a written request for early coverage under this Order.

b. The San Diego Water Board will review the application for early coverage. A notification of coverage under this Order will be issued to the Copermittees in the respective county by the San Diego Water Board upon completion of the early coverage application requirements. The effective coverage date will be specified in the notification of coverage. The Copermittees in the respective county are authorized to have MS4 discharges pursuant to the requirements of this Order starting on the effective coverage date specified in the notification of coverage. The existing Order for the respective county is rescinded upon the effective coverage date specified in the notification of coverage except for enforcement purposes.

7. Reporting Provisions

Each Copermittee must comply with all the reporting and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

G. PRINCIPAL WATERSHED COPERMITTEE RESPONSIBILITIES

1. The Copermittees within each Watershed Management Area must designate a Principal Watershed Copermittee and notify the San Diego Water Board of the name of the Principal Watershed Copermittee. An individual Copermittee should not be designated a Principal Watershed Copermittee for more than two Watershed Management Areas. The notification may be submitted with the Water Quality Improvement Plan required pursuant to Provision F.1 of this Order.

2. The Principal Watershed Copermittee is responsible for, at a minimum, the following:

a. Serving as liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues, and when necessary and appropriate, representing the Copermittees in the Watershed Management Area before the San Diego Water Board.

b. Facilitating the development of the Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order

c. Coordinating the submittal of the deliverables required by Provisions F.1, F.2, F.3.a, and F.3.b of this Order.

d. Coordinating and developing, with the other Principal Watershed Copermittees, the requirements of Provisions F.3.c, F.4, and F.5.b of this Order.

H. MODIFICATION OF PROGRAMS

1. Modifications of the Order may be initiated by the San Diego Water Board or by the Copermittees. Requests by Copermittees must be made to the San Diego Water Board.

2. Minor modifications to the Order may be made by the San Diego Water Board where the proposed modification complies with all the prohibitions and limitations, and other requirements of this Order.

3. Proposed modifications to the Order that are not minor require amendment of this Order in accordance with this Order's rules, policies, and procedures.

4. The San Diego Water Board may re-open and modify this Order at any time prior to its expiration, after opportunity for public comment and a public hearing, if the State Water Board determines that revisions are warranted to those provisions of the Order addressing compliance with water quality standards in the receiving water and/or those provisions of the Order establishing an iterative process for implementation of management practices to assure compliance with water quality standards in the receiving water.

I. STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

Each Copermittee must comply with all the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

ATTACHMENT A

DISCHARGE PROHIBITIONS AND SPECIAL PROTECTIONS

1. Basin Plan Waste Discharge Prohibitions

California Water Code Section 13243 provides that a Regional Water Board, in a water quality control plan, may specify certain conditions or areas where the discharge of waste or certain types of waste is not permitted. The following waste discharge prohibitions in the Water Quality Control Plan for the San Diego Basin (Basin Plan) are applicable to any person, as defined by Section 13050(c) of the California Water Code, who is a citizen, domiciliary, or political agency or entity of California whose activities in California could affect the quality of waters of the state within the boundaries of the San Diego Region.

1. The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in California Water Code Section 13050, is prohibited.

2. The discharge of waste to land, except as authorized by waste discharge requirements or the terms described in California Water Code Section 13264 is prohibited.

3. The discharge of pollutants or dredged or fill material to waters of the United States except as authorized by a National Pollutant Discharge Elimination System (NPDES) permit or a dredged or fill material permit (subject to the exemption described in California Water Code Section 13376) is prohibited.

4. Discharges of recycled water to lakes or reservoirs used for municipal water supply or to inland surface water tributaries thereto are prohibited, unless this San Diego Water Board issues a NPDES permit authorizing such a discharge; the proposed discharge has been approved by the State Department of Health Services (DHS) and the operating agency of the impacted reservoir; and the discharger has an approved fail-safe long-term disposal alternative.

5. The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the San Diego Water Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

6. The discharge of waste in a manner causing flow, ponding, or surfacing on lands not owned or under the control of the discharger is prohibited, unless the discharge is authorized by the San Diego Water Board.

7. The dumping, deposition, or discharge of waste directly into waters of the state, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the San Diego Water Board.

8. Any discharge to a storm water conveyance system that is not composed entirely of "*storm water*" is prohibited unless authorized by the San Diego Water Board. [The federal regulations, 40 CFR 122.26(b)(13), define storm water as storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from fire fighting activities.] [§122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

9. The unauthorized discharge of treated or untreated sewage to waters of the state or to a storm water conveyance system is prohibited.

10. The discharge of industrial wastes to conventional septic tank/subsurface disposal systems, except as authorized by the terms described in California Water Code Section 13264, is prohibited.

11. The discharge of radioactive wastes amenable to alternative methods of disposal into the waters of the state is prohibited.

12. The discharge of any radiological, chemical, or biological warfare agent into waters of the state is prohibited.

13. The discharge of waste into a natural or excavated site below historic water levels is prohibited unless the discharge is authorized by the San Diego Water Board.

14. The discharge of sand, silt, clay, or other earthen materials from any activity, including land grading and construction, in quantities which cause deleterious bottom deposits, turbidity or discoloration in waters of the state or which unreasonably affect, or threaten to affect, beneficial uses of such waters is prohibited.

15. The discharge of treated or untreated sewage from vessels to Mission Bay, Oceanside Harbor, Dana Point Harbor, or other small boat harbors is prohibited.

16. The discharge of untreated sewage from vessels to San Diego Bay is prohibited.

17. The discharge of treated sewage from vessels to portions of San Diego Bay that are less than 30 feet deep at mean lower low water (MLLW) is prohibited.

18. The discharge of treated sewage from vessels, which do not have a properly functioning US Coast Guard certified Type I or Type II marine sanitation device, to portions of San Diego Bay that are greater than 30 feet deep at mean lower low water (MLLW) is prohibited.

2. Attachment B to State Water Board Resolution 2012-0012

Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges

I. PROVISIONS FOR POINT SOURCE DISCHARGES OF STORM WATER AND NONPOINT SOURCE WASTE DISCHARGES

The following terms, prohibitions, and special conditions (hereafter collectively referred to as special conditions) are established as limitations on point source storm water and nonpoint source discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in Areas of Special Biological Significance (ASBS), as required for State Water Quality Protection Areas pursuant to California Public Resources Code Sections 36700(f) and 36710(f). These Special Protections are adopted by the State Water Board as part of the California Ocean Plan (Ocean Plan) General Exception.

The special conditions are organized by category of discharge. The State Water Resources Control Board (State Water Board) and Regional Water Quality Control Boards (Regional Water Boards) will determine categories and the means of regulation for those categories [e.g., Point Source Storm Water National Pollutant Discharge Elimination System (NPDES) or Nonpoint Source].

A. PERMITTED POINT SOURCE DISCHARGES OF STORM WATER

1. General Provisions for Permitted Point Source Discharges of Storm Water

   a. Existing storm water discharges into an ASBS are allowed only under the following conditions:

      (1) The discharges are authorized by an NPDES permit issued by the State Water Board or Regional Water Board;

      (2) The discharges comply with all of the applicable terms, prohibitions, and special conditions contained in these Special Protections; and

      (3) The discharges:

         (i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

         (ii) Are designed to prevent soil erosion;

         (iii) Occur only during wet weather;

         (iv) Are composed of only storm water runoff.

   b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

   c. The discharge of trash is prohibited.

d. Only discharges from existing storm water outfalls are allowed. Any proposed or new storm water runoff discharge shall be routed to existing storm water discharge outfalls and shall not result in any new contribution of waste to an ASBS (i.e., no additional pollutant loading). “Existing storm water outfalls” are those that were constructed or under construction prior to January 1, 2005. “New contribution of waste” is defined as any addition of waste beyond what would have occurred as of January 1, 2005. A change to an existing storm water outfall, in terms of re-location or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges are prohibited except as provided below:

(1) The term “non-storm water discharges” means any waste discharges from a municipal separate storm sewer system (MS4) or other NPDES permitted storm drain system to an ASBS that are not composed entirely of storm water.

(2) (i) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability or occur naturally:

(a) Discharges associated with emergency fire fighting operations.

(b) Foundation and footing drains.

(c) Water from crawl space or basement pumps.

(d) Hillside dewatering.

(e) Naturally occurring groundwater seepage via a storm drain.

(f) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(ii) An NPDES permitting authority may authorize non-storm water discharges to an MS4 with a direct discharge to an ASBS only to the extent the NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

2. Compliance Plans for Inclusion in Storm Water Management Plans (SWMP) and Storm Water Pollution Prevention Plans (SWPPP).

The discharger shall specifically address the prohibition of non-storm water runoff and the requirement to maintain natural water quality for storm water discharges to an ASBS in an ASBS Compliance Plan to be included in its SWMP or a SWPPP, as appropriate to permit type. If a statewide permit includes a SWMP, then the discharger shall prepare a stand-alone compliance plan for ASBS discharges. The ASBS Compliance Plan is subject to approval by the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (for permits issued by Regional Water Boards).

a. The Compliance Plan shall include a map of surface drainage of storm water runoff, showing areas of sheet runoff, prioritize discharges, and describe any structural Best Management Practices (BMPs) already employed and/or BMPs to be employed in the future. Priority discharges are those that pose the greatest water quality threat and which are identified to require installation of structural BMPs. The map shall also show the storm water conveyances in relation to other features such as service areas, sewage conveyances and treatment facilities, landslides, areas prone to erosion, and waste and hazardous material storage areas, if applicable. The SWMP or SWPPP shall also include a procedure for updating the map and plan when changes are made to the storm water conveyance facilities.

b. The ASBS Compliance Plan shall describe the measures by which all non-authorized non-storm water runoff (e.g., dry weather flows) has been eliminated, how these measures will be maintained over time, and how these measures are monitored and documented.

c. For Municipal Separate Storm Sewer System (MS4s), the ASBS Compliance Plan shall require minimum inspection frequencies as follows:

   (1) The minimum inspection frequency for construction sites shall be weekly during rainy season;

   (2) The minimum inspection frequency for industrial facilities shall be monthly during the rainy season;

   (3) The minimum inspection frequency for commercial facilities (e.g., restaurants) shall be twice during the rainy season; and

   (4) Storm water outfall drains equal to or greater than 18 inches (457 mm) in diameter or width shall be inspected once prior to the beginning of the rainy season and once during the rainy season and maintained to remove trash and other anthropogenic debris.

d. The ASBS Compliance Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff, that are necessary to comply with these special conditions, will be achieved through BMPs. Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that such installation would pose a threat to health or safety. BMPs to control storm water runoff discharges (at the end-of-pipe) during a design storm shall be designed to achieve on average the following target levels:

   (1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

   (2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges. The baseline for the reduction is the effective date of the Exception. The baseline for these determinations is the effective date of the Exception, and the

reductions must be achieved and documented within four (4) years of the effective date.

e. The ASBS Compliance Plan shall address erosion control and the prevention of anthropogenic sedimentation in ASBS. The natural habitat conditions in the ASBS shall not be altered as a result of anthropogenic sedimentation.

f. The ASBS Compliance Plan shall describe the non-structural BMPs currently employed and planned in the future (including those for construction activities), and include an implementation schedule. The ASBS Compliance Plan shall include non-structural BMPs that address public education and outreach. Education and outreach efforts must adequately inform the public that direct discharges of pollutants from private property not entering an MS4 are prohibited. The ASBS Compliance Plan shall also describe the structural BMPs, including any low impact development (LID) measures, currently employed and planned for higher threat discharges and include an implementation schedule. To control storm water runoff discharges (at the end-of-pipe) during a design storm, permittees must first consider using LID practices to infiltrate, use, or evapotranspirate storm water runoff on-site.

g. The BMPs and implementation schedule shall be designed to ensure that natural water quality conditions in the receiving water are achieved and maintained by either reducing flows from impervious surfaces or reducing pollutant loading, or some combination thereof.

h. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents in storm water runoff that alter natural ocean water quality and the sources of these constituents.

(2) The report shall describe BMPs that are currently being implemented, BMPs that are identified in the SWMP or SWPPP for future implementation, and any additional BMPs that may be added to the SWMP or SWPPP to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the BMPs.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits), the discharger shall revise its ASBS Compliance Plan to incorporate any new or modified BMPs that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised SWMP or SWPPP, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural ocean water quality conditions due to the same constituent.

(5) Compliance with this section does not excuse violations of any term, prohibition, or condition contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within one year from the effective date of the Exception, the discharger shall submit a written ASBS Compliance Plan to the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that describes its strategy to comply with these special conditions, including the requirement to maintain natural water quality in the affected ASBS. The ASBS Compliance Plan shall include a time schedule to implement appropriate non-structural and structural controls (implementation schedule) to comply with these special conditions for inclusion in the discharger's SWMP or SWPPP, as appropriate to permit type.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these special conditions shall be implemented.

d. Within four (4) years of the effective date of the Exception, any structural controls identified in the ASBS Compliance Plan that are necessary to comply with these special conditions shall be operational.

e. Within four (4) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water, pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data, and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

   If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

   The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

(1) for municipalities, a demonstration of significant hardship to discharger ratepayers, by showing the relationship of storm water fees to annual household income for residents within the discharger's jurisdictional area, and the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or
(2) for other governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process.

B. NONPOINT SOURCE DISCHARGES

[NOT INCLUDED]
[PROVISIONS FOR NONPOINT SOURCE DISCHARGES NOT APPLICABLE]

II. ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES

[NOT INCLUDED]
[ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES NOT APPLICABLE]

III. ADDITIONAL REQUIREMENTS – WATERFRONT AND MARINE OPERATIONS

[NOT INCLUDED]
[ADDITIONAL REQUIREMENTS FOR WATERFRONT AND MARINE OPERATIONS NOT APPLICABLE]

IV. MONITORING REQUIREMENTS

Monitoring is mandatory for all dischargers to assure compliance with the Ocean Plan. Monitoring requirements include both: (A) core discharge monitoring, and (B) ocean receiving water monitoring. The State and Regional Water Boards must approve sampling site locations and any adjustments to the monitoring programs. All ocean receiving water and reference area monitoring must be comparable with the Water Boards' Surface Water Ambient Monitoring Program (SWAMP).

Safety concerns: Sample locations and sampling periods must be determined considering safety issues. Sampling may be postponed upon notification to the State and Regional Water Boards if hazardous conditions prevail.

Analytical Chemistry Methods: All constituents must be analyzed using the lowest minimum detection limits comparable to the Ocean Plan water quality objectives. For metal analysis, all samples, including storm water effluent, reference samples, and ocean receiving water samples, must be analyzed by the approved analytical method with the lowest minimum detection limits (currently Inductively Coupled Plasma/Mass Spectrometry) described in the Ocean Plan.

A. CORE DISCHARGE MONITORING PROGRAM

1. General sampling requirements for timing and storm size:

   Runoff must be collected during a storm event that is greater than 0.1 inch and generates runoff, and at least 72 hours from the previously measurable storm event. Runoff samples shall be collected when post-storm receiving water is sampled, and analyzed for the same constituents as receiving water and reference site samples (see section IV B) as described below.

2. Runoff flow measurements

   a. For municipal/industrial storm water outfalls in existence as of December 31, 2007, 18 inches (457mm) or greater in diameter/width (including multiple outfall pipes in combination having a width of 18 inches, runoff flows must be measured or calculated, using a method acceptable to and approved by the State and Regional Water Boards.
   b. This will be reported annually for each precipitation season to the State and Regional Water Boards.

3. Runoff samples – storm events

   a. For outfalls equal to or greater than 18 inches (0.46m) in diameter or width:

      (1) samples of storm water runoff shall be analyzed during the same storm as receiving water samples for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination, ; and

      (2) samples of storm water runoff shall be analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS

      (3) If an applicant has no outfall greater than 36 inches, then storm water runoff from the applicant's largest outfall shall be further analyzed during the same storm as receiving water samples for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates).

   b. For outfalls equal to or greater than 36 inches (0.91m) in diameter or width:

      (1) samples of storm water runoff shall be analyzed during the same storm as receiving water samples for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

      (2) samples of storm water runoff shall be further analyzed during the same storm as receiving water samples for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates) and

(3) samples of storm water runoff shall be analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

c. For an applicant not participating in a regional monitoring program [see below in Section IV (B)] in addition to (a.) and (b.) above, a minimum of the two largest outfalls or 20 percent of the larger outfalls, whichever is greater, shall be sampled (flow weighted composite samples) at least three times annually during wet weather (storm event) and analyzed for all Ocean Plan Table A constituents, Table B constituents for marine aquatic life protection (except for toxicity, only chronic toxicity for three species shall be required), DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, and Ocean Plan indicator bacteria. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one (the largest) such discharge shall be sampled annually in each Region.

4. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may reduce or suspend core monitoring once the storm runoff is fully characterized. This determination may be made at any point after the discharge is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

B. OCEAN RECEIVING WATER AND REFERENCE AREA MONITORING PROGRAM

In addition to performing the Core Discharge Monitoring Program in Section II.A above, all applicants having authorized discharges must perform ocean receiving water monitoring. In order to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS, dischargers may choose either (1) an individual monitoring program, or (2) participation in a regional integrated monitoring program.

1. Individual Monitoring Program: The requirements listed below are for those dischargers who elect to perform an individual monitoring program to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within the affected ASBS. In addition to Core Discharge Monitoring, the following additional monitoring requirements shall be met:

   a. Three times annually, during wet weather (storm events), the receiving water at the point of discharge from the outfalls described in section (IV)(A)(3)(c) above shall be sampled and analyzed for Ocean Plan Table A constituents, Table B constituents for marine aquatic life, DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, salinity, chronic toxicity (three species), and Ocean Plan indicator bacteria.

      The sample location for the ocean receiving water shall be in the surf zone at the point of discharges; this must be at the same location where storm water runoff is sampled. Receiving water shall be sampled at approximately the same time prior to (pre-storm) and during (or immediately after) the same storm (post storm). Reference water quality shall also be sampled and analyzed for the same constituents pre-storm and post-storm, during the same storms when receiving water is sampled. Reference stations will be determined by the State Water Board's Division of Water Quality and the applicable Regional Water Board(s).

b. Sediment sampling shall occur at least three times during every five (5) year period. The subtidal sediment (sand or finer, if present) at the discharge shall be sampled and analyzed for Ocean Plan Table B constituents for marine aquatic life, DDT, PCBs, PAHs, pyrethroids, and OP pesticides. For sediment toxicity testing, only an acute toxicity test using the amphipod Eohaustorius estuarius must be performed.

c. A quantitative survey of intertidal benthic marine life shall be performed at the discharge and at a reference site. The survey shall be performed at least once every five (5) year period. The survey design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The results of the survey shall be completed and submitted to the State Water Board and Regional Water Board at least six months prior to the end of the permit cycle.

d. Once during each five (5) year period, a bioaccumulation study shall be conducted to determine the concentrations of metals and synthetic organic pollutants at representative discharge sites and at representative reference sites. The study design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The bioaccumulation study may include California mussels (Mytilus californianus) and/or sand crabs (Emerita analoga or Blepharipoda occidentalis). Based on the study results, the Regional Water Board and the State Water Board's Division of Water Quality, may adjust the study design in subsequent permits, or add or modify additional test organisms (such as shore crabs or fish), or modify the study design appropriate for the area and best available sensitive measures of contaminant exposure.

e. Marine Debris: Representative quantitative observations for trash by type and source shall be performed along the coast of the ASBS within the influence of the discharger's outfalls. The design, including locations and frequency, of the marine debris observations is subject to approval by the Regional Water Board and State Water Board's Division of Water Quality.

f. The monitoring requirements of the Individual Monitoring Program in this section are minimum requirements. After a minimum of one (1) year of continuous water quality monitoring of the discharges and ocean receiving waters, the Executive Director of the State Water Board (statewide permits) or Executive officer of the Regional Water Board (Regional Water Board permits) may require additional monitoring, or adjust, reduce or suspend receiving water and reference station monitoring. This determination may be made at any point after the discharge and receiving water is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

2. Regional Integrated Monitoring Program: Dischargers may elect to participate in a regional integrated monitoring program, in lieu of an individual monitoring program, to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS. This regional approach shall characterize natural water quality, pre- and post-storm, in ocean reference areas near the mouths of identified open space watersheds and the effects of the discharges on natural water quality (physical, chemical, and toxicity) in the ASBS receiving waters, and should include benthic marine aquatic life and bioaccumulation components. The design of the ASBS stratum of a regional integrated monitoring program may deviate from the otherwise prescribed individual monitoring approach (in Section IV.B.1) if approved by the State Water Board's Division of Water Quality and the Regional Water Boards.

a. Ocean reference areas shall be located at the drainages of flowing watersheds with minimal development (in no instance more than 10% development), and shall not be located in CWA Section 303(d) listed waterbodies or have tributaries that are 303(d) listed. Reference areas shall be free of wastewater discharges and anthropogenic non-storm water runoff. A minimum of low threat storm runoff discharges (e.g. stream highway overpasses and campgrounds) may be allowed on a case-by-case basis. Reference areas shall be located in the same region as the ASBS receiving water monitoring occurs. The reference areas for each Region are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean reference water samples must be collected from each station, each from a separate storm. A minimum of one reference location shall be sampled for each ASBS receiving water site sampled per responsible party. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

b. ASBS ocean receiving water must be sampled in the surf zone at the location where the runoff makes contact with ocean water (i.e. at "point zero"). Ocean receiving water stations must be representative of worst-case discharge conditions (i.e. co-located at a large drain greater than 36 inches, or if drains greater than 36 inches are not present in the ASBS then the largest drain greater than18 inches.) Ocean receiving water stations are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean receiving water samples must be collected during each storm season from each station, each from a separate storm. A minimum of one receiving water location shall be sampled in each ASBS per responsible party in that ASBS. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

c. Reference and receiving water sampling shall commence during the first full storm season following the adoption of these special conditions, and post-storm samples shall be collected when annual storm water runoff is sampled. Sampling shall occur in a minimum of two storm seasons. For those ASBS dischargers that have already participated in the Southern California Bight 2008 ASBS regional monitoring effort, sampling may be limited to only one storm season.

d. Receiving water and reference samples shall be analyzed for the same constituents as storm water runoff samples. At a minimum, constituents to be sampled and analyzed in reference and discharge receiving waters must include oil and grease, total suspended solids, Ocean Plan Table B metals for protection of marine life, Ocean Plan PAHs, pyrethroids, OP pesticides, ammonia, nitrate, phosphates, and critical life stage chronic toxicity for three species. In addition, within the range of the southern sea otter, indicator bacteria or some other measure of fecal contamination shall be analyzed.

3. Waterfront and Marine Operations: In addition to the above requirements for ocean receiving water monitoring, additional monitoring must be performed for marinas and boat launch and pier facilities:

a. For all marina or mooring field operators, in mooring fields with 10 or more occupied moorings, the ocean receiving water must be sampled for Ocean Plan indicator bacteria,

residual chlorine, copper, zinc, grease and oil, methylene blue active substances (MBAS), and ammonia nitrogen.

(1) For mooring field operators opting for an individual monitoring program (Section IV.B.1 above), this sampling must occur weekly (on the weekend) from May through October.

(2) For mooring field operators opting to participate in a regional integrated monitoring program (Section IV.B.2 above), this sampling must occur monthly from May through October on a high use weekend in each month. The Water Boards may allow a reduction in the frequency of sampling, through the regional monitoring program, after the first year of monitoring.

b. For all mooring field operators, the subtidal sediment (sand or finer, if present) within mooring fields and below piers shall be sampled and analyzed for Ocean Plan Table B metals (for marine aquatic life beneficial use), acute toxicity, PAHs, and tributyltin. For sediment toxicity testing, only an acute toxicity test using the amphipod Eohaustorius estuarius must be performed. This sampling shall occur at least three times during a five (5) year period. For mooring field operators opting to participate in a regional integrated monitoring program, the Water Boards may allow a reduction in the frequency of sampling after the first sampling effort's results are assessed.

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ATTACHMENT B

STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

1. Standard Permit Provisions

Code of Federal Regulations Title 40 Section 122.41 (40 CFR 122.41) includes conditions, or provisions, that apply to all National Pollutant Discharge Elimination System (NPDES) permits. Additional provisions applicable to NPDES permits are in 40 CFR 122.42. All applicable provisions in 40 CFR 122.41 and 40 CFR 122.42 must be incorporated into this Order and NPDES permit. The applicable 40 CFR 122.41 and 40 CFR 122.42 provisions are as follows:

a. DUTY TO COMPLY [40 CFR 122.41(a)]

The Copermittee must comply with all of the provisions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

(1) The Copermittee must comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement. [40 CFR 122.41(a)(1)]

(2) The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to a civil penalty not to exceed $25,000 per day for each violation. The CWA provides that any person who *negligently* violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than 2 years, or both. Any person who *knowingly* violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both. Any person who knowingly violates Section 301, 302, 303, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, and who knows at that time that he thereby places another person in imminent danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of

not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.
[40 CFR 122.41(a)(2)]

(3) Any person may be assessed an administrative penalty by the San Diego Regional Water Quality Control Board (San Diego Water Board), State Water Resources Control Board (State Water Board), or United States Environmental Protection Agency (USEPA) for violating Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.
[40 CFR 122.41(a)(3)]

b. DUTY TO REAPPLY [40 CFR 122.41(b)]

If a Copermittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Copermittee must apply for and obtain a new permit.

c. NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE [40 CFR 122.41(c)]

It shall not be a defense for a Copermittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

d. DUTY TO MITIGATE [40 CFR 122.41(d)]

The Copermittee must take all reasonable steps to minimize or prevent any discharge or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

e. PROPER OPERATION AND MAINTENANCE [40 CFR 122.41(e)]

The Copermittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Copermittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by a Copermittee only when the operation is necessary to achieve compliance with the conditions of this permit.

f. PERMIT ACTIONS [40 CFR 122.41(f)]

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Copermittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

g. PROPERTY RIGHTS [40 CFR 122.41(g)]

This permit does not convey any property rights of any sort, or any exclusive privilege.

h. DUTY TO PROVIDE INFORMATION [40 CFR 122.41(h)]

The Copermittee must furnish to the San Diego Water Board, State Water Board, or USEPA within a reasonable time, any information which the San Diego Water Board, State Water Board, or USPEA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Copermittee must also furnish to the San Diego Water Board, State Water Board, or USPEA upon request, copies of records required to be kept by this permit.

i. INSPECTION AND ENTRY [40 CFR 122.41(i)]

The Copermittee must allow the San Diego Water Board, State Water Board, USEPA, and/or their authorized representative (including an authorized contractor acting as their representative), upon presentation of credentials and other documents as may be required by law, to:

(1) Enter upon the Copermittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit; [40 CFR 122.41(i)(1)]

(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit; [40 CFR 122.41(i)(2)]

(3) Inspect and photograph at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; [40 CFR 122.41(i)(3)] and

(4) Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location. [40 CFR 122.41(i)(4)]

j. MONITORING AND RECORDS [40 CFR 122.41(j)]

(1) Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity. [40 CFR 122.41(j)(1)]

(2) Except for records of monitoring information required by this permit related to the Copermittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five (5) years (or longer as required by 40 CFR Part 503), the

Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time. [40 CFR 122.41(j)(2)]

(3) Records for monitoring information must include: [40 CFR 122.41(j)(3)]

(a) The date, exact place, and time of sampling or measurements; [40 CFR 122.41(j)(3)(i)]
(b) The individual(s) who performed the sampling or measurements; [40 CFR 122.41(j)(3)(ii)]
(c) The date(s) analyses were performed; [40 CFR 122.41(j)(3)(iii)]
(d) The individual(s) who performed the analyses; [40 CFR 122.41(j)(3)(iv)]
(e) The analytical techniques or methods used; [40 CFR 122.41(j)(3)(v)] and
(f) The results of such analyses. [40 CFR 122.41(j)(3)(vi)]

(4) Monitoring must be conducted according to test procedures under 40 CFR Part 136 unless another method is required under 40 CFR Subchapters N or O. [40 CFR 122.41(j)(4)]

In the case of pollutants for which there are no approved methods under 40 CFR Part 136 or otherwise required under 40 CFR Subchapters N and O, monitoring must be conducted according to a test procedure specified in the permit for such pollutants. [40 CFR 122.44(i)(1)(iv)]

(5) The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. [40 CFR 122.41(j)(5)]

k. SIGNATORY REQUIREMENT [40 CFR 122.41(k)]

(1) All applications, reports, or information submitted to the San Diego Water Board, State Water Board, or USEPA must be signed and certified. (See 40 CFR 122.22) [40 CFR 122.41(k)(1)]

(a) *For a municipality, State, Federal, or other public agency.* [All applications must be signed] [b]y either a principal executive officer or ranking elected official. [40 CFR 122.22(a)(3)]

(b) All reports required by permits, and other information requested by the San Diego Water Board, State Water Board, or USEPA must be signed by a person described in paragraph (a) of this section, or by a duly authorized representative of that person. A person is a duly authorized representative only if: [40 CFR 122.22(b)]

(i) The authorization is made in writing by a person described in paragraph (a) of this section; [40 CFR 122.22(b)(1)]

(ii) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company, (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) [40 CFR 122.22(b)(2)] and,

(iii) The written authorization is submitted to the San Diego Water Board and State Water Board. [40 CFR 122.22(b)(3)]

(c) *Changes to authorization.* If an authorization under paragraph (b) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (b) of this section must be submitted to the San Diego Water Board prior to or together with any reports, information, or applications to be signed by an authorized representative. [40 CFR 122.22(c)]

(d) *Certification.* Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." [40 CFR 122.22(d)]

(2) The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both. [40 CFR 122.41(k)(2)]

I. REPORTING REQUIREMENTS [40 CFR 122.41(l)]

(1) *Planned changes.* The Copermittee must give notice to the San Diego Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when: [40 CFR 122.41(l)(1)]

(a) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); [40 CFR 122.41(l)(1)(i)] or

(b) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which

are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1).
[40 CFR 122.41(l)(1)(ii)]

(c) The alteration or addition results in a significant change in the Copermittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. [40 CFR 122.41(l)(1)(iii)]

(2) *Anticipated noncompliance*. The Copermittee must give advance notice to the San Diego Water Board or State Water Board of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.
[40 CFR 122.41(l)(2)]

(3) *Transfers*. This permit is not transferable to any person except after notice to the San Diego Water Board. The San Diego Water Board may require modification or revocation and reissuance of the permit to change the name of the Copermittee and incorporate such other requirements as may be necessary under the CWA.
[40 CFR 122.41(l)(3)]

(4) *Monitoring reports.* Monitoring results must be reported at the intervals specified elsewhere in this permit. [40 CFR 122.41(l)(4)]

(a) Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the San Diego Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices. [40 CFR 122.41(l)(4)(i)]

(b) If the Copermittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or another method required for an industry-specific waste stream under 40 CFR Subchapters N or O, the results of this monitoring must be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the San Diego Water Board or State Water Board.
[40 CFR 122.41(l)(4)(ii)]

(c) Calculations for all limitations which require averaging of measurements must utilize an arithmetic mean unless otherwise specified in the permit.
[40 CFR 122.41(l)(4)(iii)]

(5) *Compliance schedules*. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date. [40 CFR 122.41(l)(5)]

(6) *Twenty-four hour reporting.*

(a) The Copermittee must report any noncompliance that may endanger health or the environment. Any information must be provided orally within 24 hours from the time the Copermittee becomes aware of the circumstances. A written submission must also be provided within five (5) days of the time the Copermittee becomes aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6)(i)]

(b) The following must be included as information which must be reported within 24 hours under this paragraph: [40 CFR 122.41(l)(6)(ii)]

(i) Any unanticipated bypass that exceeds any effluent limitation in the permit (See 40 CFR 122.41(g)). [40 CFR 122.41(l)(6)(ii)(A)]
(ii) Any upset which exceeds any effluent limitation in the permit. [40 CFR 122.41(l)(6)(ii)(B)] and,
(iii) Violation of a maximum daily discharge limitation for any of the pollutants listed by the San Diego Water Board in the permit to be reported within 24 hours. (See 40 CFR 122.44(g)) [40 CFR 122.41(l)(6)(ii)(C)]

(c) The San Diego Water Board may waive the above-required written report on a case-by-case basis if the oral report has been received within 24 hours. [40 CFR 122.41(l)(6)(iii)]

(7) *Other noncompliance.* The Copermittee must report all instances of noncompliance not reported in accordance with the standard provisions required under 40 CFR 122.41(l)(4), (5), and (6), at the time monitoring reports are submitted. The reports must contain the information listed in the standard provisions required under 40 CFR 122.41(l)(6). [40 CFR 122.41(l)(7))]

(8) *Other information.* When the Copermittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the San Diego Water Board, State Water Board, or USEPA, the Copermittee must promptly submit such facts or information. [40 CFR 122.41(l)(8)]

m. BYPASS [40 CFR 122.41(m)]

(1) *Definitions.*

(a) "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. [40 CFR 122.41(m)(1)(i)] or

(b) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be

expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
[40 CFR 122.41(m)(1)(ii)]

(2) *Bypass not exceeding limitations*. The Copermittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the standard provisions required under 40 CFR 122.41(m)(3) and (4).
[40 CFR 122.41(m)(2)]

(3) *Notice.*

(a) *Anticipated bypass*. If the Copermittee knows in advance of the need for a bypass, it must submit a notice, if possible at least ten days before the date of the bypass. [40 CFR 122.41(m)(3)(i)] or

(b) *Unanticipated bypass*. The Copermittee must submit notice of an unanticipated bypass in accordance with the standard provisions required under 40 CFR 122.41(l)(6) (24-hour notice).
[40 CFR 122.41(m)(3)(ii)]

(4) *Prohibition of Bypass.*

(a) Bypass is prohibited, and the San Diego Water Board may take enforcement action against a Copermittee for bypass, unless:
[40 CFR 122.41(m)(4)(i)]

(i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; [40 CFR 122.41(m)(4)(i)(A)]
(ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance;
[40 CFR 122.41(m)(4)(i)(B)] and,
(iii) The Copermittee submitted notice in accordance with the standard provisions required under 40 CFR 122.41(m)(3).
[40 CFR 122.41(m)(4)(i)(C)]

(b) The San Diego Water Board may approve an anticipated bypass, after considering its adverse effects, if the San Diego Water Board determines that it will meet the three conditions listed above.
[40 CFR 122.41(m)(4)(ii)]

n. UPSET [40 CFR 122.41(n)]

(1) *Definition.* "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Copermittee. An upset does not

include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. [40 CFR 122.41(n)(1)]

(2) *Effect of an upset*. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the standard provisions required under 40 CFR 122.41(n)(3) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. [40 CFR 122.41(n)(2)]

(3) *Conditions necessary for a demonstration of upset*. A Copermittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that: [40 CFR 122.41(n)(3)]

(a) An upset occurred and that the Copermittee can identify the cause(s) of the upset; [40 CFR 122.41(n)(3)(i)]
(b) The permitted facility was at the time being properly operated; [40 CFR 122.41(n)(3)(ii)] and
(c) The Copermittee submitted notice of the upset in accordance with the standard provisions required under 40 CFR 122.41(l)(6)(ii)(B) (24-hour notice). [40 CFR 122.41(n)(3)(iii)]
(d) The Copermittee complied with any remedial measures pursuant to the standard provisions required under 40 CFR 122.41(d). [40 CFR 122.41(n)(3)(iii)]

(4) *Burden of proof*. In any enforcement proceeding, the Copermittee seeking to establish the occurrence of an upset has the burden of proof. [40 CFR 122.41(n)(4)]

o. STANDARD PERMIT PROVISIONS FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS [40 CFR 122.42(c)]

The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the San Diego Water Board or State Water Board under 40 CFR 122.26(a)(1)(v) must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report must include:

(1) The status of implementing the components of the storm water management program that are established as permit conditions; [40 CFR 122.42(c)(1)]

(2) Proposed changes to the storm water management programs that are established as permit conditions. Such proposed changes must be consistent with 40 CFR 122.26(d)(2)(iii); [40 CFR 122.42(c)(2)] and

(3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under 40 CFR 122.26(d)(2)(iv) and (v); [40 CFR 122.42(c)(3)]

(4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; [40 CFR 122.42(c)(4)]

(5) Annual expenditures and budget for year following each annual report; [40 CFR 122.42(c)(5)]

(6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; [40 CFR 122.42(c)(6)]

(7) Identification of water quality improvements or degradation. [40 CFR 122.42(c)(7)]

p. STANDARD PERMIT PROVISIONS FOR STORM WATER DISCHARGES [40 CFR 122.42(d)]

The initial permits for discharges composed entirely of storm water issued pursuant to 40 CFR 122.26(e)(7) must require compliance with the conditions of the permit as expeditiously as practicable, but in no event later than three years after the date of issuance of the permit.

2. General Provisions

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. The general provisions applicable to this Order and NPDES permit are as follows:

a. DISCHARGE OF WASTE IS A PRIVILEGE

No discharge of waste into the waters of the State, whether or not such discharge is made pursuant to waste discharge requirements, shall create a vested right to continue such discharge. All discharges of waste into waters of the State are privileges, not rights. [CWC Section 13263(g)]

b. DURATION OF ORDER AND NPDES PERMIT

(1) *Effective date*. This Order and NPDES permit becomes effective on the 50th day after its adoption provided the USEPA has no objection. If the USEPA objects to its issuance, this Order shall not become effective until such objection is withdrawn. This Order supersedes Order No. R9-2007-0001 upon the effective date of this Order, and supersedes Order Nos. R9-2009-0002 and R9-2010-0016 upon their expiration or earlier notice of coverage.

(2) *Expiration*. This Order and NPDES permit expires five years after its effective date. [40 CFR 122.46(a)]

(3) *Continuation of expired order*. After this Order and NPDES permit expires, the terms and conditions of this Order and NPDES permit are automatically continued pending issuance of a new permit if all requirements of the federal NPDES regulations on the continuation of expired permits (40 CFR 122.6) are complied with.

c. AVAILABILITY

A copy of this Order must be kept at a readily accessible location and must be available to on-site personnel at all times.

d. CONFIDENTIALITY OF INFORMATION

Except as provided for in 40 CFR 122.7, no information or documents submitted in accordance with or in application for this Order will be considered confidential, and all such information and documents shall be available for review by the public at the San Diego Water Board office.

Claims of confidentiality for the following information will be denied:
[40 CFR 122.7(b)]

(1) The name and address of any permit applicant or Copermittee; [40 CFR 122.7(b)(1)] and

(2) Permit applications and attachments, permits, and effluent data. [40 CFR 122.7(b)(2)]

e. EFFLUENT LIMITATIONS

(1) *Interim effluent limitations*. The Copermittee must comply with any interim effluent limitations as established by addendum, enforcement action, or revised waste discharge requirements which have been, or may be, adopted by the San Diego Water Board.

(2) *Other effluent limitations and standards*. If any applicable toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant and that standard or prohibition is more stringent than any limitation on the pollutant in the permit, the San Diego Water Board shall institute proceedings under these regulations to modify or revoke and reissue the permit to conform to the toxic effluent standard or prohibition. [40 CFR 122.44(b)(1)]

f. DUTY TO MINIMIZE OR CORRECT ADVERSE IMPACTS

The Copermittee must take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this Order, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the noncompliance.

g. PERMIT ACTIONS

The filing of a request by the Copermittee for modification, revocation and reissuance, or termination of this Order, or a notification of planned change in or anticipated noncompliance with this Order does not stay any condition of this Order. (See 40 CFR 122.41(f)) In addition, the following provisions apply to this Order:

(1) Upon application by any affected person, or on its own motion, the San Diego Water Board may review and revise the requirements in this Order. All requirements must be reviewed periodically. [CWC Section 13263(e)]

(2) This Order may be terminated or modified for cause, including, but not limited to, all of the following: [CWC Section 13381]

(a) Violation of any condition contained in the requirements of this Order. [CWC Section 13381(a)]

(b) Obtaining the requirements in this Order by misrepresentation, or failure to disclose fully all relevant facts. [CWC Section 13381(b)]

(c) A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge. [CWC Section 13381(c)]

(3) When this Order is transferred to a new owner or operator, such requirements as may be necessary under the CWC may be incorporated into this Order.

h. NPDES PERMITTED NON-STORM WATER DISCHARGES

The San Diego Water Board has, in prior years, issued a limited number of individual NPDES permits for non-storm water discharges to MS4s. The San Diego Water Board or State Water Board may in the future, upon prior notice to the Copermittee(s), issue an NPDES permit for any non-storm water discharge (or class of non-storm water discharges) to an MS4.

i. MONITORING

In addition to the standard provisions required under 40 CFR 122.41(j) and (l)(4), the following general monitoring provisions apply to this Order:

(1) Where procedures are not otherwise specified in Order, sampling, analysis and quality assurance/quality control must be conducted in accordance with the Quality Assurance Management Plan (QAMP) for the State of California's Surface Water Ambient Monitoring Program (SWAMP), adopted by the State Water Resources Control Board (State Water Board).

(2) Pursuant to 40 CFR 122.41(j)(2) and CWC Section 13383(a), each Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five (5) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time.

(3) All chemical, bacteriological, and toxicity analyses must be conducted at a laboratory certified for such analyses by the California Department of Public Health or a laboratory approved by the San Diego Water Board.

(4) For priority toxic pollutants that are identified in the California Toxics Rule (CTR) (65 Fed. Reg. 31682), the Copermittees must instruct their laboratories to establish calibration standards that are equivalent to or lower than the Minimum Levels (MLs) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP). If a Copermittee can demonstrate that a particular ML is not attainable, in accordance with procedures set forth in 40 CFR Part 136, the lowest quantifiable concentration of the lowest calibration standard analyzed by a specific analytical procedure (assuming that all the method specified sample weights, volumes, and processing steps have been followed) may be used instead of the ML listed in Appendix 4 of the SIP. The Copermittee must submit documentation from the laboratory to the San Diego Water Board for approval prior to raising the ML for any priority toxic pollutant.

j. ENFORCEMENT

(1) The San Diego Water Board is authorized to enforce the terms of this Order under several provisions of the CWC, including, but not limited to, CWC Sections 13385, 13386, and 13387.

(2) Nothing in this Order shall be construed to protect the Copermittee from its liabilities under federal, state, or local laws.

(3) The CWC provides for civil and criminal penalties comparable to, and in some cases greater than, those provided for under the CWA.

(4) Except as provided in the standard conditions required under 40 CFR 122.41(m) and (n), nothing in this Order shall be construed to relieve the Copermittee from civil or criminal penalties for noncompliance.

(5) Nothing in this Order shall be construed to preclude the institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties to which the Copermittee is or may be subject to under Section 311 of the CWA.

(6) Nothing in this Order shall be construed to preclude institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authoring preserved by Section 510 of the CWA.

k. SEVERABILITY

The provisions of this Order are severable, and if any provision of this Order, or the application of any provisions of this Order to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this Order shall not be affected thereby.

l. APPLICATIONS

Any application submitted by a Copermittee for reissuance or modification of this Order must satisfy all applicable requirements specified in federal regulations as well as any additional requirements for submittal of a Report of Waste Discharge specified in the CWC and the California Code of Regulations.

m. IMPLEMENTATION

All plans, reports and subsequent amendments submitted in compliance with this Order must be implemented immediately (or as otherwise specified). All submittals by Copermittees must be adequate to implement the requirements of this Order.

n. REPORT SUBMITTALS

(1) All report submittals must include an executive summary, introduction, conclusion, recommendations, and signed certified statement.

(2) Each Copermittee must submit a signed certified statement covering its responsibilities for each applicable submittal.

(3) The Principal Watershed Copermittee(s) must submit a signed certified statement covering its responsibilities for each applicable submittal and the sections of the submittals for which it is responsible.

(4) Unless otherwise directed, the Copermittees must submit one hard copy and one electronic copy of each report required under this Order to the San Diego Water Board, and one electronic copy to the USEPA.

(5) The Copermittees must submit reports and provide notifications as required by this Order to the following:

EXECUTIVE OFFICER
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
9174 SKY PARK COURT, SUITE 100
SAN DIEGO CA 92123-4340
Telephone: (858) 467-2952 Fax: (858) 571-6972

EUGENE BROMLEY
US ENVIRONMENTAL PROTECTION AGENCY
REGION IX
PERMITS ISSUANCE SECTION (W-5-1)
75 HAWTHORNE STREET
SAN FRANCISCO CA 94105

ATTACHMENT C

ACRONYMS AND ABBREVIATIONS

AMAL	Average Monthly Action Level
ASBS	Area(s) of Special Biological Significance
BMP	Best Management Practice
Basin Plan	Water Quality Control Plan for the San Diego Basin
CEQA	California Environmental Quality Act
CCR	California Code of Regulations
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWC	California Water Code
CZARA	Coastal Zone Act Reauthorization Amendments of 1990
ESAs	Environmentally Sensitive Areas
GIS	Geographic Information System
IBI	Index of Biological Integrity
LID	Low Impact Development
MDAL	Maximum Daily Action Level
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
NAL	Non-Storm Water Action Level
NAICS	North American Industry Classification System
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
ROWD	Report of Waste Discharge (application for NPDES reissuance)
SAL	Storm Water Action Level
San Diego Water Board	California Regional Water Quality Control Board, San Diego Region
SIC	Standard Industrial Classification Code
State Water Board	State Water Resources Control Board
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
WDID	Waste Discharge Identification Number
WLA	Waste Load Allocation
WQBEL	Water Quality Based Effluent Limitation

DEFINITIONS

Active/Passive Sediment Treatment - Using mechanical, electrical or chemical means to flocculate or coagulate suspended sediment for removal from runoff from construction sites prior to discharge.

Anthropogenic Litter – Trash generated from human activities, not including sediment.

Average Monthly Action Level – The highest allowable average of daily discharges over a calendar month.

Beneficial Uses - The uses of water necessary for the survival or wellbeing of man, plants, and wildlife. These uses of water serve to promote tangible and intangible economic, social, and environmental goals. "Beneficial Uses" of the waters of the State that may be protected include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. Existing beneficial uses are uses that were attained in the surface or ground water on or after November 28, 1975; and potential beneficial uses are uses that would probably develop in future years through the implementation of various control measures. "Beneficial Uses" are equivalent to "Designated Uses" under federal law. [California Water Code Section 13050(f)].

Best Management Practices (BMPs) - Defined in 40 CFR 122.2 as schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Bioassessment - The use of biological community information to evaluate the biological integrity of a water body and its watershed. With respect to aquatic ecosystems, bioassessment is the collection and analysis of samples of the benthic macroinvertebrate community together with physical/habitat quality measurements associated with the sampling site and the watershed to evaluate the biological condition (i.e. biotic integrity) of a water body.

Biofiltration - Practices that use vegetation and amended soils to detain and treat runoff from impervious areas. Treatment is through filtration, infiltration, adsorption, ion exchange, and biological uptake of pollutants.

Biological Integrity - Defined in Karr J.R. and D.R. Dudley. 1981. Ecological perspective on water quality goals. *Environmental Management* 5:55-68 as: "A balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitat of the region." Also referred to as ecosystem health.

BMP Design Manual – A plan developed to eliminate, reduce, or mitigate the impacts of runoff from development projects, including Priority Development Projects.

Clean Water Act Section 303(d) Water Body - An impaired water body in which water quality does not meet applicable water quality standards and/or is not expected to meet water quality standards, even after the application of technology based pollution controls required by the

CWA. The discharge of runoff to these water bodies by the Copermittees is significant because these discharges can cause or contribute to violations of applicable water quality standards.

Construction Site – Any project, including projects requiring coverage under the Construction General Permit, that involves soil disturbing activities including, but not limited to, clearing, grading, disturbances to ground such as stockpiling, and excavation.

Contamination - As defined in the Porter-Cologne Water Quality Control Act, contamination is "an impairment of the quality of waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste whether or not waters of the State are affected."

Copermittee – An incorporated city within the County of Orange, County of Riverside, or County of San Diego in the San Diego Region, the County of Orange, the County of Riverside, the County of San Diego, the Orange County Flood Control District, the Riverside County Water Conservation and Flood Control District, the San Diego Regional Airport Authority, or the San Diego Unified Port District.

Copermittees – All of the individual Copermittees, collectively.

Critical Channel Flow (Qc) – The channel flow that produces the critical shear stress that initiates bed movement or that erodes the toe of channel banks. When measuring Qc, it should be based on the weakest boundary material – either bed or bank.

Daily Discharge – Defined as either: (1) the total mass of the constituent discharged over the calendar day or any 24 hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g. concentration.)

The Daily Discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day, or other 24 hour period other than a day), or by the arithmetic mean of analytical results from one or more grab samples taken over the course of a day.

Development Projects - Construction, rehabilitation, redevelopment, or reconstruction of any public or private residential project, industrial, commercial, or any other projects.

Dry Season –May 1 to September 30.

Dry Weather – Weather is considered dry if the preceding 72 hours has been without measurable precipitation (>0.1 inch).

Enclosed Bays – Enclosed bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost bay works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays do not include inland surface waters or ocean waters.

Erosion – When land is diminished or worn away due to wind, water, or glacial ice. Often the eroded debris (silt or sediment) becomes a pollutant via storm water runoff. Erosion occurs naturally but can be intensified by land clearing activities such as farming, development, road building, and timber harvesting.

Environmentally Sensitive Areas (ESAs) - Areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; areas designated as preserves or their equivalent under the Natural Communities Conservation Program within the Cities and County of Orange; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.

Estuaries – Waters, including coastal lagoons, located at the mouth of streams that serve as areas of mixing fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and ocean water. Estuaries do not include inland surface waters or ocean waters.

Existing Development – Any area that has been developed and exists for municipal, commercial, industrial, or residential purposes, uses, or activities. May include areas that are not actively used for its originally developed purpose, but may be re-purposed or redeveloped for another use or activity.

Flow Duration – The long-term period of time that flows occur above a threshold that causes significant sediment transport and may cause excessive erosion damage to creeks and streams (not a single storm event duration). The simplest way to visualize this is to consider a histogram of pre- and post-project flows using long-term records of hourly data. To maintain pre-development flow duration means that the total number of hours (counts) within each range of flows in a flow-duration histogram cannot increase between the pre- and post-development condition. Flow duration within the range of geomorphologically significant flows is important for managing erosion.

Grading - The cutting and/or filling of the land surface to a desired slope or elevation.

Hazardous Material – Any substance that poses a threat to human health or the environment due to its toxicity, corrosiveness, ignitability, explosive nature or chemical reactivity. These also include materials named by the USEPA in 40 CFR 116 to be reported if a designated quantity of the material is spilled into the waters of the U.S. or emitted into the environment.

Hazardous Waste - Hazardous waste is defined as “any waste which, under Section 600 of Title 22 of this code, is required to be managed according to Chapter 30 of Division 4.5 of Title 22 of this code” [CCR Title 22, Division 4.5, Chapter 11, Article 1].

Household Hazardous Waste – Paints, cleaning products, and other wastes generated during home improvement or maintenance activities.

Hydromodification – The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

Illicit Connection – Any connection to the MS4 that conveys an illicit discharge.

Illicit Discharge - Any discharge to the MS4 that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from fire fighting activities [40 CFR 122.26(b)(2)].

Inactive Areas – Areas of construction activity that are not active and those that have been active and are not scheduled to be re-disturbed for at least 14 days.

Infiltration – Water other than wastewater that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow [40 CFR 35.2005(20)].

Inland Surface Waters – Includes all surface waters of the State that do not include the ocean, enclosed bays, or estuaries.

Jurisdictional Runoff Management Program Document – A written description of the specific jurisdictional runoff management measures and programs that each Copermittee will implement to comply with this Order and ensure that storm water pollutant discharges in runoff are reduced to the MEP and do not cause or contribute to a violation of water quality standards.

Low Impact Development (LID) – A storm water management and land development strategy that emphasizes conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions.

Low Impact Development Best Management Practices (LID BMPs) – LID BMPs include schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States through storm water management and land development strategies that emphasize conservation sand the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions. LID BMPs include retention practices that do not allow runoff, such as infiltration, rain water harvesting and reuse, and evapotranspiration. LID BMPs also include flow-through practices such as biofiltration that may have some discharge of storm water following pollutant reduction.

Major Outfall – As defined in the Code of Federal Regulations, a major outfall is a MS4 outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (i.e. discharge from a single conveyance other than a circular pipe which is associated with a drainage are of more than 50 acres); or, for MS4s that receive storm water from lands zoned for industrial activity (based on comprehensive zoning plans or equivalent), a MS4 outfall that discharges from a single pipe with an inside diameter of 12 inches or more or from its equivalent

(i.e. discharge from other than a circular pipe associated with a drainage area of 2 acres or more).

Maximum Daily Action Level (MDAL) –The highest allowable daily discharge of a pollutant, over a calendar day (or 24 hour period). For pollutants with action levels expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with action levels expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

Maximum Extent Practicable (MEP) – The technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) for storm water that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) in combination with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than BAT. A definition for MEP is not provided either in the statute or in the regulations. Instead the definition of MEP is dynamic and will be defined by the following process over time: municipalities propose their definition of MEP by way of their runoff management programs. Their total collective and individual activities conducted pursuant to the runoff management programs becomes their proposal for MEP as it applies both to their overall effort, as well as to specific activities (e.g., MEP for street sweeping, or MEP for MS4 maintenance). In the absence of a proposal acceptable to the San Diego Water Board, the San Diego Water Board defines MEP.

In a memo dated February 11, 1993, entitled "Definition of Maximum Extent Practicable," Elizabeth Jennings, Senior Staff Counsel, SWRCB addressed the achievement of the MEP standard as follows:

> "*To achieve the MEP standard, municipalities must employ whatever Best Management Practices (BMPs) are technically feasible (i.e., are likely to be effective) and are not cost prohibitive. The major emphasis is on technical feasibility. Reducing pollutants to the MEP means choosing effective BMPs, and rejecting applicable BMPs only where other effective BMPs will serve the same purpose, or the BMPs would not be technically feasible, or the cost would be prohibitive. In selecting BMPs to achieve the MEP standard, the following factors may be useful to consider:*
>
> *a. Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?*
> *b. Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?*
> *c. Public Acceptance: Does the BMP have public support?*
> *d. Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?*
> *e. Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc.?*
>
> *The final determination regarding whether a municipality has reduced pollutants to the maximum extent practicable can only be made by the Regional or State Water Boards, and not by the municipal discharger. If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would*

exceed any benefit derived, it would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs that would address a pollutant source, or to pick a BMP based solely on cost, which would be clearly less effective. In selecting BMPs the municipality must make a serious attempt to comply and practical solutions may not be lightly rejected. In any case, the burden would be on the municipal discharger to show compliance with its permit. After selecting a menu of BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented."

Monitoring Year – October 1 to September 30

Municipal Separate Storm Sewer System (MS4) – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designated or used for collecting or conveying storm water; (iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.26.

National Pollutant Discharge Elimination System (NPDES) - The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the CWA.

Non-Storm Water - All discharges to and from a MS4 that do not originate from precipitation events (i.e., all discharges from a MS4 other than storm water). Non-storm water includes illicit discharges and NPDES permitted discharges.

Nuisance - As defined in the Porter-Cologne Water Quality Control Act, a nuisance is "anything which meets all of the following requirements: 1) Is injurious to health, or is indecent, or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. 2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. 3) Occurs during, or as a result of, the treatment or disposal of wastes."

Ocean Waters – the territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the State Board's California Ocean Plan.

Order – Unless otherwise specified, refers to this Order, Order No. R9-2013-0001 (NPDES No. CAS0109266)

Persistent Flow - Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

Person - A person is defined as an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof [40 CFR 122.2].

Point Source - Any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, landfill leachate collection systems, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

Pollutant - Any agent that may cause or contribute to the degradation of water quality such that a condition of pollution or contamination is created or aggravated.

Pollution - As defined in the Porter-Cologne Water Quality Control Act, pollution is "the alteration of the quality of the waters of the State by waste, to a degree that unreasonably affects the either of the following: 1) The waters for beneficial uses; or 2) Facilities that serve these beneficial uses." Pollution may include contamination.

Pollution Prevention - Pollution prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control BMPs, treatment control BMPs, or disposal.

Pre-Development Runoff Conditions – Runoff conditions that existed onsite before the existing development was constructed, or exists onsite before planned development activities occur.

Priority Development Projects - New development and redevelopment projects defined under Provision E.3.b of Order No. R9-2012-0011.

Rainy Season (aka Wet Season) –October 1 to April 30

Receiving Waters – Waters of the United States.

Receiving Water Limitations - Waste discharge requirements issued by the San Diego Water Board typically include both: (1) "Effluent Limitations" (or "Discharge Limitations") that specify the technology-based or water-quality-based effluent limitations; and (2) "Receiving Water Limitations" that specify the water quality objectives in the Basin Plan as well as any other limitations necessary to attain those objectives. In summary, the "Receiving Water Limitations" provision is the provision used to implement the requirements of CWA section 402(p)(3)(B).

Redevelopment - The creation, addition, and or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include trenching and resurfacing associated with utility work; resurfacing existing roadways; new sidewalk construction, pedestrian ramps, or bike lane on existing roads; and routine replacement of damaged pavement, such as pothole repair.

Reporting Period – The period of information that is reported in the Annual Report. The reporting period consists of two components: 1) July 1 to June 30, consistent with the fiscal year, for the implementation of the jurisdictional runoff management programs, and 2) October 1 to September 30, consistent with the monitoring year for the monitoring and assessment programs. Together, these two time periods constitute the reporting year for the Annual Report due January 31 following the end of the monitoring year.

Retain –Keep or hold in a particular place, condition, or position without discharge to surface waters.

Retrofitting – Storm water management practice put into place after development has occurred in watersheds where the practices previously did not exist. Retrofitting of developed areas is intended to improve water quality, protect downstream channels, reduce flooding, or meet other specific objectives. Retrofitting developed areas may include, but is not limited to replacing roofs with green roofs, disconnecting downspouts or impervious surfaces to drain to pervious surfaces, replacing impervious surfaces with pervious surfaces, installing rain barrels, installing rain gardens, and trash area enclosures.

Runoff - All flows in a storm water conveyance system that consists of the following components: (1) storm water (wet weather flows) and (2) non-storm water including dry weather flows.

San Diego Water Board – As used in this document the term "San Diego Water Board" is synonymous with the term "Regional Board" as defined in Water Code section 13050(b) and is intended to refer to the California Regional Water Quality Control Board for the San Diego Region as specified in Water Code Section 13200.

Sediment - Soil, sand, and minerals washed from land into water. Sediment resulting from anthropogenic sources (i.e. human induced land disturbance activities) is considered a pollutant. This Order regulates only the discharges of sediment from anthropogenic sources and does not regulate naturally occurring sources of sediment. Sediment can destroy fish-nesting areas, clog animal habitats, and cloud waters so that sunlight does not reach aquatic plants.

Source Control BMP – Land use or site planning practices, or structural or nonstructural measures that aim to prevent runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between pollutants and runoff.

Storm Water – Per 40 CFR 122.26(b)(13), means storm water runoff, snowmelt runoff and surface runoff and drainage. Surface runoff and drainage pertains to runoff and drainage resulting from precipitation events.

Stream, Channel, or Habitat Rehabilitation – Measures or activities for the purpose of improving or restoring the environmental health (i.e. physical, chemical and biological integrity) of streams, channels, or river systems. Rehabilitation techniques may include, but are not limited to, riparian zone restoration, constructed wetlands, bank stabilization, channel reconfiguration, and daylighting drainage systems.

Structural BMPs - A subset of BMPs which detains, retains, filters, removes, or prevents the release of pollutants to surface waters from development projects in perpetuity, after construction of a project is completed.

Total Maximum Daily Load (TMDL) - The maximum amount of a pollutant that can be discharged into a water body from all sources (point and non-point) and still maintain water quality standards. Under CWA section 303(d), TMDLs must be developed for all water bodies that do not meet water quality standards after application of technology-based controls.

Toxicity - Adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies). The water quality objectives for toxicity provided in the Basin Plan, state in part…"All waters shall be free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life….The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge".

Treatment Control BMP – Any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media absorption or any other physical, biological, or chemical process.

Unpaved Road – Any long, narrow stretch without pavement used for traveling by motor passenger vehicles between two or more points. Unpaved roads are generally constructed of dirt, gravel, aggregate or macadam and may be improved or unimproved.

Waste - As defined in CWC Section 13050(d), "waste includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal."

Article 2 of CCR Title 23, Chapter 15 (Chapter 15) contains a waste classification system that applies to solid and semi-solid waste, which cannot be discharged directly or indirectly to water of the state and which therefore must be discharged to land for treatment, storage, or disposal in accordance with Chapter 15. There are four classifications of waste (listed in order of highest to lowest threat to water quality): hazardous waste, designated waste, non-hazardous solid waste, and inert waste.

Water Quality Objective - Numerical or narrative limits on constituents or characteristics of water designated to protect designated beneficial uses of the water. [California Water Code Section 13050 (h)]. California's water quality objectives are established by the State and Regional Water Boards in the Water Quality Control Plans. Numeric or narrative limits for pollutants or characteristics of water designed to protect the beneficial uses of the water. In other words, a water quality objective is the maximum concentration of a pollutant that can exist in a receiving water and still generally ensure that the beneficial uses of the receiving water remain protected (i.e., not impaired). Since water quality objectives are designed specifically to protect the beneficial uses, when the objectives are violated the beneficial uses are, by definition, no longer protected and become impaired. This is a fundamental concept under the Porter Cologne Act. Equally fundamental is Porter Cologne's definition of pollution. A condition of pollution exists when the water quality needed to support designated beneficial uses has become unreasonably affected or impaired; in other words, when the water quality objectives

have been violated. These underlying definitions (regarding beneficial use protection) are the reason why all waste discharge requirements implementing the federal NPDES regulations require compliance with water quality objectives. (Water quality objectives are also called water quality criteria in the CWA.)

Water Quality Standards - Water quality standards, as defined in Clean Water Act section 303(c) consist of the beneficial uses (e.g., swimming, fishing, municipal drinking water supply, etc.,) of a water body and criteria (referred to as water quality objectives in the California Water Code) necessary to protect those uses. Under the Water Code, the water boards establish beneficial uses and water quality objectives in water quality control or basin plans. Together with an anti-degradation policy, these beneficial uses and water quality objectives serve as water quality standards under the Clean Water Act. In Clean Water Act parlance, state beneficial uses are called "designated uses" and state water quality objectives are called "criteria." Throughout this Order, the relevant term is used depending on the statutory scheme.

Waters of the State - Any water, surface or underground, including saline waters within the boundaries of the State [CWC section 13050 (e)]. The definition of the Waters of the State is broader than that for the Waters of the United States in that all water in the State is considered to be a Waters of the State regardless of circumstances or condition.

Waters of the United States - As defined in the 40 CFR 122.2, the Waters of the U.S. are defined as: "(a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate "wetlands;" (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters otherwise defined as waters of the United States under this definition: (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial seas; and (g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA."

Watershed - That geographical area which drains to a specified point on a water course, usually a confluence of streams or rivers (also known as drainage area, catchment, or river basin).

Wet Season (aka Rainy Season) –October 1 to April 30

Wet Weather – Weather is considered wet if there is a storm event of 0.1 inches and greater and the following 72 hours, unless otherwise defined by another regulatory mechanism.

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ATTACHMENT D

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

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JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM
FY _____

I. COPERMITTEE INFORMATION			
Copermittee Name:			
Copermittee Primary Contact Name:			
Copermittee Primary Contact Information: Address: City:	County:	State:	Zip:
Telephone:	Fax:	Email:	

II. LEGAL AUTHORITY		
Has the Copermittee established adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 that complies with Order No. R9-2013-0001?	**YES** **NO**	☐ ☐
A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority?	**YES** **NO**	☐ ☐

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE		
Was an update of the jurisdictional runoff management program document required or recommended by the San Diego Water Board?	**YES** **NO**	☐ ☐
If YES to the question above, did the Copermittee update its jurisdictional runoff management program document and make it available on the Regional Clearinghouse?	**YES** **NO**	☐ ☐

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM		
Has the Copermittee implemented a program to actively detect and eliminate illicit discharges and connections to its MS4 that complies with Order No. R9-2013-0001?	**YES** **NO**	☐ ☐

Number of non-storm water discharges reported by the public	
Number of non-storm water discharges detected by Copermittee staff or contractors	
Number of non-storm water discharges investigated by the Copermittee	
Number of sources of non-storm water discharges identified	
Number of non-storm water discharges eliminated	
Number of sources of illicit discharges or connections identified	
Number of illicit discharges or connections eliminated	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

V. DEVELOPMENT PLANNING PROGRAM		
Has the Copermittee implemented a development planning program that complies with Order No. R9-2013-0001?	**YES** **NO**	☐ ☐
Was an update to the BMP Design Manual required or recommended by the San Diego Water Board?	**YES** **NO**	☐ ☐
If YES to the question above, did the Copermittee update its BMP Design Manual and make it available on the Regional Clearinghouse?	**YES** **NO**	☐ ☐

Number of proposed development projects in review	
Number of Priority Development Projects in review	
Number of Priority Development Projects approved	
Number of approved Priority Development Projects exempt from any BMP requirements	
Number of approved Priority Development Projects allowed alternative compliance	
Number of Priority Development Projects granted occupancy	

Number of completed Priority Development Projects in inventory	
Number of high priority Priority Development Project structural BMP inspections	
Number of Priority Development Project structural BMP violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM
FY _____

VI. CONSTRUCTION MANAGEMENT PROGRAM

Has the Copermittee implemented a construction management program that complies with Order No. R9-2013-0001?	YES	☐
	NO	☐

Number of construction sites in inventory	
Number of active construction sites in inventory	
Number of inactive construction sites in inventory	
Number of construction sites closed/completed during reporting period	
Number of construction site inspections	
Number of construction site violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

Has the Copermittee implemented an existing development management program that complies with Order No. R9-2013-0001?	YES	☐
	NO	☐

	Municipal	Commercial	Industrial	Residential
Number of facilities or areas in inventory				
Number of existing development inspections				
Number of follow-up inspections				
Number of violations				
Number of enforcement actions issued				
Number of escalated enforcement actions issued				

VIII. PUBLIC EDUCATION AND PARTICIPATION

Has the Copermittee implemented a public education program component that complies with Order No. R9-2013-0001?	YES	☐
	NO	☐
Has the Copermittee implemented a public participation program component that complies with Order No. R9-2013-0001?	YES	☐
	NO	☐

IX. FISCAL ANALYSIS

Has the Copermittee attached to this form a summary of its fiscal analysis that complies with Order No. R9-2013-0001?	YES	☐
	NO	☐

X. CERTIFICATION

I [☐ Principal Executive Officer ☐ Ranking Elected Official ☐ Duly Authorized Representative] certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature	Date
Print Name	Title
Telephone Number	Email

ATTACHMENT E

SPECIFIC PROVISIONS FOR TOTAL MAXIMUM DAILY LOADS APPLICABLE TO ORDER NO. R9-2013-0001

These provisions implement Total Maximum Daily Loads (TMDLs), adopted by the San Diego Water Board and approved by USEPA under Clean Water Act section 303(c), which are applicable to discharges regulated under this Order. The provisions and schedules for implementation of the TMDLs described below must be incorporated into the Water Quality Improvement Plans, required pursuant to Provision B of this Order, for the specified Watershed Management Areas.

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed
2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin
3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed
4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek
5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay
6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2002-0123

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date: August 14, 2002
State Water Board Approval Date: July 16, 2003
Office of Administrative Law Approval Date: September 11, 2003
US EPA Approval Date: November 3, 2003

(3) TMDL Effective Date: September 11, 2003

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for Chollas Creek consist of the following:

(1) Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedule under Specific Provision 1.c:

Table 1.1
Receiving Water Limitations as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Diazinon	Acute	0.08 µg/L	1 hour
	Chronic	0.05 µg/L	4 days

(2) Effluent Limitations

Discharges from the MS4s must not contain concentrations that exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 1.c:

Table 1.2
Effluent Limitations as Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation	Averaging Period
Diazinon	Acute	0.072 µg/L	1 hour
	Chronic	0.045 µg/L	4 days

(3) Best Management Practices

The following BMPs for Chollas Creek must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area and implemented by the Responsible Copermittees:

(a) The Responsible Copermittees must implement BMPs to support the achievement of the WQBELs under Specific Provision 1.b for Chollas Creek.

(b) The Responsible Copermittees must implement the Diazinon Toxicity Control Plan and Diazinon Public Outreach/Education Program as described in the report titled, *Technical Report for Total Maximum Daily Load for Diazinon in Chollas Creek Watershed, San Diego County*, dated August 14, 2002, including subsequent modifications, in order to achieve the WQBELs under Specific Provision 1.b.

(c) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans as possible.

c. COMPLIANCE SCHEDULE

The Responsible Copermittees are required to achieve their respective WLAs by December 31, 2010. The Responsible Copermittees must be in compliance with the WQBELs under Specific Provision 1.b.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls for diazinon within the Chollas Creek watershed, and calculate or estimate the annual diazinon loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

e. COMPLIANCE DETERMINATION

Compliance with WQBELs of Specific Provision 1.b may be demonstrated via one of the following methods:

(1) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;

(2) There are no exceedances of the applicable receiving water limitations under Specific Provision 1.b.(1) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(3) There are no violations of the applicable effluent limitations under Specific Provision 1.b.(2) at the Responsible Copermittees' MS4 outfalls.

2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0019

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	September 22, 2005
Office of Administrative Law Approval Date:	December 2, 2005
US EPA Approval Date:	February 8, 2006

(3) TMDL Effective Date: December 2, 2005

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Shelter Island Yacht Basin

(6) Responsible Copermittee: City of San Diegot

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for Shelter Island Yacht Basin consist of the following:

(1) Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedule under Specific Provision 2.c:

Table 2.1
Receiving Water Limitations as Concentrations in Shelter Island Yacht Basin

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Dissolved Copper	Acute	4.8 µg/L	1 hour
	Chronic	3.1 µg/L	4 days

(2) Effluent Limitations

Discharges from the MS4s must not contain pollutant loads that exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 2.c:

Table 2.2
Effluent Limitations as Annual Loads in MS4 Discharges to Shelter Island Yacht Basin

Constituent	Effluent Limitation
Dissolved Copper	30 kg/yr

(3) Best Management Practices

The Responsible Copermittee must implement BMPs to support the achievement of the WQBELs under Specific Provision 2.b for Shelter Island Yacht Basin

c. Compliance Schedule

The Responsible Copermittee is required to achieve the MS4 WLA by December 2, 2005. The Responsible Copermittee must be in compliance with the WQBELs under Specific Provision 2.b.

d. Specific Monitoring and Assessment Requirements

The Responsible Copermittee must monitor the effluent of its MS4 outfalls for dissolved copper, and calculate or estimate the monthly and annual dissolved copper loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.(b)(2)of this Order. The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

e. Compliance Determination

Compliance with WQBELs of Specific Provision 2.b may be demonstrated via one of the following methods:

(1) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water;

(2) There are no exceedances of the applicable receiving water limitations under Specific Provision 2.b.(1) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(3) There are no violations of the applicable effluent limitations under Specific Provision 2.b.(2) at the Responsible Copermittee's MS4 outfalls.

3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0036

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	November 16, 2005
Office of Administrative Law Approval Date:	February 1, 2006
US EPA Approval Date:	March 22, 2006

(3) TMDL Effective Date: February 1, 2006

(4) Watershed Management Area: Santa Margarita River

(5) Water Body: Rainbow Creek

(6) Responsible Copermittee: County of San Diego

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for Rainbow Creek consist of the following

(1) Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedule under Specific Provision 3.c.(1):

Table 3.1
Receiving Water Limitations as Concentrations in Rainbow Creek

Constituent	Receiving Water Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(2) Effluent Limitations

(a) Discharges from the MS4s must not contain concentrations that exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 3.c.(1):

Table 3.2
Effluent Limitations as Concentrations in MS4 Discharges to Rainbow Creek

Constituent	Effluent Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(b) Pollutant loads from given land uses discharging to and from the MS4s must not exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 3.c.(1):

Table 3.3
Effluent Limitations as Annual Loads in MS4 Discharges to Rainbow Creek

Land Use	Total N	Total P
Commercial nurseries	116 kg/yr	3 kg/yr
Park	3 kg/yr	0.1 kg/yr
Residential areas	149 kg/yr	12 kg/yr
Urban areas	27 kg/yr	6 kg/yr

Interim effluent limitations expressed as pollutant loads are given in the compliance schedule under Specific Provision 3.0.

(3) Best Management Practices

(a) The Responsible Copermittee must implement BMPs to support the achievement of the WQBELs under Specific Provision 3.b for Rainbow Creek.

(b) The Responsible Copermittee should coordinate any BMPs implemented to address this TMDL with Caltrans and other sources as possible.

c. COMPLIANCE SCHEDULE

(1) Compliance Date

The Responsible Copermittee must be in compliance with the WQBELs under Specific Provision 3.b, by December 31, 2021.

(2) Interim Compliance Requirements

Table 3.4
Interim Effluent Limitations as Annual Loads in MS4 Discharges from Specific Land Uses to Rainbow Creek

	Total N Interim Effluent Limitations (kg/yr)			Total P Interim Effluent Limitations (kg/yr)		
	Interim Compliance Date			Interim Compliance Date		
Land Use	**2009**	**2013**	**2017**	**2009**	**2013**	**2017**
Commercial nurseries	390	299	196	20	16	10
Park	5	3	3	0.15	0.10	0.10
Residential areas	507	390	260	99	74	47
Urban areas	40	27	27	9	6	6

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

The Responsible Copermittee must implement the Sampling and Analysis Plan for Rainbow Creek Nutrient Reduction TMDL Implementation Water Quality Monitoring, dated January 2010. The results of any monitoring conducted during the reporting period, and assessment of whether the interim and final WQBELs have been achieved must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

e. COMPLIANCE DETERMINATION

(1) Compliance with interim compliance requirements of Specific Provision 3.c.(2) may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water;

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 3.b.(1) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls;

(c) There are no violations of the applicable effluent limitations under Specific Provision 3.b.(2)(a) at the Responsible Copermittee's MS4 outfalls;

(d) The pollutant loads from given land uses discharging to and from the MS4s do not exceed the applicable effluent limitations under Specific Provision 3.b.(2)(b); OR

(e) The Responsible Copermittee has submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim compliance requirements will be achieved by the interim compliance dates.

(2) Compliance with WQBELs of Specific Provision 3.b may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water;

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 3.b.(1) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls;

(c) There are no violations of the applicable effluent limitations under Specific Provision 3.b.(2)(a) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant loads from given land uses discharging to and from the MS4s do not exceed the applicable effluent limitations under Specific Provision 3.b.(2)(b).

4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2007-0043

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2007
State Water Board Approval Date:	July 15, 2008
Office of Administrative Law Approval Date:	October 22, 2008
US EPA Approval Date:	December 18, 2008

(3) TMDL Effective Date: October 22, 2008

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for Chollas Creek consist of the following:

(1) Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedule under Specific Provision 4.c.(1):

Table 4.1
Receiving Water Limitations as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$(0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$(0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$(0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$(0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER.

(2) Effluent Limitations

Discharges from the MS4s must not contain pollutant loads that exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 4.c.(1):

Table 4.2
Effluent Limitations as Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER.

(3) Best Management Practices

(a) The Responsible Copermittees must implement BMPs to support the achievement of the WQBELs under Specific Provision 4.b for Chollas Creek.

(b) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans and the U.S. Navy as possible.

c. COMPLIANCE SCHEDULE

(1) WLA Compliance Date

The Responsible Copermittees are required to achieve the WLA, thus must be in compliance with the WQBELs under Specific Provision 4.b, by October 22, 2028.

(2) Interim Compliance Requirements

The Responsible Copermittee must comply with the following interim WQBELs by the interim compliance date:

Table 4.3
Interim Effluent Limitations as Concentrations in MS4 Discharges to Chollas Creek

Interim Compliance Date	Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
October 22, 2018	Dissolved Copper	Acute	$1.2 \times 90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
	Dissolved Lead	Acute	$1.2 \times 90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
	Dissolved Zinc	Acute	$1.2 \times 90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER.

d. Specific Monitoring and Assessment Requirements

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*, when it is amended to include monitoring requirements for the Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls discharging to Chollas Creek for dissolved copper, lead, and zinc, and calculate or estimate the monthly and annual dissolved copper, lead, and zinc loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2)of this Order. The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

e. COMPLIANCE DETERMINATION

(1) Compliance with interim compliance requirements of Specific Provision 4.c.(2) may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 4.b.(1) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls;

(c) There are no violations of the applicable effluent limitations under Specific Provision 4.b.(2) at the Responsible Copermittees' MS4 outfalls; OR

(d) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim compliance requirements will be achieved by the interim compliance dates.

(2) Compliance with WQBELs of Specific Provision 4.b may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 4.b.(1) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(c) There are no violations of the applicable effluent limitations under Specific Provision 4.b.(2) at the Responsible Copermittees' MS4 outfalls.

5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2008-0027

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 11, 2008
State Water Board Approval Date:	June 16, 2009
Office of Administrative Law Approval Date:	September 15, 2009
US EPA Approval Date:	October 26, 2009

(3) TMDL Effective Date: September 15, 2009

(4) Watershed Management Areas: See Table 5.0

(5) Water Bodies: See Table 5.0

(6) Responsible Copermittees: See Table 5.0

Table 5.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County	Dana Point Harbor	Baby Beach	-City of Dana Point -County of Orange
San Diego Bay	San Diego Bay	Shelter Island Shoreline Park	- San Diego Unified Port District

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Receiving Water Limitations

(a) Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedules under Specific Provisions 5.c.(1)(a) and 5.c.(2):

Table 5.1
Receiving Water Limitations as Bacteria Densities in the Water Body

	Receiving Water Limitations	
Constituent	**Single Sample Maximum[1,2]**	**30-Day Geometric Mean[2]**
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.

(b) If the above receiving water limitations are not met in the receiving water, the Responsible Copermittees must demonstrate that the discharges from the MS4s are not causing or contributing to the exceedance of receiving water limitations.

(2) Effluent Limitations

Discharges from the MS4s must not contain densities that exceed the following effluent limitations by the end of the compliance schedules under Specific Provisions 5.c.(1)(a) and 5.c.(2) to demonstrate the discharge is not causing or contributing to a violation of receiving water quality standards:

Table 5.2
Effluent Limitations as Bacteria Densities in MS4 Discharges to the Water Body

	Effluent Limitations	
Constituent	**Single Sample Maximum[1,2]**	**30-Day Geometric Mean[2]**
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.

Interim effluent limitations expressed as pollutant loads are given in the compliance schedule under Specific Provision 5.c.

(3) Best Management Practices

(a) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 5.0 must incorporate the Bacteria Load Reduction Plan (BLRP) required to be developed pursuant to Resolution No. R9-2008-0027.

(b) The Responsible Copermittee must implement BMPs to support the achievement of the WQBELs under Specific Provision 5.0 for the segments or areas of the water bodies listed in Table 5.0

c. COMPLIANCE SCHEDULE

(1) Baby Beach in Dana Point Harbor

(a) WLA Compliance Dates

The Responsible Copermittees for MS4 discharges to Baby Beach are required to achieve the WLA, thus must be in compliance with the WQBELs under Specific Provision 5.0, according to the following compliance schedule:

Table 5.3
Compliance Schedule Dates to Achieve Baby Beach WLAs

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform	September 15, 2014	September 15, 2009
Fecal Coliform		September 15, 2009
Enterococcus		September 15, 2019

(b) Interim Compliance Requirements

The Responsible Copermittees for MS4 discharges to Baby Beach must comply with the following interim WQBELs by the interim compliance date:

Table 5.4
Interim Effluent Limitations as Loads in MS4 Discharges to Baby Beach

Constituent	Interim Compliance Date	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	4.93×10^9 MPN/day	NA*
Fecal Coliform	September 15, 2012	0.59×10^9 MPN/day	NA*
Enterococcus	September 15, 2012	0.42×10^9 MPN/day	NA**
	September 15, 2016	NA*	207×10^9 MPN/30days

Notes:
* The WQBELs under Specific Provision 5.b must already be achieved by the given interim compliance date.
** There is no corresponding interim WQBEL for the given interim compliance date.

(2) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park is required to achieve the WLA, thus must be in compliance with the WQBELs under Specific Provision 5.0, by December 31, 2012.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) Monitoring Stations

Monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[33] If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(2) Monitoring Procedures

(a) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) The Responsible Copermittees must collect wet weather monitoring samples within the first 24 hours of the first storm event[34] of the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(c) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs have been achieved.

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[33] Commonly referred to as AB 411 monitoring

[34] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(b) The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

e. COMPLIANCE DETERMINATION

(1) Compliance with interim compliance requirements of Specific Provision 5.c.(1)(b) may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 5.b.(1)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls;

(c) There are no violations of the applicable effluent limitations under Specific Provision 5.b.(2) at the Responsible Copermittees' MS4 outfalls;

(d) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the applicable effluent limitations under Specific Provision 5.c.(1)(b);

(e) The Responsible Copermittees can demonstrate that exceedances of the applicable receiving water limitations under Specific Provision 5.b.(1)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4 are not causing or contributing to the exceedances; OR

(f) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim compliance requirements will be achieved by the interim compliance dates.

(2) Compliance with WQBELs of Specific Provision 5.b may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 5.b.(1)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls;

(c) There are no violations of the applicable effluent limitations under Specific Provision 5.b.(2) at the Responsible Copermittees' MS4 outfalls;

(d) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the applicable effluent limitations under Specific Provision 5.c.(1)(b); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the applicable receiving water limitations under Specific Provision 5.b.(1)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4 are not causing or contributing to the exceedances.

6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2010-0001

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 10, 2010
State Water Board Approval Date:	December 14, 2010
Office of Administrative Law Approval Date:	April 4, 2011
US EPA Approval Date:	June 22, 2011

(3) TMDL Effective Date: April 4, 2011

(4) Watershed Management Areas: See Table 6.0

(5) Water Bodies: See Table 6.0

(6) Responsible Copermittees: See Table 6.0

Table 6.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	-City of Laguna Beach -County of Orange -Orange County Flood Control District
		at Heisler Park - North	
	Pacific Ocean Shoreline	at Main Laguna Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Woods -County of Orange -Orange County Flood Control District
		Laguna Beach at Ocean Avenue	
		Laguna Beach at Cleo Street	
		Arch Cove at Bluebird Canyon Road	
		Laguna Beach at Dumond Drive	
	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Hills -City of Laguna Niguel -City of Laguna Woods -City of Lake Forest -City of Mission Viejo -County of Orange -Orange County Flood Control District
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	
	Aliso Creek Mouth	at mouth	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County (cont'd)	Pacific Ocean Shoreline	Aliso Beach at West Street	-City of Dana Point -City of Laguna Beach -City of Laguna Niguel -County of Orange -Orange County Flood Control District
		Aliso Beach at Table Rock Drive	
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)	
		at Salt Creek (large outlet)	
		Salt Creek Beach at Salt Creek service road	
		Salt Creek Beach at Strand Road	
	Pacific Ocean Shoreline	at San Juan Creek	-City of Dana Point -City of Laguna Hills -City of Laguna Niguel -City of Mission Viejo -City of Rancho Santa Margarita -City of San Juan Capistrano -County of Orange -Orange County Flood Control District
	San Juan Creek	lower 1 mile	
	San Juan Creek Mouth	at mouth	
	Pacific Ocean Shoreline	at Poche Beach	-City of Dana Point -City of San Clemente -County of Orange -Orange County Flood Control District
		Ole Hanson Beach Club Beach at Pico Drain	
		San Clemente City Beach at El Portal Street Stairs	
		San Clemente City Beach at Mariposa Street	
		San Clemente City Beach at Linda Lane	
		San Clemente City Beach at South Linda Lane	
		San Clemente City Beach at Lifeguard Headquarters	
		under San Clemente Municipal Pier	
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	
		San Clemente State Beach at Riviera Beach	
		Can Clemente State Beach at Cypress Shores	
San Luis Rey River	Pacific Ocean Shoreline	at San Luis Rey River mouth	-City of Oceanside -City of Vista -County of San Diego

Carlsbad	Pacific Ocean Shoreline	at Moonlight State Beach	-City of Carlsbad -City of Encinitas -City of Escondido -City of San Marcos -County of San Diego
San Dieguito River	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	-City of Del Mar -City of Escondido -City of Poway -City of San Diego -City of Solana Beach -County of San Diego
Penasquitos	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	-City of Del Mar -City of Poway -City of San Diego -County of San Diego
Mission Bay	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	-City of San Diego
		La Jolla Shores Beach at Caminito del Oro	
		La Jolla Shores Beach at Vallecitos	
		La Jolla Shores Beach at Avenida de la Playa	
		at Casa Beach, Children's Pool	
		South Casa Beach at Coast Boulevard	
		Whispering Sands Beach at Ravina Street	
		Windansea Beach at Vista de la Playa	
		Windansea Beach at Bonair Street	
		Windansea Beach at Playa del Norte	
		Windansea Beach at Palomar Avenue	
		at Tourmaline Surf Park	
		Pacific Beach at Grand Avenue	
	Tecolote Creek	Entire reach and tributaries	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I- Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
San Diego River	Forrester Creek	lower 1 mile	-City of El Cajon -City of Santee -County of San Diego
	San Diego River	lower 6 miles	-City of El Cajon -City of La Mesa -City of San Diego -City of Santee -County of San Diego
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	
San Diego Bay	Chollas Creek	lower 1.2 miles	-City of La Mesa -City of Lemon Grove -City of San Diego -County of San Diego - San Diego Unified Port District

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for segments or areas of the water bodies listed in Table 6.0 consist of the following:

(1) Receiving Water Limitations

(a) Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedules under Specific Provision 6.c.(1):

Table 6.1
Receiving Water Limitations as Bacteria Densities and Allowable Exceedance Frequencies in the Water Body

	Receiving Water Limitations			
Constituent	Single Sample Maximum[1,2] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[3]	30-Day Geometric Mean[2] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform	10,000	22% / 0%	1,000	0%
Fecal Coliform	400	22% / 0%	200	0%
Enterococcus	104[4] / 61[5]	22% / 0%	35[4] / 33[5]	0%

Notes:
1. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
3. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. The 0% single sample maximum allowable exceedance frequency applies to dry weather days.
4. This *Enterococcus* receiving water limitation applies to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
5. This *Enterococcus* receiving water limitations applies to segments or areas of creeks or creek mouths listed in Table 6.0.

Interim receiving water limitations expressed as allowable exceedance frequencies are given in the compliance schedule under Specific Provision 6.c.

(b) If the above receiving water limitations are not met in the receiving water, the Responsible Copermittees must demonstrate that the discharges from the MS4s are not causing or contributing to the violation of receiving water limitations. The Copermittee must provide data that demonstrate the discharges from the MS4s are meeting the effluent limitations under Specific Provision 6.b.(2).

(2) Effluent Limitations

Discharges from the MS4s must not contain densities that exceed the following effluent limitations by the end of the compliance schedules under Specific Provision 6.c.(1) to demonstrate the discharge is not causing or contributing to a violation of receiving water quality standards:

Table 6.2
Effluent Limitations as Bacteria Densities and Allowable Exceedance Frequencies in MS4 Discharges to the Water Body

	Effluent Limitations			
Constituent	**Single Sample Maximum[1,2] (MPN/100mL)**	**Single Sample Maximum Allowable Exceedance Frequency[3]**	**30-Day Geometric Mean[2] (MPN/100mL)**	**30-Day Geometric Mean Allowable Exceedance Frequency**
Total Coliform	10,000	22% / 0%	1,000	0%
Fecal Coliform	400	22% / 0%	200	0%
Enterococcus	104[4] / 61[5]	22% / 0%	35[4] / 33[5]	0%

Notes:
1. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.
3. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. The 0% single sample maximum allowable exceedance frequency applies to dry weather days
4. This *Enterococcus* effluent limitation applies to MS4 discharges to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
5. This *Enterococcus* effluent limitation applies to MS4 discharges to segments or areas of creeks or creek mouths listed in Table 6.0.

Interim effluent limitations expressed as allowable exceedance frequencies are given in the compliance schedule under Specific Provision 6.c.

(3) Best Management Practices

(a) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 6.0 must incorporate the Comprehensive Load Reduction Plans (CLRPs) required to be developed pursuant to Resolution No. R9-2010-0001. For segments or areas in Table 6.0 that have been delisted from the Clean Water Act Section 303(d) List of Water Quality Limited Segments, a CLRP is not required.

(b) The Responsible Copermittee must implement BMPs to support the achievement of the WQBELs under Specific Provision 6.b for the segments or areas of the water bodies listed in Table 6.0.

(c) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans and owners/operators of small MS4s as possible.

c. COMPLIANCE SCHEDULE

(1) WLA Compliance Dates

The Responsible Copermittees for MS4 discharges to a segment or area of the water bodies listed in Table 6.0 are required to achieve the WLA, thus must be in compliance with the WQBELs under Specific Provision 6.b, according to the following compliance schedule:

Table 6.3
Compliance Schedule Dates to Achieve Indicator Bacteria WLAs

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform*	April 4, 2021	April 4, 2031
Fecal Coliform		
Enterococcus		

* Total coliform receiving water limitations only apply to segments or areas of Pacific Ocean Shoreline listed in Table 6.0.

(2) Interim Compliance Requirements

The Responsible Copermittees must comply with the following interim WQBELs by the interim compliance dates:

(a) Interim Dry Weather Receiving Water Limitations

The Responsible Copermittee must calculate the "existing" exceedance frequencies of the 30-day geometric mean water quality objectives for each of the indicator bacteria by analyzing the available monitoring data collected between January 1, 1996 and December 31, 2002. "Existing" exceedance frequencies may be calculated by segment or area of a water body, or by water body, and/or by Watershed Management Area listed in Table 6.0. Separate "existing" exceedance frequencies must be calculated for beaches and creeks/creek mouths.

The Responsible Copermittees must achieve a 50 percent reduction in the "existing" exceedance frequency of the 30-day geometric mean WQBELs for the segments or areas of the water bodies listed in Table 6.0 by the interim compliance dates for achieving the interim dry weather WQBELs given in Table 6.5. A 50 percent reduction in the "existing" exceedance frequency is equivalent to half of the "existing" exceedance frequency of the 30-day geometric mean WQBELs.

The "existing" exceedance frequencies and the interim dry weather allowable exceedance frequencies (i.e. interim dry weather WQBELs) calculated by the Responsible Copermittees must be included in the Water Quality Improvement Plans for the applicable Watershed Management Areas.

(b) Interim Wet Weather Receiving Water Limitations

The Responsible Copermittees must achieve the interim wet weather receiving water limitations in Table 6.4, expressed as interim allowable exceedance frequencies, by the interim compliance dates for achieving the interim wet weather WQBELs given in Table 6.5.

Table 6.4
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	38%	37%	39%
		at Heisler Park - North			
	Pacific Ocean Shoreline	at Main Laguna Beach			
		Laguna Beach at Ocean Avenue			
		Laguna Beach at Cleo Street			
		Arch Cove at Bluebird Canyon Road			
		Laguna Beach at Dumond Drive			
	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	41%	41%	42%
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	41%	41%	42%
	Aliso Creek Mouth	at mouth	41%	41%	42%
	Pacific Ocean Shoreline	Aliso Beach at West Street	36%	36%	36%
		Aliso Beach at Table Rock Drive			
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)			
		at Salt Creek (large outlet)			
		Salt Creek Beach at Salt Creek service road			
		Salt Creek Beach at Strand Road			

Table 6.4 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County (cont'd)	Pacific Ocean Shoreline	at San Juan Creek	44%	44%	48%
	San Juan Creek	lower 1 mile	44%	44%	47%
	San Juan Creek Mouth	at mouth	44%	44%	47%
	Pacific Ocean Shoreline	at Poche Beach	35%	35%	36%
		Ole Hanson Beach Club Beach at Pico Drain			
		San Clemente City Beach at El Portal Street Stairs			
		San Clemente City Beach at Mariposa Street			
		San Clemente City Beach at Linda Lane			
		San Clemente City Beach at South Linda Lane			
		San Clemente City Beach at Lifeguard Headquarters			
		under San Clemente Municipal Pier			
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)			
		San Clemente State Beach at Riviera Beach			
		Can Clemente State Beach at Cypress Shores			
San Luis Rey River	Pacific Ocean Shoreline	at San Luis Rey River mouth	45%	44%	47%
Carlsbad	Pacific Ocean Shoreline	at Moonlight State Beach	40%	40%	41%
San Dieguito River	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	33%	33%	36%

Table 6.4 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
Penasquitos	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	26%	26%	26%
Mission Bay	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	37%	37%	37%
		La Jolla Shores Beach at Caminito del Oro			
		La Jolla Shores Beach at Vallecitos			
		La Jolla Shores Beach at Avenida de la Playa			
		at Casa Beach, Children's Pool			
		South Casa Beach at Coast Boulevard			
		Whispering Sands Beach at Ravina Street			
		Windansea Beach at Vista de la Playa			
		Windansea Beach at Bonair Street			
		Windansea Beach at Playa del Norte			
		Windansea Beach at Palomar Avenue			
		at Tourmaline Surf Park			
		Pacific Beach at Grand Avenue			
	Tecolote Creek	Entire reach and tributaries	49%	49%	51%
San Diego River	Forrester Creek	lower 1 mile	46%	43%	49%
	San Diego River	lower 6 miles	46%	43%	49%
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	46%	43%	51%
San Diego Bay	Chollas Creek	lower 1.2 miles	41%	41%	43%

(c) Interim Compliance Dates

The Responsible Copermittees must achieve the interim receiving water limitations under Specific Provisions 6.c.(2)(a) and 6.c.(2)(b) by the interim compliance dates given in Table 6.5.

Table 6.5
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs
South Orange County	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	April 4, 2016	April 4, 2021
		at Heisler Park - North		
	Pacific Ocean Shoreline	at Main Laguna Beach	April 4, 2016	April 4, 2021
		Laguna Beach at Ocean Avenue		
		Laguna Beach at Cleo Street		
		Arch Cove at Bluebird Canyon Road		
		Laguna Beach at Dumond Drive		
	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	April 4, 2016	April 4, 2021
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	April 4, 2018	April 4, 2021
	Aliso Creek Mouth	at mouth	April 4, 2018	April 4, 2021
	Pacific Ocean Shoreline	Aliso Beach at West Street	April 4, 2016	April 4, 2021
		Aliso Beach at Table Rock Drive		
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)		
		at Salt Creek (large outlet)		
		Salt Creek Beach at Salt Creek service road	April 4, 2017	April 4, 2021
		Salt Creek Beach at Strand Road	April 4, 2017	April 4, 2021

Table 6.5 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs
South Orange County (cont'd)	Pacific Ocean Shoreline	at San Juan Creek	April 4, 2016	April 4, 2021
	San Juan Creek	lower 1 mile	April 4, 2018	April 4, 2021
	San Juan Creek Mouth	at mouth	April 4, 2016	April 4, 2021
	Pacific Ocean Shoreline	at Poche Beach	April 4, 2016	April 4, 2021
		Ole Hanson Beach Club Beach at Pico Drain	April 4, 2016	April 4, 2021
		San Clemente City Beach at El Portal Street Stairs	April 4, 2017	April 4, 2021
		San Clemente City Beach at Mariposa Street		
		San Clemente City Beach at Linda Lane	April 4, 2016	April 4, 2021
		San Clemente City Beach at South Linda Lane	April 4, 2018	April 4, 2021
		San Clemente City Beach at Lifeguard Headquarters	April 4, 2017	April 4, 2021
		under San Clemente Municipal Pier		
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	April 4, 2018	April 4, 2021
		San Clemente State Beach at Riviera Beach	April 4, 2016	April 4, 2021
		Can Clemente State Beach at Cypress Shores	April 4, 2017	April 4, 2021
San Luis Rey River	Pacific Ocean Shoreline	at San Luis Rey River mouth	April 4, 2017	April 4, 2021
Carlsbad	Pacific Ocean Shoreline	at Moonlight State Beach	April 4, 2016	April 4, 2021
San Dieguito River	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	April 4, 2016	April 4, 2021

Table 6.5 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs
Penasquitos	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	April 4, 2016	April 4, 2021
Mission Bay	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	April 4, 2016	April 4, 2021
		La Jolla Shores Beach at Caminito del Oro		
		La Jolla Shores Beach at Vallecitos		
		La Jolla Shores Beach at Avenida de la Playa		
		at Casa Beach, Children's Pool		
		South Casa Beach at Coast Boulevard		
		Whispering Sands Beach at Ravina Street		
		Windansea Beach at Vista de la Playa		
		Windansea Beach at Bonair Street		
		Windansea Beach at Playa del Norte		
		Windansea Beach at Palomar Avenue		
		at Tourmaline Surf Park		
		Pacific Beach at Grand Avenue		
	Tecolote Creek	Entire reach and tributaries		
San Diego River	Forrester Creek	lower 1 mile	April 4, 2018	April 4, 2021
	San Diego River	lower 6 miles		
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach		
San Diego Bay	Chollas Creek	lower 1.2 miles	April 4, 2018	April 4, 2021

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) Monitoring and Assessment Requirements for Beaches

(a) Monitoring Stations

For beaches addressed by the TMDL, monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[35] If exceedances

[35] Commonly referred to as AB 411 monitoring

of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations at least once within the first 24 hours of the first storm event[36] of the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer in exceedance of the allowable exceedance frequencies in the receiving waters.

(iii) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs for the Pacific Ocean Shoreline segments or areas listed in Table 6.0 have been achieved.

(ii) The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

[36] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(2) Monitoring and Assessment Requirements for Creeks and Creek Mouths

(a) Monitoring Stations

For creeks addressed by the TMDL, monitoring locations should consist of, at a minimum, a location at or near the mouth of the creek (e.g. Mass Loading Station or Mass Emission Station) and one or more locations upstream of the mouth (e.g. Watershed Assessment Station). If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations in accordance with the requirements of Provision D.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations within the first 24 hours of the first storm event[37] of the rainy season (i.e. October 1 through April 30).

(iii) Samples collected from receiving water monitoring stations must be analyzed for fecal coliform and *Enterococcus* indicator bacteria.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the receiving water monitoring data to assess whether the interim and final receiving water WQBELs for the creeks and creek mouths listed in Table 6.0 have been achieved.

(ii) The Responsible Copermittee must identify and incorporate additional MS4 outfall and receiving water monitoring stations and/or adjust monitoring frequencies to identify sources causing exceedances of the receiving water WQBELs.

(iii) The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

[37] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

e. COMPLIANCE DETERMINATION

(1) Compliance with interim compliance requirements of Specific Provision 6.c.(2) may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 6.b.(1) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls;

(c) There are no violations of the applicable effluent limitations under Specific Provision 6.b.(2) at the Responsible Copermittees' MS4 outfalls;

(d) There are no exceedances of the applicable interim receiving water limitations under Specific Provision 6.c.(2) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls;

(e) The Responsible Copermittees can demonstrate that exceedances of the applicable interim or final receiving water limitations under Specific Provision 6.b.(1)(a) or 6.c.(2) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4 are not causing or contributing to the exceedances; OR

(f) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim compliance requirements will be achieved by the interim compliance dates.

(2) Compliance with WQBELs of Specific Provision 6.b may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 6.b.(1) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls;

(c) There are no violations of the applicable effluent limitations under Specific Provision 6.b.(2) at the Responsible Copermittees' MS4 outfalls; OR

(d) The Responsible Copermittees can demonstrate that exceedances of the applicable final receiving water limitations under Specific Provision 6.b.(1)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4 are not causing or contributing to the exceedances.

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November 13, 2012
Item No. 10
Supporting Document No. 1

ATTACHMENT F

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

DRAFT
FACT SHEET / TECHNICAL REPORT

FOR

TENTATIVE
ORDER NO. R9-2013-0001
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

MONTH DAY, 2013

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I. FACT SHEET FORMAT

This Fact Sheet briefly sets forth the principal facts and the significant factual, legal, methodological, and policy questions that the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) considered in preparing Order No. R9-2013-0001 (Order). In accordance with the Code of Federal Regulations (CFR) Title 40 Parts 124.8 and 124.56 (40 CFR 124.8 and 40 CFR 124.56), this Fact Sheet includes, but is not limited to, the following information:

1. Contact information
2. Public process and notification procedures
3. Background of municipal storm water permits
4. Regional MS4 Permit approach
5. Economic considerations
6. Applicable statutes, regulations, plans and policies
7. Discussion of the provisions in the Order

Tentative Order No. R9-2013-0001 was distributed for public review on October 31, 2012. The San Diego Water Board accepted written comments on the Tentative Order until January 11, 2013. A public hearing was subsequently held on Month Day, 2013 to receive oral comments from interested persons.

The San Diego Water Board files applicable to the issuance of Order No. R9-2013-0001 are incorporated into the administrative record in support of the findings and requirements of the Order.

II. CONTACT INFORMATION

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The Order and other related documents can be downloaded from the San Diego Water Board website at

http://www.swrcb.ca.gov/rwqcb9/water_issues/programs/stormwater/index.shtml

The documents referenced in this Fact Sheet and in Order No. R9-2013-0001 are available for public review at the San Diego Water Board office, located at the address listed above. Public records are available for inspection during regular business hours, from 8:00 am to 5:00 pm Monday through Friday. To schedule an appointment to inspect public records, contact the San Diego Water Board Records Management Officer at 858-467-2952.

COPERMITTEES

Orange County Copermittees

- County of Orange
  - City of Aliso Viejo
  - City of Dana Point
  - City of Laguna Beach
  - City of Laguna Hills
  - City of Laguna Niguel
  - City of Laguna Woods
  - City of Lake Forest
  - City of Mission Viejo
  - City of Ranch Santa Margarita
  - City of San Clemente
  - City of San Juan Capistrano
  - Orange County Flood Control District

Riverside County Copermittees

- County of Riverside
  - City of Murrieta
  - City of Temecula
  - City of Wildomar
  - Riverside County Flood Control and Water Conservation District

San Diego County Copermittees

- County of San Diego
  - City of Carlsbad
  - City of Chula Vista
  - City of Coronado
  - City of Del Mar
  - City of El Cajon
  - City of Encinitas
  - City of Escondido
  - City of Imperial Beach
  - City of La Mesa
  - City of Lemon Grove
  - City of National City
  - City of Oceanside
  - City of Poway
  - City of San Diego
  - City of San Marcos
  - City of Santee
  - City of Solana Beach
  - City of Vista
  - San Diego County Regional Airport Authority
  - San Diego Unified Port District

III. PUBLIC PROCESS AND NOTIFICATION PROCEDURES

The San Diego Water Board followed the schedule listed below for the preparation of Order No. R9-2013-0001:

1. On February 8, 2011, the San Diego Water Board met with the San Diego County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No. R9-2007-0001.

2. Between February and May 2011, the San Diego Water Board met with select San Diego County, Orange County, and Riverside County Copermittees, as well as representatives of the environmental community to discuss concepts and receive recommendations for elements to be incorporated in a Regional Municipal Separate Storm Sewer System Permit (Regional MS4 Permit).

3. On June 27, 2011 the San Diego Water Board received the Report of Waste Discharge from the San Diego County Copermittees for the renewal of their NPDES permit, Order No. R9-2007-0001.

4. On April 9, 2012, the San Diego Water Board released an administrative draft of Tentative Order No. R9-2013-0001 for preliminary informal comments and feedback.

5. On April 25, 2012, the San Diego Water Board held an informal public workshop to present the administrative draft of Tentative Order No. R9-2013-0001 and receive verbal comments.

6. Between June and August 2012, the San Diego Water Board held four (4) focused meetings with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community, and USEPA) to discuss and receive preliminary comments and feedback about specific elements in the administrative draft of Tentative Order No. R9-2013-0001.

7. On September 5, 2012, the San Diego Water Board held an informal public workshop to present the modifications that were expected to be incorporated into the Tentative Order based on the preliminary comments and feedback received during the focused meetings held between June and August 2012.

8. Informal written comments on the administrative draft of Tentative Order No. R9-2013-0001 were accepted until September 14, 2012.

9. On October 12, 2012, the San Diego Water Board released a revised administrative draft of Tentative Order No. R9-2013-0001.

10. On October 24, 2012, the San Diego Water Board held a focused meeting with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community, and USEPA) to discuss modifications incorporated into the administrative draft of Tentative Order No. R9-2013-0001.

11. On October 31, 2012, the San Diego Water Board released Tentative Order No. R9-2013-0001 for formal public review and comment.

12. On November 13, 2012, the San Diego Water Board held a formal public Board workshop to present the public draft of Tentative Order No. R9-2013-0001 and receive verbal comments.

13. Formal written comments on the public draft of Tentative Order No. R9-2013-0001 were accepted until January 11, 2013.

14. A public hearing of Tentative Order No. R9-2013-0001 was conducted on Month Day, 2013.

IV. BACKGROUND OF THE SAN DIEGO REGION MUNICIPAL STORM WATER PERMITS

In developed and developing areas, storm water runoff is commonly transported through municipal separate storm sewer systems (MS4s) and discharged into local receiving water bodies. As the storm water runs off and flows over the land or impervious surfaces (e.g., paved streets, parking lots, and building rooftops), it accumulates debris, chemicals, sediment, and other pollutants that can adversely affect receiving water quality if discharged untreated. The United States Environmental Protection Agency (USEPA) recognizes wet weather flows from urban areas as the number one source of estuarine pollution in coastal communities,[1] such as those within the San Diego Region.

The federal Clean Water Act (CWA) was amended in 1987 to address and regulate discharges of storm water associated with industrial activities and from municipal storm sewers. With the amendments, many municipalities throughout the United States were obligated for the first time to obtain National Pollutant Discharge Elimination System (NPDES) permits for discharges of storm water from their MS4s.

In response to the CWA 1987 amendment, as well as the pending federal NPDES regulations which would implement the amendment, the San Diego Water Board issued "early" MS4 permits. The San Diego Water Board adopted and issued Order Nos. 90-38, 90-42, and 90-46 to regulate storm water discharges from the MS4s in Orange County, San Diego County, and Riverside County, respectively, within the San Diego Region on July 16, 1990.

The "early" MS4 permits, or First Term Permits, were issued prior to the November 1990 promulgation of the final federal NPDES storm water regulations. By issuing these First Term Permits before the federal regulations took effect, the San Diego Water Board was able to provide the Copermittees additional flexibility in addressing and managing storm water discharges. The First Term Permits contained the essentials of the 1990 regulations, and required the Copermittees to develop and implement runoff management programs, but provided little specificity about what was required to be included in or actually achieved by those programs.

The flexibility provided in the First Term Permits was generally continued through the Second Term Permits. The combination of the lack of specificity in the First and Second Term Permits, a general lack of meaningful action by the Copermittees and a general lack of corresponding reaction (i.e. enforcement) by the San Diego Water Board during the first ten years of the storm water program, resulted in few substantive steps towards achieving improvements in the quality of receiving waters or storm water discharges from the MS4s.

[1] US EPA. 1999. 40 CFR Parts 9, 122, 123, and 124. National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. 64 FR 68727.

From 2001, the regulatory approach incorporated into Third Term Permits was a significant departure from the regulatory approach of the First and Second Term Permits. The Third Term Permits issued by the San Diego Water Board included more detailed requirements that outlined the minimum level of implementation required for the Copermittees' programs to meet the maximum extent practicable (MEP) standard for storm water. The Third Term Permits included more detail to emphasize and enhance the jurisdictional runoff management programs developed by the Copermittees and introduced requirements for developing and implementing watershed-based programs.

The Third Term Permits also incorporated two precedent setting decisions by the State Water Board. In Order WQ 99-05, the State Water Board established receiving water limitation language to be included in all MS4 permits. The State Water Board's precedential language clarified that municipal storm water permits must include provisions requiring discharges to be controlled to attain water quality standards in receiving waters. Unlike previously adopted versions of the receiving water limitation language in the First and Second Term Permits, the language no longer stated that "*violations of water quality standards are not violations of the municipal storm water permit under certain conditions*." In addition, the receiving water limitation language no longer indicated that the "*implementation of best management practices is the 'functional equivalent' of meeting water quality standards*." State Water Board Order WQ 99-05 specifically requires language in MS4 permits for the Copermittees to comply with water quality standards based discharge prohibitions and receiving water limitations through timely implementation of control measures and other actions to reduce pollutants in discharges. (See State Water Board Order WQ 99-05 (*Environmental Health Coalition*)).

In Order WQ 2000-11, also a precedential decision, the State Water Board addressed design standards for structural post-construction best management practices (BMPs) for new development and significant redevelopment. The State Water Board found that the design standards, which require that runoff generated by 85 percent of storm events from specific development categories be infiltrated or treated, reflect the MEP standard. State Water Board Order WQ 2000-11 also found that the post-construction BMP provisions, or Standard Storm Water Mitigation Plan (SSMP) provisions, constitute MEP for addressing storm water pollutant discharges resulting from specific development categories.

The Third Term San Diego County and Orange County Permits (Order Nos. 2001-01 and R9-2002-0001, respectively) were appealed to the State Water Board. Minor modifications were made by the State Water Board, but the requirements were largely upheld. In State Water Board Order WQ 2001-15, the State Water Board upheld the Third Term San Diego County Permit requirements with certain modifications. The State Water Board removed the prohibition of storm water discharges *into* the MS4 that cause or contribute to exceedances of water quality objectives. The revision allows for treatment of pollutants in storm water runoff after the pollutants have entered the MS4. State Water Board Order WQ 2001-15 otherwise upheld all the other requirements of the permit.

In addition to the modification to the discharge prohibition in Order WQ 2001-15, the State Water Board refined Order WQ 99-05 by making clear that the Copermittees may use an iterative approach to achieving compliance with water quality standards that involves ongoing assessments and revisions. Thus, the language for the discharge prohibitions and receiving water limitations was revised to explicitly require the Copermittees to implement an iterative process of assessments and revisions to comply with the discharge prohibitions and receiving water limitations. The San Diego Water Board retained the authority to enforce receiving water limitations and discharge prohibitions even if the Copermittee is engaged in the iterative process.

The Third Term San Diego County Permit was subsequently challenged in the Superior Court of the State of California and the Court of Appeal, Fourth Appellate District. The Court of Appeals, Fourth Appellate District, found that the approach of the Third Term San Diego County Permit to regulating discharges into the MS4 was appropriate (*Building Industry Ass'n. v. State Water Resources Control Bd., et al.,* 124 Cal.App.4th 866 (2004)). The State of California Supreme Court denied review sought by the Building Industry Association in March 2005.

The Fourth Term Permits, or current MS4 permits, began with the adoption of Order No. R9-2007-0001 issued to the Copermittees of San Diego County in January 2007. Order Nos. R9-2009-0002 and R9-2010-0016 were subsequently issued to the Copermittees of Orange County and Riverside County. The Fourth Term Permits continued to include more detailed requirements to be implemented by each Copermittee's jurisdictional runoff management program. The Fourth Term Permits also include requirements to further emphasize a watershed management approach and for more coordination among jurisdictional runoff management programs. In addition, the Fourth Term Permits included more requirements for assessing the effectiveness of the runoff management programs being implemented by the Copermittees. The intent of the inclusion of additional requirements was to enhance and better define elements of the permit that were expected to be incorporated into the iterative process for managing runoff from each Copermittee's jurisdiction and within the watersheds of the San Diego Region.

The Fourth Term Permits include several new and emerging approaches for managing storm water runoff and discharges. Low impact development (LID) requirements are included for development and significant redevelopment to reduce pollutants in storm water runoff from sites through more natural processes such as infiltration and biofiltration closer to the source, rather than utilizing conventional mechanical end-of-pipe treatment systems. Hydrograph modification (hydromodification) management requirements also are included to mitigate the potential for increased erosion in receiving waters due to increased runoff rates and durations often caused by development and increased impervious surfaces. The Fourth Term Orange County and Riverside County Permits introduced requirements to identify areas of existing development where retrofitting with LID projects would be feasible and could be implemented to reduce storm water runoff and pollutants in storm water discharges.

The Fourth Term Orange County and Riverside County Permits included a clearer distinction between storm water and non-storm water discharges. The term "urban runoff" was completely removed, and a distinction between storm water (wet weather) runoff and non-storm water (dry weather) runoff was emphasized. This clarification was made to prevent any potential misunderstanding that regulation under the MS4 permits is limited only to urbanized areas, and to prevent non-storm water runoff from being managed in the same manner as storm water runoff. The term "urban runoff" is not defined in the Code of Federal Regulations (CFR) or Federal Register (FR) in the regulation of MS4 discharges. According to the CWA 402(p)(3)(B)(ii), MS4 permits must include a requirement to effectively prohibit non-storm water discharges into the MS4s.

Finally, for the Fourth Term Orange County and Riverside County Permits the San Diego Water Board found that non-storm water discharges to the MS4 from over application of irrigation water are sources of pollutants. The San Diego Water Board found that non-storm water discharges resulting from over-irrigation must be prohibited from entering the MS4 in accordance with the requirements of the CWA and pursuant to 40 CFR 122.26(d)(2)(iv)(B)(1).

The requirements of the Fourth Term Permits issued to the Copermittees in each county within the San Diego Region now have substantively the same core requirements such as discharge prohibitions, receiving water limitations, jurisdictional runoff management program components, and monitoring program requirements. There are, however, several inconsistencies that exist among the three Fourth Term Permits which complicate oversight and implementation of the permits by the San Diego Water Board.

The Fourth Term San Diego County Permit expired in January 2012. The Fourth Term Orange County and Riverside County Permits will expire in December 2014 and November 2015, respectively. Issuing the Fifth Term Permits within five years for three counties under three different permits would require the San Diego Water Board to expend significant time and resources for the issuance of the permits through three separate public proceedings, thereby greatly reducing the time and resources available to oversee implementation and compliance. Multiple permits also create confusion for determining compliance among regulated entities, especially for the land development community.

The San Diego Water Board has acknowledged that issuing a single MS4 permit for all the Copermittees in the San Diego Region can and is expected to result in more consistent implementation, improve communication among agencies within watersheds crossing multiple jurisdictions, and minimize resources spent with each permit renewal process. Within the findings of the Fourth Term Riverside County Permit issued in November 2010, the San Diego Water Board notified the public of its intent to develop and issue a single Regional MS4 Permit.

V. REGIONAL MS4 PERMIT APPROACH

The Fifth Term Permit, or Regional MS4 Permit, shifts the focus of the permit requirements from a minimum level of actions to be implemented by the Copermittees to identifying outcomes to be achieved by those actions. Order No. R9-2013-0001 represents an important paradigm shift in the approach for MS4 permits within the San Diego Region.

Historical Permitting Approach

The First and Second Term Permits were very broad and provided little specificity about what was required to be developed and implemented by the Copermittees. The Third Term Permits began to become more specific about the minimum level of implementation required by the Copermittees. The Fourth Term Permits, or current permits, subsequently increased in specificity. The MS4 permits have progressively become more detailed and focused on specifying the minimum level of actions expected to be implemented by the Copermittees. As detailed and specific as the MS4 permits have become, however, they include very little detail about what the desired outcomes of the required actions are expected to achieve. Compliance with the permit requirements has essentially been tracking numbers of actions and reporting, not tracking progress or actual improvements in the quality of receiving waters or discharges from the MS4s. The result has been an increase in actions being implemented by the Copermittees with little or no ability or expectations to determine whether or not improvements in water quality are being achieved.

The Fourth Term Permits result in significant resource expenditure by the Copermittees to report permit compliance information to the San Diego Water Board in the form of annual jurisdictional runoff management program, watershed program, and monitoring program reports. The San Diego Water Board must then expend much of its limited resources on reviewing more than 50 voluminous reports submitted annually by the Copermittees. The information currently reported by the Copermittees is of limited value when trying to measure progress toward achieving improvements in the quality of receiving waters or discharges from the MS4s. Oversight of the MS4 permits is further complicated by the inconsistencies among the requirements issued to the Orange County, San Diego County, and Riverside County Copermittees under three separate MS4 permits.

Under the Fourth Term Permits, the Copermittees must expend a significant portion of their limited resources collecting data of limited value, and putting together reports to submit that information to the San Diego Water Board. Likewise, the San Diego Water Board must expend most of its limited resources reviewing reports, and developing permits instead of working directly with the Copermittees to identify solutions to problems causing impacts to water quality. This is an unsustainable course that will continue to demand more resources from the Copermittees and the San Diego Water Board, and would continue to result in unknown water quality benefits.

New Permitting Approach

The goal of the Regional MS4 Permit is twofold: 1) bring a consistent set of MS4 permit requirements to all of the Copermittees within the San Diego Region; and, 2) provide a MS4 permit with requirements that will allow the Copermittees to focus their efforts and resources on achieving goals and desired outcomes toward the improvement of water quality rather than completing specific actions.

The overall approach included in the Regional MS4 Permit with respect to the jurisdictional runoff management programs will not differ significantly from the current permits. The general requirements for the jurisdictional runoff management program components and compliance with those requirements will remain and be applied consistently throughout the San Diego Region under the Regional MS4 Permit.

The most significant difference in the new permitting approach is the specific manner of implementation for those jurisdictional runoff management programs. Implementation will be based on decisions made by the Copermittees in accordance with what they have identified as their highest priority water quality conditions. In other words, the Copermittees will have significant control in how to implement the jurisdictional runoff management programs to best utilize their available resources in addressing a specific set of priorities effectively, instead of trying to address all the water quality priorities ineffectively.

The Copermittees are given the responsibility of identifying their highest priority water quality conditions that they intend to address. The Copermittees will develop goals that can be used to measure and demonstrate progress or improvements toward addressing those priorities. In addition to the goals, the Copermittees will provide a schedule for achieving the goals for those highest priorities. The measurement of progress toward achieving the goals for those highest priorities requires a better defined and more focused program of monitoring and assessment than under the Fourth Term Permits.

The monitoring and assessment program must be designed to inform the Copermittees of their progress, and the need for modifications in their jurisdictional runoff management programs and schedules to achieve their goals to improve water quality. The monitoring and assessment program requirements will have a more central role in the Regional MS4 Permit than in earlier permits. The monitoring and assessment requirements must also be designed to enable the Copermittees to focus and direct their efforts in implementing their jurisdictional runoff management programs toward their stated desired outcomes to improve the quality of receiving waters and/or discharges from the MS4s.

By providing a MS4 permit that allows the Copermittees to make more decisions about how to utilize and focus their resources, along with a better defined monitoring and assessment program to inform their water quality management decisions, the Copermittees will have the opportunity to:

1) *Plan strategically*. The Copermittees must have the ability to identify their available resources and develop and implement long term plans that can organize, collect, and use those resources in the most strategically advantageous and efficient manner possible. This ability to develop long term plans will allow the Copermittees to focus and utilize their resources in a more concerted way over the short term and long term to address specific water quality priorities through stated desired outcomes.

2) *Manage adaptively*. The Copermittees must be given the ability to modify their plans as additional information and data are collected from the monitoring and assessment programs. The Copermittees' plans may require modifications to the programs, priorities, goals, strategies, and/or schedules in order for the Copermittees to achieve a stated desired outcome.

3) *Identify synergies*. The Copermittees must be given more flexibility to identify efficiencies within and among their jurisdictional runoff management programs as the strategies are developed and implemented to increase the Copermittees' collective effectiveness. The Copermittees must also be able to identify and utilize resources available from other agencies and entities to further augment and enhance their jurisdictional runoff management programs and/or to collectively work with those other agencies and entities toward achieving a stated desired outcome.

The Regional MS4 Permit requirements will provide the Copermittees the flexibility and responsibility to decide what actions will be necessary to achieve an outcome that is tailored and designed by the Copermittees to improve specific prioritized water quality conditions. The San Diego Water Board expects the approach of the Regional MS4 Permit to give the Copermittees a greater sense of ownership for restoring the quality of receiving waters in the San Diego Region by becoming an integral part of the decision making process in identifying water quality conditions to be addressed, as well as determining the best use of their resources.

VI. ECONOMIC CONSIDERATIONS

Statutory Considerations

California Water Code (CWC) section 13241 requires the San Diego Water Board to consider certain factors, including economic considerations, in the adoption of water quality objectives. CWC section 13263 requires the San Diego Water Board to take into consideration the provisions of CWC section 13241 in adopting waste discharge requirements.

In *City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, the California Supreme Court considered whether Regional Water Boards must comply with CWC section 13241 when issuing waste discharge requirements under CWC section 13263(a) by taking into account the costs a permittee will incur in complying with the permit requirements. The Court concluded that whether it is necessary to consider such cost information "*depends on whether those restrictions meet or exceed the requirements of the federal Clean Water Act.*" (*Id.* at p. 627.) The Court ruled that Regional Water Boards may not consider the factors in CWC section 13241, including economics, to justify imposing pollutant restrictions that are less stringent than applicable federal law requires. (*Id.* At pp. 618, 626-627 ["*[Water Code section 13377 specifies that [] discharge permits issued by California's regional boards must meet the federal standards set by federal law. In effect, section 13377 forbids a regional board's consideration of any economic hardship on the part of the permit holder if doing so would result in the dilution of the requirements set by Congress in the Clean Water Act...Because CWC section 13263 cannot authorize what federal law forbids, it cannot authorize a regional board, when issuing a [] discharge permit, to use compliance costs to justify pollutant restrictions that do not comply with federal clean water standards*."]). However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Regional Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

As discussed in Section VII.F, Unfunded State Mandates, the San Diego Water Board finds that the requirements in this Order are not more stringent than the minimum federal requirements. Among other requirements, federal law requires MS4 permits to include requirements to effectively prohibit non-storm water discharges into the MS4s, in addition to requiring controls to reduce the discharge of pollutants in storm water to the MEP, and other provisions as USEPA or the State determines are appropriate for the control of pollutants in MS4 discharges.

The requirements in this Order may be more specific or detailed than those enumerated in federal regulations under 40 CFR 122.26 or in the USEPA guidance. However, the requirements have been designed to be consistent with and within the federal statutory mandates described in CWA section 402(p)(3)(B)(ii) and (iii) and the related federal regulations and guidance. Consistent with federal law, all of the

conditions in this Order could have been included in a permit adopted by USEPA in the absence of the in lieu authority of California to issue NPDES permits.

Moreover, the inclusion of numeric WQBELs in this Order does not cause this Order to be more stringent than federal law. Federal law authorizes both narrative and numeric effluent limitations to meet state water quality standards. The inclusion of WQBELs as discharge specifications in an NPDES permit in order to achieve compliance with water quality standards is not a more stringent requirement than the inclusion of BMP based permit limitations to achieve water quality standards (State Water Board Order No. WQ 2006-0012 (*Boeing*)). Therefore, consideration of the factors set forth in CWC section 13241 is not required for permit requirements to implement the effective prohibition on the discharge of non-storm water discharges into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determine appropriate to control such pollutants, as those requirements are mandated by federal law.

Included in the provisions of the Order are monitoring and reporting requirements that are designed to demonstrate that the Copermittees are implementing programs to comply with the CWA municipal storm water requirements. CWA section 308(a) and 40 CFR 122.41(h), (j)-(l), 122.44(i) and 122.48 require that all NPDES permits specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s (40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c)) also specify additional monitoring and reporting requirements. In addition to the federal requirements of the CWA, the San Diego Water Board also has the authority in CWC 13383 to establish monitoring, reporting, and recordkeeping requirements that implement federal and state laws and regulations through NPDES permits. .

The monitoring and assessment information that will be reported to the San Diego Water Board is necessary to determine if the Copermittees are making progress toward achieving compliance with the discharge prohibitions, receiving water limitations, and effluent limitations under Provision A of the Order. The monitoring and assessment information that will be reported is also expected to be key to the iterative approach and adaptive management process that is required to be implemented by the Copermittees if they cannot meet the discharge prohibitions and receiving water limitations under the present conditions, which is also part of the requirements under Provision A of the Order.

Notwithstanding the above, the San Diego Water Board has considered cost information in issuing this Order, as discussed below. The San Diego Water Board has also considered all of the evidence that has been presented to the San Diego Water Board regarding the CWC section 13241 factors in adopting this Order. The San Diego Water Board finds that the requirements in this Order are reasonably necessary to protect beneficial uses identified in the Basin Plan and the economic information related to costs of compliance and other CWC section 13241 factors are not sufficient to justify failing to protect those beneficial uses. Where appropriate, the

San Diego Water Board has provided or will consider providing the Copermittees with additional time to implement control measures to achieve final WQBELs and/or water quality standards.

Cost Information

Discussions of the financial and economic ramifications of municipal storm water management programs tend to focus on the significant costs incurred by municipalities in developing and implementing the programs. When considering the cost of implementing the programs, however, it is also important to consider the alternative costs that are incurred when programs are not fully implemented, as well as the economic benefits which result from effective program implementation.

The recent financial and economic conditions have amplified the concerns about the costs incurred by the municipalities in developing and implementing their programs. The reduction in resources resulting from the recent financial and economic conditions has been cited by many of the Copermittees as a justification for reducing the requirements that must be met by their programs. While the recent conditions are a cause for concern in the short term, these programs also have an opportunity to identify and implement improvements and efficiencies before the next period of growth and development, resulting in more effective and sustainable programs over the long term.

In addition, it is very difficult to ascertain the true cost of implementation of the Copermittees' management programs because of inconsistencies in reporting by the Copermittees. Reported costs of compliance for the same program element can vary widely from city to city, often by a very wide margin that is not easily explained.[2] Despite these problems, efforts have been made to identify management program costs, which can be helpful in understanding the costs of program implementation.

The San Diego Water Board recognizes that the Copermittees will incur costs in implementing this Order, potentially above and beyond the costs from the Copermittees' prior permits. The San Diego Water Board also recognizes that, due to California's current economic condition, many Copermittees currently have limited staff and resources to implement actions to address its MS4 discharges. Based on the economic considerations below, the San Diego Water Board has provided the Copermittees a significant amount of flexibility to choose how to implement the requirements of the Order.

The Order also allows the Copermittees to customize their plans, programs, and monitoring requirements. In the end, it is up to the Copermittees to determine the effective BMPs and measures necessary to comply with this Order. The Copermittees can choose to implement the least expensive measures that are effective in meeting the requirements of this Order. This Order also does not require the Copermittees to

[2] LARWQCB, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.

fully implement all requirements within a single permit term. Where appropriate, the Board has provided the Copermittees with additional time outside of the permit term to implement control measures to achieve final WQBELs and/or water quality standards.

The San Diego Water Board has considered cost information associated with compliance with this Order. It is not possible to predict accurately the cost impact of the requirements that involve an unknown level of implementation or that depend on environmental variables that are as yet undefined. Only general conclusions can be drawn from this information.

Estimated Municipal Storm Water Program Implementation Costs

The USEPA, the State Water Board, and the California Regional Water Quality Control Boards (Regional Water Boards) have attempted to evaluate the costs of implementing municipal storm water programs. The assessments have demonstrated that the true costs are difficult to ascertain and reported costs vary widely. In addition, reported fiscal analyses tend to neglect the costs incurred to municipalities when storm water and non-storm water runoff is not effectively managed, which are incurred as a result of pollution, contamination, nuisance, and damage to ecosystems, property, and human health. Nonetheless, they provide a useful context for considering the costs of requirements within Order No. R9-2013-0001.

In 1999, the USEPA reported on multiple studies it conducted to determine the cost of management programs. A study of Phase II municipalities determined that the annual cost of the Phase II program was expected to be $9.16 per household. The USEPA also studied 35 Phase I municipalities, finding costs to be $9.08 per household annually, similar to those anticipated for Phase II municipalities.[3]

The State Water Board commissioned a study by the California State University, Sacramento to assess costs of the Phase I MS4 program. This study includes an assessment of costs incurred by Phase I MS4s throughout the state to implement their programs. Annual cost per household in the study ranged from $18 to $46, with the Fresno-Clovis Metropolitan Area representing the lower end of the range, and the City of Encinitas (in San Diego County) representing the upper end of the range.[4]

A study on Phase I MS4 program costs was also conducted by the California Regional Water Quality Control Board, Los Angeles Region (Los Angeles Water Board), where program costs reported in the municipalities' annual reports were assessed. The Los Angeles Water Board estimated that average per household cost to implement the MS4 program in Los Angeles County was $12.50. [5]

[3] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791-68792.
[4] State Water Board, 2005. NPDES Stormwater Cost Survey. P. ii.
[5] Los Angeles Water Board, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.

It is important to note that reported program costs are not all attributable to solely complying with MS4 permits. Many program components, and their associated costs, existed before any MS4 permits were ever issued. For example, street sweeping and trash collection costs cannot be solely or even principally attributable to MS4 permit compliance, since these practices have long been expected from and implemented by municipalities.

Therefore, true program cost resulting from MS4 permit requirements is some fraction of reported costs. The California State University, Sacramento study found that only 38 percent of program costs are new costs fully attributable to MS4 permits. The remainder of the program costs was either pre-existing or resulted from enhancement of pre-existing programs.[6] In 2000, the County of Orange found that even lower amounts of program costs are solely attributable to MS4 permit compliance, reporting that the amount attributable to implement the County or Orange Drainage Area Management Plan (DAMP), was less than 20 percent of the total budget. The remaining 80 percent was attributable to pre-existing programs.[7] More current data from the County of Orange is not used in this discussion because the County of Orange no longer reports such information.

Estimated Value of Healthy Water Quality

Economic considerations of municipal storm water management programs cannot be limited only to program costs. Evaluation of programs must also consider information on the benefits derived from environmental protection and improvement.[8] Attention is often focused on municipal storm water management program costs, but the programs must also be viewed in terms of their value to the public.

Placing a value on healthy receiving waters is very difficult. Often the value of receiving waters with good water quality manifests in other forms, such as tourism, recreational opportunities, and/or increased property values. When surface water bodies are degraded, thereby degrading the habitat within and adjacent to the water bodies, the public loses the value and benefits associated with being able to use the area in and around the water bodies. Surface waters that are able to support the beneficial uses designated in the Basin Plan can sustain plants and wildlife that can attract visitors and residents, providing aesthetic, recreational, as well as monetary value to the public. At this time, however, there have been no studies for the San Diego Region to quantify the added value that surface waters with healthy water quality can provide.

USEPA has estimated that household willingness to pay for improvements in fresh water quality for fishing and boating is approximately $158-$210.[9] This estimate can be considered conservative, since it does not include important considerations such as

[6] State Water Board, 2005. NPDES Stormwater Cost Survey. P. 58.
[7] County of Orange, 2000. A NPDES Annual Progress Report. P. 60.
[8] Ribaudo M.O. and D. Heelerstein. 1992, *Estimating Water Quality Benefits: Theoretical and Methodological Issues.* U.S. Department of Agriculture. Technical Bulletin No. 1808.
[9] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68793.

marine waters benefits, wildlife benefits, or flood control benefits. Another study conducted by California State University, Sacramento reported that the annual household willingness to pay for statewide clean water is approximately $180.[10]

A study conducted by the University of Southern California and University of California, Los Angeles assessed the costs and benefits of implementing various approaches for achieving compliance with the MS4 permits in the Los Angeles region. The study found that non-structural systems would cost $2.8 billion but provide $5.6 billion in benefit. If structural systems were determined to be needed, the study found that total costs would be $5.7 to $7.4 billion, while benefits could reach $18 billion.[11] Costs are anticipated to be borne over many years, probably at least ten years.

As can be seen, the benefits of the municipal storm water management programs are expected to considerably exceed their costs. Such findings are corroborated by USEPA, which found that the benefits of implementation of its Phase II storm water rule would also outweigh the costs.[12]

[10] State Water Board, 2005. NPDES Stormwater Cost Survey. P. iv.
[11] Los Angeles Water Board, 2004. Alternative Approaches to Stormwater Control.
[12] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791.

VII. APPLICABLE STATUTES, REGULATIONS, PLANS AND POLICIES

A. Legal Authorities – Federal Clean Water Act and California Water Code

This Order is issued pursuant to section 402 of the CWA and implementing regulations adopted by the USEPA and chapter 5.5, division 7 of the CWC (commencing with section 13370). This Order serves as an NPDES permit for point source discharges to surface waters. This Order also serves as waste discharge requirements pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

The objective of the CWA is "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*." To carry out this objective, the CWA requires the implementation of permit programs to regulate the discharge of pollutants and dredged or fill material to the navigable waters of the U.S. and to regulate the use and disposal of sewage sludge. CWA section 402 provides the legal authority to issue a permit for the discharge of pollutants to waters of the U.S. under the NPDES. The CWA provides that NPDES permits may be issued by states which are authorized to implement the provisions of that act. California became authorized to implement the NPDES permit program on May 14, 1973.

The Porter-Cologne Water Quality Control Act (Division 7, commencing with CWC section 13000) established the State Water Resources Control Board (State Water Board) and nine Regional Water Quality Control Boards (Regional Water Boards) as the principal state agencies with primary responsibility for the coordination and control of water quality. CWC section 13200(f) established the San Diego Water Board, which has the primary responsibility for the coordination and control of water quality in the San Diego Region, which includes all the basins draining into the Pacific Ocean between the southern boundary of the Santa Ana Region and the California-Mexico boundary. The San Diego Water Board implements the CWA through Chapter 5.5 of the CWC, commencing with section 13370. CWC section 13377 provides the San Diego Water Board the legal authority to issue waste discharge requirements to ensure compliance with all applicable provisions of the CWA and acts amendatory thereof or supplementary, thereto, to implement water quality control plans, or for the protection of beneficial uses, or to prevent nuisance.

CWA section 402(p) requires the USEPA or authorized state to issue NPDES permits for storm water discharges from municipal separate storm sewer systems (MS4s) to waters of the U.S. CWA section 402(p)(3)(B)(ii) requires that NPDES permits for storm water discharges from MS4s "*effectively prohibit non-storm water discharges*" into the MS4s. CWA section 402(p)(3)(B)(iii) requires that NPDES permits for storm water discharges from MS4s to "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable* [MEP], *including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control*

of such pollutants."

The USEPA published implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]), which prescribe permit application requirements for storm water discharges from MS4s pursuant to CWA 402(p), on November 16, 1990. The USEPA published an Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems, which provided guidance on permit application requirements for regulated MS4s, on May 17, 1996. The federal regulations in 40 CFR 122 and guidance issued by USEPA serve as the foundation for the provisions of Order No. R9-2013-0001. The legal authorities provided by the above statutes and regulations are included as part of the discussions in Section VIII of this Fact Sheet.

B. Legal Authority for the Permit Issued on a Region-wide Basis

CWA section 402(p)(3)(B) provides the San Diego Water Board the legal authority to issue an NPDES permit for the San Diego Region as compared to separate MS4 permits based upon County- and partial County-wide boundaries as they exist within the San Diego Region. CWA section 402(p)(3)(B) states that "*Permits for discharges from municipal storm sewers- (i) may be issued on a system- or jurisdiction-wide basis ....*" The federal regulations in 40 CFR 122.26(a)(1)(v) also state that the San Diego Water Board "*may designate dischargers from municipal separate storm sewers on a system-wide or jurisdiction-wide basis. In making this determination, the [San Diego Water Board] may consider the following factors: (A) the location of the discharge with respect to waters of the United States; (B) the size of the discharge; (C) the quantity and nature of the pollutants discharged to waters of the United States; and (D) other relevant factors*."

More specifically, the federal regulations provide that for large and medium MS4 systems, the San Diego Water Board may issue a regional permit. Specifically, the federal regulation in 40 CFR 122.26(a)(3) provide:

"*(ii) The Director may either issue one system-wide permit covering all discharges from municipal separate storm sewers within a large or medium municipal storm sewer system or issue distinct permits for appropriate categories of discharges within a large or municipal separate storm sewer system including, but not limited to: all discharges owned or operated by the same municipality; located within the same jurisdiction; all discharges within a system that discharge to the same watershed; discharges within a system that are similar in nature; or for individual discharges from municipal separate storm sewers within the system.*

(iii) The operator of a discharge from a municipal separate storm sewer which is part of a large or medium municipal separate storm sewer system must either: (A) Participate in a permit application (to be a permittee or a co-permittee) with one or more other operator of discharges from the large or medium municipal storm sewer system which covers all, or a portion of all, discharges from the

municipal separate storm sewer system; (B) Submit a distinct permit application which only covers discharges from the municipal separate storm sewers for which the operator is responsible; or (C) A regional authority may be responsible for submitting a permit application under the following guidelines....

(iv) One permit application may be submitted for all or a portion of all municipal separate storm sewers within adjacent or interconnected large or medium municipal separate storm sewer systems. The Director may issue one systemwide permit covering all, or a portion of all municipal separate storm sewers in adjacent or interconnected large or medium municipal separate storm sewer systems.

(v) Permits for all or a portion of all discharges from large or medium municipal separate storm sewer systems that are issued on a system-wide, jurisdiction-wide, watershed or other basis may specify different conditions relating to different discharges covered by the permit, including different management programs for different drainage areas which contribute storm water to the system."

Based on these regulations, the San Diego Water Board may issue a region-wide MS4 permit. The regulations also clarify that the permit may include different conditions for separate discharges covered by the permit. This allows the San Diego Water Board to ensure that suitable water quality conditions and provisions are identified for each watershed.

The USEPA's responses to comments in the Final Rule for the above-mentioned regulations also make it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide, permits. In the Final Rule published in the Federal Register and containing the responses to comments, USEPA notes that 40 CFR 122.26(a)(3)(iv) would allow an entire system in a geographical region under the purview of a State agency to be designated under a permit.[13] USEPA also states that many commenters wanted to allow the permitting authority broad discretion to establish system-wide permits, and that EPA believes that paragraphs 40 CFR 122.26 (a)(1)(v) and (a)(3)(ii) allow for such broad discretion.[14]

This Order creates watershed requirements that apply to multiple counties. The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees. Managing storm water on a regional and watershed basis is expected to result in improved water quality, as the Order focuses on monitoring and management practices necessary to improve each watershed rather than political boundaries. A single permit also allows the San Diego Water Board staff to expend fewer resources developing successive multiple permits and allows more resources to be devoted to working cooperatively with all three current groups of Copermittees to ensure implementation of this Order results in improved water quality.

[13] 55 Federal Register 47990-01, 48042
[14] Ibid

C. Federal and California Endangered Species Acts

This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2115.5) or the Federal Endangered Species Act (16 United States Code [USC] sections 1531 to 1544). This Order requires compliance with requirements to protect the beneficial uses of waters of the U.S. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

D. California Environmental Quality Act

The action to adopt an NPDES Permit is exempt from the provisions of Chapter 3 of the California Environmental Quality Act (CEQA) (Public Resources Code section 21100, et seq.) pursuant to CWC section 13389. (*County of Los Angeles v. Cal. Water Boards* (2006) 143 Cal.App.4th 985.)

E. State and Federal Regulations, Plans and Policies

The legal authority provided by the following regulations, plans, and policies are also included as part of the discussions in Section VIII of this Fact Sheet.

Water Quality Control Plan for the San Diego Basin

The CWA requires the San Diego Water Board to establish water quality standards for each water body in its region. Water quality standards include beneficial uses, water quality objectives and criteria that are established at levels sufficient to protect beneficial uses, and an antidegradation policy to prevent degrading of waters. On September 8, 1994, the San Diego Water Board adopted the *Water Quality Control Plan for the San Diego Basin (*Basin Plan). The Basin Plan designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters in the San Diego Region. The San Diego Water Board has amended the Basin Plan on multiple occasions since 1994. In addition, the Basin Plan implements State Water Water Board Resolution No. 88-63, which established state policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply. Beneficial uses applicable to the surface water bodies that receive discharges from the MS4s within the San Diego Region generally include those listed below:

The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region:

- Municipal and Domestic Supply (MUN)
- Agricultural Supply (AGR)
- Industrial Process Supply (PROC)
- Industrial Service Supply (IND)
- Ground Water Recharge (GWR)
- Contact Water Recreation (REC1)
- Non-contact Water Recreation (REC2)
- Warm Freshwater Habitat (WARM)
- Cold Freshwater Habitat (COLD)
- Wildlife Habitat (WILD)
- Rare, Threatened, or Endangered Species (RARE)
- Freshwater Replenishment (FRSH)
- Hydropower Generation (POW)
- Preservation of Biological Habitats of Special Significance (BIOL)

The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region:

- Navigation (NAV)
- Commercial and Sport Fishing (COMM)
- Estuarine Habitat (EST)
- Marine Habitat (MAR)
- Aquaculture (AQUA)
- Migration of Aquatic Organisms (MIGR)
- Spawning, Reproduction, and/or Early Development (SPWN)
- Shellfish Harvesting (SHELL)

Pursuant to Water Code sections 13263 and 13377, the requirements of this Order implement the Basin Plan.

Water Quality Control Plan for Ocean Waters of California, California Ocean Plan

In 1972, the State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan). The State Water Board adopted the most recent amended Ocean Plan on September 15, 2009. The Office of Administrative Law approved it on March 10, 2010. On October 8, 2010, USEPA approved the 2009 Ocean Plan. The Ocean Plan is applicable, in its entirety, to ocean waters of the State. In order to protect beneficial uses, the Ocean Plan establishes water quality objectives and a program of implementation. Pursuant to Water Code sections 13263 and 13377, the requirements of this Order implement the Ocean Plan. The Ocean Plan identifies the beneficial uses of ocean waters of the State to be protected as summarized below:

- Industrial water supply
- Water contact and non-contact recreation, including aesthetic enjoyment;

navigation
- Commercial and sport fishing
- Mariculture
- Preservation and enhancement of designated Areas of Special Biological Significance
- Rare and endangered species
- Marine habitat
- Fish spawning and shellfish harvesting

On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving an exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges. The State Water Board Resolution No. 2012-0012 requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject terms and conditions of State Water Board Resolution No. 2012-0012. The Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 applicable to these discharges are hereby incorporated in this Order as if fully set forth herein. Requirements of this Order implement the Ocean Plan.

Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality

On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

Antidegradation Policy

Federal regulations (40 CFR 131.12) require that the state water quality standards include an antidegradation policy consistent with the federal antidegradation policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16 ("Statement of Policy with Respect to Maintaining the Quality of the Waters of the State"). State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law.

The San Diego Water Board's Basin Plan implements and incorporates by reference

both the State and federal antidegradation policies. State Water Board Resolution No. 68-16 and 40 CFR 131.12 require the San Diego Water Board to maintain high quality waters of the State until it is demonstrated that any change in quality will be consistent with maximum benefit to the people of the State, will not unreasonably affect beneficial uses, and will not result in water quality less than that described in the San Diego Water Boards' policies. State Water Board Resolution No. 68-16 requires that discharges of waste be regulated to meet best practicable treatment or control to assure that pollution or nuisance will not occur and the highest water quality consistent with the maximum benefit to the people of the State be maintained.

The discharges permitted in this Order are consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Board Resolution No. 68-16. Many of the water bodies within the area covered by this Order are of high quality. The Order requires the Copermittees to meet best practicable treatment or control to meet water quality standards. As required by 40 CFR 122.44(a), the Copermittees must comply with the "maximum extent practicable" technology-based standard set forth in CWA section 402(p) for discharges of pollutants in storm water from the MS4s.

Many of the waters within the area covered by this Order are impaired and listed on the State's CWA Section 303(d) List and the San Diego Water Board has established TMDLs to address the impairments. This Order requires the Copermittees to comply with permit provisions to implement the WLAs set forth in the TMDLs in order to restore the beneficial uses of the impaired water bodies consistent with the assumptions and requirements of the TMDLs. This Order includes requirements to develop and implement storm water management programs, achieve WQBELs, and effectively prohibit non-storm water discharges into the MS4. The issuance of this Order does not authorize an increase in the amount of discharge of waste.

Anti-Backsliding Requirements

CWA sections 402(o) and 303(d)(4) and 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations or conditions may be relaxed. All effluent limitations and other conditions in this Order are at least as stringent as the effluent limitations in the previous permits issued to the San Diego County Copermittees, the Orange County Copermittees and the Riverside County Copermittees.

Clean Water Act Section 303(d) List

CWA section 303(d)(1) requires each State to identify specific water bodies within its boundaries where water quality standards are not being met or are not expected to be met after implementation of technology-based effluent limitations on point sources. Water bodies that do not meet water quality standards are considered impaired and are placed on the state's "303(d) List." Periodically, USEPA approves the State's 303(d) List.

Most recently, USEPA approved the State's 2010 303(d) List of impaired water bodies on October 11, 2011, which includes certain receiving waters in the San Diego Region. For each listed water body, the state or USEPA is required to establish a TMDL of each pollutant impairing the water quality standards in that water body. A TMDL is a tool for implementing water quality standards and is based on the relationship between pollution sources and in-stream water quality conditions. The TMDL establishes the allowable pollutant loadings for a water body and thereby provides the basis to establish water quality-based controls. These controls should provide the pollution reduction necessary for a water body to meet water quality standards.

A TMDL is the sum of the allowable pollutant loads of a single pollutant from all contributing point sources (the waste load allocations or WLAs) and non-point sources (load allocations of LAs) plus the contribution from background sources and a margin of safety (40 CFR 130.2(i)). MS4 discharges are considered point source discharges. For 303(d)-listed water bodies and pollutants in the San Diego Region, the San Diego Water Board or USEPA develops and adopts TMDLs that specify these requirements.

Since 2002, the San Diego Water Board has established six (6) TMDLs to remedy water quality impairments in various water bodies within the San Diego Region (see Attachment E to the Order). These TMDLs identify MS4 discharges as a source of pollutants to these water bodies, and, as required, establish WLAs for MS4 discharges to reduce the amount of pollutant discharged to receiving waters. CWA section 402(p)(3)(B)(iii) requires the San Diego Water Board to impose permit conditions, including: "management practices, control techniques and system, design and engineering methods, and *such other provisions as the Administrator or the State determines appropriate for the control of such pollutants."* (Emphasis added.) CWA section 402(a)(1) also requires states to issue permits with conditions necessary to carry out the provisions of the CWA. Federal regulations also require that NDPES permits contain WQBELs consistent with the assumptions and requirements of all available WLAs (40 CFR 122.44(d)(1)(vii)(B)). CWC section 13377 also requires that NPDES permits include limitations necessary to implement water quality control plans. Therefore, this Order includes WQBELs and other provisions to implement the TMDL WLAs assigned to Copermittees regulated by this Order.

Other Regulations, Plans and Policies

This Order implements all other applicable federal regulations and State regulations, plans and policies, including the California Toxics Rule at 40 CFR 131.38 (Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California Rule [California Toxics Rule or CTR]), and State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP).

F. Unfunded State Mandates

Article XIII B, Section 6(a) of the California Constitution provides that whenever "*any state agency mandates a new program or higher level of service on any local government, the state shall provide a subvention of funds to reimburse that local government for the costs of the program or increased level of service*." The requirements of this Order do not constitute state mandates that are subject to a subvention of funds for several reasons, including, but not limited to, the following.

First, the requirements of this Order do not constitute a new program or a higher level of service as compared to the requirements contained in the previous Fourth Term Permits. The overarching requirement to impose controls to reduce the pollutants in discharges from MS4s is dictated by the CWA and is not new to this permit cycle (33 USC section 1342(p)(3)(B)). The inclusion of new and advanced measures as the MS4 programs evolve and mature over time is anticipated under the CWA (55 FR 47990, 48052 (Nov. 16, 1990)), and to the extent requirements in this Order are interpreted as new advanced measures, they do not constitute a new program or higher level of service.

Second, and more broadly, mandates imposed by federal law, rather than by a state agency, are exempt from the requirement that the local agency's expenditures be reimbursed (Cal. Const., art. XIII B, section 9, subd. (b)). This Order implements federally mandated requirements under the CWA and its requirements are therefore not subject to subvention of funds. This includes federal requirements to effectively prohibit non-storm water discharges, to reduce the discharge of pollutants in storm water to the MEP, and to include such other provisions as the Administrator or the State determines appropriate for the control of such pollutants (33 USC section 1342(p)(3)(B)). Federal cases have held these provisions require the development of permits and permit provisions on a case-by-case basis to satisfy federal requirements. (*Natural Resources Defense Council, Inc., v. USEPA* (9th Cir. 1992) 966 F.2d 1292, 1308, fn. 17.)

The authority exercised under this Order is not reserved state authority under the CWA's savings clause (cf. *Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 627-628 [relying on 33 USC section 1370, which allows a state to develop requirements which are not "less stringent" than federal requirements]), but instead is part of a federal mandate to develop pollutant reduction requirements for municipal separate storm sewer systems. To this extent, it is entirely federal authority that forms the legal basis to establish the permit provisions. (See, *City of Rancho Cucamonga v. Regional Water Quality Control Board, Santa Ana Region* (2006) 135 Cal.App.4th 1377, 1389; *Building Industry Ass'n of San Diego Co. v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 882-883.)

The MEP standard is a flexible standard that balances a number of considerations, including technical feasibility, cost, public acceptance, regulatory compliance, and effectiveness. (*Building Ind. Ass'n., supra,* 124 Cal.App.4th at pp. 873-874, 889.) Such considerations change over time with advances in technology and with experience

gained in storm water management (55 FR 47990, 48052 (Nov. 16, 1990)). Accordingly, a determination of whether the conditions contained in this Order exceed the requirements of federal law cannot be based on a point by point comparison of the permit conditions and the sic minimum control measures that are required "at a minimum" to reduce pollutants to the maximum extent practicable and to protect water quality (40 CFR 122.34). Rather, the appropriate focus is whether the permit conditions, as a whole, exceed the MEP standard.

In recent months, the County of Los Angeles and County of Sacramento Superior Courts have granted writs setting aside decisions of the Commission on State Mandates that held certain requirements in Phase I permits constituted unfunded mandates. In both cases, the courts have found that the correct analysis in determining whether an MS4 permit constituted a state mandate was to evaluate whether the permit as a whole – and not a specific permit provision – exceeds the MEP standard. (*State of Cal. V. Comm. on State Mandates* (Super. Ct. Sacramento County, 2012, No. 34-2010-80000604), *State of California v. County of Los Angeles* (Super. Ct. Los Angeles County, 2011, No. BS130730.) Both cases are currently pending appeal.

The requirements of the Order, taken as a whole rather than individually, are necessary to reduce the discharge of pollutants to the MEP and to protect water quality. The San Diego Water Board finds that the requirements of the Order are practicable, do not exceed federal law, and thus do not constitute an unfunded mandate. These findings are the expert conclusions of the principal state agency charged with implementing the NPDES program in California (CWC sections 13001, 13370).

It should also be noted that the provisions in this Order to effectively prohibit non-storm water discharges are also mandated by the CWA (33 USC section 1342(p)(3)(B)(ii)). Likewise, the provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state establishes or adopts a TMDL, federal law requires that permits must contain effluent limitations consistent with the assumptions and requirements of any applicable waste load allocation in a TMDL (40 CFR 122.44(d)(1)(vii)(B)).

Third, the local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental dischargers who are issued NPDES permits for storm water discharges. With a few inapplicable exceptions, the CWA regulates the discharge of pollutants from point sources (33 USC section 1342) and the Porter-Cologne Act regulates the discharge of waste (CWC section 13263), both without regard to the source of the pollutant or waste. As a result, the "costs incurred by local agencies" to protect water quality reflect an overarching regulatory scheme that places similar requirements on governmental and non-governmental dischargers. (See *County of Los Angeles v. State of California* (1987) 43 Cal.3d 46, 57-58 [finding comprehensive workers' compensation scheme did not create a cost for local agencies that was subject to state subvention].)

The CWA and the Porter-Cologne Act largely regulate storm water with an even hand, but to the extent there is any relaxation of this even-handed regulation, it is in favor of the local agencies. Generally, the CWA requires point source dischargers, including dischargers of storm water associated with industrial or construction activity, to comply strictly with water quality standards (33 USC section 1311(b)(1)(C); *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159, 1164-1165 [noting that industrial discharges must strictly comply with water quality standards]). As discussed in prior State Water Board decisions, certain provisions of this Order do not require strict compliance with water quality standards (State Water Board Order No. WQ 2001-0015, p. 7). Those provisions of this Order regulate the discharge of waste in municipal storm water under the CWA's MEP standard, not the BAT/BCT standard that applies to other types of discharges. These provisions, therefore, regulate the discharge of waste in municipal storm water more leniently than the discharge of waste from non-governmental sources.

Fourth, the Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)). To the extent that the local agency Copermittees have voluntarily availed themselves of the permit, the program is not a state mandate. (Accord, *County of San Diego v. State of California* (1997) 15 Cal.4th 68, 107-108.)

Fifth, the local agency Copermittees' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under state law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

Finally, even if any of the permit provisions could be considered unfunded mandates, under Government Code section 17556, subdivision (d), a state mandate is not subject to reimbursement if the local agency has the authority to charge a fee. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order, subject to certain voting requirements contained in the California Constitution. (See Cal. Const., Art. XIII D, section 6, subd. (c); see also *Howard Jarvis Taxpayers Ass'n v. City of Salinas* (2002) 98 Cal.App.4th 1351, 1358-1359.) The Fact Sheet demonstrates that numerous activities contribute to the pollutant loading in the MS4. Local agencies can levy service charges, fees, or assessments on these activities, independent of real property ownership. (See, e.g., *Apartment Ass'n of Los Angeles County, Inc., v. City of Los Angeles* (2001(24 Cal.4th 830, 842 [upholding inspection fees associated with renting property].) The authority and ability of a local agency to defray the cost of a program without raising taxes indicates that a program does not entail a cost subject to subvention. (*Clovis Unified School Dist. V. Chiang* (2010) 188 Cal.App.4th 794, 812, citing *Connell v. Sup. Ct.* (1997) 59 Cal.App.4th 382, 401; *County of Fresno v. State of California* (1991) 53 Cal. 3d. 482, 487-488.)

VIII. PROVISIONS

The provisions (i.e. NPDES permit requirements) of the Order are discussed below.

A. Prohibitions and Limitations

Purpose: Provision A includes the prohibitions and limitations requirements that are the foundation of all the subsequent requirements included in the Order. Compliance with the prohibitions and limitations will restore and protect receiving waters from impacts that may be caused by discharges into and from the Copermittees' MS4s and ultimately achieve the objective of the CWA.

In meeting the requirements set forth in the Order, the Copermittees must be cognizant that the prohibitions and limitations exist and will be the standard by which the San Diego Water Board will be measuring the progress and success of their implementation of the NPDES permit requirements.

***Discussion*:** The objective of the CWA is to "*restore and maintain the chemical, physical, and biological integrity of the Nation's waters*." The CWA requires the implementation of NPDES permit programs to regulate discharges of pollutants and dredged or fill material to the navigable waters of the U.S. For discharges into and from MS4s, the CWA requires the NPDES permits to "*effectively prohibit non-stormwater discharges into the storm sewers*" and "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable.*"

Provision A includes limitations, consistent with the requirements of the CWA for discharges from MS4s. Provision A expresses these limitations as discharge prohibitions, receiving water limitations, and effluent limitations. Compliance with the discharge prohibitions and receiving water limitations is also explicitly described, in conformance with precedential State Water Board Orders.

More specific and detailed discussions of the requirements of Provision A are provided below.

Provision A.1 (Discharge Prohibitions) prohibits the discharge of specific types of waste into and/or from the Copermittees' MS4s.

Provision A.1.a restates and reiterates Basin Plan Waste Discharge Prohibition 1, by prohibiting discharges into and from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the

state. The terms pollution,[15] contamination,[16] and nuisance[17] are defined under CWC 13050. Provision A.1.c incorporates all the waste discharge prohibitions of the Basin Plan into the requirements of the Order. The waste discharge prohibitions from the Basin Plan have been reproduced and provided in Attachment A to the Order.

Provision A.1.b requires non-storm water discharges into the MS4s to be effectively prohibited, consistent with the requirements of the CWA for MS4 permits to "*effectively prohibit non-stormwater discharges into the storm sewers*." The prohibition does not apply to NPDES permitted discharges into the Copermittees' MS4s. The prohibition also refers to the requirements of Provisions E.2.a.(1)-(5), which has specific requirements for the Copermittees to address certain types of non-storm water discharges if they enter the MS4.

The CWA employs the strategy of prohibiting the discharge of any pollutant from a point source into waters of the United States unless the discharger of the pollutant(s) obtains an NPDES permit pursuant to CWA Section 402. The 1987 amendment to the CWA includes provision 402(p) that specifically addresses NPDES permitting requirements for storm water discharges from MS4s. CWA section 402(p) prohibits the discharge of pollutants from specified MS4s to waters of the U.S. except as authorized by an NPDES permit and identifies two substantive standards for MS4 storm water permits. MS4 permits (1) "*shall include a requirement to effectively prohibit nonstormwater discharges into the storm sewers*" and (2) "*shall require controls to reduce the discharge of pollutants to,the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or State determines appropriate for the control of such pollutants*." (CWA section 402(p)(3)(B)(ii-iii).)

In November 1990, the USEPA published regulations addressing storm water discharges from MS4s (55 FR 47990 and following (Nov. 16, 1990) (Phase I Final Rule)). The regulations establish minimum requirements for MS4 permits, and generally focus on the requirement that MS4s implement programs to reduce the amount of pollutants found in storm water discharges to the MEP. The CWA's municipal storm water MEP standard does not require storm water discharges to strictly meet water quality standards, as is required for other NPDES permitted discharges. Compliance is achieved through an iterative approach of continuous implementation of improved BMPs. This distinction reflects Congress's recognition that

[15] CWC 13050(l): "(1) 'Pollution' means an alteration of the quality of waters of the state by waste to a degree which unreasonably affects either of the following: (A) The water for beneficial uses. (B) Facilities which serve beneficial uses. (2) 'Pollution' may include "contamination.
[16] CWC 13050(k): "Contamination' means an impairment of the quality of waters of the state by waste to a degree which creates a hazard to public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste, whether or not waters of the state are affected."
[17] CWC 13050(m): "Nuisance' means anything which meets all of the following requirements: (1) Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. (2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. (3) Occurs during, or as a result of, the treatment or disposal of wastes."

variability in flow and intensity of storm events render difficult strict compliance with water quality standards by MS4 permittees. In describing the controls that permits must include to reduce pollutants in storm water discharges to the MEP, the statute (CWA section 402(p)(3)(B)(iii)) states that the controls shall include: "*management practices, control techniques and system, design and engineering methods, and such other provisions as the [permit writer] determines appropriate for the control of such pollutants*."

In contrast, non-storm water discharges from the MS4 that are not authorized by separate NPDES permits, nor specifically included in a category of non-storm water discharges only required to be addressed if identified as a source of pollutants (see 40 CFR 122.26(d)(2)(iv)(B)), are subject to requirements under the NPDES program, including discharge prohibitions, technology based effluent limitations and water quality-based.effluent limitations (40 CFR 122.44). The regulations also require the Copermittee's program to include an element to detect and remove illicit discharges and improper disposal into the storm sewer (40 CFR 122.26(d)(2)(iv)(B)).

While "non-storm water" is not defined in the CWA or federal regulations, the federal regulations (at 40 CFR 122.26(b)(2)) define "*illicit discharge*" as *"any discharge to a municipal separate storm sewer that is not composed entirely of storm water and that is not covered by an NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer and discharges resulting from fire fighting activities)*." This definition is the most closely applicable definition of "non-storm water" contained in federal law. As stated in the Phase I Final Rule, USEPA added the illicit discharge program requirement to begin implementation of the 'effective prohibition' requirement to detect and control non-storm water discharges to their municipal system.

Thus, federal law mandates that permits issued to MS4s must require management practices that will result in reducing storm water pollutants to the MEP yet at the same time requires that non-storm water discharges be effectively prohibited from entering the MS4. "Effectively" prohibit does not mean that non-storm water discharges are authorized to be discharged into and from the Copermittees' MS4s. The Phase I Final Rule clarifies what "effectively prohibit" means (55 FR 47995):

> "*Section 402(p)(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit (other than the permit for the discharge from the municipal separate storm sewer)*."

Consistent with federal law, unless non-storm water discharges to the MS4 are authorized by a separate NPDES permit or are specifically included in a category of non-storm water discharges only required to be addressed if identified as a source of pollutants under federal regulations, non-storm water discharges are appropriately

subject to the effective prohibition requirement in the CWA and Regional Water Boards are not limited by the iterative MEP approach to storm water regulation in crafting appropriate regulations for non-storm water discharges.

The federal regulations (40 CFR 122.26(d)(vi)(B)(1)) require the Copermittees to "*implement and enforce an ordinance, order or similar means*" to prevent non-storm water discharges to their MS4s. Thus, the Copermittees are required to "*effectively*" prohibit non-storm water discharges to their MS4s through enforcing their "*ordinance, order or similar means*" and remove those discharges to their MS4s, or require those discharges to obtain coverage under a separate NPDES permit. More detail about the program that must be implemented to "*effectively*" prohibit non-storm water discharges to the Copermittees' MS4s is provided under the discussion for Provision E.2.

Provision A.1.d was included to be consistent Resolution No. 2012-0012, adopted by the State Water Board on March 20, 2012. Provision A.1.d prohibits discharges from MS4s to Areas of Special Biological Significance (ASBS), except for storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach to the Heisler Park ASBS subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012. The pertinent Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 are provided in Attachment A to the Order.

Provision A.2 (Receiving Water Limitations) specifies the condition of the receiving waters that must be achieved when there are discharges from the Copermittees' MS4s. Receiving water limitations are included in all NPDES permits issued pursuant to the CWA section 402. CWA section 402(p)(3)(B)(iii) authorizes the inclusion of "*such other provisions as the Administrator or the State determines appropriate for the control of [] pollutants*." This requirement gives USEPA or the State permitting authority, in this case the San Diego Water Board, discretion to determine what permit conditions are necessary to control pollutants.

In its Phase I Final Rule (see 55 FR 47990, 47994 (Nov. 16, 1990)), USEPA elaborated on these requirements, stating that, "*permits for discharges from municipal separate storm sewer systems must require controls to reduce the discharge of pollutants to the maximum extent practicable, and where necessary water quality-based controls*." USEPA reiterated in its Phase II Final Rule (64 FR 68722, 68737), that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL*." CWC section 13377 also requires that NPDES permits include limitations necessary to implement water quality control plans. Both the State Water Board and the San Diego Water Board have previously concluded that discharges from the MS4 contain pollutants that have the reasonable potential to cause or contribute to excursions above water quality standards. As such, inclusion of receiving water limitations is appropriate to control MS4 discharges.

The inclusion of receiving water limitations is also consistent with the Ninth Circuit Court of Appeals' ruling in *Defenders of Wildlife v. Browner* (191 F.3d 1159, 1166 (1999)) that the permitting authority has discretion regarding the nature and timing of requirements that it includes as MS4 permit conditions to attain water quality standards. The Ninth Circuit Court of Appeals recently explained that, "*[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*" (*Natural Resources Defense Council v. County of Los Angeles* (9th Cir. 2011) 673 F.3d 880, 886 (review granted by the Supreme Court on other grounds).)

The receiving water limitations included in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan or in water quality control plans or policies adopted by the State Water Board, including State Water Board Resolution No. 68-16, or in federal regulations, including but not limited to 40 CFR 131.12 and 131.38. The water quality objectives in the Basin Plan and other State Water Board plans and policies have been approved by USEPA and combined with designated beneficial uses constitute the water quality standards required under federal law.

Provision A.2.a requires that discharges from the Copermittees' MS4s must not cause or contribute to the violation of water quality standards in receiving waters. The water quality standards of the receiving waters must be protected from the impacts that may be caused by the Copermittees' MS4 discharges. Water quality standards applicable to the surface waters in the San Diego Region must be achieved through meeting the technology based standard of MEP through an iterative process of improved management actions. Provision A.2.a is also consistent with State Water Board Order WQ 99-05 precedent-setting language requiring discharges from MS4s to attain receiving water quality standards. The water quality control plans and policies with water quality standards applicable to the waters in the San Diego Region are included under Provision A.2.a.

Provisions A.2.b was included to be consistent with the requirements of State Water Board Resolution No. 2012-0012, adopted on March 20, 2012.

<u>Provision A.3 (Effluent Limitations)</u> specifies the condition of the discharges from the Copermittees' MS4s that must be achieved if and when there are discharges.

Consistent with CWA section 301(b)(1)(A) and 40 CFR 122.44(a), Provision A.3.a includes the technology-based effluent limitations that must be included in the Order. The technology-based effluent limits, representing the minimum level of control that must be imposed in a permit under CWA section 402, requires that pollutants in discharges of storm water from the Copermittees' MS4s be reduced to the MEP. This provision applies specifically to storm water discharges. Non-storm water discharges

must be effectively prohibited, as required under Provision A.1.b. Non-storm water (dry weather) discharges from the MS4 are not considered storm water (wet weather) discharges and therefore are not subject to the MEP standard.

The technology-based MEP standard is an ever-evolving, flexible, and advancing concept. Neither Congress nor USEPA has specifically defined the term "maximum extent practicable." Congress established this flexible MEP standard so that the administrative bodies would have "*the tools to meet the fundamental goals of the Clean Water Act in the context of storm water pollution*." (*Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 884.) As knowledge about controlling storm water runoff and discharges continues to evolve, so does the knowledge which constitutes MEP. Reducing the discharge of pollutants in storm water from the MS4 to the MEP requires the Copermittees to assess each program component and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP.

The San Diego Water Board or the State Water Board ultimately define MEP, and may include requirements that provide specific guidance on what is expected to demonstrate MEP. It is the responsibility of the Copermittees to propose actions that implement BMPs to reduce storm water pollution to the MEP. In other words, the Copermittees' runoff management programs developed and implemented under the Order are the Copermittees' proposals of achieving MEP. Their total collective and individual activities conducted pursuant to their runoff management programs become their proposal for achieving MEP as it applies both to their overall effort, as well as to specific activities. Provisions B through E of the Order provides a minimum framework to guide the Copermittees in achieving the MEP standard for discharges of pollutants in storm water.

Provision A.3.b incorporates any water quality based effluent limitations (WQBELs) applicable to the MS4s established for TMDLs adopted and approved for the San Diego Region and requires the Copermittees to comply with those WQBELs. This is consistent with 40 CFR 122.44(d)(1)(vii)(B), which requires that NPDES permits to incorporate WQBELs "*developed to protect a narrative water quality criterion, a numeric water quality criterion, or both…consistent with the assumptions and requirements of any available wasteload allocation for the discharge...*"

Pursuant to CWA section 303(d), for surface water bodies identified as impaired by one or more pollutants, the San Diego Water Board is required to establish TMDLs "*at a level necessary to implement the applicable water quality standards with seasonal variations and a margin of safety which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality*." The TMDLs identify sources of the pollutants causing the impairments and assign portions of the TMDL as WLAs to point sources, which include MS4s.

WLAs must be expressed in NPDES permits as WQBELs, which may include one or more numeric components such as numeric effluent limits, and/or receiving water

limitations, and/or BMP requirements. Because numeric targets for TMDLs typically include a component that will be protective of water quality standards, a TMDL will likely include one or more numeric receiving water limitations and/or effluent limitations as part of the assumptions or requirements of the TMDL. Any numeric receiving water limitations and/or effluent limitations developed as part of the assumptions or requirements of a TMDL must be incorporated and included as part of a WQBELs for the MS4s.

Because the development and approval of new TMDLs, or modification of existing TMDLs, may occur during the term of this Order, the specific provisions of those TMDLs, including effluent limitations applicable to MS4s are provided within Attachment E to the Order. Attachment E will be updated with new TMDLs and modifications to existing TMDLs in a timely manner as they occur.

Provision A.4 (Compliance with Discharge Prohibitions and Receiving Water Limitations) describes the process required to be implemented by the Copermittees if compliance with the discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a are not being achieved under current conditions.

In its Phase II Stormwater Regulations, Final Rule, USEPA states that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL.*"[18] In a series of comment letters on MS4 permits issued by various Regional Water Boards, USEPA has also reiterated that MS4 discharges must meet water quality standards.[19] In addition, the Ninth Circuit Court of Appeals explained in a recent ruling that, *"[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*"[20]

Water quality standards for the San Diego Region are established in the Basin Plan. The water quality standards of the Basin Plan are incorporated into this Order as the discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a. The discharge prohibitions and receiving water limitations in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations or prohibitions to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan, water quality control plans or policies adopted by the State Water Board, including Resolution No.

[18] Phase II Stormwater Regulations, Final Rule, 64 Fed. Reg. 68722, 68737.
[19] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.
[20] NRDC v. County of Los Angeles (9th Cir. 2011), 673 F.3d 880, 886. On July 13, 2012, the United States Supreme Court granted review of this case on other grounds. See also, *Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 884-886, citing *Defenders of Wildlife v. Browning,* (9th Cir. 1999) 191 F.3d 1159.)

68-16, or federal regulations, including but not limited to, 40 CFR 131.12 and 131.38. The waste discharge prohibitions and water quality objectives in the Basin Plan have been approved by USEPA and combined with the designated beneficial uses constitute the water quality standards required under federal law.

Under federal law (CWA section 402(p)(3)(B)(iii)), an MS4 permit must include "*controls to reduce the discharge of pollutants to the maximum extent practicable...and such other provision as...the State determines appropriate for control of such pollutants*." The State Water Board has previously determined that limitations necessary to meet water quality standards are appropriate for the control of pollutants discharged by MS4s and must be included in MS4 permits. (State Water Board Orders WQ 91-03, 98-01, 99-05, 2001-15; see also *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159.) This Order prohibits discharges that case or contribute to violations of water quality standards.

The discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a are included in this Order to ensure that discharges from the MS4s do not cause or contribute to exceedances of water quality objectives necessary to protect the beneficial uses of the receiving waters.

Provision A.4 is consistent with the precedent-setting language in State Water Board Order WQ 99-05 required to be included in municipal storm water permits. State Water Board Order WQ 2001-15 refined Order WQ 99-05 by requiring an iterative approach to compliance with water quality standards involving ongoing assessments and revisions, as referred to as the "iterative process." The "iterative process" is a fundamental NPDES requirement for municipal storm water permits to achieve the objectives of the CWA.

The State Water Board and Regional Water Boards have stated that the provisions under Provisions A.1.a, A.1.c, A.2.a, and A.4 are independently applicable, meaning that compliance with one provision does not provide a "safe harbor" where there is non-compliance with another provision (i.e., compliance with the Provision A.4 does not shield a Copermittee who may have violated Provision A.1.a, A.1.c, or A.2.a from an enforcement action). The intent of Provision A.4 is to ensure that the Copermittees have the necessary storm water management programs and controls in place, and that they are modified by the Copermittees in a timely fashion when necessary, so that compliance with Provisions A.1.a, A.1.c, and/or A.2.a is achieved as soon as possible. USEPA expressed the importance of this independent applicability in a series of comment letters on MS4 permits proposed by various Regional Water Boards. At that time, USEPA expressly objected to certain MS4 permits that included language stating, *"permittees will not be in violation of this [receiving water limitation] provision … [if certain steps are taken to evaluate and improve the effectiveness of the*

jurisdictional runoff management programs]," concluding that this phrase would not comply with the CWA.[21]

The Ninth Circuit held in *Natural Resources Defense Council v. County of Los Angeles* (2011) 673 F3d. 880, 886 (certiorari granted on other grounds) that engagement in the iterative process does not provide a safe harbor from liability for violations of permit terms prohibiting exceedances of water quality standards. The Ninth Circuit holding is consistent with the position of the State and Regional Water Boards that exceedances of water quality standards in an MS4 permit constitute violations of permit terms subject to enforcement by the Water Boards or through a citizen suit. While the Water Boards have generally directed dischargers to achieve compliance by improving control measures through the iterative process, the San Diego Water Board retains the discretion to take other appropriate enforcement and the iterative process does not shield dischargers from citizen suits under the CWA.

The requirements of Provision A.4, therefore, are required to be implemented until the water quality standards expressed under Provisions A.1.a, A.1.c, and A.2.a are achieved. The CWA requires MS4 permits to "*require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." The requirements of this Order have been deemed or determined to be "appropriate" to achieve water quality standards in receiving waters.

Part of the "*controls*" required by the Order is the process described in Provision A.4. Provision A.4 includes the process that is ultimately expected to achieve compliance with the requirement that discharges from the MS4 do not cause or contribute to violations of water quality standards in the receiving waters. The implementation of Provision A.4 is required when the Copermittees or the San Diego Water Board have determined that discharges from the MS4 are causing or contributing to violations of water quality standards in the receiving waters.

The Copermittees must effectively prohibit non-storm water discharges into the MS4s, reduce the discharge of pollutants in storm water from the MS4s to the MEP, and ensure that their MS4 discharges do not cause or contribute to violations of water quality standards. If the Copermittees have effectively prohibited non-storm water discharges and reduced storm water pollutant discharges to the MEP, but their discharges are still causing or contributing to violations of water quality standards, Provision A.4 provides a clear "iterative process" for the Copermittees to follow.

Provision A.4 essentially requires the Copermittees to implement additional BMPs until MS4 discharges no longer cause or contribute to a violation of water quality standards.

[21] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.

In assessing compliance and potential enforcement actions, the San Diego Water Board looks at the Copermittees' efforts in total to meet the requirements of Provisions A.1.a, A.1.c, A.2.a and Provision A.4. The Copermittees need to demonstrate that they are making improvements to their programs and making progress toward achieving the discharge prohibitions and receiving water limitations in Provisions A.1.a, A.1.c, and A.2.a by implementing the requirements of Provision A.4. The San Diego Water Board would consider these efforts prior to strictly enforcing the requirements of Provisions A.1.a, A.1.c, and A.2.a. Causes of exceedances of the receiving water limitations can often be more difficult to identify and attribute solely to the Copermittees' MS4s. The intent of the Order is to provide the Copermittees more clarity and flexibility in addressing these exceedances through the iterative approach and adaptive management process until the requirements under Provisions A.1.a, A.1.c, and A.2.a are fully achieved.

An exception to the iterative approach and adaptive management process would be in receiving waters subject to adopted and approved TMDLs. For TMDLs that are incorporated into the Order, there is a specific date for compliance to be achieved, after which the iterative approach and adaptive management process required under Provision A.4 no longer provides the flexibility to achieve compliance. Where compliance dates for a TMDL have passed, compliance with the WQBELs incorporated into the Order to be consistent with the assumptions and requirements of a WLA established by a TMDL to protect water quality standards is required. Thus, after the interim or final compliance dates for a TMDL have passed, if the discharges from the Copermittees' MS4s are causing or contributing to a violation of WQBELs, exceedances of WQBELs must be strictly enforced by the San Diego Water Board.

B. Water Quality Improvement Plans

Purpose: Provision B includes requirements for the Copermittees to develop and implement Water Quality Improvement Plans to ultimately comply with the prohibitions and limitations under Provision A. The Water Quality Improvement Plans will provide the Copermittees a comprehensive program that can achieve the requirements of the CWA. Implementation of the Water Quality Improvement Plans will also improve the quality of the receiving waters in the San Diego Region.

The Water Quality Improvement Plan is the backbone of the Regional MS4 Permit requirements. Provision B provides the guidance, criteria, and minimum expectations and requirements for the elements of the Water Quality Improvement Plan to be developed and implemented by the Copermittees. The Water Quality Improvement Plans will be implemented in the Watershed Management Area by the Copermittees within their jurisdictions through their jurisdictional runoff management programs.

The Water Quality Improvement Plan also incorporates a program to monitor and assess the progress of the Copermittees' jurisdictional runoff management programs toward improving the quality of discharges from the MS4s, as well as tracking improvements to the quality of receiving waters. A process to adapt and improve the effectiveness of the Water Quality Improvement Plans has also been incorporated into the requirements of Provision B to be consistent with the "iterative approach" required to achieve compliance with discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a, pursuant to the requirements of Provision A.4.

The Water Quality Improvement Plans have also been structured to incorporate the requirements of any TMDLs that have been adopted for the San Diego Region. Incorporating the requirements of the TMDLs into the requirements of Provision B allows the Copermittees to develop a single plan, instead of separate plans, to coordinate their non-storm water and storm water runoff management programs. The Water Quality Improvement Plans allow the Copermittees to meet the requirements of this Order, as well as fulfill the requirements of the WLAs that have been assigned to discharges from the MS4s.

As an added benefit, if the Copermittees demonstrate that impaired water bodies within the Watershed Management Area listed on the 303(d) List will be addressed with their Water Quality Improvement Plans in a reasonable period of time, the San Diego Water Board may be able to remove the water bodies from the 303(d) List, which would greatly reduce the need for the San Diego Water Board to develop additional TMDLs that would have to be incorporated into the Order.

***Discussion*:** The federal NPDES regulations require the Copermittees to develop a proposed management program (40 CFR 122.26(d)(2)(iv)). The proposed management program must include "*a comprehensive planning process*" and "*where*

necessary intergovernmental coordination" for the "*duration of the permit.*" The Water Quality Improvement Plan is the Copermittees' "*comprehensive planning process*" document for the proposed management program that will be implemented within a Watershed Management Area. Implementation of the Water Quality Improvement Plan requires "*intergovernmental coordination*" among the Copermittees for at least the "*duration of the permit*," and likely into and beyond the next iteration of the permit.

Developing Water Quality Improvement Plans based upon watersheds is consistent with federal regulations that support the development of permit conditions, as well as implementation of storm water management programs, at a watershed scale (40 CFR 122.26(a)(3)(ii), 122.26(a)(3)(v), and 122.26(d)(2)(iv)). In 2003, USEPA issued a Watershed-Based NPDES Permitting Policy Statement (USEPA, 2003) that defines watershed-based permitting as an approach that produces NPDES permits that are issued to point sources on a geographic or watershed basis. In this policy statement, USEPA explains that "*[t]he utility of this tool relies heavily on a detailed, integrated, and inclusive watershed planning process*." USEPA identifies a number of important benefits of watershed permitting, including more environmentally effective results, the ability to emphasize measuring the effectiveness of targeted actions on improvements in water quality, reduced cost of improving the quality of the nation's waters and more effective implementation of watershed plans, including TMDLs, among others.

An emphasis on watersheds is appropriate at this stage in the San Diego Region's MS4 program to shift the focus to more targeted, water quality driven planning and implementation. Addressing discharges on a watershed scale focuses on water quality results by emphasizing the receiving waters in the watershed. The conditions of the receiving waters drive management actions, which in turn focus measures to address pollutant contributions from MS4 discharges.

The Water Quality Improvement Plan gives the Copermittees the responsibility of developing a comprehensive plan to coordinate the efforts of their jurisdictional runoff management programs for addressing the problems related to MS4 discharges causing impacts to water quality in the Watershed Management Area. The development of the plan provides the Copermittees the opportunity to provide significant input on how to implement their jurisdictional runoff management programs, and how to best utilize their available resources in addressing a focused set of priorities that they believe will result in measureable improvements to water quality within the Watershed Management Area.

The Copermittees are encouraged to separate the Watershed Management Area into subwatersheds, as appropriate. This allows the Copermittees to identify priorities applicable to a subset of the Copermittees or specific water bodies or areas within the Watershed Management Area.

Included in the requirements for the elements to be included in the Water Quality Improvement Plan are monitoring and assessment requirements that are necessary to implement, as well as ensure the Copermittees are in compliance with, the

requirements of the Order. In addition to the federal requirements of the CWA section 308(a) and 40 CFR 122.26(d), the San Diego Water Board has the authority to establish monitoring, reporting, and recordkeeping requirements for NPDES permits under CWC 13383.

More specific and detailed discussions of the requirements of Provision B are provided below.

Provision B.1 (Watershed Management Areas) requires the Copermittees to develop a Water Quality Improvement Plan for each of the Watershed Management Areas defined by the San Diego Water Board.

Pursuant to 40 CFR 122.26(d)(2)(iv), proposed management programs "*may impose controls on a…watershed basis…*" The Water Quality Improvement Plan is the Copermittees' proposed management program. A Water Quality Improvement Plan must be developed for each Watershed Management Area identified in the Order.

The Watershed Management Areas are identified in Table B-1. Table B-1 establishes ten (10) Watershed Management Areas, and identifies the Copermittees that are responsible for developing and implementing the Water Quality Improvement Plan for each Watershed Management Area.

The Copermittees from each of the three counties within the San Diego Region are expected to be phased in as their respective NPDES municipal storm water permits expire. Because Order No. R9-2007-0001 expired in January 2012, the San Diego County Copermittees are covered under the Regional MS4 Permit on the effective date of the Order.

After San Diego Water Board receives and considers the Reports of Waste Discharge required to be submitted by the Orange County Copermittees and Riverside County Copermittees pursuant to the requirements of their current permits, and make any necessary changes to the Order, the Orange County Copermittees and Riverside County Copermittees will be covered under the Regional MS4 Permit after Order No. R9-2009-0002 expires in November 2014, and Order No. R9-2010-0016 expires in December 2015, respectively.

The Orange County Copermittees and Riverside County Copermittees also have the option to obtain coverage under the Regional MS4 Permit earlier than their respective permit expiration dates. The process to apply for early coverage is described Provision F.6.

Because the Santa Margarita River Watershed Management Area includes Copermittees from both San Diego County and Riverside County, a footnote to Table B-1 has been included to specify that the requirements of Provision B must be implemented by the County of San Diego until the Riverside County Copermittees have received a notice of coverage under the Regional MS4 Permit.

Provision B.2 (Priority Water Quality Conditions) requires the Copermittees in each Watershed Management Area to identify the highest priority water quality conditions which will be the focus of the Water Quality Improvement Plan implementation.

Provisions B.2.a and B.2.b provide the criteria that must be assessed when characterizing the receiving water quality and potential impacts from MS4 discharges of the receiving waters within the Watershed Management Area. The criteria are based primarily on the requirements in 40 CFR 122.26(d)(1)(iv)(C) and (C)(1)-(9). Characterizing the receiving water quality and identifying the potential impacts caused by MS4 discharges to receiving waters in the Watershed Management Area is necessary to identify the impacts to receiving waters associated with MS4 discharges that are of the most concern to the Copermittees.

Based on the information required to be considered under Provisions B.2.a and B.2.b, Provision B.2.c requires to Copermittees to identify the highest priority water quality conditions related to discharges from the MS4s that will be the primary focus of the Water Quality Improvement Plan in the Watershed Management Area. Addressing and improving these highest priority water quality conditions will become the focus of each Copermittee's jurisdictional runoff management program as the Water Quality Improvement Plan is implemented in the Watershed Management Area. The highest priority water quality conditions are expected to include source of pollutants and/or stressors, and/or receiving water conditions, that the Copermittees consider the highest threats or most likely to have adverse impacts on the physical, chemical, and biological integrity of receiving waters. Addressing these threats and/or adverse impacts should restore the physical, chemical, and biological integrity of receiving waters, and result in the restoration and protection of the beneficial uses of the receiving waters in the Watershed Management Area.

Provision B.2.d requires the Copermittees to identify known and suspected sources of pollutants and/or stressors contributing to the highest priority water quality conditions. The requirements of Provision B.2.d are based primarily on the requirements in 40 CFR 122.26(d)(1)(iii)(B)(1)-(6). The Copermittees are required to evaluate several factors in the identification of those sources. The Copermittees must consider and evaluate the following: (1) the land uses that may contribute toward impacts to receiving waters, (2) the locations of the Copermittees' MS4s that can convey and discharge runoff and pollutants to receiving waters, (3) other sources that discharge into the Copermittees' MS4s and receiving waters, and (4) other information and data that can help the Copermittees to evaluate the relative importance of or contribution from those sources toward the highest priority water quality conditions. Identifying the known and suspected sources, and their relative contribution toward the highest priority water quality conditions, will help the Copermittees to focus, direct, and prioritize their resources and implementation efforts within their jurisdictions.

Provision B.2.e requires the Copermittees to identify interim and final numeric goals, and schedules to achieve those goals as part of the Water Quality Improvement Plans.

Provision B.2.e requires the Copermittees to identify two types of numeric goals to be achieved:

(1) Final numeric goals in the receiving waters and/or MS4 discharges that will be able to restore and protect the water quality standards of the receiving waters for the highest priority water quality conditions identified by the Copermittees for Provision B.2.c. These final numeric goals are the ultimate goals for the Water Quality Improvement Plan, and the achievement and maintenance of these final numeric goals will indicate that one or more beneficial uses have been successfully restored and/or protected.

(2) Interim numeric goals that can be used by the Copermittees to demonstrate progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges for the highest priority water quality conditions in the Watershed Management Area. Achievement of the interim numeric goals will demonstrate to the San Diego Water Board that the Copermittees' implementation efforts are progressing toward achieving the final numeric goals.

Provision B.2.e does not specify what the interim and final numeric goals must be based on. The numeric goals must be designed to achieve compliance with water quality standards in the receiving waters. To that end, the interim goals must be based on measureable criteria or indicators capable of demonstrating progress toward achieving the numeric goals."

The interim and final numeric goals can be based on the water quality objectives in the Basin Plan. The water quality objectives in the Basin Plan, however, consist of numeric and narrative water quality objectives. Numeric water quality objectives can be directly used as numeric goals. Narrative water quality objectives, on the other hand, will require some interpretation to identify numeric goals. The achievement of multiple numeric goals based on the water quality objectives, used in combination, may be necessary to demonstrate that beneficial uses have been restored and/or protected.

The Copermittees could also propose other numeric goals that are not necessarily water quality objectives from the Basin Plan. For example, the Copermittees could propose a numeric goal that consists of achieving some percent improvement of a measureable indicator, such as acreage of a specific habitat or increase in a specific plant or animal species population. Other examples may include pollutant load reductions, number of impaired waterbodies delisted from the List of Water Quality Impaired Segments, Index of Biological Integrity (IBI) scores, etc.

The Copermittees may choose to develop interim numeric goals based on the final numeric goals they develop, such as incremental steps toward ultimately achieving the final numeric goals. The Copermittees may also choose to develop interim numeric goals that are based on other measureable indicators that can indirectly indicate improvements and progress toward the final numeric goals.

There are no limits to the types of interim numeric goals that could be proposed by the Copermittees, other than the goals must be based on measureable criteria or indicators capable of demonstrating progress toward achieving the numeric goals. Likewise, there are no limits to the types of final numeric goals that could be proposed by the Copermittees, other than the goals must "*restore and protect the water quality standards of the receiving waters.*"

Finally, Provision B.2.e also requires the Copermittees to develop schedules for measuring progress and achieving the interim and final numeric goals. Several criteria are included for the development of the schedules, but the Copermittees are required to achieve the numeric goals as soon as possible, consistent with federal NPDES regulations (40 CFR 122.47(a)(1)).

The Copermittees are also required by to incorporate any compliance schedules that are included in any applicable TMDLs. Applicable TMDL compliance schedules are set forth in Attachment E to the Order. The information provided by the Copermittees under Provision B.2.e will be used by the Copermittees and the San Diego Water Board to gauge and track the progress of the Copermittees' efforts in addressing the highest priority water quality conditions identified in the Water Quality Improvement Plan.

Provision B.3 (Water Quality Improvement Strategies) requires the Copermittees in each Watershed Management Area to identify the strategies which will be implemented by the Copermittees' jurisdictional runoff management programs to address and improve the highest priority water quality conditions identified under Provision B.2. The element of the Water Quality Improvement Plan required under Provision B.3 is where the "*comprehensive planning*" and "*intergovernmental coordination*" [40 CFR 122.26(d)(2)(iv)] of the Copermittees' actions for the proposed management programs within the Watershed Management Area is expected to be described.

Provision B.3 requires the Copermittees to identify the water quality improvement strategies that will be implemented within the Watershed Management Area to 1) reduce of pollutants in storm water discharged from the MS4 to the MEP, 2) prevent or eliminate controllable non-storm water discharges from entering the MS4, 3) achieve of demonstrable improvements in the physical, chemical, and biological receiving water conditions, 4) restore and protect water quality standards in receiving waters by controlling discharges so that they do not cause or contribute to exceedances of receiving water limitations, and 5) achieve applicable WQBELs that implement TMDLs.

The Copermittees are expected to provide a description of all the actions and potential actions that they will implement over the course of a schedule that they develop. The implementation actions may include, but are not limited to, inspection and enforcement strategies, resource identification and development efforts, non-structural and structural controls, retrofitting projects, stream and habitat rehabilitation/restoration

projects, and agency and department coordination efforts. Water quality improvement strategies that will be implemented within the Watershed Management Area may need to be different within each Copermittees' jurisdiction. The descriptions in the Water Quality Improvement Plan are not expected to specify exactly what strategies each Copermittee will implement within its jurisdiction, but enough information to allow the San Diego Water Board to determine when and where the strategies may be or should be implemented. Specific information about how those strategies will be implemented will be provided in each Copermittee's jurisdictional runoff management program document.

The Copermittees must also develop and include schedules in the Water Quality Improvement Plan for implementing the water quality improvement strategies. The schedule for implementing the water quality improvement strategies will be used by the Copermittees and San Diego Water Board to measure and demonstrate the progress of the Copermittees' implementation efforts toward reducing pollutants in storm water discharged from the MS4 to the MEP, and eliminating non-storm water discharges from entering the MS4.

Provision B.4 (Water Quality Improvement Monitoring and Assessment) requires the Copermittees to develop an integrated monitoring and assessment program to track the progress of the Water Quality Improvement Plan toward meeting the implementation goals and schedules, and improving the water quality of the Watershed Management Area. Provision B.4 is the part of the Water Quality Improvement Plan where the Copermittees describe the monitoring data that will be collected, which is not only necessary to implement the "iterative approach" required by Provision A.4, but inform the adaptive management and "*comprehensive planning process*" that allows the Copermittees to make adjustments and modifications to the Water Quality Improvement Plans and the jurisdictional runoff management programs.

Provision B.4 requires the Copermittees, at a minimum, to include the requirements of Provision D as part of the water quality improvement monitoring and assessment program for the Water Quality Improvement Plan. The Copermittees, however, are not limited to the requirements of Provision D and may include additional monitoring and assessment methods to track progress toward improving water quality in the Watershed Management Area.

In addition to incorporating the requirements of Provision D, the water quality improvement monitoring and assessment program must incorporate any monitoring and assessment requirements specified for any applicable TMDLs included in Attachment E to the Order, and the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 for Watershed Management Areas with ASBS.

The monitoring and assessments required to be incorporated into the Water Quality Improvement Plan are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order.

Provision B.5 (Iterative Approach and Adaptive Management Process) requires the Copermittees to implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a.

Provision B.5 requires the Copermittees in each Watershed Management Area to re-evaluate the highest priority water quality conditions and numeric goals, the water quality improvement strategies, and the water quality improvement monitoring and assessment program and provide recommendations for modifying those elements to improve the effectiveness of the Water Quality Improvement Plan. The re-evaluation of the Water Quality Improvement Plan is part of the assessment requirements of Provision D.

Provision B.6 (Water Quality Improvement Plan Submittal, Updates, and Implementation) requires to Copermittees to submit, update, and implement the Water Quality Improvement Plans.

The requirements for the process to develop and submit the Water Quality Improvement Plans is described in more detail under the discussion for Provision F.1. The process will include several opportunities for the public to provide input during the development of the Water Quality Improvement Plans. The process for updating the Water Quality Improvement Plans is described in more detail under the discussion for Provision F.3.c. Upon acceptance of the Water Quality Improvement Plan and updates, the Copermittees are required to immediately begin implementing the Water Quality Improvement Plan and subsequent updates.

The Water Quality Improvement Plan is expected to be a dynamic document that will evolve over time. The Water Quality Improvement Plan is also expected to be a long term plan that focuses the Copermittees' efforts and resources on a limited set of priority water quality conditions, with the ultimate goal of protecting all the beneficial uses of the receiving waters within the Watershed Management Area from impacts that may be caused or contributed to by MS4 discharges. As the Copermittees collect data, implement their jurisdictional runoff management programs, and review the results from their water quality improvement monitoring and assessment program, the Water Quality Improvement Plan is expected to be continually reviewed and updated until compliance with Provisions A.1.a, A.1.b, and A.2.a is achieved.

Implementation of the Water Quality Improvement Plans may also demonstrate that TMDLs are not required for impaired water bodies within the Watershed Management Area. Impaired water bodies are not required to be placed on the 303(d) List, thus do not require a TMDL, if technology-based effluent limitations required by the CWA, more stringent effluent limitations required by state, local, or federal authority, or other pollution control requirements (e.g., best management practices) required by local, state or federal authority are stringent enough to implement applicable water quality

standards within a reasonable period of time.[22]

The San Diego Water Board submits an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. According to USEPA guidance for the Integrated Report,[23] water bodies are placed in one of five categories. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 are placed on the 303(d) List.

Category 4 in the Integrated Report is for water bodies where available data and/or information indicate that at least one beneficial use is not being supported or is threatened, but a TMDL is not needed.[24] Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

Impaired water bodies can be included in Category 4a if a TMDL has been adopted and approved. The TMDLs in Attachment E to the Order implement the requirements of the TMDLs adopted by the San Diego Water Board, and approved by the State Water Board and USEPA. The water bodies in Attachment E will be included in Category 4a in the Integrated Report and removed from the 303(d) List.

Impaired water bodies can be included in Category 4b if there are *acceptable* "pollution control requirements" required by a local, state or federal authority stringent enough to implement applicable water quality standards within a reasonable period of time (e.g., a compliance date is set). When evaluating whether a particular set of pollution controls are "requirements," the USEPA considers a number of factors, including: (1) the authority (local, state, federal) under which the controls are required and will be implemented with respect to sources contributing to the water quality impairment (examples may include: self-executing state or local regulations, permits, and contracts and grant/funding agreements that require implementation of necessary controls), (2) existing commitments made by the sources and completion or soon to be completed implementation of the controls (including an analysis of the amount of actual implementation that has already occurred), (3) the certainty of dedicated funding for the implementation of the controls, and (4) other relevant factors as determined by USEPA depending on case-specific circumstances.[25]

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[22] 40 CFR 130.7(b)(1)
[23] USEPA, 2005. *Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act*
[24] Ibid
[25] Ibid

Impaired water bodies can be included in Category 4c if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution. Pollution, as defined by the CWA is "the man-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of water."[26] In other cases, pollution does not result from a pollutant and a TMDL is not required. Examples of circumstances where an impaired segment may be placed in Category 4c include segments impaired solely due to lack of adequate flow, stream channelization, or hydromodification. In these situations, there may be water quality management actions that can address the cause(s) of the impairment, but a TMDL may not be required to implement the actions.

The Water Quality Improvement Plans will require the implementation of pollution controls and water quality management actions (i.e. water quality improvement strategies) which can result in the attainment of water quality standards in water bodies impaired by discharges from the Copermittees' MS4s. The Water Quality Improvement Plans also include requirements that are expected to attain water quality standards in a reasonable period of time. The San Diego Water Board considers the Water Quality Improvement Plans to be a commitment by the Copermittees to develop, plan, budget for, and implement pollution controls that will attain water quality standards in receiving waters in a reasonable period of time, or as soon as possible. The results of the Copermittees' efforts in implementing the Water Quality Improvement Plans can be used to re-evaluate the condition of the impaired water bodies during the next update to the 303(d) List.

After the Copermittees submit the Water Quality Improvement Plans and demonstrate that water quality standards are being attained or will be attained in a reasonable period of time, the San Diego Water Board may re-evaluate the water bodies on the 303(d) List. These water bodies on the 303(d) List may be re-evaluated and placed into Category 4b or Category 4c in the Integrated Report. The water bodies placed in Category 4b or Category 4c in the Integrated Report must show a record that the water bodies are attaining water quality standards or supporting the identified beneficial uses, or will attain water quality standards or support identified beneficial uses in a reasonable period of time, in order for the water bodies to be appropriately removed from the 303(d) List.

[26] CWA section 502(19)

C. Action Levels

Purpose: Provision C includes requirements for the Copermittees to identify and include numeric action levels in the Water Quality Improvement Plan to direct and focus the Copermittees' jurisdictional runoff management program implementation efforts for controlling MS4 discharges to receiving waters.

***Discussion*:** Under Provision C, the numeric action levels required are for non-storm water discharges and storm water discharges. The non-storm water action levels (NALs) are applicable to non-storm water discharges from the Copermittees' MS4s, which can occur year-round. The storm water action levels (SALs) are applicable to storm water discharges from the Copermittees' MS4s, which occur during the rainy season defined as the period between October 1 and April 30.

The action levels required by Provision C are based on the action level requirements that were developed and incorporated into Order Nos. R9-2009-0002 and R9-2010-0016, the Orange County and Riverside County MS4 Permits, respectively. The Fact Sheets for these Orders provide detailed discussions about the development of the numeric NALs and SALs included in this Order.

Order Nos. R9-2009-0002 and R9-2010-0016 required the Copermittees to perform prescribed actions if the NALs or SALs are exceeded. The actions required under Order Nos. R9-2009-0002 and R9-2010-0016 generally included conducting additional monitoring and source investigations when a discharge from the MS4 is observed to exceed one or more NALs and/or SALs.

For this Order, however, the action levels of Provision C are to be used by the Copermittees to prioritize the actions to be implemented as part of the Water Quality Improvement Plan. Monitoring data collected by the Copermittees from MS4 outfalls will be compared with the NALs and SALs. Exceedances of the NALs and SALs will not require the Copermittees to immediately identify sources causing exceedances, but will provide some numeric indicator levels that can give the Copermittees a way to measure the relative severity of a pollutant contributing to receiving water quality impacts.

NALs and SALs must be included in the Water Quality Improvement Plans to be used by the Copermittees in directing and focusing their water quality improvement strategies. The Copermittees are expected to utilize the NALs and SALs to help focus their implementation efforts on addressing pollutants that have the most significant potential or observed impacts to receiving waters. The NALs and SALs will be used as part of the MS4 discharges assessments required under Provision D.4.b. The NALs and SALs may also be used by the Copermittees as the numeric goals to be achieved in MS4 discharges and/or receiving waters as the Water Quality Improvement Plans are implemented.

More specific and detailed discussions of the requirements of Provision C are provided below.

Provision C.1 (Non-storm Water Action Levels) requires the Copermittees to incorporate NALs into the Water Quality Improvement Plan for pollutants and/or constituents that are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions identified in the Water Quality Improvement Plan related to non-storm water discharges from the MS4s. NALs generally must be consistent with the water quality objectives found within the Basin Plan.

The NALs have been included to ensure that the Copermittees are implementing and complying with several requirements of the MS4 permit. The federal CWA requires permits for municipal storm sewer systems to "*effectively prohibit non-storm water discharges into the storm sewers*." The federal NPDES regulations, which were promulgated to implement the CWA requirements for discharges from municipal storm sewers, require a program to address illicit discharges, which are non-storm water discharges. Provision A.1.b prohibits "*[n]on-storm water discharges into MS4s*" unless the non-storm water discharge authorized by a separate NPDES permit, or is a category of non-storm water specified in Provisions E.2.a.(1)-(5) that does not need to be addressed through ordinance, order or similar means and is not a source of pollutants. The NALs will be used as part of the illicit discharge detection and elimination program required pursuant to Provision E.2, as well as part of the MS4 discharges assessments required pursuant to Provision D.4.b.

Provision A.1.a prohibits non-storm water discharges from the MS4 from "*causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state.*" In addition, pursuant to Provision A.2.a, non-storm water discharges "*must not cause or contribute to the violation of water quality standards in any receiving waters*."

Ideally, the Copermittees' jurisdictional runoff management programs will eliminate all non-storm water discharges entering the MS4s within their jurisdictions. The complete elimination of non-storm water discharges to the Copermittees' MS4s would be in compliance with the CWA requirements for non-storm water discharges, as well as the prohibitions and limitations of Provisions A.1.a and A.2.a.

The federal regulations, however, also refer to several non-storm water discharge categories that must be addressed as illicit discharges if they are found to be a source of pollutants. The federal regulations thus identify some non-storm water discharges that are not required to be addressed as illicit discharges if they are not a source of pollutants (e.g. non-storm water discharges specified in Provisions E.2.a.(1)-(5)). Thus, these regulations imply that some non-storm water discharges into and from the MS4 may occur even if non-storm water discharges are "effectively" prohibited by the Copermittees.

If the source of a non-storm water discharge is identified as a category of non-storm water specified in Provisions E.2.a.(1)-(5), the NALs can be used to determine the category of non-storm water discharges is a source of pollutants. For other non-storm water discharges not specified in Provisions E.2.a.(1)-(5), the CWA requires those discharges to be "*effectively"* prohibited by removing the discharge to the MS4 through enforcement of "*ordinance, order or similar mean*s."

If there are non-storm water discharges, however, those discharges must comply, at a minimum, with the discharge prohibitions and receiving water limitations of Provision A. Thus, the non-storm water discharges from the MS4 must be at levels that will not cause or contribute to a condition of pollution, contamination, or nuisance (Provision A.1.a), and must not cause or contribute to a violation of water quality standards in receiving waters (Provision A.2.a) to be consistent with the discharge prohibitions and receiving water limitations of Provisions A.1.a and A.2.a.

Furthermore, the San Diego Region has predominantly intermittent and ephemeral rivers and streams which vary in flow volume and duration at spatial and temporal scales. For most of these river and stream systems, non-storm water discharges from the MS4 are likely to be the most significant or the only source contributing to surface flows present within the receiving water, especially during the dry season.

Therefore, because of the prohibitions and limitations of Provision A.1.a and A.2.a, and the likelihood that non-storm water discharges from the MS4 are the most significant or only source contributing to surface flows present within the receiving water, NALs generally must be consistent with the water quality objectives found within the Basin Plan. Non-storm water discharges that are meeting the NALs would not be expected to cause or contribute to an exceedance of water quality objectives in receiving waters, which would be consistent with the discharge prohibitions and receiving water limitations of Provisions A.1.a and A.2.a.

Exceedances of the NALs would then provide an indication of the relative severity of a pollutant in non-storm water discharges from the MS4 contributing to potential or observed receiving water quality impacts. The relative severity or significance of a pollutant in non-storm water discharges from the MS4 will provide the Copermittees a valuable source of information that can be used to identify priority water quality conditions within a Watershed Management Area and within each Copermittee's jurisdiction.

Tables C-1 through C-4 under Provision C.1.a specify numeric NALs for several parameters or pollutant constituents for non-storm water discharges from the MS4 to several water body types. The NALs for MS4 discharges given under Provision C.1.a are based on the water quality objectives for inland surface waters in the Basin Plan, and the water quality objectives for ocean waters in the Ocean Plan. The NALs for most of the metals were calculated based on the State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP). The NALs provided in Tables C-1

through C-4 must be included in the Water Quality Improvement Plans required to be developed pursuant to Provision B.

Provision C.1.b requires the Copermittees to identify NALs for pollutants and/or constituents, not specified in Provision C.1.a, which are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions of the Watershed Management Area related to non-storm water discharges from the MS4s. The NALs must be based on the water quality objectives in the Basin Plan. The NALs identified under Provision C.1.b must be included in the Water Quality Improvement Plan.

The San Diego Water Board recognizes that some of the NALs required pursuant to Provisions C.1.a and C.1.b may be exceeded more frequently than not. Thus, Provision C.1.c has been included in the Order to provide the Copermittees the option to develop secondary NALs that are set at levels greater than the levels required pursuant to Provisions C.1.a and C.1.b to further refine the prioritization and assessment of water quality improvement strategies for addressing non-storm water discharges to and from the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and from the MS4.

Provision C.2 (Storm Water Action Levels) requires the Copermittees to incorporate SALs into the Water Quality Improvement Plan for pollutants and/or constituents causing or contributing, or may be causing or contributing, to the highest priority water quality conditions identified in the Water Quality Improvement Plan related to storm water discharges from the MS4s.

The SALs have been included to ensure that the Copermittees are implementing and complying with several requirements of the MS4 permit. Provision A.1.a prohibits storm water discharges from the MS4 from "*causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state.*" In addition, pursuant to Provision A.2.a, storm water discharges "*must not cause or contribute to the violation of water quality standards in any receiving waters*."

Provision A.3.a, however, implicitly acknowledges that compliance with Provisions A.1.a and A.2.a cannot be achieved immediately for discharges of storm water from the MS4 by applying the MEP standard. Thus, Provision A.4 requires the Copermittees to implement an iterative approach to demonstrate that MEP is being achieved. This approach is supported by USEPA.

The federal CWA requires permits for municipal storm sewer systems to "*require controls to reduce the discharge of pollutants [in storm water] to the maximum extent practicable*, *including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants.*" MEP is an ever-evolving, flexible, and advancing concept. As knowledge about controlling storm water runoff

and discharges evolves, so does the knowledge which constitutes MEP. Reducing the discharge of storm water pollutants from the MS4 to the MEP requires the Copermittees to assess their jurisdictional runoff management programs and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP. The SALs provide the Copermittees measureable goals that may be used to demonstrate the achievement of MEP for reducing pollutants in storm water discharges from the MS4. The SALs will be used as part of the MS4 discharges assessments required under Provision D.4.a.

In June of 2006, the State Water Board's Blue Ribbon Storm Water Panel released its report titled "*The Feasibility of Numerical Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities*." In the recommendations, the Blue Ribbon panel proposed storm water effluent limitations which are computed using statistical based population approaches. The SALs specified in Table C-5 under Provision C.2.a were developed from a regional subset of nationwide Phase I MS4 data by using USEPA Rain Zone 6 (arid west) data.[27] Additionally, utilization of regional data is appropriate due to the addition of data into the nationwide Phase I MS4 monitoring dataset in February 2008. This additional data increased the number of USEPA Rain Zone 6 samples to more than 400, and included additional monitoring events within Southern California.

Utilizing data from USEPA Rain Zone 6 resulted in SALs which closely reflect the environmental conditions experienced in the San Diego Region. The localized subset of data includes sampling events from multiple Southern California locations including Orange, San Diego, Riverside, Los Angeles, and San Bernardino Counties. The dataset includes samples taken from highly built-out impervious areas and from storm events representative of Southern California conditions.

The SALs for cadmium, copper, lead and zinc require the measurement of hardness and to provide more specificity in the assessment of samples with SALs for total metal concentrations. While USEPA Rain Zone 6 data include a large sample size for concentrations of total metals, the impact the concentration will have on receiving waters will vary with receiving water hardness. Since it is the goal of the SALs, through the iterative process and MEP standard, to have MS4 storm water discharges meet all applicable water quality objectives, the hardness of the receiving water should be used when assessing the total metal concentration of a sample.

Thus, when there is an exceedance of a SAL for a metal, the Copermittee must determine if that exceedance is above the existing applicable water quality objectives based upon the hardness of the receiving water. The water quality objectives Copermittees must use to assess total metal SAL exceedances are the California Toxic Rule (CTR) and USEPA National Recommended Water Quality Criteria for Freshwater Aquatic Life 1 hour maximum concentrations. The 1 hour maximum

[27] Data used to develop SAL were obtained from http://rpitt.eng.ua.edu/Research/ms4/mainms4.shtml

concentration is to be used for comparison since it is expected to most replicate the impacts to waters of the State from the first flush following a precipitation event.

The statistically calculated SALs given in Table C-5 are at levels greater than the water quality objectives in the Basin Plan or Ocean Plan. Because the objective of the CWA is to "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*", meaning eventually pollutants in storm water discharges must be reduced to a level that cannot cause or contribute to an exceedance of water quality objectives in receiving waters, over time the SALs are expected to be reduced to a level that is based on the water quality objectives rather than statistical calculations. The San Diego Water Board will review the SALs as more data for discharges of storm water from the MS4s are collected, and revise them as conditions improve and the MEP standard advances. For the Water Quality Improvement Plans required under this Order, the SALs identified under Provision C.2.a must be included.

Provision C.2.b requires the Copermittees to identify SALs for pollutants and/or constituents, not specified in Provision C.2.a, which are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions of the Watershed Management Area related to storm water discharges from the MS4s. The SALs identified under Provision C.2.b must be included in the Water Quality Improvement Plan.

The San Diego Water Board recognizes that some of the SALs required pursuant to Provisions C.2.a and C.2.b may be exceeded more frequently than not. Thus, Provision C.2.c has been included in the Order to provide the Copermittees the option to develop secondary SALs that are set at levels greater than the levels required pursuant to Provisions C.2.a and C.2.b to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s.

D. Monitoring and Assessment Program Requirements

Purpose: Provision D includes minimum monitoring and assessment requirements that must be developed and implemented by the Copermittees as part of the Water Quality Improvement Plans. Implementation of the monitoring and assessment requirements of Provision D will allow the Copermittees to demonstrate that the requirements of the CWA to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP are being achieved. Implementation of the monitoring and assessment requirements of Provision D will also allow the Copermittees and the San Diego Water Board to track improvements to the water quality in the San Diego Region. The monitoring and assessment program requirements are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order.

***Discussion*:** The San Diego Water Board recognized that changes to the monitoring and assessment requirements of the Fourth Term Permit were necessary to improve the usefulness and usability of monitoring data collected by the Copermittees to support their jurisdictional storm water programs more efficiently and with increased effectiveness. The data collected are needed to better inform the Copermittees' understanding of the physical, chemical, and biological condition of the receiving waters and the quality of the MS4 discharges. The monitoring program needs to provide opportunities for the Copermittees to integrate regional monitoring efforts into municipal storm water monitoring requirements to provide a cost-effective approach to monitoring and avoid duplication of efforts.

The requirements in Provision D were largely recommended by the Copermittees as an outcome of the San Diego Water Boards Focused Meeting process. The monitoring and assessment program requirements now require collection of more specific information necessary for each Copermittee to adapt its jurisdictional runoff management program in such a way that focuses resources on a watershed's highest priority water quality conditions. The monitoring and assessment program will require the Copermittees to collect data that can be utilized to answer both watershed level management questions (e.g. Are the chemical, physical, and biological conditions of a receiving water protective, or likely protective of beneficial uses?), and specific jurisdictional runoff management program activity questions (e.g. Are the water quality improvement strategies of the jurisdictional program effectively eliminating non-storm water discharges to the MS4?).

The monitoring data collected and assessment information that will be reported to the San Diego Water Board are necessary to determine if the Copermittees are complying with the prohibitions and limitations of Provision A. The required monitoring and assessments that must be reported to the San Diego Water Board will be utilized for three purposes:

(1) Inform the Copermittees, San Diego Water Board, and the public on the progress

of the Copermittees' efforts to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP;

(2) Inform the Copermittees, San Diego Water Board, and the public on the condition of water bodies receiving discharges from the Copermittees' MS4, and the progress of the Copermittees' water quality improvement implementation efforts toward improving the receiving water quality; and

(3) Inform the Copermittees, the San Diego Water Board, and the public on the effectiveness of the Water Quality Improvement Plan toward achieving (1) and (2).

The monitoring and assessment information reported pursuant to Provision F is also expected to be key to the iterative approach and adaptive management process required under Provision A.4 and implemented through the Water Quality Improvement Plan required under Provision B. As required by Provision A.4, the iterative approach and adaptive management process is required if the Copermittees cannot meet the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c, and/or A.2.a under the present conditions.

Provision D provides the minimum monitoring and assessment requirements that must be included in each Water Quality Improvement Plan to be developed and implemented by the Copermittees. The Copermittees, however, are not limited to the requirements of Provision D and may include additional methods to track progress toward improving water quality in a Watershed Management Area.

More specific and detailed discussions of the requirements of Provision D are provided below.

Provision D.1 (Receiving Water Monitoring Requirements) specifies the minimum receiving water monitoring that the Copermittees must conduct within the Watershed Management Area and include as part of the Water Quality Improvement Plan.

Provision D.1 establishes minimum monitoring requirements that must be conducted by the Copermittees within each Watershed Management Area. Provision D.1 requires the Copermittees to collect and develop the data and information necessary to determine potential impacts to the beneficial uses in the receiving waters due to discharges from the MS4s. The monitoring required under Provision D.1 will also provide the data that will allow the Copermittees to gauge the effectiveness and progress of its Water Quality Improvement Plan implementation efforts toward improving the quality of receiving waters.

The receiving water monitoring requirements of Provision D.1 are focused primarily on monitoring the conditions and response of the receiving waters to the Copermittees' collective implementation efforts to reduce receiving water impacts that may be

caused by the discharges from the MS4s. The preference of the San Diego Water Board is for the Copermittees to spend their resources achieving tangible and observable improvements in receiving water conditions instead of collecting samples and analyzing data that has consistently indicated that receiving water conditions are degraded and require improvement. In general, the ability to measure potential improvements in receiving water conditions due to any actions implemented by the Copermittees as part of the Water Quality Improvement Plan may require several years before a response can be observed. Thus, the frequency of collecting receiving water monitoring data has been kept to a minimum.

During the transitional period between adoption of this Order and San Diego Water Board acceptance of a Water Quality Improvement Plan, the Copermittees must conduct receiving water monitoring in accordance with Provision D.1.a. This approach to collecting receiving water data is different from what was required in the Fourth Term Permits, but one that truly embraces the concept of an integrated, cost-effective, streamlined receiving water monitoring approach.

Provision D.1.a requires Copermittees to continue performing the receiving water monitoring programs required in Order Nos. R-2007-0001, R9-2009-002, and R9-2010-0016; plus participation in: hydromodification management plan monitoring approved by the San Diego Water Board, monitoring plans as part of load reduction plans (either Bacteria Load Reduction Plans or Comprehensive Load Reduction Plans) for TMDLs in Attachment E of the Order, Storm Water Monitoring Coalition Regional Monitoring, Southern California Bight Regional Monitoring, Sediment Quality Monitoring, and ASBS Monitoring as applicable to a Watershed Management Area.

Provision D.1.a also provides an opportunity for the Copermittees to use third party data to meet receiving water monitoring requirements where feasible. Allowing the Copermittees to use the data currently collected through its participation in existing regional receiving water programs and that of third parties provides an efficiency of resources in obtaining the data necessary to inform the Copermittees and the San Diego Water Board about the physical, chemical, and biological conditions of the receiving waters, which can also help to focus the receiving water monitoring during the implementation of the Water Quality Improvement Plan. Once a Water Quality Improvement Plan is developed for a Watershed Management Area in compliance with Provision B of this Order, the transitional period is over and Copermittees are required to conduct receiving water monitoring according to the requirements of Provision D.1.b-e.

Provision D.1.b requires each Copermittee to identify at least one long term receiving water monitoring station to be representative of receiving water quality within each Watershed Management Area. Long term receiving water monitoring stations can be located at any existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees. The requirements under Provision D.1.b. are consistent with 40 CFR 122.26(d)(2)(iii)(D), which specifies that a "*monitoring program*

for representative data collection for the term of the permit" may include "*instream locations.*" For each Watershed Management Area, at least one long term watershed monitoring station is required to be established and monitored. The Copermittees may choose to establish additional long term monitoring stations where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

Provision D.1.b. requires the Copermittees to locate the long term receiving water monitoring station at one of these existing receiving water monitoring stations to provide the Copermittees an opportunity to experience monitoring cost savings while continuing to collect the necessary data to assess the status and trends of receiving water quality conditions in 1) coastal water, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under both dry weather and wet weather conditions. Ideally these stations will continue to be monitored as part of the receiving water monitoring for each Watershed Management Area to maintain a consistent set of locations and a period of data that can be built upon with the monitoring required under this Order.

The receiving water monitoring requirements are separated into monitoring required during dry weather conditions pursuant to Provision D.1.c, and wet weather conditions pursuant to Provision D.1.d.

At each long term monitoring station the Copermittees must conduct at least three dry weather monitoring events as required pursuant to Provision D.1.c and at least three wet weather monitoring events as required pursuant to Provision D.1.d per permit term. Provision D.1.c and D.1.d require the Copermittees to monitor priority water quality conditions identified in the Water Quality Improvement Plan, constituents listed as causing impairment of receiving waters in the Watershed Management Area, applicable NALs, constituents listed in Tables D-2 and D-3, and constituents for implementation plans (e.g. Bacteria Load Reduction Plans and Comprehensive Load Reduction Plans). Receiving water monitoring efforts in this Order have been streamlined to redirect resources to monitoring efforts that better support pollutant reduction solutions with an increasing emphasis on MS4 outfall monitoring, source identification and source abatement activities.

In addition to the receiving water monitoring requirements under Provisions D.1.b-d, Provision D.1.e requires the Copermittees participate in and/or conduct other types of receiving water monitoring. As recommended and requested by the Copermittees, Provision D.1.e.(1) requires the Copermittees to participate in existing regional monitoring, as applicable to each Watershed Management Area. Existing regional monitoring includes monitoring conducted by the Storm Water Monitoring Coalition and for the Southern California Bight. Participation in and use of monitoring data collected from these existing regional water quality monitoring programs provide the Copermittees a greater opportunity for efficiency in the use of their resources to manage their storm water programs and those controllable discharges under their authority.

The State Water Resources Control Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part 1 Sediment Quality which became effective August 25, 2009 (Sediment Quality Monitoring Policy). Provision D.1.e.(2) requires any Copermittees with MS4 discharges to an enclosed bay or estuary to monitoring the sediments in the enclosed bay or estuary receiving water in accordance with the sediment quality monitoring procedures as prescribed in the Sediment Quality Monitoring Policy.

The State Water Board adopted Resolution No. 2012-0012 which approved exceptions to the California Ocean Plan for selected discharges into Areas of Special Biological Significance (ASBS), including special protections for beneficial uses. State Board Resolution No. 2012-0012 became effective on March 20, 2012, and Attachment B to the Resolution established limitations on point source storm water discharges to ASBS. Copermittees with MS4s that discharge to an ASBS must monitor its discharge to assure compliance with State Board Resolution No. 2012-0012 as required pursuant to Provision D.1.e.(3).

The San Diego Water Board is currently developing a regional monitoring strategy to assess the conditions of receiving waters in the San Diego Region. The monitoring requirements of Provision D.1 are expected to be incorporated or serve as a foundation of this regional monitoring strategy, but may require some modifications. When the San Diego Water Board develops an alternative regional monitoring strategy, the Copermittees will be required to participate in the development and implementation of the alternative regional monitoring program pursuant to Provision D.1.f.

Provision D.2 (MS4 Outfall Discharge Monitoring Requirements) specifies the minimum MS4 outfall discharge monitoring requirements that the Copermittees must incorporate and implement as part of the Water Quality Improvement Plan.

The dry weather MS4 outfall discharge monitoring requirements are included under Provisions D.2.a.(2) and D.2.b. The dry weather MS4 outfall discharge monitoring requirements are part of the "*program, including a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer*" required by 40 CFR 122.26(d)(2)(iv)(B), which is expected to achieve compliance with the CWA section 402(p)(3)(B)(ii) statutory requirement for municipal storm water permits to require the Copermittees to "*effectively prohibit non-storm water discharges into the storm sewers*." The dry weather MS4 outfall discharge monitoring data collection requirements are based on requirements under 40 CFR 122.26(d)(1)(iv)(D) and 122.26(d)(2)(iv)(B)(3).

The dry weather MS4 outfall discharge monitoring requirements are designed to provide wide spatial and temporal coverage of each jurisdiction to better understand the extent and magnitude of non-storm water discharges to receiving waters, and make a distinction between persistent and transient non-storm water flows. This

information is expected to allow each Copermittee to focus its resources on eliminating and controlling the highest priority threats to receiving water quality, as well as integrating other elements of the storm water programs (e.g. complaint call response) and third party data to efficiently and effectively assist in efforts to eliminate non-storm water discharges.

The dry weather MS4 outfall discharge monitoring requirements of Provision D.2.a.(2) and D.2.b are separated into monitoring required before and after the San Diego Water Board accepts the Copemittees' Water Quality Improvement Plan. Outfall monitoring conducted prior to acceptance of the Water Quality Improvement Plan is referred to in the Order as Transitional MS4 Outfall Discharge Monitoring. Provision D.2.a.(2) includes the transitional dry weather MS4 outfall discharge monitoring requirements.

The requirements under Provision D.2.a.(2) are based on the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B), which include the requirements for a monitoring program to identify, detect, and eliminate illicit connections and illegal discharges to the MS4s. The federal regulations (40 CFR 122.26(d)(1)(iv)(D)) require the monitoring program to include "*a field screening analysis for illicit connections and illegal dumping [that]…[a]t a minimum, include[s] a narrative description, for either each field screening point or major outfall, of visual observations made during dry weather periods.*" The federal regulations (40 CFR 122.26(d)(1)(v)(B)) require the monitoring program to include "*inspection procedures and methods for detecting and preventing illicit discharges, and describe areas where this program has been implemented.*" Furthermore, the monitoring program is required by federal regulations (40 CFR 122.26(d)(2)(iv)(B)) to include "*a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer.*"

Dry weather transitional MS4 outfall discharge monitoring requires each Copermittee to field screen (inspect) its major MS4 outfalls to classify the MS4 outfall locations as having persistent dry weather flows, transient dry weather flows, or no dry weather flows. To account for the variance in size of the 39 jurisdictions covered under this Order, the Copermittees recommended a tiered approach to the number of major MS4 outfalls that must be inspected. Provision D.2.a.(2)(a) provides a tiered approach to the number of major MS4 outfalls that must be visually inspected per jurisdiction as well as a minimum frequency each Copermittee must inspect each major MS4 outfall per year. This tiered approach is based on the total number of major MS4 outfalls within a Copermittees jurisdiction within each Watershed Management Area.

Based on the field screening, each Copermittee is required to make a determination whether any observed flowing, pooled, or ponded waters are transient or persistent flows. Based on this field screening information, other jurisdictional program information, and third party information, each Copermittee is required to prioritize the MS4 outfalls within its jurisdiction for follow up investigation and elimination of the non-storm water discharge, as part of its illicit discharge detection and elimination program

required pursuant to Provision E.2. In accordance with the requirements of Provision E.2, each Copermittee is required to immediately investigate obvious illicit discharges (e.g. outfall discharges with unusual color, unusual odor, or high flows).

This approach allows a Copermittee to use all of its resources, as well as leverage resources and information provided by third parties, to effectively eliminate non-storm water discharges from its MS4 outfalls. If the source of the non-storm water discharge cannot be immediately eliminated, the Copermittee uses the persistent flow or transient flow classification along with other programmatic implementation data to prioritize the MS4 outfalls for future investigation. In accordance with the adaptive management approach deployed throughout this Order, Provision D.2.a.(2)(c) requires each Copermittee to update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow. The requirement of Provision D.2.a.(2)(c) assures that each Copermittee is collecting data that can be used to demonstrate compliance with the CWA requirement that each Copermittee must implement a program to "*effectively prohibit non-storm water discharges into the [MS4]*" and with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

Provision D.2.b describes the dry weather MS4 outfall discharge monitoring required to be incorporated and implemented as part of the Water Quality Improvement Plan. Dry weather MS4 outfall discharge monitoring must be performed by each Copermittee to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to E.3. The emphasis of the dry weather MS4 outfall discharge monitoring required pursuant to Provision D.2.b is consistent with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

Provision D.2.b.(1) requires each Copermittee to continue field screening its major MS4 outfalls and identifying those with persistent flows and transient flows, as conducted during the transitional period (i.e. before the Water Quality Improvement Plan was developed). However, each Copermittee now has the flexibility to adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of non-storm water persistent flow discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan. In order to ensure a minimum number of outfalls are inspected, Provision D.2.b.(1) requires the number of visual inspections be equal to the number of visual inspections required in the tiered inspection program pursuant to Provision D.2.a.(2)(a).

Provision D.2.b.(2)(b) requires each Copermittee to monitor a minimum of 10 major MS4 outfalls with persistent flows identified as the highest priorities within a Copermittee's jurisdiction, and within each Watershed Management Area. In other words, Copermittees located in more than one Watershed Management Area must identify at least 10 major MS4 outfalls with persistent flows per Watershed

Management Area. If a Copermittee is located in more than one Watershed Management Area, but there are less than 10 major MS4 outfalls with persistent flows within the area of its jurisdiction located in the Watershed Management Area, all the those major MS4 outfalls must be identified as the highest priority dry weather persistent flow MS4 outfalls.

Monitoring must occur at the highest priority outfall locations at least semi-annually until the non-storm water discharges have been eliminated for three consecutive dry weather monitoring events; identified to be authorized by a separate NPDES Permit; or reprioritized to a lower priority. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized MS4 major outfall in the Copermittee's jurisdiction within the Watershed Management Area, unless there are no remaining qualifying major MS4 outfalls within the Copermittees jurisdiction. The Copermittees must continually update their dry weather persistent flow MS4 outfall discharge monitoring locations with the next highest priority non-storm water flow that have yet to be eliminated until all persistent and transient flows are eliminated or its threat reduced.

Non-storm water persistent flow MS4 outfall discharge monitoring data collected during each semi-annual monitoring event, must be collected and analyzed according to the requirements of Provision D.2.b.(2)(b)–(e). These monitoring requirements are consistent with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

The wet weather MS4 outfall discharge monitoring requirements are included under Provisions D.2.a.(3) and D.2.c. The wet weather MS4 outfall discharge monitoring requirements are necessary for the Copermittees to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable, using management practices, control techniques and system, design and engineering methods, and such other provisions which are appropriate*" required by 40CFR 122.26(d)(2)(iv), which is expected to achieve compliance with the CWA section 402(p)(3)(B)(iii) statutory requirement for municipal storm water permits to require "*controls to reduce the discharge of pollutants [in storm water] to the maximum extent practicable*." The wet weather MS4 outfall discharge monitoring data collection requirements are based on requirements under 40 CFR 122.26(d)(2)(iii), 122.26(d)(2)(iii)(A) and 122.26(d)(2)(iii)(A)(1)-(4), and 40 CFR 122.21(g)(7)(i)-(ii).

The wet weather MS4 outfall discharge monitoring requirements of Provision D.2.a.(3) and D.2.c are separated into monitoring required before and after the San Diego Water Board accepts the Copemittees' Water Quality Improvement Plan. Outfall monitoring conducted prior to acceptance of the Water Quality Improvement Plan is referred to in the Order as Transitional MS4 Outfall Discharge Monitoring. Provision D.2.a.(3) includes the transitional wet weather MS4 outfall discharge monitoring requirements.

Until the wet weather MS4 outfall discharge monitoring requirements of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board, the Copermittees must comply with the requirements of transitional wet weather MS4 outfall monitoring requirements pursuant to Provision D.2.a.(3). Provision D.2.a.(3) requires each Copermittee to sample, at least five of the major MS4 outfalls inventoried pursuant to Provision D.2.a.(1) twice per wet season for the monitoring data required to be collected pursuant to Provision D.2.a.(3)(c)-(e).

At a minimum, the five sampling locations chosen must be representative of storm water discharges from residential, commercial, industrial, and typical mixed-use land uses present within a Watershed Management Area. The San Diego Water Board expects the Copermittees to extrapolate from these data to similar land uses throughout the Watershed Management Area to better inform the Water Quality Improvement Plan development process by prioritizing drainages for implementation efforts required pursuant to Provision E.

Provision D.2.c describes the wet weather MS4 outfall discharge monitoring required to be included and implemented as part of the Water Quality Improvement Plan. Provision D.2.c provides the Copermittees the flexibility to adjust the wet weather MS4 outfall discharge monitoring locations and frequencies in the Watershed Management Area, as needed, to identify sources of pollutants in storm water discharges from MS4s in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan.

Although Provision D.2.c.(1) allows the Copermittees to adaptively manage the wet weather MS4 outfall discharge monitoring locations and frequencies, the provision requires a minimum of at least five wet weather outfall stations to be monitored. Provision D.2.c.(2) further requires the Copermittees to modify the monitoring frequency at each wet weather MS4 outfall station at an appropriate frequency to identify sources of pollutants in storm water discharges.

The wet weather MS4 outfall discharge monitoring requirements of Provisions D.2.c.(3) and D.2.c.(4) are the same as the transitional wet weather MS4 outfall discharge monitoring. In contrast, the requirements of Provision D.2.c.(5) are focused on collecting analytical data specific to the highest priority water quality conditions in the Watershed Management Area identified in the Water Quality Improvement Plan. The wet weather MS4 outfall discharge monitoring data collection requirements are consistent with the requirements under 40 CFR 122.26(d)(2)(iii), 122.26(d)(2)(iii)(A) and 122.26(d)(2)(iii)(A)(1)-(4), and 40 CFR 122.21(g)(7)(i)-(ii).

Provision D.3 (Special Studies) requires the Copermittees to develop special studies that will be conducted for each Watershed Management Area and the entire San Diego Region. Data collected pursuant to Provision D.3 is to be used by the Copermittees to improve the effectiveness of the strategies implemented by the jurisdictional runoff management programs toward achieving the numeric goals identified in the Water Quality Improvement Plans and ultimately achieve compliance

with the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c, and A.2.a, which is consistent with the requirements of Provision A.4.

Special studies are often necessary to fill data gaps or provide more refined information that allow the Copermittees to better manage the generation or elimination of pollutants and discharges to and from the MS4. In the Fourth Term Permits, the Copermittees have been required to implement special studies as directed by the San Diego Water Board. The special studies required by this Order provide the Copermittees more flexibility to identify and implement special studies that will be most useful to improving the effectiveness of their jurisdictional runoff management programs.

Provision D.3.a.(1) requires the Copermittees to develop and conduct at least three special studies per Watershed Management Area, to be determined by the Copermittees. One of the three special studies may be accomplished through participation in a Regional Special Study required under Provision D.3.a.(2). The requirements provide the Copermittees great latitude in identifying and developing the special studies. Watershed Management Area special studies are required, at a minimum, to: (a) relate in some way to the highest water quality priorities identified by the Copermittees in the Water Quality Improvement Plan, (b) be conducted within the Watershed Management Area, and (c) include some form of participation (e.g. contribution of funds, personnel services, project management) by all the responsible Copermittees within the Watershed Management Area.

Examples of Watershed Management Area special studies might include, but are not limited to: (1) focused pollutant source identification studies, (2) BMP effectiveness and/or comparison studies, (3) pilot tests for new or emerging pollutant control methods, (4) receiving water pollutant or stressor source identification and/or mitigation studies, or (5) pollutant fate and transport studies. The Watershed Management Area special studies are expected to provide data that can be utilized by the Copermittees to improve the Water Quality Improvement Plan or implementation of the Copermittees' jurisdictional runoff management programs to address the highest priority water quality conditions.

Provision D.3.a.(2) requires the Copermittees to develop special studies that will be conducted for the entire San Diego region. The regional special studies are expected to provide data that can be utilized by the Copermittees to improve the Water Quality Improvement Plan or implementation of the Copermittees' jurisdictional runoff management programs to identify or address regional water quality concerns and priorities.

An example of a regional special study would be to develop and establish allowable exceedance frequencies of the bacteria water quality objectives for several types of water bodies, during different wet and dry weather conditions the San Diego region. The special study would be related to bacteria, which is a priority for the San Diego region due to the adoption of "*Bacteria TMDL Project I – Beaches and Creeks in the*

San Diego Region." The study results could be used to inform the Copermittees and the San Diego Water Board about the indictor bacteria water quality objective exceedance frequencies that occur in natural or reference watersheds.

Provision D.4 (Assessment Requirements) specifies the assessments that the Copermittees are required to perform, based on the monitoring data collected, and will be reported as part of the Annual Report for the Water Quality Improvement Plan implementation. Provision D.4 requires the Copermittees assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c, and A.2.a.

Provision D.4 specifies the assessments that Copermittees must perform for each Watershed Management Area to assess the effectiveness of each Copermittee's jurisdictional runoff management program and the Water Quality Improvement Plan. The effectiveness of each Copermittee's jurisdictional runoff management program and Water Quality Improvement Plan is measured through these types of assessments: (a) Receiving Waters Assessments (b) MS4 Outfall Discharges Assessments, (c) Special Studies Assessments, and (d) Integrated Assessment of Water Quality Improvement Plan.

Provision D.4.a requires the Copermittees to assess the status of receiving water conditions. The monitoring data collected pursuant to Provision D.1 will be evaluated, among other information, to assess the condition of a Watershed Management Area's streams, coastal waters, enclosed bays, harbors, estuaries, and lagoons. The focus of the receiving waters assessments is to measure progress toward the objective of the CWA to "*restore and maintain the chemical, physical, and biological integrity of the Nation's waters*" as the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program are implemented within a Watershed Management Area. Provision D.4.a is consistent with 40 CFR 122.42(c)(7) which requires the Copermittees to annually report the *"[i]dentification of water quality improvements or degradation."*

Provision D.4.b includes the MS4 outfall discharges assessment requirements. The focus of MS4 outfall discharges assessments is to determine if the Copermittees' are implementing programs that comply with the requirements of the CWA for MS4 permits to "*effectively prohibit non-stormwater discharges into the storm sewers*" and "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable.*" The monitoring data collected pursuant to Provisions D.2 will be evaluated, among other information, to assess the effectiveness of the implementation of the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program. The MS4 outfall discharge assessments consist of Non-Storm Water Discharges Reduction Assessments and Storm Water Pollutant Discharges Reduction Assessments.

The Non-Storm Water Discharges Reduction Assessments are how each Copermittee will demonstrate that its jurisdictional runoff management program implementation

efforts are achieving the CWA requirement to "*effectively prohibit non-stormwater discharges into the storm sewers.*" Provision D.4.b.(1) requires each Copermittee to assess and report on its illicit discharge detection and elimination program required pursuant to Provision E.2 to reduce and effectively prohibit non-storm water and illicit discharges into the MS4 within its jurisdiction. The Non-Storm Water Discharges Reduction Assessments include specific assessment requirements applicable to each Copermittee.

As each Copermittee collects and analyzes the data collected pursuant to dry weather MS4 outfall discharges monitoring requirements of Provisions D.2.a.(2) and D.2.b, Provision D.4.b.(1) requires each Copermittee to assess the progress, assess the effectiveness of its current actions, and identify modifications necessary to increase the effectiveness of its actions toward reducing and eliminating non-storm water and illicit discharges to its MS4. The findings from these assessments are expected to be utilized by the Copermittee as part of its procedures to prioritize the non-storm water discharges that will be addressed by its Illicit Discharge Detection and Elimination program required pursuant to Provision E.2.

The assessment requirements of Provision D.4.a.(1) are consistent with 40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(3) which require "*procedures…to investigate portions of the separate storm sewer system that, <u>based on the results of the field screen, or other appropriate information</u> [emphasis added], indicate a reasonable potential of contain illicit discharges or other sources of non-storm water*" as part of a "*program…to detect and remove…illicit discharges and improper disposal into the storm sewer.*" The assessment requirements of Provision D.4.a.(1) are also consistent with 40 CFR122.42(c)(1) requires the Copermittees to annually report the "*status of implementing the components of the storm water management program that are established as permit conditions.*"

The Storm Water Pollutant Discharges Reduction Assessment is how the Copermittees in each Watershed Management Area will demonstrate that their jurisdictional runoff management program implementation efforts are achieving the CWA requirement to "*reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable*." Provision D.4.b.(2) requires the Copermittees in each Watershed Management Area to assess and report the progress of the Copermittees' efforts to reduce pollutants in storm water discharges from the MS4s to the MEP. The Storm Water Pollutant Discharges Reduction Assessments include specific assessment requirements applicable to the Watershed Management Area and each Copermittee.

As the Copermittees collect and analyze the data collected pursuant to wet weather MS4 outfall discharges monitoring requirements of Provisions D.2.a.(3) and D.2.c, Provision D.4.b.(2) requires the Copermittees to assess the progress of the Water Quality Improvement Plan strategies toward reducing pollutants in storm water from the MS4 to the MEP. The findings from these assessments are expected to be utilized by the Copermittees to identify any modifications to the wet weather MS4 outfall

discharge monitoring locations and frequencies necessary to identify sources of pollutants in storm water discharges from the MS4s, as well as focus, modify, and improve the water quality improvement strategies implemented by each Copermittee within its jurisdiction to reduce pollutants in storm water discharges to the MEP.

The assessment requirements of Provision D.4.a.(1) are consistent with 40 CFR 122.26(d)(2)(iii)(B) which requires "*[e]stimates of the annual pollutant load of the cumulative discharges to waters of the United States from all identified municipal outfalls…during a storm event…accompanied by a description of the procedures for estimating constituent loads and concentrations, including any modeling, data analysis, and calculation methods.*" The assessment requirements of Provision D.4.a.(2) are consistent with 40 CFR 122.26(d)(2)(v) which requires that each Copermittee assesses the *"estimated reductions in loadings of pollutants from discharges of municipal storm sewer constituents from municipal storm sewer systems expected as the result of the municipal storm water quality management program."* The assessment requirements of Provision D.4.a.(2) are also consistent with 40 CFR122.42(c)(1) requires the Copermittees to annually report the "*status of implementing the components of the storm water management program that are established as permit conditions.*"

Provision D.4.c includes the special studies assessment requirements. Performing special studies are how the Copermittees will address data gaps identified during the development of and updates to the Water Quality Improvement Plan The relevant findings from the special studies assessments are expected to be incorporated as part of the applicable receiving water assessments, MS4 outfall discharge assessments, and integrated water quality improvement assessments required in Provision D.4.a, D.4.b, and D.4.d, respectively.

The assessment requirements in Provision D.4.d are part of the iterative approach and adaptive management process required by Provision A.4. The Copermittees are required to integrate the data collected pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision D to re-evaluate the Water Quality Improvement Plan.

The monitoring data collected pursuant to Provisions D.1 and D.2, and the results of the assessment required pursuant to Provisions D.4.a-c, will be used to determine whether the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program are effective, or require modifications or improvements to become more effective to achieve the requirements of the CWA. The assessments required by Provision D.4.d are consistent with 40 CFR 122.42(c)(1) which requires that the Copermittees to report the *"[t]he status of implementing the components of the storm water management program that are established as permit conditions."*

E. Jurisdictional Runoff Management Programs

Purpose: Provision E includes the requirements for the jurisdictional runoff management programs to be implemented by each of the Copermittees. Compliance with the requirements for the jurisdictional runoff management programs will allow the Copermittees to demonstrate that they are implementing programs to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP. The jurisdictional runoff management program document prepared by each Copermittee will also provide the details for implementing the water quality improvement strategies identified in the Water Quality Improvement Plan specifically within its jurisdiction.

***Discussion*:** Implementation of the jurisdictional runoff management program requirements under Provision E is how the Copermittees "*effectively prohibit non-stormwater discharges into the storm sewers*", and outlines the "*controls to reduce the discharge of pollutants to the maximum extent practicable"* consistent with the federal regulations under 40 CFR 122.26. The jurisdictional runoff management program is part of the "*comprehensive planning process*" that is required pursuant to 40 CFR 122.26(d)(2)(iv). Where the Water Quality Improvement Plan is the "*comprehensive planning process*" on a Watershed Management Area scale, requiring "*intergovernmental coordination*", the jurisdictional runoff management program document is the "*comprehensive planning process*" on a jurisdictional scale that should be coordinated with the other Copermittees in the Watershed Management Area to achieve the goals of the Water Quality Improvement Plan.

The jurisdictional runoff management program requirements are included to provide each Copermittee criteria that can be used to demonstrate that its storm water management program is implementing the "*comprehensive planning process*" within its jurisdiction to "*effectively prohibit non-stormwater discharges into the storm sewers*", and to identify and implement the most effective "*controls to reduce the discharge of pollutants to the maximum extent practicable"* in accordance with the performance standards given in the CWA.

Provision E includes the requirements for each of the components that must be included in the Copermittee's jurisdictional runoff management program document that will be implemented by the Copermittee within its jurisdiction. Implementation of the components of each Copermittee's jurisdictional runoff management program must be consistent with the water quality improvement strategies identified in the Water Quality Improvement Plans.

More specific and detailed discussions of the requirements of Provision E are provided below.

Provision E.1 (Legal Authority Establishment and Enforcement) requires to each Copermittee to establish and enforce sufficient legal authority to control discharges to the MS4 within its jurisdiction.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system*" and be able to demonstrate that it can "*operate pursuant to legal authority established by statute, ordinance or series of contracts.*" Provision E.1.a describes the minimum legal authorities each Copermittee must establish for itself within its jurisdiction to control discharges to its MS4 The requirements of Provision E.1.a are consistent with the requirements set forth in 40 CFR 122.26(d)(2)(i)(A)-(F).

The certification statement required from each Copermittee by Provision E.1.b is included to provide the San Diego Water Board additional documentation that each Copermittee has established the legal authorities consistent with Provision E.1.a and 40 CFR 122.26(d)(2)(i)(A)-(F), and the Copermittee can "*operate pursuant to legal authority established by statute, ordinance or series of contracts.*"

Provision E.2 (Illicit Discharge Detection and Elimination) requires each to Copermittee to implement an illicit discharge detection and elimination program to effectively prohibit non-storm water discharges to the MS4 by actively detecting and eliminating illicit discharges and disposal into its MS4.

Provision E.2 establishes the minimum requirements that each Copermittee must implement within its jurisdiction to prevent and eliminate illicit discharges, and effectively prohibit non-storm water discharges, from entering its MS4. The federal CWA requires permits for municipal storm sewer systems to "*effectively prohibit non-storm water discharges into the storm sewers*." Under 40 CFR 122.26(d)(2)(iv)(B), each Copermittee must implement a "*program…to detect and remove…illicit discharges and improper disposal into the storm sewer.*" The federal NPDES regulations, under 40 CFR 122.26(b)(2), define illicit discharges as "*any discharge to a municipal separate storm sewer that is not composed entirely of storm water*. Thus, non-storm water discharges are not authorized to enter the MS4 and are considered to be illicit discharges, unless authorized by a separate NPDES permit.

The Phase I Final Rule clarifies that non-storm water discharges through an MS4 are not authorized under the CWA (55 FR 47995):

> "*Today's rule defines the term "illicit discharge" to describe any discharge through a municipal separate storm sewer system that is not composed entirely of storm water and that is not covered by an NPDES permit. Such illicit discharges are not authorized under the Clean Water Act. Section 402(p(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…Ultimately, such non-storm water discharges through a municipal separate*

> *storm sewer must either be removed from the system or become subject to an NPDES permit*."

The federal NPDES requirements for the program to address illicit discharges must include "*inspections, to implement and enforce an ordinance, orders, or other similar means to prevent illicit discharges to the MS4*." The federal NPDES regulations also reference several categories of "*non-storm water discharges or flows* [which] *shall be addressed where such discharges are identified…as sources of pollutants to waters of the United States*." The Phase I Final Rule (55 FR 48037) further clarified the requirements of 40 CFR 122.26(d)(2)(iv)(B)(1) as follows:

> "*EPA is clarifying that section 402(p)(3)(B) of the CWA (which requires permits for municipal separate storm sewers to 'effectively' prohibit non-storm water discharges) does not require permits for municipalities to prohibit certain discharges or flows of nonstorm water to waters of the United States through municipal separate storm sewers in all cases*."

In previous iterations of the municipal storm water permits for the San Diego Region, these categories were simply listed and referred to as categories of non-storm water discharges "not prohibited" unless identified as a source of pollutants. The Copermittees have often referred to these categories as "exempt" discharges. In both cases, however, the language is inconsistent with the federal CWA and NPDES regulations. And, the clarification provided in the Phase I Final Rule does not specifically state that such discharges are "not prohibited" or "exempt" or in any way authorized. The federal NPDES regulations do, however, state that specific categories of non-storm water discharges must be "*addressed*" if identified as "*sources of pollutants to waters of the United States*."

The language of Provision E.2.a has been revised to be fully consistent with the language of the CWA and the requirements of the federal regulations under 40 CFR 122.26(d)(2)(iv)(B)(1). Provision E.2.a requires each Copermittee to address <u>all</u> types of non-storm water discharges into its MS4 as illicit discharges, <u>unless</u> the discharge is authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to Provisions E.2.a.(1) through E.2.a.(5). Only non-NPDES-permitted non-storm water discharges identified as a category of non-storm water discharges under Provisions E.2.a.(1) through E.2.a.(5) <u>and</u> *not identified as a source of pollutants* do not have to be addressed as illicit discharges.

Several of the non-storm water categories listed in 40 CFR 122.26(d)(2)(iv)(B)(1) have not been included in Provisions E.2.a.(1) through E.2.a.(5), including: street wash water, landscape irrigation, irrigation water, and lawn watering. Because these are no longer included within the categories listed under Provisions E.2.a.(1) through E.2.a.(5), the Copermittees must prohibit these types of non-storm water discharges from entering the MS4. This is consistent with the clarification of 40 CFR 122.26(d)(2)(iv)(B)(1) in the Phase I Final Rule (55 FR 48037), which states:

"*[T]he Director may include permit conditions that either require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*."

Street wash water is a category of non-storm water discharges that was removed when the Third Term Permits were issued. Street wash water is a source of several pollutants (e.g., metals, oil and grease, petroleum hydrocarbons, chlorinated solvents, sediment) which are generated during the street washing process. The removal of this category requires the Copermittees to prohibit this type of non-storm water discharge from entering the MS4.

The landscape irrigation, irrigation water, and lawn watering categories, collectively referred to hereafter as "over-irrigation" discharges, were removed from the list of non-storm water discharge categories in the Fourth Term Orange County and Riverside County Permits. Non-storm water discharges resulting from over-irrigation have been found to be a source of several types of pollutants (e.g., nutrients, bacteria, pesticides, sediment) in receiving waters. The San Diego Water Board and the Copermittees have identified categories of non-storm water discharges associated with over-irrigation as a source of pollutants and conveyance of pollutants to the MS4 and waters of the United States in the following documents:

- **SmartTimer/Edgescape Evaluation Program (SEEP) Grant Application**

  The State Water Board allocated grant funding to the SEEP project grant application submitted in 2006, which targeted irrigation runoff by retrofitting areas of existing development and documenting the conservation and runoff improvements. The basis of this grant project is that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 is a source and conveyance of pollutants. In addition, the grant application indicated that this alteration of natural flows is impacting the beneficial uses of waters of the state and U.S. Results from the study indicate that that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 *is* a source and conveyance of pollutants. The results of this study can be applied broadly to any area where over-irrigation takes place. The grant application included the following statements:

  "*Irrigation runoff contributes flow & pollutant loads to creeks and beaches that are 303(d) listed for bacteria indicators.*"

  "*Regional program managers agree that the reduction and/or elimination of irrigation-related urban flows and associated pollutant loads may be key to successful attainment of water quality and beneficial use goals as outlined in the San Diego Basin Plan and Bacteria TMDL over the long term.*"

  "*Elevated dry-weather storm drain flows, composed primarily … of landscape irrigation water wasted as runoff, carry pollutants that impair recreational use and aquatic habitats all along Southern California's urbanized coastline. Storm*

drain systems carry the wasted water, along with landscape derived pollutants such as bacteria, nutrients and pesticides, to local creeks and the ocean. Given the local Mediterranean climate, excessive perennial dry season stream flows are an unnatural hydrologic pattern, causing species shifts in local riparian communities and warm, unseasonal contaminated freshwater plumes in the near-shore marine environment."

- **2006-2007 Orange County Watershed Action Plan Annual Reports**

The Watershed Action Plan Annual Reports for the 2006-2007 reporting period were submitted by the County of Orange, Orange County Flood Control District and Copermittees within the San Juan Creek, Laguna Coastal Streams, Aliso Creek, and Dana Point Coastal Streams Watersheds. San Juan Creek, Laguna Coastal Streams, Aliso Creek and Dana Point Coastal Streams are all currently 303(d) listed as impaired for indicator bacteria within their watersheds and/or in the Pacific Ocean at the discharge points of their watersheds. The Orange County Copermittees, within their Watershed Action Strategy Table for fecal indicator bacteria included the following:

"*Support programs to reduce or eliminate the discharge of anthropogenic dry weather nuisance flow throughout the…watershed. Dry weather flow is the transport medium for bacteria and other 303(d) constituents of concern.*"

Additionally, they state that "*conditions in the MS4 contribute to high seasonal bacteria propagation in-pipe during warm weather. Landscape irrigation is a major contributor to dry weather flow, both as surface runoff due to over-irrigation and overspray onto pavements; and as subsurface seepage that finds its way into the MS4*."

- **Fiscal Year 2008 Carlsbad Watershed Urban Runoff Management Program Annual Report**

The Carlsbad Watershed Urban Runoff Management Program Annual Report for Fiscal Year 2008 was submitted by the Carlsbad Watershed Copermittees (Cities of Carlsbad, Encinitas, Escondido, Oceanside, San Marcos, Solana Beach, and Vista, and the County of San Diego). In the Annual Report, the Carlsbad Watershed Copermittees stated the following:

"The Carlsbad Watershed Management Area (WMA) collective watershed strategy identifies bacteria, sediment, and nutrients as high priority water quality pollutants in the Agua Hedionda (904.3 – bacteria and sediment), Buena Vista (904.2 – bacteria), and San Marcos Creek (904.5 – nutrients) Hydrologic Areas. Bacteria, sediment, and nutrients have been identified as potential discharges from over-irrigation."

- **2007-2008 San Diego Bay Watershed Urban Runoff Management Program Annual Report**

  The San Diego Bay Watershed Urban Runoff Management Program 2007-2008 Annual Report was submitted by the San Diego Bay Watershed Copermittees (Cities of Chula Vista, Coronado, Imperial Beach, La Mesa, Lemon Grove, National City, and San Diego, the County of San Diego, the Port of San Diego, and the San Diego County Airport Authority). In Appendix D of the Annual Report, titled "Likely Sources of Pollutants", the San Diego Bay Watershed Copermittees identified over-irrigation of lawns as a pollutant generating activity from business and/or residential land uses for bacteria, pesticides, and sediment.

- **Copermittee Public Education Materials**

  The Orange County Public Works *Tips for Landscape & Gardening* public education brochure states: "*Fertilizers, pesticides and other chemicals that are left on yards or driveways can be blown or washed into storm drains that flow to the ocean. Overwatering lawns can also send materials into storm drains*."

  The Riverside County Flood Control and Water Conservation District *Landscape and Garden* public education brochure states: *"Soil, yard wastes, over-watering and garden chemicals become part of the urban runoff mix that winds it way through streets, gutters and storm drains before entering lakes, rivers, streams, etc. Urban runoff pollution contaminates water and harms aquatic life!"*

- **Los Penasquitos Lagoon Sedimentation/Siltation TMDL Technical Report**

  The Los Penasquitos Lagoon Sedimentation/Siltation TMDL technical report was prepared for the City of San Diego and USEPA in October 2010. The technical report was included as a technical supporting document attached to the Sediment TMDL for Los Penasquitos Lagoon staff report prepared by the San Diego Water Board, dated June 13, 2012. Under the Source Assessment section, the technical report states the following:

  > "*Dry weather loading is dominated by nuisance flows from urban land use activities such as car washing, sidewalk washing, and lawn over-irrigation, which pick up and transport sediment into receiving waters.*"

These documents confirm that non-storm water discharges associated with over-irrigation are a source of pollutants and should be addressed as illicit discharges to the MS4. Prohibiting non-storm water discharges associated with over-irrigation, however, is not a new requirement for the Copermittees because it is also consistent with and required by the Water Conservation in Landscaping Act (AB 1881, Laird).

The Water Conservation in Landscaping Act required the Department of Water Resources (DWR) to prepare a Model Water Efficient Landscape Ordinance for use by local agencies (e.g. the Copermittees). All local agencies were required to adopt a water efficient landscape ordinance by January 1, 2010. Local agencies could adopt the Water Efficient Landscape Ordinance developed by DWR, or an ordinance considered at least as effective as the Model Ordinance. The Water Efficient Landscape Ordinance includes a requirement that local agencies prohibit runoff from irrigation (§ 493.2):

> "*Local agencies shall prevent water waste resulting from inefficient landscape irrigation by* <u>*prohibiting runoff from leaving the target landscape*</u> *[emphasis added] due to low head drainage, overspray, or other similar conditions where water flows onto adjacent property, non-irrigated areas, walks, roadways, parking lots, or structures. Penalties for violation of these prohibitions shall be established locally*."

Furthermore, non-storm water discharges from over-irrigation not only transport and discharge pollutants to receiving waters, but are also a likely source of the dry weather flows causing changes to habitat within and along the receiving water bodies. Examples of habitat changes from the dry weather flows include perennialization of ephemeral streams, and conversion of saltwater and brackish water marsh habitats to freshwater marsh habitats (e.g. Los Penasquitos Lagoon). Both of these examples have resulted in the promotion of invasive species in several areas of the San Diego Region.

The removal of the over-irrigation discharges categories does not require the Copermittees to strictly prohibit lawn and landscape irrigation, but does require the prohibition of excessive irrigation water that results in non-storm water discharges to the MS4. Non-storm water discharges to the MS4 from over-irrigation must be addressed as illicit discharges by the Copermittees pursuant to the requirements of Provision E.2.

The remaining non-storm water categories listed in 40 CFR 122.26(d)(2)(iv)(B)(1) are listed under Provisions E.2.a.(1) through E.2.a.(5) and generally fall into four categories: (1) non-storm water discharges subject to existing San Diego Water Board waste discharge requirements and NPDES permits; (2) non-storm water discharges generally not expected to be a source of pollutants to receiving waters; (3) non-storm water discharges likely to contain pollutants requiring some form of control to address the pollutants prior to discharging to the MS4; and (4) non-storm water discharges or flows associated with firefighting.

Provisions E.2.a.(1) and E.2.a.(2) include several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) for which the San Diego Water Board already has developed general waste discharge requirements and NPDES permits to address the discharges. The Copermittees are only required to address these types of non-storm water discharges as illicit discharges if the Copermittees or the San Diego Water Board identifies these non-storm water discharges not having

coverage under the applicable NPDES permit or as a source of pollutants to receiving waters. Generally, if these types of non-storm water discharges have coverage under an NPDES permit and are identified as a source of pollutants to receiving waters, the Copermittees would be expected to identify the responsible dischargers and report their identities to the San Diego Water Board. The San Diego Water Board would then have the responsibility to enforce the NPDES permit and/or waste discharge requirements.

Provision E.2.a.(3) includes several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) which are generally not expected to be a source of pollutants to receiving waters, many of which originate from what are typically natural, uncontrollable sources. The Copermittees are only required to address these types of non-storm water discharges as illicit discharges if the Copermittees or the San Diego Water Board identifies these non-storm water discharges as a source of pollutants to receiving waters. Because many of these sources are generally uncontrollable, enforcing a prohibition may not be a possibility for the Copermittees. The Copermittees would be able to address these non-storm water discharges by preventing these non-storm water discharges from entering the MS4. This could potentially be achieved by sealing their MS4 structures so the discharges cannot enter the MS4.

Provision E.2.a.(4) includes several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) that are likely to contain pollutants requiring some form of control to address the pollutants prior to discharging to the MS4. At this time, an outright prohibition of these types of non-storm water discharges does not yet appear to be warranted. Thus, Provision E.2.a.(4) has includes several requirements for the Copermittees to control the pollutants from these types of non-storm water discharges. This is consistent with the clarification of the federal regulations in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board has the authority to require the Copermittees to "*control any of these types of discharges where appropriate*."

Unlike non-storm water discharges from over-irrigation, these types of non-storm water discharges are not expected to occur in close proximity to each other or very frequently. Provided these types of non-storm water discharges are controlled as required in Provision E.2.a.(4), the Copermittees would only be required to address these types of non-storm water discharges as illicit discharges if the Copermittee or the San Diego Water Board identifies these non-storm water discharges as a source of pollutants to receiving waters.

Provision E.2.a.(5) includes specific requirements for fire fighting discharges and flows. The requirements for non-storm water discharges and flows associated with fire fighting have been separated into requirements for: a) non-emergency fire fighting discharges and flows, and b) emergency fire fighting discharges and flows.

The San Diego Water Board has found that discharges from building fire suppression system maintenance (e.g. fire sprinklers) contain waste and potentially a significant source of pollutants to receiving waters. As such, the San Diego Water Board is requiring these discharges be addressed as illicit discharges by the Copermittees. Thus, the discharges to the MS4 are to be prohibited via ordinance, order or similar means. For other non-emergency fire fighting discharges and flows (i.e., flows from controlled or practice blazes, fire fighting training, and maintenance activities not associated with building fire suppression systems), the Copermittees are required to develop and implement a program to address pollutants in these non-storm water discharges and flows. This is consistent with the clarification of the federal regulations in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board has the authority to require the Copermittees to "*control any of these types of discharges where appropriate*."

For emergency fire fighting discharges and flows, the Phase I Final Rule (55 FR 48037) has clarified the requirements of 40 CFR 122.26(d)(2)(iv)(B)(1) pertaining to emergency fire fighting flows and discharges, which states:

> "*In the case of fire fighting it is not the intention of these rules to prohibit in any circumstances the protection of life and public or private property through the use of water or other fire retardants that flow into separate storm sewers*."

Thus, the requirements have been made to be consistent with the guidance provided by the Phase I Final Rule. The Order recommends that the Copermittees develop and encourage implementation of BMPs to reduce or eliminate the discharge of pollutants from emergency fire fighting flows to the MS4s and receiving waters.

The Copermittees are expected to review the dry weather MS4 outfall discharge monitoring data they collect to determine if and when there are non-storm water discharges to or from their MS4s that are a source of pollutants to receiving waters. If the Copermittees identify one of the types of non-storm water discharges listed in Provisions E.2.a.(1) through E.2.a.(4) as a source of pollutants to receiving waters based on the review and evaluation of monitoring data, Provision E.2.a.(6) requires the Copermittees to prohibit those categories of discharges from entering the MS4 through ordinance, order or similar means.

Provision E.2.a.(6) also clarifies that the San Diego Water Board may identify categories of non-storm water discharges or flows listed under Provisions E.2.a.(1) through E.2.a.(4) that must be prohibited. This is consistent with the clarification of 40 CFR 122.26(d)(2)(iv)(B)(1) in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board may "*require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*."

Finally, Provision E.2.a.(7) has been included in the requirements for non-storm water discharges to clarify that any non-storm water discharges to the Copermittee's MS4, even those identified pursuant to Provisions E.2.a.(1) through E.2.a.(4), must be

reduced or eliminated. Provision E.2.a.(7) is consistent with the requirements of CWA section 402(p)(3)(B)(ii) and 40 CFR 122.26(d)(1)(v)(B), as clarified in the Phase I Final Rule (55 FR 47995) that "*[u]ltimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit*."

Consistent with 40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(1), each Copermittee must implement a "*program…to prevent illicit discharges to the municipal storm sewer system*" and "*detect…illicit discharges and improper disposal into the storm sewer.*" Provision E.2.b requires each Copermittee to implement measures to prevent and detect illicit discharges and connections to its MS4 as part of its illicit discharge detection and elimination program.

As part of the program to prevent and detect illicit discharges to the MS4, 40 CFR 122.26(d)(2)(iv)(B)(2) requires "*procedures to conduct on-going field screening activities during the life of the permit, including areas or locations that will be evaluated by such field screens*." As part of the procedures, each Copermittee is required to maintain an updated map of its entire MS4 and the corresponding drainage areas within its jurisdiction. Having knowledge about where inlets, access points, connections with other MS4s, and outfalls are located is necessary for each Copermittees to track, identify, and eliminate illicit discharges and connections. Thus, Provision E.2.b.(1) of the Order specifies that the map must include the segments of the storm sewer system owned, operated, and maintained by the Copermittee, and include locations of all known inlets, connections with other MS4s, and outfalls to the Copermittee's MS4. The remaining requirements of Provision E.2.b are consistent with the requirements of 40 CFR 122.26(d)(2)(iv)(B)(3)-(7) related to implementing measures to prevent and detect illicit discharges and connections to the MS4.

Provision E.2.c requires each Copermittee to conduct field screening and monitoring of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4. Field screening is a required element of the program to detect and eliminate illicit discharges and connections to the MS4, pursuant to 40 CFR 122.26(d)(2)(iv)(B)(2). The field screening requirement will be implemented through the dry weather MS4 outfall discharge monitoring required under Provisions D.2.a.(2) and D.2.b.(1).

Provision E.2.d specifies the measures each Copermittee must implement to eliminate illicit discharges and connections to its MS4. Elimination of illicit discharges and connections to the MS4 is consistent with the requirement of 40 CFR 122.26(d)(2)(iv)(B) "*to detect and <u>remove</u> [emphasis added]…illicit discharges and improper disposal into the storm sewer*" and will achieve the CWA requirement for MS4 permits to "*effectively prohibit non-storm water discharges into the storm sewers*."

Generally, each Copermittee is responsible for prioritizing its efforts to eliminate non-storm water and illicit discharges or connections to its MS4 based on field screening and monitoring data, NALs, illicit discharge investigation records, and the known or

suspected sources. Sources of non-storm water and illicit discharges or connections must be eliminated by enforcing the legal authority established by each Copermittee pursuant to Provision E.1.

Finally, Provision E.2.e requires the Copermittee to include the strategies and/or activities identified in the Water Quality Improvement Plan that the Copermittee will implement as part of the illicit discharge detection and elimination program within its jurisdiction. The Water Quality Improvement Plan is expected to include several strategies and options that the Copermittee can and should implement within its jurisdiction. The Copermittee is expected to describe and provide the details of when, where, and how those strategies will be implemented within its jurisdiction.

The San Diego Water Board will utilize the information provided in the jurisdictional runoff management program document pursuant to Provision E.2.e to gauge and assess the Copermittee's efforts in trying to address the highest priority water quality conditions identified in the Water Quality Improvement Plan within its jurisdiction.

Provision E.3 (Development Planning) requires each Copermittee to use its land use and planning authority to implement a development planning program to control and reduce the discharge of pollutants in storm water from new development and significant redevelopment to the MEP. Proper implementation of the development planning program will also contribute toward effectively prohibiting non-storm water discharges from development projects to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." As part of the management program, 40 CFR 122.26(d)(2)(iv)(A)(2) requires "*planning procedures including a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment*."

Development typically includes the construction of impervious surfaces such as sidewalks, driveways, roads, and rooftops. These impervious surfaces generate and concentrate pollutants (such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not found in high concentrations in the natural environment. Pollutants that accumulate on impervious surfaces are not easily biodegraded or not subject to natural treatment processes. When it rains, these pollutants are transported in storm water runoff from these impervious surfaces into receiving waters, resulting in poor water quality and degradation of beneficial uses.

In addition to the generation of pollutants, development generally alters the natural conditions of the land by removing vegetative cover, reducing the perviousness of the surface, and reducing the capacity of storm water that can be intercepted, captured, stored, infiltrated, evaporated, and/or evapotranspired. The alteration of the natural

conditions and addition of impervious surfaces associated with development causes water quality problems. Hydrograph modification, or hydromodification, is the change in the natural watershed hydrologic processes and runoff characteristics caused by development or other land use changes that result in increased stream flows, altered sediment transport, and morphological changes to channels receiving the runoff.

This is consistent with what USEPA has noted, that "*[m]ost stormwater runoff is the result of the man-made hydrologic modifications that normally accompany development. The addition of impervious surfaces, soil compaction, and tree and vegetation removal result in alterations to the movement of water through the environment. As interception, evapotranspiration, and infiltration are reduced and precipitation is converted to overland flow, these modifications affect not only the characteristics of the developed site but also the watershed in which the development is located. Stormwater has been identified as one of the leading sources of pollution for all waterbody types in the United States. Furthermore, the impacts of stormwater pollution are not static; they usually increase with more development and urbanization*."[28]

Reducing the impact from the increased pollutant loads and flows generated by impervious surfaces added to a watershed is essential to protecting and restoring the integrity of the receiving waters. Provision E.3 includes the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment*." The requirements of Provision E.3 will 1) minimize the generation and discharge of pollutants in storm water from the MS4, and 2) minimize the potential of storm water discharges from causing altered flow regimes and excessive downstream erosion in receiving waters.

Provision E.3 is based on the requirements of the Fourth Term Permits for Orange County and Riverside County, and do not differ significantly from the Fourth Term Permit for San Diego County. Provision E.3 has been modified to allow the more holistic, long-term planning approach of the Water Quality Improvement Plan to be incorporated into each Copermitee's development planning. The result will be greater pollutant removal from storm water runoff, and improvements and/or rehabilitation of the functionality and hydrologic regimes of a Watershed Management Area. Alternative compliance options have been included in Provision E.3, which will result in multiple beneficial outcomes within a jurisdiction, a subwatershed, a receiving water body, and/or a Watershed Management Area.

Incorporating a holistic and long-term planning approach into each Copermittee's development planning program is essential to reducing the impact of development on receiving waters. Development projects that convert natural open space areas into

[28] USEPA, 2007. Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices, December 2007.

urbanized areas result in the generation and discharge of pollutants associated with anthropogenic activities, and significant modifications to the hydrologic flow regimes. Both adversely affect the chemical, physical, and biological conditions of receiving waters. Redevelopment projects, on the other hand, are opportunities to reduce the generation of pollutants and restore more natural hydrologic flow regimes in areas of existing development, which can contribute toward restoring or rehabilitating the chemical, physical, and biological conditions of impacted and/or impaired receiving waters.

To improve the health and functionality of the receiving waters in a Watershed Management Area, planning and land use practices must change to reduce the various impacts due to hydromodification and pollutants associated with storm water runoff from developing and developed areas. Planning principles to preserve, enhance, and restore the functionality and hydrologic regimes were incorporated into the development planning provisions of all the Third and Fourth Term Permits within the San Diego Region. Provision E.3 of this Order focuses on mitigating the effects of development by continuing to include these principles, as well as promote the concept of utilizing storm water as a resource. By doing so, pollutants in storm water runoff generated within developing and developed areas will be treated more naturally, and storm water will be discharged to receiving waters at discharge rates that are not unnaturally erosive, thereby resulting in conditions that are more supportive of healthy and sustainable water bodies.

The requirements of Provision E.3.a are the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment*" applicable to all development projects, regardless of size or purpose of development. These requirements are based on and consistent with the requirements for all development projects in the Fourth Term Permits for San Diego, Orange, and Riverside Counties (Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016, respectively). All development projects are required to implement source control BMPs that will minimize the generation of pollutants. Additionally, each development project must implement, where applicable and feasible, LID BMPs to mimic the natural hydrology of the site and retain and/or treat pollutants in storm water runoff prior to discharging to and from the MS4.

The LID Center defines LID as "*a comprehensive land planning and engineering design approach with a goal of maintaining and enhancing the pre-development hydrologic regime of urban and developing watersheds.*"[29] LID designs seek to control storm water at the source, using small-scale integrated site design and management practices to mimic the natural hydrology of a site, retain storm water runoff by

[29] www.lowimpactdevelopment.org

minimizing soil compaction and impervious surfaces, and disconnect storm water runoff from conveyances to the storm drain system.

LID BMPs may utilize interception, storage, evaporation, evapotranspiration, infiltration, and filtration processes to retain and/or treat pollutants in storm water before it is discharged from a site. Because of these numerous options, the San Diego Water Board expects that every development project will be able to implement some form of LID BMPs. Examples of LID BMPs include using permeable pavements, rain gardens, rain barrels, grassy swales, soil amendments, and native plants.

Provision E.3.a also includes requirements for all development projects to, where feasible, landscape with native and/or low water use plants to minimize the discharge of non-storm water discharges associated with excessive irrigation, as well as harvest (i.e., storage) and use precipitation to promote the concept of utilizing storm water as a resource.

While all development projects are subject to the requirements of Provision E.3.a, Provision E.3.b identifies Priority Development Projects that exceed given size thresholds and/or fit under specific use categories. Priority Development Projects are required to incorporate specific performance criteria for structural BMPs incorporated into the project plan to reduce the generation of pollutants, and address potential impacts from hydromodfication.

The Priority Development Project categories are based on the requirements of the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), and do not differ significantly from the Fourth Term Permit for San Diego County. Furthermore, the Priority Development Project categories are consistent with Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), and Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit).

Priority Development Projects generally include new development and significant redevelopment projects that can generate large amounts of pollutants, or have large areas of impervious surface that will contribute to adverse impacts in receiving waters. Placement of impervious surfaces within the environment not only generates and accumulates significant amounts of pollutants that will be transported in storm water runoff, but also drastically modifies the natural hydrologic processes within the watersheds.

Impervious surfaces do not allow natural infiltration and treatment of storm water runoff to take place. Instead, storm water runoff from impervious surfaces have typically been directed through pipes, curbs, gutters, and other hardscape into receiving waters, with little treatment at significantly increased volumes and accelerated flow rates over what would occur naturally. The increased pollutant loads, storm water volume, discharge rates and velocities, and discharge durations discharged from the MS4 adversely impacts the flora and fauna of receiving waters, and causes increased,

unnatural erosion and scouring within creek bed and banks. Placement of impervious surfaces also encapsulates "good" sediment (such as sand, gravel, rocks and cobbles) that would normally replenish creek beds and banks to help stabilize them.

This increased and unnatural erosion, which is caused by both altered storm water flow and altered sediment flow regimes, is largely responsible for degradation of creeks, streams, and associated habitats in the San Diego Region. In an ongoing study by the Stormwater Monitoring Coalition to assess the health of streams throughout Southern California, researchers found that three of the four highest risk stressors to creeks (percent sands and fines present, channel alteration, and riparian disturbance) were related to physical habitat.[30] Researchers studying flood frequencies in Riverside County have found that increases in watershed imperviousness of only 9-22 percent can result in increases in peak flow rates for the two-year storm event of up to 100 percent.[31] Such changes in runoff have significant impacts on channel morphology.

In addition, a technical report issued by the Southern California Coastal Water Research Project (SCCWRP) stated that "*[r]ecent studies indicate that California's intermittent and ephemeral streams are more susceptible to the effects of hydromodification than streams from other parts of the United States. Physical degradation of stream channels in the central and eastern United States can initially be detected when watershed impervious cover approaches 10 percent, although biological effects (which may be more difficult to detect) may occur at lower levels. In contrast, initial response of streams in the semi-arid portions of California appears to occur between 3 and 5 percent impervious cover*."[32] These studies highlight the extent to which impacts originating from impervious surfaces created by development are responsible for the degradation and hydromodification of creeks and streams.

Because the impact relatively small increases in impervious surfaces in a watershed can have on receiving waters, Provision E.3.b.(2)(g) has been updated to include large driveways. Although they generally do not carry heavy traffic, paved, impervious driveways that are 5,000 square feet or more create significant areas of impervious surface that contribute to altered flow regimes, and are also sometimes used for storage of motor vehicles that can generate significant amounts of pollutants.

The Copermittees have identified several types of projects that they assert would be cost prohibitive if they were categorized as Priority Development Projects, and would discourage development or redevelopment within their jurisdictions. Many of these types of projects may not pose a threat when considered individually. However, collectively and cumulatively, several of these projects would likely cause significant impacts to receiving waters if they were all located within a subwatershed, watershed,

[30] Assessing the Health of Southern California Streams, Stormwater Monitoring Coalition, Fact Sheet
[31] Schueler and Holland, 2000. Storm Water Strategies for Arid and Semi-Arid Watersheds (Article 66). The Practice of Watershed Protection.
[32] Stein, E. and Zaleski, S., 2005. Technical Report 475, Managing Runoff to Protect Natural Streams: The Latest Development on Investigation and Management of Hydromodification in California. December 30, 2005.

and/or Watershed Management Area. Thus, these types of development projects should be required to implement structural BMPs that Priority Development Projects are required to implement to be protective of water quality.

Provision E.3.b.(3), however, does provide exemptions for several of these types of development projects identified by the Copermittees from being defined as Priority Development Projects. Development projects that are not Priority Development Projects are not required to be included in the inventory of Priority Development Projects that must be maintained by each Copermittee pursuant to Provision E.3.e.(2). In addition, structural BMPs on development projects that are not Priority Development Projects are not required to be inspected pursuant to Provision E.3.e.(3). Inspections of development projects that are not Priority Development Projects, however, will be performed as part of the existing development inspections required pursuant to Provision E.5.c.

The exemptions under Provision E.3.b.(3) are provided for development projects that meet certain conditions. The exemptions have been provided as an incentive for the Copermittees to encourage and promote the implementation of LID design concepts and green infrastructure and building principles. The conditions for allowing those exemptions have been included to provide an incentive for developers to implement LID design concepts and green infrastructure and building principles. Development projects that meet the conditions of Provision E.3.b.(3) are not expected to be cost prohibitive and also expected to be protective of water quality.

For development projects identified as Priority Development Projects, the requirements of Provision E.3.c are the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment.*" Provisions E.3.c.(1)-(3) describe the performance criteria for the structural BMPs that must be implemented for each Priority Development Project defined by Provision E.3.b.

Provisions E.3.c.(1)-(3) and emphasize preserving natural watershed hydrology by requiring retention of storm water and management of flows to maintain or mimic the natural hydrology of a site. The holistic and long-term planning approach of the Water Quality Improvement Plans is incorporated into Provisions E.3.c.(1)-(3) by encouraging the Copermittees to improve or rehabilitate watershed functionality and flow regimes with a combination of strategies.

Provision E.3.c.(1) describes the storm water pollutant control BMP requirements that must be implemented by all Priority Development Projects. The purpose of Provision E.3.c.(1) is to reduce pollutants in storm water runoff to the MEP from Priority Development Projects before it is discharged to the MS4. Of all the available treatment processes available, retention of storm water, and therefore capture of the pollutants in the storm water, will achieve 100 percent pollutant removal efficiency for

the volume of storm water retained. No other method of treatment can achieve 100 percent pollutant removal efficiency. Thus, retention of as much storm water onsite is the most effective way to reduce pollutants in storm water discharges to and from the MS4, and controls pollutants in storm water discharges from a site to the MEP.

Under Provision E.3.c.(1)(a)(i), retention of the 85th percentile storm event is the default design standard that Priority Development Projects must use to implement to mimic the pre-development retention volume ("design capture volume"). Since the 85th percentile storm event has previously been used as the numeric design standard for treatment control BMPs, the same size storm event has been applied as the numeric design standard for the storm water pollutant control BMP requirements. This is consistent with the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), as well as Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), and Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit).

The 85th percentile storm event is the event that has a precipitation total greater than or equal to 85 percent of all storm events over a given period of record in a specific area or location. For example, to determine what the 85th percentile storm event is in a specific location, all 24 hour storms that have recorded values over a 30 year period would be tabulated and a 85th percentile storm would be determined from this record (i.e., 15 percent of the storms would be greater than the number determined to be the 85th percentile storm). Most jurisdictions in the San Diego Region have already developed isopluvial maps that can provide this type of information. The 85th percentile storm might be determined to be a number such as 1.0 inch, and this would be multiplied by the total area of the project footprint to calculate the design capture volume. The Priority Development Project designer would then select a system of BMPs that would retain (i.e. intercept, infiltrate, store, evaporate, evapotranspire, or harvest and use) the design capture volume, based on the 85th percentile storm event, onsite.

Retention of all storm water and all pollutants in storm water onsite for the 85th percentile storm event, however, may not always mimic the natural pre-development retention volume. Retention of the volume generated by the 85th percentile storm event also may not be practical, nor desirable, as storm water flows are a necessary component of the natural hydrologic processes in a watershed.

The optimum amount of storm water retained onsite would mimic the pre-development retention volume of the project site. Mimicking the pre-development retention volume is an approach USEPA allows for federal development projects. USEPA issued guidance on implementing storm water runoff requirements for federal projects that requires the retention of the 95th percentile storm event as the default design standard

to mimic the pre-development hydrology of a project site.[33] The USEPA guidance also provided an option to develop a site-specific design standard. Similar to the USEPA guidance for federal facilities, Provision E.3.c.(1)(a)(ii) provides an option to develop a site specific design capture volume that would mimic the pre-development retention volume of the project site.

Retention BMPs will be designed to capture a specific volume, and may take some time for the intercepted or captured storm water to infiltrate, evaporate, evapotranspire, or be used. Retention of the design capture volume, however, will capture and retain a significant portion of the pollutants generated and accumulated on a Priority Development Project. In a recent study performed by SCCWRP in the Los Angeles Region, they found "*that the magnitude of constituent load associated with storm water runoff depends, at least in part, on the amount of time available for pollutant build-up on land surfaces. The extended dry period that typically occurs in arid climates such as southern California maximizes the time for constituents to build-up on land surfaces, resulting in proportionally higher concentrations and loads during initial storms of the season*."[34] This implies that the "first flush" of a rainy season and the first storm events after long antecedent dry periods tend to have the highest pollutant loads. Capturing and retaining the pollutant loads of the "first flush" of a rainy season and the first storm events after long antecedent dry periods will reduce a significant portion of the pollutants in storm water discharged to and from the MS4.

The San Diego Water Board, however, acknowledges that in some situations retaining the design capture volume fully onsite may not be technically feasible, may be cost prohibitive, or may not provide any overall water quality benefits to the Watershed Management Area. Thus, Provision E.3.c.(1)(b) allows for the use of a combination of onsite retention BMPs, and alternative compliance options described in Provision E.3.c.(3). Provision E.3.c.(3) is discussed in more detail below.

If the design capture volume is not retained onsite because the Priority Development Project is allowed to implement alternative compliance options, the pollutants in the portion of the design capture volume not reliably retained onsite must still be reduced to the MEP. Thus, flow-thru conventional treatment control BMPs are required to be implemented on Priority Development Projects in addition to the retention BMPs and/or biofiltration BMPs. The requirements of Provision E.3.c.(1)(c) include the performance standards for flow-thru conventional treatment control BMPs, consistent with the Fourth Term Permits in the San Diego Region.

Where the purpose of the requirements under Provision E.3.c.(1) is to reduce pollutants in storm water runoff to the MEP, the purpose of the requirements under Provision E.3.c.(2) is to maintain or restore more natural hydrologic flow regimes to

[33] USEPA, 2009. Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act, EPA 841-B-09-001. December 2009.
[34] Stein, E.D., Tiefenthaler, L.L., and Schiff, K.C., 2007. Technical Report 510, Sources, Patterns and Mechanisms of Storm Water Pollutant Loading from Watershed and Land Uses of the Greater Los Angeles Area, California, USA. March 20, 2007.

prevent increased, unnatural erosion in downstream receiving waters to the MEP. Provision E.3.c.(2) describes hydromodification management BMP requirements that must be implemented by all Priority Development Projects.

The development planning requirements under the Fourth Term Permits required the Copermittees in San Diego County, Orange County, and Riverside County to develop Hydromodification Management Plans (HMPs). Because the Copermittees have already developed HMPs, there is no longer a requirement to develop these plans. The Copermittees in each county, however, must update to their respective HMPs, as needed, to incorporate the hydromodification management BMP requirements of Provision E.3.c.(2).

The performance criteria for the implementation of hydromodification management BMPs on Priority Development Projects are consistent with the requirements in the Fourth Term Permits for Orange and Riverside Counties (Order Nos. R9-2009-0002 and R9-2010-0016, respectively). Modifications to the Orange County and Riverside County HMPs will likely be minor, or may not be necessary. The HMP for San Diego County, however, will likely require some modifications to incorporate the requirements of Provision E.3.c.(2) and become consistent with the Orange County and Riverside County HMPs. The San Diego Water Board does not, however, expect that it will be necessary for the San Diego County Copermittees to develop a new approach or significantly re-write the San Diego County HMP.

Provision E.3.c.(2)(a) requires that post-project flow rates and durations mimic the *pre-development* condition, and not the *pre-project* condition of the Fourth Term San Diego County Permit. This includes assuming artificially hardened channels receiving storm water discharges from a Priority Development Project have the characteristics of a natural stream segment similar to that found in the watershed. Provision E.3.c.(2)(a) will primarily apply to redevelopment projects and artificially hardened channels, whose pre-project conditions have already significantly altered the natural hydrologic regime. This will allow more natural hydrologic flow regimes to eventually be restored in the developed areas of the Watershed Management Areas, which can in turn allow hydromodified streams and creeks to eventually be restored or rehabilitated.

Provision E.3.c.(2)(b) requires hydromodification management BMPs to compensate for sediment loss in cases where the development would cause loss of sediment supply as a result of the project. Maintaining the pre-development flows and durations from a Priority Development Project will significantly reduce the potential for increased erosion caused by development. Loss of natural sediment because pervious areas covered by the impervious surfaces on the Priority Development Project, however, can still cause increased, unnatural erosion in receiving waters. Runoff that is discharged from a Priority Development Project that lacks sediment becomes “sediment hungry” and can result in increased erosion upstream and downstream from the point of discharge.

The San Diego Water Board recognizes that in some situations implementing the hydromodification management BMP requirements fully onsite may not be technically feasible, may be cost prohibitive, or may not provide any overall water quality benefits to the Watershed Management Area. Thus, Provision E.3.c.(2)(c) allows for the use of a combination of onsite hydromodification management BMPs and alternative compliance options described in Provision E.3.c.(3). The San Diego County Copermittees may incorporate the alternative compliance options into their HMP. Provision E.3.c.(3) is discussed in more detail below.

Finally, Provision E.3.c.(2)(d) allows Priority Development Projects to be exempt from the hydromodification management BMP requirements under Provisions E.3.c.(3)(a)-(b) if a limited set of conditions are met.

Provision E.3.c.(3) describes the alternative compliance options that each Copermittee may allow Priority Development Projects within its jurisdiction to utilize to meet the structural BMP performance criteria of Provisions E.3.c.(1) and E.3.c.(2). Such allowances are not required and are at the discretion of each Copermittee. Provision E.3.c.(3) was included because the San Diego Water Board recognizes that various site specific conditions can make complying with the structural BMP performance criteria requirements fully onsite difficult or impractical, and implementing the alternative compliance options can potentially realize or achieve greater water quality benefits for the Watershed Management Area.

Provision E.3.c.(3)(a) includes the conditions that must be met for a Copermittee to allow a Priority Development Project to utilize the alternative compliance options to comply with the structural BMP performance criteria of Provisions E.3.c.(1) and E.3.c.(2). Priority Development Projects that cannot comply with the requirements of Provision E.3.c.(3)(a) must be required by the Copermittee to comply with the requirements of Provisions E.3.c.(1) and E.3.c.(2) fully onsite.

Provisions E.3.c.(3)(b)-(d) describe the alternative compliance options that the Copermittee may develop and/or allow to be implemented by Priority Development Projects. The descriptions include the conditions that must be met for the alternative compliance option to be allowed to be utilized by a Priority Development Project. For the alternative compliance project options under Provision E.3.c.(3)(b), the descriptions also specify if the alternative compliance options may only be implemented to comply with the storm water pollutant control BMP requirements of Provision E.3.c.(1), hydromodification management BMP requirements of Provision E.3.c.(2), or both.

Provisions E.3.c.(4) and E.3.c.(5) were included under the BMP requirements applicable to all development projects in the Fourth Term Permits for San Diego, Orange, and Riverside Counties (Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016, respectively). In this Order, the long-term BMP maintenance and infiltration and groundwater protection requirements were move under the structural

BMP performance requirements of Provision E.3.c and only apply to structural BMPs implemented by Priority Development Projects.

Provision E.3.d requires the Copermittees to update their BMP Design Manual as needed to incorporate the requirements of Provision E.3. The BMP Design Manual is formerly known as the Standard Storm Water Mitigation Plan, or SSMP, and was renamed so that the title has a more accurate description of the document content. The contents of the BMP Design Manual are largely unchanged from the previous Standard Storm Water Mitigation Plans required under the Fourth Term Permits. The BMP Design Manual fulfills the 40 CFR 122.26(d)(2)(iv)(A)(2) requirement that the Copermittee's development planning program includes "*a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment*."

As part of the "*planning procedures*", 40 CFR 122.26(d)(2)(iv)(A)(2) requires the procedures to "*address controls to reduce pollutants in discharges from municipal separate storm sewers after construction is completed*." The requirements applicable to the implementation and oversight of structural BMPs at Priority Development Projects are provided under Provision E.3.e.

Proper installation of the structural BMPs approved for a Priority Development Project is necessary to ensure that pollutants in storm water discharges will be reduced to the MEP after the project is completed. In addition to the proper installation of structural BMPs, the maintenance of structural BMPs on Priority Development Projects is necessary to ensure that pollutants in storm water discharges will continue to be reduced to the MEP. Provision E.3.e.(1) includes the minimum requirements that each Copermittee must implement to ensure structural BMPs are properly installed and will be properly maintained.

The requirements under Provision E.3.e.(2)-(3) are necessary to demonstrate each Copermittee is implementing a program that complies with Provisions E.3.b-c and E.3.e.(1), and ensure structural BMPs at Priority Development Project will continue to be able to reduce pollutants in storm water discharges to the MEP.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary for any development projects to compel compliance with the requirements of Provision E.3 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.3.f requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Finally, Provision E.3.g requires the Copermittee to include the strategies and/or activities identified in the Water Quality Improvement Plan that the Copermittee will

implement as part of the development planning program within its jurisdiction. The Water Quality Improvement Plan is expected to include several strategies and options that the Copermittee can and should implement within its jurisdiction. The Copermittee is expected to describe and provide the details of when, where, and how those strategies will be implemented within its jurisdiction.

Provision E.3.g specifically requires the Copermittee to identify areas within its jurisdiction where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting and/or stream, channel, or habitat rehabilitation projects. This requirement has been included to promote and encourage cooperation between the Copermittees and the development community to implement projects that can reduce pollutants in storm water runoff from areas of existing development, and stabilize or rehabilitate channels, stream and/or habitats that have been hydromodified because of existing development.

Furthermore, Provision E.3.g encourages the Copermittee to collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify regional alternative compliance projects that Priority Development Projects may be allowed or should be encouraged to implement or participate in implementing. This requirement has been included to promote and encourage more collaboration and coordination, as well as long term planning, among Copermittees and other entities in the Watershed Management Area.

The San Diego Water Board will utilize the information provided in the jurisdictional runoff management program document pursuant to Provision E.3.g to gauge and assess the Copermittee's efforts in trying to address the highest priority water quality conditions identified in the Water Quality Improvement Plan within its jurisdiction.

Provision E.4 (Construction Management) requires each Copermittee to implement a construction management program to control and reduce the discharge of pollutants in storm water from construction sites to the MEP. Proper implementation of the construction management program will also contribute toward effectively prohibiting non-storm water discharges from construction sites to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." As part of the management program, 40 CFR 122.26(d)(2)(iv)(D) requires "*a program to implement and maintain structural and non-structural best management practices to reduce pollutants in storm water runoff from construction sites to the municipal storm sewer system.*"

Construction sites can be significant sources of sediment, trash, and other pollutants to receiving waters. Although sediment is naturally occurring in the natural

environment, the discharge of sediment under unnatural conditions is problematic to receiving waters. Fine sediment in creeks causes high turbidity that interferes with the functionality of native flora and fauna in local creeks. For example, turbidity interferes with both photosynthesis of water-philic plants, as well as successful foraging and reproduction of benthic macroinvertebrates. Sediment can also make it difficult for fish to breathe because it clogs fish gills. Other pollutants such as heavy metals or pesticides can adhere to sediment and are transported to receiving waters during storm events, where they dissolve in the water column and become bioavailable to aquatic organisms. Sediment is recognized as a major stressor to surface waters and is responsible for the impairment of several lagoons and creeks in the San Diego Region.

Provision E.4 includes requirements that each Copermittee must implement to minimize the discharge of sediment and other pollutants from construction sites to the MS4 within its jurisdiction. The requirements under Provision E.4 are consistent with the Fourth Term Permits for San Diego, Orange, and Riverside Counties. Therefore, Copermittees are expected to implement the requirements seamlessly, with minimal changes to their existing construction management programs. The Copermittees, however, are given more flexibility to run their programs as needed to maximize efficiency, and also to be consistent with the Water Quality Improvement Plan for the Watershed Management Area.

As part of the construction management program, 40 CFR 122.26(d)(2)(iv)(D)(1) requires "*procedures for site planning which incorporate consideration of potential water quality impacts.*" Provision E.4.a describes the minimum elements each Copermittee is required to include as part of the construction site planning and project approval process. The construction site planning and approval process is based primarily on ensuring each project had an adequate site-specific pollution control, construction BMP, and/or erosion and sediment control plan that will be implemented to minimize the discharge of pollutants in storm water to the MEP, and minimize impacts to receiving waters.

The requirements under Provision E.4.b provide the data and information necessary to identify "*priorities for inspecting sites and enforcing control measures*" required pursuant to 40 CFR 122.26(d)(2)(iv)(D)(3). Under Provision E.4.b, each Copermittee must identify construction sites that are considered a high threat to downstream surface waters. Designation of "high threat to water quality" construction sites will necessitate the Copermittees to develop criteria to identify such sites. Provision E.4.b.(2) describes a list of factors that must be considered when the Copermittee considers threat to water quality. For example, a Copermittee must identify sites as "high threat to water quality" if it is located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions, according to the Water Quality Improvement Plan. This ensures that construction management program implementation is compatible with the Copermittee's identified highest priority water quality conditions.

Pursuant to 40 CFR 122.26(d)(2)(iv)(D)(2) each Copermittee is required describe "*requirements for nonstructural and structural best management practices*" at construction sites. Provision E.4.c includes the types of construction site BMPs that the Copermittees must implement, or require the implementation of, at each construction site to reduce pollutants in storm water discharges to the MEP.

Each Copermittee is expected to require the implementation of appropriate BMPs given specific site conditions, the season and likelihood of rain events, and construction phase (i.e. grading vs. vertical construction). This means that throughout the life of the project construction, the appropriate BMPs will vary, especially if the construction of the project spans multiple wet seasons. As opposed to describing specific minimum BMPs that must be implemented, the Order describes major BMP categories that should be considered for each site.

Each Copermittee is expected to use its 20 years of storm water experience and knowledge to require implementation of appropriate BMPs from the various categories at each construction site within its jurisdiction. For example, the San Diego Water Board expects that each site will be required to implement erosion control and sediment control at each construction site. The San Diego Water Board also expects each Copermittee to require implementation of active/passive sediment treatment systems at sites where other BMPs have been tried and are known to be inadequate, and discharges of sediment are causing or contributing to water quality impairment downstream. Each Copermittee is granted flexibility in specifying the minimum level of BMP requirements at each site, but the San Diego Water Board expects each site to be capable of controlling pollutants in storm water discharges to the MEP and preventing illicit discharges.

The requirements under Provision E.4.d are necessary to demonstrate that each Copermittee is implementing a program that complies with Provisions E.4.a and E.4.c and ensure BMPs at construction sites will reduce pollutants in storm water discharges to the MEP.

Provision E.4.d does not include minimum required inspection frequencies for construction sites. Each Copermittee must use its experience and knowledge to specify an appropriate inspection frequency for both high priority and lower priority sites in their jurisdictional runoff management program documents, and in accordance with the Water Quality Improvement Plan. Appropriate inspection frequencies may vary by Copermittee, but the San Diego Water Board expects that the stated frequency will be adequate for each Copermittee to properly oversee the construction sites within its jurisdiction, confirm BMPs are implemented to reduce pollutants in storm water discharges from constructions sites to the MEP, and make needed changes to its program on an ongoing basis as necessary.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary for any development projects

to compel compliance with the requirements of Provision E.4 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.4.e requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Finally, Provision E.4.f requires the Copermittee to include the strategies and/or activities identified in the Water Quality Improvement Plan that the Copermittee will implement as part of the construction management program within its jurisdiction. The Water Quality Improvement Plan is expected to include several strategies and options that the Copermittee can and should implement within its jurisdiction. The Copermittee is expected to describe and provide the details of when, where, and how those strategies will be implemented within its jurisdiction.

The San Diego Water Board will utilize the information provided in the jurisdictional runoff management program document pursuant to Provision E.4.f to gauge and assess the Copermittee's efforts in trying to address the highest priority water quality conditions identified in the Water Quality Improvement Plan within its jurisdiction.

Provision E.5 (Existing Development Management) requires each Copermittee to implement an existing development management program to control and reduce the discharge of pollutants in storm water from areas of existing development to the MEP. Proper implementation of the existing development management program will also contribute toward effectively prohibiting non-storm water discharges from areas of existing development to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." Within 40 CFR 122.26(d)(2)(iv)(A) and (C), the management program is required to reduce impacts on receiving waters and reduce pollutants in storm water discharges to the MEP from commercial and residential areas, industrial facilities, and municipal facilities.

Commercial and residential areas, industrial facilities, and municipal facilities must be addressed by each Copermittee with the existing development management program required under Provision E.5. All other areas within each Copermittee's jurisdiction should be either undeveloped open space, or areas that are being developed or under construction. Areas being developed or under construction will be addressed by the Copermittee under the requirements of Provision E.3 (Development Planning) or Provision E.4 (Construction Management).

Areas of existing development typically include impervious surfaces such as sidewalks, driveways, roads, and rooftops, which generate and concentrate pollutants (such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not found in high concentrations in the natural environment. Pollutants that

accumulate on impervious surfaces are not easily biodegraded or not subject to natural treatment processes. When it rains, these pollutants are transported in storm water runoff from these impervious surfaces into receiving waters, resulting in poor water quality and degradation of beneficial uses.

In addition to the generation of pollutants, areas of existing development have generally altered the natural conditions of the land and removed vegetative cover, reduced the perviousness of the surface, and reduced the capacity of storm water that can be intercepted, captured, stored, infiltrated, evaporated, and/or evapotranspired. The alteration of the natural conditions and the impervious surfaces associated with areas of existing development causes water quality problems due to the alteration of natural flow regimes within the watersheds, resulting in hydromodification of channels, streams and habitats that exist within or adjacent to areas of existing development.

Thus, storm water discharges from areas of existing development are responsible for poor water quality, degraded habitats, and hydromodified channels throughout the developed portions of the watersheds in the San Diego Region. To improve the health and functionality of the receiving waters in a Watershed Management Area, land use practices and the amount of impervious surfaces in areas of existing development must change to reduce the various impacts caused by hydromodification and pollutants from storm water runoff generated in developed areas. Each Copermittee must be aggressive in tackling pollutant sources and runoff from areas of existing development to be able to reduce pollutants in storm water discharges from the MS4 to the MEP.

There is some overlap in the requirements under Provision E.5 with the requirements under Provisions E.2 (Illicit Discharge Detection and Elimination), E.3 (Development Planning), and E.4 (Construction Management). Illicit discharges frequently originate from areas of existing development. New development projects, when completed will become some type of residential, commercial, industrial or municipal existing development. Redevelopment projects are, by definition, redeveloping areas of existing development. And, redevelopment projects become construction sites located in areas of existing development. Much of the data and information collected, inspections performed, and enforcement actions taken for the requirements under Provisions E.2 to E.4 may also be utilized by the existing development management program. The requirements under Provision E.5, however, are focused primarily on reducing pollutants generated in areas of existing development that can be transported in storm water runoff and discharged to and from the MS4.

The requirements under Provision E.5 build upon existing program elements being implemented by the Copermittees. Provision E.5 is generally consistent with the existing development requirements of the Fourth Term Permits for Orange and Riverside Counties (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), but modified to provide more flexibility to implement the programs so resources can be better focused toward addressing the highest priority water quality conditions identified in the Water Quality Improvement Plans.

For a Copermittee to properly manage areas of existing development, having knowledge of what development exists within its jurisdiction is essential. The requirements under Provision E.5.a for each Copermittee to maintain a watershed-based inventory of all the existing development within its jurisdiction are necessary for each Copermittee to implement the requirements of Provision E.5.b-e.

As opposed to just maintaining separate inventories based on the type of site, each Copermittee must maintain a watershed-based inventory that includes all types of existing development within its jurisdiction. By utilizing a watershed-based inventory, the Copermittees within a Watershed Management Area can combine their inventories and review the inventories by watershed in addition to by jurisdiction. Pollutant sources and strategies for abatement can then be evaluated on a watershed level, as opposed to evaluating sources and strategies strictly by type of site.

Provision E.5.a includes the information that must be included in the inventory. Provision E.5.a.(1) specifies what facilities or areas must be included in the inventory. A commercial type of existing development may be identified in the inventory as a facility (e.g. individual building, individual business) or an area (e.g. shopping center, commercial zone). An industrial type of existing development must be identified in the inventory by facility (e.g. individual industrial entity). A municipal type of existing development must be identified in the inventory by facility, with a list of specific municipal facilities that must be included in the inventory. A residential type of existing development must be identified by areas to be designated by the Copermittee. For each of the facilities and areas identified in the Copermittee's inventory developed pursuant to Provision E.5.a.(1), Provision E.5.a.(2) specifies the information that must be included in the description for the facility or area.

Provision E.5.a.(3) requires each Copermittee to maintain an updated map showing the location of inventoried existing development, watershed boundaries, and water bodies. This requirement was included because this information is expected to help the Copermittees in a Watershed Management Area identify and prioritize sources of pollutants and/or stressors in areas of existing development that contribute toward the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Knowledge of the sources of existing development likely contributing to the highest priority water quality conditions is expected to be a key element in the Copermittees' development of the water quality improvement strategies that will be included in the Water Quality Improvement Plans. The strategies described in the Water Quality Improvement Plans will direct the existing development management programs implemented by each Copermittee.

Pursuant to 40 CFR 122.26(d)(2)(iv)(A) each Copermittee is required describe "*structural and source control measures to reduce pollutants*" in storm water runoff discharged from areas of existing development. Provision E.5.b includes the BMP

implementation and maintenance requirements that the each Copermittee must require at areas of existing development to reduce pollutants in storm water discharges to the MEP. The San Diego Water Board, however, recognizes that BMP implementation and maintenance for residential areas will require much more education and encouragement through less authoritative measures than for commercial, industrial and municipal facilities and areas. Thus, the BMP implementation and maintenance requirements have been separated between requirements under Provision E.5.b.(1) for commercial, industrial and municipal facilities and areas, and Provision E.5.b.(2) for residential areas.

Most of the requirements in Provision E.5.b are consistent with the related requirements in the Fourth Term Permits. The level of specificity, however, has been changed to allow each Copermittee the flexibility to implement its program to achieve maximum efficiency, and to perform functions that will address the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Each Copermittee is expected to require the implementation of appropriate BMPs to address the expected pollutants from each facility or area. The Third and Fourth Term Permits described specific minimum BMPs that must be implemented at various sites. This Order, however, requires each Copermittee to designate minimum BMPs themselves and require implementation. Consistent with the Fourth Term Permits, each Copermittee is required to maintain, or require the maintenance of, all BMPs as needed.

The BMP implementation and maintenance requirements include a schedule of operation and maintenance activities for the MS4 and related structures (such as catch basins, storm drain inlets, and detention basins), as well as public streets and roads. Public streets and roads specifically include public unpaved roads. The San Diego Water Board identified, through investigations and complaints, sediment discharges from unpaved roads as a significant source of water quality problems in the San Diego Region. Enforcement and inspection activities conducted by the San Diego Water Board since the Third Term Permits were issued have found a lack of source control for many unpaved roads within the jurisdiction of the Copermittees.

Unpaved roads are a source of sediment that can be discharged in runoff to receiving waters, especially during storm events. Erosion of unpaved roadways occurs when soil particles are loosened and carried away from the roadway base, ditch, or road bank by water, wind, traffic, or other transport means. Exposed soils, high runoff velocities and volumes, sandy or silty soil types, and poor compaction increase the potential for erosion.

Road construction, culvert installation, and other maintenance activities can disturb the soil and drainage patterns to streams in undeveloped areas, causing excess runoff and thereby erosion and the release of sediment. Poorly designed unpaved roads can act as preferential drainage pathways that carry runoff and sediment into natural streams, impacting water quality. In addition, other public works activities along

unpaved roads have the potential to significantly affect sediment discharge and transport within streams and other waterways, which can degrade the beneficial uses of those waterways.

USEPA also recognizes that discharges from unpaved roads pose a significant potential threat to water quality. USEPA guidance[35] emphasizes the threat of unpaved roads to water quality:

> "*Dirt and gravel roads are a major potential source of these pollutants [sediment] and pollutants that bind to sediment such as oils, nutrients, pesticides, herbicides, and other toxic substances. Many roads have unstable surfaces and bases. Roads act like dams, concentrating flows that accelerate erosion of road materials and roadsides. Both unstable surfaces and accelerated erosion then lead to sediment and dust.*"

There are several guidance documents, developed by the USEPA,[36] the US Forest ervice,[37] the University of California,[38] and others, that include design and construction specifications and BMPs that are readily available for implementation by public entities. Implementing design and other source control BMPs for unpaved roads in the region is necessary to reduce and minimize the impacts of sediment discharged during storm events from unpaved roads to the MS4s and receiving waters.

Provision E.5.c describes existing development site inspection frequency, content, and tracking that each Copermittee must incorporate into their existing development management programs. The requirements under Provision E.5.c are necessary to demonstrate each Copermittee is implementing a program that complies with Provision E.5.b and ensure BMPs implemented in areas of existing development will reduce pollutants in storm water discharges to the MEP. Provision E.5.c has been modified to include a minimum of once every 5 years for all inventoried facilities and areas of existing development, utilizing one or more methods of inspection.

In addition to onsite inspections, the methods of inspection have been expanded to include drive-by inspections. Inspections may be performed by the Copermittee's municipal and contract staff, or by volunteer monitoring or patrol programs. Volunteer monitoring or patrol programs are not expected to enforce the Copermittee's ordinances, or to inspect areas or facilities where members of the public are not allowed access. Volunteer monitoring or patrol programs must be trained by the Copermittee, and are only expected to collect visual observations. By utilizing drive-by inspections and volunteer monitoring or patrol programs, the Copermittees will be able

[35] USEPA, 2006. Environmentally Sensitive Maintenance for Dirt and Gravel Roads. Gesford and Anderson, USEPA-PA-2005.
[36] Ibid
[37] US Forest Service, 1996. Forest Service Specifications for Construction of Roads & Bridges. EM-7720-100. Revised August 1996.
[38] University of California Division of Agriculture and Natural Resources, 2007. Rural Roads: A Construction and Maintenance Guide of California Landowners. Publication 8262.

to maximize and efficiently use their resources to identify and address sources of pollutants in areas of existing development.

The municipal and contract staff of each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial, industrial, and municipal facilities and areas in its inventoried existing development pursuant to Provision E.5.c.(1)(a)(iv). An "equivalent" of at least 20 percent means if any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspection may count toward the total annual inspection requirement. Linear municipal facilities (i.e., MS4, streets, roads and highways) in the Copermittee's existing development inventory are not subject to the inspection frequency requirement of Provision E.5.c.(1)(a)(iv).

The inspection content specified in Provision E.5.c.(2)(a) includes the information required to be collected during an inspection by any method. The inspection content specified in Provision E.5.c.(2)(a) includes additional information that must be collected when a Copermittee's municipal or contract staff perform an onsite inspection. Provision E.5.c.(3) specifies the information that each Copermittee must maintain in its existing development inspection records.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary to compel compliance with the requirements of Provision E.5 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.5.d requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Finally, Provision E.5.e requires the Copermittee to include the strategies and/or activities identified in the Water Quality Improvement Plan that the Copermittee will implement as part of the existing development management program within its jurisdiction. The Water Quality Improvement Plan is expected to include several strategies and options that the Copermittee can and should implement within its jurisdiction. The Copermittee is expected to describe and provide the details of when, where, and how those strategies will be implemented within its jurisdiction.

Provisions E.5.e.(2)-(3) specifically require the Copermittee to identify areas of existing development as candidates for retrofitting, and streams, channels, and/or habitats as candidates for rehabilitation. Provisions E.5.e.(2)-(3) are based on the retrofitting requirements of the Fourth Term Permits for Orange and Riverside Counties, but modified to also include identifying projects to rehabilitate channels within areas of existing development. The requirements have also been modified to be more focused on utilizing these types of projects for addressing the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Interest and opportunity to retrofit areas of existing development and rehabilitate channels located in areas of existing development has been observed in several programs the San Diego Water Board oversees (e.g., CWA Section 401 Water Quality Certification program, supplemental environmental projects, and grant programs). Each jurisdiction has miles and miles of streets that could be retrofitted to become green streets. Reshaping landscaped areas from convex to concave configurations can detain storm water instead of directing runoff as quickly as possible to the MS4. Retrofit projects could also include simply replacing impervious surfaces with permeable surfaces.

Retrofitting projects do not necessarily have to be expensive. Retrofitting projects could be as simple as redirecting downspouts from roofs to pervious or landscaped areas instead of to hardscaped areas discharging directly to the MS4, providing rain barrels to harvest storm water from downspouts for use at a later time, or planting more trees in areas with little vegetation to provide canopy that can intercept storm water. The San Diego Water Board encourages the Copermittees to identify simple, low-cost retrofitting opportunities that can be easily implemented, in addition to other more expensive retrofitting and channel rehabilitation projects.

Rehabilitation of channels, streams, and/or habitat will require more significant planning and resources to implement. There are, however, also abundant opportunities to rehabilitate channels, streams and/or habitats in or adjacent to areas of existing development. Each Watershed Management Area likely has several creeks and stream reaches that have been undergrounded, artificially hardened, or hydromodified that could be rehabilitated to be more sustainably configured, which would slow down storm water flows and potentially have more assimilative capacity for pollutants while still being supportive of designated beneficial uses.

The San Diego Water Board recognizes that it may be infeasible to implement retrofitting or channel rehabilitation projects within certain areas of a Copermittee's jurisdictions. For such areas, the Copermittee must instead identify, develop, and implement regional retrofitting and channel rehabilitation projects (i.e. projects that can retain and/or treat storm water from one or more areas of existing development) adjacent to and/or downstream of the areas of existing development.

Provisions E.5.e.(2)-(3) do not require the implementation of retrofitting and rehabilitation projects, but do require the Copermittee to develop a strategy to facilitate the implementation of these types of projects in areas of existing development. The strategy is expected to include allowing and encouraging Priority Development Projects to implement these types of projects to comply with the structural BMP performance criteria requirements of Provisions E.3.c.(1) and E.3.c.(2).

The San Diego Water Board will utilize the information provided in the jurisdictional runoff management program document pursuant to Provision E.5.e to gauge and assess the Copermittee's efforts in trying to address the highest priority water quality conditions identified in the Water Quality Improvement Plan within its jurisdiction.

Provision E.6 (Enforcement Response Plans) requires each Copermittee to develop an Enforcement Response Plan as part of its jurisdictional runoff management program document. Proper implementation of the Enforcement Response Plans is necessary to effectively prohibit non-storm water discharges to the MS4, and reduce the discharge of pollutants in storm water from the MS4 to the MEP.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system*" and be able to demonstrate that it can "*operate pursuant to legal authority established by statute, ordinance or series of contracts*" to control the discharge of non-storm water and pollutants in storm water to and from its MS4. Pursuant to 40 CFR 122.26(d)(2)(i)(E) each Copermittee is specifically required to have the legal authority to "*[r]equire compliance with conditions in ordinances, permits, contracts or order*s."

The requirements under Provision E.6 are necessary to demonstrate that each Copermittee can enforce its legal authority to *"effectively prohibit non-stormwater discharges"* and "*reduce the discharge of pollutants to the maximum extent practicable*" as well as "*[r]equire compliance with conditions in ordinances, permits, contracts or order*."

The Enforcement Response Plan required under Provision E.6 will serve as a reference for the Copermittee and the San Diego Water Board to determine if consistent enforcement actions are being implemented to achieve timely and effective compliance from all public and private entities that are not in compliance with the Copermittee's ordinances, permits, or other requirements. The Enforcement Response Plan must contain clear direction for the Copermittee to take immediate enforcement action, when appropriate and necessary, in their illicit discharge detection and elimination, development planning, construction management, and existing development management programs.

If the entities subject to the Copermittee's legal authority do not implement appropriate corrective actions in a timely manner, or if violations repeat, the Copermittee must take progressively stricter responses to enforce its legal authority and achieve compliance with its ordinances, permits, or other requirements to *"effectively prohibit non-stormwater discharges"* and "*reduce the discharge of pollutants to the maximum extent practicable.*"

Provision E.7 (Public Education and Participation) requires each Copermittee to implement a public education and participation program. Proper implementation of the public education and participation program as part of its jurisdictional runoff management program will contribute toward effectively prohibiting non-storm water discharges to the MS4, and toward the reduction of pollutants in storm water from the MS4 to the MEP.

Provision E.7 establishes the minimum requirements that each Copermittee must implement to engage members of the public as part of its jurisdictional runoff management program. In the Fourth Term Permits, the public education program requirements and the public participation requirements were included as separate jurisdictional runoff management program components. In this Order, the public education requirements have been consolidated with the public participation requirements, as both sets of requirements are related to the engagement of the public by each Copermittee. Engagement of the public is critical for the success of each Copermittee's jurisdictional runoff management program.

The Copermittees have been implementing public education programs for the last 20 years, which are now well established. The specificity of expected public education program elements of the Fourth Term Permits has been removed. For the most part, the public education program requirements in Provision E.7.a have been reduced to a set of requirements that are specifically included in the federal regulations under 40 CFR 122.26(d)(2)(iv)(A)(6), 122.26(d)(2)(B)(6) and 122.26(d)(2)(D)(4), which should already be incorporated into each Copermittee's existing public education program. Each Copermittee is expected to utilize the information and data collected from the monitoring and assessments conducted within the Watershed Management Area, and from its inventories and inspections to best direct its public education program resources toward addressing the highest priority water quality conditions identified within the Water Quality Improvement Plan.

According to 40 CFR 122.26(d)(2)(iv), public participation is required to be included as part of the "*comprehensive planning process*", which includes the development and implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs. The requirements under Provision E.7.b specify the opportunities that the public must be provided to be involved in the "*comprehensive planning process*", as required by to 40 CFR 122.26(d)(2)(iv).

Provision E.8 (Fiscal Analysis) requires each Copermittee to secure the resources and provide an analysis of the resources that will be necessary to implement the requirements of the Order. Adequate fiscal resources are necessary for a jurisdictional runoff management program to effectively prohibit non-storm water discharges to the MS4, and reduce pollutants in storm water from the MS4 to the MEP.

According to 40 CFR 122.26(d)(2)(vi), each Copermittee is responsible for providing "*a fiscal analysis of the necessary capital and operation and maintenance expenditures necessary to accomplish the activities*" required by this Order, including "*a description of the source of funds that are proposed to meet the necessary expenditures, including legal restrictions on the use of such funds.*" The fiscal analysis requirements of Provision E.8 are consistent with 40 CFR 122.26(d)(2)(vi).

The San Diego Water Board has chosen not to require a description of fiscal benefits realized from implementation of the jurisdictional runoff management programs. This

is a recommendation from the National Association of Flood and Stormwater Management Agencies.[39] For instance, the fiscal analysis requirements do not address city-wide fiscal benefits of protection (e.g., public health, tourism, property values, economic activity, beneficial uses, etc.), even though many costs currently reported to the San Diego Water Board are for related activities. This type of assessment may help Copermittees improve the allocation of resources and it may help the Copermittees secure adequate funding for the program. Qualitative assessments, however, could be overly subjective and most Copermittees likely lack the ability to provide accurate quantitative assessments. The San Diego Water Board encourages the Copermittees to consider means for conducting assessments of fiscal benefits derived from the programs. Such assessments could be conducted on a regional scale similar to studies of program costs conducted by the State Water Board.[40]

[39] National Association of Flood and Stormwater Management Agencies. 2006. *Guidance for Municipal Stormwater Funding.* Prepared under a grant provided by the USEPA.
[40] State Water Board, 2005. NPDES Stormwater Cost Survey.

F. Reporting

Purpose: Provision F includes the requirements for the documents and reports that the Copermittees must prepare and provide to the San Diego Water Board. The documents prepared by the Copermittees and provided to the San Diego Water Board and made available to the public will provide the documentation that the Copermittees are complying with the requirements of the Order.

***Discussion*:** Provision F requires the Copermittees to prepare several documents and reports that must be provided to the San Diego Water Board and made available to the public. The reporting requirements have been significantly reduced compared to the Fourth Term Permit reporting requirements. The reduction in reporting requirements was recommended by the San Diego County Copermittees in the Report of Water Discharge submitted in June 2011.

More specific and detailed discussions of the requirements of Provision F are provided below.

Provision F.1 (Water Quality Improvement Plans) requires the Copermittees in each Watershed Management Area to develop and submit a Water Quality Improvement Plan in accordance with the requirements of Provision B.

Of all the requirements of Provision F, the Water Quality Improvement Plans will likely be the documents requiring the most significant effort to develop. The content of the Water Quality Improvement Plans, however, is expected to include content that should already have been developed for the Watershed Plans and several elements that are included in the Monitoring and Reporting Programs required under the Fourth Term Permits.

Because the Water Quality Improvement Plan is part of the "*comprehensive planning process*" requiring public participation, Provision F.1 includes requirements to give multiple opportunities to the public to provide input on the content of the plans. The Water Quality Improvement Plans are required to be submitted by the Copermittees within 18 months after adoption of this Order.

Provision F.2 (Updates) requires the Copermittees to update specific documents that the Copermittees will utilize to implement the requirements of this Order.

Each Copermittee is required to continue implementing a jurisdictional runoff management program, as required under Provision E. Implementation of each Copermittee's jurisdictional runoff management program is directed by its jurisdictional runoff management program document. Provision F.2.a requires each Copermittee to update its jurisdictional runoff management program document to be consistent with the requirements of Provision E within 18 months after the adoption of this Order.

Likewise, each Copermittee must continue to require new development and redevelopment projects to implement BMPs to control pollutants in storm water runoff. The control of pollutants in storm water runoff from development and redevelopment projects within each Copermittee's jurisdiction is guided and directed by its BMP Design Manual, formerly known as a Standard Storm Water Mitigation Plan (SSMP). Provision F.2.b requires each Copermittee to update its BMP Design Manual to be consistent with the requirements of Provision E.3 within 18 months after the adoption of this Order.

In general, the requirements of the Order should not necessitate a complete rewrite of each Copermittee's jurisdictional runoff management program document or BMP Design Manual, as was required by the Third Term Permits. The jurisdictional runoff management program and BMP Design Manual requirements of this Order are not significantly different than the requirements of the Fourth Term Permits. Thus, only sections of the Order which are new or have been significantly changed should warrant revisions to specific sections of the Copermittee's jurisdictional runoff management program document and BMP Design Manual.

Finally, the Water Quality Improvement Plans are expected to require updates as the iterative approach and adaptive management process included in the Water Quality Improvement Plan, as required under Provision B.5, is implemented by the Copermittees. Provision F.2.c requires the Copermittees to submit the updates to the Water Quality Improvement Plan as part of the Annual Reports required under Provision F.3.b.

Provision F.3 (Progress Reporting) requires the Copermittees to report on the progress of implementing the Water Quality Improvement Plans.

The requirements of Provision F.3 are to report the progress toward improving water quality that the Copermittees are achieving with the implementation of the Water Quality Improvement Plans and each Copermittee's jurisdictional runoff management program. The Progress Report Presentations required under Provision F.3.a are included to provide the Copermittees an opportunity to communicate directly with the San Diego Water Board and the public. The Progress Report Presentations will also provide the members of the San Diego Water Board and members of the public an opportunity to become more acquainted with the Copermittees and their projects and programs to address non-storm water and storm water discharges into and from their MS4s.

The Annual Report requirements of Provision F.3.b are a consolidation of several reporting requirements from the Fourth Term Permits, including the Jurisdictional Runoff Management Program Annual Reports, the Watershed Annual Reports, and the Monitoring and Reporting Program Annual Reports. Furthermore, the Annual Report requirements are consistent with the requirements under 40 CFR 122.42(c).

Pursuant to 40 CFR 122.42(c), "*[t]he operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the Director…must submit an annual report*", which must include the following:

(1) *The status of implementing the components of the storm water management program that are established as permit conditions* [40 CFR 122.42(c)(1)];

(2) *Proposed changes to the storm water management programs that are established as permit conditions* [40 CFR 122.42(c)(2)];

(3) *Revisions, if necessary, to the assessment of controls and fiscal analysis* [40 CFR 122.42(c)(3)];

(4) *A summary of data, including monitoring data, that is accumulated throughout the reporting year* [40 CFR 122.42(c)(4)];

(5) *Annual expenditures and budget for year following each annual report* [40 CFR 122.42(c)(5)];

(6) *A summary describing the number and nature of enforcement actions, inspections, and public education programs* [40 CFR 122.42(c)(6)];

(7) *Identification of water quality improvements or degradation* [40 CFR 122.42(c)(7)].

Under the Fourth Term Permits, each Copermittee is responsible for submitting a Jurisdictional Runoff Management Program Annual Report; the Copermittees in each designated watershed are responsible for submitting a Watershed Annual Report; and the Copermittees from each county are responsible for submitting a Monitoring and Reporting Program Annual Report.

There are 39 Copermittees in the San Diego Region, each required to prepare and submit a Jurisdictional Runoff Management Program Annual Report. There are 9 designated watersheds in San Diego County, 6 designated watersheds in Orange County, and 1 designated watershed in Riverside County for a total of 16 designated watersheds, each requiring a Watershed Annual Report. There are 3 sets of Copermittees in 3 counties in the San Diego Region, requiring Copermittees from each county to prepare and submit a Monitoring and Reporting Program Annual Report. Thus each Copermittee is currently required to prepare, or participate in the preparation of at least 3 annual reports. In addition, the San Diego County Copermittees are required to prepare and submit a Regional Urban Runoff Management Plan Annual Report.

In total, there are 59 annual reports that are prepared by the Copermittees and submitted to the San Diego Water Board for the Fourth Term Permits. The preparation of these annual reports requires significant time and resources from each Copermittee, which could otherwise be expended on actions that could improve water

quality within its jurisdiction. In turn, significant time and resources are required from the San Diego Water Board staff to review these reports, which could otherwise be expended on working directly with the Copermittees to improve their implementation efforts toward restoring and protecting water quality.

Provision F.3.b only requires one Annual Report for each of the 10 Watershed Management Areas designated under Provision B.1, which is a significant reduction in the number of annual reports required to be prepared and submitted by the Copermittees. The Annual Report will document the Copermittees' efforts to implement the Water Quality Improvement Plan. Each Annual Report will be focused primarily on reporting the analysis of the monitoring data collected pursuant to Provisions D.1-D.3 during the reporting period, and the assessments that are required pursuant to Provision D.4 based on the data. The monitoring data analyses and the assessments that are provided in the Annual Report will be the core of the report. The reporting of the jurisdictional runoff management program implementation efforts have been reduced to a single 2-page form, and will no longer be the primary focus of the reporting requirements as in the Third and Fourth Term Permits.

The Jurisdictional Runoff Management Program Annual Report Form (see Attachment D to the Order) will certify that each Copermittee has implemented its jurisdictional runoff management program in accordance with the requirements of Provision E. Instead of reviewing a voluminous report from each Copermittee, as was required under the Third and Fourth Term Permits, the San Diego Water Board will conduct audits of each Copermittee's jurisdictional runoff management program to investigate and confirm the information provided by each Copermittee on its Jurisdictional Runoff Management Program Annual Report Form. The audits will allow the San Diego Water Board to become more familiar with the each Copermittee's jurisdictional runoff management program, and each Copermittee will become more informed about the expectations of the San Diego Water Board.

The reduction in the number and content of the Annual Reports should result in significant time, cost and resource savings for the Copermittees, as well as the San Diego Water Board. Those savings should offset a significant portion of any additional costs that may be incurred to develop the Water Quality Improvement Plans and to implement the monitoring and assessment program requirements of Provision D.

The reporting period for the Annual Reports consists of two periods. Because the jurisdictional runoff management programs are typically budgeted and implemented during a fiscal year, the information provided on the Jurisdictional Runoff Management Program Annual Report Forms will cover the period from July 1 to June 30 of the following year.

The Annual Reports, however, are focused primarily on the monitoring data and the assessments based on the monitoring data. The monitoring data is collected during the monitoring year, which begins October 1 and ends September 30 of the following year. The monitoring year begins after the beginning of the fiscal year and ends after

the end of the fiscal year. Therefore, to accommodate and capture the information collected during the fiscal year and the monitoring year, the Annual Report reporting period incorporates both periods.

Finally, Provision F.3.c requires the Copermittees to develop and submit a Regional Monitoring and Assessment Report. The Regional Monitoring and Assessment Report is similar to the Long Term Effectiveness Assessment required under the Fourth Term San Diego County Permit. The Regional Monitoring and Assessment Report is expected to utilize the entire body of data and information collected by the Copermittees during the term of this Order to assess improvements to water quality on a regional scale.

Provision F.4 (Regional Clearinghouse) requires the Copermittees to develop, update, and maintain an internet-based Regional Clearinghouse that can be used to store, disseminate, and share the Copermittees' documents, monitoring data, special studies, and any other data or information.

Most of the documents and data that are generated by the Copermittees can be provided in electronic format, and made available to the San Diego Water Board and the public on the internet. The San Diego Water Board has been gradually transitioning its document submittal requirements to electronic submittals. Provision F.4 has been included to further these efforts.

Provision F.4 has also been included to improve the exchange and availability of information among the Copermittees, as well as between the Copermittees and the San Diego Water Board. Provision F.4 will also make the information generated during the implementation of the Order more accessible to the public.

Provision F.5 (Report of Waste Discharge) requires the Copermittees to submit a Report of Waste Discharge to reapply for renewal of the Order prior to its expiration, in accordance with 40 CFR 122.21(d)(2) and CWC section 13376.

Because the Orange County and Riverside County Copermittees will not be subject to the requirements of this Order until they are notified of coverage, Provision F.5.a describes the process of submitting their Reports of Waste Discharge pursuant to the requirements of their current permits to obtain coverage under this Order.

For the Copermittees subject to the requirements of this Order, Provision F.5.b requires the Copermittees to submit a Report of Waste Discharge 180 days in advance of the expiration of this Order Provision F.5.b also describes the minimum information to be included in the Report of Waste Discharge, based on USEPA guidance "Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems", dated May 17, 1996.

Provision F.6 (Application for Early Coverage) describes the process that would allow the Orange County and/or Riverside County Copermittees to obtain coverage under this Order earlier than the expiration of their current Orders.

If the Orange County and/or Riverside County Copermittees choose to obtain coverage under this Order earlier than the expiration of their current Orders, the preparation and submittal of a Report of Waste Discharge, as required by the Fourth Term Permits, will not be necessary. The existing Order for the respective county will be rescinded upon the effective coverage date under this Order, except for enforcement purposes.

G. Principal Watershed Copermittee Responsibilities

Purpose: Provision G includes the requirements for the Principal Watershed Copermittee designated by the Copermittees in each Watershed Management Area.

***Discussion*:** Unlike previous NPDES requirements, there will no longer be a single Principal Copermittee. Provision G.1 requires the Copermittees to designate a Principal Watershed Copermittee for each Watershed Management Area. There are ten (10) Watershed Management Areas in the San Diego Region, as defined in Table B-1 under Provision B.1 of the Order. An individual Copermittee should not be the Principal Watershed Copermittee for more than two (2) Watershed Management Areas. There could be up to 10 Principal Water Copermittees designated for the Watershed Management Areas in the San Diego Region.

Provision G.2 describes the minimum responsibilities of each Principal Watershed Copermittee. The primary responsibility of the Principal Watershed Copermittees is to serve as the liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues. Ideally, the Principal Watershed Copermittee can represent the interests of all the Copermittees within a Watershed Management Area during discussions or meetings to facilitate communication with the San Diego Water Board. The Principal Watershed Copermittees are also responsible for facilitating and coordinating the implementation efforts of the Copermittees and submittals of required documents and reports.

The Principal Watershed Copermittee is responsible for facilitating the efforts of the Copermittees within the Watershed Management Area to develop the Water Quality Improvement Plan required under Provision B, and submit it for approval in accordance with Provision F.1. The Principal Watershed Copermittee is also responsible for coordinating the submittal of the document updates, Progress Report Presentations, and Annual Reports required from the Copermittees within each Watershed Management Area under Provisions F.2, F.3.a, and F.3.b. The Principal Watershed Copermittees are responsible for coordinating with each other to develop and submit the Regional Clearinghouse, Regional Monitoring and Assessment Report, and the Report of Waste Discharge required under Provisions F.3.c, F.4, and F.5.

The designated Principal Watershed Copermittee for each Watershed Management Area does not necessarily have to serve as the Principal Watershed Copermittee for the entire term of the Order. If the Copermittees in a Watershed Management Area choose to designate a new Principal Watershed Copermittee, the change may be submitted as part of the Annual Report required under Provision F.3.b, with an update to the Water Quality Improvement Plan in accordance with Provision F.2.c.

H. Modification of Programs

Purpose: Provision H provides the conditions under which modifications to Order No. R9-2013-0001 may occur.

***Discussion*:** Provision H allows for modifications to Order No. R9-2013-0001. Minor modifications may be made by the San Diego Water Board Executive Officer without a public notice or public hearing. Minor modifications are defined under 40 CFR 122.63. Minor modifications under 40 CFR 122.63 potentially applicable to this Order are the following:

- Correcting typographical errors;
- Requiring more frequent monitoring or reporting by the Copermittees;
- Changing an interim compliance date in a schedule of compliance, provided the new date is not more than 120 days after the date specified in the existing permit and does not interfere with attainment of the final compliance date requirement.

Modifications that are not one of the above minor modifications will require re-opening the Order, subject to the requirements of 40 CFR 122.62 and 124.5(c)(1)-(3), but only for the specific provisions subject to the modification. Modifications of the Order that are not minor require a draft Order with the proposed modifications made available for public review, a public notice and comment period, and a public hearing. Comments on the provisions not subject to the proposed modifications are not required to be considered in the San Diego Water Board's responses to comments or during the public hearing.

Provision H.4 was included specifically to allow for the Order to be re-opened to make modifications to the requirements of Provision A should new language addressing compliance with water quality standards in the receiving waters be developed and issued by the State Water Board.

I. Standard Permit Provisions and General Provisions

Purpose: Provision I incorporates the standard permit provisions required to be included in all NPDES permits, as well as several other general provisions.

***Discussion*:** Provision I refers to Attachment B to the Order. Attachment B expressly incorporates the conditions applicable to all NPDES permits as provided under 40 CFR 122.41(a)-(n), as well as the applicable conditions for MS4s and storm water discharges provided under 40 CFR 122.42(c) and 40 CFR 122.42(d), respectively. Attachment B also includes several general provisions that are typically included in or applicable to waste discharge requirements issued by the San Diego Water Board.

IX. ATTACHMENTS

The attachments to the Order are discussed below. The discussions describe the content of the attachments.

Attachment A – Discharge Prohibitions and Special Protections

Section 1 of Attachment A includes the Waste Discharge Prohibitions from the Basin Plan. They have been provided verbatim in their entirety.

Section 2 of Attachment A includes the "*Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges*" applicable to permitted point source discharges of storm water, adopted under State Water Board Resolution No. 2012-0012. The terms, prohibitions, and special conditions (collectively referred to as special conditions) are established as limitations on point source storm water discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in ASBS, as required for State Water Quality Protection Areas pursuant to California Public Resources Code sections 36700(f) and 36710(f). These Special Protections were adopted by the State Water Board as part of the Ocean Plan General Exception.

Attachment B – Standard Permit Provisions and General Provisions

Conditions applicable to all NPDES permits, as required under 40 CFR 122.41, and conditions applicable to MS4s and storm water discharges, as required under 40 CFR 122.42(c) and 122.42(d), respectively are provided in Attachment B to the Order. They have been provided expressly in their entirety.

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. These general provisions are typically included in or applicable to waste discharge requirements issued by the San Diego Water Board. Many of the general provisions were developed by the State Water Board. Where a general provision is derived from statute or regulation, a citation of the statute or regulation section is provided. General provisions that do not provide a citation are included under the authority provided CWC 13377.

Attachment C – Acronyms, Abbreviations and Definitions

The acronyms and abbreviations that are used in the Order are provided in Attachment C. Attachment C also includes definitions that may provide an explanation or description of the meaning or intent of specific terms or phrases included in the Order.

Attachment D – Jurisdictional Runoff Management Program Annual Report Form

An example of the Jurisdictional Runoff Management Program Annual Report Form required to be submitted by each Copermittee as part of the Annual Reports required under Provision F.3.b.(1)(e) is provided as Attachment D to the Order. An electronic version of the form will be available from the San Diego Water Board after the adoption of the Order.

The Jurisdictional Runoff Management Program Annual Report Form includes the minimum information necessary to demonstrate that the Copermittee is implementing and in compliance with the requirements of Provision E, and includes much of the information required to be reported pursuant to 40 CFR 122.42(c).

The information that must be provided on the Jurisdictional Runoff Management Program Annual Report Form is limited to the fiscal year, which begins July 1 and ends June 30 of the following year. The information expected to be provided by the Copermittees in each section of the Jurisdictional Runoff Management Program Annual Report Form is discussed below.

I. COPERMITTEE INFORMATION

The name of the Copermittee (e.g. name of city, county, or special district) and the contact information for the storm water program manager are provided under this section.

II. LEGAL AUTHORITY

The Copermittee must confirm whether or not the legal authorities under Provision E.1.a have been established for itself within its jurisdiction.

The Copermittee must also confirm whether or not a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority, as required under Provision E.1.b. The certification statement required by Provision E.1.b is only required to be submitted with the first Annual Report required under Provision F.3.b.

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

The Copermittee must inform the San Diego Water Board whether or not an update to its jurisdictional runoff management program document was required or recommended by the San Diego Water Board during the reporting period. An update to the jurisdictional runoff management program is required under Provision F.2.a. The San Diego Water Board may recommend modifications to the jurisdictional runoff management program as part of the iterative approach and adaptive management process required under Provision B.5, which may result in an update that is necessary for the Copermittee's jurisdictional runoff management document.

If an update was required or recommended, the Copermittee must confirm whether or not the update was completed and made available on the Regional Clearinghouse within the reporting period. If no update was required or recommended, an answer is not required. If the answer is NO, meaning the required or recommended update was not completed and/or made available on the Regional Clearinghouse, the Copermittee must attach a schedule for the completion of the update and/or posting of the updated document on the Regional Clearinghouse.

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

The Copermittee must confirm whether or not a program was implemented during the fiscal year to actively detect and eliminate illicit discharges and connections in accordance with the requirements under Provision E.2.

In addition to confirming that a program to detect and eliminate illicit discharges was implemented during the reporting period, the Copermittee is also required to report on several items related to the program. The information that must be reported is limited to the fiscal year for the Annual Report.

All non-storm water discharges are considered illicit discharges unless the source is identified as one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5). If a non-storm water discharge is identified as one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5), the discharge is a non-storm water discharge, but not an illicit discharge. If a non-storm water discharge is identified but in not one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5), the discharge is both a non-storm water discharge and an illicit discharge.

V. DEVELOPMENT PLANNING PROGRAM

The Copermittee must confirm whether or not a development planning program was implemented during the fiscal year in accordance with the requirements under Provision E.3.

The Copermittee must also inform the San Diego Water Board whether or not an update to its BMP Design Manual was required or recommended by the San Diego Water Board during the fiscal year. An update to the BMP Design Manual is required under Provision F.2.b. The San Diego Water Board may recommend modifications to the BMP Design Manual, which may result in an update that is necessary for Copermittee's the BMP Design Manual.

If an update was required or recommended, the Copermittee must confirm whether or not the update was completed and made available on the Regional Clearinghouse within the reporting period. If no update was required or recommended, an answer is not required. If the answer is NO, meaning the required or recommended update was not completed and/or made available on the Regional Clearinghouse, the Copermittee must attach a schedule for the completion of the update and/or posting of the updated document on the Regional Clearinghouse.

The Copermittee is also required to report on several items related to the program. For the development and redevelopment projects that are reviewed under the program, the Copermittee must report the total number projects submitted for review during the fiscal year. Of those projects, the Copermittee must report the number that are Priority Development Projects, as defined under Provision E.3.b.(1). The Copermittee must also report the number of Priority Development Projects that were approved and/or granted occupancy during the fiscal year, regardless of when the project was originally submitted for review. Any projects that were approved during the fiscal year and granted any exemptions from the BMP Design Manual requirements and/or allowed to implement alternative compliance options in accordance with Provision E.3.c.(3) must be reported.

Finally, the Copermittee must also report on several items related to its oversight of permanent BMPs on Priority Development Projects within its jurisdiction, as required under Provision E.3.e. The information that must be reported is limited to the fiscal year for the Annual Report.

VI. CONSTRUCTION MANAGEMENT PROGRAM

The Copermittee must confirm whether or not a construction management program was implemented during the fiscal year in accordance with the requirements under Provision E.4.

The Copermittee is also required to report on several items related to its oversight construction projects within its jurisdiction. The information that must be reported is limited to the fiscal year for the Annual Report.

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

The Copermittee must confirm whether or not an existing development management program was implemented during the fiscal year in accordance with the requirements under Provision E.5.

The Copermittee is also required to report on several items related to its oversight in areas of existing development within its jurisdiction. The information that must be reported is limited to the fiscal year for the Annual Report. The information must also be separated into four categories of existing development: municipal, commercial, industrial, and residential.

VIII. PUBLIC EDUCATION AND PARTICIPATION

The Copermittee must confirm whether or not a public education program component was implemented during the fiscal year in accordance with the requirements under Provision E.7.a.

The Copermittee must also confirm whether or not a public participation program component was implemented during the fiscal year in accordance with the requirements under Provision E.7.b.

IX. FISCAL ANALYSIS

The Copermittee must confirm a summary of its fiscal analysis, conducted in accordance with the requirements under Provision E.8, has been attached to the form.

X. CERTIFICATION

A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative must sign and certify the Jurisdictional Runoff Management Program Annual Report Form. The appropriate box must be checked to indicate the whether the a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative is signing the form.

Attachment E – Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2013-0001

Attachment E provides specific provisions for implementing the Total Maximum Daily Loads (TMDLs) adopted by the San Diego Water Board and approved by USEPA in which the Copermittees are identified as responsible for meeting an assigned wasteload allocation (WLA). Federal regulations require that NPDES requirements incorporate water quality based effluent limitations (WQBELs) that must be consistent with the requirements and assumptions of any available WLAs,[41] which may be expressed as numeric effluent limitations, when feasible, and/or as a best management practice (BMP) program of expanded or better-tailored BMPs.[42] Where the TMDL includes WLAs that provide numeric pollutant load or pollutant parameter objectives, the WLA has been, where feasible, translated into numeric WQBELs.[43]

For each TMDL in Attachment E, five sections are included:

1) Applicability: This section provides the resolution under which the TMDL Basin Plan amendment was adopted and approved, with the applicable adoption and approval dates. This section also gives the effective date of the TMDL and where the TMDL is applicable (i.e. Watershed Management Area and water body). The Copermittees that are responsible for implementing the specific provisions are also given in this section.

2) Water Quality Based Effluent Limitations: For each TMDL, the WQBELs are expressed in terms of receiving water limitations, effluent limitations, and/or best management practices (BMPs). The WQBELs for the TMDLs are incorporated by reference into Provision A of the Order. The WQBELs when the compliance dates have passed. Applicable BMPs within the WQBELs must be incorporated into the Water Quality Improvement Plans.

3) Compliance Schedule: The final date for compliance with the WLA assigned to the Copermittees is provided in this section. If there are interim compliance requirements, they are included in this section as well. The WQBELs become enforceable when the final compliance date has passed. If there are interim WQBELs with interim compliance dates, the interim WQBELs become enforceable when the corresponding interim compliance dates have passed.

4) Specific Monitoring and Assessment Requirements: If there are specific monitoring and assessment requirements that cannot be met with the monitoring and assessment program requirements under Provision D of the Order, the additional requirements are included in this section.

5) Compliance Determination: There may be several options to demonstrate compliance with the WQBELs. If there is more than one option to demonstrate compliance with the WQBELs, the options are provided in this section.

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[41] 40 CFR 122.44(d)(1)(vii)(B)
[42] 40 CFR 122.44(k)(2) and 40 CFR 122.44(k)(3)
[43] November 12, 2010 Memorandum from the USEPA, Revisions to the November 22, 2002 Memorandum "Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLA""

The requirements of the TMDLs are based on the assumptions and requirements of any available WLAs for adopted and approved TMDLs that have been incorporated into the Basin Plan. Modifications to the requirements for the TMDLs in Attachment E cannot be made unless the TMDLs are modified in the Basin Plan.

A modification to any aspect of a TMDL in the Basin Plan requires a Basin Plan amendment. A Basin Plan amendment to modify a TMDL will require the San Diego Water Board to adopt a resolution to amend the Basin Plan, which includes a separate public process. When the San Diego Water Board adopts a Basin Plan amendment, it subsequently requires approval from the State Water Board, the Office of Administrative Law, and the USEPA before it becomes effective.

If and when the TMDLs are a modified in the Basin Plan, the San Diego Water Board will revise the requirements of the TMDL in accordance with the Basin Plan amendment. When a Basin Plan amendment to modify a TMDL becomes effective, the San Diego Water Board will modify the requirements of the TMDL pursuant to the requirements of Provision H of the Order as soon as possible.

November 13, 2012
Item No. 10
Supporting Document No. 2

Regional MS4 Permit Timeline	
Date	**Event Description**
January 24, 2007	Order No. R9-2007-0001, San Diego County Municipal Separate Storm Sewer System (MS4) Storm Water Permit adopted by San Diego Water Board.
December 16, 2009	Order No. R9-2009-0002, Orange County MS4 Storm Water Permit adopted by San Diego Water Board.
November 10, 2010	Order No. R9-2010-0016, Riverside County MS4 Storm Water Permit adopted by San Diego Water Board. Order No. R9-2010-0016 includes finding that announces San Diego Water Board's plan to develop a Regional Storm Water Permit (Regional MS4 Permit). Finding E.12 states: *The San Diego Water Board recognizes that issuing a single MS4 permit for all Phase I entities in the San Diego Region will provide consistent implementation, improve communication among agencies within watersheds crossing multiple jurisdictions, and minimize staff resources spent with each permit renewal. The San Diego Water Board plans to develop a single regional MS4 permit prior to the expiration of this Order that will transfer the Copermittees' enrollment to the regional permit upon expiration of this Order.*
February 8, 2011	Meeting with San Diego County Copermittees. Purpose of the meeting was to discuss the expectations for the Copermittees' Report of Waste Discharge (ROWD) and the Copermittees' concerns about Regional MS4 Permit.
February 15, 2011	Meeting with the Cities of Carlsbad, Encinitas, Poway, and San Marcos (together). Purpose of the meeting was to solicit feedback, criticisms, and recommendations for improving the permit requirements in the Regional MS4 Permit.
February 17, 2011	Meetings with the City of Santee. Purpose of the meetings was to solicit feedback, criticisms, and recommendations for improving the permit requirements in the Regional MS4 Permit.
February 17, 2011	Meetings with the City of San Diego. Purpose of the meetings was to solicit feedback, criticisms, and recommendations for improving the permit requirements in the Regional MS4 Permit.
February 22, 2011	Meeting with the City of Chula Vista. Purpose of the meeting was to solicit feedback, criticisms, and recommendations for improving the permit requirements in the Regional MS4 Permit.
March 10, 2011	Meetings with the City of Laguna Niguel. Purpose of the meetings was to solicit feedback, criticisms, and recommendations for improving the permit requirements in the Regional MS4 Permit.
March 10, 2011	Meetings with the City of Laguna Beach. Purpose of the meetings was to solicit feedback, criticisms, and recommendations for improving the permit requirements in the Regional MS4 Permit.
March 22, 2011	Meeting with environmental groups (San Diego Coastkeeper, Coast Law Group, Environmental Health Coalition). Purpose of the meeting was to solicit feedback, criticisms, and recommendations for improving the permit requirements in the Regional MS4 Permit.
April 6, 2011	Meeting with San Diego County Copermittees' Watershed (Visioning) Workgroup representatives. Purpose of the meeting was to discuss the Copermittees' watershed vision and goals and how it might be incorporated into the ROWD and Regional MS4 Permit.
April 19, 2011	Meeting with San Diego County Copermittees' Monitoring Workgroup representatives. Purpose of the meeting was to discuss potential elements to be included in the monitoring requirements of the Regional MS4 Permit.
April 21, 2011	Meeting with San Diego Coastkeeper monitoring program. Purpose of the meeting was to discuss Coastkeeper's monitoring program and how it may be used for regional monitoring.

Regional MS4 Permit Timeline	
Date	**Event Description**
April 27, 2011	Meeting with Orange County. Purpose of the meeting was to discuss the Orange County Copermittees' monitoring program and potential elements to be included in the monitoring requirements of the Regional MS4 Permit.
May 5, 2011	Meeting with Riverside County. Purpose of the meeting was to discuss the County of Riverside's jurisdictional program and to solicit feedback, criticisms, and recommendations for improving the jurisdictional management program permit requirements in the Regional MS4 Permit.
May 5, 2011	Executive Officer Report about the San Diego Water Board's intent to develop the Regional MS4 Permit.
May 10, 2011	Meeting with the City of Murrieta. Purpose of the meeting was to discuss the City of Murrieta's jurisdictional program and to solicit feedback, criticisms, and recommendations for improving the jurisdictional management program permit requirements in the Regional MS4 Permit.
June 27, 2011	San Diego County Copermittees submit ROWD for renewal of MS4 Permit.
October 5, 2011	Presentation at the San Diego IRWM RAC Meeting to provide an overview of the integration of TMDLs with the Regional MS4 Permit.
November 1, 2011	Meeting with the Southern California Water Committee's Stormwater Task Force. Purpose of the meeting was to discuss ways to increase the use of storm water as a resource for water supply purposes and permit requirements that support or impede its use as a resource.
January 10, 2012	Meeting with USEPA. Purpose of the meeting was to present the proposed concepts and approaches to be incorporated into the Regional MS4 Permit, and answer questions.
January 19, 2012	Presentation at the San Diego County Copermittees Management Meeting to provide an overview of the changes to the permit requirements that can be expected in the Regional MS4 Permit, and the target date for adoption.
January 31, 2012	Preliminary draft of Regional MS4 Permit provided to USEPA for review and comments.
February 14, 2012	USEPA provided written comments on preliminary draft of Regional MS4 Permit.
February 16, 2012	Meeting with USEPA to discuss their comments provided on preliminary draft of Regional MS4 Permit.
February 28, 2012	Presentation of the Regional MS4 Permit concept and approach at the Clean Water Environment Association (CWEA) Pretreatment, Pollution Prevention and Stormwater (P3S) Training Conference in Huntington Beach as part of USEPA's Stormwater Regulatory Outlook session.
February 29, 2012	Presentation to the North County Civil Engineers and Land Surveying Association. Part of the presentation included providing a preview of what to expect in the Regional MS4 Permit pertaining to development and construction.
April 2, 2012	Notice of Public Workshop for the administrative draft of the Regional MS4 Permit posted on the San Diego Water Board website and sent to the Lyris email lists for the San Diego County, Orange County, and Riverside County MS4 Permits.
April 9, 2012	Administrative draft of the Regional MS4 Permit posted on the San Diego Water Board website.
April 25, 2012	Public Workshop for the administrative draft Regional MS4 Permit held at the San Diego Water Board.
May 2, 2012	Meeting with San Diego County Copermittees. Purpose of the meeting was to receive feedback and recommendations on the focused meeting process, and answer questions and provide additional information about the provisions in the administrative draft Regional MS4 Permit.
May 8, 2012	Presentation to the San Diego Regional Chamber of Commerce regarding the development of the Regional MS4 Permit.

Regional MS4 Permit Timeline	
Date	**Event Description**
May 9, 2012	Meeting with Riverside County Copermittees. Purpose of the meeting was to receive feedback and recommendations on the focused meeting process, and answer questions and provide additional information about the provisions in the administrative draft Regional MS4 Permit.
May 14, 2012	Meeting with Orange County Copermittees. Purpose of the meeting was to receive feedback and recommendations on the focused meeting process, and answer questions and provide additional information about the provisions in the administrative draft Regional MS4 Permit.
June 7, 2012	Executive Officer Report about the release of the administrative draft Regional MS4 Permit, the public workshop, and the planned focused meetings.
June 14, 2012	Meeting with Orange County, Riverside County, and San Diego County Principle Copermittees. Purpose of the meeting was to inform the Copermittees of the revised focused meeting process and schedule and receive additional input.
June 21, 2012	Notice of Revised Administrative Draft Regional Municipal Separate Storm Sewer System (MS4) Permit Focused Meeting Procedures and Schedule posted on the San Diego Water Board website and sent to the Lyris email lists for the San Diego County, Orange County, and Riverside County MS4 Permits.
June 27, 2012	Focused Meeting to discuss the Assessment and Planning concepts in the administrative draft Regional MS4 Permit with stakeholders. Meeting was held at the San Luis Rey Wastewater Treatment Plant in Oceanside.
July 11, 2012	Focused Meeting to discuss the Assessment and Planning concepts in the administrative draft Regional MS4 Permit with stakeholders. Meeting was held at the City Hall of Escondido.
July 17, 2012	Meeting with representatives of San Diego County Copermittees Monitoring Workgroup. Purpose of the meeting was for the Monitoring Workgroup to provide an overview of their proposed monitoring approach and get input and feedback from the Regional Permit Team.
July 20, 2012	Meeting with representatives of San Diego County Copermittees. Purpose of the meeting was to discuss and provide feedback about the Copermittees' alternative proposals, concepts, and ideas that could be incorporated into the Regional MS4 Permit.
July 24, 2012	Meeting with the San Diego County Copermittees Land Development Workgroup. Purpose of the meeting was to provide additional information about the development planning and construction requirements of the Regional MS4 Permit.
July 25, 2012	Focused Meeting to discuss the Assessment and Monitoring concepts in the administrative draft Regional MS4 Permit with stakeholders. Meeting was held at the Faraday Center in Carlsbad.
July 31, 2012	Meeting with San Diego County Copermittees Hydromodification Management Plan Monitoring Sub-workgroup. Purpose of the meeting was to present the Copermittees' findings from their first year of monitoring and to solicit recommendations from the State Water Board (Eric Bernstein) and San Diego Water Board for modifications to monitoring plan.
August 1, 2012	Meeting with representatives of the San Diego County Copermittees Existing Development Workgroup. Purpose of the meeting was to provide additional information about the existing development requirements of the Regional MS4 Permit.
August 2, 2012	Meeting with representatives of San Diego County Copermittees Monitoring Workgroup. Purpose of the meeting was to discuss and provide feedback about specific elements of the Copermittees' proposed monitoring approach.

Regional MS4 Permit Timeline	
Date	**Event Description**
August 3, 2012	Meeting with representatives of the Building Industry Association (BIA). Purpose of the meeting was to discuss and provide additional information about the non-storm water and development planning requirements of the Regional MS4 Permit.
August 3, 2012	Presentation to the San Dieguito River Valley Regional Open Space Park Citizens Advisory Committee regarding the development of the Regional MS4 Permit. Participated as part of a panel with the County of San Diego and the BIA to provide information about the Regional MS4 Permit.
August 7, 2012	Meeting with representatives of the Orange County Copermittees. Purpose of the meeting was to discuss and provide additional information about the requirements of the Regional MS4 Permit.
August 9, 2012	Meeting with representatives of the San Diego County Copermittees Land Development Workgroup. Purpose of the meeting was to discuss and provide feedback about the Copermittees' alternative proposals, concepts, and ideas that could be incorporated into the development planning requirements.
August 10, 2012	Meeting with representatives of the San Diego County Copermittees Existing Development Workgroup. Purpose of the meeting was to discuss and provide feedback about the Copermittees' alternative proposals, concepts, and ideas that could be incorporated into the existing development requirements.
August 17, 2012	Meeting with representatives of the BIA. Purpose of the meeting was to discuss the non-storm water and development planning requirements of the Regional MS4 Permit.
August 20, 2012	Meeting with representatives of San Diego County Copermittees. Purpose of the meeting was to discuss and provide feedback about the Copermittees' alternative proposals, concepts, and ideas that could be incorporated into the Regional MS4 Permit.
August 22, 2012	Focused Meeting to discuss the Planning and Implementation concepts in the administrative draft Regional MS4 Permit with stakeholders. Meeting was held at the City of Vista.
August 23, 2012	Meeting with representatives of San Diego County Copermittees Monitoring Workgroup. Purpose of the meeting was to discuss and provide feedback about specific elements of the Copermittees' proposed monitoring approach.
August 30, 2012	Regional Permit Team attended Hydromodification Management Meeting/Symposium organized by the Copermittees. Meeting was held at the City of San Diego Concourse.
August 31, 2012	Meeting with representatives of San Diego Coastkeeper and U.S. Green Building Council. Purpose of the meeting was to discuss the role of green building principles in development planning.
September 5, 2012	Focused Meeting Wrap Up Workshop held at the San Diego Water Board. Purpose of the workshop was to inform the stakeholders about concepts and information provided during the Focused Meetings would likely result in revisions to the Administrative Draft Regional MS4 Permit.
September 14, 2012	Final date for submitting written comments on the Administrative Draft Regional MS4 Permit.
October 12, 2012	Revised administrative draft Regional MS4 Permit with tracked changes posted on the San Diego Water Board website and sent to the Lyris email lists for the San Diego County, Orange County, and Riverside County MS4 Permits.
October 24, 2012	Final Focused Meeting to present and discuss revisions made to the administrative daft Regional MS4 Permit.

November 13, 2012
Item No. 10
Supporting Document No. 3

CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

September 7, 2012

Via U.S. Mail and E-Mail

Ryan M. F. Baron, Senior Deputy
Office of the County Counsel
County of Orange
333 W. Santa Ana Blvd., Suite 407
Santa Ana, CA 92701

David H. K. Huff, Deputy County Counsel
Office of County Counsel
County of Riverside
3960 Orange Street, Suite 500
Riverside, CA 92501-3674

Subject: May 10, 2012, Letter from County of Orange, County Counsel and May 21, 2012, Letter from County of Riverside, County Counsel Re Regional Municipal Separate Storm Sewer System Permit

Messrs. Baron and Huff:

This letter responds to legal concerns raised in a May 10, 2012, letter from the County of Orange and the Orange County Flood Control District (collectively Orange County) and in a May 21, 2012, letter from the County of Riverside and Riverside County Flood Control & Water Conservation District (collectively Riverside County). Both letters question whether legal authority exists to support a Regional Municipal Separate Storm Sewer System (MS4) Permit (Regional MS4 Permit), as is under development by the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board). Orange County questions whether and how a regional MS4 permit application process is consistent with and can satisfy the individual permit application requirements in federal law as neither County is yet required to submit, nor has submitted a Report of Waste Discharge (ROWD) for the discharges covered under their respective MS4 Permits.

As a foundation for their concerns, the Counties maintain that the three groups of Copermittees (San Diego County, portions of Orange County and portions of Riverside County) presently regulated under three separate MS4 permits do not share an interconnected MS4, are not under common jurisdiction, contain separate and distinct watersheds, are

characterized by different hydrologic and climatic conditions and possess distinctly different water quality concerns.

The San Diego Water Board has the legal authority to issue a regional MS4 permit through its authority in the Clean Water Act. Section 402, subpart (p)(3)(B) of the Clean Water Act states that "Permits for discharges from municipal storm sewers—(i) may be issued on a system- or jurisdiction-wide basis . . . ." The federal storm water regulations in 40 Code of Federal Regulations (CFR) at Part 122.26, subdivision (a)(1)(v) also state that the Director may designate dischargers from municipal separate storm sewers on a system-wide or jurisdiction-wide basis. In making this determination, the Director may consider the following factors: (A) the location of the discharge with respect to waters of the United States; (B) the size of the discharge; (c) the quantity and nature of the pollutants discharged to waters of the United States; and (D) other relevant factors. (40 CFR Part 122.26(a)(1)(v).)

More specifically, the federal regulations provide that for large and medium MS4 systems, the San Diego Water Board may issue a regional permit. Specifically, the regulations provide:

> "(ii) The Director may either issue one system-wide permit covering all discharges from municipal separate storm sewers within a large or medium municipal storm sewer system or issue distinct permits for appropriate categories of discharges within a large or municipal separate storm sewer system including, but not limited to: all discharges owned or operated by the same municipality; located within the same jurisdiction; all discharges within a system that discharge to the same watershed; discharges within a system that are similar in nature; or for individual discharges from municipal separate storm sewers within the system.
>
> (iii) The operator of a discharge from a municipal separate storm sewer which is part of a large or medium municipal separate storm sewer system must either: (A) Participate in a permit application (to be a permittee or a co-permittee) with one or more other operator of discharges from the large or medium municipal storm sewer system which covers all, or a portion of all, discharges from the municipal separate storm sewer system; (B) Submit a distinct permit application which only covers discharges from the municipal separate storm sewers for which the operator is responsible; or (C) A regional authority may be responsible for submitting a permit application under the following guidelines . . . .
>
> (iv) One permit application may be submitted for all or a portion of all municipal separate storm sewers within adjacent or interconnected large or medium municipal separate storm sewer systems. The Director may issue one system-wide permit covering all, or a portion of all municipal separate storm sewers in adjacent or interconnected large or medium municipal separate storm sewer systems.
>
> (v) Permits for all or a portion of all discharges from large or medium municipal separate storm sewer systems that are issued on a system-wide, jurisdiction-

> wide, watershed or other basis may specify different conditions relating to different discharges covered by the permit, including different management programs for different drainage areas which contribute storm water to the system."

(40 CFR Part 122.26 (a)(3)(ii)-(v).)[1]

These regulations make it clear that the San Diego Water Board may issue a regional MS4 permit. The regulations also clarify that the permit may include different conditions for separate discharges covered by the permit. This allows the San Diego Water Board to ensure that suitable water quality conditions and provisions are identified for each watershed.

The United States Environmental Protection Agency's (USEPA) responses to comments for the above-mentioned regulations also make it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide permits. In the Final Rule published in the Federal Register and containing the responses to comments, USEPA notes that that paragraph (iv) (40 CFR § 122.26(a)(3)(iv)) would allow an entire system in a geographical region under the purview of a State agency to be designated under a permit. (National Pollutant Discharge Elimination System Permit Application Regulations for Storm Water Discharges, 55 FR 47990-01, 48042.) USEPA also states that many commenters wanted to allow the permitting authority broad discretion to establish system-wide permits, and that EPA believes that paragraphs (a)(1)(v) and (a)(3)(ii) allow for such broad discretion. (*Id.,* 47990-01, 48039-48042.)

Not only is it legally allowable for the San Diego Water Board to issue a regional MS4 permit, it is also appropriate for the San Diego Water Board to do so. Orange County argues that the three large metropolitan counties "do not share an interconnected municipal storm sewer system, are not under common jurisdiction, and contain separate and distinct watersheds."[2] However, the counties are connected through shared watersheds and/or are adjacent to each other. For example, the Santa Margarita watershed begins in Riverside County but drains into San Diego County. The Regional MS4 Permit creates watershed requirements that apply to multiple counties, which will ensure consistency of regulations in a watershed and result in overall cost savings for the Copermittees due to reduced redundancy in water quality monitoring. Even if the MS4s were not interconnected, the regulations make it clear the San Diego Water Board can require one permit for all MS4s that are adjacent. (40 CFR Part 122.26(a)(3)(iv).) Managing storm water on a watershed basis is expected to result in improved water quality, as the Regional MS4 Permit focuses the monitoring and management practices necessary to improve each watershed rather than arbitrary political boundaries. A single permit also allows San Diego Water Board staff to expend fewer resources developing multiple permits and more resources working cooperatively with all three current groups of Copermittees to ensure implementation of the permit results in improved water quality.

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[1] These regulations are applicable to California's NPDES program. (40 CFR §123.25.)

[2] Letter from the County of Orange, dated May 10, 2012, on page 1.

A regional MS4 permit also does not expand the requirements for each municipality beyond its borders as each municipality is only responsible for discharge within its jurisdictional boundaries. The federal regulations make it clear that Copermittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators. (40 CFR Part 122.26(a)(3)(vi).) The Administrative Draft Regional MS4 Permit does not require the Counties to manage storm water outside of their jurisdictional boundaries, but rather to work collectively to improve storm water management within watersheds.

The San Francisco region-wide permit from the Regional Water Quality Control Board, San Francisco Region, provides an example of a regional MS4 permit. Neither the USEPA nor the State Water Resources Control Board (State Water Board) objected to the San Francisco regional MS4 permit. While that permit was developed with consensus among the Copermittees, the Federal Regulations make it clear that the San Diego Water Board may impose a regional MS4 permit without a consensus. Another example of a regional MS4 permit is in Alaska, where the City of Fairbanks, the City of North Pole, the University of Alaska, and Department of Transportation and Public Facilities received a single permit, NPDES Permit No. AKS-053406.

The Regional MS4 Permit will continue to use the ROWD process prior to initially enrolling any Orange or Riverside County Copermittee into the Regional MS4 Permit or renewing the permit. The San Diego Water Board understands that each municipality is unique although the Counties share watersheds and geographical boundaries. As provided in their current MS4 permits, the Orange and Riverside County Copermittees will submit a ROWD no later than 180 days prior to expiration of their current permits. Staff at the San Diego Water Board will review the ROWDs to determine whether the Copermittees should be enrolled in the Regional MS4 Permit, what changes to the Regional MS4 Permit proposed in the ROWD are appropriate, and what is the proper level of public process for consideration of the issues raised in the ROWDs. The regional MS4 permit will continue to rely on the ROWD process to frame prospective revisions to the permit. Prior to release of the Public Comment Draft Permit, San Diego Water Board staff will consider whether changes to the text of the Administrative Draft are necessary for consistency with the intent to fully evaluate the ROWDs submitted by the Orange and Riverside County Copermittees as outlined above.

Please contact either me at 916-341-5168 or by e-mail at Jessica.jahr@waterboards.ca.gov or Catherine George Hagan at 858-467-2958 or by e-mail at catherine.hagan@waterboards.ca.gov if you have questions.

Respectfully,

Catherine George Hagan for

Jessica Jahr

cc: See next page

cc: David W. Gibson, Executive Officer (via e-mail only)
San Diego Water Board Interested Persons List (via e-mail only)

November 13, 2012
Item No. 10
Supporting Document No. 4

California Regional Water Quality Control Board

San Diego Region

Over 50 Years Serving San Diego, Orange, and Riverside Counties
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(858) 467-2952 • Fax (858) 571-6972
http:// www.waterboards.ca.gov/sandiego

NOTICE OF PUBLIC WORKSHOP

A workshop will be held to discuss
Tentative Order No. R9-2013-0001, NPDES No. CAS0109266
Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region

Tuesday, November 13, 2012
9:00 a.m.
City of San Diego Public Utilities Department
Wastewater Branch Auditorium
9192 Topaz Way, San Diego, California
San Diego, CA 92123

SUBJECT OF WORKSHOP
The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) will hold an informational public workshop at its regularly scheduled public meeting to receive information and discuss requirements in the public draft of a Regional NPDES Permit for Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region (Regional MS4 Permit) (Tentative Order No. R9-2013-0001). The Tentative Order will be available **on or before October 31, 2012** and will be accessible electronically at:

http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

BACKGROUND
The San Diego Water Board is considering the adoption of a Regional MS4 Permit that will be issued to municipal Copermittees in San Diego County, Southern Orange County and Southwest Riverside County. Currently, each of these counties within the San Diego Region has its own MS4 Storm Water Permit. In order to better achieve regulatory consistency as well as maximum efficiency and economy of resources, the San Diego Water Board has drafted a single MS4 Permit based on the boundaries of the San Diego Region instead of county political boundaries. Under this approach, the Regional MS4 Permit will uniformly regulate all three counties within the San Diego Region once it becomes effective for all Copermittees. The Regional MS4 Permit will also provide opportunities for a comprehensive monitoring framework, incentive for a regional collaborative approach, and opportunities for regional cost efficiencies among Copermittees. Upon adoption by the San Diego Water Board, this Regional MS4 Permit will be issued to all 39 Copermittees in a phased manner according to the expiration dates of their current MS4 Storm Water Permits and after consideration of Reports of Waste Discharge filed by the Orange County and Riverside County Copermittees.

PROCEDURAL MATTERS
The November 13, 2012 public workshop will be informal and conducted to provide San Diego Water Board members with information about the Regional MS4 Permit and to facilitate discussion. There will be no sworn testimony or cross-examination of participants. San Diego Water Board staff will explain the permit development process and summarize significant elements of the Regional MS4 Permit for the San Diego Water Board and the public. Copermittees, interested stakeholders, and the public will also have an opportunity to provide oral comments as set forth below. The San Diego Water Board may provide general feedback to staff on development of the permit; however, no action or voting will take place at this workshop.

To ensure a productive and efficient Workshop, and to ensure that all attending have an opportunity to participate, oral presentations from Copermittees, stakeholders, and any interested persons may be limited at the discretion of the Chair. This item has significant interest and to provide enough time for all interested parties to participate, participants with similar comments are requested to make joint presentations.

The San Diego Water Board will issue a separate public hearing notice announcing the release of the draft Regional MS4 Permit as a Tentative Order for public review and comment at a later date. The public hearing notice will establish the deadline for submission of comments, the date of the public hearing, and the procedures that the San Diego Water Board will follow at the public hearing to consider adoption of the Tentative Order. Once released, the Tentative Order will serve as the public comment draft permit for purposes of applicable public notice requirements under the Code of Federal Regulations (40 C.F.R. § 124.10) and Water Code section 13167.5, subdivision (b).

ELECTRONIC MAIL LIST SUBSCRIPTION
The San Diego Water Board has established an electronic mail list specifically for information and notices on the development of a Regional MS4 Permit. The San Diego Water Board will use the email list to notify interested persons of upcoming important events and the availability of on-line documents. Persons interested in receiving future notices and information on this specific project can subscribe to one of the electronic mail lists titled "Orange County MS4 Permit," "Riverside County MS4 Permit, or "San Diego MS4 Permit" located on the San Diego Water Board website at:

http://www.waterboards.ca.gov/resources/email_subscriptions/reg9_subscribe.shtml

Persons who wish to receive hard copy notices of future notices or meetings on the Regional MS4 Storm Water Permit in lieu of electronic notices should submit a request to Mr. Wayne Chiu, Water Resource Control Engineer, 9174 Sky Park Court, Suite 100, San Diego, CA 92123.

Please bring this matter to the attention of any person known to you who may be affected by the Regional MS4 Permit.

INFORMATION REGARDING WORKSHOP
If you have any questions or wish to receive a hard copy of the Tentative Order when it is released, please contact Wayne Chiu at (858) 637-5558 or via e-mail at wchiu@waterboards.ca.gov or Laurie Walsh at (858) 467-2970 or via e-mail at lwalsh@waterboards.ca.gov.

State of California
Regional Water Quality Control Board
San Diego Region

SUPPLEMENTAL EXECUTIVE OFFICER
SUMMARY REPORT
November 13, 2012

ITEM: 10

SUBJECT: Public Workshop: The San Diego Water Board will hold a public workshop to receive information and discuss proposed requirements in the public draft of a Regional NPDES Permit for Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region (Tentative Order No. R9-2013-0001, NPDES No. CAS0109266). The San Diego Water Board will not take any formal action on this item at the workshop. (*Christina Arias and Laurie Walsh*).

PURPOSE: The purpose of this workshop is for the San Diego Water Board to receive information and discuss proposed requirements in the public draft of Tentative Order No. R9-2013-0001 (Tentative Order; Supporting Document 1). A public hearing to consider adoption of the Tentative Order will occur at a later date.

RECOMMENDATION: There is no recommendation as this is a public workshop and the San Diego Water Board will take no action.

DISCUSSION:

Public Comment Period Now Underway

On October 31, 2012, the San Diego Water Board sent a Notice to Interested Persons (Notice), including the municipal entities regulated under the Tentative Order, announcing the availability of the Tentative Order for public review and comment (Supporting Document 5). The Notice establishes procedures and a January 11, 2013 deadline for submission of written comments.

The San Diego Water Board will provide written responses to timely submitted written comments on the Tentative Order. The responses will be available for Board member consideration prior to a public hearing to consider adoption of the Tentative Order (as yet unscheduled).

To date, the San Diego Water Board has received two comment letters from the City of Del Mar and the County of San Diego on the Tentative Order (Supporting Documents 6 & 7), which are included in this agenda item at the request of the submitters. The San Diego Water Board will not be responding directly to these comment letters at today's workshop but will be responding to them in the future as part of the public review and comment process that is now underway pursuant to the October 31, 2012 Notice.

Today's workshop on the Tentative Order is noticed for San Diego Water Board members to provide general feedback to staff on development of the permit; however, no action or voting should take place in regard to the comment letters or other aspects of the Tentative Order.

ADDITIONAL SUPPORTING DOCUMENTS:

(Supporting Documents 1-4 were provided in the first agenda packet)

1. Tentative Order No. R9-2013-0001
2. Regional MS4 Permit Timeline
3. Response from San Diego Water Board Counsel to Orange County Counsel and Riverside County Counsel (September 7, 2012)
4. Notice of Public Workshop
5. Notice of Availability of Tentative Order No. R9-2013-0001 for public review and comment
6. Letter from the County of San Diego, Office of County Counsel dated November 2, 2012
7. Letter from the City of Del Mar dated November 5, 2012

November 13, 2012
Item No. 10
Supporting Document No. 5

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

CALIFORNIA
Water Boards

California Regional Water Quality Control Board, San Diego Region

October 31, 2012

San Diego County Copermittees
Orange County Copermittees
Riverside County Copermittees

In reply refer to / attn:
Place ID: 786088Wchiu

Subject: Tentative Order No. R9-2013-0001
San Diego Region MS4 Permit Reissuance

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) is pleased to release for public review and comment Tentative Order No. R9-2013-0001, NPDES No. CAS0109266, *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Tentative Order). Notice is hereby given that the San Diego Water Board will receive written comments on the Tentative Order in accordance with title 40 Code of Federal Regulations section 124.10 and Water Code section 13167.5.

The Tentative Order is a regional MS4 permit that proposes to jointly cover all 39 Copermittees within the San Diego Region (i.e., South Orange County, Southwestern Riverside County, and San Diego County), in a phased manner as their current MS4 permits expire or upon request for earlier coverage prior to permit expiration. The Tentative Order covers multiple discharge points to multiple receiving waters throughout the San Diego Water Board Region. All MS4 Copermittees in the San Diego Region are therefore on notice that they may ultimately be regulated under the Tentative Order, if adopted. Copermittees covered by the San Diego County MS4 permit (Order No. R9-2007-0001) must submit any written comments on the Tentative Order during the comment period described below. Copermittees covered by the Orange County and Riverside County MS4 permits (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), for which Reports of Waste Discharge have not yet been filed, are strongly encouraged to submit written comments on the Tentative Order during the comment period described below.

The Tentative Order includes in Attachment F, a Fact Sheet pursuant to title 40 code of Federal Regulations section 124.8 (a) that sets forth the principal background information and facts, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of the Tentative Order.

Document Availability
The Tentative Order, and attachments thereto, are available on the San Diego Water Board website at:
http://www.waterboards.ca.gov/rwqcb9/water_issues/programs/stormwater/index.shtml

You may also receive a copy of the Tentative Order by contacting Wayne Chiu at (858) 637-5558 or wchiu@waterboards.ca.gov or by visiting the San Diego Water Board's office at 9174 Sky Park Court, Suite 100, San Diego, California 92123-4340, weekdays between 8:00 a.m. and 5:00 p.m., telephone 858-467-2952.

Submission of Written Comments
Copermittees or interested persons wishing to submit comments on the Tentative Order must submit them so that they are received no later than **5:00 p.m. on Friday, January 11, 2013.** Written comments should be submitted to:

Wayne Chiu, P.E.
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego California 92123-4340

The early submission of written comments on the Tentative Order is encouraged. Electronic written comments are acceptable and should be submitted via e-mail to the attention of Wayne Chiu at wchiu@waterboards.ca.gov.

Please indicate in the subject line of all written comments "Comment – Tentative Order No. R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu." If the submitted written comments exceed five pages in length or contain foldouts, color graphics, or maps, 15 hard copies must be submitted for distribution to the San Diego Water Board members and staff.

The submission of written comments is the opportunity for Copermittees and interested persons to raise and comment on issues pertaining to the terms and conditions of the Tentative Order. All written comments including testimony, technical documentation and factual information pertaining to the terms and conditions of the Tentative Order to be considered by the San Diego Water Board at the as yet unscheduled public hearing must be received by 5:00 pm on January 11, 2013. At a later date following submittal of written comments, the San Diego Water Board will convene a public hearing to hear testimony and policy statements from the Copermittees and interested persons summarizing their written comments and to consider adoption of the Tentative Order. The scope of oral testimony at the public hearing will be strictly limited to summarizing the previously submitted written comments and making policy statements. No new issues may be raised at the hearing.

Consistent with State Water Board regulations that apply to this proceeding, written comments received after the close of the comment period will not be accepted and will not be incorporated into the administrative record if doing so would prejudice any party. Written comments received by the close of the comment period will be provided to the San Diego

Water Board members for their review in advance of a public hearing to consider adoption of the Tentative Order. All timely written comments will also be posted as they are received on the San Diego Water Board website at:

http://www.waterboards.ca.gov/rwqcb9/water_issues/programs/stormwater/index.shtml

Public Hearing for Consideration of Tentative Order Adoption
The San Diego Water Board will issue a separate notice announcing a public hearing to receive oral comments and consider adoption of the Tentative Order at a later date. Notice of the public hearing will be provided to the Copermittees and interested persons at least thirty (30) days in advance of the hearing. Participants will have an opportunity to address the San Diego Water Board members subject to reasonable limitations prior to the Board taking action on the Tentative Order.

The public notice providing the specific date for the San Diego Water Board adoption meeting and any other public notices related to the Tentative Order will be distributed through the Lyris e-mail list server and posted on the San Diego Water Board website at:

http://www.waterboards.ca.gov/rwqcb9/water_issues/programs/stormwater/index.shtml

Any person desiring to receive future public notices regarding this Tentative Order can subscribe to one of the electronic mail lists (i.e. Lyris List) titled "Orange County MS4 Permit", "Riverside County MS4 Permit", or "San Diego MS4 Permit ", located on the San Diego Water Board website at:

http://www.waterboards.ca.gov/resources/email_subscriptions/reg9_subscribe.shtml

Contact for further Information
For questions or comments concerning this notice, please contact Wayne Chiu by phone at (858) 637-5558, or by email at wchiu@waterboards.ca.gov.

Respectfully,

James G. Smith, AEO
for David W. Gibson
Executive Officer
San Diego Regional Water Quality Control Board

DWG:dtb esb:law:wc

cc:

Distribution via US Mail and email:
(see attached address list)

San Diego County Copermittees
Orange County Copermittees
Riverside County Copermittees
Resource Agencies

Distribution list via email:

San Diego County MS4 Permit Lyris List
Riverside County MS4 Permit Lyris List
Orange County MS4 Permit Lyris List
San Diego Water Board Agenda Lyris List

Tech Staff Info & Use	
Order No.	R9-2013-0001
Party (GT/CIWQS) ID	536787
File No.	n/a
WDID	n/a
NPDES No.	CAS0109266
Reg. Measure ID	387335
Place ID	786088
Person ID	n/a
Inspection ID	n/a

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November 13, 2012
Item No. 10
Supporting Document No. 6

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DANA L. BEGLEY
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JUSTIN A. CRUMLEY
CHRISTOPHER DAWOOD
KRISTEN LAYCHUS

November 2, 2012

Grant Destache, Chairman
California Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4353

Re: Receiving Water Limitations Language (Provision A) in Draft Regional MS4 Permit

Dear Mr. Destache:

On November 13, 2012, the San Diego Regional Board will hold a workshop on the proposed Regional MS4 Permit. A major policy issue for the Regional Board to consider at the workshop is how the Permit should address compliance with water quality standards in receiving waters. Consistent with the Clean Water Act and prior decisions of the State Board, such compliance for MS4 discharges should be achieved over time, through an adaptive management approach. However, the 9th Circuit Court of Appeal has recently interpreted receiving water limitations language similar to that proposed in Provision A as requiring strict and immediate compliance with water quality standards. To respond to this recent interpretation of similar language, the Regional Board should realign Provision A to reflect the original policy goal of compliance through an adaptive management approach.

The purpose of this letter is to stress that the Regional Board has the discretion to make the policy decision to realign the language of Provision A to reflect the adaptive management approach. For the following key legal reasons, the Regional Board has this authority:

- It is settled law that the Clean Water Act does not require MS4 discharges to strictly comply with water quality standards. (Defenders of Wildlife v. Browner

(9th Circuit) 191 F.3d 1159.) In 1987, when Congress created the MS4 permitting system, it expressly treated MS4 discharges differently than all other MS4 discharges. As Courts have affirmed, Congress unambiguously decided that strict compliance with water quality standards was not required for MS4 discharges.

- The State Board has developed standard receiving water limitations language and has expressly interpreted that language as not requiring strict compliance with water quality standards. (State Board Order 2001-15.) To the contrary, the State Board has explained that "compliance is to be achieved over time, through an iterative approach requiring improved BMPs."

- Other MS4 permits issued by U.S. EPA directly or approved by U.S. EPA have employed the adaptive management approach as the basis for compliance with water quality standards. These permits have not required strict and immediate compliance with water quality standards for MS4 discharges.

Because the Clean Water Act does not demand that MS4 discharges strictly comply with water quality standards, and because the State Board has confirmed that compliance is to be achieved over time through the iterative process, the Regional Board should revise Provision A to realign the language with this policy approach. In light of the unique nature of MS4 discharges, as recognized by Congress, strict and immediate compliance with water quality standards is generally not feasible or appropriate.

Although the State Board has scheduled a November 20, 2012 workshop to discuss the receiving water limitations language, the Regional Board should provide policy direction on this issue now. It is requested that the Regional Board provide direction to staff to revise the language of Provision A to reflect the adaptive management approach as the basis for compliance. It is also requested that the Regional Board provide direction to staff to work with the State Board to support State Board language based on the adaptive management process. Addressing this issue now is particularly important for the Regional Permit because a failure to address the issue will undermine the value and acceptability of the watershed-based approach reflected in the Permit. The innovative approach taken in the Permit may be undermined entirely by the rigid language in Provision A. To support and allow dischargers to embrace the watershed-based approach, Provision A must be realigned with the adaptive management process.

We ask that this letter be provided to the full Board in advance of the workshop. It has been authored and signed below by our office and by counsel on behalf of the City of San Diego and City of Santee.

Very truly yours,

THOMAS E. MONTGOMERY, County Counsel

By

James R. O'Day, Senior Deputy

JAN I. GOLDSMITH, City Attorney, City of San Diego

By

Heather Stroud, Deputy City Attorney

CITY OF SANTEE

Shawn Hagerty
BEST BEST & KRIEGER LLP

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Very truly yours,

THOMAS E. MONTGOMERY, County Counsel

By
James R. O'Day, Senior Deputy

JAN I. GOLDSMITH, City Attorney, City of San Diego

By
Heather Stroud, Deputy City Attorney

CITY OF SANTEE

Shawn Hagerty
BEST BEST & KRIEGER LLP

Mr. Destache

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Very truly yours,

THOMAS E. MONTGOMERY, County Counsel

By
James R. O'Day, Senior Deputy

JAN I. GOLDSMITH, City Attorney, City of San Diego

By
Heather Stroud, Deputy City Attorney

CITY OF SANTEE

Shawn Hagerty
BEST BEST & KRIEGER LLP

November 13, 2012
Item No. 10
Supporting Document No. 7

City of Del Mar

November 5, 2012

Honorable Chairman Grant Destache and Board Members
California Regional Water Quality Control Board
San Diego – Region 9
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

SUBJECT: TENTATIVE ORDER R9-2013-0001 REGIONAL NPDES PERMIT FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4S) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

Dear Chairman Destache and Board Members:

The City of Del Mar has been pleased with the progressive process used to engage the regional Copermittees and stakeholders in the MS4 Permit reissuance process. RWQCB staff deserves commendation for their efforts to accommodate the Copermittees' written and verbal comments received into the Tentative Order in a quick and timely manner. This effort demonstrates the shared commitment of the RWQCB staff and Copermittees to develop an implementable, cost effective Permit that leads to improvements in water quality conditions. In light of the upcoming Public Workshop on November 13th, 2012 for the NPDES MS4 permit reissuance, the City of Del Mar would like to take the opportunity to address some key issues regarding Tentative Order R9-2013-0001.

In addition to those identified above, the City would like to highlight some of the valued outcomes of the permit reissuance process thus far, namely the Water Quality Improvement Plans (WQIP) as watershed planning documents and the requirement of adaptive management. We also agree with the intended approach for points of compliance with the Permit, as stated by RWQCB staff at the June 27th, 2012 focused meeting with stakeholders. Staff indicated that compliance would be based on the submission of complete Water Quality Improvement Plans (WQIP) and also the implementation and assessment of those WQIPs. Assessment includes adaptation to improve programs and plans to meet the established WQIP goals and ultimately water quality standards.

However, there are areas within the Tentative Order that we feel continue to warrant further consideration. This letter identifies the three primary areas of utmost importance where the process thus far appears to have reached an impasse. For these three topics, the RWQCB staff states that they are either not willing or, contrary to our understanding, not allowed to make further changes. The specific areas include:

I. Receiving Water Limitations language in **Provision A** of the Tentative Order;

1050 Camino Del Mar, Del Mar, California 92014-2698. Telephone: (858) 755-9313.Fax: (858) 755-2794
www.delmar.ca.us

II. Expression of Total Maximum Daily Load compliance is **Attachment E** of the Tentative Order, and;

III. Applicability of hydromodificaiton management requirements in **Provision E** of the Tentative Order.

A technical memorandum is attached with details on these topics of concern.

Our recommendations on these three issues are as follows:

I. Provision A Language Should Be Revised
The City urges you to provide direction to your staff to take an active and lead role on this extremely important issue. The new paradigm shift (WQIPs and required adaptive management) in the Tentative Order should be supported by revised state and local policies that encourage complete participation in the WQIP and adaptive management approach. Receiving water limitations language is driven by state and local policy and with a new standard of permitting upon us, the policies should reflect this new paradigm.

II. TMDL Compliance Should Be Consistent
The City of Del Mar urges you to direct staff to correct this apparent conflict between the RWQCB adopted Bacteria TMDL and the compliance requirements of the Tentative Order, Attachment E, Section 6.

III. Hydromodification Management BMPs Should Be Applied To Mitigate Hydromodification Impacts
The City of Del Mar respectfully requests you as RWQCB Members to direct RWQCB staff to include within the permit, the exemptions that were included in the HMP that RWQCB Members approved by Resolution No. R9-2010-0066 in 2010.

In summary, the City of Del Mar respectfully requests that RWQCB Staff and Copermittees work cooperatively on these three issues to find consensus and resolution. We appreciate your attention to our concerns, and we trust that this letter will be entered into the record at the November 13, 2012 meeting.

Sincerely,

Carl Hilliard
Mayor

cc: Del Mar City Council Members

Attachment: Technical Memo of November 1, 2012

November 13, 2012
Item No. 10
Supporting Document No. 7

City of Del Mar Memorandum

TO: Scott Huth, City Manager
Kathleen Garcia, Planning and Community Development Director

FROM: Mikhail Ogawa, Clean Water Manager

DATE: November 1, 2012

SUBJECT: San Diego Regional Water Quality Control Board Tentative Order R9-2013-0001

BACKGROUND

The San Diego Regional Water Quality Control Board (RWQCB) issues Municipal Separate Storm Sewer (MS4) permits to the Cities within San Diego County, the County of San Diego, the San Diego County Regional Airport Authority and San Diego Unified Port District (Copermittees). These permits are extensions of the federal Clean Water Act.

In April 2012, the RWQCB staff initiated an informal process by releasing an Administrative Draft of the forthcoming permit. The intent was to engage the Copermittees and stakeholders through focused meetings to allow the opportunity for a dialog to occur. The focused meeting process included five focused meetings, two public workshops, and a workshop sponsored by Orange County Copermittees focused on Hydromodification Management. The process has culminated in the release of a Tentative Order for public review on October 31, 2012. Public comments on the Tentative Order must be submitted by January 11, 2013. In addition, the RWQCB will hold a public workshop as a part of their regularly scheduled Board meeting on November 13th, 2012 to receive input from the public.

Two outcomes of the permit reissuance process thus far include Water Quality Improvement Plans (WQIP) as watershed planning documents and the requirement of adaptive management. The use of WQIPs as planning documents and allowing modifications to MS4 implementation programs, the Tentative Order offers a paradigm shift from previous prescriptive permits that may have led to unfocused programs not directed towards improvements in water quality.

In abridged terms, the WQIPs will be watershed planning documents intended to direct program implementation to focus on the highest of watershed specific water quality issues. The WQIP process requires Copermittees to establish interim and final goals where the objective is to bring MS4 discharges and waterbodies into compliance with water quality standards. The goals must be measureable so that progress towards them can be demonstrated. The WQIPs require schedules to be established for achievement of the interim and final goals. In some cases, these schedules may extend beyond the intended five-year life of the MS4 permit. Specific programmatic strategies are also prescribed to identify the means of achieving the established goals within the schedules. Lastly, the WQIPs also require adaptive management, so that Copermittees may learn from special studies and past efforts to use the most efficient and effective strategies and Best Management Practices to achieve water quality goals. The stated intent of the Permit is to have compliance based on the development, implementation and

adaptation of the strategies in WQIPs to meet the established goals and ultimately water quality standards.

CONCERNS REGARDING TENTATIVE ORDER

Provision A – Prohibitions and Limitations

The present use of the limitations in Provision A of the Tentative Order presents a dichotomy between requiring adaptive management BMP programs (i.e., WQIPs) and including receiving water limitations that prohibit discharges from the MS4s causing or contributing to violations of water quality standards[1]. The dichotomy may discourage the City from supporting the WQIP process, including adaptive management, if there is enforcement exposure based on the prohibition of discharges from the MS4s causing or contributing to violations of water quality standards. The City could be in violation immediately and continuously regardless of the efforts put towards the WQIPs and therefore may be discouraged from funding and participating in the adaptive management process that could ultimately work towards achieving water quality standards.

Board staff has verbalized that they have the discretion as to whether or not to enforce the receiving water limitations provision and intend not enforce this provision as long as the Copermittees demonstrate adequate progress through WQIP implementation and adaptation of program strategies. Furthermore, Board staff stated they have been directed to take a passive role and allow the State process[2] to be completed prior to making changes to the San Diego Regional MS4 Permit.

Attachment E – Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2013-0001

The Bacteria TMDL[3] states that for watersheds where there are no longer any impairments listed on the 2008 303(d) List (for REC-1 water quality standards), the Phase I MS4s are not required to submit a load reduction plan and are not subject to any further action under the TMDL as long as monitoring continues to support compliance with REC-1 water quality standards. However, if the impairment returns for REC-1 water quality standards, the Responsible Parties will be required to submit a load reduction plan to the RWQCB.

The City of Del Mar and other Responsible Parties in the San Dieguito and Los Peñasquitos watersheds demonstrated to the RWQCB that the two watersheds are within this scenario where the Pacific Ocean Shoreline of the two watersheds are no longer listed as impaired for indicator bacteria under REC-1 water quality standards. The Responsible Copermittees received written confirmation (see attached two email) that they are "not subject to further action under Resolution No. R9-2010-0001 as long as monitoring data continues to support compliance with the REC-1 water quality standards." This scenario essentially places our two watersheds in a "dormant TMDL", unless the Pacific Ocean shoreline of the one or both of the watersheds are relisted on future 303(d) lists for indicator bacteria[4].

---

[1] Tentative Order R9-2013-0001 Provision A.2.a.

[2] State Water Resources Control Board is holding a Public Workshop on MS4 permits Receiving Water Limitations (RWL) Language on November 20, 2012. There is currently no schedule as to when and if the SWRCB will develop revised positions on RWL for MS4 permits.

[3] Revised TMDL for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek) adopted by SDRWQCB Resolution No. R9-2010-0001

[4] Page A66 of SDRWQCB Resolution No. R9-2010-0001

Attachment E, Section 6[5] of the Tentative Order requires, amongst other provisions, the compliance with Water Quality Based Effluent Limitations (WQBELs). The WQBELs as described in the Tentative Order are expressed as Receiving Water Limitations, Effluent Limitations and as Best Management Practices requirements. As written, the Responsible Copermittees in the two watersheds are required to meet the listed WQBELs even while under the "dormant TMDL" condition.

There is a conflict between relisting of the Pacific Ocean shoreline and the more strict WQBEL limitations. Relisting of the Pacific Ocean shoreline would be done under the criteria established in the 2004 SWRCB Listing Policy[6] which allows for a certain number of water quality standard exceedances prior to listing. The WQBEL limitations allow **zero** water quality standard exceedances under dry weather conditions – a much higher bar with which to comply. If the WQBELs are included in the final adopted Permit, at a minimum, the WQBEL compliance is only applicable when the TMDL is in an active phase – i.e., the waterbody is impaired and listed on the 303(d) list as specified in the Bacteria TMDL (SDRWQCB Resolution R9-2010-0001). Otherwise, the Copermittees will be required to focus intense resources to address bacteria at the Pacific Ocean shorelines where water quality monitoring has demonstrated that it is not an issue. This ironic paradox would be contradictory to the watershed based adaptive management process where the objective is to focus limited resources on the highest water quality issues.

Provision E.3.c.(2) Hydromodification Management BMP Requirements
The Tentative Order defines hydromodification as:

> The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

The Tentative Order requires that priority development projects, including redevelopment projects, are required to control post-project runoff flow rates and durations so as not to result in increased potential for erosion, or degraded instream habitat conditions downstream of the projects. There are several explicit exemptions for these requirements identified in the Tentative Order. However, these exemptions are not inclusive of many of the exemptions identified in the San Diego Regional Copermittees Final Hydromodification Management Plan[7] (HMP). The exemptions identified in the HMP include, but are not limited to, projects that discharges to an exempt river reach, or a tidally-influenced area and other areas where there was little or no increased potential for erosion, or degraded instream habitat conditions downstream of the projects.

Over 95% of the City of Del Mar's MS4 system drains directly to either the Pacific Ocean or to tidally influenced areas of the San Dieguito estuary and river. The areas that drain to the Pacific

[5] Attachment E, Section 6 of the Tentative Order is the Specific Provisions for Total Maximum Daily Loads Applicable to Order R9-2013-0001 for the Revised TMDL for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)
[6] State Water Resources Control Board – Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List, adopted September 2004
[7] Approved on July 14, 2010 by San Diego RWQCB Resolution No. 2010-0066

Scott Huth
SDRWQCB Tentative Order R9-2013-0001
November 1, 2012

Ocean will remain exempt per the Tentative Order, however, those areas that drain to tidally influenced areas of the San Dieguito estuary and river will not be exempt even though they have no Hydromodification impacts. The City will be forced to require priority development projects to mitigate for impacts they will not have.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

BOARD MEETING PARTICIPATION SIGN-IN SHEET

NOVEMBER 13, 2012 – 9:00 A.M. – SAN DIEGO

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Kevin Sullivan	Helix Water Dist	619-696-3111
Deborah Mosley	County of SD	619-204-5831
Claudia Padrick	RCFC & WCD	951 312 7467
BILL VALLE	City of Chula Vista	619 540 0705
Gary Felien	City of Ocean Side	760-453-3551
GARY BROWN	City of Imperial Beach	619-423-0314
Gary Nelson	City of Imperial Beach	619-424-4045

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

BOARD MEETING PARTICIPATION SIGN-IN SHEET

NOVEMBER 13, 2012 – 9:00 A.M. – SAN DIEGO

Name (Please Print Legibly)	Representing	Telephone No.
ERIC LOMELI	RCFCWCD	951 955 8589
Claudia Spielding	RCTrans. Dept	951-955-1694
NATALIE DE VRETTOS	CITY OF SAN DIEGO	
Lee Kaminetz	San Diego Airport Auth	619-400-2479
Bret Cosmer	"	619-400-2473
SEAN KARAFFA	SD County Taxpayers Assoc	
Rich Crompton	County of San Diego	858 694-2233
Jessica Palmer	NAVY-NBSD	858-405-8737
DAVID GARCIA	RCFC & WCD	951 955-1330
Foster Wilson	State POC	760-[illegible]-4420
Tim Wellner	" "	" " "
Matt Little	City of Coronado	619-522-7712
Tyler Carson	PLSA ENGINEERING	858-259-8212
Patricia Romo	Riverside County	951 670 4700
Colin Kelly	OC COASTKEEPER/JENWATERKEEPER	714 850 1965
Eli Wittman	LSMCA	760-510-7941
Ken Lounsbery	LSMCA	760-743-1201
JOHN HAMMERSTRAND	PUBLIC	619-822-1537-C
DOUG LOGAN	NCCELSA	760-510-3152
James O'Day	SD County	619-531-4869
Pino Vitti	CDC	858-353-2484
Peter Kiesecker	Standard Pacific Homes	949 789-1667
John Emerson	Palomar College	760 744 1150
Erika Hess	KEN Group	619 339 4107
Rae Barner	City of RSM	7147886936
John Guerrero	City of National City	858 556 6600
Kris McFadden	City of San Diego	619 228 4098
Arsalan Dadkhah	D-MAX Engineering	858 586 6600
Julia Chunn-Heer	Surfrider San Diego	619-246-8881

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

BOARD MEETING PARTICIPATION SIGN-IN SHEET

NOVEMBER 13, 2012 – 9:00 A.M. – SAN DIEGO

Name (Please Print Legibly)	Representing	Telephone No.
Nancy Palmer ✓	City of Laguna Niguel	949-362-4384
Jim Janney	Imperial Beach	619 885 1085
Kim Godby	Coronado	619-522-7387
PAUL CLARKE	PADRE DAM MWD	619-258-4746
Rick BLANK	AMEC EIT McASMuraner	858 5146452
BRAD SAGER	MASSON + ASSOC	760-741-3570
Jeff Warner	City of Escondido	760-839-4528
JENNIFER KEARNS	CITY OF SAN DIEGO	858) 541-4331
Will Svec	City of San Diego	619-992-3061
Daniel Apt	RBF for OC	949-~~885~~-4117
Scott Taylor ✓	" "	760 603 6242
Remi Candelo		949-855-7007
Cindy Lin ✓	US EPA R9	213 244 1803
Rosanna Lacarra	City of Coronado	760-533 1875
S Sirapac	CITY OF POWAY	714 815 1536
Tim Holbrook	County of SD	858-614-7746
KEITH BAUERLE	CITY OF SAN DIEGO	619-236-7219
Drew Kleis	"	858-541-4329
Kathy Kessel	Lakeside Chamber	619-561-1031
CHERLYN CHE	CITY OF SAN DIEGO	858.541.4359
Genene Lehotsky	" "	858 541 4314
ROGER BUTOW ✓	CLEAN WATER NOW	949-715-1912
Heather Stroud	City of San Diego	619 533 5872
Jeff Cartfield	CDC	619 325-0441
Bryan Evans ✓	URS for Industrial Environmental Association	619-259 8129292
TROY BANKSON	COUNTY OF SAN DIEGO	(858) 694-2125
S. Gaurino	County "	858 694 3493
CID TESORO	COUNTY SAN DIEGO	858 694-3672
MARK WILLIAMS	AECOM	619 207 9627
Jim Peugh	San Diego Audubon Society	619-224-4591

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

BOARD MEETING PARTICIPATION SIGN-IN SHEET

NOVEMBER 13, 2012 – 9:00 A.M. – SAN DIEGO

Name (Please Print Legibly)	Representing	Telephone No.
Dennis Davies	City of El Cajon	619-441-1661
Shane Cancos	City of El Cajon	619-441-5554
Kimberly Nesbitt	Parsons Brinckerhoff	619-525-8376
Karen Cowan	Larry Walker Assoc.	310-394-1036
Jennifer Cashy-Gonzalez	Latham & Watkins	619 238 2810
Kathi Riser	Greater SD Chamber of Comm	619-523-1930
Laura Fontes	RWQCB	(619) 240-3363 x 297
Karen Herman	Port of SD	619 725-6073
Lesley Dobalian	SDCWA	858-522-6747
Khosro Aminpour	City of Chula Vista	619-397-6111
Woody Arnold	San Diego River Foundation	310-756-9051
Deborah Brown	U-T San Diego	6
Harry Orgovan	Self	619-422-3600
Malik Tamimi	City of Lemon Grove	619 825-3827
John A. Young	Caltrans	760-207-3422
Gabriel Gutierrez	County of SD	619-531-5544
Tim McCann	" "	" "
Chairman Ron Roberts	" "	" "
Pedro Orso	City of Santee	(619) 258-4100 x 167
Dick Robertz	San Dieguito River Park JPA	858 674-2275
Paul Manasjan	SDCR Airport Authority	(619) 400-2783
Ari Isaak	Evari GIS Consulting	858 633 6447
Paul Hartman	City of Vista	760 726-1340
Tiffany Bromfield	BID Council	619 239 2487
Annie Martin	Airport	619 400 2793
Allison Vosskuhler	Port	619-686-6321
Marvin Estrin	Bio Organic Catalyst Inc	619 225-8575
Vaikko Allen	Contech	310-850-1736
Carlos Mendoza	Harris & Associates	cmendoza@harris-assoc.com 619 236 1778 x 2530
Brian Diaz	Recupero & Assoc.	949-429-6300
Karen Ashley	Larry Walker Assoc.	530-753-6400

BILLY WALKER BWALKER@CI.OCEANSIDE.CA.US 760 435-5164
Sumer Hasenin syhasenin@sandiego.gov 858-541-4330
Mo. Lahsaie mlahsaie@ci.oceanside.ca.us 760-435-5803
ERIK STEENBLOCK esteenblock@ci.poterichikes.gov 760 943-2108
ALISON WITHERIDGE awitheridge@ci.oceanside.ca.gov 760-435-5822
Sheri McPherson sheri.mcpherson@sdcounty.ca.gov 858-495-5285
TRACY Jagebrightsen tingebrightsen@lagunabeachcity.net
Cynthia Gorham cgorham@waterboards.ca.gov 858 467 2957
Mike Woiwode mwoiwode@coronado.ca.us
Bret Schanzenbach ✓ bret@vistachamber.org 760-726-1102
Eric Mosolgo eric.mosolgo@tetratech.com [redacted]
Cheryl Filar cfilare@escondido.org 760-838-6375
ANDRE MONTEITH
Scott Smith CITY OF OCEANSIDE 760.435.5079
Kelly Porsey RWQCB
Mary Anne Skelding County of Orange
MICHAEL R WELCH mwelch1@sun.net (8) 625-0167
HELEN DAVIES hdavies@ci-santee.com (619) 258-4100 x177
Jim Nabors jnabors@sandiego.gov
Rachel Davenport rachel.davenport@amec.com
JOE PARCO Jparco@CITYOFRSM.ORG
Erica Ryan ✓ eryan@san-marcos.net
760 744 1050 X3218
Chuck Crampton County of Riverside
Graham Mitchell City of Lemon Grove

005197

NAME: Dr. Cindy Lin

AGENDA ITEM NO. 10

V

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: US EPA R9

ADDRESS: 600 Wilshire Blvd, Suite 1460, LA, CA TELEPHONE: 213 244 1803

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

OATH: I, Cindy Lin hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 11/13/2012

Signature:

005198

NAME: Claudio Padres

AGENDA ITEM NO. 10

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Senior Civil Engineer / Riverside County Flood Control and Water Conservation District

ADDRESS: 1995 Market St., Riverside, CA TELEPHONE:

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

OATH: I, Claudio Padres hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 11/13/12

Signature:

005199

NAME: Patricia Romo

AGENDA ITEM NO. 10

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Deputy Director Riverside County Transportation Dept

ADDRESS: 4070 Lemon Street Riverside CA TELEPHONE: 951 955 6740

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

OATH: I, Patricia Romo hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 11/11/12

Signature: Patricia Romo

Please allow my time to be given to

NAME: Patricia Romo

AGENDA ITEM NO. 10 ✓

005200

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Riverside County

ADDRESS: 3525 14th St Riverside TELEPHONE: 951-955-1694

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

OATH: I, Claudia Steiding hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 11/13/12

Signature: Claudia Steiding

Chairman

005201

NAME: Ron Roberts

AGENDA ITEM NO. 10

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Chairman, County of San Diego Board of Supervisors

ADDRESS: 1600 Pacific Highway TELEPHONE: 619 531 5544

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

OATH: I, _____ hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 11/13/12 Signature: _____

005202

Supervisor

NAME: Pam Slater-Price

AGENDA ITEM NO. 10 ✓

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Board of Supervisors, County of San Diego

ADDRESS: 1600 Pacific Highway TELEPHONE: 619 531 5533

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

OATH: I, _____ hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 11/13/12 Signature: _____

005203

10

NAME: Gary Felien

AGENDA ITEM NO. M54 Permit

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Oceanside City Councilman

ADDRESS: 300 N Coast Hwy, Oceanside 92054 TELEPHONE: 760-435-3551

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

OATH: I, Gary Felien hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 11/13/12

Signature: Gary Felien

005204

NAME: Poway Deputy Mayor Jim Cunningham

AGENDA ITEM NO. 10

REQUEST TO ADDRESS REGIONAL BOARD

DURING PUBLIC FORUMS, STATUS REPORTS, WORKSHOPS AND OTHER NON-ACTION ITEMS

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: City of Poway Deputy Mayor

ADDRESS: Poway

TELEPHONE: 619-871-5111

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

Meeting Date: 11/13/12

Signature:

005205

NAME: Todd Snyder

AGENDA ITEM NO. 10

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Watershed planning Program

ADDRESS: 5510 Overland Ave TELEPHONE: 858 694-3482

State your name and address (spell your last name) for the record prior to beginning your presentation. Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

OATH: I, Todd Snyder hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 11-13-12 Signature: Todd Snyder

005206

NAME: Ruth Kolb

AGENDA ITEM NO. 10

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: City of San Diego

ADDRESS: 9370 Chesapeake Dr, SD TELEPHONE: 858.541.4328

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

OATH: I, Ruth Kolb hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 11.13.12

Signature: [signature]

OPPOSE PINIC SLIPS WERE EMPTY ✓

005207

NAME: Julie Procopio

(speaking with San Diego Coperm Ttees)

AGENDA ITEM NO. 1

REQUEST TO ADDRESS REGIONAL BOARD

DURING PUBLIC FORUMS, STATUS REPORTS, WORKSHOPS AND OTHER NON-ACTION ITEMS

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: City of Santee

ADDRESS: 10601 Magnolia Avenue TELEPHONE: 619 258-4100

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

Meeting Date: 11/13/12

Signature: Julie Procopio

NAME: Nancy Palmer

AGENDA ITEM NO. 10

005208

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: City of Laguna Niguel

ADDRESS: 30111 Crown Valley Parkway TELEPHONE: 949-362-4389

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

OATH: I, Nancy Palmer hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: Nov-13-2012 Signature: Nancy R Palmer

005209

NAME: Scott Taylor

AGENDA ITEM NO. 10

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Scott Taylor on behalf of OC Public Works

ADDRESS: 5050 Avenida Encinas Carlsbad CA TELEPHONE: 760 603 6272

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

OATH: I, Scott Taylor hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 11/13/12 Signature: [signature]

005210

NAME: RICHARD BOON

AGENDA ITEM NO. 10

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: CHIEF OC STORMWATER PROGRAM

ADDRESS: 2301 N. GLASSELL ST ORANGE TELEPHONE: 714 955 0670

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

OATH: I, RICHARD BOON hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 11/13/12 Signature: Richard Boon

005211

NAME: Geoffrey Hunt, Port & OC Presentation

AGENDA ITEM NO. 1

*REQUEST TO SPEAK **IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Deputy ~~Counsel~~ County Counsel, Orange County

ADDRESS: 10 Civic Center Plaza, Santa Ana TELEPHONE: 714 834 3306

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

OATH: I, Geoffrey Hunt hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 10/13/2012

Signature:

005212

NAME: Kris McFadden

AGENDA ITEM NO. 6

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Deputy Director City of San Diego

ADDRESS: 9370 Chesapeake Dr. TELEPHONE: 858 541 4320

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

OATH: I, Kris McFadden hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 11/13/12

Signature: [illegible]

NAME: Jill Witkowski

AGENDA ITEM NO. 10

005213

✓

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Waterkeeper San Diego Coastkeeper

ADDRESS: 2825 Dewey Rd TELEPHONE: 619. 758 7743

State your name and address (spell your last name) for the record prior to beginning your presentation. Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

OATH: I, Jill Witkowski hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 11/13/12 Signature:

005214

NAME: Colin Kelly **AGENDA ITEM NO.** 10

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Staff Attorney, ORANGE COUNTY COASTKEEPER, INLAND EMPIRE WATERKEEPER

ADDRESS: 3151 Airway Ave, Ste F-110, Costa Mesa, CA 92626 TELEPHONE: _____

State your name and address (spell your last name) for the record prior to beginning your presentation. Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

OATH: I, Colin Kelly hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 11/13/12 Signature: Colin Kelly

NAME: Bryn Evans

AGENDA ITEM NO. 10

005215

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Industrial Environmental Association

ADDRESS: _____ TELEPHONE: 858 829292

State your name and address (spell your last name) for the record prior to beginning your presentation. Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

OATH: I, Bryn Evans hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 11-13-12 Signature: Bryn

005216

NAME: Noah Garrison

AGENDA ITEM NO. 10

REQUEST TO ADDRESS REGIONAL BOARD

DURING PUBLIC FORUMS, STATUS REPORTS, WORKSHOPS AND OTHER NON-ACTION ITEMS

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Attorney / NRDC

ADDRESS: 1314 2nd St Santa Monica, CA 90401 TELEPHONE: 310 434 2300

State your name and address (spell your last name) for the record prior to beginning your presentation. Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

Meeting Date: 1-13-12

Signature:

NAME: ROGER BUTOW

AGENDA ITEM NO. 10 ✓

006217

NPDES

REQUEST TO ADDRESS REGIONAL BOARD

DURING PUBLIC FORUMS, STATUS REPORTS, WORKSHOPS AND OTHER NON-ACTION ITEMS

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: EXECUTIVE DIRECTOR CLEAN WATER NOW

ADDRESS: P.O. BOX 4711 LAGUNA ~~Be~~ 92652 TELEPHONE: 949-715-1912

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

Meeting Date: 11/13/2012 Signature: [signature]

005218

NAME: KATHI RISER

AGENDA ITEM NO. 10

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: GREATER SAN DIEGO CHAMBER OF COMMERCE

ADDRESS: 402 W BROADWAY SD 92101 TELEPHONE: 619-544-1378

State your name and address (spell your last name) for the record prior to beginning your presentation. Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

OATH: I, KATHLEEN RISER hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 11/13/12 Signature: Kathleen Riser

005219

NAME: PEDRO ORSO-DELGADO AGENDA ITEM NO. 10

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Deputy City Manager / City of Santee

ADDRESS: 10601 Magnolia Av Santee Ca 92071 TELEPHONE: (619)258-4100 x167

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

OATH: I, PEDRO ORSO-DELGADO affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 11/13/12 Signature: [signature]

005220

NAME: Tory Walker

AGENDA ITEM NO. 10

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: President, Tory R Walker Engineering, Inc

ADDRESS: 122 Civic Center Drive, #206, Vista, CA 92084 TELEPHONE: 760 414-9212

State your name and address (spell your last name) for the record prior to beginning your presentation. Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

OATH: I, Tory Walker hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 11/13/12

Signature: Tory R Walker

005221

NAME: Bret Schanzenbach AGENDA ITEM NO. 10

Ceeding my time to Tony Walker

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

PLEASE PRINT LEGIBLY

TITLE/AFFILIATION: CEO - Vista Chamber of Commerce

ADDRESS: 127 Main St. Vista, CA TELEPHONE: 760-726-1122

State your name and address (spell your last name) for the record prior to beginning your presentation. Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

OATH: I, Bret Schanzenbach hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 11-13-12 Signature: Bret

005222

NAME: THOM FULLER

AGENDA ITEM NO. 10

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Decatur Advisors for SDBIA

ADDRESS: 12466 Yerba Valley Rd, Lakeside, 92040 TELEPHONE: 619-851-5121

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

OATH: I, Thomas A. Fuller hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 11-13-12

Signature: Thomas A. Fuller

005223

NAME: Richard Hopkins

AGENDA ITEM NO. 10

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Director of Public Works, City of Chula Vista

ADDRESS: 276 4th Avenue TELEPHONE: 619 397-6053

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

OATH: I, Richard Hopkins hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: Nov 13, 2012 Signature:

NAME: Luis Parra 6 min AGENDA ITEM NO. 10

005224

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Applied Hydrology Professor, San Diego State University

ADDRESS: 122 Civic Dr, #206, Vista, CA, 92084 TELEPHONE: 760-414 9212

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

OATH: I, Luis Parra hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 11/13/12 Signature:

NAME: Tyler Lawson → Cede time to Luis Parra

AGENDA ITEM NO. 15

005225

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Civil Engineer

ADDRESS: 525 N. Hwy 101 Ste A TELEPHONE: 858-259-8212

State your name and address (spell your last name) for the record prior to beginning your presentation. Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

OATH: I, Tyler Lawson hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 11-13-12 Signature:

NAME: Richard Crompton

AGENDA ITEM NO. 10

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Director of Public Works, County of San Diego

ADDRESS: 5510 Overland Ave, Suite 410, San Diego CA 92123 TELEPHONE: 858 694-2233

State your name and address (spell your last name) for the record prior to beginning your presentation. Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

OATH: I, Richard Crompton hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 11/13/12

Signature: [illegible]

005227

NAME: DENNIS BOWLING

AGENDA ITEM NO. 10

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: CHAIRMAN HMP TAC

ADDRESS: 5620 FRIARS RD, SD 92110 TELEPHONE: 619 688-1477

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

OATH: I, DENNIS BOWLING hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 11 13/2012

Signature:

NAME: MARK GOREY

AGENDA ITEM NO. 10 (Resolution) MS4 permit

005228

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Technical Director Construction Industry Coalition on Water Quality

ADDRESS: 17744 Sky Park Circle #170 Irvine, CA TELEPHONE: 909-525-0623

State your name and address (spell your last name) for the record prior to beginning your presentation. Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

OATH: I, MARK GOREY hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 11/13/12

Signature: Mark Gorey

005229

NAME: S. Dwyne Rosenbaum

AGENDA ITEM NO. 10

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Partner - Stoel Rives

ADDRESS: 12255 El Camino Real Suite 100, San Diego CA.

TELEPHONE: 858-794-4112

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

OATH: I, S. Dwyne Rosenbaum hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 11/13/12

Signature: S. Dwyne Rosenbaum

NAME: MICHAEL McSWEENEY

AGENDA ITEM NO. 10

005230

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: SR. PUBLIC POLICY ADVISOR – BIA SAN DIEGO

ADDRESS: 9201 SPECTRUM CENTER BLVD. SD 92123 TELEPHONE: 858-450-1221

State your name and address (spell your last name) for the record prior to beginning your presentation. Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

OATH: I, Michael McSweeney hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: NOV 13 2012

Signature: [signature]

005231

NAME: JEFF O'CONNOR

AGENDA ITEM NO. 10

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: DIRECTOR OF OPERATIONS - OTAY LAND CO.

ADDRESS: 1903 WRIGHT ST. CARLSBAD TELEPHONE: 760-918-8200

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

OATH: I, JEFF O'CONNOR hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 11/13/12

Signature: Jeff N. O'C

NAME: SEAN KARAFIN

AGENDA ITEM NO. 10

005232

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Economic Policy Analyst / SD County Taxpayers Assoc.

ADDRESS: 707 Broadway #905 SD CA 92101 TELEPHONE: 619 234 6423

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

OATH: I, SEAN KARAFIN hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 11/13/12

Signature: [signature]

NAME: Erica Ryan OPPOSITION AGENDA ITEM NO. 10 005233

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: City of San Marcos Stormwater Program Manager

ADDRESS: 1 Civic Center Dr. San Marcos CA 92069 TELEPHONE: 760 744 1050 X3218

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

OATH: I, Erica Ryan hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 11-13-12 Signature: [signature]

005234

NAME: Livia Borak

AGENDA ITEM NO. MS4 Workshop

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Coastal Environmental Rights Foundation

ADDRESS: 1140 S. Coast HWY 101 Encinitas CA 92024 TELEPHONE: 760-942-8505

State your name and address (spell your last name) for the record prior to beginning your presentation. Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

OATH: I, Livia Borak hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 11/13/2012 Signature: [signature]

005235

NAME: Marco Gonzalez

AGENDA ITEM NO. M&I workshop

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Coastal Environmental Rights Foundation

ADDRESS: 1140 S. Coast Hwy 101 Encinitas CA 92024 TELEPHONE: 760-942-8505

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

OATH: I, Marco Gonzalez hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 11/13/2012 Signature: M. Gonzalez

005286

NAME: JOHN L. HAMMERSTRAND AGENDA ITEM NO. 10

REQUEST TO ADDRESS REGIONAL BOARD

DURING PUBLIC FORUMS, STATUS REPORTS, WORKSHOPS AND OTHER NON-ACTION ITEMS

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: PUBLIC CONCERN

ADDRESS: 17391 COBLE GRANDE TELEPHONE: 619-922-1537-c
ALPINE CA 91901

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

Meeting Date: _____ Signature: _____

NAME: DOUG LOGAN

AGENDA ITEM NO. 18

005237

REQUEST TO ADDRESS REGIONAL BOARD

DURING PUBLIC FORUMS, STATUS REPORTS, WORKSHOPS AND OTHER NON-ACTION ITEMS

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Owner, Rancho Coastal Engr. & Surveying.

ADDRESS: 310 S. Twin Oaks Valley Rd. TELEPHONE: 760-510-3152

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

Meeting Date: 11-13-12

Signature:

NAME: KAREN HOLMAN

AGENDA ITEM NO. 18

005238

REQUEST TO ADDRESS REGIONAL BOARD ~~SD County~~ ?

DURING PUBLIC FORUMS, STATUS REPORTS, WORKSHOPS AND OTHER NON-ACTION ITEMS

*****PLEASE PRINT LEGIBLY*****

Port of San Diego

TITLE/AFFILIATION: MANAGER, ENVIRONMENTAL PROGRAMS

ADDRESS: 3165 PACIFIC HWY

TELEPHONE: (619) 725-6073

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

Meeting Date: Nov 13, 2012

Signature: [signature]

NAME: STEWART McCLURE

AGENDA ITEM NO. 10

005239

REQUEST TO ADDRESS REGIONAL BOARD

DURING PUBLIC FORUMS, STATUS REPORTS, WORKSHOPS AND OTHER NON-ACTION ITEMS

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: President - ClearWater Solutions

ADDRESS: Vista, CA.

TELEPHONE: 760 801-9301

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

Meeting Date: 11/13/12

Signature:

NAME: VAIKKO ALLEN AGENDA ITEM NO. 10 005240

REQUEST TO ADDRESS REGIONAL BOARD

DURING PUBLIC FORUMS, STATUS REPORTS, WORKSHOPS AND OTHER NON-ACTION ITEMS

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: REGULATORY DIRECTOR CONTECH ENGINEERED SOLUTIONS

ADDRESS: 2550 BONMARE DR. OSAL CA 93023 TELEPHONE: 310-850-1736

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

Meeting Date: 11/13/12 Signature:

NAME: Julia Chunn Heer

AGENDA ITEM NO. M34 workshop

005241

REQUEST TO ADDRESS REGIONAL BOARD

DURING PUBLIC FORUMS, STATUS REPORTS, WORKSHOPS AND OTHER NON-ACTION ITEMS

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Campaign Coordinator Surfrider San Diego

ADDRESS: 9883 Pacific Heights Blvd Ste D San Diego 92121 TELEPHONE: 619-246-8881

State your name and address (spell your last name) for the record prior to beginning your presentation. Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

Meeting Date: 11/13/12

Signature: [signature]

Regional MS4 Permit

Tentative Order No. R9-2013-0001

Regional Water Quality Control Board
San Diego Region

Laurie Walsh, PE
Christina Arias, PE

WHY ?

Restore and maintain the physical, chemical, and biological integrity of the Nation's waters

Improve and protect water quality

Our mission is to preserve, enhance and restore the quality of California's water resources, and ensure their proper allocation and efficient use for the benefit of present and future generations

A sustainable future for our children

HOW ?

An effective permit is required for water quality improvement and protection

Effectively prohibit non-storm water discharges into storm sewers

Require controls to reduce the discharge of pollutants in storm water to the maximum extent practicable

Restore and maintain the physical, chemical, and biological integrity of receiving waters

Strategic
❶

Adaptive
❷

Synergistic
❸

WHAT ?

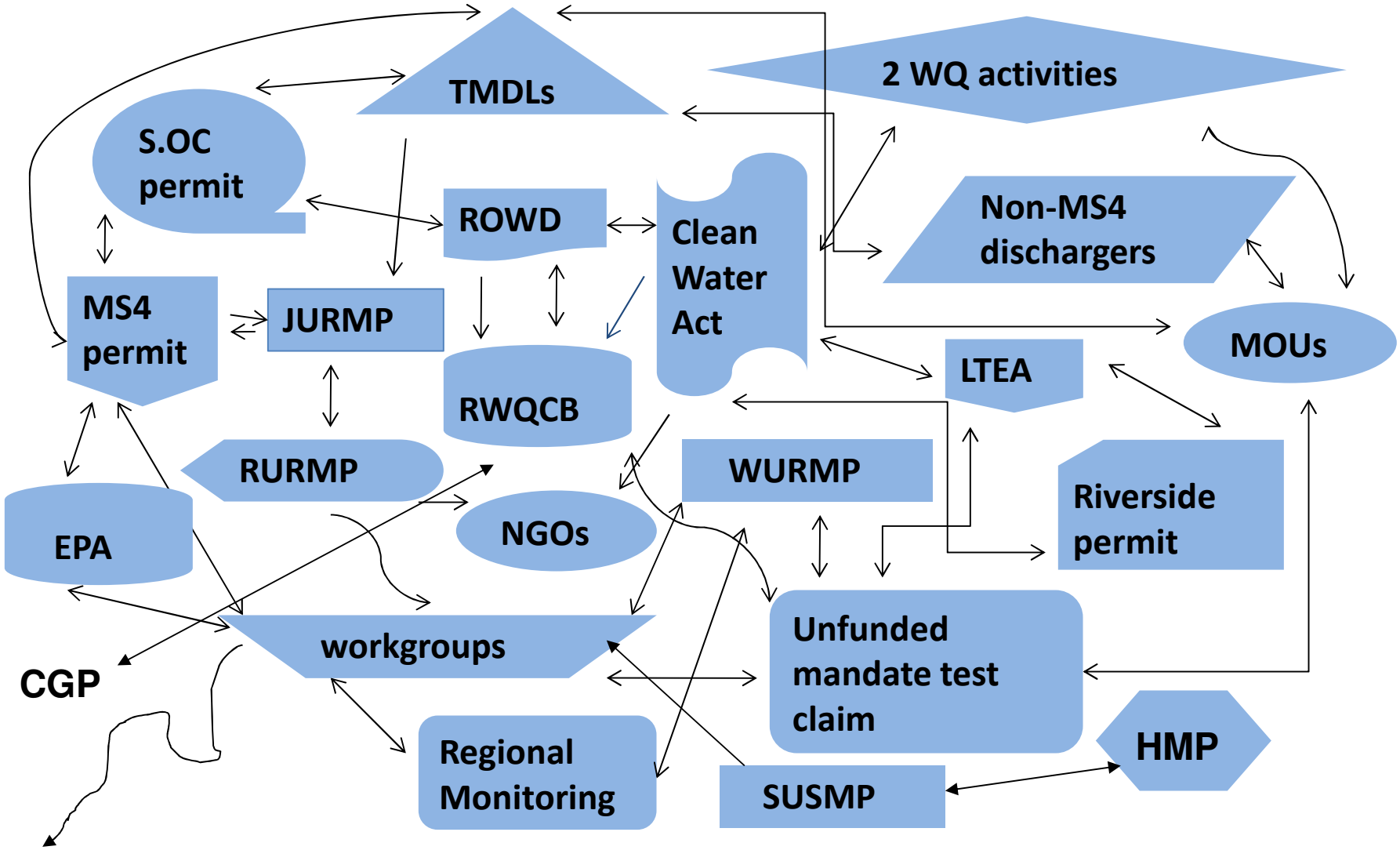
TMDLs
2 WQ activities
S.OC permit
ROWD
Clean Water Act
Non-MS4 dischargers
MS4 permit
JURMP
MOUs
LTEA
RWQCB
RURMP
WURMP
Riverside permit
EPA
NGOs
workgroups
Unfunded mandate test claim
CGP
HMP
Regional Monitoring
SUSMP

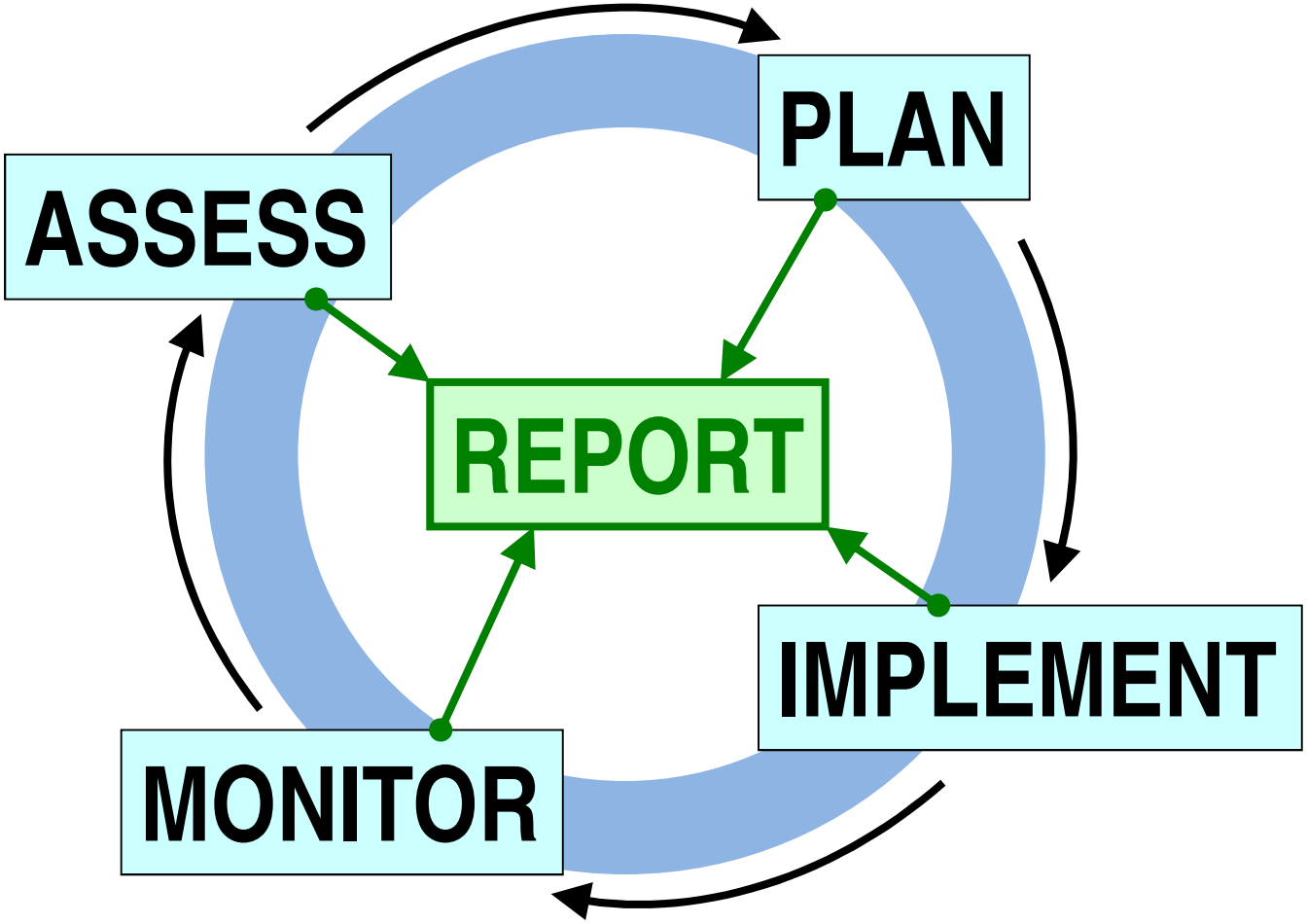
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REPORT
IMPLEMENT
MONITOR

The New Paradigm…

Action oriented

Outcome oriented

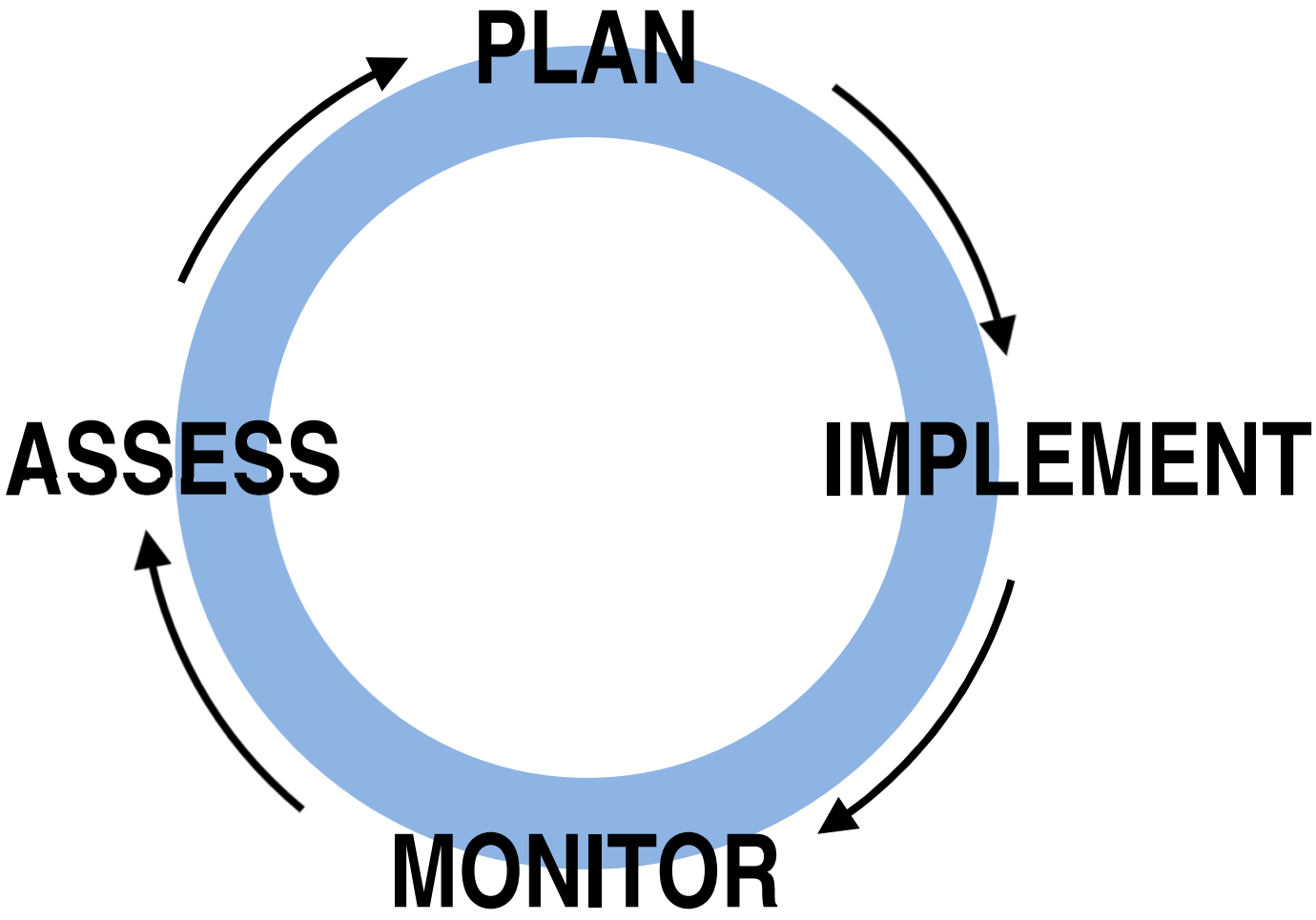
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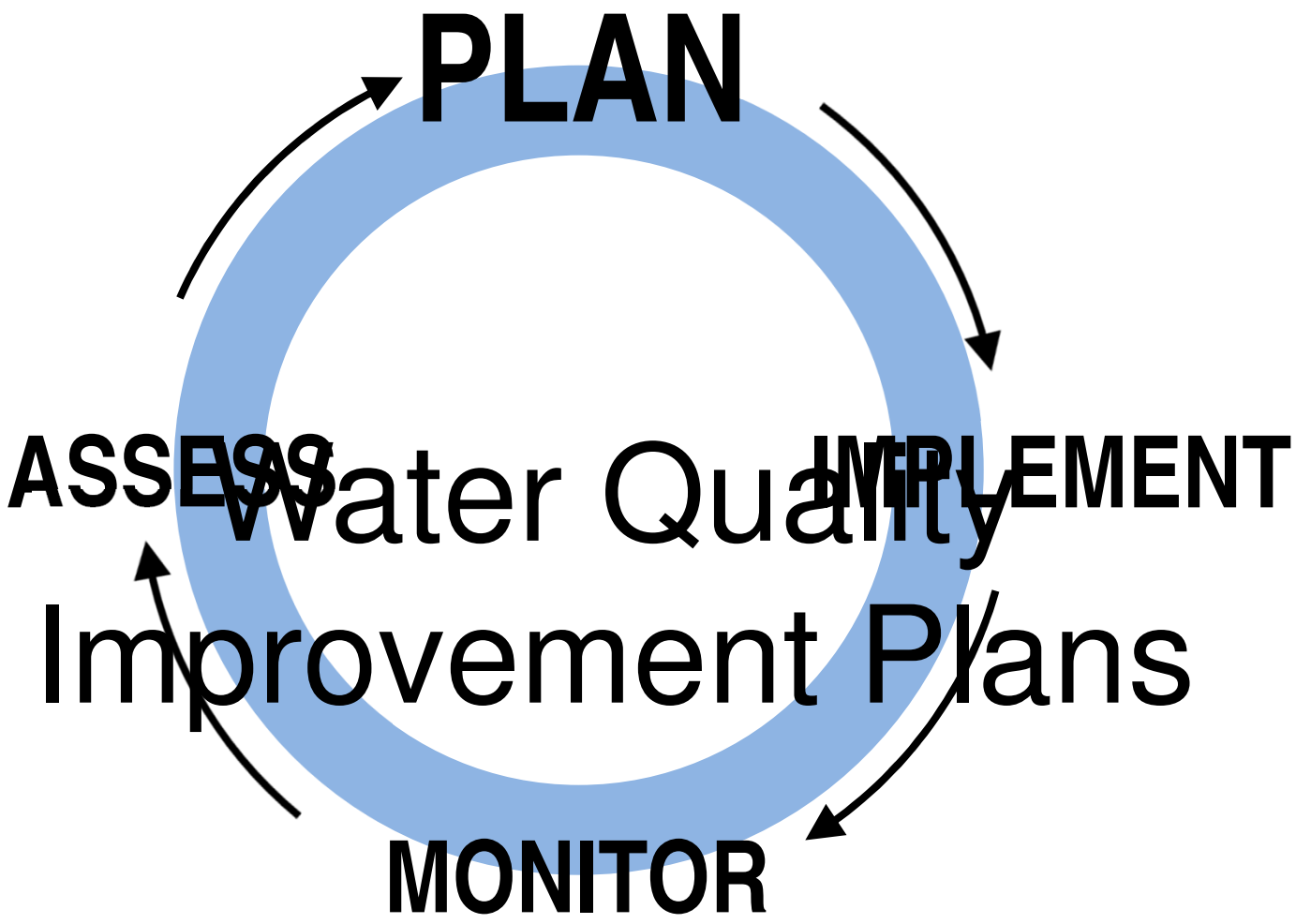

Water Quality Improvement Plans

Region 9

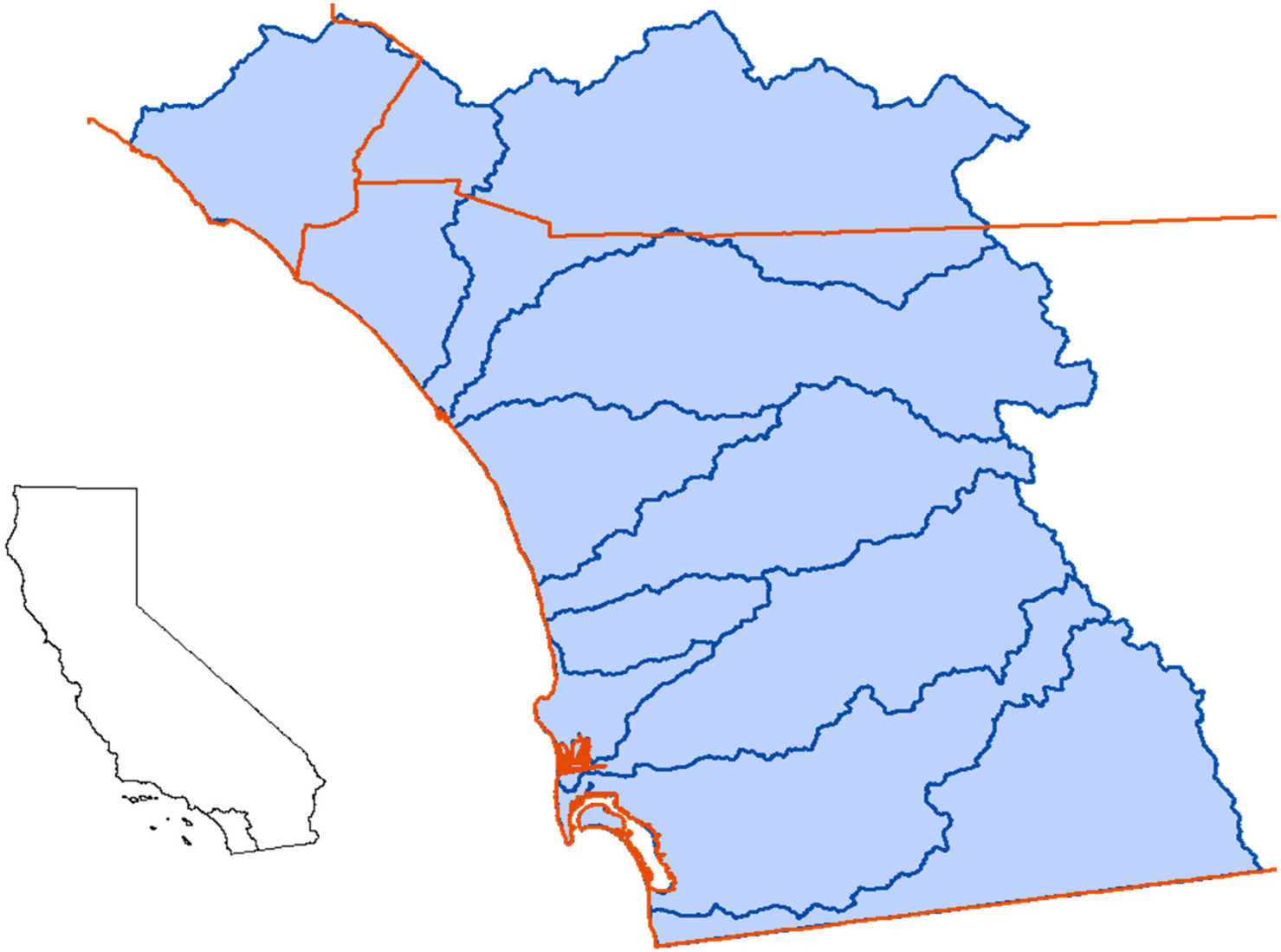

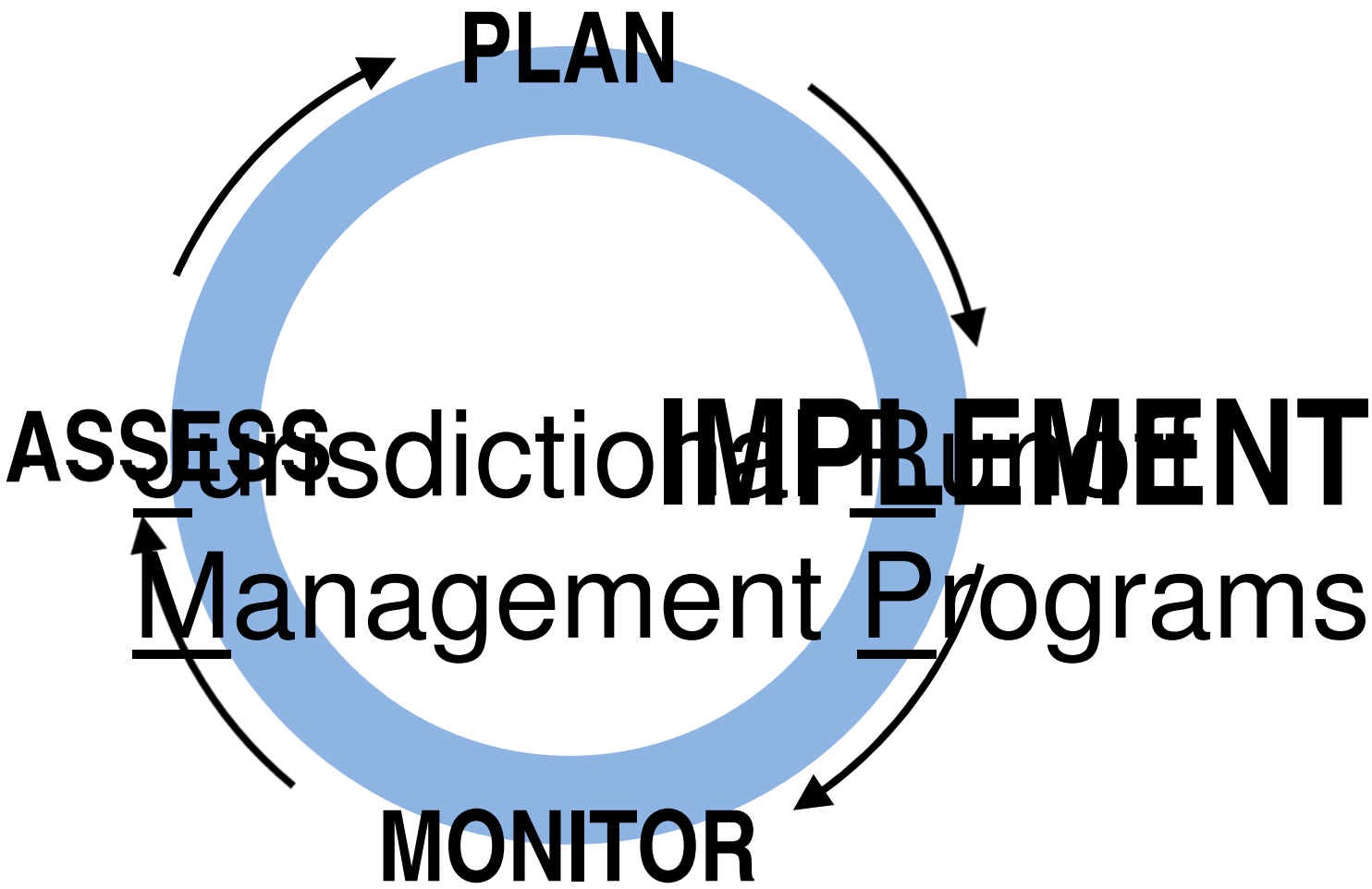

Jurisdictional Runoff
Management Programs

WASTE
OIL
EMPTY
EMPTY

Illicit Discharge Detection and Elir

Construction Management

Existing Development Management

Development Planning

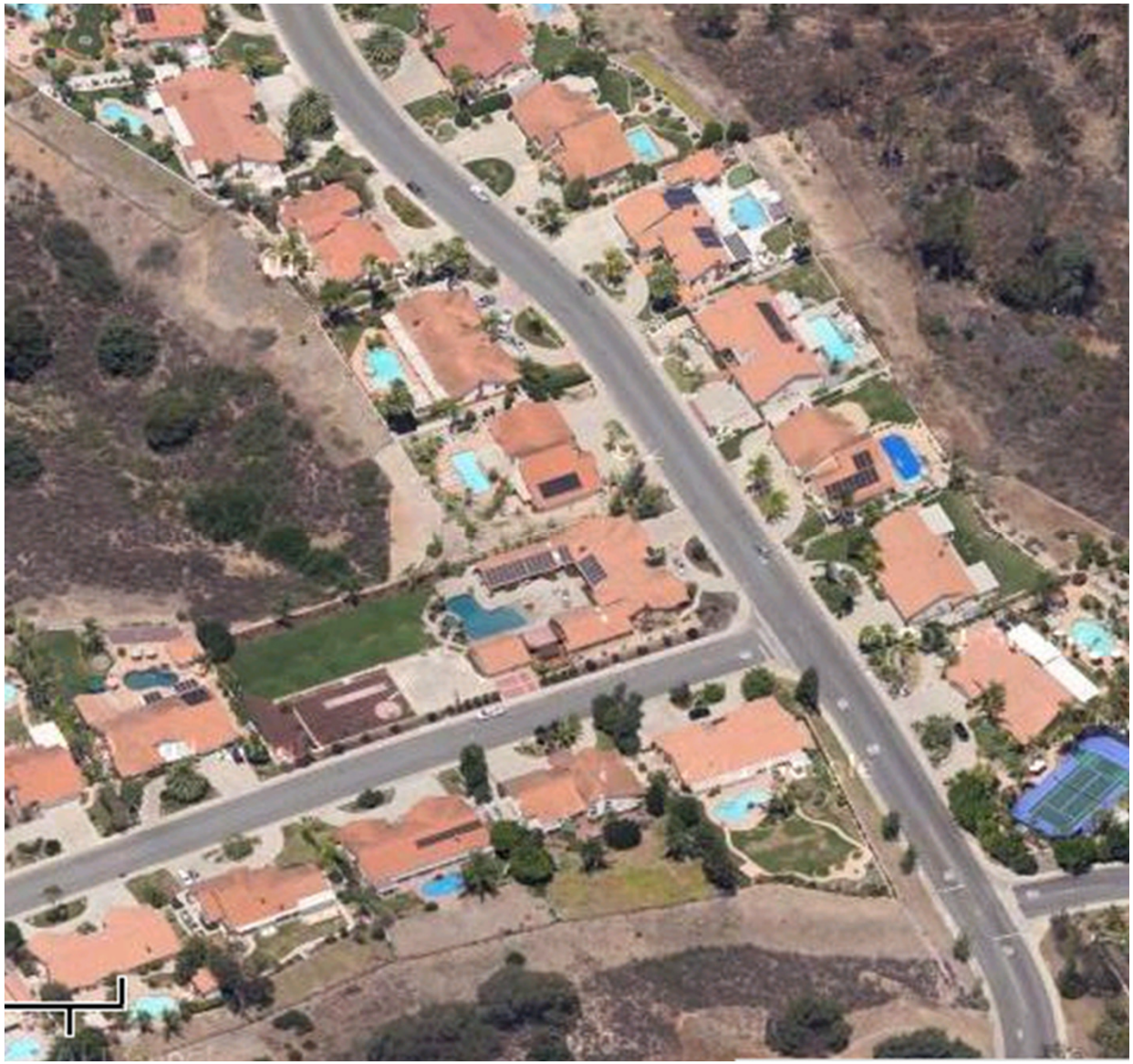

Development Planning

Development Planning

Development Planning

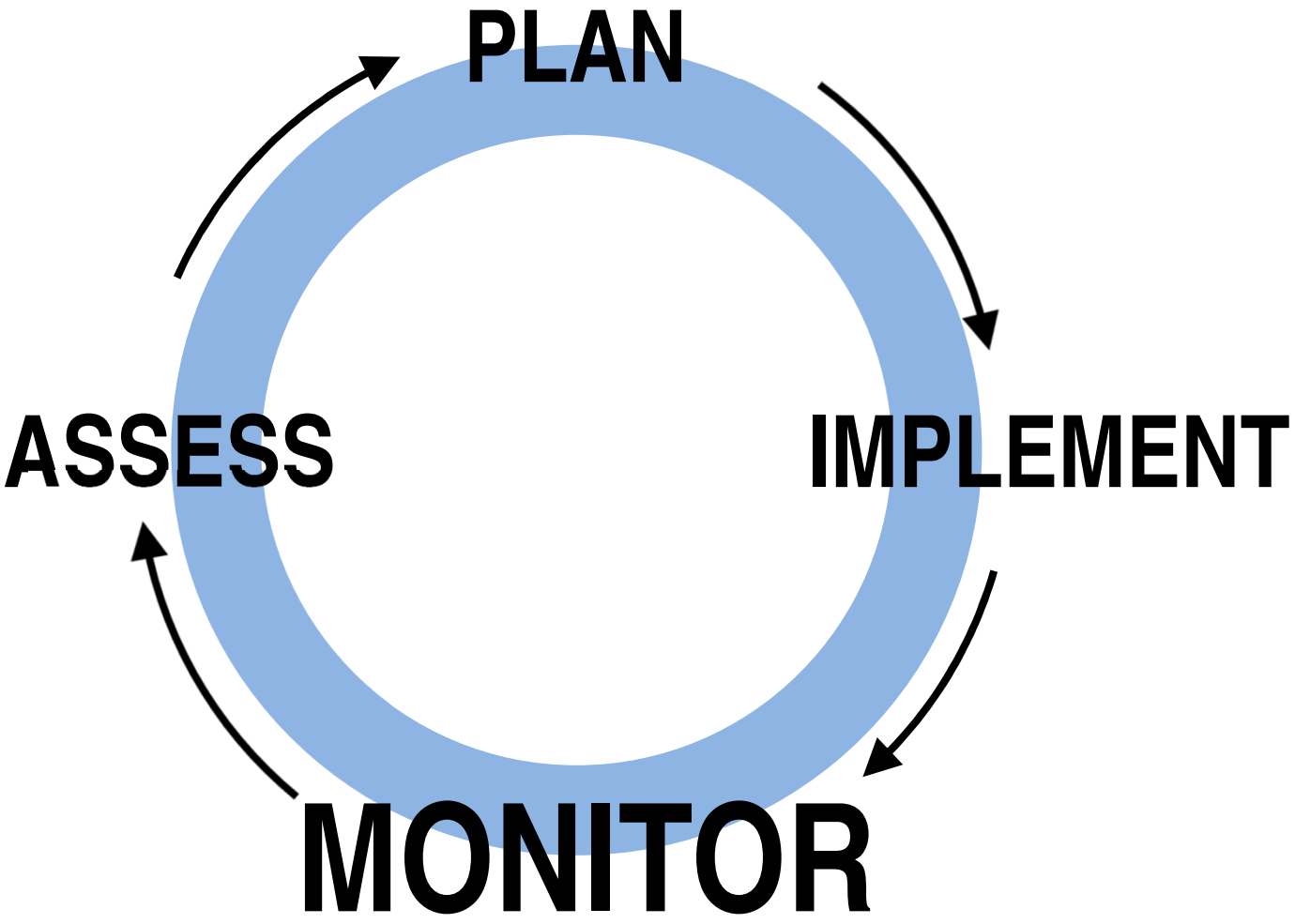
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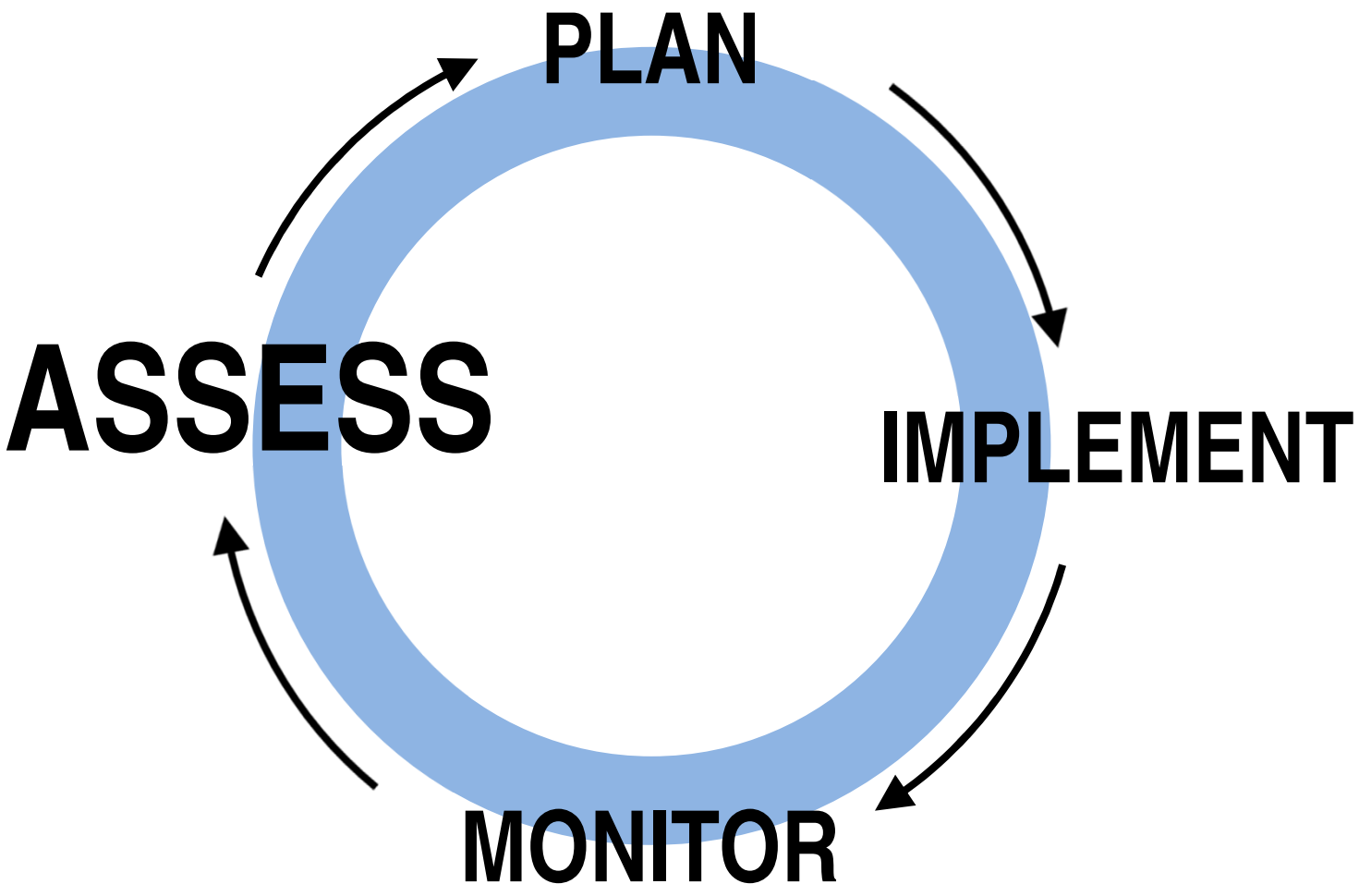
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Remaining Outstanding Issues

1. Discharge Prohibitions and Receiving Waters Limitations
2. Development Planning Provision
3. Inclusion of TMDLs

Focusing on Outcomes

Claudio M. Padres, P.E.
Riverside County Flood Control
and Water Conservation District

1

What outcomes?

- Need to ensure the outcomes are
  - Appropriate, and
  - Achievable

2

Focusing on Outcomes

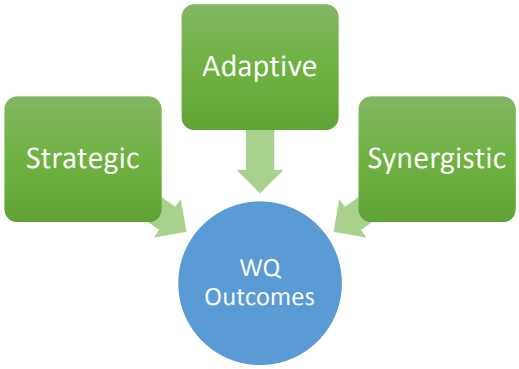

3

What prevents us from focusing on outcomes?

- Will always requiring <u>more</u> help us or hurt us**?**

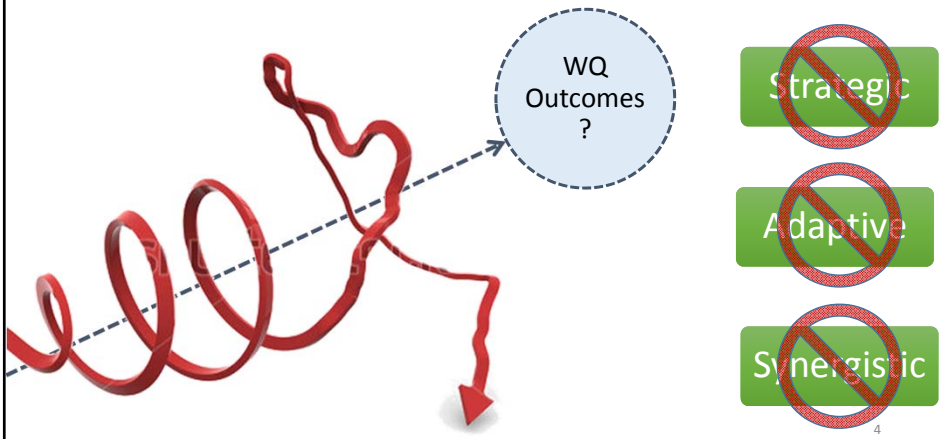

4

Where are we now?

- ‘More’ isn’t needed
  - Already invest multiple MILLION$ each year.
  - 20+ years with ‘Boots on the ground’ Experience
  - Good things have been done
    - Pyrethroid Pesticide labeling through DPR
    - $2.5 Million LID Testing and Demonstration Facility
    - Detailed LID BMP Design Handbook
    - Nutrient Initiative for Santa Margarita Lagoon and Estuary

5

What prevents us from focusing on outcomes?

One Size Fits All

- Construction
- SSMP / HMP
- IDDE
- Commercial
- Industrial
- Residential
- Public Education
- Enforcement
- Retrofit
- Monitoring

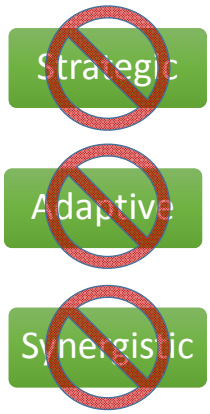

6

Paradigm Shift

Activity Focus

- **'One Size fits All'**
- **Do MORE activities**

Outcome Focus

- **Be more STRATEGIC and ADAPTIVE and SYNERGISTIC**

7

Does the Tentative Order allow us to be:

	Strategic	Adaptive	Synergistic
Water Quality Improvement Plan	YES	YES	YES
Jurisdictional Program	NO	NO	NO
Monitoring Program	NO	NO	NO

WQ Outcomes ???

8

Paradigm Shift

What we needed

9

Paradigm Shift ???

What we needed

What we got

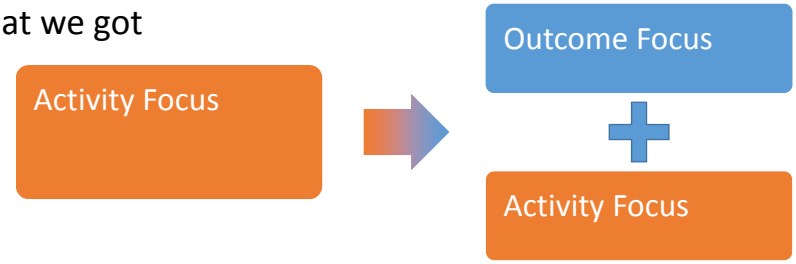

10

Action Item #1

- Work with the Permittees to fix elements of the permit that do not allow us to be strategic, adaptive or synergistic with our Citizen's resources.
  - Particularly by strengthening the link between the JRMP and Monitoring requirements, and the specific strategies developed in the WQIPs.

11

Receiving Water Limitations

Focus on Water Quality Outcomes → Focus on Litigation

Resources directed to effective strategies → Resources directed to lawyers

Resolution: Authorize staff to work with the Permittees to develop language that can be complied with.

12

LID Sizing and Hierarchy

- **Major Changes**
  - LID BMPs will be 2-3 times larger
  - Require a complete re-write of the SSMPs
  - Throws our $2.5M LID Testing and Demonstration facility out the window
    - Including our innovative LID BMP Design Handbook.

Resolution: Work with the Permittees to develop requirements compatible with programs developed for the Riverside and OC Permits

13

Hydromodification

- **Reality: Many streams are managed by Flood Control Districts**
  - Engineered and maintained. **Not susceptible to Hydromodification.**
  - Provide necessary protection of life and property of our citizens.
- **Permit: Tentative Draft sets Hydromodification policy that conflicts with this reality**
  - Presumes that all streams can and will be restored to a natural floodplain;
  - Presumes that people will simply be moved out of the watersheds to accomplish this goal;
  - Conflicts with Legislative Mandate of the Flood Control Districts.

Resolution: Work with the Permittees to focus requirements on streams that are actually susceptible to hydromodification through the WQIP.

14

Monitoring

- Improvements were made in Focused Meetings
  - Starting point was to require everything they felt the law allowed, and negotiate back from there.
- Still not well tied to the WQIP Monitoring strategies
  - Sets arbitrary minimums
  - Still requires 'one-size fits all' actions for Non-Storm Water
- Requires every watershed to develop complicated and extremely costly pollutant models

Resolution: Work with the Permittees to resolve these issues

15

[redacted]

16

San Diego Copermittee Comments
Regional Board Workshop
San Diego Regional MS4 Permit
November 13, 2012

Overview

- Appreciate Board staff's efforts on Admin Draft
  - Focused Meetings and individual meetings have been very valuable
  - Support the watershed-based (WQIP) approach
  - Staff made many changes based on stakeholder input
- **Critical issues remain, and request Board direction**:
  1. Compliance Provisions
  2. Total Maximum Daily Loads
  3. Development Requirements and Hydromodification

- **MS4s have demonstrated success**:
  - Fewer beach closures
  - Removal copper from brake pads (SB 346)
  - Revised development standards (LID and HMP)
- **Challenges remain**:
  - WQOs can be exceeded even with treatment (see International BMP Database)
  - 2008 National Academy of Science Report: *"…pollutant loadings in stormwater effluent vary dramatically over time…"*

WQIPs provide path forward to a new paradigm

- Addresses all prohibitions and limitations in a watershed
- Prioritizes resources
- Identifies effective actions using sound science
- Vets through public process
- Implements E.O. approved WQIP per schedule
- Revises actions/BMPs based on water quality <u>outcomes</u>
- Alleviates need for further TMDLs

Compliance Provisions

Comment 1: Compliance language in permit is conflicting

REQUEST: Develop language to clearly link WQIPs to Permit compliance

- *Prohibitions and Limitations* (Provision A);
- *Water Quality Improvement Plans* (Provision B); and
- *TMDL Provisions* (Attachment E)

Total Maximum Daily Loads

TMDLs

Comment 2: Permit does not allow for BMP-based TMDL compliance

- Board has discretion to allow BMP-based compliance
- Previously included in Board-adopted TMDLs
- Permit removes this as an option

REQUEST: Add an option for BMP-based compliance with WLAs as envisioned in adopted TMDLs

TMDLs

Comment 3: Permit applies concentration-based Effluent Limitations at each MS4 outfall

- Requires compliance at every discharge point in the MS4 rather than the cumulative loading to receiving waters
- Limits ability to strategically target problem areas

REQUEST: Include an option for load-based WLAs (not WQ objectives) as envisioned in adopted TMDLs

Effect of Effluent Limits (Chollas Creek)

005287

Outfalls that must be addressed if effluent limits are WQOs	
Outfalls that must be addressed if effluent limits are WLAs	

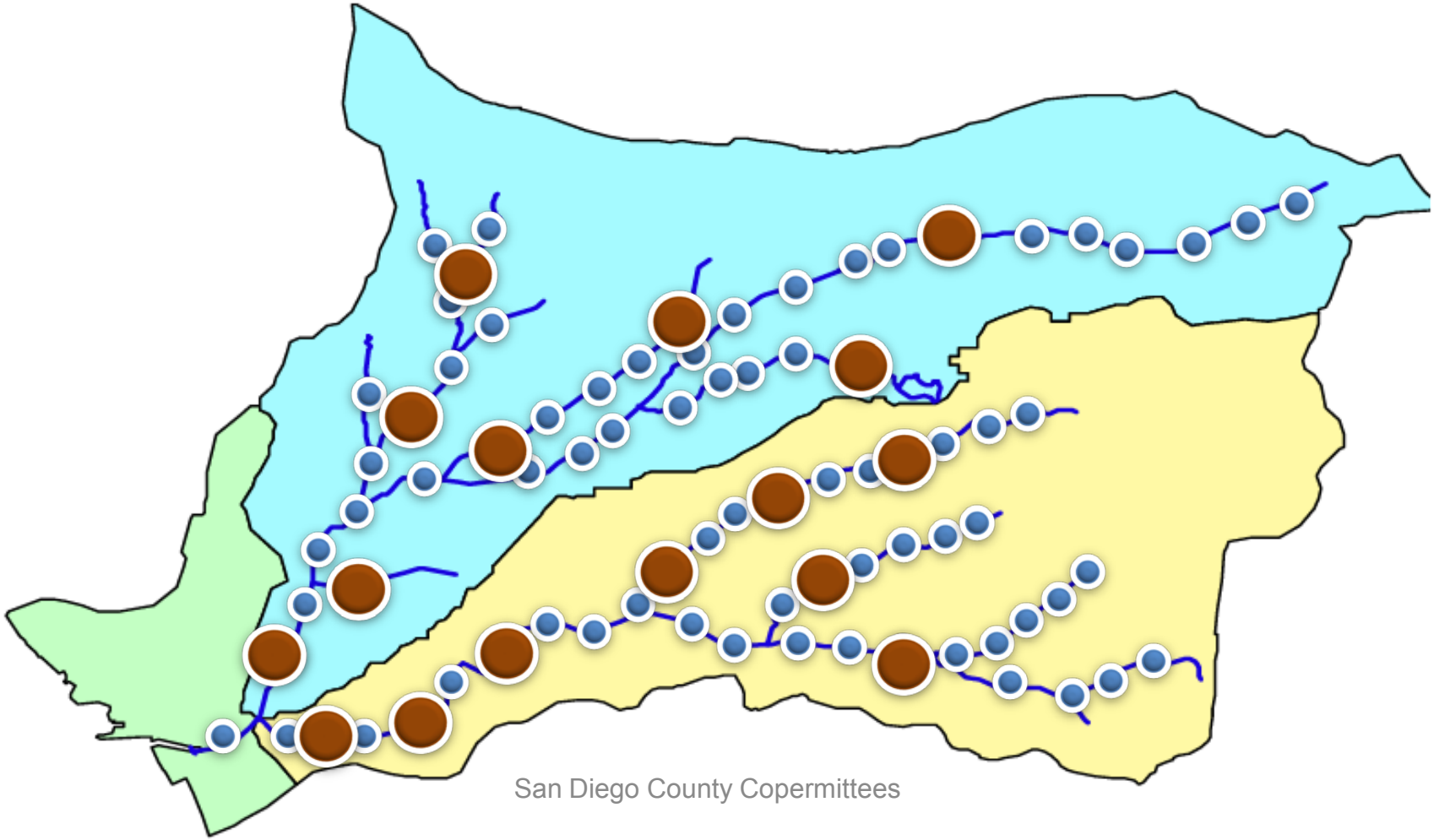

Project I Bacteria TMDL

005288

Comment 4: Permit does not acknowledge Project I Bacteria TMDL reopener

- During TMDL adoption hearing, Permittees raised technical issues and concerns related to attainability
- To address concerns, the Board itself added a reopener provision to the TMDL
- Permit does not allow for CLRP modifications

REQUEST: Insert language in *Modification of Programs* (Provision H) to reopen Permit to incorporate TMDL revisions and CLRP modifications

Hydromodification

Hydromodification Management Plan

Comment 5: Draft permit revises Board-adopted HMP prematurely and without technical basis

San Diego HMP:

- Technically robust
- Publicly vetted
- 5-yr effectiveness monitoring (in progress)

REQUEST: Reaffirm Resolution R9-2010-0066; reference the Resolution in the permit

HMP Applicability

Comment 6: The draft Permit expands the application of HMP to areas where there will be no benefit (at a large cost)

- HMP Goal: Protect streams from unnatural **erosion**
- No potential impact to:
  - Ocean
  - Depositional (non-erosive) streams
  - Concrete lined flood control channels

REQUEST: Maintain HMP exemptions as identified in the Board-adopted San Diego HMP

HMP Baseline

Comment 7: The draft Permit requires projects to reduce flow to "naturally occurring" rates rather than to pre-project rates

- Discourages redevelopment projects that benefit water quality
- Mandates mitigation beyond project's impacts

REQUEST: Replace "pre-development naturally occurring" with "pre-project"

Summary of Requests

Compliance

- Develop language to clearly link WQIPs to Permit compliance

TMDLs

- Add options for BMP- and load-based compliance with WLAs
- Insert language in *Modification of Programs* (Provision H) to reopen Permit to incorporate TMDL revisions and CLRP modifications

Summary of Requests

Hydromodification Management Plan

- Reaffirm Resolution R9-2010-0066; reference the Resolution in the permit
- Replace “pre-development naturally occurring” with “pre-project”

County of San Diego
City of Carlsbad
City of Chula Vista
City of Coronado
City of Del Mar
City of El Cajon
City of Encinitas
City of Escondido
City of Imperial Beach
City of Lemon Grove
City of National City
City of Oceanside
City of Poway
City of San Diego
City of San Marcos
City of Santee
City of Solana Beach
City of Vista
S.D. Unified Port District

November 13, 2012

Mr. Grant Destache
Chairman
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Re: Regional Municipal Storm Water Permit

Dear Chairman Destache:

As representatives of the jurisdictions in San Diego County that are regulated by the Regional Water Quality Control Board (Regional Board), we share deep concerns over proposed regulations in the new Regional Municipal Storm Water Permit. While we strongly believe in the mission of achieving clean water, the proposed regulations are without sound scientific merit and, if implemented, will have catastrophic negative impacts on the fiscal health of local governments and private industry.

Collectively, we are committed to the goal of improving water quality through the storm water management programs that have been developed in conjunction with the Regional Board. Current compliance efforts to reduce storm water pollution are significant and cost regional agencies more than $100 million annually. As stewards of public tax dollars and governments that are faced with having to do more with less, we are concerned that with each permit renewal cycle, the stringency and cost of the unfunded mandates continue to go beyond any practical standards of attainment and what is required by the Clean Water Act.

The Draft Regional Municipal Storm Water Permit released by the Regional Board continues to include the far-reaching Bacteria Total Maximum Daily Load (TMDL), and other additional impractical and unattainable requirements for development projects. It is estimated that the proposed Bacteria TMDL standards alone would cost between $2.2 billion and $4.2 billion for those jurisdictions that share responsibility in six of the watersheds included in the permit. The cost to private industry is unknown but it is clear that any additional costs will be passed on to already struggling and financially burdened families.

Taxpayers will be gravely impacted if this unilateral regulatory practice is allowed to move forward. Governing bodies will be forced to shift public funds away from existing programs, increase taxes or assessments, or face regulatory fines resulting from non-compliance. The Bacteria TMDL, along with the many other proposed regulations, should not be incorporated into the next Regional Municipal Storm Water Permit until we are certain that they are founded on verifiable scientific data, achievable standards, and until sufficient resources are available.

On behalf of our respective constituencies, we are requesting that the Regional Water Quality Control Board direct staff to work collaboratively with all the co-permitees and various stakeholders to draft language that makes practical sense from an environmental and economic standpoint.

Sincerely,

Chairman Ron Roberts
County of San Diego

Vice Chairman Greg Cox
County of San Diego

Mayor Matt Hall
City of Carlsbad

Mayor Cheryl Cox
City of Chula Vista

Mayor Casey Tanaka
City of Coronado

Mayor Carl Hilliard
City of Del Mar

Mayor Mark Lewis
City of El Cajon

Mayor Jerome Stocks
City of Encinitas

Mayor Sam Abed
City of Escondido

Mayor Jim Janney
City of Imperial Beach

Mayor Mary Teresa Sessom
City of Lemon Grove

Mayor Ron Morrison
City of National City

Mayor Jim Wood
City of Oceanside

Mayor Don Higginson
City of Poway

Mayor Jerry Sanders
City of San Diego

Mayor Jim Desmond
City of San Marcos

Mayor Randy Voepel
City of Santee

Mayor Joe Kellejian
City of Solana Beach

Mayor Judy Ritter
City of Vista

Admiral Lou Smith
Chairman
S.D. Unified Port District

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Richard Boon and Geoff Hunt, County of Orange
Nancy Palmer, City of Laguna Niguel
Scott Taylor, RBF

November 13, 2012

Regional Permit Workshop

COUNTY OF ORANGE CALIFORNIA

Overview

- Orange County Stormwater Program
  - Established Program
  - Applies In-Depth Experience and Expertise
  - Achieving Results
- Critical Policy Issues Need to be Considered
  - Compliance Needs to be Attainable
  - Prior Progress and Public Processes cannot be Ignored
    - Bacteria TMDL
    - Green Streets
    - Hydromodification
- Regional Permits and Permitting

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Orange County Stormwater Program Experience and Expertise

- 22 years of program implementation (MS4 permits since 1990)
- County and City staff bring 100's of years of collective water quality experience
- Nationally recognized consultant expertise has assisted in all areas of program development
- Highly acclaimed program elements:
  - Land Development – OC Engineering Council Engineering Project Achievement Award 2012
  - Public Education – CASQA Outstanding Outreach and Media Project

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Orange County Stormwater Program Achieving Results

- Water Quality Management Plans
  - Comprehensive Model WQMP, Technical Guidance, and HMP
    - Developed through a collaborative process
    - Developed by experts in LID & Hydromodification
  - Hundreds of WQMPs processed and structural BMPs installed over the current and past permits

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Orange County Stormwater Program Achieving Results

- Heal The Bay 2012 Beach Water Quality Report Card Highlights
  - Excellent - 94% A or B grades (89% were A).
  - Wet weather grades - 69% A or B grades (15% better than the five-year average)
  - 10 consecutive months (June 21, 2011 to April 6, 2012) OC did not have any beach closures
    - Unprecedented (longest w/o a closure)

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Orange County Stormwater Program Achieving Results

- Baby Beach in Orange County had a long history of chronically polluted beach water.
- CBI funds allowed the City of Dana Point to install a storm drain diversion.
- Since the diversion became operational in May 2007, Baby Beach has earned excellent water quality grades during the summer dry weather.

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Orange County Stormwater Program Achieving Results

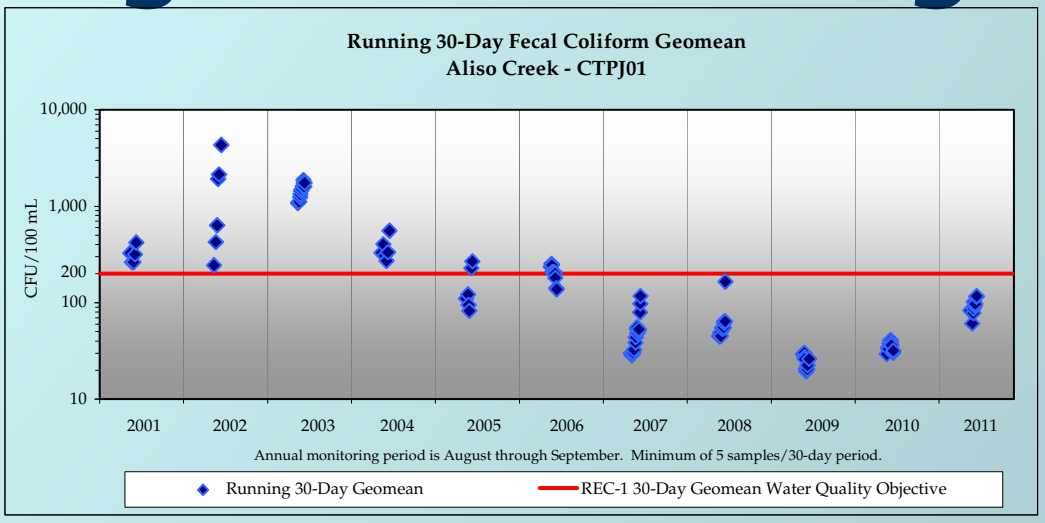

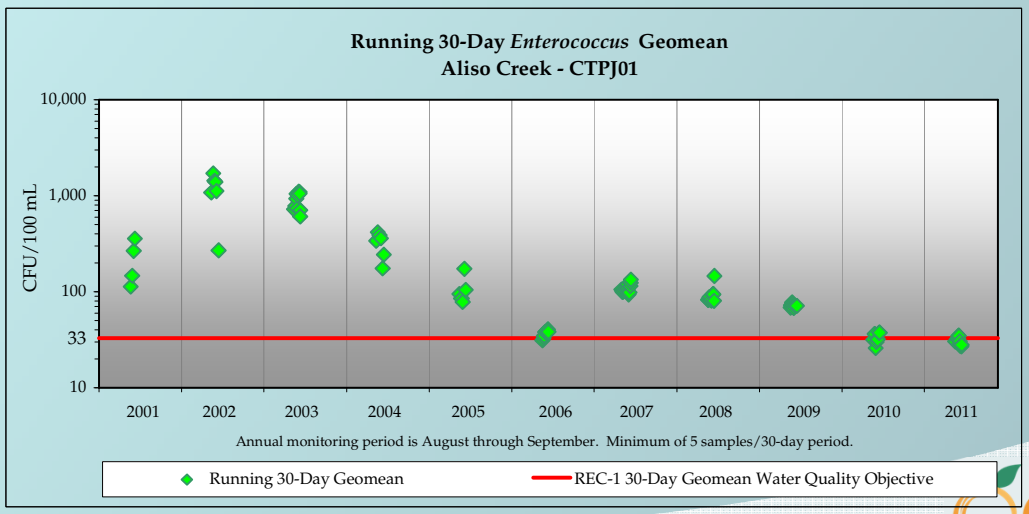

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Critical Policy Issues

- Compliance Needs to be Attainable
- Prior Progress and Public Processes Cannot Be Ignored
  - Bacteria TMDL
  - Green Streets
  - Hydromodification
- Regional Permits and Permitting

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Compliance Needs to be Attainable

- Issue: Receiving Water Limitations and Ninth Circuit Decision has created strict liability for discharges causing or contributing to a violation of a water quality standard irrespective of source or significance.

- Basis: “Runoff Retention” is preferred management strategy for addressing “imperviousness” and progress is tied to development cycle and retrofit opportunities – wet weather urban runoff management is a long term endeavor.

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Compliance Needs to be Attainable

- Receiving Water Limitations
  - Ninth Circuit Decision: NRDC vs. LACFCD
  - …offers no textual support for the proposition that compliance with certain provisions [i.e. the iterative process] shall forgive non-compliance with the discharge prohibitions…..

Footnotes: November 20 SWRCB Workshop
US Supreme Court

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Compliance Needs to be Attainable

- Recommendation:
- Direct staff to work with the Co-permittees to revise Sections A, D and E to base compliance on development and implementation of the WQIP.
- Direct staff to advocate for WQIP-based "compliance mechanism" at State Board workshop

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Bacteria TMDL Provisions

Nancy Palmer
City of Laguna Niguel
Bacteria TMDL Stakeholder Advisory Group

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A Long Road

- Language in Bacteria Total Maximum Daily Load documents and Basin Plan Amendments painstakingly developed over 10 years to achieve concurrence and support from Stakeholder Advisory Group, Staff, public, Permittees, Federal EPA and Board
- Total Maximum Daily Loads and Bacteria TMDL Implementation Provisions incorporated into Basin Plan via Board-approved Amendments

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Draft Permit TMDL Provisions Aren't Consistent with BPAs

- TMDL provisions must be consistent with the assumptions and requirements of Basin Plan Amendments (40 CFR 122.44(d)(1)(vii)(B))
- Basin Plan Amendments express Regional Board's intent for how TMDLs would be incorporated into the MS4 Permit
- Several critical points where the Draft Permit is **contrary** to the intent of Basin Plan Amendments approved by this Board

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Critical Points of Inconsistency

- TMDL-defined Waste Load Allocations not carried forward into Permit
- Intent for feasible WQBELs not respected
- Monitoring sampling requirements altered
- Key compliance demonstration methods omitted
- Re-opener provisions and purpose not acknowledged

<u>Net Result</u>: Non-compliance and Mandatory Minimum Penalties

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Bacteria Waste Load Allocations from TMDLs Not Incorporated

- Bacteria TMDLs allocated numeric daily, monthly, annual and seasonal bacteria *Waste Loads* to Permittees, reflecting flow volumes
- 40 CFR 122.44(d)(1)(vii)(B) requires Water Quality Based Effluent Limits (WBELs) in MS4 Permits to be consistent with any available TMDL Waste Load Allocations (WLAs)
- Draft Permit defines bacteria Water Quality Objective *concentrations*, instead of the available TMDL WLAs, as WQBELs

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BPAs' Intent for Feasible WQBELs Not Respected

- Text: "WQBELs may be expressed as numeric effluent limitations (NELs), when feasible, and/or as a best management practice program of expanded or better-tailored BMPs."
- Draft Permit fails to include either "better BMPs" or TMDL WLAs for expressing WQBELs
- Draft expresses WQBELs only as Water Quality concentration NELs, which State Board's Blue Ribbon Panel concluded were *not feasible;* i.e., not reasonably achievable, for MS4 Permits

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BPA Re-Opener Provision Not Acknowledged

- Board committed to a 5-year re-opener of TMDL
- Recognized there was no local reference data available, so non-local exceedance-frequencies were used in the TMDL, and need to be corrected through research
- Draft Permit sets non-local exceedance-frequencies as final compliance requirement
- Doesn't acknowledge re-opener's role in correcting the final compliance criteria

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Sampling Requirements and Starting Line Altered

- BPA provided for wet-weather sampling "within 24 hours of the end of a storm event"; and set 1996-2002 as baseline for assessing progress
- Draft Permit requires sampling "within the first 24 hours of the first storm event of the season"; and sets baseline as 2002-2010
- Translation: Sets up sampling during worst-case concentration conditions, and negates credit for progress already made toward interim 50% compliance

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Key Compliance Demonstration Methods Omitted

- BPA allows for final compliance by demonstrating implementation of Best Management Practices to “control all anthropogenic sources of indicator bacteria”
- Draft Permit does NOT allow for either BMP-based or load-based final compliance

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How It All Adds Up

- The Draft's WQBELs are not going to be achievable, and Permittees will be out of compliance and in violation of NELs
- Noncompliance with Numeric Effluent Limits in Permit = *Mandatory Minimum Penalties for violations* {Section 13385 Water code}
- Regional Board has *no discretion* when it comes to MMPs, even for minor violations {Section 13385 Water code}

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Corrections Needed

- Incorporate TMDL Waste Load Allocations as Water Quality Based Effluent Limits
- Correct the starting line and monitoring requirements
- Re-affirm the re-opener commitment to correct the finish-line criteria
- Allow for final compliance option through implementing BMPs

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Recommendation

- Direct your Staff to work with the Stakeholders to correct all the TMDL provisions that are inconsistent with Federal law, contrary to the intent of the Basin Plan Amendments, and will result in non-discretionary Mandatory Minimum Penalties

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"Green Streets" and Hydromodification

Scott Taylor
RBF

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Critical Policy Issues: LID and Hydromodification - Roads

Issue: USEPA guidance "Managing Wet Weather with Green Infrastructure: Green Streets" should be compliance for municipal roadway projects

Basis:

- **SD Regional Permit**
  - Inconsistent with existing other So Cal MS4 permits
  - Does not consider roadway constraints; inflexible
  - Potential to impede retrofit roadway projects
- **USEPA Guidance**
  - Used in all other So Cal MS4 permits - national standard
  - Considers roadway constraints; provides flexibility
  - Encourages retrofit of roadways to the MEP

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Retrofit of Existing Roadways

Example

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Retrofit of Existing Roadways

- Constraints
  - **Slope**
  - **Existing Drainage/Storm Drain**

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Retrofit of Existing Roadways

- Constraints
  - Slope
  - Existing Drainage/Storm Drain
  - **Limited Right-of-Way**
  - **Physical Constraints**

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Retrofit of Existing Roadways

- Constraints
  - Slope
  - Existing Drainage/Storm Drain
  - Limited Right-of-Way
  - Physical Constraints
  - **Utilities**
  - **Geotechnical**
  - **Structural Concerns**
  - **Street Trees**

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Retrofit of Existing Roadways

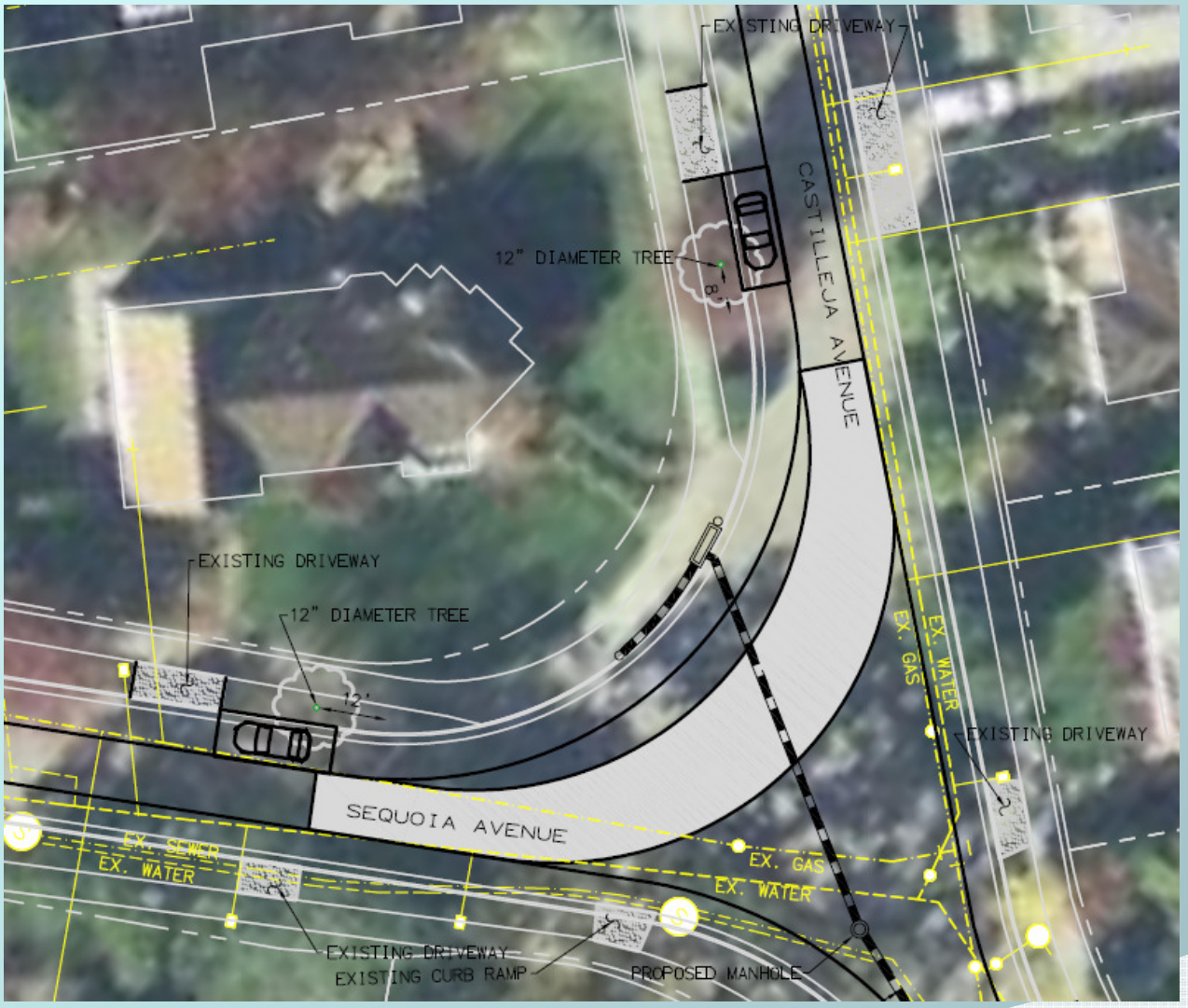

- Constraints
  - Slope
  - Existing Drainage/Storm Drain
  - Limited Right-of-Way
  - Physical Constraints
  - Utilities
  - Geotechnical
  - Structural Concerns
  - Street Trees
  - **Parking**
  - **Fire Truck Access**

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Retrofit of Existing Roadways

- Constraints
  - Slope
  - Existing Drainage/Storm Drain
  - Limited Right-of-Way
  - Physical Constraints
  - Utilities
  - Geotechnical
  - Structural Concerns
  - Street Trees
  - Parking
  - Fire Truck Access
- Proposed BMPs
  - **Biofiltration Planters**
  - **Pervious Pavers**

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New Roadways

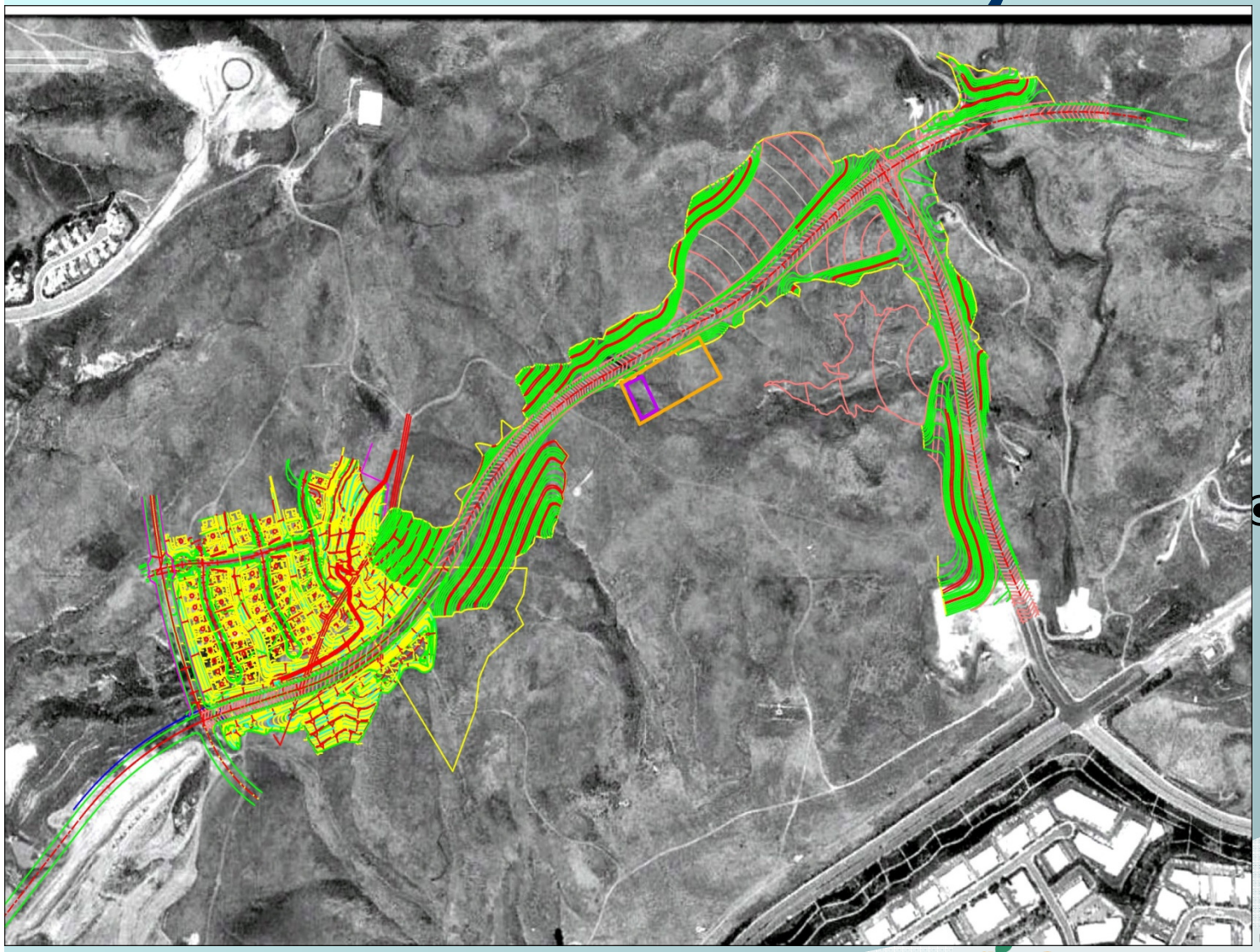

- Constraints
  - Utilities
  - Geotechnical
    - Soils
    - Cut & Fill
  - Slope
  - Physical Constraints
  - Parking
  - Pedestrian Access
  - Bicycle Access
- Additional Footprint
  - Hydromod Basin (orange)
    - 3 acres
  - Biofiltration (purple)
    - 0.5 acres
  - Roadway
    - 12.4 acres

Critical Policy Issues: LID and Hydromodification - Roads

Recommendation: Direct staff to include the USEPA guidance "Managing Wet Weather with Green Infrastructure: Green Streets" as the compliance standard for municipal roadways

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Critical Policy Issues: Hydromodification

- **Issue:** The permit uses a one size fits all approach to applicability of hydromodification management which is not appropriate as the criteria should not apply to engineered channels

- **Basis:**
  - No environmental benefit as the engineered channels are designed to accept increased flows
  - Engineered channels serve a flood control purpose (Legislative Mandate)
  - No opportunity for restoration for engineered channels when there is adjacent development

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Example 1: Prima Descheca

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N

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Miles

Sources: ESRI; OCPW; OC Parks; Microsoft Satellite Imagery; SDRWQCB

Prima Deshecha Watershed - Comparison 1947/2012
San Diego Regional Water Quality Control Board

South OC Hydromodification Workshop

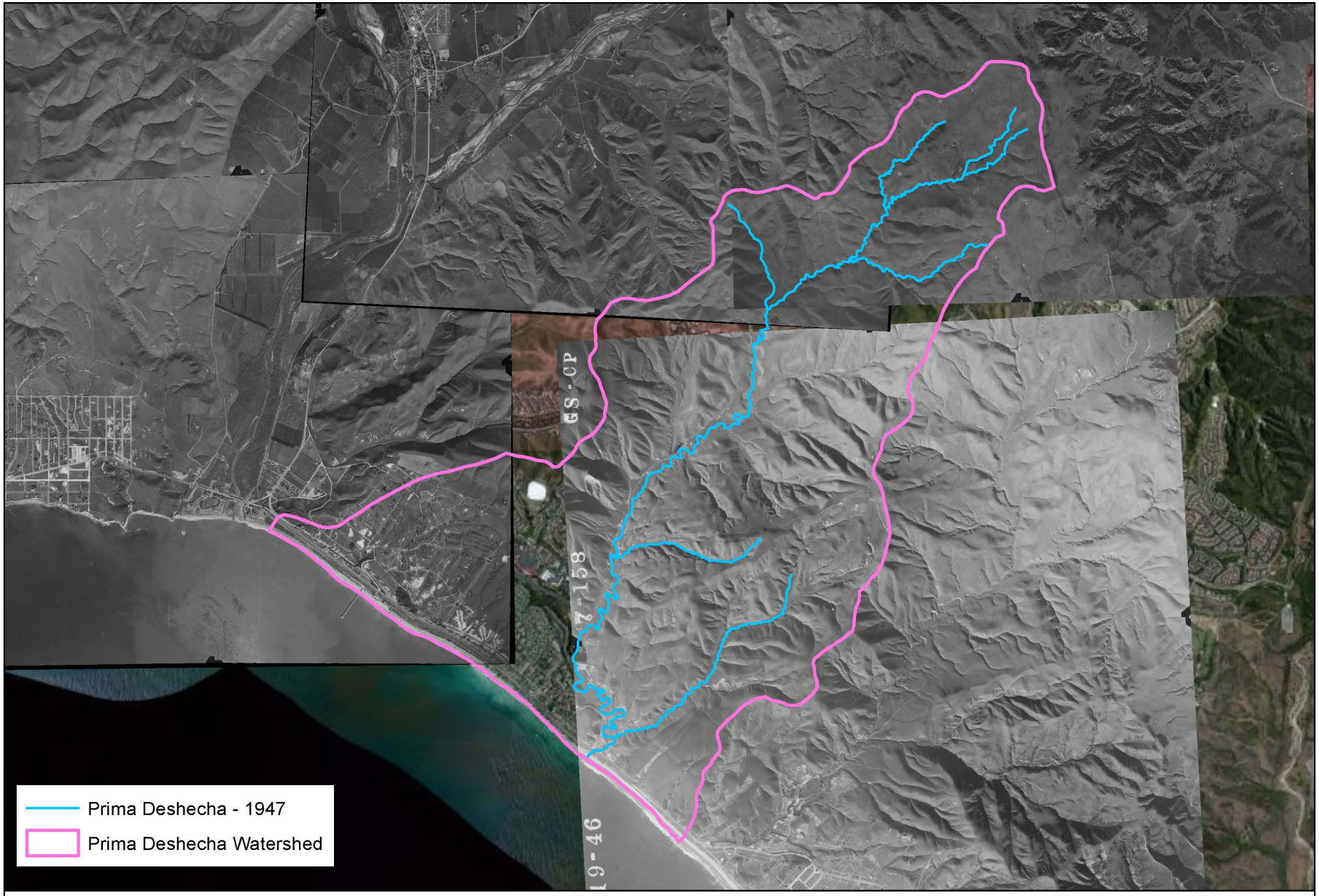

RBF CONSULTING GIS

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Sources: ESRI; OCPW; OC Parks; Microsoft Satellite Imagery; SDRWQCB

Prima Deshecha - Aerial - 1947
San Diego Regional Water Quality Control Board

South OC Hydromodification Workshop

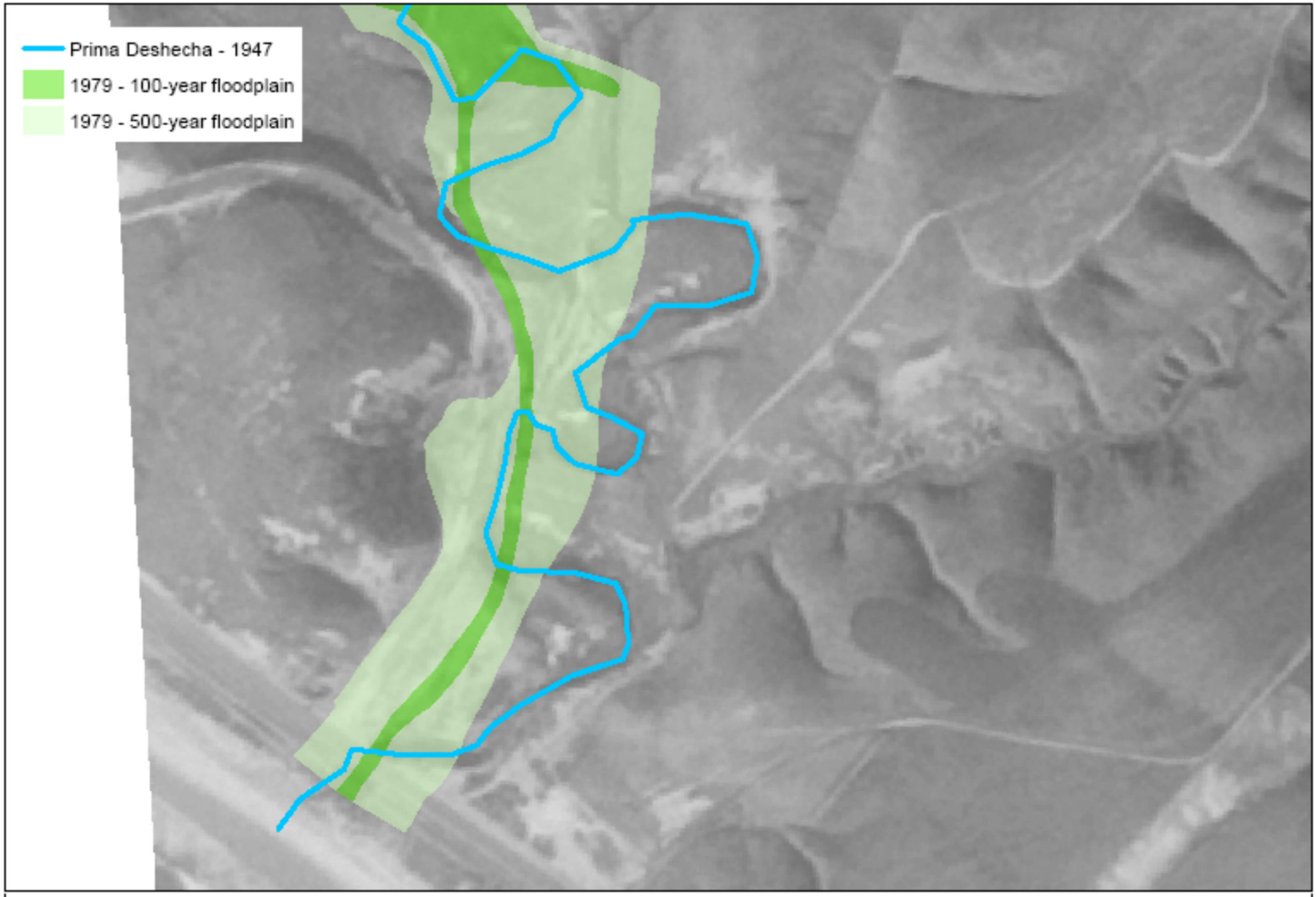

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Sources: ESRI; OCPW; OC Parks; Microsoft Satellite Imagery; SDRWQCB

Prima Deshecha Watershed - 1947 Alignment
San Diego Regional Water Quality Control Board

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Sources: ESRI; OCPW; OC Parks; Microsoft Satellite Imagery; SDRWQCB

Prima Deshecha Watershed - 1947 vs. 2012 Alignment
San Diego Regional Water Quality Control Board

Regional Permit Discussion - Hydromodification in South Orange County

Example 2: Segunda Descheca

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Sources: ESRI; OCPW; OC Parks; Microsoft Satellite Imagery; SDRWQCB

Segunda Deshecha Watershed - Comparison 1947 vs. 2012
San Diego Regional Water Quality Control Board

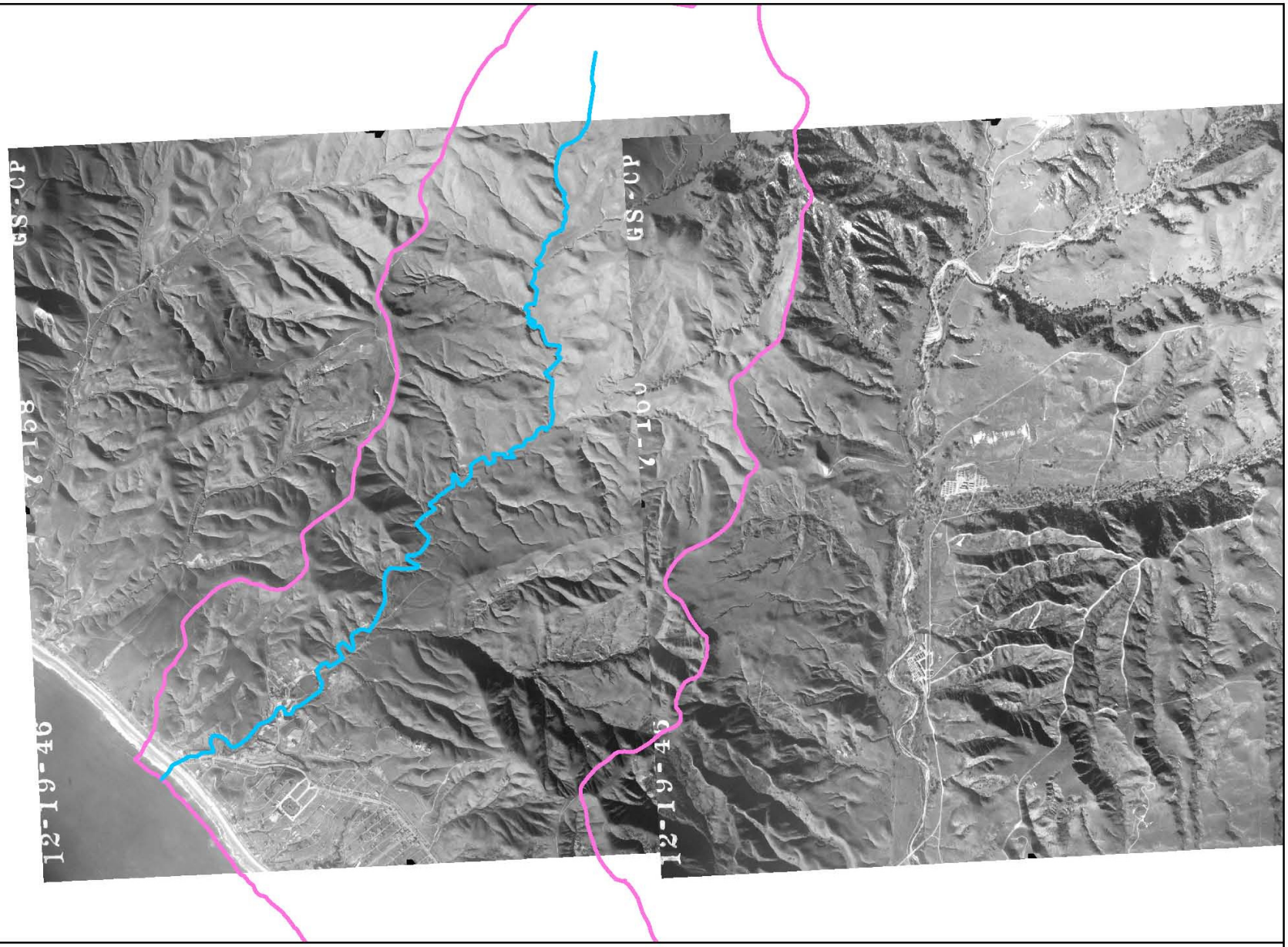

RBF CONSULTING GIS

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Sources: ESRI; OCPW; OC Parks; Microsoft Satellite Imagery; SDRWQCB

Segunda Deschecha Watershed - Aerial - 1946
San Diego Regional Water Quality Control Board

South OC Hydromodification Workshop

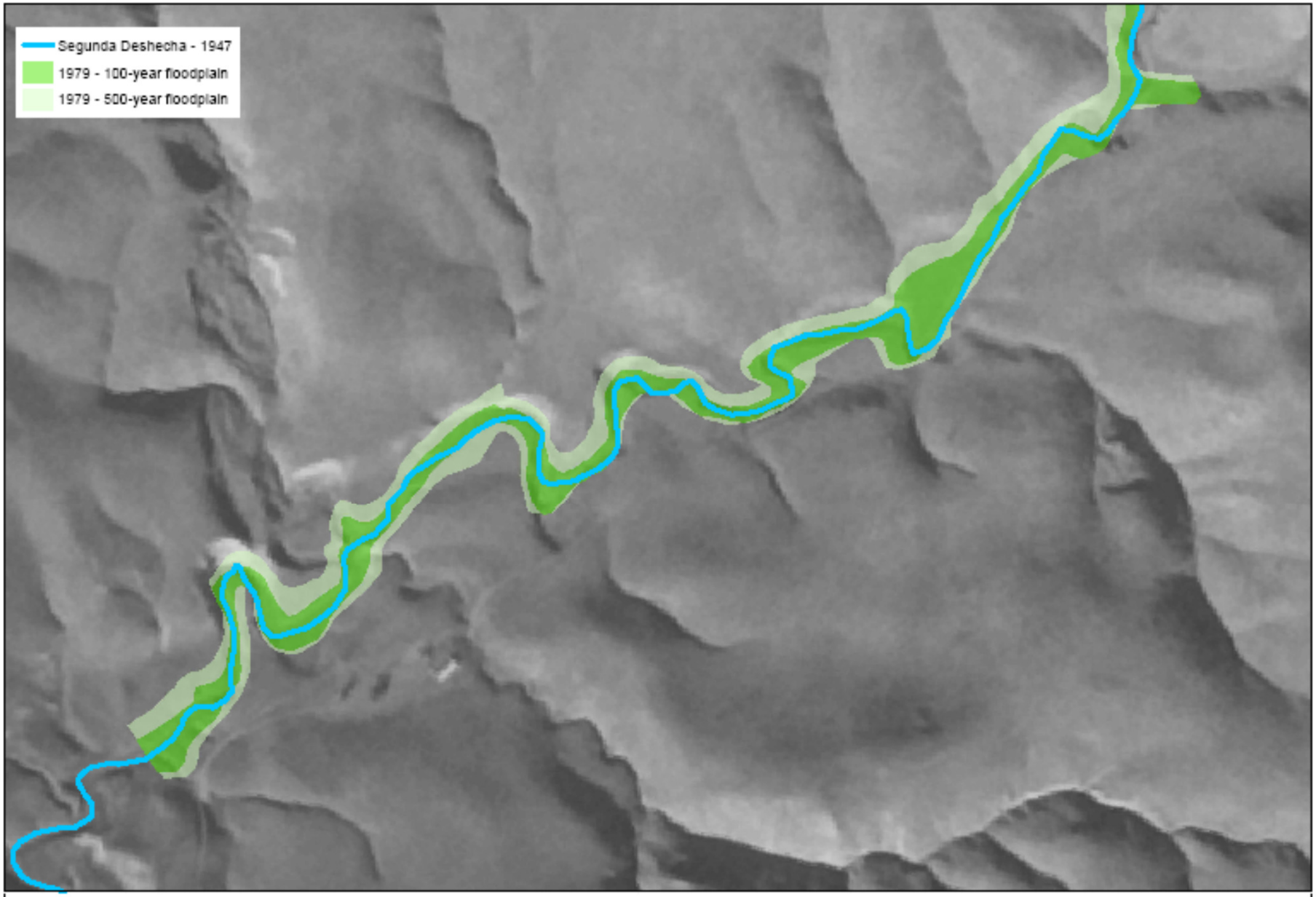

RBF GIS

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Sources: ESRI; OCPW; OC Parks; FEMA ; USGS ; Microsoft Satellite Imagery; SDRWQCB

Segunda Deshecha Watershed - 1947 Alignment
San Diego Regional Water Quality Control Board

N

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Miles

Sources: ESRI; OCPW; OC Parks; USGS ; FEMA ; Microsoft Satellite Imagery; SDRWQCB

Segunda Deshecha Watershed - 1947 vs. 2012 Alignment
San Diego Regional Water Quality Control Board

Hydromodification Management & LID Costs

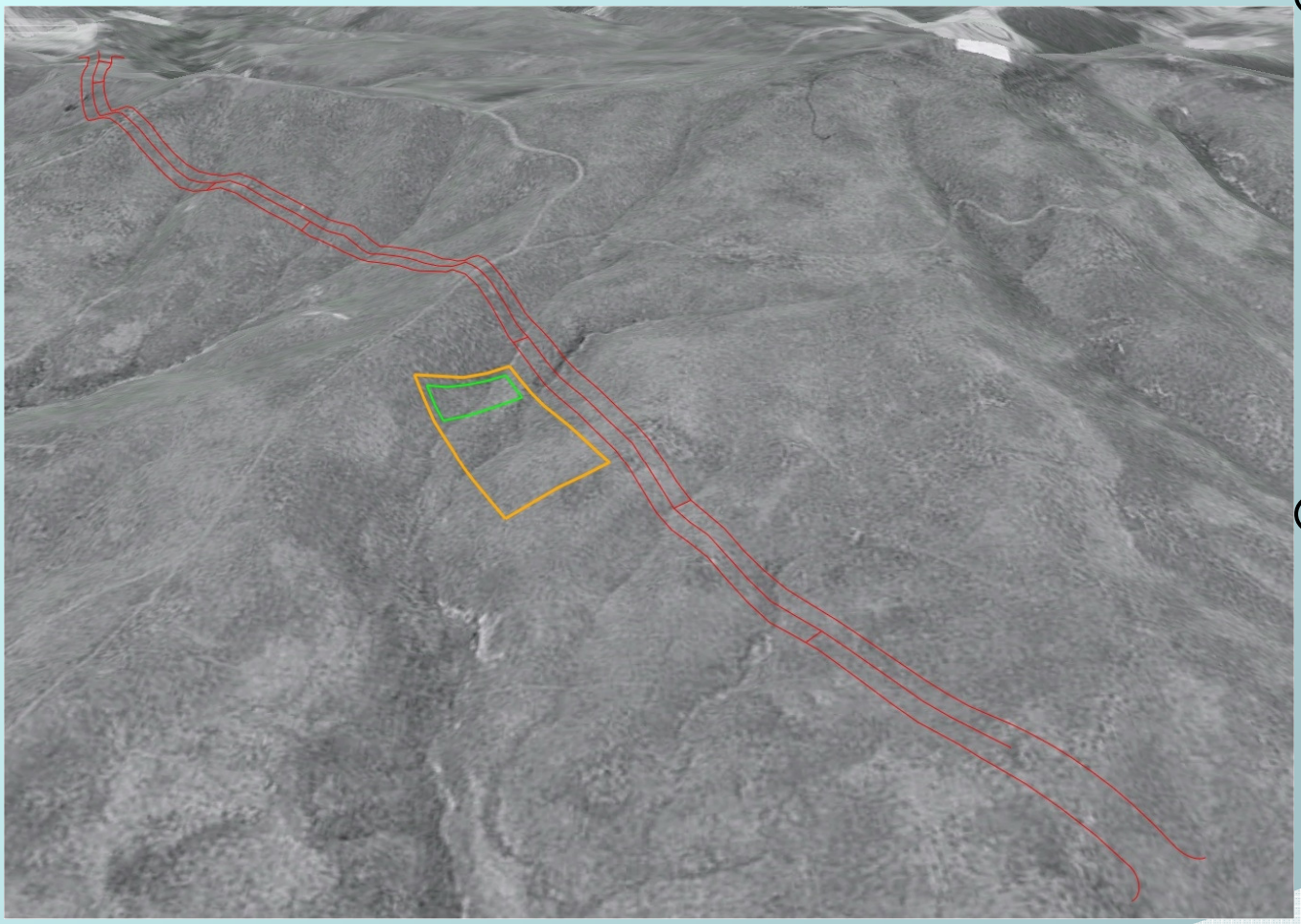

- Hydromod Basin (orange)
  - Volume: 11.5 ac-ft
  - Size: 3 acres
  - $2.8 Million
- Biofiltration (green)
  - Volume: 0.9 ac-ft
  - Size: .5 acres
  - $540,000

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Critical Policy Issues: Hydromodification

Recommendation: Direct staff to include a special condition that engineered channels are not subject to the hydromodification criteria

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Critical Policy Issues: Regional Permit Not Consistent with CWA

- Regional Permitting Approach Requires Adjacency:
  - an interconnected MS4,
  - common jurisdiction, or
  - common watershed

- San Juan Hydrologic Unit in South OC drains to the Pacific Ocean

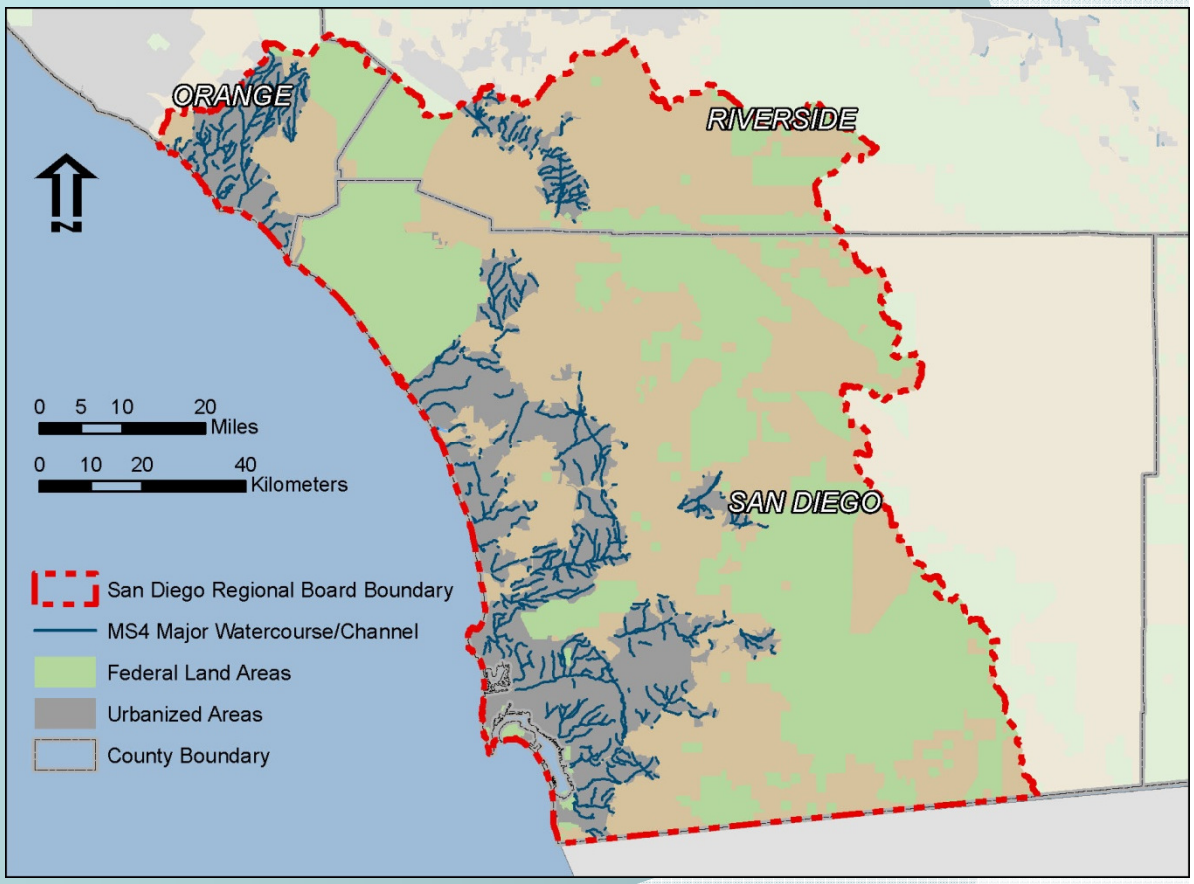

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Summary

- Critical Policy Issues Need to be Addressed:
  - Compliance Needs to Be Attainable
  - Prior Progress and Public Processes Cannot Be Ignored
    - LID and Hydromodification – Roads
    - Hydromodification
    - Bacteria TMDL
- Recommendation: Direct staff to continue the dialogue

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Our Community. Our Commitment.

Tackling Southern California's #1 Pollution Problem

Jill Witkowski
San Diego Coastkeeper

Colin Kelly
Orange County Coastkeeper
Inland Empire Waterkeeper

POP QUIZ:

How much does it have to rain to trigger an advisory?

0.2 inches

How long does the advisory last?

72 hours

SAN DIEGO COASTKEEPER

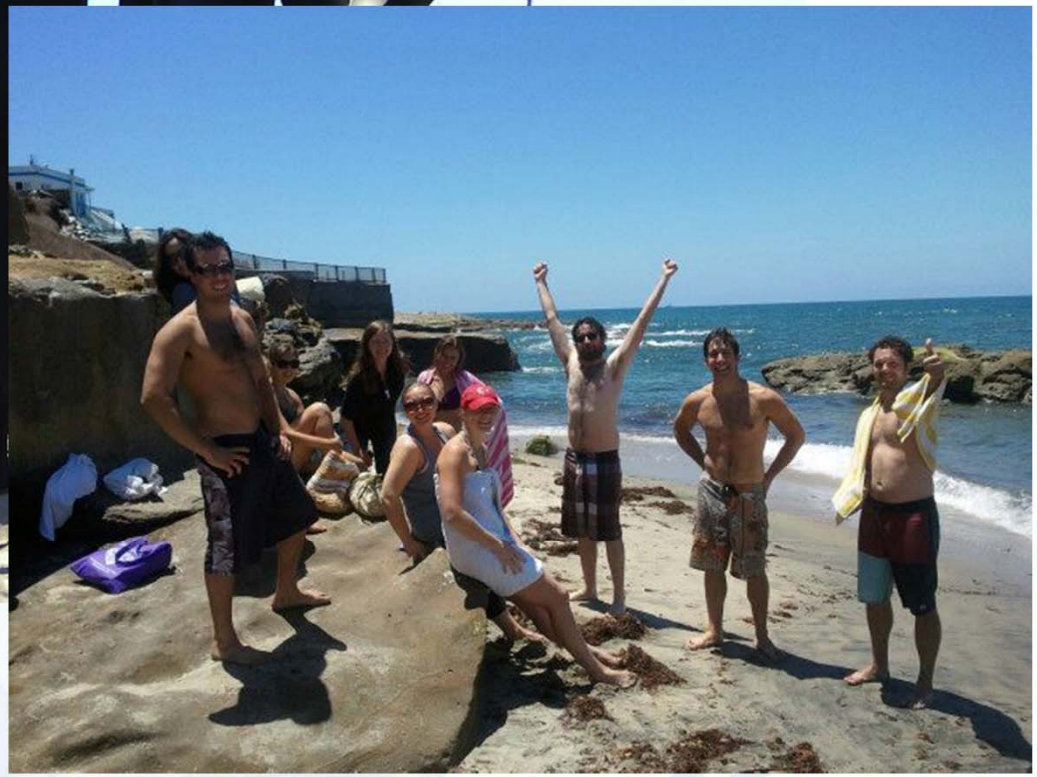

SAN DIEGO COASTKEEPER

SAN DIEGO COASTKEEPER

GOALS:

- Safeguard water quality improvements and protections
- See measureable water quality improvements
- Protect and encourage public participation

Hydromodification: Alternative Compliance in-lieu fee option

Bacteria TMDL

REQUIRED BY LAW

Adaptive Management

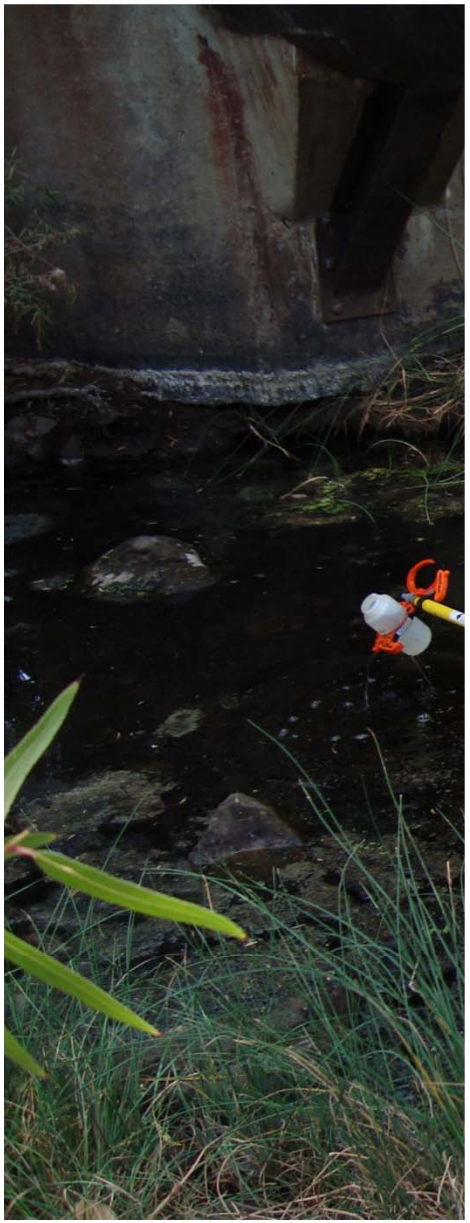

Monitoring Locations of San Diego Coastkeeper

ORANGE COUNTY COASTKEEPER®

INLAND EMPIRE WATERKEEPER®

SAN DIEGO COASTKEEPER®

SURFRIDER FOUNDATION
SAN DIEGO COUNTY CHAPTER

COASTAL ENVIRONMENTAL RIGHTS FOUNDATION

ENVIRONMENTAL HEALTH COALITION
EMPOWERING PEOPLE. ORGANIZING COMMUNITIES. ACHIEVING JUSTICE.

Friends of Rose Canyon

SURFRIDER FOUNDATION
SOUTH ORANGE COUNTY CHAPTER

Laguna Bluebelt Coalition

HOBO ALISO
NEIGHBORHOOD ASSOCIATION

Preserve Wild Santee

ORANGE COUNTY
COASTKEEPER
Inland Empire WATERKEEPER

Tens of Millions of Beachgoers Per Year

NRDC
The Earth's Best Defense

Ocean Economy

- "California has the largest Ocean Economy in the United States, ranking number one overall for both employment and gross state product . . . ."

- Beach goers in California spend as much as $9.5 billion annually and the non-market values associated with beach going in California may be as high as $5.8 billion annually.

NRDC
The Earth's Best Defense

Beach Closures

- San Diego County reported nearly 300 closing or advisory days in 2011 from all sources, and Orange County more than 750. Stormwater is the largest cause.
- An increase in water quality in Long Beach (a C grade), to the healthier standards of Huntington City Beach (a B grade) would create $8.8 million in economic benefits over a 10-year period.

NRDC
The Earth's Best Defense

Public Health Costs

- Depending on the cost model used, for Orange County alone, excess cases of gastrointestinal illness from swimming in bacteria contaminated beachwater cost:
  - between $6 million and $16 million per year, or;
  - when willingness to pay *not* to get sick is included, between $56 million and $136 million per year.

NRDC
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The Clean Water Act

NRDC
The Earth's Best Defense

Beneficial Uses and Water Quality Standards

State must adopt water quality standards – include maximum permissible pollutant levels sufficiently stringent to protect public health and enhance water quality consistent with designated uses.

33 U.S.C. §§ 1311(b)(1)(C), 1313

Water quality standards provide a basis for regulating discharges "to prevent water quality from falling below acceptable levels."

PUD No. 1 of Jefferson County v. Washington Dep't of Ecology (1994) 511 U.S. 700, 704

NRDC
The Earth's Best Defense

Receiving Water Limitations

2001 San Diego MS4 Permit:

discharges from the MS4 that cause or contribute to the violation of Water Quality Standards or water quality objectives are prohibited.

(LA Times)

Receiving Water Limitations

The Regional Board "included Parts 2.1 and 2.2 in the Permit without a 'safe harbor.'" These are independently enforceable requirements that prohibit discharges that cause or contribute to a violation of Water Quality Standards.

L.A. County Mun. Storm Water Permit Litigation, No. BS 080548 at 7 (L.A. Super. Ct. March 24, 2005)

9th Circuit Court of Appeals

"no such 'safe harbor' is present in this Permit . . . . [there is] no textual support for the proposition that compliance with certain provisions shall forgive non-compliance with the discharge prohibitions."

Natural Resources Defense Council v. County of Los Angeles (2011) 673 F.3d 880, 897

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The Clean Water Act

Anti-Backsliding:

"when a permit is renewed or reissued, interim effluent limitations, standards, or conditions must be at least as stringent as the final effluent limitations, standards, or conditions in the previous permit."

40 C.F.R. 122.44(l)(1)

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

AUG 0 8 2012

Mr. Jay Sakai, Director
Water Management Administration
Maryland Department of the Environment
1800 Washington Boulevard
Baltimore, Maryland 21230

"Backsliding is prohibited in NPDES permits. . . . Allowing additional time to complete a task that was required by the previous permit constitutes a less stringent condition and violates the prohibition against anti-backsliding."

referenced permit pursuant to 40 C.F.R. §§ 123.44(b)(1) and (c)(1) and Section III.A of the MOA. As further explained herein, EPA believes that several substantive requirements for MS4 permits, as required by the federal Clean Water Act, 33 U.S.C. §§ 1251 *et seq.* (CWA), and its implementing regulations, have not been incorporated into the Prince George's County permit.

EPA's objection to the draft permit and identification of revisions needed before EPA can remove the objection, *see* 40 C.F.R. § 123.44(b)(2)(ii), are described below:

1. **Water Quality Standards**

Federal regulations require that all NPDES permits contain limitations to control discharges which may cause, have the reasonable potential to cause or contribute to an excursion above water quality standards. 40 C.F.R. §122.44(d)(1)(i). Part VI of the draft Prince George's County permit (Enforcement and Penalties) contains general language

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Antidegradation Policy

Protects existing uses and water quality necessary to support existing uses, or, for “high quality” waters, protects water quality better than necessary for “fishable/swimmable” uses.

Water quality may only be lowered in certain limited circumstances. In no case may water quality be lowered to a level which would interfere with existing or designated uses.

See, State Bd. Resolution 68-16,
40 CFR § 131.12

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Impaired Waters and TMDLs

Ballona Creek, Los Angeles

(California Coastal Commission)

TMDLs are the means for bringing impaired waterways back into compliance for pollutants such as bacteria, metals, trash, etc.

Clean Water Act NPDES permits must be consistent with the waste load allocation ("WLA") in each TMDL.

(40 C.F.R. § 122.44(d)(1)(vii)(B)

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Legal Context

MS4 Permits:

shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants.

33 U.S.C. § 1342(p)(3)(B)(iii)

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Low Impact Development

Environmental Services, City of Portland, Oregon/Kevin Robert Perry

NRDC
The Earth's Best Defense

Impervious vs. Pervious Surfaces and Groundwater Recharge

City of Lincoln, NE, Watershed Management Division

NRDC
The Earth's Best Defense

Infiltration & Capture BMPs

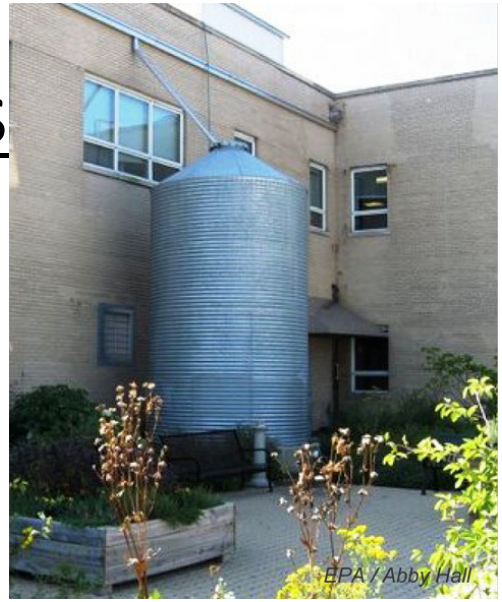

City of Los Angeles/Haan-Fawn Chau

LID is Cost Effective

National Association of Home Builders:

ter Costs through pment (LID)

Ever wish you could simultaneously lower your site infrastructure costs, protect the environment, and increase your project's marketability? Using Low Impact Development (LID) techniques you can.

focused c
Environm
practices
protectin

the vast majority of cases, the U.S.
that implementing well-chosen LID
ers, and communities while

techniques that conserve natural systems and hydrologic functions on a site.

LID has a variety of benefits to Builders, Municipalities, and the Environment such as:

- The reduction of land clearing and grading costs;
- Balancing the need for growth and environmental protection;
- The protection of local land and water resources.

LID utilizes a system of source controls and small-scale, decentralized treatment practices to help maintain a hydrologically functional landscape. The conservation of open space, the reduction of impervious surfaces, and the use of small-scale storm water controls, such as bioretention, are just a few of the LID practices that can help maintain predevelopment hydrological conditions.

Featured case study

Somerset is an 80-acre development in suburban Maryland consisting of 199 homes on 10,000 square foot lots. During Somerset's creation, the developer used LID practices to reduce its storm water management costs. By using LID, the developer:

- Eliminated the need for storm water ponds by using bioretention techniques saving approximately $300,000;
- Gained 6 additional lots and their associated revenues;
- Reduced finished lot cost by approximately $4,000.

For more information, download copies of the Builder's Guide to Low Impact Development and Municipal Guide to Low Impact Development brochures.

NAHB Research Center
400 Prince Georges Blvd.
Upper Marlboro, MD 20774
301.249.4000 / 800.638.8556
www.nahbrc.org

Feasibility of Retention

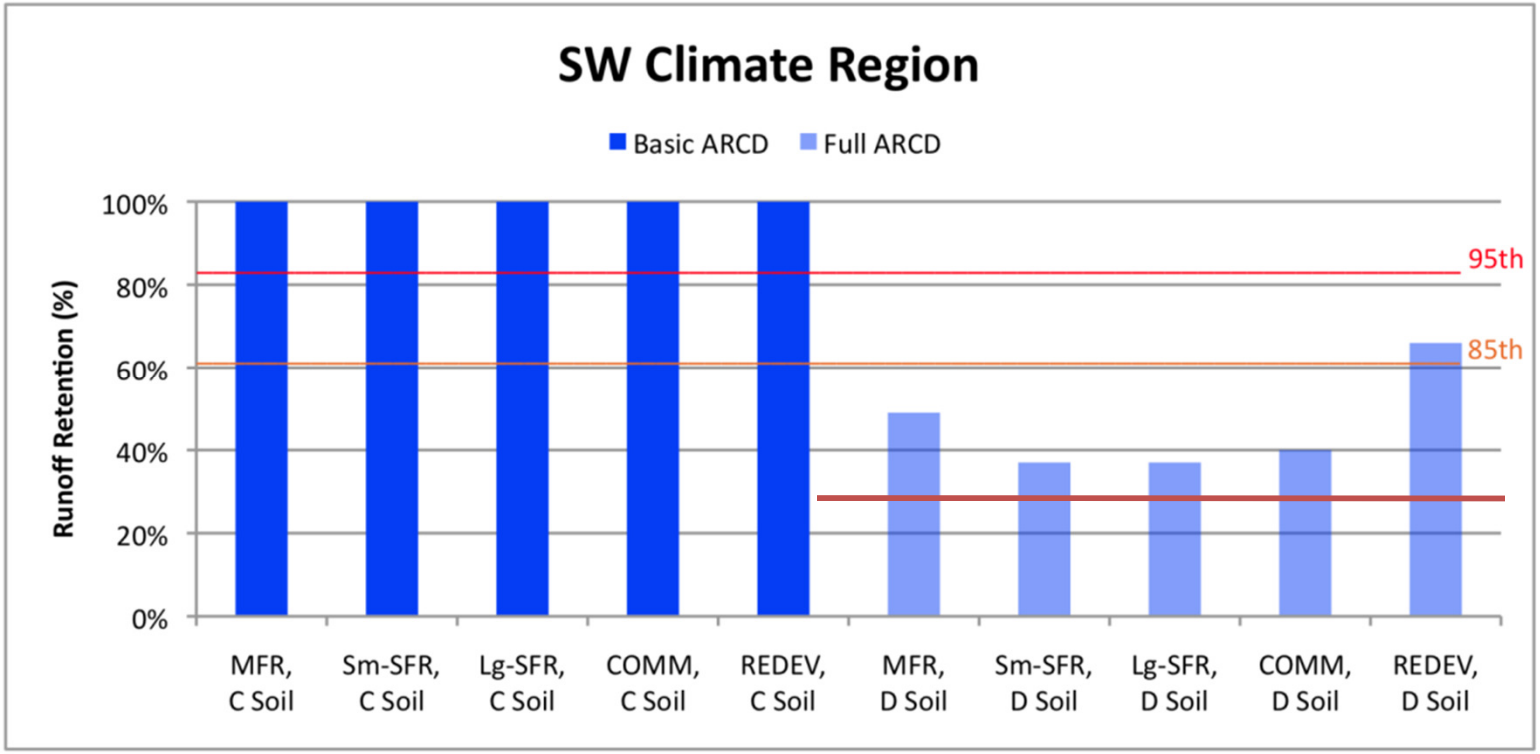

Public Participation & Board Oversight

"Stormwater management programs that are designed by regulated parties must, in every instance, be subject to meaningful review by an appropriate regulating entity. . . ."

Environmental Defense Center v. U.S. EPA (9th Cir. 2003) 344 F.3d 832, 854-56

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Audio Recordings
November 13, 2012 Board Workshop
Item No. 10

Item 10(a).WMA
Item 10(b).WMA
Item 10(c).WMA
Item 10(d).WMA
Item 10(e).WMA
Item 10(f).WMA
Item 10(g).WMA

From: lyris@swrcb18.waterboards.ca.gov
To: Chiu, Wayne@Waterboards
Subject: Tentative Order No. R9-2013-0001 December 12, 2012 Public Workshop Continuation
Date: Tuesday, November 27, 2012 12:27:12 PM
Attachments: Workshop_Continuation_Notice_final.pdf
Workshop_Board_Members_Questions_11252012.pdf

Greetings,

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) will continue an informational public workshop on December 12, 2012 at its regularly scheduled public meeting to receive information and discuss proposed requirements in the public draft of a Regional NPDES Permit for Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region (Regional MS4 Permit) (Tentative Order No. R9-2013-0001). A public workshop was held on November 13, 2012, regarding the Tentative Order; however, the workshop was continued because more time is warranted to discuss certain proposed requirements of the Tentative Order.

The December Workshop Notice and the list of questions presented by the Board members at the November Workshop are attached. All other materials related to the Tentative Order are on the San Diego Water Boards website at:

http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

Should you have any questions, please contact a member of the Team.

Laurie Walsh, PE
San Diego Water Board
Lwalsh@waterboards.ca.gov
858-467-2970

Wayne Chiu, wchiu@waterboards.ca.gov
Christina Arias, carias@waterboards.ca.gov
Eric Becker, ebecker@waterboards.ca.gov
David Barker, dbarker@waterboards.ca.gov

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California Water Boards

Edmund G. Brown Jr. Governor

Matthew Rodriguez Secretary for Environmental Protection

California Regional Water Quality Control Board, San Diego Region

NOTICE OF WORKSHOP CONTINUATION

The public workshop held on November 13, 2012 will be continued to discuss

Tentative Order No. R9-2013-0001, NPDES No. CAS0109266
Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region

Wednesday, December 12, 2012
9:00 a.m.
California Regional Water Quality Control Board, San Diego Region
Regional Water Board Room
San Diego Water Board Office Building
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

SUBJECT OF WORKSHOP

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) will continue an informational public workshop on December 12, 2012 at its regularly scheduled public meeting to receive information and discuss proposed requirements in the public draft of a Regional NPDES Permit for Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region (Regional MS4 Permit) (Tentative Order No. R9-2013-0001). A public workshop was held on November 13, 2012, regarding the Tentative Order; however, the workshop was continued because more time is warranted to discuss certain proposed requirements of the Tentative Order. The San Diego Water Board posted the Tentative Order on October 31, 2012 at the following website:

http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

BACKGROUND

The San Diego Water Board is considering the adoption of a Regional MS4 Permit that will be issued to municipal Copermittees in San Diego County, Southern Orange County and Southwest Riverside County. Currently, each of these counties within the San Diego Region has its own MS4 Storm Water Permit. In order to better achieve regulatory consistency as well as maximum efficiency and economy of resources, the San Diego Water Board has drafted a single MS4 Permit based on the boundaries of the San Diego Region instead of county political boundaries. Under this approach, the Regional MS4 Permit will uniformly regulate all three counties within the San Diego Region once it becomes effective for all Copermittees. The Regional MS4 Permit will also provide opportunities for a comprehensive monitoring framework, incentive for a regional collaborative approach, and opportunities for regional cost efficiencies among Copermittees. Upon adoption by the San Diego Water Board, this Regional MS4 Permit will be issued to all 39 Copermittees in a phased manner according to the expiration dates

of their current MS4 Storm Water Permits and after consideration of Reports of Waste Discharge filed by the Orange County and Riverside County Copermittees.

PROCEDURAL MATTERS

The San Diego Water Board held a public workshop on November 13, 2012 in which Water Board staff explained the permit development process and summarized significant elements of the Regional MS4 Permit for the San Diego Water Board Members and the public. Many Copermittees and other interested stakeholders voiced comments and concerns regarding the Tentative Order. At the conclusion of the item, San Diego Water Board members asked staff to prepare responses to specific questions (see attachment). The specific questions pertain to items of concern voiced at the public workshop and generally fall into one of three areas: hydromodification management, total maximum daily loads (TMDLs), and costs associated with storm water programs.

On December 12, 2012, the San Diego Water Board will continue the public workshop for this item. Water Board staff will provide oral responses to the questions posed by the San Diego Water Board members. Copermittees and members of the public are also invited to provide comments on the subject matter as permitted by the Chair. The San Diego Water Board may provide general feedback to staff on development of the Tentative Order; however, no action or voting will take place at this workshop.

INFORMATION REGARDING WORKSHOP

If you have any questions regarding the workshop, please contact Wayne Chiu at (858) 637-5558 or via e-mail at wchiu@waterboards.ca.gov or Laurie Walsh at (858) 467-2970 or via e-mail at lwalsh@waterboards.ca.gov.

Questions from San Diego Water Board Members
November 13, 2012 Public Workshop
on
Tentative Order No. R9-2013-0001
Regional Municipal Separate Storm Sewer Systems (MS4) Permit

Hydromodification

1. When accounting for the impacts caused by hydromodification at a development or redevelopment site, how far back should the analysis go, preproject or predevelopment? {*Grant Destache*}

2. How can the San Diego County Hydromodification Plan (HMP) be implemented into the MS4 Permit in a more succinct manner? How can we implement the rules and regulations in the San Diego County HMP, because we really have not had it in place for very long before we, "throw it down the drain?" {*Grant Destache*}

3. How do you document predevelopment or naturally occurring on a map? How is "naturally occurring" defined? How far back do you go to document predevelopment? 100 years? 500 years? Before the Indians were picking up acorns? {*Gary Strawn*}

4. Why was the concrete/hardened channel exemptions removed? {*Eric Anderson*}

5. Copermittees commented that road projects have unique space limitations and may not be able to meet retention & HMP requirements. Should road projects be treated differently and could requirements in the new CALTRANS Storm Water Permit be used to provide more options? {*Grant Destache*}

6. If a project is unable to comply with the HMP requirements at the site, how far away from the site can the project proponent place their retention basins? What other limitations exist when not placing a BMP on site? There is a concern that low income areas will become targets for placement of the retention basins. {*Tomas Morales*}

Cost

1. What is the cost of not implementing the provisions in the Tentative Order? (e.g. beach closures, ill health that taxpayers have to pay for through their private health plans or public costs, deaths ....) {*Henry Abarbanel*}

2. Lots of big cost numbers were used during the meeting. (e.g. $2 to $4 billion over 20 years) How much do the Copermittees spend now? What is being spent now and on what? {*Henry Abarbanel*}

3. What is the breakdown of costs? What is the timeframe of these costs? How much is already being spent? {*Tomas Morales*}

Total Maximum Daily Load (TMDL)

1. Can the Copermittees meet the bacteria levels that are specified in the Total Maximum Daily Loads (TMDLs)? What sorts of technologies are available to the Copermittees to treat bacteria to the levels specified in the TMDLs? {*Grant Destache*}

2. Can the Copermittees achieve adequate waste load reductions in MS4 discharges to meet the effluent limitations and compliance dates for bacteria in the Tentative Order? {*Grant Destache*}

3. What are the benefits of BMP based compliance with the TMDLs for bacteria compared to compliance with Water Quality Based Effluent Limitations (WQBELs)? {*Grant Destache*}

4. Address the issues that Ruth Kolb, City of San Diego raised regarding the Bacteria TMDLs. Clarify how we incorporated the Bacteria TMDLs into the Tentative Order to demonstrate that we incorporated it into the Tentative Order the way it was intended to be implemented. {*Eric Anderson*}

5. Throughout the presentations, it was said that it is infeasible to cleanup bacteria. Provide an explanation as to why, it is not the case, that cleanup of bacteria is infeasible. IN OTHER WORDS… Explain why it is in fact feasible to cleanup bacteria. Is it feasible to cleanup bacteria to the levels in the TMDLs? {*Tomas Morales*}

Other

1. Clarify if the Tentative Order is a one size fits all approach. Is the Water Quality Improvement Plan a one size fits all approach? {*Grant Destache*}

2. Further explain the Illicit Discharge Detection and Elimination requirement in Provision E.2.a.(1) and (3) of the Tentative Order that pertains to discharges from footing drains and fountain drains. {*Eric Anderson*}

From: lyris@swrcb18.waterboards.ca.gov
To: Chiu, Wayne@Waterboards
Subject: REVISED Notice of Public Workshop Continuation - Tentative Order R9-2013-0001 Regional Storm Water Permit
Date: Friday, December 07, 2012 10:19:45 AM

Greetings Copermittees and Interested Persons,

Attached is the REVISED Notice of the Public Workshop Continuation on Tentative Order R9-2013-0001. This revised Notice provides direction from the San Diego Water Board's Chairman on procedures for hearing input from the Copermittees and other interested persons at the upcoming San Diego Water Board's December 12, 2012 meeting.

Additionally, a copy of the San Diego Water Board's list of questions posed by the Board at the November 13, 2012 Public Workshop are also attached.

This REVISED Notice of the Public Workshop Continuation, list of Board member questions, and all other documents pertaining to Tentative Order R9-2013-0001 can be found on the San Diego Water Board website at http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

Questions can be directed to either myself or Wayne Chiu at (858) 637-5558 or wchiu@waterboards.ca.gov.

Laurie Walsh P.E.
San Diego Water Board
858-467-2970
lwalsh@waterboards.ca.gov

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California Water Boards

Edmund G. Brown Jr.
Governor

Matthew Rodriquez
Secretary for
Environmental Protection

California Regional Water Quality Control Board, San Diego Region

REVISED[1]
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[1] Text changes to the original November 26, 2012 notice are indicated in red.

for all Copermittees. The Regional MS4 Permit will also provide opportunities for a comprehensive monitoring framework, incentive for a regional collaborative approach, and opportunities for regional cost efficiencies among Copermittees. Upon adoption by the San Diego Water Board, this Regional MS4 Permit will be issued to all 39 Copermittees in a phased manner according to the expiration dates of their current MS4 Storm Water Permits and after consideration of Reports of Waste Discharge filed by the Orange County and Riverside County Copermittees.

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The San Diego Water Board's acting Chair, Gary Strawn, has issued the following additional direction in response to requests from Copermittees and other interested persons wishing to make formal presentations at the December 12, 2012 workshop. The San Diego Water Board is not seeking formal presentations from the Copermittees or other interested persons on all of the questions posed to staff at the conclusion of the November 13, 2012 workshop and is not interested in rehashing presentations made at the November 13 workshop. The San Diego Water Board is seeking comments from Copermittees or other interested persons specifically on the questions related to 1) the projected costs of implementing the Tentative Order, including cost breakdowns, timeframes and comparisons with current expenditures and 2) the projected costs of not implementing the Tentative Order in terms of beach closures, public health effects, public costs and other pertinent considerations. The San Diego Water Board will allow comments pertaining to the other questions if the Copermittees or other interested persons wish to provide additional information not previously presented. Presentations may be informal, and if visual aids are necessary to convey information they will be permitted. To ensure a productive and efficient workshop, and to ensure that all attending have an opportunity to participate, presentations by Copermittees or other interested persons may be limited at the discretion of the acting Chair. This workshop has significant interest and to provide enough time for all interested persons to participate, participants with similar comments are requested to make joint presentations.

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1. Can the Copermittees meet the bacteria levels that are specified in the Total Maximum Daily Loads (TMDLs)? What sorts of technologies are available to the Copermittees to treat bacteria to the levels specified in the TMDLs? {*Grant Destache*}

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3. What are the benefits of BMP based compliance with the TMDLs for bacteria compared to compliance with Water Quality Based Effluent Limitations (WQBELs)? {*Grant Destache*}

4. Address the issues that Ruth Kolb, City of San Diego raised regarding the Bacteria TMDLs. Clarify how we incorporated the Bacteria TMDLs into the Tentative Order to demonstrate that we incorporated it into the Tentative Order the way it was intended to be implemented. {*Eric Anderson*}

5. Throughout the presentations, it was said that it is infeasible to cleanup bacteria. Provide an explanation as to why, it is not the case, that cleanup of bacteria is infeasible. IN OTHER WORDS… Explain why it is in fact feasible to cleanup bacteria. Is it feasible to cleanup bacteria to the levels in the TMDLs? {*Tomas Morales*}

Other

1. Clarify if the Tentative Order is a one size fits all approach. Is the Water Quality Improvement Plan a one size fits all approach? {*Grant Destache*}

2. Further explain the Illicit Discharge Detection and Elimination requirement in Provision E.2.a.(1) and (3) of the Tentative Order that pertains to discharges from footing drains and fountain drains. {*Eric Anderson*}

STATE OF CALIFORNIA
REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

MEETING NOTICE AND AGENDA

Wednesday, December 12, 2012
9:00 a.m.

Water Quality Control Board
Board Meeting Room
9174 Sky Park Court
San Diego, California

The purpose of this meeting is for the San Diego Water Board to obtain testimony and information from concerned and affected persons and to make decisions based on the information received. Persons who want to submit written comments or evidence on any agenda item must comply with the procedures described in the agenda and agenda notes. Persons wishing to speak at the meeting should complete an attendance card (see Note F, attached to this Notice). The San Diego Water Board requests that all lengthy comments be submitted in writing in advance of the meeting date. To ensure that the San Diego Water Board members and staff have the opportunity to review and consider written material, comments should be received in the San Diego Water Board's office no later than noon on Tuesday, November 27, 2012* and should indicate the agenda item to which it is applicable. If the submitted written material is more than 5 pages or contains foldouts, color graphics, maps, etc., 15 copies must be submitted for distribution to the Board members and staff. Written material submitted after 5:00 P.M. on Tuesday, December 4, 2012, will not be provided to the Board members and may not be considered by the San Diego Water Board (See Note D, attached to this Notice).

****PLEASE NOTE THAT SOME ITEMS ON THE AGENDA MAY HAVE BEEN PREVIOUSLY NOTICED WITH EARLIER DEADLINES FOR SUBMITTING WRITTEN COMMENTS OR MAY HAVE A SEPARATE HEARING PROCEDURES DOCUMENT THAT ESTABLISHES DIFFERENT DEADLINES OR PROCEDURES FOR SUBMITTING WRITTEN MATERIALS. IN THOSE CASES THE DIFFERENT DEADLINES OR PROCEDURES APPLY.***

Comments on agenda items will be accepted by E-mail subject to the same conditions set forth for other written submissions as long as the total submittal (including attachments) does not exceed five printed pages in length. E-mail must be submitted to: rb9agenda@waterboards.ca.gov. Type the word “Agenda” in the subject line.

Pursuant to Title 23, California Code of Regulations, section 648.4, the San Diego Water Board may refuse to admit written testimony or evidence into the record if it is not submitted to the San Diego Water Board in a timely manner and shall refuse to do so if admitting it would prejudice any party or the board, unless the proponent demonstrates that compliance with the deadline would create an unreasonable hardship.

NOTE D, attached to this Notice, refers to the procedures that will be followed by the San Diego Water Board in contested adjudicatory matters if a separate Hearing Procedures Document has not been issued for a particular agenda item. Parties requesting an alternate hearing process must do so in accord with the directions in NOTE D. Any such request, together with supporting material, must be received in the San Diego Water Board's office no later than noon on Tuesday, November 27, 2012.

Copies of the agenda items to be considered by the San Diego Water Board are posted on the San Diego Water Board's website at http://www.waterboards.ca.gov/sandiego/board_info/agendas

Except for items designated as time certain, there are no set times for agenda items. Items may be taken out of order at the discretion of the Chairman.

1. Roll Call and Introductions

2. PUBLIC FORUM: Any person may address the Board regarding a matter within the Board's jurisdiction that is not related to an item on this Meeting agenda and is not scheduled for a future Meeting. **Comments will generally be limited to three minutes, unless otherwise directed by the Board Chairperson**. Any person wishing to make a longer presentation should contact the Executive Officer at least ten days prior to the meeting.

3. Minutes of Board Meeting: November 13, 2012

4. Chairman's, Board Members', State Board liaison's and Executive Officer's Reports: These items are for Board discussion only. No public testimony will be allowed, and the Board will take no formal action.

Consent Calendar: Items 5 through 8 are considered non-controversial issues. (NOTE: If there is public interest, concern, or discussion regarding any consent calendar item or a request for a public hearing, then the item(s) will be removed from the consent calendar and considered after all other agenda items have been completed.)

5. Mitigated Negative Declaration: Leuthe Residence Onsite Wastewater Treatment System, San Diego County (Tentative Resolution No. R9-2012-0057) (*Fisayo Osibodu*).

6. Waste Discharge Requirements: Leuthe Residence Onsite Wastewater Treatment System, San Diego County (Tentative Order No. R9-2012-0056) (*Fisayo Osibodu*)

7. NPDES Permit: General Permit for the Discharge of Lanthanum-Modified Clay to Surface Waters of the United States in the San Diego Region (Tentative Order No. R9-2012-0063, NPDES No. CAG999003) (*Ben Neill*).

8. Administrative Civil Liability: Ariel Suites, L.P., Mandatory Minimum Penalty for violations of Order No. R9-2007-0034. The San Diego Water Board will consider adoption of a Tentative Order that would impose a $138,000 mandatory minimum penalty recommended in Complaint No. R9-2012-0065 for violations of effluent limitations prescribed in *General Waste Discharge Requirements for Discharges from Temporary Groundwater Extraction and Similar Waste Discharges to San Diego Bay, Tributaries Thereto Under Tidal Influence, and Storm Drains or Other Conveyances Systems Tributary Thereto (WDR), Order No. R9-2007-0034, NPDES No. CAG919001*. The San Diego Water Board may approve or reject assessment of the recommended penalty. If the San Diego Water Board rejects the Tentative Order, the matter may be rescheduled to a future public hearing, at which time the San Diego Water Board will consider assessment of civil liability (*Frank Melbourn*).

Remainder of the Agenda (Non-Consent Items):

9. Tentative Resolution: Resolution in Support of a Regional Monitoring Framework (*Lilian Busse*).

10. Information Item: San Dieguito Lagoon: Restoration, Fill Removal, and Storm Water BMPs (*Tony Felix*)

11. Public Workshop (continued): The San Diego Water Board will hold a public workshop to receive information and discuss proposed requirements in the public draft of a Regional NPDES Permit for Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region (Tentative Order No. R9-2013-0001, NPDES No. CAS0109266). The San Diego Water Board will not take any formal action on this item at the workshop. (*Christina Arias and Laurie Walsh*)

12. *Closed Session* - Discussion of Ongoing Litigation [Authorized under Government Code Section 11126, subd. (e)]. The San Diego Water Board may meet in closed session to discuss ongoing litigation for the following cases:

    Civil Actions (Judicial and Administrative, other than Petitions for Review filed with the State Water Board)

    a. *People of the State of California Ex Rel. the Regional Water Quality Control Board, San Diego Region v. Edward Drusina, an individual in his capacity as Commissioner of the International Boundary and Water Commission, United States Section, et al.,* Complaint for Violations of the Clean Water Act and Related State Law Claims. United States District Court, Southern District of California, Case No. 01-CV-027BTM(JFS) (filed February 2001). *(David Gibson).*

    b. *In re: Test Claim on California Regional Water Quality Control Board, San Diego Region, Order No. R9-2007-001, (NPDES No. CAS0108758) Waste*

Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego County, the San Diego Unified Port District, and the San Diego County Regional Airport Authority adopted on January 24, 2007. Test Claim filed by San Diego County, et al., with Commission on State Mandates, No. 07-TC-09 (filed June 2008). *(Catherine George Hagan)*

c. *Surfrider Foundation v. California Regional Water Quality Control Board, San Diego Region,* Petition for Writ of Mandate [re: San Diego Water Board's adoption of Order No. R9-2009-0038 amending Order No. R9-2006-0065 for Poseidon Resources (Channelside), LLC, NPDES Permit No. CA0109223, approval of a Flow, Entrainment and Impingement Minimization Plan under the California Water Code]. San Diego County Superior Court, Case No. 37-2010-0009-436-CU-WM-CTL (filed April 2010). *(Brian Kelley)*

d. *California Regional Water Quality Control Board, San Diego Region v. Bill and Heidi Dickerson, Larry and Penelope Gunning and Perry & Papenhausen, Inc.* Complaint for Damages for Breach of Contract and for Specific Performance. San Diego County Superior Court, Case No. 37-2010-00096011-CU-CO-CTL (filed July 2010) *(Jeremy Haas)*

e. *State of California Department of Finance, State Water Resources Control Board, And California Regional Water Quality Control Board, San Diego Region v. Commission on State Mandates.* Petition for Writ of Administrative Mandamus. Sacramento County Superior Court, Case No. 34-2010-80000604 (filed July 2010) *(Catherine George Hagan)*

f. *In re: Citizens Development Corporation, Debtor and Debtor in Possession*, Case No. 10-15142-LT11. United States Bankruptcy Court, Southern District of California. (San Diego Water Board Claim in Bankruptcy) (filed June 2011) (*Catherine George Hagan*)

g. *Test Claim on California Regional Water Quality Control Board, San Diego Region, Order No. R9-2009-0002, (NPDES No. CAS0108740) Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of Orange, the Incorporated Cities of the County of Orange, and the Orange County Flood Control District adopted on December 16, 2009. Test Claim filed by County of Orange, et al., with Commission on State Mandates, No. 10-TC-11* (filed June 2011). *(Jessica Jahr)*

h. *Test Claim on California Regional Water Quality Control Board, San Diego Region, Order No. R9-2010-0016 (NPDES No. CAS0108766) adopted November 10, 2010, County of Riverside, Riverside County Flood Control and Water Conservation District, and the Cities of Murrieta, Temecula and Wildomar, Co-Claimants, filed with Commission on State Mandates, No. 11-TC-03 (filed November 2011). (Catherine George Hagan)*

Petitions for Review Pending Before State Water Resources Control Board[1]

i. Petitions of the National Fireworks Association and Fireworks & Stage FX America Inc., Coastal Environmental Rights Foundation, and San Diego Coastkeeper (General National Pollutant Discharge Elimination System (NPDES) Permit Order No. R9-2011-0022 (NPDES No. CAG999002) for Residual Firework Pollutant Waste Discharges to Waters of the United States in the San Diego Region from the Public Display of Fireworks), SWRCB/OCC Files A-2164(a)-(c), filed June and July 2011. *(Michelle Mata)*

j. Petition of Citizens Development Corporation (Water Code Section 13267 Investigative Order No. R9-2011-0033 dated September 14, 2011, Requiring Submission of Technical Reports Pertaining to Investigation of Lake San Marcos Nutrient Impairment, San Diego County), SWRCB/OCC File A-2185, filed October 2011. (*Laurie Walsh*)

k. Petition of City of San Diego (Time Schedule Order No. R9-2011-0052 dated September 14, 2011, for the Kinder Morgan Energy Partners, Mission Valley Terminal Remediation Dewatering Discharge to Murphy Canyon Creek, San Diego County), SWRCB/OCC File A-2186, filed October 2011. (*Ben Neill*)

l. Petition of Jack Eitzen (Administrative Assessment of Civil Liability Order Nos. R9-2011-0048 and R9-2011-0049 against Jack Eitzen for 38175 and 38155 Via Vista Grande, Murrieta, Riverside County), issued October 12, 2011), SWRCB/OCC File A-2193, filed November 2011. (*Rebecca Stewart*)

m. Petitions for Review of San Diego Bay Shipyard Sediment Cleanup and Abatement Order No. R9-2012-0024 for National Steel and Shipbuilding Company (NASSCO), BAE Systems, San Diego Ship Repair (BAE Systems), Campbell Industries, City of San Diego, San Diego Gas & Electric (SDG&E) and San Diego Unified Port District (Port District) issued March 14, 2012. Petitions for Review and Requests for Stay filed by NASSCO, BAE Systems and City of San Diego. Petitions for Review w/o requests for stay filed by SDG&E, Star & Crescent Boat Company and Port District. SWRCB/OCC File A-XXXX, filed April 2012. (*Frank Melbourn)*

n. Petition of NASSCO for Review of Resolution No. R9-2012-0025 (Certifying Final Environmental Impact Report for San Diego Bay Shipyard Sediment Cleanup and Abatement Order No. R9-2012-0024), adopted March 14, 2012, SWRCB/OCC File A-XXXX, filed April 2012. (*Frank Melbourn)*

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[1] Petitions for review of San Diego Water Board actions or inactions filed with the State Water Board being held in abeyance by the State Water Board are not listed in the agenda. The titles of these matters are available at the San Diego Water Board. Please contact Catherine George Hagan at chagan@waterboards.ca.gov or 858-467-2958 for more information.

o. Petition of South Laguna Civic Association for Review of Order No. R9-2012-0013, NPDES No. CA0107611, NPDES Permit Reissuance: South Orange County Waste Authority, Discharges to the Pacific Ocean via Aliso Creek Ocean Outfall, adopted April 11, 2012, SWRCB/OCC File A-XXXX, filed May 2012. (*Joann Lim*)

p. Petition of City of San Diego for Review of Resolution No. R9-2012-0045, re NPDES Permit Notice of Enrollment Amendment for Kinder Morgan Energy Partners, June 13, 2012, SWRCB/OCC File A-XXXX, filed July 2012. (*Ben Neill*)

13. *Closed Session* - Consideration of Initiation of Litigation or Discussion of Significant Exposure to Litigation. The San Diego Water Board may meet in closed session to initiate or consider initiating litigation concerning matters within its jurisdiction or to discuss significant exposure to litigation [Authorized under Government Code Section 11126(e)] *(David Gibson).*

14. *Closed Session* - Deliberation on a Decision to be Reached Based on Evidence Introduced in a Hearing. The San Diego Water Board may meet in closed session to consider evidence received in an adjudicative hearing and to deliberate on a decision to be reached based upon that evidence [Authorized under Government Code Section 11126(c)(3)].

15. *Closed Session* – Personnel. The San Diego Water Board may meet in closed session to consider the appointment, employment, evaluation of performance, or dismissal of a public employee or to hear complaints or charges brought against that employee by another person or employee unless the employee requests a public hearing [Authorized under Government Code Section 11126(a)].

16. Arrangements for Next Meeting and Adjournment:
    Wednesday, February 13, 2013 - 9:00 a.m.
    Water Quality Control Board
    Regional Board Meeting Room
    9174 Sky Park Court
    San Diego, California

NOTIFICATIONS

A. On December 18, 2012, the San Diego Water Board will hold a public workshop on its Strategy for Achieving Healthy Waters in San Diego Bay (San Diego Bay Strategy). The purpose of the San Diego Bay Strategy is to identify how the San Diego Water Board will use its regulatory and enforcement authority to address sites with impaired water and/or sediment quality to achieve healthy waters in San Diego Bay. The workshop will provide an opportunity to share information on this effort and to receive public comments. The workshop will be held from 9:00 a.m. to 11:00 a.m. in the Board Room of the San Diego Water Board office. The full public notice can be found at http://www.waterboards.ca.gov/sandiego/docs/Notice_of_Public_Workshop.pdf. (*Melissa Valdovinos*)

B. Completed Cleanup Action - 30-day Notice. The San Diego Water Board intends to issue a no further action letter for completion of cleanup of pollutants from leaking underground storage tanks (USTs) 922 I and II, 924, and 925 at Naval Outlying Landing Field, Imperial Beach, California. This notification is made pursuant to California Code of Regulations, Title 23, section 2728. The residual concentrations of fuel constituents in soil do not appear to pose a threat to human health and the environment and the unauthorized release case may be closed. Additional details about these USTs are available on the GeoTracker website at:
UST 922:
https://geotracker.waterboards.ca.gov/regulators/screens/menu.asp?global_id=T10000000479.
UST 924:
https://geotracker.waterboards.ca.gov/regulators/screens/menu.asp?global_id=T10000000480
UST 925:
https://geotracker.waterboards.ca.gov/regulators/screens/menu.asp?global_id=T10000000482

Provided no significant issues arise during the public notification period, the San Diego Water Board will issue a no further action letter in January 2013. (*Sherrie Komeylyan*)

C. **Follow the Board Meeting on Twitter**: Updates on the progress of the San Diego Water Board meeting will be posted on Twitter at www.twitter.com/SDWaterBoard. The San Diego Water Board's use of Twitter is a courtesy and is for informational purposes only. It is not always reliable, and is not a substitute for personal attendance at a Board meeting.

DIRECTIONS TO MEETING

From Downtown: I-15 north - take the Aero Drive exit - turn left (west). Proceed to the 3rd stoplight, which is Ruffin Road – turn right. Turn left on Sky Park Court (stoplight). Our building is located at the end of the court – veer to the right into the parking lot.

From the North: I-15 south - take the Balboa Ave. exit - turn right (west). Proceed to the 2nd stoplight, which is Ruffin Road – turn left. Turn right on Sky Park Court (stoplight). Our building is located at the end of the court – veer to the right into the parking lot.

State of California
Regional Water Quality Control Board
San Diego Region

EXECUTIVE OFFICER SUMMARY REPORT
December 12, 2012

ITEM: 11

SUBJECT: Public Workshop (continued): The San Diego Water Board will continue the November 13, 2012 public workshop to receive additional information and discuss proposed requirements in the public draft of a Regional NPDES Permit for Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region (Tentative Order No. R9-2013-0001, NPDES No. CAS0109266). (*Christina Arias and Laurie Walsh*).

PURPOSE: The purpose of this workshop is for the San Diego Water Board to continue receiving information and further discuss proposed requirements in the public draft of Tentative Order No. R9-2013-0001 (Tentative Order).

RECOMMENDATION: There is no recommendation as this is a public workshop and the San Diego Water Board will take no action.

DISCUSSION: The San Diego Water Board is developing a Regional Municipal Separate Storm Sewer System (MS4) Storm Water NPDES Permit that will cover municipal Copermittees in San Diego County, Southern Orange County and Southwest Riverside County (Tentative Order No. R9-2013-0001). The Tentative Order was released for public review and comment on October 31, 2012.

At the November 13, 2012 San Diego Water Board meeting, the Board held a public workshop to receive information and discuss proposed requirements in the Tentative Order. The workshop was well attended and a large diverse group of stakeholders including the Copermittees, the development community, the environmental community, and the general public participated in the workshop discussions. The San Diego Water Board continued the public workshop to today's meeting so that staff could respond to a list of questions posed by Board members on a variety of topics pertaining to hydromodification, Total Maximum Daily Loads (TMDLs), storm water program costs, and other requirements of the

Tentative Order (Supporting Document No.1). At today's workshop, San Diego Water Board staff will respond to these questions.

With the release of the Tentative Order on October 31, 2012, the public review and comment process is now underway. The deadline for submission of written comments is January 11, 2013. The San Diego Water Board will provide written responses to timely submitted written comments on the Tentative Order. The responses will be available for Board member consideration prior to a public hearing to consider adoption of the Tentative Order (as yet unscheduled).

The San Diego Water Board has received comment letters from the City of Carlsbad and the City of Encinitas on the Tentative Order (Supporting Document Nos. 2 and 3), which are included in this agenda item at the request of the submitters. The San Diego Water Board will not be responding directly to these comment letters at today's workshop, but will be responding to them in the future as part of the public review and comment process on the Tentative Order that is now underway.

San Diego Water Board members may provide general feedback to staff on development of the Tentative Order at today's workshop; however, no action or voting should take place in regard to the comment letters or other aspects of the Tentative Order. The Tentative Order and additional information on the public workshop is available in the agenda material for the November 13, 2012 workshop and posted on the San Diego Water Board website.

SUPPORTING DOCUMENTS:

1. Questions from San Diego Water Board Members
2. Letter from the City of Encinitas dated November 5, 2012
3. Letter from the City of Carlsbad dated November 5, 2012

PUBLIC NOTICE:

Notice of this item was provided to interested persons at the November 13, 2012 Board meeting. Notice was also provided in the Meeting Notice and Agenda for the December 12, 2012 Board meeting, which is posted on the San Diego Water Board website.

Questions from San Diego Water Board Members
November 13, 2012 Public Workshop
on
Tentative Order No. R9-2013-0001
Regional Municipal Separate Storm Sewer Systems (MS4) Permit

Hydromodification

1. When accounting for the impacts caused by hydromodification at a development or redevelopment site, how far back should the analysis go, preproject or predevelopment? {*Grant Destache*}

2. How can the San Diego County Hydromodification Plan (HMP) be implemented into the MS4 Permit in a more succinct manner? How can we implement the rules and regulations in the San Diego County HMP, because we really have not had it in place for very long before we, "throw it down the drain?" {*Grant Destache*}

3. How do you document predevelopment or naturally occurring on a map? How is "naturally occurring" defined? How far back do you go to document predevelopment? 100 years? 500 years? Before the Indians were picking up acorns? {*Gary Strawn*}

4. Why was the concrete/hardened channel exemptions removed? {*Eric Anderson*}

5. Copermittees commented that road projects have unique space limitations and may not be able to meet retention & HMP requirements. Should road projects be treated differently and could requirements in the new CALTRANS Storm Water Permit be used to provide more options? {*Grant Destache*}

6. If a project is unable to comply with the HMP requirements at the site, how far away from the site can the project proponent place their retention basins? What other limitations exist when not placing a BMP on site? There is a concern that low income areas will become targets for placement of the retention basins. {*Tomas Morales*}

Cost

1. What is the cost of not implementing the provisions in the Tentative Order? (e.g. beach closures, ill health that taxpayers have to pay for through their private health plans or public costs, deaths ....) {*Henry Abarbanel*}

2. Lots of big cost numbers were used during the meeting. (e.g. $2 to $4 billion over 20 years) How much do the Copermittees spend now? What is being spent now and on what? {*Henry Abarbanel*}

3. What is the breakdown of costs? What is the timeframe of these costs? How much is already being spent? {*Tomas Morales*}

Total Maximum Daily Load (TMDL)

1. Can the Copermittees meet the bacteria levels that are specified in the Total Maximum Daily Loads (TMDLs)? What sorts of technologies are available to the Copermittees to treat bacteria to the levels specified in the TMDLs? {*Grant Destache*}

2. Can the Copermittees achieve adequate waste load reductions in MS4 discharges to meet the effluent limitations and compliance dates for bacteria in the Tentative Order? {*Grant Destache*}

3. What are the benefits of BMP based compliance with the TMDLs for bacteria compared to compliance with Water Quality Based Effluent Limitations (WQBELs)? {*Grant Destache*}

4. Address the issues that Ruth Kolb, City of San Diego raised regarding the Bacteria TMDLs. Clarify how we incorporated the Bacteria TMDLs into the Tentative Order to demonstrate that we incorporated it into the Tentative Order the way it was intended to be implemented. {*Eric Anderson*}

5. Throughout the presentations, it was said that it is infeasible to cleanup bacteria. Provide an explanation as to why, it is not the case, that cleanup of bacteria is infeasible. IN OTHER WORDS… Explain why it is in fact feasible to cleanup bacteria. Is it feasible to cleanup bacteria to the levels in the TMDLs? {*Tomas Morales*}

Other

1. Clarify if the Tentative Order is a one size fits all approach. Is the Water Quality Improvement Plan a one size fits all approach? {*Grant Destache*}

2. Further explain the Illicit Discharge Detection and Elimination requirement in Provision E.2.a.(1) and (3) of the Tentative Order that pertains to discharges from footing drains and fountain drains. {*Eric Anderson*}

City of Encinitas

November 5, 2012

Honorable Grant Destache, Chair
Honorable Board Members
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, California 92123-4340

SUBJECT: TENTATIVE ORDER R9-2013-0001 REGIONAL NPDES PERMIT FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS OF WITHIN THE SAN DIEGO REGION

Dear Chairman Destache and Board Members,

As it relates to the forthcoming Public Workshop on November 13th, 2012 please accept this letter on behalf of the City of Encinitas and the responsible parties of the San Marcos Hydrologic Area (HA) including the Cities of Carlsbad, Escondido, San Marcos, and the County of San Diego, as identified in Resolution No. R9-2010-0001 incorporating into the San Diego Basin Plan the *Revised Total Maximum Daily Loads (TMDL) for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)* (Bacteria TMDL).

At the November 13, 2012 Public Workshop, two significant and interrelated regulatory Orders will converge that individually deserve careful consideration, and even more so collectively. Tentative Order No. R9-2013-0001 includes *Attachment E – Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2013-0001*, and specific provisions for implementing the TMDLs adopted by the San Diego Water Board. Included in *Attachment E* are compliance requirements specific to the Bacteria TMDL[1], including the San Marcos HA.

The Bacteria TMDL states that for watersheds where there are no longer any impairments listed on the 2008 303(d) List (for REC-1 water quality standards), the Phase I MS4s are not required to submit a load reduction plan and are <u>not subject to any further action under the TMDL as long as monitoring continues to</u>

[1] Revised TMDL for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek) adopted by SDRWQCB Resolution No. R9-2010-0001

support compliance with REC-1 water quality standards. However, if the impairment returns for REC-1 water quality standards, the Responsible Parties will be required to submit a load reduction plan to the RWQCB.

The City of Encinitas and the San Marcos HA Responsible Parties have demonstrated to the RWQCB that this hydrologic area is consistent with the scenario described in the Bacteria TMDL, as the Pacific Ocean Shoreline Segment at Moonlight Beach in Encinitas (in the San Marcos HA) is no longer listed as impaired for indicator bacteria under REC-1 water quality standards. The Responsible Parties received written confirmation (*See Attached E-Mail dated Wednesday, May 16, 2012)* that they are "*not subject to further action under Resolution No. R9-2010-0001 as long as monitoring data continues to support compliance with the REC-1 water quality standards.*" This scenario effectively places the San Marcos HA in a "dormant TMDL" status, unless the Pacific Ocean shoreline of the San Marcos HA is relisted on future 303(d) lists for indicator bacteria[2] and REC-1 impairment.

Attachment E, Section 6[3] of the Tentative Order requires, amongst other provisions, compliance with Water Quality Based Effluent Limitations (WQBELs). The WQBELs as described in the Tentative Order are expressed as Receiving Water Limitations, Effluent Limitations and as Best Management Practices requirements. As *Attachment E* of the Tentative Order is currently written, the Responsible Copermittees in the San Marcos HA are required to meet the listed WQBELs even while under the "dormant TMDL" condition.

Further exacerbating this conflict, there is a disparity between relisting of the Pacific Ocean shoreline and the more strict WQBEL limitations presented in the Tentative Order. If future conditions and monitoring data were to support a re-listing of the Pacific Ocean shoreline at Moonlight Beach, this would be done under the criteria established in the 2004 SWRCB Listing Policy[4] which allows for a certain number of water quality standard exceedances prior to listing. In clear contrast, the WQBEL limitations in the Tentative Order allow **zero** water quality standard exceedances under dry weather conditions – a much higher bar with which to comply than the listing criteria. In effect, San Marcos HA Responsible Parties will be required to focus intense resources to address bacteria at this Pacific Ocean shoreline segment where water quality monitoring has demonstrated an impairment does not exist.

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[2] Page A66 of SDRWQCB Resolution No. R9-2010-0001
[3] Attachment E, Section 6 of the Tentative Order is the Specific Provisions for Total Maximum Daily Loads Applicable to Order R9-2013-0001 for the Revised TMDL for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)
[4] State Water Resources Control Board – Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List, adopted September 2004

In summary and in consideration of this involved and complex set of issues it is important to acknowledge the following facts:

- Per the 2010 303(d) list, the Pacific Ocean shoreline at Moonlight Beach (San Marcos HA) is NOT impaired for REC-1 Beneficial Uses (Moonlight Beach is the location that is the basis for including the San Marcos HA in the Bacteria TMDL).
- Per the 2010 303(d) list, the listing at Moonlight Beach for total coliform is based upon the water quality objectives for the SHELL beneficial use only, and as stated above, is not listed for REC-1.
- Per Resolution No. R9-2010-0001, the TMDL applies only to REC-1 and does not apply to SHELL impairments

  Pg. 4, footnote 17: "waterbodies with SHELL beneficial use impairments will be addressed in a separate TMDL project and/or standards action."

Based upon this background information and the conclusions presented above, at this time the Responsible Parties of the San Marcos HA would like to request your direction to RWQCB staff to address the conflict between the RWQCB adopted Bacteria TMDL and the compliance requirements of Tentative Order R9-2013-0001.

Sincerely,

Gus Vina,
City Manager, City of Encinitas

cc: Erik Steenblock, City of Encinitas
Todd Snyder, County of San Diego
Elaine Lukey, City of Carlsbad
Cheryl Filar, City of Escondido
Erica Ryan, City of San Marcos

Attachment A

Erik Steenblock

From: Deborah Jayne [djayne@waterboards.ca.gov]

Sent: Wednesday, May 16, 2012 5:27 PM

To: elaine.lukey@carlsbadca.gov; Erik Steenblock; vina@cityofencinitas.org; constantine_kontaxis@dot.ca.gov; cfilar@escondido.org; eryan@san-marcos.net; Todd.Snyder@sdcounty.ca.gov

Cc: David Barker; Deborah Woodward; Eric Becker; Jeremy Haas; Lisa Honma; Wayne Chiu

Subject: Your April 23, 2012 Letter Regarding Bacteria TMDLs and Moonlight State Beach

Dear Mr. Vina et al,
Thank you for your letter dated April 23, 2012 requesting written acknowledgment of your conclusions regarding the applicability of the Bacteria TMDLs to Moonlight State Beach and the requirement for submittal of a Bacteria (or Comprehensive) Load Reduction Plan (BLRP or CLRP).

The REC-1 TMDLs adopted under Resolution R9-2010-0001 remain in effect and applicable at Moonlight State Beach. However you are correct that the Responsible Parties (RPs) are not required to submit a BLRP or CLRP (specific to this beach segment) within 18 months of the effective date of the Bacti I TMDLs because this beach segment is not currently impaired/listed for REC-1. Furthermore, the Moonlight State Beach segment is not subject to further action under Resolution No. R9-2010-0001 as long as monitoring data continues to support compliance with the REC-1 water quality standards (Resolution No. R9-2010-0001 page A2). If, however, the segment is re-listed on a future 303(d) List for a REC-1 impairment, the RPs will be required to submit a BLRP or CLRP for this beach segment within 6 months of the adoption of the 303(d) List by the San Diego Regional Board (Resolution No. R9-2010-0001 page A66).

I trust this email adequately addresses your inquiry regarding TMDL applicability and BLRP or CLRP submittal. Regarding ongoing monitoring requirements, please refer to your MS4 permit for the general requirements and direct any specific monitoring questions to Mr. Wayne Chiu at wchiu@waterboards.ca.gov . Please feel free to contact me or Wayne at any time if additional clarification is needed.

Sincerely,

Deborah Jayne
Senior Environmental Scientist
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, California 92123-4340
Office: (858) 467-2972
Fax: (858) 571-6972
e-mail: djayne@waterboards.ca.gov

CITY OF
CARLSBAD
Office of the City Manager

www.carlsbadca.gov

November 5, 2012

Honorable Grant Destache, Chair
Honorable Board Members
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123

Re: TENTATIVE ORDER R9-2013-0001 REGIONAL NPDES PERMIT FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS OF WITHIN THE SAN DIEGO REGION

Dear Chairman Destache and Board Members:

On behalf of the City of Carlsbad (City), please accept the information contained in this letter as formal comment to Tentative Order R9-2013-0001 Regional NPDES permit for Municipal Separate Storm Sewer Systems (MS4s) draining the watersheds within the San Diego Region, in preparation for the Regional Board Member workshop on November 13, 2012.

The City would like to take this opportunity to thank the San Diego Regional Water Quality Control Board (RWQCB) personnel for their progressive approach to stakeholder involvement in drafting the Tentative Order in the past six months. Overall, the focused meetings have been successful and have resulted in an improved permit. However, there are a few areas that warrant further refinement to ensure the permit is implementable, effective at improving water quality where needed, and sustainable from a social, environmental, and economic perspective.

The San Diego Copermittees will be providing verbal comments during the workshop which are supported by the City.

The City is also a Responsible Party in the San Marcos Hydrologic Area (SMHA), and therefore subject to the Bacteria Beaches and Creeks TMDL regulations included in Attachment E of Tentative Order R9-2012-0001. The City of Encinitas, as the lead for the SMHA Responsible Parties has submitted a comment letter on behalf of the Responsible Parties, which is also supported by the City of Carlsbad. We look forward to your thorough review of both sets of comments.

We appreciate the opportunity to work with the Regional Board and stakeholders in the development of regulations to improve water quality in our region. If you have any questions or need further clarification, please do not hesitate to contact Elaine Lukey, Environmental Manager, at (760) 602-7582.

Sincerely,

John Coates

John Coates
Acting City Manager

cc: Ronald Kemp, Assistant City Attorney
Cynthia Haas, Deputy City Manager
David Hauser, Director Property and Environmental Management
Elaine Lukey, Environmental Manager

City of Del Mar

November 5, 2012

Honorable Chairman Grant Destache and Board Members
California Regional Water Quality Control Board
San Diego – Region 9
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

SUBJECT: TENTATIVE ORDER R9-2013-0001 REGIONAL NPDES PERMIT FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4S) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

Dear Chairman Destache and Board Members:

The City of Del Mar has been pleased with the progressive process used to engage the regional Copermittees and stakeholders in the MS4 Permit reissuance process. RWQCB staff deserves commendation for their efforts to accommodate the Copermittees' written and verbal comments received into the Tentative Order in a quick and timely manner. This effort demonstrates the shared commitment of the RWQCB staff and Copermittees to develop an implementable, cost effective Permit that leads to improvements in water quality conditions. In light of the upcoming Public Workshop on November 13th, 2012 for the NPDES MS4 permit reissuance, the City of Del Mar would like to take the opportunity to address some key issues regarding Tentative Order R9-2013-0001.

In addition to those identified above, the City would like to highlight some of the valued outcomes of the permit reissuance process thus far, namely the Water Quality Improvement Plans (WQIP) as watershed planning documents and the requirement of adaptive management. We also agree with the intended approach for points of compliance with the Permit, as stated by RWQCB staff at the June 27th, 2012 focused meeting with stakeholders. Staff indicated that compliance would be based on the submission of complete Water Quality Improvement Plans (WQIP) and also the implementation and assessment of those WQIPs. Assessment includes adaptation to improve programs and plans to meet the established WQIP goals and ultimately water quality standards.

However, there are areas within the Tentative Order that we feel continue to warrant further consideration. This letter identifies the three primary areas of utmost importance where the process thus far appears to have reached an impasse. For these three topics, the RWQCB staff states that they are either not willing or, contrary to our understanding, not allowed to make further changes. The specific areas include:

I. Receiving Water Limitations language in **Provision A** of the Tentative Order;

II. Expression of Total Maximum Daily Load compliance is **Attachment E** of the Tentative Order, and;

III. Applicability of hydromodificaiton management requirements in **Provision E** of the Tentative Order.

A technical memorandum is attached with details on these topics of concern.

Our recommendations on these three issues are as follows:

I. Provision A Language Should Be Revised

The City urges you to provide direction to your staff to take an active and lead role on this extremely important issue. The new paradigm shift (WQIPs and required adaptive management) in the Tentative Order should be supported by revised state and local policies that encourage complete participation in the WQIP and adaptive management approach. Receiving water limitations language is driven by state and local policy and with a new standard of permitting upon us, the policies should reflect this new paradigm.

II. TMDL Compliance Should Be Consistent

The City of Del Mar urges you to direct staff to correct this apparent conflict between the RWQCB adopted Bacteria TMDL and the compliance requirements of the Tentative Order, Attachment E, Section 6.

III. Hydromodification Management BMPs Should Be Applied To Mitigate Hydromodification Impacts

The City of Del Mar respectfully requests you as RWQCB Members to direct RWQCB staff to include within the permit, the exemptions that were included in the HMP that RWQCB Members approved by Resolution No. R9-2010-0066 in 2010.

In summary, the City of Del Mar respectfully requests that RWQCB Staff and Copermittees work cooperatively on these three issues to find consensus and resolution. We appreciate your attention to our concerns, and we trust that this letter will be entered into the record at the November 13, 2012 meeting.

Sincerely,

Carl Hilliard
Mayor

cc: Del Mar City Council Members

Attachment: Technical Memo of November 1, 2012

City of Del Mar Memorandum

TO: Scott Huth, City Manager
Kathleen Garcia, Planning and Community Development Director

FROM: Mikhail Ogawa, Clean Water Manager

DATE: November 1, 2012

SUBJECT: San Diego Regional Water Quality Control Board Tentative Order R9-2013-0001

BACKGROUND

The San Diego Regional Water Quality Control Board (RWQCB) issues Municipal Separate Storm Sewer (MS4) permits to the Cities within San Diego County, the County of San Diego, the San Diego County Regional Airport Authority and San Diego Unified Port District (Copermittees). These permits are extensions of the federal Clean Water Act.

In April 2012, the RWQCB staff initiated an informal process by releasing an Administrative Draft of the forthcoming permit. The intent was to engage the Copermittees and stakeholders through focused meetings to allow the opportunity for a dialog to occur. The focused meeting process included five focused meetings, two public workshops, and a workshop sponsored by Orange County Copermittees focused on Hydromodification Management. The process has culminated in the release of a Tentative Order for public review on October 31, 2012. Public comments on the Tentative Order must be submitted by January 11, 2013. In addition, the RWQCB will hold a public workshop as a part of their regularly scheduled Board meeting on November 13th, 2012 to receive input from the public.

Two outcomes of the permit reissuance process thus far include Water Quality Improvement Plans (WQIP) as watershed planning documents and the requirement of adaptive management. The use of WQIPs as planning documents and allowing modifications to MS4 implementation programs, the Tentative Order offers a paradigm shift from previous prescriptive permits that may have led to unfocused programs not directed towards improvements in water quality.

In abridged terms, the WQIPs will be watershed planning documents intended to direct program implementation to focus on the highest of watershed specific water quality issues. The WQIP process requires Copermittees to establish interim and final goals where the objective is to bring MS4 discharges and waterbodies into compliance with water quality standards. The goals must be measureable so that progress towards them can be demonstrated. The WQIPs require schedules to be established for achievement of the interim and final goals. In some cases, these schedules may extend beyond the intended five-year life of the MS4 permit. Specific programmatic strategies are also prescribed to identify the means of achieving the established goals within the schedules. Lastly, the WQIPs also require adaptive management, so that Copermittees may learn from special studies and past efforts to use the most efficient and effective strategies and Best Management Practices to achieve water quality goals. The stated intent of the Permit is to have compliance based on the development, implementation and

adaptation of the strategies in WQIPs to meet the established goals and ultimately water quality standards.

CONCERNS REGARDING TENTATIVE ORDER

Provision A – Prohibitions and Limitations

The present use of the limitations in Provision A of the Tentative Order presents a dichotomy between requiring adaptive management BMP programs (i.e., WQIPs) and including receiving water limitations that prohibit discharges from the MS4s causing or contributing to violations of water quality standards[1]. The dichotomy may discourage the City from supporting the WQIP process, including adaptive management, if there is enforcement exposure based on the prohibition of discharges from the MS4s causing or contributing to violations of water quality standards. The City could be in violation immediately and continuously regardless of the efforts put towards the WQIPs and therefore may be discouraged from funding and participating in the adaptive management process that could ultimately work towards achieving water quality standards.

Board staff has verbalized that they have the discretion as to whether or not to enforce the receiving water limitations provision and intend not enforce this provision as long as the Copermittees demonstrate adequate progress through WQIP implementation and adaptation of program strategies. Furthermore, Board staff stated they have been directed to take a passive role and allow the State process[2] to be completed prior to making changes to the San Diego Regional MS4 Permit.

Attachment E – Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2013-0001

The Bacteria TMDL[3] states that for watersheds where there are no longer any impairments listed on the 2008 303(d) List (for REC-1 water quality standards), the Phase I MS4s are not required to submit a load reduction plan and are not subject to any further action under the TMDL as long as monitoring continues to support compliance with REC-1 water quality standards. However, if the impairment returns for REC-1 water quality standards, the Responsible Parties will be required to submit a load reduction plan to the RWQCB.

The City of Del Mar and other Responsible Parties in the San Dieguito and Los Peñasquitos watersheds demonstrated to the RWQCB that the two watersheds are within this scenario where the Pacific Ocean Shoreline of the two watersheds are no longer listed as impaired for indicator bacteria under REC-1 water quality standards. The Responsible Copermittees received written confirmation (see attached two email) that they are "not subject to further action under Resolution No. R9-2010-0001 as long as monitoring data continues to support compliance with the REC-1 water quality standards." This scenario essentially places our two watersheds in a "dormant TMDL", unless the Pacific Ocean shoreline of the one or both of the watersheds are relisted on future 303(d) lists for indicator bacteria[4].

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[1] Tentative Order R9-2013-0001 Provision A.2.a.

[2] State Water Resources Control Board is holding a Public Workshop on MS4 permits Receiving Water Limitations (RWL) Language on November 20, 2012. There is currently no schedule as to when and if the SWRCB will develop revised positions on RWL for MS4 permits.

[3] Revised TMDL for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek) adopted by SDRWQCB Resolution No. R9-2010-0001

[4] Page A66 of SDRWQCB Resolution No. R9-2010-0001

Attachment E, Section 6[5] of the Tentative Order requires, amongst other provisions, the compliance with Water Quality Based Effluent Limitations (WQBELs). The WQBELs as described in the Tentative Order are expressed as Receiving Water Limitations, Effluent Limitations and as Best Management Practices requirements. As written, the Responsible Copermittees in the two watersheds are required to meet the listed WQBELs even while under the "dormant TMDL" condition.

There is a conflict between relisting of the Pacific Ocean shoreline and the more strict WQBEL limitations. Relisting of the Pacific Ocean shoreline would be done under the criteria established in the 2004 SWRCB Listing Policy[6] which allows for a certain number of water quality standard exceedances prior to listing. The WQBEL limitations allow **zero** water quality standard exceedances under dry weather conditions – a much higher bar with which to comply. If the WQBELs are included in the final adopted Permit, at a minimum, the WQBEL compliance is only applicable when the TMDL is in an active phase – i.e., the waterbody is impaired and listed on the 303(d) list as specified in the Bacteria TMDL (SDRWQCB Resolution R9-2010-0001). Otherwise, the Copermittees will be required to focus intense resources to address bacteria at the Pacific Ocean shorelines where water quality monitoring has demonstrated that it is not an issue. This ironic paradox would be contradictory to the watershed based adaptive management process where the objective is to focus limited resources on the highest water quality issues.

Provision E.3.c.(2) Hydromodification Management BMP Requirements
The Tentative Order defines hydromodification as:

> The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

The Tentative Order requires that priority development projects, including redevelopment projects, are required to control post-project runoff flow rates and durations so as not to result in increased potential for erosion, or degraded instream habitat conditions downstream of the projects. There are several explicit exemptions for these requirements identified in the Tentative Order. However, these exemptions are not inclusive of many of the exemptions identified in the San Diego Regional Copermittees Final Hydromodification Management Plan[7] (HMP). The exemptions identified in the HMP include, but are not limited to, projects that discharges to an exempt river reach, or a tidally-influenced area and other areas where there was little or no increased potential for erosion, or degraded instream habitat conditions downstream of the projects.

Over 95% of the City of Del Mar's MS4 system drains directly to either the Pacific Ocean or to tidally influenced areas of the San Dieguito estuary and river. The areas that drain to the Pacific

[5] Attachment E, Section 6 of the Tentative Order is the Specific Provisions for Total Maximum Daily Loads Applicable to Order R9-2013-0001 for the Revised TMDL for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

[6] State Water Resources Control Board – Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List, adopted September 2004

[7] Approved on July 14, 2010 by San Diego RWQCB Resolution No. 2010-0066

Ocean will remain exempt per the Tentative Order, however, those areas that drain to tidally influenced areas of the San Dieguito estuary and river will not be exempt even though they have no Hydromodification impacts. The City will be forced to require priority development projects to mitigate for impacts they will not have.

State of California
Regional Water Quality Control Board
San Diego Region

SUPPLEMENTAL EXECUTIVE OFFICER
SUMMARY REPORT
December 12, 2012

ITEM: 11

SUBJECT: Public Workshop (continued): The San Diego Water Board will continue the November 13, 2012 public workshop to receive additional information and discuss proposed requirements in the public draft of a Regional NPDES Permit for Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region (Tentative Order No. R9-2013-0001, NPDES No. CAS0109266). (*Christina Arias and Laurie Walsh*).

PURPOSE: The purpose of this workshop is for the San Diego Water Board to continue receiving information and further discuss proposed requirements in the public draft of Tentative Order No. R9-2013-0001 (Tentative Order).

RECOMMENDATION: There is no recommendation as this is a public workshop and the San Diego Water Board will take no action.

DISCUSSION: The San Diego Water Board is developing a Regional Municipal Separate Storm Sewer System (MS4) Storm Water NPDES Permit that will cover municipal Copermittees in San Diego County, Southern Orange County and Southwest Riverside County (Tentative Order No. R9-2013-0001). The Tentative Order was released for public review and comment on October 31, 2012.

At the November 13, 2012 San Diego Water Board meeting, the Board held a public workshop to receive information and discuss proposed requirements in the Tentative Order. The workshop was well attended and a large diverse group of stakeholders including the Copermittees, the development community, the environmental community, and the general public participated in the workshop discussions. The San Diego Water Board continued the public workshop to today's meeting so that staff could respond to a list of questions posed by Board members on a variety of topics pertaining to hydromodification, Total Maximum Daily Loads (TMDLs), storm water program costs, and other requirements of the

Tentative Order (Supporting Document No.1). At today's workshop, San Diego Water Board staff will respond to these questions.

With the release of the Tentative Order on October 31, 2012, the public review and comment process is now underway. The deadline for submission of written comments is January 11, 2013. The San Diego Water Board will provide written responses to timely submitted written comments on the Tentative Order. The responses will be available for Board member consideration prior to a public hearing to consider adoption of the Tentative Order (as yet unscheduled).

The San Diego Water Board has received comment letters from the City of Del Mar and the City of San Diego on the Tentative Order (Supporting Document Nos. 4 and 5), which are included in this agenda item at the request of the submitters. The San Diego Water Board will not be responding directly to these comment letters at today's workshop, but will be responding to them in the future as part of the public review and comment process on the Tentative Order that is now underway. Supporting Document Nos. 6 and 7 are provided by Board staff to address questions asked by the San Diego Water Board members (See Supporting Document No. 1) during the November 13, 2012 public workshop. The San Diego Water Board also received a letter from the County of San Diego addressing some of the questions posed by the Board members (Supporting Document No. 8).

San Diego Water Board members may provide general feedback to staff on development of the Tentative Order at today's workshop; however, no action or voting should take place in regard to the comment letters or other aspects of the Tentative Order. The Tentative Order and additional information on the public workshop is available in the agenda material for the November 13, 2012 workshop and posted on the San Diego Water Board website.

ADDITIONAL SUPPORTING DOCUMENTS:

(Supporting Documents 1-3 were provided in the first agenda packet)

1. Questions from San Diego Water Board Members
2. Letter from the City of Encinitas dated November 5, 2012
3. Letter from the City of Carlsbad dated November 5, 2012
4. Letter from the City of Del Mar dated November 5, 2012
5. Letter from the City of San Diego dated December 4, 2012
6. Regional Storm Water Program Expenditures Table

7. Regional Comprehensive Load Reduction Plan for Bacteria TMDL Estimated Cost Table
8. Letter from the County of San Diego dated December 4, 2012

PUBLIC NOTICE: Notice of this item was provided to interested persons at the November 13, 2012 Board meeting. Notice was also provided in the Meeting Notice and Agenda for the December 12, 2012 Board meeting, which is posted on the San Diego Water Board website.

THE CITY OF SAN DIEGO

December 12, 2012
Item No. 11
Supporting Document No. 5

December 4, 2012

VIA EMAIL to: rb9agenda@waterboards.ca.gov

Mr. Gary Strawn
Acting Chair
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123

Subject: Tentative Order No. R9-2013-0001, December 12, 2012 Regional Board Meeting Agenda Item No. 11

Dear Mr. Strawn:

Thank you for the opportunity to participate in the Regional Water Quality Control Board's (Regional Board) December 12, 2012 workshop regarding the Tentative Order No. R9-2013-0001 hereinafter referred to as the "Tentative Order." This letter is being submitted to communicate the City of San Diego's (City) concerns regarding the Tentative Order for discussion at the Regional Board's December 12th meeting. A summary of the key issues is provided below. In addition, the City participated with the Copermittees in the San Diego region to develop written responses to the questions raised by the Regional Board at the November 13, 2012 workshop. The City requests that the Regional Board direct staff to work with the Copermittees to address these remaining issues before considering approval of the Tentative Order.

- *Revise the Tentative Order to allow a Copermittee to achieve compliance with Receiving Water Limitations, Areas of Special Biological Significance (ASBS) and Total Maximum Daily Load (TMDL) requirements, if the Copermittee is implementing an approved Water Quality Improvement Plan.* The City is committed to protecting and improving water quality in the San Diego Region. To that end, it is the City's objective for the Tentative Order to allow for the City to efficiently integrate its TMDL, ASBS and Municipal Permit requirements into an adaptive management program that allows the City to achieve compliance through implementation and iterative improvement of programs designed to achieve water quality goals. The mechanics and structure of the Water Quality Improvement Plan developed by Regional Board staff provide an innovative, thoughtful, and strategic framework for such an approach. However, the Tentative Order still does not provide a pathway for the City to achieve compliance with ASBS and TMDL regulations and the

Tentative Order's receiving water limitations while implementing the Water Quality Improvement Plans. Without these linkages, there remains little incentive for the City to undertake the significant increases in investments that would be required to implement the Water Quality Improvement Plans.

- *Revise the Bacteria TMDL requirements to allow for load- and BMP-based compliance, per the adopted Bacteria I TMDL.* The Bacteria I TMDL Basin Plan Amendment included options for concentration and load-based methods of calculating Waste Load Allocations. In addition, the Basin Plan Amendment allowed for the possibility of BMP-based compliance with the Bacteria I TMDL provided certain criteria and assurances were acceptable to Regional Board staff. These options should be included in the Tentative Order.

- *Revise the Tentative Order to uphold the previously adopted San Diego Hydromodification Management Plan (San Diego HMP), Resolution No. R9-2010-0066.* This plan has been in effect for less than two years. The San Diego HMP was developed by an expert consultant team that utilized extensive scientific studies, analysis and modeling to determine the appropriate hydromodification control criteria. Additionally, the San Diego Copermittees have embarked upon a $1.5 million, 5 year monitoring plan to validate the parameters and design criteria. There have been no scientific advances in the last 2 years to justify revisions to the San Diego HMP, therefore we request allowing the Copermittees to continue implementation of the current San Diego HMP.

- *Replace the monitoring and assessment requirements in the Draft Permit (Provision D.4) with the strategic monitoring approach developed collectively by the Copermittees.* The Copermittees' approach will more efficiently and effectively address critical questions necessary to adaptively manage the City's programs and realize our storm water quality goals.

We appreciate this opportunity to share our comments and look forward to continued discussions in finding ways to improve and protect water quality. If you have any questions please contact Drew Kleis, Program Manager at (858) 541-4329.

Sincerely,

Kris McFadden
Deputy Director

KM:dk

cc: David Gibson, Executive Officer, San Diego Regional Water Quality Control Board
Heather Stroud, City Attorney's Office
Bill Harris, Transportation & Storm Water Department
Sumer Hasenin, Transportation & Storm Water Department
Ruth Kolb, Transportation & Storm Water Department
Andre Sonksen, Transportation & Storm Water Department

Regional Storm Water Program Expenditures FY 2011/2012

Copermittee	Administration	Development Planning	Construction (public & private)	Municipal	Industrial & Commercial	Residential, Education & Public Participation	IDDE	Watershed	Regional	Total
San Diego County										
City of San Diego	$536,961	$11,482,676	$9,372,038	$16,926,207	$1,142,811	$1,753,316	$4,872,827	$7,313,307	$675,703	$54,075,846
County of San Diego	$1,220,385	$6,633,794	$5,363,719	$13,716,276	$1,373,062	$1,127,502	$1,171,659	$1,341,806	$894,652	$32,842,855
City of Lemon Grove	$35,270	$2,100	$7,439	$67,340	$2,537	$10,663	$19,375	$50,866	$37,865	$233,455
City of National City	$25,478	$63,174	$40,492	$318,856	$61,566	$73,884	$53,360	$31,201	$62,813	$730,824
City of Santee	$99,431	$14,836	$13,335	$392,555	$16,182	$10,578	$144,624	$128,531	$62,677	$882,749
City of Poway	$289,490	$27,736	$20,628	$977,479	$54,449	$216,521	$48,500	$122,633	$97,260	$1,854,696
City of La Mesa	$101,781	$26,214	$13,273	$3,715	$51,298	$14,663	$53,182	$91,737	$64,258	$420,121
City of Solona Beach	$52,030	$17,200	$24,260	$144,100	$12,530	$21,530	$55,780	$28,440	$21,970	$377,840
City of Coronado	$11,269	$7,315	$53,305	$737,954	$1,703	$13,116	$22,233	$3,140	$30,921	$880,956
City of Carlsbad	$645,278	$126,997	$140,041	$1,360,839	$123,900	$35,299	$96,699	$40,327	$125,718	$2,695,098
City of Imperial Beach	$142,906	$80,295	$11,150	$386,676	$6,920	$42,562	$34,440	$577,247	$68,124	$1,350,320
City of San Marcos	$364,000	$162,000	$65,000	$739,000	$33,000	$43,000	$238,000	$4,000	$75,000	$1,723,000
City of Encinitas	$137,693	$490,005	$183,612	$1,651,958	$107,162	$66,975	$149,360	$2,519	$58,064	$2,847,348
City of Del Mar	$43,020	$50,093	$25,927	$148,733	$16,948	$42,150	$28,269	$77,915	$29,869	$462,924
City of Vista	$68,675	$65,885	$40,027	$2,033,161	$94,844	$71,998	$166,319	$108,433	$78,801	$2,728,143
City of Escondido	$352,350	$255,630	$77,850	$384,805	$88,000	$203,655	$47,730	$32,775	$107,330	$1,550,125
City of El Cajon *	NSR	NSR	NSR	NSR	NSR	$10,074	$35,675	$4,463	$57,943	$1,282,802
City of Chula Vista	$270,111	$78,916	$127,320	$1,061,810	$81,430	$64,820	$316,082	$35,441	$236,308	$2,272,238
San Diego Airport Authority	$97,800	$59,700	$86,100	$1,832,200	$260,900	$46,500	$132,700	$96,500	$16,800	$2,629,200
City of Oceanside	$112,351	$99,871	$24,815	$2,035,532	$218,995	$140,475	$302,421	$132,152	$201,662	$3,268,274
Port of San Diego	$0	$0	$226,648	$2,666,612	$29,233	$277,470	$614,208	$45,907	$20,225	$3,880,303
San Diego County Totals										$118,989,117
Orange County										
City of Laguna Niguel	$127,360	$35,689	$225,768	$787,165	$65,792	$69,744	$21,880	NSR	$233,674	$1,567,072
City of Mission Viejo	$211,112	$16,084	$16,084	$1,162,499	$4,980	$121,221	$45,930	NSR	$219,104	$1,797,014
City of Laguna Woods	$93,533	$8,279	$16,739	$244,930	$5,917	$53,470	$85,168	NSR	$35,474	$543,510
City of Lake Forest	$198,550	$37,223	$29,238	$1,173,911	$192,562	$54,360	$110,260	NSR	$116,661	$1,912,765
City of Dana Point	$503,767	NSR	NSR	$1,122,869	$10,260	$9,502	$14,093	NSR	$50,713	$1,711,204
City of Laguna Hills	$287,145	NSR	NSR	$330,312	NSR	NSR	NSR	NSR	$109,959	$727,418
County of Orange	$882,220	$151,458	$958,498	$28,193,926	$12,071	$78,473	$199,293	NSR	$1,296,832	$31,772,771
City of Rancho Santa Margarita	$13,997	$4,666	$16,998	$125,824	$6,998	$27,787	$6,291	NSR	$132,781	$335,342
City of San Clemente	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	$2,681,628
City of San Juan Capistrano	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	$2,000,000
City of Aliso Viejo	$163,726	$10,915	$35,604	$211,673	$13,644	$64,166	$13,644	NSR	$116,917	$630,289
Orange County Totals										$45,679,013
Riverside County										
City of Murrietta										DUE 10-13-2013
City of Temecula										DUE 10-13-2013
City of Wildomar										DUE 10-13-2013
County of Riverside										DUE 10-13-2013
Riverside County Flood Control										DUE 10-13-2013
Riverside County Totals										
NSR = Not Seperately Reported										**$164,668,130**

Comprehensive Load Reduction Plan Estimated Cost

Bacteria TMDL / Affected Copermittees	Regional Structural BMPs		Distributed Structural BMPs		Nonstructural BMPs		Stream Restoration Projects		Dry-Weather Diversion/ Treatment		Infrastructure Improvement		Private Property BMPs (optional strategy)		Special Studies		Monitoring		Total Lower Limit Costs ($M) / 20 years	Total Lower Limit Costs ($M) / year	Total Upper Limit Costs ($M) / 20 years	Total Upper Limit Costs ($M) / year
[1] Costs are additative to existing jurisdictional program costs.	Lower Limit	Upper Limit	Lower Limit	Upper Limit	Lower Limit	Upper Limit	Lower Limit	Upper Limit	Lower Limit	Upper Limit	Lower Limit	Upper Limit	Lower Limit	Upper Limit	Lower Limit	Upper Limit	Lower Limit	Upper Limit				
San Diego River[1]	$59	$141	$66	$219	$38	$104	$42	$42	$19	$43	$144	$423	$216	$360	$3	$7	$3	$3	$590	$30	$1,342	$67
County of San Diego																						
City of San Diego																						
CalTrans																						
City of Santee																						
City of El Cajon																						
Chollas Creek[1]	$52		$98		$248														$398	$20		
City of San Diego																						
City of La Mesa																						
City of Lemon Grove																						
County of San Diego																						
San Diego Unified Port District																						
Tecolote Creek[1]	$51		$52		$213														$316	$16		
City of San Diego																						
Caltrans																						
San Luis Rey River[1]	$53	$81	$17	$55	$50	$131			$1	$3					$3	$6	$1	$1	$125	$6	$276	$14
County of San Diego																						
Caltrans																						
City of Oceanside																						
City of Vista																						
Scripps Watershed[1]	$33		$12		$198														$243	$12		
City of San Diego																						
San Juan Creek																				$8		
City of Dana Point																			Estimated cumulative Aliso Creek watershed program expenditures for FY 10/11. Budget and funding for bacteria TMDL/CLRP efforts is ongoing and will be reevaluated annually as the program evolves. **San Juan CLRP 10/4/2012**			
City of Laguna Hills																						
City of Laguna Niguel																						
City of San Juan Capistrano																						
City of Mission Viejo																						
City of Rancho Santa Margarita																						
Aliso Creek																				$4		
City of Aliso Viejo																			Estimated cumulative San Juan Creek watershed program expenditures for FY 10/11. Budget and funding for bacteria TMDL/CLRP efforts is ongoing and will be reevaluated annually as the program evolves. **Aliso Creek CLRP 10/4/2012**			
City of Laguna Beach																						
City of Laguna Hills																						
City of Laguna Niguel																						
City of Laguna Woods																						
City of Lake Forest																						
City of Mission Viejo																						

December 12, 2012
Item No. 11
Supporting Document No. 8

REGIONAL
WATER QUALITY
CONTROL BOARD

2012 DEC -4 P 5: 18

County of San Diego

DEPARTMENT OF PUBLIC WORKS

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December 4, 2012

Regional Water Quality Control Board
9174 Sky Park Court
San Diego, CA 92123

Dear Members of the San Diego Regional Water Quality Control Board:

SAN DIEGO COUNTY COPERMITTEE REPONSES TO QUESTIONS FROM SAN DIEGO WATER BOARD MEMBERS ON TENTATIVE ORDER NO. R9-2013-0001

The San Diego County Copermittees have developed answers to the some of the questions posed by the San Diego Board Members during the November 13, 2012 Public Workshop. These are provided for your consideration below.

Hydromodification

1. *When accounting for the impacts caused by hydromodification at a development or redevelopment site, how far back should the analysis go, pre-project or pre-development? {Grant Destache}*

   San Diego County Copermittee Response to Questions 1 and 3

   There are two aspects of the question: the policy perspective and the technical perspective. In terms of policy, the Tentative Order proposed requirement to match predevelopment hydrographs (flow rates and duration) is the exception to the current hydromodification requirement found in other parts of the State. Specifically, the following permits/programs require hydromodification controls to match pre-project conditions: Ventura, Sacramento, Caltrans, draft Phase 2 MS4, San Bernardino, and Los Angeles. The Caltrans, draft Phase 2 MS4 and Los Angeles are recent permits and reflect the current position of the State and other Regional Boards. Thus, there is precedent to use pre-project conditions as a reference for hydromodification. Additionally, requiring matching the predevelopment hydrograph may impose mitigation beyond a project's impacts.

   Regarding the technical perspective, the San Diego Copermittees have invested considerable time and resources to develop a technically sound and defensible hydromodification management plan (HMP). The San Diego Copermittees determined, during the development of the San Diego HMP, that the flow control design criteria should be based on flow duration matching the pre-project condition and not the pre-development condition. This determination was made based upon the following.

- Prior HMP implementation precedent in the State of California, specifically in Santa Clara and Contra Costa Counties, mandated flow duration matching to the pre-project condition.
- Following consultation with leading geomorphologists in the State of California, the San Diego Copermittees determined that in areas of significant existing urbanization the receiving streams had shown an ability to attain a new channel equilibrium based upon the developed flow conditions.
- Redevelopment practices often decrease the existing site's impervious area, especially with the new Low Impact Development (LID) requirements. In such cases, the post-project runoff rates and durations will decrease rather than increase over time.
- The Copermittees stated a desired goal of encouraging redevelopment projects for multiple planning, economical, and water quality purposes. From a hydromodification perspective, increasing redevelopment project implementation would invariably decrease the conversion of existing open space. The Copermittees were careful to avoid implementing hydromodification requirements on beneficial redevelopment projects if the redevelopment project decreased the site impervious area as compared to existing conditions.

In the case of new development, where open land was to be converted to impervious area, the hydromodification controls were required to match the pre-project condition, which equates to the pre-development condition. In these situations the pre-development conditions were based on Natural Resources Conservation Service soil maps and existing topography and vegetation. In cases where redevelopment projects increase impervious area as compared to the existing condition, hydromodification controls were required to mitigate for the impacts of the added impervious surfaces.

Copermittee Request:

We request to use pre-project conditions as a reference for hydromodification.

2. *How can the San Diego County Hydromodification Plan (HMP) be implemented into the MS4 Permit in a more succinct manner? How can we implement the rules and regulation in the San Diego County HMP, because we really have not had it in place for a very long before we, "throw it down the drain"? {Grant Destache}*

San Diego County Copermittee Response

The SD HMP Plan can be incorporated into the Permit by clearly referencing Resolution No. R9-2010-0066, a *Resolution for Approval of the Hydromodification Management Plan for the San Diego County*, and stating that all provisions of the order continue to be in effect. Chairman Destache correctly stated that the SD HMP has not been in place for that long. The San Diego County Copermittees met all scheduling requirements for HMP development and submittals as outlined in Attachment D of the Municipal Permit Order No. R9-2007-0001.

The San Diego County Copermittees developed a technically sound HMP with a Technical Advisory Committee and input from all stakeholders. This HMP has been in effect for less than two years. In accordance with the adopted resolution, the San Diego County Copermittees have embarked on a monitoring project to validate the HMP parameters and design criteria. The SD Copermittees are not aware of any current scientific data that would suggest the SD HMP is no longer effective or needs improvement prior to the completion of their current monitoring project.

Copermittee Request:

We request that the Regional Board incorporate the approved resolution into the Permit and allow implementation and monitoring according to the approved HMP during this Permit cycle.

3. *How do you document predevelopment or naturally occurring on a map? How is "naturally occurring" defined? How far do you go to document predevelopment? 100 years? 500 years? Before the Indians were picking acorns? {Gary Strawn}*

   San Diego County Copermittee Response to Question 3

   Please see the response to Question #1 above.

4. *Why was the concrete/hardened channel exemptions removed? {Eric Anderson}*

   San Diego County Copermittee Response

A Hydromodification Workshop with a panel of hydromodification management experts was held on August 30, 2012 as part of the Administrative Draft Permit process. The purpose of the workshop was to share ideas on different hydromodification management approaches. Some of the more innovative researchers brought forth philosophical shifts in how stakeholders might think about applying hydromodification management. The Regional Board staff may have assumed that a consensus was reached at the workshop because they subsequently issued a revised administrative draft with the hardened channel exemption stricken. Review of the HMP Workshop Recommendations document dated October 10, 2012 finds the absence of consensus from the panel on this type of exemption. Recommendations emphasized that this is largely a policy decision rather than a technical matter. The focused meetings allowed for policy debate, but this final edit was introduced after the focused meetings were completed.

The exemptions that are currently in the SD HMP are a product of thorough technical analyses and policy debate, and therefore represent the most appropriate rule for the region for the present date. SD Copermittees are in their second year of a 5 year effectiveness monitoring plan, and work has only recently started to establish a state-wide framework for hydromodification management. There will be opportunity to update policies on exemptions as this work progresses, rather than making an abrupt and somewhat arbitrary change immediately.

Copermittee Response:

We request that this exemption be included in the Permit.

5. *Copermittees commented that road projects have unique space limitations and may not be able to meet retention & HMP requirements. Should road projects be treated differently and could requirements in the new CALTRANS Storm Water Permit be used to provide more options? {Grant Destache}*

   San Diego County Copermittee Response

   Road projects should be treated differently than other types of land development projects because of public safety and their unique characteristics compared to traditional land development. The primary difference is that road projects are linear in nature, with a limited contribution to many receiving waters and right-of-way space constraints. The space constraints are exacerbated by underground utilities and other appurtenances which further limits the area available for Best Management Practices. Many roadway projects are an expansion of existing roadways, constrained within the existing available land area.

   Other MS4 permits also provide options beyond retention of the water quality volume for road projects. Below is a list of MS4 Permits in California where the requirements for road projects use the USEPA Guidance, "Managing Wet Weather with Green Infrastructure: Green Streets".

Region	Region/County	Permit Reference	Regional Board
4	Los Angeles	Order No. R4-2012-XXXX NPDES No. CAS004001	LARWQCB
4	Ventura	Order No. R4-2010-0108 NPDES No. CAS004002	LARWQCB
5	Central Valley	Order No. R5-2008-0142 NPDES No. CAS004003	CVRWQCB
5	Sacramento	Order No. R5-2008-0142 NPDES No. CAS082597	CVRWQCB
8	Riverside (SAR)	Order NO. R8-2010-0033 NPDES NO. CAS618033	SARWQCB
8	Orange (SAR)	Order NO. R8-2009-0030 NPDES NO. CAS618030	SARWQCB
8	San Bernardino	Order NO. R8-2010-0036 NPDES NO. CAS618036	SARWQCB

Copermittee Request:

We request that road projects be treated differently than other types of land development projects because of public safety and their unique characteristics compared to traditional land development.

6. *If a project is unable to comply with the HMP requirements at the site, how far away from the site can the project proponent place their retentions basins? What other limitations exist when not placing a BMP on site? There is a concern that low income areas will become targets for placement of retention basins. {Tomas Morales}*

   San Diego County Copermittee Response

   No response to this question.

Cost

1. *What is the cost of not implementing the provision in the Tentative Order? (e.g. beach closures, ill health that taxpayers have to pay for through their private health plans or public costs, deaths...) {Henry Abarbanel}*

   San Diego County Copermittee Response

   No response to this question.

2. *Lots of big cost numbers were used during the meeting. (e.g. $2 to $4 billion over 20 years) How much do the Copermittees spend now? What is being spent now and on what? {Henry Abarbanel}*

   San Diego County Copermittee Response

   Please see the response to Question #3 below.

3. *What is the breakdown of costs? What is the timeframe of these costs? How much is already being spent? {Tomas Morales}*

San Diego County Copermittee Response to Questions 2 and 3

Recent Storm Water Program Implementation Costs for Copermittees

As previously stated by the Copermittees during the focused meeting process, current costs already represent over $150 million annually. As detailed below, Project I Beaches and Creeks Bacteria TMDL (Bacteria TMDL) would add $144 million to $272 million per year, in addition to the current programmatic costs.

Current Annual Costs	$150 million
Bacteria TMDL Costs	$144 - 272 million
Total Annual Cost	**$294 – 422 million**

Bacteria TMDL Costs

Full implementation of the Bacteria TMDL is to be complete within 10 years of the effective date (April 4, 2011) for both wet and dry weather TMDLs, unless an alternative compliance schedule is approved as a part of a Comprehensive Load Reduction Plan (CLRP). If a CLRP is approved by the Regional Board, Copermittees must achieve compliance with the wasteload allocation (WLAs) within 20-years, by 2031.

The Bacteria TMDL addresses 1,738 square miles throughout the region, with implementation efforts spanning multiple city and county jurisdictions. The costs of implementation efforts over the entire compliance schedule are still being determined as CLRPs are being developed. However, preliminary cost estimates have been compiled from various references.

Costs from the Bacteria TMDL Technical Report

Section 12.6 of the Regional Board's Bacteria TMDL Technical Report (2010) includes economic factors, or ranges of cost estimates for various TMDL implementation activities. The following summarizes some of the estimates generated by Board staff (monitoring is not included):

- **Education and Outreach:** up to $211,000 *per program*
- **Structural BMPs:** $500,000 to $9.73 billion *per watershed*
- **Yearly maintenance:** $10,000 to $68 million *per watershed*

Costs from the Comprehensive Load Reduction Plans

CLRPs were submitted to the Regional Board for five watersheds in the San Diego Region. The CLRPs include recommendations for various activities to address bacteria and other pollutants in the watersheds, including:

- Nonstructural BMPs (e.g., street sweeping, public education, inspections)
- Decentralized structural BMPs (e.g., bioretention, green streets, porous pavement)
- Centralized structural BMPs (e.g., regional detention facilities)
- Special studies to better understand sources of impairments, appropriate BMPs, etc.
- Monitoring to evaluate BMP effectiveness, compliance to receiving water quality objectives, and overall achievement of the objectives of the CLRPs

Based on the CLRPs submitted for the San Diego Region, costs for the above activities were estimated through a robust modeling process to range from $2.6 billion to $4.9 billion over the 20 year compliance schedule. This would more than double current program costs.

Copermittee Request:

Incorporate the recommendation shown in response to TMDL Question #4.

Total Maximum Daily Load (TMDL)

1. *Can the Copermittees meet the bacteria levels that are specified in the Total Maximum Daily Loads (TMDLs)? What sorts of technologies are available to the Copermittees to treat bacteria to the levels specified in the TMDLs? {Grant Destache}*

   San Diego County Copermittee Response

   Please see the response to Question #5.

2. *Can the Copermittees achieve adequate waste load reductions in MS4 discharges to meet the effluent limitations and compliance dates for bacteria in the Tentative Order? {Grant Destache}*

   San Diego County Copermittee Response

   Please see the response to Question #5.

3. *What are the benefits of BMP based compliance with the TMDLs for bacteria compared to compliance with Water Quality Based Effluent Limitations (WQBELs)? {Grant Destache}*

   San Diego County Copermittee Response

   According to USEPA guidance[1], water quality based effluent limitations can either be expressed as numeric limits or as BMPs. As stated by USEPA and NRDC representatives during their comments at the November 13 workshop, BMP-based WQBELs are allowed as long as BMP strategies (as described in the WQIPs) are measureable and have sufficient scientific and engineering rigor. The Copermittees have fully embraced the WQIP approach and are prepared to develop scientifically-based WQIPs that will result in improved water quality.

   The proposed approach to WQBELs will have a profound effect on the Copermittees' storm water programs. The draft Tentative Order currently requires compliance with end-of-pipe, numeric, concentration-based WQBELs, which will require a "brute force" approach to TMDL implementation, addressing every single outfall in every watershed. If the WQBELs were expressed as BMPs (as envisioned when the TMDL was originally adopted), Copermittees would have much greater opportunity to implement innovative, watershed-based implementation plans (e.g., WQIPs). The BMP-based WQBELs are trackable and enforceable, and Copermittees would be out of compliance if they did not implement the committed-to BMPs. Overall, BMP-based WQBELs would provide the Copermittees many advantages over numeric WQBELs, as follows:

   - **BMP-based WQBELs will improve the ability of Copermittees to secure the funding needed to implement BMPs:** In order for storm water programs to achieve the pollutant reductions needed to attain TMDL wasteload allocations, we must garner broad public support for the needed projects/BMPs. In our experience, this support hinges on whether

[1] Memorandum (Revised) from Denise Keehner, Director of OWOW and James Hanlon, Director of OWM to Regional Water Division Directors: Establishing TMDL Wasteload Allocations (PDF) http://www.epa.gov/npdes/pubs/establishingtmdlwla_revision.pdf

rate payers and other members of the public perceive projects as likely to be successful (i.e., the projects improve water quality and result in compliance with the permit). Given the overwhelming number of water quality challenges across our jurisdictions and the compounding costs to address those challenges, it is increasingly difficult for water quality projects to receive the acceptance necessary to attain funding. Given the estimated billions of dollars in costs that will be required to implement the Bacteria TMDL (as described above) it will be necessary to seek additional funding from the public. Without the linkage between BMPs/projects and TMDL compliance, major expenditures to comply with TMDLs are perceived as "risky", with the risk being that projects are implemented (based on a scientifically-robust plan) yet the Copermittees may still be deemed to be out of compliance with its MS4 permit. BMP-based WQBELs will increase public support for funding measures to implement storm water quality BMPs/projects.

- **BMP-based WQBELs would promote innovative WQIPs, and lead to an integrated, watershed-based permitting approach:** During the Focused Meetings and Workshop, all stakeholders have expressed support for the watershed-based (WQIP) approach to permitting. The WQIPs could serve as the vehicle for identifying cost-effective, innovative BMP strategies. For development of the Comprehensive Load Reduction Plans (CLRPs), the Copermittees developed watershed-scale BMP modeling systems to create BMP strategies. Application of BMP-based WQBELs (instead of concentration-based WQBELs) would foster continued refinement of these modeling systems and creation of next-generation TMDL implementation approaches. These approaches are most likely to include multi-use BMPs that support open space in the region and sustainable LID practices that would promote infiltration to increase regional groundwater supplies. If the WQBELs are expressed as end-of-pipe concentrations, the type and location of BMPs will be greatly constrained given the need to focus resources on each individual outfall rather than through a watershed approach, and innovative strategies would be stymied.

- **BMP-based WQBELs better reflect the nature of storm water management:** MS4s are faced with highly variable flows and transient pollutant sources, and thus uncertainty is an inherent aspect of our program. Design and implementation of storm water BMPs is challenging due to the nature of storm water and the types of treatment systems that are available. The State Water Board's Blue Ribbon Panel of Experts[2] concluded the following:

  > "Even for conventional pollutants, there presently is no protocol that enables an engineer to design with certainty a BMP that will produce a desired outflow concentration..." [page 6]

  In other words, the state of the science is in *direct conflict* with the concentration-based, end-of-pipe WQBELs that are currently in the Order. BMP-based WQBELs would allow the Copermittees to focus on the highest impact outfalls (not all outfalls are created equal in terms of their effect on receiving waters) and use green/low impact development (LID) practices to reduce *flows* instead of being "locked in" to concentrations.

To reiterate, BMP-based WQBELs are allowed by USEPA, which was stated by USEPA and NRDC representatives at the November 13 workshop. If these stakeholders acknowledge that BMP-based WQBELs are allowed under certain conditions, and the Copermittees are ready to meet those conditions by developing scientifically-based WQIPs, then why not revise the Order to promote innovative, watershed-based approaches?

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[2] *The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial, and Construction Activities.* Storm Water Panel Recommendations to the State Water Board. June 2006. http://www.swrcb.ca.gov/water_issues/programs/stormwater/docs/numeric/swpanel_final_report.pdf

Copermittee Request:

Revise language in Attachment E.6.b and Attachment E.6.e to incorporate BMP based WQBELs through a Regional Board EO approved WQIP as allowed by the TMDL.

4. *Address the issues that Ruth Kolb, City of San Diego raised regarding the Bacteria TMDLs. Clarify how we incorporated the Bacteria TMDLs into the Tentative Order to demonstrate that we incorporated it into the Tentative Order the way it was intended to be implemented. {Eric Anderson}*

San Diego County Copermittee Response

As described above, the Phase I Bacteria TMDL represents an enormous undertaking for the Copermittees. The TMDL went through a significant public process where the technical and policy elements were discussed and ultimately adopted by the Regional Water Board. The Copermittees have already begun implementing the requirements of the TMDL, and the requirements to submit Comprehensive Load Reduction Plans (CLRPs) will be met in all applicable watersheds. These CLRPs will be an important resource for Copermittees as WQIPs are developed in accordance with the Tentative Order. However, the approach by which the TMDL is currently incorporated into the Tentative Order (in Attachment E) can have a profound impact on the Copermittees' TMDL implementation efforts. The current approach of the current Tentative Order has greatly and unnecessarily increased the stringency of the TMDL, in that it requires more BMPs than are needed to meet TMDL wasteload allocations (WLAs) and implementation schedules will be shorter. The current approach of the Tentative Order goes against the intent of the TMDL that was adopted by the Board.

There are four key areas where the Tentative Order could be improved to better reflect the TMDL and allow for consistency with the efforts completed to date, as presented in the table below, and described in the following subsections:

Concern	TMDL	Tentative Order	Copermittee Request
Reopener	TMDL contains an explicit reopener provision	No specific TMDL reopener	Include language in Provision H (Modification of Programs) and Attachment E acknowledging the TMDL reopener and describe how the Permit will be modified to reflect the TMDL reopener.
Revision to Interim Milestone Compliance Dates	TMDL contains specific language allowing for the revision of interim milestones based on CLRPs	No acknowledgement of the ability to revise the interim schedules	Include language in Attachment E 6.c.2.c acknowledging that the interim compliance dates may be revised based on alternative interim compliance dates provided in a BLRP/CLRP (or WQIP) accepted by the San Diego Regional Board Executive Officer.
BMP-Based WQBELs	TMDL states that WLAs will be incorporated as BMP-based WQBELs	No BMP-based WQBELs are incorporated nor is an allowance for a BMP-based approach provided	Revise language in Attachment E.6.b and Attachment E.6.e to incorporate BMP based WQBELs through a Regional Board EO approved WQIP as allowed by the TMDL.
Mass-based WLAs	TMDL assigns mass-based WLAs to MS4 Copermittees	No mass-based WLAs are incorporated into the permit as WQBELs, rather concentration based WQBELs are used.	Replace concentration based effluent WQBELs with mass-based effluent WQBELs.

TMDL Reopener not Acknowledged in the Permit

A TMDL reopener is scheduled to occur during the term of the permit, and Copermittees consider the reopener to be a critical component of the TMDL. During the TMDL adoption process, the Regional Water Board members added the reopener provision *during the adoption hearing* to address Copermittees concerns. The Copermittees have placed much weight on the reopener as an opportunity to add to the knowledge and improve upon a number of the technical aspects of the TMDL through additional data collection efforts. Data is already being collected to address the reopener, including the Reference Watershed Study. Given the significant efforts the Copermittees to improve our understanding of the science, it is imperative the Order recognizes the importance of the TMDL reopener and describe how the Order will reflect the TMDL after it is revised. We would greatly appreciate the inclusion of language into both Provision H (Modification of Programs) and Attachment E to acknowledge the reopener. The language should outline a process by which the Order will be reopened and revised to reflect the revised TMDL after it is adopted.

Ability to Revise Interim Milestone Compliance Dates for Copermittees Submitting CLRPs

As discussed in the TMDL and noted in the TMDL Implementation Milestone schedule (see page A70/71), alternative interim milestone compliance dates may be proposed in BLRPs or CLRPs to reflect the implementation approach selected by Copermittees. The Tentative Order does not currently acknowledge or allow for alternative interim compliance dates. The BLRPs and CLRPs to be submitted by Copermitees will likely propose alternative interim compliance dates, as allowed by the TMDL, to meet the 50% reduction milestone for dry and wet weather. The CLRPs submitted by Copermittees may propose different interim compliance dates for different watersheds, and the Order should acknowledge the flexibility allowed by the TMDL (see page 68 of Attachment A of the Basin Plan Amendment). We would greatly appreciate the inclusion of language into Attachment E 6.c.2.c acknowledging that the interim compliance dates may be revised based on alternative interim compliance dates provided in a BLRPs/CLRPs (or WQIP) that are accepted by the San Diego Regional Board Executive Officer.

BMP-based WQBELs are not Incorporated into the Permit

As stated under the header of "Implementation of TMDLs" on page 12 of the TMDL Resolution:

> "WQBELs may be expressed as numeric effluent limitations, when feasible, and/or as a best management practice (BMP) program of expanded or better-tailored BMPs[3]. The WQBELs will likely need to include a BMP program to achieve the load reductions required to attain the TMDLs in the receiving waters. The Phase I MS4s and Caltrans will be required to submit Bacteria or Comprehensive Load Reduction Plans outlining a proposed BMP program that will be capable of achieving the necessary load reductions required to attain the TMDLs in the receiving water."

Additionally, in the discussion of the incorporation of the TMDL into the MS4 permit on page A41, the TMDL clearly states the intent to consider the expression of WQBELs as BMPs:

"In addition to the discharge prohibitions and receiving water limitations, WQBELs consistent with the assumptions and requirements of the WLAs of any applicable TMDL must also be incorporated into the NPDES requirements. The San Diego Water Board will revise and re-issue the WDRs and NPDES requirements for Phase I MS4s to incorporate the following:

- WQBELs consistent with the requirements and assumptions of the Municipal MS4 WLAs. WQBELs may be expressed as numeric effluent limitations, when feasible, and/or as a BMP program of expanded or better-tailored BMPs.[4]
- If the WQBELs include a BMP program, periodic reporting requirements on BMP planning, implementation, and effectiveness in improving water quality at impaired beaches and creeks (i.e., progress reports). Progress reports will also be required to include water quality monitoring results. Progress reports will be required as long as necessary to ensure that the beneficial uses of the impaired water bodies have been restored and maintained.
- Compliance schedule for Phase I MS4s to attain the MS4 WLAs and TMDLs in the receiving waters."

The concept and stated intent of allowing for the incorporation of BMP-based WQBELs into the MS4 permit is repeated throughout the TMDL. However, the Tentative Order does not incorporate this approach into Attachment E.6. Copermittees believe the WQIPs can and should be used as the

[3] Code of Federal Regulations Title 40 section 122.44(k)(2)&(3)

[4] Code of Federal Regulations Title 40 section 122.44(k)(2)&(3)

basis for establishing BMP-based WQBELs. The TMDL envisioned the CLRPs would satisfy this requirement and the WQIPs required by the Tentative Order could and should be viewed as a natural extension of the CLRP requirement. The WQIPs can outline the BMPs, a corresponding schedule, and provide, through a robust technical analysis, reasonable assurance that BMPs are expected to meet the TMDL requirements consistent with EPA's expectations. We would greatly appreciate the revision of language in Attachment E.6.b and Attachment E.6.e to incorporate BMP-based WQBELs through a Regional Board EO approved WQIP as allowed by the TMDL.

TMDL Expresses MS4 WLAs on a "Mass-Basis", but Order uses Concentrations

To quantify the amount of bacteria that could be discharged from MS4s while the creeks and beaches still attain WQOs, the TMDL used mass-based wasteload allocations (WLAs). As stated in the TMDL:

"Each mass-load based TMDL is allocated to known point sources and nonpoint sources. WLAs are assigned to point sources and load allocations (LAs) are assigned to nonpoint sources. WLAs and LAs are the ***maximum load a source can discharge*** and still achieve the TMDL in the receiving water." [emphasis added]

The TMDL presents the assigned mass-based loads in a series of tables that define current loads, allowable loads (i.e., MS4 WLAs), and the percent reduction needed in the current loads to attain the allowable loads. It is clear the TMDL intended these mass-based WLAs and/or percent reductions to be incorporated into the MS4 permit(s).

In contrast, the Tentative Order expresses WQBELs as *concentrations.* Instead of allowing the MS4s to manage their bacteria loading (both flow and concentration) on a watershed-basis, the Order requires that every single outfall meet the WQOs at the end of the pipe (prior to discharge). This approach is extremely stringent, and would greatly increase the cost of TMDL implementation without added environmental benefit. The Copermittees should have the flexibility to address the outfalls in the watershed that have the biggest impact on water quality, rather than be required to address every single outfall. During source investigation analyses for the Los Angeles River Bacteria TMDL, it was estimated the TMDL could be achieved by addressing the loads from the 20% of the outfalls that were highest-ranked in terms of bacteria loading[5]. The current Order does not allow for such a ranking/prioritization; it unnecessarily requires that 100% of outfalls be addressed, which could increase implementation requirements by a factor of five (100% instead of 20%). The concentration-based approach is not a good use of the Copermittees resources, and it will not result in greater environmental benefit to our watersheds.

In summary, the TMDL clearly established mass-based TMDLs, assigned a portion of the TMDLs to the MS4 via mass-based WLAs, and intended for those loads to be incorporated into the MS4 permit(s). However, no mass-based WLAs are incorporated into the Permit as WQBELs or otherwise. The concentration based effluent WQBELs in the Permit should be replaced with the mass-based effluent WLAs consistent with the TMDL. Alternatively, and at a minimum, the Permit should incorporate the mass-based WLAs as effluent WQBELs as an option so that Copermittees who are meeting the TMDL WLAs are in compliance with the Permit.

5. *Throughout the presentation, it was said that it is infeasible to cleanup bacteria. Provide an explanation as to why, it is not the case, that the cleanup of bacteria is infeasible. IN OTHER WORDS... Explain why it is in fact feasible to cleanup bacteria. Is it feasible to cleanup bacteria to the levels in the TMDLs? {Tomas Morales}*

[5] Los Angeles River Watershed Bacteria TMDL Staff Technical Report. Page 88.
http://www.waterboards.ca.gov/losangeles/board_decisions/basin_plan_amendments/technical_documents/80_New/LARiverFinal/Staff%20Report%20LAR%20Bact%2015Jul10%20final.pdf

San Diego County Copermittee Response to Questions 1, 2 and 5

Two main types of technologies are available to potentially treat bacteria to the levels specified in the TMDLs: non-structural and structural BMPs. These technologies and their ability to meet the effluent limits for bacteria specified in the Tentative Order were researched in the development of the Bacteria TMDL CLRPS and are discussed below.

Bacteria Water Quality Standards are Not Consistently Attainable by Non-Structural Source Controls Only

Because of their low cost relative to structural treatment controls, the first emphasis during the development of the Bacteria CLRPs was to exhaustively explore non-structural options to control bacteria at the source. Non-structural BMPs include outreach, inspection, and enforcement-based programs, such as those targeting homeowners to address over-irrigation and car washing as sources of dry weather runoff, pet owners to address pet waste, and food outlets to address sidewalk hose-down and proper trash and grease trap management. Non-structural BMPs also include illicit discharge detection and elimination programs, including efforts to identify sources of human waste into the MS4, such as recreational vehicle discharges and leaking sewer lines (where such flows may re-emerge into nearby stormdrains). Street sweeping and catch basin cleaning are also emphasized and intended to remove sources of sediment, trash and organic litter, all of which may contribute bacteria to the MS4.

Non-structural BMPs are essential components of the CLRPs, and their effectiveness was quantified to the extent possible based on available data. The CLRP analyses found these collective BMPs to achieve MS4 bacteria load reductions of 8 to 43% during dry weather and 5 to 29% during wet weather; wide ranges are necessary due to the significant uncertainty associated with the effectiveness of such programs. However, even with the most optimistic assumptions, a thoroughly exhaustive and comprehensive implementation of non-structural BMPs can simply not achieve compliance with the TMDL WLAs. This is partly because outreach, inspection, and enforcement can never achieve perfect control outcomes (i.e., some target groups will miss outreach, some behaviors won't change, and some activities will miss inspection). This is also partly because some urban bacteria loads are not addressable by such programs (e.g., biofilms in storm drains consistently grow and then mobilize whenever flows are present, such as during one of the many allowed dry weather flow sources like groundwater inflow and infiltration, and fire hydrant testing). Evaluations of the effectiveness of other source controls, such as sweeping and cleaning programs, have indicated that they are not able to capture 100% of sediments and organic debris.

Bacteria Water Quality Standards are Not Attainable by Using Structural BMPs

Because of limitations in the effectiveness and consistent performance of non-structural BMPs, more costly and time-intensive (i.e., longer time to implement), structural BMPs are described in the CLRPs in order to provide additional, more effective and controllable bacteria reduction. Dry weather structural BMPs potentially include localized infiltration, diversions to sewer, and disinfection. During wet weather, however, many of these BMPs are often not feasible because flow rates are substantially greater and more variable, and considerable transient storage would be required. In general, more natural, passive, and sustainable wet weather structural BMPs are preferred and recommended (as opposed to energy-intensive, mechanical systems). The International Stormwater BMP Database was used to help evaluate and predict performance of such BMPs. Statistically evaluated monitoring data from the database, however, indicate that many structural BMPs are not capable of achieving REC WQOs with the consistency, frequency, and predictability required by the TMDL and a corresponding load reduction plan. The CLRPs also describe other structural BMPs for wet weather controls such as subsurface flow wetlands (which have less performance data available but initial datasets suggest a relatively high level of effectiveness) and "zero discharge" types that rely on infiltration (e.g., infiltration trenches and basins) or capture and use (e.g., rainwater harvesting cisterns). These BMPs are effective for bacteria but are subject to local and site-specific constraints,

which must be evaluated before implementation. For instance, infiltration BMPs are not appropriate for areas with relatively impervious soils, shallow groundwater, steep hillsides, subsurface contamination, or close proximity to certain structures. Similarly, capture and use BMPs are not cost effective for areas with little available water demand (such as minimal landscaping irrigation needs) or where water demand is temporally inconsistent with available supply (frequently the case in the arid southwest where rainfall occurs during one season while peak irrigation demands occur during a different period).

Even Combining Structural and Non-Structural BMPs, Consistent and Reliable Attainment of Bacteria Standards is not Possible

In order to reduce existing wet weather MS4 bacteria concentrations with the objective of meeting TMDL waste load allocations (with some regularity), no potential and reasonable non-structural and structural BMPs are excluded from the currently developed CLRPs. Many Los Angeles area MS4 Copermittees include the same strategy in their TMDL Implementation Plans.

There remain numerous examples where exhaustive non-structural and structural BMP efforts were conducted, and significant costs expended, without the desired (or initially predicted) outcome of compliance.

- In Santa Barbara, extensive storm drain investigations were conducted using conventional techniques (e.g., CCTV, visual flow observation, automated flow rate measurement, wastewater chemical indicators, bacteria sampling, dye testing, etc.) as well as more novel ones (e.g., canines scent trained for human waste, and human waste genetic markers) to seek inputs of human waste. As a result, RV discharges and leaking sewer lines were identified and immediately addressed. Despite these efforts, however, channel and creek indicator bacteria levels are unchanged.
- At the Santa Monica Pier, BMPs included bird netting, trash covers, homeless enforcement, prevention of pier washing, repair of leaking sewer, major dry weather storm drain diversion and potable offset use, and human source marker sampling to confirm that human fecal sources were indeed removed. Despite these significant efforts, however, beach bacteria concentrations improved but TMDL exceedances persist.
- At Inner Cabrillo Beach in the Port of Los Angeles, BMPs and studies included circulation enhancement pilot testing, bird deterrent testing, dry weather storm drain diversions, sewer inspection and groundwater sampling, eelgrass sampling (eelgrass was found to be a natural source of indicator bacteria), human source marker sampling, and beach sand replacement (since beach sands were found to be a reservoir for indicator bacteria). Again, despite several million dollars spent at this one beach, TMDL WLA exceedances persist.
- At Ramirez Canyon in Malibu, where dry weather flows are disinfected at the beach, surf zone water quality continues to exceed TMDL WLAs.

It therefore stands to reason that if the comprehensive bacteria removal of dry weather flows (coming at a very high cost when every creek and beach in the San Diego TMDL is considered) does not result in receiving water TMDL compliance, uncertainty must remain during wet weather conditions (which would require a cost significantly greater than for dry weather). As such, consistent and reliable compliance with TMDL standards and recreational bacteria water quality objectives is infeasible.

Copermittee Request:

Include language in Provision H (Modification of Programs) and Attachment E acknowledging the TMDL reopener and describe how the Permit will be modified to reflect the TMDL reopener.

Other

1. *Clarify the Tentative Order is a one size fits all approach. Is the Water Quality Improvement Plan a one size fits all approach? {Grant Destache}*

   San Diego County Copermittee Response

   The Permit provides considerable flexibility in many places, but a critical example of a one-size-fits-all approach is land development. While the Permit uses the concept of a Water Quality Improvement Plan to allow Copermittees to define priorities on a watershed basis and to tailor programs and BMPs based on the specific needs of each watershed, **the Permit takes a one size fits all approach to development planning standards**. Specifically, the sizing criteria to meet pollutant removal and hydromodication BMPs are very prescriptive in the Permit. The sizing criteria are the same for all projects regardless of pollutant removal efficiencies, soil retention capacities and susceptibility to erosion.

Copermittee Request:

We request that the Permit allow adaptive management to establish sizing criteria on a watershed level, and to propose in the Water Quality Improvement Plans adjustments to the Board recommended standards. This would allow Copermittees to define areas where more attention is needed and areas where applying the fixed standards does not provide a significant water quality benefit.

2. *Further explain the Illicit Discharge Detection and Elimination Requirement in Provision E.2.a (1) and (3) of the Tentative Order that pertains to discharges from footing drains and fountain drains. {Eric Anderson}*

   San Diego County Copermittee Response

   No response to this question.

Sincerely,

CID TESORO, Manager
Department of Public Works

Cc: David Gibson
Eric Becker
Laurie Walsh

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

BOARD MEETING PARTICIPATION SIGN-IN SHEET

DECEMBER 12, 2012 – 9:00 A.M. – SAN DIEGO

Name (Please Print Legibly)	Representing	Telephone No.
Jeff O'Connor ✓	OTAY LAND Co.	760-918-8200
ERIC COMELI	RCFC&WCD	951 955 8589
Claudio Padres ✓	"	951 955 8802
Claudia Stridiney	RiV Co Transportation Dep	951-955-1694
Drew Kleis ✓	City of San Diego	858-541-4329
Ruth Kolb ✓	City of San Diego	858 541 4828
Tammy Dunpar	City of Solana Beach	858-720-2487
Deborah Lee	Coastal Commission	(619) 767-2370
DENNIS BOWLING ✓	RICK ENGINEERING	619 698 1447
STEVE HORN	County of Riverside	951. 955. 1186
Erik Ruehr ✓	San Diego Highway Development Association	858 1361-7151
Paul Manasjan	SDCR Airport Authority	(619) 400-2783
Bryn Evans ✓	VRS for Industrial Environmental Association	858 8129292
Michael Blankinship ✓	Sepro Corp	530 757-0941
Dennis Davies	CITY OF EL CAJON	619-441-1661
JAIME LAMPOS	CITY OF EL CAJON	619-441-5554
ROBIN MADDFFER	WESTFIELD	6199850940
James O'Day	County of SD	619 531-4869
GABRIELLE SKIPPER	MCB CAMP PENDLETON	
Lisa Zawaski ✓	Dana Point	949-248-3584
Nancy Gardiner	Weston Solution	760 795 6991
Robert Collacott ✓	VRS	714 6875146
Lee Kaminetz	San Diego County Reg Airport Auth	619-400-2429
BILLY WALKER	OCEANSIDE	760 435 5164
Rosanna Lacarra ✓	City of Coronado/La Jolla CEW	760-533-1875
John Emerson	Palomar College	760 744 1150
GARY REIST ✓	DEL MAR FAIRGROUNDS	858-692-4752
Trevor Alsop	Geosyntec	619-810-4020
D. CRAIG BARILOTTI ✓	SUNSET CLIFFS ASSOCIATION	(619) 223-9335
Karen Cowan ✓	Larry Walker Assoc.	310-394-1036

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

BOARD MEETING PARTICIPATION SIGN-IN SHEET

DECEMBER 12, 2012 – 9:00 A.M. – SAN DIEGO

Name (Please Print Legibly)	Representing	Telephone No.
Deborah Mosley	San Diego Copermittees	619-204-5831
MIKE NAGY	SD CHAMBER OF COMMERCE	619 544-1378
LEAH HEMZE ✓	" " "	619 544-1361
BRIAN DIAZ	RECURPO & ASSOC.	949-429-6300
TROY BANKSTON	SD COUNTY	858 694-2125
Todd Snyder ✓	SD County	858 694-3482
Elaine Lukey	City of Carlsbad	760-602-7582
James Wood	City of Carlsbad	760-602-3384
Lisa Skutecki	Brown + Caldwell	858-571-6739
Christian Braun	Geosyntec Consultants	858-220-1367
Chris Minton	Larry Walker Associates	310 743 6235
BRAD FOWLER ✓	CITY OF DANA POINT	949 248 3582
JEVEE TAGARAO	PURE EFFECT / GSA	714 459-4306
Kelly Tait	AMEC	858-300-4341
Stephanie Gaeino	County SD NPP	8-694-3493
Mo. Lahsaie	city of Oceanside	760-435-5803
Cynthia Mallett	" " "	760-435-5807
KEN SUSILO ✓	GEOSYNTEC CONSULTANTS	310 957 6100
Kim Williams	Geosyntec	619 840 0878
Kim Godby	Coronado	619-522-7387
HELEN DAVIES	CITY OF SANTEE	619 258 4100 x179
W GAIEN	SDG&E	
Eric Lardy	SD County	619 531 6257
Heather Stroud ✓	City of SD	619 533 5872
Cheryl Filar	Escondido	760-839-6315
Mikhail Ogawa	City of Del Mar	619 454 7074
Christine Sloan ✓	County of San Diego	858-495-5257
Doug Johnson	Stantec Consulting	949 923-6297

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

BOARD MEETING PARTICIPATION SIGN-IN SHEET

DECEMBER 12, 2012 – 9:00 A.M. – SAN DIEGO

Name (Please Print Legibly)	Representing	Telephone No.
MICHAEL STEDNITZ	FIREWORKS AMERICA	619.456-7441
Julia Chunn-Heer	Surfrider San Diego	619-246-8881
KHOSRO AMINPOUR	CITY OF CHULA VISTA	619-397-6111
Michael Welch		858-625-0167
RICHARD BOON	COUNTY OF ORANGE	
MICHAEL McSWEENEY	BIA	858-514-7004
James Fortuna	County of Orange	714-955-0600
Amanda Archerfeld	AMEC	858-514 6468
Sumer Hasenin	City of San Diego	858-541-4330
JACK MONGER	IEA	619 522-9000
Paul Hartman	City of Vista	760 726-1340
ERIK STEENBRICK	CITY OF ENCINITAS	760-943-2108
ERIC MOSOLGO	TETRA TECH	858-268-5746
Erica Ryan	City of San Marcos	760 744 1050 X3218
Faith Picthing	BIDCOM	(858) 455-0300 x113
Chris Helmer	City of Imperial Beach	~~619-351-3412~~
RICHARD LEDA	SAN DIEGO AIRPORT AUTH	858-800-8045
Kelly Barker	City of Del Mar	619-993-4853
Jennifer Shook	County of Orange	714-955-0671
JAY SHRAKE	AMEC	858-514-6459
MaryAnne Skorpanich	County of Orange	714.955.0601
DAVID GARCIA	RIVERSIDE CO. FLOOD & WATER CON	951.955.1330
Gursaran Dadkhah	City of National City	858 586 6600

NAME: Leah Hemze

AGENDA ITEM NO. 11

005437

REQUEST TO ADDRESS REGIONAL BOARD

DURING PUBLIC FORUMS, STATUS REPORTS, WORKSHOPS AND OTHER NON-ACTION ITEMS

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Acting Executive Director, SD Regional Chamber

ADDRESS: 402 W Broadway, San Diego TELEPHONE: (619) 544-1361

State your name and address (spell your last name) for the record prior to beginning your presentation. Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

Meeting Date: 12/12/12 Signature: Leah

Cons

005438

NAME: ~~Livia Borak~~ Jim Witkowski (for Hope) AGENDA ITEM NO. 11

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Coastal Environmental Rights Foundation (CERF)

ADDRESS: 1140 S. Coast ~~[illegible]~~ Hwy 101 Encinitas CA 92024 TELEPHONE: 760-942-8505

State your name and address (spell your last name) for the record prior to beginning your presentation. Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

OATH: I, Livia Borak hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 12/12/2012 Signature: [signature]

Costs

NAME: Todd Snyder

AGENDA ITEM NO. Workshop ✓ 11

005439

REQUEST TO ADDRESS REGIONAL BOARD

DURING PUBLIC FORUMS, STATUS REPORTS, WORKSHOPS AND OTHER NON-ACTION ITEMS

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: County of San Diego

ADDRESS: 5510 Overland Ave, San Diego, CA 92123 TELEPHONE: 858-694-3482

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

Meeting Date: 12/12/12

Signature: Todd Snyder

CASTR

✓

NAME: Mary Anne Skorpanich

AGENDA ITEM NO. 11

005440

REQUEST TO ADDRESS REGIONAL BOARD

DURING PUBLIC FORUMS, STATUS REPORTS, WORKSHOPS AND OTHER NON-ACTION ITEMS

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Manager, OC Watersheds @ County of Orange

ADDRESS: 2301 N. Glassell St., Orange

TELEPHONE: 714.955.0601

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

Meeting Date: 12.13.2012

Signature:

NAME: Bryn Evans

AGENDA ITEM NO. 11

005441

REQUEST TO ADDRESS REGIONAL BOARD

DURING PUBLIC FORUMS, STATUS REPORTS, WORKSHOPS AND OTHER NON-ACTION ITEMS

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: URS representing Industrial Environmental Association (IEA)

ADDRESS: 4225 Executive Square

TELEPHONE: 858 812922

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

Meeting Date: 12-12-12

Signature: Bryn

RE: REGIONAL MS4 PERMIT

REQUEST: IF POSSIBLE, PRIOR TO 3:30PM

005442

NAME: Rosanna Lacarra

AGENDA ITEM NO. 11

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

Footing Drain Issue

PLEASE PRINT LEGIBLY

TITLE/AFFILIATION: San Diego Copermittees / LaRoc Environmental

ADDRESS: PO Box 324, Carlsbad, CA 92018 TELEPHONE: 760-533-1875

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

OATH: I, Rosanna Lacarra hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 12/12/2012

Signature:

005443

NAME: Lisa Zawaski

AGENDA ITEM NO. 11

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Sr. W.Q Engineer Dana Point

ADDRESS: 33282 Golden Lantern Dana Point TELEPHONE: 949-248-3584

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

OATH: I, Lisa Zawaski hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 12-12-12 Signature:

TMDL

005444

NAME: Karen Cowan
* to follow Richard Boon

AGENDA ITEM NO. 11

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Larry Walker Associates, on behalf of the County of Orange

ADDRESS: _____ TELEPHONE: _____

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

OATH: I, Karen Cowan hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 12/12/12 Signature: [signature]

TMDLs

005445

NAME: KEN SUSILO

AGENDA ITEM NO. 11

REQUEST TO ADDRESS REGIONAL BOARD

DURING PUBLIC FORUMS, STATUS REPORTS, WORKSHOPS AND OTHER NON-ACTION ITEMS

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: PRINCIPAL / GEOSYNTEC

ADDRESS: 3415 S. SEPULVEDA, SUITE 500, LOS ANGELES

TELEPHONE: 310 957 6100

State your name and address (spell your last name) for the record prior to beginning your presentation. Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

Meeting Date: 12/12/12

Signature:

TMDL BACTERIAL ATTAINABILITY

005446

NAME: Drew Kleis

AGENDA ITEM NO. 11

REQUEST TO ADDRESS REGIONAL BOARD

DURING PUBLIC FORUMS, STATUS REPORTS, WORKSHOPS AND OTHER NON-ACTION ITEMS

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Program Manager, City of San Diego

ADDRESS: 9370 Chesapeake Dr, Ste100, San Diego, 92123 TELEPHONE: 858-541-4329

State your name and address (spell your last name) for the record prior to beginning your presentation. Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

Meeting Date: 12/12/12

Signature: [illegible]

TMDL

005447

NAME: MICHAEL McSWEENEY

AGENDA ITEM NO. 11

TMDL'S + COSTS

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: SR. PUBLIC POLICY ADVISOR for the BIA

ADDRESS: 9201 SPECTRUM CENTER BLVD 92123 TELEPHONE: 858 450 1221

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

OATH: I, michael mcsweeney hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 12 - 12 - 12 Signature: [signature]

TMDL

005448

NAME: Ruth Kolb

AGENDA ITEM NO. 11

REQUEST TO ADDRESS REGIONAL BOARD

DURING PUBLIC FORUMS, STATUS REPORTS, WORKSHOPS AND OTHER NON-ACTION ITEMS

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Program Manager, City of San Diego

ADDRESS: 9370 Chesapeake Dr, San Diego TELEPHONE: 858.541.4328

State your name and address (spell your last name) for the record prior to beginning your presentation. Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

Meeting Date: 12.12.12

Signature:

TMDLs

005449

NAME: Julia Chunn-Heer

AGENDA ITEM NO. 11

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Surfrider San Diego

ADDRESS: 9883 Pacific Heights Blvd Ste D 92121 TELEPHONE: 619-246-8881

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

OATH: I, Julia Chunn-Heer hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 12/12/12 Signature:

Hydromod

005450

NAME: ~~Erik Ruehr~~ AGENDA ITEM NO. 11

(If I am not present, please allow Richard Leja to speak on my behalf)

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Advocacy Chair / San Diego Highway Development Association

ADDRESS: 9520 Padgett St, Ste 213, San Diego CA 92126 TELEPHONE: 858 / 361-7151

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

OATH: I, Erik Ruehr hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 12/12/12 Signature: [signature]

HMORO MeO

005451

NAME: Julie Procopio

AGENDA ITEM NO. 11

REQUEST TO ADDRESS REGIONAL BOARD

DURING PUBLIC FORUMS, STATUS REPORTS, WORKSHOPS AND OTHER NON-ACTION ITEMS

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: City of Santee

ADDRESS: 10601 Magnolia Ave

TELEPHONE: 619 258 4100

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

Meeting Date: 12/12/12

Signature:

Hmoramos

005452

NAME: Jill Witkowski

AGENDA ITEM NO. 11

Q. Hydromod #1
Q. Cost #1, 3

REQUEST TO ADDRESS REGIONAL BOARD

DURING PUBLIC FORUMS, STATUS REPORTS, WORKSHOPS AND OTHER NON-ACTION ITEMS

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Waterkeeper San Diego Coastkeeper

ADDRESS: 2825 Dewey Rd TELEPHONE: _____

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

Meeting Date: _____ Signature: _____

Hydromod

1

005453

NAME: Claudio Padres

AGENDA ITEM NO. 11

REQUEST TO ADDRESS REGIONAL BOARD

DURING PUBLIC FORUMS, STATUS REPORTS, WORKSHOPS AND OTHER NON-ACTION ITEMS

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Senior Civil Engineer / RCFC&WCD

ADDRESS: 1995 Market St. Riverside CA TELEPHONE: 951-955-8602

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

Meeting Date: 12-12-12 Signature:

Hydrology

005454

NAME: Ryan Baron

AGENDA ITEM NO. 11

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Senior Deputy County Counsel

ADDRESS: _____ TELEPHONE: 714-834-5206

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

OATH: I, Ryan Baron hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 12/12

Signature: _____

Hydromod

005455

NAME: JEFF O'CONNOR

AGENDA ITEM NO. 11

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: OTAY LAND COMPANY

ADDRESS: 1903 WRIGHT PLACE CARLSBAD CA 92008

TELEPHONE: 760-918-8200

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

OATH: I, JEFF O'CONNOR hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 12/12/12

Signature: Jeff N. O'C

H:\0000000

005456

NAME: Jim Nabong

AGENDA ITEM NO. 11

REQUEST TO ADDRESS REGIONAL BOARD

DURING PUBLIC FORUMS, STATUS REPORTS, WORKSHOPS AND OTHER NON-ACTION ITEMS

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Civil Engineer, City of San Diego, Citizen

ADDRESS: 9370 Chesapeake Dr Suite 100 92123 TELEPHONE: 858-541-4327

State your name and address (spell your last name) for the record prior to beginning your presentation. Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

Meeting Date: Dec 12, 2012

Signature:

HYDROMOD

005457

NAME: DENNIS BOWLING AGENDA ITEM NO. 11

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: RICK ENGINEERING

ADDRESS: 5620 FRIARS RD SAN DIEGO TELEPHONE: 6192910704

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

OATH: I, DENNIS BOWLING hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 12/12/12 Signature:

Hybrano

005458

NAME: D. CRAIG BARILOTTI AGENDA ITEM NO. 11

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: SUNSET CLIFFS ASSOCIATION

ADDRESS: 4369 OSPREY ST, SAN DIEGO, CA 92107 TELEPHONE: (619) 225-9335

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

OATH: I, D. CRAIG BARILOTTI hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: DEC. 12, 2012 Signature: [signature]

SUNSET CLIFFS

Hundramos

NAME: Bob Gallagher

AGENDA ITEM NO. 11

005459

Regional MS4 Permit

REQUEST TO ADDRESS REGIONAL BOARD

DURING PUBLIC FORUMS, STATUS REPORTS, WORKSHOPS AND OTHER NON-ACTION ITEMS

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Riverside County Transportation Dept.

ADDRESS: _____ TELEPHONE: 714 697 5146

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

Meeting Date: 12/12

Signature: [signature]

Hudzomoo

NAME: Heather Stroud

AGENDA ITEM NO. 11

005460

REQUEST TO ADDRESS REGIONAL BOARD

DURING PUBLIC FORUMS, STATUS REPORTS, WORKSHOPS AND OTHER NON-ACTION ITEMS

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Deputy City Attorney / City of San Diego

ADDRESS: 1200 3rd Ave, Suite 1100, San Diego CA 92101

TELEPHONE: 619 533 5872

State your name and address (spell your last name) for the record prior to beginning your presentation. Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

Meeting Date: 12/12/12

Signature:

HYDROMOD - MITIGATION FEE

005461

NAME: RICHARD BOON

AGENDA ITEM NO. 11

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: COUNTY OF ORANGE

ADDRESS: _____ TELEPHONE: _____

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

OATH: I, RICHARD BOON hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 12/12/12

Signature: Richard Boon

Hydromo

005462

NAME: Sumer Hasenin

AGENDA ITEM NO. 14

REQUEST TO ADDRESS REGIONAL BOARD

DURING PUBLIC FORUMS, STATUS REPORTS, WORKSHOPS AND OTHER NON-ACTION ITEMS

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: City of San Diego, Land Development

ADDRESS: _____ TELEPHONE: 858-541-4330

State your name and address (spell your last name) for the record prior to beginning your presentation. Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

Meeting Date: Dec 12, 2012

Signature: Sumer Hasenin

Hydromod

005463

NAME: BRAD FOWLER

AGENDA ITEM NO. WORKSHOP

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: DIRECTOR OF PUBLIC WORKS, CITY OF DANA POINT

ADDRESS: 33282 GOLDEN LANTERN, DANA POINT, CA 92606 TELEPHONE: 949 248 3582

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

OATH: I, BRAD FOWLER hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 12-12-12

Signature: BRAD FOWLER

HYDROMOD

005464

NAME: Christine Sloan

AGENDA ITEM NO. II

REQUEST TO ADDRESS REGIONAL BOARD

DURING PUBLIC FORUMS, STATUS REPORTS, WORKSHOPS AND OTHER NON-ACTION ITEMS

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Chair, Land Development Workgroup, San Diego Copermittees

ADDRESS: County of San Diego

TELEPHONE: 858-495-5257

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

Meeting Date: 12/12/12

Signature:

ithoromod

005465

NAME: Jerry Engen

AGENDA ITEM NO. 11

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: WestField

ADDRESS: 225 Broadway Ste. 1700 TELEPHONE: 6195448131

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

OATH: I, Jerry Engen hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 12/12/12 Signature: _____

005466

NAME: James O'Day - possible (Responder to questions - As Requested)

AGENDA ITEM NO. 11

REQUEST TO ADDRESS REGIONAL BOARD

DURING PUBLIC FORUMS, STATUS REPORTS, WORKSHOPS AND OTHER NON-ACTION ITEMS

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: County of San Diego

ADDRESS: 1600 Pacific Hwy - Rm 355

TELEPHONE: 619-531-4869

State your name and address (spell your last name) for the record prior to beginning your presentation. Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

Meeting Date: 12/12/12

Signature: [signature]

005467

NAME: Faith Picking

AGENDA ITEM NO. 11

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: BIOCOM

ADDRESS: 4510 Executive Drive #1, SD, CA 92121 TELEPHONE: (858)455-0300x113

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

OATH: I, Faith Picking hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 12/12/12

Signature: [signature]

NAME: Richard Crompton

AGENDA ITEM NO. 11 (Against)

005468

REQUEST TO ADDRESS REGIONAL BOARD

DURING PUBLIC FORUMS, STATUS REPORTS, WORKSHOPS AND OTHER NON-ACTION ITEMS

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Director of Public Works - County of San Diego

ADDRESS: 5510 Overland Ave, San Diego CA 92123 TELEPHONE: (858) 694-2233

State your name and address (spell your last name) for the record prior to beginning your presentation. Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

Meeting Date: 12/12/12 Signature: [illegible]

Regional MS4 Permit

Public Workshop (*continued*)

December 12, 2012

Christina Arias, PE
Wayne Chiu, PE
Laurie Walsh, PE

Provision E.3.c.(2)

Hydromodification Management

HYDROMODIFICATION ASSESSMENT AND MANAGEMENT IN CALIFORNIA

Eric D. Stein
Felicia Federico
Derek B. Booth
Brian P. Bledsoe
Chris Bowles
Zan Rubin
G. Mathias Kondolf
Ashmita Sengupta

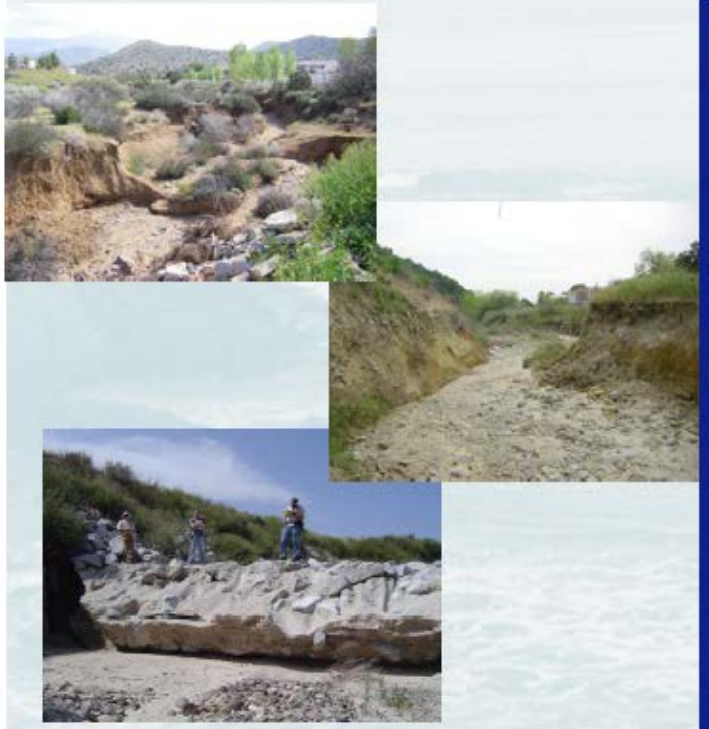

Southern California Coastal Water Research Project
Technical Report 667 - April 2012

What about exemptions?

Tent. Order Requirement: Use Pre-Development Hydrology

Already included in South Orange, Riverside County MS4 Permits

Q: What is Pre-Development Hydrology?

A: Check surrounding area….

…or consult soil maps

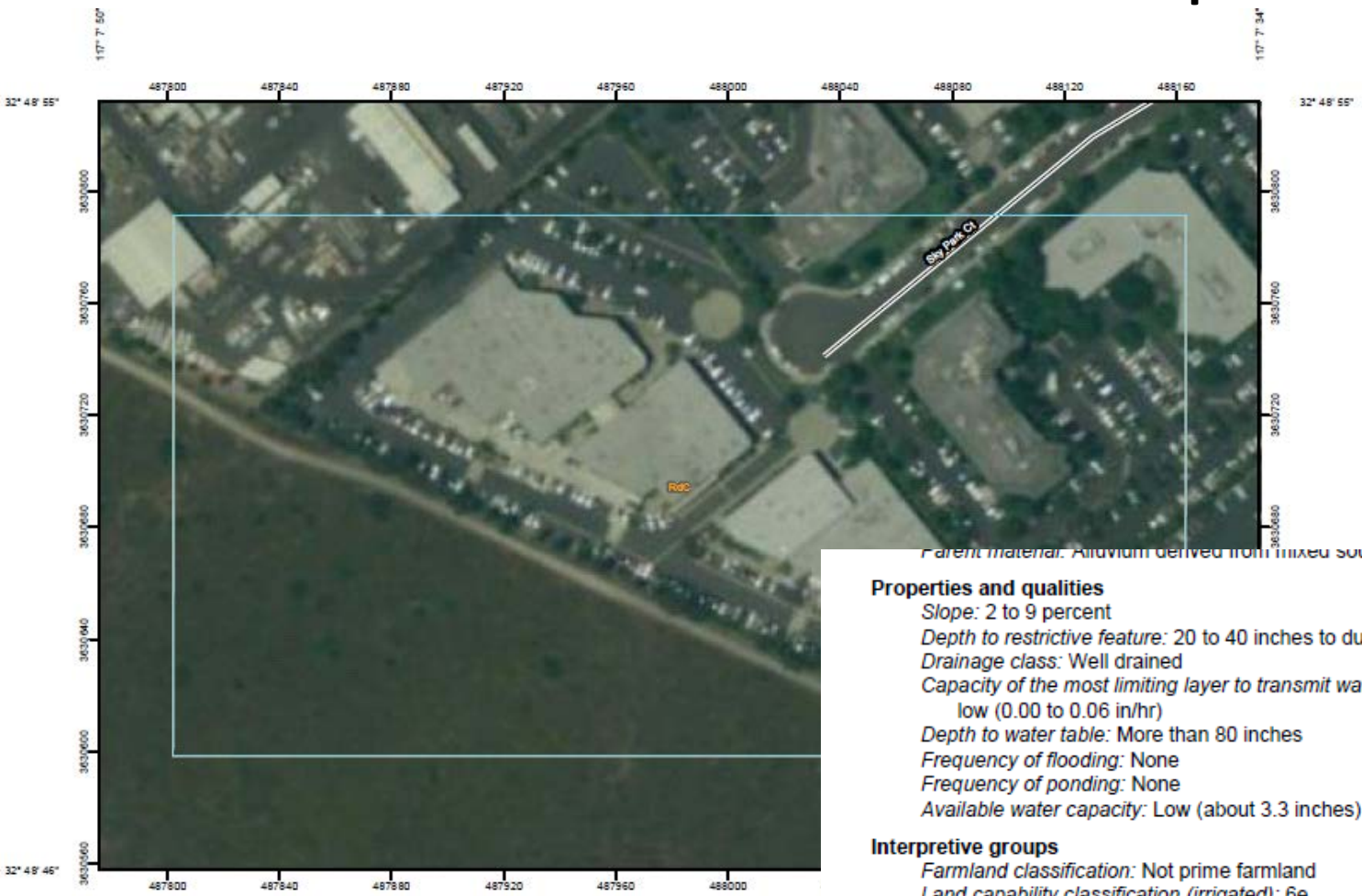

Parent material: Alluvium derived from mixed sources

Properties and qualities

Slope: 2 to 9 percent
Depth to restrictive feature: 20 to 40 inches to duripan
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 3.3 inches)

Interpretive groups

Farmland classification: Not prime farmland
Land capability classification (irrigated): 6e
Land capability (nonirrigated): 6e
Hydrologic Soil Group: D
Ecological site: ACID CLAYPAN (R019XD062CA)

Typical profile

0 to 15 inches: Gravelly loam

Alternative Compliance Offsite

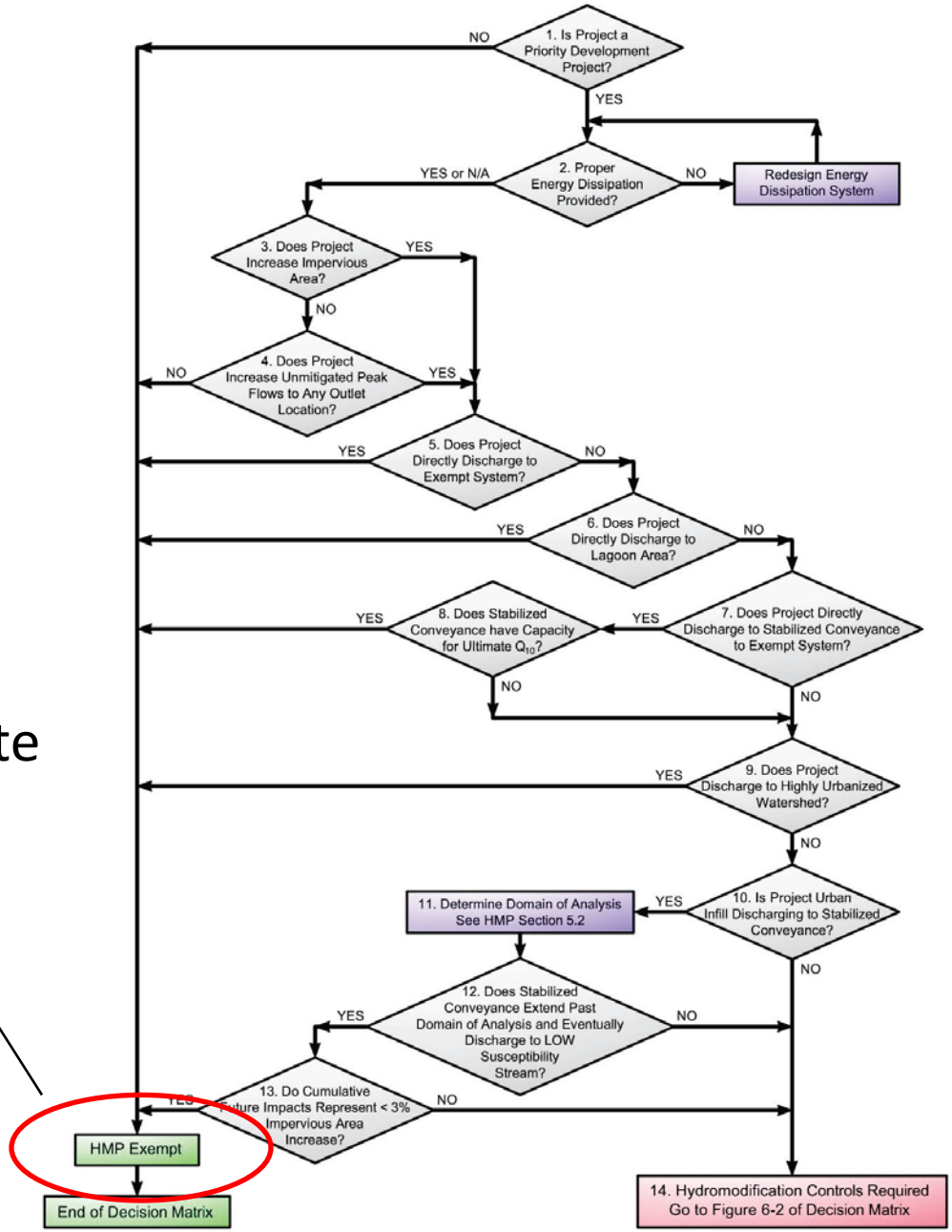

Alternative Compliance Options

- Offsite BMPs
- Retrofit projects
- Stream/habitat rehabilitation projects
- In-lieu fee

Where are suitable locations?

- Same HU, preferably same HSA
- Wherever there is most beneficial impact for water quality
- Strategy is spelled out in Water Quality Improvement Plans

Retrofit: 43rd and Logan St.

Courtesy City of San Diego

Total Maximum Daily Loads

and

Other

Other

1. Clarify if the Tentative Order is a one size fits all approach. Is the Water Quality Improvement Plan a one size fits all approach? {*Grant Destache*}
2. **Further explain the Illicit Discharge Detection and Elimination requirement in Provision E.2.a.(1) and (3) of the Tentative Order that pertains to discharges from footing drains and foundation drains. {*Eric Anderson*}**

Total Maximum Daily Load (TMDL)

1. Can the Copermittees meet the bacteria levels that are specific in the Total Maximum Daily Loads (TMDLs)? What sorts of technologies are available to the Copermittees to treat bacteria to the levels specified in the TMDLs? {*Grant Destache*}
2. Can the Copermittees achieve adequate waste load reductions in the MS4 discharges to meet the effluent limitations and compliance dates for bacteria in the Tentative Order? {*Grant Destache*}
3. What are the benefits of BMP based compliance with the TMDLs for bacteria compared to the Water Quality Based Effluent Limitations (WQBELs)? {*Grant Destache*}
4. Address the issue that Ruth Kolb, City of San Diego, raised regarding the Bacteria TMDLs. Clarify how we incorporated the Bacteria TMDLs into the Tentative Order to demonstrate that we incorporated it into the Tentative Order the way it was intended to be implemented. {*Eric Anderson*}
5. Throughout the presentations, it was said that it is infeasible to cleanup bacteria. Provide an explanation as to why, it is not the case, that cleanup of bacteria is infeasible. IN OTHER WORDS…Explain why it is in fact feasible to cleanup bacteria. Is it feasible to cleanup bacteria to levels in the TMDLs? {*Tomas Morales*}

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2. Can the Copermittees achieve adequate waste load reductions in the MS4 discharges to meet the effluent limitations and compliance dates for bacteria in the Tentative Order? {*Grant Destache*}
3. **What are the benefits of BMP based compliance with the TMDLs for bacteria compared to the Water Quality Based Effluent Limitations (WQBELs)? {*Grant Destache*}**
4. **Address the issue that Ruth Kolb, City of San Diego, raised regarding the Bacteria TMDLs. Clarify how we incorporated the Bacteria TMDLs into the Tentative Order to demonstrate that we incorporated it into the Tentative Order the way it was intended to be implemented. {*Eric Anderson*}**
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Other

1. **Clarify if the Tentative Order is a one size fits all approach. Is the Water Quality Improvement Plan a one size fits all approach? {*Grant Destache*}**
2. Further explain the Illicit Discharge Detection and Elimination requirement in Provision E.2.a.(1) and (3) of the Tentative Order that pertains to discharges from footing drains and foundation drains. {*Eric Anderson*}

Question 3

How much is already being spent? What is the breakdown of costs? What is the timeframe of these? {Thomas Morales}

Answer

$165 Million plus……
each year

Question 2

Lots of big cost numbers were used during the meeting. (e.g. $2 to $4 billion over 20 years) How much do the Copermittees spend now and on what? {Henry Abarbanel}

Answer

Supporting Document 6 & 7

Question 1

What is the cost of NOT implementing the provisions in the Tentative Order? (e.g. beach closures, ill health that taxpayers have to pay for through their private health plans or public costs, death's…) {Henry Abarbanel}

Question 1

What is the cost of NOT implementing the provisions in the Tentative Order?

Answer

Beach Closures: 5,794 closing / advisory days California 2011

- A hypothetical closure of Huntington Beach due to poor water quality:

  Loss in beach related spending:

  - One day: $100,000
  - One month: $3.5 million
  - Three months (summer season): $9 million

Question 1

What is the cost of NOT implementing the provisions in the Tentative Order?

Answer

Tourism: 31 million visitors to San Diego each year,
Tourism employs over 160,000 San Diegans

- Spend more than $7.5 billion annually in San Diego
- Future brings Non-stop international flights

Illnesses: Excess cases of GI illness resulting from swimming in bacteria contaminated beach water costs Californians up to $51 million per year (Pendleton et al., 2006)

Up to $176 million per year (non-market costs included = wiliness to pay NOT to get sick)

Public Health Costs—Orange County

Excess cases of gastrointestinal illness from swimming at bacteria-contaminated beaches

- Direct Cost: $ 6.7 million to $16 million/year (over 20 years = $134 M to $320M)

- Value of not getting sick: $56 million and $136 million/year (20 years = $1 Billion - $2.7 Billion)

Pendleton et al., 2006

Beach Closures

A hypothetical closure of Huntington Beach due to poor water quality:

- One day = losses of $100,000
- One month = losses of $3.5 million
- Three months (summer season) = economic losses of $9 million

Hanemann, M., L. Pendleton, and C. Mohn (November 2005) Welfare Estimates for Five Scenarios of Water Quality Change in Southern California. A Report from the Southern California Beach Valuation Project, at 7-8

NRDC The Earth's Best Defense · Los Angeles Waterkeeper · Orange County Coastkeeper · Inland Empire Waterkeeper · California Coastkeeper Alliance · Heal the Bay

hat is the breakdown and timeframe of the costs?

San Diego River

- Cost opinions "contain considerable uncertainties"
- "The budget forecasts… are order-of magnitude estimates."

CLRP at 113

- "Cost estimates should be considered planning-level only."

CLRP at 116

San Diego River

- Cost range from $590 M to $ 1.3 Billion
- Includes "Private Property BMPs" ranging in cost from $216 M to $360 M
- Private Party BMPs "are an *optional strategy* and may be considered at the discretion of the individual jurisdictions only if needed to meet load reduction targets."
- Most expensive element of program at lower cost.
- Without Private Property: $374 M -$940M

CLRP at 114

San Diego River

Land costs for Private Party BMPs

- Based on LA County land prices from 2008
- Discounted to 2005 prices
- 2011 prices assumed to be same as 2005 prices

Structural BMP costs

- Structural BMP Prioritization & Analysis Tool developed for LA
- Add in a cost multiplier, 2.0 and 4.0

San Diego River

Nonstructural BMP Costs

- Largely based on number of staff hours
- Copermittees made the estimates
- Large potential savings if volunteers used
  - Pet waste: $100/yr vs. $100/month
- Did not solicit information from stakeholder groups that could implement programs

Chollas Watershed

- Costs not given in a range, no upper/lower limit (see Supporting Doc. 7)
- Costs include $9.6 million for landscape practices, $2 million for outreach
- What about program elements with multiple benefits?

San Diego Copermittees Response to Regional Board Member Questions

December 12, 2012

HMP supports the use of controls to match *Pre-Project* Conditions

- San Diego HMP TAC validated the use of *pre-project* conditions
- Other regions support runoff matching to *pre-project* conditions
- Encourages redevelopment
- Appropriate nexus to project impacts
- Allows adaptability based on monitoring

Response to Hydromod Q1, Q3, Q4

005503

Permit or Plan	Pre-Project or Naturally Occurring	Exemptions					
		Storm Drain to ocean	Engineered Channel to ocean	Tidal Zone	Major River or Aggrading Reach	Reservoir	Urban Infill
San Diego HMP	Pre-Project	Yes	Yes	Yes	Yes	Yes	Yes
Draft San Diego Permit	Naturally Occurring	Yes	No	No	No	No	No
Riverside Santa Ana WQMP	Pre-Project	Yes	Yes	n/a	Yes	Yes	No
Los Angeles County	Pre-Project	Yes	Yes	Yes	Yes	Yes	Yes
Ventura County	Pre-Project	Yes	Yes	Yes	Yes	Yes	Yes*
San Francisco Bay Area	Pre-Project	Yes	Yes	Yes	Yes	Yes	Yes
Draft Sacramento HMP	Pre-Project	Yes	Yes	n/a	Yes	Yes	Yes

* LID Exception for < 1 acre

Recommendations

Reference previously adopted **Resolution R9-2010-0066** into the permit (Section E.3.c.(2)(d) page 80)

- Supports HMP pre-project
- Upholds HMP exemptions
- Allows adaptability after completion of HMP monitoring

No Robust Study to Quantify Benefits of the Bacteria TMDL

- Beaches are valuable.
- Current regional spending $119 million/year.
- Over 90% of San Diego County beaches received A grades.
- Beach grades and posting stats have improved.

Current Program Costs

- **San Diego County Copermittees:** Currently ~$119 M/year.
- For Example, the City of San Diego's current costs are:

Jurisdictional Program	$46,086,836
Watershed Program	$7,313,307
Regional Program	$675,703
Total FY 12 Costs:	$54,082,449

Bacteria TMDL Increases Program Costs

Bacteria TMDL Cost for SD Region: $2.6 to $4.9 billion over 20 years.

- Costs are additive.
- Based on robust BMP modeling.
- Based on **managing loads** on a watershed-basis.
- Costs increase based on managing concentrations.

Cost Type	Annual Cost	Factor
Current Program	$119 million	---
Bacteria TMDL	$144 - 272 million	1x- 2x
Total	$263 – 391 million	2x– 3x

Bacteria Standards are Not Consistently Attainable

Non-Structural Source Controls

- Large uncertainties in stormwater load reductions.
  - Uncertainties in loading (wide range of potential sources)
  - Uncertainties in effectiveness (wide ranges of estimates, particularly for non-structural measures)
  - Example: Santa Barbara - effective source control, still with noncompliance
- Long term sustainability of effectiveness (maintain equally effective approach into perpetuity)
- Location of source control measures are not conducive to compliance
  - Regrowth within MS4
  - Uncontrollable non-human sources upsetting effectiveness

Structural BMP Performance

005509

Required mitigation volumes are significant

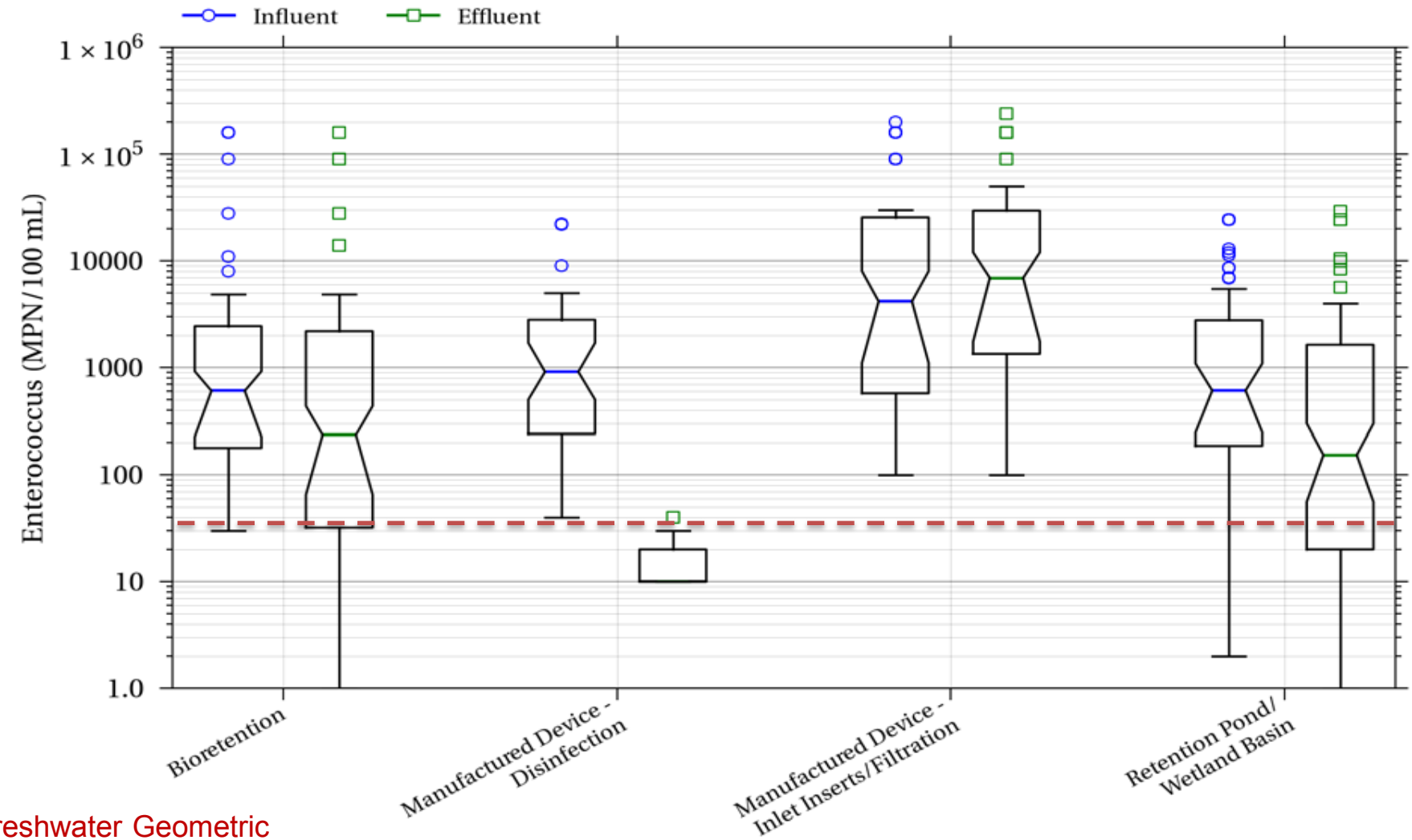

Freshwater Geometric Mean Criterion = 33/100 mL

Clary, J., B. Steets, J. Jones, E. Strecker, M. Leisenring. *Fecal Indicator Bacteria Reduction in Urban Runoff.* October 2012. <www.stormh20.com>.

Even with BMPs, Consistent and Reliable Attainment of Bacteria Standards is Not Possible

- Example of structural + non-structural BMP implementation:
  - Santa Monica Pier
    - Full dry-weather capture SMURFF
    - Bird/trash control and exclusion
    - Sewer connections and rehabilitation
    - High levels of Enterococcus remain
- Direct sources in receiving waters
  - Natural sources (kelp wrack, sediments)
  - Regrowth in enclosed systems
  - Human sources (bather shedding, etc.)
- Natural variability and loading (reference watersheds)

Response to TMDL Q1, Q2, Q5:

005511

Reference Watershed Exceeds TMDL Standard 50% of the Time

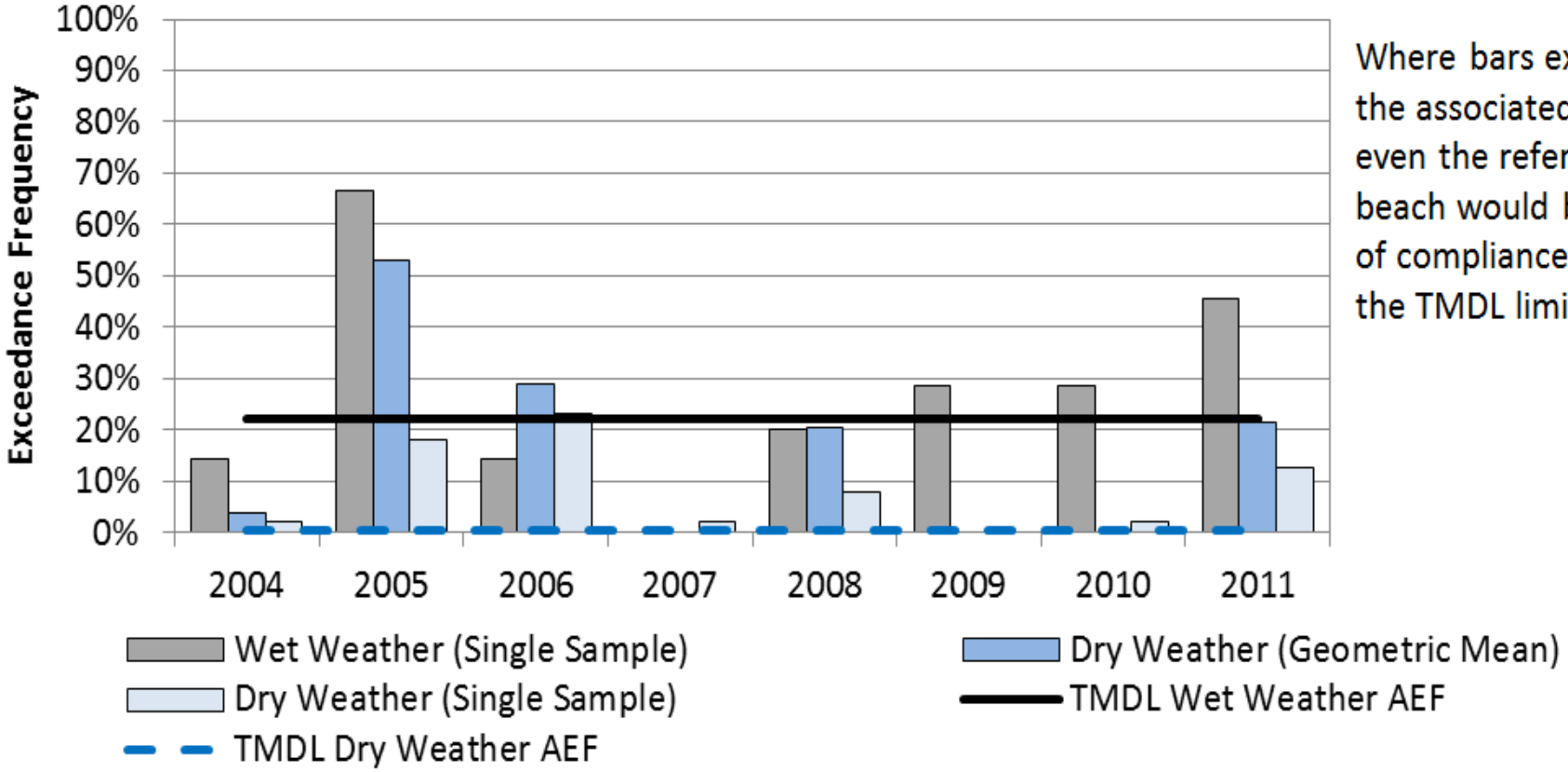

Where bars exceed the associated AEF, even the reference beach would be out of compliance with the TMDL limits.

Notes:

1. 30-day Rolling GM - Geometric mean calculation performed every week, on the dry weather samples within the previous 30-days period, if 5 or more samples have been taken in the 30-day period.

BMP-Based WQBELs

BMP-based WQBELs have many advantages:

- Match the language in the Board-adopted TMDL
- Facilitate innovative, watershed-based approaches
- Better reflect challenges of stormwater management
- Improve ability to articulate funding needs
- Can be measured, tracked, and enforced by the Board

Incorporate Options from Bacteria TMDL

Options in TMDL	Recommendation
Reopener	Add the Bacteria TMDL's reopener to Provision H
Interim Milestone Schedules	Add the Bacteria TMDL's option to propose alternative interim milestones if a Comprehensive (multi-pollutant) Load Reduction Plan approach is taken
BMP-Based WQBELs	Add the Bacteria TMDL's option for BMP-based WQBELs as effluent limitations
Mass-Based WLAs	Add the Bacteria TMDL's option for mass-based effluent WQBELs

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Hydromodification

1. *When accounting for the impacts caused by hydromodification at a development or redevelopment site, how far back should the analysis go, pre-project or predevelopment? {Grant Destache}*
    - This decision should depend largely on the condition of the receiving water that the development or redevelopment project discharges into and if it is restorable.
    - If the receiving water is in its natural state or only slightly modified and it is possible to restore the receiving water then the analysis should go back to pre-development.
    - If the receiving water is an engineered system that serves a flood control purpose, and it is not feasible to restore its original flow path and slope, due to adjacent development then no analysis should be performed as this should be an exempt receiving water as there is no environmental benefit to implementation of onsite hydromodification controls.
    - The SCCWRP Technical Report 667, the results of the August 30, 2012 Hydromodification Management Meeting, and the recent SWRCB Hydromodification Management Workshop on November 28, 2012 all recognize that:
        - hydromodification management is not a one size fits all approach;
        - criteria for hydromodification analysis is largely a policy decision,
        - and that ability to restore or rehabilitate receiving water bodies should be a primary consideration in the application of hydromodification management measures.
    - If a one size fits all approach is taken and all projects are required to meet the same criteria, many projects will not be built, especially the small redevelopment projects due to cost. This situation will be a lost opportunity to improve water quality through redevelopment as redevelopment projects would still be required to meet the LID requirements, and if the projects are not built due to cost these water quality improvements will not be realized.

Recommendation:

- This decision should depend largely on the management goals for the specific receiving water that the development or redevelopment project discharges into. Is it, indeed, restorable?

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2. *How can the San Diego County Hydromodification Plan (HMP) be implemented into the MS4 Permit in a more succinct manner? How can we implement the rules and regulations in the San Diego County HMP, because we really have not had it in place for very long before we "throw it down the drain?" {Grant Destache}*
    - Although the question references only the San Diego County HMP, the Orange County Permittees have also spent considerable time, effort, and funds to develop the South Orange County HMP.
    - The South OC HMP uses the most current hydromodification science in the development of a practical HMP that specifies criteria that can be achieved and special conditions that are warranted based on achievable restoration in the watershed.

Recommendation:

- The South OC HMP can be incorporated into the permit by referencing the South Orange County HMP dated October 25, 2012.

3. *How do you document predevelopment or naturally occurring on a map? How is "naturally occurring" defined? How far back do you go to document predevelopment? 100 years? 500 years? Before the Indians were picking up acorns? {Gary Strawn}*
    - Identifying "naturally occurring" conditions for redevelopment sites is extremely difficult as in many cases there are no historical records of the natural condition of the site.
    - In cases where natural conditions of a site are not known the best approach is to use an undeveloped natural site in proximity to the re-development site as a reference site.
    - The vegetative cover, soil type, and slope will most affect the hydrology of a site and so approximating these conditions for a re-development site using a natural reference site where these parameters can be measured is a way to approximate the natural conditions of a redevelopment site.
    - However, locating a natural reference site in proximity to a redevelopment site is difficult, as the entire sub-watershed or watershed may be developed.
    - Additionally the conditions of the natural reference site maybe totally different than the "naturally occurring" conditions of the re-development

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site as vegetative cover, soil type, and slope may have been very different and without historical records there is no way of knowing the actual ““naturally occurring” conditions of a re-development site.

- The question of how far back you go to document pre-development is a policy question that should be decided not only by the Regional Board staff, but by reaching consensus with all watershed stakeholders on what the level of “restoration” of the watershed should be. It may not be feasible to go back very far, however as there just are not many historical records that go back 100 years, and none that go back 500 years.

4. *Why was the concrete/hardened channel exemptions removed? {Eric Anderson}*
    - The exemption for concrete and hardened channels was included in the SD HMP based on detailed technical analysis and coordination among watershed stakeholders and the SD Board staff in the development of the HMP. This same exemption is included in the South Orange County HMP, although yet to be approved by the Regional Board.
    - The concrete and hardened channel exemption was likely removed by Board Staff with the intention that these channels will be returned to a natural condition.
    - Channels were hardened in the past because to enable them to serve a flood control and public safety purpose. Because they serve this purpose and because in most cases where they are implemented there is development in the floodplain, which rely on the engineered channels for flood protection, there will be very few, if any, opportunities for restoration of the receiving water.

Recommendation:

- Reinstate the hardened channel exemption into the permit.

5. *Copermittees commented that road projects have unique space limitations and may not be able to meet retention & HMP requirements. Should road projects be treated differently and could requirements in the new CALTRANS Storm Water Permit be used to provide more options? {Grant Destache}*
    - Road projects are different than other types of land development projects due to their linear nature and their space constraints.

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- These constraints are exacerbated in a retrofit roadway condition due to limited right-of-way and utilities.
- For new roadways in some conditions the amount of land needed to meet these requirements is significant and mitigation may create additional adverse environmental impacts.
- Compliance with the USEPA Guidance for Green Streets is the appropriate requirement for the San Diego Regional Permit as most of the other MS4 Permits in Southern California including Los Angeles, Ventura, Orange County (SAR), Riverside (SAR), and San Bernardino specify its use for compliance.

Recommendation:

- Create "Green Streets" compliance approach for street and highway projects.

6. *If a project is unable to comply with the HMP requirements at the site, how far away from the site can the project proponent place their retention basins? What other limitations exist when not placing a BMP on site? There is a concern that low income areas will become targets for placement of the retention basins. {Tomas Morales}*

- Proximity of offsite basin placement, effectively alternative compliance, is better understood when there is an understanding of the conditions of a sub-watershed and/or watershed and the goals for restoration of the sub-watershed and/or watershed have been identified.
- Optimal basin locations to achieve alternative compliance are those locations where the most benefit will be achieved to help rehabilitate the sub-watershed and/or watershed.
- The limitations of not placing a BMP on a site is that that site may not be achieving pre-development hydrologic conditions, however there are sites where this is not necessary including sites that discharge into engineered channels designed to accept additional runoff from development.
- It may be more beneficial not to restore hydrologic function at a particular project site and instead restore hydrologic function at a site that will be more beneficial for rehabilitation of the sub-watershed and/or watershed.

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Cost -

1. What is the cost of not implementing the provisions in the Tentative Order? (e.g. beach closures, ill health that taxpayers have to pay for through their private health plans or public costs, deaths ....) {*Henry Abarbanel*}
    - No response

2. Lots of big cost numbers were used during the meeting. (e.g. $2 to $4 billion over 20 years) How much do the Copermittees spend now? What is being spent now and on what? {*Henry Abarbanel*}
    - See attached Table 1

3. What is the breakdown of costs? What is the timeframe of these costs? How much is already being spent? {*Tomas Morales*}
    - See Attached Table 1

Total Maximum Daily Load (TMDL) –

1. *Can the Copermittees meet the bacteria levels that are specified in the Total Maximum Daily Loads (TMDLs)? What sorts of technologies are available to the Copermittees to treat bacteria to the levels specified in the TMDLs? {Grant Destache}*
    - To answer the question of what is achievable, it is critical to understand that there is a significant distinction between the bacteria levels that are specified in the TMDLs (in the Basin Plan Amendments) and how the TMDLs have been incorporated into the Permit.
        - The TMDL BPAs establish mass-based limits while the Permit establishes the TMDLs as concentration-based limits.
        - Based upon the implementation of many projects to date in Orange County, Permittees can make significant strides in attaining the mass-based WLAs.
        - Attainment of the concentration-based limits, 100% of the time, is unlikely achievable

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- Permittees can make significant improvements, but attainment of the final WLAs is not guaranteed given the effectiveness of BMPs and treatment technologies
    - The International Stormwater BMP Database compares the performance of various conventional stormwater BMP types in achieving wet-weather effluent concentrations of FIB. The Database does not identify any stormwater BMP types that can achieve the effluent concentrations that are required for Fecal Coliform or for Enterococcus.
    - Many projects have been implemented locally. Projects have included constructed wetlands, dry weather flow reductions (achieved via water district drought restrictions), channel restoration, as well as high-tech solutions (pumping, multi-step filtration, and ozone or ultraviolet radiation).
    - The projects have resulted in significant reductions in the mass load of bacteria and concentrations of FIB, achieving up to 99% reductions for certain indicators. However, attainment of the concentration-based water quality standards 100% of the time has not been achievable.
- Therefore, it is important to ensure that the TMDLs are incorporated properly and to consider how compliance with the TMDLs will be assessed
    - Mass-based WLAs are consistent with the assumptions and requirements of the Basin Plan Amendments
    - Mass-based reductions are significantly more achievable than concentration-based limits (where 100% of samples must meet the limits)
    - BMP-based compliance encourages significant reductions while still providing strong enforcement for Permittees that fail to implement approved plans
    - See additional bullets on why compliance matters under #3
- The Beaches and Creeks TMDL and the Baby Beach Bacteria TMDL explicitly acknowledge a reassessment/re-opener of the TMDL. Therefore, feasibility of achieving the TMDL WLAs is dependent upon consideration of additional assessments and revisions to the TMDLs, as appropriate and warranted.
    - The 0%-exceedance target set in the TMDLs was based on 0-3% exceedance seen in beach data, not creek data. The preliminary results from the first year of SCCWRP's "natural reference stream"

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study showed that natural dry-weather wildlife-derived FIB exceedance rates in San Diego Region's creeks was very far from the proposed standard of 0%: 34% of reference creek samples exceeded the single-sample maximum for Enterococcus and 71% exceeded the Enterococcus geomean. It is therefore likely that the wet weather exceedance rate in creeks may approach 100%, rather than 22% as at the beach .

- The consensus of both Federal EPA and the Beach Water Quality Work Group experts collected at SCCWRP on Nov 28-29 was that this wildlife-derived FIB indicates a significantly lower risk to human health than the threshold enshrined in the Basin Plan's sewage-derived FIB WQOs.
- An explicit re-opener in the Permit provides a mechanism to:
  - Explicitly acknowledge that revisions to the TMDLs may be warranted
  - Ensure such assessments occur prior to triggering final compliance requirements (such as numeric effluent limitations)

Recommendations:

- Ensure TMDLs are properly incorporated into the Permit as mass-based limits, not as concentration-based limits
- Establish BMP-based compliance for the TMDL provisions
- Provide an explicit re-opener provision in the Permit to ensure additional information is considered in the TMDLs/Permit prior to triggering final compliance requirements

2. *Can the Copermittees achieve adequate waste load reductions in MS4 discharges to meet the effluent limitations and compliance dates for bacteria in the Tentative Order? {Grant Destache}*
   - See Responses under #1 above.
   - In addition, for Baby Beach:
     - The TMDL established mass-based WLAs
     - The compliance schedule was based upon an assessment of existing conditions and current attainment of certain WLAs

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- As existing conditions met certain WLAs, the compliance date was set equal to the effective date of the TMDL (2009)
- By establishing concentration-based WLAs, the WLAs are not only incorrectly incorporated, but Permittees will not be provided any time to come into compliance with the final WLAs that were established based upon an assessment of mass-based allocations, not concentration-based allocations

Recommendation:

- Properly incorporate the TMDLs into the Permit as mass-based WLAs

3. *What are the benefits of BMP based compliance with the TMDLs for bacteria compared to compliance with Water Quality Based Effluent Limitations (WQBELs)? {Grant Destache}*
   - The Tentative Order establishes WQBELs expressed as numeric effluent limitations (NELs)
   - Permittees request that the Regional Board establishes WQBELs expressed as BMPs (BMP-based compliance)
   - The method of compliance matters
     - NELs do not provide the Regional Board with discretion for enforcement and subjects Permittees to Mandatory Minimum Penalties (MMPs)
     - A Permittee that does everything and a Permittee that does nothing are treated equally and therefore equally subject to MMPs
     - With BMP-based compliance, Regional Board has discretion in enforcement and could continue to work with the Permittee doing everything but could enforce on the Permittee that does nothing
     - Compliance is further complicated by the inappropriate incorporation of the TMDLs into the Permit where the compliance point is concentration-based rather than mass-based
     - Local projects demonstrate that up to 99% reductions can be achieved, whereas 100% attainment of concentration-based limits are infeasible
     - BMP-based compliance would allow the Regional Board to exercise discretion to continue to work with the Permittee that has achieved

the 99% reduction whereas NELs would subject the Permittee to MMPs
    - Baby Beach implementation is a great example of the extensive actions taken by Permittees, resulting in the beach being delisted. NELs would subject Permittees to MMPs for a single exceedance at a delisted beach whereas a BMP-based approach would provide Regional Board the discretion as to the need for any additional actions/enforcement.
- BMP-based compliance is not a "safe harbor"
    - Can be structured to ensure Permittees are held accountable via discrete milestones and actions; ensure Permittees provide reasonable assurance that actions will attain WQBELs; ensure Regional Board can enforce where Permittees are not attaining milestones/implementing actions
    - Los Angeles Regional Board and Board staff provided testimony during adoption hearing (November 8, 2012) that the watershed approach is not a "safe harbor"

- Numeric Effluent Limitations are not feasible
    - EPA's memorandum discusses feasibility in terms of implementation and attainment of WLAs, not in terms of calculating a WLA
    - State Board Blue Ribbon Panel Report found NELs to be infeasible for municipal stormwater discharges

Recommendation:

- Establish BMP-based compliance as an option for Final WLAs

4. *Address the issues that Ruth Kolb, City of San Diego raised regarding the Bacteria TMDLs. Clarify how we incorporated the Bacteria TMDLs into the Tentative Order to demonstrate that we incorporated it into the Tentative Order the way it was intended to be implemented. {Eric Anderson}*
    - TMDLs established mass-based WLAs whereas the Tentative Order established concentration-based limits

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- Tentative Order does not recognize the CLRPs and the watershed-specific milestones and monitoring requirements provided for in the BPA
- Tentative Order does not consider the re-opener provided explicitly in the BPA
- Tentative Order does not consider BMP-based compliance as an option though it is provided as an option in the BPA

5. *Throughout the presentations, it was said that it is infeasible to cleanup bacteria. Provide an explanation as to why, it is not the case, that cleanup of bacteria is infeasible. IN OTHER WORDS… Explain why it is in fact feasible to cleanup bacteria. Is it feasible to cleanup bacteria to the levels in the TMDLs? {Tomas Morales}*
    - Concept of feasibility is based upon how the TMDLs were inappropriately incorporated into the Permit
    - Attaining the TMDLs is significantly more feasible if the Permit is consistent with the assumptions and requirements of the BPAs, as noted in response to #4 above

Other

1. *Clarify if the Tentative Order is a one size fits all approach. Is the Water Quality Improvement Plan a one size fits all approach? {Grant Destache}*
    - The WQIPs are a welcomed and necessary shift in the development and implementation of stormwater programs.
        - The WQIP framework (Provision B) allows for the identification and development of a program around the highest priority water quality conditions within a specific watershed.
        - The WQIP allows for the integration of all program elements and focuses the efforts on the highest priorities for each watershed through the customization of actions and strategies.
    - However, the Tentative Order provisions (especially Provision E, JRMP) seem to then take a counter, “one-size fits all approach”.
        - For example, the Existing Development provisions dictate specific BMPs that must be implemented, regardless of the high priority water quality concerns within a watershed.
        - Thus, these provisions become “additive” instead of “prioritized” and supportive of the overarching WQIP.

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Recommendation:

- The Tentative Order should be modified so that the WQIPs and related JRMPs can be streamlined and focus on the highest priorities within each watershed.

2. Further explain the Illicit Discharge Detection and Elimination requirement in Provision E.2.a.(1) and (3) of the Tentative Order that pertains to discharges from footing drains and fountain drains. {*Eric Anderson*}
    - No response.

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Project Name	BMP Type	Treatment Area (Acres)	Average Bacteria Load Reduction Dry (%)	Average Load Reduction Wet (%)	Watershed Dry Reduction (%)	Watershed Wet Reduction (%)	Year Active	BMP Construction	Maintenance / Year
Catch Basin Debris Gates (M2 Tier 1 Project) (Laguna Niguel)	Catch Basin Inserts	96	68%	85%	0.29%	0.37%	2012	$72,000	$1,680
Catch Basin Debris Gates (M2 Tier 1 Project) (Lake Forest)	Catch Basin Debris Gates	54	9%	14%	0.02%	0.03%	2012	$30,000	$945
Catch Basin Inserts (Laguna Woods)	Kristar Flogard Filters	109	9%	85%	0.04%	0.42%	2007	$80,000	$1,800
Dairy Fork Wetland	Treatment Wetland	1,368.00	95%	0%	5.82%	0.00%	2014	$716,000	$10,000
El Toro Frontage Road Storm Drain Improvement Project (Lake Forest)	Catch Basin Filters	1	90%	50%	0.00%	0.00%	2006	$100,000	$500
El Toro Traffic & Landscape Project (Lake Forest)	Water Conservation	5	40%	0%	0.01%	0.00%	2006	$1,303,640	$73,700
English Creek Aquatic Restoration Project (Mission Viejo)	Restoration	1,247.00	35%	10%	1.96%	0.56%	2015	$4,470,000	n/a
Glenwood Wetland J06P03 Subwatershed (Aliso Viejo)	Treatment Wetland	230	95%	0%	0.98%	0.00%	2011	$450,000	$10,000
J01P28 Urban Runoff Treatment Facility	UV and Filter Media Treatment	609.4	96%	0%	2.62%	0.00%	2012	$575,000	$80,000
J03P01 Restoration (Laguna Niguel)	Channel Restoration	1,099	30%	0%	1.48%	0.00%	2003	$75,000	$5,000
Laguna Hills Wetland at J05 (Laguna Hills)	Treatment Wetland	977	65%	0%	2.85%	0.00%	2003	$300,000	$3,000
Middle Sulphur Creek Restoration (Laguna Niguel)	Channel Restoration	2,300	20%	30%	2.06%	3.09%	2008	$2,000,000	$25,000
Munger Planted Sand Filter (Lake Forest)	Sand Filter	640	90%	0%	2.58%	0.00%	2012	$282,600	n/a
Narco Channel Restoration (Aliso Viejo)	Channel Restoration	141	59%	10%	0.37%	0.06%	2007	$77,729	$466
Narco Channel Restoration (Laguna Hills)	Channel Restoration	1,156	59%	10%	3.06%	0.52%	2007	$637,266	$3,824
Narco Channel Restoration (Laguna Niguel)	Channel Restoration	517	59%	10%	1.37%	0.23%	2007	$285,005	$1,710
Oso Parkway Landscape Improvements (Laguna Hills)	Water Conservation	7	40%	0%	0.01%	0.00%	2010	$1,300,000	$3,000
Oso Parkway South Side Wetland (Laguna Hills)	Treatment Wetland	30	95%	0%	0.13%	0.00%	2012	$1,875,000	$3,000
Pollution Reduction and Water Conservation Retrofit Program within J01P08 Sub-watershed (Lake Forest)	Water Conservation	9.35	40%	0%	0.11%	0.00%	2008	$12,000	n/a
Public Development Water Quality Management Plan (WQMP) Projects- Alicia Skate Park (Laguna Niguel)	Continuous Defelection System (CDS)	4	0%	44%	0.00%	0.01%	2003	$100,000	$1,000
Public Development Water Quality Management Plan (WQMP) Projects- La Paz Sports Park (Laguna Niguel)	Catch Basin Filters/Biofiltration Basins	4	90%	50%	0.02%	0.01%	2003	$150,000	$1,200
Public Redevelopment Water Quality Management Plan (WQMP) Projects- City Hall (Laguna Niguel)	Stormwater Treatment Vaults/Bioswales	4	40%	44%	0.01%	0.01%	2011	$150,000	$1,000
SCWD Water Harvesting Project	Flow Diversion	18,192	8%	0%	0.91%	0.00%	2015	$525,000	n/a
SmarTimer Edgescape Evaluation Project (SEEP) (Aliso Viejo)	Water Conservation	6	40%	0%	0.01%	0.00%	2008	$67,937	$500
SmarTimer Edgescape Evaluation Project (SEEP) (Laguna Hills)	Water Conservation	4	40%	0%	0.01%	0.00%	2008	$153,235	$2,400
Smartimer Edgescape Evaluation Project (SEEP) (Laguna Niguel)	Water Conservation	1.36	40%	0%	0.00%	0.00%	2008	$46,000	$500
SmarTimer Edgescape Evaluation Project (SEEP) (Laguna Woods)	Water Conservation	5.2	40%	0%	0.01%	0.00%	2008	$59,853	$500
Smartimer Edgescape Evaluation Project (SEEP) (Lake Forest)	Water Conservation	1.2	40%	0%	0.00%	0.00%	2008	$13,950	$3,650
SmarTimer Edgescape Evaluation Project (SEEP) (Mission Viejo)	Water Conservation	74	40%	0%	0.13%	0.00%	2008	$300,000	n/a
Sulphur Solution "Control" Subproject (Laguna Hills)	Catch Basin Debris Gates	168	68%	85%	0.51%	0.64%	2008	$168,000	$5,800
Sulphur Solution "Control" Subproject (Laguna Niguel)	Catch Basin Debris Gates	120	68%	85%	0.37%	0.46%	2008	$90,000	$2,100
Sulphur Solutions "Green Back" Water Conservation and Pollution Prevention Project (Laguna Niguel)	Water Conservation	16	64%	18%	0.05%	0.01%	2006	$342,000	$9,600
Sulphur Solutions "Green Back" Water Conservation and Pollution Prevention Project-Landscape Renewable Rebates (Laguna Hills)	Water Conservation	1	64%	18%	0.00%	0.00%	2006	$107,614	n/a
Upper Sulphur Restoration (Laguna Niguel)	Channel Restoration	1,322	56%	0%	3.32%	0.00%	2007	$1,400,000	$65,000
Wetland Capture and Treatment at J03P02 (Laguna Niguel)	Treatment Wetland	538	95%	0%	2.29%	0.00%	2004	$469,400	$29,200
Wood Canyon Emergent Wetland at J02P08 (Aliso Viejo)	Treatment Wetland	313	96%	0%	1.35%	0.00%	2005	$240,000	$5,000
Aliso Creek Watershed Subtotal		**31,370**			**35%**	**6%**		**$19,024,229**	**$351,075**
Salt Creek Ozone Treament Plant	Ozone Treatment	4,500						$6,900,000	$130,000
TOTAL		**35,870**						**$25,924,229**	**$481,075**

J01P28
UV and Media Filter Treatment System
J04 (Narco)
Channel Restoration
J03P02
WetCat Network
Salt Creek Ozone Treatment System
N
0 0.5 1 2
Miles
0 0.5 1 2
Kilometers

Industrial Environmental Association (IEA)

REGIONAL NPDES PERMIT FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

(TENTATIVE ORDER NO. R9-2013-0001, NPDES NO. CAS0109266)

IEA Overview

- Formed in 1983
- Promote responsible, cost-effective environmental laws and regulations
- Facilitate environmental compliance among members
- Provide education for community at large

Key Point: Monitoring Framework

- Generally support monitoring approach that is:
  - Strategic
  - Question-driven
  - Cost-effective
- Recognize more work required to ensure Permit monitoring provisions meet these needs

Non-stormwater Discharges

- Permitted NPDES discharges now specifically excluded from being considered illicit discharge
  - IEA supports clarifying language RWQCB added:

    NPDES permitted discharges are not prohibited

Non-stormwater Discharges

- Firefighting discharges (non-emergency) considered illicit discharges
  - Building fire-suppression maintenance can be treated with BMPs
  - Allows discharge to not be a “significant source of pollutants”
  - Recommend retaining existing authorization for maintenance discharges when Copermittees require use of appropriate BMPs

Development Planning

- Hydromodification requirements
  - IEA disappointed the Regional MS4 Permit modifies the recently approved HMP
  - HMP painstakingly developed at great cost to Copermittees
    - HMP not yet fully vetted and evaluated

Development Planning

- At a minimum:
  - Return exemptions:
    - Highly urbanized watersheds
    - Discharges to concrete lined channels
    - San Diego Bay and other embayments and lagoons
  - Return baseline to “pre-project”

Development Inspections

- Existing development inspection provision revised to remove re-inspection for change in pollutant activities
  - IEA appreciates RWQCB staff revision on this issue
- Inspection methods need careful consideration
  - "Onsite inspections by volunteer monitoring or patrol programs"
    - Likely not feasible for many private property and/or industrial/commercial inspections

DECEMBER 12, 2012 SAN DIEGO RWQCB WORKSHOP:

Will tentative storm water regulations be applicable to controlling Sunset Cliffs Natural Park erosion and marine pollution?

D. Craig Barilotti, Ph. D
Scientific Project Director
Sunset Cliffs Association (SCA)
(619) 592-8681, cbarilotti@cox.net

STATE OF CALIFORNIA—CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

PETE WILSON, Governor

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
9771 CLAIREMONT MESA BOULEVARD, SUITE B
SAN DIEGO, CA 92124-1331
TELEPHONE (619) 467-2952

May 26, 1992

Robert E. Cain, NPDES Program Coordinator
Engineering and Development Department
City of San Diego
Executive Complex
1010 Second Avenue, Suite 1200
San Diego, CA 92101-4154

Dear Mr. Cain:

STORMWATER EROSION IN SUNSET CLIFFS SHORELINE PARK AND RESULTING SEDIMENTATION OF ADJACENT TIDE POOL HABITATS

It has come to the attention of the Regional Board that there is an ongoing problem of severe erosion within the City of San Diego's Sunset Cliffs Shoreline Park. Staff of the Regional Board has found that the accelerated erosion in this park is contributing large amounts of sediment into sensitive ocean waters adjacent to the park.

The extensive tide pool habitats which are located within the adjacent coastal waters can be expected to be adversely impacted by the sediment which is being discharged from the park. Adverse impacts associated with such a discharge include: (1) the physical covering of attached biota (killing attached animals through suffocation and attached algae through shading), (2) reduced primary productivity through a reduction in water clarity, and (3) a reduction in the recruitment of new attached biota since the microscopic settling stages of this biota are less likely to find a suitable hard substrate upon which to attach.

Since the majority of the accelerated erosion and sedimentation is being caused by urban stormwater, I felt that perhaps your department might be the most logical to address it. One obvious solution to prevent most of the park erosion is contain all significant offsite stormwaters within lined channels or piping, and not allow such stormwaters to traverse the park through unprotected natural lands.

After you have had a chance to investigate this matter, I would appreciate your informing me of what remedial actions the City intends to take. We are eager to get this problem corrected before the next rainy season. Please contact Greig Peters of my staff at (619) 467-2976 if you have any questions regarding this matter.

Very truly yours,

ARTHUR J. COE
Executive Officer

92110

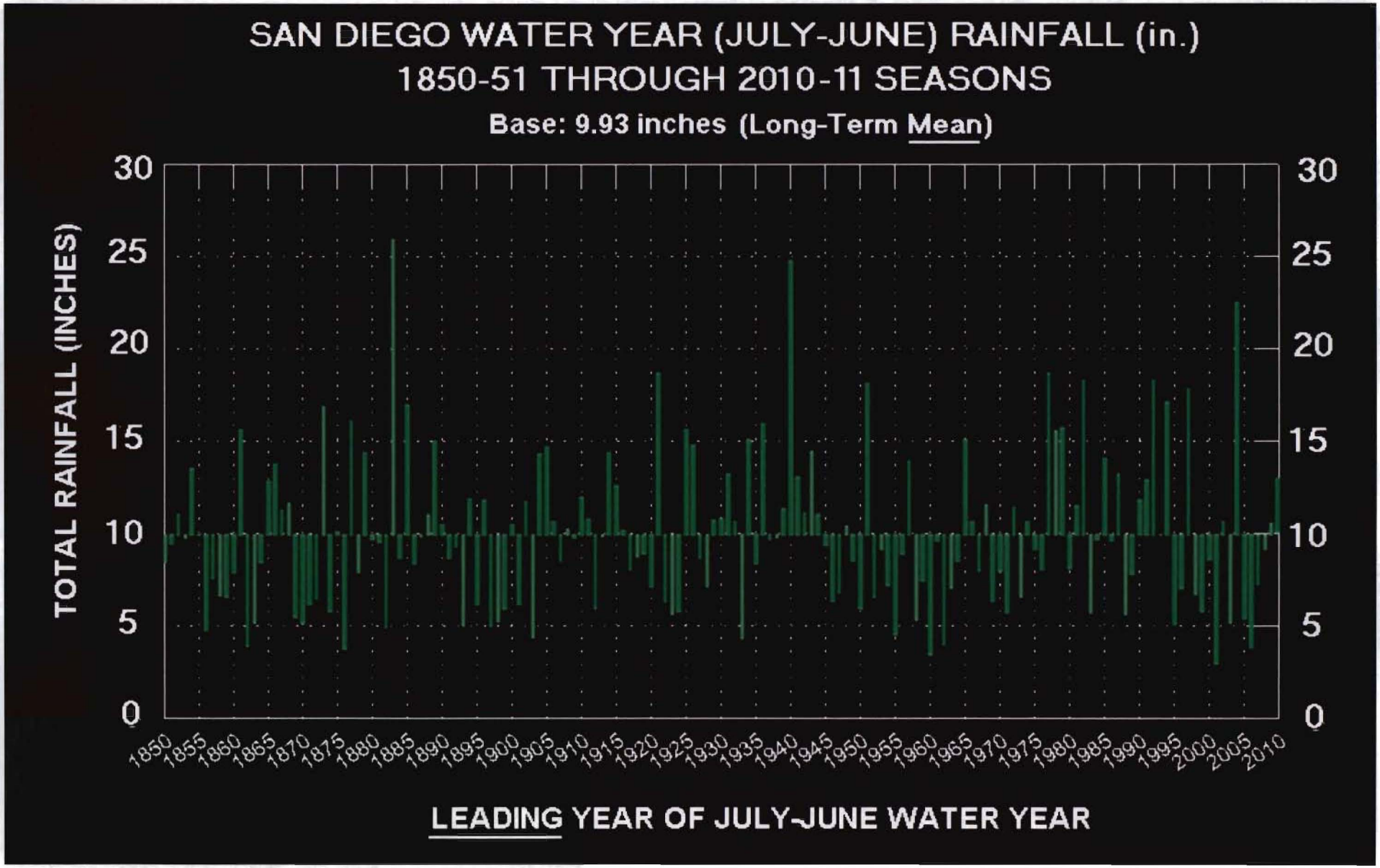
SAN DIEGO WATER YEAR (JULY-JUNE) RAINFALL (in.)
1850-51 THROUGH 2010-11 SEASONS
Base: 9.93 inches (Long-Term Mean)
TOTAL RAINFALL (INCHES)
30
25
20
15
10
5
0
1850 1855 1860 1865 1870 1875 1880 1885 1890 1895 1900 1905 1910 1915 1920 1925 1930 1935 1940 1945 1950 1955 1960 1965 1970 1975 1980 1985 1990 1995 2000 2005 2010
LEADING YEAR OF JULY-JUNE WATER YEAR

005538

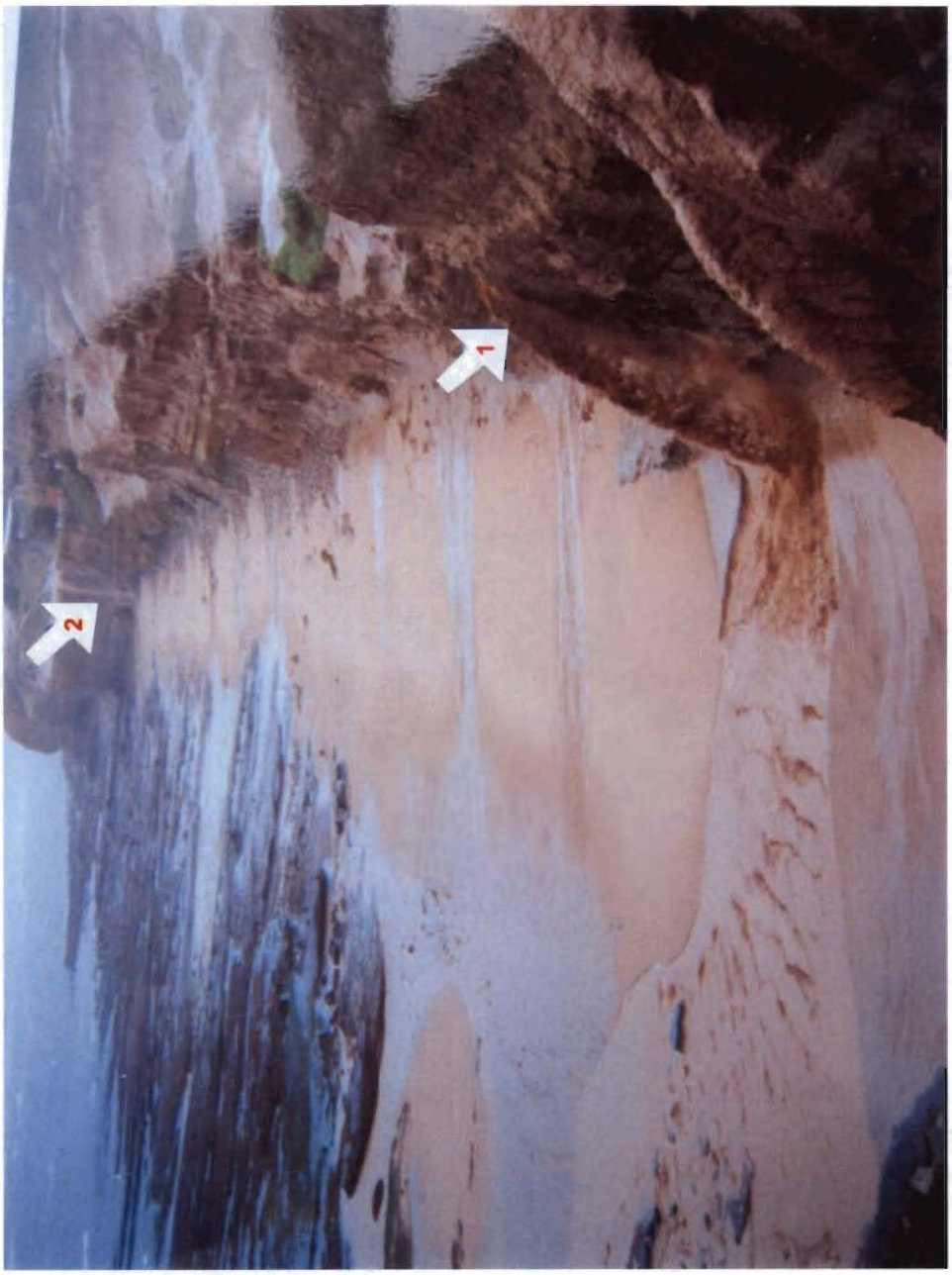
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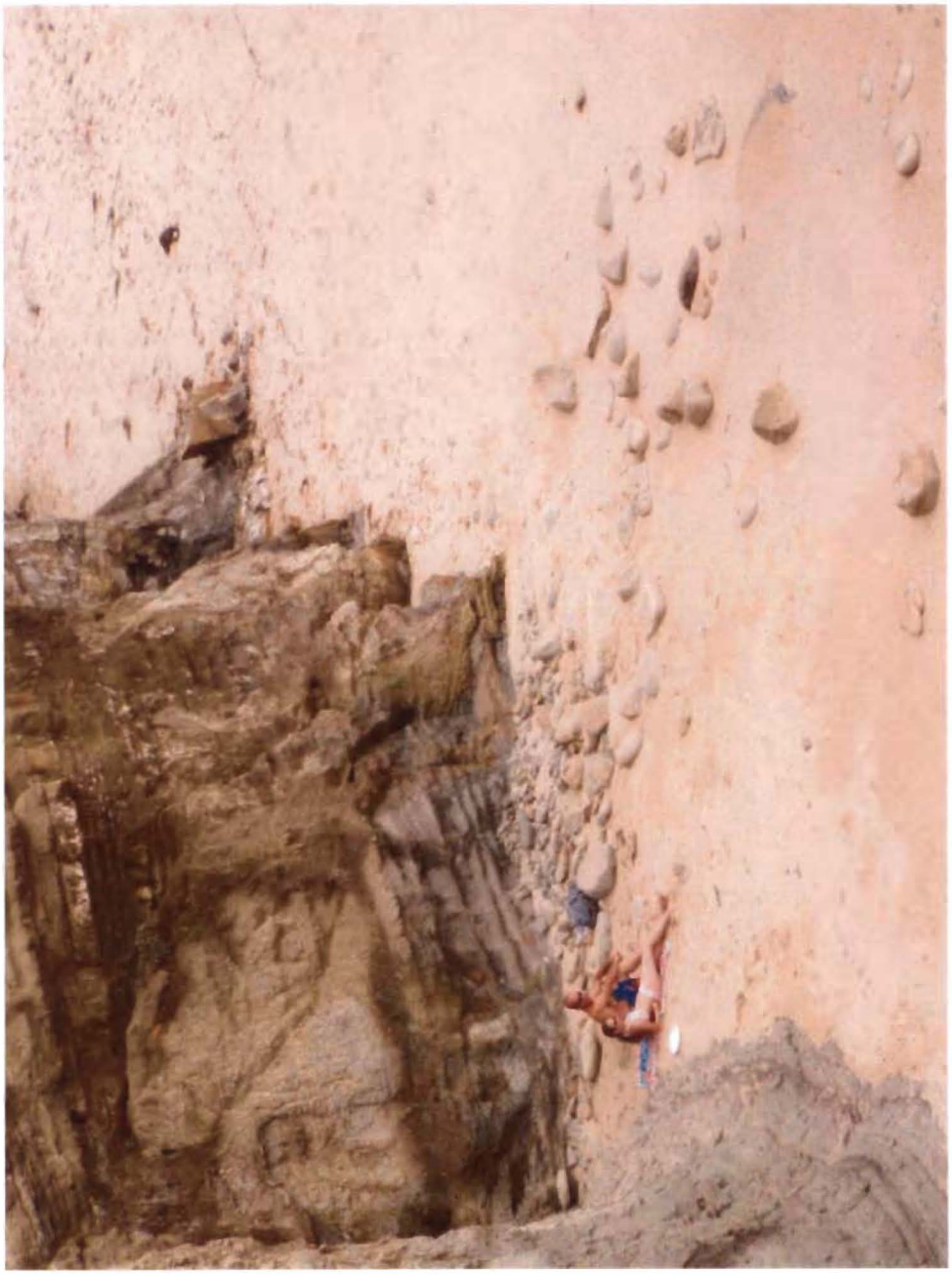

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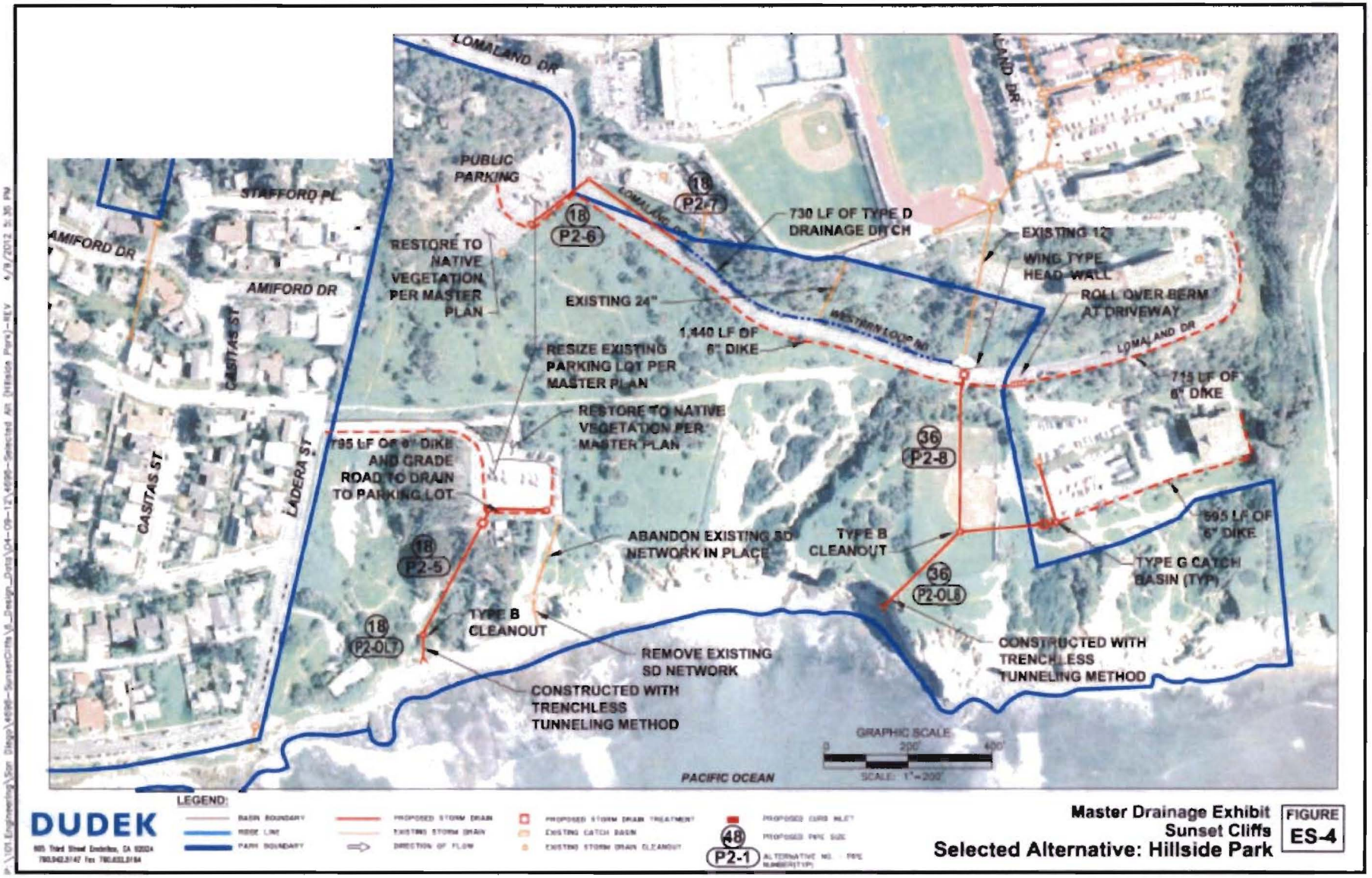

LEGEND:

BASIN BOUNDARY
RIDGE LINE
PARK BOUNDARY
PROPOSED STORM DRAIN
EXISTING STORM DRAIN
DIRECTION OF FLOW
PROPOSED STORM DRAIN TREATMENT
EXISTING CATCH BASIN
EXISTING STORM DRAIN CLEANOUT
48 P2-1 ALTERNATIVE NO. - PIPE NUMBER(TYP)
PROPOSED CURB INLET
PROPOSED PIPE SIZE

DUDEK
605 Third Street Encinitas, CA 92024
760.942.5147 Fax 760.632.5184

Master Drainage Exhibit
Sunset Cliffs
Selected Alternative: Hillside Park

FIGURE ES-4

P:\101 Engineering\San Diego\4696-SunsetCliffs\6_Design_Docs\04-09-12\4696-Selected Alt (Hillside Park)-REV 4/9/2012 5:35 PM

DECEMBER 12, 2012 SAN DIEGO R.W.Q.C.B. WORKSHOP

POSSIBLE AREAS FOR USING LID/BMP APPROACHES FOR CONTROLLING AND USING STORM WATER

FROM A POINT LOMA NAZARENE UNVIVERSITY (PLNU) AND THE SURFRIDER FOUNDATION GRANT PROPOSAL
AND
SUNSET CLIFF ASSOCIATION (SCA) DATA

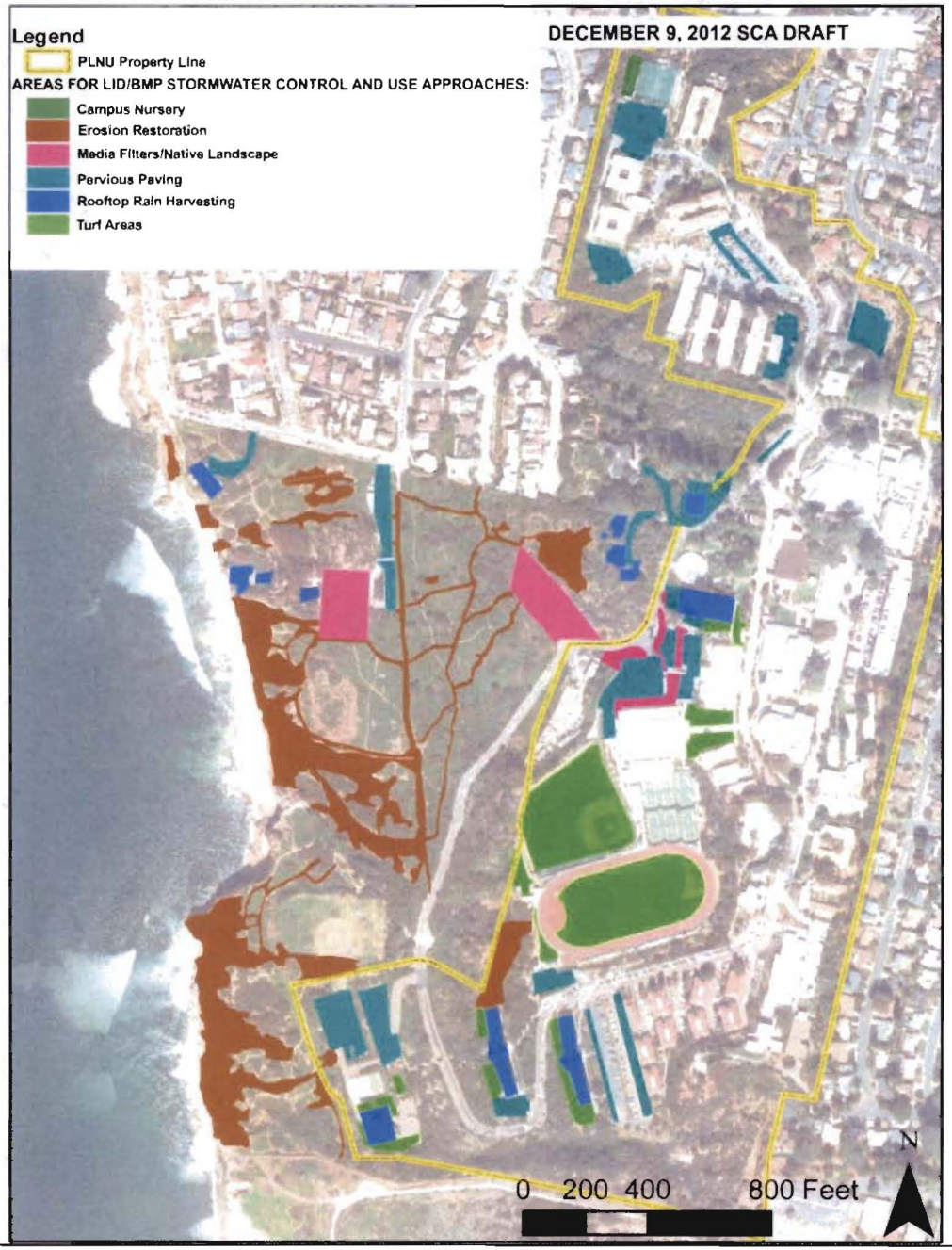

STORM WATER REGULATIONS AND SCNP

- Will the tentative storm water regulations be relevant to SCNP erosion and marine pollution?
- Where in the planning for SCNP projects, design and construction will the City of San Diego become part of the process for the new storm water regulations?
- How will it be determined if the City of San Diego is or is not in compliance with water quality regulations relative to pollutants and sedimentation in the near shore waters?

Sunset Cliffs Association

Mr. Lee McEachern
California Coastal Commission
Deputy Director, San Diego District
7575 Metropolitan Drive
San Diego, CA 92108-4421

October 3, 2012

Dear Lee:

The Sunset Cliffs Association (SCA) is registered as an Unincorporated Nonprofit Association pursuant to California Corporations Code Section 21300. One of our goals is to help ensure that the marine and terrestrial resources of Sunset Cliffs Natural Park (SCNP) are used in a sustainable manner.

I understand you had a phone conversation last week with Craig Barilotti and Norm Allenby, where they registered concerns about implementation of the PLNU drainage plan at Sunset Cliffs. SCAs concern is that the plan if executed would exacerbate the erosion problems in the park and create significant pollution of the ocean west of the park. At your suggestion to put something in writing, here are our thoughts.

We are concerned with the SCNP Hillside Park. Let's review where we have been, where we are and where we perhaps should go.

BACKGROUND

The park is a 50 – acre site at the lower portion of a watershed. The upper portion of the water – shed is a 90 – acre college campus largely developed with lots of building footprints and hardscape from which storm water is collected and directed into the park. This storm water runoff has resulted in erosion and marine pollution due to the runoff transporting eroded sediments over Sunset Cliffs (See Figure 1) for more than twenty years.

With an average annual rainfall of about ten inches, based on a comparison to native vegetation on adjacent Navy property, SCNP can absorb its ten inches of annual rain with zero discharge to the beach. Properly restored with coastal sage plants it may absorb more, but the park as is has periodically been overwhelmed with storm water runoff from the PLNU campus as noted in a 1992 letter from the Regional Water Quality Control Board asking the City to abate the erosion before the next rainy season. The volume and relatively high velocity of the runoff has caused the erosion (See Figure 2) and marine pollution due to sediment discharges (see Figures 3 and 4) that has been apparent throughout the SCNP Hillside Park since 1975.

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Sunset Cliffs Association

WHERE WE HAVE BEEN

The PNLU Master Plan, as conceived in 1992, was in response to an amended CUP item 38e which states:

> "The applicant shall submit a drainage and erosion control plan, to be approved by the Planning Director and City Engineer, which identifies mitigation measures for the sole purpose of correcting future erosion problems which directly relate to the proposed new land use authorized by this CDP/CUP amendment."

Such a plan was prepared, signed off by the appropriate persons, but never implemented. There was public comment to the effect that the contemplated drainage system construction would do more harm than good. Discussions took place between the City and PLNU regarding the use of PLNU funds to offset construction costs to presumably pursue a different plan.

As time continued to pass, an advisory group formed by the City of San Diego Parks and Recreation Department called the Sunset Cliffs Natural Park Council, developed a Master Plan for the Park in 2005. The SCNP Master Plan contemplated project EIRs, a Comprehensive Drainage Plan and a series of sequential steps to be taken in the creation of a Natural Park. The PNLU drainage plan collected dust. The ocean pollution continued as did the erosion. SCNP was literally disappearing.

WHERE WE ARE

A review of the CUP for PLNU came up in 2011. CUP 38e remained an open item. PLNU resuscitated its 1992 drainage plan. Without benefit of any substantial public review, PNLU pressed forward using a private ministerial process where public review and commentary were not required. There was approval of its 1992 drainage plan as amended in 2012, without consideration of the impact such a plan would have on park erosion and ocean pollution and the destruction of the registered archeological sites in the SCNP the 1992 PLNU Drainage Plan would have protected.

The volume of the storm water flow to be anticipated with a fifty-year storm left the design professional for the park drainage plan with no alternative but to design a traditional storm drain system with a big pipe ocean disposal solution to solve the storm water problem.

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The big pipe solution itself would have significant impact on the park but, more importantly, it would not protect the ocean from sediment laden runoff discharge into marine waters and habitats.

That is not to say that the PNLU plan 2012 is not better than the PNLU plan 1992, but it nonetheless does not correct future erosion problems, as required by its CUP item 38e. These past current and future problems could be altogether avoided by the application of current standards of care reflected in BMPs, LID, Storm Water Regulations and good engineering practices.

WHERE ARE WE GOING?

Integrated watershed planning is the twenty-first century's answer to the problem posed by the condition of Sunset Cliffs Natural Park. Ocean pollution will continue if storm water controls have not been properly addressed.

There are four separate plans, that include drainage components, in various project stages of development, that could adversely impact sensitive coastal resources as follows: 1) SCNP Hillside Tails and Renovation plan funded in part by the California Coastal Conservancy, is 90% complete; 2) a final Drainage Study recommended by City Parks and Recreation Department (not a comprehensive plan) is finished; 3) the PLNU CUP drainage plan; and 4) a completed SCNP Master Plan. Coordinated environmental work should be done for each plan, yet none of these separate plans discuss any of the others, even though the key entities involved are well aware of each plan, thus creating a piece meal approach. Unless the City and PNLU are required to act together to handle these storm water issues, the park will continue to erode and the beaches and ocean continue to be polluted.

I hope that your group will take a leadership role to get planning and implementation of storm water control measures by PLNU that will eliminate PLNU storm water runoff into the SCNP. Simply put, the 2012 PNLU Drainage Plan should be rejected. PLNU needs a storm water management plan, not a drainage plan. Such a plan would cure future erosion problems and allow the development of a natural park as reflected in the SCNP Master Plan.

Yours truly,

Signed original taken by courier to San Diego CCC Office October 4, 2012

Daniel Mendiguchia
Vice President, Sunset Cliffs Association

Cc: Norm Allenby, Craig Barilotti, Camilla Ingram, Suhail Khalil

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FIGURES FOR SCA CCC OCTOBER 3, 2012 PLNU CUP LETTER

List of Figures:

Figure 1. Garbage Beach waterfalls due to uncontrolled runoff.

Figure 2. Erosion caused by PLNU Young Hall dormitory runoff during December 2004.

Figure 3. Aerial photograph taken November 2, 1986 of the SCNP area and turbid ocean waters.

Figure 4. February 2, 2003 photograph of Culvert Canyon turbid storm water runoff discharges.

Figure 5. Diagram from the 1992 PLNU Young Hall drainage plan EIR.

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Figure 1. Garbage Beach waterfalls due to uncontrolled runoff. In this undated photograph provided by Ann Swanson, runoff, mostly from PLNU, that is channeled down the major erosion gully running through the middle of the Hillside Park that is often called "Culvert Canyon", forms the waterfall that is shown discharging at the south end of Garbage Beach pointed out by Arrow 1. Arrow 2 points to the location of a waterfall made up mostly of runoff generated on SCNP impervious surfaces including the park Lower Parking Lot, roofs, and trails where the soil is compacted by pedestrian traffic. Smaller flows from storm water flowing over the cliffs between Arrows 1 and 2 can also be seen. These runoff flows add erosion sediments to the near shore zone that impact marine plants and animals in intertidal and sub – tidal habitats including surf grass (*Phyllospadix*) beds that provide a nursery habitat for juvenile lobsters during the first 1 – 2 years after they settle out of the plankton. The San Diego Regional Water Quality Control Board Executive Officer in a May 26, 1992 letter to the City of San Diego NPDES Program Coordinator requested that the discharge of sediment laden runoff to the marine water adjacent to the SCNP be abated before the next rainy season.

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Figure 2. Erosion caused by PLNU Young Hall dormitory runoff during December 2004. The runoff caused erosion that partially severed the main trail many park users follow to the shoreline access point called "Ab Trail" by local surfers. This erosion was rapid and deep enough that there was concern it would washout the high pressure force main that transports digested sludge from the Point Loma Water Treatment Plant to the Miramar Sludge processing plant 23 miles away. The runoff causing this erosion in December 2004 originated from the same runoff sources that the contemporary PLNU Drainage system is designed to capture and infiltrate into the soil. Infiltration of runoff into the soil could be problematic if the soil down slope in the SCNP lost its strength, as the soil did in part in the 2004 – 2005 rainy season as evidenced by piping and slumping, exacerbating erosion in the SCNP archeological sites.

Sunset Cliffs Association

Figure 3. Aerial photograph taken November 2, 1986 of the SCNP area and turbid ocean waters. The turbidity of the ocean waters that is greatest off the southern areas of the SCNP Hillside Park, presumably due to erosion sediments that have been transported to the sea by runoff from SCNP and PLNU. Currents will move the turbidity plume north and southward along the coastline by a number of factors including: tides, wind and prevailing alongshore currents. This photograph is part of an aerial photographic time series for the California coastal zone that is available online, and is compiled by the California Coastal Records Project.

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Figure 4. February 2, 2003 photograph of Culvert Canyon turbid storm water runoff discharges. This photograph, taken by Craig Barilotti, shows how turbidity due to sediment discharges from Culvert Canyon after being introduced into the coastal waters, moves offshore and alongshore depending on prevailing currents, in this case northward towards Ocean Beach.

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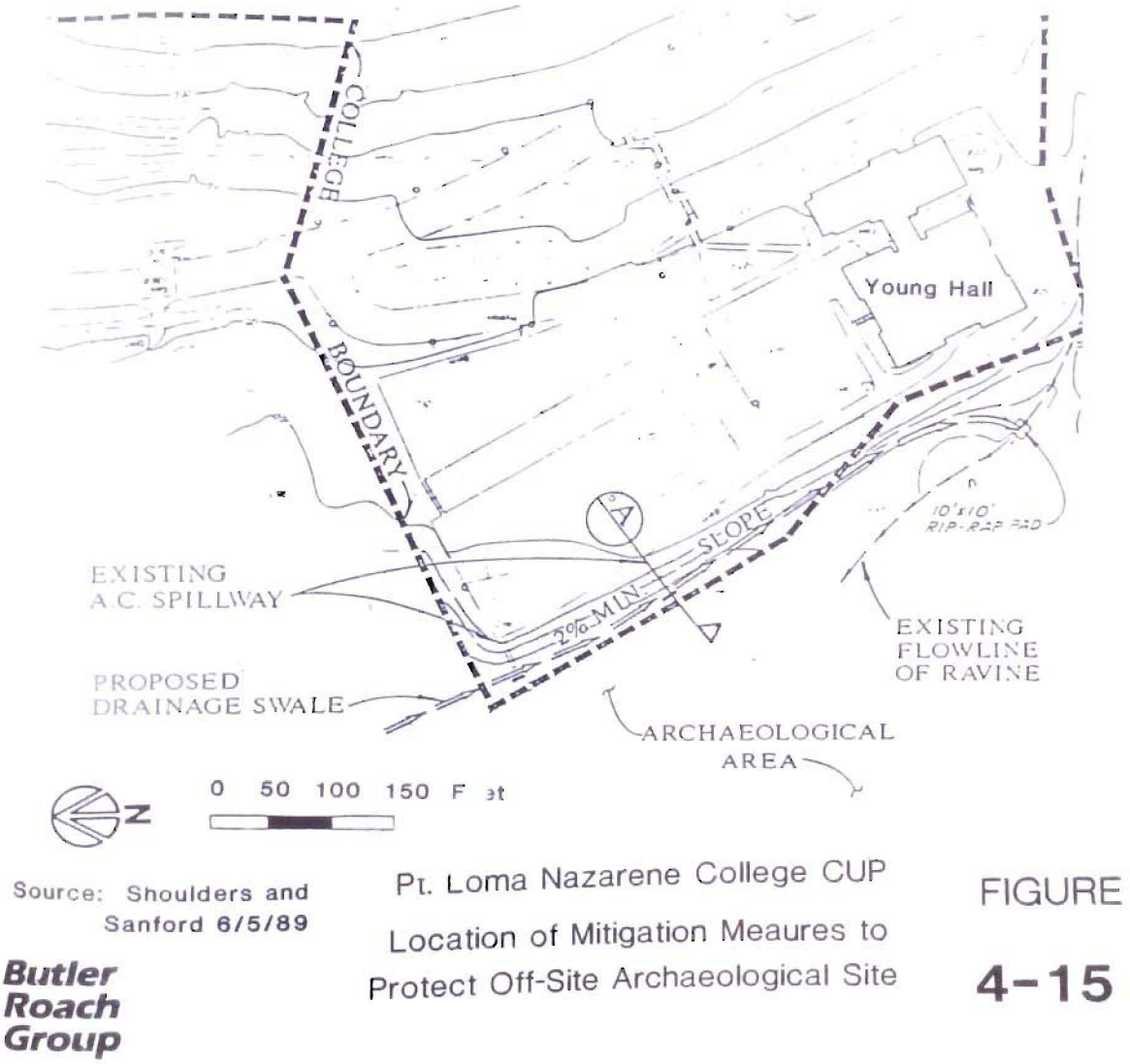

Figure 5. Diagram from the 1992 PLNU Young Hall drainage plan EIR. This design was prompted by concerns for protecting the California registered Native American archeological sites that are just to the west of Young Hall on SCNP property. The discharge structure shown in this diagram and page 3 of the 1992 Drainage System Plans was to have been on SCNP property where it discharged into South Canyon, in part to protect the archeological sites from the Young Hall runoff. The 2012 PLNU Drainage Plan proposes to discharge into velocity dissipaters located on PLNU property, and during periods of heavy rainfall when the drainage system retention capacity is reached, runoff is expected to flow across the PLNU/SCNP property line with a velocity of 2.5 feet per second and into the parkland where the archeological sites are located. The potential for erosion due to Young Hall runoff was demonstrated during the 2004 – 2005 wet season (see Figure 2), when runoff from the Young Hall caused major erosion in the archeological area shown on the EIR diagram.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
9174 Sky Park Court, Suite 100
San Diego, California

MINUTES OF MEETING
DECEMBER 12, 2012

At 9:00 a.m., Vice Chairman Strawn called to order the meeting of the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) at the Regional Water Quality Control Board, 9174 Sky Park Court, San Diego, California.

Item 1 – Roll Call and Introductions
Board Members present: Henry Abarbanel, Eric Anderson, Tomas Morales, and Gary Strawn.

Staff Present: David Gibson, James Smith, Chris Witte, Julie Chan, David Barker, Eric Becker, Wayne Chiu, Frank Melbourn, Lilian Busse, Chiara Clemente, Roger Mitchell, John Odermatt, Ben Neill, Jeremy Haas, Fisayo Osibodu, Bob Morris, Tony Felix, Cynthia Gorham, Mike Porter, Debbie Woodward, Sheila Christine McQuaid-Moran, Michelle Mata, Amy Grove, Cheryl Prowell, Chad Loflen, Barry Pulver, Deborah Jayne, Laurie Walsh, Lori Costa, Carey Nagoda, Craig Carlisle, Christina Arias, Joann Lim, Alan Monji, Lisa Honma, Helen Yu, Phil Moskal.

Others present on behalf of the San Diego Water Board: State Water Resources Control Board – Frances Spivy-Weber, Catherine Hagan, Jessica Jahr. California Court Reporters – Jonelle Gallivan.

Public Attendance: Jeff O'Connor, Otay Land Company; Eric Comeci, Riverside County Flood Control (RCFC) & Water Control District (WCD); Claudio Padres, RCFC & WCD; Claudia Steiding, Riverside County Transportation Dept.; Drew Kleis, City of San Diego; Ruth Kolb, City of San Diego; Tammy Dunbar, City of Solana Beach; Deborah Lee, Coastal Comission; Dennis Bowling, Rick Engineering; Steve Horn, County of Riverside; Erik Ruehr, San Diego Highway Development Association; Paul Manasjan, SDCR Airport Authority; Bryn Evans, URS for Industrial Environmental Association; Michael Blankinship, SePro Corporation; Dennis Davies, City of El Cajon; James Campos, City of El Cajon; Robin Madaffer, Westfield; James O'Day, County of San Diego; Gabrielle Skipper, MCB Camp Pendleton; Lisa Zawaski, City of Dana Point; Nancy Gardiner, Weston Solutions; Robert Galludett, URS; Lee Kaminetz, SDCR Airport Authority; Billy Walker, Oceanside; Rosanna Lacarra, City of Coronado; John Emerson, Palomar College; Gary Reist, Del Mar Fairgrounds; Trevor Alsop, Geosyntec; D. Craig Baricotti, Sunset Cliffs Association; Karen Cowan, Larry Walker Associates; Deborah Mosley, San Diego Copermittees; Mike Nagy, SD Chamber of Commerce; Leah Hemze, SD Chamber of Commerce; Brian Diaz, Recupero & Associates; Troy Bankston, County of San Diego; Todd Snyder, County of San Diego; Elaine Lukey, City of Carlsbad; James Wood, City of Carlsbad; Lisa Skutecki, Brown & Caldwell; Christian Bracka, Geosyntec Consultants; Chris Minton, Larry Walker Associates; Brad Fowler,

City of Dana Point; Jevee Tagarao, Pure Effect/GSA; Kelly Tair, AMEC; Stephanie Gaines, County of San Diego WPP; Mo Lahsaie, City of Oceanside; Cynthia Mallett, City of Oceanside; Ken Susilo, Geosyntec Consultants; Kim Williams, Geosyntec Consultants; Kim Goodby, Coronado; Helen Davies, City of Santee; W. Gates, SDG&E; Eric Lardy, County of San Diego; Heather Stroud, City of San Diego; Cheryl Filar, Escondido; Mikhail Ogawa, City of Del Mar; Christine Sloan, County of San Diego; Doug Johnson, Stantec Consulting; Michael Stednitz, Fireworks America; Julia Chunn-Heer, Surfrider San Diego; Khosro Aminpour, City of Chula Vista; Michael Welcoy; Richard Boon, County of Orange; Michael McSweeney, BIA; James Fortuna, County of Orange; Amanda Arkenhold, AMEC; Sumer Hasenin, City of San Diego; Jack Monger, IEA; Paul Hartman, City of Vista; Erik Steenblock, City of Encinitas; Eric Mosolgo, Tetra Tech; Erica Ryan, City of San Marcos; Faith Picking, Biocom; Chris Helmer, City of Imperial Beach; Richard Leja, San Diego Highway Development; Kelly Barker, City of Del Mar; Jennifer Shook, County of Orange; Jay Shrake, AMEC; Maryanne Skorpanich, County of Orange; David Garcia, RCFC; Cursealan Dadkhah, City of National City.

Item 2 – Public Forum

Jill Witkowski, Waterkeeper for San Diego Coastkeeper, addressed the Board regarding a remedial action plan for the San Diego Bay cleanup.

Guy Asaro, Chairman of the Building Industry Association, spoke regarding the MS4 permit. Mr. Asaro spoke out of order on Item 11. His comments are incorporated into the record for Item 11.

Michael Stednitz, General Manager of Fireworks America, commended Board staff for their work on fireworks permits. Mr. Stednitz was allowed to speak before the commencing Item 11.

Item 3 – Minutes of Board Meeting: November 13, 2012.

Mr. Anderson moved that the minutes be approved, and the motion was seconded by Mr. Morales The minutes were approved by unanimous vote.

Item 4 – Chairman's, Board Members', State Water Board liaison's, and Executive Officer's Reports. These items are for Board discussion only. No public testimony will be allowed, and the Board will take no formal action.

Fran Spivy-Weber provided an update on upcoming appointments of new Board members, the budget, and other State Board matters.

Mr. Gibson provided a summary of the Executive Officer's report.

Consent Calendar: Items 5 through 8 are considered non-controversial issues. (NOTE: If there is public interest, concern, or discussion regarding any consent calendar item or a request for a public hearing, then the item(s) will be removed from the consent calendar and considered after all other agenda items have been completed.)

Item 5 – Mitigated Negative Declaration: Leuthe Residence Onsite Wastewater Treatment System, San Diego County. (*Fisayo Osibodu*)

Item 6 – Waste Discharge Requirements: Leuthe Residence Onsite Wastewater Treatment System, San Diego County. (*Fisayo Osibodu*)

Item 7 – NPDES Permit: General Permit for the Discharge of Lanthanum-Modified Clay to Surface Waters of the United States in the San Diego Region (Tentative Order No. R9-2012-0063). (*Ben Neill*)

Item 8 – Administrative Civil Liability: Ariel Suites, L.P., Mandatory Minimum Penalty for violations of Order No. R9-2007-0034. The San Diego Water Board will consider adoption of a Tentative Order that would impose a $138,000 mandatory minimum penalty recommended in Complaint No. R9-2012-0065 for violations of effluent limitations prescribed in *General Waste Discharge Requirements for Discharges from Temporary Groundwater Extraction and Similar Waste Discharges to San Diego Bay, Tributaries Thereto Under Tidal Influence, and Storm Drains or Other Conveyances Systems Tributary Thereto (WDR), Order No. R9-2007-0034, NPDES No. CAG919001.* The San Diego Water Board may approve or reject assessment of the recommended penalty. If the San Diego Water Board rejects the Tentative Order, the matter may be rescheduled to a future public hearing, at which time the San Diego Water Board will consider assessment of civil liability. (*Frank Melbourn*)

A motion to adopt the Consent Calendar with errata to Item 6 was made by Dr. Abarbanel and seconded by Mr. Anderson. The Consent Calendar was adopted by unanimous vote.

Remainder of the Agenda (Non-Consent Items)

Item 9 – Tentative Resolution: Resolution in Support of a Regional Monitoring Framework (*Lilian Busse*)

Mr. Gibson introduced the Regional Monitoring Framework as a key element of the San Diego Water Board's Practical Vision.

Dr. Busse made a presentation regarding the Monitoring Framework.

Mr. Morales made a motion to adopt the Tentative Resolution with errata, the motion was seconded by Mr. Anderson, and the motion was adopted by unanimous vote.

Mr. Strawn called a recess at 10:15 a.m. and reconvened the meeting at 10:25 a.m.

Item 10 – Information Item: San Dieguito Lagoon: Restoration, Fill Removal, and Storm Water BMPs (*Tony Felix*)

Mike Porter introduced the speakers who would make presentations regarding the San Dieguito Lagoon.

The following people made presentations regarding San Dieguito Lagoon:

- Patrick Tennant, San Onofre Nuclear Generating Station
- Deborah Lee, Southern California Edison, California Coastal Commission
- Dustin Fuller and Gary Reist of Del Mar Fairgrounds

After concluding Item 10, Mr. Strawn administered the Oath of Office to newly appointed Board member Sharon Kalemkiarian. Ms. Kalemkiarian then took her place on the dais and expressed her appreciation for the meeting attendees and their participation in the regulatory process.

Item 11 – Public Workshop (continued): The San Diego Water Board will hold a public workshop to receive information and discuss proposed requirements in the public draft of a Regional NPDES Permit for Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region (Tentative Order No. R9-2013-0001, NPDES No. CAS0109266). The San Diego Water Board will not take any formal action on this item at the workshop. (*Christina Arias and Laurie Walsh*)

Christina Arias spoke regarding hydromodification management programs. Following Ms. Arias, the Board heard from stakeholders and the public on the topic.
Wayne Chiu addressed TMDLs and other items. Following Mr. Chiu, the Board heard from stakeholders and the public on the topics.
Laurie Walsh concluded the staff presentation by presenting a breakdown and timeframe of the costs associated with the proposed Order. Following Ms. Walsh, the Board heard from stakeholders and the public on the topic.

Mr. Strawn recessed for lunch and Closed Session at 12:00 p.m. and reconvened the meeting at 1:00 p.m.

The following people commented on the proposed Order:

- Leah Hemze, Acting Executive Director, San Diego Regional Chamber of Commerce
- Jill Witkowski, Waterkeeper, San Diego Coastkeeper
- Todd Snyder, County of San Diego
- Mary Anne Skorpanich, Manager, Orange County Watersheds
- Bryn Evans, URS representing Industrial Environmental Association (IEA)

- Rosanna Lacarra, San Diego Copermittees/LaRoc Environmental
- Lisa Zawaski, Senior Water Quality Engineer, Dana Point
- Karen Cowan, Larry Walker Associates, on behalf of the County of Orange
- Ken Susilo, Geosyntec
- Drew Kleis, Program Manager, City of San Diego
- Michael McSweeney, Senior Public Advisor for the Building Industry Association
- Ruth Kolb, Program Manager, City of San Diego
- Julia Chunn-Heer, Surfrider San Diego
- Richard Leja, Advocacy Chair, San Diego Highway Development Association
- Julie Procopio, City of Santee
- Claudio Padres, Senior Civil Engineer, Riverside County Flood Control and Water Control District
- Ryan Baron, Senior Deputy County Counsel, County of Orange
- Jeff O'Connor, Otay Land Company
- Jim Nabong, Civil Engineer, City of San Diego
- Dennis Bowling, Rick Engineering
- D. Craig Barilotti, Sunset Cliffs Association
- Bob Callacott, Riverside County Transportation Department
- Heather Stroud, Deputy City Attorney, City of San Diego
- Richard Boon, County of Orange
- Sumer Hasenin, City of San Diego Land Development
- Brad Fowler, Director of Public Works, City of Dana Point
- Christine Sloan, Chair, Land Development Workgroup, San Diego Copermittees

Mr. Strawn called a recess at 2:10 p.m. and reconvened the meeting at 2:20 p.m.

Item 12 - *Closed Session* - Discussion of Ongoing Litigation [Authorized under Government Code Section 11126, subd. (e)]. The San Diego Water Board may meet in closed session to discuss ongoing litigation for the following cases:

Civil Actions (Judicial and Administrative, other than Petitions for Review filed with the State Water Board)

a. *People of the State of California Ex Rel. the Regional Water Quality Control Board, San Diego Region v. Edward Drusina, an individual in his capacity as Commissioner of the International Boundary and Water Commission, United States Section, et al.,* Complaint for Violations of the Clean Water Act and Related State Law Claims. United States District Court, Southern District of California, Case No. 01-CV-027BTM(JFS) (filed February 2001). *(David Gibson)*

b. *In re: Test Claim on California Regional Water Quality Control Board, San Diego Region, Order No. R9-2007-001, (NPDES No. CAS0108758) Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal*

Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego County, the San Diego Unified Port District, and the San Diego County Regional Airport Authority adopted on January 24, 2007. Test Claim filed by San Diego County, et al., with Commission on State Mandates, No. 07-TC-09 (filed June 2008). *(Catherine George Hagan)*

c. *Surfrider Foundation v. California Regional Water Quality Control Board, San Diego Region,* Petition for Writ of Mandate [re: San Diego Water Board's adoption of Order No. R9-2009-0038 amending Order No. R9-2006-0065 for Poseidon Resources (Channelside), LLC, NPDES Permit No. CA0109223, approval of a Flow, Entrainment and Impingement Minimization Plan under the California Water Code]. San Diego County Superior Court, Case No. 37-2010-0009-436-CU-WM-CTL (filed April 2010). *(Brian Kelley)*

d. *California Regional Water Quality Control Board, San Diego Region v. Bill and Heidi Dickerson, Larry and Penelope Gunning and Perry & Papenhausen, Inc.* Complaint for Damages for Breach of Contract and for Specific Performance. San Diego County Superior Court, Case No. 37-2010-00096011-CU-CO-CTL (filed July 2010) *(Jeremy Haas)*

e. *State of California Department of Finance, State Water Resources Control Board, And California Regional Water Quality Control Board, San Diego Region v. Commission on State Mandates.* Petition for Writ of Administrative Mandamus. Sacramento County Superior Court, Case No. 34-2010-80000604 (filed July 2010) *(Catherine George Hagan)*

f. *In re: Citizens Development Corporation, Debtor and Debtor in Possession*, Case No. 10-15142-LT11. United States Bankruptcy Court, Southern District of California. (San Diego Water Board Claim in Bankruptcy) (filed June 2011) (*Catherine George Hagan*)

g. *Test Claim on California Regional Water Quality Control Board, San Diego Region, Order No. R9-2009-0002, (NPDES No. CAS0108740) Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of Orange, the Incorporated Cities of the County of Orange, and the Orange County Flood Control District adopted on December 16, 2009. Test Claim filed by County of Orange, et al., with Commission on State Mandates, No. 10-TC-11* (filed June 2011). *(Jessica Jahr)*

h. *Test Claim on California Regional Water Quality Control Board, San Diego Region, Order No. R9-2010-0016 (NPDES No. CAS0108766) adopted November 10, 2010, County of Riverside, Riverside County Flood Control and Water Conservation District, and the Cities of Murrieta, Temecula and*

Wildomar, Co-Claimants, filed with Commission on State Mandates, No. 11-TC-03 (filed November 2011). (Catherine George Hagan)

Petitions for Review Pending Before State Water Resources Control Board[1]

i. Petitions of the National Fireworks Association and Fireworks & Stage FX America Inc., Coastal Environmental Rights Foundation, and San Diego Coastkeeper (General National Pollutant Discharge Elimination System (NPDES) Permit Order No. R9-2011-0022 (NPDES No. CAG999002) for Residual Firework Pollutant Waste Discharges to Waters of the United States in the San Diego Region from the Public Display of Fireworks), SWRCB/OCC Files A-2164(a)-(c), filed June and July 2011. *(Michelle Mata)*

j. Petition of Citizens Development Corporation (Water Code Section 13267 Investigative Order No. R9-2011-0033 dated September 14, 2011, Requiring Submission of Technical Reports Pertaining to Investigation of Lake San Marcos Nutrient Impairment, San Diego County), SWRCB/OCC File A-2185, filed October 2011. (*Laurie Walsh*)

k. Petition of City of San Diego (Time Schedule Order No. R9-2011-0052 dated September 14, 2011, for the Kinder Morgan Energy Partners, Mission Valley Terminal Remediation Dewatering Discharge to Murphy Canyon Creek, San Diego County), SWRCB/OCC File A-2186, filed October 2011. (*Ben Neill*)

l. Petition of Jack Eitzen (Administrative Assessment of Civil Liability Order Nos. R9-2011-0048 and R9-2011-0049 against Jack Eitzen for 38175 and 38155 Via Vista Grande, Murrieta, Riverside County), issued October 12, 2011), SWRCB/OCC File A-2193, filed November 2011. (*Rebecca Stewart*)

m. Petitions for Review of San Diego Bay Shipyard Sediment Cleanup and Abatement Order No. R9-2012-0024 for National Steel and Shipbuilding Company (NASSCO), BAE Systems, San Diego Ship Repair (BAE Systems), Campbell Industries, City of San Diego, San Diego Gas & Electric (SDG&E) and San Diego Unified Port District (Port District) issued March 14, 2012. Petitions for Review and Requests for Stay filed by NASSCO, BAE Systems and City of San Diego. Petitions for Review w/o requests for stay filed by SDG&E, Star & Crescent Boat Company and Port District. SWRCB/OCC File A-XXXX, filed April 2012. (*Frank Melbourn)*

n. Petition of NASSCO for Review of Resolution No. R9-2012-0025 (Certifying Final Environmental Impact Report for San Diego Bay Shipyard Sediment

[1] Petitions for review of San Diego Water Board actions or inactions filed with the State Water Board being held in abeyance by the State Water Board are not listed in the agenda. The titles of these matters are available at the San Diego Water Board. Please contact Catherine George Hagan at chagan@waterboards.ca.gov or 858-467-2958 for more information.

Cleanup and Abatement Order No. R9-2012-0024), adopted March 14, 2012, SWRCB/OCC File A-XXXX, filed April 2012. (*Frank Melbourn)*

o. Petition of South Laguna Civic Association for Review of Order No. R9-2012-0013, NPDES No. CA0107611, NPDES Permit Reissuance: South Orange County Waste Authority, Discharges to the Pacific Ocean via Aliso Creek Ocean Outfall, adopted April 11, 2012, SWRCB/OCC File A-XXXX, filed May 2012. (*Joann Lim*)

p. Petition of City of San Diego for Review of Resolution No. R9-2012-0045, re NPDES Permit Notice of Enrollment Amendment for Kinder Morgan Energy Partners, June 13, 2012, SWRCB/OCC File A-XXXX, filed July 2012. (*Ben Neill*)

This closed session was held, and the Board Members discussed items *a, d,* and *m.*

Item 13 - *Closed Session* - Consideration of Initiation of Litigation or Discussion of Significant Exposure to Litigation. The San Diego Water Board may meet in closed session to initiate or consider initiating litigation concerning matters within its jurisdiction or to discuss significant exposure to litigation [Authorized under Government Code Section 11126(e)]. *(David Gibson)*

This Closed Session was not held.

Item 14 - *Closed Session* - Deliberation on a Decision to be Reached Based on Evidence Introduced in a Hearing. The San Diego Water Board may meet in closed session to consider evidence received in an adjudicative hearing and to deliberate on a decision to be reached based upon that evidence [Authorized under Government Code Section 11126(c)(3)].

This Closed Session was not held.

Item 15 - *Closed Session* – Personnel. The San Diego Water Board may meet in closed session to consider the appointment, employment, evaluation of performance, or dismissal of a public employee or to hear complaints or charges brought against that employee by another person or employee unless the employee requests a public hearing [Authorized under Government Code Section 11126(a)].

This Closed Session was not held.

Item 16 – Arrangements for Next Meeting and Adjournment:
Wednesday, February 13, 2013 – 9:00 a.m.
Water Quality Control Board
Regional Board Meeting Room
9174 Sky Park Court
San Diego, California

There being no further business, the meeting was adjourned at 4:53 p.m.

These minutes were prepared by: Signed by:

Chris Witte
Executive Assistant

David Gibson
Executive Officer

Audio Recordings
December 12, 2012 Board Workshop
Item No. 11

Item 11(1).WMA
Item 11(2).WMA
Item 11(3).WMA

THOMAS E. MONTGOMERY
COUNTY COUNSEL

DEBORAH A. McCARTHY
ASSISTANT COUNTY COUNSEL

CLAUDIA ANZÚRES
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MORRIS G. HILL
RICKY R. SANCHEZ
TIMOTHY M. BARRY
WILLIAM L. PETTINGILL
JUDITH A. McDONOUGH
JAMES R. O'DAY
RODNEY F. LORANG
DAVID J. SMITH
THOMAS D. BUNTON
LAUREL G. TOBAR
MIRIAM E. BREWSTER
WILLIAM H. SONGER
MARK C. MEAD
PAUL J. MEHNERT
DENNIS FLOYD
LISA MACCHIONE
KEVIN G. KENNEDY
DAVID G. AXTMANN
JAMES M. CHAPIN
ALEC S. BEYER
DAVID BRODIE
STEPHANIE KISH
THOMAS DEÁK
RACHEL H. WITT
THOMAS L. BOSWORTH
WALTER J. DE LORRELL III
JAMES M. TOPPER
CARRA L. RHAMY
B. GEORGE SEIKALY
PAULA FORBIS
BRYAN M. ZIEGLER
WILLIAM W. WITT
JAMES G. BOYD
LORI A. WINFREE
CHRISTOPHER J. WELSH
SHIRI M. HOFFMAN
DANA L. BEGLEY
MARK M. DAY
JUSTIN A. CRUMLEY
CHRISTOPHER DAWOOD
KRISTEN LAYCHUS

November 2, 2012

Grant Destache, Chairman
California Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4353

Re: Receiving Water Limitations Language (Provision A) in Draft Regional MS4 Permit

Dear Mr. Destache:

On November 13, 2012, the San Diego Regional Board will hold a workshop on the proposed Regional MS4 Permit. A major policy issue for the Regional Board to consider at the workshop is how the Permit should address compliance with water quality standards in receiving waters. Consistent with the Clean Water Act and prior decisions of the State Board, such compliance for MS4 discharges should be achieved over time, through an adaptive management approach. However, the 9th Circuit Court of Appeal has recently interpreted receiving water limitations language similar to that proposed in Provision A as requiring strict and immediate compliance with water quality standards. To respond to this recent interpretation of similar language, the Regional Board should realign Provision A to reflect the original policy goal of compliance through an adaptive management approach.

The purpose of this letter is to stress that the Regional Board has the discretion to make the policy decision to realign the language of Provision A to reflect the adaptive management approach. For the following key legal reasons, the Regional Board has this authority:

- It is settled law that the Clean Water Act does not require MS4 discharges to strictly comply with water quality standards. (Defenders of Wildlife v. Browner

(9th Circuit) 191 F.3d 1159.) In 1987, when Congress created the MS4 permitting system, it expressly treated MS4 discharges differently than all other MS4 discharges. As Courts have affirmed, Congress unambiguously decided that strict compliance with water quality standards was not required for MS4 discharges.

- The State Board has developed standard receiving water limitations language and has expressly interpreted that language as not requiring strict compliance with water quality standards. (State Board Order 2001-15.) To the contrary, the State Board has explained that "compliance is to be achieved over time, through an iterative approach requiring improved BMPs."

- Other MS4 permits issued by U.S. EPA directly or approved by U.S. EPA have employed the adaptive management approach as the basis for compliance with water quality standards. These permits have not required strict and immediate compliance with water quality standards for MS4 discharges.

Because the Clean Water Act does not demand that MS4 discharges strictly comply with water quality standards, and because the State Board has confirmed that compliance is to be achieved over time through the iterative process, the Regional Board should revise Provision A to realign the language with this policy approach. In light of the unique nature of MS4 discharges, as recognized by Congress, strict and immediate compliance with water quality standards is generally not feasible or appropriate.

Although the State Board has scheduled a November 20, 2012 workshop to discuss the receiving water limitations language, the Regional Board should provide policy direction on this issue now. It is requested that the Regional Board provide direction to staff to revise the language of Provision A to reflect the adaptive management approach as the basis for compliance. It is also requested that the Regional Board provide direction to staff to work with the State Board to support State Board language based on the adaptive management process. Addressing this issue now is particularly important for the Regional Permit because a failure to address the issue will undermine the value and acceptability of the watershed-based approach reflected in the Permit. The innovative approach taken in the Permit may be undermined entirely by the rigid language in Provision A. To support and allow dischargers to embrace the watershed-based approach, Provision A must be realigned with the adaptive management process.

We ask that this letter be provided to the full Board in advance of the workshop. It has been authored and signed below by our office and by counsel on behalf of the City of San Diego and City of Santee.

Very truly yours,

THOMAS E. MONTGOMERY, County Counsel

By

James R. O'Day, Senior Deputy

JAN I. GOLDSMITH, City Attorney, City of San Diego

By

Heather Stroud, Deputy City Attorney

CITY OF SANTEE

Shawn Hagerty
BEST BEST & KRIEGER LLP

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CITY OF SANTEE

Shawn Hagerty
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Mr. Destache

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Very truly yours,

THOMAS E. MONTGOMERY, County Counsel

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JAN I. GOLDSMITH, City Attorney, City of San Diego

By

Heather Stroud, Deputy City Attorney

CITY OF SANTEE

Shawn Hagerty
BEST BEST & KRIEGER LLP

CITY OF
CARLSBAD
Office of the City Manager

www.carlsbadca.gov

November 5, 2012

Honorable Grant Destache, Chair
Honorable Board Members
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123

Re: TENTATIVE ORDER R9-2013-0001 REGIONAL NPDES PERMIT FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS OF WITHIN THE SAN DIEGO REGION

Dear Chairman Destache and Board Members:

On behalf of the City of Carlsbad (City), please accept the information contained in this letter as formal comment to Tentative Order R9-2013-0001 Regional NPDES permit for Municipal Separate Storm Sewer Systems (MS4s) draining the watersheds within the San Diego Region, in preparation for the Regional Board Member workshop on November 13, 2012.

The City would like to take this opportunity to thank the San Diego Regional Water Quality Control Board (RWQCB) personnel for their progressive approach to stakeholder involvement in drafting the Tentative Order in the past six months. Overall, the focused meetings have been successful and have resulted in an improved permit. However, there are a few areas that warrant further refinement to ensure the permit is implementable, effective at improving water quality where needed, and sustainable from a social, environmental, and economic perspective.

The San Diego Copermittees will be providing verbal comments during the workshop which are supported by the City.

The City is also a Responsible Party in the San Marcos Hydrologic Area (SMHA), and therefore subject to the Bacteria Beaches and Creeks TMDL regulations included in Attachment E of Tentative Order R9-2012-0001. The City of Encinitas, as the lead for the SMHA Responsible Parties has submitted a comment letter on behalf of the Responsible Parties, which is also supported by the City of Carlsbad. We look forward to your thorough review of both sets of comments.

We appreciate the opportunity to work with the Regional Board and stakeholders in the development of regulations to improve water quality in our region. If you have any questions or need further clarification, please do not hesitate to contact Elaine Lukey, Environmental Manager, at (760) 602-7582.

Sincerely,

John Coates

John Coates
Acting City Manager

cc: Ronald Kemp, Assistant City Attorney
Cynthia Haas, Deputy City Manager
David Hauser, Director Property and Environmental Management
Elaine Lukey, Environmental Manager

City of Del Mar

November 5, 2012

Honorable Chairman Grant Destache and Board Members
California Regional Water Quality Control Board
San Diego – Region 9
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

SUBJECT: TENTATIVE ORDER R9-2013-0001 REGIONAL NPDES PERMIT FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4S) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

Dear Chairman Destache and Board Members:

The City of Del Mar has been pleased with the progressive process used to engage the regional Copermittees and stakeholders in the MS4 Permit reissuance process. RWQCB staff deserves commendation for their efforts to accommodate the Copermittees' written and verbal comments received into the Tentative Order in a quick and timely manner. This effort demonstrates the shared commitment of the RWQCB staff and Copermittees to develop an implementable, cost effective Permit that leads to improvements in water quality conditions. In light of the upcoming Public Workshop on November 13th, 2012 for the NPDES MS4 permit reissuance, the City of Del Mar would like to take the opportunity to address some key issues regarding Tentative Order R9-2013-0001.

In addition to those identified above, the City would like to highlight some of the valued outcomes of the permit reissuance process thus far, namely the Water Quality Improvement Plans (WQIP) as watershed planning documents and the requirement of adaptive management. We also agree with the intended approach for points of compliance with the Permit, as stated by RWQCB staff at the June 27th, 2012 focused meeting with stakeholders. Staff indicated that compliance would be based on the submission of complete Water Quality Improvement Plans (WQIP) and also the implementation and assessment of those WQIPs. Assessment includes adaptation to improve programs and plans to meet the established WQIP goals and ultimately water quality standards.

However, there are areas within the Tentative Order that we feel continue to warrant further consideration. This letter identifies the three primary areas of utmost importance where the process thus far appears to have reached an impasse. For these three topics, the RWQCB staff states that they are either not willing or, contrary to our understanding, not allowed to make further changes. The specific areas include:

I. Receiving Water Limitations language in **Provision A** of the Tentative Order;

1050 Camino Del Mar, Del Mar, California 92014-2698. Telephone: (858) 755-9313.Fax: (858) 755-2794
www.delmar.ca.us

II. Expression of Total Maximum Daily Load compliance is **Attachment E** of the Tentative Order, and;

III. Applicability of hydromodificaiton management requirements in **Provision E** of the Tentative Order.

A technical memorandum is attached with details on these topics of concern.

Our recommendations on these three issues are as follows:

I. Provision A Language Should Be Revised
The City urges you to provide direction to your staff to take an active and lead role on this extremely important issue. The new paradigm shift (WQIPs and required adaptive management) in the Tentative Order should be supported by revised state and local policies that encourage complete participation in the WQIP and adaptive management approach. Receiving water limitations language is driven by state and local policy and with a new standard of permitting upon us, the policies should reflect this new paradigm.

II. TMDL Compliance Should Be Consistent
The City of Del Mar urges you to direct staff to correct this apparent conflict between the RWQCB adopted Bacteria TMDL and the compliance requirements of the Tentative Order, Attachment E, Section 6.

III. Hydromodification Management BMPs Should Be Applied To Mitigate Hydromodification Impacts
The City of Del Mar respectfully requests you as RWQCB Members to direct RWQCB staff to include within the permit, the exemptions that were included in the HMP that RWQCB Members approved by Resolution No. R9-2010-0066 in 2010.

In summary, the City of Del Mar respectfully requests that RWQCB Staff and Copermittees work cooperatively on these three issues to find consensus and resolution. We appreciate your attention to our concerns, and we trust that this letter will be entered into the record at the November 13, 2012 meeting.

Sincerely,

Carl Hilliard
Mayor

cc: Del Mar City Council Members

Attachment: Technical Memo of November 1, 2012

City of Del Mar Memorandum

TO: Scott Huth, City Manager
Kathleen Garcia, Planning and Community Development Director

FROM: Mikhail Ogawa, Clean Water Manager

DATE: November 1, 2012

SUBJECT: San Diego Regional Water Quality Control Board Tentative Order R9-2013-0001

BACKGROUND

The San Diego Regional Water Quality Control Board (RWQCB) issues Municipal Separate Storm Sewer (MS4) permits to the Cities within San Diego County, the County of San Diego, the San Diego County Regional Airport Authority and San Diego Unified Port District (Copermittees). These permits are extensions of the federal Clean Water Act.

In April 2012, the RWQCB staff initiated an informal process by releasing an Administrative Draft of the forthcoming permit. The intent was to engage the Copermittees and stakeholders through focused meetings to allow the opportunity for a dialog to occur. The focused meeting process included five focused meetings, two public workshops, and a workshop sponsored by Orange County Copermittees focused on Hydromodification Management. The process has culminated in the release of a Tentative Order for public review on October 31, 2012. Public comments on the Tentative Order must be submitted by January 11, 2013. In addition, the RWQCB will hold a public workshop as a part of their regularly scheduled Board meeting on November 13th, 2012 to receive input from the public.

Two outcomes of the permit reissuance process thus far include Water Quality Improvement Plans (WQIP) as watershed planning documents and the requirement of adaptive management. The use of WQIPs as planning documents and allowing modifications to MS4 implementation programs, the Tentative Order offers a paradigm shift from previous prescriptive permits that may have led to unfocused programs not directed towards improvements in water quality.

In abridged terms, the WQIPs will be watershed planning documents intended to direct program implementation to focus on the highest of watershed specific water quality issues. The WQIP process requires Copermittees to establish interim and final goals where the objective is to bring MS4 discharges and waterbodies into compliance with water quality standards. The goals must be measureable so that progress towards them can be demonstrated. The WQIPs require schedules to be established for achievement of the interim and final goals. In some cases, these schedules may extend beyond the intended five-year life of the MS4 permit. Specific programmatic strategies are also prescribed to identify the means of achieving the established goals within the schedules. Lastly, the WQIPs also require adaptive management, so that Copermittees may learn from special studies and past efforts to use the most efficient and effective strategies and Best Management Practices to achieve water quality goals. The stated intent of the Permit is to have compliance based on the development, implementation and

adaptation of the strategies in WQIPs to meet the established goals and ultimately water quality standards.

CONCERNS REGARDING TENTATIVE ORDER

Provision A – Prohibitions and Limitations

The present use of the limitations in Provision A of the Tentative Order presents a dichotomy between requiring adaptive management BMP programs (i.e., WQIPs) and including receiving water limitations that prohibit discharges from the MS4s causing or contributing to violations of water quality standards[1]. The dichotomy may discourage the City from supporting the WQIP process, including adaptive management, if there is enforcement exposure based on the prohibition of discharges from the MS4s causing or contributing to violations of water quality standards. The City could be in violation immediately and continuously regardless of the efforts put towards the WQIPs and therefore may be discouraged from funding and participating in the adaptive management process that could ultimately work towards achieving water quality standards.

Board staff has verbalized that they have the discretion as to whether or not to enforce the receiving water limitations provision and intend not enforce this provision as long as the Copermittees demonstrate adequate progress through WQIP implementation and adaptation of program strategies. Furthermore, Board staff stated they have been directed to take a passive role and allow the State process[2] to be completed prior to making changes to the San Diego Regional MS4 Permit.

Attachment E – Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2013-0001

The Bacteria TMDL[3] states that for watersheds where there are no longer any impairments listed on the 2008 303(d) List (for REC-1 water quality standards), the Phase I MS4s are not required to submit a load reduction plan and are not subject to any further action under the TMDL as long as monitoring continues to support compliance with REC-1 water quality standards. However, if the impairment returns for REC-1 water quality standards, the Responsible Parties will be required to submit a load reduction plan to the RWQCB.

The City of Del Mar and other Responsible Parties in the San Dieguito and Los Peñasquitos watersheds demonstrated to the RWQCB that the two watersheds are within this scenario where the Pacific Ocean Shoreline of the two watersheds are no longer listed as impaired for indicator bacteria under REC-1 water quality standards. The Responsible Copermittees received written confirmation (see attached two email) that they are "not subject to further action under Resolution No. R9-2010-0001 as long as monitoring data continues to support compliance with the REC-1 water quality standards." This scenario essentially places our two watersheds in a "dormant TMDL", unless the Pacific Ocean shoreline of the one or both of the watersheds are relisted on future 303(d) lists for indicator bacteria[4].

---

[1] Tentative Order R9-2013-0001 Provision A.2.a.

[2] State Water Resources Control Board is holding a Public Workshop on MS4 permits Receiving Water Limitations (RWL) Language on November 20, 2012. There is currently no schedule as to when and if the SWRCB will develop revised positions on RWL for MS4 permits.

[3] Revised TMDL for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek) adopted by SDRWQCB Resolution No. R9-2010-0001

[4] Page A66 of SDRWQCB Resolution No. R9-2010-0001

Attachment E, Section 6[5] of the Tentative Order requires, amongst other provisions, the compliance with Water Quality Based Effluent Limitations (WQBELs). The WQBELs as described in the Tentative Order are expressed as Receiving Water Limitations, Effluent Limitations and as Best Management Practices requirements. As written, the Responsible Copermittees in the two watersheds are required to meet the listed WQBELs even while under the "dormant TMDL" condition.

There is a conflict between relisting of the Pacific Ocean shoreline and the more strict WQBEL limitations. Relisting of the Pacific Ocean shoreline would be done under the criteria established in the 2004 SWRCB Listing Policy[6] which allows for a certain number of water quality standard exceedances prior to listing. The WQBEL limitations allow **zero** water quality standard exceedances under dry weather conditions – a much higher bar with which to comply. If the WQBELs are included in the final adopted Permit, at a minimum, the WQBEL compliance is only applicable when the TMDL is in an active phase – i.e., the waterbody is impaired and listed on the 303(d) list as specified in the Bacteria TMDL (SDRWQCB Resolution R9-2010-0001). Otherwise, the Copermittees will be required to focus intense resources to address bacteria at the Pacific Ocean shorelines where water quality monitoring has demonstrated that it is not an issue. This ironic paradox would be contradictory to the watershed based adaptive management process where the objective is to focus limited resources on the highest water quality issues.

Provision E.3.c.(2) Hydromodification Management BMP Requirements
The Tentative Order defines hydromodification as:

> The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

The Tentative Order requires that priority development projects, including redevelopment projects, are required to control post-project runoff flow rates and durations so as not to result in increased potential for erosion, or degraded instream habitat conditions downstream of the projects. There are several explicit exemptions for these requirements identified in the Tentative Order. However, these exemptions are not inclusive of many of the exemptions identified in the San Diego Regional Copermittees Final Hydromodification Management Plan[7] (HMP). The exemptions identified in the HMP include, but are not limited to, projects that discharges to an exempt river reach, or a tidally-influenced area and other areas where there was little or no increased potential for erosion, or degraded instream habitat conditions downstream of the projects.

Over 95% of the City of Del Mar's MS4 system drains directly to either the Pacific Ocean or to tidally influenced areas of the San Dieguito estuary and river. The areas that drain to the Pacific

[5] Attachment E, Section 6 of the Tentative Order is the Specific Provisions for Total Maximum Daily Loads Applicable to Order R9-2013-0001 for the Revised TMDL for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)
[6] State Water Resources Control Board – Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List, adopted September 2004
[7] Approved on July 14, 2010 by San Diego RWQCB Resolution No. 2010-0066

Ocean will remain exempt per the Tentative Order, however, those areas that drain to tidally influenced areas of the San Dieguito estuary and river will not be exempt even though they have no Hydromodification impacts. The City will be forced to require priority development projects to mitigate for impacts they will not have.

City of Encinitas

November 5, 2012

Honorable Grant Destache, Chair
Honorable Board Members
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, California 92123-4340

SUBJECT: TENTATIVE ORDER R9-2013-0001 REGIONAL NPDES PERMIT FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS OF WITHIN THE SAN DIEGO REGION

Dear Chairman Destache and Board Members,

As it relates to the forthcoming Public Workshop on November 13th, 2012 please accept this letter on behalf of the City of Encinitas and the responsible parties of the San Marcos Hydrologic Area (HA) including the Cities of Carlsbad, Escondido, San Marcos, and the County of San Diego, as identified in Resolution No. R9-2010-0001 incorporating into the San Diego Basin Plan the *Revised Total Maximum Daily Loads (TMDL) for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)* (Bacteria TMDL).

At the November 13, 2012 Public Workshop, two significant and interrelated regulatory Orders will converge that individually deserve careful consideration, and even more so collectively. Tentative Order No. R9-2013-0001 includes *Attachment E – Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2013-0001*, and specific provisions for implementing the TMDLs adopted by the San Diego Water Board. Included in *Attachment E* are compliance requirements specific to the Bacteria TMDL[1], including the San Marcos HA.

The Bacteria TMDL states that for watersheds where there are no longer any impairments listed on the 2008 303(d) List (for REC-1 water quality standards), the Phase I MS4s are not required to submit a load reduction plan and are <u>not subject to any further action under the TMDL as long as monitoring continues to</u>

[1] Revised TMDL for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek) adopted by SDRWQCB Resolution No. R9-2010-0001

support compliance with REC-1 water quality standards. However, if the impairment returns for REC-1 water quality standards, the Responsible Parties will be required to submit a load reduction plan to the RWQCB.

The City of Encinitas and the San Marcos HA Responsible Parties have demonstrated to the RWQCB that this hydrologic area is consistent with the scenario described in the Bacteria TMDL, as the Pacific Ocean Shoreline Segment at Moonlight Beach in Encinitas (in the San Marcos HA) is no longer listed as impaired for indicator bacteria under REC-1 water quality standards. The Responsible Parties received written confirmation (*See Attached E-Mail dated Wednesday, May 16, 2012)* that they are "*not subject to further action under Resolution No. R9-2010-0001 as long as monitoring data continues to support compliance with the REC-1 water quality standards.*" This scenario effectively places the San Marcos HA in a "dormant TMDL" status, unless the Pacific Ocean shoreline of the San Marcos HA is relisted on future 303(d) lists for indicator bacteria[2] and REC-1 impairment.

Attachment E, Section 6[3] of the Tentative Order requires, amongst other provisions, compliance with Water Quality Based Effluent Limitations (WQBELs). The WQBELs as described in the Tentative Order are expressed as Receiving Water Limitations, Effluent Limitations and as Best Management Practices requirements. As *Attachment E* of the Tentative Order is currently written, the Responsible Copermittees in the San Marcos HA are required to meet the listed WQBELs even while under the "dormant TMDL" condition.

Further exacerbating this conflict, there is a disparity between relisting of the Pacific Ocean shoreline and the more strict WQBEL limitations presented in the Tentative Order. If future conditions and monitoring data were to support a re-listing of the Pacific Ocean shoreline at Moonlight Beach, this would be done under the criteria established in the 2004 SWRCB Listing Policy[4] which allows for a certain number of water quality standard exceedances prior to listing. In clear contrast, the WQBEL limitations in the Tentative Order allow **zero** water quality standard exceedances under dry weather conditions – a much higher bar with which to comply than the listing criteria. In effect, San Marcos HA Responsible Parties will be required to focus intense resources to address bacteria at this Pacific Ocean shoreline segment where water quality monitoring has demonstrated an impairment does not exist.

---

[2] Page A66 of SDRWQCB Resolution No. R9-2010-0001

[3] Attachment E, Section 6 of the Tentative Order is the Specific Provisions for Total Maximum Daily Loads Applicable to Order R9-2013-0001 for the Revised TMDL for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

[4] State Water Resources Control Board – Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List, adopted September 2004

In summary and in consideration of this involved and complex set of issues it is important to acknowledge the following facts:

- Per the 2010 303(d) list, the Pacific Ocean shoreline at Moonlight Beach (San Marcos HA) is NOT impaired for REC-1 Beneficial Uses (Moonlight Beach is the location that is the basis for including the San Marcos HA in the Bacteria TMDL).
- Per the 2010 303(d) list, the listing at Moonlight Beach for total coliform is based upon the water quality objectives for the SHELL beneficial use only, and as stated above, is not listed for REC-1.
- Per Resolution No. R9-2010-0001, the TMDL applies only to REC-1 and does not apply to SHELL impairments

  Pg. 4, footnote 17: "waterbodies with SHELL beneficial use impairments will be addressed in a separate TMDL project and/or standards action."

Based upon this background information and the conclusions presented above, at this time the Responsible Parties of the San Marcos HA would like to request your direction to RWQCB staff to address the conflict between the RWQCB adopted Bacteria TMDL and the compliance requirements of Tentative Order R9-2013-0001.

Sincerely,

Gus Vina,
City Manager, City of Encinitas

cc: Erik Steenblock, City of Encinitas
Todd Snyder, County of San Diego
Elaine Lukey, City of Carlsbad
Cheryl Filar, City of Escondido
Erica Ryan, City of San Marcos

Attachment A

Erik Steenblock

From: Deborah Jayne [djayne@waterboards.ca.gov]

Sent: Wednesday, May 16, 2012 5:27 PM

To: elaine.lukey@carlsbadca.gov; Erik Steenblock; vina@cityofencinitas.org; constantine_kontaxis@dot.ca.gov; cfilar@escondido.org; eryan@san-marcos.net; Todd.Snyder@sdcounty.ca.gov

Cc: David Barker; Deborah Woodward; Eric Becker; Jeremy Haas; Lisa Honma; Wayne Chiu

Subject: Your April 23, 2012 Letter Regarding Bacteria TMDLs and Moonlight State Beach

Dear Mr. Vina et al,
Thank you for your letter dated April 23, 2012 requesting written acknowledgment of your conclusions regarding the applicability of the Bacteria TMDLs to Moonlight State Beach and the requirement for submittal of a Bacteria (or Comprehensive) Load Reduction Plan (BLRP or CLRP).

The REC-1 TMDLs adopted under Resolution R9-2010-0001 remain in effect and applicable at Moonlight State Beach. However you are correct that the Responsible Parties (RPs) are not required to submit a BLRP or CLRP (specific to this beach segment) within 18 months of the effective date of the Bacti I TMDLs because this beach segment is not currently impaired/listed for REC-1. Furthermore, the Moonlight State Beach segment is not subject to further action under Resolution No. R9-2010-0001 as long as monitoring data continues to support compliance with the REC-1 water quality standards (Resolution No. R9-2010-0001 page A2). If, however, the segment is re-listed on a future 303(d) List for a REC-1 impairment, the RPs will be required to submit a BLRP or CLRP for this beach segment within 6 months of the adoption of the 303(d) List by the San Diego Regional Board (Resolution No. R9-2010-0001 page A66).

I trust this email adequately addresses your inquiry regarding TMDL applicability and BLRP or CLRP submittal. Regarding ongoing monitoring requirements, please refer to your MS4 permit for the general requirements and direct any specific monitoring questions to Mr. Wayne Chiu at wchiu@waterboards.ca.gov . Please feel free to contact me or Wayne at any time if additional clarification is needed.

Sincerely,

Deborah Jayne
Senior Environmental Scientist
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, California 92123-4340
Office: (858) 467-2972
Fax: (858) 571-6972
e-mail: djayne@waterboards.ca.gov

THE CITY OF SAN DIEGO

December 4, 2012

VIA EMAIL to: rb9agenda@waterboards.ca.gov

Mr. Gary Strawn
Acting Chair
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123

Subject: Tentative Order No. R9-2013-0001, December 12, 2012 Regional Board Meeting Agenda Item No. 11

Dear Mr. Strawn:

Thank you for the opportunity to participate in the Regional Water Quality Control Board's (Regional Board) December 12, 2012 workshop regarding the Tentative Order No. R9-2013-0001 hereinafter referred to as the "Tentative Order." This letter is being submitted to communicate the City of San Diego's (City) concerns regarding the Tentative Order for discussion at the Regional Board's December 12th meeting. A summary of the key issues is provided below. In addition, the City participated with the Copermittees in the San Diego region to develop written responses to the questions raised by the Regional Board at the November 13, 2012 workshop. The City requests that the Regional Board direct staff to work with the Copermittees to address these remaining issues before considering approval of the Tentative Order.

- *Revise the Tentative Order to allow a Copermittee to achieve compliance with Receiving Water Limitations, Areas of Special Biological Significance (ASBS) and Total Maximum Daily Load (TMDL) requirements, if the Copermittee is implementing an approved Water Quality Improvement Plan.* The City is committed to protecting and improving water quality in the San Diego Region. To that end, it is the City's objective for the Tentative Order to allow for the City to efficiently integrate its TMDL, ASBS and Municipal Permit requirements into an adaptive management program that allows the City to achieve compliance through implementation and iterative improvement of programs designed to achieve water quality goals. The mechanics and structure of the Water Quality Improvement Plan developed by Regional Board staff provide an innovative, thoughtful, and strategic framework for such an approach. However, the Tentative Order still does not provide a pathway for the City to achieve compliance with ASBS and TMDL regulations and the

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Transportation & Storm Water Department
9370 Chesapeake Drive, Suite 100, MS 1900 • San Diego, CA 92123
Hotline (619) 235-1000 Fax (858) 541-4350

Tentative Order's receiving water limitations while implementing the Water Quality Improvement Plans. Without these linkages, there remains little incentive for the City to undertake the significant increases in investments that would be required to implement the Water Quality Improvement Plans.

- *Revise the Bacteria TMDL requirements to allow for load- and BMP-based compliance, per the adopted Bacteria I TMDL.* The Bacteria I TMDL Basin Plan Amendment included options for concentration and load-based methods of calculating Waste Load Allocations. In addition, the Basin Plan Amendment allowed for the possibility of BMP-based compliance with the Bacteria I TMDL provided certain criteria and assurances were acceptable to Regional Board staff. These options should be included in the Tentative Order.

- *Revise the Tentative Order to uphold the previously adopted San Diego Hydromodification Management Plan (San Diego HMP), Resolution No. R9-2010-0066.* This plan has been in effect for less than two years. The San Diego HMP was developed by an expert consultant team that utilized extensive scientific studies, analysis and modeling to determine the appropriate hydromodification control criteria. Additionally, the San Diego Copermittees have embarked upon a $1.5 million, 5 year monitoring plan to validate the parameters and design criteria. There have been no scientific advances in the last 2 years to justify revisions to the San Diego HMP, therefore we request allowing the Copermittees to continue implementation of the current San Diego HMP.

- *Replace the monitoring and assessment requirements in the Draft Permit (Provision D.4) with the strategic monitoring approach developed collectively by the Copermittees.* The Copermittees' approach will more efficiently and effectively address critical questions necessary to adaptively manage the City's programs and realize our storm water quality goals.

We appreciate this opportunity to share our comments and look forward to continued discussions in finding ways to improve and protect water quality. If you have any questions please contact Drew Kleis, Program Manager at (858) 541-4329.

Sincerely,

Kris McFadden
Deputy Director

KM:dk

cc: David Gibson, Executive Officer, San Diego Regional Water Quality Control Board
Heather Stroud, City Attorney's Office
Bill Harris, Transportation & Storm Water Department
Sumer Hasenin, Transportation & Storm Water Department
Ruth Kolb, Transportation & Storm Water Department
Andre Sonksen, Transportation & Storm Water Department

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DEPT. OF PUBLIC WORKS
ADMINISTRATIVE OFFICE

Pala Pauma Valley Community Sponsor Group
P O Box 1273, Pauma Valley, CA 92061
760.481.4201

By: USPS

Monday, December 10, 2012

Mr. Rich Crompton, Director
County of San Diego Department of Public Works
5510 Overland Ave, Ste 410
San Diego, CA 92123

Dear Mr. Crompton,

Re: Comment – Tentative Order No.R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu

At its December 4, 2012 meeting the Pala Pauma Community Sponsor Group ("PPCSG") voted unanimously to support the action of San Diego County to protect water quality while controlling the mounting and unsubstantiated costs of increased regulation on local governments, business and industry. In particular, PPCSG supports the view that regulation based upon unproven science used in pursuit of parametric objectives that are apparently unattainable is poor governance and detrimamential to the interests of our community.

PPCSG believes that it is incumbent upon regulatory agencies to ensure that their enacted regulations are practical, cost-effective, and scientifically based. We are concerned that, otherwise, public funds may have to be spent to comply with requirements that are not proven nor effective, and that this will ultimately reduce the funding available for community projects and essential public services and increase the costs absorbed by trade and industry thereby inhibiting badly needed economic growth.

It appears that, as written, the Tentative Order will result in a significant and unprecedented level of regulation and cost without clear scientific basis or environmental benefit. The three main areas of concern in the draft permit are: i.) a far-reaching Bacteria Total Maximum Daily Load ("BTMDL"), ii.) additional requirements for development projects, and iii.) performance standards that unnecessarily expose municipalities to third-party lawsuits

PPCSG understands that the cost to comply with the Bacteria TMDL is estimated to be between $2.6 billion and $4.9 billion for the named watersheds in the region over the 20 year TMDL compliance timeline, of which only 18 years remain. The numeric targets in this TMDL may never be attainable even if government agencies were to spend billions in public resources, thereby increasing the costs of business and trade. PPCSG understand that available technology does not exist to return urbanized watersheds back to pristine, "reference" conditions.

Additionally, the Tentative Order requires that new and re-development projects return site hydrology to pre-development conditions as opposed to pre-project conditions. Returning urban infill projects to conditions that existed under "natural", pre-urban conditions would be a substantial constraint to re-development to the disadvantage of general Plans that seek to use infill development as a way of reducing urban sprawl. Further, the Tentative Order ignores all of the good work invested in the Hydromodification Management Plan developed at a significant cost to the public over the past years between the County and Regional Board staff and apparently seeks to impose a new, one-size-fits-all requirements standard that is unrealistic and without scientific justification. The result of all these changes is that the structures built to mitigate development impacts will need to be bigger and will cost significantly more than under the currently approved program.

PPCSG understands that receiving water limitations language is contrary to the intent of the Federal Clean Water Act, which is to assure municipal agencies will be regulated to a reasonable standard resulting in State and Regional Water Boards having the responsibility to ensure that water quality regulations are applied in a context that results in economic and environmental sustainability. PPCSG further understands that the 21 Co-permittees in our region (the County, 18 cities, Port District, and Airport Authority) already spend close to $120 million a year to comply with current regulations. PPCSG would like to see the Regional Board adopt Permit standards that will be cost neutral in a way that local municipalities will have the flexibility to apply funding to priority areas.

PPCSG is hopeful that the final permit language will result in programs that are rational from both environmental and economic standpoints -regulation within reason- and not impose upon our community the crippling disadvantages of regulation without reason.

Yours sincerely,

Charles Mathews, Chair,
Pala Pauma Valley Community Sponsor Group.

Copy: PPCSG members
Gary Strawn, Vice Chairman
Eric Anderson, SD RWQCB
Henry Abarbanel, SD RWQCB
Tomas Morales, SD RWQCB
David Gibson, SD RWQCB
Wayne Chiu, SD RWQCB
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego California 92123-4340
Stephanie Gaines, DPW Watershed Protection Program (by email)

Via e-mail to lwalsh@waterboards.ca.gov

San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

December 10, 2012

RE: Supplemental Comments for Aliso Watershed in South Orange County
San Diego Regional Municipal Separate Storm Sewer System (MS4) Permit,
Tentative Order No. R9-2012-0011

The South Laguna Civic Association, established in 1946, supports comments and recommendations submitted September 14, 2012 by the "Environmental Groups" regarding the administrative draft of the San Diego Regional Municipal Separate Storm Sewer System (MS4) Permit, Tentative Order No. R9-2012-0011 ("Administrative Draft Permit").

While a regional permit can provide improved levels of efficiency, smaller, high value habitats and coastal receiving waters established as critical marine life recovery areas may be overlooked. The Aliso Watershed in south Orange County represents an area requiring closer consideration.

Aliso Creek discharges 1 to 5 million gallons per day of dry weather urban runoff from known inland MS4 point sources. Twenty years of monitoring reports and over $20 million have clearly

identified at least one dozen offending storm drains with daily dry weather flows exceeding 150,000 gallons per day (GPD). Only one storm drain in Laguna Niguel has received a Clean-up and Abatement Order during this period.

As recently as 1982, surveys of Aliso Creek indicated no flows throughout the dry season. In fact, early ranching of Aliso Canyon with subsequent destruction of critical native trees and vegetation led to long drought conditions and widespread, fatal dehydration of cattle.

Today, the primary source of elevated creek flows originates exclusively from inland over-irrigation and careless discharges of recycled water. Non-native creek flows transport a toxic variety of pollutants and carcinogens from residential, commercial and municipal known point sources with measurable quantities of herbicide, pesticide, fertilizer, automotive and similar residues to protected creek, estuary and coastal receiving waters. Aliso Beach is permanently posted for contaminated water and remains a risk to public health and safety.
(Please see Exhibit A – 2011 Aliso Creek Daily Flow/e.g., August 1, 2011 @ 7.6cfs = 4.9 MGD)

Economics of Water Pollution

Water Districts profit significantly from the sales of recycled water yet fail to be held accountable by the SDRWQCB for illicit discharges generated specifically by careless over-irrigation. Over-irrigation produces hundreds of thousands of dollars in excess revenues each year to inland Water Districts that persistently ignore the impact of their product water. Profiting from water pollution discharges to protected receiving waters is illegal as adjudicated by Friends of the Earth v Laidlaw (2000) and other statutes and regulations.

"District Court found that Laidlaw had gained a total economic benefit of $1,092,581 as a result of its extended period of noncompliance with the permit's mercury discharge limit; nevertheless, the court concluded that a civil penalty of $405,800 was appropriate. In particular, the District Court found that the judgment's "total deterrent effect" would be adequate to forestall future violations..." (Friends of Earth, Inc. v. Laidlaw Environmental Services (TOC), Inc. - 528 U.S. 167 (1999)

In the Aliso Watershed, recycled water sold for irrigation and over watering produces an average creek discharge flow of 3 MGD during the nine month dry season. Sold at $1000 per Acre Foot (AF), this irrigation product water yields revenues to inland Water Districts of over $10 million during the five year MS4 Permit cycle. (calculation: 3 MGD = 9 AF x $1000/AF x 300 days = $ 2.7/year x 5 year permit cycle = $10 mil+).

Lacking effective enforcement measures by the SDRWQCB, these excessive and illegal profits encourage increased sales of irrigation water without any accountability for the obvious impacts of water products to protected creek and coastal receiving waters. The Irvine Ranch Water District, El Toro Water District, Santa Margarita Water District and Moulton Niguel Water District must not be allowed to profit from water pollution.

Persistent violations of MS4 requirements are acknowledged by all parties yet the SDRWQCB refuses to invoke effective enforcement measures and fines. Without economic disincentives, offending Water Districts gain illegal profits while inland cities accumulate tax property revenues from poorly

engineered development projects. Citations against the more egregious offending storm drain dischargers can release funds for effective mitigation measures and support incentives for regional MS4 compliance.

Environmentally Sensitive Areas (ESA)

The Aliso Watershed is a compact 34 square mile area suffering decades of neglect and pollution originating from poorly engineered residential developments among inland cities. Plans to add 17,000 new houses to South Orange County in the coming years will exacerbate the water pollution crisis facing Laguna Beach. Runoff management plans fail to control dry weather urban runoff and knowingly contribute directly to increased flows and erosion during routine storm events.

The Aliso Creek Wilderness Park remains degraded from erosion impacts to streambed habitat and threatens to expose critical sewage infrastructure transporting 10 to 15 million gallons of secondary sewage to the Aliso Creek Ocean Outfall only 1.2 miles offshore. A recent study by TetraTech for the South Orange County Wastewater Authority (SOCWA) determined the integrity of creek infrastructure to be capable of failure in as little as 5 years. Coastal receiving waters at the mouth of Aliso Creek are impaired by polluted urban runoff flowing at 1 to 5 million gallons per day (GPD). Aliso Creek is listed as a 303(d) Impaired Water Body by the Clean Water Act and continues to fail to meet present and previous MS4 Permit requirements. (Exhibit B – Aliso Creek Watershed 303(d) Impaired Waterbodies)

All Co-Permitees, as signatories to the MS4 Permit, are legally responsible for water quality in terms of coastal receiving waters. The regulatory and legal nexus is clear between unpermitted discharges by inland Co-Permitees, creek erosion and infrastructure damage, ocean pollution and public health hazards associated with these contaminated daily flows.

Aliso Beach, at the mouth of the federally listed contaminated creek, is permanently posted. However, coastal receiving waters are protected as the Laguna Beach State Marine Conservation Area established unanimously by the California Fish & Game Commission on January 1, 2012.

Laguna Beach State Marine Reserve

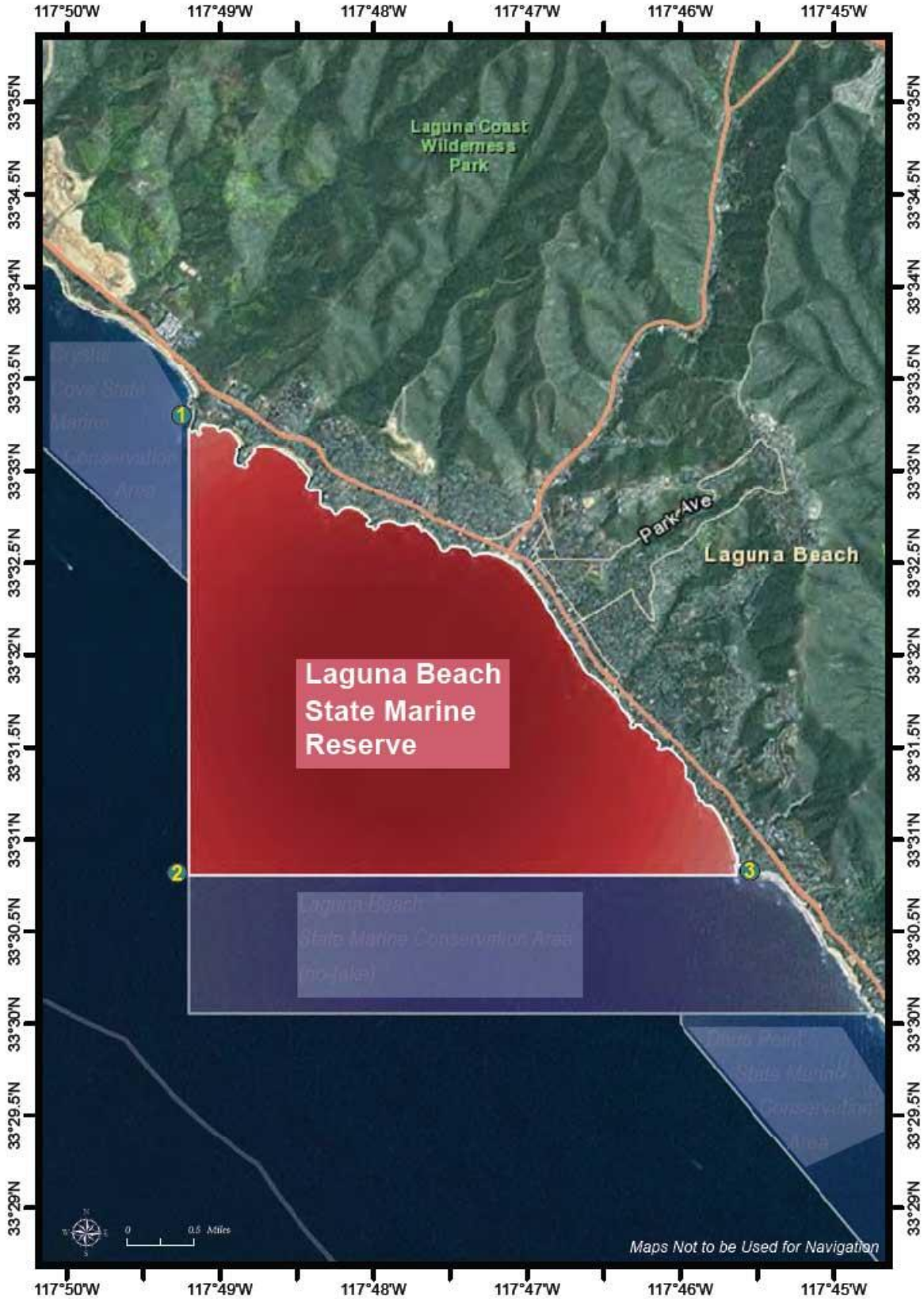

The proposed MS4 Permit does not adequately address efficacious measures to protect creek and coastal receiving waters while allowing contaminated discharges to persist without adequate enforcement actions. Lacking meaningful enforcement actions, inland cities as Co-Permitees, persist in ignoring or circumventing water quality regulations with impunity while creek and coastal receiving waters and ESA habitats continue to be incrementally degraded by polluted dry weather flows. Damage to coastal habitats is cumulative and potentially expensive in terms of restoration.

Likewise, failed Best Management Practices (BMP) stormwater facilities required as a Condition of Approval for inland residential, industrial and municipal developments are inadequately engineered devices incapable of mitigating elevated flows from stormwater events directed to creek and coastal receiving waters. The cumulative impacts of contaminated dry weather discharges and elevated stormwater flows have destroyed the functions of the Aliso Estuary (a protected coastal wetland), tidepools, fish nurseries and local kelp forests.

Shellfish areas in California receive the highest water quality protection standards. The economic value of shellfish to the economy is well established and place names such as Abalone Point, Mussel Cove, Shellfish Beach, etc. along Laguna Beach's coastal receiving waters suggests the prominence of shellfish habitat in the local area. Routine underwater surveys of mussel grounds near the mouth of Aliso Creek reveal large areas of dead shellfish likely exposed to the urban runoff plume. Dry weather discharges and elevated stormwater flows to Laguna Beach's coastal receiving waters are incompatible with protection of ESA Shellfish habitat and should be vigorously regulated and prohibited in the proposed MS4 Permit.

Laguna's coastal receiving waters are prime foraging grounds for protected marine life including coastal dolphins, gray whales and blue whales.

Safari/Marc Carpenter, via Associated Press

A blue whale surfacing at 1000 Steps, South Laguna

The California Coastal Act is specific in protecting the health and welfare of marine mammals among other species. Therefore, the proposed MS4 Permit must address water quality inconsistencies among regulating agencies.

1. California Coastal Act, Article 4, Section 30230. Recent summer sightings of federally protected Blue Fin Whales feeding at the location of the Aliso Ocean Outfall suggest the need for compliance with the Coastal Act. The unseasonal presence of marine mammals feeding on krill indicates the presence of phytoplankton populations sustained by nutrient rich urban runoff and offshore sewage discharge plumes migrating to surface waters. New research also highlights the presence of hormonal endocrine disruptors in recycled water and sewage discharges as a contributing factor in the feminization of male fish.

2. California Coastal Act, Article 4, Section 30231. The SDRWQCB overlooks requirements for "the biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of waste water discharges and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface water flow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams."

3. Water Reuse Law, Water Code Sections 461-465 and Water Reclamation Law, Water Code Sections 13500-13556 requiring beneficial reuse of inland water product to implement recycled water throughout Laguna Beach in achieving a State mandated 20% reduction in imported water by 2020.

The recent Army Corp of Engineers Study Area Map recognizes the relationship of MS4 regulated areas by incorporating the coastal receiving waters for lower Aliso Creek project considerations. No similar map or chart is available to track and monitor regulated coastal receiving waters subjected to the contaminated urban runoff "freshwater lens".

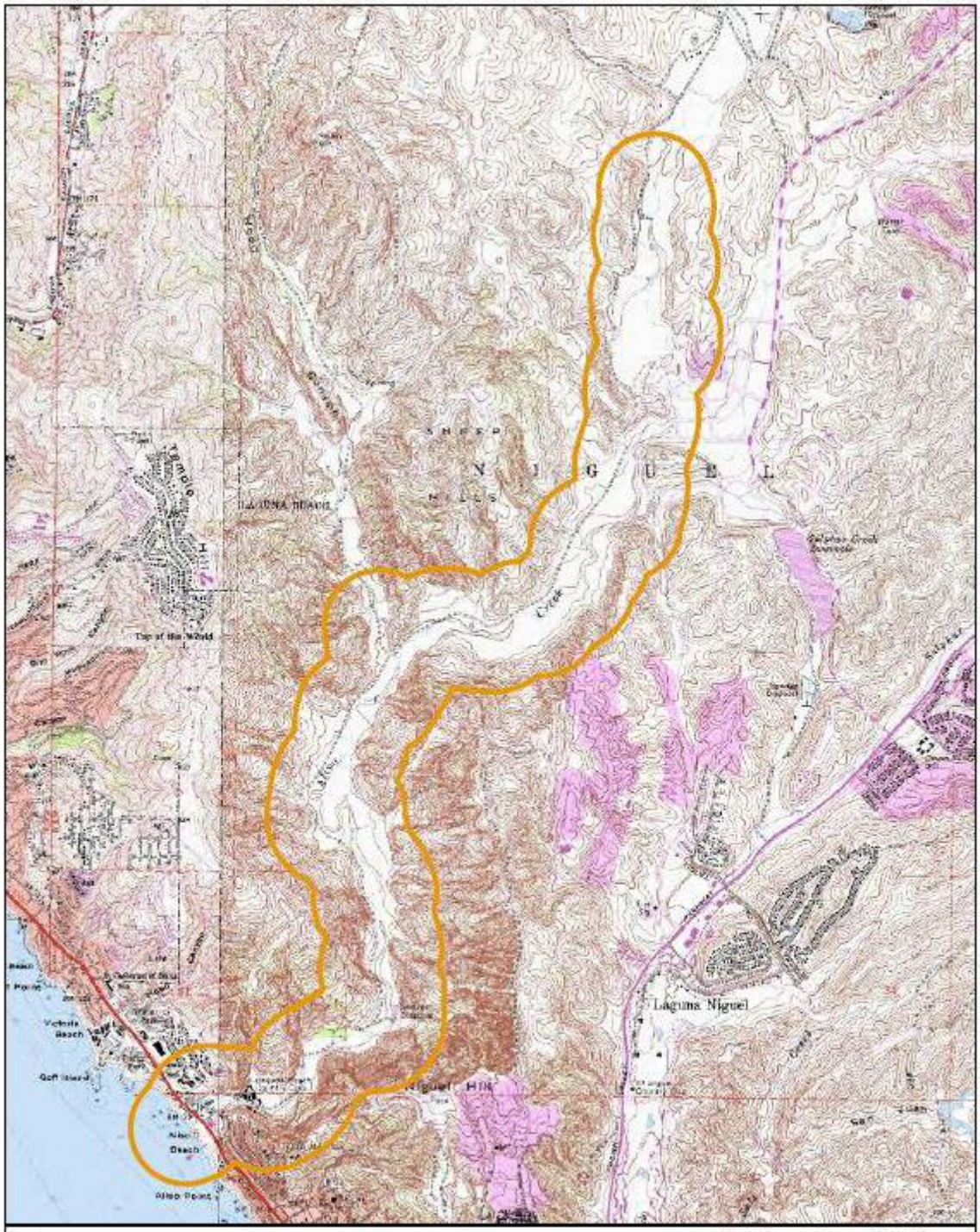

N

CDM

Legend

Study Area Boundary

0.25 0 0.25
Miles

U.S. Army Corps of Engineers
Aliso Creek Ecosystem
Restoration Study
USGS Topographic Map

Figure 2.1-1

Urban Runoff, Secondary Sewage Discharges & Ocean Upwelling

Coastal receiving waters at the mouth of Aliso Creek are protected as the Laguna State Marine Conservation Area (SMCA). These important tidepool, rocky shore and kelp forest habitats, however, are subjected to multiple water pollution impacts from the combined urban creek urban runoff plume and Aliso Creek Ocean Outfall.

Ocean upwelling transports contaminates from the offshore sewage discharges to shore and mix with the visible creek urban runoff freshwater plume. Harmful algae blooms fed by these "nutrient rich" discharges plague coastal receiving waters and contribute to the destruction of kelp forests and shoreline fish nurseries. Beach visitors, often from regional low-income disadvantaged communities, suffer exposure to severe public health threats.

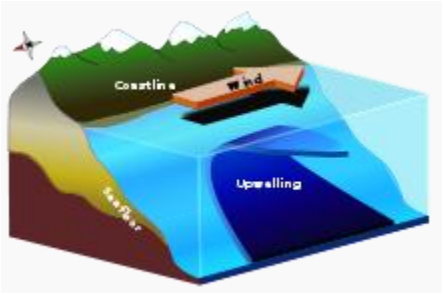

Multiple requests to South Coast Wastewater Authority for a comprehensive interactive map of the Aliso Creek coastal discharge plume and the Aliso Creek Ocean Outfall Plume are routinely ignored. An accurate map will identify protected coastal receiving water resources including tidepools, rocky fish nurseries and shellfish habitats, kelp forests, dolphin birthing and foraging grounds, as well as near shore whale migration routes. Charting dominant littoral currents and counter currents will reveal distribution patterns of urban runoff induced Harmful Algae Blooms and thermal plumes. Lacking such basic information, assurances of safe ocean water quality are presented without a fundamental scientific understanding of coastal dynamics.

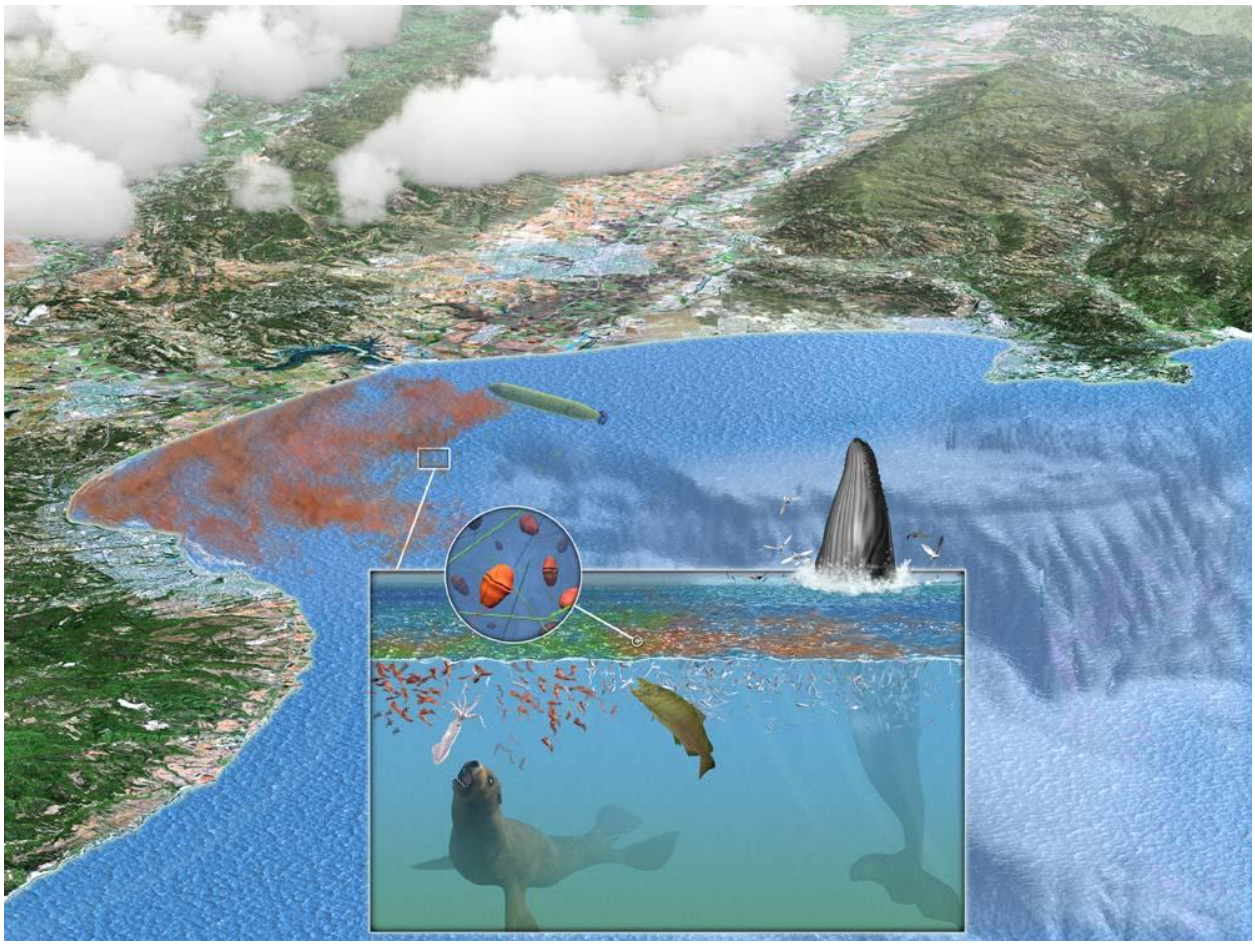

Dry weather urban runoff plumes to Laguna's coastal receiving waters feed summer-long Harmful Algae Blooms (HABs) contributing to domoic acid poisoning of sea lions, whales, shellfish and fishing resources.

Hydromodification

The rapid regional development of residential tracts over the past few decades has been accomplished using grading techniques to create long, flat terraced building sites. In an effort to simplify construction on flat sites, natural contours are replaced with cut and fill earthworks removing natural top soils before paving over hydric substrates and native deep root vegetation. These practices expose expansive clay soils.

Developers avoid expensive deep caissons to bedrock or multiple dewatering wells and simply pour concrete pads over unstable clay substrate. City leaders seeking increased tax revenues and development fees utilize engineers unfamiliar with local clay soils and the semi-arid ecology to approve massive grading plans that ultimately fail.

Unsuspecting homeowners subsequently experience extensive expansion and contraction of clay subsoils following annual storm events. As foundations fail, water supply lines, sewage lines and

related infrastructure become compromised requiring expensive repairs. By this time, however, developers have either moved or filed for bankruptcy protection leaving thousands of present homeowners without remediation opportunities. Engineers, city planners and elected officials, while complicit, are not held accountable through enforcement by the SDRWQCB. Poorly engineered residential developments with substandard clay soils continue to be approved to aggravate the condition and burden taxpayers for expensive repairs.

The Aliso Watershed is a clear example of faulty hydromodification design. Beginning with the construction of the federal Chet Holfield Ziggerat Complex, large areas of the native creek with valuable hydric soils were paved over for massive parking lots. The channelized creek lost critical inland wetlands and groundwater percolation sites with the removal of over 1500 feet of the creek ox bow. This wetland site historically provided water, fish and double canopy vegetative cover for the early "Nigueli"... the name of a Juaneno Native American village once located near a lagoon along Aliso Creek. The City of Laguna Niguel derives its name from the Spanish designation of this critical creek ox bow area.

Systematic destruction of vast native watershed trees and vegetation to support early ranching activities continue to plague the effectiveness of this and many watersheds in the San Diego region. Developers and complacent city planners exploiting degraded ranchlands simply continue the “biodegradation” while avoiding the true costs to the environment and taxpayers for their profiteering urbanization schemes. Facing unrelenting pressure from developers, water districts and municipalities, regulatory agencies charged with protecting critical creek and coastal receiving waters, fail to invoke effective enforcement with measurable water quality benefits.

Recommended Actions

Poorly engineered projects can be re-engineered to achieve mandated water quality objectives.

1. Maps of all creek and coastal receiving waters indicating water quality impacts can be created by SCCWRP, Scripps, NOAA or any number of competent university or regulatory groups. A Bioregional Watershed Map will identify degraded land elements, offending storm drain outlets and candidate areas for re-forestation and estuarine/coastal restoration.

2. On an annual basis, citations against the primary six known storm drain point sources in each watershed can incrementally compel clean-up and abatement throughout a given watershed bioregion without the burden of costs to abate all points of contamination at once. Failed Best Management Practices (BMPs) urban runoff facilities, required as a Condition of Approval for inland residential developments, can be retrofitted with dry weather diversions to local Publically Owned Treatment Works (POTWs) or, alternatively, re-engineered with deep groundwater injection wells.

3. Fines must be allocated to re-vegetate impaired watersheds and kelp forests to restore the native functions of semi-arid creeks and protected coastal receiving waters. A re-forested Aliso Canyon with a canopy similar to San Mateo Creek will qualify for California Cap and Trade

funding to offset costs. Restoration of natural habitats is demonstrated to be the best, most cost effective measure for improving watershed water quality.

4. Restoration of high value coastal wetlands and estuaries will guarantee protection of natural beach sand berms and provide measurable improvement to coastal receiving waters. Funds from the California Coastal Conservancy and other wetland recovery resources can offset costs.

5. Watershed restoration will offer multiple community benefits by reducing destructive stormwater flows, eliminating pollutants and increasing eco-tourist revenues to surrounding cities. Large street cisterns incorporating designs proposed by GeoSynTech for the re-development of the Aliso Golf Course can serve as a model for extensive rainwater harvest/reuse systems. Restoration of some or all of the 1500 foot Aliso Creek Ox Bow in Laguna Niguel can restore hydric soils to reduce stormwater impacts.

6. Increased use of recycled water for wildland fire suppression along the entire Highway 73 Toll Road bisecting the Laguna Greenbelt will maintain a healthy, fire safe wilderness area. Orange County Measure M and State Proposition funds are available to offset costs. Increased use of recycled water reduces ocean discharges to the Laguna State Marine Conservation Area.

7. A citywide network of recycled water for all of Laguna Beach will reduce imported water demand significantly and increase water security, disaster preparedness and fire suppression resources. Revenues from routine use for irrigation mandated Fuel Modification Zones will provide new revenue streams. Laguna Beach is the only Orange County city without a comprehensive recycled water program and remains a "once use" community of valuable imported water.

The MS4 Permit Renewal process offers the opportunity to advance beyond failed measures and begin the renewal of the region's unique watershed and coastal ecology. All Stakeholders can benefit through proactive initiatives and, as the overall watershed ecology improves, the cost savings from stormwater damage, water pollution, protracted litigation and public health threats will become evident. The South Laguna Civic Association has offered constructive, critical information and suggestions during the previous MS4 Permit cycle which have been largely ignored to the public's detriment.
(Exhibit C – SLCA Comments on Tentative Order No. R9-2007-0002 NPDES, No. CAS0108740)

Cooperation and courage are essential and the South Laguna Civic Association remains committed to working towards real, measurable, sustainable solutions. On behalf of our community and the many visitors from throughout the world to our shores, we thank you for your review and support of our recommended actions.

Michael Beanan

Vice President
South Laguna Civic Association

mike@southlaguna.org

Attachments

Exhibit A - Daily Mean Discharge in Cubic Feet/Second - Water Year Jul 2011 to Jan 30, 2012
Exhibit B - Aliso Creek Watershed 303(d) Impaired Waterbodies)
Exhibit C – SLCA Comments to Tentative Order No. R9-2007-0002 NPDES, No. CAS0108740

Exhibit A - Daily Mean Discharge in Cubic Feet/Second Water Year Jul 2011 to Jan 30, 2012

Day	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
1	5.5	7.6	5.7	4.9	4.9	4.9	5.6		
2	5.4	6.3	5.6	4.6	4.8	4.8	5.6		
3	5.3	5.6	5.6	4.6	4.8	5.2	5.7		
4	5.8	5.4	5.5	12	26	4.9	5.6		
5	5.8	5.4	5.9	145	13	5	5.9		
6	5.5	5.4	6	28	20	5.4	5.8		
7	5.4	5.5	5.6	10	11	5.7	5.7		
8	5.5	5.4	5.4	6.9	6.9	6	7.1		
9	5.8	5.7	5.4	5.8	5.7	6.5	6		
10	5.7	5.6	8.4	5.3	5.2	5.9	5.6		
11	5.7	6	7.8	5	5.1	5.7	5.7		
12	5.8	5.8	7.1	5	36	22	5.7		
13	5.7	5.8	5.7	5.1	18	16	5.8		
14	5.8	5.7	5.2	5.1	8.7	8	5.4		
15	6	5.6	5.2	4.9	6.3	38	5.5		
16	5.9	5.7	5.1	4.9	5.5	18	19		
17	5.9	5.7	5.4	5	5.3	8.2	7.4		
18	5.9	5.4	5.3	5.3	5.2	6.9	6.1		
19	5.9	5.7	5.1	5.4	5.1	6.3	5.7		
20	5.8	5.7	5.1	5.4	86	6.4	5.5		

21	5.8	5.6	5	5.6	36	6		69	
22	6	5.6	5	5.3	10	5.5		16	
23	5.9	5.8	5.1	5.5	7.2	5.4		56	
24	5.9	5.8	5.1	5.5	6.1	5.5		19	
25	6	5.7	5.1	5.6	5.6	5.5		9.2	
26	5.6	5.8	5.1	5.3	5.4	5.7		7.3	
27	5.6	5.6	5.2	4.9	5.3	5.8		6.6	
28	5.7	5.6	5	4.9	5	5.7		6.1	
29	5.9	5.6	5	4.7	5.1	5.5		5.9	
30	5.7	5.8	5	4.7	5.1	5.7		------	
							------	------	---
31	8.9	5.8	------	4.8	------	5.9		---	

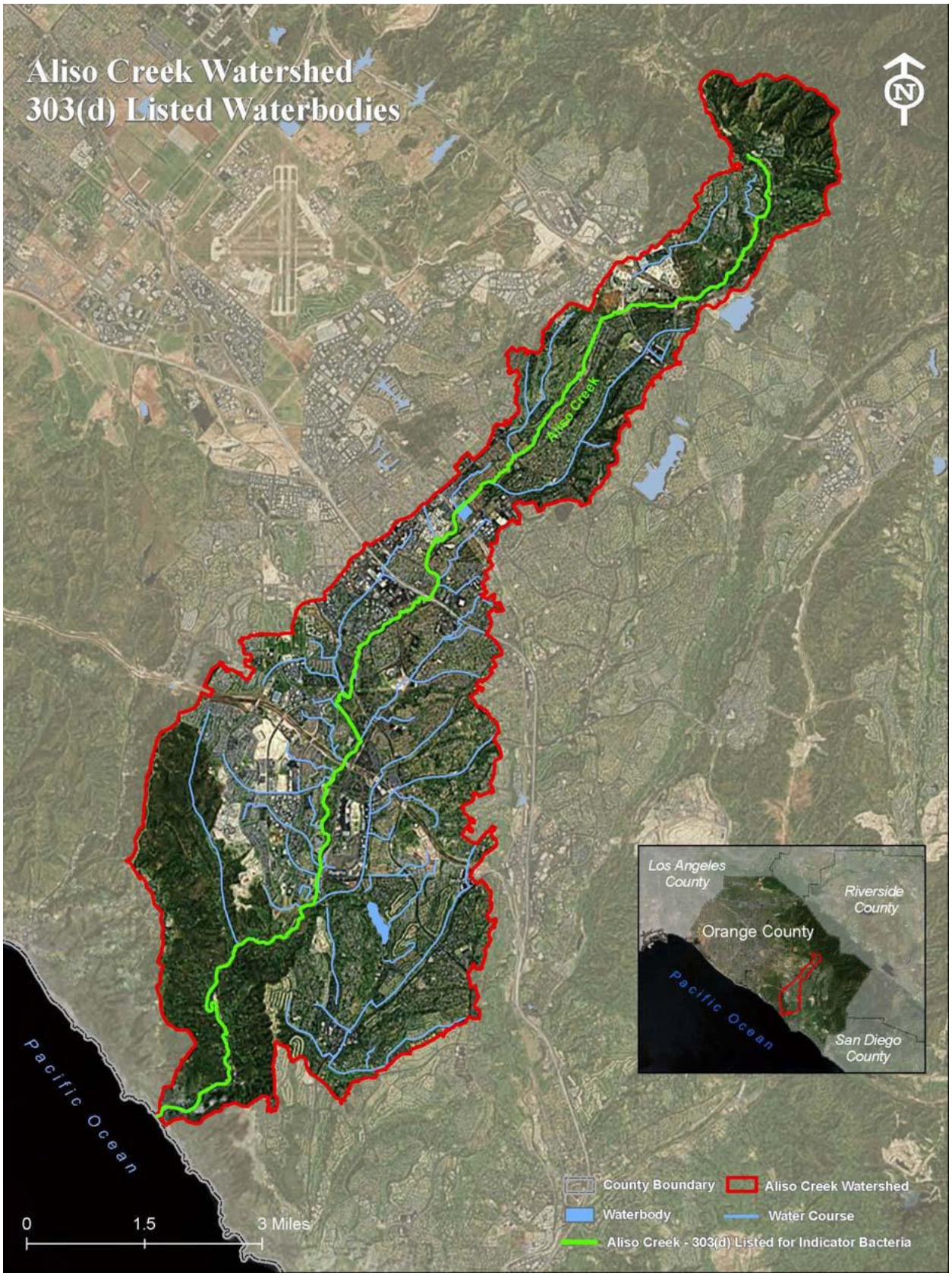
Aliso Creek Watershed
303(d) Listed Waterbodies
N
Aliso Creek
Pacific Ocean
Los Angeles County
Riverside County
Orange County
Pacific Ocean
San Diego County
0
1.5
3 Miles
County Boundary
Aliso Creek Watershed
Waterbody
Water Course
Aliso Creek - 303(d) Listed for Indicator Bacteria

Exhibit C - SLCA Comments to 2007 MS4 Permit

Jeremy Haas April 11, 2007
California Regional Water Quality Control Board
San Diego Region 9
9174 Sky Park Court, Suite 100
San Diego, CA 92123
RE: Tentative Order No. R9-2007-0002 NPDES, No. CAS0108740

The members of the community of South Laguna represented by the South Laguna Civic Association, established in 1946, recognizes urban runoff from dry weather flows continues to be discharged through regional storm drain systems permitted exclusively to convey rain water.

The proposed SDRWQCB Tentative Order No. R9-2007-0002 knowingly, willfully and intentionally perpetuates a threat to health and safety while contributing to degradation of local creek and coastal water resources by allowing MS4 storm drain systems to transport polluted water originating from the imported water supply industry.

Dry weather flow rates in the subject watershed presently exceed all previous flow rates and are recognized as the principle source of nutrient loading and ocean pollution. Chemical fingerprinting analysis of urban runoff by the Santa Margarita Water District attributes the source of 60% to 90% of urban runoff dry weather flows as originating from imported water sources in either Northern California or Colorado. Dry weather flows to storm drains are from anthropogenic influences rather than natural storm events.

Seminal research by the University of Southern California and others concludes urban runoff is responsible for feeding prolonged, destructive algae blooms along the Southern California Bight. In conveying inland sources of fertilizer and phosphates nutrients, dry weather urban runoff estimated at 5,000,000 gallons per day in the Aliso Watershed alone is causing increased outbreaks of domoic acid poisoning and deaths among sea mammals in Laguna Beach. The SDRWQCB fails to take into consideration impacts of uncontrolled dry season urban runoff on the health and welfare of coastal receiving waters. In spite of repeated requests, the SDRWQCB and Co-Permitees to not incorporate the urban runoff ocean plume into the watershed mapping procedure rendering decision making ineffective and monitoring activities scientifically incomplete.

As indicated in Staff Reports, the SDRWQCB, South Orange County Wastewater Authority (SOCWA), inland cities and County Co-Permitees continue to fail to Cleanup and Abate contaminated dry weather urban runoff flows and thereby violate key statues of the Porter-Cologne Act and Clean Water Act.
In allowing the County and City Co-Permitees to continue to discharge polluted urban runoff water flows, the members of the SLCA and the general public are denied access to safe, unpolluted coastal recreational opportunities while exposing them to known respiratory and digestive illnesses. The incremental and cumulative discharge from Aliso Watershed storm drains also knowingly and willfully contributes to potential health risks from consuming local fish.

Likewise, potential private property values are threatened by disclosures during real estate transactions of public health hazards emanating from polluted coastal waters.

Residences at the mouth of Aliso Creek are permanently damaged by summer urban runoff from erosion and stagnant ponds. Damage from urban runoff pollution to critical kelp habitats and marine mammals characteristic of South Laguna Marine Reserve off of Aliso Beach are well documented in the scientific literature.

The Aliso Watershed has more than 64 storm drains with elevated fecal coliform levels and excessive flow rates. The inability of the SDRWQCB over the past 20 years to control illegal dry weather discharges suggests a pattern of failed interventions portending a dangerous precedent of chronic future water pollution to the community of South Laguna with a population of 5,000 residents and the general beach visiting public.

The South Laguna Civic Association (SLCA) seeks a thorough review of the laws, regulations and facts pertaining to mismanagement of the subject MS4 Storm Drain Permit. Verifiable action capable of significant reductions in dry weather flow rates must be implemented. Numerical flow rate reduction, specific performance benchmark deadlines and significant penalties for non-compliance must be incorporated into any credible permitting process. Interception of urban runoff flows at known inland point sources is technologically feasible through deployment of approved Best Available Control Technologies presently used by the development, military and oil industries. If necessary, a watershed Cleanup and Abatement Order can accelerate permitting and fast track measures until such time full compliance is achieved.

Failure to mitigate or comply requires the SDRWQCB to be directed to California Water Code Section 13304(a) and following to seek an injunction against the County and offending cities or perform the work itself. Concurrent with the present evaluation of Tentative Order No. R9-2007-0002, the SLCA seeks emergency action due to significant, immediate and potential harm from known health risks associated with dry weather urban runoff conveying elevated levels of fecal coliform and other contaminates to South Laguna since:

1. Substantial harm to the community of South Laguna will continue to occur this summer from exposure to dry-weather flows of contaminated urban runoff in the subject watershed. The approval of a systematically flawed MS4 Storm Drain Program will establish a dangerous precedent in the Aliso Creek Watershed and other impaired watersheds in the State of California to the detriment of South Laguna's public health and safety as well as the protection of natural resources.

2. Neither the inland cities, County, SDRWQCB, SOCWA nor public will incur substantial harm from issuance of a comprehensive dry weather storm drain management program. The South Laguna Civic Association, in fact, will benefit from incremental reduction of contaminated flows from inland storm drains into creek and coastal receiving waters. Establishing a pattern of enforcement and full compliance with cleanup and abatement laws will initiate additional timely actions by the SDRWQCB to improve water quality in the Aliso Watershed and elsewhere. Costs associated with a comprehensive program to control dry weather flows can be minimized by fines, deployment of cost saving water conservation measures and revenues generated from beneficial reuse opportunities of 5 million gallons of urban runoff per day in the Aliso Watershed.

3. As indicated in this and other communications, substantial questions of fact and law are associated with the proposed Tentative Order No. R9-2007- 0002. The fact remains that immediate compliance and cessation of dry weather urban runoff is technologically and economically feasible as demonstrated by earlier diversions to the Moulton Niguel Water District's sewer treatment facility and, later, short term operation of mobilized urban runoff filtration units.

The narrative below cites a number of laws pertaining to enforcement of Cleanup and Abatement Orders (California Water Code Section 13304); the SWRCB Water Quality Enforcement Policy (February 19, 2002; pages 3,4,11,26, 39,42); regulations and policies governing Environmental Justice (Government Code Section 65040.12 and Public Resources Code Section 72000).

The County and City Co-Permitees concede their failure to Cleanup and Abate elevated levels of fecal coliform and increased urban runoff flow rates in the Aliso Watershed. The SDRWQCB does not comply with California Water Code Section 13304. Indeed, during the past 20 years, the Regional Board has failed to effectively intervene.

California Water Code Section 213300-13308, Chapter 5, provides the SDRWQCB Enforcement authority to issue a Cleanup and Abatement Order to remedy dry weather urban runoff.

Section 13304(a) "Upon failure of any person to comply with a cleanup and abatement order, the attorney general, at the request of the board, shall petition the Superior Court of the County for an issuance of an injunction requiring the person to comply with the order."

The SDRWQCB unwillingness to enforce compliance also violates Section 13304 (1)(b);(2)(a), (c), (e) to expend available money themselves to perform cleanup, abatement or remedial work; to intervene to perform the work itself; recover costs for cleanup and abatement work; and protect or prevent threatened probability of harm to persons, property or natural resources.

It is again worth noting, temporary compliance was achieved in 2003 utilizing mobilized water filtration units recognized among Best Management Practices (BMP). During its brief period of operation, the above BMP treated over 14 million gallons at JO3PO2 to reduce fecal coliform from 10,000 cfu's to less than 1. The SDRWQCB, SOCWA, Moulton Niguel Water District, City of Laguna Niguel and County dischargers arbitrarily elected to terminate this effective technology to experiment with low cost constructed wetlands, which ultimately failed to reach compliance levels for fecal coliform at the JO3PO2 outlet and took no effort to remove flows originating from abandoned imported water sources.

The SWRCB Water Quality Enforcement Policy (February 19, 2002; pages 3,4,11,26, 39,42) specifically directs the Regional Board to take action against the following:

- Any knowing, willful, or intentional violation of the (Porter Cologne Act)
- Any violation of (the Porter Cologne Act) that enables the violator to benefit economically from noncompliance, either by realizing reduced costs or by gaining a competitive edge advantage.
- Any violation that is a chronic violation or that is committed by a recalcitrant violator.
- Any violation that cannot be corrected in 30 days.

The SDRWQCB has taken no action pursuant to the above policies while proceeding to accommodate City and County Co-Permitees, Water Districts, SOCWA and developers at the expense of and detriment to the members of the SLCA and the general public.

Section 13350(m) of the Porter-Cologne Clean Water Act defines nuisance as anything which meets all of the following requirements:

1. Is injurious to health, or is indecent of offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life and property.

2. Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal.

3. Occurs during, or as a result of, the treatment or disposal of wastes.

Dry weather urban runoff meets and exceeds the legal definition of "nuisance" by virtue of it's widespread impacts to water quality variables. "Waste" refers to "waste water" knowingly and willfully generated by imported and reclaimed water sold at reduced rates that ignore significant post-irrigation dry weather urban runoff impacts.

Members of the South Laguna Civic Association are at particular risk of injurious health from frequent exposure to pollution in Aliso Creek and recreational coastal water activities. Such threats and illnesses create an obstruction to the free use of public property at local County parks, protect State Marine Reserves and beaches to thereby interfere with the comfortable enjoyment of life and property.
The extent of annoyance and damage is unequal with increasing harm to individuals such as swimmers, surfers, SCUBA divers, etc. with more frequent contact to polluted creek and ocean waters according to recent studies by the University of California, Irvine. Young children playing long hours at the beach and pregnant women are particularly high-risk populations.

The casual relationship occurring with the discharge of contaminated urban runoff wastewater with elevated fecal coliform levels is well established in scientific and medical literature as to impose a viable threat to the community of South Laguna. Government Code Section 65040.12 and Public Resources Code Section 72000 states:

"…the fair treatment of people of all races, cultures and income with respect to the development, adoption, implementation and enforcement of environmental laws, regulations and policies"

The proposed Tentative Order No. R9-2007-0002 is discriminatory and violates the State of California's definition of Environmental Justice.

As previously noted, the community of South Laguna and visitors to the Aliso Creek Watershed and Aliso Creek County Beach have entreated the SDRWQCB for decades for relief from polluted urban runoff flows resulting from the non-regulation or enforcement of the County/City's chronic storm drain discharges of dry season urban runoff. Local low income and working class residents have suffered damages to health, safety and liberty in their access to Aliso Creek and the Pacific Ocean.

Despite the obvious tangible and verifiable nature of these damages, South Laguna and the general public have yet to receive any effective regulatory assistance either from the State or Regional Water Boards. This failure to provide relief is not due to any lack of knowledge or information. The SDRWQCB has repeatedly and extensively investigated the mechanism by which storm drains physically convey fecal coliform bacteria and other contaminants downstream into the Aliso/Woods Canyon Regional Wilderness Park, South Laguna and the Aliso Creek County Beach. There remains no doubt that the City/County dry weather storm drain discharges are the cause of summer beach and ocean pollution.

Despite this clear and present causal relationship, the SDRWQCB and Staff have denied pleas from the public for remedial action in the form of abatement of nonseasonal storm drain urban runoff, beneficial reuse for sustainable treatment projects, water conservation and immediate temporary mobilized emergency capture/treatment options common among petrochemical, agribusiness and development economic sectors. In addition, the SDRWCB has not supplied a contingency emergency plan to protect our community and the public from current and summer dry weather MS4 storm drain discharges.

Instead, the Regional Board has relied on promulgating more general directives and future contamination tables, which may or may not be effective in abating polluted urban runoff. The proposed Tentative Order No. R9-2007-0002 is to accommodate the failures of inland Water Districts, SOCWA, Cities and County at the expense of the community, public and ocean ecology.

The SDRWQCB action when combined with the Staff and City/County history of ineffective action towards the residents and visitors of South Laguna, have the cumulative effect of giving second class status to the physical health and safety needs of the public in the Aliso Watershed. Thus any action by the Regional Board to approve the use of MS4 Storm Drain System to knowingly convey dry weather urban runoff flows is discriminatory and violates the State of California's definition of Environmental Justice.

Conclusion

The general regulations, requirements and studies pertaining to the Aliso Creek Watershed and associated MS4 Storm Drain System are clearly not effective in controlling water pollution or the effects of artificially elevated flow rates during the area's annual ten month dry season.

More than twenty years and $20 million dedicated to achieve compliance in a relatively small, compact 34 square miles residential development watershed is an enormous investment and, ultimately, waste of taxpayer revenues. The failure to achieve compliance represents a lost opportunity to demonstrate effective interventions to protect communities like South Laguna from polluted urban runoff and sends a message to the public that urban runoff pollution cannot be controlled.

Despite the various failed efforts over two decades, the fact remains numerous State laws are being violated by the SDRWCB for allowing the discharge of dry weather flows with elevated fecal coliform and related contaminate levels to continue to pollute daily the protected receiving waters of Aliso Creek and the Pacific Ocean. By this communication, the SLCA reserves the right to appeal any unfavorable decision perpetuating dry season urban runoff flows to Aliso Beach, South Laguna to the SWRCB and State Attorney General for timely relief.

The South Laguna Civic Association appreciates the efforts by the San Diego Regional Water Quality Control Board to consider the enormous impacts of uncontrolled dry weather urban runoff pollution before approving a genuinely effective Storm Drain Permit Program for the Aliso Watershed.

Respectfully submitted,

Michael Beanan, Director
South Laguna Civic Association
PO Box 9668
South Laguna, California, 92651

ASSOCIATED GENERAL CONTRACTORS OF AMERICA

SAN DIEGO CHAPTER, INC.

6212 FERRIS SQUARE - SAN DIEGO, CALIFORNIA 92121

(858) 558-7444 - FAX (858) 558-8444

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Executive Vice President

December 12, 2012

Wayne Chiu, P.E.
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, California 92123-4340

Re: Comment – Tentative Order No. R9-2013-001 – Regional MS4 Permit - Place ID: 786088Wchiu

Dear Mr. Chiu:

This letter is written in response to the San Diego Regional Water Quality Control Board's Tentative Order R9-2012-0011 ("Permit") dated October 31, 2012. We have reviewed the draft of the Permit; there is no question if the Permit, as now proposed, goes into effect, it will impose excessively expensive and onerous regulations not only on local governments but on regional businesses and the public at large. The regulations, as written, are untested with no proof of improved water quality.

The Associated General Contractors of America ("AGC"), San Diego Chapter, represents over 1,000 firms that build the region's industrial, commercial, institutional, heavy highway and general engineering construction projects. We understand the importance of a clean, safe water supply; we want that for our region and for our families. However, it is imperative the regulations put in place to achieve this goal are reasonable, tested and known, to the extent possible, to produce the outcome of improving water quality.

The use of Water Quality Improvement Plans ("WQIP") is an excellent way to develop a cost-effective approach to improved water quality. We would encourage the Board to allow the WQIPs to be developed, ensuring public

participation, and implemented before moving forward with enforcement of new regulatory requirements.

Other serious concerns are the stringent new proposal for stormwater retention and discharge and the non-existing source of funding to execute the proposed changes.

Our request is for the Regional Water Quality Control Board to allow the current Permit to remain in effect until WQIPs are developed for the 10 watersheds in District 9. This District needs to develop a Regional Permit that is based on rules and regulations known to be sustainable and effective. The development and use of WQIP's will give our communities that opportunity without the imposition of impossible regulation at horrendous economic cost to our regional cities, local businesses and the residents of our communities.

Thank you for hearing our concerns. If you have questions, please contact me at 858.558.7444.

Sincerely,

Debbie Day
Vice President,
Engineering Construction and Industry Relations

Continental Maritime of San Diego

SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD

2012 DEC 18 PM 12 39

12DEC12
CMSD Serial Number: 237-12

Mr. Wayne Chiu, P.E.
Place ID: 786088Wchiu
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Re: Comment - Tentative Order No. R9-2013-001, Regional MS4 Permit

Dear Mr. Chiu:

As a member of the San Diego Port Tenants Association, I am responding to the San Diego Regional Water Quality Control Board's Tentative Order R9-2012-0011 ("Permit") dated October 31, 2012. After reviewing the proposed Permit, I am concerned it will impose expensive and untested regulations on local governments, businesses, and residents. The new permit will impact the region without improving water quality.

I do understand the importance of clean, safe water to the region and as a member of the business community I am interested in improving San Diego's water. It is important, however, that we use our limited resources wisely, and ensure that our efforts produce the desired outcome of improving water quality. I applaud the Board's inclusion of Water Quality Improvement Plans (WQIP) as a first step in developing a cost-effective approach to improving our water. Analysis remains a critical component of a successful strategy, and I am glad to see that the Board is committed to finding the best possible solution to water quality improvement.

I am concerned however that the costs associated with enforcing and implementing the permit will have a negative impact on my business and San Diego's economy. The four primary areas of concern include: 1) the strict liability for exceeding water quality objectives; 2) the additional and changing requirements for development projects, impacting items such as storm water retention and discharge; 3) the preemption of WQIPs by new and changing regulatory requirements prior to allowing the WQIPs to be developed and implemented; and 4) the lack of reliable funding sources to implement these regulatory changes.

While it is necessary to hold individuals, businesses and governments accountable these measures must be reasonably achieved and provide a significant and positive impact on San Diego's water. I respectfully request that the Permit focus on the timely development of effective and enforceable WQIPs, and that each of these be developed through a process that ensures public participation. I also ask that the designation of Best Management Practices in each watershed be determined through the WQIP process rather than the one size fits all strategy currently proposed in the Permit. I ask further that, until the Board adopts a WQIP for a watershed, the provisions of the existing Permit remain in place for that watershed. Finally, in order to avoid unnecessary litigation I request that the Board adopt the WQIPs as Orders implementing the proposed Permit.

I urge you to adopt final permit language that is evidence-based and both environmentally and economically sustainable. Please contact me using the number below, X236, with questions. Thank you for your consideration.

Sincerely,

Dewey Youngerman
Manager, EH&S

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Cc: Sharon Cloward, San Diego Port Tenants Association

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CONTROL BOARD
2012 DEC 17 PM 3 46

David J. Akers, P.E.
Fellow - American Society of Civil Engineers, Fellow – American Concrete Institute
Consulting Concrete and Materials Engineer
5841 Amaro Drive, San Diego, CA 92124
858-437-1445

December 12, 2012

California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Reference: **ORDER NO. R9-2013-0001/NPDES NO. CAS0109266**

Subject: Sustainable Structural Source Control Storm Water BMPs

Board Members:

Water is the most precious resource next to clean air that we have in southern California. Without a safe, reliable source clean water for drinking, cooking, bathing, and commercial uses (high-tech research and manufacturing), the habitability of our region is seriously degraded. As you prepare the referenced order, I urge you to strongly consider the implementation and use of sustainable, structural source control BMPs that will capture, treat, and infiltrate storm and landscape water in-place.

Sustainability is defined as practices that allow the present generation to meet our needs without compromising the ability of the succeeding generations to meet their needs. Founded on economic, environmental, and social principles, sustainability ties together low-cost infrastructure to solve environmental issues in everyone's best interest.

The paper "California's Water Energy Relationship" prepared by the California Energy Commission noted that 19% of the state's electrical usage plus huge quantities of natural gas and diesel fuel were used in development, transportation, and usage of California's water. Of this nearly one-fifth of an already constrained resource, 22% is used in moving water from northern to southern California (10,300 GWh or 4.1% of the total electrical usage). Four percent is used in wastewater processing. A first line of defense is needed to reduce the need for more imported water and reduce the amount of water being processed and decrease the demand on an already overstressed electrical system.

Until "toilet to tap" becomes socially accepted, systems that naturally capture, treat, and slowly release storm and landscape water into the shallow and deep aquifers and waterways are needed. Such low-impact development systems are more sustainable and less costly than large storm water treatment plants that ultimately discharge huge plumes of clean water into

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the ocean. Examples of these LIDs are pervious concrete, permeable interlocking pavers, rain-gardens, storm detention basins, and porous asphalt.

Pervious concrete is in the simplest terms conventional concrete that is made without the inclusion of sand. It contains only cementitious material (portland cement and perhaps fly ash a recycled industrial by-product), water, and coarse aggregate. The concrete has a void content of 18% to 25% and is typically placed over a 6-inch to 10-inch recharge basin of 1-inch maximum size aggregate. Pervious concrete can be designed to accept the water from the parking lot, building roof, and hardscape so that even in the slowest draining soils, no water will leave the site.

Permeable interlocking pavers are small precast concrete blocks that portions of their corners removed. The ½-inch square opening at the intersection of four blocks is filled with small aggregate which allows water to infiltrate into a permeable base under the pavers. Their performance is very similar to pervious concrete.

The pre-infiltration storage capacity of one acre of PV/PIPs is approximately 9,600 cf or 2.7-in of storm water. The water that passes through PV/PIPs is cleaned by naturally occurring micro-organisms as it infiltrates the soil. Once in the soil, the water stays in a shallow aquifer where it available to surface vegetation or it eventually replenishes local waterways or it continues to deeper aquifers where it can be removed by pumping for domestic and commercial uses. Pervious concrete and permeable interlocking pavers will provide a 20 to 30-year service life with minimal maintenance. The uses of PC/PIPs are generally in parking lots, but they have also been used in sidewalks, nature trails, low-volume streets, and gutters. Caltrans has used pervious concrete in rest stop parking lots and on highway shoulders.

PC/PIPs used in parking lots free space for additional economic and recreational development. Development is constrained by the amount of parking that is available. When storm detention basins are used, valuable land is consumed in constructing an "attractive nuisance" that fills with trash during dry periods and breeds mosquitoes when wet. PV/PIPs are storm detention basins that have dual uses. An example of pervious concrete replacing a storm detention basin is Stratford Place, a 19 unit sub-division in Sultan, WA, where two detention basins were replaced with pervious concrete streets, sidewalks, and driveways allowing the developer to construct two additional homes with overall construction savings of $260,000. The completed site hydraulically mimicked the natural state. The Kaiser Hospital organization is now using pervious concrete for parking lots in its new projects.

PV/PIPs are energy efficient. Once constructed, the energy requirement is possibly an occasional sweeping to keep the surface voids open.

Rain gardens are attractive methods for capturing and treating storm water, but have a limited capacity compared to PV/PIPs. Detention basins can store large quantities of water, but are generally attractive nuisances. Porous asphalt pavement is similar to pervious concrete in that fine aggregate is removed to create the voided interstitial structure. The major drawback to PAP is that asphalt is a flexible material that is subject to weathering of the organic structural

material. In hot weather, the PAP can be shoved by traffic closing the surface voids. Ultraviolet radiation degrades the asphalt surface (oil). Typical asphalt pavement surfaces are rejuvenated by spraying with fresh oil or a slurry seal. Neither option is viable for PAP since the surface voids would be closed. Further, as the price of oil rises and refining techniques are improved, the amount of asphalt oil is reduced and its price is increasing compared to portland cement which has been relatively stable.

In closing, a sustainable first line of defense is needed to capture, treat, and infiltrate storm and landscape water back into our natural system. Wyatt Troxell, a former board member of the Inland Empire Utility Agency, commented after a pervious concrete presentation that "for every acre of ground that covered by streets or buildings, we must import an acre-foot of water forever." Capturing, treating, and re-using water is essential.

Respectfully,

David J. Akers, P.E.
Civil Engineer

SAN DIEGO ASSOCIATION OF REALTORS®

The Trusted Voice of San Diego Real Estate

December 12, 2012

Mr. Wayne Chiu, P.E.
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Re: Comment—Tentative Order No. R9-2013-001, Regional MS4 Permit,

Place ID: 786088Wchiu

Dear Mr. Chiu:

As President of the Greater San Diego Association of REALTORS® (SDAR), the largest trade association in San Diego County representing over 12,000 members, I am responding to the San Diego Regional Water Quality Control Board's Tentative Order R9-2012-0011 ("Permit") dated October 31, 2012. After reviewing the proposed Permit, we are concerned it will impose expensive, onerous, and untested regulations on local governments, businesses, and residents. These new regulations will impact the region's economy without improving its water quality.

Everyone understands the importance of clean, safe water to the region. As a member of the business community, I too am interested in improving San Diego's water. It is important, however, that we use our limited resources wisely. We must ensure that our efforts produce the desired outcome of improving water quality.

SDAR applauds the Board's inclusion of Water Quality Improvement Plans (WQIP) as a first step in developing a cost-effective approach to improving our water. Analysis remains a critical component of a successful strategy. Furthermore, we are glad to see that the Board is committed to finding the best possible solution to water quality improvement.

We are concerned, however, that the costs associated with enforcing and implementing the permit will have a negative impact on my business and San Diego's economy. The four primary areas of concern include: 1) the strict liability for exceeding water quality objectives; 2) the additional and changing requirements for development projects, impacting items such as storm water retention and discharge; 3) the preemption of WQIPs by new and changing regulatory requirements prior to allowing the WQIPs to be developed and implemented; and 4) the lack of reliable funding sources to implement these regulatory changes.

SDAR
SAN DIEGO ASSOCIATION OF REALTORS®

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It is necessary to hold individuals, businesses and governments accountable. However, it is critical that the accountability measures can be reasonably achieved and are likely to have a significant and positive impact on San Diego's water. Due to these concerns, we respectfully request that the Permit focus on the timely development of effective and enforceable WQIPs. We also request that each of the WQIPs be developed through a process that ensures public participation. We ask also that the designation of appropriate Best Management Practices in each watershed be determined through the WQIP process rather than the one size fits all strategy currently being proposed in the Permit. We further request that until the Board adopts a WQIP for a watershed that the provisions of the existing Permit remain in place for that watershed. Finally, in order to avoid unnecessary litigation, we request that the Board adopt the WQIPs as Orders implementing the proposed Permit.

On behalf of SDAR, I urge you to adopt final permit language that is evidence-based and as well as environmentally and economically sustainable. Thank you for your consideration. Please contact Jordan Marks, SDAR Director of Government Affairs, at 858-715-8012 if you have any questions.

Sincerely,

Donna Sanfilippo
President
Greater San Diego Association of REALTORS®

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California State Senate

SENATOR
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THIRTY-EIGHTH SENATE DISTRICT

005617

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December 12, 2012

Mr. Wayne Chiu, P.E.
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Re: Comment—Tentative Order No. R9-2013-001, Regional MS4 Permit, Place ID: 786088Wchiu

Dear Mr. Chiu:

I am responding to the San Diego Regional Water Quality Control Board's Tentative Order R9-2012-0011 ("Permit") dated October 31, 2012. After reviewing the proposed permit, I am concerned it will impose expensive and burdensome regulations on local governments, businesses, and residents throughout San Diego County. As a member of the legislature, I too am interested in improving our regional water quality. However, we must use our limited resources wisely, and ensure that our efforts produce the desired outcome of improving water quality.

I applaud the Board's inclusion of Water Quality Improvement Plans (WQIP) as a first step in developing a cost-effective approach. However, I am concerned that the costs associated with enforcing and implementing the permit will have a negative impact on many businesses within the region. My concerns include: 1) the strict liability for exceeding water quality objectives; 2) the additional and changing requirements for development projects, impacting items such as storm water retention and discharge; 3) the preemption of WQIPs by new and changing regulatory requirements prior to allowing the WQIPs to be developed and implemented; and 4) the lack of reliable funding sources to implement these regulatory changes.

I urge you to adopt final permit language that is evidence-based and both environmentally and economically sustainable. Thank you for your consideration.

Sincerely,

Mark Wyland

MARK WYLAND
Senator, 38th District

JAMUL DULZURA
COMMUNITY PLANNING GROUP
P.O. Box 613
Jamul, California 91935

December 14, 2012

Mr. Rich Crompton, Director
County of San Diego Department of Public Works
5510 Overland Ave, Ste 410
San Diego, CA 92123

SUBJECT: Comment – Tentative Order No.R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu

Dear Mr. Crompton,

The Jamul Dulzura Community Planning Group feels compelled to provide written comments on the draft San Diego Regional MS4 Permit to ensure that water quality regulations are practical, cost-effective, and scientifically based. While we are not directly regulated by the Regional MS4 Permit, we are concerned that public funds may have to be spent to comply with requirements that are not proven or effective, and that this will ultimately reduce the funding available for community projects and essential public services.

It is vital that the resources required to implement regulations are balanced with other public and environmental programs. For this reason we have joined the County's call to action to protect water quality while controlling the mounting and unsubstantiated costs of increased regulation on local governments, business and industry. As written, the Tentative Order will result in a significant and unprecedented level of regulation and cost without clear scientific basis or environmental benefit. The three main areas of concern in the draft permit are: 1) a far-reaching Bacteria Total Maximum Daily Load (TMDL), 2) additional requirements for development projects, and 3) performance standards that unnecessarily expose municipalities to third-party lawsuits. These requirements needlessly increase costs for regulated parties and may further constrain development in the region.

The cost to comply with the Bacteria TMDL is estimated between $2.6 billion and $4.9 billion for the named watersheds in the region over the 20 year TMDL compliance timeline, of which only 18 years remain. The numeric targets in this TMDL may never be attainable even if the County and other municipalities were to spend billions in public resources. This puts us in an untenable situation with the public, who will ultimately fund this effort. Technology simply does not exist to return urbanized watersheds back to pristine, "reference" conditions. The TMDL compliance targets must be attainable. The Bacteria TMDL requirement should not be incorporated into the MS4 Permit until there are more practical goals to work toward. We cannot ask the public to fund a program that will not succeed.

The cost of doing business in California has already pushed many businesses and developers out of the state. The draft permit will impose significant hardships on development. Permit requirements would require almost all development projects in the County to comply with hydromodification requirements, regardless of whether the projects themselves contribute to the problem. It also requires that new and re-development projects return site hydrology to pre-development conditions as opposed to pre-project conditions. Returning urban infill projects to conditions that existed under "natural", pre-urban conditions would be a substantial constraint to re-development. Over the last several years, local governments in San Diego have worked together with Regional Board staff and a host of technical experts to develop a Hydromodification Management Plan with reasonable and scientifically based standards. The

Regional Board recently approved that Plan. This draft permit ignores all of the good work invested in that Plan, which was developed at a significant cost to the public. In its place, it would impose new, one-size-fits-all requirements that impose a standard that is unrealistic and without scientific justification. The result of all these changes is that the structures built to mitigate development impacts will need to be bigger and will cost significantly more than the current approved program. Implementing these requirements would be an economic burden to our region and, are targeted at an unobtainable endpoint.

Accordingly, we would like for the Regional Board to honor existing plans, including the Hydromodification Management Plan. SANDAG has worked for many years through a comprehensive public process to develop the Regional Transportation Plan and Regional Comprehensive Plan that provides the framework for local General Plans. These plans recognize regional smart growth opportunity areas, including infill development. These are sound principals. Urban infill reduces aerial deposition which then reduces pollutant loading in urban runoff. Re-development is considered an environmentally preferable method of development. The MS4 permit should encourage re-development, retrofit landscapes, and green streets, through greater flexibility and reduced requirements rather than penalizing it with additional cost and constraints. To this end, any new regulations must be integrated into approved plans and must not be a burdensome, additional layer.

Finally, the draft permit includes performance standards that should be amended so that regulated municipalities are not unnecessarily exposed to third-party litigation. This Permit's receiving water limitations language is contrary to the intent of the federal Clean Water Act, which is to assure municipal agencies will be regulated to a reasonable standard. The State and Regional Water Boards have the discretion and a responsibility to ensure that water quality regulations are applied in a context that results in economic and environmental sustainability. It is imperative to reduce the threat of litigation when a municipality is engaged in a good faith effort to comply. The current receiving water provisions do not serve the environment, the public or the permittees. Public funds should be used to implement comprehensive programs that are proactive and adaptive to promote clean water goals.

Local government must have the flexibility to make policy decisions for the good of our residents. The 21 Copermittees in our region (the County, 18 cities, Port District, and Airport Authority) already spend close to $120 million a year to comply with current permit requirements. Heal the Bay's own report cards show that water quality at local beaches is improving. We would like to see the Regional Board adopt a permit that will be cost neutral and that local municipalities will have the flexibility to apply funding to priority areas.

We are hopeful that the final permit language will result in programs that make sense from both an environmental and economic standpoint. Please contact me if you have questions or would like to discuss our concerns.

Sincerely,

Michael Casinelli, Chair
Jamul Dulzura Community Planning Group

CC:
Vice Chairman Gary Strawn, San Diego Regional Water Quality Control Board (SD RWQCB)
Board Member Eric Anderson, SD RWQCB
Board Member Henry Abarbanel, SD RWQCB
Board Member Tomas Morales, SD RWQCB
Executive Officer David Gibson, SD RWQCB
Mr. Wayne Chiu, SD RWQCB

RAMONA COMMUNITY PLANNING GROUP
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Angus Tobiason

Richard Tomlinson

Kevin Wallace

December 14, 2012

Mr. Rich Crompton, Director
County of San Diego Department of Public Works
5510 Overland Ave, Ste 410
San Diego, CA 92123

Dear Mr. Crompton,

SUBJECT: Comment – Tentative Order No.R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu

As the Ramona Community Planning Group, a land use advisory group to the County of San Diego for land use issues in Ramona, we feel compelled to provide written comments on the draft San Diego Regional MS4 Permit to ensure that water quality regulations are practical, cost-effective, and scientifically based. While we are not directly regulated by the Regional MS4 Permit, we are concerned that public funds may have to be spent to comply with requirements that are not proven or effective, and that this will ultimately reduce the funding available for community projects and essential public services.

It is vital that the resources required to implement regulations are balanced with other public and environmental programs. For this reason we have joined the County's call to action to protect water quality while controlling the mounting and unsubstantiated costs of increased regulation on local governments, business and industry. As written, the Tentative Order will result in a significant and unprecedented level of regulation and cost without clear scientific basis or environmental benefit. The three main areas of concern in the draft permit are: 1) a far-reaching Bacteria Total Maximum Daily Load (TMDL), 2) additional requirements for development projects, and 3) performance standards that unnecessarily expose municipalities to third-party lawsuits. These requirements needlessly increase costs for regulated parties and may further constrain development in the region.

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Finally, the draft permit includes performance standards that should be amended so that regulated municipalities are not unnecessarily exposed to third-party litigation. This Permit's receiving water limitations language is contrary to the intent of the federal Clean Water Act, which is to assure municipal agencies will be regulated to a reasonable standard. The State and Regional Water Boards have the discretion and a responsibility to ensure that water quality regulations are applied in a context that results in economic and environmental sustainability. It is imperative to reduce the threat of litigation when a municipality is engaged in a good faith effort to comply. The current receiving water provisions do not serve the environment, the public or the permittees. Public funds should be used to implement comprehensive programs that are proactive and adaptive to promote clean water goals.

Local government must have the flexibility to make policy decisions for the good of our residents. The 21 Copermittees in our region (the County, 18 cities, Port District, and Airport Authority) already spend close to $120 million a year to comply with current permit requirements. Heal the Bay's own report cards show that water quality at local beaches is improving. We would like to see the Regional Board adopt a permit that will be cost neutral and that local municipalities will have the flexibility to apply funding to priority areas.

We are hopeful that the final permit language will result in programs that make sense from both an environmental and economic standpoint. Please contact Jim Piva if you have questions or would like to discuss our concerns.

Sincerely,

Jim Piva

JIM PIVA, Chair
Ramona Community Planning Group

CC:
Vice Chairman Gary Strawn, San Diego Regional Water Quality Control Board (SD RWQCB)
Board Member Eric Anderson, SD RWQCB
Board Member Henry Abarbanel, SD RWQCB
Board Member Tomas Morales, SD RWQCB
Executive Officer David Gibson, SD RWQCB
Mr. Wayne Chiu, SD RWQCB

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005622

December 19, 2012

VIA EMAIL AND U.S. MAIL

Catherine Hagen, Esq.
San Diego Regional Water Quality Control Board
9174 Sky Park Ct., Suite 100
San Diego, CA 92123-4340

RE: Hydromodification Management Requirements of Draft Tentative Order No. R9-2013-0001 (San Diego Regional MS4 Permit)

Dear Ms. Hagen:

The purpose of this letter is to further address the nexus issue raised by members of the Regional Board at the Municipal Separate Storm Sewer Systems (MS4) permit workshop held on December 12, 2012. As the Copermittees commented at the workshop, we are concerned that the hydromodification management requirements would expose the Copermittees to significant litigation risk and may be unenforceable. Specifically, we are concerned with the provisions: (1) requiring Copermittees to compel development projects that have no impact on hydromodification to implement on-site or "alternative compliance" hydromodification mitigation measures; and (2) using "pre-development (naturally occurring)" runoff reference condition as applied to sites that are, in fact, developed. These requirements are located in Provision E(3)(c) of the Draft Tentative Order.

We are concerned that implementing these requirements would subject the Copermittees to liability under the takings clauses of the U.S. and California Constitutions and the Mitigation Fee Act because of the questionable nexus between a project's impacts on hydromodification and the hydromodification management measures in the Draft Tentative Order. When imposing a condition on a development permit, a local government is required under the federal and state constitutions to establish that the condition bears a reasonable relationship to the impacts of the project. This rule applies even to legislatively enacted requirements and impact fees or exactions.[1] Moreover, fees imposed on a discretionary ad hoc basis are subject to heightened scrutiny under a two-part test. First, local governments must show that there is a substantial relationship between the burden created by the impact of development and any fee or exaction.[2] Second, a project's impacts must bear a "rough proportionality" to any development fee or

[1] *Building Indus. Ass'n v. City of Patterson*, 171 Cal. App. 4th 886, 898 (2009).
[2] *Nollan v. California Coastal Comm'n*, 483 U.S. 825, 837 (1987).

exaction.[3] Under California law, the *Nollan/Dolan* heightened scrutiny test also applies to in-lieu fees.[4]

The Legislature has memorialized these requirements in the Mitigation Fee Act which establishes procedures that local governments must follow to impose impact fees.[5] Irrespective of whether the hydromodification management requirements are implemented by legislative act or on an ad hoc basis, the Copermittees' attempt to enforce them as proposed in the Tentative Order would likely result in claims alleging unconstitutional takings of private property and violations of the Mitigation Fee Act. This is because a developer could argue that limiting hydromodification impacts of already developed property to its "naturally occurring" state, or requiring hydromodification mitigation measures for impacts not imposed by the project, would not have a legally sufficient nexus to the impact of the development project.

Based on these concerns, we respectfully request that these provisions be modified. The Copermittees will be submitting comments on this issue and a redline of the Draft Tentative Order prior to the close of the public comment period on January 11, 2013. In the meantime, we are available to meet with you to discuss this important issue.

Sincerely yours,

JAN I. GOLDSMITH, City Attorney

By

Heather L. Stroud
Deputy City Attorney

COUNTY OF ORANGE
Nicholas S. Chrisos, County Counsel

By

Ryan M. F. Baron
Senior Deputy County Counsel

---

[3] *Dolan v. City of Tigard*, 512 U.S. 374, 391 (1994).
[4] *Ehrlich v. City of Culver City*, 12 Cal. 4th 854, 876 (1996).
[5] Cal. Gov't Code §§ 66000-66025.

CITY OF SAN MARCOS

By

Helen Holmes Peak
Lounsbery Ferguson Altona & Peak, LLP
Attorneys for City of San Marcos

COUNTY OF RIVERSIDE
Pamela J. Walls, County Counsel

By

Karin Watts-Bazan
Principal Deputy County Counsel

CITY OF ALISO VIEJO

By

Shawn Hagerty, Best Best & Krieger LLP
Attorneys for City of Aliso Viejo

CITY OF SANTEE

By

Shawn Hagerty, Best Best & Krieger LLP
Attorneys for City of Santee

CITY OF LAKE FOREST

By

Shawn Hagerty, Best Best & Krieger LLP
Attorneys for City of Lake Forest

HLS:cw
Doc. No.:488983

CITY OF SAN MARCOS

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Karin Watts-Bazan
Principal Deputy County Counsel

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CITY OF SANTEE

By

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CITY OF LAKE FOREST

By

Shawn Hagerty, Best Best & Krieger LLP
Attorneys for City of Lake Forest

HLS:cw
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Sharon Bernie-Cloward
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Sophie Silvestri
DIRECTOR OF OPERATIONS

* SDPTA Past Chairmen

SAN DIEGO PORT TENANTS ASSOCIATION

December 19, 2012

Mr. David Gibson, Executive Officer
California Regional Water Quality Control Board
San Diego Region
9174 Sky Park Court, Ste. 100
San Diego, CA 92123-4340

Dear Mr. Gibson,

I am contacting you on behalf of the San Diego Port Tenant's Association (SDPTA). The Association was formed in 1989 as a non-profit mutual benefit corporation and is made up of over 250 members that include Tideland's businesses that are tenants of the Unified Port District. On behalf of the Board of Directors of the San Diego Port Tenants Association, please allow me to offer the follow comments and suggestions in regard to the Regional MS4 Permit:

Monitoring and Assessment. With regard to the use of members of the public to support volunteer monitoring, SDPTA is very concerned about the possibility for mis-interpretation of this provision. Well-intentioned but overly-aggressive parties may interpret this provision to allow volunteers to enter private property, via the public right-of-way, looking for unlawful or improper discharges. This raises several legal concerns and poses significant liability issues for copermitees should a volunteer be injured in the course of an unauthorized inspection, or if private property is damaged, or if manufacturing processes are adversely affected as a result of the unauthorized intrusion.

We recommend that the language governing the use of volunteers be very explicit regarding the intent of the Board which we believe is to help

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www.sdpta.com

copermitees reduce monitoring costs by utilizing volunteers to monitor properties that are part of the public right-of-way.

Non-Storm Water Discharges. The Regional MS4 Permit currently specifies that air conditioner condensation is a non-storm water discharge that must be directed to landscaped areas or other pervious surfaces, where feasible. SDPTA is concerned about the cost of compliance for this particular. Re-routing condensation lines in existing buildings, more often than not is very expensive. We would suggest that the new requirements be limited to development/re-development. In addition, discharges from fire suppression equipment maintenance activities can be treated with BMPs and in such cases should not be considered an illicit discharge.

Finally, The Regional MS4 Permit Generally specifies that all non-storm water discharges must be terminated rather than making a distinction that discharges with permits are actually authorized. SDPTA recommends that the Regional Board add language for clarification, something like the following:

> *Each Copermittee shall effectively prohibit all types of non-storm water discharges into its MS4 nless such discharges are authorized by a separate National Pollutant Discharge Elimination system (NPDES) Permit.*

On behalf of SDPTA, I want to thank the Regional Board and Staff for the very collaborative nature of this process. We thank you for the opportunity to submit these comments, and appreciate your consideration.

Best regards,

Sharon Cloward

Sharon Cloward
President, San Diego Port Tenants Association

Cc: SDPTA Board of Directors
Port Chair, Lou Smith, San Diego Unified Port District
Port President, Wayne Darbeau, San Diego Unified Port District

Julian Community Planning Group

P.O. Box 249, Julian, CA 92036

January 4, 2013

Ms. Stephanie Gaines, Land Use/Environmental Planner
DPW/Watershed Protection Program (M.S. 0326)
5510 Overland Avenue, Suite 410
San Diego CA 921123

Dear Stephanie;

First I want to thank you for meeting with our Planning Group to discuss the reissuance process regarding the region NPDES Permit (MS4 Storm Water) with particular focus on the Total Maximum Daily Load plan (TMDL) and the effects that may have on our community.

After reviewing the documents provided to us, discussing the issue with you, and considerable discussion by our Group, the following statement has been prepared to express the position of the Julian Community Planning Group:

1) As written, the tentative order MS4 will result in a significant, unprecedented and likely unattainable level of regulation and unsustainable cost. The tentative order includes:

A. Far reaching water quality improvements.

B. Performance standards that cannot conceivably be attained.

C. Transferring the state's responsibility of cost to the local agencies, including testing, liability, and enforcement.

D. Ignoring of existing plans developed by other agencies.

E. Requiring the co-permittee to comply with unknown conditions.

The far reaching water quality improvements likely never can be attained, especially in urban developed areas. Will the Regional Water Quality Control Board remove legal conforming residences to obtain pre-development conditions; or require all existing developments to retrofit in order to attain the requested standards?
There are also jurisdictions over which the co-permittee has no authority and therefore can not require compliance. Those include Caltrans, State lands and parks, Federal lands and parks, and Indian Reservations.

2) The San Diego Regional Water Quality Control Board is attempting to pass all cost and responsibility to the co-permittee. Why would any agency accept these liabilities and costs? The County of San Diego has estimated the cost to comply with the Bacteria TMDL alone to be between 2.6 and 4.9 million dollars.

3) The County of San Diego, Cities and SanDag have worked extensively to develop Transportation plans, regional comprehensive plans and general plans that address the concerns shown in the tentative order MS4. The San Diego Regional Water Quality Control Board has ignored this effort in the new proposed regulation.

4) The proposed MS4 permit requires the co-permittees to accept new regulation without knowledge of what they are or their impacts.

5) The requirement of returning all watersheds back to pristine reference level is just not practical nor feasible.

6) The County of San Diego should not require the portion of the County in the Colorado River Basin to comply with San Diego County Water Quality Control Board requirements. The issues and conditions in the Colorado River Basin are not similar to those in the western coastal portion of the County.

Thank you for including our comments in your presentation to the San Diego Region Water Quality Control Board.

Sincerely

Jack D. Shelver, Chair
Julian Community Planning Group

Walsh

005630

OTAY LAND COMPANY

SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD

2013 JAN -7 P 2:29

Promoting Chula Vista's future by preserving its past.

January 4, 2013

San Diego Water Board
9174 Sky Park Circle
Suite 100
San Diego, CA 92123
Attn: Mr. Tomas Morales

Subject: Tentative order No. R9-2013-0001
Municipal Separated Storm Sewer Systems (MS4s)
Draining the Watersheds within the San Diego Region

Dear Mr. Morales,

I would like to thank you for hosting the two recent public workshops on the Tentative Order No. R9-2013-0001 regarding MS4s Draining the Watersheds within the San Diego Region. They were very informative and I appreciated the opportunity to address the Board at both hearings.

Our company is close to completing our entitlements for a sustainable, walkable, "green" master planned community in Otay Ranch. Our property is adjacent to Otay River west of Otay Lakes. We have spent thousands of man hours and millions of dollars planning a community that takes the environment into consideration, including water quality.

As I mentioned when I addressed the Board, the Otay River Valley west of the dam is barren and full of invasive plant species that literally suck the water out of the ground. In following the hydromodification requirements that were implemented only about a year ago, we have devised a plan that will clean our storm water runoff prior to introducing it into the Otay River. Once the water is reintroduced into the river we will remove the invasive plants and establish wetland varieties which will flourish and bring the river valley back to what it once was many years ago. We are able to accomplish this because the Otay River west of the dam is currently exempt from hydromodification requirements.

This exemption was put into place based on scientific research and technical expertise of the Hydromodification Task Force. This committee, representing environmental and engineering experts determined that limiting runoff to certain bodies of water and rivers

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within your jurisdiction would not be beneficial to the health of those watersheds. Due to the influence of the Otay Lakes and Dam upstream of our project, the Otay River was determined to be one of the bodies of water that would benefit from the exemption.

If the exemption for the Otay River is deleted from the new Tentative Order, our land plan will be altered and our restoration efforts will not be put in place.

In addition, the proposed Tentative Order also calls for retention onsite of the 24 hour 85th percentile storm event. Similar to the issue of hydromodification, retention of flows from the majority of storm events will adversely impact this watershed that is described as being "starved" for runoff in the Otay River Watershed Management Plan. Since infiltration is infeasible on our site due to soil conditions, the permit proposes to arbitrarily increase our bioretention facilities by 25%, a number that does not appear to have any scientific basis.

We applaud the new permit for looking at regional solutions through the implementation of the Watershed Improvement Plans. However, we should be allowed to operate under the current permit until the Watershed Improvement Plans determine the best regional solutions for the health of each watershed. Specifically, we request that the hydromodification exemptions be left in place and the retention requirements not be added to the permit until the Watershed Improvement Plans determine whether retention is beneficial to the watersheds.

Sincerely,

Jeff O'Connor
Director of Operations

Cc: Paul Borden
Kent Aden

County of San Diego

HERMAN REDDICK
PROGRAM MANAGER
(858) 974-5813
FAX (858) 974-5928

PUBLIC SAFETY GROUP
SAN DIEGO COUNTY FIRE AUTHORITY
5510 Overland Ave, Suite 250, San Diego, CA 92123

KEN MILLER & RALPH STEINHOFF
FIRE SERVICES COORDINATOR
(858) 974-5920
FAX (858) 974-5928

January 4, 2013

Mr. Wayne Chiu, P.E.
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego California 92123-4340

Dear Mr. Chiu,

SUBJECT: Amendment of Draft Permit Language for Fire Fighting Activities – Tentative Order No.R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu

As a local authority affected by the most recent MS4 Draft Permit we feel compelled to provide written comments to ensure that water quality regulations are practical, cost-effective, and scientifically justified. Since the County Fire Authority will be directly regulated by the Regional MS4 Permit, we are concerned that public funds and critical personnel may have to be spent or resourced to comply with requirements that are unnecessary, and that this will ultimately reduce the emergency personnel and funding available for essential public services.

It is vital that the resources required to keep our communities safe from the threat of fire be solely purposed for that task. For this reason the 15 rural fire agencies within San Diego County have joined the County Fire Authority's call to action to protect water quality while controlling the mounting and unsubstantiated costs of increased regulation on local governments, business, and industry. As written, the Tentative Order will result in a significant and unprecedented level of regulation and cost without clear scientific basis or environmental benefit. The Fire Authority along with the 15 rural agencies believe that the language incorporated in a re-issued permit should not deviate from the current permit unless the RWQCB can provide clear evidence that emergency fire fighting activities and fire sprinkler line flushing significantly impact stormwater runoff, and that the increased costs associated with proposed changes are justified and feasible. Accordingly, we ask that the Regional Board honor the language in the existing permit and make no changes at this time.

In order to provide the best service possible the Fire Authority and its 15 participating agencies must be focused on emergency activities and not with implementing BMPs or removing debris caused by the emergency after the fact. This should be the sole responsibility of the entities owning or operating the sites or facilities for which the fire agencies are responding. The Fire Authority also believes that existing requirements are sufficient to ensure that the flushing of fire sprinkler systems has minimal impact to storm water quality and should not be prohibited. These activities exist for the safety of the public and the environment and should be continued in their current fashion pursuant to existing permit requirements.

We are hopeful that the final permit language will result in programs that make sense from a public safety, environmental and economic standpoint. Please contact Greg Schreiner, Fire Marshal, if you have questions or would like to discuss our concerns. His number is 858-495-5425, email is greg.schreiner@sdcounty.ca.gov

Sincerely,

Herman Reddick,
Program Manager

CC:
Acting Chairman Gary Strawn, San Diego Regional Water Quality Control Board (SD RWQCB)
Board Member Eric Anderson, SD RWQCB
Board Member Henry Abarbanel, SD RWQCB
Board Member Tomas Morales, SD RWQCB
Board Member Sharon Kalemkiarian, SD RWQCB
Executive Officer David Gibson, SD RWQCB

January 5, 2013

Via e-mail to wchiu@waterboards.ca.gov
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

RE: Comments on Tentative Order Number: R9-2013-0001

Dear Mr. Chiu:

I am a professor of microbiology and general biology for San Diego County Community Colleges and a member of the San Diego Coastkeeper Community Advisory Council. I respectfully submit the following comments on the draft San Diego Regional Municipal Separate Storm Sewer System permit, Tentative Order No. R9-2013-0001.

Urban runoff is the San Diego region's most urgent pollution problem. Arguably, it is the most difficult to solve. In a region known for its beaches and strong tourism economy, polluted runoff makes our beaches and waterways unsafe for swimming, fishing and other recreation for at least 72 hours after a rain event. Even in dry weather, our "urban drool" from residents and businesses overwatering lawns becomes a major pollution source. A recent scientific article by Viswanathan *et al.* delineated 'urban runoff' as a problem in almost every watershed in San Diego County:

Watersheds and Description of Associated Concerns

Name of watersheds	Water quality concerns	Impacts
Carlsbad	Surface water quality degradation, beach closures, sedimentation, habitat degradation, and eutrophication	Urban runoff, agricultural runoff, sewage spills, domestic animals, and livestock
Otay	Surface water quality degradation, sedimentation, habitat degradation, and loss	Urban runoff, agricultural runoff, resource extraction, septic systems, and marinas
Penasquitos	Decline in surface water quality, beach closures, sedimentation, habitat degradation, and eutrophication	Urban runoff, sewage spills, dredging, and landfill leachate
Pueblo San Diego	Decline in surface water quality, habitat degradation, and toxins	Urban runoff
San Diego	Decline in surface water quality, degrading habitats, sediment, and eutrophication	Urban runoff, agricultural runoff, mining operations, sewage spills, and sand mining
San Dieguito	High levels of coliform bacteria, nutrients and sediment, resulting in declining surface water quality and habitat degradation	Urban runoff, agricultural runoff, and domestic animals
San Juan	Decline in water quality and habitat loss	Urban runoff, agricultural runoff, and military operations from Camp Pendleton are the major sources of pollution in this watershed
San Luis Rey	High levels of coliform bacteria, nutrients and sediment, resulting in declining surface water quality and habitat degradation	Agriculture and orchards, livestock, urban runoff, sand mining, and septic systems
Santa Margarita	Surface and groundwater quality degradation; habitat loss	Excessive sedimentation from development and agricultural areas
Sweetwater	Declining surface and groundwater quality and habitat degradation	Agricultural and urban runoff
Tijuana	Most severely impacted watershed in San Diego Basin	Urban runoff, sewage spills, industrial discharges, agricultural, livestock, and septic systems

The good news is by working together as a community, we can solve this challenging public health problem. The Water Quality Improvement Plans proposed in the draft permit have the potential to become powerful tools to help us improve water quality within our watersheds. However, the Copermittees cannot be tasked with creating these plans alone. Specifically:

- The Permit should require formation of a stakeholder advisory group for each watershed that includes representatives of environmental groups with knowledge of the watershed.
- This stakeholder advisory group should work closely with the Copermittees and a regional board staff member while the Water Quality Improvement Plans are being developed to ensure these plans aggressively pursue water quality gains.
- The stakeholder advisory process should include accountability and measureable milestones to ensure the goals of the Permit are being met.

By taking advantage of the knowledge and resources of diverse stakeholders like municipalities, businesses and residents, our region can be on the cutting-edge of addressing urban runoff and creating healthier communities and watersheds. But this can only be achieved if these diverse voices are impacting the planning process in a meaningful way. The impacts of reaching our goals together are two-fold, resulting in a win-win situation for the environment and society as described by Dearborn and Kark :

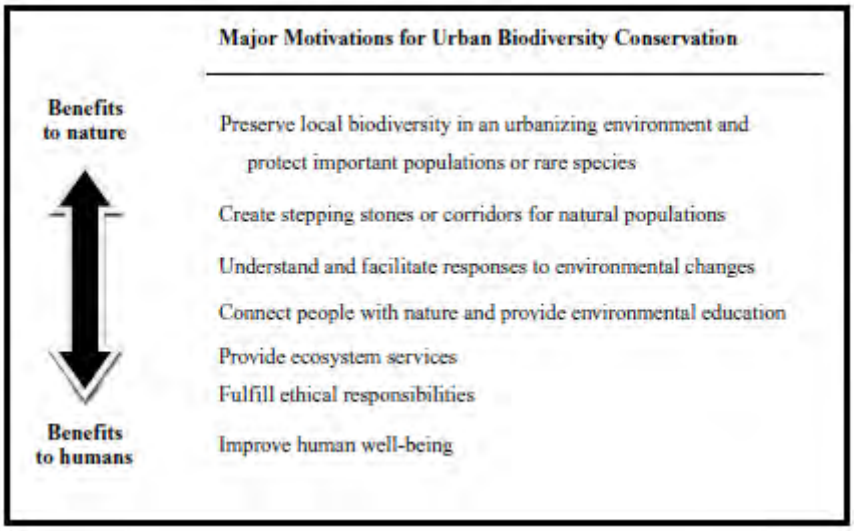

As San Diego continues to grow at 10% annually, it is imperative that we "understand and facilitate responses to environmental changes" as not only an 'ethical responsibility', but to improve our own human well-being. I've seen constant growth (even in the past 4 years of "recession") in the East County, including a steady degradation of the biodiversity of the San Diego River despite the best conservation efforts of San Diego Mission Trails and other county and city parks. What occurs upstream is beyond the control of parks and land set aside for conservation. Urban runoff is a major contributor to this.

San Diego County Community Colleges and the San Diego Coastkeeper Community Advisory Council recognize the challenge urban runoff presents to our region, and we want to do our part to solve the problem. San Diego County Community Colleges and the San Diego Coastkeeper Community Advisory Council are interested in participating in a Water Quality Improvement Plan development process for the San Diego River watershed.

San Diego County Community Colleges the San Diego Coastkeeper Community Advisory Council urges the Regional Board to enhance the stakeholder participation opportunities as Water Quality Improvement Plans are developed and then approve the permit.

Respectfully submitted,

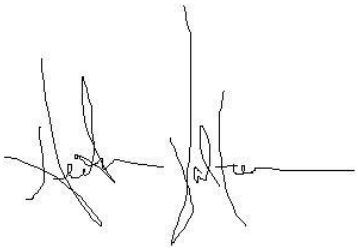

Professor Hector Valtierra,
M.A. (Liberal Arts), M.S. (Biochemistry), MPH (Public Health)
San Diego County Community Colleges
San Diego Coastkeeper Community Advisory Council

References

Dearborn DC and Kark S. **Motivations for Conserving Urban Biodiversity**. *Conservation Biology*. April 2010. Vol. 24, No. 2; pgs. 432 – 440.

Viswanathan S, Voss KA, Alex Pohlman, Gibson D, and Purohit J. **Evaluation of the Biocriteria of Streams in the San Diego Hydrologic Region**. *Journal of Environmental Engineering*. June 2010. Vol. 136; pgs. 627 - 637.

THE CITY OF SAN DIEGO

January 7, 2013

VIA EMAIL TO: wchiu@waterboards.ca.gov

Wayne Chiu, P.E.
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego California 92123-4340

Dear Mr. Chiu:

Subject: Draft Municipal Storm Water Permit, Tentative Order No. R9-2013-0001

Thank you for the opportunity to comment on the San Diego Regional Water Quality Control Board's (Regional Board) draft Municipal Storm Water Permit (Tentative Order No. R9-2013-0001, hereinafter referred to as "Tentative Order"). The City of San Diego (City) participated with the twenty one permittees in the San Diego region subject to the current Municipal Permit (Copermittees) to develop a collective set of comments on the Tentative Order. The Copermittee comments were submitted separately by the County of San Diego and are supported by the City. In addition, the City submits this letter to provide additional comments on the Tentative Order.

- *Revise the Tentative Order to allow for compliance with Discharge Prohibitions, Receiving Water Limitations, and Areas of Special Biological Significance (ASBS) and Total Maximum Daily Load (TMDL) requirements if a Copermittee is implementing an approved Water Quality Improvement Plan (WQIP) that includes a reasonable assurance analysis.* The City's objective is for the Tentative Order to allow the City to efficiently integrate its TMDL, ASBS and Municipal Permit requirements into a program that allows for compliance through implementation. The WQIP developed by Regional Board staff provides an innovative, thoughtful, and strategic framework for such an approach. However, the Tentative Order does not provide a mechanism for the City to achieve compliance with ASBS and TMDL regulations and the Tentative Order's prohibitions and limitations while implementing the WQIPs. The City supports the proposed process offered by the San Diego Copermittees which links compliance to the WQIPs provided that a reasonable assurance analysis is provided which demonstrates that water quality goals will be met if the WQIP is implemented. The City requests inclusion of the Copermittee's "WQIP-Based Compliance" option in the Tentative Order.

- *Incorporate 4 options from the adopted Bacteria I TMDL into the Tentative Order.* The following options are included in the Bacteria I TMDL and consistent with federal regulations. These options should be included in the Tentative Order because they encourage

efforts to target the highest polluting outfalls, address multiple pollutants comprehensively, and improve best management practices through adaptive management.

1. Mass (load)-based method for complying with Water Quality Based Effluent Limits (WQBELs). A mass (load)-based approach would allow the City to achieve water quality improvements more quickly and efficiently by targeting the highest polluting outfalls in each watershed.
2. BMP-based method for complying with WQBELs. The Bacteria I TMDL allows for BMP-based WQBELs, and is supported by federal regulations provided that measurable goals are set and efforts are iteratively adapted if water quality targets are not initially met. The WQIP-Based Compliance framework proposed by the Copermittees in their comment letter qualifies as a BMP-based program, consistent with federal regulations.
3. Adjusting interim Bacteria I TMDL compliance dates. The Bacteria I TMDL allows for Copermittees to propose alternative interim dry and wet weather compliance dates if the Copermittee proposes to address multiple pollutants (in addition to bacteria) through a comprehensive approach.
4. TMDL Re-opener. The Bacteria I TMDL states that the TMDL will be re-opened within 5 years after the effective date or later as new information becomes available to improve the science supporting the TMDL. The Tentative Order should include a corresponding acknowledgement that the adopted Order will be re-opened if the Bacteria I TMDL is amended.

- *Revise the Tentative Order to uphold the previously adopted San Diego Hydromodification Management Plan (San Diego HMP), Resolution No. R9-2010-0066.* This plan has been in effect for less than two years. The San Diego HMP was developed by an expert consultant team that utilized extensive scientific studies, analysis and modeling to determine the appropriate hydromodification control criteria. Additionally, the Copermittees have embarked upon a $1.5 million, 5 year monitoring plan to validate the parameters and design criteria. There have been no scientific advances in the last 2 years to justify revisions to the San Diego HMP. Therefore, we request allowing the Copermittees to continue implementation of the current San Diego HMP. Additionally, the Tentative Order expands the application of HMP controls beyond a project's impact by: 1) imposing HMP requirements on sites that have no potential of causing erosion downstream; and 2) setting pre-development as a baseline for HMP mitigation. The City requests limiting the HMP requirements to only the project's impact.

- *Replace the monitoring and assessment requirements in the Tentative Order (Provision D.4) with the strategic monitoring approach developed collectively by the Copermittees.* The Copermittees' approach will more efficiently and effectively address critical questions necessary to adaptively manage the City's programs and realize our storm water quality goals.

- *Add the San Diego Unified Port District (Port) as a Municipal Separate Stormwater Sewer System (MS4) Operator to the Shelter Island Yacht Basin Copper TMDL.* The Port should be

listed as an MS4 Operator because the Port is responsible for storm drains in parking lots within the Port's jurisdiction that drain to the Shelter Island Yacht Basin.

Thank you for the opportunity to comment. We look forward to continued discussions in finding ways to improve and protect water quality. If you have any questions please contact Drew Kleis, Program Manager at (858) 541-4329.

Sincerely,

Kris McFadden
Deputy Director

KM:dk

cc: Heather Stroud, Deputy City Attorney, City Attorney's Office
Sumer Hasenin, Senior Civil Engineer, Storm Water Division
Drew Kleis, Program Manager, Storm Water Division
Ruth Kolb, Program Manager, Storm Water Division
Andre Sonksen, Program Manager, Storm Water Division

005640

Wayne Chiu

January 8, 2013

SAN DIEGO REGIONAL
WATER QUALITY
CONTROL BOARD

Wayne Chiu, P.E.
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego California 92123-4340

2013 JAN 11 PM 12 17

Subject: City of Imperial Beach comments on the proposed Tentative Order No. R9-2013-0001

Dear Mr. Chiu:

The City of Imperial Beach appreciates this opportunity to provide comments on the Tentative Order No. R9-2013-0001. We recognize the effort made by RWQCB staff to consider and discuss the various stakeholder positions for this new permit and agree that developing a new permit through a series of focused meetings was innovative and successful in getting the stakeholders to understand each other's positions for achieving the same end goal of improved water quality. We hope that similar efforts for collaboration are continued at the water board.

The City of Imperial Beach has been actively involved in the focus meeting process and subsequent special workshops held on the new permit. The City also participated in the development of the San Diego Regional Copermittees response to the new permit and support the redline draft being proposed by the Copermittees. The comments on the new permit below are provided in addition to the comments being made by the San Diego Copermittees. We look forward to working with the RWQCB on the final development of this new storm water permit and are optimistic that this new permit will allow for the more efficient use of community resources to implement a successful storm water management program.

Comments by the City of Imperial Beach on Tentative Order R9-2013-0001:

- Provision A: The point of jurisdictional compliance under provision A is vague and presents the potential for unintended 3rd party lawsuits. If the regional board truly embraces an adaptive approach to address priority pollutants then that needs to be explicitly clear in the new permit. It is not clear if compliance means meeting the water quality objective or implementing an adaptive WQIP. We recognize the position by the Regional Board to not get ahead of the State Water Board especially in light of the recent November 20th workshop in Sacramento to discuss concerns on the limitations of receiving water limitations in municipal storm water permits, however, we want to strongly emphasize the importance of preventing unnecessary and costly 3rd party lawsuits in the new permit.
- Provision D: We strongly support the San Diego County Copermittee's recommended changes to the monitoring program in Provision D. The Copermittees met with RWQCB staff on multiple occasions after the focus meetings to discuss recommended changes. Please incorporate a monitoring program such as the one suggested by the Copermittees that uses a scientific and question driven monitoring approach that most effectively uses public funding to demonstrate any statistically significant changes in water quality.
- E.3.B.2.e Priority Development Project Categories: The definition for a priority development project that "discharges directly to" an Environmental Sensitive Area was changed in this permit. The clarifying language from the last permit specified flows that "discharge directly to" <u>as outflow from a drainage conveyance systems that is comprised entirely of flows from the subject development and not commingled with flows from adjacent lands</u>. It is my understanding from the RWQCB that their intent was not to change the definition for discharging to an Environmentally Sensitive Area and request that the clarifying language from the old permit is reintroduced for clarity.

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- E.3.B.3.b Priority Development Project Exemptions: Major maintenance on roads, alleys, and sidewalks should be treated different than other redevelopment projects because design standards and public safety take priority over water quality regulations. It is not practical to incorporate green streets and LIDs into every street retrofit project due to site feasibility, conflicting design standards, and increased project costs; however, the Copermittees should be allowed the flexibility to consider the application of green streets and LIDs into street retrofit projects whenever and wherever feasible.
- E.3.B.3.c Priority Development Project Exemptions: Single family residential redevelopment projects should not be held to the specific design standards for regular priority development projects because it discourages redevelopment of old properties. LID and HMP sizing criteria requires hydrology reports and engineered BMP design plans that captures the 24-hr 85th percentile storm event and prevents not more than 10 percent of the naturally occurring flow off the site, which is beyond the normal scope of many single family residential projects. These regulations are complex and hard to understand for the regular home owner and general contractor. Requiring costly engineered BMP plans for single family residential redevelopment projects disproportionally impacts lower income communities like Imperial Beach that already have a hard time encouraging new development. We support permit language that does not require engineered BMP solutions for single family residential projects such as the disconnection of impervious surfaces, improved landscaped areas with 12" of loamy soil, and incorporation of LID concepts into the project area.
- E.3.C.2 Hydromodification Management BMP Requirements: We strongly support the recommended HMP changes discussed at length by the San Diego Copermittees. Most importantly the City requests the HMP exemptions that were removed from the previous permit be reintroduced. The entire City of Imperial Beach discharges into a tidally influenced area and does not contribute to downstream erosion. Requiring HMP on project sites in the City does not make any sense and furthermore, requiring offsite mitigation somewhere in the watershed essentially translates into a tax on development that does not mitigate for any downstream flow impacts from the project site.
- E.3.C.3.b Alternative Compliance Project Options: It does not seem appropriate for the RWQCB or any government agency to regulate alternative compliance based on LEED Certified Redevelopment projects when there are other green building certification programs on the market. Being LEED Certified does not necessarily modify storm water runoff pollution. LEED accreditation is a noteworthy building accomplishment but it is bad policy to write LEED into the regulations.
- Attachment E Provisions for TMDLs: We support the comments made by the County of San Diego related to incorporating the requirements of existing TMDLs into this new permit.

Sincerely,

Chris Helmer
Environmental Programs Manger

cc: Gary Brown – City Manager; Greg Wade – Assistant City Manager; Hank Levien – Public Works Director

From: Jessica Toth
To: Chiu, Wayne@Waterboards
Subject: Comments on Tentative Order No. R9-2013-0001
Date: Tuesday, January 08, 2013 12:55:28 PM

January 8, 2013

San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

RE: Comments on Tentative Order Number: R9-2013-0001

Dear Mr. Chiu:

Curious Company respectfully submits the following comments on the draft San Diego Regional Municipal Separate Storm Sewer System permit, Tentative Order No. R9-2013-0001.

Urban runoff is the San Diego region's most urgent pollution problem. Arguably, it is the most difficult to solve. In a region known for its beaches and strong tourism economy, polluted runoff makes our beaches and waterways unsafe for swimming, fishing and other recreation for at least 72 hours after a rain event. Even in dry weather, our "urban drool" from residents and businesses overwatering lawns becomes a major pollution source.

The good news is by working together as a community, we can solve this challenging public health problem. The Water Quality Improvement Plans proposed in the draft permit have the potential to become powerful tools to help us improve water quality within our watersheds. However, the Co-permittees cannot be tasked with creating these plans alone. Specifically:

* The Permit should require formation of a stakeholder advisory group for each watershed that includes representatives of environmental groups with knowledge of the watershed.
* This stakeholder advisory group should work closely with the Co-permittees and a regional board staff member while the Water Quality Improvement Plans are being developed to ensure these plans aggressively pursue water quality gains.
* The stakeholder advisory process should include accountability and measureable milestones to ensure the goals of the Permit are being met.

By taking advantage of the knowledge and resources of diverse stakeholders like municipalities, businesses and residents, our region can be on the cutting-edge of addressing urban runoff and creating healthier communities and watersheds. But this can only be achieved if these diverse voices are impacting the planning process in a meaningful way.

Curious Company recognizes the challenge urban runoff presents to our region, and we want to do our part to solve the problem. Curious Company is interested in participating in a Water Quality Improvement Plan development process for San Dieguito Watershed.

Curious Company urges the Regional Board to enhance the stakeholder participation opportunities as Water Quality Improvement Plans are developed and then approve the permit.

Respectfully submitted,
Jessica Toth
Curious Company

Jessica Toth
Curious Company
www.curiousco.com
(760) 809-1143

January 8, 2013

Wayne Chiu, P.E.
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego California 92123-4340

Subject: Comment – Tentative Order No. R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu.

Topic: Requirement to upload data to CEDEN

Section F.3.b.(3) of the Tentative Order requires that, "Any monitoring data utilized in developing the Annual Report must be uploaded to the California Environmental Data Exchange Network (CEDEN)."

We ask the RWQCB to either remove this requirement or make it optional. We see the following problems with the above requirement:

1. At its core, this new permit relies on Water Quality Improvement Plans which are to be prepared on a watershed by watershed basis. Bifurcating the reporting of monitoring information from the goals and objectives of the WQIPs makes the data unintelligible and superfluous to the public. Data should be reported through independent data warehouses associated with each of the ten WQIPs.

2. The phrase "any monitoring data" is ambiguous and creates a compliance burden on co-permittees that CEDEN currently does not support. As seen in the screen shot below, CEDEN supports only Chemistry, Field, and Toxicity data. The overall monitoring task under the Order includes a much larger data set.

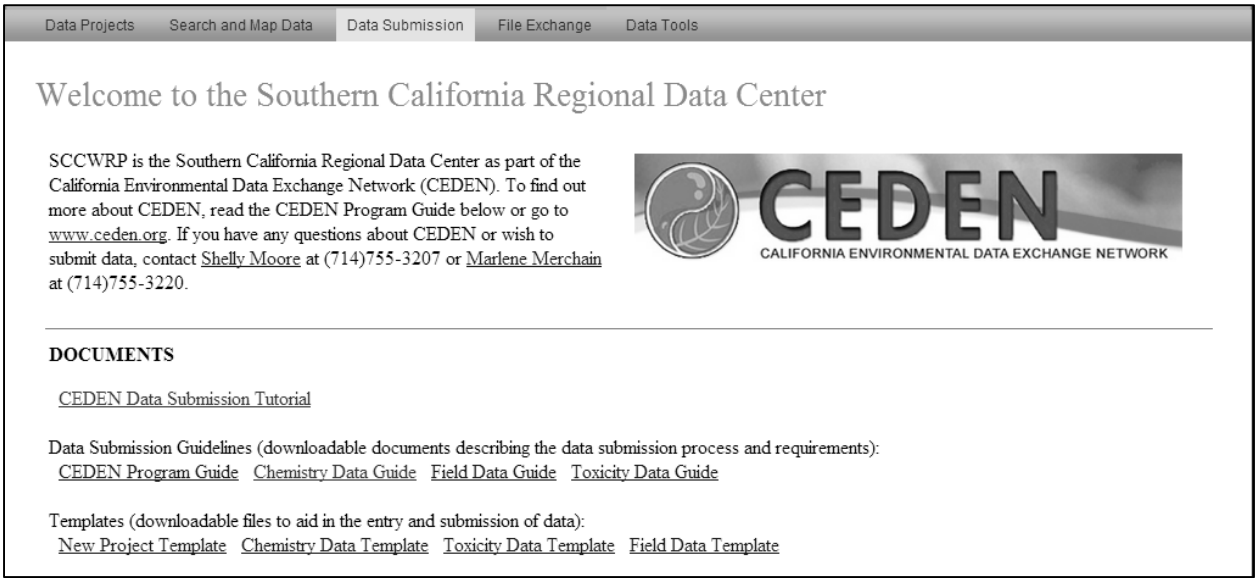

3. Uploading data to CEDEN seems redundant since the Order is also asking co-permittees, "Any monitoring and assessment data utilized in developing the Annual Report must be provided on the Regional Clearinghouse required pursuant to Provision F.4." A WMA-based data warehouse is a more practical and comprehensive source of data for the RWQCB, other co-permitees, and public.

4. In practical terms, uploading "any monitoring data" to CEDEN is unnecessary. CEDEN, through its data upload process, basically provides data standardization. However, the Order already requires that all monitoring data be compatible with SWAMP, the Surface Water Ambient Monitoring Program adopted by the State Water Board. So CEDEN formats must be identical to SWAMP, which happens to be the case, nullifying the value added by CEDEN. Co-permittees should not be burdened with this additional cost and statutory obligation.

   The California Department of Water Resources or the State Water Board requires that grant funded projects submit their monitoring data to CEDEN. The primary recipients of these grants are non-government organizations employing citizen volunteers, and projects that do not have any legal obligation to meet stormwater permit requirements. Since their monitoring programs may not meet statutory standards, achieving some level of standardization through CEDEN in these situations is a reasonable objective. However, this is not the case with stormwater permittees.

Respectfully yours,

Joe

Joe Purohit
EcoLayers, Inc.

Phone: 858 240 2340
Email: joe@ecolayers.com

OTAY RANCH NEW HOMES
HOME BUILDER SINCE 1990

SAN DIEGO REGIONAL
WATER QUALITY
CONTROL BOARD

2013 JAN 10 AM 11 28

January 8, 2013

Ms. Laurie Walsh
San Diego Regional Water Quality Control Board
9174 Sky Park Circle, Suite 100
San Diego, CA 92123

RE: Tentative Order No. R9-2013-0001/Municipal Separated Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region

Dear Ms. Walsh:

Thank for the opportunity to provide comments on Tentative Order No. R-9-2013-0001. Our company is close to completing entitlements for a sustainable, walkable master planned community within the Otay Ranch. We have been processing these entitlements for the past four years and have expended millions of dollars planning a community that protects the environment, and specifically, water quality.

Our project is located north of the Otay River Valley and has been designed consistent with the permit approved by the Board just a year ago. In following the requirements in the current permit, we have devised a plan that cleans all project storm water runoff prior to introducing into the Otay River. This plan is contingent upon maintaining the hydromodification exemption for the Otay River.

The Otay River exemption was put into place based on the scientific and technical expertise of the Hydromodification Task Force. This committee, representing environmental and engineering experts, determined that limiting runoff to certain bodies of water and rivers within your jurisdiction would not be beneficial to the health of those watersheds. Due to the influence of the Otay Lakes and Dam upstream of our project, your Board approved an exemption for the Otay River.

If the Otay River exemption is removed from the new Tentative Order, our land plan would need to be dramatically altered, in effect, wiping out years of planning, engineering and environmental work.

1392 East Palomar Street, Ste. 202 • Chula Vista, California 91913• 619-210-0560

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The proposed Tentative Order also calls for retention of the 24 hour 85th percentile storm event onsite. Retention flows from the majority of storm events will adversely impact the Otay River watershed that is described as being "starved" for runoff in the Otay River Watershed Management Plan. Since infiltration is infeasible on our site due to soil conditions, the new permit proposes to arbitrarily increase our bio-retention facilities by 25%, a number that does not appear to have any scientific basis but would severely impact our land plans.

We certainly appreciate efforts to identify regional solutions through implementation of the Watershed Improvement Plans; however, we must be allowed to operate under the current permit until the Watershed Improvements Plans determine the best regional solutions for each watershed. Specifically, we ask that the Otay River hydromodification exemption remain in place and the retention requirements not be added to the permit until and if the Watershed Improvement Plans determine if retention is beneficial to the Otay River watershed.

Thank you for your consideration.

Sincerely,

Ranie L. Hunter
Executive Vice President

County of San Diego

RICHARD E. CROMPTON
DIRECTOR

DEPARTMENT OF PUBLIC WORKS

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January 8, 2013

Wayne Chiu, P.E.
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Dear Mr. Chiu:

SAN DIEGO COPERMITTEE COMMENT SUBMITTAL – TENTATIVE ORDER NO. R9-2013-0001, REGIONAL MS4 PERMIT, PLACE ID 786088WCHIU

Thank you for the opportunity to comment on Tentative Order No. R9-2013-0001, NPDES No. CAS0109266, *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Tentative Order). The County of San Diego, as Principal Permittee, submits the attached comments on behalf of the 21 Copermittees subject to Regional Water Quality Control Board (Regional Board) Order 2007-0001, the existing San Diego County MS4 Permit.

These comments were developed jointly with the San Diego Copermittees and should be considered to represent a general group consensus. However, although we have strived to obtain unanimity in our comments and proposed permit revisions, individual Copermittees do sometimes have differing opinions. These will be expressed in separate written comments provided by individual Copermittees.

We greatly appreciate the public process employed to date toward the development of a new and improved permit for the San Diego Region, as well as the openness of staff and Regional Water Quality Control Board (Regional Board) members in listening to the issues and concerns put forth by the County and numerous other interested parties. The San Diego Copermittees' recommended edits to the Tentative Order are attached. The supporting rationale for each is provided in a separate comment table. Most edits are in the form of redline-strikeout changes.

Again, thank you for the opportunity to participate in the development of a new permit for the San Diego Region. We look forward to continued discussion of the issues raised above. If you have questions, please contact Todd Snyder, Land Use & Environmental Planning Manager, at (858) 694-3482, or todd.snyder@sdcounty.ca.gov.

Sincerely,

CID TESORO, Manager
Department of Public Works

CT:js

Attachments: San Diego Copermittee Recommended Edits to Tentative Order R9-2013-0001
San Diego Copermittee Comment Table

CC: Todd Snyder, Department of Public Works

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

TENTATIVE
ORDER NO. R9-2013-0001
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The San Diego County Copermittees in Table 1a are subject to waste discharge requirements set forth in this Order.

Table 1a. San Diego County Copermittees

City of Carlsbad	City of Oceanside
City of Chula Vista	City of Poway
City of Coronado	City of San Diego
City of Del Mar	City of San Marcos
City of El Cajon	City of Santee
City of Encinitas	City of Solana Beach
City of Escondido	City of Vista
City of Imperial Beach	County of San Diego
City of La Mesa	San Diego County Regional Airport Authority
City of Lemon Grove	San Diego Unified Port District
City of National City	

After the San Diego Water Board receives and considers the Orange County Copermittees' Report of Waste Discharge and makes any necessary changes to the Order, the Orange County Copermittees in Table 1b will become subject to waste discharge requirements set forth in this Order after expiration of Order No. R9-2009-0002, NPDES No. CAS0108740 on or after December 16, 2014.

Table 1b. Orange County Copermittees

City of Aliso Viejo	City of Rancho Santa Margarita
City of Dana Point	City of San Clemente
City of Laguna Beach	City of San Juan Capistrano
City of Laguna Hills	City of Laguna Woods
City of Laguna Niguel	County of Orange
City of Lake Forest	Orange County Flood Control District
City of Mission Viejo	

After the San Diego Water Board receives and considers the Riverside County Copermittees' Report of Waste Discharge and makes any necessary changes to this Order, the Riverside County Copermittees in Table 1c will become subject to waste discharge requirements set forth in this Order after expiration of Order No. R9-2010-0016, NPDES No. CAS0108766 on or after November 10, 2015.

Table 1c. Riverside County Copermittees

City of Murrieta	County of Riverside
City of Temecula	Riverside County Flood Control and Water Conservation District
City of Wildomar	

The Orange County Copermittees and Riverside County Copermittees may become subject to the requirements of this Order at a date earlier than the expiration date of their current Orders subject to the conditions described in Provision F.6 of this Order if the Copermittees in the respective county receive a notification of coverage from the San Diego Water Board.

The term Copermittee in this Order refers to any San Diego County, Orange County, or Riverside County Copermittee covered under this Order, unless specified otherwise.

This Order provides permit coverage for the Copermittee discharges described in Table 2.

Table 2. Discharge Locations and Receiving Waters

Discharge Points	Locations throughout San Diego Region
Discharge Description	Municipal Separate Storm Sewer System (MS4) Discharges
Receiving Waters	Inland Surface Waters, Enclosed Bays and Estuaries, and Coastal Ocean Waters of the San Diego Region

Table 3. Administrative Information

This Order was adopted by the San Diego Water Board on:	**Month Day, 2013**
This Order will become effective on:	**Month Day, 2013**
This Order will expire on:	**Month Day, 2018**
The Copermittees must file a Report of Waste Discharge in accordance with Title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than 180 days in advance of the Order expiration date.	

I, David W. Gibson, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on Month Day, 2013.

TENTATIVE

David W. Gibson
Executive Officer

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ATTACHMENTS

Attachment A - Discharge Prohibitions and Special Protections A-1
Attachment B - Standard Permit Provisions and General Provisions B-1
Attachment C - Acronyms, Abbreviations and Definitions C-1
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Attachment F - Fact Sheet / Technical Report for Order No. R9-2013-0001 ..... F-1

I. FINDINGS

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), finds that:

JURISDICTION

1. **MS4 Ownership or Operation.** Each of the Copermittees owns or operates an MS4, through which it discharges storm water and non-storm water into waters of the U.S. within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the U.S.

2. **Legal and Regulatory Authority.** This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]) adopted by the United States Environmental Protection Agency (USEPA), and chapter 5.5, division 7 of the California Water Code (CWC) (commencing with section 13370). This Order serves as an NPDES permit for discharges from MS4s to surface waters. This Order also serves as waste discharge requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

   The San Diego Water Board has the legal authority to issue a regional MS4 permit pursuant to its authority under CWA section 402(p)(3)(B) and 40 CFR 122.26(a)(1)(v). The USEPA also made it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide permits (55 Federal Register [FR] 47990, 48039-48042). The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees and San Diego Water Board.

   The federal regulations make it clear that the Copermittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators (40 CFR 122.26(a)(3)(vi)). This Order does not require the Copermittees to manage storm water outside of their jurisdictional boundaries, but rather to work collectively to improve storm water management within watersheds.

3. **CWA NPDES Permit Conditions.** Pursuant to CWA section 402(p)(3)(B), NPDES permits for storm water discharges from MS4s must include requirements to effectively prohibit non-storm water discharges into MS4s, and require controls to reduce the discharge of pollutants ~~in storm water~~ to the maximum extent practicable (MEP), and to require other provisions as the San Diego Water Board determines are appropriate to control such pollutants. This Order prescribes conditions to assure

compliance with the CWA requirements for owners and operators of MS4s to effectively prohibit non-storm water discharges in to the MS4s, and require controls to reduce the discharge of pollutants in storm water from the MS4s to the MEP.

4. **CWA and CWC Monitoring Requirements.** CWA section 308(a) and 40 CFR 122.41(h),(j)-(l) and 122.48 require that NPDES permits must specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s also specify additional monitoring and reporting requirements in 40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c). CWC section 13383 authorizes the San Diego Water Board to establish monitoring, inspection, entry, reporting and recordkeeping requirements. This Order establishes monitoring and reporting requirements to implement federal and State requirements.

5. **Total Maximum Daily Loads.** CWA section 303(d)(1)(A) requires that "[e]ach state shall identify those waters within its boundaries for which the effluent limitations…are not stringent enough to implement any water quality standard applicable to such waters." The CWA also requires states to establish a priority ranking of impaired water bodies known as Water Quality Limited Segments and to establish Total Maximum Daily Loads (TMDLs) for such waters. This priority list of impaired water bodies is called the Clean Water Act Section 303(d) List of Water Quality Limited Segments, commonly referred to as the 303(d) List. The CWA requires the 303(d) List to be updated every two years.

   TMDLs are numerical calculations of the maximum amount of a pollutant that a water body can assimilate and still meet water quality standards. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point sources (waste load allocations or WLAs) and non-point sources (load allocations or LAs), background contribution, plus a margin of safety. Discharges from MS4s are point source discharges. The federal regulations (40 CFR 122.44(d)(1)(vii)(B)) require that NPDES permits to incorporate water quality based effluent limitations (WQBELs) developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, consistent with the assumptions and requirements of any available WLA for the discharge. Requirements of this Order implement the TMDLs adopted by the San Diego Water Board and approved by USEPA.

6. **Non-Storm Water Discharges.** Pursuant to CWA section 402(p)(3)(B)(ii), this Order requires each Copermittee to effectively prohibit discharges of non-storm water into its MS4. Nevertheless, non-storm water discharges into and from the MS4s continue to be reported to the San Diego Water Board by the Copermittees and other persons. Monitoring conducted by the Copermittees, as well as the 303(d) List, have identified dry weather, non-storm water discharges from the MS4s as a source of pollutants causing or contributing to receiving water quality impairments in the San Diego Region. The federal regulations (40 CFR 122.26(d)(2)(iv)(B)(1)) require the Copermittees to have a program to prevent illicit discharges to the MS4. The federal regulations, however, allow for specific categories of non-storm water discharges or flows to be addressed as illicit discharges only where such discharges

are identified as sources of pollutants to waters of the U.S.

7. **In-Stream Treatment Systems.** Pursuant to federal regulations (40 CFR 131.10(a)), in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S. Authorizing the construction of a runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to accepting waste assimilation as an appropriate use for that water body. Runoff treatment must occur prior to the discharge of runoff into receiving waters. Treatment control best management practices (BMPs) must not be constructed in waters of the U.S. Construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body.

DISCHARGE CHARACTERISTICS AND RUNOFF MANAGEMENT

8. **Point Source Discharges of Pollutants.** Discharges from the MS4s may contain waste, as defined in the CWC, and pollutants that adversely affect the quality of the waters of the state. A discharge from an MS4 is a "discharge of pollutants from a point source" into waters of the U.S. as defined in the CWA. Storm water and non-storm water discharges from the MS4s may contain pollutants that cause or threaten to cause a violation of surface water quality standards, as outlined in the ~~Water Quality Control Plan for the San Diego Basin (~~Basin Plan~~). Storm water and non-storm water discharges from the MS4s are subject to the conditions and requirements established in the Basin Plan for point source discharges~~.

9. **Potential Beneficial Use Impairment.** The discharge of pollutants and/or increased flows from MS4s may cause or threaten to cause the concentration of pollutants to exceed applicable receiving water quality objectives and impair or threaten to impair designated beneficial uses resulting in a condition of pollution, contamination, or nuisance.

10. **Pollutants Generated by Land Development.** Land development has created and continues to create new sources of non-storm water discharges and pollutants in storm water discharges as human population density increases. This brings higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash. Pollutants from these sources are dumped or washed off the surface by non-storm water or storm water flows into and from the MS4s. When development converts natural vegetated pervious ground cover to impervious surfaces such as paved highways, streets, rooftops, and parking lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving a developed area without BMPs that can maintain pre-development conditions will contain greater pollutant loads and have significantly greater runoff volume, velocity, and peak flow rate than pre-development runoff from the same area.

11. **Runoff Discharges to Receiving Waters.** The MS4s discharge runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within the eleven hydrologic units comprising the San Diego Region. Historic and current development makes use of natural drainage patterns and features as conveyances for runoff. ~~Rivers, streams and creeks in developed areas used in this manner are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and receiving water.~~ Numerous receiving water bodies and water body segments have been designated as impaired by the San Diego Water Board pursuant to CWA section 303(d).

12. **Pollutants in Runoff.** The most common pollutants in runoff discharged from the MS4s include total suspended solids, sediment, pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., cadmium, copper, lead, and zinc), petroleum products and polynuclear aromatic hydrocarbons, synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus), oxygen-demanding substances (e.g., decaying vegetation, animal waste), detergents, and trash. As operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not effectively prohibit or otherwise control. These discharges may cause or contribute to a condition of pollution or a violation of water quality standards.

13. **Human Health and Aquatic Life Impairment.** Pollutants in runoff discharged from the MS4s can threaten and adversely affect human health and aquatic organisms. Adverse responses of organisms to chemicals or physical agents in runoff range from physiological responses such as impaired reproduction or growth anomalies to mortality. Increased volume, velocity, rate, and duration of storm water runoff greatly accelerate the erosion of downstream natural channels. This alters stream channels and habitats and can adversely affect aquatic and terrestrial organisms.

14. **Water Quality Effects.** The Copermittees' water quality monitoring data submitted to date documents persistent exceedances of Basin Plan water quality objectives for runoff-related pollutants at various watershed monitoring stations. Persistent toxicity has also been observed at several watershed monitoring stations. In addition, bioassessment data indicate that the majority of the monitored receiving waters have Poor to Very Poor Index of Biological Integrity (IBI) ratings. These findings indicate that runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in the San Diego Region. Non-storm water discharges from the MS4s have been shown to contribute significant levels of pollutants and flow in arid, developed Southern California watersheds, and contribute significantly to exceedances of applicable receiving water quality objectives.

15. **Non-Storm Water and Storm Water Discharges.** ~~Non-storm water discharges from the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard of CWA section 402(p)(3)(B)(iii), which is explicitly for "Municipal … *Stormwater Discharges* (emphasis added)" from the MS4s.~~ Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s must be effectively prohibited. "Permits for discharges from municipal storm sewers… shall require controls to reduce the discharge of pollutants to the maximum extent practicable…" 402(p)(3)(B)(iii).

16. **Best Management Practices.** Waste and pollutants which are deposited and accumulate in MS4 drainage structures will be discharged from these structures to waters of the U.S. unless they are removed. These discharges may cause or contribute to, or threaten to cause or contribute to, a condition of pollution in receiving waters. For this reason, pollutants in storm water discharges from the MS4s can be and must be effectively reduced in runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Pollution prevention is the reduction or elimination of pollutant generation at its source and is the best "first line of defense". Source control BMPs (both structural and non-structural) minimize the contact between pollutants and runoff, therefore keeping pollutants onsite and out of receiving waters. Treatment control BMPs remove pollutants that have been mobilized by storm water or non-storm water flows.

17. **BMP Implementation.** Runoff needs to be addressed during the three major phases of development (planning, construction, and use) in order to reduce the discharge of storm water pollutants to the MEP, effectively prohibit non-storm water discharges, and protect receiving waters. Development which is not guided by water quality planning policies and principles can result in increased pollutant load discharges, flow rates, and flow durations which can negatively affect receiving water beneficial uses. Construction sites without adequate BMP implementation result in sediment runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. Existing development can generate substantial pollutant loads which are discharged in runoff to receiving waters. Retrofitting areas of existing development with storm water pollutant control and hydromodification management BMPs is necessary to address storm water discharges from existing development that may cause or contribute to a condition of pollution or a violation of water quality standards.

18. **Long Term Planning and Implementation.** Federal regulations require municipal storm water permits to expire 5 years from adoption, after which the permit must be renewed and reissued. The San Diego Water Board recognizes that the degradation of water quality and impacts to beneficial uses of the waters in the San Diego Region occurred over several decades. The San Diego Water Board further recognizes that a decade or more may be necessary to realize demonstrable improvement to the quality of waters in the Region. This Order includes a long term planning and implementation approach that will require more than a single permit term to complete.

WATER QUALITY STANDARDS

19. **Basin Plan.** The San Diego Water Board adopted the Water Quality Control Plan for the San Diego Basin (Basin Plan) on September 8, 1994 that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for receiving waters addressed through the plan. The Basin Plan was subsequently approved by the State Water Resources Control Board (State Water Board) on December 13, 1994. Subsequent revisions to the Basin Plan have also been adopted by the San Diego Water Board and approved by the State Water Board. Requirements of this Order implement the Basin Plan.

    The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Process Supply (PROC), Industrial Service Supply (IND), Ground Water Recharge (GWR), Contact Water Recreation (REC1), Non-contact Water Recreation (REC2), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Freshwater Replenishment (FRSH), Hydropower Generation (POW), and Preservation of Biological Habitats of Special Significance (BIOL). The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region: Navigation (NAV), Commercial and Sport Fishing (COMM), Estuarine Habitat (EST), Marine Habitat (MAR), Aquaculture (AQUA), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN), and Shellfish Harvesting (SHELL).

20. **Ocean Plan.** The State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, and 2005. The State Water Board adopted the latest amendment on April 21, 2005 and it became effective on February 14, 2006. The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean. Requirements of this Order implement the Ocean Plan.

    The Ocean Plan identifies the following beneficial uses of ocean waters of the state to be protected: Industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture; preservation and enhancement of designated Areas of Special Biological Significance; rare and endangered species; marine habitat; fish spawning and shellfish harvesting

21. **Sediment Quality Control Plan**. On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan

establishes: 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

22. **National Toxics Rule and California Toxics Rule.** USEPA adopted the National Toxics Rule (NTR) on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the NTR applied in California. On May 18, 2000, USEPA adopted the California Toxics Rule (CTR). The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants.

23. **Antidegradation Policy.** This Order is in conformance with the federal Antidegradation Policy described in 40 CFR 131.12, and State Water Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality Waters in California*. Federal regulations at 40 CFR 131.12 require that the State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. State Water Board Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies.

CONSIDERATIONS UNDER FEDERAL AND STATE LAW

24. **Coastal Zone Act Reauthorization Amendments.** Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states with approved coastal zone management programs to address non-point source pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point source pollution: agriculture, silviculture, urban, marinas, and hydromodification. This Order addresses the management measures required for the urban category, with the exception of septic systems. The runoff management programs developed pursuant to this Order fulfills the need for coastal cities to develop a runoff non-point source plan identified in the Non-Point Source Program Strategy and Implementation Plan. The San Diego Water Board addresses septic systems through the administration of other programs.

25. **Endangered Species Act.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 USC sections 1531 to 1544). This Order requires compliance with receiving water limits, and other requirements to protect the beneficial uses of

waters of the State. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

26. **Report of Waste Discharge Process.** The waste discharge requirements set forth in this Order are based upon the Report of Waste Discharge submitted by the San Diego County Copermittees prior to the expiration of Order No. R9-2007-0001 (NPDES No. CAS0109266). The Orange County and Riverside County Copermittees are not immediately covered by the waste discharge requirements in this Order. The San Diego Water Board understands that each municipality is unique although the Counties share watersheds and geographical boundaries. The Order will continue to use the Report of Waste Discharge process prior to initially making Orange County or Riverside County Copermittees subject to the requirements of this Order.

    The federal regulations (40 CFR 122.21(d)(2)) and CWC section 13376 impose a duty on the Copermittees to reapply for continued coverage through submittal of a Report of Waste Discharge no later than 180 days prior to expiration of a currently effective permit. This requirement is set forth in the Orange County Copermittees' and Riverside County Copermittees' currently effective permits at Provisions K.2.b and K.2.c, respectively. The Orange County Permit, Order No. R9-2009-0002 (NPDES No. CAS0108740) expires on December 16, 2014 and the Riverside County MS4 Permit, Order No. R9-2010-0016 (NPDES No. CAS0108766) expires on November 10, 2015.

    Unless the Orange County or Riverside County Copermittees apply for and receive early coverage under this Order, the Orange County Copermittees' and the Riverside County Copermittees' respective permits will be superseded by this Order upon expiration of their respective permits, subject to any necessary revisions to the requirements of this Order made after the San Diego Water Board considers their respective Reports of Waste Discharge through the public process provided in 40 CFR 124.

27. **Integrated Report and Clean Water Act Section 303(d) List.** The San Diego Water Board and State Water Board submit an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. USEPA issued its *Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act* on July 29, 2005, which advocates the use of a five category approach for classifying the attainment status of water quality standards for water bodies in the Integrated Report. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 in the Integrated Report are placed on the 303(d) List.

    Water bodies with available data and/or information that indicate at least one beneficial use is not being supported or is threatened, but a TMDL is not required, are included in Category 4 in the Integrated Report. Impaired surface water bodies

may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

Implementation of the requirements of this Order will~~may~~ allow the San Diego Water Board to include surface waters impaired by discharges from the Copermittees' MS4s in Category 4 in the Integrated Report for consideration during the next 303(d) List submittal by the State to USEPA.

28. **Economic Considerations.** The California Supreme Court has ruled that although CWC section 13263 requires the State and Regional Water Boards (collectively Water Boards) to consider factors set forth in CWC section 13241 when issuing an NPDES permit, the Water Board may not consider the factors to justify imposing pollutant restrictions that are less stringent than the applicable federal regulations require. (*City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 618, 626-627.) However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

As noted in the following finding, the San Diego Water Board finds that the requirements in this permit are not more stringent than the minimum federal requirements. Therefore, a CWC section 13241 analysis is not required for permit requirements that implement the effective prohibition on the discharge of non-storm water into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determined appropriate to control such pollutants, as those requirements are mandated by federal law. Notwithstanding the above, the San Diego Water Board has developed an economic analysis of the requirements in this Order. The economic analysis is provided in the Fact Sheet.

~~29. **Unfunded Mandates.** This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following:~~

~~a. This Order implements federally mandated requirements under CWA section 402 (33 USC section 1342(p)(3)(B)).~~

~~b. The local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental and new dischargers who are issued NPDES permits for storm water and non-storm water discharges.~~

~~c. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order.~~

~~d. The Copermittees have requested permit coverage in lieu of compliance with the~~

~~complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)) and in lieu of numeric restrictions on their MS4 discharges (i.e. effluent limitations).~~

~~**e.** The local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under State law predates the enactment of Article XIIIB, Section (6) of the California Constitution.~~

~~**f.** The provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state develops a TMDL, federal law requires that permits must contain water quality based effluent limitations consistent with the assumptions and requirements of any applicable wasteload allocation (40 CFR 122.44(d)(1)(vii)(B)).~~

~~See the Fact Sheet for further discussion of unfunded mandates.~~

~~30.~~29. **California Environmental Quality Act.** The issuance of waste discharge requirements and an NPDES permit for the discharge of runoff from MS4s to waters of the U.S. is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 et seq.) in accordance with CWC section 13389.

STATE WATER BOARD DECISIONS

~~31.~~30. **Compliance with Prohibitions and Limitations.** The receiving water limitation language specified in this Order is consistent with language recommended by the USEPA and established in State Water Board Order WQ 99-05, *Own Motion Review of the Petition of Environmental Health Coalition to Review Waste Discharge Requirements Order No. 96-03, NPDES Permit No. CAS0108740*, adopted by the State Water Board on June 17, 1999. The receiving water limitation language in this Order requires storm water discharges from MS4s to not cause or contribute to a violation of water quality standards, which is to be achieved through an iterative approach requiring the implementation of improved and better-tailored BMPs over time. Implementation of the iterative approach to comply with receiving water limitations based on applicable water quality standards is necessary to ensure that storm water discharges from the MS4 will not ultimately cause or contribute to violations of water quality standards and will not create conditions of pollution, contamination, or nuisance.

~~32.~~31. **Special Conditions for Areas of Special Biological Significance.** On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving an exception to the Ocean Plan effective prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges. State Water Board Resolution No. 2012-0012 requires monitoring and

testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, effective prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject terms and conditions of State Water Board Resolution No. 2012-0012. The Special Protections contained in Attachment B to Resolution No. 2012-0012, applicable to these discharges, are hereby incorporated into this Order as if fully set forth herein.

ADMINISTRATIVE FINDINGS

~~33.~~32. **Executive Officer Delegation of Authority.** The San Diego Water Board by prior resolution has delegated all matters that may legally be delegated to its Executive Officer to act on its behalf pursuant to CWC section 13223. Therefore, the Executive Officer is authorized to act on the San Diego Water Board's behalf on any matter within this Order unless such delegation is unlawful under CWC section 13223 or this Order explicitly states otherwise.

~~34.~~33. **Standard Provisions.** Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR 122.42, are provided in Attachment B to this Order.

~~35.~~34. **Fact Sheet.** The Fact Sheet for this Order contains background information, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of this Order. The Fact Sheet is hereby incorporated into this Order and constitutes part of the Findings of this Order.

~~36.~~35. **Public Notice.** In accordance with State and federal laws and regulations, the San Diego Water Board notified the Copermittees, and interested agencies and persons of its intent to prescribe waste discharge requirements for the control of discharges into and from the MS4s to waters of the U.S. and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet.

~~37.~~36. **Public Hearing.** The San Diego Water Board held a public hearing on Month Day, 2013 and heard and considered all comments pertaining to the terms and conditions of this Order. Details of the public hearing are provided in the Fact Sheet.

~~38.~~37. **Effective Date.** This Order serves as an NPDES permit pursuant to CWA section 401 or amendments thereto, and becomes effective fifty (50) days after the date of its adoption, provided that the Regional Administrator,

USEPA, Region IX, does not object to this Order.

~~39.~~38. **Review by the State Water Board.** Any person aggrieved by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with CWC section 13320 and California Code of Regulations, title 23, sections 2050, et seq. The State Water Board must receive the petition by 5:00 p.m., 30 days after the San Diego Water Board action, except that if the thirtieth day following the action falls on a Saturday, Sunday or State holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

THEREFORE, IT IS HEREBY ORDERED that the Copermittees, in order to meet the provisions contained in division 7 of the CWC and regulations adopted thereunder, and the provisions of the CWA and regulations adopted thereunder, must each comply with the following:

II. PROVISIONS

A. PROHIBITIONS AND LIMITATIONS

The purpose of this provision is to describe the conditions under which storm water and non-storm water discharges into and from MS4s are effectively prohibited or limited. The goal of the effective prohibitions and limitations is to protect the water quality and designated beneficial uses of waters of the ~~state~~ U.S. from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through the implementation of water quality improvement strategies and runoff management programs that effectively prohibit non-storm water discharges into the Copermittees' MS4s, and reduce pollutants in storm water discharges from the Copermittees' MS4s to the MEP. The process for determination of compliance with the Discharge Prohibitions (A.1), Receiving Water Limitations (A.2), and Effluent Limitations (A.3) is defined in Provision A.4.

1. Discharge Prohibitions

a. Discharges from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the ~~state~~ U.S. are effectively prohibited, unless such discharges are addressed by the Copermittee through A.1.d, A.3.b or A.4.

b. Non-storm water discharges into MS4s are to be effectively prohibited, unless such discharges are either authorized by a separate NPDES permit, or the discharge is a category of non-storm water discharges or flows that must be addressed pursuant to Provisions E.2.a.(1)-(5) of this Order.

c. Discharges from MS4s are subject to all waste discharge prohibitions in the Basin Plan, included in Attachment A to this Order, unless such discharges are addressed by the Copermittee through A.1.d, A.3.b, or A.4.

d. Storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 applicable to these discharges, included in Attachment A to this Order. All other discharges from the Copermittees' MS4s to ASBS are prohibited.

2. Receiving Water Limitations

a. Discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters, ~~including but not limited to~~ set forth in all applicable provisions ~~contained in:~~ below, unless such discharges are addressed by the Copermittee through A.1.d, A.3.b, or A.4:

(1) The San Diego Water Board's Basin Plan, including beneficial uses, water quality objectives, and implementation plans;

(2) State Water Board plans for water quality control including the following:

(a) Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries (Thermal Plan), and

(b) The Ocean Plan, including beneficial uses, water quality objectives, and implementation plans;

(3) State Water Board policies for water and sediment quality control including the following:

(a) Water Quality Control Policy for the Enclosed Bays and Estuaries of California,

(b) Sediment Quality Control Plan which includes the following narrative objectives for bays and estuaries:

(i) Pollutants in sediments shall not be present in quantities that, alone or in combination, are toxic to benthic communities, and

(ii) Pollutants shall not be present in sediments at levels that will bioaccumulate in aquatic life to levels that are harmful to human health,

(c) The Statement of Policy with Respect to Maintaining High Quality of Waters in California;[1]

(4) Priority pollutant criteria promulgated by the USEPA through the following:

(a) National Toxics Rule (NTR)[2] (promulgated on December 22, 1992 and amended on May 4, 1995), and

(b) California Toxics Rule (CTR).[3,4]

[1] State Water Board Resolution No. 68-16
[2] 40 CFR 131.36
[3] 65 Federal Register 31682-31719 (May 18, 2000), adding Section 131.38 to 40 CFR

b. Discharges from MS4s composed of storm water runoff must not alter natural ocean water quality in an ASBS.

[4] If a water quality objective and a CTR criterion are in effect for the same priority pollutant, the more stringent of the two applies.

3. Effluent Limitations

a. TECHNOLOGY BASED EFFLUENT LIMITATIONS

Pollutants in ~~storm water~~ discharges from MS4s must be reduced to the MEP.[5]

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

This Order establishes water quality based effluent limitations (WQBELs) consistent with the assumptions and requirements of all available TMDL waste load allocations (WLAs) assigned to discharges from the Copermittees' MS4s. Each Copermittee must comply with applicable WQBELs established for the TMDLs in Attachment E to this Order, pursuant to the applicable TMDL compliance schedules.

4. Compliance with Discharge Prohibitions and Receiving Water Limitations

Each Copermittee must achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order through timely implementation of strategies, control measures and other actions as specified in Provisions B and E of this Order, including any modifications. The Water Quality Improvement Plans required under Provision B must be designed and adapted to ultimately achieve compliance with Provisions A.1.a, A.1.c and A.2.a, and may be used for compliance determination as described in Provision B.3.a.(3).

a. If exceedance(s) of water quality standards persist in receiving waters notwithstanding implementation of this Order, the Copermittees must comply with the following procedures:

(1) For exceedance(s) of a water quality standard in the process of being addressed by the Water Quality Improvement Plan, the Copermittee(s) must implement the Water Quality Improvement Plan as accepted by the San Diego Water Board, and update the Water Quality Improvement Plan, as necessary, pursuant to Provision F.2.c;

(2) Upon a determination by either the Copermittees or the San Diego Water Board that discharges from the MS4 are causing or contributing to ~~a new~~ persistent indications of an exceedance of an applicable water quality standard not addressed by the Water Quality Improvement Plan, the Copermittees must submit the following updates to the Water Quality Improvement Plan pursuant to Provision F.2.c or as part of the Annual Report

[5] This does not apply to MS4 discharges which receive subsequent treatment to reduce pollutants in ~~storm water~~ discharges to the MEP prior to entering receiving waters (e.g., low flow diversions to the sanitary sewer). Runoff treatment must occur prior to the discharge of runoff into receiving waters per Finding 7.

required under Provision F.3.b, unless the San Diego Water Board directs an earlier submittal:

(a) The water quality improvement strategies being implemented that are effective and will continue to be implemented,

(b) Water quality improvement strategies (i.e. BMPs, retrofitting projects, stream and/or habitat rehabilitation or restoration projects, adjustments to jurisdictional runoff management programs, etc.) that will be implemented to reduce or eliminate any pollutants or conditions that are causing or contributing to the exceedance of water quality standards,

(c) For Copermittees who are implementing the Water Quality Improvement Plan compliance option pursuant to Provision B.3.a.(3), the updated Water Quality Improvement Plan must provide reasonable assurance the updated strategies will address the new exceedance(s),

~~(c)~~(d) Updates to the schedule for implementation of the existing and additional water quality improvement strategies, and

~~(d)~~(e) Updates to the monitoring and assessment program to track progress toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a of this Order;

(3) The San Diego Water Board may require the incorporation of additional modifications to the Water Quality Improvement Plan required under Provision B. The applicable Copermittees must submit any modifications to the update to the Water Quality Improvement Plan within 90 days of notification that additional modifications are required by the San Diego Water Board, or as otherwise directed;

(4) Within 90 days of the San Diego Water Board determination that the update to the Water Quality Improvement Plan meets the requirements of this Order, the applicable Copermittees must revise the jurisdictional runoff management program documents to incorporate the updated water quality improvement strategies that have been and will be implemented, the implementation schedule, and any additional monitoring required; and

(5) Each Copermittee must implement the updated Water Quality Improvement Plan.

b. The procedure set forth above to achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order do not have to be repeated for continuing or recurring exceedances of the same water quality standard(s) following implementation of scheduled actions unless directed to do otherwise by the San Diego Water Board.

~~**c.** Nothing in Provisions A.4.a and A.4.b prevents the San Diego Water Board from enforcing any provision of this Order while the applicable Copermittees prepare and implement the above update to the Water Quality Improvement Plan and jurisdictional runoff management programs.~~

B. WATER QUALITY IMPROVEMENT PLANS

The purpose of this provision is to develop Water Quality Improvement Plans that guide the Copermittees' jurisdictional runoff management programs towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plans is to ~~protect, preserve, enhance~~1) effectively prohibit non-storm water discharges into the MS4s, 2) reduce pollutants in discharges from the MS4s to the MEP, and ~~restore the~~ 3) support the attainment and reasonable protection, preservation, and enhancement of water quality and designated beneficial uses of waters of the state. This goal will be accomplished through an adaptive planning and management process that identifies the highest priority water quality conditions within a watershed and implements strategies through the jurisdictional runoff management programs to achieve improvements in the quality of discharges from the MS4s and receiving waters. Therefore, implementation of the Water Quality Improvement Plans also provides the basis for complying with Provisions A.1, A.2 and A.3, as described in Provision B.3.a.(3).

1. Watershed Management Areas

The Copermittees must develop a Water Quality Improvement Plan for each of the Watershed Management Areas in Table B-1. A total of ten Water Quality Improvement Plans must be developed for the San Diego Region.

Development of the Water Quality Improvement Plan for the Santa Margarita River Watershed Management Area shall commence upon notification of coverage of the Riverside County Copermittees under this Order. Until this time, the County of San Diego shall use the water quality priorities in the Santa Margarita River Watershed Urban Runoff Management Plan, developed pursuant to Order No. R9-2007-0001, to guide implementation of Provisions D and E within its jurisdiction.

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
San Juan (901.00)	South Orange County	- Aliso Creek - San Juan Creek - San Mateo Creek - Pacific Ocean - Heisler Park ASBS	- City of Aliso Viejo[1] - City of Dana Point[1] - City of Laguna Beach[1] - City of Laguna Hills[1] - City of Laguna Niguel[1] - City of Laguna Woods[1] - City of Lake Forest[1] - City of Mission Viejo[1] - City of Rancho Santa Margarita[1] - City of San Clemente[1] - City of San Juan Capistrano[1] - County of Orange[1] - Orange County Flood Control District[1]

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
Santa Margarita (902.00)	Santa Margarita River	- Murrieta Creek - Temecula Creek - Santa Margarita River - Santa Margarita Lagoon - Pacific Ocean	- City of Murrieta[2] - City of Temecula[2] - City of Wildomar[2] - County of Riverside[2] - County of San Diego[3] - Riverside County Flood Control and Water Conservation District[2]
San Luis Rey (903.00)	San Luis Rey River	- San Luis Rey River - San Luis Rey Estuary - Pacific Ocean	- City of Oceanside - City of Vista - County of San Diego
Carlsbad (904.00)	Carlsbad	- Loma Alta Slough - Buena Vista Lagoon - Agua Hedionda Lagoon - Batiquitos Lagoon - San Elijo Lagoon - Pacific Ocean	- City of Carlsbad - City of Encinitas - City of Escondido - City of Oceanside - City of San Marcos - City of Solana Beach - City of Vista - County of San Diego
San Dieguito (905.00)	San Dieguito River	- San Dieguito River - San Dieguito Lagoon - Pacific Ocean	- City of Del Mar - City of Escondido - City of Poway - City of San Diego - City of Solana Beach - County of San Diego
Penasquitos (906.00)	Penasquitos	- Los Penasquitos Lagoon - Pacific Ocean	- City of Del Mar - City of Poway - City of San Diego - County of San Diego
	Mission Bay	- Mission Bay - Pacific Ocean - San Diego Marine Life Refuge ASBS	- City of San Diego
San Diego (907.00)	San Diego River	- San Diego River - Pacific Ocean	- City of El Cajon - City of La Mesa - City of San Diego - City of Santee - County of San Diego
Pueblo San Diego (908.00) Sweetwater (909.00) Otay (910.00)	San Diego Bay	- Sweetwater River - Otay River - San Diego Bay - Pacific Ocean	- City of Chula Vista - City of Coronado - City of Imperial Beach - City of La Mesa - City of Lemon Grove - City of National City - City of San Diego - County of San Diego - San Diego County Regional Airport Authority - San Diego Unified Port District
Tijuana (911.00)	Tijuana River	- Tijuana River - Tijuana Estuary - Pacific Ocean	- City of Imperial Beach - City of San Diego - County of San Diego

Notes:
1. The Orange County Copermittees will be covered under this Order after expiration of Order No. R9-2009-0002, or earlier if the Orange County Copermittees meet the conditions in Provision F.6.
2. The Riverside County Copermittees will be covered under this Order after expiration of Order No. R9-2010-0016, or earlier if the Riverside County Copermittees meet the conditions in Provision F.6.
3. The County of San Diego is required to implement the requirements of Provision B for its jurisdiction within the Santa

Margarita River Watershed Management Area until the Riverside County Copermittees have been notified of coverage under this Order.

2. Priority Water Quality Conditions

The Copermittees must identify the water quality priorities within each Watershed Management Area that will be addressed by the Water Quality Improvement Plan. Where appropriate, Watershed Management Areas may be separated into subwatersheds to focus water quality prioritization and jurisdictional runoff management program implementation efforts by receiving water.

a. Assessment of Receiving Water Conditions

The Copermittees must consider the following, at a minimum, to identify water quality priorities based on impacts of MS4 discharges on receiving water beneficial uses:

(1) Receiving waters listed as impaired on the CWA Section 303(d) List of Water Quality Limited Segments (303(d) List);

(2) TMDLs adopted and under development by the San Diego Water Board;

(3) Receiving waters recognized as sensitive or highly valued by the Copermittees, including estuaries designated under the National Estuary Program under CWA section 320, wetlands defined by the State or U.S. Fish and Wildlife Service's National Wetlands Inventory as wetlands, and receiving waters identified as ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (Attachment A);

(4) The receiving water limitations of Provision A.2;

(5) Known historical versus current physical, chemical, and biological water quality conditions;

(6) Available, relevant, and appropriately collected and analyzed physical, chemical, and biological receiving water monitoring data, including, but not limited to, data describing:

(a) Chemical constituents,

(b) Water quality parameters (i.e. pH, temperature, conductivity, etc.),

(c) Toxicity Identification Evaluations for both receiving water column and sediment,

(d) Trash impacts,

(e) Bioassessments, and

(f) Physical habitat;

(7) Available evidence of erosional impacts in receiving waters due to accelerated flows (i.e. hydromodification);

(8) Available evidence of adverse impacts to the chemical, physical, and biological integrity of receiving waters; and

(9) The potential improvements in the overall condition of the Watershed Management Area that can be achieved.

b. ASSESSMENT OF IMPACTS FROM MS4 DISCHARGES

The Copermittees must consider the following, at a minimum, to identify the potential impacts to receiving waters that may be caused or contributed to by discharges from the Copermittees' MS4s:

(1) The discharge prohibitions of Provision A.1 and effluent limitations of Provision A.3; and

(2) Available, relevant, and appropriately collected and analyzed storm water and non-storm water monitoring data from the Copermittees' MS4 outfalls;

(3) Locations of each Copermittee's MS4 outfalls that discharge to receiving waters;

(4) Locations of MS4 outfalls that are known to persistently discharge non-storm water to receiving waters likely causing or contributing to impacts on receiving water beneficial uses;

(5) Locations of MS4 outfalls that are known to discharge pollutants in storm water causing or contributing to impacts on receiving water beneficial uses; and

(6) The potential improvements in the quality of discharges from the MS4 that can be achieved.

c. IDENTIFICATION OF PRIORITY WATER QUALITY CONDITIONS

(1) The Copermittees must use the information gathered for Provisions B.2.a and B.2.b to develop a list of priority water quality conditions as pollutants, stressors and/or receiving water conditions that are the highest threat to receiving water quality or that most adversely affect the physical, chemical, and biological integrity of receiving waters. The list must include the following information for each priority water quality condition:

(a) The beneficial use(s) associated with the priority water quality condition;

(b) The geographic extent of the priority water quality condition within the Watershed Management Area, if known;

(c) The temporal extent of the priority water quality condition (e.g., dry weather and/or wet weather);

(d) The Copermittees with MS4s discharges that may cause or contribute to the priority water quality condition; and

(e) An assessment of the adequacy of and data gaps in the monitoring data to characterize the conditions causing or contributing to the priority water quality condition, including a consideration of spatial and temporal variation.

(2) The Copermittees must identify the highest priority water quality conditions to be addressed by the Water Quality Improvement Plan, and provide a rationale for selecting a subset of the water quality conditions identified pursuant to Provision B.2.c.(1) as the highest priorities.

d. IDENTIFICATION OF MS4 SOURCES OF POLLUTANTS AND/OR STRESSORS

The Copermittees must identify and prioritize known and suspected sources of storm water and non-storm water pollutants and/or other stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c. The identification of known and suspected sources of pollutants and/or stressors that cause or contribute to the highest priority water quality conditions as identified for Provision B.2.c must consider the following:

(1) Pollutant generating facilities, areas, and/or activities within the Watershed Management Area, including:

(a) Each Copermittee's inventory of construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas,

(b) Publicly owned parks and/or recreational areas,

(c) Open space areas, and

(d) All currently operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste~~, and~~.

~~(e) Areas not within the Copermittees' jurisdictions (e.g., Phase II MS4s, tribal lands, state lands, federal lands) that are known or suspected to be discharging to the Copermittees' MS4s;~~

(2) Locations of the Copermittees' MS4s, including the following:

(a) All MS4 outfalls that discharge to receiving waters, and

(b) Locations of major structural controls for storm water and non-storm water (e.g., retention basins, detention basins, major infiltration devices, etc.);

~~(3) Other known and suspected sources of non-storm water or pollutants in storm water discharges to receiving waters within the Watershed Management Area, including the following:~~

~~(a) Other MS4 outfalls (e.g., Phase II Municipal and Caltrans),~~

~~(b) Other NPDES permitted discharges,~~

~~(c) Any other discharges that may be considered point sources (e.g., private outfalls), and~~

~~(d) Any other discharges that may be considered non-point sources (e.g., agriculture, wildlife or other natural sources);~~

~~(4)~~(3) Review of available data, including but not limited to:

(a) Findings from the Copermittees' illicit discharge detection and elimination programs,

(b) Findings from the Copermittees' MS4 outfall discharge monitoring,

(c) Findings from the Copermittees' receiving water monitoring,

(d) Findings from the Copermittees' MS4 outfall discharge and receiving water assessments, and

(e) Other available, relevant, and appropriately collected data, information, or studies related to pollutant sources and/or stressors that contribute to the highest priority water quality conditions as identified for Provision B.2.c.

~~(5)~~(4) The adequacy of the available data to identify and prioritize sources and/or stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c.

e. NUMERIC GOALS AND SCHEDULES

The Copermittees must develop and incorporate interim and final numeric goals[6] and schedules into the Water Quality Improvement Plan. Numeric goals must be used to support Water Quality Improvement Plan implementation and measure progress towards addressing the highest priority water quality conditions identified under Provision B.2.c. Numeric goals are not enforceable compliance standards, effluent limitations, or receiving water limitations. When establishing numeric goals and corresponding schedules, the Copermittees must consider the following:

(1) Final numeric goals must be based on measureable criteria or indicators, to be achieved in the receiving waters and/or MS4 discharges for the highest priority water quality conditions which will be capable of demonstrating the achievement of the restoration and/or protection of water quality standards in receiving waters;[7]

(2) Interim numeric goals must be based on measureable criteria or indicators capable of demonstrating incremental progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges; and

(3) Schedules must be adequate for measuring progress toward achieving the interim and final numeric goals required for Provisions B.2.e.(1) and B.2.e.(2). Schedules must incorporate the following:

(a) Interim dates for achieving the interim numeric goals,

(b) Compliance schedules for any applicable TMDLs in Attachment E to this Order,

(c) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A),

(d) Achievement of the final numeric goals in the receiving waters and/or MS4 discharges for the highest water quality priorities must be as soon as possible, and

[6] Interim and final numeric goals may take a variety of forms such as TMDL established WQBELs, action levels, pollutant concentration, load reductions, number of impaired water bodies delisted from the List of Water Quality Impaired Segments, Index of Biotic Integrity (IBI) scores, or other appropriate metrics. Interim and final numeric goals are not necessarily limited to one criterion or indicator, but may include multiple criteria and/or indicators. Except for TMDL established WQBELs, interim and final numeric goals and corresponding schedules may be revised through the adaptive management process under Provision B.5.

[7] Achievement of final numeric goals within 10 years represents progress towards attainment of water quality standards, but is not a requirement to fully attain all applicable water quality standards or all priority receiving water conditions within 10 years.

(e) Final dates for achieving the final numeric goals must not initially extend more than 10 years beyond the effective date of this Order, unless a longer period of time is authorized by the San Diego Water Board Executive Officer or the schedule includes an applicable TMDL in Attachment E to this Order.

3. Water Quality Improvement Strategies and Schedules

The Copermittees must develop specific water quality improvement strategies to address the highest priority water quality conditions identified within a Watershed Management Area. The water quality improvement strategies must address the highest priority water quality conditions by ~~preventing or eliminating~~ effectively prohibiting non-storm water discharges to ~~and from~~ the MS4, reducing pollutants in ~~storm water~~ discharges from the MS4 to the MEP, and restoring and/or protecting the water quality standards of receiving waters.

a. WATER QUALITY IMPROVEMENT STRATEGIES

The Copermittees must identify and prioritize water quality improvement strategies based on their likely effectiveness and efficiency, and implement strategies to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in ~~storm water~~ discharges from the MS4 to the MEP, improve the physical, chemical, and biological receiving water conditions, and achieve the interim and final numeric goals in accordance with the schedules required for Provision B.2.e.(3). The following water quality improvement strategies must be included and described in the Water Quality Improvement Plan:

(1) Specific strategies and/or activities that may be implemented by one or more Copermittees within their jurisdictions through the jurisdictional runoff management programs that will address the highest priority water quality conditions within the Watershed Management Area, in accordance with the following requirements:

(a) Strategies and/or activities must, at a minimum, be described for each jurisdictional runoff management program component where strategies to address the highest priority water quality conditions are required under Provision E;

(b) The Water Quality Improvement Plan must describe the circumstances or conditions when and where the strategies or/activities should be or will be implemented, but specific details about how each Copermittee will implement the strategies and/or activities within its jurisdiction are not required; and

(c) Descriptions of strategies and/or activities must include any monitoring, information collection, special studies, and/or data analysis that is necessary to assess the effectiveness of the strategy and/or activity toward addressing the highest priority water quality conditions.

(2) Additional strategies and/or activities that may be implemented within the Watershed Management Area on a jurisdictional, sub-watershed, or watershed scale by one or more Copermittees, not specifically required under Provision E, which are designed to achieve the interim and final numeric goals identified in Provisions B.2.e.(1) and B.2.e.(2);

(3) Copermittees may elect to develop their Water Quality Improvement Plan to serve as an iterative, implementation-based compliance mechanism for the discharge prohibitions (A.1), receiving water limitations (A.2), and effluent limitations (A.3). To utilize the Water Quality Improvement Plan-based compliance option, Permittees shall conduct a Reasonable Assurance Analysis. The objective of the Reasonable Assurance Analysis shall be to demonstrate the strategies and activities of the Water Quality Improvement Plan will ultimately result in attainment of the discharge prohibitions (A.1), receiving water limitations (A.2), and effluent limitations (A.3).

In order for a Copermittee to utilize the Water Quality Improvement Plan-based compliance option, the Regional Board Executive Officer must determine the following conditions are met:

(a) The Copermittee requests that the Water Quality Improvement Plan be approved as the basis for compliance with the discharge prohibitions (A.1), receiving water limitations (A.2), and/or effluent limitations (A.3) in the letter of submittal to the San Diego Water Board as described in Provision F.1.(a); AND

(b) The submitted Water Quality Improvement Plan includes a Reasonable Assurance Analysis that demonstrates that the strategies and activities in the Water Quality Improvement Plan will attain the applicable discharge prohibitions (A.1), receiving water limitations (A.2), and/or effluent limitations (A.3); AND

(c) The submitted Water Quality Improvement Plan includes a schedule as outlined in Provision B.3.b that provides sufficient detail regarding the strategies and activities to be implemented to allow the Regional Board to use the schedule for compliance determination in a clear, specific, measurable, and enforceable manner.

If a Water Quality Improvement Plan-based compliance option is approved by the Regional Board Executive Officer, then in instances when the discharge prohibitions (A.1), receiving water limitations (A.2), and/or effluent limitations (A.3) are not met, the implementation of the strategies and activities contained in the Water Quality Improvement Plan will be used for determination of compliance with Provision A. That is, any determination of a

Copermittee's compliance with Provision A shall be based on the following conditions:

(a) The strategies and activities of the Water Quality Improvement Plan are implemented per the approved schedule outlined pursuant to Provision B.3.b and adapted pursuant to Provisions B.5, F.1, and F.2; AND

(b) If exceedances persist notwithstanding implementations of the strategies and activities in the approved Water Quality Improvement Plan, then Responsible Copermittees revise the Water Quality Improvement Plan pursuant to Provision A.4.a, and implement the revised Water Quality Improvement Plan including additional or alternative activities per the schedule submitted with the revised Water Quality Improvement Plan.

For cases when applicable discharge prohibitions (A.1), receiving water limitations (A.2), or effluent limitations (A.3) are not attained during the time period between a Copermittee's notification of intent to utilize a Water Quality Improvement Plan-based compliance option, pursuant to Provision F.1.(a), and Regional Board Executive Officer approval of the submitted Water Quality Improvement Plan, determination of a Copermittee's compliance with Provision A shall be based on the following conditions:

(a) All deadlines for development of a Water Quality Improvement Plan pursuant to Provision F.1.(a) and (b) are met; AND

(b) The Water Quality Improvement Plan ultimately receives final approval.

b. IMPLEMENTATION SCHEDULES

(1) The Copermittees must develop schedules for implementing the water quality improvement strategies identified under Provision B.3.a to achieve the interim and final numeric goals identified under Provision B.2.e.(1) and B.2.e.(2). Schedules must be developed for both the water quality improvement strategies implemented by each Copermittee within its jurisdiction and for strategies that the Copermittees choose to implement on a collaborative basis.

(2) The Copermittees must incorporate the implementation compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

4. Water Quality Improvement Monitoring and Assessment Program

a. The Copermittees in each Watershed Management Area must develop and incorporate an integrated monitoring and assessment program into the Water Quality Improvement Plan that assesses: 1) the progress toward achieving the numeric goals and schedules, 2) the progress toward addressing the highest priority water quality conditions for each Watershed Management Area, and 3) each Copermittee's overall efforts to implement the Water Quality Improvement Plan.

b. The monitoring and assessment program must incorporate the monitoring and assessment requirements of Provision D, which may allow the Copermittees to modify the program to be consistent with and focus on the highest priority water quality conditions for each Watershed Management Area.

c. For Watershed Management Areas with applicable TMDLs, the monitoring and assessment program must incorporate the specific monitoring and assessment requirements of Attachment E.

d. For Watershed Management Areas with any ASBS, the water quality monitoring and assessment program must incorporate the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

5. Iterative Approach and Adaptive Management Process

The Copermittees in each Watershed Management Area must implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a, and must include the following:

a. RE-EVALUATION OF PRIORITY WATER QUALITY CONDITIONS

The priority receiving water quality conditions, and numeric goals and corresponding schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.2.c and B.2.e, may be re-evaluated by the Copermittees as needed during the term of this Order as part of the Annual Report. Re-evaluation and recommendations for modifications to the priority water quality conditions, and numeric goals and corresponding schedules must be provided in the Report of Waste Discharge, and must consider the following:

(1) Achieving the outcome of improved water quality in MS4 discharges and receiving waters through implementation of the water quality improvement strategies identified in the Water Quality Improvement Plan;

(2) Progress toward achieving interim and final numeric goals in receiving waters and/or MS4 discharges for the highest priority water quality conditions in the

Watershed Management Area,

(3) Progress toward achieving outcomes according to established schedules;

(4) New information developed when the requirements of Provisions B.2.a-c have been re-evaluated;

(5) New policies or regulations that may affect identified numeric goals;

(6) Spatial and temporal accuracy of monitoring data collected to inform prioritization of water quality conditions and implementation strategies to address the highest priority water quality conditions;

(7) Availability of new information and data from sources other than the jurisdictional runoff management programs within the Watershed Management Area that informs the effectiveness of the actions implemented by the Copermittees;

(8) San Diego Water Board recommendations; and

(9) Recommendations for modifications solicited through a public participation process.

b. ADAPTATION OF STRATEGIES AND SCHEDULES

The water quality improvement strategies and schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.3, must be re-evaluated and adapted as new information becomes available to result in more effective and efficient measures to achieve the numeric goals established pursuant to Provision B.2.e. Re-evaluation of and modifications to the water quality improvement strategies must be provided in the Annual Report, and must consider the following:

(1) Modifications to the priority water quality conditions, and numeric goals and corresponding schedules based on Provision B.5.a;

(2) Measurable or demonstrable reductions of non-storm water discharges to ~~and from~~ each Copermittee's MS4;

(3) Measurable or demonstrable reductions of pollutants in ~~storm water~~ discharges from each Copermittee's MS4 to the MEP;

(4) New information developed when the requirements of Provisions B.2.b and B.2.d have been re-evaluated;

(5) Efficiency in implementing the Water Quality Improvement Plan;

(6) San Diego Water Board recommendations; and

(7) Recommendations for modifications solicited through a public participation process.

c. ADAPTATION OF MONITORING AND ASSESSMENT PROGRAM

The water quality improvement monitoring and assessment program, included in the Water Quality Improvement Plan pursuant to Provisions B.4, must be re-evaluated and adapted when new information becomes available. Re-evaluation and recommendations for modifications to the monitoring and assessment program, pursuant to the requirements of Provision D, may be provided in the Annual Report, but must be provided in the Report of Waste Discharge.

6. Water Quality Improvement Plan Submittal, Updates, and Implementation

a. The Copermittees must submit the Water Quality Improvement Plans in accordance with the requirements of Provision F.1.

b. The Copermittees must submit proposed updates to the Water Quality Improvement Plan for acceptance by the San Diego Water Board Executive Officer in accordance with the requirements of Provision F.2.c.

c. The Copermittees must commence with implementation of the Water Quality Improvement Plans immediately after acceptance by the San Diego Water Board, in accordance with the schedules, or subsequently updated schedules, within the Water Quality Improvement Plan.

C. ACTION LEVELS

The purpose of this provision is for the Copermittees to incorporate numeric action levels in the Water Quality Improvement Plans. The goal of the action levels is to guide Water Quality Improvement Plan implementation efforts and measure progress towards the protection of water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through monitoring and assessing the quality of the MS4 discharges during the implementation of the Water Quality Improvement Plans.

1. Non-Storm Water Action Levels[8]

The Copermittees must develop and incorporate numeric non-storm water action levels (NALs) into the Water Quality Improvement Plan to: 1) support the development and prioritization of water quality improvement strategies for addressing non-storm water discharges to and from the MS4s, 2) assess the effectiveness of the water quality improvement strategies toward addressing MS4 non-storm water discharges, required pursuant to Provision D.4.b.(1), and 3) support the detection and elimination of non-storm water and illicit discharges to and from the MS4, required pursuant to Provision E.2.[9]

a. The following NALs must be incorporated if the Copermittees do not establish numeric action levels within the Water Quality Improvement Plan based on watershed priorities:

(1) Non-Storm Water Discharges from MS4s to Ocean Surf Zone

Table C-1. Non-Storm Water Action Levels for Discharges from MS4s to Ocean Surf Zone

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Total Coliform	MPN/100 ml	1,000	-	10,000/1,000[1]	OP
Fecal Coliform	MPN/100 ml	200[2]	-	400	OP
Enterococci	MPN/100 ml	35	-	104[3]	OP

Abbreviations/Acronyms
AMAL – average monthly action level
MDAL – maximum daily action level
OP – Ocean Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Total coliform density NAL is 1,000 MPN/100 ml when the fecal/total coliform ratio exceeds 0.1.
2. Fecal coliform density NAL is 200 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas."

[8] NALs are not considered ~~by the San Diego Water Board~~ to be enforceable limitations.
[9] The Copermittees may utilize NALs or other benchmarks currently established by the Copermittees as interim NALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

(2) Non-Storm Water Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Table C-2. Non-Storm Water Action Levels for Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Turbidity	NTU	75	-	225	OP
pH	Units	Within limit of 6.0 to 9.0 at all times			OP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	35	-	104[3]	BP
Priority Pollutants	ug/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
OP – Ocean Plan water quality objective
NTU – Nephelometric Turbidity Units
ug/L – micrograms per liter
MDAL – maximum daily action level
BP – Basin Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas" and is not applicable to waterbodies that are not designated with the water contact recreation (REC-1) beneficial use.

Table C-3. Non-Storm Water Action Levels for Priority Pollutants

Parameter	Units	Freshwater (CTR)		Saltwater (CTR)	
		MDAL	AMAL	MDAL	AMAL
Cadmium	ug/L	**	**	16	8
Copper	ug/L	*	*	5.8	2.9
Chromium III	ug/L	**	**	-	-
Chromium VI	ug/L	16	8.1	83	41
Lead	ug/L	*	*	14	2.9
Nickel	ug/L	**	**	14	6.8
Silver	ug/L	*	*	2.2	1.1
Zinc	ug/L	*	*	95	47

Abbreviations/Acronyms:
CTR – California Toxic Rule
AMAL – average monthly action level
ug/L – micrograms per liter
MDAL – maximum daily action level

Notes:
* Action levels developed on a case-by-case basis (see below)
** Action levels developed on a case-by-case basis (see below), but calculated criteria are not to exceed Maximum Contaminant Levels (MCLs) under the California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64431

The Cadmium, Copper, Chromium (III), Lead, Nickel, Silver and Zinc NALs for MS4 discharges to freshwater receiving waters will be developed on a case-by-case basis because the freshwater criteria are based on site-specific water quality data (receiving water hardness). For these priority pollutants, refer to ~~the following equations (~~40 CFR 131.38.b.2~~) will be required~~ for details:

~~Cadmium (Total Recoverable) = exp(0.7852[ln(hardness)] - 2.715)~~
~~Chromium III (Total Recoverable) = exp(0.8190[ln(hardness)] + 0.6848)~~
~~Copper (Total Recoverable) = exp(0.8545[ln(hardness)] - 1.702)~~
~~Lead (Total Recoverable) = exp(1.273[ln(hardness)] - 4.705)~~
~~Nickel (Total Recoverable) = exp(.8460[ln(hardness)] + 0.0584)~~
~~Silver (Total Recoverable) = exp(1.72[ln(hardness)] - 6.52)~~
~~Zinc (Total Recoverable) = exp(0.8473[ln(hardness)] + 0.884)~~

(3) Non-Storm Water Discharges from MS4s to Inland Surface Waters

Table C-4. Non-Storm Water Action Levels for Discharges from MS4s to Inland Surface Waters

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Dissolved Oxygen	mg/L	Not less than 5.0 in WARM waters and not less than 6.0 in COLD waters			BP
Turbidity	NTU	-	20	See MDAL	BP
pH	Units	Within limit of 6.5 to 8.5 at all times			BP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	33	-	61[3]	BP
Total Nitrogen	mg/L	-	1.0	See MDAL	BP
Total Phosphorus	mg/L	-	0.1	See MDAL	BP
MBAS	mg/L	-	0.5	See MDAL	BP
Iron	mg/L	-	0.3	See MDAL	BP
Manganese	mg/L	-	0.05	See MDAL	BP
Priority Pollutants	ug/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
BP – Basin Plan water quality objective
COLD – cold freshwater habitat beneficial use
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
MDAL – maximum daily action level
WARM – warm freshwater habitat beneficial use
MBAS – Methylene Blue Active Substances
MPN/100 ml – most probable number per 100 milliliters
ug/L – micrograms per liter

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for freshwater "designated beach areas" and is not applicable to waterbodies that are not designated with the water contact recreation (REC-1) beneficial use.

b. ~~If not identified in Provision C.1.a,~~ NALs must be identified, developed and incorporated in the Water Quality Improvement Plan for any pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in waters of the state associated with the highest priority water quality conditions related to non-storm water discharges from the MS4s. NALs must be based on:

(1) Applicable water quality standards which may be dependent upon site-specific or receiving water-specific conditions or assumptions to be identified by the Copermittees; or

(2) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the NALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary NALs specific to the Watershed Management Area at levels greater than the NALs required by Provisions C.1.a and C.1.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for addressing non-storm water discharges to and from the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and from the MS4. The secondary NALs may be developed using an approach acceptable to the San Diego Water Board.

d. Dry weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.b may be utilized to develop or revise NALs based on watershed-specific data, subject to San Diego Water Board Executive Officer approval.

2. Storm Water Action Levels[10]

The Copermittees must develop and incorporate numeric storm water action levels (SALs) in the Water Quality Improvement Plans to: 1) support the development and prioritization of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s, and 2) assess the effectiveness of the water quality improvement strategies toward reducing pollutants in storm water discharges, required pursuant to Provision D.4.b.(2).[11]

a. The following SALs for discharges of storm water from the MS4 must be incorporated if the Copermittees do not establish numeric action levels within the Water Quality Improvement Plan based on watershed priorities:

Table C-5. Storm Water Action Levels for Discharges from MS4s to Receiving Waters

Parameter	Units	Action Level
Turbidity	NTU	126
Nitrate & Nitrite (Total)	mg/L	2.6
Phosphorus (Total P)	mg/L	1.46
Cadmium (Total Cd)*	µg/L	3.0
Copper (Total Cu)*	µg/L	127
Lead (Total Pb)*	µg/L	250
Zinc (Total Zn)*	µg/L	976

Abbreviations/Acronyms:
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
ug/L – micrograms per liter

Notes:
* The sampling must include a measure of receiving water hardness at each MS4 outfall. If a total metal concentration exceeds the corresponding metals SAL in Table C-5, that concentration must be compared to the California Toxics Rule criteria and the USEPA 1-hour maximum concentration for the detected level of receiving water hardness associated with that sample. If it is determined that the sample's total metal concentration for that specific metal exceeds that SAL, but does not exceed the applicable USEPA 1-hour maximum concentration criterion for the measured level of hardness, then the sample result will not be considered above the SAL for that measurement.

b. ~~If not identified in Provision C.2.a,~~ SALs must be identified, developed and incorporated in the Water Quality Improvement Plan for pollutants or waste

[10] SALs are not considered ~~by the San Diego Water Board~~ to be enforceable limitations.
[11] The Copermittees may utilize SALs or other benchmarks currently established by the Copermittees as interim SALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in waters of the state associated with the highest water quality priorities related to storm water discharges from the MS4s. SALs must be based on:

(1) Federal and State water quality guidance and/or water quality standards; and

(2) Site-specific or receiving water-specific conditions; or

(3) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the SALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary SALs specific to the Watershed Management Area at levels greater than the SALs required by Provisions C.2.a and C.2.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s. The secondary SALs may be developed based on the approaches recommended by the State Water Board's Storm Water Panel[12] or using an approach acceptable to the San Diego Water Board.

d. Wet weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.c may be used to develop or revise SALs based upon watershed-specific data, subject to San Diego Water Board Executive Officer approval.

[12] Storm Water Panel Recommendations to the California State Water Resources Control Board: The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities (June 2006)

D. MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS

The purpose of this provision is for the Copermittees to monitor and assess the impact on the chemical, physical, and biological conditions of receiving waters caused by discharges from the Copermittees' MS4s under wet weather and dry weather conditions. The goal of the monitoring and assessment program is to inform the Copermittees about the nexus between the health of receiving waters and the water quality condition of the discharges from their MS4s. This goal will be accomplished through monitoring and assessing the conditions of the receiving waters, discharges from the MS4s, pollutant sources and/or stressors, and effectiveness of the water quality improvement strategies implemented as part of the Water Quality Improvement Plans.

1. Receiving Water Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the condition of the receiving waters in each Watershed Management Area during dry weather and wet weather. Following acceptance of the Water Quality Improvement Plans and schedule for implementation of monitoring for each Watershed Management Area, the Copermittees must conduct long-term receiving water monitoring during implementation of the Water Quality Improvement Plan to assess the long term trends and determine if conditions in receiving waters are improving. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following receiving water monitoring procedures:

a. TRANSITIONAL RECEIVING WATER MONITORING

Until the monitoring requirements and implementation schedule for monitoring of Provisions D.1.b-e are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following receiving water monitoring in the Watershed Management Area:

(1) Continue the receiving water monitoring programs required in Order Nos. R9-2007-0001 (Attachment A, Section II. A. 1-5), R9-2009-0002, and R9-2010-0016;

(2) Continue the monitoring in the Hydromodification Management Plans approved by the San Diego Water Board;

(3) Participate in the following regional receiving water monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring,

(b) Southern California Bight Regional Monitoring, and

(c) Sediment Quality Monitoring;

(4) Implement the monitoring programs developed as part of any implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) for the TMDLs in Attachment E to this Order; and

(5) For Watershed Management Areas with ASBS, implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

b. LONG-TERM RECEIVING WATER MONITORING STATIONS

The Copermittees must select at least one long-term receiving water monitoring station from among the existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees to be representative of the receiving water quality in the Watershed Management Area. Additional long-term receiving water monitoring stations must be selected where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

c. DRY WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three dry weather monitoring events at each of the long-term receiving water monitoring stations. At least one monitoring event must be conducted during the dry season (May 1 – September 30) and at least one monitoring event must be conducted during a dry weather period during the wet season (October 1 – April 30), after the first wet weather event of the season, with an antecedent dry period of at least 72 hours following a storm event producing measureable rainfall of greater than 0.1 inch.

(1) Dry Weather Receiving Water Field Observations

For each dry weather monitoring event, the Copermittees must record field observations consistent with Table D-1 at each long-term receiving water monitoring station.

Table D-1. Field Observations for Receiving Water Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) • Station description (i.e. deposits or stains, vegetation condition, structural condition, and observable biology) • Presence and assessment of trash in and around station

(2) Dry Weather Receiving Water Field Monitoring

For each dry weather monitoring event, if conditions allow the collection of the data, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

Table D-2. Field Monitoring Parameters for Receiving Water Monitoring Stations

Parameters
• pH • Temperature • Specific conductivity • Dissolved oxygen • Turbidity

(3) Dry Weather Receiving Water Analytical Monitoring

For each dry weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable NAL constituents, and

(v) Constituents listed in Table D-3.

Table D-3. Analytical Monitoring Constituents for Receiving Water Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Pesticides	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Mercury • Nickel • Selenium • Thallium • Zinc	• Organophosphate Pesticides • Pyrethroid Pesticides	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(4) Dry Weather Receiving Water Toxicity Monitoring

For each dry weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for toxicity in accordance with Table D-4:

Table D-4. Dry Weather Toxicity Testing for Receiving Water Monitoring Stations

Freshwater Organism	Test Approach	USEPA Protocol[2]
Pimephales promelas	1 acute 1 chronic[1]	EPA-821-R-02-012
Hyalella Azteca	1 acute 1 chronic[1]	EPA-821-R-02-012
Psuedokirchneriella subcapitata	1 acute 1 chronic[1]	EPA-821-R-02-013

Notes:
1. Chronic toxicity testing is not required at receiving water monitoring stations located at mass loading stations if the channel flows are diverted year-round during dry weather conditions to the sanitary sewer for treatment.
2. USEPA protocols must be utilized for toxicity testing unless alternate toxicity testing protocols have been approved by the San Diego Water Board.

(5) Dry Weather Receiving Water Bioassessment Monitoring

Bioassessment monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must conduct bioassessment monitoring during at least one dry weather monitoring event at each long-term receiving water monitoring station as follows:

(a) The following bioassessment samples and measurements must be collected:

(i) Macroinvertebrate samples must be collected in accordance with the "Reachwide Benthos (Multihabitat) Procedure" in the most current Surface Water Ambient Monitoring Program (SWAMP) Bioassessment Standard Operating Procedures (SOP), and amendments, as applicable;[13]

(ii) The "Full" suite of physical habitat characterization measurements must be collected in accordance with the most current SWAMP Bioassessment SOP, and as summarized in the SWAMP Stream Habitat Characterization Form – Full Version;[14] and

(iii) Freshwater algae samples must be collected in accordance with the SWAMP Standard Operating Procedures for Collecting Algae

[13] Ode, P.R.. 2007. Standard operating procedures for collecting macroinvertebrate samples and associated physical and chemical data for ambient bioassessments in California. California State Water Resources Control Board Surface Water Ambient Monitoring Program (SWAMP) Bioassessment SOP 001. http://www.swrcb.ca.gov/water_issues/programs/swamp/tools.shtml#monitoring
[14] Available at: http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/reports/fieldforms_fullversion052908.pdf

Samples.[15] Analysis of samples must include algal taxonomic composition (diatoms and soft algae) and algal biomass.

(b) The bioassessment samples, measurements, and appropriate water chemistry data must be used to calculate the following:

(i) An Index of Biological Integrity (IBI) for macroinvertebrates for each monitoring station where bioassessment monitoring was conducted, based on the most current calculation method;[16] and

(ii) An IBI for algae for each monitoring station where bioassessment monitoring was conducted, when a calculation method is developed.[17]

(c) In lieu of the requirements of Provision D.1.c.(5)(a), the Copermittees may conduct the bioassessment monitoring in accordance with the "Triad" assessment approach[18] to calculate the IBIs required for Provision D.1.c.(5)(b). The Copermittees must conduct sampling, analysis, and reporting of specified in-stream biological and habitat data according to the protocols specified in the SCCWRP Technical Report No. 539, or subsequent protocols, if developed.

(6) Dry Weather Receiving Water Hydromodification Monitoring

In addition to the hydromodification monitoring conducted as part of the Copermittees' Hydromodification Management Plans, hydromodification monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must collect the following hydromodification monitoring observations and measurements within an appropriate domain of analysis during at least one dry weather monitoring event for each long-term receiving water monitoring station:

(a) Channel conditions, including:

(i) Channel dimensions,

[15] Fetscher et al. 2009. Standard Operating Procedures for Collecting Stream Algae Samples and Associated Physical Habitat and Chemical Data for Ambient Bioassessments in California.
[16] The most current calculation method at the time the Order was adopted is outlined in "A Quantitative Tool for Assessing the Integrity of Southern California Coastal Streams" (Ode, et al. 2005. Environmental Management. Vol. 35, No. 1, pp. 1-13). If an updated or new calculation method is developed, either both (i.e. current and updated/new) methods must be used, or historical IBIs must be recalculated with the updated or new calculation method.
[17] When a calculation method is developed, IBIs must be calculated for all available and appropriate historical data.
[18] Stormwater Monitoring Coalition Model Monitoring Technical Committee, 2004. Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California. Technical Report #419. August 2004.

(ii) Hydrologic and geomorphic conditions, and

(iii) Presence and condition of vegetation and habitat;

(b) Location of discharge points;

(c) Habitat integrity;

(d) Photo documentation of existing erosion and habitat impacts, with location (i.e. latitude and longitude coordinates) where photos were taken;

(e) Measurement or estimate of dimensions of any existing channel bed or bank eroded areas, including length, width, and depth of any incisions; and

(f) Known or suspected cause(s) of existing downstream erosion or habitat impact, including flow, soil, slope, and vegetation conditions, as well as upstream land uses and contributing new and existing development.

d. WET WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three wet weather monitoring events at each long-term receiving water monitoring station. At least one wet weather monitoring event must be conducted during the first wet weather event of the wet season (October 1 – April 30), and at least one wet weather monitoring event during a wet weather event that occurs after February 1.

(1) Wet Weather Receiving Water Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each long-term receiving water monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event;

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(d) Presence and assessment of trash in and around station.

(2) Wet Weather Receiving Water Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

(3) Wet Weather Receiving Water Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) Constituents listed in Table D-3.

(4) Wet Weather Receiving Water Toxicity Monitoring

For each wet weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for toxicity in accordance with Table D-5:

Table D-5. Wet Weather Toxicity Testing for Receiving Water Monitoring Stations

Freshwater Organism	Test Approach	USEPA Protocol[1]
Pimephales promelas	1 acute	EPA-821-R-02-012
Hyalella Azteca	1 acute	EPA-821-R-02-012
Psuedokirchneriella subcapitata	1 acute	EPA-821-R-02-013

Notes:
1. USEPA protocols must be utilized for toxicity testing unless alternate toxicity testing protocols have been approved by the San Diego Water Board.

e. Other Receiving Water Monitoring Requirements

(1) Regional Monitoring

The Copermittees must participate in the following regional receiving waters monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring; and

(b) Southern California Bight Regional Monitoring.

(2) Sediment Quality Monitoring

The Copermittees must perform sediment monitoring to assess compliance with sediment quality receiving water limits applicable to MS4 discharges to enclosed bays and estuaries. The monitoring may be performed either by individual or multiple Copermittees to assess compliance with receiving water limits, or through participation in a water body monitoring coalition. The Copermittees must identify sediment sampling stations that are spatially representative of the sediment within the water body segment or region of interest. Sediment quality monitoring must be conducted in conformance with the monitoring requirements set forth in the State Water Board Sediment Quality Control Plan.

(3) ASBS Monitoring

For Watershed Management Areas with ASBS, the Copermittees must implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

f. ALTERNATIVE WATERSHED MONITORING REQUIREMENTS

The San Diego Water Board may direct the Copermittees to participate in an effort to develop alternative watershed monitoring with other regulated entities, other interested parties, and the San Diego Water Board to refine, coordinate, and implement regional monitoring and assessment programs to determine the status and trends of water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams.

2. MS4 Outfall Discharge Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the discharges from the MS4 outfalls in each Watershed Management Area during dry weather and wet weather. Following acceptance of the Water Quality Improvement Plans and schedule for implementation of monitoring for each Watershed Management Area, the Copermittees must conduct MS4 outfall discharge monitoring during implementation of the Water Quality Improvement Plan to assess the effectiveness of their jurisdictional runoff management programs toward effectively prohibiting non-storm water discharges and reducing pollutants in storm water discharges to and from their MS4s. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following MS4 outfall monitoring procedures:

a. TRANSITIONAL MS4 OUTFALL DISCHARGE MONITORING

Until the monitoring requirements of Provisions D.2.b-c are incorporated into a Water Quality Improvement Plan and schedule for implementation of monitoring that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following MS4 outfall discharge monitoring in the Watershed Management Area:

(1) MS4 Outfall Discharge Monitoring Station Inventory

Each Copermittee must identify all major MS4 outfalls that discharge directly to receiving waters within its jurisdiction and geo-locate those outfalls on a map of the MS4 pursuant to Provision E.2.b.(1). This information must be compiled into a MS4 outfall discharge monitoring station inventory, and must include the following information:

(a) Latitude and longitude of MS4 outfall point of discharge;

(b) Watershed Management Area;

(c) Hydrologic subarea;

(d) Outlet size;

(e) Accessibility (i.e. safety and without disturbance of critical habitat);

(f) Approximate drainage area; and

(g) Classification of whether the MS4 outfall is known to have persistent dry weather flows, transient dry weather flows, no dry weather flows, or unknown dry weather flows.

(2) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Until the monitoring requirements and the monitoring implementation schedule described in ~~of~~ Provision D.2.b are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, each Copermittee must perform dry weather MS4 outfall field screening monitoring to identify non-storm water and illicit discharges within its jurisdiction in accordance with Provision E.2.c, to determine which discharges are transient flows and which are persistent flows, and prioritize the dry weather MS4 discharges that will be investigated and eliminated in accordance with Provision E.2.d. Each Copermittee must conduct the following dry weather MS4 outfall discharge field screening monitoring within its jurisdiction:

(a) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Frequency

Each Copermittee must field screen the MS4 outfalls in its inventory developed pursuant to Provision D.2.a.(1) as follows:

(i) For Copermittees with less than 125 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 80 percent of the outfalls must be visually inspected two times per year during dry weather conditions. For Copermittees with jurisdiction in more than one WMA, this requirement is limited to 500 inspections annually per Provision D.2.a.(2)(a)(iv).

(ii) For Copermittees with 125 major MS4 outfalls or more, but less than or equal to 500, that discharge to receiving waters within a Watershed Management Area all the outfalls must be visually

inspected at least annually during dry weather conditions. For Copermittees with jurisdiction in more than one WMA, this requirement is limited to 500 inspections annually per Provision D.2.a.(2)(a)(iv).

(iii) For Copermittees with more than 500 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 500 outfalls must be visually inspected at least annually during dry weather conditions. Copermittees with more than 500 major MS4 outfalls within a Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

For Copermittees with jurisdiction in more than one WMA, this requirement is limited to 500 inspections annually, per Provision D.2.a.(2)(a)(iv).

(iv) For Copermittees with more than 500 major MS4 outfalls within its jurisdiction that are located in more than one Watershed Management Area, at least 500 major MS4 outfalls within its inventory must be visually inspected at least annually during dry weather conditions. Copermittees with more than 500 major MS4 outfalls in more than one Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(v) Inspections of major MS4 outfalls conducted in response to public reports and staff or contractor reports and notifications may count toward the required visual inspections of MS4 outfall discharge monitoring stations.

(b) Transitional Dry Weather MS4 Outfall Discharge Field Screening Visual Observations

(i) An antecedent dry period of at least 72 hours following any storm event producing measurable rainfall greater than 0.1 inch is required prior to conducting field screening visual observations during a field screening monitoring event.

(ii) During the field screening monitoring event, each Copermittee must record visual observations consistent with Table D-6 at each MS4 outfall discharge monitoring station inspected.

Table D-6. Field Screening Visual Observations for MS4 Outfall Discharge Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) - Flow source(s) suspected or identified from non-storm water source investigation - Flow source(s) eliminated during non-storm water source identification • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) - Known or suspected source(s) of pooled or ponded water • Station description (i.e. deposits or stains, vegetation condition, structural condition, observable biology) • Presence and assessment of trash in and around station • Evidence or signs of illicit connections or illegal dumping

(iii) Each Copermittee must implement the requirements of Provisions E.2.d.(2)(c)-(e) based on the field observations.

(iv) Each Copermittee must evaluate field observations together with existing information available from prior reports, inspections and monitoring results to determine whether any observed flowing, pooled, or ponded waters are likely to be transient or persistent flow.[19]

(c) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Records

[19] Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

Based upon the results of the transitional dry weather MS4 outfall discharge field screening monitoring conducted pursuant to Provisions D.2.a.(2)(a)-(b), each Copermittee must update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow.

(3) Transitional Wet Weather MS4 Outfall Discharge Monitoring

Until the monitoring requirements and the monitoring implementation schedule described in~~requirements of~~ Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(a) Transitional Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees must select at least five wet weather MS4 outfall discharge monitoring stations from the inventories developed pursuant to Provision D.2.a.(1) that are representative of storm water discharges from areas consisting primarily of residential, commercial, industrial, and typical mixed-use land uses present within the Watershed Management Area.

The County of San Diego shall select at least two (2) transitional wet weather MS4 outfall discharge monitoring stations for the portion of the Santa Margarita River Watershed Management Area within its jurisdiction until the Riverside Copermittees are enrolled under this Order. After the Riverside Copermittees are enrolled, the Watershed Management Area Copermittees shall select at least five (5) transitional wet weather MS4 outfall discharge monitoring stations consistent with the requirements above.

(b) Transitional Wet Weather MS4 Outfall Discharge Monitoring Frequency

Each wet weather MS4 outfall discharge monitoring station selected pursuant to Provision D.2.a.(3)(a) must be monitored twice during the wet season (October 1 – April 30) in the transitional period. ~~One~~ The wet weather monitoring events shall be selected to be representative of the range of hydrological conditions experienced in the region. At least 10% of samples must be conducted during the first wet weather event of the wet season, to include at least one such sample in each Watershed Management Area~~and one wet weather monitoring event at least a month after the first wet weather event of the wet season~~.

(c) Transitional Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(i) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(ii) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(iii) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(iv) Presence and assessment of trash in and around station.

(d) Transitional Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(e) Transitional Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, and indicator bacteria;

(iv) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

[a] Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or
[b] Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or
[c] If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours;

(v) Only one analysis of the composite of aliquots is required;

(vi) The samples must be analyzed for the following constituents:

[a] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,
[b] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and
[c] Constituents listed in ~~in~~ Table D-7.

Table D-7. Analytical Monitoring Constituents for Wet Weather MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Nickel • Selenium • Thallium • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(f) Other Transitional Wet Weather MS4 Outfall Discharge Monitoring

The San Diego County Copermittees must continue the wet weather MS4 outfall monitoring program developed under Order No. R9-2007-0001, as approved by the San Diego Water Board, through its planned completion.

b. Dry Weather MS4 Outfall Discharge Monitoring

Each Copermittee must perform dry weather MS4 outfall monitoring to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. Each Copermittee must conduct the following dry weather MS4 outfall discharge monitoring within its jurisdiction:

(1) Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Each Copermittee must continue to perform the dry weather MS4 outfall discharge field screening monitoring in accordance with the requirements of Provision D.2.a.(2). The Copermittee may adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of persistent flow non-storm water discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of visual inspections performed is equivalent to the number of visual inspections required under Provision D.2.a.(2)(a).

(2) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring

Each Copermittee must perform non-storm water persistent flow MS4 outfall discharge monitoring to determine which persistent non-storm water discharges contain concentrations of pollutants below NALs, and which persistent non-storm water discharges impact receiving water quality during dry weather. Each Copermittee must conduct the following non-storm water persistent flow MS4 outfall discharge monitoring within its jurisdiction:

(a) Prioritization of Non-Storm Water Persistent Flow MS4 Outfalls

Based upon the dry weather MS4 outfall discharge field screening monitoring records developed pursuant to Provision D.2.a.(2)(c), each Copermittee must identify and prioritize the MS4 outfalls with persistent flows based on the highest priority water quality conditions identified in the Water Quality Improvement Plan and any additional criteria developed by the Copermittee, which may include historical data and data from sources other than what the Copermittee collects.

(b) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring Frequency

(i) Based on the prioritization of major MS4 outfalls developed under Provision D.2.b.(2)(a), each Copermittee must identify, at a minimum, the ~~10~~ 5 highest priority major MS4 outfalls with non-storm water persistent flows that the Copermittee will monitor within each Watershed Management Area within its jurisdiction. If a Copermittee has less than 5 major outfalls within a WMA, the Copermittee shall monitor all of its major outfalls with persistent flows within that WMA. The location of the highest priority non-storm water persistent flow MS4 outfall monitoring stations must be identified on the map required pursuant to Provision E.2.b.(1).

(ii) Each of the highest priority non-storm water persistent flow MS4 outfall monitoring stations identified pursuant to Provision D.2.b.(2)(b)(i) must be monitored under dry weather conditions at least semi-annually until one of the following occurs:

[a] The non-storm water discharges have been effectively eliminated (i.e. no flowing, pooled, or ponded water) for three consecutive dry weather monitoring events; or

[b] The source(s) of the persistent flows has been identified as a category of non-storm water discharges that does not require an NPDES permit and does not have to be addressed as an illicit discharge because it was not identified as a source of pollutants (i.e. constituents in non-storm water discharge do not exceed

NALs), and the persistent flow can be re-prioritized to a lower priority; or

[c] The constituents in the persistent flow non-storm water discharge do not exceed NALs, and the persistent flow can be re-prioritized to a lower priority; or

[d] The source(s) of the persistent flows has been identified as a non-storm water discharge authorized by a separate NPDES permit.

(iii) Where the criteria under Provision D.2.b.(2)(c)(ii) are not met, but the threat to water quality has been reduced by the Copermittee, the highest priority persistent flow MS4 outfall monitoring stations may be reprioritized accordingly for continued dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1).

(iv) Each Copermittee must document removal or re-prioritization of the highest priority persistent flow MS4 outfall monitoring stations identified under Provision D.2.b.(2)(b) in the Annual Report. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized major MS4 ~~major~~ outfall in the Watershed Management Area within its jurisdiction, unless there are no remaining qualifying major MS4 outfalls within the Copermittee's jurisdiction in the Watershed Management Area.

(c) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Observations

During each semi-annual monitoring event, each Copermittee must record field observations consistent with Table D-6 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(d) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Monitoring

During each semi-annual monitoring event, if conditions allow the collection of the data, each Copermittee must monitor and record the parameters in Table D-2 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(e) Non-Storm Water Persistent Flow MS4 Outfall Discharge Analytical Monitoring

During each semi-annual monitoring event in which measurable flow is present, each Copermittee must collect and analyze samples from each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) During development of the Water Quality Improvement Plan, for each WMA, consider the following sources to select constituents for ~~C~~collection of grab or composite samples to be analyzed at a qualified analytical laboratory~~for the following constituents~~:

[a] Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,
[b] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,
[c] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,
[d] Applicable NAL constituents, and
[e] Constituents listed in Table D-8~~, unless the~~

(iv) Copermittees may adjust the analytical list for a given WMA in successive monitoring events ~~Copermittee has~~ to add or eliminate constituents based on ~~historical~~ data that can demonstrate or provide justification ~~that~~ regarding the need or lack of need for analysis of ~~the~~ specific constituents ~~is not necessary~~.

Table D-8. Analytical Monitoring Constituents for Persistent Flow MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Total Hardness • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Cadmium • Copper • Lead • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(v) If the Copermittee identifies and eliminates the source of the persistent flow non-storm water discharge, analysis of the sample is not required.

c. WET WEATHER MS4 OUTFALL DISCHARGE MONITORING

The Copermittees must perform wet weather MS4 outfall monitoring to identify ~~sources of~~ pollutants in storm water discharges from the MS4s in the Watershed Management Area, and provide information to help guide source identification efforts. The Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(1) Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees may adjust the wet weather MS4 outfall discharge monitoring locations and frequencies in the Watershed Management Area, as needed, to identify ~~sources of~~ pollutants in storm water discharges from MS4s in the Watershed Management Area in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of stations is at least equivalent to the number of stations required under Provision D.2.a.(3)(a).

(2) Wet Weather MS4 Outfall Discharge Monitoring Frequency

The Copermittees must monitor the wet weather MS4 outfall discharge monitoring stations in the Watershed Management Area at an appropriate frequency to identify ~~sources of~~ pollutants in storm water discharges from the MS4s causing or contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan.

(3) Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(c) Station condition (i.e. deposits or stains, vegetation condition, structural

condition, observable biology); and

(d) Presence and assessment of trash in and around station.

(4) Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(5) Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

(iii) If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours.

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and

(iv) Applicable SAL constituents.

3. Special Studies

a. Within the term of this Order, the Copermittees must ~~develop and implement~~initiate the following special studies:

(1) At least two ~~three~~ special studies in each Watershed Management Area to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that cause or contribute to highest priority water quality conditions identified in the Water Quality Improvement Plan.

(2) At least one ~~two~~ special study~~ies~~ for the San Diego Region to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that are impacting receiving waters on a regional basis in the San Diego Region.

(3) One of the two ~~three~~ special studies in each Watershed Management Area may be replaced by a special study implemented pursuant to Provision D.3.a.(2).

b. The special studies must, at a minimum, be in conformance with the following criteria:

(1) The special studies must be related to the highest priority water quality conditions identified by the Copermittees in the Watershed Management Area and/or for the entire San Diego Region;

(2) The special studies developed pursuant to Provision D.3.a.(1) must:

(a) Be implemented within the applicable Watershed Management Area, and

(b) Require some form of participation by all the Copermittees within the Watershed Management Area;

(3) The special studies developed pursuant to Provision D.3.a.(2) must:

(a) Be implemented within the San Diego Region, and

(b) Require some form of participation by all Copermittees covered under the requirements of this Order.

c. Special studies developed to identify sources of pollutants and/or stressors should be pollutant and/or stressor specific and based on historical monitoring data and monitoring performed pursuant to Provisions D.1 and D.2. Development of source identification special studies should include the following:

(1) A compilation of known information on the specific pollutant and/or stressor, including data on potential sources and movement of the pollutant and/or stressor within the watershed. Data generated by the Copermittees and others, as well as information available from a literature research on the pollutant and/or stressor should be compiled and analyzed as appropriate.

(2) An identification of data gaps, based on the compiled information generated on the specific pollutant and/or stressor in Provision D.3.d.(1). Source identification special studies should be developed to fill identified data gaps.

(3) A monitoring plan that will collect and provide data the Copermittees can utilize to do the following:

(a) Quantify the relative loading or impact of a pollutant and/or stressor from a particular source or pollutant generating activity;

(b) Improve understanding of the fate of a pollutant and/or stressor in the environment;

(c) Develop an inventory of known and suspected sources of a pollutant and/or stressor in the Watershed Management Area; and/or

(d) Prioritize known and suspected sources of a pollutant and/or stressor based on relative magnitude in discharges, geographical distribution (i.e., regional or localized), frequency of occurrence in discharges, human health risk, and controllability.

d. Special studies initiated prior to the ~~acceptance of the Water Quality Improvement Plan~~term of this Order that meet the requirements of Provision D.3.b and are ~~completed~~ implemented during the term of this Order may be utilized to fulfill the special study requirements of Provision D.3.a.

e. The Copermittees must submit the monitoring plans for the special studies in the Water Quality Improvement Plans required pursuant to Provision F.1.

f. The Copermittees are encouraged to share the results of the special studies regionally among the Copermittees to provide information useful in improving and adapting the management of non-storm water and storm water runoff through the implementation of the Water Quality Improvement Plans.

4. Assessment Requirements

Each Copermittee must evaluate the data collected pursuant to Provisions D.1, D.2 and D.3, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E, to assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a. Assessments must be performed as described in the following provisions:

a. Receiving Waters Assessments

(1) The Copermittees must assess and report the conditions of the receiving waters in the Watershed Management Area as follows:

(a) Based on data collected pursuant to Provision D.1.a, the assessments under Provision D.4.a.(2) must be included in the first Annual Report required pursuant to Provision F.3.b.(1).

(b) Based on the data collected pursuant to Provisions D.1.a-e, the assessments required under Provision D.4.a.(2) must be included in the Report of Waste Discharge required pursuant to Provision F.5.b.

(2) The Copermittees must assess the status and trends of receiving water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under dry weather and wet weather conditions. For each of the three types of receiving waters in each Watershed Management Area the Copermittees must:

(a) Determine whether or not the conditions of the receiving waters are protective of the designated beneficial uses;

(b) Identify the most critical beneficial uses that must be protected or restored to ensure overall health of the receiving water;

(c) Determine whether or not those critical beneficial uses are being protected and where those beneficial used must be restored;

(d) Identify short-term and/or long-term improvements or degradation of those

critical beneficial uses;

(e) Identify data gaps in the monitoring data necessary to assess Provisions D.4.a.(2)(a)-(d).

b. MS4 OUTFALL DISCHARGES ASSESSMENTS

(1) Non-Storm Water Discharges Reduction Assessments

(a) Each Copermittee must assess and report the progress of its illicit discharge detection and elimination program, required to be implemented pursuant to Provision E.2, toward reducing and effectively prohibiting non-storm water and illicit discharges into the MS4 within its jurisdiction as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(2), the assessments under Provision D.4.b.(1)(b) must be included in the first Annual Report required pursuant to Provision F.3.b.(1).

(ii) Based on the data collected pursuant to Provisions D.2.b, the assessments required under Provision D.4.b.(1)(c) must be included when complete in the first Annual Report required pursuant to Provision F.3.b.(1), and annually thereafter.

(iii) Based on the data collected pursuant to Provisions D.2.b, the assessment required under Provision D.4.b.(1)(c) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.a.(2), each Copermittee must assess and report the following:

(i) Identify the known and suspected controllable sources (e.g. facilities, areas, land uses, pollutant generating activities) of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area;

(ii) Identify sources of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area that have been reduced or eliminated; and

(iii) Identify modifications to the field screening monitoring locations and frequencies for the MS4 outfalls in its inventory necessary to identify and eliminate sources of persistent flow non-storm water discharges pursuant to Provision D.2.b.(1).

(c) Based on the dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b, each Copermittee must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(1)(b);

(ii) Based on the data collected and applicable NALs in the Water Quality Improvement Plan, rank the MS4 outfalls in the Copermittee's jurisdiction according to potential threat to receiving water quality, and produce a prioritized list of major MS4 outfalls for follow-up action to update the Water Quality Improvement Plan, with the goal of eliminating persistent flow non-storm water discharges and/or pollutant loads in order of the ranked priority list through targeted programmatic actions and source investigations;

(iii) For the highest priority major MS4 outfalls with persistent flows that are in exceedance of NALs, identify the known and suspected sources within the Copermittee's jurisdiction in the Watershed Management Area that may cause or contribute to the NAL exceedances;

(iv) Each Copermittee must analyze the data collected pursuant to Provision D.2.b, and utilize a model or other method, to calculate or estimate the non-storm water volumes and pollutant loads collectively discharged from all the major MS4s outfalls in its jurisdiction identified as having persistent dry weather flows during the monitoring year. These calculations or estimates must be updated annually. ~~Each Copermittee must calculate or estimate:~~

[a] Each Copermittee must calculate or estimate:
Annual non-storm water volumes and pollutant loads collectively discharged from the Copermittee's major MS4 outfalls to receiving waters within the Copermittee's jurisdiction~~, with an estimate of the percent contribution from each known and suspected source for each MS4 outfall~~;

[b] Each Copermittee must ~~Annual non-storm water volumes and pollutant loads~~ identify and quantify, where feasible, sources of non-stormwater flows ~~from areas or facilities subject to~~ not subject to the Copermittee's legal authority that are discharged from the Copermittee's major MS4 outfalls to downstream receiving waters.

(v) Each Copermittee must review the data collected pursuant to Provision D.2.b and findings from the assessments required pursuant to Provision D.4.b.(1)(c)(i)-(iv) ~~on an annual basis to~~ once per Permit term to:

[a] Identify reductions and progress in achieving reductions in non-storm water and illicit discharges to the Copermittee's MS4 in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction, with an estimate, if possible, of the non-storm water volume and/or pollutant load reductions attributable to specific water quality strategies implemented by the Copermittee; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittee in the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction.

(vi) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(v).

(2) Storm Water Pollutant Discharges Reduction Assessments

(a) The Copermittees must assess and report the progress of the water quality improvement strategies, required to be implemented pursuant to Provisions B and E, toward reducing pollutants in storm water discharges from the MS4s within the Watershed Management Area as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(3), the assessments under Provision D.4.b.(2)(b) must be included in the first Annual Report required pursuant to Provision F.3.b.(1).

(ii) Based on the data collected pursuant to Provisions D.2.c, the assessments required under Provisions D.4.b.(2)(c)(i) and (ii) must be included when complete in the ~~first~~ Annual Report required pursuant to Provision F.3.b.(1), and annually thereafter.

(iii) Based on the data collected pursuant to Provisions D.2.c, the assessment required under Provisions D.4.b.(2)(c)-(d) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.a.(3) the Copermittees must assess and report the following:

(i) ~~The Copermittees must a~~Analyze the monitoring data collected pursuant to Provision D.2.a.(3), and utilize a watershed model or other method, to calculate or estimate storm water volumes and pollutant loads discharged from the MS4s in each Copermittee's

jurisdiction within the Watershed Management Area. The Copermittees must calculate or estimate the following for each monitoring year:

[a] The average storm water runoff coefficient for each land use type within the Watershed Management Area;

[b] The volume of storm water and pollutant loads discharged from each of the Copermittee's ~~major~~ monitored MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch;

~~[c] The pollutant loads discharged from each of the Copermittee's major MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch; and~~

~~[d] The percent contribution of storm water volumes and pollutant loads discharged from each land use type within the drainage basin to each of the Copermittee's major MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch.~~

[c] The total flow volume and pollutant loadings discharged from the Copermittee's jurisdiction within the Watershed Management Area over the course of the wet season, extrapolated from the data produced from the monitored outfalls.

(ii) Identify modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify ~~sources~~ pollutants in storm water discharges from the MS4s in the Watershed Management Area pursuant to Provision D.2.c.(1).

(c) Based on the wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.c the Copermittees must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(2)(b);

(ii) Based on the data collected and applicable SALs in the Water Quality Improvement Plan, analyze and compare the monitoring data to the analyses and assumptions used to develop the Water Quality Improvement Plans, including strategies developed per Provision B.3, and evaluate whether those analyses and assumptions should be updated as a component of the adaptive management efforts under Provision B.5,~~rank the MS4 outfalls in the Watershed Management Area according to potential threat to receiving water quality, and produce a prioritized list of major MS4 outfalls~~ for follow-up action to update the Water Quality Improvement Plan;

(iii) The Copermittees must review the data collected pursuant to Provision D.2.c and findings from the assessments required pursuant to Provisions D.4.b.(2)(c)(i)-(ii) ~~on an annual basis~~ once per Permit term to:

[a] Identify reductions and progress in achieving reductions in pollutant concentrations and/or pollutant loads from different land uses and/or drainage areas discharging from the Copermittees' MS4s in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters within the Watershed Management Area to the MEP, with an estimate, if possible, of the pollutant load reductions attributable to specific water quality strategies implemented by the Copermittees; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittees in the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters in the Watershed Management Area to the MEP.

(iv) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(iii).

(d) The Copermittees must evaluate all the data collected pursuant to Provision D.2.c, and incorporate new outfall monitoring data into time series plots for each long-term monitoring constituent for the Watershed Management Area, and perform statistical trends analysis on the cumulative long-term wet weather MS4 outfall discharge water quality data set.

c. Special Studies Assessments

The Copermittees must annually evaluate the results and findings from the special studies developed and implemented pursuant to Provision D.3, and assess their relevance to the Copermittees' efforts to characterize receiving water conditions, understand sources of pollutants and/or stressors, and control and reduce the discharges of pollutants from the MS4 outfalls to receiving waters in the Watershed Management Area. The Copermittees must report the results of the special studies assessments applicable to the Watershed Management Area, and identify any necessary modifications or updates to the Water Quality Improvement Plan based on the results in the Annual Reports required pursuant to Provision F.3.b.

d. Integrated Assessment of Water Quality Improvement Plan

As part of the iterative approach and adaptive management process required for the Water Quality Improvement Plan pursuant to Provision B.5, the Copermittees in each Watershed Management Area must integrate the data collected pursuant to Provisions D.1-D.3, the findings from the assessments required pursuant to Provisions D.4.a-c, and information collected during the implementation of the

jurisdictional runoff management programs required pursuant to Provision E to assess the effectiveness of, and identify necessary modifications to, the Water Quality Improvement Plan as follows:

(1) The Copermittees must re-evaluate the priority water quality conditions and numeric goals for the Watershed Management Area, as needed, during the term of this Order pursuant to Provision B.5.a. The re-evaluation and recommendations for modifications to the priority water quality conditions, and/or numeric goals and corresponding schedules may be provided in the Annual Reports required pursuant to Provision F.3.b, but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The priority water quality conditions and numeric goals for the Watershed Management Area must be re-evaluated as follows:

(a) Re-evaluate the receiving water conditions in the Watershed Management Area in accordance with Provision B.2.a;

(b) Re-evaluate the impacts on receiving waters in the Watershed Management Area from MS4 discharges in accordance with Provision B.2.b;

(c) Re-evaluate the identification of MS4 sources of pollutants and/or stressors in accordance with Provision B.2.d;

(d) Identify beneficial uses of the receiving waters that are protected or must be restored in accordance with Provision D.4.a;

(e) Evaluate the progress toward achieving the interim and final numeric goals for restoring impacted beneficial uses in the receiving waters.

(2) The Copermittees must re-evaluate the water quality improvement strategies for the Watershed Management Area during the term of this Order pursuant to Provision B.5.b. The re-evaluation and recommendations for modifications to the water quality improvement strategies and schedules must be provided in the ~~Annual Reports required pursuant to Provision F.3.b, and provided in the~~ Report of Waste Discharge pursuant to Provision F.5.b. The water quality improvement strategies for the Watershed Management Area must be re-evaluated as follows:

(a) Identify the non-storm water and storm water pollutant loads from the Copermittees' MS4 outfalls in the Watershed Management Area, calculated or estimated pursuant to Provisions D.4.b;

(b) Identify the non-storm water and storm water pollutant load reductions, or other improvements to receiving water or water quality conditions, that are necessary to attain the interim and final numeric goals for restoring impacted beneficial uses in the receiving waters;

(c) Identify the non-storm water and storm water pollutant load reductions, or other improvements to the quality of MS4 discharges, that are necessary for the Copermittees to demonstrate that non-storm water and storm water discharges from their MS4s are not causing or contributing to exceedances of receiving water limitations;

(d) Evaluate the progress of the water quality improvement strategies toward achieving the interim and final numeric goals for restoring impacted beneficial uses in the receiving waters.

(3) The Copermittees must re-evaluate and adapt the water quality monitoring and assessment program for the Watershed Management Area when new information becomes available to improve the monitoring and assessment program pursuant to Provision B.5.c. The re-evaluation and recommendations for modifications to the monitoring and assessment program may be provided in the Annual Reports required pursuant to Provision F.3.b, but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. Modifications to the water quality monitoring and assessment program must be consistent with the requirements of Provision D.1-D.3. The re-evaluation of the water quality monitoring and assessment program for the Watershed Management Area must consider the data gaps identified by the assessments required pursuant to Provisions D.4.a-b, and results of the special studies implemented pursuant to Provision D.4.c.

5. Monitoring Provisions

Each Copermittee must comply with all the monitoring, reporting, and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

E. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS

The purpose of this provision is for each Copermittee to implement a program to control the contribution of pollutants to and the discharges from the MS4 within its jurisdiction. The goal of the jurisdictional runoff management programs is to implement strategies that effectively prohibit non-storm water discharges to the MS4 and reduce the discharge of pollutants from the MS4~~in storm water~~ to the MEP. This goal will be accomplished through implementing the jurisdictional runoff management programs in accordance with the strategies identified in the Water Quality Improvement Plans. For the Santa Margarita River Watershed Management Area, the County of San Diego shall use the water quality priorities in the Santa Margarita River Watershed Urban Runoff Management Plan (developed pursuant to Order No. R9-2007-0001) to guide jurisdictional runoff management program implementation until notified by the San Diego Water Board that the Water Quality Improvement Plan developed in conjunction with the Riverside Copermittees has been approved.

Each Copermittee must update its jurisdictional runoff management program document, in accordance with Provision F.2.a, to incorporate all the requirements of Provision E. Until the Copermittee has updated its jurisdictional runoff management program document with the requirements of Provision E, the Copermittee must continue implementing its current jurisdictional runoff management program.

Modification of Jurisdictional Runoff Management Program Requirements

Modifications shall be considered and where selected, proposed according to the process in Provision B.5. Proposed modifications may increase, decrease, and/or replace minimum requirements identified in Provision E.

1. Legal Authority Establishment and Enforcement

a. Each Copermittee must establish, maintain, and enforce adequate legal authority within its jurisdiction to control pollutant discharges ~~into and~~ from its MS4 through statute, ordinance, permit, contract, order, or similar means. This legal authority must, at a minimum, authorize the Copermittee to:

(1) Effectively ~~P~~prohibit and eliminate all illicit discharges and illicit connections to its MS4;

(2) Control the contribution of pollutants in discharges of runoff associated with industrial and construction activity to its MS4 and control the quality of runoff from industrial and construction sites that do not~~, including industrial and construction sites which~~ have coverage under the statewide General Permit for Discharges of Storm Water Associated with Industrial Activities (Industrial General Permit) or General Permit for Discharges of Storm Water Associated with Construction Activities (Construction General Permit),~~ as well as to those sites which do not~~;

(3) Control the discharge of spills, dumping, or disposal of materials other than storm water into its MS4;

~~(4)~~ Coordinate, as possible, with other agencies to minimize the contribution of pollutant discharges from the Copermittee's portion of the MS4 to portions of the MS4 under another agency's jurisdiction and from other agency's portions of the MS4 to the portion of the MS4 under the Copermittee's jurisdiction~~Control through interagency agreements among Copermittees the contribution of pollutants from one portion of the MS4 to another portion of the MS4;~~

~~Control, by coordinating and cooperating with other owners of the MS4 such as Caltrans, the U.S. federal government, or sovereign Native American Tribes through interagency agreements, where possible, the contribution of pollutants from their portion of the MS4 to the portion of the MS4 within the Copermittee's jurisdiction~~;

~~(5)~~(4) Require compliance with conditions in its statutes, ordinances, permits, contracts, orders, or similar means to hold dischargers to its MS4 accountable for their contributions of pollutants and flows;

~~(6)~~(5) Require the use of BMPs to prevent or reduce the discharge of pollutants in ~~storm water~~ from its MS4 to the MEP;

~~(7)~~(6) Require documentation on the effectiveness of BMPs implemented to prevent or reduce the discharge of pollutants ~~in storm water~~ from its MS4 to the MEP;

~~(8)~~(7) Utilize enforcement mechanisms to require compliance with its statutes, ordinances, permits, contracts, orders, or similar means; and

~~(9)~~(8) Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with its statutes, ordinances, permits, contracts, orders, or similar means and with the requirements of this Order, including the effective prohibition of illicit discharges and connections to its MS4; the Copermittee must also have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from industrial facilities, including construction sites, discharging into its MS4.

b. With the first Annual Report required pursuant to Provision F.3.b, each Copermittee must submit a statement certified by its Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative that the Copermittee has taken the necessary steps to obtain and maintain full legal authority within its jurisdiction to implement and enforce each of the requirements contained in this Order.

2. Illicit Discharge Detection and Elimination

Each Copermittee must implement a program to actively detect and eliminate illicit discharges and improper disposal into the MS4, or otherwise require the discharger to apply for and obtain a separate NPDES permit. The illicit discharge detection and elimination program must be implemented in accordance with the strategies identified in the Water Quality Improvement Plan and include, at a minimum, the following requirements:

a. NON-STORM WATER DISCHARGES

To the extent allowable by law, ~~E~~each Copermittee must address all non-storm water discharges as illicit discharges, where the likelihood exists that they are a source of pollutants to waters of the U.S., unless a non-storm water discharge is either identified as a discharge authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to the following requirements:

(1) Discharges of non-storm water to the MS4 from uncontaminated pumped groundwater ~~the following categories~~ must be addressed as illicit discharges where there is evidence that suggests that they are the source of pollutants to waters of the U.S., unless the discharge has coverage under NPDES Permit No. CAG919001 (Order No. R9-2007-0034, or subsequent order) for discharges to San Diego Bay, or NPDES Permit No. CAG919002 (Order No. R9-2008-0002, or subsequent order) for discharges to surface waters other than San Diego Bay~~:~~.

~~(a) Uncontaminated pumped ground water;~~

~~(b) Discharges from foundation drains;[20]~~

~~(c) Water from crawl space pumps; and~~

~~(d) Water from footing drains.[19]~~

(2) Discharges of non-storm water from water line flushing and water main breaks to the MS4 must be addressed as illicit discharges unless the discharge has coverage under a valid NPDES Permit ~~No. CAG 679001 (Order No. R9-2010-0003~~, ~~(~~Order No. R9-2010-0003, or a subsequent order). This category includes water line flushing and water main break discharges from water purveyors under the Copermittee's jurisdiction that have been issued a water supply permit by the California Department of Public Health or

~~[20] Provision E.2.a.(1) only applies to this category on non-storm water if the system is designed to be located at or below the highest historical groundwater table to actively or passively extract groundwater during any part of the year.~~

federal military installations. Discharges from recycled or reclaimed water lines to the MS4 must be addressed as illicit discharges, unless the discharges have coverage under a separate NPDES permit.

(3) Discharges of non-storm water to the MS4 from the following categories must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a source of pollutants to receiving waters:

(a) Diverted stream flows;

(b) Rising ground waters;

(c) Uncontaminated ground water infiltration to MS4s;

(d) Springs;

(e) Flows from riparian habitats and wetlands;

(f) Discharges from potable water sources;

(g) Discharges from foundation drains;[21] and

(h) Discharges from footing drains.; [20] and

(h)(i) Water from crawl space pumps.

(4) Discharges of non-storm water to the MS4 from the following categories must be controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means where the Copermittees or the San Diego Water Board identifies those discharges are a source of pollutants to waters of the U.S.- Discharges of non-storm water to the MS4 from the following categories not controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means must be addressed by the Copermittee as illicit discharges.

(a) Air conditioning condensation

The discharge of air conditioning condensation must should be directed to landscaped areas, or other pervious surfaces where feasible, or to the sanitary sewer.

(b) Individual residential vehicle washing

[21] Provision E.2.a.(3) only applies to this category of non-storm water discharge if the system is designed to be located above the highest historical groundwater table at all times of the year, and the system is only expected to discharge non-storm water under unusual circumstances.

~~(i)~~ The discharge of wash water must be encouraged through public outreach and education;

(i) to be directed to landscaped areas or other pervious surfaces where feasible; and

(ii) to m~~M~~inimize the use of water for vehicle washing, use as little washing detergent and other vehicle wash products as possible, wash vehicles at commercial wash facilities, and implement other practices or behaviors that will prevent the discharge of pollutants associated with individual residential vehicle washing from entering the MS4.

(c) Dechlorinated swimming pool discharges should be managed as to:

(i) Eliminate residual chlorine, algaecide, filter backwash, or other pollutants from swimming pools prior to discharging to the MS4; and

(ii) The discharge of saline swimming pool water must be directed to the sanitary sewer, landscaped areas, or other pervious surfaces that can accommodate the volume of water, unless the saline swimming pool water can be discharged via a pipe or concrete channel directly to a naturally saline water body (e.g. Pacific Ocean).

(5) Firefighting discharges to the MS4 must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a significant source of pollutants to receiving waters. Firefighting discharges to the MS4 not identified as a significant source of pollutants to receiving waters, must be addressed, at a minimum, as follows:

(a) Non-emergency firefighting discharges

(i) Building fire suppression system maintenance discharges (e.g., sprinkler line flushing) to the MS4 must be addressed as illicit discharges unless BMPs are implemented to prevent the discharge of pollutants to the MS4.

(ii) Non-emergency firefighting discharges (i.e., discharges from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems) must be addressed by a program, to be developed and implemented by the Copermittee, to reduce or eliminate pollutants in such discharges from entering the MS4.

(b) Emergency firefighting discharges

Each Copermittee should develop and encourage implementation of BMPs to reduce or eliminate pollutants in emergency firefighting discharges to the MS4s and receiving waters within its jurisdiction. During emergency situations, priority of efforts should be directed toward life, property, and the environment (in descending order). BMPs should not interfere with immediate emergency response operations or impact public health and safety.

(6) If the Copermittee or San Diego Water Board identifies any category of non-storm water discharges listed under Provisions E.2.a.(1)-(4) as a source of pollutants to receiving waters, the category must be ~~prohibit~~effectively prohibited through ordinance, order, or similar means and addressed as an illicit discharge.

(7) Each Copermittee must, where feasible, reduce or effectively eliminate non-storm water discharges listed under Provisions E.2.a.(1)-(4) into its MS4 ~~whether or not the non-storm water discharge has been identified as an illicit discharge~~, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit.

b. PREVENT AND DETECT ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to prevent and detect illicit discharges to the MS4:

(1) Each Copermittee must maintain an updated map of its entire MS4 and the corresponding drainage areas. The accuracy of the MS4 map must be confirmed during the field screening required pursuant to Provision E.2.c. The MS4 map must be included as part of the jurisdictional runoff management program document. Any geographic information system (GIS) layers or files used by the Copermittee to maintain the MS4 map must be made available to the San Diego Water Board upon request. The MS4 map must identify the following:

(a) All segments of the MS4 owned, operated, and maintained by the Copermittee;

(b) All known locations of inlets that discharge and/or collect runoff into the Copermittee's MS4;

(c) All known locations of connections with other MS4s not owned or operated by the Copermittee (e.g. Caltrans MS4s);

(d) All known locations of Major MS4 outfalls and private outfalls that discharge runoff collected from areas within the Copermittee's jurisdiction;

(e) All segments of receiving waters within the Copermittee's jurisdiction that

receive and convey runoff discharged from the Copermittee's MS4 outfalls;

(f) Locations of the MS4 outfalls, identified pursuant to Provision D.2.a.(1), within its jurisdiction; and

(g) Locations of the non-storm water persistent flow MS4 outfall discharge monitoring stations, identified pursuant to Provision D.2.b.(2)(b), within its jurisdiction.

(2) Each Copermittee must use Copermittee personnel and contractors to assist in identifying and reporting illicit discharges and connections during their daily employment activities.

(3) Each Copermittee must promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges to or from the MS4, including the following methods for public reporting:

(a) Operate a public hotline, which can be Copermittee-specific or shared by the Copermittees, and must be capable of receiving reports in both English and Spanish 24 hours per day and seven days per week; and

(b) Designate an e-mail address for receiving electronic reports from the public, which can be Copermittee-specific or shared by the Copermittees, and must be prominently displayed on the Copermittee's webpage and the Regional Clearinghouse required pursuant to Provision F.4.

(4) Each Copermittee must implement practices and procedures (including a notification mechanism) to prevent, respond to, contain, and clean up any spills that may discharge into the MS4 within its jurisdiction from any source. The Copermittee must coordinate, to the extent possible, with spill response teams to prevent entry of spills into the MS4, and prevent contamination of surface waters of the U.S.~~water, ground water, and soil.~~ The Copermittee must coordinate spill prevention, containment, and response activities throughout all appropriate Copermittee departments, programs, and agencies.

(5) Each Copermittee must implement practices and procedures to prevent and limit infiltration of seepage from sanitary sewers (including private laterals and failing septic systems) to the MS4.

(6) Each Copermittee ~~must~~ shall coordinate, when necessary, with upstream Copermittees and/or entities to prevent illicit discharges from upstream sources into the MS4 within its jurisdiction.

c. FIELD SCREENING

Each Copermittee must conduct field screening (i.e. visual observations, field testing, and/or analytical testing) of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4 in accordance with the dry weather MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

d. INVESTIGATE AND ELIMINATE ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to investigate and eliminate illicit discharges to the MS4:

(1) Each Copermittee must prioritize and determine when follow-up investigations will be performed in response to visual observations and/or water quality monitoring data collected during an investigation of a detected non-storm water or illicit discharge to or from the MS4. The criteria for prioritizing investigations must consider the following:

(a) Pollutants identified as causing or contributing to the highest water quality priorities identified in the Water Quality Improvement Plan;

(b) Pollutants identified as causing or contributing, or threatening to cause or contribute to impairments in water bodies on the 303(d) List and/or in environmentally sensitive areas (ESAs), located within its jurisdiction;

(c) Pollutants identified from sources or land uses known to exist within the area, drainage basin, or watershed that discharges to the portion of the MS4 within its jurisdiction included in the investigation;

(d) Pollutants identified as causing or contributing to an exceedance of a NAL in the Water Quality Improvement Plan where the source has not been identified as natural; and

(e) Pollutants identified as a threat to human health or the environment.

(2) Each Copermittee must implement procedures to investigate and inspect portions of its MS4 that, based on reports or notifications, field screening, or other appropriate information, indicate a reasonable potential of ~~receiving, containing, or~~ discharging pollutants due to illicit discharges, illicit connections, or other sources of non-storm water. The procedures must include the following:

(a) Each Copermittee must develop criteria to:

(i) Assess the validity of each report or notification received; and

(ii) Prioritize the response to each report or notification received.

(b) Each Copermittee must prioritize and respond to each valid report or notification (e.g., public reports, staff or contractor reports and notifications, etc.) of an incident in a timely manner.

(c) In accordance with the procedures defined in Provision E.2.d.(1), ~~E~~each Copermittee must investigate and seek to identify the source(s) of discharges of non-storm water where flows are observed in and from the MS4 during the field screening required pursuant to Provision D.2.b.(1) as follows:

(i) Obvious illicit discharges (i.e., unusual color or odor) must be immediately investigated to identify the source(s) of non-storm water discharges;

(ii) The investigation must include field investigations to identify sources or potential sources for the discharge, unless the source or potential source has already been identified during previous investigations; and

(iii) The investigation may include follow-up field investigations and/or reviewing Copermittee inventories and other land use data to identify potential sources of the discharge.

(d) Each Copermittee must maintain records and a database of the following information:

(i) Location of incident, including hydrologic subarea, portion of MS4 receiving the non-storm water or illicit discharge, and point of discharge or potential discharge from MS4 to receiving water;

(ii) Source of information initiating the investigation (e.g., public reports, staff or contractor reports and notifications, field screening, etc.);

(iii) Date the information used to initiate the investigation was received;

(iv) Date the investigation was initiated;

(v) Dates of follow-up investigations;

(vi) Identified or suspected source of the illicit discharge or connection, if determined;

(vii) Known or suspected related incidents, if any;

(viii) Result of the investigation; and

(ix) If a source cannot be identified and the investigation is not continued, document the response per the requirements of Provision E.2.d.(3) ~~a rationale for why a discharge does not pose a threat to water quality~~

~~and/or does not require additional investigation~~.

(e) Each Copermittee must ~~track~~ document and, if readily identifiable in accordance with Provision E.2.d.(1) procedures, seek to identify the source(s) of non-storm water discharges from the MS4 where there is evidence of non-storm water having been discharged into or from the MS4 (e.g., ~~pooled~~ flowing water), in accordance with MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.

(3) Each Copermittee must initiate the implementation of procedures, in a timely manner, to eliminate all detected and identified illicit discharges and connections within its jurisdiction. The procedures must include the following responses:

(a) Each Copermittee must enforce its legal authority, as required under Provision E.1, to eliminate illicit discharges and connections to the MS4.

(b) If the Copermittee identifies the source as a controllable source of non-storm water or illicit discharge or connection, the Copermittee must implement its Enforcement Response Plan pursuant to Provision E.6 and enforce its legal authority to effectively prohibit and eliminate illicit discharges and connections to its MS4.

(c) If the Copermittee identifies the source of the discharge as a category of non-storm water discharges in Provision E.2.a, and the discharge is in exceedance of NALs in the Water Quality Improvement Plan, then the Copermittee must determine if: (1) this is an isolated incident or set of circumstances that will be addressed through its Enforcement Response Plan pursuant to Provision E.6, or (2) the category of discharge must be addressed through the effective prohibition of that category of discharge as an illicit discharge pursuant to Provision E.2.a.(6).

(d) If the Copermittee suspects the source of the non-storm water discharge as natural in origin (i.e. non-anthropogenically influenced) and in conveyance into the MS4, then the Copermittee must document and provide the data and evidence necessary to demonstrate to the San Diego Water Board that it is natural in origin and does not require further investigation.

(e) If the Copermittee is unable to identify and document the source of a recurring non-storm water discharge to or from the MS4, then the Copermittee must address the discharge as an illicit discharge and update its jurisdictional runoff management program to address the common and suspected sources of the non-storm water discharge within its jurisdiction in accordance with the Copermittee's priorities.

(4) Each Copermittee must submit a summary of the non-storm water discharges

and illicit discharges and connections investigated and eliminated within its jurisdiction with each Annual Report required under Provision F.3.b of this Order.

e. STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the illicit discharge detection and elimination program to address non-storm water and illicit discharges and connections that the Copermittee has identified as potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, and/or increase/decrease frequency of inspections in specific areas); and

(2) The strategies and/or activities must be consistent with the requirements of Provisions E.2.a-d and the strategies identified in the Water Quality Improvement Plan.

3. Development Planning

Each Copermittee~~-~~, within their respective jurisdictions and to the extent that they may lawfully impose requirements, must ~~use their land use and planning authorities to~~ implement a development planning program in accordance with the strategies identified in the Water Quality Improvement Plan and includes, at a minimum, the following requirements:

a. BMP REQUIREMENTS FOR ALL DEVELOPMENT PROJECTS

Each Copermittee, as practical and feasible, must prescribe the following BMP requirements during the planning process (i.e. prior to project approval and issuance of local permits) for all development projects (regardless of project type or size), where local permits are issued, including unpaved roads and flood management projects, except emergency projects implemented for the protection of persons and property:

(1) General Requirements

(a) Onsite BMPs must be located so as to remove pollutants from runoff prior to its discharge to any receiving waters, and as close to the source as possible; and

(b) Structural BMPs must not be constructed within a water~~s~~ of the U.S. unless authorized by the San Diego Water Board Executive Officer~~or~~

~~waters of the state~~.

(2) Source Control BMP Requirements

The following source control BMPs must be implemented at all development projects where applicable and feasible:

(a) Prevention of illicit discharges into the MS4;

(b) Storm drain system stenciling or signage;

(c) Properly designed outdoor material storage areas;

(d) Properly designed outdoor work areas;

(e) Properly designed trash storage areas; and

(f) Any additional BMPs necessary to minimize pollutant generation at each project.

(3) Low Impact Development (LID) BMP Requirements

The following LID BMPs must be implemented at all development projects where applicable and feasible:

(a) Maintenance or restoration of natural storage reservoirs and drainage corridors (including topographic depressions, areas of permeable soils, natural swales, and ephemeral and intermittent streams);[22]

(b) Buffer zones for natural water bodies (where buffer zones are technically infeasible, require project applicant to include other buffers such as trees, access restrictions, etc.);

(c) Conservation of natural areas within the project footprint including existing trees, other vegetation, and soils;

(d) Construction of streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided public safety is not compromised;

(e) Minimization of the impervious footprint of the project;

(f) Minimization of soil compaction to landscaped areas;

[22] Development projects proposing to dredge or fill materials in waters of the U.S. must obtain a CWA Section 401 Water Quality Certification. Projects proposing to dredge or fill waters of the state must obtain waste discharge requirements.

(g) Disconnection of impervious surfaces through distributed pervious areas;

(h) Landscaped or other pervious areas designed and constructed to effectively receive and infiltrate, retain and/or treat runoff from impervious areas, prior to discharging to the MS4;

(i) Small collection strategies located at, or as close as possible to, the source (i.e. the point where storm water initially meets the ground) to minimize the transport of runoff and pollutants to the MS4 and receiving waters;

(j) Use of permeable materials for projects with low traffic areas and appropriate soil conditions;

(k) Landscaping with native or drought tolerant species; and

(l) Harvesting and using precipitation.

b. PRIORITY DEVELOPMENT PROJECTS

(1) Definition of Priority Development Project

Priority Development Projects include the following:

(a) All new development projects that fall under the Priority Development Project categories listed under Provision E.3.b.(2) (where a new development project feature, such as a parking lot, falls into a Priority Development Project category, the entire project footprint is subject to Priority Development Project requirements); and

(b) Those redevelopment projects that create, add, or replace at least 5,000 square feet of impervious surfaces on an already developed site, and the redevelopment project is a Priority Development Project category listed under Provision E.3.b.(2) (where redevelopment results in an increase of less than fifty percent of the impervious surfaces of a previously existing development and was not subject to previous Priority Project Development requirements, and the existing development was not subject to Priority Development Project requirements, the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) apply only to the addition or replacement, and not to the entire development; where redevelopment results in an increase of more than fifty percent of the impervious surfaces of a previously existing development, the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) apply to the entire development).

~~(b)~~(c) Projects where redevelopment results in an increase of more than fifty percent of impervious surfaces of a previously existing development,

and the existing development was subject to previous Priority Project Development Requirements, only the altered portion of development is subject to the new Priority Development Project requirements.

(2) Priority Development Project Categories

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This category includes commercial, industrial, residential, mixed-use, and public development projects on public or private land which fall under the planning and building authority of the Copermittee.

~~(b) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.~~

~~(c) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812), where the land area for development is 5,000 square feet or more.~~

~~(d) Hillside development projects. This category includes any development which creates 5,000 square feet or more of impervious surface which is located in an area with known erosive soil conditions, where the development will grade on any natural slope that is twenty-five percent or greater.~~

~~(e) Environmentally sensitive areas (ESAs). This category includes any development located within, directly adjacent to, or discharging directly to an ESA, which either creates 2,500 square feet of impervious surface on a proposed project site or increases the area of imperviousness of a proposed project site to 10 percent or more of its naturally occurring condition. "Directly adjacent to" means situated within 200 feet of the ESA. "Discharging directly to" means outflow from a drainage conveyance system that collects runoff from the subject development or redevelopment site and terminates at or in receiving waters within the ESA.~~

~~(f) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce that has 5,000 square feet or more of impervious surface.~~

~~(g) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface that is 5,000 square feet or more~~

~~used for the transportation of automobiles, trucks, motorcycles, and other vehicles.~~

~~(h) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.~~

(b) Development projects that create 5,000 square feet or more of impervious surfaces (collectively over the entire project site), and support one or more of the following uses (see Appendix C for definitions):

(i) Automotive repair shop

(ii) Restaurant

(iii) Parking lot

(iv) Street, road, highway, freeway and driveway

(v) Retail gasoline outlet (RGO)

~~(i)~~(c) Development projects that create 2,500 square feet or more of impervious surfaces (collectively over the entire project site) and where the project will directly discharge to an Environmentally Sensitive Area (see Appendix C for definitions).

~~(j)~~(d) Large development projects. This category includes any post-construction pollutant-generating new development projects that result in the disturbance of one acre or more of land.

(3) Priority Development Project Exemptions

Each Copermittee has the discretion to exempt the following projects from being defined as Priority Development Projects:

(a) New paved sidewalks, bicycle lanes, driveways, or trails that meet the following criteria:

(i) Designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas; OR

(ii) Designed and constructed to be hydraulically disconnected from paved streets or roads; OR

(iii) Designed and constructed with permeable pavements or surfaces in accordance with USEPA Green Streets guidance.[23]

[23] See "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).

(b) Any paved impervious surface that is 5,000 square feet or more used for the transportation of automobiles, trucks, motorcycles, and other vehicles that follows the USEPA guidance regarding Managing Wet Weather with Green Infrastructure: Green Streets, or equivalent standards, to the maximum extent practicable.

~~(b) Retrofitting of existing paved alleys, streets or roads that meet the following criteria:~~

~~(i) Must be two lanes or less; AND~~

~~(ii) Must be a retrofitting project implemented as part of an alternative compliance project option under Provision E.3.c.(3)(b)(v) to achieve the performance requirements of Provisions E.3.c.(1) and/or E.3.c.(2) for a Priority Development Project; AND~~

~~(iii) Designed and constructed in accordance with the USEPA Green Streets guidance.~~[24]

(c) New single family residences that meet the following criteria:

(i) Must not be constructed as part of a larger development or proposed subdivision; AND

(ii) Designed and constructed to meet requirements for certification ~~to be certified~~ under ~~-~~the U.S. Green Building Council (USGCB) Leadership in Energy and Environmental Design (LEED) for Homes green building certification program, receiving at least four (4) Surface Water Management credits under the Sustainable Sites category~~;~~, [25] or other locally accepted certification of equivalent effectiveness; OR

(iii) Designed and constructed with ~~structural~~ BMPs that will achieve ~~the~~ equivalent performance to the requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite, OR

~~(iii)~~(iv) Designed and constructed with structural BMPs that meet minimum performance standards, as outlined in the BMP Design Manual.

(d) Redevelopment of existing single family residences that meet the following criteria:

(i) Designed and constructed to meet requirements for certification ~~to be certified~~ under the USGCB LEED for Homes green building certification program, receiving at least four (4) Surface Water

~~[24] Ibid.~~

[25] See LEED for Homes rating system at http://www.usgbc.org

Management credits under the Sustainable Sites category~~;~~, [26] or other locally accepted certification of equivalent effectiveness; OR

(ii) Designed and constructed with ~~structural~~ BMPs that will achieve ~~the~~ equivalent performance to the requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite; OR

(iii) Designed and constructed with structural BMPs that meet minimum performance standards, as outlined in the BMP Design Manual.

c. Priority Development Project Structural BMP Performance Requirements

In addition to the BMP requirements listed for all development projects under Provision E.3.a, Priority Development Projects must also implement structural BMPs that conform to performance requirements below. Alternatively, watershed-specific performance requirements may be developed as part of a Water Quality Improvement Plan; these requirements would replace the general performance requirements below. Watershed-specific requirements must provide at least equivalent protection as the general performance requirement below.

(1) Storm Water Pollutant Control BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite structural BMPs to control pollutants in storm water that may be discharged from a project as follows:

(a) Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite the pollutants contained in the design capture volume. The design capture volume is equivalent to:

(i) The volume of storm water produced from a 24-hour 85th percentile storm event;[27] OR

(ii) The volume of storm water that would be retained onsite prior to the project~~if the site was fully undeveloped and naturally vegetated~~, as determined using continuous simulation modeling or other techniques based on site-specific soil conditions and ~~typical native~~ vegetative cover.

[26] See LEED for Homes rating system at http://www.usgbc.org

[27] This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals. The volume is a single event-based volume that occurs after an extended dry period.

(b) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) to comply with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1)(a).

(c) If a Priority Development project is allowed to utilize alternative compliance pursuant to Provisions E.3.c.(1)(b), flow-thru conventional treatment control BMPs must be implemented to treat the portion of the design capture volume that is not retained onsite. Additionally, project applicants must mitigate for the portion of the pollutant load in the design capture volume that is not retained onsite through one or more alternative compliance options under Provision E.3.c.(3). Conventional treatment control BMPs must be sized and designed to:

(i) Remove pollutants from storm water to the MEP;

(ii) Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;

(iii) Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Conventional treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of conventional treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

(2) Hydromodification Management BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite structural BMPs to manage hydromodification that may be caused by storm water runoff discharged from a project as follows:

(a) Post-project runoff flow rates and durations must not exceed pre-project~~development (naturally occurring)~~ runoff flow rates and durations by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat conditions downstream of Priority Development Projects).

(i) In evaluating the range of flows that results in increased potential for erosion of natural (non-hardened) channels, the lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks.

~~(ii) For artificially hardened channels, analysis to identify the lower boundary must use characteristics of a natural stream segment similar to that found in the watershed. The lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or erodes the toe of the channel banks.~~

~~(iii)~~(ii) The Copermittees may use monitoring results collected pursuant to Provision D.1.a.(2) to re-define the range of flows resulting in increased potential for erosion, or degraded instream habitat conditions, as warranted by the data.

(b) In accordance with the BMP Design Manual, projects shall preserve or provide compensation for significant losses of sediment supply anticipated as a result of development. ~~Post-project runoff flow rates and durations must compensate for the loss of sediment supply due to the development project, should loss of sediment supply occur as a result of the development project.~~

(c) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) to comply with the performance requirements of Provisions E.3.c.(2)(a)-(b).

(d) Exemptions

Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provisions E.3.c.(2)(a)-(b) where the project:

(i) Discharges storm water runoff into existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, tidally influenced waters, or the Pacific Ocean;

(ii) Discharges stormwater runoff into conveyance channels whose bed and bank are stabilized (e.g. concrete lined, an engineering interlocking paver, gabion system, etc.) all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, tidally influenced waters, or the Pacific Ocean;

~~(ii)~~(iii) Is a redevelopment Priority Development Project that meets the alternative compliance requirements of Provision E.3.c.(3)(b)(ii); or

~~(iii)~~(iv) Discharges storm water runoff into other areas identified by the San Diego Water Board as exempt, including those exemptions recognized in the 2010 San Diego Hydromodification Plan, approved by the San Diego Water Board Resolution No. R9-2010-0066, from the requirements of Provisions E.3.c.(2)(a)-(b).

(3) Alternative Compliance to Onsite Structural BMP Performance Requirements

Alternative compliance is an optional program for each jurisdiction to utilize if it is determined to provide an equivalent or greater benefit to the watershed than onsite compliance. Where alternative compliance is allowed, the determination of the responsible party to execute the onsite alternative compliance is at the jurisdiction's discretion and in accordance with policies set in place in the individual jurisdiction or in coordination with other jurisdictions, agencies, or Copermittees:

(a) Applicability

At the discretion of each Copermittee, Priority Development Projects may be allowed to utilize an alternative option to comply with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) under the following conditions:

(i) The Copermittee must determine that implementation of the alternative compliance option will have an equal or greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite;

(ii) The alternative compliance options must be designed by a registered professional engineer, geologist, architect, biologist, hydrologist, or landscape architect, or other appropriate certified professional;

(iii) The alternative compliance options must be implemented within the same ~~hydrologic unit~~ Watershed Management Area as the Priority Development Project, and preferably within the same hydrologic subarea;

~~(iv) Receiving waters must not be utilized to convey storm water runoff to the alternative compliance options;~~

~~(v) The pollutants in storm water runoff from the Priority Development Project must be treated to the MEP by the alternative compliance options prior to being discharged to receiving waters;~~

~~(vi)~~(iv) Unless otherwise allowed by Provision E.3.c.(3)(b), the alternative compliance options must have a net result of at least the same level of pollutant removal as would have been achieved if the Priority Development Project had fully complied with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1) onsite;

~~(vii)~~(v) Unless otherwise allowed by Provision E.3.c.(3)(b), the alternative compliance options must have a net result of at least the same level of protection from potential downstream and upstream erosion in the receiving water as would have been achieved if the Priority

Development Project had fully complied with the hydromodification management BMP performance requirements of Provision E.3.c.(2) onsite; and

~~(viii)~~(vi) The alternative compliance options utilized by the Priority Development Project to comply with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) must have reliable sources of funding for operation and maintenance.

(b) Alternative Compliance Project Options

The Copermittee may allow implementation of one or more of the following project options as part of an alternative approach to complying with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2):

(i) *Onsite LID Biofiltration Treatment Control BMPs*

The Copermittee may allow Priority Development Projects to utilize onsite LID biofiltration treatment control BMPs to comply with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1). Onsite LID biofiltration treatment control BMPs must be sized and designed to:

[a] Remove pollutants from storm water to the MEP; AND
[b] Have an appropriate surface loading rate to prevent erosion, scour and channeling within the BMP; AND
[c] Biofilter at least 1.5 times the design capture volume that is not reliably retained onsite; OR
[d] Biofilter up to the design capture volume that is not reliably retained onsite, AND 1) treat the remaining portion of the design capture volume not retained onsite with conventional treatment control BMPs in accordance with Provision E.3.c.(1)(c), and 2) if necessary, mitigate for the portion of the pollutant load in the design capture volume not retained onsite through one or more alternative compliance project, in-lieu fee and/or water quality credit system options below.

(ii) *LEED Certified Redevelopment Projects*

The Copermittee may ~~allow~~ exempt redevelopment Priority Development Projects ~~to comply with~~ from the hydromodification management BMP performance requirements of Provision E.3.c.(2) where the project is designed and constructed to be certified under the USGCB LEED for New Construction and Major Renovations green building certification program or other locally accepted certification of equivalent effectiveness. The Priority Development Project must receive at least one (1) Site Design credit and two (2)

Stormwater Design credits under the Sustainable Sites category.[28] In addition, the existing and future configuration of the receiving water must not be unnaturally altered or adversely impacted by storm water flow rates and durations discharged from the site.

(iii) *Watershed-Based Planned Development Projects*

The Copermittee may allow Priority Development Projects greater than 100 acres in total project size (or smaller than 100 acres in size yet part of a larger common plan of development that is over 100 acres) to comply with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) under~~. The Priority Development Project must comply with~~ the following conditions:

[a] The Priority Development Project was planned utilizing watershed and/or subwatershed based water quality, hydrologic, and fluvial geomorphologic planning principles that implement regional LID BMPs in accordance with the performance and location criteria of this Order and acceptable to the San Diego Water Board;

[b] Regional LID BMPs may be used provided that the BMPs capture and retain the volume of runoff produced from the design capture volume defined in Provision E.3.c.(1)(a)(i) and that such controls are located upstream of receiving waters;

[c] Regional LID BMPs must clearly exhibit that they will not result in a net impact from pollutant loadings over and above the impact caused by capture and retention of the design capture volume;

[d] Any portion of the design capture volume that is not retained by the regional LID BMPs must be treated using biofiltration BMPs; and

[e] Where regional LID BMPs are demonstrated to the Copermittee as technically infeasible to retain the entire design capture volume, any volume up to and including the design capture volume not retained by regional LID BMPs, nor treated by biofiltration BMPs, must be treated using conventional treatment control BMPs and the project applicant must implement additional alternative compliance project, in-lieu fee and/or water quality credit system options below.

(iv) *Offsite Regional BMPs*

[a] The Copermittee may allow Priority Development Projects to utilize offsite regional BMPs to comply with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1) if the offsite regional BMPs have the capacity to receive and retain at least 1.1 times the design capture volume that is not reliably retained onsite.

[28] See LEED for New Construction and Major Renovations rating system at http://www.usgbc.org

[b] The Copermittee may allow Priority Development Projects to utilize offsite regional BMPs to comply with the hydromodification management BMP performance requirements of Provision E.3.c.(2) if the offsite regional BMPs ~~have the capacity to manage the storm water flows rates and durations from the site such that the receiving waters are protected from the potential for increased erosion that would be caused if the unmanaged portion of the runoff was discharged from the site~~will have a greater overall receiving water benefit within the Watershed Management Area than implementation of the hydromodification controls onsite.

(v) *Offsite Retrofitting Projects*

The Copermittee may allow Priority Development Projects to utilize offsite retrofitting projects to comply with the storm water pollutant control and hydromodification management BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) if the retrofitting projects have been identified within the strategies included in the Water Quality Improvement Plan, or identified as potential retrofitting projects by the Copermittee pursuant to Provision E.5.

(vi) *Offsite Channel, Stream, or Habitat Rehabilitation Projects*

The Copermittee may allow Priority Development Projects to utilize offsite channel, stream, or habitat rehabilitation projects to comply with the hydromodification management BMP performance requirements of Provision E.3.c.(2) if the rehabilitation projects have been identified within the strategies included in the Water Quality Improvement Plan, or identified as potential channel rehabilitation projects by the Copermittee pursuant to Provision E.5. The channel, stream, or habitat rehabilitation project cannot be utilized for pollutant treatment ~~except~~ unless constructed with an artificial wetland.~~where artificial wetlands are constructed and located upstream of receiving waters~~.

(vii) *Offsite Regional Water Supply Augmentation Projects*

The Copermittee may allow Priority Development Projects to utilize offsite regional water supply augmentation projects (i.e. groundwater recharge, recycled water, storm water harvesting) to comply with the storm water pollutant control and hydromodification management BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) if the projects have been identified within the strategies included in the Water Quality Improvement Plan.

(viii) *Project Applicant Proposed Alternative Compliance Projects*

The Copermittee may allow one or more Priority Development Project applicant(s) to propose and implement alternative compliance

projects to comply with the storm water pollutant control and hydromodification management BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) if the alternative compliance projects are consistent with, and will address the highest water quality priorities of the Water Quality Improvement Plan, and comply with the requirements of Provision E.3.c.(3)(a).

(c) Alternative Compliance In-Lieu Fee Option

The Copermittee may develop and implement an alternative compliance in-lieu fee option, individually or with other Copermittees and/or entities, as a means for designing, developing, constructing, operating and/or maintaining offsite alternative compliance projects under Provision E.3.c.(3)(b). Priority Development Projects allowed to utilize the alternative compliance in-lieu fee option must comply with the following conditions:

(i) The in-lieu fee must be transferred to the Copermittee (for public projects) or an escrow account (for private projects) prior to the construction initiation date ~~construction~~ of the Priority Development Project ~~is initiated~~.

(ii) If the in-lieu fee is applied to the development, design, ~~and~~ construction, operation and maintenance of offsite alternative compliance projects, the following conditions must be met:

[a] The offsite alternative compliance projects must allow the Priority Development Project to comply with the onsite BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2);

[b] The offsite alternative compliance projects must be constructed as soon as possible, but no later than ~~4~~ 8 years after the certificate of occupancy is granted for the first Priority Development Project that contributed funds toward the construction of the offsite alternative compliance projects, unless a longer period of time is authorized by the San Diego Water Board Executive Officer;

~~[c] The in-lieu fee for the Priority Development Project must include mitigation of the pollutant loads and increased storm water flow rates and durations that are allowed to discharge from the site before the offsite alternative compliance projects are constructed; and~~

[d] The in-lieu fee must ~~also~~ include the cost to operate and maintain the offsite alternative compliance projects for the anticipated life of the constructed priority development project.

(iii) If the in-lieu fee ~~is applied~~ applies only to the operation and maintenance of offsite alternative compliance projects that have

already been constructed, the offsite alternative compliance projects must allow the Priority Development Project to comply with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2).

(d) Alternative Compliance Water Quality Credit System Option

The Copermittee may develop and implement an alternative compliance water quality credit system option, individually or with other Copermittees and/or entities, provided that such a credit system clearly exhibits that it will not allow discharges from Priority Development Projects to cause or contribute to a net impact over and above the impact caused by projects meeting the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2). Any credit system that a Copermittee chooses to implement must be submitted to the San Diego Water Board Executive Officer for review and acceptance as part of the Water Quality Improvement Plan.

~~(3)~~(4) Long-Term Structural BMP Maintenance

Each Copermittee must require the project applicant to submit proof of the mechanism under which ongoing long-term maintenance of all structural BMPs will be conducted.

~~(4)~~(5) Infiltration and Groundwater Protection

(a) Structural BMPs designed to primarily function as large, centralized infiltration devices (such as large infiltration trenches and infiltration basins) must not cause or contribute to an exceedance of an applicable groundwater quality objective. At a minimum, such infiltration BMPs must be in conformance with the design criteria listed below, unless the development project applicant demonstrates to the Copermittee that one or more of the specific design criteria listed below are not necessary to protect groundwater quality. The design criteria listed below do not apply to small infiltration systems dispersed throughout a development project.

(i) Runoff must undergo pretreatment such as sedimentation or filtration prior to infiltration;

(ii) Pollution prevention and source control BMPs must be implemented at a level appropriate to protect groundwater quality at sites where infiltration BMPs are to be used;

(iii) Infiltration BMPs must be adequately maintained to remove pollutants in storm water to the MEP;

(iv) The vertical distance from the base of any infiltration BMP to the seasonal high groundwater mark must be at least 10 feet. Where

groundwater basins do not support beneficial uses, this vertical distance criteria may be reduced, provided groundwater quality is maintained;

(v) The soil through which infiltration is to occur must have physical and chemical characteristics (e.g., appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses;

(vi) Infiltration BMPs must not be used for areas of industrial or light industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee, unless runoff does not exceed Basin Plan water quality standards or runoff is first treated or filtered to remove pollutants prior to infiltration; and

(vii) Infiltration BMPs must be located a minimum of 100 feet horizontally from any water supply wells.

(b) The Copermittee may develop, individually or with other Copermittees, alternative mandatory design criteria to that listed above for infiltration BMPs which are designed to primarily function as centralized infiltration devices. Before implementing the alternative design criteria in the development planning process the Copermittee(s) must:

(i) Notify the San Diego Water Board of the intent to implement the alternative design criteria submitted; and

(ii) Comply with any conditions set by the San Diego Water Board.

d. BMP Design Manual Update

Each Copermittee must update its BMP Design Manual[29] pursuant to Provision F.2.b. Until the Copermittee has updated its BMP Design Manual with the requirements of Provisions E.3.a-c, the Copermittee must continue implementing its current BMP Design Manual. Unless directed otherwise by the San Diego Water Board, the Copermittee must implement the BMP Design Manual within 180 days of completing the update. The update of the BMP Design Manual must include the following:

(1) Updated procedures to determine the nature and extent of storm water requirements applicable to a potential development or redevelopment projects. These procedures must inform project applicants of the storm water management requirements applicable to their project including, but not limited to, general requirements for all development projects, structural BMP design procedures and requirements, hydromodification management requirements, requirements specific to phased projects, and procedures specific to private

[29] The BMP Design Manual was formerly known as the Standard Storm Water Mitigation Plan under Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016.

developments and public improvement projects;

(2) Updated procedures to identify pollutants and conditions of concern for selecting the most appropriate structural BMPs that consider, at a minimum, the following:

(a) Receiving water quality (including pollutants for which receiving waters are listed as impaired under the CWA section 303(d) List);

(b) Pollutants, stressors, and/or receiving water conditions that cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(c) Land use type of the project and pollutants associated with that land use type; and

(d) Pollutants expected to be present onsite.

(3) Updated procedures for designing structural BMPs, including any updated performance requirements to be consistent with the requirements of Provision E.3.c for all structural BMPs listed in the BMP Design Manual;

(4) Long-term maintenance criteria for each structural BMP listed in the BMP Design Manual; and

(5) Alternative compliance criteria, in accordance with the requirements under Provision E.3.c.(3), if the Copermittee elects to allow Priority Development Projects within its jurisdiction to utilize alternative compliance.

e. PRIORITY DEVELOPMENT PROJECT BMP IMPLEMENTATION AND OVERSIGHT

Each Copermittee must implement a program that requires and confirms structural BMPs on all Priority Development Projects are designed, constructed, and maintained to remove pollutants in storm water to the MEP.

(1) Structural BMP Approval and Verification Process

(a) Each Copermittee must require and confirm that for all Priority Development Project applications that have not received prior lawful approval by the Copermittee by 18 months after the commencement of coverage under this Order, the requirements of Provision E.3 are implemented. For project applications that have received prior lawful approval by 18 months after the commencement of coverage under this Order, the Copermittee may allow previous land development requirements to apply.

(b) Each Copermittee must identify the roles and responsibilities of various municipal departments in implementing the structural BMP requirements,

including each stage of a project from application review and approval through BMP maintenance and inspections.

(c) Each Copermittee must require and confirm that appropriate easements and ownerships are properly recorded in public records~~ and the information is conveyed to all appropriate parties when there is a change in project or site ownership~~.

(d) Each Copermittee must require and confirm that prior to occupancy and/or intended use of any portion of the Priority Development Project, each structural BMP is inspected to verify that it has been constructed and is operating in compliance with all of its specifications, plans, permits, ordinances, and the requirements of this Order.

(2) Priority Development Project Inventory and Prioritization

(a) Each Copermittee must develop, maintain, and update~~ at least annually~~regularly, a watershed-based database to track and inventory all Priority Development Projects and associated structural BMPs within its jurisdiction. Inventories must be accurate and complete beginning from January 2002 for the San Diego County Copermittees, February 2003 for the Orange County Copermittees, and July 2005 for the Riverside County Copermittees, where data is available. The use of an automated database system, such as GIS, is highly recommended. The database must include, at a minimum, the following information:

(i) Priority Development Project location (address and hydrologic subarea);

(ii) Descriptions of structural BMP type(s);

(iii) Date(s) of construction;

(iv) Party responsible for structural BMP maintenance;

(v) Dates and findings of structural BMP maintenance verifications; and

(vi) Corrective actions and/or resolutions when applicable.

(b) Each Copermittee must prioritize the Priority Development Projects with structural BMPs within its jurisdiction. The designation of Priority Development Projects as high priority must consider the following:

(i) The highest water quality priorities identified in the Water Quality Improvement Plan;

(ii) Receiving water quality;

(iii) Number and sizes of structural BMPs;

(iv) Recommended maintenance frequency of structural BMPs;

(v) Likelihood of operation and maintenance issues of structural BMPs;

(vi) Land use and expected pollutants generated; and

(vii) Compliance record.

(3) Structural BMP Maintenance Verifications and Inspections

Each Copermittee is required to verify that structural BMPs on each Priority Development Project are adequately maintained, and continue to operate effectively to remove pollutants in storm water to the MEP through inspections, self-certifications, surveys, or other equally effective approaches.

(a) All (100 percent) of the structural BMPs at Priority Development Projects that are designated as high priority must be inspected directly by the Copermittee annually prior to each rainy season;

(b) For verifications performed through a means other than direct Copermittee inspection, adequate documentation must be required by the Copermittee to provide assurance that the required maintenance of structural BMPs at each Priority Development Project has been completed; and

(c) Appropriate follow-up measures (including re-inspections, enforcement, etc.) must be conducted to ensure that structural BMPs at each Priority Development Project continue to reduce pollutants in storm water to the MEP as originally designed.

f. DEVELOPMENT PROJECT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all development projects, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

g. STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the development planning program to address development and redevelopment projects that may become sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, increase frequency of verifications and/or inspections, alternative compliance options);

(2) Each Copermittee must identify areas within its jurisdiction where Priority

Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting and/or stream, channel, or habitat rehabilitation projects;

(3) Each Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify regional alternative compliance projects that Priority Development Projects may be allowed or should be encouraged to implement or participate in implementing; and

(4) The strategies and/or activities must be consistent with the requirements of Provisions E.3.a-c and E.3.e-f and the strategies identified in the Water Quality Improvement Plan.

4. Construction Management

Each Copermittee must implement a construction management program in accordance with the strategies identified in the Water Quality Improvement Plan and includes, at a minimum, the following requirements:

a. CONSTRUCTION PROGRAM MANAGEMENT

Each Copermittee must define in the Jurisdictional Runoff Management Plan the following:

(1) Define construction sites to be inventoried, such as sites that involve any ground disturbance or soil disturbing activities.

(2) Define a process for confirming adequate construction BMP implementation for non-inventoried sites. Non-inventoried sites involve minor construction activities that are not anticipated to create storm water pollution such as interior improvements, plumbing, electrical and mechanical work.

~~h.~~b. PROJECT APPROVAL PROCESS

Prior to issuance of any local permit(s) that allows the commencement of construction projects that involve ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff, each Copermittee must:

(1) Require a site-specific Pollution Control, construction BMP, and/or erosion and sediment control plan, to be submitted by the project applicant to the Copermittee;

(2) Confirm the Pollution Control, construction BMP, and/or erosion and sediment control plan, complies with the local grading ordinance, other applicable local

ordinances, and the requirements of this Order;

(3) Confirm the Pollution Control, construction BMP, and/or erosion and sediment control plan, includes seasonally appropriate and effective BMPs and management measures described in Provision E.4.c, as applicable to the project; and

(4) Verify that the project applicant has obtained coverage under ~~applicable permits, including, but not limited to~~ the Construction General Permit~~, Clean Water Act Section 401 Water Quality Certification and Section 404 Permit, and California Department of Fish and Game Streambed Alteration Agreement~~.

~~i.~~c. **CONSTRUCTION SITE INVENTORY AND TRACKING**

(1) Each Copermittee must maintain, and update at least monthly, a watershed-based inventory of all construction projects issued a local permit that allows ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff. The use of an automated database system, such as GIS, is highly recommended. The inventory must include:

(a) Relevant contact information for each site (e.g., name, address, phone, and email for the owner and contractor);

(b) The basic site information including location (address and hydrologic subarea), Waste Discharge Identification (WDID) number (if applicable), size of the site, and approximate area of disturbance;

(c) Whether or not the site is considered a high threat to water quality, as defined in Provision E.4.b.(2) below;

(d) The project start and ~~anticipated completion~~ completed dates;

(e) Current construction phase;

(f) The required inspection frequency, as defined in the Copermittee's jurisdictional runoff management program document;

(g) The date the Copermittee accepted and/or approved the site-specific pollution control, construction BMP, and/or erosion and sediment control plan; and

(h) Whether or not there are ongoing enforcement actions administered to the site.

(2) Each Copermittee must identify all construction sites within its jurisdiction that represent a high threat to downstream surface water quality. The designation of construction sites as high threat to water quality must consider the

following:

(a) Sites located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Sites located within the same hydrologic subarea and tributary to a water body segment listed as impaired for sediment on the CWA section 303(d) List;

(c) Sites located within, directly adjacent to, or discharging directly to a receiving water within an ESA; and

(d) Other sites determined by the Copermittees or the San Diego Water Board as a high threat to water quality.

~~j.~~d. CONSTRUCTION SITE BMP IMPLEMENTATION

Each Copermittee must implement, or require the implementation of effective BMPs to reduce discharges of pollutants in storm water from construction sites to the MEP, and prevent non-storm water discharges from construction sites into the MS4. These BMPs must be site specific, seasonally appropriate, and construction phase appropriate. BMPs must be implemented at each construction site year round. Dry season BMP implementation must plan for and address unseasonal rain events that may occur during the dry season (May 1 through September 30). Copermittees must implement, or require the implementation of, BMPs in the following categories:

(1) Project Planning;

(2) Good Site Management “Housekeeping”, including waste management;

(3) Non-storm Water Management;

(4) Erosion Control;

(5) Sediment Control;

(6) Run-on and Run-off Control; and

(7) Active/Passive Sediment Treatment Systems, where applicable.

~~k.~~e. CONSTRUCTION SITE INSPECTIONS

Each Copermittee must conduct construction site inspections to require and confirm compliance with its local permits and applicable local ordinances, and the requirements of this Order. Priority for site inspections must consider threat to water quality pursuant to Provision E.4.b as well as the nature of the construction

activity, topography, and the characteristics of soils and receiving water quality.

(1) Inspection Frequency

(a) Each Copermittee must conduct inspections at all inventoried sites, including high threat to water quality sites, at an appropriate frequency for each phase of construction to ~~ensure~~ confirm the site reduces the discharge of pollutants in storm water from construction sites to the MEP, and prevents non-storm water discharges from entering the MS4.

(b) Each Copermittee must establish appropriate inspection frequencies for high threat to water quality sites, and all other sites, for each phase of construction. Inspection frequencies appropriate for addressing the highest water quality priorities identified in the Water Quality Improvement Plan, and for complying with the requirements of this Order must be identified in each Copermittee's jurisdictional runoff management program document.

(c) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e., re-inspection, enforcement) necessary to require and confirm site compliance with its local permits and applicable local ordinances, and the requirements of this Order.

(2) Inspection Content

Inspections of construction sites by the Copermittee must include, at a minimum:

(a) Verification of coverage under the Construction General Permit (Notice of Intent (NOI) and/or WDID number) during initial inspections, when applicable;

(b) Assessment of compliance with its local permits and applicable local ordinances related to pollution prevention, including the implementation and maintenance of applicable BMPs;

(c) Assessment of BMP adequacy and effectiveness;

(d) Visual observations of actual non-storm water discharges;

(e) Visual observations of actual or potential discharge of sediment and/or construction related materials from the site;

(f) Visual observations of actual or potential illicit connections; and

(g) If any violations are found and BMP corrections are needed, inspectors must take and document appropriate actions in accordance with the

Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried construction sites. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Site name, location (address and hydrologic subarea), and WDID number (if applicable);

(b) Inspection date;

(c) ~~Approximate amount of rainfall since last inspection~~Weather condition during inspection;

(d) Description of problems observed with BMPs and indication of need for BMP addition/repair/replacement and any scheduled re-inspection, and date of re-inspection;

(e) Descriptions of any other specific inspection comments which must, at a minimum, include rationales for longer compliance time;

(f) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(g) Resolution of problems noted and date problems fixed.

~~l.~~f. CONSTRUCTION SITE ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried construction sites, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

~~m.~~g. STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the construction management program to address construction sites that the Copermittee has identified as potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) Provide specific details about how the strategies and/or activities will be

implemented (e.g. designate additional BMPs, focus education, and/or increase/decrease frequency of inspections for specific types of sites and/or activities); and

(2) The strategies and/or activities must be consistent with the requirements of Provisions E.4.c-e and the strategies identified in the Water Quality Improvement Plan.

5. Existing Development Management

Each Copermittee must implement an existing development management program in accordance with the strategies identified in the Water Quality Improvement Plan and includes, at a minimum, the following requirements:

a. Existing Development Inventory and Tracking

Each Copermittee must maintain, and update at least annually, a watershed-based inventory of the existing development within its jurisdiction that ~~may~~ has the reasonable potential to discharge a pollutant load to and from the MS4. The use of an automated database system, such as GIS, is highly recommended. The inventory must, at a minimum, include:

(1) Name, location (hydrological subarea and address, if applicable) of the following types of existing development with its jurisdiction:

(a) Commercial facilities or areas;

(b) Industrial facilities;

(c) Municipal facilities, including:

(i) MS4 and related structures,[30]

(ii) Roads, streets, and highways,

(iii) Parking facilities,

(iv) Municipal airfields,

(v) Parks and recreation facilities,

(vi) Flood management and flood control devices and structures,

(vii) Operating or closed municipal landfills,

(viii) Publicly owned treatment works (including water and wastewater treatment plants) and sanitary sewer collection systems,

[30] The inventory may refer to the MS4 map required to be maintained pursuant to Provision E.2.b.(1).

(ix) Corporate yards, including maintenance and storage yards for materials, waste, equipment, and vehicles,

(x) Hazardous waste collection facilities,

(xi) Other treatment, storage or disposal facilities for municipal waste, and

(xii) Other municipal facilities that the Copermittee determines may contribute a significant pollutant load to the MS4; and

(d) Residential areas, which may be designated by one or more of the following:

(i) Residential management area,

(ii) Drainage basin or area,

(iii) Land use (e.g., single family, multi-family, rural),

(iv) Neighborhood,

(v) Common Interest Area,

(vi) Home Owner Association, and/or

~~(vii) Mobile home park, and/or~~

~~(viii)~~(vii) Other designations accepted by the San Diego Water Board Executive Officer.

(2) A description of the facility or area, including the following information:

(a) Classification as commercial, industrial, municipal, or residential;

(b) Status of facility or area as active or inactive;

(c) Identification if a business is a mobile business;

(d) SIC Code or NAICS Code, if applicable;

(e) Industrial General Permit NOI and/or WDID number, if applicable;

(f) ~~Identification if a residential area is or includes a~~ Common Interest Areas (CIAs) / Home Owner Associations (HOAs)~~, or mobile home park~~;

(g) Identification of pollutants generated and potentially generated by the facility or area;

(h) Whether the facility or area is adjacent to an ESA;

(i) Whether the facility or area is tributary to and within the same hydrologic subarea as a water body segment listed as impaired on the CWA section 303(d) List and generates pollutants for which the water body segment is impaired; and

(j) Whether the facility or area contributes or potentially contributes to the highest priority water quality conditions identified in the Water Quality Improvement Plan.

(3) An annually updated map showing the location of inventoried existing development, watershed boundaries, and water bodies.

b. EXISTING DEVELOPMENT BMP IMPLEMENTATION AND MAINTENANCE

Each Copermittee must designate a minimum set of BMPs required for all inventoried existing development with the reasonable potential to discharge pollutant loads to their MS4, including special event venues. The designated minimum BMPs must be specific to facility or area types and pollutant generating activities, as appropriate.

(1) Commercial, Industrial, and Municipal Facilities and Areas

(a) Pollution Prevention

Each Copermittee must ~~require~~ promote the use of pollution prevention methods by the commercial, industrial, and municipal facilities and areas in its inventoried existing development through public outreach.

(b) BMP Implementation

Each Copermittee must implement, or require the implementation of, designated BMPs at commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development.

(c) BMP Operation and Maintenance

(i) Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development.

(ii) Each Copermittee must implement a schedule of operation and maintenance activities for its MS4 and related structures (including but not limited to catch basins, storm drain inlets, detention basins, etc.), and verify proper operation of all its municipal structural treatment controls designed to reduce pollutants (including floatables) in storm water discharges to or from its MS4s and related drainage structures. Operation and maintenance activities may

include, but is not limited to, the following:

[a] Inspections of the MS4 and related structures;
[b] Cleaning of the MS4 and related structures; and
[c] Proper disposal of materials removed from cleaning of the MS4 and related structures.

(iii) Each Copermittee must implement a schedule of operation and maintenance for public streets, unpaved roads, paved roads, and paved highways and freeways within its jurisdiction to minimize pollutants that can be discharged in storm water.

(iv) Each Copermittee must implement controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers. Copermittees that operate both a municipal sanitary sewer system and a MS4 must implement controls and measures to prevent and eliminate seeping sewage from infiltrating the MS4. Copermittees that do not operate both a municipal sanitary sewer system and a MS4 must coordinate with sewering agencies to keep themselves informed of relevant and appropriate maintenance activities and sanitary sewage projects in their jurisdiction that may cause or contribute to seepage of sewage into the MS4.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must implement BMPs, or require the implementation of BMPs, to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development. Such BMPs must include, as appropriate, educational activities, permits, certifications and other measures for applicators and distributors.

(2) Residential Areas

(a) Pollution Prevention

Each Copermittee must promote and encourage the use of pollution prevention methods, where appropriate, by the residential areas in its inventoried existing development.

(b) BMP Implementation

Each Copermittee must promote and encourage the implementation of designated BMPs at residential areas in its inventoried existing development.

(c) BMP Operation and Maintenance

Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at residential areas in its inventoried existing development.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must promote and encourage the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from residential areas in its inventoried existing development.

c. Existing Development Inspections

Each Copermittee must conduct inspections of inventoried existing development that have been identified by the Copermittee as having the reasonable potential to discharge pollutant loads from their MS4 to ensure compliance with applicable local ordinances and permits, and the requirements of this Order.

(1) Inspection Frequency

(a) Each Copermittee must establish appropriate inspection frequencies for inventoried existing development in accordance with the following requirements:

(i) At a minimum, inventoried existing development that has been identified by the Copermittee as having the reasonable potential to discharge pollutant loads to and from their MS4 must be inspected once during the permit term ~~every five years~~ utilizing one or more of the following methods:

[a] Drive-by inspections by Copermittee municipal and contract staff,
[b] Onsite inspections by Copermittee municipal and contract staff, and/or
[c] Inspections by volunteer monitoring or patrol programs trained by the Copermittee;

(ii) The frequency of inspections must be appropriate to confirm that BMPs are being implemented to reduce the discharge of pollutants in storm water from the MS4 to the MEP and effectively prohibit non-storm water discharges to the MS4;

(iii) The frequency of inspections must be based on the potential for a facility or area to discharge non-storm water and pollutants in storm water, and should reflect the priorities set forth in the Water Quality Improvement Plan;

(iv) Each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial facilities and

areas, industrial facilities, and municipal facilities in its inventoried existing development;[31] and

(v) Inventoried existing development must be inspected by the Copermittee, as needed, in response to valid public complaints and findings from the Copermittee's municipal and contract staff ~~or volunteer monitoring or patrol program~~ inspections.

(b) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e. education and outreach, re-inspection, enforcement) necessary to require and confirm compliance with its applicable local ordinances and permits and the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

(2) Inspection Content

(a) Inspections of existing development by the Copermittee or volunteer monitoring or patrol programs must include, at a minimum:

(i) Visual inspections for actual non-storm water discharges, if present;

(ii) Visual inspections for actual or potential discharge of pollutants, if present;

(iii) Visual inspections for actual or potential illicit connections, if present; and

(iv) Verification that the description of the facility or area in the inventory, required pursuant to Provision E.5.a.(2), has not changed.

(b) Onsite inspections of existing development by the Copermittee must include, at a minimum:

(i) Assessment of compliance with its applicable local ordinances and permits related to non-storm water and storm water discharges and runoff;

(ii) Assessment of the implementation of the designated BMPs;

(iii) Verification of coverage under the Industrial General Permit, when applicable; and

(iv) If any problems or violations are found, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

[31] If any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspection may count toward the total annual inspection requirement. This requirement excludes linear municipal facilities (i.e., MS4, streets, roads and highways).

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried existing development. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Name and location of facility or area (address and hydrologic subarea) consistent with the inventory name and location, pursuant to Provision E.5.a.(1);

(b) Inspection and re-inspection date(s);

(c) Inspection method(s) (i.e. drive-by, onsite);

(d) Observations and findings from the inspection(s);

(e) For onsite inspections of existing development by Copermittee municipal or contract staff, the records must also include, as applicable:

(i) Description of any problems or violations found during the inspection(s),

(ii) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6, and

(iii) The date problems or violations were resolved.

d. EXISTING DEVELOPMENT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried existing development identified by the Copermittee as having the reasonable potential to discharge pollutant loads from the MS4 within their jurisdiction, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

e. STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Each Copermittee must implement the water quality improvement strategies, where necessary, to address areas of existing development within its jurisdiction that are identified as sources of pollutants and/or stressors contributing to the highest priority water quality conditions in the Watershed Management Area. For the existing development management program, the following strategies must be implemented:

(1) Specific Existing Development Management Program Strategies

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented within its jurisdiction to address areas of existing development that the Copermittee has identified as sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(a) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, and/or increase/decrease frequency of inspections for specific types of facilities, areas and/or activities);

(b) The facilities and/or areas within the Copermittee's jurisdiction where the strategies and/or activities will be implemented; and

(c) The strategies and/or activities must be consistent with the requirements of Provisions E.5.b-d and the strategies identified in the Water Quality Improvement Plan.

(2) Retrofitting Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to retrofit areas of existing development within its jurisdiction to address identified sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify areas of existing development as candidates for retrofitting, focusing on areas where retrofitting will address pollutants and/or stressors that contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for retrofitting projects may be utilized to reduce pollutants that may be discharged in storm water from areas of existing development, and/or address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of retrofitting projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting projects; and

(e) Where retrofitting projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional retrofitting projects (i.e. projects that can receive and/or treat storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment) adjacent to and/or downstream of the areas of existing development.

(3) Stream, Channel and/or Habitat Rehabilitation in Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to rehabilitate streams, channels, and/or habitats in areas of existing development within its jurisdiction to address the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify streams, channels, and/or habitats in areas of existing development as candidates for rehabilitation, focusing on areas where stream, channel, and/or habitat rehabilitation projects will address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for stream, channel, and/or habitat rehabilitation projects may be utilized to address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters, rehabilitate channelized or hydromodified streams, restore wetland and riparian habitat, restore watershed functions, and/or restore beneficial uses of receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of stream, channel, and/or habitat rehabilitation projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance stream, channel, and/or habitat rehabilitation projects; and

(e) Where stream, channel, and/or habitat rehabilitation projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality

Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional stream, channel, and/or habitat rehabilitation projects (i.e. projects that can receive storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment).

(4) Upon Regional Board approval and in lieu of monitoring during any given year, the Copermittees may reallocate resources originally authorized for water quality monitoring for retrofit and/or rehabilitation project(s), if those projects occur at a location where monitoring is conducted, for a maximum of two nonconsecutive years during the permit term.

6. Enforcement Response Plans

Each Copermittee must develop and implement an Enforcement Response Plan as part of its jurisdictional runoff management program document. The Enforcement Response Plan must describe the applicable approaches and options to enforce its legal authority established pursuant to Provision E.1, as necessary, to achieve compliance with the requirements of this Order. The Enforcement Response Plan must include the following:

a. Enforcement Response Plan Components

The Enforcement Response Plan must include the following individual components:

(1) Illicit Discharge Detection and Elimination Enforcement Component;

(2) Development Planning Enforcement Component;

(3) Construction Management Enforcement Component; and

(4) Existing Development Enforcement Component.

b. Enforcement Response Approaches and Options

Each component of the Enforcement Response Plan must describe the enforcement response approaches that the Copermittee will implement to compel compliance with its statutes, ordinances, permits, contracts, orders, or similar means, and the requirements of this Order. The description must include the protocols for implementing progressively stricter enforcement responses. The enforcement response approaches must include appropriate sanctions to compel compliance, including, at a minimum, the following tools or their equivalent:

(1) Verbal and written notices of violation;

(2) Cleanup requirements;

(3) Fines;

(4) Bonding requirements;

(5) Administrative and criminal (if intentional or criminally negligent) penalties;

(6) Liens;

(7) Stop work orders; and

(8) Permit and occupancy denials.

c. CORRECTION OF VIOLATIONS

(1) Violations must be corrected in a timely manner with the goal of correcting the violations within 30 calendar days after the violations are discovered, or prior to the next predicted rain event, whichever is sooner.

(2) If more than 30 calendar days are required to achieve compliance, then a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

d. ESCALATED ENFORCEMENT

(1) The Enforcement Response Plan must include a definition of "escalated enforcement." Escalated enforcement must include any enforcement scenario where a violation or other non-compliance is determined to cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan. Escalated enforcement may be defined differently for development planning, construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas.

(2) Where the Copermittee determines escalated enforcement is not required, a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

(3) Escalated enforcement actions must continue to increase in severity, as necessary, to compel compliance as soon as possible.

e. REPORTING OF NON-COMPLIANT SITES

(1) Each Copermittee must notify the San Diego Water Board in writing within ~~2~~

~~working days~~ 5 calendar days of issuing escalated enforcement (as defined in the Copermittee's Enforcement Response Plan) to a construction site that poses a significant threat to water quality as a result of violations or other non-compliance with its permits and applicable local ordinances, and the requirements of this Order. Written notification may be provided electronically by email.

(2) Each Copermittee must notify the San Diego Water Board of non-filers under the Industrial General Permit and Construction General Permit by email to Nonfilers_R9@waterboards.ca.gov.

7. Public Education and Participation

Each Copermittee must implement, individually or with other Copermittees, a public education and participation program in accordance with the strategies identified in the Water Quality Improvement Plan to promote and encourage the development of programs, management practices, and behaviors that reduce the discharge of pollutants from the MS4 ~~in storm water~~ to the MEP, prevent controllable non-storm water discharges from entering the MS4, and protect water quality standards in receiving waters.

a. PUBLIC EDUCATION

The public education program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) Educational activities, public information activities, and other appropriate outreach activities intended to reduce pollutants ~~associated with the application of pesticides, herbicides and fertilizer and other pollutants of concern in storm water discharges~~ of concern ~~to and~~ from ~~its~~ the MS4 to the MEP. Activities shall be determined and prioritized by Copermittees by jurisdiction and/or watershed (Provision B) to address the highest threats to water quality (such as pesticides, herbicides and fertilizers, used oil, toxic waste, etc.; and to facilitate the proper management and disposal of used oil and toxic waste, etc.) as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed to address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

~~(2) Educational activities, public information activities, and other appropriate outreach activities to facilitate the proper management and disposal of used oil and toxic materials; and~~

~~(3)~~(2) Appropriate education and training measures for specific target audiences, such as construction site operators, residents, underserved target audiences and school-aged children, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed, based on high risk behaviors and pollutants of concern.

b. PUBLIC PARTICIPATION

The public participation program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) A process for members of the public to participate in updating the highest priority water quality conditions, numeric goals, and water quality improvement strategies in the Water Quality Improvement Plan.

(2) Opportunities for members of the public to participate in providing the Copermittee recommendations for improving the effectiveness of the water quality improvement strategies implemented within its jurisdiction.

(3) Opportunities for members of the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or restoration and protection of the quality of receiving waters.

c. STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented within its jurisdiction, as applicable, to educate the public and encourage public participation to address potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) The target audiences and/or areas within the Copermittee's jurisdiction where the strategies and/or activities will be implemented;

(2) Provide specific details about how the strategies and/or activities will be implemented (e.g. educational topics, materials and/or activities, public outreach and participation programs and/or opportunities);

(3) Each Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify and implement regional public education and participation activities, programs and opportunities;

(4) Each Copermittee must incorporate a mechanism for evaluating and

assessing educational and other public outreach activities, as needed, to identify progress and incorporate modifications necessary to increase the effectiveness of the public education and participation program.

8. Fiscal Analysis

a. Each Copermittee must secure the resources necessary to meet all the requirements of this Order.

b. Each Copermittee must conduct an annual fiscal analysis of its jurisdictional runoff management program in its entirety. The fiscal analysis must include the following:

(1) Identification of the various categories of expenditures necessary to implement the requirements of this Order, including a description of the specific capital, operation and maintenance, and other expenditure items to be accounted for in each category of expenditures;

(2) The staff resources needed and allocated to meet the requirements of this Order, including any development, implementation, and enforcement activities required;

(3) The estimated expenditures for Provisions E.8.b.(1) and E.8.b.(2) for the current fiscal year; and

(4) The source(s) of funds that are proposed to meet the necessary expenditures described in Provisions E.8.b.(1) and E.8.b.(2), including legal restrictions on the use of such funds, for the current fiscal year and next fiscal year.

c. Each Copermittee must submit a summary of the annual fiscal analysis with each Annual Report required pursuant to Provision F.3.b.

d. Each Copermittee must provide the documentation used to develop the summary of the annual fiscal analysis upon request by the San Diego Water Board.

F. REPORTING

The purpose of this provision is to determine and document compliance with the requirements set forth in this Order. The goal of reporting is to communicate to the San Diego Water Board and the people of the State of California the implementation status of each jurisdictional runoff management program and compliance with the requirements of this Order. This goal is to be accomplished through the submittal of specific deliverables to the San Diego Water Board by the Copermittees.

1. Water Quality Improvement Plans

The Copermittees for each Watershed Management Area must develop and submit the Water Quality Improvement Plan in accordance with the following requirements:

a. WATER QUALITY IMPROVEMENT PLAN DEVELOPMENT

Each Water Quality Improvement Plan must be developed in accordance with the following process:

(1) Priority Water Quality Conditions and Potential Strategies ~~Numeric Goals~~

(a) The Copermittees must implement a public participation process to solicit data and information to be utilized in the development and identification of the priority water quality conditions for the Watershed Management Area.

(b) The Copermittees are encouraged to involve the public and key stakeholders as early and often as possible during the development of the priority water quality conditions and ~~numeric goals~~ potential strategies to be included in the Water Quality Improvement Plan.

(c) Within 6 months after the commencement of coverage under this Order, the Copermittees must develop and submit the Water Quality Improvement Plan requirements of Provision B.2.a-d and a list of potential strategies that will be considered for the draft Water Quality Improvement Plan to the San Diego Water Board. Each Copermittee selecting the option to develop a Water Quality Improvement Plan to serve as an iterative, implementation-based compliance mechanism per Provision B.3.a.(3) must also indicate their intent to pursue the option in the submittal. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of 60 days.

(d) The Copermittees must consider ~~revise~~ revisions to the priority water quality conditions ~~and numeric goals~~ based on comments received and must respond to ~~and/or~~ recommendations or direction from the San Diego Water Board Executive Officer.

(2) Numeric Goals and Water Quality Improvement Strategies and Schedules

(a) The Copermittees are encouraged to involve the public and key stakeholders as early and often as possible during the development of the numeric goals and water quality improvement strategies and schedules to be included in the Water Quality Improvement Plan.

(b) Within ~~9~~ 16 months after the commencement of coverage under this Order, the Copermittees must develop and submit the Water Quality Improvement Plan requirements of Provisions B.2.e and B.3 to the San Diego Water Board. Each Copermittee selecting the option to develop a Water Quality Improvement Plan to serve as an iterative, implementation-based compliance mechanism per Provision B.3.a.(3) must also submit a draft Reasonable Assurance Analysis. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of 60 days.

(c) The Copermittees must consider revisions to~~revise~~ the numeric goals and water quality improvement strategies and schedules based on public comments received ~~and/or~~ and must respond to recommendations or direction from the San Diego Water Board Executive Officer.

b. WATER QUALITY IMPROVEMENT PLAN SUBMITTAL

(1) Within ~~18~~ 24 months after the commencement of coverage under this Order, the Copermittees for each Watershed Management Area must submit a complete Water Quality Improvement Plan in accordance with the requirements of Provision B to the San Diego Water Board. Each Copermittees selecting the option to develop a Water Quality Improvement Plan to serve as an iterative, implementation-based compliance mechanism per Provision B.3.a.(3) must also submit a final Reasonable Assurance Analysis. The Santa Margarita River Watershed Management Area must submit a complete Water Quality Improvement Plan in accordance with the requirements of Provision B to the San Diego Water Board 18 months after the Riverside Copermittees are covered under this Order. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of 30 days.

(2) Based on the comments received, the San Diego Water Board will determine whether to hold a public hearing or to limit public input to submittal of written comments. If no hearing is held the San Diego Water Board will notify the Copermittees within 6 months that the Water Quality Improvement Plan has been accepted as complete following its review and determination that the Water Quality Improvement Plan meets the requirements of this Order.

(3) The Copermittees must consider revisions to ~~revise~~ the Water Quality Improvement Plan based on public comments received ~~and/or~~ and must

respond to recommendations or direction from the San Diego Water Board Executive Officer.

(4) The Water Quality Improvement Plan must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance by the San Diego Water Board.

(5) Copermittees must commence with implementation of the Water Quality Improvement Plan no later than the fiscal year (July 1) following San Diego Water Board approval of the Water Quality Improvement Plan.

2. Updates

a. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATES

Each Copermittee must update its jurisdictional runoff management program document in accordance with the following requirements:

(1) Each Copermittee is encouraged to involve the public and key stakeholders as early and often as possible to solicit recommendations for updates to its jurisdictional runoff management program document.

(2) Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E no later than ~~18~~24 months after the commencement of coverage under this Order.

(3) Each Copermittee must submit updates to its jurisdictional runoff management program, with a rationale for the modifications, either in the Annual Report required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge required pursuant to Provision F.5.b.

(4) The Copermittee must revise the modifications as directed by the San Diego Water Board Executive Officer.

(5) Updated jurisdictional runoff management program documents must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of submitting the Annual Report.

b. BMP DESIGN MANUAL UPDATES

Each Copermittee must update its BMP Design Manual in accordance with the following requirements:

(1) Each Copermittee must update its BMP Design Manual to incorporate the requirements of Provisions E.3.a-d no later than ~~18~~24 months after the commencement of coverage under this Order.

(2) Subsequent updates must be consistent with the requirements of Provisions E.3.a-d and must be submitted as part of the Annual Reports required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge required pursuant to Provision F.5.b.

(3) Updated BMP Design Manuals must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of completing the update.

c. WATER QUALITY IMPROVEMENT PLAN UPDATES

The Water Quality Improvement Plans must be updated in accordance with the following process:

(1) The Copermittees must implement a public participation process to solicit data and information to be utilized in updating the Water Quality Improvement Plan.

(2) The Copermittees are encouraged to involve the public and key stakeholders as early and often as possible during the updates to the Water Quality Improvement Plan.

(3) The Copermittees for each Watershed Management Area must submit requested updates to the Water Quality Improvement Plan, with the public input received and the rationale for the requested updates, either in the Annual Reports required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The requested updates are considered accepted by the San Diego Water Board if no response is provided to the Copermittee after 3 months of submitting the request.

(4) The Copermittees must revise the requested updates as directed by the San Diego Water Board Executive Officer.

(5) Updated Water Quality Improvement Plans must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance of the requested updates by the San Diego Water Board.

3. Progress Reporting

a. PROGRESS REPORT PRESENTATIONS

The Copermittees for each Watershed Management Area must appear before the San Diego Water Board, as requested by the San Diego Water Board, to provide progress reports on the implementation of the Water Quality

Improvement Plan and jurisdictional runoff management programs.

b. ANNUAL REPORTS

(1) The Copermittees for each Watershed Management Area must submit an Annual Report for each reporting period no later than January 31 of the following year. The annual reporting period consists of two periods: 1) July 1 to June 30 of the following year for the jurisdictional runoff management programs, 2) October 1 to September 30 of the following year for the monitoring and assessment programs. The first Annual Report must be prepared for the reporting period beginning July 1 after commencement of coverage under this Order, and upon San Diego Water Board determination that the Water Quality Improvement Plan meets the requirements of this Order to June 30 in the following year for the jurisdictional runoff management programs.~~,~~ The first Annual Report must be prepared for the reporting period beginning 50 days after adoption of this Order and the January 31st following the first September 30th (conclusion of monitoring season) after the San Diego Water Board determines that the Water Quality Improvement Plan meets the requirements of this Order ~~and September 30 in the following year~~ for the monitoring and assessment programs. Annual Reports must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Each Annual Report must include the following:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, summarized and presented in tabular and graphical form;

(b) Progress of the special studies required pursuant to Provision D.3, and the results or findings when a special study, or each phase of a special study, is completed;

(c) The findings from the assessments required pursuant to Provision D.4;

(d) The progress of implementing the Water Quality Improvement Plan, including, but not limited to, the following:

(i) The progress toward achieving the interim and final numeric goals for the highest water quality priorities for the Watershed Management Area,

(ii) The water quality improvement strategies that were implemented and/or no longer implemented by each of the Copermittees during the reporting period and previous reporting periods, and are planned to be implemented during the next reporting period,

(iii) Proposed modifications to the water quality improvement strategies, with public input received and rationale for the proposed

modifications,

(iv) Previously proposed modifications or updates incorporated into the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document and implemented by the Copermittees in the Watershed Management Area, and

(v) Proposed modifications or updates to the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document;

(d) A completed Jurisdictional Runoff Management Program Annual Report Form (Attachment D or accepted revision) for each Copermittee in the Watershed Management Area, certified by a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative.

(2) Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (Attachment D or accepted revision) no later than October 31 of each year until the first Annual Report is required to be submitted. Each Copermittee must submit the information on the Jurisdictional Runoff Management Program Annual Report Form specific to the area within its jurisdiction in each Watershed Management Area.

(3) Each Copermittee must provide any data or documentation utilized in developing the Annual Report upon request by the San Diego Water Board. ~~Any~~ Copermittee monitoring data utilized in developing the Annual Report must be uploaded to the California Environmental Data Exchange Network (CEDEN).[32] Any Copermittee monitoring and assessment data utilized in developing the Annual Report must be provided on the Regional Clearinghouse required pursuant to Provision F.4.

~~c. Regional Monitoring and Assessment Report~~

~~(1) The Copermittees must submit a Regional Monitoring and Assessment Report no later than 180 days in advance of the expiration date of this Order. The Regional Monitoring and Assessment Report may be submitted as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The Copermittees must review the receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, and findings from the assessments required pursuant to Provision D.4, to assess the following:~~

~~(a) The beneficial uses of the receiving waters within the San Diego Region~~

[32] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

~~that are protected or must be restored;~~

~~(b) The progress toward restoring impacted beneficial uses in the receiving waters within the San Diego Region; and~~

~~(c) Pollutants or conditions of emerging concern that may impact beneficial uses in the receiving waters within the San Diego Region.~~

~~(2) The Regional Monitoring and Assessment Report must include recommendations for improving the implementation and assessment of the Water Quality Improvement Plans and jurisdictional runoff management programs.~~

~~(3) Each Copermittee must provide any data or documentation utilized in developing the Regional Monitoring and Assessment Report upon request by the San Diego Water Board. Any monitoring and assessment data utilized in developing the Regional Monitoring and Assessment Report must be provided on the Regional Clearinghouse required pursuant to Provision F.4.~~

4. Regional Clearinghouse

The Copermittees must develop, update, and maintain an internet-based Regional Clearinghouse that is made available to the public no later than 18 months after the effective date of this Order.[33]

a. The Copermittees, through the Regional Clearinghouse, must make the following documents and data available, organized by Watershed Management Area, which may be linked to other internet-based data portals and databases where the original documents are stored:

(1) Water Quality Improvement Plan for the Watershed Management Area, and all updated versions with date of update;

(2) Annual Reports for the Watershed Management Area;

(3) Jurisdictional Runoff Management Program document for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(4) BMP Design Manual for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

[33] The Copermittee may elect to develop and maintain the clearinghouse(s) provided by other Copermittees or agencies.

(5) Reports from special studies (e.g. source identification, BMP effectiveness assessment) conducted in the Watershed Management Area;

(6) Monitoring data collected pursuant to Provision D for each Watershed Management Area must be uploaded to CEDEN,[34] with links to the uploaded data; and

(7) Available GIS data, layers, and/or shapefiles used to develop the maps generated and maintained by the Copermittees for the Water Quality Improvement Plans, Annual Reports, and jurisdictional runoff management program documents.

b. The Copermittees, through the Regional Clearinghouse, must make the following information and documents available:

(1) Contact information (point of contact, phone number, email address, and mailing address) for each Copermittee;

(2) Public hotline number for reporting non-storm water and illicit discharges for each Copermittee;

[34] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

(3) Email address for reporting non-storm water and illicit discharges for each Copermittee;

(4) Link to each Copermittee's website, if available, where the public may find additional information about the Copermittee's storm water management program and for requesting records for the implementation of its program;

(5) Information about opportunities for the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or restoration and protection of the quality of receiving waters; and

(6) Reports from regional monitoring programs in which the Copermittees participate (e.g. Southern California Monitoring Coalition, Southern California Coastal Water Research Project Bight Monitoring);

(7) Regional Monitoring and Assessment Reports; and

(8) Any other information, data, and documents the Copermittees determine as appropriate for making available to the public.

5. Report of Waste Discharge

a. The Orange County Copermittees and the Riverside County Copermittees are required to submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders. The San Diego Water Board will review and consider the Reports of Waste Discharge to determine whether modification to this Order, pursuant to the requirements of Provision H, will be required prior the Orange County Copermittees and/or Riverside County Copermittees becoming covered under this Order. The current Orders for the Orange County Copermittees and Riverside County Copermittees are rescinded upon notification of coverage under this Order except for enforcement purposes.

b. The Copermittees subject to the requirements of this Order must submit to the San Diego Water Board a complete Report of Waste Discharge as an application for the re-issuance of this Order and NPDES permit. The Report of Waste Discharge must be submitted no later than 180 days in advance of the expiration date of this Order. The Report of Waste Discharge must contain the following minimum information:

(1) Names and addresses of the Copermittees;

(2) Names and titles of the primary contacts of the Copermittees;

(3) Proposed changes to the Copermittees' Water Quality Improvement Plans and the supporting justification;

(4) Proposed changes to the Copermittees' jurisdictional runoff management programs and the supporting justification;

(5) Any other information necessary for the re-issuance of this Order;

(6) Any information to be included as part of the Report of Waste Discharge pursuant to the requirements of this Order; and

(7) Any other information required by federal regulations for NPDES permit reissuance.

6. Application for Early Coverage

a. The Orange County Copermittees, collectively, or Riverside County Copermittees, collectively, may apply for early coverage under this Order by submitting a Report of Waste Discharge Form 200, with a written request for early coverage under this Order.

b. The San Diego Water Board will review the application for early coverage. A notification of coverage under this Order will be issued to the Copermittees in the respective county by the San Diego Water Board upon completion of the early coverage application requirements. The effective coverage date will be specified in the notification of coverage. The Copermittees in the respective county are authorized to have MS4 discharges pursuant to the requirements of this Order starting on the effective coverage date specified in the notification of coverage. The existing Order for the respective county is rescinded upon the effective coverage date specified in the notification of coverage except for enforcement purposes.

7. Reporting Provisions

Each Copermittee must comply with all the reporting and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

G. PRINCIPAL WATERSHED COPERMITTEE RESPONSIBILITIES

1. The Copermittees within each Watershed Management Area must designate a Principal Watershed Copermittee and notify the San Diego Water Board of the name of the Principal Watershed Copermittee. ~~An individual Copermittee should not be designated a Principal Watershed Copermittee for more than two Watershed Management Areas.~~ The notification may be submitted with the Water Quality Improvement Plan required pursuant to Provision F.1 of this Order.

2. All Copermittees have some level of commitment, not just the Principal Watershed Copermittee. The Principal Watershed Copermittee is responsible for, at a minimum, the following:

a. Serving as liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues, and when necessary and appropriate, representing the Copermittees in the Watershed Management Area before the San Diego Water Board.

b. Facilitating the development of the Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order

c. Coordinating the submittal of the deliverables required by Provisions F.1, F.2, F.3.a, and F.3.b of this Order.

d. Coordinating and developing, with the other Principal Watershed Copermittees, the requirements of Provisions F.3.c, F.4, and F.5.b of this Order.

H. MODIFICATION OF PROGRAMS

1. Modifications of the Order may be initiated by the San Diego Water Board or by the Copermittees. Requests by Copermittees must be made to the San Diego Water Board.

2. Minor modifications to the Order may be made by the San Diego Water Board where the proposed modification complies with all the effective prohibitions and limitations, and other requirements of this Order.

3. Proposed modifications to the Order outside of the Water Quality Improvement Plan process that are not minor require amendment of this Order in accordance with this Order's rules, policies, and procedures.

4. The San Diego Water Board may re-open and modify this Order at any time prior to its expiration, after opportunity for public comment and a public hearing, if the State Water Board determines that revisions are warranted to those provisions of the Order addressing compliance with water quality standards in the receiving water and/or those provisions of the Order establishing an iterative process for implementation of management practices to assure compliance with water quality standards in the receiving water.

~~4.~~5. The San Diego Water Board may re-open and modify this order at any time prior to its expiration, after opportunity for public comment and a public hearing, if the Basin Plan Amendments for any of the TMDLs in Attachment E are revised by the San Diego Regional Board. Should a TMDL Basin Plan Amendment be revised and adopted by the Regional Board, then the Regional Board will re-open this Order as soon as possible to update the TMDL requirements in Attachment E to reflect the revised Basin Plan Amendment.

I. STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

Each Copermittee must comply with all the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

ATTACHMENT A

DISCHARGE PROHIBITIONS AND SPECIAL PROTECTIONS

1. Basin Plan Waste Discharge Prohibitions

California Water Code Section 13243 provides that a Regional Water Board, in a water quality control plan, may specify certain conditions or areas where the discharge of waste or certain types of waste is not permitted. The following waste discharge prohibitions in the Water Quality Control Plan for the San Diego Basin (Basin Plan) are applicable to any person, as defined by Section 13050(c) of the California Water Code, who is a citizen, domiciliary, or political agency or entity of California whose activities in California could affect the quality of waters of the state within the boundaries of the San Diego Region.

1. The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in California Water Code Section 13050, is prohibited.

2. The discharge of waste to land, except as authorized by waste discharge requirements or the terms described in California Water Code Section 13264 is prohibited.

3. The discharge of pollutants or dredged or fill material to waters of the United States except as authorized by a National Pollutant Discharge Elimination System (NPDES) permit or a dredged or fill material permit (subject to the exemption described in California Water Code Section 13376) is prohibited.

4. Discharges of recycled water to lakes or reservoirs used for municipal water supply or to inland surface water tributaries thereto are prohibited, unless this San Diego Water Board issues a NPDES permit authorizing such a discharge; the proposed discharge has been approved by the State Department of Health Services (DHS) and the operating agency of the impacted reservoir; and the discharger has an approved fail-safe long-term disposal alternative.

5. The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the San Diego Water Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

6. The discharge of waste in a manner causing flow, ponding, or surfacing on lands not owned or under the control of the discharger is prohibited, unless the discharge is authorized by the San Diego Water Board.

7. The dumping, deposition, or discharge of waste directly into waters of the state, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the San Diego Water Board.

8. Any discharge to a storm water conveyance system that is not composed entirely of "*storm water*" is effectively prohibited unless authorized by the San Diego Water Board. [The federal regulations, 40 CFR 122.26(b)(13), define storm water as storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from fire fighting activities.] [§122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

9. The unauthorized discharge of treated or untreated sewage to waters of the state or to a storm water conveyance system is prohibited.

10. The discharge of industrial wastes to conventional septic tank/subsurface disposal systems, except as authorized by the terms described in California Water Code Section 13264, is prohibited.

11. The discharge of radioactive wastes amenable to alternative methods of disposal into the waters of the state is prohibited.

12. The discharge of any radiological, chemical, or biological warfare agent into waters of the state is prohibited.

13. The discharge of waste into a natural or excavated site below historic water levels is prohibited unless the discharge is authorized by the San Diego Water Board.

14. The discharge of sand, silt, clay, or other earthen materials from any activity, including land grading and construction, in quantities which cause deleterious bottom deposits, turbidity or discoloration in waters of the state or which unreasonably affect, or threaten to affect, beneficial uses of such waters is prohibited.

15. The discharge of treated or untreated sewage from vessels to Mission Bay, Oceanside Harbor, Dana Point Harbor, or other small boat harbors is prohibited.

16. The discharge of untreated sewage from vessels to San Diego Bay is prohibited.

17. The discharge of treated sewage from vessels to portions of San Diego Bay that are less than 30 feet deep at mean lower low water (MLLW) is prohibited.

18. The discharge of treated sewage from vessels, which do not have a properly functioning US Coast Guard certified Type I or Type II marine sanitation device, to portions of San Diego Bay that are greater than 30 feet deep at mean lower low water (MLLW) is prohibited.

2. Attachment B to State Water Board Resolution 2012-0012

Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges

I. PROVISIONS FOR POINT SOURCE DISCHARGES OF STORM WATER AND NONPOINT SOURCE WASTE DISCHARGES

The following terms, prohibitions, and special conditions (hereafter collectively referred to as special conditions) are established as limitations on point source storm water and nonpoint source discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in Areas of Special Biological Significance (ASBS), as required for State Water Quality Protection Areas pursuant to California Public Resources Code Sections 36700(f) and 36710(f). These Special Protections are adopted by the State Water Board as part of the California Ocean Plan (Ocean Plan) General Exception.

The special conditions are organized by category of discharge. The State Water Resources Control Board (State Water Board) and Regional Water Quality Control Boards (Regional Water Boards) will determine categories and the means of regulation for those categories [e.g., Point Source Storm Water National Pollutant Discharge Elimination System (NPDES) or Nonpoint Source].

A. PERMITTED POINT SOURCE DISCHARGES OF STORM WATER

1. General Provisions for Permitted Point Source Discharges of Storm Water

   a. Existing storm water discharges into an ASBS are allowed only under the following conditions:

      (1) The discharges are authorized by an NPDES permit issued by the State Water Board or Regional Water Board;

      (2) The discharges comply with all of the applicable terms, prohibitions, and special conditions contained in these Special Protections; and

      (3) The discharges:

         (i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

         (ii) Are designed to prevent soil erosion;

         (iii) Occur only during wet weather;

(iv) Are composed of only storm water runoff.

b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

c. The discharge of trash is prohibited.

d. Only discharges from existing storm water outfalls are allowed. Any proposed or new storm water runoff discharge shall be routed to existing storm water discharge outfalls and shall not result in any new contribution of waste to an ASBS (i.e., no additional pollutant loading). “Existing storm water outfalls” are those that were constructed or under construction prior to January 1, 2005. “New contribution of waste” is defined as any addition of waste beyond what would have occurred as of January 1, 2005. A change to an existing storm water outfall, in terms of re-location or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges are prohibited except as provided below:

(1) The term “non-storm water discharges” means any waste discharges from a municipal separate storm sewer system (MS4) or other NPDES permitted storm drain system to an ASBS that are not composed entirely of storm water.

(2) (i) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability or occur naturally:

(a) Discharges associated with emergency fire fighting operations.

(b) Foundation and footing drains.

(c) Water from crawl space or basement pumps.

(d) Hillside dewatering.

(e) Naturally occurring groundwater seepage via a storm drain.

(f) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(ii) An NPDES permitting authority may authorize non-storm water discharges to an MS4 with a direct discharge to an ASBS only to the extent the

NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

2. Compliance Plans for Inclusion in Storm Water Management Plans (SWMP) and Storm Water Pollution Prevention Plans (SWPPP).

The discharger shall specifically address the prohibition of non-storm water runoff and the requirement to maintain natural water quality for storm water discharges to an ASBS in an ASBS Compliance Plan to be included in its SWMP or a SWPPP, as appropriate to permit type. If a statewide permit includes a SWMP, then the discharger shall prepare a stand-alone compliance plan for ASBS discharges. The ASBS Compliance Plan is subject to approval by the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (for permits issued by Regional Water Boards).

a. The Compliance Plan shall include a map of surface drainage of storm water runoff, showing areas of sheet runoff, prioritize discharges, and describe any structural Best Management Practices (BMPs) already employed and/or BMPs to be employed in the future. Priority discharges are those that pose the greatest water quality threat and which are identified to require installation of structural BMPs. The map shall also show the storm water conveyances in relation to other features such as service areas, sewage conveyances and treatment facilities, landslides, areas prone to erosion, and waste and hazardous material storage areas, if applicable. The SWMP or SWPPP shall also include a procedure for updating the map and plan when changes are made to the storm water conveyance facilities.

b. The ASBS Compliance Plan shall describe the measures by which all non-authorized non-storm water runoff (e.g., dry weather flows) has been eliminated, how these measures will be maintained over time, and how these measures are monitored and documented.

c. For Municipal Separate Storm Sewer System (MS4s), the ASBS Compliance Plan shall require minimum inspection frequencies as follows:

(1) The minimum inspection frequency for construction sites shall be weekly during rainy season;

(2) The minimum inspection frequency for industrial facilities shall be monthly during the rainy season;

(3) The minimum inspection frequency for commercial facilities (e.g., restaurants) shall be twice during the rainy season; and

(4) Storm water outfall drains equal to or greater than 18 inches (457 mm) in diameter or width shall be inspected once prior to the beginning of the rainy season and once during the rainy season and maintained to remove trash and other anthropogenic debris.

d. The ASBS Compliance Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff, that are necessary to comply with these special conditions, will be achieved through BMPs. Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that such installation would pose a threat to health or safety. BMPs to control storm water runoff discharges (at the end-of-pipe) during a design storm shall be designed to achieve on average the following target levels:

(1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

(2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges. The baseline for the reduction is the effective date of the Exception. The baseline for these determinations is the effective date of the Exception, and the reductions must be achieved and documented within four (4) years of the effective date.

e. The ASBS Compliance Plan shall address erosion control and the prevention of anthropogenic sedimentation in ASBS. The natural habitat conditions in the ASBS shall not be altered as a result of anthropogenic sedimentation.

f. The ASBS Compliance Plan shall describe the non-structural BMPs currently employed and planned in the future (including those for construction activities), and include an implementation schedule. The ASBS Compliance Plan shall include non-structural BMPs that address public education and outreach. Education and outreach efforts must adequately inform the public that direct discharges of pollutants from private property not entering an MS4 are prohibited. The ASBS Compliance Plan shall also describe the structural BMPs, including any low impact development (LID) measures, currently employed and planned for higher threat discharges and include an implementation schedule. To control storm water runoff discharges (at the end-of-pipe) during a design storm, permittees must first consider using LID practices to infiltrate, use, or evapotranspirate storm water runoff on-site.

g. The BMPs and implementation schedule shall be designed to ensure that natural water quality conditions in the receiving water are achieved and maintained by

either reducing flows from impervious surfaces or reducing pollutant loading, or some combination thereof.

h. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents in storm water runoff that alter natural ocean water quality and the sources of these constituents.

(2) The report shall describe BMPs that are currently being implemented, BMPs that are identified in the SWMP or SWPPP for future implementation, and any additional BMPs that may be added to the SWMP or SWPPP to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the BMPs.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits), the discharger shall revise its ASBS Compliance Plan to incorporate any new or modified BMPs that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised SWMP or SWPPP, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural ocean water quality conditions due to the same constituent.

(5) Compliance with this section does not excuse violations of any term, prohibition, or condition contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within one year from the effective date of the Exception, the discharger shall submit a written ASBS Compliance Plan to the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that describes its strategy to comply with these special conditions, including the requirement to maintain natural water quality in the affected ASBS. The ASBS Compliance Plan shall include a time schedule to implement appropriate non-structural and structural controls (implementation

schedule) to comply with these special conditions for inclusion in the discharger's SWMP or SWPPP, as appropriate to permit type.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these special conditions shall be implemented.

d. Within four (4) years of the effective date of the Exception, any structural controls identified in the ASBS Compliance Plan that are necessary to comply with these special conditions shall be operational.

e. Within four (4) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water, pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data, and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

   If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

   The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

   (1) for municipalities, a demonstration of significant hardship to discharger ratepayers, by showing the relationship of storm water fees to annual

household income for residents within the discharger's jurisdictional area, and the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or

(2) for other governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process.

B. NONPOINT SOURCE DISCHARGES

[NOT INCLUDED]
[PROVISIONS FOR NONPOINT SOURCE DISCHARGES NOT APPLICABLE]

II. ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES

[NOT INCLUDED]
[ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES NOT APPLICABLE]

III. ADDITIONAL REQUIREMENTS – WATERFRONT AND MARINE OPERATIONS

[NOT INCLUDED]
[ADDITIONAL REQUIREMENTS FOR WATERFRONT AND MARINE OPERATIONS NOT APPLICABLE]

IV. MONITORING REQUIREMENTS

Monitoring is mandatory for all dischargers to assure compliance with the Ocean Plan. Monitoring requirements include both: (A) core discharge monitoring, and (B) ocean receiving water monitoring. The State and Regional Water Boards must approve sampling site locations and any adjustments to the monitoring programs. All ocean receiving water and reference area monitoring must be comparable with the Water Boards' Surface Water Ambient Monitoring Program (SWAMP).

Safety concerns: Sample locations and sampling periods must be determined considering safety issues. Sampling may be postponed upon notification to the State and Regional Water Boards if hazardous conditions prevail.

Analytical Chemistry Methods: All constituents must be analyzed using the lowest minimum detection limits comparable to the Ocean Plan water quality objectives. For metal analysis, all samples, including storm water effluent, reference samples, and ocean receiving water samples, must be analyzed by the approved analytical method with the lowest minimum detection limits (currently Inductively Coupled Plasma/Mass Spectrometry) described in the Ocean Plan.

A. CORE DISCHARGE MONITORING PROGRAM

1. General sampling requirements for timing and storm size:

   Runoff must be collected during a storm event that is greater than 0.1 inch and generates runoff, and at least 72 hours from the previously measurable storm event. Runoff samples shall be collected when post-storm receiving water is sampled, and analyzed for the same constituents as receiving water and reference site samples (see section IV B) as described below.

2. Runoff flow measurements

   a. For municipal/industrial storm water outfalls in existence as of December 31, 2007, 18 inches (457mm) or greater in diameter/width (including multiple outfall pipes in combination having a width of 18 inches, runoff flows must be measured or calculated, using a method acceptable to and approved by the State and Regional Water Boards.
   b. This will be reported annually for each precipitation season to the State and Regional Water Boards.

3. Runoff samples – storm events

   a. For outfalls equal to or greater than 18 inches (0.46m) in diameter or width:

      (1) samples of storm water runoff shall be analyzed during the same storm as receiving water samples for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination, ; and

      (2) samples of storm water runoff shall be analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS

      (3) If an applicant has no outfall greater than 36 inches, then storm water runoff from the applicant's largest outfall shall be further analyzed during the same storm as receiving water samples for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates).

   b. For outfalls equal to or greater than 36 inches (0.91m) in diameter or width:

      (1) samples of storm water runoff shall be analyzed during the same storm as receiving water samples for oil and grease, total suspended solids, and,

within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

(2) samples of storm water runoff shall be further analyzed during the same storm as receiving water samples for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates) and

(3) samples of storm water runoff shall be analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

c. For an applicant not participating in a regional monitoring program [see below in Section IV (B)] in addition to (a.) and (b.) above, a minimum of the two largest outfalls or 20 percent of the larger outfalls, whichever is greater, shall be sampled (flow weighted composite samples) at least three times annually during wet weather (storm event) and analyzed for all Ocean Plan Table A constituents, Table B constituents for marine aquatic life protection (except for toxicity, only chronic toxicity for three species shall be required), DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, and Ocean Plan indicator bacteria. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one (the largest) such discharge shall be sampled annually in each Region.

4. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may reduce or suspend core monitoring once the storm runoff is fully characterized. This determination may be made at any point after the discharge is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

B. OCEAN RECEIVING WATER AND REFERENCE AREA MONITORING PROGRAM

In addition to performing the Core Discharge Monitoring Program in Section II.A above, all applicants having authorized discharges must perform ocean receiving water monitoring. In order to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS, dischargers may choose either (1) an individual monitoring program, or (2) participation in a regional integrated monitoring program.

1. Individual Monitoring Program: The requirements listed below are for those dischargers who elect to perform an individual monitoring program to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within the affected ASBS. In addition to Core Discharge Monitoring, the following additional monitoring requirements shall be met:

a. Three times annually, during wet weather (storm events), the receiving water at the point of discharge from the outfalls described in section (IV)(A)(3)(c) above shall be sampled and analyzed for Ocean Plan Table A constituents, Table B constituents for marine aquatic life, DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, salinity, chronic toxicity (three species), and Ocean Plan indicator bacteria.

   The sample location for the ocean receiving water shall be in the surf zone at the point of discharges; this must be at the same location where storm water runoff is sampled. Receiving water shall be sampled at approximately the same time prior to (pre-storm) and during (or immediately after) the same storm (post storm). Reference water quality shall also be sampled and analyzed for the same constituents pre-storm and post-storm, during the same storms when receiving water is sampled. Reference stations will be determined by the State Water Board's Division of Water Quality and the applicable Regional Water Board(s).

b. Sediment sampling shall occur at least three times during every five (5) year period. The subtidal sediment (sand or finer, if present) at the discharge shall be sampled and analyzed for Ocean Plan Table B constituents for marine aquatic life, DDT, PCBs, PAHs, pyrethroids, and OP pesticides. For sediment toxicity testing, only an acute toxicity test using the amphipod Eohaustorius estuarius must be performed.

c. A quantitative survey of intertidal benthic marine life shall be performed at the discharge and at a reference site. The survey shall be performed at least once every five (5) year period. The survey design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The results of the survey shall be completed and submitted to the State Water Board and Regional Water Board at least six months prior to the end of the permit cycle.

d. Once during each five (5) year period, a bioaccumulation study shall be conducted to determine the concentrations of metals and synthetic organic pollutants at representative discharge sites and at representative reference sites. The study design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The bioaccumulation study may include California mussels (Mytilus californianus) and/or sand crabs (Emerita analoga or Blepharipoda occidentalis). Based on the study results, the Regional Water Board and the State Water Board's Division of Water Quality, may adjust the study design in subsequent permits, or add or modify additional test organisms (such as shore crabs or fish), or modify the study design appropriate for the area and best available sensitive measures of contaminant exposure.

e. Marine Debris: Representative quantitative observations for trash by type and source shall be performed along the coast of the ASBS within the influence of the

discharger's outfalls. The design, including locations and frequency, of the marine debris observations is subject to approval by the Regional Water Board and State Water Board's Division of Water Quality.

f. The monitoring requirements of the Individual Monitoring Program in this section are minimum requirements. After a minimum of one (1) year of continuous water quality monitoring of the discharges and ocean receiving waters, the Executive Director of the State Water Board (statewide permits) or Executive officer of the Regional Water Board (Regional Water Board permits) may require additional monitoring, or adjust, reduce or suspend receiving water and reference station monitoring. This determination may be made at any point after the discharge and receiving water is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

2. Regional Integrated Monitoring Program: Dischargers may elect to participate in a regional integrated monitoring program, in lieu of an individual monitoring program, to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS. This regional approach shall characterize natural water quality, pre- and post-storm, in ocean reference areas near the mouths of identified open space watersheds and the effects of the discharges on natural water quality (physical, chemical, and toxicity) in the ASBS receiving waters, and should include benthic marine aquatic life and bioaccumulation components. The design of the ASBS stratum of a regional integrated monitoring program may deviate from the otherwise prescribed individual monitoring approach (in Section IV.B.1) if approved by the State Water Board's Division of Water Quality and the Regional Water Boards.

   a. Ocean reference areas shall be located at the drainages of flowing watersheds with minimal development (in no instance more than 10% development), and shall not be located in CWA Section 303(d) listed waterbodies or have tributaries that are 303(d) listed. Reference areas shall be free of wastewater discharges and anthropogenic non-storm water runoff. A minimum of low threat storm runoff discharges (e.g. stream highway overpasses and campgrounds) may be allowed on a case-by-case basis. Reference areas shall be located in the same region as the ASBS receiving water monitoring occurs. The reference areas for each Region are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean reference water samples must be collected from each station, each from a separate storm. A minimum of one reference location shall be sampled for each ASBS receiving water site sampled per responsible party. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

   b. ASBS ocean receiving water must be sampled in the surf zone at the location where the runoff makes contact with ocean water (i.e. at "point zero"). Ocean

receiving water stations must be representative of worst-case discharge conditions (i.e. co-located at a large drain greater than 36 inches, or if drains greater than 36 inches are not present in the ASBS then the largest drain greater than18 inches.) Ocean receiving water stations are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean receiving water samples must be collected during each storm season from each station, each from a separate storm. A minimum of one receiving water location shall be sampled in each ASBS per responsible party in that ASBS. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

c. Reference and receiving water sampling shall commence during the first full storm season following the adoption of these special conditions, and post-storm samples shall be collected when annual storm water runoff is sampled. Sampling shall occur in a minimum of two storm seasons. For those ASBS dischargers that have already participated in the Southern California Bight 2008 ASBS regional monitoring effort, sampling may be limited to only one storm season.

d. Receiving water and reference samples shall be analyzed for the same constituents as storm water runoff samples. At a minimum, constituents to be sampled and analyzed in reference and discharge receiving waters must include oil and grease, total suspended solids, Ocean Plan Table B metals for protection of marine life, Ocean Plan PAHs, pyrethroids, OP pesticides, ammonia, nitrate, phosphates, and critical life stage chronic toxicity for three species. In addition, within the range of the southern sea otter, indicator bacteria or some other measure of fecal contamination shall be analyzed.

3. Waterfront and Marine Operations: In addition to the above requirements for ocean receiving water monitoring, additional monitoring must be performed for marinas and boat launch and pier facilities:

a. For all marina or mooring field operators, in mooring fields with 10 or more occupied moorings, the ocean receiving water must be sampled for Ocean Plan indicator bacteria, residual chlorine, copper, zinc, grease and oil, methylene blue active substances (MBAS), and ammonia nitrogen.

(1) For mooring field operators opting for an individual monitoring program (Section IV.B.1 above), this sampling must occur weekly (on the weekend) from May through October.

(2) For mooring field operators opting to participate in a regional integrated monitoring program (Section IV.B.2 above), this sampling must occur monthly from May through October on a high use weekend in each month. The Water

Boards may allow a reduction in the frequency of sampling, through the regional monitoring program, after the first year of monitoring.

b. For all mooring field operators, the subtidal sediment (sand or finer, if present) within mooring fields and below piers shall be sampled and analyzed for Ocean Plan Table B metals (for marine aquatic life beneficial use), acute toxicity, PAHs, and tributyltin. For sediment toxicity testing, only an acute toxicity test using the amphipod Eohaustorius estuarius must be performed. This sampling shall occur at least three times during a five (5) year period. For mooring field operators opting to participate in a regional integrated monitoring program, the Water Boards may allow a reduction in the frequency of sampling after the first sampling effort's results are assessed.

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ATTACHMENT B

STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

1. Standard Permit Provisions

Code of Federal Regulations Title 40 Section 122.41 (40 CFR 122.41) includes conditions, or provisions, that apply to all National Pollutant Discharge Elimination System (NPDES) permits. Additional provisions applicable to NPDES permits are in 40 CFR 122.42. All applicable provisions in 40 CFR 122.41 and 40 CFR 122.42 must be incorporated into this Order and NPDES permit. The applicable 40 CFR 122.41 and 40 CFR 122.42 provisions are as follows:

a. DUTY TO COMPLY [40 CFR 122.41(a)]

The Copermittee must comply with all of the provisions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

(1) The Copermittee must comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement. [40 CFR 122.41(a)(1)]

(2) The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to a civil penalty not to exceed $25,000 per day for each violation. The CWA provides that any person who *negligently* violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than 2 years, or both. Any person who *knowingly* violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both. Any person who knowingly violates Section 301, 302, 303, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, and who knows at that time that he thereby places another person in imminent danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of

not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.
[40 CFR 122.41(a)(2)]

(3) Any person may be assessed an administrative penalty by the San Diego Regional Water Quality Control Board (San Diego Water Board), State Water Resources Control Board (State Water Board), or United States Environmental Protection Agency (USEPA) for violating Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.
[40 CFR 122.41(a)(3)]

b. DUTY TO REAPPLY [40 CFR 122.41(b)]

If a Copermittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Copermittee must apply for and obtain a new permit.

c. NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE [40 CFR 122.41(c)]

It shall not be a defense for a Copermittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

d. DUTY TO MITIGATE [40 CFR 122.41(d)]

The Copermittee must take all reasonable steps to minimize or prevent any discharge or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

e. PROPER OPERATION AND MAINTENANCE [40 CFR 122.41(e)]

The Copermittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Copermittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by a Copermittee only when the operation is necessary to achieve compliance with the conditions of this permit.

f. PERMIT ACTIONS [40 CFR 122.41(f)]

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Copermittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

g. PROPERTY RIGHTS [40 CFR 122.41(g)]

This permit does not convey any property rights of any sort, or any exclusive privilege.

h. DUTY TO PROVIDE INFORMATION [40 CFR 122.41(h)]

The Copermittee must furnish to the San Diego Water Board, State Water Board, or USEPA within a reasonable time, any information which the San Diego Water Board, State Water Board, or USPEA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Copermittee must also furnish to the San Diego Water Board, State Water Board, or USPEA upon request, copies of records required to be kept by this permit.

i. INSPECTION AND ENTRY [40 CFR 122.41(i)]

The Copermittee must allow the San Diego Water Board, State Water Board, USEPA, and/or their authorized representative (including an authorized contractor acting as their representative), upon presentation of credentials and other documents as may be required by law, to:

(1) Enter upon the Copermittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit; [40 CFR 122.41(i)(1)]

(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit; [40 CFR 122.41(i)(2)]

(3) Inspect and photograph at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; [40 CFR 122.41(i)(3)] and

(4) Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location. [40 CFR 122.41(i)(4)]

j. MONITORING AND RECORDS [40 CFR 122.41(j)]

(1) Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity. [40 CFR 122.41(j)(1)]

(2) Except for records of monitoring information required by this permit related to the Copermittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five (5) years (or longer as required by 40 CFR Part 503), the

Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time. [40 CFR 122.41(j)(2)]

(3) Records for monitoring information must include: [40 CFR 122.41(j)(3)]

(a) The date, exact place, and time of sampling or measurements; [40 CFR 122.41(j)(3)(i)]
(b) The individual(s) who performed the sampling or measurements; [40 CFR 122.41(j)(3)(ii)]
(c) The date(s) analyses were performed; [40 CFR 122.41(j)(3)(iii)]
(d) The individual(s) who performed the analyses; [40 CFR 122.41(j)(3)(iv)]
(e) The analytical techniques or methods used; [40 CFR 122.41(j)(3)(v)] and
(f) The results of such analyses. [40 CFR 122.41(j)(3)(vi)]

(4) Monitoring must be conducted according to test procedures under 40 CFR Part 136 unless another method is required under 40 CFR Subchapters N or O. [40 CFR 122.41(j)(4)]

In the case of pollutants for which there are no approved methods under 40 CFR Part 136 or otherwise required under 40 CFR Subchapters N and O, monitoring must be conducted according to a test procedure specified in the permit for such pollutants. [40 CFR 122.44(i)(1)(iv)]

(5) The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. [40 CFR 122.41(j)(5)]

k. SIGNATORY REQUIREMENT [40 CFR 122.41(k)]

(1) All applications, reports, or information submitted to the San Diego Water Board, State Water Board, or USEPA must be signed and certified. (See 40 CFR 122.22) [40 CFR 122.41(k)(1)]

(a) *For a municipality, State, Federal, or other public agency.* [All applications must be signed] [b]y either a principal executive officer or ranking elected official. [40 CFR 122.22(a)(3)]

(b) All reports required by permits, and other information requested by the San Diego Water Board, State Water Board, or USEPA must be signed by a person described in paragraph (a) of this section, or by a duly authorized representative of that person. A person is a duly authorized representative only if: [40 CFR 122.22(b)]

(i) The authorization is made in writing by a person described in paragraph (a) of this section; [40 CFR 122.22(b)(1)]

(ii) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company, (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) [40 CFR 122.22(b)(2)] and,

(iii) The written authorization is submitted to the San Diego Water Board and State Water Board. [40 CFR 122.22(b)(3)]

(c) *Changes to authorization.* If an authorization under paragraph (b) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (b) of this section must be submitted to the San Diego Water Board prior to or together with any reports, information, or applications to be signed by an authorized representative. [40 CFR 122.22(c)]

(d) *Certification.* Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." [40 CFR 122.22(d)]

(2) The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both. [40 CFR 122.41(k)(2)]

I. REPORTING REQUIREMENTS [40 CFR 122.41(l)]

(1) *Planned changes.* The Copermittee must give notice to the San Diego Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when: [40 CFR 122.41(l)(1)]

(a) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); [40 CFR 122.41(l)(1)(i)] or

(b) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which

are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1).
[40 CFR 122.41(l)(1)(ii)]

(c) The alteration or addition results in a significant change in the Copermittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. [40 CFR 122.41(l)(1)(iii)]

(2) *Anticipated noncompliance*. The Copermittee must give advance notice to the San Diego Water Board or State Water Board of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.
[40 CFR 122.41(l)(2)]

(3) *Transfers*. This permit is not transferable to any person except after notice to the San Diego Water Board. The San Diego Water Board may require modification or revocation and reissuance of the permit to change the name of the Copermittee and incorporate such other requirements as may be necessary under the CWA.
[40 CFR 122.41(l)(3)]

(4) *Monitoring reports.* Monitoring results must be reported at the intervals specified elsewhere in this permit. [40 CFR 122.41(l)(4)]

(a) Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the San Diego Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices. [40 CFR 122.41(l)(4)(i)]

(b) If the Copermittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or another method required for an industry-specific waste stream under 40 CFR Subchapters N or O, the results of this monitoring must be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the San Diego Water Board or State Water Board.
[40 CFR 122.41(l)(4)(ii)]

(c) Calculations for all limitations which require averaging of measurements must utilize an arithmetic mean unless otherwise specified in the permit.
[40 CFR 122.41(l)(4)(iii)]

(5) *Compliance schedules*. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date. [40 CFR 122.41(l)(5)]

(6) *Twenty-four hour reporting.*

(a) The Copermittee must report any noncompliance that may endanger health or the environment. Any information must be provided orally within 24 hours from the time the Copermittee becomes aware of the circumstances. A written submission must also be provided within five (5) days of the time the Copermittee becomes aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6)(i)]

(b) The following must be included as information which must be reported within 24 hours under this paragraph: [40 CFR 122.41(l)(6)(ii)]

(i) Any unanticipated bypass that exceeds any effluent limitation in the permit (See 40 CFR 122.41(g)). [40 CFR 122.41(l)(6)(ii)(A)]
(ii) Any upset which exceeds any effluent limitation in the permit. [40 CFR 122.41(l)(6)(ii)(B)] and,
(iii) Violation of a maximum daily discharge limitation for any of the pollutants listed by the San Diego Water Board in the permit to be reported within 24 hours. (See 40 CFR 122.44(g)) [40 CFR 122.41(l)(6)(ii)(C)]

(c) The San Diego Water Board may waive the above-required written report on a case-by-case basis if the oral report has been received within 24 hours. [40 CFR 122.41(l)(6)(iii)]

(7) *Other noncompliance.* The Copermittee must report all instances of noncompliance not reported in accordance with the standard provisions required under 40 CFR 122.41(l)(4), (5), and (6), at the time monitoring reports are submitted. The reports must contain the information listed in the standard provisions required under 40 CFR 122.41(l)(6). [40 CFR 122.41(l)(7))]

(8) *Other information.* When the Copermittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the San Diego Water Board, State Water Board, or USEPA, the Copermittee must promptly submit such facts or information. [40 CFR 122.41(l)(8)]

~~**m. BYPASS** [40 CFR 122.41(m)]~~

~~(1) *Definitions.*~~

~~(a) "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. [40 CFR 122.41(m)(1)(i)] or~~

~~(b) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be~~

~~expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.~~
~~[40 CFR 122.41(m)(1)(ii)]~~

~~(2) *Bypass not exceeding limitations*. The Copermittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the standard provisions required under 40 CFR 122.41(m)(3) and (4).~~
~~[40 CFR 122.41(m)(2)]~~

~~(3) *Notice.*~~

~~(a) *Anticipated bypass*. If the Copermittee knows in advance of the need for a bypass, it must submit a notice, if possible at least ten days before the date of the bypass. [40 CFR 122.41(m)(3)(i)] or~~

~~(b) *Unanticipated bypass*. The Copermittee must submit notice of an unanticipated bypass in accordance with the standard provisions required under 40 CFR 122.41(l)(6) (24-hour notice).~~
~~[40 CFR 122.41(m)(3)(ii)]~~

~~(4) *Prohibition of Bypass.*~~

~~(a) Bypass is prohibited, and the San Diego Water Board may take enforcement action against a Copermittee for bypass, unless:~~
~~[40 CFR 122.41(m)(4)(i)]~~

~~(i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; [40 CFR 122.41(m)(4)(i)(A)]~~
~~(ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance;~~
~~[40 CFR 122.41(m)(4)(i)(B)] and,~~
~~(iii) The Copermittee submitted notice in accordance with the standard provisions required under 40 CFR 122.41(m)(3).~~
~~[40 CFR 122.41(m)(4)(i)(C)]~~

~~(b) The San Diego Water Board may approve an anticipated bypass, after considering its adverse effects, if the San Diego Water Board determines that it will meet the three conditions listed above.~~
~~[40 CFR 122.41(m)(4)(ii)]~~

~~n.~~**m. UPSET** [40 CFR 122.41(n)]

(1) *Definition.* "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Copermittee. An upset does not

include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. [40 CFR 122.41(n)(1)]

(2) *Effect of an upset*. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the standard provisions required under 40 CFR 122.41(n)(3) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. [40 CFR 122.41(n)(2)]

(3) *Conditions necessary for a demonstration of upset*. A Copermittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that: [40 CFR 122.41(n)(3)]

(a) An upset occurred and that the Copermittee can identify the cause(s) of the upset; [40 CFR 122.41(n)(3)(i)]
(b) The permitted facility was at the time being properly operated; [40 CFR 122.41(n)(3)(ii)] and
(c) The Copermittee submitted notice of the upset in accordance with the standard provisions required under 40 CFR 122.41(l)(6)(ii)(B) (24-hour notice). [40 CFR 122.41(n)(3)(iii)]
(d) The Copermittee complied with any remedial measures pursuant to the standard provisions required under 40 CFR 122.41(d). [40 CFR 122.41(n)(3)(iii)]

(4) *Burden of proof*. In any enforcement proceeding, the Copermittee seeking to establish the occurrence of an upset has the burden of proof. [40 CFR 122.41(n)(4)]

~~o.~~n. STANDARD PERMIT PROVISIONS FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS
[40 CFR 122.42(c)]

The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the San Diego Water Board or State Water Board under 40 CFR 122.26(a)(1)(v) must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report must include:

(1) The status of implementing the components of the storm water management program that are established as permit conditions; [40 CFR 122.42(c)(1)]

(2) Proposed changes to the storm water management programs that are established as permit conditions. Such proposed changes must be consistent with 40 CFR 122.26(d)(2)(iii); [40 CFR 122.42(c)(2)] and

(3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under 40 CFR 122.26(d)(2)(iv) and (v); [40 CFR 122.42(c)(3)]

(4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; [40 CFR 122.42(c)(4)]

(5) Annual expenditures and budget for year following each annual report; [40 CFR 122.42(c)(5)]

(6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; [40 CFR 122.42(c)(6)]

(7) Identification of water quality improvements or degradation. [40 CFR 122.42(c)(7)]

~~p.~~o. **STANDARD PERMIT PROVISIONS FOR STORM WATER DISCHARGES** [40 CFR 122.42(d)]

The initial permits for discharges composed entirely of storm water issued pursuant to 40 CFR 122.26(e)(7) must require compliance with the conditions of the permit as expeditiously as practicable, but in no event later than three years after the date of issuance of the permit.

2. General Provisions

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. The general provisions applicable to this Order and NPDES permit are as follows:

a. DISCHARGE OF WASTE IS A PRIVILEGE

No discharge of waste into the waters of the State, whether or not such discharge is made pursuant to waste discharge requirements, shall create a vested right to continue such discharge. All discharges of waste into waters of the State are privileges, not rights. [CWC Section 13263(g)]

b. DURATION OF ORDER AND NPDES PERMIT

(1) *Effective date*. This Order and NPDES permit becomes effective on the 50th day after its adoption provided the USEPA has no objection. If the USEPA objects to its issuance, this Order shall not become effective until such objection is withdrawn. This Order supersedes Order No. R9-2007-0001 upon the effective date of this Order, and supersedes Order Nos. R9-2009-0002 and R9-2010-0016 upon their expiration or earlier notice of coverage.

(2) *Expiration*. This Order and NPDES permit expires five years after its effective date. [40 CFR 122.46(a)]

(3) *Continuation of expired order*. After this Order and NPDES permit expires, the terms and conditions of this Order and NPDES permit are automatically continued pending issuance of a new permit if all requirements of the federal NPDES regulations on the continuation of expired permits (40 CFR 122.6) are complied with.

c. AVAILABILITY

A copy of this Order must be kept at a readily accessible location and must be available to on-site personnel at all times.

d. CONFIDENTIALITY OF INFORMATION

Except as provided for in 40 CFR 122.7, no information or documents submitted in accordance with or in application for this Order will be considered confidential, and all such information and documents shall be available for review by the public at the San Diego Water Board office.

Claims of confidentiality for the following information will be denied:
[40 CFR 122.7(b)]

(1) The name and address of any permit applicant or Copermittee; [40 CFR 122.7(b)(1)] and

(2) Permit applications and attachments, permits, and effluent data. [40 CFR 122.7(b)(2)]

e. EFFLUENT LIMITATIONS

(1) *Interim effluent limitations*. The Copermittee must comply with any interim effluent limitations as established by addendum, enforcement action, or revised waste discharge requirements which have been, or may be, adopted by the San Diego Water Board.

(2) *Other effluent limitations and standards*. If any applicable toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant and that standard or prohibition is more stringent than any limitation on the pollutant in the permit, the San Diego Water Board shall institute proceedings under these regulations to modify or revoke and reissue the permit to conform to the toxic effluent standard or prohibition. [40 CFR 122.44(b)(1)].

f. DUTY TO MINIMIZE OR CORRECT ADVERSE IMPACTS

The Copermittee must take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this Order, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the noncompliance.

g. PERMIT ACTIONS

The filing of a request by the Copermittee for modification, revocation and reissuance, or termination of this Order, or a notification of planned change in or anticipated noncompliance with this Order does not stay any condition of this Order. (See 40 CFR

122.41(f)) In addition, the following provisions apply to this Order:

(1) Upon application by any affected person, or on its own motion, the San Diego Water Board may review and revise the requirements in this Order. All requirements must be reviewed periodically. [CWC Section 13263(e)]

(2) This Order may be terminated or modified for cause, including, but not limited to, all of the following: [CWC Section 13381]

(a) Violation of any condition contained in the requirements of this Order. [CWC Section 13381(a)]

(b) Obtaining the requirements in this Order by misrepresentation, or failure to disclose fully all relevant facts. [CWC Section 13381(b)]

(c) A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge. [CWC Section 13381(c)]

(3) When this Order is transferred to a new owner or operator, such requirements as may be necessary under the CWC may be incorporated into this Order.

h. NPDES PERMITTED NON-STORM WATER DISCHARGES

The San Diego Water Board has, in prior years, issued a limited number of individual NPDES permits for non-storm water discharges to MS4s. The San Diego Water Board or State Water Board may in the future, upon prior notice to the Copermittee(s), issue an NPDES permit for any non-storm water discharge (or class of non-storm water discharges) to an MS4. A Copermittee will not be held responsible for pollutants in its MS4 discharge originating from an NPDES-permitted non-storm water discharge.

i. MONITORING

In addition to the standard provisions required under 40 CFR 122.41(j) and (l)(4), the following general monitoring provisions apply to this Order:

(1) Where procedures are not otherwise specified in Order, sampling, analysis and quality assurance/quality control must be conducted in accordance with the Quality Assurance Management Plan (QAMP) for the State of California's Surface Water Ambient Monitoring Program (SWAMP), adopted by the State Water Resources Control Board (State Water Board).

~~(2) Pursuant to 40 CFR 122.41(j)(2) and CWC Section 13383(a), each Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five (5) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time.~~

~~(3)~~(2) All chemical, bacteriological, and toxicity analyses must be conducted at a

laboratory certified for such analyses by the California Department of Public Health or a laboratory approved by the San Diego Water Board.

~~(4)~~(3) For priority toxic pollutants that are identified in the California Toxics Rule (CTR) (65 Fed. Reg. 31682), the Copermittees must instruct their laboratories to establish calibration standards that are equivalent to or lower than the Minimum Levels (MLs) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP). If a Copermittee can demonstrate that a particular ML is not attainable, in accordance with procedures set forth in 40 CFR Part 136, the lowest quantifiable concentration of the lowest calibration standard analyzed by a specific analytical procedure (assuming that all the method specified sample weights, volumes, and processing steps have been followed) may be used instead of the ML listed in Appendix 4 of the SIP. The Copermittee must submit documentation from the laboratory to the San Diego Water Board for approval prior to raising the ML for any priority toxic pollutant.

j. ENFORCEMENT

(1) The San Diego Water Board is authorized to enforce the terms of this Order under several provisions of the CWC, including, but not limited to, CWC Sections 13385, 13386, and 13387.

(2) Nothing in this Order shall be construed to protect the Copermittee from its liabilities under federal, state, or local laws.

(3) The CWC provides for civil and criminal penalties comparable to, and in some cases greater than, those provided for under the CWA.

(4) Except as provided in the standard conditions required under 40 CFR 122.41(m) and (n), nothing in this Order shall be construed to relieve the Copermittee from civil or criminal penalties for noncompliance.

(5) Nothing in this Order shall be construed to preclude the institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties to which the Copermittee is or may be subject to under Section 311 of the CWA.

(6) Nothing in this Order shall be construed to preclude institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authoring preserved by Section 510 of the CWA.

k. SEVERABILITY

The provisions of this Order are severable, and if any provision of this Order, or the application of any provisions of this Order to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this Order shall not be affected thereby.

l. APPLICATIONS

Any application submitted by a Copermittee for reissuance or modification of this Order

must satisfy all applicable requirements specified in federal regulations as well as any additional requirements for submittal of a Report of Waste Discharge specified in the CWC and the California Code of Regulations.

m. IMPLEMENTATION

All plans, reports and subsequent amendments submitted in compliance with this Order must be implemented immediately (or as otherwise specified). All submittals by Copermittees must be adequate to implement the requirements of this Order.

n. REPORT SUBMITTALS

(1) All report submittals must include an executive summary, introduction, conclusion, recommendations, and signed certified statement.

(2) Each Copermittee must submit a signed certified statement covering its responsibilities for each applicable submittal.

(3) The Principal Watershed Copermittee(s) must submit a signed certified statement covering its responsibilities for each applicable submittal and the sections of the submittals for which it is responsible.

(4) Unless otherwise directed, the Copermittees must submit one hard copy and one electronic copy of each report required under this Order to the San Diego Water Board, and one electronic copy to the USEPA.

(5) The Copermittees must submit reports and provide notifications as required by this Order to the following:

EXECUTIVE OFFICER
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
9174 SKY PARK COURT, SUITE 100
SAN DIEGO CA 92123-4340
Telephone: (858) 467-2952 Fax: (858) 571-6972

EUGENE BROMLEY
US ENVIRONMENTAL PROTECTION AGENCY
REGION IX
PERMITS ISSUANCE SECTION (W-5-1)
75 HAWTHORNE STREET
SAN FRANCISCO CA 94105

ATTACHMENT C

ACRONYMS AND ABBREVIATIONS

AMAL	Average Monthly Action Level
ASBS	Area(s) of Special Biological Significance
BMP	Best Management Practice
Basin Plan	Water Quality Control Plan for the San Diego Basin
CEQA	California Environmental Quality Act
CCR	California Code of Regulations
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWC	California Water Code
CZARA	Coastal Zone Act Reauthorization Amendments of 1990
ESAs	Environmentally Sensitive Areas
GIS	Geographic Information System
IBI	Index of Biological Integrity
LID	Low Impact Development
MDAL	Maximum Daily Action Level
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
NAL	Non-Storm Water Action Level
NAICS	North American Industry Classification System
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
ROWD	Report of Waste Discharge (application for NPDES reissuance)
SAL	Storm Water Action Level
San Diego Water Board	California Regional Water Quality Control Board, San Diego Region
SIC	Standard Industrial Classification Code
State Water Board	State Water Resources Control Board
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
WDID	Waste Discharge Identification Number
WLA	Waste Load Allocation
WQBEL	Water Quality Based Effluent Limitation

DEFINITIONS

Active/Passive Sediment Treatment - Using mechanical, electrical or chemical means to flocculate or coagulate suspended sediment for removal from runoff from construction sites prior to discharge.

Anthropogenic Litter – Trash generated from human activities, not including sediment.

Automotive Repair Shop – a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539 or equivalent NAICS code.

Average Monthly Action Level – The highest allowable average of daily discharges over a calendar month.

Beneficial Uses - The uses of water necessary for the survival or wellbeing of man, plants, and wildlife. These uses of water serve to promote tangible and intangible economic, social, and environmental goals. "Beneficial Uses" of the waters of the State that may be protected include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. Existing beneficial uses are uses that were attained in the surface or ground water on or after November 28, 1975; and potential beneficial uses are uses that would probably develop in future years through the implementation of various control measures. "Beneficial Uses" are equivalent to "Designated Uses" under federal law. [California Water Code Section 13050(f)].

Best Management Practices (BMPs) - Defined in 40 CFR 122.2 as schedules of activities, effective prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. In the case of municipal discharge permits, BMPs may be used in the place of numeric effluent limits.

Bioassessment - The use of biological community information to evaluate the biological integrity of a water body and its watershed. With respect to aquatic ecosystems, bioassessment is the collection and analysis of samples of the benthic macroinvertebrate community together with physical/habitat quality measurements associated with the sampling site and the watershed to evaluate the biological condition (i.e. biotic integrity) of a water body.

Biofiltration - Practices that use vegetation and amended soils to detain and treat runoff from impervious areas. Treatment is through filtration, infiltration, adsorption, ion exchange, and biological uptake of pollutants.

Biological Integrity - Defined in Karr J.R. and D.R. Dudley. 1981. Ecological perspective on water quality goals. *Environmental Management* 5:55-68 as: "A balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitat of the region." Also referred to as ecosystem health.

BMP Design Manual – A plan developed to eliminate, reduce, or mitigate the impacts of runoff

from development projects, including Priority Development Projects.

Channel Rehabilitation and Improvement – Remedial measures or activities for the purpose of improving or restoring the environmental health of streams, channels or river systems. Techniques may vary from in-stream restoration techniques to off-line stormwater management practices installed in the system corridor or upland areas. Rehabilitation techniques may include, but are not limited to the following: riparian zone restoration, constructed wetlands, bank stabilization, channel modifications, and day lighting of drainage systems. Effectiveness may be measured in various manners, included: assessment of habitat, reduced stream bank erosion, and restoration of water and sediment transport balance.

Clean Water Act Section 303(d) Water Body - An impaired water body in which water quality does not meet applicable water quality standards and/or is not expected to meet water quality standards, even after the application of technology based pollution controls required by the CWA. The discharge of runoff to these water bodies by the Copermittees is significant because these discharges can cause or contribute to violations of applicable water quality standards.

Construction Site – Any project, including projects requiring coverage under the Construction General Permit, that involves soil disturbing activities greater than 10,000 square feet including, but not limited to, clearing, grading, disturbances to ground such as stockpiling, and excavation. This does not include interior construction activities such as interior remodeling, plumbing, electrical, or mechanical work.

Contamination - As defined in the Porter-Cologne Water Quality Control Act, contamination is "an impairment of the quality of waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste whether or not waters of the State are affected."

Copermittee – An incorporated city within the County of Orange, County of Riverside, or County of San Diego in the San Diego Region (Region 9), the County of Orange, the County of Riverside, the County of San Diego, the Orange County Flood Control District, the Riverside County Water Conservation and Flood Control District, the San Diego Regional Airport Authority, or the San Diego Unified Port District.

Copermittees – All of the individual Copermittees, collectively.

Critical Channel Flow (Qc) – The channel flow that produces the critical shear stress that initiates bed movement or that erodes the toe of channel banks. When measuring Qc, it should be based on the weakest boundary material – either bed or bank.

Daily Discharge – Defined as either: (1) the total mass of the constituent discharged over the calendar day or any 24 hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g. concentration.)

The Daily Discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day, or other 24 hour period other than a day), or by the arithmetic mean of analytical results from one or more grab samples taken over the course of a day.

Development Projects - Construction, rehabilitation, redevelopment, or reconstruction of any public or private ~~residential~~ projects involving land disturbance activities~~, industrial, commercial, or any other projects~~.

Direct Discharge to an Environmentally Sensitive Area – Flow that is conveyed overland a distance of 200 ft or less from the development to the ESA, or conveyed in a pipe any amount of distance as an isolated flow from the development to the ESA (i.e. not commingled with flows from adjacent lands).

Dry Season –May 1 to September 30.

Dry Weather – Weather is considered dry if the preceding 72 hours has been without measurable precipitation (>0.1 inch).

Enclosed Bays – Enclosed bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost bay works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays do not include inland surface waters or ocean waters.

Erosion – When land is diminished or worn away due to wind, water, or glacial ice. Often the eroded debris (silt or sediment) becomes a pollutant via storm water runoff. Erosion occurs naturally but can be intensified by land clearing activities such as farming, development, road building, and timber harvesting.

Environmentally Sensitive Areas (ESAs) - Areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; areas designated as preserves or their equivalent under the Natural Communities Conservation Program within the Cities and County of Orange; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.

Estuaries – Waters, including coastal lagoons, located at the mouth of streams that serve as areas of mixing fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and ocean water. Estuaries do not include inland surface waters or ocean waters.

Existing Development – Any area that has been developed and exists for municipal, commercial, industrial, or residential purposes, uses, or activities. May include areas that are not actively used for its originally developed purpose, but may be re-purposed or redeveloped for another use or activity.

Flow Duration – The long-term period of time that flows occur above a threshold that causes significant sediment transport and may cause excessive erosion damage to creeks and streams (not a single storm event duration). The simplest way to visualize this is to consider a histogram

of pre- and post-project flows using long-term records of hourly data. To maintain pre-development flow duration means that the total number of hours (counts) within each range of flows in a flow-duration histogram cannot increase between the pre- and post-development condition. Flow duration within the range of geomorphologically significant flows is important for managing erosion.

Grading - The cutting and/or filling of the land surface to a desired slope or elevation.

Hazardous Material – Any substance that poses a threat to human health or the environment due to its toxicity, corrosiveness, ignitability, explosive nature or chemical reactivity. These also include materials named by the USEPA in 40 CFR 116 to be reported if a designated quantity of the material is spilled into the waters of the U.S. or emitted into the environment.

Hazardous Waste - Hazardous waste is defined as "any waste which, under Section 600 of Title 22 of this code, is required to be managed according to Chapter 30 of Division 4.5 of Title 22 of this code" [CCR Title 22, Division 4.5, Chapter 11, Article 1].

Household Hazardous Waste – Paints, cleaning products, and other hazardous wastes generated during home improvement or maintenance activities.

Hydromodification – The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

Illicit Connection – Any connection to the MS4 that conveys an illicit discharge.

Illicit Discharge - Any discharge to the MS4 that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from fire fighting activities [40 CFR 122.26(b)(2)].

Inactive Areas – Areas of construction activity that are not active and those that have been active and are not scheduled to be re-disturbed for at least 14 days.

Infiltration – Water other than wastewater that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow [40 CFR 35.2005(20)].

Inland Surface Waters – Includes all surface waters of the U.S. ~~State~~ that do not include the ocean, enclosed bays, or estuaries.

Jurisdictional Runoff Management Program Document – A written description of the specific jurisdictional runoff management measures and programs that each Copermittee will implement to comply with this Order and ensure that storm water pollutant discharges in runoff are reduced to the MEP and do not cause or contribute to a violation of water quality standards.

Low Impact Development (LID) – A storm water management and land development strategy that emphasizes conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions.

Low Impact Development Best Management Practices (LID BMPs) – LID BMPs include schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States through storm water management and land development strategies that emphasize conservation ~~s~~and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions. LID BMPs include retention practices that do not allow runoff, such as infiltration, rain water harvesting and reuse, and evapotranspiration. LID BMPs also include flow-through practices such as biofiltration that may have some discharge of storm water following pollutant reduction.

Major Outfall – As defined in the Code of Federal Regulations, a major outfall is a MS4 outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (i.e. discharge from a single conveyance other than a circular pipe which is associated with a drainage area of more than 50 acres); or, for MS4s that receive storm water from lands zoned for industrial activity (based on comprehensive zoning plans or equivalent), a MS4 outfall that discharges from a single pipe with an inside diameter of 12 inches or more or from its equivalent (i.e. discharge from other than a circular pipe associated with a drainage area of 2 acres or more).

Maximum Daily Action Level (MDAL) –The highest allowable daily discharge of a pollutant, over a calendar day (or 24 hour period). For pollutants with action levels expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with action levels expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

Maximum Extent Practicable (MEP) – The technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) for ~~storm water~~ discharges of pollutants that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) in combination with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than BAT. A definition for MEP is not provided either in the statute or in the regulations. Instead the definition of MEP is dynamic and will be defined by the following process over time: municipalities propose their definition of MEP by way of their runoff management programs. Their total collective and individual activities conducted pursuant to the runoff management programs becomes their proposal for MEP as it applies both to their overall effort, as well as to specific activities (e.g., MEP for street sweeping, or MEP for MS4 maintenance). In the absence of a proposal acceptable to the San Diego Water Board, the San Diego Water Board defines MEP.

In a memo dated February 11, 1993, entitled "Definition of Maximum Extent Practicable," Elizabeth Jennings, Senior Staff Counsel, SWRCB addressed the achievement of the MEP standard as follows:

"*To achieve the MEP standard, municipalities must employ whatever Best Management*

Practices (BMPs) are technically feasible (i.e., are likely to be effective) and are not cost prohibitive. The major emphasis is on technical feasibility. Reducing pollutants to the MEP means choosing effective BMPs, and rejecting applicable BMPs only where other effective BMPs will serve the same purpose, or the BMPs would not be technically feasible, or the cost would be prohibitive. In selecting BMPs to achieve the MEP standard, the following factors may be useful to consider:

a. Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?
b. Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?
c. Public Acceptance: Does the BMP have public support?
d. Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?
e. Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc.?

The final determination regarding whether a municipality has reduced pollutants to the maximum extent practicable can only be made by the Regional or State Water Boards, and not by the municipal discharger. If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit derived, it would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs that would address a pollutant source, or to pick a BMP based solely on cost, which would be clearly less effective. In selecting BMPs the municipality must make a serious attempt to comply and practical solutions may not be lightly rejected. In any case, the burden would be on the municipal discharger to show compliance with its permit. After selecting a menu of BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented."

Monitoring Year – October 1 to September 30

Municipal Separate Storm Sewer System (MS4) – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designated or used for collecting or conveying storm water; (iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.22~~26~~. Copermittees need only comply with permit conditions relating to discharges from the municipal separate storm sewers for which they are operators." 40 CFR §122.21(a)(vi).

National Pollutant Discharge Elimination System (NPDES) - The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of

the CWA.

Non-Storm Water - All discharges to and from a MS4 that do not originate from precipitation events (i.e., all discharges from a MS4 other than storm water). Non-storm water includes illicit discharges and NPDES permitted discharges and the discharges described in Provision E(2)(a)(3)-(5).

Nuisance - As defined in the Porter-Cologne Water Quality Control Act, a nuisance is "anything which meets all of the following requirements: 1) Is injurious to health, or is indecent, or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. 2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. 3) Occurs during, or as a result of, the treatment or disposal of wastes."

Ocean Waters – the territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the State Board's California Ocean Plan.

Order – Unless otherwise specified, refers to this Order, Order No. R9-2013-0001 (NPDES No. CAS0109266)

Outfall - *Outfall* means a *point source* as defined by 40 CFR 122.2 at the point where a municipal separate storm sewer discharges to waters of the United States and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels or other conveyances which connect segments of the same stream or other waters of the United States and are used to convey waters of the United States. 40 C.F.R. 122.26(b)(9).

Parking Lot – a land area or facility for the tempraory parking or storage of motor vehicles used personally, for business, or for commerce.

Persistent Flow - Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

Person - A person is defined as an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof [40 CFR 122.2].

Point Source - Any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, landfill leachate collection systems, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

Pollutant - Any agent that may cause or contribute to the degradation of water quality such that a condition of pollution or contamination is created or aggravated.

Pollution - As defined in the Porter-Cologne Water Quality Control Act, pollution is "the alteration of the quality of the waters of the State by waste, to a degree that unreasonably affects the either of the following: 1) The waters for beneficial uses; or 2) Facilities that serve these beneficial uses." Pollution may include contamination.

Pollution Prevention - Pollution prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control BMPs, treatment control BMPs, or disposal.

~~**Pre-Development**~~ **Pre-Project Runoff Conditions** – Runoff conditions that exist~~ed~~ onsite immediately before ~~the existing development was constructed, or exists onsite before~~ planned development activities occur. Pre-project is not intended to be interpreted as that period before any human-induced land disturbance has occurred. 64 FR 68761.

Priority Development Projects - New development and redevelopment projects defined under Provision E.3.b of Order No. R9-2012-0011.

Properly Designed – Designed in accordance with the Copermittee's BMP Design Manual and/or any appropriate design requirements set forth by the Copermittee and based on widely accepted design criteria.

Public Education, Outreach and Participation – Programs to educate residents, businesses and visitors about the importance of water quality and water quality programs so that they will support local efforts and understand their role in protecting receiving waters. The Education and Outreach Program will increase knowledge and awareness, improve attitudes toward storm pollution prevention, and provide a foundation for changing behaviors that contribute to storm water pollution.

Rainy Season (aka Wet Season) –October 1 to April 30

Receiving Waters – Waters of the United States.

Receiving Water Limitations - Waste discharge requirements issued by the San Diego Water Board typically include both: (1) "Effluent Limitations" (or "Discharge Limitations") that specify the technology-based or water-quality-based effluent limitations; and (2) "Receiving Water Limitations" that specify the water quality objectives in the Basin Plan as well as any other limitations necessary to attain those objectives. In summary, the "Receiving Water Limitations" provision is the provision used to implement the requirements of CWA section 402(p)(3)(B).

Redevelopment - The creation, addition, and or replacement of impervious surface on an already developed site through construction or alteration of the existing footprint. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include trenching and resurfacing associated with utility work; resurfacing existing roadways; resurfacing, cutting and reconfiguring of surface parking lots; new sidewalk construction, pedestrian ramps, or bike lane on existing roads; and routine replacement of damaged pavement, such as pothole repair.

Reporting Period – The period of information that is reported in the Annual Report. The

reporting period consists of two components: 1) July 1 to June 30, consistent with the fiscal year, for the implementation of the jurisdictional runoff management programs, and 2) October 1 to September 30, consistent with the monitoring year for the monitoring and assessment programs. Together, these two time periods constitute the reporting year for the Annual Report due January 31 following the end of the monitoring year.

Restaurant – A facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812).

Retail gasoline outlet (RGO) – A business that sells automotive or truck fuel to the general public.

Retain –Keep or hold in a particular place, condition, or position without discharge to surface waters.

Retrofitting – – Storm water management practice put into place after development has occurred in watersheds where the practices previously did not exist or are ineffective. Retrofitting of developed areas is intended to improve water quality, protect downstream channels, reduce flooding, or meet other specific objectives. Retrofitting developed areas may include, but is not limited to replacing roofs with green roofs, disconnecting downspouts or impervious surfaces to drain to pervious surfaces, replacing impervious surfaces with pervious surfaces, installing rain barrels, installing rain gardens, and trash area enclosures.

Runoff - All flows in a storm water conveyance system that consists of the following components: (1) storm water (wet weather flows) and (2) non-storm water including dry weather flows.

San Diego Water Board – As used in this document the term "San Diego Water Board" is synonymous with the term "Regional Board" as defined in Water Code section 13050(b) and is intended to refer to the California Regional Water Quality Control Board for the San Diego Region as specified in Water Code Section 13200.

Sediment - Soil, sand, and minerals washed from land into water. Sediment resulting from anthropogenic sources (i.e. human induced land disturbance activities) is considered a pollutant. This Order regulates only the discharges of sediment from anthropogenic sources and does not regulate naturally occurring sources of sediment. Sediment can destroy fish-nesting areas, clog animal habitats, and cloud waters so that sunlight does not reach aquatic plants.

Source Control BMP – –Land use or site planning practices, or structural or nonstructural measures that aim to prevent runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between pollutants and runoff.

Street, Road, Highway, Freeway and Driveway – Any paved impervious surface that is used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

Storm Water – – Per 40 CFR 122.26(b)(13), means storm water runoff, snowmelt runoff and surface runoff and drainage. Surface runoff and drainage pertains to runoff and drainage resulting from precipitation events.

Stream, Channel, or Habitat Rehabilitation – – Measures or activities for the purpose of improving or restoring the environmental health (i.e. physical, chemical and biological integrity) of streams, channels, or river systems. Rehabilitation techniques may include, but are not limited to, riparian zone restoration, constructed wetlands, bank stabilization, channel reconfiguration, and daylighting drainage systems.

Structural BMPs - A subset of BMPs which detains, retains, filters, removes, or prevents the release of pollutants to surface waters from development projects in perpetuity, after construction of a project is completed.

Total Maximum Daily Load (TMDL) - The maximum amount of a pollutant that can be discharged into a water body from all sources (point and non-point) and still maintain water quality standards. Under CWA section 303(d), TMDLs must be developed for all water bodies that do not meet water quality standards after application of technology-based controls.

Toxicity - Adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies). The water quality objectives for toxicity provided in the Basin Plan, state in part…"All waters shall be free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life….The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge".

Treatment Control BMP – Any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media absorption or any other physical, biological, or chemical process.

Unpaved Road – Any long, narrow stretch without pavement used for traveling by motor passenger vehicles between two or more points. Unpaved roads are generally constructed of dirt, gravel, aggregate or macadam and may be improved or unimproved.

Waste - As defined in CWC Section 13050(d), "waste includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal."

Article 2 of CCR Title 23, Chapter 15 (Chapter 15) contains a waste classification system that applies to solid and semi-solid waste, which cannot be discharged directly or indirectly to water of the state and which therefore must be discharged to land for treatment, storage, or disposal in accordance with Chapter 15. There are four classifications of waste (listed in order of highest to lowest threat to water quality): hazardous waste, designated waste, non-hazardous solid waste, and inert waste.

Water Quality Objective - Numerical or narrative limits on constituents or characteristics of water designated to protect designated beneficial uses of the water. [California Water Code Section 13050 (h)]. California's water quality objectives are established by the State and Regional Water Boards in the Water Quality Control Plans. Numeric or narrative limits for pollutants or characteristics of water designed to protect the beneficial uses of the water. In

other words, a water quality objective is the maximum concentration of a pollutant that can exist in a receiving water and still generally ensure that the beneficial uses of the receiving water remain protected (i.e., not impaired). Since water quality objectives are designed specifically to protect the beneficial uses, when the objectives are violated the beneficial uses are, by definition, no longer protected and become impaired. This is a fundamental concept under the Porter Cologne Act. Equally fundamental is Porter Cologne's definition of pollution. A condition of pollution exists when the water quality needed to support designated beneficial uses has become unreasonably affected or impaired; in other words, when the water quality objectives have been violated. These underlying definitions (regarding beneficial use protection) are the reason why all waste discharge requirements implementing the federal NPDES regulations require compliance with water quality objectives. (Water quality objectives are also called water quality criteria in the CWA.)

Water Quality Standards - Water quality standards, as defined in Clean Water Act section 303(c) consist of the beneficial uses (e.g., swimming, fishing, municipal drinking water supply, etc.,) of a water body and criteria (referred to as water quality objectives in the California Water Code) necessary to protect those uses. Under the Water Code, the water boards establish beneficial uses and water quality objectives in water quality control or basin plans. Together with an anti-degradation policy, these beneficial uses and water quality objectives serve as water quality standards under the Clean Water Act. In Clean Water Act parlance, state beneficial uses are called "designated uses" and state water quality objectives are called "criteria." Throughout this Order, the relevant term is used depending on the statutory scheme.

Waters of the State - Any water, surface or underground, including saline waters within the boundaries of the State [CWC section 13050 (e)]. The definition of the Waters of the State is broader than that for the Waters of the United States in that all water in the State is considered to be a Waters of the State ~~regardless of circumstances or condition~~.

Waters of the United States - As defined in the 40 CFR 122.2, the Waters of the U.S. are defined as: "(a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate "wetlands;" (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters otherwise defined as waters of the United States under this definition: (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial seas; and (g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA."

Watershed - That geographical area which drains to a specified point on a water course, usually a confluence of streams or rivers (also known as drainage area, catchment, or river basin).

Wet Season (aka Rainy Season) –October 1 to April 30

Wet Weather – Weather is considered wet if there is a storm event of 0.1 inches and greater and the following 72 hours, unless otherwise defined by another regulatory mechanism.

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ATTACHMENT D

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

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JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

FY _____

I. COPERMITTEE INFORMATION

Copermittee Name:

Copermittee Primary Contact Name:

Copermittee Primary Contact Information:
Address:
City: County: State: Zip:
Telephone: Fax: Email:

II. LEGAL AUTHORITY

Has the Copermittee established adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 that complies with Order No. R9-2013-0001?	YES NO	☐ ☐
A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority?	YES NO	☐ ☐

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

Was an update of the jurisdictional runoff management program document required or recommended by the San Diego Water Board?	YES NO	☐ ☐
If YES to the question above, did the Copermittee update its jurisdictional runoff management program document and make it available on the Regional Clearinghouse?	YES NO	☐ ☐

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

Has the Copermittee implemented a program to actively detect and eliminate illicit discharges and connections to its MS4 that complies with Order No. R9-2013-0001?	YES NO	☐ ☐

Number of non-storm water discharges reported by the public	
Number of non-storm water discharges detected by Copermittee staff or contractors	
Number of non-storm water discharges investigated by the Copermittee	
Number of sources of non-storm water discharges identified	
Number of non-storm water discharges eliminated	
Number of sources of illicit discharges or connections identified	
Number of illicit discharges or connections eliminated	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

V. DEVELOPMENT PLANNING PROGRAM

Has the Copermittee implemented a development planning program that complies with Order No. R9-2013-0001?	YES NO	☐ ☐
Was an update to the BMP Design Manual required or recommended by the San Diego Water Board?	YES NO	☐ ☐
If YES to the question above, did the Copermittee update its BMP Design Manual and make it available on the Regional Clearinghouse?	YES NO	☐ ☐

Number of proposed development projects in review	
Number of Priority Development Projects in review	
Number of Priority Development Projects approved	
Number of approved Priority Development Projects exempt from any BMP requirements	
Number of approved Priority Development Projects allowed alternative compliance	
Number of Priority Development Projects granted occupancy	

Number of completed Priority Development Projects in inventory	
Number of high priority Priority Development Project structural BMP inspections	
Number of Priority Development Project structural BMP violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM
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VI. CONSTRUCTION MANAGEMENT PROGRAM

Has the Copermittee implemented a construction management program that complies with Order No. R9-2013-0001?	YES	☐
	NO	☐

Number of construction sites in inventory	
Number of active construction sites in inventory	
Number of inactive construction sites in inventory	
Number of construction sites closed/completed during reporting period	
Number of construction site inspections	
Number of construction site violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

Has the Copermittee implemented an existing development management program that complies with Order No. R9-2013-0001?	YES	☐
	NO	☐

	Municipal	Commercial	Industrial	Residential
Number of facilities or areas in inventory				
Number of existing development inspections				
Number of follow-up inspections				
Number of violations				
Number of enforcement actions issued				
Number of escalated enforcement actions issued				

VIII. PUBLIC EDUCATION AND PARTICIPATION

Has the Copermittee implemented a public education program component that complies with Order No. R9-2013-0001?	YES	☐
	NO	☐
Has the Copermittee implemented a public participation program component that complies with Order No. R9-2013-0001?	YES	☐
	NO	☐

IX. FISCAL ANALYSIS

Has the Copermittee attached to this form a summary of its fiscal analysis that complies with Order No. R9-2013-0001?	YES	☐
	NO	☐

X. CERTIFICATION

I [☐ Principal Executive Officer ☐ Ranking Elected Official ☐ Duly Authorized Representative] certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature	Date
Print Name	Title
Telephone Number	Email

ATTACHMENT E

SPECIFIC PROVISIONS FOR TOTAL MAXIMUM DAILY LOADS APPLICABLE TO ORDER NO. R9-2013-0001

These provisions implement Total Maximum Daily Loads (TMDLs), adopted by the San Diego Water Board and approved by USEPA under Clean Water Act section 303(c), which are applicable to discharges regulated under this Order. The provisions and schedules for implementation of the TMDLs described below must be incorporated into the Water Quality Improvement Plans, required pursuant to Provision B of this Order, for the specified Watershed Management Areas.

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed
2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin
3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed
4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek
5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay
6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2002-0123

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	August 14, 2002
State Water Board Approval Date:	July 16, 2003
Office of Administrative Law Approval Date:	September 11, 2003
US EPA Approval Date:	November 3, 2003

(3) TMDL Effective Date: September 11, 2003

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS~~WATER QUALITY BASED EFFLUENT LIMITATIONS~~

Final TMDL compliance requirements ~~The WQBELs~~ for Chollas Creek consist of the following:

(1) Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the ~~violation~~ exceedance of the following receiving water limitations by the end of the compliance schedule under Specific Provision 1.a~~a~~a~~a~~:

Table 1.1
Receiving Water Limitations as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Diazinon	Acute	0.16~~08~~ µg/L	1 hour
	Chronic	0.10~~05~~ µg/L	4 days

(2) Final Water Quality Based Effluent Limitations

~~Discharges from the MS4s must not contain concentrations that exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 1.c:~~
In the case that receiving water limitations are exceeded after the end of the compliance schedules under Specific Provision 1.b.(4), effluent limitations will be used to determine whether MS4 discharges are causing or contributing to exceedances of receiving water quality limitations. To demonstrate MS4 discharges are not causing or contributing to an exceedance of receiving

water quality limitations, MS4 discharges must meet the concentration-based effluent limitations in Table 1.2.

Table 1.2
Effluent Limitations as Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation	Averaging Period
Diazinon	Acute	0.~~072~~ 144 µg/L	1 hour
	Chronic	0.~~045~~ 09 µg/L	4 days

1. Concentrations shall be determined on a flow-weighted basis across all outfalls within a jurisdiction, not outfall-by-outfall.

(3) Best Management Practices

The following BMPs for Chollas Creek must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area and implemented by the Responsible Copermittees:

(a) The Responsible Copermittees must implement BMPs to support the achievement of the WQBELs under Specific Provision 1.b for Chollas Creek.

(b) The Responsible Copermittees must implement the Diazinon Toxicity Control Plan and Diazinon Public Outreach/Education Program as described in the report titled, *Technical Report for Total Maximum Daily Load for Diazinon in Chollas Creek Watershed, San Diego County*, dated August 14, 2002, including subsequent modifications, in order to achieve the WQBELs under Specific Provision 1.b.

(c) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans as possible.

(d) For Copermittees utilizing the Water Quality Improvement Plan compliance option, the strategies and activities contained in the Water Quality Improvement Plan accepted by the San Diego Water Board and adaptively managed as outlined in Provision B.6, F.1, and F.2, will serve as BMP-based WQBELs under the following conditions, as outlined in Provision B.3.a:

(1) A Responsible Copermittee requests that the Water Quality Improvement Plan be approved as the basis for compliance with the discharge prohibitions (A.1), receiving water limitations (A.2), and/or effluent limitations (A.3) in the letter of submittal to the San Diego Water Board;

(2) Reasonable assurance is demonstrated that the strategies and activities in the Water Quality Improvement Plan are expected to attain the final receiving water limitations or final WQBELs under Specific Provision 1.b;

(3) The submitted schedule as outlined in Provision B.3 provides sufficient detail regarding the strategies and activities to be implemented to allow

the Regional Board to use the schedule for compliance determination in a clear, specific, measurable, and enforceable manner; AND

(4) The Water Quality Improvement Plan is approved by the Regional Board Executive Officer and is implemented per the approved schedule and adapted pursuant to Provisions B.6, F.1, and F.2.

~~c. COMPLIANCE SCHEDULE~~

(4) Final Compliance Dates

The Responsible Copermittees are required to achieve their respective WLAs by December 31, 2010. The Responsible Copermittees must be in compliance with the final receiving water limitations or final WQBELs under Specific Provision 1.b.

(5) Final Compliance Determination

Compliance with final compliance requirements of Specific Provision 1.b may be demonstrated by a Responsible Copermittee via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water; OR

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 1.b.(1) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the applicable effluent limitations under Specific Provision 1.b.(2) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittee can demonstrate that exceedances of the applicable final receiving water limitations under Specific Provision 1.b.(1) in the receiving water are due to loads from non-MS4 sources; OR

(e) The Responsible Copermittee has submitted and is fully implementing a Water Quality Improvement Plan that is developed and adaptively managed as outlined in Provisions B, F.1 and F.2, is accepted by the San Diego Water Board, and meets the conditions of Specific Provision 1.b.(3).d.

~~d.~~c. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal*

Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls for diazinon within the Chollas Creek watershed, and calculate or estimate the annual diazinon loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

~~e. COMPLIANCE DETERMINATION~~

~~Compliance with WQBELs of Specific Provision 1.b may be demonstrated via one of the following methods:~~

~~(1) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;~~

~~(2) There are no exceedances of the applicable receiving water limitations under Specific Provision 1.b.(1) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR~~

~~(3) There are no violations of the applicable effluent limitations under Specific Provision 1.b.(2) at the Responsible Copermittees' MS4 outfalls.~~

2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0019

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	September 22, 2005
Office of Administrative Law Approval Date:	December 2, 2005
US EPA Approval Date:	February 8, 2006

(3) TMDL Effective Date: December 2, 2005

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Shelter Island Yacht Basin

(6) Responsible Copermittee: City of San Diego~~t~~

b. FINAL TMDL COMPLIANCE REQUIREMENTS ~~WATER QUALITY BASED EFFLUENT LIMITATIONS~~

~~The WQBELs~~ Final TMDL compliance requirements for Shelter Island Yacht Basin consist of the following:

(1) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance ~~violation~~ of the following receiving water limitations by the end of the compliance schedule under Specific Provision 2.~~c~~b(4):

Table 2.1
Receiving Water Limitations as Concentrations in Shelter Island Yacht Basin

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Dissolved Copper	Acute	4.8 x WER µg/L	1 hour
	Chronic	3.1 x WER µg/L	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER.

(2) Final Water Quality Based Effluent Limitations

In the case that receiving water limitations are exceeded after the end of the compliance schedule under Specific Provision 2.b.(4), ~~Discharges from the MS4s must not contain pollutant loads that exceed the following~~ effluent limitations will be used to determine whether MS4 discharges are causing or contributing to exceedances of receiving water quality limitations~~by the end of the compliance schedule under Specific Provision 2.c:~~. To demonstrate MS4 discharges are not causing or contributing to exceedances of receiving water quality limitations, MS4 discharges must meet the load-based effluent limitations in Table 2.2.

Table 2.2
Effluent Limitations as Annual Loads in MS4 Discharges to Shelter Island Yacht Basin

Constituent	Effluent Limitation
Dissolved Copper	30 x WER kg/yr

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER.

(3) Final Best Management Practices

~~The Responsible Copermittee must implement BMPs to support the achievement of the WQBELs under Specific Provision 2.b for Shelter Island Yacht Basin~~

(a) The Responsible Copermittee must implement BMPs to support the achievement of the final receiving water limitations or final WQBELs under Specific Provision 2.b.

(b) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with other responsible parties as possible.

(c) For Copermittees utilizing the Water Quality Improvement Plan compliance option, the strategies and activities contained in the Water Quality Improvement Plan accepted by the San Diego Water Board and adaptively managed as outlined in Provision B.6, F.1, and F.2, will serve as BMP-based WQBELs under the following conditions, as outlined in Provision B.3.a:

(1) A Responsible Copermittee requests that the Water Quality Improvement Plan be approved as the basis for compliance in the letter of submittal to the San Diego Water Board;

(2) Reasonable assurance is demonstrated that the strategies and activities in the Water Quality Improvement Plan are expected to attain the final receiving water limitations or final WQBELs under Specific Provision 2.b;

(3) The submitted schedule as outlined in Provision B.3 provides sufficient

detail regarding the strategies and activities to be implemented to allow the Regional Board to use the schedule for compliance determination in a clear, specific, measurable, and enforceable manner; AND

(4) The Water Quality Improvement Plan is approved by the Regional Board Executive Officer and is implemented per the approved schedule and adapted pursuant to Provisions B.6, F.1, and F.2.

(4) Final Compliance Schedule

The Responsible Copermittee is required to achieve the MS4 WLA by December 2, 2005. The Responsible Copermittee must be in compliance with the final receiving water limitations or final WQBELs under Specific Provision 2.b.

(5) Final Compliance Determination

Compliance with final compliance requirements of Specific Provision 2.b.(1) may be demonstrated by a Responsible Copermittee via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 1.b.(1) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the applicable effluent limitations under Specific Provision 2.b.(2) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittee can demonstrate that exceedances of the applicable final receiving water limitations under Specific Provision 2.b.(1) in the receiving water are due to loads from non-MS4 sources; OR

(e) The Responsible Copermittee has submitted and is fully implementing a Water Quality Improvement Plan that is developed and adaptively managed as outlined in Provisions B, F.1 and F.2, is accepted by the San Diego Water Board, and meets the conditions of Specific Provision 2.b.(3).c.

c. Specific Monitoring and Assessment Requirements

The Responsible Copermittee must monitor the effluent of its MS4 outfalls for dissolved copper, and calculate or estimate the monthly and annual dissolved copper loads, in accordance with the requirements of Provisions D.2, D.4.b.(1),

and D.4.(b)(2)of this Order. The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

~~**d. COMPLIANCE DETERMINATION**~~

~~Compliance with WQBELs of Specific Provision 2.b may be demonstrated via one of the following methods:~~

~~(1) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water;~~

~~(2) There are no exceedances of the applicable receiving water limitations under Specific Provision 2.b.(1) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR~~

~~(3) There are no violations of the applicable effluent limitations under Specific Provision 2.b.(2) at the Responsible Copermittee's MS4 outfalls.~~

3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0036

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	November 16, 2005
Office of Administrative Law Approval Date:	February 1, 2006
US EPA Approval Date:	March 22, 2006

(3) TMDL Effective Date: February 1, 2006

(4) Watershed Management Area: Santa Margarita River

(5) Water Body: Rainbow Creek

(6) Responsible Copermittee: County of San Diego

b. FINAL TMDL COMPLIANCE REQUIREMENTS~~WATER QUALITY BASED EFFLUENT LIMITATIONS~~

~~The WQBELs~~ Final TMDL compliance requirements for Rainbow Creek consist of the following:

(1) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the ~~violation~~ exceedance of the following receiving water limitations by the end of the compliance schedule under Specific Provision 3.b(4)~~c.(1)~~:

Table 3.1
Receiving Water Limitations as Concentrations in Rainbow Creek

Constituent	Receiving Water Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(2) Final Water Quality Based Effluent Limitations

(a) In the case that receiving water limitations are exceeded after the end of the compliance schedules under Specific Provision 3.b.(4), ~~Discharges from the MS4s must not contain concentrations that exceed the following~~ effluent limitations will be used to determine whether MS4 discharges are causing or contributing to exceedances of receiving water quality limitations. ~~by the end of the compliance schedule under Specific Provision 3.c.(1):~~ To demonstrate MS4 discharges are not causing or contributing to exceedances of receiving water quality limitations, MS4 discharges must meet either the concentration-based effluent limitations in Table 3.2 or the load-based effluent limitations in Table 3.3.

Table 3.2
Effluent Limitations as Concentrations in MS4 Discharges to Rainbow Creek

Constituent	Effluent Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

1. Concentrations shall be determined on a flow-weighted basis across all outfalls within a jurisdiction, not outfall-by-outfall.

~~(b) Pollutant loads from given land uses discharging to and from the MS4s must not exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 3.c.(1):~~

Table 3.3
Effluent Limitations as Annual Loads in MS4 Discharges to Rainbow Creek

Land Use	Total N	Total P
Commercial nurseries	116 kg/yr	3 kg/yr
Park	3 kg/yr	0.1 kg/yr
Residential areas	149 kg/yr	12 kg/yr
Urban areas	27 kg/yr	6 kg/yr

~~Interim effluent limitations expressed as pollutant loads are given in the compliance schedule under Specific Provision 3.0.~~

(3) Final Best Management Practices

(a) The Responsible Copermittee must implement BMPs to support the achievement of the final receiving water limitations or final WQBELs under Specific Provision 3.b for Rainbow Creek.

(b) The Responsible Copermittee should coordinate any BMPs implemented to address this TMDL with Caltrans and other sources as possible.

(c) For Copermittees utilizing the Water Quality Improvement Plan compliance option, the strategies and activities contained in the Water Quality Improvement Plan accepted by the San Diego Water Board and adaptively managed as outlined in Provision B.6, F.1, and F.2, will serve

as BMP-based WQBELs under the following conditions, as outlined in Provision B.3.a:

(1) A Responsible Copermittee requests that the Water Quality Improvement Plan be approved as the basis for compliance in the letter of submittal to the San Diego Water Board;

(2) Reasonable assurance is demonstrated that the strategies and activities in the Water Quality Improvement Plan are expected to attain the final receiving water limitations or final WQBELs under Specific Provision 3.b;

(3) The submitted schedule as outlined in Provision B.3 provides sufficient detail regarding the strategies and activities to be implemented to allow the Regional Board to use the schedule for compliance determination in a clear, specific, measurable, and enforceable manner; AND

(4) The Water Quality Improvement Plan is approved by the Regional Board Executive Officer and is implemented per the approved schedule and adapted pursuant to Provisions B.6, F.1, and F.2.

~~c. Compliance Schedule~~

(5) Final Compliance Date

The Responsible Copermittee must be in compliance with the final receiving water limitations or final WQBELs under Specific Provision 3.b, by December 31, 2021.

(6) Final Compliance Determination

Compliance with final compliance requirements of Specific Provision 3.b.(1) may be demonstrated by a Responsible Copermittee via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 3.b.(1) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of either the applicable numeric or load based effluent limitations under Specific Provision 3.b.(2) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittee can demonstrate that exceedances of the applicable final receiving water limitations under Specific Provision 3.b.(1).a in the receiving water are due to loads from natural sources or non-MS4 sources; OR

(e) The Responsible Copermittee is using its legal authority to reduce nutrient discharges from the land uses identified under Specific Provision 3.b.(2).b to the maximum extent practicable; OR

(f) The Responsible Copermittee has submitted and is fully implementing a Water Quality Improvement Plan that is developed and adaptively managed as outlined in Provisions B, F.1 and F.2, is accepted by the San Diego Water Board, and meets the conditions of Specific Provision 3.b.(3).d.

c. Interim Compliance Requirements

~~(6) Interim Compliance Requirements~~

Interim TMDL compliance requirements consist of the following:

(1) Interim Water Quality Based Effluent Limitations

Discharges from the MS4s must not exceed the interim WQBELs presented in

Table 3.4 by the end of the interim compliance schedule as presented in Table 3.4.

Table 3.4
Interim Effluent Limitations as Annual Loads in MS4 Discharges from Specific Land Uses to Rainbow Creek

	Total N Interim Effluent Limitations (kg/yr)			Total P Interim Effluent Limitations (kg/yr)		
	Interim Compliance Date			Interim Compliance Date		
Land Use	**2009**	**2013**	**2017**	**2009**	**2013**	**2017**
Commercial nurseries	390	299	196	20	16	10
Park	5	3	3	0.15	0.10	0.10
Residential areas	507	390	260	99	74	47
Urban areas	40	27	27	9	6	6

(2) Interim Best Management Practices

(a) The Responsible Copermittee must implement BMPs to support the achievement interim effluent limitations under Specific Provision 3.c.(1).

(b) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with other responsible parties as possible.

(c) For Copermittees utilizing the Water Quality Improvement Plan compliance option, the strategies and activities contained in the Water Quality Improvement Plan accepted by the San Diego Water Board and adaptively managed as outlined in Provision B.6, F.1, and F.2, will serve as BMP-based WQBELs under the following conditions, as outlined in Provision B.3.a:

(1) A Responsible Copermittee requests that the Water Quality Improvement Plan be approved as the basis for compliance with the discharge prohibitions (A.1), receiving water limitations (A.2), and/or effluent limitations (A.3) in the letter of submittal to the San Diego Water Board;

(2) Reasonable assurance is demonstrated that the strategies and activities in the Water Quality Improvement Plan are expected to attain the interim load requirements under Specific Provision 3.c.(1);

(3) The submitted schedule as outlined in Provision B.3 provides sufficient detail regarding the strategies and activities to be implemented to allow the Regional Board to use the schedule for compliance determination in a clear, specific, measurable, and enforceable manner; AND

(4) The Water Quality Improvement Plan is approved by the Regional Board Executive Officer and is implemented per the approved schedule and adapted pursuant to Provisions B.6, F.1, and F.2.

(3) Interim Compliance Determination

Compliance with interim compliance requirements of Specific Provision 3.c may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the applicable final receiving limitations under Specific Provision 3.b.(1) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) The Responsible Copermittee demonstrates applicable interim WQBELs under Specific Provision 3.c.(1) have been achieved; OR

(d) The Responsible Copermittee can demonstrate that exceedances of the applicable final receiving water limitations under Specific Provision 3.b.(1) are due to loads from natural sources or non-MS4 sources; OR

(e) The Responsible Copermittee is using its legal authority to reduce nutrient discharges from the land uses identified under Specific Provision 3.b.(2).(b) to the maximum extent practicable; OR

(f) The Responsible Copermittee has submitted and is fully implementing a Water Quality Improvement Plan, that is developed and adaptively managed as outlined in Provisions B, F.1 and F.2, is accepted by the San Diego Water Board, and meets the conditions of Specific Provision 3.c.(2).c.

d. Specific Monitoring and Assessment Requirements

The Responsible Copermittee must implement the Sampling and Analysis Plan for Rainbow Creek Nutrient Reduction TMDL Implementation Water Quality Monitoring, dated January 2010. The results of any monitoring conducted during the reporting period, and assessment of whether the interim and final WQBELs have been achieved must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

~~e. Compliance Determination~~

~~(1) Compliance with interim compliance requirements of Specific Provision 3.c.(2) may be demonstrated via one of the following methods:~~

~~(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water;~~

~~(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 3.b.(1) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls;~~

~~(c) There are no violations of the applicable effluent limitations under Specific Provision 3.b.(2)(a) at the Responsible Copermittee's MS4 outfalls;~~

~~(d) The pollutant loads from given land uses discharging to and from the MS4s do not exceed the applicable effluent limitations under Specific Provision 3.b.(2)(b); OR~~

~~(e) The Responsible Copermittee has submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim compliance requirements will be achieved by the interim compliance dates.~~

~~(2) Compliance with WQBELs of Specific Provision 3.b may be demonstrated via one of the following methods:~~

~~(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water;~~

~~(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 3.b.(1) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls;~~

~~(c) There are no violations of the applicable effluent limitations under Specific Provision 3.b.(2)(a) at the Responsible Copermittee's MS4 outfalls; OR~~

~~(d) The pollutant loads from given land uses discharging to and from the MS4s do not exceed the applicable effluent limitations under Specific Provision 3.b.(2)(b).~~

4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2007-0043

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2007
State Water Board Approval Date:	July 15, 2008
Office of Administrative Law Approval Date:	October 22, 2008
US EPA Approval Date:	December 18, 2008

(3) TMDL Effective Date: October 22, 2008

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS~~WATER QUALITY BASED EFFLUENT LIMITATIONS~~

~~The WQBELs~~ Final TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the ~~violation~~ exceedance of the following receiving water limitations by the end of the compliance schedule under Specific Provision 4.b.(4)~~c.(1)~~:

Table 4.1
Receiving Water Limitations as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$(0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$(0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$(0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$(0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:

* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER.

(2) Final Water Quality Based Effluent Limitations

In the case that receiving water limitations are exceeded after the end of the compliance schedules under Specific Provision 4.b.(4), ~~Discharges from the MS4s must not contain pollutant loads that exceed the following~~ effluent limitations will be used to determine whether MS4 discharges are causing or contributing to exceedances of receiving water quality limitations. ~~by the end of the compliance schedule under Specific Provision 4.c.(1):~~ To demonstrate MS4 discharges are not causing or contributing to exceedances of receiving water quality limitations, MS4 discharges must meet the concentration-based effluent limitations in Table 4.2.

Table 4.2
Effluent Limitations as Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER.

(3) Final Best Management Practices

(a) The Responsible Copermittees must implement BMPs to support the achievement of the final receiving water limitations or final WQBELs under Specific Provision 4.b.(1) for Chollas Creek.

(b) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans and the U.S. Navy as possible.

(c) For Copermittees utilizing the Water Quality Improvement Plan compliance option, the strategies and activities contained in the Water Quality Improvement Plan accepted by the San Diego Water Board and adaptively managed as outlined in Provision B.6, F.1, and F.2, will serve as BMP-based WQBELs under the following conditions, as outlined in Provision B.3.a:

(1) A Responsible Copermittee requests that the Water Quality Improvement Plan be approved as the basis for compliance with the

discharge prohibitions (A.1), receiving water limitations (A.2), and/or effluent limitations (A.3) in the letter of submittal to the San Diego Water Board;

(2) Reasonable assurance is demonstrated that the strategies and activities in the Water Quality Improvement Plan are expected to attain the final receiving water limitations or final WQBELs under Specific Provision 4.b;

(3) The submitted schedule as outlined in Provision B.3 provides sufficient detail regarding the strategies and activities to be implemented to allow the Regional Board to use the schedule for compliance determination in a clear, specific, measurable, and enforceable manner; AND

(4) The Water Quality Improvement Plan is approved by the Regional Board Executive Officer and is implemented per the approved schedule and adapted pursuant to Provisions B.6, F.1, and F.2.

~~c. COMPLIANCE SCHEDULE~~

(4) Final WLA Compliance Date

The Responsible Copermittees ~~are required to achieve the WLA, thus~~ must be in compliance with the final receiving water limitation or final WQBELs under Specific Provision 4.b, by October 22, 2028.

(5) Final Compliance Determination

Compliance with final compliance requirements of Specific Provision 4.b.(1) may be demonstrated by a Responsible Copermittee via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 4.b.(1) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the applicable effluent limitations under Specific Provision 4.b.(2) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittee can demonstrate that exceedances of the applicable final receiving water limitations under Specific Provision 4.b.(1) in the receiving water are due to loads from natural sources or non-MS4 sources; OR

(e) The Responsible Copermittee has submitted and is fully implementing an Enhanced Water Quality Improvement Plan that is developed and adaptively managed as outlined in Provisions B, F.1 and F.2, is accepted by the San Diego Water Board, and meets the conditions of Specific Provision 4.b.(3).c.

~~d.~~c. INTERIM COMPLIANCE REQUIREMENTS

Interim TMDL compliance requirements consist of the following:

(1) Interim Water Quality Based Effluent Limitations

Discharges from the MS4s must not exceed the interim WQBELs by the interim compliance schedule under Specific Provision 4.c.(3). ~~The Responsible Copermittee must comply with the following interim WQBELs by the interim compliance date:~~

Table 4.3
Interim Effluent Limitations as Concentrations in MS4 Discharges to Chollas Creek

Interim Compliance Date	Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
October 22, 2018	Dissolved Copper	Acute	$1.2 \times 90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
	Dissolved Lead	Acute	$1.2 \times 90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
	Dissolved Zinc	Acute	$1.2 \times 90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER.

(2) Interim Best Management Practices

(a) The Responsible Copermittee must implement BMPs to support the achievement interim effluent limitations under Specific Provision 4.c.(1).

(b) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with other responsible parties as possible.

(c) For Copermittees utilizing the Water Quality Improvement Plan compliance option, the strategies and activities contained in the Water Quality Improvement Plan accepted by the San Diego Water Board and adaptively managed as outlined in Provision B.6, F.1, and F.2, will serve as BMP-based WQBELs under the following conditions, as outlined in Provision B.3.a:

(1) A Responsible Copermittee requests that the Water Quality Improvement Plan be approved as the basis for compliance with the discharge prohibitions (A.1), receiving water limitations (A.2), and/or effluent limitations (A.3) in the letter of submittal to the San Diego Water Board;

(2) Reasonable assurance is demonstrated that the strategies and activities in the Water Quality Improvement Plan are expected to attain the interim WQBELs under Specific Provision 4.c.(1);

(3) The submitted schedule as outlined in Provision B.3 provides sufficient detail regarding the strategies and activities to be implemented to allow the Regional Board to use the schedule for compliance determination in a clear, specific, measurable, and enforceable manner; AND

(4) The Water Quality Improvement Plan is approved by the Regional Board Executive Officer and is implemented per the approved schedule and adapted pursuant to Provisions B.6, F.1, and F.2.

(3) Interim Compliance Date

The Responsible Copermittees must be in compliance with the interim WQBELs under Specific Provision 4.c, by October 22, 2018.

(4) Interim Compliance Determination

Compliance with interim compliance requirements of Specific Provision 4.c may be demonstrated via by a Responsible Copermittee one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the applicable final receiving limitations under Specific Provision 4.b.(1) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) The Responsible Copermittee demonstrates applicable interim WQBELs under Specific Provision 4.c.(1) have been achieved; OR

(d) The Responsible Copermittee can demonstrate that exceedances of the applicable final receiving water limitations under Specific Provision 4.b.(1) are due to loads from natural sources or non-MS4 sources; OR

(e) The Responsible Copermittee has submitted and is fully implementing a Water Quality Improvement Plan, that is developed and adaptively managed as outlined in Provisions B, F.1 and F.2, is accepted by the San Diego Water Board, and meets the conditions of Specific Provision 4.c.(2).c.

~~e.~~d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*, when it is amended to include monitoring requirements for the Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls discharging to Chollas Creek for dissolved copper, lead, and zinc, and calculate or estimate the monthly and annual dissolved copper, lead, and zinc loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2)of this Order. The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

~~f. COMPLIANCE DETERMINATION~~

~~(1) Compliance with interim compliance requirements of Specific Provision 4.c.(2) may be demonstrated via one of the following methods:~~

~~(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;~~

~~(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 4.b.(1) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls;~~

~~(c) There are no violations of the applicable effluent limitations under Specific Provision 4.b.(2) at the Responsible Copermittees' MS4 outfalls; OR~~

~~(d) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim compliance requirements will be achieved by the interim compliance dates.~~

~~(2) Compliance with WQBELs of Specific Provision 4.b may be demonstrated via one of the following methods:~~

~~(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;~~

~~(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 4.b.(1) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR~~

~~(c) There are no violations of the applicable effluent limitations under Specific Provision 4.b.(2) at the Responsible Copermittees' MS4 outfalls.~~

5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2008-0027

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 11, 2008
State Water Board Approval Date:	June 16, 2009
Office of Administrative Law Approval Date:	September 15, 2009
US EPA Approval Date:	October 26, 2009

(3) TMDL Effective Date: September 15, 2009

(4) Watershed Management Areas: See Table 5.0

(5) Water Bodies: See Table 5.0

(6) Responsible Copermittees: See Table 5.0

Table 5.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County	Dana Point Harbor	Baby Beach	-City of Dana Point -County of Orange
San Diego Bay	San Diego Bay	Shelter Island Shoreline Park	- San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS ~~WATER QUALITY BASED EFFLUENT LIMITATIONS~~

~~The WQBELs~~ Final TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Final Receiving Water Limitations

(a) Discharges from the MS4s must not cause or contribute to the ~~violation~~ exceedance of the following receiving water limitations by the end of the compliance schedules under Specific Provisions 5.c.(1)(a)~~(u)~~ and 5.c.(b):

Table 5.1
Receiving Water Limitations as Bacteria Densities in the Water Body

	Receiving Water Limitations	
Constituent	**Single Sample Maximum[1,2]**	**30-Day Geometric Mean[2]**
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.

~~(b) If the above receiving water limitations are not met in the receiving water, the Responsible Copermittees must demonstrate that the discharges from the MS4s are not causing or contributing to the exceedance of receiving water limitations.~~

(2) Final Water Quality Based Effluent Limitations

In the case that receiving water limitations are exceeded after the end of the compliance schedules under Specific Provision 5.b.4, ~~Discharges from the MS4s must not contain densities that exceed the following~~ effluent limitations will be used to determine whether MS4 discharges are causing or contributing to exceedances of receiving water quality limitations. ~~by the end of the compliance schedules under Specific Provisions 5.c.(1)(a) and 5.c.(2) to demonstrate the discharge is not causing or contributing to a violation of receiving water quality standards:~~ To demonstrate MS4 discharges are not causing or contributing to exceedances of receiving water quality limitations, MS4 discharges must meet either the concentration-based effluent limitations in Table 5.2a or the load-based effluent limitations in Table 5.2b.

Table 5.2
Effluent Limitations as Bacteria Densities in MS4 Discharges to the Water Body

	Concentration-Based Effluent Limitations	
Constituent	**Single Sample Maximum[1,2]**	**30-Day Geometric Mean[2]**
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.
3. Concentrations shall be determined on a flow-weighted basis across all outfalls within a jurisdiction, not outfall-by-outfall

~~Interim effluent limitations expressed as pollutant loads are given in the compliance schedule under Specific Provision 5.c.~~

Table 5.2b
Effluent Limitations as Allowable Loading Rates for MS4 Discharges to the Water Body

		Load-based Effluent Limitations Expressed as Required % Load Reduction by MS4s					
		Dry Weather			Wet Weather		
Waterbody	Shoreline Segment/Area	Total Coliform	Fecal Coliform	*Entero-coccus*	Total Coliform	Fecal Coliform	*Entero-coccus*
Dana Point Harbor	Baby Beach	90.4% reduction	82.7% reduction	96.2% reduction	0% reduction	0% reduction	62.2% reduction
San Diego Bay	Shelter Island Shoreline Park	0% reduction	0% reduction	0% reduction	0% reduction	0% reduction	0% reduction

(3) Final Best Management Practices

(a) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 5.0 must incorporate the Bacteria Load Reduction Plan (BLRP) required to be developed pursuant to Resolution No. R9-2008-0027.

(b) The Responsible Copermittee must implement BMPs to support the achievement of the final receiving water limitations or final WQBELs under Specific Provision 5.0 for the segments or areas of the water bodies listed in Table 5.0

(c) For Copermittees utilizing the Water Quality Improvement Plan compliance option, the strategies and activities contained in the Water Quality Improvement Plan accepted by the San Diego Water Board and adaptively managed as outlined in Provision B.6, F.1, and F.2, will serve as BMP-based WQBELs under the following conditions, as outlined in Provision B.3.a:

(1) A Responsible Copermittee requests that the Water Quality Improvement Plan be approved as the basis for compliance with the discharge prohibitions (A.1), receiving water limitations (A.2), and/or effluent limitations (A.3) in the letter of submittal to the San Diego Water Board;

(2) Reasonable assurance is demonstrated that the strategies and activities in the Water Quality Improvement Plan are expected to attain the final receiving water limitations or final WQBELs under Specific Provision 5.b;

(3) The submitted schedule as outlined in Provision B.3 provides sufficient detail regarding the strategies and activities to be implemented to allow the Regional Board to use the schedule for compliance determination in a clear, specific, measurable, and enforceable manner; AND

(4) The Water Quality Improvement Plan is approved by the Regional Board Executive Officer and is implemented per the approved schedule and adapted pursuant to Provisions B.6, F.1, and F.2.

~~c. COMPLIANCE SCHEDULE~~

(4) Final Compliance Dates

(a) Baby Beach in Dana Point Harbor

~~(b) WLA Compliance Dates~~

The Responsible Copermittees for MS4 discharges to Baby Beach ~~are~~

~~required to achieve the WLA, thus~~ must be in compliance with the final receiving water limitations or final WQBELs under Specific Provision 5.b~~0,~~ according to the following compliance schedule:

Table 5.3
Compliance Schedule Dates to Achieve Baby Beach WLAs

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform	September 15, 2014	September 15, 2009
Fecal Coliform		September 15, 2009
Enterococcus		September 15, 2019

~~(c) Interim Compliance Requirements~~

~~The Responsible Copermittees for MS4 discharges to Baby Beach must comply with the following interim WQBELs by the interim compliance date:~~

~~**Table 5.4**~~
~~*Interim Effluent Limitations as Loads in MS4 Discharges to Baby Beach*~~

~~Constituent~~	~~Interim Compliance Date~~	~~Dry Weather Interim Effluent Limitation~~	~~Wet Weather Interim Effluent Limitation~~
~~Total Coliform~~	~~September 15, 2012~~	~~4.93×10^9 MPN/day~~	~~NA*~~
~~Fecal Coliform~~	~~September 15, 2012~~	~~0.59×10^9 MPN/day~~	~~NA*~~
~~*Enterococcus*~~	~~September 15, 2012~~	~~0.42×10^9 MPN/day~~	~~NA**~~
	~~September 15, 2016~~	~~NA*~~	~~207×10^9 MPN/30days~~

~~Notes:~~
~~* The WQBELs under Specific Provision 5.b must already be achieved by the given interim compliance date.~~
~~** There is no corresponding interim WQBEL for the given interim compliance date.~~

~~(d)~~(b) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park ~~is required to achieve the WLA, thus~~ must be in compliance with the final receiving water limitations or final WQBELs under Specific Provision 5.b~~0~~, by December 31, 2012.

(5) Final Compliance Determination

Compliance with final compliance requirements of Specific Provision 5.b may be demonstrated a Responsible Copermittee via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 5.b.(1) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the applicable effluent limitations under Specific Provision 5.b.(2) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittee can demonstrate that exceedances of the applicable final receiving water limitations under Specific Provision 5.b.(1)(a) in the receiving water are due to loads from natural sources or non-MS4 sources; OR

(e) The Responsible Copermittee has submitted and is fully implementing an Enhanced Water Quality Improvement Plan that is developed and adaptively managed as outlined in Provisions B, F.1 and F.2, is accepted by the San Diego Water Board, and meets the conditions of Specific Provision 5.b.(3).c.

c. INTERIM COMPLIANCE REQUIREMENTS

Interim TMDL compliance requirements consist of the following:

(1) Interim Water Quality Based Effluent Limitations and Schedule

The Responsible Copermittees for MS4 discharges to Baby Beach must comply with the following interim WQBELs by the interim compliance date:

Table 5.4
Interim Effluent Limitations as Loads in MS4 Discharges to Baby Beach

Constituent	Interim Compliance Date	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	4.93×10^9 MPN/day	NA*
Fecal Coliform	September 15, 2012	0.59×10^9 MPN/day	NA*
Enterococcus	September 15, 2012	0.42×10^9 MPN/day	NA**
	September 15, 2016	NA*	207×10^9 MPN/30days

Notes:
* The WQBELs under Specific Provision 5.b must already be achieved by the given interim compliance date.
** There is no corresponding interim WQBEL for the given interim compliance date.

(2) Interim Best Management Practices

(a) The Water Quality Improvement Plans for the applicable Watershed Management Areas must incorporate the Bacteria Load Reduction Plan (BLRP) required to be developed pursuant to Resolution No. R9-2008-0027.

(b) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans and owners/operators of small MS4s as possible.

(c) For Copermittees utilizing the Water Quality Improvement Plan compliance option, the strategies and activities contained in the Water Quality Improvement Plan accepted by the San Diego Water Board and adaptively managed as outlined in Provision B.6, F.1, and F.2, will serve as BMP-based WQBELs under the following conditions, as outlined in Provision B.3.a:

(1) A Responsible Copermittee requests that the Water Quality Improvement Plan be approved as the basis for compliance with the discharge prohibitions (A.1), receiving water limitations (A.2), and/or effluent limitations (A.3) in the letter of submittal to the San Diego Water Board;

(2) Reasonable assurance is demonstrated that the strategies and activities in the Water Quality Improvement Plan are expected to attain the interim effluent limitations under Specific Provision 5.c.(1);

(3) The submitted schedule as outlined in Provision B.3 provides sufficient detail regarding the strategies and activities to be implemented to allow the Regional Board to use the schedule for compliance determination in a clear, specific, measurable, and enforceable manner; AND

(4) The Water Quality Improvement Plan is approved by the Regional Board Executive Officer and is implemented per the approved schedule and adapted pursuant to Provisions B.6, F.1, and F.2.

(3) Interim Compliance Determination

Compliance with interim compliance requirements of Specific Provision 5.c may be demonstrated by a Responsible Copermittee via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the applicable final receiving limitations under Specific Provision 5.b.(1) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) The Responsible Copermittee demonstrates applicable interim WQBELs under Specific Provision 5.c.(1) have been achieved; OR

(d) The Responsible Copermittee can demonstrate that exceedances of the applicable final receiving water limitations under Specific Provision 5.b.(1) are due to loads from natural sources or non-MS4 sources; OR

(e) The Responsible Copermittee has submitted and is fully implementing a Water Quality Improvement Plan, that is developed and adaptively managed as outlined in Provisions B, F.1 and F.2, is accepted by the San Diego Water Board, and meets the conditions of Specific Provision 5.c.(2).c.

d. Specific Monitoring and Assessment Requirements

(1) Monitoring Stations

Monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[35] If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(2) Monitoring Procedures

(a) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) The Responsible Copermittees must collect wet weather monitoring samples within the first 24 hours of the first storm event[36] of the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(c) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs have been achieved.

[35] Commonly referred to as AB 411 monitoring

[36] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(b) The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

~~e. COMPLIANCE DETERMINATION~~

~~(1) Compliance with interim compliance requirements of Specific Provision 5.c.(1)(b) may be demonstrated via one of the following methods:~~

~~(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;~~

~~(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 5.b.(1)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls;~~

~~(c) There are no violations of the applicable effluent limitations under Specific Provision 5.b.(2) at the Responsible Copermittees' MS4 outfalls;~~

~~(d) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the applicable effluent limitations under Specific Provision 5.c.(1)(b);~~

~~(e) The Responsible Copermittees can demonstrate that exceedances of the applicable receiving water limitations under Specific Provision 5.b.(1)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4 are not causing or contributing to the exceedances; OR~~

~~(f) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim compliance requirements will be achieved by the interim compliance dates.~~

~~(2) Compliance with WQBELs of Specific Provision 5.b may be demonstrated via one of the following methods:~~

~~(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;~~

~~(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 5.b.(1)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls;~~

~~(c) There are no violations of the applicable effluent limitations under Specific Provision 5.b.(2) at the Responsible Copermittees' MS4 outfalls;~~

~~(d) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the applicable effluent limitations under Specific Provision 5.c.(1)(b); OR~~

~~(e) The Responsible Copermittees can demonstrate that exceedances of the applicable receiving water limitations under Specific Provision 5.b.(1)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4 are not causing or contributing to the exceedances.~~

6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2010-0001

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 10, 2010
State Water Board Approval Date:	December 14, 2010
Office of Administrative Law Approval Date:	April 4, 2011
US EPA Approval Date:	June 22, 2011

(3) TMDL Effective Date: April 4, 2011

(4) Watershed Management Areas: See Table 6.0

(5) Water Bodies: See Table 6.0; Consistent with Basin Plan Amendment (Resolution No. R9-2010-0001, p. A-2); specific beach segments from some of the Pacific Ocean shorelines listed in Table 6.0 have been delisted from the 2008 (sic 2010) 303(d) list that was approved by the San Diego Board on December 16, 2009, and therefore are not subject to the requirements of Attachment E as long as monitoring data continues to support compliance with water quality standards.

(6) Responsible Copermittees: See Table 6.0

Table 6.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	-City of Laguna Beach -County of Orange -Orange County Flood Control District
		at Heisler Park - North	
	Pacific Ocean Shoreline	at Main Laguna Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Woods -County of Orange -Orange County Flood Control District
		Laguna Beach at Ocean Avenue	
		Laguna Beach at Cleo Street	
		Arch Cove at Bluebird Canyon Road	
		Laguna Beach at Dumond Drive	
	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Hills -City of Laguna Niguel -City of Laguna Woods -City of Lake Forest
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries:	

		- Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	-City of Mission Viejo -County of Orange -Orange County Flood Control District
	Aliso Creek Mouth	at mouth	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County (cont'd)	Pacific Ocean Shoreline	Aliso Beach at West Street	-City of Dana Point -City of Laguna Beach -City of Laguna Niguel -County of Orange -Orange County Flood Control District
		Aliso Beach at Table Rock Drive	
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)	
		at Salt Creek (large outlet)	
		Salt Creek Beach at Salt Creek service road	
		Salt Creek Beach at Strand Road	
	Pacific Ocean Shoreline	at San Juan Creek	-City of Dana Point -City of Laguna Hills -City of Laguna Niguel -City of Mission Viejo -City of Rancho Santa Margarita -City of San Juan Capistrano -County of Orange -Orange County Flood Control District
	San Juan Creek	lower 1 mile	
	San Juan Creek Mouth	at mouth	
	Pacific Ocean Shoreline	at Poche Beach	-City of Dana Point -City of San Clemente -County of Orange -Orange County Flood Control District
		Ole Hanson Beach Club Beach at Pico Drain	
		San Clemente City Beach at El Portal Street Stairs	
		San Clemente City Beach at Mariposa Street	
		San Clemente City Beach at Linda Lane	
		San Clemente City Beach at South Linda Lane	
		San Clemente City Beach at Lifeguard Headquarters	
		under San Clemente Municipal Pier	
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	

		San Clemente State Beach at Riviera Beach	
		Can Clemente State Beach at Cypress Shores	
San Luis Rey River	Pacific Ocean Shoreline	at San Luis Rey River mouth	-City of Oceanside -City of Vista -County of San Diego

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
Carlsbad	Pacific Ocean Shoreline	at Moonlight State Beach	-City of Carlsbad -City of Encinitas -City of Escondido -City of San Marcos -County of San Diego
San Dieguito River	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	-City of Del Mar -City of Escondido -City of Poway -City of San Diego -City of Solana Beach -County of San Diego
Penasquitos	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	-City of Del Mar -City of Poway -City of San Diego -County of San Diego
Mission Bay	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	-City of San Diego
		La Jolla Shores Beach at Caminito del Oro	
		La Jolla Shores Beach at Vallecitos	
		La Jolla Shores Beach at Avenida de la Playa	
		at Casa Beach, Children's Pool	
		South Casa Beach at Coast Boulevard	
		Whispering Sands Beach at Ravina Street	
		Windansea Beach at Vista de la Playa	
		Windansea Beach at Bonair Street	
		Windansea Beach at Playa del Norte	
		Windansea Beach at Palomar Avenue	
		at Tourmaline Surf Park	
		Pacific Beach at Grand Avenue	
	Tecolote Creek	Entire reach and tributaries	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I- Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
San Diego River	Forrester Creek	lower 1 mile	-City of El Cajon -City of Santee -County of San Diego
	San Diego River	lower 6 miles	-City of El Cajon -City of La Mesa -City of San Diego -City of Santee -County of San Diego
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	
San Diego Bay	Chollas Creek	lower 1.2 miles	-City of La Mesa -City of Lemon Grove -City of San Diego -County of San Diego - San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS ~~WATER QUALITY BASED EFFLUENT LIMITATIONS~~

~~The WQBELs~~ Final TMDL compliance requirements for segments or areas of the water bodies listed in Table 6.0 consist of the following:

(1) Receiving Water Limitations

(a) Discharges from the MS4s must not cause or contribute to the exceedance ~~violation~~ of the following receiving water limitations by the end of the compliance schedules under Specific Provision 6.c.(5)~~(1)~~:

Table 6.1
Receiving Water Limitations as Bacteria Densities and Allowable Exceedance Frequencies in the Water Body

	Receiving Water Limitations			
Constituent	Single Sample Maximum[1,2] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[3]	30-Day Geometric Mean[2] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform	10,000	22% / 0%	1,000	0%
Fecal Coliform	400	22% / 0%	200	0%
Enterococcus	104[4] / 61[5]	22% / 0%	35[4] / 33[5]	0%

Notes:
1. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
3. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. The 0% single sample maximum allowable exceedance frequency applies to dry weather days.
4. This *Enterococcus* receiving water limitation applies to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
5. This *Enterococcus* receiving water limitations applies to segments or areas of creeks or creek mouths listed in Table 6.0.

~~Interim receiving water limitations expressed as allowable exceedance frequencies are given in the compliance schedule under Specific Provision 6.c.~~

(b) If the above receiving water limitations are not met in the receiving water, the Responsible Copermittees must demonstrate that the discharges from the MS4s are not causing or contributing to the exceedance ~~violation~~ of receiving water limitations. The Copermittee must provide data that demonstrate the discharges from the MS4s are meeting the effluent limitations under Specific Provision 6.b.(2).

(2) Final Water Quality Based Effluent Limitations

In the case that receiving water limitations are exceeded after the end of the compliance schedules under Specific Provision 6.b.5, ~~Discharges from the MS4s must not contain densities that exceed the following~~ effluent limitations will be used to determine whether MS4 discharges are causing or contributing to exceedances of receiving water quality limitations. ~~by the end of the compliance schedules under Specific Provision 6.c.(1) to demonstrate the discharge is not causing or contributing to a violation of receiving water quality standards:~~ To demonstrate MS4 the discharges are not causing or contributing to a exceedance of receiving water quality limitations, MS4 discharges must meet either the concentration-based effluent limitations in Table 6.2a or the load-based effluent limitations in Table 6.2b.

~~**Table 6.2**~~
Table 6.2a
Effluent Limitations as Bacteria Densities and Allowable Exceedance Frequencies in MS4 Discharges to the Water Body

	Concentration-based Effluent Limitations[6]			
Constituent	**Single Sample Maximum[1,2] (MPN/100mL)**	**Single Sample Maximum Allowable Exceedance Frequency[3]**	**30-Day Geometric Mean[2] (MPN/100mL)**	**30-Day Geometric Mean Allowable Exceedance Frequency**
Total Coliform	10,000	22% / 0%	1,000	0%
Fecal Coliform	400	22% / 0%	200	0%
Enterococcus	104[4] / 61[5]	22% / 0%	35[4] / 33[5]	0%

Notes:
1. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.
3. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. The 0% single sample maximum allowable exceedance frequency applies to dry weather days
4. This *Enterococcus* effluent limitation and all total coliform limitations ~~applies~~ apply only to MS4 discharges to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
5. This *Enterococcus* effluent limitation applies only to MS4 discharges to segments or areas of creeks or creek mouths listed in Table 6.0.
6. Concentrations shall be determined on a flow-weighted basis across all outfalls within a jurisdiction, not outfall-by-outfall.

~~Interim effluent limitations expressed as allowable exceedance frequencies are given in the compliance schedule under Specific Provision 6.c.~~

Table 6.2b
Effluent Limitations as Allowable Loading Rates for MS4 Discharges to the Water Body

Watershed	Load-based Effluent Limitations Expressed as Required % Load Reduction by MS4s					
	Dry Weather			Wet Weather		
	Total Coliform	Fecal Coliform	*Entero-coccus*	Total Coliform	Fecal Coliform	*Entero-coccus*
San Joaquin Hills/ Laguna Hills HSAs (901.11 and 901.12)	91.78%	91.72%	98.28%	46.85%	52.07%	51.26
Aliso HSA (901.13)	95.47%	95.58%	99.13%	25.29%	26.62%	27.52%
Dana Point HSA (901.14)	95.04%	95.03%	98.98%	13.15%	14.86%	15.16%
Lower San Juan HSA (901.27)	72.96%	74.21%	94.94%	19.21%	12.82%	27.12%
San Clemente HA (901.30)	94.28%	94.23%	98.83%	23.85%	24.58%	25.26%
San Luis Rey HU (903.00)	38.13%	39.09%	87.38%	5.62%	3.12%	11.69%
San Marcos HA (904.50)	82.82%	82.55%	96.03%	18.47%	18.98%	20.19%
San Dieguito HU (905.00)	14.39%	20.72%	83.48%	4.29%	1.46%	7.72%
Miramar Reservoir HA (906.10)	96.50%	96.59%	99.42%	1.61%	1.99%	1.93%
Scripps HA (906.30)	96.44%	96.42%	99.25%	16.32%	21.14%	18.82%
Tecolote HA (906.5)	94.51%	94.59%	98.94%	16.51%	20.47%	18.15%
Mission San Diego/ Santee HSAs (907.11 and 907.12)	74.03%	69.44%	93.96%	38.14%	53.22%	42.74%
Chollas HSA (908.22)	92.06%	92.15%	98.46%	17.82%	24.84%	21.26%

(3) Best Management Practices

(a) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 6.0 must incorporate the Comprehensive Load Reduction Plans (CLRPs) required to be developed pursuant to Resolution No. R9-2010-0001. For segments or areas in Table 6.0 that have been delisted from the Clean Water Act Section 303(d) List of Water Quality Limited Segments, a CLRP is not required.

(b) The Responsible Copermittee must implement BMPs to support the achievement of the final receiving water limitations or final WQBELs under Specific Provision 6.b for the segments or areas of the water bodies listed in Table 6.0.

(c) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans and owners/operators of small MS4s as possible.

(d) For Copermittees utilizing the Water Quality Improvement Plan compliance option, the strategies and activities contained in the Water Quality Improvement Plan accepted by the San Diego Water Board and adaptively managed as outlined in Provision B.6, F.1, and F.2, will serve as BMP-based WQBELs under the following conditions, as outlined in Provision B.3.a:

(1) A Responsible Copermittee requests that the Water Quality Improvement Plan be approved as the basis for compliance with the discharge prohibitions (A.1), receiving water limitations (A.2), and/or effluent limitations (A.3) in the letter of submittal to the San Diego Water Board;

(2) Reasonable assurance is demonstrated that the strategies and activities in the Water Quality Improvement Plan are expected to attain the final receiving water limitations or final WQBELs under Specific Provision 6.b;

(3) The submitted schedule as outlined in Provision B.3 provides sufficient detail regarding the strategies and activities to be implemented to allow the Regional Board to use the schedule for compliance determination in a clear, specific, measurable, and enforceable manner; AND

(4) The Water Quality Improvement Plan is approved by the Regional Board Executive Officer and is implemented per the approved schedule and adapted pursuant to Provisions B.6, F.1, and F.2.

~~c. Compliance Schedule~~

(1) ~~WLA~~ Compliance Dates

The Responsible Copermittees for MS4 discharges to a segment or area of the water bodies listed in Table 6.0 are required to achieve the WLA, thus must be in compliance with the WQBELs under Specific Provision 6.b, according to the following compliance schedule:

Table 6.3

Compliance Schedule Dates to Achieve Indicator Bacteria WLAs

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform*	April 4, 2021	April 4, 2031
Fecal Coliform		
Enterococcus		

* Total coliform receiving water limitations only apply to segments or areas of Pacific Ocean Shoreline listed in Table 6.0.

(5) Final Compliance Determination

Compliance with final compliance requirements of Specific Provision 6.b may be demonstrated by a Responsible Copermittee via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water;

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 6.b.(1) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls;

(c) There are no exceedances of the applicable effluent limitations under Specific Provision 6.b.(2) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittee can demonstrate that exceedances of the applicable final receiving water limitations under Specific Provision 6.b.(1)(a) in the receiving water are due to loads from natural sources or non-MS4 sources; OR

(e) The Responsible Copermittee has submitted and is fully implementing a Water Quality Improvement Plan that is developed and adaptively managed as outlined in Provisions B, F.1 and F.2, is accepted by the San Diego Water Board, and meets the conditions of Specific Provision 6.b.(3).d.

~~d.~~c. INTERIM COMPLIANCE REQUIREMENTS

Interim TMDL compliance requirements for segments or areas of the water bodies listed in Table 6.0 consist of the following:

~~The Responsible Copermittees must comply with the following interim WQBELs by the interim compliance dates:~~

(1) Interim Dry Weather Receiving Water Limitations

The Responsible Copermittee must calculate the “existing” exceedance frequencies of the 30-day geometric mean water quality objectives for each of the indicator bacteria by analyzing the available monitoring data

collected between January 1, 1996 and December 31, 2002. "Existing" exceedance frequencies may be calculated by segment or area of a water body, or by water body, and/or by Watershed Management Area listed in Table 6.0. Separate "existing" exceedance frequencies must be calculated for beaches and creeks/creek mouths.

The Responsible Copermittees must achieve a 50 percent reduction in the "existing" exceedance frequency of the 30-day geometric mean WQBELs for the segments or areas of the water bodies listed in Table 6.0 by the interim compliance dates for achieving the interim dry weather WQBELs given in Table 6.5. A 50 percent reduction in the "existing" exceedance frequency is equivalent to half of the "existing" exceedance frequency of the 30-day geometric mean WQBELs.

The "existing" exceedance frequencies and the interim dry weather allowable exceedance frequencies (i.e. interim dry weather WQBELs) calculated by the Responsible Copermittees must be included in the Water Quality Improvement Plans for the applicable Watershed Management Areas.

(2) Interim Wet Weather Receiving Water Limitations

The Responsible Copermittees must achieve the interim wet weather receiving water limitations in Table 6.4, expressed as interim allowable exceedance frequencies, by the interim compliance dates for achieving the interim wet weather WQBELs given in Table 6.5.

Table 6.4
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	38%	37%	39%
		at Heisler Park - North			
	Pacific Ocean Shoreline	at Main Laguna Beach			
		Laguna Beach at Ocean Avenue			
		Laguna Beach at Cleo Street			
		Arch Cove at Bluebird Canyon Road			
		Laguna Beach at Dumond Drive			
	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	41%	41%	42%
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	41%	41%	42%
	Aliso Creek Mouth	at mouth	41%	41%	42%
	Pacific Ocean Shoreline	Aliso Beach at West Street	36%	36%	36%
		Aliso Beach at Table Rock Drive			
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)			
		at Salt Creek (large outlet)			
		Salt Creek Beach at Salt Creek service road			
		Salt Creek Beach at Strand Road			

Table 6.4 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County (cont'd)	Pacific Ocean Shoreline	at San Juan Creek	44%	44%	48%
	San Juan Creek	lower 1 mile	44%	44%	47%
	San Juan Creek Mouth	at mouth	44%	44%	47%
	Pacific Ocean Shoreline	at Poche Beach	35%	35%	36%
		Ole Hanson Beach Club Beach at Pico Drain			
		San Clemente City Beach at El Portal Street Stairs			
		San Clemente City Beach at Mariposa Street			
		San Clemente City Beach at Linda Lane			
		San Clemente City Beach at South Linda Lane			
		San Clemente City Beach at Lifeguard Headquarters			
		under San Clemente Municipal Pier			
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)			
		San Clemente State Beach at Riviera Beach			
		Can Clemente State Beach at Cypress Shores			
San Luis Rey River	Pacific Ocean Shoreline	at San Luis Rey River mouth	45%	44%	47%
Carlsbad	Pacific Ocean Shoreline	at Moonlight State Beach	40%	40%	41%
San Dieguito River	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	33%	33%	36%

Table 6.4 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
Penasquitos	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	26%	26%	26%
Mission Bay	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	37%	37%	37%
		La Jolla Shores Beach at Caminito del Oro			
		La Jolla Shores Beach at Vallecitos			
		La Jolla Shores Beach at Avenida de la Playa			
		at Casa Beach, Children's Pool			
		South Casa Beach at Coast Boulevard			
		Whispering Sands Beach at Ravina Street			
		Windansea Beach at Vista de la Playa			
		Windansea Beach at Bonair Street			
		Windansea Beach at Playa del Norte			
		Windansea Beach at Palomar Avenue			
		at Tourmaline Surf Park			
		Pacific Beach at Grand Avenue			
	Tecolote Creek	Entire reach and tributaries	49%	49%	51%
San Diego River	Forrester Creek	lower 1 mile	46%	43%	49%
	San Diego River	lower 6 miles	46%	43%	49%
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	46%	43%	51%
San Diego Bay	Chollas Creek	lower 1.2 miles	41%	41%	43%

(3) Interim Water Quality Based Effluent Limitations

In the case that interim receiving water limitations are exceeded after the end of the interim compliance schedules under Specific Provision 6.c.5, interim effluent limitations, expressed as required MS4 load reductions, will be used to determine whether MS4 discharges are causing or contributing to exceedances of interim receiving water quality limitations. To demonstrate MS4 the discharges are not causing or contributing to a exceedance of receiving water quality limitations, MS4 discharges must meet the required MS4 load reductions in Table 6.5.

Table 6.5
Interim Effluent Limitations as Allowable Loading Rates for MS4 Discharges to the Water Body

	Interim Effluent Limitations Expressed as Required % Load Reduction by MS4s					
	Dry Weather			Wet Weather		
Watershed	Total Coliform	Fecal Coliform	*Entero-coccus*	Total Coliform	Fecal Coliform	*Entero-coccus*
San Joaquin Hills/ Laguna Hills HSAs (901.11 and 901.12)	45.89%	45.86%	49.14%	23.43%	26.04%	25.63%
Aliso HSA (901.13)	47.74%	47.79%	49.57%	12.65%	13.31%	13.76%
Dana Point HSA (901.14)	47.52%	47.52%	49.49%	6.58%	7.43%	7.58%
Lower San Juan HSA (901.27)	36.48%	37.11%	47.47%	9.61%	6.41%	13.56%
San Clemente HA (901.30)	47.14%	47.12%	49.42%	11.93%	12.29%	12.63%
San Luis Rey HU (903.00)	19.07%	19.55%	43.69%	2.81%	1.56%	5.85%
San Marcos HA (904.50)	41.41%	41.28%	48.02%	9.24%	9.49%	10.10%
San Dieguito HU (905.00)	7.20%	10.36%	41.74%	2.15%	0.73%	3.86%
Miramar Reservoir HA (906.10)	48.25%	48.30%	49.71%	0.81%	1.00%	0.97%
Scripps HA (906.30)	48.22%	48.21%	49.63%	8.16%	10.57%	9.41%
Tecolote HA (906.5)	47.26%	47.30%	49.47%	8.26%	10.24%	9.08%
Mission San Diego/ Santee HSAs (907.11 and 907.12)	37.02%	34.72%	46.98%	19.07%	26.61%	21.37%

Chollas HSA (908.22)	92.06%	92.15%	98.46%	17.82%	24.84%	21.26%

(4) Interim Best Management Practices

(a) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 6.0 must incorporate the Comprehensive Load Reduction Plans (CLRPs) required to be developed pursuant to Resolution No. R9-2010-0001. For segments or areas in Table 6.0 that have been delisted from the Clean Water Act Section 303(d) List of Water Quality Limited Segments, a CLRP is not required.

(b) The Responsible Copermittee must implement BMPs to support the achievement interim receiving water limitations under Specific Provision 6.c.(1) and 6.c.(2) for the segments or areas of the water bodies listed in Table 6.0.

(c) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans and owners/operators of small MS4s as possible.

(d) For Copermittees utilizing the Water Quality Improvement Plan compliance option, the strategies and activities contained in the Water Quality Improvement Plan accepted by the San Diego Water Board and adaptively managed as outlined in Provision B.6, F.1, and F.2, will serve as BMP-based WQBELs under the following conditions, as outlined in Provision B.3.a:

(1) A Responsible Copermittee requests that the Water Quality Improvement Plan be approved as the basis for compliance with the discharge prohibitions (A.1), receiving water limitations (A.2), and/or effluent limitations (A.3) in the letter of submittal to the San Diego Water Board;

(2) Reasonable assurance is demonstrated that the strategies and activities in the Water Quality Improvement Plan are expected to attain the interim receiving water limitations under Specific Provision 6.c.(1) and 6.c.(2) or interim load reduction requirements under Specific Provision 6.c.(3);

(3) The submitted schedule as outlined in Provision B.3 provides sufficient detail regarding the strategies and activities to be implemented to allow the Regional Board to use the schedule for compliance determination in a clear, specific, measurable, and enforceable manner; AND

(4) The Water Quality Improvement Plan is approved by the Regional Board Executive Officer and is implemented per the approved schedule and adapted pursuant to Provisions B.6, F.1, and F.2.

~~(3)~~(5) Interim Compliance Dates

The Responsible Copermittees must achieve the interim receiving water limitations under Specific Provisions 6.c.(2)(1) and 6.c.(~~2~~3)~~(b)~~ or the interim WQBELs under Specific Provisions 6.c.(3) by the interim compliance dates given in Table 6.~~5~~6 unless alternative interim compliance dates are provided in a Comprehensive Load Reduction Plan or Water Quality Improvement Plan accepted by the San Diego Regional Board Executive Officer.

Table 6.5
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs
South Orange County	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	April 4, 2016	April 4, 2021
		at Heisler Park - North		
	Pacific Ocean Shoreline	at Main Laguna Beach	April 4, 2016	April 4, 2021
		Laguna Beach at Ocean Avenue		
		Laguna Beach at Cleo Street		
		Arch Cove at Bluebird Canyon Road		
		Laguna Beach at Dumond Drive		
	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	April 4, 2016	April 4, 2021
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	April 4, 2018	April 4, 2021
	Aliso Creek Mouth	at mouth	April 4, 2018	April 4, 2021
	Pacific Ocean Shoreline	Aliso Beach at West Street	April 4, 2016	April 4, 2021
		Aliso Beach at Table Rock Drive		
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)		
		at Salt Creek (large outlet)		
		Salt Creek Beach at Salt Creek service road	April 4, 2017	April 4, 2021

		Salt Creek Beach at Strand Road	April 4, 2017	April 4, 2021

Table 6.5 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs
South Orange County (cont'd)	Pacific Ocean Shoreline	at San Juan Creek	April 4, 2016	April 4, 2021
	San Juan Creek	lower 1 mile	April 4, 2018	April 4, 2021
	San Juan Creek Mouth	at mouth	April 4, 2016	April 4, 2021
	Pacific Ocean Shoreline	at Poche Beach	April 4, 2016	April 4, 2021
		Ole Hanson Beach Club Beach at Pico Drain	April 4, 2016	April 4, 2021
		San Clemente City Beach at El Portal Street Stairs	April 4, 2017	April 4, 2021
		San Clemente City Beach at Mariposa Street		
		San Clemente City Beach at Linda Lane	April 4, 2016	April 4, 2021
		San Clemente City Beach at South Linda Lane	April 4, 2018	April 4, 2021
		San Clemente City Beach at Lifeguard Headquarters	April 4, 2017	April 4, 2021
		under San Clemente Municipal Pier		
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	April 4, 2018	April 4, 2021
		San Clemente State Beach at Riviera Beach	April 4, 2016	April 4, 2021
		Can Clemente State Beach at Cypress Shores	April 4, 2017	April 4, 2021
San Luis Rey River	Pacific Ocean Shoreline	at San Luis Rey River mouth	April 4, 2017	April 4, 2021
Carlsbad	Pacific Ocean Shoreline	at Moonlight State Beach	April 4, 2016	April 4, 2021
San Dieguito River	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	April 4, 2016	April 4, 2021

Table 6.5 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs
Penasquitos	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	April 4, 2016	April 4, 2021
Mission Bay	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	April 4, 2016	April 4, 2021
		La Jolla Shores Beach at Caminito del Oro		
		La Jolla Shores Beach at Vallecitos		
		La Jolla Shores Beach at Avenida de la Playa		
		at Casa Beach, Children's Pool		
		South Casa Beach at Coast Boulevard		
		Whispering Sands Beach at Ravina Street		
		Windansea Beach at Vista de la Playa		
		Windansea Beach at Bonair Street		
		Windansea Beach at Playa del Norte		
		Windansea Beach at Palomar Avenue		
		at Tourmaline Surf Park		
		Pacific Beach at Grand Avenue		
	Tecolote Creek	Entire reach and tributaries		
San Diego River	Forrester Creek	lower 1 mile	April 4, 2018	April 4, 2021
	San Diego River	lower 6 miles		
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach		
San Diego Bay	Chollas Creek	lower 1.2 miles	April 4, 2018	April 4, 2021

(6) Interim Compliance Determination

Compliance with interim compliance requirements of Specific Provision 6.c may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water;

(b) There are no exceedances of the applicable interim receiving water limitations under Specific Provision 6.c.(1) and 6.c.(2) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls;

(c) The Responsible Copermittee demonstrates applicable interim WQBELs

under Specific Provision 6.c.(3) have been achieved;

(d) The Responsible Copermittee can demonstrate that exceedances of the applicable interim receiving water limitations under Specific Provision 6.c.(1) and 6.c.(2) in the receiving water are due to loads from natural sources or non-MS4 sources; OR

(e) The Responsible Copermittee has submitted and is fully implementing a Water Quality Improvement Plan, that is developed and adaptively managed as outlined in Provisions B, F.1 and F.2, is accepted by the San Diego Water Board, and meets the conditions of Specific Provision 6.c.(4).d.

~~e.~~d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) Monitoring and Assessment Requirements for Beaches

(a) Monitoring Stations

For beaches addressed by the TMDL, monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[37] If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations at least once

[37] Commonly referred to as AB 411 monitoring

within the first 24 hours of the first storm event[38] of the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer in exceedance of the allowable exceedance frequencies in the receiving waters.

(iii) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs for the Pacific Ocean Shoreline segments or areas listed in Table 6.0 have been achieved.

(ii) The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

(2) Monitoring and Assessment Requirements for Creeks and Creek Mouths

(a) Monitoring Stations

For creeks addressed by the TMDL, monitoring locations should consist of, at a minimum, a location at or near the mouth of the creek (e.g. Mass Loading Station or Mass Emission Station) and one or more locations upstream of the mouth (e.g. Watershed Assessment Station). If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

[38] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations in accordance with the requirements of Provision D.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations within the first 24 hours of the first storm event[39] of the rainy season (i.e. October 1 through April 30).

(iii) Samples collected from receiving water monitoring stations must be analyzed for fecal coliform and *Enterococcus* indicator bacteria.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the receiving water monitoring data to assess whether the interim and final receiving water WQBELs for the creeks and creek mouths listed in Table 6.0 have been achieved.

(ii) The Responsible Copermittee must identify and incorporate additional MS4 outfall and receiving water monitoring stations and/or adjust monitoring frequencies to identify sources causing exceedances of the receiving water WQBELs.

(iii) The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

~~**f. COMPLIANCE DETERMINATION**~~

~~(1) Compliance with interim compliance requirements of Specific Provision 6.c.(2) may be demonstrated via one of the following methods:~~

~~(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;~~

~~(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 6.b.(1) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls;~~

~~(c) There are no violations of the applicable effluent limitations under Specific Provision 6.b.(2) at the Responsible Copermittees' MS4 outfalls;~~

[39] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)]. If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event shall be equal to the results from that one sample. If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all the wet weather days not sampled shall be equal to the highest bacteria density result reported from samples collected. The exceedance frequency shall be calculated by dividing the number of wet weather days that exceed the single sample maximum REC-1 WQOs by the total number of wet weather days during the rainy season.

~~(d) There are no exceedances of the applicable interim receiving water limitations under Specific Provision 6.c.(2) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls;~~

~~(e) The Responsible Copermittees can demonstrate that exceedances of the applicable interim or final receiving water limitations under Specific Provision 6.b.(1)(a) or 6.c.(2) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4 are not causing or contributing to the exceedances; OR~~

~~(f) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim compliance requirements will be achieved by the interim compliance dates.~~

~~(2) Compliance with WQBELs of Specific Provision 6.b may be demonstrated via one of the following methods:~~

~~(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;~~

~~(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 6.b.(1) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls;~~

~~(c) There are no violations of the applicable effluent limitations under Specific Provision 6.b.(2) at the Responsible Copermittees' MS4 outfalls; OR~~

~~(d) The Responsible Copermittees can demonstrate that exceedances of the applicable final receiving water limitations under Specific Provision 6.b.(1)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4 are not causing or contributing to the exceedances.~~

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SAN DIEGO COPERMITTEE COMMENTS ON TENTATIVE ORDER NO. R9-2013-0001				
Permit Section	Tentative Order Page	Section Title	Reason for Proposed Changes/Comments	Proposed Changes
General Comment	Multiple	Multiple	The term "prohibit" is broader than Clean Water Act requirements, and should be changed to "effectively prohibit." CWA Provision 402(p) (3) (B) (ii) reads as follows: (B) Municipal Discharge – Permits for discharges from municipal storm sewers – (ii) shall include a requirement to effectively prohibit non-stormwater discharges into the storm sewer; (Emphasis added) The provision does not provide any reference to exemptions. Rather the Provision may be read that a permit shall "effectively prohibit non-stormwater discharges" but may exempt certain discharges that are not significant sources of pollutants from the prohibition. The Provision does not require a full prohibition but rather an effective prohibition. The operative word is "effective". The more precise and correct finding/provision should note that non-stormwater discharges are effectively prohibited (per 402 (p) (3) (B) (ii)). However discharges that are not significant sources of pollutants are exempted from the prohibition. In a practical sense the use of word "effective" provides flexibility to assess the impacts of relatively benign discharges such as landscape irrigation, air condition condensate, individual car washing, and non-emergency fire fighting flows or non-anthropogenic sources before instituting a prohibition.	Revise "prohibit" to "effectively prohibit" throughout the Permit when referring to non-storm water discharges.

SAN DIEGO COPERMITTEE COMMENTS ON TENTATIVE ORDER NO. R9-2013-0001				
Permit Section	Tentative Order Page	Section Title	Reason for Proposed Changes/Comments	Proposed Changes
I. FINDINGS				
3 and throughout, as applicable	1	CWA NPDES Permit Conditions		Remove the following term in Finding 3 and throughout, as provided in the Strikeout: "~~storm water~~"
8	3	Point Source Discharges of Pollutants	Discharges may contain waste or pollutants, but it should not be presumed that they necessarily always contain waste or pollutants. In addition, it is inappropriate to consider all storm water and non-storm water discharges point source discharges.	Revise the text as follows: "Discharges from the MS4s may contain waste, as defined in the CWC, and pollutants that adversely affect the quality of the waters of the state. A discharge from an MS4 is a "discharge of pollutants from a point source" into waters of the U.S. as defined in the CWA. Storm water and non-storm water discharges from the MS4s may contain pollutants that cause or threaten to cause a violation of surface water quality standards, as outlined in the ~~Water Quality Control Plan for the San Diego Basin (~~Basin Plan~~)~~. ~~Storm water and non-storm water discharges from the MS4s are subject to the conditions and requirements established in the Basin Plan for point source discharges.~~ "
11	4	Runoff Discharges to Receiving Waters	Finding 11 is inconsistent with the definition of the MS4 in 40 C.F.R. 122.26, which does not include natural rivers and streams: "(8) *Municipal separate storm sewer* means a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management	Revise the text as follows: "11. Runoff Discharges to Receiving Waters. The MS4s discharge runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within the eleven hydrologic units comprising the San Diego Region. Historic and current development makes use of natural drainage patterns and features as conveyances for runoff. ~~Rivers, streams and creeks in developed areas used in this manner are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and receiving water.~~ Numerous receiving water bodies and water body segments have been designated as impaired by the San

SAN DIEGO COPERMITTEE COMMENTS ON TENTATIVE ORDER NO. R9-2013-0001				
Permit Section	Tentative Order Page	Section Title	Reason for Proposed Changes/Comments	Proposed Changes
			agency under Provision 208 of the CWA that discharges to waters of the United States; (ii) Designed or used for collecting or conveying storm water; (iii) Which is not a combined sewer; and (iv) Which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.2.	Diego Water Board pursuant to CWA Provision 303(d)."
15	5	Non-Storm Water and Storm Water Discharges	This is a legal argument that is contrary to the plain language of the statute, which specifically states that 'Permits for discharges from municipal storm sewers… shall require controls to reduce the discharge of pollutants to the maximum extent practicable…"402(p)(3)(B)(iii). The maximum extent practicable standard applies to storm water and non-storm water discharges.	Revise the text as follows: "~~Non-storm water discharges from the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard of CWA section 402(p)(3)(B)(iii), which is explicitly for Municipal… *Stormwater Discharges* (emphasis added)" from the MS4s.~~ Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s must be effectively prohibited. "Permits for discharges from municipal storm sewers shall require controls to reduce the discharge of pollutants to the maximum extent practicable…" 402(p)(3)(B)(iii)."
27	8	Integrated Report and Clean Water Act Section 303(d) List.		Revise the last paragraph as follows: "Implementation of the requirements of this Order will ~~may~~ allow the San Diego Water Board to include surface waters impaired by discharges from the Copermittees' MS4s in Category 4 in the Integrated Report for consideration during the next 303(d) List submittal by the State to USEPA."
29	9	Unfunded Mandates	Finding 29 states that the Order does not constitute an unfunded mandate under Article XIIIB, Section 6 of the California Constitution. This finding has no legal effect because the Regional Board does not have jurisdiction to determine what is a state mandate, and therefore should be deleted. The Commission on State Mandates, the agency with exclusive jurisdiction over state mandate claims, determined that multiple requirements in the 2007 San Diego MS4 Permit were unfunded state mandates. This case is currently on appeal before the Third Appellate	Delete Finding 29.

SAN DIEGO COPERMITTEE COMMENTS ON TENTATIVE ORDER NO. R9-2013-0001				
Permit Section	Tentative Order Page	Section Title	Reason for Proposed Changes/Comments	Proposed Changes
			District (Case No. C070357). Like the 2007 Permit, the Tentative Order exceeds the requirements of federal law, and the Copermittees reserve their right to challenge permit provisions exceeding federal law in the appropriate forum.	
II. PROVISIONS				
A. Prohibitions and Limitations				
A	13	Prohibitions and Limitations	The proposed Prohibitions and Limitation provisions may be construed as stand-alone provisions that could expose the Copermittees to state and federal enforcement actions, as well as to third party actions under the federal Clean Water Act's citizen suit provisions. Consistent with the recent 9th Circuit Court of Appeal decision (NRDC v. LA County), each provision of the permit could be read separately so if provision A.2.a states that "the MS4 must not cause or contribute to a violations of a water quality standard" then that is the stand-alone provision, and the accompanying language found in A.4 (Compliance with Discharge Prohibitions) regarding compliance may be considered irrelevant. As such, a clear linkage between the compliance provisions and the prohibitions, receiving water limitations, and effluent limitations must be established.	Insert the following sentence at the end of the introductory paragraph of Provision A: "The process for determination of compliance with the Discharge Prohibitions (A.1), Receiving Water Limitations (A.2), and Effluent Limitations (A.3) is defined in Provision A.4."
A.1.a (and throughout, as applicable)	13	Discharge Prohibitions	Provision A.1.a prohibits certain discharges into waters of the state. NPDES permits under the authority of the Clean Water Act regulate discharges into navigable (surface) waters. Expanding the scope of the Discharge Prohibitions to waters of the state would expand the scope of the Permit to protect groundwater. This exceeds federal requirements and would represent an unfunded mandate. Other MS4 permits in California, including the Los Angeles County MS4 permit, protect "waters of the United States."	Throughout the Permit, change "waters of the state" to "waters of the United States", where applicable (and throughout the Tentative Order). Revise the text as follows: "…in receiving waters of the US ~~state~~ are effectively prohibited…"

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A.1.a A.1.c A.2.a	13 13 13	Prohibitions and Limitations	The Discharge Prohibitions do not establish a sufficient linkage with approved compliance schedules for TMDLs that have been incorporated into the Basin Plan. TMDLs adopted within the region include a schedule to provide MS4 Copermittees the time necessary to develop and implement a plan to achieve water quality standards in impaired waters. The compliance schedules for effective TMDLs have been incorporated into Attachment E, but these schedules are not included in Provision A.1 or A.2. By not referencing TMDL schedules, these provisions could result in violations of the permit even though the implementation compliance dates have not yet passed. Without modification, the Discharge Prohibitions *conflict* with TMDL compliance schedules. Language should be included to clarify that in instances where a TMDL is in place, or a TMDL is being developed, the Copermittees shall achieve compliance with these provisions as outlined in Attachment E (Specific Provisions for Total Maximum Daily Loads).	Revise A.1.a, A.1.c, and A.2.a by adding the following onto the end of each provision: "…, unless such discharges are addressed by the Copermittee(s) through Provision A.1.d, A.3.b or A.4."
A.3.a, footnote 5	15	Technology Based Effluent Limitations	See comment for Finding 15.	Revise text as follows: "This does not apply to MS4 discharges which receive subsequent treatment to reduce pollutants in ~~storm water~~ discharges to the MEP…"
A.4	15	Compliance with Discharge Prohibition and Receiving Water Limitations	The Copermittees envision Water Quality Improvement Plans as the foundation for a compliance approach for the Discharge Prohibitions, RWLs, and Effluent Limitations. However, the language in Provision A does not clearly link compliance with the iterative process set forth in the Water Quality Improvement Plans. The Water Quality Improvement Plans should provide an optional mechanism to "raise the bar" with regards to the detail and quantitative analyses used to identify pollutant sources, implement BMPs to address those sources, and increase the number or size of BMPs until water quality standards are attained. However, as Provision A.4 is written, the envisioned	Revise the text as follows: "Each Copermittee must achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order through timely implementation of strategies, control measures and other actions as specified in Provisions B and E of this Order, including any modifications. The Water Quality Improvement Plans required under Provision B must be designed and adapted to ultimately achieve compliance with Provisions A.1.a, A.1.c, and A.2.a, and may be used for compliance determination as described in Provision B.3.a.(3).

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			strategic compliance process falls short, and the Water Quality Improvement Plans do not have a meaningful linkage to Permit compliance. An unintended but significant consequence of this compliance uncertainty is that Copermittees will be faced with increased difficulty securing program funding because even substantial increases in funding would not eliminate the potential for non-compliance. The proposed approach for incorporating Water Quality Improvement Plan-based compliance option into the Permit is described in comments on Provision B.3.a.(3).	
A.4.a.(2)	15	Compliance with Discharge Prohibitions and Receiving Water Limitations	The Water Quality Improvement Plan should be responsive to new pollutants of concern if they are persistently exceeding standards and not be tied to a reactionary commitment based on a one time exceedance of a water quality objective.	Revise first sentence of Provision A.4.a.(2) as follows: "Upon a determination by either the Copermittees or the San Diego Water Board that discharges from the MS4 are causing or contributing to ~~a new~~ persistent indications of an exceedance…"
A.4.a.(2)	15	Compliance with Discharge Prohibitions and Receiving Water Limitations	See comment A.4.	Add new Provision A.4.a.(2)(c) as follows: "(c)For Copermittees who are implementing an Water Quality Improvement Plan pursuant to Provision B.2, the updated Water Quality Improvement Plan should provide reasonable assurance the updated strategies are expected to address the new exceedance(s)."
A.4.c	16	Compliance with Discharge Prohibitions and Receiving Water Limitations		Remove Provision A.4.c.
B. Water Quality Improvement Plans				
B	17	Water Quality Improvement Plans	The Copermittees request a revision to the Water Quality Improvement Plan goal statement. A concise goal statement that is more central to MS4 permitting is requested. This goal statement provides context to several	Revise the goal statement in the second sentence as follows: The goal of the Water Quality Improvement Plans is to

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			requested revisions to subsequent provisions.	~~protect, preserve, enhance,~~ 1) effectively prohibit non-storm water discharges into the MS4s, 2) reduce pollutants in discharges from the MS4s to the MEP, and ~~restore the~~ 3) support the attainment and reasonable protection, preservation, and enhancement of water quality and designated beneficial uses of waters of the state. This goal will be accomplished through an adaptive planning and management process that identifies the highest priority water quality conditions within a watershed and implements strategies through the jurisdictional runoff management programs to achieve improvements in the quality of discharges from the MS4s and receiving waters.
B	17	Water Quality Improvement Plans	The Copermittees request the Regional Board use Water Quality Improvement Plans to fully integrate watershed planning, BMP implementation, and Permit compliance determination and have proposed an approach for Water Quality Improvement Plans to form the basis for compliance as described in the comment below regarding the addition of a new subsection to B.3. Additional language is requested in the opening paragraph to Provision B to provide a linkage to the proposed revision to Provision B.3.	Add the following sentence at the end of the first paragraph in Provision B: Therefore, implementation of the Water Quality Improvement Plans also provides the basis for complying with Provisions A.1, A.2 and A.3, as described in Provision B.3.a.(3).
B.1	17	Watershed Management Areas	Allow Riverside County Copermittees to enroll and for a full watershed scale public process in the development of the Water Quality Improvement Plan for the Santa Margarita River Watershed.	Add an additional paragraph to B.1 that reads: "Development of the Water Quality Improvement Plan for the Santa Margarita River Watershed Management Area shall commence upon notification of coverage of the Riverside County Copermittees under this Order. Until this time, the County of San Diego shall use the water quality priorities in the Santa Margarita River Watershed Urban Runoff Management Plan, developed pursuant to Order No. R9-2007-0001, to guide implementation of Provisions D and E within its jurisdiction."
B.2.d.(1)(e) and B.2.d.(3)	21-22	Identification of MS4 Sources of	The Copermittees do not have jurisdiction to control MS4 discharges outside of their respective MS4s.	Delete Provisions B.2.d.(1)(e) and B.2.d(3).

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		Pollutants and/or Stressors		
B.2.e	23	Numeric Goals and Schedules	The requirement that "Final dates for achieving final numeric goals must not initially extend more than 10 years..." may be broadly misinterpreted as currently written with major implications. Based on conversations with Regional Board staff, it is understood that goals can take a number of forms and the "10 year" requirement is not intended as a requirement to attain all Basin Plan water quality standards within 10 years. However, to ensure this requirement is not misinterpreted by third parties, language should be added to make this clarification.	Add a footnote Provision B.2.e., as follows: "Achievement of final numeric goals within 10 years represents progress towards attainment of water quality standards, but is not a requirement to fully attain all applicable water quality standards or all priority receiving water conditions within 10 years." Revise text as follows: "… Numeric goals must be used to support Water Quality Improvement Plan implementation and measure progress towards addressing the highest priority water quality conditions identified under Provision B.2.c. Numeric goals are not enforceable compliance standards, effluent limitations, or receiving water limitations."…
B.3	24	Water Quality Improvement Strategies		Revise the text as follows: "…by ~~preventing or eliminating~~ effectively prohibiting non-storm water discharges to ~~and from~~ the MS4, reducing pollutants in ~~storm water~~ discharges from the MS4 to the MEP…"
B.3.a.	24	Water Quality Improvement Strategies and Schedules	The Copermittees request the Regional Board use Water Quality Improvement Plans to fully integrate watershed planning, BMP implementation, and Permit compliance determination. The Copermittees propose an optional compliance mechanism that Copermittees could chose to follow. To follow this optional path the Water Quality Improvement Plans would be required to demonstrate via a scientific analyses that the number and type of strategies and	To incorporate an option for Water Quality Improvement Plan-based compliance, add a new Provision "B.3.a.(3)" as follows: (3) Copermittees may elect to develop their Water Quality Improvement Plan to serve as an iterative, implementation-based compliance mechanism for the discharge prohibitions (A.1), receiving water limitations (A.2), and effluent limitations (A.3). To utilize the Water

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			activities to be implemented will attain discharge prohibitions, receiving water limitations, and effluent limitations. The analyses would be detailed in an optional *Reasonable Assurance Analysis*. The types of analyses that would be included a Reasonable Assurance Analysis – including efforts to quantify stormwater pollutant fate and transport and strategy/activity effectiveness – are beyond conventional stormwater planning efforts, and thus the Reasonable Assurance Analysis should be optional and not required. In order to qualify for the Water Quality Improvement Plan-based compliance mechanism, a Water Quality Improvement Plan would be [1] developed using rigorous, quantitative analyses to provide reasonable assurance that BMPs are expected to attain water quality standards and [2] sufficiently detailed in terms of the strategies and activities that will be implemented so that an quantitative analysis can be conducted. The proposed approach would allow the Regional Board to measure compliance in a clear, specific, measurable, and enforceable manner. In order to a Copermittee to qualify for the optional, Water Quality Improvement Plan-based compliance mechanism, the Copermittee would be required to [1] notify the Regional Board of its intent to pursue the optional compliance mechanism, [2] submit a *Reasonable Assurance Analysis*, , and [3] provide a sufficiently detailed implementation schedule.	Quality Improvement Plan-based compliance option, Copermittees shall conduct a Reasonable Assurance Analysis. The objective of the Reasonable Assurance Analysis shall be to demonstrate the strategies and activities of the Water Quality Improvement Plan will ultimately result in attainment of the discharge prohibitions (A.1), receiving water limitations (A.2), and effluent limitations (A.3). In order for a Copermittee to utilize the Water Quality Improvement Plan-based compliance option, the Regional Board Executive Officer must determine the following conditions are met: (1) The Copermittee requests that the Water Quality Improvement Plan be approved as the basis for compliance with the discharge prohibitions (A.1), receiving water limitations (A.2), and/or effluent limitations (A.3) in the letter of submittal to the San Diego Water Board as described in Provision F.1.(a); AND (2) The submitted Water Quality Improvement Plan includes a Reasonable Assurance Analysis that demonstrates that the strategies and activities in the Water Quality Improvement Plan will attain the applicable discharge prohibitions (A.1), receiving water limitations (A.2), and/or effluent limitations (A.3); AND (3) The submitted Water Quality Improvement Plan includes a schedule as outlined in Provision B.3.b that provides sufficient detail regarding the strategies and activities to be implemented to allow the Regional Board to use the schedule for compliance determination in a clear, specific, measurable, and enforceable

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				manner. If a Water Quality Improvement Plan-based compliance option is approved by the Regional Board Executive Officer, then in instances when the discharge prohibitions (A.1), receiving water limitations (A.2), and/or effluent limitations (A.3) are not met, the implementation of the strategies and activities contained in the Water Quality Improvement Plan will be used for determination of compliance with Provision A. That is, any determination of a Copermittee's compliance with Provision A shall be based on the following conditions: (1) The strategies and activities of the Water Quality Improvement Plan are implemented per the approved schedule outlined pursuant to Provision B.3.b and adapted pursuant to Provisions B.5, F.1, and F.2; AND (2) If exceedances persist notwithstanding implementations of the strategies and activities in the approved Water Quality Improvement Plan, then Responsible Copermittees revise the Water Quality Improvement Plan pursuant to Provision A.4.a, and implement the revised Water Quality Improvement Plan including additional or alternative activities per the schedule submitted with the revised Water Quality Improvement Plan. For cases when applicable discharge prohibitions (A.1), receiving water limitations (A.2), or effluent limitations (A.3) are not attained during the time period between a Copermittee's notification of intent to utilize a Water Quality Improvement Plan-based compliance option, pursuant to Provision F.1.(a), and Regional Board Executive Officer approval of the submitted Water Quality

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				Improvement Plan, determination of a Copermittee's compliance with Provision A shall be based on the following conditions: (1) All deadlines for development of a Water Quality Improvement Plan pursuant to Provision F.1.(a) and (b) are met; AND (2) The Water Quality Improvement Plan ultimately receives final approval.
B.5.a	25	Re-Evaluation of Priority Water Quality Conditions	The proposed revisions to Provision B.5 are intended to add a link with jurisdictional implementation efforts and to clarify receiving water conditions.	Revise first paragraph of B.5.a. as follows: "The priority receiving water quality conditions, and numeric goals and corresponding schedules, included…"
B.5.b.(2)	27	Adaptation of Strategies and Schedules		Revise the text as follows: "…reductions of non-storm water discharges to ~~and from~~ each Copermittee's MS4…"
B.5.b.(3)	27	Adaptation of Strategies and Schedules	See comment for Finding 15.	Revise the text as follows: "…reductions of pollutants in ~~storm water~~ discharges from each Copermittee's MS4…"
C. Action Levels				
C.1, footnote 7	28	Non-Storm Water Action Levels	Clarify that NALs are not enforceable compliance points.	Revise text as follows: "NALs are not considered ~~by the San Diego Water Board~~ to be enforceable limitations.
C.1.a C.1.b C.2.a C.2.b	28 30 31 32	Action Levels	The Draft Order in Provision B states that the goal of the Water Quality Improvement Plan is to identify the highest water quality priorities within a watershed and implement strategies to achieve improvements in the quality of discharge and receiving waters. Furthermore in Provision B.2.d the Copermittees are required to develop and use *interim and final numeric targets/goals* to measure progress towards the protection/enhancement of the receiving waters and beneficial uses. The choice of the target/goals of the watershed may be biological, chemical, or physical based	Revise the following Provisions, as indicated: C.1.a:"The following NALs must be incorporated, if the Copermittees do not establish numeric action levels within the Water Quality Improvement Plan based on watershed priorities: " C.1.b: "~~If not identified in Provision C.1.a~~, NALs must be identified, developed, and incorporated in the Water

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			and may include multiple criteria and/or indicators. The permit now provides a clear linkage between Provision B and Provision C and states that the Water Quality Improvement Plan should guide the customization of the NALs/SALs to meet the highest water quality priorities in a given watershed and that NALs/SALs will be used to assist Copermittees in reaching the goals specified in the Water Quality Improvement Plan. Although action levels will be used for several different purposes, the action levels defined in Provision C.1.a and C. 2.a are chemically based and may be in conflict with the selected watershed metrics. As an example, if the watershed metric is improved IBI scores for a water body, then NALs and SALs associated with water chemistry are unlikely to be the best metric to evaluate progress towards improving IBI scores or for assessing our implementation efforts. Thus, the chemically based NALs/SALs may direct resources away from the watershed priorities. Since Provision C indicates that there are three different purposes for the action levels, the permit should recognize that the action levels for each permit provision (B.4, D.4.a, and/or E.2) may be based on different constituents, metrics, and/or may be different values. A revision of the language in C.1.a and C.2.a stating that Tables C-1 to C-5 are only applicable if the Copermittees do not establish numeric action levels to support the Water Quality Improvement Plan would allow for the determination of appropriate numeric NALs and SALs per the intent of each permit provision.	Quality Improvement Plans…." C.2.a: "The following SALs for discharges of storm water from the MS4 must be incorporated, <u>if the Copermittees do not establish numeric action levels within the Water Quality Improvement Plan based on watershed priorities:</u> " C.2.b: "~~If not identified in Provision C.1.a~~, SALs must be identified, developed, and incorporated in the Water Quality Improvement Plans…."
C.1.a.(2) Table C-3	29	Non-Storm Water Action Levels	Refer to the California Toxics Rule (CTR) instead of including equations in the notes of Table C-3. The note to the table incorrectly sets the chronic CTR standard (Criterion Continuous Concentration; CCC) as both the	Revise the Table C-3 Notes as follows: * Action levels developed on a case-by-case basis (see below)

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			monthly average (AMAL) and daily maximum (MDAL) NALs. However, the acute CTR standard (Criterion Maximum Concentration; CMC) should be used instead of the chronic standard for the daily maximum. Another important reason to include the equations by reference is that the equations in the notes of Table C-3 also do not take into account that in some cases a site-specific water effects ratio may apply, which is considered in and allowed by the California Toxics Rule.	** Action levels developed on a case-by-case basis (see below), but calculated criteria are not to exceed Maximum Contaminant Levels (MCLs) under the California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Provision 64431 The Cadmium, Copper, Chromium (III), Lead, Nickel, Silver and Zinc NALs for MS4 discharges to freshwater receiving waters will be developed on a case-by-case basis because the freshwater criteria are based on site-specific water quality data (receiving water hardness). For these priority pollutants, refer to ~~the following~~ 40 CFR 131.38.b.2 for details.~~) will be required:~~ ~~Cadmium (Total Recoverable) = exp(0.7852[ln(hardness)] - 2.715)~~ ~~Chromium III (Total Recoverable) = exp(0.8190[ln(hardness)] + 0.6848)~~ ~~Copper (Total Recoverable) = exp(0.8545[ln(hardness)] - 1.702)~~ ~~Lead (Total Recoverable) = exp(1.273[ln(hardness)] - 4.705)~~ ~~Nickel (Total Recoverable) = exp(.8460[ln(hardness)] + 0.0584)~~ ~~Silver (Total Recoverable) = exp(1.72[ln(hardness)] - 6.52)~~ ~~Zinc (Total Recoverable) = exp(0.8473[ln(hardness)] + 0.884)~~
C.2, footnote 9	31	Storm Water Action Levels	Clarify that SALs are not enforceable compliance points.	Revise text as follows: "SALs are not considered ~~by the San Diego Water Board~~ to be enforceable limitations.
D. Monitoring and Assessment Requirements				
D.1	33	Receiving Water	About one year of lead time is needed to plan and secure	The Copermittees must develop and conduct a program to

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		Monitoring Requirements	the resources and contracting mechanisms to conduct monitoring programs. If the Order is adopted on March 1, 2013, then the Water Quality Improvement Plan would be submitted to the Regional Board by September 2014. The Water Quality Improvement Plan could be accepted by the Regional Board as early as 60 days after submittal (by November 2014) and as late as 6 months after submittal (by February 2015). Budgeting for the next fiscal year usually begins in October. Without an approved Water Quality Improvement Plan, it will be difficult to plan and secure the necessary funding. Therefore, to accommodate budgeting cycles, transitional monitoring should be required until the implementation monitoring schedule proposed in the Water Quality Improvement Plan is approved. Allowing this flexibility will allow time for the necessary resources to be secured by the WMA. Moreover, individual Water Quality Improvement Plans may likely be adopted at different times by the Regional Board and incorporating the implementation schedule of monitoring within the Water Quality Improvement Plan will increase the efficiency of the process.	monitor the condition of the receiving waters in each Watershed Management Area during dry weather and wet weather. Following acceptance of the Water Quality Improvement Plans <u>and schedule for implementation of monitoring</u> for each Watershed Management Area, the Copermittees must conduct long-term receiving water monitoring during implementation of the Water Quality Improvement Plan to assess the long term trends and determine if conditions in receiving waters are improving. This change is incorporated in *Proposed Changes* to Provision D below:
D.1.a	33	Transitional Receiving Water Monitoring	See comment D.1	Until the monitoring requirements <u>and implementation schedule for monitoring</u> of Provisions D.1.b-e are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following receiving water monitoring in the Watershed Management Area:
D.1.a.(1)	33	Transitional Receiving Water Monitoring	The Copermittees request removal of Coastal Storm Drain Monitoring Program from Transient Receiving Monitoring. The San Diego Copermittees' Report of Waste Discharge (2011) demonstrated a limited relationship (less than 2 %) between receiving water concentrations/exceedances and storm drain concentrations/exceedances in dry weather. <u>Duplicative Effort</u> - Many storm drain outfalls/receiving waters will be monitored as part of the Bacteria TMDL or the	Revise Provision D.1.a.(1) as follows: (1) Continue the receiving water monitoring programs required in Orders Nos. R9-2007-0001 <u>(Attachment A, Provision II. A. 1-5),</u> R9-2009-0002, and R9-2010-0016;

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			transient MS4 Outfall Program in D.2.a.(2).	
D.2	42	MS4 Outfall Discharge Monitoring Requirements	See comment D.1.	Revise Provision D.2. as follows: "The Copermittees must develop and conduct a program to monitor the discharges from the MS4 outfalls in each Watershed Management Area during dry weather and wet weather. Following acceptance of the Water Quality Improvement Plans and schedule for implementation of monitoring for each Watershed Management Area…"
D.2.a	42	Transitional MS4 Outfall Discharge Monitoring	See comment D.1.	Revise Provision D.2.a. as follows: "Until the monitoring requirements and schedule for implementation of monitoring of Provisions D.2.b-c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1
D.2.a.(2)	43	Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring	See comment D.1.	Revise Provision D.2.a.(2) as follows: "Until the monitoring requirements and the monitoring implementation schedule described in ~~of~~ Provision D.2.b are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1…"
D.2.a.(2)(a)	43-44	Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Frequency	To clarify that the maximum number of outfall inspections required annually per Copermittee is 500, per the limit on the number of major MS4 outfalls for field screening specified in CFR40CFR$122.26(d)(2)(iv)(D)(6) - "in large municipal separate storm sewer systems, no more than 500 cells need to have identified field screening points"	Revise Provision D.2.a.(2)(a) as follows: (a) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Frequency Each Copermittee must field screen the MS4 outfalls in its inventory developed pursuant to Provision D.2.a.(1) as follows: (i) For Copermittees with less than 125 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 80 percent of the outfalls must be visually inspected two times per year during dry weather conditions. For Copermittees with jurisdiction in more than one WMA, this requirement is limited to 500 inspections annually per Provision D.2.a.(2)(a)(iv).

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				(ii) For Copermittees with 125 major MS4 outfalls or more, but less than or equal to 500, that discharge to receiving waters within a Watershed Management Area all the outfalls must be visually inspected at least annually during dry weather conditions. For Copermittees with jurisdiction in more than one WMA, this requirement is limited to 500 inspections annually per Provision D.2.a.(2)(a)(iv). (iii) For Copermittees with more than 500 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 500 outfalls must be visually inspected at least annually during dry weather conditions. Copermittees with more than 500 major MS4 outfalls within a Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following: [a] Assessment of connectivity of the discharge to a flowing receiving water; [b] Reported exceedances of NALs in water quality monitoring data; [c] Surrounding land uses; [d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA Provision 303(d) List; and [e] Flow rate. For Copermittees with jurisdiction in more than one WMA, this requirement is limited to 500 inspections annually, per Provision D.2.a.(2)(a)(iv).
D.2.a.(3)	45	Transitional Wet Weather MS4 Outfall Discharge Monitoring	See D.1	Revise Provision D.2.a.(3) as follows: "Until the monitoring requirements and the monitoring implementation schedule described in ~~of~~ Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1…"
D.2.a.(3)(a)	46	Transitional Wet	Reduce the number of transitional wet weather MS4 outfall	Add an additional paragraph to D.2.a.(3)(a) that reads:

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		Weather MS4 Outfall Discharge Monitoring Stations	discharge monitoring stations for the Santa Margarita River Watershed Management Area to be proportional to the area of the watershed within the County of San Diego until such time the County of Riverside Copermittees are notified of coverage. After such time, the number of wet weather MS4 outfall discharge monitoring stations will be increased to five (5) as defined in D.2.(3).(a).	"The County of San Diego shall select at least two (2) transitional wet weather MS4 outfall discharge monitoring stations for the portion of the Santa Margarita River Watershed Management Area within its jurisdiction until the Riverside Copermittees are enrolled under this Order. After the Riverside Copermittees are enrolled, the Watershed Management Area Copermittees shall select at least five (5) transitional wet weather MS4 outfall discharge monitoring stations consistent with the requirements above."
D.2.a.(3)(b)	46	Transitional Wet Weather MS4 Outfall Discharge Monitoring Frequency	Reduce the frequency of sampling from annual to once during the 2-year transition period, because San Diego Copermittees have already satisfied the intent of this provision to provide baseline MS4 data. The 2007 Permit MS4 program will be completed in 2013 and characterizes baseline MS4 conditions through a statistically robust random sampling program (over 160 samples collected to date), in addition to targeted monitoring at selected sites. Collectively, the San Diego Copermittees also have performed storm event composite sampling for more than 150 wet weather MS4 discharge events to derive event mean concentrations and estimate the loading from single family residential, commercial and industrial land uses. The current First flush requirement skews the data set towards very early season conditions. Need samples representing a broader range of conditions to produce more representative data to better characterize seasonal/hydrological variation, and produce more accurate loading estimates. Logistically difficult to get equipment and personnel ready/available to monitor all sites in any one event. Propose minimum 10% of samples be First Flush, with at least one per WMA.	Revise Provision D.2.a.(3)(b) as follows: (b) Transitional Wet Weather MS4 Outfall Discharge Monitoring Frequency Each wet weather MS4 outfall discharge monitoring station selected pursuant to Provision D.2.a.(3)(a) must be monitored twice during the wet season (October 1 – April 30) in the transitional period. ~~One~~ The wet weather monitoring events shall be selected to be representative of the range of hydrological conditions experienced in the region. At least 10% of samples must be conducted during the first wet weather event of the wet season, to include at least one such sample in each Watershed Management Area~~, and one wet weather monitoring event at least a month after the first wet weather event of the wet season.~~

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D.2.b.(2)(b)(i)	49	Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring Frequency	The tentative order currently requires monitoring twice annually of at least 10 MS4 outfalls per WMA in which a jurisdiction is present; this adds up to 322 outfalls at one time across the region. The current requirement, as written, would significantly restrict available resources to follow-up on the top priorities - particularly in mid-size jurisdictions. The analytical requirements twice a year for mid-size cities would cost significantly more than the current dry weather program. Jurisdictions vary in size, population and thus number of major MS4 outfalls. Our recommendation is for an equitable approach: Assume 5 (unless a jurisdiction has less than 5) instead of 10 per jurisdiction within each WMA in which a jurisdiction is present. The total then equals 172 outfalls regionally instead of 322 (we proposed 69 on Sept 14th).	Revise Provision D.2.b.(2)(b)(i) as follows: "Based on the prioritization of major MS4 outfalls developed under Provision D.2.b.(2)(a), each Copermittee must identify, at a minimum, the ~~10~~ 5 highest priority major MS4 outfalls with non-storm water persistent flows that the Copermittee will monitor within each Watershed Management Area within its jurisdiction. If a Copermittee has less than 5 major outfalls within a WMA, the Copermittee shall monitor all of its major outfalls with persistent flows within that WMA."
D.2.b.(2)(e)(iii)	51	Non-Storm Water Persistent Flow MS4 Outfall Discharge Analytical Monitoring	Allow increased flexibility to developers of the Water Quality Improvement Plans to determine the appropriate analytes necessary to track and eliminate the prioritized persistent flows for specific Watershed Management Areas. Increase efficiency by increasing flexibility of analytical requirements in D.2.b & Table D-8 (p. 51): • Allow flexibility in Water Quality Improvement Plan to focus analytical testing and • After initial identification of issue, allow analytical testing reduced to key pollutants that exceed WQOs and aid in source abatement	Revise Provision D.2.b.(2)(e)(iii) as follows: (iii) During development of the Water Quality Improvement Plan, for each WMA, consider the following sources to select constituents for ~~C~~ collection of grab or composite samples to be analyzed ~~for the following constituents~~ at a qualified analytical laboratory: [a] Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan, [b] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA Provision 303(d) List, [c] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, [d] Applicable NAL constituents, and [e] Constituents listed in Table D-8~~, unless the~~ (iv) Copermittees may adjust the analytical list for a given WMA in successive monitoring events ~~has~~ to add or

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				eliminate constituents based on ~~historical~~ data that can demonstrate or provide justification ~~that~~ regarding the need or lack of need for analysis of ~~the~~ specific constituents ~~is not necessary~~. (~~i~~v) If the Copermittee identifies and eliminates the source of the persistent flow non-storm water discharge, analysis of the sample is not required.
D.2.c	52	Wet Weather MS4 Outfall Discharge Monitoring	Outfall monitoring is generally not an efficient or effective way of identifying sources of pollutants within urban watersheds. Source identification will be undertaken in the context of Special Studies (Provision D.3), as directed by the Water Quality Improvement Plan strategies to address specific issues in WMAs. The outfall monitoring data will be used to help design those strategies.	Revise Provision D.2.c. as follows: "c. Wet Weather MS4 Outfall Discharge Monitoring The Copermittees must perform wet weather MS4 outfall monitoring to identify ~~sources of~~ pollutants in storm water discharges from the MS4s in the Watershed Management Area, and provide information to help guide source identification efforts. The Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area: (1) Wet Weather MS4 Outfall Discharge Monitoring Stations The Copermittees may adjust the wet weather MS4 outfall discharge monitoring locations and frequencies in the Watershed Management Area, as needed, to identify ~~sources of~~ pollutants in storm water discharges from MS4s in the Watershed Management Area in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of stations is at least equivalent to the number of stations required under Provision D.2.a.(3)(a). (2) Wet Weather MS4 Outfall Discharge Monitoring Frequency The Copermittees must monitor the wet weather MS4 outfall discharge monitoring stations in the Watershed Management Area at an appropriate frequency to identify ~~sources of~~ pollutants in storm water discharges from the MS4s causing or contributing to the highest priority water quality conditions identified in the Water Quality

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				Improvement Plan."
D.3.a D.3.d	54 55	Special Studies	Special studies are typically multi-year efforts, requiring planning, funding approval/allocation, implementation, and analysis. Allow for special studies to be counted that are *initiated* during the current permit term as well as under the new permit term. Otherwise, unexpected delays (e.g., due to fire storms, etc.) could result in permit noncompliance. Flexibility is needed to maintain scientific rigor of studies and to accommodate variation in hydrological conditions, etc… Several Special Studies are currently ongoing. Planning and schedule for implementation of new Special Studies will be included within each Water Quality Improvement Plan, subject to RWQCB approval. In addition, the Copermittees request the number of Special Studies be reduced from 3 to 2 per WMA and from 2 to 1 for Regional Studies in consideration of the planning period required to develop the Monitoring and Assessment Plan required as part of the Water Quality Improvement Plan.	Revise Provision D.3.a.as follows: "a. Within the term of this Order, the Copermittees must ~~develop and implement~~ initiate the following special studies: (1) At least two ~~three~~ special studies in each Watershed Management Area to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that cause or contribute to highest priority water quality conditions identified in the Water Quality Improvement Plan. (2) At least one ~~two~~ special study~~ies~~ for the San Diego Region to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that are impacting receiving waters on a regional basis in the San Diego Region. (3) One of the two ~~three~~ special studies in each Watershed Management Area may be replaced by a special study implemented pursuant to Provision D.3.a.(2)…" Revise Provision D.2.d. as follows: "d. Special studies initiated prior to the ~~acceptance of the Water Quality Improvement Plan~~ term of this Order that meet the requirements of Provision D.3.b and are ~~completed~~ implemented during the term of this Order may be utilized to fulfill the special study requirements of Provision D.3.a. "

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D.4	56-63	Assessment Requirements	Assuming that the overall purpose is to assess progress in reducing concentrations and loads of pollutants in runoff, the issue is that *annual* assessments of progress in load reductions won't provide useful information and will divert resources from program implementation, the high variability of water quality data and relatively small annual changes in loading and quality (≤10%) can't be overcome with reasonable numbers of samples. A longer assessment term is needed for meaningful analysis.	See proposed changes below.
D.4.b.(1)(a)(ii)	57	Non-Storm Water Discharges Reduction Assessments	Need to ensure timing for reporting will be compatible with completion of assessment.	Revise Provision D.4.b.(1)(a)(ii) as follows: "(ii) Based on the data collected pursuant to Provisions D.2.b, the assessments required under Provision D.4.b.(1)(c) must be included when complete in the ~~first~~ Annual Report required pursuant to Provision F.3.b.(1), and annually thereafter. "

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D.4.b.(1)(c)(iv)	58	Non-Storm Water Discharges Reduction Assessments	Proposed Dry Weather method for calculation of jurisdictional loads: extrapolate from monitored major MS4 outfalls with persistent flows to remainder of major MS4 outfalls with persistent flows collectively for each jurisdiction in each WMA.	Revise Provision D.4.b.(1)(c)(iv) as follows: "(iv) Each Copermittee must analyze the data collected pursuant to Provision D.2.b, and utilize a model or other method, to calculate or estimate the non-storm water volumes and pollutant loads collectively discharged from all the major MS4s outfalls in its jurisdiction identified as having persistent dry weather flows during the monitoring year. These calculations or estimates must be updated annually. [a] Each Copermittee must calculate or estimate: ~~[a]~~ Annual non-storm water volumes and pollutant loads collectively discharged from the Copermittee's major MS4 outfalls to receiving waters within the Copermittee's jurisdiction~~, with an estimate of the percent contribution from each known and suspected source for each MS4 outfall~~; [b] Each Copermittee must ~~Annual non-storm water volumes and pollutant loads~~ identify and quantify, where feasible, sources of non-stormwater flows ~~from areas or facilities subject to~~ not subject to the Copermittee's legal authority that are discharged from the Copermittee's major MS4 outfalls to downstream receiving waters."
D.4.b.(1)(c)(v)	58	Non-Storm Water Discharges Reduction Assessments	Loads will be calculated annually per previous comment, but strategic assessments should not be required more than once per permit term.	Revise Provision D.4.b.(1)(c)(v) as follows: "(v) Each Copermittee must review the data collected pursuant to Provision D.2.b and findings from the assessments required pursuant to Provision D.4.b.(1)(c)(i)-(iv) ~~on an annual basis~~ once per Permit term to:"
D.4.b.(2)(a)(ii)	59	Storm Water Pollutant Discharges Reduction Assessments	Need to ensure timing for reporting will be compatible with completion of assessment. Very important also to reference specifically the assessments that will occur annually (only D.4.b.(c)(i) and (ii)).	Revise Provision D.4.b.(2)(a)(ii) as follows: "(ii) Based on the data collected pursuant to Provision~~s~~ D.2.c., the assessments required under Provisions D.4.b.(2)(c)(i) and (ii) must be included when complete in the ~~first~~ Annual Report required pursuant to Provision F.3.b.(1), and annually thereafter."

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D.4.b.(2)(b)	59	Storm Water Pollutant Discharges Reduction Assessments	Proposed Wet Weather method for calculation of jurisdictional loads: extrapolate from monitored major MS4 outfalls to area-wide discharge from jurisdictional area within each WMA. Do not extrapolate wet weather data to individual (non-monitored) outfalls, as this is not technically supportable. The proposed method is a more effective means of establishing jurisdictional accountability. Per discussion with RWQCB staff, have consolidated calculation requirements in proposed language, given the added area-based jurisdictional computational approach.	Revise Provision D.4.b.(2)(b) as follows: "(b) Based on the transitional wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.a.(3) the Copermittees must assess and report the following: (i) ~~The Copermittees must a~~Analyze the monitoring data collected pursuant to Provision D.2.a.(3), and utilize a watershed model or other method, to calculate or estimate storm water volumes and pollutant loads discharged from the MS4s in each Copermittee's jurisdiction within the Watershed Management Area. The Copermittees must calculate or estimate the following for each monitoring year: [a] The average storm water runoff coefficient for each land use type within the Watershed Management Area; [b] The volume of storm water and pollutant loads discharged from each of the Copermittee's ~~major~~ monitored MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch; ~~[c] The pollutant loads discharged from each of the Copermittee's major MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch; and~~
				~~[d] The percent contribution of storm water volumes and pollutant loads discharged from each land use type within the drainage basin to each of the Copermittee's major MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch.~~

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				[c] The total flow volume and pollutant loadings discharged from the Copermittee's jurisdiction within the Watershed Management Area over the course of the wet season, extrapolated from the data produced from the monitored outfalls. (ii) Identify modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify ~~sources~~ pollutants in storm water discharges from the MS4s in the Watershed Management Area pursuant to Provision D.2.c.(1)."
D.4.b.(2)(c)	60	Storm Water Pollutant Discharges Reduction Assessments	(c)(ii): Clarify connection to improvement of strategies and Water Quality Improvement Plans in Provision B, and eliminate technically-infeasible ranking of outfalls based on extrapolated wet weather data. (c)(iii): Loads will be calculated annually per previous comment, but strategic assessments should not be required more than once per permit term.	Revise Provision D.4.b.(2)(c) as follows: (c) Based on the wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.c the Copermittees must assess and report the following: (i) The assessments required pursuant to Provision D.4.b.(2)(b); (ii) Based on the data collected and applicable SALs in the Water Quality Improvement Plan, analyze and compare the monitoring data to the analyses and assumptions used to develop the Water Quality Improvement Plans, including strategies developed per Provision B.3, and evaluate whether those analyses and assumptions should be updated as a component of the adaptive management efforts under Provision B.5, ~~rank the MS4 outfalls in the Watershed Management Area according to potential threat to receiving water quality, and produce a prioritized list of major MS4 outfalls~~ for follow-up action to update the Water Quality Improvement Plan; (iii) The Copermittees must review the data collected pursuant to Provision D.2.c and findings from the assessments required pursuant to Provisions D.4.b.(2)(c)(i)-(ii) ~~on an annual basis~~ once per Permit term to:

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D.4.d.(2)	62	Integrated Assessment of Water Quality Improvement Plan	The integrated assessment should be based on more than one year of data, and strategic assessments should not be required more than once per permit term. Information will be shared among monitoring personnel and stormwater program managers on an ongoing basis, and monitoring data will be used to assess program needs and data gaps annually per prior provisions (c.f., Provisions D.4.b.(c)(i) and (ii), with proposed revisions above). This information will then be used in adopting annual budgets and related resource planning.	Revise Provision D.4.d.(2) as follows: (2) The Copermittees must re-evaluate the water quality improvement strategies for the Watershed Management Area during the term of this Order pursuant to Provision B.5.b. The re-evaluation and recommendations for modifications to the water quality improvement strategies and schedules must be provided in the ~~Annual Reports required pursuant to Provision F.3.b, and provided in the~~ Report of Waste Discharge pursuant to Provision F.5.b. The water quality improvement strategies for the Watershed Management Area must be re-evaluated as follows:
E. Jurisdictional Runoff Management Programs				
E	64	Jurisdictional Runoff Management Programs	Minor grammatical correction in the first sentence.	Revise the first sentence of Provision E as follows: "The purpose of this provision is for each Copermittee to implement a program to control the contribution of pollutants to and the discharges from the MS4 within its jurisdiction.
E and throughout	64	Jurisdictional Runoff Management Programs	Language should reflect Clean Water Act, which requires Copermittees to effectively prohibit non-stormwater discharges into the MS4; and implement controls to reduce the discharge of pollutants from the MS4 to the maximum extent practicable. Language should be used and modified, as appropriate, throughout the Permit for consistency with federal regulations.	Revise the second sentence of Provision E as follows: "The goal of the jurisdictional runoff management programs is to implement strategies that effectively prohibit non-storm water discharges to the MS4 and reduce the discharge of pollutants from the MS4 ~~in storm water~~ to the MEP."
E	64	Jurisdictional Runoff Management Programs	Clarify that County of San Diego jurisdictional runoff management program implementation will based on the water quality priorities identified in the Santa Margarita River Watershed Urban Runoff Management Plan (required in Order No. R9-2007-0001) until a Water Quality Improvement Plan for the Santa Margarita River Watershed Management Area is approved.	Add to the first paragraph: "For the Santa Margarita River Watershed Management Area, the County of San Diego shall use the water quality priorities in the Santa Margarita River Watershed Urban Runoff Management Plan (developed pursuant to Order No. R9-2007-0001) to guide jurisdictional runoff management program implementation until notified by the San Diego Water Board that the Water Quality Improvement Plan developed in conjunction with the Riverside Copermittees has been approved."

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E	64	Jurisdictional Runoff Management Programs	As stated in the introduction to the Provision B (Water Quality Improvement Plans) "The purpose of this provision is to develop Water Quality Improvement Plans that guide the Copermittees' jurisdictional runoff management programs…" However, the provisions do not clearly allow for the appropriate modification of the JRMP requirements (increases, decreases, and/or replacement of activities) contained in the permit, with justification provided and subject to public input, to support adaptive management of programs.	Include language into the introductory provision that clearly indicates that the JRMP requirements contained in Provision E may be modified to allow for implementation of the JRMP consistent with the Water Quality Improvement Plan if appropriate justification is provided. In addition, add the following: Modification of Jurisdictional Runoff Management Program Requirements Modifications shall be considered and where selected, proposed according to the process in Provision B.5. Proposed modifications may increase, decrease, and/or replace minimum requirements identified in Provision E.
E.1.a.	64	Legal Authority Establishment and Enforcement		Revise text as follows: "… to control pollutant discharges ~~into and~~ from its MS4"
E.1.a.(2)	64	Legal Authority Establishment and Enforcement	Sites regulated under the Construction and Industrial General Permits are regulated elsewhere and through alternative means. Clarification is necessary for sites that are not regulated under the respective General Permits.	Revise Provision E.1.a.(2) as follows: "Control the contribution of pollutants in discharges of runoff associated with industrial and construction activity to its MS4 and control the quality of runoff from industrial and construction sites that do not~~, including industrial and construction sites which~~ have coverage under the statewide General Permit for Discharges of Storm Water Associated with Industrial Activities (Industrial General Permit) or General Permit for Discharges of Storm Water Associated with Construction Activities (Construction General Permit)~~, as well as to those sites which do not~~; "
E.1.a.(4) E.1.a.(5)	64 64	Legal Authority Establishment and Enforcement	The Copermittees do not have jurisdiction to control MS4 discharges outside of their respective MS4s and the Regional Board does not have the authority to require interagency agreements to grant such jurisdiction, particularly for those agencies not subject to the Order (Caltrans, Native American Tribes, Military installations,	Revise Provision E.1.a.(4) and E.1.a.(5) as follows: ~~"Control through interagency agreements among Copermittees the contribution of pollutants from one portion of the MS4 to another portion of the MS4;"~~ and ~~"Control, by coordinating and cooperating with other owners of the MS4 such as Caltrans, the U.S. federal~~

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			etc.).	~~government, or sovereign Native American Tribes, through interagency agreements, where possible, the contribution of pollutants from their portion of the MS4 to the portion of the MS4 within the Copermitee's jurisdiction;"~~ "Coordinate, as possible, with other agencies to minimize the contribution of pollutant discharges from the Copermittee's portion of the MS4 to portions of the MS4 under another agency's jurisdiction and from other agency's portions of the MS4 to the portion of the MS4 under the Copermittee's jurisdiction"
E.2.a	65	Non-Storm Water Discharges	The addition of "to the extent allowable by law", as referenced from the Phase II Regulations, limits Copermittees responsibility to those that they have the legal authority to implement. Copermittees cannot implement programs outside of what they have legal authority to do. In addition, some non-storm water discharges are authorized under the permit unless the Copermittee or San Diego Water Board determines they are a source of pollutants in receiving waters of the U.S., as consistent with 40 CFR 122.26(d)(2)(iv)(B)(1). Language should be provided to account for subsection E.2.a.(3).	Revise Provision E.2.a. as follows: "To the extent allowable by law, ~~E~~each Copermittee must address all non-storm water discharges as illicit discharges, where the likelihood exists that they are a source of pollutants to waters of the U.S."
E.2.a.(1)	66	Non-Storm Water Discharges	Uncontaminated pumped groundwater is the only category under this Provision that is required to be permitted under an NPDES Permit. It should be added to the initial paragraph and the remainder of the bullets should be added to E.2.a.(3), as consistent with 40 CFR 122.26(d)(2)(iv)(B)(1). No justification is provided in the fact sheet for inclusion of discharges from foundation drains, water from crawl space pumps, or from footing drains as requiring NPDES permits for the entire region. This exceeds CWA standards and there is no evidence that the Regional Board has considered the economic cost of enacting such measures under this permit. The reasoning provided in the fact sheet cites 40 CFR 122.26(d)(2)(iv)(B)(1), applicable to	Revise Provision E.2.a.(1) as follows: "Discharges of non-storm water to the MS4 from uncontaminated pumped groundwater ~~the following categories~~ must be addressed as illicit discharges where there is evidence that suggests that they are the source of pollutants to waters of the U.S., unless the discharge has coverage under NPDES Permit No. CAG919001 (Order No. R9-2007-0034, or subsequent order) for discharges to San Diego Bay, or NPDES Permit No. CAG919002 (Order No. R9-2008-0002, or subsequent order) for discharges to surface waters other than San Diego Bay: ~~(a) Uncontaminated pumped ground water;~~

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			"receiving waters of the US". Groundwater is not a receiving water of the US and, thus, the added footnote is inapplicable and inappropriate. While "the Director may include permit conditions that either require municipalities to prohibit or otherwise control any of these discharges where appropriate" (55 FR 48037), there is no justification provided to support these discharges as appropriate to require NPDES permits or that they have been "identified by the municipality [or the Regional Board] as sources of pollutants to waters of the United States". 40 CFR 122.26(d)(2)(iv)(B)(1). Water from foundation drains, crawl space pumps, and footing drains has not been identified as a source of pollutants to waters of the US and should be included under Provision E.2.a.(3). The footnote is inapplicable since groundwater is not a water of the US. In the future, based on data collected through the Monitoring Program and as part of the Water Quality Improvement Plan, Copermittees or the Regional Board may include any category of discharges determined to be a source of pollutants based on evidence that such discharge is causing or contributing pollutants to the receiving waters through the MS4. The "blanket" prohibition of the listed sources creates an unnecessary burden and potentially costly requirement that may yield little if any benefit. Footnotes 19 and 20 (E.2.a.3) provide a technical/engineering distinction between types of groundwater discharges that has no direct linkage to pollutants. Furthermore, it is unlikely that the location of the pipes and other features will be identifiable in the field or in any records; making it a burdensome investigative effort for discharges having no impact on water quality. Lastly, there are no reliable and readily available records (or a definition)	~~(b) Discharges from foundation drains[19];~~ ~~(c) Water from crawl space pumps; and~~ ~~(d) Water from footing drains[19].~~" And delete Footnotes 19 and 20.

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			for the "highest historical groundwater table".	
E.2.a.(2)	66	Non-Storm Water Discharges	Limit to within the Copermittee's jurisdiction per prior comments and reword the applicable permitting portion to allow flexibility for any subsequent NPDES permits that may be issued.	Revise Provision E.2.a.(2) as follows: "Discharges of non-storm water from water line flushing and water main breaks to the MS4 must be addressed as illicit discharges unless the discharge has coverage under a valid NPDES Permit, ~~No. CAG 679001 (~~Order No. R9-2010-0003, or a subsequent order~~)~~. This includes water line flushing and water main break discharges from water purveyors under the Copermittee's jurisdiction that have been issued a water supply permit by the California Department of Public Health or federal military installations."
E.2.a.(3)	66-67	Non-Storm Water Discharges	Non-storm water sources should be limited to anthropogenic sources of pollutants within the Copermittees jurisdiction to enable to Copermittees to address those sources in which they have control over. Also, see comment E.2.a.1.	Revise Provision E.2.a.(3) as follows: Limit the source of pollutants in receiving waters to anthropogenic sources identified as an illicit discharge within the Copermittees jurisdiction and add water from crawl space pumps. In addition, remove footnote 19.
E.2.a.(4)	67	Non-Storm Water Discharges	See comment E.2.a, as consistent with 40 CFR 122.26(d)(2)(iv)(B)(1).	Revise Provision E.2.a.(4) as follows: Add "or similar means where the Copermittee of the San Diego Water Board identifies those discharges as a source of pollutants to waters of the U.S."
E.2.a.(4)(a)	67	Non-Storm Water Discharges	Individual buildings may require substantial structural modifications to redirect air conditioning condensation to landscaped areas. Redirection should be encouraged instead of required. In addition, air conditioning condensate should be permitted to be directed to the sanitary sewer.	Revise Provision E.2.a.(4)(a) as follows: "The discharge of air conditioning condensation ~~must~~ should be directed to landscaped areas, other pervious surfaces where feasible, or to the sanitary sewer;"
E.2.a.(4)(b)	67	Non-Storm Water Discharges	Complete removal of residential car washing activities is unrealistic and resources would be better used to educate the public. Public outreach has proven to be also effective in minimizing water and detergent use and encouraging the use of commercial facilities.	Revise Provision E.2.a.(4)(b) as follows: "~~(i)~~ The discharge of wash water must be encouraged through public outreach and education (i) to be directed to landscaped areas or other pervious surfaces where feasible, and (ii) to m~~M~~inimize the use of water for vehicle washing, use as little washing detergent and other vehicle wash products as possible, wash vehicles at commercial wash facilities, and implement other practices or behaviors that will prevent the discharge of pollutants associated with

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				individual residential vehicle washing from entering the MS4; and"
E.2.a.(4)(c)	67	Non-Storm Water Discharges		Revise Provision E.2.a.(4)(c) as follows: "Dechlorinated swimming pool discharges should be managed as to:"
E.2.a.(5)(a)(i)	68	Non-Storm Water Discharges	Building fire suppression system maintenance discharges should not be considered an illicit discharge if BMPs are implemented to prevent discharge of pollutants to the MS4.	Revise Provision E.2.a.(5)(a)(i) as follows: Add "unless BMPs are implemented to prevent the discharge of pollutants to the MS4."
E.2.a.(7)	68	Non-Storm Water Discharges	Allowable discharges should not be treated the same as illicit discharges. This requirement will limit the Copermittee's ability to focus on priorities identified in Water Quality Improvement Plan and focus resources that could be used for reduction of illicit discharges on authorized discharges. This standard is more stringent than that applied by the State to Areas of Special Biological Significance.	Revise Provision E.2.a.(7) as follows: "Each Copermittee must, where feasible, reduce or effectively eliminate non-storm water discharges listed under Provisions E.2.a.(1)-(4) into its MS4 ~~whether or not the non-storm water discharge has been identified as an illicit discharge~~, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit."
E.2.b.(1)(d)	69	Prevent and Detect Illicit Discharges and Connections	MS4 and Private Outfalls should be clearly defined consistent with the Code of Federal Regulations.	Revise Provision E.2.b.(1)(d) as follows: "All known locations of Major MS4 outfalls and private outfalls that discharge runoff collected from areas within the Copermittee's jurisdiction,"
E.2.b.(4)	69-70	Prevent and Detect Illicit Discharges and Connections	Spill response should be limited to waters of the U.S. and is not applicable to soil contamination under an NPDES permit.	Revise Provision E.2.b.(4) as follows: "Each Copermittee must implement practices and procedures (including a notification mechanism) to prevent, respond to, contain, and clean up any spills that may discharge into the MS4 within their jurisdiction from any source. The Copermittee must coordinate with spill response teams to prevent to the extent possible entry of spills into the MS4, and prevent contamination of waters of the U.S. ~~surface water, ground water, and soil~~."
E.2.b.6	70	Prevent and Detect Illicit Discharges and Connections	Copermittees cannot control other agencies or MS4s outside their jurisdiction.	Revise Provision E.2.b.(6) as follows: "(6) Each Copermittee shall ~~must~~ coordinate, when necessary, with upstream Copermittees and/or entities to prevent illicit discharges from upstream sources into the MS4 within its jurisdiction."
E.2.d.(1)(d)	70	Investigate and Eliminate Illicit	Natural sources should be excluded to prevent diversion of resources for follow-ups on exceedances where the source	Revise Provision E.2.d.(1)(d) as follows: "Pollutants identified as causing or contributing to an

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		Discharges and Connections	has been determined as natural, versus focusing efforts on controllable sources.	exceedance of a NAL in the Water Quality Improvement Plan where the source has not been identified as natural; and"
E.2.d.(2)	71	Investigate and Eliminate Illicit Discharges and Connections	TCBMPs may be part of the MS4 and specifically designed to receive and contain pollutants. The language, as written, is inconsistent with the TCBMP requirements prescribed in Provision E.3.a of the proposed permit.	Revise Provision E.2.d.(2) as follows: "Each Copermittee must implement procedures to investigate and inspect portions of its MS4 that, based on reports or notifications, field screening and monitoring, or other appropriate information, indicate a reasonable potential of ~~receiving, containing, or~~ discharging pollutants to receiving waters within the Copermittees jurisdiction due to illicit discharges, illicit connections, or other sources of non-storm water."
E.2.d.(2)(c)	71		Clarify requirements for follow-up investigations on non-Storm Water flows; ensure consistency with Provision D and earlier Provision E requirements.	Revise Provision E.2.d.(2)(c) as follows: "(c) In accordance with the procedures defined in Provision E.2.d.(1), ~~E~~ each Copermittee must investigate and seek to identify the source(s) of discharges of non-storm water where flows are observed in and from the MS4 during the field screening required pursuant to Provision D.2.b.(1) as follows: (i) Obvious illicit discharges (i.e., unusual color or odor) must be immediately investigated to identify the source(s) of non-storm water discharges; "
E.2.d.(2)(d)(ix)	72	Investigate and Eliminate Illicit Discharges and Connections	The requirement to provide "a rationale for why a discharge does not pose a threat to water quality and/or does not require additional investigation" is not consistent with E.2.d.(3).	Revise Provision E.2.d.(2)(d)(ix) as follows: "(ix) If a source cannot be identified and the investigation is not continued, document the response per the requirements of Provision E.2.d.(3)~~a rationale for why a discharge does not pose a threat to water quality and/or does not require additional investigation."~~
E.2.d.(2)(e)	72	Investigate and Eliminate Illicit Discharges and Connections	Clarify requirements for follow-up investigations on non-Storm Water flows; ensure consistency with Provision D and earlier Provision E requirements. In addition, the example of "pooled" water is an unreasonable expectation based on over 10 years of dry weather monitoring data collected by the Copermittees that	Revise Provision E.2.d.(2)(e) as follows: " (e) Each Copermittee must ~~track~~ document and, if readily identifiable in accordance with Provision E.2.d.(1) procedures, seek to identify the source(s) of non-storm water discharges from the MS4 where there is evidence of non-storm water having been discharged into or from the MS4 (e.g., ~~pooled~~ flowing water), in accordance with MS4

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			clearly demonstrates the presence of pooled water in parts of the MS4 where no illegal or illicit discharges can be found after exhaustive investigations. Pooled water may result from past storm discharges due to minor imperfections or settling of the MS4 infrastructure. Flowing water should be set as the standard for investigating illicit or illegal discharges instead of pooled water.	outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b."
E.3	73	Development Planning	The Provisions of E.3 regulating storm water flow exceed the requirements of federal law. See Virginia Department of Transportation v. U.S. EPA, Civil Action No. 1:12-CV-775 (E.D. Va. Jan 3, 2013) (holding that EPA exceeded its authority under the Clean Water Act when it regulated storm water flow as a "surrogate" for pollutant discharges).	Acknowledge that affected provisions of E.3 regulating storm water flow exceed federal law.
E.3	73	Development Planning	No jurisdictional limitations are provided in this section. As a result, language in the subsections may be interpreted as expanding Copermittee requirements outside their MS4 jurisdiction. In addition how the Copermittees implement their program should be a decision left to the Copermittees. In rare instances a requirement listed within the permit may not be legal for the jurisdiction to impose upon an applicant.	Revise Provision E.3. as follows: "Each Copermittee, within their respective jurisdictions and to the extent that they may lawfully impose requirements, must ~~use their land use and planning authorities to~~ implement a development planning program…"
E.3.a	73	BMP Requirements for All Development Projects	Added language to clarify that not all the prescribed BMPs in Provision E.3.a. are applied to every project. These BMPs are applied as practical and feasible and as applicable based on the sites condition and nature of development.	Revise Provision E.3.a. as follows: "Each Copermittee, as practical and feasible, must prescribe the following BMP requirements during the planning process (i.e. prior to project approval and issuance of grading or building permits) for all development projects (regardless of project type or size), where local permits are issued, including unpaved roads and flood management projects, except emergency projects implemented for the protection of persons and property:"

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E.3.a.(1)(b)	74	BMP Requirements for All Development Projects	Include "unless authorized by the San Diego Water Board Executive Officer" because Hydromodification Mitigation may need to occur within receiving waters to address watershed water quality issues. This aligns with Regional Board staff suggestion that the 401 permit process should be streamlined to allow alternative compliance opportunities to mitigate and/or improve water quality conditions within a waterway. Delete "waters of the state". According to the definition of "Waters of the State," "all water in the State is considered to be Waters of the State". Thus the MS4 itself could be considered waters of the state and therefore structural BMPs cannot be constructed within the MS4. Therefore a stormdrain filter insert would be prevented, as would a bioretention device or basin holding state waters. The intent is to protect natural receiving waters, not to prevent the use of structural BMPs in the MS4. Removing "or waters of the state" will protect the natural receiving waters from construction and will protect the receiving waters from potential MS4 pollution.	Revise Provision E.3.a.(1)(b) as follows: "Structural BMPs must not be constructed within a waters of the U.S. unless authorized by the San Diego Water Board Executive Officer~~or waters of the state~~."
E.3.b.(1)(b) and E.3.b.(1)(c)	75	Definition of Priority Development Project	Since SUSMP requirements have been in effect since 2001, will start seeing some redevelopment projects that were subject to previous SUSMPS. Therefore, the 50% rule for redevelopment projects should apply only to projects that were not subject to any previous SUSMP requirements.	Revise Provision E.3.b.(1)(b) as follows: "Those redevelopment projects that create, add, or replace at least 5,000 square feet of impervious surfaces on an already developed site, and the redevelopment project is a Priority Development Project category listed under Provision E.3.b.(2)… where redevelopment results in an increase of more than fifty percent of the impervious surfaces of a previously existing development and was not subject to previous Priority Project Development requirements…". Add Provision E.3.b.(1)(c) as follows: (c) Projects where redevelopment results in an increase of more than fifty percent of impervious surfaces of a

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				previously existing development, and the existing development was subject to previous Priority Project Development Requirements, only the altered portion of development is subject to the new Priority Development Project requirements."
E.3.b.(2)	76	Priority Development Project Categories	Considerable staff resources are spent on understanding the complex set of rules in order to correctly apply them to each project. A simpler set of rules for the determination of whether or not a project is a Priority Development Project will greatly improve government efficiency and allow more focus on reviewing the project's compliance with performance requirements, thus resulting in greater overall Permit effectiveness. The proposed change is consistent with the current draft, while making the rules simpler. The definitions of each category are in Appendix C.	Delete items b through h and replace with the following: " (b) Development projects that create 5,000 square feet or more of impervious surfaces (collectively over the entire project site), and support one or more of the following uses (see Appendix C for definitions): i. Automotive repair shop ii. Restaurant iii. Parking lot iv. Street, road, highway, freeway and driveway v. Retail gasoline outlet (RGO) (c) Development projects that create 2,500 square feet or more of impervious surfaces (collectively over the entire project site) and where the project will directly discharge to an Environmentally Sensitive Area (see Appendix C for definitions)."
E.3.b.(2)(d)	76	Priority Development Project Categories	A separate Hillside Development category is unnecessary and redundant. Projects that grade on a natural slope that is twenty-five percent or greater require special consideration during the construction stage of the project, which is addressed elsewhere in the Permit. Local ordinances are very strict about adequate post-construction stabilization of hillside areas. Development projects that drain to a slope of sensitive habitat will be subject to the Environmentally Sensitive Area category. Removal of this category will facilitate the establishment of simpler rules as described above, while still keeping the same level of standards.	Delete this Provision.
E.3.b.(2)(e)	76	Priority Development Project Categories	The definition of a direct discharge has been established to mean that the project is releasing flows directly into the receiving water. If the project drains into an MS4 connection	If comment E.2.b.(2) is not incorporated, revise the last sentence of Provision E.3.b.(2)(e) as follows: "…means outflow from a drainage conveyance system

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			which serves existing developed areas before discharging to receiving water, this is not a direct discharge. Added language for clarification.	that collects runoff from the subject development or redevelopment site not commingled with flows from adjacent lands and terminates at or in receiving waters within the ESA.“
E.3.b.(2)(g)	76	Priority Development Project Categories	This requirement was present in the prior permit; however, the residential driveways clause was added under the proposed permit. Including residential driveways as a PDP will require unnecessary, burdensome PDP process without proportional water quality benefits. Driveways experience low daily traffic trips compared to highways and roads.	If comment E.2.b.(2) is not incorporated, revise Provision E.3.b.(2)(g) as follows: “Streets, roads, highways, and freeways, ~~and driveways~~. This category is defined as any paved impervious surface that is 5,000 square feet or more used for the transportation of automobiles, trucks, motorcycles, and other vehicles.”
E.3.b.(3)(a)	77	Priority Development Project Exemptions	The three methods listed as adequate for mitigating the minimal impacts that sidewalks, bicycle lanes and trails would have upon receiving waters should also be applied to driveways. Driveways typically have only very light vehicle usage and because they are linear it is possible to be very effective at removing pollutants and reducing runoff by techniques such as sloping the driveway toward a sufficiently sized landscape area and disconnecting from the MS4. The San Diego Model SUSMP currently has specific design parameters for controlling this type of design to ensure adequate effectiveness, and the BMP Design Manual Update that is require as part of this permit can further improve these design parameters using the latest information such as recent studies by Caltrans on the effectiveness of vegetated filter strips adjacent to major highways. The Manual’s detailed design guidance on effective practices will allow an “over the counter” design review, rather than subjecting the public to unnecessarily burdensome requirements to submit the extensive technical documents that accompany more significant projects.	Add “driveways” to the list of project types that can qualify for this exemption.
E.3.b.(3)(b)	77	Priority Development Project Exemptions	All municipal roadway projects should only be subject to the USEPA guidance regarding Managing Wet Weather with Green Infrastructure: Green Streets.	Replace the current language in Provision E.3.b.(3)(b) as follows: "Any paved impervious surface that is 5,000 square feet

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			The Ventura County NPDES MS4 Permit, the Santa Ana Region permits for Orange County, San Bernardino County, and Riverside County, and the Greater Los Angeles MS4 Permit provide that streets, roads, and highways follow USEPA guidance regarding Managing Wet Weather with Green Infrastructure: Green Streets to the maximum extent practicable. Roadways are different than other development projects as there are significant constraints to implementation of BMPs that need to be considered such as limited right-of-way, utilities, geotechnical and structural concerns, street trees, parking, and fire truck access among others. The USEPA guidance considers these constraints where the PDP requirements do not. Even in new roadways implementing hydromodification requirements can disturb a significant area of land which has its own environmental impacts including changing the natural hydrology which is antithetical to the LID approach.	or more used for the transportation of automobiles, trucks, motorcycles, and other vehicles that follows the USEPA guidance regarding Managing Wet Weather with Green Infrastructure: Green Streets, or equivalent standards, to the maximum extent practicable." ~~(b) Retrofitting of existing paved alleys, streets or roads that meet the following criteria:~~ ~~(i) Must be two lanes or less; AND~~ ~~(ii) Must be a retrofitting project implemented as part of an alternative compliance project option under Provision E.3.c.(3)(b)(v) to achieve the performance requirements of Provisions E.3.c.(1) and/or E.3.c.(2) for a Priority Development Project; AND~~ ~~(iii) Designed and constructed in accordance with the USEPA Green Streets guidance.~~[24]
E.3.b.(3)(c)(ii) E.3.b.(3)(c)(iii)	77 78	Priority Development Project Exemptions	Provide more flexibility for a jurisdiction to accept other comparable certification standards. In some cases a project may be already pursuing a certification from a different organization (such as Envision or SITES) and they should be allowed to get their credits that way rather than having to additionally comply with a second set of certification requirements. In addition, specifying "structural" BMPs is unnecessary. These types of projects could meet the performance requirements using non-structural BMPs.	Revise Provisions E.3.b.(3)(c)(ii) and E.3.b.(3)(c)(iii) and add a Provision (iv) as follows: "(ii) Designed and constructed ~~to be certified~~ to meet requirements for certification under the U.S. Green Building Council (USGCB) Leadership in Energy and Environmental Design (LEED) for Homes green building certification program, receiving at least four (4) Surface Water Management credits under the Sustainable Sites category, or other locally accepted certification of equivalent effectiveness; ~~OR~~ (iii) Designed and constructed with ~~structural~~ BMPs that will achieve ~~the~~ equivalent performance to the requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite, OR

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				(iv) Designed and constructed with structural BMPs that meet minimum performance standards, as outlined in the BMP Design Manual."
E.3.b.(3)(c)(iv)	78	Priority Development Project Exemptions	This exemption allows small individual residential projects to apply minimum BMPs that meet a minimum performance standards without going through the burdensome PDP review and approval process including; preparation of a full PDP study, and maintenance, verifications, and inspection of permanent treatment control BMPs. Under the current proposed language, single family residence as small as 5,000 sf may be subject to PDP requirements, and is lumped in with industrial and commercial development; The potential pollutants generated by small residential are not as significant as industrial or commercial and can be effectively reduced by effective source control and minimum permanent BMPs.	Add Provision E.3.b.(3)(c)(iv)as follows: "(iv) Designed and constructed with structural BMPs that meet minimum performance standards, as outlined in the BMP Design Manual."
E.3.b.(3)(d)(i) E.3.b.(3)(d)(ii)	78	Priority Development Project Exemptions	See comments for E.3.b.(3)(c)(ii) and E.3.b.(3)(c)(iii).	Revise Sections E.3.b.(3)(d)(i) and E.3.b.(3)(d)(ii) and add a Provision (iii) as follows: "(i) Designed and constructed ~~to be certified~~ to meet requirements for certification under the U.S. Green Building Council (USGCB) Leadership in Energy and Environmental Design (LEED) for Homes green building certification program, receiving at least four (4) Surface Water Management credits under the Sustainable Sites category, or other locally accepted certification of equivalent effectiveness; OR (ii) Designed and constructed with ~~structural~~ BMPs that will achieve ~~the~~ equivalent performance to the requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite~~.~~; OR (iii) Designed and constructed with structural BMPs that

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				meet minimum performance standards, as outlined in the BMP Design Manual."
E.3.c	78	Priority Development Projects Structural BMP Performance Requirements	Water Quality Improvement Plans allow Copermittees to define priorities on a watershed basis and to tailor programs and BMPs based on the specific needs of each watershed. The structural BMP performance requirements are an example of a prescriptive one-size-fits-all approach. The sizing criteria are the same for all projects regardless of pollutant removal efficiencies, soil retention capacities, or susceptibility to erosion. Encouraging watershed-specific performance requirements to be developed within the Water Quality Improvement Plans will allow for watershed specific flexibility while providing the same level of protection needed.	Revise Provision E.3.c as follows: "In addition to the BMP requirements listed for all development projects under Provision E.3.a, Priority Development Projects must also implement structural BMPs that conform to performance requirements below. Alternatively, watershed-specific performance requirements may be developed as part of a Water Quality Improvement Plan; these requirements would replace the general performance requirements below. Watershed-specific requirements must provide at least equivalent protection as the general performance requirement below."
E.3.c.(1)(a)(ii)	78	Storm Water Pollutant Control BMP Requirements	Language should be consistent with pre-project language used in Provision E.3.c.(2)(a).	Revise Provision E.3.c.(1)(a)(ii) as follows: "The volume of storm water that would be retained onsite prior to the project ~~if the site was fully undeveloped and naturally vegetated~~, as determined using continuous simulation modeling or other techniques based on site-specific soil conditions and ~~typical native~~ vegetative cover."
Footnote 26	78	Storm Water Pollutant Control BMP Requirements	Include language to clarify that the 85th design capture volume refers to first flush and it is a particular volume that corresponds to 85 percent of all the rain events for the area.	Revise Footnote 26 as follows: "Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals. The volume is a single event-based volume that occurs after an extended dry period."
E.3.c.(2)(a)	80	Hydromodification Management BMP Requirements	The Tentative Order proposed requirement to match predevelopment hydrographs (flow rates and duration) is the exception to the current hydromodification requirement found in other parts of the state. Specifically, the following permits/programs require hydromodification controls to match pre-project conditions: Region 2, Region 4, Region	Revise Provision E.3.c.(2)(a) as follows: "Post-project runoff flow rates and durations must not exceed pre-project ~~development (naturally occurring)~~ runoff flow rates and durations by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat conditions

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			5, Region 8, Caltrans and draft Phase 2 MS4. Region's 4 MS4 permit, Order No. R4-2012-0175 was recently adopted on November 8, 2012. Thus, there is very recent precedent to use pre-project conditions as a reference for hydromodification. Additionally, requiring matching the predevelopment hydrograph may impose mitigation beyond a project's impacts. Pre-project standard is the appropriate nexus to project impacts. In the case of new development, where open land is to be converted to impervious area, the hydromodification controls are required to match the pre-project condition, which equates to the pre-development, naturally occurring, condition. In these situations the pre-development conditions were based on Natural Resources Conservation Service soil maps and existing topography and vegetation. In cases where redevelopment projects increase impervious area as compared to the existing condition, hydromodification controls were required to mitigate for the impacts of the added impervious surfaces. The San Diego Copermittees have invested considerable time and resources to develop a technically sound and defensible hydromodification management plan (HMP). The San Diego Copermittees determined, during the development of the San Diego HMP, that the flow control design criteria should be based on flow duration matching to the pre-project condition and not the pre-development condition. This determination was made based upon the following. • Prior HMP implementation precedent in the State of California, specifically in Santa Clara and Contra Costa Counties, mandated flow duration matching to the pre-project condition. • Following consultation with leading geomorphologists in	downstream of Priority Development Projects)."

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			the State of California, the San Diego Copermittees determined that in areas of significant existing urbanization the receiving streams had shown an ability to attain a new channel equilibrium based upon the developed flow conditions. • Redevelopment practices often decrease the existing site's impervious area, especially with the 2007 Low Impact Development (LID) requirements. In such cases, the post-project site impervious area contributing to the receiving stream would be smaller and, based on the improvement relative to pre-project conditions, no hydromodification requirements would be required. • The Copermittees stated a desired goal of encouraging redevelopment projects for multiple planning, economical, and water quality purposes. From a hydromodification perspective, increasing redevelopment project implementation would invariably decrease the conversion of existing open space. The Copermittees were careful to avoid implementing hydromodification requirements on beneficial redevelopment projects if the redevelopment project decreased the site impervious area as compared to existing conditions. San Diego Copermittees have worked closely with Southern California Coastal Water Research Project (SCCWRP) during the development of the HMP. SCCWRP published technical report 667, Hydromodification Assessment and Management in California, dated April 2012. This report describes the "flow-duration control standards…require that the post-project discharge rates and durations may not deviate above the pre-project discharge rates and durations by more than a specific percent…and this approach is a dramatic improvement over earlier methods."	

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			Furthermore, the Copermittees are concerned that using "pre-development (naturally occurring)" reference condition as applied to sites that are, in fact, developed would expose the Copermittees to significant litigation risk and may be unenforceable. We are concerned this would subject the Copermittees to liability under the takings clauses of the U.S. and California Constitutions and the Mitigation Fee Act because of the questionable nexus between a project's impacts on hydromodification and the hydromodification management measures in the Draft Tentative Order. When imposing a condition on a development permit, a local government is required under the federal and state constitutions to establish that the condition bears a reasonable relationship to the impacts of the project. This rule applies even to legislatively enacted requirements and impact fees or exactions.[1]Moreover, fees imposed on a discretionary ad hoc basis are subject to heightened scrutiny under a two-part test. First, local governments must show that there is a substantial relationship between the burden created by the impact of development and any fee or exaction.[2] Second, a project's impacts must bear a "rough proportionality" to any development fee or exaction.[3] Under California law, the *Nollan/Dolan* heightened scrutiny test also applies to in-lieu fees.[4] The Legislature has memorialized these requirements in the Mitigation Fee Act which establishes procedures that local governments must follow to impose impact fees.[5] Irrespective of whether the hydromodification management	

[1] Building Indus. Ass'n v. City of Patterson, 171 Cal. App. 4th 886, 898 (2009).
[2] Nollan v. California Coastal Comm'n, 483 U.S. 825, 837 (1987).
[3] *Dolan v. City of Tigard*, 512 U.S. 374, 391 (1994).
[4] *Ehrlich v. City of Culver City*, 12 Cal. 4th 854, 876 (1996).
[5] Cal. Gov't Code §§ 66000-66025.

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			requirements are implemented by legislative act or on an ad hoc basis, the Copermittees' attempt to enforce them as proposed in the Tentative Order would likely result in claims alleging unconstitutional takings of private property and violations of the Mitigation Fee Act. This is because a developer could argue that limiting hydromodification impacts of already developed property to its "naturally occurring" state would not have a legally sufficient nexus to the impact of the development project.	
E.3.c.(2)(a)(ii)	80	Hydromodification Management BMP Requirements	A stable, naturally vegetated channel is a balance of sediment supply, channel geometry, longitudinal slope, channel material and size, and type, size and cover of channel vegetation. When a concrete channel is restored it is not just a process of removing the concrete. A naturally vegetated channel must be engineered in a configuration that will not be subject to hydromodification from the existing and any future discharges that may occur in the channel. This requires a larger channel cross Provision to convey flood control peak discharges, usually a wider channel and sometimes grade control structures. These existing concrete channels are typically in urbanized areas. Since the naturally vegetated channel must be engineered to convey all flows, additional hydromodification controls in the watersheds draining to these channels would provide no benefit at significant construction and perpetual maintenance costs.	Delete Provision E.3.c.(2)(a)(ii). ~~For artificially hardened channels, analysis to identify the lower boundary must use characteristics of a natural stream segment similar to that found in the watershed. The lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or erodes the toe of the channel banks.~~
E.3.c.(2)(b)	80	Hydromodification Management BMP Requirements	The current Tentative Order language as written is unclear and implies that each development project will be required to conduct studies and compensation for the loss of sediment supply specifically on site. However, the ability to compensate for the loss of sediment supply has not yet been fully researched, nor have practices yet been	Revise Provision E.3.c.(2)(b) as follows: "In accordance with the BMP Design Manual, projects shall preserve or provide compensation for significant losses of sediment supply anticipated as a result of development. ~~Post project runoff flow rates and durations~~

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			developed. Therefore the ability to require sediment compensation on a project by project basis is not yet validated or possible. SCCWRP technical report 667 cites that management approaches to compensate for the loss of sediment supply are necessary but "continues to prove challenging because, the effects of urban development on sediment supply in different geologic settings are not well understood and poorly represented in current models." The proposed change would allow the Copermittees to study and adapt to how sediment supply should appropriately be managed. Research may determine that sediment compensation would be addressed more appropriately on a regional or local level. The BMP Design Manual is a suitable mechanism to handle this evolving science over time, where the Copermittees can specify requirements and update the plan and practices as research advances.	~~must compensate for the loss of sediment supply due to the development project, should loss of sediment supply occur as a result of the development project."~~
E.3.c.(2)(d)(i) through (iii)	80	Hydromodification Management Exemptions	The permit should clearly reference the recently Board adopted Resolution No. R9-2010-0066, a Resolution for Approval of the Hydromodification Management Plan for the San Diego County. The SD Copermittees developed a technically sound HMP with a Technical Advisory Committee (TAC) and input from all stakeholders. This HMP has only been in effect for two years. In accordance with the adopted resolution, the SD Copermittees have embarked on a 5-year monitoring project to validate the HMP parameters and design criteria. The SD Copermittees are not aware of any current scientific data that would suggest the SD HMP is no longer effective or needs adjustment prior to the completion of their current monitoring project. It is appropriate to incorporate the approved resolution authorizing the SD HMP into the Permit and allow implementation and monitoring during this Permit cycle.	Revise Provision E.3.c.(2)(d) as follows: "(i) Discharges storm water runoff into existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, tidally influenced waters, or the Pacific Ocean; (ii) Discharges stormwater runoff into conveyance channels whose bed and bank are stabilized (e.g. concrete lined, an engineering interlocking paver, gabion system, etc.) all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, tidally influenced waters, or the Pacific Ocean; ~~(ii)~~ (iii) Is a redevelopment Priority Development Project that meets the alternative compliance requirements of Provision E.3.c.(3)(b)(ii); or

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				~~(iii)~~ (iv) Discharges storm water runoff into other areas identified by the San Diego Water Board as exempt, including those exemptions recognized in the 2010 San Diego Hydromodification Plan, approved by the San Diego Water Board Resolution No. R9-2010-0066, from the requirements of Provisions E.3.c.(2)(a)-(b). "
E.3.c.(3)	80	Alternative Compliance to Onsite Structural BMP Performance Requirements	The proposed language allows the alternative compliance program to be optional and gives Copermittees the discretion to exercise the program if it is determined to be beneficial and practical for the municipality. The permit as currently written could create an expectation that the Copermittees manage offsite mitigation for private developments. There are many factors to be considered when administering a mitigation program, including: overhead program management and administrative costs, availability of land, long term maintenance responsibilities and costs, variability and lack of accurate cost estimates for BMP construction and maintenance costs.	Revise Provision E.3.c.(3) as follows: "(3) Alternative Compliance to Onsite Structural BMP Performance Requirements Alternative compliance is an optional program for each jurisdiction to utilize if it is determined to provide an equivalent or greater benefit to the watershed than onsite compliance. Where alternative compliance is allowed, the determination of the responsible party to execute the onsite alternative compliance is at the jurisdiction's discretion and in accordance with policies set in place in the individual jurisdiction or in coordination with other jurisdictions, agencies, or Copermittees:"
E.3.c.(3)(a)(i)	81	Alternative Compliance to Onsite Structural BMP Performance Requirements-Applicability		Revise text as follows: "…implementation of the alternative compliance option will have an equal or greater overall water quality benefit…"
E.3.c.(3)(a)(ii)	81	Alternative Compliance to Onsite Structural BMP Performance Requirements-Applicability	Stream rehabilitation projects should be designed by a biologist and/or a hydrologist. Other certified professionals may have more specific knowledge to a particular stormwater design than an engineer or architect. Other applicable certifications could include LEED, QSD, CPESC, CPSWQ, Envision, SITES, or certifications that do not currently exist but may exist in the future.	Revise Provision E.3.c.(3)(a)(ii) as follows: The alternative compliance options must be designed by a registered professional engineer, geologist, architect, biologist, hydrologist, landscape architect, or other appropriate certified professional;
E.3.c.(3)(a)(iii)	81	Alternative Compliance to Onsite Structural	To be consistent with E.3.c.(3)(a)(i) which requires alternative compliance with greater water quality benefit for the Watershed Management Area.	Revise Provision E.3.c.(3)(a)(iii) as follows: The alternative compliance options must be implemented within the same ~~hydrologic unit~~ Watershed Management

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		BMP Performance Requirements-Applicability		Area as the Priority Development Project, and preferably within the same hydrologic subarea;
E.3.c.(3)(a)(iv)	81	Alternative Compliance to Onsite Structural BMP Performance Requirements-Applicability	This language suggests that the alternative compliance must be downstream of the PDP. However, this may not be necessary if HMP improvement is needed in the upper watershed instead of the lower watershed. SCCWRP Technical Report 667 concludes that "hydromodification management should be considered in the context of an overall watershed-scale strategy that targets maintenance and restoration of critical processes in the critical locations in the watershed." However, the current language in the tentative order limits the ability to utilize alternative compliance, including using a regional BMP constructed to mitigate for increases in flow. All PDPs must treat for water quality to the MEP to prevent polluted stormwater from entering MS4 and receiving waters. (vi) and (vii) sufficiently protect the watershed as a whole. Delete this language to remove this conflict.	Delete Provision E.3.c.(3)(a)(iv). ~~Receiving waters must not be utilized to convey storm water runoff to the alternative compliance options~~
E.3.c.(3)(a)(v)	81	Alternative Compliance to Onsite Structural BMP Performance Requirements - Applicability	Without deletion this would render Alternative Compliance through E.3.c(3)(b)(v) invalid as it would mean that all runoff from a PDP must be treated by Alternative Compliance that is physically in series with the PDP and not a separate site discharging to the same watershed as described in E.3.c(3)(a)(iii).	Delete Provision E.3.c.(3)(a)(v). ~~The pollutants in storm water runoff from the Priority Development Project must be treated to the MEP by the alternative compliance options prior to being discharged to receiving waters~~
E.3.c.(3)(b)(ii)	82	Alternative Compliance Project Options	This is an exemption listed in E.3.c.(2)(d)(ii). Other locally accepted certification programs should be made available. See same comment for sections E.3.b.(3)(c) & (d)	Revise Provision E.3.c.(3)(b)(ii) as follows: "The Copermittee may ~~allow~~ exempt redevelopment Priority Development Projects ~~to comply with~~ from the hydromodification management BMP performance requirements of Provision E.3.c.(2) where the project is designed and constructed to be certified under the USGCB LEED for New Construction and Major Renovations green building certification program, or other locally accepted certification of equivalent effectiveness."
E.3.c.(3)(b)(iii)	82	Alternative	Minor clarification.	Revise Provision E.3.c.(3)(b)(iii) as follows:

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		Compliance Project Options		"The Copermittee may allow Priority Development Projects greater than 100 acres in total project size (or smaller than 100 acres in size yet part of a larger common plan of development that is over 100 acres) to comply with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2)~~.~~ under ~~The Priority Development Project must comply with~~ the following conditions: "
E.3.c.(3)(b)(iv)[b]	83	Alternative Compliance Project Options	Without this change, this language would dictate that the alternative flow control be downstream of the PDP, when the downstream area may not benefit from any HMP control. By locating areas within the watershed that are in need of hydromodification mitigation, alternative compliance can be directed to areas that will have the greatest benefit for the watershed as a whole. This is in agreement with recommendations made in the SCCWRP technical report 667 which concludes that "hydromodification management should be considered in the context of an overall watershed-scale strategy that targets maintenance and restoration of critical processes in the critical locations in the watershed."	Revise Provision E.3.c.(3)(b)(iv)[b] as follows: "The Copermittee may allow Priority Development Projects to utilize offsite regional BMPs to comply with the hydromodification management BMP performance requirements of Provision E.3.c.(2) if the offsite regional BMPs ~~have the capacity to manage the storm water flows rates and durations from the site such that the receiving waters are protected from the potential for increased erosion that would be caused if the unmanaged portion of the runoff was discharged from the site~~ will have a greater overall receiving water benefit within the Watershed Management Area than implementation of the hydromodification controls onsite."
E.3.c.(3)(b)(vi)	84	Alternative Compliance Project Options	Minor clarification.	Revise Provision E.3.c.(3)(b)(vi) as follows: "The channel, stream, or habitat rehabilitation project cannot be utilized for pollutant treatment ~~except~~ unless constructed with an artificial wetland. ~~where artificial wetlands are constructed and located upstream of receiving waters.~~"
E.3.c.(3)(c)	854	Alternative Compliance In-Lieu Fee Option	Add "or" to indicate that operation and maintenance may be a separate option as indicated in E.3.c.(3)(c)(iii).	Revise Provision E.3.c.(3)(c) as follows: "The Copermittee may develop and implement an alternative compliance in-lieu fee option, individually or with other Copermittees and/or entities, as a means for designing, developing, constructing, operating and/or maintaining offsite alternative compliance projects under Provision E.3.c.(3)(b). Priority Development Projects allowed to utilize the alternative compliance in-lieu fee

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				option must comply with the following conditions:"
E.3.c.(3)(c)(i)	84	Alternative Compliance In-Lieu Fee Option	Minor clarification.	Revise Provision E.3.c.(3)(c)(i) as follows: "The in-lieu fee must be transferred to the Copermittee (for public projects) or an escrow account (for private projects) prior to the construction initiation date ~~constructed~~ of the Priority Development Project ~~is initiated~~."
E.3.c.(3)(c)(ii)	84	Alternative Compliance In-Lieu Fee Option	Include "operation and maintenance" since it is included in E.3.c.(3)(c)(ii)[d].	Revise Provision E.3.c.(3)(c)(ii) as follows: "If the in-lieu fee is applied to the development, design, ~~and~~ construction, operation and maintenance of offsite alternative compliance projects, the following conditions must be met:"
E.3.c.(3)(c)(ii)[b]	85	Alternative Compliance In-Lieu Fee Option	Multiple PDPs joining into an alternative compliance regional BMP will require a longer timeline in order to generate enough funding to begin the planning, design, permitting, and construction of the regional BMP. In addition, multiple permits will likely be necessary from multiple government agencies (party agreements, jurisdictional agreements, Army Corp of Engineers, 401, 404, maintenance agreements, etc), thus slowing the timeline of completion of the alternative compliance project. If the alternative compliance project must be completed within the first 4 years of the first project to fund, then the complexity or size of the project will be limited and may serve as a deterrent to the use of the alternative compliance option.	Revise Provision E.3.c.(3)(c)(ii)[b] as follows: "The offsite alternative compliance projects must be constructed as soon as possible, but no later than 8 ~~4~~ years after the certificate of occupancy is granted for the first Priority Development Project that contributed funds toward the construction of the offsite alternative compliance projects, unless a longer period of time is authorized by the San Diego Water Board Executive Officer."
E.3.c.(3)(c)(ii)[c]	85	Alternative Compliance In-Lieu Fee Option	Delete redundant and ambiguous language	Delete Provision E.3.c.(3)(c)(ii)[c]. ~~The in-lieu fee for the Priority Development Project must include mitigation of the pollutant loads and increased storm water flow rates and durations that are allowed to discharge from the site before the offsite alternative compliance projects are constructed; and~~
E.3.c.(3)(c)(ii)[d]	85	Alternative Compliance In-Lieu Fee Option	A reasonable timeframe must be established to base the fee upon, however that time frame must be relevant to the type of project being constructed and its anticipated	Revise Provision E.3.c.(3)(c)(ii)[d] as follows: The in-lieu fee must ~~also~~ include the cost to operate and maintain the offsite alternative compliance projects for the

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			lifespan.	anticipated life of the constructed priority development project.
E.3.c.(3)(c)(iii)	85	Alternative Compliance In-Lieu Fee Option	Minor clarification.	Revise Provision E.3.c.(3)(c)(iii) as follows: If the in-lieu fee ~~is applied~~ applies only to the operation and maintenance of offsite alternative compliance projects that have already been constructed, the offsite alternative compliance projects must allow the Priority Development Project to comply with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2).
E.3.c.(5)(a)(vi)	86	Infiltration and Groundwater Protection	Treatment for infiltration BMPs should only be required if significant pollutant levels are present.	Revise Provision E.3.c.(5)(a)(vi) as follows: "Infiltration BMPs must not be used for areas of industrial or light industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee, unless runoff does not exceed Basin Plan water quality standards or runoff is first treated or filtered to remove pollutants prior to infiltration; and"
E.3.e(1)(c)	88	Structural BMP Approval and Verification Process	When easements and agreements are publicly recorded, information is conveyed during the sale of the property. Therefore this sentence is not necessary.	Revise Provision E.3.e.(1)(c) as follows: Each Copermittee must require and confirm that appropriate easements and ownerships are properly recorded in public records. ~~And the information is conveyed to all appropriate parties when there is a change in project or site ownership.~~
E.3.e.(2)(a)	89	Priority Development Project Inventory and Prioritization	Copermittees update databases on a regular basis to input new projects, track inventory, import/export data for daily activities, and pull data on an annual basis for reporting.	Revise Provision E.3.e.(2)(a) as follows: Each Copermittee must develop, maintain, and update ~~at least annually~~ regularly, a watershed-based database to track and inventory all Priority Development Projects and associated structural BMPs within its jurisdiction. Inventories must be accurate and complete beginning from January 2002 for the San Diego County Copermittees, February 2003 for the Orange County Copermittees, and July 2005 for the Riverside County Copermittees, where data is available.
E.3.e.(2)(a)(vi)	89	Priority Development Project Inventory	In some cases, corrective actions or resolutions are not needed if no violations were found. Therefore they would only be entered into the database "when applicable".	Revise Provision E.3.e.(2)(a)(vi) as follows: Corrective actions and/or resolutions when applicable.

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		and Prioritization		
E.4	90	Construction Management	The language has been updated so that the Copermittee can define which construction projects will be inventoried within its jurisdictional program. Not all jurisdictions apply permits the same way, therefore each needs the ability to address their processes in regards to construction projects. This will eliminate projects in the inventory that are issued local building or construction permits but have no ground disturbance, e.g. plumbing, electrical, mechanical, decks, patios, etc.	Add the following after the first paragraph of Provision E.4.: a. "Construction Program Management Each copermittee must define in the Jurisdictional Runoff Management Plan the following: (1) Define construction sites to be inventoried, such as sites that involve any ground disturbance or soil disturbing activities. (2) Define a process for confirming adequate construction BMP implementation for non-inventoried sites. Non-inventoried sites involve minor construction activities that are not anticipated to create storm water pollution such as interior improvements, plumbing, electrical and mechanical work. "
E.4.a.(4)	91	Project Approval Process	Language is redundant and unnecessary because applicable permits are included as an attachment of the project's SWPPP as required under the Construction General Permit.	Revise Provision E.4.a.(4) as follows: Delete language as shown: "Verify that the project applicant has obtained coverage under ~~applicable permits, including, but not limited to~~ the Construction General Permit. ~~, Clean Water Act Section 401 Water Quality Certification and Section 404 Permit, and California Department of Fish and Game Streambed Alteration Agreement.~~"
E.4.b.(1)(d)	91	Construction Site Inventory and Tracking	The anticipated completion date is often unknown and can fluctuate based on unpredictable and unforeseen circumstances. Keeping track of accurate dates in an inventory would be difficult and would not add significant value to the database. Construction Inspectors keep a close eye on the progress of projects and would not need to rely on inventory data to achieve effective stormwater management and oversight. Once a project is completed, the date can be entered into the database.	Revise Provision E.4.b.(1)(d) as follows: "The project start and ~~anticipated completion~~ completed dates;"
E.4.d.(1)(a)	93	Inspection	Minor clarification.	Revise Provision E.4.d.(1)(a) as follows:

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		Frequency		Each Copermittee must conduct inspections at all inventoried sites, including high threat to water quality sites, at an appropriate frequency for each phase of construction to ~~ensure~~ confirm the site reduces the discharge of pollutants in storm water from construction sites to the MEP, and prevents non-storm water discharges from entering the MS4.
E.4.d.(3)(c)	94	Inspection Tracking and Records	Considerable staff resources would be spent on calculating the amount of rainfall since last inspection and this information is not useful. This information would be really subjective if there is no nearby rain gauge. Instead, the current weather conditions observed during the inspection is more useful and easy data to capture.	Revise Provision E.4.d.(3)(c) as follows: ~~Approximate amount of rainfall since last inspection;~~ Weather condition during inspection;
E.5.a	95	Existing Development Inventory and Tracking	Adding the term "reasonable potential to discharge", consistent with the Clean Water Act, allows flexibility for the Copermittees to determine priorities. The term "may discharge" is too broad and will limit Copermittees ability to focus on jurisdictional and watershed priorities. The focus needs to be on significant pollutant load discharges so inspections and enforcement can actually succeed in receiving water pollutant load reductions versus spending an exhaustive amount of time and money inspecting sites that discharge no pollutant loads, but "may" discharge pollutant loads, even though unlikely to do so.	Revise Provision E.5.a. as follows: "Each Copermittee must maintain an annually updated watershed-based inventory of all the existing development that has the reasonable potential to ~~may~~ discharge a pollutant load to and from the MS4".
E.5.a.(1)(d)(vii) E.5.a.(2)(f)	96 96	Existing Development Inventory and Tracking	Mobile home parks are outside the jurisdiction of the Copermittees. They are regulated by the state.	Revise Provision E.5.a.(1)(d)(vii) as follows: ~~"Mobile home park"~~ Revise Provision E.5.a.(2)(f) as follows: "(f) ~~Identification if an area is a~~ Common Interest Areas (CIAs) / Home Owner Associations (HOAs)~~, or~~ and ~~mobile home parks~~; "
E.5.b	97	Existing Development BMP Implementation and Maintenance	See comment E.5.a.	Revise Provision E.5.b. as follows: "Each Copermittee must designate a minimum set of BMPs required for all inventoried existing development with the reasonable potential to discharge pollutant loads

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				to their MS4, including special event venues."
E.5.b.(1)(a)	97	Existing Development BMP Implementation and Maintenance	Required use of pollution prevention methods will be extremely difficult to enforce. Pollution prevention is proven to be more effective through public behavioral changes via public outreach and education.	Revise Provision E.5.b.(1)(a) as follows: "Each Copermittee must ~~require~~ promote the use of pollution prevention methods by the commercial, industrial, and municipal facilities and areas in its inventoried existing development through public outreach."
E.5.c	99	Existing Development Inspections	See comment E.5.a.	Revise Provision E.5.c. as follows: "Each Copermittee must conduct inspections of inventoried existing development that have been identified by the Copermittee as having the reasonable potential to discharge pollutant loads from their MS4 to ensure compliance with applicable local ordinances and permits, and the requirements of this Order."
E.5.c.(1)(a)(i)	99	Inspection Frequency	See comment E.5.a. The schedule for inspections should be limited to the permit term because the permit cannot require or enforce schedules beyond the term of the permit.	Revise Provision E.5.C.(1)(a)(i). as follows: "At a minimum, inventoried existing development that has been identified by the Copermittee as having the reasonable potential to discharge pollutant loads to and from their MS4 must be inspected once ~~every five years~~ during the permit term."
E.5.c.(1)(a)(v)	99	Inspection Frequency	Volunteer and patrol programs fall under the category of valid public complaints and should be clairified as such in the fact sheet. Volunteer and patrol programs may not have enforcement authority, requiring follow-up by the Copermittees. This Provision should be limited to Copermittees municipal and contract staff with some level of enforcement authority.	Revise Provision E.5.c.(1)(a)(v) as follows: "Inventoried existing development must be inspected by the Copermittee, as needed, in response to valid public complaints and findings from the Copermittee's municipal and contract staff ~~or volunteer monitoring or patrol program~~ inspections."
E.5.c.(2)(a)(i) through (iii)	100	Inspection Content	The addition of "if present" is necessary for clarification. Otherwise, it implies that an inspection must take place to observe an actual discharge which is an unpredictable event (would require inspector to be present for a long period of time waiting for such an event to take place).	Revise Provision E.5.c.(2)(a)(i) through (iii) as follows: "(i) Visual inspections of actual non-storm water discharges, if present; (ii)Visual inspections of actual or potential discharge of pollutants, if present; (iii)Visual inspections of actual or potential illicit connections, if present; and…"

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E.5.d	101	Existing Development Enforcement	Limiting language should be included for the Copermittee's jurisdiction. The existing development inventory and enforcement should be limited to development with the reasonable potential to discharge pollutants.	Revise Provision E.5.d.as follows: "Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried existing development identified by the Copermittee as having the reasonable potential to discharge pollutant loads from the MS4 within their jurisdiction, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6."
E.5.e	101	Strategies to Address the Highest Priority Water Quality Conditions	Resource re-allocation will assist in neutralizing costs for any channel rehabilitation/retrofit projects undertaken by the Copermittees and will have a more significant likelihood of improving water quality than monitoring.	Add: the following text to Provision E.5.e.: "(4) Upon Regional Board approval and in lieu of monitoring during any given year, the Copermittees may reallocate resources originally authorized for water quality monitoring for retrofit and/or rehabilitation project(s) if those projects occur at a location where monitoring is conducted, for a maximum of two nonconsecutive years during the Permit term."
E.6.b.(5)	104	Enforcement Response Approaches and Options	Criminal penalties should be limited to intentional or criminally negligent acts.	Revise Provision E.6.b.(5)(e) as follows: (5) Administrative and criminal (if intentional or criminally negligent) penalties; (a)
E.6.e.(1)	105	Reporting of Non-Compliant Sites	San Diego Water Board notice should be consistent with 40 CFR §122.41(l)(6) and the State of California Construction General Permit. The requirements should be 24 hour verbal notice and five day written notification	Revise Provision E.6.e.(1) as follows: "Each Copermittee must notify the San Diego Water Board in writing within ~~2 working days~~ 5 calendar days of issuing escalated enforcement…"
E.7	106	Public Education and Participation		"…discharge of pollutants from the MS4 ~~in storm water~~ to the MEP"
E.7.a.(1)	106	Public Education	There is specific emphasis on pesticides, herbicides and fertilizers. The rationale for the specificity of these topics is unclear. Given the emphasis on showing changes in water quality, education efforts should be focused on activities that address the pollutants of concern and behaviors that are tied to water quality issues. Therefore, each Copermittee, by jurisdiction and watershed, should identify, determine and prioritize the activities that address priorities consistent with Provision B.	Revise Provision E.7.e.(1) as follows: "Educational activities, public information activities, and other appropriate outreach activities intended to reduce pollutants ~~associated with the application of pesticides, herbicides and fertilizer in storm water discharges~~ of concern from the MS4 to the MEP. Activities shall be determined and prioritized by Copermittees by jurisdiction and/or watershed (Provision B) to address the highest threats to water quality (such as pesticides, herbicides and

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				fertilizers, used oil, toxic waste, etc. and to facilitate the proper management and disposal of used oil and toxic waste, etc.)…"
E.7.a.(2)	106	Public Education	There is specific emphasis on used oil and toxic material disposal. The rationale for the specificity in education topics is unclear. As stated above, Copermittees should be able to target education efforts on the pollutants and behaviors most commonly linked to the water quality issues within their respective jurisdictions and watersheds. Thus, this Provision is incorporated in the changes proposed above and would become part of E.7.a.1.	Move Provision E.7.a(2) into E.7.a(1).
F. Reporting				
F.1	109-110	Water Quality Improvement Plans	Based on the mock WQIP development process completed by stakeholders in recent months, the Copermittees have developed an alternative submittal schedule for the WQIPs. The alternative submittal schedule would provide additional information on potential BMP strategies with the first submittal (Priority Conditions and Potential Strategies), but allow for more time to develop numeric goals, detailed JRMP commitments, and Reasonable Assurance Analysis with the second submittal (Numerical Goals and Water Quality Improvement Strategies and Schedules) and approval from elected officials for final submittal (Water Quality Improvement Plan submittal). The revised timeline better reflects the schedule needed by Copermittees to develop robust WQIPs, but also provides additional information early in the process for stakeholder review. These requested changes are outlined in the comments below.	See the changed in the attached revised Permit to section F.1, as described in the comments below.
F.1.a.(1)	109	Priority Water Quality Conditions	The stakeholders' mock WQIP process has highlighted elements of the WQIP development process that could be	Revise Provision F.1.a.(1) as follows:

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			revised to better reflect the Copermittees' internal processes. For the early submittal, it is preferred to submit Priority Water Quality Conditions and Potential Strategies. Selection of specific strategies will be important, but an initial step is proposed at the 6-month mark to establish a level of understanding regarding the "menu" of options including terminology, BMP types, etc. The effort to develop numeric goals, however, will require more analyses, considering the array of pollutants and beneficial uses that will need to be considered. As such, it is requested that numeric goals be moved to the second WQIP submittal (as opposed to the first submittal). Finally, with the first submittal is when a Copermittee should express its intent to pursue an iterative, WQIP-based compliance mechanism using a Water Quality Improvement Plan with Reasonable Assurance Analysis, per our comments on Provision B.3.a.	(1) Priority Water Quality Conditions and Potential Strategies ~~Numeric Goals~~ (a) The Copermittees must implement a public participation process to solicit data and information to be utilized in the development and identification of the priority water quality conditions for the Watershed Management Area. (b) The Copermittees are encouraged to involve the public and key stakeholders as early and often as possible during the development of the priority water quality conditions and ~~numeric goals~~ potential strategies to be included in the Water Quality Improvement Plan. (c) Within 6 months after the commencement of coverage under this Order, the Copermittees must develop and submit the Water Quality Improvement Plan requirements of Provision B.2.a-d and a list of potential strategies that will be considered for the draft Water Quality Improvement Plan to the San Diego Water Board. Each Copermittee selecting the option to develop a Water Quality Improvement Plan to serve as an iterative, implementation-based compliance mechanism per Provision B.3.a.(3) must also indicate their intent to pursue the option in the submittal. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of 60 days. (d) The Copermittees must consider revisions to ~~revise~~ the priority water quality

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				conditions ~~and numeric goals~~ based on public comments received and must respond to ~~and/or~~ recommendations or direction from the San Diego Water Board Executive Officer.
F.1	109 and 110	Water Quality Improvement Plans	The public comment process for the WQIP submittals will be open to a wide array of stakeholders and the Regional Board staff. There is potential that some comments may conflict with one another, and may conflict with comments provided by the Regional Board EO. The language in the Permit suggests that each comment requires a revision. Each comment should be considered, but some comments may not result in a revision. The Copermittees agree, however, that all comments from the Regional Board Executive Officer must be responded to.	Revise Provisions F.1.a.(1).(d), F.1.a.(2).(c), and F.1.b.(3) as follows: "The Copermittees must consider revisions to ~~revise~~ the priority water quality conditions ~~and numeric goals~~ based on public comments received and must respond to ~~and/or~~ recommendations or direction from the San Diego Water Board Executive Officer."
F.1.a.(2)	109	Water Quality Improvement Strategies and Schedules	Modifications to the second WQIP submittals are proposed, based on the stakeholders' mock WQIP development process. The commitments to implement strategies/BMPs associated with JRMPs were highlighted as a major challenge of the second WQIP submittal. The 9-month timeline does not allow sufficient time to develop JRMP commitments, particularly if an optional Reasonable Assurance Analysis will be developed. A 16-month timeline is needed for Copermittees to engage elected officials/management on the draft WQIP numeric goals and resulting WQIP commitments (strategies, activities, etc.) to meet those goals. Furthermore, as mentioned above, it is requested that numeric goals be submitted with the second WQIP submittal (as opposed to the first submittal).	Revise Provision F.1.a.(2) as follows: (2) Numeric Goals and Water Quality Improvement Strategies and Schedules (a) The Copermittees are encouraged to involve the public and key stakeholders as early and often as possible during the development of the numeric goals and water quality improvement strategies and schedules to be included in the Water Quality Improvement Plan. (b) Within ~~9~~ 16 months after the commencement of coverage under this Order, the Copermittees must develop and submit the Water Quality Improvement Plan requirements of Provisions B.2.e and B.3 to the San Diego Water Board. Each Copermittee selecting the option to develop a Water Quality Improvement Plan to serve as an iterative, implementation-based compliance mechanism per Provision B.3.a.(3) must also submit a draft Reasonable Assurance Analysis. The San Diego Water Board will issue a public notice and solicit public

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				comments on the Water Quality Improvement Plan for a minimum of 60 days. (c) The Copermittees must consider revisions to ~~revise~~ the numeric goals and water quality improvement strategies and schedules based on public comments received ~~and/or~~ and must respond to recommendations or direction from the San Diego Water Board Executive Officer.
F.1.b.(1)	110	Water Quality Improvement Plan Submittal	Based on the comment above, and to allow Copermittees at least two months to respond to comments received during the 60-day comment period on the draft WQIP and provide four months for elected officials to approve the final WQIPs and incorporated commitments (strategies, activities, etc.), a total of 24 months are requested for final WQIP submittal. In this manner, the timeline from draft WQIP development to Regional Board submittal would proceed as follows: O 16 months: Draft WQIP O 18 months: comment period ends O 20 months: revise WQIPs O 24 months: Copermittee approval of WQIPs and submit to RB The 24-month timeline is considered reasonable, as it comprises the first two years of the Permit cycle, while the remaining three years can be focused on WQIP implementation. Also, Clarify that the Santa Margarita River Water Quality Improvement Plan is not due until 18 months after the Riverside County Copermittees are covered under this order.	Revise Provision F.1.b.(1) as follows: (1) Within ~~18~~ 24 months after the commencement of coverage under this Order, the Copermittees for each Watershed Management Area must submit a complete Water Quality Improvement Plan in accordance with the requirements of Provision B to the San Diego Water Board. Each Copermittee selecting the option to develop a Water Quality Improvement Plan to serve as an iterative, implementation-based compliance mechanism per Provision B.3.a.(3) must also submit a final Reasonable Assurance Analysis. The Santa Margarita River Watershed Management Area must submit a complete Water Quality Improvement Plan in accordance with the requirements of Provision B to the San Diego Water Board 18 months after the Riverside Copermittees are covered under this Order. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of 30 days.
F.1.b	109	Water Quality Improvement Plan	For WQIP implementation to be feasible, Copermittees must have at least one full fiscal year budgeting cycle within	Add Provision F.1.b.(5) as follows:

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		Submittal	which to seek additional funding to implement the WQIP from our governing bodies (i.e., City councils and County supervisors).	(5) Copermittees must commence with implementation of the Water Quality Improvement Plan no later than the fiscal year (July 1) following San Diego Water Board approval of the Water Quality Improvement Plan.
F.3.b.(1)	112	Annual Reports	The Annual Report for monitoring and assessment programs typically requires seven months to prepare. Lead time is needed to plan and secure the resources and contracting mechanisms to conduct monitoring programs. Therefore, If the Order is adopted on March 1, 2013, then the Water Quality Improvement Plan would be submitted to the SDRWQCB by September 2014. The Water Quality Improvement Plan could be accepted by SDRWQCB as early as 60 days after submittal (November 2014). This would then require the first Annual Monitoring and Assessment Report to be due on January 30, 2015. This report would only include one year of transitional monitoring instead of two. To rectify this, modify the reporting deadline such that it is the following January 31st of the conclusion of the monitoring season of September 30th.	Revise Provision F.3.b.1 as follows: "(1) The Copermittees for each Watershed Management Area must submit an Annual Report for each reporting period no later than January 31 of the following year. The annual reporting period consists of two periods: 1) July 1 to June 30 of the following year for the jurisdictional runoff management programs, 2) October 1 to September 30 of the following year for the monitoring and assessment programs. The first Annual Report must be prepared for the reporting period beginning July 1 after commencement of coverage under this Order, and upon San Diego Water Board determination that the Water Quality Improvement Plan meets the requirements of this Order to June 30 in the following year for the jurisdictional runoff management programs. ~~,~~The first Annual Report must be prepared for the reporting period beginning 50 days after adoption of this Order and the January 31st following the first September 30th (conclusion of monitoring season) after the San Diego Water Board determines that the Water Quality Improvement Plan meets the requirements of this Order ~~September 30 in the following year~~ for the monitoring and assessment programs. Annual Reports must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Each Annual Report must include the following:"
F.3.b.(3)	113	Annual Reports	Originators of data are legally responsible for their data and should enter the data into CEDEN. It is not always possible for Copermittees to verify the veracity or quality of third party data. The quality control data requirements of CEDEN do not easily allow third parties to successfully enter data	Revise Provision F.3.b.3.e as follows: "(3) Each Copermittee must provide any data or documentation utilized in developing the Annual Report upon request by the San Diego Water Board. ~~Any~~ Copermittee monitoring data utilized in developing the

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			without the associated detailed laboratory QA/QC data, detailed knowledge of the field protocols employed, and the ability to verify SWAMP comparability. There are also often difficulties associated with the practical aspects of data formatting to meet the requirements of the CEDEN data checker; these issues could be very difficult or impossible to resolve with third party data. The draft requirement would likely discourage Copermittees from seeking out third party data sets, as Copermittees would be in violation of the Permit if data could not readily be uploaded to CEDEN.	Annual Report must be uploaded to the California Environmental Data Exchange Network (CEDEN).[32] Any Copermittee monitoring and assessment data utilized in developing the Annual Report must be provided on the Regional Clearinghouse required pursuant to Provision F.4."
F.3.c	114	Regional Monitoring and Assessment Report	This report appears to be duplicative with the Integrated Assessment of Water Quality Improvement Plan (Provision D.4.d) that is also due with the Report of Waste Discharge. Please clarify the intent of these reports and if the same modify accordingly.	Delete Provision F.3.c. ~~a. REGIONAL MONITORING AND ASSESSMENT REPORT~~ ~~(1) The Copermittees must submit a Regional Monitoring and Assessment Report no later than 180 days in advance of the expiration date of this Order. The Regional Monitoring and Assessment Report may be submitted as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The Copermittees must review the receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, and findings from the assessments required pursuant to Provision D.4, to assess the following:~~ ~~(a) The beneficial uses of the receiving waters within the San Diego Region that are protected or must be restored;~~ ~~(b) The progress toward restoring impacted beneficial uses in the receiving waters within the San Diego Region; and~~ ~~(c) Pollutants or conditions of emerging concern that may impact beneficial uses in the receiving waters within the San Diego Region.~~ (2) ~~The Regional Monitoring and Assessment Report must include recommendations for improving the implementation and assessment of the Water Quality Improvement Plans and jurisdictional runoff~~

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				~~management programs.~~ (3) ~~Each Copermittee must provide any data or documentation utilized in developing the Regional Monitoring and Assessment Report upon request by the San Diego Water Board. Any monitoring and assessment data utilized in developing the Regional Monitoring and Assessment Report must be provided on the Regional Clearinghouse required pursuant to Provision F.4.~~
F.3.c.(3)	114	Regional Monitoring and Assessment Report	[*Applies if provision not stricken per prior comment:*] Originators of data are legally responsible for their data and should enter the data into CEDEN. It is not always possible for Copermittees to verify the veracity or quality of third party data. The quality control data requirements of CEDEN do not easily allow third parties to successfully enter data without the associated detailed laboratory QA/QC data, detailed knowledge of the field protocols employed, and the ability to verify SWAMP comparability. There are also often difficulties associated with the practical aspects of data formatting to meet the requirements of the CEDEN data checker; these issues could be very difficult or impossible to resolve with third party data. The draft requirement would likely discourage Copermittees from seeking out third party data sets, as Copermittees would be in violation of the Permit if data could not readily be uploaded to CEDEN.	If Provision F.3.c.(3) is not removed, revise Provision F.3.c.(3) as follows: "(3) Each Copermittee must provide any data or documentation utilized in developing the Regional Monitoring and Assessment Report upon request by the San Diego Water Board. Any monitoring and assessment data collected by Copermittees ~~utilized~~ in developing the Regional Monitoring and Assessment Report must be provided on the Regional Clearinghouse required pursuant to Provision F.4."
F.4	115	Regional Clearinghouse	The Copermittees require language clarification that the regional clearinghouse may be maintained by another agency.	Add the following footnote to the first paragraph of Provision F.4: "The Copermittee may elect to develop and maintain the clearinghouse(s) provided by other Copermittees or agencies."
F.5	116-117	Report of Waste Discharge	See comment F.4.	Add similar language from F.4 to a footnote.
G. Principal Watershed Copermittee Responsibilities				
G	118	Principal Watershed	Coordinating and developing, with the other Copermittees, the requirements of Provisions F.3.c, F.4, and F.5.b of this	Remove requirement that Principal Copermittee can only be Principal Copermittee for 2 watersheds and clarify that

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		Copermittee Responsibilities	Order.	all Copermittees have some level of commitment, not just the Principal Watershed Copermittee.
H. Modification of Programs				
H	119	Modification of Programs	Modifications of programs are allowed under the Water Quality Improvement Plan as part of the iterative process and adaptive management. Language should be added to that effect or there may be annual amendments to the Order.	Revise Provision H.3. as follows: "Proposed modifications outside of the Water Quality Improvement Plan process that are not minor require amendment of this Order in accordance with this Order's rules, policies, and procedures."
H	119	Modification of Programs	The reopener for the Project I Beaches and Creeks Bacteria TMDL is scheduled to fall within the term of this Permit (April 2016). This TMDL is a major component of TMDL requirements incorporated into this Permit, and should be acknowledged in Provision H. Other TMDLs may be reopened during this Permit as well. The Regional Board should express a good faith effort to revise this Order based on the revised TMDL requirements.	Add Provision H.5, as follows: 5. The San Diego Water Board may re-open and modify this order at any time prior to its expiration, after opportunity for public comment and a public hearing, if the Basin Plan Amendments for any of the TMDLs in Attachment E are revised by the San Diego Regional Board. Should a TMDL Basin Plan Amendment be revised and adopted by the Regional Board, then the Regional Board will re-open this Order as soon as possible to update the TMDL requirements in Attachment E to reflect the revised Basin Plan Amendment.
I. Standard Permit Provisions and General Provisions				
			N/A	None.
Attachment A. Discharge Prohibitions				
			N/A	None.
Attachment B. Standard Permit Provisions and General Provisions				
Attachment B	B1-B5	Standard Permit Provisions and General Provisions	This attachment incorporates the standard NPDES permit provisions as identified in 40 CFR 122.41. Although correctly transposed from the regulations the provisions are obviously developed for a traditional point source permit (i.e. wastewater permit). As such there are a number of standard provision that pose challenges to the Copermittees to comply with. Clarification is requested on a number of the provisions.	See specific changes noted below.
Attachment B;	B-7	Bypass	This provision requires the Copermittees to notify the	Delete this provision.

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1.m			Regional Board whenever an anticipated or unanticipated bypass will occur. Given the nature of storm events and the fact that stormwater treatment BMPs include bypass provisions to protect the BMP integrity it would appear that the Copermittees would have to notify the Regional Board anytime a storm is predicted to ensure compliance with the provision. This provision was crafted for typical wastewater discharges and has little relevance to stormwater.	
Attachment B, 2.h	B-12	NPDES Permitted Non-Storm Water Discharges		Add the following text at the end of the Provision: "A Copermittee will not be held responsible for pollutants in its MS4 discharge originating from an NPDES-permitted non-storm water discharge.
Attachment B, 2.i.2	B-12	Monitoring	The timeline for retention of records is in conflict with similar retention provisions under Att B.1.j.(2)	Align requirements or delete either Provision.
Attachment C. Acronyms, Abbreviations and Definitions				
Attachment C	C-2	Definitions – Automotive Repair Shop	This is no change to the definition in E.3.b, but relocates the definition to Appendix C for consistency with the rest of the document. The square footage threshold is retained in Provision E.3.b because this is a regulatory specific rather than a definition.	Add the following definition: Automotive Repair Shop – a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539 or equivalent NAICS code.
Attachment C	C-2	Definitions – Best Management Practices	Include in the definition that BMPs may be used in place of numeric effluent limits.	Reinstate the previous definition as follows: "In the case of municipal discharge permits, BMPs may be used in the place of numeric effluent limits.
Attachment C	C-3	Definitions – Channel Rehabilitation and Improvement	The term channel rehabilitation and Improvement is used in the permit but is not adequately defined. Adding a definition with clarify which projects that would fit under this category.	Add the following definition: Channel Rehabilitation and Improvement – Remedial measures or activities for the purpose of improving or restoring the environmental health of streams, channels or river streams. Techniques may vary from in-stream restoration techniques to off-line stormwater management practices installed in the system corridor or upland areas. Rehabilitation techniques may include, but are not limited

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				to the following: riparian zone restoration, constructed wetlands, bank stabilization, channel modifications, and daylighting of drainage systems. Effectiveness may be measured in various manners, including: assessments of habitat, reduced streambank erosion, and restoration of water and sediment transport balance.
Attachment C	C-3	Definitions – Construction Site	Update the definition for Construction site to define the area to be disturbed and narrow definition to work outside of a facility.	Revise the definition of Construction Site as follows: "…soil disturbing activities greater than 10,000 square feet…excavation. This does not include interior construction activities such as interior remodeling, plumbing, electrical, or mechanical work."
Attachment C	C-3	Definitions - Copermittee	Add clarification that the San Diego Region is Region 9.	Add: "..Region (Region 9) …"
Attachment C	C-3	Definitions - Development Project	More concise and specifies development projects that have land disturbance, in line with Grading Ordinance definitions.	Edit the following definition as follows: Development Projects - Construction, rehabilitation, redevelopment, or reconstruction of any public or private ~~residential~~ projects involving land disturbance activities ~~industrial, commercial, or any other projects~~.
Attachment C	C-4	Definitions – Direct Discharge to an Environmentally Sensitive Area	The "Environmentally Sensitive Area" definition found elsewhere in Appendix C would remain unchanged. This new definition would support interpretation of the Priority Development Project category titled "Environmentally Sensitive Areas" (E.3.b(d)) and remove much current confusion that applicants and reviewers have in interpreting these rules. In discussions with Regional Board staff we have learned specifically what their concern is regarding a direct hydraulic connection between the development project and the specially protected areas. We feel that this language adequately addresses that concern while providing the most succinct language that can be interpreted reasonably well for a wide range of development scenarios.	Add the following definition: Direct Discharge to an Environmentally Sensitive Area – Flow that is conveyed overland a distance of 200 ft or less from the development to the ESA, or conveyed in a pipe any amount of distance as an isolated flow from the development to the ESA (i.e. not commingled with flows from adjacent lands).
Attachment C	C-4	Definitions – Household		Revise the text as follows: "… other hazardous wastes"

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		Hazardous Waste		
Attachment C	C-5	Definitions - Inland Surface Waters	Change the definition to include waters of the U.S. not State.	Replace the definition as follows: "Inland Surface Waters – Includes all surface waters of the U.S. that do not include the ocean, enclosed bays, or estuaries."
Attachment C	C-5	Definitions – Low Impact Development Best Management Practices	Minor grammatical correction.	Revise the definition as follows: "that emphasize conservation ~~s~~and the use of on-site natural features"
Attachment C	C-6	Definitions - Major Outfall	Minor grammatical correction	"…with a drainage area of more…"
Attachment C	C-6	Definitions – Maximum Extent Practicable (MEP)		Revise the text as follows: "The technology-based standard established by Congress in CWA Provision 402(p)(3)(B)(iii) for ~~storm water~~ discharges of pollutants that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) in combination with treatment methods serving as a backup (additional line of defense)."
Attachment C	C-7	Definitions – MS4	The addition of CWA language to the definition of MS4 limits Copermittees' responsibilities to within their jurisdiction and strengthens support that Copermittees are not responsible for discharges in MS4s that they do not operate.	Revise text as follows: "… Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.~~26~~22. Copermittees need only comply with permit conditions relating to discharges from the municipal separate storm sewers for which they are operators." 40 CFR §122.21(a)(vi).
Attachment C	C-7	Definitions – Non-Storm Water		Revise text as follows: All discharges to and from a MS4 that do not originate from precipitation events (i.e., all discharges from a MS4 other than storm water). Non-storm water includes illicit

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				discharges, ~~and~~ NPDES permitted discharges, and the discharges described in Provision E(2)(a)(3)-(5).
Attachment C	C-8	Definitions - Outfall	Add the definition of outfall and cite the Federal Regulations.	Add the following definition: Outfall - *Outfall* means a *point source* as defined by 40 CFR 122.2 at the point where a municipal separate storm sewer discharges to waters of the United States and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels or other conveyances which connect segments of the same stream or other waters of the United States and are used to convey waters of the United States. 40 C.F.R. 122.26(b)(9).
Attachment C	C-8	Definitions – Parking Lot	This is no change to the definition in E.3.b, but relocates the definition to Appendix C for consistency with the rest of the document. The square footage threshold is retained in Provision E.3.b because this is a regulatory specific rather than a definition.	Add the following definition: Parking Lot – a land area or facility for the tempraory parking or storage of motor vehicles used personally, for business, or for commerce.
Attachment C	C-8	Definitions – Pre-Development Runoff Conditions	The definition for Pre-Development Runoff Conditions should be the exact language EPA used in the Federal Register at 64 FR §68761. We acknowledge the removal of language referencing natural watershed hydrology before human induced alterations. Jurisdictions cannot require project applicants to match post-project hydrograph to the pre-development hydrograph because it may impose mitigation beyond the project's impacts. The pre-project standard provides the appropriate nexus to the project impacts, as is the standard followed by CEQA.	Revise the definition as follows: ~~Pre-Development~~ Pre-Project Runoff Conditions – "Runoff conditions that exist~~ed~~ onsite immediately before the ~~existing development was constructed, or exists onsite before~~ planned development activities occur. Pre-development is not intended to be interpreted as that period before any human-induced land disturbance has occurred. 64 FR 68761."
Attachment C	C-8	Definitions – Properly Designed	A definition of "Properly Designed," which mentioned in Source Control BMP Requirements is not mentioned in the definitions Provision of Attachment C. As currently written, the permit authorizes subjective broad authority and deference to the Regional Board in interpretation of the definitions, if not included. This term requires a definition.	Add the following definition: "Properly Designed – Designed in accordance with the Copermittee's BMP Design Manual and/or any appropriate design requirements set forth by the Copermittee and based on widely accepted design criteria."

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Attachment C	C-8	Definitions – Public Education, Outreach, and Participation	Neither Public Education and Outreach, nor Public Participation are mentioned in the definitions Provision of Attachment C. Please add definitions for these non-structural BMPs.	Add the following definition: "Public Education, Outreach and Participation – Programs to educate residents, businesses and visitors about the importance of water quality and water quality programs so that they will support local efforts and understand their role in protecting receiving waters. The Education and Outreach Program will increase knowledge and awareness, improve attitudes toward storm pollution prevention, and provide a foundation for changing behaviors that contribute to storm water pollution."
Attachment C	C-8 through C-9	Definitions - Redevelopment	The current San Diego permit R9-2007-0001 Definition for Redevelopment states "Redevelopment does not include trenching and resurfacing associated with utility work; resurfacing and reconfiguring surface parking lots and existing roadways." Resurfacing and reconfiguration of parking lots should still be included in this sentence as these actions are not increasing impervious surfaces and are necessary for ongoing maintenance (pothole repair, root intrusion, damage repair, etc).	Revise the following definition: Redevelopment – "The creation, addition, and/or replacement of impervious surface on an already developed site through construction or alteration of the existing footprint" …Redevelopment does not include trenching and resurfacing associated with utility work; resurfacing existing roadways; resurfacing, cutting and reconfiguring of surface parking lots; new sidewalk construction, pedestrian ramps, or bike lane on existing roads; and routine replacement of damaged pavement, such as pothole repair."
Attachment C	C-9	Definitions - Restaurant	This is no change to the definition in E.3.b, but relocates the definition to Appendix C for consistency with the rest of the document. The square footage threshold is retained in Provision E.3.b because this is a regulatory specific rather than a definition.	Add the following definition: Restaurant – a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812).
Attachment C	C-9	Definitions – Retail gasoline outlet	No prior definition existed, so one was created for consistency with the other priority development project categories. The square footage threshold is retained in Provision E.3.b because this is a regulatory specific rather than a definition.	Add the following definition: Retail gasoline outlet (RGO) – a business that sells automotive or truck fuel to the general public.
Attachment C	C-9	Definitions - Retrofitting	Minor edit to improve understanding of when retrofitting is appropriate.	Revise the following definition:

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				"Retrofitting – Storm water management practice put into place after development has occurred in watersheds where the practices previously did not exist or are ineffective…"
Attachment C	C-10	Definitions – Street, Road, Highway, Freeway, and Driveway	This is no change to the definition in E.3.b, but relocates the definition to Appendix C for consistency with the rest of the document. The square footage threshold is retained in Provision E.3.b because this is a regulatory specific rather than a definition.	Add the following definition: Street, Road, Highway, Freeway and Driveway – "Any paved impervious surface that is used for the transportation of automobiles, trucks, motorcycles, and other vehicles."
Attachment C	C-10	Definitions – Waters of the state	This language should be limited based on the intent of the definition (natural water sources) and should not be interpreted to include man-made structures that collect runoff for the sole purpose of flow volume/velocity and/or pollutant reduction, such as a wet pond. Circumstance and condition should be considered as part of determination whether a water body is a water of the state.	"Waters of the State - Any water, surface or underground, including saline waters within the boundaries of the State [CWC Provision 13050 (e)]. The definition of the Waters of the State is broader than that for the Waters of the United States in that all water in the State is considered to be a Waters of the State ~~regardless of circumstance or condition~~."
Attachment D. Jurisdictional Runoff Management Program Annual Report Form				
			N/A	None.
Attachment E. Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2013-0001				
Attachment E. (General)	E-1 through E-47	Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2013-0001	The organization of the TMDL provisions could be improved to help more clearly outline the interim and final requirements and schedules. The Copermittees recommend a reformat that would be easier to follow and has a clearer connection between receiving water limitations, effluent limitations, BMP requirements, and compliance determination.	As shown in the attached revised Permit, revise the organizational structure of the TMDL Specific Provisions, using the following outline: (a) Applicability (b) Final TMDL Compliance Requirements (c) Interim TMDL Compliance Requirements (d) Monitoring and Assessment
Attachment E. (General)	E-1 through E-47	Compliance Determination sub-sections for each TMDL	As discussed in comments under Provision B, the Copermittees have fully embraced using WQIPs as an integral component of our programs, and would like to extend the role of WQIPs into TMDL compliance determination.	Incorporate a WQIP-based compliance option (BMP-based WQBELs) into the Compliance Determination sections of Attachment E (consistent with the comment on the revisions to Provision B.3.a) , with the WQIPs serving as the compliance mechanism.

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			There is regulatory precedent for including WQIP-based compliance mechanisms ("BMP-based WQBELs") as a TMDL compliance option. State and federal law do not require the use of numeric effluent limitations for MS4 Copermittees, but rather encourage flexible implementation of best management practices through an iterative process. Specifically, the choice to include either management practices or numeric limitations in MS4 permits is within the regulatory agency's discretion, and on the question of whether MS4 permits must contain numeric effluent limitations, the court upheld EPA's use of iterative BMPs in place of numeric effluent limitations for storm water discharges. (See Defenders of Wildlife v. Browner, 191 F.3d 1159, 1166-1167 (9th Cir. 1999)[6] The findings of California's Stormwater Blue Ribbon Panel, which was convened specifically to examine the feasibility of incorporating numeric effluent limits in stormwater permits, ultimately concluded that numeric limits were generally infeasible across all three stormwater activities (municipal, industrial, and construction), with a few exceptions (*The Feasibility of Numeric Effluent Limits Applicable to Discharges of Stormwater Associated with Municipal, Industrial and Construction Activities, June 19, 2006*). Additionally, state law and policy does not require the use of numeric effluent limitations in MS4 permits. In 2009, the State Water Board affirmed this approach in a precedential order, stating: "[it] is our intent that federally mandated TMDLs be given substantive effect. Doing so can improve the efficacy of California's NPDES storm water permits. This is not to say that a wasteload allocation will result in	As shown in the attached revised Permit, the following sub-bullet would be incorporated into the interim and final Compliance Determination sections for each TMDL: "The Responsible Copermittee has submitted and is fully implementing a Water Quality Improvement Plan that is developed and adaptively managed as outlined in Provisions B, F.1 and F.2, is accepted by the San Diego Water Board, and meets the conditions of Specific Provision x.x.(x).x."

[6] See also California Regional Water Quality Control Board San Diego Region - Fact Sheet / Technical Report For Order No. R9-2010-0016 / NPDES NO. CAS0108766.

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			numeric effluent limitations for municipal storm water dischargers. Whether a future municipal storm water permit requirement appropriately implements a storm water wasteload allocation will need to be decided on the regional water quality control board's findings *supporting either the numeric or non-numeric* effluent limitations contained in the permit." (Order WQ 2009-0008, In the Matter of the Petition of County of Los Angeles and Los Angeles County Flood Control District, at p. 10 (emphasis added).) Furthermore, a memo issued in 2010 by EPA directors Hanlon and Keehner describes how permitting agencies have discretion to use BMP-based WQBELs for MS4 Permits: "The permitting authority's decision as to how to express the WQBELs(s), either as numeric effluent limitations or BMPs, including BMPs accompanied by numeric benchmarks, should be based on an analysis of the specific facts and circumstances surrounding the permit, and/or the underlying WLA, including the nature of the stormwater discharge, available data, modeling results or other relevant information." In a July 23, 2012 comment letter from EPA to the Los Angeles Regional Board on the recent LA County MS4 Permit regarding that Board's use of this approach,, EPA stated: "This is consistent with EPA guidance in its updated memorandum of November 10, 2010 concerning the incorporation of WLAs into stormwater permits, available at: http://www.epa.gov/npdes/pubs/establishingtmdlwla revision.pdf. This memorandum recommends the use of numeric effluent limits when feasible, and notes that BMP-	

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			based approaches are appropriate in cases where the administrative record for the permit quantitatively demonstrates the BMPs required by the permit will be sufficient to ensure compliance with the WLAs. This has also been a long-standing EPA policy dating back to EPA's previous 2002 guidance memorandum concerning the incorporation of WLAs into stormwater permits, available at: http://www.epa.gov/npdes/pubs/final-wwtmdl.pdf." The WQIPs could 1) demonstrate that BMP-based approaches are appropriate and 2) provide the necessary information so that the administrative record for the permit can demonstrate the BMPs required by the permit will be sufficient to ensure compliance with the WLAs.	
Attachment E. (General)	E-1 through E-47	Best Management Practice sub-sections for each TMDL	The "Best Management Practices" subsections for each TMDL should incorporate the WQIP-based compliance concept as proposed in the proposed revisions to Provision B.3, and describe the steps that Copermittees must take for WQIPs and BMP-based WQBELs to be approved by the Regional Board as a compliance mechanism. It is important to note that this approach would be subject to public review and Regional Board approval, and thus this approach has many "checkpoints" where the Regional Board is able to determine whether WQIP-based compliance (BMP-based WQBELs) is appropriate given the approach and level of rigor in the WQIP. Furthermore, the WQIPs would provide sufficient detail regarding the strategies and activities to be implemented, which would allow the Regional Board to use the schedule for compliance determination in a clear, specific, measurable, and enforceable manner.	As shown in the attached revised Permit, insert a new Best Management Practices sub-bullet in the interim and final TMDL Compliance Requirements sections for each TMDL as follows: (a) For Copermittees utilizing the WQIP-based compliance option, the strategies and activities contained in the WQIP accepted by the San Diego Water Board and adaptively managed as outlined in Provision B.6, F.1, and F.2, will serve as BMP-based WQBELs under the following conditions, as outlined in Provision B.3.a: (1) A Responsible Copermittee requests that the Water Quality Improvement Plan be approved as the basis for compliance with the discharge prohibitions (A.1), receiving water limitations (A.2), and/or effluent limitations (A.3) in the letter of submittal to the San Diego Water

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				Board; (2) Reasonable assurance is demonstrated that the strategies and activities in the Water Quality Improvement Plan are expected to attain the final receiving water limitations or final WQBELs under Specific Provision xx.y; (3) The submitted schedule as outlined in Provision B.3 provides sufficient detail regarding the strategies and activities to be implemented to allow the Regional Board to use the schedule for compliance determination in a clear, specific, measurable, and enforceable manner; AND (4) The WQIP is approved by the Regional Board Executive Officer and is implemented per the approved schedule and adapted pursuant to Provisions B.6, F.1, and F.2.
Attachment E. (General)	E-1 through E-47	Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2013-0001	The Receiving Water Limitations associated with TMDLs should not be referred to as Water Quality Based Effluent Limitations (WQBELs). The Copermittees are only responsible for their discharges to receiving waters not for concentrations in receiving waters. Receiving water quality can be affected by multiple sources, including agriculture and other sources that are permitted by this Board. A WQBEL is a restriction on the quantity or concentration of a pollutant that may be *discharged from a point source* into a receiving water that is necessary to achieve an applicable water quality standard in the receiving water (See 40 CFR § 122.2; NPDES Permit Writer's Manual, Appendix A. Categorizing the Receiving Water Limitations as WQBELs is inconsistent with federal regulations and standard permitting practices and could subject the Copermittees to	As shown in the attached revised Permit, for each TMDL, clearly separate receiving water limitations from Water Quality Based Effluent Limitations using separate sub-section headers.

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			Mandatory Minimum Penalties.	
Attachment E. (General)	E-1 through E-47	Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2013-0001	The Order needs to clearly describe the linkage between receiving water limitations and effluent limitations. The effluent limitations should be used to determine whether Copermittees are causing or contributing to exceedances of receiving water limitations. They are not a standalone provision. If receiving water limitations are met, then the effluent limitations are not applicable.	For each Water Quality Based Effluent Limitations sub-section, insert language to describe how WQBELs and RWLs are linked. As shown in the attached revised Permit, the corresponding WQBEL sub-section for each TMDL should open with language similar to the following: "In the case that receiving water limitations are exceeded after the end of the compliance schedules under Specific Provision E.X.x, effluent limitations will be used to determine whether MS4 discharges are causing or contributing to exceedances of receiving water quality limitations. To demonstrate MS4 discharges are not causing or contributing to an exceedance of receiving water quality limitations, MS4 discharges must meet the concentration-based effluent limitations in Table X.X." Similarly interim and final compliance schedules should reflect this as well. As shown in the attached revised Permit, the Interim and Final Compliance Schedule sub-sections for each TMDL should include language similar to the following: "The Responsible Copermittee must be in compliance with the final receiving water limitations or final WQBELs under Specific Provision E.X."
Attachment E. (General)	E-1 through E-47	Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2013-0001	Concentration-based effluent limitations should be applied on a watershed-basis, not outfall by outfall. The Copermittees should have flexibility to address the highest impact outfalls, and not be required to *address every single outfall* (e.g., there is little environmental benefit to construct	For each Water Quality Based Effluent Limitations table with concentration-based WQBELs, insert a footnote to allow Copermittees to manage stormwater quality on a watershed basis. As shown in the attached revised Permit, the footnote for

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			BMPs to control outfalls with relatively low *loadings* that do not affect receiving water conditions). If the approach is outfall-by-outfall (instead of watershed basis), then the costs of compliance will be MUCH higher as nearly every outfall will require an action/BMP regardless of whether or not the loading has an effect on the receiving water. The Copermittees can protect receiving waters by ensuring that discharge concentrations are below the effluent limitations on a *flow-weighted* basis. If one outfall is slightly higher than the WQBEL concentration, but another is below the WQBEL concentration then the MS4s have not impacted water quality as long as the flow-averaged concentration is below the effluent limitation.	each concentration-based WQBEL table would read as follows: "Concentrations shall be determined on a flow-weighted basis across all outfalls within a jurisdiction, not outfall-by-outfall."
Attachment E.1.b (Chollas Creek Diazinon TMDL)	E-3	Water Quality Based Effluent Limitations	The Chollas Creek Diazinon TMDL is based on an erroneous target. The TMDL set the numeric targets equal to the California Department of Fish and Game (CDFG) Water Quality Criteria for the protection of freshwater aquatic organisms from diazinon (Menconi and Cox 1994). The acute and chronic targets equal 0.08 ug/L and 0.05 ug/L, respectively. However, an error in a data point contained in the CDFG criteria was found. In a letter dated May 19, 2004, from Chris Ingersoll (US Geological Survey) to Lenwood Hall (University of Maryland), Mr. Ingersoll discusses an error in the 96-h LC50 of 0.2 ug/L for *Gammarus fasciatus* reported by Johnson and Finley (1980) and by Mayer and Ellersieck (1986). Mr. Ingersoll's letter notes that based on his review of the data sheets, the 96-h LC50 should have been reported as 2 ug/L and not 0.2 ug/L, which was used to calculate the criteria. In a letter dated July 30, 2004 from Brian Finlayson (CA Department of Fish and Game) to Joe Karkoski (Central Valley Regional Water Quality Control Board), Mr. Finlayson confirms that a transcription error occurred and suggests that these data	Replace the receiving water limitation with the recalculated Criterion Maximum Concentration (aka acute criterion) and the Criterion Continuous Concentration (aka chronic criterion) of 0.16 ug/L and 0.10 ug/L, respectively. Set the acute and chronic effluent limitations as 90% of the criteria (same approach as the TMDL) equal to 0.144 ug/L and 0.09 ug/L, respectively.

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			cannot be used in the calculation of the criteria. Mr. Finlayson suggests the recalculated Criterion Maximum Concentration (aka acute criterion) and the Criterion Continuous Concentration (aka chronic criterion) should be 0.16 ug/L and 0.10 ug/L, respectively. Additionally, USEPA published aquatic life water quality criteria for diazinon in December 2005 (EPA-822-R-05-006), which established acute and chronic criteria equal to 0.17 ug/L. Incorporation of the Chollas Creek Diazinon TMDL into the MS4 permit based on the CDFG criteria is inappropriate given the fact these criteria are known to be faulty. The receiving water limitations and effluent limitations should either 1) be removed until the TMDL can be corrected or 2) the recalculated CDFG or USEPA criteria should be utilized. The TMDL assumed, at the time, the CDFG criteria were correct and their use in setting targets and corresponding WLAs was appropriate. However, new information is available that demonstrates those criteria are faulty. Thus, replacement of the receiving water limitations and effluent limitations, would be consistent with the assumptions of the WLAs because the WLAs were intended to implement the narrative toxicity and pesticide objectives in the Basin Plan. As stated on page 16 of the TMDL Staff Report: "By setting the numeric targets equal to the CDFG Water Quality Criteria for diazinon, the Regional Board is quantitatively interpreting the narrative water quality objective of "no toxics in toxic amounts" to mean "no diazinon concentrations in Chollas Creek in excess of 0.08 µg/L for any 1 hour period or in excess of 0.05 µg/L for any 4-day period". The pesticide water quality objective is interpreted in the same way."	
Attachment E.2.b	E-5	Water Quality Based Effluent	The California Toxics Rule (CTR) establishes dissolved	Add the WER term to the receiving water limitations acute

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(Shelter Island Dissolved Copper TMDL)		Limitations	saltwater criteria that are expressed as a function of a Water-Effect Ratio (WER). The WER is set equal to 1.0 unless a site-specific study has been completed. The WER term was incorporated into the Chollas Creek Dissolved Metals TMDL.	and chronic criteria and the effluent limitations, tables 2.1 and 2.2, respectively. Add the following footnote to both tables: "The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER."
Attachment E.2 (Shelter Island Dissolved Copper TMDL)	E-6	Compliance Determination	The TMDL envisioned MS4s would implement management practices to reduce copper loadings to the Shelter Island Yacht Basin (SIYB). As stated on page 53 of the TMDL Staff Report: "The Regional Board will amend Order No. 2001-01, "Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm /Sewer Systems" to require that discharges of copper into SIYB waters not increase from existing loadings… The order could also be amended to require BMPs designed to reduce copper loading into SIYB, and/or monitoring for copper in the runoff management plan pertinent to SIYB."	Allow for BMP-based WQBELs, as envisioned when the TMDL was adopted. As shown in the attached revised Permit, a new Compliance Determination sub-bullet for each TMDL (for both final and interim WLAs) should be added as follows: "(e) The Responsible Copermittees have submitted and are fully implementing an Water Quality Improvement Plan that is developed and adaptively managed as outlined in Provisions B, F.1 and F.2, is accepted by the San Diego Water Board, and meets the conditions of Specific Provision x.x.(x).x."
Attachment E.3.b (Rainbow Creek Watershed Nutrient TMDL)	E-9 of redline	Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2012-0011	The Rainbow Creek TMDL for Total Nitrogen and Phosphorous does not include Wasteload Allocations for the County of San Diego Copermittees. The TMDL only contains Load Allocations. Load allocations should not be implemented through an NPDES permit. It is inappropriate to simply "re-name" the Load Allocations as Wasteload Allocations.	Strike the following TMDL from Attachment E in its entirety: Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed
Attachment E.3.b (Rainbow Creek Watershed Nutrient	E-10	Water Quality Based Effluent Limitations	Notwithstanding the previous comment, the TMDL clearly states which dischargers are subject to wasteload/load reductions that must be incorporated into their respective permits. For example the TMDL Technical Report states: "nutrient wasteload reductions will eventually be incorporated into Caltrans statewide NPDES storm water	If not striken entirely, add the following compliance determination method to Specific Provisions 3 "The Responsible Copermittee is using its legal authority to reduce nutrient discharges from the land uses identified under Specific Provision 3.b.(2).(b) to the maximum extent practicable."

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TMDL)			permit." Similar language cannot be found regarding incorporating nutrient wasteload and/or load reductions into the County of San Diego's NPDES permit. The only NPDES permit-related requirement imposed upon the County of San Diego is "to require increasingly stringent best management practices" for nutrient discharges to or from the MS4 within the watershed. Furthermore, the Technical Report states that "any Regional Board enforcement action taken will be against individual dischargers and not the County of San Diego."	
Attachment E.4.b (Chollas Creek Dissolved Metals TMDL)	E-12	Compliance Determination	The TMDL envisioned MS4s would implement actions to reduce metals loadings to Chollas Creek. As stated on page 4 of the BPA: "Actions to meet the WLAs in discharges to Chollas Creek will be required in WDRs that regulate MS4 discharges, industrial facility and construction activity stormwater discharges, and groundwater extraction discharges in the Chollas Creek watershed." Additionally, as stated on page 1 of the State Water Board's Resolution (No. 2008-00054) approving the BPA: "The amendment requires actions to be taken to implement management practices to ensure compliance with water quality criteria."	Allow for BMP-based WQBELs, as envisioned when the TMDL was adopted. As shown in the attached revised Permit, a new Compliance Determination sub-bullet for each TMDL (for both final and interim WLAs) should be added as follows: "(e) The Responsible Copermittees have submitted and are fully implementing an Water Quality Improvement Plan that is developed and adaptively managed as outlined in Provisions B, F.1 and F.2, is accepted by the San Diego Water Board, and meets the conditions of Specific Provision x.x.(x).x."
Attachment E.5.b (Baby Beach and Shelter Island Bacteria TMDL)	E-16	Final Water Quality Based Effluent Limitations	The WLAs from the Baby Beach and Shelter Island Bacteria TMDL include percent reductions that should be incorporated into the Order. These percent reductions would allow the Copermittees to plan and implement BMPs in a manner that best reflects the TMDL load reduction requirements. The load reduction requirements would also facilitate BMP-based compliance mechanisms and allow the WQIPs to be better integrated with TMDL requirements.	Incorporate load-based effluent limitations into the Specific Provisions for the Baby Beach and Shelter Island Bacteria TMDL. As shown in the attached revised Permit, a new Table 5.2b should be added to the Final WQBEL sub-section, including the % reductions required by the TMDL. These % reductions should be linked to the concentration-based effluent limitations with an "OR" statement.

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			For the Baby Beach and Shelter Island Bacteria TMDL, there were certain conditions that required ZERO reduction by MS4s. The effluent limitations should reflect these TMDL expectations.	
Attachment E.6.a.(5)	E-21	Applicability	Since adoption of the Project I Bacteria TMDL, the Copermittees have submitted data analysis to the Regional Board to demonstrate that 303(d) listings for San Marcos HA, San Dieguito River HA, and Los Penasquitos HA were incorrectly applied to REC beneficial uses. The Regional Board has concurred with the findings for each HA and stated that these HAs are "not subject to further action under Resolution No. R9-2010-0001." Similar responses are expected for the other HAs.	Add the following text to Section 6.a.(5): "See table 6.0; Consistent with Basin Plan Amendment (Resolution No. R9-2010-0001, p. A-2); specific beach segments from some of the Pacific Ocean shorelines listed in Table 6.0 have been delisted from the 2008 (sic 2010) 303(d) list that was approved by the San Diego Board on December 16, 2009, and therefore are not subject to the requirements of Attachment E as long as monitoring data continues to support compliance with water quality standards."
Attachment E.6.b (Project I Beaches and Creeks Bacteria TMDL)	E-24	Water Quality Based Effluent Limitations	The total coliform WQO only applies ocean waters, and should not be applied to creeks. The freshwater (creek) receiving water limitations in the TMDL do not include total coliform.	As shown in the attached revised Permit, apply the footnote 4 to total coliform receiving water limitations and WQBELs and specify the following: "Total coliform limitations apply only to segments of areas of Pacific Ocean Shoreline listed in Table 6.0."
Attachment E.6.b (Project I Beaches and Creeks Bacteria TMDL)	E-24 through E-25	Water Quality Based Effluent Limitations	The WLAs from the Project I Bacteria TMDL include allowable loadings and percent reductions that should be incorporated into the Order. These percent reductions would allow the Copermittees to plan and implement BMPs in a manner that best reflects the TMDL load reduction requirements. The load reduction requirements would also facilitate BMP-based compliance mechanisms and allow the WQIPs to be better integrated with TMDL requirements.	Incorporate load-based effluent limitations into the Specific Provisions for Project I Bacteria TMDL. As shown in the attached revised Permit, a new Table 6.2b should be added to the Final WQBEL sub-section, specifying the % reductions required by the TMDL. These % reductions should be linked to the concentration-based effluent limitations with an "OR" statement.
Attachment E.6.c	E-30	Compliance Schedule	Similarly, the interim effluent limitations should reflect the % reductions required by the TMDL. The TMDL requires a	Incorporate load-based, interim effluent limitations into the

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(Project I Beaches and Creeks Bacteria TMDL)			50% reduction, so the % reductions applied to the final effluent limitations should be divided by two and included as interim WQBELs.	Specific Provisions for Project I Bacteria TMDL. As shown in the attached revised Permit, a new Table 6.5 should be added to the Interim WQBEL sub-section, specifying the % reductions required by the TMDL. These % reductions, which are 50% of the reductions required for final WQBELs, should be linked to the interim concentration-based effluent limitations with an "OR" statement.
Attachment E.6.b (Project I Beaches and Creeks Bacteria TMDL)	E-30	Interim Compliance Dates	The CLRPs to be submitted by Copermitees propose interim compliance dates, as allowed by the Project I Bacteria TMDL, to meet the 50% reduction milestone for dry and wet weather. The CLRPs submitted by Copermittees may not all propose the same interim compliance dates and the Permit should acknowledge the flexibility allowed by the TMDL (see page 68 of Attachment A of the Basin Plan Amendment) to revise the interim compliance dates via the CLRPs. In fact, this scheduling flexibility was a primary "incentive" for Copermitees to develop CLRPs instead of BLRPs.	Revise the Order to reflect the flexibility allowed by the TMDL. As shown in the attached revised Permit, add language to the interim compliance dates section to allow interim compliance date flexibility, as follows: "…unless alternative interim compliance dates are provided in a Comprehensive Load Reduction Plan or Water Quality Improvement Plan accepted by the San Diego Regional Board Executive Officer."
Attachment E.6.b (Project I Beaches and Creeks Bacteria TMDL)	E-31 and 32 of redline	Final Receiving Water Limitations and Final WQBELs	The Basin Plan Amendment for the Project I Bacteria TMDL contains Receiving Water Limitations. These Receiving Water Limitations should be incorporated directly into the Permit. However, Attachment E contains Receiving Water Limitations that do not match those from the TMDL. The Regional Board should not revise or translate the RWLs from the TMDL, they should be incorporated directly. The RWLs incorporated into Attachment E have several discrepancies with the RWLs in the TMDL, including application of single sample targets to the dry weather RWLs and application of total coliform RWLs for inland waters.	Replace entirely the RWLs in the Permit with those from the TMDL, which separates RWLs into RWLs for beaches (Table 6.1) and RWLs for Creeks (Table 6.2). The TMDL RWLs should be *pasted directly* from the Basin Plan Amendment (Attachment A, page 52).

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Attachment E 6.d.1.b.ii and 6.d.2.b.ii, footnotes 36 and 3837 respectively (Project I Beaches and Creeks Bacteria TMDL)	E-33	Specific Monitoring and Assessment Requirements	To be consistent with Attachment A of Resolution No. R902010-0001,Section (7) (i) 2. Monitoring for TMDL Compliance and Compliance Assessment (p. A54), allow additional wet weather samples collected to be applied to the wet weather period as indicated in the following: "If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event shall be equal to the results from that one sample. If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all the wet weather days not sampled shall be equal to the highest bacteria density result reported from samples collected. The exceedance frequency shall be calculated by dividing the number of wet weather days that exceed the single sample maximum REC-1 WQOs by the total number of wet weather days during the rainy season."	Revise text as follows: Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)]. <u>If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event shall be equal to the results from that one sample. If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all the wet weather days not sampled shall be equal to the highest bacteria density result reported from samples collected. The exceedance frequency shall be calculated by dividing the number of wet weather days that exceed the single sample maximum REC-1 WQOs by the total number of wet weather days during the rainy season.</u>

San Elijo Lagoon CONSERVANCY
25 years of watershed moments

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January 08, 2013

Via e-mail to wchiu@waterboards.ca.gov
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

RE: Comments on Tentative Order Number: R9-2013-0001

Dear Mr. Chiu:

San Elijo Lagoon Conservancy respectfully submits the following comments on the draft San Diego Regional Municipal Separate Storm Sewer System permit.

Urban runoff is the San Diego region's most urgent pollution problem. Arguably, it is the most difficult to solve. In a region known for its beaches and strong tourism economy, polluted runoff makes our beaches and waterways unsafe for swimming, fishing and other recreation for at least 72 hours after a rain event. Even in dry weather, our "urban drool" from residents and businesses overwatering lawns becomes a major pollution source.

The good news is by working together as a community, we can solve this challenging public health problem. The Water Quality Improvement Plans proposed in the draft permit have the potential to become powerful tools to help us improve water quality within our watersheds. However, the Copermittees cannot be tasked with creating these plans alone. Specifically:

- The Permit should require formation of a stakeholder advisory group for each watershed that includes representatives of environmental groups with knowledge of the watershed.
- This stakeholder advisory group should work closely with the Copermittees and a regional board staff member while the Water Quality Improvement Plans are being developed to ensure these plans aggressively pursue water quality gains.
- The stakeholder advisory process should include accountability and measureable milestones to ensure the goals of the Permit are being met.

By taking advantage of the knowledge and resources of diverse stakeholders like municipalities, businesses and residents, our region can be on the cutting-edge of addressing urban runoff and creating healthier communities and watersheds. But this can only be achieved if these diverse voices are impacting the planning process in a meaningful way.

San Elijo Lagoon Conservancy recognizes the challenge urban runoff presents to our region, and we want to do our part to solve the problem. San Elijo Lagoon Conservancy is interested in participating in a Water Quality Improvement Plan development process for Escondido Creek watershed and the Carlsbad Hydraulic Unit.

San Elijo Lagoon Conservancy urges the Regional Board to enhance the stakeholder participation opportunities during Water Quality Improvement Plan development and then approve the permit.

Respectfully submitted,

Doug Gibson
Executive Director / Principal Scientist

From: Carol Crossman
To: Chiu, Wayne@Waterboards
Subject: draft water permit
Date: Wednesday, January 09, 2013 3:02:41 PM

Mr. Wayne Chiu, P.E.
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Re: Comment—Tentative Order No. R9-2013-001, Regional MS4 Permit, Place ID: 786088Wchiu

Dear Mr. Chiu:

I am writing in regards to the San Diego Regional Water Quality Control Board's Tentative Order R9-2012-0011 ("Permit") dated October 31, 2012. After reviewing the proposed Permit, I am concerned it will impose expensive, onerous, and untested regulations on local governments, businesses, and residents. These new regulations will impact the region's economy without improving its water quality.

Everyone understands the importance of clean, safe water to the region. It is important, however, that we use our limited resources wisely, and ensure that our efforts produce the desired outcome of improving water quality. I applaud the Board's inclusion of Water Quality Improvement Plans (WQIP) as a first step in developing a cost-effective approach to improving our water. Analysis remains a critical component of a successful strategy, and I am glad to see that the Board is committed to finding the best possible solution to water quality improvement.

I am concerned, however, that the costs associated with enforcing and implementing the permit will have a negative impact on my business and San Diego's economy. The four primary areas of concern include: 1) the strict liability for exceeding water quality objectives; 2) the additional and changing requirements for development projects, impacting items such as storm water retention and discharge; 3) the preemption of WQIPs by new and changing regulatory requirements prior to allowing the WQIPs to be developed and implemented; and 4) the lack of reliable funding sources to implement these regulatory changes.

It is necessary to hold individuals, businesses and governments accountable, but it is critical that the accountability measures can be reasonably achieved and are likely to have a significant and positive impact on San Diego's water. Because of these concerns, I respectfully request that the Permit focus on the timely development of effective and

enforceable WQIPs, and that each of the WQIPs be developed through a process that ensures public participation. I ask also that the designation of appropriate Best Management Practices in each watershed be determined through the WQIP process rather than the one size fits all strategy currently being proposed in the Permit. I ask further that until the Board adopts a WQIP for a watershed that the provisions of the existing Permit remain in place for that watershed. Finally, in order to avoid unnecessary litigation I request that the Board adopt the WQIPs as Orders implementing the proposed Permit.

I urge you to adopt final permit language that is evidence-based and both environmentally and economically sustainable. Thank you for your consideration.
Sincerely,

Carol T. Crossman
Independent Owner of rental units
Board Member of SDCAA
746 Horton Road Bonita CA 91902
619-479-2482

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JOHN MULLIN, Deputy Mayor
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January 9, 2013

California Regional Water Quality Control Board, San Diego Region
Attn: Wayne Chiu, P.E.
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

RE: Comment -Tentative Order No. R9-2013-0001
Regional MS4 Permit, Place ID: 786088Wchiu

Dear Wayne,

The Priority Development "cutoff" levels don't appear to have a link to soil types, which greatly impact the amount of runoff. A site with Type A soil ("Site A") retains a large portion of rainwater naturally, and has a small amount of runoff. Adding 5,000 square feet (SF) of impervious surface to "Site A" massively increases the amount of runoff compared to the natural condition because the water that previously soaked into the ground now runs off. Compare this to a site of equal size and slope but with Type D soil ("Site D"). In its natural condition very little water is retained by soaking into the ground due to the tight soil matrix and rock. Adding 5,000 square feet of impervious surface to "Site D" only slightly increases runoff from the site, since the site was nearly impervious in its natural condition. The permit should reflect this basic hydrologic tenant, and have stepped cutoff, such as: 5,000 SF for A soils, 6,000 SF for B, 7,000 for C, and 9,000 SF for D. This would more accurately reflect the increase in runoff from sites with differing soils.

Suggested language:

II.E.b.(2)(a)
New development projects that create ~~10,000 square feet or~~ more ~~of~~ impervious surfaces (collectively over the entire project site) based on the following soil types:

Type A soil = 10,000 square feet or more
Type B soil = 12,000 square feet or more
Type C soil = 14,000 square feet or more
Type D soil = 16,000 square feet or more

This category includes commercial, industrial, residential, mixed-use, and public development projects on public or private land which fall under the planning and building authority of the Copermittee.

II.E.b.(2)(g)
Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface ~~that is 5,000 square feet or more~~ used for the transportation of automobiles, trucks, motorcycles, and other vehicles that meet the following criteria:

Type A soil = 5,000 square feet or more
Type B soil = 6,000 square feet or more
Type C soil = 7,000 square feet or more
Type D soil = 9,000 square feet or more

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Compliance

Develop language to clearly link WQIPs to Permit compliance.

TMDLs

Add options for BMP - and load-based compliance with WLAs. Insert language in *Modification of Programs* (Provision H) to reopen Permit to incorporate TMDL revisions and CLRP modifications.

Hydromodification Management Plan

Reaffirm Resolution R9-2010-0066; reference the Resolution in the permit.
Replace "pre-development naturally occurring" with "pre-project".

Should you have questions, you may contact me via email at sstrapac@poway.org or by phone at (858) 668-4653.

Sincerely,

DEVELOPMENT SERVICES DEPARTMENT

Steven E. Strapac, P.E., P.L.S.
Senior Civil Engineer

c: Steve Crosby, P.E., City Engineer
Roger Morrison, Management Analyst

M:\engserv\NPDES\2012 Permit\Request to Board.docx

County of San Diego

JACK MILLER
Director

DEPARTMENT OF ENVIRONMENTAL HEALTH
P.O. BOX 129261, SAN DIEGO, CA 92112-9261
Phone: (858) 505-6700 FAX (858) 505-6890
Phone: 1 (800) 253-9933
www.sdcdeh.org

ELIZABETH POZZEBON
Assistant Director

January 9, 2013

Mr. Wayne Chiu
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4353

NPDES PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION (REGIONAL MS4 PERMIT) (ORDER NO. R9-2013-0001)

Dear Mr. Chiu:

The County of San Diego, Department of Environmental Health (DEH) has reviewed the proposed draft Order No. R9-2013-001 (Regional MS4 Permit), and offers the following comments:

The existing San Diego MS4 Storm Water permit includes vector-related language which is intended to raise awareness of the potential unintended public health risk resulting from mosquito production in certain storm water management devices, the proposed draft permit does not. The removal of the vector-related language raises a significant concern, and we request that it be placed back into the proposed draft to protect public health. Please note that the San Diego Regional MS4 permit was the first in the United States to include vector-related language, and ultimately resulted in improved language adopted into storm water permits throughout the State.

The vector-related language included in the existing MS4 permit represents a compromise that allows water quality goals to be met while minimizing the risk to public health. It recognizes that mosquitoes cannot completely be eliminated given the current water quality requirements. It further serves a critical public health purpose of maintaining an awareness of the potential unintended public health threat created by mosquitoes, and emphasizes the importance of proper maintenance of storm water management and treatment structures to minimize the potential for mosquito production and ultimately the spread of mosquito-borne diseases including West Nile Virus (WNV).

WNV continues to be a threat to human health, and has proven to be unpredictable. 2012 was the second worst year for WNV in the United States and California since it was introduced 13 years ago. Approximately 5,400 human illnesses were confirmed nationwide, with 243 deaths as of December 12, 2012. In California there were 464 confirmed cases in 2012 with 18 deaths as of December 24, 2012.

It is critical that the State and the RWQCB continue to include vector-related language in storm water NPDES permits to protect public health. It would be counterproductive and counterintuitive to strive to improve the quality of water for the benefit of public and environmental health only to create environments highly conducive to mosquitoes that have the potential to severely impact human and animal health from mosquito-borne diseases.

The County of San Diego's DEH respectfully requests that the Board restore the vector-related language in the proposed draft MS4 Permit. The following is the existing permit language from Section D - Urban Runoff Management Systems, Subsection 2 - Development Planning:

> f. *If not properly designed or maintained, certain BMPs implemented or required by municipalities for urban runoff management may create a habitat for vectors (e.g. mosquitoes and rodents). However, proper BMP design and maintenance can prevent the creation of vector habitat. Nuisances and public health impacts resulting from vector breeding can be prevented with close collaboration and cooperative effort between municipalities and local vector control agencies and the State Department of Health Services during the development and implementation of urban runoff management programs.*

In addition, the County of San Diego's DEH requests that to facilitate inspection of new BMPs, the San Diego Regional Permit require that a list of new storm water management and treatment units be submitted by the Permittees to their respective vector control agencies. The County requests that the Permit include the following language recently added to the draft Fact Sheet for the Los Angeles MS4 permit:

> *Monitoring studies conducted by the California Department of Public Health (CDPH) have documented that mosquitoes opportunistically breed in structural storm water Best Management Practices (BMPs), particularly those that hold standing water for over 96 hours. Certain Low Impact Development (LID) site design measures that hold standing water such as rainwater capture systems may similarly produce mosquitoes. BMPs and LID design features should incorporate design, construction, and maintenance principles to promote drainage within 96 hours to minimize standing water available to mosquitoes. This Order requires regulated MS4 Permittees to coordinate with other agencies necessary to successfully implement the provisions of this Order. These agencies may include CDPH and local mosquito and vector control agencies on vector-related issues surrounding implementation of post-construction BMPs.*

Thank you for the opportunity to submit comments on the proposed draft language for the MS4 Permit. If you have questions regarding the above comments, please contact Rebecca Lafreniere, Chief, at (858) 694-3595 or by E-mail at Rebecca.Lafreniere@sdcounty.ca.gov.

Sincerely,

JACK MILLER, Director

cc: Richard Crompton, Director, County of San Diego, Department of Public Works
Rebecca Lafreniere, Chief, County of San Diego, Department of Environmental Health, Community Health Division

COUNTY OF RIVERSIDE
TRANSPORTATION AND LAND MANAGEMENT AGENCY
Transportation Department

Juan C. Perez, P.E., T.E.
Director of Transportation

January 9, 2013 *Submitted via email* to WChiu@waterboards.ca.gov

Wayne Chiu, PE
California Regional Water Quality Control Board – San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4353

Subject: Comment – Tentative Order No. R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu

Dear Mr. Chiu:

The Riverside County Transportation Department (Transportation Department) appreciates the opportunity to comment on Tentative Order No. R9-2013-0001, NPDES No. CAS0109266, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region (Tentative Order). The Transportation Department requests that the Tentative Order be revised to provide that public works transportation improvement projects are exempt from individual project-specific Standard Stormwater Mitigation Plans (SSMPs) when they are designed and constructed to the Maximum Extent Practicable (MEP) in conformance with the USEPA guidance "Managing Wet Weather with Green Infrastructure: Green Streets."[1]

Background

The Public Works departments of municipalities have an obligation to the traveling public to provide safe, efficient, and reliable street and road systems for travel. Municipalities are not profit driven, but, as public servants, strive to maintain and improve as many roads as possible within each fiscal year budget and within a reasonable (but uncertain) capital improvement program planning horizon. The Riverside County Transportation Department takes advantage of state and federal safety grants as often as we can; however such grants often come with funding limits, matching requirements, and time constraints for project completion.

Public Works transportation projects are different from conventional private development projects

[1] USEPA. 2008. http://water.epa.gov/infrastructure/greeninfrastructure/upload/gi_munichandbook_green_streets.pdf and http://water.epa.gov/infrastructure/greeninfrastructure/gi_policy.cfm#municipalhandbook

due to the following:

- State and federal funding for Public Works transportation projects have strict timelines.
- Most Public Works transportation projects (1) are constrained by private property and utility easements on either side of the road right-of-way; (2) are linear in nature, and (3) have great difficulty meeting each and every requirement associated with a project-specific SSMP given right-of-way constraints.
- The number of roadway projects delivered to the public is based on annual transportation fund allocations.
- The purpose of the majority of Public Works transportation projects is to improve public safety. Safety projects include intersection improvements, minor shoulder widening, curve realignments, adjustments to vertical grades, and turn pockets.

On July 2, 2012 Riverside County submitted to the Executive Officer of the San Diego Regional Water Quality Control Board the Transportation Project Guidance that was developed in accordance with Order No. R9-2010-0016, NPDES No. CAS0108766, Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the County of Riverside, the Incorporated Cities of Riverside County, and the Riverside County Flood Control and Water Conservation District within the San Diego Region (2010 Riverside County MS4 Permit). The Transportation Project Guidance was prepared in accordance with Directive F.1.d.(2)(g) of the 2010 Riverside County MS4 Permit, which stated:

> *"...To the extent that the Copermittees develop revised standard roadway design and post-construction BMP guidance that comply with the provisions of Section F.1 of the Order, then public works projects that implement the revised standard roadway sections do not have to develop a project specific SSMP. The standard roadway design and post-construction BMP guidance must be submitted with the Copermittee's updated SSMP."*

The Transportation Project Guidance addresses improvements to streets, roads, highways, and freeways, and Class I Bikeway and sidewalk projects undertaken by the MS4 Copermittees and incorporates the principles contained in the USEPA guidance, "Managing Wet Weather with Green Infrastructure: Green Streets" and addresses Hydrologic Conditions of Concern criteria. The Transportation Project Guidance was also submitted to the Santa Ana Regional Water Quality Control Board and was approved by its Executive Officer on October 22, 2012. To date, the Riverside County NPDES MS4 Copermittees have received no comments or questions from staff of the San Diego Regional Water Quality Control Board relative to the Transportation Project Guidance submitted on July 2, 2012.

Transportation Department Project Example

Recently the Riverside County Transportation Department completed the construction of a roundabout on Rancho California Road in the Temecula area. The purpose of the project was to improve an existing intersection deficiency. Several thousand cars travel Rancho California Road each day for touring the many wineries in the Temecula area. Rancho California Road has multiple intersections with several in need of traffic control measures to slow the traffic through the area. The needed traffic control measures would improve safety and provide an opportunity for residents, tourists, and commercial vehicles to cross Rancho California Road or to merge into traffic on the road. A traffic signal light would have been the appropriate solution in a more urban setting. However, in this relatively rural environment, a roundabout was determined to be a more appropriate traffic control measure. This project was built at a cost of $1.6 million with $800,000 (half the total project cost) needed to purchase land and to construct a water quality basin to treat 100% of the runoff from the project site. We believe that a regional approach to water quality would have been much more appropriate, not only due to cost, but also because of the aesthetic sensitivity of the surrounding community. Although the water quality basin performs its function and meets the requirements of a project-specific Standard Stormwater Mitigation Plan (SSMP), it does not aesthetically complement the surrounding environment. This project area consists of rolling hills, a vast landscape of vineyards, beautiful wineries, and now, a nicely landscaped roundabout with an adjacent and unattractive water quality basin. In addition to the less than optimal (aesthetically) water quality basin, the cost of the project meant that other roundabouts planned for Rancho California Road had to be deferred.

Support for Transportation Department's Request

Providing the NPDES MS4 Copermittees the alternative of using the Transportation Project Guidance would provide the most efficient use of limited public resources by:

- Ensuring that *all new roadway projects* would incorporate hydromodification Best Management Practices (BMPs) as described in the Tentative Draft Regional MS4 Permit.
- Ensuring *all roadway improvement projects* would incorporate hydromodification BMPs to the Maximum Extent Practicable (MEP) through the use of templates included in the Transportation Project Guidance
- Allowing time sensitive projects to proceed without delay.
- Ensuring that projects do not get "shelved" due to costly project-specific SSMPs for individual projects.
- Reducing the need to condemn property for the purpose of acquiring enough right-of-way to meet the requirements of SSMPs for individual projects.

The Santa Ana River Region and the Santa Margarita River Region NPDES MS4 Permittees have

dedicated substantial time and resources to developing Transportation Project Guidance intended to provide a consistent structure and decision-making procedures during the planning and design of their transportation improvement projects. These NPDES MS4 Permittees are just beginning to implement the Transportation Project Guidance in which they invested to comply with their 2010 NPDES MS4 permits. The planning horizon for most transportation improvement projects is years. The NPDES MS4 Permittees should now be afforded the opportunity to implement the Transportation Project Guidance

The recently adopted 2012 NPDES MS4 Permit for the Coastal Watersheds of Los Angeles County requires street and road construction of 10,000 square feet or more of impervious surface area to (1) follow the USEPA guidance regarding "Managing Wet Weather with Green Infrastructure: Green Streets" to the maximum extent practicable and (2) to address hydromodification control measures. However, projects that are replacement, maintenance or repair of a Permittee's existing flood control facility, storm drain, or transportation network may be exempted from the hydromodification control measures. Further, the Coastal Los Angeles NPDES MS4 permit does not impose post-construction (permanent) BMPs on routine maintenance activities that are conducted to maintain original line and grade, hydraulic capacity, original purpose of facility or emergency redevelopment activity required to protect public health and safety, including impervious surface replacement or repaving, such as the reconstruction of parking lots and roadways which does not disturb additional area and maintains the original grade and alignment.

Request for Revision of Tentative Order

We urge you to reconsider the requirements imposed upon Public Works transportation projects as included in the Tentative Order No. R9-2013-0001. We request that you direct staff include the following exemption language into Provision E.3.(b)(3):

(b) Any impervious surface that is 5,000 square feet or more used for the transportation of automobiles, trucks, motorcycles, and other vehicles that is designed and constructed to the Maximum Extent Practicable in accordance with the USEPA guidance "Managing Wet Weather with Green Infrastructure: Green Streets"[2]. ~~Retrofitting of existing paved alleys, streets or roads that meet the following criteria:~~

~~(i) Must be two lanes or less; AND~~

~~(ii) Must be a retrofitting project implemented as part of an alternative compliance project option under Provision E.3.c.(3)(b)(v) to achieve the performance requirements of Provisions E.3.c.(1) and/or E.3.c.(2) for a Priority Development Project; AND~~

[2] USEPA. 2008. http://water.epa.gov/infrastructure/greeninfrastructure/upload/gi_munichandbook_green_streets.pdf and http://water.epa.gov/infrastructure/greeninfrastructure/gi_policy.cfm#municipalhandbook

~~(iii) Designed and constructed in accordance with the USEPA Green Streets guidance.~~

Conclusion

The Transportation Department appreciates the opportunity to comment on the Tentative Order and your consideration of our comments. The Transportation Department looks forward to participating in the further development of the next version of the Tentative Order in a collaborative process aimed at addressing the issues raised in this letter. If you have any questions regarding our comments, please contact Claudia Steiding at 951.955.1694.

Sincerely,

Patricia Romo

Patricia Romo, PE
Deputy Director
Riverside County Transportation Department

cc: Claudia Steiding
Jason Uhley

From: Matthew Boomhower
To: Chiu, Wayne@Waterboards
Subject: Comment - Tentative Order No.R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu.
Date: Wednesday, January 09, 2013 4:44:32 PM

Mr. Wayne Chiu, P.E.
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Re: Comment—Tentative Order No. R9-2013-001, Regional MS4 Permit, Place ID: 786088Wchiu

Dear Mr. Chiu:

I am writing in regards to the San Diego Regional Water Quality Control Board's Tentative Order R9-2012-0011 ("Permit") dated October 31, 2012. After reviewing the proposed Permit, I am concerned it will impose expensive, onerous, and untested regulations on local governments, businesses, and residents. These new regulations will impact the region's economy without improving its water quality.

Everyone understands the importance of clean, safe water to the region. It is important, however, that we use our limited resources wisely, and ensure that our efforts produce the desired outcome of improving water quality. I applaud the Board's inclusion of Water Quality Improvement Plans (WQIP) as a first step in developing a cost-effective approach to improving our water. Analysis remains a critical component of a successful strategy, and I am glad to see that the Board is committed to finding the best possible solution to water quality improvement.

I am concerned, however, that the costs associated with enforcing and implementing the permit will have a negative impact on my business and San Diego's economy. The four primary areas of concern include: 1) the strict liability for exceeding water quality objectives; 2) the additional and changing requirements for development projects, impacting items such as storm water retention and discharge; 3) the preemption of WQIPs by new and changing regulatory requirements prior to allowing the WQIPs to be developed and implemented; and 4) the lack of reliable funding sources to implement these regulatory changes.

It is necessary to hold individuals, businesses and governments accountable, but it is critical that the accountability measures can be reasonably achieved and are likely to have a significant and positive impact on San Diego's water. Because of these concerns, I respectfully request that the Permit focus on the timely development of effective and

enforceable WQIPs, and that each of the WQIPs be developed through a process that ensures public participation. I ask also that the designation of appropriate Best Management Practices in each watershed be determined through the WQIP process rather than the one size fits all strategy currently being proposed in the Permit. I ask further that until the Board adopts a WQIP for a watershed that the provisions of the existing Permit remain in place for that watershed. Finally, in order to avoid unnecessary litigation I request that the Board adopt the WQIPs as Orders implementing the proposed Permit.

I urge you to adopt final permit language that is evidence-based and both environmentally and economically sustainable. Thank you for your consideration.

Sincerely,

Matthew C. Boomhower, RA, CSI, CCCA
President
Southern Cross Property Consultants
858-395-8657
www.southerncrosspc.com

CITY OF DANA POINT

DEPARTMENT OF PUBLIC WORKS

January 10, 2013

Wayne Chiu, P.E.
California Regional Water Quality Control Board, San Diego region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340
(submitted electronically to wchiu@waterboards.ca.gov)

Subject: Comment - Tentative Order No. R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu.

Dear Mr. Chiu:

First, we would like to acknowledge the work that the Board staff has already accomplished through the focused work group efforts during the fall. Significant progress has been made on the Draft Permit from the input of co-permittees and NGO's alike since this process began in April 2012. Thank you.

That said, it was also apparent by the amount of testimony over two days at the following Board workshops that there remain significant concerns, many of which we believe can be easily be rectified to clarify and improve the Permit.

Following the Staff work sessions, we have spent a tremendous amount of additional time trying to explain our concerns at the Board workshops and work with our fellow permitees and co-permittees to develop comments and provide redline recommendations for the Permit language. Please review the comments and recommendations in writing that have been submitted on our behalf by the County of Orange, and which we support in great part.

Although it may first appear voluminous, the County of Orange redline recommendations should make for easy adjustment provided you concur with the justification and support that is presented. We have been working with these Permits now for many years and understand the importance of having carefully crafted language to allow for consistent implementation.

All of the issues that the Orange County letter raises reflect our concerns. However, we will add a few comments here on several selected issues to reinforce those comments from our own City's perspective.

For the hydromodification provision, please include the Engineered Channel Exemption (E3c2dii). While there may be a few locations upstream where reestablishment of a soft walled meandering stream may be technically & economically feasible, those locations are a small minority of the existing hard walled flood control channel system. As a suggestion to allow for that restoration possibility, you may want to reinstate the exemption, "Discharges storm water runoff into conveyance channels that are engineered for the capacity to convey the 10-year ultimate build out condition flow and are regularly maintained to ensure flow capacity all the

way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; except where the responsible flood control agency agrees with the likely feasibility of the proposed natural reestablishment and the long range goal is reflected in the approved WQIP." Although charging an in lieu fee to do other water quality improvements is a nice idea, it just won't stand up to legal challenge without a nexus. We feel it is important for the Permit to include justified requirements that are not subject to legal battles so as to not diminish the integrity of the program as a whole.

While we appreciate the intent of requiring roadwork to meet priority development standards, it must be restricted to new development (E.B.2g). In many cases, introducing water into the subgrade of street and gutter projects will be infeasible.

Our single biggest annual capital expenditure is street repair projects. The feasibility and cost to meet the draft imposed requirements could add 10% to 100% additional cost for these projects. This single requirement could exceed all the annual funding the City currently puts toward Water Quality Improvement. White it may be feasible to add these requirements to new development it is not appropriate for redevelopment and repair. Please allow EPA Green Street guidance to suffice as other NPDES permits do.

Please insert the TMDLs as originally written and intended. The municipalities and the SDRWQCB spent years developing the TMDL technical documents and approving them as part of the associated Basin Plan Amendment. As briefed by Nancy Palmer and carefully explained in the Orange County comments this is critical for both the Beaches and Creek TMDL, affecting the entire San Diego Region and Baby Beach TMDL. TMDLs by definition are based upon load, not concentration, and please include the necessary reopener provision(s).

The provisions requiring the development and implementation of a Water Quality Improvement Plan can be better aligned with the Jurisdictional Runoff Management Program requirements so that the programs are complimentary and prioritized instead of additive. We believe this is your intent, but the Draft Permit, as written, is unclear and open to conflicting interpretation at this time.

The City also underwent an audit of three key components of the current NPDES MS4 Permit in June of 2012, specifically covering the over-irrigation prohibition, the IC/ID Detection, and the NAL program elements. Although we have not received any feedback regarding the outcome of the audit beyond the debrief that occurred at the end of the audit (which appeared to be positive), we wanted to mention it to ensure that any potentially helpful information obtained was not overlooked in this process.

Again, I would like to emphasize there are many more critical issues contained in Orange County's response letter (attached via reference). We believe that while well intended, some of the draft provisions exceed the Federal Clean Water Act MS4 regulations. Given the potential for third party lawsuits, these are of great concern to our elected officials representing our constituency. As a beach city we are strongly committed to improving water quality. We can still accomplish that progressively with the modifications the County has recommended.

Again, thank you for your past efforts and for continuing consideration of our remaining concerns. The City would like to request the opportunity to meet with you, other Regional Board staff and the County of Orange to review in detail the changes requested in the County letter. Perhaps including the other Counties in the meeting to resolve language issues would be good as well.

Please direct any questions regarding this letter to myself at (949) 248-3582.

Yours sincerely,

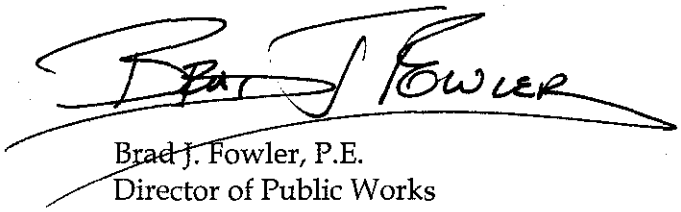

Brad J. Fowler, P.E.
Director of Public Works

Attachment via reference: Comments/Redline submitted by the County of Orange

CC: -Douglas Chotkevys, City Manager
- Richard Montevideo, City Attorney
- Dana Point OWQ Subcommittee Members
- Lisa Zawaski, City of Dana Point
- Mary Ann Skorpanich, County of Orange

005988

City of Mission Viejo

Public Works Department

Frank Ury
Mayor
Rhonda Reardon
Mayor Pro Tem
Trish Kelley
Council Member
Dave Leckness
Council Member
Cathy Schlicht
Council Member

January 10, 2013

Wayne Chiu, P.E.
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Subject: Comments on Tentative Order No. R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu.

Dear Mr. Chiu:

The City of Mission Viejo appreciates the opportunity to provide comments on Tentative Order No. R9-2013-0001, which is intended by the Regional Board to serve as the basis for stormwater regulation in the City upon the expiration of current Order R9-2009-0002. The City has been actively involved in the development of the comprehensive set of comments submitted by the County of Orange and supports those comments and attaches them by reference.

The City appreciates the revisions made by Regional Board staff since the prior Administrative Draft but believes that further changes are necessary, which are included in redline format in the County letter. A number of key issues have been extensively discussed in the focus meetings and Board workshops and, despite some changes, still remain a significant concern to the City. These include:

- The Receiving Water Limitations provisions in the Tentative Order could expose the City to Clean Water Act liabilities for discharges that cause or contribute to an exceedance of a water quality standard. A clear linkage between the compliance provisions and prohibitions, receiving water limitations, and effluent limitations must be established.

- The provisions dealing with land development, Low Impact Development (LID) and hydromodification control are significantly ratcheted up while existing permit programs are only just being implemented and/or pending approval. The City is particularly concerned with the elimination of all exemptions for the hydromodification control requirements, including for discharges to channels that have been engineered to prevent erosion. Exemptions for hydromodification management should include discharges to certain types of receiving waters and certain types of projects.

- The provisions implementing the Beaches and Creeks Total Maximum Daily Load (TMDL) bacteria requirements are inconsistent with the TMDL as it was developed and

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949/470-3056
FAX 949/581-5394

pose additional significant liabilities. Permit provisions must be consistent with the corresponding Basin Plan amendments.

- The provisions requiring the development and implementation of a Water Quality Improvement Plan need to be aligned with the Jurisdictional Runoff Management Program requirements so that the programs are complimentary and prioritized instead of additive.

Thank you for the opportunity to provide comments. The City would like to request the opportunity to meet with you, other Regional Board staff and the County of Orange to review in detail the changes requested in the County letter.

Please direct any questions regarding this letter to Joe Ames, Assistant City Engineer, at 949/470-8419.

Sincerely,

Dennis Wilberg
City Manager

C: Mark Chagnon, Director of Public Works
Rich Schlesinger, City Engineer
Joe Ames, Assistant City Engineer

CITY OF RANCHO SANTA MARGARITA

January 10, 2013

Mayor
L. Anthony Beall

Mayor Pro Tempore
Carol Gamble

Council Members
Steven Baric
Brad McGirr
Jesse Petrilla

City Manager
Jennifer M. Cervantez

Wayne Chiu, P.E.
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Subject: Comment – Tentative Order No. R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu.

Dear Mr. Chiu:

The City of Rancho Santa Margarita appreciates the opportunity to provide comments on Tentative Order No. R9-2013-0001, which is intended by the Regional Board to serve as the basis for stormwater regulation in the City upon the expiration of current Order R9-2009-0002. The City has been actively involved in the development of the comprehensive set of comments submitted by the County of Orange and supports those comments and attaches them by reference.

The City appreciates the revisions made by Regional Board staff since the prior Administrative Draft, but believes that further changes are necessary, which are included in redline format in the County letter. A number of key issues have been extensively discussed in the focus meetings and Board workshops and, despite some changes, still remain a significant concern to the City. These include, without limitation:

- The Receiving Water Limitations provisions in the Tentative Order could expose the City to Clean Water Act liabilities for discharges that cause or contribute to an exceedance of a water quality standard. A clear linkage between the compliance provisions and prohibitions, receiving water limitations, and effluent limitations must be established.

- The provisions dealing with land development, Low Impact Development (LID) and hydromodification control are significantly ratcheted up while existing permit programs are only just being implemented and/or pending approval. In addition, many of the land development requirements conflict with applicable federal and/or state constitutional provisions, laws and court decisions and may not be practically enforceable.

- The City is particularly concerned with the elimination of all exemptions for the hydromodification control requirements, including for discharges to channels that have been engineered to prevent erosion. Exemptions for hydromodification management should include discharges to certain types of receiving waters and certain types of projects.

- The provisions implementing the Beaches and Creeks Total Maximum Daily Load (TMDL) bacteria requirements are inconsistent with the TMDL as it was developed and pose additional significant liabilities. Permit provisions must be consistent with the corresponding Basin Plan amendments.

- The provisions requiring the development and implementation of a Water Quality Improvement Plan need to be aligned with the Jurisdictional Runoff Management Program requirements so that the programs are complimentary and prioritized instead of additive.

Thank you for the opportunity to provide comments. The City would like to request the opportunity to meet with you, other Regional Board staff and the County of Orange to review in detail the changes requested in the County letter.

Please direct any questions regarding this letter to myself or Rae Beimer, Environmental Associate, at 949-635-1800 x 6503.

Yours sincerely,

E. (Max) Maximous, P.E.
City Engineer

CC: City Council
Jennifer M. Cervantez, City Manager
Gregory E. Simonian, City Attorney
County of Orange, OC Public Works Department

EM/rb

CITY OF VISTA
CALIFORNIA

January 10, 2013

Wayne Chiu, P.E.
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Subject: **City of Vista Comments – Tentative Order No. R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu**

Dear Mr. Chiu:

The City of Vista appreciates the efforts that the Regional Water Board staff has undertaken to involve the stakeholders in the development of the new permit. The early release of the administrative draft, subsequent focused meetings, and revisions incorporated into the Tentative Order have resulted in a Tentative Order that is much improved and will allow stormwater programs in the region to make meaningful progress towards improving water quality.

The City of Vista participated in the development of the comments submitted by the County of San Diego on behalf of the 21 Copermittees in San Diego County. We support the comments and look forward to their inclusion in the Final Order. Additionally, a couple of comments are included in the attached table related to the Land Development Provisions for consideration.

We understand the need to balance the collaborative process in the development of the permit with the regulatory oversight incumbent on the Regional Water Quality Control Board. Thank you for the opportunities provided for the Copermittees to add their experience and insights to the process. Please contact Paul Hartman at (760) 726-1340 x1373 or at phartman@cityofvista.com with any questions related to our comments.

Sincerely,

Greg Mayer
City Engineer

P: 760-639-6111 | www.cityofvista.com | F: 760-639-6112
200 Civic Center Drive, Vista, California 92084-6275

Attachment 1 - City of Vista Comments on Tentative Order R9-2013-0001

Permit Section	Tentative Order Page	Section Title	Reason for Prosed Change/Comments	Proposed Changes
E.3.c.(1)(a)	78	Development Planning - Structural BMP Performance Requirements (Stormwater Pollutant Control BMP Requirements)	LID is intended to retain the first flush up to the 85th percentile runoff difference. In San Diego County, the 24 hour - 85th percentile precipitation event (P_{85}) usually generates runoff in natural conditions, as impervious soils (Type D) and poor or fair natural vegetation are predominant in the County. Runoff as a percentage of precipitation is dependent on the conditions of the natural terrain and the size of P85. The removal of this naturally occurring runoff as required in Section E.3.c.(1)(a)(i) may create an environmental problem in downstream wetlands, where critical habitat depends on this runoff for survival.	Modify E.3.c.(1)(a)(i) to read "The volume of storm water produced from a 24-hour 85th percentile storm event in post-development conditions less the volume of storm water produced by the same storm under natural conditions[26]" Modify footnote 26 to read "LID is intended to retain the first flush up to the 85th percentile runoff difference. The 85th percentile runoff in natural conditions will depend on the original natural vegetation and soil type."
E.3.c.(3)(b)(i)[c]	82	Alternative Compliance to Onsite Structural BMP Performance Requirements	The selection of 1.5 does not appear to be scientifically based. It is understood that a number greater than one is needed, but such a number could also be obtained from a concentration load – runoff analysis. The permit should have flexibility for projects where a more accurate scientific justification is provided.	Modify section E.3.c.(3)(b)(i)[c] to read "Biofilter at least 1.5 the design capture volume that is not reliably retained onsite, or biofilter a volume that demonstrates an equivalent load reduction that would occur if a retention LID volume is in place;"

DEPARTMENT OF THE NAVY
COMMANDER NAVY REGION SOUTHWEST
937 NO. HARBOR DR.
SAN DIEGO, CALIFORNIA 92132-0058

IN REPLY REFER TO:
5090
Ser N45JWW.ch/013
January 10, 2013

Wayne Chiu, P.E.
California Regional Water Quality Control Board,
San Diego Region
9174 Sky Park Court, Suite 100
San Diego California 92123-4340

Dear Mr. Chiu:

SUBJECT: COMMENT - TENTATIVE ORDER NO. R9-2013-0001, REGIONAL MS4 PERMIT, PLACE ID: 786088WCHIU

On behalf of Navy Region Southwest I respectfully submit these comments on the draft Regional MS4 Permit.

In a conscious policy decision, supported by the CWA, the MS4 permit mandates toxicity monitoring for receiving waters. This policy direction recognizes some very important and unique aspects of storm water discharges namely; they are intermittent, flow is unpredictable, and they are short duration representing a very temporary condition in the receiving water.

Receiving water toxicity testing is consistent with the San Diego Region Basin Plan which states that *"All waters shall be maintained free of toxic substances in concentrations that are toxic, or that produce detrimental physiological responses in human, plant, animal, or aquatic life"*. It is also consistent with the current draft of the State Water Board Policy for Toxicity Assessment and Control as well as the recently adopted Framework for Monitoring and Assessment in the San Diego Region. Together these documents insure that reliable and statistically and scientifically sound information is produced to show permit compliance, and guide decisions about, and the evaluation of, the progress of efforts to protect and restore the quality and beneficial uses of waters in the San Diego Region.

The Navy supports the use of toxicity testing of the receiving water as described in Provision D Monitoring and Assessment Program Requirements. Toxicity testing of the receiving water, as opposed to testing 100% storm water, is protective of water quality and beneficial uses and accurately measures toxicity impacts from storm water discharges.

Lastly, as articulated in the MS4 Fact sheet F-36:

> *"[t]he inclusion of receiving water limitations is also consistent with the Ninth Circuit Court of Appeals' ruling in Defenders of Wildlife v. Browner (191 F.3d 1159, 1166 (1999)) that the permitting authority has discretion regarding the nature and timing of requirements that it includes as MS4 permit conditions to attain water quality standards."*

We support the San Diego Regional Board's use of toxicity testing of the receiving water in all NPDES Stormwater Permits where toxicity limitations or monitoring requirements are determined necessary to insure water quality protection. This position is supported by the CWA, Porter Cologne Act, State Policy, US EPA-approved Regional Basin plans.

The Navy requests that you consider these comments in the upcoming permit adoption. The points of contact for this letter are Mr. Christopher Haynes at christopher.a.haynes@navy.mil or (619)532-2285 and Mr. Brian Gordon at brian.gordon@navy.mil or (619)532-2273.

Sincerely,

Brian S. Gordon

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RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

January 10, 2013

Mr. Wayne Chiu, P.E.
California Regional Water Quality
Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego, California 92123-4340

Dear Mr. Chiu:

Re: Tentative Order No. R9-2013-0001
Regional MS4 Permit
Place ID: 786088Wchiu

The Riverside County Flood Control and Water Conservation District (District) is submitting this comment letter on the above listed Tentative Draft Order on behalf of the Riverside County MS4 Copermittees within the San Diego Region (Riverside County Copermittees) which includes the District, the County of Riverside and the Cities of Murrieta, Temecula and Wildomar. Tentative Draft Order R9-2013-0001 (Draft Permit) was drafted by Board staff to cover Phase I municipal separate storm sewer system (MS4) Copermittees in San Diego County, southern Orange County, and the portion of southwestern Riverside County within the Santa Margarita Hydrologic Unit.

The Riverside County Copermittees have previously commented that the San Diego Water Board lacks authority to adopt a regional permit covering Orange and Riverside Counties, in addition to San Diego County; a comment which is discussed in further detail below and in the attached legal comments. Notwithstanding such objection, and subject to it, the Riverside County Copermittees are providing comments on the Draft Permit.

In the workshop on the Administrative Draft Order held on April 22, 2012 San Diego Water Board staff identified the following desired outcomes for the proposed permit:

- Improving the quality of water discharged from the MS4
- Restoring or enhancing Beneficial Uses and Receiving Water quality

It was further identified by Board staff that to be able to meet those goals, the proposed regional MS4 permit needed to be 1) Strategic, 2) Adaptive, and 3) Synergistic.

Notwithstanding the concerns of the Riverside County Copermittees with regard to the legal authority to issue a regional MS4 permit, the Copermittees agree that being able to adapt and direct resources toward specific water quality priorities in a given watershed, rather than all potential problems simultaneously, is more likely to result in actual and meaningful improvements in water quality. However, to be able to achieve those improvements the MS4 Permit must be crafted to provide the Copermittees with the ability to truly and fully

adaptively manage their programs to focus resources on those BMP strategies and monitoring efforts that are identified as being most effective, consistent with the MEP standard, at addressing watershed priorities.

Unfortunately, many provisions in the Draft Permit, including but not limited to the Receiving Water limitation provisions in Provision A and others discussed in this letter, still do not fully support the achievement of those outcomes. The Draft Permit does not provide the Copermittees with the flexibility to be fully strategic in managing their resources nor the ability to fully adapt their programs to focus on the highest priority water quality needs of the watershed. This comment letter and the other documents submitted herewith (a redline of the Draft Permit and Legal Comments) identify some suggestions which, if adopted by the San Diego Water Board, will help to address these limitations and facilitate the desired improvements.

This comment letter is organized as follows:

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As noted, the Riverside County Copermittees also are submitting a redline of the Draft Permit ("Redline") that proposes alternative language intended at achieving solutions to the various issues raised in this letter, and a Legal Comment document ("Legal Comments") that provides additional legal context for the various issues raised in this letter. The Riverside County Copermittees reserve their right, in the context of filing a Report of Waste Discharge ("ROWD") prior to the expiration of Order R9-2010-0016 (the 2010 MS4 Permit), to again address these issues and others relevant and appropriate to the SMR.

1 BACKGROUND

The Riverside County Copermittees were issued an extensive and prescriptive MS4 Permit in November 2010 which greatly expanded monitoring obligations, required special studies, a jurisdictional runoff management program, and Watershed Workplan requirements that were very different than the requirements set forth in the previous MS4 Permit issued to the Copermittees. Development and implementation of the 2010 MS4 Permit compliance requirements has been very expensive, especially in comparison to the relatively few demonstrated impairments of Beneficial Uses in the region and the Copermittees' resources. These requirements have left other important societal needs unfulfilled by the Riverside County Copermittees during a period of unprecedented and continuing economic distress. Further, the Riverside County Copermittees are still in the process of developing and implementing these 2010 MS4 Permit requirements, which is a serious concern given the very different compliance approach proposed in the Draft Permit. The Copermittees hope that the compliance efforts under the current MS4 Permit are taken into account when they submit their ROWD at the expiration of the 2010 MS4 Permit.

2 General Comments

2.1 Regional Permit

The Riverside County Copermittees respectfully submit that the San Diego Water Board is not authorized under the Clean Water Act or under its implementing regulations to issue a regional permit to Copermittees in San Diego County, South Orange County and the Santa Margarita Region (SMR) of Riverside County. As discussed more fully in the Legal Comments, the only circumstance under which the San Diego Water Board could issue such a permit would be if the Copermittees in these counties agreed to such a permit. Additionally, while the Draft Permit purports to affect the conduct of the Riverside County Copermittees upon expiration of the 2010 MS4 Permit in November 2015, the Riverside County Copermittees have not submitted a ROWD requesting coverage under a regional permit. Because no application has been made for the regional permit, which is a requirement set forth in the CWA regulations, the San Diego Water Board lacks jurisdiction to name the Riverside County Copermittees on the Draft Permit at this time.

Notwithstanding the above, the Riverside County Copermittees are submitting the comments in this letter based on:

- The San Diego Water Board staff's stated intent to enroll the Riverside County Copermittees in this permit upon expiration of the 2010 MS4 Permit.
- Statements made by San Diego Water Board staff that this comment period would serve as the primary opportunity for the Riverside County Copermittees to influence their next term MS4 Permit. The Riverside County Copermittees are entitled, as part of the ROWD process, to again raise relevant issues regarding permit provisions, but have undertaken in these comments to address major current concerns.

2.2 Outcome Focus

As mentioned above, the Copermittees agree that being able to adapt and direct resources toward addressing the specific water quality priorities in a given watershed, rather than all potential problems simultaneously, is more likely to result in actual/meaningful improvements in water quality. However, to be able to achieve those improvements, the MS4 Permit must fully integrate the following principles:

- **The Jurisdictional Program requirements must be fully flexible:** The Permit must be written in a way that allows the Copermittees to truly and adaptively manage their programs to fully focus their existing resources on those BMP strategies and monitoring efforts that are identified within the Water Quality Improvement Plan (WQIP) as being most effective, consistent with the Maximum Extent Practicable (MEP) standard, at addressing the watershed's priorities. We understand this to be the goal of the San Diego Water Board as well. While some elements of the Draft Permit embody this need, others do not and require dedication of resources to specific pre-defined efforts, regardless of the identified need for that effort in the watershed. The specific program areas that need more work to this end are:

    - The approach to addressing Non-stormwater discharges
    - Development Planning
    - Retrofitting
    - Channel Rehabilitation

These issues and proposed new language to address these issues are included throughout this letter and/or in the attached Redline.

- **Basin Plan updates need to be Prioritized by the San Diego Water Board:** For outcome-based permitting to be successful, the desired outcomes must be achievable by and appropriate to the Copermittee. To do that, the outcomes must take into account the background conditions in the watershed, and be appropriate for the attainment of Beneficial Uses in the specific waterbody, based on the specific conditions within and influencing that waterbody. The values in the Basin Plan should be comprehensively re-evaluated to ensure that water quality standards are scientifically justified to protect Beneficial Uses. Without updating the Basin Plan, the outcomes that the Copermittees target in the WQIPs would be arbitrary and not guaranteed to achieve the desired beneficial use improvements. Such an update should be pursued aggressively, led by and adequately funded by the San Diego Water Board, with participation by the MS4 Copermittees and other dischargers and stakeholders in the watershed.

- **Other Dischargers need to be Similarly Regulated by the San Diego Water Board:** The MS4 Copermittees are not the only dischargers of pollutants in the watershed. For example, the SMR of Riverside County includes State Lands (such as Caltrans), Tribal Lands, Agricultural Operators, Industrial Permit dischargers, Construction Permit dischargers, Phase II entities, Water Districts, and 'De Minimus' dischargers issued general permit coverage; all of which:

- Have separate regulatory programs (such as permits or waivers) implemented by the San Diego Water Board;
- May discharge pollutants, including non-stormwater, that can affect the quantity and quality of runoff, both directly within Receiving Waters, and in runoff discharges that may enter into and be discharged from the MS4; and
- Cannot be regulated by the Copermittees for the quantity and quality of their runoff because of their separate permits or waivers granted by the NPDES Program Administrator.

As such, while MS4 Copermittees can implement programs to reduce pollutants in discharges that are within their legal jurisdiction, no amount of effort by the MS4 Copermittees can be expected to fully attain water quality standards in the Receiving Waters. The only way to achieve that outcome will be for the NPDES Program Administrator (the San Diego Water Board in most cases) to directly regulate each of these entities to similar levels and standards as set forth by this Permit.

2.3 Responsibility for meeting goals of CWA

The CWA requires Copermittees subject to any MS4 permit, including the Draft Permit, only to address discharges from their MS4s. 33 U.S.C. § 1342(p)(3)(B). The Copermittees are not required to restore Beneficial Uses in any Receiving Water, or to address sources of pollution to those Receiving Waters that are not being discharged into or from those MS4s. However, in various provisions in the Draft Permit, there is a suggestion that the Copermittees are solely responsible for attaining water quality standards in their respective Receiving Waters. The San Diego Water Board must make clear in the Draft Permit that the responsibilities of the Copermittees are limited to their MS4s and the requirements of the CWA for municipal stormwater dischargers. Redline changes have been proposed in the above referenced portions of the Draft Permit to address this issue.

3 Specific Comments

The following comments represent specific high level concerns that the Riverside County Copermittees have identified at this time. Additional comments on the Draft Permit can be found in the Redline, as well as in the attached Legal Comments.

3.1 Findings

The Riverside County Copermittees have two separate sets of comments on the Findings. The first addresses the need for additional findings, with respect to aspects of California law and the physical setting of the SMR. The second set of comments focuses on existing Findings in the Draft Permit.

3.1.1 Needed Additional Findings

The Findings in the Draft Permit fail to fully address the context and conditions under which the proposed permit requirements are to be applied. A more complete explanation of this background is necessary to ensure that the Provisions ultimately included in the Draft Permit are credible, appropriate and legally required, and that the Permit Provisions (which must stem from the Findings) reflect the

context of the broader issues that affect MS4s within the region. The Riverside County Copermittees request that San Diego Water Board staff work with the MS4 Copermittees to expand the Findings, including the addition of findings to address the following:

California Water Law

California law requires that downstream entities must accept runoff from up-gradient properties. Owners and operators of MS4s are not exempt from this legal mandate, even if that runoff contains pollutants. Moreover, flood control districts, including the District, are mandated by the California Legislature (Legislature) to protect the lives and property of residents from floodwaters. The Riverside County Copermittees request that a finding, in the form set forth in the Redlines, be added to the Draft Permit.

Flooding

Many areas that would be under the jurisdiction of the Draft Permit are subject to periodic catastrophic flooding, which results from natural conditions, specifically the presence of mountains and hilly areas in close proximity to development, along with the effect of strong Pacific storms. This flooding would occur even in the absence of development. The Legislature recognized the importance of this issue in the early 20th Century, when it established flood control districts across the state, including in Riverside, Orange and San Diego Counties. Such flooding has, and if not controlled, could result in loss of life and widespread property damage. Further, the flooding can mobilize significant amounts of pollutants from industrial, commercial, residential and agricultural lands, damaging watercourses, habitat, and the Beneficial Uses therein. MS4 systems are designed and constructed to mitigate these impacts. The Riverside County Copermittees request that a finding in the form set forth in the Redline be added to the Draft Permit.

Flood Control District Acts

As noted above, the Legislature established Flood Control Districts in Orange, Riverside, and San Diego Counties through a series of Flood Control Acts. The Legislature determined that protection of life and property from the effects of flooding through the implementation of flood control improvements was a priority, and assigned those Districts with the sole responsibility to design, construct and maintain those improvements necessary to manage and contain floodwaters to prevent such negative impacts, as well as to conserve floodwaters for beneficial use. As noted above, these improvements represent fundamental water quality BMPs inasmuch as they reduce the widespread exposure of runoff to pollutants. The Flood Control Districts, while owners and operators of MS4s, have no authority or powers beyond those granted by the Legislature. The Legislature did not provide the Flood Control Districts, for example, the authority to regulate land uses within the municipal jurisdictions of Riverside County, nor to control the volume or quality of runoff discharged by those land uses. Findings describing the legislative priority for flood control and the limitations on the governing power of the Flood Control Districts should be added to set forth the appropriate role of the Flood Control Districts as MS4 Copermittees. The Riverside County Copermittees request that a finding, in the form set forth in the Redline, be added to the Draft Permit.

Limits on Extent of Permittee Legal Authority

The MS4 Copermittees lack the authority to regulate many significant sources of pollutants that may impact Receiving Waters. For example, the Copermittees cannot regulate pollutants discharged from federal and state lands, facilities, tribal lands, special districts, utilities, agricultural lands, or railroads. Moreover, the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) preclude local regulation of pesticides. The Riverside County Copermittees request that a finding in the form set forth in the Redline be added to the Draft Permit.

3.1.2 Comments on Existing Findings

Findings 3 and 15 (and elsewhere in Draft Permit)

In Findings 3 and 15 (and throughout the Draft Permit), it is stated that the CWA requires controls to reduce the discharge of pollutants "in stormwater" to the MEP. Finding 15, moreover, states that non-stormwater discharges from the MS4 are "not considered stormwater discharges and therefore are not subject to the MEP standard, stating that the MEP standard "is explicitly for 'Municipal . . . Stormwater Discharges" from the MS4s.

These conclusions are directly contrary to the plain language of the CWA, as set forth in the November 16, 1990 preamble accompanying the CWA stormwater regulations. Those authorities provide that the MEP standard applies to *all* pollutants discharged from the MS4, notwithstanding that some may be transported by non-stormwater. Additionally, the Redline reflects deletion of the limitation of the MEP standard to stormwater discharges in multiple locations, reflecting federal law. For a further discussion of this issue, please see the Legal Comments. The Riverside County Copermittees also request deletion of Finding 15.

Finding 11

This Finding states that "[r]ivers, streams and creeks in developed areas used [to convey runoff] . . . are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and Receiving Water." This statement is incorrect and must be deleted (as reflected in the Redline). For reasons more fully set forth in the Legal Comments, natural streams cannot be considered MS4; there is no MS4 "outfall" from a channelized river or stream to a natural stream; and, USEPA itself requires a distinction between MS4s and Receiving Waters.

Finding 12

This Finding states that as operators of MS4s, "Copermittees cannot passively receive and discharge pollutants from third parties." By providing free and open access to an MS4 that conveys discharges to Waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not prohibit or otherwise control. This statement is incorrect and must be deleted (as set forth in the Redline). As the discussion in the Legal Comments indicates, municipalities must maintain the MS4 to protect the lives and property of their citizens and to prevent nuisance. Flood Control Districts have a statutory obligation to operate and maintain such MS4, an obligation which is not affected by

either the CWA or the terms of the Draft Permit. While an MS4 operator has the obligation to effectively prohibit the entry of non-stormwater into the MS4, it does not have legal responsibility for such discharges, which are the responsibility of the discharger itself and subject to the jurisdiction of the San Diego Water Board, pursuant to Water Code section 13260 *et seq.*

Finding 28

This Finding recites that the San Diego Water Board finds that the requirements of the Draft Permit "are not more stringent than the minimum federal requirements." The Riverside County Copermittees disagree with this finding, as it is not supported by the evidence, *i.e.*, the many requirements in the Draft Permit which exceed the federal MEP standard. Moreover, any decision by the San Diego Water Board to adopt "other provisions" going beyond MEP is not a federal requirement, but rather a discretionary decision taken by a state agency under authorization in the CWA. *See Defenders of Wildlife v. Browner,* 191 F.3d 1159, 1164-65 (9th Cir. 1999). Please see discussion in the Legal Comments. The Finding also indicates that the San Diego Water Board has developed an economic analysis of the Draft Permit. As set forth in the Legal Comments, the Riverside County Copermittees challenge the adequacy of that analysis.

Finding 29

This finding purports to find that the Draft Permit does not constitute an unfunded state mandate. The Riverside County Copermittees disagree with the conclusions set forth in this finding. More importantly, the finding is without legal effect because exclusive jurisdiction as to whether a state mandate exists, and whether it is unfunded lies with the Commission on State Mandates. Government Code §§ 17751 and 17552; *Lucia Mar Unified School District v. Honig* (1988) 44 Cal.3d 830, 837; *Hayes v. Commission on State Mandates* (1992) 11 Cal.App.4th 1546, 1596-97. The finding of an agency that has no jurisdiction to make that finding is entitled to no weight and should be deleted, as shown in the Redline. For an additional discussion of these issues, please see the Legal Comments.

Finding 31

The Riverside County Copermittees believe that the Receiving Water Limitation ("RWL") language set forth in the Draft Permit renders compliance with the permit impossible, since exceedances of water quality standards occur routinely through no fault of the MS4 Permittees. Thus, unless the RWL is modified to provide the Copermittees with a means to be in compliance, those Copermittees risk the threat of arbitrary San Diego Water Board enforcement or the bringing of citizen suit lawsuits under the CWA, which could nullify compliance with all other terms set forth in the Draft Permit, as discussed more fully in the Legal Comments. The exposure to third party litigation from the proposed RWL language is one of the most significant threats to an otherwise collaborative approach to achieving long term water quality improvement. This threat was emphasized by the recent bringing of a citizen suit lawsuit against the City of Malibu, the County of Los Angeles and the Los Angeles County Flood Control District based on similar language in the 2001 Los Angeles County MS4 Permit. The Riverside County Copermittees have suggested modifications to Provision A in the Redline and as discussed below and in the Legal Comments that are intended to better support the Iterative Process for compliance authorized by the State Water Resources Control Board in Order No.

2001-15, through the WQIP process. The Copermittees also note that the State Board considered the problems with the RWL language at a recent workshop, which may eventually result in modifications which should, if applicable, be reflected in the Draft Permit. Other requested changes to the Findings are set forth in the Redline.

3.2 Provision A, Prohibitions and Limitations

As noted above, the requirements set forth in Provision A are of great concern to the Riverside County Copermittees. The Copermittees generally support an approach to compliance that utilizes WIQPs as the implementing mechanism for the 'Iterative Process' described in Provision A.4, and that by implementing that iterative process in accordance with A.4, that the Copermittee should be in compliance with Provisions A.1 and A.2. The Redline reflects edits of Provision A to clarify the linkage between the prohibitions and limitations in Provisions A.1. through A.3. and Provision A.4 – which is described as the method for complying with the prohibitions and limitations. It must be noted, however, that the Riverside County Copermittees do not agree with the approach suggested, that any WQIP-based compliance approach be necessarily accompanied by a Reasonable Assurance Analysis. Such analyses can be extremely complex, expensive and time-intensive to develop, and similar analyses are commonly developed within TMDL models; taking a number of years to develop and refine. Given that the Santa Margarita Watershed has no adopted TMDLs; thus, comprehensive pollutant transport and BMP models are not available for the suite of constituents that might be considered for prioritization within a WQIP for the Santa Margarita Watershed. In the context of a TMDL, such models would be developed by the combined resources of the San Diego Water Board and a range of stakeholders and dischargers. Undertaking such an exercise solely with the public resources of the 275,000 residents of the SMR is beyond the financial ability of the Copermittees and would shift the responsibility for development of TMDLs from the San Diego Water Board to the Copermittees. Comments on Provision A can be found below, in the Redline and in the Legal Comments.

3.2.1 Overview of Key Issues

As noted above, an overriding issue for the Riverside County Copermittees is having a permit that, while being appropriately proactive and aggressive at addressing the prioritized water quality conditions with the Receiving Waters, is one that all Copermittees can remain in compliance with while implementing those requirements. As presently drafted (and as made clear by statements in the Fact Sheet), Provision A imposes immediate potential liability on every Copermittee if monitoring in the Receiving Waters reflects exceedances of water quality standards that may have been caused or contributed to by MS4 discharges. San Diego Water Board staff has repeatedly indicated in workshop presentations that they expect that Copermittees will not be able to comply with the Receiving Water Limitations and Discharge Prohibitions for some time. Staff has separately indicated that they are interested in having the Copermittees undertake bold initiatives in trying to address urban runoff pollution, and that the Copermittees have actually been encouraged to "fail early and fail often" as this would reflect such progress in refining these initiatives. The iterative, flexible and priority-setting approach reflected in the WQIP is intended to allow the Copermittees to focus on the most important problems in their watershed. The entire approach is endangered, however, by RWL provisions which would allow either the San Diego Water Board or a citizen plaintiff to sue the Copermittees for any individual exceedance of the

RWLs. Under the current version of Provision A, the unmitigated risk of such actions leads not to bold initiatives but rather to attempts to minimize liability.

As set forth in the Legal Comments, this approach is not mandated by the CWA, State Board orders or the opinion of the Ninth Circuit Court of Appeals in *Natural Resources Defense Council v. County of Los Angeles*, 673 F.3d 880 (9th Cir. 2011), *reversed*, 568 U.S. __ (January 8, 2013). As importantly, the threat of immediate potential noncompliance actually interferes with the ability of the Copermittees, including the Riverside County Copermittees, to comply with the Draft Permit. Instead of being able to focus on pollutants of highest concern in the watershed, as called for in the WQIP, the Copermittees will be forced to try to address every pollutant monitored, since the exceedance of any water quality standard leads to immediate potential liability. Moreover, because citizen plaintiffs are entitled to injunctive relief under Section 505(a) of the CWA, a federal judge could order the Copermittees to undertake steps completely independent of the WQIP or other compliance provisions in the Draft Permit.

The Riverside County Copermittees do not object to compliance provisions that will provide a means to achieve real improvement in water quality. The Copermittees are willing to undertake these Provisions, because the success or failure is in their control. Compliance with the requirements of Provision A, however, is beyond the control of the Copermittees. Based on the statements made during the workshop process, the Riverside County Copermittees believe that the San Diego Water Board is serious about working with the Copermittees on a permit that provides flexibility and problem solving approaches. To ensure that this flexibility is not lost, the Draft Permit must tie in compliance with Provisions A.1 through A.3 to a process set forth in Provision A.4. This approach is shown in the Redline and is discussed further below.

3.2.2 Comments in support of specific changes

Provision A, Introduction

The introduction notes that pollutants "in stormwater discharges" from the MS4 must be controlled to the MEP. As discussed above, the CWA does not differentiate between stormwater and non-stormwater discharges from the MS4; both must be controlled to the MEP standard. The Riverside County Copermittees have requested revised language in the Redline. Additionally, the linkage between compliance with Discharge Prohibitions (Provision A.1), Receiving Water Limitations (Provision A.2) and Effluent Limitations (Provision A.3) should be noted as being defined by Provision A.4. This change is reflected in the Redline.

A.1.a

First, language must be added providing that compliance may be addressed through the process set forth in Provision A.4. This language is provided in the Redline. Second, the Provision prohibiting discharges which are "threatening to cause" a condition of pollution, etc., is unenforceable, because it prohibits an action that, with respect to MS4 operators, is beyond their control. Moreover, there is no authority for such provisions in the Porter-Cologne Act. The Riverside County Copermittees request

deletion of this phrase, as shown in the Redline. Additionally, as set forth in the Legal Comments, the Provision improperly expands the Discharge Prohibitions to Waters of the State.

A.1.b

40 CFR § 122.26(d)(2)(iv)(B)(1) clarifies that the requirement for an MS4 Copermittee to "effectively prohibit" the discharge of Non-stormwater/illegal discharges into its MS4s is to be accomplished through "a program, including inspections, to implement and enforce an ordinance, orders or similar means…". The language of this Provision should reflect federal law in this respect. The Redline reflects this change.

A.1.c

First, this Provision requires the Copermittees to comply with the Basin Plan prohibitions listed in Attachment A. This list is over-inclusive, as it contains requirements that are not applicable to some or all of the Copermittees' MS4 discharges, or to the Riverside County Copermittees in particular. The Riverside County Copermittees request that this Provision be amended to read as follows: "Discharges from MS4s are subject to all applicable waste Discharge Prohibitions in the Basin Plan." This change is noted in the Redline. Second, language must be added providing that compliance with this restriction can be obtained through the process set forth in Provision A.4. This language is provided in the Redline.

A.2.a

First, this Provision and Provisions A.1. and A.3 should be linked to the iterative process described in A.4. Please see the Redline.

Second, not all plans, policies, etc. set forth in Provision A.2.a.(1)-(4) may qualify as "water quality standards" or be applicable to all the MS4 Copermittees. These subsections should be deleted, and replaced with a reference to "Water Quality Standards," which is a defined term in the Draft Permit (This change is reflected in the Redline). Otherwise, the MS4 Permit would become over inclusive with respect to what is considered a water quality standard. Such standards must be established in accordance with federal and state law. If this process has not been followed for a particular requirement, it is not a "water quality standard."

A.3.a

As discussed above, this Provision erroneously states that pollutants "in stormwater discharges" from MS4s must be reduced to the MEP. Please see the Redline.

A.3.b

This Provision should also provide that compliance with a TMDL constitutes compliance with Provisions A.1 and A.2, for those pollutants/waterbodies subject to the TMDL.

A.4.a

The Riverside County Copermittees support an approach whereby compliance with Provisions A.1 through A.3 are achieved through a truly iterative approach, one which reflects the intent of the

precedential State Water Board Order Nos. 99-05 and 2001-015. As set forth in the Redline, the Riverside County Copermittees believe that they and the other Copermittees under the Draft Permit should be considered in compliance with Provisions A.1, A.2 and A.3, as applicable, through development of the WQIP, unless the San Diego Water Board denies approval of a WQIP or amendment thereof. This ensures that the Iterative Process which is the focus of the WQIP, is utilized to provide a means to be in compliance for the Copermittees.

A.4.c

This Provision should be deleted, as is reflected in the Redline. Again, this Provision defeats the purpose of an iterative approach to compliance with the Provisions A.1 through A.3, because it allows the San Diego Water Board to enforce any provision of the Draft Permit, including those provisions at any time. The San Diego Water Board obviously retains full ability to enforce the provisions of the Draft Permit, including with respect to the failure of the Copermittees to carry out required provisions. To short circuit the WQIP/JRMP process, however, is to defeat the entire intent of the Draft Permit.

3.3 Provision B, Water Quality Improvement Plans

3.3.1 Overview of Key Issues

- The goals and requirements of the WQIP need to be aligned with the requirements of the CWA that were established specifically for MS4 permits, and not impose the restoration of Receiving Waters entirely upon MS4 Copermittees.
- The WQIP should focus on addressing sources of pollutants within the jurisdiction of the respective Copermittees.
- The BMP strategies identified in the WQIP should fully inform the selection and design of programs identified in the JRMP. Some minor edits were proposed in Provision B, with additional edits as warranted in Provisions D and E.

3.3.2 Comments in support of specific changes

Introductory paragraph

The introductory language implies that the WQIP should be designed to unilaterally protect, preserve, enhance, and restore water quality and Beneficial Uses in waters of the state. As noted in Section 2.3 above, MS4 Copermittees are responsible only for discharges from their MS4s, not the unilateral protection of Beneficial Uses within their watersheds.

Redline edits were provided to:

- Tie the goals of the WQIP to the requirements of the CWA applicable to MS4 Permits.
- Replace 'waters of the state' with 'Receiving Waters' to be consistent with federal law.
- Clarify the linkage between Provision A and Provision B.

Additionally, Redline edits were provided to clarify that the strategies identified in the WQIP are intended to guide the specific actions that will be implemented by the Copermittees pursuant to Provision E.

B.1

The Riverside Copermittees support the redlines of the San Diego County Copermittees with regard to setting forth that the WQIP for the Santa Margarita Watershed Management Area (WMA) would commence upon enrollment of the Riverside County Copermittees into the Order.

B.2.e.

Two changes have been proposed, as shown in the Redline:

- The introductory paragraph includes language that clarifies that the Numeric Goals are not enforceable compliance standards, effluent limitations, or Receiving Water limitations. This clarification is consistent with San Diego Water Board staffs' verbally stated intent.
- Provision B.2.e.(1) as written requires that the final Numeric Goals be "capable of demonstrating the achievement of the restoration and/or protection of water quality standards in Receiving Waters". As discussed in Provision 2.3 above, meeting WQS in Receiving Waters is a goal of the overall NPDES regulatory programs under the CWA and not as a requirement to be accomplished alone by MS4 Copermittees. Redline edits have been provided to clarify that such goals are only required to be for MS4 discharges.

B.3.

In the Redline, edits were made to the introductory paragraph to ensure that the requirements are consistent with federal law. The CWA requires the 'effective prohibition' of non-stormwater discharges, not 'preventing' or 'eliminating' them.

Edits were also made to Provision B.3.a. to link the strategies more clearly to the Numeric Goals developed pursuant to Provision B.2.e, as well as to link them to the JRMP programs in Provision E.

B.5

In the Redline, edits were made to the introductory paragraph to clarify that the WQIP (and by extension the JRMP and Monitoring programs) are intended to meet the requirements of Provisions A.1, A.2, and A.3. The Tentative Order particularly excluded Provision A.1.b. (dealing with non-stormwater discharges). However, as discussed in the attached Legal Comments, the CWA requires that illegal discharges must be addressed via a program (as included in Provision E.2), and it is appropriate that the program be guided by the priorities and strategies included in the WQIP.

Other edits were made to clearly link Provision B.5 to the applicable requirements of Provision F.

3.4 Provision C, Action Levels

3.4.1 Overview of Key Issues

- The Action Levels (non-stormwater, and stormwater) applicable within each watershed should only be those that are associated with the priority water quality conditions in that watershed, or that are 303(d) listed for that watershed. For example, if Zinc is not a priority pollutant for a watershed, and is not 303(d) listed, there should not be a Zinc action level. This change is needed because Provision D requires analysis for all 'action level' parameters. Analysis for pollutants that are not a priority for a watershed is a waste of Copermittee resources.
- The Copermittees should be able to establish alternative action levels that are appropriate to the WMA within their WQIP. Such alternative action levels would be subject to Executive Officer approval as part of the WQIP approval process.
- Footnote 8 and 10 need to clarify that the NALs and SALs are not enforceable limitations.
- Various references to 'waters of the state' need to be changed to Receiving Waters for consistency with the Draft Order and the CWA.

Please see the Redline for further detailed comments and language changes.

3.5 Provision D, Monitoring and Assessment

The Riverside County Copermittees appreciate the changes in the monitoring program reflected in the Draft Permit, as compared to the Administrative Draft. However, elements of the revised requirements are still infeasible for the Riverside County Copermittees. The comments below identify modifications of areas of the monitoring requirement's which can significantly improve the Copermittees' ability to implement and comply with the requirements, while still maintaining appropriate jurisdictional accountability and assessment requirements to guide the implementation of the WQIPs and JRMP programs. The Redline provides further detailed comments and language changes.

3.5.1 Overview of Key Issues

- Dry Weather MS4 Outfall Monitoring
  - The level of effort dedicated to monitoring and addressing outfalls with non-stormwater discharges should be commensurate with the potential impact that discharge has on a Receiving Water. If a discharge, whether persistent or transient, has no or little potential for impacting a flowing Receiving Water, (e.g. due to infiltration, evaporation, or treatment of the flows), the outfall should be de-emphasized relative to other outfalls that have discharges that have connectivity to a flowing Receiving Water.
  - Outfall Dry Weather Field Screening – As currently drafted, the number of required visual inspections of outfalls during dry weather required per Provision D.2.a.(2)(a) and Provision D.2.b.(1) is both excessive and disproportionate. This will particularly impact smaller jurisdictions, which may be required to do more visual inspections of MS4 outfalls than would larger jurisdictions with more outfalls and more resources.
  - Similarly, as written, the Persistent Flow Outfall Monitoring requirements of Provision D.2.b.(2)(b) are excessive and also will disproportionately impact smaller jurisdictions.

Jurisdictions with several hundred outfalls will likely have significantly more resources to perform the required monitoring than smaller jurisdictions with fewer outfalls, yet both are required to implement the same level of persistent flow monitoring.

- Assessment Requirements
  - The assessment requirements require modeled extrapolation of monitored outfall data to non-monitored outfalls for the purposes of calculating loads from each outfall in each jurisdiction. Such extrapolations though modeling or other calculations will not accurately reflect actual jurisdictional loads, and have no benefit that directly analyzing the monitored data cannot more accurately provide.

3.5.2 Other Global Issues

- As currently drafted, MS4s operated by a flood control district within a city or county would be effectively double-counted for identification of outfalls in each jurisdiction and for performance of the load calculations from each jurisdiction. Additionally, Flood Control Districts have no land use or enforcement authorities outside of the MS4 and rely on the local Copermittee to address pollutant sources and discharges to their MS4. Redline edits have been included to clarify the relationship between districts and the municipal jurisdictions they serve for the purposes of outfall monitoring and the assessment requirements.
- Timelines for monitoring and assessments were clarified throughout and linked to specific reporting requirements of Provision F in the Redline.

3.5.3 Comments in support of specific changes

D.1.a.(3) and D.1.e.

The Redline clarifies that the Receiving Water monitoring described in these sections must be conducted as applicable to the WMA and the Copermittees' MS4 discharges, because some of the monitoring requirements only apply to MS4 discharges to certain waterbodies. Not all Copermittees within a WMA will have discharges to that waterbody.

D.1.b.

The Redline proposes language to allow for alternative long-term monitoring stations to be identified. Using the SMR as an example, the Copermittees might wish to utilize a location other than the existing stations due to the influence of groundwater during dry weather and/or the general lack of MS4 contributions in dry weather to those locations.

Table D-1 and D-6

The Redline proposes an addition to the list of field observations, an assessment for flow connectivity of any MS4 discharges to the sampled Receiving Water. It is important to know whether the sampled Receiving Water included a contribution of flows from MS4 discharges, or whether the data reflect conditions in the absence of an apparent MS4 discharge contribution.

D.2.a.(2)

The Redline clarifies that the identification of annual outfall monitoring requirements is based on municipal Copermittee boundaries, inclusive of Flood Control District MS4 outfalls within their jurisdiction.

The Redline clarifies that the field screening requirements apply to those outfalls in the Copermittee's inventory that are 'accessible'. If an outfall is inaccessible for safety reasons or due to habitat restrictions, it would not need to be field screened.

The Redline simplifies the 'tiers' in Provision D.2.a.(2)(a) by removing the lower tier (i), and expanding the second tier (ii) to cover all Copermittees with 500 or less outfalls. This resolves the disproportionality that occurs for Copermittees with a number of outfalls near the current 125 outfall threshold. For example, as currently drafted, a city with 150 outfalls would be required to do 150 visual inspections per year, but a smaller city with 120 outfalls would be required to do 192 visual inspections per year. The Redline also maintains the 80% requirement from the first tier to help smaller Copermittees manage their workload for meeting the field screening requirements while also conducting the additional source identifications that are required under the Draft Permit.

The Redline includes edits to Footnote 19 to clarify that persistent flow should effectively be a discharge that is hydraulically connected to a flowing Receiving Water. Any other discharges that are not affecting a flowing Receiving Water (such as pooled or ponded water) would be addressed as a Transient Discharge, with source IDs any time an obvious illegal discharge (i.e. color or odor) is identified.

D.2.a.(3)

The Redline incorporates edits proposed by the San Diego County Copermittees to require 10% of the samples in each WMA to be from a first storm event. As described in the comments of the San Diego County Copermittees, this will help avoid overly skewing of the data to 'first flush' data, while still incorporating such data into the data and analyses.

D.2.b.(1)

The Redline removes the requirement that the number of visual inspections performed be equivalent to the number of inspections required under Provision D.2.a.(2)(a).

As areas within a jurisdiction are confirmed not to have non-stormwater discharges, inspections of other outfalls would have to be perpetually (and unnecessarily) increased to maintain compliance with this requirement. For example, if a Copermittee had 150 outfalls, but after the transitional period it confirmed that 100 of those outfalls had no evidence of non-stormwater discharges to flowing Receiving Waters, it would have to visit the remaining 50 outfalls for up to three times a year to meet the requirement in this Provision. As the Copermittee got closer to eliminating non-stormwater flows at more outfalls, inspections at the remaining outfalls would quickly become excessive and unreasonable. Removing this requirement will better incentivize the elimination of non-stormwater

flows, as a Copermittee can look forward to reducing its workload in areas confirmed to not have non-stormwater flows.

D.2.b.(2)(b)

While the Riverside County Copermittees support the San Diego County Copermittees' proposal to reduce the number of required outfalls from 10 to 5 persistently flowing outfalls per WMA, the Riverside County Copermittees believe that applying the same minimum bar to all Copermittees is inappropriate and disproportionately affects smaller Copermittees that have commensurately less staff and resources.

The Riverside County Copermittees propose requiring monitoring of the top 10% of the prioritized persistent flow outfalls, with a lower and upper limit of 1 and 5 respectively, as shown in the redlines. With this change, the level of effort required of any individual Copermittee would scale consistent with the number of persistent flow outfalls within each Copermittees' jurisdiction.

Additionally, the Riverside County Copermittees request changing the requirement of Provision D.2.b.(2)(b)(ii) to require annual monitoring rather than semi-annual monitoring. With this change, a Copermittee could focus more of their annual budget on conduction Source ID efforts – which can result in eliminating problematic non-stormwater flows, rather than on a second monitoring event. Copermittees would still have the option to conduct a second monitoring event if they have more resources available and want to remove the outfall from their monitoring list sooner in accordance with Sub-Provisions [a] through [d].

D.2.b.(2)(e)

The Riverside County Copermittees support the San Diego County Copermittees' comments regarding allowing for a tailored list of constituents to be developed for each WMA. The Redline incorporates those edits.

D.3.

The Riverside County Copermittees support the changes recommended by the San Diego County Copermittees to this section, and these changes are reflected in the Redline.

D.4.a.(2)

This Provision as drafted would require the MS4 Copermittees to make comprehensive evaluations of Beneficial Uses that are beyond their expertise or the scope of an MS4 permit. Such evaluations and determinations would require advanced studies and cannot be answered with the monitoring data collected through this permit. This Provision should either be deleted or, alternatively the Riverside County Copermittees request that the assessments be focused on determining the status and progress toward addressing any Numeric Goals established for those Receiving Waters in the WQIP. Please see the Redline.

D.4.b.(1)

The Redline clarifies that outfall assessments are to be done for the area covered by each Municipal Copermittee (consistent with the proposed definition), and that the data to be used by each Municipal Copermittee would include the data collected from any Flood Control District Copermittee operated MS4s within its jurisdiction. This ensures that jurisdictional data is not double reported for Flood Control District MS4s within a city or county.

For Sub-Provision D.4.b.(1)(c)(iv) three key changes are requested in the Redline:

1) Annual volumes and pollutant loads should only be calculated from the monitored outfalls with persistent discharge to a flowing Receiving Water. This is directly applicable to the purpose of the Draft Permit and an important change, because volume and pollutant data extrapolated to non-monitored MS4 outfalls would be inaccurate and potentially misused if taken out of context. It is understood that San Diego Water Board staff want to ensure that jurisdictional accountability is maintained. However, since MS4 outfall monitoring will be conducted within each jurisdiction, inter-jurisdiction comparisons and accountability can be accomplished using the monitoring data directly without such extrapolations.
2) Added language to require a Copermittee to include in its jurisdictional load calculations any discharge that was demonstrated to have entered another Copermittees' MS4 before being discharged into the flowing Receiving Waters. This is important to ensure that each Copermittee maintains accountability for pollutants discharged to flowing Receiving Waters from within its jurisdiction.
3) The Redline proposes that the calculations of pollutant loads be only for the priority water quality constituents identified in the WQIP.

D.4.b.(2)(b)

Two key changes are recommended in the Redline:

1) Annual volumes and pollutant loads should only be calculated from the monitored outfalls for the monitored storm events. This is an important change because volume and pollutant data extrapolated to non-monitored events would be inaccurate and potentially misused if taken out of context. It is understood that San Diego Water Board staff want to ensure that jurisdictional accountability is maintained, so the Redline proposes that data from the monitored outfalls be extrapolated to identify loads for each jurisdiction during each monitored event. With this information, inter-jurisdiction comparisons and the desired 'accountability' can be accomplished using the monitoring data directly without such extrapolations to non-monitored events.
2) The Redline requests that calculations of pollutant loads be performed only for the priority water quality constituents identified in the WQIP.

D.4.b.(2)(c)

The Redline edits are consistent with those proposed by the San Diego County Copermittees, with minor modifications for clarity.

D.4.d.(2)(c)

It would be difficult to proactively determine the pollutant load reductions that *would* be necessary to demonstrate that discharges *are not* causing or contributing to exceedances of Receiving Water Limitations. Instead it would make more sense to calculate the necessary pollutant load reductions where the discharge has been demonstrated to be causing or contributing to such exceedances. In such circumstances, the necessary parameters would be known to calculate the needed load reduction. These changes are set forth in the Redline.

3.6 Provision E.1, Legal Authority

3.6.1 Overview of Key Issues

The Riverside County Copermittees note that Provision E.1, relating to the establishment of adequately legal authority, exceeds the requirements of federal CWA regulations in several respects. The federal regulations at 40 CFR 122.26(d)(2)(i)(A)-(F), provide explicit guidance for the Copermittees in developing the necessary legal authority to control MS4 discharges within its jurisdiction. However, several of the subsections of Provision E.1 go beyond these federal requirements, with respect to areas not within the responsibility of MS4 dischargers, such as negotiating with non-Copermittee entities. The Riverside County Copermittees have provided requested changes in the Redline, which are explained briefly below.

3.6.2 Comments in support of specific changes

E.1.a(1)

Changes in the Redline to accurately reflect the language of 40 CFR 122.26(d)(2)(i)(B).

E.1.a(2)

Changes in the Redline to accurately reflect the language of 40 CFR 122.26(d)(2)(i)(A). In addition, the Provision as written improperly requires the Copermittees to control the quality of runoff from sites covered by the state general permits for industrial activity and construction. These general permits are enforced by the State Board and the regional boards, and it is a state responsibility which cannot be handed off to the Municipal Copermittees.

E.1.a(3)

Changes in the Redline to accurately reflect the language of 40 CFR 122.26(d)(2)(i)(C).

E.1.a(5)

The Redline requests deletion of this Provision, which is not a requirement for municipal stormwater dischargers set forth in the CWA regulations. The Provision also improperly requests the Municipal Copermittees to attempt to negotiate with third parties the contribution of pollutants to the Copermittees' MS4. The Copermittees have no jurisdiction over such parties. The San Diego Water

Board has such jurisdiction, and should take responsibility for addressing non-MS4 sources of pollutants that may ultimately enter the MS4.

E.1.a(6)

Changes in the Redline to reflect accurately the language of 40 CFR 122.26(d)(2)(i)(E).

E.1.a(7)

The Redline requests deletion of this Provision, which is not a requirement for municipal stormwater dischargers set forth in the CWA regulations.

E.1.a(8)

The Redline requests deletion of this Provision, which is not a requirement for municipal stormwater dischargers set forth in the CWA regulations.

E.1.a(9)

The Redline requests deletion of this Provision, which is not a requirement for municipal stormwater dischargers set forth in the CWA regulations.

E.1.a(10)

The Redline requests both correction of the language in this Provision to comport with the federal regulations in 40 CFR 122.26(d)(2)(i)(F) and deletion of the second clause of this Provision, which is not found in 40 CFR 122.26(d)(2)(i)(F). Moreover, the requirement to inspect and monitor in the first clause of this Provision covers the issues set forth in the second clause. It is therefore unnecessary.

3.7 Provision E.2, IDDE

3.7.1 Overview of Key Issues

- The Draft Permit requires the Copermittees to address all non-stormwater discharges from the MS4 as illegal discharges, and then describes certain sources that need not be prohibited. This is effectively a 'guilty until proven innocent' provision, where a Copermittee will be required to expend potentially significant resources conducting source identification efforts any time non-stormwater is observed discharging from the MS4. In addition to the issues discussed in the Legal Comments, the Provision raises two practical and logistical problems:

    - This requirement is entirely independent of the determination that there are in fact any significant pollutants in such a discharge. A Copermittee could be spending substantial sums tracking (and then potentially enforcing upon) the source of a discharge that is not negatively impacting Receiving Waters. This not only is a waste of public resources, but would undermine the credibility of stormwater programs.
    - The San Diego Water Board and the State Water Board do not treat non-stormwater flows in the same manner across all of their regulatory mechanisms. For example, Order

> No. R9-2008-0002 allows non-stormwater discharges to occur, POTWs are issued permits for their discharges and agricultural operators can discharge irrigation water. The Copermittees should not be forced to conduct an expensive source investigation, only to find that the discharge complies with a permit or a waiver granted by the Water Board. The Copermittee would have no ability to address such a discharge as an 'illegal discharge', and further would have no ability to recuperate their costs for the source identification.

The best way to address these issues, is to require the Copermittee to have and enforce an effective prohibition of illegal discharges of *pollutants* (through statutes, ordinances, permits, contracts, orders or similar means), and then allow the Copermittee full discretion to determine which non-stormwater discharges have the potential to negatively impact Receiving Waters, consistent with the WQIP priorities – and address those as illegal discharges.

- Several categories of non-stormwater discharge that were previously conditionally exempt consistent with the CWA, are required by the Draft Permit to be treated as illegal discharges, unless they have coverage under another order issued by the San Diego Water Board. In addition to the problems identified above for conducting enforcement in the absence of a pollutant discharge, the San Diego Water Board, not the Copermittees, is responsible for evaluating coverage, need for coverage, and compliance with other orders issued by the Water Board. The Copermittees have neither authority nor jurisdiction. Please see the Redline.
- Several categories of non-stormwater discharge that were previously conditionally exempt consistent with the CWA, are required by the draft permit to be 'controlled' or otherwise prohibited by the Copermittees. The Fact Sheet further describes that such controls are warranted because they could potentially contain pollutants. However, the CWA only requires controls where the discharges are determined to be a significant source of pollutants. Please see Legal Comments for a further discussion of this issue as well as the Redline.
- The Draft Permit eliminates the conditional exemptions for Landscape Irrigation, Irrigation Water, and Lawn Watering (collectively 'irrigation runoff'). The San Diego Water Board has provided no data demonstrating that these discharge categories have contributed a significant pollutant load to Receiving Waters within Riverside County. Information discussed in the Fact Ssheet focuses on data from other counties. The only data from Riverside County is public educational material referring to irrigation runoff; this material, however, was adapted from public education material from other counties. That public educational material was intended to help prevent such discharges from becoming a significant source of impact on the Receiving Waters, and did not constitute a determination that such discharges are in fact, actually a significant source that needs to be subject to a prohibition. See the discussion in the Legal Comments as well as the Redline.
- The Draft Permit, in Provision E.2.a.(7) requires efforts to minimize or eliminate all non-stormwater flows, including those that are natural, conditionally exempt, or otherwise permitted by the San Diego Water Board, regardless of whether or not such discharges are not contributing pollutants to the MS4. Such a requirement conflicts with the prior Provisions E.2.a.(1) through

(5), which state conditions where such discharges need not be prohibited. The requirement should therefore be removed, as set forth in the Redline.

3.7.2 Comments in support of specific changes

E.2.a.(1) and (3)

The Riverside County Copermittees request that this Provision be deleted (as shown in the Redline) and the categories of non-stormwater discharges be re-incorporated into Provision E.2.a.(3). The apparent premise of Provision E.2.a(1) as drafted is that since the San Diego Water Board requires those discharges to have coverage under a separate order, they are illegal if they lack such coverage. The MS4 Copermittees, however, are not responsible for enforcing discharge coverage under separate San Diego Water Board orders; that is the responsibility of the San Diego Water Board itself. Requiring the Copermittees to enforce such entities for their lack of coverage under a separate San Diego Order shifts that responsibility from the Board to Copermittees. This is not authorized by the CWA or the Porter-Cologne Water Quality Act. The Copermittees are, under the CWA, only required to address such discharges as illegal discharges if the discharge is found to be contributing a significant pollutant load to the MS4. By moving those categories to Provision E.2.a.(3), as shown in the Redline, the Copermittees will still be required to treat such discharges as illegal discharges if and when they are found to be contributing significant pollutants to the MS4. This proposed approach is consistent with other MS4 permits in the state, including prior San Diego Water Board orders, and is further consistent with the approach taken for the WQIP, which is intended to allow the Copermittees to focus resources on addressing the specific impacts that MS4 discharges are having on Receiving Water quality.

E.2.a.(2)

This Provision requires the Copermittees to treat water line breaks as illegal discharges, which in turn requires the Copermittee to conduct enforcement measures. Water main breaks are accidental occurrences, or may be the result of acts of nature. It is no more appropriate to treat accidents as illegal and subject to enforcement than it would be for a city to declare vehicular accidents as illegal, and conduct enforcement against those involved. This language needs to be removed as shown in the Redline. Additionally, as discussed in the Legal Comments, a recent case from the federal district court in Virginia suggests that the regulation of mere flow may exceed the authority of the CWA.

E.2.a.(4)

The Redline clarifies that if the 'statues, ordinances, permits, contracts, orders or similar means' are enacted/adopted by a Copermittee, the categories of non-stormwater discharges listed do not need to be treated as illegal discharges. Otherwise, the language could be read to imply that, for example, if it was infeasible for a particular resident to direct wash water to landscaped areas, that the Copermittee would be required to treat that residents' discharge as illegal and enforce upon them.

E.2.a.(5)

Contrary to the provisions of the CWA regulations, prior MS4 permits issued by the San Diego Water Board and other permits in the state, the Draft Permit requires implementation of BMPs, where

feasible, during emergency firefighting activities. During such emergencies, all focus of public resources must appropriately be dedicated to protecting life and property. Any diversions from that mission would only serve to diminish and potentially compromise that mission. The Redline proposes language consistent with that adopted by the San Diego Water Board in 2010 for the Riverside County MS4 Permit (Order R9-2010-0016).

E.2.a.(7)

Provisions E.2.a.(1) through E.2.a.(6) describe circumstances where non-stormwater discharges need not be prohibited. This Provision then requires the Copermittees to minimize such 'conditionally allowed' flows anyway. This requirement exceeds the scope of the CWA and its implementing regulations and makes no sense. The Redline requests deletion of these Provisions.

E.2.b.(1)(d)

This Provision requires the MS4 Copermittees to map all known private outfalls to Receiving Waters. Such a requirement is beyond the scope of an MS4 permit and should be removed, as shown in the Redline. The Draft Permit does not require a Copermittee to address private outfalls to Receiving Waters; this is the responsibility of the San Diego Water Board, which governs all waste dischargers under the authority of the CWA or the Porter-Cologne Act.

E.2.b.(4)

This Provision requires the Copermittees, in conjunction with a spill, to 'prevent contamination of surface water, groundwater, and soil.'This requirement is clearly beyond the scope of an MS4 permit issued under the CWA (which regulates only discharges of water containing pollutants *from* the MS4 to Receiving Waters) and must be removed, as shown in the Redline. The Draft Permit could more appropriately require the Copermittees to 'coordinate, to the extent possible, with spill response teams to prevent entry of spills into the MS4.'

E.2.d.(2)(e)

The Redline requests edits to clarify that the intent of this Provision is to document and attempt to quantify any obvious sources of non-stormwater illegal discharges in response to the outfall monitoring, and that it is not necessary to conduct a full source identification any time there is evidence of water near an outfall.

New Provisions E.2.d.(3)(e)-(f)

The Redline adds two new provisions to this section to address a gap in potential outcomes from a source identification effort. These Provisions address scenarios where a Copermittee identifies A) the illegal discharge is coming from another upstream Copermittees' MS4, or B) that the discharge has been authorized by the San Diego Water Board, either through an order or waiver of WDRs. In the first scenario, the responsibility to continue the source identification, and conduct enforcement, would be transferred to the upstream Copermittee. In the second scenario, the responsibility for follow-up would fall on the San Diego Water Board, after receiving relevant information from the Copermittee. This Provision also provides for reimbursement to the Copermittee for the cost of the source identification, since the San Diego Water Board required the Copermittee to conduct the investigation,

while not commensurately prohibiting all non-storm water discharges from all other sources regulated by the Water Boards.

3.8 Provision E.3, Development Planning

3.8.1 Overview of Key Issues

- Priority Development Projects - The Tentative Order identifies categories of projects that are to be defined as 'Priority Development Projects' (PDPs), which in turn will be required to comply with specific water quality and Hydromodification mitigation and quantitative requirements. The criteria for PDPs is quite broad and would include the majority of development projects, from small convenience stores and residences, to mega malls and specific plan developments. The Fact Sheet describes that while some smaller project types may not have significant pollutant loads, they may have a hydrologic impact upon Receiving Waters. However, it is important to recognize that pursuant to Provision E.3.a., All projects are required to implement a variety of LID principles such as disconnecting impervious surfaces, draining impervious surfaces to landscaped areas, and minimization of soil compaction in landscaped areas. Since such LID principles will be implemented wherever feasible consistent with the MEP standard, these smaller development projects are unlikely to create a pollutant or hydrologic impact. Additionally, the Fact Sheet advocates incentivizing LID design concepts and green infrastructure and building principles. Accordingly, the Redline requests changes to Provision E.3.b.(3) as described in Provision 3.8.2 below. The Legal Comments further note the potential impact of the Virginia case (*Virginia Dept. of Transp. v. U.S. Environmental Protection* Agency) holding that the CWA does not regulate stormwater as a pollutant.
- Design Capture Volume – There are two problems with how the Draft Permit defines the Design Capture Volume:
    - The Draft Permit changes the 'design capture volume' from previous permits by eliminating the term 'runoff'. Prior permits described that the design capture volume is the volume of stormwater runoff from the 24-hour 85th percentile storm event. This permit changes that to be the volume of stormwater produced from a 24-hour 85th percentile storm event. The elimination of the term 'runoff' means that BMPs would need to be sized potentially much larger than previously. For example, if the 85th percentile storm is 1" and a BMP is designed to treat 1 acre of residential land with a coefficient of runoff of 0.6, then under the current permits the BMP must be sized to hold 2,178 cubic feet of water. However, under the language of the Draft Permit, the BMP treating the same area would be required to hold 3,630 cubic feet of water, a 70% increase in BMP size. Accordingly, the Redline restores the term 'runoff'.
    - Additionally, the Draft Permit defines the Design Capture Volume alternatively as: *"the volume of storm water that would be retained onsite if the site was fully undeveloped and naturally vegetated, as determined using continuous simulation modeling techniques based on site-specific soil conditions and typical native vegetative cover."* In addition, to the problem identified above regarding the volume of storm water runoff, this language does not provide a temporal standard for determining which volume to

calculate from a continuous simulation model. Additionally, such models are not commonly used among general practitioners in the civil engineering community. The Redlines propose an alternative and simpler approach for this second definition: "The volume of stormwater runoff produced from a 24-hour 85th percentile storm event, that would be retained onsite in the pre-project condition." This definition is advantageous for several reasons: 1) it is simple for any civil engineer to understand, calculate, and comply with and is based on the same storm and hydrologic calculations as the first option, 2) it respects natural hydrology for the site, which may have had runoff in the pre-project condition, and as such, is more compatible with the intent of LID to mimic natural hydrology, and 3) as a result it is less likely to result in potential degradation of Beneficial Uses downstream, from reductions in flows beyond the pre-project condition.

- Pre-Project vs Pre-Development – Both the Storm Water Pollutant Control BMP requirements and the Hydromodification Management BMP requirements in the Draft Permit specify a 'pre-development' condition as the mitigation standard for all PDPs. In addition to the legal problems with such a standard as set forth in the Legal Comments, there are practical problems with the standard.
    - The presumption made in the discussions in the Fact Sheet are that all Receiving Waters can, and will, be restored to a fully natural condition - effectively to a natural floodplain. This presumption does not address reality, which is that development has occurred in those floodplains over many generations. The San Diego Water Board obviously lacks the authority to force homeowners and businesses to vacate such floodplains to effectuate restored natural conditions. Such an action would represent an unconstitutional taking. Moreover, the Legislature, in the Flood Control Acts covering all three counties proposed to be covered by the Draft Permit, has specifically authorized Flood Control Districts to construct flood control structures required to protect the lives and properties of the citizens.
    - Mitigation to a pre-development condition also may not be necessary to protect Receiving Waters from the effects of Hydromodification. If, for example a Receiving Water with existing development tributary to it, has not experienced increased erosion due to that existing development, there is no reason to require Hydromodification mitigation to anything more than the existing condition. In the counter-example, if under the existing condition the Receiving Water has experienced increased erosion due to that existing development, then, legal issues aside, there would be technical benefit to mitigating to that pre-development condition.

  The Redline proposes alternative language that requires mitigation to a pre-development standard only where it is legal and technically justified based on the conditions of the Receiving Water.
- Alternative Compliance – The alternative compliance project options as set forth in the Draft Permit pose two key problems:

- Several statements are conflicting and thus confusing as to what the required standard is for the various alternative compliance projects. For example, throughout Provision E.3.c. it is stated that 'a PDP may be allowed to comply with Provision E.3.c.(1)(a) and/or Provision E.3.c.(2) if they …'. This language can be mis-read to imply that the project must comply both with Provisions E.3.c.(1)(a) and E.3.c.(2) *and* implement the alternative compliance project (thus negating the benefit of alternative compliance). The Redline clarifies this language.
- The Biofiltration option set forth in the Draft Permit arbitrarily, and without technical basis or justification, **doubles** the sizing standard for biofiltration BMPs from 0.75 times the design capture volume (as set forth in the 2010 MS4 Permit and the 2009 Orange County Permit) to 1.5 times the design capture volume. The existing 0.75 standard was set due to the fact that 1) the 85th percentile 24-hour storm occurs over a period of time, and 2) such BMPs have outflows and will regain some capacity during the storm event, and as such, do not need to instantaneously hold the entire 'Design Capture Volume' to have fully treated that volume. In fact, studies have shown that in addition to yielding excellent pollutant concentration reductions, LID Biofiltration BMPs are excellent at reducing the volume of runoff similar to retention BMPs. According to the ASCE International BMP database 60% or more of the long-term volume of runoff from a site can be retained within a Bioretention BMP (Bioretention BMPs are the primary 'biofiltration' BMP now allowed in Riverside County). In comparison, a Retention BMP sized to hold the runoff from the 85th percentile storm event (the Design Capture Volume) will end up retaining approximately 80% of the long-term volume of runoff. Thus, by simple proportions, a Bioretention BMP sized to 'hold' 100% of the Design Capture Volume may also be able to retain 80% of the long-term volume of runoff. $\left(\frac{0.75\times DCV}{60\%\ retained}=\frac{1.0\times DCV}{80\%\ retained}\right)$. This is being validated through Bioretention BMPs that have been constructed and are being monitored for such volume reductions at the Riverside County Flood Control District's headquarters in Riverside. Further, Biofiltration BMPs have the added benefit of providing better overall treatment of back to back storms. Where a Retention BMP would be full after the first storm, fully bypassing the second storm without treatment, a Biofiltration BMP will have restored some capacity after the first storm, providing for treatment of some or all of the second of the back to back storms. Thus, the attached redlines propose changing the sizing factor for Biofiltration BMPs to 1.0 times the Design Capture Volume. The Redline proposes changes consistent with these comments.

3.8.2 Comments in support of specific changes

Introduction

Provision E.3.g (Strategies to address the highest priority water quality conditions) was moved to the beginning to support and better integrate the development planning programs in the JRMP with the strategies developed in the WQIP.

E.3.a.(3)

The Redline changes the title of this section (and other appropriate references to this Provision) to refer to LID Principles, as identified in the CASQA LID Manual for Southern California (https://www.casqa.org/LIDDemo/LowImpactDevelopmentManual/tabid/242/Default.aspx)

E.3.b.(1)(c) (New Provision)

This Provision was added to clarify the requirements if a project that was already subjected to SSMP requirements redevelops a portion of the site.

E.3.b.(2)

The Redline edits shown for this Provision are primarily to simplify this Provision, by grouping various categories by their applicable square footage threshold and including some of the specifics in the definitions (Attachment C). Other changes (beyond reorganization) include:

- Removing the addition of 'driveways' from subsection (g) as described in Provision 3.8.1 of this letter.
- Adding a footnote for parking lots, to clarify that the trigger would not include parking lots that are not exposed to runoff, such as subterranean or covered parking lots. It is beneficial to not have parking lots exposed to runoff; excluding such parking lots from being defined as a PDP is a good way to encourage such practices.
- Hillside development projects were not included as it is not believed to be necessary anymore with the relatively low threshold (10,000 square feet) identified for other categories included in this and other recent MS4 permits.
- The definition for "Environmentally Sensitive Areas" from existing MS4 permits was restored to include the language referring to discharges that are not commingled with flows from adjacent or other upstream lands (note that the change is shown in the definitions per the re-organization suggested above).

E.3.b.(3)

- The PDP exemption for sidewalks, bicycle lanes, or trails, [E.3.b.(3)(a)] has been expanded to as shown in the Redline to include driveways and parking lots. If those projects implement criteria already described in that section, they are also unlikely to create an impact to Receiving Waters. Further, including those project types in that exemption will further incentivize developers to utilize those LID Principles.
- The exemption described in Provision E.3.b(3)(b), was modified as shown in the Redline, and as discussed in the comment letter submitted by the Riverside County Transportation Department. Please see that letter for a justification for the requested changes.
- As shown in the Redline, the exemptions for new and redeveloped single family residences [E.3.b.(3)(c) and (d)] were consolidated into a new provision [E.3.b.(3)(c)], covering all single family residential projects (both new and redeveloped). The key difference is that such projects would be considered exempt if they are both 1) not part of a larger common plan of development or planned subdivision, and 2) successfully incorporate each of the applicable source control and LID Principles identified in Provision E.2.a.(2)-(3) to the MEP.

- A new Provision-E.3.b.(3)(d), titled 'Watershed Protection Projects' was added in the Redline. The project types described therein are all projects that are undertaken to rehabilitate or prevent environmental, social, and economic damage within the watershed, including Receiving Waters. These projects, while they may in some cases require some level of impervious surfaces to be constructed, are 1) not designed for human use or activity that would generate pollutants, or are designed specifically to mitigate such pollutants; and 2) will implement each of the applicable source control and LID Principles identified in Provision E.2.a.(2)-(3) to the MEP.

E.3.c.(1)

In addition to the edits discussed in Provision 3.8.1 of this letter, the Redline removed subprovision E.3.c.(1)(c) , for two reasons:

- The requirements that must be met to when implementing an alternative compliance project are more fully described in Provision E.3.c.(3).
- The language, as drafted, appeared to require double-mitigation. It requires that: 1) conventional treatment is required to treat the entire volume not retained onsite, and 2) the pollutant load discharged must also be mitigated with an alternative compliance project. Such a scenario would be requiring double-mitigation. The Redline provides a clearer and more simple mitigation standard.

E.3.c.(2)

The Riverside County Copermittees have two concerns with this Provision:

- The first concern is the universal requirement to mitigate to the 'pre-development' standard, as discussed above in section 3.8.1 of this letter. The Copermittees in the Redline propose that this language be changed to the 'pre-project' condition. For new development projects, the 'pre-project' condition will be equivalent to the 'pre-development' condition. For redevelopment projects, the standard would be the conditions that exist onsite prior to the construction of the project. This is appropriate, because in many areas, particularly in areas of existing development that would be subject to 'redevelopment', Receiving Waters are engineered and maintained to 1) provide flood protection for the public, 2) ensure that floodwaters don't comingle with pollutants on adjacent private properties and 3) to ensure that the existing development draining to that system does not cause erosion. In cases where the Receiving Waters are not engineered and maintained, and erosion problems caused by existing development are observed, language has been added to the Redline to provide for additional standards to be developed in the WQIP, based on the WQIP priorities.
- Additionally, the Redline proposes an additional exemption from HMP requirements for projects that discharge into conveyance channels that are engineered and maintained for the build-out condition all the way from the project to a waterbody that is sufficiently resistant to Hydromodification. This language is consistent with the above discussions, and ensures the PDPs are not required to mitigate for non-existent impacts. Please see the specific language in the Redline. The engineered channel exemption can be found in other recent MS4 permits, including the recently adopted Los Angeles County MS4 Permit.

E.3.c.(3)(a) and (b)

These two Provisions were re-written in the Redline to be simpler and clearer on what BMPs, criteria, sizing standards are required for what type of project. This alternative language still meets the intent of the Draft Permit, while being easier to understand and comply with. Aside from simplifying the language, the following other changes were made in the Redline:

- The alternative compliance options must be determined to provide an equal or greater overall water quality benefit for the WMA.
- Additional options were provided for who can design the alternative compliance projects
- All alternative compliance projects are required to be consistent with the strategies in the WQIP. While the specific alternative compliance project would not be required to be identified in the WQIP, the goal of this language is to ensure that allowing the alternative compliance project would not in any way be detrimental to or contrary to the strategies in the WQIP.
- Requirements E.3.c.(3)(a)(iv) and (v) were removed entirely, as they conflict with E.3.c.(3)(a)(iii) which allowed the projects to be in the same WMA (preferably the same HSA)
- Changed the sizing factor for Biofiltration BMPs to 1.0 as discussed in section 3.8.1 of this letter, and deleted the option [d] which required triple mitigation by requiring Biofiltration + Conventional Treatment + Alternative Compliance projects.
- Added Conventional Treatment Control BMPs as an alternative compliance option, only where it has been shown to be technically infeasible to meet E.3.c.(1) and technically infeasible to implement LID Biofiltration Treatment Control BMPs.

E.3.c.(3)(c)

Redline edits in this section are primarily to simplify and consolidate the requirements. Sub-Provision [C] was removed, as it was duplicative of the mitigation standards for the alternative compliance project are specified in E.3.c.(3)(b) and E.3.c.(3)(c)(i)[a].

3.9 Provision E.4, Construction

3.9.1 Overview of Key Issues

This Riverside County Copermittees' comments and edits are set forth in the Redline.

- One key issue for the Copermittees is the edit shown in the Redline to Provision E.4.c, which clarifies that the Copermittees are responsible for *requiring* BMPs at private construction sites, and *implementing* BMPs at Copermittee construction sites.

3.9.2 Comments in support of specific changes

The Redline edits include comments supporting the requested edits.

3.10 Provision E.5., Existing Development

3.10.1 Overview of Key Issues

The Draft Permit includes requirements for advanced programs to identify opportunities and implement programs to facilitate the construction of Retrofit and Stream/Channel/Habitat Rehabilitation projects on private properties. Such requirements are clearly beyond the requirements of the CWA for a management plan to be implemented by an MS4 Copermittee. The Riverside County Copermittees request deletion of these requirements.

Alternatively, the Riverside County Copermittees have the following comments:

While these retrofitting and rehabilitation approaches can be helpful and/or needed in some circumstances, they are not required in all circumstances, nor are required to address all pollutants that may be identified in a WQIP as the highest priority water quality conditions. For example, some pollutants are best addressed with regulatory source controls at the state or federal level, such as the removal of copper from brake pads, and controls on pesticides, while other pollutants can be adequately addressed through inspections and enforcement. There are several problems with requiring Copermittee resources to be invested in such Retrofit and/or Rehabilitation strategies (collectively referred to as 'retrofit'):

- Land Ownership: The land that could potentially be identified for retrofit would likely not be owned by a Copermittee. The Copermittee therefore has no ability to force the property owner to retrofit their property. Although the Copermittee could potentially implement programs to "facilitate" implementation, such a program would still be limited by the rights of the individual property owner. Even if a Copermittee were to attempt to purchase a privately owned existing development for the purposes of retrofit (a step going far beyond any requirements in the CWA or the Porter-Cologne Act), such a process can take many years, and if the owner is unwilling to sell, the retrofit project could never be realized. In any scenario, the process to facilitate such "retrofits" is extremely costly and lengthy, with no guarantee of a benefit to water quality. Retrofits should only be undertaken where the Copermittee identifies it as a necessary step to addressing the MS4 contributions to Receiving Water problems to the MEP. Otherwise, it forces the Copermittee to utilize resources very ineffectively, which is contrary to the goals of the WQIP and may actually be detrimental to water quality.
- Permitting: Aside from the limitations discussed above, stream/channel/habitat restorations have the additional complexities of requiring other regulatory permits that are not the discretion of the San Diego Water Board nor the Copermittees to issue. Such projects can take many decades to implement, and thus, are not expected to be highly effective at addressing the goals of the WQIP, except in rare circumstances.

Redline edits have been provided to clarify that these strategies and programs should only be used when, and to the extent directed by the strategies developed in the WQIP.

3.10.2 Comments in support of specific changes

E.5.b.(1)(b) and (d)

BMP implementation requirements of Provision E.5.b.(1)(b) and (d) have been clarified in the Redline to require the Copermittee to implement BMPs on their existing development, and require implementation of BMPs on private existing development.

E.5.c.(1)(a)(iv)

The Riverside County Copermittees request deletion of this Provision. The Copermittees should be provided the flexibility to schedule inspections as they see fit, provided that the schedules they establish pursuant to E.5.c.(1)(a), and the minimum frequency in E.5.c.(1)(a)(i) are met. Requiring 20% every year will be difficult to track as businesses may be opened or closed throughout the year and throughout the permit term.

Additionally, the Riverside Copermittees understand that other Copermittees may be recommending that E.5.c.(1)(a)(i) be changed to 'once per permit term'. The Riverside Copermittees believe that the current language of 'once every five years' is more appropriate for two reasons: 1) not all Copermittees (i.e. OC and Riverside) will be enrolled into the permit at the beginning of the 'permit term', and 2) not all businesses will be in existence at the beginning of the permit term. Accordingly it is more appropriate to simply require the minimum to be once every five years, that way a program manager can simply look at the last time a facility was inspected, and use that date to schedule the next inspection.

3.11 Provision E.6, Enforcement Response Plans

3.11.1 Overview of Key Issues

The Riverside County Copermittees' edits and comments are shown in the Redline and discussed below.

3.11.2 Comments in support of specific changes

E.6.d.

The terminology in this Provision was changed in the Redline from 'escalated' enforcement to 'progressive' enforcement. The proposed language better reflects the nature of enforcement actions, which are not simply 'escalated' or 'not escalated', as implied by Provision E.6.d.(2), but are progressive as needed in response to the severity of the violation. Since every violation comes with a unique set of circumstances, it is not reasonable to presume that a single set of 'triggers' will universally result in the same level of enforcement.

3.12 Provision E.7, Public Education

3.12.1 Overview of Key Issues

The Riverside County Copermittees' edits and comments are shown in the Redline.

3.13 Provision, E.8 Fiscal Analysis

3.13.1 Overview of Key Issues

The requirement that the Copermittees "must secure all the resources necessary to comply with this Order" exceeds the requirements of the CWA and illegally intrudes on the home rule authority of municipalities to govern themselves. This must be deleted. Please also see Legal Comments.

With regard to other provisions, the Riverside County Copermittees' edits and comments are shown in the Redline.

3.14 Provision F

3.14.1 Overview of Key Issues

- F.1 – WQIP Submittal
  - Based on the schedule for the initial submittal of the Priority Water Quality Conditions and Numeric Goals, and the subsequent 60-day public review, only one month would be left for the Copermittees to finalize strategies based on those conditions and goals and the public input received. This is an insufficient amount of time. The Redline requests modifications to the schedule that would provide for the submittal of the final WQIP within 24 months (instead of 18), to provide additional time for the development of strategies.
- F.1 and F.2.
  - The schedules for submittals should be linked to the receipt of comments on prior submittals, or the approval of prior submittals, rather than the permit adoption date. If it is tied to the permit adoption date, the submittal dates could become out of sync with the comment periods or San Diego Water Board approvals if any unexpected delays occur (for example if the San Diego Water Board is delayed in approving a document, or posting a document online for public comment). The Redline requests appropriate modifications.
  - Implementation dates for the plans are unclear / undefined. The Redline clarifies this issue.
- F.3. Progress Reports
  - The reporting requirements across the transitional period were unclear. Redlines are provided to clarify and consolidate.
  - The Regional Monitoring and Assessment Report language was revised to be consistent with the requirements of the Integrated Assessment of the Water Quality Improvement Plan, rather than an additional, slightly different report, due at the same time.

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3.15 Attachments B and C

Comments and edits to Attachments B and C are shown in the Redline.

Very truly yours,

for JASON E. UHLEY
Chief of Watershed Protection Division

CP:cw
P8/

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

TENTATIVE
ORDER NO. R9-2013-0001
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The San Diego County Copermittees in Table 1a are subject to waste discharge requirements set forth in this Order.

Table 1a. San Diego County Copermittees

Municipal Copermittees	
City of Carlsbad	City of Oceanside
City of Chula Vista	City of Poway
City of Coronado	City of San Diego
City of Del Mar	City of San Marcos
City of El Cajon	City of Santee
City of Encinitas	City of Solana Beach
City of Escondido	City of Vista
City of Imperial Beach	County of San Diego
City of La Mesa	San Diego County Regional Airport Authority
City of Lemon Grove	San Diego Unified Port District
City of National City	

After the San Diego Water Board receives and considers the Orange County Copermittees' Report of Waste Discharge and makes any necessary changes to the Order, the Orange County Copermittees in Table 1b will become subject to waste discharge requirements set forth in this Order after expiration of Order No. R9-2009-0002, NPDES No. CAS0108740 on or after December 16, 2014.

Table 1b. Orange County Copermittees

Municipal Copermittees	
City of Aliso Viejo	City of Rancho Santa Margarita
City of Dana Point	City of San Clemente
City of Laguna Beach	City of San Juan Capistrano
City of Laguna Hills	City of Laguna Woods
City of Laguna Niguel	County of Orange
City of Lake Forest	~~Orange County Flood Control District~~

City of Mission Viejo	
Special District Copermittee	
Orange County Flood Control District	

After the San Diego Water Board receives and considers the Riverside County Copermittees' Report of Waste Discharge and makes any necessary changes to this Order, the Riverside County Copermittees in Table 1c will become subject to waste discharge requirements set forth in this Order after expiration of Order No. R9-2010-0016, NPDES No. CAS0108766 on or after November 10, 2015.

Table 1c. Riverside County Copermittees

Municipal Copermittee	
City of Murrieta	County of Riverside
City of Temecula	~~Riverside County Flood Control and Water Conservation District~~
City of Wildomar	
Special District Copermittee	
Riverside County Flood Control and Water Conservation District	

The Orange County Copermittees and Riverside County Copermittees may become subject to the requirements of this Order at a date earlier than the expiration date of their current Orders subject to the conditions described in Provision F.6 of this Order if the Copermittees in the respective county receive a notification of coverage from the San Diego Water Board.

The term Copermittee in this Order refers to any San Diego County, Orange County, or Riverside County Copermittee covered under this Order, unless specified otherwise.

This Order provides permit coverage for the Copermittee discharges described in Table 2.

Table 2. Discharge Locations and Receiving Waters

Discharge Points	Locations throughout San Diego Region
Discharge Description	Municipal Separate Storm Sewer System (MS4) Discharges
Receiving Waters	Inland Surface Waters, Enclosed Bays and Estuaries, and Coastal Ocean Waters of the San Diego Region

Table 3. Administrative Information

This Order was adopted by the San Diego Water Board on:	**Month Day, 2013**
This Order will become effective on:	**Month Day, 2013**
This Order will expire on:	**Month Day, 2018**
The Copermittees must file a Report of Waste Discharge in accordance with Title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than 180 days in advance of the Order expiration date.	

I, David W. Gibson, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on Month Day, 2013.

TENTATIVE

David W. Gibson
Executive Officer

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ATTACHMENTS

Attachment A - Discharge Prohibitions and Special Protections A-1
Attachment B - Standard Permit Provisions and General Provisions B-1
Attachment C - Acronyms, Abbreviations and Definitions C-1
Attachment D - Jurisdictional Runoff Management Program Annual Report Form D-1
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Attachment F - Fact Sheet / Technical Report for Order No. R9-2013-0001 ..... F-1

I. FINDINGS

Comment [A1]: See discussions in section 3.1 of the comment letter

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), finds that:

JURISDICTION

1. **MS4 Ownership or Operation.** Each of the Copermittees owns or operates an MS4, through which it discharges storm water and non-storm water into waters of the U.S. within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the U.S.

Many geographical areas subject to this Order are subject to the threat of periodic catastrophic flooding resulting from natural conditions, specifically the presence of mountains and hilly areas in close proximity to urban development and the effect of period strong Pacific Ocean storms. Such flooding would occur in the absence of development. The Legislature recognized the importance of this issue when it established flood control districts across the state, including in Orange, Riverside and San Diego Counties. Such flooding has in the past, and if not controlled, could in the future result in loss of life and property damage. Such flooding can also mobilize significant Pollutants from industrial, commercial, residential and agricultural lands, damaging watercourses and the beneficial uses thereof, including habitat. MS4s are designed and constructed to mitigate such impacts.

2. Riverside County Flood Control and Water Conservation District.

Comment [A2]: See discussion in section 3.1.1 of the comment letter.

In 1945, the California Legislature enacted the Riverside County Flood Control and Water Conservation District Act, establishing the Riverside County Flood Control and Water Conservation District (District). The objects and purposes of the Act are to provide for the control and conservation of flood and storm waters and for the protection of watercourses, watersheds, public highways, life and property within the District from damage or destruction from flood waters. Among its other powers, the District also has the power to conserve, reclaim and save such waters for beneficial use. However the Act does not provide the District with the power to control the volume or quality of discharges that runs off of private property, which may end up in the District's flood control system. The District is governed by the District's Board of Supervisors as a separate legal entity from the County of Riverside.

Many of the flood management systems that the District operates are defined by the Clean Water Act as an MS4, and include many of the larger MS4s within the Santa Margarita watershed region of Riverside County (SMR). District does not however

own or operate streets, catch basins or storm drains smaller than 36 inches that collect runoff from the incorporated and unincorporated jurisdictions within the SMR, and commonly connect into the District's flood management system. Such systems are typically owned and operated by either the County of Riverside or the incorporated Cities within the SMR.

The waters and pollutants that may enter the regional receiving waters and/or the District's flood management systems come from various sources. These sources can include storm water and non-storm water from the Municipal Copermittees under this permit as well as from other NPDES and non-NPDES permittees, including industrial waste water dischargers, waste water treatment facilities, industrial and construction stormwater dischargers, water suppliers, tribal lands, other state and federal government entities, and Caltrans. Sources can also include discharges from Phase II entities such as school districts and discharges from entities that have been granted waste discharge requirements or waivers of waste discharge requirements, including agricultural operations.

The District does not own or operate any municipal sanitary sewer systems, public streets, roads, or highways. The District has no planning, zoning, development permitting or other land use authority, thus, it has no permitting or governing authority over industrial or commercial facilities, residents, new developments or re-development projects, and development construction sites located in any incorporated or unincorporated areas within its service area, including the SMR. The Copermittees that have such authority are responsible for implementing a storm water management program to address pollutants discharged from such industrial and commercial facilities, residential areas, new development and re-development projects, and development construction sites within their jurisdictional boundaries. Nonetheless, as an owner and operator of an MS4, the District is required to control pollutant discharges into and from its MS4, such as through interagency agreements among Copermittees and other owners of a MS4, the contribution of pollutants from one portion of the MS4 to another portion of the MS4 within their jurisdiction.

2. **Legal and Regulatory Authority.** This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]) adopted by the United States Environmental Protection Agency (USEPA), and chapter 5.5, division 7 of the California Water Code (CWC) (commencing with section 13370). This Order serves as an NPDES permit for discharges from MS4s to surface waters. This Order also serves as waste discharge requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

   The San Diego Water Board has the legal authority to issue a regional MS4 permit pursuant to its authority under CWA section 402(p)(3)(B) and 40 CFR 122.26(a)(1)(v). The USEPA also made it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide permits (55 Federal Register [FR] 47990, 48039-48042). The regional nature of this Order will ensure consistency of regulation within watersheds and is expected

to result in overall cost savings for the Copermittees and San Diego Water Board.

The federal regulations make it clear that the Copermittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators (40 CFR 122.26(a)(3)(vi)). This Order does not require the Copermittees to manage storm water outside of their jurisdictional boundaries, but rather to work collectively to improve storm water management within watersheds.

3. **CWA NPDES Permit Conditions.** Pursuant to CWA section 402(p)(3)(B), NPDES permits for storm water discharges from MS4s must include requirements to effectively prohibit non-storm water discharges into MS4s, and require controls to reduce the discharge of pollutants from the MS4s ~~in storm water~~ to the maximum extent practicable (MEP), and to require other provisions as the San Diego Water Board determines are appropriate to control such pollutants. This Order prescribes conditions to assure compliance with the CWA requirements for owners and operators of MS4s to effectively prohibit non-storm water discharges in to the MS4s, and require controls to reduce the discharge of pollutants ~~in storm water~~ from the MS4s to the MEP.

Comment [A3]: See discussion in section 3.1.2 of the comment letter.

4. **CWA and CWC Monitoring Requirements.** CWA section 308(a) and 40 CFR 122.41(h),(j)-(l) and 122.48 require that NPDES permits must specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s also specify additional monitoring and reporting requirements in 40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c). CWC section 13383 authorizes the San Diego Water Board to establish monitoring, inspection, entry, reporting and recordkeeping requirements. This Order establishes monitoring and reporting requirements to implement federal and State requirements.

5. **Total Maximum Daily Loads.** CWA section 303(d)(1)(A) requires that "[e]ach state shall identify those waters within its boundaries for which the effluent limitations…are not stringent enough to implement any water quality standard applicable to such waters." The CWA also requires states to establish a priority ranking of impaired water bodies known as Water Quality Limited Segments and to establish Total Maximum Daily Loads (TMDLs) for such waters. This priority list of impaired water bodies is called the Clean Water Act Section 303(d) List of Water Quality Limited Segments, commonly referred to as the 303(d) List. The CWA requires the 303(d) List to be updated every two years.

   TMDLs are numerical calculations of the maximum amount of a pollutant that a water body can assimilate and still meet water quality standards. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point sources (waste load allocations or WLAs) and non-point sources (load allocations or LAs), background contribution, plus a margin of safety. Discharges from MS4s are point source discharges. The federal regulations (40 CFR 122.44(d)(1)(vii)(B)) require that NPDES permits to incorporate water quality based effluent limitations (WQBELs) developed to protect a narrative water quality criterion, a numeric water

quality criterion, or both, consistent with the assumptions and requirements of any available WLA for the discharge. Requirements of this Order implement the TMDLs adopted by the San Diego Water Board and approved by USEPA.

6. **Non-Storm Water Discharges.** Pursuant to CWA section 402(p)(3)(B)(ii), this Order requires each Copermittee to effectively prohibit discharges of non-storm water into its MS4. Nevertheless, non-storm water discharges into and from the MS4s continue to be reported to the San Diego Water Board by the Copermittees and other persons. Monitoring conducted by the Copermittees, as well as the 303(d) List, have identified dry weather, non-storm water discharges from the MS4s as a source of pollutants causing or contributing to receiving water quality impairments in the San Diego Region. The federal regulations (40 CFR 122.26(d)(2)(iv)(B)(1)) require the Copermittees to have a program to prevent illicit discharges to the MS4. The federal regulations, however, allow for specific categories of non-storm water discharges or flows to be addressed as illicit discharges only where such discharges are identified as sources of pollutants to waters of the U.S.

7. **In-Stream Treatment Systems.** Pursuant to federal regulations (40 CFR 131.10(a)), in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S. Authorizing the construction of a runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to accepting waste assimilation as an appropriate use for that water body. Runoff treatment must occur prior to the discharge of runoff into receiving waters. Treatment control best management practices (BMPs) must not be constructed in waters of the U.S. Construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body.

DISCHARGE CHARACTERISTICS AND RUNOFF MANAGEMENT

8. **Point Source Discharges of Pollutants.** Discharges from the MS4s may contain waste, as defined in the CWC, and pollutants that adversely affect the quality of the waters of the state. A discharge from an MS4 is a "discharge of pollutants from a point source" into waters of the U.S. as defined in the CWA. Storm water and non-storm water discharges from the MS4s may contain pollutants that cause or threaten to cause a violation of surface water quality standards, as outlined in the Water Quality Control Plan for the San Diego Basin (Basin Plan). ~~Storm water and non-storm water discharges from the MS4s are subject to the conditions and requirements established in the Basin Plan for point source discharges.~~

9. **Potential Beneficial Use Impairment.** The discharge of pollutants and/or increased flows from MS4s may cause or threaten to cause the concentration of pollutants to exceed applicable receiving water quality objectives and impair or threaten to impair designated beneficial uses or which may result~~ing~~ in a condition of pollution, contamination, or nuisance. In addition, the reduction of flows below the

existing condition may impact negatively impact beneficial uses.

10. **Pollutants Generated by Land Development.** Land development has created and continues to create new sources of non-storm water discharges and pollutants in storm water discharges as human population density increases. This brings higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash. Pollutants from these sources are dumped or washed off the surface by non-storm water or storm water flows into and from the MS4s. When development converts natural vegetated pervious ground cover to impervious surfaces such as paved highways, streets, rooftops, and parking lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving a developed area without BMPs that can maintain pre-development conditions will contain greater pollutant loads and have significantly greater runoff volume, velocity, and peak flow rate than pre-development runoff from the same area.

11. **Runoff Discharges to Receiving Waters.** The MS4s discharge runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within the eleven hydrologic units comprising the San Diego Region. ~~Historic and current development makes use of natural drainage patterns and features as conveyances for runoff. Rivers, streams and creeks in developed areas used in this manner are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and receiving water.~~ Numerous receiving water bodies and water body segments have been designated as impaired by the San Diego Water Board pursuant to CWA section 303(d).

Comment [A4]: See discussion in section 3.1.2 of the comment letter.

Pollutants in Runoff. The most common pollutants in runoff discharged from the MS4s include total suspended solids, sediment, pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., cadmium, copper, lead, and zinc), petroleum products and polynuclear aromatic hydrocarbons, synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus), oxygen-demanding substances (e.g., decaying vegetation, animal waste), detergents, and trash. ~~As operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not effectively prohibit or otherwise control.~~ These discharges may cause or contribute to a condition of pollution or a violation of water quality standards. California law requires downstream landowners, including owners and operators of MS4, to accept upstream flows, even if that flow contains Pollutants. Failure to do can create conditions.

Comment [A5]: See discussion in section 3.1.2 of the comment letter.

Limitation on Powers of Copermittees. This Order regulates the discharge of non-stormwater into and Pollutants from non-agricultural Anthropogenic sources from the MS4s owned and/or operated by the Copermittees. The Copermittees lack legal

Comment [A6]: This finding is based on Findings I.B and I.C in Order R8-2010-33, applicable to portions of Riverside County within the Santa Ana region.

jurisdiction over discharges into their MS4 from agricultural activities, State and federal facilities, public schools and hospitals, utilities, railroads, special districts, Native American tribal lands, wastewater management agencies and other point and non-point source discharges otherwise permitted by the Water Board. The Water Board recognizes that the Copermittees should not be held responsible for discharges from such facilities or Pollutants in those discharges. Also, certain activities and sources that generate pollutants present in urban runoff may be beyond the ability of the Copermittees to prevent or eliminate. Examples of these activities and sources include, but are not limited to: emissions from internal combustion engines, brake pad wear and tear, atmospheric deposition, non-Anthropogenic sources of bacteria (including wildlife and feral cats and dogs), the regulation of pesticides and leaching of naturally occurring nutrients and minerals from local soils. This Order is not intended to address background or naturally occurring Pollutants or flows.

12.

13. **Human Health and Aquatic Life Impairment.** Pollutants in runoff discharged from the MS4s can threaten and adversely affect human health and aquatic organisms. Adverse responses of organisms to chemicals or physical agents in runoff range from physiological responses such as impaired reproduction or growth anomalies to mortality. Increased volume, velocity, rate, and duration of storm water runoff greatly accelerate the erosion of downstream natural channels. This alters stream channels and habitats and can adversely affect aquatic and terrestrial organisms.

14. **Water Quality Effects.** The Copermittees' water quality monitoring data submitted to date documents various persistent exceedances of Basin Plan water quality objectives for runoff-related pollutants at various watershed monitoring stations. Persistent toxicity has also been observed at several watershed monitoring stations. In addition, bioassessment data indicate that the majority of the monitored receiving waters have Poor to Very Poor Index of Biological Integrity (IBI) ratings. ~~These findings indicate that runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in the San Diego Region. Non-storm water discharges from the MS4s have been shown to contribute significant levels of pollutants and flow in arid, developed Southern California watersheds, and contribute significantly to exceedances of applicable receiving water quality objectives.~~

Comment [A7]: These statements are completely unsubstantiated.

15. ~~**Non-Storm Water and Storm Water Discharges.** Non-storm water discharges from the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard of CWA section 402(p)(3)(B)(iii), which is explicitly for "Municipal … *Stormwater Discharges* (emphasis added)" from the MS4s. Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s must be effectively prohibited.~~

Comment [A8]: See discussion in section 3.1.2 of the comment letter.

16. **Best Management Practices.** Waste and pollutants which are deposited and accumulate in MS4 drainage structures may~~will~~ be discharged from these structures

to waters of the U.S. unless they are removed. These discharges may cause or contribute to, or threaten to cause or contribute to, a condition of pollution in receiving waters. For this reason, pollutants in storm water discharges from the MS4s can be and must be effectively reduced in runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Pollution prevention is the reduction or elimination of pollutant generation at its source and is the best "first line of defense". Source control BMPs (both structural and non-structural) minimize the contact between pollutants and runoff, therefore keeping pollutants onsite and out of receiving waters. Treatment control BMPs remove pollutants that have been mobilized by storm water or non-storm water flows.

17. **BMP Implementation.** Runoff needs to be addressed during the three major phases of development (planning, construction, and use) in order to reduce the discharge of storm water pollutants to the MEP, effectively prohibit non-storm water discharges, and protect receiving waters. Development which is not guided by water quality planning policies and principles can result in increased pollutant load discharges, flow rates, and flow durations which can negatively affect receiving water beneficial uses. Construction sites without adequate BMP implementation result in sediment runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. Existing development can generate substantial pollutant loads which are discharged in runoff to receiving waters. Retrofitting areas of existing development with storm water pollutant control and hydromodification management BMPs may in many cases be ~~is~~ necessary to address storm water discharges from existing development that may cause or contribute to a condition of pollution or a violation of water quality standards.

Comment [A9]: It is not necessary in all cases.

18. **Long Term Planning and Implementation.** Federal regulations require municipal storm water permits to expire 5 years from adoption, after which the permit must be renewed and reissued. The San Diego Water Board recognizes that the degradation of water quality and impacts to beneficial uses of the waters in the San Diego Region occurred over several decades. The San Diego Water Board further recognizes that a decade or more may be necessary to realize demonstrable improvement to the quality of waters in the Region. This Order includes a long term planning and implementation approach that will require more than a single permit term to complete.

WATER QUALITY STANDARDS

19. **Basin Plan.** The San Diego Water Board adopted the Water Quality Control Plan for the San Diego Basin (Basin Plan) on September 8, 1994 that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for receiving waters addressed through the plan. The Basin Plan was subsequently approved by the State Water

Resources Control Board (State Water Board) on December 13, 1994. Subsequent revisions to the Basin Plan have also been adopted by the San Diego Water Board and approved by the State Water Board. Requirements of this Order implement the Basin Plan.

The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Process Supply (PROC), Industrial Service Supply (IND), Ground Water Recharge (GWR), Contact Water Recreation (REC1), Non-contact Water Recreation (REC2), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Freshwater Replenishment (FRSH), Hydropower Generation (POW), and Preservation of Biological Habitats of Special Significance (BIOL). The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region: Navigation (NAV), Commercial and Sport Fishing (COMM), Estuarine Habitat (EST), Marine Habitat (MAR), Aquaculture (AQUA), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN), and Shellfish Harvesting (SHELL).

20. **Ocean Plan.** The State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, and 2005. The State Water Board adopted the latest amendment on April 21, 2005 and it became effective on February 14, 2006. The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean. Requirements of this Order implement the Ocean Plan.

    The Ocean Plan identifies the following beneficial uses of ocean waters of the state to be protected: Industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture; preservation and enhancement of designated Areas of Special Biological Significance; rare and endangered species; marine habitat; fish spawning and shellfish harvesting

21. **Sediment Quality Control Plan**. On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes: 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

22. **National Toxics Rule and California Toxics Rule.** USEPA adopted the National Toxics Rule (NTR) on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the NTR applied in California. On May 18, 2000, USEPA adopted the California Toxics Rule (CTR). The CTR promulgated

new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants.

23. **Antidegradation Policy.** This Order is in conformance with the federal Antidegradation Policy described in 40 CFR 131.12, and State Water Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality Waters in California*. Federal regulations at 40 CFR 131.12 require that the State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. State Water Board Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies.

CONSIDERATIONS UNDER FEDERAL AND STATE LAW

24. **Coastal Zone Act Reauthorization Amendments.** Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states with approved coastal zone management programs to address non-point source pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point source pollution: agriculture, silviculture, urban, marinas, and hydromodification. This Order addresses the management measures required for the urban category, with the exception of septic systems. The runoff management programs developed pursuant to this Order fulfills the need for coastal cities to develop a runoff non-point source plan identified in the Non-Point Source Program Strategy and Implementation Plan. The San Diego Water Board addresses septic systems through the administration of other programs.

25. **Endangered Species Act.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 USC sections 1531 to 1544). This Order requires compliance with receiving water limits, and other requirements to protect the beneficial uses of waters of the State. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

26. **Report of Waste Discharge Process.** The waste discharge requirements set forth in this Order are based upon the Report of Waste Discharge submitted by the San Diego County Copermittees prior to the expiration of Order No. R9-2007-0001 (NPDES No. CAS0109266). The Orange County and Riverside County Copermittees are not immediately covered by the waste discharge requirements in this Order. The San Diego Water Board understands that each municipality is

unique although the Counties share watersheds and geographical boundaries. The Order will continue to use the Report of Waste Discharge process prior to initially making Orange County or Riverside County Copermittees subject to the requirements of this Order.

The federal regulations (40 CFR 122.21(d)(2)) and CWC section 13376 impose a duty on the Copermittees to reapply for continued coverage through submittal of a Report of Waste Discharge no later than 180 days prior to expiration of a currently effective permit. This requirement is set forth in the Orange County Copermittees' and Riverside County Copermittees' currently effective permits at Provisions K.2.b and K.2.c, respectively. The Orange County Permit, Order No. R9-2009-0002 (NPDES No. CAS0108740) expires on December 16, 2014 and the Riverside County MS4 Permit, Order No. R9-2010-0016 (NPDES No. CAS0108766) expires on November 10, 2015.

Unless the Orange County or Riverside County Copermittees apply for and receive early coverage under this Order, the Orange County Copermittees' and the Riverside County Copermittees' respective permits will be superseded by this Order upon expiration of their respective permits, subject to any necessary revisions to the requirements of this Order made after the San Diego Water Board considers their respective Reports of Waste Discharge through the public process provided in 40 CFR 124.

Comment [A10]: Please see Comment Letter and Legal Comments regarding regional permit authority,

27. **Integrated Report and Clean Water Act Section 303(d) List.** The San Diego Water Board and State Water Board submit an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. USEPA issued its *Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act* on July 29, 2005, which advocates the use of a five category approach for classifying the attainment status of water quality standards for water bodies in the Integrated Report. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 in the Integrated Report are placed on the 303(d) List.

Water bodies with available data and/or information that indicate at least one beneficial use is not being supported or is threatened, but a TMDL is not required, are included in Category 4 in the Integrated Report. Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

Implementation of the requirements of this Order may allow the San Diego Water Board to include surface waters impaired by discharges from the Copermittees'

MS4s in Category 4 in the Integrated Report for consideration during the next 303(d) List submittal by the State to USEPA.

28. **Economic Considerations.** The California Supreme Court has ruled that although CWC section 13263 requires the State and Regional Water Boards (collectively Water Boards) to consider factors set forth in CWC section 13241 when issuing an NPDES permit, the Water Board may not consider the factors to justify imposing pollutant restrictions that are less stringent than the applicable federal regulations require. (*City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 618, 626-627.) However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

Comment [A11]: See discussion in section 3.1.2 of the Comment Letter and also Legal Comments..

As noted in the following finding, the San Diego Water Board finds that the requirements in this permit are not more stringent than the minimum federal requirements. Therefore, a CWC section 13241 analysis is not required for permit requirements that implement the effective prohibition on the discharge of non-storm water into the MS4 or for controls to reduce the discharge of pollutants ~~in storm water~~ to the MEP, or other provisions that the San Diego Water Board has determined appropriate to control such pollutants, as those requirements are mandated by federal law. Notwithstanding the above, the San Diego Water Board has developed an economic analysis of the requirements in this Order. The economic analysis is provided in the Fact Sheet.

29. ~~**Unfunded Mandates.** This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following:~~

Comment [A12]: See discussion in section 3.1.2 of the comment letter and in the Legal Comments.

~~**a.** This Order implements federally mandated requirements under CWA section 402 (33 USC section 1342(p)(3)(B)).~~

~~**b.** The local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental and new dischargers who are issued NPDES permits for storm water and non-storm water discharges.~~

~~**c.** The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order.~~

~~**d.** The Copermittees have requested permit coverage in lieu of compliance with the complete effective prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)) and in lieu of numeric restrictions on their MS4 discharges (i.e. effluent limitations).~~

~~**e.** The local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under State law predates the enactment of Article XIIIB, Section (6) of the California Constitution.~~

~~f. The provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state develops a TMDL, federal law requires that permits must contain water quality based effluent limitations consistent with the assumptions and requirements of any applicable wasteload allocation (40 CFR 122.44(d)(1)(vii)(B)).~~

~~See the Fact Sheet for further discussion of unfunded mandates.~~

30. **California Environmental Quality Act.** The issuance of waste discharge requirements and an NPDES permit for the discharge of runoff from MS4s to waters of the U.S. is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 et seq.) in accordance with CWC section 13389.

STATE WATER BOARD DECISIONS

31. **Compliance with Prohibitions and Limitations.** The receiving water limitation language specified in this Order is consistent with language recommended by the USEPA and established in State Water Board Order WQ 99-05, *Own Motion Review of the Petition of Environmental Health Coalition to Review Waste Discharge Requirements Order No. 96-03, NPDES Permit No. CAS0108740*, adopted by the State Water Board on June 17, 1999. The receiving water limitation language in this Order requires storm water discharges from MS4s to not cause or contribute to a violation of water quality standards, which is to be achieved through an iterative approach requiring the implementation of improved and better-tailored BMPs over time. Implementation of the iterative approach to comply with receiving water limitations based on applicable water quality standards is necessary to ensure that Pollutant ~~storm water~~ discharges from the MS4 will not ultimately cause or contribute to violations of water quality standards and will not create conditions of pollution, contamination, or nuisance.

Comment [A13]: See discussion in section 3.1.2 of the comment letter.

Comment [A14]: Please see discussion in section 3.1.2 of the Comment Letter and Legal Comments.

32. **Special Conditions for Areas of Special Biological Significance.** On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving an exception to the Ocean Plan effective prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges. State Water Board Resolution No. 2012-0012 requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, effective prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject terms and conditions of State Water Board Resolution No. 2012-0012. The Special

Protections contained in Attachment B to Resolution No. 2012-0012, applicable to these discharges, are hereby incorporated into this Order as if fully set forth herein.

ADMINISTRATIVE FINDINGS

33. **Executive Officer Delegation of Authority.** The San Diego Water Board by prior resolution has delegated all matters that may legally be delegated to its Executive Officer to act on its behalf pursuant to CWC section 13223. Therefore, the Executive Officer is authorized to act on the San Diego Water Board's behalf on any matter within this Order unless such delegation is unlawful under CWC section 13223 or this Order explicitly states otherwise.

34. **Standard Provisions.** Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR 122.42, are provided in Attachment B to this Order.

35. **Fact Sheet.** The Fact Sheet for this Order contains background information, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of this Order. The Fact Sheet is hereby incorporated into this Order and constitutes part of the Findings of this Order.

36. **Public Notice.** In accordance with State and federal laws and regulations, the San Diego Water Board notified the Copermittees, and interested agencies and persons of its intent to prescribe waste discharge requirements for the control of discharges into and from the MS4s to waters of the U.S. and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet.

37. **Public Hearing.** The San Diego Water Board held a public hearing on Month Day, 2013 and heard and considered all comments pertaining to the terms and conditions of this Order. Details of the public hearing are provided in the Fact Sheet.

38. **Effective Date.** This Order serves as an NPDES permit pursuant to CWA section 401 or amendments thereto, and becomes effective fifty (50) days after the date of its adoption, provided that the Regional Administrator, USEPA, Region IX, does not object to this Order.

39. **Review by the State Water Board.** Any person aggrieved by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with CWC section 13320 and California Code of Regulations, title 23, sections 2050, et seq. The State Water Board must receive the petition by 5:00 p.m., 30 days after the San Diego Water Board action, except that if the thirtieth day following the action falls on a Saturday, Sunday or State holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the

Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

THEREFORE, IT IS HEREBY ORDERED that the Copermittees, in order to meet the provisions contained in division 7 of the CWC and regulations adopted thereunder, and the provisions of the CWA and regulations adopted thereunder, must each comply with the following:

II. PROVISIONS

A. PROHIBITIONS AND LIMITATIONS

Comment [A15]: See discussion in section 3.2 of the comment letter.

The purpose of this provision is to describe the conditions under which storm water and non-storm water discharges into and from MS4s are to be effectively prohibited or limited. The goal of the prohibitions and limitations is to protect the water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through the implementation of water quality improvement strategies and runoff management programs that effectively prohibit non-storm water discharges into the Copermittees' MS4s, and reduce pollutants in ~~storm water~~ discharges from the Copermittees' MS4s to the MEP. The process for determination of compliance with the Discharge Prohibitions (A.1), Receiving Water Limitations (A.2), and Effluent Limitations (A.3) is defined in Provisions A.3.b and A.4.

1. Discharge Prohibitions

a. Discharges from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters ~~of the state~~ are to be ~~prohibited.~~ effectively prohibited, unless the Regional Board determines such discharges are addressed by the Copermittee through A.3.b or A.4, including any modifications.~~prohibited.~~

Comment [A16]: See discussion in section 3.2.2 of the comment letter.

b. Non-storm water discharges into MS4s are to be effectively prohibited through a program consistent with the requirements of provision E.2. of this order, including inspections, to implement and enforce an ordinance, orders or similar means to prevent illicit discharges to the MS4, unless such discharges are either authorized by a separate NPDES permit, or the discharge is a category of non-storm water discharges or flows that must be addressed pursuant to Provisions E.2.a.(1)-(5) of this Order.

Comment [A17]: See discussion in section 3.2.2 of the comment letter.

c. Discharges from MS4s are subject to all applicable waste discharge prohibitions in the Basin Plan, included in Attachment A to this Order, unless the Regional Board determines such discharges are addressed by the Copermittee through A.3.b or A.4, including any modifications.

Comment [A18]: See discussion in section 3.2.2 of the comment letter.

d. Storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No.

2012-0012 applicable to these discharges, included in Attachment A to this Order. All other discharges from the Copermittees' MS4s to ASBS are ~~to be effectively~~ prohibited.

2. Receiving Water Limitations

Comment [A19]: See discussion in section 3.2.2 of the comment letter.

a. Discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters, including but not limited to all applicable provisions ~~contained in:~~below, unless the Regional Board determines such discharges are addressed by the Copermittee through A.3.b or A.4::~~contained in:~~

(1) The San Diego Water Board's Basin Plan, including beneficial uses, water quality objectives, and implementation plans;

(2) State Water Board plans for water quality control including the following:

(a) Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries (Thermal Plan), and

(b) The Ocean Plan, including beneficial uses, water quality objectives, and implementation plans;

(3) State Water Board policies for water and sediment quality control including the following:

(a) Water Quality Control Policy for the Enclosed Bays and Estuaries of California,

(b) Sediment Quality Control Plan which includes the following narrative objectives for bays and estuaries:

(i) Pollutants in sediments shall not be present in quantities that, alone or in combination, are toxic to benthic communities, and

(ii) Pollutants shall not be present in sediments at levels that will bioaccumulate in aquatic life to levels that are harmful to human health,

(c) The Statement of Policy with Respect to Maintaining High Quality of Waters in California;[1]

(4) Priority pollutant criteria promulgated by the USEPA through the following:

[1] State Water Board Resolution No. 68-16

(a) National Toxics Rule (NTR)[2] (promulgated on December 22, 1992 and amended on May 4, 1995), and

(b) California Toxics Rule (CTR).[3,4]

b. Discharges from MS4s composed of storm water runoff must not alter natural ocean water quality in an ASBS.

[2] 40 CFR 131.36
[3] 65 Federal Register 31682-31719 (May 18, 2000), adding Section 131.38 to 40 CFR
[4] If a water quality objective and a CTR criterion are in effect for the same priority pollutant, the more stringent of the two applies.

3. Effluent Limitations

a. TECHNOLOGY BASED EFFLUENT LIMITATIONS

Comment [A20]: See discussion in section 3.2.2 of the comment letter.

Pollutants in ~~storm water~~ discharges from MS4s must be reduced to the MEP.[5]

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

This Order establishes water quality based effluent limitations (WQBELs) consistent with the assumptions and requirements of all available TMDL waste load allocations (WLAs) assigned to discharges from the Copermittees' MS4s. Each Copermittee must comply with applicable WQBELs established for the TMDLs in Attachment E to this Order, pursuant to the applicable TMDL compliance schedules.

4. Compliance with Discharge Prohibitions and Receiving Water Limitations

Comment [A21]: See discussion in section 3.2.2 of the comment letter.

Each Copermittee must achieve compliance with Provisions A.1.a~~,~~ through A.1.c and A.2.a of this Order through timely implementation of control measures and other actions as specified in Provisions B and E of this Order, including any modifications. The Water Quality Improvement Plans required under Provision B must be designed and adapted to ultimately achieve compliance with Provisions A.1.a~~,~~ through A.1.c and A.2.a~~.~~, as described in Provision B.2.~~.~~

a. If exceedance(s) of water quality standards persist in receiving waters notwithstanding implementation of this Order, the Copermittees must comply with the following procedures:

(1) For exceedance(s) of a water quality standard in the process of being addressed by the Water Quality Improvement Plan, the Copermittee(s) must implement the Water Quality Improvement Plan as accepted by the San Diego Water Board, and update the Water Quality Improvement Plan, as necessary, pursuant to Provision F.2.c;

(2) Upon a determination by either the Copermittees or the San Diego Water Board that discharges from the MS4 are causing or contributing to a new exceedance of an applicable water quality standard not addressed by the Water Quality Improvement Plan, the Copermittees must submit the following updates to the Water Quality Improvement Plan pursuant to Provision F.2.c or as part of the Annual Report required under Provision F.3.b, unless the San

[5] This does not apply to MS4 discharges which receive subsequent treatment to reduce pollutants in storm water discharges to the MEP prior to entering receiving waters (e.g., low flow diversions to the sanitary sewer). Runoff treatment must occur prior to the discharge of runoff into receiving waters per Finding 7.

Diego Water Board directs an earlier submittal:

(a) The water quality improvement strategies being implemented that are effective and will continue to be implemented,

(b) Water quality improvement strategies (i.e. BMPs, retrofitting projects, stream and/or habitat rehabilitation or restoration projects, adjustments to jurisdictional runoff management programs, etc.) that will be implemented to reduce or eliminate any pollutants or conditions that are causing or contributing to the exceedance of water quality standards,

(c) Updates to the schedule for implementation of the existing and additional water quality improvement strategies, and

(d) Updates to the monitoring and assessment program to track progress toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a of this Order;

(3) The San Diego Water Board may require the incorporation of additional modifications to the Water Quality Improvement Plan required under Provision B. The applicable Copermittees must submit any modifications to the update to the Water Quality Improvement Plan within 90 days of notification that additional modifications are required by the San Diego Water Board, or as otherwise directed;

(4) Within 90 days of the San Diego Water Board determination that the update to the Water Quality Improvement Plan meets the requirements of this Order, the applicable Copermittees must revise the jurisdictional runoff management program documents to incorporate the updated water quality improvement strategies that have been and will be implemented, the implementation schedule, and any additional monitoring required; and

(5) Each Copermittee must implement the updated Water Quality Improvement Plan.

b. The procedure set forth above to achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order do not have to be repeated for continuing or recurring exceedances of the same water quality standard(s) following implementation of scheduled actions unless directed to do otherwise by the San Diego Water Board.

c. Nothing in Provisions A.4.a and A.4.b prevents the San Diego Water Board from enforcing any of provisions B through I of this Order while the applicable Copermittees prepare and implement the above update to the Water Quality Improvement Plan and jurisdictional runoff management programs.

B. WATER QUALITY IMPROVEMENT PLANS

The purpose of this provision is to develop Water Quality Improvement Plans (WQIPs) that guide the Copermittees' jurisdictional runoff management programs towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plans is to ~~protect, preserve, enhance, and restorerestore the~~address the impacts of MS4 discharges so that such discharges do not impair water quality and designated beneficial uses of receiving waters~~. of the state.~~ Therefore, implementation of the WQIPs also provides the basis for complying with Provisions II.A.1, II.A.2, and II.A.3, as described in Provision II.A.4. This goal will be accomplished through an adaptive planning and management process that identifies the highest priority water quality conditions within a watershed and implements strategies through the jurisdictional runoff management programs to achieve improvements in the quality of discharges from the MS4s ~~and~~ to receiving waters. As such, the requirements outlined in Provision E may be modified for consistency with the WQIP priorities for the applicable Watershed Management Area, if appropriate justification is provided approved within the WQIP.

Comment [A22]: See section 3.3 of the comment letter for discussions of the changes requested herein.

Comment [A23]: See discussion in section 3.3.2 of the comment letter.

1. Watershed Management Areas

Comment [A24]: See discussion in section 3.3.2 of the comment letter.

The Copermittees must develop a Water Quality Improvement Plan for each of the Watershed Management Areas in Table B-1. A total of ten Water Quality Improvement Plans must be developed for the San Diego Region.

Development of the Water Quality Improvement Plan for the Santa Margarita River Watershed Management Area shall commence upon notification of coverage of the Riverside County Copermittees under this Order. Until this time, the County of San Diego shall use the water quality priorities in the Santa Margarita River Watershed Urban Runoff Management Plan, developed pursuant to Order No. R9-2007-0001, to guide implementation of Provisions D and E within its jurisdiction

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
San Juan (901.00)	South Orange County	- Aliso Creek - San Juan Creek - San Mateo Creek - Pacific Ocean - Heisler Park ASBS	- City of Aliso Viejo[1] - City of Dana Point[1] - City of Laguna Beach[1] - City of Laguna Hills[1] - City of Laguna Niguel[1] - City of Laguna Woods[1] - City of Lake Forest[1] - City of Mission Viejo[1] - City of Rancho Santa Margarita[1] - City of San Clemente[1] - City of San Juan Capistrano[1] - County of Orange[1] - Orange County Flood Control District[1]

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
Santa Margarita (902.00)	Santa Margarita River	- Murrieta Creek - Temecula Creek - Santa Margarita River - Santa Margarita Lagoon - Pacific Ocean	- City of Murrieta[2] - City of Temecula[2] - City of Wildomar[2] - County of Riverside[2] - County of San Diego[3] - Riverside County Flood Control and Water Conservation District[2]
San Luis Rey (903.00)	San Luis Rey River	- San Luis Rey River - San Luis Rey Estuary - Pacific Ocean	- City of Oceanside - City of Vista - County of San Diego
Carlsbad (904.00)	Carlsbad	- Loma Alta Slough - Buena Vista Lagoon - Agua Hedionda Lagoon - Batiquitos Lagoon - San Elijo Lagoon - Pacific Ocean	- City of Carlsbad - City of Encinitas - City of Escondido - City of Oceanside - City of San Marcos - City of Solana Beach - City of Vista - County of San Diego
San Dieguito (905.00)	San Dieguito River	- San Dieguito River - San Dieguito Lagoon - Pacific Ocean	- City of Del Mar - City of Escondido - City of Poway - City of San Diego - City of Solana Beach - County of San Diego
Penasquitos (906.00)	Penasquitos	- Los Penasquitos Lagoon - Pacific Ocean	- City of Del Mar - City of Poway - City of San Diego - County of San Diego
	Mission Bay	- Mission Bay - Pacific Ocean - San Diego Marine Life Refuge ASBS	- City of San Diego
San Diego (907.00)	San Diego River	- San Diego River - Pacific Ocean	- City of El Cajon - City of La Mesa - City of San Diego - City of Santee - County of San Diego
Pueblo San Diego (908.00) Sweetwater (909.00) Otay (910.00)	San Diego Bay	- Sweetwater River - Otay River - San Diego Bay - Pacific Ocean	- City of Chula Vista - City of Coronado - City of Imperial Beach - City of La Mesa - City of Lemon Grove - City of National City - City of San Diego - County of San Diego - San Diego County Regional Airport Authority - San Diego Unified Port District
Tijuana (911.00)	Tijuana River	- Tijuana River - Tijuana Estuary - Pacific Ocean	- City of Imperial Beach - City of San Diego - County of San Diego

Notes:
1. The Orange County Copermittees will be covered under this Order after expiration of Order No. R9-2009-0002, or earlier if the Orange County Copermittees meet the conditions in Provision F.6.
2. The Riverside County Copermittees will be covered under this Order after expiration of Order No. R9-2010-0016, or earlier if the Riverside County Copermittees meet the conditions in Provision F.6.
3. The County of San Diego is required to implement the requirements of Provision B for its jurisdiction within the Santa

Margarita River Watershed Management Area until the Riverside County Copermittees have been notified of coverage under this Order.

2. Priority Water Quality Conditions

The Copermittees must identify the water quality priorities within each Watershed Management Area that will be addressed by the Water Quality Improvement Plan. Where appropriate, Watershed Management Areas may be separated into subwatersheds to focus water quality prioritization and jurisdictional runoff management program implementation efforts by receiving water.

a. Assessment of Receiving Water Conditions

The Copermittees must consider the following, at a minimum, to identify water quality priorities based on impacts of MS4 discharges on receiving water beneficial uses:

(1) Receiving waters listed as impaired on the CWA Section 303(d) List of Water Quality Limited Segments (303(d) List);

(2) TMDLs adopted and under development by the San Diego Water Board;

(3) Receiving waters recognized as sensitive or highly valued by the Copermittees, including estuaries designated under the National Estuary Program under CWA section 320, wetlands defined by the State or U.S. Fish and Wildlife Service's National Wetlands Inventory as wetlands, and receiving waters identified as ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (Attachment A);

(4) The receiving water limitations of Provision A.2;

(5) Known historical versus current physical, chemical, and biological water quality conditions;

(6) Available, relevant, and appropriately collected and analyzed physical, chemical, and biological receiving water monitoring data, including, but not limited to, data describing:

(a) Chemical constituents,

(b) Water quality parameters (i.e. pH, temperature, conductivity, etc.),

(c) Toxicity Identification Evaluations for both receiving water column and sediment,

(d) Trash impacts,

(e) Bioassessments, and

(f) Physical habitat;

(7) Available evidence of erosional impacts in receiving waters due to accelerated flows (i.e. hydromodification);

(8) Available evidence of adverse impacts to the chemical, physical, and biological integrity of receiving waters; and

(9) The potential improvements in the overall condition of the Watershed Management Area that can be achieved.

b. ASSESSMENT OF IMPACTS FROM MS4 DISCHARGES

The Copermittees must consider the following, at a minimum, to identify the potential impacts to receiving waters that may be caused or contributed to by discharges from the Copermittees' MS4s:

(1) The discharge prohibitions of Provision A.1 and effluent limitations of Provision A.3; and

(2) Available, relevant, and appropriately collected and analyzed storm water and non-storm water monitoring data from the Copermittees' MS4 outfalls;

(3) Locations of each Copermittee's MS4 outfalls that discharge to receiving waters;

(4) Locations of MS4 outfalls that are known to persistently discharge non-storm water to receiving waters likely causing or contributing to impacts on receiving water beneficial uses;

(5) Locations of MS4 outfalls that are known to discharge pollutants in storm water causing or contributing to impacts on receiving water beneficial uses; and

(6) The potential improvements in the quality of discharges from the MS4 that can be achieved.

c. IDENTIFICATION OF PRIORITY WATER QUALITY CONDITIONS

(1) The Copermittees must use the information gathered for Provisions B.2.a and B.2.b to develop a list of priority water quality conditions as pollutants, stressors and/or receiving water conditions that are the highest threat to receiving water quality or that most adversely affect the physical, chemical, and biological integrity of receiving waters. The list must include the following information for each priority water quality condition:

(a) The beneficial use(s) associated with the priority water quality condition;

(b) The geographic extent of the priority water quality condition within the Watershed Management Area, if known;

(c) The temporal extent of the priority water quality condition (e.g., dry weather and/or wet weather);

(d) The Copermittees with MS4s discharges that may cause or contribute to the priority water quality condition; and

(e) An assessment of the adequacy of and data gaps in the monitoring data to characterize the conditions causing or contributing to the priority water quality condition, including a consideration of spatial and temporal variation.

(2) The Copermittees must identify the highest priority water quality conditions to be addressed by the Water Quality Improvement Plan, and provide a rationale for selecting a subset of the water quality conditions identified pursuant to Provision B.2.c.(1) as the highest priorities.

d. IDENTIFICATION OF MS4 SOURCES OF POLLUTANTS AND/OR STRESSORS

The Copermittees must identify and prioritize known and suspected sources of storm water and non-storm water pollutants and/or other stressors within their jurisdiction, associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c. ~~The identification of known and suspected sources of pollutants and/or stressors that cause or contribute to the highest priority water quality conditions as identified for Provision B.2.c must~~ considering the following:

(1) Pollutant generating facilities, areas, and/or activities within the Watershed Management Area, including:

(a) Each Copermittee's inventory of construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas,

(b) Publicly owned parks and/or recreational areas,

(c) Open space areas,

(d) All currently operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste,,, and

(e) Areas not within the Copermittees' jurisdictions (e.g., Phase II MS4s, tribal lands, state lands, federal lands) that are known or suspected to be discharging to the Copermittees' MS4s;

(2) Locations of the Copermittees' MS4s, including the following:

(a) All major MS4 outfalls [per 40CFR 122.26 (b)(5)] that discharge to receiving waters, and

(b) Locations of major structural controls for storm water and non-storm water (e.g., retention basins, detention basins, major infiltration devices, etc.);

(3) Other known and suspected sources of non-storm water or pollutants in storm water discharges to receiving waters within the Watershed Management Area, including the following:

(a) Other MS4 outfalls (e.g., Phase II Municipal and Caltrans),

(b) Other NPDES permitted discharges,

(c) Any other discharges that may be considered point sources (e.g., private outfalls), and

(d) Any other discharges that may be considered non-point sources (e.g., agriculture, wildlife or other natural sources);

(4) Review of available data, including but not limited to:

(a) Findings from the Copermittees' illicit discharge detection and elimination programs,

(b) Findings from the Copermittees' MS4 outfall discharge monitoring,

(c) Findings from the Copermittees' receiving water monitoring,

(d) Findings from the Copermittees' MS4 outfall discharge and receiving water assessments, and

(e) Other available, relevant, and appropriately collected data, information, or studies related to pollutant sources and/or stressors that contribute to the highest priority water quality conditions as identified for Provision B.2.c.

(5) The adequacy of the available data to identify and prioritize sources and/or stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c.

e. NUMERIC GOALS AND SCHEDULES

Comment [A25]: See discussion in section 3.3.2 of the comment letter.

The Copermittees must develop and incorporate action levels, interim and final numeric goals[6] and schedules into the Water Quality Improvement Plan. Numeric goals must be used to support Water Quality Improvement Plan implementation and measure progress towards addressing the highest priority water quality conditions identified under Provision B.2.c. . Action Levels, Numeric goals are not enforceable compliance standards, effluent limitations, or receiving water limitations. When establishing numeric goals and corresponding schedules, the Copermittees must consider the following:

(1) Final numeric goals must be based on measureable criteria or indicators, to be achieved in ~~the receiving waters and/or~~ MS4 discharges for the highest priority water quality conditions which will ~~be capable of demonstrating the achievement of the restoration and/or protection~~ comply with the Receiving Water Limitations (A.2) of this Order; ~~water quality standards in receiving waters;~~

(2) Interim numeric goals must be based on measureable criteria or indicators capable of demonstrating incremental progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges; and

(3) Schedules must be adequate for measuring progress toward achieving the interim and final numeric goals required for Provisions B.2.e.(1) and B.2.e.(2). Schedules must incorporate the following:

(a) Interim dates for achieving the interim numeric goals,

(b) Compliance schedules for any applicable TMDLs in Attachment E to this Order,

(c) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A),

(d) Achievement of the final numeric goals in the receiving waters and/or MS4 discharges for the highest water quality priorities must be as soon as possible, and

[6] Interim and final numeric goals may take a variety of forms such as TMDL established WQBELs, action levels, pollutant concentration, load reductions, number of impaired water bodies delisted from the List of Water Quality Impaired Segments, Index of Biotic Integrity (IBI) scores, or other appropriate metrics. Interim and final numeric goals are not necessarily limited to one criterion or indicator, but may include multiple criteria and/or indicators. Except for TMDL established WQBELs, interim and final numeric goals and corresponding schedules may be revised through the adaptive management process under Provision B.5.

(e) Final dates for achieving the final numeric goals must not initially extend more than 10 years beyond the effective date of this Order, unless a longer period of time is authorized by the San Diego Water Board Executive Officer through an approved WQIP or the schedule includes an applicable TMDL in Attachment E to this Order[7].

Comment [A26]: Clarify that a longer period can be granted through the WQIP process.

[7] Achievement of final numeric goals within 10 years represents progress towards attainment of water quality standards, but is not a requirement to fully attain all applicable water quality standards or all priority receiving water conditions within 10 years.

3. Water Quality Improvement Strategies and Schedules

Comment [A27]: See discussion in section 3.3.2 of the comment letter.

The Copermittees must develop specific water quality improvement strategies to address the highest priority water quality conditions identified within a Watershed Management Area. The water quality improvement strategies must address the highest priority water quality conditions by ensuring the effective prohibition of~~preventing or eliminating~~ non-storm water discharges to and from the MS4, reducing pollutants in ~~storm water~~ discharges from the MS4 to the MEP, as applicable to the priority water quality conditions established per provision B.2. ~~and restoring and/or protecting the water quality standards of receiving waters~~.

a. Water Quality Improvement Strategies

The Copermittees must identify and prioritize water quality improvement strategies based on their likely effectiveness and efficiency, and design the JRMP programs to focus resources on those strategies to~~implement strategies to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, improve the physical, chemical, and biological receiving water conditions, and~~ achieve the interim and final numeric goals in accordance with the schedules required for Provision B.2.e.(3). The following water quality improvement strategies must be included and described in the Water Quality Improvement Plan:

(1) Specific strategies and/or activities that may be implemented by one or more Copermittees within their jurisdictions through the jurisdictional runoff management programs that will address the highest priority water quality conditions within the Watershed Management Area, in accordance with the following requirements:

(a) Strategies and/or activities must, at a minimum, be described for each jurisdictional runoff management program component where strategies to address the highest priority water quality conditions are required under Provision E;

(b) The Water Quality Improvement Plan must describe the circumstances or conditions when and where the strategies or/activities should be or will be implemented, but specific details about how each Copermittee will implement the strategies and/or activities within its jurisdiction are not required; and

(c) Descriptions of strategies and/or activities must include any monitoring, information collection, special studies, and/or data analysis that is necessary to assess the effectiveness of the strategy and/or activity toward addressing the highest priority water quality conditions.

(2) Additional strategies and/or activities that may be implemented within the Watershed Management Area on a jurisdictional, sub-watershed, or watershed scale by one or more Copermittees, not specifically required under

Provision E, which are designed to achieve the interim and final numeric goals identified in Provisions B.2.e.(1) and B.2.e.(2);

b. IMPLEMENTATION SCHEDULES

(1) The Copermittees must develop schedules for implementing the water quality improvement strategies identified under Provision B.3.a to achieve the interim and final numeric goals identified under Provision B.2.e.(1) and B.2.e.(2). Schedules must be developed for both the water quality improvement strategies implemented by each Copermittee within its jurisdiction and for strategies that the Copermittees choose to implement on a collaborative basis.

(2) The Copermittees must incorporate the implementation compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

4. Water Quality Improvement Monitoring and Assessment Program

a. The Copermittees in each Watershed Management Area must develop and incorporate an integrated monitoring and assessment program into the Water Quality Improvement Plan that assesses: 1) the progress toward achieving the numeric goals and schedules, 2) the progress toward addressing the highest priority water quality conditions for each Watershed Management Area, and 3) each Copermittee's overall efforts to implement the Water Quality Improvement Plan.

b. The monitoring and assessment program must incorporate the monitoring and assessment requirements of Provision D, which may allow the Copermittees to modify the program to be consistent with and focus on the highest priority water quality conditions for each Watershed Management Area.

c. For Watershed Management Areas with applicable TMDLs, the monitoring and assessment program must incorporate the specific monitoring and assessment requirements of Attachment E.

d. For Watershed Management Areas with any ASBS, the water quality monitoring and assessment program must incorporate the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

5. Iterative Approach and Adaptive Management Process

Comment [A28]: See discussion in section 3.3.2 of the comment letter.

The Copermittees in each Watershed Management Area must implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management

programs to become more effective toward achieving compliance with Provisions A.1, A.2, and A.3.~~A.1.a, A.1.c and A.2.a~~, and must include the following:

a. RE-EVALUATION OF PRIORITY WATER QUALITY CONDITIONS

The priority receiving water quality conditions, and numeric goals and corresponding schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.2.c and B.2.e, may be re-evaluated by the Copermittees as needed during the term of this Order as part of the Annual Report. Re-evaluation and recommendations for modifications to the priority water quality conditions, and numeric goals and corresponding schedules must be provided in the Regional Monitoring and Assessment Report pursuant to F.3.c~~Report of Waste Discharge~~, and must consider the following:

(1) Achieving the outcome of improved water quality in MS4 discharges and receiving waters through implementation of the water quality improvement strategies identified in the Water Quality Improvement Plan;

(2) Progress toward achieving interim and final numeric goals in receiving waters and/or MS4 discharges for the highest priority water quality conditions in the Watershed Management Area,

(3) Progress toward achieving outcomes according to established schedules;

(4) New information developed when the requirements of Provisions B.2.a-c have been re-evaluated;

(5) New policies or regulations that may affect identified numeric goals;

(6) Spatial and temporal accuracy of monitoring data collected to inform prioritization of water quality conditions and implementation strategies to address the highest priority water quality conditions;

(7) Availability of new information and data from sources other than the jurisdictional runoff management programs within the Watershed Management Area that informs the effectiveness of the actions implemented by the Copermittees;

(8) San Diego Water Board recommendations; and

(9) Recommendations for modifications solicited through a public participation process.

b. ADAPTATION OF STRATEGIES AND SCHEDULES

The water quality improvement strategies and schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.3, must be re-evaluated and adapted as new information becomes available to result in more effective and efficient measures to achieve the numeric goals established pursuant to

Provision B.2.e. Re-evaluation of and modifications to the water quality improvement strategies, if determined to be necessary, must be provided in the applicable Annual Report per F.3.b.(3)., and must consider the following:

(1) Modifications to the priority water quality conditions, and numeric goals and corresponding schedules based on Provision B.5.a;

(2) Measurable or demonstrable reductions of non-storm water discharges to and from each Copermittee's MS4;

(3) Measurable or demonstrable reductions of pollutants in ~~storm water~~ discharges from each Copermittee's MS4 to the MEP;

(4) New information developed when the requirements of Provisions B.2.b and B.2.d have been re-evaluated;

(5) Efficiency in implementing the Water Quality Improvement Plan;

(6) San Diego Water Board recommendations; and

(7) Recommendations for modifications solicited through a public participation process.

c. ADAPTATION OF MONITORING AND ASSESSMENT PROGRAM

The water quality improvement monitoring and assessment program, included in the Water Quality Improvement Plan pursuant to Provisions B.4, must be re-evaluated and adapted when new information becomes available. Re-evaluation and recommendations for modifications to the monitoring and assessment program, pursuant to the requirements of Provision D, may be provided in the Annual Report, but must be provided in the Report of Waste Discharge.

6. Water Quality Improvement Plan Submittal, Updates, and Implementation

a. The Copermittees must submit the Water Quality Improvement Plans in accordance with the requirements of Provision F.1.

b. The Copermittees must submit proposed updates to the Water Quality Improvement Plan for acceptance by the San Diego Water Board Executive Officer in accordance with the requirements of Provision F.2.c.

c. The Copermittees must commence with implementation of the Water Quality Improvement Plans ~~immediately after acceptance by the San Diego Water Board, in accordance with the schedules, or subsequently updated schedules, within the Water Quality Improvement Plan.~~in accordance with Provision F.1.b.(5).

C. ACTION LEVELS

Comment [A29]: See comment letter section 3.4 for a discussion of the redlines shown herein.

The purpose of this provision is for the Copermittees to incorporate numeric non-stormwater action levels (NALs) and stormwater action levels (SALs) in the Water Quality Improvement Plans (Provision B), and numeric non-stormwater action levels (NALs) in the Illicit Discharge Detection and Elimination (IDDE) program (Provision E.2.).

- For the purposes of the WQIPs, ~~T~~the goal of the action levels is to guide ~~Water Quality Improvement Plan~~ the implementation efforts and measure progress towards the protection of the identified high priority water quality conditions and associated designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through monitoring and assessing the quality of the MS4 discharges during the implementation of the Water Quality Improvement Plans.

- For the purposes of the IDDE program, the goal of the non-stormwater action levels is to assist in determining whether a persistent non-stormwater discharge into or from the MS4 contains pollutants at levels that have the potential to negatively affect the identified high priority water quality conditions.

Action levels will be developed and incorporated into the WQIP (Provision B) and the IDDE Program (Provision E). Depending upon the goals/objectives for the use of the action levels and the priority receiving water conditions, the constituents and values at which they are set may differ between watersheds. Copermittees may develop Watershed Management Area specific numeric action levels for non-stormwater and stormwater MS4 discharges using an approach approved by the Regional Board or use the default non-stormwater and stormwater action levels prescribed in C.1 and C.2 below.

The Copermittees will submit the action levels as a part of the WQIP and JRMP submittals. The action levels currently established will serve as the interim action levels until revised action levels are completed and approved. Exceedances of the action levels are not subject to enforcement or non-compliance actions under this Order.

1. Default Non-Storm Water Action Levels[8]

~~The Copermittees must develop and incorporate numeric non-storm water action levels (NALs) into the Water Quality Improvement Plan to: 1) support the development and prioritization of water quality improvement strategies for addressing non-storm water discharges to and from the MS4s, 2) assess the effectiveness of the water quality improvement strategies toward addressing MS4~~

Comment [A30]: As discussed in section 2.4 of the Riverside comment letter.

[8] NALs are not ~~considered by the San Diego Water Board to be~~ enforceable limitations under this Order.

~~non-storm water discharges, required pursuant to Provision D.4.b.(1), and 3) support the detection and elimination of non-storm water and illicit discharges to and from the MS4, required pursuant to Provision E.2.~~[9]

a. The following NALs must be incorporated as applicable to the WMA and the Copermittees' MS4 discharges,~~:~~ if the Copermittees do not establish numeric action levels within the WQIP based on watershed priorities:

(1) Non-Storm Water Discharges from MS4s to Ocean Surf Zone

Table C-1. Non-Storm Water Action Levels for Discharges from MS4s to Ocean Surf Zone

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Total Coliform	MPN/100 ml	1,000	-	10,000/1,000[1]	OP
Fecal Coliform	MPN/100 ml	200[2]	-	400	OP
Enterococci	MPN/100 ml	35	-	104[3]	OP

Abbreviations/Acronyms

AMAL – average monthly action level
MDAL – maximum daily action level
OP – Ocean Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Total coliform density NAL is 1,000 MPN/100 ml when the fecal/total coliform ratio exceeds 0.1.
2. Fecal coliform density NAL is 200 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas."

[9] ~~The Copermittees may utilize NALs or other benchmarks currently established by the Copermittees as interim NALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.~~

(2) Non-Storm Water Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Table C-2. Non-Storm Water Action Levels for Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Turbidity	NTU	75	-	225	OP
pH	Units	Within limit of 6.0 to 9.0 at all times			OP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	35	-	104[3]	BP
Priority Pollutants	ug/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
OP – Ocean Plan water quality objective
NTU – Nephelometric Turbidity Units
ug/L – micrograms per liter
MDAL – maximum daily action level
BP – Basin Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas" and is not applicable to waterbodies that are not designated with the water contact recreation (REC-1) beneficial use.

Table C-3. Non-Storm Water Action Levels for Priority Pollutants

Parameter	Units	Freshwater (CTR)		Saltwater (CTR)	
		MDAL	AMAL	MDAL	AMAL
Cadmium	ug/L	**	**	16	8
Copper	ug/L	*	*	5.8	2.9
Chromium III	ug/L	**	**	-	-
Chromium VI	ug/L	16	8.1	83	41
Lead	ug/L	*	*	14	2.9
Nickel	ug/L	**	**	14	6.8
Silver	ug/L	*	*	2.2	1.1
Zinc	ug/L	*	*	95	47

Abbreviations/Acronyms:
CTR – California Toxic Rule
AMAL – average monthly action level
ug/L – micrograms per liter
MDAL – maximum daily action level

Notes:
* Action levels developed on a case-by-case basis (see below)
** Action levels developed on a case-by-case basis (see below), but calculated criteria are not to exceed Maximum Contaminant Levels (MCLs) under the California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64431

The Cadmium, Copper, Chromium (III), Lead, Nickel, Silver and Zinc NALs for MS4 discharges to freshwater receiving waters will be developed on a case-by-case basis because the freshwater criteria are based on site-specific water quality data (receiving water hardness). For these priority pollutants, refer to ~~the following equations (~~40 CFR 131.38.b.2 for details~~) will be required~~:

~~Cadmium (Total Recoverable) = exp(0.7852[ln(hardness)] - 2.715)~~
~~Chromium III (Total Recoverable) = exp(0.8190[ln(hardness)] + 0.6848)~~
~~Copper (Total Recoverable) = exp(0.8545[ln(hardness)] - 1.702)~~
~~Lead (Total Recoverable) = exp(1.273[ln(hardness)] - 4.705)~~
~~Nickel (Total Recoverable) = exp(.8460[ln(hardness)] + 0.0584)~~
~~Silver (Total Recoverable) = exp(1.72[ln(hardness)] - 6.52)~~
~~Zinc (Total Recoverable) = exp(0.8473[ln(hardness)] + 0.884)~~

Comment [A31]: Consistent with SD Permittee recommendations.

(3) Non-Storm Water Discharges from MS4s to Inland Surface Waters

Table C-4. Non-Storm Water Action Levels for Discharges from MS4s to Inland Surface Waters

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Dissolved Oxygen	mg/L	Not less than 5.0 in WARM waters and not less than 6.0 in COLD waters			BP
Turbidity	NTU	-	20	See MDAL	BP
pH	Units	Within limit of 6.5 to 8.5 at all times			BP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	33	-	61[3]	BP
Total Nitrogen	mg/L	-	1.0	See MDAL	BP
Total Phosphorus	mg/L	-	0.1	See MDAL	BP
MBAS	mg/L	-	0.5	See MDAL	BP
Iron	mg/L	-	0.3	See MDAL	BP
Manganese	mg/L	-	0.05	See MDAL	BP
Priority Pollutants	ug/L	See Table C-3			

Abbreviations/Acronyms:

AMAL – average monthly action level
BP – Basin Plan water quality objective
COLD – cold freshwater habitat beneficial use
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
MDAL – maximum daily action level
WARM – warm freshwater habitat beneficial use
MBAS – Methylene Blue Active Substances
MPN/100 ml – most probable number per 100 milliliters
ug/L – micrograms per liter

Notes:

1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for freshwater "designated beach areas" and is not applicable to waterbodies that are not designated with the water contact recreation (REC-1) beneficial use.

b. NALs must be identified, developed and incorporated in the Water Quality Improvement Plan for any pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in Receiving waters ~~of the state~~ associated with the highest priority water quality conditions related to non-storm water discharges from the MS4s. NALs must be based on:

(1) Applicable water quality standards which may be dependent upon site-specific or receiving water-specific conditions or assumptions to be identified by the Copermittees; or

(2) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. ~~For the NALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary NALs specific to the Watershed Management Area at levels greater than the NALs required by Provisions C.1.a and C.1.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for addressing non-~~

~~storm water discharges to and from the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and from the MS4. The secondary NALs may be developed using an approach acceptable to the San Diego Water Board.~~

d. Dry weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.b may be utilized to develop or revise NALs based on watershed-specific data, subject to San Diego Water Board Executive Officer approval.

2. Default Storm Water Action Levels[10]

The Copermittees must develop and incorporate numeric storm water action levels (SALs) in the Water Quality Improvement Plans to: 1) support the development and prioritization of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s, and 2) assess the effectiveness of the water quality improvement strategies toward reducing pollutants in storm water discharges, required pursuant to Provision D.4.b.(2).[11]

a. The following SALs for discharges of storm water from the MS4 must be incorporated~~:~~ if the Copermittees do not establish stormwater action levels within the WQIP based on watershed priorities::~~:~~

Table C-5. Storm Water Action Levels for Discharges from MS4s to Receiving Waters

Parameter	Units	Action Level
Turbidity	NTU	126
Nitrate & Nitrite (Total)	mg/L	2.6
Phosphorus (Total P)	mg/L	1.46
Cadmium (Total Cd)*	µg/L	3.0
Copper (Total Cu)*	µg/L	127
Lead (Total Pb)*	µg/L	250
Zinc (Total Zn)*	µg/L	976

Abbreviations/Acronyms:
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
ug/L – micrograms per liter

Notes:
* The sampling must include a measure of receiving water hardness at each MS4 outfall. If a total metal concentration exceeds the corresponding metals SAL in Table C-5, that concentration must be compared to the California Toxics Rule criteria and the USEPA 1-hour maximum concentration for the detected level of receiving water hardness associated with that sample. If it is determined that the sample's total metal concentration for that specific metal exceeds that SAL, but does not exceed the applicable USEPA 1-hour maximum concentration criterion for the measured level of hardness, then the sample result will not be considered above the SAL for that measurement.

[10] SALs are not ~~considered by the San Diego Water Board to be~~ enforceable limitations under this Order.
[11] The Copermittees may utilize SALs or other benchmarks currently established by the Copermittees as interim SALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

b. SALs must be identified, developed and incorporated in the Water Quality Improvement Plan for pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in Receiving waters ~~of the state~~ associated with the highest water quality priorities related to storm water discharges from the MS4s. SALs must be based on:

(1) Federal and State water quality guidance and/or water quality standards; and

(2) Site-specific or receiving water-specific conditions; or

(3) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. ~~For the SALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary SALs specific to the Watershed Management Area at levels greater than the SALs required by Provisions C.2.a and C.2.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s. The secondary SALs may be developed based on the approaches recommended by the State Water Board's Storm Water Panel[12] or using an approach acceptable to the San Diego Water Board.~~

d. Wet weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.c may be used to develop or revise SALs based upon watershed-specific data, subject to San Diego Water Board Executive Officer approval.

~~[12] Storm Water Panel Recommendations to the California State Water Resources Control Board: The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities (June 2006)~~

D. MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS

Comment [A32]: See discussion in section 3.5 of the comment letter.

The purpose of this provision is for the Copermittees to monitor and assess the impact on the chemical, physical, and biological conditions of receiving waters caused by discharges from the Copermittees' MS4s under wet weather and dry weather conditions. The goal of the monitoring and assessment program is to inform the Copermittees about the nexus between the health of receiving waters and the water quality condition of the discharges from their MS4s to those receiving waters.~~.~~ This goal will be accomplished through monitoring and assessing the conditions of the receiving waters, discharges from the MS4s to those receiving waters, pollutant sources and/or stressors, and effectiveness of the water quality improvement strategies implemented as part of the Water Quality Improvement Plans.

1. Receiving Water Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the condition of the receiving waters in each Watershed Management Area during dry weather and wet weather. Following acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct long-term receiving water monitoring during implementation of the Water Quality Improvement Plan to assess the long term trends and determine if water quality conditions in receiving waters are improving. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following receiving water monitoring procedures:

a. TRANSITIONAL RECEIVING WATER MONITORING

Beginning October 1st or May 1st (whichever is sooner) following enrollment under this order and until~~Until~~ the monitoring requirements of Provisions D.1.b-e are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following receiving water monitoring in the Watershed Management Area:

(1) Continue the receiving water monitoring programs required in Order Nos. R9-2007-0001~~,~~ (Attachment A, Section II. A. 1-5),~~,~~ R9-2009-0002, and R9-2010-0016;

(2) Continue the monitoring in the Hydromodification Management Plans approved by the San Diego Water Board;

(3) Participate in the following regional receiving water monitoring programs, as applicable to the Watershed Management Area and each Copermittees' MS4 discharges:

Comment [A33]: See discussion in section 3.5.3 of the comment letter.

(a) Storm Water Monitoring Coalition Regional Monitoring,

(b) Southern California Bight Regional Monitoring, and

(c) Sediment Quality Monitoring;

(4) Implement the monitoring programs developed as part of any implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) for the TMDLs in Attachment E to this Order; and

(5) For Watershed Management Areas with ASBS, implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

b. LONG-TERM RECEIVING WATER MONITORING STATIONS

The Copermittees must select at least one long-term receiving water monitoring station from among the existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees to be representative of the receiving water quality in the Watershed Management Area. Additional or alternative long-term receiving water monitoring stations may~~must~~ be selected where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

Comment [A34]: See discussion in section 3.5.3 of the comment letter.

c. DRY WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three dry weather monitoring events at each of the long-term receiving water monitoring stations. At least one monitoring event must be conducted during the dry season (May 1 – September 30) and at least one monitoring event must be conducted during a dry weather period during the wet season (October 1 – April 30), after the first wet weather event of the season, with an antecedent dry period of at least 72 hours following a storm event producing measureable rainfall of greater than 0.1 inch.

(1) Dry Weather Receiving Water Field Observations

For each dry weather monitoring event, the Copermittees must record field observations consistent with Table D-1 at each long-term receiving water monitoring station.

Table D-1. Field Observations for Receiving Water Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) • Assessment of any observed connectivity of MS4 discharges to a flowing receiving water. • Station description (i.e. deposits or stains, vegetation condition, structural condition, and observable biology) • Presence and assessment of trash in and around station

Comment [A35]: See discussion in section 3.5.3 of the comment letter.

(2) Dry Weather Receiving Water Field Monitoring

For each dry weather monitoring event, if conditions allow the collection of the data, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

Table D-2. Field Monitoring Parameters for Receiving Water Monitoring Stations

Parameters
• pH • Temperature • Specific conductivity • Dissolved oxygen • Turbidity

(3) Dry Weather Receiving Water Analytical Monitoring

For each dry weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity,

dissolved oxygen, turbidity, hardness, and indicator bacteria Grab samples may also be collected for the analyses described in (f) where MS4 discharge runoff constitutes less than ten percent of the flow;

Comment [A36]: The receiving water stations in Riverside County either do not receive runoff from MS4 discharges or receive deminimus flows during dry weather conditions. The flow at these stations during dry weather consists virtually entirely of rising groundwater. Background receiving water quality conditions In such cases composite samples of receiving waters not affected by MS4 discharges is not warranted.

(d) For all other constituents where runoff constitutes more than ten percent of the flow, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable NAL constituents, and

(v) Constituents listed in Table D-3.

Table D-3. Analytical Monitoring Constituents for Receiving Water Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Pesticides	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1]	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Mercury • Nickel • Selenium • Thallium • Zinc	• Organophosphate Pesticides • Pyrethroid Pesticides	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

• Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia			

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(4) Dry Weather Receiving Water Toxicity Monitoring

For each dry weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for toxicity in accordance with Table D-4:

Table D-4. Dry Weather Toxicity Testing for Receiving Water Monitoring Stations

Freshwater Organism	Test Approach	USEPA Protocol[2]
Pimephales promelas	1 acute 1 chronic[1]	EPA-821-R-02-012
Hyalella Azteca	1 acute 1 chronic[1]	EPA-821-R-02-012
Psuedokirchneriella subcapitata	1 acute 1 chronic[1]	EPA-821-R-02-013

Notes:
1. Chronic toxicity testing is not required at receiving water monitoring stations located at mass loading stations if the channel flows are diverted year-round during dry weather conditions to the sanitary sewer for treatment.
2. USEPA protocols must be utilized for toxicity testing unless alternate toxicity testing protocols have been approved by the San Diego Water Board.

(5) Dry Weather Receiving Water Bioassessment Monitoring

Bioassessment monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must conduct bioassessment monitoring during at least one dry weather monitoring event at each long-term receiving water monitoring station as follows:

(a) The following bioassessment samples and measurements must be collected:

(i) Macroinvertebrate samples must be collected in accordance with the "Reachwide Benthos (Multihabitat) Procedure" in the most current Surface Water Ambient Monitoring Program (SWAMP) Bioassessment Standard Operating Procedures (SOP), and amendments, as applicable;[13]

(ii) The "Full" suite of physical habitat characterization measurements

[13] Ode, P.R.. 2007. Standard operating procedures for collecting macroinvertebrate samples and associated physical and chemical data for ambient bioassessments in California. California State Water Resources Control Board Surface Water Ambient Monitoring Program (SWAMP) Bioassessment SOP 001. http://www.swrcb.ca.gov/water_issues/programs/swamp/tools.shtml#monitoring

must be collected in accordance with the most current SWAMP Bioassessment SOP, and as summarized in the SWAMP Stream Habitat Characterization Form – Full Version;[14] and

(iii) Freshwater algae samples must be collected in accordance with the SWAMP Standard Operating Procedures for Collecting Algae Samples.[15] Analysis of samples must include algal taxonomic composition (diatoms and soft algae) and algal biomass.

(b) The bioassessment samples, measurements, and appropriate water chemistry data must be used to calculate the following:

(i) An Index of Biological Integrity (IBI) for macroinvertebrates for each monitoring station where bioassessment monitoring was conducted, based on the most current calculation method;[16] and

(ii) An IBI for algae for each monitoring station where bioassessment monitoring was conducted, when a calculation method is developed.[17]

(c) In lieu of the requirements of Provision D.1.c.(5)(a), the Copermittees may conduct the bioassessment monitoring in accordance with the "Triad" assessment approach[18] to calculate the IBIs required for Provision D.1.c.(5)(b). The Copermittees must conduct sampling, analysis, and reporting of specified in-stream biological and habitat data according to the protocols specified in the SCCWRP Technical Report No. 539, or subsequent protocols, if developed.

(6) Dry Weather Receiving Water Hydromodification Monitoring

In addition to the hydromodification monitoring conducted as part of the Copermittees' Hydromodification Management Plans, hydromodification monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must collect the

[14] Available at: http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/reports/fieldforms_fullversion052908.pdf

[15] Fetscher et al. 2009. Standard Operating Procedures for Collecting Stream Algae Samples and Associated Physical Habitat and Chemical Data for Ambient Bioassessments in California.

[16] The most current calculation method at the time the Order was adopted is outlined in "A Quantitative Tool for Assessing the Integrity of Southern California Coastal Streams" (Ode, et al. 2005. Environmental Management. Vol. 35, No. 1, pp. 1-13). If an updated or new calculation method is developed, either both (i.e. current and updated/new) methods must be used, or historical IBIs must be recalculated with the updated or new calculation method.

[17] When a calculation method is developed, IBIs must be calculated for all available and appropriate historical data.

[18] Stormwater Monitoring Coalition Model Monitoring Technical Committee, 2004. Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California. Technical Report #419. August 2004.

following hydromodification monitoring observations and measurements within an appropriate domain of analysis during at least one dry weather monitoring event for each long-term receiving water monitoring station:

(a) Channel conditions, including:

(i) Channel dimensions,

(ii) Hydrologic and geomorphic conditions, and

(iii) Presence and condition of vegetation and habitat;

(b) Location of discharge points;

(c) Habitat integrity;

(d) Photo documentation of existing erosion and habitat impacts, with location (i.e. latitude and longitude coordinates) where photos were taken;

(e) Measurement or estimate of dimensions of any existing channel bed or bank eroded areas, including length, width, and depth of any incisions; and

(f) Known or suspected cause(s) of existing downstream erosion or habitat impact, including flow, soil, slope, and vegetation conditions, as well as upstream land uses and contributing new and existing development.

d. WET WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three wet weather monitoring events at each long-term receiving water monitoring station. At least one wet weather monitoring event must be conducted during the first wet weather event of the wet season (October 1 – April 30), and at least one wet weather monitoring event during a wet weather event that occurs after February 1.

(1) Wet Weather Receiving Water Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each long-term receiving water monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event;

(b) The flow rates and volumes measured or estimated (data from nearby

USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(d) Presence and assessment of trash in and around station.

(2) Wet Weather Receiving Water Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

(3) Wet Weather Receiving Water Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) Constituents listed in Table D-3.

(4) Wet Weather Receiving Water Toxicity Monitoring

For each wet weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for toxicity in accordance with Table D-5:

Table D-5. Wet Weather Toxicity Testing for Receiving Water Monitoring Stations

Freshwater Organism	Test Approach	USEPA Protocol[1]
Pimephales promelas	1 acute	EPA-821-R-02-012
Hyalella Azteca	1 acute	EPA-821-R-02-012
Psuedokirchneriella subcapitata	1 acute	EPA-821-R-02-013

Notes:
1. USEPA protocols must be utilized for toxicity testing unless alternate toxicity testing protocols have been approved by the San Diego Water Board.

e. OTHER RECEIVING WATER MONITORING REQUIREMENTS

(1) Regional Monitoring

The Copermittees must participate in the following regional receiving waters monitoring programs, as applicable to the Watershed Management Area and the Copermittee's MS4 discharges:

(a) Storm Water Monitoring Coalition Regional Monitoring; and

(b) Southern California Bight Regional Monitoring.

(2) Sediment Quality Monitoring

The applicable Copermittees must perform sediment monitoring to assess compliance with sediment quality receiving water limits applicable to MS4

discharges to enclosed bays and estuaries. The monitoring may be performed either by individual or multiple affected Copermittees to assess compliance with receiving water limits, or through participation in a water body monitoring coalition. The Copermittees must identify sediment sampling stations that are spatially representative of the sediment within the water body segment or region of interest. Sediment quality monitoring must be conducted in conformance with the monitoring requirements set forth in the State Water Board Sediment Quality Control Plan.

(3) ASBS Monitoring

For Watershed Management Areas with ASBS, the applicable Copermittees must implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

f. ALTERNATIVE WATERSHED MONITORING REQUIREMENTS

The San Diego Water Board may direct the Copermittees to participate in an effort to develop alternative watershed monitoring with other regulated entities, other interested parties, and the San Diego Water Board to refine, coordinate, and implement regional monitoring and assessment programs to determine the status and trends of water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and/or 3) streams. As directed by the San Diego Water Board, such alternative watershed monitoring would be done in place and stead of the commensurate requirements set forth in Provision D.1.

2. MS4 Outfall Discharge Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the discharges from the major MS4 outfalls to receiving waters in each Watershed Management Area during dry weather and wet weather. Following acceptance of the Water Quality Improvement Plans and schedule for implementation of monitoring for each Watershed Management Area, the Copermittees must conduct MS4 outfall discharge monitoring during implementation of the Water Quality Improvement Plan to assess the effectiveness of their jurisdictional runoff management programs toward effectively prohibiting non-storm water discharges into the MS4 and reducing pollutants in ~~storm water~~ discharges ~~to and~~ from their MS4s to the MEP. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following MS4 outfall monitoring procedures:

Comment [A37]: Suggest same edits for SD and OC.

a. TRANSITIONAL MS4 OUTFALL DISCHARGE MONITORING

Beginning October 1st or May 1st (whichever is sooner) following enrollment under this order and until~~Until~~ the monitoring requirements of Provisions D.2.b-c

are incorporated into a Water Quality Improvement Plan and schedule for implementation of monitoring that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following monitoring of MS4 outfall discharges to flowing receiving waters ~~monitoring~~ in the Watershed Management Area:

(1) MS4 Outfall Discharge Monitoring Station Inventory

Each Municipal Copermittee must identify all major MS4 outfalls (including those operated by a Special District Copermittee) that discharge directly to receiving waters within its jurisdiction and geo-locate those outfalls on a map of the MS4 pursuant to Provision E.2.b.(1). This information must be compiled into a MS4 outfall discharge monitoring station inventory, and must include the following information:

(a) Latitude and longitude of MS4 outfall point of discharge;

(b) Watershed Management Area;

(c) Hydrologic subarea;

(d) Outlet size;

(e) Accessibility (i.e. safety and without disturbance of critical habitat);

(f) Approximate drainage area; and

(g) Classification of whether the MS4 outfall is known to have persistent dry weather flows, transient dry weather flows, no dry weather flows, or unknown dry weather flows.

(2) Transitional Dry Weather MS4 Outfall ~~Discharge~~ Field Screening ~~Monitoring~~

Until the monitoring requirements of Provision D.2.b are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, each Municipal Copermittee must perform the following dry weather MS4 outfall field screening monitoring to identify non-storm water and illicit discharges being discharged from MS4s within its jurisdiction in accordance with Provision E.2.c, to determine which discharges are transient ~~flows~~ and which are persistent discharges to flowing receiving waters~~flows~~, and prioritize the dry weather MS4 discharges that will be investigated and eliminated in accordance with Provision E.2.d. ~~Each Copermittee must conduct the following dry weather MS4 outfall discharge field screening monitoring within its jurisdiction:~~

Comment [A38]: Suggested change of title to better characterize the requirements of this section, compared to that of D.2.b.

Comments in this section are discussed in section 3.5.3 of the comment letter.

Comment [A39]: Duplicative of previous sentence

(a) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Frequency

Each Municipal Copermittee must field screen the accessible MS4 outfalls in its inventory developed pursuant to Provision D.2.a.(1) as follows:

(i) ~~For Copermittees with less than 125 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 80 percent of the outfalls must be visually inspected two times per year during dry weather conditions.~~

(ii) For Municipal Copermittees with ~~125 major MS4 outfalls or more, but~~ less than or equal to 500 MS4 outfalls~~,~~ that discharge to receiving waters within a Watershed Management Area, ~~all~~ at least 80 percent of the accessible outfalls must be visually inspected at least annually during dry weather conditions.

(iii) For Municipal Copermittees with more than 500 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 500 outfalls must be visually inspected at least annually during dry weather conditions. Copermittees with more than 500 major MS4 outfalls within a Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(iv) Municipal Copermittees with more than 500 major MS4 outfalls within its jurisdiction that are located in more than one Watershed Management Area, at least 500 major MS4 outfalls within its inventory must be visually inspected at least annually during dry weather conditions. Copermittees with more than 500 major MS4 outfalls in more than one Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;

[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and

[e] Flow rate.

(v) Inspections of major MS4 outfalls conducted in response to public reports and staff or contractor reports and notifications may count toward the required visual inspections of MS4 outfall discharge monitoring stations.

(b) Transitional Dry Weather MS4 Outfall Discharge Field Screening Visual Observations

(i) An antecedent dry period of at least 72 hours following any storm event producing measurable rainfall greater than 0.1 inch is required prior to conducting field screening visual observations during a field screening monitoring event.

(ii) During the field screening monitoring event, each Municipal Copermittee must record visual observations consistent with Table D-6 at each MS4 outfall discharge monitoring station inspected.

Table D-6. Field Screening Visual Observations for MS4 Outfall Discharge Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) - Flow source(s) suspected or identified from non-storm water source investigation - Flow source(s) eliminated during non-storm water source identification • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) - Known or suspected source(s) of pooled or ponded water • Assessment of any observed MS4 discharge ~~with~~ to a flowing receiving water. • Station description (i.e. deposits or stains, vegetation condition, structural condition, observable biology) • Presence and assessment of trash in and around station • Evidence or signs of illicit connections or illegal dumping

(iii) Each Municipal Copermittee must implement the requirements of Provisions E.2.d.(2)(c)-(e) based on the field observations.

(iv) Each Copermittee must evaluate field observations together with existing information available from prior reports, inspections and monitoring results to determine whether any observed flowing,

pooled, or ponded waters are likely to be transient or persistent flow.[19]

Comment [A40]: See footnote edits

(c) Transitional Dry Weather MS4 Outfall Discharge Field Screening ~~Monitoring~~ Records

Based upon the results of the transitional dry weather MS4 outfall discharge field screening monitoring conducted pursuant to Provisions D.2.a.(2)(a)-(b), each Municipal Copermittee must update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow.

(3) Transitional Wet Weather MS4 Outfall Discharge Monitoring

Comment [A41]: See discussion in section 3.5.3 of the comment letter.

Until the monitoring requirements of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(a) Transitional Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees must select at least five wet weather MS4 outfall discharge monitoring stations from the inventories developed pursuant to Provision D.2.a.(1) that are representative of storm water discharges from areas consisting primarily of residential, commercial, industrial, and typical mixed-use land uses present within the Watershed Management Area.

(b) Transitional Wet Weather MS4 Outfall Discharge Monitoring Frequency

Each wet weather MS4 outfall discharge monitoring station selected pursuant to Provision D.2.a.(3)(a) must be monitored twice during the wet season (October 1 – April 30~~)).~~) in the transitional period. The~~). One~~ wet weather monitoring ~~event~~events shall be selected to be representative of the range of hydrologic conditions experienced in the region. At least 10% of samples~~event~~ must be conducted during the first wet weather event of the wet season, ~~and~~to include~~and one wet weather monitoring event~~ at least one such sample in each Watershed Management Area~~, a month after the first wet weather event of the wet season.~~

[19] Persistent flow, for the purposes of provision II.D.2.b.(2) is defined as the presence of an MS4 discharge that is hydraulically connected to a flowing receiving~~, pooled, or ponded~~ water more than 72 hours after a measureable rainfall event of 0.1 inch or greater, during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

(c) Transitional Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded of the flow from~~at~~ each wet weather MS4 outfall discharge monitoring station:

(i) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(ii) The flow rates and volumes measured or estimated from the outfall (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(iii) ~~Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and~~

(iv) Presence ~~and assessment~~ of trash in and around station.

Comment [A42]: This isn't appropriate for a wet weather event.

Comment [A43]: This isn't appropriate for a wet weather event.

(d) Transitional Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(e) Transitional Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, and indicator bacteria;

(iv) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant

concentrations and runoff flows using one of the following techniques:

[a] Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

[b] Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

[c] If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours;

(v) Only one analysis of the composite of aliquots is required;

(vi) The samples must be analyzed for the following constituents:

[a] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

[b] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and

[c] Constituents listed in in Table D-7.

Table D-7. Analytical Monitoring Constituents for Wet Weather MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Nickel • Selenium • Thallium • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(f) Other Transitional Wet Weather MS4 Outfall Discharge Monitoring

The San Diego County Copermittees must continue the wet weather MS4 outfall monitoring program developed under Order No. R9-2007-0001, as approved by the San Diego Water Board, through its planned completion.

b. DRY WEATHER MS4 OUTFALL DISCHARGE MONITORING

Each Municipal Copermittee must perform the following dry weather MS4 outfall monitoring within its jurisdiction to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. ~~Each Copermittee must conduct the following dry weather MS4 outfall discharge monitoring within its jurisdiction:~~

(1) Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Each Municipal Copermittee must continue to perform the dry weather MS4 outfall discharge field screening monitoring in accordance with the requirements of Provision D.2.a.(2). ~~The~~ however the Municipal Copermittee may adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of persistent ~~flow~~ non-storm water illegal discharges from the MS4 to flowing receiving waters in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan. ~~, provided the~~

Comment [A44]: Repetitive of previous sentence

Comment [A45]: See discussion in section 3.5.3 of the comment letter.

~~number of visual inspections performed is equivalent to the number of visual inspections required under Provision D.2.a.(2)(a).~~

Comment [A46]: See comments in comment letter

(2) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring

Each Municipal Copermittee must perform the following non-storm water monitoring of MS4 outfalls that persistently ~~flow MS4 outfall~~ discharge to flowing receiving waters ~~monitoring~~ to determine which persistent non-storm water discharges contain concentrations of pollutants below NALs, and which persistent non-storm water discharges impact receiving water quality during dry weather. ~~Each Copermittee must conduct the following non-storm water persistent flow MS4 outfall discharge monitoring within its jurisdiction:~~

Comment [A47]: Repetitive of previous sentence.

(a) Prioritization of Non-Storm Water Persistent Flow MS4 Outfalls

Based upon the dry weather MS4 outfall discharge field screening monitoring records developed pursuant to Provision D.2.a.(2)(c), each Municipal Copermittee must identify and prioritize the MS4 outfalls within its jurisdiction that have~~with~~ persistent discharges to flowing receiving waters ~~flows~~ based on the highest priority water quality conditions identified in the Water Quality Improvement Plan and any additional criteria developed by the Copermittee, which may include historical data and data from sources other than what the Copermittee collects.

(b) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring Frequency

Comment [A48]: See comment letter section 3.5.3

(i) Based on the prioritization of major MS4 outfalls developed under Provision D.2.b.(2)(a), each Municipal Copermittee must identify, at a minimum, the top 10 percent of the~~10~~ highest priority major MS4 outfalls with non-storm water persistent flows that the Copermittee will monitor within each Watershed Management Area within its jurisdiction, with a minimum of one persistent ~~flow~~discharge outfall, and a maximum of 5 required per WMA. The location of the selected highest priority non-storm water persistent ~~flow~~ discharge MS4 outfall monitoring stations must be identified on the map required pursuant to Provision E.2.b.(1).

(ii) Each of the highest priority non-storm water persistent flow MS4 outfall monitoring stations identified pursuant to Provision D.2.b.(2)(b)(i) must be monitored under dry weather conditions at least ~~semi~~ annually until one of the following occurs:

[a] The non-storm water discharges have been effectively eliminated (i.e. no flowing, pooled, or ponded water) for three consecutive dry weather monitoring events; or

[b] The source(s) of the persistent flows has been identified as a category of non-storm water discharges that does not require an NPDES permit and does not have to be addressed as an illicit discharge because it was not identified as a source of pollutants (i.e. constituents in non-storm water discharge do not exceed NALs), and the persistent flow can be re-prioritized to a lower priority; or

[c] The constituents in the persistent flow non-storm water discharge do not exceed NALs, and the persistent flow can be re-prioritized to a lower priority; or

[d] The source(s) of the persistent flows has been identified as a non-storm water discharge authorized by a separate NPDES permit.

(iii) Where the criteria under Provision D.2.b.(2)(c)(ii) are not met, but the threat to water quality has been reduced by the Copermittee, the highest priority persistent flow MS4 outfall monitoring stations may be reprioritized accordingly for continued dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1).

(iv) Each Municipal Copermittee must document removal or re-prioritization of the highest priority persistent flow MS4 outfall monitoring stations identified under Provision D.2.b.(2)(b) in the Annual Report. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized MS4 major outfall in the Watershed Management Area within its jurisdiction, unless there are no remaining qualifying major MS4 outfalls within the Copermittee's jurisdiction in the Watershed Management Area.

(c) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Observations

During each semi-annual monitoring event, each Municipal Copermittee must record field observations consistent with Table D-6 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(d) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Monitoring

During each ~~semi-annual~~ monitoring event, if conditions allow the collection of the data, each Municipal Copermittee must monitor and record the parameters in Table D-2 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(e) Non-Storm Water Persistent Flow MS4 Outfall Discharge Analytical Monitoring

Comment [A49]: See discussion in section 3.5.3 of the comment letter.

During each semi-annual monitoring event in which measurable flow from the MS4 outfall to a flowing receiving water is present, each Municipal Copermittee must collect and analyze samples from each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) During development of the WQIP, for each WMA, consider the following sources to select constituents for collection of~~Collect~~ grab or composite samples to be analyzed at a qualified analytical laboratory::~~for the following constituents:~~

[a] Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,
[b] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,
[c] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,
[d] Applicable NAL constituents, and
[e] Constituents listed in Table D-8, unless the Copermittee has historical data that can demonstrate or provide justification that the analysis of the constituent is not necessary.

(iv) Copermittees may adjust the analytical list for a given WMA in successive monitoring events to add or eliminate constituents based on data that can demonstrate or provide justification regarding need or lack of need for the analysis of specific constituents.

Table D-8. Analytical Monitoring Constituents for Persistent Flow MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Total Hardness • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen	• Cadmium • Copper • Lead • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

• Ammonia		

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

~~(iv)~~(v) If the Copermittee identifies and eliminates the source of the persistent flow non-storm water discharge, analysis of the sample is not required.

c. WET WEATHER MS4 OUTFALL DISCHARGE MONITORING

The Copermittees must perform wet weather MS4 outfall monitoring to identify sources areas of pollutants in ~~storm water~~ discharges from the MS4s in the Watershed Management Area. The Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(1) Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees may adjust the wet weather MS4 outfall discharge monitoring locations and frequencies in the Watershed Management Area, as needed, to identify sources of pollutants in storm water discharges from MS4s in the Watershed Management Area in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of stations is at least equivalent to the number of stations required under Provision D.2.a.(3)(a).

(2) Wet Weather MS4 Outfall Discharge Monitoring Frequency

The Copermittees must monitor the wet weather MS4 outfall discharge monitoring stations in the Watershed Management Area at an appropriate frequency to identify source areas of pollutants in ~~storm water~~ discharges from the MS4s causing or contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan.

(3) Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or

estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

~~(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and~~

~~(d) Presence and assessment of trash in and around station.~~

Comment [A50]: These are inappropriate for wet weather observations.

(4) Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(5) Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

(iii) If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours.

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and

(iv) Applicable SAL constituents.

3. Special Studies

Comment [A51]: See discussion in section 3.5.3 of the comment letter.

a. Within the term of this Order, the Copermittees must initiate~~develop and implement~~ the following special studies:

(1) At least two~~three~~ special studies in each Watershed Management Area to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that cause or contribute to highest priority water quality conditions identified in the Water Quality Improvement Plan.

(2) At least one~~two~~ special study~~studies~~ for the San Diego Region to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that are impacting receiving waters on a regional basis in the San Diego Region.

(3) One of the two~~three~~ special studies in each Watershed Management Area may be replaced by a special study implemented pursuant to Provision D.3.a.(2).

b. The special studies must, at a minimum, be in conformance with the following criteria:

(1) The special studies must be related to the highest priority water quality conditions identified by the Copermittees in the Watershed Management Area and/or for the entire San Diego Region;

(2) The special studies developed pursuant to Provision D.3.a.(1) must:

(a) Be implemented within the applicable Watershed Management Area, and

(b) Require some form of participation by all the Copermittees within the Watershed Management Area;

(3) The special studies developed pursuant to Provision D.3.a.(2) must:

(a) Be implemented within the San Diego Region, and

(b) Require some form of participation by all Copermittees covered under the requirements of this Order.

c. Special studies developed to identify sources of pollutants and/or stressors should be pollutant and/or stressor specific and based on historical monitoring data and monitoring performed pursuant to Provisions D.1 and D.2. Development of source identification special studies should include the following:

(1) A compilation of known information on the specific pollutant and/or stressor, including data on potential sources and movement of the pollutant and/or stressor within the watershed. Data generated by the Copermittees and others, as well as information available from a literature research on the pollutant and/or stressor should be compiled and analyzed as appropriate.

(2) An identification of data gaps, based on the compiled information generated on the specific pollutant and/or stressor in Provision D.3.d.(1). Source identification special studies should be developed to fill identified data gaps.

(3) A monitoring plan that will collect and provide data the Copermittees can utilize to do the following:

(a) Quantify the relative loading or impact of a pollutant and/or stressor from a particular source or pollutant generating activity;

(b) Improve understanding of the fate of a pollutant and/or stressor in the environment;

(c) Develop an inventory of known and suspected sources of a pollutant and/or stressor in the Watershed Management Area; and/or

(d) Prioritize known and suspected sources of a pollutant and/or stressor based on relative magnitude in discharges, geographical distribution (i.e.,

regional or localized), frequency of occurrence in discharges, human health risk, and controllability.

d. Special studies initiated prior to the term~~acceptance~~ of ~~the~~this Order~~the Water Quality Improvement Plan~~ that meet the requirements of Provision D.3.b and are implemented~~completed~~ during the term of this Order may be utilized to fulfill the special study requirements of Provision D.3.a.

e. The Copermittees must submit the monitoring plans for the special studies in the Water Quality Improvement Plans required pursuant to Provision F.1.

f. The Copermittees are encouraged to share the results of the special studies regionally among the Copermittees to provide information useful in improving and adapting the management of non-storm water and storm water runoff through the implementation of the Water Quality Improvement Plans.

4. Assessment Requirements

Each Copermittee must evaluate the data collected pursuant to Provisions D.1, D.2 and D.3, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E, to assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a. Assessments must be performed as described in the following provisions:

a. RECEIVING WATERS ASSESSMENTS

(1) The Copermittees must assess and report the conditions of the receiving waters in the Watershed Management Area as follows:

(a) Based on data collected pursuant to Provision D.1.a, the assessments under Provision D.4.a.(2) must be included in the transitional~~first~~ Annual Report required pursuant to Provision F.3.b.(2~~1~~).

Comment [A52]: See our edits to that section

(b) Based on the data collected pursuant to Provisions D.1.a-e, the assessments required under Provision D.4.a.(2) must be included in the Report of Waste Discharge required pursuant to Provision F.5.b.

(2) The Copermittees must assess the status and trends of receiving water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under dry weather and wet weather conditions, as those conditions are affected by discharges from the Copermittees' MS4, to determine the progress towards meeting interim or final goals of the Water Quality Implementation Plan for the Watershed Management Area~~.~~ For each of the three types of receiving waters that are present in each Watershed Management Area the applicable Copermittees must:

Comment [A53]: See discussion in section 3.5.3 of the comment letter.

(a) Determine whether or not the conditions of the receiving waters are meeting any applicable numeric goals established pursuant to provision B.2.e.~~protective of the designated beneficial uses~~;

~~(b) Identify the most critical beneficial uses that must be protected or restored to ensure overall health of the receiving water;~~

~~(c) Determine whether or not those critical beneficial uses are being protected and where those beneficial used must be restored;~~

~~(d)~~(b) Identify short-term and/or long-term improvements or degradation of Receiving Water conditions related to those numeric goals~~those critical beneficial uses~~;

~~(e)~~(c) Identify data gaps in the monitoring data necessary to assess Provisions D.4.a.(2)(a)-(d).

b. MS4 OUTFALL DISCHARGES ASSESSMENTS

(1) Non-Storm Water Discharges Reduction Assessments

Comment [A54]: See discussion in section 3.5.3 of the comment letter for key changes. Other changes are described in comments below.

(a) ~~Each Copermittee must assess and report the progress of its illicit discharge detection and elimination program, required to be implemented pursuant to Provision E.2, toward reducing and effectively prohibiting non-storm water and illicit discharges into the MS4 within its jurisdiction as follows:~~

~~(i) Based on data collected pursuant to Provisions D.2.a.(2), the assessments under Provision D.4.b.(1)(b) must be included when complete in the Annual Report required pursuant to Provision F.3.b.(1).~~

~~(ii) Based on the data collected pursuant to Provisions D.2.b, the assessments required under Provision D.4.b.(1)(c) must be included in the first Annual Report required pursuant to Provision F.3.b.(1), and annually thereafter.~~

~~(iii) Based on the data collected pursuant to Provisions D.2.b, the assessment required under Provision D.4.b.(1)(c) must be included in the Report of Waste Discharge required pursuant to F.5.b.~~

Comment [A55]: For clarity and simplicity, these timelines were integrated into the following sections.

(b) Based on the transitional dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.a.(2), each

Municipal Copermittee must assess and report the following, as applicable to discharges from the MS4 (including Special District Copermittee MS4s) to flowing receiving waters within their jurisdiction, in the Annual Report required pursuant to Provision F.3.b.(2):~~:~~

(i) Identify the known and suspected controllable sources (e.g. facilities, areas, land uses, pollutant generating activities) of transient and persistent flow discharges to flowing receiving waters~~flows~~ within the Copermittee's jurisdiction in the Watershed Management Area;

(ii) Identify sources of transient and persistent flow discharges to flowing receiving waters~~flows~~ within the Copermittee's jurisdiction in the Watershed Management Area that have been reduced or eliminated; and

(iii) Identify modifications to the field screening monitoring locations and frequencies for the MS4 outfalls in its inventory necessary to identify and eliminate sources of persistent flow non-storm water discharges to flowing receiving waters, pursuant to Provision D.2.b.(1).

(c) Based on the dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b, each Municipal Copermittee must assess and report the following, as applicable to discharges from the MS4 (including Special District Copermittee MS4s) within their jurisdiction, in each Annual Report required pursuant to F.3.b.(3) and in the Report of Waste Discharge required pursuant to Provision F.5.b.:~~:~~

(i) The assessments required pursuant to Provision D.4.b.(1)(a~~b~~);

(ii) Based on the data collected and applicable NALs in the Water Quality Improvement Plan, rank the MS4 outfalls in the Copermittee's jurisdiction according to potential threat to receiving water quality, and produce a prioritized list of major MS4 outfalls for follow-up action to update the Water Quality Improvement Plan, with the goal of eliminating persistent flow non-storm water discharges to flowing receiving waters and/or pollutant loads in order of the ranked priority list through targeted programmatic actions and source investigations;

(iii) For the highest priority major MS4 outfalls with persistent flow discharges to a flowing receiving water~~flows~~ that are in exceedance of NALs, identify the known and suspected sources within the Copermittee's jurisdiction in the Watershed Management Area that may cause or contribute to the NAL exceedances;

(iv) Each Copermittee must analyze the data collected pursuant to Provision D.2.b.(2), and: ~~utilize a model or other method, to calculate or estimate the non-storm water volumes and pollutant loads collectively discharged from all the major MS4s outfalls in its jurisdiction identified as having persistent dry weather flows during~~

Comment [A56]: Per edits to that section

Comment [A57]: Per edits to that section

Comment [A58]: Per edits above

Comment [A59]: Edits to this section (and sub-sections) is different than SD edits.

the monitoring year. These calculations or estimates must be updated annually. Each Copermittee must calculate or estimate:

[a] Calculate or estimate annual non-storm water volumes and pollutant loads (associated with the priority constituents identified in the WQIP) collectively discharged from the monitored persistently flowing Copermittee's major MS4 outfalls discharging to flowing receiving waters within the Copermittee's jurisdiction, or discharged into another Copermittee's MS4 as demonstrated through provision E.2.d. with an estimate of the percent contribution from each known and suspected source for each MS4 outfall;

[b] Identify identify and quantify, where feasible, known sources of non-stormwater flows not [b] Annual non-storm water volumes and pollutant loads from areas or facilities subject to the Copermittee's legal authority that are discharged from the Copermittee's major MS4 outfalls to downstream receiving waters.

(v) Each Copermittee must review the data collected pursuant to Provision D.2.b and findings from the assessments required pursuant to Provision D.4.b.(1)(c)(i)-(iv) once per Permit termon an annual basis, and then report within the Regional Monitoring and Assessment Report per Provision F.3.c., the following to:

[a] Identify reductions and progress in achieving reductions in non-storm water and illicit discharges to the Copermittee's MS4 in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction, with an estimate, if possible, of the non-storm water volume and/or pollutant load reductions attributable to specific water quality strategies implemented by the Copermittee; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittee in the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction.

(vi) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(v).

(2) Storm Water Pollutant Discharges Reduction Assessments

(a) The Copermittees must assess and report the progress of the water quality improvement strategies, required to be implemented pursuant to

Comment [A60]: This is to help ensure jurisdictional accountability for what is being discharged from their jurisdiction.

~~Provisions B and E, toward reducing pollutants in storm water discharges from the MS4s within the Watershed Management Area as follows:~~

~~(i) Based on data collected pursuant to Provisions D.2.a.(3), the assessments under Provision D.4.b.(2)(b) must be included in the first Annual Report required pursuant to Provision F.3.b.(1).~~

~~Based on the data collected pursuant to Provisions D.2.c, the assessments required under ProvisionProvision first Annual Report required pursuant to Provision F.3.b.(1), and annually thereafter.~~

~~Based on the data collected pursuant to Provisions D.2.c, the assessment required under Provisions D.4.b.(2)(c)-(d) must be included in the Report of Waste Discharge required pursuant to F.5.b.~~

(b) Based on the transitional wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.a.(3) the Copermittees must assess and report the following in the Transitional Period Monitoring Report required pursuant to Provision F.3.b.(2):

(i) The Copermittees must analyze the monitoring data collected pursuant to Provision D.2.a.(3), and utilize a watershed model or other method, to calculate or estimate: ~~storm water volumes and pollutant loads discharged from the MS4s in each Copermittee's jurisdiction within the Watershed Management Area. The Copermittees must calculate or estimate the following for each monitoring year:~~

[a] The average storm water runoff coefficient for each land use type within the Watershed Management Area;

[b] The volume of storm water and pollutant loads discharged from each of the Copermittee's monitored major MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each monitored storm event with measurable rainfall greater than 0.1 inch, for each of the priority water quality constituents identified in the WQIP;

[c] The total volume and pollutant loads potentially discharged from each Municipal Copermittee's jurisdiction within the watershed management area, for each monitored event, extrapolated from the data produced from the monitored outfalls.

~~The pollutant loads discharged from each of the Copermittee's major MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch; and~~

~~[d] The percent contribution of storm water volumes and pollutant loads discharged from each land use type within the drainage basin to each of the Copermittee's major MS4 outfalls in its~~

Comment [A61]: See discussion in section 3.5.3 of the comment letter.

Comment [A62]: Removed as this was confusing as it was duplicative of the subsections below.

Comment [A63]: There is no need to perform this analysis for other pollutants not identified as priorities in the WQIP.

~~jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch.~~

(ii) Identify modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify ~~sources~~ pollutants in storm water discharges from the MS4s in the Watershed Management Area pursuant to Provision D.2.c.(1).

(c) Based on the wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.c the Copermittees must assess and report (i) and (ii) below in the annual reports required per F.3.b.(3), and (i) through (iv) below in the Regional Monitoring and Assessment Report required per F.3.c. ~~the following~~:

(i) The assessments required pursuant to Provision D.4.b.(2)(a~~b~~);

(ii) Based on the data collected and applicable SALs in the Water Quality Improvement Plan, analyze and compare the monitoring data to the analyses and assumptions used to develop the Water Quality Improvement Plans, including strategies developed per Provision B.3, and evaluate whether ~~,rank the MS4 outfalls in the Watershed Management Area according to potential threat to receiving water quality, and produce a prioritized list of major MS4~~ there is a need to update the Water Quality Improvement Plan;

(iii) The Copermittees must review the data collected pursuant to Provision D.2.c and findings from the assessments required pursuant to Provisions D.4.b.(2)(c)(i)-(ii) ~~on an annual basis~~ to:

[a] Identify reductions and progress in achieving reductions in pollutant concentrations and/or pollutant loads from different land uses and/or drainage areas discharging from the Copermittees' MS4s in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing pollutants in ~~storm water~~ discharges from the MS4s to receiving waters within the Watershed Management Area to the MEP, with an estimate, if possible, of the pollutant load reductions attributable to specific water quality strategies implemented by the Copermittees; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittees in the Watershed Management Area toward reducing pollutants in ~~storm water~~ discharges from the MS4s to receiving waters in the Watershed Management Area to the MEP.

(iv) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(iii).

Comment [A64]: See discussion in section 3.5.3 of the comment letter.

Comment [A65]: Per edits to that section

Comment [A66]: Per edits above

(d) Within the Regional Monitoring and Assessment report required pursuant to F.3.c.~~The~~ Copermittees must evaluate all the data collected pursuant to Provision D.2.c, and incorporate new outfall monitoring data into time series plots for each long-term monitoring constituent for the Watershed Management Area, and perform statistical trends analysis on the cumulative long-term wet weather MS4 outfall discharge water quality data set.

c. SPECIAL STUDIES ASSESSMENTS

The Copermittees must in the applicable annual report required pursuant to F.3.b.,~~annually~~ evaluate the results and findings from the special studies developed and implemented pursuant to Provision D.3, and assess their relevance to the Copermittees' efforts to characterize receiving water conditions, understand sources of pollutants and/or stressors, and control and reduce the discharges of pollutants from the MS4 outfalls to receiving waters in the Watershed Management Area. The Copermittees must report the results of the special studies assessments applicable to the Watershed Management Area, and identify any necessary modifications or updates to the Water Quality Improvement Plan based on the results in the Annual Reports required pursuant to Provision F.3.b.

d. INTEGRATED ASSESSMENT OF WATER QUALITY IMPROVEMENT PLAN

As part of the iterative approach and adaptive management process required for the Water Quality Improvement Plan pursuant to Provision B.5, the Copermittees in each Watershed Management Area must integrate the data collected pursuant to Provisions D.1-D.3, the findings from the assessments required pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to assess the effectiveness of, and identify necessary modifications to, the Water Quality Improvement Plan as follows:

(1) The Copermittees must re-evaluate the priority water quality conditions and numeric goals for the Watershed Management Area, as needed, during the term of this Order pursuant to Provision B.5.a. The re-evaluation and recommendations for modifications to the priority water quality conditions, and/or numeric goals and corresponding schedules may be provided in the Annual Reports required pursuant to Provision F.3.b, but must at least be provided in the Regional Monitoring and Assessment Report ~~of Waste Discharge~~ pursuant to Provision F.3.c~~5.b~~. The priority water quality conditions and numeric goals for the Watershed Management Area must be re-evaluated as follows:

(a) Re-evaluate the receiving water conditions in the Watershed Management Area in accordance with Provision B.2.a;

(b) Re-evaluate the impacts on receiving waters in the Watershed Management Area from MS4 discharges in accordance with Provision B.2.b;

(c) Re-evaluate the identification of MS4 sources of pollutants and/or stressors in accordance with Provision B.2.d;

(d) Identify beneficial uses of the receiving waters that are protected or must be restored in accordance with Provision D.4.a;

(e) Evaluate the progress toward achieving the interim and final numeric goals for restoring impacted beneficial uses in the receiving waters.

(2) The Copermittees must re-evaluate the water quality improvement strategies for the Watershed Management Area during the term of this Order pursuant to Provision B.5.b. The re-evaluation and recommendations for modifications to the water quality improvement strategies and schedules may be provided in the Annual Reports required pursuant to Provision F.3.b, but must at least be provided in the Regional Monitoring and Assessment Report pursuant to Provision F.3.c~~must be provided in the Annual Reports required pursuant to Provision F.3.b, and provided in the Report of Waste Discharge pursuant to Provision F.5.b~~. The water quality improvement strategies for the Watershed Management Area must be re-evaluated as follows:

(a) Identify the non-storm water and storm water pollutant loads from the Copermittees' MS4 outfalls in the Watershed Management Area, calculated or estimated pursuant to Provisions D.4.b;

(b) Identify the non-storm water and storm water pollutant load reductions, or other improvements to receiving water or water quality conditions, that are necessary to attain the interim and final numeric goals identified in the WQIP~~for restoring impacted beneficial uses in the receiving waters~~;

(c) Identify any~~the~~ non-storm water and storm water pollutant load reductions, or other improvements to the quality of MS4 discharges, that are necessary for the Copermittees to ~~demonstrate that non-storm water and storm water~~ reduce discharges of pollutants from their MS4s that have been demonstrated to be~~are not~~ causing or contributing to exceedances of receiving water limitations;

Comment [A67]: See discussion in section 3.5.3 of the comment letter.

(d) Evaluate the progress of the water quality improvement strategies toward achieving the interim and final numeric goals identified in the WQIP~~for restoring impacted beneficial uses in the receiving waters~~.

(3) The Copermittees must re-evaluate and adapt the water quality monitoring and assessment program for the Watershed Management Area when new information becomes available to improve the monitoring and assessment

program pursuant to Provision B.5.c. The re-evaluation and recommendations for modifications to the monitoring and assessment program may be provided in the Annual Reports required pursuant to Provision F.3.b, but must at least be provided in the Regional Monitoring and Assessment Report ~~of Waste Discharge~~ pursuant to Provision F.3.c~~5.b~~. Modifications to the water quality monitoring and assessment program must be consistent with the requirements of Provision D.1-D.3. The re-evaluation of the water quality monitoring and assessment program for the Watershed Management Area must consider the data gaps identified by the assessments required pursuant to Provisions D.4.a-b, and results of the special studies implemented pursuant to Provision D.4.c.

5. Monitoring Provisions

Each Copermittee must comply with all the monitoring, reporting, and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

E. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS

The purpose of this provision is for each Copermittee to implement a program to control the contribution of pollutants to and the discharges from the MS4 within its jurisdiction. The goal of the jurisdictional runoff management programs is to implement strategies that effectively prohibit non-storm water discharges to the MS4 and reduce the discharge of pollutants in ~~storm water~~ to the MEP. This goal will be accomplished through implementing the jurisdictional runoff management programs in accordance with the strategies identified in the Water Quality Improvement Plans.

Each Copermittee must update its jurisdictional runoff management program document, in accordance with Provision F.2.a, to incorporate all the requirements of Provision E, consistent with their legal authority. Until the Copermittee has updated its jurisdictional runoff management program document with the applicable requirements of Provision E, the Copermittee must continue implementing its current jurisdictional runoff management program.

Modification of Jurisdictional Runoff Management Program Requirements

Modifications shall be considered and where selected, proposed according to the process in Provision B.5. Proposed modifications may increase, decrease, and/or replace minimum requirements identified in Provision E.

1. Legal Authority Establishment and Enforcement

Comment [A68]: See discussion in section 3.6 of the comment letter.

a. Each Copermittee must establish, maintain, and enforce adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 through statute, ordinance, permit, or series of contracts, ~~order, or similar means~~ which~~. This legal authority must~~, at a minimum, authorize the Copermittee to:

(1) Effectively prohibit through ordinance, order or other similar means~~Prohibit and eliminate all~~ illicit discharges ~~and illicit connections~~ to its MS4;

(2) Control, through ordinance, permit, contract, order or similar means the contribution of pollutants in discharges to the MS4 by storm water discharges ~~of runoff~~ associated with industrial and construction activity~~ to its MS4~~, and ~~control~~ the quality of storm water discharges ~~runoff~~ from sites of industrial and construction activity~~sites~~, whose discharges have not been separately authorized through~~ that do not, including industrial and construction sites which~~ have coverage under the statewide General Permit for Discharges of Storm Water Associated with Industrial Activities (Industrial General Permit) or General Permit for Discharges of Storm Water Associated with Construction Activities (Construction General Permit)~~, as well as to those sites which do not;~~

Comment [A69]: See discussion in section 3.6.2 of the comment letter.

(3) Control, through ordinance, order or similar means the discharge to the MS4 of spills, dumping, or disposal of materials other than storm water~~ into its~~

Comment [A70]: See discussion in section 3.6.2 of the comment letter.

~~MS4~~;

(4) Control through interagency agreements among Copermittees the contribution of pollutants from one portion of the MS4 to another portion of the MS4;

(5) ~~Control, by coordinating and cooperating with other owners of the MS4 such as Caltrans, the U.S. federal government, or sovereign Native American Tribes through interagency agreements, where possible, the contribution of from their portion of the MS4 to the portion of the MS4 within the Copermittee's jurisdiction;~~

(6) Require compliance with conditions in its ~~statutes,~~ ordinances, permits, contracts, or orders~~, or similar means to hold dischargers to its MS4 accountable for their contributions of pollutants and flows~~;

(7) ~~Require the use of BMPs to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;~~

(8) ~~Require documentation on the effectiveness of BMPs implemented to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;~~

(9) ~~Utilize enforcement mechanisms to require compliance with its statutes, ordinances, permits, contracts, orders, or similar means; and~~

(10) Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with permit conditions~~its statutes, ordinances, permits, contracts, orders, or similar means and with the requirements of this Order~~, including the prohibition of illicit discharges and connections to its MS4; ~~the Copermittee must also have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from industrial facilities, including construction sites, discharging into its MS4.~~

b. With the first Annual Report required pursuant to Provision F.3.b, each Copermittee must submit a statement certified by its Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative that the Copermittee has taken the necessary steps to obtain and maintain full legal authority within its jurisdiction to implement and enforce each of the requirements contained in this Order.

2. Illicit Discharge Detection and Elimination

Each Copermittee must implement a program to actively detect and eliminate illicit discharges and improper disposal into the MS4, or otherwise require the discharger

Comment [A71]: See discussion in section 3.6.2 of the comment letter.

Comment [A72]: See discussion in section 3.6.2 of the comment letter.

Comment [A73]: See discussion in section 3.6.2 of the comment letter.

Comment [A74]: See discussion in section 3.6.2 of the comment letter.

Comment [A75]: See discussion in section 3.7 of the comment letter.

to apply for and obtain a separate NPDES permit. The illicit discharge detection and elimination program must be implemented in accordance with the strategies identified in the Water Quality Improvement Plan and include, at a minimum, the following requirements:

STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the illicit discharge detection and elimination program to address ~~non-storm water and~~ illicit discharges and connections that the Copermittee has identified as potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate~~ additional~~ BMPs, focus education, and/or increase/decrease frequency of inspections in specific areas); and

(2) The strategies and/or activities ~~must~~ may be modified from ~~consistent with~~ the default requirements of Provisions E.2.b-e~~a-d~~ ~~and~~ to be consistent with the strategies identified in the Water Quality Improvement Plan;

(3) The requirements of the programs as outlined in the following sub-provisions may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality improvement Plan(s).

a. NON-STORM WATER DISCHARGES

To the extent allowable by law, each~~Each~~ Copermittee must address all non-storm water discharges ~~from~~into the MS4 as illicit discharges, where the likelihood exists that they are a source of pollutants to the Receiving Waters, unless ~~a non-storm water~~the discharge is either identified as a discharge authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that is consistent with~~must be addressed pursuant to~~ the following requirements:

(1) ~~Discharges of non-storm water to the MS4 from the following categories must be addressed as illicit dischargeunless the discharge has coverage under NPDES Permit No. CAG919001 (Order No. R9-2007-0034, or subsequent order) for discharges to San Diego Bay, or NPDES Permit No. CAG919002 (Order No. R9-2008-0002, or subsequent order) for discharges to surface waters other than San Diego Bay.~~

Comment [A76]: See discussion in section 3.7.2 of the comment letter.

~~(a) Uncontaminated pumped ground water;~~

~~(b) Discharges from foundation drains;~~[20]

~~(c) Water from crawl space pumps; and~~

~~(d) Water from footing drains.~~[19]

(2) Discharges of non-storm water from water line flushing and water main breaks to the MS4 must be addressed as illicit discharges unless the discharge has coverage under a valid NPDES Permit, ~~No. CAG 679001~~ (Order No. R9-2010-0003, or a subsequent order). This category includes potable water line flushing ~~and water main break~~ discharges from water purveyors issued a water supply permit by the California Department of Public Health or federal military installations. Discharges from recycled or reclaimed water lines to the MS4 must be addressed as illicit discharges, unless the discharges have coverage under a separate NPDES permit.

(3) Discharges of non-storm water into the MS4 from the following categories must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the individual discharge as a source of pollutants to receiving waters:

(a) Diverted stream flows;

(b) Rising ground waters;

(c) Uncontaminated ground water infiltration to MS4s;

(d) Uncontaminated pumped ground water;

(e) Springs;

(f) Water from crawl space pumps;

~~(c)~~(g) Flows from riparian habitats and wetlands;

(h) Landscape irrigation;

(i) Irrigation water;

(j) Lawn watering;

Comment [A77]: See discussion in section 3.7.2 of the comment letter.

Comment [A78]: See discussion in section 3.7.2 of the comment letter.

Comment [A79]: See Legal Comments discussion.

[20] ~~Provision E.2.a.(1) only applies to this category on non-storm water if the system is designed to be located at or below the highest historical groundwater table to actively or passively extract groundwater during any part of the year.~~

~~(d)~~(k) Discharges from potable water sources;

~~(e)~~(l) Discharges from foundation drains;[21] ~~and~~

(m)Discharges from footing drains. .[21]

(4) Discharges of non-storm water into the MS4 from the following categories must be controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means. ~~Discharges of non-storm water to the MS4 from the following categories not controlled by the requirements given below through~~ If such statutes, ordinances, permits, contracts, orders, or similar means have not been enacted by the Copermittee, the applicable categories below must be addressed by the Copermittee as illicit discharges.

(a) Air conditioning condensation

The discharge of air conditioning condensation should~~must~~ be directed to landscaped areas or other pervious surfaces where feasible.

(b) Individual residential vehicle washing

(i) The discharge of wash water ~~must~~ should be directed to landscaped areas or other pervious surfaces where feasible; and

(ii) Minimize the use of water for vehicle washing, use as little washing detergent and other vehicle wash products as possible, wash vehicles at commercial wash facilities, and implement other practices or behaviors that will prevent the discharge of pollutants associated with individual residential vehicle washing from entering the MS4.

(c) Dechlorinated swimming pool discharges

(i) Eliminate residual chlorine, algaecide, filter backwash, or other pollutants from swimming pools prior to discharging to the MS4; and

(ii) The discharge of saline swimming pool water must be directed to the sanitary sewer, landscaped areas, or other pervious surfaces that can accommodate the volume of water, unless the saline swimming pool water can be discharged via a pipe or concrete channel directly to a naturally saline water body (e.g. Pacific Ocean).

(5) Firefighting discharges to the MS4 must be addressed by the Copermittee as

Comment [A80]: See discussion in section 3.7.2 of the comment letter.

Comment [A81]: See discussion in section 3.7.2 of the comment letter.

[21] ~~Provision E.2.a.(3) only applies to this category of non-storm water discharge if the system is designed to be located above the highest historical groundwater table at all times of the year, and the system is only expected to discharge non-storm water under unusual circumstances.~~

follows:illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a significant source of pollutants to receiving waters. Firefighting discharges to the MS4 not identified as a significant source of pollutants to receiving waters, must be addressed, at a minimum, as follows:

(a) Non-emergency firefighting discharges

(i) Building fire suppression system maintenance discharges (e.g.., sprinkler line flushing) to the MS4 must be addressed as illicit discharges unless appropriate BMPs are implemented.

(ii) Non-emergency firefighting discharges (i.e., discharges from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems) must be addressed by a program, to be developed and implemented by the Copermittee in conjunction with the local Fire Authority/District, to reduce or eliminate pollutants in such discharges from entering the MS4.

(b) Emergency firefighting discharges (i.e., flows necessary for the protection of life or property) do not require BMPs and need not be prohibited.

Each Copermittee should develop and encourage implementation of BMPs to reduce or eliminate pollutants in emergency firefighting discharges to the MS4s and receiving waters within its jurisdiction. During emergency situations, priority of efforts should be directed toward life, property, and the environment (in descending order). BMPs should not interfere with immediate emergency response operations or impact public health and safety.

(6) If the Copermittee or San Diego Water Board identifies any category of non-storm water discharges listed under Provisions E.2.a.(1)-(4) as a source of pollutants to receiving waters, the category must be effectively prohibited through ordinance, order, or similar means and addressed as an illicit discharge.

(7) Each Copermittee must, where feasible, reduce or eliminate non-storm water discharges listed under Provisions E.2.a.(1)-(4) into its MS4 whether or not the non-storm water discharge has been identified as an illicit discharge, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit.

Comment [A82]: See discussion in section 3.7.2 of the comment letter.

b. Prevent And Detect Illicit Discharges And Connections

Each Copermittee must include the following measures within its program to prevent and detect illicit discharges to the MS4:

(1) Each Copermittee must maintain an updated map of its entire MS4 and the corresponding drainage areas. The accuracy of the MS4 map must be confirmed during the field screening required pursuant to Provision E.2.c. The MS4 map must be included as part of the jurisdictional runoff management program document. Any geographic information system (GIS) layers or files used by the Copermittee to maintain the MS4 map must be made available to the San Diego Water Board upon request. The MS4 map must identify the following:

(a) All segments of the MS4 owned, operated, and maintained by the Copermittee;

(b) All known locations of inlets that discharge and/or collect runoff into the Copermittee's MS4;

(c) All known locations of connections with other MS4s not owned or operated by the Copermittee (e.g. Caltrans MS4s);

(d) All known locations of major MS4 outfalls as defined by 40 CFR §122.26(b)(5-6) ~~and private outfalls,~~ that discharge runoff collected from areas within the Copermittee's jurisdiction;

Comment [A83]: See discussion in section 3.7.2 of the comment letter.

(e) All segments of receiving waters within the Copermittee's jurisdiction that receive and convey runoff discharged from the Copermittee's MS4 outfalls;

(f) Locations of the MS4 outfalls, identified pursuant to Provision D.2.a.(1), within its jurisdiction; and

(g) Locations of the non-storm water persistent flow MS4 outfall discharge monitoring stations, identified pursuant to Provision D.2.b.(2)(b), within its jurisdiction.

(2) Each Copermittee must use Copermittee personnel and contractors to assist in identifying and reporting illicit discharges and connections during their daily employment activities.

(3) Each Copermittee must promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges to or from the MS4, including the following methods for public reporting:

(a) Operate a public hotline, which can be Copermittee-specific or shared by the Copermittees, and must be capable of receiving reports in both English and Spanish 24 hours per day and seven days per week; and

(b) Designate an e-mail address for receiving electronic reports from the public, which can be Copermittee-specific or shared by the Copermittees, and must be prominently displayed on the Copermittee's webpage and the Regional Clearinghouse required pursuant to Provision F.4.

(4) Each Copermittee must implement practices and procedures (including a notification mechanism) to prevent, respond to, contain, and clean up any spills that may discharge into the MS4 within its jurisdiction from any source. Such practices and procedures may include the coordination with other parties, such as sanitary sewer operators. The Copermittee must coordinate, to the extent possible, with spill response teams to prevent entry of spills into the MS4~~, and prevent contamination of surface water, ground water, and soil.~~ The Copermittee must coordinate spill prevention, containment, and response activities throughout all appropriate internal~~Copermittee~~ departments, programs, and agencies.

Comment [A84]: See discussion in section 3.7.2 of the comment letter.

(5) Each Copermittee must implement practices and procedures to ~~prevent~~ control and limit infiltration of seepage from sanitary sewers owned by a Copermittee agency (including private laterals and failing septic systems) to the MS4.

(6) Each Copermittee shall~~must~~ coordinate, when necessary, with upstream Copermittees and/or entities to prevent illicit discharges from upstream sources into the MS4 within its jurisdiction.

c. FIELD SCREENING

Each Copermittee must conduct field screening (i.e. visual observations, field testing, and/or analytical testing) of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4 in accordance with the dry weather MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

d. INVESTIGATE AND ELIMINATE ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to investigate and eliminate illicit discharges to the MS4 to comply with provision A.1.b:

(1) Each Copermittee must prioritize and determine when follow-up investigations will be performed in response to visual observations and/or water quality monitoring data collected during an investigation of a detected non-storm water ~~or~~ illicit discharge into or from the MS4. The criteria for prioritizing investigations must consider the following:

(a) Pollutants identified as causing or contributing to the highest water quality

priorities identified in the Water Quality Improvement Plan;

(b) Pollutants identified as causing or contributing, or threatening to cause or contribute to impairments in water bodies on the 303(d) List and/or in environmentally sensitive areas (ESAs), located within its jurisdiction;

(c) Pollutants identified from sources or land uses known to exist within the area, drainage basin, or watershed that discharges to the portion of the MS4 within its jurisdiction included in the investigation;

(d) Pollutants identified as causing or contributing to an exceedance of a NAL in the Water Quality Improvement Plan, where the source has not been identified as natural or otherwise permitted; and

(e) Pollutants identified as an immediate and significant threat to human health or the environment.

(2) Each Copermittee must implement procedures to investigate and inspect portions of its MS4 that, based on reports or notifications, field screening, or other appropriate information, indicate a reasonable potential of receiving, containing, or discharging pollutants due to illicit discharges, or illicit connections~~, or other sources of non-storm water~~. The procedures must include the following:

(a) Each Copermittee must develop criteria to:

(i) Assess the validity of each report or notification received; and

(ii) Prioritize the response to each report or notification received.

(b) Each Copermittee must prioritize and respond to each valid report or notification (e.g., public reports, staff or contractor reports and notifications, etc.) of an incident in a timely manner.

(c) ~~Each~~In accordance with the procedures defined in Provision E.2.d.(1), each~~Each~~ Copermittee must investigate and seek to identify the source(s) of discharges of non-storm water illicit discharges or illicit connections ~~where flows are~~ observed into and from the MS4 during the field screening required pursuant to Provision D.2.b.(1) as follows:

(i) Obvious illicit discharges (i.e., unusual color or odor) must be immediately investigated to identify the source(s) of non-storm water illegal discharges;

(ii) The investigation must include field investigations to identify sources or potential sources for the discharge, unless the source or potential source has already been identified during previous investigations; and

(iii) The investigation may include follow-up field investigations and/or reviewing Copermittee inventories and other land use data to identify potential sources of the discharge.

(d) Each Copermittee must maintain records and a database of the following information:

(i) Location of incident, including hydrologic subarea, portion of MS4 receiving the non-storm water ~~or~~ illicit discharge, and point of discharge or potential discharge from MS4 to receiving water;

(ii) Source of information initiating the investigation (e.g., public reports, staff or contractor reports and notifications, field screening, etc.);

(iii) Date the information used to initiate the investigation was received;

(iv) Date the investigation was initiated;

(v) Dates of follow-up investigations;

(vi) Identified or suspected source of the illicit discharge or connection, if determined;

(vii) Known or suspected related incidents, if any;

(viii) Result of the investigation; and

(ix) If a source cannot be identified and the investigation is not continued, a rationale for why a discharge does not pose a threat to water quality and/or does not require additional investigation.

(e) Each Copermittee must ~~track~~ document, and where feasible quantify, any readily~~and seek to~~ identifiable~~y~~ the source(s) of non-storm water illegal discharges from the MS4 where there is evidence of non-storm water ~~having been discharged~~illegal discharges or connections into or from the MS4 (e.g., pooled water), in accordance with MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.

Comment [A85]: See discussion in section 3.7.2 of the comment letter.

(3) Each Copermittee must initiate the implementation of procedures, in a timely manner, to eliminate all detected and identified illicit discharges and connections within its jurisdiction. The procedures must include the following responses:

(a) Each Copermittee must enforce its legal authority, as required under Provision E.1, to eliminate illicit discharges and connections to the MS4.

(b) If the Copermittee identifies the source as a controllable source of non-storm water ~~or~~ illicit discharge or connection, the Copermittee must implement its Enforcement Response Plan pursuant to Provision E.6 and enforce its legal authority to effectively prohibit and with the goal of eliminating~~e~~ illicit discharges and connections to its MS4.

(c) If the Copermittee identifies the source of the discharge as a category of non-storm water discharges in Provision E.2.a, and the discharge is in exceedance of NALs in the Water Quality Improvement Plan, then the Copermittee must determine if: (1) this is an isolated incident or set of circumstances that will be addressed through its Enforcement Response Plan pursuant to Provision E.6, or (2) the category of discharge must be addressed through the effective prohibition of that category of discharge as an illicit discharge pursuant to Provision E.2.a.(6).

(d) If the Copermittee suspects the source of the non-storm water discharge as natural in origin (i.e. non-anthropogenically influenced) and in conveyance into the MS4, then the Copermittee must document and provide the data and evidence necessary to demonstrate to the San Diego Water Board that it is natural in origin and does not require further investigation.

(e) If the Copermittee identifies that the discharge is coming from another Copermittees' jurisdiction, the receiving Copermittee must document and provide the findings to the upstream Copermittee. The obligation to implement the requirements of provision E.2.d.(3) are thenceforth the responsibility of the upstream Copermittee.

(f) If the Copermittee identifies the source as a non-storm water discharge that has been separately authorized by the San Diego Water Board, or that is contributing pollutants to the MS4 and that may require coverage under a WDR from the San Diego Water Board, the Copermittee shall provide all relevant findings to the San Diego Water Board and may back charge the Regional Board for the entire cost of conducting the source investigation.

Comment [A86]: See discussion in section 3.7.2 of the comment letter.

~~(e)~~(g) If the Copermittee is unable to identify and document the source of a recurring non-storm water discharge to or from the MS4, then the Copermittee must ~~address the discharge as an illicit discharge and~~ update its jurisdictional runoff management program to address the common and suspected sources of the non-storm water discharge within its jurisdiction in accordance with the Copermittee's priorities.

(4) Each Copermittee must submit a summary of the non-storm water discharges and illicit discharges and connections investigated and eliminated within its jurisdiction with each Annual Report required under Provision F.3.b of this Order.

3. Development Planning

Comment [A87]: See discussion in section 3.8 of the comment letter.

Each Copermittee must, within their jurisdiction, use their land use and planning

authorities, to the extent that they may lawfully impose requirements, to implement a development planning program in accordance with the strategies identified in the Water Quality Improvement Plan and includes, at a minimum, the following requirements:

STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Comment [A88]: See discussion in section 3.8.2 of the comment letter.

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the development planning program to address development and redevelopment projects that may become sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional or alternative BMPs, focus education, increase frequency of verifications and/or inspections, alternative compliance options);

(2) Each Copermittee must identify areas within its jurisdiction where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting and/or stream, channel, or habitat rehabilitation projects;

(3) Each Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify regional alternative compliance projects that Priority Development Projects may be allowed or should be encouraged to implement or participate in implementing; and

(4) The requirements of the programs as outlined in the following sub-provisions may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality improvement Plan(s).~~The strategies and/or activities must be consistent with the requirements of Provisions E.3.a-c and E.3.e-f and the strategies identified in the Water Quality Improvement Plan.~~

a. BMP REQUIREMENTS FOR ALL DEVELOPMENT PROJECTS

Each Copermittee, as practical and feasible, must prescribe the following BMP requirements during the planning process (i.e. prior to project approval and issuance of local permits) for all development projects (regardless of project type or size), where local permits are issued, including unpaved roads and flood management projects, except emergency / public safety projects implemented for the protection of persons and property:

(1) General Requirements

(a) Onsite BMPs must be located so as to remove pollutants from runoff prior to its discharge to any receiving waters, and as close to the source as possible; and

(b) Structural BMPs must not be constructed within a waters of the U.S.. ~~or waters of the state.~~

(2) Source Control BMP Requirements

The following source control BMPs must be implemented at all development projects where applicable and feasible:

(a) Prevention of illicit discharges into the MS4;

(b) Storm drain system stenciling or signage;

(c) Properly designed outdoor material storage areas;

(d) Properly designed outdoor work areas;

(e) Properly designed trash storage areas; and

(f) Any additional BMPs determined necessary by the Copermittee to minimize pollutant generation at each project.

(3) Low Impact Development (LID) ~~BMP Requirements~~Principles

Comment [A89]: See discussion in section 3.8.2 of the comment letter.

The following LID ~~BMPs~~ Principles must be implemented at all development projects where applicable and feasible:

(a) Maintenance or restoration of natural storage reservoirs and drainage corridors (including topographic depressions, areas of permeable soils, natural swales, and ephemeral and intermittent streams);[22]

(b) Buffer zones for natural water bodies (where buffer zones are technically infeasible, require project applicant to include other buffers such as trees, access restrictions, etc.);

(c) Conservation of natural areas within the project footprint including existing trees, other vegetation, and soils;

[22] Development projects proposing to dredge or fill materials in waters of the U.S. must obtain a CWA Section 401 Water Quality Certification. Projects proposing to dredge or fill waters of the state must obtain waste discharge requirements.

(d) Construction of streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided public safety is not compromised;

(e) Minimization of the impervious footprint of the project;

(f) Minimization of soil compaction to landscaped areas;

(g) Disconnection of impervious surfaces through distributed pervious areas;

(h) Landscaped or other pervious areas designed and constructed to effectively receive and infiltrate, retain and/or treat runoff from impervious areas, prior to discharging to the MS4;

(i) Small collection strategies located at, or as close as possible to, the source (i.e. the point where storm water initially meets the ground) to minimize the transport of runoff and pollutants to the MS4 and receiving waters;

(j) Use of permeable materials for projects with low traffic areas and appropriate soil conditions;

(k) Landscaping with native or drought tolerant species; and

(l) Harvesting and using precipitation.

b. PRIORITY DEVELOPMENT PROJECTS

(1) Definition of Priority Development Project

Priority Development Projects include the following:

(a) All new development projects that fall under the Priority Development Project categories listed under Provision E.3.b.(2) (where a new development project feature, such as a parking lot, falls into a Priority Development Project category, the entire project footprint is subject to Priority Development Project requirements); and

(b) Those redevelopment projects that create, add, or replace at least 5,000 square feet of impervious surfaces on an already developed site, and the redevelopment project is a Priority Development Project category listed under Provision E.3.b.(2) (where redevelopment results in an increase of less than fifty percent of the impervious surfaces of a previously existing development, and the existing development was not subject to Priority Development Project requirements, the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) apply only to the addition or replacement, and not to the entire development; where redevelopment

results in an increase of more than fifty percent of the impervious surfaces of a previously existing development, the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) apply to the entire development).

(c) Projects where redevelopment results in an increase of more than fifty percent of impervious surfaces of a previously existing development, and the existing development *was* subject to previous Priority Project Development Requirements, only the altered portion of development is subject to the new Priority Development Project requirements.

Comment [A90]: See discussion in section 3.8.2 of the comment letter.

(2) Priority Development Project Categories

Comment [A91]: See discussion in section 3.8.2 of the comment letter.

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This category includes commercial, industrial, residential, mixed-use, and public development projects on public or private land which fall under the planning and building authority of the Copermittee.

(b) New development projects that create 5,000 square feet or more of impervious surfaces (collectively over the entire project site), and are designed for support one or more of the following uses (see Appendix for definitions):

(i) Automotive repair shop
(ii) Restaurant
(iii) Parking lot[23]
(iv) Street, road, highway, freeway
(v) Retail gasoline outlet (RGO)

Comment [A92]: See footnote

~~(b) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.~~

~~(c) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812), where the land area for development is 5,000 square feet or more.~~

~~(d) Hillside development projects. This category includes any development which creates 5,000 square feet or more of impervious surface which is~~

[23] Excluding parking lots that are not subject to runoff, such as but not limited to covered or subterranean parking lots

located in an area with known erosive soil conditions, where the development will grade on any natural slope that is twenty-five percent or greater.

(e)(c) New development projects that create 2,500 square feet or more of impervious surfaces (collectively over the entire project site), and are Environmentally sensitive areas (ESAs). This category includes any development located within, directly adjacent to, or discharging directly to an ESA, which either creates 2,500 square feet of impervious surface on a proposed project site or increases the area of imperviousness of a proposed project site to 10 percent or more of its naturally occurring condition. "Directly adjacent to" means situated within 200 feet of the ESA. "Discharging directly to" means outflow from a drainage conveyance system that collects runoff from the subject development or redevelopment site and terminates at or in receiving waters within the ESA and is not commingled with flows from adjacent or other upstream lands.

(f) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce that has 5,000 square feet or more of impervious surface.

(g) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface that is 5,000 square feet or more used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

(h) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

(i)(d) Large development projects. This category includes any post-construction pollutant-generating new development projects that result in the permanent disturbance of one acre or more of land.

(3) Priority Development Project Exemptions

Comment [A93]: See discussion in section 3.8.2 of the comment letter.

Each Copermittee has the discretion to exempt the following projects from being defined as Priority Development Projects:

(a) New paved sidewalks, driveways, parking lots, bicycle lanes, or trails that meet the following criteria:

(i) Designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas; OR

(ii) Designed and constructed to be hydraulically disconnected from paved streets or roads; OR

(iii) Designed and constructed with permeable pavements or surfaces in accordance with USEPA Green Streets guidance.[24]

(b) Any impervious surface that is 5,000 square feet or more used for the transportation of automobiles, trucks, motorcycles, and other vehicles that is designed and constructed to the Maximum Extent Practicable in accordance with the USEPA Green Streets Guidance "Managing Wet Weather with Green Infrastructure: Green Streets"[25]. ~~Retrofitting of existing paved alleys, streets or roads that meet the following criteria:~~

~~(i) Must be two lanes or less; AND~~

~~(ii) Must be a retrofitting project implemented as part of an alternative compliance project option under Provision E.3.c.(3)(b)(v) to achieve the performance requirements of Provisions E.3.c.(1) and/or E.3.c.(2) for a Priority Development Project; AND~~

~~(iii) Designed and constructed in accordance with the USEPA Green Streets guidance.[26]~~

(c) Single-family residential projects that meet the following criteria:

(i) Must not be constructed as part of a larger development or proposed subdivision;

(ii) Successfully incorporate and document that they have incorporated, each of the applicable Source Control and LID BMP strategies identified in provisions E.3.a.(2)-(3) to the MEP.

~~(c) New single family residences that meet the following criteria:~~

~~(i) Must not be constructed as part of a larger development or proposed subdivision; AND~~

~~(ii) Designed and constructed to be certified under the U.S. Green Building Council (USGCB) Leadership in Energy and Environmental Design (LEED) for Homes green building certification program, receiving at least four (4) Surface Water Management credits under the Sustainable Sites category[27] OR~~

~~Designed and constructed with structural BMPs that will achieve the~~

[24] USEPA. 2008. http://water.epa.gov/infrastructure/greeninfrastructure/upload/gi_munichandbook_green_streets.pdf and http://water.epa.gov/infrastructure/greeninfrastructure/gi_policy.cfm#municipalhandbook ~~See "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).~~

~~[26] Ibid.~~

~~[27] See LEED for Homes rating system at http://www.usgbc.org~~

~~performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite~~

~~(d) Redevelopment of existing single family residences that meet the following criteria:~~

~~(i) Designed and constructed to be certified under the USGCB LEED for Homes green building certification program, receiving at least four (4) Surface Water Management credits under the Sustainable Sites category;[28] OR~~

~~(ii) Designed and constructed with structural BMPs that will achieve the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite.~~

(d) Watershed Protection Projects that meet the following criteria:

(i) Projects undertaken to rehabilitate or prevent environmental, social, and economic damage to the watershed, including receiving waters, by providing one or more of the following:

- Water quality protection by the proper management of stormwater and floodplains
- Flood risk reduction to adjacent land uses, stored matter and stockpiled material
- Elimination of the comingling of stormwater and hazardous materials
- Erosion Mitigation
- Restoration of Rivers and Ecosystems
- Groundwater Recharge
- Creation of new open space and wetlands
- Programs for water conservation, stormwater capture and management
- Retrofit projects constructed to improve water quality or address hydromodification.

(ii) AND are not expected to be pollutant generating or are designed to reduce existing pollutant loads

(iii) AND incorporate and document that they have incorporated, each of the applicable Source Control and LID BMP strategies identified in provisions E.3.a.(2)-(3) to the MEP.

(e) Emergency public safety projects in any of the Priority Development Categories may be excluded if the delay caused due to the requirement for a SSMP compromises public safety, public health and/or environmental protection

[28] ~~See LEED for Homes rating system at http://www.usgbc.org~~

c. Priority Development Project Structural BMP Performance Requirements

In addition to the BMP requirements listed for all development projects under Provision E.3.a, Priority Development Projects must also implement structural BMPs that conform to performance requirements below. If watershed-specific performance requirements are ~~may be~~ developed as part of a Water Quality Improvement Plan; these requirements would take precedence over the general performance requirements below. The watershed-specific requirement must provide at least equal protection as the general performance requirements below.

(1) Storm Water Pollutant Control BMP Requirements

Comment [A94]: See discussion in section 3.8.2 of the comment letter.

Each Copermittee must require each Priority Development Project to implement onsite structural BMPs to control pollutants in storm water that may be discharged from a project as follows:

(a) Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite the pollutants contained in the design capture volume. The design capture volume is equivalent to:

(i) The volume of storm water runoff produced from a 24-hour 85th percentile storm event;[29] OR

(ii) The volume of storm water runoff produced from a 24-hour 85th percentile storm event, that would be retained onsite ~~if~~ in the pre-project condition. ~~site was fully undeveloped and naturally vegetated~~, ~~as determined using continuous simulation modeling techniques based on site-specific soil conditions and typical native vegetative cover.~~

(b) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of~~to~~ complying with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1)(a).

~~(c) If a Priority Development project is allowed to utilize alternative compliance pursuant to Provisions E.3.c.(1)(b), flow-thru conventional~~

[29] This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals. The volume is a single event-based volume that occurs after an extended dry period.

~~treatment control BMPs must be implemented to treat the portion of the design capture volume that is not retained onsite. Additionally, project applicants must mitigate for the portion of the pollutant load in the design capture volume that is not retained onsite through one or more alternative compliance options under Provision E.3.c.(3). Conventional treatment control BMPs must be sized and designed to:~~

~~(i) Remove pollutants from storm water to the MEP;~~

~~(ii) Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;~~

~~(iii) Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Conventional treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of conventional treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.~~

(2) Hydromodification Management BMP Requirements

Comment [A95]: See discussion in section 3.8.2 of the comment letter.

Each Copermittee must require each Priority Development Project disturbing greater than one acre to implement management measures~~onsite structural BMPs~~ to ensure ~~manage hydromodification~~ that ~~may be caused by~~ storm water runoff discharged from the~~a~~ project won't cause adverse Hydromodification impacts in the downstream receiving waters as follows:

The Copermittees in each Watershed Management Area may establish within the WQIP, watershed specific mitigation requirements that will apply to priority development projects, based on the susceptibility of the receiving waters to Hydromodification impacts caused by the project, and consistent with the priorities and strategies identified in the WQIP. Such requirements may be uniform across a Hydrologic Unit, or identified at an appropriate smaller scale to ensure that receiving waters are properly protected.

(a) Post-project runoff flow rates and durations must not exceed pre-project ~~development (naturally occurring)~~ runoff flow rates and durations by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat conditions downstream of Priority Development Projects~~)~~.

(i) In evaluating the range of flows that results in increased potential for

erosion of natural (non-hardened) channels, the lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks.

~~(ii) For artificially hardened channels, analysis to identify the lower boundary must use characteristics of a natural stream segment similar to that found in the watershed. The lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or erodes the toe of the channel banks.~~

~~(iii)~~(ii) The Copermittees may use monitoring results collected pursuant to Provision D.1.a.(2) to re-define the range of flows resulting in increased potential for erosion, or degraded instream habitat conditions, as warranted by the data.

(b) Priority Development Projects ~~Post-project runoff flow rates and durations~~ must implement appropriate measures to minimize the ~~compensate~~ for the loss of sediment supply delivered ~~due~~ to the Receiving Waters, consistent with WQIP priorities, ~~development project,~~ should loss of sediment supply be anticipated to occur as a result of the development project.

(c) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of~~to comply with~~ the performance requirements of Provisions E.3.c.(2)(a)-(b).

(d) Exemptions

Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provisions E.3.c.(2)(a)-(b) where the project:

(i) Discharges storm water runoff into existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;

(ii) Discharges of storm water into conveyance channels whose bed and bank are engineered and maintained for the 10-year ultimate development flow rate all the way from the point of discharge from the project to an water body that is sufficiently resistant to hydromodification (water storage reservoirs, lakes, enclosed embayments, pacific ocean, or other water bodies identified in the WQIP);

~~(ii)~~(iii) Is a redevelopment Priority Development Project that meets the alternative compliance requirements of Provision E.3.c.(3)(b)(ii); or

~~(iii)~~(iv) Discharges storm water runoff into other areas identified by the San Diego Water Board as exempt from the requirements of Provisions E.3.c.(2)(a)-(b), through an approved WQIP.

(3) Alternative Compliance to Onsite Structural BMP Performance Requirements

Comment [A96]: See discussion in section 3.8.2 of the comment letter.

(a) Applicability

At the discretion of each Copermittee, Priority Development Projects may be allowed to implement one or more of the alternative compliance project options described in E.3.c.(3)(b) below, in lieu of complying with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2), under the following conditions:

(i) The Copermittee must determine that implementation of the alternative compliance option will have an equal or greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite;

(ii) The alternative compliance options must be designed by a registered professional engineer, geologist, architect, biologist, hydrologist, landscape architect, or other appropriate certified professional;

(iii) The alternative compliance option must be consistent with the strategies developed within the WQIP, for the highest priority water quality conditions.

(iv) The alternative compliance options must be implemented within the same Watershed Management Area as the Priority Development Project, and preferably within the same hydrologic subarea;

(v) The alternative compliance options must have reliable sources of funding for operation and maintenance.

(b) Alternative Compliance Options

(i) *LID Biofiltration Treatment Control BMPs*

LID biofiltration treatment control BMPs may be used as an alternative compliance option if the BMPs are sized and designed to:

[a] Remove pollutants from storm water to the MEP; AND
[b] Have an appropriate surface loading rate to prevent erosion, scour and channeling; AND
[c] Biofilter at least 1.0 times the design capture volume that is not reliably retained onsite

(ii) *LEED Certified Redevelopment Projects*

Priority Development Projects that are designed and constructed to be certified under the USGCB LEED for New Construction and Major Renovations green building certification program, or other locally accepted certification of equivalent effectiveness, may be considered as an acceptable alternative compliance option if the project meets the following criteria:

[a] The project is designed to receive at least: One (1) Site Design credit, and Two (2) Stormwater Design credits under the Sustainable Sites category.[30] , and

[b] The existing and future configuration of the receiving water must not be unnaturally altered or adversely impacted by the project.

(iii) *Watershed-Based Planned Development Projects*

Priority Development Projects greater than 100 acres in total project size (or smaller than 100 acres in size yet part of a larger common plan of development that is over 100 acres) may be considered as an acceptable alternative compliance option if the project meets the following conditions:

[a] The Priority Development Project was planned utilizing watershed and/or subwatershed based water quality, hydrologic, and fluvial geomorphologic planning principles that implement regional LID BMPs in accordance with the performance and location criteria of this Order and acceptable to the San Diego Water Board;

[b] Regional LID BMPs may be used provided that the BMPs capture and retain the volume of runoff produced from the design capture volume defined in Provision E.3.c.(1)(a)(i) and that such controls are located upstream of receiving waters;

[c] Regional LID BMPs must clearly exhibit that they will not result in a net impact from pollutant loadings over and above the impact caused by capture and retention of the design capture volume;

[d] Any portion of the design capture volume that is not retained by the regional LID BMPs must be treated using biofiltration BMPs; and

[e] Where regional LID BMPs are demonstrated to the Copermittee as technically infeasible to retain the entire design capture volume, any volume up to and including the design capture volume not retained by regional LID BMPs, nor treated by biofiltration BMPs, must be treated using conventional treatment control BMPs and the project applicant must implement additional alternative compliance project, in-lieu fee and/or water quality

[30] See LEED for New Construction and Major Renovations rating system at http://www.usgbc.org

credit system options below.

(iv) *Offsite Projects*

Offsite Projects, such as but not limited to Regional BMPs; Retrofitting Projects; Channel, Stream or Habitat Rehabilitation Projects; Water Supply Augmentation Projects; or other Offsite Projects proposed by a project proponent, may be considered as an acceptable alternative compliance option if the offsite project meets the following requirements:

- The project must provide a net result of at least the same level of pollutant removal, and/or protection from potential downstream and upstream erosion in the receiving water as would be required to meet the performance requirements of Provision E.3.c.(1) and E.3.c.(2), as applicable.
- The project must be consistent with the strategies identified in the WQIP.
- The project must be constructed and operational prior to occupancy being granted for the PDP.

(v) *Conventional Treatment Control BMPs*

Onsite Conventional Treatment Control BMPs may be used as an alternative compliance option, only if the following criteria have been met:

[a] It has been demonstrated to the satisfaction of the Copermittee that it is technically infeasible to comply with the onsite requirements of E.3.c.(1), AND

[b] It has been demonstrated to the satisfaction of the Copermittee that it is technically infeasible to implement onsite Biofiltration Treatment Control BMPs, AND

[c] The Conventional Treatment Control BMPs will remove pollutants from storm water to the MEP; AND

[d] The Conventional Treatment Control BMPs will filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two; AND

[e] The Conventional Treatment Control BMPs are ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Conventional treatment control BMPs with a low removal

efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of conventional treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

~~(a) Applicability~~

~~At the discretion of each Copermittee, Priority Development Projects may be allowed to utilize an alternative option to comply with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) under the following conditions:~~

~~(i) The Copermittee must determine that implementation of the alternative compliance option will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite;~~

~~(ii) The alternative compliance options must be designed by a registered professional engineer, geologist, architector landscape architect;~~

~~(iii) The alternative compliance options must be implemented within the same hydrologichydrologic unit as the Priority Development Project, and preferably within the same hydrologic subarea;~~

~~(iv) Receiving waters must not be utilized to convey storm water runoff to the alternative compliance options;~~

~~(v) The pollutants in storm water runoff from the Priority Development Project must be treated to the MEP by the alternative compliance options prior to being discharged to receiving waters;~~

~~(vi) Unless otherwise allowed by Provision E.3.c.(3)(b), the alternative compliance options must have a net result of at least the same level of pollutant removal as would have been achieved if the Priority Development Project had fully complied with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1) onsite;~~

~~(vii) Unless otherwise allowed by Provision E.3.c.(3)(b), the alternative compliance options must have a net result of at least the same level of protection from potential downstream and upstream erosion in the receiving water as would have been achieved if the Priority Development Project had fully complied with the hydromodification management BMP performance requirements of Provision E.3.c.(2) onsite; and~~

~~(viii) The alternative compliance options utilized by the Priority Development Project must have reliable sources of funding for operation and maintenance.~~

~~(b) Alternative Compliance Project Options~~

~~The Copermittee may allow implementation of one or more of the following project options as part of an alternative approach to complying with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2):~~

~~(i) *Onsite LID Biofiltration Treatment Control BMPs*~~

~~The Copermittee may allow Priority Development Projects to utilize onsite LID biofiltration treatment control BMPs to comply with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1). Onsite LID biofiltration treatment control BMPs must be sized and designed to:~~

~~[a] Remove pollutants from storm water to the MEP; AND~~
~~[b] Have an appropriate surface loading rate to prevent erosion, scour and channeling within the BMP; AND~~
~~[c] Biofilter at least 1.5 times the design capture volume that is not reliably retained onsite; OR~~
~~[d] Biofilter up to the design capture volume that is not reliably retained onsite, AND 1) treat the remaining portion of the design capture volume not retained onsite with conventional treatment control BMPs in accordance with Provision E.3.c.(1)(c), and 2) if necessary, mitigate for the portion of the pollutant load in the design capture volume not retained onsite through one or more alternative compliance project, in-lieu fee and/or water quality credit system options below.~~

~~(ii) *LEED Certified Redevelopment Projects*~~

~~The Copermittee may allow redevelopment Priority Development Projects to comply with designed and constructed to be certified under the USGCB LEED for New Construction and Major Renovations green building certification program. The Priority Development Project must receive at least one (1) Site Design credit and two (2) Stormwater Design credits under the Sustainable Sites category.[31] In addition, the existing and future configuration of the receiving water must not be unnaturally altered or adversely impacted by storm water flow rates and durations discharged from the site.~~

~~(iii) *Watershed Based Planned Development Projects*~~

~~The Copermittee may allow Priority Development Projects greater than 100 acres in total project size (or smaller than 100 acres in size~~

~~[31] See LEED for New Construction and Major Renovations rating system at http://www.usgbc.org~~

~~yet part of a larger common plan of development that is over 100 acres) to comply with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2). The Priority Development Project must comply with the following conditions:~~

~~[a] The Priority Development Project was planned utilizing watershed and/or subwatershed based water quality, hydrologic, and fluvial geomorphologic planning principles that implement regional LID BMPs in accordance with the performance and location criteria of this Order and acceptable to the San Diego Water Board;~~

~~[b] Regional LID BMPs may be used provided that the BMPs capture and retain the volume of runoff produced from the design capture volume defined in Provision E.3.c.(1)(a)(i) and that such controls are located upstream of receiving waters;~~

~~[c] Regional LID BMPs must clearly exhibit that they will not result in a net impact from pollutant loadings over and above the impact caused by capture and retention of the design capture volume;~~

~~[d] Any portion of the design capture volume that is not retained by the regional LID BMPs must be treated using biofiltration BMPs; and~~

~~[e] Where regional LID BMPs are demonstrated to the Copermittee as technically infeasible to retain the entire design capture volume, any volume up to and including the design capture volume not retained by regional LID BMPs, nor treated by biofiltration BMPs, must be treated using conventional treatment control BMPs and the project applicant must implement additional alternative compliance project, in-lieu fee and/or water quality credit system options below.~~

~~(iv) *Offsite Regional BMPs*~~

~~[a] The Copermittee may allow Priority Development Projects to utilize offsite regional BMPs to comply with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1) if the offsite regional BMPs have the capacity to receive and retain at least 1.1 times the design capture volume that is not reliably retained onsite.~~

~~[b] The Copermittee may allow Priority Development Projects to utilize offsite regional BMPs to comply with the hydromodification management BMP performance requirements of Provision E.3.c.(2) if the offsite regional BMPs have the capacity to manage the storm water flows rates and durations from the site such that the receiving waters are protected from the potential for increased erosion that would be caused if the unmanaged portion of the runoff was discharged from the site.~~

~~(v) *Offsite Retrofitting Projects*~~

~~The Copermittee may allow Priority Development Projects to utilize offsite retrofitting projects to comply with the storm water pollutant control and hydromodification management BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) if the retrofitting projects have been identified within the strategies included in the Water Quality Improvement Plan, or identified as potential retrofitting projects by the Copermittee pursuant to Provision E.5.~~

~~(vi) *Offsite Channel, Stream, or Habitat Rehabilitation Projects*~~

~~The Copermittee may allow Priority Development Projects to utilize offsite channel, stream, or habitat rehabilitation projects to comply with the hydromodification management BMP performance requirements of Provision E.3.c.(2) if the rehabilitation projects have been identified within the strategies included in the Water Quality Improvement Plan, or identified as potential channel rehabilitation projects by the Copermittee pursuant to Provision E.5. The channel, stream, or habitat rehabilitation project cannot be utilized for pollutant treatmentexcept where artificial wetlands areand located upstream of receiving waters.~~

~~(vii) *Offsite Regional Water Supply Augmentation Projects*~~

~~The Copermittee may allow Priority Development Projects to utilize offsite regional water supply augmentation projects (i.e. groundwater recharge, recycled water, storm water harvesting) to comply with the storm water pollutant control and hydromodification management BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) if the projects have been identified within the strategies included in the Water Quality Improvement Plan.~~

~~(viii) *Project Applicant Proposed Alternative Compliance Projects*~~

~~The Copermittee may allow one or more Priority Development Project applicant(s) to propose and implement alternative compliance projects to comply with the storm water pollutant control and hydromodification management BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) if the alternative compliance projects are consistent with, and will address the highest water quality priorities of the Water Quality Improvement Plan, and comply with the requirements of Provision E.3.c.(3)(a).~~

(c) Alternative Compliance In-Lieu Fee Option

The Copermittee may develop and implement an alternative compliance in-lieu fee option, individually or with other Copermittees and/or entities, as a means for designing, developing, constructing, operating and/or maintaining offsite alternative compliance projects under Provision E.3.c.(3)(b). Priority Development Projects allowed to utilize the

alternative compliance in-lieu fee option must comply with the following conditions:

(i) The in-lieu fee must be collected and held in accordance with the Mitigation Fee Act and all other applicable development fee laws. ~~transferred to the Copermittee (for public projects) or an escrow account (for private projects) prior to the date construction of the Priority Development Project is initiated~~.

Comment [A97]: Please see Legal Comments.

(ii) If the in-lieu fee is applied to the development, design, ~~and~~ construction, operation and maintenance of offsite alternative compliance projects, the following conditions must be met:

[a] The offsite alternative compliance projects must meet ~~allow~~ the criteria identified within E.3.c.(3)(b)-, for each Priority Development Project relying on~~to comply with~~ the alternative compliance project;~~onsite BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2);~~

[b] The offsite alternative compliance projects must be constructed as soon as possible, but no later than 4 years after the certificate of occupancy is granted for the first Priority Development Project that contributed funds toward the construction of the offsite alternative compliance projects, unless a longer period of time is provided for in an approved WQIP~~authorized by the San Diego Water Board Executive Officer~~;

~~[c] The in-lieu fee for the Priority Development Project must include mitigation of the pollutant loads and increased storm water flow rates and durations that are allowed to discharge from the site before the offsite alternative compliance projects are constructed; and~~

[d] The in-lieu fee must also include the cost to operate and maintain the offsite alternative compliance projects for the anticipated life of the constructed priority development project.

(iii) If the in-lieu fee applies only~~is applied~~ to the operation and maintenance of offsite alternative compliance projects that have already been constructed, the offsite alternative compliance projects must meet~~allow~~ the requirements of E.3.c.(3)(a)(iv) and (v) as applicable, for each Priority Development Project relying on~~to comply with~~ the alternative compliance project..~~onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2).~~

(d) Alternative Compliance Water Quality Credit System Option

The Copermittee may develop and implement an alternative compliance water quality credit system option, individually or with other Copermittees

and/or entities, provided that such a credit system clearly exhibits that it will not allow discharges from Priority Development Projects to cause or contribute to a net impact over and above the impact caused by projects meeting the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2). Any credit system that a Copermittee chooses to implement must be submitted to the San Diego Water Board Executive Officer for review and acceptance as part of the Water Quality Improvement Plan.

(4) Long-Term Structural BMP Maintenance

Each Copermittee must require the project applicant to submit proof of the mechanism under which ongoing long-term maintenance of all structural BMPs will be conducted.

(5) Infiltration and Groundwater Protection

(a) Structural BMPs designed to primarily function as large, centralized infiltration devices (such as large infiltration trenches and infiltration basins) must not cause or contribute to an exceedance of an applicable groundwater quality objective. At a minimum, such infiltration BMPs must be in conformance with the design criteria listed below, unless the development project applicant demonstrates to the Copermittee that one or more of the specific design criteria listed below are not necessary to protect groundwater quality. The design criteria listed below do not apply to small infiltration systems dispersed throughout a development project.

(i) Runoff must undergo pretreatment such as sedimentation or filtration prior to infiltration;

(ii) Pollution prevention and source control BMPs must be implemented at a level appropriate to protect groundwater quality at sites where infiltration BMPs are to be used;

(iii) Infiltration BMPs must be adequately maintained to remove pollutants in storm water to the MEP;

(iv) The vertical distance from the base of any infiltration BMP to the seasonal high groundwater mark must be at least 10 feet. Where groundwater basins do not support beneficial uses, this vertical distance criteria may be reduced, provided groundwater quality is maintained;

(v) The soil through which infiltration is to occur must have physical and chemical characteristics (e.g., appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses;

(vi) Infiltration BMPs must not be used for areas of industrial or light

industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee, unless first treated or filtered to remove pollutants prior to infiltration; and

(vii) Infiltration BMPs must be located a minimum of 100 feet horizontally from any water supply wells.

(b) The Copermittee may develop, individually or with other Copermittees, alternative mandatory design criteria to that listed above for infiltration BMPs which are designed to primarily function as centralized infiltration devices. Before implementing the alternative design criteria in the development planning process the Copermitee(s) must:

(i) Notify the San Diego Water Board of the intent to implement the alternative design criteria submitted; and

(ii) Comply with any conditions set by the San Diego Water Board.

d. BMP DESIGN MANUAL UPDATE

Each Copermittee must update and implement its BMP Design Manual[32] pursuant to Provision F.2.b. ~~Until the Copermittee has updated its BMP Design Manual with the requirements of Provisions E.3.a-c, the Copermittee must continue implementing its current BMP Design Manual. Unless directed otherwise by the San Diego Water Board, the Copermittee must implement the BMP Design Manual within 180 days of completing the update.~~ The update of the BMP Design Manual must include the following:

Comment [A98]: This info was incorporated into F.2.b.

(1) Updated procedures to determine the nature and extent of storm water requirements applicable to a potential development or redevelopment projects. These procedures must inform project applicants of the storm water management requirements applicable to their project including, but not limited to, general requirements for all development projects, structural BMP design procedures and requirements, hydromodification management requirements, requirements specific to phased projects, and procedures specific to private developments and public improvement projects;

(2) Updated procedures to identify ~~pollutants and conditions of concern for selecting~~ the most appropriate structural BMPs that consider, at a minimum, the following:

(a) The requirements of E.3.c.(1) and (2)

~~(a)~~(b) Receiving water quality (including pollutants for which receiving waters are listed as impaired under the CWA section 303(d) List);

[32] The BMP Design Manual was formerly known as the Standard Storm Water Mitigation Plan under Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016.

~~(b)~~(c) Pollutants, stressors, and/or receiving water conditions that cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

~~(c)~~(d) Land use type of the project and pollutants associated with that land use type; and

~~(d)~~(e) Pollutants expected to be present onsite.

(3) Updated procedures for designing structural BMPs, including any updated performance requirements to be consistent with the requirements of Provision E.3.c for all structural BMPs listed in the BMP Design Manual;

(4) Long-term maintenance criteria for each structural BMP listed in the BMP Design Manual; and

(5) Alternative compliance criteria, in accordance with the requirements under Provision E.3.c.(3), if the Copermittee elects to allow Priority Development Projects within its jurisdiction to utilize alternative compliance.

e. PRIORITY DEVELOPMENT PROJECT BMP IMPLEMENTATION AND OVERSIGHT

Each Copermittee must implement a program that requires and confirms structural BMPs on all Priority Development Projects are designed, constructed, and maintained to remove pollutants in storm water to the MEP.

(1) Structural BMP Approval and Verification Process

(a) Each Copermittee must require and confirm that for all Priority Development Project applications that have not received prior lawful approval by the Copermittee by 18 months after the commencement of coverage under this Order, the requirements of Provision E.3 are implemented. For project applications that have received prior lawful approval by 18 months after the commencement of coverage under this Order, the Copermittee may allow previous land development requirements to apply.

(b) Each Copermittee must identify the roles and responsibilities of their various municipal departments in implementing the structural BMP requirements, including each stage of a project from application review and approval through BMP maintenance and inspections.

(c) Each Copermittee must require and confirm that appropriate easements and ownerships are properly recorded in public records and the information is conveyed to all appropriate parties when there is a change in project or site ownership.

(d) Each Copermittee must require and confirm that prior to occupancy and/or intended use of any portion of the Priority Development Project, each structural BMP is inspected to verify that it has been constructed and is operating in compliance with all of its specifications, plans, permits, ordinances, and the requirements of this Order.

(2) Priority Development Project Inventory and Prioritization

(a) Each Copermittee must develop, maintain, and update ~~at~~regularly~~at least annually~~, a watershed-based database to track and inventory all constructed Priority Development Projects and associated structural BMPs within its jurisdiction. Inventories must be accurate and complete beginning from January 2002 for the San Diego County Copermittees, February 2003 for the Orange County Copermittees, and July 2005 for the Riverside County Copermittees~~.~~, where data is available.~~.~~ The use of an automated database system, such as GIS, is highly recommended. The database must include, at a minimum, the following information:

(i) Priority Development Project location (address and hydrologic subarea);

(ii) Descriptions of structural BMP type(s);

(iii) Date(s) of construction;

(iv) Party responsible for structural BMP maintenance;

(v) Dates and findings of structural BMP maintenance verifications; and

(vi) Corrective actions and/or resolutions when applicable.

(b) Each Copermittee must prioritize the Priority Development Projects with structural BMPs within its jurisdiction. The designation of Priority Development Projects as high priority must consider the following:

(i) The highest water quality priorities identified in the Water Quality Improvement Plan;

(ii) Receiving water quality;

(iii) Number and sizes of structural BMPs;

(iv) Recommended maintenance frequency of structural BMPs;

(v) Likelihood of operation and maintenance issues of structural BMPs;

(vi) Land use and expected pollutants generated; and

(vii) Compliance record.

(3) Structural BMP Maintenance Verifications and Inspections

Each Copermittee is required to verify that structural BMPs on each Priority

Development Project are adequately maintained, and continue to operate effectively to remove pollutants in storm water to the MEP through inspections, self-certifications, surveys, or other equally effective approaches.

(a) All (100 percent) of the structural BMPs at Priority Development Projects that are designated as high priority must be inspected directly by the Copermittee annually prior to each rainy season;

(b) For verifications performed through a means other than direct Copermittee inspection, adequate documentation must be required by the Copermittee to provide assurance that the required maintenance of structural BMPs at each Priority Development Project has been completed; and

(c) Appropriate follow-up measures (including re-inspections, enforcement, etc.) must be conducted to ensure that structural BMPs at each Priority Development Project continue to reduce pollutants in storm water to the MEP as originally designed.

f. DEVELOPMENT PROJECT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all development projects, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

g. ~~STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS~~

Comment [A99]: This section was moved to the beginning of provision E.3.

~~Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the development planning program to address development and redevelopment projects that may become sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:~~

~~(5) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, increase frequency of verifications and/or inspections, alternative compliance options);~~

~~(6) Each Copermittee must identify areas within its jurisdiction where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting and/or stream, channel, or habitat rehabilitation projects;~~

~~(7) Each Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify regional alternative compliance projects that Priority Development Projects may be allowed or should be encouraged to implement or participate in implementing; and~~

~~(8) The strategies and/or activities must be consistent with the requirements of Provisions E.3.a-c and E.3.e-f and the strategies identified in the Water Quality Improvement Plan.~~

4. Construction Management

Each Copermittee must implement a construction management program in accordance with the strategies identified in the Water Quality Improvement Plan and includes, at a minimum, the following requirements:

STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Comment [A100]: This section was moved from provision E.4.f, Changes are shown in Redline

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the construction management program to address construction sites that the Copermittee has identified as potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, and/or increase/decrease frequency of inspections for specific types of sites and/or activities); and

(2) The strategies and/or activities must be consistent with the requirements of Provisions E.4.c-e and the strategies identified in the Water Quality Improvement Plan.

(3) The requirements of the programs as outlined in the following sub-provisions may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality improvement Plan(s).

a. PROJECT APPROVAL PROCESS

Prior to issuance of any local permit(s) that allows the commencement of construction projects that involve ground disturbance or soil disturbing activities that has the reasonable potential to discharge a pollutant load to and from the MS4, as defined in each Copermittees' JRMP~~can potentially generate pollutants in storm water runoff~~, each Copermittee must:

(1) Require a ~~site-specific~~ Pollution Control Plan~~pollution control~~, construction BMP, and/or erosion and sediment control plan, to be submitted by the project applicant to the Copermittee;

(2) Confirm the Pollution Control Plan~~pollution control~~, construction BMP, and/or erosion and sediment control plan, complies with the local grading ordinance, other applicable local ordinances, and the requirements of this Order;

(3) Confirm the Pollution Control Plan~~pollution control~~, construction BMP, and/or erosion and sediment control plan, includes seasonally appropriate and effective BMPs and management measures described in Provision E.4.c, as applicable to the project; and

(4) Verify that the project applicant has obtained coverage under ~~applicable permits, including, but not limited to~~ the Construction General Permit~~, Clean Water Act Section 401 Water Quality Certification and Section 404 Permit, and California Department of Fish and Game Streambed Alteration Agreement~~.

b. CONSTRUCTION SITE INVENTORY AND TRACKING

(1) Each Copermittee must maintain, and update ~~at least monthly~~regularly, a watershed-based inventory of all construction projects issued a local permit that allows ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff. The use of an automated database system, such as GIS, is highly recommended. The inventory must include:

(a) Relevant contact information for each site (e.g., name, address, phone, and email for the owner and contractor);

(b) The basic site information including location (address and hydrologic subarea), Waste Discharge Identification (WDID) number (if applicable), size of the site, and approximate area of disturbance;

(c) Whether or not the site is considered a high threat to water quality, as defined in Provision E.4.b.(2) below;

(d) The project start and ~~anticipated~~ completion dates;

~~(e) Current construction phase;~~

~~(f)~~(e) The required inspection frequency, as defined in the Copermittee's jurisdictional runoff management program document;

~~(g)~~(f) The date the Copermittee accepted and/or approved the ~~site-specific~~ pollution control plan, construction BMP, and/or erosion and sediment control plan; and

~~(h)~~(g) Whether or not there are ongoing enforcement actions administered to the site.

Comment [A101]: Some of the info can only be updated based on an inspection, which may or may not be monthly year round for all sites.

Comment [A102]: The anticipated completion date is often unknown and can fluctuate based on unpredictable and unforeseen circumstances. Keeping track of accurate dates in an inventory would be difficult and would not add significant value to the database. Construction Inspectors keep a close eye on the progress of projects and would not need to rely on inventory data to achieve effective stormwater management and oversight. Once a project is completed, the date can be entered into the database,.

(2) Each Copermittee must identify all construction sites within its jurisdiction that represent a high threat to downstream surface water quality. The designation of construction sites as high threat to water quality must consider the following:

(a) Sites located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Sites located within the same hydrologic subarea and tributary to a water body segment listed as impaired for sediment on the CWA section 303(d) List;

(c) Sites located within, directly adjacent to, or discharging directly to a receiving water within an ESA; and

(d) Other sites determined by the Copermittees or the San Diego Water Board as a high threat to water quality.

c. CONSTRUCTION SITE BMP IMPLEMENTATION

Comment [A103]: See discussion in section 3.9.1 of the comment letter.

Each Copermittee must implement, or require the implementation of effective BMPs (for Copermittee construction sites and private construction sites, respectively) to reduce discharges of pollutants in ~~storm water~~ runoff from construction sites to the MEP, and effectively prohibit~~prevent~~ non-storm water discharges from construction sites into the MS4. These BMPs must be site specific, seasonally appropriate, and construction phase appropriate. BMPs must be implemented at each construction site year round. Dry season BMP implementation must plan for and address unseasonal rain events that may occur during the dry season (May 1 through September 30). Copermittees must implement, or require the implementation of, BMPs in the following categories:

(1) Project Planning;

(2) Good Site Management “Housekeeping”, including waste management;

(3) Non-storm Water Management;

(4) Erosion Control;

(5) Sediment Control;

(6) Run-on and Run-off Control; and

(7) Active/Passive Sediment Treatment Systems, where applicable.

d. CONSTRUCTION SITE INSPECTIONS

Each Copermittee must conduct construction site inspections to require and confirm compliance with its local permits and applicable local ordinances, and the requirements of this Order. Priority for site inspections must consider threat to water quality pursuant to Provision E.4.b as well as the nature of the construction activity, topography, and the characteristics of soils and receiving water quality.

(1) Inspection Frequency

(a) Each Copermittee must conduct inspections at all inventoried sites, including high threat to water quality sites, at an appropriate frequency for each phase of construction to confirm~~ensure~~ the site reduces the discharge of pollutants in runoff~~storm water~~ from construction sites to the MEP, and effectively prevents non-storm water discharges from entering the MS4.

(b) Each Copermittee must establish appropriate inspection frequencies for high threat to water quality sites, and all other sites, for each phase of construction. Inspection frequencies appropriate for addressing the highest water quality priorities identified in the Water Quality Improvement Plan, and for complying with the requirements of this Order must be identified in each Copermittee's jurisdictional runoff management program document.

(c) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e., re-inspection, enforcement) necessary to require and confirm site compliance with its local permits and applicable local ordinances, and the requirements of this Order.

(2) Inspection Content

Inspections of construction sites by the Copermittee must include, at a minimum:

(a) Verification of coverage under the Construction General Permit (Notice of Intent (NOI) and/or WDID number) during initial inspections, when applicable;

(b) Assessment of compliance with its local permits and applicable local ordinances related to pollution prevention, including the implementation and maintenance of applicable BMPs;

(c) Assessment of BMP adequacy and effectiveness;

(d) Visual observations of actual non-storm water discharges;

(e) Visual observations of actual or potential discharge of sediment and/or construction related materials from the site;

(f) Visual observations of actual or potential illicit connections; and

(g) If any violations are found and BMP corrections are needed, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried construction sites. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Site name, location (address and hydrologic subarea), and WDID number (if applicable);

(b) Inspection date;

(c) Weather condition during~~Approximate amount of rainfall since last~~ inspection;

(d) Description of problems observed with BMPs and indication of need for BMP addition/repair/replacement and any scheduled re-inspection, and date of re-inspection;

(e) Descriptions of any other specific inspection comments which must, at a minimum, include rationales for longer compliance time;

(f) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(g) Resolution of problems noted and date problems fixed.

e. CONSTRUCTION SITE ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried construction sites, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

5. Existing Development Management

Comment [A104]: See discussion in section 3.10 of the comment letter.

Each Copermittee must implement an existing development management program in accordance with the strategies identified in the Water Quality Improvement Plan. and includes, at a minimum, the following requirements:

STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Comment [A105]: Moved from sub-provision e. Changes shown in redline

Each Copermittee must implement the water quality improvement strategies, where necessary, to address areas of existing development within its jurisdiction that are identified as sources of pollutants and/or stressors contributing to the highest priority water quality conditions in the Watershed Management Area. For the existing development management program, the following strategies must be implemented:

(1) Specific Existing Development Management Program Strategies

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented within its jurisdiction to address areas of existing development that the Copermittee has identified as sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(a) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, and/or increase/decrease frequency of inspections for specific types of facilities, areas and/or activities);

(b) The facilities and/or areas within the Copermittee's jurisdiction where the strategies and/or activities will be implemented; and

(2) The requirements of the programs as outlined in the following sub-provisions may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality improvement Plan(s).~~The strategies and/or activities must be consistent with the requirements of Provisions E.5.b-d and the strategies identified in the Water Quality Improvement Plan.~~

a. EXISTING DEVELOPMENT INVENTORY AND TRACKING

Each Copermittee must maintain, and update at least annually, a watershed-based inventory of the existing development within its jurisdiction that ~~may~~has the reasonable potential to~~may~~ discharge a high priority pollutant load to and from the MS4, as defined in the Copermittee's JRMP. The use of an automated database system, such as GIS, is highly recommended. The inventory must, at a minimum, evaluate and include the following if identified as a source of a high priority pollutant~~include~~:

(1) Name, location (hydrological subarea and address, if applicable) of the following types of existing development with its jurisdiction:

(a) Commercial facilities or areas;

(b) Industrial facilities;

(c) Copermittee owned Municipal facilities, including:

(i) MS4 and related structures,[33]

(ii) Roads, streets, and highways,

(iii) Parking facilities,

(iv) Municipal airfields,

(v) Parks and recreation facilities,

(vi) Flood management projects and flood control devices and structures,

(vii) Operating or closed municipal landfills,

(viii) Publicly owned treatment works (including water and wastewater treatment plants) and sanitary sewer collection systems,

(ix) Corporate yards, including maintenance and storage yards for materials, waste, equipment, and vehicles,

(x) Hazardous waste collection facilities,

(xi) Other treatment, storage or disposal facilities for municipal waste, and

(xii) Other Copermittee owned municipal facilities that the Copermittee determines may contribute a significant high priority pollutant load to the MS4; and

(d) Residential areas, which may be designated by one or more of the following:

(i) Residential management area,

(ii) Drainage basin or area,

(iii) Land use (e.g., single family, multi-family, rural),

(iv) Neighborhood,

[33] The inventory may refer to the MS4 map required to be maintained pursuant to Provision E.2.b.(1).

(v) Common Interest Area,

(vi) Home Owner Association,

(vii) Mobile home park, and/or

(viii) Other designations accepted by the San Diego Water Board Executive Officer.

(2) A description of the facility or area, including the following information:

(a) Classification as commercial, industrial, municipal, or residential;

(b) Status of facility or area as active or inactive;

(c) Identification if a business is a mobile business;

(d) SIC Code or NAICS Code, if applicable;

(e) Industrial General Permit NOI and/or WDID number, if applicable;

(f) Identification if a residential area is or includes a Common Interest Area / Home Owner Association, or mobile home park;

(g) Identification of pollutants generated and potentially generated by the facility or area;

(h) Whether the facility or area is adjacent to an ESA;

(i) Whether the facility or area is tributary to and within the same hydrologic subarea as a water body segment listed as impaired on the CWA section 303(d) List and generates pollutants for which the water body segment is impaired; and

(j) Whether the facility or area contributes or potentially contributes to the highest priority water quality conditions identified in the Water Quality Improvement Plan.

(3) An annually updated map showing the location of inventoried existing development, watershed boundaries, and water bodies.

b. EXISTING DEVELOPMENT BMP IMPLEMENTATION AND MAINTENANCE

Each Copermittee must designate a minimum set of BMPs required for all inventoried existing development, including special event venues. The designated minimum BMPs must be specific to facility or area types and pollutant generating activities, as appropriate.

(1) Commercial, Industrial, and Municipal Facilities and Areas

(a) Pollution Prevention

Each Copermittee must require the use of appropriate pollution prevention methods by the commercial, industrial, and municipal facilities and areas in its inventoried existing development, as determined necessary by the Copermittee to address the priorities and strategies addressed in the WQIP.

(b) BMP Implementation

Comment [A106]: See discussion in section 3.10.2 of the comment letter.

Each Copermittee must ~~implement, or~~ require the implementation of, designated BMPs at commercial facilities and areas, industrial facilities, and implement designated BMPs at municipal facilities in its inventoried existing development, as determined necessary by the Copermittee to address the priorities and strategies addressed in the WQIP.

(c) BMP Operation and Maintenance

(i) Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development.

(ii) Each Copermittee must implement a schedule of operation and maintenance activities for its MS4 and related structures (including but not limited to catch basins, storm drain inlets, detention basins, etc.), and verify proper operation of all its municipal structural treatment controls designed to reduce pollutants (including floatables) in storm water discharges to or from its MS4s and related drainage structures. Operation and maintenance activities may include, but is not limited to, the following:

[a] Inspections of the MS4 and related structures;
[b] Cleaning of the MS4 and related structures; and
[c] Proper disposal of materials removed from cleaning of the MS4 and related structures.

(iii) Each Copermittee must implement a schedule of operation and maintenance for public streets, unpaved roads, paved roads, and paved highways and freeways within its jurisdiction to minimize pollutants that can be discharged in storm water.

(iv) Each Copermittee must implement the following controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers:

[a]~~.~~ Copermittees that operate both a municipal sanitary sewer system and a MS4 must implement controls and measures to

prevent and eliminate seeping sewage from infiltrating the MS4.

[b]- Copermittees that do not operate both a municipal sanitary sewer system and a MS4 must coordinate with sewering agencies to keep themselves informed of relevant and appropriate maintenance activities and sanitary sewage projects in their jurisdiction that may cause or contribute to seepage of sewage into the MS4.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Comment [A107]: See discussion in section 3.10.2 of the comment letter.

Each Copermittee must implement BMPs, or require the implementation of BMPs, to reduce pollutants in runoffstorm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from commercial facilities and areas, industrial facilities;, and implement such BMPs at municipal facilities in its inventoried existing development. Such BMPs must include, as appropriate, educational activities, permits, certifications and other measures for applicators and distributors.

(2) Residential Areas

(a) Pollution Prevention

Each Copermittee must promote and encourage the use of pollution prevention methods, where appropriate, by the residential areas in its inventoried existing development.

(b) BMP Implementation

Each Copermittee must promote and encourage the implementation of designated BMPs at residential areas in its inventoried existing development.

(c) BMP Operation and Maintenance

Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at residential areas in its inventoried existing development.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must promote and encourage the implementation of BMPs to reduce pollutants in runoffstorm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from residential areas in its inventoried existing development.

c. Existing Development Inspections

Each Copermittee must conduct inspections of inventoried existing development that have been identified by the Copermittee as having the reasonable potential to discharge pollutant loads from their MS4, to ensure compliance with applicable local ordinances and permits, and the requirements of this Order.

(1) Inspection Frequency

(a) Each Copermittee must establish appropriate inspection frequencies for inventoried existing development in accordance with the following requirements:

(i) At a minimum, inventoried existing development must be inspected once every five years utilizing one or more of the following methods:

[a] Drive-by inspections by Copermittee municipal and contract staff,
[b] Onsite inspections by Copermittee municipal and contract staff, and/or
[c] Inspections by volunteer monitoring or patrol programs trained by the Copermittee;

(ii) The frequency of inspections must be appropriate to confirm that BMPs are being implemented to reduce the discharge of pollutants in runoff~~storm water~~ from the MS4 to the MEP and effectively prohibit non-storm water discharges to the MS4;

(iii) The frequency of inspections must be based on the potential for a facility or area to discharge non-storm water and pollutants in storm water, and should reflect the priorities set forth in the Water Quality Improvement Plan;

~~(iv) Each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development;[34] and~~

~~(v)~~(iv) Inventoried existing development must be inspected by the Copermittee, as needed, in response to valid public complaints and findings from the Copermittee's municipal and contract staff or volunteer monitoring or patrol program inspections.

(b) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e. education and outreach, re-inspection, enforcement) necessary to require and confirm compliance with its applicable local

Comment [A108]: Recommend keeping this instead of SD proposed 'during the permit term'. The 'during the permit term' language is problematic for businesses that are added to the inventory during the permit term. For example, if a business is added to the inventory one month before the expiration of the permit, it may not be reasonable to expect it to be immediately inspected. It is also problematic for Riverside (and OC?), who may be added to the permit less than two years before the end of the permit term.

Comment [A109]: See discussion in section 3.10.2 of the comment letter.

~~[34] If any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspection may count toward the total annual inspection requirement. This requirement excludes linear municipal facilities (i.e., MS4, streets, roads and highways).~~

ordinances and permits and the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

(2) Inspection Content

(a) Inspections of existing development by the Copermittee or volunteer monitoring or patrol programs must include, at a minimum:

(i) Visual inspections for actual non-storm water discharges, if present;

(ii) Visual inspections for actual or potential discharge of pollutants, if present;

(iii) Visual inspections for actual or potential illicit connections, if present; and

(iv) Verification that the description of the facility or area in the inventory, required pursuant to Provision E.5.a.(2), has not changed.

(b) Onsite inspections of existing development by the Copermittee must include, at a minimum:

(i) Assessment of compliance with its applicable local ordinances and permits related to non-storm water and storm water discharges and runoff;

(ii) Assessment of the implementation of the designated BMPs;

(iii) Verification of coverage under the Industrial General Permit, when applicable; and

(iv) If any problems or violations are found, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried existing development. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Name and location of facility or area (address and hydrologic subarea) consistent with the inventory name and location, pursuant to Provision E.5.a.(1);

(b) Inspection and re-inspection date(s);

(c) Inspection method(s) (i.e. drive-by, onsite);

(d) Observations and findings from the inspection(s);

(e) For onsite inspections of existing development by Copermittee municipal or contract staff, the records must also include, as applicable:

(i) Description of any problems or violations found during the inspection(s),

(ii) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6, and

(iii) The date problems or violations were resolved.

d. EXISTING DEVELOPMENT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried existing development, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

e. RETROFITTING AND REHABILITATION~~STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS~~

~~Each Copermittee must implement the water quality improvement strategies, where necessary, to address areas of existing development within its jurisdiction that are identified as sources of pollutants and/or stressors contributing to the highest priority water quality conditions in the Watershed Management Area. For the existing development management program, the following strategies must be implemented:~~

~~(3) Specific Existing Development Management Program Strategies~~

~~Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented within its jurisdiction to address areas of existing development that the Copermittee has identified as sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:~~

~~(a) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, and/or increase/decrease frequency of inspections for specific types of facilities, areas and/or activities);~~

~~(b) The facilities and/or areas within the Copermittee's jurisdiction where the strategies and/or activities will be implemented; and~~

~~(c)~~(a) ~~The strategies and/or activities must be consistent with the requirements of Provisions E.5.b-d and the strategies identified in the Water Quality Improvement Plan.~~

~~(4)~~(3) Retrofitting Areas of Existing Development

Where identified in the WQIP as a required strategy to address the highest priority water quality conditions, each~~Each~~ Copermittee must describe in its jurisdictional runoff management program document, a program to retrofit areas of existing development within its jurisdiction to address identified sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must, where necessary pursuant to the strategies identified in the WQIP, identify areas of existing development as candidates for retrofitting, focusing on areas where retrofitting will address pollutants and/or stressors that contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for retrofitting projects may be utilized to reduce pollutants that may be discharged in storm water from areas of existing development, and/or address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of retrofitting projects, where needed in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting projects; and

(e) Where retrofitting projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional retrofitting projects (i.e. projects that can receive and/or treat storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment) adjacent to and/or downstream of the areas of existing development.

~~(5)~~(4) Stream, Channel and/or Habitat Rehabilitation in Areas of Existing Development

Where identified in the WQIP as a required strategy to address the highest priority water quality conditions, each~~Each~~ Copermittee must describe in its jurisdictional runoff management program document, a program to rehabilitate streams, channels, and/or habitats in areas of existing development within its jurisdiction to address the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must, where necessary pursuant to the strategies identified in the WQIP, identify streams, channels, and/or habitats in areas of existing development as candidates for rehabilitation, focusing on areas where stream, channel, and/or habitat rehabilitation projects will address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for stream, channel, and/or habitat rehabilitation projects may be utilized to address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters, rehabilitate channelized or hydromodified streams, restore wetland and riparian habitat, restore watershed functions, and/or ~~restore~~ protect beneficial uses of receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of stream, channel, and/or habitat rehabilitation projects, where needed, in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance stream, channel, and/or habitat rehabilitation projects; and

(e) Where stream, channel, and/or habitat rehabilitation projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional stream, channel, and/or habitat rehabilitation projects (i.e. projects that can receive storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment).

(5) Upon Regional Board Executive Officer approval the Copermittees may reallocate resources in the WQIPs for retrofit and rehabilitation project(s).

6. Enforcement Response Plans

Each Copermittee must develop and implement an Enforcement Response Plan as part of its jurisdictional runoff management program document. The Enforcement Response Plan must describe the applicable approaches and options to enforce its legal authority established pursuant to Provision E.1, as necessary, to achieve compliance with the requirements of this Order. Copermittees may continue to utilize and implement established, equivalent guidelines and procedures for enforcement. If such equivalent guidelines and procedures have not been developed, Tthe Enforcement Response Plan must include the following:

a. ENFORCEMENT RESPONSE PLAN COMPONENTS

The Enforcement Response Plan must include the following individual components:

(1) Illicit Discharge Detection and Elimination Enforcement Component;

(2) Development Planning Enforcement Component;

(3) Construction Management Enforcement Component; and

(4) Existing Development Enforcement Component.

b. ENFORCEMENT RESPONSE APPROACHES AND OPTIONS

Each component of the Enforcement Response Plan must describe the enforcement response approaches that the Copermittee will implement to compel compliance with its statutes, ordinances, permits, contracts, orders, or similar means, and the requirements of this Order. The description must include the protocols for implementing progressively stricter enforcement responses. The enforcement response approaches must include appropriate sanctions, as legally appropriate, to compel compliance, including, at a minimum, the following tools or their equivalent:

(1) Verbal and written notices of violation;

(2) Cleanup requirements;

(3) Fines;

(4) Bonding requirements;

(5) Administrative and criminal (if intentional or criminally negligent) penalties;

(6) Liens;

(7) Stop work orders; and

(8) Permit and occupancy denials.

c. CORRECTION OF VIOLATIONS

(1) Violations must be corrected in a timely manner with the goal of correcting the violations within 30 calendar days after the violations are discovered, or prior to the next predicted rain event, whichever is sooner.

(2) The status of the enforcement actions~~If more than 30 calendar days are required to achieve compliance, then a rationale~~ must be recorded and updated in the applicable electronic database or tabular system used to track violations.

Comment [A110]: This is just asking for paperwork violations if someone forgets to write a specific justification – even if all appropriate steps are being diligently pursued. Request alternatively to simply require that the status be updated as appropriate.

d. ~~ESCALATED~~ PROGRESSIVE ENFORCEMENT

Comment [A111]: See discussion in section 3.11.2 of the comment letter.

(1) The Enforcement Response Plan must include a definition of "~~escalated~~ progressive enforcement." ~~Escalated~~ Progressive enforcement must include a series of enforcement actions that match the severity of the violations and include distinct, progressive steps. ~~any enforcement scenario where a violation or other non-compliance is determined to cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan~~. ~~Escalated~~ Progressive enforcement may be defined differently for development planning, construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and/or residential areas.

(2) Where the Copermittee determines ~~escalated~~ the identified progressive enforcement steps ~~is~~are not required, a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

(3) ~~Escalated~~ Progressive enforcement actions must continue to increase in severity, as necessary, to compel compliance as soon as possible.

e. REPORTING OF NON-COMPLIANT SITES

(1) Each Copermittee must notify the San Diego Water Board in writing within ~~22~~5 calendar~~2 working~~ days of issuing escalated enforcement (as defined in the Copermittee's Enforcement Response Plan) to a construction site that poses a significant threat to water quality as a result of violations or other non-compliance with its permits and applicable local ordinances, and the requirements of this Order. Written notification may be provided electronically by email.

(2) Each Copermittee must notify the San Diego Water Board of non-filers under the Industrial General Permit and Construction General Permit by email to Nonfilers_R9@waterboards.ca.gov.

7. Public Education and Participation

Each Copermittee must implement, individually or with other Copermittees, a public education and participation program in accordance with the strategies identified in the Water Quality Improvement Plan to promote and encourage the development of programs, management practices, and behaviors that reduce the discharge of pollutants in runoff~~storm water~~ to the MEP, prevent controllable non-storm water discharges from entering the MS4, and protect water quality standards in receiving waters.

STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Comment [A112]: Recommended move from (c)

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented within its jurisdiction, as applicable, to educate the public and encourage public participation to address potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) The target audiences and/or areas within the Copermittee's jurisdiction where the strategies and/or activities will be implemented;

(2) Provide specific details about how the strategies and/or activities will be implemented (e.g. educational topics, materials and/or activities, public outreach and participation programs and/or opportunities);

(3) Each Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify and implement regional public education and participation activities, programs and opportunities;

(4) Each Copermittee must incorporate a mechanism for evaluating and assessing educational and other public outreach activities, as needed, to identify progress and incorporate modifications necessary to increase the effectiveness of the public education and participation program.

(5) The requirements of the programs as outlined in the following sub-provisions

may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality improvement Plan(s).

a. PUBLIC EDUCATION

The public education program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) Educational activities, public information activities, and other appropriate outreach activities intended to reduce pollutants associated with the ~~application of pesticides, herbicides and fertilizer- and other pollutants of concern in storm water discharges to and from its MS4 to the MEP, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed to address the~~ highest priority water quality conditions identified in the Water Quality Improvement Plan;

(2) Educational activities, public information activities, and other appropriate outreach activities to facilitate the proper management and disposal of used oil and toxic materials; and

(3) Appropriate education and training measures for specific target audiences, such as construction site operators, residents, underserved target audiences and school-aged children, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed, based on high risk behaviors and pollutants of concern.

b. PUBLIC PARTICIPATION

The public participation program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) A process for members of the public to participate in updating the highest priority water quality conditions, numeric goals, and water quality improvement strategies in the Water Quality Improvement Plan.

(2) Opportunities for members of the public to participate in providing the Copermittee recommendations for improving the effectiveness of the water quality improvement strategies implemented within its jurisdiction.

(3) Opportunities for members of the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in ~~storm wate~~r discharges from

the MS4, and/or ~~restoration and~~ protection of the quality of receiving waters.

8. Fiscal Analysis

a. ~~Each Copermittee must secure the resources necessary to meet all the requirements of this Order~~.

b. Each Copermittee must conduct an annual fiscal analysis of its jurisdictional runoff management program in its entirety. The fiscal analysis must include the following:

(1) Identification of the various categories of expenditures necessary to implement the requirements of this Order, including a description of the specific capital, operation and maintenance, and other expenditure items to be accounted for in each category of expenditures;

(2) The staff resources needed and allocated to meet the requirements of this Order, including any development, implementation, and enforcement activities required;

(3) The estimated expenditures for Provisions E.8.b.(1) and E.8.b.(2) for the current fiscal year; and

(4) The source(s) of funds that are proposed to meet the necessary expenditures described in Provisions E.8.b.(1) and E.8.b.(2), including legal restrictions on the use of such funds, for the current fiscal year and next fiscal year.

c. Each Copermittee must submit a summary of the annual fiscal analysis with each Annual Report required pursuant to Provision F.3.b.

d. Each Copermittee must provide the documentation used to develop the summary of the annual fiscal analysis upon request by the San Diego Water Board.

Comment [A113]: Since the monitoring period is different than a fiscal year, we won't be able to consistently and accurately report monitoring costs incurred by the Copermittees. (which are a big part of overall budgets)

Comment [A114]: Please see Legal Comments.

F. REPORTING

Comment [A115]: See discussion in section 3.14 of the comment letter.

The purpose of this provision is to determine and document compliance with the requirements set forth in this Order. The goal of reporting is to communicate to the San Diego Water Board and the people of the State of California the implementation status of each jurisdictional runoff management program and compliance with the requirements of this Order. This goal is to be accomplished through the submittal of specific deliverables to the San Diego Water Board by the Copermittees.

1. Water Quality Improvement Plans

Comment [A116]: See discussion in section 3.14.1 of the comment letter.

The Copermittees for each Watershed Management Area must develop and submit the Water Quality Improvement Plan in accordance with the following requirements:

a. WATER QUALITY IMPROVEMENT PLAN DEVELOPMENT

Each Water Quality Improvement Plan must be developed in accordance with the following process:

(1) Priority Water Quality Conditions and Numeric Goals

(a) The Copermittees must implement a public participation process to solicit data and information to be utilized in the development and identification of the priority water quality conditions for the Watershed Management Area.

(b) The Copermittees are encouraged to involve the public and key stakeholders as early and often as possible during the development of the priority water quality conditions and numeric goals to be included in the Water Quality Improvement Plan.

(c) Within 6 months after the commencement of coverage under this Order, the Copermittees must develop and submit the Water Quality Improvement Plan requirements of Provision B.2 to the San Diego Water Board. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of 60 days.

(d) The Copermittees must revise the priority water quality conditions and numeric goals based on comments received and/or recommendations or direction from the San Diego Water Board Executive Officer.

(2) Water Quality Improvement Strategies and Schedules

(a) The Copermittees are encouraged to involve the public and key stakeholders as early and often as possible during the development of the water quality improvement strategies and schedules to be included in the Water Quality Improvement Plan.

(b) Within 9 months after receipt~~the commencement~~ of public comments and/or recommendations from the Executive Officer per (1)(c) above~~coverage under this Order~~, the Copermittees must develop and submit the Water Quality Improvement Plan requirements of Provision B.3 to the San Diego Water Board. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of 60 days.

(c) The Copermittees must revise the water quality improvement strategies and schedules based on comments received and/or recommendations or direction from the San Diego Water Board Executive Officer.

b. WATER QUALITY IMPROVEMENT PLAN SUBMITTAL

(1) Within 6~~18~~ months after receipt~~the commencement~~ of public comments and/or recommendations from the Executive Officer per (2)(c) above~~coverage under this Order~~, the Copermittees for each Watershed Management Area must submit a complete Water Quality Improvement Plan in accordance with the requirements of Provision B to the San Diego Water Board. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of 30 days.

(2) Based on the comments received, the San Diego Water Board will determine whether to hold a public hearing or to limit public input to submittal of written comments. If no hearing is held the San Diego Water Board will notify the Copermittees within 6 months that the Water Quality Improvement Plan has been accepted as complete following its review and determination that the Water Quality Improvement Plan meets the requirements of this Order.

(3) The Copermittees must revise the Water Quality Improvement Plan based on comments received and/or recommendations or direction from the San Diego Water Board Executive Officer.

(4) The Water Quality Improvement Plan must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance by the San Diego Water Board.

(5) Copermittees must commence with implementation of the BMP strategies identified in the Water Quality Improvement Plan no later than the fiscal year (July 1) following San Diego Water Board approval of the Water Quality Improvement Plan, and the monitoring strategies identified in the Water Quality Improvement Plan no later than October 1st (or May 1st, whichever is sooner) following the San Diego Water Board approval of the Water Quality Improvement Plan.

2. Updates

Comment [A117]: See discussion in section 3.14.1 of the comment letter.

a. Jurisdictional Runoff Management Program Document Updates

Each Copermittee must update its jurisdictional runoff management program document in accordance with the following requirements:

(1) Each Copermittee is encouraged to involve the public and key stakeholders as early and often as possible to solicit recommendations for updates to its jurisdictional runoff management program document.

(2) Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E and the strategies identified in the applicable WQIPs no later than 6~~18~~ months after approval~~the commencement~~ of the applicable Water Quality Improvement Plans (or updates thereto).~~coverage under this Order.~~

(3) The updated JRMP document must be implemented beginning July 1st following completion of the update, unless directed otherwise by the Executive Officer.

~~(3)~~(4) Each Copermittee must submit any subsequent updates to its jurisdictional runoff management program, with a rationale for the modifications, either in the Annual Report required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge required pursuant to Provision F.5.b.

~~(4)~~(5) The Copermittee must revise the modifications as directed by the San Diego Water Board Executive Officer.

~~(5)~~(6) Updated jurisdictional runoff management program documents must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of submitting the Annual Report.

b. BMP Design Manual Updates

Each Copermittee must update its BMP Design Manual in accordance with the following requirements:

(1) Each Copermittee must update its BMP Design Manual to incorporate the requirements of Provisions E.3.a-d, and E.3.g. no later than 6~~18~~ months after approval~~the commencement~~ of the applicable Water Quality Improvement Plans..

Comment [A118]: This is necessary for the WQIP strategies to inform the Development Planning process

(2) Unless directed otherwise by the San Diego Water Board, the Copermittee must implement the updated BMP Design Manual within 180 days of

Comment [A119]: An implementation date was missing from the Tentative Order

completing updates to the BMP Design Manual.

~~(1)~~(3) Until the Copermittee begins implementation of its updated BMP Design Manual, the Copermittee must continue implementing its current BMP Design Manual~~coverage under this Order~~.

Comment [A120]: This was moved to here

~~(2)~~(4) Subsequent updates must be consistent with the requirements of Provisions E.3.a-d and must be submitted as part of the Annual Reports required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge required pursuant to Provision F.5.b.

~~(3)~~(5) Updated BMP Design Manuals must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of completing the update.

c. WATER QUALITY IMPROVEMENT PLAN UPDATES

The Water Quality Improvement Plans must be updated in accordance with the following process:

(1) The Copermittees must implement a public participation process to solicit data and information to be utilized in updating the Water Quality Improvement Plan.

(2) The Copermittees are encouraged to involve the public and key stakeholders as early and often as possible during the updates to the Water Quality Improvement Plan.

(3) The Copermittees for each Watershed Management Area must submit requested updates to the Water Quality Improvement Plan, with the public input received and the rationale for the requested updates, either in the Annual Reports required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The requested updates are considered accepted by the San Diego Water Board if no response is provided to the Copermittee after 3 months of submitting the request.

(4) The Copermittees must revise the requested updates as directed by the San Diego Water Board Executive Officer.

(5) Updated Water Quality Improvement Plans must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance of the requested updates by the San Diego Water Board.

3. Progress Reporting

Comment [A121]: See discussion in section 3.14.1 of the comment letter.

a. PROGRESS REPORT PRESENTATIONS

The Copermittees for each Watershed Management Area must appear before the San Diego Water Board, as requested by the San Diego Water Board, to provide progress reports on the implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs.

b. ANNUAL REPORTS

Comment [A122]: See discussion in section 3.14.1 of the comment letter.

(1) Transitional Period JRMP Reports: Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (Attachment D or accepted revision) no later than October 31 of each year prior to the implementation of updated JRMP programs pursuant to F.2.a. Each Copermittee must submit the information on the Jurisdictional Runoff Management Program Annual Report Form specific to the area within its jurisdiction in each Watershed Management Area.

(2) Transitional Period Monitoring Report: The transitional period monitoring conducted pursuant to D.1.a and D.2.a. shall be reported in a single report that covers the entire reporting period from the initiation of the transitional period monitoring (as described in D.1.a and D.2.a.), through September 30th following approval of the Water Quality Improvement Plan. The Transitional Period Monitoring Report shall include the assessments required per D.4.a.(1)(a), D.4.b.(1)(a) and D.4.b.(2)(a); and be submitted by January 31st following completion of the above mentioned transitional period.

~~(1)~~(3) Post-Transitional Annual Reports – Following the initial transitional period after enrollment into this Order, the~~The~~ Copermittees for each Watershed Management Area must submit an combined Annual Report for each reporting period no later than January 31 of the following year. The annual reporting period consists of two periods: 1) July 1 to June 30 of the following year for the jurisdictional runoff management programs, 2) October 1 to September 30 of the following year for the monitoring and assessment programs~~. The first Annual Report must be prepared for the reporting period beginning July 1 after commencement of coverage under this Order, and upon San Diego Water Board determination that the Water Quality Improvement Plan meets the requirements of this Order to June 30 in the following year for the jurisdictional runoff management programs, and September 30 in the following year for the monitoring and assessment programs.~~ Annual Reports must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Each Annual Report must include the following:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, summarized and presented in tabular and graphical form;

(b) Progress of the special studies required pursuant to Provision D.3, and the results or findings when a special study, or each phase of a special study, is completed;

(c) The findings from the applicable assessments required pursuant to Provision D.4;

Comment [A123]: Not all are required annually.

(d) The progress of implementing the Water Quality Improvement Plan, including, but not limited to, the following:

(i) The progress toward achieving the interim and final numeric goals for the highest water quality priorities for the Watershed Management Area,

(ii) The water quality improvement strategies that were implemented and/or no longer implemented by each of the Copermittees during the reporting period and previous reporting periods, and are planned to be implemented during the next reporting period,

(iii) Proposed modifications to the water quality improvement strategies, with public input received and rationale for the proposed modifications,

(iv) Previously proposed modifications or updates incorporated into the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document and implemented by the Copermittees in the Watershed Management Area, and

(v) Proposed modifications or updates to the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document;

(e) A completed Jurisdictional Runoff Management Program Annual Report Form (Attachment D or accepted revision) for each Copermittee in the Watershed Management Area, certified by a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative.

~~(2) Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (Attachment D or accepted revision) no later than October 31 of each year until the first Annual Report is required to be submitted. Each Copermittee must submit the information on the Jurisdictional Runoff Management Program Annual Report Form specific to the area within its jurisdiction in each Watershed Management Area.~~

Comment [A124]: Adapted into new section (1)

~~(3)~~(4) Each Copermittee must provide any data or documentation utilized in

developing the Annual Report upon request by the San Diego Water Board. ~~AnyAny~~Copermittee~~Any~~ monitoring data utilized in developing the Annual Report must be uploaded to the California Environmental Data Exchange Network (CEDEN).[35] Any Copermittee monitoring and assessment data utilized in developing the Annual Report must be provided on the Regional Clearinghouse required pursuant to Provision F.4.

C. Regional Monitoring and Assessment Report

(1) The Copermittees must submit a Regional Monitoring and Assessment Report no later than 180 days in advance of the expiration date of this Order. The Regional Monitoring and Assessment Report may be submitted as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The Regional Monitoring and Assessment Report shall incorporate the Integrated Assessment of the Water Quality Improvement Plan per D.4.d.

~~(1) The Copermittees must review the receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, and findings from the assessments required pursuant to Provision D.4, to assess the following:~~

~~(2)~~

~~(3) The beneficial uses of the receiving waters within the San Diego Region that are protected or must be restored;~~

~~(4)~~

~~(5) The progress toward restoring impacted beneficial uses in the receiving waters within the San Diego Region; and~~

~~(6)~~

~~(7) Pollutants or conditions of emerging concern that may impact beneficial uses in the receiving waters within the San Diego Region.~~

~~(8)~~

~~(9) The Regional Monitoring and Assessment Report must include recommendations for improving the implementation and assessment of the Water Quality Improvement Plans and jurisdictional runoff management programs.~~

(2) Each Copermittee must provide any data or documentation utilized in developing the Regional Monitoring and Assessment Report upon request by the San Diego Water Board. Any monitoring and assessment data utilized in developing the Regional Monitoring and Assessment Report must be provided on the Regional Clearinghouse required pursuant to Provision F.4.

[35] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

4. Regional Clearinghouse

The Copermittees must develop, update, and maintain an internet-based Regional Clearinghouse that is made available to the public no later than 18 months after the effective date of this Order.[36]

a. The Copermittees, through the Regional Clearinghouse, must make the following documents and data available, organized by Watershed Management Area, which may be linked to other internet-based data portals and databases where the original documents are stored:

(1) Water Quality Improvement Plan for the Watershed Management Area, and all updated versions with date of update;

(2) Annual Reports for the Watershed Management Area;

(3) Jurisdictional Runoff Management Program document for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(4) BMP Design Manual for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(5) Reports from special studies (e.g. source identification, BMP effectiveness assessment) conducted in the Watershed Management Area;

(6) Monitoring data collected pursuant to Provision D for each Watershed Management Area must be uploaded to CEDEN,[37] with links to the uploaded data; and

(7) Available GIS data, layers, and/or shapefiles used to develop the maps generated and maintained by the Copermittees for the Water Quality Improvement Plans, Annual Reports, and jurisdictional runoff management program documents.

b. The Copermittees, through the Regional Clearinghouse, must make the following information and documents available:

(1) Contact information (point of contact, phone number, email address, and mailing address) for each Copermittee;

[36] The Copermittee may elect to develop and maintain the clearinghouse(s) provided by other Copermittees or agencies.

[37] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

(2) Public hotline number for reporting non-storm water and illicit discharges for each Copermittee;

(3) Email address for reporting non-storm water and illicit discharges for each Copermittee;

(4) Link to each Copermittee's website, if available, where the public may find additional information about the Copermittee's storm water management program and for requesting records for the implementation of its program;

(5) Information about opportunities for the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in ~~storm water~~ discharges from the MS4, and/or restoration and protection of the quality of receiving waters; and

(6) Reports from regional monitoring programs in which the Copermittees participate (e.g. Southern California Monitoring Coalition, Southern California Coastal Water Research Project Bight Monitoring);

(7) Regional Monitoring and Assessment Reports; and

(8) Any other information, data, and documents the Copermittees determine as appropriate for making available to the public.

5. Report of Waste Discharge

a. The Orange County Copermittees and the Riverside County Copermittees are required to submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders. The San Diego Water Board will review and consider the Reports of Waste Discharge to determine whether modification to this Order, pursuant to the requirements of Provision H, will be required prior the Orange County Copermittees and/or Riverside County Copermittees becoming covered under this Order. The current Orders for the Orange County Copermittees and Riverside County Copermittees are rescinded upon notification of coverage under this Order except for enforcement purposes.

b. The Copermittees subject to the requirements of this Order must submit to the San Diego Water Board a complete Report of Waste Discharge as an application for the re-issuance of this Order and NPDES permit. The Report of Waste Discharge must be submitted no later than 180 days in advance of the expiration date of this Order. The Report of Waste Discharge must contain the following minimum information:

(1) Names and addresses of the Copermittees;

(2) Names and titles of the primary contacts of the Copermittees;

(3) Proposed changes to the Copermittees' Water Quality Improvement Plans and the supporting justification;

(4) Proposed changes to the Copermittees' jurisdictional runoff management programs and the supporting justification;

(5) Any other information necessary for the re-issuance of this Order;

(6) Any information to be included as part of the Report of Waste Discharge pursuant to the requirements of this Order; and

(7) Any other information required by federal regulations for NPDES permit reissuance.

6. Application for Early Coverage

a. The Orange County Copermittees, collectively, or Riverside County Copermittees, collectively, may apply for early coverage under this Order by submitting a Report of Waste Discharge Form 200, with a written request for early coverage under this Order.

Comment [A125]: This form requests information that is not applicable to MS4s.

b. The San Diego Water Board will review the application for early coverage. A notification of coverage under this Order will be issued to the Copermittees in the respective county by the San Diego Water Board upon completion of the early coverage application requirements. The effective coverage date will be specified in the notification of coverage. The Copermittees in the respective county are authorized to have MS4 discharges pursuant to the requirements of this Order starting on the effective coverage date specified in the notification of coverage. The existing Order for the respective county is rescinded upon the effective coverage date specified in the notification of coverage except for enforcement purposes.

7. Reporting Provisions

Each Copermittee must comply with all the reporting and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

G. PRINCIPAL WATERSHED COPERMITTEE RESPONSIBILITIES

1. The Copermittees within each Watershed Management Area must designate a Principal Watershed Copermittee and notify the San Diego Water Board of the name of the Principal Watershed Copermittee. ~~An individual Copermittee should not be designated a Principal Watershed Copermittee for more than two Watershed Management Areas.~~ The notification may be submitted with the Water Quality Improvement Plan required pursuant to Provision F.1 of this Order.

2. The Principal Watershed Copermittee is responsible for, at a minimum, the following:

a. Serving as liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues, and when necessary and appropriate, representing the Copermittees in the Watershed Management Area before the San Diego Water Board.

b. Facilitating the development of the Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order

c. Coordinating the submittal of the deliverables required by Provisions F.1, F.2, F.3.a, and F.3.b of this Order.

d. Coordinating the development of~~and developing~~, with the other Principal Watershed Copermittees, the requirements of Provisions F.3.c, F.4, and F.5.b of this Order.

H. MODIFICATION OF PROGRAMS

1. Modifications of the Order may be initiated by the San Diego Water Board or by the Copermittees, including as part of the ROWD process applicable to the Orange County and Riverside County Copermittees. Requests by Copermittees must be made to the San Diego Water Board.

2. Minor modifications to the Order may be made by the San Diego Water Board Executive Officer, where the proposed modification complies with all the effective prohibitions and limitations, and other requirements of this Order.

3. Proposed modifications to the Order outside of the WQIP process that are not minor require amendment of this Order in accordance with this Order's rules, policies, and procedures.

4. The San Diego Water Board may re-open and modify this Order at any time prior to its expiration, after opportunity for public comment and a public hearing, if the State Water Board determines that revisions are warranted to those provisions of the Order addressing compliance with water quality standards in the receiving water and/or those provisions of the Order establishing an iterative process for implementation of management practices to assure compliance with water quality standards in the receiving water.

I. STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

Each Copermittee must comply with all the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

ATTACHMENT A

DISCHARGE PROHIBITIONS AND SPECIAL PROTECTIONS

1. Basin Plan Waste Discharge Prohibitions

California Water Code Section 13243 provides that a Regional Water Board, in a water quality control plan, may specify certain conditions or areas where the discharge of waste or certain types of waste is not permitted. The following waste discharge effective prohibitions in the Water Quality Control Plan for the San Diego Basin (Basin Plan) are applicable to any person, as defined by Section 13050(c) of the California Water Code, who is a citizen, domiciliary, or political agency or entity of California whose activities in California could affect the quality of waters of the state within the boundaries of the San Diego Region.

1. The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in California Water Code Section 13050, is prohibited.

2. The discharge of waste to land, except as authorized by waste discharge requirements or the terms described in California Water Code Section 13264 is prohibited.

3. The discharge of pollutants or dredged or fill material to waters of the United States except as authorized by a National Pollutant Discharge Elimination System (NPDES) permit or a dredged or fill material permit (subject to the exemption described in California Water Code Section 13376) is prohibited.

4. Discharges of recycled water to lakes or reservoirs used for municipal water supply or to inland surface water tributaries thereto are prohibited, unless this San Diego Water Board issues a NPDES permit authorizing such a discharge; the proposed discharge has been approved by the State Department of Health Services (DHS) and the operating agency of the impacted reservoir; and the discharger has an approved fail-safe long-term disposal alternative.

5. The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the San Diego Water Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

6. The discharge of waste in a manner causing flow, ponding, or surfacing on lands not owned or under the control of the discharger is prohibited, unless the discharge is authorized by the San Diego Water Board.

7. The dumping, deposition, or discharge of waste directly into waters of the state, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the San Diego Water Board.

8. Any discharge to a storm water conveyance system that is not composed entirely of "*storm water*" is effectively prohibited unless authorized by the San Diego Water Board. [The federal regulations, 40 CFR 122.26(b)(13), define storm water as storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from fire fighting activities.] [§122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

9. The unauthorized discharge of treated or untreated sewage to waters of the state or to a storm water conveyance system is prohibited.

10. The discharge of industrial wastes to conventional septic tank/subsurface disposal systems, except as authorized by the terms described in California Water Code Section 13264, is prohibited.

11. The discharge of radioactive wastes amenable to alternative methods of disposal into the waters of the state is prohibited.

12. The discharge of any radiological, chemical, or biological warfare agent into waters of the state is prohibited.

13. The discharge of waste into a natural or excavated site below historic water levels is prohibited unless the discharge is authorized by the San Diego Water Board.

14. The discharge of sand, silt, clay, or other earthen materials from any activity, including land grading and construction, in quantities which cause deleterious bottom deposits, turbidity or discoloration in waters of the state or which unreasonably affect, or threaten to affect, beneficial uses of such waters is prohibited.

15. The discharge of treated or untreated sewage from vessels to Mission Bay, Oceanside Harbor, Dana Point Harbor, or other small boat harbors is prohibited.

16. The discharge of untreated sewage from vessels to San Diego Bay is prohibited.

17. The discharge of treated sewage from vessels to portions of San Diego Bay that are less than 30 feet deep at mean lower low water (MLLW) is prohibited.

18. The discharge of treated sewage from vessels, which do not have a properly functioning US Coast Guard certified Type I or Type II marine sanitation device, to portions of San Diego Bay that are greater than 30 feet deep at mean lower low water (MLLW) is prohibited.

2. Attachment B to State Water Board Resolution 2012-0012

Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges

I. PROVISIONS FOR POINT SOURCE DISCHARGES OF STORM WATER AND NONPOINT SOURCE WASTE DISCHARGES

The following terms, effective prohibitions, and special conditions (hereafter collectively referred to as special conditions) are established as limitations on point source storm water and nonpoint source discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in Areas of Special Biological Significance (ASBS), as required for State Water Quality Protection Areas pursuant to California Public Resources Code Sections 36700(f) and 36710(f). These Special Protections are adopted by the State Water Board as part of the California Ocean Plan (Ocean Plan) General Exception.

The special conditions are organized by category of discharge. The State Water Resources Control Board (State Water Board) and Regional Water Quality Control Boards (Regional Water Boards) will determine categories and the means of regulation for those categories [e.g., Point Source Storm Water National Pollutant Discharge Elimination System (NPDES) or Nonpoint Source].

A. PERMITTED POINT SOURCE DISCHARGES OF STORM WATER

1. General Provisions for Permitted Point Source Discharges of Storm Water

   a. Existing storm water discharges into an ASBS are allowed only under the following conditions:

      (1) The discharges are authorized by an NPDES permit issued by the State Water Board or Regional Water Board;

      (2) The discharges comply with all of the applicable terms, effective prohibitions, and special conditions contained in these Special Protections; and

      (3) The discharges:

         (i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

         (ii) Are designed to prevent soil erosion;

         (iii) Occur only during wet weather;

         (iv) Are composed of only storm water runoff.

   b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

   c. The discharge of trash is effectively prohibited.

d. Only discharges from existing storm water outfalls are allowed. Any proposed or new storm water runoff discharge shall be routed to existing storm water discharge outfalls and shall not result in any new contribution of waste to an ASBS (i.e., no additional pollutant loading). “Existing storm water outfalls” are those that were constructed or under construction prior to January 1, 2005. “New contribution of waste” is defined as any addition of waste beyond what would have occurred as of January 1, 2005. A change to an existing storm water outfall, in terms of re-location or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges are effectively prohibited except as provided below:

(1) The term “non-storm water discharges” means any waste discharges from a municipal separate storm sewer system (MS4) or other NPDES permitted storm drain system to an ASBS that are not composed entirely of storm water.

(2) (i) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability or occur naturally:

(a) Discharges associated with emergency fire fighting operations.

(b) Foundation and footing drains.

(c) Water from crawl space or basement pumps.

(d) Hillside dewatering.

(e) Naturally occurring groundwater seepage via a storm drain.

(f) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(ii) An NPDES permitting authority may authorize non-storm water discharges to an MS4 with a direct discharge to an ASBS only to the extent the NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

2. Compliance Plans for Inclusion in Storm Water Management Plans (SWMP) and Storm Water Pollution Prevention Plans (SWPPP).

The discharger shall specifically address the effective prohibition of non-storm water runoff and the requirement to maintain natural water quality for storm water discharges to an ASBS in an ASBS Compliance Plan to be included in its SWMP or a SWPPP, as appropriate to permit type. If a statewide permit includes a SWMP, then the discharger shall prepare a stand-alone compliance plan for ASBS discharges. The ASBS Compliance Plan is subject to approval by the Executive Director of the State Water Board (statewide permits) or

Executive Officer of the Regional Water Board (for permits issued by Regional Water Boards).

a. The Compliance Plan shall include a map of surface drainage of storm water runoff, showing areas of sheet runoff, prioritize discharges, and describe any structural Best Management Practices (BMPs) already employed and/or BMPs to be employed in the future. Priority discharges are those that pose the greatest water quality threat and which are identified to require installation of structural BMPs. The map shall also show the storm water conveyances in relation to other features such as service areas, sewage conveyances and treatment facilities, landslides, areas prone to erosion, and waste and hazardous material storage areas, if applicable. The SWMP or SWPPP shall also include a procedure for updating the map and plan when changes are made to the storm water conveyance facilities.

b. The ASBS Compliance Plan shall describe the measures by which all non-authorized non-storm water runoff (e.g., dry weather flows) has been eliminated, how these measures will be maintained over time, and how these measures are monitored and documented.

c. For Municipal Separate Storm Sewer System (MS4s), the ASBS Compliance Plan shall require minimum inspection frequencies as follows:

   (1) The minimum inspection frequency for construction sites shall be weekly during rainy season;

   (2) The minimum inspection frequency for industrial facilities shall be monthly during the rainy season;

   (3) The minimum inspection frequency for commercial facilities (e.g., restaurants) shall be twice during the rainy season; and

   (4) Storm water outfall drains equal to or greater than 18 inches (457 mm) in diameter or width shall be inspected once prior to the beginning of the rainy season and once during the rainy season and maintained to remove trash and other anthropogenic debris.

d. The ASBS Compliance Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff, that are necessary to comply with these special conditions, will be achieved through BMPs. Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that such installation would pose a threat to health or safety. BMPs to control storm water runoff discharges (at the end-of-pipe) during a design storm shall be designed to achieve on average the following target levels:

   (1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

   (2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges. The baseline for the reduction is the effective date of the Exception. The

baseline for these determinations is the effective date of the Exception, and the reductions must be achieved and documented within four (4) years of the effective date.

e. The ASBS Compliance Plan shall address erosion control and the prevention of anthropogenic sedimentation in ASBS. The natural habitat conditions in the ASBS shall not be altered as a result of anthropogenic sedimentation.

f. The ASBS Compliance Plan shall describe the non-structural BMPs currently employed and planned in the future (including those for construction activities), and include an implementation schedule. The ASBS Compliance Plan shall include non-structural BMPs that address public education and outreach. Education and outreach efforts must adequately inform the public that direct discharges of pollutants from private property not entering an MS4 are effectively prohibited. The ASBS Compliance Plan shall also describe the structural BMPs, including any low impact development (LID) measures, currently employed and planned for higher threat discharges and include an implementation schedule. To control storm water runoff discharges (at the end-of-pipe) during a design storm, permittees must first consider using LID practices to infiltrate, use, or evapotranspirate storm water runoff on-site.

g. The BMPs and implementation schedule shall be designed to ensure that natural water quality conditions in the receiving water are achieved and maintained by either reducing flows from impervious surfaces or reducing pollutant loading, or some combination thereof.

h. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents in storm water runoff that alter natural ocean water quality and the sources of these constituents.

(2) The report shall describe BMPs that are currently being implemented, BMPs that are identified in the SWMP or SWPPP for future implementation, and any additional BMPs that may be added to the SWMP or SWPPP to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the BMPs.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits), the discharger shall revise its ASBS Compliance Plan to incorporate any new or modified BMPs that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised SWMP or SWPPP, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural ocean water quality conditions due to the same constituent.

(5) Compliance with this section does not excuse violations of any term, effective prohibition, or condition contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within one year from the effective date of the Exception, the discharger shall submit a written ASBS Compliance Plan to the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that describes its strategy to comply with these special conditions, including the requirement to maintain natural water quality in the affected ASBS. The ASBS Compliance Plan shall include a time schedule to implement appropriate non-structural and structural controls (implementation schedule) to comply with these special conditions for inclusion in the discharger's SWMP or SWPPP, as appropriate to permit type.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these special conditions shall be implemented.

d. Within four (4) years of the effective date of the Exception, any structural controls identified in the ASBS Compliance Plan that are necessary to comply with these special conditions shall be operational.

e. Within four (4) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water, pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data, and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

(1) for municipalities, a demonstration of significant hardship to discharger ratepayers, by showing the relationship of storm water fees to annual household income for residents within the discharger's jurisdictional area, and the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or
(2) for other governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process.

B. NONPOINT SOURCE DISCHARGES

[NOT INCLUDED]
[PROVISIONS FOR NONPOINT SOURCE DISCHARGES NOT APPLICABLE]

II. ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES

[NOT INCLUDED]
[ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES NOT APPLICABLE]

III. ADDITIONAL REQUIREMENTS – WATERFRONT AND MARINE OPERATIONS

[NOT INCLUDED]
[ADDITIONAL REQUIREMENTS FOR WATERFRONT AND MARINE OPERATIONS NOT APPLICABLE]

IV. MONITORING REQUIREMENTS

Monitoring is mandatory for all dischargers to assure compliance with the Ocean Plan. Monitoring requirements include both: (A) core discharge monitoring, and (B) ocean receiving water monitoring. The State and Regional Water Boards must approve sampling site locations and any adjustments to the monitoring programs. All ocean receiving water and reference area monitoring must be comparable with the Water Boards' Surface Water Ambient Monitoring Program (SWAMP).

Safety concerns: Sample locations and sampling periods must be determined considering safety issues. Sampling may be postponed upon notification to the State and Regional Water Boards if hazardous conditions prevail.

Analytical Chemistry Methods: All constituents must be analyzed using the lowest minimum detection limits comparable to the Ocean Plan water quality objectives. For metal analysis, all samples, including storm water effluent, reference samples, and ocean receiving water samples, must be analyzed by the approved analytical method with the lowest minimum detection limits (currently Inductively Coupled Plasma/Mass Spectrometry) described in the Ocean Plan.

A. CORE DISCHARGE MONITORING PROGRAM

1. General sampling requirements for timing and storm size:

   Runoff must be collected during a storm event that is greater than 0.1 inch and generates runoff, and at least 72 hours from the previously measurable storm event. Runoff samples shall be collected when post-storm receiving water is sampled, and analyzed for the same constituents as receiving water and reference site samples (see section IV B) as described below.

2. Runoff flow measurements

   a. For municipal/industrial storm water outfalls in existence as of December 31, 2007, 18 inches (457mm) or greater in diameter/width (including multiple outfall pipes in combination having a width of 18 inches, runoff flows must be measured or calculated, using a method acceptable to and approved by the State and Regional Water Boards.
   b. This will be reported annually for each precipitation season to the State and Regional Water Boards.

3. Runoff samples – storm events

   a. For outfalls equal to or greater than 18 inches (0.46m) in diameter or width:

      (1) samples of storm water runoff shall be analyzed during the same storm as receiving water samples for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination, ; and

      (2) samples of storm water runoff shall be analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS

      (3) If an applicant has no outfall greater than 36 inches, then storm water runoff from the applicant's largest outfall shall be further analyzed during the same storm as receiving water samples for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates).

   b. For outfalls equal to or greater than 36 inches (0.91m) in diameter or width:

      (1) samples of storm water runoff shall be analyzed during the same storm as receiving water samples for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

      (2) samples of storm water runoff shall be further analyzed during the same storm as receiving water samples for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides

(pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates) and

(3) samples of storm water runoff shall be analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

c. For an applicant not participating in a regional monitoring program [see below in Section IV (B)] in addition to (a.) and (b.) above, a minimum of the two largest outfalls or 20 percent of the larger outfalls, whichever is greater, shall be sampled (flow weighted composite samples) at least three times annually during wet weather (storm event) and analyzed for all Ocean Plan Table A constituents, Table B constituents for marine aquatic life protection (except for toxicity, only chronic toxicity for three species shall be required), DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, and Ocean Plan indicator bacteria. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one (the largest) such discharge shall be sampled annually in each Region.

4. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may reduce or suspend core monitoring once the storm runoff is fully characterized. This determination may be made at any point after the discharge is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

B. OCEAN RECEIVING WATER AND REFERENCE AREA MONITORING PROGRAM

In addition to performing the Core Discharge Monitoring Program in Section II.A above, all applicants having authorized discharges must perform ocean receiving water monitoring. In order to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS, dischargers may choose either (1) an individual monitoring program, or (2) participation in a regional integrated monitoring program.

1. Individual Monitoring Program: The requirements listed below are for those dischargers who elect to perform an individual monitoring program to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within the affected ASBS. In addition to Core Discharge Monitoring, the following additional monitoring requirements shall be met:

   a. Three times annually, during wet weather (storm events), the receiving water at the point of discharge from the outfalls described in section (IV)(A)(3)(c) above shall be sampled and analyzed for Ocean Plan Table A constituents, Table B constituents for marine aquatic life, DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, salinity, chronic toxicity (three species), and Ocean Plan indicator bacteria.

      The sample location for the ocean receiving water shall be in the surf zone at the point of discharges; this must be at the same location where storm water runoff is sampled. Receiving water shall be sampled at approximately the same time prior to (pre-storm) and during (or immediately after) the same storm (post storm). Reference water quality shall also be sampled and analyzed for the same constituents pre-storm and post-storm, during the same storms when receiving water is sampled. Reference stations will be

determined by the State Water Board's Division of Water Quality and the applicable Regional Water Board(s).

b. Sediment sampling shall occur at least three times during every five (5) year period. The subtidal sediment (sand or finer, if present) at the discharge shall be sampled and analyzed for Ocean Plan Table B constituents for marine aquatic life, DDT, PCBs, PAHs, pyrethroids, and OP pesticides. For sediment toxicity testing, only an acute toxicity test using the amphipod Eohaustorius estuarius must be performed.

c. A quantitative survey of intertidal benthic marine life shall be performed at the discharge and at a reference site. The survey shall be performed at least once every five (5) year period. The survey design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The results of the survey shall be completed and submitted to the State Water Board and Regional Water Board at least six months prior to the end of the permit cycle.

d. Once during each five (5) year period, a bioaccumulation study shall be conducted to determine the concentrations of metals and synthetic organic pollutants at representative discharge sites and at representative reference sites. The study design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The bioaccumulation study may include California mussels (Mytilus californianus) and/or sand crabs (Emerita analoga or Blepharipoda occidentalis). Based on the study results, the Regional Water Board and the State Water Board's Division of Water Quality, may adjust the study design in subsequent permits, or add or modify additional test organisms (such as shore crabs or fish), or modify the study design appropriate for the area and best available sensitive measures of contaminant exposure.

e. Marine Debris: Representative quantitative observations for trash by type and source shall be performed along the coast of the ASBS within the influence of the discharger's outfalls. The design, including locations and frequency, of the marine debris observations is subject to approval by the Regional Water Board and State Water Board's Division of Water Quality.

f. The monitoring requirements of the Individual Monitoring Program in this section are minimum requirements. After a minimum of one (1) year of continuous water quality monitoring of the discharges and ocean receiving waters, the Executive Director of the State Water Board (statewide permits) or Executive officer of the Regional Water Board (Regional Water Board permits) may require additional monitoring, or adjust, reduce or suspend receiving water and reference station monitoring. This determination may be made at any point after the discharge and receiving water is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

2. Regional Integrated Monitoring Program: Dischargers may elect to participate in a regional integrated monitoring program, in lieu of an individual monitoring program, to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS. This regional approach shall characterize natural water quality, pre- and post-storm, in ocean reference areas near the mouths of identified open space watersheds and the effects of the discharges on natural water quality (physical, chemical, and toxicity) in the ASBS receiving waters, and should include benthic marine aquatic life and bioaccumulation components. The design of the ASBS stratum of a regional integrated monitoring program may deviate from the otherwise prescribed individual

monitoring approach (in Section IV.B.1) if approved by the State Water Board's Division of Water Quality and the Regional Water Boards.

a. Ocean reference areas shall be located at the drainages of flowing watersheds with minimal development (in no instance more than 10% development), and shall not be located in CWA Section 303(d) listed waterbodies or have tributaries that are 303(d) listed. Reference areas shall be free of wastewater discharges and anthropogenic non-storm water runoff. A minimum of low threat storm runoff discharges (e.g. stream highway overpasses and campgrounds) may be allowed on a case-by-case basis. Reference areas shall be located in the same region as the ASBS receiving water monitoring occurs. The reference areas for each Region are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean reference water samples must be collected from each station, each from a separate storm. A minimum of one reference location shall be sampled for each ASBS receiving water site sampled per responsible party. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

b. ASBS ocean receiving water must be sampled in the surf zone at the location where the runoff makes contact with ocean water (i.e. at "point zero"). Ocean receiving water stations must be representative of worst-case discharge conditions (i.e. co-located at a large drain greater than 36 inches, or if drains greater than 36 inches are not present in the ASBS then the largest drain greater than18 inches.) Ocean receiving water stations are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean receiving water samples must be collected during each storm season from each station, each from a separate storm. A minimum of one receiving water location shall be sampled in each ASBS per responsible party in that ASBS. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

c. Reference and receiving water sampling shall commence during the first full storm season following the adoption of these special conditions, and post-storm samples shall be collected when annual storm water runoff is sampled. Sampling shall occur in a minimum of two storm seasons. For those ASBS dischargers that have already participated in the Southern California Bight 2008 ASBS regional monitoring effort, sampling may be limited to only one storm season.

d. Receiving water and reference samples shall be analyzed for the same constituents as storm water runoff samples. At a minimum, constituents to be sampled and analyzed in reference and discharge receiving waters must include oil and grease, total suspended solids, Ocean Plan Table B metals for protection of marine life, Ocean Plan PAHs, pyrethroids, OP pesticides, ammonia, nitrate, phosphates, and critical life stage chronic toxicity for three species. In addition, within the range of the southern sea otter, indicator bacteria or some other measure of fecal contamination shall be analyzed.

3. Waterfront and Marine Operations: In addition to the above requirements for ocean receiving water monitoring, additional monitoring must be performed for marinas and boat launch and pier facilities:

a. For all marina or mooring field operators, in mooring fields with 10 or more occupied moorings, the ocean receiving water must be sampled for Ocean Plan indicator bacteria, residual chlorine, copper, zinc, grease and oil, methylene blue active substances (MBAS), and ammonia nitrogen.

   (1) For mooring field operators opting for an individual monitoring program (Section IV.B.1 above), this sampling must occur weekly (on the weekend) from May through October.

   (2) For mooring field operators opting to participate in a regional integrated monitoring program (Section IV.B.2 above), this sampling must occur monthly from May through October on a high use weekend in each month. The Water Boards may allow a reduction in the frequency of sampling, through the regional monitoring program, after the first year of monitoring.

b. For all mooring field operators, the subtidal sediment (sand or finer, if present) within mooring fields and below piers shall be sampled and analyzed for Ocean Plan Table B metals (for marine aquatic life beneficial use), acute toxicity, PAHs, and tributyltin. For sediment toxicity testing, only an acute toxicity test using the amphipod Eohaustorius estuarius must be performed. This sampling shall occur at least three times during a five (5) year period. For mooring field operators opting to participate in a regional integrated monitoring program, the Water Boards may allow a reduction in the frequency of sampling after the first sampling effort's results are assessed.

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ATTACHMENT B

STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

1. Standard Permit Provisions

Code of Federal Regulations Title 40 Section 122.41 (40 CFR 122.41) includes conditions, or provisions, that apply to all National Pollutant Discharge Elimination System (NPDES) permits. Additional provisions applicable to NPDES permits are in 40 CFR 122.42. All applicable provisions in 40 CFR 122.41 and 40 CFR 122.42 must be incorporated into this Order and NPDES permit. The applicable 40 CFR 122.41 and 40 CFR 122.42 provisions are as follows:

a. DUTY TO COMPLY [40 CFR 122.41(a)]

The Copermittee must comply with all of the provisions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

(1) The Copermittee must comply with effluent standards or effective prohibitions established under Section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or effective prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement. [40 CFR 122.41(a)(1)]

(2) The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to a civil penalty not to exceed $25,000 per day for each violation. The CWA provides that any person who *negligently* violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than 2 years, or both. Any person who *knowingly* violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both. Any person who knowingly violates Section 301, 302, 303, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, and who knows at that time that he thereby places another person in imminent danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of

not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.
[40 CFR 122.41(a)(2)]

(3) Any person may be assessed an administrative penalty by the San Diego Regional Water Quality Control Board (San Diego Water Board), State Water Resources Control Board (State Water Board), or United States Environmental Protection Agency (USEPA) for violating Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.
[40 CFR 122.41(a)(3)]

b. DUTY TO REAPPLY [40 CFR 122.41(b)]

If a Copermittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Copermittee must apply for and obtain a new permit.

c. NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE [40 CFR 122.41(c)]

It shall not be a defense for a Copermittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

d. DUTY TO MITIGATE [40 CFR 122.41(d)]

The Copermittee must take all reasonable steps to minimize or prevent any discharge or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

e. PROPER OPERATION AND MAINTENANCE [40 CFR 122.41(e)]

The Copermittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Copermittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by a Copermittee only when the operation is necessary to achieve compliance with the conditions of this permit.

f. PERMIT ACTIONS [40 CFR 122.41(f)]

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Copermittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

g. PROPERTY RIGHTS [40 CFR 122.41(g)]

This permit does not convey any property rights of any sort, or any exclusive privilege.

h. DUTY TO PROVIDE INFORMATION [40 CFR 122.41(h)]

The Copermittee must furnish to the San Diego Water Board, State Water Board, or USEPA within a reasonable time, any information which the San Diego Water Board, State Water Board, or USPEA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Copermittee must also furnish to the San Diego Water Board, State Water Board, or USPEA upon request, copies of records required to be kept by this permit.

i. INSPECTION AND ENTRY [40 CFR 122.41(i)]

The Copermittee must allow the San Diego Water Board, State Water Board, USEPA, and/or their authorized representative (including an authorized contractor acting as their representative), upon presentation of credentials and other documents as may be required by law, to:

(1) Enter upon the Copermittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit; [40 CFR 122.41(i)(1)]

(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit; [40 CFR 122.41(i)(2)]

(3) Inspect and photograph at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; [40 CFR 122.41(i)(3)] and

(4) Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location. [40 CFR 122.41(i)(4)]

j. MONITORING AND RECORDS [40 CFR 122.41(j)]

(1) Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity. [40 CFR 122.41(j)(1)]

(2) Except for records of monitoring information required by this permit related to the Copermittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five (5) years (or longer as required by 40 CFR Part 503), the

Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time. [40 CFR 122.41(j)(2)]

(3) Records for monitoring information must include: [40 CFR 122.41(j)(3)]

(a) The date, exact place, and time of sampling or measurements; [40 CFR 122.41(j)(3)(i)]
(b) The individual(s) who performed the sampling or measurements; [40 CFR 122.41(j)(3)(ii)]
(c) The date(s) analyses were performed; [40 CFR 122.41(j)(3)(iii)]
(d) The individual(s) who performed the analyses; [40 CFR 122.41(j)(3)(iv)]
(e) The analytical techniques or methods used; [40 CFR 122.41(j)(3)(v)] and
(f) The results of such analyses. [40 CFR 122.41(j)(3)(vi)]

(4) Monitoring must be conducted according to test procedures under 40 CFR Part 136 unless another method is required under 40 CFR Subchapters N or O. [40 CFR 122.41(j)(4)]

In the case of pollutants for which there are no approved methods under 40 CFR Part 136 or otherwise required under 40 CFR Subchapters N and O, monitoring must be conducted according to a test procedure specified in the permit for such pollutants. [40 CFR 122.44(i)(1)(iv)]

(5) The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. [40 CFR 122.41(j)(5)]

k. SIGNATORY REQUIREMENT [40 CFR 122.41(k)]

(1) All applications, reports, or information submitted to the San Diego Water Board, State Water Board, or USEPA must be signed and certified. (See 40 CFR 122.22) [40 CFR 122.41(k)(1)]

(a) *For a municipality, State, Federal, or other public agency.* [All applications must be signed] [b]y either a principal executive officer or ranking elected official. [40 CFR 122.22(a)(3)]

(b) All reports required by permits, and other information requested by the San Diego Water Board, State Water Board, or USEPA must be signed by a person described in paragraph (a) of this section, or by a duly authorized representative of that person. A person is a duly authorized representative only if: [40 CFR 122.22(b)]

(i) The authorization is made in writing by a person described in paragraph (a) of this section; [40 CFR 122.22(b)(1)]

(ii) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company, (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) [40 CFR 122.22(b)(2)] and,

(iii) The written authorization is submitted to the San Diego Water Board and State Water Board. [40 CFR 122.22(b)(3)]

(c) *Changes to authorization.* If an authorization under paragraph (b) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (b) of this section must be submitted to the San Diego Water Board prior to or together with any reports, information, or applications to be signed by an authorized representative. [40 CFR 122.22(c)]

(d) *Certification.* Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." [40 CFR 122.22(d)]

(2) The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both. [40 CFR 122.41(k)(2)]

I. REPORTING REQUIREMENTS [40 CFR 122.41(l)]

(1) *Planned changes.* The Copermittee must give notice to the San Diego Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when: [40 CFR 122.41(l)(1)]

(a) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); [40 CFR 122.41(l)(1)(i)] or

(b) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which

are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1).
[40 CFR 122.41(l)(1)(ii)]

(c) The alteration or addition results in a significant change in the Copermittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. [40 CFR 122.41(l)(1)(iii)]

(2) *Anticipated noncompliance*. The Copermittee must give advance notice to the San Diego Water Board or State Water Board of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.
[40 CFR 122.41(l)(2)]

(3) *Transfers*. This permit is not transferable to any person except after notice to the San Diego Water Board. The San Diego Water Board may require modification or revocation and reissuance of the permit to change the name of the Copermittee and incorporate such other requirements as may be necessary under the CWA.
[40 CFR 122.41(l)(3)]

(4) *Monitoring reports.* Monitoring results must be reported at the intervals specified elsewhere in this permit. [40 CFR 122.41(l)(4)]

(a) Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the San Diego Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices. [40 CFR 122.41(l)(4)(i)]

(b) If the Copermittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or another method required for an industry-specific waste stream under 40 CFR Subchapters N or O, the results of this monitoring must be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the San Diego Water Board or State Water Board.
[40 CFR 122.41(l)(4)(ii)]

(c) Calculations for all limitations which require averaging of measurements must utilize an arithmetic mean unless otherwise specified in the permit.
[40 CFR 122.41(l)(4)(iii)]

(5) *Compliance schedules*. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date. [40 CFR 122.41(l)(5)]

(6) *Twenty-four hour reporting.*

(a) The Copermittee must report any noncompliance that may endanger health or the environment. Any information must be provided orally within 24 hours from the time the Copermittee becomes aware of the circumstances. A written submission must also be provided within five (5) days of the time the Copermittee becomes aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6)(i)]

(b) The following must be included as information which must be reported within 24 hours under this paragraph: [40 CFR 122.41(l)(6)(ii)]

(i) Any unanticipated bypass that exceeds any effluent limitation in the permit (See 40 CFR 122.41(g)). [40 CFR 122.41(l)(6)(ii)(A)]
(ii) Any upset which exceeds any effluent limitation in the permit. [40 CFR 122.41(l)(6)(ii)(B)] and,
(iii) Violation of a maximum daily discharge limitation for any of the pollutants listed by the San Diego Water Board in the permit to be reported within 24 hours. (See 40 CFR 122.44(g)) [40 CFR 122.41(l)(6)(ii)(C)]

(c) The San Diego Water Board may waive the above-required written report on a case-by-case basis if the oral report has been received within 24 hours. [40 CFR 122.41(l)(6)(iii)]

(7) *Other noncompliance.* The Copermittee must report all instances of noncompliance not reported in accordance with the standard provisions required under 40 CFR 122.41(l)(4), (5), and (6), at the time monitoring reports are submitted. The reports must contain the information listed in the standard provisions required under 40 CFR 122.41(l)(6). [40 CFR 122.41(l)(7))]

(8) *Other information.* When the Copermittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the San Diego Water Board, State Water Board, or USEPA, the Copermittee must promptly submit such facts or information. [40 CFR 122.41(l)(8)]

~~**m. BYPASS** [40 CFR 122.41(m)]~~

~~(1) *Definitions.*~~

~~(a) "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. [40 CFR 122.41(m)(1)(i)] or~~

~~(b) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be~~

Comment [A126]: While this is a standard condition for NPDES permits, it is manifestly inapplicable to MS4 permits. Since BMPs constructed to comply with the Order include bypass provisions to protect their entirety, the Copermittees would have to notify the Regional Board whenever a storm was predicted. This provision should be deleted.

~~expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.~~
~~[40 CFR 122.41(m)(1)(ii)]~~

~~(2) *Bypass not exceeding limitations*. The Copermittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the standard provisions required under 40 CFR 122.41(m)(3) and (4).~~
~~[40 CFR 122.41(m)(2)]~~

~~(3) *Notice*.~~

~~(a) *Anticipated bypass*. If the Copermittee knows in advance of the need for a bypass, it must submit a notice, if possible at least ten days before the date of the bypass. [40 CFR 122.41(m)(3)(i)] or~~

~~(b) *Unanticipated bypass*. The Copermittee must submit notice of an unanticipated bypass in accordance with the standard provisions required under 40 CFR 122.41(l)(6) (24 hour notice).~~
~~[40 CFR 122.41(m)(3)(ii)]~~

~~(4) *Prohibition of Bypass*.~~

~~(a) Bypass is prohibited, and the San Diego Water Board may take enforcement action against a Copermittee for bypass, unless:~~
~~[40 CFR 122.41(m)(4)(i)]~~

~~(i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; [40 CFR 122.41(m)(4)(i)(A)]~~
~~(ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance;~~
~~[40 CFR 122.41(m)(4)(i)(B)] and,~~
~~(iii) The Copermittee submitted notice in accordance with the standard provisions required under 40 CFR 122.41(m)(3).~~
~~[40 CFR 122.41(m)(4)(i)(C)]~~

~~(b) The San Diego Water Board may approve an anticipated bypass, after considering its adverse effects, if the San Diego Water Board determines that it will meet the three conditions listed above.~~
~~[40 CFR 122.41(m)(4)(ii)]~~

~~n.~~m. **UPSET** [40 CFR 122.41(n)]

(1) *Definition.* "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Copermittee. An upset does not

include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. [40 CFR 122.41(n)(1)]

(2) *Effect of an upset*. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the standard provisions required under 40 CFR 122.41(n)(3) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. [40 CFR 122.41(n)(2)]

(3) *Conditions necessary for a demonstration of upset*. A Copermittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that: [40 CFR 122.41(n)(3)]

(a) An upset occurred and that the Copermittee can identify the cause(s) of the upset; [40 CFR 122.41(n)(3)(i)]
(b) The permitted facility was at the time being properly operated; [40 CFR 122.41(n)(3)(ii)] and
(c) The Copermittee submitted notice of the upset in accordance with the standard provisions required under 40 CFR 122.41(l)(6)(ii)(B) (24-hour notice). [40 CFR 122.41(n)(3)(iii)]
(d) The Copermittee complied with any remedial measures pursuant to the standard provisions required under 40 CFR 122.41(d). [40 CFR 122.41(n)(3)(iii)]

(4) *Burden of proof*. In any enforcement proceeding, the Copermittee seeking to establish the occurrence of an upset has the burden of proof. [40 CFR 122.41(n)(4)]

~~o.~~n. STANDARD PERMIT PROVISIONS FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS

[40 CFR 122.42(c)]

The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the San Diego Water Board or State Water Board under 40 CFR 122.26(a)(1)(v) must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report must include:

(1) The status of implementing the components of the storm water management program that are established as permit conditions; [40 CFR 122.42(c)(1)]

(2) Proposed changes to the storm water management programs that are established as permit conditions. Such proposed changes must be consistent with 40 CFR 122.26(d)(2)(iii); [40 CFR 122.42(c)(2)] and

(3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under 40 CFR 122.26(d)(2)(iv) and (v); [40 CFR 122.42(c)(3)]

(4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; [40 CFR 122.42(c)(4)]

(5) Annual expenditures and budget for year following each annual report; [40 CFR 122.42(c)(5)]

(6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; [40 CFR 122.42(c)(6)]

(7) Identification of water quality improvements or degradation. [40 CFR 122.42(c)(7)]

~~p.~~o. **STANDARD PERMIT PROVISIONS FOR STORM WATER DISCHARGES** [40 CFR 122.42(d)]

The initial permits for discharges composed entirely of storm water issued pursuant to 40 CFR 122.26(e)(7) must require compliance with the conditions of the permit as expeditiously as practicable, but in no event later than three years after the date of issuance of the permit.

2. General Provisions

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. The general provisions applicable to this Order and NPDES permit are as follows:

a. DISCHARGE OF WASTE IS A PRIVILEGE

No discharge of waste into the waters of the State, whether or not such discharge is made pursuant to waste discharge requirements, shall create a vested right to continue such discharge. All discharges of waste into waters of the State are privileges, not rights. [CWC Section 13263(g)]

b. DURATION OF ORDER AND NPDES PERMIT

(1) *Effective date*. This Order and NPDES permit becomes effective on the 50th day after its adoption provided the USEPA has no objection. If the USEPA objects to its issuance, this Order shall not become effective until such objection is withdrawn. This Order supersedes Order No. R9-2007-0001 upon the effective date of this Order, and supersedes Order Nos. R9-2009-0002 and R9-2010-0016 upon their expiration or earlier notice of coverage.

(2) *Expiration*. This Order and NPDES permit expires five years after its effective date. [40 CFR 122.46(a)]

(3) *Continuation of expired order*. After this Order and NPDES permit expires, the terms and conditions of this Order and NPDES permit are automatically continued pending issuance of a new permit if all requirements of the federal NPDES regulations on the continuation of expired permits (40 CFR 122.6) are complied with.

c. AVAILABILITY

A copy of this Order must be kept at a readily accessible location and must be available to on-site personnel at all times.

d. CONFIDENTIALITY OF INFORMATION

Except as provided for in 40 CFR 122.7, no information or documents submitted in accordance with or in application for this Order will be considered confidential, and all such information and documents shall be available for review by the public at the San Diego Water Board office.

Claims of confidentiality for the following information will be denied:
[40 CFR 122.7(b)]

(1) The name and address of any permit applicant or Copermittee;
[40 CFR 122.7(b)(1)] and

(2) Permit applications and attachments, permits, and effluent data.
[40 CFR 122.7(b)(2)]

e. EFFLUENT LIMITATIONS

(1) *Interim effluent limitations*. The Copermittee must comply with any interim effluent limitations as established by addendum, enforcement action, or revised waste discharge requirements which have been, or may be, adopted by the San Diego Water Board.

(2) *Other effluent limitations and standards*. If any applicable toxic effluent standard or effective prohibition (including any schedule of compliance specified in such effluent standard or effective prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant and that standard or effective prohibition is more stringent than any limitation on the pollutant in the permit, the San Diego Water Board shall institute proceedings under these regulations to modify or revoke and reissue the permit to conform to the toxic effluent standard or effective prohibition. [40 CFR 122.44(b)(1~~)]}]}].~~}]

f. DUTY TO MINIMIZE OR CORRECT ADVERSE IMPACTS

The Copermittee must take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this Order, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the noncompliance.

g. PERMIT ACTIONS

The filing of a request by the Copermittee for modification, revocation and reissuance, or termination of this Order, or a notification of planned change in or anticipated

noncompliance with this Order does not stay any condition of this Order. (See 40 CFR 122.41(f)) In addition, the following provisions apply to this Order:

(1) Upon application by any affected person, or on its own motion, the San Diego Water Board may review and revise the requirements in this Order. All requirements must be reviewed periodically. [CWC Section 13263(e)]

(2) This Order may be terminated or modified for cause, including, but not limited to, all of the following: [CWC Section 13381]

(a) Violation of any condition contained in the requirements of this Order. [CWC Section 13381(a)]

(b) Obtaining the requirements in this Order by misrepresentation, or failure to disclose fully all relevant facts. [CWC Section 13381(b)]

(c) A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge. [CWC Section 13381(c)]

(3) When this Order is transferred to a new owner or operator, such requirements as may be necessary under the CWC may be incorporated into this Order.

h. NPDES PERMITTED NON-STORM WATER DISCHARGES

The San Diego Water Board has, in prior years, issued a limited number of individual NPDES permits for non-storm water discharges to MS4s. The San Diego Water Board or State Water Board may in the future, upon prior notice to the Copermittee(s), issue an NPDES permit for any non-storm water discharge (or class of non-storm water discharges) to an MS4. A Copermittee will not be held responsible for pollutants in its MS4 discharge originating from an NPDES-permitted non-storm water discharge.

Comment [A127]: This comment reflects the appropriate responsibility between NPDES dischargers.

i. MONITORING

In addition to the standard provisions required under 40 CFR 122.41(j) and (l)(4), the following general monitoring provisions apply to this Order:

(1) Where procedures are not otherwise specified in Order, sampling, analysis and quality assurance/quality control must be conducted in accordance with the Quality Assurance Management Plan (QAMP) for the State of California's Surface Water Ambient Monitoring Program (SWAMP), adopted by the State Water Resources Control Board (State Water Board).

(2) Pursuant to 40 CFR 122.41(j)(2) and CWC Section 13383(a), each Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five (5) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time.

Comment [A128]: This provision and the provision in Attachment B 1.j(2) conflict. The Water Board should reconcile these provisions or delete one.

(3) All chemical, bacteriological, and toxicity analyses must be conducted at a laboratory certified for such analyses by the California Department of Public Health or a laboratory approved by the San Diego Water Board.

(4) For priority toxic pollutants that are identified in the California Toxics Rule (CTR) (65 Fed. Reg. 31682), the Copermittees must instruct their laboratories to establish calibration standards that are equivalent to or lower than the Minimum Levels (MLs) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP). If a Copermittee can demonstrate that a particular ML is not attainable, in accordance with procedures set forth in 40 CFR Part 136, the lowest quantifiable concentration of the lowest calibration standard analyzed by a specific analytical procedure (assuming that all the method specified sample weights, volumes, and processing steps have been followed) may be used instead of the ML listed in Appendix 4 of the SIP. The Copermittee must submit documentation from the laboratory to the San Diego Water Board for approval prior to raising the ML for any priority toxic pollutant.

j. ENFORCEMENT

(1) The San Diego Water Board is authorized to enforce the terms of this Order under several provisions of the CWC, including, but not limited to, CWC Sections 13385, 13386, and 13387.

(2) Nothing in this Order shall be construed to protect the Copermittee from its liabilities under federal, state, or local laws.

(3) The CWC provides for civil and criminal penalties comparable to, and in some cases greater than, those provided for under the CWA.

(4) Except as provided in the standard conditions required under 40 CFR 122.41(m) and (n), nothing in this Order shall be construed to relieve the Copermittee from civil or criminal penalties for noncompliance.

(5) Nothing in this Order shall be construed to preclude the institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties to which the Copermittee is or may be subject to under Section 311 of the CWA.

(6) Nothing in this Order shall be construed to preclude institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authoring preserved by Section 510 of the CWA.

k. SEVERABILITY

The provisions of this Order are severable, and if any provision of this Order, or the application of any provisions of this Order to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this Order shall not be affected thereby.

l. APPLICATIONS

Any application submitted by a Copermittee for reissuance or modification of this Order must satisfy all applicable requirements specified in federal regulations as well as any additional requirements for submittal of a Report of Waste Discharge specified in the CWC and the California Code of Regulations.

m. IMPLEMENTATION

All plans, reports and subsequent amendments submitted in compliance with this Order must be implemented immediately (or as otherwise specified). All submittals by Copermittees must be adequate to implement the requirements of this Order.

n. REPORT SUBMITTALS

(1) All report submittals must include an executive summary, introduction, conclusion, recommendations, and signed certified statement.

(2) Each Copermittee must submit a signed certified statement covering its responsibilities for each applicable submittal.

(3) The Principal Watershed Copermittee(s) must submit a signed certified statement covering its responsibilities for each applicable submittal and the sections of the submittals for which it is responsible.

(4) Unless otherwise directed, the Copermittees must submit one hard copy and one electronic copy of each report required under this Order to the San Diego Water Board, and one electronic copy to the USEPA.

(5) The Copermittees must submit reports and provide notifications as required by this Order to the following:

EXECUTIVE OFFICER
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
9174 SKY PARK COURT, SUITE 100
SAN DIEGO CA 92123-4340
Telephone: (858) 467-2952 Fax: (858) 571-6972

EUGENE BROMLEY
US ENVIRONMENTAL PROTECTION AGENCY
REGION IX
PERMITS ISSUANCE SECTION (W-5-1)
75 HAWTHORNE STREET
SAN FRANCISCO CA 94105

ATTACHMENT C

ACRONYMS AND ABBREVIATIONS

AMAL	Average Monthly Action Level
ASBS	Area(s) of Special Biological Significance
BMP	Best Management Practice
Basin Plan	Water Quality Control Plan for the San Diego Basin
CEQA	California Environmental Quality Act
CCR	California Code of Regulations
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWC	California Water Code
CZARA	Coastal Zone Act Reauthorization Amendments of 1990
ESAs	Environmentally Sensitive Areas
GIS	Geographic Information System
IBI	Index of Biological Integrity
LID	Low Impact Development
MDAL	Maximum Daily Action Level
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
NAL	Non-Storm Water Action Level
NAICS	North American Industry Classification System
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
ROWD	Report of Waste Discharge (application for NPDES reissuance)
SAL	Storm Water Action Level
San Diego Water Board	California Regional Water Quality Control Board, San Diego Region
SIC	Standard Industrial Classification Code
State Water Board	State Water Resources Control Board
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
WDID	Waste Discharge Identification Number
WLA	Waste Load Allocation
WQBEL	Water Quality Based Effluent Limitation

DEFINITIONS

Active/Passive Sediment Treatment - Using mechanical, electrical or chemical means to flocculate or coagulate suspended sediment for removal from runoff from construction sites prior to discharge.

Anthropogenic Litter – Trash generated from human activities, not including sediment.

Automotive Repair Shop – a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539 or equivalent NAICS code.

Average Monthly Action Level – The highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month, or the geometric mean for bacteria, as applicable.

Beneficial Uses - The uses of water necessary for the survival or wellbeing of man, plants, and wildlife. These uses of water serve to promote tangible and intangible economic, social, and environmental goals. "Beneficial Uses" ~~of the waters of the State~~ that may be protected include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. Existing beneficial uses are uses that were attained in the surface or ground water on or after November 28, 1975; and potential beneficial uses are uses that would probably develop in future years through the implementation of various control measures. "Beneficial Uses" are equivalent to "Designated Uses" under federal law. [California Water Code Section 13050(f)].

Best Management Practices (BMPs) - Defined in 40 CFR 122.2 as schedules of activities, effective prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. In the case of municipal discharge permits, BMPs may be used in the place of numeric effluent limits.

Bioassessment - The use of biological community information to evaluate the biological integrity of a water body and its watershed. With respect to aquatic ecosystems, bioassessment is the collection and analysis of samples of the benthic macroinvertebrate community together with physical/habitat quality measurements associated with the sampling site and the watershed to evaluate the biological condition (i.e. biotic integrity) of a water body.

Biofiltration - Practices that use vegetation and amended soils to detain and treat runoff from impervious areas. Treatment is through filtration, infiltration, adsorption, ion exchange, and biological uptake of pollutants.

Biological Integrity - Defined in Karr J.R. and D.R. Dudley. 1981. Ecological perspective on water quality goals. *Environmental Management* 5:55-68 as: "A balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitat of the region." Also referred to as ecosystem health.

BMP Design Manual – A plan developed to eliminate, reduce, or mitigate the impacts of runoff from development projects, including Priority Development Projects.

Channel Rehabilitation and Improvement – Remedial measures or activities for the purpose of improving or restoring the environmental health of streams, channels or river systems. Techniques may vary from in-stream restoration techniques to off-line stormwater management practices installed in the system corridor or upland areas. Rehabilitation techniques may include, but are not limited to the following: riparian zone restoration, constructed wetlands, bank stabilization, channel modifications, and day lighting of drainage systems.

Comment [A129]: This term should be defined in Attachment C given its use in the Order.

Clean Water Act Section 303(d) Water Body - An impaired water body in which water quality does not meet applicable water quality standards and/or is not expected to meet water quality standards, even after the application of technology based pollution controls required by the CWA. The discharge of runoff to these water bodies by the Copermittees is significant because these discharges can cause or contribute to violations of applicable water quality standards.

Construction Site – Any project, including projects requiring coverage under the Construction General Permit, that involves soil disturbing activities greater than 10,000 square feet including, but not limited to, clearing, grading, disturbances to ground such as stockpiling, and excavation. This does not include interior construction activities such as interior remodeling, plumbing, electrical, or mechanical work.

Contamination - As defined in the Porter-Cologne Water Quality Control Act, contamination is "an impairment of the quality of waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste whether or not waters of the State are affected."

Copermittee – An incorporated city within the County of Orange, County of Riverside, or County of San Diego in the San Diego Region~~,~~ (Region 9),~~,~~ the County of Orange, the County of Riverside, the County of San Diego, the Orange County Flood Control District, the Riverside County Water Conservation and Flood Control District, the San Diego Regional Airport Authority, or the San Diego Unified Port District. See also "Municipal Copermittee" and "Special District Copermittee".

Comment [A130]: As set forth above, the Riverside County Copermittees make a distinction in these classes of Copermittees based on their respective legal authorities.

Copermittees – All of the individual Copermittees, collectively, unless the obligation in question is directed to one or a sub-group of Copermittees.

Comment [A131]: This clarifies that not all obligations in the Order directed to "Copermittees" are in fact applicable to all Copermittees.

Critical Channel Flow (Qc) – The channel flow that produces the critical shear stress that initiates bed movement or that erodes the toe of channel banks. When measuring Qc, it should be based on the weakest boundary material – either bed or bank.

Daily Discharge – Defined as either: (1) the total mass of the constituent discharged over the calendar day or any 24 hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g. concentration.)

The Daily Discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day, or other 24 hour period other than a day), or by the arithmetic mean of analytical results from one or more grab samples taken over the course of a

day.

Development Projects - Construction, rehabilitation, redevelopment, or reconstruction of any public or private residential project, industrial~~,~~ or commercial facility, or any other projects designed for post-construction human activity or occupation and involving land disturbance activities.

Comment [A132]: This definition clarifies the nature of Development Projects covered under the Order.

Direct Discharge to an Environmentally Sensitive Area – refers to outflow from a drainage conveyance system that collects runoff from the subject development or redevelopment site and terminates at or in receiving waters within the ESA, and is not commingled with flows from adjacent or other upstream lands.

Dry Season –May 1 to September 30.

Dry Weather – Weather is considered dry if the preceding 72 hours has been without measurable precipitation (>0.1 inch).

Enclosed Bays – Enclosed bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost bay works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays do not include inland surface waters or ocean waters.

Erosion – When land is diminished or worn away due to wind, water, or glacial ice. Often the eroded debris (silt or sediment) becomes a pollutant via storm water runoff. Erosion occurs naturally but can be intensified by land clearing activities such as farming, development, road building, and timber harvesting. This permit is concerned particularly with non-naturally occurring Erosion that eventually results in a Sediment discharge from MS4s into Receiving Waters.

Environmentally Sensitive Areas (ESAs) - Areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; areas designated as preserves or their equivalent under the Natural Communities Conservation Program within the Cities and County of Orange; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.

Estuaries – Waters, including coastal lagoons, located at the mouth of streams that serve as areas of mixing fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and ocean water. Estuaries do not include inland surface waters or ocean waters.

Existing Development – Any area that has been developed and exists for municipal, commercial, industrial, or residential purposes, uses, or activities. May include areas that are not actively used for its originally developed purpose, but may be re-purposed or redeveloped

for another use or activity.

Flow Duration – The long-term period of time that flows occur above a threshold that causes significant sediment transport and may cause excessive erosion damage to creeks and streams (not a single storm event duration). The simplest way to visualize this is to consider a histogram of pre- and post-project flows using long-term records of hourly data. To maintain pre-development flow duration means that the total number of hours (counts) within each range of flows in a flow-duration histogram cannot increase between the pre- and post-development condition. Flow duration within the range of geomorphologically significant flows is important for managing erosion.

Grading - The cutting and/or filling of the land surface to a desired slope or elevation.

Hazardous Material – Any substance that poses a threat to human health or the environment due to its toxicity, corrosiveness, ignitability, explosive nature or chemical reactivity. These also include materials named by the USEPA in 40 CFR 116 to be reported if a designated quantity of the material is spilled into the waters of the U.S. or emitted into the environment.

Hazardous Waste - Hazardous waste is defined as "any waste which, under Section 600 of Title 22 of this code, is required to be managed according to Chapter 30 of Division 4.5 of Title 22 of this code" [CCR Title 22, Division 4.5, Chapter 11, Article 1].

Household Hazardous Waste – Paints, cleaning products, and other hazardous wastes generated during home improvement or maintenance activities.

Hydromodification – The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

Illicit Connection – Any connection to the MS4 that conveys an illicit discharge.

Illicit Discharge - Any discharge to the MS4 that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from fire fighting activities [40 CFR 122.26(b)(2)]. Discharges from natural sources or from conditionally exempt sources described in this Order are not considered Illicit Discharges.

Inactive Areas – Areas of construction activity that are not active and those that have been active and are not scheduled to be re-disturbed for at least 14 days.

Infiltration – Water other than wastewater that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow [40 CFR 35.2005(20)].

Comment [A133]: Wrong definition. Should be defining infiltration (of stormwater into soil)

Inland Surface Waters – Includes all surface waters of the U.S.~~State~~ that do not include the ocean, enclosed bays, or estuaries.

Jurisdictional Runoff Management Program Document – A written description of the specific jurisdictional runoff management measures and programs that each Copermittee will implement to comply with this Order and ensure that illicit discharges are effectively prohibited, and storm water pollutant discharges in runoff are reduced to the MEP and do not cause or contribute to a violation of water quality standards.

Low Impact Development (LID) – A storm water management and land development strategy that emphasizes conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions.

Low Impact Development Best Management Practices (LID BMPs) – LID BMPs include schedules of activities, effective prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States through storm water management and land development strategies that emphasize conservation ~~s~~and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions. LID BMPs include retention practices that do not allow runoff, such as infiltration, rain water harvesting and reuse, and evapotranspiration. LID BMPs also include flow-through practices such as biofiltration that may have some discharge of storm water following pollutant reduction.

Major Outfall – As defined in the Code of Federal Regulations, a major outfall is a MS4 outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (i.e. discharge from a single conveyance other than a circular pipe which is associated with a drainage area of more than 50 acres); or, for MS4s that receive storm water from lands zoned for industrial activity (based on comprehensive zoning plans or equivalent), a MS4 outfall that discharges from a single pipe with an inside diameter of 12 inches or more or from its equivalent (i.e. discharge from other than a circular pipe associated with a drainage area of 2 acres or more).

Maximum Daily Action Level (MDAL) –The highest allowable daily discharge of a pollutant, over a calendar day (or 24 hour period). For pollutants with action levels expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with action levels expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

Maximum Extent Practicable (MEP) – The technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) ~~for storm water~~ that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) in combination with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than BAT. A definition for MEP is not provided either in the statute or in the regulations. Instead the definition of MEP is dynamic and will be defined by the following process over time: municipalities propose their definition of MEP by way of their runoff management programs. Their total collective and individual activities conducted pursuant to the runoff management programs becomes their proposal for MEP as it applies both to their overall effort, as well as to specific activities (e.g., MEP for street sweeping, or MEP for MS4 maintenance). In the absence of a proposal acceptable to the San Diego Water Board, the San Diego Water Board

defines MEP.

In a memo dated February 11, 1993, entitled "Definition of Maximum Extent Practicable," Elizabeth Jennings, Senior Staff Counsel, SWRCB addressed the achievement of the MEP standard as follows:

> "*To achieve the MEP standard, municipalities must employ whatever Best Management Practices (BMPs) are technically feasible (i.e., are likely to be effective) and are not cost prohibitive. The major emphasis is on technical feasibility. Reducing pollutants to the MEP means choosing effective BMPs, and rejecting applicable BMPs only where other effective BMPs will serve the same purpose, or the BMPs would not be technically feasible, or the cost would be prohibitive. In selecting BMPs to achieve the MEP standard, the following factors may be useful to consider:*
>
> *a. Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?*
> *b. Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?*
> *c. Public Acceptance: Does the BMP have public support?*
> *d. Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?*
> *e. Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc.?*
>
> *The final determination regarding whether a municipality has reduced pollutants to the maximum extent practicable can only be made by the Regional or State Water Boards, and not by the municipal discharger. If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit derived, it would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs that would address a pollutant source, or to pick a BMP based solely on cost, which would be clearly less effective. In selecting BMPs the municipality must make a serious attempt to comply and practical solutions may not be lightly rejected. In any case, the burden would be on the municipal discharger to show compliance with its permit. After selecting a menu of BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented."*

Monitoring Year – October 1 to September 30

Municipal Copermittee – Any Copermittee, exclusive of Special District Copermittees.

Comment [A134]: This definition clarifies distinction between municipal and special district copermittees.

Municipal Separate Storm Sewer System (MS4) – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designated or used for collecting or conveying storm water;

(iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.226. Copermittees need only comply with permit conditions relating to "discharges from the municipal separate storm sewers for which they are operators." 40 CFR 122.26(a)(vi).

Comment [A135]: These changes correct a citation and clarifies the responsibility of the copermittees as to other MS4s.

National Pollutant Discharge Elimination System (NPDES) - The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the CWA.

Non-Storm Water - All discharges to and from a MS4 that do not originate from precipitation events (i.e., all discharges from a MS4 other than storm water). ~~Non-storm water includes illicit discharges and NPDES permitted discharges.~~

Comment [A136]: This is overly limiting, There are other types of Non-storm discharges that do not fit these two categories (e.g. irrigated agriculture, natural flows, conditionally exempt flows, others). Rather than trying to identify all types of non-stormwater discharges, suggest just deleting this sentence.

Nuisance - As defined in the Porter-Cologne Water Quality Control Act, a nuisance is "anything which meets all of the following requirements: 1) Is injurious to health, or is indecent, or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. 2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. 3) Occurs during, or as a result of, the treatment or disposal of wastes."

Ocean Waters – the territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the State Board's California Ocean Plan.

Order – Unless otherwise specified, refers to this Order, Order No. R9-2013-0001 (NPDES No. CAS0109266)

Outfall – *Outfall* means a *point source* as defined by 40 CFR 122.2 at the point where a MS4 discharges to waters of the United States and does not include open conveyances connecting two MS4s, or pipes, tunnels or other conveyances which connect segments of the same stream or other waters of the United States and are used to convey waters of the United. 40 CFR 122.26(b)(9).

Comment [A137]: This federal regulatory definition clarifies the nature of an outfall.

Parking Lot – a land area or facility for the tempraory parking or storage of motor vehicles used personally, for business, or for commerce.

Comment [A138]: Definition placed in Attachment C for consistency.

Persistent Flow - Persistent flow is defined as the presence of an MS4 discharge that is hydraulically connected to a flowing~~, pooled, or ponded~~ receiving water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

Comment [A139]: Changes reflect the necessity of a connection to flowing receiving waters. Discharges that are pooled are not discharges to waters of the United States. Please see Comment Letter section 3.5.3.

Person - A person is defined as an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof [40 CFR 122.2].

Point Source - Any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, landfill leachate collection systems, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return

flows from irrigated agriculture or agricultural storm water runoff.

Pollutant - Any agent that may cause or contribute to the degradation of water quality such that a condition of pollution or contamination is created or aggravated.

Pollution - As defined in the Porter-Cologne Water Quality Control Act, pollution is "the alteration of the quality of the waters of the State by waste, to a degree that unreasonably affects the either of the following: 1) The waters for beneficial uses; or 2) Facilities that serve these beneficial uses." Pollution may include contamination.

Pollution Prevention - Pollution prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control BMPs, treatment control BMPs, or disposal.

Pre-Project~~Development~~ Runoff Conditions – Runoff conditions that exist~~existed~~ onsite immediately before the ~~existing development was constructed, or exists onsite before~~ planned development activities occur. Pre-development is not intended to be interpreted as that period before any human-induced land disturbance has occurred. 64 FR 68761.

Comment [A140]: This definition reflects the exact language used by U.S. EPA in the Federal Register. Moreover, it avoids the constitutional and statutory problems with requiring developers to mitigate for impacts not attributable to their project. It also is consistent with the CEQA standard for project impact mitigation.

Priority Development Projects - New development and redevelopment projects defined under Provision E.3.b of Order No. R9-2012-0011.

Properly Designed – Designed in accordance with the Copermittee's BMP Design Manual and/or any appropriate design requirements set forth by the Copermittee and based on widely accepted design criteria and in accordance with this Order.

Comment [A141]: This definition is required to address this standard, which is mentioned in the Order but not defined.

Rainy Season (aka Wet Season) –October 1 to April 30

Receiving Waters – Waters of the United States.

Receiving Water Limitations - Waste discharge requirements issued by the San Diego Water Board typically include both: (1) "Effluent Limitations" (or "Discharge Limitations") that specify the technology-based or water-quality-based effluent limitations; and (2) "Receiving Water Limitations" that specify the water quality objectives in the Basin Plan as well as any other limitations necessary to attain those objectives. In summary, the "Receiving Water Limitations" provision is the provision used to implement the requirements of CWA section 402(p)(3)(B).

Redevelopment - The creation, addition, and or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include trenching and resurfacing associated with utility work; parking lots; resurfacing existing roadways; cutting and reconfiguring of surface parking lots; new sidewalk construction, pedestrian ramps, or bike lane on existing roads; and routine replacement of damaged pavement, such as pothole repair and emergency restoration and public safety projects.

Comment [A142]: The changes requested in this definition appropriately exempts de minimis or emergency/public safety projects.

Reporting Period – The period of information that is reported in the Annual Report. The reporting period consists of two components: 1) July 1 to June 30, consistent with the fiscal

year, for the implementation of the jurisdictional runoff management programs, and 2) October 1 to September 30, consistent with the monitoring year for the monitoring and assessment programs. Together, these two time periods constitute the reporting year for the Annual Report due January 31 following the end of the monitoring year.

Restaurant – a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812).

Retail gasoline outlet (RGO) – a business that sells automotive or truck fuel to the general public with a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

Retain –Keep or hold in a particular place, condition, or position without discharge to ~~surface~~ Receiving W~~w~~aters.

Retrofitting – Storm water management practices put into place after development has occurred in watersheds where the practices previously did not exist~~.~~ or are ineffective.~~.~~ Retrofitting of developed areas is intended to improve water quality, protect downstream channels, reduce flooding, or meet other specific objectives. Retrofitting developed areas may include, but is not limited to replacing roofs with green roofs, disconnecting downspouts or impervious surfaces to drain to pervious surfaces, replacing impervious surfaces with pervious surfaces, installing rain barrels, installing rain gardens, and trash area enclosures.

Runoff - All flows in a storm water conveyance system that consists of the following components: (1) storm water (wet weather flows) and (2) non-storm water including dry weather flows.

San Diego Water Board – As used in this document the term "San Diego Water Board" is synonymous with the term "Regional Board" as defined in Water Code section 13050(b) and is intended to refer to the California Regional Water Quality Control Board for the San Diego Region as specified in Water Code Section 13200.

Sediment - Soil, sand, and minerals washed from land into water. Sediment resulting from anthropogenic sources (i.e. human induced land disturbance activities) that is discharged into Receiving Waters is considered a pollutant. This Order regulates only the discharges of sediment from anthropogenic sources into Receiving Waters and does not regulate naturally occurring sources of sediment. Sediment can destroy fish-nesting areas, clog animal habitats, and cloud waters so that sunlight does not reach aquatic plants.

Special District Copermittee – A separate legal entity that may own or operate MS4 systems, but has no land use authorities outside of their MS4. The Riverside County Flood Control and Water Conservation District [and Orange County Flood Control District?] is a [are] Special District Copermittee[s].

Source Control BMP – Land use or site planning practices, or structural or nonstructural measures that aim to prevent runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between pollutants and runoff.

Storm Water – Per 40 CFR 122.26(b)(13), means storm water runoff, snowmelt runoff and surface runoff and drainage. ~~Surface runoff and drainage pertains to runoff and drainage resulting from precipitation events.~~

Comment [A143]: Relocation of definition to Attachment C.

Comment [A144]: Definition added for clarity and consistency with prior redlines

Comment [A145]: Edit clarifies intent of definition.

Stream, Channel, or Habitat Rehabilitation – Measures or activities for the purpose of improving or restoring the environmental health (i.e. physical, chemical and biological integrity) of streams, channels, or river systems. Rehabilitation techniques may include, but are not limited to, riparian zone restoration, constructed wetlands, bank stabilization, channel reconfiguration, and daylighting drainage systems.

Street, Road, Highway, Freeway– Any paved impervious surface that is used for the transportation of automobiles, trucks, motorcycles, and other vehicles, with an ADT of at least 100 vehicles per day.

Comment [A146]: Definition relocated to Attachment C.

Comment [A147]: Consistent with RGO definition.

Structural BMPs - A subset of BMPs which detains, retains, filters, removes, or prevents the release of pollutants to surface waters from development projects in perpetuity, after construction of a project is completed.

Total Maximum Daily Load (TMDL) - The maximum amount of a pollutant that can be discharged into a water body from all sources (point and non-point) and still maintain water quality standards. Under CWA section 303(d), TMDLs must be developed for all water bodies that do not meet water quality standards after application of technology-based controls.

Toxicity - Adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies). The water quality objectives for toxicity provided in the Basin Plan, state in part…"All waters shall be free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life….The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge".

Treatment Control BMP – Any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media absorption or any other physical, biological, or chemical process.

Unpaved Road – Any long, narrow stretch without pavement used for traveling by motor passenger vehicles between two or more points. Unpaved roads are generally constructed of dirt, gravel, aggregate or macadam and may be improved or unimproved.

Waste - As defined in CWC Section 13050(d), "waste includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal."

Article 2 of CCR Title 23, Chapter 15 (Chapter 15) contains a waste classification system that applies to solid and semi-solid waste, which cannot be discharged directly or indirectly to water of the state and which therefore must be discharged to land for treatment, storage, or disposal in accordance with Chapter 15. There are four classifications of waste (listed in order of highest to lowest threat to water quality): hazardous waste, designated waste, non-hazardous solid waste, and inert waste.

Water Quality Objective - Numerical or narrative limits on constituents or characteristics of

water designated to protect designated beneficial uses of the water. [California Water Code Section 13050 (h)]. California's water quality objectives are established by the State and Regional Water Boards in the Water Quality Control Plans. Numeric or narrative limits for pollutants or characteristics of water designed to protect the beneficial uses of the water. In other words, a water quality objective is the maximum concentration of a pollutant that can exist in a receiving water and still generally ensure that the beneficial uses of the receiving water remain protected (i.e., not impaired). Since water quality objectives are designed specifically to protect the beneficial uses, when the objectives are violated the beneficial uses are, by definition, no longer protected and become impaired. This is a fundamental concept under the Porter Cologne Act. Equally fundamental is Porter Cologne's definition of pollution. A condition of pollution exists when the water quality needed to support designated beneficial uses has become unreasonably affected or impaired; in other words, when the water quality objectives have been violated. These underlying definitions (regarding beneficial use protection) are the reason why all waste discharge requirements implementing the federal NPDES regulations require compliance with water quality objectives. (Water quality objectives are also called water quality criteria in the CWA.)

Water Quality Standards - Water quality standards, as defined in Clean Water Act section 303(c) consist of the beneficial uses (e.g., swimming, fishing, municipal drinking water supply, etc.,) of a water body and criteria (referred to as water quality objectives in the California Water Code) necessary to protect those uses. Under the Water Code, the water boards establish beneficial uses and water quality objectives in water quality control or basin plans. Together with an anti-degradation policy, these beneficial uses and water quality objectives serve as water quality standards under the Clean Water Act. In Clean Water Act parlance, state beneficial uses are called "designated uses" and state water quality objectives are called "criteria." Throughout this Order, the relevant term is used depending on the statutory scheme.

Waters of the State - Any water, surface or underground, including saline waters within the boundaries of the State [CWC section 13050 (e)]. The definition of the Waters of the State is broader than that for the Waters of the United States in that all water in the State is considered to be a Waters of the State. ~~regardless of circumstances or condition.~~

Comment [A148]: The intent of the definition is to cover natural water sources, and not anthropogenic structures that collect runoff to reduce volume/velocity or pollutants.

Waters of the United States - As defined in the 40 CFR 122.2, the Waters of the U.S. are defined as: "(a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate "wetlands;" (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters otherwise defined as waters of the United States under this definition: (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial seas; and (g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA."

Watershed - That geographical area which drains to a specified point on a water course, usually a confluence of streams or rivers (also known as drainage area, catchment, or river basin).

Wet Season (aka Rainy Season) –October 1 to April 30

Wet Weather – Weather is considered wet if there is a storm event of 0.1 inches and greater and the following 72 hours, unless otherwise defined by the Copermittee for the purposes of monitoring consistent with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), or developed pursuant to another regulatory mechanism.

Comment [A149]: This is important as the monitoring requirements require you to sample the first 'Wet Weather' event. 0.1" of rainfall doesn't result in runoff in all watersheds. Copermittees should be able to define mobilization criteria to identify storms that are likely to produce runoff in that drainage area consistent with this EPA guidance.

LEGAL AND FACT SHEET COMMENTS ON TENTATIVE ORDER R9-2013-0001 MADE ON BEHALF OF THE RIVERSIDE COUNTY COPERMITTEES

This document provides comments on various legal issues raised by Tentative Order No. R9-2013-0001 (the "Draft Permit") and associated attachments, including Attachment F, the Fact Sheet/Technical Report ("Fact Sheet"), and are made on behalf of the Riverside County Flood Control & Water Conservation District ("District"), the County of Riverside and the Cities of Murrieta, Temecula and Wildomar (collectively, the "Riverside County Copermittees").

These legal comments are in addition to the other comments on the Draft Permit and attachments made by the Riverside County Copermittees (including the Comment Letter dated January 10, 2013 and signed by Jason E. Uhley, Chief of the District's Watershed Protection Division) and the redline attachment ("Redline"), as well as any comments or testimony which may be offered at the public hearing(s) on the Draft Permit. The Comment Letter and Redline also discuss legal issues. The Riverside County Copermittees appreciate this opportunity to comment and welcome any questions that Water Board staff may have.

These comments are submitted subject to the same reservations set forth in the Comment Letter regarding the Water Board's lack of authority, in the absence of agreement by the Riverside County Copermittees or the filing of a Report of Waste Discharge ("ROWD"), to issue a regional municipal separate storm sewer system ("MS4") permit to the Riverside County Copermittees. Submission of these comments does not waive this objection.

Request for Additional Public Comment

Before turning to comments on the Draft Permit, the Riverside County Copermittees wish to note that in view of the extensive comments made by them, as well as what we anticipate will be extensive comments by the South Orange County and San Diego County Copermittees, as well as from other stakeholders, it would greatly facilitate the permit adoption process if the Water Board were to release a revised Tentative Order for further review and comment prior to final adoption of the Permit. This will enable the Water Board staff to address the comments in a more orderly fashion and provide all parties with the opportunity to see how staff proposes to incorporate the comments in the Draft Permit.

Comments on Findings

Finding 2 and Fact Sheet Section VII.B: This finding recites that the Water Board "has the legal authority to issue a regional MS4 permit pursuant to its authority under Clean Water Act ("CWA") section 402(p)(3)(B) and 40 CFR 122.26(a)(i)(v)." Section VII.B of the Fact Sheet provides a more detailed rationale for this finding (at pages F-22-23).

The Riverside County Copermittees respectfully disagree with this finding and the analysis provided in the Fact Sheet. We do not believe that a regional MS4 permit is authorized under the CWA or the implementing regulations, absent agreement by the copermittees to be bound by such a MS4 permit (as is the case with the Bay Area MS4 permit covering discharges into the Bay).

The CWA itself does not explicitly authorize MS4 permits that, like the Draft Permit, cross county lines. CWA section 402(p)(3)(B) provides only that "[p]ermits for discharges from municipal storm sewers . . . may be issued on a system- or jurisdiction-wide basis." This language, contrary to the conclusion in Finding 2, indicates that a multi-county permit, covering several distinct non-interconnected municipal stormwater "systems" in multiple watersheds with multiple receiving waters, is not one issued on a "system-wide" basis and that an MS4 permit covering multiple jurisdictions in three different counties is not one issued on a "jurisdiction-wide basis." Because neither "system-wide" nor "jurisdiction-wide" are defined in the CWA, however, the CWA regulations must also be reviewed.

The regulatory provision cited in Finding 2, 40 CFR § 122.26(a)(1)(v), does not add clarity, since it merely repeats the "system-wide" and "jurisdiction-wide" language of the Act and the regulations define neither term. The regulations do, however, suggest that "system-wide" is not intended to cover multiple large MS4s in different jurisdictions. The regulations, at 40 CFR § 122.26(a)(1)(v) state that in making the determination to designate a system-wide or jurisdiction-wide basis" the permitting authority should consider the location of the "discharge" with respect to waters of the United States, the size of the discharge, the quantity and nature of the pollutants discharge and other relevant factors.

The Draft Permit covers multiple "discharges" into receiving waters located in three separate counties and the size, quality and nature of the discharges vary widely, due to varying hydrologic and climatic conditions in the three areas.

The Fact Sheet cites 40 CFR § 122.26(a)(3)(iv), which provides, in relevant part, that the Water Board "may issue one systemwide permit covering all, or a portion of all municipal separate storm systems in adjacent or interconnected large or medium municipal separate storm sewer systems." This provision does not, however, authorize issuance of a regional MS4 permit covering multiple counties and multiple watersheds that are not interconnected and which do not share a common receiving water. In fact, the only common fact uniting the various MS4s in the three counties under the Water Board's jurisdiction is that common jurisdiction.

First, even if the subject MS4 facilities otherwise met the criteria specified in the federal regulations (which, as noted below, they do not), the prospective permittees must apply for such a MS4 permit, as set forth in the first sentence of 40 CFR § 122.26(a)(3)(iv): "*One permit application may be submitted for all or a portion of all* municipal separate storm sewers within adjacent or interconnected large or medium municipal separate storm sewer systems." (emphasis supplied). No such application has been filed with respect to the Draft Permit. Only the San Diego County copermittees submitted a ROWD for MS4 facilities within that county.[1]

[1] Moreover, the fact that permittees have the ability to determine the geographic scope of the permit is reinforced by the language in 40 CFR § 122.26(a)(3)(iii)(B), which allows an individual municipality to submit "a distinct permit application which only covers discharges from the [MS4] for which the owner is responsible . . ." If a permittee can "opt out" of a multi-MS4 permit by submitting a individual permit application, a permitting authority such as a water board cannot impose a multi-MS4 permit on that permittee.

Second, this provision requires that the MS4s to be covered in the permit be "adjacent or interconnected." This is not true with respect to the MS4s proposed to be included within the Draft Permit. For example, the MS4 within the Santa Margarita Region of Riverside County is not "interconnected" with any other MS4s except those within that region. This is true also of the MS4s within South Orange County and San Diego County, which are not interconnected. Additionally, none of the MS4s in the three counties is "adjacent" to each other – each is separated by miles of non-urban area. In the SMR for example, the confluence of Temecula and Murrieta Creeks to form the Santa Margarita River is miles upstream of Rainbow Creek, the first discharge from San Diego County to the River. And, the confluence of Temecula and Murrieta Creeks is over 30 miles from the discharge of the Santa Margarita River to the Pacific Ocean.

The next inquiry is whether the three separate county MS4s could be considered, together, to form a single "large municipal separate storm sewer system." The federal MS4 regulations define this term as follows:

> *Large municipal separate storm sewer system* means all municipal separate storm sewers that are either:
>
> (i) Located in an incorporated place with a population of 250,000 or more . . . ."
>
> (ii) Located in the counties listed in Appendix H, except municipal separate storm sewers that are located in the incorporated places, townships or towns within such counties; or
>
> (iii) Owned or operated by a municipality other than those described [in paragraphs (i) and (ii)] . . . and that are designated by the Director as part of the large or medium municipal separate storm sewer system due to the interrelationship between the discharges of the designated storm sewer and the discharges from municipal separate storm sewers described [in paragraphs (i) and (ii)]. In making this determination the Director may consider the following factors:
>
> (A) Physical interconnections between the municipal separate storm sewers;
>
> (B) The location of discharges from the designated municipal separate storm sewer relative to discharges from municipal separate storm sewers described in [paragraph (i)];
>
> (C) The quantity and nature of pollutants discharged to waters of the United States;
>
> (D) The nature of the receiving waters; and
>
> (E) Other relevant factors, or
>
> (iv) The Director may, upon petition, designate as a large municipal separate storm sewer system, municipal separate storm sewers located within the boundaries of a region

> defined by a storm water management regional authority based on a jurisdictional, watershed, or other appropriate basis that includes one or more of the systems described [in paragraphs (i), (ii) or (iii)].

40 CFR § 122.26(b)(4).

None of paragraphs (i), (ii) or (iii) authorizes a regional MS4 permit such as that envisioned in the Draft Permit. The Draft Permit applies beyond a single incorporated place, County or municipality. Of these paragraphs, only paragraph (iv) could arguably be used to define the MS4s in the three Counties as a single MS4 and thus authorize a regional permit. The key limiting language is, however, "within the boundaries of a region **defined by a storm water management regional authority,** based on a jurisdictional, watershed, or other appropriate basis . . . ." A regional water board is not a stormwater management regional authority. This is clear from the MS4 regulations, which provide that a "**regional authority may be responsible for submitting a permit application"** under certain conditions. 40 CFR § 122.26(a)(3)(iii)(C). Clearly, a Water Board is not responsible for submitting MS4 permit applications.

U.S. EPA, in the Preamble to the final Phase I MS4 regulations (55 Fed Reg. 47990, November 16, 1990), further illuminated the meaning of the regulatory language. The Preamble indicates that commenters proposed eight different MS4 permitting options:

> Option 1 – systems owned or operated by incorporated places augmented by integrated discharges; Option 2 – systems owned or operated by incorporated places augmented with significant other municipal discharges; Option 3 – systems owned or operated by counties; Option 4 – systems owned and operated by States or State departments of transportation; Option 5 – systems within the boundaries of an incorporated place; Option 6 – systems within the boundaries of counties; Option 7 – systems in census designated urbanized areas; and Option 8 – systems defined by watershed boundaries.

55 Fed Reg. at 48039. None of these options encompasses the fact pattern presented by the Draft Permit, which covers multiple counties and multiple watersheds, are not interconnected, do not share common receiving waters and are located in separate census designated urbanized areas.

In explaining the derivation of 40 CFR 122.26(b)(4)(iv), U.S. EPA noted that it was "an outgrowth of comments on all options, especially Option 4 (State owned systems/State highways) and Option 8 (watersheds)." 55 Fed. Reg. at 48040. Thus, the Caltrans MS4 permit (which applies statewide) is authorized under paragraph (iv), since the "storm water management regional authority" defining the region to be covered is Caltrans itself. No such single authority exists for the three-county area proposed to be included in the Draft Permit, which also would encompass multiple watersheds.

Moreover, paragraph (iv) provides that the regional authority must "petition" the U.S. EPA Director to have a single MS4 designated within the boundaries of the region defined by the regional authority. Because California has been delegated NPDES permitting authority, a regional authority would presumably need to petition its Water Board to authorize such a regional permit. Since no such regional authority exists to establish the geographical basis for a

three-county MS4 permit, there is no such entity to "petition" the Water Board to establish a regional permit. This is clear from the Preamble to the Phase I regulations, which indicate that "regional storm water authorities" established by "some States or counties" may "petition the Director [or its state designee] to assume a regional role. 55 Fed. Reg. at 48042. It is clear from the Preamble that it is not the Water Board that has the authority to make such a petition, but rather the "storm water authorities" (i.e., municipalities, districts and Caltrans).

It should be noted that the Bay Area Regional MS4 Permit was a joint Bay Area Water Board and copermittee effort, coordinated by the Bay Area Stormwater Agencies Management Association ("BASMAA"). It is not the case that the Bay Area Water Board imposed this regional MS4 permit. The copermittees, coordinated by BASMAA, themselves determined to develop a regional MS4 permit. Further, all of the copermittees to the Bay Area Regional MS4 Permit discharge to a common receiving water, San Francisco Bay. Also, an Alaska MS4 permit cited in a letter from the Office of Chief Counsel to county counsel for Orange and Riverside Counties was issued to several municipalities and entities within a single "borough," which is equivalent in Alaska to a county.

Additionally, neither the Riverside County Copermittees nor those in South Orange County have filed ROWDs with the San Diego Water Board, which serve as the application for an NPDES MS4 permit in California. Water Code § 13260. The current Riverside County MS4 permit for the Santa Margarita Region provides that the ROWD is not required to be filed until May 2015, 180 days prior to the November 10, 2015 expiration date of that permit. Order R9-2010-0016, Part II.K.2.c.

> This ROWD must include:
>
> (1) Proposed changes to the Copermittees' runoff management programs; (2) Proposed changes to monitoring programs; (3) Justification for proposed changes; (4) Name and mailing addresses of the Copermittees; (5) Names and titles of primary contacts of the Copermittees; (6) Any other information necessary for the reissuance of this Order and (7) Any other information required by federal regulations for permit reapplications.

Id. It should be noted that several items of this ROWD are specifically intended to assist in the formulation of a new, SMR-specific MS4 permit, including proposed changes to the runoff management and monitoring programs, as well as justification for such changes, information necessary for "reissuance" of the SMR MS4 permit and information required by the federal regulations for MS4 permit reapplications.

As a simple jurisdictional matter, the Water Board cannot issue a regional MS4 permit to MS4 dischargers that have not applied for it. Moreover, as noted above, the SMR copermittees are entitled to apply for an MS4 permit applicable to their jurisdiction. Further, each individual copermittee has the right to apply for a MS4 permit covering only its discharges, as has the City of Long Beach in the Los Angeles Region.

Finding 3, Finding 15, in Fact Sheet Section VII.A and in Multiple Locations Throughout Draft Permit: In Finding 3, the Fact Sheet and in multiple locations throughout the Draft Permit (which are identified in the redline of the Draft Permit submitted with these comments by the Riverside County Copermittees ("Redline")), it is stated that the maximum extent practicable ("MEP") applies only to "storm water" discharges from the MS4. This is not correct.[2]

In fact, the Clean Water Act does not distinguish between non-stormwater and stormwater in terms of MS4 discharges which must be controlled to the MEP standard. *See* 33 U.S.C. § 1342(p)(3)(B)(iii)(the MS4 permit "shall require controls to reduce the discharge of pollutants to the maximum extent practicable . . . ." While the heading of 33 U.S.C. § 1342(p) refers to "Municipal and industrial stormwater discharges," this is not dispositive, as 33 U.S.C. § 1342(p)(3)(B)(ii), which requires the effective prohibition of "non-stormwater discharges" into the MS4. Thus, the language of this heading does not in fact support the argument that the MEP standard applies only to pollutants in stormwater discharges.

That both non-stormwater and stormwater must be controlled to the MEP standard was made clear by U.S. EPA itself in the preamble to the final Phase I stormwater regulations. In that preamble, U.S. EPA made it clear that "MEP control measures" would be implemented to address not only pollutants in "storm water" but also from "non-storm water discharges." As the preamble states:

> "Permittees are required to develop management programs for four types of pollutant sources which discharge to large and medium municipal storm sewer systems. Discharges from [such systems] are usually expected to be composed primarily of: (1) Runoff from commercial and residential areas; (2) storm water runoff from industrial areas; (3) runoff from construction sites; and (4) *non-storm water discharges*. Part 2 of the permit application has been designed to allow [permittees] the opportunity to propose *MEP control measures for each* of these components of the discharge."

55 Fed. Reg. at 48052 (emphasis supplied).

This language sets forth USEPA's understanding of the plain language of the CWA: "pollutants" must be controlled to the MEP from any MS4 "discharge," not merely pollutants in stormwater.

Finding 11: This finding, in relevant part, states that "[h]istoric and current development makes use of natural drainage patterns and features as conveyances for runoff. Rivers, streams and creeks in developed areas used in this manner are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and receiving water." This conclusion is legally incorrect.

First, under no circumstance can a natural stream constitute an MS4. The definition of "MS4" in the CWA regulations (a definition found in Attachment C of the Draft Permit) refers to a

[2] Finding 15 also states, erroneously, that the MEP standard "is explicitly for "Municipal . . . *Stormwater Discharges* (emphasis added)" from the MS4.

"conveyance or system of conveyances" "owned or operated" by a municipality. 40 CFR §122.26(b)(8). In California, natural rivers and streams are not "owned" nor "operated" by the municipality through which they flow. Moreover, a municipality obviously cannot "operate" a natural creek or stream. In further support of the point that a MS4 is an artificial, not natural, watercourse, the types of "conveyances" identified in the regulation ("roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains") all refer to anthropogenic structures, not natural streams. 40 CFR § 122.26(b)(8).

Second, a "receiving water" cannot also be an MS4, as is plain from the CWA regulations. An MS4 is itself defined as discharging to waters of the United States. 40 C.F.R. §122.26(b)(8). An MS4 cannot, in essence, discharge to itself. Moreover, an "outfall" from an MS4 (the point at which the discharge enters a receiving water) does not, pursuant to 40 C.F.R §122.26 (b)(9), include conveyances connecting "segments of the same stream or other waters of the United States and are used to convey waters of the United States."

Moreover, U.S. EPA, in the Preamble to the initial version of the MS4 regulations (53 Fed. Reg. 49416 (Dec. 7, 1988)) expressly determined that "streams, wetlands and other water bodies that are waters of the United States are not storm sewers for the purposes of this rule" and that "stream channelization, and stream bed stabilization, which occur in waters of the United States" were not subject to National Pollutant Discharge Elimination System ("NPDES") permits under Section 402 of the CWA. 53 Fed. Reg. at 49442.

Additionally, the United States Supreme Court recently reversed the Ninth Circuit Court of Appeals and ruled that flows from sections of the Los Angeles and San Gabriel Rivers that are comprised of concrete flood control channels are not a "discharge" under the CWA, confirming that such rivers, even if improved, are "receiving waters" along with any natural portions of those rivers. *Los Angeles County Flood Control Dist. v. Natural Resources Defense Council*, 568 U.S. __(January 8, 2013) (slip op.).

The above-cited statement in the finding is incorrect and should be stricken, as recommended in the Redline.

Finding 12: This finding states, in relevant part, that "[a]s operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not prohibit or otherwise control." This statement is legally incorrect, and ignores the salient point that the "discharger" of a pollutant is primarily responsible for controlling/permitting that discharge, under both the CWA and the Porter-Cologne Act. For example, under the Porter-Cologne Act, any persons discharging or proposing to discharge "waste" into waters of the state must file a report of waste discharge and obtain a waste discharge requirement. Water Code §§ 13260, 13263. The operator of the MS4 into which that water eventually flows is not "essentially accepting" responsibility for the discharge. The responsibility of the MS4 operator is established under the CWA, and that is to effectively prohibit non-stormwater discharges into [the MS4] and to control the discharge of pollutants from the MS4 to the MEP.

Moreover, the statement ignores the fact that in California, downstream property owners (including municipalities owning and operating MS4 facilities) must accept the flow of upstream waters. In fact, for a downstream municipality to block such flow would constitute an inverse condemnation or the creation of a nuisance under California law. *See Arreola v. County of Monterey* (2002) 99 Cal.App.4th 722 (obstruction of flood waters by improperly designed highway constituted inverse condemnation and nuisance).

Finding 28 and Fact Sheet Section VI: In the Finding, it is stated that the Water Board "finds that the requirements in this permit are not more stringent than the minimum federal requirements" and that therefore "a CWC section 13241 analysis is not required." The Finding further recites that notwithstanding this fact, "the San Diego Water Board has developed an economic analysis of the requirements in this Order."

For the reasons set forth in the comments of the Riverside County Copermittees, numerous provisions in the Draft Permit are in fact more stringent than the requirements of the CWA and its implementing regulations and therefore require an adequate Water Code § 13241 analysis. Unfortunately, this analysis is not provided in the Fact Sheet.

First, the economic analysis set forth in the Fact Sheet does not meet the requirements of Section 13241, as it does not analyze the six specific factors required to be analyzed under the section. Second, the analysis uses cost data from other sources, only a few of which were from the municipalities proposed to be included under the Draft Permit. These data are also a number of years old; the most recent study referenced in the Fact Sheet, the one done for the State Board by Cal State Sacramento, was dated January 2005 and included decade-old cost data from the City of Encinitas that dated from 2002-2003.

Third, the section of the Fact Sheet discussing the benefits of water quality notes that "there have been no studies for the San Diego Region to quantify the added value that surface waters with healthy water quality can provide." Thus, the Water Board has no evidence with which to compare the costs and benefits of the programs set forth in the Draft Permit. Moreover, the discussion makes the incorrect assumption that the alternative to the programs in the Draft Permit would be no controls on pollutants in urban runoff. As the Fact Sheet correctly notes, the Draft Permit is the fifth term MS4 permit for the copermittees. The previous four permits all contained increasingly complex and expensive control requirements, both structural and non-structural, designed to improve the quality of MS4 discharges. Thus, an appropriate cost analysis must compare the incremental costs of the programs set forth in the Draft Permit and the incremental benefits attributable to that permit. This has not been done in the Fact Sheet. Finally, the analysis does not recognize that the receiving waters provided economic benefits to residents of the San Diego Region long before issuance of the first MS4 permits in 1990. It is thus illogical to suggest that these pre-existing economic benefits would be lost if the Draft Permit is not adopted.

Finding 29 and Fact Sheet Section VII.F: The finding and the supporting argument in the Fact Sheet represents an attempt by Water Board staff to address whether the requirements of the Draft Permit represent an unfunded state mandate. That attempt, however, is beyond the scope of the Water Board's powers, since the *only* agency charged by the Legislature with determining

the presence of a state mandate, and whether that mandate is unfunded, is the Commission on State Mandates. Govt. Code § 17552; *Kinlaw v. State of California* (1991) 54 Cal.3d 326, 333. The Water Board has no jurisdiction to make a legal finding or discuss in the Fact Sheet that the Draft Permit, in whole or in part, does not constitute an unfunded state mandate.

Additionally fact sheets are required, under the CWA regulations, to provide the legal authority and reasons for each substantive permit provision (40 CFR § 124.8(a)(4); 40 CFR § 124.56(a)). *See also City of Rancho Cucamonga v. Regional Water Quality Control Board-Santa Ana Region* (2006), 135 Cal.App.4th 1377, 1382 (stating that fact sheets contains "the legal and factual grounds for the Water Board's recommendation to adopt the . . . permit"). Finding 29 and the discussion in Section VII.F of the Fact Sheet do not relate to any Draft Permit provision, nor provide legal authority or justification for the Draft Permit's adoption. As such, the finding and Fact Sheet discussion are surplussage and should be deleted.

The Riverside County Copermittees disagree with each of the arguments set forth in the Finding and Fact Sheet as to why the Draft Permit does not constitute an unfunded state mandate. Nevertheless, because the exclusive arena for such disagreements is the Commission on State Mandates, whose jurisdiction does not commence unless and until a test claim is filed before the Commission, the Copermittees need not and will not address those arguments.

Comments on Provisions in Draft Permit

Provision A and Fact Sheet Section VIII.A:

Lack of True Iterative Compliance Process

As set forth in the Redline and in the Comment Letter, the Riverside County Copermittees believe that to effectuate the iterative approach to compliance with water quality standards and other discharge prohibitions in the Draft Permit, the copermittees must be provided with the means to be in compliance. Based on monitoring, exceedances of water quality standards are occurring in the receiving waters subject to the Draft Permit, as set forth in Table G-14 to the latest 2011-2012 monitoring report submitted by the Riverside County Copermittees. Thus, if the copermittees are not provided an iterative means to be in compliance, which was contemplated by State Board's Order No. 2001-15, the copermittees will be issued an illegal MS4 permit, since it is a permit with which they cannot comply. This violates the intent of Congress in the CWA, which "is presumed not to have intended absurd (impossible) results." *Hughey v. JMS Development Corp.*, 78 F.3d 1523, 1529 (11th Cir. 1996); *accord, Mississippi River Revival v. City of Minneapolis*, 319 F.3d 1013, 1017-1018 (8th Cir. 2003).

With regard to the iterative process, Water Board staff has indicated numerous times during the workshop process that achievement of water quality standards is expected to take many years. The entire WQIP approach is aimed at the eventual attainment of such standards, as are the TMDLs issued to other copermittees, which have final compliance dates years into the future.

This approach is, however, put into jeopardy by the requirement, as expressed in the Fact Sheet at F-39, that the discharge prohibition and receiving water limitation provisions are

"independently applicable, meaning that compliance with one provision does not provide a 'safe harbor' where there is non-compliance with another provision (i.e., compliance with Provision A.4 does not shield a Copermittee who may have violated Provision A.1.a, A.1.c, or A.2.a from an enforcement action." While the Fact Sheet appropriately notes how this process should work through Provision A.4 (which "essentially requires the Copermittees to implement additional BMPs until MS4 discharges no longer cause or contribute to a violation of water quality standards") it also states that despite this iterative process, "the San Diego Water Board retains the discretion to take other appropriate enforcement and the iterative process does not shield dischargers from citizen suits under the CWA." Fact Sheet at F-40.

The consequences of this approach cannot be overemphasized. Despite the copermittees' good faith undertaking to follow the iterative process outlined in Provision A.4, a Water Board enforcement proceeding or a citizen suit can be brought for violations of water quality standards and, if the citizen plaintiff is successful, a federal judge is empowered to use his/her injunctive powers under Section 505(a) of the CWA to throw out the WQIP, JRMP or other compliance efforts of the copermittees and require other efforts. In such a case, the time and money spent by the copermittees in trying to comply with the Draft Permit, as well as the effort spent by the copermittees and Water Board staff in developing the Draft Permit's terms, are completely wasted.

Thus, the essential conundrum of Provision A, as presently drafted, is clearly exposed. Even though a copermittee may spend significant sums and undertake significant tasks under its WQIP or JRMP, be conducting expensive monitoring and special studies, and be in *full compliance* with all of the programmatic requirements of the Draft Permit, it would still face either a Water Board enforcement action or a citizen suit under Section 505 of the CWA. And, such a suit would allege exceedances of water quality standards (some of which are hardly capable of laboratory detection, much less control) that the Water Board acknowledges cannot be achieved for years.

Provision A is not, however, required by the CWA, as held by the Ninth Circuit in *Defenders of Wildlife v. Browner*, 191 F.3d 1159 (9th Cir. 1999). The holding in *Browner* is further reflected in State Board Order WQ 2001-15 (which the Fact Sheet acknowledges incorporates an "iterative process") which states:

> [O]ur [receiving water limitation] language, similar to the U.S. EPA's permit language discussed in the Browner case, **does not require strict compliance with water quality standards.** Our language requires that **storm water management plans be designed to achieve compliance with water quality standards**. **Compliance is to be achieved over time, through an iterative approach requiring improved BMPs**. As pointed out by the Browner court, there is nothing inconsistent between this approach and the determination that the Clean Water Act does not mandate strict compliance with water quality standards.

Order WQ 2001-15 at 7 (emphasis added). Thus, Provision A is inconsistent with the State Board's own precedential order, which requires the iterative approach effectuated by the suggested Redline changes.[3]

In further support, it may be noted that the U.S. EPA-drafted MS4 permit for the District of Columbia does not contain the type of language found in Provision A, but rather requires "an iterative and an adaptive management process for pollutant reduction and for achieving applicable water quality standard and/or total maximum daily load (TMDL) compliance." DC MS4 Permit Fact Sheet, page 5 (attached as Exhibit A).

Also, despite the assertion in the Fact Sheet that the copermittees are seeking a "safe harbor" from liability, this is incorrect. Every provision of an MS4 permit is subject to enforcement; given the complexity of the Draft Permit, the failure by a copermittee to comply with any provision could lead to such enforcement.

As noted above, MS4 discharges may not be achieving compliance with strict water quality standards, as recognized by the Issue Paper released by State Board staff in preparation for a November 20, 2012 workshop on receiving water limitation issues raised by *NRDC v. County of Los Angeles*. That Issue Paper stated that as "the storm water management programs of municipalities have matured, **an increasing body of monitoring data indicates that water quality standards are in fact not being met by many MS4s.**" (State Board Issue Paper, Page 2, emphasis supplied) (*see* Exhibit B.)

Perhaps most importantly, requiring strict and immediate compliance with discharge prohibition and receiving water limitations inhibits, not supports, the philosophy of the Draft Permit, which is to encourage the copermittees to focus on the most significant problems in their watersheds and to prioritize their resources to address those problems. Provision A, by contrast, discourages innovative approaches or prioritization, since all pollutants exceeding water quality standards create liability. Moreover, as discussed above, in the event of a citizen suit being brought such as that in the *NRDC* case, a federal judge could award injunctive relief to a successful plaintiff that could completely ignore or supplant the WQIP and other permit terms.

For additional discussion of receiving water limitations issues, please see Exhibit C, a letter submitted by the District to the State Board in connection with the recent workshop held by the State Board on receiving water limitations language. The Riverside County Copermittees hereby reference and incorporate this Exhibit into these comments.

The Riverside County Copermittees support a true iterative process that requires refinement and amendment of the WQIP and associated BMPs when receiving water limitation violations are recorded. That is the essence of the iterative process; the identification of problems and the development of BMPs to attempt to address those problems.

[3] While the Fact Sheet cites as authority *Natural Resources Defense Council v. County of Los Angeles*, discussed above, the Ninth Circuit was simply responding to language in the former Los Angeles County MS4 permit, and did not determine that such non-iterative language was required by the CWA.

The Redline proposes a means to achieve compliance using the WQIPs, which are intended to bring the copermittees into compliance with the discharge prohibition and receiving water limitation provisions of the Draft Permit over time. The Redline links compliance with Provisions A.1, A.2 and A.3 to A.4, which indicates that compliance is obtained through the preparation and updating of the WQIPs.

It must be noted, however, that the Riverside County Copermittees do not agree with the approach suggested by others, that any WQIP-based compliance approach be necessarily accompanied by a "Reasonable Assurance Analysis." Such an analysis could be extremely complex, expensive and time intensive to develop. Generally, such analyses are developed in the preparation of TMDLs and take a number of years to develop and refine. Given that the Santa Margarita Watershed has no adopted TMDLs, there are no comprehensive pollutant transport or BMP models available for the suite of constituents that might be considered for prioritization within a WQIP for that watershed. In the context of a TMDL, such models would be developed by the combined resources of the Water Board, stakeholders and dischargers. Requiring such an exercise to be undertaken solely with the public resources of the residents of the SMR is beyond the Copermittees' financial ability and would shift responsibility for development of TMDLs from the Water Board to the Copermittees.

Discussion in Fact Sheet

The Fact Sheet discussion also contains a number of legal and factual errors. First, the statement on page F-34 that non-stormwater discharges from the MS4 are subject to NPDES permitting requirements is unsupported by the plain language of the CWA, which (as noted above) applies the MEP standard to *all* discharges of pollutants from the MS4, not just those in stormwater. Also, such discharges are not subject to separate requirements under the NPDES program, as suggested on F-34, and non-storm water discharges are not the same, legally, as "illicit discharges." Please see discussion below.

Similarly, the Fact Sheet's conclusion that "Regional Water Boards are not limited by the iterative MEP approach to storm water regulation in crafting appropriate regulations for non-storm water discharges" is incorrect. The Fact Sheet correctly states that MEP has not been defined in the CWA or by U.S. EPA in the CWA regulations. However, the Fact Sheet incorrectly concludes that MEP is "ultimately defined" by the Water Boards or the State Board. What constitutes "MEP" is a question of federal law under the CWA, not a matter for definition by agencies which merely have been delegated the authority to enforce the CWA in California. The only source for such a finding is a memorandum from a State Board attorney, not case authority.

Moreover, Provisions B-E of the Draft Permit, far from establishing a "minimum framework" for the copermittees to achieve the MEP standard, sets forth in many cases requirements that far exceed the plain requirements of the CWA, the implementing regulations and in some cases even state law, or which require the copermittees to undertake steps that are not "practicable." These requirements are identified in the comments of the Riverside County Copermittees. In such respects, those requirements do not represent a "minimum framework" for MEP.

Other Issues

The Riverside County Copermittees also object to the provision in A.1.a and other portions of the Draft Permit that prohibit certain discharges into "waters of the state." The CWA regulates discharges into waters of the United States, which are surface waters. Expanding the prohibition to cover waters of the state expands the scope of the Draft Permit to protect groundwater, as a matter of state law. It should be noted that the recent Los Angeles County MS4 Permit appropriately applies this prohibition to waters of the United States.

Provision B.5: As noted in the Comment Letter, the CWA requires that illegal discharges into the MS4 be addressed by a program of steps taken to address such discharges. The Redline emphasizes that this program be guided by WQIP priorities, which is consistent with the overall intent of the Draft Program.

Provision E.2.a and E.2.a.(7): These provisions require the Copermittees to, as a part of their Illicit Discharge Detection and Elimination (IDDE) program, address all non-stormwater discharges as "illicit discharges," thus requiring the copermittees to "reduce or eliminate non-stormwater discharges" whether or not the discharges have been identified as "illicit."

The Fact Sheet asserts that "Provision E.2.a.(7) is consistent with the requirements of the CWA section 402(p)(3)(B)(ii) and 40CFR 122.26(d)(1)(v)(B). That assertion is not correct. Section 402(p)(3)(B)(ii) of the CWA states that MS4 permits "shall include a requirement to *effectively prohibit* non-stormwater discharges into the storm sewers" (emphasis supplied). The CWA regulations include two provisions designed to begin implementation of the "effective prohibition." The first provision requires MS4 permittees to perform a screening analysis, intended to provide sufficient information to develop priorities for a program to detect and remove illicit discharges. 40 CFR 122.26(d)(1)(iv)(D). The second requires MS4 permittees to develop a recommended site-specific management plan to detect and remove illicit discharges (or ensure they are covered by an NPDES permit) and to control improper disposal to MS4s. 40 CFR 122.26(d)(1)(iv)(D) and 122.26(d)(2)(B). The MS4 permittees are required to identify the non-stormwater discharge as an illicit discharge prior to having an obligation to effectively prohibit it. There is not otherwise a presumption to reduce or eliminate it.

40 CFR 122.26(d)(1)(v)(B), cited in the Fact Sheet, requires "[a] description of the existing program to identify illicit connections to the municipal storm sewer system. The description should include inspection procedures and methods for detecting and preventing illicit discharges, and describe areas where this program has been implemented."

The provision and rationale within the Fact Sheet blur the distinction between the copermittees' need to "effectively" prohibit non-stormwater discharges and to detect and eliminate illicit discharges.

- The requirement is "effectively prohibit" non-stormwater discharges, not "reduce or eliminate" non-stormwater discharges.
- Although copermittees are required to have a program to prevent illicit discharges to the MS4, non-stormwater discharges should only be addressed as illicit discharges where

such discharges are identified as sources of pollutants that may cause or contribute to an exceedance of a water quality objective.

- The IDDE program is established to detect and eliminate "illicit discharges", not non-stormwater discharges in general.

Please see the Redline for modifications to Provision E.2 addressing these issues.

Provision E.2.a.(3): In the Redline, the Riverside County Copermittees request that categories of irrigation runoff discharges (landscape irrigation, irrigation water and lawn watering) be considered as conditionally exempt discharges (not subject to treatment as illicit discharges).

The rationale for not including irrigation runoff discharges lacks a legal and factual basis. As noted in the Comment Letter, the only factual basis for this provision with respect to the Riverside County Copermittees is discussion in a public information informational brochure, which was itself based on a similar document from Orange County. Fact Sheet F-76. Despite assertions to the contrary in the Fact Sheet, this brochure does not represent a determination by the Riverside County Copermittees that irrigation runoff is a category of non-stormwater discharge that must be effectively prohibited. The other evidence in support of prohibiting the conditional exemption for irrigation runoff is entirely from different areas of the region, with different urban development patterns, lithology and hydrology. No specific determination has been made by the Copermittees (or the Water Board) that irrigation runoff in the Santa Margarita Region has actually been shown to be significant source of pollutants to receiving waters in the SMR.

EPA, in the preamble to the federal MS4 regulations, required that a *permittee* must make a finding that the "irrigation water" discharges must be a "source of pollutants to waters of the United States . . . ." 55 Fed. Reg. 48037. Moreover, such discharges must represent a "significant" source of pollutants to waters of the United States "under certain conditions." U.S. EPA, *Guidance Manual for the Preparation of Part 2 of the NPDES Permit Application for Discharges from Municipal Separate Storm Sewer Systems,* November 1992 ("EPA Part 2 Guidance Manual"), at p. 6-33. These conditions require a focus not on an entire category of discharges, but rather a discharger-by-discharger examination.

In the MS4 regulatory preamble, EPA stated that "[i]n general, municipalities will not be held responsible for prohibited some specific components of discharges or flows listed below through their [MS4], even though such components may be considered non-storm water discharges, unless such discharges *are specifically identified on a case-by-case basis as needing to be addressed."* 55 Fed. Reg. 47995 (emphasis supplied). In the Guidance Manual, EPA states:

> If an applicant knows . . . that landscape irrigation water from a ***particular site*** flows through and picks up pesticides **or *excess*** nutrients from fertilizer applications, there may be a reasonable potential for a storm water discharge to result in a water quality impact. In such an event, the applicant should contact the NPDES permitting authority to request that the authority order ***the discharger*** . . . to obtain a separate NPDES permit (or in this case, the discharge could be controlled through the storm water management program of the MS4).

EPA Part 2 Guidance Manual, p. 6-33 (emphasis added). Read in this context of this language, the Water Board has no power greater than a municipality in terms of its ability to identify non-stormwater discharges as "illicit" and thus required to be regulated, and must identify specific discharges, and not entire categories of discharges. *See* 55 Fed. Reg. 48037. This has not been done in the Fact Sheet.

Provision E.3(c): This provision requires the Copermittees to compel development projects that may not result in a hydromodification impact to the applicable receiving waters, to implement on-site or "alternative compliance" hydromodification mitigation measures and to use using "pre-development (naturally occurring)" runoff reference condition as applied to sites that are, in fact, developed.

The Riverside County Copermittees are concerned that implementing these requirements would subject the Copermittees to liability under the takings clauses of the U.S. and California Constitutions as well as under the Mitigation Fee Act because of the questionable nexus between such a project's lack of actual hydromodification impacts upon the receiving waters, and the hydromodification management measures required in the Draft Permit.

When imposing a condition on a development permit, a local government is required under the federal and state constitutions to establish that the condition bears a reasonable relationship to the impacts of the development project. This rule applies even to legislatively enacted requirements and impact fees or exactions.[4] Moreover, fees imposed on a discretionary ad hoc basis are subject to heightened scrutiny under a two-part test. First, local governments must show that there is a substantial relationship between the burden created by the impact of development and any fee or exaction.[5] Second, a development project's impacts must bear a "rough proportionality" to any development fee or exaction.[6] Under California law, the *Nollan/Dolan* heightened scrutiny test also applies to in-lieu fees.[7]

The Legislature has memorialized these requirements in the Mitigation Fee Act, which establishes procedures that local governments must follow to impose impact fees.[8] Irrespective of whether the hydromodification management requirements are implemented by legislative act or on an ad hoc basis, the copermittees' attempt to enforce them as proposed in the Draft Permit would likely result in claims by developers and property owners alleging unconstitutional takings of private property and violations of the Mitigation Fee Act. This is because a developer could argue that limiting hydromodification impacts of already developed property to its "naturally occurring" state, or requiring hydromodification mitigation measures for impacts not imposed by the project, would not have a legally sufficient nexus to the impact of the development project.

In addition, the Copermittees wish to bring the Water Board's attention to a recent case, *Virginia Dept. of Transportation v. United States Environmental Protection Agency*, Civ. Action No.

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[4] *Building Indus. Ass'n v. City of Patterson* (2009)171 Cal. App. 4th 886, 898.
[5] *Nollan v. California Coastal Comm'n*, 483 U.S. 825, 837 (1987).
[6] *Dolan v. City of Tigard*, 512 U.S. 374, 391 (1994).
[7] *Ehrlich v. City of Culver City* (1996) 12 Cal. 4th 854, 876.
[8] Cal. Gov't Code §§ 66000-66025.

1:12-CV-775 (E.D. Va. January 3, 2013) (slip op.), which is attached for the Water Board's convenience as Exhibit D. In this case, a federal district judge found that the CWA did not authorize U.S. EPA to regulate stormwater itself as a pollutant. The impact of this case is not known at this time, as it will probably be appealed to the Fourth Circuit Court of Appeals. Still, any approach to hydromodification which focuses on flows *per se*, as opposed to pollutants, may not withstand legal scrutiny.

Provision E.3.c.(3)(c)(i): This provision requires the entire alternative compliance in-lieu fee to be transferred to the copermittee or an escrow account prior to construction of a Priority Development Project (PDP). This provision is problematic, as development fees (which would include the in-lieu fees) are collected at the time of building permit issuance. In large-scale projects, permits may be issued (and development fees collected) in phases. Further, for master-planned developments, fees are generally negotiated through a development agreement to be collected based on certain development milestones. Therefore, collecting and holding the entire in-lieu fee prior to construction interferes with the development practice and may violate the Mitigation Fee Act and local development ordinances. The Redline requests that in-lieu fees be collected in accordance with state and local law.

Provision E.5: In addition to other comments on this provision and others in the Draft Permit relating to retrofitting, any requirements in Draft Permit relating to the retrofitting of engineered channels and other structures employed for flood control purposes must be consistent with the judgment of the flood control districts, to which the Legislature has assigned sole authority for the protection of the lives and property of their citizens from flooding. (Please see Comment Letter and proposed new findings in Redline for further discussion). Due to the urbanization of the counties over the past 150 years, as well as the particular topography and weather conditions found in Southern California, there is a great risk of flooding and hence the need for flood control structures and channels. The flood control districts have both the expertise and the sole legal authority to determine whether retrofitting of flood control structures can be accomplished in light of their statutory obligations, and that expertise and authority must be recognized in the Draft Permit.

Provision E.8: As noted in the Redline, the first requirement under Fiscal Analysis, that each "Copermittee must secure the resources necessary to meet all the requirements of this Order" has been deleted. This requirement is not found in the CWA regulations, which require only the conduct of a fiscal analysis. Moreover, this requirement intrudes on the home rule power of cities and counties by requiring, in essence, that municipal budgets must reflect the priority of compliance with the Order over any competing obligation, including police, fire protection and public health. A key issue in complying with stormwater and MS4 obligations is the ability of municipalities to afford the increasing costs associated with those obligations. In California, of course, the ability to raise taxes to pay for such obligations has been severely curtailed through several voter-approved propositions.

The Riverside County Copermittees request that Provision E.8.a be deleted.

EXHIBIT A

NPDES Permit No. DC0000221

AUTHORIZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM MUNICIPAL SEPARATE STORM SEWER SYSTEM PERMIT

In compliance with the provisions of the Clean Water Act, 33 U.S.C. §§ 1251 *et seq.*

Government of the District of Columbia
The John A. Wilson Building
1350 Pennsylvania Avenue, N.W.
Washington, D.C. 20004

is authorized to discharge from all portions of the municipal separate storm sewer system owned and operated by the District of Columbia to receiving waters named:

Potomac River, Anacostia River, Rock Creek and stream segments tributary to each such water body

in accordance with the Stormwater Management Program(s) dated February 19, 2009, subsequent updates, and related reports, strategies, effluent limitations, monitoring requirements and other conditions set forth in Parts I through IX herein.

The effective issuance date of this permit is: October 7, 2011.

This permit and the authorization to discharge shall expire at midnight, on: October 7, 2016.

Signed this 30th day of September, 2011.

Jon M. Capacasa, Director
Water Protection Division
U.S. Environmental Protection Agency
Region III

1. DISCHARGES AUTHORIZED UNDER THIS PERMIT

1.1 Permit Area

This permit covers all areas within the jurisdictional boundary of the District of Columbia served by, or otherwise contributing to discharges from, the Municipal Separate Storm Sewer System (MS4) owned or operated by the District of Columbia. This permit also covers all areas served by or contributing to discharges from MS4s owned or operated by other entities within the jurisdictional boundaries of the District of Columbia unless those areas have separate NPDES MS4 permit coverage or are specifically excluded herein from authorization under the District's stormwater program. Hereinafter these areas collectively are referred to as "MS4 Permit Area".

1.2 Authorized Discharges

This permit authorizes all stormwater point source discharges to waters of the United States from the District of Columbia's MS4 that comply with the requirements of this permit. This permit also authorizes the discharge of stormwater commingled with flows contributed by process wastewater, non-process wastewater, or stormwater associated with industrial activity provided such discharges are authorized under separate NPDES permits.

This permit authorizes the following non-stormwater discharges to the MS4 when appropriate stormwater activities and controls required through this permit have been applied and which are: (1) discharges resulting from clear water flows, roof drainage, dechlorinated water line flushing, landscape irrigation, ornamental fountains, diverted stream flows, rising ground waters, uncontaminated ground water infiltration to separate storm sewers, uncontaminated pumped ground water, discharges from potable water sources, foundation drains, air conditioning condensation, irrigation waters, springs, footing drains, lawn watering, individual resident car washing, flows from riparian habitats and wetlands, dechlorinated swimming pool discharges, wash water, fire fighting activities, and similar types of activities; and (2) which are managed so that water quality is not further impaired and that the requirements of the federal Clean Water Act, 33 U.S.C. §§ 1251 *et seq.*, and EPA regulations are met.

1.3 Limitations to Coverage

1.3.1 Non-stormwater Discharges

The permittee, as defined herein, shall effectively prohibit non-stormwater discharges into the MS4, except to the extent such discharges are regulated with an NPDES permit.

1.3.2 Waivers and Exemptions

This permit does not authorize the discharge of any pollutant from the MS4 which arises from or is based on any existing waivers and exemptions that may otherwise apply and are not consistent with the Federal Clean Water Act and other pertinent guidance, policies, and regulations. This narrative prohibition on the applicability of such waivers and exemptions extends to any activity that would otherwise be authorized under District law, regulations or

ordinance but which impedes the reduction or control of pollutants through the use of stormwater control measures and/or prevents compliance with the narrative /numeric effluent limits of this permit. Any such discharge not otherwise authorized may constitute a violation of this permit.

1.4 Discharge Limitations

The permittee must manage, implement and enforce a stormwater management program (SWMP) in accordance with the Clean Water Act and corresponding stormwater NPDES regulations, 40 C.F.R. Part 122, to meet the following requirements:

1.4.1. Effectively prohibit pollutants in stormwater discharges or other unauthorized discharges into the MS4 as necessary to comply with existing District of Columbia Water Quality Standards (DCWQS);

1.4.2. Attain applicable wasteload allocations (WLAs) for each established or approved Total Maximum Daily Load (TMDL) for each receiving water body, consistent with 33 U.S.C. § 1342(p)(3)(B)(iii); 40 C.F.R. § 122.44(k)(2) and (3); and

1.4.3. Comply with all other provisions and requirements contained in this permit, and in plans and schedules developed in fulfillment of this permit.

Compliance with the performance standards and provisions contained in Parts 2 through 8 of this permit shall constitute adequate progress toward compliance with DCWQS and WLAs for this permit term.

2. LEGAL AUTHORITY, RESOURCES AND STORMWATER PROGRAM ADMINSTRATION

2.1 Legal Authority

2.1.1 The permittee shall use its existing legal authority to control discharges to and from the Municipal Separate Storm Sewer System in order to prevent or reduce the discharge of pollutants to achieve water quality objectives, including but not limited to applicable water quality standards. To the extent deficiencies can be addressed through regulation or other Executive Branch action, the permittee shall remedy such deficiencies within 120 days. Deficiencies that can only be addressed through legislative action shall be remedied within 2 years of the effective date of this permit, except where otherwise stipulated, in accordance with the District's legislative process. Any changes to or deficiencies in the legal authority shall be explained in each Annual Report.

2.1.2 No later than 18 months following the effective date of this permit, the District shall update and implement Chapter 5 of Title 21 of District of Columbia Municipal Regulations (Water Quality and Pollution) ("updated DC Stormwater Regulations"), to address the control of stormwater throughout the MS4 Permit Area. Such regulations shall be consistent with this

FACT SHEET

National Pollutant Discharge Elimination System (NPDES)
Municipal Separate Storm Sewer System (MS4)
Permit No. DC0000221 (Government of the District of Columbia)

NPDES PERMIT NUMBER: DC0000221 (Reissuance)

FACILITY NAME AND MAILING ADDRESS:

Government of the District of Columbia
The John A. Wilson Building
1350 Pennsylvania Avenue, N.W.
Washington, D.C. 20004

MS4 ADMINISTRATOR NAME AND MAILING ADDRESS:

Director, District Department of the Environment
1200 First Street, N.E., 6th Floor
Washington, D.C. 20002

FACILITY LOCATION:

District of Columbia's Municipal Separate Storm Sewer System (MS4)

RECEIVING WATERS:

Potomac River, Anacostia River, Rock Creek, and Stream Segments Tributary
To Each Such Water Body

INTRODUCTION:

Today's action finalizes reissuance of the District of Columbia Municipal Separate Storm Sewer System (MS4) Permit. In the Final Permit EPA has continued to integrate the adaptive management approach with enhanced control measures to address the complex issues associated with urban stormwater runoff within the corporate boundaries of the District of Columbia, where stormwater discharges via the Municipal Separate Storm Sewer System (MS4).

Since the United States Environmental Protection Agency, Region III (EPA) issued the District of Columbia (the District) its first MS4 Permit in 2000, the Agency has responded to a number of legal challenges involving both that Permit (as well as amendments thereto) and the second-round MS4 Permit issued in 2004. For the better part of ten years, the Agency has worked with various parties in the litigation, including the District and two non-governmental organizations, Defenders of Wildlife and Friends of the Earth, to address the concerns of the various parties. The Agency has engaged in both litigation and negotiation, including formal

mediation.[1] These activities ultimately led to an enhanced stormwater management strategy in the District, consisting of measurable outputs for addressing the issues raised during the litigation and mediation process.

FACILITY BACKGROUND AND DESCRIPTION:

The Government of the District of Columbia owns and operates its own MS4, which discharges stormwater from various outfall locations throughout the District into its waterways.[2]

On April 21, 2010 EPA public noticed the Draft Permit. The Draft Fact Sheet published with that Draft Permit contains more extensive permit background information, and the reader is referred to that document for the history of the District of Columbia MS4 permit.

The public comment period closed on June 4, 2010. EPA received comments from 21 individual commenters and an additional 53 form letters. The Draft Permit, Draft Fact Sheet, and comments received on those documents are all available at: http://www.epa.gov/reg3wapd/npdes/draft_permits.html. The Final Permit reflects many of the comments received. EPA is simultaneously releasing a responsiveness summary responding to these comments.

ACTION TO BE TAKEN:

EPA is today reissuing the District of Columbia NPDES MS4 Permit. The Final Permit replaces the 2004 Permit, which expired on August 18, 2009 and has been administratively extended since that time. The Final Permit incorporates concepts and approaches developed from studies and pilot projects that were planned and implemented by the District under the 2000 and 2004 MS4 permits and modifying Letters of Agreement, and implements Total Maximum Daily Loads (TMDLs) that have been finalized since the prior permit was issued, including the Chesapeake Bay TMDL. A number of applicable measurable performance standards have been incorporated into the Final Permit. These and other changes between the 2004 Permit and today's Final Permit are reflected in a Comparison Document that is part of today's Permit issuance.

WATER QUALITY IN DISTRICT RECEIVING WATERS:

The District's *2008 Integrated Report to the Environmental Protection Agency and U.S. Congress Pursuant to Sections 305(b) and 303(d) Clean Water Act*[3] documents the serious water

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1 A procedural history of Permit appeals can be viewed at the EPA Environmental Appeals Board web: http://yosemite.epa.gov/oa/EAB_Web_Docket.nsf/77355bee1a56a5aa8525711400542d23/b5e5b68e89edabe98525714f00731c6f!OpenDocument&Highlight=2,municipal.

2 Portions of the District are served by a combined sanitary and storm sewer system. The discharges from the combined sewer system are not subject to the MS4 permit, but are covered under NPDES Permit No. xxxx issued to the District of Columbia Water and Sewer Authority.

3 District Department of the Environment, *The District of Columbia Water Quality Assessment, 2008 Integrated Report to the Environmental Protection Agency and U.S. Congress Pursuant to Sections 305(b) and 303(d) Clean Water Act* (hereinafter "2008 Integrated Report").

quality impairments in the surface waters in and around the District. A number of the relevant designated uses are not being met, *e.g.*, aquatic life, fish consumption, and full body contact, and there are a number of specific pollutants of concern that have been identified (for additional discussion on relevant TMDLs *see* Section 4.10 of this Final Fact Sheet).

Commenters on the Draft Permit expressed some frustration over very slow progress or even lack of progress after a decade of implementation of the MS4 program and even longer for other water quality programs. EPA appreciates this concern. Although the District's receiving waters are affected by a range of discharge sources, discharges from the MS4 are a significant contributor of pollutants and cause of stream degradation. EPA also recognizes, however, that stormwater management efforts that achieve a reversal of the ongoing degradation of water quality caused by urban stormwater discharges entail a long term, multi-faceted approach.

Consistent with the federal stormwater regulations for characterizing discharges from the MS4 (40 C.F.R. §122.26(d)(2)(iii)), the first two permit terms for the District's MS4 program required end-of-pipe monitoring to determine the type and severity of pollutants discharging via the system. The monitoring program was not designed to evaluate receiving water quality *per se*, therefore detection of trends or patterns was not reasonably possible. Today's Final Permit includes requirements for a Revised Monitoring Program, and one of the objectives for the program is to use a suite of approaches and indicators to evaluate and track water quality over the long-term (*see* discussion of Section 5.1 in this Final Fact Sheet).
There have been identified improvements in some areas. For example the *2008 Integrated Report* noted improvements in the diversity of submerged aquatic vegetation in the Potomac River, as well as improvements in fish species richness in Rock Creek. Biota metrics are often the best indicators of the integrity of any aquatic system.

EPA also notes that there are a variety of indirect measures indicative of improvement. The federal stormwater regulations foresaw the difficulty, especially in the near-term, of detecting measurable improvement in receiving waters, and relied instead on indirect measures, such as estimates of pollutant load reductions (40 C.F.R. §122.26(d)(2)(v)). The District documents these types of indirect measures in its annual reports, *e.g.*, tons of solids collected from catch basin clean-outs, amount of household hazardous waste collected, number of trees planted, square footage of green roofs installed, and many other measures of success.[4]

EPA believes that documenting trends in water quality, whether improvements, no change, or even further degradation, is an important element of a municipal water quality program. Today's Final Permit recognizes this principle, both in the types of robust measures required as well as the transition to new monitoring paradigms. EPA encourages all interested parties to provide the District with input during the development of these program elements.

THIS FACT SHEET:

(http://ddoe.dc.gov/ddoe/frames.asp?doc=/ddoe/lib/ddoe/information2/water.reg.leg/DC_IR_2008_Revised_9-9-2008.pdf)

4 District MS4 Annual Reports can be found at: http://ddoe.dc.gov/ddoe/cwp/view,a,1209,q,495855.asp

This Final Fact Sheet is organized to correspond with the chronological organization and numbering in today's Final Permit. Where descriptions or discussions may be relevant to more than one element of the Final Permit the reader will be referred to the relevant section(s).

To keep today's Final Fact Sheet of readable length, many of the elements included in the fact sheet published with the Draft Permit (Draft Fact Sheet) on April 21, 2010 have not been repeated, but are referenced. Readers are referred to the Draft Fact Sheet published with the Draft Permit for additional discussion on provisions that have been finalized as proposed.[5] The Final Fact Sheet does discuss significant changes since the 2004 Permit (even if discussed in the Draft Fact Sheet). The Final Fact Sheet also contains additional explanation of the Final Permit where commenters requested additional clarification. In addition, this Final Fact Sheet explains modifications to the Final Permit where provisions were changed in response to comments.

In many cases EPA made a number of very simple modifications to the Final Permit, *e.g.*, a word, phrase, or minor reorganization, simply for purposes of clarification. These modifications were not intended to change the substance of the permit provisions, only to clarify them. Most of those types of edits are not discussed in this Final Fact Sheet, but EPA has provided a Comparison Document of the Draft and Final Permits for readers who would like that level of detail.

Many commenters noted that the Draft Permit was not logically organized. EPA agrees. The major reorganization principles include:

1) There is a new Section 3, Stormwater Management Program (SWMP) Plan consolidating the various plans, strategies and other documents developed in fulfillment of permit requirements.
2) All implementation measures, *i.e.*, those stipulating management measures and implementation policies, are included in Section 4 of today's Final Permit. This includes "Source Identification" elements (Section 3 in the Draft Permit) and "Other Applicable Provisions" elements (Section 8 in the Draft Permit), which included TMDL requirements.
3) All monitoring requirements are consolidated in Section 5 of the Final Permit.
4) All reporting requirements are consolidated in Section 6 of the Final Permit.

EPA also refers readers to the Responsiveness Summary released today along with the Final Permit and Final Fact Sheet, for responses to comments and questions received on the Draft Permit. That document contains additional detailed explanations of the rationale for changes made to the Draft Permit in the Final Permit.

Finally, EPA made significant effort to avoid appending or incorporating by reference other documents containing permit requirements into the Final Permit. In the interest of clarity

5 The Permit and Fact Sheet proposed on April 21, 2010 can be viewed at: http://www.epa.gov/reg3wapd/npdes/draft_permits.html

and transparency EPA, to the extent possible, has included all requirements directly in the permit. Thus, EPA reviewed a variety of documents with relevant implementation measures, *e.g.*, TMDL Implementation Plans and the 2008 Modified Letter of Agreement to the 2004 permit[6], and translated elements of those plans and strategies into specific permit requirements that are now contained in the Final Permit. This Fact Sheet provides an explanation of the sources of provisions that are significant and are a direct result of one of those strategies.

1. DISCHARGES AUTHORIZED UNDER THIS PERMIT

(1.2 Authorized Discharges): The Final Permit authorizes certain non-stormwater discharges, including discharges from water line flushing. One commenter noted that many of these discharges, especially from potable water systems, contain concentrations of chlorine that may exceed water quality standards. EPA agrees, and has therefore clarified that dechlorinated water line flushing is authorized to be discharged under the Final Permit.

(1.4 Discharge Limitations): Comments on the language in Part 1.4 varied widely. Some commenters did not believe it was reasonable to require discharges to meet water quality standards. Other commenters believed this to be an unambiguous requirement of the Clean Water Act.

Today's Final Permit is premised upon EPA's longstanding view that the MS4 NPDES permit program is both an iterative and an adaptive management process for pollutant reduction and for achieving applicable water quality standard and/or total maximum daily load (TMDL) compliance. *See generally,* "National Pollutant Discharge Elimination System Permit Application Regulations for Stormwater Discharges," 55 F.R. 47990 (Nov. 16, 1990).

EPA is aware that many permittees, especially those in highly urbanized areas such as the District, likely will be unable to attain all applicable water quality standards within one or more MS4 permit cycles. Rather the attainment of applicable water quality standards as an incremental process is authorized under section 402(p)(3)(B)(iii) of the Clean Water Act, 33 U.S.C. § 1342(p)(3)(B)(iii), which requires an MS4 permit "to reduce the discharge of pollutants to the maximum extent practicable" (MEP) "and such other provisions" deemed appropriate to control pollutants in municipal stormwater discharges. To be clear, the goal of EPA's stormwater program is attainment of applicable water quality standards, but Congress expected that many municipal stormwater dischargers would need several permit cycles to achieve that goal.

Specifically, the Agency expects that attainment of applicable water quality standards in waters to which the District's MS4 discharges, requires staged implementation and increasingly more stringent requirements over several permitting cycles. During each cycle, EPA will continue to review deliverables from the District to ensure that its activities constitute sufficient progress toward standards attainment. With each permit reissuance EPA will continue to increase

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6 District Department of the Environment, *Modification to the Letter of Agreement dated November 27, 2007 for the NPDES Municipal Separate Storm Sewer (MS4) Permit DC0000222* (2008) http://www.epa.gov/reg3wapd/npdes/pdf/DCMS4/Letter.PDF

stringency until such time as standards are met in all receiving waters. Therefore today's Final Permit is clear that attainment of applicable water quality standards and consistency with the assumptions and requirements of any applicable WLA are requirements of the Permit, but, given the iterative nature of this requirement under CWA Section 402(p)(3)(B)(iii), the Final Permit is also clear that "compliance with all performance standards and provisions contained in the Final Permit shall constitute adequate progress toward compliance with DCWQS and WLAs for this permit term" (Section 1.4).

EPA believes that permitting authorities have the obligation to write permits with clear and enforceable provisions and thus the determination of what is the "maximum extent practicable" under a permit is one that must be made by the permitting authority and translated into provisions that are understandable and measurable. In this Final Permit EPA has carefully evaluated the maturity of the District stormwater program and the water quality status of the receiving waters, including TMDL wasteload allocations. In determining whether certain measures, actions and performance standards are practicable, EPA has also looked at other programs and measures around the country for feasibility of implementation. Therefore today's Final Permit does not qualify any provision with MEP thus leaving this determination to the discretion of the District. Instead each provision has already been determined to be the maximum extent practicable for this permit term for this discharger.

EPA modified the language in the Final Permit to provide clarity on the expectations consistent with the preceding explanation. Specifically Section 1.4.2 of the Final Permit requires that discharges 'attain' applicable wasteload allocations rather than just 'be consistent' with them, since the latter term is somewhat ambiguous.

In addition, the general discharge limitation 'no increase in pollutant loadings from discharges from the MS4 may occur to receiving waters' was removed because of the difficulty in measuring, demonstrating and enforcing this provision. Instead, consistent with EPA's belief that the Final Permit must include all of the enforceable requirements that would achieve this principle, the following discharge limitation is substituted: "comply with all other provisions and requirements contained in this permit, and in plans and schedules developed in fulfillment of this permit."

In addition, EPA made the following modifications: "Compliance with <u>the</u> performance standards and provisions contained in <u>Parts 2 through 8 of</u> this permit shall constitute adequate progress towards compliance with DCWQS <u>and WLAs for this permit term</u>" (*underlined text added*) (Section 1.4 of the Final Permit). EPA eliminated circularity with the addition of "Parts 2 through 8", clarifying that this requirement does not circle back to include the statements in 1.4.1 and 1.4.2, but rather interprets them. Also, although WLAs are a mechanism for attainment of water quality standards, EPA added the specific language "and WLAs" to make this concept explicit rather than just implicit. In addition this revised language emphasizes that the specific measures contained in the Final Permit, while appropriate for this permit term, will not necessarily constitute full compliance in subsequent permit terms. It is the expectation that with each permit reissuance, additional or enhanced requirements will be included with the objective

of ensuring that MS4 discharges do not cause or contribute to an exceedance of applicable water quality standards, including attainment of relevant WLAs.

2. LEGAL AUTHORITY, RESOURCES, AND STORMWATER PROGRAM ADMINISTRATION

(2.1 Legal Authority): Several commenters pointed out that there were a number of requirements in the Draft Permit without clear compliance schedules or deadlines, or with deadlines that did not correspond well to others in the permit. In the Final Permit, EPA has made several revisions to address these comments. For example, EPA changed a requirement that deficiencies in legal authority must be remedied "as soon as possible" to a 120-day requirement for deficiencies that can be addressed through regulation, and two years for deficiencies that require legislative action (Section 2.1.1). Also, EPA increased the compliance schedule for updating the District's stormwater regulation from twelve months to eighteen months, *id.,* so that this action could be adequately coordinated with the development of the District's new offsite mitigation/payment-in-lieu program (for more discussion see Section 4.1.3 below).

(2.2 Fiscal Resources): One commenter suggested eliminating the reference to the District's Enterprise Fund since funding was likely to come from a number of different budgets within the District. EPA agrees with this comment and has removed this reference.

On the other hand, many commenters noted that the implementation costs of the District's stormwater program will be significant. EPA agrees. The federal stormwater regulations identify the importance of adequate financial resources [40 C.F.R. §122.26(d)(1)(vi) and (d)(2)(vi)]. In addition, after seeing notable differences in the caliber of stormwater programs across the country, EPA recognizes that dedicated funding is critical for implementation of effective MS4 programs.[7,8,9] In 2009 the District established, and in 2010 revised, an impervious-based surface area fee for service to provide core funding to the stormwater program[10] (understanding that stormwater-related financing may still come from other sources as they fulfill multiple purposes, *e.g.,* street and public right-of-way retrofits). In conjunction with the 2010 rule-making to revise the fee the District issued a Frequently Asked Questions document[11] that indicates the intent to restrict this fee to its original purpose, *i.e.*, dedicated funding to implement the stormwater program and comply with MS4 permit requirements. EPA believes this action is essential, and he expects that the District will maintain a dedicated source of funding for the stormwater program.

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7 National Research Council, *Urban Stormwater Management in the United States* (2009) National Academy of Sciences http://www.nap.edu/catalog.php?record_id=12465

8 National Association of Flood and Stormwater Agencies, Funded by EPA, *Guidance for Municipal Stormwater Funding* (2006) http://www.nafsma.org/Guidance%20Manual%20Version%202X.pdf

9 EPA, *Funding Stormwater Programs* (2008) http://www.epa.gov/npdes/pubs/region3_factsheet_funding.pdf

10 District of Columbia, Rule 21-566 Stormwater Fees, http://www.dcregs.dc.gov/Gateway/RuleHome.aspx?RuleID=474056

11 District of Columbia, FAQ Document *Changes to the District's Stormwater Fee* (2010) http://ddoe.dc.gov/ddoe/frames.asp?doc=/ddoe/lib/ddoe/information2/water.reg.leg/Stormwater_Fee_FAQ_10-5-10_-final.pdf

EXHIBIT B

CALIFORNIA Water Boards

EDMUND G. BROWN JR. GOVERNOR

MATTHEW RODRIQUEZ SECRETARY FOR ENVIRONMENTAL PROTECTION

State Water Resources Control Board

State Water Resources Control Board

Issue Paper
Municipal Storm Water Permit Receiving Water Limitations
Board Workshop
November 20, 2012

ISSUE:

The State Water Resources Control Board (State Water Board) has been asked, in public comments received on National Pollutant Discharge Elimination System (NPDES) permits for Municipal Separate Storm Sewer Systems (MS4s), to adopt permit provisions that create a partial or complete exemption from enforcement for violations of water quality standards while a discharger engages in an iterative process of improving controls (commonly referred to as a "safe harbor" provision). The State Water Board has scheduled a public workshop to consider the issue.

DISCUSSION:

Background:

The Clean Water Act generally requires NPDES permits to include technology-based effluent limitations and any more stringent limitations necessary to meet water quality standards. In the context of NPDES permits for MS4s, however, the Clean Water Act does not reference the requirement to meet water quality standards. MS4 discharges must meet a technology-based standard of reducing pollutants in the discharge to the Maximum Extent Practicable (MEP), but requirements to meet water quality standards are at the discretion of the permitting agency.[1] Further, under the Porter-Cologne Water Quality Control Act, waste discharge requirements must implement applicable water quality control plans, including water quality objectives; however, the Porter-Cologne Act also affords the State Water Board and regional water quality control boards (collectively, Water Boards) flexibility to consider other factors, such as economics, when establishing any NPDES permit requirements that are more stringent than required by the Clean Water Act.[2]

The State Water Board has exercised its discretion with regard to requiring compliance with water quality standards in MS4 permits by directing, in precedential orders, that MS4 permits contain provisions requiring discharges to be controlled so as not to cause or contribute to exceedances of water quality standards in receiving waters.[3] However, consistent with federal

[1] 33 U.S.C. § 1342(p); *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159.

[2] Wat. Code, §§ 13241, 13263; *City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613.

[3] SWRCB Order WQ 98-01 (*Environmental Health Coalition*), WQ 99-05 (*Environmental Health Coalition)*.

law, the State Water Board has found it appropriate to implement Best Management Practices (BMPs) in lieu of numeric water quality-based effluent limitations to meet water quality standards.[4] Additionally, in lieu of "strict compliance" with water quality standards, the State Water Board has prescribed an iterative process whereby an exceedance of a water quality standard triggers a process of BMP improvements: reporting of the violation, submission of a report describing proposed improvements to BMPs expected to better meet water quality standards, and implementation of these new BMPs.

While the Water Boards have generally directed dischargers to achieve compliance with water quality standards by improving control measures through the iterative process, the iterative process does not provide a "safe harbor" to MS4 permittees: that is, when a discharger is shown to be causing or contributing to an exceedance of water quality standards, that discharger is in violation of the relevant discharge prohibitions and receiving water limitations of the permit and potentially subject to enforcement by the Water Boards or through a citizen suit, even if the discharger is actively engaged in the iterative process. Despite the lack of a safe harbor provision, however, the Water Boards have, as a matter of practice, declined to initiate enforcement actions against MS4 permittees who have been actively engaged in the iterative process. The Water Boards' decisions to decline to include a safe harbor in MS4 permits have been upheld by courts of appeal.[5]

Need for and Purpose of Workshop:

The lack of a safe harbor in the iterative process was recently highlighted by the Ninth Circuit's decision in a citizen suit brought by the Natural Resources Defense Council (NRDC) against the County of Los Angeles and the Los Angeles County Flood Control District for violations of the receiving water limitations of their MS4 permit. The Ninth Circuit confirmed that, as the receiving water limitations of the Water Boards' MS4 permits are currently drafted, engagement in the iterative process does not excuse liability for violations of water quality standards.[6]

As the storm water management programs of municipalities have matured, an increasing body of monitoring data indicates that water quality standards are in fact not being met by many MS4s. MS4s accordingly assert that the receiving water limitations and iterative process provisions of the Water Boards' permits do not afford them with a viable path to compliance for these violations, which may take years of technical efforts to correct, especially for wet weather discharges. MS4s argue that they are increasingly vulnerable to citizen suits and/or Water Board enforcement. This concern has been raised by the California Stormwater Quality Association (CASQA) in comments on the proposed Phase II MS4 permit and by the California Department of Transportation (Caltrans) in comments on the Caltrans MS4 permit adopted

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[4] *See* SWRCB Orders WQ 91-03 (*Citizens for a Better Environment)*, WQ 98-01 (*Environmental Health Coalition*), WQ 2001-15 (*Building Industry Association of San Diego County*); *See also* 40 C.F.R. § 122.44(k); Interim Permitting Approach for Water Quality-Based Effluent Limitations In Storm Water Permits, USEPA, September 1995. In such orders and guidance, the State Water Board and Environmental Protection Agency acknowledge that the storm water program may evolve over time to incorporate stricter limitations, including improved BMPs to meet water quality standards or numeric water quality based effluent limitations.

[5] *Building Industry Assn. of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866; *City of Rancho Cucamonga v. Regional Water Quality Control Bd.* (2006) 135 Cal.App.4th 1377; see also *Natural Resources Defense Council v. County of Los Angeles* (9th Cir. 2011) 673 F.3d 880, 897, n.7.

[6] *Natural Resources Defense Council v. County of Los Angeles, supra*, 673 F.3d at p. 897. On July 13, 2012, the United States Supreme Court granted review of this case on other grounds.

September 19, 2012, as well as by numerous MS4s and interested persons in comments on both permits. The issue is additionally relevant to the Phase I MS4 permits issued by the regional water quality control boards.[7]

At the same time, the environmental community has commented that the iterative process has been underutilized and ineffective to date in bringing MS4 discharges into compliance with water quality standards. Environmental parties argue that direct enforcement of water quality standards is necessary to protect water quality, especially in such second- or third-generation permits where dischargers have already had a number of years to come into compliance.

Because of the broad applicability of any policy decisions regarding the receiving water limitations and iterative process provisions, the State Water Board is holding a public workshop to consider several alternatives in addressing the issue and to seek public input on these alternatives. Following the workshop, the State Water Board may propose revisions to the receiving water limitations in the Caltrans MS4 and Phase II MS4 permits, and as necessary, re-open those permits after public review and comment, to make the revisions.

ALTERNATIVES FOR CONSIDERATION:

The State Water Board may consider the alternatives below, individually or in combination, to address concerns with the receiving water limitations in the Caltrans or Phase II MS4 permits. While the listed alternatives attempt to capture the range of alternatives before the State Water Board, the Board welcomes comments proposing other options and will not be limiting its consideration to the alternatives as listed in this issue paper.

The receiving water limitations language prescribed by State Water Board Order WQ 99-05 is attached as Attachment 1 and forms the basis of Alternative 1. CASQA has submitted specific proposed language for the Receiving Water Limitations provision of the proposed Phase II MS4 permit (CASQA Proposal). The CASQA Proposal is attached as Attachment 2 and is referenced as appropriate in the discussion of the alternatives below.

Alternative 1: Keep the status quo of no safe harbor.

This alternative makes no changes to the existing State Water Board approach or to the current language of the adopted Caltrans MS4 permit or the proposed Phase II MS4 permit. As stated previously, the current MS4 permit provisions laying out the iterative process are based on language set forth in precedential State Water Board orders. (See Attachment 1.) Alternative 1 adheres to the prescribed language. Under this alternative, the Water Boards may choose to exercise their enforcement discretion to refrain from taking action against dischargers engaged in good faith implementation of the iterative process; however, they would not be constrained from enforcing the receiving water limitations when an MS4 causes or contributes to exceedances of water quality standards. As a limitation within an NPDES permit, dischargers who cause or contribute to an exceedance of water quality standards could be subject to citizen suits.

[7] Note that the issue is not relevant to any other NPDES permits, including permits for storm water discharges associated with industrial activity, because all other NPDES permits must include technology-based effluent limitations and any more stringent limitations necessary to meet water quality standards. (33 U.S.C. § 1311(b)(1)(C).)

Alternative 2: No safe harbor, but provide greater clarity and specificity for iterative process implementation and wet weather data analysis.

Greater clarity and specificity in the MS4 permits as to the iterative process requirements may result in increased efforts to improve controls and achieve compliance. Such clarity and specificity may include:

1. Clarification on how compliance with the relevant discharge prohibitions and receiving water limitations is determined, including type and frequency of monitoring;
2. Clarification that dischargers must begin the iterative process after documentation of violations without waiting to be directed to do so by the Water Boards;
3. Specification of the minimum efforts that will constitute meaningful compliance with the iterative process;
4. Specification of the scope of any corrective action, including whether it applies only at the location where exceedances are measured or throughout the relevant watershed;
5. Specification of additional wet weather data analysis to better define and assess the impact of municipal storm water discharges on receiving waters, as well as the efficacy of specific best management practices.

As the MS4 program continues to mature and more data becomes available, this alternative may be enhanced by the development of water quality-based effluent limitations for pollutants, as appropriate, as a means of determining compliance with receiving water limitations. In addition, the enhanced wet weather data could be used to identify surrogates that could be used as a measure of protecting beneficial uses. In time, the data could be used to develop actual wet weather water quality standards or wet weather implementation provisions for existing water quality standards that could be applied consistently on a statewide basis.

Given the nature of storm water discharges and of MS4s, questions such as where and how compliance with water quality standards should be measured and how narrowly or broadly corrective actions should be applied, pose complicated technical issues that require careful study and consideration. These challenges notwithstanding, water quality improvements are more likely to be achieved as the iterative process becomes automatic and dischargers follow clear guidelines for determining and addressing non-compliance with permit terms. Such improvements may dissuade the Water Boards and the public from bringing enforcement actions/citizen suits for all except the most egregious and repeated violations.

In addition to being a stand-alone alternative, Alternative 2 may be considered in combination with Alternatives 3 through 5. The CASQA Proposal incorporates some greater specificity in the iterative process requirements as a component of its proposed receiving water limitations.

Alternative 3: Safe harbor that applies only if a discharger is in compliance with the implementation provisions of an approved TMDL.

Under Alternative 3, the receiving water limitations would be amended to provide a safe harbor for permittees that are in compliance with the implementation provisions of a TMDL. In effect, as long as the permittee is in compliance with the TMDL (including any compliance schedule) the terms of the TMDL would replace the requirement to comply with water quality standards for the pollutants that are covered by the TMDL.

The CASQA Proposal contemplates a safe harbor for dischargers in compliance with a TMDL as a component of the receiving water limitations.

Alternative 4: Safe harbor that applies if a discharger is in compliance with the implementation provisions of an approved TMDL, as in Alternative 3, and, in addition, that applies when the discharger engages in good faith compliance with the iterative process for exceedances caused by wet weather discharges.

In addition to the safe harbor for TMDL implementation, Alternative 4 would provide a safe harbor when dischargers engage in the iterative process in good faith to address violations of permit terms caused by wet weather discharges. Thus, if a storm water discharge from an MS4 is causing or contributing to an exceedance of a water quality standard in the receiving water, the exceedance would not constitute a violation of the permit as long as the discharger was engaged in good faith efforts to address the exceedance through improved controls. Alternative 4 recognizes that wet weather discharges from MS4s frequently cause or contribute to violations of water quality standards and allows the MS4s time to address these violations by improving control measures.

However, the safe harbor would not extend to dry weather discharges. Non-storm water discharges are generally prohibited in MS4 permits and only a few categories of non-storm water discharges are exempted from the prohibition, with the condition that these exempted discharges also be prohibited if they are identified as sources of pollutants to receiving waters.

Alternative 5: Full safe harbor.

This alternative would provide a full safe harbor to dischargers complying with the implementation provisions of a TMDL or engaging in the iterative process to address exceedances caused by wet or dry weather discharges.

The CASQA Proposal attached provides for a full safe harbor.

Attachments Removed

EXHIBIT C

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RIVERSIDE COUNTY FLOOD CONTROL
AND WATER CONSERVATION DISTRICT

November 13, 2012

Honorable Members of the State Water Resources Control Board
Attn: Ms. Jeanine Townsend, Clerk to the Board
State Water Resources Control Board
1001 I Street, 24th Floor
Sacramento, CA 95814

Dear Honorable Board Members and Ms. Townsend:

Re: Comment Letter – Receiving Water Limitations Language Workshop

I am writing on behalf of the Riverside County Flood Control and Water Conservation District ("District") regarding the State Water Resources Control Board's consideration of Receiving Water Limitations ("RWL") language in MS4 permits. This review was triggered by a decision of the Ninth Circuit United States Court of Appeals in *Natural Resources Defense Council v. County of Los Angeles* (9th Cir. 2011) 673 F.3d 880, *cert granted,* __ U.S. __ (June 25, 2012) ("*NRDC*"). This letter is being submitted in advance of the State Board's November 20, 2012 workshop on reform of the RWL language to be incorporated into MS4 permits as a matter of statewide policy.

The District is the Principal Permittee for three Phase I MS4 permits applicable to municipalities across Riverside County: Order R8-2010-0033, issued by the Santa Ana Regional Water Board to municipalities within the Santa Ana River Region of Riverside County; Order R9-2010-016, issued by the San Diego Regional Water Board to municipalities within the Santa Margarita Region of Riverside County; and Order R7-2008-0001, issued by the Colorado River Regional Water Board to municipalities within the Whitewater River Region of Riverside County. Given our unique perspective as the manager of three Phase 1 MS4 permits, the District and its staff thus, have considerable experience and expertise in developing and administering MS4 permits, and a keen understanding of the issues that the above mentioned court case creates.

The District strongly supports reform of the RWL language to make clear the State Board's often-expressed intention that MS4 Permittees' compliance with RWL be effectuated through an iterative process. However, under the Ninth Circuit's interpretation, any MS4 discharge that causes or contributes to an exceedance of a Water Quality Standard subjects the MS4 Permittee to civil penalty liability, injunctive relief and the payment of attorneys' fees in an action brought by a citizen plaintiff, even where the Permittee is fully implementing the programmatic requirements of their MS4 Permit.

The District supports the California Stormwater Quality Association's ("CASQA") efforts to obtain RWL language that ensures that the iterative process favored by the State Board is honored. The District also supports the comments of the California State Association of Counties, and believes the proposed RWL language attached to those comments is a step in the right direction.

This letter contains additional District comments about the RWL language and the iterative process. We believe that they are best expressed in terms of correcting misperceptions regarding the current RWL language, as interpreted by the Ninth Circuit.

Misperception Number One: Strict compliance with Water Quality Standards is required of MS4 Permittees by the Clean Water Act.

The Clean Water Act provides that MS4 discharges must control pollutants in discharges from the MS4 to the "Maximum Extent Practicable" (33 U.S.C. § 1342(p)(3)(B)(iii)). Unlike the case with other NPDES Permittees, the Clean Water Act does not require that municipalities strictly comply with Water Quality Standards, as determined by the Ninth Circuit in *Browner v. Defenders of Wildlife*. The State Board's own precedential Order WQ 2001-15 recognizes this fact and states that the RWL language was intended to be consistent with the *Browner* case. In that Order, which interpreted RWL language similar to that in *NRDC*, the Board stated:

> *[O]ur language, similar to the U.S. EPA's permit language discussed in the Browner case, does not require strict compliance with water quality standards. Our language requires that storm water management plans be designed to achieve compliance with water quality standards. Compliance is to be achieved over time, through an iterative approach requiring improved BMPs. As pointed out by the Browner court, there is nothing inconsistent between this approach and the determination that the Clean Water Act does not mandate strict compliance with water quality standards. [Order WQ 2001-15 at 7 (emphasis added)].*

Unfortunately, the Ninth Circuit completely disregarded this language, and the Order, in holding that strict compliance was required of MS4 Permittees.

USEPA itself has issued MS4 permits (in non-delegated states) that do not contain RWL language requiring strict compliance with Water Quality Standards. Therefore, it is clear that such compliance is not required by the Clean Water Act nor is such compliance established by USEPA policy. The most prominent example of a recent MS4 permit promulgated by USEPA is that for the District of Columbia ("DC Permit") (relevant portions of which are attached as Exhibit A), which was adopted in 2011.

Part 1.4 of the DC Permit contains the requirements relating to Water Quality Standards and provides, in relevant part: "Compliance with the performance standards and provisions contained in Parts 2 through 8 of the permit shall constitute adequate progress towards compliance with DCWQS [water quality standards] and WLAs [established under TMDLs] for this permit term." The DC Permit Fact Sheet explains the rationale for that language as follows [DC Permit Fact Sheet, Pages 5-6, emphasis added, attached as Exhibit B]:

> *Comments on the language in Part 1.4 varied widely. Some commenters did not believe it was reasonable to require discharges to meet water quality standards. Other commenters believed this to be an unambiguous requirement of the Clean Water Act.*

> *Today's Final Permit is premised upon* **EPA's longstanding view that the MS4 NPDES permit program is both an iterative and an adaptive management process for pollutant reduction and for achieving applicable water quality standard and/or total maximum daily load (TMDL) compliance.** *See generally, "National Pollutant Discharge Elimination System Permit Application Regulations for Stormwater Discharges," 55 F.R. 47990 (Nov. 16, 1990).*
>
> **EPA is aware that many Permittees, especially those in highly urbanized areas such as the District, likely will be unable to attain all applicable water quality standards within one or more MS4 permit cycles.** *Rather the attainment of applicable water quality standards* **as an incremental process** *is authorized under section 402(p)(3)(B)(iii) of the Clean Water Act, 33 U.S.C. § 1342(p)(3)(B)(iii), which requires an MS4 permit "to reduce the discharge of pollutants to the maximum extent practicable" (MEP) "and such other provisions" deemed appropriate to control pollutants in municipal stormwater discharges.* **To be clear, the goal of EPA's stormwater program is attainment of applicable water quality standards, but Congress expected that many municipal stormwater dischargers would need several permit cycles to achieve that goal.**
>
> *Specifically, the Agency expects that attainment of applicable water quality standards in waters to which the District's MS4 discharges, requires staged implementation and increasingly more stringent requirements over several permitting cycles. During each cycle, EPA will continue to review deliverables from the District to ensure that its activities constitute sufficient progress toward standards attainment. With each permit reissuance EPA will continue to increase stringency until such time as standards are met in all receiving waters.* **Therefore today's Final Permit is clear that attainment of applicable water quality standards and consistency with the assumptions and requirements of any applicable WLA are requirements of the Permit, but, given the iterative nature of this requirement under CWA Section 402(p)(3)(B)(iii), the Final Permit is also clear that "compliance with all performance standards and provisions contained in the Final Permit shall constitute adequate progress toward compliance with DCWQS and WLAs for this permit term" (Section 1.4).**

USEPA is now proposing clarifying changes to this language and to other sections of the DC Permit as the result of a settlement with various parties. However, those changes do not require strict compliance with Water Quality Standards, but rather compliance through the programs developed under the Permit.

The State Board is thus, free to adopt new RWL language that effectuates its previously expressed intent that MS4 permits not require strict compliance with Water Quality Standards with regard to contributions from discharges from MS4s.

Misperception Number Two: The MS4 Permittees are Seeking a "Safe Harbor" that would Insulate them from Responsibility Under the Clean Water Act.

While State Board staff's "Issue Paper" uses the term "safe harbor" in describing the iterative process, the District believes that this is fundamentally misleading. Even a cursory review of the terms of a typical MS4 permit in California reveals that it is full of compliance points. In the three MS4 Permits in which the District serves as Principal Permittee, literally every sentence is a separate point of compliance.

This fact is supported by the language of the Permits themselves. For example, in Order R8-2010-0033 Part XX.G provides: **"The Permittees must comply with all terms, requirements, and conditions of this Order. Any violation of this Order constitutes a violation of the CWA, its regulations and the California Water Code, and is grounds for enforcement action . . . ."** (emphasis added). Similar provisions are contained in the other two Riverside County MS4 Permits. Even without the strict Water Quality Standard language imposed under the Ninth Circuit's opinion, there is no "safe harbor" from liability under the Clean Water Act or, where applicable, the California Water Code, for any Permittee that fails to fully implement each the detailed and prescriptive requirements of its MS4 Permit.

There is a fundamental difference however, between fully complying with activities within the control and responsibility of the Permittees, such as monitoring, implementing BMPs and performing other programmatic requirements of the MS4 Permit; and being forced to guarantee that MS4 discharges will not cause or contribute to exceedances of Water Quality Standards in Receiving Waters, a guarantee that the Permittees' have no ability to make.

What the District and other MS4 Permittees seek is relief from what is essentially "guaranteed non-compliance" where a Permittee can be found in violation of their MS4 Permit even if the exceedance occurs at no fault of or failure by the Permittee, or put another way, even in circumstances where there is nothing a Permittee could have done to prevent that exceedance from occurring. In such a case, the Permittee can be held liable for potentially millions of dollars in legal costs, penalties and other expenses. We note that the City of Malibu, a city of only 13,000 residents, spent more than $2 million in defending against a citizen suit filed with respect to its MS4 Permit and more than $6 million to settle the case, including payment of $750,000 in attorney fees to plaintiffs. Given the tremendous financial challenges faced by every California municipality, including the District, the County of Riverside and the Permittee cities within the County, such a diversion of resources that otherwise would be directed at clean water programs or other vital municipal programs is a poor policy choice. And, as noted, it is not a policy choice that is required by the Clean Water Act, nor is it required by USEPA in their own Permits.

The District recognizes that regulatory enforcement actions and citizen suits are authorized by the Clean Water Act and that such suits may be an appropriate remedy where, for example, a Permittee has failed to comply with the programmatic requirements of its MS4 Permit. Where, however, the Permittees are complying with those requirements in good faith but, due to circumstances beyond

their control, their MS4 discharge causes or contributes to a Water Quality Standard exceedance in Receiving Waters, a citizen suit based on those exceedances potentially throws away the work done by the Permittees and the Water Boards under the MS4 Permit, as discussed below.

Misperception Number Three: MS4 can achieve compliance with strict Water Quality Standards.

MS4 Permittees cannot guarantee that discharges from their MS4s will in fact, not cause or contribute to an exceedance of Water Quality Standards in a Receiving Water. The monitoring conducted under our MS4 Permits reflects exceedances of various Water Quality Standards in Receiving Waters, and we understand that such results are typical for MS4 discharges around the state (please see Pages 2-3 of the CASQA comment letter dated November 2, 2012). The extreme variability of stormwater quality and quantity itself (which, in Southern California, arrives infrequently and from widely varying storm sizes) combined with a multitude of potential pollutant sources beyond a Permittee's ability to truly "control", make it impossible for a municipality to ensure that no discharges from its MS4 will ever cause or contribute to exceedances of Water Quality Standards in Receiving Waters. This was recognized by the Issue Paper released by State Board staff in preparation for the November 20th workshop, which found that as "the storm water management programs of municipalities have matured, **an increasing body of monitoring data indicates that water quality standards are in fact not being met by many MS4s**" (Issue Paper, Page 2 (emphasis supplied)).

Thus, even if municipal Permittees are to be held strictly liable for the ensuring that no discharges from their MS4s cause or contribute to an exceedance of Water Quality Standards, as the Ninth Circuit has interpreted the current RWL language, those Permittees have no ability to attain those standards. The reasons are several-fold and include the following:

1) Unlike an industrial NPDES Permittee, a municipal Permittee is not typically the source of the pollutants in the MS4 discharge (whether wet or dry). The municipality can regulate sources to some degree (through, for example, the operation of structural and non-structural BMPs and implementation of an Illegal Connection/Illicit Discharge program), but the municipality cannot guarantee that pollutants will not enter the MS4 and then be discharged into the Receiving Waters.

2) Municipalities cannot control natural sources of pollutants that are discharged through the MS4. Monitoring has indicated that many pollutants are likely from natural and not anthropogenic sources.

3) While Permittees conduct extensive public education programs as part of their MS4 programs, municipalities cannot "control" human behavior, or "prevent" an individual from taking an action that might cause pollution to enter the MS4. As an example, a resident may, despite all ordinances, regulations, potential penalties or enforcement, public outreach, available BMPs, etc., choose not to pick up after their pets, and

stormwater may, through no fault of the Permittee, pick up animal waste and deposit into the MS4.

4) MS4 Permittees cannot "prevent" flows from entering their MS4. To protect the health and property of their residents, MS4 operators must allow the legitimate flows of water into their drains. This is especially true for the District, which is charged directly by the Legislature [in Water Code App. §48-9] with the task of taking necessary steps to protect the people, properties and watersheds of Riverside County from the negative impacts of flooding. The District cannot, in effect, cause flooding by preventing flows from entering their storm drain, simply because such flows may contain pollutants that cause a violation of the Receiving Waters Limitation provisions of their MS4 Permits. In fact, California law requires downstream property owners (such as MS4 operators) to accept flows from upstream property owners.

5) Further, the authorities granted to flood control districts, such as this District, by the Legislature are narrow and do not include the authority to condition or regulate the quality or nature of stormwater runoff discharged from up gradient properties. This responsibility is appropriately assigned by the Legislature to the Regional Boards.

Similarly, MS4 Permittees cannot guarantee compliance with Water Quality Standards in dry weather. "Alternative 4" in the staff's Issue Paper suggests an alternative RWL approach that would not extend the iterative approach to dry weather discharges. The District submits that this alternative does not reflect the reality of urban runoff. Monitoring conducted under the Riverside County MS4 Permits reflects exceedances of Water Quality Standards during dry weather as well as wet weather. There is no justification for imposition of strict liability for exceedances during such conditions, for the following reasons:

1) During dry weather, other NPDES-permitted discharges continue to flow into the Receiving Waters. For example, much of the flow in the Santa Ana River during dry weather conditions is from non-MS4 sources, such as publicly owned treatment works. Additionally, numerous other separate NPDES-permitted discharges will occur, potentially at concentrations of pollutants that exceed Water Quality Standards. Evidence generated during the *NRDC* case involving the County of Los Angeles, for example, indicated that NPDES permits covering hundreds of these dischargers, including POTWs allowed the discharge of pollutants at concentrations *greater* than Water Quality Standards. Because of these discharges, which are legal and authorized by the Regional Boards, the MS4 Permittees have essentially no more control over compliance with Water Quality Standards in dry weather than they would have during wet weather conditions.

2) Accidental or even intentional illicit discharges by third parties into the MS4 obviously can occur during dry weather as well as wet weather. Such discharges would potentially have an even greater impact on sampling, since they are not diluted by large volumes of stormwater. For example, a vehicular accident recently caused hundreds of gallons of

asphalt tar to enter Sandia Creek, a Receiving Water in Riverside County. While this spill was not discharged through an MS4, if the vehicular accident had occurred in another portion of the watershed, the spill could feasibly have entered into and been discharged from an MS4. Similarly in many places throughout the State, sanitary sewer systems are owned and operated by special districts that have no relation to the MS4 Permittees that own or operate the MS4 systems. Nevertheless, an overflow of such sanitary sewer systems may cause an unavoidable discharge into, and from a Permittee-owned MS4. Such accidental or illicit discharges cannot be "prevented" or "controlled" by the Permittees except to the extent that they can be cleaned up or blocked if promptly reported. However, if the discharge has reached Receiving Waters and caused a measured exceedance of Water Quality Standards, under the Ninth Circuit's interpretation, liability for civil penalties, injunctive relief and attorneys fees will attach to the MS4 Permittee.

3) Enforcing strict Water Quality Standard limits in dry or wet weather is counter-productive to the watershed planning-based MS4 Permits currently being promulgated by many regional water boards. Enforcing such limits will divert Permittee attention and resources from watershed-based, monitoring-heavy compliance programs, as will be discussed in greater detail below.

In essence, under the Ninth Circuit's interpretation of the current RWL language, the District, and potentially every other MS4 Permittee in the state, is in violation of its Permit any time that an exceedance of a Water Quality Standard is recorded and attributed to a discharge from its MS4. This means that the Regional Water Boards have issued, and continue to adopt permits that include RWL language **which cannot be complied with**. The Clean Water Act, however, does not require Permittees to achieve the impossible. *See, e.g., Hughey v. JMS Development Corp.* (11th Cir. 1996) 78 F.3d 1523, 1530 ("In interpreting the liability provisions of the CWA, we realize that Congress is presumed not to have intended absurd (impossible) results.").

Misperception Number Four: The Current RWL Language is more Protective of Receiving Water Quality.

This statement is not only untrue but maintaining the current RWL language actually **impedes** efforts to protect Receiving Water Quality.

We understand that some stakeholders believe that there should be Numeric Effluent Limitations (NELs) contained in the MS4 Permits for purposes of accountability. In response, we note that many MS4 permits now contain numeric Stormwater and Non-stormwater Action Levels ("SALs" and "NALs") or other numeric targets or goals, the exceedance of which trigger specific compliance responses by the Permittees. It is these action levels (which were advocated by the Blue Ribbon Panel established by the State Board to investigate the appropriateness of NELs in MS4 permits) which provide such "numeric" accountability. This is in addition to the numerous other compliance documentation and reporting provisions required of MS4 Permittees that also provide measures of accountability.

More importantly, the current RWL language as interpreted by the Ninth Circuit actually impedes efforts by municipalities to protect water quality. First, by requiring immediate compliance, the language undermines efforts to bring Water Quality Standard-impaired waterbodies into compliance through the Total Maximum Daily Load ("TMDL") program. TMDLs are designed with the recognition that, due to the complexity of the issues causing the waterbody to be impaired in the first place, meeting these requirements cannot be achieved immediately. Therefore, TMDL compliance plans include timelines to achieve such compliance over periods of years and sometimes decades.

Second, most MS4 permits have begun incorporating sophisticated watershed management plans, which prioritize pollutants by waterbody and attempt, through aggressive monitoring and source identification efforts, to identify and address the sources of those prioritized pollutants. Municipalities subject to strict RWL language will have no ability to prioritize pollutants, since they must address any pollutant that exceeds a Water Quality Standard, irrespective of the relative impact that that discharge may have had upon the environment or beneficial uses. Moreover, these watershed management plan approaches employ cooperative monitoring and other watershed-based approaches. Permittees faced with potential liability for any exceedance of Water Quality Standards in Receiving Waters that may be caused or contributed to by discharges of their MS4s, will not likely volunteer to cooperate on any watershed-based approach, if cooperation could subject them to additional unnecessary liability.

Third, in a citizen suit brought under the Clean Water Act, a federal judge is free to impose any appropriate injunctive relief to enforce a permit (33 U.S.C. § 1365(a)). Thus, for example, a court could ignore the provisions of a MS4 permit in ordering municipal defendants to address Water Quality Standard exceedances in Receiving Water. This means that the thousands of people-hours invested in the Permit's development, implementation and oversight by municipalities, the Regional Water Boards and other stakeholders would be wasted. In essence, under the Ninth Circuit's reading of the RWL language, all other language in an MS4 permit appears to be superfluous, since the RWL language would control all compliance efforts. This result, of course, is not required by plain language of the Clean Water Act.

Fourth, if a municipality is in unavoidable and automatic non-compliance with the requirements of its MS4 Permit, it will be unable to justify budgeting for water quality management programs and BMPs otherwise required by the Permit as the municipality will simply receive no benefit from making compliance investments. To gain public support for stormwater programs, a municipality must demonstrate to its residents that such investments will constitute compliance with the Permit.

Discussion of Alternatives

The State Board staff's Issue Paper sets forth five alternatives for consideration. Alternative 1, no change in the current RWL language, is completely unacceptable to the District (and, we believe, to other municipalities across the state) because it fails to address the "guaranteed non-compliance" problem of the current language.

Alternative 2, which proposes to maintain the language that puts the MS4 Permittees in a situation of unavoidable and potentially "guaranteed" non-compliance, but would add greater specification as to how the iterative process might be carried out, is also unacceptable as the MS4 Permittees will still have no viable means to ensure their compliance with the RWL language. While the District does not object in principle to RWL language that spells out clearly, and in achievable terms, what is required of MS4 Permittees when exceedances are recorded, such a change alone does not address the fundamental issues identified in this letter.

Alternative 3, which proposes to provide an iterative process for compliance with the RWL only for pollutants being addressed by dischargers in compliance with an approved TMDL, is better than the first two alternatives, but is still entirely insufficient. By failing to provide a viable means for compliance with the RWL language for non-TMDL pollutants, this alternative language would force Permittees into unavoidable non-compliance, and require them to redirect their efforts and resources away from the TMDL activities, to those other pollutants, due to the strict liability attached to those exceedances. This would be a poor policy choice, as pollutants that are not subject to a TMDL may have significantly less, or even no impact on beneficial uses in the Receiving Waters, as noted in the CASQA comment letter.

Alternative 4, which excludes dry weather discharges from the iterative process to comply with the RWL, is unacceptable for the reasons previously set forth regarding an MS4 Permittees inability to truly "prevent" or "control" accidental or illegal dry weather discharges.

Alternative 5, which provides viable means for compliance with the RWL, for all types of MS4 discharges, is the only viable solution among the alternatives presented by State Board staff. In an era of limited budgets, the only and best way to make progress toward improving the quality our Receiving Waters, is to provide MS4 Permittees the ability to prioritize their efforts, as required in the Watershed Management Plan provisions contained in the most recent MS4 Permits, including the Los Angeles County Permit and the proposed Regional Permit for the San Diego Regional Water Board. As previously discussed, such prioritization cannot occur in the context of strict liability for the exceedance of Water Quality Standards in the Receiving Waters. For all of the reasons set forth in this letter, no other alternative makes policy sense or is congruent with the Maximum Extent Practicable standard in the Clean Water Act.

The District would add that Alternative 5 should additionally incorporate the concept of achieving RWL compliance through watershed management plans, and requests the Board to direct staff to work with stakeholders to ensure that any revised RWL language does not force intermittent or minor exceedances of Water Quality Standards to become de-facto higher priorities than those set by the watershed stakeholders.

In summary, the District supports CASQA, the California State Association of Counties and other municipal stakeholders in advocating for a fully iterative and viable approach to compliance with RWL language in both wet and dry weather conditions. Only when such an approach is in place and endorsed by the State Board will Permittees, including the District, feel confident that they can focus

fully on efforts to address pollutants in discharges into and from their MS4s, and not on preparing for costly and pointless litigation.

The District therefore, respectfully requests the State Board direct its staff to commence development of new language providing for an enforceable, iterative and viable process for MS4 Permittees to comply with the RWL language included in MS4 permits.

We wish to thank you and State Board staff for your consideration of these comments and any further comments, written or oral, that the District may make on these important issues.

Very truly yours,

Steve Thomas

for WARREN D. WILLIAMS
General Manager-Chief Engineer

CP:cw
P8/150189

EXHIBIT D

FILED
JAN - 3 2013
CLERK, U.S. DISTRICT COURT
ALEXANDRIA, VIRGINIA

IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF VIRGINIA
Alexandria Division

VIRGINIA DEPARTMENT OF TRANSPORTATION, ET AL, Plaintiffs, -v- UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, ET AL, Defendants.	Civil Action No. 1:12-CV-775

Memorandum Opinion

Before the Court is the Plaintiffs' motion for judgment on the pleadings under Federal Rule of Civil Procedure 12(c). The Defendants opposed the motion, and the Plaintiffs replied. The Court heard oral arguments on December 14, 2012 and now issues this memorandum opinion and accompanying order granting the Plaintiffs' motion.

Background

The Clean Water Act, 33 U.S.C. § 1251 et seq., establishes the basic structure for regulating discharge of pollutants into the waters of the United States, and provides certain mechanisms to improve and maintain the quality of surface waters.

One such mechanism is the requirement that states identify "designated uses" for each body of water within their borders, as well as "water quality criteria" sufficient to support those uses. 33 U.S.C. § 1313(c)(2)(A). The Environmental Protection Agency ("EPA") evaluates the uses and criteria developed by the states, and either approves them or else proposes and

promulgates its own set of standards. § 1313(c)(3).

Once the standards are in place, each state is required to maintain a list—also subject to approval or modification by EPA—of its waterbodies that are "impaired" because they do not meet their respective water quality criteria. 33 U.S.C. § 1313(d)(1)(A). For each waterbody on the impaired list, the state is required to establish a set of total maximum daily loads ("TMDLs") sufficient to bring the body back into compliance with its water quality criteria. § 1313(d)(1)(C). Each TMDL establishes the maximum amount of a pollutant that may be added to the waterbody daily from all sources (runoff, point sources, etc.). EPA is required to publish a list of pollutants suitable for maximum daily load measurement, § 1314(a)(2)(D), and it has determined that *all* pollutants are suitable for TMDLs, *see* Total Maximum Daily Loads Under Clean Water Act, 43 Fed. Reg. 60,662. Therefore, any pollutant that falls within the relatively broad definition of "pollutant" set forth in § 1362(6) may be regulated via TMDL. EPA can approve or modify as it sees fit TMDLs proposed by the states. § 1313(d)(2).

Here the state in question is Virginia, and the waterbody is a 25-mile long tributary of the Potomac River, located in Fairfax County, called Accotink Creek. The creek has been the subject of litigation in the past that is not relevant to this matter except the result: EPA was required to set TMDLs for Accotink Creek once Virginia failed to do so by a certain date. Specifically, the creek had been identified as having "benthic impairments," which is to say the community of organisms that live on or near the bottom of the creek were not as numerous or healthy as they should be. EPA was to set appropriate TMDLs to improve the health of the benthic community in Accotink Creek.

On April 18, 2011, EPA established a TMDL for Accotink Creek which limited the flow rate of stormwater into Accotink Creek to 681.8 ft^3/acre-day. The TMDL was designed to

regulate the amount of sediment in the Accotink, because EPA believed sediment was a primary cause of the benthic impairment. Both parties agree that sediment is a pollutant, and that stormwater is not. EPA refers to stormwater flow rate as a "surrogate" for sediment.

The Plaintiffs are now challenging the TMDL on multiple grounds, but presently before the Court is a single issue: Does the Clean Water Act authorize the EPA to regulate the level of a pollutant in Accotink Creek by establishing a TMDL for the flow of a nonpollutant into the creek?

Analysis

I. Standard of Review

Count I of the complaint, at issue here, is brought under the Administrative Procedures Act. *See* Comp. ¶ 169. The APA "confines judicial review of executive branch decisions to the administrative record of proceedings before the pertinent agency." *Shipbuilders Council of Am. V. U.S. Dept. of Homeland Sec.*, 770 F. Supp. 2d 793, 802 (E.D. Va. 2011). As such, the district court "sits as an appellate tribunal," and APA claims can be resolved equally well in the context of Rule 12 or Rule 56. *Univ. Med. Ctr. Of S. Nev. V. Shalala*, 173 F.3d 438, 441 n. 3 (D.C. Cir. 1999).

Because Count I presents a question of statutory interpretation, the Court reviews EPA's decision using the two-step analysis set forth in *Chevron, U.S.A., Inc. v. NRDC, Inc.*, 467 U.S. 837 (1984). For a given question of statutory interpretation, the first step under *Chevron* is to determine whether Congress addressed the "precise question at issue." 467 U.S. at 842. "If the intent of Congress is clear, that is the end of the matter . . . ." *Id.* If the Court cannot find that Congress has squarely addressed the question, the Court must move to Chevron's second step. In

the second step of statutory construction under *Chevron*, the Court must determine whether the agency's interpretation of the statute is "permissible." *Id.* at 843. The agency's construction is permissible if it is reasonable, but it need not be what the Court considers the *best* or *most reasonable* construction. *See id.* at 845. The Court is not to simply impose its own construction on the statute, but instead it gives deference to any reasonable statutory construction by the agency. *Id.* at 843.

II. Chevron Step One

Whether statutory ambiguity exists so that the issue cannot be settled at *Chevron's* first step is for the Court to decide, and the Court "owe[s] the agency no deference on the existence of ambiguity." *Am. Bar Ass'n v. FTC*, 430 F.3d 457, 468 (D.C. Cir. 2005). The Court begins the inquiry by "employing traditional tools of statutory construction." *Chevron*, 467 U.S. at 843 n.9. As always, the analysis begins with the text of the statute. *Nat'l Elec. Mfrs. Ass'n v. U.S. Dept'l of Energy*, 654 F.3d 496, 504 (4th Cir. 2011).

The text of the statute that requires states to establish their own TMDLs, 33 U.S.C. § 1313(d)(1)(C), is:

> Each State shall establish for the waters identified in paragraph (1)(A) of this subsection, and in accordance with the priority ranking, **the total maximum daily load, for those pollutants which the Administrator identifies** under section 1314(a)(2) of this title as suitable for such calculation. Such load shall be established at a level necessary to implement the applicable water quality standards with seasonal variations and a margin of safety which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality. (emphasis added)

The next subsection, § 1313(d)(2), grants EPA the authority to set TMDLs when the state

has not done so adequately. "Pollutant" is a statutorily defined term. 33 U.S.C. § 1362(6).

The Court sees no ambiguity in the wording of this statute. EPA is charged with establishing TMDLs for the appropriate pollutants; that does not give them authority to regulate nonpollutants. The parties agree that sediment is a pollutant under 33 U.S.C. § 1362(6), and stormwater is not. Then how does EPA claim jurisdiction over setting TMDLs for stormwater?

EPA frames the stormwater TMDL as a surrogate. EPA's research apparently indicates that the "[sediment] load in Accotink Creek is a function of the amount of stormwater runoff generated within the watershed." Def. Opp. at 8. And EPA believes that framing the TMDL in terms of stormwater flow rate is superior to simply expressing it in terms of maximum sediment load.

The DC Circuit has considered and rejected a similar attempt by EPA to take liberties with the way Congress intended it to express its TMDLs. In *Friends of the Earth, Inc. v. Env. Protection Agency*, EPA had promulgated TMDLs for the Anacostia River that expressed the maximum load of certain pollutants in terms of annual and seasonal amounts. 446 F.3d 140, 143 (D.C. Cir. 2006). The court found that expressing a TMDL in terms of annual or seasonal maximums was not allowed, because the statute granted authority only for daily loads. *Id.* at 148. The court reached its conclusion even though EPA apparently made a strong argument that expressing TMDLs in terms of annual or seasonal loads was an effective and reasonable approach. *See id.* Presumably a daily load could have been derived by simply dividing the annual load by 365, yet the court still required expression in the terms dictated by Congress.

Here too, EPA hopes to express a TMDL in terms other than those contemplated by the statute, arguing that such an expression is the most effective method. But, as *Friends of the Earth* illustrates, EPA may not regulate something over which it has no statutorily granted power—

annual loads or nonpollutants—as a proxy for something over which it *is* granted power—daily loads or pollutants.

EPA's argument that its surrogate approach should be allowed because the statute does not specifically forbid it fails. EPA is not explicitly forbidden from establishing total maximum *annual* loads any more than they are explicitly barred from establishing TMDLs for nonpollutants. The question is whether the statute grants the agency the authority it is claiming, not whether the statute explicitly withholds that authority. And in this case, as in *Friends of the Earth*, the statute simply does not grant EPA the authority it claims.

The dicta in *Weyerhaeuser Co. v. Costle* is not as helpful to EPA's case as it would like. 590 F.2d 1011, 1022 n.6 (D.C. Cir. 1978). It is true that the court said in a footnote "[i]t is well recognized that EPA can use pollution parameters that are not harmful in themselves, but act as indicators of harm." *Id.* But in that case, the non-harmful pollution parameters the EPA sought to regulate were components of the effluent commonly discharged from paper mills, *id.* at 1022, making them effluents themselves. And power to regulate effluents is expressly granted to the EPA in the relevant statutory section. *See* 33 U.S.C. § 1314(b).

EPA would like to create the impression that Congress has given it loose rein to determine exactly what it could and could not regulate. On page 16 of its opposition to this motion, EPA points out that "Congress authorized EPA to determine which pollutants were suitable for TMDL calculation and measurement." (Internal quotes removed). While this may be true, EPA glosses over the fact that 33 U.S.C. § 1314(a)(2)(D) only gives EPA the power to regulate pollutants as that term is defined—by Congress—elsewhere in the statute. And, as discussed above, sediment is a pollutant for these purposes, but stormwater is not.

In a similar vein, EPA regulations which imply that the agency has discretion to set the

TMDL as it sees fit do not bear on the question now before the Court. EPA has promulgated a regulation allowing TMDLs to be "expressed in terms of either mass per time, toxicity, or other appropriate measure," 40 C.F.R. § 130.2(i), and another that allows TMDLs to be expressed as a "property of pollution," 50 Fed. Reg. 1774, 1776 (Jan. 11, 1985). But, EPA citing these regulations to demonstrate that the surrogate TMDL approach is permissible is mere bootstrapping. To the extent the regulations allow EPA to set TMDLs for nonpollutants, they exceed the statutory authority of EPA.

The plain language of the statute trumps all, but legislative history also supports Plaintiffs' argument. Congress's intent to limit EPA's discretion in this context is evidenced by the committee record cited by Plaintiffs, which has also been used by the Ninth Circuit, in which Senator Randolph, Chairman of the Senate committee that amended the act in 1972, explained, "We have written into law precise standards and definite guidelines on how the environment should be protected. We have done more than just provide broad directives [for] administrators to follow." Pl. Mot. 7, *citing Nw. Envtl. Def. Ctr. v. Brown*, 640 F.3d 1063, 1072 (9th Cir. 2011). Congress created a statutory scheme that included a precise definition of the word "pollutant," and then gave EPA authority to set TMDLs for those pollutants. Senator Randolph's comments strongly imply that Congress did not intend anything more or less than what is written in the statute.

The Court considers the language of 33 U.S.C. § 1313(d)(1)(C) to be unambiguous. Congress has spoken directly on the question at issue, and its answer is that EPA's authority does not extend to establishing TMDLs for nonpollutants as surrogates for pollutants. The legislative history of the CWA is consistent with this reading. Therefore, this Court finds EPA's interpretation of § 1313 and the related provisions to be impermissibly broad based on analysis

under the first step of *Chevron* analysis.

III. Chevron Step Two

Because the Court considers Congress's intent to be clear and unambiguously expressed by the language of the statute, it need not move to the second step of *Chevron* analysis. But the Court notes that there is substantial reason to believe EPA's motives go beyond "permissible gap-filling."

Page 9 of EPA's opposition says, "stormwater flow rates as a surrogate would more effectively address the process by which sediment impairs aquatic life in Accontink Creek." If the sediment levels in Accotink Creek have become dangerously high, what better way to address the problem than by limiting the amount of sediment permitted in the creek? If sediment level is truly "a function of" the amount of stormwater runoff, as EPA claims, then the TMDL could just as easily be expressed in terms of sediment load.

In fact, the Board of Supervisors of Fairfax County argued at the December 14th hearing (without objection from EPA) that EPA has approved 3,700 TMDLs for sediment nationwide, and in Virginia has addressed 111 benthic impairments with TMDLs. None of them regulated the flow rate of stormwater. By comparison, EPA has tried out its novel approach of regulating sediment via flow in only four instances nationwide, and all four attempts were challenged in court. One has settled, the other three are still pending.

The Court suspects that the decision to regulate stormwater flow as a surrogate for sediment load would not constitute a permissible construction of § 1313(d)(1)(C), even given the deference due at *Chevron's* second step. This is especially likely because EPA is attempting to increase the extent of its own authority via flow TMDLs, which courts must examine carefully.

See Brown & Williamson Tobacco Corp. v. Food & Drug Admin., 153 F.3d 155, 161-62 (4th Cir. 1998). EPA's attempt to set TMDLs for nonpollutants probably goes beyond "permissible gap-filling" and is instead an impermissible construction of the statute.

Conclusion

The language of § 1313(d)(1)(C) is clear. EPA is authorized to set TMDLs to regulate pollutants, and pollutants are carefully defined. Stormwater runoff is not a pollutant, so EPA is not authorized to regulate it via TMDL. Claiming that the stormwater maximum load is a surrogate for sediment, which is a pollutant and therefore regulable, does not bring stormwater within the ambit of EPA's TMDL authority. Whatever reason EPA has for thinking that a stormwater flow rate TMDL is a better way of limiting sediment load than a sediment load TMDL, EPA cannot be allowed to exceed its clearly limited statutory authority. For these reasons, the Plaintiffs' motion for Rule 12(c) judgment on the pleadings on Count I of their complaint is granted.

January 3, 2013
Alexandria, Virginia

/s/ LOG
Liam O'Grady
United States District Judge

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ALEXANDRIA, VIRGINIA

IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF VIRGINIA
Alexandria Division

VIRGINIA DEPARTMENT OF TRANSPORTATION, ET AL, Plaintiffs, -v- UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, ET AL, Defendants.	Civil Action No. 1:12-CV-775

Order

In accordance with the memorandum opinion that accompanies this order, it is now **ORDERED**:

1. Plaintiffs' motion (Dkt. No. 29) for judgment on the pleadings as to Count I of the complaint is **GRANTED**.
2. The clerk shall enter judgment in favor of the Plaintiffs.
3. The Accotink Creek TMDL is remanded to EPA for reconsideration consistent with this order.

January 3, 2013
Alexandria, Virginia

/s/
Liam O'Grady
United States District Judge

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January 10, 2013

Catherine Hagan, Esq.
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via Fed Ex

Re: Tentative Order R9-2013-0001

Dear Catherine:

On behalf of our client the County of San Diego, I am writing concerning some provisions in Tentative Order R9-2013-0001 that are of particular concern to the County. I respectfully ask that you review our legal position on those provisions as outlined below, and please call me to discuss if you have any questions or need further information to assist your review.

The Bacteria TMDL Resolution

The Tentative Order would incorporate elements and requirements from the Bacteria TMDL Resolution (Resolution R9-2010-0001) into the new MS4 permit for San Diego Region copermittees, including the County of San Diego. We specifically urge the San Diego Regional Board to not incorporate the Bacteria TMDL provisions in this permit renewal cycle. It is our legal position that your Board has the authority to decline the demands of other interested parties that this action be taken.

Reasons Not to Incorporate the Bacteria TMDL Into the Permit

From a recent summary by Regional Board (RB) staff, County of San Diego copermittees spend approximately $119M per year on programs to improve water quality

in the San Diego region. Those programs have improved water quality in general and at beaches in the region. With ever-increasing knowledge gained through trial and error, and with the Watershed Quality Improvement Plan concept expected to permit existing resources to be focused in more efficient and effective ways, San Diego copermittees expect to continue the march toward improved water quality using the current level of resources. The copermittees are continually working on ways to improve water quality and have done so for over two decades. As evident in our annual expenditure and work with experts, we are committed to improving water quality.

By RB staff estimates and as confirmed by San Diego copermittees, the implementation of the Bacteria TMDL in the next permit cycle would add a magnitude of additional costs to copermittee budgets that is unsustainable using existing methods for raising general fund monies and given California's legal constraints on taxation or fees. As your Board has heard, the range of additional cost attributable to the Bacteria TMDL alone is $144M to $272M per year, meaning billions of taxpayer dollars over the compliance period.

As presentations in the adoption process have shown, given the unique challenges associated with bacteria as a constituent in stormwater, the cost-benefit analysis dictates that implementing the Bacteria TMDL at this time, as written, would be bad public policy. Studies and experience show that any magnitude of controls for bacteria, up to and including disinfectant efforts, will not consistently achieve the Resolution's numeric standards, even with the expenditure of billions of dollars. So, the sensible, logical next step is to take a hard look at the standards and assumptions of the Bacteria TMDL and devise plans to improve water quality using existing resources and as realistically achievable with today's scientific methods.

Legal Authority to Not Incorporate the Bacteria TMDL Into the Permit

As you know in 1987, Congress declared its intent to chart a different course for improving water quality flowing from MS4 systems by enacting Clean Water Act § 402 (33 U.S.C. § 1342). In establishing the "maximum extent practicable" (MEP) standard of CWA § 402(p)(3)(B), Congress recognized and enacted a different standard than the technology based requirements of CWA § 301. The MEP standard is the legal standard for stormwater compliance.

In *Defenders of Wildlife v. Browner,* 191 F.3d 1159 (1999) the Ninth Circuit held that the MEP standard of CWA § 402(p)(3)(B) *replaces* the requirements of CWA § 301(b)(1)(C) for MS4 dischargers. The *Browner* decision goes on to discuss the

discretion vested in permitting authorities to either require strict compliance, or less than strict compliance, with water quality standards.

Our office believes that the November 12, 2010 EPA memorandum concerning the incorporation and use of numeric WQBELs in permits is not dispositive of this issue. As acknowledged in its March 17, 2011 letter, EPA is still considering whether to retain, reissue, or withdraw the 2010 memorandum. And, in the same letter, EPA acknowledges that the 2010 memorandum, "does not impose legally binding requirements on EPA, States, or the regulated community, nor does it confer legal rights or impose legal obligations on any member of the public."

With regard to the unique challenges associated with bacteria control, the science shows that consistent achievement of the Bacteria TMDL numeric standards is not possible, even with any level of expenditure. Therefore, imposing the 2010 Bacteria TMDL provisions as permit conditions would exceed the "maximum extent practicable" standard. Accordingly, we believe your Board is vested with the discretion to elect not to incorporate the Bacteria TMDL provisions at this time.

Your Board would be justified to open a process to revisit and re-examine the Bacteria TMDL assumptions in the context of its basin planning process, instead of taking the irrevocable step of incorporating the TMDL into the permit and potentially wasting valuable taxpayer dollars that could better be spent on achievable water quality improvement goals.

Receiving Water Limitations (RWL) Language

As you know, the copermittees have expressed significant concerns about third-party liability risks resulting from the Ninth Circuit's interpretation of receiving water limitation language in the L.A. Region's stormwater permit. While we appreciate the State Water Resources Control Board's willingness to take comment and review those concerns, it may take several months for the State Board to act. The Tentative Order retains language similar to the problematic language reviewed in the *NRDC* case; this leaves the County and other copermittees immediately exposed to similar litigation from third parties for violations of water quality standards. We know that several various proposals to modify RWL language have been presented at state and local levels.

We suggest a simple solution consistent with Congress' intent in enacting CWA § 402 as discussed above: simply remove the RWL language in Provision A of the Tentative Order. Federal law does not require imposition of the receiving water limitations for MS4 systems. There is precedent for this action; a number of EPA issued

stormwater permits throughout the country do not include this language. Your Board has the discretion under CWA § 402 and *Browner* to remove the language. If EPA does not consider the RWL language to be essential to its own MS4 permitting, it seems logical that your Board is not required to include it in the new permit.

State Water Board policy supports the iterative process approach to water quality improvement, and acknowledges that water quality standards for many pollutants from MS4s cannot be met immediately. Therefore it is unrealistic and at odds with the iterative process to enact a standard that puts the third-party lawsuit gun to the head of public entities diligently spending significant time and public money pursuing water quality improvement. The permit would still include its enforceable prescriptive requirements and the WQIP features that all parties believe will focus resources in each watershed in the most productive fashion. Over the past two decades, the region has developed the knowledge and skill set to improve water quality, but understands that only through an iterative process can true progress be made.

Removal of the RWL language would eliminate the inevitable jousting over modified language proposals and the uncertainty created by its retention in light of the *NRDC* ruling. Copermittees would simply be obligated to focus on permit condition compliance, including the tasks identified in approved WQIPs, subject to RB enforcement if appropriate. Removal of the language would not create a "free pass"; to the contrary, it would encourage effective water quality monitoring and reporting that might otherwise be discouraged by the specter of third party lawsuits like those filed in the *NRDC* and other cases.

Land Development Standards/Hydromodification Issues

County Counsel concurs with the legal concerns sent to your attention in the December 19, 2012 letter from the Office of the City Attorney of the City of San Diego. The letter points out potential constitutional issues with hydromodification requirements imposed in the Tentative Order. We urge you to recommend modifying the referenced provisions to avoid the potential consequences for copermittees outlined in the letter.

The County also urges the Regional Board to amend the Tentative Order to incorporate the approved hydromodification management plan (HMP) for San Diego County into the permit, and remove provisions of the Tentative Order that are inconsistent with the HMP. As you know, the HMP was developed at significant cost to copermittees, and has only recently been implemented. Therefore, scrapping key components and changing the baseline standard for redevelopment to the questionable "pre-development" standard without further study of the effectiveness of the HMP as

implemented is legally inconsistent with the premise upon which the HMP was required to be developed in the first instance. Our client is submitting a more comprehensive technical comment on the HMP issue for your review.

Other legal concerns with various Tentative Order provisions will be woven into the comprehensive written comments to be submitted by the County and copermittees. Because of the potential impact of the above provisions of the Tentative Order for our client, we urge you to review and revise your recommendations to the Regional Board. Our mutual goal should be a permit that realistically and responsibly advances the march toward improved water quality in the region using available existing resources. As always, thank you for your consideration.

Very truly yours,

THOMAS E. MONTGOMERY, County Counsel

By James R. O'Day

James R. O'Day, Senior Deputy

JRO/tlm
12-00802

006275

Board of Directors

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San Diego's Voice for Binational Business

South County Economic Development Council

SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD

2013 JAN 11 A 10:55

January 10, 2013

Mr. Wayne Chiu, P.E.
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Ct Ste 100
San Diego, CA 92123-4340

Dear Mr. Chiu,

On January 8, 2013, The South County Economic Development Council (SCEDC) Board of Directors agreed to send you a letter voicing our concerns with the changes proposed to the Regional Water Quality Board's Stormwater permit. While our members noted the intent of the ordinance is admirable, the anticipated implementing of the ordinance was viewed as onerous and expensive and a detriment to economic development in South San Diego County.

The draft language of the permit includes new requirements for development. These new requirements will increase costs substantially on an already over-burdened business community. These costs are due to the measures that must be taken to comply with the new regulations. Additionally, the new liability for exceeding the water quality objectives will discourage investment in our region at a time when we should encourage businesses to invest and create more jobs. Furthermore, it was noted that many of the previous exemptions to the Stormwater regulations had been deleted in this new ordinance. The additional measures needed to comply with these regulations will make a project infeasible.

SCEDC would like to offer our services if the San Diego Regional Water Quality Control Board would like to create an implementation task force to discuss best practices and realistic methods to achieve your goals. If I may be of further assistance or provide additional information please feel free to contact me at (619)424-5143.

Sincerely,

Cindy Gompper Graves
President & Chief Executive Officer

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SAN DIEGO
AMERICAN SOCIETY OF
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STUDENT AFFILIATE PRES.
John Thomas, Affiliate ASLA

EXECUTIVE DIRECTOR
Tracy Morgan Hollingworth, CAE

January 11, 2012

Re: SDASLA COMMENTS ON THE DRAFT REGIONAL MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) (Tentative Order No. R9-2013-0001)/(NPDS Case No. CAS0109266)

Dear Mr. Chiu:

The American Society of Landscape Architects (ASLA) continues to advocate across the country for economic recovery, sustainable design, quality of life issues and wise use of our natural resources including clean water. The San Diego Chapter of the American Society of Landscape Architects (SDASLA) is fully committed to these principals and respectfully submits the following comments, observations and recommendations to the draft San Diego Regional Municipal Separate Storm Sewer System at the request of the Regional Board.

The SDASLA fully supports the proposed approach to the permit that includes:

- Regional Permit / Holistic Approach
- Includes Strategic Planning
- Adaptive / Results Based Management
- Alternative Compliance / Mitigation
- Water Quality Improvement Plans (WQIP)

SDASLA understands that the proposed WQIPs in the draft permit will become powerful tools to help improve water quality within each of our ten watersheds and strongly recommends the following be added to the permit:

- Timely development of effective and enforceable WQIP(s).
- Each WQIP be developed through a process that ensures public participation such as the formation of a stakeholders advisory group.
- Stakeholder advisory groups for each watershed shall include representatives of environmental groups, business groups, community planning and /or sponsor groups, local universities and technical experts with knowledge of the watershed.
- This stakeholder advisory group should work closely with the Copermittees and a regional board staff member while the Water Quality Improvement Plans are being developed to ensure these plans aggressively pursue water quality gains.
- The stakeholder advisory process should include accountability and measureable milestones to ensure the goals of the Permit are being met.
- Appropriate BMP's should be determined for each watershed and should be reviewed by a project engineer and / or Landscape Architect to determine if they are infeasible.

- If project BMP's are determined to be infeasible than no other burden of proof should be required.
- To sections 3.b.(3)(c) Priority Development Exemptions (Page 77), and 3.c.(b) Alternative Compliance Project Options (Page 81), add the following option:
  - Designed and constructed to be certified under the Sustainable Sites Initiative (SITES™), a voluntary certification program through the American Society of Landscape Architects, the Lady Bird Johnson Wildflower Center at The University of Texas at Austin and the United States Botanic Garden, receiving at least credits 3.5 and 3.6. under the "Site Design - Water" category.

SDASLA supports the use of Low Impact Development (LID) BMP Requirements strategies when geologically appropriate and feasible. However, other options should be available to strengthen overall water quality such as in-lieu fees, mitigation and redevelopment of key sites to encourage smart growth and urban infill / redevelopment in the future. SDASLA encourages the required development of a priority site list by each Copermittee during the planning process for which in-lieu fees / mitigation may be applied. These sites could function as large water holding and infiltration sites and double as public open space / educational areas. However, SDASLA is concerned that not all BMPs will be effective or feasible throughout the basin. SDASLA recommends that the Copermittees be allowed to customize the application of specific BMPs on a watershed by watershed basis through the development of robust and enforceable Water Quality Improvement Plans rather than imposing a universal suite of BMPs on all watersheds regardless of their feasibility of applicability.

By taking advantage of the knowledge and resources of diverse stakeholders like municipalities, businesses and residents, environmental groups, technical experts and the academia, our region can benefit greatly from solutions that provide cleaner water more efficiently, quickly and cost effectively creating healthier communities. But this can only be achieved if these stakeholders are involved in a meaningful way during the Water Quality Improvement Plan development process.

SDASLA recognizes the challenge this permit and the proposed changes represents to our region, and would like to help by participating in the Water Quality Improvement Plan development process. SDASLA urges the Regional Board to enhance the stakeholder participation opportunities during Water Quality Improvement Plan development before approving the final permit.

Thank you for your consideration and we look forward to continuing our work with you and your staff on this draft permit.

Sincerely yours in Landscape Architecture,

Tim Jachlewski, Jr., ASLA
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VIA E-MAIL

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January 11, 2013
Mr. Wayne Chiu, P.E.
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, Ca 92123-4340

Re: Comment Letter– Tentative Order No.R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu."

Dear: Mr. Chiu,

On behalf of Building Industry Association of Southern California, Inc. (BIASC), Construction Industry Coalition on Water Quality (CICWQ) and the members of both, we appreciate the opportunity to provide comments on the San Diego Regional Water Quality Control Board Tentative Order No. R9-2013-0001; NPDES No. CAS0109266, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems ("MS4s") Draining the Watersheds within the San Diego Region (the "Tentative Order"). In addition, we respectfully request that our comment letter submitted to the Regional Board on September 14, 2012 be made a part of our overall comments to the Tentative Order and admitted into the formal administrative record, because the constructive suggestions for permit improvement remain relevant at this point in the Tentative Order development.

BIASC is a nonprofit trade association representing nearly 1,000 member companies, which together have nearly 100,000 employees. For decades, BIASC's members have built the majority of the new homes in Ventura, Los Angeles, Orange, Riverside, and San Bernardino Counties in southern California. CICWQ is an education, research, and advocacy water quality coalition comprised of representatives from five industry trade associations (in addition to BIASC) which are involved in the development of public and private building, infrastructure and roads throughout California (Associated General Contractors, Engineering Contractors Association, Southern California Contractors Association, Engineering and General Contractors Association, and United Contractors). All of the above trade associations, their members and the union labor work force are affected by the post-construction runoff control requirements proposed in the Tentative Order, and this letter is meant to provide the San Diego Regional Board with constructive suggestions for improvement.

We appreciate the Regional Board's earlier release of a precursor to the Tentative Order as an Administrative Draft, and the extensive stakeholder involvement process that ensued over the summer and autumn of 2012. Unfortunately, the Tentative Order does not reflect critically important changes to the Tentative Order's Development Planning requirements which we and many other public and private stakeholders recommended, both during the focused stakeholder meetings and in comments submitted to the Regional Board. Moreover, Regional Board staff does not provide sufficient findings of fact to support the priority project water quality and hydromodification control design criteria and performance standards in the Tentative Order. The requirements proposed in the Tentative Order are vastly different from those contained in the 2010 South Orange and South Riverside County MS4 permits, and there is simply insufficient performance data to demonstrate the need for any change.

We are concerned that key water quality and hydromodification control provisions within the Development Planning section (Section C.3) are (i) unsupported by substantial evidence, (ii) very bad public policy, and (iii) not properly considered as legally required. Specifically, certain provisions: (i) lack sufficient auditing or performance data showing the need for or advisability of such requirements, (ii) lack technical or scientific basis, and (iii) depart without any justification from required and approved technical documents that have been issued by the San Diego Regional Board for priority development projects in San Diego, Orange, and Riverside Counties. In addition, the hydromodification control provisions illuminate the Regional Board's failure to consider the factors required by California Water Code section 13241 – especially subsection (b) thereof.

1. There are no findings of fact to support changes in the requirements to evaluate, design and install LID BMPs (Section E.3.c) when comparing the proposed requirements in the Tentative Order with that of the requirements in the 2010 adopted South Orange and South Riverside County MS4 permits.

The Orange and Riverside County permits have been in effect for a short period of time (<2 years); and there is no data (program audits or annual report data, for example) that we can find that would support any changes to priority development project water quality control design criteria (found in Section E.3.C of the Tentative Order). Moreover, in one particular instance concerning which we and others have repeatedly commented to Regional Board staff, there is no technical justification provided by staff for requiring biofiltration LID BMP to be sized at 1.5 times the remaining design capture volume not reliably retained on-site. Section E.3.c.(3)(b)(i)[c] requires that if biofiltration is used as an alternative compliance method the biofiltration BMP is required to be sized to 1.5 times the design capture volume, which is an increase from the existing South Orange County permit. The permit and the fact sheet provide no technical justification for the 1.5 factor and therefore this requirement should be deleted from the permit. BIASC and CICWQ comment letter submitted to the Regional Board on September

14, 2012 and attachments including suggested permit redline remains relevant in this matter. We have provided this here as Attachment1.

2. There are no findings of fact or supporting technical and scientific data indicating the need for changes in hydromodification control requirements for priority development projects.

As we have commented before, there needs to be (i) an in-stream hydromodification control performance standard using the erosion potential (EP) approach; and (ii) the permit must recognize that there are a number of different types of channel hardening that have been used for armoring in stream systems besides concrete. In Attachment 1, we again make suggestions for improving the consistency of hydromodification control standards with those identified and allowed in the South Orange County MS4 permit.

The Tentative Order provides an "on-site" option for addressing hydromodification through flow duration control. This is an important element of the hydromodification control standard. However the Tentative Order is incomplete in that it lacks an option to assess and demonstrate hydromodification control through in-stream metrics. In many cases, significant development within a watershed has already caused hydromodification impacts. Requiring project-by-project flow duration control for each new project may not address the existing issue as effectively as a regionally-coordinated approach that combines upland control with in-stream remedies. Including the EP standard—as BIASC and CICWQ urge--would enable the development of more comprehensive approaches that include both upland controls and stream modifications (i.e., restoration). This option is critical for more effectively and efficiently protecting the region's aquatic resources.

Additionally, the Tentative Order includes an unnecessarily narrow definition of hardened channels that includes only those channels lined with concrete. Other forms of artificial hardening may be comparably resistant to hydromodification impacts, such as channels that are lined with rip rap, armored with soil cement, or armored with other practices. While the co-permittees or the project proponent should be responsible for demonstrating that a specific channel material is sufficiently stable, the narrow definition currently provided by the Tentative Order does not allow the use of sound engineering judgment and does not allow for use of innovative materials.

The comment letter submitted by BIASC and CICWQ to the Regional Board on September 14, 2012 remains relevant here, as the Regional Board staff did not make any changes to the hydromodification control requirements except for minor exemption allowances for using USGB council's LEED for redevelopment program standards. Exemptions, generally, are welcome and appropriate. But, in practice, referencing a voluntary, national green building and

development certification program for use as part of a NPDES permit does not provide a viable pathway for most priority development projects that are located in already urbanized areas that are served by existing MS4 infrastructure. Exemptions identified in the adopted San Diego Hydromodification Management Plan are appropriate and should be cited and referenced in the Tentative Order, and any reference to USGB LEED standards deleted.

3. Preserve the 2010 adopted San Diego County Hydromodification Management Plan elements

The Regional Board staff has provided no technical justification for the new hydromodification provisions. The HMPs for San Diego and South Orange County are based on sound science and should be allowed time to understand if they are adequate for mitigating hydromodification impacts. The Regional Board adopted the San Diego Hydromodification Management Plan (HMP) in July 2010. Significant work, technical analysis and stakeholder input have gone into the development of the HMP and these requirements have been in effect for just 16 months. Rather than providing separate criteria, the permit should acknowledge implementation of the Regional Board approved HMP as a sufficient mechanism for meeting hydromodification requirements. Of particular note and concern is the removal of exemptions for certain priority development projects (projects in urban areas with greater than 70% existing impervious surface, for example) that discharge to an MS4 system that then discharges into a significantly hardened channel system. It is unquestionably bad public policy to require installation of controls (or payment of in-lieu fees to compensate for the inability to install controls) when there is no threat to the receiving water.

To this end--and for sake of brevity, we support and encourage the Regional Board to accept comments from Orange County Public Works which pertain to the hydromodification control requirements. Changes in permit language as indicated in the County's redline of the Tentative Order would sufficiently address our concerns about the tentative hydromodification control requirements, and we urge the Regional Board to accept these changes.

Regional Board staff has publically stated that the proposed hydromodification control requirements in the Tentative Order are consistent with the 2010 adopted HMP and that only minor adaptation is necessary. That assertion is simply not true and in fact adoption of the Tentative Order requirements will render the HMP obsolete and require a total overhaul. According to the County of San Diego and the co-permittees within the County (and private developer stakeholders), more than $1.5 million have been spent to date developing the plan and conducting required monitoring. By changing the performance standards, requiring hydromodification controls at all priority development projects, and removing standard exemptions that are found in all other 4th term MS4 permits in California, the Regional Board is sweeping away years of program development activities and turning program implementation on

its head. The Tentative Order should explicitly recognize the findings of hydromodification management plans (HMPs) that have been previously approved by this Regional Board. The South Orange County HMP and the San Diego County HMPs were both the products of rigorous technical analysis based on the state of the practice, which were reviewed in detail by Regional Board Staff. The findings of these efforts must not be jeopardized under the new terms of the Tentative Order. *S*pecifically, findings regarding exempt water bodies must be appreciated and upheld, and they should be explicitly recognized in the Tentative Order.

4. The Tentative Order's proposed hydromodification control measures betray the Regional Board's failure to take into account the considerations required by California Water Code section 13241

For years, BIASC and CICWQ have been urging the water boards when developing MS4 permit requirements to address and respect their longstanding legal obligation to take into account the six, specified, non-exclusive factors which are set forth in California Government Code section 13241. The water boards have persistently refused. Most recently (just months ago), the Los Angeles Regional Board dismissed its obligation to consider the Section 13241 factors by noting that it had, in fact, more or less considered two of them (economics and some technical considerations). If the Regional Board here were to adhere to such a position, it would act in violation of California law and without justification.

There is perhaps no greater example of a permit condition written pursuant to a failure to consider the Section 13241 factors than the hydromodification control measures in the Tentative Order – particularly those which impose heroic, expensive engineering standards on development that drains into hardened flood control channels. Section 13241, subsection (b), requires consideration of the "[e]nvironmental characteristics of the hydrological unit under consideration…." By imposing expensive hydromodification control measures even where a receiving flood control system is already firmly hardened, the Tentative Order ignores this Section 13241, subsection (b), factor (obviously so, and regrettably consistent with the Regional Board's general refusal to take into account all six Section 13241 considerations).

BIASC and CICWQ believe that the water boards' persistent refusal to take demonstrably and meaningfully into account the Section 13241 required considerations results from a mistaken view of the applicable law. Specifically, the water boards' seemingly hold to the belief that the "maximum extent practicable" standard in federal law absolves the state agencies of any obligation to apply Section 13241when issuing MS4 permits. If indeed the water boards' legal position is thus, then it reflects a mistaken view of the degree of "federalism" reflected in the Clean Water Act and its interplay with the California Water Code. Moreover, such a position would reflect a failure to apply basic "federal preemption principles," which apply any time a party claims that federal law displaces state law.

BIASC and CICWQ urge the Regional Board to reconsider and reverse its refusal to apply meaningfully all six Section 13241 considerations, and to correct the Tentative Order accordingly.

Concluding Remarks:

BIASC and CICWQ have been active participants and contributors to the creation of improved MS4 permits across southern California. We continue to believe that rational, *implementable*, and *effective* permit requirements are critical to achieving great progress concerning water quality and our environment. We hope that these comments are received in the manner in which they are intended – to create a workable permit that improves water quality to the maximum extent practicable. We remain committed to a positive dialog with the Regional Board and its staff – one that will result in an informed, balanced and effective permit.

If you have any questions or want to discuss the content of our comment letter, please feel free to contact me at (951) 781-7310, ext. 213, (909) 525-0623, cell phone, or mgrey@biasc.org.

Sincerely,

Mark Grey, Ph.D.
Director of Environmental Affairs and Technical Director
Building Industry Association of Southern California and
Construction Industry Coalition on Water Quality

Enclosures:
Attachment 1

cc. Andy Henderson, Esq., Building Industry Legal Defense Foundation

006284

VIA E-MAIL

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September 14, 2012
Ms. Laurie Walsh, Senior Engineer
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, Ca 92123-4340

Re: ADMINISTRATIVE DRAFT REGIONAL MUNICIPAL SEPARATE STORM SEWER SYSTEM (Tentative Order No. R9-2012-0011)

Dear: Ms. Walsh

On behalf of the Building Industry Association of Southern California, Inc. (BIA/SC) and the Construction Industry Coalition on Water Quality (CICWQ) and the members of both, we appreciate the opportunity to provide comments on the Administrative Draft of the San Diego County Regional MS4 Permit (Administrative Draft Permit). We submit these comments in addition to and in support of comments made by our affiliate in San Diego County, the Building Industry Association of San Diego and its coalition partners, and comments submitted by Rancho Mission Viejo.

BIA/SC is a nonprofit trade association representing nearly 1,000 member companies, which together have nearly 100,000 employees. BIA/SC's members have, for decades, built the majority of the homes in Ventura, Los Angeles, Orange, Riverside, and San Bernardino Counties in southern California. CICWQ is a water quality coalition comprised of representatives from five industry trade associations (in addition to BIA/SC) involved in the development of public and private building, infrastructure and roads throughout California (Associated General Contractors, Engineering Contractors Association, Southern California Contractors Association, Engineering and General Contractors Association, and United Contractors). All of the above trade associations and their members and the union labor work force are affected by the post-construction runoff control requirements proposed in the Draft Permit, and this letter and supporting attachments are intended to provide the San Diego Regional Board staff with constructive suggestions for improvement.

We appreciate the Regional Board's release of the Administrative Draft Permit in April 2012, and the extensive stakeholder involvement process that ensued over the summer of 2012. The comments provided here are intended to further meet the permit's underlying objective of protecting and improving water quality within the watersheds administered by the San Diego Regional Board. Our comments, supporting attachments, and suggested redline permit language

modifications reflect years of working not only on MS4 permits issued by the San Diego Board, but other MS4 permits administered by the Los Angeles, Santa Ana, and San Francisco Bay Regional Water Quality Control Boards.

We have four primary concerns with the Administrative Draft Permit content and the following discussion summarizes those concerns and provides the technical basis for those concerns including supporting attachments:

1. **Administrative Draft Permit Provision E. 3.c.(2)(c) establishes a zero discharge standard for biofiltration-type LID BMPs that are designed with an outlet/underdrain. This type of LID BMP cannot meet the on-site design capture volume standard as it is written. Such a zero discharge standard is scientifically and technically unsound and unsupported.**

Biofiltration is an established LID BMP for use in attempting to mimic pre-development hydrology. The US EPA, in multiple guidance documents produced since 2006, have recognized the use of biofiltration-type systems such as curb contained biofilters, bioswales, rain gardens, and using landscape areas for impervious area disconnection as essential LID BMP elements to include in land development projects, a few of which are cited below. The inclusion of biofiltration BMPs in US EPA's menu is a reflection of the practical limitations to retention of stormwater – retention practices are not universally feasible or desirable. When appropriately selected and designed, biofiltration BMPs achieve high levels of pollutant removal, which may exceed pollutant removal achieved in retention BMPs, particularly in cases where retention BMPs are inappropriately applied.

The retention requirement is contrary to EPA's definition of LID because it disfavors development strategies designed to appropriately "filter" runoff, such as bioretention cells or other vegetated LID BMPs. There are five principal EPA documents regarding LID; and four of them identify the appropriate roles of biotreatment-type BMP, such as detention (i.e., slow down, treat through vegetation, and then release across property lines), filtration, and surface release of stormwater.

In a compilation of case studies by EPA, most of 17 exemplary projects included biotreatment elements, such as bioretention, swales, and wetlands. *See* U.S. EPA 841-F-07-006. Each of two case studies described in another EPA document (s*ee* Attachment 1 at pp. 1-2, EPA 841-B-00-005) included the use of underdrains, and the example in one of the two specifically fed into the MS4 system at issue. Another EPA document updated in January 2009 refers to the many practices used to adhere to LID principles of promoting a watershed's hydrologic and ecological functions, such as bioretention facilities and rain gardens. *See* Attachment 2 at p. 2, EPA-560-F-07-231 (describing "an under-drain system to release treated stormwater off site," permitting planted areas to "safely allow filtration and evapotranspiration of stormwater");

http://www.epa.gov/owow/nps/lid/ (fact sheet describing under-drains used to release treated stormwater off site and permitting planted areas to safely allow filtration of stormwater). Thus, EPA's literature and guidance clearly recognize the important and even necessary role that biofiltration/biotreatment approaches play in real-world implementation of LID principles.

The National Research Council, in their 2008 Report to Congress titled "Urban Stormwater Management in the United States" cite the use of biofiltration and bioretention systems in improving water quality and in attempting to mimic predevelopment hydrology at many different site contexts and locations across the United States. The 2008 NRC report contains and cites numerous examples of using biofiltration type systems to reduce runoff volume and pollutant loads. The 2008 NRC Report clearly recognizes the role that biofiltration systems play in the LID BMP feasibility and selection process, and in achieving runoff management goals. The report states "In some situations ARCD (Aquatic Resources Conservation Design) practices will not be feasible, at least not entirely, and the SCMs [stormwater control measures] conventionally used now and in the recent past (e.g., retention/detention basins, biofiltration without soil enhancement, and sand filters) should be integrated into the overall system to realize the highest management potential." Note that the NRC report definition of ARCD includes both retention and biofiltration elements.

From a management perspective, a review of 4th Term Phase I MS4 permits within California (San Francisco Bay Area, Sacramento Area, North and South Orange County, Western and Southern Riverside County, and San Bernardino County) shows that the use of biofiltration to meet water quality volume and flow control performance standards is clearly allowed (See matrices submitted by BIA/SC_CICWQ at the August 22, 2012 Stakeholder Meeting and provided to the Regional Board by Mark Grey on August 24, 2012). These Regional Boards in California recognize that biofilter-type LID BMPs are an integral component of applying site design principles which seek to mimic pre-development hydrology. Furthermore, these permits implement a clear LID BMP feasibility and selection process, one that first requires examination of on-site retention systems (infiltration, harvest and use, and evapotranspiration), before moving to the evaluation and potential selection of bioinfiltration (some infiltration achieved) and biofiltration systems. This feasibility evaluation hierarchy, which is clearly explained in the South Orange County and South Riverside County MS4 permits adopted by the San Diego Regional Board in 2009 and 2010, respectively, must be preserved and included in the next version of the Administrative Draft Permit.

In summary, the zero discharge standard established by the Administrative Draft Permit significantly narrows the definition of LID, which is contrary to US EPA guidance, the 2008 NRC Report, and the standards established in recently-adopted Permits by the San Diego Regional Board and other Regional Boards. In essence, the proposed provisions would establish a standard that (i) will be impracticable in a relatively large proportion of sites, and (ii) has not

been demonstrated to be necessary to protect receiving water quality. We provide in Attachment 3 suggested permit language to address the continued use of biofiltration.

2. **A mitigation requirement is established when using flow-thru biofiltration-type LID BMPs to manage that portion of the SWQDv that is not retained on-site. This requirement is inconsistent with all other adopted Phase I MS4 permits in California and nationally. Biofiltration and bioretention BMPs are established LID practices; requiring accompanying mitigation of SWQDv that has already been biofiltered penalizes and dis-incentivizes use of these controls.**

Equally problematic, because it does not allow biofiltration type LID BMPs to meet the on-site storm water quality design volume (SWQDv) standard, is the current requirement in Administrative Draft Permit Provision E. 3.c.(2)(c) to "perform mitigation for the portion of the pollutant load that is not retained on-site." In other words, the draft provisions would require that, if a project proponent cannot retain 100 percent of the SWQDv on-site, and must therefore use biofiltration LID BMPs (with a treated discharge), then the use and installation of these systems will trigger an off-site mitigation or in-lieu fee program participation requirement. This provision in the Administrative Draft Permit is technically unjustified, disfavors the use of all types of recognized biofiltration LID BMPs, and could theoretically require a project proponent to not only pay for the installation and O&M of a biofiltration LID BMP, but also require mitigation or fee payment for that portion of runoff managed by it.

Biofiltration BMPs including natural treatment systems such as those that are part of the Irvine Ranch Water District's Natural Treatment System in Orange County (a regional example) can remove vast quantities of pollutant load, and provide other benefits such as habitat, flood control, and aesthetic, recreational and educational value. To relegate multi-benefit biofiltration or biotreatment BMPs applied at a site scale to a status inferior to on-site retention BMPs is not justified on a water quality basis, and is poor public policy, essentially depriving the region of an extremely important and effective approach to managing water quality.

While we agree that project proponents should be required to retain stormwater where technically and economically feasible, there are numerous conditions beyond a project's control that make retention infeasible, undesirable and/or ineffective. For example, in achieving a zero discharge standard, it is necessary to either maintain pre-project ET (which is generally impracticable) or increase the volume of stormwater that is infiltrated (which is the common result). Over-infiltrating rainwater can have adverse consequences such as altering the natural flow regime of the receiving waters such that riparian habitat changes, mobilizing pre-existing contamination in shallow groundwater, increasing inflow and infiltration to sanitary sewers, causing damage from rising groundwater, and other potential effects. By discouraging the use of biofiltration LID BMPs where there are more appropriate than retention, the Administrative

Draft Permit irresponsibly encourages the use of retention where it may have adverse consequences.

Retention BMPs are not necessarily more effective than biofiltration BMPs as the Administrative Draft Permit implies, especially considering the back-to-back-to-back nature of storm systems that arrive in southern California during winter months and deliver the majority of total rainfall volume. The Administrative Draft Permit establishes a SWQDv that must be retained, but does not specify the time over which this volume must be drawn down (i.e., drained) in order to have capacity for the volume from subsequent storms. The rate at which the SWQDv can be drained is a function of the infiltration rates of soils and the demand for harvested water. Where soils are not sufficiently permeable and/or where harvested water demands are moderate to low, the drawdown time of retention BMPs can be in the range of several days to several weeks.

In comparison, biofiltration BMPs are designed with engineered soils that can generally drain the SWQDv much more quickly, on the order of several hours. In cases where retention opportunities are limited, this results in a higher level of capture and treatment by biofiltration BMPs than retention BMPs, which can more than offset the lower "treatment efficiency" afforded by biofiltration compared to full retention. For example, based on rigorous technical analysis contained in the Orange County Technical Guidance Document (Figure III.2, Page III-11), a hypothetical biofiltration BMP draining in 12 hours would achieve approximately 25 percent greater treatment of average annual stormwater runoff volume than an equivalently sized retention BMP that drains in 72 hours and approximately 60 percent greater treatment than a retention BMP that drains in 10 days.

Because drawdown time is an important factor in (i) assessing BMP effectiveness and (ii) evaluating the site-specific determination of whether retention or biofiltration are preferable, we strongly recommend (in addition to allowing the use of biofiltration or biotreatment systems to meet the retention standard) including a secondary performance metric of managing 80 percent of annual runoff volume using continuous simulation modeling. This provides a means of accounting for the performance of strictly on-site retention BMPs versus the addition of biofiltration or biotreatment BMPs which can be designed to manage a greater volume of average annual runoff volume than retention BMPs of the same size. The total amount of water captured and treated and associated pollutant load reduction should be a primary deciding factor in whether retention or biofiltration BMPs are selected for a given project. As written, the Administrative Draft Permit strongly discourages an entire group of effective practices which have the potential to provide better protection of water quality, when compared to retention, in a wide range of cases. Attachment 3 provides suggestions for permit language which corrects these deficiencies.

3. Hydromodification control measures should allow use of the EP method to meet in stream standards; recognize multiple types of channel hardening when evaluating applications for hydromodification control exemptions

In Attachment 3, we also make suggestions for improving the consistency of hydromodification control standards with those identified and allowed in the South Orange County MS4 permit. Specifically, we recommend providing for an in-stream hydromodification control performance standard using the erosion potential (EP) approach and recognizing that there are a number of different types of channel hardening that have been used for armoring in stream systems besides concrete.

The Administrative Draft Permit provides an "on-site" option for addressing hydromodification through flow duration control. This is an important element of the hydromodification control standard. However the Administrative Draft Permit is incomplete without an option to assess and demonstrate hydromodification control through in-stream metrics. In many cases, significant development within a watershed has already caused hydromodification impacts. Requiring project-by-project flow duration control for each new project may not address the existing issue as effectively as a regionally-coordinated approach that combines upland control with in-stream remedies. Including the EP standard enables the development of more comprehensive approaches that include both upland controls and stream modifications (i.e., restoration). This option is critical for more effectively and efficiently protecting the region's aquatic resources.

Additionally, the Administrative Draft Permit includes an unnecessarily narrow definition of hardened channels that includes only those channels lined with concrete. Other forms of artificial hardening may be comparably resistant to hydromodification impacts, such as channels that are lined with rip rap, armored with soil cement, or armored with other practices. While the Permittees or the project proponent should be responsible for demonstrating that a specific channel material is sufficiently stable, the narrow definition currently provided by the Administrative Draft Permit does not allow the use of sound engineering judgment and does not allow for use of innovative materials.

Finally, the Administrative Draft Permit should explicitly recognize the findings of hydromodification management plans (HMPs) that have been previously approved by this Board. The South Orange County HMP and the San Diego County HMPs were both the products of rigorous technical analysis based on the state of the practice, which were reviewed in detail by Board Staff. The findings of these efforts must not be jeopardized under the new terms of the Administrative Draft Permit. Specifically, findings regarding exempt water bodies must be appreciated and upheld, and they should be explicitly recognized in the Administrative Draft Permit per our suggested redline.

4. **The Permit must preserve important provisions for watershed level design and implementation of LID BMPs.**

The proposed development project criteria and requirements in the Administrative Draft Permit do not include the language in the current South Orange County Permit that provides for Alternative Compliance for Watershed-Based Planning (See page 40-41 of the 2009 Permit). We ask that the Regional Board continue to recognize the protections to water quality and enhancements to water bodies which are achieved through watershed-based projects such as the Rancho Mission Viejo Ranch Plan, as it has in the current South County MS4 permit, and define Watershed Planning as an alternative and co-equal approach to the project-specific requirements. Attachment 3 to this submittal contains suggested redline language for addition to the Administrative Draft Permit.

Concluding Remarks:

BIA/SC and CICWQ have been active participants and contributors to the creation of improved MS4 permits across southern California. We continue to believe that rational, *implementable*, and *effective* permit requirements are critical to achieving great progress concerning water quality and our environment. We hope that these comments are received in the manner in which they are intended – to continue the discussion of how we can create a workable permit that improves water quality to the maximum extent practicable. We remain committed to a positive dialog with the Board and its staff – one that will result in an informed, balanced and effective permit.

If you have any questions or want to discuss the content of our comment letter, please feel free to contact me at (951) 781-7310, ext. 213, (909) 525-0623, cell phone, or mgrey@biasc.org.

Sincerely,

Mark Grey, Ph.D.
Director of Environmental Affairs and Technical Director
Building Industry Association of Southern California and
Construction Industry Coalition on Water Quality

United States
Environmental Protection Agency

Office of Water (4203)
Washington, DC 20460

EPA-841-B-00-005A
October 2000

Bioretention Applications

Inglewood Demonstration Project, Largo, Maryland
Florida Aquarium, Tampa, Florida

Key Concepts:

- Retrofits
- Structural Controls
- Source Controls

LOW-IMPACT DEVELOPMENT CENTER

Project Benefits:

- Retrofit Opportunity
- Pollutant Removal
- Volume Reduction
- Cost-Effectiveness

Introduction

Two case studies demonstrate the potential to use integrated management plans (IMPs) in the design of new parking facilities and as retrofits for existing parking facilities. The Inglewood study in Largo, Maryland, compared the pollutant removal efficiency of a bioretention cell in a laboratory setting to that of a comparable facility constructed in a parking lot. The Florida Aquarium study in Tampa, Florida, included monitoring of several storm events for volume and water quality control.

Inglewood Project Area

The project area is an existing 5-acre outdoor parking area located in a highly urbanized office park adjacent to Interstate 95. Runoff from adjacent areas does not flow across the lot. The slope of the parking area is approximately 3 percent. Parking stalls are aligned at 90-degree angles, and there are approximately 30 cars in each row of an aisle. At the end of each aisle are planting areas surrounded by curbs and gutters. Curb drainage inlets have been placed in some of the islands to intercept and collect runoff as sheet flow, which is piped to a downstream regional stormwater management facility.

Inglewood Project Description

The Inglewood project consisted of a laboratory segment and a field segment. The laboratory segment involved construction of a planter box filled with a typical bioretention facility soil mixture (50 percent construction sand, 20 to 30 percent topsoil, and 20 to 30 percent compost). This facility is approximately half the size in volume of the Inglewood facility. The box was planted with representative plants and mulched. A synthetic stormwater mixture was applied and the pollutant removal efficiency, temperature, and runoff volume rate were measured. The pollutant mix included metals (copper, lead, and zinc), phosphorus, organic nitrogen, and nitrate.

A landscaped island measuring approximately 38 feet by 12 feet was chosen as the retrofit area. The island contains a curb inlet that drains into the municipal storm drain system. Almost the entire drainage area is impervious. A 4-foot slot was cut into the curb immediately before the inlet. The landscaped island was then excavated to a depth of 4 feet. An underdrain was installed and tied into the bottom of the existing inlet to completely drain the planting soil to avoid oversaturation. The underdrain was covered with 8 inches of 1- to 2-inch gravel and backfilled with typical bioretention soil mix. The backfill extended to a depth of about 12 inches below the top of the curb, which allows for a ponding depth of approximately 6 inches of water in the island

Figure 1. Bioretention landscaping at the Inglewood demonstration project site.

Table 1. Summary of bioretention pollutant removal results for the Inglewood demonstration project.

Pollutant	Input mean ± standard deviation	Output mean ± standard deviation	Output range	Output percent removal mean ± standard deviation
Cu dissolved (μg/L)	120 ± 27	63 ± 6.5	55–75	48 ± 12
Cu total (μg/L)	120 ± 27	69 ± 9.4	55–85	43 ± 11
Pb dissolved (μg/L)	54 ± 9.4	11 ± 6	6.7–25	79 ± 26
Pb total (μg/L)	54 ± 9.4	16 ± 7	6.7–26	70 ± 23
Zn dissolved (mg/L)	1.1 ± 0.021	0.24 ± 0.44	0.11–0.56	78 ± 29
Zn total (mg/L)	1.1 ± 0.021	0.39 ± 0.44	0.12–1.4	64 ± 42
Ca (mg/L)	44 ± 6.4	32 ± 6.1	24–41	27 ± 14
Cl^- (mg/L)	5.1 ± 0.48	162 ± 80	74–228	3,000[a]
Na (mg/L)	3.1	359 ± 170	68–497	11,000[a]
P (mg/L)	0.83	0.11 ± 0.017	0.10–0.13	87 ± 2
TKN (mg/L as N)	6.9 ± 0.81	2.3 ± 0.64	1.7–3.0	67 ± 9
NO_3^- (mg/L as N)	1.3 ± 0.05	1.1 ± 0.15	0.94–1.2	15 ± 12

[a]Shows percent production.

before a backwater is created at the curb opening. Subsequently the area was planted and covered with 3 inches of shredded hardwood mulch. Figure 1 shows the bioretention area after vegetation was established.

The stormwater mixture was applied to a 50-square-foot area in the field facility at a rate of 1.6 inches per hour for 6 hours. The removal rates for several pollutants are shown in Table 1. In addition to pollutant removal, the runoff temperature was lowered approximately 12 °C as the runoff was processed and filtered through the soil mixture. Most of the pollutant removal process occurred in the mulch layer.

A similar field investigation was conducted on an 8-year-old facility, and the metals removal rate was much higher (Davis et al., 1998). This effect might be attributed to slower flow rates through the soil, which has higher clay content, as well as greater pollutant uptake by vegetation.

Inglewood Project Summary and Benefits

This study showed the feasibility of retrofitting an existing parking facility and demonstrated the consistency of laboratory and field pollutant removal performance. The retrofit cost approximately $4,500 to construct and treats approximately one-half acre of impervious surface. The bioretention retrofit was a more cost-effective way to filter pollutants than many proprietary devices designed to treat the same volume of runoff. These proprietary devices could cost $15,000 to $20,000, would be more expensive to maintain, and would not significantly decrease runoff volume or temperature. Also, bioretention areas offer the ancillary benefit of aesthetic enhancement. It is interesting to note that a drought occurred after the installation of the plants, and although many of the other plants in the parking lot died or experienced severe drought stress, the plants in the bioretention facility survived because of the retained water supply.

Florida Aquarium Project Area

The Florida Aquarium site is an 11.5-acre, asphalt and concrete parking area that serves approximately 700,000 visitors per year. Runoff was controlled using the following IMPs:

- End-of-island bioretention cells
- Bioretention swales located around the parking perimeter
- Permeable paving
- Bioretention strips between parking stalls
- A small pond to supplement storage and pollutant removal

Figure 2 is an illustration of the site that details the type and location of runoff controls.

Florida Aquarium Project Description

A total of 30 storm events were monitored for one year at the Florida Aquarium site during 1998-1999. The Southwest Florida Water Management

District measured rainfall and flow from eight of the subcatchments in the parking area and collected water quality samples on a flow-weighted basis. Comparisons between pavement areas controlled by IMPs and uncontrolled asphalt areas were made for peak runoff rate, runoff volume, runoff coefficients, and water quality. Sediment cores from swales also were collected and analyzed.

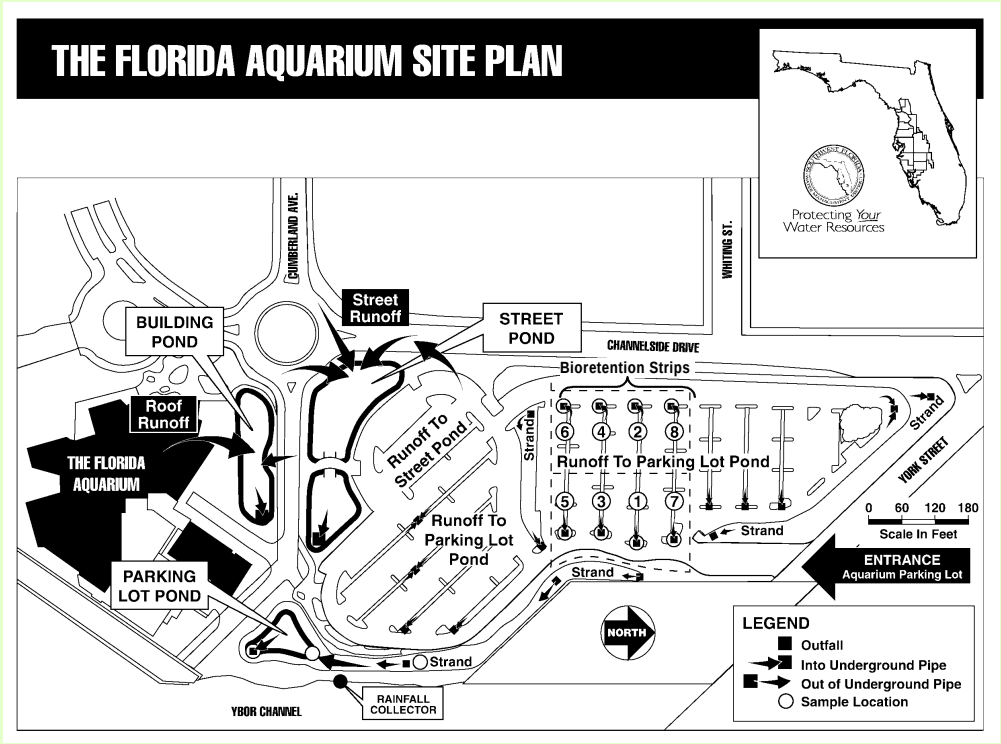

Figure 2. Layout of the Florida Aquarium site with IMPs. The eight basins outlined with dotted lines were evaluated in this part of the study.

Florida Aquarium Project Summary and Benefits

The parking areas controlled by IMPs showed a significant reduction in runoff volume and peak runoff rate. Table 2 shows pollutant load reductions for three pavement types; reduction is compared to pollutant loads in runoff from a basin without a swale. Much of the pollutant reduction is attributed to the reduced runoff in basins with swales. Because the swales are only the first element in the treatment train, even better removal efficiencies should be seen when data are analyzed for the entire system.

Table 2. Load efficiency of pollutants expressed as percent reduction for three types of pavement at the Florida Aquarium site.

Constituents	Percent pollutant reduction[a]		
	Asphalt w/swale	Cement w/swale	Porous w/swale
Ammonia	45	73	85
Nitrate	44	41	66
Total Nitrogen	9	16	42
Orthophosphorus	-180	-180	-74
Total Phosphorus	-94	-62	3
Suspended Solids	46	78	91
Copper	23	72	81
Iron	52	84	92
Lead	59	78	85
Manganese	40	68	92
Zinc	46	62	75

[a]The basins with swales were compared to a basin without a swale to determine the amount of reduction in pollutant loads possible using these small alterations. Notice that the efficiencies for phosphorus are negative, indicating an increase in phosphorus load in the basins with a swale.

References

Davis, A., M. Shokouhian, H. Sharma, and C. Minami, 1998. *Optimization of Bioretention Design for Water Quality and Hydrologic Characteristics*. Report 01-04-31032. Final report to Prince George's County, Maryland.

Rushton, B. 1999. *Low Impact Parking Lot Design Reduces Runoff and Pollutant Loads: Annual Report #1*. Southwest Florida Watershed Management District, Brooksville, Florida.

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006294

Design Principles

for Stormwater Management on Compacted, Contaminated Soils in Dense Urban Areas

EPA's Brownfields Program is designed to empower states, communities, and other stakeholders in economic redevelopment to work together in a timely manner to prevent, assess, safely clean up, and sustainably reuse brownfields. A brownfield is a property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. EPA's Brownfields Program provides financial and technical assistance for brownfield revitalization, including grants for environmental assessment, cleanup, and job training.

What is Green Infrastructure?

Most development and redevelopment practices cover large areas of the ground with impervious surfaces such as roads, driveways, sidewalks, and new buildings themselves, which then prevent rainwater from soaking into the ground. These hard surfaces increase the speed and amount of stormwater that runs into nearby waterways, carrying pollutants and sediment each time it rains.

Green infrastructure seeks to reduce or divert stormwater from the sewer system and direct it to areas where it can be infiltrated, reused or evapotranspirated. Soil and vegetation are used instead of, or in conjunction with, traditional drains, gutters, pipes and centralized treatment areas. In many new and redevelopment projects, green infrastructure is implemented to manage and mitigate the polluted runoff created by precipitation that falls on rooftops, streets, sidewalks, parking lots and other impervious surfaces.

How can Green Infrastructure be Applied to Brownfield Sites?

Preparing brownfields for redevelopment often requires capping of contaminated soils, creating even larger impervious surfaces. The challenge for managing stormwater on brownfield sites is allowing this capping while mitigating the impervious surface conditions that can negatively impact local waterways.

Unlike many conventional developments, impervious footprints on brownfields cannot always be minimized through site designs that incorporate more porous surfaces to allow for infiltration. Direct infiltration on a brownfield site may introduce additional pollutant loads to groundwater and nearby surface waters. However, green infrastructure practices exist that can retain, treat and then release stormwater without it ever coming in contact with contaminated soils.

A bioswale in Wilmington, Delaware, designed to absorb and retain stormwater runoff.

The University of Michigan's School of Natural Resources and Environment developed design guidelines that use low impact development techniques on contaminated sites. Using a former industrial site in Flint, Michigan, called Chevy in the Hole, graduate students considered and refined methods to prevent residual contamination from moving with stormwater.

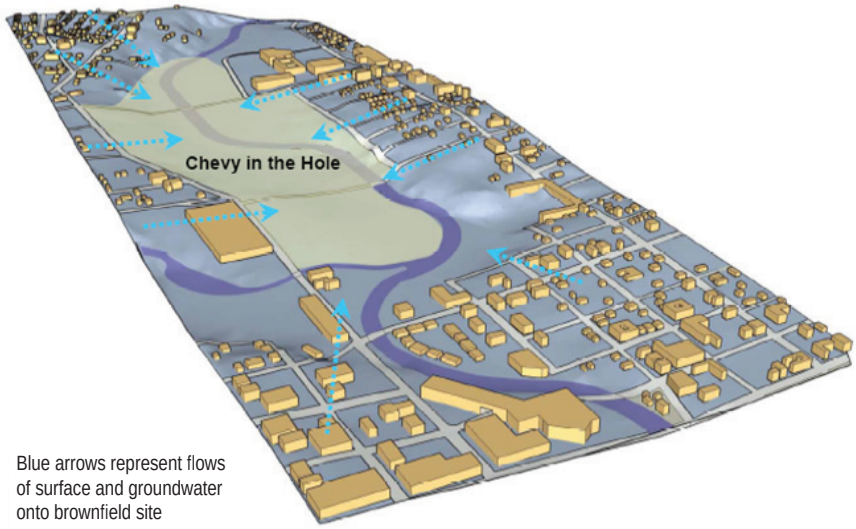

Blue arrows represent flows of surface and groundwater onto brownfield site

Design Considerations

A key component of using green infrastructure for brownfield sites is treatment and storage of stormwater, rather than complete infiltration. Most brownfields that have residual contamination need caps, so vegetated areas need to be located above caps and fitted with underdrain systems to remove overflow stormwater.

Development and redevelopment projects should start with keeping existing trees onsite, minimizing compaction of earth that inhibits water infiltration, and planting trees and other vegetation in areas where none exists. Retaining existing tree cover and vegetated areas helps infiltrate and evapotranspirate stormwater runoff while intercepting large amounts of rainfall that would otherwise enter waterways as runoff.

Buildings and other impervious surfaces can be strategically located to act as caps over areas with known contamination. Areas with fill caps can include soils and vegetation above the cap in the form of swales or rain gardens. If fitted with an under-drain system to release treated stormwater off site, these planted areas can safely allow filtration and evapotranspiration of stormwater. Additional features like impermeable liners or gravel filter blankets can be coupled with modified low impact development (LID) practices that safely filter stormwater without exposing the water to contaminated soils.

Green roofs are an ideal way to reduce the runoff from building roofs by encouraging evapotranspiration of rainwater. Another option for brownfield sites is the capture and reuse of stormwater for non-potable uses; this can include runoff storage in rain barrels for irrigation of green roofs or landscaped areas, or in cisterns that store rainwater for toilet flushing and other uses.

Site location within the watershed is very important. In particular, projects in groundwater recharge areas should avoid low impact development practices that promote infiltration, and use techniques that directly discharge treated stormwater instead. Furthermore, new and redeveloped sites near brownfields should use green infrastructure practices to prevent additional runoff from flowing onto potentially contaminated areas.

Overall, when developing a stormwater management plan on a brownfield, surrounding sites must be considered. *(Source: Flint Futures: Alternative Futures for Brownfield Redevelopment in Flint, Michigan.)*

The Matthew Henson Conservation Center in Washington, DC, utilizes a green roof.

General Principles for Using Green Infrastructure on Brownfield Sites

Guideline #1: Differentiate between groups of contaminants as a way to better minimize risks.

Guideline #2: Keep non-contaminated stormwater separate from contaminated soils and water to prevent leaching and spreading of contaminants.

Guideline #3: Prevent soil erosion using vegetation, such as existing trees, and structural practices like swales or sediment basins.

Guideline #4: Include measures that minimize runoff on all new development within and adjacent to a brownfield. These measures include green roofs, green walls, large trees, and rainwater cisterns.

Definitions

Bioswales are open channels with a dense cover of vegetation where runoff is directed or retained to evapotranspirate and filter.

Evapotranspiration is the return of water to the atmosphere either through evaporation or by plants.

Green Infrastructure and ***Low Impact Development (LID)*** both refer to systems and practices that use or mimic natural processes to infiltrate, evapotranspirate or reuse stormwater or runoff on the site where it is generated.

Green roofs can be used to effectively reduce or eliminate runoff from small and medium sized storms. A soil mixture is placed over a waterproof membrane and drainage system and then planted with water absorbent and drought tolerant plants. Most systems also have root barriers. These roofs soak up stormwater and release it back into the atmosphere through evaporation and plant respiration, while draining excess runoff.

Rain gardens serve the same purpose as stormwater planters and are appropriate where there is more area to plant vegetation. Sizing is dependent on the area of impervious surfaces draining to the rain garden, but they can be designed to only treat a portion of the runoff so they can be placed in most situations.

Stormwater harvest and reuse. Rainwater harvested in cisterns, rain barrels, or other devices may be used to reduce potable water used for landscape irrigation, fire suppression, toilet and urinal flushing, and custodial uses. Storage and reuse techniques range from small-scale systems (e.g., rain barrels) to underground cisterns that may hold large volumes of water.

Stormwater planters. Downspouts can be directed into stormwater planters. These planters are used to temporarily detain, filter and evapotranspirate stormwater using plant uptake.

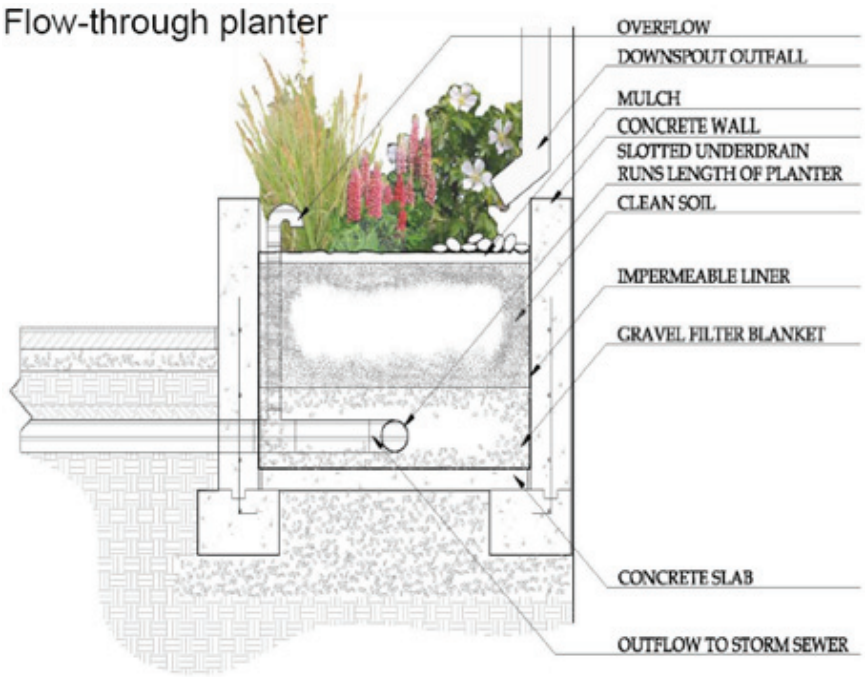

Additional Resources

The Emeryville, California *Stormwater Guidelines for Green, Dense Redevelopment* provides guidance on using vegetative stormwater treatment measures for this dense, brownfield-laden city: www.ci.emeryville.ca.us/planning/stormwater.html.

EPA's *Green Infrastructure Web site* (www.epa.gov/npdes/greeninfrastructure) provides definitions, case studies and performance data for various practices that might be applicable to brownfield sites.

The Low Impact Development Center is dedicated to research, development, and training for water resource and natural resource protection issues. The Center focuses specifically on furthering the advancement of Low Impact Development technology: www.lowimpactdevelopment.org.

Green Roofs for Healthy Cities collects and publishes technical information on green roof products and services: www.greenroofs.org.

The Center for Watershed Protection's Better Site Design Tools provide links to various better site design resources and publications: www.cwp.org/PublicationStore/bsd.htm.

American Rivers' *Catching the Rain: A Great Lakes Resource Guide for Natural Stormwater Management* describes a variety of low impact development strategies that can be implemented in a wide range of built environments. Available at: www.americanrivers.org/site/DocServer/CatchingTheRain.pdf?docID=163

NRDC's *Rooftops to Rivers: Green Strategies for Controlling Stormwater and Combined Sewer Overflows* is a policy guide for decision makers looking to implement green strategies in their own area, including nine case studies of cities that have successfully used green techniques to create a healthier urban environment. Available at: www.nrdc.org/water/pollution/rooftops/contents.asp

Portland's (Oregon) *Trees for Green Streets: An Illustrated Guide* is a guidebook that helps communities select street trees that reduce stormwater runoff from streets and improve water quality. Available at: www.metro-region.org/article.cfm?articleID=263

Seattle's *pilot Street Edge Alternatives Project (SEA Streets)* is designed to provide drainage that more closely mimics the natural landscape prior to development than traditional piped systems. Good information can be found at: www.seattle.gov/util/About_SPU/Drainage_&_Sewer_System/Natural_Drainage_Systems/Street_Edge_Alternatives/index.asp

EPA's *Protecting Water Resources with Higher-Density Development* report helps communities better understand the impacts of higher and lower density development on water resources. The findings indicate that low-density development may not always be the preferred strategy for protecting water resources. Available at: www.epa.gov/dced/water_density.htm.

Portland Metro's (Oregon) *Green Streets: Innovative Solutions for Stormwater and Stream Crossings* is a handbook that describes stormwater management strategies and includes detailed illustrations of "green" street designs that allow infiltration and limit stormwater runoff. Available at www.metro-region.org/article.cfm?articleID=262

EPA's *Protecting Water Resources with Smart Growth* is a report intended for audiences already familiar with smart growth concepts who seek specific ideas on how techniques for smarter growth can be used to protect water resources. The report describes 75 policies that communities can use to grow in the way that they want while protecting their water quality. Available at: www.epa.gov/dced/water_resource.htm

EPA's *Using Smart Growth Techniques as Stormwater Best Management Practices* reviews nine common smart growth techniques and examines how they can be used to prevent or manage stormwater runoff. Available at: www.epa.gov/dced/stormwater.htm

EPA's *Brownfields Program Website* (www.epa.gov/brownfields) provides information on and resources for assessing, cleaning up and redeveloping brownfields, including grant funding opportunities.

3. Development Planning

Each Copermittee must use their land use/planning authorities to implement a development planning program that includes, at a minimum, the following requirements.

a. Permanent BMP Requirements for All Development Projects

Each Copermittee must prescribe the following BMP requirements during the planning process (i.e. prior to project approval and issuance of grading or building permits) for all pollutant-generating[14] development projects (regardless of project type or size), where local permits are issued~~, including unpaved roads and flood management projects:~~

(1) General Requirements

(a) All BMPs must be located so as to remove pollutants from runoff prior to its discharge to any receiving waters~~, and as close to the source as possible~~;

(b) Multiple development projects may use shared permanent BMPs as long as construction of any shared BMP is completed prior to the use or occupation of any development project from which the BMP will receive runoff; and

(c) Permanent BMPs must not be constructed within a waters of the U.S. or waters of the state except those that have obtained a CWA Section 401 Water Quality Certification or Waste Discharge Requirement as applicable.

(2) Source Control BMP Requirements

The following source control BMPs must be implemented at all development projects where applicable and feasible:

(a) Prevention of illicit discharges into the MS4;

(b) Storm drain system stenciling or signage;

(c) Properly designed outdoor material storage areas;

(d) Properly designed outdoor work areas;

(e) Properly designed trash storage areas; ~~and~~

~~(f) Any additional BMPs necessary to minimize pollutant generation at each project.~~

[14] Pollutant generating development projects are those projects that generate pollutants at levels greater than natural background levels.

(3) Low Impact Development (LID) BMP Requirements

The following LID BMPs must be implemented at all pollutant generating development projects where applicable and feasible:

(a) Maintenance or restoration of natural storage reservoirs and drainage corridors (including topographic depressions, areas of permeable soils, natural swales, and ephemeral and intermittent streams);[14][15]

(b) Buffer zones for natural water bodies (where buffer zones are technically infeasible, require project applicant to include other buffers such as trees, access restrictions, etc.);

(c) Conservation of natural areas within the project footprint including existing trees, other vegetation, and soils;

(d) Construction of streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided public safety is not compromised;

(e) Minimization of the impervious footprint of the project;

(f) Minimization of soil compaction to landscaped areas;

(g) Disconnection of impervious surfaces through distributed pervious areas;

(h) Landscaped or other pervious areas designed and constructed to effectively receive and infiltrate, retain and/or treat runoff from impervious areas, prior to discharge to the MS4;

(i) Small collection strategies located at, or as close as possible to, the source (i.e. the point where storm water initially meets the ground) to minimize the transport of runoff and pollutants to receiving waters;

(j) Use of permeable materials for projects with low traffic areas and appropriate soil conditions;

(k) Landscaping with native or drought tolerant species; and

(l) Harvesting and using precipitation.

~~14~~ 15 Development projects proposing to dredge or fill materials in waters of the U.S. must obtain a CWA Section 401 Water Quality Certification. Projects proposing to dredge or fill waters of the State must obtain Waste Discharge Requirements.

(4) Long-Term Permanent BMP Maintenance

Each Copermittee must require the project applicant to submit proof of the mechanism under which ongoing long-term maintenance of all permanent BMPs will be conducted.

(5) Infiltration and Groundwater Protection

(a) Infiltration and treatment control BMPs ~~designed to primarily function as large, centralized infiltration devices (such as large infiltration trenches and infiltration basins)~~ must not cause or contribute to an exceedance of an applicable groundwater quality objective. At a minimum, such infiltration and treatment control BMPs must be in conformance with the design criteria listed below, unless the development project applicant demonstrates to the Copermittee that one or more of the specific design criteria listed below are not necessary to protect groundwater quality. The ~~The design criteria listed below do not apply to small infiltration systems dispersed throughout a development project.~~Permittees may establish different design criteria than those listed below for different BMP types based on the inherent degree of risk to groundwater quality (for example, dry wells versus bioretention).

(i) Runoff must undergo pretreatment such as sedimentation or filtration prior to infiltration;

(ii) Pollution prevention and source control BMPs must be implemented at a level appropriate to protect groundwater quality at sites where infiltration treatment control BMPs are to be used;

(iii) Infiltration treatment control BMPs must be adequately maintained to remove pollutants in storm water to the MEP;

(iv) The vertical distance from the base of any infiltration treatment control BMP to the seasonal high groundwater mark must be at least 10 feet. Where groundwater basins do not support beneficial uses, this vertical distance criteria may be reduced, provided groundwater quality is maintained;

(v) The soil through which infiltration is to occur must have physical and chemical characteristics (e.g., appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses, unless first treated or filtered to remove pollutants prior to infiltration;

(vi) Infiltration treatment control BMPs must not be used for areas of industrial or light industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee, unless first treated or filtered to remove pollutants prior to infiltration; and

(vii) Infiltration treatment control BMPs must be located a minimum of 100 feet horizontally from any water supply wells.

(b) The Copermittees may collectively or individually develop alternative mandatory design criteria to that listed above for infiltration and treatment control BMPs which are designed to primarily function as centralized infiltration devices. Before implementing the alternative design criteria in the development planning process the Copermitee(s) must:

(i) Notify the San Diego Water Board of the intent to implement the alternative design criteria submitted; and

(ii) Comply with any conditions set by the San Diego Water Board.

b. PRIORITY DEVELOPMENT PROJECTS

(1) Definition of Priority Development Project

Priority Development Projects include the following:

(a) All new development projects that fall under the Priority Development Project categories listed under Provision E.3.b.(2). Where a new development project feature, such as a parking lot, falls into a Priority Development Project category, the entire project footprint is subject to Priority Development Project requirements; and

(b) Those redevelopment projects that create, add, or replace at least 5,000 square feet of impervious surfaces on an already developed site, or the redevelopment project is a Priority Development Project

category listed under Provision E.3.b.(2). Where redevelopment results in an increase of less than fifty percent of the impervious surfaces of a previously existing development, and the existing development was not subject to Priority Development Project requirements, the performance and sizing requirements discussed in Provisions E.3.c.(2) and E.3.c.(3) apply only to the addition or replacement, and not to the entire development. Where redevelopment results in an increase of more than fifty percent of the impervious surfaces of a previously existing development, the performance and sizing requirements apply to the entire development.

(2) Priority Development Project Categories

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This category includes commercial, industrial, residential, mixed-use, and public development projects on public or private land which fall under the planning and building authority of the Copermittee.

(b) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

(c) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812), where the land area for development is 5,000 square feet or more.

(d) Hillside development projects. This category includes any development which creates 5,000 square feet or more of impervious surface which is located in an area with known erosive soil conditions, where the development will grade on any natural slope that is twenty-five percent or greater.

(e) Environmentally sensitive areas (ESAs). This category includes any development located within, directly adjacent to, or discharging directly to an ESA, which either creates 2,500 square feet of impervious surface on a proposed project site or increases the area of imperviousness of a proposed project site to 10 percent or more of its naturally occurring condition. “Directly adjacent to” means situated within 200 feet of the ESA. “Discharging directly to” means outflow from a drainage conveyance system that collects runoff

from the subject development or redevelopment site and terminates at or in receiving waters within the ESA.

(f) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce that has 5,000 square feet or more of impervious surface.

(g) Streets, roads, highways, freeways, and residential driveways. This category is defined as any paved impervious surface that is 5,000 square feet or more used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

(h) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

(i) Large development projects. This category includes any post-construction pollutant-generating new development projects that result in the disturbance of one acre or more of land.

(3) Priority Development Project Exemptions

Each Copermittee has the discretion to exempt the following projects from being defined as Priority Development Projects:

(a) Sidewalks constructed as part of new streets or roads and designed to direct storm water runoff to adjacent vegetated areas;

(b) Bicycle lanes that are constructed as part of new streets or roads but are not hydraulically connected to the new streets or roads and designed to direct storm water runoff to adjacent vegetated areas;

(c) Impervious trails constructed and designed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas;

(d) Sidewalks, bicycle lanes, or trails constructed with permeable surfaces.

c. Priority Development Project Permanent BMP Performance and Sizing Requirements

In addition to the BMP requirements listed for all pollutant generating development projects under Provision E.3.a, Priority Development Projects

must also implement permanent BMPs that conform to performance and sizing requirements.

(1) Source Control BMP Requirements

Each Copermittee must require each Priority Development Project to implement applicable source control BMPs listed under Provision E.3.a.(2).

(2) Retention and Treatment Control BMP Requirements

Each Copermittee must require each Priority Development Project to implement BMPs to retain and treat pollutants onsite in the following order:

(a) Each Priority Development Project must be required to implement LID BMPs as described in Provision E.3.a.(3);

(b) Each Priority Development Project must be required to implement LID BMPs that are sized and designed to retain the volume equivalent to runoff produced from a 24-hour 85th percentile storm ~~event~~[15] event[16] ("design capture volume").~~;~~

(c) If onsite retention using LID BMPs is technically infeasible per Provision E.3.c.(4), flow-thru LID ~~and/or conventional~~ treatment control BMPs, such as bioretention with an underdrain, must be implemented to treat the portion of the design capture volume that is not retained onsite. Flow-thru LID treatment control BMPs that are sized for the portion of the design capture volume that is not retained onsite may be used if full onsite retention is technically infeasible. Flow-thru LID treatment control BMPs must be designed for an appropriate surface loading rate to prevent erosion, scour and channeling within the BMP. ~~Additionally, project applicants must perform mitigation for the portion of the pollutant load in the design capture volume that is not retained onsite, as described in Provision E.3.c.(4)(c).~~

(d) If it is shown to be technically infeasible per Provision E.3.c.(4) to retain and/or treat with flow-thru LID treatment control BMPs sized for the portion of the design capture volume that is not retained onsite, then the project must implement conventional treatment control BMPs in accordance with Provision E.3.c.(2)(d) below and must participate in the alternative compliance program in Provision E.3.c.(4)(c).

(~~d~~e) All onsite treatment control BMPs must:

(i) Be correctly sized and designed so as to remove pollutants from storm water to the MEP;

(ii) Be sized to comply with the following numeric sizing criteria:

[a] Volume-based treatment control BMPs must be designed to treat the remaining portion of the design capture volume that was not retained and/or treated with flow-thru LID treatment control BMPs sized for the portion of the design capture volume that is not retained onsite~~retained or onsite~~; or

[b] Flow-based treatment control BMPs must be designed to ~~mitigate (filter or~~ treat~~)~~ either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event; or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two, or 3) an alternative design rate that is demonstrated to result in the treatment of a volume of stormwater equivalent to that achieved under c.(2)(e)(ii)[a].

(iii) Be ranked with high or medium pollutant removal efficiency for the project's most significant pollutants of concern. Treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

[15] This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals.

(3) Hydromodification Management BMP Requirements

Each Copermittee must require each Priority Development Project to implement hydromodification management BMPs so that:

(a) ~~(a)~~ Post-project runoff flow rates and durations do not exceed pre-development (naturally occurring) runoff flow rates and durations by more than 10 percent (for the range of flows that result in increased potential for erosion or degraded channel conditions downstream of Priority Development Projects).

OR

The erosion potential ratio is maintained to within 10 percent of the target value from the project discharge point to a downstream receiving water that is exempt from the hydromodification management BMP requirements per Provision E.3.c.(3)(d). Erosion potential is the ratio of total long-term sediment transport capacity or channel work in the proposed condition versus the pre-development (naturally occurring) condition.

(i) In evaluating the range of flows that results in increased potential for erosion of natural (non-hardened) channels, the lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks.

~~(ii) For artificially hardened channels, analysis to identify the lower boundary must use characteristics of a natural stream segment similar to that found in the watershed. The lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or erodes the toe of the channel banks.~~

(ii~~i~~) The Copermittees may use monitoring results pursuant to Provision D.2.b.(6) to re-define the range of flows resulting in increased potential for erosion or degraded channel conditions, as warranted by the data.

(b) ~~(b)~~ Post-project conditions ~~runoff flow rates and durations~~ must ~~compensate~~ manage for the loss of bed sediment supply due to the development project, ~~should~~ if significant loss of sediment supply occurs as a result of the development project.

~~(a)~~(c) If hydromodification management BMPs are technically infeasible per Provision E.3.c.(4), project applicants must perform mitigation for the portion of the runoff volume that is not controlled and will cause or contribute to increased potential for erosion of receiving

waters downstream of the Priority Development Project, as described in Provision E.3.c.(4)(c).

~~(b)~~(d) Exemptions

Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP requirements where the project:

(i) Discharges storm water runoff into underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, ~~or~~ the Pacific Ocean, or exempt river reaches identified in Hydromodification Management Plans (HMPs) approved by the San Diego Water Board;

(ii) Discharges storm water runoff into conveyance channels whose bed and bank are ~~concrete lined~~artificially hardened all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, ~~or~~ the Pacific Ocean; ~~or~~or exempt river reaches identified in HMPs approved by the San Diego Water Board; or

(iii) Discharges storm water runoff into other areas identified by the San Diego Water Board as exempt from the requirements of Provisions E.3.c.(3)(a)-(c)~~.~~, ~~S~~such areas include those identified in HMPs approved by the San Diego Water Board.

(4) Alternative Compliance for Technical Infeasibility

At the discretion of each Copermittee, alternative compliance may be allowed for certain Priority Development Projects to comply with Provisions E.3.c.(2) and E.3.c.(3), subject to the following requirements:

(a) Applicability

Priority Development Projects may be allowed alternative compliance if:

(i) The Copermittee reviews and approves site-specific hydrologic and/or design analysis performed by a registered professional engineer, geologist, architect, or landscape architect;

(ii) The project applicant demonstrates, and the Copermittee determines and documents, that retention LID, flow-through LID treatment control BMPs, and/or hydromodification management BMPs per Provisions E.3.c.(2) and E.3.c.(3) were incorporated into the project

design to the maximum extent technically feasible given the project site conditions;

(iii) The project applicant is required to perform mitigation described in Provision E.3.c.(4)(c) with a net result of at least the same level of water quality protection as would have been achieved if the Priority Development Project had fully implemented the retention LID, flow-through LID treatment control BMPs, and hydromodification management BMP requirements under Provisions E.3.c.(2) and E.3.c.(3) onsite.

(b) Criteria For Technical Infeasibility

Each Copermittee must develop, or develop in collaboration with the other Copermittees, criteria to determine technical infeasibility for fully implementing the retention LID and hydromodification management BMP requirements under Provisions E.3.c.(2) and E.3.c.(3) and include these requirements in the Permanent BMP Sizing Criteria Design Manual pursuant to Provision E.3.d. Technical infeasibility may result from conditions including, but not limited to:

(i) Locations that cannot meet the infiltration and groundwater protection requirements in Provision E.3.a.(5) due to the presence of shallow bedrock, contaminated soils, near surface groundwater, underground facilities, or utilities;

(ii) Brownfield development sites or other locations where pollutant mobilization is a documented concern;

(iii) The design of the site precludes the use of soil amendments, plantings of vegetation, or other designs that can be used to infiltrate and evapotranspirate runoff;

(iv) Soils cannot be sufficiently amended to provide for the requisite infiltration rates;

(v) Locations with geotechnical hazards;

(vi) Insufficient onsite and/or offsite demand for storm water use;

(vii) Modifications to an existing building to manage storm water are not feasible due to structural or plumbing constraints; and

(viii) Smart growth and infill or redevelopment locations where the density and/or nature of the project would create significant

difficulty for compliance with Provisions E.3.c.(2) and E.3.c.(3) onsite.

(c) Mitigation

Priority Development Projects that meet the Copermittee's technical infeasibility criteria developed pursuant to Provision E.3.c.(4)(b) must be required to mitigate for the increased flow rates, increased flow durations, and/or increased pollutant loads expected to be discharged from the site. For the pollutant load in the volume of storm water not retained onsite with retention LID BMPs treated with flow-thru LID treatment control BMPs sized for the portion of the design capture volume that is not retained onsite, ~~, tre~~ or increased potential erosion of downstream receiving waters not fully controlled onsite with hydromodification management BMPs, the Copermittee must require the project applicant to either 1) implement an offsite mitigation project, and/or 2) provide sufficient funding for a public or private offsite mitigation project via a mitigation fund.

(i) *Mitigation Project Locations*

Offsite mitigation projects must be implemented within the same hydrologic unit as the Priority Development Project, and preferably within the same hydrologic subarea. Mitigation projects outside of the hydrologic subarea but within the same hydrologic unit may be approved provided that the project applicant demonstrates that mitigation projects within the same hydrologic subarea are infeasible and that the mitigation project will address similar potential impacts expected from the Priority Development Project.

(ii) *Mitigation Project Types*

Offsite mitigation projects must include, where applicable and feasible, retrofitting opportunities and stream and/or habitat rehabilitation or restoration opportunities identified in the Water Quality Improvement Plans, identified pursuant to Provision B.3.a. Other offsite mitigation projects may include green streets or infrastructure projects, or regional BMPs upstream of receiving waters. In-stream rehabilitation or restoration measures to protect or prevent adverse physical changes to creek bed and banks must not include the use of non-naturally occurring hardscape material such as concrete, riprap, or gabions. Project applicants seeking to utilize these alternative compliance provisions may propose other offsite mitigation projects, which the Copermittees may approve if they meet the requirements of Provision E.3.c.(4)(a).

(iii) *Mitigation Project Timing*

The Copermittee and/or project applicant must develop a schedule for the completion of offsite mitigation projects, including milestone dates to identify, fund, design, and construct the projects. Offsite mitigation projects must be completed upon the granting of occupancy for the first project that contributed funds toward the offsite mitigation project, unless a longer period is authorized by the San Diego Water Board.

(iv) *Mitigation Fund*

A Copermittee may choose to implement additional mitigation programs (e.g., pollutant credit system, mitigation fund) as a means for developing and implementing offsite mitigation projects, provided the projects conform to the requirements for project locations, types, and timing described above.

(5) Alternative Compliance for Watershed-Based Planning

Where a development project, greater than 100 acres in total project size or smaller than 100 acres in size yet part of a larger common plan of development that is over 100 acres, has been prepared using watershed and/or sub-watershed based water quality, hydrologic, and fluvial geomorphologic planning principles that implement regional LID BMPs in accordance with the sizing and location criteria of this Order and acceptable to the Regional Board, such standards shall govern review of projects with respect to Provision E.3. of this Order and shall be deemed to satisfy this Order's requirements for LID site design, buffer zone, infiltration and groundwater protection standards, source control, treatment control, and hydromodification control standards. Regional BMPs must clearly exhibit that they will not result in a net impact from pollutant loadings over and above the impact caused by capture and retention of the design storm. Regional BMPs may be used provided that the BMPs capture and retain the volume of runoff produced from the 24-hour 85th percentile storm event as defined in Provision E.3.c. and that such controls are located upstream of receiving waters. Any volume that is not retained by the LID BMPs, up to the design capture volume, must be treated using LID biofiltration sized for the design capture volume that has not been retained. Where regional LID implementation has been shown to be technically infeasible (per Provision E.3.c.(4)(b)) any volume up to and including the design capture volume, not retained by LID BMPs, nor treated by LID biofiltration, must be treated using conventional treatment control BMPs in accordance with Provision E.3.c.(2)(d) and participation in the mitigation program in Provision E.3.c.(4)(c).

January 11, 2013

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via Electronic Mail
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RE: Comment – Tentative Order No. R9-2013-0001, Regional MS4 Permit
Place ID: 786088Wchiu
Monitoring Requirements Should Be Strengthened

Please accept these comments on behalf of the Coastal Environmental Rights Foundation (CERF), Environmental Health Coalition (EHC), and San Diego Coastkeeper (SDCK). These San Diego organizations act through community involvement, regulatory participation, and legal action to ensure the protection restoration of San Diego Bay, Mission Bay, and the region's coastal waters.

CERF, EHC and SDCK support and hereby join in the comments submitted by the Keepers (San Diego, Orange County, and Inland Empire), and specifically reiterate the need for more stakeholder input in the development of Water Quality Improvement Plans, especially the monitoring component. CERF submits this comment letter to specifically focus on the water monitoring requirements within the Regional MS4 Permit.

As the Regional Water Quality Control Board (Regional Board) is likely aware, the United States Supreme Court recently issued a very narrow opinion in *L.A. County Flood Control Dist. v. NRDC, Inc*., 2013 U.S. LEXIS 597 (U.S. Jan. 8, 2013), reviewing a portion of the Ninth Circuit's decision in *NRDC, Inc. v. County of Los Angeles*, 673 F.3d 880 (9th Cir. Cal. 2011). The Supreme Court's ruling did not reach a portion of the Ninth Circuit's ruling related to the question of whether "exceedances detected at the instream monitoring stations are by themselves sufficient to establish the District's liability under the CWA for its upstream discharges." (*L.A. County Flood Control Dist,* 2013 U.S. LEXIS 597, 8-10).[1] (*NRDC, Inc*., 673 F.3d at 901). Therefore, it remains to be seen whether the Ninth Circuit's admonishment to citizen complainants that they must "spotlight how the flow of water from an ms4 'contribute[s]' to a water-quality exceedance detected at the Monitoring Stations" will stand.

In light of this potential new evidentiary hurdle, and more importantly the longstanding requirement that all NPDES permits contain monitoring provisions sufficient to assess compliance, CERF urges the Regional Board to require more robust, frequent, and widespread monitoring in the Regional MS4 Permit. (See Permit Attachment F, Fact Sheet, p. F-16). As reiterated by the Ninth Circuit, "Congress intended the Clean Water Act to function by self-monitoring and self-reporting violations to avoid the necessity of lengthy fact-finding,

[1] Environmental citizen plaintiffs still believe the water-quality exceedance itself is enough to establish Clean Water Act liability.

investigations, and negotiations at the time of enforcement." (*Id*. at 896, quoting S. Rep. No. 414, 92d Cong., 1st Sess. 64, reprinted in 1972 U.S.C.C.A.N. 3668, 3730).

Notwithstanding the aforementioned requirements, as amended from the previous, more expansive, administrative version of the permit, the current Regional MS4 Permit takes a more lax approach to monitoring. Pursuant to the proposed Regional MS4 Permit, the copermittees are not required to perform *any* transitional dry weather outfall monitoring, instead relying on field screening only. (D.2.a.(1)-(2)). In addition, the longterm monitoring plan for non-storm water persistent flow MS4 outfall discharge monitoring frequency is "at least semi-annually", while it was a monthly requirement in the previous draft. Most significantly, the currently proposed Regional MS4 moved away from the grid system, whereby the copermittees would monitor at least one station in each cell containing a segment of the copermittees' MS4. Now, copermittees will only have to monitor the ten highest priority non-storm water persistent flow outfalls. (D.2.b.(2)(b)).

This monitoring approach is insufficient for achieving the stated goal of informing copermittees about the "nexus between the health of receiving waters and the water quality condition of the discharges from their MS4." (Permit, p. 33). Equally important are the Regional Board's need to assess compliance and the public's ability to stay informed of the copermittees' compliance and progress:

> The monitoring and assessment information that will be reported to the San Diego Water Board is necessary to determine if the Copermittees are making progress toward achieving compliance with the discharge prohibitions, receiving water limitations, and effluent limitations under Provision A of the Order. (Permit Attachment F, Fact Sheet, p. F-16).
>
> Implementation of the monitoring and assessment requirements of Provision D will allow the Copermittees to demonstrate that the requirements of the CWA to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP are being achieved. (*Id*. at p. F-58).

The required semi-annual dry weather outfall monitoring does not adequately serve any of these functions. EPA *Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters* (*NPS Management Guidance*) provides some insight on the need for more frequent sampling:

> Coastal waters, estuaries, ground water, and lakes will typically have longer response times than streams and rivers. Thus, sampling frequency will usually be greater for streams and rivers than for other water resource types. Some parameters such as total suspended solids and fecal coliform bacteria can be highly variable in stream systems dominated by nonpoint sources, while nitrate levels may be less volatile in systems driven by baseflow from ground water. The highly variable parameters would generally require more frequent sampling, but parameter variability should be evaluated on a site-specific basis rather than by rule of thumb. (*NPS Management Guidance*, Chapter 8, section 5a.).

Thus, the proposed semi-annual monitoring frequency is unlikely to capture the variability of most inland receiving waters and many parameters.

The EPA further recognizes that *monthly* sampling is suitable to detect the annual pattern of changes with time. (*Id.*). Indeed, the original administrative version of the permit contained a monthly monitoring requirement. This more appropriate frequency was replaced with the current semi-annual monitoring provision apparently in response to comments by the San Diego copermittees.[2] The copermittees' reasoning, however, provides little justification for this change. The copermittees relied in part on their poor results in detecting and eliminating illicit discharges through the current permit's monitoring requirements. (San Diego Copermittee Supporting Documentation and Rationale for Alternative Provision II.D Monitoring and Assessment Requirements ("Supporting Rationale"), September 14, 2012, p. 26). The copermittees' inability to detect and eliminate non-storm water flows is more likely an enforcement issue rather than a monitoring problem. Indeed, if the copermittees need more data in order to trace the source of the non-storm water flow, *more* monitoring should be required, not less.

The copermittees also point to the effectiveness of their industrial and commercial inspections to justify less frequent monitoring. However, their own data shows that from 2009 to 2011, no ICIDs were detected, and therefore none were stopped. Rather than representing an effective ICID detection program, this data shows that inventoried commercial and industrial uses are not the source of ICIDs. In other words, this constitutes an exercise in the process of elimination, not detection.

Lastly, the copermittees argue the complaint process is the most effective means of detecting and eliminating ICIDs, and therefore should be relied upon more heavily. While CERF, EHC and SDCK applaud the copermittees for their success in complaint responses, and in ICID elimination as a result, the fact remains that dry weather flows continue, and copermittees have failed to adequately determine their source and effectively eliminate them. This is evident in the copermittees data. In response to dry weather monitoring, only 174 site visits were made, while the successful complaint procedure resulted in 939 visits – five times more visits. (*Id*. at p. 27). It appears copermittees are simply not *using* the dry weather monitoring data. Rather than reward the copermittees for their failure, the Regional Board should require more data in order to enable to copermittees to more effectively trace dry weather flows to their source.

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[2] The copermittees argued: " The approach outlined in the Administrative Draft Tentative Order would generate a great deal of water quality data for dry weather flows and identify some IC/IDs. However, *since the purpose of the program is to eliminate dry weather flows and IC/ID flows entirely*, there is little value to collecting extensive dry weather water quality data for MS4 sites. Very little of the water quality data collected would support assessment of the stated program management objective to effectively prohibit non-storm water discharges to the MS4s." (San Diego Copermittee Comments on Tentative Order No. R9-2012-0011, September 14, 2012, p. 31, emphasis added).

Importantly, while the copermittees focus on the ICID detection and elimination aspect of dry weather monitoring, of equal importance is the compliance aspect. More frequent monitoring is integral to demonstrating active compliance with the prohibition against non-storm water flows in the MS4.

In addition to lax dry weather monitoring, the current permit requires minimal wet weather monitoring, as the copermittees are to monitor wet weather MS4 outfalls at "an **appropriate frequency** to identify sources of pollutants in storm water discharges from the MS4s causing or contributing to the highest priority water quality conditions...". (D.2.c.(2), emphasis added). As has been the case historically, when given the option copermittees will monitor as *infrequently* as possible.

Further, as provision B.4. of the Regional MS4 Permit requires, at a minimum, that Water Quality Improvement Plans (WQIPs) include the requirements of Provision D as part of the water quality improvement monitoring and assessment program for the WQIPs, it is very likely the copermittees will do no more monitoring than required in Provision D.[3] Thus, if the public, the Regional Board, and the copermittees are to truly assess compliance and the success of their iterative approach, the Regional MS4 Permit itself must require more monitoring.

We urge the Regional Board to reconsider its revised monitoring requirements in the draft Regional MS4 Permit in light of the stated goals of the monitoring program, and the potential compliance and enforcement issues that may result if adequate monitoring is not made part of the new permit.

Thank you in advance for your consideration of our comments. Should you have any questions, please feel free to contact us directly.

Sincerely,

Marco Gonzalez
Coastal Environmental Rights Foundation
marco@cerf.org

Livia Borak
Coastal Environmental Rights Foundation
livia@cerf.org

Nicole Capretz
Environmental Health Coalition
nicole@environmentalhealth.org

Jill Witkowski
San Diego Coastkeeper
jill@sdcoastkeeper.org

[3] Monitoring for TMDLs and ASBS is also required, but these provisions only apply to those copermittees where TMDLs have been adopted and ASBS are located. (See Attachment E).

CITY OF CHULA VISTA **Public Works Department**

January 11, 2013
File # 0780-85-KY181
Via: Email and Hand Delivery

Mr. Wayne Chiu, P.E.
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Subject: Comment – Tentative Order No. R9-2013-0001, Regional MS4 Permit
Place ID: 786088Wchiu

The City of Chula Vista appreciates the opportunity to provide comments on the Tentative Order No. R9-2013-0001 (NPDES General Permit No. CAS0109266). City staff has carefully reviewed the Tentative Order, and has specific comments that are presented in Attachment A to this letter. Additionally, the City of Chula Vista supports the comments and proposed revisions to the Tentative Order submitted by the County of San Diego on behalf of the San Diego Copermittees.

We trust that the San Diego Regional Board will give full consideration to our comments and recommendations in order to facilitate continued compliance, and to increase effectiveness of the MS4 Permit for the San Diego Region.

Should you have any questions or if you need further information, please call me at (619) 397-6111. Thank you.

K. Aminpour

KHOSRO AMINPOUR
SENIOR CIVIL ENGINEER

Attachment

C: Richard A. Hopkins, Director of Public Works
William S. Valle, Assistant Director of Public Works Engineering
Silvester Evetovich, Principal Civil Engineer

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ATTACHMENT A – City of Chula Vista Comments on Tentative Order No. R9-2013-0001

Comment No.	Page No.	Comment
1	73	II.E.3.a – Change "all development projects" to "all non-exempt development projects." An exempt-projects category should be created to include projects such as tenant improvements, traffic signals, utility work, road resurfacing, and projects similar to those exempted under the definition of Redevelopment (Attachment "C").
2	74	II.E.3.a.(1)(b) – By definition, all water in the state is considered to be a Waters of the State. Permanent BMPs require to be connected to drainage systems by conveyance systems that are also considered Waters of the State. Therefore, permanent BMPs inevitably are located within waters of the state. Please consider deleting "or waters of the state" similar to Order No. R9-2007-0001.
3	77	II.E.3.b.(3) – Add maintenance access roads to the list of potentially exempt categories, since this type of project results in insignificant pollutant discharge.
4	77	II.E.3.b.(3)(a) – Directing runoff from sidewalks to vegetated areas may result in localized flooding, standing water, degradation/damage to sidewalks, and excessive infiltration into electrical and other utility trenches. It is recommended to provide categorical exemption for sidewalks from SUSMP requirements, similar to Order No. R9-2007-0001.
5	78	II.E.3.c.(1)(a) – Examples of LID BMPs that retain runoff should be provided. Retention facilities typically include retention basins, rain barrels, or underground vaults. Can these facilities be considered LID BMPs? What should be done with the retained water in situations where soils are impermeable and there is a lack of demand for irrigation water during the rainy season?
6	78	II.E.3.c.(1)(a)(i) and (ii) – Please add "runoff" to read "The volume of storm water runoff…"
7	79	II.E.3.c.(1)(c) and throughout the Permit – Please provide a definition for "conventional treatment control BMPs".
8	79	II.E.3.c.(2) – Compliance with hydromodification control requirements on small projects is often infeasible and inefficient. It is recommended to adopt a lower threshold of one acre of impervious area (addition or replacement) for hydromodification control compliance, in line with the San Francisco Bay Area NPDES Municipal Permit.
9	80	II.E.3.c.(2)(a)(iii) – Monitoring data from Provision II.D.1.a.(2) will not provide necessary information to re-define the range of flows causing erosion.
10	80	II.E.3.c.(2)(b) – The Permit should provide guidelines to calculate sediment loss and the methods by which sediment loss can be compensated.

ATTACHMENT A – City of Chula Vista Comments on Tentative Order No. R9-2013-0001

Comment No.	Page No.	Comment
11	80	II.E.3.c.(2)(d) - The Copermittees spent about four years to develop the Final HMP, which includes exemptions based on sound technical justifications. The exemptions mainly deal with projects that discharge directly to depositional reaches of major rivers or large water bodies; small infill projects located within highly developed impervious drainage basins; or discharge to stabilized or hardened channels. Implementation of the Final HMP started in January of 2011 and many issues still remain to be resolved. Eliminating those exemptions at this time would create one size fits all regulations for all projects without regard to technical considerations. It is requested that the exemptions in the Final HMP remain in the Tentative Order until such time that further technical studies prove that they are no longer justified.
12	81	II.E.3.c.(3)(b) – Sizing criteria have not been provided for some alternative compliance options such as offsite retrofitting projects; offsite channel, stream, or habitat restoration; or offsite regional water supply augmentation. Sizing criteria is required to determine the size of alternative options that would provide the same level of water quality protection as would have been achieved by implementing provisions II.E.3.c.(1) and II.E.3.c.(2).
13	88	II.E.3.e.(2)(a) – Implementation of local SUSMPs in San Diego County started on 12/12/2002. Inventories of Priority Development Projects prior to that date are not available. Please revise the date.
14	91	II.E.4.a.(4) – This requirement is already included in other environmental regulations and its inclusion in this Permit is redundant.
15	95	II.E.5.a. – The permit should allow the Copermittees to use more than one data management system (inventory) to track the required information. For example, a GIS system can be used to identify and track the names and locations of existing facilities, while another system such as a business license database or a custom made industrial/commercial database can provide the SIC codes, WDID Nos., etc.
16	96	II.E.5.a.(2)(g) – Pollutants generated and potentially generated by existing facilities or areas can only be identified for typical land uses and not individual facilities or areas.
17	98	II.E.5.b.(1)(c)(iii) – Freeways are under the jurisdiction of Caltrans and that agency is responsible for their operation and maintenance. Please remove freeways from the list.

City of Del Mar

January 11, 2013

Mr. Wayne Chiu, P.E.
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego, California 92123-4340

SUBJECT: Comment – Tentative Order No. R9-2013-0001, Regional MS4 Permit
Place ID: 786088Wchiu

Dear Mr. Chiu:

The City of Del Mar would like to take the opportunity to provide written comments for Tentative Order R9-2013-0001. As stated in previous correspondence, the City appreciates the Order reissuance process to date. The process has allowed stakeholders to participate in shaping the Tentative Order by providing ideas and concepts that support an MS4 Permit that moves us towards our goal – improved water quality and receiving water conditions.

The City of Del Mar has participated in the process for development of the San Diego County Regional Copermittees' comments. Those comments, including an electronic version of recommended changes (e.g., redline/strikeouts), are to be submitted under separate cover by the County of San Diego on behalf of the San Diego County Regional Copermittees. The City of Del Mar supports the comprehensive comments and recommended edits to the Tentative Order.

In addition to supporting the comprehensive comments noted above, the City of Del Mar is providing two specific comments related to Attachment E (provisions for TMDLs) and applicability of hydromodication requirements.

Attachment E – Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2013-0001
The Bacteria TMDL[1] states that for watersheds where there are no longer any impairments listed on the 2008 303(d) List (for REC-1 water quality standards), the Phase I MS4s are not required to submit a load reduction plan and are not subject to any further action under the TMDL as long as monitoring continues to support compliance with REC-1 water quality standards. However, if the impairment returns for REC-1 water quality standards, the Responsible Parties will be required to submit a load reduction plan to the RWQCB.

The City of Del Mar and other Responsible Parties in the San Dieguito and Los Peñasquitos watersheds demonstrated to the RWQCB that the two watersheds are within this scenario where the Pacific Ocean Shoreline of the two watersheds are no longer listed as impaired for indicator bacteria under REC-1 water quality standards. The Responsible Copermittees received written confirmation that they are "not subject to further action under Resolution No. R9-2010-0001 as long as monitoring data continues

[1] Revised TMDL for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek) adopted by SDRWQCB Resolution No. R9-2010-0001

to support compliance with the REC-1 water quality standards." This scenario essentially places our two watersheds in a *dormant* TMDL condition, unless the Pacific Ocean shoreline of the one or both of the watersheds are relisted on future 303(d) lists for indicator bacteria[2].

Attachment E, Section 6[3] of the Tentative Order requires, amongst other provisions, the compliance with Water Quality Based Effluent Limitations (WQBELs). The WQBELs as described in the Tentative Order are expressed as Receiving Water Limitations, Effluent Limitations and as Best Management Practices requirements. As written, the Responsible Copermittees in the two watersheds are required to meet the listed WQBELs even while under the *dormant* TMDL condition.

There is a conflict between relisting of the Pacific Ocean shoreline and the more strict WQBEL limitations. Relisting of the Pacific Ocean shoreline would be done under the criteria established in the 2004 SWRCB Listing Policy[4] which allows for a certain number of water quality standard exceedances prior to listing. The WQBEL limitations allow **zero** water quality standard exceedances under dry weather conditions – a much higher bar with which to comply.

If the WQBELs are included in the final adopted Permit, at a minimum, the WQBEL compliance should only apply when the TMDL is in an *active* phase – i.e., the waterbody is impaired and listed on the 303(d) list as specified in the Bacteria TMDL (SDRWQCB Resolution R9-2010-0001). Otherwise, the Copermittees will be required to focus intense resources to address bacteria at the Pacific Ocean shorelines where water quality monitoring has demonstrated that it is not an issue. This ironic paradox would be contradictory to the watershed based adaptive management process where the objective is to focus limited resources on the highest water quality issues.

Comment – Based on the supporting information included in this letter and in SDRWQCB Resolution No. R9-2010-0001, correct the conflict between the Bacteria TMDL and Attachment E of the Tentative Order so that the WQBEL requirements are applicable when the TMDL is in an *active* phase, i.e., the waterbody is impaired and listed on the 303(d) list as specified in the Bacteria TMDL. Implied with correction of this conflict is that watersheds in a *dormant* TMDL condition, i.e., no longer listed as impaired for indicator bacteria under REC-1 water quality standards, are not subject to the WQBEL requirements of Attachment E of the Tentative Order.

Provision E.3.c.(2) Hydromodification Management BMP Requirements

The Tentative Order defines hydromodification as:

> The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

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[2] Page A66 of SDRWQCB Resolution No. R9-2010-0001

[3] Attachment E, Section 6 of the Tentative Order is the Specific Provisions for Total Maximum Daily Loads Applicable to Order R9-2013-0001 for the Revised TMDL for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

[4] State Water Resources Control Board – Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List, adopted September 2004

The Tentative Order requires that priority development projects, including redevelopment projects, are required to control post-project runoff flow rates and durations so as not to result in increased potential for erosion, or degraded instream habitat conditions downstream of the projects. There are several explicit exemptions for these requirements identified in the Tentative Order. However, these exemptions are not inclusive of many of the exemptions identified in the San Diego Regional Copermittees Final Hydromodification Management Plan[5] (HMP). The exemptions identified in the HMP include, but are not limited to, projects that discharges to an exempt river reach, or a tidally-influenced area and other areas where there was little or no increased potential for erosion, or degraded instream habitat conditions downstream of the projects.

Over 95% of the City of Del Mar's MS4 system drains directly to either the Pacific Ocean or to tidally influenced areas of the San Dieguito estuary and river. The areas that drain to the Pacific Ocean will remain exempt per the Tentative Order, however, those areas that drain to tidally influenced areas of the San Dieguito estuary and river will not be exempt even though they have no Hydromodification impacts. The City will be forced to require priority development projects to mitigate for impacts they will not have, e.g., mitigation with no nexus to impacts.

Comment – Based on the definition of hydromodification, correct the hydromodification management requirements in the Tentative Order to be applicable for project sites that have the potential to create hydromodification impacts downstream of the project sites. At a minimum, this can be achieved by reinstating appropriate exemptions in the Order requirements.

The City looks forward to continuing our dialog with Regional Water Quality Control Board staff during the next phases of the permit reissuance process. If you have any questions, please contact me at (619) 994-7074.

Sincerely,

Mikhail Ogawa, P.E.
Clean Water Manager

c: Kathleen A. Garcia, Planning and Community Development Director
File

[5] Approved on July 14, 2010 by San Diego RWQCB Resolution No. 2010-0066

City of Encinitas

January 11, 2013

Wayne Chiu, P.E.
California Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego, California 92123-4340

SUBJECT: Comment – Tentative Order No.R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu

Dear Mr. Chiu,

Thank you for the opportunity to comment on *Tentative Order No. R9-2013-0001 Regional NPDES Permit and Waste Discharge Requirements for Discharges of Urban Runoff from Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Tentative Order).

The intent of this comment letter is to first offer that the City of Encinitas has participated in and is in support of the comprehensive comments and suggested permit language edits (e.g., red-line/strikeout) as submitted under separate cover by the San Diego County Copermittees on January 11, 2013.

In addition, consistent with the City's ongoing appeal to both Board Members and Staff related to *Attachment E – Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2013-0001, Section 6,* it is prudent and logical to distinguish the San Marcos HA as a 303(d) de-listed Pacific Ocean shoreline segment. This request has been captured in suggested language included in the San Diego County Copermittees submittal, premised upon the principles of the Tentative Order to focus resources on the highest water quality problems within a watershed, and supported by comprehensive technical analysis provided to RWQCB staff. As currently drafted without the necessary regulatory distinction, San Marcos HA Copermittees will be unreasonably constrained through an assessment of receiving water conditions (as prescribed in Provision B.2.a) to prioritize a water quality condition (indicator Bacteria) in a receiving water (Pacific Ocean) with unsupported beneficial use (REC-1) impairments.

Tel 760/633-2600 FAX 760/633-2627, 505 South Vulcan Avenue, Encinitas, CA 92024 TDD 760/633-2700

Reasoned as such, the City of Encinitas requests the following update to *Attachment E, Section 6.a(5):*

(5) Water Bodies: See Table 6.0; Consistent with Basin Plan Amendment (Resolution No. R9-2010-0001, p. A-2); specific beach segments from some of the Pacific Ocean shorelines listed in Table 6.0 have been delisted from the 2008 (sic 2010) 303(d) list that was approved by the San Diego Board on December 16, 2009, and therefore are not subject to the requirements of Attachment E as long as monitoring data continues to support compliance with water quality standards.

Thank you for your consideration of these comments and your evaluation of the significant matters presented above.

Sincerely,

Erik Steenblock,
Stormwater Program Manager, City of Encinitas

CITY OF LAGUNA HILLS

January 11, 2013

Wayne Chiu, P.E.
California Regional Water Quality Control Board, San Diego region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

SUBJECT: COMMENT – TENTATIVE ORDER NO. R9-2013-0001, REGIONAL MS4 PERMIT, PLACE ID: 786088WCHIU.

Dear Mr. Chiu:

The City of Laguna Hills appreciates the opportunity to provide comments on Tentative Order No. R9-2013-0001, which is intended by the Regional Board to serve as the basis for stormwater regulation in the City following the expiration of current Order R9-2009-0002. The City has been actively involved in the development of the comprehensive set of comments submitted by the County of Orange. The City of Laguna Hills supports those comments and incorporates them herein by reference.

The City appreciates the efforts put forth by the Regional Board staff to revise certain provisions of the prior Administrative Draft. However, there is a need to implement further significant changes in the Permit to make it feasible to implement. These changes are included in redline format in the County submitted comments. A number of key issues have been extensively discussed in the focus meetings and Board workshops and, despite some changes, still remain a significant concern to the City. These include:

- The Receiving Water Limitations provisions in the Tentative Order could expose the City to Clean Water Act liabilities for discharges that cause or contribute to an exceedance of a water quality standard. A clear linkage between the compliance provisions and prohibitions, receiving water limitations, and effluent limitations must be established.

- The provisions dealing with Land Development, Low Impact Development (LID) and Hydromodification control have been arbitrarily tightened even while existing

24035 El Toro Road • Laguna Hills, California 92653 • (949) 707-2600 • FAX (949) 707-2633
website: www.ci.laguna-hills.ca.us

permit programs are only just being implemented and/or are pending approval and have not been able to be evaluated for success. The City is particularly concerned with the elimination of all exemptions for the hydromodification control requirements, including for discharges to channels that have been engineered to prevent erosion. Exemptions for hydromodification management should include discharges to certain types of receiving waters and certain types of projects.

- The provisions implementing the Beaches and Creeks Total Maximum Daily Load (TMDL) bacteria requirements are inconsistent with the TMDL as it was developed and pose additional significant liabilities. Permit provisions must be consistent with the corresponding Basin Plan amendments.

- The provisions requiring the development and implementation of a Water Quality Improvement Plan need to be aligned with the Jurisdictional Runoff Management Program requirements so that the programs are complimentary and prioritized instead of additive.

Thank you, for the opportunity to provide comments. The City would like to request the opportunity to meet with you, other Regional Board staff and the County of Orange to review the changes requested in the County letter.

Sincerely,

Kenneth H. Rosenfield, P.E.
Director of Public Services

CALIFORNIA
NATIONAL CITY
1887
INCORPORATED

SAN DIEGO REGIONAL
WATER QUALITY
CONTROL BOARD
2013 JAN 9 PM 2 34

January 11, 2013

Wayne Chiu, P.E.
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego California 92123-4340

Subject: Comment – Tentative Order No. R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu.

Dear Mr. Chiu:

The City of National City (City) appreciates the opportunity to comment on the proposed revision to the San Diego Regional Municipal Storm Water Permit, Tentative Order No. R9-2013-0001 (Tentative Order). The City generally supports the consensus comments prepared and submitted by the San Diego Copermittees. Two groups of comments are included in this letter: (1) Copermittee consensus comments for which the City wishes to provide additional, City-specific rationales in support of the proposed changes and (2) proposed changes that are different than the Copermittee consensus comments.

Additional City-specific rationales supporting selected Copermittee consensus comments are provided below to supplement the rationales provided in the overall Copermittee document.

- **Hydromodification management requirements for redevelopment projects, Tentative Order section E.3.c.(2)(a).** Requiring hydromodification management controls to match pre-development rather than pre-project conditions effectively has no impact on new development, for which pre-project and pre-development conditions are the same. However, requiring a redevelopment project to match runoff characteristics for the project area as it would have been before any development occurred on the property rather than based on the existing condition of the property dramatically increases requirements and cost for redevelopment projects. Redevelopment projects are important sources of jobs and economic development to cities like the City of National City. The proposed changes to the hydromodification requirements create a disincentive for redevelopment, which is particularly harmful to economically disadvantaged areas with contaminated sites due to past industrial activity that rely on redevelopment for economic improvement.
- **Non-storm water discharge requirements related to groundwater, Tentative Order section E.2.a.(1).** Tracking down locations of foundation and footing drains and crawl space pumps in the City, as well as records of prior approvals and plans and site-specific groundwater history, would be extremely time-consuming without a commensurate benefit in water quality. If any of

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these types of drains or pumps are identified as a persistent source of pollutants to the City's MS4, the City will perform the necessary follow-up investigation and research for the particular drain of concern as required by other provisions of the Tentative Order.

- **Assessment requirements, Tentative Order section D.4.** Revisions to these requirements as proposed by the Copermittees will still provide jurisdictional accountability while removing calculations and reporting requirements that would take up a proportionally large amount of program resources for a smaller jurisdiction like the City of National City and that would be unlikely to provide information useful for managing storm water programs. The proposed revisions would help minimize the extent to which reporting efforts would pull resources away from field implementation components of the City's program that reduce storm water pollution.

The City differs with Copermittee consensus comments with respect to the following sections of the Tentative Order:

- **Non-storm water discharge requirements for air conditioning condensate, Tentative Order section E.2.a.(4)(a).**
  - **Proposed revised language:** "The discharge of air conditioning condensation should be directed to landscaped areas or other pervious surfaces where feasible."
  - **Rationale and discussion:** The proposed language change would provide the City with more flexibility to target key sources of pollutants with program resources. If this recommendation is not acceptable, the City would prefer the existing Tentative Order language to the proposed consensus Copermittee language because the Tentative Order language more clearly recognizes that directing air conditioning condensate to landscaping or other pervious areas, while desirable, may not be feasible at all sites. The existing Tentative Order language also does not unnecessarily introduce the complexity of sanitary sewer diversions, as the Copermittee consensus language does. The City has required sanitary sewer diversions for air conditioning condensate discharges in site-specific circumstances, but these diversions are generally not suitable or desirable for widespread use.
- **Requirements for pretreatment for infiltration BMPs, Tentative Order section E.3.c.(5)(a)(vi).**
  - **Proposed revised language:** "Infiltration BMPs must not be used for high threat to water quality land uses and activities as designated by each Copermittee, unless sufficient permanent source control BMPs to prevent exposure of high threat activities are proposed or runoff from high threat land uses or activities is first treated or filtered to remove pollutants prior to infiltration; and"
  - **Rationale and discussion:** In some cases, developments with industrial or light industrial land use may not have significantly different pollutant generating activities than commercial properties. For example, current designs for most light industrial developments have virtually no exposed areas of industrial activities. It makes more sense to base requirements for additional measures to protect groundwater on the specific proposed activities at a development rather than general land use categories, which may or may not indicate a potential threat of groundwater contamination if

infiltration BMPs are used. Also, permanent source control BMPs that prevent exposure of high threat activities, such as structural canopies, may be more effective and require less maintenance for continued long-term effectiveness than filtration or other pretreatment approaches and should be allowed.

The City appreciates the Regional Board's consideration of our comments. Should you have any questions about any of the comments contained in this letter, please contact John Quenzer at (858) 586-6600 or Barby Tipton at (619) 336-4583.

Sincerely,

Stephen Manganiello
City Engineer

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MEMBERS OF THE CITY COUNCIL
SAM ALLEVATO
ROY L. BYRNES, M.D.
LARRY KRAMER
DEREK REEVE
JOHN TAYLOR

January 11, 2013

Wayne Chiu, P.E.
California Regional Water Quality Control Board, San Diego region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Subject: Comment – Tentative Order No. R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu.

Dear Mr. Chiu:

The City of San Juan Capistrano appreciates the opportunity to provide comments on Tentative Order No. R9-2013-0001, which is intended by the Regional Board to serve as the basis for stormwater regulation in the City upon the expiration of current Order R9-2009-0002. The City has been actively involved in the development of the comprehensive set of comments submitted by the County of Orange and supports those comments and attaches them by reference.

The City appreciates the revisions made by Regional Board staff since the prior Administrative Draft but believes that further changes are necessary, which are included in redline format in the County letter. A number of key issues have been extensively discussed in the focus meetings and Board workshops and, despite some changes, still remain a significant concern to the City. These include:

- The Receiving Water Limitations provisions in the Tentative Order could expose the City to Clean Water Act liabilities for discharges that cause or contribute to an exceedance of a water quality standard. A clear linkage between the compliance provisions and prohibitions, receiving water limitations, and effluent limitations must be established.

- The provisions dealing with land development, Low Impact Development (LID) and hydromodification control are significantly ratcheted up while existing permit programs are only just being implemented and/or pending approval. The City is particularly concerned with the elimination of all exemptions for the hydromodification control requirements, including for discharges to channels that have been engineered to prevent erosion. Exemptions for hydromodification management should include discharges to certain types of receiving waters and certain types of projects.

- The provisions implementing the Beaches and Creeks Total Maximum Daily Load (TMDL) bacteria requirements are inconsistent with the TMDL as it was developed and pose additional significant liabilities. Permit provisions must be consistent with the corresponding Basin Plan amendments.

- The provisions requiring the development and implementation of a Water Quality Improvement Plan need to be aligned with the Jurisdictional Runoff Management Program requirements so that the programs are complimentary and prioritized instead of additive.

Thank you for the opportunity to provide comments. The City would like to request the opportunity to meet with you, other Regional Board staff and the County of Orange to review in detail the changes requested in the County letter.

Please direct any questions regarding this letter to Ziad Mazboudi, Senior Civil Engineer, at zmazboudi@sanjuancapistrano.org or 949-234-4413

Yours sincerely,

Keith Van Der Maaten, PE
City of San Juan Capistrano
Utilities Director

CITY OF SANTEE

MAYOR
Randy Voepel

CITY COUNCIL
Jack E. Dale
Rob McNelis
John W. Minto
John Ryan

CITY MANAGER
Keith Till

January 11, 2013

Mr. Wayne Chiu, P.E
Regional Water Quality Control Board San Diego Region
9174 Sky Park Court, Suite 100
San Diego, Ca 92123

SUBJECT: DRAFT REGIONAL MUNICIPAL PERMIT

Dear Mr. Chiu,

I am writing to express the City of Santee's general support for the revised comments being submitted on behalf of the San Diego County Copermittees.

One issue that we would like to highlight is the inference from the inventory requirements (E.5.a.1(vii)) that mobile home parks can be regulated by the City. The Mobile Home Parks Act preempts the City's ability to regulate within a mobile home park, except for specifically enumerated areas where regulation is allowed. (Health & Safety section 18500: County of Santa Cruz v. Waterhouse (2005) 127 Cal.App.4th 1483, 1495.) The City is allowed to regulate, pursuant to its police powers, only the following:

(1) Zones where parks may be located,
(2) Park perimeter walls or enclosures on public street frontage,
(3) Signs,
(4) Access
(5) Vehicle parking,
(6) Certain uses for parks,
(7) Construction and use of equipment and facilities located outside of manufactured home or mobile home used to supply gas, water, or electricity thereto
(8) Permit to use a manufactured home or mobile home outside a park,
(9) Local building permit to construct an accessory structure for a manufactured home or mobile home when the manufactured home or mobile home is located outside a mobile home park
(10) Setback and separation requirements governing the installation of a manufactured home, mobile home, or mobile home accessory structure or building installed outside of a mobile home park.

As you can see from the above summary, the City is restricted in its ability to require best management practice (BMP) implementation , or even to conduct inspections in mobile home parks. We therefore recommend that these types of development not be inventoried for inspection and BMP retrofitting.

We appreciate the opportunity to constructively participate in the development of this permit and hope that the RWQCB will continue the discussion with us as we progress towards permit approval.

Pedro Orso Delgado, P.E.
Deputy City Manager/Director of Development Services

CLEAN WATER NOW

==========

Date: January 11, 2013

TRANSMITTED VIA E-MAIL

To: Ms. Laurie Walsh
WRC Engineer
San Diego Regional Water Quality Control Board (SDRWQCB)
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

From: Roger E. Bütow Executive Director Clean Water Now

Re: Revised Administrative Draft San Diego Regional Municipal Separate Storm Sewer System (MS4) Permit: Tentative Order No. R9-2013-0001

Ms. Walsh

Clean Water Now (hereafter referred to as CWN) **was** prepared to submit extensive comments and provide proposed revisions in regards to the NPDES (MS4) Permit noted above by the determined deadline of today, January 11, 2013.

Instead, CWN supports the San Diego Building Industry of America (SDBIA) Coalition in their respectful request that the SDRWQCB remand the Tentative Order back to staff so that it may be revised in conformity and in resonance with the United States Supreme Court's 9-0 opinion handed down this past Tuesday, January 8, 2013. This Coalition generously shared their most recent draft dated January 10, 2013 and we also find ourselves in agreement with many of their other concerns and suggested revisions.

In light of numerous recent and related court decisions, we are going to place any further comments in abeyance pending more clarity. CWN feels that it would be precipitous, even futile to go any further in the ratification process for this particular regional permit. We definitely oppose placing it on the SDRWQCB agenda until such a time as the apparent disparities and discrepancies are reviewed then determined by legal counsel to be minor, major, real or false.

CWN has been in constant contact with the San Diego BIA personnel and with several other South Orange County MS4 Copermittees for the past 3 days regarding these decisions and their potential dissonance and some disarray for our regional regulatory oversight mechanisms.

Mailing Address: P.O. Box 4711 Laguna Beach CA 92652
Phone: (949) 715.1912 **www.clean-water-now.org**

Many of the **Findings** and other sections of the Tentative Order now appear to be in potential contradiction or conflict, inconsistent and/or incongruent. The only thing that CWN is certain of is the auspice, the aura and appearance of general uncertainty. Even if only seen as an emotional disequilibrium, the onus and burden should be placed squarely upon the SDRWQCB staff to cure, to at minimum remedy this by remanding it pending greater specificity and subsequent clarification. We do not feel that remanding is a form of over-reaction or exaggeration.

The amount of confusion over the short, mid and long-term ramifications alone is daunting, but it is rampantly clear that a great portion of the Tentative Order may be subject to subsequent revisions by the SDRWQCB, even aspects of appropriative and riparian water rights entitlements that need other State agencies input. As presently written, it appears fragile, vulnerable, and will be exposed to extensive legal challenges if sustained as drafted.

The **Total Maximum Daily Load** (TMDL) provisions are another critically important element of the Tentative Order that we perceive to be problematic in light of the recent legal renderings.

SDRWQCB staff repeatedly embraced and implemented **"Adaptive Management"** (AM) at the stakeholder focused group meetings that took place in 2012. Staff encouraged stakeholders to follow their lead and guidance, to integrate this well-known, successful business and corporate methodology. Integral in the AM process are **"Conflict Resolution"** prescriptions.

It should be noted that this emerging conflict is in part self-inflicted by the SDRWQCB staff as it disallowed protracted yet potentially fruitful discussions about the present conundrum. A basic assertion by the facilitator noted the inherently egalitarian nature of AM, plus respect for ALL opinions and concerns yet dialogue on this subject was arguably suppressed and stifled.

To the best of our recollection during the entire focused group process and SDRWQCB rollout, at each venue, at least one significant stakeholder requested staff to clarify the State's legal position and projections, its legal counsel's perceptions regarding subsequent ramifications if the US Supreme Court over-ruled the NRDC and Santa Monica Baykeepers.

"Adaptive management (AM) is a structured, iterative process of robust decision making in the face of uncertainty, with an aim to reducing uncertainty over time via system monitoring. In this way, decision making simultaneously meets one or more resource management objectives and, either passively or actively, accrues information needed to improve future management."

In our humble opinion, this **"What if"** scenario should have been discussed to a greater length and depth per AM than allowed by staff and the facilitator who basically discouraged it. Staff appeared to lean towards irrelevance at some of these venues and at others towards confidence that ultimately the 9th Circuit Court of Appeals determination would be sustained.

Another example of the **"What if"** speculation and significant doubt is embedded in the SDBIA pleadings regarding down-slope (declivity) relief and the nexus with certain water rights disputes. CWN would go further and introduce another random and chaotic by-product of the MS4 proposal, the Law of Unintended Consequences:

Stormwater capture and who may claim accompanying increases in groundwater production rights associated with causing increased percolation is currently a major topic in the Chino Groundwater Basin (Region 8, SARWQCB). This topic includes the question of whether increased groundwater production rights should be accorded where the capture is compelled by regulatory requirements such as MS4 permits.

Personally, I have some arguable expertise in this **"one-size-fits-all"** shortcoming in the MS4 proposal. I have been a general contractor and builder of both commercial and custom residential homes for some 40+ years in South Orange County. Onsite detention/retention of stormwater could create and/or exacerbate the very conditions that caused both of the slides, the significant and monolithic slope failures that occurred in Bluebird Canyon here in Laguna.

We are a predominantly clay-expansive soil region, subject to flocculation and de-flocculation determined by events out of our control. Droughts cycles followed by El Niños followed by yet more drought cycles create subterranean pocket, voids that make us prone to such catastrophic failures. We now require greater compaction and subterranean stabilization (caissons, etc.) during construction, but that translates into more difficulties regarding full compliance with this MS4. Here in Laguna Beach, we cannot serve the two masters, and the MS4 demands uniformity and coherence among ALL of the copermittees jurisdictions where it cannot be reasonably accomplished. Practicality seems missing.

We strongly believe in the engineering project maxim expressed via an acronym metric: **SMART: "S**pecific**, Me**asurable**, A**chievable **R**ealistic and **T**imely. Compliance in Laguna Beach is neither achievable nor realistic, and perhaps impossible to implement, putting us in chronic violation hence prone to fines by the SDRWQCB. And to impose, to initiate and assertively pursue the retrofitting elements of the Tentative Order's demands would make my city vulnerable to massive, mind-boggling private litigation. Ironically, it would also not **be** smart.

IF the US Supreme Court and other related decisions have no significance or bearing on this Tentative Order, need not result in remanding, then the SDRWQCB staff should mass broadcast, that is widely transmit that legally justifiable position to its stakeholder master list. Memorialize, that is codify it in some discernible and defensible manner. CWN had hoped that the AM process would streamline, would in essence triage and winnow to fast-track approval without rancor or post-ratification litigious challenges.

At the focused meetings we were only given non-binding verbal responses and assurances about the LA County case by staff without benefit or the immediate feedback via SDRWQCB legal counsel presence. The SDRWQCB should then publicize that legally tenable/defensible brief via mass media and post prominently their reasoning at the SDRWQCB website.

IF it is of **any** significance that might require revisiting or reopening, then reconvene the stakeholder focused group, appropriately confirm and acknowledge the US Supreme Court decision as a **"game-changer."** If it is, that should trigger a subsequent draft process with revisions and/or editing: Then, and only then, should staff proceed accordingly.

It is far better to delay, to get the Tentative Order aligned, to deal with potential irregularities leading to endless post-adoption legal challenges preemptively and hopefully summarily (immediately) than to let it move forward as is. In this case, **"One size fits none."**

We would also add our voice, our support, to the SDBIA proposal that such a regional permit ignores the impossibility of such a water quality management document to what I consistently pointed out at focused meetings as the equivalent to Einstein's Unified Field Theory research. He never succeeded in creating one equation or series of theoretical equations that explained everything in the Universe.

It would be better to create MS4s by apparent identifiably unique topographical/geo-morphological characteristics or watershed-by-watershed bases. It was intended to cut down on staff's invaluable entanglement time, yet we feel it will only increase demands and burdens on budgets, including the copermittees. The **"case-by-case basis"** concept **sounds** reasonable, but this could readily de-evolve into innumerable side-bar intrigues and endless negotiations.

This MS4 tries, attempts, to accomplish the noble goals of both the Clean Water Act and Porter-Cologne Water Quality Control Act in a singularity. CWN does not believe that is possible. Laguna Beach isn't an anomaly, we believe that other steep terrain copermittees will find themselves in similar conundrums and community disputes, some having gross sum $$$ litigious expenditure impacts unaddressed in the permit.

The very morass, the uncertainty that AM was supposed to attenuate, reduce or obviate has occurred. We, as stakeholders, bought into AM as our primary negotiation tool during meetings. In lieu of more time to professionally analyze the ramifications of the US Supreme Court decision, we feel that it is impossible at this time to properly assess what deserves serious consideration and possible mid-course corrections.

We have a rule on construction sites: **"Measure twice, cut once."** Many times, if the material is expensive and/or the potential adverse $$$ impacts of error considerable, we measure or gauge numerous times in proactive, pre-emptive anticipatory avoidance.

The SDRWQCB can do the same. It was the intent of the MS4 focused meetings to at least minimize and un-complicate subsequent challenges, not to protract in a continuous, post-mortem loop. Instead, the US Supreme Court decision, in conjunction with other-related ongoing legal proceedings in California, seems poised to expand and create interminable contention.

One determination of the Order regarding **Priority Development Projects** (PDP) is that ALL hillside development in Laguna Beach will necessitate, will force the City into imposing such stringent categorization and compliance oversight on its construction industry and pass the increases on to parcel owners. Compliance would equate to fiscal suicide.

These multiple development or redevelopment designations will be impossible to implement on the broad-swath, grand scale suggested, and when added to non-hillside projects laughingly, absurdly unaffordable and unobtainable.

We have been repeatedly told that funding is not a legal issue for the SDRWQCB. But if Laguna and other copermittees cannot afford the implementation necessary to achieve compliance, then this Order will create a revolving door of staff meetings and violation hearings. Even bankrupt areas already fiscally impaired, depressed and distressed.

What happened to Economically Feasibility and Technological Possibility as reasonable, fair metrics? What good does it do to demand unachievable compliance standards?

Let's remand it, retract and revise if necessary, thus getting it done right the first time when finally placed on the SDRWQCB docket. As the present, highly prescriptive existing permits under the SDRWQCB jurisdictional domain don't expire or need renewal soon, are in place until a subsequent one is ratified, what's the hurry, the rush?

Otherwise, putting it in historical perspective regarding previous MS4 Permits, it'll be like the movie **"Groundhog Day,"** or as Yogi Berra exclaimed **"déjà vu all over again."** This happened back in 2002 when due to extensive legal appeals by the South Orange County copermittees, CWN was forced to spend precious internal funds to represent itself plus the Sierra Club and the Surfrider Foundation at the SWRCB hearing in Sacramento.

Litigation over this will only line the pockets of consultants and attorneys, including those aligned with eco-NGOs .This Order will expand that emerging compliance cottage industry tremendously, and should therefore be prophylactically remanded as soon as possible.

CWN sincerely believes that this remanding and return could be accomplished in 90-120 days at most and does not constitute stalling nor is it unreasonable. We're certain that the dominant majority of the stakeholders would support this front-loaded revisitation and refinement to the Order as opposed to back-end dissolution, un-subsided disorder and jumbled chaos.

Respectfully submitted,

Roger E. Bütow
Executive Director
Email: **roger@clean-water-now.org**

CLEAN WATER NOW is an innovative, science-based organization committed to solution-oriented collaboration as a means of developing safe, sustainable water supplies and preserving healthy ecosystems.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

JAN 11 2013

Wayne Chui
San Diego Regional Water Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Re: Draft San Diego Regional MS4 Permit

Dear Mr. Chui:

The following are EPA Region 9's comments on the draft permit for the municipal separate storm sewer system (MS4) located within the jurisdiction of the San Diego Regional Board, which the Board released for public comment on October 31, 2012. We also provided comments on an early draft of this permit in a letter to the Board dated February 14, 2012. For the most part, we are pleased with the latest version of the permit and we commend the Board and its staff for their extensive efforts in developing this draft permit. We also offer the following comments for the Board's consideration:

A. *Total Maximum Daily Loads (TMDLs)*

In our February 14, 2012 letter, we also generally supported the Board's approach for incorporation of applicable TMDL requirements into the permit, i.e., incorporation of applicable wasteload allocations (WLAs) as numeric effluent limits. We urge the Board to retain this approach in the final permit as well since it will enhance enforceability and will most clearly ensure consistency with the WLAs.

Our February 14, 2012 letter had also suggested revisions of certain provisions of the early draft permit related to TMDLs; the October 31, 2012 draft permit has been substantially revised from the early draft and many of our early comments have been addressed. However, as discussed below, we still have certain concerns whether the monitoring requirements of the October 31, 2012 draft permit would be adequate to ensure compliance with the TMDLs.

Sections II.D.1 and 2 set forth the receiving water monitoring and MS4 outfall monitoring requirements of the draft permit. In general, a monitoring program would be developed and conducted by the permittees to assess the impacts of the discharges and the effectiveness of the Water Quality Improvement Plans (WQIPs), focusing on the highest priority water quality conditions. Compliance with applicable WLAs from TMDLs would be one of several competing priorities in selecting monitoring locations in the receiving waters and at MS4 outfalls.

Attachment E to the draft permit requires monitoring at MS4 outfalls or receiving water locations, but the locations to be monitored are not fully specified. Although TMDL compliance would presumably receive a high ranking in setting the monitoring program priorities, it is still not clear that appropriate monitoring locations would necessarily be selected to measure compliance with WLAs. As such, we recommend that Section II.D of the permit clarify that notwithstanding other monitoring priorities, at a minimum, appropriate monitoring locations must be selected to ensure compliance with all applicable WLAs and associated effluent limitations. The permit should specify that a mix of receiving water and representative end-of-pipe monitoring locations must be selected to ensure that the monitoring data collected will be sufficient to determine compliance with effluent limitations based on WLAs and to determine whether individual copermittees have caused or contributed to observed in-stream noncompliance. The permit should provide that the parties that develop and submit for Regional Board review a monitoring plan for a WQIP agree to the use of monitoring plan results for purposes of compliance determination.

Section II.D.2.c.(2) of the draft permit also requires monitoring at an "appropriate" frequency for the post-transitional period; the transitional monitoring program (Section II.D.2.a.(3)) would require twice/year monitoring during the wet season. We recommend the permit clarify the minimum monitoring frequency for the post-transitional period and suggest maintaining the twice/year frequency.

Attachment E also describes the specific provisions for TMDLs adopted and approved that are applicable to this tentative order. We note that a few of the compliance requirements provided in an existing TMDL were not included in this tentative order. We recommend that all applicable TMDL WLAs and compliance endpoints be included in Attachment E. For instance, the TMDL for Indicator Bacteria Project I – Twenty Beaches and Creeks in San Diego Region (including Tecolote Creek), provided both concentration-based and mass-based TMDLs. All identified TMDL WLAs and endpoints should be included in Attachment E to prevent confusion with the WLA requirements described and adopted in the TMDL.

Provision B.6 identifies the WQIP submittal, updates and implementation. Paragraph 3 under this Provision should clarify that the intent of all monitoring and assessment is to improve our evaluation of the waterbodies' conditions, including the 303(d) listed impaired waterbodies. We recommend paragraph 3 under Provision B.6 be modified to the following:

> *"All State identified impaired waterbodies within the Watershed Management Area should be placed on the 303(d) List as required under CWA Section 303(d) and 40 CFR §130.7(b)(4)). However, in specific cases supported by robust analytical documentation the implementation of the Water Quality Improvement Plans may demonstrate that TMDLs are not necessary for identified impaired waterbodies within the Watershed Management Area if the analytical record demonstrates that technology-based effluent limitations required by the CWA, more stringent effluent*

limitations required by state, local, or federal authority, and/or other pollution control requirements (e.g., best management practices) required by local, state or federal authority are together stringent enough to implement applicable water quality standards associated with the waterbody impairment causes within a reasonable period of time."

Finally, we reiterate our suggestion from the February 14, 2012 letter that a provision be added to the draft permit to address TMDLs approved during the term of the permit; we had suggested a provision similar to section O of the 2012 MS4 permit for the City of Salinas (NPDES permit No. CA0049981) available at: http://www.ci.salinas.ca.us/services/maintenance/pdf/NPDES_Permit.pdf. The provision requires the development and submittal (within one year of final TMDL approval) of a plan for complying with applicable WLAs. Such a provision would expedite compliance with the WLAs by the permittees.

B. Low Impact Development (LID) Requirements

In our February 14, 2012 letter, we generally supported the LID provisions of the early draft permit, and we continue to largely support the proposed LID requirements of the October 31, 2012 draft permit. The proposed requirements in the October 31, 2012 draft (beginning on page 78) are also similar to the requirements in other recent California MS4 permits such as those for Los Angeles and Orange Counties. As you know, Region 9 is encouraging the Boards to include measurable requirements in MS4 permits to enhance clarity and enforceability of the permits. We are pleased to see the inclusion of the measurable requirement for onsite management of the runoff from the 85% storm similar to other recent permits. However, we also note that Section II.E.3.c.(1)(a)(ii) of the October 31, 2012 draft permit provides a new alternative of retaining the volume (determined by modeling) that would retained under natural, undeveloped conditions. We are concerned that this option may create uncertainty and provide opportunities for subjective analyses that would be resource intensive and difficult to review. For this reason, and for consistency with other recent California MS4 permits, we recommend that Section II.E.3.c.(1)(a)(ii) of the proposed permit be removed. However, if this provision is retained, the permit and fact sheet should fully clarify that undeveloped conditions refer to natural conditions prior to any anthropogenic impacts.

We did raise a couple of questions regarding LID in our February 14, 2012 letter which we believe have been adequately addressed in the latest draft. We had been unclear concerning requirements related to biofiltration; the October 31, 2012 permit has been restructured in a way which clarifies the questions we had raised.

We had also suggested that the Board may want to consider off-site water supply augmentation projects as an acceptable alternative when onsite stormwater management is not feasible. Several recent studies have highlighted the many benefits (such as energy

savings) of increased stormwater infiltration for groundwater recharge. We note such a provision has been added to the draft permit, and we support this provision.

C. Water Quality Improvement Plan Review

In our February 14, 2012 letter, we had expressed concern whether the public would have an adequate opportunity to review draft WQIPs consistent with the 2005 decision by the Second Circuit Court in *Waterkeeper Alliance et al. v. EPA*, 399 F.3d 486, and the 2003 decision by the Ninth Circuit Court in *Environmental Defense Center, Inc. v. EPA*, 344 F.3d 832. We are pleased to see the draft permit (section F) and the fact sheet have been revised to clarify that the Board would be soliciting public comment concerning draft WQIPs submitted to the Board for approval during the term of the permit.

The fact sheet and the permit also describe the WQIPs as dynamic and evolving documents which are likely to be updated and modified over time in accordance with the iterative process. Although permittees must solicit public input in developing proposed updates that are submitted to the Board, it does not appear that public comment would necessarily be solicited concerning Board action in approving, disapproving or revising proposed updates; we suggest that an opportunity be provided for public comment on such Board actions similar to that provided when the original WQIPs are submitted.

D. Prescriptive BMP Requirements

In our February 14, 2012 letter, we expressed concern that the early draft permit would only require inspections of construction sites "at an appropriate frequency"; this provision has also been included in the October 31, 2012 draft permit. We noted in our comments that the existing San Diego MS4 permit includes specific frequencies for the inspections (such as once/two weeks, or once/month), as do other recent California MS4 permits such as the San Ana Board's 2009 MS4 permit for Orange County. As noted earlier, we are trying to improve the clarity and enforceability of MS4 permits and terms such as "an appropriate frequency" reduce clarity and make enforcement of the permit more difficult. Such provisions may also be insufficient to ensure compliance with the Clean Water Act's requirement to reduce pollutants in the discharges to the maximum extent practicable (MEP). We recommend that the permit specify the required frequency of construction site inspections.

Certain other provisions of the October 31, 2012 draft permit are also less prescriptive than the existing permit, such as the storm drain maintenance requirements and the inspection requirements for commercial and industrial facilities. We recognize that the Board is attempting to improve the environmental outcome of its stormwater program by shifting the focus from prescriptive BMPs to prescriptive water quality results, and we concur with the increased emphasis on water quality results. However, we are not convinced that the prescriptive BMPs of the existing permit are as significant

a burden as portrayed in the draft fact sheet, and we suggest they be retained for the most part in the new permit to ensure permit clarity, enforceability and compliance with MEP. To the extent the requirements for numeric water quality goals in the WQIPs would also ensure compliance with MEP, such requirements would be acceptable.

We recommend the permit or fact sheet also clarify that the numeric water quality goals (and the schedule for attainment of the goals) in the draft WQIPs would become enforceable permit requirements once the Plans are approved by the Board. EPA's 1999 regulations for Phase II MS4s (64 FR 68722, December 8, 1999) required similar measurable goals for stormwater management programs and intended that "goals" would be enforceable permit requirements once approved. Further, a wide variety of measurable goals were intended to be considered including measurable BMPs and measurable water quality improvements.

E. Action Levels

In our February 14, 2012 letter, we expressed concern that there did not seem to be any clear actions which would be required on the part of permittees if an action level concentration were exceeded. Although the draft fact sheet of October 31, 2012 provides additional insight into the Board's intent, we still believe the clarity and enforceability of the permit would be enhanced by adding clearer provisions for acting upon action level exceedences to the permit similar to the Board's 2009 permit for Orange County.

Footnote 7 in the proposed permit notes that NALs are not intended to be enforceable limitations. Provision II.C.1.b.(2) also provides that some NALs may be based on WLAs established in TMDLs included in Attachment E of the permit. We believe the Board intends the WLAs to be enforceable permit requirements; as such, we recommend NALs not be based on the WLAs. Instead, enforceable effluent limitations should be incorporated that are consistent with and ensure effective implementation of WLAs.

F. Toxicity Testing

The toxicity testing monitoring provisions proposed in the draft permit should be brought up to date with those in MS4 permits recently issued by the State Water Board (Caltrans MS4) and the Los Angeles Regional Water Board (Los Angeles MS4). Following the approach in these permits, only chronic toxicity monitoring should be required and biological toxicity test endpoints should be analyzed using the Test of Significant Toxicity hypothesis testing approach. At minimum, the permit should be revised to reflect the following requirements: (1) monitoring for chronic toxicity in fresh or marine waters shall be estimated as specified in U.S. EPA's short-term chronic toxicity methods in the most recent edition of 40 CFR 136; and (2) for chronic toxicity test samples (either stormwater or non-stormwater), the in-stream waste concentration (IWC) is 100 percent to calculate either a pass or fail test sample result following Appendix A in

National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document (EPA 833-R-10-003, June 2010). A pass result indicates no toxicity at the IWC. A fail result indicates toxicity at the IWC.

G. Permit Expiration Date

In our letter of February 14, 2012, we had expressed concern that the Board appeared to be considering a permit term longer than five years to accommodate the expiration dates of the current MS4 permits for Orange County and Riverside County. We noted such a provision would conflict with NPDES regulations at 40 CFR 122.46 which require that the term of a permit not exceed five years. We are pleased to see the proposed permit term has been revised to be consistent with this requirement.

We appreciate the opportunity to provide our views on the draft permit. If you would like to discuss these comments, please contact me at (415) 972-3464 or Eugene Bromley of the NPDES Permits Office at (415) 972-3510.

Sincerely,

David Smith, Manager
NPDES Permits Office (WTR-5)

County of San Diego

RICHARD E. CROMPTON
DIRECTOR

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January 11, 2013

Wayne Chiu, P.E.
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Dear Mr. Chiu:

COUNTY OF SAN DIEGO COMMENTS – TENTATIVE ORDER NO. R9-2013-0001, REGIONAL MS4 PERMIT, PLACE ID 786088WCHIU

Thank you for the opportunity to comment on Tentative Order No. R9-2013-0001, NPDES No. CAS0109266, *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Tentative Order). These comments are offered by the County of San Diego (County) in addition to those submitted separately on behalf of the 21 Copermittees of Order 2007-0001 (San Diego Copermittee Comment Letter). In this respect, the Copermittee comments should be considered to represent a general group consensus and those below to provide additional input necessary to reflect the unique perspective of the County as Regional Principal Permittee and a large jurisdiction covering portions of eight Watershed Management Areas. Additionally, these comments build on input provided in our September 14, 2012, comment letter on the Administrative Draft, many of which we do not believe to have been sufficiently addressed in the Tentative Order.

We greatly appreciate the public process employed to date toward the development of a new and improved permit for the San Diego Region, as well as the openness of staff and Regional Water Quality Control Board (Regional Board) members in listening to the issues and concerns put forth by the County and numerous other interested parties. However, the County is unable to support adoption of the Tentative Order as currently drafted. This letter addresses our remaining issues, the three principal of which are: 1) inclusion of requirements from a scientifically flawed Bacteria Total Maximum Daily Load (TMDL) with unattainable targets and unrealistic implementation costs, 2) inclusion of receiving water limitation (RWL) language that unnecessarily exposes the County to liability from third-party lawsuits, and 3) unwarranted expansion of requirements for development and redevelopment projects.

Please also note that on November 9, 2012, Ron Roberts, Chairman of the County of San Diego Board of Supervisors, sent letters to Governor Jerry Brown and other members of the San Diego delegation explaining the Board of Supervisors' concerns over the cost and reasonability of the permit's requirements, specifically the incorporation of the Bacteria Total Maximum Daily Load (TMDL) and the unwarranted expansion of requirements for development and redevelopment projects. A subsequent comment letter echoing these same concerns was submitted by elected officials from 19 of the 21 San Diego Copermittees to Regional Board Chairman Grant Destache on November 13, 2012. Both letters are included here as Attachment 1 and should be entered into the public record on this matter.

1. Bacteria TMDL for Beaches and Creeks

The Tentative Order incorporates elements and requirements from Resolution R9-2010-0001, *the Revised Total Maximum Daily Loads (TMDLs) for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region* (Bacteria TMDL). We specifically want to urge the Regional Board to <u>not</u> incorporate the Bacteria TMDL provisions in this permit renewal.

<u>Legal Authority to Not Incorporate the Bacteria TMDL into the Permit</u>

As documented in a letter to Catherine Hagen, Esq. (see Attachment 2), it is the legal position of our County Counsel's office that your Board has the authority to decline the demands of other interested parties to incorporate the Bacteria TMDL provisions in this permit renewal.

In 1987, Congress declared its intent to chart a different course for improving water quality flowing from MS4 systems by enacting Clean Water Act §402 (33 U.S.C.§1342). In establishing the "maximum extent practicable" (MEP) standard of CWA §402(p)(3)(B), Congress recognized and enacted a different standard than the technology-based requirements of CWA §301. The MEP standard is the legal standard for stormwater compliance.

In *Defenders of Wildlife v. Browner* 191 F.3d 1159, the Ninth Circuit held that the MEP standard of CWA §402(p)(3)(B) replaces the requirements of CWA §301(b)(1)(C) for MS4 dischargers. The Browner decision goes on to discuss the discretion vested in permitting authorities to either require strict compliance, or less than strict compliance, with water quality standards.

It is the County's belief that the November 12, 2010, United States Environmental Protection Agency (USEPA) memorandum concerning the incorporation and use of numeric water quality based effluent limitations (WQBELs) in permits is not dispositive of this issue. As acknowledged in its subsequent March 17, 2011, letter, USEPA is still considering whether to retain, reissue, or withdraw the 2010 memorandum. And, USEPA acknowledges that the 2010 memorandum "does not impose legally binding requirements on EPA, States, or the regulated community, nor does it confer legal rights or impose legal obligations on any member of the public."

<u>Scientific flaws and unattainable targets justify exclusion of the Bacteria TMDL.</u>

Serious scientific flaws and unattainable targets are the main reasons the County feels it is appropriate for the Regional Board to exclude the Bacteria TMDL from the permit at this time. The County hired Geosyntec Consultants, a nationally recognized firm with expertise in water

quality engineering and the co-principal investigator on the USEPA/American Society of Civil Engineers International Stormwater BMP Database, to assess the scientific merits of the Bacteria TMDL and to analyze whether the TMDL's numeric targets are achievable in practice. There are four main concerns in this regard, which are discussed in more detail in the memorandum from Geosyntec Consultants that is attached to this letter (see Attachment 3).

First, the science used to develop the Bacteria TMDL underestimates the amount of bacteria that come from natural sources such as birds, wildlife, and natural decomposition. In doing so, it overestimates the amount of bacteria required to be controlled by the County and other responsible parties named in the TMDL. Specifically, the TMDL inappropriately applies data from a "reference" (or minimally developed) watershed in Los Angeles County, which is not representative of San Diego County. It mistakenly applies data from a "reference" beach system to fresh water inland creeks, where natural concentrations of bacteria have been shown to be much higher. The TMDL does not incorporate a body of more recent water quality data which shows that the TMDL's numeric limits are overly conservative. For example, Geosyntec's analysis in Attachment 3 clearly shows that even the reference watershed itself in Los Angeles County has exceeded the Bacteria TMDL's targets in more than half of the years monitored. It is not appropriate to set a water quality target so stringent that a watershed with little to no development cannot consistently comply. The San Diego and Orange County MS4 Copermittees, partnering with Caltrans and with technical assistance from the Southern California Coastal Water Research Project (SCCWRP), are spending close to $2 million to fund a local "reference" watershed study that will provide data much more appropriate to the water bodies regulated by the Bacteria TMDL. TMDL development should not have proceeded until this data collection was conducted. Section 1 of Attachment 3 presents more detail on this subject.

Our second concern is that the Bacteria TMDL does not adequately reflect public health protection. Recreational water quality criteria published by USEPA acknowledge that indicator bacteria are not predictive of human health risk in stormwater-dominated waters, such as those regulated by this TMDL. Moreover, urban runoff epidemiology studies show a weak correlation between bacteria concentrations and human illness. USEPA Quantitative Microbial Risk Assessment (QMRA) studies also show that the numeric objectives used in this Bacteria TMDL are overly conservative for sites with minimal human bacteria sources. Related to our first concern, many studies show that natural sources, which are not appropriately accounted for in this TMDL, contribute significantly to bacteria levels but present lower human illness risk. Section 2 of Attachment 3 presents more detail on this subject.

Third, although a scientific peer review was conducted on the Bacteria TMDL prior to its adoption, that review was much too limited in scope to provide adequate defense of the TMDL basis and approach. Section 3 of Attachment 3 presents more detail on this subject.

Fourth, after thorough review of available non-structural and structural BMP performance data, Geosyntec, USEPA's own technical investigator of the International Stormwater BMP Database, finds that the Bacteria TMDL's numeric targets are not consistently or reliably attainable even with significant investment in new infrastructure. This is not surprising given that the Bacteria TMDL essentially requires the impacts of over 100 years of urbanization to be reversed to pristine, pre-development levels. BMP technology simply does not exist to comply with the

TMDL's aggressive targets. Statistically evaluated monitoring data from the International Stormwater BMP Database indicate that all non-disinfection structural BMPs are not capable of reducing effluent concentrations that would achieve bacterial water quality objectives with the consistency, frequency, and predictability required by the TMDL. Disinfection systems are widely considered not to be suitable or cost-effective for treating wet weather MS4 discharges, which are a primary focus of this TMDL. Section 4 of Attachment 3 presents more detail on this subject.

For all of the reasons discussed above and in Attachment 3, it is appropriate for the Regional Board to use its discretion to exclude the Bacteria TMDL from the permit at this time.

Practical Considerations

From a recent summary by Regional Board staff, County of San Diego Copermittees already spend approximately $119 million per year on programs to improve water quality in the San Diego region. Those programs have improved water quality in general and at beaches specifically throughout this region. For example, according to Heal the Bay's recent beach report cards, over 90% of San Diego County beaches receive A or A+ grades during dry weather conditions, when the vast majority of recreation occurs. With ever-increasing knowledge gained through trial and error, and with the Tentative Order's Watershed Quality Improvement Plan (WQIP) concept expected to encourage existing resources to be focused in more efficient and effective ways, the County expects to continue the march toward improved water quality using its current level of resources.

By Regional Board staff estimates (see Appendix R of the Bacteria TMDL Technical Report), and as confirmed by San Diego Copermittees through recent analysis using state-of-the-art BMP forecast modeling, implementation of the Bacteria TMDL in the next permit cycle would add a magnitude of additional costs to Copermittee budgets that is unsustainable using existing methods for raising general fund monies, given California's legal constraints on taxation or fees. As your Board has heard, the range of additional costs to the region that attributable to the Bacteria TMDL alone is expected to be $144 million to $272 million per year, meaning billions of additional taxpayer dollars over the compliance period. Funding does not exist to support this additional level of investment. If, in the future, a coalition of partners, including the Regional Board, environmental groups, regulated industry, Copermittees, and other stakeholders, decided it was in the best interest of the community to ask the public to support additional revenues for such an investment, only then could the County potentially support such significant expenditures. Without a reliable funding source, compliance with the Bacteria TMDL is simply not possible at this time.

As presentations in the adoption process have shown, given the unique challenges associated with bacteria as a constituent in stormwater, the cost-benefit analysis dictates that implementing the Bacteria TMDL at this time, as written, would be bad public policy. Studies and experience show that any magnitude of controls for bacteria, up to and including disinfectant efforts, will not consistently achieve the Resolution's numeric standards, even assuming the expenditure of billions of dollars. So, the sensible and logical next step is to take a hard look at the standards and assumptions of the Bacteria TMDL and devise plans to improve water quality using existing resources and as realistically achievable with today's scientific methods.

With regard to the unique circumstances concerning bacteria, because the science shows that consistent achievement of the Bacteria TMDL numeric standards is not possible, given any level of expenditure, imposing the Bacteria TMDL as currently written would exceed the "maximum extent practicable" standard. Accordingly, we believe your Board is vested with the discretion to elect not to incorporate the Bacteria TMDL provisions at this time, and it would be justified to open a process to revisit and re-examine the Bacteria TMDL assumptions in the context of its basin planning process, instead of taking the irrevocable step of incorporating the TMDL into the permit and potentially wasting valuable taxpayer dollars that could better be spent on achievable water quality improvement goals.

If, over these objections, your Board chooses to include the Bacteria TMDL into the permit, the San Diego Copermittees have proposed alternative language that, although still not acceptable to the County, would more appropriately incorporate the TMDL into the permit in a manner consistent with the intent of the TMDL Basin Plan Amendment.

2. Receiving Water Limitations (RWL) Language

Significant concerns have been expressed by the County and other Copermittees about third-party liability risks resulting from the Ninth Circuit's interpretation of receiving water limitation (RWL) language in the Los Angeles Region's stormwater permit. While we appreciate the State Water Resources Control Board's willingness to take comment and review those concerns, it may take several months for the State Board to act. The Tentative Order retains language similar to the problematic language reviewed in the *LA v. NRDC* case. This leaves the County and other Copermittees immediately exposed to similar litigation from third parties for violations of water quality standards. We know that several varied proposals to modify RWL language have been made at the state and local levels. The San Diego County Copermittees have proposed multiple alternatives, first in response to the April 2012 Administrative Draft Permit, which were rejected, and now to this Tentative Order.

The County suggests a simple solution consistent with Congress' intent in enacting CWA §402 as discussed above: simply remove the RWL language in Provision A of the Tentative Order. Federal law does not require imposition of the RWL language for MS4 systems. There is precedent for this action; a number of USEPA issued stormwater permits throughout the country do not include this language. Your Board has the discretion under CWA §402 and *Browner* to remove the language. If USEPA does not consider the RWL language to be essential to MS4 permitting, it seems logical that your Board is not required to include it in the new permit.

State Water Board policy supports the iterative process approach to water quality improvement, and acknowledges that water quality standards for many pollutants from MS4s cannot be met immediately. Therefore, it is unrealistic and at odds with the iterative process to enact a standard that puts public entities under threat of third-party lawsuits, even when they are diligently spending significant time and public money pursuing water quality improvement. The permit could still include its prescriptive requirements and the WQIP features that all parties believe will focus resources in each watershed in the most productive fashion, through the iterative process envisioned by Congress for MS4 systems.

Removal of the RWL language would eliminate the inevitable jousting over modified language proposals and the uncertainty created by its retention in light of the *LA v. NRDC* ruling. Copermittees would simply be obligated to focus on permit condition compliance, including the tasks identified in approved WQIPs, subject to Regional Board enforcement if appropriate. Removal of the language would not create a "free pass"; to the contrary, it would encourage effective water quality monitoring that might otherwise be discouraged by the specter of third-party lawsuits like those filed in the *LA v. NRDC* case.

3. New requirements for development and re-development projects.

On-site retention requirements for Priority Development Projects

The County does not support the Tentative Order's shift from current permit requirements by requiring Priority Development Projects to "retain" rather than "treat" pollutants. We specifically request that the language in Tentative Order section E.3.c.(1)(a) be changed as follows: *"Each Priority Development Project must be required to implement LID BMPs that are designed to ~~retain~~ treat (i.e. intercept, filter, store, infiltrate, evaporate, and evapotranspire) onsite the pollutants from storm water to the MEP."* All other applicable language in the Tentative Order should be made consistent with this change.

The shift to a "retention" standard will require large stormwater controls and corresponding cost increases, and lacks a scientific peer-reviewed study that considers all possible environmental impacts. Runoff is an important water source to creeks and rivers in our semi-arid climate. Retaining more than pre-project volumes of water could result in loss of downstream habitat and subsequent channel erosion. USEPA Municipal Permit Improvement Guide, Chapter 5, Page 54, recommends retaining pre-project volumes and SCCWRP's *Hydromodification Assessment and Management in CA* recommends a water balance approach to mimic natural hydrology.

The ability to retain water is constrained by many factors, such as: soil types, space, underground utilities and water table level. The permit should not include performance standards that are not possible onsite for most projects in the San Diego region. Projects need to be provided with a means to comply onsite even when soil conditions are poor.

The County hired Rick Engineering, a highly regarded company in the field of water quality engineering, to estimate the cost increase to development projects having to implement the new retention standard. As explained in detail in Attachment 4 (Rick Engineering Cost Comparison Study, December 2012), costs are expected to increase two- to 12-fold from the current Permit standard of "infiltrate, treat or detain". The San Diego Copermittees have invested considerable time and resources to develop a technically sound, effective, and defensible Standard Urban Stormwater Mitigation Plan (SUSMP), which was approved by the Regional Board in 2010. Low Impact Development (LID) and Treatment Control BMPs are efficient at pollutant load reduction. In many priority development projects, standard LID and treatment control BMPs are more than adequate for full pollutant load reduction. Existing requirements for development and redevelopment are already designed to improve water quality; therefore, forcing all priority development projects to retain the pre-developed 85th percentile storm volume is not scientifically justified, could be harmful to the watershed, and is forcing a "one size fits all" approach on all projects.

In addition, requiring the retention standard to be based on when the site was historically undeveloped and naturally vegetated may impose mitigation beyond a project's impacts. Applying the pre-development reference condition to sites that are, in fact, developed would expose the Copermittees to litigation risk and may be unenforceable. Whereas, the pre-project standard allows the appropriate nexus to the project's impacts and is enforceable by the local jurisdiction. Please see the letter from the City of San Diego, City Attorney, to Catherine Hagen, dated December 19, 2012, for additional justification for why a "Pre-development (naturally occurring)" standard is not supported.

Offsite Mitigation / Alternative Compliance Programs

The County has serious reservations about the creation of an alternative compliance program to allow private development to mitigate for project impacts off-site. There are significant administrative costs associated with developing mitigation methodology, establishing off-site locations suitable for mitigation, and establishing outside agreements with agencies to perform perpetual maintenance. Plus, there is the cost of constructing the piping from the project sites to the mitigation area (due to Tentative Order section E.3.c.(3)(a)(iv), which prohibits the use of receiving waters to convey stormwater runoff from a development site to the location of off-site mitigation). In addition, the taxpayer (not the developer) will ultimately be responsible for the perpetual maintenance of the piping and the offsite mitigation lands. And finally, the short time frame of four years for an alternative compliance in-lieu fee does not allow enough time to leverage enough resources from multiple projects to pay for the establishment of a regional solution prior to the first private project completion (occupancy). A State loan program will be necessary to provide a funding mechanism to initiate mitigation projects (similar to Clean Water State Revolving Fund used for Wetland mitigation).

The County recommends the following changes in order for an alternative compliance program to be effective:

- The alternative compliance program should be administered directly by the Regional Board. Applicants wishing to utilize off-site mitigation must have approval by the Regional Board for mitigation applicability, option, location and perpetual maintenance fee to be eligible for alternative compliance within a jurisdiction.

- Delete section E.3.c.(3)(a)(iv), which prohibits receiving waters from being utilized to convey storm water runoff to the alternative compliance options

- Change Section E.3.c.(3)(a)(iv) to allow for a ten-year alternative compliance in-lieu fee.

Mitigation for Loss of Sediment Supply

Tentative Order section E.3.c.(2)(b) as written is unclear and implies that each development project will be required to conduct studies and compensation for the loss of sediment supply specifically on site. However, the ability to compensate for the loss of sediment supply has not yet been fully researched, nor have practices been developed to accomplish this. Therefore, the ability to require sediment compensation on a project-by-project basis is not yet validated or

possible. The County recommends the language be removed from section E.3.c.(2)(b) and moved to Section E.3.d. as line item (6) so that it can be addressed regionally instead of at a project level: "Update sediment supply mitigation procedures, as research becomes available, to compensate for significant losses of sediment supply anticipated as a result of development." This proposed wording change would allow the Copermittees to study and adapt to how sediment supply should appropriately be managed.

Vector Breeding in Storm Water Management Devices

The existing permit includes vector-related language intended to raise awareness of the potential unintended public health risks resulting from mosquito production in certain storm water management devices. The Tentative Order does not include this language. The removal of the vector-related language raises a significant concern with the County's Department of Environmental Health, and the County requests that it be placed back into the proposed draft to protect public health. Please see the Department of Environmental Health's detailed comments on this issue in Attachment 5.

Other Concerns

In addition, the County fully supports the following San Diego County Copermittee recommendations related to requirements for new and re-development projects:

- Maintain the existing exemptions in the Regional Board-adopted San Diego Hydromodification Management Plan.
- Maintain the "pre-project" rather than "pre-development" standard for controlling runoff flow rates and durations.
- Instead of adjusting hydromodification management requirements now, reference the recently Board-adopted Resolution No. R9-2010-0066.

More detail and discussion on all of these recommendations is provided under separate cover in the San Diego County Copermittees' comment letter.

4. Attachment E, Total Maximum Daily Load for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed

The Rainbow Creek TMDL for Total Nitrogen and Phosphorous assigns a Load Allocation (LA) to the County. The Tentative Order inappropriately incorporates this Load Allocation as a Waste Load Allocation (WLA). We are aware of no legal basis for such a change, and therefore believe it was made in error. We request that the Regional Board strike the Rainbow Creek TMDL from Attachment E of the Tentative Order.

5. Santa Margarita Watershed WQIP and Transitional Monitoring Program

The County requests that the development of a WQIP and of a modified transitional monitoring program for the Santa Margarita River Watershed Management Area (WMA) be deferred until such time as the Riverside County Copermittees are covered under the reissued Order.

We are particularly concerned that the resource and time commitments required of dischargers, stakeholders, and Regional Board staff to develop a *provisional* WQIP for a limited portion of the Santa Margarita River WMA is not justified. San Diego County represents only 19% of the total land area and 12% of the population in this WMA. The extensive effort required to develop a WQIP for this limited area would be commensurate with that required to go through a full and inclusive WQIP process for the entire WMA – which would again be required once the Riverside County permittees obtain permit coverage. But this "first round" iteration would necessarily exclude many of the watershed stakeholders representing the Riverside County portion of the watershed, as well as other potential state and federal stakeholders. It simply does not make sense to invest in a "partial" WQIP process and to then repeat it on enrollment of the remaining watershed permittees – quite possibly only one or two years later. A full and inclusive process that involves all relevant watershed stakeholders should be the goal of WQIP development. Piecemeal plan development is antithetical to the WQIP vision.

We request that the County be allowed to use the current Watershed Urban Runoff Management Plan (WURMP), including the water quality priorities developed pursuant to Order No. R9-2007-0001, to guide implementation of Provisions D and E within its jurisdiction. We also request a reduction in the number of wet weather MS4 outfall discharge monitoring stations in the transitional monitoring program from five to two stations since: 1) the land uses within the unincorporated County represent only residential and agricultural use and not the full range of land uses listed in Provision D.2.a.(3).(a), and 2) this level of effort better reflects the County's portion of the WMA in terms of population and land area.

We understand that continued progress must be made during any transitional period, and can assure the Regional Board that the County is committed to maintaining its existing commitments in this WMA. We have already demonstrated, through the implementation of a 319(h) grant received in 2006, that we are committed to implementing actions within Rainbow Creek Watershed to reduce nutrient loadings. More recently, we have been awarded another 319(h) grant for Rainbow Creek to implement education and property evaluation programs targeted to agricultural and residential audiences, as well as extensive receiving water quality monitoring.

In addition to these implementation activities, the County, in partnership with Riverside County Flood Control and Conservation District, is committed to furthering our understanding of how nutrients are impacting the beneficial uses in the watershed. This effort is being funded through a Proposition 84 Integrated Regional Water Management (IRWM) grant to "test-drive" the State Water Board Nutrient Numeric Endpoint (NNE) process. This work will include the development of a Nutrients Process Plan to define the NNE process and to form as the foundation of an agreement between the various dischargers in the watershed and the Regional Board. The grant funds are also being used to collect background information, coordinate and facilitate stakeholder input and participation, complete data collection and modeling of the estuary, and to conduct water quality monitoring needed for the NNE process.

6. Non-Storm Water Discharges of Irrigation Runoff

Section B.2 of Order R9-2007-0001 requires that discharges from irrigation water, lawn watering, and landscape irrigation (collectively "over-irrigation discharges") be prohibited only where they have been identified as a <u>significant source</u> of pollutants to waters of the U.S. In

contrast, Section E.2.a of the Tentative Order categorically defines these as illicit discharges based on a conclusion that each represents a source of pollutants to waters of the U.S., thus requiring their outright prohibition.

In our comment letter on the Administrative Draft Permit, we noted the significance of this change and posed two critical questions that remained unanswered. First, we requested a rationale for the determination that these irrigation runoff discharges are sources of pollutants to receiving waters. And second, we asked that if such a rationale were provided, these discharges alternatively be added to Section E.2.a.(4), which would allow their control through statute, ordinance, permit, contract, order, or similar means rather than outright prohibition. The Fact Sheet/Technical Report provided as Attachment F of the Tentative Order partially answers the County's first question and does not address the second. Our remaining concerns are addressed below.

Question 1: Are irrigation water, lawn watering, and landscape irrigation discharges [significant] sources of pollutants to receiving waters?

Regarding the designation of over-irrigation discharges as sources of pollutants to receiving waters, the Fact Sheet (pp. F-74 through F-77) states:

"Non-storm water discharges resulting from over-irrigation have been found to be a source of several types of pollutants (e.g., nutrients, bacteria, pesticides, sediment) in receiving waters. The San Diego Water Board and the Copermittees have identified categories of non-storm water discharges associated with over-irrigation as a source of pollutants and conveyance of pollutants to the MS4 and waters of the United States in the following documents...". In support, six references are provided and briefly described.

1. SmartTimer/Edgescape Evaluation Program (SEEP) Grant Application;
2. 2006-2007 Orange County Watershed Action Plan Annual Reports;
3. Fiscal Year 2008 Carlsbad Watershed Urban Runoff Management Program Annual Report;
4. 2007-2008 San Diego Bay Watershed Urban Runoff Management Program Annual Report;
5. Orange and Riverside County Copermittee Public Education Materials; and
6. Los Penasquitos Lagoon Sedimentation/Siltation TMDL Technical Report (June 2012)

Each is accompanied by one or more qualitative statements about the nature of urban runoff and the potential or actual contribution of various types of over-irrigation practices to it. The following overall conclusion is provided: "These documents confirm that non-storm water discharges associated with over-irrigation are a source of pollutants and should be addressed as illicit discharges to the MS4."

Several aspects of this analysis are problematic. In moving from the language of the previous permit to that of the Tentative Order, the applicable litmus for evaluation of potential discharge prohibitions has been modified from significant sources of pollutants to sources of pollutants. While we understand that this change is consistent with 40 CFR 122.26(d)(2)(iv)(B)(1) ("flows shall be addressed where such discharges are identified by the municipality as sources of

pollutants to waters of the United States."), we would also emphasize that the implications of such a change go well beyond a paper exercise. Clearly, some potential exists for any over-irrigation discharge to reach receiving water. The pertinent question is really whether this potential is of a demonstrated level of significance that would justify the broad policy changes and resource commitments necessary to enforce their outright prohibition. From the little evidence cited in the Fact Sheet/Technical Report, we believe that such a case is not made.

None of the statements provided in support of staff's conclusion are supported by data, technical analysis, or any other form of substantiation. In particular, the use of outreach materials and a grant application (items 1 and 5) to justify the establishment of a categorical discharge prohibition covering portions of three counties is overreaching and inappropriate. Moreover, even if the remainder of the sources cited could be accepted as supporting staff's conclusions for the limited areas to which they apply (the Carlsbad, San Diego Bay, and Los Penasquitos Watersheds), they would not provide support for a more general conclusion that other watershed areas covered by the permit (San Juan, Santa Margarita, San Luis Rey, San Dieguito, San Diego, and Tijuana Watersheds) are similarly impacted.

It also bears emphasis that none of the discussion provided supports the conceptual leap that staff has taken from general statements concerning the presence of over-irrigation discharges to more specific conclusions that they are a source of pollutants to receiving waters <u>and</u> that they should be addressed as prohibited discharges. No evidence for either of these conclusions is presented.

Question 2: Why are over-irrigation discharges not included in Tentative Order Section E.2.a.(4) along with air conditioning condensation, individual residential vehicle washing, and dechlorinated swimming pool discharges?

In our comment letter on the Administrative Draft Permit, we noted that even if irrigation runoff discharges are determined to be sources of pollutants to receiving waters, a more appropriate compliance pathway for managing them is provided in Tentative Order Section E.2.a.(4), which would allow their control through statute, ordinance, permit, contract, order, or similar means rather than outright prohibition.

The Fact Sheet/Technical Report (p. F-76) states that "[p]rohibiting non-storm water discharges associated with over-irrigation, however, is not a new requirement for the Copermittees because it is also consistent with and required by the Water Conservation in Landscaping Act (AB 1881, Laird)." It is true that important conceptual similarities exist in the aims this Act and the Tentative Order. However, to equate the two sets of requirements is to miss critical distinctions between them, i.e., one establishes a variety of tools and approaches to conserve water and to discourage and prohibit runoff from leaving properties, and the other simply makes it illegal for over-irrigation runoff to enter MS4s. Since the former requirements are already in place through the adoption of local water conservation ordinances (County Ordinance No. 10032 was amended on 01/13/2010), it serves little function to create an additional layer of bureaucracy (and potential Copermittee liability) for the same discharges simply because they enter the MS4. It makes more sense to recognize these existing ordinances as substantially meeting the stated objective of Tentative Order Section E.2.a.(4) to instead allow these discharges to be controlled "through statute, ordinance, permit, contract, order, or similar means." In doing so,

Copermittees are afforded greater opportunity to appropriately utilize their local water conservation ordinances, but also to augment these approaches with tools other than strict enforcement. Given the significant variety in the nature and severity of over-irrigation discharges likely to be encountered over a permit cycle, it makes sense to allow Copermittees the discretion they need to effectively deal with them. Tentative Order Section E.2.a.(4) already provides this discretion for air conditioning condensation, individual residential vehicle washing, and dechlorinated swimming pool discharges. The County sees no fundamental difference in the potential risk posed by over-irrigation discharges, and again would emphasize that the Fact Sheet/Technical Report has provided no evidence that it exists.

The County requests that over-irrigation discharges be added to Section E.2.a.(3) of the final adopted Order. Alternatively, if sufficient rationale is provided for their designation as illicit discharges, we request that they instead be added to Section E.2.a.(4) since their control through statute, ordinance, permit, contract, order, or similar means would constitute a more appropriate management response than outright prohibition.

7. Staffing and cost increases for new and expanded requirements cannot be absorbed

The County is tentatively supportive of many of the key conceptual shifts likely to occur under a re-issued permit. In particular, we agree that an increased presence in residential areas can help us to better characterize source contributions from these areas and to craft more effective approaches to managing them. We also believe that developing and fine tuning our WQIP strategies will over time result in commercial and industrial inspection programs that are more focused and efficient in addressing key watershed problems.

However, the County is compelled to support a cost-neutral permitting approach that takes advantage of increased efficiencies and prioritization to put limited resources where they will be best utilized. To comply with the current permit, the County currently spends well over $30 million each year. This is equivalent to the entire budget of our Department of Parks and Recreation. Unfortunately, our analysis of the Tentative Order indicates that the cost to comply would increase significantly. The County cannot support a permit that increases costs for which no reliable source of funding exists.

On top of the Bacteria TMDL-related costs discussed above (see item 1), other new permit costs include the following:

- Development and implementation of a residential inspection program

The Department of Public Works estimates that the County will require a minimum of two to three additional staff to carry out these inspections and conduct all necessary follow-up activities (education, enforcement, etc.) over eight WMAs and 24 Community Planning Areas.

- Increases to agricultural inspections

The Department of Agriculture, Weights, and Measures estimates that seven additional staff may be needed to conduct inspections of a wider variety of agricultural operations. This is due primarily to possible increases in inspections and complaint referrals of additional agricultural

sites, where the County's inventory may increase approximately eightfold (from 483 to more than 4,000). These increases would be responsive to updated JRMP requirements and the development and implementation of WQIPs.

- Development and implementation of an alternative compliance program (see item 3 above):

There are significant administrative costs associated with developing off-site mitigation methodology, establishing off-site locations suitable for mitigation, and establishing outside agreements with agencies to perform perpetual maintenance. Plus, there is the cost of constructing the piping from the project sites to the mitigation area (due to Tentative Order section E.3.c.(3)(a)(iv)). In addition, the taxpayer (not the developer) will ultimately be responsible for the perpetual maintenance of the piping and the off-site mitigation lands.

- Development and implementation of a retrofit program for areas of existing development:

Per Section E.5.e.(2), the County would be required to develop "a program to retrofit areas of existing development within its jurisdiction to address identified sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area." While it is not possible at this time to anticipate the specific resource implications of this requirement, it is essential that they be acknowledged. Significant ongoing costs will be incurred in developing and managing the program itself, acquiring candidate properties, designing and constructing public projects, encouraging and/or compelling the construction of private facilities, and providing long-term maintenance of privately or publicly constructed facilities (e.g., permanent treatment control facilities installed in road rights-of-way). Such changes will require additional funding and resources that are not currently available.

Collectively, these increases are beyond the County's current ability to absorb. We believe that through additional dialogue we can identify commensurate reductions in other permit requirements or areas where greater prioritization and increased efficiencies can be achieved. We are anxious to continue dialogue so that an acceptable cost-neutral approach to implementing these new permit priorities can be found.

8. Determination of minimum inspection frequencies for industrial, commercial, and municipal facilities.

Tentative Order Section II.E.5.c.(1)(a)(iv) fails to differentiate compliance inspections from operation and maintenance inspections. In particular, inspections of linear municipal facilities and associated structures should not be included as part of a requirement to annually perform onsite inspections of an equivalent of at least 20 percent of a Copermittee's combined commercial, industrial, and municipal inventory.

Section II.E.5.a.(1) requires that Copermittee source inventories include commercial and industrial sources, and the following types of municipal facilities:

(i) MS4 and related structures

(ii) Roads, streets, and highways,
(iii) Parking facilities,
(iv) Municipal airfields,
(v) Parks and recreation facilities,
(vi) Flood management and flood control devices and structures,
- Operating or closed municipal landfills,

(vii) Publicly owned treatment works (including water and wastewater treatment plants) and sanitary sewer collection systems,
(viii) Corporate yards, including maintenance and storage yards for materials, waste, equipment, and vehicles,
(ix) Hazardous waste collection facilities,
(x) Other treatment, storage or disposal facilities for municipal waste, and
(xi) Other municipal facilities that the Copermittee determines may contribute a significant pollutant load to the MS4.

Section II.E.5.c.(1)(a)(iv) additionally requires that "[e]ach Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development". As such, it establishes a minimum inspection frequency that is based on each Copermittee's combined industrial, commercial, and municipal inventory totals.

Most of the facilities listed above are easily tabulated as discrete point sources (a building, a business location, etc.) and share a number of structural and operational commonalities (rooftop areas, parking lots, equipment operation, fueling, cleaning, etc.). As such, they are well-suited to the inspection requirements of Tentative Order Section II.E.5.c., which are primarily for compliance verification (assessment of BMP implementation, correction deficiencies or violations, etc.). Other facility types (streets, roads, highways, sanitary sewer collection systems, and MS4s) are fundamentally different because they consist of extensive networks of linear facilities and associated features (e.g., inlets and outlets). As such, it is impractical to inventory them as discrete point sources. Moreover, inspections of these facilities are conducted primarily for evaluating operation and maintenance needs, not for regulatory compliance. The following inventory totals are provided to illustrate how these differences in facility types apply to the County's current inventory.

<u>Facilities subject to "compliance" inspections (2,286 total "facilities")</u>

- Industrial sources (181 facilities)
- Stationary commercial sources (1,921 facilities)
- Solid waste facilities (22 facilities)
- Wastewater facilities (18 facilities)
- Road stations (21 facilities)
- Fleet maintenance facilities (27 facilities)
- Municipal airfields (4 facilities)
- Parks and recreational facilities (92 facilities)
- Office buildings and other municipal facilities (74 facilities)

Facilities subject to "maintenance" inspections (23,347 total "facilities")

- Streets, roads, and highways (1,929 linear miles)
- MS4 inlets and basins (18,974 facilities)
- MS4 linear channels (1,994 linear miles)
- Wastewater collection systems (450 linear miles)

As shown, calculating a combined total inventory across both lists by which either annual or 5-year inspection frequencies can be determined is problematic. Assuming for simplicity that each linear mile of road, MS4, or sewer collection system can be counted as a single facility, the "numbers" of these sources would outweigh all of the other discrete point sources in the first list by more than ten to one, artificially inflating the number of required annual facility inspections well beyond the apparent intent of the Tentative Order. While this would initially appear to drive inspection totals upward, it could have other unintended consequences. For example, a Copermittee could easily meet its overall targets by making comparatively minor increases to its inspections of streets, roads, highways, sewer collection systems, or MS4s. In essence, by focusing their efforts on linear municipal facilities, they could obviate the need for required inspections of other facility types. Such problems are easily remedied by separating the two sets of inspection requirements.

The County, therefore, requests that the following facility types be excluded from the requirements of Section II.E.5.c.(1)(a)(iv) to annually perform onsite inspections of an equivalent of at least 20 percent of the commercial facilities and areas, industrial facilities, and municipal facilities in each Copermittee's inventoried existing development:

- MS4 and related structures (inlets and outlets)
- Roads, streets, and highways, and
- Sanitary sewer collection systems.

This is consistent with Sections II.E.5.b.(1)(b) and (c), which make a clear distinction between general BMP implementation and those practices related to BMP operation and maintenance. We believe that the requirements of Section II.E.5.b.(1) are sufficient to ensure proper inspection frequencies for these other facilities.

9. Unfunded mandates

Permit Finding 29 (p. 9) states that the Tentative Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution, and cites six reasons for this conclusion. Section VII-F of the Fact Sheet/Technical Report (p. F-29) provides further explanation of staff's reasoning. The County disagrees that the general discussion provided in each of these sections is sufficient to summarily dismiss the possibility that specific provisions of the final Order might in fact constitute unfunded mandates. The County also disagrees that the Fact Sheet's attempt at legal analysis is correct, or controlling of the unfunded mandate issue that is currently being litigated, and as may be litigated with regard to new provisions and requirements of the Tentative Order.

10. Firefighting discharges

Since the County Fire Authority will be directly regulated by this permit, the County is very concerned that public funds and critical personnel may have to be spent or resourced to comply with requirements that are unnecessary, and that this will ultimately reduce the emergency personnel and funding available for essential public services. The County Fire Authority's detailed comments on permit requirements for firefighting-related discharges are included as Attachment 6.

Also attached for your consideration are several comment letters received from Community Planning and Sponsor Groups in the unincorporated area. These letters express support for the County's positions and recommendations and are included here as Attachment 7.

Again, thank you for the opportunity to participate in the development of a new permit for the San Diego Region. We look forward to continued discussion of the issues raised above. If you have questions, please contact Jon VanRhyn, Water Quality Program Manager, at (858) 495-5133, or Todd Snyder, Land Use & Environmental Planning Manager, at (858) 694-3482.

Sincerely,

RICHARD E. CROMPTON, Director
Department of Public Works

REC:cw

ATTACHMENTS:

1) Letter from Ron Roberts, Chairman, County of San Diego Board of Supervisors, to Governor Jerry Brown, dated November 9, 2012, and letter from 20 elected officials to Regional Board Chairman Grant Destache, dated November 13, 2012.
2) County Counsel letter to Catherine Hagen, Esq.
3) Geosyntec Consultants, Technical Assessment of the San Diego Beaches & Creeks Bacteria TMDL
4) Rick Engineering Cost Comparison Study, December 2012
5) County of San Diego Department of Environmental Health Comment Letter
6) County of San Diego Fire Authority Comment Letter
7) Community Planning and Sponsor Groups Comment Letters

RON ROBERTS
CHAIRMAN
SUPERVISOR, FOURTH DISTRICT
SAN DIEGO COUNTY BOARD OF SUPERVISORS

November 9, 2012

The Honorable Jerry Brown
Governor, State of California
State Capitol Building, Suite 1173
Sacramento, CA 95814

Dear Governor Brown:

On behalf of the County of San Diego (County), I would like to inform you of recent action taken by the Board of Supervisors (Board) regarding the renewal of the San Diego Municipal Stormwater Permit (Permit). The Board has voted unanimously to approve a strategy to ensure that reasonable compliance standards are incorporated into the renewed Permit now under consideration at the San Diego Regional Water Quality Control Board (RWQCB). The County is concerned that the proposed permit requirements included in the draft tentative order of the Permit would impose unreasonable costs and at the same time guarantee non-compliance with permit requirements. This is particularly true for the numeric standards that would have to be achieved to meet the objectives of the Bacteria Total Maximum Daily Load (TMDL).

The County of San Diego has been the principal permittee for the San Diego Municipal Stormwater Permit and is joined by 20 other regulated parties referred to as copermittees, including the 18 incorporated cities, the San Diego Unified Port District and the San Diego County Regional Airport Authority. This Permit is renewed every five years, and with each renewal the permittees have been required to meet more stringent and costly requirements. "Sustainable Environments" is one of the County's three Strategic Initiatives, and the County has long been a leader in promoting clean water at local beaches, bays and streams.

The County currently spends over $35 million annually to comply with existing stormwater requirements, and collectively the copermittees spend over $100 million per year. Additional compliance costs are difficult to quantify, but are also paid by the private sector. These costs would be compounded by new permit requirements, including the Bacteria TMDL, which seeks to return beaches and creeks to conditions that existed prior to urbanization within 18 years. Regional compliance costs for the Bacteria TMDL alone are estimated to be between $2.2 billion and $4.2 billion in the six watersheds that involve the County over the remaining 18 years of the 20-year compliance schedule. The County's portion of estimated compliance costs is between $286 million and $567 million. On average, this program would cost the County an additional $16 to $31 million dollars each year. These cost estimates are consistent with estimates provided in the RWQCB's own TMDL documentation, as well as estimates developed as part of TMDL load reduction plans in other regions. The state or federal government does not provide any funding to local agencies to comply with these requirements.

Despite the unrealistic price, the required limits may be unattainable and current science cannot reliably guarantee that this effort will result in permit compliance.

COUNTY ADMINISTRATION CENTER • 1600 PACIFIC HIGHWAY, ROOM 335 • SAN DIEGO, CALIFORNIA 92101-2470
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Printed on recycled paper

The purpose of the Bacteria TMDL is to protect public health, as elevated bacteria levels at beaches have been shown to increase the risk of water-related illness in surfers and swimmers. However, the science used to develop the Bacteria TMDL underestimates the amount of bacteria that comes from natural sources such as birds, wildlife and natural decomposition. Since those sources of bacteria cannot be eliminated, compliance with the numeric limits in the proposed TMDL is unattainable. Additionally, bacteria are pervasive and can re-grow and multiply at a rapid rate, making them some of the most difficult pollutants to eliminate from the environment. Essentially, the Bacteria TMDL would require the impacts of over 100 years of urbanization to be reversed to pristine levels as soon as eight years from now in dry weather conditions and in less than 18 years for wet weather conditions. Above all, recent studies show that current technology is not capable of removing bacteria to levels that would meet standards, especially during rain events.

In addition to the Bacteria TMDL, the draft permit includes new unreasonable requirements for development projects that will increase costs significantly. The draft permit also includes performance standards that unnecessarily expose copermittees to third-party lawsuits.

While we necessarily focus on the specific requirements of the San Diego Municipal Stormwater Permit, we also remain concerned about developing policies at the national level where new stormwater permit requirements are expected next summer and United States Environmental Protection Agency (U.S. EPA) guidance on "waters of the U.S." could be released later this year. These represent significant additional regulatory requirements that could further impact the San Diego Municipal Stormwater Permit and increase its cost to residents and businesses in the San Diego region.

In the coming weeks the County will continue to express these concerns to the Regional Water Quality Control Board. The County urges your engagement on this issue at all levels, with the U.S. EPA, State Water Resources Control Board and RWQCB. Local government needs realistic objectives and schedules for the Bacteria TMDL, and more complete scientific analysis to ensure that resource commitments in water quality programs are justified based on the resulting benefits. Per the provisions of federal and state law, and the Maximum Extent Practicable standard established by the Clean Water Act, permit requirements should promote and ensure clean water while striking a reasonable balance in cost.

Concerns about the costs and compliance schedules for stormwater permits are shared by many jurisdictions in California and across the country. For this reason, the County is joining with other jurisdictions to bring attention to these concerns to regional water quality control boards, the U.S. EPA, and other appropriate state and federal offices. We appreciate your attention to the pending permit concerns in San Diego County, and we look forward to working with you in the months ahead to ensure that limited public funds are wisely dedicated to stormwater control. Please contact Geoff Patnoe, Director of the County of San Diego Office of Strategy and Intergovernmental Affairs, at (619) 531-5202 if you have any questions.

Sincerely,

RON ROBERTS
Chairman
San Diego County Board of Supervisors

RR:sia

County of San Diego
City of Carlsbad
City of Chula Vista
City of Coronado
City of Del Mar
City of El Cajon
City of Encinitas
City of Escondido
City of Imperial Beach
City of Lemon Grove
City of National City
City of Oceanside
City of Poway
City of San Diego
City of San Marcos
City of Santee
City of Solana Beach
City of Vista
S.D. Unified Port District

November 13, 2012

Mr. Grant Destache
Chairman
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Re: Regional Municipal Storm Water Permit

Dear Chairman Destache:

As representatives of the jurisdictions in San Diego County that are regulated by the Regional Water Quality Control Board (Regional Board), we share deep concerns over proposed regulations in the new Regional Municipal Storm Water Permit. While we strongly believe in the mission of achieving clean water, the proposed regulations are without sound scientific merit and, if implemented, will have catastrophic negative impacts on the fiscal health of local governments and private industry.

Collectively, we are committed to the goal of improving water quality through the storm water management programs that have been developed in conjunction with the Regional Board. Current compliance efforts to reduce storm water pollution are significant and cost regional agencies more than $100 million annually. As stewards of public tax dollars and governments that are faced with having to do more with less, we are concerned that with each permit renewal cycle, the stringency and cost of the unfunded mandates continue to go beyond any practical standards of attainment and what is required by the Clean Water Act.

The Draft Regional Municipal Storm Water Permit released by the Regional Board continues to include the far-reaching Bacteria Total Maximum Daily Load (TMDL), and other additional impractical and unattainable requirements for development projects. It is estimated that the proposed Bacteria TMDL standards alone would cost between $2.2 billion and $4.2 billion for those jurisdictions that share responsibility in six of the watersheds included in the permit. The cost to private industry is unknown but it is clear that any additional costs will be passed on to already struggling and financially burdened families.

Taxpayers will be gravely impacted if this unilateral regulatory practice is allowed to move forward. Governing bodies will be forced to shift public funds away from existing programs, increase taxes or assessments, or face regulatory fines resulting from non-compliance. The Bacteria TMDL, along with the many other proposed regulations, should not be incorporated into the next Regional Municipal Storm Water Permit until we are certain that they are founded on verifiable scientific data, achievable standards, and until sufficient resources are available.

On behalf of our respective constituencies, we are requesting that the Regional Water Quality Control Board direct staff to work collaboratively with all the co-permitees and various stakeholders to draft language that makes practical sense from an environmental and economic standpoint.

Sincerely,

Chairman Ron Roberts
County of San Diego

Vice Chairman Greg Cox
County of San Diego

Mayor Matt Hall
City of Carlsbad

Mayor Cheryl Cox
City of Chula Vista

Mayor Casey Tanaka
City of Coronado

Mayor Carl Hilliard
City of Del Mar

Mayor Mark Lewis
City of El Cajon

Mayor Jerome Stocks
City of Encinitas

Mayor Sam Abed
City of Escondido

Mayor Jim Janney
City of Imperial Beach

Mayor Mary Teresa Sessom
City of Lemon Grove

Mayor Ron Morrison
City of National City

Mayor Jim Wood
City of Oceanside

Mayor Don Higginson
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Mayor Jerry Sanders
City of San Diego

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City of San Marcos

Mayor Randy Voepel
City of Santee

Mayor Joe Kellejian
City of Solana Beach

Mayor Judy Ritter
City of Vista

Admiral Lou Smith
Chairman
S.D. Unified Port District

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JUSTIN A. CRUMLEY
CHRISTOPHER DAWOOD
KRISTEN LAYCHUS

January 10, 2013

Catherine Hagan, Esq.
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, California 92123-4340

via Fed Ex

Re: Tentative Order R9-2013-0001

Dear Catherine:

On behalf of our client the County of San Diego, I am writing concerning some provisions in Tentative Order R9-2013-0001 that are of particular concern to the County. I respectfully ask that you review our legal position on those provisions as outlined below, and please call me to discuss if you have any questions or need further information to assist your review.

The Bacteria TMDL Resolution

The Tentative Order would incorporate elements and requirements from the Bacteria TMDL Resolution (Resolution R9-2010-0001) into the new MS4 permit for San Diego Region copermittees, including the County of San Diego. We specifically urge the San Diego Regional Board to not incorporate the Bacteria TMDL provisions in this permit renewal cycle. It is our legal position that your Board has the authority to decline the demands of other interested parties that this action be taken.

Reasons Not to Incorporate the Bacteria TMDL Into the Permit

From a recent summary by Regional Board (RB) staff, County of San Diego copermittees spend approximately $119M per year on programs to improve water quality

in the San Diego region. Those programs have improved water quality in general and at beaches in the region. With ever-increasing knowledge gained through trial and error, and with the Watershed Quality Improvement Plan concept expected to permit existing resources to be focused in more efficient and effective ways, San Diego copermittees expect to continue the march toward improved water quality using the current level of resources. The copermittees are continually working on ways to improve water quality and have done so for over two decades. As evident in our annual expenditure and work with experts, we are committed to improving water quality.

By RB staff estimates and as confirmed by San Diego copermittees, the implementation of the Bacteria TMDL in the next permit cycle would add a magnitude of additional costs to copermittee budgets that is unsustainable using existing methods for raising general fund monies and given California's legal constraints on taxation or fees. As your Board has heard, the range of additional cost attributable to the Bacteria TMDL alone is $144M to $272M per year, meaning billions of taxpayer dollars over the compliance period.

As presentations in the adoption process have shown, given the unique challenges associated with bacteria as a constituent in stormwater, the cost-benefit analysis dictates that implementing the Bacteria TMDL at this time, as written, would be bad public policy. Studies and experience show that any magnitude of controls for bacteria, up to and including disinfectant efforts, will not consistently achieve the Resolution's numeric standards, even with the expenditure of billions of dollars. So, the sensible, logical next step is to take a hard look at the standards and assumptions of the Bacteria TMDL and devise plans to improve water quality using existing resources and as realistically achievable with today's scientific methods.

Legal Authority to Not Incorporate the Bacteria TMDL Into the Permit

As you know in 1987, Congress declared its intent to chart a different course for improving water quality flowing from MS4 systems by enacting Clean Water Act § 402 (33 U.S.C. § 1342). In establishing the "maximum extent practicable" (MEP) standard of CWA § 402(p)(3)(B), Congress recognized and enacted a different standard than the technology based requirements of CWA § 301. The MEP standard is the legal standard for stormwater compliance.

In *Defenders of Wildlife v. Browner,* 191 F.3d 1159 (1999) the Ninth Circuit held that the MEP standard of CWA § 402(p)(3)(B) *replaces* the requirements of CWA § 301(b)(1)(C) for MS4 dischargers. The *Browner* decision goes on to discuss the

discretion vested in permitting authorities to either require strict compliance, or less than strict compliance, with water quality standards.

Our office believes that the November 12, 2010 EPA memorandum concerning the incorporation and use of numeric WQBELs in permits is not dispositive of this issue. As acknowledged in its March 17, 2011 letter, EPA is still considering whether to retain, reissue, or withdraw the 2010 memorandum. And, in the same letter, EPA acknowledges that the 2010 memorandum, "does not impose legally binding requirements on EPA, States, or the regulated community, nor does it confer legal rights or impose legal obligations on any member of the public."

With regard to the unique challenges associated with bacteria control, the science shows that consistent achievement of the Bacteria TMDL numeric standards is not possible, even with any level of expenditure. Therefore, imposing the 2010 Bacteria TMDL provisions as permit conditions would exceed the "maximum extent practicable" standard. Accordingly, we believe your Board is vested with the discretion to elect not to incorporate the Bacteria TMDL provisions at this time.

Your Board would be justified to open a process to revisit and re-examine the Bacteria TMDL assumptions in the context of its basin planning process, instead of taking the irrevocable step of incorporating the TMDL into the permit and potentially wasting valuable taxpayer dollars that could better be spent on achievable water quality improvement goals.

Receiving Water Limitations (RWL) Language

As you know, the copermittees have expressed significant concerns about third-party liability risks resulting from the Ninth Circuit's interpretation of receiving water limitation language in the L.A. Region's stormwater permit. While we appreciate the State Water Resources Control Board's willingness to take comment and review those concerns, it may take several months for the State Board to act. The Tentative Order retains language similar to the problematic language reviewed in the *NRDC* case; this leaves the County and other copermittees immediately exposed to similar litigation from third parties for violations of water quality standards. We know that several various proposals to modify RWL language have been presented at state and local levels.

We suggest a simple solution consistent with Congress' intent in enacting CWA § 402 as discussed above: simply remove the RWL language in Provision A of the Tentative Order. Federal law does not require imposition of the receiving water limitations for MS4 systems. There is precedent for this action; a number of EPA issued

stormwater permits throughout the country do not include this language. Your Board has the discretion under CWA § 402 and *Browner* to remove the language. If EPA does not consider the RWL language to be essential to its own MS4 permitting, it seems logical that your Board is not required to include it in the new permit.

State Water Board policy supports the iterative process approach to water quality improvement, and acknowledges that water quality standards for many pollutants from MS4s cannot be met immediately. Therefore it is unrealistic and at odds with the iterative process to enact a standard that puts the third-party lawsuit gun to the head of public entities diligently spending significant time and public money pursuing water quality improvement. The permit would still include its enforceable prescriptive requirements and the WQIP features that all parties believe will focus resources in each watershed in the most productive fashion. Over the past two decades, the region has developed the knowledge and skill set to improve water quality, but understands that only through an iterative process can true progress be made.

Removal of the RWL language would eliminate the inevitable jousting over modified language proposals and the uncertainty created by its retention in light of the *NRDC* ruling. Copermittees would simply be obligated to focus on permit condition compliance, including the tasks identified in approved WQIPs, subject to RB enforcement if appropriate. Removal of the language would not create a "free pass"; to the contrary, it would encourage effective water quality monitoring and reporting that might otherwise be discouraged by the specter of third party lawsuits like those filed in the *NRDC* and other cases.

Land Development Standards/Hydromodification Issues

County Counsel concurs with the legal concerns sent to your attention in the December 19, 2012 letter from the Office of the City Attorney of the City of San Diego. The letter points out potential constitutional issues with hydromodification requirements imposed in the Tentative Order. We urge you to recommend modifying the referenced provisions to avoid the potential consequences for copermittees outlined in the letter.

The County also urges the Regional Board to amend the Tentative Order to incorporate the approved hydromodification management plan (HMP) for San Diego County into the permit, and remove provisions of the Tentative Order that are inconsistent with the HMP. As you know, the HMP was developed at significant cost to copermittees, and has only recently been implemented. Therefore, scrapping key components and changing the baseline standard for redevelopment to the questionable "pre-development" standard without further study of the effectiveness of the HMP as

implemented is legally inconsistent with the premise upon which the HMP was required to be developed in the first instance. Our client is submitting a more comprehensive technical comment on the HMP issue for your review.

Other legal concerns with various Tentative Order provisions will be woven into the comprehensive written comments to be submitted by the County and copermittees. Because of the potential impact of the above provisions of the Tentative Order for our client, we urge you to review and revise your recommendations to the Regional Board. Our mutual goal should be a permit that realistically and responsibly advances the march toward improved water quality in the region using available existing resources. As always, thank you for your consideration.

Very truly yours,

THOMAS E. MONTGOMERY, County Counsel

By James R. O'Day

James R. O'Day, Senior Deputy

JRO/tlm
12-00802

Geosyntec consultants

Technical Assessment of the San Diego Beaches & Creeks Bacteria TMDL

County of San Diego, Department of Public Works
January 2013

Executive Summary

The purpose of this paper is to evaluate the Beaches and Creeks Bacteria Total Maximum Daily Load (San Diego Bacteria TMDL), which was adopted by the San Diego Regional Water Quality Control Board (Regional Board) on February 10, 2010, and is proposed for inclusion in Tentative Order R9-2013-0001, the draft San Diego Municipal Separate Storm Sewer System (MS4) Permit (Permit). This technical evaluation identified three fundamental weaknesses: 1) the TMDL reference approach is inappropriately applied to the TMDL compliance sites; 2) the TMDL does not adequately reflect a protection of public health; and 3) the TMDL targets are unattainable given technological and environmental constraints. In addition, while a technical peer review of the TMDL was conducted prior to TMDL adoption, that review is found here to be too limited in scope to provide adequate defense of the TMDL basis and approach.

Introduction

The County of San Diego is a co-permittee in the San Diego MS4 Permit (Tentative Order No. R9-2013-0001), which is currently in draft form but expected to be adopted in 2013. The Regional Board proposes to include requirements consistent with the San Diego Bacteria TMDL (Resolution R9-2010-0001) in the MS4 Permit, thereby making compliance with the TMDL's requirements an enforceable permit requirement.

BACKGROUND

The California Ocean Plan and the San Diego Region Basin Plan (for inland waters) establish beneficial use designations (such as water contact recreation, or REC-1) and associated water quality objectives (WQOs) for marine beaches, estuaries, bays and freshwater bodies. The stated goal of the San Diego Bacteria TMDL is to protect human health and allow for water contact recreation at the 20 beach and creek segments in San Diego and southern Orange Counties. The TMDL defines achievement of the REC-1 beneficial use through attainment of WQOs, which are expressed as concentrations of bacterial indicators – total coliform, fecal coliform, and Enterococcus. The REC-1 WQOs are expressed as both single sample maximum (SSM) and geometric mean (GM) values.

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Following adoption by the Regional Board, the TMDL became effective on April 4, 2011, upon approval by the State Water Board, Office of Administrative Law. The TMDL sets numeric compliance limits, or Wasteload Allocations (WLAs), for MS4 co-permittees based on a reference system approach. To account for natural sources of bacteria, this approach allows an identified percentage of samples to exceed the REC-1 WQOs based on observed exceedance frequencies at an undeveloped "reference" beach. The reference beach used in this TMDL is Leo Carrillo Beach in Los Angeles County. The TMDL's MS4 WLAs are expressed as allowable exceedance frequencies (AEFs) for any of the three SSM indicator bacteria WQOs, or 22% during wet weather (i.e., 22% of "wet weather" water samples are allowed to exceed any of the SSM WQOs) and 0% during dry weather, and 0% AEF of the GM during dry weather (i.e., no allowed exceedances). A "wet weather" day is defined in the TMDL as a day with rainfall of 0.2 inches or greater and the following 72 hours. All other days are treated as dry weather.

PURPOSE

The purpose of this white paper is to evaluate the TMDL based on a review of available data and relevant studies. This critical evaluation is structured into four fundamental questions: is the TMDL reference approach applied appropriately, does the TMDL reflect public health protection, are the TMDL MS4 WLAs attainable, and was the peer review sufficient?

1. Is the TMDL Reference Approach Applied Appropriately?

ALLOWABLE EXCEEDANCE FREQUENCIES ARE NOT APPROPRIATELY SET

To account for natural sources of bacteria, the San Diego Bacteria TMDL allows an identified percentage of samples to exceed REC-1 WQOs based on observed exceedance frequencies at an undeveloped "reference" beach. The "reference" beach used to set allowable exceedance frequencies (AEFs) for the San Diego Bacteria TMDL is Leo Carrillo Beach in Los Angeles County. MS4 WLAs are expressed as AEFs for three indicator bacteria (fecal coliform, total coliform, and Enterococcus) WQOs as follows:

- 22% AEF during wet weather[1] (i.e., 22% of "wet weather" water samples are allowed to exceed any of the SSM WQOs);

[1] A "wet weather" day is defined in the TMDL as a day with rainfall of 0.2 inches or greater and the following 72 hours. All other days are treated as dry weather.

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- 0% AEF of the SSM during dry weather;
- 0% AEF of the GM during dry weather.

The TMDL inappropriately applies the same AEFs to all compliance points, regardless of their beach type (e.g., open beach or lagoonal outlet), waterbody type (e.g., beach or stream), or watershed size. Enclosed lagoonal outlets have higher AEFs than open beaches due to limited flushing and stagnant water, nutrient and organic rich sediments and vegetation that harbor bacteria, and huge densities of birds and other wildlife, due to the high quality habitat. Freshwater streams are expected to have higher AEFs than marine beaches since beaches are sampled at "point zero", or in the mixing zone (where the discharge from the storm drain or stream initially mixes with the ocean water, resulting in dilution), and because streams carry higher suspended sediments, which harbor bacteria. For this reason, watershed size is expected to influence beach AEFs since large watersheds have greater discharge, and therefore less surfzone dilution. To demonstrate this influence, a 2006 Southern California Coastal Water Research Project (SCCWRP) monitoring study at Southern California reference beaches (Schiff et al, 2006) found that exceedance frequencies of bacteria WQOs in wet weather were greater in large (>100 km^2) watersheds than in medium (28-56 km^2) watersheds or small (3-12 km^2) watersheds. The Los Angeles Regional Board has acknowledged some of these factors in setting AEFs for various bacteria TMDLs. The Santa Clara Estuary, for example, has a wet weather SSM AEF of 30%, which is higher than that of other waterbodies due to its enclosed nature, which supports bacteria regrowth and natural sources. The Arroyo Sequit watershed, which drains to the Leo Carrillo reference beach, has a drainage area of approximately 31 km^2, placing it in the "medium watershed" category. For reference, the San Luis Rey River and San Diego River watersheds (two watersheds affected by the San Diego Bacteria TMDL) are 1,500 and 1,100 km^2, respectively, putting them in the "large watershed" category, and suggesting that TMDL compliance points at their outlets should have higher AEFs. AEFs could be more appropriately set to better reflect the watershed-specific characteristics of the regulated water bodies.

The San Diego Bacteria TMDL does not allow any exceedances during dry weather, which is inconsistent with both the reference watershed datasets and the Los Angeles bacteria TMDLs. The San Diego Bacteria TMDL requires a 0% SSM AEF during all dry weather conditions, while all Los Angeles TMDLs

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allow a higher dry weather SSM AEF, in some cases by separating summer-season dry weather from winter-season dry weather. In fact, based on review of recent monitoring data from the Leo Carrillo reference beach, Los Angeles beach bacteria TMDLs were modified in 2012 to increase the winter-season dry weather AEF from 3% to 10%. Furthermore, Geosyntec analysis of Leo Carrillo reference beach data from 2004 through 2011 shows an average SSM exceedance rate of 9% during summer-season dry weather, further challenging the basis for a 0% dry weather AEF in the San Diego TMDL. Table 1 compares dry weather single sample AEFs in the San Diego Bacteria TMDL with other Bacteria TMDLs adopted in the Los Angeles region.

Table 1. Bacteria TMDL Dry Weather Single Sample Allowable Exceedance Frequencies

Waterbody	Allowable Exceedance Frequency (%)	
	Winter Dry	Summer Dry
Los Angeles Region TMDLs		
Santa Monica Bay Beaches (reopened)	10%	0%
Malibu Creek (reopened)	1.6% (all dry weather)	
Los Angeles River	1.6% (all dry weather)	
Ballona Creek (reopened)	1.6% (all dry weather)	
Santa Clara River	1.6% (all dry weather)	
Santa Clara River Estuary	13.4%	4.7%
Malibu Lagoon (reopened)	10.4%	0%
Ballona Estuary (reopened)	10.4%	0%
San Diego Region TMDL		
San Diego 20 Beaches and Creeks (for comparison)	0% (all dry weather)	

The San Diego TMDL's use of AEFs as the compliance metric is also inconsistent with the Los Angeles reference approach (which uses allowable exceedance *days*) and, as a result, the wet weather WLAs are often unattainable at the reference beach itself. The Los Angeles TMDLs use the average wet weather reference beach exceedance frequency with the number of local wet days in the 90th percentile wet year to calculate the number of allowable exceedance days (AEDs)[2]. By doing this, the Los Angeles Regional Board has established a compliance metric that is only exceeded at the reference beach during 10% of years, and that accounts for the influence of year-to-year rainfall variability. In contrast, by using the average wet weather exceedance frequency as the compliance metric, the San Diego Bacteria TMDL

[2] The San Diego Bacteria TMDL also does this, but ultimately sets AEFs as the compliance metric, making its AED calculations unused and meaningless.

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establishes a metric that is exceeded at the reference beach during approximately half of the years (since they are taking the average value).

Reference-based compliance metrics could be set such that the reference beaches and creeks consistently meet the TMDL WLAs. Geosyntec analysis of Leo Carrillo monitoring data from 2004 through 2011 demonstrates that the average wet weather SSM exceedance frequency (28%), the average dry weather 30-day GM exceedance frequency (16%), and the average dry weather SSM exceedance frequency (10%) are higher than the AEFs defined in the TMDL (22%, 0%, and 0% respectively). Figure 1 shows the annual exceedance frequencies (or percent of samples that exceed the SSM WQOs) for the Leo Carrillo reference beach compared to the TMDL AEFs. During these eight years of monitoring, this reference beach would have exceeded the TMDL's single sample AEFs in 4 of 8 years during wet weather and 7 of 8 years during dry weather. The reference beach also would have exceeded the GM AEF in 5 of 8 years. These results demonstrate that the TMDL AEFs are exceeded during most years at the reference beach itself. Furthermore, in its 2008 report (Tiefenthaler et al), SCCWRP evaluated bacteria concentrations in reference streams during dry weather. The study results demonstrated that bacteria levels at the reference stream sites fluctuate seasonally, annually, and from site to site, often with measured exceedance frequencies above the AEFs. Therefore, currently available reference beach and stream datasets could be used to set more appropriate TMDL compliance metrics.

Figure 1. Leo Carillo Annual Bacteria Exceedance Frequency

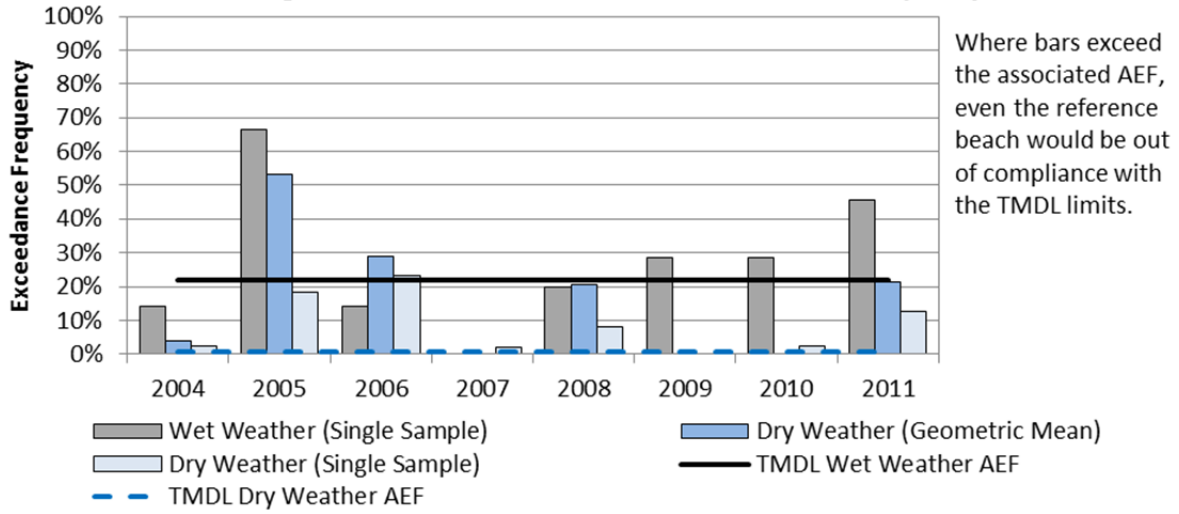

Notes:
1. 30-day Rolling GM - Geometric mean calculation performed every week, on the dry weather samples within the previous 30-days period, if 5 or more samples have been taken in the 30-day period.

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THE TMDL REFERENCE SITE IS NOT REPRESENTATIVE OF THE SAN DIEGO REGION

The Los Angeles region's reference beach, Leo Carrillo, which was used to set the San Diego TMDL AEFs, is not located in the San Diego region. Temperature, rainfall, and vegetation type and density may vary significantly by geographic region. These factors are known to influence bacterial concentrations in environmental samples. Therefore, the AEFs developed based on Leo Carrillo may be very different than the AEFs developed for a San Diego reference beach, and the same may be true of San Diego reference streams. This hypothesis is supported by an extensive SCCWRP study, completed between 2004 and 2006, where multiple reference beaches were monitored (Schiff et al, 2006). This study, which has been referenced in several Southern California bacteria TMDLs, shows higher wet and dry weather exceedance frequencies at the two San Diego reference beaches (San Onofre and San Mateo) than at Leo Carrillo (Table 2).

Table 2. Average exceedance frequencies for key reference beaches

Season		SD TMDL	Leo Carrillo	San Onofre[1]	San Mateo[1]
Wet Weather (Single sample)		22%	28%	30%	30%
Dry Weather (GM)		0%	16%	-	-
Dry Weather (Single sample)	Winter	0%	9%	7%	20%
	Summer			0%	9%

[1]Exceedance frequencies at these beaches are believed to be based on SSMs for dry weather; however the report did not describe the analysis method used.

WET DAY DEFINITION IS UNSUPPORTED

The TMDL inconsistently uses a wet weather definition of 0.2 inches of rainfall for compliance purposes, but adopted the Leo Carrillo reference beach AEFs that were determined using a 0.1 inch definition. Table 3 summarizes the AEFs defined in Tentative Order R9-2013-0001, based on the San Diego Bacteria TMDL, as well as the average exceedance frequencies calculated between 2004 and 2011 at the Leo Carrillo reference beach. These results are presented based on two methods: 1) assuming wet weather is defined as 0.1 inches (per the Los Angeles Regional Board and Leo Carrillo reference beach) and 2) assuming wet weather is defined as 0.2 inches (per the San Diego Regional Board). As shown, the AEFs observed using the 0.2 inches definition are higher (10-31%) than those observed using the 0.1 inches definition (9-28%). This suggests that the TMDL AEFs are biased lower, or resulting in more stringent AEFs, than they would be if the 0.2 inches definition was accurately applied.

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Table 3. Leo Carrillo average exceedance frequencies based on different wet weather definitions, 2004-2011

Season	SD TMDL AEFs	Average Observed Exceedance Frequency at Leo Carrillo Reference Beach	
		0.1 inch	0.2 inch
Wet Weather (Single sample)	22%	28%	31%
Dry Weather (GM)	0%	16%	18%
Dry Weather (Single sample)	0%	9%	10%

In addition, the San Diego Bacteria TMDL's wet day definition (0.2 inches) inappropriately skews the number of dry days high (and noting that dry days have no allowed exceedances) and wet days low (whereas wet days are allowed a number of exceedances).

To further evaluate the 0.2 vs. 0.1 inch definition, an analysis was performed correlating rainfall data from the San Diego County ALERT Flinn Springs gauge (32.8464N 116.8636W, San Diego County) and streamflow data from the USGS Los Coches Creek gauge (11022200, Lakeside, CA) from October 2007 to September 2012 (5 water years). Los Coches Creek is a small tributary of the San Diego River with a drainage area of 12.2 square miles. This pair of gauges was selected because the Flinn Springs rain gauge reasonably represents the Los Coches Creek drainage. Of the 12 storms that occurred during this period that produced rainfall depths between 0.1 inches and 0.2 inches, all 12 resulted in rainfall-induced excess runoff to the creek, as defined by a temporary increase in flow rate of at least 50% above pre-event base flow. The increased flows for these storms averaged 840% above baseflow with a range between 74% and 2500%. Therefore, 0.1 inches is a more appropriate threshold value for defining TMDL wet days in the San Diego region.

TMDL SHOULD REFLECT APPROPRIATE REC USE CATEGORIES

By assuming a "designated beach" usage frequency (the highest REC use category) for all beaches and creeks, the TMDL applies the most stringent REC-1 Enterococcus WQOs from the Basin Plan, or 61 and 104 MPN/100mL for freshwater and saltwater, respectively. However, Chapter 7 of the Basin Plan states that the "designated beach" category may be over-protective of water quality for the impaired freshwater creeks because of their infrequent recreational use, and that these waters may be better represented by the "moderately to lightly used areas" category, which has an Enterococci freshwater REC-1 SSM WQO of 108 MPN/100mL. The San Diego Regional Board has indicated in the TMDL that they may be open to amending the Basin Plan for these lower usage water bodies, and the MS4 co-permittees would likely support this action, which would more accurately reflect freshwater REC uses in the region. Furthermore, a lower REC use intensity or alternatively a REC use suspension could be considered to limit the applicability of REC-1 bacteria WQOs during wet weather when creek access is rare and often unsafe due to high flows. Such Basin Plan Amendments have been approved in the Los Angeles and Santa Ana regions.

In addition, the TMDL applies reference beach AEFs to San Diego creeks and rivers; however, these AEFs were developed based on a 104 MPN/100mL Enterococcus WQO (along with other indicator bacteria WQOs), whereas the TMDL then applies this AEF to a freshwater WQO of 61 MPN/100mL. As a result, the conservatively low AEFs are compounded with the conservatively low WQO, again resulting in unnecessarily low TMDL WLAs. Based on the Leo Carrillo reference beach data that is used to develop the TMDL AEFs, using a 61 MPN/100mL WQO for Enterococcus (along with other indicator bacteria WQOs) the site's WQO exceedance frequency is 13% and 33% for dry and wet weather, respectively. Therefore, the San Diego Bacteria TMDL could use these percentages as the basis for their freshwater AEFs if the 61 MPN/100mL threshold is kept. Another potential solution would be to use USEPA's 2012 recommended REC criteria for both freshwater and saltwater, which is 35 CFU/100mL Enterococcus as a geomean and 130 CFU/100mL as a 90th percentile Statistical Threshold Value. Notably, USEPA REC 2012 criteria guidance also now allows site-specific criteria to be developed where appropriate based on study approaches such as Quantitative Microbial Risk Assessment.

SAN DIEGO REFERENCE WATERSHED STUDY

In its response to comments on the San Diego Bacteria TMDL (TMDL Appendix V), the Regional Board recognized that a San Diego reference watershed is needed, stating: *"For these bacteria TMDLs, the San Diego Water Board decided to use the 22 percent wet weather exceedance frequency as an initial allowable exceedance frequency, with the expectation that a region specific or multiple watershed specific allowable exceedance frequencies would be developed as additional data were collected in reference systems identified for the San Diego Region"* (San Diego Regional Board, 2010).

The San Diego and Orange County MS4 Co-permittees are currently partnering with Caltrans, with technical assistance from SCCWRP, to fund a local reference study that will provide data much more appropriate to the water bodies regulated by the San Diego Bacteria TMDL. For example, water body-specific AEFs could be determined for reference beaches, creeks, and enclosed lagoonal outlets, rather than applying AEFs derived for one reference beach to all three water body types. AEFs could also be determined for reference watersheds of varying sizes, rather than applying AEFs derived for a medium watershed to all other size watersheds. AEFs could also be derived using the same wet weather definition as will be used for compliance assessment purposes, resulting in greater scientific validity of the compliance metrics. Lastly, it is anticipated that local hydrologic, geologic, and environmental (freshwater vs. marine water and flora/fauna) factors may result in AEFs more appropriate for local water bodies than those derived for the Leo Carrillo reference beach. Therefore, local AEFs would be expected to improve upon the limitations mentioned above.

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2. Does the TMDL Reflect Public Health Protection?

USEPA REC CRITERIA ACKNOWLEDGE THAT INDICATOR BACTERIA ARE NOT PREDICTIVE OF HUMAN HEALTH RISK AT STORMWATER-DOMINATED WATERS

Indicator bacteria are not themselves pathogens, or illness-causing microorganisms. Rather, indicator bacteria are used as a proxy for gastrointestinal (GI) illness risk because of their presumed correlation with human fecal waste, which is presumed to carry pathogens and is therefore presumed to generate illness as a result of body contact recreation. However, this inference chain breaks down for recreational waters -- like the San Diego Bacteria TMDL waterbodies -- that are impacted by urban runoff rather than municipal wastewater effluent, since urban runoff carries many non-human (and much less pathogenic) sources of indicator bacteria, such as from pets, birds, other wildlife, plants, and soils or sediment. Recent epidemiology studies (i.e., studies that "measure" swimmer illness rates via post-activity surveys) and Quantitative Microbial Risk Assessments (QMRA) (i.e., studies that calculate swimmer illness rates based on measured pathogen concentrations in recreational waters and using known dose-response relationships) support this understanding. USEPA's 2012 REC criteria recommendation also acknowledges this limitation for urban runoff-impacted waters, and as a result they now formally allow epidemiology and/or QMRA studies to be used to develop site-specific criteria where the default REC criteria are inappropriate. The San Diego Bacteria TMDL and MS4 Permit could acknowledge this fundamental weakness by refining the WLAs as possible based on currently available information from USEPA and allowing site-specific criteria to be developed through stakeholder-led special studies.

Bacteria WQOs have historically been derived from epidemiological studies conducted in recreational waters impacted by municipal wastewater effluent. Experts on bacteria water quality in California have suggested that an unclear relationship exists between illness and bacteria from non-point sources, supporting the finding that the application of relationships based on epidemiological studies conducted in the 1970s for effluent-impacted water bodies may be inappropriate for recreational waters (Boehm et al. 2009). Other recent studies have also demonstrated that the traditional bacterial indicators, fecal coliform and total coliform in particular, show a weak correlation with illness in stormwater-dominated waters. For example, as part of the National Epidemiological and Environmental Assessment of Recreational water (NEEAR) program, the USEPA most recently conducted epidemiological studies at an urban runoff-impacted beach in South Carolina. No statistically significant relationship between Enterococcus and GI illness was observed at Surfside Beach (USEPA, 2010), which was hypothesized to be due to either the lack of human inputs or

> The USEPA 2012 REC Criteria include only Enterococcus and *E. coli* (latter for freshwater only). These were found to be better indicators of public health than total and fecal coliforms. The USEPA also recommends the use of the GM and STV, not SSMs.

the low bacteria densities observed. A 2007 epidemiology study at Mission Bay (Colford et al) did not find any association between illness incidence and traditional fecal indicators (total coliform, fecal coliform, and Enterococcus). A four-year study conducted at 45 stormwater outfalls in Milwaukee found no correlation between E. coli or Enterococcus to the human Bacteroides genetic marker, even though all tested outfalls had Bacteroides detected in at least one sample (Sauer et al, 2011). The study further suggested that fecal indicators may be of little use for prioritizing efforts to protect human health in urban areas where numerous non-human sources of fecal pollution exist. A 2010 study (Fleischer et al) conducted at a recreational marine beach with no known point source inputs concluded that "there was no dose-response relationship between gastroenteritis and increasing exposure to Enterococci, even though many current water-monitoring standards use gastroenteritis as the major outcome illness." Other literature suggests that total coliform and fecal coliform concentrations do not correlate as well as Enterococcus with human illness rates in recreational waters (Cabelli 1983; Cabelli et al., 1982). Wade et al. (2003) conducted a scientific review of 27 studies evaluating the association between microbial indicators of recreational water quality and GI illness. The studies found that overall illness rates were better correlated with Enterococci in marine waters and with *E. coli* in freshwaters than with total coliform and fecal coliforms. Therefore, recreational waters that are not impacted by effluent require very careful application of bacteria WQOs (otherwise they create a compliance burden without providing any real human health benefit), and allowances for site-specific adjustments.

The recently finalized 2012 USEPA Recreational Water Quality Criteria Report states: *"Scientific advancements in microbiological, statistical, and epidemiological methods have demonstrated E. coli [for freshwater] and Enterococci [for marine sites] are better indicators of health than the previous indicators, total coliforms and fecal coliforms"* (USEPA 2012). This is consistent with USEPA's Ambient Water Quality Criteria for Bacteria (1986) which states: *"The freshwater studies confirmed the findings of the marine studies with respect to Enterococci and fecal coliforms in that densities of the former in bathing water showed strong correlation with swimming associated gastroenteritis rates and densities of the latter showed no correlation at all…. E. coli is the most fecal specific of the coliform indicators; and Enterococci, another fecal indicator, better emulates the virus than do the coliforms with respect to survival in marine waters"* (USEPA, 1986). Neither REC criteria (1986 or 2012) have been adopted by the California State Water Resources Control Board or the San Diego Regional Board. Given their weak link to public health, total coliform and fecal coliform WQOs could be removed from the San Diego Bacteria TMDL.

In the same 2012 document, USEPA further expresses that SSMs are overly conservative, statistically incorrect, and do not correlate with the same level of risk associated with the GM criteria. For this reason, they recommend replacing the 104 cfu/100mL SSM with the 130 cfu/100mL statistical threshold value (STV), or 90th percentile value (i.e., 10% of samples are allowed to exceed this). The STV corresponds to the same level of health protection as the GM, which was set based on observed illness rate correlations. Use of the STV would also increase consistency between states, which the USEPA has

encouraged. In fact, even the San Diego Regional Board, in their Peer Review issue #9, acknowledge that, "the GM is more appropriate [for dry weather conditions] since this value likewise represents average conditions over 30 days." Inconsistent with Regional Board staff responses to peer reviewer comments, the SSM limit was included for all weather conditions in the adopted TMDL and draft permit.

URBAN RUNOFF BEACH EPIDEMIOLOGY STUDIES SHOW A WEAK CORRELATION BETWEEN BACTERIA CONCENTRATIONS AND HUMAN ILLNESS

Bacterial indicators, even *E. coli* and Enterococcus as recently recommended by USEPA, have been shown to have a weak (or nonexistent) correlation with human illness rates in stormwater-dominated waters, suggesting that WQOs based on these indicators may not accurately reflect public health as intended. Epidemiological results from the SCCWRP Pacific Coast Water Quality Study at Surfrider Beach in Malibu show increased illness rates for swimmers, although no relationship between illness and bacteria was observed (Arnold et al, draft, 2012). This is perhaps due to bather shedding of skin fungus and fecal pathogens (Elmir et al., 2007; Plano et al., 2011). Many epidemiological studies have similarly found no or very minor correlation between bacteria concentrations and illness rates associated with swimming in receiving waters impacted by non-point sources of bacteria. For example, a 2007 study conducted in Mission Bay in San Diego by Colford et al. found no associations between traditional bacteria concentrations (total coliforms, fecal coliforms, and Enterococcus) and illness. A number of other studies conducted in coastal water bodies in Southern California have also shown a lack of correlation between bacteria and human pathogens (Noble et al., 2006; Rajal et al., 2007; Boehm et al., 2003; Choi & Jiang 2005; Jiang & Chu, 2004a). Moore et al (2007) and Imamura et al (2011) found that Enterococcus in particular can originate in plants and kelp, thereby questioning the presumed human health linkage for urban runoff-impacted receiving waters. A recent epidemiology study in Dana Point, conducted at Doheny State Beach, which frequently exceeds bacteria WQOs, found that swimmer illness rates were not correlated to bacteria concentrations at any time except when a creek berm was open (Colford et al., 2012). Doheny State Beach is located at the outlet of the San Juan River, which is separated from the ocean by a sand berm for most of the dry season. The San Juan River is impacted by human sources, as evidenced by the consistent correlation of bacteria and human waste markers in the creek (McQuaig et al., 2012) and the fact that a municipal wastewater treatment plant discharges disinfected effluent into the creek less than a mile upstream of the outfall. On the ocean side of the berm, however, no consistent correlations were found between bacteria and human waste markers (McQuaig et al., 2012), suggesting that the dry weather bacteria exceedances at this beach may often be caused by sources other than those of human-origin when the berm is not overtopped. In all three recent Southern California beach epidemiology studies, the additional highly credible gastrointestinal illnesses (HCGIs) observed among swimmers (i.e., illnesses beyond those measured in the non-swimmer control group) were consistently below the USEPA's tolerable illness rate (up to 3.6%) that forms the basis for its REC criteria. This was even true for Doheny Beach with the creek berm open, which was the only beach and condition where an Enterococcus-illness association was observed (no illness

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associations for total or fecal coliform were observed at any of the beaches). Therefore, while indicator bacteria exceedances persist at these three Southern California beaches, measured swimmer illness rates are low and consistently meet USEPA's allowed levels. The San Diego Regional Board could therefore safely increase REC water quality objectives and still protect public health at creeks and beaches.

USEPA QMRA STUDIES SHOW RECREATIONAL OBJECTIVES ARE OVERLY CONSERVATIVE FOR SITES WITH MINIMAL HUMAN BACTERIA SOURCES

Recent USEPA Quantitative Microbial Risk Assessment (QMRA) studies (Soller et al 2010 and Schoen et al 2010) also indicate that REC objectives, specifically the Enterococcus GM, correspond to swimmer illness rates that are well below USEPA's tolerable levels at beaches with minimal human bacteria sources. Applying the 35 MPN/100mL limit at non-wastewater impacted beaches is a conservative (overly stringent) approach since recent peer-reviewed QMRA work by USEPA's contractor (Soller et al 2010) and USEPA (Schoen et al 2010) shows that the 35 MPN/100mL limit can be greatly increased at beaches where bacteria sources are primarily non-human, while still being protective of USEPA's gastrointestinal illness benchmark, as shown in Figure 2 from USEPA (Schoen et al 2010). Schoen states: *"The dominant source of fecal indicator at a recreational beach may not be the source of dominant risk."* This fact was recently acknowledged by USEPA REC criteria and QMRA experts at the November 28-29 State of the Science Workshop at SCCWRP, organized by SWRCB staff and the California Beach Water Quality Workgroup. So, while there are non-negligible risks from non-human fecal sources, for the same Enterococcus levels, these risks are much lower than those from human waste, which are the basis for default REC criteria. Therefore, if human sources are found to be very low or not detected, Enterococcus GM criteria can be safely increased[3].

[3] While used in the California Ocean Plan and San Diego Basin Plan, total and fecal coliform and SSM maximum objectives are no longer used in current USEPA REC criteria and are not associated with swimmer illnesses, therefore they are not mentioned here.

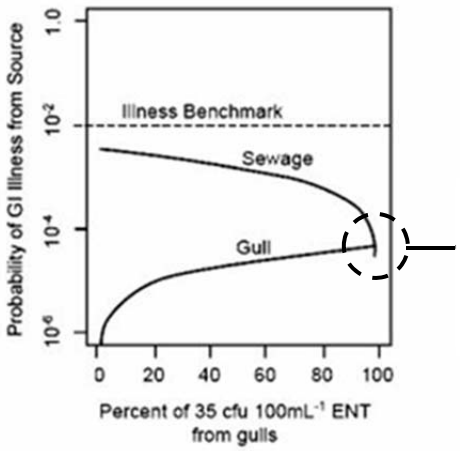

[Low illness rate sum, where Enterococcus is primarily from gull sources rather than human sewage.]

Figure 2. Comparison of median illness risk for adults when total ENT concentration (at 35 CFU /100mL) is attributed to a mixture of primary POTW effluent (sewage) and seagull feces (gulls) (Schoen et al 2010), of USEPA.

STUDIES SHOW THAT NATURAL SOURCES CONTRIBUTE SIGNIFICANTLY TO BACTERIA LEVELS, BUT PRESENT LOW HUMAN ILLNESS RISKS

Natural sources of bacteria, which present much lower human illness risks compared to human fecal sources, have shown to contribute to WQO exceedances at many Southern California sites. Table 4 summarizes several scientific studies that have identified and observed natural sources of bacteria, including plants, algae, soil, beach wrack, insects, and animal feces (especially birds). In fact, a very recent study conducted by SCCWRP and the San Diego MS4 co-permittees (Griffith and Ferguson, 2012) at Moonlight State Beach in Encinitas and Rock Pile Beach in La Jolla observed that at Moonlight Beach, *"the distribution of enterococci species and strains found in the creek and the storm drain system during the 22 week sampling period were phenotypically most similar to species and strains found among natural sources as compared to those present in sewage."* The *Bacteroides* marker was not found in any of the creek/stream or beach samples, suggesting that "human fecal contamination may not have been a significant source of Enterococci to either storm drain during the study period." In combination, these studies provide further evidence that natural sources are indeed significant contributors of indicator bacteria in Southern California recreational waters, while not likely contributing to an increased health risk.

Table 4. Summary of findings on natural sources of bacteria

Finding	Reference(s)
Non-anthropogenic sources of bacteria confirmed, potentially contributing to exceedances.	Imamura et al 2011, Izbicki 2012b
Sand, sediment, and wrack can serve as reservoirs for bacteria.	Imamura et al 2011, Izbicki et al 2012b, Lee et al 2006, Ferguson et al 2005, Grant et al 2001, Griffith 2012, Litton et al 2010, Phillips et al 2011, Jiang et al 2004b, Sabino et al 2011, Weston Solutions 2010
Enterococci include non-fecal or "natural" strains that live and grow in water, soil, plants, and insects.	Griffith and Ferguson, 2012, Griffith 2012, Litton et al 2010, Weston Solutions 2010, Izbicki et al 2012b, Weisberg et al 2009
Lagoonal sediments have been shown to harbor nutrients, which when released may encourage regrowth of bacteria.	Sutula et al 2004, Weisberg et al 2009, Surbeck et al 2010

Bacterial regrowth can limit the ability of an MS4 to comply with the WQOs for a number of reasons. First, bacteria concentrations measured in impacted watersheds may be a result of actively growing, possibly environmental (rather than anthropogenic) communities within sediments or storm drain systems rather than a result of human fecal inputs. In addition, regrowth may lead to a decoupling of bacteria from pathogens, reducing the potential for bacteria concentrations to reflect risk of human illness (Litton et al 2010). The 2012 San Diego SCCWRP study also found that the naturally occurring bacteria species were apt to form biofilms on concrete surfaces, such as in storm drains, ultimately leading to sloughing and downstream release over time. These studies suggest that regrowth is a relatively uncontrollable source that, while potentially contributing to WQO exceedances, are unlikely to contribute increased risks to human health.

3. Was the Peer Review Sufficient?

In 2010 the San Diego Regional Board solicited two experts, Dr. Patricia Holden from University of California (UC) Santa Barbara, and Dr. Kara Nelson from UC Berkeley, to provide peer review of the wet and dry weather TMDL modeling approaches. Both are highly respected research scientists and academics. Dr. Holden is an expert on source tracking method development and testing, while Dr. Nelson is an expert on removal and inactivation of pathogens as well as vegetated treatment systems. While both researchers are highly respected in their fields, neither are expert practitioners on bacteria control technology selection or performance. Therefore, their approval of the TMDL should not reflect on the technical feasibility of meeting the TMDL limits.

The following are our specific comments on the expert peer review and San Diego Regional Board responses:

a. *Other sources of bacteria*. In peer review topic #2 (use of wet weather model to simulate fate and transport of bacteria, and to calculate TMDL, to affected beaches and creeks), the reviewer raised the concern that "…the resuspension and erosion of sediments in water channels during storm events may be an important source of indicator bacteria that is not accounted for in the current model." Although the Board responds that, "the association of bacteria to sediments in the stream channels and processes of settling and resuspension are important considerations, and the LSPC model includes capabilities for the simulation of these processes if data becomes available to define modeling assumptions to facilitate model calibration", a peer-reviewed article co-authored by the expert reviewer was published on this exact topic in 2003 (Steets and Holden, 2003).

b. *Reference watershed.* In the peer review topic #3 (selection of Los Angeles watershed as a "reference" for background loading of bacteria in the San Diego Region during wet weather), it was noted by the reviewer that, "the Implementation Plan should require that one or more appropriate reference watersheds are identified and characterized for the San Diego region, and that these data are used to determine the TMDLs." This comment supports our opinion, expressed earlier in this paper, that a San Diego reference beach should be used to determine the final TMDL. The Board's response includes information that (1) measurements were based on the 2004-2005 winter season, (2) a single WQO was exceeded 27% of the time, on average across the four reference beaches evaluated, and (3) acknowledges that natural process do generate bacteria loads in both reference and urbanized systems. Although the reviewers were not provided an opportunity to respond to these items, we are concerned that (1) this response is based on only one wet season, while year to year variability has been illustrated at a reference beach per Figure 1, (2) if a 27% exceedance rate was observed across the four "local" reference beaches, why was 22% selected as the wet weather AEF?, and (3) natural source contribution processes occur year round, including during dry weather, therefore dry weather exceedances should be allowed.

c. *SSM objectives.* The use of SSM objectives (peer review topic #4) was questioned as follows, "…given that rainfall events subject the watersheds to more variability in flow and load, the use of a GM for wet weather seems more practical." The San Diego Regional Board responded, "The GM value does not evaluate peak loads at short time intervals because values are calculated over several weeks' time. Because the model used for wet weather analyzes high flow and loads, which are short-term events, the numeric target must likewise characterize risk from short-term events. Therefore the SSM WQOs were used." However, the comment was not regarding long term risk or short term risk, it was referring to the variability during individual storm events making it difficult for a single sample to accurately reflect the risk. The response did not adequately address the issue of variability in defending the use of SSM objectives. This

reviewer comment is further supported by the 2012 USEPA REC criteria guidance, which does not recommend SSM for REC use protection.

d. *Assumptions concerning regrowth*. Peer review topic #10 (reasonableness of assumptions for dry weather modeling) prompted the reviewer to comment, "I agree that given the lack of data on the occurrence of bacterial regrowth in the Southern California region, however, it is not possible [to] include regrowth in the model for dry weather flows. However, regrowth has been demonstrated in tidally-influenced river sediments in Florida…Thus, regrowth should be recognized as a potential source of error, and should regrowth be documented in the region in the future, it may need to be incorporated into the modeling framework." The Griffith and Ferguson (2012) SCCWRP study has since demonstrated regrowth in the region. Also, although not directly identified by the reviewer, the model assumes that 100% of the existing load comes from MS4 discharges, while significant reference stream/beach data were available to demonstrate otherwise (e.g., SCCWRP Technical Report #542, "Fecal indicator bacteria (FIB) levels during dry weather from Southern California reference streams" [Tiefenthaler et al, 2008]). Therefore, we suggest the following: 1) Reopen the TMDL and remodel to include regrowth and other natural sources, 2) Use the model results to set MS4 compliance metrics (e.g., load based-metrics), and 3) Use the new model to evaluate whether AEFs are consistently achievable through MS4 load reductions, or whether instream regrowth, sediment resuspension, and other natural processes/inputs might prevent receiving water compliance with the WQOs even with substantial MS4 load reduction.

e. *Lagoons and estuaries.* The reviewer commented on peer review topic #11 (location of critical points for TMDL calculation) that, "where small estuaries or lagoons separate the creek mouth from the coastal ocean, they should be considered in this process." The San Diego Regional Board responded that, "the Board recognizes that small estuaries and lagoons provide habitat for wildlife, and therefore can be a significant source of bacteria. For this reason, systems with estuaries or lagoons were not analyzed in this project." While the San Diego Regional Board acknowledges that lagoons may have higher levels of bacteria than open beaches and streams, the Board does not set higher AEFs for such creeks and beaches. This is inconsistent and imposes unfairly strict AEFs on such waterbodies, and will likely result in more frequent an attainable non-compliance.

f. *Use of indicator bacteria for compliance and public health protection.* In response to the overarching question (b), "Is the scientific portion of the proposed rule based upon scientific knowledge, methods and practice", the reviewer questions the relationship between indicator bacteria and the threat to swimmers and fishers. It was specifically noted that, "At the time of this review, there is a reasonable amount of evidence in the peer-reviewed scientific literature that DNA-based markers of human waste can be used to more definitively understand the

presence of human waste." We support this point that the indicators used in the TMDL do not protect public health, and that human waste marker data should be used as the basis for the TMDL.

g. *Insufficient data.* There were several instances where the reviewers could not fully comment on the question posed to them because the draft of the TMDL they were given contained insufficient data (peer review topics #2, #5, #6, #7, #8, and #12). This lack of data was mentioned by at least one of the reviewers in 5 of the 12 topics they were asked to comment on. While this information was often added to the TMDL in response, the reviewers did not have a chance to review the new information added to the TMDL, and therefore could not give their full opinion on the original question posed to them.

h. *Conservative assumptions.* There were also a number of instances where the reviewers pointed out sources of significant error and uncertainty in the models, data, or parameters used in developing the TMDL (peer review topics #2, #3, #7, #8, and #10). For example, the lack of regrowth in the model, the use of parameters from a few subwatersheds for use in the entire TMDL area, the assumptions about dry weather flows, and several other issues were identified as potential sources of significant uncertainty. To each of these, the San Diego Regional Board responded that while they recognize these issues as significant sources of uncertainty, the parameters and models they used were the best possible given the state of the science and the limited data available. They also pointed to efforts they are currently undertaking to collect more data to improve the models, and that, if these lead to significant changes to the TMDL, it could be addressed in a reopener. While we accept that there are many limitations imposed by limited data and the state of the science, the number and magnitude of these many sources of uncertainty underline the need for a more transparent and quantitative assessment of the level of conservatism that was applied within the TMDL analyses, since "conservative assumptions" are cited by the Regional Board as the "implicit margin of safety" used to address these sources of uncertainty. It is common in modeling studies to quantify uncertainty that derives from assumptions and limited data. Such scientific rigor is standard practice and should be followed by the Regional Board within this TMDL as well. One reviewer comment (peer review topic #12) stated, "It is really difficult to tell what are the 'conservative assumptions'." While the discussion of these assumptions was subsequently expanded after the peer review, the reviewers did not have access to them when giving their comments. Therefore, the TMDL's assumptions were recognized by the reviewers as being conservative as well as non-transparent, therefore their ability to review (including the lack of an opportunity to review the expanded discussion) was limited.

i. *San Diego Regional Board responses not reviewed.* While many positive changes were made to the TMDL as a result of the peer review, the experts were not offered the opportunity to

approve the responses to their comments. Therefore, some of the responses by the Board may not have adequately addressed the reviewers' comments.

Lastly, a significant focus of this review was on the TMDL dry and wet weather modeling approaches, despite the fact that the TMDL model predictions (e.g., MS4 required load reductions to achieve the AEF during the critical year) were not used to set MS4 compliance metrics as stated in the draft Tentative Order. Rather, these compliance metrics were simply set to the reference beach average exceedance frequency for wet weather (22%) and the WQOs (SSM and GM) for dry weather. Therefore very little of the reviewers' attention was focused on aspects of the TMDL that are actually implemented for compliance determination purposes. For example, the reviewers were not asked to review the reference watershed data used to derive the AEF targets. Among other critical topics, reviewers were also not asked to comment on the appropriateness of using total coliform and fecal coliform rather than other indicators, nor were they consulted regarding the limits of technical achievability (nor are they experts on this subject). Therefore, we believe the peer review to have been limited in scope and lacking applicability to the important issues raised in this document.

4. Are TMDL MS4 WLAs Attainable?

BACTERIA WATER QUALITY STANDARDS ARE NOT CONSISTENTLY ATTAINABLE BY NON-STRUCTURAL SOURCE CONTROLS ALONE

Because of their low cost relative to structural treatment controls, the first emphasis of most Bacteria TMDL implementation strategies is to exhaustively explore and implement non-structural options to control bacteria at their source. Non-structural BMPs include outreach, inspection, and enforcement-based programs, such as those targeting homeowners to address over-irrigation and car washing as sources of dry weather runoff, pet owners to address pet waste, and food outlets to address sidewalk hose-down and proper trash and grease trap management. Non-structural BMPs also include illicit discharge detection and elimination programs, including efforts to identify sources of human waste into the MS4, such as recreational vehicle discharges and leaking sewer lines (where such flows may re-emerge into nearby stormdrains). Street sweeping and catch basin cleaning are also emphasized and intended to remove sources of sediment, trash and organic litter, all of which may contribute bacteria to the MS4.

Non-structural BMPs are essential components of the Comprehensive Load Reduction Plans (CLRPs) recently submitted to the Regional Board by the responsible parties named in the San Diego Bacteria TMDL. To the extent possible based on available data, the CLRPs quantified the effectiveness of non-structural BMPs. The CLRP analyses found these collective BMPs to achieve MS4 bacteria load reductions of 8 to 43% during dry weather and 5 to 29% during wet weather. Wide ranges were assumed due to the significant uncertainty associated with the effectiveness of such programs.

However, even with the most optimistic assumptions, a thoroughly exhaustive and comprehensive implementation of non-structural BMPs can simply not achieve compliance with the TMDL WLAs. This is partly because outreach, inspection, and enforcement can never achieve perfect control outcomes (i.e., some target groups will miss outreach, some behaviors won't change, and some waste generation activities will miss inspection). This is also partly because some urban bacteria loads are unable to be addressed by such programs (e.g., biofilms in stormdrains consistently grow and then mobilize whenever flows are present, such as during one of the many allowed dry weather flow sources like groundwater inflow and infiltration, and fire hydrant testing). Evaluations of the effectiveness of other source controls, such as sweeping and cleaning programs, have consistently indicated that they are not able to capture 100% of sediments and organic debris.

BACTERIA WATER QUALITY STANDARDS ARE NOT EVEN ATTAINABLE THROUGH USE OF STRUCTURAL BMPS

Because of limitations in the effectiveness and consistent performance of non-structural BMPs, more costly and time-intensive structural BMPs are described in the CLRPs in order to demonstrate additional, more effective and controllable bacteria reduction. Dry weather structural BMPs potentially include localized infiltration, diversions to sewer, and disinfection. During wet weather, however, many of these BMPs are often not feasible because flow rates are substantially greater and more variable, and considerable transient storage would be required. In general, more natural, passive, sustainable, and multi-benefit wet weather structural BMPs are preferred and recommended (as opposed to energy-intensive, mechanical systems).

Geosyntec is co-principal investigator on the EPA/ASCE International Stormwater BMP Database. The database is used to help evaluate and predict performance of structural BMPs in removing bacteria. Statistically evaluated monitoring data from the database, however, indicate that most non-disinfection[4] structural BMPs are not capable of achieving REC WQOs with the consistency, frequency, and predictability required by the TMDL and the CLRPs (Figure 3).

[4] Disinfection is not considered suitable or cost-effective for treating wet weather MS4 discharges.

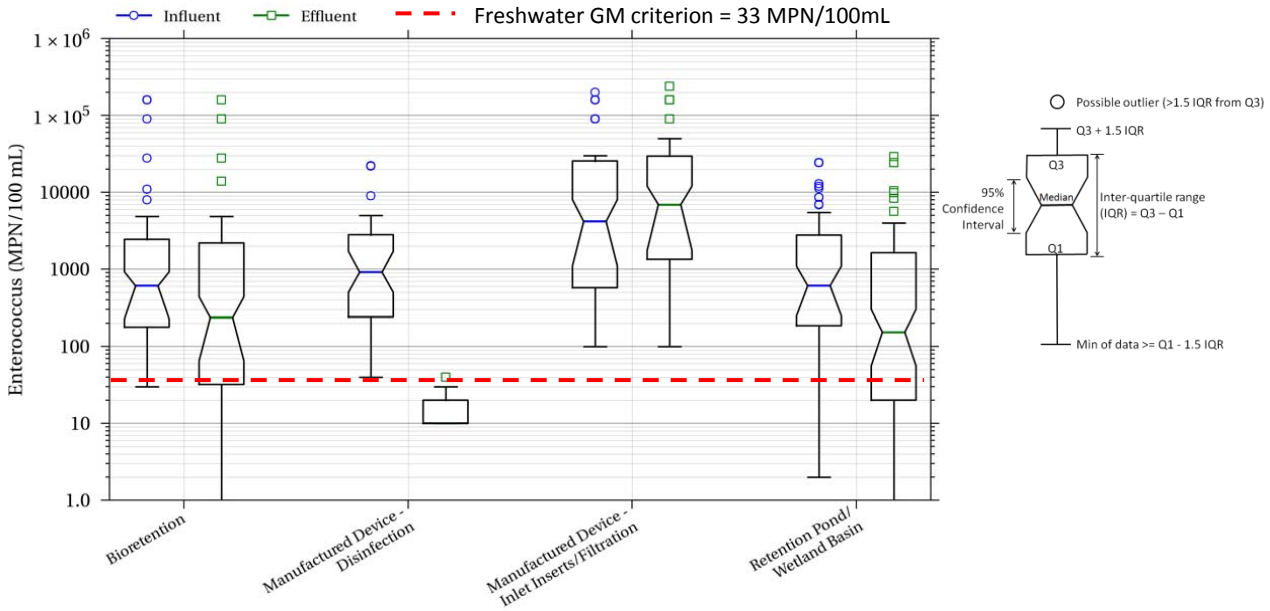

Figure 3. Structural BMP performance (Clary et al, 2012)

The CLRPs also describe other structural BMPs for wet weather controls such as subsurface flow wetlands (which have less performance data available but initial datasets suggest a relatively high level of effectiveness) and "zero discharge" types that rely on infiltration (e.g., infiltration trenches and basins) or capture and use (e.g., rainwater harvesting cisterns). These BMPs are effective for bacteria but are subject to local and site-specific constraints, which must be evaluated before implementation. For instance, infiltration BMPs are not appropriate for areas with relatively impervious soils, shallow groundwater, steep hillsides, landslide or liquefaction risk zones, subsurface contamination, or close proximity to certain structures. Similarly, capture and use BMPs are not cost effective for areas with little available water demand (such as minimal landscaping irrigation needs) or where water demand is temporally inconsistent with available supply (frequently the case in the arid southwest where rainfall occurs during one season while peak irrigation demands occur during a different period). Therefore many urban areas exist without feasible or cost-effective wet weather structural BMP options available.

EVEN COMBINING STRUCTURAL AND NON-STRUCTURAL BMPS, CONSISTENT AND RELIABLE ATTAINMENT OF BACTERIA STANDARDS IS NOT POSSIBLE

In order to reduce existing wet weather MS4 bacteria concentrations with the objective of meeting TMDL WLAs (with some regularity), no potential and reasonable non-structural and structural BMPs are excluded. This is the same strategy that is planned by many Los Angeles-area MS4 co-permittees in their TMDL Implementation Plans.

That said, there remain numerous small watershed and beach examples where exhaustive non-structural and structural BMP efforts have been intensively applied, and significant costs expended, without the desired (or initially predicted) outcome of compliance. Extrapolating such costs on a per acre basis to the entire Sand Diego Bacteria TMDL area would result in tremendous cost estimates without evidence that TMDL compliance would be achieved, or that public health would benefit as a result.

- In Santa Barbara, extensive stormdrain investigations were conducted using conventional techniques (e.g., CCTV, visual flow observation, automated flow rate measurement, wastewater chemical indicators, bacteria sampling, dye testing, etc.) as well as more novel ones (e.g., canines scent trained for human waste, and human waste genetic markers) to seek inputs of human waste. As a result, RV discharges and leaking sewer lines were identified and immediately addressed (Sercu et al, 2011). Despite these efforts, however, channel and creek indicator bacteria levels are unchanged.

- At the Santa Monica Pier, BMPs included bird netting, trash covers, homeless enforcement, prevention of pier washing, repair of leaking sewers, major dry weather storm drain diversion (Santa Monica Urban Runoff Recycling Facility [SMURRF]) and potable offset use, and human source marker sampling to confirm that human fecal sources were indeed removed (Gold, 2012). However, despite these significant efforts which cost approximately $14M to treat runoff from 5,000 acres, beach bacteria concentrations improved but TMDL exceedances persist.

- At Inner Cabrillo Beach in the Port of Los Angeles, BMPs and studies included hydrodynamic modeling, circulation enhancement field investigations, bird deterrent testing, bird exclusion structures, dry weather storm drain diversions, sewer inspection and groundwater sampling, sewer repair, eelgrass sampling (eelgrass was found to be a natural source of indicator bacteria), human source marker sampling, and beach sand replacement (since beach sands were found to be a reservoir for indicator bacteria) and storm drain outfall exclusion. Again, despite over $30 million dollars spent at this one beach, TMDL WLA exceedances persist (Port of Los Angeles, 2006).

- In the Aliso Creek watershed in Orange County, dry weather storm drain discharges were treated with disinfection; despite complete bacteria removal at the treatment system outlet, bacteria concentrations in the concrete channel shortly downstream (with no other discharges entering the channel) rebounded as a result of uncontrollable regrowth) (Andersen, 2005).

- At Ramirez Canyon in Malibu, where dry weather flows are disinfected at the beach by a system costing approximately $1 million dollars, surf zone water quality continues to exceed TMDL WLAs.

Perhaps most importantly, all the focused source control and treatment case studies described here focused on dry weather only; wet weather compliance costs would completely eclipse these dry weather compliance costs due to the orders of magnitude greater treatment flow rates.

OTHER ENVIRONMENTAL GOALS OFTEN CONFLICT WITH TMDL COMPLIANCE

There are also significant trade-offs between bacteria control measures and environmental concerns. For example, in-stream diversions often inhibit fish passage and impact downstream baseflow and habitat needs. In coastal environments, while shoreline wrack has been shown to contribute natural sources of bacteria, wrack itself is a valuable part of the beach ecosystem, and its removal is potentially problematic and often prohibited by resource agencies. Where bird feces is a significant bacteria source (like at many lagoons and beaches), resource agency requirements often restrict the use of bird deterrents because of needs to protect special status species such as the brown pelican. UV treatment of urban creeks also results in the sterilization of natural and beneficial aquatic microbes. Looking at the big picture, while massive treatment projects such as disinfection systems could be more effective at treating bacteria, such processes require significant long-term power consumption and do not necessarily align with the "sustainability" goals of regulators, municipalities, and the public (and in some cases, like the $12M Santa Monica Urban Runoff Facility, when the treatment system's water demand is not met by urban runoff, potable water must be supplied, resulting is a highly wasteful outcome). Lastly, some regional BMP footprints rely on recreational spaces for retention during wet weather and this land becomes unavailable for the intended public uses for a longer period than would have been the case otherwise. In summary, environmental constraints may be hindrances to projects that could reduce bacteria levels.

Conclusions

We appreciate the San Diego Regional Board's review of the above concerns and welcome any feedback. Our main concerns with the San Diego Bacteria TMDL are the lack of scientific justification and the infeasibility of achieving compliance. We strongly value the recreational uses of our water bodies; therefore, we are seeking revisions to the TMDL that would better reflect public health protection and the realities of technological and environmental constraints. To support these ends, the stakeholders have recently or are currently invested in the following significant efforts to improve the TMDL:

- The MS4 co-permittees have recently worked with SCCWRP to study the effects of Enterococci regrowth and natural bacteria sources at Moonlight State Beach in Encinitas and Rock Pile Beach in La Jolla (Griffith and Ferguson, 2012).
- The MS4 co-permittees are working with SCCWRP on an ongoing reference study evaluating both local reference watersheds and the impact of the wet day definition.
- The County and other San Diego MS4 co-permittees participated in the November 28-29 State of the Science Workshop to explore the current state of bacteria and science through the collaboration of experts, stakeholders, and regulators.
- The County is embarking upon significant bacteria source investigation work in the San Luis Rey, San Diego River, and San Dieguito River Watersheds.
- Other San Diego municipalities are considering QMRA test cases, including a proposal for funding through the Clean Beaches Initiative (CBI).

Geosyntec consultants

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COMPARISON OF COST OF ON-SITE RETENTION VS. TREATMENT AND RELEASE OF 85TH PERCENTILE STORM WATER RUNOFF

Job Number 16289-Z

November 29, 2012
Revised: January 8, 2013

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COMPARISON OF COST OF ON-SITE RETENTION VS. TREATMENT

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January 8, 2013

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COMPARISON OF COST OF ON-SITE RETENTION VS. TREATMENT AND RELEASE OF 85TH PERCENTILE STORM WATER RUNOFF
January 8, 2013

This paper presents the results of an investigation of the potential cost of on-site retention of 85th percentile storm water runoff in San Diego County pursuant to the anticipated future municipal storm water permit (Tentative Order No. R9-2013-0001) versus the current cost of treatment and release of storm water runoff under the current municipal storm water permit (Order No. R9-2007-0001). This study was funded by the County of San Diego.

Background

California Regional Water Quality Control Board San Diego Region (SDRWQCB) Order No. R9-2007-0001, the municipal storm water permit in effect today for San Diego County and Co-Permittees, places requirements for new development and redevelopment to implement low impact development (LID) practices and/or treatment of storm water runoff. Priority development projects (PDPs) must implement LID practices such as infiltration or bioretention to treat storm water runoff to the maximum extent practicable (MEP). When LID practices are shown to be infeasible, storm water runoff may be treated using conventional treatment methods such as extended detention or filtration. The treated storm water runoff can be released from the project site. See Provisions D.1.d.(4) and D.1.d.(6) of Order No. R9-2007-0001 for LID and treatment control BMP requirements for PDPs.

A new municipal storm water permit, SDRWQCB Tentative Order No. R9-2013-0001, is anticipated to be adopted in spring 2013. The new municipal storm water permit would require each PDP to implement LID BMPs that are designed to retain (i.e., intercept, store, infiltrate, evaporate, evapotranspire, or harvest and use) a design capture volume of storm water runoff. See Provision E.3.c.(1)(a) and Appendix F, page F-87 of Tentative Order No. R9-2013-0001. When site conditions preclude the use of infiltration practices to remove the design capture volume, as is often the case in San Diego County due to geologic constraints, another potential way to dispose of the captured storm water runoff is to use it on-site ("harvest and use"). The purpose of this paper is to compare the cost of treating and releasing storm water runoff pursuant to current requirements of Order No. R9-2007-0001 (storm water management practice "today") to the potential cost of harvest and use of storm water runoff under the requirements of Tentative Order No. R9-2013-0001 (storm water management practice "future").

Selection of Projects and Practices for Analysis

For the purpose of this study, sample projects and storm water management practices had to be selected. There are many factors to be considered when evaluating the impact of the changing regulations. Any of the following factors could influence the results of the cost analysis: project size, project type (new development or redevelopment), proposed land use, site condition (e.g., soil type, geology, topography, proximity to existing infrastructure), amount of rainfall, or other factors. Therefore, multiple projects were evaluated. A range of typical projects was found from the "APWA BMP Sizing Calculator Training" workshop presented on March 8, 2011. In early 2011,

Rick Engineering Company developed five example projects for the purpose of training engineers to use the San Diego BMP Sizing Calculator in the "APWA BMP Sizing Calculator Training" workshop. All of the five example projects were based on actual PDPs. For the APWA workshop, "snapshots" of portions of the PDPs were taken for simplified analysis, amounts of impervious and pervious area were tabulated, and details of project site characteristics that affect runoff such as soil type, rainfall basin, and slope were created to represent a range of conditions throughout San Diego County. Using these previously developed example projects provided an un-biased range of realistic projects. Exhibits of the five example projects are attached (Attachment 1). Note the facility sizes and orifice sizes shown on the attached exhibits are from the BMP Sizing Calculator results for hydromodification management from the APWA workshop and are not a part of this study.

Tables 1 and 2 present the project data for the five example projects. In general it will be assumed that all of the project area will be captured in the storm water management practice, including landscaping area. However, example project 5 includes such a significant amount of landscaping area (approximately 30.55 acres or 51%) that this project will be evaluated both with and without capturing the landscaping area. Example project "5" will capture all of the project area including landscaping, and example project "5a" is the same project but capturing only the impervious area.

Table 1
Example Project Data

Project	Description	Total Area (Acres)	Rain Gauge	Slope	Hydrologic Soil Group
1	New Linear Roadway	0.77	Oceanside	Flat	C
2	Residential	1.15	Oceanside	Moderate	D
3	Small Commercial	0.53	Lake Wohlford	Flat	B
4	Redevelopment (Apartment Complex)	0.29	Lindbergh Field	Flat	D
5	Large Commercial	59.59	Lake Wohlford	Flat	D
5a	Large Commercial (Capturing the Impervious Area Only)	59.59	Lake Wohlford	Flat	D

Table 2
Example Project Proposed Impervious Area, Landscape Area, and Post-Project Effective Impervious Area

Project	Description	Total Area (ft^2)	Proposed Impervious Area (ft^2)	Proposed Landscape Area (ft^2)	Post-Project Effective Impervious Area* (ft^2)
1	New Linear Roadway	33,452	28,366	5,086	28,875
2	Residential	49,886	29,525	20,361	31,561
3	Small Commercial	23,020	19,787	3,233	20,110
4	Redevelopment (Apartment Complex)	12,613	11,163	1,450	11,308
5	Large Commercial	2,595,606	1,264,901	1,330,705	1,397,972
5a	Large Commercial (Capturing the Impervious Area Only)	2,595,606	1,264,901	1,330,705 (not captured)	1,264,901

*Post-project Effective Impervious Area = (Proposed Impervious Area x 1.0) + (Proposed Landscape Area x 0.1), pursuant to the County of San Diego SUSMP dated January 8, 2011.

Post-project effective impervious area was calculated based on the method and runoff factors presented in the County of San Diego SUSMP dated January 8, 2011. The runoff factor for impervious area is 1.0. The runoff factor for landscape area is 0.1.

Stormwater Management Practice "Today"

There is a wide range of options available to satisfy the PDP LID and treatment control requirements of Order No. R9-2007-0001. In order to quantify the cost of requirements today, an appropriate LID or treatment control BMP must be selected. Bioretention was selected for this analysis because it would satisfy requirements for LID as well as provide a high level of treatment for most pollutants. Provided that land is available for a bioretention system (i.e., provided the bioretention system can fit into land already slated for project landscaping), it is also expected to be a relatively cost-effective practice, especially when long-term maintenance is considered.

Treatment-only bioretention facilities were sized for each example project using a sizing factor of 0.04 multiplied by the effective impervious area, pursuant to the County of San Diego SUSMP dated January 8, 2011. Table 3 presents the sizing of treatment-only bioretention facilities.

Table 3
Sizing of Bioretention Facilities

Project	Description	Post-Project Effective Impervious Area (ft^2)	Surface Area of Treatment-Only Bioretention Facility* (ft^2)
1	New Linear Roadway	28,875	1,155
2	Residential	31,561	1,262
3	Small Commercial	20,110	804
4	Redevelopment (Apartment Complex)	11,308	452
5	Large Commercial	1,397,972	55,919
5a	Large Commercial (Capturing the Impervious Area Only)	1,264,901	50,596
*Area of Treatment-Only Bioretention Facility = 0.04 x Post-Project Effective Impervious Area			

Stormwater Management Practice "Future"

It is anticipated that harvest and use of storm water will be the typical method for PDPs to satisfy the on-site retention requirement of Provision E.3.c.(1)(a) of Tentative Order No. R9-2013-0001. There are many ways to use harvested storm water. Some typical uses include irrigation, toilet flushing, and HVAC cooling. For the purpose of this study, it is assumed that the harvested storm water will be used for spray irrigation. All of the five example projects include landscaping on-site and will have a demand for irrigation water. However, this study does not establish a maximum holding time for the harvested storm water, size storage units to ensure collection of back to back storm events, or optimize the size of the storage unit based on irrigation demand. This study simply calculates the minimum design capture volume of storm water runoff pursuant to Provision E.3.c.(1)(a)(i) of Tentative Order No. R9-2013-0001. For the purpose of this study, the storm water harvesting system is assumed to include a pre-treatment unit to capture gross pollutants (for example inlet inserts or a hydrodynamic separator), an underground concrete vault for storage, a mechanical system for distribution that includes a pump, a treatment system consisting of fine filtration and ultraviolet disinfection, and a connection to a source of make-up water using a reduced pressure zone (RPZ) valve. Make-up water is the municipal water supply that will augment the harvested storm water supply to fulfill the total water demand (in this case, the total irrigation demand).

The minimum volume of the storm water runoff harvesting facility was calculated based on Provision E.3.c.(1)(a)(i) of Tentative Order No. R9-2013-0001, the volume of storm water produced from a 24-hour 85th percentile storm event. The 85th percentile rainfall was determined from the June 2003 *San Diego County Hydrology Manual,* Appendix E, 85th Percentile Precipitation Isopluvial Map. Table 4 presents the sizing of storm water harvesting facilities (minimum on-site retention volume).

Table 4
Sizing of Storm Water Harvesting Facilities

Project	Description	85th Percentile Rainfall (inches)	Post-Project Effective Impervious Area (ft^2)	Minimum On-Site Retention Volume* (ft^3)	Minimum On-Site Retention Volume (gallons)
1	New Linear Roadway	0.70	28,875	1,684	12,600
2	Residential	0.70	31,561	1,841	13,772
3	Small Commercial	0.85	20,110	1,424	10,656
4	Redevelopment (Apartment Complex)	0.60	11,308	565	4,229
5	Large Commercial	0.85	1,397,972	99,023	740,743
5a	Large Commercial (Capturing the Impervious Area Only)	0.85	1,264,901	89,597	670,233

*Minimum On-Site Retention Volume (ft^3) = (85th Percentile Rainfall / 12 inches per foot) x Post-Project Effective Impervious Area
**1 cubic foot is approximately 7.48 gallons

Costs

Rick Engineering Company estimated the cost of a typical treatment-only bioretention system in San Diego (based on a detail consistent with the County of San Diego SUSMP) at approximately $9.00 per square foot for media, liners, subdrains, lansdcaping, and installation. Based on the California Storm Water Quality Association New Development and Redevelopment Handbook Fact Sheet TC-32 Bioretention, construction costs for bioretention for commercial, industrial, or institutional sites can range from $10.00 to $40.00 per square foot, based on the need for control structures, curbing, storm drains, and underdrains. All of the example projects in this study would be considered to be "commercial-sized" projects. The low range cost for a commercial scale bioretention system was selected from TC-32. The following was used to estimate the cost for the treatment-only bioretention systems: $10.00 per square foot of bioretention area.

The cost of a rainwater harvesting system includes the cost of the pre-treatment unit (for example inlet inserts or a hydrodynamic separator), the storage vault, and the mechanical system for distribution. Pre-treatment costs were estimated to be $1,000.00 per inlet insert or roof drain insert (example projects 1 and 3 would each require 1 inlet insert and example project 4 would require 4 roof drain inserts), $15,000.00 for a small hydrodynamic separator for example project 2, or $40,000.00 for a large hydrodynamic separator for example project 5. The cost of the storage vault was estimated to be $8.50 per cubic foot for a modular concrete underground storage system. The

mechanical system includes a pump, a treatment system consisting of fine filtration and ultraviolet disinfection, and a connection to a source of make-up water. The total mechanical system cost was estimated to be $45,000.00 for the small projects (example projects 1 through 4, which will be storing and processing an average of 10,000 gallons of runoff), and $110,000 for the large project (example project 5, which will be processing approximately 700,000 gallons of runoff). The sum of the pre-treatment, storage, and mechanical system costs for each example project is presented in Table 5.

Table 5
Sum of Estimated Costs for Rainwater Harvesting Systems

Project	Description	Total Area (Acres)	Estimated Cost for Pre-Treatment	Estimated Cost for Runoff Storage	Estimated Cost for Mechanical System	Total Estimated Cost
1	New Linear Roadway	0.77	$1,000	$14,317	$45,000	$60,317
2	Residential	1.15	$15,000	$15,649	$45,000	$75,649
3	Small Commercial	0.53	$1,000	$12,108	$45,000	$58,108
4	Redevelopment (Apartment Complex)	0.29	$4,000	$4,806	$45,000	$53,806
5	Large Commercial	59.59	$40,000	$841,695	$110,000	$991,695
5a	Large Commercial (Capturing the Impervious Area Only)	(29.04 acres new impervious area)	$40,000	$761,576	$110,000	$911,576

Cost Comparison

Table 6 presents the estimated costs for on-site retention (harvest and use) of storm water runoff vs. treatment (treatment-only bioretention) and release of storm water runoff.

Table 6
Comparison of Costs for Harvest and Use of Storm Water Runoff vs. Treatment and Release of Storm Water Runoff

Project	Description	Total Area (Acres)	Estimated Cost for Treatment-Only Bioretention	Estimated Cost for Harvest and Use System	Ratio of Harvest and Use Cost to Treatment-Only Bioretention Cost
1	New Linear Roadway	0.77	$11,550	$60,317	5
2	Residential	1.15	$12,624	$75,649	6
3	Small Commercial	0.53	$8,044	$58,108	7
4	Redevelopment (Apartment Complex)	0.29	$4,523	$53,806	12
5	Large Commercial	59.59	$559,189	$991,695	2
5a	Large Commercial (Capturing the Impervious Area Only)	(29.04 acres new impervious area)	$505,960	$911,576	2

The results in Table 5 show that for example projects 1 through 4 ranging in size from 0.29 to 1.15 acres, the cost to harvest and use storm water runoff is approximately 5 to 12 times the cost of treatment-only bioretention and release of storm water runoff under the requirements of Order No. R9-2007-0001. For the larger project, example project 5, the cost of harvest and use is approximately twice the cost of treatment and release of runoff, regardless of whether the project design will capture runoff from all of the project area or from only the impervious area.

The following other factors may be significant to the cost or benefit of harvest and use of storm water runoff: the value of land not used for bioretention, the cost of electricity to operate the system, the value of the harvested water, system maintenance costs, possible enhancement to property value from "green" infrastructure, or other factors. These factors can only be quantified for systems that are in place and operating, and are not a part of this study.

Impact With Hydromodification Management

All of the five example projects were initially developed for the purpose of training engineers to use the San Diego BMP Sizing Calculator, which is a tool for sizing hydromodification management facilities pursuant to the "Final Hydromodification Management Plan" for County of San Diego dated March 2011. This study used the same previously developed example projects to evaluate treatment-only storm water management facilities, and the cost analysis in this study does not factor in the facility sizes potentially needed to meet hydromodification management criteria. In all cases, the size of the hydromodification management facility would be much larger than the size of the potential harvest and use facility. It can be expected that for PDPs subject to hydromodification management, the hydromodification management requirements will determine the design of storm water management facilities, and the impact of the future on-site retention requirements may be less significant.

Conclusion

Based on the costs estimated for this study, the cost of storm water management features for new development and redevelopment priority development projects to satisfy the requirements of the future municipal storm water permit, Tentative Order No. R9-2013-0001, may be two to twelve the cost of storm water management practices to satisfy the requirements of the current municipal storm water permit, Order No. R9-2007-0001. It is important to note that all new development and redevelopment projects are unique, and may or may not implement the specific storm water management features evaluated in this study, as there are many practices available to meet the current or future municipal permit requirements.

Attachment 1
Exhibits of Five Example Projects

New Linear Roadway
Residential
Small Commercial
Redevelopment (Apartment Complex)
Large Commercial

APWA BMP SIZING CALCULATOR TRAINING
EXAMPLE #1 ~ NEW LINEAR ROADWAY
EXHIBIT 1 (SHEET 1 OF 2)

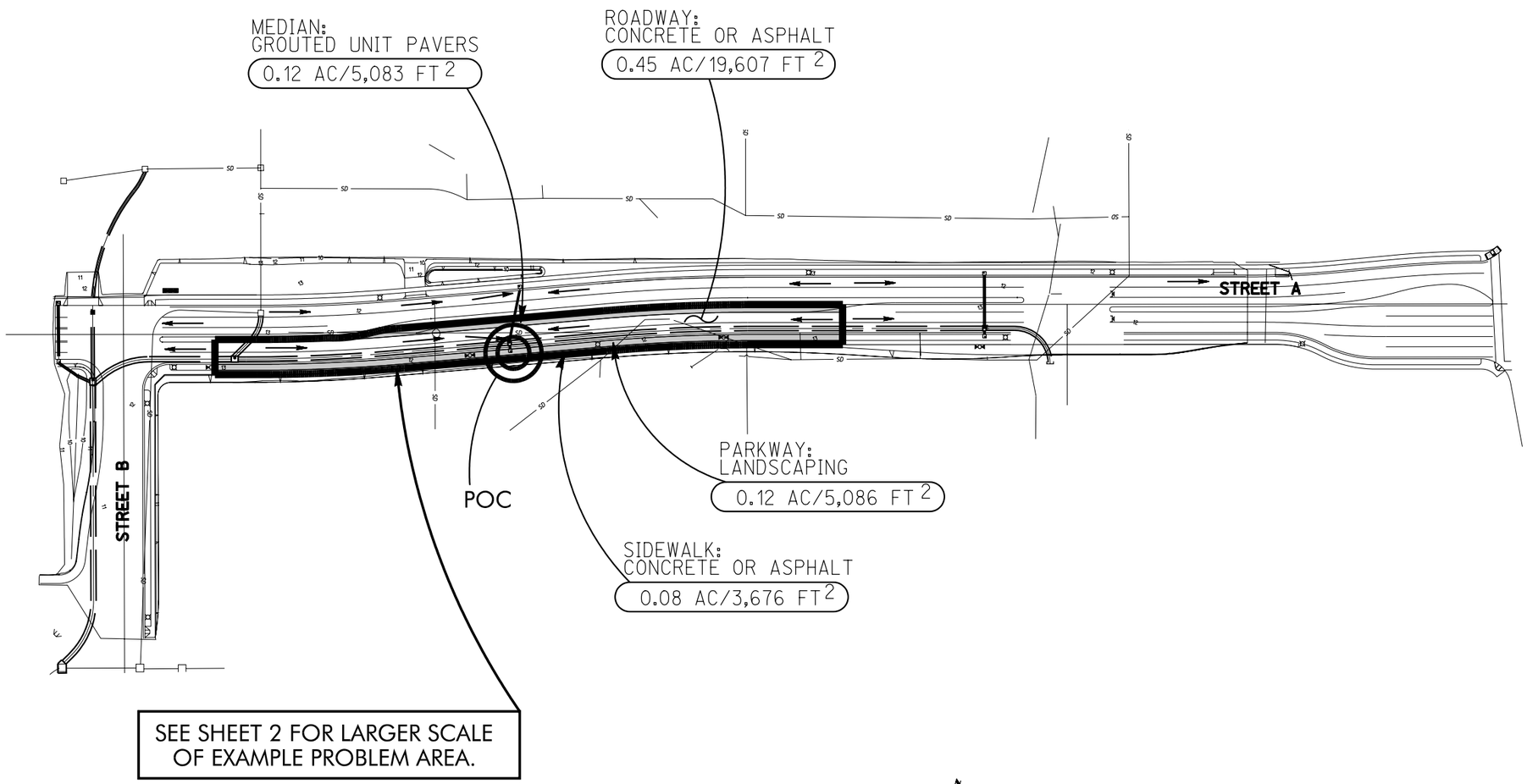

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GRAPHIC SCALE 1"= 150'

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APWA BMP SIZING CALCULATOR TRAINING
EXAMPLE #1 ~ NEW LINEAR ROADWAY
EXHIBIT 1 (SHEET 2 OF 2)

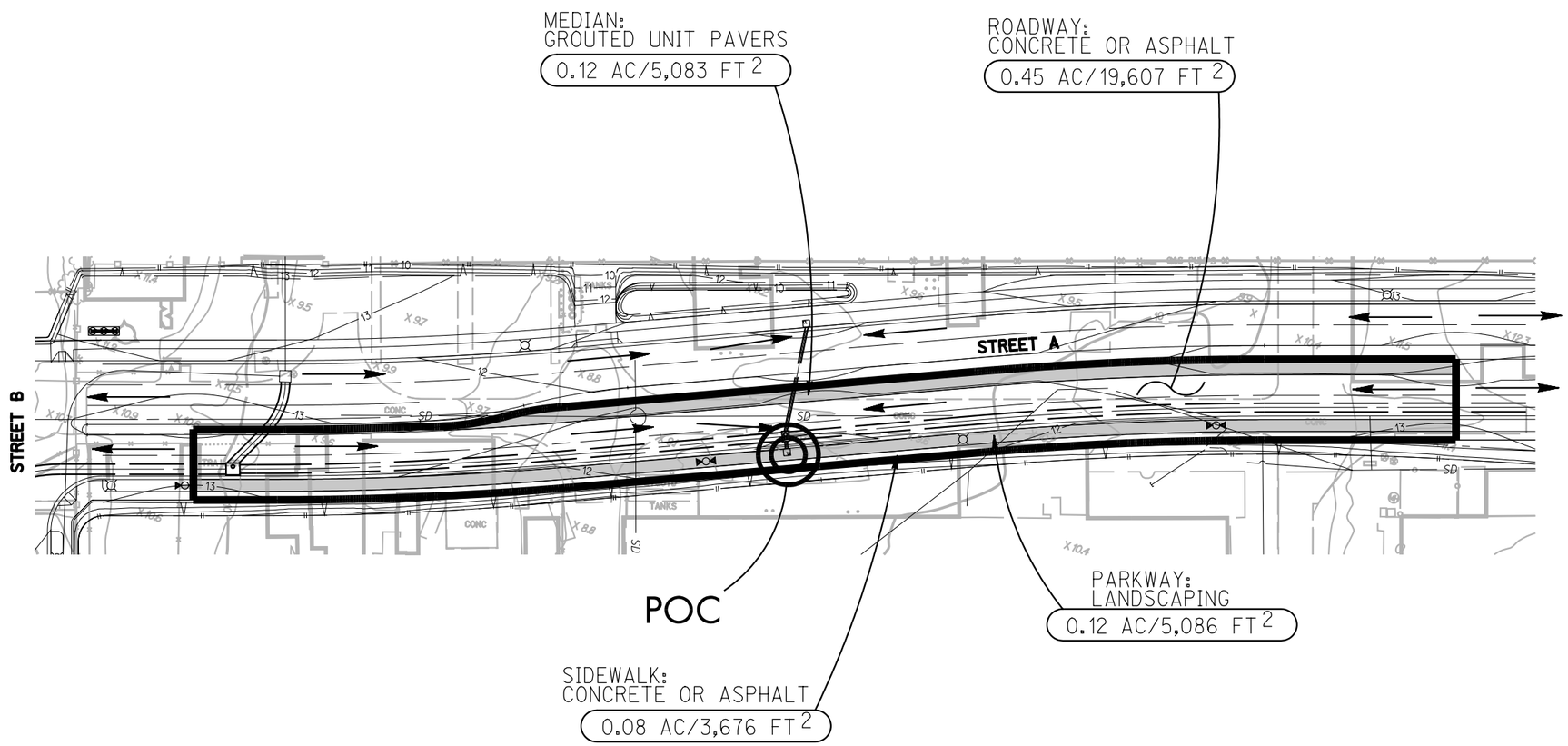

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EXAMPLE # 1 ~ NEW LINEAR ROADWAY

EXAMPLE INPUT DATA

- ☐ DESIGN GOAL: TREATMENT + FLOW CONTROL
- ☐ RAINFALL BASIN: OCEANSIDE
- ☐ POINT OF COMPLIANCE (POC): SUMP INLET ON STREET A
- ☐ DRAINAGE SOIL (HYDROLOGIC SOIL TYPE): TYPE C
- ☐ POST SURFACE: VARIES (SEE EXHIBIT)
- ☐ PRE-PROJECT COVER: PERVIOUS
- ☐ PRE-PROJECT SLOPE: 2%

EXAMPLE PROBLEM

SCENARIO 1:

DESIGN BIORETENTION BMP FOR PROPOSED PROJECT SURFACE AS SHOWN ON EXHIBIT.

ANSWER: AREA 3,748.8 FT^2
V_1 3,123.1 FT^3
V_2 2,249.3 FT^3
ORIFICE 0.5 IN

SCENARIO 2:

CHANGE BIORETENTION BMP TO FLOW-THROUGH PLANTER BMP.

ANSWER: AREA 5,479.1 FT^2
V_1 4,565.0 FT^3
V_2 3,287.4 FT^3
ORIFICE 0.5 IN

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APWA BMP SIZING CALCULATOR TRAINING
EXAMPLE #2 ~ RESIDENTIAL
EXHIBIT 1 (SHEET 1 OF 2)

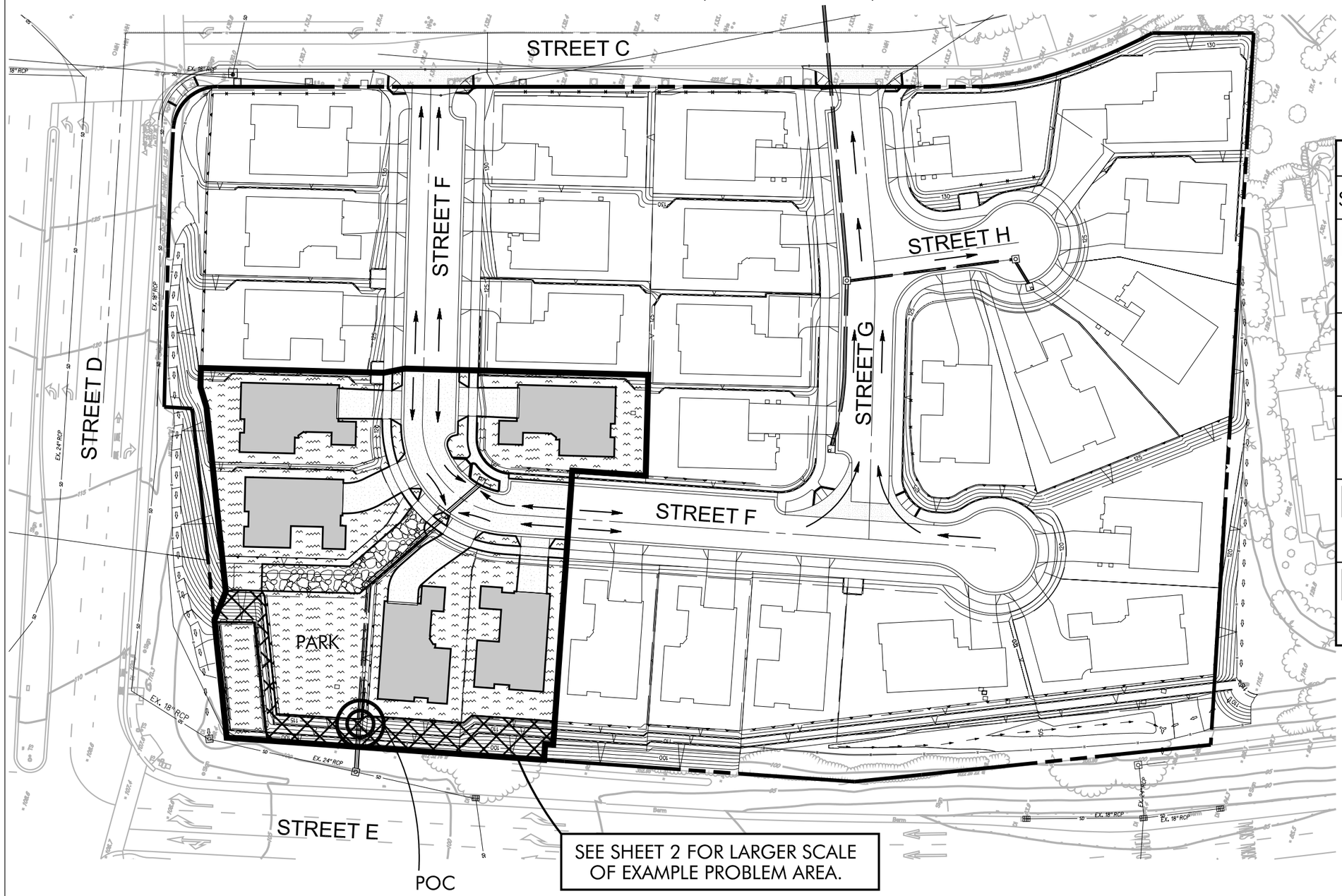

LEGEND		
SYMBOL	SURFACE	TOTAL AREA
	DRIVEWAYS, SIDEWALKS AND ROADWAY: CONCRETE OR ASPHALT	0.19 AC/8,194 FT^2
	ROOFS: ROOFS	0.45 AC/19,785 FT^2
	MAINTENANCE ACCESS: CRUSHED AGGREGATE	0.03 AC/1,546 FT^2
	LAWNS, PARK: LANDSCAPING	0.47 AC/20,361 FT^2
	SLOPES: LANDSCAPING (SELF-TREATING)	0.08 AC/3,699 FT^2

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APWA BMP SIZING CALCULATOR TRAINING
EXAMPLE #2 ~ RESIDENTIAL
EXHIBIT 1 (SHEET 2 OF 2)

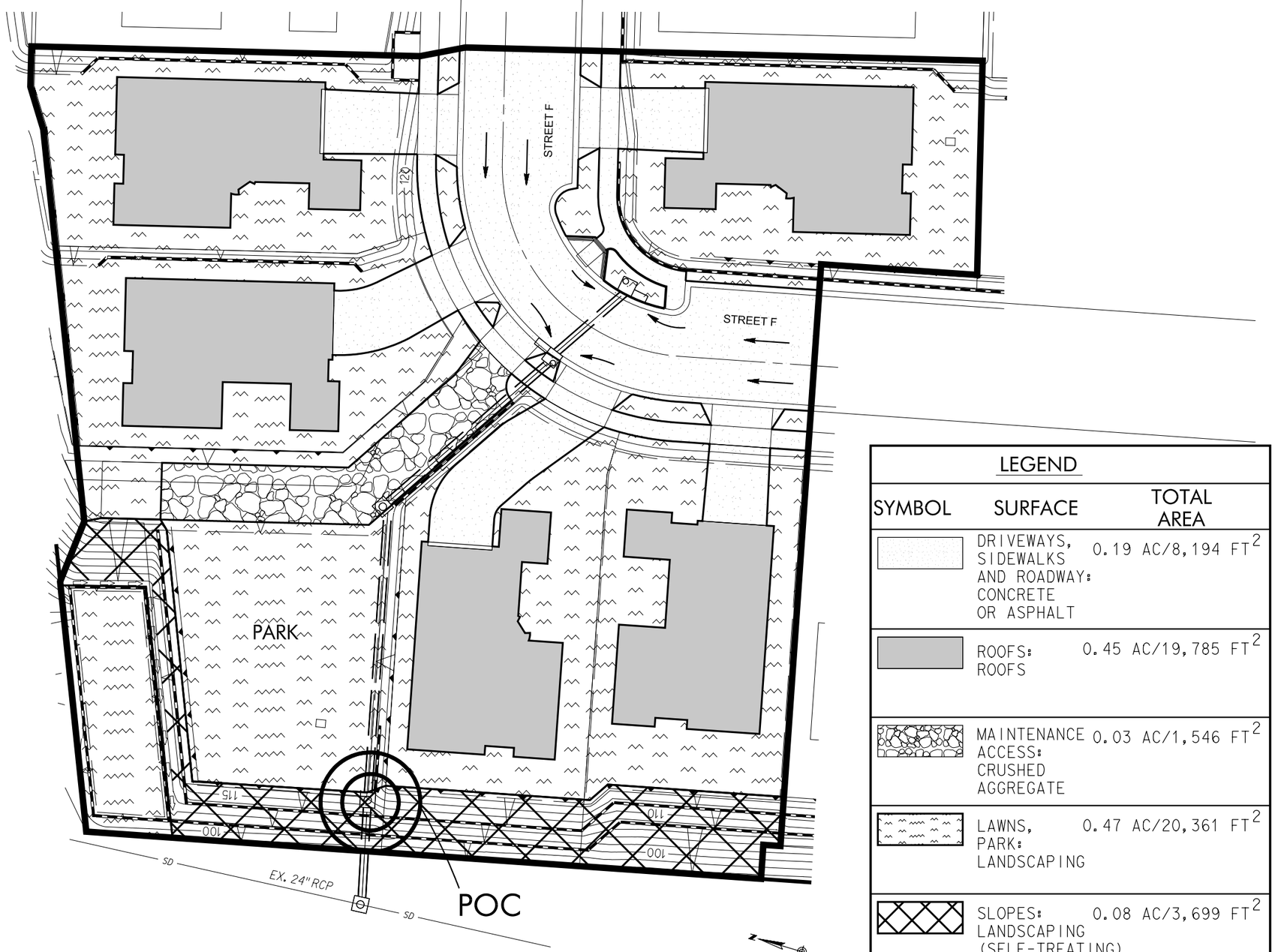

LEGEND

SYMBOL	SURFACE	TOTAL AREA
	DRIVEWAYS, SIDEWALKS AND ROADWAY: CONCRETE OR ASPHALT	0.19 AC/8,194 FT^2
	ROOFS: ROOFS	0.45 AC/19,785 FT^2
	MAINTENANCE ACCESS: CRUSHED AGGREGATE	0.03 AC/1,546 FT^2
	LAWNS, PARK: LANDSCAPING	0.47 AC/20,361 FT^2
	SLOPES: LANDSCAPING (SELF-TREATING)	0.08 AC/3,699 FT^2

EXAMPLE #2 ~ RESIDENTIAL

EXAMPLE INPUT DATA

- ☐ DESIGN GOAL: TREATMENT + FLOW CONTROL
- ☐ RAINFALL BASIN: OCEANSIDE
- ☐ POINT OF COMPLIANCE (POC): OUTLET TO STREET E
- ☐ DRAINAGE SOIL (HYDROLOGIC SOIL TYPE): TYPE D
- ☐ POST SURFACE: VARIES (SEE EXHIBIT)
- ☐ PRE-PROJECT COVER: PERVIOUS
- ☐ PRE-PROJECT SLOPE: 7%

EXAMPLE PROBLEM

SCENARIO 1:

DESIGN CISTERN PLUS BIORETENTION BMP FOR PROJECT SURFACES AS SHOWN ON EXHIBIT.

ANSWER: CISTERN VOLUME 6,011.4 FT^3

BIORETENTION AREA 601.1 FT^2

ORIFICE 0.6 IN

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APWA BMP SIZING CALCULATOR TRAINING
EXAMPLE #3 ~ SMALL COMMERCIAL
EXHIBIT 1 (SHEET 1 OF 2)

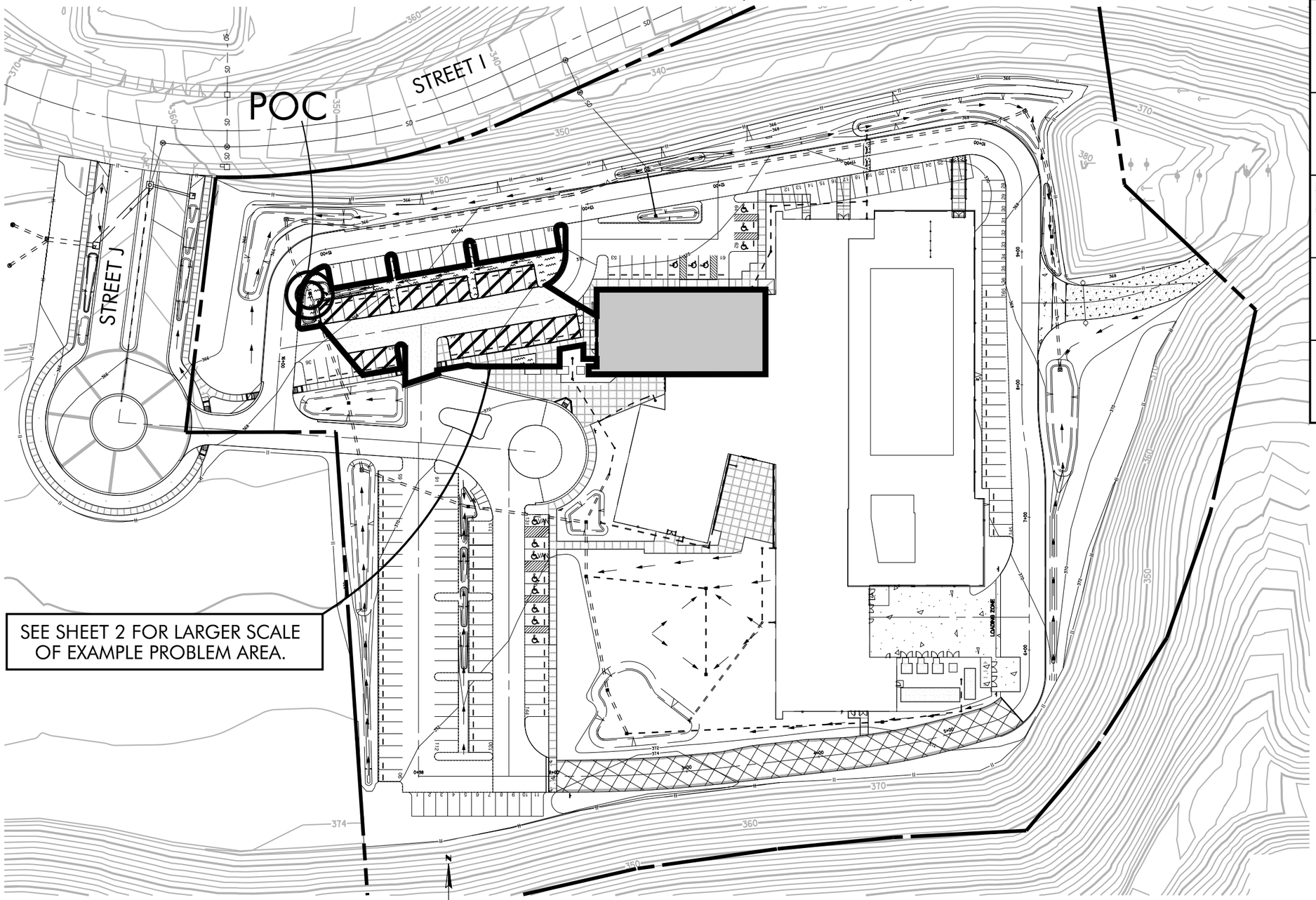

LEGEND

SYMBOL	SURFACE	TOTAL AREA
	DRIVE LANE: CONCRETE OR ASPHALT	0.11 AC/5,030 FT^2
	ROOFS: ROOFS	0.19 AC/8,126 FT^2
	PARKING STALLS: CONCRETE OR ASPHALT	0.12 AC/5,112 FT^2
	SIDEWALK: CONCRETE OR ASPHALT	0.03 AC/1,519 FT^2
	LANDSCAPING: LANDSCAPING	0.07 AC/3,233 FT^2

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APWA BMP SIZING CALCULATOR TRAINING
EXAMPLE #3 ~ SMALL COMMERCIAL
EXHIBIT 1 (SHEET 2 OF 2)

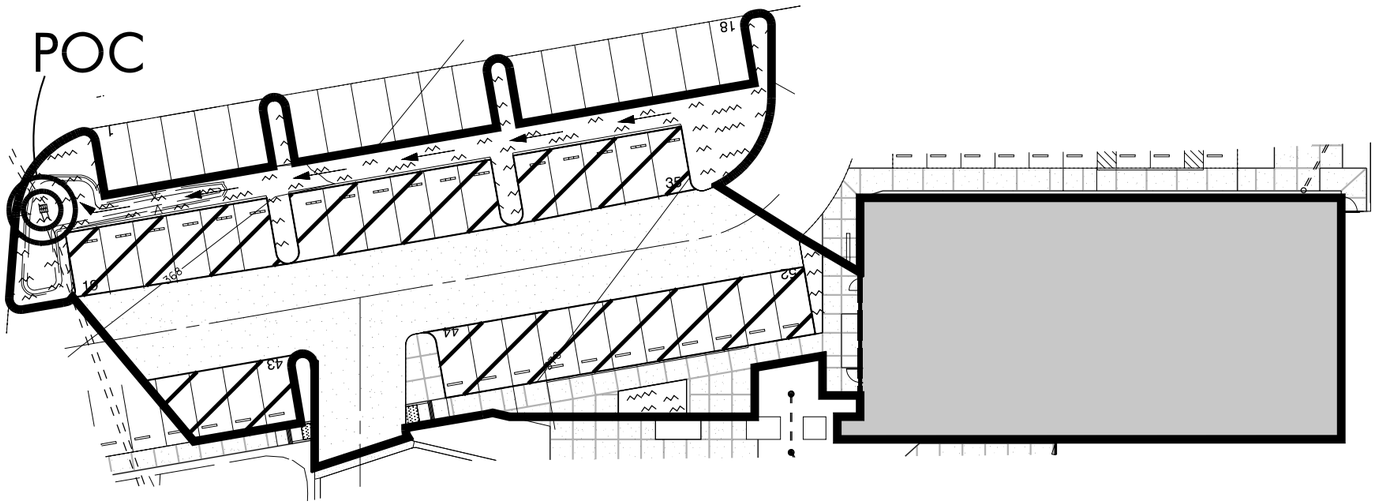

EXAMPLE # 3 ~ SMALL COMMERCIAL

EXAMPLE INPUT DATA

- ☐ DESIGN GOAL: TREATMENT + FLOW CONTROL
- ☐ RAINFALL BASIN: LAKE WOHLFORD
- ☐ POINT OF COMPLIANCE (POC): NORTHWEST CORNER OF PARKING ISLAND
- ☐ DRAINAGE SOIL (HYDROLOGIC SOIL TYPE): TYPE B
- ☐ POST SURFACE: VARIES (SEE EXHIBIT)
- ☐ PRE-PROJECT COVER: PERVIOUS
- ☐ PRE-PROJECT SLOPE: 1%

EXAMPLE PROBLEM

SCENARIO 1:

DESIGN DRY WELL BMP FOR PROPOSED PROJECT SURFACES AS SHOWN ON EXHIBIT.

ANSWER: AREA 1,542.8 FT^2

VOLUME 4,011.3 FT^3

SCENARIO 2:

CHANGE SURFACE OF PARKING STALLS FROM CONCRETE OR ASPHALT TO SOLID UNIT PAVERS ON GRANULAR AND RE-SIZE DRY WELL BMP.

ANSWER: AREA 1,218.7 FT^2

VOLUME 3,168.7 FT^3

LEGEND

SYMBOL	SURFACE	TOTAL AREA
	DRIVE LANE: CONCRETE OR ASPHALT	0.11 AC/5,030 FT^2
	ROOFS: ROOFS	0.19 AC/8,126 FT^2
	PARKING STALLS: CONCRETE OR ASPHALT	0.12 AC/5,112 FT^2
	SIDEWALK: CONCRETE OR ASPHALT	0.03 AC/1,519 FT^2
	LANDSCAPING: LANDSCAPING	0.07 AC/3,233 FT^2

N

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APWA BMP SIZING CALCULATOR TRAINING
EXAMPLE #4 ~ REDEVELOPMENT
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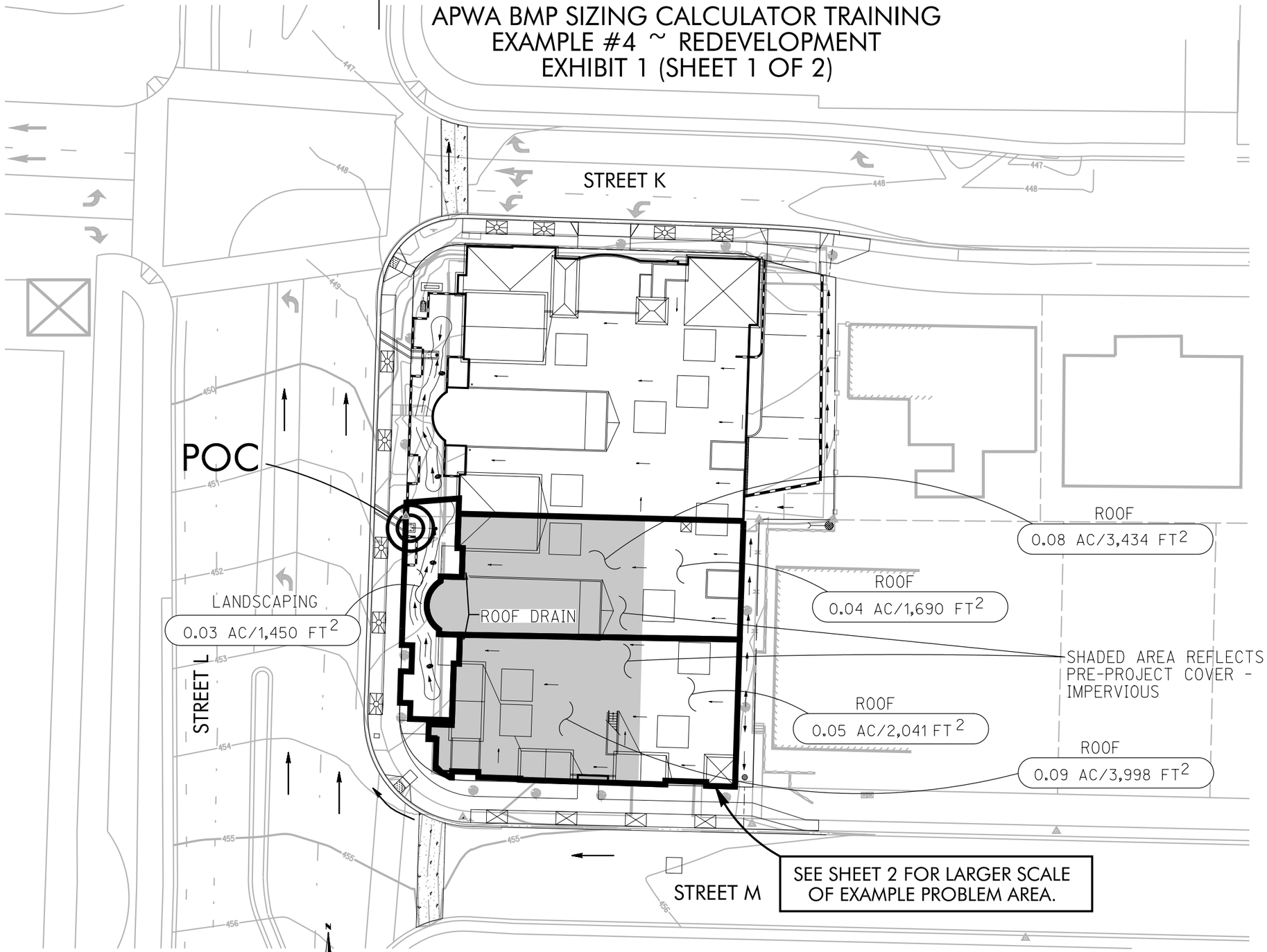

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03-MAR-2011 09:52

APWA BMP SIZING CALCULATOR TRAINING
EXAMPLE #4 ~ REDEVELOPMENT
EXHIBIT 1 (SHEET 2 OF 2)

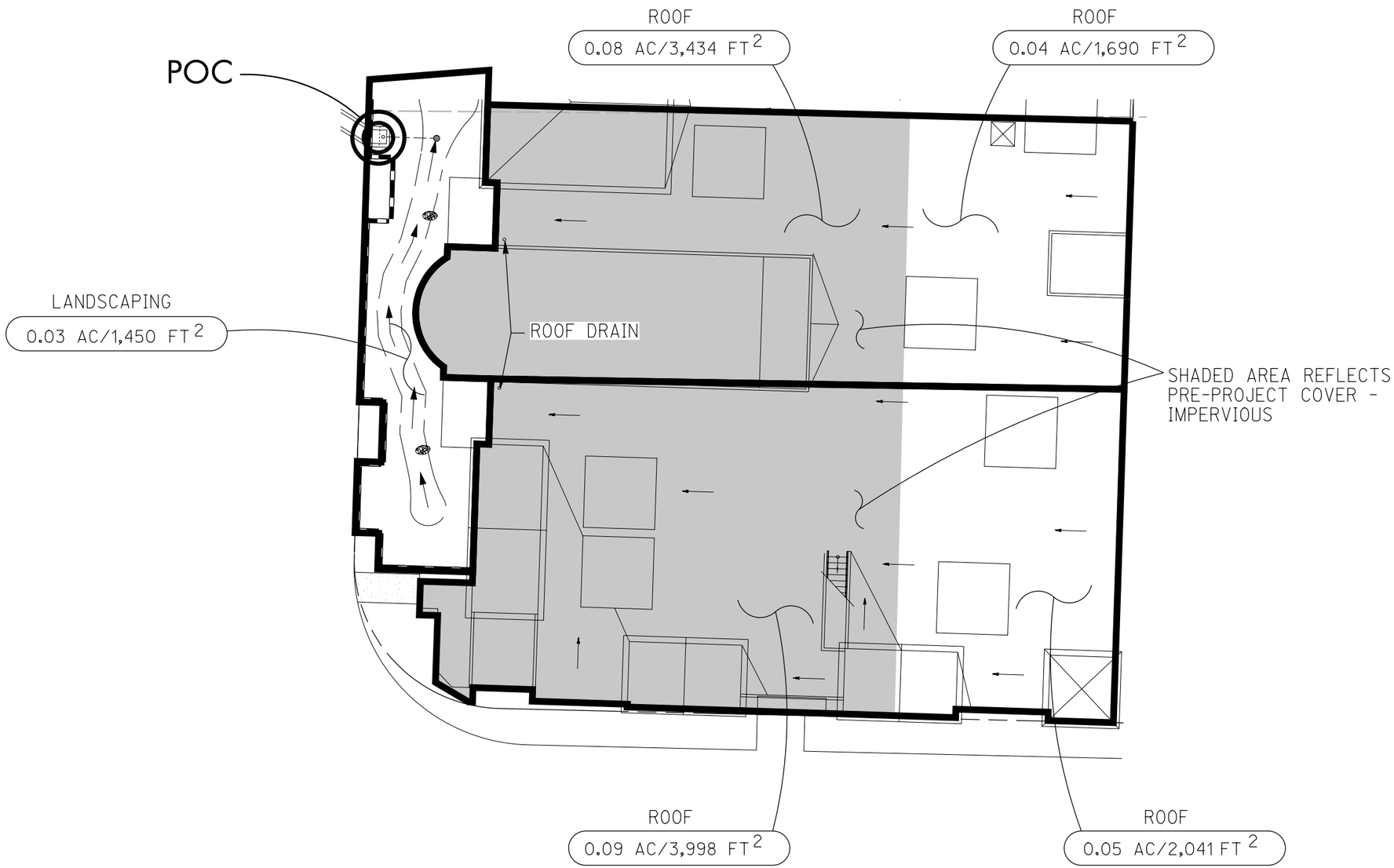

N

20 10 0 20 40 60

GRAPHIC SCALE 1"= 20'

EXAMPLE # 4 ~ REDEVELOPMENT

EXAMPLE INPUT DATA

- ☐ DESIGN GOAL: TREATMENT + FLOW CONTROL
- ☐ RAINFALL BASIN: LINDBERGH FIELD
- ☐ POINT OF COMPLIANCE (POC): OUTLET TO STREET L
- ☐ DRAINAGE SOIL (HYDROLOGIC SOIL TYPE): TYPE D
- ☐ POST SURFACE: VARIES (SEE EXHIBIT)
- ☐ PRE-PROJECT COVER: PERVIOUS EXCEPT SHADED AREA - IMPERVIOUS (SEE EXHIBIT)
- ☐ PRE-PROJECT SLOPE: 1%

EXAMPLE PROBLEM

SCENARIO 1:

DESIGN BIORETENTION PLUS VAULT BMP FOR PROPOSED PROJECT SURFACES AS SHOWN ON EXHIBIT.

ANSWER: AREA 162.0 FT^2

V_1 1,053.3 FT^3

ORIFICE 0.4 IN

SCENARIO 2:

ASSUME THIS IS NEW DEVELOPMENT AND ALL PRE-PROJECT COVER IS PERVIOUS.

DESIGN BIORETENTION PLUS VAULT BMP FOR PROPOSED PROJECT SURFACES AS SHOWN ON EXHIBIT.

ANSWER: AREA 458.2 FT^2

V_1 2,978.7 FT^3

ORIFICE 0.1 IN

RICK ENGINEERING COMPANY
5620 FRIARS ROAD
SAN DIEGO, CA 92110
619.291.0707
(FAX)619.291.4165

MARCH 8, 2011

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04-MAR-2011 18:25

APWA BMP SIZING CALCULATOR TRAINING
EXAMPLE #5 ~ LARGE COMMERCIAL
EXHIBIT 1 (SHEET 1 OF 2)

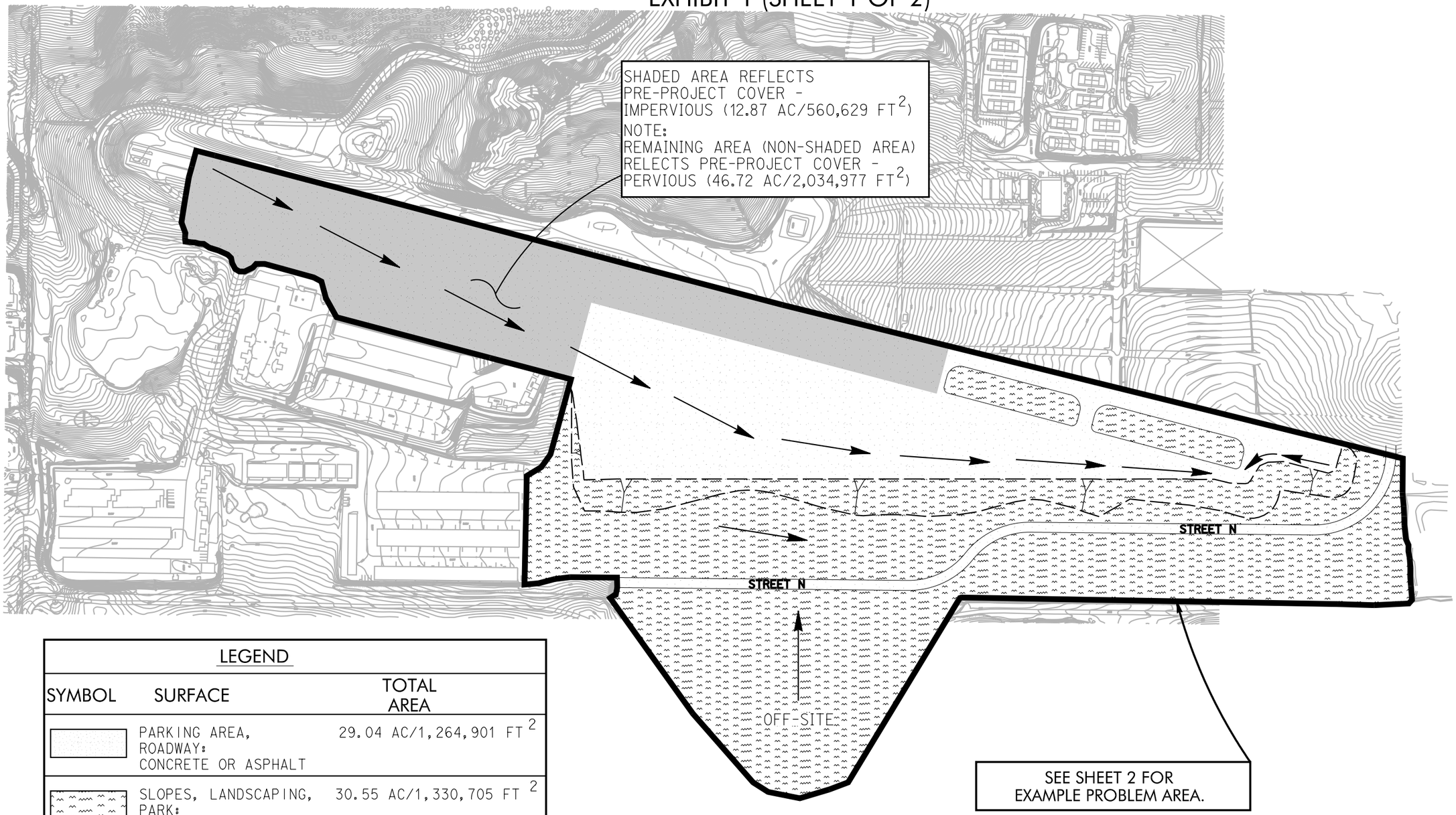

LEGEND

SYMBOL	SURFACE	TOTAL AREA
	PARKING AREA, ROADWAY: CONCRETE OR ASPHALT	29.04 AC/1,264,901 FT^2
	SLOPES, LANDSCAPING, PARK: LANDSCAPING	30.55 AC/1,330,705 FT^2

RICK ENGINEERING COMPANY
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SAN DIEGO, CA 92110
619.291.0707
(FAX)619.291.4165

300 150 0 300 600 900

GRAPHIC SCALE 1"= 300'

MARCH 8, 2011

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04-MAR-2011 19:32

APWA BMP SIZING CALCULATOR TRAINING
EXAMPLE #5 ~ LARGE COMMERCIAL
EXHIBIT 1 (SHEET 2 OF 2)

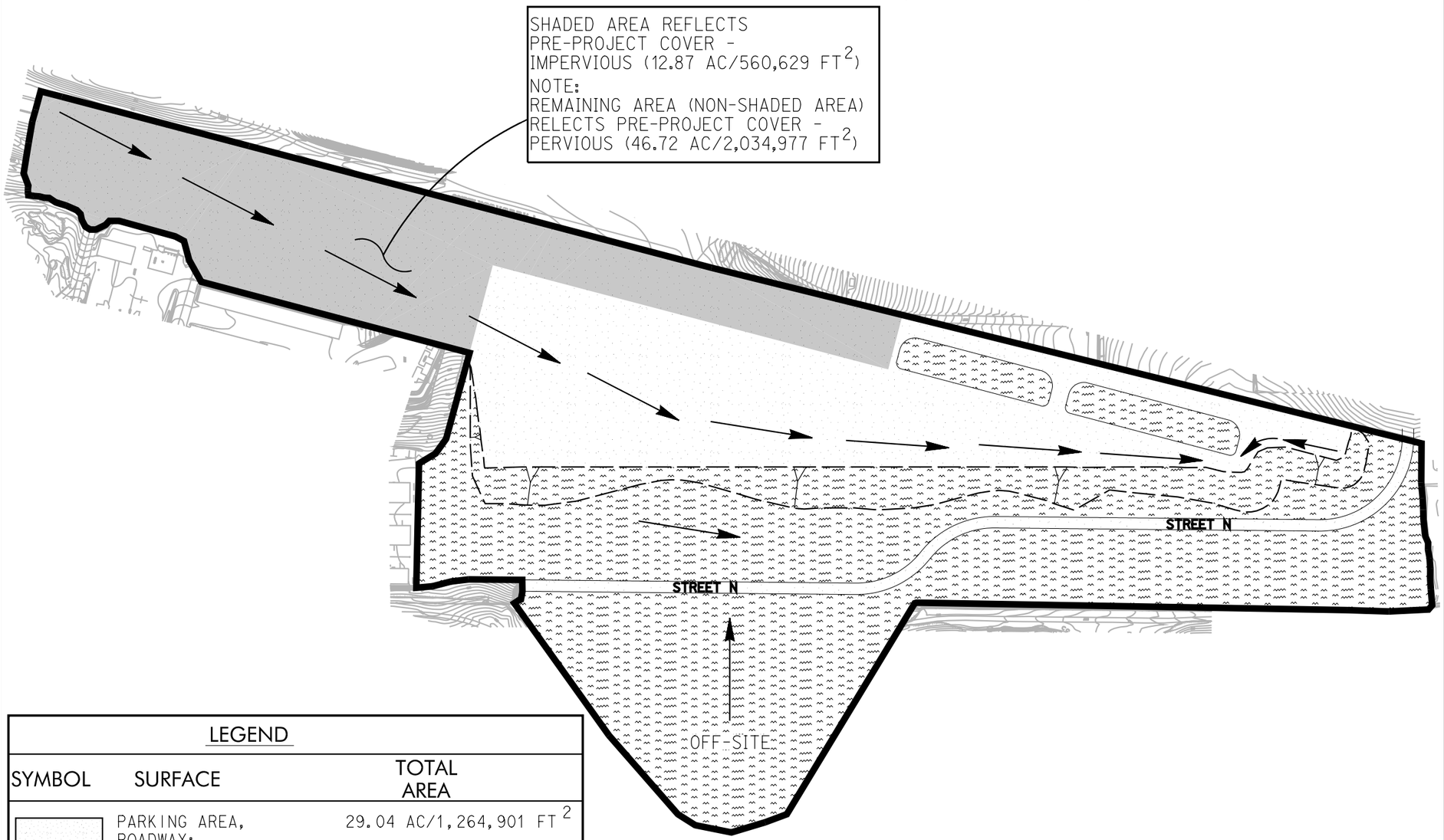

LEGEND

SYMBOL	SURFACE	TOTAL AREA
	PARKING AREA, ROADWAY: CONCRETE OR ASPHALT	29.04 AC/1,264,901 FT^2
	SLOPES, LANDSCAPING, PARK: LANDSCAPING	30.55 AC/1,330,705 FT^2

300 150 0 300 600 900

GRAPHIC SCALE 1"= 300'

EXAMPLE # 5 ~ LARGE COMMERCIAL

EXAMPLE INPUT DATA

- ☐ DESIGN GOAL: TREATMENT + FLOW CONTROL
- ☐ RAINFALL BASIN: LAKE WOHLFORD
- ☐ POINT OF COMPLIANCE (POC): SOUTHWEST CORNER OF SITE
- ☐ DRAINAGE SOIL (HYDRLOGIC SOIL TYPE): TYPE D
- ☐ POST-PROJECT COVER: VARIES (SEE EXHIBIT)
- ☐ PRE-PROJECT COVER: PERVIOUS EXCEPT SHADED AREA - IMPERVIOUS (SEE EXHIBIT)
- ☐ PRE-PROJECT SLOPE: 3%

EXAMPLE PROBLEM

SCENARIO 1:

DESIGN POND BMP FOR PROPOSED PROJECT SURFACES AS SHOWN ON EXHIBIT.

POND DIMESNIONS (INPUT DATA):

SIDE SLOPE 1 (H:1)	3.00	
SIDE SLOPE 2 (H:1)	3.00	
DEPTH	5.0	FT
LOWER ORIFICE INVERT	0.00	FT
UPPER ORIFICE INVERT	3.0	FT
WEIR INVERT	5.0	FT
WEIR LENGTH	0.0	FT

ANSWER:

LOWER MAX. ORIFICE SIZE	5.0	IN
UPPER MAX. ORIFICE SIZE	28.0	IN
TOP AREA	75,596	FT^2
BOTTOM AREA	60,000	FT^2
VOLUME	338,992.3	FT^3
DRAWDOWN TIME	74.0	HRS
PERCENT DRAINED (96 HRS)	100	%

RICK ENGINEERING COMPANY
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MARCH 8, 2011

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04-MAR-2011 19:37

County of San Diego

JACK MILLER
Director

DEPARTMENT OF ENVIRONMENTAL HEALTH
P.O. BOX 129261, SAN DIEGO, CA 92112-9261
Phone: (858) 505-6700 FAX (858) 505-6890
Phone: 1 (800) 253-9933
www.sdcdeh.org

ELIZABETH POZZEBON
Assistant Director

January 9, 2013

Mr. Wayne Chiu
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4353

NPDES PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION (REGIONAL MS4 PERMIT) (ORDER NO. R9-2013-0001)

Dear Mr. Chiu:

The County of San Diego, Department of Environmental Health (DEH) has reviewed the proposed draft Order No. R9-2013-001 (Regional MS4 Permit), and offers the following comments:

The existing San Diego MS4 Storm Water permit includes vector-related language which is intended to raise awareness of the potential unintended public health risk resulting from mosquito production in certain storm water management devices, the proposed draft permit does not. The removal of the vector-related language raises a significant concern, and we request that it be placed back into the proposed draft to protect public health. Please note that the San Diego Regional MS4 permit was the first in the United States to include vector-related language, and ultimately resulted in improved language adopted into storm water permits throughout the State.

The vector-related language included in the existing MS4 permit represents a compromise that allows water quality goals to be met while minimizing the risk to public health. It recognizes that mosquitoes cannot completely be eliminated given the current water quality requirements. It further serves a critical public health purpose of maintaining an awareness of the potential unintended public health threat created by mosquitoes, and emphasizes the importance of proper maintenance of storm water management and treatment structures to minimize the potential for mosquito production and ultimately the spread of mosquito-borne diseases including West Nile Virus (WNV).

WNV continues to be a threat to human health, and has proven to be unpredictable. 2012 was the second worst year for WNV in the United States and California since it was introduced 13 years ago. Approximately 5,400 human illnesses were confirmed nationwide, with 243 deaths as of December 12, 2012. In California there were 464 confirmed cases in 2012 with 18 deaths as of December 24, 2012.

It is critical that the State and the RWQCB continue to include vector-related language in storm water NPDES permits to protect public health. It would be counterproductive and counterintuitive to strive to improve the quality of water for the benefit of public and environmental health only to create environments highly conducive to mosquitoes that have the potential to severely impact human and animal health from mosquito-borne diseases.

The County of San Diego's DEH respectfully requests that the Board restore the vector-related language in the proposed draft MS4 Permit. The following is the existing permit language from Section D - Urban Runoff Management Systems, Subsection 2 - Development Planning:

> f. *If not properly designed or maintained, certain BMPs implemented or required by municipalities for urban runoff management may create a habitat for vectors (e.g. mosquitoes and rodents). However, proper BMP design and maintenance can prevent the creation of vector habitat. Nuisances and public health impacts resulting from vector breeding can be prevented with close collaboration and cooperative effort between municipalities and local vector control agencies and the State Department of Health Services during the development and implementation of urban runoff management programs.*

In addition, the County of San Diego's DEH requests that to facilitate inspection of new BMPs, the San Diego Regional Permit require that a list of new storm water management and treatment units be submitted by the Permittees to their respective vector control agencies. The County requests that the Permit include the following language recently added to the draft Fact Sheet for the Los Angeles MS4 permit:

> *Monitoring studies conducted by the California Department of Public Health (CDPH) have documented that mosquitoes opportunistically breed in structural storm water Best Management Practices (BMPs), particularly those that hold standing water for over 96 hours. Certain Low Impact Development (LID) site design measures that hold standing water such as rainwater capture systems may similarly produce mosquitoes. BMPs and LID design features should incorporate design, construction, and maintenance principles to promote drainage within 96 hours to minimize standing water available to mosquitoes. This Order requires regulated MS4 Permittees to coordinate with other agencies necessary to successfully implement the provisions of this Order. These agencies may include CDPH and local mosquito and vector control agencies on vector-related issues surrounding implementation of post-construction BMPs.*

Thank you for the opportunity to submit comments on the proposed draft language for the MS4 Permit. If you have questions regarding the above comments, please contact Rebecca Lafreniere, Chief, at (858) 694-3595 or by E-mail at Rebecca.Lafreniere@sdcounty.ca.gov.

Sincerely,

JACK MILLER, Director

cc: Richard Crompton, Director, County of San Diego, Department of Public Works
Rebecca Lafreniere, Chief, County of San Diego, Department of Environmental Health, Community Health Division

County of San Diego

HERMAN REDDICK
PROGRAM MANAGER
(858) 974-5813
FAX (858) 974-5928

PUBLIC SAFETY GROUP
SAN DIEGO COUNTY FIRE AUTHORITY
5510 Overland Ave, Suite 250, San Diego, CA 92123

KEN MILLER & RALPH STEINHOFF
FIRE SERVICES COORDINATOR
(858) 974-5920
FAX (858) 974-5928

January 4, 2013

Mr. Wayne Chiu, P.E.
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego California 92123-4340

Dear Mr. Chiu,

SUBJECT: Amendment of Draft Permit Language for Fire Fighting Activities – Tentative Order No.R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu

As a local authority affected by the most recent MS4 Draft Permit we feel compelled to provide written comments to ensure that water quality regulations are practical, cost-effective, and scientifically justified. Since the County Fire Authority will be directly regulated by the Regional MS4 Permit, we are concerned that public funds and critical personnel may have to be spent or resourced to comply with requirements that are unnecessary, and that this will ultimately reduce the emergency personnel and funding available for essential public services.

It is vital that the resources required to keep our communities safe from the threat of fire be solely purposed for that task. For this reason the 15 rural fire agencies within San Diego County have joined the County Fire Authority's call to action to protect water quality while controlling the mounting and unsubstantiated costs of increased regulation on local governments, business, and industry. As written, the Tentative Order will result in a significant and unprecedented level of regulation and cost without clear scientific basis or environmental benefit. The Fire Authority along with the 15 rural agencies believe that the language incorporated in a re-issued permit should not deviate from the current permit unless the RWQCB can provide clear evidence that emergency fire fighting activities and fire sprinkler line flushing significantly impact stormwater runoff, and that the increased costs associated with proposed changes are justified and feasible. Accordingly, we ask that the Regional Board honor the language in the existing permit and make no changes at this time.

In order to provide the best service possible the Fire Authority and its 15 participating agencies must be focused on emergency activities and not with implementing BMPs or removing debris caused by the emergency after the fact. This should be the sole responsibility of the entities owning or operating the sites or facilities for which the fire agencies are responding. The Fire Authority also believes that existing requirements are sufficient to ensure that the flushing of fire sprinkler systems has minimal impact to storm water quality and should not be prohibited. These activities exist for the safety of the public and the environment and should be continued in their current fashion pursuant to existing permit requirements.

We are hopeful that the final permit language will result in programs that make sense from a public safety, environmental and economic standpoint. Please contact Greg Schreiner, Fire Marshal, if you have questions or would like to discuss our concerns. His number is 858-495-5425, email is greg.schreiner@sdcounty.ca.gov

Sincerely,

Herman Reddick,
Program Manager

CC:
Acting Chairman Gary Strawn, San Diego Regional Water Quality Control Board (SD RWQCB)
Board Member Eric Anderson, SD RWQCB
Board Member Henry Abarbanel, SD RWQCB
Board Member Tomas Morales, SD RWQCB
Board Member Sharon Kalemkiarian, SD RWQCB
Executive Officer David Gibson, SD RWQCB

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JAMUL DULZURA
COMMUNITY PLANNING GROUP
P.O. Box 613
Jamul, California 91935

December 14, 2012

Mr. Rich Crompton, Director
County of San Diego Department of Public Works
5510 Overland Ave, Ste 410
San Diego, CA 92123

SUBJECT: Comment – Tentative Order No.R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu

Dear Mr. Crompton,

The Jamul Dulzura Community Planning Group feels compelled to provide written comments on the draft San Diego Regional MS4 Permit to ensure that water quality regulations are practical, cost-effective, and scientifically based. While we are not directly regulated by the Regional MS4 Permit, we are concerned that public funds may have to be spent to comply with requirements that are not proven or effective, and that this will ultimately reduce the funding available for community projects and essential public services.

It is vital that the resources required to implement regulations are balanced with other public and environmental programs. For this reason we have joined the County's call to action to protect water quality while controlling the mounting and unsubstantiated costs of increased regulation on local governments, business and industry. As written, the Tentative Order will result in a significant and unprecedented level of regulation and cost without clear scientific basis or environmental benefit. The three main areas of concern in the draft permit are: 1) a far-reaching Bacteria Total Maximum Daily Load (TMDL), 2) additional requirements for development projects, and 3) performance standards that unnecessarily expose municipalities to third-party lawsuits. These requirements needlessly increase costs for regulated parties and may further constrain development in the region.

The cost to comply with the Bacteria TMDL is estimated between $2.6 billion and $4.9 billion for the named watersheds in the region over the 20 year TMDL compliance timeline, of which only 18 years remain. The numeric targets in this TMDL may never be attainable even if the County and other municipalities were to spend billions in public resources. This puts us in an untenable situation with the public, who will ultimately fund this effort. Technology simply does not exist to return urbanized watersheds back to pristine, "reference" conditions. The TMDL compliance targets must be attainable. The Bacteria TMDL requirement should not be incorporated into the MS4 Permit until there are more practical goals to work toward. We cannot ask the public to fund a program that will not succeed.

The cost of doing business in California has already pushed many businesses and developers out of the state. The draft permit will impose significant hardships on development. Permit requirements would require almost all development projects in the County to comply with hydromodification requirements, regardless of whether the projects themselves contribute to the problem. It also requires that new and re-development projects return site hydrology to pre-development conditions as opposed to pre-project conditions. Returning urban infill projects to conditions that existed under "natural", pre-urban conditions would be a substantial constraint to re-development. Over the last several years, local governments in San Diego have worked together with Regional Board staff and a host of technical experts to develop a Hydromodification Management Plan with reasonable and scientifically based standards. The

Regional Board recently approved that Plan. This draft permit ignores all of the good work invested in that Plan, which was developed at a significant cost to the public. In its place, it would impose new, one-size-fits-all requirements that impose a standard that is unrealistic and without scientific justification. The result of all these changes is that the structures built to mitigate development impacts will need to be bigger and will cost significantly more than the current approved program. Implementing these requirements would be an economic burden to our region and, are targeted at an unobtainable endpoint.

Accordingly, we would like for the Regional Board to honor existing plans, including the Hydromodification Management Plan. SANDAG has worked for many years through a comprehensive public process to develop the Regional Transportation Plan and Regional Comprehensive Plan that provides the framework for local General Plans. These plans recognize regional smart growth opportunity areas, including infill development. These are sound principals. Urban infill reduces aerial deposition which then reduces pollutant loading in urban runoff. Re-development is considered an environmentally preferable method of development. The MS4 permit should encourage re-development, retrofit landscapes, and green streets, through greater flexibility and reduced requirements rather than penalizing it with additional cost and constraints. To this end, any new regulations must be integrated into approved plans and must not be a burdensome, additional layer.

Finally, the draft permit includes performance standards that should be amended so that regulated municipalities are not unnecessarily exposed to third-party litigation. This Permit's receiving water limitations language is contrary to the intent of the federal Clean Water Act, which is to assure municipal agencies will be regulated to a reasonable standard. The State and Regional Water Boards have the discretion and a responsibility to ensure that water quality regulations are applied in a context that results in economic and environmental sustainability. It is imperative to reduce the threat of litigation when a municipality is engaged in a good faith effort to comply. The current receiving water provisions do not serve the environment, the public or the permittees. Public funds should be used to implement comprehensive programs that are proactive and adaptive to promote clean water goals.

Local government must have the flexibility to make policy decisions for the good of our residents. The 21 Copermittees in our region (the County, 18 cities, Port District, and Airport Authority) already spend close to $120 million a year to comply with current permit requirements. Heal the Bay's own report cards show that water quality at local beaches is improving. We would like to see the Regional Board adopt a permit that will be cost neutral and that local municipalities will have the flexibility to apply funding to priority areas.

We are hopeful that the final permit language will result in programs that make sense from both an environmental and economic standpoint. Please contact me if you have questions or would like to discuss our concerns.

Sincerely,

Michael Casinelli

Michael Casinelli, Chair
Jamul Dulzura Community Planning Group

CC:
Vice Chairman Gary Strawn, San Diego Regional Water Quality Control Board (SD RWQCB)
Board Member Eric Anderson, SD RWQCB
Board Member Henry Abarbanel, SD RWQCB
Board Member Tomas Morales, SD RWQCB
Executive Officer David Gibson, SD RWQCB
Mr. Wayne Chiu, SD RWQCB

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Pala Pauma Valley Community Sponsor Group
P O Box 1273, Pauma Valley, CA 92061
760.481.4201

By: USPS

Monday, December 10, 2012

Mr. Rich Crompton, Director
County of San Diego Department of Public Works
5510 Overland Ave, Ste 410
San Diego, CA 92123

Dear Mr. Crompton,

Re: Comment – Tentative Order No.R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu

At its December 4, 2012 meeting the Pala Pauma Community Sponsor Group ("PPCSG") voted unanimously to support the action of San Diego County to protect water quality while controlling the mounting and unsubstantiated costs of increased regulation on local governments, business and industry. In particular, PPCSG supports the view that regulation based upon unproven science used in pursuit of parametric objectives that are apparently unattainable is poor governance and detrimamential to the interests of our community.

PPCSG believes that it is incumbent upon regulatory agencies to ensure that their enacted regulations are practical, cost-effective, and scientifically based. We are concerned that, otherwise, public funds may have to be spent to comply with requirements that are not proven nor effective, and that this will ultimately reduce the funding available for community projects and essential public services and increase the costs absorbed by trade and industry thereby inhibiting badly needed economic growth.

It appears that, as written, the Tentative Order will result in a significant and unprecedented level of regulation and cost without clear scientific basis or environmental benefit. The three main areas of concern in the draft permit are: i.) a far-reaching Bacteria Total Maximum Daily Load ("BTMDL"), ii.) additional requirements for development projects, and iii.) performance standards that unnecessarily expose municipalities to third-party lawsuits

PPCSG understands that the cost to comply with the Bacteria TMDL is estimated to be between $2.6 billion and $4.9 billion for the named watersheds in the region over the 20 year TMDL compliance timeline, of which only 18 years remain. The numeric targets in this TMDL may never be attainable even if government agencies were to spend billions in public resources, thereby increasing the costs of business and trade. PPCSG understand that available technology does not exist to return urbanized watersheds back to pristine, "reference" conditions.

Additionally, the Tentative Order requires that new and re-development projects return site hydrology to pre-development conditions as opposed to pre-project conditions. Returning urban infill projects to conditions that existed under "natural", pre-urban conditions would be a substantial constraint to re-development to the disadvantage of general Plans that seek to use infill development as a way of reducing urban sprawl. Further, the Tentative Order ignores all of the good work invested in the Hydromodification Management Plan developed at a significant cost to the public over the past years between the County and Regional Board staff and apparently seeks to impose a new, one-size-fits-all requirements standard that is unrealistic and without scientific justification. The result of all these changes is that the structures built to mitigate development impacts will need to be bigger and will cost significantly more than under the currently approved program.

PPCSG understands that receiving water limitations language is contrary to the intent of the Federal Clean Water Act, which is to assure municipal agencies will be regulated to a reasonable standard resulting in State and Regional Water Boards having the responsibility to ensure that water quality regulations are applied in a context that results in economic and environmental sustainability. PPCSG further understands that the 21 Co-permittees in our region (the County, 18 cities, Port District, and Airport Authority) already spend close to $120 million a year to comply with current regulations. PPCSG would like to see the Regional Board adopt Permit standards that will be cost neutral in a way that local municipalities will have the flexibility to apply funding to priority areas.

PPCSG is hopeful that the final permit language will result in programs that are rational from both environmental and economic standpoints -regulation within reason- and not impose upon our community the crippling disadvantages of regulation without reason.

Yours sincerely,

Charles Mathews, Chair,
Pala Pauma Valley Community Sponsor Group.

Copy: PPCSG members
Gary Strawn, Vice Chairman
Eric Anderson, SD RWQCB
Henry Abarbanel, SD RWQCB
Tomas Morales, SD RWQCB
David Gibson, SD RWQCB
Wayne Chiu, SD RWQCB
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego California 92123-4340
Stephanie Gaines, DPW Watershed Protection Program (by email)

Julian Community Planning Group

P.O. Box 249, Julian, CA 92036

January 4, 2013

Ms. Stephanie Gaines, Land Use/Environmental Planner
DPW/Watershed Protection Program (M.S. 0326)
5510 Overland Avenue, Suite 410
San Diego CA 921123

Dear Stephanie;

First I want to thank you for meeting with our Planning Group to discuss the reissuance process regarding the region NPDES Permit (MS4 Storm Water) with particular focus on the Total Maximum Daily Load plan (TMDL) and the effects that may have on our community.

After reviewing the documents provided to us, discussing the issue with you, and considerable discussion by our Group, the following statement has been prepared to express the position of the Julian Community Planning Group:

1) As written, the tentative order MS4 will result in a significant, unprecedented and likely unattainable level of regulation and unsustainable cost. The tentative order includes:

A. Far reaching water quality improvements.

B. Performance standards that cannot conceivably be attained.

C. Transferring the state's responsibility of cost to the local agencies, including testing, liability, and enforcement.

D. Ignoring of existing plans developed by other agencies.

E. Requiring the co-permittee to comply with unknown conditions.

The far reaching water quality improvements likely never can be attained, especially in urban developed areas. Will the Regional Water Quality Control Board remove legal conforming residences to obtain pre-development conditions; or require all existing developments to retrofit in order to attain the requested standards?
There are also jurisdictions over which the co-permittee has no authority and therefore can not require compliance. Those include Caltrans, State lands and parks, Federal lands and parks, and Indian Reservations.

2) The San Diego Regional Water Quality Control Board is attempting to pass all cost and responsibility to the co-permittee. Why would any agency accept these liabilities and costs? The County of San Diego has estimated the cost to comply with the Bacteria TMDL alone to be between 2.6 and 4.9 million dollars.

3) The County of San Diego, Cities and SanDag have worked extensively to develop Transportation plans, regional comprehensive plans and general plans that address the concerns shown in the tentative order MS4. The San Diego Regional Water Quality Control Board has ignored this effort in the new proposed regulation.

4) The proposed MS4 permit requires the co-permittees to accept new regulation without knowledge of what they are or their impacts.

5) The requirement of returning all watersheds back to pristine reference level is just not practical nor feasible.

6) The County of San Diego should not require the portion of the County in the Colorado River Basin to comply with San Diego County Water Quality Control Board requirements. The issues and conditions in the Colorado River Basin are not similar to those in the western coastal portion of the County.

Thank you for including our comments in your presentation to the San Diego Region Water Quality Control Board.

Sincerely

Jack D. Shelver, Chair
Julian Community Planning Group

RAMONA COMMUNITY PLANNING GROUP
15873 HWY 67, RAMONA, CALIFORNIA 92065
Phone: (760)445-8545

Jim Piva
Chair

Chris Anderson
Vice-Chair

Kristi Mansolf
Secretary

Chad Anderson

Torry Brean

Matt Deskovick

Scotty Ensign

Bob Hailey

Carl Hickman

Eb Hogervorst

Dennis Sprong

Paul Stykel

Angus Tobiason

Richard Tomlinson

Kevin Wallace

December 14, 2012

Mr. Rich Crompton, Director
County of San Diego Department of Public Works
5510 Overland Ave, Ste 410
San Diego, CA 92123

Dear Mr. Crompton,

SUBJECT: Comment – Tentative Order No.R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu

As the Ramona Community Planning Group, a land use advisory group to the County of San Diego for land use issues in Ramona, we feel compelled to provide written comments on the draft San Diego Regional MS4 Permit to ensure that water quality regulations are practical, cost-effective, and scientifically based. While we are not directly regulated by the Regional MS4 Permit, we are concerned that public funds may have to be spent to comply with requirements that are not proven or effective, and that this will ultimately reduce the funding available for community projects and essential public services.

It is vital that the resources required to implement regulations are balanced with other public and environmental programs. For this reason we have joined the County's call to action to protect water quality while controlling the mounting and unsubstantiated costs of increased regulation on local governments, business and industry. As written, the Tentative Order will result in a significant and unprecedented level of regulation and cost without clear scientific basis or environmental benefit. The three main areas of concern in the draft permit are: 1) a far-reaching Bacteria Total Maximum Daily Load (TMDL), 2) additional requirements for development projects, and 3) performance standards that unnecessarily expose municipalities to third-party lawsuits. These requirements needlessly increase costs for regulated parties and may further constrain development in the region.

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ADMINISTRATIVE OFFICE

Finally, the draft permit includes performance standards that should be amended so that regulated municipalities are not unnecessarily exposed to third-party litigation. This Permit's receiving water limitations language is contrary to the intent of the federal Clean Water Act, which is to assure municipal agencies will be regulated to a reasonable standard. The State and Regional Water Boards have the discretion and a responsibility to ensure that water quality regulations are applied in a context that results in economic and environmental sustainability. It is imperative to reduce the threat of litigation when a municipality is engaged in a good faith effort to comply. The current receiving water provisions do not serve the environment, the public or the permittees. Public funds should be used to implement comprehensive programs that are proactive and adaptive to promote clean water goals.

Local government must have the flexibility to make policy decisions for the good of our residents. The 21 Copermittees in our region (the County, 18 cities, Port District, and Airport Authority) already spend close to $120 million a year to comply with current permit requirements. Heal the Bay's own report cards show that water quality at local beaches is improving. We would like to see the Regional Board adopt a permit that will be cost neutral and that local municipalities will have the flexibility to apply funding to priority areas.

We are hopeful that the final permit language will result in programs that make sense from both an environmental and economic standpoint. Please contact Jim Piva if you have questions or would like to discuss our concerns.

Sincerely,

Jim Piva

JIM PIVA, Chair
Ramona Community Planning Group

CC:
Vice Chairman Gary Strawn, San Diego Regional Water Quality Control Board (SD RWQCB)
Board Member Eric Anderson, SD RWQCB
Board Member Henry Abarbanel, SD RWQCB
Board Member Tomas Morales, SD RWQCB
Executive Officer David Gibson, SD RWQCB
Mr. Wayne Chiu, SD RWQCB

EOMPOA

East Otay Mesa Property Owners Association

January 10, 2013

Mr. Wayne Chiu, P.E.
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego California 92123-4340

SUBJECT: Comment – Tentative Order No.R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu

Dear Mr. Chui:

Everyone, from every edge of the political and economic spectrum, supports improved water quality and environmentally healthy watersheds. The East Otay Mesa Property Owners Association ("EOMPOA") represents the major landowners within the County portion of Otay Mesa, who collectively control more than 2,000 acres at the last large scale industrial development site in the County, also support the California Regional Water Quality Control Board's ("Board") goal of clean water for all users in the region.

However, after listening to public testimony at recent board workshops, and being briefed by co-permittees on the proposed Tentative Order No. R9-2013-0001, Regional MS4 Permit ("Tentative Order"), we are writing to express our significant reservations on the Tentative Order. In brief, our concerns fall into these broad categories:

1. Existing Tentative Order No. R9-2007-0001-- Over the last several years, local governments in San Diego have worked together with your staff and a host of technical experts to develop a Hydromodification Management Plan with reasonable and scientifically based standards. Your Board recently approved that Plan in July 2010. This draft permit ignores all of the good work invested in that Plan, which was developed at a significant cost to the public. The existing Plan has only been in effect for 2 years, with 3 years remaining prior to its expiration. Given the short timeframe that the existing Plan has been in practice, we do not yet have adequate data to determine if the measures within the existing Plan are sufficient. Pursuing a new tentative order at this time has not been scientifically validated and is premature.

2. Legal Issues--The attempt by Board staff to mandate a proposed in lieu fee for watershed and hydrologic unit improvements to projects that have no impacts and therefore, no nexus to the watershed or unit improvements is a direct violation of CEQA, according to multiple city attorneys who spoke to the issue at the December 12, 2012 public hearing. On such a key issue as a CEQA violation, why didn't Board counsel catch this error in advance in the draft permit?

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EOMPOA
East Otay Mesa Property Owners Association

3. Clarity on Pre-Development vs. Pre-Project Conditions--We are at a loss to find a definition of the term pre-development conditions in the Tentative Order. For such a significant determination and impact, the lack of clarity on this matter is concerning. In the most current public workshop on December 12, 2012, when a Board member pressed staff on this issue, the staff member was unable to clearly define what the term meant, how far back was a reasonable gauge of pre-development conditions and finally, when pressed about the source of a soils database found on the internet that would be used as a key determinant of compliance, staff was unable to describe the accuracy or source documents for the website's database.

4. Hydromodification--We disagree with the proposed deletion of the current exemption in the hydromodification permit approved by the Board in July of 2010 for projects that discharge stormwater into lined or engineered channels. Speaker after speaker in the public comment period of the December 12th workshop representing co-permittees and other stakeholders, gave numerous examples of the conflict they had with Board staff on this issue. Further, the potential waste of public and private dollars and man-hours spent on already approved permits under the current hydromod scheme would be shocking. And this leads to our next point.

5. Fiscal Impact--Why is there no credible economic analysis on the potential cost to the co-permittees and the public for the implementation of the Tentative Order? For a regulator, or staff, to propose such broad and sweeping changes to public policy, without any consequence to the cost of their grand ideal, is irresponsible.

6. Coordination with neighboring regional boards and publication of previous similar experiences--According to public testimony at the December 12th workshop, the neighboring regional water boards in North Orange County and the Inland Empire have already dealt with several of the issues contemplated in the San Diego Board's Tentative Order. Specific examples include pre-development vs. pre-project conditions. Why hasn't the experience of the neighboring boards on these critical issues been shared with the public so our decision could benefit from their experience?

SANDAG estimates that the industrial development of the East Otay Mesa sub-region can produce up to 42,000 well-paying jobs for unemployed San Diegans by 2020. When the total cost of environmental compliance from local, state and federal agencies is placed upon the backs of landowners in East Otay and other parts of our region with other habitat and environmental mandates, the financial return on economic development will simply not pencil out. Proposed projects will not develop, jobs will not be created, economies will not grow and the dream of an emerging economy will die hard. The cost of doing business in California has already pushed many businesses and developers out of the state and disincentive developers further would be a catastrophic loss to California.

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EOMPOA

East Otay Mesa Property Owners Association

If implemented as written, this Tentative Order, and the actions of the Board, will further degrade San Diego's economy. We will have an economy based on sand and suntan oil, with a lower income workforce to match, instead of a healthy and diverse economic base with well-paying jobs for all San Diegans.

We urge the Board to delay implementation of the Proposed Order and revisit the untimely, unfunded mandate, poorly drafted terminology, the lack of key definitions, the apparent CEQA violations and unjust burden on industry and the economy. The Tentative Order is not ready for implementation and should not be considered until data from the existing 2010 Plan is fully understood. It would be a public travesty and irresponsible act by the Board to enact the Tentative Order in its current form at this premature stage.

Sincerely,

Judd Halenza, Vice President
EOMPOA

cc: Assemblymember Ben Hueso
Supervisor Greg Cox
Richard Crompton, County of San Diego
Stephanie Gaines, County of San Diego

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January 11th, 2013

Via e-mail to
wchiu@waterboards.ca.gov
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

The Escondido Creek Conservancy

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Everett Delano of Delano Law Offices

RE: Comments on Tentative Order Number: R9-2013-0001

Dear Mr. Chiu:

The Escondido Creek Conservancy (TECC) respectfully submits the following comments on the draft San Diego Regional Municipal Separate Storm Sewer System Permit, Tentative Order No. R9-2013-0001.

Urban runoff is not only one of the San Diego area's most urgent pollution problem, it is also one of the most challenging. In a region known for its beaches and strong tourism economy, polluted runoff makes our beaches and waterways unsafe for surfing, swimming, fishing, and other recreation for at least 72 hours after a rain event. Even in dry weather, runoff due to residential, municipal, and industrial irrigation for urban and suburban landscape can be a major pollution source.

Despite this challenge, we are confident that this public health problem can be successfully mitigated by working collaboratively as a community. The Water Quality Improvement Plans proposed in the draft permit have the potential to become powerful tools to help us improve water quality within our watersheds. However, the Copermittees cannot be tasked with creating these plans alone.

Specifically:

•The Permit should require formation of a stakeholder advisory group for each watershed, and these groups should include representatives of environmental and other public interest organizations with knowledge of the respective watersheds.

•The stakeholder advisory groups should work closely with the Copermittees and a Regional Board staff member during the development phase of Water Quality Improvement Plans to ensure these Plans target significant water quality goals that are both significant and quantifiable.

•The stakeholder advisory process should include accountability and measureable milestones to ensure the goals of the Permit are being met, as defined in the Water Quality Improvement Plans.

By taking advantage of the knowledge and resources of diverse stakeholders like municipalities, businesses, and residents, the San Diego area can be a pioneer in controlling urban runoff, creating healthier communities and watersheds, and improving our local beaches. Not only will the steps listed above help to accomplish these goals, but also bolster the local economy by firmly establishing San Diego as the country's finest coastal destination. However, all of these benefits can only be achieved if the diverse voices of the watershed stakeholders are influencing the planning process in a meaningful way.

TECC recognizes the challenge urban runoff presents to our region and is committed being a part of the solution. Consequently, TECC is interested in participating in a Water Quality Improvement Plan development process for the Carlsbad Hydrologic Unit watershed.

In summary, TECC urges the Regional Board to enhance the stakeholder participation opportunities as Water Quality Improvement Plans are developed and subsequently approve the permit.

Respectfully submitted,

Kevin Barnard

Kevin Barnard
President
The Escondido Creek Conservancy

January 11, 2013

Via e-mail to wchiu@waterboards.ca.gov
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

RE: Comments on Tentative Order Number: R9-2013-0001

Dear Mr. Chiu:

Friends of Rose Canyon, Friends of Rose Creek, and the Rose Creek Watershed Alliance respectfully submit the following comments on the draft San Diego Regional Municipal Separate Storm Sewer System permit.

We have been working together to implement some aspects of the Rose Creek Watershed Opportunities Assessment, a plan whose goal is to enhance and preserve the Rose Creek Watershed (www.rosecreekwatershed.org). Urban runoff is the San Diego region's most urgent pollution problem and was identified in the Assessment for action. Arguably, it is the most difficult to solve. In a region known for its beaches and strong tourism economy, polluted runoff makes our beaches and waterways unsafe for swimming, fishing and other recreation for at least 72 hours after a rain event. Even in dry weather, our "urban drool" from residents and businesses overwatering lawns becomes a major pollution source.

The good news is that by working together as a community, we can solve this challenging public health problem. The Water Quality Improvement Plans proposed in the draft permit have the potential to become powerful tools to help us improve water quality within our watersheds. However, the Copermittees cannot be tasked with creating these plans alone. Specifically:

- The Permit should require formation of a stakeholder advisory group for each watershed that includes representatives of environmental and community groups with knowledge of the watershed.
- These stakeholder advisory groups should work closely with the Copermittees and a regional board staff member while the Water Quality Improvement Plans are being developed to ensure that these plans aggressively pursue water quality gains.
- The stakeholder advisory process should include accountability and measureable milestones to ensure the goals of the Permit are being met.

By taking advantage of the knowledge and resources of diverse stakeholders like municipalities, businesses and residents, our region can be on the cutting-edge of addressing urban runoff and creating healthier communities and watersheds.

Friends of Rose Canyon, Friends of Rose Creek, and the Rose Creek Watershed Alliance recognize the challenge urban runoff presents to our region. We look forward to participating in a Water Quality Improvement Plan development process for the Rose Creek watershed in the city of San Diego.

We urge the Regional Board to enhance the stakeholder participation opportunities during Water Quality Improvement Plan development.

Respectfully submitted,

Deborah Knight
Executive Director, Friends of Rose Canyon
www.rosecanyon.org

Karin Zirk
Friends of Rose Creek
www.saverosecreek.org

Ann Van Leer
Rose Creek Watershed Alliance
www.rosecreekwatershed.org

From: Tom Gable
To: Chiu, Wayne@Waterboards
Subject: Public Participation in Water Quality Control Regulation Development, Measurement, Accountability
Date: Friday, January 11, 2013 4:49:54 PM
Attachments: 29A587CE-9A0C-489F-86E3-03B425129930[61].png

Mr. Gary Strawn

Vice Chairman

San Diego Regional Water Quality Control Board

9174 Sky Park Court, Suite 100

San Diego, CA 92123-4340

Re: Comment—Tentative Order No. R9-2013-001, Regional MS4 Permit,

Place ID: 786088Wchiu

Dear Vice Chair Strawn:

As a native San Diegan and businessman, I am concerned that implementing the permit outlined in Board's Tentative Order R9-2012-0011 ("Permit") dated October 31, 2012, we be detrimental to the clients of our public relations firm in the life science, biotech, clean tech and technology industries.

We all want clean, safe water to the region. But in participating in several committee meetings and reviewing documents related to the permit, indicators are the costs will be debilitating to many, particularly in those industries which have significant water usage requirements.

To echo concerns raised by others, the three primary areas of concern include: 1) the strict liability for exceeding water quality objectives; 2) the preemption of WQIPs by new and changing regulatory requirements prior to allowing the WQIPs to be developed and implemented; and 3) the lack of reliable funding sources to implement these regulatory changes.

It is necessary to hold individuals, businesses and governments accountable. But what are the accountability measures that would be practical and have a demonstrable, positive effects on water quality?

Because of these concerns, I respectfully request that the Permit focus on the timely development of effective and enforceable WQIPs, and that each of the WQIPs be developed through a process that ensures public participation. I ask also that the designation of appropriate Best Management Practices in each watershed be determined through the WQIP process rather than the one size fits all strategy currently being proposed in the Permit. I ask further that until the Board adopts a WQIP for a watershed that the provisions of the existing Permit remain in place for that watershed. Finally, in order to avoid unnecessary litigation I request that the Board adopt the WQIPs as Orders implementing the proposed Permit.

I urge you to adopt final permit language that is evidence-based and both environmentally and economically sustainable.

Thank you for your consideration.

Sincerely,

Tom Gable

CEO

_____

gablepr

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INDUSTRIAL
ENVIRONMENTAL
ASSOCIATION

January 11, 2013

Mr. Wayne Chiu
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego, California, 92123-4340

Sent Via Email to: wchiu@waterboards.ca.gov

Re: Comment – Tentative Order No. R9-2013-0001, NPDES No. CAS0109266
Regional MS4 Permit

Dear Mr. Chiu:

Please find attached comments prepared and submitted by the Industrial Environmental Association (IEA) regarding the San Diego Region MS4 Permit Reissuance.

The Industrial Environmental Association (IEA) was formed in 1983 to promote responsible, cost-effective environmental laws and regulations, facilitate environmental compliance among member companies and provide related education activities for the community at large. IEA actively insists on strong environmental compliance efforts among member companies as a matter of written policy. Further, IEA urges reliance on scientific, analytical data to evaluate the regulations necessary to protect the public and the environment.

After many hours of review and consideration, we appreciate the opportunity to submit these suggestions which we believe will help meet the goals of the Regional Board in a manner that avoids excessive cost and regulatory burden for our members.

We appreciate the opportunity to work with the Board and Staff throughout what has been a very open process, and we look forward to the opportunity to discuss these issues more comprehensively in the weeks ahead. .

Sincerely,

Jack Monger
Executive Director

1330 Orange Avenue, Suite 100 • Coronado, CA 92118 • 619-522-9000 • IEA-sd.com

Industrial Environmental Association (IEA) Comments

Tentative

Order No. R9-2013-0001

NPDES No. CAS0109266

National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region

1. **Overall Methodology**- In general, IEA supports a Regional MS4 Permit promoting an adaptive planning and management process that allows implementation of appropriate strategies, control measures, and best management practices (BMPs) to protect and preserve water quality and suitable beneficial uses of waters of the state.

2. **Water Quality Improvement Plan Approach-** IEA recognizes the general intent of the Water Quality Improvement Plans (Provision B) is for Copermittees to develop focused watershed-based plans to identify water quality conditions and issues, develop priorities, establish strategies and schedules, and implement adaptive processes to carry out prioritized actions to improve water quality. IEA welcomes the opportunity to participate in the Water Quality Improvement Plan development process and collaborate with Copermittees to develop targeted and cost-efficient strategies and assessment metrics aimed at water quality improvement.

3. **Monitoring and Assessment**- IEA recognizes a key goal of an effective Monitoring and Assessment framework (Provision D) is the collection of precise and useful data to inform stakeholders about water quality conditions in discharges and receiving waters. It is presumed that this data will allow for focused implementation actions and water quality improvement strategies. IEA supports a monitoring framework that provides cost-effective informed data to guide future actions. Accordingly, IEA supports coordination of Regional Water Quality Control Board (RWQCB) staff and Copermittee stakeholders in identifying an iterative, strategic, cost-effective, question-driven monitoring approach. The approach should incorporate short-, medium-, and long-term goals and outline procedures to collect comparable data across watersheds/jurisdictions that allows for future statistical assessments. Short-term goals can include discharge and receiving water characterization to understand current conditions and track progress. Medium-term goals can include planning for Clean Water Act Section 303(d) listings/delistings and best available science-based TMDL development in accordance with the Clean Water Act. Long-term goals can include collecting data appropriate for development of site-specific water quality objectives and potential revisions to Basin Plan objectives.

4. **Non-Storm Water Discharges**- There is still confusion in the Regional MS4 Permit regarding which non-storm water discharges are effectively prohibited and must be eliminated and those that are authorized. The Regional MS4 Permit both states that it authorizes and prohibits non-storm water discharges but it is not always clear which are authorized and which are prohibited. In multiple locations (e.g. Finding 15), the Regional MS4 Permit states that non-stormwater discharges into the MS4s must be

"effectively prohibited" or eliminated. This language conflicts with other provisions (Provision II.A.1.b., for example), which state, consistent with EPA's regulations, that non-stormwater discharges authorized by a NPDES permit are authorized to be discharged to the MS4 system. One change that would help to clarify this issue would be to revise Finding 15 as follows:

> **Non-Storm Water and Storm Water Discharges.** Non-storm water discharges from the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard of CWA section 402(p)(3)(B)(iii), which is explicitly for "Municipal … *Stormwater Discharges* (emphasis added)" from the MS4s. Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s must be effectively prohibited. *However, consistent with EPA's regulations, the draft Permit authorizes discharges of non-storm water to MS4s that are either authorized by a separate NPDES permit, or the discharge is a category of non-storm water discharges or flows that must be addressed pursuant to Provisions E.2.a.(1)-(5) of this Order.*

IEA recognizes the Regional MS4 Permit intent to reduce transport of pollutants through elimination of non-storm water discharges (Provision E. 2). However, this intent can also be achieved through implementation of appropriate BMPs if, and when, the listed sources of non-storm water are found to be sources of pollutants to the receiving water. This is the approach used in previous MS4 permits and is consistent with EPA storm water regulations.

A good example of this is non-emergency firefighting flows from fire suppression equipment maintenance activities that can and have been treated with BMPs. IEA recognizes that the RWQCB has identified fire suppression equipment maintenance discharges "contain waste"1 and thus need to be prohibited by the Copermittees as illicit discharges through ordinance, order, or similar means. IEA recommends the Regional MS4 Permit be modified to allow the Water Quality Improvement Plan process to incorporate the use of BMPs for fire suppression equipment maintenance activity discharges.

IEA recommends the following amendment of Provision E.2.a.6:

> If the Copermittee or San Diego Water Board identifies any category of non-storm water discharges listed under Provisions E.2.a.(1)-(4) as a source of pollutants to receiving waters, the category must be prohibited through ordinance, order, or similar means and addressed as an illicit discharge. *Alternately, the Copermittee can designate different and/ or additional BMPs to be implemented as opposed to prohibiting the category of non-stormwater.*

---

[1] Order R9-2010-0016 Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the County of Riverside, the Incorporated Cities of Riverside County, and the Riverside County Flood Control and Water Conservation District within the San Diego Region. NPDES No. CAS0108766. November 10, 2010.

Further, the Regional MS4 Permit currently specifies that air conditioner condensation [Provision E.2.a.(4).(a)] is a non-storm water discharge that must be directed to landscaped areas or other pervious surfaces *where feasible* (emphasis added). IEA members have previously independently evaluated this potential action and have identified potentially significant costs for compliance. A case study in the Los Penasquitos watershed estimated that due to current system configuration, re-routing the condensation line at one building facility would require ~$12,000 investment. For these reasons, it is suggested that these requirements be limited to new development and the actual footprint of any re-development, unless otherwise required by the Water Quality Improvement Plans.

5. **Development Planning**- IEA supports the implementation of cost-effective methods to reduce the discharge of pollutants in storm water to the maximum extent practicable (MEP) and effectively prohibit non-storm water discharges to provide the reasonable protection, preservation, enhancement, and restoration of water quality and designated beneficial uses of waters of the state. IEA supports the business and development community in requesting the Development Planning (Provision E.3) criteria for priority development project structural BMP requirements and alternative compliance be carefully examined. Given the poor soil infiltration rates in much of San Diego County, many development projects will likely demonstrate technical infeasibility in implementing cost-effective Low Impact Development (LID) and hydromodification controls. The process currently identified in the Regional MS4 Permit does not provide sufficient detail for consistency among Copermittees in evaluating technical infeasibility conditions and implementation of feasible mitigation alternatives. IEA supports development of a stakeholder-lead Technical Advisory Committee to assist in the revision of Provision E.3 to meet multiple objectives for both improved water quality and consideration of site-specific conditions and economic constraints.

6. **Existing Development Management-Inspections-** In general, IEA recognizes the importance of Copermittee inspection activities at inventoried existing development to ensure compliance with applicable local ordinances and permits and the Regional MS4 Permit. However, Provision E.5.c currently contains language that provides for "volunteer monitoring or patrol programs" to conduct visual and verification inspections for Copermittees. IEA strongly opposes authorization of volunteer monitoring and/or patrol programs for third party inspections of industrial or commercial facilities through the Regional MS4 Permit. This type of action has potentially serious safety, procedural, and liability issues for the volunteer program responsible party, Copermittees and inspected facility owner. IEA recognizes there may be some amount of water quality, collaboration, and cost-efficiency value in engaging properly-trained and insured volunteer programs for certain types of visual observation activities on public right-of-way property. However, Provision E.5.c.(1). (a) (i) is not the appropriate permit provision to reference this type of collaboration in the Regional MS4 Permit.

   IEA recommends Provision E. 5.c..(1).(a) (i) be revised to delete provision [c] that states: "Inspections by volunteer monitoring or patrol programs trained by the Copermittee". As an alternative, IEA recommends the "volunteer monitoring or patrol programs trained by the Copermittee" language be added to Provision E. 5.c.(1). (a) (i) [a] such that the whole section would as indicated below. Further IEA

recommends a footnote be added to the word "program" to clearly identify that volunteer program staff shall conduct visual observations in the public right-of-way only as indicated below.

..(1) Inspection Frequency

(a) Each Copermittee must establish appropriate inspection frequencies for inventoried existing development in accordance with the following requirements:

(i) At a minimum, inventoried existing development must be inspected once every five years utilizing one or more of the following methods:

[a] Drive-by inspections by Copermittee municipal or contract staff, or volunteer monitoring or patrol program[1] staff trained by the Copermittee, and

[b] Onsite inspections by Copermittee municipal and contract staff;

[1] *Volunteer monitoring or patrol program staff shall be limited to only inspection activities performed in the public right-of-way, when conducted at the direction of a copermittee.*

In order to further clarify this issue, IEA recommends Provision E.5.c.(2). (a) be revised to delete the words "by the Copermittee or volunteer monitoring or patrol programs". Provision E. 5.c.(2).(a) would then read:

..(2) Inspection Content

(a) Inspections of existing development must include, at a minimum:

Finally, IEA recommends the Regional MS4 Permit language and/or Attachment F - Fact Sheet/Technical Report include language that requires participating volunteer monitoring or patrol programs to demonstrate appropriate training, equipment calibration records, and proof of professional liability insurance to Copermittee or other responsible party(s) prior to engagement in visual or other monitoring activities under the Regional MS4 Permit. This requirement will work to both protect the interests of Copermittee and other interested organizations as well as provide reasonable assurance that data collected by volunteer monitoring or patrol programs is consistent and of high quality.

January 11, 2013

San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Subject: Tentative Draft Order Number: R9-2013-0001

The Laguna Bluebelt Coalition is dedicated to marine life protection through cooperative efforts in education, enforcement, water quality improvements, habitat restoration and networking among diverse stakeholders, agencies and elected officials. We support efforts by many local and regional environmental groups and organizations to address urban runoff pollution in the Aliso Watershed as a model for other impaired creek and coastal receiving waters. The following comments on the draft San Diego Regional Municipal Separate Storm Sewer System permit are intended to educate and motivate sustainable solutions to creek and ocean pollution..

Urban runoff is the San Diego region's most urgent pollution problem. Laguna Beach and the regional economy depend upon a healthy ecology. In a region known for its beaches and strong tourism economy, polluted runoff makes our beaches and waterways unsafe for swimming, fishing and other recreation for at least 72 hours after a rain event. Even in dry weather, contaminated urban runoff from known from residential and commercial overwatering becomes a major regional pollution source.

Today modern techniques, tactics and technologies can re-purpose polluted water as a "new water" resource. By working together as a community, we can solve this challenging public health problem affecting our economy and healthy ecology. The Water Quality Improvement Plans proposed in the draft permit have the potential to become powerful tools to help us improve water quality within our watersheds. However, the Copermittees cannot be tasked with creating these plans alone.

Specifically:

- The Permit should require formation of a stakeholder advisory group for each watershed that includes representatives of environmental groups with knowledge of the watershed.
- This stakeholder advisory group should work closely with the Copermittees and a regional board staff member while the Water Quality Improvement Plans are being developed to ensure these plans aggressively pursue water quality gains.
- The stakeholder advisory process should include accountability and measureable milestones to ensure the goals of the Permit are being met.

By taking advantage of the knowledge and resources of diverse stakeholders like municipalities, businesses and residents, our region can be on the cutting-edge of addressing urban runoff and creating healthier communities and watersheds. But this can only be achieved if these diverse voices are impacting the planning process in a meaningful way.

The Laguna Bluebelt Coalition recognizes the challenges and opportunities urban runoff presents to our region, and we want to do our part to implement innovative, sustainable solutions to water pollution. The Laguna Bluebelt Coalition is committed to participating in a Water Quality Improvement Plan development process for the Aliso Watershed.

Among recommended actions to mitigate present impacts to Laguna Beach's creek, estuary, beach and coastal receiving waters are the following:

1. Map all creek and coastal receiving waters indicating water quality impacts. (SCCWRP, Scripps, NOAA,etc.) A Bioregional Watershed Map will identify degraded land elements, offending storm drain outlets and candidate areas for re-forestation and estuarine/coastal restoration.

2. On an annual basis, issue citations against the primary six known storm drain point sources in each watershed. This measure will incrementally compel clean-up and abatement throughout a given watershed bioregion without the burden of costs to abate all points of contamination at once. Failed Best Management Practices (BMPs) urban runoff facilities, required as a Condition of Approval for inland residential developments, can be retrofitted with dry weather diversions to local Publically Owned Treatment Works (POTWs) or, alternatively, re-engineered with deep groundwater injection wells.

3. Fines must be allocated to re-vegetate impaired watersheds and kelp forests to restore the native functions of semi-arid creeks and protected coastal receiving waters. A re-forested Aliso Canyon with a canopy similar to San Mateo Creek will qualify for California Cap and Trade funding to offset costs. Restoration of natural habitats is demonstrated to be the best, most cost effective measure for improving watershed water quality.

4. Restoration of high value coastal wetlands and estuaries will guarantee protection of natural beach sand berms and provide measurable improvement to coastal receiving waters. Funds from the California Coastal Conservancy and other wetland recovery resources can offset costs.

5. Watershed restoration will offer multiple community benefits by reducing destructive stormwater flows, eliminating pollutants and increasing eco-tourist revenues to surrounding cities. Large street cisterns incorporating designs proposed by GeoSynTech for the re-development of the Aliso Golf Course can serve as a model for extensive rainwater harvest/reuse systems. Restoration of some or all of the 1500 foot Aliso Creek Ox Bow in Laguna Niguel can restore hydric soils to reduce stormwater impacts.

6. Increased use of recycled water for wildland fire suppression along the entire Highway 73 Toll Road bisecting the Laguna Greenbelt will maintain a healthy, fire safe wilderness area. Orange County Measure M and State Proposition funds are available to offset costs. Increased use of recycled water reduces ocean discharges to the Laguna State Marine Conservation Area.

7. A citywide network of recycled water for all of Laguna Beach will reduce imported water demand significantly and increase water security, disaster preparedness and fire suppression resources. Revenues from routine use for irrigation mandated Fuel Modification Zones will provide new revenue streams. Laguna Beach is the only Orange County city without a comprehensive recycled water program and remains a "once use" community of valuable imported water.

The Laguna Bluebelt Coalition appreciates the Staff and Regional Board's commitment to supporting key community stakeholder participation opportunities during Water Quality Improvement Plan development and then approves the permit.

Thank you for your dedication to regional water quality improvements for our creeks, canyon and coastal waters.

Jonathan Claypool
Facilitator

jonathan@lagunabluebelt.org

LATITUDE 33
PLANNING & ENGINEERING
5355 Mira Sorrento Place, Suite 650
San Diego, CA 92121
Tel 858.751.0633

Mr. Gary Strawn
Vice Chairman
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Re: Comment—Tentative Order No. R9-2013-001, Regional MS4 Permit, Place ID: 786088Wchiu

Dear Vice Chair Strawn:

I am responding to the San Diego Regional Water Quality Control Board's Tentative Order R9-2012-0011 ("Permit") dated October 31, 2012. After reviewing the proposed Permit, I am concerned it will impose expensive, onerous, and untested regulations on local governments, businesses, and residents.

Everyone understands the importance of clean, safe water to the region. As a member of the business community, I too am interested in improving San Diego's water. It is important, however, that we use our limited resources wisely, and ensure that our efforts produce the desired outcome of improving water quality.

I applaud the Board's inclusion of Water Quality Improvement Plans (WQIP) as a first step in developing a cost-effective approach to improving our water. Analysis remains a critical component of a successful strategy, and I am glad to see that the Board is committed to finding the best possible solution to water quality improvement.

I am concerned, however, that the costs associated with enforcing and implementing the permit will have a negative impact on my business and San Diego's economy. The three primary areas of concern include: 1) the strict liability for exceeding water quality objectives; 2) the preemption of WQIPs by new and changing regulatory requirements prior to allowing the WQIPs to be developed and implemented; and 3) the lack of reliable funding sources to implement these regulatory changes.

It is necessary to hold individuals, businesses and governments accountable, but it is critical that accountability measures are practical with demonstrable, positive effects on water quality. Because of these concerns, I respectfully request that the Permit focus on the timely development of effective and enforceable WQIPs, and that each of the WQIPs be developed through a process that ensures public participation. I ask also that the designation of appropriate Best Management

Practices in each watershed be determined through the WQIP process rather than the one size fits all strategy currently being proposed in the Permit. I ask further that until the Board adopts a WQIP for a watershed that the provisions of the existing Permit remain in place for that watershed. Finally, in order to avoid unnecessary litigation I request that the Board adopt the WQIPs as Orders implementing the proposed Permit.

I urge you to adopt final permit language that is evidence-based and both environmentally and economically sustainable. Thank you for your consideration. Please contact Ted Shaw at ted.shaw@latitude33.com if you have any questions.

Sincerely,

Theodore RL Shaw

Principal, Latitude 33 Planning & Engineering

January 11, 2013

Attention: Wayne Chiu, P.E.
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

RE: Comments on Tentative Order No. R9-2013-0001 (San Diego Region MS4 Permit Reissuance)

Dear Mr. Chiu,

On behalf of the Los Peñasquitos Lagoon Foundation (LPLF), I would like to submit the following comments on Tentative Order No. R9-2013-0001 San Diego Region MS4 Permit Reissuance (Please see attached Exhibit A). Thank you for this opportunity and I look forward to working with Water Board staff and Co-Permittees on improving and protecting the beneficial uses afforded by Los Peñasquitos Lagoon, a State Preserve that is also listed as an impaired water body in the Clean Water Act Section 303(d).

Please contact me if you have any questions. (760) 271-0574.

Sincerely,

Mike Hastings

Mike Hastings
Executive Director, Los Peñasquitos Lagoon Foundation

Exhibit A.
Comments for Tentative Order No. R9-2013-0001
San Diego Region MS4 Permit Reissuance
Los Peñasquitos Lagoon Foundation
1/11/13

GENERAL COMMENTS

- Require public participation in Water Quality Improvement Plans (WQIP) development process to improve the Plan and avoid unnecessary "surprises" later on.
- WQIP development, implementation and assessment processes and efforts should be transparent to all stakeholders to facilitate their involvement.
- Provide summarized details on what a jurisdiction is doing in a particular watershed for understanding of RWQCB and public.
- WQIPs should be coordinated with other planning documents developed to improve, enhance and protect beneficial uses of receiving water bodies, including those prepared by third parties (e.g. NGOs).

SPECIFIC COMMENTS

Comment #1.

Page 2, #6. Non-Storm Water Discharges
Page 4, #12. Pollutants in Runoff
Page #15. Non-Storm Water and Storm Water Discharges
Page 65, #2 Illicit Discharges Detection and Elimination

Comment: Provide mechanisms to allow Co-permittees to address dry-weather flows/illicit discharges into receiving waters regardless of whether or not constituents of concern are present within these flows. These mechanisms should be broad enough to allow co-permittees to require landowners to modify their actions (e.g. landscape irrigation) that are identified directly or indirectly as contributing to dry weather discharges into the MS4. Priority given to dry weather discharges into the MS4 that discharge directly into 303(d) listed water bodies.

Context: Dry weather discharges can create serious impacts to the beneficial uses of receiving water bodies that support salt marsh habitats, especially when these discharges are perennial in nature. These flows are directly related to habitat conversion through their ability to alter salinity levels in soils that displace native salt marsh species, often permanently. Numerous studies, including those pertaining to Los Peñasquitos Lagoon, document the impacts of dry weather flows. The current methods available to co-permittees reduce their ability to effectively control all of these discharges.

Example: Ground-water charging from irrigation practices on top of sandstone bluffs. Water filters down, through the sandstone and seeps out at the bottom and into MS4. Although lines of evidence point to the irrigation practices that contribute

to and/or cause the mounding and subsequent seepage(s) that generated dry weather discharges into the MS4, co-permittees cannot address the source under the current regulatory format.

Figure 1. Perrenial seepage from over-irrigation on mesa top. Flow enter the MS4 and discharge into Los Peñasquitos Lagoon, a 303(d) listed waterbody.

Comment #2.

Page 3. #8. Point Source Discharge of Pollutants.

Comment: Needs to include discharges from the MS4 that generate and/or contribute to pollutant discharges below the outfall (e.g. sediment scoured below MS4 outlets). Or, keep the language under #11 that recognizes natural drainages and conveyances (e.g. creeks) within developed areas as part of the MS4 and receiving waters.

Context: Multiple lines of evidence support this claim (e.g. Los Peñasquitos Lagoon Sediment TMDL).

Comment #3.

Page 4. #13.

Comment. Human Health and Aquatic Impairment. Dry weather flows themselves, especially those that are perennial in nature, can contribute to impacts to receiving water bodies that historically received ephemeral flows (e.g. coastal salt marshes). One such impact is habitat conversion that can contribute to impaired beneficial uses within the receiving water body (e.g. Los Peñasquitos Lagoon) and substantial

threats to nearby communities. One example is related to the presence of West Nile Virus (WNV) at Los Peñasquitos Lagoon (LPL), as documented by the County of San Diego's Department of Environmental Health. WNV is transmitted by the freshwater mosquito *Culex tarsalis* that was not present in LPL prior to the recent establishment of riparian and brackish marsh habitats caused by perennial flows of dry weather discharges into the Lagoon's main tributaries and along Lagoon boundaries.

Another impact related to dry weather flows of freshwater include aquatic impairment within tidally influenced lagoons (e.g. salinity/temperature stratification within lagoon tidal channels that can be harmful to aquatic species).

Comment #4.

Page 66, #2(3) Illicit Discharges Detection and Elimination

Comment: Revise language under (3) to replace "…identifies the discharge a source of pollutants to receiving waters" with "…identifies the discharge a source of pollutants and/or contributor to the impairment (e.g. habitat conversion) of the receiving waterbody." Please see Comment #1 for more information and supporting justification for this requested change in language.

Comment #5.

Page 13 & 14, #2 Receiving Water Limitations

Comment: Insert the following (underlined) language under 2a. "Discharge from MS4 must not cause or contribute to the violation of water quality standards and/or impairment to receiving waters, ……."

Comment #6.

Page 19, #2 Priority Water Quality Conditions

Comment: include the following language under the first paragraph - "The Copermittees must work with the appropriate land managers and related management groups directly associated with the receiving water body to identify the water quality priorities within each Watershed Management Area."

This needs to occur since the land managers and associated groups will have a better idea (and supporting data) about what should be priorities for water quality improvements in receiving water bodies. Priority should be given to the land managers and management entities (e.g. NGOs) directly associated with the receiving water body (e.g. lagoon foundations/conservancies). Relevant monitoring

programs and management documents (e.g. enhancement plans) for receiving waterbodies should be considered and included in efforts to identify priority water quality conditions.

Comment #7.

Page 24, #3 Water Quality Improvement Strategies

Comment: include the following language under the first paragraph - "The Copermittees must work with the appropriate land managers and related management groups directly associated with the receiving water body to identify and prioritize strategies to address the highest priority water quality conditions identified within a Watershed Management Area."

This needs to occur since the land managers and associated groups will have a better idea (and supporting data) about what should be priorities for water quality improvements in receiving water bodies. Priority should be given to the land managers and management entities (e.g. NGOs) directly associated with the receiving water body (e.g. lagoon foundations/conservancies). Relevant monitoring programs management documents (e.g. enhancement plans) for receiving waterbodies should be considered and included in efforts to identify, develop and implement Water Quality Improvement Strategies.

Comment #8.

Page 25, #4 Water Quality Improvement Monitoring and Assessment Program

Comment: include the following sentence under the paragraph for 4a.- "The Copermittees in each Watershed Management Area must work with the appropriate land managers and related management groups directly associated with the receiving water body to plan, implement and review Water Quality Improvement Monitoring and Assessment Program.

Justification: The use of better data sets collected by land managers and related NGOs over longer periods of time that better describe water quality conditions. Also improves data collection by determining the appropriate monitoring locations by avoiding areas or conditions that can confound monitoring efforts (e.g. salinity stratification in lagoon channels).

Comment #9.

Page 25, #5 Iterative Approach and Adaptive Management Process

Comment: include the following language in the first sentence - "The Copermittees in each Watershed Management Area must work with the appropriate land managers and related management groups directly associated with the receiving water body to implement the iterative approach ……."

Comment #10.

Page 28, C. Action Levels

Comment: Include action levels for insecticides (e.g. pyrethroids), since they are known to contribute impairment to receiving water bodies and quite possibly directly related to low Index of Biological Integrity (IBI) for macroinvertebrates in most, if not all, receiving water bodies.

Comment #11.

Page 33, D. Monitoring and Assessment Program Requirements

Comment: "The Copermittees in each Watershed Management Area must work with the appropriate land managers and related management groups directly associated with the receiving water body to plan, implement and review Water Quality Improvement Monitoring and Assessment Program.

Justification: The use of better data sets collected by land managers and related NGOs over longer periods of time that better describe water quality conditions. Also improves data collection by determining the appropriate monitoring locations by avoiding areas or conditions that can confound monitoring efforts (e.g. salinity stratification in lagoon channels).

Comment #12.

Page 39, D 1(c). Dry Weather Receiving Water Monitoring

Comment 1: Include continuous flow monitoring at the base of tributaries to 303(d) listed water bodies to better document the transport of pollutants and total volume of dry weather inputs that impair the beneficial uses of receiving water bodies (i.e. salt marshes) by converting lagoon tributaries from seasonal to perennial and facilitating habitat conversion through reductions in soil salinities.

Comment 2: Include monitoring of groundwater seepages into 303(d) listed water bodies to better document the transport dry weather inputs that impair the beneficial uses of receiving water bodies (i.e. salt marshes) by converting native habitats through reductions in soil salinities.

Comment #13.

Page 39, D 1(d). Wet Weather Receiving Water Monitoring

Comment: Include continuous flow monitoring at the base of tributaries to 303(d) listed water bodies to better document the transport of pollutants, peak discharge and total volume of storm runoff.

Comment #14.

Page 56, #4 Assessment Requirements

Comment: under 4a(2), include language such that the Copermittees must work with local land managers and related management entities (e.g. NGOs) for receiving water bodies to assess the status and trends of receiving water quality conditions. This is essential for the effective management of receiving water bodies and surrounding environs.

From: Jeff Marston
To: Chiu, Wayne@Waterboards
Subject: SDRWQCB Storm Water Permit Administrative Draft
Date: Friday, January 11, 2013 3:39:51 PM

January 11, 2013

Mr. Gary Strawn

Vice Chairman

San Diego Regional Water Quality Control Board

9174 Sky Park Court, Suite 100

San Diego, CA 92123-4340

Re: Comment—Tentative Order No. R9-2013-001, Regional MS4 Permit,

Place ID: 786088Wchiu

Dear Vice Chair Strawn:

I am responding to the San Diego Regional Water Quality Control Board's Tentative Order R9-2012-0011 ("Permit") dated October 31, 2012. After reviewing the proposed Permit and consulting with numerous colleagues, I am concerned it will impose expensive, onerous, and untested regulations on local governments, businesses, and residents alike.

As a business owner, I understand the importance of clean and safe water to the region. It is important, however, that we use our limited resources wisely, and ensure that our efforts produce the desired outcome of improving water quality.

I applaud the Board's inclusion of Water Quality Improvement Plans (WQIP) as a first step in developing a cost-effective approach to improving our water. Analysis remains a critical component of a successful strategy, and I am glad to see that the Board is committed to finding the best possible solution to water quality improvement.

I am concerned, however, that the costs associated with enforcing and implementing the permit will have a negative impact on my business and San Diego's economy. I have three primary areas of concern: 1) the strict liability for exceeding water quality objectives; 2) the preemption of WQIPs by new and changing regulatory requirements prior to allowing the WQIPs to be developed and implemented; and 3) the lack of reliable funding sources to

implement these regulatory changes.

While it is necessary to hold individuals, businesses and governments accountable, it is critical that accountability measures are practical, with demonstrable, positive effects on water quality. Because of these concerns, I respectfully request that the Permit focus on the following: timely development of effective and enforceable WQIPs and that each of the WQIPs be developed through a process that ensures public participation. I ask also that the designation of appropriate Best Management Practices in each watershed be determined through the WQIP process rather than the one size fits all strategy currently being proposed in the Permit. Also, that until the Board adopts a WQIP for a watershed that the provisions of the existing Permit remain in place for that watershed. Finally, in order to avoid unnecessary litigation I request that the Board adopt the WQIPs as Orders implementing the proposed Permit.

I urge you to adopt final permit language that is evidence-based and both environmentally and economically sustainable. Thank you for your time and consideration.

Sincerely,

Jeff Marston

President

Marston+Marston, Inc.

From: Clark,Joyce Truhan
To: Chiu, Wayne@Waterboards
Cc: Bell,Janet J
Subject: "Comment - Tentative Order No. R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu"
Date: Friday, January 11, 2013 3:00:04 PM
Importance: High

January 11, 2013

Sent Via E-Mail

Attention: Mr. Wayne Chiu, P.E.
wchiu@waterboards.ca.gov

California Regional Water Quality Control Board
San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4353

Subject: Metropolitan Water District of Southern California – "Comment – Tentative Order No. R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu"

Dear Mr. Chiu:

The Metropolitan Water District of Southern California (MWD) appreciates the opportunity to comment on subject Tentative Order No. R9-2013-0001, Regional MS4 Permit (MS4 Tentative Order). MWD is a consortium of 26 cities and water districts that provides drinking water to nearly 19 million people in parts of Los Angeles, Orange, San Diego, Riverside, San Bernardino, and Ventura counties. MWD delivers an average of 1.7 billion gallons of water per day to a 5,200 square mile service area. Our facilities include the Colorado River Aqueduct, pumping plants, treatment plants, reservoirs, tunnels, pipelines and hydroelectric plants. MWD is enrolled under the current 2010 San Diego Regional Water Quality Control Board's (SDRWQCB) General Permit, Order No.R9-2010-0003 (Existing General Permit), which captures dewatering, hydrostatic testing, and related potable water discharges for our Skinner Water Treatment Plant and water supply pipelines under the jurisdiction of the SDRWQCB.

To ensure continuous safety and protection of water supplies, MWD, our member agencies, and other water supply purveyors must perform various routine operations and maintenance activities that result in planned drinking water system releases of potable water, raw water, or low volume releases. These activities include, but are not limited to, routine dewatering/flushing of distribution systems for maintenance, cleaning and lining of pipe sections, pipeline disinfection, reservoir repairs and reservoir cover cleaning, and hydrostatic testing. Additionally, MWD and other water purveyors may also have unplanned releases that include pipeline breaks, leaks, overflows, and emergency flushing activities.

Comments

In the MS4 Tentative Order, MWD has noted that non-storm water discharges from water purveyors are categorized as "illicit" discharges. We understand the rationale for the MS4 Tentative Order using the term "illicit discharges" to define any discharges to an MS4 that are not composed entirely of storm water, and are not covered under a separate NPDES permit. However, we feel that use of another category would be more appropriate to describe these potable water discharges. Such a category could be similar to those included in the recently adopted Los Angeles Regional Water Quality Control Board's MS4 Permit (e.g. "conditionally exempt essential non-storm water discharges," or "authorized non-storm water discharges separately regulated by an individual or general NPDES permit").

Additionally, the MS4 Tentative Order references Order No. R9-2010-0003, which covers all discharges from water purveyors and community water systems. MWD has reviewed the MS4 Tentative Order against the Existing General Permit, and the abbreviated language in the MS4 Tentative Order is not consistent with the language used to describe these covered discharge in the Existing General Order. The MS4 Tentative Order needs to be consistent with the authorized discharges from water purveyors and community water systems that are captured in the Existing General Permit. As such, MWD staff recommends that SDRWQCB revise the language in the MS4 Tentative Order that applies to water purveyors and community water systems as follows:

Section E – Jurisdictional Runoff Management Programs, 2. Illicit Discharge Detection and Elimination, a. Non-Storm Water Discharges

Item (2) – Current Language: "Discharges of non-storm water from water line flushing and water main breaks to the MS4 must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG 679001 (Order No.R9-2010-0003, or subsequent order). This category includes water line flushing and water main break discharges from water purveyors issued a water supply permit by the California Department of Public Health or federal military installations. Discharges from recycled or reclaimed water lines to the MS4 must be addressed as illicit discharges under a separate NPDES permit."

Item(2) – **Suggested Revision:** **"Discharges of non-storm water from water purveyors and community water systems are authorized discharges, and are not considered illicit discharges, if the discharger is enrolled and regulated under an individual or general NPDES permit, such as NPDES Permit No. CAG 679001 (Order No. R9-2010-0003, or subsequent order). This category includes those discharge activities described in Order No. R9-2010-0003, which includes but is not limited to the following: discharges resulting from repair, maintenance, and disinfection of pipelines, tanks, vessels, and reservoirs dedicated to drinking water purveyance and storage, and hydrostatic test water discharges resulting from testing of pipelines, tanks, and vessels that are dedicated to drinking water purveyance and storage."**

Please contact Janet Bell at (213) 217-5516 or via email at jbell@mwdh2o.com, if you have any questions.

Thank you,

Joyce T. Clark
Program Manager
Metropolitan Water District of Southern California
(213) 217-5593
jtruhan@mwdh2o.com

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January 11, 2013

Via electronic mail

Mr. David Gibson
Executive Officer and Members of the Board
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123
Email: wchiu@waterboards.ca.gov

Re: Comments on Tentative Order R9-2013-0001, San Diego Region MS4 Permit

Dear Mr. Gibson:

On behalf of the Natural Resources Defense Council ("NRDC"), we are writing with regard to the Draft National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds Within the San Diego Region, Draft permit R9-2013-0001, NPDES Permit No. CAS0109266 ("Draft Permit"). We appreciate the opportunity to submit these comments to the San Diego Regional Water Quality Control Board ("Regional Board") on the Draft Permit.[1]

I. Stormwater Runoff is a Leading Source of Water Pollution in the San Diego Region

The U.S. Environmental Protection Agency ("U.S. EPA") considers urban runoff to be "one of the most significant reasons that water quality standards are not being met nationwide."[2] As the U.S. EPA has stated:

> Most stormwater runoff is the result of the man-made hydrologic modifications that normally accompany development. The addition of impervious surfaces, soil compaction, and tree and vegetation removal

[1] NRDC previously submitted comments on the Draft Permit to the Regional Board on September 14, 2012. We incorporate those comments and documents submitted in support by reference here.
[2] U.S. General Accounting Office (June 2001) *Water Quality: Urban Runoff Programs*, Report No. GAO-01-679.

> result in alterations to the movement of water through the environment. As interception, evapotranspiration, and infiltration are reduced and precipitation is converted to overland flow, these modifications affect not only the characteristics of the developed site but also the watershed in which the development is located. Stormwater has been identified as one of the leading sources of pollution for all waterbody types in the United States. Furthermore, the impacts of stormwater pollution are not static; they usually increase with more development and urbanization.[3]

A recent study of the effects of urban development on stream ecosystems by the U.S. Geological Survey showed that urban development impacts stream chemistry, hydrology, habitat, and species composition, and that communities of invertebrate species "Begin to Degrade at the Earliest Stages of Urban Development."[4]

In the San Diego Region, the Regional Board has found that:

- "Land development has created and continues to create new sources of non-storm water discharges and pollutants in storm water discharges as human population density increases. This brings higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash. Pollutants from these sources are dumped or washed off the surface by non-storm water or storm water flows into and from the MS4s." (Draft Permit, at Finding 10);

- "[C]ommon pollutants in runoff discharged from the MS4s include total suspended solids, sediment, pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., cadmium, copper, lead, and zinc), petroleum products and polynuclear aromatic hydrocarbons, synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus), oxygen-demanding substances (e.g., decaying vegetation, animal waste), detergents, and trash." (Draft Permit, at Finding 12); and,

- "The Copermittees' water quality monitoring data . . . documents persistent exceedances of Basin Plan water quality objectives for runoff-related pollutants at various watershed monitoring stations. Persistent toxicity has also been observed at several watershed monitoring stations. In addition, bioassessment data indicate that the majority of the monitored receiving waters have Poor to Very Poor Index

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[3] U.S. Environmental Protection Agency (December 2007) *Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices*, at v.
[4] U.S. Geological Survey (2012) *Effects of Urban Development on Stream Ecosystems in Nine Metropolitan Study Areas Across the United States*, at 4; see generally, 1-5. Available at: http://pubs.usgs.gov/circ/1373/.

> of Biotic Integrity (IBI) ratings. These findings indicate that runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in the San Diego Region." (Draft Permit, at Finding 14.)

The Draft Permit establishes requirements critical to addressing this pollution.

II. Pollutants in Stormwater Must be Reduced to the Maximum Extent Practicable

Consistent with the federal Clean Water Act, a fundamental goal of all municipal stormwater permits is to ensure that discharges from storm sewers do not cause or contribute to a violation of water quality standards. (33 U.S.C. § 1341.) In addition, for MS4s covered under the National Pollutant Discharge Elimination System program, permits for discharges from municipal storm sewers:

> shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants.

(33 U.S.C. § 1342(p)(3)(B)(iii).) The maximum extent practicable ("MEP") standard serves as a floor to performance for regulated parties. This standard does not grant unbridled leeway to Permittees in developing controls to reduce the discharge of pollution. "[W]hat the discharger will do to reduce discharges to the 'maximum extent practicable' . . . crosses the threshold from being an item of procedural correspondence to being a substantive requirement of a regulatory regime." (*Environmental Defense Center, Inc. v. U.S. E.P.A* (9th Cir. 2003) 344 F.3d 832, 853.) The MEP standard "imposes a clear duty on the agency to fulfill the statutory command to the extent that it is feasible or possible." (*Defenders of Wildlife v. Babbitt,* 130 F. Supp. 2d 121, 131 (D.D.C. 2001); *Friends of Boundary Waters Wilderness v. Thomas,* 53 F.3d 881, 885 (8th Cir. 1995) ("feasible" means "physically possible").

As one state hearing board held:

> [MEP] means to the fullest degree technologically feasible for the protection of water quality, except where costs are wholly disproportionate to the potential benefits…. This standard requires more of Permittees than mere compliance with water quality standards or numeric effluent limitations designed to meet such standards…. The term "maximum extent practicable" in the stormwater context implies that the mitigation measures in a stormwater permit must be more than simply adopting standard practices. This definition applies particularly in areas where standard practices are already failing to protect water quality….

(*North Carolina Wildlife Fed. Central Piedmont Group of the NC Sierra Club v. N.C. Division of Water Quality* (N.C.O.A.H. October 13, 2006) 2006 WL 3890348, Conclusions of Law 21-22 (internal citations omitted).) The North Carolina board further found that the permits in question violated the MEP standard both because commenters highlighted measures that would reduce pollution more effectively than the permits' requirements and because other controls, such as infiltration measures, "would [also] reduce discharges more than the measures contained in the permits." (*Id.* at Conclusions of Law 19.)

Nor is MEP a static requirement—the standard anticipates and in fact requires new and additional controls to be included with each successive permit. As U.S. EPA has explained, NPDES permits, including the MEP standard, will "evolve and mature over time" and must be flexible "to reflect changing conditions." (55 Fed. Reg. 47990, 48052.) "EPA envisions application of the MEP standard as an iterative process. MEP should continually adapt to current conditions and BMP effectiveness and should strive to attain water quality standards. Successive iterations of the mix of BMPs and measurable goals will be driven by the objective of assuring maintenance of water quality standards." (64 Fed. Reg. 68722, 68754.) In other words, successive iterations of permits for a given jurisdiction will necessarily evolve, and contain new and more stringent requirements for controlling the discharge of pollutants in runoff.

Although requiring compliance with MEP may be sufficient to achieve water quality standards and other common permit terms, the Clean Water Act independently requires that MS4 permits achieve water quality standard compliance.[5] EPA has stated "all permits for MS4s must include any requirements necessary to achieve compliance with [water quality standards]."[6] Notwithstanding this requirement, permits also require "such other provisions as the Administrator or the State determines appropriate for the control of such pollutants." This language in section 1342(p) has been held by California courts to grant "the EPA (and/or a state approved to issue the NPDES permit) . . . the discretion to impose 'appropriate' water pollution controls in addition to those that come within the definition of 'maximum extent practicable.'" (*Building Industry Ass'n of San*

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[5] See, 33 U.S.C. § 1311(a); 1313; 1341(a); 1342(p); 40 C.F.R. § 122.44(d)(1) (permits must contain, as applicable, any requirements necessary to "[a]chieve water quality standards established under section 303 of the CWA, including State narrative criteria for water quality"); Memorandum from E. Donald Elliott, Assistant Administrator and General Counsel, U.S. Environmental Protection Agency, to Nancy J. Marvel, Regional Counsel Region IX, re: Compliance with Water Quality Standards in NPDES Permits Issued to Municipal Separate Storm Sewer Systems, Jan. 9, 1991 ("EPA Elliott Memo"). But see, *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159, 1166 (holding that permitting authority is not required to impose strict water quality-based effluent limitations, but has the authority to do so).

[6] EPA Elliott Memo, at 1; *In re: Government of the District of Columbia Municipal Separate Storm Sewer System* (EPA 2002) 10 E.A.D. 323, 2002 WL 257698.

Diego County v. State Water Resources Control Bd. (2004) 124 Cal.App.4th 866, 883 (citing *Defenders of Wildlife v. Browner* (1999) 191 F.3d 1159, at 1165–1167).)

As a result, while the MEP standard represents a statutory floor, rather than limit, for permit requirements, the Regional Board and EPA maintain the authority to impose additional restrictions over and above MEP as they determine appropriate. Both California and federal authority maintain that MS4 permits must include provisions to ensure that discharges do not cause or contribute to exceedances of water quality standards.

III. Permit Provisions

A. The Draft Permit's Receiving Water Limitations Appropriately Prohibit Discharges that Cause or Contribute to the Violation of Water Quality Standards.

Consistent with the 2007 San Diego County MS4 Permit, 2009 South Orange County MS4 Permit, and 2010 Riverside County MS4 Permit,[7] as well as federal authority and State Water Board WQ Order No. 99-05,[8] the Draft Permit requires that "Discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters." (Draft Permit, at II.A.2.a.)[9] Multiple California and federal courts have upheld such provisions, including in prior iterations of the San Diego MS4 Permit.[10]

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[7] See, San Diego Regional Water Quality Control Board (January 24, 2007) San Diego County MS4 Permit, Order No. R9-2007-0001, at A.3 ("2007 San Diego Permit"); San Diego Regional Water Quality Control Board (December 16, 2009) South Orange County MS4 Permit, Order No. R9-2009-0002, at A.3; San Diego Regional Water Quality Control Board (November 10, 2010) Riverside County MS4 Permit, Order No. R9-2010-0016, at A.3.

[8] Under Order No. 99-05, the State Board directed the Regional Boards to include receiving water limitations language devised by EPA, without incorporation of a safe harbor provision, into all future MS4 permits.

[9] See, 2007 San Diego Permit, at § A.3; see also, South Orange County MS4 Permit, Order No. R9-2009-0002, at § A.3.

[10] *See, e.g., Building Industry Ass'n of San Diego County*, 124 Cal.App.4th at 883; *In re L.A. County Mun. Storm Water Permit Litigation.*, No. BS 080548 at 4-7 (L.A. Super. Ct. Mar. 24, 2005) ("*L.A. County Mun. Stormwater*"); *County of Los Angeles v. Cal. State Water Res. Control Bd.* (2006) 143 Cal.App.4th 985, 989; *Natural Resources Defense Council v. County of Los Angeles* (2011) 673 F.3d 880, 897. The court in *In re L.A. County Mun. Stormwater* noted that, "the Regional Board acted within its authority when it included Parts 2.1 and 2.2 in the Permit without a 'safe harbor,' whether or not compliance therewith requires efforts that exceed the 'MEP' standard." (*In re L.A. County Mun. Stormwater*, at 7.) But regardless of this authority, the Court found that "the terms of the Permit taken, as a whole [including the Permit's receiving water limitations], constitute the Regional Board's definition of MEP." (*Id*. at 7-8.)

As such, the prohibition against discharges that cause or contribute to violations of water quality standards is appropriately incorporated into the Draft Permit's receiving water limitations here.

Moreover, any weakening of the receiving water limitations language would constitute a violation of the Clean Water Act's anti-backsliding provisions, which require that "a permit may not be renewed, reissued, or modified to contain effluent limitations which are less stringent than the comparable effluent limitations in the previous permit," except in circumstances not presented by the Draft Permit. (33 U.S.C. § 1342(o)(1).) Similarly, federal regulations require that "when a permit is renewed or reissued, interim effluent limitations, standards or conditions must be at least as stringent as the final effluent limitations, standards, or conditions in the previous permit. . . ." (40 C.F.R. § 122.44(l)(1).) Because the prohibition against exceedances of water quality standards was required by the prior San Diego, South Orange County, and Riverside permits, this provision cannot be less stringent in the Draft Permit. A weakening of the receiving water limitations would further violate state and federal antidegradation requirements, which mandate that existing water quality in navigable waters be maintained unless degradation is justified by specific findings.[11] As a result, the adopted permit must require compliance with water quality standards, without restriction.

B. The Draft Permit's Development Planning Requirements Must Require On-Site Retention of at least the 85th Percentile Storm

We strongly support that the Draft Permit establishes requirements for new development and redevelopment projects to retain stormwater runoff on-site. A principal reason to adopt such an approach is the superior pollutant load reduction capacity of LID practices that retain runoff on-site, for a variety of climatic scenarios, including for the San Diego region.[12] However, we are concerned that, as currently drafted, the Draft Permit's Development Planning requirements in many circumstances will allow projects to retain less runoff than has been demonstrated to be practicable. This in turn will result in increased discharge of pollutants to receiving waters over what could practicably be reduced, in violation of Clean Water Act's MEP standard. In particular, the Draft Permit's provision allowing for required runoff retention to be calculated as the "volume

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[11] See, 40 C.F.R. § 131.12; State Board Resolution 68-16; *Associacion de Gente Unida for El Agua v. Central Valley Regional Board* (2012) (210 Cal.App.4th 1255) [149 Cal.Rptr.3d 132, 142; 144] (citing "St. Water Res. Control Bd., Guidance Memorandum (Feb. 16, 1995)).

[12] Dr. Richard Horner and Jocelyn Gretz (December 2011) Investigation of the Feasibility and Benefits of Low-Impact Site Design Practices Applied to Meet Various Potential Stormwater Runoff Regulatory Standards ("Horner and Gretz Runoff Study"); see also, Horner, Richard. Report for Ventura County; Horner, Richard. Initial Investigation for San Francisco Bay Area; Horner, Richard. Supplementary Investigation for San Francisco Bay Area; Horner, Richard. Report for San Diego Region.

of storm water that would be retained on-site if the site was fully undeveloped and naturally vegetated" should be deleted. (See Draft Permit, at E.3.c(1)(a)(ii).)

The Draft Permit requires, under one provision, that the runoff from the 85th percentile, 24-hour rain event must be retained on-site. (Draft Permit, at E.3.c(1)(a)(i).) This requirement, resulting in retention of stormwater runoff with no off-site discharge in the vast majority of storms, is consistent with on-site retention requirements of other permits throughout California, as in permits and ordinances found in all corners of the United States. Similar or more stringent requirements are included in the following permits:

Ventura County: MS4 permit requires on-site retention of ninety-five percent of rainfall from the 85th percentile storm; off-site mitigation allowed if on-site retention is technically infeasible;[13]

South Orange County: MS4 permit requires on-site retention of the 85th percentile storm, off-site mitigation allowed if on-site retention is technically infeasible;[14]

However, the 85th percentile standard is actually less stringent than required by permits in many other parts of the county. For example, permits in the following locations require retention that generally exceeds the 85th percentile storm volume in San Diego:

Washington D.C.: MS4 permit requires retention of the first 1.2 inches of stormwater (which represents the 90th percentile storm) for all new development and redevelopment over 5,000 square feet.[15]

West Virginia: Statewide Phase II MS4 permit requires on-site retention of "the first one inch of rainfall from a 24-hour storm" event unless infeasible;[16] and,

Philadelphia, PA: Infiltrate the first one inch of rainfall from all impervious surfaces; if on-site infiltration is infeasible, the same performance must be achieved off-site.[17]

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[13] Los Angeles Regional Water Quality Control Board (July 8, 2010) Ventura County Municipal Separate Stormwater National Pollutant Discharge Elimination System (NPDES) Permit; Order No. R4-2009-0057; NPDES Permit No. CAS004002.
[14] San Diego Regional Water Quality Control Board (December 16, 2009) South Orange County MS4 Permit, Order No. R9-2009-0002, NPDES Permit No. CAS0108740.
[15] U. S. EPA (2011) Fact Sheet, National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Permit No. DC0000221 (Government of the District of Columbia).
[16] State of West Virginia Department of Environmental Protection, Division of Water and Waste Management, General National Pollution Discharge Elimination System Water Pollution Control Permit, NPDES Permit No. WV0116025 at 13-14 (June 22, 2009).
[17] City of Philadelphia (Jan. 29, 2008) Stormwater Management Guidance Manual 2.0, at 1.1, available at.

Further, research conducted by Dr. Richard Horner, a member of the National Academy of Sciences Panel on Reducing Stormwater Discharge Contributions to Water Pollution demonstrates that, for five different types of land use development or redevelopment projects in Southern California, the full 85th percentile, or even the full 95th percentile, 24-hour precipitation event could be retained on-site using *only* infiltration practices on sites overlying soils classified as Group C (typically containing 20 to 40 percent clay) under the Natural Resources Conservation Service (NRCS) major soil orders classification scheme.[18] Critically, even for sites overlying Group D soils (typically 40 percent or more clay with substantially restricted water transmissivity) and assuming *no* infiltration was feasible, greater than 50 percent of the 85th percentile storm (or between 37 and 62 percent of annual runoff) could be retained at each development type using only rooftop runoff dispersion or rooftop harvest and reuse techniques.[19] Additional retention under these scenarios could be achieved through use of evaporation practices, green roofs, or, in cases where some infiltration is feasible, use of infiltration BMPs.

The Permit also allows for required stormwater runoff retention to be calculated as the "volume of storm water that would be retained onsite if the site was fully undeveloped and naturally vegetated" based on site specific soil conditions and natural vegetative cover. (Draft Permit, at E.3.c(1)(a)(ii).) This approach requires only that a development retain the change in runoff between pre-development (or undeveloped) conditions and post-development, or the "delta volume." Yet, as described below, the delta volume approach alone does not achieve control of pollutants to the MEP, and represents a significant departure from both state and national precedents. For this reason, it has been rejected in other California Permits as insufficient to meet statutory requirements.[20]

While the delta volume approach may be appropriate in assessing effects of hydromodification, because preservation of hydrologic profile from pre-development to post-development[21] will not cause modification in the hydrology of the receiving water,

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[18] Horner and Gretz Runoff Study, at Table 16 p. 35; Natural Resources Conservation Service, Distribution Maps of Dominant Soil Orders (http://soils.usda.gov/technical/classification/orders/, last accessed December 16, 2011).

[19] Horner and Gretz Runoff Study, at Table 16 p. 35; 27-34. We note as well that even in areas characterized regionally as underlain by D soils, site specific investigation may establish substantial potential for infiltration of runoff.

[20] See, e.g., Santa Ana Regional Water Quality Control Board, OC MS4 Tentative Order No. R8-2008-0030 (R8-2009-0030) Comments/Responses, at comment 103.

[21] We distinguish delta volume's application to water quality considerations from the otherwise appropriate application of comparisons of pre-development to post development hydrology as a means of establishing hydromodification controls. Irrespective of this approach, however, we note that the Draft Permit should require projects to implement hydromodification controls to meet "predevelopment (naturally occurring)" runoff flow rate (see Draft Permit, at E.3.c.(2)(a)), rather than "pre-project" conditions, or the conditions of a previously developed site immediately prior to

this approach is inappropriate for management of water quality. Under the delta volume approach, the unretained volume of runoff resulting from development (i.e., any amount of runoff greater than would have been retained under undeveloped conditions), will carry pollutants to receiving waters that would not have been present in runoff from undeveloped land.

This is particularly a concern in the San Diego region, which contains significant land area underlain by clay rich soils that may reduce infiltrative capacity.[22] For example, for development sites underlain by C soils, Dr. Horner's research demonstrates that the delta volume approach may actually require the site to retain more runoff than would be retained under the 85th percentile storm standard.[23] However, for development sites underlain by D soils, which may include large portions of the San Diego region, the delta volume approach will result in requiring development to substantially *less* runoff than would be required, or feasibly retained, under the 85th percentile storm standard. Under case studies for the 85th percentile storm standard, development sites would be required to retain between 37 and 62 percent of average annual runoff, with even greater retention possible given use of soil amendments or other practices to augment recharge. For the same sites, the delta volume approach would only require retention of between 27 and 44 percent of annual runoff.[24] Because the delta volume standard allows runoff that could be feasibly retained on-site to be discharged and carry pollutants to receiving waters, the standard violates the Clean Water Act's MEP requirement. The Draft Permit should either delete reference to this standard from section E.3.c(1)(a)(ii), or require that a project site retain the runoff from the 85th percentile, 24-hour storm event, or the delta volume approach, *whichever is greater*.

1. <u>The Draft Permit Must Require a Determination that it is Technically Infeasible to Retain the Design Storm On-Site Before Biofiltration or Off-site Mitigation/Retrofitting is Authorized.</u>

While we support the inclusion of strong retention standards for stormwater runoff, and the Draft Permit's requirement to incorporate on-site treatment in addition to performance of off-site mitigation in the event of technical infeasibility for on-site retention, we are concerned by statements of Regional Board staff that they "would like to make a shift away from determining what is infeasible onsite to determining what is

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construction. This issue is of concern for both natural, non-hardened channels, and for concrete lined or hardened channels, where allowing use of a "pre-project" standard for hydromodification may serve to prevent stream rehabilitation.

[22] See, e.g., Horner and Gretz Runoff Study, at 15-16.

[23] *Id*., at Table 16 p 35. In the San Marcos case studies, the delta volume approach would require retention of 72 to 80 percent of average annual runoff, while retention of the 85th percentile storm event would result in retention of 62 percent of average annual runoff.

[24] *Id*.

feasible onsite"[25] and Draft Permit provisions allowing for use of biofiltration and off-site mitigation even where on-site retention is feasible. Because retention of the 85th Percentile Storm event has been established as MEP in California Permits,[26] the project proponent must meet this standard or demonstrate that it cannot be met.

The jurisdictions identified in sections above have recognized the paramount importance of mandating on-site retention of a certain quantity of stormwater since, in contrast to retention practices, which ensure that 100 percent of the pollutant load in the retained volume of runoff does not reach receiving waters, biofiltration practices (or tree-box filters and other similar practices) that treat and then discharge runoff through an underdrain result in the release of pollutants to receiving waters. Indeed, in order to achieve equivalent pollutant load reduction benefits to the use of on-site retention, biofiltration practices would have to be 100 percent effective at filtering pollutants from the same volume of runoff, which they are invariably not. As a result, while biofiltration practices (or conventional flow-through practices) may be appropriate for on-site treatment when coupled with an off-site mitigation requirement in cases of technical infeasibility (discussed further below), they are not a proper substitute for low impact development ("LID") practices that retain water on-site.

This conclusion is borne out by data presented in the Draft Ventura County Technical Guidance Manual, which estimates pollutant removal efficiency for total suspended solids to be 54-89 percent, and for total zinc to be 48-96 percent.[27] Biofiltration has additionally been shown to be a particularly ineffective method of pollutant removal for addressing nitrogen or phosphorous, two common contaminants found in stormwater.[28] The Draft Ventura Technical Guidance, for example, indicates that biofiltration achieves

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[25] Regional MS4 Permit RWQCB Workshop Notes, September 5, 2012, at 4.

[26] See, e.g., Ventura County MS4 Permit, Order No. R4-2009-0057; San Francisco Bay Area MS4 Permit, Order No. R2-2009-0074; North Orange County MS4 Permit, Order No. R8-2009-0030; South Orange County MS4 Permit, Order No. R9-2009-0002.

[27] Ventura County Low Impact Development Technical Guidance Manual, July 13, 2011, at D-7.

[28] Lawn irrigation has been identified as a "hot spot" for nutrient contamination in urban watersheds—lawns "contribute greater concentrations of Total N, Total P and dissolved phosphorus than other urban source areas . . . source research suggests that nutrient concentrations in lawn runoff can be as much as four times greater than other urban sources such as streets, rooftops or driveways." Center for Watershed Protection (March 2003) *Impacts of Impervious Cover on Aquatic Systems* at 69; see also H.S. Garn (2002) *Effects of lawn fertilizer on nutrient concentration in runoff from lakeshore lawns, Lauderdale Lakes, Wisconsin*. U.S. Geological Survey Water- Resources Investigations Report 02-4130 (In an investigation of runoff from lawns in Wisconsin, runoff from fertilized lawns contained elevated concentrations of phosphorous and dissolved phosphorous).

pollutant removal efficiency for total nitrogen at between only 21-54 percent,[29] as compared with 100 percent for runoff retained on-site. As a result, even where a multiplier is applied requiring 1.5 times as much runoff be treated using biofiltration as would otherwise be retained, biofiltration may achieve substantially less pollution reduction as would retention.

Likewise, the Draft Permit's provisions allowing for a project to perform off-site mitigation through off-site regional BMPs or retrofits may violate the Clean Water Act's MEP requirement because it does not provide any actual mechanism to ensure that an alternative "off-site" location will provide "greater overall water quality benefit" to on-site retention. (Draft Permit, at E.3.c(3)(b).) NRDC supports use of regional projects that may provide multiple benefits, including increased local water supply, where runoff is *conveyed* from a project site to a regional facility that will retain that runoff, albeit at a different location, with no discharge to receiving waters, as this process typically does not implicate significant water quality concerns. Where the same, specific quantum of runoff from the project is ultimately retained, 100 percent of the pollution contained in that particular volume of water will be prevented from reaching receiving waters.

In contrast, where a project, performs off-site mitigation or retrofit at some other location within the same watershed or sub-watershed that is not hydrologically connected to the original project site, it raises substantial concerns as to whether the alternate location will provide equal water quality benefits to the receiving surface water. Among the issues presented by this form of off-site mitigation are whether the off-site mitigation will be performed at a similar land use type; whether the mitigation project will achieve equivalent pollutant load reduction; and if so, what pollutants it will be monitored for. In practice it may prove exceedingly difficult to assess the equivalency of benefits to surface water quality from retention at one site to the next. Further, while we note that the Regional Board has included a multiplier for retention 1.1 times the design volume not retained on-site in cases of off-site mitigation, (Draft Permit, at E.3.c(3)(b)(iv)) the Board has not provided any analysis or evidence to demonstrate that this volume will be sufficient to offset the release of pollution from on-site sources. As a result, off-site mitigation should be allowed only where on-site retention or regional projects where runoff is conveyed directly to the retention site are infeasible.

Finally, while we support development under the USGCB LEED program, the Board has not provided any analysis to demonstrate that meeting the criteria set forth in section E.3.c(3)(b)(ii) will result in a reduction of pollution equivalent to the Permit's otherwise

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[29] Ventura County Low Impact Development Technical Guidance Manual, July 13, 2011, at D-7. See also, BASMAA (December 1, 2010) *Draft Model Bioretention Soil Media Specifications-MRP Provision C.3.c.iii*, at Annotated Bibliography section 3.0 (noting nutrient removal from synthetic stormwater runoff demonstrated only 55 to 65 percent of total Kjeldahl nitrogen removal and that only 20 percent of nitrate is removed from the runoff).

applicable retention standard, or to the MEP. This section should therefore be revised accordingly or deleted.

2. LID Is Cost-Effective and Provides Significant Economic Benefits

LID "provides ecosystem services and associated economic benefits that conventional stormwater controls do not."[30] Because traditional stormwater management approaches involve the construction of complex systems of infrastructure, they can entail substantial costs. Since LID emphasizes storage and use, infiltration, and use of a site's existing drainage conditions, "[c]ost savings are typically seen in reduced infrastructure because the total volume of runoff to be managed is minimized."[31] A 2007 U.S. EPA study found that "in the vast majority of cases . . . implementing well-chosen LID practices saves money for developers, property owners, and communities while protecting and restoring water quality."[32] With only "a few exceptions," the EPA study found that "[t]otal capital cost savings ranged from 15 to 80 percent when LID methods were used" instead of conventional stormwater management techniques.[33] The savings identified in documented studies are noteworthy considering they do not reflect the additional economically beneficial attributes LID provides, including reduced costs of municipal infrastructure, reduced costs of municipal stormwater management, and increased value of real estate.[34]

Nor is the EPA study alone in reaching this conclusion. A survey released by the American Society of Landscape Architects in 2011 found that green infrastructure reduced or did not influence project costs 75 percent of the time.[35] A joint project by the University of New Hampshire Stormwater Center and Virginia Commonwealth University found that use of LID provided stormwater management cost savings of 6 percent for residential development and 26 percent for commercial developments as compared with conventional stormwater management.[36] And while the economics of

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[30] ECONorthwest, The Economics of Low-Impact Development: A Literature Review, at iii. (2007) ("ECONorthwest") (Exh. 61).
[31] U.S. EPA Cost Study, at 2; U.S. Department of Housing and Urban Development, The Practice of Low Impact Development, at 33 (2003) (Exh. 62).
[32] U.S. EPA Cost Study, at iii.
[33] *Id.* at iv.
[34] See ECONorthwest, at 5; *Id*. at 15 (disconnecting downspouts to allow for natural infiltration in the Beecher Water District near Flint, Michigan cost the district about $15,000, but decreased the mean volume of sewer flows by 26 percent, and saved the district more than $8,000 per month in stormwater fees); U.S. EPA Cost Study, at 7.
[35] American Society of Landscape Architects (2011) Advocacy: Stormwater Case Studies.
[36] Roseen, R., T. Janeski, J. Houle, M. Simpson, and J. Gunderson (2011) *Forging the Link: Linking the Economic Benefits of Low Impact Development and Community*

integrating LID into redevelopment projects vary slightly from new development, there is little evidence it typically raises project costs. An analysis of three communities by ECONorthwest found that while complying with stormwater standards, including strict runoff volume reduction requirements, is a cost consideration, it is rarely, if ever, a driving factor in decisions to undertake redevelopment projects.[37]

Further, LID can provide substantial benefits for the San Diego region in terms of increased local supply of water and reduced energy usage, in addition to the stormwater runoff and pollution benefits it can provide.[38]

C. The Requirements for Water Quality Improvement Plans Lack Sufficient Detail, Represent an Illicit Self Regulatory Scheme, and Violate Clean Water Act Prohibitions Against the Discharge of Non-stormwater

1. The Draft Permit Must Provide for Adequate Public and Agency Review of Any Substantive Permit Requirements Designed by the Permittees

While we support watershed based efforts to address stormwater pollution in the San Diego region, the Draft Permit's requirements for Water Quality Improvement Plans are in many parts vague, essentially directing Permittees to develop their own priorities and requirements, which are subject only to minimal, inadequate public review or Regional Board oversight. In this way, the provisions represent a "plan to develop a plan," rather than any form of plan in itself. In *Environmental Defense Center, Inc. v. U.S. E.P.A* ((9th Cir. 2003) 344 F.3d 832, 854-56), the court explained: "[S]tormwater management programs that are designed by regulated parties must, in every instance, be subject to meaningful review by an appropriate regulating entity. . . . Congress identified public participation rights as a critical means of advancing the goals of the Clean Water Act in

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Decisions. University of New Hampshire Stormwater Center, the Virginia Commonwealth University, and Antioch University New England. Available at: http://www.unh.edu/unhsc/resource-manual-and-fact-sheets; see generally, NRDC (2011) Rooftops to Rivers II: Green Strategies for Controlling Stormwater and Combined Sewer Overflows, at 19-30.

[37] ECONorthwest (2011) "Managing Stormwater in Redevelopment and Greenfield Development Projects Using Green Infrastructure: Economic Factors that Influence Developers Decisions,"prepared by S. Reich et al, at 2.

[38] See, NRDC and University of California at Santa Barbara (2009) A Clear Blue Future: How Greening California Cities Can Address Water Resources and Climate Challenges in the 21st Century; See also, NRDC (2011) Capturing Rainwater from Rooftops: An Efficient Water Resource Management Strategy that Increases Supply and Reduces Pollution; NRDC and University of California at Los Angeles (2012) Looking Up: How Green Roofs and Cool Roofs Can Reduce Energy Use, Address Climate Change, and Protect Water Resources in Southern California.

its primary statement of the Act's approach and philosophy." Provisions or substantive permit terms such as these which get at the core of permit requirements, and are designed or developed by the Permittees must be subject to proper opportunity for public comment to the Regional Board, and should be properly reviewed by the Regional Board at public hearing prior to approval and implementation.

2. The Permit's use of Numeric Action Limits Violates Clean Water Act Prohibitions Against the Discharge of Non-Stormwater

While we support the Regional Board's attempt to provide increased focus on dry weather, non-storm water discharges, we are concerned that the provisions for use of "numeric action limits" ("NALs") as drafted in the Water Quality Improvement Plans (Draft Permit, at II.C.1), do not fully support the Clean Water Act's absolute prohibition against the discharge of non-storm water to the MS4 system. The federal Clean Water Act mandates that MS4 permits "include a requirement to effectively prohibit non-stormwater discharges into the storm sewers." (33 U.S.C. § 1342(p)(3)(B)(ii); see 40 C.F.R. § 122.26(d)(2)(iv)(B)(1).) The Permit incorporates this requirement under section II.A.1.b. To support the development and prioritization of water quality improvement strategies for addressing non-storm water discharges to and from the MS4s and identify sources of non-stormwater pollution or potential violations of Permit provisions, the Draft Permit establishes (or requires Permittees to establish) quantifiable discharge goals for specific pollutants in the form of NALs.

We presume that the NAL provisions are intended to support the goal of compliance with the Clean Water Act's prohibition. However, the Draft Permit, which states that "NALs are not considered by the San Diego Water Board to be enforceable limitations," could be confusingly taken to suggest that the Permit allows for non-storm water discharges to occur or to contribute pollutants to the MS4 system so long as the pollution occurs at levels below the NALs.[39] This would violate both the Clean Water Act's absolute prohibition against non-storm water discharges to the MS4 under 33 U.S.C. § 1342(p)(3)(B)(ii), and the Act's implementing regulations, which require that "where such discharges are identified by the municipality as sources of pollutants to waters of the United States," in any amount, they must be addressed by the Permittee. (40 C.F.R. § 122.26(d)(2)(iv)(B)(1).)[40] The Draft Permit must require action by the Permittees to address non-stormwater discharges for pollution observed at levels both above *and* below

[39] We note a similar concern with respect to "SALs" for stormwater discharges, as this provision could be interpreted as authorizing the discharge of pollutants below the SAL, but which may contribute to an exceedance of water quality standards. (Draft Permit, at II.C.2.)

[40] Critically in this regard, any amount of pollution from an exempt source is prohibited, regardless of whether it occurs at levels below the NALs. As a result, action should be required of the Copermittees even for pollution occurring at levels below the NALs

the specified NALs in order to meet obligations fixed by the Clean Water Act, as the Act requires action to prohibit all discharges, regardless of the discharge's pollutant load.

IV. Conclusion

We appreciate this opportunity to comment on the Draft Permit. Please feel free to contact us with any questions or concerns you may have.

Sincerely,

Noah Garrison
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January 11, 2013

Mr. David Gibson, Executive Officer, and Members of the Board
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123

Dear Mr. Gibson and Board Members:

I am writing with respect to a provision with which I disagree among the Storm Water Pollutant Control BMP Requirements of Tentative Order No. R9-2013-0001, NPDES No. CAS0109266 ("the Tentative Order"). I base my comments on my extensive experience in the stormwater management field, summarized in the attachment to this letter. My full *curriculum vitae* are available on request.

I refer specifically to Tentative Order section E.3.c(1)(a)(ii), which gives as one of two options for a standard of runoff retention (i.e., interception, storage, infiltration, and/or evapotranspiration):

> The volume of storm water that would be retained onsite if the site was fully undeveloped and naturally vegetated, as determined using continuous simulation modeling techniques based on site-specific soil conditions and typical native vegetative cover.

The implication of this passage is that the retention requirement is equal to the difference between the post- and pre-development stormwater runoff volumes. In this letter I refer to this requirement as the "differential volume standard".

I disagree with the Tentative Order's allowing application of the differential volume standard, in any case and without restriction, as an alternative to a retention requirement based on the full volume of storm water produced by the 85th percentile, 24-hour storm event [i.e., provision E.3.c(1)(a)(i)]. Broadly exercising the differential volume option instead of the alternative would result in considerably greater volumes of urban stormwater discharge over the San Diego region as a whole, with concomitant, substantial increases in the mass loading to receiving waters of a range of pollutants.[1] It also departs from standard and well-accepted practice around the nation. This letter provides supporting documentation for my opinion.

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[1] For purposes of my analysis and comments I assume that the difference implied by the provision is between the post- and pre-development average annual runoff volumes. If, on the other hand, the intent is to apply it up to a certain rainfall event cap (e.g., the 85th percentile, 24-hour storm), I object even more strenuously to allowance of this option. I do so because that capped standard would result in the release of even more stormwater pollutant mass, as shown later in this letter.

Basis of Full-Volume Standard

Using the differential volume between pre- and post-development conditions breaks the long-standing precedent, in California and elsewhere, of using the full volume of stormwater discharged from the developed site in a designated event as the basis for stormwater best management practices ("BMPs") that store runoff for longer than a few minutes.[1] The widespread adoption (see examples below) of the full water quality volume instead of the differential volume occurred for good reasons. The total runoff volume from the 85th percentile, 24-hour event—the prevailing design standard in southern California—was determined through objective analysis to represent the point above which substantially diminishing returns in water quality improvement would accompany considerable BMP size enlargement and, therefore, cost (Guo and Urbonas 1996).[2] The analysis identified the full volume generated by the 85th percentile, 24-hour event— not some lesser quantity like the differential volume—as the appropriate threshold at which the decrease in benefits accelerates.

The use of a differential hydrologic measure that compares pre- and post-development states is common in the management of storm runoff quantity (i.e., hydromodification). The pre- vs. post-development measure is appropriate in that situation because successfully matching pre- and post-development hydrologic characteristics causes no modification in the hydrologic status of the receiving water and, hence, no negative physical effects.

When managing water quality, in contrast, any untreated volume (in the differential volume scenario, this would be the amount that originally flowed from the undeveloped land) would deliver to the receiving water the many pollutants characteristic of urban runoff. There, these pollutants would create negative physical, chemical, and biological effects. On the other hand, if the appropriate water quality volume is used (i.e., no less than the full volume of the 85th percentile, 24-hour event), the retentive stormwater management BMPs would deliver no pollutants to the receiving water in any rainfall up to and including the design event. Undeveloped land generates runoff discharged to surface waters as a function of factors such as its soils, hydrogeology, topography, and vegetative cover. Sites having conditions such as soils of relatively fine texture, high groundwater table, steep slopes, and/or scanty vegetation can produce substantial surface runoff flows in the undeveloped state compared to locations not having such characteristics.

Comparative Quantitative Assessment of Alternative Standards for the San Diego Area

A fairly common condition in the San Diego area is soil relatively restrictive to infiltration of water (Hydrologic Soil Group D soils). Lands with these soils, even in the undeveloped

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[1] There is a different basis for BMPs through which water flows rapidly (e.g., biofiltration swales), as given by Tentative Order provision E.3.c(1)(c)(ii).

[2] Guo, J.C.Y. and B. Urbonas. 1996. Maximized Detention Volume Determined by Runoff Capture Ratio. *Journal of Water Resources Planning and Management*, January/February.

condition, produce substantially more runoff than other soils, the least restrictive of which yield very little runoff at all when undeveloped. However, that D soil runoff is uncontaminated with the numerous pollutants characteristic of urban runoff. Developing on these soils and allowing retention only of the differential runoff volume still releases the relatively high pre-development quantity of runoff, now contaminated with the urban pollutants.

I performed an analysis and prepared a report on the relative benefits of five potential runoff retention standards, including: Standard 1—the 85th percentile, 24-hour event standard; Standard 4—a differential standard based on the average annual runoff volume; and Standard 5—a differential standard capped at the 85th percentile, 24-hour event (standard numerical designation are from the original report, Horner and Gretz 2011).[1] I applied "low impact development" (LID) runoff retention strategies to attempt to meet each standard for a range of land uses from single-family residential, to "big-box" commercial, to high-density infill redevelopment. I divided the strategies into Basic ARCD and Full ARCD (ARCD is aquatic resources conservation design, essentially a synonym for LID). When infiltration alone (Basic ARCD) could not accomplish full retention according to the standard, roof runoff management strategies were selected as appropriate for the land use case (Full ARCD). For the retail commercial development, roof runoff management would be accomplished by harvesting, temporarily storing, and applying water to use in the building. In residential cases roof runoff would be dispersed on the landscape for evapotranspiration and some infiltration. I performed the analysis for four locations around the nation, including the San Diego area (a specific location based on San Marcos). I used the two most common soil types around San Marcos, Hydrologic Soil Groups C (somewhat restrictive to infiltration) and D.

My calculations showed that it is possible to retain <u>all</u> of the average annual runoff volume on the C soil using only Basic ARCD.[2] No urban stormwater pollutants would enter receiving waters in an average year in that situation. Any retention standard that might be set by a permit could be met with that soil condition, and also in any less restrictive Hydrologic Soil Group (e.g, A and B soils) present. With D soils I estimated that Full ARCD would retain 37-66 percent of the average annual runoff volume, depending on the land use and its land cover characteristics. The pollutant mass (the multiplication product of pollutant concentration and runoff volume) prevented from entering receiving waters would be somewhat greater as a percentage of the total produced in an average year, because the BMPs would reduce concentrations as well as volume.

I also analyzed the water quality benefits that would be realized if each standard was <u>just</u> met; i.e., the BMPs do not necessarily accomplish all that they could but just enough to meet the respective standard. With the San Diego area D soil I determined that the 85th percentile, 24-

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[1] Horner, R.R. and J. Gretz. 2011. Investigation of the Feasibility and Benefits of Low-Impact Site Design Practices Applied to Meet Various Potential Stormwater Runoff Regulatory Standards. Report to U.S. Environmental Protection Agency by Natural Resources Defense Council.

[2] As a result, a more stringent standard, such as retention of runoff from the 90th or 95th percentile, 24-hour storm event or, alternatively, 90 or 95 percent of the average annual runoff volume would be appropriately applied in the permit. Retention Standards 2 and 3 assessed by Horner and Gretz (2011) were based , respectively, on the 95th percentile, 24-hour event and 90 percent of the average annual volume

hour event standard (Standard 1) would not actually be met with Full ARCD strategies for most land use cases. However, in attempting to meet that standard those strategies would retain 37-62 percent of the average annual runoff volume, again depending on the land use. The capped differential volume standard (Standard 5) would be met with Full ARCD for all land use cases, but the average annual volume retention would be only 16-28 percent. The differential standard based on the average annual runoff volume (Standard 4) would be achieved with all but one land use, retaining 27-44 percent of the average annual volume, still less than with Standard 1. This analysis demonstrates the clear superiority of Standard 1, especially over the capped differential volume standard, on the relatively restrictive soils. Priority projects should be required to comply with this standard on-site to the extent possible and to compensate for any shortfall by creating or contributing to off-site retention opportunities in the same watershed.

As I noted above, all standards can be achieved for any land use considered on the C soils. If those standards are just met, Standard 1 would result in retention of 62 percent of the average annual runoff volume in all land use cases. Standard 4 would actually out-perform Standard 1with these soils, retaining an estimated 72-80 percent. However, Standard 5 would again yield lesser benefits, retaining only 44-49 percent. Accordingly, here should be no consideration of a capped differential volume standard in my opinion; and there should be no consideration of a differential volume standard on D soils or where this standard under-performs the standard based on retention of the 85th percentile, 24-hour storm event.

My Recommendations

For optimum water quality benefits, I recommend and encourage that the Tentative Order be revised to require the larger of the two retention volumes determined according to both provisions E.3.c(1)(a)(i) and E.3.c(1)(a)(ii). The latter standard should be clarified to constitute the difference between the post- and pre-development average annual runoff volumes, with the pre-development state taken as the typical land cover existing before European settlement of an area. Furthermore, I urge that the permit require compensation for any shortfall in meeting the retention requirement by creating or contributing to off-site retention opportunities in the same watershed.

Example Standards from Elsewhere in the United States

As pointed out above, adopting a volumetric basis for stormwater treatment design and then subjecting that full volume to onsite retention or treatment has been the rule in the United States. Jurisdictions take differing approaches to defining that volume; but, once it is set, they utilize the entire quantity as the basis for BMP design. Common approaches include the storm percentile method: a storm event of selected frequency and duration is chosen, which correlates to a certain depth of precipitation spread over a watershed area. In addition to southern California, Georgia provides an example of this approach (http://www.georgiastormwater.com/vol2/1-3.pdf at 1.3-1):

> Treat the runoff from 85% of the storms that occur in an average year. For Georgia, this equates to providing water quality treatment for the runoff resulting from a rainfall depth

of 1.2 inches.

The state of Washington employs a second approach, originally developed according to a storm percentile analysis (http://www.ecy.wa.gov/pubs/0510029.pdf at 2-28):

> Water Quality Design Storm Volume: The volume of runoff predicted from a 24-hour storm with a 6-month return frequency (a.k.a., 6-month, 24-hour storm). Wetpool facilities are sized based upon the volume of runoff predicted through use of the Natural Resource Conservation Service curve number equations … for the 6-month, 24-hour storm. Alternatively, the 91st percentile, 24-hour runoff volume indicated by an approved continuous runoff model may be used.

Numerous jurisdictions, such as Maine, use the precipitation depth approach (http://www.maine.gov/dep/blwq/docstand/stormwater/stormwaterbmps/vol3/chapter2.pdf at 2-12):

> Stormwater management facilities must be designed to treat the first 1 inch of runoff ...

Similarly, Maryland's standard is (http://www.mde.state.md.us/assets/document/chapter2.pdf at 2.1):

> P= rainfall depth in inches and is equal to 1.0" in the Eastern Rainfall Zone and 0.9" in the Western Rainfall Zone ...

Pennsylvania specifies (http://www.depweb.state.pa.us/watershedmgmt/cwp/view.asp?a=1437&q=529063&watershedmgmtNav=| at 3.3.4):

- Stormwater facilities shall be sized to capture at least the first two inches (2") of runoff from all contributing impervious surfaces.

- At least the first one inch (1.0") of runoff from new impervious surfaces shall be permanently removed from the runoff flow – i.e., it shall not be released into the surface Waters of this Commonwealth. Removal options include reuse, evaporation, transpiration, and infiltration.

North Carolina's approach is (http://h2o.enr.state.nc.us/su/documents/BMPManual_WholeDocument_CoverRevisedDec2007.pdf at 2-2):

> Non-coastal counties: Control and treat the first 1.0" of rain. (Note: a more complex basis applies to coastal counties.)

In none of these cases does the stormwater treatment design basis involve a differential volume computation, and certainly not one capped at a certain event. I encourage the San Diego Regional Board to take notice.

I would be glad to discuss my comments and invite you to contact me if you wish to do so.

Sincerely,

Richard R. Horner

Attachment: Richard R. Horner, Ph.D., Background and Experience

RICHARD R. HORNER, PH.D.

BACKGROUND AND EXPERIENCE

I have 36 years of experience in the urban stormwater management field and 11 additional years of engineering practice. During this period I have performed research, taught, and offered consulting services on all aspects of the subject, including investigating the sources of pollutants and other causes of aquatic ecological damage, impacts on organisms in waters receiving urban stormwater drainage, and the full range of methods of avoiding or reducing these impacts.

I received a Ph.D. in Civil and Environmental Engineering from the University of Washington in 1978, following two Mechanical Engineering degrees from the University of Pennsylvania. Although my degrees are all in engineering, I have had substantial course work and practical experience in aquatic biology and chemistry. For 12 years beginning in 1981, I was a full-time research professor in the University of Washington's Department of Civil and Environmental Engineering. From 1993 until 2011, I served half time in that position and had adjunct appointments in two additional departments (Landscape Architecture and the College of the Environment's Center for Urban Horticulture). I spent the remainder of my time in private consulting through a sole proprietorship. My appointment became emeritus in late 2011, but I continue university research and teaching at a reduced level while maintaining my consulting practice.

I have conducted numerous research investigations and consulting projects involving all aspects of stormwater management. Serving as a principal or co-principal investigator on more than 40 research studies, my work has produced three books, approximately 30 papers in the peer-reviewed literature, and over 20 reviewed papers in conference proceedings. I have also authored or co-authored more than 80 scientific or technical reports. In addition to graduate and undergraduate teaching, I have taught many continuing education short courses to professionals in practice. My consulting clients include federal, state, and local government agencies; citizens' environmental groups; and private firms that work for these entities, primarily on the West Coast of the United States and Canada but in some instances elsewhere in the nation.

Over an 18-year period I spent a major share of my time as the principal investigator on two extended research projects concerning the ecological responses of freshwater resources to urban conditions and the urbanization process. I led an interdisciplinary team for 11 years in studying the effects of human activities on freshwater wetlands of the Puget Sound lowlands. This work led to a comprehensive set of management guidelines to reduce negative effects and a published book detailing the study and its results. The second effort, extending 10 years, involved an analogous investigation of human effects on Puget Sound's salmon spawning and rearing streams. These two research programs had broad sponsorship, including the U.S. Environmental Protection Agency, the Washington Department of Ecology, and a number of local governments.

I have helped to develop stormwater management programs in Washington State, California, and British Columbia and studied such programs around the nation. I was one of four principal participants in a U.S. Environmental Protection Agency-sponsored assessment of 32 state,

regional, and local programs spread among 14 states in arid, semi-arid, and humid areas of the West and Southwest, as well as the Midwest, Northeast, and Southeast. This evaluation led to the 1997 publication of "Institutional Aspects of Urban Runoff Management: A Guide for Program Development and Implementation" (subtitled "A Comprehensive Review of the Institutional Framework of Successful Urban Runoff Management Programs").

My background includes 19 years of work in California, where I have been a federal court-appointed overseer of stormwater program development and implementation at the city and county level and for two Caltrans districts. I was directly involved in the process of developing the 13 volumes of Los Angeles County's Stormwater Program Implementation Manual, working under the terms of a settlement agreement in federal court as the plaintiffs' technical representative. My role was to provide quality-control review of multiple drafts of each volume and contribute to bringing the program and all of its elements to an adequate level. I have also evaluated the stormwater programs in San Diego, Orange, Riverside, San Bernardino, Ventura, Santa Barbara, San Luis Obispo, and Monterey Counties, as well as a regional program for the San Francisco Bay Area. My clients in these cases include Natural Resources Defense Council, Santa Monica Baykeeper, Orange County Coastkeeper, Ventura Coastkeeper, Santa Barbara Channelkeeper, Russian Riverkeeper, and San Diego Coastkeeper. At the recommendation of the latter organization, I have been a consultant on stormwater issues to the City of San Diego, the San Diego Unified Port District, and the San Diego County Regional Airport Authority.

For the last six years I have been a member of Salmon-Safe's assessment team. Salmon-Safe is an organization based in Portland, Oregon that certifies academic and professional campuses and other developed lands for maintaining practices supportive of salmon protection and recovery. We have assessed numerous parcels in Oregon and Washington and extended certification to those whose practices met our criteria or conditions imposed to achieve certification.

I was a member of the National Academy of Sciences-National Research Council (NAS-NRC) committee on Reducing Stormwater Discharge Contributions to Water Pollution. NAS-NRC committees bring together experts to address broad national issues and give unbiased advice to the federal government. The present panel was the first ever to be appointed on the subject of stormwater. Its broad goals were to understand better the links between stormwater discharges and impacts on water resources, to assess the state of the science of stormwater management, and to apply the findings to make policy recommendations to the U.S. Environmental Protection Agency relative to municipal, industrial, and construction stormwater permitting. The committee issued its final report in October 2008.

INVESTIGATION OF THE FEASIBILITY AND BENEFITS OF LOW-IMPACT SITE DESIGN PRACTICES APPLIED TO MEET VARIOUS POTENTIAL STORMWATER RUNOFF REGULATORY STANDARDS

By

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Report to

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From

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EXECUTIVE SUMMARY

STUDY DESIGN

A study was performed to investigate the degree to which stormwater management practices, commonly referred to as “low-impact development” methods or “green infrastructure,” can retain urban runoff and meet five possible regulatory standards that could be applied nationally. Retention is defined as preventing the conversion of precipitation to runoff discharging from a development site on the surface, from where it can enter a receiving water. Retaining runoff from impervious and pollutant generating pervious surfaces prevents the introduction of urban runoff pollutants to receiving waters as well as reduces runoff volume to prevent stream channel and habitat damage, flooding, and loss of groundwater recharge. ARCD methods were assessed for their ability to: (1-2) meet standards pertaining to retention of the runoff generated by the 85th and 95th percentile, 24-hour precipitation events; (3) retain 90 percent of the post-development runoff; and (4-5) retain the difference between the post- and pre-development runoff, both with and without a cap at the 85th percentile, 24-hour event. The study assessed five urban land use types (three residential, one retail commercial, and one infill redevelopment), each placed in four climate regions in the continental United States on two regionally common soil types.

Infiltrating bioretention was applied as an initial strategy in the analysis of each case. When the initial strategy could not fully retain post-development runoff, additional methods were applied, involving roof runoff harvesting in the most impervious development cases and roof water dispersion in those with substantial pervious area. Benefits were assessed with respect to reduction of the annual average surface runoff volume from the quantity estimated without any stormwater management practices, the associated maintenance of pre-development groundwater recharge, and water quality improvement achieved through preventing discharge to receiving waters of pollutants generated with developed land uses.

RETENTION AND POLLUTANT REDUCTION CAPABILITIES

The initial strategy of infiltrating bioretention could retain all post-development runoff and pre-existing groundwater recharge, as well as attenuate all pollutant transport, in the three residential land use development types on hydrologic soil group (HSG) B soils, in all cases, in all regions, taking a fraction of the available pervious area to do so. For the more highly impervious commercial retail and redevelopment cases, bioretention would retain about 45 percent of the runoff and pollutants generated and save about 40 percent of the pre-development recharge. Adding roof runoff management measures in these cases would approximately double retention and pollutant reduction for the retail commercial land use and raise it to 100 percent for the redevelopment. Results were generally similar with HSG C soils, although more of the pervious portion of sites was required to equal the retention seen on B soils.

For development on the D soils in all climate regions, use of roof runoff management techniques was estimated to increase runoff retention and pollutant reduction from zero to between about one-third to two-thirds of the post-development runoff generated, depending on the land use case. These strategies would offer little groundwater recharge benefit with this soil condition, but would still have the potential to significantly reduce runoff volume and pollutant loading.

ABILITY TO MEET STANDARDS

The projected ability to meet the five standards identified above was found to vary mostly in relation to soil type (B or C versus D) and the relative imperviousness of development. The ability to meet the five standards varied much less across climate regions. With B and C soils,

the methods considered were projected to meet all five standards in all but 12 of 125 evaluations. With D soils, however, only three standards could be met at all and those only occasionally. However, even on D soils, all cases for Standard 1 (retention of the 85th percentile, 24-hour precipitation event) were able to retain greater than 50 percent of the required runoff volume. Moreover, opportunities to use ARCD practices or site design principles not modeled in this analysis have the potential to further increase runoff retention volume.

Standard 3 (retain 90 percent of the average annual post-development runoff volume) would be the most environmentally protective standard. Meeting or coming as close as possible to meeting, but not exceeding, this standard was estimated to lead to 66-90 percent of total runoff retention and pollutant loading reduction on B and C soils and 37-66 percent runoff retention on D soils. Standard 2 (retain the runoff produced by the 95th percentile, 24-hour precipitation event) would yield equivalent protection on D soils and only slightly less protection with B and C soils. The outcome with this standard would also be more consistent region to region than with the alternative standard 1, based on the 85th instead of the 95th percentile precipitation event. Sites located on B or C soils were able retain the runoff produced by the 85th percentile storm in 24 of 25 cases modeled (in 18 of the 25 cases by using infiltrating bioretention alone), and were able to retain the runoff produced by the 95th percentile storm in 22 of 25 cases modeled.

Standards 4 and 5, based on the differential between pre- and post-development runoff volume, are inconsistent in retaining runoff and reducing pollutants, in that they are relatively protective where pre-development runoff is estimated to be low relative to post-development flow, but result in progressively lower retention and pollutant loading reduction as pre- and post-development volumes converge, such as in several cases on D soils. Standard 5 is especially weak in this regard. The potentially low level of retention and pollutant loading reduction renders these standards based on the change in pre- versus post-development runoff volume poor candidates for national application, at least as formulated in these terms.

In summary, standards 2 and 3 are clearly superior to the other three options from both a volume and pollutant load reduction standpoint. Standard 3 is entirely consistent from place to place in degree of environmental protection, and standard 2 does not deviate much. Analysis of the five development cases on two soil groups in each of four regions demonstrated the two standards are virtually identical in the runoff retention and pollutant loading reduction they would bring about. Of the remaining standards, standard 1 (retantion of the runoff produced by the 85th percentile storm event) remains more consistent across regions and more protective of water quality for development on D soils than either standard 4 or 5, and is preferable to those standards in this regard.

INTRODUCTION

GENERAL STUDY DESCRIPTION

Study Design

This purpose of this study was to investigate the degree to which low-impact development (LID) [1] practices can meet or exceed the requirements of various potential stormwater management facility design standards and to determine the environmental benefits that can be realized by applying these techniques. The investigation was performed by estimating the stormwater retention possible with full application of low-impact options under a range of conditions broadly representative of different regions within the United States and then determining the implications of the findings for achieving various standards and for providing benefits. Retention is defined as preventing the conversion of precipitation to surface runoff from urbanized land uses through infiltration, evapotranspiration, and/or harvesting for some water supply purpose. Retaining runoff from impervious and pollutant generating pervious surfaces prevents the introduction of urban runoff pollutants to receiving waters as well as reduces runoff volume to prevent stream channel and habitat damage, flooding, and loss of groundwater recharge. Benefits were assessed with respect to reduction of the potential developed land surface runoff volume, the associated maintenance of pre-development groundwater recharge, and water quality improvement achieved through preventing discharge to receiving waters of pollutants generated with developed land uses.

The potential regulatory standards investigated were capture and retention of, at minimum:

- Standard 1—The runoff produced by the 85th percentile, 24-hour precipitation event,[2] a standard commonly used in California;
- Standard 2—The runoff produced by the 95th percentile, 24-hour precipitation event, the standard adopted under Section 438 of the Energy Independence and Security Act;
- Standard 3—90 percent of the average annual post-development runoff volume;
- Standard 4—The difference between the post- and pre-development[3] average annual runoff volumes; and
- Standard 5—The difference between the post- and pre-development runoff volumes for all events up to and including the 85th percentile, 24-hour precipitation event.

Conditions broadly representative of the nation were selected by, first, considering the climate regions defined in USEPA's (1983) Nationwide Urban Runoff Project (NURP) report. For full analysis, climate regions 1 (Northeast-Upper Midwest), 3 (Southeast), 5 (South Central), and 6 (Southwest) were chosen as providing a wide range of climatological conditions and geographic distribution. Once the four regions were picked, a metropolitan area and a specific city in each were chosen to serve as typical models of development circumstances in the general area, as

[1] The National Research Council (NRC, 2009) renamed LID, also known as green infrastructure, as aquatic resources conservation design (ARCD), the term used henceforth in this report.

[2] The 85th percentile, 24-hour event represents the precipitation quantity in a 24-hour period not exceeded in 85 percent of all events in an extended record.

[3] In this study the pre-development state is taken as the typical land cover existing before European settlement of an area.

detailed in the Case Studies discussion below. In addition, region 7 (Pacific Northwest) was identified as an additional location to be discussed. This region is the site of a considerable amount of ARCD application in an area somewhat different climatologically than other selected regions, in having persistent winter rainfall totaling annually, in the major urban areas, intermediately among the other regions. Results of research on ARCD conducted in this region are discussed at several points in this report.

Soils and topography were the next considerations in developing broadly representative conditions. U.S. Department of Agriculture websites were the source of general soil characterizations for the study regions and specific soil survey data in and around the representative metropolitan areas. Soils generally represented some range in textural classes and associated hydraulic conductivities. For each region, a soil type predominating among those representing hydraulic conductivities relatively high and low for the region were selected to serve as a basis for the analyses. The effect of slope was also investigated but ultimately found not to affect results substantially.

Five types of urban development were selected to represent breadth in land use: (1) multi-family residential, (2) small-scale single-family residential, (3) large-scale single-family residential, (4) large-scale commercial, and (5) infill redevelopment. Building permit data from each region were consulted to determine typical distributions of site features for each (e.g., land cover by buildings, parking areas, roadways, walkways, driveways, landscaping).

Case studies thus comprised four climate regions, each with two soil conditions and five land use types, for a total of 40 permutations. For each, the ability of the site to accommodate soil- and vegetation-based ARCD practices was investigated. Runoff quantities were estimated and compared to the five potential regulatory standards. Annual mass loading discharges were estimated for four pollutants: total suspended solids (TSS), total recoverable copper (TCu) and zinc (TZn), and total phosphorus (TP). In any case where soil- and vegetation-based ARCD infiltration techniques appeared not to be able to attenuate all runoff, specific roof runoff management strategies were investigated as possible measures to achieve additional retention. Runoff quantities and pollutant discharges were recalculated based on use of these additional practices in place.

This report covers the methods employed in the investigation, data sources, and references for both. It then presents the results, discusses their consequences, draws conclusions, and makes recommendations relative to the feasibility of utilizing low-impact development practices to meet the respective potential regulatory standards.

AQUATIC RESOURCES CONSERVATION DESIGN PRACTICES

General Description

As the stormwater management field developed, it passed through several stages. First, it was thought that the key to success was to match post-development with pre-development peak flow rates, while also reducing a few common pollutants (usually, TSS) by a set percentage. Finding that these efforts generally required large ponds, but that they did not forestall impacts, stormwater managers next deduced that runoff volumes and high discharge durations would also have to decrease. Almost simultaneously, although not necessarily in concert, the idea of low-impact development arose to offer a way to achieve actual avoidance, or at least minimization, of discharge quantity and pollutant increases reaching far above pre-development levels. These methods reduce storm runoff and its contaminants by decreasing their generation

at sources, infiltrating into the soil or evaporating or transpiring[4] storm flows before they can enter surface receiving waters, and treating flow remaining on the surface through contact with vegetation and soil, or a combination of these strategies.

The National Research Council ("NRC") (2009) renamed LID as Aquatic Resources Conservation Design (ARCD) for several reasons. First, this term signifies that the principles and many of the methods apply not only to building on previously undeveloped sites, but also to redeveloping and retrofitting existing development. Second, incorporating aquatic resources conservation in the title is a direct reminder of the central reason for improving stormwater regulation and management. ARCD encompasses the complete range of practices to counteract all negative urban runoff impacts; i.e., the full suite of practices that emphasize and accomplish retention as defined above. These practices aim at decreasing surface runoff peak flow rates, volumes, and elevated flow durations, as well as avoiding or at least minimizing the introduction of pollutants to any surface runoff produced. Reducing the concentration of pollutants, together with runoff volume decrease, cuts the cumulative mass loadings (mass per unit time) of pollutants entering receiving waters over time.

The menu of ARCD practices begins with conserving, as much as possible, existing trees, other vegetation, and soils, as well as natural drainage features (e.g., depressions, dispersed sheet flows, swales). Clustering development to affect less land is a fundamental practice advancing this goal. Conserving natural features would further entail performing construction in such a way that vegetation and soils are not needlessly disturbed and soils are not compacted by heavy equipment. Using less of polluting materials, isolating contaminating materials and activities from contact with rainfall or runoff, and reducing the introduction of irrigation and other non-stormwater flows into storm drain systems are essential. Many ARCD practices fall into the category of minimizing impervious areas through decreasing building footprints and restricting the widths of streets and other pavements to the minimums necessary. Another important category of ARCD practices involves directing runoff from roofs and pavements onto pervious areas as sheet flow, where all or much of the runoff can infiltrate or evaporate in many situations.

Water can be harvested from impervious surfaces, especially roofs, and put to use for irrigation, non-potable indoor water supply. Harvesting is a standard technique for Leadership in Energy and Environmental Design (LEED) buildings (U.S. Green Building Council, 2008). Many successful systems of this type are in operation, with examples such as the Natural Resources Defense Council offices (Santa Monica, CA), the King County Administration Building (Seattle, WA), and two buildings on the Portland State University campus (Portland, OR). Harvesting is feasible at the small scale using rain barrels and at larger scales using larger collection cisterns and piping systems. These small-scale applications have been used throughout the world for centuries and are rapidly spreading in the United States today (See, e.g., Texas Water Development Board, 2005; Georgia Department of Community Affairs, 2009).

If these practices are used but runoff is still produced, ARCD offers an array of techniques to retain it on-site through infiltration and evapotranspiration (ET). The bioretention cell (rain garden) is the workhorse practice in this category, but swales conveying flow slowly, filter strips set up for sheet flows, and other modes are also important. Relatively low traffic areas can be constructed with permeable surfaces such as porous asphalt, open-graded Portland cement concrete, coarse granular materials, concrete or plastic unit pavers, or plastic grid systems to allow for infiltration.

[4] Transpiration refers to vaporization of water from plant tissue, while evaporation applies to vaporization from a liquid (e.g., pool) or solid (e.g., leaf) surface. The terms are often combined to form the compound evapotranspiration (ET).

ARCD practices should be selected and applied as close to sources as possible to stem runoff and pollutant production near the point of potential generation. However, these practices must also work well together and, in many cases, must be supplemented with strategies operating farther downstream. For example, the City of Seattle, in its "natural drainage system" retrofit initiative, built serial bioretention cells flanking relatively flat streets. "Cascades" of vegetated stepped pools created by weirs were installed along more sloping streets. In some cases the cells drain to downstream cascades. The upstream components are highly effective in attenuating most or even all runoff. Flowing at higher velocities on sloped surfaces, the cascades do not perform at such a high level, although under favorable conditions they can still infiltrate or evapotranspire the majority of the incoming runoff (Chapman 2006, Chapman and Horner 2010). Even if not as impressive statistically, cascades can actually decrease storm discharge to streams more than the cells do, because of their generally greater size. Also, the cascades extract pollutants from remnant runoff through mechanisms mediated by vegetation and soils. The success of Seattle's natural drainage systems demonstrates that well designed ARCD practices can mimic natural landscapes hydrologically, and thereby avoid raising discharge quantities.

A watershed-based program emphasizing ARCD practices would convey significant benefits beyond greatly improved stormwater management. ARCD techniques overall would advance water conservation, and infiltrative practices would increase recharge of groundwater resources. ARCD practices can be made attractive and thereby improve neighborhood aesthetics and property values. Retention of more natural vegetation can both save wildlife habitat and provide recreational opportunities. Municipalities could use the program in their general urban improvement initiatives, giving incentives to property owners to contribute to goals in that area while also protecting water resources.

A Catalogue of ARCD Practices

ARCD practices are numerous and expanding as existing configurations are applied in new ways. Table 1 presents a catalogue adapted from USEPA (2007) and NRC (2009). This catalogue contains practices that are not equally applicable in all settings; e.g., nevertheless, each category offers practices applicable in a broad variety of circumstances.

The best strategy for choosing among and implementing these practices is a decentralized, integrated one; i.e., selecting practices that fit together as a system, starting at or near sources and working through the landscape until management objectives are met. This strategy makes maximum possible use of practices in the first three categories, which prevent stormwater quantity and quality problems, and then selects among the remaining classifications in relation to the localized and overall site conditions. Source control and preservation of existing vegetation and soils obviously avoid post-development runoff quantity and pollutant increases from any portion of the site that can be so treated. Among all strategies, these best maintain natural infiltration and ET patterns and yield of materials flowing from the site. This preventive strategy is supplemented by strategies to create as little impervious cover as possible. The remaining practices then contend with the excess runoff and pollutants over pre-development levels generated by the development.

For the practices that infiltrate water, a site's soil characteristics and depth to groundwater can and should be determined through infiltration rate testing and excavation to determine the infiltration capability. Because of the often substantial variability of conditions around a site, these determinations should be made at multiple points. If the natural infiltration rate is low, generally < 0.5 inch/hour (< 1.25 cm/h, Geosyntec 2008), in many situations the soil can be amended, usually with organic compost, to apply an infiltrative practice.

In addition to soil characteristics, the position of the groundwater table is a crucial determinant of whether or not stormwater infiltration should be promoted by applying ground-based ARCD

practices. A seasonal high water table too close to the surface results in rapid saturation of a thin soil column and retarded infiltration. Ponding water longer than 72 hours can permit mosquito growth, damage vegetation, and promote clogging of the facility by microorganism growths and polysaccharide organic materials that form in the reduced-oxygen environment accompanying excessive ponding time (Mitchell and Nevo 1964, Ronner and Wong 1996). Also, storm runoff flow through a short soil column or very rapidly through a coarse-textured soil can convey contaminants to groundwater.

Evidence gathering from available performance data is that evapotranspiration (ET) can be a substantial factor in water retention (discussed below) but may be difficult to quantify at a given site without more research. A conservative approach is to design on the basis of infiltration rate, calculated to include consideration of soil amendments, if any. Together with careful investigation of soils and hydrogeologic conditions, this means of proceeding is very likely to produce facilities that retain at least as much runoff as predicted, and almost certainly more as a result of unquantified ET.

Table 1. A Catalogue of Aquatic Resources Conservation Design Practices (USEPA [2007] and NRC [2009])

Category	Definition	Examples
Source control	Minimizing pollutants or isolating them from contact with rainfall or runoff	• Substituting less for more polluting products • Segregating, covering, containing, and/or enclosing pollutant-generating materials, wastes, and activities • Avoiding or minimizing fertilizer and pesticide applications • Removing animal wastes deposited outdoors • Conserving water to reduce non-stormwater discharges
Conservation site design	Minimizing the generation of runoff by preserving open space and reducing the amount of land disturbance and impervious surface	• Clustering development • Preserving wetlands, riparian areas, forested tracts, and porous soils • Reducing pavement widths (streets, sidewalks, driveways, parking lot aisles) • Reducing building footprints
Conservation construction	Retaining vegetation and avoiding removing topsoil or compacting soil	• Minimizing site clearing • Minimizing site grading • Prohibiting heavy vehicles from driving anywhere unnecessary
Runoff harvesting	Capturing rainwater, generally from roofs, for a beneficial use	• Using storage and distribution systems (rain barrels or cisterns) for irrigation and/or indoor supply for public and private buildings
Natural runoff conveyance practices	Maintaining natural drainage patterns (e.g., depressions, natural swales) as much as possible, and designing drainage paths to increase the time before runoff leaves the site	• Emphasizing sheet instead of concentrated flow • Eliminating curb-and-gutter systems in favor of natural drainage systems • Roughening land surfaces • Creating long flow paths over landscaped areas • When flow must be concentrated, using vegetated channels with flow controls (e.g., check dams)
Practices for temporary runoff storage followed by infiltration and/or evapotranspiration[a]	Use of soil pore space and vegetative tissue to increase the opportunity for runoff to percolate to groundwater or vaporize to the atmosphere	• Bioretention cells (rain garden) • Vegetated swales (channel flow) • Vegetated filter strips (sheet flow) • Planter boxes • Tree pits • Infiltration basins • Infiltration trenches • Roof downspout surface or subsurface dispersal • Permeable pavement • Vegetated (green) roofs
ARCD landscaping[b]	Soil amendment and/or plant selection to increase storage, infiltration, and evapotranspiration	• Organic compost soil amendments • Native, drought-tolerant plantings • Reforestation • Turf conversion to meadow, shrubs, and/or trees

[a] Some of these practices are also conventional stormwater BMPs but are ARCD practices when ARCD landscaping methods are employed as necessary to maximize storage, infiltration, and evapotranspiration. The first five examples can be constructed with an impermeable liner and an underdrain connection to a storm sewer, if full retention is technically infeasible (see further discussion later). Vegetated roofs store and evapotranspire water but offer no infiltration opportunity, unless their discharge is directed to a secondary, ground-based facility.

[b] Selection of landscaping methods depends on the ARCD practice to which it applies and the stormwater management objectives, but amending soils unless they are highly infiltrative and planting several vegetation canopy layers (e.g., herbaceous growth, shrubs, and trees) are generally conducive to increasing storage, infiltration, and evapotranspiration.

Application of ARCD Practices in This Study

The investigation performed for this study first assessed the capacity of each case study site to infiltrate the full average annual post-development storm runoff volume and thereby reduce pollutant releases to zero. The report terms this initial evaluation as the "Basic ARCD Analysis". The means of infiltration was not distinguished at this level of analysis. For example, it was not specified if runoff would be distributed in sheet flow across a pervious area or channeled into a rain garden. As detailed later in the Methods of Analysis section, this analysis was limited to the estimated infiltration capacity of the case study soil type, possibly compost-amended, and the available pervious area.

Critically, there was no attempt to estimate the loss of surface runoff through ET in the Basic ARCD analysis (ET is considered, to address rooftop runoff only, as part of our "Full ARCD analysis," discussed below). In general, the estimated mean annual evapotranspiration in the Southeast is about 70 percent of the precipitation, or roughly 35 inches per year. For large areas of the Southwest, evapotranspiration is virtually equal to 100 percent of the precipitation, which is only about 10 inches per year. The ratio of estimated mean annual evapotranspiration to precipitation is least in the mountains of the Pacific Northwest and New England where evapotranspiration is about 40 percent of the precipitation (Hanson, 1991). By leaving out these substantial losses, generally 40 percent of precipitation or more, the retention estimates in this study can be considered quite conservative.

Additionally, there was no consideration of many ARCD practices in the Table 1 catalogue that could be applied in site-specific design. For example, there were no refinements of the prevailing building standards to reduce street widths or cluster buildings and reduce their footprints. Further, green roofs were not considered in this study, although they are already making a contribution to runoff reduction around the nation and reflect a significant additional opportunity to retain runoff on-site. The U.S. EPA has stated that "a 3.5-4 in. (8 -10 cm) deep green roof can retain 50% or more of the annual precipitation." (U.S. EPA, 2009a). For water quality, we did not assume any source control implementation. Thus, actual site design could take advantage of substantial additional capabilities not considered in this study.

In cases where the practices incorporated in the initial level of analysis (infiltration through bioretention) did not, according to the estimates, fully attenuate post-development pollutant discharges, specific attention was directed at ways of extracting additional water from surface discharge by managing roof runoff. This assessment is called the "Full ARCD Analysis" in the report. The options broadly divide into harvesting water for a purpose such as irrigation and/or non-potable indoor supply, or making special provisions to infiltrate or evapotranspire roof runoff even if soil conditions are limiting. Harvesting applies best to relatively large developments having sufficient demand for the collected water. While single-family residences can harvest water into rain barrels or cisterns for lawn and garden watering, these containers may be small in volume relative to runoff production; and though opportunity exists, no credit was taken for them in this study. However, even in poorly infiltrating soils, options exist to disperse house roof runoff as sheet flow for storage in vegetation and soil until evapotranspiration and some infiltration occurs.

CASE STUDIES

CLIMATE REGIONS

Basis of Selection

The Nationwide Urban Runoff Project divided the nation into nine regions based on differences in volume, intensity, and duration of precipitation and interval between precipitation events (USEPA 1983). For broad representation of the U.S. generally this study chose regions 1 (Northeast-Upper Midwest), 3 (Southeast), 5 (South Central), and 6 (Southwest) for analysis. Table 2 provides the annual precipitation statistics from the NURP compilation.

Table 2. Precipitation Statistics (Means) for Four NURP Regions Selected for Study (USEPA 1983)

Region	Volume (inch)	Intensity (inch/hour)	Duration (hours)	Interval (hours)
1—Northeast-Upper Midwest	0.26	0.051	5.8	73
3—Southeast	0.49	0.102	5.2	89
5—South Central	0.33	0.080	4.0	108
6—Southwest	0.17	0.045	3.6	277

The selected regions represent a volume differential of about a factor of three, intensity variation of approximately two times, and inter-storm interval varying by almost four times. The NURP report shows coefficients of variation (mean/standard deviation) of greater than 1.0 for all of these means, indicating an overall high degree of dispersion.

Figure 1 visually depicts variation in mean annual precipitation across the continental United States. It shows that the selected regions are overall representative of the broadly prevailing range across the nation, particularly its major urban and still urbanizing areas.

Region 7 (Pacific Northwest) was also identified for discussion of research results on ARCD, although not full analysis. It has less intense (mean 0.024 inch/hour) but much more extended (mean 20.0 hours) precipitation compared to any other region in the nation. Mean storm volume ranks with region 3 (mean 0.48 inch); but fewer storms, especially in the summer, yield overall less total annual precipitation in lowland areas holding all urban development in region 7. It was of interest because of the already occurring use of ARCD techniques in a relatively rainy part of the country.

Representative Metropolitan Areas and Cities

Once the regions were identified, a metropolitan area within each area was chosen as a basis for assigning specific precipitation and development characteristics. The areas considered were USEPA-designated Urban Areas: “An urbanized area is a land area comprising one or more places – central place(s) – and the adjacent densely settled surrounding area – urban fringe – that together have a residential population of at least 50,000 and an overall population density of at least 1,000 people per square mile” (USEPA 2007). Stormwater regulations would have the most impact in areas that are being quickly developed, redeveloped, or both. Five of the twenty fastest growing counties in the nation from 2000 to 2009 were near Atlanta, GA and five were in the state of Texas (U.S. Census Bureau 2010). These statistics factored into the decision to focus on records from these regions.

Each selected metropolitan area is generally representative of its region in precipitation and development characteristics. Each is also undergoing relatively active new development and redevelopment, offering candidate locations where a prospective stormwater standard would frequently be applied. These metropolitan areas are: region 1—Boston, MA, region 3—Atlanta, GA, region 5—Austin, TX, and region 6—San Diego, CA

Figure 1. Precipitation of the Conterminous States of the United States, National Atlas of the United States, 2011.

Finally, a city with a high rate of development (and often redevelopment) was picked in each metropolitan area for investigation of building patterns and standards. The intent was to match regional patterns of climate, soils (see discussion on physiographic data, below), and land use and land cover realistically. After substantial investigation, the conclusion was that building standards, how land is used, and the relative allocation of impervious and pervious lands do not vary in any systematic way across the nation and cannot be regionally distinguished. Therefore, the variables of interest came down to precipitation and soils.

Alpharetta, about 30 miles north of Atlanta, represents that metropolitan area. In 1981 it was a small town of approximately 3,000 residents but grew to 51,243 by 2007. During the workday, the city swells to more than 120,000 residents, workers, and visitors. Alpharetta is home to large corporations such as AT&T (3500 employees), Verizon Wireless (3000 employees), and ADP, Inc./National Account Services (2100 employees). Infill redevelopment projects are anticipated in the downtown area (City of Alpharetta, 2011).

Round Rock is a typical developing city located 15 miles to the north of Austin, TX. In 1970 there were only 2,700 residents in this town, while today the population exceeds 100,000. Round Rock is the eighth-fastest growing city in the nation and the location of several large corporate campuses.

The Town of Framingham, 20 miles west of Boston, represents the northeastern climate zone. At nearly 67,000 inhabitants, Framingham is the largest entity designated as a "town" in the Commonwealth of Massachusetts. It is home to three large corporations and overall 2200 businesses providing 45,000 jobs. Differing greatly from the representative communities in

other regions, Framingham was incorporated in 1700 and developed early in the nation's history. Today's activity includes redevelopment of brownfields and downtown revitalization, although some agricultural land still remains within the town limits (Town of Framingham, 2011).

San Marcos, representing the San Diego area and located about 35 miles north of the city, grew from a population of 17,479 in 1980 to 82,743 by 2008. Major institutions in the city include California State University San Marcos and Palomar Community College. At this stage the city is only approximately 72 percent built out, and thus new development continues (City of San Marcos, 2011).

Precipitation Data

Average monthly precipitation data were obtained from the NOAA Hourly Precipitation Data Rainfall Event Statistics[5] for one station with a long-term record in each region: Southeast—Atlanta/Hartsfield International Airport (Station #90451), South Central—Austin/Robert Mueller Municipal Airport (410428), Northeast—Boston/Logan International Airport (190770), and Southwest—San Diego/San Diego International Airport (Lindbergh Field) (47740). Atlanta receives the most precipitation, averaging about 49 inches per year, followed by Boston (47 inches/year), Austin (33 inches/year), and San Diego (10 inches/year). Figure 2 depicts precipitation variations over more than 50 years.

Values for either the 85th and 95th percentile, 24-hour storms were available in a number of state-specific resources, including the Georgia Stormwater Standards Supplement (Center for Watershed Protection 2009) and the Integrated Stormwater Management Program (North Central Texas Council of Governments 2010), as well as national publications such as an USEPA's technical guidance documents (USEPA 2009). However, few references had values for both 85th and 95th percentile storms. Therefore, these values were calculated following the methodology outlined in the USEPA's Technical Guidance on Implementing the Stormwater Runoff Requirements (USEPA 2009, page 30). Daily precipitation and temperature data from the National Climatic Data Center's TD Summary of the Day data set were collected and analyzed for the four stations lover a time period of 60 years, January 1, 1950 to January, 31 2010.

[5] National Climatic Data Center, Hourly Precipitation Data Rainfall Event Statistics (http://cdo.ncdc.noaa.gov/cgi-bin/HPD/HPDStats.pl, last accessed December 15, 2011).

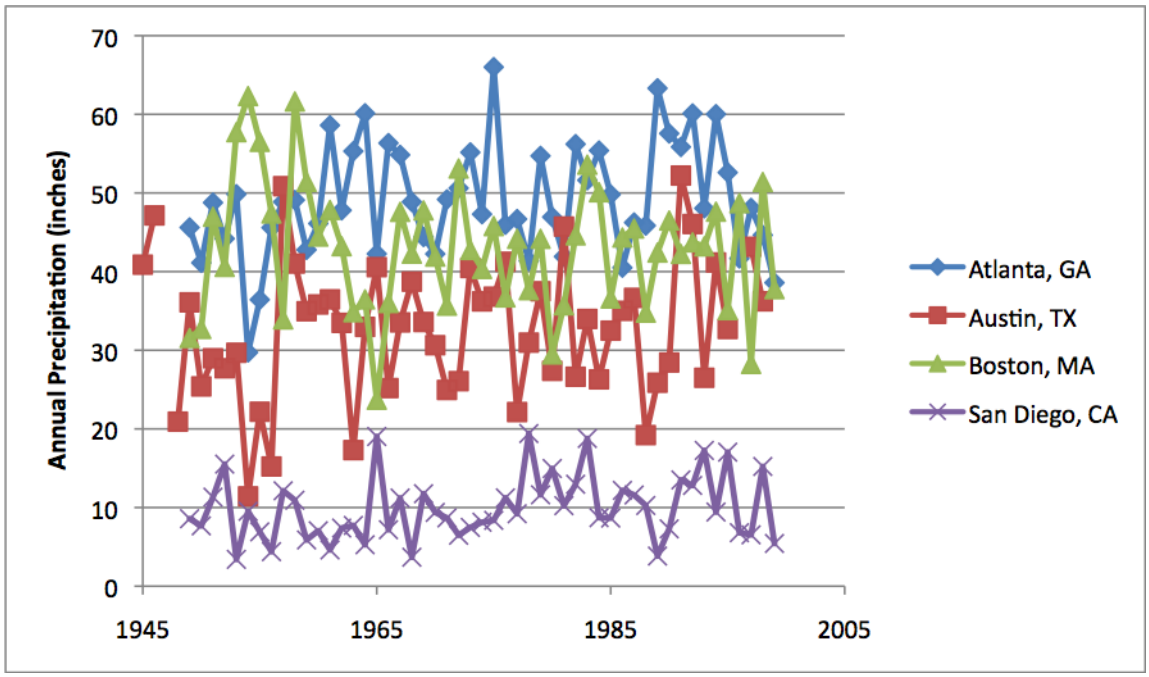

Figure 2. Average Annual Precipitation for Four Climate Regions over the Latter Part of the Twentieth Century (from NOAA Hourly Precipitation Data Rainfall Event Statistics, http://cdo.ncdc.noaa.gov/cgi-bin/HPD/HPDStats.pl)

For snowfall days, snow water equivalent (SWE) was calculated according to the guidelines provided by a National Climate Data Center's (NCDC) document, Estimating the Water Equivalent of Snow, utilizing the reported mean temperature for the day (National Climatic Data Center, accessed December 16, 2011). The NCDC tables calculate that the SWE is at most, about 10 percent of the total snowfall depth. In the methodology for determining the 85th and 95th percentile events, all days with < 0.1 inch precipitation are removed, lowering the impact of snow on the results. Snowfall had no effect in the Southwest region, a very minor effect in the Southeast and South Central, and still a relatively small effect in the Northeast, as follows: San Diego—0 snow days; Atlanta—74 of 4600 total days having ≥ 0.1 inch (1.6 percent), with a contribution ranging 0.01-0.79 inch precipitation; Austin—32 of 2418 days (1.3 percent), contributing 0.01-0.50 inch; and Boston—993 of 4783 days (20.8 percent), contributing 0.01-2.24 inch. Since snow does add to runoff that must be managed in a location like the Northeast, these snow water equivalents were left in the records. Table 3 summarizes precipitation data used in the analyses for the four regions.

Table 3. Precipitation Summary for Study Regions

Region	Average Annual Precipitation (inches)	85th Percentile, 24-Hour Event		95th Percentile, 24-Hour Event	
		Depth (inch)[a]	Fraction Covered[b]	Depth (inch)[a]	Fraction Covered[b]
Southeast	49.02	1.13	0.63	1.79	0.87
South Central	32.67	1.19	0.58	1.99	0.82
Northeast	47.03	1.07	0.81	1.72	0.89
Southwest	9.68	0.76	0.62	1.26	0.83

[a] Calculated from National Climatic Data Center's TD Summary of the Day, for all precipitation days >0.1 inch for period January 1, 1950 – December 31, 2009
[b] Fraction of total annual precipitation covered by event standard

Physiographic Data

General Methods

This section of the report covers the soils, groundwater, and topographic data underlying the analyses. Soil characteristics are largely a product of climate, geology and topography. The characteristics of most interest for this study were those controlling infiltration of surface water and percolation to an aquifer. Although there is variation within each climate region, the major soil orders can be used to identify regional characteristics. The Natural Resources Conservation Service (NRCS) website[6] describing the major soil orders and their locations was the initial source of these data. Maps generated by Miller and White (1998) gave information from the State Soil Geographic Database (STATSGO), including characteristics such as soil texture and hydrologic soil group. These resources were employed to gain a broad view of the soils in each of the four regions.

To extend the scope of the study, soils were investigated in the Upper Midwest, in addition to the Southeast, South Central, Northeast, and Southwest climate regions. Upper Midwest and Northeast soils share general similarities. Both regions also have temperate, seasonal, humid climates. While average annual precipitation is overall somewhat greater in the Northeast compared to the Upper Midwest, the two regions were deemed similar enough physiographically and climatologically to be considered together. This report henceforth groups them as the Northeast – Upper Midwest climate region.

To validate the regional patterns emerging from the general sources, custom "soil resource" reports for four cities were generated using the NRCS Web Soil Survey[7] tool. These reports collected characteristics related to infiltration rates and runoff including soil texture, hydrologic soil group, drainage classification, representative slope, and depth to water table. Using this tool requires selecting an "area of interest". This examination utilized a size of at least 8,000 acres (10,000 acres is the maximum allowed) to insure a representative sample of soil and related conditions.

Hydrologic soil group assignment is a means of generally categorizing soils according to their tendency to admit and transmit water. The hydrologic soil group (HSG) is determined with respect to the water-transmitting soil layer with the lowest saturated hydraulic conductivity and depth to any layer that is more or less water impermeable (such as a fragipan or duripan) or depth to a water table. Box 1 summarizes the characteristics of the four HSGs (NRCS 2007).

The position of the groundwater table is a crucial determinant of whether or not stormwater infiltration should be promoted by applying ground-based ARCD practices. A seasonal high water table too close to the surface results in rapid saturation of a thin soil column and retarded infiltration. Ponding water longer than 72 hours can permit mosquito growth, damage vegetation, and promote clogging of the facility by microorganism growths and polysaccharide organic materials that form in the reduced-oxygen environment accompanying excessive ponding time (Mitchell and Nevo 1964, Ronner and Wong 1996). Also, storm runoff flow through a short soil column or very rapidly through a coarse-textured soil can potentially convey contaminants to groundwater. To avoid entertaining stormwater management strategies threatening development of these problems, data on depth to groundwater was obtained from the U.S. Geological Survey's (USGS) Groundwater-Level Annual Statistics (USGS 2011).

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[6] Natural Resources Conservation Service, Distribution Maps of Dominant Soil Orders (http://soils.usda.gov/technical/classification/orders/, last accessed December 16, 2011).

[7] Natural Resources Conservation Service, 2011, Web Soil Survey (http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm).

Topographic slope influences runoff production by setting incident precipitation in motion downslope, thus producing a horizontal component of velocity vector partially counteracting the tendency to penetrate the soil vertically. This study investigated that importance of that effect by considering two slopes typical of urban development sites. As discussed during the presentation of results, below, this factor did not have a large effect on the analysis.

Box 1. Summary of Hydrologic Soil Groups (NRCS 2007)

Group A—Soils in this group have low runoff potential when thoroughly wet. Water is transmitted freely through the soil. Group A soils typically have less than 10 percent clay and more than 90 percent sand or gravel and have gravel or sand textures. Some soils having loamy sand, sandy loam, loam or silt loam textures may be placed in this group if they are well aggregated, of low bulk density, or contain greater than 35 percent rock fragments. The saturated hydraulic conductivity of all soil layers exceeds 5.67 inches per hour. The depth to any water-impermeable layer is greater than 20 inches. The depth to the water table is greater than 24 inches. Soils deeper than 40 inches to a water-impermeable layer are in group A if the saturated hydraulic conductivity of all soil layers within 40 inches of the surface exceeds 1.42 inch per hour.[a]

Group B—Soils in this group have moderately low runoff potential when thoroughly wet. Water transmission through the soil is unimpeded. Group B soils typically have between 10 percent and 20 percent clay and 50 percent to 90 percent sand and have loamy sand or sandy loam textures. Some soils having loam, silt loam, silt, or sandy clay loam textures may be placed in this group if they are well aggregated, of low bulk density, or contain greater than 35 percent rock fragments. The saturated hydraulic conductivity in the least transmissive layer between the surface and 20 inches ranges from 10.0 1.42 to 5.67 inches per hour. The depth to any water-impermeable layer is greater than 20 inches. The depth to the water table is greater than 24 inches. Soils deeper than 40 inches to a water- impermeable layer or water table are in group B if the saturated hydraulic conductivity of all soil layers within 40 inches of the surface exceeds 0.57 inch per hour but is less than 1.42 inch per hour.

Group C—Soils in this group have moderately high runoff potential when thoroughly wet. Water transmission through the soil is somewhat restricted. Group C soils typically have between 20 percent and 40 percent clay and less than 50 percent sand and have loam, silt loam, sandy clay loam, clay loam, and silty clay loam textures. Some soils having clay, silty clay, or sandy clay textures may be placed in this group if they are well aggregated, of low bulk density, or contain greater than 35 percent rock fragments. The saturated hydraulic conductivity in the least transmissive layer between the surface and 20 inches is between 0.14 and 1.42 inch per hour. The depth to any water-impermeable layer is greater than 20 inches. The depth to the water table is greater than 24 inches. Soils deeper than 40 inches to a restriction or water table are in group C if the saturated hydraulic conductivity of all soil layers within 40 inches of the surface exceeds 0.06 inch per hour but is less than 0.57 inch per hour.

Group D—Soils in this group have high runoff potential when thoroughly wet. Water movement through the soil is restricted or very restricted. Group D soils typically have greater than 40 percent clay, less than 50 percent sand, and have clayey textures. In some areas, they also have high shrink-swell potential. All soils with a depth to a water-impermeable layer less than 20 inches and all soils with a water table within 24 inches of the surface are in this group, although some may have a dual classification if they can be adequately drained. For soils with a water-impermeable layer at a depth between 20 and 40 inches, the saturated hydraulic conductivity in the least transmissive soil layer is less than or equal to 0.14 inch per hour. For soils deeper than 40 inches to a restriction or water table, the saturated hydraulic conductivity of all soil layers within 40 inches of the surface is less than or equal to 0.06 inch per hour.

[a] While Group A soils are present across large areas of the country, our analysis considers only Group B, C, and D soils to provide a conservative assessment of infiltration potential in urban areas, and to account for potential issues such as soil compaction that may occur for lawn and other landscaping in urban and suburban development.

Southeast Climate Region

The major soil order found throughout the southeastern United States is Utisols, sub-order Udults. The humid climate with frequent rainfall gives the soils an udic moisture regime; soils are rarely dry for more than 45 consecutive days. Utisols are highly weathered and are deficient in calcium and other bases. Georgia is known for its red soils, which are the unhydrated iron oxides left in the weathered material. Pre-European contact, these soils supported mixed conifer and deciduous woodlands. Due to its relatively flat topography and warmer temperatures, Florida has primarily Spodosols, Alphisols and Histosols (Soil Survey Staff, NRCS 2011).

This region has a variety of soil textures, ranging from sand and sandy loam throughout Mississippi, Alabama, and Georgia; silty loam soils near the Appalachian Mountains; and some areas with significant organic materials in Florida. The major soil hydrologic groups of the region are varied as well, with C and D soils dominating the Georgia coastline and most of Florida. Group A and B soils are more prevalent in the interior parts of the region, in central Georgia and Alabama (Miller and White 1998).

A NRCS web soil survey was conducted for an area of interest (AOI) centered in Alpharetta, GA. The selected AOI did not have complete soil survey coverage, and findings were compared with another AOI of 8990.5 acres north of the city in Fulton County. In both AOIs, the leading HSG is B (86 percent of AOI), followed by group C (11 percent of AOI). Approximately 97 percent of the AOI has a sandy loam soil texture. The leading drainage classification was well drained (86 percent of AOI), followed by somewhat poorly drained (10 percent of AOI). The selected AOI was moderately steep, with approximately 70 percent of the AOI having slopes between 8 and 12 percent.

Fulton County, Georgia has four wells in the USGS record, three with depth-to-groundwater data. Two wells have only one recorded depth: site 08CC08 had a depth of 2.447 ft in 1986, and site 10DD01 had a depth of 16.131 ft in 1968. Site 10DD02 has been monitored annually from 1977-2010 and has an annual well-depth average in this time period of 6.292 ft.

South Central Climate Region

The major soil order in Texas is Mollisols, sub-order ustolls. These soils span the sub-humid and semiarid climate zones, and are common on the western Great Plains and throughout the Rocky Mountain States. These soils originally supported grasslands and (in mountainous regions) forests, and now are ranched or farmed. Houston black soils are also characteristic of the region and are important in agriculture and urban areas, occurring throughout central Texas. Dry soils in the Order Aridisols, sub-orders Argids and Calcids, are found in west Texas and large portions of New Mexico as well. These soils were formerly sparsely vegetated areas, now used for rangeland or wildlife habitat (Soil Survey Staff, NRCS 2011).

Soil characteristic maps generated by Miller & White (1998) indicate that the majority of soil types in the South Central climate region are diverse: sandy loam and clay dominate eastern Texas, clay soils are prevalent in central parts of the state and loam soils are in western Texas and New Mexico. Most soils tend to be in the C and D hydrologic groups, however B soils are found in bands in New Mexico (Miller & White, 1998).

A web soil survey was conducted for an area of interest of 8267.5 acres centered in Round Rock, TX. The leading HSG is D (68 percent of AOI), followed by group C (22 percent of AOI) and group B (10 percent). Primary soil textures are clay (33 percent), silty clay (27 percent), extremely stony clay (17 percent), and silty clay loam (10 percent). The leading drainage classification is well drained (79 percent of AOI) followed by moderately well drained (21

percent). The selected AOI is relatively flat; approximately 70 percent of the AOI has slopes under 2 percent, and 20 percent has slopes of 3-4 percent.

Travis County, Texas had three wells that were measured in 2003 and recorded by USGS (site YD-58-50-216) and 2004 (sites YD-58-50-216 and YD-58-25-907). Groundwater is very deep in each location, averaging 220 ft below the ground surface.

Northeast – Upper Midwest Climate Region

This climate region has significant variation in dominant soil orders. The Spodsols order, sub-order Orthods, dominates the northern portions (northern Minnesota, Wisconsin, Michigan, Vermont, and Maine) and is generally considered infertile without soil amendments. Inceptisols, sub-order Udepts, are also prevalent in the region, especially in New England states, through the Appalachian Mountains and northeastern Minnesota. Alfisols, sub-order Udalfs, too are prevalent in the region, extending from Minnesota east to New York. These two soils both have an udic moisture regime, and are rarely dry for more than 45 consecutive days due to the year-round precipitation in the area (Soil Survey Staff, NRCS 2011). The state soil of Massachusetts is the Paxton fine sandy loam and also extends into New Hampshire, New York and Vermont. These deep soils were formed in acid subglacial till and are derived from schist, gneiss and granite (NRCS undated).

Based on maps generated by Miller and White (1998), sandy loam and silt loam soils tend to dominate the region, with small areas of clay and silty clay soils. Hydrologic soil group B is most prevalent in the Midwestern states (Minnesota, Wisconsin, Illinois), and Group C is most common in the rest of the region, spanning from Indiana to Maine. The region primarily supported forest ecosystems before development.

A web soil survey was conducted for an area of interest centered in Framingham, MA with an AOI of 8645.6 acres. The region has relatively equal amounts of each HSG: 20 percent of the AOI in Group A, 19 percent in group B, 20 percent in Group C, and 24 percent in Group D. Soil textures represented are fine sandy loam (49 percent), muck (10 percent), loamy sand (9 percent), and moderately decomposed plant material (8 percent). The leading drainage classification is well drained (32 percent of AOI) followed by very poorly drained (16 percent), somewhat excessively drained (12 percent), and moderately well drained (11 percent). Fourteen percent of the AOI has slopes of 1 percent or less, with 18 percent at 2-5 percent, 23 percent at 6-8 percent, and another 23 percent at 8-12 percent slopes.

There are three wells in the USGS record for Middlesex County, MA including 5 years of record for an Acton well averaging 17.75 ft, 6 years for the Wakefield well with an average depth of 6.59 ft, and 11 years at the Wilmington well with an average of 8.09 ft.

Southwest Climate Region

There are multiple soil orders in California due to its variation in climate, topography and geologic history. Entisols occur in the southern parts of the state; sub-order Psamments is a frequently found sandy soil that makes productive rangeland. Order Mollisols, sub-order Xerolls, are freely drained and dry soils found in the Mediterranean climate along the coast of California. Pre-settlement ecosystems supported by these soils include oak savanna, grasslands, and chaparral. Current soils may be used as cropland or rangeland (Soil Survey Staff, NRCS 2011).

A web soil survey was conducted for an 8267.5-acre area of interest centered in San Marcos, CA. The leading HSG is D (58 percent of AOI), followed by group C (26 percent) and group B (14 percent). Soil texture include sandy loam (19 percent), coarse sandy loam (17 percent), silt loam (15 percent), very fine sandy loam (14 percent), loamy fine sand (12 percent), loam (7

percent), and clay (5 percent). The leading drainage classification is well drained (51 percent of AOI), followed by moderately well drained (34 percent). Approximately 10 percent of the AOI has slopes ≤ 5 percent, and 66 percent has slopes of 5-10 percent.

There are no groundwater records for San Diego County available on the USGS website. Data were collected from the California Department of Water Resource Water Data Library[8]. Ten wells west of San Marcos near Escondido were sampled in 1987. The depth to groundwater ranged from 2.0 to 28.1 ft for an average of 11.6 ft.

Summary of Physiographic Characteristics

Due to the large area of land encompassed in each climate region, it is difficult to select one location that is truly "representative" of the entire region. By selecting four cities that are spaced throughout the country with different climate and soil characteristics, however, this study can demonstrate the different potential for ARCD strategies in regions around the nation. Table 4 summarizes the major soils, groundwater, and topographic characteristics for these regions. Figure 3 shows the distributions of hydrologic soil groups in areas of interest investigated in the four metropolitan areas.

Table 4. Summary of Physiographic Data

Characteristic	Southeast	South Central	Northeast – Upper Midwest	Southwest
Main soil types	Sandy loam	Clay, clay loam	Sandy loam, silt loam	Sandy loam, loam
Hydrologic soil group near study site	B (GA, AL, SC)	D (TX)	C (Northeastern states)	D
Other hydrologic soil group in climate region	D (FL)	C (NM)	B (MN, WI, IL, MI)	C
Predominant pre-development land cover	Woods	Semi-arid herbaceous	Woods	Narrow-leaved chaparral
Predominant slopes	70% @ 8-12%	90% < 4%	65% < 12%	76% < 10%

LAND USE CASES

Five cases were selected to represent a range of urban development types considered to be representative of the nation. These cases involved: a multi-family residential complex (MFR), a relatively small-scale (23 homes) single-family residential development (Sm-SFR), a relatively large (1000 homes) single-family residential development (Lg-SFR), a sizeable commercial retail installation (COMM), and an urban redevelopment (REDEV).

Building permit records from the City of San Marcos in San Diego County, California provided data on total site areas for the first three cases, including numbers of buildings, building footprint areas (including porch and garage for Sm-SFR), and numbers of parking spaces associated with the development projects. Information was not as complete for cities in other regions, but what data was available indicated no substantial difference in these site features. Therefore, the San Marcos data were used for all regional case studies. This uniformity had the advantage of placing comparisons completely on the basis of the major variables of interest, climatological and soils characteristics.

[8] http://www.water.ca.gov/waterdatalibrary (last accessed December 16, 2011).

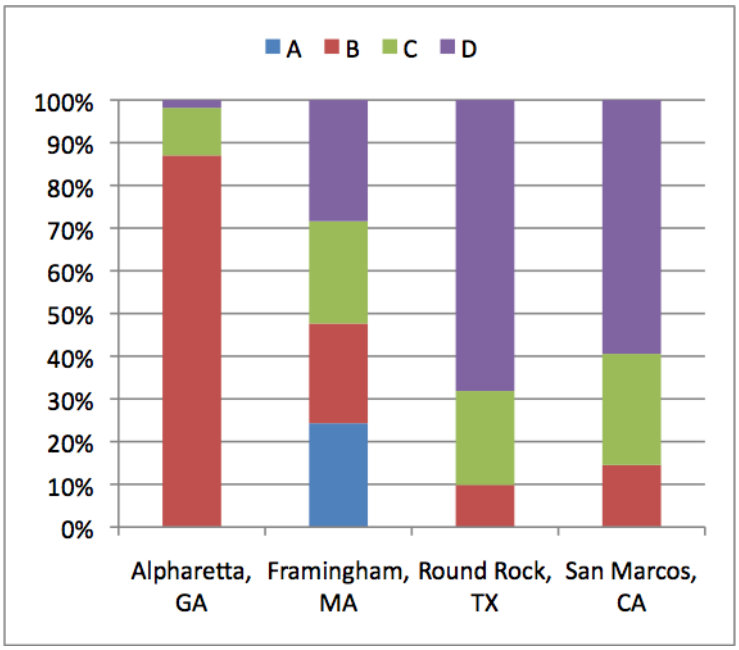

Figure 3. Distribution of Hydrologic Soil Groups in Four Study Cities

The REDEV case was taken from an actual project in Berkeley, California involving conversion of an existing structure, built originally as a corner grocery store, to apartments and addition of a new building to create a nine-unit, mixed-use, urban infill project. Space remained for a large side yard.

Larger developments were not represented in the sampling of building permits from the San Marcos database. To take larger development projects into account in the subsequent analysis, the two larger scale cases were hypothesized. The Lg-SFR scenario scaled up all land use estimates from the Sm-SFR case in the ratio of 1000:23. The hypothetical COMM scenario consisted of a building with a 2-acre footprint and 500 parking spaces. As with the smaller-scale cases, these hypothetical developments were assumed to have roadways, walkways, and landscaping, as described below.

While the building permit records made no reference to features such as roadways, walkways, and landscaping normally associated with development projects, these features were taken into account in the case studies using assumptions described herein. Parking spaces were estimated to be 176 square ft in area, which corresponds to 8 ft width by 22 ft length dimensions. Code requirements vary by jurisdiction, with the tendency now to drop below the traditional 200 square ft average. About 180 square ft is common, but various standards for full- and compact-car spaces, and for the mix of the two, can raise or lower the average (Gibbons, 2009). The 176 square ft size is considered to be a reasonable value for conventional practice.

Roadways and walkways assume a wide variety of patterns. Exclusive of the two SFR cases, simple, square parking lots with roadways around the four sides and square buildings with walkways also around the four sides were assumed. Roadways and walkways were taken to be 20 ft and 6 ft wide, respectively.

Each single-family residences (SFR) was assumed to have a lot area of 5749 square ft,, and a driveway 20 ft wide and 30 ft long. Assuming a square lot, each would have a sidewalk 76 feet by 4 feet wide, and a walkway that is 40 feet by 4 feet. .

Exclusive of the COMM case, the total area for all of these impervious features was subtracted from the total site area to estimate the pervious area, which was assumed to have conventional landscaping cover (grass, small herbaceous decorative plants, bushes, and a few trees). For the COMM scenario, an additional 10 percent was added to the building, parking lot, access road, and walkway area to represent the landscaping, on the belief that a typical retail commercial establishment would be mostly impervious.

Table 5 summarizes the characteristics of the five land use cases. The table also provides the recorded or estimated areas in each land use and cover type.

Table 5. Summary of Cases with Land Use and Land Cover Areas

	MFR[a]	Sm-SFR[a]	Lg-SFR[a]	COMM[a]	REDEV[a]
No. buildings	11	23	1000	1	2
Total area (ft^2)	476,982	132,227	5,749,000	226,529	5,451
Roof area (ft^2)	184,338	34,949	1,519,522	87,120	3,435
No. parking spaces[b]	438	-	-	500	2
Parking area (ft^2)[b]	77,088	-	-	88,000	316
Access road area (ft^2)	22,212	-	-	23,732	-
Walkway area (ft^2)	33,960	10,656	463,289	7,084	350
Driveway area (ft^2)	-	13,800	600,000	-	650
Landscape area (ft^2)	159,384	72,822	3,166,190	20,594	700

[a] MFR—multi-family residential; Sm-SFR—small-scale single-family residential; Lg-SFR—large-scale single-family residential; COMM—retail commercial; REDEV—redevelopment
[b] Uncovered

METHODS OF ANALYSIS

AVERAGE EVENT AND ANNUAL STORMWATER RUNOFF VOLUMES

Calculation Methods

Surface runoff volumes produced were estimated for both pre- and post-development conditions for each case study. The pre-development state was considered to be the predominant land cover for each region prior to European settlement.

For impervious areas, average event and annual runoff volumes were computed as the product of event or average annual precipitation, contributing drainage area, and a runoff coefficient (ratio of runoff produced to precipitation received) according to the familiar Rational Method equation. The runoff coefficient was determined from the equation C = (0.009) I + 0.05, where I is the impervious percentage. This equation was derived by Schueler (1987) from Nationwide Urban Runoff Program data (USEPA 1983). With I = 100 percent for fully impervious surfaces, C is 0.95.

The basis for pervious area runoff coefficients, for both the pre-development state and landscaped areas in developments, was the NRCS's Urban Hydrology for Small Watersheds (NRCS 1986, as revised from the original 1975 edition). This model estimates storm event runoff (R, inch) as a function of precipitation (P, inch) and a variable representing land cover and soil, termed the curve number (CN, dimensionless). CN enters the calculation via a variable S, which is the potential maximum soil moisture retention after runoff begins. The equations for English units of measurement are:

$$R = \frac{(P - 0.2S)^2}{P + 0.8S} \qquad S = \frac{1000}{CN} - 10$$

The runoff equation is valid for P > 0.2S, which represents the initial abstraction, the amount of water retained before runoff begins by vegetative interception and infiltration (NRCS 1986). According to this model, larger events are forecast to produce a greater amount of runoff in relation to amount of precipitation, because they more fully saturate the soil. Therefore, use of the model to estimate annual runoff requires selecting some event or group of events to compute an average runoff coefficient representing the year.

Average pre- and post-development pervious area average runoff coefficients were derived by computing runoff from a series of precipitation events ranging from 0.1 inch up to the 95th percentile, 24-hour event for the respective metropolitan areas, dividing by the associated precipitation, and averaging for all event amounts > 0.2S. Average annual runoff volumes for pervious areas were estimated based on these runoff coefficients and average annual precipitation quantities recorded at the respective gauging locations.

Curve Number Selection

Pre-development curve numbers were determined from existing studies and NRCS (1986) CN tables based on pre-European settlement land cover. Before development, woods predominated in Georgia and Massachusetts. Pre-development Texas had principally arid and semi-arid range with herbaceous cover. Chaparral was the predominant land cover in the San Diego area, however, this land cover type is not listed in the NRCS tables. For that region the selection came from a study by Easterbrook (undated) on curve numbers and associated soil hydrologic groups in an investigation of mainly chaparral lands before and after wildfires in the San Diego area.

Conversion to landscaping typical of development modifies soil and water infiltration characteristics by removing topsoil and even subsoil, compacting the remaining soil, and changing the vegetative cover. For pervious landscaping after development, CN was based on 1/8-acre urban development for all building types.

To demonstrate a range of results, runoff estimates were made for two soils in each region falling in B and C, B and D, or C and D HSGs. The more infiltrative soil was assumed to be in "good" condition and the less permeable one in "poor" condition, differentiations made in the NRCS tables. Table 6 summarizes the curve numbers used in the analyses. The paragraphs following the table detail how the selections were made for each region.

Table 6. Summary of Curve Numbers for Study Regions

	Southeast		South Central		Northeast – Upper Midwest		Southwest	
Hydrologic soil group-condition	B-good	D-poor	C-good	D-poor	B-good	C-poor	C-good	D-poor
Pre-development	55	83	74	93	55	77	77	90
Post-development	85	92	90	93	85	90	91	93

The Georgia Stormwater Manual Supplement recommends that watershed managers select curve numbers proposed by the NRCS based on hydrologic soil groups A through D and hydrologic condition of the site (Center for Watershed Protection 2009). As aforementioned, the pre-European land cover of the southeastern United States was forested. A study by Dyke (2001) in Forsyth and Hall Counties northeast of Atlanta confirmed that, immediately prior to development, approximately 50 percent of urban lands were forested, with 22 percent in agricultural use.

Because the region includes B soils in the interior of Alabama and Georgia, and poorly draining D soils in Florida and along the coasts, it was decided, for the purpose of demonstrating a range of results, to base NRCS Curve number values on B soils in good condition and D soils in poor condition. The corresponding pre- and post-development curve numbers are 55 and 83 and 85 and 92, respectively.

Prior to human development, approximately 80 percent of Texas, mostly in the central part, was covered in short and tall grassland communities; the western 10 percent of the state was desert grassland; and the eastern 10 percent was forested (University of Texas 2000). McLendon (2002) conducted a study on the observed and predicted curve numbers in 107 watersheds in Texas. For rural watersheds the CNs ranged from 48 to 88. The range in Austin was 49-89 and in Dallas 60-90. The Texas Department of Transportation's (2001) Hydraulic Design Manual Section 7 lists values for pre-development curve numbers for arid and semi- arid rangelands. Based on these sources, the respective pre- and post-development CN choices were 74 (C—good soil) and 93 (D—poor soil) and 90 (C—good soil) and 93 (D—poor soil).

Before European development, most of the Northeast – Upper Midwest region was covered in mixed hardwood and coniferous forests. A recent USGS report confirms that most urban development in the region from 1973 to 2000 has converted forestland (47 percent of all changes), followed by farmland (11 percent) (Auch undated). For this study's pre-development curve number, the woods cover type, soil group B in good condition and C soil in poor condition gave corresponding curve numbers of 55 and 77, respectively. Post-development curve numbers for these soil types at 1/8-acre development size were 85 and 90 for the good B and poor C soils, respectively. These post-development curve numbers are similar to a recent study in the Aberjona River watershed, an urban catchment northwest of Boston, where the authors used an overall CN of 89 to represent the more impervious parts of the watershed (Perez-Pedini et al. 2005).

With the lack of NRCS data for chaparral, CN selection for the San Diego area was based on an analysis performed in the area of the 2003 Cedar Fire in San Diego County by Easterbrook (undated). For pre-development C soils in good condition and D soils in poor condition, the choices were 77 and 90, respectively. Post-development curve numbers were selected from Easterbrook's estimation of CN after a high-burn fire; for good C soils CN = 91, and for poor D soils CN = 93.

Effect of Slope on Curve Number

NRCS documents developing the curve number concept and associated methods did not cover the effect of land slope. Independent researchers have given some attention to the question though. Sharpley and Williams (1990) introduced the empirical equation that has been most often used to adjust CN relative to slope:

$$CN_s = 0.333(CN_w - CN)(1 - 2e^{-13.86s}) + CN$$

where CN is the curve number reported in NRCS tables for an average soil moisture condition and assumed slope ≤ 5 percent, CN_s = slope-adjusted CN, CN_w = CN in an initially wet soil condition, and s = slope (ft/ft). Ward and Trimble provided factors to adjust tabulated CN values to obtain CN_w. Carrying through the analysis in this manner demonstrated that results deviated between two assessed slopes (5 and 10 percent) by only around 2-6 percent. This small difference was considered minimal in the context of the approximations and assumptions inherent in the modeling process. While the results presentation gives some additional data on slope effects, full coverage is given only for 5 percent, the topographic basis of the NRCS model and by far the subject of its greatest application.

ESTIMATING INFILTRATION CAPACITY OF THE CASE STUDY SITES

Infiltration Rates

Infiltrating sufficient runoff to maintain pre-development hydrologic characteristics and prevent pollutant transport is the most effective way to protect surface receiving waters. Successfully applying infiltration requires soils and hydrogeological conditions that will pass water sufficiently rapidly to avoid overly-lengthy ponding, while not allowing percolating water to reach groundwater before the soil column captures pollutants.

The study assumed that infiltration would occur in surface facilities and not in below-ground trenches. The use of trenches is certainly possible. However, the intent of this investigation was to determine the ability of pervious areas to manage the site runoff, and their exclusion is consistent with the conservative approach to modeling taken in this analysis. This inquiry was accomplished by evaluating the ability of the predominant soil types identified for each region to provide an infiltration rate of at least 0.5 inch/hour, the rate often regarded in the stormwater management field as the minimum for the use of infiltration practices (e.g., Geosyntec Consultants 2008). The assessment considered soils that either would provide this rate, at a minimum, in their original condition or could be organically amended to augment soil water storage and increase infiltration, while also safeguarding groundwater. Therefore, prevailing groundwater depths were assessed in relation to runoff percolation times generally regarded as safe.

Infiltration rates were based on saturated hydraulic conductivities (obtained from Leij et al. 1996) typical of the basic soil types incorporated in the U.S. Department of Agriculture (USDA, 1987) soil textural triangle. Sand, loamy sand, sandy loam have conductivities well above 0.5 inch/hour. As Table 4 indicates, three of the four regions have a sandy loam as the dominant soil type. For such a soil in the B HSG in these regions, the infiltration rate was taken as 1.74

inch/hour (Leij et al. 1996). Other textures represented that would generally fall in the C group are mostly loam and silt loam. These soil types either have conductivities in excess of 0.5 inch/hour or, in the first author's experience, can be and have been successfully organically amended to produce such a rate and infiltrate accumulated water within 72 hours, and usually less time. The D soils in some study regions, silty clay and clay, were regarded as not amendable to reach 0.5 inch/hour conductivity to host conventional or ARCD-type facilities designed specifically for infiltration. Still, locations with these soils could distribute sheet flow over pervious areas for evapotranspiration and some infiltration at slow rates and could utilize roof downspout surface or subsurface dispersal.

Groundwater Protection Assessment

Avoidance of groundwater contamination was assessed by assuming a hydraulic conductivity generally regarded as the maximum rate for the use of infiltration practices, 2.4 inches/hour (e.g., Geosyntec Consultants 2008), and a minimum spacing to seasonal high groundwater from the bed of an infiltration facility of 4 ft. These conditions would provide a travel time of 20 hours, during which contaminant capture would occur through soil contact. This 20-hour travel time was regarded as a minimum for any soil type. For example, infiltrating on loamy sand with a hydraulic conductivity of 5.7 inches/hour would require minimum spacing from the infiltration surface to groundwater of 10 ft. This consideration did not actually become an issue for analyses in any region in this study, because all predominant soil types have infiltration rates under 2.4 inches/hour and groundwater spacings that exceed 4 ft.

Site Infiltration Capacities

Runoff volumes were estimated for the 85th and 95th percentile, 24-hour events as described previously. Bioretention cell surface area to accommodate these volumes was calculated based on a method in the City of Santa Barbara's Storm Water BMP Guidance Manual (Geosyntec Consultants 2008) (adapted from the Georgia Stormwater Manual (Atlanta Regional Commission, 2001)):

$$A = \frac{(V_{design})(l)}{(t)(k_{design})(d + l)}$$

where:

V_{design} = design volume of runoff to be infiltrated (ft3);

k_{design} = design infiltration rate (in/hr), taken as 0.5 times the typical rate for the soil type naturally or amended as a safety factor;

d = ponding depth (ft), assumed as 0.25 ft for a shallow landscape feature on the recommendation of the Georgia manual;

l = depth of planting media (ft), assumed as 4 ft on the recommendation of the Georgia manual;

t = required drawdown time (hr), taken as 48 hours.

The design variable selections are conservative in applying a safety factor to hydraulic conductivity, using minimum depths for economy and limiting site disruption, and applying a drain time lower than the maximum of 72 hours.

In considering the long-term capacity of a facility designed to infiltrate, the potential for groundwater mounding below or aside the unit is a concern. To avoid this problem a basic analysis was made using a groundwater rise equation from Zomorodi (2005):

$$\text{Rise} = 0.86\,\frac{(K_v)(W)}{(K_h - K_v)}$$

where:

Rise = mounding occurring in a year of use (ft);

K_v = vertical saturated hydraulic conductivity (ft/year);

W = bioretention cell width (ft); and

K_h = horizontal saturated hydraulic conductivity (ft/year).

This equation was solved for K_v for computation of the allowable annual infiltration rate, assuming a rise limited to 1 ft. It was assumed that the bioretention surface area would be broken up to have no more than one basin for each 5 acres of total site area, another measure safeguarding against groundwater mounding. Also assumed was a square cell (i.e., W was computed as the square root of the surface area calculated according to the equation for A above). Horizontal hydraulic conductivites for loams such as represented among the B and C soils in the study regions tend to run in the range of 10 to 1000 meters/year (0.1 to 9 ft/day. A conservative value of 3 ft/day was used in the analysis.

The yearly rate of infiltration from a bioretention cell can be expressed in terms of volume of runoff per unit infiltrating surface area, acre-ft/acre-year, which is equivalent to K_v expressed as ft/year. The K_v value avoiding groundwater monitoring was therefore used to assess maximum annual infiltration capacity by multiplying by the total available pervious surface area. However, the K_v value was capped at a rate found in a study of infiltration capacity and benefits for Los Angeles' San Fernando Valley by Chralowicz et al. (2001). The Los Angeles study posited providing 0.1-0.5 acre for infiltration basins to serve each 5 acres of contributing drainage area. At 2-3 ft deep, it was estimated that such basins could infiltrate 0.90-1.87 acre-ft/year of runoff in San Fernando Valley conditions. Three types of soils predominate in the study area: sandy loams (35 percent of the area), a clay loam (23 percent), and a silty clay loam (29 percent). The balance of 13 percent includes small amounts at both ends of the textural spectrum, a clay and loamy sands. Infiltration rates are in the approximate range of 0.5-2.0 inches/hour, within the span generally regarded as ideal for successful infiltration without threatening groundwater. Computing the ratios of the rate and basin size data of Chralowicz et al. (2001), K_v maximized at approximately 20 acre-ft of runoff/acre infiltration surface-year under the most limiting conditions of soils and basin dimensions. This value was applied in this study if calculated rates were higher, another conservative feature to obtain the most realistic projections of infiltration potential.

In some cases analyzed, the maximum annual infiltration capacity was estimated at greater than post-development runoff volume production. In these instances complete retention would be possible with excess capacity left, and only a fraction of the available pervious area would have to be devoted to bioretention. That fraction was expressed as the ratio of annual runoff production to infiltration capacity.

STORMWATER RUNOFF VOLUME AND POLLUTANT DISCHARGES

Urban Land Use Pollutant Yields

Annual pollutant mass loadings prior to application of any stormwater management practices were estimated as the product of annual runoff volumes produced by the various land use and cover types and pollutant concentrations typical of those areas. General land use types (e.g., single-family residential, commercial) have typically been the basis for measuring and reporting stormwater pollutant data. However, an investigation of ARCD practices of the type of interest in this study demands data on specific land coverages. The literature offers few data on this basis. Those available and used herein were assembled by a consultant to the City of Seattle for a project in which the author participated. They appear in Attachment A (Herrera Environmental Consultants, Inc. undated). Table 7 summarizes the representative values used in the analysis.

Table 7. Pollutant Concentrations in Runoff from Developed Land Uses (after Herrera Environmental Consultants, Inc. undated)

Land Use	Total Suspended Solids (mg/L)	Total Copper (µg/L)	Total Zinc (µg/L)	Total Phosphorus (µg/L)
Residential roof	25	13	159	110
Commercial roof	18	14	281	140
Access road/driveway	120	22	118	660
Parking	75	36	97	140
Walkway	25	13	59	110
Landscaping	213	13	59	2040

Pollutant concentrations expected to occur typically in the mixed runoff from the several land use and cover types making up a development were estimated by mass balance; i.e., the concentrations from the different areas of the sites were combined in proportion to their contribution to the total runoff.

Estimating Retention

The principal interest of this study was to estimate how much of the post-development runoff volume for the various land use cases could be retained by ARCD measures and prevented from discharging from the site on the surface. The analyses initially evaluated the runoff volume that could potentially be infiltrated by using a portion or all of the available pervious area for bioretention facilities. In some instances judicious use of the pervious area could infiltrate the full volume. In other cases use of the pervious area for as much infiltration as possible plus special management of roof runoff would fully attenuate post-development runoff.

Complete retention would, of course, exceed any ordinary regulatory standard intended to govern discharge quantity and quality. To the extent that full retention could not be expected, the study was interested in assessing the degree to which bioretention and roof runoff management could meet the specific potential standards outlined earlier. Performance was estimated in terms of volume retained versus released, the extent to which pre-development groundwater recharge would be preserved, and the pollutant loading reduction accompanying volume retention in comparison to the quantities that would enter receiving waters with no stormwater management actions. These measures expressed in equation form are:

$$\text{Runoff retention (\%)} = \frac{(\text{Volume with no practices} - \text{Volume with ARCD practices})}{\text{Volume with no practices}} \text{x}100$$

(expresses amount of the theoretical maximum post-development runoff prevented from discharging by ARCD)

$$\text{Recharge retention (\%)} = [1 - \frac{(\text{Predevelopment recharge} - \text{Postdevelopment recharge with ARCD})}{\text{Predevelopment recharge}}]\text{x}100$$

Pre-development recharge = Rainfall volume – Predevelopment runoff volume

Post-development recharge = The smaller of rainfall volume or post-development infiltration volume

$$\text{Loading reduction (\%)} = \frac{(\text{Loading with no practices} - \text{Loading with ARCD practices})}{\text{Loading with no practices}} \text{x}100$$

It should be noted that runoff retention and recharge retention express different quantities and are not equal numerically.

When infiltration alone (Basic ARCD) could not accomplish full retention, roof runoff management strategies were selected as appropriate for the land use case (Full ARCD). For the retail commercial development (COMM), roof runoff management was assumed to be accomplished by harvesting, temporarily storing, and applying water to use in the building. To this end, the assumption was made that the commercial development would be able to manage and would have capacity to store and make use of the entire roof runoff volume. While this particular assumption is, on its own, speculative, the commercial development would, as discussed in the section on Application of ARCD Practices, earlier, see a reduction in runoff as a result of evapotranspiration, and would have the option to employ ARCD site design principles to reduce impervious surface area, to install a green roof to retain runoff, or to implement any of a number of other ARCD practices designed to reduce runoff volume and pollutant loading. As a result, the overall analysis of the commercial site remains conservative in its assessment of the potential to retain runoff onsite.

In the three multi-family and single-family residential cases it was assumed that the roof water would be dispersed on or within the pervious area according to accepted and standardized practices. For example, the Washington Department of Ecology's (2005) Stormwater Management Manual for Western Washington provides design criteria for two methods: splash blocks followed by vegetated dispersion areas and gravel-filled trenches. These devices can be used wherever space is sufficient regardless of infiltration rates, as they operate by evapotranspiration and slow infiltration. Even clay can infiltrate at an approximate rate of 0.2 inch/hour or higher (Leij et al. 1996; Pitt, Chen, and Clark 2002). Care was taken to assure that pervious area already allocated to infiltration would not also be counted upon for dispersion. While dispersion was assumed for simplification of the study analyses, in reality a site designer would have the option of using rain barrels, cisterns, and/or green roofs instead of or along with ground dispersion to manage roof water. Analyses for the final case, the redevelopment scenario (REDEV), assumed dispersion and/or small-scale harvesting of roof runoff above whatever level of infiltration could be accomplished given the soil condition.

Additional Analyses When Full Retention Cannot Be Expected

Retaining runoff from impervious and pollutant generating pervious surfaces is the best stormwater management policy, because it prevents the introduction of urban runoff pollutants

to receiving waters as well as serves quantity discharge control requirements. Maintaining pre-development peak flow rates, volumes, and elevated flow durations prevents stream channel and habitat damage, flooding, and loss of groundwater recharge. When conditions were expected to render full retention technically infeasible for the study cases, estimates were made of the volume and pollutant loadings that would be discharged assuming the remaining surface runoff is released to a receiving water with and without treatment. Treatment was assumed to be provided by bioretention discharging either directly on the surface or via an underdrain. While not as environmentally beneficial as retention, such treatment is superior to conventional stormwater management practices like ponds and sand filters. It captures pollutants through a number of mechanisms as contaminants are held for a time in the facility and contact vegetation and soil, such as sedimentation, filtration by plants, and adsorption and ion exchange in soil.

The effectiveness of bioretention in removing pollutants from surface runoff was estimated according to measurements by Chapman and Horner (2010). This study was performed on a linear bioretention device located on a slope and made up of a number of cells separated by weirs (termed a “cascade”). While an estimated 74 percent of all entering runoff infiltrated or evapotranspired before discharging, the flows reaching the end in the larger storms would have less residence time in the facility than in a unit on flat ground percolating water through soil before surface discharge via an underdrain. Therefore, pollutant concentrations exiting such a unit could be less yet. On the other hand, some bioretention facilities bypass the relatively rare higher flows, affording no treatment, while the cascade was designed to convey all runoff, even beyond its water quality design storm flow, and provide some treatment. On balance between the advantage and disadvantage of the facility providing the data, the discharge concentrations are considered to be representative of bioretention.

Chapman and Horner (2010) computed volume-weighted average discharge pollutant concentrations by multiplying concentrations times flow volumes for each monitored storm, summing, and dividing by total volume. The resulting values for the contaminants considered in this study are: total suspended solids (TSS)—30 mg/L, total copper—6.3 µg/L, total zinc—47 µg/L, and total phosphorus—133 µg/L. In a few instances these concentrations are higher than those in Table 7, an expression of the observation sometimes made in stormwater management that treatment cannot reduce concentrations in relatively “clean” flows below certain minimum values. In these situations the concentrations in Table 8 were also used in computing discharge loadings; i.e., no concentration reduction was applied in estimating discharge loadings, although flow volume would still be decreased to the extent infiltration could occur.

RESULTS OF THE ANALYSIS

ASSESSMENT OF MAXIMUM ARCD CAPABILITIES

Runoff Retention and Groundwater Recharge

Basic ARCD

One goal of this exercise was to determine if ARCD practices could eliminate post-development runoff production, and the pollutants it transports, and maintain pre-development groundwater recharge. The first assessment, termed the Basic ARCD analysis in this report, was to estimate if each site's pervious area is sufficient for full infiltration if given to this purpose to the extent necessary without compromising other uses. Accordingly, shallow, unobtrusive bioretention cells (i.e., rain gardens) are envisioned, dispersed through sites at no more than one for each 5 acres. It bears reemphasis that no credit was taken for water loss through evapotranspiration in this assessment, although a substantial, but not necessarily easily quantifiable, amount would undoubtedly occur. Estimates of runoff retention are therefore conservative.

Table 8 presents comparisons, for the Southeast climate region, between estimated annual runoff volumes generated before development and then post-development with and without Basic ARCD stormwater management. The table also gives annual groundwater recharge estimates for these same conditions.

Table 8. Runoff and Groundwater Recharge Volumes with Basic ARCD: Southeast Climate Region[a]

Period	Volume (acre-ft) or Percentage Measure	MFR	Sm-SFR	Lg-SFR	COMM	REDEV
B soil						
Pre-dev.	Runoff	0.046	0.013	0.56	0.022	0.001
	Recharge	44.7	12.4	539	21.2	0.51
Post-dev.	Runoff without stormwater practices	29.5	6.85	298	18.7	0.45
	Runoff retained with Basic ARCD	29.5	6.85	298	8.30	0.21
	Runoff released with Basic ARCD	0	0	0	10.4	0.25
	Runoff retention (%)	100%	100%	100%	44%	45%
	Recharge without stormwater practices	15.3	5.55	241	2.53	0.06
	Recharge with Basic ARCD	44.7	12.4	539	8.30	0.21
	Recharge retention (%)	100%	100	100%	39%	40%
	Pervious area needed (%)[b]	36%	22%	22%	100%	100%
D soil						
Pre-dev.	Runoff	13.5	3.76	163	6.43	0.16
	Recharge	31.2	8.64	376	14.8	0.36
Post-dev.	Runoff without stormwater practices	Full ARCD needed to maximize retention on D soil				
	Runoff retained with Basic ARCD					
	Runoff released with Basic ARCD					
	Runoff retention (%)					
	Recharge without stormwater practices	11.6	4.17	181	2.12	0.05
	Recharge with Basic ARCD	Full ARCD needed to maximize retention on D soil				
	Recharge retention (%)	37%	48%	48%	14%	14%
	Pervious area needed (%)[b]	Full ARCD needed to maximize retention on D soil				

[a] Pre-dev.—pre-development; post-dev.—post-development; ARCD—aquatic resources conservation design; MFR—multi-family residential; Sm-SFR—small-scale single-family residential; Lg-SFR—large-scale single-family residential; COMM—retail commercial; REDEV—infill redevelopment; Basic ARCD—infiltrating bioretention; runoff—quantity of water discharged from the site on the surface; recharge--quantity of water infiltrating the soil

[b] Proportion of the total pervious area on the site required for bioretention to achieve given results

In all cases the majority of the infiltration that would recharge groundwater in the undeveloped state would be lost to surface runoff after development. These losses would approach 90 percent in the most impervious developments. The greatly increased surface flow would raise peak flow rates and volumes in receiving water courses, increase flooding risk, and transport pollutants.

Basic ARCD could retain all post-development runoff and pre-existing groundwater recharge in the three residential cases on the B soils, using from less than one-fourth to just over one-third of the available pervious area for bioretention cells. Taking all available pervious area for the more highly impervious COMM and REDEV cases on B soil, bioretention would retain about 45 percent of the runoff generated and save about 40 percent of the pre-development recharge. To illustrate the relatively small role that slope increase from 5 to 10 percent plays in runoff retention, full retention would still be expected in the three residential cases and for the remaining two cases (COMM and REDEV) would decrease from 44-45 percent only slightly to 40-41 percent (not shown in table).

On the D soil, infiltrating bioretention may not be technically feasible and was not relied upon for retention estimates. Without the use of additional measures in the Full ARCD category, only incidental post-development runoff would be retained; and most pre-development recharge would be lost.

Tables 9-11 are companions to Table 8 for the South Central, Northeast – Upper Midwest, and Southwest climate regions, respectively. Results for the Northeast - Upper Midwest B soil are very close to those for the Southeast B soil, as would be expected given the similar precipitation quantities and soil characteristics. In the three regions having C soils, Basic ARCD can retain all runoff for the MFR, Sm-SFR, and Lg-SFR residential cases. With these soils, except in the Southwest, achieving full retention requires more of the available pervious area than with B soils, up to 69 percent, but is still fully attainable.

The effect of lower rainfall is evident in the South Central and, especially, the Southwest regions. In the latter location, not only the residential cases but also the COMM and REDEV scenarios can achieve full runoff retention with Basic ARCD on the C soil. The residential cases need much smaller percentages of the available pervious area for bioretention than for the same cases on C and even B soils elsewhere. Applying Basic ARCD to the South Central, C soil, REDEV case results in higher runoff retention than for the B soil cases in higher rainfall regions.

The study cases demonstrated two interesting points about groundwater recharge. First, with effective infiltrating bioretention it is possible for post-development annual recharge to exceed the pre-development quantity. This phenomenon is most evident in comparing the two amounts for cases with 100 percent runoff retention on C soils, which in the natural state produce much less recharge in relation to runoff than B soils. The B soils have a recharge-to-runoff ratio of about 500, whereas that ratio is only 4-6 for the C soils studied. One reason for higher post- compared to pre-development recharge is that bioretention is set up to hold water, increasing the time for infiltration to occur, instead of letting it run off. Another is that soils, especially in the C HSG, are often improved by organic amendments to yield both more water storage capacity and higher infiltration rates than the pre-existing soils.

A related point is that the percentage of pre-development recharge retained after development can be higher with C than B soils. This situation can best be seen in cases without full runoff retention, COMM and sometimes REDEV. In terms of recharge, installing bioretention conveys a greater advantage to the C than the B soils, which already have more pore space for water storage and higher infiltration and recharge rates.

Table 9. Runoff and Groundwater Recharge Volumes with Basic ARCD: South Central Climate Region[a]

Period	Volume (acre-ft) or Percentage Measure	MFR	Sm-SFR	Lg-SFR	COMM	REDEV
C soil						
Pre-dev.	Runoff	4.10	1.14	49.4	1.95	0.05
	Recharge	25.7	7.13	310	12.2	0.29
Post-dev.	Runoff without stormwater practices	21.2	5.15	224	12.7	0.31
	Runoff retained with Basic ARCD	21.2	5.15	224	4.33	0.21
	Runoff released with Basic ARCD	0	0	0	8.32	0.10
	Runoff retention (%)	100	100	100	34	67
	Recharge without stormwater practices	8.62	3.11	135	1.51	0.03
	Recharge with Basic ARCD	29.8	8.3	359	4.33	0.21
	Recharge retention (%)	100	100	100	38	70
	Pervious area needed (%)[b]	51	23	30	100	100
D soil						
Pre-dev.	Runoff	18.5	5.14	223	8.80	0.21
	Recharge	11.3	3.13	136	5.36	0.13
Post-dev.	Runoff without stormwater practices	Full ARCD needed to maximize retention on D soil				
	Runoff retained with Basic ARCD					
	Runoff released with Basic ARCD					
	Runoff retention (%)					
	Recharge without stormwater practices	7.23	7.59	112	1.35	0.03
	Recharge with Basic ARCD	Full ARCD needed to maximize retention on D soil				
	Recharge retention (%)	64	83	83	25	24
	Pervious area needed (%)[b]	Full ARCD needed to maximize retention on D soil				

Table 10. Runoff and Groundwater Recharge Volumes with Basic ARCD: Northeast – Upper Midwest Climate Region[a]

Period	Volume (acre-ft) or Percentage Measure	MFR	Sm-SFR	Lg-SFR	COMM	REDEV
B soil						
Pre-dev.	Runoff	0.04	0.01	0.54	0.02	0.001
	Recharge	42.9	11.9	517	20.4	0.49
Post-dev.	Runoff without stormwater practices	28.3	6.68	286	18.0	0.44
	Runoff retained with Basic ARCD	28.3	6.68	286	8.53	0.21
	Runoff released with Basic ARCD	0	0	0	9.43	0.23
	Runoff retention (%)	100	100	100	48	47
	Recharge without stormwater practices	14.6	5.32	231	2.42	0.06
	Recharge with Basic ARCD	42.9	11.9	517	8.53	0.21
	Recharge retention (%)	100	100	100	42	42
	Pervious area needed (%)[b]	34	21	21	100	100
C soil						
Pre-dev.	Runoff	7.87	2.18	94.8	3.74	0.09
	Recharge	35.1	9.72	422	16.6	0.40
Post-dev.	Runoff without stormwater practices	30.5	7.42	323	18.2	0.44
	Runoff retained with Basic ARCD	30.5	7.42	323	4.57	0.21
	Runoff released with Basic ARCD	0	0	0	13.6	0.24
	Runoff retention (%)	100	100	100	25	47
	Recharge without stormwater practices	12.4	4.48	195	2.17	0.05
	Recharge with Basic ARCD	42.9	11.9	517	4.57	0.21
	Recharge retention (%)	100	100	100	27	51
	Pervious area needed (%)[b]	69	31	40	100	100

Table 11. Runoff and Groundwater Recharge Volumes with Basic ARCD: Southwest Climate Region[a]

Period	Volume (acre-ft) or Percentage Measure	MFR	Sm-SFR	Lg-SFR	COMM	REDEV
C soil						
Pre-dev.	Runoff	1.62	0.45	19.5	0.77	0.02
	Recharge	7.22	2.00	87.0	3.43	0.08
Post-dev.	Runoff without stormwater practices	6.41	1.57	68.5	3.77	0.09
	Runoff retained with Basic ARCD	6.41	1.57	68.5	3.77	0.09
	Runoff released with Basic ARCD	0	0	0	0	0
	Runoff retention (%)	100	100	100	100	100
	Recharge without stormwater practices	2.43	0.88	38.1	0.43	0.01
	Recharge with Basic ARCD	8.84	2.45	107	4.20	0.10
	Recharge retention (%)	100	100	100	100	100
	Pervious area needed (%)[b]	12	5	7	69	44
D soil						
Pre-dev.	Runoff	4.47	1.24	53.8	2.12	0.05
	Recharge	4.37	1.21	52.7	2.08	0.05
Post-dev.	Runoff without stormwater practices	Full ARCD needed to maximize retention on D soil				
	Runoff retained with Basic ARCD					
	Runoff released with Basic ARCD					
	Runoff retention (%)					
	Recharge without stormwater practices	2.14	0.77	33.3	0.40	0.01
	Recharge with Basic ARCD	Full ARCD needed to maximize retention on D soil				
	Recharge retention (%)	49	63	63	19	18
	Pervious area needed (%)[b]	Full ARCD needed to maximize retention on D soil				

Full ARCD

Infiltration is one of a wide variety of ARCD-based source reduction techniques. Where site conditions such as soil quality or available area limit a site's infiltration capacity, other ARCD measures can enhance a site's runoff retention capability. Such practices can also be used where infiltration capacity is adequate, but the developer desires greater flexibility for land use on-site. Among those techniques, this study considered special management of roof water in those cases where bioretention could not infiltrate all post-development runoff.

Specifically, water harvesting for supply of irrigation and/or non-potable indoor uses was investigated for the retail commercial development. In residential cases with insufficient capacity for infiltrative bioretention but remaining space not already devoted to infiltration, efficiently directing roof runoff into the soil through downspout dispersion systems was the method of choice. Such cases invariably occurred with HSG D soils. The Full-ARCD scenario applied to the redevelopment case was roof water dispersion, harvesting, or a combination of the two practices. Generally speaking, infiltration consumed all available pervious area in the REDEV cases on B and C soils, making roof runoff harvesting the mechanism to retain more water. With no bioretention facility on D soil, the pervious area would be available for dispersion. Of course, harvesting could be applied instead of or along with dispersion. Again, it was assumed that that the commercial and, as needed, redevelopment sites had capacity to harvest and make use of the full volume of roof runoff generated, however, the analysis remains conservative in terms of the potential for onsite retention as it does not consider the use of ARCD site design principles to reduce impervious surfaces, green roofs, and evaporation/evapotranspration from surfaces other than rooftops.

Table 12 gives Southeast climate region results with the addition of Full ARCD techniques: roof runoff management, consisting of harvesting for reuse in the COMM case, dispersion on or within pervious land for the three residential cases, and a combination of these measures for REDEV. On the B soil runoff retention would approximately double for the retail commercial

land use and reach 100 percent for the redevelopment. Groundwater recharge would not be expected to increase over the Basic ARCD case, though; because harvesting still keeps water out of the soil system.

For development on the D soil, use of roof runoff management techniques was estimated to increase runoff retention from zero to about one-third to two-thirds of the post-development runoff generated, depending on the land use case. Groundwater recharge would not materially benefit, however; because harvest does not contribute to it. Also, no recharge credit was taken for dispersion, since infiltration is restricted and loss by ET would tend to occur before infiltration. Some small amount of recharge would still be likely though. To illustrate further the small role of topography, in this D soil, Full ARCD scenario runoff retention is forecast to decrease by only 1-2 percent at a 10 percent slope compared to a 5 percent slope (not shown in table).

Table 12. Runoff and Groundwater Recharge Volumes with Full ARCD: Southeast Climate Region[a]

Period	Volume (acre-ft) or Percentage Measure	MFR	Sm-SFR	Lg-SFR	COMM	REDEV
B soil						
Pre-dev.	Runoff	0.046	0.013	0.56	0.022	0.001
	Recharge	44.7	12.4	539	21.2	0.51
Post-dev.	Runoff without stormwater practices	Complete retention possible with Basic ARCD			18.7	0.45
	Runoff retained with Full ARCD				16.1	0.45
	Runoff released with Full ARCD				2.66	0
	Runoff retention (%)				86%	100%
	Recharge without stormwater practices				2.53	0.06
	Recharge with Full ARCD				8.30	0.21
	Recharge retention (%)				39%	40%
	Pervious area needed (%)[b]				100%	100%
D soil						
Pre-dev.	Runoff	13.5	3.76	163	6.43	0.16
	Recharge	31.2	8.64	376	14.8	0.36
Post-dev.	Runoff without stormwater practices	33.1	8.23	358	19.1	0.46
	Runoff retained with Full ARCD	16.4	3.11	135	7.76	0.31
	Runoff released with Full ARCD	16.7	5.12	222	11.4	0.16
	Runoff retention (%)	50%	38%	38%	41%	66%
	Recharge without stormwater practices	11.6	4.17	181	2.12	0.05
	Recharge with Full ARCD	11.6	4.17	181	2.12	0.05
	Recharge retention (%)	37.2%	48.3%	48.3%	14.3%	13.6%
	Pervious area needed (%)[b]	100%	100%	100%	100%	100%

[a] Pre-dev.—pre-development; post-dev.—post-development; ARCD—aquatic resources conservation design; MFR—multi-family residential; Sm-SFR—small-scale single-family residential; Lg-SFR—large-scale single-family residential; COMM—retail commercial; REDEV—infill redevelopment; Full ARCD—infiltrating bioretention, roof runoff harvesting, and/or roof runoff dispersion; runoff—quantity of water discharged from the site on the surface; recharge--quantity of water infiltrating the soil
[b] Proportion of the total pervious area on the site required for bioretention to achieve given results

Tables 13-15 give data analogous to Table 12 for the South Central, Northeast – Upper Midwest, and Southwest climate regions, respectively. Results are similar to those reported for the Southeast region. Full ARCD can approximately double runoff retention from the Basic ARCD level for the COMM case and extend runoff retention to 100 percent for the redevelopment on both B and C soils. Once again, application of Full ARCD to the D soil cases increases runoff retention from zero to one-third to two-thirds of the volume produced, depending on land use case.

Table 13. Runoff and Groundwater Recharge Volumes with Full ARCD: South Central Climate Region[a]

Period	Volume (acre-ft) or Percentage Measure	MFR	Sm-SFR	Lg-SFR	COMM	REDEV
C soil						
Pre-dev.	Runoff	4.10	1.14	49.4	1.95	0.05
	Recharge	25.7	7.13	310	12.2	0.29
Post-dev.	Runoff without stormwater practices	Complete retention possible with Basic ARCD			12.7	0.31
	Runoff retained with Full ARCD				9.51	0.31
	Runoff released with Full ARCD				3.15	0
	Runoff retention (%)				75	100
	Recharge without stormwater practices				1.51	0.03
	Recharge with Full ARCD				4.33	0.21
	Recharge retention (%)				35	72
	Pervious area needed (%)[b]				100	100
D soil						
Pre-dev.	Runoff	18.5	5.14	223	8.80	0.21
	Recharge	11.3	3.13	136	5.36	0.13
Post-dev.	Runoff without stormwater practices	22.6	5.68	247	12.8	0.31
	Runoff retained with Full ARCD	11.0	2.08	90.3	5.17	0.20
	Runoff released with Full ARCD	11.6	3.60	157	7.63	0.11
	Runoff retention (%)	49	37	37	40	66
	Recharge without stormwater practices	7.23	2.59	112	1.35	0.03
	Recharge with Full ARCD	7.23	2.59	112	1.35	0.03
	Recharge retention (%)	64	83	83	25	24
	Pervious area needed (%)[b]	100	100	100	100	100

Table 14. Runoff and Groundwater Recharge Volumes with Full ARCD: Northeast – Upper Midwest Climate Region[a]

Period	Volume (acre-ft) or Percentage Measure	MFR	Sm-SFR	Lg-SFR	COMM	REDEV
B soil						
Pre-dev.	Runoff	0.04	0.01	0.54	0.02	0.001
	Recharge	42.9	11.9	51.7	20.4	0.49
Post-dev.	Runoff without stormwater practices	Complete retention possible with Basic ARCD			18.0	0.44
	Runoff retained with Full ARCD				16.0	0.44
	Runoff released with Full ARCD				2.00	0
	Runoff retention (%)				89	100
	Recharge without stormwater practices				2.42	0.06
	Recharge with Full ARCD				8.53	0.21
	Recharge retention (%)				42	43
	Pervious area needed (%)[b]				100	100
C soil						
Pre-dev.	Runoff	7.87	2.18	94.8	3.74	0.09
	Recharge	35.1	9.72	422	16.6	0.40
Post-dev.	Runoff without stormwater practices	Complete retention possible with Basic ARCD			18.2	0.44
	Runoff retained with Full ARCD				12.0	0.44
	Runoff released with Full ARCD				6.19	0
	Runoff retention (%)				66	100
	Recharge without stormwater practices				2.17	0.05
	Recharge with Full ARCD				4.57	0.21
	Recharge retention (%)				28	43
	Pervious area needed (%)[b]				100	100

Table 15. Runoff and Groundwater Recharge Volumes with Full ARCD: Southwest Climate Region[a]

Period	Volume (acre-ft) or Percentage Measure	MFR	Sm-SFR	Lg-SFR	COMM	REDEV
C soil						
Pre-dev.	Runoff	1.62	0.45	19.5	0.77	0.02
	Recharge	7.22	2.00	87.0	3.43	0.08
Post-dev.	Runoff without stormwater practices	Complete retention possible with Basic ARCD				
	Runoff retained with Full ARCD					
	Runoff released with Full ARCD					
	Runoff retention (%)					
	Recharge without *stormwater* practices					
	Recharge with Full ARCD					
	Recharge retention (%)					
	Pervious area needed (%)[b]					
D soil						
Pre-dev.	Runoff	4.47	1.24	53.8	2.12	0.05
	Recharge	4.37	1.21	52.7	2.08	0.05
Post-dev.	Runoff without stormwater practices	6.70	1.68	73.2	3.80	0.09
	Runoff retained with Full ARCD	3.25	0.62	26.8	1.53	0.06
	Runoff released with Full ARCD	3.45	1.07	46.5	2.26	0.03
	Runoff retention (%)	49	37	37	40	66
	Recharge without stormwater practices	2.14	0.77	33.3	0.40	0.01
	Recharge with Full ARCD	2.14	0.77	33.3	0.40	0.01
	Recharge retention (%)	49	63	63	19	18
	Pervious area needed (%)[b]	100	100	100	100	100

Pollutant Loading Reductions

The examination of maximum ARCD capabilities considered the reductions of annual mass loadings of four water pollutants that would accompany runoff retention. Since retention means no surface discharge, these loading reductions are, at a minimum, equal to the percentages of runoff retention. In those cases with less than full runoff retention, there is good reason to expect pollutant loading reductions higher than the percentage of runoff retained. The early runoff ("first flush"), occurring when the soils are least saturated, is more likely to be retained than later runoff. It is frequently observed that the first flush has higher pollutant concentrations than later runoff, particularly in the wash off after relatively extended dry periods.

For the B and D soil and the residential cases on C soils, the reductions were very consistent among regions:

- B and C soils, Basic ARCD, residential cases—100%;
- B soil, Basic ARCD, COMM and REDEV cases—44-45%;
- B soil, Full ARCD, COMM and REDEV cases—86-100%;
- D soil, Full ARCD, SFR and COMM cases—38-41%;
- D soil, Full ARCD, MFR case—50%; and
- D soil, Full ARCD, REDEV case—66%.

For the most highly impervious cases, COMM and REDEV, on C soils reduction was variable and dependent on precipitation. With Basic ARCD the range was from 25 to 100 percent, going from relatively high to low precipitation. Full ARCD is expected to raise the lowest reductions to 100 percent for REDEV and at least 66 percent for COMM.

Therefore, taking the greatest advantage of what ARCD offers could prevent the addition to receiving waters of all or almost all pollutant mass that would otherwise discharge from a range

of urban developments on B and C soils. With D soils, Full ARCD can accomplish loading reductions approaching or somewhat exceeding 50 percent.

ABILITY TO MEET POTENTIAL STANDARDS

General Summary

This section evaluates the ability of the Basic and Full ARCD strategies to meet each of the five potential stormwater management standards enumerated in the beginning of the report. It also examines the extent of pollutant loading reduction if the standards are just met; i.e., if runoff is retained at the minimum needed to meet the standard. It has already been demonstrated that retention of all post-development runoff and full pollutant attenuation is possible in some circumstances. Table 16 summarizes the results for all regions and cases and both ARCD strategies.

Ability to Meet Standards

The projected ability to meet the standards overall varies mostly in relation to soil type (B or C versus D) and the relative imperviousness of development, and much less across climate regions. The one exception to this generality is that implementing Basic ARCD practices on the Southwest region C soil would meet all five standards. This uniformity does not occur elsewhere on either B or C soils, and is apparently primarily a function of the relatively low precipitation in the region.

Setting aside the Southwest region, success in complying with standards is mostly comparable among the various B and C soils, with a small number of instances where a development type meets a standard on B but not on C soil. Basic ARCD methods invariably can meet all standards on B and C soils for the residential development cases (MFR and Sm- and Lg-SFR). Full ARCD practices are forecast to meet all standards for the redevelopment case on B soils but only standards 1 and 5 consistently on C soils. The combination of infiltration and roof runoff management applied to the retail commercial development allows meeting these same two standards on B soils but only the latter on both of the C soils occurring outside the Southwest region. The only standards that cannot be met on B and C soils by the ARCD methods considered are standards 2-4 for the COMM case. Therefore, of the 125 standards assessments, ARCD practices are projected to meet 113 (90.4 percent) with B and C soils.

The ability to meet these standards is much reduced on D soils. Standard 1 can be met occasionally with Full ARCD used in the redevelopment. All cases with Full ARCD comply with standard 4 on this soil where pre-development runoff is estimated to be relatively high, reflecting a low overall requirement for retention volume. Standard 5 can be met with Full ARCD with the exception of one COMM case. Standards 2 and 3 were never estimated to be met in any D soil case. All in all, with this soil 26 of the 75 scenarios (34.7 percent) are expected to meet a standard.

Table 16. Ability to Meet Potential Regulatory Standards with Basic/Full ARCD Practices

Region-Case[a]	Standards Met—Basic ARCD[b]	Standards Met—Full ARCD[b]	Runoff Retention and Pollutant Loading Reduction (%)[b, c]				
			Std. 1	Std. 2	Std. 3	Std. 4	Std. 5
SE(B)-MFR	1, 2, 3, 4, 5		63	87	90	>99	63
Sm-SFR	1, 2, 3, 4, 5		63	87	90	>99	63
Lg-SFR	1, 2, 3, 4, 5		63	87	90	>99	63
COMM		1, 5	63	86	86	86	63
REDEV		1, 2, 3, 4, 5	63	87	90	>99	63
SE(D)-MFR		5	50	50	50	50	37
Sm-SFR		5	38	38	38	38	34
Lg-SFR		5	38	38	38	38	34
COMM			41	41	41	41	41
REDEV		1, 5	63	66	66	66	42
SC(C)-MFR	1, 2, 3, 4, 5		58	82	90	81	47
Sm-SFR	1, 2, 3, 4, 5		58	82	90	78	45
Lg-SFR	1, 2, 3, 4, 5		58	82	90	78	45
COMM		1, 5	58	75	75	75	49
REDEV		1, 2, 3, 4, 5	58	82	90	84	49
SC(D)-MFR		4, 5	49	49	49	18	10
Sm-SFR		4, 5	37	37	37	10	6
Lg-SFR		4, 5	37	37	37	10	6
COMM		4, 5	40	40	40	31	18
REDEV		1, 4, 5	58	66	66	32	18
NM(B)-MFR	1, 2, 3, 4, 5		81	89	90	>99	81
Sm-SFR	1, 2, 3, 4, 5		81	89	90	>99	81
Lg-SFR	1, 2, 3, 4, 5		81	89	90	>99	81
COMM		1, 2, 5	81	89	89	89	81
REDEV		1, 2, 3, 4, 5	81	89	90	>99	81
NM(C)-MFR	1, 2, 3, 4, 5		81	89	90	74	60
Sm-SFR	1, 2, 3, 4, 5		81	89	90	71	57
Lg-SFR	1, 2, 3, 4, 5		81	89	90	71	57
COMM		5	66	66	66	66	64
REDEV		1, 2, 3, 4, 5	81	89	90	80	64
SW(C)-MFR	1, 2, 3, 4, 5		62	83	90	75	46
Sm-SFR	1, 2, 3, 4, 5		62	83	90	72	44
Lg-SFR	1, 2, 3, 4, 5		62	83	90	72	44
COMM	1, 2, 3, 4, 5		62	83	90	80	49
REDEV	1, 2, 3, 4, 5		62	83	90	80	49
SW(D)-MFR		4, 5	49	49	49	33	21
Sm-SFR		4, 5	37	37	37	27	16
Lg-SFR		4, 5	37	37	37	27	16
COMM		5	40	40	40	40	27
REDEV		1, 4, 5	62	66	66	44	28

[a] Region (hydrologic soil group)—land use; regions: SE—Southeast, SC—South-central, NM—Northeast-Upper Midwest, SW—Southwest; land uses: MFR—multi-family residential, Sm-SFR—small single-family residential, Lg-SFR--large single-family residential, COMM—retail commercial, REDEV--redevelopment

[b] Standard (Std.) 1—Retain the runoff produced by the 85th percentile, 24-hour precipitation event
Standard 2—Retain the runoff produced by the 95th percentile, 24-hour precipitation event
Standard 3—Retain 90 percent of the average annual post-development runoff volume
Standard 4—Retain the difference between the post- and pre-development average annual runoff volumes
Standard 5—Retain the difference between the post- and pre-development runoff volumes for all events up to and including the 85th percentile, 24-hour precipitation event

[c] Reduction estimated to result from meeting the standard, to the extent it can be met (fully met if so indicated in preceding columns), without treatment of remaining discharge. Where a standard can be met using Basic or Full ARCD application it is indicated in black, where a standard cannot be met using Basic or Full ARCD it is highlighted red.

Figure 4a. Ability to Meet Potential Regulatory Standards with Basic/Full ARCD Practices for Southeast Climate Region

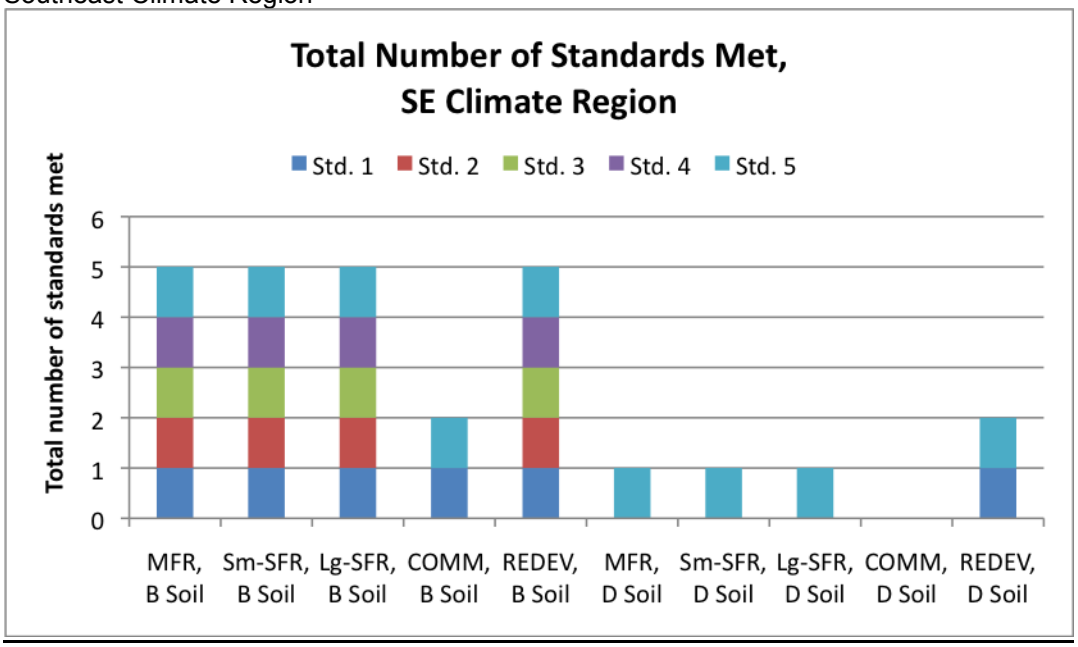

MFR—multi-family residential, Sm-SFR—small single-family residential, Lg-SFR--large single-family residential, COMM—retail commercial, REDEV—redevelopment. Standard (Std.) 1—Retain the runoff produced by the 85th percentile, 24-hour precipitation event; Standard 2—the 95th percentile, 24-hour precipitation event; Standard 3—90 percent of the average annual post-development runoff volume; Standard 4—the difference between the post- and pre-development average annual runoff volumes; and, Standard 5—the difference between the post- and pre-development runoff volumes for all events up to and including the 85th percentile, 24-hour precipitation event

Figure 4b. Ability to Meet Potential Regulatory Standards with Basic/Full ARCD Practices for South Central Climate Region

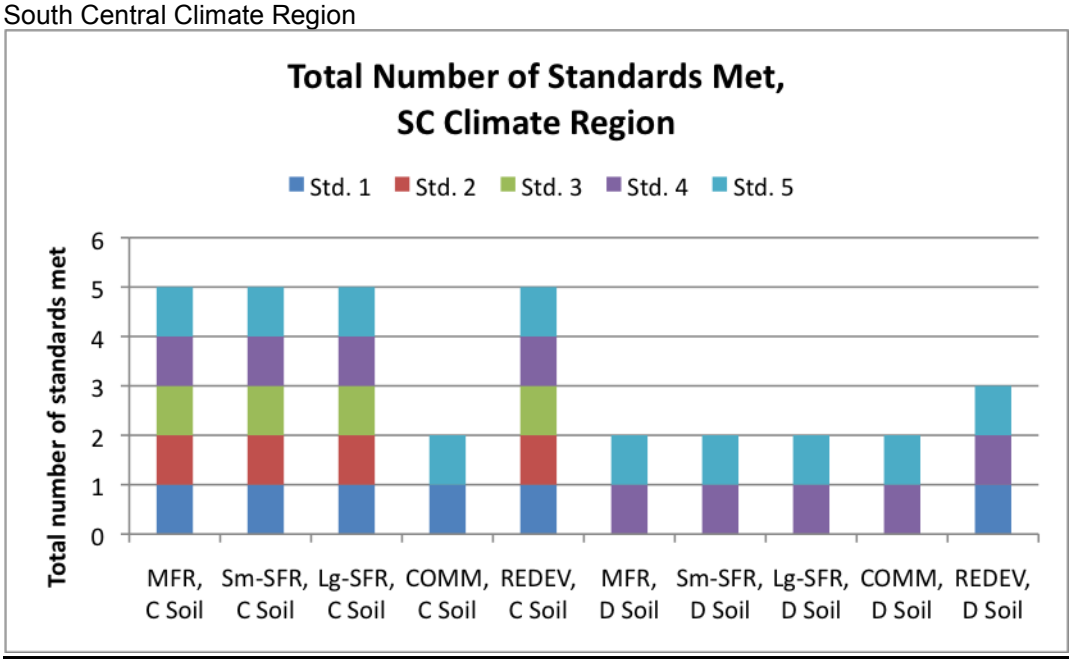

Figure 4c. Ability to Meet Potential Regulatory Standards with Basic/Full ARCD Practices for Northeast-Midwest Climate Region

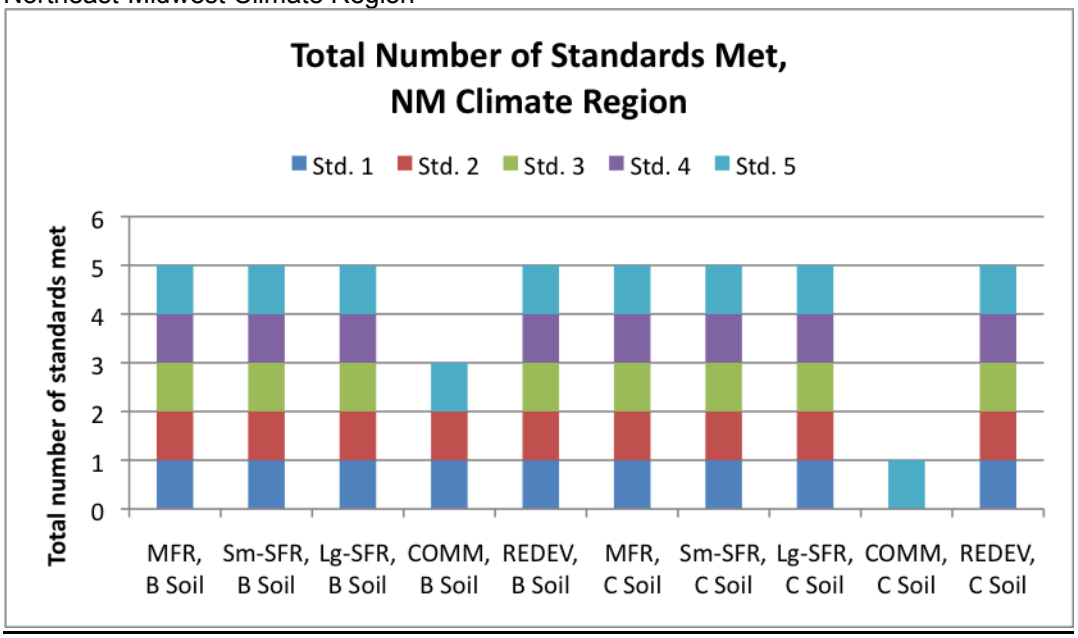

Figure 4d. Ability to Meet Potential Regulatory Standards with Basic/Full ARCD Practices for Southwest Climate Region

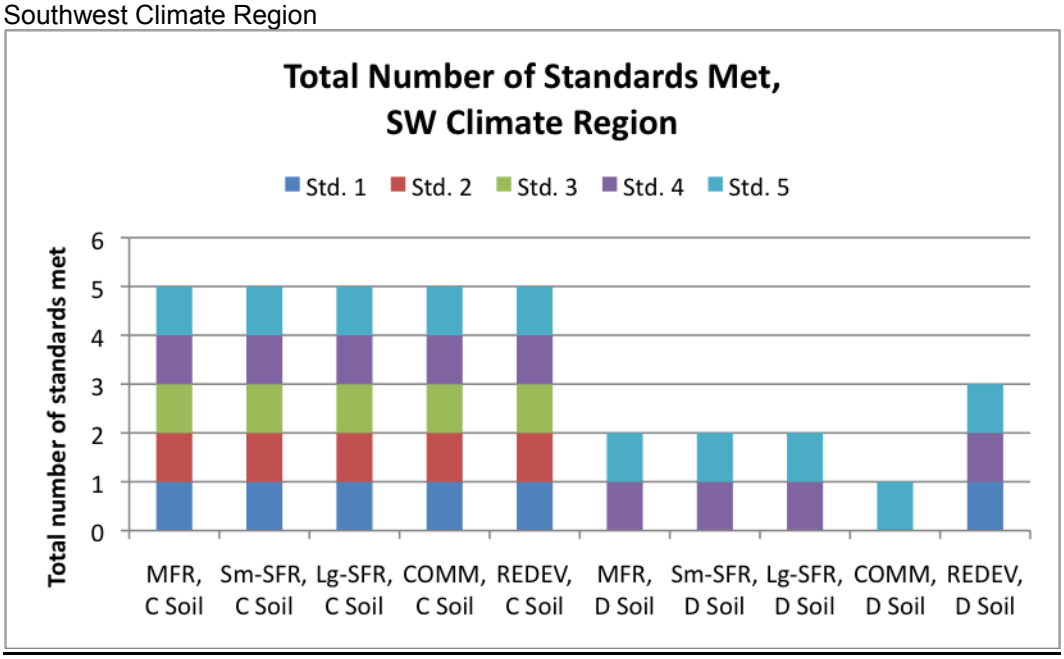

Figure 5a. Percentage of Runoff Retained Relative to Standards 1 (85th Percentile, 24-hour precipitation event) and 2 (95th Percentile event) for Southeast Climate Region

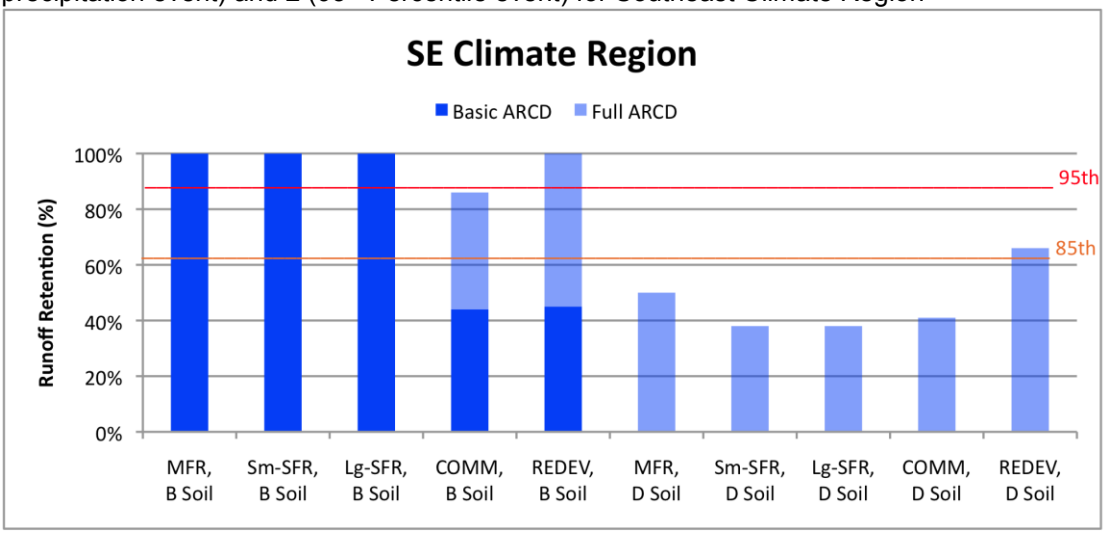

MFR—multi-family residential, Sm-SFR—small single-family residential, Lg-SFR--large single-family residential, COMM—retail commercial, REDEV—redevelopment. Standard (Std.) 1—Retain the runoff produced by the 85th percentile, 24-hour precipitation event; Standard 2—the 95th percentile, 24-hour precipitation event; Standard 3—90 percent of the average annual post-development runoff volume; Standard 4—the difference between the post- and pre-development average annual runoff volumes; and, Standard 5—the difference between the post- and pre-development runoff volumes for all events up to and including the 85th percentile, 24-hour precipitation event

Figures 5a-d show the percentage of runoff that can be retained for each development type, in each region, using either Basic or Full ARCD practices, in comparison with Standard 1 (retention of the 85th percentile, 24-hour precipitation event) and Standard 2 (retention of the 95th percentile, 24 hour event). Even where Standards 1 and 2 cannot be met in full, ARCD practices can still result in substantial compliance, and retention of significant runoff volume.

Figure 5b. Percentage of Runoff Retained Relative to Standards 1 (85th Percentile, 24-hour precipitation event) and 2 (95th Percentile event) for South Central Climate Region

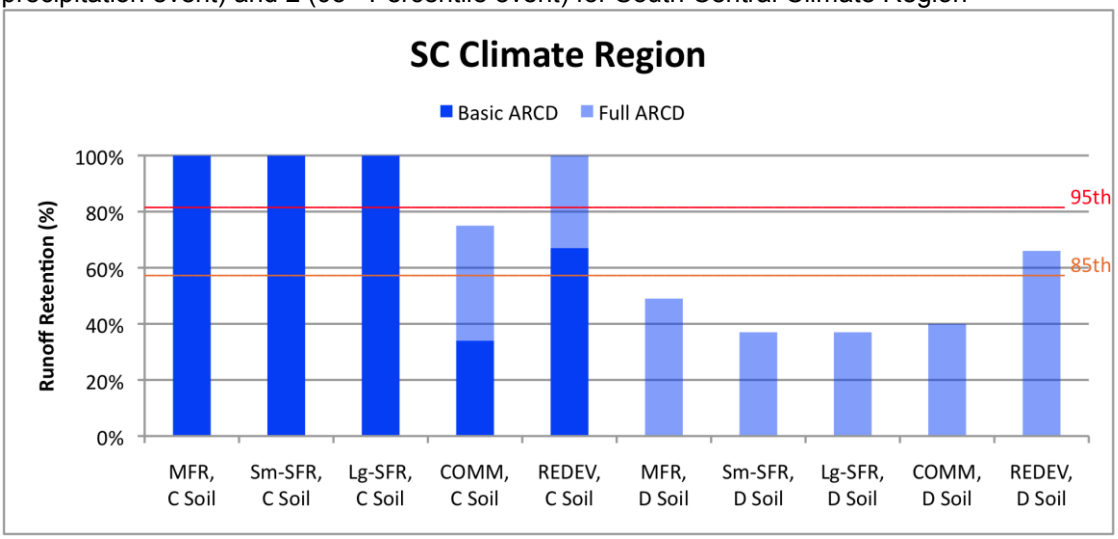

Figure 5c. Percentage of Runoff Retained Relative to Standards 1 (85th Percentile, 24-hour precipitation event) and 2 (95th Percentile event) for Northeast-Midwest Region

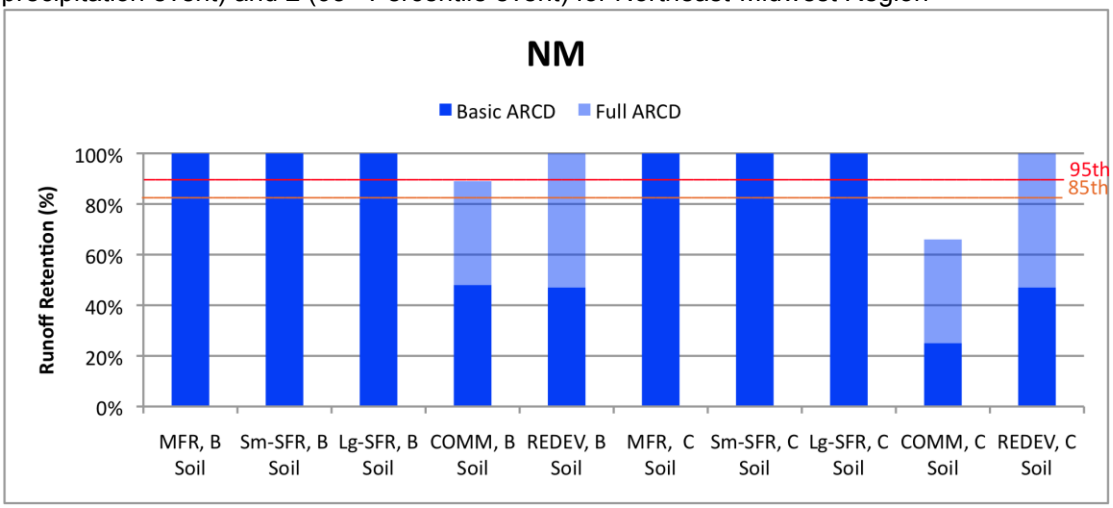

Figure 5d. Percentage of Runoff Retained Relative to Standards 1 (85th Percentile, 24-hour precipitation event) and 2 (95th Percentile event) for Southwest Region

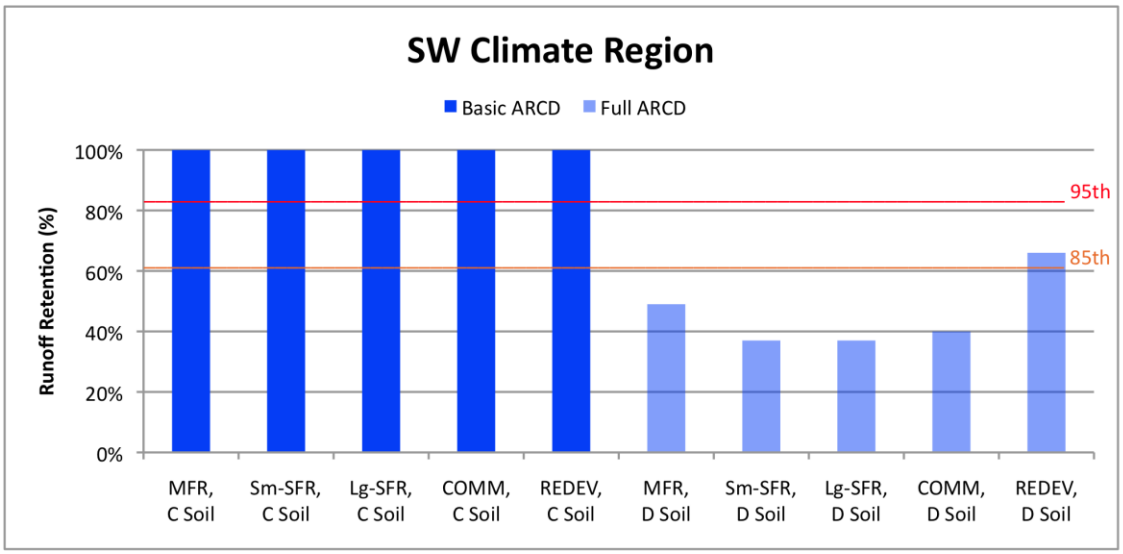

Effectiveness of Standards in Environmental Protection

Standard 3 (retain 90 percent of the average annual post-development runoff volume) would be the most protective standard. Meeting or coming as close as possible to meeting, but not exceeding, this standard is estimated to lead to 66-90 percent runoff retention and pollutant loading reduction on B and C soils and 37-66 percent on D soil. Standard 2 (retain the runoff produced by the 95th percentile, 24-hour precipitation event) would yield only slightly less protection with B and C soils and, with D soil, retention and loading reduction equivalent to standard 3.

Standards 4 and 5, based on the differential between pre- and post-development runoff volume, are highly inconsistent in retaining runoff and reducing pollutants, in that they are relatively protective where pre-development runoff is estimated to be very low relative to post-development flow, but result in progressively lower retention and pollutant loading reduction as pre- and post-development volumes converge, such as in several cases on D soils. Standard 5 is especially weak in this regard. The potentially low level of retention and pollutant loading reduction renders these standards based on the change in pre- versus post-development runoff volume poor candidates for national application, at least as formulated in these terms.

Fully meeting standard 1 (retain the runoff produced by the 85th percentile, 24-hour precipitation event) would yield runoff retention and pollutant mass reduction ranging from 58 to 81 percent, depending on climate region. This level of inconsistency decreases the utility of this standard for widespread use. Standard 2, based on the 95th percentile event, is much better in this respect, with variability in runoff retention and loading reduction across the nation in the much narrower 82-89 percent range. However, standard 1 remains more consistent across regions, and more protective of water quality for development on D soils than either standard 4 or 5, and is preferable to those standards in this regard.

In summary, standards 2 and 3 are clearly superior to the other three options. Standard 3 is entirely consistent from place to place in degree of environmental protection, and standard 2 does not deviate much. Analysis of the five development cases on two soil groups in each of four regions demonstrated the two standards are virtually identical in the runoff retention and pollutant loading reduction they would bring about.

Management or Runoff in Excess of Standards Requirements

All of the analysis reported above assumed that any remaining runoff after the application of ARCD and meeting, or coming as close as possible to meeting a standard, would discharge with no treatment. In fact, additional treatment could further decrease pollutant loadings. Treatment without further runoff retention could be accomplished by many conventional or ARCD methods designed to lower contaminant concentrations. The most effective of the alternatives is probably bioretention discharging non-retained runoff either on the surface or through an underdrain, assumed in the analysis conducted for this study according to the methods cited above. Treatment of all remaining runoff with underdrained bioretention cells where space remains but all infiltration capacity is used can raise the pollutant removals given in Table 16 to the levels in Table 17. These estimates apply to the four pollutants considered, TSS and total copper, zinc, and phosphorus. Space would most likely be available in the three MFR and SFR cases but not the COMM and REDEV scenarios.

While there is substantial variability in these results, they demonstrate that discharging effluent of relatively consistent, high quality can be accomplished with a comprehensive ARCD strategy. This strategy would embrace, first, retaining as much urban runoff as possible and then utilizing treatment based on soil and vegetative media to capture contaminants from the remainder.

Table 17. Estimated Pollutant Loading Reduction Benefits of Bioretention Treatment of Runoff Remaining After ARCD Implemented to Meet or Approach Standards

Range of Table 16 Values (%)	Approximate Pollutant Removal Increase (%)	Total Estimated Pollutant Removal Range (%)
35-45	30-45	65-90
45-55	25-35	70-90
55-65	20-30	75-95
65-75	15->20	80->95
75-85	10->15	85->95
>85	5->10	90->95

SUMMARY AND CONCLUSIONS

STUDY DESIGN

This study was performed to investigate the degree to which low-impact development ARCD practices can meet or exceed the requirements of various potential stormwater management facility design standards and the resulting environmental benefits. The investigation was performed by estimating the stormwater retention possible with full application of ARCD practices to five land use cases in four representative climatic regions in the United States on two prominent soil types in each region. Retention is defined as preventing the conversion of precipitation to surface runoff. Retaining runoff from impervious and pollutant generating pervious surfaces prevents the introduction of urban runoff pollutants to receiving waters as well as reduces runoff volume to prevent stream channel and habitat damage, flooding, and loss of groundwater recharge. Infiltrating bioretention was first applied in the analysis of each case, a strategy termed Basic ARCD. When Basic ARCD could not fully retain post-development runoff, a Full ARCD strategy was added, involving roof runoff harvesting in the most impervious development cases and roof water dispersion in those with substantial pervious area. Benefits were assessed with respect to reduction of the annual average surface runoff volume from the quantity estimated without any stormwater management practices, and associated maintenance of pre-development groundwater recharge and water quality improvement through preventing discharge to receiving waters of pollutants generated with developed land uses.

A number of conservative assumptions were built into the analysis to ensure that the capabilities and benefits of ARCD would not be over-estimated. In summary, these assumptions are:

- No retention credit for evapotranspiration in the Basic ARCD strategy, although generally a substantial amount would occur, and consideration of evapotranspiration only for roof runoff in the Full ARCD strategy;
- Letting aside many available ARCD practices and site design principles that could be employed to reduce the runoff quantity, and the pollutants it transports, by reducing impervious surface area or directing the runoff to bioretention, harvesting, and dispersion facilities;
- The assumption of no infiltration on hydrologic soil group D soils, although some infiltration occurs at finite rates even on clay;
- Application of a safety factor to estimated infiltration rates;
- Minimum bioretention cell depths, so that these facilities would not be disruptive to site design and could be put to other uses;
- Requiring a 48-hour drawdown time for bioretention, instead of the 72-hour maximum;
- An analysis to guard against groundwater mounding under bioretention cells, with conservative assumptions for horizontal and vertical hydraulic conductivity rates; and
- An analysis demonstrating that doubling topographic slope changes results by only a few percent.

CAPABILITIES OF FULL ARCD APPLICATION

Comparison of estimated runoff production in the pre- and post-development states demonstrated that the majority of the infiltration that would recharge groundwater in the undeveloped state would be lost to surface runoff after development with no stormwater management practices. These losses would approach 90 percent in the most impervious developments. These observations apply in in all climate regions and with the full range of soil conditions.

Basic ARCD could retain all post-development runoff and pre-existing groundwater recharge, as well as attenuate all pollutant transport, in the three residential cases on B soils in the two climate regions where these soils were analyzed. Bioretention cells to accomplish this retention would use from less than one-fourth to just over one-third of the available pervious area for infiltration. Taking all available pervious area for the more highly impervious COMM and REDEV cases, bioretention would retain about 45 percent of the runoff and pollutants generated and save about 40 percent of the pre-development recharge. Adding Full ARCD measures in these cases would approximately double retention and pollutant reduction for the retail commercial land use and raise it to 100 percent for the redevelopment. Groundwater recharge would not increase, however, because the additional retention is accomplished by harvesting or dispersion.

In the three regions having C soils, Basic ARCD can again retain all runoff and reduce urban runoff pollutant mass loading to zero for the MFR and Sm-SFR and Lg-SFR residential cases, although generally requiring more of the available pervious area to do so than in B soil cases. The effect of lower rainfall is evident in the South Central and, especially, the Southwest regions. In the latter location, not only the residential cases but also the COMM and REDEV scenarios can achieve full runoff and groundwater recharge retention and pollutant loading attenuation with Basic ARCD on C soil. Full ARCD can approximately double runoff retention and pollutant removal from the Basic ARCD level for the COMM case and extend these measures to 100 percent for the redevelopment.

For development on the D soils in all climate regions, use of roof runoff management techniques was estimated to increase runoff retention and pollutant reduction from zero to between about one-third to two-thirds of the post-development runoff generated, depending on the land use case. These strategies would offer little groundwater recharge benefit with this soil condition, but would still have the potential to significantly reduce runoff volume and pollutant loading.

Therefore, taking the greatest advantage of what ARCD offers is expected to retain the great majority of post-development runoff and pre-development groundwater recharge. This strategy would also prevent the addition to receiving waters of all or almost all pollutant mass that would otherwise discharge from a range of urban developments on B and C soils. With D soils, Full ARCD can accomplish runoff retention and loading reductions approaching or somewhat exceeding 50 percent, and opportunities to use ARCD practices or site design principles not modeled in this analysis can further increase runoff retention volume.

ABILITY TO MEET STANDARDS

ARCD methods were assessed for their ability to meet five potential regulatory standards, the first two pertaining to retention of the 85th and 95th percentile, 24-hour precipitation events, the third to retain 90 percent of the post-development runoff, and the last two to retain the difference between the post- and pre-development runoff, the final standard capped at the 85th percentile, 24-hour event. The projected ability to meet the five standards varies mostly in relation to soil type (B or C versus D) and the relative imperviousness of development, and much less across climate regions, except for the relatively arid Southwest.

The only standards that cannot be fully met on B and C soils by the ARCD methods considered are standards 2-4 for the COMM case. Of the 125 standards assessments, ARCD practices are projected to meet 113 (90.4 percent) with B and C soils. The ability to meet these standards is much reduced on D soils. Only standards 1 (85th percentile, 24-hour precipitation event, and 4 and 5 (related to the difference between the post- and pre-development runoff) can be met occasionally and under limited conditions using Full ARCD methods. However, even on D soils, all cases for Standard 1 were able to retain greater than 50 percent of the required runoff volume.

Standard 3 (retain 90 percent of the average annual post-development runoff volume) would be the most environmentally protective standard. Meeting or coming as close as possible to meeting, but not exceeding, this standard was estimated to lead to 66-90 percent runoff retention and pollutant loading reduction on B and C soils and 37-66 percent on D soil. Standard 2 (retain the runoff produced by the 95th percentile, 24-hour precipitation event) would yield equivalent protection on D soils and only slightly less protection with B and C soils.

Standards 4 and 5, based on the differential between pre- and post-development runoff volume, are very inconsistent in retaining runoff and reducing pollutants. They are highly protective where pre-development runoff is estimated to be very low relative to post-development flow, and then to result in progressively lower retention and loading reduction as pre- and post-development volumes converge. Standard 5 is especially weak in this regard. This inconsistency makes these standards poor candidates for national application, at least as formulated in these terms.

Fully meeting standard 1 (retain the runoff produced by the 85th percentile, 24-hour precipitation event) would yield runoff retention and pollutant mass reduction ranging from 58 to 81 percent, depending on climate region. This level of inconsistency decreases the utility of this standard to some degree. Standard 2, based on the 95th percentile event, is much better in this respect, with variability in runoff retention and loading reduction across the nation in the much narrower 82-89 percent range. However, standard 1 remains more consistent across regions, and more protective of water quality for development on D soils than either standard 4 or 5, and is preferable to those standards in this regard.

In summary, standards 2 and 3 are clearly superior to the other three options. Standard 3 is entirely consistent from place to place in degree of environmental protection, and standard 2 does not deviate much. Analysis of the five development cases on two soil groups in each of four regions demonstrated the two standards are virtually identical in the runoff retention and pollutant loading reduction they would bring about.

All five standards are based on some stipulated runoff retention. Pollutant mass loading reduction is at least equal to the amount of retention that occurs. It is possible to decrease loadings further by treating excess runoff. Analysis showed that subjecting that runoff to bioretention treatment before discharge could reduce loadings of TSS and total copper, zinc, and phosphorus by at least two-thirds and as much as over 95 percent. This conclusion applies to all climate regions and soil types for land use cases where space is available for the additional bioretention cells. The three residential cases are in this group but not the COMM or REDEV cases, where all pervious land would have already been used for retentive or roof water dispersion practices.

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ATTACHMENT A

POLLUTANT CONCENTRATIONS FOR URBAN SOURCE AREAS (HERRERA ENVIRONMENTAL CONSULTANTS, INC. UNDATED)

Source Area	Study	Location	Sample Size (n)	TSS (mg/L)	TCu (µg/L)	TPb (µg/L)	TZn (µg/L)	TP (mg/L)	Notes
Roofs									
Residential	Steuer, et al. 1997	MI	12	36	7	25	201	0.06	2
Residential	Bannerman, et al. 1993	WI	~48	27	15	21	149	0.15	3
Residential	Waschbusch, et al. 2000	WI	25	15	n.a.	n.a.	n.a.	0.07	3
Residential	FAR 2003	NY		*19*	*20*	*21*	*312*	*0.11*	4
Residential	Gromaire, et al. 2001	France		*29*	*37*	*493*	*3422*	*n.a.*	5
Representative Residential Roof Values				**25**	**13**	**22**	**159**	**0.11**	
Commercial	Steuer, et al. 1997	MI	12	24	20	48	215	0.09	2
Commercial	Bannerman, et al. 1993	WI	~16	15	9	9	330	0.20	3
Commercial	Waschbusch, et al. 2000	WI	25	18	n.a.	n.a.	n.a.	0.13	3
Representative Commercial Roof Values				**18**	**14**	**26**	**281**	**0.14**	
Parking Areas									
Res. Driveways	Steuer, et al. 1997	MI	12	157	34	52	148	0.35	2
Res. Driveways	Bannerman, et al. 1993	WI	~32	173	17	17	107	1.16	3
Res. Driveways	Waschbusch, et al. 2000	WI	25	34	n.a.	n.a.	n.a.	0.18	3
Driveway	FAR 2003	NY		*173*	*17*		*107*	*0.56*	4
Representative Residential Driveway Values				**120**	**22**	**27**	**118**	**0.66**	
Comm./ Inst. Park. Areas	Pitt, et al. 1995	AL	16	110	116	46	110	n.a.	1
Comm. Park. Areas	Steuer, et al. 1997	MI	12	110	22	40	178	0.2	2
Com. Park. Lot	Bannerman, et al. 1993	WI	5	58	15	22	178	0.19	3
Parking Lot	Waschbusch, et al. 2000	WI	25	51	n.a.	n.a.	n.a.	0.1	3
Parking Lot	Tiefenthaler, et al. 2001	CA	5	36	28	45	293	n.a.	6
Loading Docks	Pitt, et al. 1995	AL	3	40	22	55	55	n.a.	1
Highway Rest Areas	CalTrans 2003	CA	53	*63*	*16*	*8*	*142*	*0.47*	7

Park and Ride Facilities	CalTrans 2003	CA	179	*69*	*17*	*10*	*154*	*0.33*	7
Comm./ Res. Parking	FAR 2003	NY		*27*	*51*	*28*	*139*	*0.15*	4
Representative Parking Area/Lot Values				**75**	**36**	**26**	**97**	**0.14**	
Landscaping/Lawns									
Landscaped Areas	Pitt, et al. 1995	AL	6	33	81	24	230	n.a.	1
Landscaping	FAR 2003	NY		*37*	*94*	*29*	*263*	n.a.	4
Representative Landscaping Values				**33**	**81**	**24**	**230**	**n.a.**	
Lawns - Residential	Steuer, et al. 1997	MI	12	262	n.a.	n.a.	n.a.	2.33	2
Lawns - Residential	Bannerman, et al. 1993	WI	~30	397	13	n.a.	59	2.67	3
Lawns	Waschbusch, et al. 2000	WI	25	59	n.a.	n.a.	n.a.	0.79	3
Lawns	Waschbusch, et al. 2000	WI	25	122	n.a.	n.a.	n.a.	1.61	3
Lawns - Fertilized	USGS 2002	WI	58	n.a.	n.a.	n.a.	n.a.	2.57	3
Lawns - Non-P Fertilized	USGS 2002	WI	38	n.a.	n.a.	n.a.	n.a.	1.89	3
Lawns - Unfertilized	USGS 2002	WI	19	n.a.	n.a.	n.a.	n.a.	1.73	3
Lawns	FAR 2003	NY	3	*602*	*17*	*17*	*50*	*2.1*	4
Representative Lawn Values				**213**	**13**	**n.a.**	**59**	**2.04**	

Notes:
Representative values are weighted means of collected data. Italicized values were omitted from these calculations.
1 - Grab samples from residential, commercial/institutional, and industrial rooftops. Values represent mean of DETECTED concentrations
2 - Flow-weighted composite samples, geometric mean concentrations
3 - Geometric mean concentrations
4 - Citation appears to be erroneous - original source of data is unknown. Not used to calculate representative value
5 - Median concentrations. Not used to calculate representative values due to site location and variation from other values.
6 - Mean concentrations from simulated rainfall study
7 - Mean concentrations. Not used to calculate representative values due to transportation nature of land use.

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1	Lake Forest	General	N/A	The Draft Permit does not have a Table of Contents	Add a Table of Contents to allow easier navigation to various sections	Comment noted. Due to time constraints, the recommendation could not be implemented.
2	Irvine, County of Orange, Anaheim, Lake Forest,	Finding A5.c	The Permittees have the authority to levy service charges, fees or assessments to pay for compliance with this order.	Assessments to pay for compliance with this order must meet voter approval	Remove Section A.5c	Permit language has been revised to reflect the need for voter approval for some assessments.
3	County of Orange-Attachment B	General	Reference to Permittees	Reference to the Permittees is inconsistent throughout the permit.	Use the recommended language.	Permit language has been revised.
4	County of Orange-Attachment B	Finding A.3, Fact Sheet page 13	MEP definition	The definition of maximum extent practicable stated in the permit and the fact sheet are different and are not consistent with the case law.	Use recommended language.	Permit language has been revised.
5	Irvine	Finding C.8 and Section XVIII.B.3	This order is intended to regulate the discharge of pollutants…from anthropogenic…sourc es…not… background or naturally occurring pollutants	While this finding indicates an appropriate focus of the permit, Section XVIII, which addresses selenium in rising groundwater is not consistent with Finding C.8. Selenium should be addressed under the TMDL and NSMP programs.	Revise Section XVIII to make it consistent with Finding C.8.	Permit language has been revised to describe the co-operative process that is being used to address the selenium and nutrient impacted groundwater in the San Diego Creek Watershed.
6	Irvine	Finding C.10	Regional Board recognition that the permittees may lack jurisdiction over certain discharges	While this finding appropriately identifies the legal limitations of the co-permittees, Section XVIII requires co-permittees to address selenium in rising groundwater and copper in receiving waters when it's beyond their ability to eliminate those pollutants.	Revise Section XVIII to make it consistent with Finding C.10	Permit language has been revised to describe the co-operative process that is being used to address the selenium and nutrient impacted groundwater in the San Diego Creek Watershed. The sources of copper include controllable sources such as industrial sites.
7	Irvine	Finding 16.b, Finding K.56, Section	The 2007 DAMP includes all activities the permittees propose to undertake during the next permit	This finding references the Draft 2007 Drainage Area Management Plan, which has not been reviewed by the co-permittees.	Ensure that the co-permittees have had an opportunity to review and approve the entire 2007 DAMP prior to permit adoption.	The 2007 Draft Drainage Area Management Plan (DAMP) was submitted with the ROWD on July 21, 2006 by the principal permittee.

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		II.B.2 and Section XIX.3	term.			
8	Irvine	Finding F.18	The County's storm water conveyance systems include an estimated 400 miles of storm drains	The 2002 MS4 permit stated that there were an estimated 400 miles of storm drains in the County and that number should have increased.	Revise estimate.	Finding has been updated to current conditions.
9	Irvine	Finding G.21	This order prohibits the construction of treatment BMPs within waters of the U.S.	This language is overly broad and appears to prohibit trash booms and Natural Treatment System facilities that are installed in retrofitted channels and basins.	Eliminate or narrow the prohibition against natural and structural treatment BMPs.	As stated in the current language of the draft permit, if discharge treatment sufficiently protects the beneficial uses of the receiving water, additional polishing within waters of the U.S. may be considered. Street sweeping, catch basin inserts/filters and catch basin cleanouts result in discharges that, for the most part, protect the beneficial uses of those receiving waters. The use of trash booms primarily protects the downstream beaches. Finding 21 indicates that treatment systems within waters of the U.S. could be considered on a case-by-case basis.
10	Irvine	Finding H.30	It is anticipated that many of the inspections required under this order can be carried out by inspectors currently conducting other types of inspections for the permittees.	It should not be assumed that additional duties added to current inspections do not lead to any additional workload or City resources.	Remove that language.	The permit language does not assume that no additional workload will result from these duties being carried out by inspectors currently conducting other types of inspections, but rather identifies possible workload savings using this strategy, rather than always sending out an additional inspector to address only storm water issues.

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11	Irvine	Finding I.38 and O.74	Theses findings discuss the use of debris booms within apparent waters of the U.S.	This statement would appear to violate the restriction identified in Finding G.21, prohibiting the implementation of treatment BMPs in waters of the U.S.	Please clarify.	See response to comment 9.
12	Irvine	Finding J.43	TMDLs have been established by the Regional Board for… the San Diego Creek / Newport Bay watershed.	It is the City's understanding that the San Diego Creek/Newport Bay watershed is referred to as the Newport Bay watershed.	Please clarify.	Permit language has been revised.
13	Irvine	Finding K.55	The permittees have adopted grading and erosion control ordinances, guidelines and BMPs for municipal, commercial, and industrial activities.	The co-permittees have not adopted BMPs but instead the DAMP and LIPs contain guidelines for the implementation of minimum BMPs	*Revise to read: The permittees have adopted grading and erosion control ordinances and guidelines for the implementation of minimum best management practices (BMPs) for municipal, commercial, and industrial activities.*	Permit language has been revised.
14	Irvine	Finding L and throughout	NEW DEVELOPMENT/ SIGNIFICANT REDEVELOPMENT – WQMP/LIP/LID	Throughout the draft order there should be a distinction between the model WQMP and the project WQMP.	Please differentiate between the project and model WQMPs	Permit language has been revised.
15	Irvine	Finding L.61	Finding identifies that the Southern California Coastal Water Research Project (SCCWRP) is developing a Low Impact Development Manual for Southern California.	It is our understanding that SCCWRP is not developing this manual.	Please clarify.	Permit language has been revised.
16	Irvine	Finding L.62	Finding identifies that USEPA has determined that by limiting the effective impervious area (EIA) of a site, downstream	USEPA has not determined that prescriptively limiting EIA to 5% or less is the best way to minimize receiving water impacts in all watersheds and for all physical conditions. With	Revise this finding to recognize other white papers and information submitted to the Regional Board and revise the New Development and Significant Redevelopment provisions to use a volume	Permit language has been revised.

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			impacts could be minimized. A limited study conducted by Dr. Richard Horner concluded that a 3% EIA standard for development in Ventura County is feasible.	regards to Dr. Horner's study, additional white papers produced in meetings regarding this Orange County permit indicate that a 3% EIA standard may be inappropriate for incorporation into this permit.	treatment performance standard for LID implementation, more specific exemption criteria for when LID may be undesirable, and establish timelines for the development of watershed plans and LID/hydromodification control standards.	
17	Irvine	Finding L.66	Finding states that if certain BMPs are not properly designed and maintained, they could become sources of groundwater pollution, nuisance, etc.	While the City supports the more stringent requirements for use of LID BMPs, if LID infiltration BMPs are used in inappropriate conditions, they may be sources of pollution or nuisance.	Revise findings to indicate technical and environmental constraints on LID infiltration BMPs.	Permit language has been revised.
18	Irvine	Finding L.67	Finding states that if the BMPs in Finding L.65 are not properly designed and maintained, they could become sources of nuisance and/or habitat for vectors.	If LID infiltration BMPs are not properly designed or maintained, they may become sources of nuisance and/or habitat for vectors.	Revise findings to indicate that LID infiltration BMPs may become sources of nuisance and/or habitat for vectors if not properly designed or maintained.	Permit language has been revised.
19	Irvine	Finding M.68	Finding discusses de minimus discharges and states that municipal de minimus discharges generally do not require separate coverage under the Regional Board's de minimus permit.	This finding can be interpreted to mean that all de minimus discharges are prohibited in the San Diego Creek/Newport Beach watershed.	The language should be clarified. Further, the City supports the County comment that all de minimus discharges should be allowed unless a finding is made that those discharges are a significant source of pollutants.	Permit language has been revised to clearly state that a separate de minimus permit is required for non-storm water discharges to the MS4 in the San Diego Creek/Newport Beach watershed.
20	Irvine	Finding M.69	Finding points out the high nitrate and/or selenium levels in the soils and/or groundwater in the San Diego Creek/Newport	LID infiltration BMPs can also potentially mobilize nitrogen and selenium.	The findings should recognize that fact.	While the comment is valid, it was not the intent of Regional Board staff to identify <u>all scenarios</u> that could lead to mobilization of nitrogen and selenium in Finding 69.

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			Bay watershed and that dewatering activities could mobilize these pollutants.			
21	Irvine	Finding N.71	The principal permittee in collaboration with the co-permittees is to develop guidelines for the competencies and training schedules for municipal storm water positions.	While training is necessary, the City wants the flexibility to design and conduct training as well as the methodology for assessing the competency of staff.	Revise this finding and add an option to enable individual co-permittees to provide in-house training using curriculum developed by the principal permittee in collaboration with the co-permittees.	Permit language has been revised.
22	Irvine	Finding O.76	The finding discusses the importance of cooperation by public agency organizations within Orange County that have an impact on storm water quality.	More needs to be done to secure the participation of some of the larger public agencies within the Newport Bay Watershed, such as UCI.	Encourage state institutions and other major dischargers in the watershed, such as UCI, to join the NSMP and other applicable watershed efforts.	Regional Board staff will continue to work with the stakeholders whose activities and/or discharge contributes to the selenium/nutrient impacts in the watershed.
23	Irvine	Finding R.83	The finding discusses the elimination of illegal discharges and illicit connections to the MS4.	The terms 'illegal' and 'illicit' should not be used interchangeably	Determine correct/consistent terminology and use throughout the permit.	Permit language has been revised.
24	County of Orange, Riverside County Flood Control	General comment	General comment	The proposed permit increases administrative burden.	Adjust the current reporting requirements rather than increasing the reporting requirements.	Draft permit amended to streamline reporting requirements.
25	Riverside County Flood Control	General comment	General Comment	The basis for the Riverside County MS4 Permit should be the 2002 Riverside County MS4 Permit, not the Draft OC MS4 permit	The basis for the Riverside County MS4 Permit should be the 2002 Riverside County MS4 Permit	Comment noted
26	San Bernardino Stormwater Program	I.B.12	Requires permittee to develop adequate guidelines for competency	This requires developing an entire training program to be placed upon the shoulders of the Principal Permittee	These competencies are in a large part already well-established by CASQA and other organizations. It would be appropriate for the	Although guidance documents have been created by various organizations, it is the

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			requirements for stormwater managers, inspectors etc.		Principal Permittee to coordinate only the training effort	responsibility of the Principal Permittee to collaborate with co-permittees to develop a competency program specific to the requirements within this permit.
27	Irvine	Section I.B.12	Develop guidelines for defining competencies of municipal managers and inspectors	The competency of staff and the outcome of any evaluation of competency are confidential	The permittee cannot commit to providing any competency evaluations or reporting on confidential documents that are part of an employees' performance.	The permit language has been revised, with the understanding that deficiencies in a permittee's program that are the result of either management or staff's lack of understanding of the program will result in enforcement actions.
28	Orange County-Attachment B, Riverside County Flood Control	III.3.	Discharge limitation/prohibition	Make the prohibitions consistent with the federal regulations.	Retain language from Order No. R8-2002-0010.	Language revised to be consistent with the federal regulations, 122.26(d)(2)(iv)(B)(1).
29	Orange County-Attachment B, Riverside County Flood Control	III.3.	Public education to reduce non-storm water discharges	Remove the requirements for public education and outreach to reduce non-storm water discharges.	Retain language from Order No. R8-2002-0010.	Reducing non-storm water discharges could possibly reduce the pollutant load to the MS4s.
30	Orange County-Attachment B, Riverside County Flood Control	III.3.	Categories of non-storm water	Irrigation water from agricultural sources.	Runoff from agricultural sources should be addressed through other programs.	Permit language has been revised.
31	Irvine	Section III.3.i	The discharges identified below need not be prohibited by the permittees if they have been determined	The wording reverses the presumption found in Federal regulations that these de minimus discharges are not significant sources unless a	No submitted recommendation was submitted for this comment.	Permit language has been revised.

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			not to be substantial contributors of pollutants to the MS4 and receiving waters.	finding is made to the contrary.		
32	Irvine	Section III.3.i.l	Discharges of potable water (i.e., fire hydrant flushing) would have to be addressed as a de minimus discharge.	Discharges from fire hydrant flushing would require capture, analysis and volumetrically and velocity controlled discharges.	Change III.3.i.l to existing de minimus permit requirements by cross-referencing that permit.	The proposed permit conditions for the discharge of fire hydrant flushing waters remain the same as the de minimus permit with regard to residual chlorine concentrations. The proposed language regarding volumetrically and velocity controlled to prevent resuspension of sediments has been revised to read "…prevent hydrologic conditions of concern in receiving waters."
33	Irvine	Section III.3.i.l and XXI.5	With regards to emergency fire fighting flows, where possible, when not interfering with health and safety issues, BMPs should be implemented.	BMPs should only be required during controlled fire exercises and/or training. BMPs should not be required, even as 'where possible' for emergency situations.	Delete sentence referring to implementation of BMPs during emergency fire fighting operations, as well as the requirement in XXI.5.	While the sensitivity of implementing BMPs during actual fire fighting activities is understood, it is not unreasonable to expect BMPs to be implemented where feasible to meet the Maximum Extent Practicable threshold for permittee action.
34	County of Orange-Attachment A, Riverside County Flood Control	III.3.i.c	Irrigation runoff from agricultural sources	Runoff from agricultural sources is exempt from NPDES requirements.	Agricultural sources should not be included in this category.	Permit language has been revised.
35	Irvine	Section III.3.i.c	Irrigation water from agricultural sources.	Agricultural sources are non-point source, are not subject to NPDES permits, and are not currently the subject of Waste	The category 'irrigation water from agricultural sources' should be amended to read 'irrigation water' and the category 'irrigation water	Permit language has been revised.

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				Discharge Requirements or a Conditional Waiver of WDRs. Federal regulations do not specify agricultural irrigation runoff as a de minimus discharge to MS4 systems.	from agricultural sources' should be addressed through other Regional Board regulatory mechanisms.	
36	SDGE	III.3	Prohibition of non-storm water discharges unless the following conditions are met:	As the permit is currently worded, there could be some misunderstanding that non-storm water discharges covered under a separate permit may be considered prohibited	Revise sentence to read: The permittees shall prohibit the following categories of non-stormwater discharges unless such discharges are authorized by a separate NPDES and/or the stated conditions below are met.	Permit language has been revised.
37	Cypress	III.3 (ii)a	Discharge Limitations/Prohibition: Discharges from potable water sources, including water line flushing, superchlorinated water line flushing, fire hydrant system flushing , and pipeline hydrostatic test water: Planned discharges shall be dechlorinated to a concentration of 0.1 ppm or less, pH adjusted if necessary , and volumetrically and velocity controlled to prevent resuspension of sediments.	The Orange County Stormwater program has developed BMP Fact Sheets FP-6 – Water and Sewer Utility Operation and Maintenance, FP-7 Fire Department Activities and IC-23 Fire Sprinkler Testing/Maintenance. In the absence of any Finding that existing control efforts are inadequate,	Specific requirements for the discharges identified in Section 3.ii.a should reference these Fact Sheets	Although the information contained within the Orange County Storm water program's Fact Sheets may be consistent with the requirements illustrated within this Section of the Draft Order and have been developed in order to comply with previous iterations of the Order, the Order itself sets the requirements for compliance. Fact Sheets have been prepared as a guidance tool to be used by co-permittees.
38	State Water Resources Control Board	III.3(ii)c	Dechlorinated swimming pool discharges: reduce volume and velocity to	Is the intent to prevent resuspension of sediments in the receiving water, the MS4 or the BMP?	Clarify information concerning comment and revise paragraph heading to read "Swimming Pool Discharge"	The proposed language regarding volumetrically and velocity controlled to prevent resuspension of sediments

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			prevent resuspension of sediments			has been revised to read "…prevent hydrologic conditions of concern in receiving waters." The paragraph heading as been revised.
39	Cypress	III.3(ii)c	Dechlorinated swimming pool discharges: reduce volume and velocity to prevent resuspension of sediments	Placing numeric limits for pool discharges affirms that the City is already doing by distributing the County's "Tips for Pool Maintenance" brochure.	The City wants to be certain the intent is not to make the City test each discharge or have the City require residents to obtain permits for such.	The criteria listed in this section should be used to establish municipal codes and enforcement procedures. In most cases, we do not anticipate the need for residual chlorine testing or permitting.
40	County of Orange	Section IV of the M&RP	Program Effectiveness Assessment	Use existing and newly generated data for program assessment in accordance with the CASQA Guidance.	Make program assessment requirements consistent with the recommendations in the ROWD.	The permit provides the permittees the option of using the CASQA Guidance or other technically sound methodology.
41	Orange County-Attachment B	Section VI	Reporting of State's General Permit violations.	Permittees do not enforce the State's General Permit.	Revise language as suggested.	Enforcement requirements have not changed from the 2002 permit; this approach avoids duplicative efforts and fosters cooperation among various regulatory/local agencies.
42	Irvine	Section VI.1,VI.3, VII.1	Such legal authority must address all illegal connections and illicit discharges into the MS4s, including those from all industrial and construction sites.	The legal authority documents (ordinances, etc.) give authority to the permittee to develop a program to control illicit discharges and illegal connections, but does not set forth the specific components of the program. Legal authority should not be confused with procedures and methods to accomplish compliance.	Revise the language of this requirement to indicate the role of the DAMP and LIPs in setting forth the program to address illegal connections and illicit discharges.	Permit language has been revised.

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43	Lake Forest	VI.2	The permittees shall progressively and decisively take enforcement actions against any violators of their Water Quality Ordinance	This language (progressively and decisively) creates ambiguity about what is actually required.	None offered	The language in question reflects the progressive enforcement actions as referenced in the permittee adopted Orange County Enforcement Consistency Guide.
44	Anaheim, Villa Park, Cypress	VI.2	The permittees' ordinance must include adequate legal authority to enter, inspect, gather evidence (pictures, videos, samples, documents, etc.) from industrial, construction and commercial establishments	Concern about search and seizure laws and the necessity to obtain a Court Order are being looked into, should the current iteration of the proposed permit language remain as is. Villa Park states: Proposed language may be viewed as a violation of 4th amendment	Therefore, in order to ensure inspections may be conducted as intended through legal authority via municipal codes, the permit language should be retooled to avoid unnecessary efforts	Permit language has been revised.
45	Irvine	Section VI.2	The permittee's ordinance must include adequate legal authority to enter, inspect and gather evidence from industrial, construction and commercial establishments.	The City agrees with the County comments that this provision could impose entry requirements on the co-permittees that violate the 4th Amendment rights of property owners	"The permittees shall carry out inspections, surveillance, and monitoring necessary to determine compliance with their ordinances and permits. The permittees' ordinance must include adequate legal authority, to the extent permitted by California and Federal Law and subject to the limitations on municipal action under the constitutions of California and the United States, to enter, inspect and gather evidence (pictures, videos, samples, documents, etc.) from industrial, construction and commercial establishments…"	Permit language has been revised.
46	Lake Forest	VI.3	"these penalties shall be issued in a decisive manner	The term *decisive* creates ambiguity about what is actually required	None offered	The term decisive was used to infer a directly definitive, results-oriented enforcement process.
47	Villa Park, Cypress, Laguna Hill	VI.6	Permittees are to provide quarterly notifications w/	Quarterly reporting of enforcement activity is an administratively burdensome	Maintain current enforcement activity reporting requirements	Reporting requirements have not changed with respect to the information to be

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			inspection results to RB, for all inspections conducted at sites covered under the Statewide General Industrial and Construction Permits.	requirement for medium and small cities with little to no staff resources.		submitted. However, the frequency has been changed. Historically, many permittees have submitted inspection information on a monthly basis or immediately following the inspection event.
48	Fullerton, Costa Mesa, Brea, Irvine	Various	Additional reporting requirements throughout various Sections	The draft Order requires additional reporting to the Regional Board staff. The City believes that adjusting the existing reporting processes rather than creating additional reporting requirements is the most effective approach to increasing transparency and accountability	None	Information collected during the (third term permit) MS4 audits, concluded that additional reporting requirements were warranted. In order to ensure compliance with data collection requirements within the permit, various reporting requirements have either been sustained or introduced accordingly
49	Orange County-Attachment B	Section VII.5	Trash Characterization	Each Permittee should not be required to characterize trash.	Principal Permittee should be responsible for this.	While trash sources may not significantly vary among municipalities, the relative quantities of trash type will vary between municipalities and even within municipalities. The purpose of this study is to focus municipal resources (education and enforcement) on the most prevalent trash sources within the municipality in an effort to avoid a possible, future trash TMDL.
50	Orange	VII.5	Permittees to review their trash control ordinance. To determine the need for	Is the intent of the Permit to have each permittee carry out this requirement? It makes no sense to have each permittee conduct a	Revise the paragraph to require the principal permittee instead of the co-permittees to conduct the county-wide study over the 5 year	Permit language has been revised. See response to Comment #49

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			any revisions/ determine sources and proper BMPs to control urban runoff. Include findings in the Annual Report	county-wide study, since trash sources do not vary significantly among municipalities	permit term to characterize trash sources	
51	Orange, Cypress, Riverside County Flood Control	VIII.2	Construction site inventory to include all sites, within each co-permittee's jurisdiction for which building or grading permits have been issued where activities at the site include …..	The first part of the paragraph requires the inventory list is limited to sites with issued building or grading permits that raise concerns regarding water quality, but later contradicts itself by stating "all sites". This would include plumbing, encroachment or other indoor permits.	Change language to make it not contradictory. Exclude the GIS requirement from construction projects within the public right of way as well.	Permit language has been revised. .
52	Irvine	VIII.2	Construction site inventory to be maintained and updated quarterly	This requirement will be burdensome and unnecessary as it will just be created to satisfy a draft tentative order. Since construction project timelines are not short enough to result in meaningful additions to the inventory within the period of three months.	Updates should only be required on a biannual basis (in September, preparatory for the rainy season and rainy season inspections).	Maintaining and updating the site inventory quarterly is to ensure that records remain current concerning the regular and constant oversight of construction activities within each permittee's jurisdiction.
53	Irvine	Section VIII.4	Each permittee shall conduct construction inspections for compliance with its ordinances (grading, Water Quality Management Plans, etc.), local permits (construction, grading, etc.), the Model Construction Program…	Water Quality Ordinances do not include a reference to project WQMPs, which are post-construction documents.	Remove parenthetical entries. "Each permittee shall conduct construction inspections for compliance with its ordinances, local permits, the Model Construction Program…"	Permit language has been revised.

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54	Riverside County Flood Control		Construction site inspection requirement to include review of the Erosion & Sediment Control Plan	In addition to requiring a significant increase in the level of training and expertise of construction site inspectors, this requirement will significantly increase the amount of time needed for each construction site inspection	Exclude requirement from the draft Riverside County MS4 permit	The current (2002) OC MS4 permit already requires, inspection staff to have sufficient expertise in construction inspection processes as they relate to water quality and storm water related issues.
55	Lake Forest	VIII.6	"[e]ach permittee shall respond to complaints received by a third party in a *timely* manner to ensure that the construction sites are not a source of pollutants in the MS4s and the receiving waters	The term "timely" creates ambiguity about what is actually required	None offered	Response to complaints must be handled in order of severity, with respect to the sites' potential to act as a pollutant source to the MS4. Therefore, the term "timely manner" was listed with the understanding that municipal staff receiving the complaint would be properly trained and equipped to determine how potentially grievous the pollutant threat could be and address it accordingly. The setting of an arbitrary time limit (e.g., within 1 business day) could put permittees in violation of the permit by not addressing very low priority complaints in that time limit.
56	County of Orange – Attachment A	Sections VIII, IX and X	Inspection requirements	The inspection requirements are well beyond federal law.	Make requirements in the permit consistent with the federal laws and regulations.	The inspection requirements are consistent with the federal laws and regulations. See 40CFR112.26(d)(2)(F) and the MEP provisions in Clean Water Act at Section 402(p)(3)(B)(iii).
57	County of Orange – Attachment A	Sections VIII, IX and X	Inspection requirements	Requirements beyond the federal requirements tantamount to unfunded mandate.	Unfunded mandates should not be part of this permit.	The permit requirements are consistent with the federal laws and regulations and,

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						therefore, are not unfunded mandates.
58	County of Orange – Attachment A	Sections VIII, IX and X	Inspection requirements	The inspection requirements violate the fourth amendment.	Make changes to the inspection requirements consistent with the state and federal laws and regulations.	Permit language amended.
59	San Bernardino Stormwater Program	VIII,IX,X	Inspection requirements	Requirement within these sections have new specific actions, such as electronic database, to check if sites have filed NOI, photos that need to be taken and included in the database, requirements for on-site enforcement actions.	We suggest that the permittees be allowed to prioritize and take enforcement actions based on their own criteria.	While the permittees have the ability to prioritize enforcement activities based on their own criteria to a certain extent, the Regional Board still has the obligation to set a minimum standard in the permit to ensure a level of consistency amongst the permittees.
60	Orange	IX.2	Facilities Covered under the General Industrial Permit are automatically considered as High Priority and therefore are required to be inspected.	History has shown that once a facility has been inspected at least once, there is an increased awareness of water quality impacts and facilities will implement BMPs to minimize storm water and non storm water discharges.	Allow redesignation of mandatory high priority facilities based on the suite of factors in the DAMP used to rank a facility.	The criteria by which facilities are identified for coverage under the General Industrial Permit are based on either their industry's potential to pollute and/or the actual exposure of materials, wastes, or processes to storm water. This criteria alone is sufficient for a mandatory 'high' priority.
61	Irvine	Section IX.3	Industrial inspections shall include a review of material and waste handling and storage practices, written documentation of pollutant control BMP implementation and	The written documentation, in the form of storm water pollution prevention plan, is only required for facilities with industrial storm water permits. The burden of SWPPP review for compliance with the State's General Industrial permit should remain	Please clarify the intent of the industrial facility document inspections consistent with the City's comments.	Permit language has been revised to clarify that the '… written documentation of pollutant control BMP implementation and maintenance procedures …', refers to one of the four items required to be in a permittee-

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			maintenance procedures and digital photographic documentation for any water quality violations, as well as, evidence of past or present unauthorized, non-storm water discharges and enforcement actions issued at the time of inspection.	with the Regional Board staff. The City's inspections should continue to assure no ICs/IDs and compliance of facilities with City water quality ordinances and requirements		prepared inspection report. Those four items include: a written review of material/waste storage procedures; the written documentation of BMP implementation; photographic documentation of evidence of discharges; and, a listing of enforcement actions resulting from the inspection.
62	Westminster	IX.6 & X.5	Electronic inspection database submittal requirement in each annual report for Industrial and Commercial inspection programs	Clarify if permittees should submit only inspection inventory or the entire inspection database for these categories.	None. Request for clarification only	Permit language has been revised to allow the submittal of all inspection documentation/information in hardcopy form if a municipality's database uses a proprietary program (not Access or Excel compatible)
63	County of Orange	Section X	Commercial inspections	The permit extends the regulatory reach of local jurisdictions without technical justification.	Unjustified inspections should not be required.	Quantifiable inspection requirements are included to ensure an equitable level of effort across all permittees.
64	Irvine	Section X.1	Each permittee shall continue to maintain and quarterly update an inventory of the types of commercial businesses listed below.	Section X.1 requires 11 new, additional categories to be added to the commercial facilities inventory. It does not make sense to increase the commercial facility inspection burden so significantly in the time of budget constraint. Further, there's no indication in the ROWD that commercial facilities are currently such significant sources of pollutants to warrant this increase in inspections.	The new categories should be deleted until such a time that these types of facilities have been determined to contribute a significant pollutant load to the MS4.	The Fact Sheet and the findings have been revised. The revised permit language requires the Principal Permittee to prioritize these new categories based on potential threat to water quality.

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65	Orange County-Attachment B	Section X.1	Municipal inspections of commercial facilities.	There are 11 new categories included in the draft permit with out any technical justification.	These resource intensive inspection requirements should be deleted.	The Fact Sheet and the findings have been revised. The revised permit language requires the Principal Permittee to prioritize these new categories based on potential threat to water quality.
66	Orange County-Attachment B	Section X.1	Commercial inspection frequencies	Some of the facilities listed under the commercial inspection program should be under the industrial program.	Move industrial type of facilities under the industrial program.	Permit language has been revised.
67	Orange County-Attachment B	Section X.2	Commercial inspection frequencies	The permit arbitrarily assigns priorities for inspections.	The Permittees should be allowed to develop a prioritization system.	Audits conducted by Regional Board staff indicated that some Permittees were ranking all their commercial facilities as “low” even though similar facilities were ranked as “high” by other Permittees.
68	Orange County-Attachment B	Section X.8	Mobile businesses	No technical basis. Difficulty in regulating mobile businesses.	Principal Permittee to develop a pilot program.	A uniform prioritization criteria and inspection requirements are acceptable alternatives. Permit language has been changed.
69	Villa Park, Yorba Linda, Tustin	X.1	Permittees to maintain and update commercial facility inventories quarterly, in a computer-based database system with all third term permit inventory criteria, as well as information on ownership, size, location, GIS w/ Lat/Longitude	Quarterly updating of the commercial facilities database and the implementation of GIS tracking of commercial fixed facilities is a burdensome requirement that for medium to small cities with little to no staff resources is not viable	Maintain current commercial facility tracking requirements	Third term permit recommended annual updating of commercial inventories with GIS tracking capabilities. During the 3rd term permit, MS4 Audits conducted by Regional Board staff indicated the need for more regimented oversight regarding commercial inventory management. Therefore this recommendation transitioned into a requirement within the fourth term permit.

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70	Laguna Hills	X.1	Permittees to maintain and quarterly update an inventory of commercial facilities within its jurisdiction.	This section should be modified to allow the permittees to update the commercial inventory annually and submit it with the annual NPDES report	The requirements within this section should not be changed from the current 3rd term permit.	The purpose of maintaining an updated inventory list is to ensure that adequate oversight controls are in place. During the 3rd term permit, MS4 Audits conducted by Regional Board staff indicated the need for more regimented oversight regarding commercial inventory management.
71	Irvine	Section X.2 and X.3	Commercial facility inspection criteria	The mandate that 10%, 40% and 50% of commercial facilities be ranked high, medium and low is not based on technical data or on demonstrated risk posed by commercial facilities.	The DAMP and LIP provisions should instead be reviewed and revised to assure that the criteria result in adequate oversight. Secondly, high ranked sites should be inspected once per permit cycle rather than once a year and medium and low site inspections be dropped.	During the third permit term, the permittees were given the opportunity to design a commercial facility ranking system based on a number of criteria including type/size of activity, potential for pollutant discharge and history of pollutant discharges. Despite this opportunity, in the most recent annual report, some permittees are reporting few or no high priority commercial sites out of hundreds to thousands of sites that met one or more of the 11 categories listed in the third term permit. The 10/40/50 breakdown should be used to ensure that the 10% of commercial facilities with the highest potential for pollutant discharge be ranked 'high' and be inspected annually, similarly for the medium and low priority rankings.

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72	OC Public Works, Huntington Beach, Costa Mesa, Orange, Brea, Westminster, Villa Park, Lake Forest, Cypress, Laguna Hills, Yorba Linda, Tustin	X.2	10% of all commercial sites (excluding restaurants) shall be ranked "high" , 40% ranked medium and the remaining 50% ranked low	This new requirement will increase the annual inspection requirements to a point where resources are incapable of complying with the requirements. The inventory should be determined solely on a risk-based instead of a mandatory curve-based criterion.	Each permittee conduct inspections of its commercial facilities as indicated below. To establish priorities for inspection, the perrmittees shall continue to prioritize commercial facilities/businesses within their jurisdiction as a high, medium or low threat to water quality based on such factors as the type, magnitude and location of the commercial activity, potential for discharges, proximity and sensitivity of receiving waters, material used and wastes generated at he site. Within 6 mos. Of the adoption of this order, the Permittees shall review their existing prioritization system, criteria and results based on the inspections and determine if any modifications are necessary. The modifications shall be completed within 6 months of the determination and reported on in the annual report.	During the 3rd term permit, MS4 Audits conducted by Regional Board staff indicated the need for more regimented oversight regarding commercial inventory management and inspections within this section. The percentages indicated within this section were developed following extensive review of inspection information within PEAs submitted by co-permittees during the 3rd term permit.
73	Irvine, Westminster	Section X.3 and X.5	Commercial facility inspection documentation	The commercial inspection section that requires photographic documentation for all aspects of the inspection is too onerous.	Photographic evidence should only be required in the case of water quality ordinance violations and only in manner consistent with local, state and federal ordinance, regulations and laws.	Photographic evidence of all aspects of commercial inspections will assist permittees in supporting the appropriate enforcement action and will provide evidence during Regional Board audits that site conditions during inspections by municipal staff, are receiving the appropriate enforcement actions, if any.

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74	County of Orange	Section X.8	Mobile businesses	A new regulatory oversight is prescribed for mobile businesses.	The permittees have already developed BMPs for these businesses; additional requirements are not warranted.	Complaints received in the Regional Board office and Board staff's field observations indicate that these discharges have not been fully eliminated and additional measures are needed to control discharges from mobile businesses.
75	Villa Park, Cypress, Laguna Hills	X.8	Mobile businesses shall implement appropriate control measures within 3 months of being notified by permittees	It's unrealistic to expect that over any period of time it would be possible for the principal permittee to notify all mobile businesses operating within the County, of minimum source controls and pollution prevention measures that they must develop and implement.	…modify the requirement to read that "…the principal permittee shall utilize all reasonable resources to notify mobile businesses…"	Permit language has been revised.
76	ProntoWash	X.8	Mobile businesses shall implement appropriate control measures within 3 months of being notified by permittees	Require mobile operators to be inspected and trained in water quality control measures during the business licensing process.	During the licensing process, the mobile operations should be inspected and the operators should be trained on water quality protection procedures.	Many municipalities currently do not issue business licenses. Listed within Section X.8, are requirements for the permittee to distribute educational materials to businesses as well as a training program requirement.
77	Lake Forest	X.8	Mobile businesses shall implement appropriate control measures within 3 months of being notified by permittees	The regular, effective practice of unannounced inspections is difficult to impossible to implement. Identifying mobile businesses is difficult because they are often not permitted or licensed. Mobile businesses are transient in nature, advertise a mobile phone number as the only means of contact and may have geographic scope of several cities or the entire region.	Remove the mobile business requirements from the draft permit and instead, require the permittees to develop their own program for implementation during the next permit cycle.	Permit language has been revised.

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78	County of Orange, Villa Park, San Bernardino Stormwater Program	Section XI	Each permittee shall develop and implement a residential program to reduce the discharge of pollutants from residential facilities to the MS4 to MEP…	No technical justification for the residential program. Remove the Residential Program from the Order completely	Recognize the fact that the current public education programs are working. Remove the Residential Program from the Order completely.	Despite implementation of public education programs, residential areas continue to be a significant source of pesticides, herbicides, nutrients and nuisance flows. Additional actions are necessary to further address these problems.
79	Irvine	Section XI.2	Identification of residential areas and activities that are potential pollution sources and requiring residents to implement pollution prevention BMPs.	Many aspects of this proposed requirement are already covered by Public Education activities. Further it may require passage of new ordinances forcing residents to implement specific minimum BMPs and those types of ordinances are unpopular.	Retain the residential program as part of the Public Education section and revise the key provision in the draft permit to : "The permittees shall ~~require~~ *encourage* residents to implement pollution prevention measures via the public education and outreach Program …".	Despite implementation of public education programs, residential areas continue to be significant sources of pesticides, herbicides, nutrients and nuisance flows. Additional programs are needed to address these problems. Some changes made to the provisions.
80	Orange County-Attachment B,	Section XI.2	Residential program	The requirement for a residential program is duplicative of existing public education and outreach activities.	Avoid duplicative requirements.	Permit language has been amended.
81	Anaheim, Fullerton, Costa Mesa, Brea, Cypress, Laguna Hills, Yorba Linda, Tustin	XI.2	The permittees shall require residents to implement pollution prevention measures	Requiring residents to implement best management practices is problematic	Change the wording to state: "The permittees shall *encourage* residents to implement pollution prevention measures."	Permit language has been revised.
82	Cypress	XI.3	The permittees, collectively or individually, shall facilitate the proper collection and management of used oil, toxic and hazardous materials, and other household wastes.	The city is concerned with the funding for conducting collection events.	The current County of Orange Household Hazardous Waste Collection Program has been working well since its implementation and agencies continue to do a good job making residents aware of this service. Change language from "shall" to "…***should*** *facilitate the proper collection and management*."	Requirements within this section have not changed essentially from requirements within Section I.4 of the 3rd term permit.

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83	Irvine	Section XI.4	Control measure requirements for common interest areas and areas managed by Home Owner Associations.	A limited pilot HOA program has been initiated by the City to educate certain property managers on the economic and water quality benefits of improved irrigation and landscaping practices. But the draft tentative order as currently written mandates that co-permittees must develop and implement new BMPs for common interest areas, including, we presume, structural treatment control BMPs as well as source control BMPs.	Revise the first sentence of this section as follows: "The permittees shall develop ~~and implement~~ a public education and outreach component to encourage owners …".	The tentative order requires the permittees to develop and implement a public education and outreach component to encourage HOAs to implement BMPs. Nothing in that section requires permittees to build or maintain BMPs on private property.
84	Cypress, Irvine	Section XII.A.2	Inclusion of LID requirements in WQMPs.	The 6-month time frame for this requirement is too aggressive and does not allow time to collect info on watershed characteristics, stakeholder participation and the time required for adoption of the revisions by local governments.	A more reasonable time frame should be established.	Much of the groundwork for this requirement has been completed through a series of meetings between permittees, environmental NGOs and development representatives. It should be noted that this deadline refers to the default plan. Watershed specific plans can be delivered after that date. Some changes have been made to the new development section of the permit.
85	Irvine	Section XII.A.4	The first annual report following adoption of this permit must include a review of the inclusion of LID principals in the General Plan and other city documents.	This requirement is out of sync with the actual requirements for updating the DAMP, LIPs and model WQMPs.	Revise the requirements so that a single, integrated update of these documents is implemented.	Permit language has been revised.

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86	Irvine	Section XII.B.2	The list of priority development projects requiring a WQMP	Items f and g of this section would require treatment control BMPs for single-family homes, if they were large enough. This would be too much of a burden on homeowners and on City staff required to review and inspect these BMPs.	Do not require WQMPs or treatment control BMPs for single-family homes.	This permit requirement will only affect projects on hillsides with a natural slope of 25 percent or more and projects that are within 200 feet of an Area of Biological Significance (ASBS). As such these projects need the extra level of protection afforded by the development of a WQMP and implementation of appropriate control measures.
87	Irvine	XII.B.2.c	Priority Development Projects would include commercial/industrial developments greater than 10,000 square feet.	The threshold has been lowered in this permit from 100,000 square feet to 10,000 square feet.	The fact sheet should explain the basis for lowering the threshold criterion.	Fact sheet has been revised to provide basis.
88	Irvine	XII.B.2.i	Priority Development Projects would include streets, roads, highways and freeways of 5,000 square feet or more.	Road projects as small as 5,000 do not and cannot properly involve changes to the drainage facilities. Further it is not feasible to implement a 5%EIA or LID BMPs for the 85th percentile design treatment volume.	Reconsider this requirement.	The permit will be revised including the incorporation of the concepts presented in "Managing Wet Weather with Green Infrastructure: Green Streets" (U.S. EPA, 2008)
89	Irvine	XII.B.5.a	Use of structural infiltration treatment BMPs shall not cause or contribute to groundwater water quality objective exceedances.	In the Newport Bay Watershed, there are areas where the use of any infiltration BMPs will result in mobilization of nitrogen and/or selenium.	Explicitly preclude the use of LID BMPs and exempt projects from LID implementation and hydromodification control performance standards in areas with shallow groundwater, polluted groundwater, inappropriate geotechnical conditions or rising groundwater.	The current Draft Permit language already contains sufficient warnings regarding the use of infiltration BMPs, including LID-type BMPs, without having to specifically add this language.
90	NAIOP	Section XII.C	Treatment and Low Impact Development (LID) BMPs.	It appears that the permit is biased against the use of a watershed-based or regional type solutions.	Allow as much flexibility as possible in order to achieve the permit's goals across the jurisdiction regulated by the permit.	Comment noted. The permit provides sufficient flexibility for regional and sub-regional type solutions.

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91	Irvine	XII.C.1	Requirements that LID site design principals be implemented to reduce runoff to the maximum extent practicable.	The list of site design BMPs provided is a confusing mix of goals, tasks and work products that don't provide a clear basis for compliance.	Separate the provisions to distinguish between recommended site design BMPs and other goals for the new development and redevelopment program.	Permit language has been revised.
92	Irvine	XII.C.2	Requirements for source control BMP implementation.	It is not clear why the major discussion of LID also includes prescribed source control BMPs.	Section XII.C.2 should be deleted from the current section and proposed as a separate section.	While the primary focus of Section C is on LID BMP implementation, source control BMPs, particularly when they're implemented through proper site design, play a play a role in LID.
93	Irvine	XII.C.4	Conditions for the substitution of treatment control BMPs for LID measures.	One of the conditions is for EIA to be 5% or less. How does one achieve an EIA of 5% or less without implementing LID?	Delete this section.	Permit language has been revised.
94	Irvine	XII.D	Hydromodification	It is not clear how the 5% or less hydrologic impact standard would be measured and does the standard allow for dense infill and transit oriented development as required by SB 375?	Revise and clarify section.	Permit language has been revised.
95	Irvine	XII.E.2	Structural treatment control BMP requirement met by regional treatment systems.	No mention of obtaining Executive Officer determination on regional treatment systems.	Please revise to clarify the need for Executive Officer approval of common project BMPs.	Permit language has been revised.
96	Irvine	XII.G.3	Prior to occupancy, permittees shall verify through visual observation that the BMPs are operational.	It will be impossible to ascertain the operation of BMPs prior to occupancy unless it rains between construction and occupancy	Revise to verification that BMPs are built according to approved plans prior to occupancy.	Permit language has been revised.
97	Irvine	XII.H	Change of ownership and recordation	The City already has a non-recorded mechanism that tracks the transfer of long-term maintenance and operation responsibilities from a developer to an appropriate operator upon completion of	Delete reference of recording any documents and explicitly allow other methods of tracking ownership and responsibility.	Permit language has been revised.

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				development. The recordation requirement should be left to the discretion of the permittees.		
98	ConTech	Section XII	5% Effective Impervious Area (EIA)	Reliance on a 5% EIA standard is inappropriate. The water quality benefits of applying a 5% EIA standard on a site-by-site basis are unknown.	Support the approach outlined in the January 2009[1] white paper. Use delta volume (post minus pre-development) from the water quality design storm event.	Permit language has been revised based on the water quality design storm event.
99	ConTech	Section XII	Treatment and Low Impact Development (LID) BMPs.	Treatment and LID BMPs inspection and maintenance requirements are not well defined.	All water quality and/or water quantity control BMPs should have maintenance and inspection requirements.	Permit language has been revised.
100	ConTech	Section XII	Post-construction	There is no standard for selection of post-construction BMPs	Provide standards for selection of post-construction BMPs.	There are a number of handbooks (e.g., CASQA[2] BMP handbooks) available for this purpose.
101	ConTech	General	Potential pollutants of concern	Match potential pollutants with control BMPs.	The permit should require that pollutants be controlled by matching with appropriate BMPs.	There are a number of handbooks (e.g., CASQA[3] BMP handbooks) available for this purpose.
102	NRDC/OCC[4]	Section XII	Need for LID metrics	To ensure compliance with the Clean Water Act, quantifiable measures must be included.	Support the use of an EIA limitation in the permit; a 3% EIA limitation is recommended.	Comment noted. The 5% EIA metric in the permit has been replaced with a volume capture metric.
103	NRDC/OCCCI CWQ	Section XII	EIA definition	Change the EIA definition to include full onsite retention of a design storm event. EIA is not clearly defined.	The design storm should not be the delta volume from a 2-year storm event; it should be the full volume. Include a design storm volume.	The draft permit has been amended to incorporate appropriate design storm criteria.
104	NRDC/OCC	Section XII	EIA definition	The tern “percolate” is not defined.	Revise the permit such that BMPs are required to have the capacity to “infiltrate, harvest for reuse, or evapotranspire”.	Permit language has been changed.

[1] January 2009 white paper=
[2] CASQA=California Stormwater Quality Association
[3] CASQA=California Stormwater Quality Association
[4] OCC=Orange County Coastkeeper

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105	NRDC/OCC	Section XII	Waiver Provisions	Existing waiver provisions are very broad. The permit's waiver provisions should include a floor for all projects to meet.	The permit should include a provision to implement all feasible LID BMPs and must include a provision for offsite mitigation of storm water not retained onsite. The permit should define technical infeasibility. Rewrite the waiver provisions to include establishment of an "urban runoff fund". Include time limitations for the expenditure of funds.	Permit language has been revised to provide clarification.
106	NRDC/OCC	Section XII	Waiver provisions	The permit must impose limits on water quality credit system to ensure equivalent benefits within the watershed.	Having a cap of something like 50% or less of the volumetric requirement should be considered.	Waiver provisions have been revised.
107	NRDC/OCC	Section XII	Prioritize LID BMPs	A hierarchy of BMPs should be included.	Include a preferred approach of BMPs.	Permit language has been revised.
108	NRDC/OCC	Section XII	Treatment Control BMPs	LID should not be a substitute for treatment control BMPs.	Any project exercising this option should be required to provide 1:1.5 mitigation offsite.	Permit language has been revised to provide clarification.
109	NRDC/OCC	Section XII	Hydrologic conditions of concern	No waiver should be provided for discharges to engineered hardened conveyance channels.	Do not allow this waiver provision.	The waiver provision has been revised.
110	NRDC/OCC	Section XII	Priority projects	Support the inclusion of projects with a threshold of 5,000 sq ft impervious area.	Add clarifying language to Section XII.B.2.(a)	Permit language has been revised.
111	NRDC/OCC	Section XII	Groundwater Protection	The 10' separation requirement may be overly restrictive.	A 5' separation requirement may be appropriate.	The 10' separation is a conservative approach; there is an option for a case-by-case consideration of other options.
112	NRDC/OCC	Section XII	LID Metrics	A critique[5] of the January 2009 white paper (see footnote 1).	The critique provides some arguments in support of a 3-5% EIA metric and provides an analysis of some of the other findings of the January 2009 white paper (see footnote 1).	The January 2009 white paper and its critique have been considered in the revision of some of the LID provisions in the permit.

[5] Critique of Certain Elements of "Low Impact Development Metrics in Stormwater Permitting" by Dr. Richard Horner.

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113	CICWQ[6]	Section XII	LID/Regional BMPs LID BMPs should be preferred	Support LID; regional BMPs and off-site solutions should be considered.	Both provisions are in the current draft.	Comments noted.
114	CICWQ	Section XII	LID design storm	A 2-year, 24-hour design storm is not appropriate.	Consider a design storm as specified in the DAMP.	Permit language has been revised.
115	CICWQ	Section XII	LID	LID BMPs should be the preferred approach.	LID BMPs should be required of all projects.	Permit language revised.
116	CICWQ	Section XII	HCOC	HCOC should be considered on a watershed specific basis.	A technically sound hydromodification plan should be permitted.	Permit language has been revised.
117	CICWQ	Section XII	Watershed Master Plan	Support such a plan.	Include a provision in the permit to require development of a watershed master plan or plans.	Permit language has been revised and a new section has been added.
118	NAIOP	Section XII	Watershed Master Plan	The entire issue surrounding hydromodificaton, infiltration and addressing water quality is very complex. The draft permit seems to want to approach it with a focus on a project by project basis.	Watershed Master Plans can be developed such that water resource goals can be integrated to address water quality, hydromodification, water supply and habitat issues.	Comment noted. Some changes have been made to the new/re-development section of the permit.
119	CICWQ	Section XII	Capture volume	Permit should not require make up of capture volume off site or require a fee.	Delete all requirements for off site mitigation.	The preferred option is 100% LID implementation on site. Off site mitigation is one option where full on site implementation of LID BMPS are not feasible.
120	CICWQ	Section XII	LID feasibility	Permittee should decide whether LID is feasible.	Permittees should have the option to require conventional or LID BMPs on a site-specific basis.	LID BMPs are cost effective and provides water quality and quantity benefits. As such, LID should be the preferred option. Permit does provide other options.
121	CICWQ	Section XII	LID guidance	Additional time is needed to develop LID guidance	Provide 12 months to develop LID guidance and revise WQMP.	Much of the required information is already in the WQMP and six months should be enough to consolidate readily available information.

[6] CICWQ=Construction Industry Coalition on Water Quality

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122	CICWQ	Section XII	WQMP Contents	Revise the requirements specified in the draft permit for revising the WQMP.	Delete Section XII.B.3(a) of the permit.	While some revisions to the permit have been incorporated, Section XII.b.3(a) is still applicable.
123	CICWQ	Section XII	Design volume	Capture volume should be SUSMP volume.	Delete references to 5% EIA and include a capture volume design based on the SUSMP design criteria.	The design volume has been changed to SUSMP criteria.
124	CICWQ	Section XII	HCOC	Hydromodification control strategies should be those recommended in the GeoSyntec white papers[7].	Use control strategies as defined in Attachment 4 (see footnote 7).	Some changes have been made to the permit based on this white paper and other discussions at the stakeholder meetings.
125	CICWQ, NAIPO	Section XII	Areas of agreement	1) EIA or other metrics may be used for LID. 2) Capture volume design may be based on WQMP criteria. 3) LID BMPs should be prioritized. 4) Offsite mitigation needed if on site treatment is not provided		Comments noted and agreed upon items are reflected in the revised draft.
126	County of Orange	Section XII.G	Field verification of BMPs	The requirement to inspect treatment control BMPs is burdensome.	Allow self certification and/or third party verification.	An option is added for self-certification and/or third party verification.
127	County of Orange	Section XII	LID/HCOC	The Model Water Quality Management Plan addresses LID and HCOC; additional mandates and metrics need careful consideration.	Areas of agreement: A performance standard other than the 5% EIA. Water quality design volume at 85th percentile. Prioritize LID BMPs.	LID and HCOC sections have been amended to reflect areas of agreement and to provide clarity.
128	County of Orange-Attachment A	Section XII	Land use authority/LID	The permit intrudes upon local land use authority.	Requirements, such as the 5% EIA requirement, are in contravention to the separation of powers.	As an agency of the State of California, the Regional Water Board has full legal authority

[7] Orange County MS4 Permit Stakeholder Sub-Group Examining LID BMP and Hydormodification Control Sizing Alternatives, prepared by Geosyntec for the January 27, 2009 Sub-Group meeting.

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						to implement LID requirement in this permit, including the 5% EIA requirement. Furthermore, the 5% EIA requirement was one of the options provided as a quantifiable measure for determining compliance with the LID/HCOC provisions of the permit. Other options were also provided in the permit. Providing several tools for compliance determination does not intrude into local land use authority. (The 5% EIA requirement has been amended.)
129	County of Orange-Attachment A	Section XII	Land use authority/LID	Prescribing a method of compliance is a violation of Section 13360 of the Water Code.	Do not specify a method of compliance.	As indicated above, the 5% EIA was one of the tools for compliance determination. Further, the Regional Board is well within its legal authority to determine what is included in the MEP standard.
130	Orange County-Attachment B	Section XII	New Development/re-development	Revisions to proposed land development provisions are needed.	Revise “grandfathering” provision.	Permit language has been revised.
131	Orange County-Attachment B	Section XII.A.2	WQMP guidance	Revisions should be in the LIP.	Modify permit language.	Permit language has been revised.
132	Orange County Attachment B	Section XIIA.6	CEQA review	Annual review of CEQA process is unnecessary.	Modify permit language.	Permit language has been revised.
133	Orange County Attachment B	Section XII.B.2	Commercial/industrial development	The threshold has been changed w/o technical justification.	Provide justification for changing it from 100,000 to 10,000 square feet.	Fact Sheet has been revised.
134	Orange County Attachment B	Section XII.B.2.(c)	Streets, roads and highways	The LID provision is difficult to implement.	Make it consistent with the U.S. EPA requirements.	Permit language has been revised.

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135	Orange County Attachment B	Section XII.B.2.(j)	Retail gasoline outlets	The DAMP includes BMPs for these types of facilities.	Avoid duplicative efforts.	The BMPs in the DAMP, along with LID and other requirements, should be considered for these types of facilities.
136	Orange County Attachment B	Section XII.B.3.	WQMP goals	Goals are written as specific requirements.	Revise permit language.	Permit language has been revised.
137	Orange County Attachment B	Section XII.B.5	Structural infiltration BMPs	No technical basis for the 10 feet separation for infiltration systems, light industrial category and for high vehicular traffic.	Consider the proposed regulations developed by State Board for onsite wastewater treatment systems.	Permit language provides for other options on a case-by-case basis.
138	Orange County Attachment B	Section XII.B.7	WQMP for non-priority projects	Certain non-priority projects may not require a WQMP.	A WQMP should not be required of all projects.	The permit language provides other options.
139	Orange County Attachment B	Section XII.C.1	LID design principals	The design BMPs is a confusing mix of goals, tasks and work products.	Revise the list.	Permit language has been revised.
140	Orange County Attachment B	Section XII.C.2	LID site design	Source control BMPs should not a part of this discussion.	Should delete this section.	Permit language has been revised.
141	Orange County Attachment B	Section XII.C.3	LID/EIA	5% EIA is not appropriate.	Use other LID metric.	Permit language has been revised.
142	Orange County Attachment B	Section XII.C.4	Substitution of LID/treatment controls	This provision, as written, does not appear to be correct.	Provide clarification.	Permit language has been revised.
143	Orange County Attachment B	Section XII. D.1	HCOC	An assessment of a project's impact on the hydrologic regime should not be required for all projects.	For some projects, there may not be a hydrologic condition of concern.	Permit language has been revised.
144	Orange County Attachment B	Section XII.D.2	HCOC	5% EIA should not be the metric for hydrologic conditions of concern.	Express the metric in terms of runoff volume.	The metric for hydrologic condition of concern has been changed.
145	Orange County Attachment B	Section XII.D	HCOC	An additional provision should be added to this section to include HCOC mapping as an option.	Add an interim provision till development of an appropriate LID metric.	Permit language has been revised.

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146	Irvine	XIII.J.1	The LID and hydrologic conditions of concern provisions are not applicable to projects that have an approved WQMP as of the date of adoption of this order.	Under the DAMP and LIPs, project WQMPs are prepared at a conceptual level to be used as planning documents and at a project level, to implement the concept project WQMP planning document. It is unclear whether the conceptual level WQMPs will be grandfathered in as were the land use approvals in the 2002 permit.	Revise to specify land use approvals that will determine development projects that are grandfathered and those that are not.	Permit language has been revised to further identify the level of approval/stage of planning where the requirements of this permit do not apply.
147	Irvine	XIII.3	Public education requirements include making 10 million impressions per year.	There must be a clear definition for an impression. Currently an impression can consist of anything from driving past a pollution prevention banner to and extended face-to-face interaction with a member of the public.	Consider a more effective way of evaluating the effectiveness of a public education program rather than relying on impressions. If impressions must be used, develop a standardized method of determining what qualifies as an impression.	While it is agreed that a more precise method of measuring the impacts of each and every public education interaction would be advantageous, trying to evaluate the effectiveness of City bus placards (depends on the route of the bus), City bill mailing inserts (determining percentage of inserts dumped without seeing, glanced at or actually read), etc., may be more tedious.
148	County of Orange-Attachment B	Section XIII.4	Public Education and Outreach	Requirements for annual business-related workshops may not be very useful.	Suggest modifying the language to include chamber of commerce or other outreach efforts.	Permit language has been revised.
149	County of Orange-Attachment B	Section XIV	Municipal facilities	Annual inspection requirement should be only for open channel systems.	Change annual inspection requirements to open channels only.	Permit language has been revised.
150	Irvine	XIV.7	Report on the effectiveness of debris boom	Do debris booms violate the restriction on treatment BMPs being employed in waters of the U.S.?	Clarify the Regional Board's position.	No violation exists (see Comment 9).
151	Irvine	XIV.10	Permittees shall examine opportunities to retrofit existing	A 2005 retrofit study performed by RBF Consultants has not been adopted or approved by the	The 2005 RBF Retrofit Study should not be mandated as the basis for co-permittee retrofit	The permit requires that a retrofit study be performed and a report on the study be

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			storm water conveyance systems and parks with water quality protection measures and report within 12 months of permit adoption	principal permittee, is still in draft form and co-permittees have not had the opportunity to review the draft.	programs until the co-permittees have had an opportunity to review, comment, and approve the final draft, as required in the current MS4 permit for any program developed by the principal permittee.	submitted within a year of permit adoption. If the 2005 study is still current/valid, that study could be submitted after review, and if not then a new study would have to be initiated.
152	County of Orange-Attachment B	Section XVI	Training program	Revise annual training requirement to be consistent with the County program (2 year frequency).Permittees should be given an option to have their own training programs.	Change training frequency requirements.	Permit language has been revised.
153	Irvine	XVI.2	Water quality training program curriculum	Permittees should be able to tailor their training programs. Non-management staff should not be responsible for knowing the whole storm water program, just their discrete tasks.	Revise order to allow greater flexibility in tailoring course curriculum to be appropriate to an employee's area of responsibility.	Permit language has been revised.
154	Irvine	XVI.3	Training modules should include an outline of the curriculum, a training procedure at the end and Certificate of Completion.	Mandatory training and practical application workshops should provide an alternative to a Certificate of Completion, which raises employment and labor issues.	Delete reference to testing requirements, certifications and Certificates of Completion.	Permit language has been revised.
155	Irvine	XVI.4, XVI.5 and XVI.6	At least on an annual basis, the principal permittee shall provide training to staff on Fixed Facility Model Maintenance procedures, Field Program Model Training, etc.	While this section explicitly states that the principal permittee shall provide training, where city management is competent in the storm water program, they should be allowed to provide that training in-house. Cities with a demonstrated or perceived deficiency may benefit from training provided by the principal permittee.	Revise the tentative order to allow individual cities to provide in-house training rather than participate in training administered by the principal permittee or by their consultants.	Permit language has been revised with the understanding that deficiencies in a permittee's program that are the result of either management or staff's lack of understanding about the program could result in enforcement actions.
156	Irvine	XVI.7	The principal permittee shall notify Regional Board staff at least 30	This notification requirement should not be applied to the initial training given to new	Revise the tentative order to allow documentation of training summary information in the annual report	By notifying Regional Board staff, by email, prior to conducting training, it gives

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			days prior to conducting training sessions.	employees, but only to the annual training given to all appropriate staff. Further, providing a summary training in the annual report be used in lieu of contacting Regional Board staff.	rather than notifying Regional Board staff of it's occurrence, but at minimum clarify that new employee training sessions do not require Regional Board notification.	Regional Board staff the opportunity to sit in on the training to ensure that the quality of the training meets the requirements of the permit. The Regional Board is also interested in the initial training for new storm water program employees
157	Irvine	XVI.8	Permittee shall adequately train staff within 60 days of being assigned duties related to the storm water permit.	It would be impractical for the principal permittee or their consultant to provide training within 60 days of every new co-permittee hire. If co-permittees are responsible for this training then it makes sense for co-permittees to be responsible for training existing staff.	Add an option to enable individual co-permittees to provide in-house training for new hires using curriculum developed by the principal permittee in collaboration with the co-permittees.	Permit language has been revised.
158	Irvine	XIV	None	Sections are misnumbered	No recommendation submitted.	Section numbers corrected.
159	U.S. EPA	XVIII.B.2	TMDL applicability	Although 2007 TMDL listed in this section have been adopted by the Regional Board, they have not been submitted to the State Board for approval. Until the State Board, OAL and the EPA have approved these TMDLs, they are not applicable.	Continue to implement the currently approved 2002 TMDLs until the 2007 TMDLs have been approved by the State Board, OAL and EPA	Permit language has been revised to include both 2002 and 2007 TMDLs.
160	U.S. EPA	XVIII Tables 1A/B		These tables do not accurately reflect the WLA's for urban runoff in EPA's 2002 TMDLs. Additionally, the table should clarify that the WLAs are intended to be enforceable effluent limits.	Compliance with WLAs could be required in accordance with the time frame envisioned by the Board's implementation plan, since this would be consistent with the intent of the EPA TMDLs.	Tables have been revised
161	County of Orange-Attachment A	Sections III.3.i and XVIII.B.3	Selenium in rising groundwater	The source of selenium in the rising groundwater should be considered as a non-point source	Since selenium is from a non-point source, it should not be regulated under the NPDES permit.	The release of selenium has been caused, in part, due to anthropogenic

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				and should not be subject to the NPDES permit.		hydromodification of the watershed. 40 CFR 122.26 requires the prevention of illicit discharges, which includes selenium contained in rising groundwater, into the MS4 system.
162	County of Orange-Attachment B, U.S. EPA	Section XVIII.B.3	Selenium and nutrient TMDL	Make the collaborative language more explicit.	Use suggested changes.	Permit language has been revised to describe the co-operative process that is being used to address the selenium and nutrient impacted groundwater in the San Diego Creek Watershed.
163	County of Orange-Attachment B, U.S. EPA	Section XVIII.E	Numeric effluent limits	The reference to numeric effluent limit is not accurate.	Recognize these as wasteload/load allocations.	Permit language has been revised.
164	County of Orange-Attachment A	Section XVIII.B.4	San Gabriel River metals TMDL	The permit inappropriately implements TMDLs developed by the U.S.EPA.	The requirements in the permit are for Coyote Creek; the upper reach of Coyote Creek is not listed as an impaired waterbody and therefore this requirement is inappropriate.	While the San Gabriel River metals TMDL lists the portion of Coyote Creek that lies within the Los Angeles Region, the upstream portion of Coyote Creek that lies within Orange County is one of the sources of pollutants responsible for the exceedances in the lower Coyote Creek, San Gabriel River and San Gabriel Estuary. The San Gabriel River metals TMDL contains a specific Waste Load Allocation of the MS4 discharge to the upper Coyote Creek. Moreover, the Coyote Creek TMDL was

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						promulgated by USEPA, and pursuant to 40 CFR 122.44, the Regional Board is required to incorporate this TMDL into the NPDES permit. The Regional Board does not have the authority to revisit and revise a USEPA promulgated TMDL.
165	County of Orange-Attachment A	Section XVIII.B.4	San Gabriel River metals TMDL	Since the Santa Ana Regional Board's Basin Plan does not include an implementation plan for Coyote Creek TMDL, this requirement is not consistent with the Clean Water Act and the TMDL requirements. For San Gabriel River.	This TMDL's requirements are outside the scope of authority given to the Regional Board by the Clean Water Act's NPDES program.	These TMDLs where promulgated by US EPA and notification and the opportunity to comment was given to the entities that discharge to these impacted waters. There is no state or federal law requirement that the Regional Board adopt the USEPA promulgated TMDL into the basin plan (and develop an associated implementation plan), prior to incorporating the TMDL into the NPDES permit pursuant to 40 CFR 122.26.
166	U.S. EPA	XVIII.C Tables 5a & 5b	Tables illustrating future Fecal Coliform TMDL's	These tables contain errors in that the first two rows of each table both include "TMDL for Fecal Coliform". It appears that one of these rows should present the WLA for urban runoff.	Make necessary changes in tables as deemed appropriate. Additionally, clarification language should be added to reflect that urban runoff WLA's are intended to be permit effluent limits	Tables corrected and clarification added.
167	U.S. EPA	XVIII.D.1	Diazinon and chlorpyriphos TMDLs for San Diego Creek and Newport Bay	The permit does not explicitly state that diazinon and chlorpyriphos WLAs are intended to be permit effluent limits and that the permittees shall comply with the wasteload allocations in	Add language in this section that states "The permittees shall comply with the following wasteload allocations in tables 6a and 6b." Additionally, the Fact Sheet should discuss the current compliance	Permit language has been revised.

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				tables 6a and 6b.	status of the permittees with the WLAs; given the phase-out of these pesticides within urban areas.	
168	U.S. EPA	XVIII.D.4	Sediment load allocations for Newport Bay and San Diego Creek	The permit should include firm dates for the submittal of monitoring data presenting the 10-year running averages.	The permit should include firm dates for the submittal of monitoring data presenting the 10-year running averages.	Permit language has been changed.
169	U.S. EPA	XVIII.E.2	Compliance with TMDLs	Language should be clarified for consistency with the rest of section XVIII.	Recommend revising language to read: "Based on the TMDLs, numeric effluent limits have been specified to ensure consistency with the wasteload allocations."	Permit language has been revised.
170	Irvine	XIX.B.4	"The Management Committee shall meet at least six times a year to discuss issues related to permit…"	Has the Permittee Committee's name been changed to the Management Committee?	Please clarify.	Permit language has been revised.
171	County of Orange-Attachment C	Monitoring and Reporting	Bioassessment	Integrate this requirement with the regional bioassessment programs.	Integrate monitoring programs.	Permit language has been revised.
172	County of Orange	Monitoring and Reporting	Land use correlation	This information has already been collected.	Eliminate the land use correlation element.	Permit language has been revised.
173	County of Orange	Monitoring and Reporting	Bacteriological monitoring	Intense bacteriological monitoring has been conducted for the last four years.	Reduce bacteriological monitoring requirements.	Permit language has been revised.

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174	NRDC	ROWD MRP IV.2.b	Permit renewal application	The permit renewal application is incomplete as it did not include an assessment of controls.	ROWD should have included an assessment of control measures and their effectiveness in removing pollutants.	The ROWD was posted for public comments. No comments were received and we accepted it as complete after providing 30 days of public notice and review period. We believe that the requirement in the Monitoring and Reporting Section of the draft order for program effectiveness analysis is an appropriate requirement to address this issue.
175	Orange	Fact Sheet	Section IX	Fact sheet still refers to 5% EIA	Delete this reference.	Fact sheet language has been amended.
176	BIA	General	Maximum extent practicable (MEP)	Some stakeholders misrepresent the meaning of MEP.	MEP is “hortatory” (i.e., merely encouraging or exhorting) and permit requirements should be based on the real meaning of MEP.	This comment appears to take issue with characterizations of the term MEP made by other stakeholders. Thus, the comment is noted, but no substantive response is given as the Regional Board cannot speak for other stakeholders.
177	Cypress			Please give further consideration to previously submitted recommendations.		Comment noted.
178	Contech Stormwater Solutions	Finding 66 and 67	Requires proper design of BMPs	Vortex systems, filters, and catch basin inlets have no connection to groundwater and cannot therefore cause groundwater pollution.	Remove these BMPs from this finding.	The finding also references these BMPs becoming a nuisance and/or cause surface water pollution. Improper maintenance of the aforementioned BMPs can result in these problems.
179	County of Orange	Various	Reporting requirements	The County believes that the refining of existing reporting	Revise reporting requirements.	The permit has been revised giving the permittees the

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				mechanisms is the most effective approach to increasing transparency and accountability		opportunity to propose alternative reporting methodologies contingent on the approval of the Executive Officer.
180	County of Orange, Irvine, Lake Forest	Various	Deliverables and submittal dates	Compliance submittals within 6 months or with the first annual report may not provide enough time to budget and complete work.	With the exception of the hydrologic conditions of concern mapping, revise compliance dates to at least one year after permit approval.	For the majority of these deadlines, the compliance dates have been revised.
181	NRDC	III	Non-storm water discharges	Prohibit non-storm water discharges.	Include a prohibition on non-storm water discharges.	The permit provisions are consistent with the Clean Water Act and the federal regulations (40 CFR 122.26(d)(2)(iv)(B). The federal regulations state that certain types of de minimus discharges need not be prohibited from the MS4s unless they are identified by the permittees as a significant source of pollutants.. Section III.1 of the draft order prohibits all other types of non-storm water discharges.
182	Golden State Water Company	III.3	De minimus discharge requirements	Does section III.3.ii refers to discharges from all entities or just municipal permittees?	Clarify requirement.	Permit language has been amended to clarify that this section only applies to discharges from municipal permittee owned/operated facilities and activities.
183	Laguna Hills	VI.6	Construction and industrial inspections	The new requirement that cities notify the Regional Board regarding violations at sites that are State General Permittees is unwarranted	Remove this requirement.	This requirement was in previous permit (Order R8-2002-0010 – Section VI.5). Further, coordinated enforcement actions will enhance water quality and meets the MEP threshold for this MS4 permit.

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184	County of Orange	IX.10 and X.11	Coordination of inspections with Regional Board staff	The current limited resources available to both the Regional Board and permittees to conduct inspections makes coordination of these activities a priority. It is recommended that a formal framework for inspection responsibilities be established.	Revise permit accordingly.	Permit language has been added identifying this goal.
185	Laguna Hills	X.1	Quarterly update of commercial facility inventory	The City already updates it's commercial inventory on a continuous basis.	Allow permittees to constantly track facilities.	The permit has been revised to give the permittees an opportunity to devise an alternate updating methodology that's approved by the Executive Officer.
186	Huntington Beach	X.2	Prioritizing commercial sites.	Requirement will increase number of inspections 10-fold.	Allow self-inspections of commercial sites 4 of 5 years and have cities inspect once per permit term.	While analysis of the permittee's commercial site database revealed numerous commercial businesses not listed in X.1.a-s, which could probably be dropped from their inspection database without threat to water quality, the permit has been revised to lower the Medium priority percentage to 20%. In the April 10, 2009 draft, Section XII.2 provides an option for the permittees to develop a scheme for prioritization and inspection of commercial sites.
187	Laguna Hills	X.2	Prioritizing commercial sites	The assignment of arbitrary percentages for high, medium and low priority sites means if a City has already assigned 100% commercial sites a High priority, it will have to downgrade at least 40% to meet the requirement.	Permittees should be given the flexibility as to designating its facilities without being restricted by the Regional Board.	During the 3rd term permit, MS4 Audits conducted by Regional Board staff indicated the need for more regimented oversight regarding commercial inventory management and inspections

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						within this section. If the example cited by the commenter arises, certainly, having 100% High priority ranked sites would be going beyond the minimum standards set by the permit and would not be viewed as a violation. Section XII.2 provides an option to develop a scheme for prioritization and inspection of commercial sites.
188	Irvine	X.2 and 3	Inspections of commercial sites	The new 10/40/50 High/Medium/ Low commercial breakdown will require that the City perform an additional 985 inspections per year resulting in an additional annual cost of $279,700.	Make use of the 10% High priority, but only require inspections of High priority sites.	While communication with the permittee has revealed some problems with their estimates, revisions to the permit have lowered the Medium priority percentage to 20%. In addition, Section XII.2 provides an option to develop a scheme for prioritization and inspection of commercial sites.
189	County of Orange	X.2 and 3	Commercial facility inspections	The permit should provide an opportunity to develop a risk-based scheme as an alternative to current permit language.	Revise permit accordingly.	Section X.2 now provides the permittees an opportunity to develop a prioritization scheme for inspections. The commercial inspection program was introduced in the 2002 permit cycle. The permit requirements prescribed a minimum of the program's structure. As a result of permittee's implementation of the program, further prescription of a minimum program was warranted.

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						Through implementation of the program proposed in the current draft permit, a more efficient program should evolve for the next permit cycle.
190	Huntington Beach, Irvine	X.3 and X.5	Photographic documentation of commercial sites	Permit requires photos of waste & material handling BMPs which is beyond the requirement for industrial sites.	Require photos only to document violations.	Photographic documentation of waste and material handling practices will ensure that sufficiently substandard storage is appropriately documented as a violation by the permittees and will allow Regional Board staff to more accurately evaluate permittee inspection/enforcement activities during audits.
191	Orange	X.3	Commercial inspections	The proposed 10/40/50 (high/medium/low) priority breakdown will require an additional 900 inspections per permit cycle for the City.	Either maintain current flexibility or introduce the 10% mandatory 'High' priority and inspect remaining 90% as needed.	While the 900 additional inspections/permit cycle works out to 4 additional inspections a week, the priority breakdown has been adjusted to a minimum 10/20/70.
192	BIA	Section XII	CEQA	Integrate MS4 permit requirements into the CEQA documents.	Use CEQA to integrate LID principles into the project at an early stage.	We agree; there are a number of requirements in the draft permit requiring such integration (e.g., see Section XII.A.4 and 6)
193	NRDC	XII	New Development	This section should be revised to require meeting MEP standard.	Include clarifications to ensure that Permittees meet MEP standard.	Clarifications added.
194	NRDC	XII	Documents submitted for review and approval	The public should have an opportunity to review and comment on the documents submitted for approval.	Revise permit language.	Permit language revised (See Footnote 55).
195	Irvine	XII.A.7	Project approval process requirement	None	Clarify that the update of the project approval process is the same as for the DAMP finalization.	Permit language has been revised.

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196	Lake Forest	XII.B and C	Implementation of LID	Implementation of LID and hydromodification requirements will not always be feasible, in particular there is concern about implementing the USEPA's 'Green Streets' guidance document.	None	The permit addresses situations where requirements may not be feasible and provides suitable alternatives in these situations (See Section XII.E).
197	NRDC	XII.B.2	List of priority projects	Revise the list to make it clear.	Revise the list to make it clear.	List revised.
198	Orange	XII.B.2.b	New Development	By revising permit language to include subdivisions with less than 10 units, if there's a combined 10,000 sq. ft. of imperviousness, the permit may now require single family homes to be priority development projects.	Retain the language exempting subdivisions of less than 10 units.	If the threshold of 10,000 sq. ft. of impervious surface is exceeded there is the potential for a similar level of pollutant load and alteration of the hydrologic regime, whether that area is divided between 10 residential units or less than 10.
199	Orange	XII.B.2.c and j	Priority Development Project classification	It is unclear whether the 10,000 square feet refers to land area or building area.	Clarify	Permit language has been amended to indicate that 10,000 sq. ft. refers to impervious area.
200	Orange County Business Council	XII.B.2.h	WQMPs for streets	The requirement for adherence to US EPA's 'Green Infrastructure" for public streets will increase costs and may not be possible.	Remove this requirement.	The incorporation of the US. EPA guidance document was at the suggestion of some of the stakeholders. Further, XII.B.2.h only requires the incorporation of the US EPA guidance document to the Maximum Extent Practicable.
201	NRDC	XII.B.5	Infiltration systems	The specified separation needed for infiltration systems to groundwater of 10' should be revised.	Make the separation 5'.	Permit language revised.
202	Irvine	XII.B.5(a)	Structural infiltration BMPs	Structural infiltration BMPs should meet minimum requirements that they not increase seepage or exfiltration of contaminated groundwater	Clarify language.	Permit language states that infiltration systems shall not cause or contribute to groundwater water quality exceedances (Section XII.B.5.a).

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203	Orange County Water District	XII.b.5.f	LID – Infiltration requirements	Footnote 50 restricts infiltration in sites known to have soil 'and' groundwater contamination. The word 'and' should be replaced with the word 'or.'	Revise permit language.	The footnote (54 in 3rd draft) has been revised.
204	Orange County Water District	XII.B.5.f	LID – Infiltration requirements	There are some land uses that should be restricted from infiltration whether or not there is current contamination (e.g., gas stations).	Include restrictions on infiltration for sites that have a high threat to water quality	The tentative order includes restrictions on infiltration systems in high vehicular traffic areas. We believe that this restriction along with the underground storage tank regulations should provide the needed groundwater protection from infiltration systems.
205	Contech Stormwater Solutions	XII.B.5.f	Structural infiltration BMPs	In high traffic areas, infiltration BMPs should have a minimum 75 gallon spill retention capability for diesel/hydraulic fluid spills.	Add requirement.	Rather than risking groundwater contamination by spills greater than the design volume of a proposed BMP, it is more prudent to prohibit infiltration BMPs in the situations presented in XII.B.5.f.
206	Orange County Water District	XII.C	LID – Infiltration requirements	OCWD would encourage the creation of a comprehensive map of Orange County identifying areas suitable for infiltration.	Require data to be collected and a map to be prepared.	The permittees are encouraged to prepare a Watershed Master Plan (see Section XII.D.5) to address LID infiltration and hydrologic conditions of concern in a comprehensive manner. Also Section XII.E.1 of the order requires the permittees to develop feasibility criteria for implementing LID BMPs.
207	Orange County Water District	XII.C	LID – Infiltration requirements	From a management and monitoring standpoint, grouping or clustering infiltration systems on a regional basis would make sense.	Consider the grouping of infiltration systems.	Sections XII.D.5 and XII.E of the order provides an opportunity for the permittees to develop LID infiltration systems on a regional or sub-regional basis.

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208	Orange County Water District	XII.C	LID – Infiltration requirements	Data needs to be collected in Orange County to assess the potential impacts to groundwater quality due to dry wells, infiltration galleries and poorly maintained infiltrations systems.	Revise permit language.	A requirement for developing a monitoring program for the infiltration systems has been added to the tentative order (see Section XII.B.5.g).
209	Orange County Water District	XII.C	LID – Infiltration requirements	An anti-degradation analysis in terms of groundwater quality should be provided in the Order.	Revise permit language.	We do not believe that any further anti-degradation analysis is needed as the infiltration systems are required to be designed to mimic pre-development hydrologic conditions with proper controls for pollutant sources.
210	Orange	XII.C	LID requirements	Redevelopment and in-fill projects may not be able to meet the LID requirements.	Exempt redevelopment and in-fill projects from LID requirements where sites drain to hardened or engineered channels.	While permit language in the 3rd draft, acknowledges that sites for which all receiving waters are hardened do not need to meet hydrology modification requirements, LID implementation also addresses pollutant transport by reducing the runoff responsible for the transport. So were possible, LID BMPs should be implemented.
211	Irvine	XII.C	LID requirements	It should be made clear that "LID requirements do not apply to development of conceptual or project WQMPs approved prior to 12 months after permit adoption…"	Clarify language.	XII.J clearly states that the only fully grandfathered projects are those that already have an approved WQMP. For all projects for which conceptual or project WQMPs are approved after the adoption of the permit and prior 90 days after approval of the revised model WQMP must implement the provisions in Section XII of the permit to the maximum extent practicable.

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212	Irvine	XII.C	Hydrologic conditions of concern requirements	It should be made clear that "hydromodification control requirements do not apply to development of conceptual or project WQMPs approved prior to 12 months after permit adoption…"	Clarify language.	XII.J clearly states that the only fully grandfathered projects are those that already have an approved WQMP. For all projects for which conceptual or project WQMPs are approved after the adoption of the permit and prior 90 days after approval of the revised model WQMP must implement the provisions in Section XII of the permit to the maximum extent practicable.
213	Orange County Business Council	XII.C	LID requirements	The permit should make clear that capture and infiltration is not required where infeasible or impractical.	Clarify permit.	The permit already makes this clear. See Section XII.E.1.
214	CICWQ	Section XII.C.	Conventional treatment control BMPs	Conventional treatment control BMPs should be considered only as a last resort.	Require structural treatment controls only if LID BMPs are infeasible.	We agree.
215	CICWQ	Section XII.C	LID BMPs	NGOs references to more restrictive volume controls for MS4 permits are not relevant.	Most references are from guidance documents and are not included in the adopted MS4 permits.	We agree that most references are not from adopted MS4 permits. Nevertheless, some of these are useful guidance documents for implementing LID.
216	BIA	Section XII.C	LID BMPs	The Board should include filtration as an acceptable LID BMP.	Include "filtration" as an LID BMP.	We have no objection to considering filtration as a second-tier LID BMP. This should be done on a case-by-case basis.
217	BIA	Section XII.C	LID BMPs	100% on-site retention should not be mandated. Reject any "universal retention doctrine".	Allow for "natural flow doctrine".	The draft permit does not require 100% on-site retention.
218	NRDC	XII.C	LID	LID provisions should be clearly articulated with performance standards.	Revise daft permit language.	Permit language has been revised.

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219	NRDC	XII.C	LID	LID BMPs must meet the MEP standard.	Provide clarification.	Permit language revised.
220	County of Orange	XII.C.1 and 2	LID requirements	Clarifying text change recommendations were provided for these sections.	Revise permit accordingly.	Permit language has been revised to include some of the recommended changes.
221	Contech Stormwater Solutions	XII.C.2.b	LID BMPs	Permit should not limit permeable paving alternatives.	Allow alternatives to permeable concrete or porous asphalt.	Permit language has been amended.
222	Contech Stormwater Solutions	XII.C.2.b	LI D BMPs	The phrase "minimize pipes, culverts and engineered systems…" should be replaced.	Replace statement with a more general "minimize changes to the time of concentration on site."	Recommended language has been incorporated into the permit.
223	Orange	XII.C.3	Infiltration BMPs	Dry wells are listed as an allowable BMP, but may result in groundwater contamination	Require consultation with local water district prior to approval of dry wells.	Permit language has been revised.
224	Contech Stormwater Solutions	XII.C.4	LID BMP design requirements	While the goal of LID BMPs might be capturing the 85th percentile event, it shouldn't be a design requirement	Delete this section.	The permit already provides options for sites where conditions rule out treating the 85th percentile event through LID BMPs.
225	Contech Stormwater Solutions	XII.C.5	Treatment BMP requirements	This section does not specify any level of treatment that is required by BMPs.	Specify the treatment control BMPs must be designed to have medium or high effectiveness based on full-scale, in-field testing.	The current Model WQMP has a similar requirement and it will be carried over in the Model WQMP approved for this permit.
226	CICWQ	Section XII.C. 5 & 7	LID BMPs	The current language in provisions 5 and 7 restricts the application of all available LID BMPs. These provisions include a universal mandate to infiltrate.	Include a second tier option for biofiltration, bioretention, filter strips, etc.	We believe that the most effective LID BMPs are those that infiltrate or harvest and re-use storm water onsite. The bio-treatment types of BMPs should be considered on a case-by-case basis.
227	Contech Stormwater Solutions	XII.C.7.a-b	LID BMPs	It is overly prescriptive to dictate where BMPs should be implemented.	Delete these sections.	The intent of this permit language is to encourage mimicking natural conditions where localized detention areas address the majority of storm events.

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228	Orange County Business Council	XII.D	Hydrologic modifications	The permit should recognize that most, if not all, in-fill projects are incapable of mimicking the pre-development hydrologic regime.	Clarify permit	The permit already acknowledges that not all sites will be able to meet this requirement on-site and provides suitable alternative compliance mechanisms.
229	Orange, County of Orange	XII.D.2.b	Hydrologic Conditions of Concern (HCOC)	Second draft of the permit has added that HCOC may exist for downstream hardened channels if those channels are Waters of the U.S. In the City's experience, all conveyance channels have been considered Waters of the U.S. by the Army Corps of Engineers.	Delete the added statement.	Permit language has been revised.
230	Irvine	XII.D.2(b)	Hydrologic conditions of concern exemptions	The permit language that currently exempts hardened channels from requiring hydrologic controls should be expanded to include stabilized channels	Clarify language.	If channels are engineered and regularly maintained to ensure design flow capacity, they do not have a hydrologic condition of concern per the third draft permit language.
231	CICWQ	Section XII.D.2.(b)	HCOC	The addition of the last sentence eliminates any waivers for HCOC.	Delete the last sentence.	The last sentence has been deleted.
232	NRDC	XII.E	Alternatives and in-lieu programs	The alternatives should be better integrated.	Revise permit language.	We did not see the need for any additional changes.
233	County of Orange	XII.E.1	Alternative and In-lieu programs	Clarifying text change recommendations were provided for this section.	Revise permit accordingly.	It's the judgment of Regional Board staff that the language currently in the draft permit more accurately portrays staff's intent.
234	Irvine	XII.H	Structural treatment BMP tracking	This section requires permittees to establish a mechanism to track structural BMPs and ensure that proper easements are recorded and conveyed to new owners.	There are already procedures in place at the County Recorder's office and through permittee's WQMP approval processes that address these requirements.	If the permittees can ensure that the requirements set forth in XII.H are being addressed then XII.H is satisfied.

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235	Laguna Hills	XII.H.1	Ensure that structural treatment control information is tracked with ownership change.	Recorded information is already transferred to new owner and City should not be held responsible for keeping track of this.	Delete requirement.	If the permittees can ensure that the requirements set forth in XII.H are being addressed then XII.H is satisfied.
236	Lake Forest	XII.I.3	Structural treatment BMP database	It appears that the requirement is that all BMPs installed to date would have to be included.	Limit database to only newly constructed BMPs.	Permit language has been revised.
237	Irvine	XII.I.5	Structural treatment BMP inspections	Current permit language limits inspection of these BMPs to the dry season. Further, because the number of these BMPs will increase every year we request that the number inspected be dropped from 50% to 25%.	Revise permit	The need to ensure that the BMPs are functional during the wet season requires inspection prior to the wet season. However, the inspection quantities have been reduced to 25% per year with 100% coverage during every 4 year cycle.
238	Lake Forest	XII.I.5	Structural treatment BMP inspections	The number of these BMPs will be increasing every year, becoming burdensome.	The permit should allow self inspections or use a representative sampling	Permit language has been revised.
239	Laguna Hills	XIII.4	Commercial business training	Business owners will not attend training during the work day.	Rely on education during site visits.	Because site visits for some facilities may not occur until the end of the permit cycle, site visit education can only be one part of an overall business education system.
240	Orange	XVI.3 and 4	Permittee employee training	The requirement for testing and Certificates of Completion infringes on the City's right to set employee class specifications.	Allow attendance sheets or other proof that training has been completed in place of Certificates of Completion and allow other procedures to substitute for testing to verify an employee's understanding of the curriculum.	Section XVI.3 has been amended to include other methods of course completion.
241	NRDC	XVIII	TMDL	Specify that the wasteload allocations (WLA) are enforceable permit limits.	Make WLAs enforceable permit limits.	Permit language revised.

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242	NRDC	XVIII	TMDL	Prohibit new sources and new dischargers from discharging into 303(d) listed waters.	Include a prohibition on new sources and new dischargers into impaired waters.	First, while new development or redevelopment in an urban area may change the characteristics of the discharge entering the MS4 and hence the receiving water, each new development or redeveloped area does not constitute a new source or discharge. Further, the intent of the current MS4 permit is to address pollutant loads through an iterative BMP process. Moreover, the case primarily relied on in this comment, *Friends of Pinto Creek v. USEPA*, 504 F.3d 1007, did not involve an MS4 permit. Rather, it involved an individual NPDES permit for an individual discharger discharging directly into a water of the United States. Here, NRDC asks that the Regional Board expand the holding of that case to prohibit discharges into an MS4 system. These are two very different contexts, as the regulatory scheme/NPDES permitting requirements for an MS4 system are distinct from that of an individual discharger discharging directly into federal waters. Thus, to the extent that *Friends of Pinto Creek* is factually, distinguishable from the current situation, the holding is not applicable to this permit.

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243	County of Orange, Lake Forest	XVIII.B.10	Coyote Creek TMDL	TMDLs adopted by another Regional Board should not be applied outside their jurisdiction. Regulated entities should have the opportunity to participate and dispute the adoption of a TMDL.	The Coyote Creek TMDLs should not be included in this permit.	This TMDL was promulgated by USEPA. While the San Gabriel River metals TMDL lists the portion of Coyote Creek that lies within the Los Angeles Region, the upstream portion of Coyote Creek that lies within Orange County is one of the sources of pollutants responsible for the exceedances in the lower Coyote Creek, San Gabriel River and San Gabriel Estuary. Further, the San Gabriel River metals TMDL contains a specific Waste Load Allocation of the MS4 discharge to the upper Coyote Creek. We also note that the permittees that discharge to the listed waters were notified during the TMDL stakeholder process and commented on the TMDL at that time. See also response to comment numbers 164 and 165.
244	Lake Forest	Distribution list	None	Saddleback Valley School District was not included.	Include the school district.	The school district has been added to the list of other entities with the potential to discharge pollutants to the Orange County storm water system.

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Comment No.	**Commenting Parties**	**Section No.**	**Permit Requirement**	**Comment**	**Submitted Recommendations**	**Response**
	COMMENTS RECEIVED ON THE APRIL 10, 2009 DRAFT					
245	NRDC	XII	The permittees shall incorporate LID site design principles to reduce runoff to MEP.	The language in this Section of the tentative order requires a feasibility analysis before any LID BMP is required, as opposed to providing an "out" in situations of true infeasibility. This would mean that you would have to prove feasibility in each situation which is very problematic for many reasons and cuts against the common agreement by all that LID is generally feasible at some scale.	Modify Permit language.	During the public hearing on April 24, 2009, staff proposed a change to address this issue. This change is reflected in the 4th draft of the permit. Further changes may be made to Sections XII.C.1 & 2 based on comments on the 4th draft and any revisions will be addressed at the May 22, 2009 Regional Board meeting..
246	NRDC	XII	LID design criteria	The permit language does not require retaining the water on site from the design capture storm unless Infeasible. Rather, it says to capture and if you cannot you can use LID and conventional treatment BMPs. This doesn't seem to provide any requirement to retain the design storm when it can be done.	Change language to include a clear measurable performance standard that requires landscape-based treatment, on-site retention, and/or storage for re-use. These should be written in order to incorporate clear, enforceable LID requirements. Qualifier language such as: 'to the extent feasible' and 'as practicable' should not be used.	During the public hearing on April 24, 2009, staff proposed a change to address this issue. This change is reflected in the 4th draft of the permit. Further changes may be made to Sections XII.C.1 & 2 based on comments on the 4th draft and any revisions will be addressed at the May 22, 2009 Regional Board meeting.
247	EPA	XII.C.1	LID BMPs	The Tentative Order states that projects that "meet the feasibility criteria" shall implement the permit's specific LID provisions. The feasibility criteria are prepared as a separate deliverable by the permittees (under section XII.E), and require EO approval. With this language, LID requirements will not apply until the permittees prepare an approvable feasibility criteria.	Modify Permit language.	This issue is under review and any revisions will be addressed at the May 22, 2009 Regional Board meeting.

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Comment No.	**Commenting Parties**	**Section No.**	**Permit Requirement**	**Comment**	**Submitted Recommendations**	**Response**
248	EPA	XII.C.2	LID criteria	As it is currently written, the tentative Ooder opens the door to allow the use of conventional treatment controls in-lieu of LID BMPs.	LID BMPs should be considered for each priority development project.	This issue is under review and any revisions will be addressed at the May 22, 2009 Regional Board meeting.
249	Orange County Water District	XII.B.5(d)	The vertical distance from the bottom of the infiltration system to the seasonal high groundwater must be at least 5 feet.	The Water District was concerned about the uncertainty factor in determining historic high groundwater and recommended a minimum 10 feet separation.	It would be prudent to specify a 10 feet vertical separation in the permit.	Permit language was modified in the 4th draft permit.
250	County of Orange	Finding J.52		Reference to 40 CFR citation is wrong.	Modify Permit language.	Permit language was modified in the 4th draft permit.
251	County of Orange	XVIII		Technical TMDLs (TMDLs with no implementation plans) should not be included in the permit	Delete technical TMDLs from the permit.	40 CFR 122.44(d)(1)(vii)(B) requires that this MS4 permit be consistent with the applicable waste load allocations in TMDLs and does not exempt those without implementation plans.
252	Riverside County Flood Control	Various	`	Commenter references numerous findings and permit requirements and requests that either they not be included in the Riverside County permit or be included with changes.	None	Comment noted.
253	Latham & Watkins, CICWQ,	XII.C.2 and 7	LID Implementation	Approved LID BMPs should include bio-treatment.	Modify Permit language.	Bio-filtration has been added to XII.C.2 in the 4th draft permit and may need to be added elsewhere within the permit to achieve consistency.
254	County of Orange, OC Coastkeeper, CICWQ	XII	Watershed Master Planning	Commenters support the inclusion of Watershed Master Planning and want it to be mandatory.	CICWQ supports the use of Watershed Master Plans. The County of Orange and OC Coastkeeper jointly submitted language making Watershed Master Plans mandatory.	The permit language proposed by the commenters was incorporated in Section XII.D.5
255	Prontowash	X.8	Mobile Commercial Source Program	Permit should require mobile car detailer to contain all discharge.	Revise permit language	The permit currently prohibits mobile car wash discharge as a non-storm water discharge and requires municipalities to prohibit this discharge.

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Comment No.	**Commenting Parties**	**Section No.**	**Permit Requirement**	**Comment**	**Submitted Recommendations**	**Response**
256	CICWQ	XII.C.2	LID	Provide clarification for the word "capture"; does it include bio-treatment.	Make the definition of LID consistent with the USEPA definition to include bio-treatment.	The 4th draft of the permit addresses this issue.
257	CICWQ	XII.C.3	Design "strategy"	Request replacing the word "strategy" with the word "preference"	Modify permit language.	This issue is under review and any revisions will be addressed at the May 22, 2009 Regional Board meeting.
258	Geosyntec, County of Orange	General	Assessment of Pollutant Reductions	Response to NRDC comments	Response to NRDC comments	Comments noted.
259	Geosyntec, County of Orange	General, LID	LID Metrics	A response to Dr. Horner's critical comments on "LID Metrics in Storm Water Permitting".	Response to critical comments.	Comments noted.
260	Latham& Watkins	General, New Discharges	"New "discharges to impaired waters	A response to NRDC's comments regarding the applicability of Friends of Pinto Creek v. U.S. EPA.	Latham & Watkins analysis concludes that this case is not applicable to the Orange County MS4 permit.	Comments noted.
	ORAL COMMENTS RECEIVED AT THE APRIL 24, 2009 PUBLIC HEARING (Extracted From Audio Records, May Be Supplemented Based On Transcripts, When Available.) (Comments Reflected In Written Correspondence Not Duplicated.)					
261	City of Lake Forest	Various		Keep in mind financial considerations and maximize the flexibility of permit requirements.		Comment noted.
262	County of Riverside	Various		The County wants the opportunity to base their new permit on their old permit.		Comment noted.
263	County of Orange	XII.C.1	LID Implementation	Recommends phasing in the LID requirements over an 18-month period instead of immediately, as reflected in the U.S. EPA proposed language.	Revise implementation date to 18 months.	This issue is under review and any revisions will be addressed at the May 22, 2009 Regional Board meeting.
264	County of Orange	XII.C.2	LID Implementation	If LID is required prior to the establishment of the feasibility criteria, as proposed in the U.S. EPA language, how do the permittees determine if LID is in fact infeasible at a site?		This issue is under review and any revisions will be addressed at the May 22, 2009 Regional Board meeting.

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Comment No.	**Commenting Parties**	**Section No.**	**Permit Requirement**	**Comment**	**Submitted Recommendations**	**Response**
265	County of Orange	XVIII.B.9	Coyote Creek TMDLs	The Los Angeles Regional Board should identify the load for dischargers in the Santa Ana Region. The Santa Ana Region should then determine impairment, list the impaired waters and develop TMDLs for those impaired waters. Only Santa Ana Board adopted TMDLs should be in the Santa Ana permit.	Modify Permit language.	The San Gabriel River TMDLs (including Coyote Creek) and the waste load allocations associated with those TMDLs were promulgated by the U.S. EPA and therefore this Permit must be consistent with those TMDLs as provided in 40 CFR section 122.26. Please see responses to comments number 164 and 165.
266	CICWQ	XII.C.1	LID Implementation	Put back the portion of XII.C.1, deleted in the proposed U.S. EPA language.	Modify Permit language.	This issue is under review and any revisions will be addressed at the May 22, 2009 Regional Board meeting.
267	CICWQ, City of Irvine, County of Orange	XII.C.2	LID Implementation	Strike the language added in the U.S. EPA changes in XII.C.2.	Modify Permit language.	This issue is under review and any revisions will be addressed at the May 22, 2009 Regional Board meeting.
268	CICWQ, Michael Recupero	XII.C	LID Implementation	Clarify that bio-filtration is consistent with U.S. EPA definition of LID	Modify Permit language.	Bio-filtration has been added to XII.C.2 in the 4th draft permit and may need to be added elsewhere within the permit to achieve consistency.
269	CICWQ	XII.C.3	LID Implementation	Replace the word 'strategy' with the word 'preference'.	Modify Permit language.	The word "strategy" may be replaced with the word "goal" as discussed at the April 24, 2009 public hearing.
270	GeoSyntec	XII.C	LID Implementation	Keeping the design storm volume on site will not always work, in many cases evapotranspiration is the key transport mechanism and replacing that with infiltration may have unintended consequences.	None	Comment noted.
271	OC Coastkeeper	XII.C	LID Implementation	This permit should have a three-pronged approach with Watershed Master Plans and an internet based information	None	Comment noted.

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				system with hydrologic data for builders and planners.		
272	City of Irvine	XII.C	LID Implementation	It should be made clear that if the design storm volume is addressed through bio-treatment and there is subsequent discharge to the MS4, no further treatment or offset is required.	Modify Permit language.	This issue is under review and any revisions will be addressed at the May 22, 2009 Regional Board meeting.
273	City of Orange	XII.J.1	Pre-Approved Projects	The permit language may not include all projects that have already received approval by the municipalities.	Ensure that permit language includes all projects approved by municipalities.	The current permit language recognizes this and requires implementation of LID BMPs consistent with the MEP standard.
274	Lennar Homes	XII.C.7	Regional Treatment	Regional treatment should be allowed without a waiver requirement and without additional treatment or offset.	Modify Permit language.	The draft permit includes provisions for regional treatment. The Watershed Master Plan, Section XII.D.5, should be used as another tool to incorporate regional treatment systems.
275	Michael Recupero	XII.C.1	Feasibility criteria	Does the language proposed by U.S. EPA strike the feasibility analysis?	None	While the feasibility analysis is not eliminated, the timing of LID implementation and the approval of a model WQMP (including feasibility criteria) are under review and any revisions will be addressed at the May 22, 2009 Regional Board meeting.
276	Michael Recupero	XII.C	Feasibility criteria	What will be the threshold for infeasibility and who decides it and does every project not implementing LID for the full 85th percentile 24-hour storm require a Regional Board granted waiver?	None	These issues are under review and any revisions will be addressed at the May 22, 2009 Regional Board meeting.
277	Michael Recupero	XII.B.5(d)	The vertical distance from the bottom of the infiltration system to	Supports a 10' vertical separation.	Modify Permit language.	The 4th draft permit specifies a 10-foot vertical separation.

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			the seasonal high groundwater must be at least 5 feet.			
278	San Bernardino County Flood Control District, Storm Water Program	General	Various	Commenter requests that the Orange County Permit should not be used as a template for the San Bernardino County Permit. .	None	Comments noted.
	COMMENTS RECEIVED ON THE MAY 1, 2009 DRAFT					
279	U.S. EPA	XII.C.2	LID	Language should be added to clarify that compliance with XII.C.& or XII.E meets the permit's LID requirements.	Insert "Compliance with the permit's LID requirements may also be achieved by implementation of the alternatives specified in section XII.C.7 or by implementation of an approved waiver under section XII.E" at the end of XII.C.2.	With other changes made to subsections XII.C.1 and 2, insertion of the submitted language would not have clarified the intent of this permit requirement. It is thought that the other changes made to this section have sufficiently clarified these requirements.
280	U.S. EPA	XII.C.2	LID	The meaning of the term 'bio-filter' is unclear and the use may not be necessary.	Criteria for the design and operation of these systems should be specified in the permit or should be part of the feasibility criteria required pursuant to Section XII.E.	The term 'bio-filter' has been replaced by 'bio-treatment' and the requirement that design, operation, and maintenance criteria be developed as part of the model WQMP has been added.
281	U.S. EPA	XII.C.7	LID	The term 'treat' is used repeatedly in Section XII.C.7, which sets up an inconsistency with other permit requirements.	Either 'treat' should be deleted or with Board approval, changed to 'bio-treat'.	The references to 'treat' in Section XII.C.7 have been changed to 'bio-treat' or 'bio-treatment'.
282	U.S. EPA	XII.E	Waiver Approval	With regards to project-specific waivers generated by Section XII.E, commenter believes that the number of waivers will be small. While supporting the 4th	None made.	While waiver approval per Section XII.E remains the same, if the feasibility criteria required by that section is not approved within 12 months of

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				draft permit language, the commenter would be open to revisions that do not require EO approval for waivers.		permit adoption, the resulting case-by-case feasibility determination by the municipalities on proposed projects will not require EO approval, but will be submitted for Regional Board staff review 30 days prior to municipal approval.
283	Paul Singarella, Latham & Watkins	Findings	None	A Finding should be added stating that the Regional Board does not expect on-site retention of 100% of the design capture volume to be feasible in all cases and that implementation of bio-treatment will still satisfy legal requirements and provide a significant advance on the previous Order.	Insert provided Finding.	The existing Findings clearly indicate that LID itself, much less LID with 100% on-site retention may not be feasible at all sites.
284	Larry McKenny, RBF Consulting	XII.C	LID	Commenter supports the CICWQ comments and notes that the MEP standard does not dictate full retention of a design storm volume on site.	None	Comment noted.
285	County of Orange	None	None	The County notes involvement in the development of their comments by the Cities of Anaheim, Buena Park, Cypress, Fountain Valley, Irvine, La Palma, Laguna Hills, Lake Forest, Newport Beach, Orange, Placentia, Tustin, Villa Park and Westminster , as well as their concurrence with the submitted comments.	None	Comment noted.
286	County of Orange	XII.C.1	LID	While the change in Section XII.C.1 made at the Public Hearing and further in the fourth	Language was submitted by the commenter for Section XII.C.1.	Many of the changes in language, proposed by the commenter were incorporated

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				draft were made to address the possibility that approval of the feasibility criteria may drag on, it has the possible effect of excessive administrative burden and project delays.		in the permit and are reflected in the Errata Sheet.
287	County of Orange	XII.C.2	LID	The consequence of changes to Section XII.C.2 in the fourth draft result in the need for a waiver and EO approval for any project not addressing 100% of the design storm volume through on-site LID BMPs.	Language was submitted by the commenter for Section XII.C.2.	Many of the changes in language, proposed by the commenter were incorporated in the permit and are reflected in the Errata Sheet.
288	County of Orange	XII.C.2	LID	The term 'bio-filter' was used instead of 'bio-treat'. Further, the language in footnote 56 identifies that bio-treatment can only be used if infiltration, harvest/reuse and evapotranspiration are infeasible.	Language was submitted by the commenter for Section XII.C.2 and footnote 56/57.	The term 'bio-filtration' has been used throughout Section XII.C. While much of the permit language suggested by the commenter has been used, the permit continues to require that the use of 'on-site' retention LID BMPs be implemented (where feasible) prior to the use of 'treat and release' lid BMPs.
289	NRDC/ Coastkeeper	General Comment and Section XII.C	LID	The language in the draft permit is not based on any consensus agreement among the stakeholders. There are key disagreements on certain issues.	NRDC and Coastkeeper believe that law requires a standard that retains on site the design storm whenever possible.	The draft permit language includes on site retention as the highest priority LID BMP.
290	NRDC/ Coastkeeper	Section XII.C	LID	Infiltration and reuse implements MEP requirements and is a wise policy.	Require infiltration and reuse.	Infiltration and reuse are the highest priority LID BMPs included in the draft permit.
291	NRDC/ Coastkeeper	Section XII.C.2	LID	Clarify permit language.	Use suggested permit language.	Draft permit language now includes the requested change.
292	NRDC/ Coastkeeper	Sections XII.C. 1 & 2	LID	Disagree with the inclusion of bio-filtration to meet the basic LID standard.	Remove references to bio-filtration	Permit language has been modified; it still includes bio-treatment as the lowest priority LID BMP.

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293	NRDC/ Coastkeeper	Footnotes 56 and 57	LID	Include a design standard for bi-filtration systems.	Use suggested language to modify the footnotes.	The footnotes have been revised and the permittees are now required to include specific design criteria in the WQMP for bio-treatment systems.
294	NRDC/ Coastkeeper	Section XII.C	LID	Other sections of the permit have references to "treatment". It should be replaced with bio-treatment.	Replace references to treatment with bio-treatment.	Permit language changed.
295	City of Cypress	XII.C	LID	Consideration should be given to leaving the language in Section XII.C as existed in the third draft.	Revise permit language to reflect that proposed in the third draft.	The changes proposed in the Errata sheet for the May 22, 2009 Regional Board meeting represent an effort to allow maximum flexibility in the implementation of post-construction BMPs while maintaining a set of minimum requirements designed to insure compliance.
296	City of Irvine			Support comments made by County of Orange and CICWQ	Refer to County of Orange and CICWQ	Comment noted.
297	CONTECH	XII.C.3	LID criteria	The word "bio-filter " should be replaced with "filter" The addition of the term bio-filter appears to be excluding non-vegetative media filters, which in some cases, may prove more effective.	Replace the term Bio-filter with filter.	Wording has been changed in this case by using the term "bio-treat" or "bio-treatment"
298	City of Orange	XI.C.1	LID implementation schedule	By deleting the phrase "that meet the feasibility criteria established pursuant to Section XII.E1" within this Section, this could be interpreted as making the Permittees begin immediate implementation of LID following permit adoption.	Maintain the existing language in Section XII.C.1 in order to maintain clarity	Permit language has been revised to address this issue within this Section
299	City of Orange	XII.C.2		The proposed language change to this paragraph can be interpreted to read that projects that cannot fully infiltrate,	Delete second sentence in Section XII.C.2 "Projects that do not comply with this requirement shall meet requirements established in	Permit language has been revised.

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				harvest, reuse or evapotranspire or capture will need to meet in-lieu programs and still require treatment by conventional BMPs.	Section XII.E for alternative and in-lieu compliance. Alternatively, adopt the County of Orange recommended language.	
300	City of Orange	(general) LID Systems		Concern has been raised about allowing only BMPs that capture the 85th percentile storm. This requirement will not allow the use of systems such as grass swales or vegetated strips. Use of these systems, under the new criteria will not be allowed, as they will be deemed only as "infiltration systems"	Comment only	Comment noted
301	CICWQ	Section XII.C	LID	Provided a marked up copy of Section XII.C	Make changes as per the marked up copy.	See revised permit language.
302	San Bernardino County Storm Water Program	Section XII	LID	Section XII lacks clarity.	Provide clarifying language or a flow chart.	Permit language amended to clarify some of the requirements.
303	San Bernardino County Storm Water Program	Section XII.B.4	Design capture volume	Does the design capture volume include all the options under Section XII.B.4?	Provide clarification.	The design capture volume only provides two of these options, "runoff produced from a 24-hour, 85th percentile storm event", as indicated in XII.B.4.A.1 and 2.
304	San Bernardino County Storm Water Program	Section XII.B.5.f	Infiltration	Is a feasibility analysis required for infiltration systems in industrial areas?	Provide clarification.	A feasibility analysis is not required for infiltration systems for the type of facilities listed under Section XII.B. 5.f.
305	San Bernardino County Storm Water Program	Section XII.C.2 And XII.E	Feasibility Criteria	Section XII.E requires the principal permittee to develop a "technically-based" feasibility criteria.	The MEP standard should be applicable here.	The co-permittees are governed by the MEP standard.
306	San Bernardino County Storm Water Program	Sections XII.C.1 & 2	Full retention	There is an overemphasis on full retention BMPs.	Consider other equally effective LID BMPs. A broader concept of LID BMPs should be included.	The permit language includes a hierarchy of LID BMPs mostly based on their effectiveness in protecting water quality and quantity.

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Comment No.	**Commenting Parties**	**Section No.**	**Permit Requirement**	**Comment**	**Submitted Recommendations**	**Response**
307	Riverside County Water Flood Control and Water Conservation District	Section XII.C.2	On site retention	Avoid infiltration centric definition of LID.	Provide flexibility to implement proactive, effective, and economical LID BMPs.	Please note that the permit does provide other options, including bio-treatment.
308	Riverside County Water Flood Control and Water Conservation District	Section XII.C.2	On site infiltration	The permit does not allow properly designed filtration systems.	Include filtration as an option for implementing LID BMPs.	Bio-filtration is generally considered as an LID BMP and is included in the draft permit.
309	Riverside County Water Flood Control and Water Conservation District	Section XII.C.2	LID	The permit focuses on micro-scale LID	Allow broader implementation of LID BMPs.	Section XII.C.7 provides for sub-regional and regional LID implementation techniques.
310	Riverside County Water Flood Control and Water Conservation District	Section XII.C	LID	The goal should be to mimic pre-development hydrology.	Revise Section XII.C.	Section XII.C.3 notes that the design goal is to replicate pre-development hydrologic regime.
311	Riverside County Water Flood Control and Water Conservation District	Section XII.C	LID	Allow filtration and detention.	Revise Footnotes 56 and 57.	Minor changes have been made to Footnotes 56 & 57.
312	Riverside County Water Flood Control and Water Conservation District	Section XII.C	LID	The District's qualifications for submitting comments on LID	The District developed criteria for the use of LID BMPs.	Comments noted.

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313	Riverside County Water Flood Control and Water Conservation District	Section XII.C	LID	USEPA's guide includes filtration as an LID BMP.	Allow properly engineered filtration systems as an LID BMP.	Even though filtration per se is not included, bio-filtration is recognized as an LID BMP.
314	Riverside County Water Flood Control and Water Conservation District	Section XII.C	LID BMPs	On site vs. regional	Regional systems have many advantages, including ease of public maintenance, municipal inspections and nuisance reduction.	The permit language has provisions for regional and sub-regional systems (see Section XII.C. 7).

To	From
Co.	Co.
Dept.	Phone #
Fax #	Fax #

JAN - 9 1991

OFFICE OF GENERAL COUNSEL

MEMORANDUM

SUBJECT: Compliance with Water Quality Standards in NPDES Permits Issued To Municipal Separate Storm Sewer Systems

FROM: E. Donald Elliott
Assistant Administrator and
General Counsel (LE-130)

TO: Nancy J. Marvel
Regional Counsel
Region IX

In your memorandum of August 9, 1990, you have asked for our views on the following two issues:

ISSUES

1) Must NPDES permits for municipal separate storm sewer systems ("MS4s") issued under Section 402(p)(3)(B) of the Clean Water Act (CWA) include requirements necessary to achieve water quality standards (WQS), as generally required by Section 301(b)(1)(C) for all NPDES permits?

2) If permits issued to MS4s must comply with WQS, by what date must the permit ensure compliance?

SHORT ANSWERS

1) The better reading of Sections 402(p)(3)(B) and 301(b)(1)(C) is that all permits for MS4s must include any requirements necessary to achieve compliance with WQS.

2) Sections 402(p)(4)(A) and (p)(4)(B) give "large" and "medium" MS4s three years to comply with permit conditions from the date of permit issuance. This three year compliance date also applies to WQS-based permit requirements.

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DISCUSSION

1. Statutory Background

Section 402(a)(1) requires that all NPDES permits comply with the applicable provisions of section 301. This includes compliance with appropriate technology-based standards and effluent limits (sections 301(b)(1)(B), 301(b)(2)). Permits must include "any more stringent limitation" necessary to meet WQS. Section 301(b)(1)(C). In addition, Section 401 requires that any applicant for a federal permit (including NPDES permits issued by EPA) must provide the permitting agency a certification from the State in which the discharge originates that the discharge will comply with the State's WQS.

As part of the 1987 amendments to the Clean Water Act, Congress added Section 402(p) to the Act, related to storm water discharges. Congress exempted some storm water discharges from the requirement to obtain an NPDES permit until after October 1, 1992. Section 402(p)(1). For certain specific categories of storm water discharges, this permit "moratorium" is not in effect, including discharges "associated with industrial activity," discharges from large and medium municipal separate storm sewer systems (i.e., systems serving a population over 250,000 or systems serving a population between 100,000 and 250,000, respectively). Section 402(p)(2).

For industrial and municipal storm water discharges, EPA was instructed to promulgate new regulations specifying permit application requirements. Congress mandated EPA to issue permits no later than February 4, 1991 (for industrial and large municipal discharges) or February 4, 1993 (for medium municipal discharges). Section 402(p)(4). These permits shall provide for compliance "as expeditiously as practicable, but in no event later than 3 years after the date of issuance of such permit." Id.

Section 402(p) also specified the levels of control to be incorporated into storm water permits. Permits for discharges associated with industrial activity are to require compliance with all applicable provisions of Sections 301 and 402 of the CWA, i.e., all technology-based and water quality-based requirements. Section 402(p)(3)(A). By contrast, permits for discharges from municipal separate storm sewers "shall require controls to reduce the discharge of pollutants to the maximum extent practicable" ("MEP"). Section 402(p)(3)(B)(iii).

2. Analysis

A. WQ-based Requirements in Municipal Storm Water Permits

The relationship of Section 402(p)(3)(B)(iii) to Section 301(b)(1)(C) is not clear, either on the face of the statute or in legislative history. Section 402(p)(3) is clearly intended to draw a distinction between the requirements on industrial and municipal storm water discharges. Section 402(p)(3)(A) states that industrial discharges shall comply with the applicable provisions of section 301, i.e., BAT/BCT technology-based requirements as well as any more stringent WQ-based requirements pursuant to 301(b)(1)(C). In the next sub-paragraph, Congress requires municipalities to control storm water to the MEP standard; no mention is made of section 301. The juxtaposition of (p)(3)(A) and (p)(3)(B) gives rise to the argument that Congress may have intended to waive all section 301 requirements for municipal discharges in favor of the MEP standard. On the other hand, one could read (p)(3)(B)(iii) as modifying only technology-based requirements for municipal storm water (i.e., MEP substitutes for BAT/BCT); any WQ-based requirements would still be necessary in a municipal permit, even if those requirements are more stringent than "practicable." The legislative history of Section 402(p) provides no guidance as to how Congress intended the MEP standard to operate.

Where Congressional intent behind a statutory provision is ambiguous in light of the language or legislative history, the Agency charged with administering that statute may adopt any reasonable interpretation consistent with the goals and purposes of the statute. Chevron, U.S.A. v. NRDC, 467 U.S. 837 (1984). Therefore, EPA has a large degree of discretion to choose how it will interpret the applicability of WQS to municipal storm water discharges. The only interpretation by EPA to date, contained in its proposed rulemaking, has been that WQS would continue to apply to permits for municipal storm water discharges. See, e.g., 53 Fed. Reg. 49,457 (Dec. 7, 1988) (priorities for controls in municipal storm water management programs will be developed to ensure achievement of water quality standards and the CWA).[1] There has been no intervening interpretation expressed by EPA on this issue. It is the opinion of the Office of General Counsel that the interpretation adopted by the Agency in the proposal is a reasonable one, for the following reasons.

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[1] EPA's intent to apply WQS to municipal storm water discharges can also be inferred by the fact that the 1988 proposal did not propose to alter 40 CFR 122.44(d), which provides that all NPDES permits must contain water quality-based requirements more stringent than technology-based requirements, where necessary to achieve WQS.

First, to support the opposite reading (i.e., that WQ-based requirements do not apply to municipal storm water permits), one would have to assert that Congress implicitly waived section 301(b)(1)(C) requirements for municipal storm water. One would further have to assume that Congress impliedly exempted municipal storm water permits from the Section 401 certification requirements. Implied repeals of statutory provisions are generally disfavored. Morton v. Mancari, 417 U.S. 535, 549 (1974). A court generally will find a statute impliedly repealed only if the later enacted provision is in "irreconcilable conflict" with the earlier provision. Kremer v. Chemical Construction Corp., 456 U.S. 461, 468 (1982) (citations omitted). In this case, the statutory provisions are not in irreconcilable conflict; rather, as discussed above, one may read Section 301(b)(1)(C) as requiring "any more stringent limitation" necessary to meet a WQS in every NPDES permit, including permits for discharges from municipal separate storm sewers which are subject to the MEP standard. Such a reading would harmonize the two provisions and give effect to the policy behind Sections 301(b)(1)(C) and 401, i.e., to ensure that WQS are met, regardless of practical considerations (such as the availability of treatment technology or the "practicability" of MS4 permit requirements).

To read Section 402(p)(3)(B) as overriding 301(b)(1)(C) requirements would also cause a conflict between Section 402(p) and the general focus of the provisions in the 1987 Amendments, many of which reflect a Congressional desire to improve compliance with the WQ-based requirements of the Act. The amendments to/additions of sections 303(c)(2)(B), 304(1), 319, 320, 402(o) all reflect Congressional concern with the improvement of water quality through the NPDES and other CWA programs. It would be particularly difficult to argue that the storm water provisions, a major part of the 1987 Amendments, were intended to create an exemption from the general rule regarding WQ-based requirements without an explicit acknowledgment of that result. We think the approach taken in the proposed rule is preferable.

B. Compliance Date for WQ-Based Limits in Municipal Storm Water Permits

In contrast to the issue of whether WQ-based requirements apply at all to MS4s, Congress had indeed spoken to the compliance date issue. Section 402(p)(4) requires compliance with all permit conditions no later than three years from the date of issuance. In light of the express language, we believe the Agency may reasonably interpret the three-year compliance provisions in Section 402(p)(4) to apply to all permit

conditions, including those imposed under 301(b)(1)(C).[2]

There are arguments which support the reasonableness of this interpretation. First, EPA has issued few, if any storm water permits to MS4s to date. Many of these systems will face NPDES permit conditions for the first time, and I understand immediate compliance for these systems is likely to be unrealistic. The compliance date in Section 402(p)(4) apparently reflects a Congressional realization of that reality. Second, EPA has already construed another very similar provision of the 1987 Amendments in the same manner. Section 304(l) establishes an identical three-year compliance date for achieving water quality standards in Individual Control Strategies issued under that section. EPA has interpreted that provision, while not repealing Section 301(b)(1)(C), to allow for three-year compliance with new effluent limits established to meet WQS on 304(l)-identified streams. 54 Fed. Reg. 23,889 (Jun. 2, 1989). Given that 304(l) deals directly with WQ-based standards and permit requirements, a consistent interpretation with respect to 402(p)(3) and (p)(4) (which, as we have seen, is silent on the role of WQ-based requirements for MS4s) is certainly reasonable.[3]

If you have any questions regarding this memorandum, please contact Randy Hill of my staff, FTS 382-7700.

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[2]. There may be some municipal separate storm sewer systems which are unable to meet even the three-year compliance date in their permits. The Agency retains the discretion to issue an administrative order fixing a schedule for compliance if compliance is not achieved in that three-year period.

[3] The decision of the Administrator in the Star-Kist permit appeal does not affect this analysis. Indeed, the decision itself supports the reading that compliance schedules under Section 304(l) (and, by extension, schedules under Section 402(p)(4)) are unaffected by the holding in that decision. Cf. Order on Petition for Reconsideration, In the Matter of Star-Kist Caribe, Inc., NPDES Appeal No. 88-5, (Apr. 17, 1990), at 6 n.5 (because decision does not prevent all post-1977 compliance schedules, arguments regarding 304(l) are not pertinent); (order stayed Sept. 4 1990).

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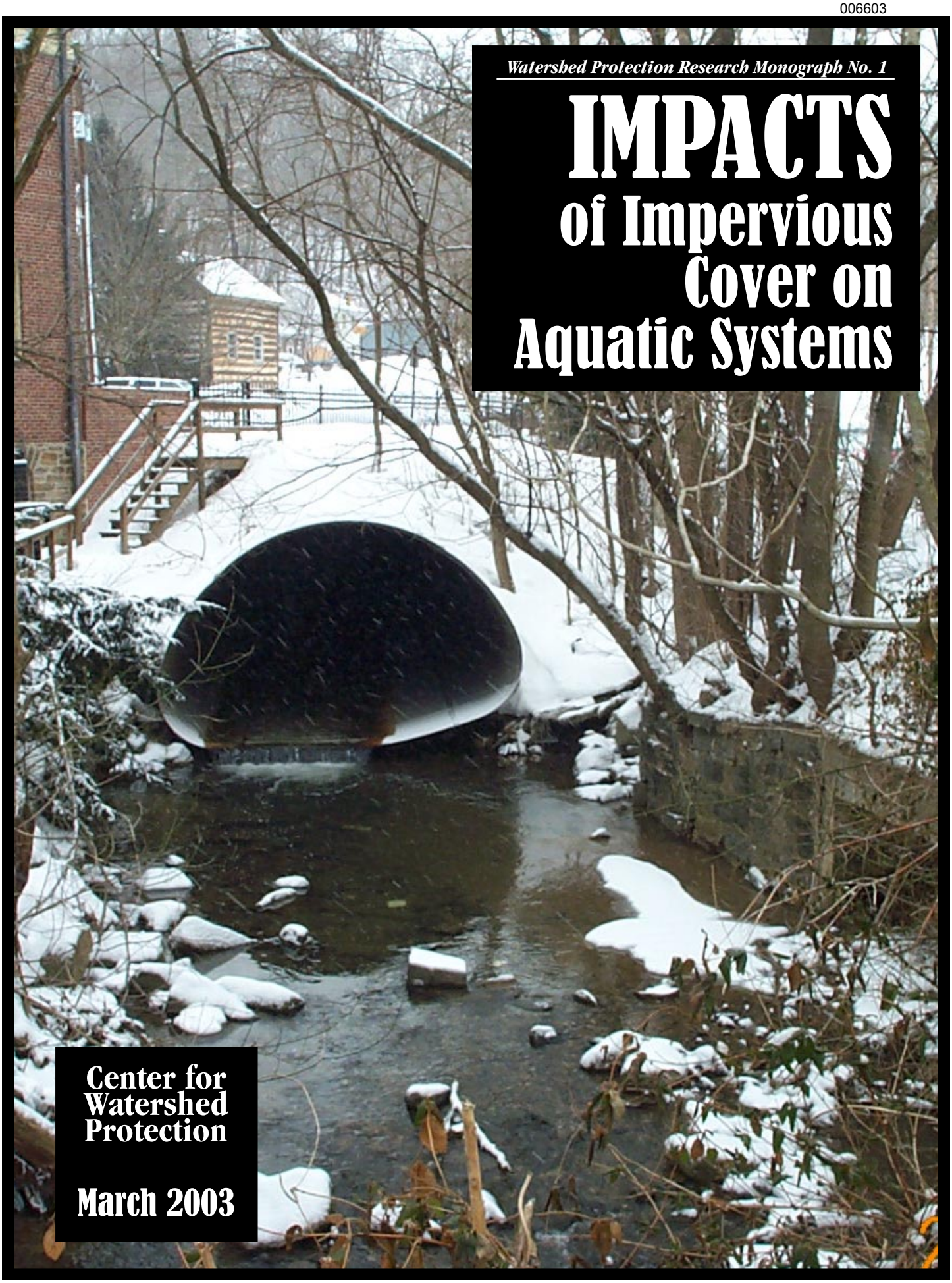

Watershed Protection Research Monograph No. 1

IMPACTS of Impervious Cover on Aquatic Systems

Center for Watershed Protection

March 2003

Cover photograph Ellicott City, Maryland 2003.
Courtesy Anne Kitchell, Center for Watershed Protection.

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Watershed Protection Research Monograph No. 1

Impacts of Impervious Cover on Aquatic Systems

March 2003

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Foreword

We are extremely pleased to launch the first edition of a new series called *Watershed Protection Research Monographs*. Each monograph will synthesize emerging research within a major topical area in the practice of watershed protection. The series of periodic monographs will replace our journal *Watershed Protection Techniques,* which lapsed in 2002. We hope this new format will provide watershed managers with the science and perspectives they need to better protect and restore their local watersheds.

This monograph was written to respond to many inquiries from watershed managers and policy makers seeking to understand the scientific basis behind the relationship between impervious cover and the health of aquatic ecosystems. It reviews more than 225 research studies that have explored the impact of impervious cover and other indicators of urbanization on aquatic systems. This report comprehensively reviews the available scientific data on how urbanization influences hydrologic, physical, water quality, and biological indicators of aquatic health, as of late 2002.

Our intention was to organize the available scientific data in a manner that was accessible to watershed leaders, policy-makers and agency staff. In addition, the research itself, which spans dozens of different academic departments and disciplines, was conducted in many different eco-regions, climatic zones, and stream types. In order to communicate across such a wide audience, we have resorted to some simplifications, avoided some important particulars, refrained from some jargon, and tried, wherever possible, to use consistent terminology. Thus, the interpretations and conclusions contained in this document are ours alone, and our readers are encouraged to consult the original sources when in doubt.

We would also like to note that the Center for Watershed Protection and the University of Alabama are currently developing a major national database on stormwater quality. The database will contain nearly 4,000 station-storm events collected by municipalities as part of the U.S. EPA's National Pollutant Discharge Elimination System (NPDES) Phase I Stormwater Permit Program. We anticipate releasing a data report in late 2003 that will provide a much needed update of stormwater event mean concentrations (EMCs).

As of this writing, many research efforts are underway that will further test and refine these relationships (most notably, the U.S. Geological Survey gradients initiative, but also many other local, state and academic efforts). We hope that this report provides a useful summary of the existing science, suggests some directions for new research, and stimulates greater discussion of this important topic in watershed management. We also feel it is time for a major conference or symposium, where this diverse community can join together to discuss methods, findings and the important policy implications of their research.

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Acknowledgments

Putting this first research monograph together took a lot of energy, editing and analysis, and many Center staff devoted their time and energy over the last two years to get it done. The project team consisted of Karen Cappiella, Deb Caraco, Samantha Corbin, Heather Holland, Anne Kitchell, Stephanie Linebaugh, Paul Sturm, and Chris Swann. Special thanks are extended to Tiffany Wright, who worked tirelessly to assemble, edit and otherwise polish the final draft.

I am also grateful to Michael Paul of Tetratech, Inc., who graciously provided us with an extensive literature review from his PhD days at the University of Georgia that contained many obscure and hard to find citations. Portions of this monograph were developed as part of a literature review conducted as part of a work assignment for the U.S. EPA Office of Wastewater Management in 2001, which proved indispensable in our efforts. Lastly, I would like to thank the hundreds of scientists who have contributed their time and data to explore and test the relationships between urbanization and aquatic health.

Tom Schueler
Center for Watershed Protection

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Acronyms and Abbreviations

B-IBI	Benthic Index of Biotic Integrity
BOD	Biological Oxygen Demand
BSD	Better Site Design
C-IBI	Combined Index of Biotic Integrity
cfs	cubic feet per second
COD	Chemical Oxygen Demand
CSO	Combined Sewer Overflow
Cu	Copper
DOC	Dissolved Organic Carbon
du/ac	dwelling units per acre
EMC	Event Mean Concentration
EPT	Ephemeroptera, Plecoptera and Trichoptera
FC	Forest Cover
GIS	Geographic Information Systems
IBI	Index of Biotic Integrity
IC	Impervious Cover
ICM	Impervious Cover Model
lbs/ac	pounds per acre
LWD	Large Woody Debris
mg/kg	milligrams per kilogram
mg/l	milligrams per liter (equal to ppm)
MPN	Most Probable Number
MTBE	Methyl Tertiary-Butyl Ether
N	Number of Studies
N/R	data not reported
NO_2	Nitrite
NO_3	Nitrate
NO_x	Nitrogen Oxides
NPDES	National Pollutant Discharge Elimination System
NTU	Nephelometric Turbidity Unit
NURP	National Urban Runoff Program
PAH	Polycylic Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyl
ppb	Parts per billion (equal to ug/l)
ppm	Parts per million (equal to mg/l)
RBP	Rapid Bioassessment Protocol
SLAMM	Source Loading Assessment/ Management Model
SPMD	Semi-Permeable Membrane Device
SSO	Sanitary Sewer Overflow
STP	Stormwater Treatment Practice
TC	Turf Cover
TDS	Total Dissolved Solids
TKN	Total Kjeldhal Nitrogen
TMDL	Total Maximum Daily Load
Total N	Total Nitrogen
Total P	Total Phosphorous
TOC	Total Organic Carbon
TSS	Total Suspended Solids
ug/l	micrograms per liter (equal to ppb)
VMT	Vehicle Miles Traveled
VOC	Volatile Organic Compound
WLF	Water Level Fluctuation
WTP	Wastewater Treatment Plant

Chapter 1: Introduction

This research monograph comprehensively reviews the available scientific data on the impacts of urbanization on small streams and receiving waters. These impacts are generally classified according to one of four broad categories: changes in hydrologic, physical, water quality or biological indicators. More than 225 research studies have documented the adverse impact of urbanization on one or more of these key indicators. In general, most research has focused on smaller watersheds, with drainage areas ranging from a few hundred acres up to ten square miles.

Streams vs. Downstream Receiving Waters

Urban watershed research has traditionally pursued two core themes. One theme has evaluated the direct impact of urbanization on small streams, whereas the second theme has explored the more indirect impact of urbanization on downstream receiving waters, such as rivers, lakes, reservoirs, estuaries and coastal areas. This report is organized to profile recent research progress in both thematic areas and to discuss the implications each poses for urban watershed managers.

When evaluating the direct impact of urbanization on streams, researchers have emphasized hydrologic, physical and biological indicators to define urban stream quality. In recent years, impervious cover (IC) has emerged as a key paradigm to explain and sometimes predict how severely these stream quality indicators change in response to different levels of watershed development. The Center for Watershed Protection has integrated these research findings into a general watershed planning model, known as the impervious cover model (ICM). The ICM predicts that most stream quality indicators decline when watershed IC exceeds 10%, with severe degradation expected beyond 25% IC. In the first part of this review, we critically analyze the scientific basis for the ICM and explore some of its more interesting technical implications.

While many researchers have monitored the quality of stormwater runoff from small watersheds, few have directly linked these pollutants to specific water quality problems within streams (e.g., toxicity, biofouling, eutrophication). Instead, the prevailing view is that stormwater pollutants are a downstream export. That is, they primarily influence downstream receiving water quality. Therefore, researchers have focused on how to estimate stormwater pollutant loads and then determine the water quality response of the rivers, lakes and estuaries that receive them. To be sure, there is an increasing recognition that runoff volume can influence physical and biological indicators within some receiving waters, but only a handful of studies have explored this area. In the second part of this review, we review the impacts of urbanization on downstream receiving waters, primarily from the standpoint of stormwater quality. We also evaluate whether the ICM can be extended to predict water quality in rivers, lakes and estuaries.

This chapter is organized as follows:

1.1 A Review of Recent Urban Stream Research and the ICM
1.2 Impacts of Urbanization on Downstream Receiving Waters
1.3 Implications of the ICM for Watershed Managers

1.1 A Review of Recent Urban Stream Research and the ICM

In 1994, the Center published "The Importance of Imperviousness," which outlined the scientific evidence for the relationship between IC and stream quality. At that time, about two dozen research studies documented a reasonably strong relationship between watershed IC and various indicators of stream quality. The research findings were subsequently integrated into the ICM (Schueler, 1994a and CWP, 1998). A brief summary of the basic assumptions of the ICM can be found in Figure 1. The ICM has had a major influence in watershed planning, stream classification and land use regulation in many communities. The ICM is a deceptively simple model that raises extremely complex and profound policy implications for watershed managers.

The ICM has been widely applied in many urban watershed settings for the purposes of small watershed planning, stream classification, and supporting restrictive development regulations and watershed zoning. As such, the ICM has stimulated intense debate among the planning, engineering and scientific communities. This debate is likely to soon spill over into the realm of politics and the courtroom, given its potential implications for local land use and environmental regulation. It is no wonder that the specter of scientific uncertainty is frequently invoked in the ICM debate, given the land use policy issues at stake. In this light, it is helpful to review the current strength of the evidence for and against the ICM.

The ICM is based on the following assumptions and caveats:

- Applies only to 1st, 2nd and 3rd order streams.
- Requires accurate estimates of percent IC, which is defined as the total amount of impervious cover over a subwatershed area.
- Predicts potential rather than actual stream quality. It can and should be expected that some streams will depart from the predictions of the model. For example, monitoring indicators may reveal poor water quality in a stream classified as "sensitive" or a surprisingly high biological diversity

Figure 1: Impervious Cover Model

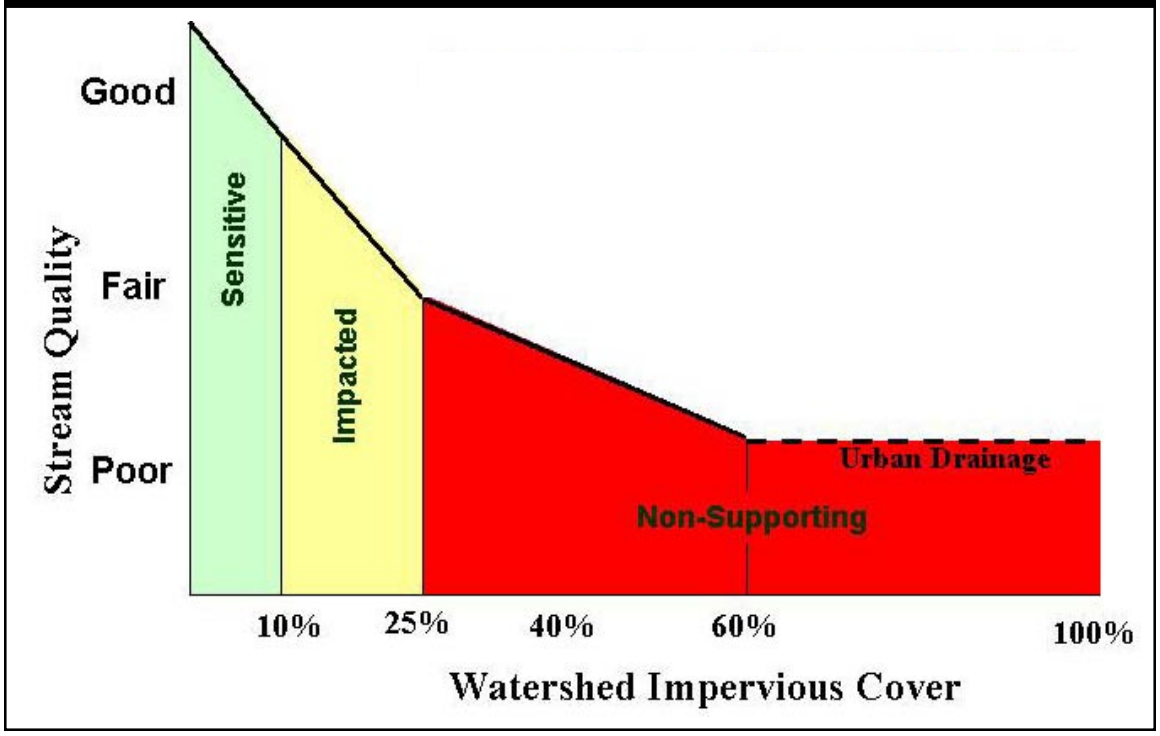

score in a "non-supporting" one. Consequently, while IC can be used to initially diagnose stream quality, supplemental field monitoring is recommended to actually confirm it.

- Does not predict the precise score of an individual stream quality indicator but rather predicts the average behavior of a group of indicators over a range of IC. Extreme care should be exercised if the ICM is used to predict the fate of individual species (e.g., trout, salmon, mussels).

- "Thresholds" defined as 10 and 25% IC are not sharp "breakpoints," but instead reflect the expected transition of a composite of individual indicators in that range of IC. Thus, it is virtually impossible to distinguish real differences in stream quality indicators within a few percentage points of watershed IC (e.g., 9.9 vs. 10.1%).

- Should only be applied within the ecoregions where it has been tested, including the mid-Atlantic, Northeast, Southeast, Upper Midwest, and Pacific Northwest.

- Has not yet been validated for non-stream conditions (e.g., lakes, reservoirs, aquifers and estuaries).

- Does not currently predict the impact of watershed treatment.

In this section, we review available stream research to answer four questions about the ICM:

1. Does recent stream research still support the basic ICM?
2. What, if any, modifications need to be made to the ICM?
3. To what extent can watershed practices shift the predictions of the ICM?
4. What additional research is needed to test the ICM?

1.1.1 Strength of the Evidence for the ICM

Many researchers have investigated the IC/stream quality relationship in recent years. The Center recently undertook a comprehensive analysis of the literature to assess the scientific basis for the ICM. As of the end of 2002, we discovered more than 225 research studies that measured 26 different urban stream indicators within many regions of North America. We classified the research studies into three basic groups.

The first and most important group consists of studies that directly test the IC/stream quality indicator relationship by monitoring a large population of small watersheds. The second and largest group encompasses secondary studies that indirectly support the ICM by showing significant differences in stream quality indicators between urban and non-urban watersheds. The third and last group of studies includes widely accepted engineering models that explicitly use IC to directly predict stream quality indicators. Examples include engineering models that predict peak discharge or stormwater pollutant loads as a direct function of IC. In most cases, these relationships were derived from prior empirical research.

Table 1 provides a condensed summary of recent urban stream research, which shows the impressive growth in our understanding of urban streams and the watershed factors that influence them. A negative relationship between watershed development and nearly all of the 26 stream quality indicators has been established over many regions and scientific disciplines. About 50 primary studies have tested the IC/stream quality indicator relationship, with the largest number looking at biological indicators of stream health, such as the diversity of aquatic insects or fish. Another 150 or so secondary studies provide evidence that stream quality indicators are significantly different between urban and non-urban watersheds, which lends at least indirect support for the ICM and suggests that additional research to directly test the IC/stream quality indicator

Table 1: The Strength of Evidence: A Review of the Current Research on Urban Stream Indicators

Stream Quality Indicator	#	IC	UN	EM	RV	Notes
Increased Runoff Volume	2	Y	Y	Y	N	extensive national data
Increased Peak Discharge	7	Y	Y	Y	Y	type of drainage system key
Increased Frequency of Bankfull Flow	2	?	Y	N	N	hard to measure
Diminished Baseflow	8	?	Y	N	Y	inconclusive data
Stream Channel Enlargement	8	Y	Y	N	Y	stream type important
Increased Channel Modification	4	Y	Y	N	?	stream enclosure
Loss of Riparian Continuity	4	Y	Y	N	?	can be affected by buffer
Reduced Large Woody Debris	4	Y	Y	N	?	Pacific NW studies
Decline in Stream Habitat Quality	11	Y	Y	N	?	
Changes in Pool Riffle/Structure	4	Y	Y	N	?	
Reduced Channel Sinuosity	1	?	Y	N	?	straighter channels
Decline in Streambed Quality	2	Y	Y	N	?	embeddedness
Increased Stream Temperature	5	Y	Y	N	?	buffers and ponds also a factor
Increased Road Crossings	3	?	Y	N	?	create fish barriers
Increased Nutrient Load	30+	?	Y	Y	N	higher stormwater EMCs
Increased Sediment Load	30+	?	Y	N	Y	higher EMCs in arid regions
Increased Metals & Hydrocarbons	20+	?	Y	Y	N	related to traffic/VMT
Increased Pesticide Levels	7	?	Y	N	Y	may be related to turf cover
Increased Chloride Levels	5	?	Y	N	Y	related to road density
Violations of Bacteria Standards	9	Y	Y	N	Y	indirect association
Decline in Aquatic Insect Diversity	33	Y	Y	N	N	IBI and EPT
Decline in Fish Diversity	19	Y	Y	N	N	regional IBI differences
Loss of Coldwater Fish Species	6	Y	Y	N	N	trout and salmon
Reduced Fish Spawning	3	Y	Y	N	?	
Decline in Wetland Plant Diversity	2	N	Y	N	?	water level fluctuation
Decline in Amphibian Community	5	Y	Y	N	?	few studies

#: *total number of all studies that evaluated the indicator for urban watersheds*
IC: *does balance of studies indicate a progressive change in the indicator as IC increases? Answers: Yes, No or No data (?)*
UN: *If the answer to IC is no, does the balance of the studies show a change in the indicator from non-urban to urban watersheds? Yes or No*
EM *Is the IC/stream quality indicator relationship implicitly assumed within the framework of widely accepted engineering models? Yes, No or No models yet exist (?)*
RV: *If the relationship has been tested in more than one eco-region, does it generally show major differences between ecoregions? Answers: Yes, No, or insufficient data (?)*

relationship is warranted. In some cases, the IC/stream quality indicator relationship is considered so strongly established by historical research that it has been directly incorporated into accepted engineering models. This has been particularly true for hydrological and water quality indicators.

1.1.2 Reinterpretation of the ICM

Although the balance of recent stream research generally supports the ICM, it also offers several important insights for interpreting and applying the ICM, which are discussed next.

Statistical Variability

Scatter is a common characteristic of most IC/stream quality indicator relationships. In most cases, the overall trend for the indicator is down, but considerable variation exists along the trend line. Often, linear regression equations between IC and individual stream quality indicators produce relatively modest correlation coefficients (reported r^2 of 0.3 to 0.7 are often considered quite strong).

Figure 2 shows typical examples of the IC/stream quality indicator relationship that illustrate the pattern of statistical variability. Variation is always encountered when dealing with urban stream data (particularly so for biological indicators), but several patterns exist that have important implications for watershed managers.

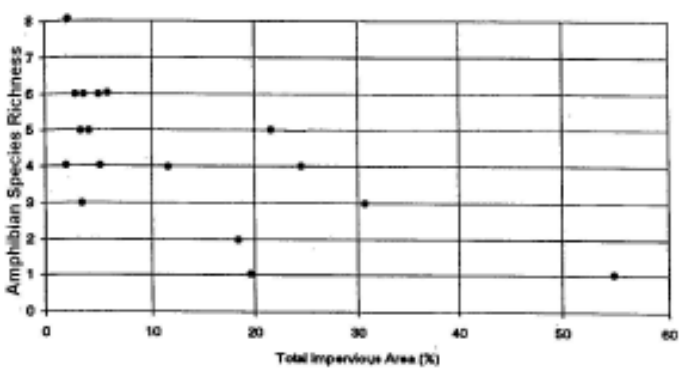

a. Fish IBI vs. IC in Fairfax, VA (Fairfax County, 2001)

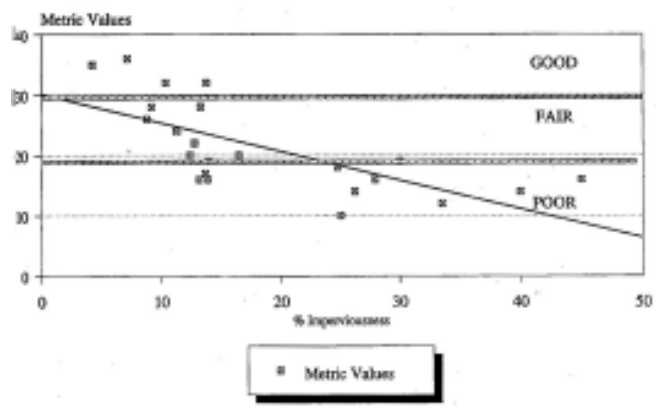

b. CPSS vs. IC in Montgomery County, MD (MNCPPC, 2000)

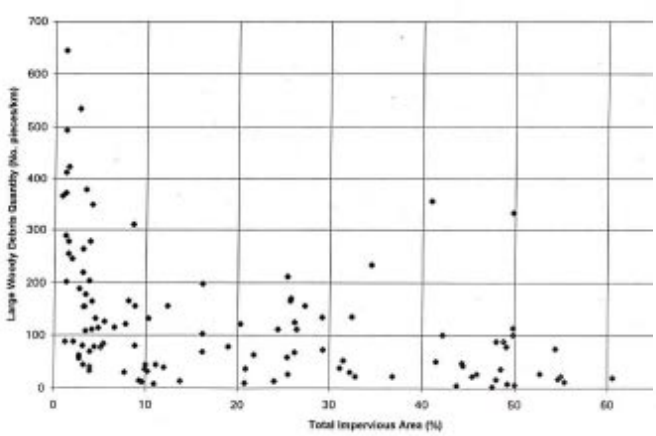

c. Large Woody Debris vs. IC (Booth *et al.*, 1997)

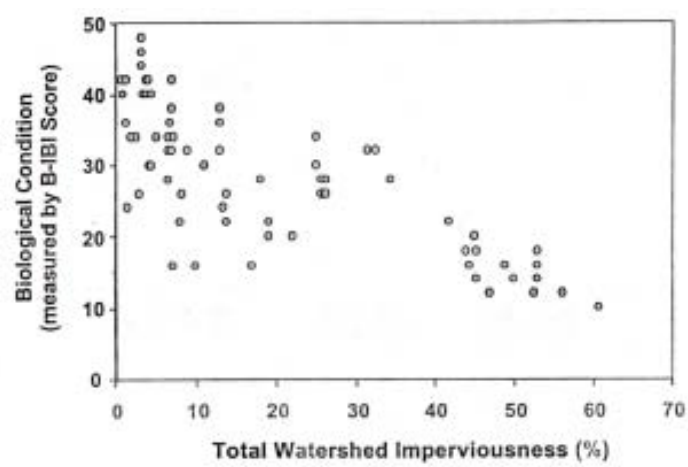

d. Biological Condition vs. Total Watershed IC (Booth, 2000)

Figure 2: Typical Scatter Found in IC/Stream Quality Indicator Research

The first pattern to note is that the greatest scatter in stream quality indicator scores is frequently seen in the range of one to 10% IC. These streams, which are classified as "sensitive" according to the ICM, often exhibit low, moderate or high stream quality indicator scores, as shown in Figure 2. The key interpretation is that sensitive streams have the potential to attain high stream quality indicator scores, but may not always realize this potential.

Quite simply, the influence of IC in the one to 10% range is relatively weak compared to other potential watershed factors, such as percent forest cover, riparian continuity, historical land use, soils, agriculture, acid mine drainage or a host of other stressors. Consequently, watershed managers should never rely on IC alone to classify and manage streams in watersheds with less than 10% IC. Rather, they should evaluate a range of supplemental watershed variables to measure or predict actual stream quality within these lightly developed watersheds.

The second important pattern is that variability in stream quality indicator data is usually dampened when IC exceeds 10%, which presumably reflects the stronger influence of stormwater runoff on stream quality indicators. In particular, the chance that a stream quality indicator will attain a high quality score is sharply diminished at higher IC levels. This trend becomes pronounced within the 10 to 25% IC range and almost inevitable when watershed IC exceeds 25%. Once again, this pattern suggests that IC is a more robust and reliable indicator of overall stream quality beyond the 10% IC threshold.

Other Watershed Variables and the ICM

Several other watershed variables can potentially be included in the ICM. They include forest cover, riparian forest continuity and turf cover.

Forest cover (FC) is clearly the main rival to IC as a useful predictor of stream quality in urban watersheds, at least for humid regions of North America. In some regions, FC is simply the reciprocal of IC. For example, Horner and May (1999) have demonstrated a strong interrelationship between IC and FC for subwatersheds in the Puget Sound region (Figure 3). In other regions, however, "pre-

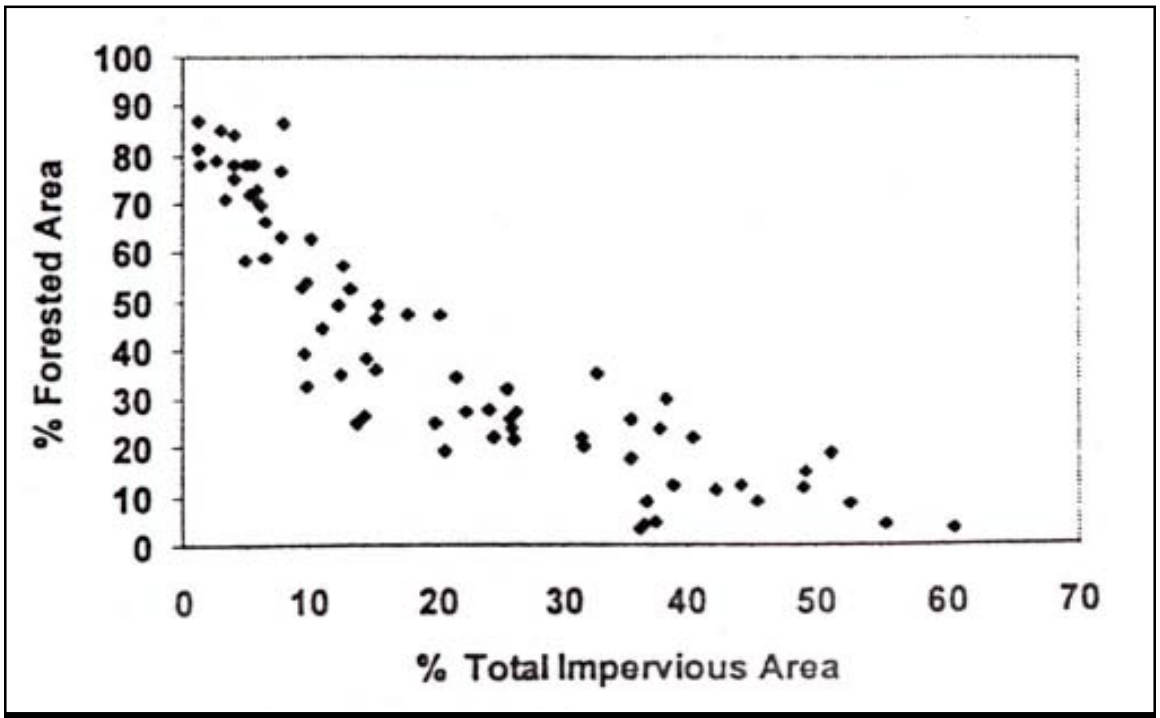

Figure 3: Relationship of IC and FC in Puget Sound Subwatersheds (Horner and May, 1999)

development" land use represents a complex mosaic of crop land, pasture and forest. Therefore, an inverse relationship between FC and IC may not be universal for subwatersheds that have witnessed many cycles of deforestation and cultivation.

It should come as little surprise that the progressive loss of FC has been linked to declining stream quality indicators, given that forested watersheds are often routinely used to define natural reference conditions for streams (Booth, 2000 and Horner *et al.*, 2001). Mature forest is considered to be the main benchmark for defining pre-development hydrology within a subwatershed, as well. Consequently, FC is perhaps the most powerful indicator to predict the quality of streams within the "sensitive" category (zero to 10% IC).

To use an extreme example, one would expect that stream quality indicators would respond quite differently in a subwatershed that had 90% FC compared to one that had 90% crop cover. Indeed, Booth (1991) suggests that stream quality can only be maintained when IC is limited to less than 10% <u>and</u> at least 65% FC is retained within a subwatershed. The key management implication then is that stream health is best managed by simultaneously minimizing the creation of IC and maximizing the preservation of native FC.

FC has also been shown to be useful in predicting the quality of terrestrial variables in a subwatershed. For example, the Mid-Atlantic Integrated Assessment (USEPA, 2000) has documented that watershed FC can reliably predict the diversity of bird, reptile and amphibian communities in the mid-Atlantic region. Moreover, the emerging discipline of landscape ecology provides watershed managers with a strong scientific foundation for deciding where FC should be conserved in a watershed. Conservation plans that protect and connect large forest fragments have been shown to be effective in conserving terrestrial species.

Riparian forest continuity has also shown considerable promise in predicting at least some indicators of stream quality for urban watersheds. Researchers have yet to come up with a standard definition of riparian continuity, but it is usually defined as the proportion of the perennial stream network in a subwatershed that has a fixed width of mature streamside forest. A series of studies indicates that aquatic insect and fish diversity are associated with high levels of riparian continuity (Horner *et al.,* 2001; May *et al.*, 1997; MNCPPC, 2000; Roth *et al.,* 1998). On the other hand, not much evidence has been presented to support the notion that riparian continuity has a strong influence on hydrology or water quality indicators.

One watershed variable that received little attention is the fraction of watershed area maintained in turf cover (TC). Grass often comprises the largest fraction of land area within low-density residential development and could play a significant role in streams that fall within the "impacted" category (10 to 25% IC). Although lawns are pervious, they have sharply different properties than the forests and farmlands they replace (i.e., irrigation, compacted soils, greater runoff, and much higher input of fertilizers and pesticides, etc.). It is interesting to speculate whether the combined area of IC and TC might provide better predictions about stream health than IC area alone, particularly within impacted subwatersheds.

Several other watershed variables might have at least supplemental value in predicting stream quality. They include the presence of extensive wetlands and/or beaverdam complexes in a subwatershed; the dominant form of drainage present in the watershed (tile drains, ditches, swales, curb and gutters, storm drain pipes); the average age of development; and the proximity of sewer lines to the stream. As far as we could discover, none of these variables has been systematically tested in a controlled population of small watersheds. We have observed that these factors could be important in our field investigations and often measure them to provide greater insight into subwatershed behavior.

Lastly, several watershed variables that are closely related to IC have been proposed to predict stream quality. These include popula-

tion, percent urban land, housing density, road density and other indices of watershed development. As might be expected, they generally track the same trend as IC, but each has some significant technical limitations and/or difficulties in actual planning applications (Brown, 2000).

Individual vs. Multiple Indicators

The ICM does not predict the precise score of individual stream quality indicators, but rather predicts the average behavior of a group of indicators over a range of IC. Extreme care should be exercised if the ICM is used to predict the fate of individual indicators and/or species. This is particularly true for sensitive aquatic species, such as trout, salmon, and freshwater mussels. When researchers have examined the relationship between IC and individual species, they have often discovered lower thresholds for harm. For example, Boward *et al.* (1999) found that brook trout were not found in subwatersheds that had more than 4% IC in Maryland, whereas Horner and May (1999) asserted an 8% threshold for sustaining salmon in Puget Sound streams.

The key point is that if watershed managers want to maintain an individual species, they should be very cautious about adopting the 10% IC threshold. The essential habitat requirements for many sensitive or endangered species are probably determined by the *most sensitive* stream quality indicators, rather than the *average behavior* of all stream quality indicators.

Direct Causality vs. Association

A strong relationship between IC and declining stream quality indicators does not always mean that the IC is directly responsible for the decline. In some cases, however, causality can be demonstrated. For example, increased stormwater runoff volumes are directly caused by the percentage of IC in a subwatershed, although other factors such as conveyance, slope and soils may play a role.

In other cases, the link is much more indirect. For these indicators, IC is merely an index of the cumulative amount of watershed development, and more IC simply means that a greater number of known or unknown pollutant sources or stressors are present. In yet other cases, a causal link appears likely but has not yet been scientifically demonstrated. A good example is the more than 50 studies that have explored how fish or aquatic insect diversity changes in response to IC. While the majority of these studies consistently shows a very strong negative association between IC and biodiversity, they do not really establish which stressor or combination of stressors contributes most to the decline. The widely accepted theory is that IC changes stream hydrology, which degrades stream habitat, and in turn leads to reduced stream biodiversity.

Regional Differences

Currently, the ICM has been largely confirmed within the following regions of North America: the mid-Atlantic, the Northeast, the Southeast, the upper Midwest and the Pacific Northwest. Limited testing in Northern California, the lower Midwest and Central Texas generally agrees with the ICM. The ICM has not been tested in Florida, the Rocky Mountain West, and the Southwest. For a number of reasons, it is not certain if the ICM accurately predicts biological indicators in arid and semiarid climates (Maxted, 1999).

Measuring Impervious Cover

Most researchers have relied on total impervious cover as the basic unit to measure IC at the subwatershed level. The case has repeatedly been made that effective impervious cover is probably a superior metric (e.g., only counting IC that is hydraulically connected to the drainage system). Notwithstanding, most researchers have continued to measure total IC because it is generally quicker and does not require extensive (and often subjective) engineering judgement as to whether it is connected or not. Researchers have used a wide variety of techniques to estimate subwatershed IC, including satellite imagery, analysis of aerial photographs, and derivation from GIS land use layers. Table 2 presents some standard land use/IC relationships that were developed for suburban regions of the Chesapeake Bay.

Table 2: Land Use/IC Relationships for Suburban Areas of the Chesapeake Bay
(Cappiella and Brown, 2001)

Land Use Category	Sample Number (N)	Mean IC (SE)	Land Use Category	Sample Number (N)	Mean IC (SE)
Agriculture	8	**1.9** – 0.3	Institutional	30	**34.4** – 3.45
Open Urban Land	11	**8.6** – 1.64	Light	20	**53.4** – 2.8
2 Acre Lot Residential	12	**10.6** – 0.65	Commercia	23	**72.2** – 2.0
1 Acre Lot Residential	23	**14.3** – 0.53	Churches	8	**39.9** – 7.8 1
1/2 Acre Lot Residential	20	**21.2** – 0.78	Schools	13	**30.3** – 4.8
1/4 Acre Lot Residential	23	**27.8** – 0.60	Municipals	9	**35.4** – 6.3
1/8 Acre Lot Residential	10	**32.6** – 1.6	Golf	4	**5.0** – 1.7
Townhome Residential	20	**40.9** – 1.39	Cemeteries	3	**8.3** – 3.5
Multifamily Residential	18	**44.4** – 2.0	Parks	4	**12.5** – 0.7

Three points are worth noting. First, it is fair to say that most researchers have spent more quality control effort on their stream quality indicator measurements than on their subwatershed IC estimates. At the current time, no standard protocol exists to estimate subwatershed IC, although Cappiella and Brown (2001) presented a useful method. At best, the different methods used to measure IC make it difficult to compare results from different studies, and at worst, it can introduce an error term of perhaps +/- 10% from the true value within an individual subwatershed. Second, it is important to keep in mind that IC is not constant over time; indeed, major changes in subwatershed IC have been observed within as few as two years. Consequently, it is sound practice to obtain subwatershed IC estimates from the most recent possible mapping data, to ensure that it coincides with stream quality indicator measurements. Lastly, it is important to keep in mind that most suburban and even rural zoning categories exceed 10% IC (see Table 2). Therefore, from a management standpoint, planners should try to project future IC, in order to determine the future stream classification for individual subwatersheds.

1.1.3 Influence of Watershed Treatment Practices on the ICM

The most hotly debated question about the ICM is whether widespread application of watershed practices such as stream buffers or stormwater management can mitigate the impact of IC, thereby allowing greater development density for a given watershed. At this point in time, there are fewer than 10 studies that directly bear on this critical question. Before these are reviewed, it is instructive to look at the difficult technical and scientific issues involved in detecting the effect of watershed treatment, given its enormous implications for land use control and watershed management.

The first tough issue is how to detect the effect of watershed treatment, given the inherent scatter seen in the IC/stream quality indicator relationship. Figure 4 illustrates the "double scatter" problem, based on three different urban stream research studies in Delaware, Maryland and Washington. A quick inspection of the three plots shows how intrinsically hard it is to distinguish the watershed treatment effect. As can be seen, stream quality indicators in subwatersheds with treatment tend to

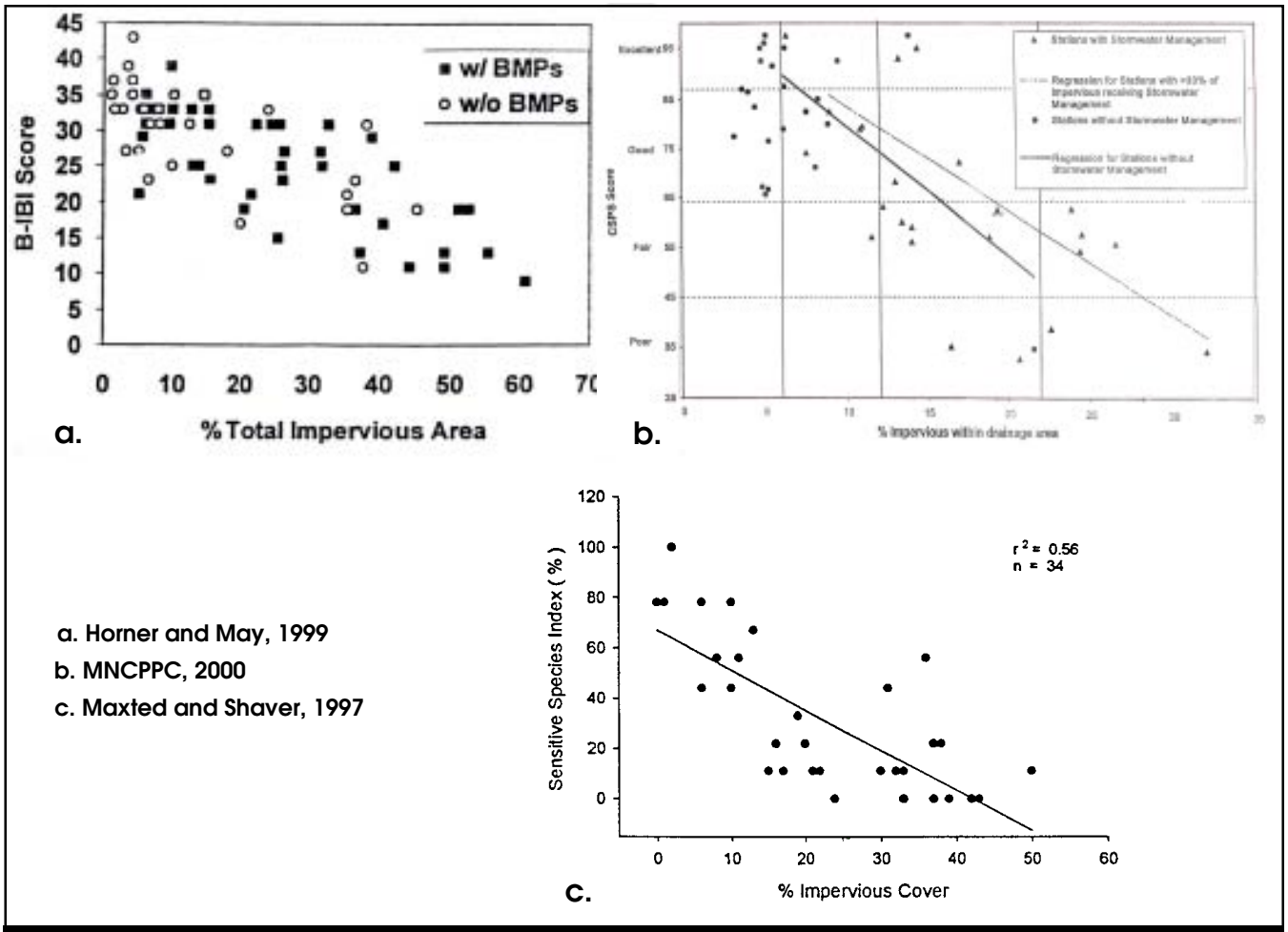

Figure 4: The Double Scatter Problem: Difficulties in Detecting the Effect of Watershed Treatment

overplot those in subwatersheds that lack treatment. While subtle statistical differences may be detected, they are not visibly evident. This suggests that the impact of watershed treatment would need to be extremely dramatic to be detected, given the inherent statistical variability seen in small watersheds (particularly so within the five to 25% IC range where scatter is considerable).

In an ideal world, a watershed study design would look at a controlled population of small urban watersheds that were developed with and without watershed practices to detect the impact of "treatment." In the real world, however, it is impossible to strictly control subwatershed variables. Quite simply, no two subwatersheds are ever alike. Each differs slightly with respect to drainage area, IC, forest cover, riparian continuity, historical land use, and percent watershed treatment. Researchers must also confront other real world issues when designing their watershed treatment experiments.

For example, researchers must carefully choose which indicator or group of indicators will be used to define stream health. IC has a negative influence on 26 stream quality indicators, yet nearly all of the watershed treatment research so far has focused on just a few biological indicators (e.g., aquatic insect or fish diversity) to define stream health. It is conceivable that watershed treatment might have no effect on biological indicators, yet have a positive influence on hydrology, habitat or water quality indicators. At this point, few of these indicators have been systematically

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tested in the field. It is extremely doubtful that any watershed practice can simultaneously improve or mitigate all 26 stream quality indicators, so researchers must carefully interpret the outcomes of their watershed treatment experiments.

The second issue involves how to quantify watershed treatment. In reality, watershed treatment collectively refers to dozens of practices that are installed at individual development sites in the many years or even decades it takes to fully "build out" a subwatershed. Several researchers have discovered that watershed practices are seldom installed consistently across an entire subwatershed. In some cases, less than a third of the IC in a subwatershed was actually treated by any practice, because development occurred prior to regulations; recent projects were exempted, waived or grandfathered; or practices were inadequately constructed or maintained (Horner and May, 1999 and MNCPPC, 2000).

Even when good coverage is achieved in a watershed, such as the 65 to 90% reported in studies of stormwater ponds (Jones *et al*., 1996; Maxted, 1999; Maxted and Shaver, 1997), it is still quite difficult to quantify the actual quality of treatment. Often, each subwatershed contains its own unique mix of stormwater practices installed over several decades, designed under diverse design criteria, and utilizing widely different stormwater technologies. Given these inconsistencies, researchers will need to develop standard protocols to define the extent and quality of watershed treatment.

Effect of Stormwater Ponds

With this in mind, the effect of stormwater ponds and stream buffers can be discussed. The effect of larger stormwater ponds in mitigating the impacts of IC in small watersheds has received the most scrutiny to date. This is not surprising, since larger ponds often control a large fraction of their contributing subwatershed area (e.g. 100 to 1,000 acres) and are located on the stream itself, therefore lending themselves to easier monitoring. Three studies have evaluated the impact of large stormwater ponds on downstream aquatic insect communities (Jones *et al.*, 1996; Maxted and Shaver, 1997; Stribling *et al.*, 2001). Each of these studies was conducted in small headwater subwatersheds in the mid-Atlantic Region, and none was able to detect major differences in aquatic insect diversity in streams with or without stormwater ponds.

Four additional studies statistically evaluated the stormwater treatment effect in larger populations of small watersheds with varying degrees of IC (Horner and May, 1999; Horner *et al.,* 2001; Maxted, 1999; MNCPPC, 2000). These studies generally sampled larger watersheds that had many stormwater practices but not necessarily complete watershed coverage. In general, these studies detected a small but positive effect of stormwater treatment relative to aquatic insect diversity. This positive effect was typically seen only in the range of five to 20% IC and was generally undetected beyond about 30% IC. Although each author was hesitant about interpreting his results, all generally agreed that perhaps as much as 5% IC could be added to a subwatershed while maintaining aquatic insect diversity, given effective stormwater treatment. Forest retention and stream buffers were found to be very important, as well. Horner *et al.* (2001) reported a somewhat stronger IC threshold for various species of salmon in Puget Sound streams.

Some might conclude from these initial findings that stormwater ponds have little or no value in maintaining biological diversity in small streams. However, such a conclusion may be premature for several reasons. First, the generation of stormwater ponds that was tested was not explicitly designed to protect stream habitat or to prevent downstream channel erosion, which would presumably promote aquatic diversity. Several states have recently changed their stormwater criteria to require extended detention for the express purpose of preventing downstream channel erosion, and these new criteria may exert a stronger influence on aquatic diversity. Instead, their basic design objective was to maximize pollutant removal, which they did reasonably well.

The second point to stress is that streams with larger stormwater ponds should be considered "regulated streams" (Ward and Stanford, 1979), which have a significantly altered aquatic insect community downstream of the ponds. For example, Galli (1988) has reported that on-stream wet stormwater ponds shift the trophic structure of the aquatic insect community. The insect community above the pond was dominated by shredders, while the insect community below the pond was dominated by scrapers, filterers and collectors. Of particular note, several pollution-sensitive species were eliminated below the pond. Galli reported that changes in stream temperatures, carbon supply and substrate fouling were responsible for the downstream shift in the aquatic insect community. Thus, while it is clear that large stormwater ponds can be expected to have a negative effect on aquatic insect diversity, they could still exert positive influence on other stream quality indicators.

Effect of Stream Buffers

A handful of studies have evaluated biological indicator scores for urban streams that have extensive forest buffers, compared to streams where they were mostly or completely absent (Horner and May, 1999; Horner *et al.,* 2001; May *et al.*, 1997; MNCPPC, 2000; Roth *et al.,* 1998; Steedman, 1988). Biological indicators included various indices of aquatic insect, fish and salmon diversity. Each study sampled a large population of small subwatersheds over a range of IC and derived a quantitative measure to express the continuity, width and forest cover of the riparian buffer network within each subwatershed. Riparian forests were hypothesized to have a positive influence on stream biodiversity, given the direct ways they contribute to stream habitat (e.g., shading, woody debris, leaf litter, bank stability, and organic carbon supply).

All five studies detected a small to moderate positive effect when forested stream buffers were present (frequently defined as at least two-thirds of the stream network with at least 100 feet of stream side forest). The greatest effect was reported by Horner and May (1999) and Horner *et al.* (2001) for salmon streams in the Puget Sound ecoregion. If excellent riparian habitats were preserved, they generally reported that fish diversity could be maintained up to 15% IC, and good aquatic insect diversity could be maintained with as much as 30% IC. Steedman (1988) reported a somewhat smaller effect for Ontario streams. MNCPPC (2000), May *et al.* (1997), and Roth *et al.* (1998) could not find a statistically significant relationship between riparian quality and urban stream quality indicators but did report that most outliers (defined as higher IC subwatersheds with unusually high biological indicator scores) were generally associated with extensive stream side forest.

1.1.4 Recommendations for Further ICM Research

At this point, we recommend three research directions to improve the utility of the ICM for watershed managers. The **first direction** is to expand basic research on the relationship between IC and stream quality indicators that have received little scrutiny. In particular, more work is needed to define the relationship between IC and hydrological and physical indicators such as the following:

- Physical loss or alteration of the stream network
- Stream habitat measures
- Riparian continuity
- Baseflow conditions during dry weather

In addition, more watershed research is needed in ecoregions and physiographic areas where the ICM has not yet been widely tested. Key areas include Florida, arid and semiarid climates, karst areas and mountainous regions. The basic multiple subwatershed monitoring protocol set forth by Schueler (1994a) can be used to investigate IC/stream quality relationships, although it would be wise to measure a wider suite of subwatershed variables beyond IC (e.g., forest cover, turf cover, and riparian continuity).

The **second** research direction is to more clearly define the impact of watershed treatment on stream quality indicators. Based on

the insurmountable problems encountered in controlling variation at the subwatershed level, it may be necessary to abandon the multiple watershed or paired watershed sampling approaches that have been used to date. Instead, longitudinal monitoring studies within individual subwatersheds may be a more powerful tool to detect the effect of watershed treatment. These studies could track changes in stream quality indicators in individual subwatersheds over the entire development cycle: pre-development land use, clearing, construction, build out, and post construction. In most cases, longitudinal studies would take five to 10 years to complete, but they would allow watershed managers to measure and control the inherent variability at the subwatershed level and provide a "before and after" test of watershed treatment. Of course, a large population of test subwatersheds would be needed to satisfactorily answer the watershed treatment question.

The **third** research direction is to monitor more non-supporting streams, in order to provide a stronger technical foundation for crafting more realistic urban stream standards and to see how they respond to various watershed restoration treatments. As a general rule, most researchers have been more interested in the behavior of sensitive and impacted streams. The non-supporting stream category spans a wide range of IC, yet we do not really understand how stream quality indicators behave over the entire 25 to 100% IC range.

For example, it would be helpful to establish the IC level at the upper end of the range where streams are essentially transformed into an artificial conveyance system (i.e., become pipes or artificial channels). It would also be interesting to sample more streams near the lower end of the non-supporting category (25 to 35% IC) to detect whether stream quality indicators respond to past watershed treatment or current watershed restoration efforts. For practical reasons, the multiple subwatershed sampling approach is still recommended to characterize indicators in non-supporting streams. However, researchers will need to screen a large number of non-supporting subwatersheds in order to identify a few subwatersheds that are adequate for subsequent sampling (i.e., to control for area, IC, development age, percent watershed treatment, type of conveyance systems, etc.).

1.2 Impacts of Urbanization on Downstream Receiving Waters

In this section, we review the impacts of urbanization on downstream receiving waters, primarily from the standpoint of impacts caused by poor stormwater quality. We begin by looking at the relationship between IC and stormwater pollutant loadings. Next, we discuss the sensitivity of selected downstream receiving waters to stormwater pollutant loads. Lastly, we examine the effect of watershed treatment in reducing stormwater pollutant loads.

1.2.1 Relationship Between Impervious Cover and Stormwater Quality

Urban stormwater runoff contains a wide range of pollutants that can degrade downstream water quality (Table 3). Several generalizations can be supported by the majority of research conducted to date. First, the unit area pollutant load delivered by stormwater runoff to receiving waters increases in direct proportion to watershed IC. This is not altogether surprising, since pollutant load is the product of the average pollutant concentration and stormwater runoff volume. Given that runoff volume increases in direct proportion to IC, pollutant loads must automatically increase when IC increases, as long the average pollutant concentration stays the same (or increases). This relationship is a central assumption in most simple and complex pollutant loading models (Bicknell *et al.*, 1993; Donigian and Huber, 1991; Haith *et al.*, 1992; Novotny and Chester, 1981; NVPDC, 1987; Pitt and Voorhees, 1989).

The second generalization is that stormwater pollutant concentrations are generally similar

Table 3: Summary of Urban Stormwater Pollutant Loads on Quality of Receiving Waters

Pollutants in Urban Stormwater	WQ Impacts To:					Higher Unit Load?	Load a function of IC?	Other Factors Important in Loading
	R	L	E	A	W			
Suspended Sediment	Y	Y	Y	N	Y	Y (ag)	Y	channel erosion
Total Nitrogen	N	N	Y	Y	N	Y (ag)	Y	septic systems
Total Phosphorus	Y	Y	N	N	Y	Y (ag)	Y	tree canopy
Metals	Y	Y	Y	?	N	Y	Y	vehicles
Hydrocarbons	Y	Y	Y	Y	Y	Y	?	related to VMTs and hotspots
Bacteria/Pathogens	Y	Y	Y	N	Y	Y	Y	many sources
Organic Carbon	N	?	?	?	Y	Y	Y	
MTBE	N	N	N	Y	Y	Y	?	roadway, VMTs
Pesticides	?	?	?	?	Y	Y	?	turf/landscaping
Chloride	?	Y	N	Y	Y	Y	?	road density
Trash/Debris	Y	Y	Y	N	?	Y	Y	curb and gutters

Major Water Quality Impacts Reported for:
R = River, L = Lake, E = Estuary, A = Aquifer, W = Surface Water Supply
Higher Unit Area Load? Yes (compared to all land uses) (ag): with exception of cropland
Load a function of IC? Yes, increases proportionally with IC

at the catchment level, regardless of the mix of IC types monitored (e.g., residential, commercial, industrial or highway runoff). Several hundred studies have examined stormwater pollutant concentrations from small urban catchments and have generally found that the variation within a catchment is as great as the variation between catchments. Runoff concentrations tend to be log-normally distributed, and therefore the long term "average" concentration is best expressed by a median value. It should be kept in mind that researchers have discovered sharp differences in pollutant concentrations for smaller, individual components of IC (e.g., rooftops, parking lots, streets, driveways and the like). Since most urban catchments are composed of many kinds of IC, this mosaic quality tempers the variability in long term pollutant concentrations at the catchment or subwatershed scale.

The third generalization is that median concentrations of pollutants in urban runoff are usually higher than in stormwater runoff from most other non-urban land uses. Consequently, the unit area nonpoint pollutant load generated by urban land normally exceeds that of nearly all watershed land uses that it replaces (forest, pasture, cropland, open space — see Table 3). One important exception is cropland, which often produces high unit area sediment and nutrient loads in many regions of the country. In these watersheds, conversion of intensively managed crops to low density residential development may actually result in a slightly decreased sediment or nutrient load. On the other hand, more intensive land development (30% IC or more) will tend to equal or exceed cropland loadings.

The last generalization is that the effect of IC on stormwater pollutant loadings tends to be weakest for subwatersheds in the one to 10% IC range. Numerous studies have suggested that other watershed and regional factors may have a stronger influence, such as the underlying geology, the amount of carbonate rock in the watershed, physiographic region, local soil types, and most important, the relative fraction of forest and crop cover in the subwatershed (Herlihy *et al*., 1998 and Liu *et al.,* 2000). The limited influence of IC on pollutant loads is generally consistent with the finding for hydrologic, habitat and biological indicators over this narrow range of IC. Once again, watershed managers are advised to track other watershed indicators in the sensitive stream category, such as forest or crop cover.

1.2.2 Water Quality Response to Stormwater Pollution

As noted in the previous section, most ICM research has been done on streams, which are directly influenced by increased stormwater. Many managers have wondered whether the ICM also applies to downstream receiving waters, such as lakes, water supply reservoirs and small estuaries. In general, the exact water quality response of downstream receiving waters to increased nonpoint source pollutant loads depends on many factors, including the specific pollutant, the existing loading generated by the converted land use, and the geometry and hydraulics of the receiving water. Table 3 indicates the sensitivity of rivers, lakes, estuaries, aquifers and water supply reservoirs to various stormwater pollutants.

Lakes and the ICM

The water column and sediments of urban lakes are impacted by many stormwater pollutants, including sediment, nutrients, bacteria, metals, hydrocarbons, chlorides, and trash/debris. Of these pollutants, limnologists have always regarded phosphorus as the primary lake management concern, given that more than 80% of urban lakes experience symptoms of eutrophication (CWP, 2001a).

In general, phosphorus export steadily increases as IC is added to a lake watershed, although the precise amount of IC that triggers eutrophication problems is unique to each urban lake. With a little effort, it is possible to calculate the specific IC threshold for an individual lake, given its internal geometry, the size of its contributing watershed, current in-lake phosphorus concentration, degree of watershed treatment, and the desired water quality goals for the lake (CWP, 2001a). As a general rule, most lakes are extremely sensitive

to increases in phosphorus loads caused by watershed IC. Exceptions include lakes that are unusually deep and/or have very small drainage area/lake area ratios. In most lakes, however, even a small amount of watershed development will result in an upward shift in trophic status (CWP, 2001a).

Reservoirs and the ICM

While surface water supply reservoirs respond to stormwater pollutant loads in the same general manner as lakes, they are subject to stricter standards because of their uses for drinking water. In particular, water supply reservoirs are particularly sensitive to increased turbidity, pathogens, total organic carbon, chlorides, metals, pesticides and hydrocarbon loads, in addition to phosphorus (Kitchell, 2001). While some pollutants can be removed or reduced through expanded filtering and treatment at drinking water intakes, the most reliable approach is to protect the source waters through watershed protection and treatment.

Consequently, we often recommend that the ICM be used as a "threat index" for most drinking water supplies. Quite simply, if current or future development is expected to exceed 10% IC in the contributing watershed, we recommend that a very aggressive watershed protection strategy be implemented (Kitchell, 2001). In addition, we contend that drinking water quality cannot be sustained once watershed IC exceeds 25% and have yet to find an actual watershed where a drinking water utility has been maintained under these conditions.

Small Tidal Estuaries and Coves and the ICM

The aquatic resources of small tidal estuaries, creeks, and coves are often highly impacted by watershed development and associated activities, such as boating/marinas, wastewater discharge, septic systems, alterations in freshwater flow and wetland degradation and loss. Given the unique impacts of eutrophication on the marine system and stringent water quality standards for shellfish harvesting, the stormwater pollutants of greatest concern in the estuarine water column are nitrogen and fecal coliform bacteria. Metals and hydrocarbons in stormwater runoff can also contaminate bottom sediments, which can prove toxic to local biota (Fortner *et al*., 1996; Fulton *et al.*, 1996; Kucklick *et al.*, 1997; Lerberg *et al.*, 2000; Sanger *et al.,* 1999; Vernberg *et al.*, 1992).

While numerous studies have demonstrated that physical, hydrologic, water quality and biological indicators differ in urban and non-urban coastal watersheds, only a handful of studies have used watershed IC as an indicator of estuarine health. These studies show significant correlations with IC, although degradation thresholds may not necessarily adhere to the ICM due to tidal dilution and dispersion. Given the limited research, it is not fully clear if the ICM can be applied to coastal systems without modification.

Atmospheric deposition is considered a primary source of nitrogen loading to estuarine watersheds. Consequently, nitrogen loads in urban stormwater are often directly linked to IC. Total nitrogen loads have also been linked to groundwater input, especially from subsurface discharges from septic systems, which are common in low density coastal development (Swann, 2001; Valiela *et al.*, 1997; Vernberg *et al.*, 1996a). Nitrogen is generally considered to be the limiting nutrient in estuarine systems, and increased loading has been shown to increase algal and phytoplankton biomass and cause shifts in the phytoplankton community and food web structure that may increase the potential for phytoplankton blooms and fish kills (Bowen and Valiela, 2001; Evgenidou *et al.*, 1997; Livingston, 1996).

Increased nitrogen loads have been linked to declining seagrass communities, finfish populations, zooplankton reproduction, invertebrate species richness, and shellfish populations (Bowen and Valiela, 2001; Rutkowski *et al*., 1999; Short and Wyllie-Echeverria, 1996; Valiela and Costa, 1988). Multiple studies have shown significant increases in nitrogen loading as watershed land use becomes more urban (Valiela *et al.,* 1997; Vernberg *et al.* 1996a; Wahl *et al.,* 1997). While a few studies

link nitrogen loads with building and population density, no study was found that used IC as an indicator of estuarine nitrogen loading.

The second key water quality concern in small estuaries is high fecal coliform levels in stormwater runoff, which can lead to the closure of shellfish beds and swimming beaches. Waterfowl and other wildlife have also been shown to contribute to fecal coliform loading (Wieskel *et al.*, 1996). Recent research has shown that fecal coliform standards are routinely violated during storm events at very low levels of IC in coastal watersheds (Mallin *et al.,* 2001; Vernberg *et al.*, 1996b; Schueler, 1999). Maiolo and Tschetter (1981) found a significant correlation between human population and closed shellfish acreage in North Carolina, and Duda and Cromartie (1982) found greater fecal coliform densities when septic tank density and IC increased, with an approximate threshold at 10% watershed IC.

Recently, Mallin *et al.* (2000) studied five small North Carolina estuaries of different land uses and showed that fecal coliform levels were significantly correlated with watershed population, developed land and IC. Percent IC was the most statistically significant indicator and could explain 95% of the variability in fecal coliform concentrations. They also found that shellfish bed closures were possible in watersheds with less than 10% IC, common in watersheds above 10% IC, and almost certain in watersheds above 20% IC. While higher fecal coliform levels were observed in developed watersheds, salinity, flushing and proximity to pollution sources often resulted in higher concentrations at upstream locations and at high tides (Mallin *et al.*, 1999). While these studies support the ICM, more research is needed to prove the reliability of the ICM in predicting shellfish bed closures based on IC.

Several studies have also investigated the impacts of urbanization on estuarine fish, macrobenthos and shellfish communities. Increased PAH accumulation in oysters, negative effects of growth in juvenile sheepshead minnows, reduced molting efficiency in copepods, and reduced numbers of grass shrimp have all been reported for urban estuaries as compared to forested estuaries (Fulton *et al.,* 1996). Holland *et al. (*1997) reported that the greatest abundance of penaid shrimp and mummichogs was observed in tidal creeks with forested watersheds compared to those with urban cover. Porter *et al.* (1997) found lower grass shrimp abundance in small tidal creeks adjacent to commercial and urban development, as compared to non-urban watersheds.

Lerberg *et al.* (2000) studied small tidal creeks and found that highly urban watersheds (50% IC) had the lowest benthic diversity and abundance as compared to suburban and forested creeks, and benthic communities were numerically dominated by tolerant oligochaetes and polychaetes. Suburban watersheds (15 to 35% IC) also showed signs of degradation and had some pollution tolerant macrobenthos, though not as markedly as urban creeks. Percent abundance of pollution-indicative species showed a marked decline at 30% IC, and the abundance of pollution-sensitive species also significantly correlated with IC (Lerberg *et al*., 2000). Holland *et al*. (1997) reported that the variety and food availability for juvenile fish species was impacted at 15 to 20% IC.

Lastly, a limited amount of research has focused on the direct impact of stormwater runoff on salinity and hypoxia in small tidal creeks. Blood and Smith (1996) compared urban and forested watersheds and found higher salinities in urban watersheds due to the increased number of impoundments. Fluctuations in salinity have been shown to affect shellfish and other aquatic populations (see Vernberg, 1996b). When urban and forested watersheds were compared, Lerberg *et al.* (2000) reported that higher salinity fluctuations occurred most often in developed watersheds; significant correlations with salinity range and IC were also determined. Lerberg *et al.* (2000) also found that the most severe and frequent hypoxia occurred in impacted salt marsh creeks and that dissolved oxygen dynamics in tidal creeks were comparable to dead-end canals common in residential marina-style

coastal developments. Suburban watersheds (15 to 35% IC) exhibited signs of degradation and had some pollution-tolerant macrobenthic species, though not to the extent of urban watersheds (50% IC).

In summary, recent research suggests that indicators of coastal watershed health are linked to IC. However, more research is needed to clarify the relationship between IC and estuarine indicators in small tidal estuaries and high salinity creeks.

1.2.3 Effect of Watershed Treatment on Stormwater Quality

Over the past two decades, many communities have invested in watershed protection practices, such as stormwater treatment practices (STPs), stream buffers, and better site design, in order to reduce pollutant loads to receiving waters. In this section, we review the effect of watershed treatment on the quality of stormwater runoff.

Effect of Stormwater Treatment Practices
We cannot directly answer the question as to whether or not stormwater treatment practices can significantly reduce water quality impacts at the watershed level, simply because no controlled monitoring studies have yet been conducted at this scale. Instead, we must rely on more indirect research that has tracked the change in mass or concentration of pollutants as they travel through individual stormwater treatment practices. Thankfully, we have an abundance of these performance studies, with nearly 140 monitoring studies evaluating a diverse range of STPs, including ponds, wetlands, filters, and swales (Winer, 2000).

These studies have generally shown that stormwater practices have at least a moderate ability to remove many pollutants in urban stormwater. Table 4 provides average removal efficiency rates for a range of practices and stormwater pollutants, and Table 5 profiles the mean storm outflow concentrations for various practices. As can be seen, some groups of practices perform better than others in removing certain stormwater pollutants. Consequently, managers need to carefully choose which practices to apply to solve the primary water quality problems within their watersheds.

It is also important to keep in mind that site-based removal rates cannot be extrapolated to the watershed level without significant adjustment. Individual site practices are never implemented perfectly or consistently across a watershed. At least three discount factors need to be considered: bypassed load, treatability and loss of performance over time. For a review on how these discounts are derived, consult Schueler and Caraco (2001). Even under the most optimistic watershed implementation scenarios, overall pollutant reduc-

Table 4: The Effectiveness of Stormwater Treatment Practices in Removing Pollutants - Percent Removal Rate (Winer, 2000)

Practice	N	TSS	TP	OP	TN	NOx	Cu	Zn	Oil/ Grease[1]	Bacteria
Dry Ponds	9	47	19	N/R	25	3.5	26	26	3	44
Wet Ponds	43	80	51	65	33	43	57	66	78	70
Wetlands	36	76	49	48	30	67	40	44	85	78
Filtering Practices[2]	18	86	59	57	38	-14	49	88	84	37
Water Quality Swales	9	81	34	1.0	84	31	51	71	62	-25
Ditches[3]	9	31	-16	N/R	-9.0	24	14	0	N/R	0
Infiltration	6	95	80	85	51	82	N/R	N/R	N/R	N/R

1: Represents data for Oil and Grease and PAH
2: Excludes vertical sand filters
3: Refers to open channel practices not designed for water quality
N/R = Not Reported

Table 5: Median Effluent Concentrations from Stormwater Treatment Practices (mg/l) (Winer, 2000)

Practice	N	TSS	TP	OP	TN	NOx	Cu[1]	Zn[1]
Dry Ponds[2]	3	28	0.18	N/R	0.86	N/R	9.0	98
Wet Ponds	25	17	0.11	0.03	1.3	0.26	5.0	30
Wetlands	19	22	0.20	0.07	1.7	0.36	7.0	31
Filtering Practices[3]	8	11	0.10	0.07	1.1	0.55	9.7	21
Water Quality Swales	7	14	0.19	0.09	1.1	0.35	10	53
Ditches[4]	3	29	0.31	N/R	2.4	0.72	18	32

1. Units for Zn and Cu are micrograms per liter (Fg/l)
2. Data available for Dry Extended Detention Ponds only
3. Excludes vertical sand filters
4. Refers to open channel practices not designed for water quality
N/R = Not Reported

tions by STPs may need to be discounted by at least 30% to account for partial watershed treatment.

Even with discounting, however, it is evident that STPs can achieve enough pollutant reduction to mimic rural background loads for many pollutants, as long as the watershed IC does not exceed 30 to 35%. This capability is illustrated in Figure 5, which shows phosphorus load as a function of IC, with and without stormwater treatment.

Effect of Stream Buffers/Riparian Areas
Forested stream buffers are thought to have very limited capability to remove stormwater pollutants, although virtually no systematic monitoring data exists to test this hypothesis. The major reason cited for their limited removal capacity is that stormwater generated from upland IC has usually concentrated before it reaches the forest buffer and therefore crosses the buffer in a channel, ditch or storm drain pipe. Consequently, the opportunity to filter runoff is lost in many forest buffers in urban watersheds.

Effect of Better Site Design
Better site design (BSD) is a term for nonstructural practices that minimize IC, conserve natural areas and distribute stormwater treatment across individual development sites. BSD is also known by many other names, including conservation development, low-impact development, green infrastructure, and sustainable urban drainage systems. While

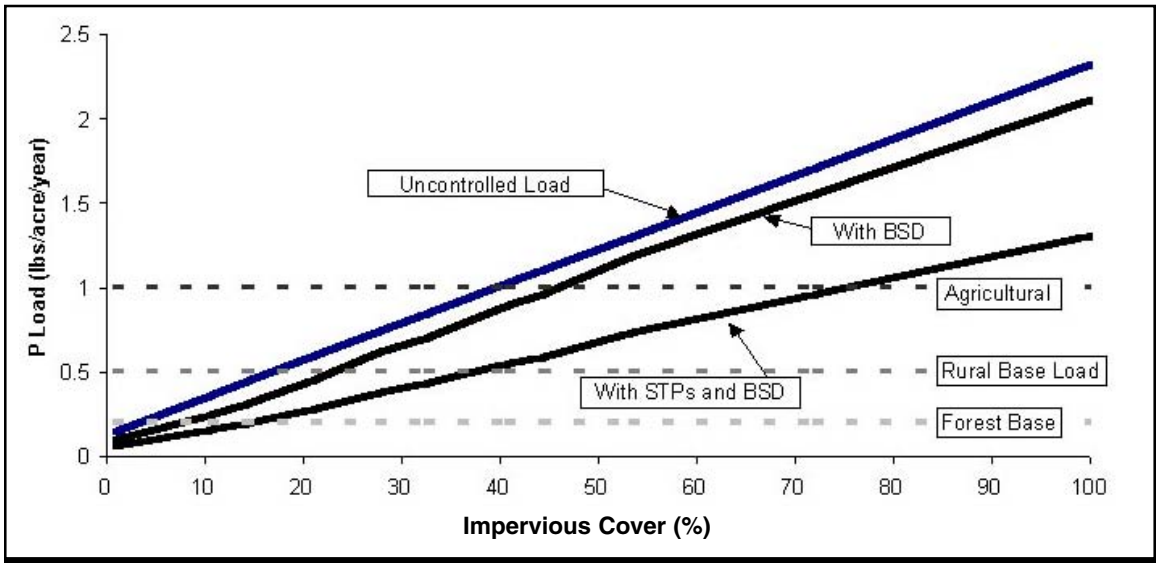

Figure 5: Estimated Phosphorus Load as a Function of Impervious Cover, Discounted Stormwater Treatment and Better Site Design (Schueler and Caraco, 2001)

some maintain that BSD is an alternative to traditional STPs, most consider it to be an important complement to reduce pollutant loads.

While BSD has become popular in recent years, only one controlled research study has evaluated its potential performance, and this is not yet complete (i.e. Jordan Cove, CT).

Indirect estimates of the potential value of BSD to reduce pollutant discharges have been inferred from modeling and redesign analyses (Zielinski, 2000). A typical example is provided in Figure 5, which shows the presumed impact of BSD in reducing phosphorus loadings. As is apparent, BSD appears to be a very effective strategy in the one to 25% IC range, but its benefits diminish beyond that point.

1.3 Implications of the ICM for Watershed Managers

One of the major policy implications of the ICM is that in the absence of watershed treatment, it predicts negative stream impacts at an extremely low intensity of watershed development. To put this in perspective, consider that a watershed zoned for two-acre lot residential development will generally exceed 10% IC, and therefore shift from a sensitive to an impacted stream classification (Cappiella and Brown, 2001). Thus, if a community wants to protect an important water resource or a highly regarded species (such as trout, salmon or an endangered freshwater mussel), the ICM suggests that there is a maximum limit to growth that is not only quite low, but is usually well below the current zoning for many suburban or even rural watersheds. Consequently, the ICM suggests the unpleasant prospect that massive down-zoning, with all of the associated political and legal carnage involving property rights and economic development, may be required to maintain stream quality.

It is not surprising, then, that the ICM debate has quickly shifted to the issue of whether or not watershed treatment practices can provide adequate mitigation for IC. How much relief can be expected from stream buffers, stormwater ponds, and other watershed practices, which might allow greater development density within a given watershed? Only a limited amount of research has addressed this question, and the early results are not reassuring (reviewed in section 1.1.3). At this early stage, researchers are still having trouble detecting the impact of watershed treatment, much less defining it. As noted earlier, both watershed research techniques and practice implementation need to be greatly improved if we ever expect to get a scientifically defensible answer to this crucial question. Until then, managers should be extremely cautious in setting high expectations for how much watershed treatment can mitigate IC.

1.3.1 Management of Non-Supporting Streams

Most researchers acknowledge that streams with more than 25% IC in their watersheds cannot support their designated uses or attain water quality standards and are severely degraded from a physical and biological standpoint. As a consequence, many of these streams are listed for non-attainment under the Clean Water Act and are subject to Total Maximum Daily Load (TMDL) regulations. Communities that have streams within this regulatory class must prepare implementation plans that demonstrate that water quality standards can ultimately be met.

While some communities have started to restore or rehabilitate these streams in recent years, their efforts have yielded only modest improvements in water quality and biological indicators. In particular, no community has yet demonstrated that they can achieve water quality standards in an urban watershed that exceeds 25% IC. Many communities are deeply concerned that non-supporting streams may never achieve water quality standards, despite massive investments in watershed restoration. The ICM suggests that water quality standards may need to be sharply revised for streams with more than 25% IC, if they are ever to come into attainment. While states have authority to create more achievable standards for non-supporting streams within the regulatory framework of the Clean Water Act (Swietlik, 2001), no state has yet exercised this authority. At this time, we are not aware of any water quality standards that are based on the ICM or similar urban stream classification techniques.

Two political perceptions largely explain why states are so reticent about revising water quality standards. The first is a concern that they will run afoul of anti-degradation provisions within the Clean Water Act or be accused of “backsliding” by the environmental community. The second concern relates to the demographics of watershed organizations across the country. According to recent surveys, slightly more than half of all watershed organizations

represent moderately to highly developed watersheds (CWP, 2001a). These urban watershed organizations often have a keen interest in keeping the existing regulatory structure intact, since it is perceived to be the only lever to motivate municipalities to implement restoration efforts in non-supporting streams.

However, revised water quality standards are urgently needed to support smart growth efforts. A key premise of smart growth is that it is more desirable to locate new development within a non-supporting subwatershed rather than a sensitive or impacted one (i.e., concentrating density and IC within an existing subwatershed helps prevent sprawl from encroaching on a less developed one). Yet while smart growth is desirable on a regional basis, it will usually contribute to already serious problems in non-supporting watersheds, which makes it even more difficult to meet water quality standards.

This creates a tough choice for regulators: if they adopt stringent development criteria for non-supporting watersheds, their added costs can quickly become a powerful barrier to desired redevelopment. If, on the other hand, they relax or waive environmental criteria, they contribute to the further degradation of the watershed. To address this problem, the Center has developed a "smart watersheds" program to ensure that any localized degradation caused by development within a non-supporting subwatershed is more than compensated for by improvements in stream quality achieved through municipal restoration efforts (CWP, in press). Specifically, the smart watersheds program includes 17 public sector programs to treat stormwater runoff, restore urban stream corridors and reduce pollution discharges in highly urban watersheds. It is hoped that communities that adopt and implement smart watershed programs will be given greater flexibility to meet state and federal water quality regulations and standards within non-supporting watersheds.

1.3.2 Use of the ICM for Urban Stream Classification

The ICM has proven to be a useful tool for classifying and managing the large inventory of streams that most communities possess. It is not unusual for a typical county to have several thousand miles of headwater streams within its political boundaries, and the ICM provides a unified framework to identify and manage these subwatersheds. In our watershed practice, we use the ICM to make an initial diagnosis rather than a final determination for stream classification. Where possible, we conduct rapid stream and subwatershed assessments as a final check for an individual stream classification, particularly if it borders between the sensitive and impacted category. As noted earlier, the statistical variation in the IC/stream quality indicator makes it difficult to distinguish between a stream with 9% versus 11% IC. Some of the key criteria we use to make a final stream classification are provided in Table 6.

1.3.3 Role of the ICM in Small Watershed Planning

The ICM has also proven to be an extremely important tool for watershed planning, since it can rapidly project how streams will change in response to future land use. We routinely estimate existing and future IC in our watershed planning practice and find that it is an excellent indicator of change for subwatersheds in the zero to 30% IC range. In particular, the ICM often forces watershed planners to directly confront land use planning and land conservation issues early in the planning process.

On the other hand, we often find that the ICM has limited planning value when subwatersheds exceed 30% IC for two practical reasons. First, the ICM does not differentiate stream conditions within this very large span of IC (i.e., there is no difference in the stream quality prediction for a subwatershed that has 39.6% IC versus one that has 58.4% IC). Second, the key management question for non-supporting watersheds is whether or not

they are potentially restorable. More detailed analysis and field investigations are needed to determine, in each subwatershed, the answer to this question. While a knowledge of IC is often used in these feasibility assessments, it is but one of many factors that needs to be considered.

Lastly, we have come to recognize several practical factors when applying the ICM for small watershed planning. These include thoughtful delineation of subwatershed boundaries, the proper accounting of a direct drainage area in larger watersheds, and the critical need for the most recent IC data. More guidance on these factors can be found in Zielinski (2001).

Impervious cover is not a perfect indicator of existing stream quality. A number of stream and subwatershed criteria should be evaluated in the field before a final classification decision is made, particularly when the stream is on the borderline between two classifications. We routinely look at the stream and subwatershed criteria to decide whether a borderline stream should be classified as sensitive or impacted. Table 6 reviews these additional criteria.

Table 6: Additional Considerations for Urban Stream Classification
Stream Criteria
Reported presence of rare, threatened or endangered species in the aquatic community (e.g., freshwater mussels, fish, crayfish or amphibians) Confirmed spawning of cold-water fish species (e.g., trout) Fair/good, good, or good to excellent macro invertebrate scores More than 65% of EPT species present in macro-invertebrate surveys No barriers impede movement of fish between the subwatershed and downstream receiving waters Stream channels show little evidence of ditching, enclosure, tile drainage or channelization Water quality monitoring indicates no standards violations during dry weather Stream and flood plain remain connected and regularly interact Stream drains to a downstream surface water supply Stream channels are generally stable, as determined by the Rosgen level analysis Stream habitat scores are rated at least fair to good
Subwatershed Criteria
Contains terrestrial species that are documented as rare, threatened and endangered Wetlands, flood plains and/or beaver complexes make up more than 10% of subwatershed area Inventoried conservation areas comprise more than 10% of subwatershed area More than 50% of the riparian forest corridor has forest cover and is either publicly owned or regulated Large contiguous forest tracts remain in the subwatershed (more than 40% in forest cover) Significant fraction of subwatershed is in public ownership and management Subwatershed connected to the watershed through a wide corridor Farming, ranching and livestock operations in the subwatershed utilize best management practices Prior development in the subwatershed has utilized stormwater treatment practices

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1.4 Summary

The remainder of this report presents greater detail on the individual research studies that bear on the ICM. Chapter 2 profiles research on hydrologic indicators in urban streams, while Chapter 3 summarizes the status of current research on the impact of urbanization on physical habitat indicators. Chapter 4 presents a comprehensive review of the impact of urbanization on ten major stormwater pollutants. Finally, Chapter 5 reviews the growing body of research on the link between IC and biological indicators within urban streams and wetlands.

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Chapter 2: Hydrologic Impacts of Impervious Cover

The natural hydrology of streams is fundamentally changed by increased watershed development. This chapter reviews the impacts of watershed development on selected indicators of stream hydrology.

This chapter is organized as follows:

2.1 Introduction
2.2 Increased Runoff Volume
2.3 Increased Peak Discharge Rates
2.4 Increased Bankfull Flow
2.5 Decreased Baseflow
2.6 Conclusions

2.1 Introduction

Fundamental changes in urban stream hydrology occur as a result of three changes in the urban landscape that accompany land development. First, large areas of the watershed are paved, rendering them impervious. Second, soils are compacted during construction, which significantly reduces their infiltration capabilities. Lastly, urban stormwater drainage systems are installed that increase the efficiency with which runoff is delivered to the stream (i.e., curbs and gutters, and storm drain pipes). Consequently, a greater fraction of annual rainfall is converted to surface runoff, runoff occurs more quickly, and peak flows become larger. Additionally, dry weather flow in streams may actually decrease because less groundwater recharge is available. Figure 6 illustrates the change in hydrology due to increased urban runoff as compared to pre-development conditions.

Research has demonstrated that the effect of watershed urbanization on peak discharge is more marked for smaller storm events. In particular, the bankfull, or channel forming flow, is increased in magnitude, frequency and duration. Increased bankfull flows have strong ramifications for sediment transport and channel enlargement. All of these changes in the natural water balance have impacts on the physical structure of streams, and ultimately affect water quality and biological diversity.

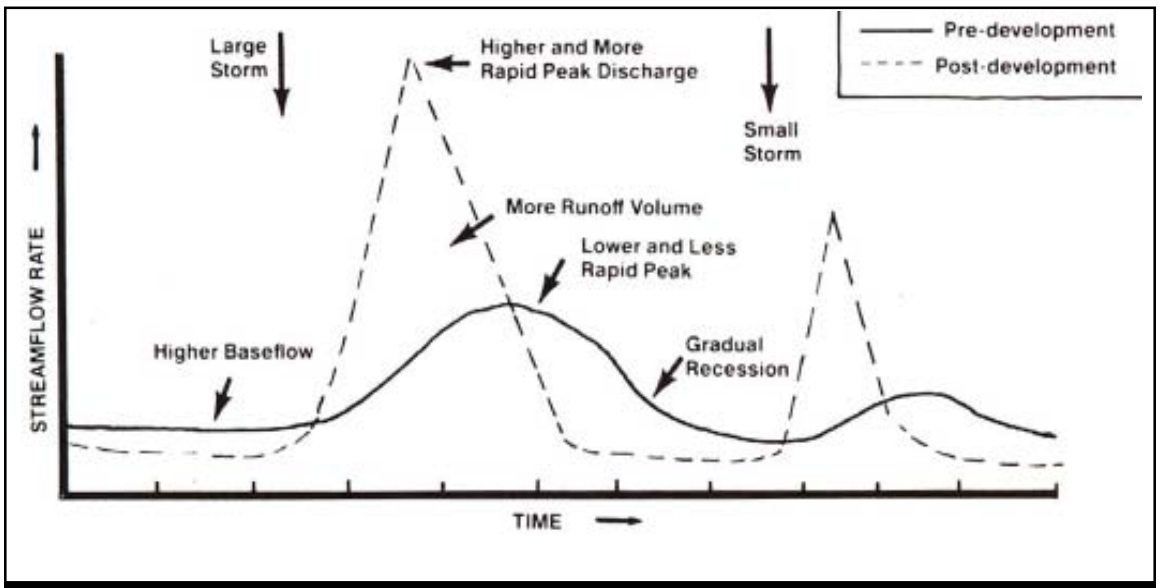

Figure 6: Altered Hydrograph in Response to Urbanization (Schueler, 1987)

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The relationship between watershed IC and stream hydrology is widely accepted, and has been incorporated into many hydrologic engineering models over the past three decades. Several articles provide a good summary of these (Bicknell *et al.*, 1993; Hirsch *et al.*, 1990; HEC, 1977; Huber and Dickinson, 1988; McCuen and Moglen, 1988; Overton and Meadows, 1976; Pitt and Voorhees, 1989; Schueler, 1987; USDA, 1992; 1986).

The primary impacts of watershed development on stream hydrology are as follows:

- Increased runoff volume
- Increased peak discharge rates
- Increased magnitude, frequency, and duration of bankfull flows
- Diminished baseflow

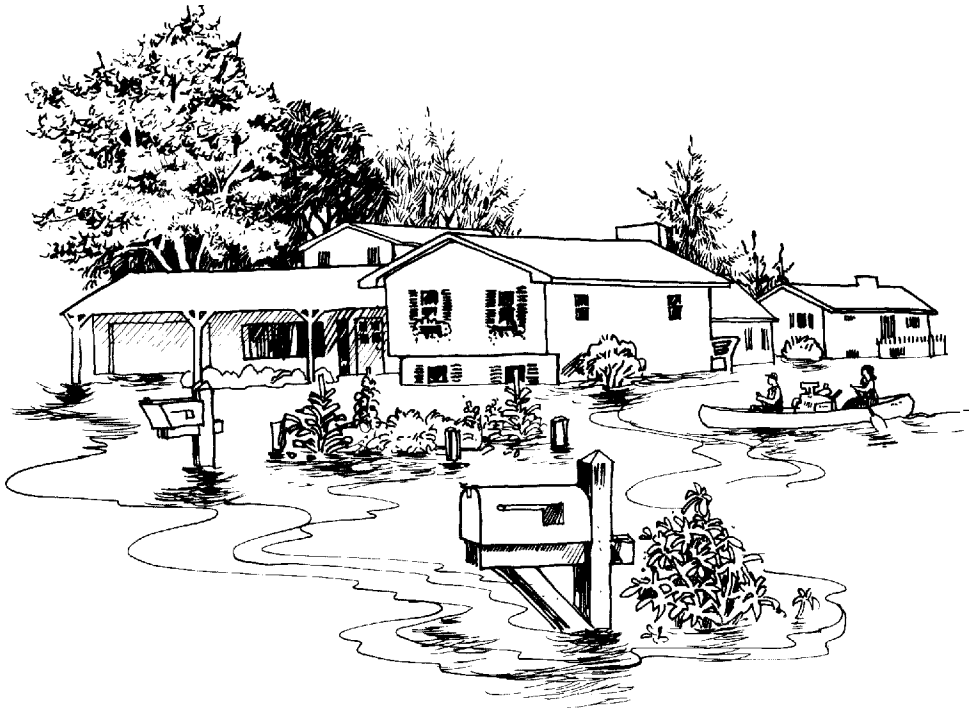

2.2 Increased Runoff Volume

Impervious cover and other urban land use alterations, such as soil compaction and storm drain construction, alter infiltration rates and increase runoff velocities and the efficiency with which water is delivered to streams. This decrease in infiltration and basin lag time can significantly increase runoff volumes. Table 7 reviews research on the impact of IC on runoff volume in urban streams. Schueler (1987) demonstrated that runoff values are directly related to subwatershed IC (Figure 7). Runoff data was derived from 44 small catchment areas across the country for EPA's Nationwide Urban Runoff Program.

Table 8 illustrates the difference in runoff volume between a meadow and a parking lot, as compiled from engineering models. The parking lot produces more than 15 times more runoff than a meadow for the same storm event.

Urban soils are also profoundly modified during the construction process. The compaction of urban soils and the removal of topsoil can decrease the infiltration capacity, causing increases in runoff volumes (Schueler, 2000). Bulk density is often used to measure soil compaction, and Table 9 illustrates how bulk density increases in many urban land uses.

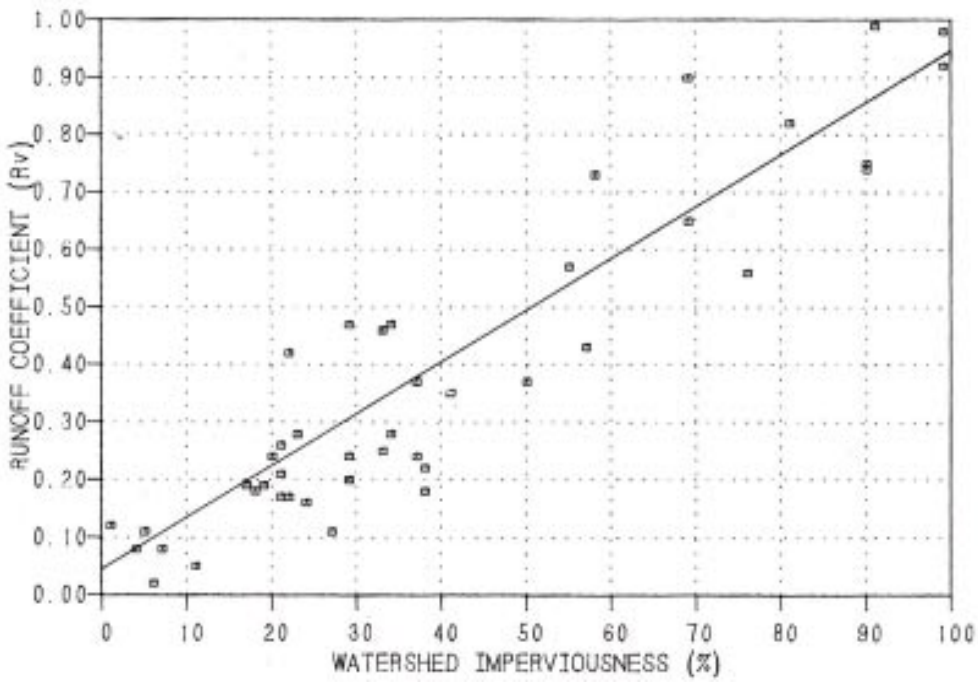

Note: 44 small urban catchments monitored during the national NURP study

Figure 7: Runoff Coefficient vs. IC (Schueler, 1987)

Table 7: Research Review of Increased Runoff Volume and Peak Discharge in Urban Streams		
Reference	**Key Finding**	**Location**
Increased Runoff Volume		
Schueler, 1987	Runoff coefficients were found to be strongly correlated with IC at 44 sites nationwide.	U.S.
Neller, 1988	Urban watershed produced more than seven times as much runoff as a similar rural watershed. Average time to produce runoff was reduced by 63% in urban watersheds compared to rural watersheds.	Australia
Increased Peak Discharge		
Hollis, 1975	Review of data from several studies showed that floods with a return period of a year or longer are not affected by a 5% watershed IC; small floods may be increased 10 times by urbanization; flood with a return period of 100 years may be doubled in size by a 30% watershed IC.	N/A
Leopold, 1968	Data from seven nationwide studies showed that 20% IC can cause the mean annual flood to double.	U.S.
Neller, 1988	Average peak discharge from urban watersheds was 3.5 times higher than peak runoff from rural watersheds.	Australia
Doll *et al.*, 2000	Peak discharge was greater for 18 urban streams versus 11 rural Piedmont streams.	NC
Sauer *et al.*, 1983	Estimates of flood discharge for various recurrence intervals showed that less than 50% watershed IC can result in a doubling of the 2-year, 10-year, and 100-year floods.	U.S.
Leopold, 1994	Watershed development over a 29-year period caused the peak discharge of the 10-year storm to more than double.	MD
Kibler *et al.*, 1981	Rainfall/runoff model for two watersheds showed that an increase in IC caused a significant increase in mean annual flood.	PA
Konrad and Booth, 2002	Evaluated streamflow data at 11 streams and found that the fraction of annual mean discharges was exceeded and maximum annual instantaneous discharges were related to watershed development and road density for moderately and highly developed watersheds.	WA

Table 8: Hydrologic Differences Between a Parking Lot and a Meadow (Schueler, 1994a)		
Hydrologic or Water Quality Parameter	**Parking Lot**	**Meadow**
Runoff Coefficient	0.95	0.06
Time of Concentration (minutes)	4.8	14.4
Peak Discharge, two-year, 24-hour storm (cfs)	4.3	0.4
Peak Discharge Rate, 100-year storm (cfs)	12.6	3.1
Runoff Volume from one-inch storm (cu. ft)	3,450	218
Runoff Velocity @ two-year storm (ft/sec)	8	1.8

Key Assumptions:

2-yr, 24-hr storm = 3.1 in; 100-yr storm = 8.9 in.

Parking Lot: 100% imperviousness; 3% slope; 200ft flow length; hydraulic radius =.03; concrete channel; suburban Washington C values

Meadow: 1% impervious; 3% slope; 200 ft flow length; good vegetative condition; B soils; earthen channel

Source: Schueler, 1994a

Table 9: Comparison of Bulk Density for Undisturbed Soils and Common Urban Conditions (Schueler, 2000)			
Undisturbed Soil Type or Urban Condition	**Surface Bulk Density (grams/cubic centimeter)**	**Urban Condition**	**Surface Bulk Density (grams/cubic centimeter)**
Peat	0.2 to 0.3	Urban Lawns	1.5 to 1.9
Compost	1.0	Crushed Rock Parking Lot	1.5 to 1.9
Sandy Soils	1.1 to 1.3	Urban Fill Soils	1.8 to 2.0
Silty Sands	1.4	Athletic Fields	1.8 to 2.0
Silt	1.3 to 1.4	Rights-of-Way and Building Pads (85%)	1.5 to 1.8
Silt Loams	1.2 to 1.5	Rights-of-Way and Building Pads (95%)	1.6 to 2.1
Organic Silts/Clays	1.0 to 1.2	Concrete Pavement	2.2
Glacial Till	1.6 to 2.0	Rock	2.65

2.3 Increased Peak Discharge Rate

Watershed development has a strong influence on the magnitude and frequency of flooding in urban streams. Peak discharge rates are often used to define flooding risk. Doll *et al.* (2000) compared 18 urban streams with 11 rural streams in the North Carolina Piedmont and found that unit area peak discharge was always greater in urban streams (Figure 8). Data from Seneca Creek, Maryland also suggest a similar increase in peak discharge. The watershed experienced significant growth during the 1950s and 1960s. Comparison of pre- and post-development gage records suggests that the peak 10-year flow event more than doubled over that time (Leopold, 1994).

Hollis (1975) reviewed numerous studies on the effects of urbanization on floods of different recurrence intervals and found that the effect of urbanization diminishes when flood recurrence gets longer (i.e., 50 and 100 years). Figure 9 shows the effect on flood magnitude in urban watersheds with 30% IC, and shows the one-year peak discharge rate increasing by a factor of 10, compared to an undeveloped watershed. In contrast, floods with a 100-year recurrence interval only double in size under the same watershed conditions.

Sauer *et al.* (1983) evaluated the magnitude of flooding in urban watersheds throughout the United States. An equation was developed for estimating discharge for floods of two-year, 10-year, and 100-year recurrence intervals. The equations used IC to account for increased runoff volume and a basin development factor to account for sewers, curbs and gutters, channel improvements and drainage development. Sauer noted that IC is not the dominant factor in determining peak discharge rates for extreme floods because these storm events saturate the soils of undeveloped watersheds and produce high peak discharge rates. Sauer found that watersheds with 50% IC can increase peak discharge for the two-year flood by a factor of four, the 10-year flood by a factor of three, and the 100-year flood by a factor of 2.5, depending on the basin development factor (Figure 10).

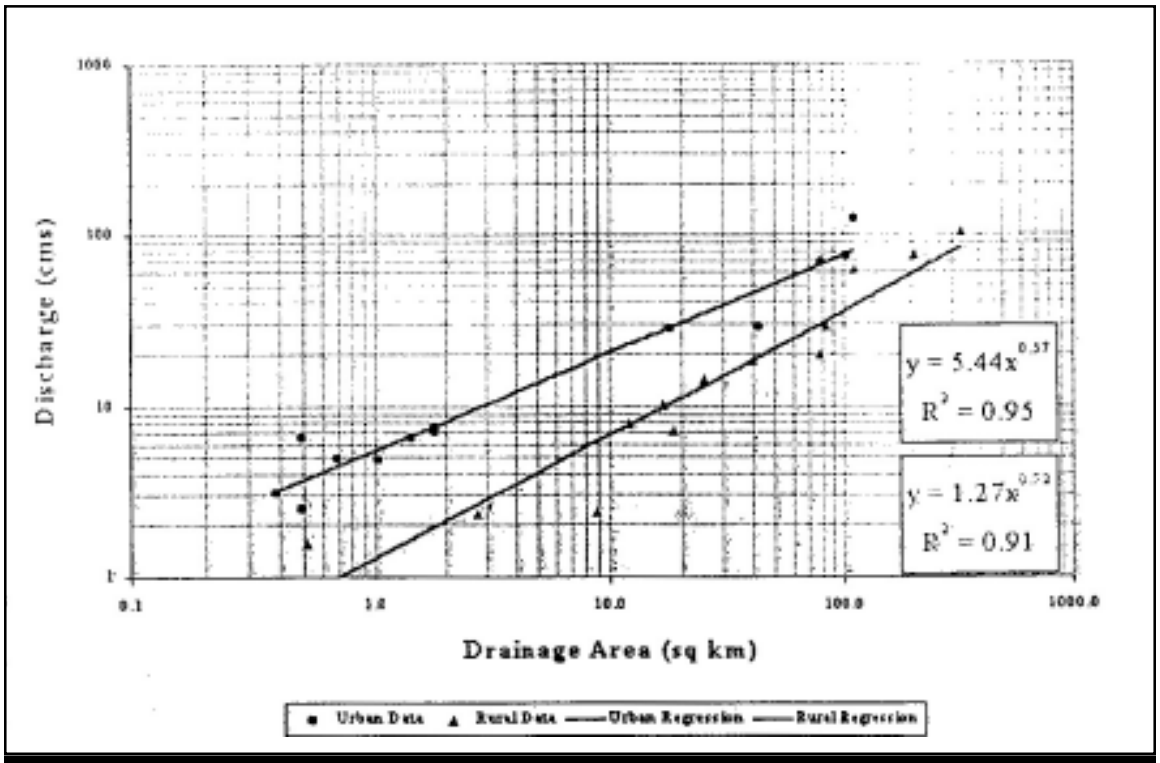

Figure 8: Peak Discharge for Urban and Rural Streams in North Carolina (Doll *et al.*, 2000)

2.4 Increased Bankfull Flow

Urbanization also increases the frequency and duration of peak discharge associated with smaller flood events (i.e., one- to two-year return storms). In terms of stream channel morphology, these more frequent bankfull flows are actually much more important than large flood events in forming the channel. In fact, Hollis (1975) demonstrated that urbanization increased the frequency and magnitude of bankfull flow events to a greater degree than the larger flood events.

An example of the increase in bankfull flow in arid regions is presented by the U.S. Geological Survey (1996), which compared the peak discharge rate from two-year storm events before and after watersheds urbanized in Parris Valley, California. Over an approximately 20-year period, watershed IC increased by 13.5%, which caused the two-year peak flow to more than double. Table 10 reviews other research studies on the relationship between watershed IC and bankfull flows in urban streams.

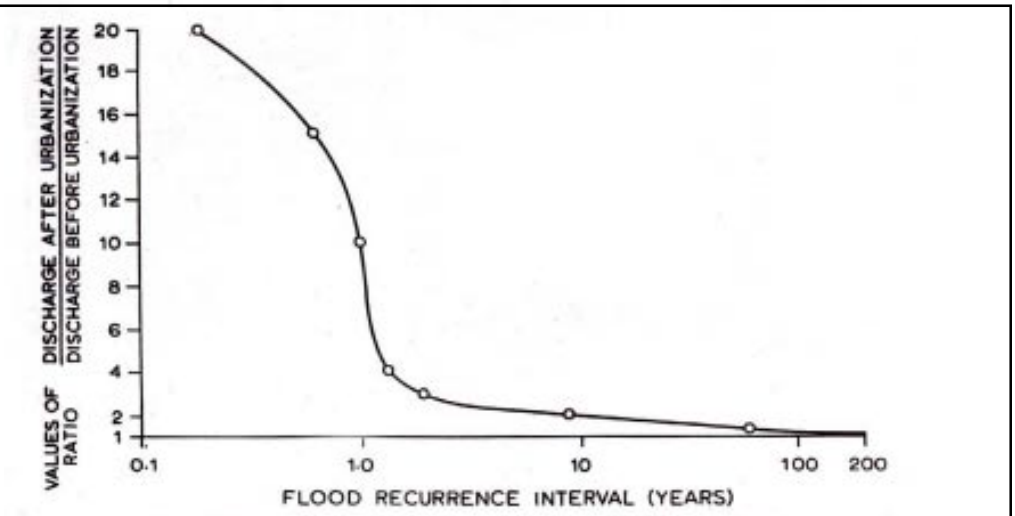

Fig. 3. Effect on flood magnitudes of paving 20% of a basin (based on Figure 2).

Figure 9: Effect on Flood Magnitudes of 30% Basin IC (Hollis, 1975)

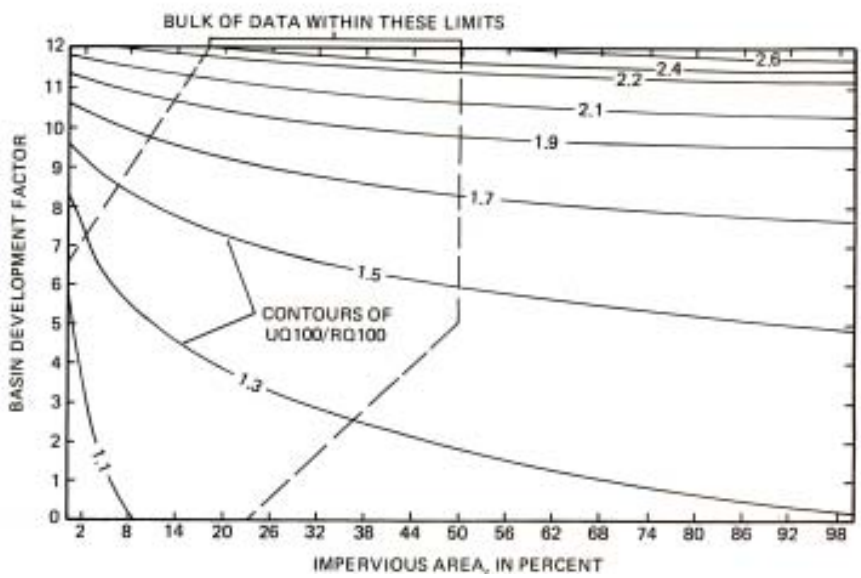

Figure 10: Relationship of Urban/Rural 100-Year Peak Flow Ratio to Basin Development Factor and IC (Sauer *et al.*, 1983)

Table 10: Research Review of Increased Bankfull Discharge in Urban Streams		
Reference	**Key Finding**	**Location**
Booth and Reinelt, 1993	Using a simulation model and hydrologic data from four watersheds, it was estimated that more than 10% watershed IC may cause discharge from the two-year storm under current conditions to equal or exceed discharge from the 10-year storm under forested conditions.	WA
Fongers and Fulcher, 2001	Bankfull flow of 1200 cfs was exceeded more frequently over time with urbanization, and exceedence was three times as frequent from 1930s to 1990s.	MI
USGS, 1996	Over a 20-year period, IC increased 13.5%, and the two-year peak flow more than doubled in a semi-arid watershed.	CA
Henshaw and Booth, 2000	Two of three watersheds in the Puget Sound lowlands showed increasing flashiness over 50 years with urbanization.	WA
Leopold, 1968	Using hydrologic data from a nine-year period for North Branch Brandywine Creek, it was estimated that for a 50% IC watershed, bankfull frequency would be increased fourfold.	PA
Leopold, 1994	Bankfull frequency increased two to seven times after urbanization in Watts Branch.	MD
MacRae, 1996	For a site downstream of a stormwater pond in Markham, Ontario hours of exceedence of bankfull flows increased by 4.2 times after the watershed urbanized (34% IC)	Ontario

Leopold (1968) evaluated data from seven nationwide studies and extrapolated this data to illustrate the increase in bankfull flows due to urbanization. Figure 11 summarizes the relationship between bankfull flows over a range of watershed IC. For example, watersheds that have 20% IC increase the number of flows equal to or greater than bankfull flow by a factor of two. Leopold (1994) also observed a dramatic increase in the frequency of the bankfull event in Watts Branch, an urban subwatershed in Rockville, Maryland. This watershed experienced significant urban development during the 1950s and 1960s. Leopold compared gage records and found that the bankfull storm event frequency increased from two to seven times per year from 1958 to 1987.

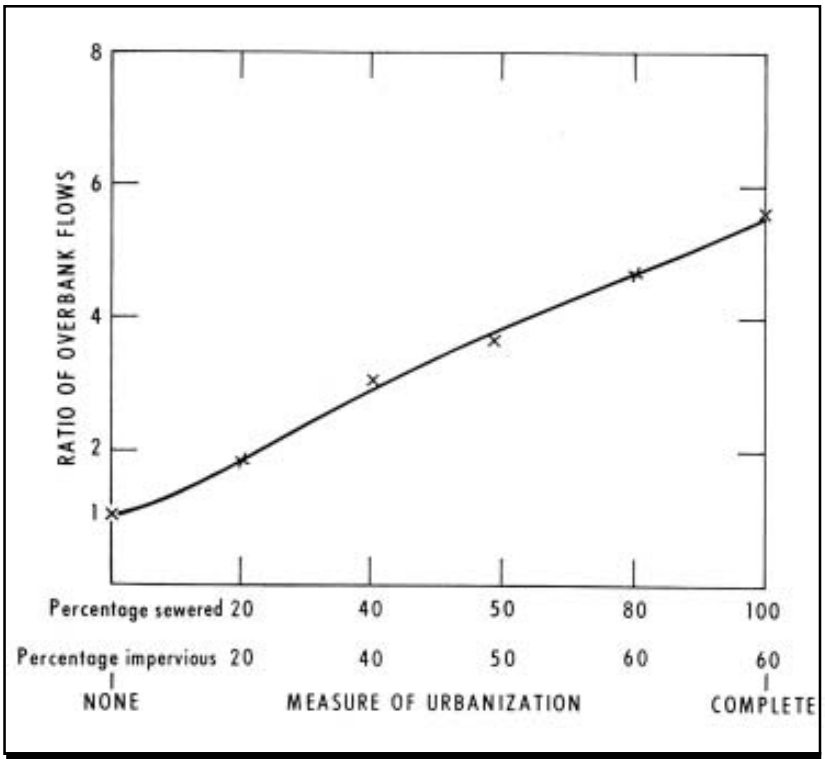

Figure 11: Increase in Bankfull Flows Due to Urbanization (Leopold, 1968)

More recent data on bankfull flow frequency was reported for the Rouge River near Detroit, Michigan by Fongers and Fulcher (2001). They noted that channel-forming flow (1200 cfs) was exceeded more frequently as urbanization increased in the watershed and had become three times more frequent between 1930 and 1990 (Figure 12).

McCuen and Moglen (1988) have documented the increase in duration of bankfull flows in response to urbanization using hydrology models. MacRae (1996), monitored a stream in Markham, Ontario downstream of a stormwater pond and found that the hours of

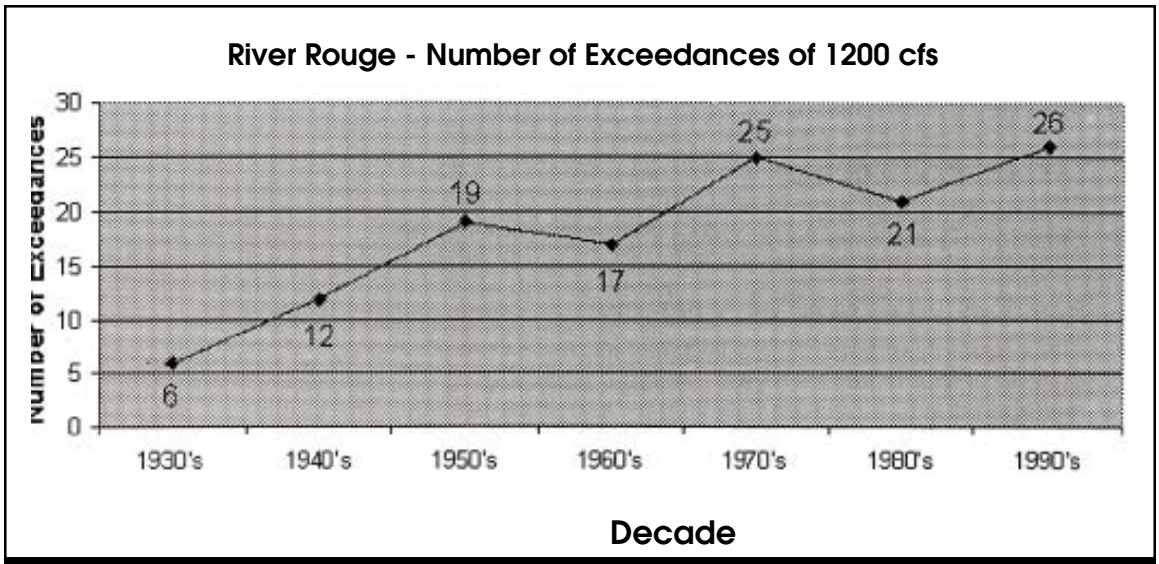

Figure 12: Increase in Number of Exceedences of Bankfull Flow Over Time With Urbanization in the Rouge River, MT (Fongers and Fulcher, 2001)

exceedence of bankfull flows increased by a factor of 4.2 once watershed IC exceeded 30%. Modeling for seven streams also downstream of stormwater ponds in Surrey, British Columbia also indicated an increase in bankfull flooding in response to watershed development (MacRae, 1996).

Watershed IC also increases the "flashiness" of stream hydrographs. Flashiness is defined here as the percent of daily flows each year that exceeds the mean annual flow. Henshaw and Booth (2000) evaluated seven urbanized watersheds in the Puget Sound lowland streams and tracked changes in flashiness over 50 years (Figure 13). The most urbanized watersheds experienced flashy discharges. Henshaw and Booth concluded that increased runoff in urban watersheds leads to higher but shorter-duration peak discharges.

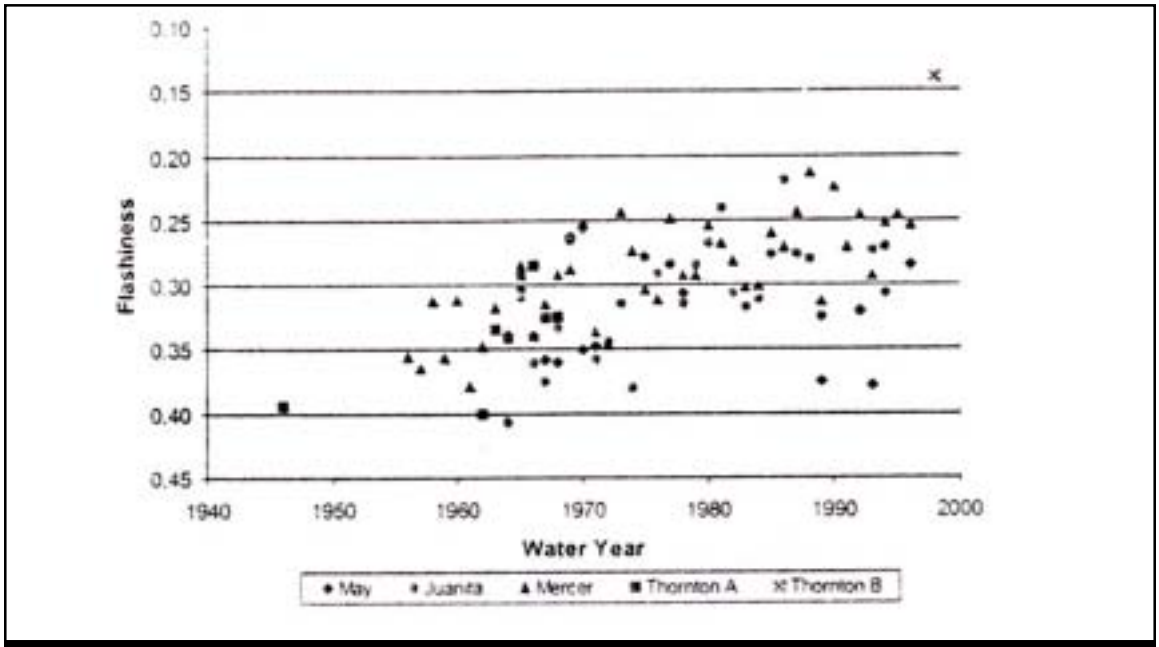

Figure 13: Percent of Gage Reading Above Mean Annual Flow for Puget Sound Lowland Streams (Henshaw and Booth, 2000)

2.5 Decreased Baseflow

As IC increases in a watershed, less groundwater infiltration is expected, which can potentially decrease stream flow during dry periods, (i.e. baseflow). Several East Coast studies provide support for a decrease in baseflow as a result of watershed development. Table 11 reviews eight research studies on baseflow in urban streams.

Klein (1979) measured baseflow in 27 small watersheds in the Maryland Piedmont and reported an inverse relationship between IC and baseflow (Figure 14). Spinello and Simmons (1992) demonstrated that baseflow in two urban Long Island streams declined seasonally as a result of urbanization (Figure 15). Saravanapavan (2002) also found that percentage of baseflow decreased in direct proportion to percent IC for 13 subwatersheds of the Shawsheen River watershed in Massachusetts (Figure 16).

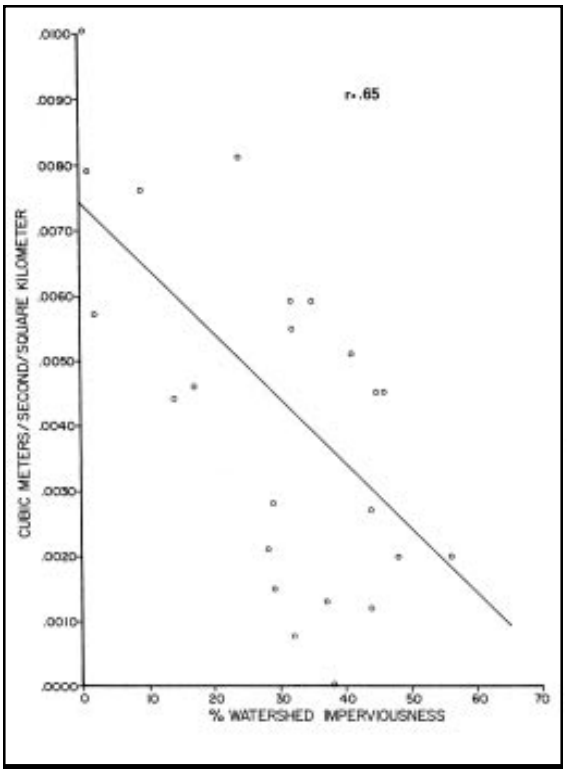

Figure 14: Relationship Between Baseflow and Watershed IC in the Streams on Maryland Piedmont (Klein, 1979)

Table 11: Research Review of Decreased Baseflow in Urban Streams

Reference	Key Finding	Location
Finkenbine *et al.*, 2000	Summer base flow was uniformly low in 11 streams when IC reached 40% or greater.	Vancouver
Klein, 1979	Baseflow decreased as IC increased in Piedmont streams.	MD
Saravanapavan, 2002	Percentage of baseflow decreased linearly as IC increased for 13 subwatersheds of Shawsheen River watershed.	MA
Simmons and Reynolds, 1982	Dry weather flow dropped 20 to 85% after development in several urban watersheds on Long Island.	NY
Spinello and Simmons, 1992	Baseflow in two Long Island streams went dry as a result of urbanization.	NY
Konrad and Booth, 2002	No discernable trend over many decades in the annual seven day low flow discharge for 11 Washington streams.	WA
Wang *et al.*, 2001	Stream baseflow was negatively correlated with watershed IC in 47 small streams, with an apparent breakpoint at 8 to 12% IC.	WI
Evett *et al.*, 1994	No clear relationship between dry weather flow and urban and rural streams in 21 larger watersheds.	NC

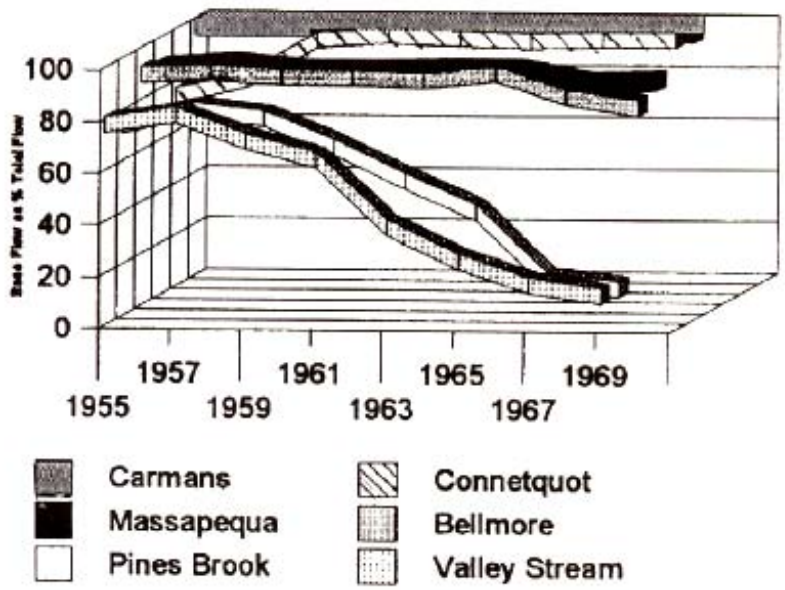

Notes:

Carmans and Connetquot: Rural/suburban, watersheds are unsewered

Bellmore and Massapequa: Moderately urbanized, not sewered until 1989

Valley Stream and Pine Brook: Urbanized and densely populated watersheds, sewer systems completed in 1960s

1953-1964: Period of sanitary sewer construction in eastern Nassau County

1962-1966: Drought years

Figure 15: Baseflow Response to Urbanization in Long Island Streams (Spinello and Simmons, 1992)

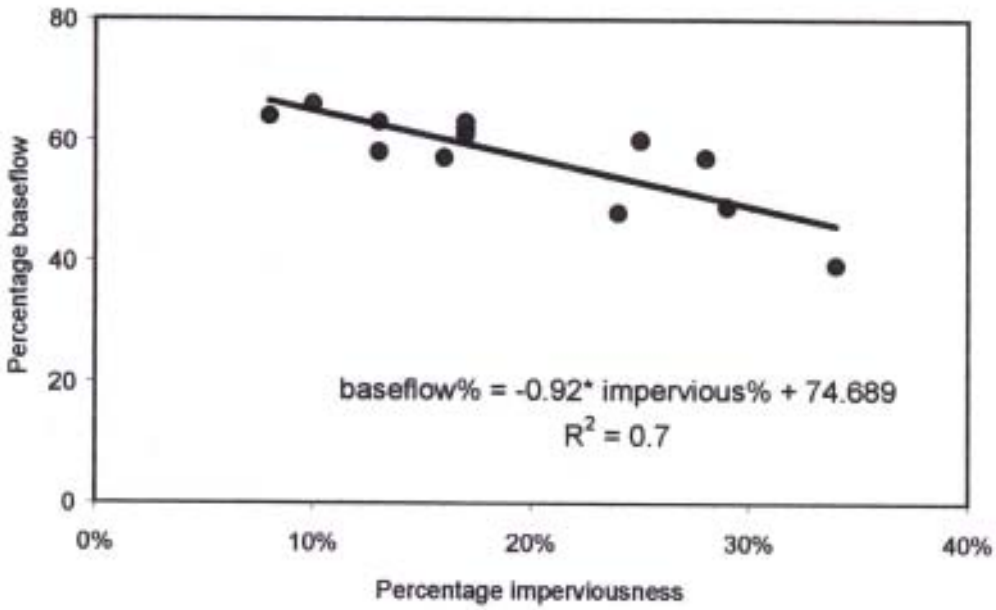

Figure 16: Relationship Between Percentage Baseflow and Percent IC in Massachusetts Streams (Saravanapan, 2002)

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Finkebine *et al.* (2000) monitored summer baseflow in 11 streams near Vancouver, British Columbia and found that stream base flow was uniformly low due to decreased groundwater recharge in watersheds with more than 40% IC (Figure 17). Baseflow velocity also consistently decreased when IC increased (Figure 18). The study cautioned that other factors can affect stream baseflow, such as watershed geology and age of development.

Other studies, however, have not been able to establish a relationship between IC and declining baseflow. For example, a study in North Carolina could not conclusively determine that urbanization reduced baseflow in larger urban and suburban watersheds in that area (Evett *et al.*, 1994). In some cases, stream baseflow is supported by deeper aquifers or originate in areas outside the surface watershed boundary. In others, baseflow is augmented by leaking sewers, water pipes and irrigation return flows.

This appears to be particularly true in arid and semi-arid areas, where baseflow can actually increase in response to greater IC (Hollis, 1975). For instance, Crippen and Waananen (1969) found that Sharon Creek near San Francisco changed from an ephemeral stream into a perennial stream after urban development. Increased infiltration from lawn watering and return flow from sewage treatment plants are two common sources of augmented baseflows in these regions (Caraco, 2000a).

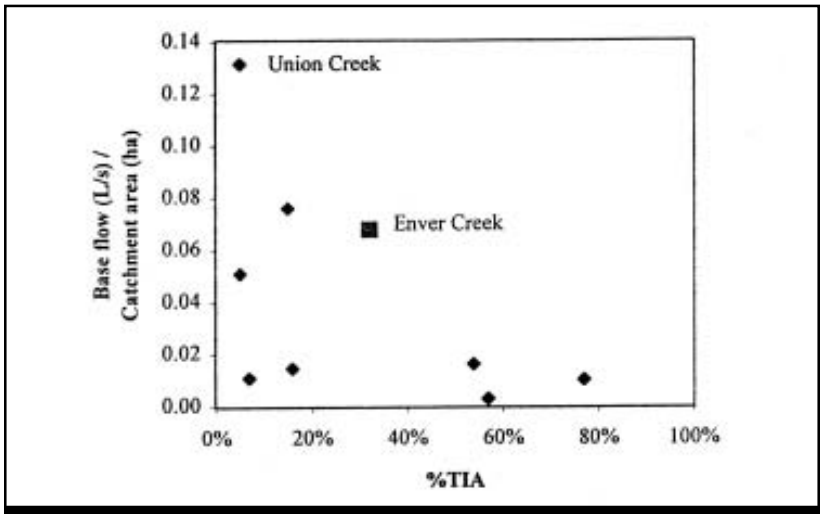

Figure 17: Effect of IC on Summer Baseflow in Vancouver Streams (Finkerbine *et al.*, 2000)

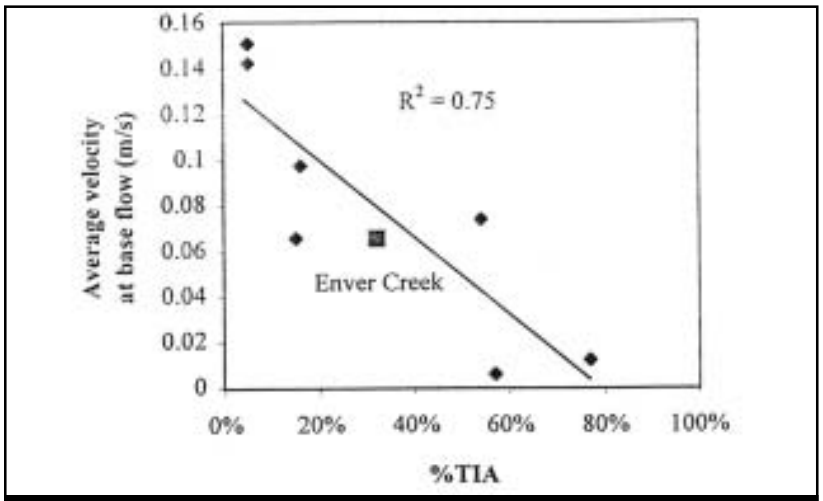

Figure 18: Effect of Watershed IC on Summer Stream Velocity in Vancouver Streams (Finkerbine *et al.*, 2000)

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2.6 Conclusions

The changes in hydrology indicators caused by watershed urbanization include increased runoff volume; increased peak discharge; increased magnitude, frequency and duration of bankfull flows; flashier/less predictable flows; and decreased baseflow. Many studies support the direct relationship between IC and these indicators. However, at low levels of watershed IC, site-specific factors such as slope, soils, types of conveyance systems, age of development, and watershed dimensions often play a stronger role in determining a watershed's hydrologic response.

Overall, the following conclusions can be drawn from the relationship between watershed IC and hydrology indicators:

- Strong evidence exists for the direct relationship between watershed IC and increased stormwater runoff volume and peak discharge. These relationships are considered so strong that they have been incorporated into widely accepted engineering models.
- The relationship between IC and bankfull flow frequency has not been extensively documented, although abundant data exists for differences between urban and non-urban watersheds.
- The relationship between IC and declining stream flow is more ambiguous and appears to vary regionally in response to climate and geologic factors, as well as water and sewer infrastructure.

The changes in hydrology indicators caused by watershed urbanization directly influence physical and habitat characteristics of streams. The next chapter reviews how urban streams physically respond to the major changes to their hydrology.

Chapter 3: Physical Impacts of Impervious Cover

A growing body of scientific literature documents the physical changes that occur in streams undergoing watershed urbanization. This chapter discusses the impact of watershed development on various measures of physical habitat in urban stream channels and is organized as follows:

3.1 Difficulty in Measuring Habitat
3.2 Changes in Channel Geometry
3.3 Effect on Composite Indexes of Stream Habitat
3.4 Effect on Individual Elements of Stream Habitat
3.5 Increased Stream Warming
3.6 Alteration of Stream Channel Network
3.7 Conclusion

This chapter reviews the available evidence on stream habitat. We begin by looking at geomorphological research that has examined how the geometry of streams changes in response to altered urban hydrology. The typical response is an enlargement of the cross-sectional area of the stream channel through a process of channel incision, widening, or a combination of both. This process triggers an increase in bank and/or bed erosion that increases sediment transport from the stream, possibly for several decades or more.

Next, we examine the handful of studies that have evaluated the relationship between watershed development and composite indicators of stream habitat (such as the habitat Rapid Bioassessment Protocol, or RBP). In the fourth section, we examine the dozen studies that have evaluated how individual habitat elements respond to watershed development. These studies show a consistent picture. Generally, streams with low levels of IC have stable banks, contain considerable large woody debris (LWD) and possess complex habitat structure. As watershed IC increases, however, urban streambanks become increasingly unstable, streams lose LWD, and they develop a more simple and uniform habitat structure. This is typified by reduced pool depths, loss of pool and riffle sequences, reduced channel roughness and less channel sinuosity.

Water temperature is often regarded as a key habitat element, and the fifth section describes the stream warming effect observed in urban streams in six studies. The last section looks at the effect of watershed development on the stream channel network as a whole, in regard to headwater stream loss and the creation of fish barriers.

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3.1 Difficulty in Measuring Habitat

The physical transformation of urban streams is perhaps the most conspicuous impact of watershed development. These dramatic physical changes are easily documented in sequences of stream photos with progressively greater watershed IC (see Figure 19). Indeed, the network of headwater stream channels generally disappears when watershed IC exceeds 60% (CWP).

3.1.1 The Habitat Problem

It is interesting to note that while the physical impacts of urbanization on streams are widely accepted, they have rarely been documented by the research community. As a consequence, no predictive models exist to quantify how physical indicators of stream habitat will decline in response to watershed IC, despite the fact that most would agree that some kind of decline is expected (see Table 12).

Figure 19: Urban Stream Channels with Progressively Greater IC

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The main reason for this gap is that "habitat" is extremely hard to define, and even more difficult to measure in the field. Most indices of physical habitat involve a visual and qualitative assessment of 10 or more individual habitat elements that are perceived by fishery and stream biologists to contribute to quality stream habitat. Since these indices include many different habitat elements, each of which is given equal weight, they have not been very useful in discriminating watershed effects (Wang *et al.*, 2001).

Researchers have had greater success in relating individual habitat elements to watershed conditions, such as large woody debris (LWD), embeddedness, or bank stability. Even so, direct testing has been limited, partly because individual habitat elements are hard to measure and are notoriously variable in both space and time. Consider bank stability for a moment. It would be quite surprising to see a highly urban stream that did not have unstable banks. Yet, the hard question is exactly how would bank instability be quantitatively measured? Where would it be measured — at a point, a cross-section, along a reach, on the left bank or the right?

Geomorphologists stress that no two stream reaches are exactly alike, due to differences in gradient, bed material, sediment transport, hydrology, watershed history and many other factors. Consequently, it is difficult to make controlled comparisons among different streams. Indeed, geomorphic theory stresses that individual stream reaches respond in a highly dynamic way to changes in watershed hydrology and sediment transport, and can take several decades to fully adjust to a new equilibrium.

Table 12: Physical Impacts of Urbanization on Streams

Specific Impacts
Sediment transport modified
Channel enlargement
Channel incision
Stream embeddedness
Loss of large woody debris
Changes in pool/riffle structure
Loss of riparian cover
Reduced channel sinuosity
Warmer in-stream temperatures
Loss of cold water species and diversity
Channel hardening
Fish blockages
Loss of 1st and 2nd order streams through storm drain enclosure

Returning to our example of defining bank stability, how might our measure of bank instability change over time as its watershed gradually urbanizes, is built out, and possibly reaches a new equilibrium over several decades? It is not very surprising that the effect of watershed development on stream habitat is widely observed, yet rarely measured.

3.2 Changes in Stream Geometry

As noted in the last chapter, urbanization causes an increase in the frequency and duration of bankfull and sub-bankfull flow events in streams. These flow events perform more "effective work" on the stream channel, as defined by Leopold (1994). The net effect is that an urban stream channel is exposed to more shear stress above the critical threshold needed to move bank and bed sediments (Figure 20). This usually triggers a cycle of active bank erosion and greater sediment transport in urban streams. As a consequence, the stream channel adjusts by expanding its cross-sectional area, in order to effectively accommodate greater flows and sediment supply. The stream channel can expand by incision, widening, or both. Incision refers to stream down-cutting through the streambed, whereas widening refers to lateral erosion of the stream bank and its flood plain (Allen and Narramore, 1985; Booth, 1990; Morisawa and LaFlure, 1979).

3.2.1 Channel Enlargement

A handful of research studies have specifically examined the relationship between watershed development and stream channel enlargement (Table 13). These studies indicate that stream cross-sectional areas can enlarge by as much as two to eight times in response to urbanization, although the process is complex and may take several decades to complete (Pizzuto *et al*., 2000; Caraco, 2000b; Hammer, 1972). An example of channel enlargement is provided in Figure 21, which shows how a stream cross-section in Watts Branch near Rockville, Maryland has expanded in response to nearly five decades of urbanization (i.e., watershed IC increased from two to 27%).

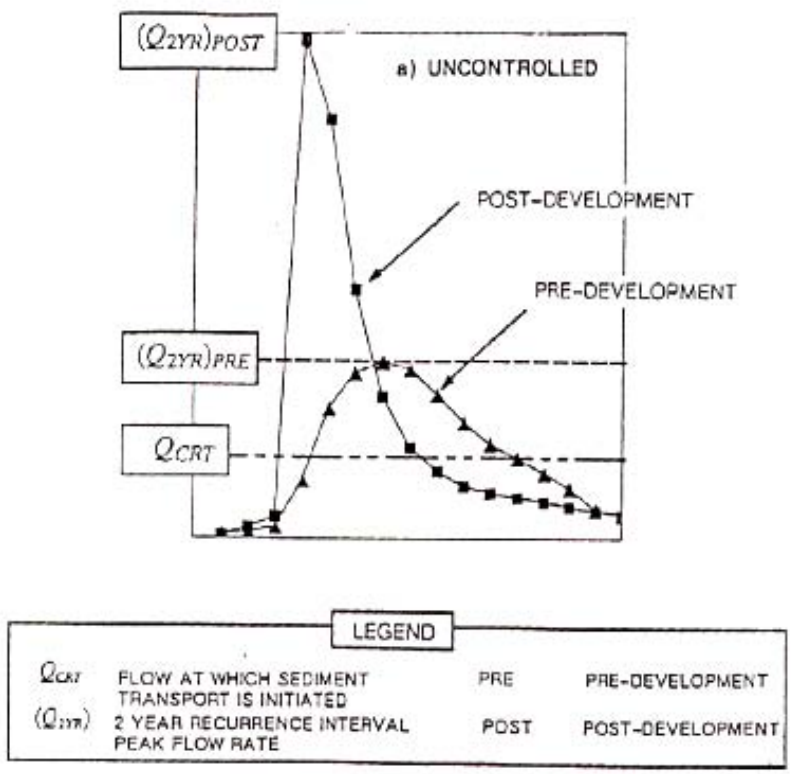

Figure 20: Increased Shear Stress from a Hydrograph (MacRae and Rowney, 1992)

Table 13: Research Review of Channel Enlargement and Sediment Transport in Urban Streams		
Reference	**Key Finding**	**Location**
% IC used as Indicator		
Caraco, 2000b	Reported enlargement in ratios of 1.5 to 2.2 for 10 stream reaches in Watts Branch and computed ultimate enlargement ratios of 2.0	MD
MacCrae and De Andrea, 1999	Introduced the concept of ultimate channel enlargement based on watershed IC and channel characteristics.	Ontario, TX
Morse, 2001	Demonstrated increased erosion rates with increases in IC (channels were generally of the same geomorphic type).	ME
Urbanization Used as Indicator		
Allen and Narramore, 1985	Enlargement ratios in two urban streams ranged from 1.7 to 2.4.	TX
Bledsoe, 2001	Reported that channel response to urbanization depends on other factors in addition to watershed IC including geology, vegetation, sediment and flow regimes.	N/A
Booth and Henshaw, 2001	Evaluated channel cross section erosion rates and determined that these rates vary based on additional factors including the underlying geology, age of development and gradient.	WA
Hammer, 1972	Enlargement ratios ranged from 0.7 to 3.8 in urban watersheds.	PA
Neller, 1989	Enlargement ratios in small urban catchments ranged from two to 7.19, the higher enlargement ratios were primarily from incision occurring in small channels.	Australia
Pizzuto *et al.*, 2000	Evaluated channel characteristics of paired urban and rural streams and demonstrated median bankfull cross sectional increase of 180%. Median values for channel sinuosity were 8% lower in urban streams; Mannings N values were found to be 10% lower in urban streams.	PA
Hession *et al.*, *in press*	Bankfull widths for urban streams were significantly wider than non-urban streams in 26 paired streams. Forested reaches were consistently wider than non-forested reaches in urban streams.	MD, DE, PA
Dartiguenave *et al.*, 1997	Bank erosion accounted for up to 75% of the sediment transport in urban watersheds.	TX
Trimble, 1997	Demonstrated channel enlargement over time in an urbanizing San Diego Creek; Bank erosion accounted for over 66% of the sediment transport.	CA

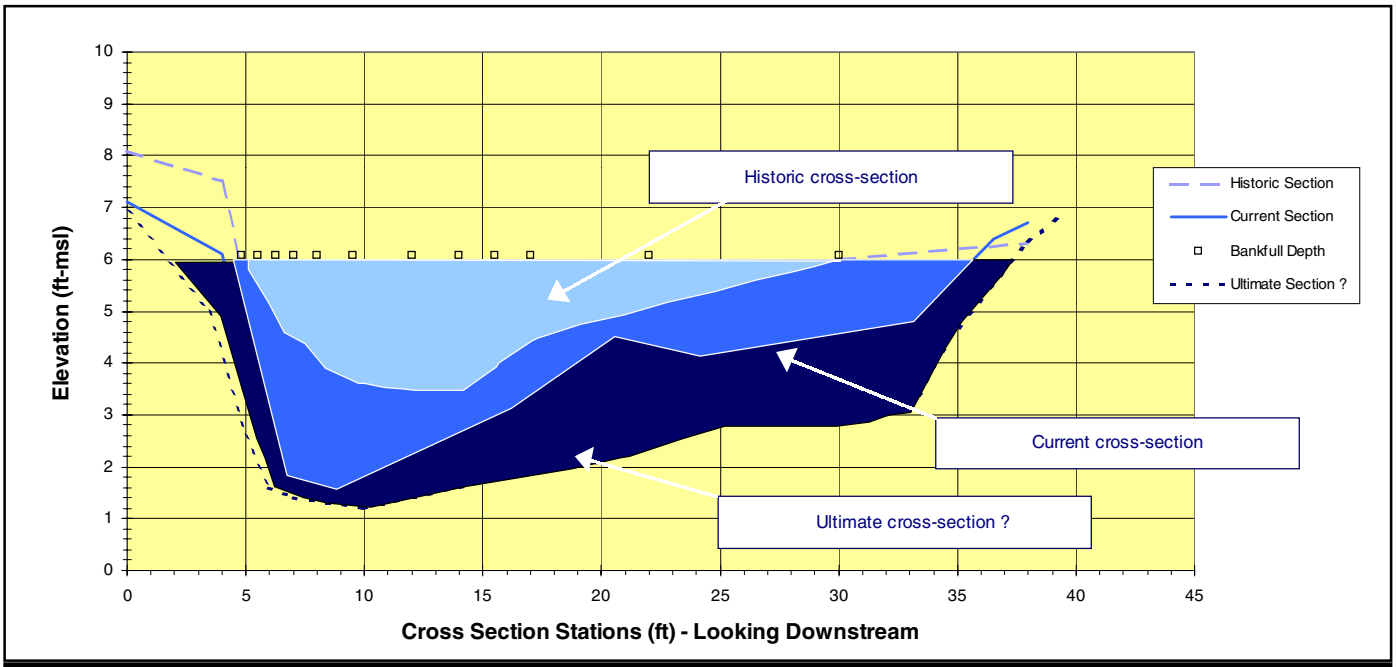

Figure 21: Stream Channel Enlargement in Watts Branch, MD 1950-2000 (Caraco, 2000b)

Some geomorphologists suggest that urban stream channels will reach an "ultimate enlargement" relative to pre-developed channels (MacRae and DeAndrea, 1999) and that this can be predicted based on watershed IC, age of development, and the resistance of the channel bed and banks. A relationship between ultimate stream channel enlargement and watershed IC has been developed for alluvial streams in Texas, Vermont and Maryland (Figure 22). Other geomorphologists such as Bledsoe (2001) and Booth and Henshaw (2001) contend that channel response to urbanization is more complex, and also depends on geology, grade control, stream gradient and other factors.

Channel incision is often limited by grade control caused by bedrock, cobbles, armored substrates, bridges, culverts and pipelines. These features can impede the downward erosion of the stream channel and thereby limit the incision process. Stream incision can become severe in streams that have softer substrates such as sand, gravel and clay (Booth, 1990). For example, Allen and Narramore (1985) showed that channel enlargement in chalk channels was 12 to 67% greater than in shale channels near Dallas, Texas. They attributed the differences to the softer substrate, greater velocities and higher shear stress in the chalk channels.

Neller (1989) and Booth and Henshaw (2001) also report that incised urban stream channels possess cross-sectional areas that are larger than would be predicted based on watershed area or discharge alone. This is due to the fact that larger floods are often contained within the stream channel rather than the floodplain. Thus, incised channels often result in greater erosion and geomorphic change. In general, stream conditions that can foster incision include erodible substrates, moderate to high stream gradients, and an absence of grade control features.

Channel widening occurs more frequently when streams have grade control and the stream has cut into its bank, thereby expanding its cross-sectional area. Urban stream channels often have artificial grade controls caused by frequent culverts and road crossings. These grade controls often cause localized sediment deposition that can reduce the capacity of culverts and bridge crossings to pass flood waters.

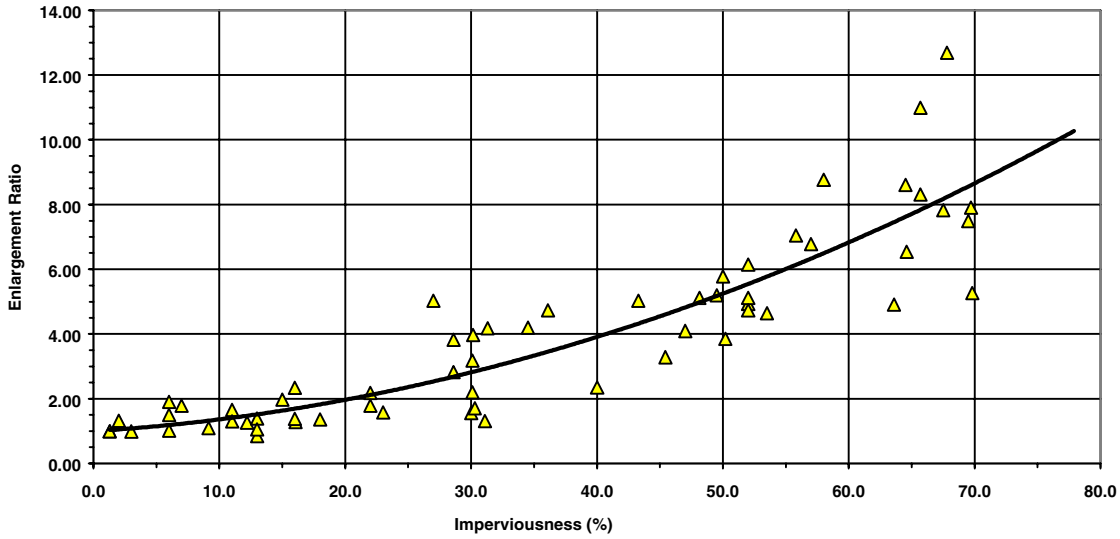

Figure 22: Ultimate Channel Enlargement in MD, UT and TX Alluvial Streams (MacRae and DeAndrea, 1999 and CWP, 2001b)

The loss of flood plain and riparian vegetation has been strongly associated with watershed urbanization (May *et al.*, 1997). A few studies have shown that the loss of riparian trees can result in increased erosion and channel migration rates (Beeson and Doyle, 1995 and Allmendinger *et al.*, 1999). For example, Beeson and Doyle (1995) found that meander bends with vegetation were five times less likely to experience significant erosion from a major flood than non-vegetated meander bends.Hession *et al.* (in press) observed that forested reaches consistently had greater bankfull widths than non-forested reaches in a series of urban streams in Pennsylvania, Maryland and Delaware.

3.2.2 Effect of Channel Enlargement on Sediment Yield

Regardless of whether a stream incises, widens, or does both, it will greatly increase sediment transport from the watershed due to erosion. Urban stream research conducted in California and Texas suggests that 60 to 75% of the sediment yield of urban watersheds can be derived from channel erosion (Trimble, 1997 and Dartingunave *et al.*, 1997) This can be compared to estimates for rural streams where channel erosion accounts for only five to 20% of the annual sediment yield (Collins *et al.*, 1997 and Walling and Woodward, 1995).

Some geomorphologists speculate that urban stream channels will ultimately adjust to their post-development flow regime and sediment supply. Finkenbine *et al.* (2000) observed these conditions in Vancouver streams, where study streams eventually stabilized two decades after the watersheds were fully developed. In older urban streams, reduced sediment transport can be expected when urbanization has been completed. At this point, headwater stream channels are replaced by storm drains and pipes, which can transport less sediment. The lack of available sediment may cause downstream channel erosion, due to the diminished sediment supply found in the stream.

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3.3 Effect on Composite Measures of Stream Habitat

Composite measures of stream habitat refer to assessments such as EPA's Habitat Rapid Bioassessment Protocol (RBP) that combine multiple habitat elements into a single score or index (Barbour *et al*., 1999). For example, the RBP requires visual assessment of 10 stream habitat elements, including embeddedness, epifaunal substrate quality, velocity/depth regime, sediment deposition, channel flow status, riffle frequency, bank stabilization, streambank vegetation and riparian vegetation width. Each habitat element is qualitatively scored on a 20 point scale, and each element is weighted equally to derive a composite score for the stream reach.

To date, several studies have found a relationship between declining composite habitat indicator scores and increasing watershed IC in different eco-regions of the United States. A typical pattern in the composite habitat scores is provided for headwater streams in Maine (Morse, 2001; Figure 23). This general finding has been reported in the mid-Atlantic, Northeast and the Northwest (Black and Veatch, 1994; Booth and Jackson, 1997; Hicks and Larson, 1997; Maxted and Shaver, 1997; Morse, 2001; Stranko and Rodney, 2001).

However, other researchers have found a much weaker relationship between composite habitat scores and watershed IC. Wang and his colleagues (2001) found that composite habitat scores were not correlated with watershed IC in Wisconsin streams, although it was correlated with individual habitat elements, such as streambank erosion. They noted that many agricultural and rural streams had fair to poor composite habitat scores, due to poor riparian management and sediment deposition. The same basic conclusion was also reported for streams of the Maryland Piedmont (MNCPPC, 2000).

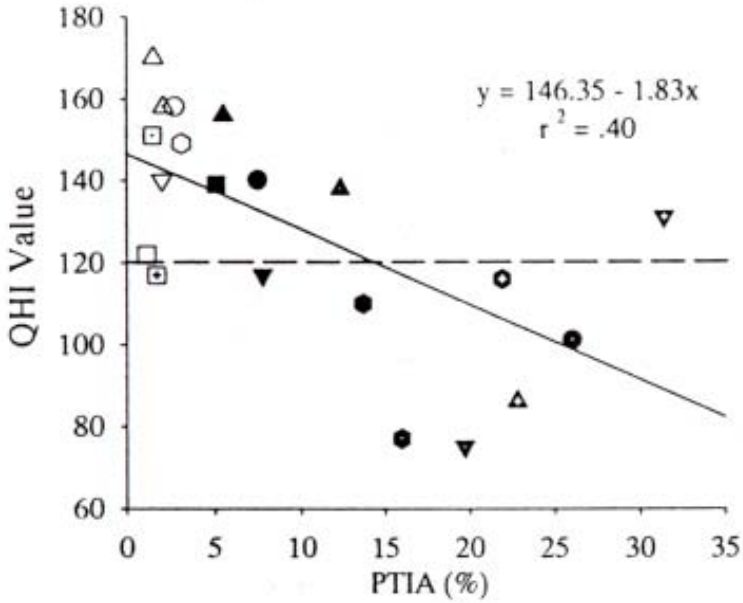

Figure 23: Relationship Between Habitat Quality and IC in Maine Streams (Morse, 2001)

3.4 Effect on Individual Elements of Stream Habitat

Roughly a dozen studies have examined the effect of watershed development on the degradation of individual stream habitat features such as bank stability, embeddedness, riffle/pool quality, and loss of LWD (Table 14). Much of this data has been acquired from the Pacific Northwest, where the importance of such habitat for migrating salmon has been a persistent management concern.

3.4.1 Bank Erosion and Bank Stability

It is somewhat surprising that we could only find one study that related bank stability or bank erosion to watershed IC. Conducted by Booth (1991) in the streams of the Puget Sound lowlands, the study reported that stream banks were consistently rated as stable in watersheds with less than 10% IC, but became progressively more unstable above this threshold. Dozens of stream assessments have found high rates of bank erosion in urban streams, but none, to our knowledge, has systematically related the prevalence or severity of bank erosion to watershed IC. As noted earlier, this may reflect the lack of a universally recognized method to measure comparative bank erosion in the field.

3.4.2 Embeddedness

Embeddedness is a term that describes the extent to which the rock surfaces found on the stream bottom are filled in with sand, silts and clay. In a healthy stream, the interstitial pores between cobbles, rock and gravel generally lack fine sediments, and are an active habitat zone and detrital processing area. The increased sediment transport in urban streams can rapidly fill up these pores in a process known as embedding. Normally, embeddedness is visually measured in riffle zones of streams. Riffles tend to be an important habitat for aquatic insects and fish (such as darters and sculpins). Clean stream substrates are also critical to trout and salmon egg incubation and embryo development. May *et al.* (1997) demonstrated that the percent of fine sediment particles in riffles generally increased with watershed IC (Figure 24). However, Finkenbine *et al.* (2000) reported that embeddedness eventually decreased slightly after watershed land use and sediment transport had stabilized for 20 years.

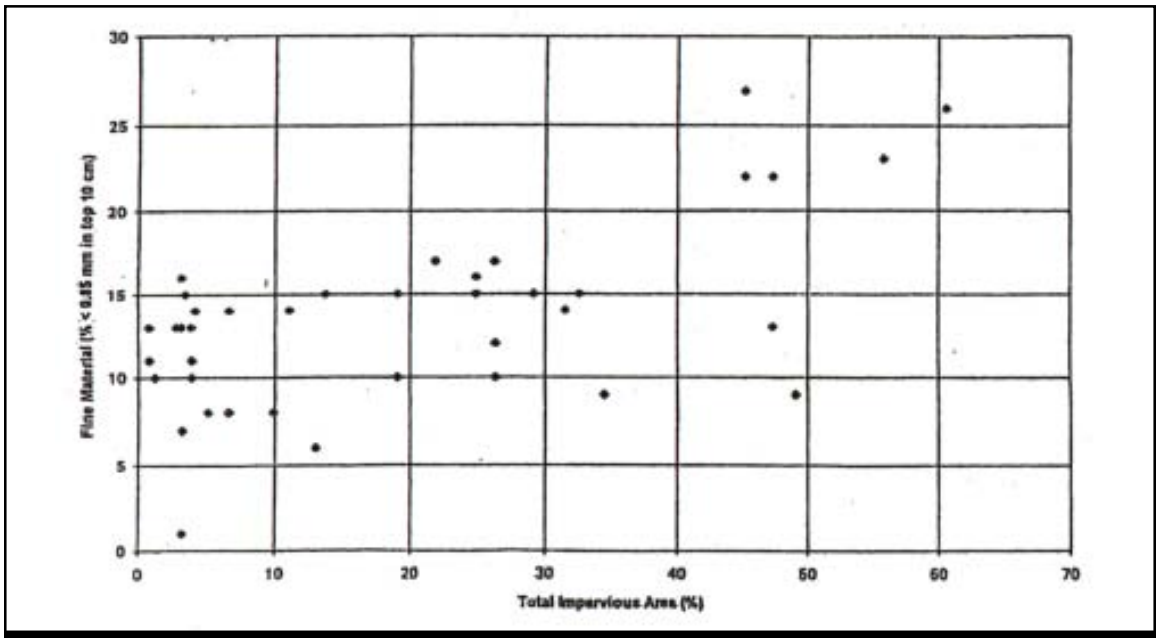

Figure 24: Fine Material Sediment Deposition as a Function of IC in Pacific Northwest Streams (Horner *et al.*, 1997)

Table 14: Research Review of Changes in Urban Stream Habitat		
Reference	**Key Finding**	**Location**
% IC Used as Indicator		
Black & Veatch, 1994	Habitat scores were ranked as poor in five subwatersheds that had greater than 30% IC.	MD
Booth and Jackson, 1997	Increase in degraded habitat conditions with increases in watershed IC.	WA
Hicks and Larson, 1997	Reported a reduction in composite stream habitat indices with increasing watershed IC.	MA
May *et al.*, 1997	Composite stream habitat declined most rapidly during the initial phase of the watershed urbanization, when percent IC exceeded the 5-10% range.	WA
Stranko and Rodney, 2001	Composite index of stream habitat declined with increasing watershed IC in coastal plain streams.	MD
Wang *et al.*, 2001	Composite stream habitat scores were not correlated with watershed IC in 47 small watersheds, although channel erosion was. Non-urban watersheds were highly agricultural and often lacked riparian forest buffers.	WI
MNCPPC, 2000	Reported that stream habitat scores were not correlated with IC in suburban watersheds.	MD
Morse, 2001	Composite habitat values tended to decline with increases in watershed IC.	ME
Booth, 1991	Channel stability and fish habitat quality declined rapidly after 10% watershed IC.	WA
Booth *et al.*, 1997	Decreased LWD with increased IC.	PNW
Finkenbine *et al.*, 2000	LWD was scarce in streams with greater than 20% IC in Vancouver.	B.C.
Horner & May, 1999	When IC levels were >5%, average LWD densities fell below 300 pieces/kilometer.	PNW
Horner *et al.*, 1997	Interstitial spaces in streambed sediments begin to fill with increasing watershed IC.	PNW
Urbanization Used as Indicator		
Dunne and Leopold, 1978	Natural channels replaced by storm drains and pipes; increased erosion rates observed downstream.	MD
May *et al.*, 1997	Forested riparian corridor width declines with increased watershed IC.	PNW
MWCOG, 1992	Fish blockages caused by bridges and culverts noted in urban watersheds.	D.C.
Pizzuto *et al.*, 2000	Urban streams had reduced pool depth, roughness, and sinuosity, compared to rural streams; Pools were 31% shallower in urban streams compared to non-urban ones.	PA
Richey, 1982	Altered pool/riffle sequence observed in urban streams.	WA
Scott *et al.*, 1986	Loss of habitat diversity noted in urban watersheds.	PNW
Spence *et al.*, 1996	Large woody debris is important for habitat diversity and anadromous fish.	PNW

3.4.3 Large Woody Debris (LWD)

LWD is a habitat element that describes the approximate volume of large woody material (< four inches in diameter) found in contact with the stream. The presence and stability of LWD is an important habitat parameter in streams. LWD can form dams and pools, trap sediment and detritus, stabilize stream channels, dissipate flow energy, and promote habitat complexity (Booth *et al.,* 1997). LWD creates a variety of pool features (plunge, lateral, scour and backwater); short riffles; undercut banks; side channels; and a range of water depths (Spence *et al.*, 1996). Urban streams tend to have a low supply of LWD, as increased stormwater flows transport LWD and clears riparian areas. Horner *et al.* (1997) presents evidence from Pacific Northwest streams that LWD decreases in response to increasing watershed IC (Figure 25).

3.4.4 Changes in Other Individual Stream Parameters

One of the notable changes in urban stream habitat is a decrease in pool depth and a general simplification of habitat features such as pools, riffles and runs. For example, Richey (1982) and Scott *et al.* (1986) reported an increase in the prevalence of glides and a corresponding altered riffle/pool sequence due to urbanization. Pizzuto *et al.* (2000) reported a median 31% decrease in pool depth in urban streams when compared to forested streams. Pizzuto *et al.* also reported a modest decrease in channel sinuosity and channel roughness in the same urban streams in Pennsylvania.

Several individual stream habitat parameters appear to have received no attention in urban stream research to date. These parameters include riparian shading, wetted perimeter, various measures of velocity/depth regimes, riffle frequency, and sediment deposition in pools. More systematic monitoring of these individual stream habitat parameters may be warranted.

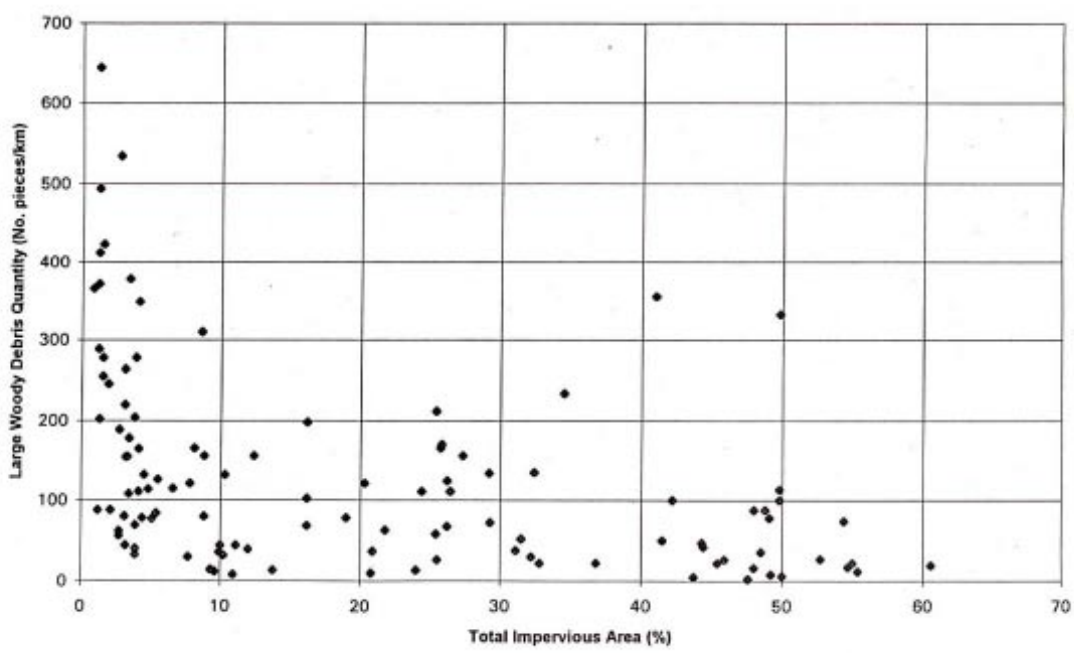

Figure 25: LWD as a Function of IC in Puget Sound Streams (Horner *et al.*, 1997)

3.5 Increased Stream Warming

IC directly influences our local weather in urban areas. This effect is obvious to anyone walking across a parking lot on a hot summer day, when temperatures often reach a scorching 110 to 120 degrees F. Parking lots and other hard surfaces tend to absorb solar energy and release it slowly. Furthermore, they lack the normal cooling properties of trees and vegetation, which act as natural air conditioners. Finally, urban areas release excess heat as a result of the combustion of fossil fuels for heating, cooling and transportation. As a result, highly urban areas tend to be much warmer than their rural counterparts and are known as urban heat islands. Researchers have found that summer temperatures tend to be six to eight degrees F warmer in the summer and two to four degrees F warmer during the winter months.

Water temperature in headwater streams is strongly influenced by local air temperatures. Summer temperatures in urban streams have been shown to increase by as much as five to 12 degrees F in response to watershed development (Table 15). Increased water temperatures can preclude temperature-sensitive species from being able to survive in urban streams.

Figure 26 shows the stream warming phenomenon in small headwater streams in the Maryland Piedmont.

Galli (1990) reported that stream temperatures throughout the summer increased in urban watersheds. He monitored five headwater streams in the Maryland Piedmont with different levels of IC. Each urban stream had mean temperatures that were consistently warmer than a forested reference stream, and stream warming appeared to be a direct function of watershed IC. Other factors, such as lack of riparian cover and the presence of ponds, were also demonstrated to amplify stream warming, but the primary contributing factor appeared to be watershed IC.

Johnson (1995) studied how stormwater influenced an urban trout stream in Minnesota and reported up to a 10 degree F increase in stream water temperatures after summer storm events. Paul *et al.* (2001) evaluated stream temperatures for 30 subwatersheds to the Etowah River in Georgia, which ranged from five to 61% urban land. They found a correlation between summer daily mean water temperatures and the percentage of urban land in a subwatershed.

Table 15: Research Review of Thermal Impacts in Urban Streams

Reference	Key Finding	Location
%IC Used as Indicator		
Galli, 1990	Increase in stream temperatures of five to 12 degrees Fahrenheit in urban watersheds; stream warming linked to IC.	MD
Urbanization Used as Indicator		
Johnson, 1995	Up to 10 degrees Fahrenheit increases in stream temperatures after summer storm events in an urban area	MN
LeBlanc *et al.*, 1997	Calibrated a model predicting stream temperature increase as a result of urbanization	Ontario
MCDEP, 2000	Monitoring effect of urbanization and stormwater ponds on stream temperatures revealed stream warming associated with urbanization and stormwater ponds	MD
Paul *et al.*, 2001	Daily mean stream temperatures in summer increased with urban land use	GA

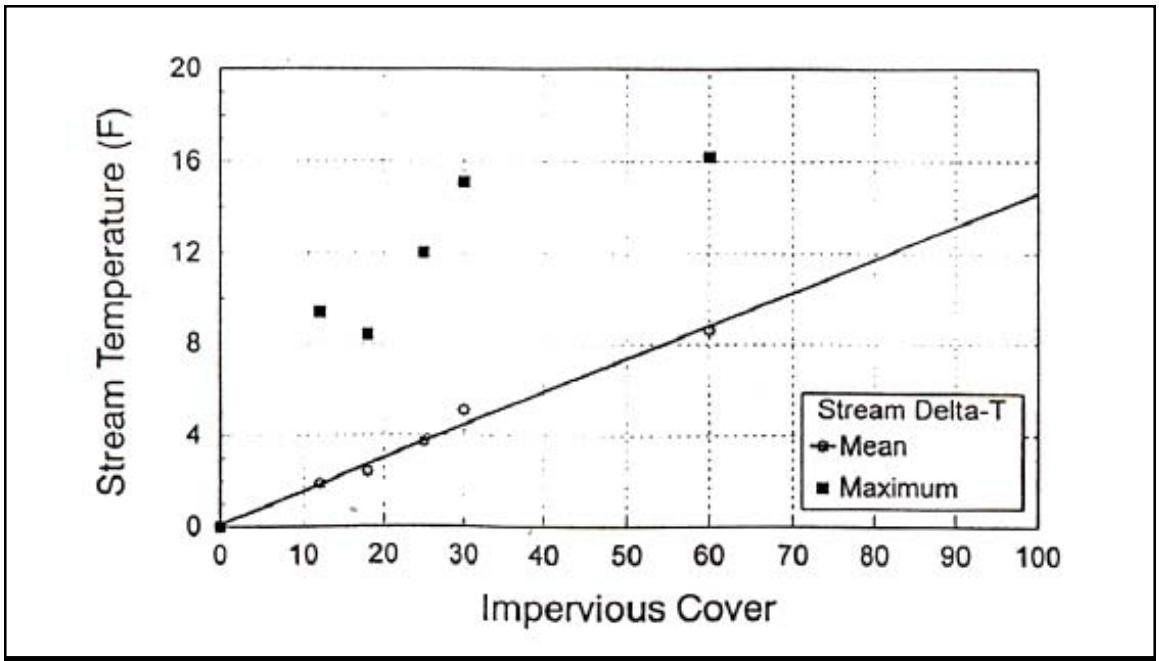

Figure 26: Stream Temperature Increase in Response to IC in Maryland Piedmont Streams (Galli, 1990)

Discharges from stormwater ponds can also contribute to stream warming in urban watersheds. Three studies highlight the temperature increase that can result from stormwater ponds. A study in Ontario found that baseflow temperatures below wet stormwater ponds increased by nine to 18 degrees F in the summer (SWAMP, 2000a, b). Oberts (1997) also measured change in the baseflow temperature as it flowed through a wetland/wet pond system in Minnesota. He concluded that the temperature had increased by an average of nine degrees F during the summer months. Galli (1988) also observed a mean increase of two to 10 degrees F in four stormwater ponds located in Maryland.

3.6 Alteration of Stream Channel Networks

Urban stream channels are often severely altered by man. Channels are lined with rip rap or concrete, natural channels are straightened, and first order and ephemeral streams are enclosed in storm drain pipes. From an engineering standpoint, these modifications rapidly convey flood waters downstream and locally stabilize stream banks. Cumulatively, however, these modifications can have a dramatic effect on the length and habitat quality of headwater stream networks.

3.6.1 Channel Modification

Over time, watershed development can alter or eliminate a significant percentage of the perennial stream network. In general, the loss of stream network becomes quite extensive when watershed IC exceeds 50%. This loss is striking when pre- and post-development stream networks are compared (Figure 27). The first panel illustrates the loss of stream network over time in a highly urban Northern Virginia watershed; the second panel shows how the drainage network of Rock Creek has changed in response to watershed development.

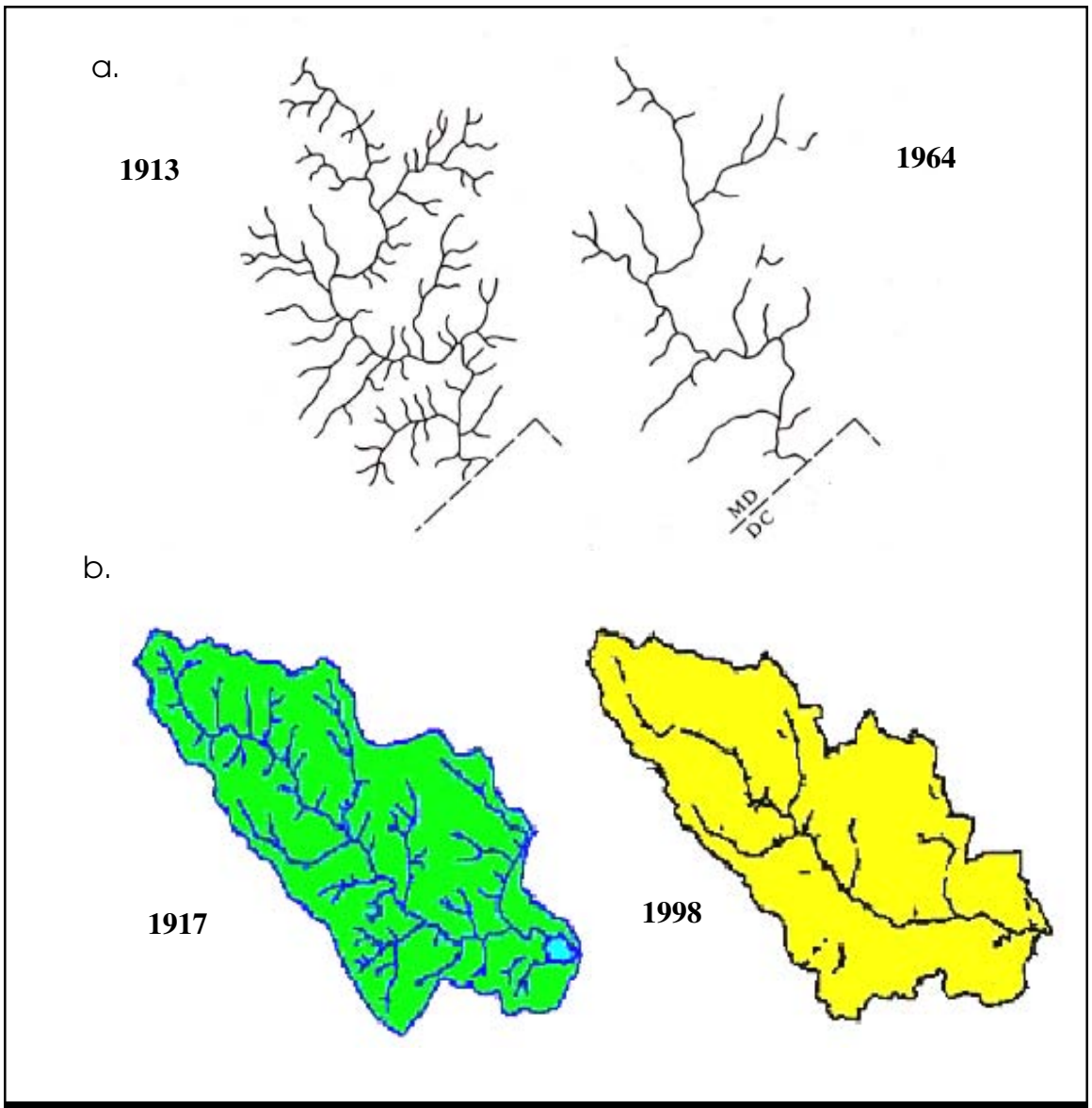

Figure 27: a. Drainage Network of Rock Creek, D.C. (Dunne and Leopold, 1978) and b. Drainage Network of Four Mile Run, VA Before and After Urbanization (NVRC, 2001)

In a national study of 269 gaged urban watersheds, Sauer *et al.* (1983) observed that channelization and channel hardening were important watershed variables that control peak discharge rates. The channel modifications increase the efficiency with which runoff is transported through the stream channel, increasing critical shear stress velocities and causing downstream channel erosion.

3.6.2 Barriers to Fish Migration

Infrastructure such as bridges, dams, pipelines and culverts can create partial or total barriers to fish migration and impair the ability of fish to move freely in a watershed. Blockages can have localized effects on small streams where non-migratory fish species can be prevented from re-colonizing upstream areas after acutely toxic events. The upstream movement of anadromous fish species such as shad, herring, salmon and steelhead can also be blocked by these barriers. Figure 28 depicts the prevalence of fish barriers in the Anacostia Watershed (MWCOG, 1992).

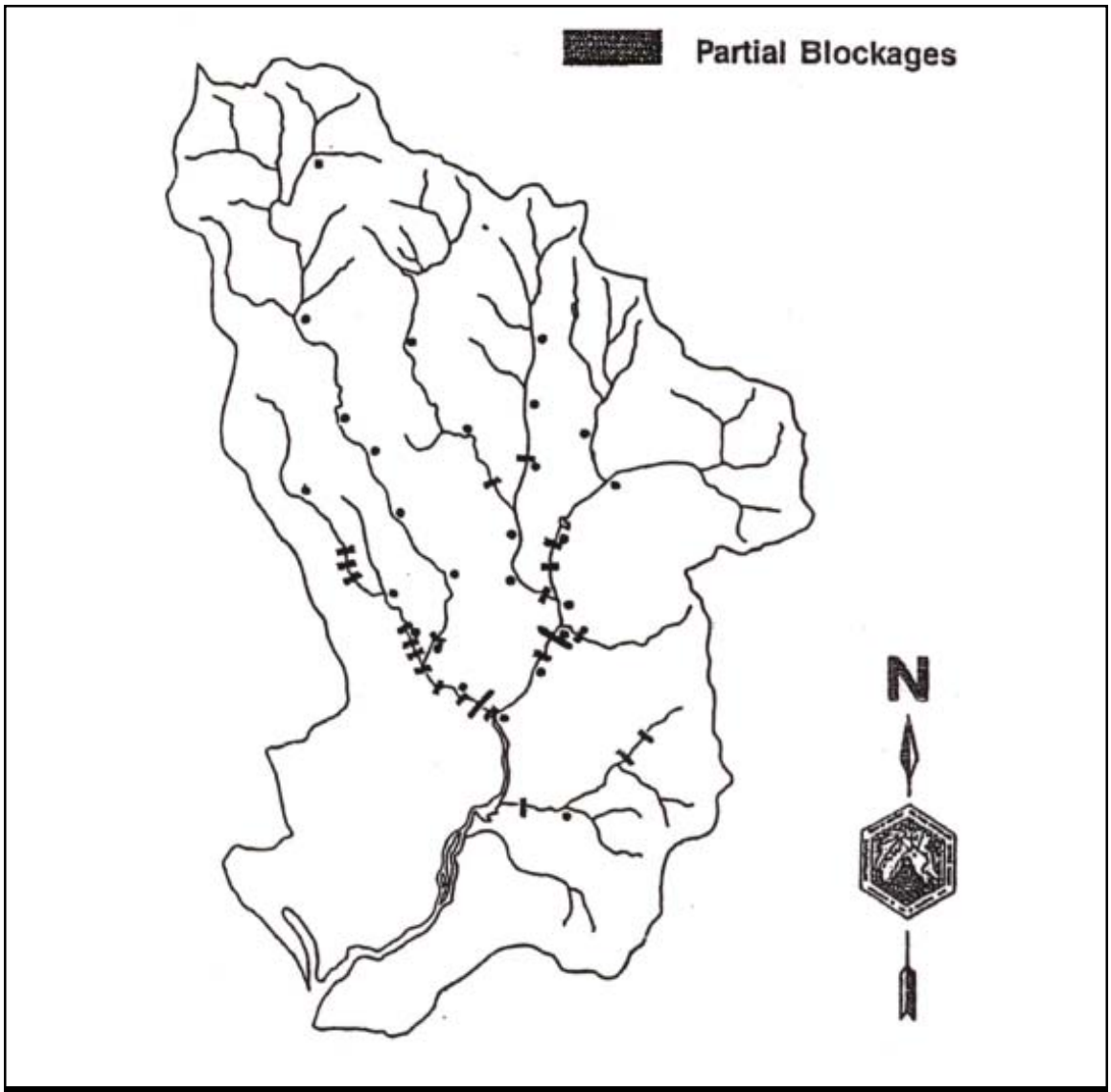

Figure 28: Fish Migration Barriers in the Anacostia Watershed of D.C. and MD (MWCOG, 1992)

3.7 Conclusion

Watershed development and the associated increase in IC have been found to significantly degrade the physical habitat of urban streams. In alluvial streams, the effects of channel enlargement and sediment transport can be severe at relatively low levels of IC (10 to 20%). However, the exact response of any stream is also contingent upon a combination of other physical factors such as geology, vegetation, gradient, the age of development, sediment supply, the use and design of stormwater treatment practices, and the extent of riparian buffers (Bledsoe, 2001).

Despite the uncertainty introduced by these factors, the limited geomorphic research to date suggests that physical habitat quality is almost always degraded by higher levels of watershed IC. Even in bedrock-controlled channels, where sediment transport and channel enlargement may not be as dramatic, researchers have noted changes in stream habitat features, such as embeddedness, loss of LWD, and stream warming.

Overall, the following conclusions can be made about the influence of watershed development on the physical habitat of urban streams:

- The major changes in physical habitat in urban streams are caused by the increased frequency and duration of bankfull and sub-bankfull discharges, and the attendant changes in sediment supply and transport. As a consequence, many urban streams experience significant channel enlargement. Generally, channel enlargement is most evident in alluvial streams.

- Typical habitat changes observed in urban streams include increased embeddedness, reduced supply of LWD, and simplification of stream habitat features such as pools, riffles and runs, as well as reduced channel sinuosity.

- Stream warming is often directly linked to watershed development, although more systematic subwatershed sampling is needed to precisely predict the extent of warming.

- Channel straightening, hardening and enclosure and the creation of fish barriers are all associated with watershed development. More systematic research is needed to establish whether these variables can be predicted based on watershed IC.

- In general, stream habitat diminishes at about 10% watershed IC, and becomes severely degraded beyond 25% watershed IC.

While our understanding of the relationship between stream habitat features and watershed development has improved in recent years, the topic deserves greater research in three areas. First, more systematic monitoring of composite habitat variables needs to be conducted across the full range of watershed IC. In particular, research is needed to define the approximate degree of watershed IC where urban streams are transformed into urban drainage systems.

Second, additional research is needed to explore the relationship between watershed IC and individual and measurable stream habitat parameters, such as bank erosion, channel sinuosity, pool depth and wetted perimeter. Lastly, more research is needed to determine if watershed treatment such as stormwater practices and stream buffers can mitigate the impacts of watershed IC on stream habitat. Together, these three research efforts could provide a technical foundation to develop a more predictive model of how watershed development influences stream habitat.

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Chapter 4: Water Quality Impacts of Impervious Cover

This chapter presents information on pollutant concentrations found in urban stormwater runoff based on a national and regional data assessment for nine categories of pollutants. Included is a description of the Simple Method, which can be used to estimate pollutant loads based on the amount of IC found in a catchment or subwatershed. This chapter also addresses specific water quality impacts of stormwater pollutants and explores research on the sources and source areas of stormwater pollutants.

This chapter is organized as follows:

4.1 Introduction
4.2 Summary of National and Regional Stormwater Pollutant Concentration Data
4.3 Relationship Between Pollutant Loads and IC: The Simple Method
4.4 Sediment
4.5 Nutrients
4.6 Trace Metals
4.7 Hydrocarbons (PAH and Oil and Grease)
4.8 Bacteria and Pathogens
4.9 Organic Carbon
4.10 MTBE
4.11 Pesticides
4.12 Deicers
4.13 Conclusion

4.1 Introduction

Streams are usually the first aquatic system to receive stormwater runoff, and their water quality can be compromised by the pollutants it contains. Stormwater runoff typically contains dozens of pollutants that are detectable at some concentration, however small. Simply put, any pollutant deposited or derived from an activity on land will likely end up in stormwater runoff, although certain pollutants are consistently more likely to cause water quality problems in receiving waters. Pollutants that are frequently found in stormwater runoff can be grouped into nine broad categories: sediment, nutrients, metals, hydrocarbons, bacteria and pathogens, organic carbon, MTBE, pesticides, and deicers.

The impact that stormwater pollutants exert on water quality depends on many factors, including concentration, annual pollutant load, and category of pollutant. Based on nationally reported concentration data, there is considerable variation in stormwater pollutant concentrations. This variation has been at least partially attributed to regional differences, including rainfall and snowmelt. The volume and regularity of rainfall, the length of snow accumulation, and the rate of snowmelt can all influence stormwater pollutant concentrations.

The annual pollutant load can have long-term effects on stream water quality, and is particularly important information for stormwater managers to have when dealing with non-point source pollution control. The Simple Method is a model developed to estimate the pollutant load for chemical pollutants, assuming that the annual pollutant load is a function of IC. It is an effective method for determining annual sediment, nutrient, and trace metal loads. It cannot always be applied to other stormwater pollutants, since they are not always correlated with IC.

The direct water quality impact of stormwater pollutants also depends on the type of pollutant, as different pollutants impact streams differently. For example, sediments affect stream habitat and aquatic biodiversity; nutrients cause eutrophication; metals, hydrocarbons, deicers, and MTBE can be toxic to aquatic life; and organic carbon can lower dissolved oxygen levels.

The impact stormwater pollutants have on

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water quality can also directly influence human uses and activities. Perhaps the pollutants of greatest concern are those with associated public health impacts, such as bacteria and pathogens. These pollutants can affect the availability of clean drinking water and limit consumptive recreational activities, such as swimming or fishing. In extreme situations, these pollutants can even limit contact recreational activities such as boating and wading.

It should be noted that although there is much research available on the effects of urbanization on water quality, the majority has not been focused on the impact on streams, but on the response of lakes, reservoirs, rivers and estuaries. It is also important to note that not all pollutants are equally represented in monitoring conducted to date. While we possess excellent monitoring data for sediment, nutrients and trace metals, we have relatively little monitoring data for pesticides, hydrocarbons, organic carbon, deicers, and MTBE.

4.2 Summary of National and Regional Stormwater Pollutant Concentration Data

4.2.1 National Data

National mean concentrations of typical stormwater pollutants are presented in Table 16. National stormwater data are compiled from the Nationwide Urban Runoff Program (NURP), with additional data obtained from the U.S.Geological Survey (USGS), as well as initial stormwater monitoring conducted for EPA's National Pollutant Discharge Elimination System (NPDES) Phase I stormwater program.

In most cases, stormwater pollutant data is reported as an event mean concentration (EMC), which represents the average concentration of the pollutant during an entire stormwater runoff event.

When evaluating stormwater EMC data, it is important to keep in mind that regional EMCs can differ sharply from the reported national pollutant EMCs. Differences in EMCs between regions are often attributed to the variation in the amount and frequency of rainfall and snowmelt.

4.2.2 Regional Differences Due to Rainfall

The frequency of rainfall is important, since it influences the accumulation of pollutants on IC that are subsequently available for wash-off during storm events. The USGS developed a national stormwater database encompassing 1,123 storms in 20 metropolitan areas and used it as the primary data source to define regional differences in stormwater EMCs. Driver (1988) performed regression analysis to determine which factors had the greatest influence on stormwater EMCs and determined that annual rainfall depth was the best overall predictor. Driver grouped together stormwater EMCs based on the depth of average annual rainfall, and Table 17 depicts the regional rainfall groupings and general trends for each

region. Table 18 illustrates the distribution of stormwater EMCs for a range of rainfall regions from 13 local studies, based on other monitoring studies. In general, stormwater EMCs for nutrients, suspended sediment and metals tend to be higher in arid and semi-arid

Table 16: National EMCs for Stormwater Pollutants

Pollutant	Source	EMCs		Number of Events
		Mean	Median	
Sediments (mg/l)				
TSS	(1)	78.4	54.5	3047
Nutrients (mg/l)				
Total P	(1)	0.32	0.26	3094
Soluble P	(1)	0.13	0.10	1091
Total N	(1)	2.39	2.00	2016
TKN	(1)	1.73	1.47	2693
Nitrite & Nitrate	(1)	0.66	0.53	2016
Metals (Fg/l)				
Copper	(1)	13.4	11.1	1657
Lead	(1)	67.5	50.7	2713
Zinc	(1)	162	129	2234
Cadmium	(1)	0.7	N/R	150
Chromium	(4)	4	7	164
Hydrocarbons (mg/l)				
PAH	(5)	3.5	N/R	N/R
Oil and Grease	(6)	3	N/R	N/R
Bacteria and Pathogens (colonies/ 100ml)				
Fecal Coliform	(7)	15,038	N/R	34
Fecal Streptococci	(7)	35,351	N/R	17
Organic Carbon (mg/l)				
TOC	(11)	17	15.2	19 studies
BOD	(1)	14.1	11.5	1035
COD	(1)	52.8	44.7	2639
MTBE	(8)	N/R	1.6	592
Pesticides (Fg/l)				
Diazinon	(10)	N/R	0.025	326
	(2)	N/R	0.55	76
Chlorpyrifos	(10)	N/R	N/R	327
Atrazine	(10)	N/R	0.023	327
Prometon	(10)	N/R	0.031	327
Simazine	(10)	N/R	0.039	327
Chloride (mg/l)				
Chloride	(9)	N/R	397	282

Sources: (1) Smullen and Cave, 1998; (2) Brush et al., 1995; (3) Baird et al., 1996; (4) Bannerman et al., 1996; (5) Rabanal and Grizzard, 1995; (6) Crunkilton et al., 1996; (7) Schueler, 1999; (8) Delzer, 1996; (9) Environment Canada, 2001; (10) USEPA, 1998; (11) CWP, 2001a N/R - Not Reported

Table 17: Regional Groupings by Annual Rainfall Amount (Driver, 1988)			
Region	**Annual Rainfall**	**States Monitored**	**Concentration Data**
Region I: Low Rainfall	<20 inches	AK, CA, CO, NM, UT	Highest mean and median values for Total N, Total P, TSS and COD
Region II: Moderate Rainfall	20 40 inches	HA, IL, MI, MN, MI, NY, TX, OR, OH, WA, WI	Higher mean and median values than Region III for TSS, dissolved phosphorus and cadmium
Region III: High Rainfall	>40 inches	FL, MD, MA, NC, NH, NY, TX, TN, AR	Lower values for many parameters likely due to the frequency of storms and the lack of build up in pollutants

regions and tend to decrease slightly when annual rainfall increases (Table 19).

It is also hypothesized that a greater amount of sediment is eroded from pervious surfaces in arid or semi-arid regions than in humid regions due to the sparsity of protective vegetative cover. Table 19 shows that the highest concentrations of total suspended solids were recorded in regions with least rainfall. In addition, the chronic toxicity standards for several metals are most frequently exceeded during low rainfall regions (Table 20).

4.2.3 Cold Region Snowmelt Data

In colder regions, snowmelt can have a significant impact on pollutant concentrations. Snow accumulation in winter coincides with pollutant build-up; therefore, greater concentrations of pollutants are measured during snowmelt events. Sources of snowpack pollution in urban areas include wet and dry atmospheric deposition, traffic emissions, urban litter, deteriorated infrastructure, and deicing chemicals and abrasives (WERF, 1999).

Oberts *et al.* (1989) measured snowmelt pollutants in Minnesota streams and found that as much as 50% of annual sediment, nutrient, hydrocarbon and metal loads could be attributed to snowmelt runoff during late winter and early spring. This trend probably applies to any region where snow cover persists through much of the winter. Pollutants accumulate in the snowpack and then contribute high concentrations during snowmelt runoff. Oberts (1994) described four types of snowmelt runoff events and the resulting pollutant characteristics (Table 21).

A typical hydrograph for winter and early spring snow melts in a northern cold climate is portrayed in Figure 29. The importance of snowpack melt on peak runoff during March 1989 can clearly be seen for an urban watershed located in St. Paul, Minnesota.

Major source areas for snowmelt pollutants include snow dumps and roadside snowpacks. Pollutant concentrations in snow dumps can be as much as five times greater than typical stormwater pollutant concentrations (Environment Canada, 2001). Snow dumps and packs accumulate pollutants over the winter months and can release them during a few rain or snow melt events in the early spring. High levels of chloride, lead, phosphorus, biochemical oxygen demand, and total suspended solids have been reported in snow pack runoff (La Barre *et al*, 1973; Oliver *et al.*, 1974; Pierstorff and Bishop, 1980; Scott and Wylie, 1980; Van Loon, 1972).

Atmospheric deposition can add pollutants to snow piles and snowpacks. Deposited pollutants include trace metals, nutrients and particles that are primarily generated by fossil fuel combustion and industrial emissions (Boom and Marsalek, 1988; Horkeby and Malmqvist, 1977; Malmqvist, 1978; Novotny and Chester, 1981; Schrimpff and Herrman, 1979).

Table 18: Stormwater Pollutant Event Mean Concentration for Different U.S. Regions (Units: mg/l, except for metals which are in *F*g/l)

		Region I - Low Rainfall				Region II - Moderate Rainfall			Region III - High Rainfall				Snow
	National	Phoenix, AZ	San Diego, CA	Boise, ID	Denver, CO	Dallas, TX	Marquette, MI	Austin, TX	MD	Louisville, KY	GA	FL	MN
Reference	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(11)	(12)
Annual Rainfall (in.)	N/A	7.1"	10"	11"	15"	28"	32"	32"	41"	43"	51"	52"	N/R
Number of Events	3000	40	36	15	35	32	12	N/R	107	21	81	N/R	49
Pollutant													
TSS	78.4	227	330	116	242	663	159	190	67	98	258	43	112
Total N	2.39	3.26	4.55	4.13	4.06	2.70	1.87	2.35	N/R	2.37	2.52	1.74	4.30
Total P	0.32	0.41	0.7	0.75	0.65	0.78	0.29	0.32	0.33	0.32	0.33	0.38	0.70
Soluble P	0.13	0.17	0.4	0.47	N/R	N/R	0.04	0.24	N/R	0.21	0.14	0.23	0.18
Copper	14	47	25	34	60	40	22	16	18	15	32	1.4	N/R
Lead	68	72	44	46	250	330	49	38	12.5	60	28	8.5	100
Zinc	162	204	180	342	350	540	111	190	143	190	148	55	N/R
BOD	14.1	109	21	89	N/R	112	15.4	14	14.4	88	14	11	N/R
COD	52.8	239	105	261	227	106	66	98	N/R	38	73	64	112

Sources: Adapted from Caraco, 2000a: (1) Smullen and Cave, 1998; (2) Lopes et al.; 1995; (3) Schiff, 1996; (4) Kjelstrom, 1995 (computed); (5) DRCOG, 1983, (6) Brush et al., *1995; (7) Steuer* et al., *1997; (8) Barrett* et al., *1995; (9) Barr, 1997; (10) Evaldi* et al., *1992; (11) Thomas and McClelland, 1995; (12) Oberts, 1994 N/R = Not Reported; N/A = Not Applicable*

Table 19: Mean and Median Nutrient and Sediment Stormwater Concentrations for Residential Land Use Based on Rainfall Regions (Driver, 1988)

Region	Total N (median)	Total P (median)	TSS (mean)
Region I: Low Rainfall	4	0.45	320
Region II: Moderate Rainfall	2.3	0.31	250
Region III: High Rainfall	2.15	0.31	120

Table 20: EPA 1986 Water Quality Standards and Percentage of Metal Concentrations Exceeding Water Quality Standards by Rainfall Region (Driver, 1988)

	Cadmium	Copper	Lead	Zinc
EPA Standards	10 *F*g/l	12 *F*g/l	32 *F*g/l	47 *F*g/l
Percent Exceedance of EPA Standards				
Region I: Low Rainfall	1.5%	89%	97%	97%
Region II: Moderate Rainfall	0	78%	89%	85%
Region III: High Rainfall	0	75%	91%	84%

Table 21: Runoff and Pollutant Characteristics of Snowmelt Stages (Oberts, 1994)

Snowmelt Stage	Duration /Frequency	Runoff Volume	Pollutant Characteristics
Pavement	Short, but many times in winter	Low	Acidic, high concentrations of soluble pollutants; Chloride, nitrate, lead; total load is minimal
Roadside	Moderate	Moderate	Moderate concentrations of both soluble and particulate pollutants
Pervious Area	Gradual, often most at end of season	High	Dilute concentrations of soluble pollutants; moderate to high concentrations of particulate pollutants depending on flow
Rain-on-Snow	Short	Extreme	High concentrations of particulate pollutants; moderate to high concentrations of soluble pollutants; high total load

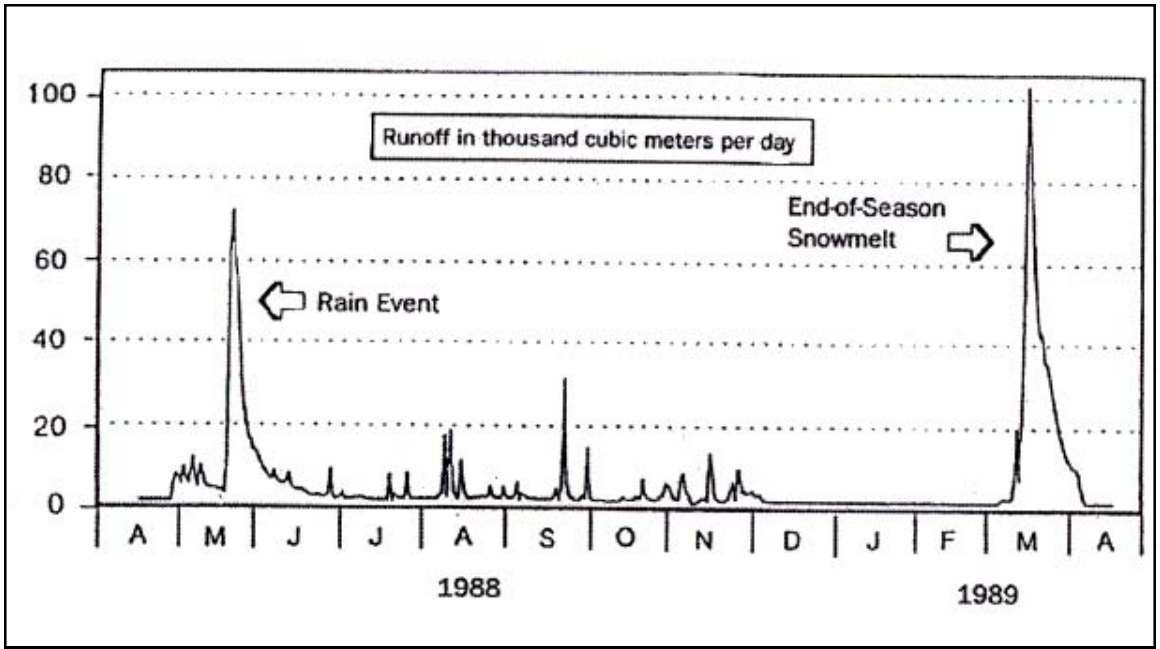

Figure 29: Snowmelt Runoff Hydrograph for Minneapolis Stream (Oberts, 1994)

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4.3 Relationship Between Pollutant Loads and IC: The Simple Method

Urban stormwater runoff contains a wide range of pollutants that can degrade downstream water quality. The majority of stormwater monitoring research conducted to date supports several generalizations. First, the unit area pollutant load delivered to receiving waters by stormwater runoff increases in direct proportion to watershed IC. This is not altogether surprising, since pollutant load is the product of the average pollutant concentration and stormwater runoff volume. Given that runoff volume increases in direct proportion to IC, pollutant loads must automatically increase when IC increases, as long the average pollutant concentration stays the same (or increases). This relationship is a central assumption in most simple and complex pollutant loading models (Bicknell *et al.*, 1993; Donigian and Huber, 1991; Haith *et al.*, 1992; Novotny and Chester, 1981; NVPDC, 1987; Pitt and Voorhees, 1989).

Recognizing the relationship between IC and pollutant loads, Schueler (1987) developed the "Simple Method" to quickly and easily estimate stormwater pollutant loads for small urban watersheds (see Figure 30). Estimates of pollutant loads are important to watershed managers as they grapple with costly decisions on non-point source control. The Simple Method is empirical in nature and utilizes the extensive regional and national database (Driscoll, 1983; MWCOG, 1983; USEPA, 1983). Figure 30 provides the basic equations to estimate pollutant loads using the Simple

Figure 30: The Simple Method - Basic Equations

The Simple Method estimates pollutant loads as the product of annual runoff volume and pollutant EMC, as:

$$(1)\ L = 0.226 * R * C * A$$

Where: L = Annual load (lbs), and:
R = Annual runoff (inches)
C = Pollutant concentration in stormwater, EMC (mg/l)
A = Area (acres)
0.226 = Unit conversion factor

For bacteria, the equation is slightly different, to account for the differences in units. The modified equation for bacteria is:

$$(2)\ L = 1.03 * 10^{-3} * R * C * A$$

Where: L = Annual load (Billion Colonies), and:
R = Annual runoff (inches)
C = Bacteria concentration (#/100 ml)
A = Area (acres)
$1.03 * 10^{-3}$ = Unit conversion factor

Annual Runoff

The Simple Method calculates the depth of annual runoff as a product of annual runoff volume and a runoff coefficient (Rv). Runoff volume is calculated as:

$$(3)\ R = P * P_j * Rv$$

Where: R = Annual runoff (inches), and:
P = Annual rainfall (inches)
P_j = Fraction of annual rainfall events that produce runoff (usually 0.9)
Rv = Runoff coefficient

In the Simple Method, the runoff coefficient is calculated based on IC in the subwatershed. The following equation represents the best fit line for the data set (N=47, R^2=0.71).

$$(4)\ Rv=0.05+0.9Ia$$

Where: Rv = runoff coefficient, and:
Ia = Impervious fraction

Method. It assumes that loads of stormwater pollutants are a direct function of watershed IC, as IC is the key independent variable in the equation.

The technique requires a modest amount of information, including the subwatershed drainage area, IC, stormwater runoff pollutant EMCs, and annual precipitation. With the Simple Method, the investigator can either divide up land use into specific areas (i.e. residential, commercial, industrial, and roadway) and calculate annual pollutant loads for each land use, or utilize a generic urban land use. Stormwater pollutant EMC data can be derived from the many summary tables of local, regional, or national monitoring efforts provided in this chapter (e.g., Tables 16, 18, 22, 28, 30, 35, 36, 40, and 44). The model also requires different IC values for separate land uses within a subwatershed. Representative IC data from Cappiella and Brown (2001) were provided in Table 2 (Chapter 1).

Additionally, the Simple Method should not be used to estimate annual pollutant loads of deicers, hydrocarbons and MTBE, because they have not been found to be correlated with IC. These pollutants have been linked to other indicators. Chlorides, hydrocarbons and MTBE are often associated with road density and vehicle miles traveled (VMT). Pesticides are associated with turf area, and traffic patterns and "hotspots" have been noted as potential indicators for hydrocarbons and MTBE.

Limitations of the Simple Method

The Simple Method should provide reasonable estimates of changes in pollutant export resulting from urban development. However, several caveats should be kept in mind when applying this method.

The Simple Method is most appropriate for assessing and comparing the relative stormflow pollutant load changes from different land uses and stormwater treatment scenarios. The Simple Method provides estimates of storm pollutant export that are probably close to the "true" but unknown value for a development site, catchment, or subwatershed. However, it is very important not to overemphasize the precision of the load estimate obtained. For example, it would be inappropriate to use the Simple Method to evaluate relatively similar development scenarios (e.g., 34.3% versus 36.9% IC). The Simple Method provides a general planning estimate of likely storm pollutant export from areas at the scale of a development site, catchment or subwatershed. More sophisticated modeling is needed to analyze larger and more complex watersheds.

In addition, the Simple Method only estimates pollutant loads generated during storm events. It does not consider pollutants associated with baseflow during dry weather. Typically, baseflow is negligible or non-existent at the scale of a single development site and can be safely neglected. However, catchments and subwatersheds do generate significant baseflow volume. Pollutant loads in baseflow are generally low and can seldom be distinguished from natural background levels (NVPDC, 1979).

Consequently, baseflow pollutant loads normally constitute only a small fraction of the total pollutant load delivered from an urban area. Nevertheless, it is important to remember that the load estimates refer only to storm event derived loads and should not be confused with the total pollutant load from an area. This is particularly important when the development density of an area is low. For example, in a low density residential subwatershed (IC < 5%), as much as 75% of the annual runoff volume could occur as baseflow. In such a case, annual baseflow load may be equivalent to the annual stormflow load.

4.4 Sediment

Sediment is an important and ubiquitous pollutant in urban stormwater runoff. Sediment can be measured in three distinct ways: Total Suspended Solids (TSS), Total Dissolved Solids (TDS) and turbidity. TSS is a measure of the total mass suspended sediment particles in water. The measurement of TSS in urban stormwater helps to estimate sediment load transported to local and downstream receiving waters. Table 22 summarizes stormwater EMCs for total suspended solids, as reported by Barrett *et al.* (1995), Smullen and Cave (1998), and USEPA (1983). TDS is a measure of the dissolved solids and minerals present in stormwater runoff and is used as a primary indication of the purity of drinking water. Since few stormwater monitoring efforts have focused on TDS, they are not reported in this document. Turbidity is a measure of how suspended solids present in water reduce the ability of light to penetrate the water column. Turbidity can exert impacts on aquatic biota, such as the ability of submerged aquatic vegetation to receive light and the ability of fish and aquatic insects to use their gills (Table 23).

4.4.1 Concentrations

TSS concentrations in stormwater across the country are well documented. Table 18 reviews mean TSS EMCs from 13 communities across the country and reveals a wide range of recorded concentrations. The lowest concentration of 43 mg/l was reported in Florida, while TSS reached 663 mg/l in Dallas, Texas. Variation in sediment concentrations has been attributed to regional rainfall differences (Driver, 1988); construction site runoff (Leopold, 1968); and bank erosion (Dartiguenave *et al.*, 1997). National values are provided in Table 22.

Turbidity levels are not as frequently reported in national and regional monitoring summaries. Barrett and Malina (1998) monitored turbidity at two sites in Austin, Texas and reported a mean turbidity of 53 NTU over 34 storm events (Table 22).

4.4.2 Impacts of Sediment on Streams

The impacts of sediment on aquatic biota are well documented and can be divided into impacts caused by suspended sediment and those caused by deposited sediments (Tables 23 and 24).

In general, high levels of TSS and/or turbidity can affect stream habitat and cause sedimentation in downstream receiving waters. Deposited sediment can cover benthic organisms such as aquatic insects and freshwater mussels. Other problems associated with high sediments loads include stream warming by reflecting radiant energy due to increased turbidity (Kundell and Rasmussen, 1995), decreased flow capacity (Leopold, 1973), and increasing overbank flows (Barrett and Malina, 1998). Sediments also transport other pollutants which bind to sediment particles. Significant levels of pollutants can be transported by sediment during stormwater runoff events,

Table 22: EMCs for Total Suspended Solids and Turbidity

Pollutant	EMCs		Number of Events	Source
	Mean	Median		
TSS (mg/l)	78.4	54.5	3047	Smullen and Cave, 1998
	174	113	2000	USEPA, 1983
Turbidity (NTU)	53	N/R	423	Barrett and Malina, 1998

N/R = Not Reported

Table 23: Summary of Impacts of Suspended Sediment on the Aquatic Environment (Schueler and Holland, 2000)
Abrades and damages fish gills, increasing risk of infection and disease
Scouring of periphyton from stream (plants attached to rocks)
Loss of sensitive or threatened fish species when turbidity exceeds 25 NTU
Shifts in fish community toward more sediment-tolerant species
Decline in sunfish, bass, chub and catfish when month turbidity exceeds 100 NTU
Reduces sight distance for trout, with reduction in feeding efficiency
Reduces light penetration causing reduction in plankton and aquatic plant growth
Adversely impacts aquatic insects, which are the base of the food chain
Slightly increases the stream temperature in the summer
Suspended sediments can be a major carrier of nutrients and metals
Reduces anglers chances of catching fish

Table 24: Summary of Impacts of Deposited Sediments on the Aquatic Environment (Schueler and Holland, 2000)
1. Physical smothering of benthic aquatic insect community
2. Reduced survival rates for fish eggs
3. Destruction of fish spawning areas and eggs
4. Embeddedness of stream bottom reduced fish and macroinvertebrate habitat value
5. Loss of trout habitat when fine sediments are deposited in spawning or riffle-runs
6. Sensitive or threatened darters and dace may be eliminated from fish community
7. Increase in sediment oxygen demand can deplete dissolved oxygen in streams
8. Significant contributing factor in the alarming decline of freshwater mussels
9. Reduced channel capacity, exacerbating downstream bank erosion and flooding
10. Reduced flood transport capacity under bridges and through culverts
11. Deposits diminish scenic and recreational values of waterways

including trace metals, hydrocarbons and nutrients (Crunkilton *et al.,* 1996; Dartiguenave *et al*., 1997; Gavin and Moore, 1982; Novotny and Chester, 1989; Schueler 1994b).

4.4.3 Sources and Source Areas of Sediment

Sediment sources in urban watersheds include stream bank erosion; erosion from exposed soils, such as from construction sites; and washoff from impervious areas (Table 25).

As noted in this chapter, streambank erosion is generally considered to be the primary source of sediment to urban streams. Recent studies by Dartiguenave *et al.* (1997) and Trimble (1997) determined that streambank erosion contributes the majority of the annual sediment budget of urban streams. Trimble (1997) directly measured stream cross sections, sediment aggradation and suspended sediment loads and determined that two-thirds of the annual sediment budget of a San Diego, California watershed was supplied by streambank erosion. Dartiguenave *et al.* (1997) developed a GIS based model in Austin, Texas to determine the effects of stream bank erosion on the annual sediment budget. They compared modeled sediment loads from the watershed with the actual sediment loads measured at USGS gaging stations and concluded that more than 75% of the sediment load came from streambank erosion. Dartiguenave *et al.* (1997) reported that sediment load per unit area increases with increasing IC (Figure 31).

Sediment loads are also produced by washoff of sediment particles from impervious areas and their subsequent transport in stormwater runoff sediment. Source areas include parking lots, streets, rooftops, driveways and lawns. Streets and parking lots build up dirt and grime from the wearing of the street surface, exhaust particulates, "blown on" soil and organic matter, and atmospheric deposition. Lawn runoff primarily contains soil and organic matter. Urban source areas that produce the highest TSS concentrations include streets, parking lots and lawns (Table 26).

Parking lots and streets are not only responsible for high concentrations of sediment but also high runoff volumes. The SLAMM source loading model (Pitt and Voorhees, 1989) looks at runoff volume and concentrations of pollutants from different urban land uses and predicts stream loading. When used in the Wisconsin and Michigan subwatersheds, it demonstrated that parking lots and streets were responsible for over 70% of the TSS delivered to the stream. (Steuer *et al*., 1997; Waschbusch *et al.*, 2000).

Table 25: Sources and Loading of Suspended Solids Sediment in Urban Areas

Sources	Loading	Source
Bank Erosion	75% of stream sediment budget	Dartinguenave *et al.*, 1997
	66% of stream sediment budget	Trimble, 1997
Overland Flow- Lawns	397 mg/l (geometric mean)	Bannerman *et al.*, 1993
	262 mg/l	Steuer *et al.*, 1997
	11.5% (estimated; 2 sites)	Waschbusch *et al.*, 2000
Construction Sites	200 to 1200 mg/l	Table 27
Washoff from Impervious Surfaces	78 mg/l (mean)	Table 16

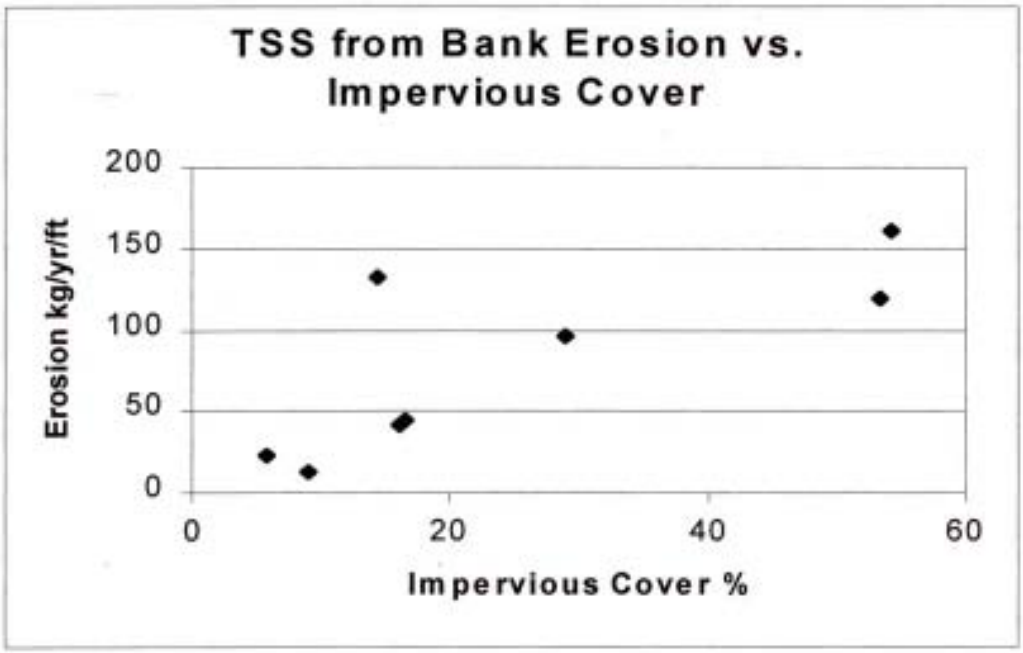

Figure 31: TSS from Bank Erosion vs. IC in Texas Streams (Daringuenave *et al.*, 1997)

The third major source of sediment loads is erosion from construction sites. Several studies have reported extremely high TSS concentrations in construction site runoff, and these findings are summarized in Table 27. TSS concentrations from uncontrolled construction sites can be more than 150 times greater than those from undeveloped land (Leopold, 1968) and can be reduced if erosion and sediment control practices are applied to construction sites.

Table 26: Source Area Geometric Mean Concentrations for Suspended Solids in Urban Areas

Source Area	Suspended Solids (mg/l)		
Source	(1)	(2)	(3)
Commercial Parking Lot	110	58	51
High Traffic Street	226	232	65
Medium Traffic Street	305	326	51
Low Traffic Street	175	662	68
Commercial Rooftop	24	15	18
Residential Rooftop	36	27	15
Residential Driveway	157	173	N/R
Residential Lawn	262	397	59

Sources: (1) Steuer et al., 1997; (2) Bannerman et al., 1993; (3) Waschbusch et al., 2000; N/R = Not Reported

Table 27: Mean TSS Inflow and Outflow at Uncontrolled, Controlled and Simulated Construction Sites

Source	Mean Inflow TSS Concentration (mg/l)	Mean Outflow TSS Concentration (mg/l)	Location
Uncontrolled Sites			
Horner *et al.*, 1990	7,363	281	PNW
Schueler and Lugbill,1990	3,646	501	MD
York and Herb, 1978	4,200	N/R	MD
Islam *et al.*, 1988	2,950	N/R	OH
Controlled Sites			
Schueler and Lugbill, 1990	466	212	MD
Simulated Sediment Concentrations			
Jarrett, 1996	9,700	800	PA
Sturm and Kirby, 1991	1,500-4,500	200-1,000	GA
Barfield and Clar, 1985	1,000-5,000	200-1,200	MD
Dartiguenave *et al.*, 1997	N/R	600	TX

N/R = Not Reported

4.5 Nutrients

Nitrogen and phosphorus are essential nutrients for aquatic systems. However, when they appear in excess concentrations, they can exert a negative impact on receiving waters. Nutrient concentrations are reported in several ways. Nitrogen is often reported as nitrate (NO_3) and nitrite (NO_2), which are inorganic forms of nitrogen; total nitrogen (Total N), which is the sum of nitrate, nitrite, organic nitrogen and ammonia; and total Kjeldhal nitrogen (TKN), which is organic nitrogen plus ammonia.

Phosphates are frequently reported as soluble phosphorus, which is the dissolved and reactive form of phosphorus that is available for uptake by plants and animals. Total phosphorus (Total P) is also measured, which includes both organic and inorganic forms of phosphorus. Organic phosphorus is derived from living plants and animals, while inorganic phosphate is comprised of phosphate ions that are often bound to sediments.

4.5.1 Concentrations

Many studies have indicated that nutrient concentrations are linked to land use type, with urban and agricultural watersheds producing the highest nutrient loads (Chessman *et al.* 1992; Paul *et al.*, 2001; USGS, 2001b and Wernick *et al.*,1998). Typical nitrogen and phosphorus EMC data in urban stormwater runoff are summarized in Table 28.

Some indication of the typical concentrations of nitrate and phosphorus in stormwater runoff are evident in Figures 32 and 33. These graphs profile average EMCs in stormwater runoff recorded at 37 residential catchments across the U.S. The average nitrate EMC is remarkably consistent among residential neighborhoods, with most clustered around the mean of 0.6 mg/l and a range of 0.25 to 1.4 mg/l. The concentration of phosphorus during storms is also very consistent with a mean of 0.30 mg/l and a rather tight range of 0.1 to 0.66 mg/l (Schueler, 1995).

The amount of annual rainfall can also influence the magnitude of nutrient concentrations in stormwater runoff. For example, both Caraco (2000a) and Driver (1988) reported that the highest nutrient EMCs were found in stormwater from arid or semi-arid regions.

Table 28: EMCs of Phosphorus and Nitrogen Urban Stormwater Pollutants

Pollutant	EMCs (mg/l)		Number of Events	Source
	Mean	Median		
Total P	0.315	0.259	3094	Smullen and Cave, 1998
	0.337	0.266	1902	USEPA, 1983
Soluble P	0.129	0.103	1091	Smullen and Cave, 1998
	0.1	0.078	767	USEPA, 1983
Total N	2.39	2.00	2016	Smullen and Cave, 1998
	2.51	2.08	1234	USEPA, 1983
TKN	1.73	1.47	2693	Smullen and Cave, 1998
	1.67	1.41	1601	USEPA, 1983
Nitrite & Nitrate	0.658	0.533	2016	Smullen and Cave, 1998
	0.837	0.666	1234	USEPA, 1983

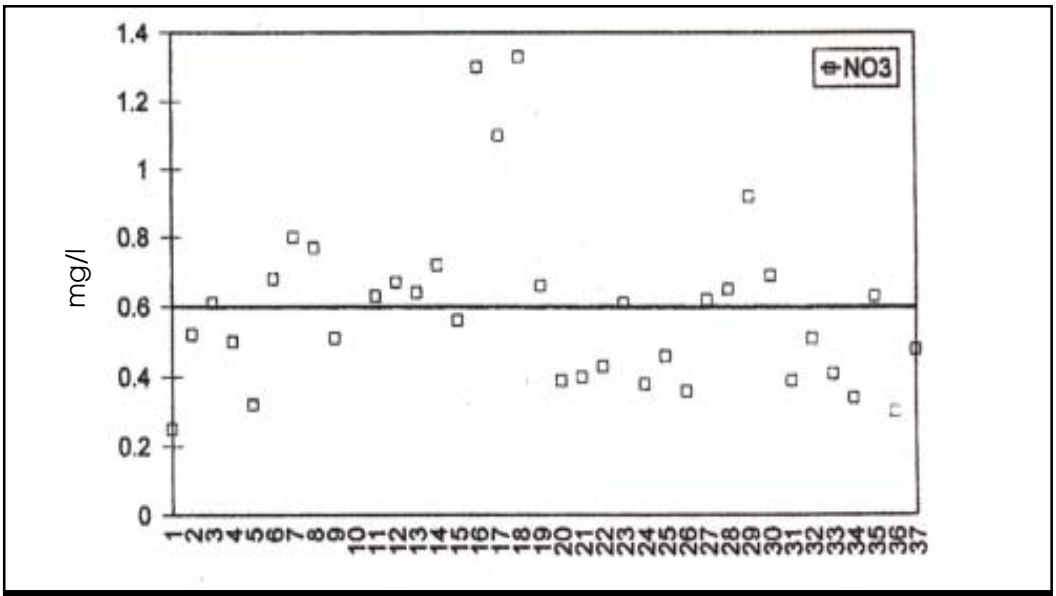

Figure 32: Nitrate-Nitrogen Concentration in Stormwater Runoff at 37 Sites Nationally (Schueler, 1999)

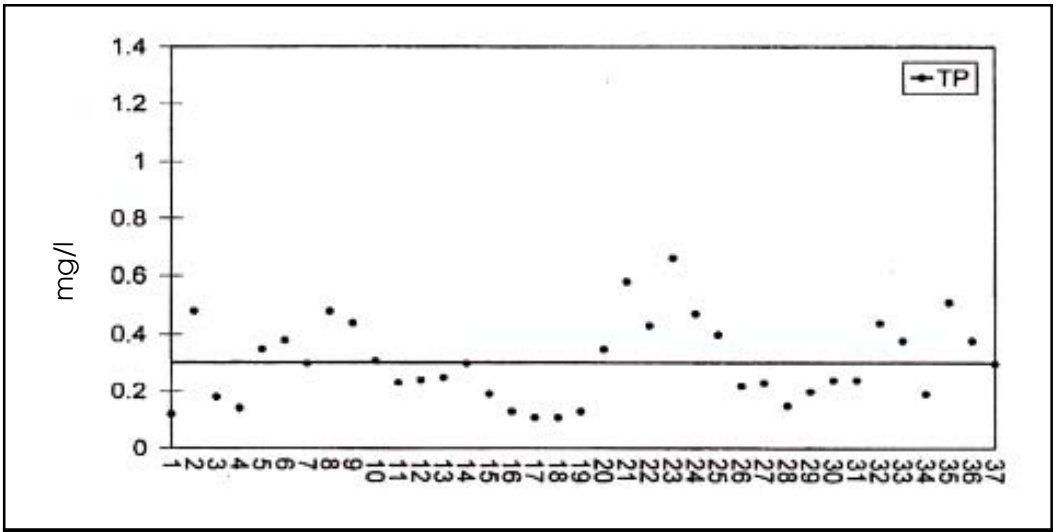

Figure 33: Total Phosphorus Concentration in Stormwater at 37 Sites Nationally (Schueler, 1999)

4.5.2 Impacts of Nutrients on Streams

Much research on the impact of nutrient loads has been focused on lakes, reservoirs and estuaries, which can experience eutrophication. Nitrogen and phosphorus can contribute to algae growth and eutrophic conditions, depending on which nutrient limits growth (USEPA, 1998). Dissolved oxygen is also affected by eutrophication. When algae or aquatic plants that are stimulated by excess nutrients die off, they are broken down by bacteria, which depletes the oxygen in the water. Relatively few studies have specifically explored the impact of nutrient enrichment on urban streams. Chessman *et al*. (1992) studied the limiting nutrients for periphyton growth in a variety of streams and noted that the severity of eutrophication was related to low flow conditions. Higher flow rates in streams may cycle nutrients faster than in slow flow rates, thus diminishing the extent of stream eutrophication.

4.5.3 Sources and Source Areas of Nutrients

Phosphorus is normally transported in surface water attached to sediment particles or in soluble forms. Nitrogen is normally transported by surface water runoff in urban watersheds. Sources for nitrogen and phosphorus in urban stormwater include fertilizer, pet waste, organic matter (such as leaves and detritus), and stream bank erosion. Another significant source of nutrients is atmospheric deposition. Fossil fuel combustion by automobiles, power plants and industry can supply nutrients in both wet fall and dry fall. The Metropolitan Washington Council of Governments (MWCOG, 1983) estimated total annual atmospheric deposition rates of 17 lbs/ac for nitrogen and 0.7 lbs/ac for phosphorus in the Washington, D.C. metro area.

Research from the upper Midwest suggests "hot spot" sources can exist for both nitrogen and phosphorus in urban watersheds. Lawns, in particular, contribute greater concentrations of Total N, Total P and dissolved phosphorus than other urban source areas. Indeed, source research suggests that nutrient concentrations in lawn runoff can be as much as four times greater than other urban sources such as streets, rooftops or driveways (Bannerman *et al.*, 1993; Steuer *et al.*, 1997 and Waschbusch *et al.*, 2000) (Table 29). This finding is significant, since lawns can comprise more than 50% of the total area in suburban watersheds. Lawn care, however, has seldom been directly linked to elevated nutrient concentrations during storms. A very recent lakeshore study noted that phosphorus concentrations were higher in fertilized lawns compared to unfertilized lawns, but no significant difference was noted for nitrogen (Garn, 2002).

Wash-off of deposited nutrients from IC is thought to be a major source of nitrogen and phosphorus during storms (MWCOG, 1983). While the concentration of nitrogen and phosphorus from parking lots and streets is lower than lawns, the volume of runoff is significantly higher. In two studies using the SLAMM source loading model (Pitt and Voorhees, 1989), parking lots and streets were responsible for over 30% of the nitrogen and were second behind lawns in their contributions to the phosphorus load (Steuer *et al.*, 1997; Waschbusch *et al.*, 2000).

Table 29: Source Area Monitoring Data for Total Nitrogen and Total Phosphorous in Urban Areas

Source Area	Total N (mg/l)	Total P (mg/l)		
Source	(1)	(1)	(2)	(3)
Commercial Parking Lot	1.94	0.20	N/R	0.10
High Traffic Street	2.95	0.31	0.47	0.18
Med. Traffic Street	1.62	0.23	1.07	0.22
Low Traffic Street	1.17	0.14	1.31	0.40
Commercial Rooftop	2.09	0.09	0.20	0.13
Residential Rooftop	1.46	0.06	0.15	0.07
Residential Driveway	2.10	0.35	1.16	N/R
Residential Lawn	9.70	2.33	2.67	0.79
Basin Outlet	1.87	0.29	0.66	N/R

(1) Steuer et al., 1997; (2) Bannerman et al., 1993; (3) Waschbusch et al., 2000; N/R= Not Reported

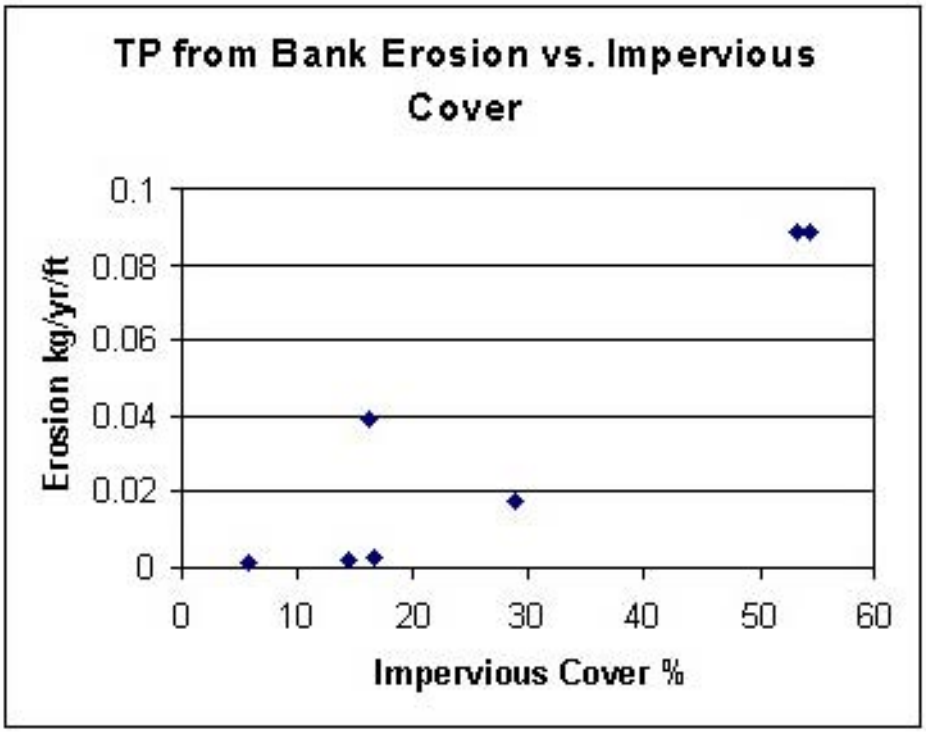

Figure 34: Total Phosphorus from Bank Erosion as a Function of IC in Texas Streams (Dartiguenave *et al.*, 1997)

Streambank erosion also appears to be a major source of nitrogen and phosphorus in urban streams. Both nitrogen and phosphorus are often attached to eroded bank sediment, as indicated in a recent study by Dartiguenave *et al.* (1997) in Austin, Texas. They showed that channel erosion contributed nearly 50% of the Total P load shown for subwatersheds with IC levels between 10 and 60 % (Figure 34). These findings suggest that prevention or reduction of downstream channel erosion may be an important nutrient reduction strategy for urban watersheds.

Snowmelt runoff generally has higher nutrient EMCs, compared to stormwater runoff. Oberts (1994) found that TKN and nitrate EMCs were much higher in snowmelt at all sites. The same pattern has also been observed for phosphorus EMCs during snowmelt and stormwater runoff. Zapf-Gilje *et al*. (1986) found that the first 20% of snowmelt events contained 65% of the phosphorus and 90% of the nitrogen load. Ayers *et al.* (1985) reported that a higher percentage of the annual nitrate, TKN and phosphorus load was derived from snowmelt runoff compared to stormwater runoff in an urban Minnesota watershed, which presumably reflects the accumulation of nutrients in the snowpack during the winter.

4.6 Trace Metals

Many trace metals can be found at potentially harmful concentrations in urban stormwater. Certain metals, such as zinc, copper, lead, cadmium and chromium, are consistently present at concentrations that may be of concern. These metals primarily result from the use of motor vehicles, weathering of metals and paints, burning of fossil fuels and atmospheric deposition.

Metals are routinely reported as the total recoverable form or the dissolved form. The dissolved form refers to the amount of metal dissolved in the water, which excludes metals attached to suspended particles that cannot pass through a 0.45 micron filter. Total recoverable refers to the concentration of an unfiltered sample that is treated with hot dilute mineral acid. In general, the toxicity of metals is related more to the dissolved form than the recoverable form.

4.6.1 Concentrations

Stormwater EMCs for zinc, copper, lead, cadmium and chromium vary regionally and are reviewed in Table 30. Regional differences in trace metal concentrations and water quality standard exceedence appears to be related to climate. In general, drier regions often have a

Table 30: EMCs and Detection Frequency for Metals in Urban Stormwater

Metal	Detection Frequency(1)	EMCs (Fg/l)		Number of Events	Source
		Mean	Median		
Zinc	94%	162	129	2234	Smullen and Cave, 1998
		176	140	1281	USEPA, 1983
Copper	91%	13.5	11.1	1657	Smullen and Cave, 1998
		66.6	54.8	849	USEPA, 1983
Lead	94%	67.5	50.7	2713	Smullen and Cave, 1998
		175(2)	131 (2)	1579	USEPA, 1983
Cadmium	48%	0.7	N/R	150	USEPA, 1983
		0.5	N/R	100	USEPA, 1993
		N/R	0.75 **R** 0.96 **C** 2.1 **I**	30	Baird *et al.*, 1996
		3 **I** 1**U**	N/R	9	Doerfer and Urbonas, 1993
Chromium	58%	4	N/R	32	Baird *et al.*, 1996
		N/R	2.1 **R** 10 **C** 7 **I**	30	Baird *et al.*, 1996
		N/R	7	164	Bannerman *et al.*, 1993

N/R = Not Reported; R- Residential, C- Commercial, I- Industrial; (1) as reprinted in USEPA, 1983; (2) Lead levels have declined over time with the introduction of unleaded gasoline

Table 31: Average Total Recoverable and Dissolved Metals for 13 Stormwater Flows and Nine Baseflow Samples from Lincoln Creek in 1994 (Crunkilton *et al.*, 1996)

	Total Recoverable		Dissolved	
Metal (Fg/l)	Storm Flow	Baseflow	Storm Flow	Baseflow
Lead	35	3	1.7	1.2
Zinc	133	22	13	8
Copper	23	7	5	4
Cadmium	0.6	0.1	0.1	0.1

higher risk of exceeding trace metal concentration standards.

Crunkilton *et al.* (1996) measured recoverable and dissolved metals concentrations in Lincoln Creek, Wisconsin and found higher EMCs during storm events compared to baseflow periods (Table 31). They also found that total recoverable metal concentrations were almost always higher than the dissolved concentration (which is the more available form).

4.6.2 Impacts of Trace Metals on Streams

Although a great deal is known about the concentration of metals in urban stormwater, much less is known about their possible toxicity on aquatic biota. The primary concern related to the presence of trace metals in streams is their potential toxicity to aquatic organisms. High concentrations can lead to bioaccumulation of metals in plants and animals, possible chronic or acute toxicity, and contamination of sediments, which can affect bottom dwelling organisms (Masterson and Bannerman, 1994). Generally, trace metal concentrations found in urban stormwater are not high enough to cause acute toxicity (Field and Pitt, 1990). The cumulative accumulation of trace metal concentrations in bottom sediments and animal tissues are of greater concern. Some evidence exists for trace metal accumulation in bottom sediments of receiving waters and for bioaccumulation in aquatic species (Bay and Brown, 2000 and Livingston, 1996).

Relatively few studies have examined the chronic toxicity issue. Crunkilton *et al.* (1996) found that concentrations of lead, zinc and copper exceeded EPA's Chronic Toxicity Criteria more than 75% of the time in stormflow in stormwater samples for Lincoln Creek in Wisconsin. When exposed to storm and base flows in Lincoln Creek, *Ceriodaphnia dubia*, a common invertebrate test species, demonstrated significant mortality in extended flow-through tests. Around 30% mortality was recorded after seven days of exposure and 70% mortality was recorded after 14 days.

Crunkilton *et al.* (1996) also found that significant mortality in bullhead minnows occurred in only 14% of the tests by the end of 14 days, but mortality increased to 100% during exposures of 17 to 61 days (see Table 32). In a related study in the same watershed, Masterson and Bannerman (1994) determined that crayfish in Lincoln Creek had elevated levels of lead, cadmium, chromium and copper when compared to crayfish from a reference stream. The Lincoln Creek research provides limited evidence that prolonged exposure to trace metals in urban streams may result in significant toxicity.

Most toxicity research conducted on urban stormwater has tested for acute toxicity over a short period of time (two to seven days). Shorter term whole effluent toxicity protocols are generally limited to seven days (Crunkilton *et al.*, 1996). Research by Ellis (1986) reported delayed toxicity in urban streams. Field and Pitt (1990) demonstrated that pollutants deposited to the stream during storm events

may take upwards of 10 to 14 days to exert influence. The research suggests that longer term in-situ and flow-through monitoring are needed to definitively answer the question whether metal levels in stormwater can be chronically toxic.

An additional concern is that trace metals co-occur with other pollutants found in urban stormwater, and it is not clear whether they interact to increase or decrease potential toxicity. Hall and Anderson (1988) investigated the toxicity and chemical composition of urban stormwater runoff in British Columbia and found that the interaction of pollutants changed the toxicity of some metals. In laboratory analysis with *Daphnia pulex*, an aquatic invertebrate, they found that the toxicity of iron was low and that its presence reduced the toxicity of other metals. On the other hand, the presence of lead increased the toxicity of copper and zinc.

Interaction with sediment also influences the impact of metals. Often, over half of the trace metals are attached to sediment (MWCOG, 1983). This effectively removes the metals from the water column and reduces the availability for biological uptake and subsequent bioaccumulation (Gavin and Moore, 1982 and OWML, 1983). However, metals accumulated in bottom sediment can then be resuspended during storms (Heaney and Huber, 1978). It is important to note that the toxic effect of metals can be altered when found in conjunction with other substances. For instance, the presence of chlorides can increase the toxicity of some metals. Both metals and chlorides are common pollutants in snowpacks (see section 4.2 for more snow melt information).

4.6.3 Sources and Source Areas of Trace Metals

Research conducted in the Santa Clara Valley of California suggests that cars can be the dominant loading source for many metals of concern, such as cadmium, chromium, copper, lead, mercury and zinc (EOA, Inc., 2001). Other sources are also important and include atmospheric deposition, rooftops and runoff from industrial and residential sites.

The sources and source areas for zinc, copper, lead, chromium and cadmium are listed in Table 33. Source areas for trace metals in the urban environment include streets, parking lots, snowpacks and rooftops. Copper is often found in higher concentrations on urban streets, because some vehicles have brake pads that contain copper. For example, the Santa Clara study estimated that 50% of the total copper load was due to brake pad wear (Woodward-Clyde, 1992). Sources of lead include atmospheric deposition and diesel fuel emissions, which frequently occur along rooftops

Table 32: Percentage of In-situ Flow-through Toxicity Tests Using Daphnia *magna* and Pimephales *promelas* with Significant Toxic Effects from Lincoln Creek (Crunkilton *et al.*, 1996)

Species	Effect	Percent of Tests with Significant ($p<0.05$) Toxic Effects as Compared to Controls According to Exposure				
		48 hours	96 hours	7 days	14 days	17-61 days
D. *magna*	Mortality	0	N/R	36%	93%	N/R
	Reduced Reproduction	0	N/R	36%	93%	N/R
P. *promelas*	Mortality	N/R	0	0	14%	100%
	Reduced Biomass	N/R	N/R	60%	75%	N/R

N/R = Not Reported

and streets. Zinc in urban environments is a result of the wear of automobile tires (estimated 60% in the Santa Clara study), paints, and weathering of galvanized gutters and downspouts. Source area concentrations of trace metals are presented in Table 34. In general, trace metal concentrations vary considerably, but the relative rank among source areas remains relatively constant. For example, a source loading model developed for an urban watershed in Michigan estimated that parking lots, driveways and residential streets were the primary source areas for zinc, copper and cadmium loads (Steuer *et al.*, 1997).

Table 33: Metal Sources and Source Area "Hotspots" in Urban Areas

Metal	Sources	Source Area Hotspots
Zinc	tires, fuel combustion, galvanized pipes, roofs and gutters, road salts **estimate of 60% from tires*	parking lots, commercial and industrial rooftops, and streets
Copper	auto brake linings, pipes and fittings, algacides, and electroplating **estimate of 50% from brake pad wear*	parking lots, commercial roofs and streets
Lead	diesel fuel, paints and stains	parking lots, rooftops, and streets
Cadmium	component of motor oil and corrodes from alloys and plated surfaces	parking lots, rooftops, and streets
Chromium	found in exterior paints and corrodes from alloys and plated surfaces	most frequently found in industrial and commercial runoff

Sources: Bannerman et al., 1993; Barr, 1997; Steuer et al., 1997; Good, 1993; Woodward - Clyde, 1992

Table 34: Metal Source Area Concentrations in the Urban Landscape (Fg/l)

Source Area	Dissolved Zinc	Total Zinc	Dissolved Copper		Total Copper	Dissolved Lead		Total Lead		
Source	(1)	(2)	(1)	(2)	(2)	(1)	(3)	(1)	(3)	(2)
Commercial Parking Lot	64	178	10.7	9	15	N/R	N/R	40	N/R	22
High Traffic Street	73	508	11.2	18	46	2.1	1.7	37	25	50
Medium Traffic Street	44	339	7.3	24	56	1.5	1.9	29	46	55
Low Traffic Street	24	220	7.5	9	24	1.5	.5	21	10	33
Commercial Rooftop	263	330	17.8	6	9	20	N/R	48	N/R	9
Residential Rooftop	188	149	6.6	10	15	4.4	N/R	25	N/R	21
Residential Driveway	27	107	11.8	9	17	2.3	N/R	52	N/R	17
Residential Lawn	N/R	59	N/R	13	13	N/R	N/R	N/R	N/R	N/R
Basin Outlet	23	203	7.0	5	16	2.4	N/R	49	N/R	32

Sources: (1) Steuer et al., 1997; (2) Bannerman et al., 1993; (3) Waschbusch, 2000; N/R = Not Reported

4.7 Hydrocarbons: PAH, Oil and Grease

Hydrocarbons are petroleum-based substances and are found frequently in urban stormwater. The term "hydrocarbons" is used to refer to measurements of oil and grease and polycyclic-aromatic hydrocarbons (PAH). Certain components of hydrocarbons, such as pyrene and benzo[b]fluoranthene, are carcinogens and may be toxic to biota (Menzie-Cura , 1995). Hydrocarbons normally travel attached to sediment or organic carbon. Like many pollutants, hydrocarbons accumulate in bottom sediments of receiving waters, such as urban lakes and estuaries. Relatively few studies have directly researched the impact of hydrocarbons on streams.

4.7.1 Concentrations

Table 35 summarizes reported EMCs of PAH and oil and grease derived from storm event monitoring at three different areas of the U.S. The limited research on oil and grease concentrations in urban runoff indicated that the highest concentrations were consistently found in commercial areas, while the lowest were found in residential areas.

4.7.2 Impacts of Hydrocarbons on Streams

The primary concern of PAH and oil and grease on streams is their potential bioaccumulation and toxicity in aquatic organisms. Bioaccumulation in crayfish, clams and fish has been reported by Masterson and Bannerman (1994); Moring and Rose (1997); and Velinsky and Cummins (1994).

Table 35: Hydrocarbon EMCs in Urban Areas

Hydrocarbon Indicator	EMC Mean	Number of Events	Source	Location
PAH (Fg/l)	3.2*	12	Menzie-Cura, 1995	MA
	7.1	19	Menzie-Cura, 1995	MA
	13.4	N/R	Crunkilton *et al.*, 1996	WI
Oil and Grease (mg/l)	1.7 **R** 9 **C** 3 **I**	30	Baird *et al.*, 1996	TX
	3	N/R	USEPA, 1983	U.S.
	5.4*	8	Menzie-Cura, 1995	MA
	3.5	10	Menzie-Cura, 1995	MA
	3.89 **R** 13.13 **C** 7.10 **I**	N/R	Silverman *et al.*, 1988	CA
	2.35 **R** 5.63 **C** 4.86 **I**	107	Barr, 1997	MD

*N/R = Not Reported; R = Residential, C = Commercial, I = Industrial; * = geometric mean, ** = median*

Moring and Rose (1997) also showed that not all PAH compounds accumulate equally in urban streams. They detected 24 different PAH compounds in semi-permeable membrane devices (SPMDs), but only three PAH compounds were detected in freshwater clam tissue. In addition, PAH levels in the SPMDs were significantly higher than those reported in the clams.

While acute PAH toxicity has been reported at extremely high concentrations (Ireland *et al.*, 1996), delayed toxicity has also been found (Ellis, 1986). Crayfish from Lincoln Creek had a PAH concentration of 360 Fg/kg, much higher than the concentration thought to be carcinogenic (Masterson and Bannerman, 1994). By comparison, crayfish in a non-urban stream had undetectable PAH levels. Toxic effects from PAH compounds may be limited since many are attached to sediment and may be less available, with further reduction occurring through photodegradation (Ireland *et al.,* 1996).

The metabolic effect of PAH compounds on aquatic life is unclear. Crunkilton *et al.* (1996) found potential metabolic costs to organisms, but Masterson and Bannerman (1994) and MacCoy and Black (1998) did not. The long-term effect of PAH compounds in sediments of receiving waters remains a question for further study.

4.7.3 Sources and Source Areas of Hydrocarbons

In most residential stormwater runoff, hydrocarbon concentrations are generally less than 5mg/l, but the concentrations can increase to five to 10 mg/l within some commercial, industrial and highway areas (See Table 35). Specific "hotspots" for hydrocarbons include gas stations, commuter parking lots, convenience stores, residential parking areas and streets (Schueler and Shepp, 1993). These authors evaluated hydrocarbon concentrations within oil and grease separators in the Washington Metropolitan area and determined that gas stations had significantly higher concentrations of hydrocarbons and trace metals, as compared to other urban source areas. Source area research in an urban catchment in Michigan showed that commercial parking lots contributed 64% of the total hydrocarbon load (Steuer *et al.*, 1997). In addition, highways were found to be a significant contributor of hydrocarbons by Lopes and Dionne (1998).

4.8 Bacteria and Pathogens

Bacteria are single celled organisms that are too small to see with the naked eye. Of particular interest are coliform bacteria, typically found within the digestive system of warm-blooded animals. The coliform family of bacteria includes fecal coliform, fecal streptococci and Escherichia coli, which are consistently found in urban stormwater runoff. Their presence confirms the existence of sewage or animal wastes in the water and indicates that other harmful bacteria, viruses or protozoans may be present, as well. Coliform bacteria are indicators of potential public health risks and not actual causes of disease.

A pathogen is a microbe that is actually known to cause disease under the right conditions. Two of the most common waterborne pathogens in the U.S. are the protozoans *Cryptosporidium parvum* and *Giardia lambia*. *Cryptosporidium* is a waterborne intestinal parasite that infects cattle and domestic animals and can be transmitted to humans, causing life-threatening problems in people with impaired immune systems (Xiao *et al.*, 2001). *Giardia* can cause intestinal problems in humans and animals when ingested (Bagley *et al.,* 1998). To infect new hosts, protozoans create hard casings known as oocysts (*Cryptosporidium*) or cysts (*Giardia*) that are shed in feces and travel through surface waters in search of a new host.

4.8.1 Concentrations

Concentrations of fecal coliform bacteria in urban stormwater typically exceed the 200 MPN/100 ml threshold set for human contact recreation (USGS, 2001b). Bacteria concentrations also tend to be highly variable from storm to storm. For example, a national summary of fecal coliform bacteria in stormwater runoff is shown in Figure 35 and Table 36. The variability in fecal coliform ranges from 10 to 500,000 MPN/100ml with a mean of 15,038 MPN/100ml (Schueler, 1999). Another national database of more than 1,600 stormwater events computed a mean concentration of 20,000

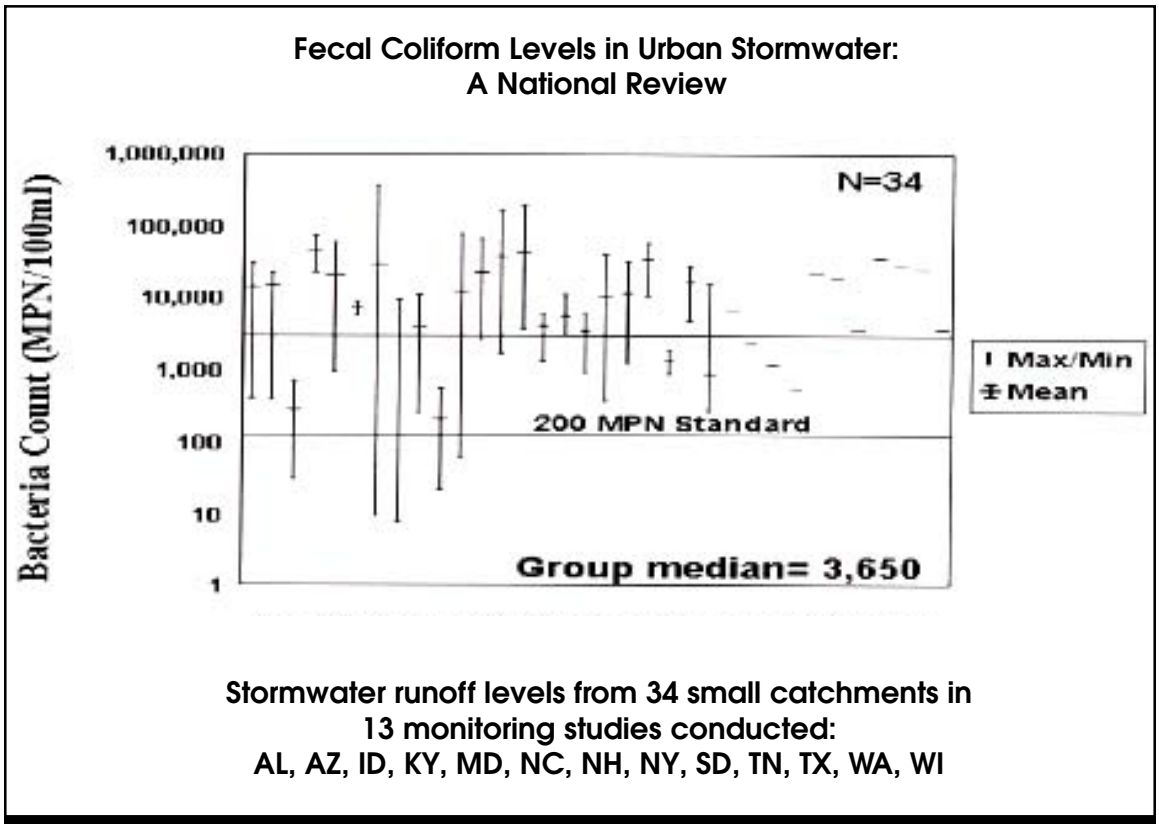

Figure 35: Fecal Coliform Levels in Urban Stormwater (Schueler, 1999)

Table 36: Bacteria EMCs in Urban Areas

Bacteria Type	EMCs (MPN/100ml) Mean	Number of Events	Source	Location
Fecal Coliform	15,038	34	Schueler, 1999	U.S.
	20,000	1600	Pitt, 1998	U.S.
	7,653	27	Thomas and McClelland, 1995	GA
	20,000 **R*** 6900 **C** 9700 **I**	30*	Baird *et al.*, 1996	TX
	77,970	21 watersheds	Chang *et al.*, 1990	TX
	4,500	189	Varner, 1995	WA
	23,500	3	Young and Thackston, 1999	TN
Fecal Strep	35,351	17	Schueler, 1999	U.S.
	28,864 **R**	27	Thomas and McClelland, 1995	GA
	56,000 **R** * 18,000 **C** 6,100 **I**	30*	Baird *et al.*, 1996	TX

*N/R = Not Reported, R = Residential Area, C = Commercial Area, I = Industrial Area, * = Median*

MPN/100ml for fecal coliform (Pitt, 1998). Fecal streptococci concentrations for 17 urban sites across the country had a mean of 35,351 MPN/100ml (Schueler, 1999).

Young and Thackston (1999) showed that bacteria concentrations at four sites in metro Nashville were directly related to watershed IC. Increasing IC reflects the cumulative increase in potential bacteria sources in the urban landscape, such as failing septic systems, sewage overflows, dogs, and inappropriate discharges. Other studies show that concentrations of bacteria are typically higher in urban areas than rural areas (USGS, 1999a), but they are not always directly related to IC. For example, Hydroqual (1996) found that concentrations of fecal coliform in seven subwatersheds of the Kensico watershed in New York were generally higher for more developed basins, but fecal coliform concentrations did not directly increase with IC in the developed basins (Figure 36).

There is some evidence that higher concentrations of coliform are found in arid or semi-arid watersheds. Monitoring data from semi-arid regions in Austin, San Antonio, and Corpus Christi, Texas averaged 61,000, 37,500 and 40,500 MPN/100ml, respectively (Baird *et al.*,1996 and Chang *et al.* 1990). Schiff (1996), in a report of Southern California NPDES monitoring, found that median concentrations of fecal coliform in San Diego were 50,000 MPN/100ml and averaged 130,000 MPN/100ml in Los Angeles. In all of these arid and semi-arid regions, concentrations were significantly higher than the national average of 15,000 to 20,000 MPN/100ml.

Concentrations of *Cryptosporidium* and *Giardia* in urban stormwater are shown in Table 37. States *et al.* (1997) found high concentrations of *Cryptosporidium* and *Giardia* in storm samples from a combined sewer in Pittsburgh (geometric mean 2,013 oocysts/100ml and 28,881 cysts/100ml). There is evidence that urban stormwater runoff may have higher concentrations of *Cryptosporidium* and *Giardia* than other surface waters, as reported in Table 38 (Stern, 1996). Both pathogens were detected in about 50% of urban stormwater samples, suggesting some concern for drinking water supplies.

4.8.2 Impacts of Bacteria and Pathogens on Streams

Fecal coliform bacteria indicate the potential for harmful bacteria, viruses, or protozoans and are used by health authorities to determine public health risks. These standards were established to protect human health based on exposures to water during recreation and drinking. Bacteria standards for various water uses are presented in Table 39 and are all easily exceeded by typical urban stormwater concentrations. In fact, over 80,000 miles of streams and rivers are currently in non-attain-

Table 37: *Cryptosporidium* and *Giardia* EMCs

Pathogens	Units	EMCs		Number of Events	Source
		Mean	Median		
Cryptosporidium	oocysts	37.2	3.9	78	Stern, 1996
	oocysts/100ml	2013	N/R	N/R	States *et al.*, 1997
Giardia	cysts	41.0	6.4	78	Stern, 1996
	cysts/100ml	28,881	N/R	N/R	States *et al.*, 1997

N/R= Not reported

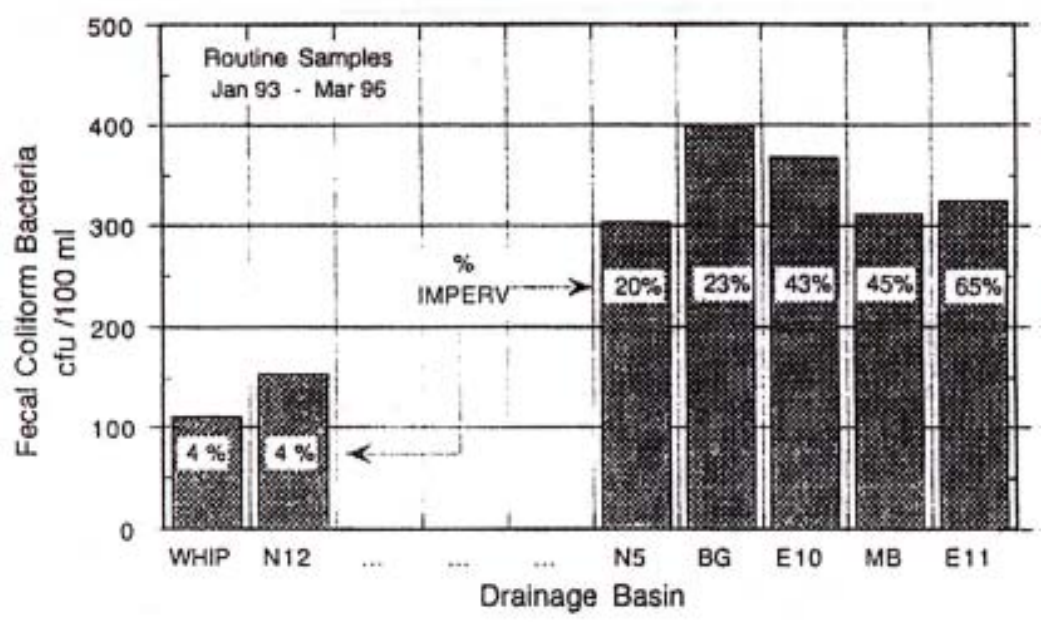

Figure 36: Relationship Between IC and Fecal Coliform Concentrations in New York Streams (Hydroqual, 1996)

Table 38: Percent Detection of *Giardia* cysts and *Cryptosporidium* oocysts in Subwatersheds and Wastewater Treatment Plant Effluent in the New York City Water Supply Watersheds (Stern, 1996)

Source Water Sampled	Number of Sources/ Number of Samples	Percent Detection			
		Total *Giardia*	Confirmed *Giardia*	Total *Cryptosporidium*	Confirmed *Cryptosporidium*
Wastewater Effluent	8/147	41.5%	12.9%	15.7%	5.4%
Urban Subwatershed	5/78	41.0%	6.4%	37.2%	3.9%
Agricultural Subwatershed	5/56	30.4%	3.6%	32.1%	3.6%
Undisturbed Subwatershed	5/73	26.0%	0.0%	9.6%	1.4%

Table 39: Typical Coliform Standards for Different Water Uses (USEPA, 1998)

Water Use	Microbial Indicator	Typical Water Standard
Water Contact Recreation	Fecal Coliform	<200 MPN per 100ml
Drinking Water Supply	Fecal Coliform	<20 MPN per 100ml
Shellfish Harvesting	Fecal Coliform	<14 MPN/ 100ml
Treated Drinking Water	Total Coliform	No more than 1% coliform positive samples per month
Freshwater Swimming	E.Coli	<126 MPN per 100ml

Important Note: Individual state standards may employ different sampling methods, indicators, averaging periods, averaging methods, instantaneous maximums and seasonal limits. MPN = most probable number. Higher or lower limits may be prescribed for different water use classes.

ment status because of high fecal coliform levels (USEPA, 1998).

4.8.3 Sources and Source Areas of Bacteria and Pathogens

Sources of coliform bacteria include waste from humans and wildlife, including livestock and pets. Essentially, any warm-blooded species that is present in significant numbers in a watershed is a potential culprit. Source identification studies, using methods such as DNA fingerprinting, have put the blame on species such as rats in urban areas, ducks and geese in stormwater ponds, livestock from hobby farms, dogs and even raccoons (Blankenship, 1996; Lim and Olivieri, 1982; Pitt, 1998; Samadpour and Checkowitz, 1998).

Transport of bacteria takes place through direct surface runoff, direct inputs to receiving waters, or indirect secondary sources. Source areas in the urban environment for direct runoff include lawns and turf, driveways, parking lots and streets. For example, dogs have high concentrations of fecal coliform in their feces and have a tendency to defecate in close proximity to IC (Schueler, 1999). Weiskel *et al.* (1996) found that direct inputs of fecal coliform from waterfowl can be very

important; these inputs accounted for as much as 67% of the annual coliform load to Buttermilk Bay, Massachusetts.

Indirect sources of bacteria include leaking septic systems, illicit discharges, sanitary sewer overflows (SSOs), and combined sewer overflows (CSOs). These sources have the potential to deliver high coliform concentrations to urban streams. In fact, extremely high bacteria concentrations are usually associated with wastewater discharges. CSOs and SSOs occur when the flow into the sewer exceeds the capacity of the sewer lines to drain them. CSOs result from stormwater flow in the lines, and SSOs are a result of infiltration problems or blockages in the lines.

Illicit connections from businesses and homes to the storm drainage system can discharge sewage or washwater into receiving waters. Illicit discharges can often be identified by baseflow sampling of storm sewer systems. Leaking septic systems are estimated to comprise between 10 and 40% of the systems, and individual inspections are the best way to determine failing systems (Schueler, 1999).

There is also evidence that coliform bacteria can survive and reproduce in stream sediments and storm sewers (Schueler, 1999). During a storm event, they often become resuspended and add to the in-stream bacteria load. Source area studies reported that end of pipe concentrations were an order of magnitude higher than any source area on the land surface; therefore, it is likely that the storm sewer system itself acts as a source of fecal coliform (Bannerman *et al.*, 1993 and Steuer *et al.*, 1997). Resuspension of fecal coliform from fine stream sediments during storm events has been reported in New Mexico (NMSWQB, 1999). The sediments in-stream and in the storm sewer system may be significant contributors to the fecal coliform load.

Sources of *Cryptosporidium* and *Giardia* include human sewage and animal feces. *Cryptosporidium* is commonly found in cattle, dogs and geese. Graczyk *et al.* (1998) found that migrating Canada geese were a vector for *Cryptosporidium* and *Giardia*, which has implications for water quality in urban ponds that support large populations of geese.

4.9 Organic Carbon

Total organic carbon (TOC) is often used as an indicator of the amount of organic matter in a water sample. Typically, the more organic matter present in water, the more oxygen consumed, since oxygen is used by bacteria in the decomposition process. Adequate levels of dissolved oxygen in streams and receiving waters are important because they are critical to maintain aquatic life. Organic carbon is routinely found in urban stormwater, and high concentrations can result in an increase in Biochemical Oxygen Demand (BOD) and Chemical Oxygen Demand (COD). BOD and COD are measures of the oxygen demand caused by the decay of organic matter.

4.9.1 Concentrations

Urban stormwater has a significant ability to exert a high oxygen demand on a stream or receiving water, even two to three weeks after an individual storm event (Field and Pitt, 1990). Average concentrations of TOC, BOD and COD in urban stormwater are presented in Table 40. Mean concentrations of TOC, BOD and COD during storm events in nationwide studies were 17 mg/l, 14.1 mg/l and 52.8 mg/l, respectively (Kitchell, 2001 and Smullen and Cave,1998).

4.9.2 Impacts of Organic Carbon on Streams

TOC is primarily a concern for aquatic life because of its link to oxygen demand in streams, rivers, lakes and estuaries. The initial effect of increased concentrations of TOC, BOD or COD in stormwater runoff may be a depression in oxygen levels, which may persist for many days after a storm, as deposited organic matter gradually decomposes (Field and Pitt, 1990).

TOC is also a concern for drinking water quality. Organic carbon reacts with chlorine during the drinking water disinfection process and forms trihalomethanes and other disinfection by-products, which can be a serious drinking water quality problem (Water, 1999). TOC concentrations greater than 2 mg/l in treated water and 4 mg/l in source water can result in unacceptably high levels of disinfection byproducts and must be treated to reduce TOC or remove the disinfection byproducts (USEPA, 1998). TOC can also be a carrier for other pollutants, such as trace metals, hydrocarbons and nutrients.

4.9.3 Sources and Source Areas of Total Organic Carbon

The primary sources of TOC in urban areas appear to be decaying leaves and other organic matter, sediment and combustion by-products. Source areas include curbs, storm drains, streets and stream channels. Dartiguenave *et al.* (1997) determined that about half of the annual TOC load in urban watersheds of Austin, TX was derived from the eroding streambanks.

Table 40: EMCs for Organic Carbon in Urban Areas

Organic Carbon Source	EMCs (mg/l)		Number of Events	Source
	Mean	Median		
Total Organic Carbon (TOC)	32.0	N/R	423	Barrett and Malina, 1998
	17	15.2	19 studies	Kitchell, 2001
Biological Oxygen Demand (BOD)	14.1	11.5	1035	Smullen and Cave, 1998
	10.4	8.4	474	USEPA, 1983
Chemical Oxygen Demand (COD)	52.8	44.7	2639	Smullen and Cave, 1998
	66.1	55	1538	USEPA, 1983

N/R = Not Reported

4.10 MTBE

Methyl tertiary butyl-ether (MTBE) is a volatile organic compound (VOC) that is added to gasoline to increase oxygen levels, which helps gas burn cleaner (called an oxygenate). MTBE has been used as a performance fuel additive since the 1970s. In 1990, the use of oxygenates was mandated by federal law and concentrations of MTBE in gasoline increased. Today, MTBE is primarily used in large metropolitan areas that experience air pollution problems. Since 1990, MTBE has been detected at increasing levels in both surface water and groundwater and is one of the most frequently detected VOCs in urban watersheds (USGS, 2001a). EPA has declared MTBE to be a potential human carcinogen at high doses. In March 2000, a decision was made by EPA to follow California's lead to significantly reduce or eliminate the use of MTBE in gasoline.

4.10.1 Concentrations

MTBE is highly soluble in water and therefore not easily removed once it enters surface or ground water. Delzer (1999) detected the presence of MTBE in 27% of the shallow wells monitored in eight urban areas across the country (Figure 37). Detection frequency was significantly higher in New England and Denver, as shown in Table 41. In a second study conducted in 16 metropolitan areas, Delzer (1999) found that 83% of MTBE detections occurred between October and March, the time when MTBE is primarily used as a fuel additive. The median MTBE concentration was 1.5 ppb, well below EPA's draft advisory level of 20 ppb (Delzer, 1996).

4.10.2 Impacts of MTBE on Streams

The primary concerns regarding MTBE are that it is a known carcinogen to small mammals, a suspected human carcinogen at higher

Table 41: MTBE Detection Frequency

Location	Detection Frequency	Source	Year
211 shallow wells in eight urban areas	27%	Delzer	1999
Surface water samples in 16 metro areas	7%	Delzer	1996

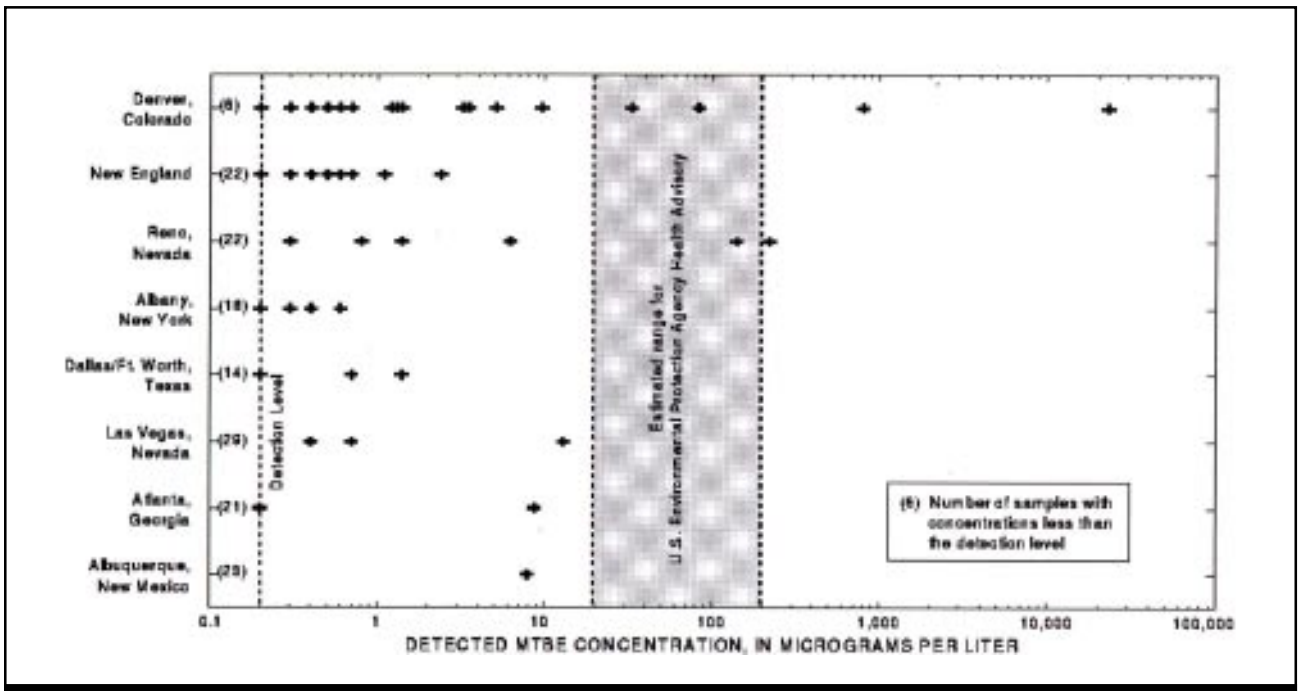

Figure 37: MTBE Concentrations in Surface Water from Eight Cities (Delzer, 1996)

doses and may possibly be toxic to aquatic life in small streams (Delzer, 1996). MTBE can also cause taste and odor problems in drinking water at fairly low concentrations. EPA issued a Drinking Water Advisory in 1997 that indicated that MTBE concentrations less than 20 ppb should not cause taste and odor problems for drinking water. However, the Association of California Water Agencies reports that some consumers can detect MTBE at levels as low as 2.5 ppb (ACWA, 2000). Because MTBE is frequently found in groundwater wells, it is thought to be a potential threat to drinking water (Delzer, 1999). For example, Santa Monica, California reportedly lost half of its groundwater drinking water supply due to MTBE contamination (Bay and Brown, 2000). MTBE has also been detected in human blood, especially in people frequently exposed to gasoline, such as gas station attendants (Squillace *et al.*, 1995).

4.10.3 Sources and Source Areas of MTBE

Since MTBE is a gasoline additive, its potential sources include any area that produces, transports, stores, or dispenses gasoline, particularly areas that are vulnerable to leaks and spills. Leaking underground storage tanks are usually associated with the highest MTBE concentrations in groundwater wells (Delzer, 1999). Vehicle emissions are also an important source of MTBE. Elevated levels are frequently observed along road corridors and drainage ditches. Once emitted, MTBE can travel in stormwater runoff or groundwater. Main source areas include heavily used multilane highways. Gas stations may also be a hotspot source area for MTBE contamination.

Another potential source of MTBE is watercraft, since two cycle engines can discharge as much as 20 to 30% of their fuel through the exhaust (Boughton and Lico, 1998). MTBE concentrations are clearly associated with increased use of gas engines, and there is concern that MTBE is an increasing component of atmospheric deposition (Boughton and Lico, 1998 and UC Davis, 1998).

4.11 Pesticides

Pesticides are used in the urban environment to control weeds, insects and other organisms that are considered pests. EPA estimates that nearly 70 million pounds of active pesticide ingredients are applied to urban lawns each year as herbicides or insecticides. Herbicides are used on urban lawns to target annual and perennial broadleaf weeds, while insecticides are used to control insects. Many types of pesticides are available for use in urban areas. Immerman and Drummond (1985) report that 338 different active ingredients are applied to lawns and gardens nationally. Each pesticide varies in mobility, persistence and potential aquatic impact. At high levels, many pesticides have been found to have adverse effects on ecological and human health. Several recent research studies by the USGS have shown that insecticides are detected with the greatest frequency in urban streams, and that pesticide detection frequency increases in proportion to the percentage of urban land in a watershed (Ferrari *et al.*, 1997; USGS, 1998, 1999a-b, 2001b). A national assessment by the USGS

Table 42: Median Concentrations and Detection Frequency of Herbicides and Insecticides in Urban Streams

Pollutant	Detection Frequency	Median Concentration (Fg/l)	Number of Samples	Source
Insecticides				
Diazinon	75%	0.025	326	USGS, 1998b
	92%	0.55	76	Brush *et al.*, 1995
	17%	0.002	1795	Ferrari *et al.*, 1997
Chlorpyrifos	41%	Non Detect	327	USGS, 1998b
	14%	0.004	1218	Brush *et al.*, 1995
Carbaryl	46%	Non Detect	327	USGS, 1998b
	22%	0.003	1128	Ferrari *et al.*, 1997
Herbicides				
Atrazine	86%	0.023	327	USGS, 1998b
	72%	0.099	2076	Ferrari *et al.*, 1997
Prometon	84%	0.031	327	USGS, 1998b
	56%	0.029	1531	Ferrari *et al.*, 1997
Simazine	88%	0.039	327	USGS, 1998b
	17%	0.046	1995	Ferrari *et al.*, 1997
2,4 -D	67%	1.1	11	Dindorf, 1992
	17%	0.035	786	Ferrari *et al.*, 1997
Dicamba	22%	1.8	4	Dindorf, 1992
MCPP	56%	1.8	10	Dindorf, 1992
MCPA	28%	1.0	5	Dindorf, 1992

(2001a) also indicates that insecticides are usually detected at higher concentrations in urban streams than in agricultural streams.

4.11.1 Concentrations

Median concentrations and detection frequency for common pesticides are shown in Table 42. Herbicides that are frequently detected in urban streams include atrazine; simazine; prometon; 2,4-D; dicamba; MCPP; and MCPA. Insecticides are also frequently encountered in urban streams, including diazinon, chlorpyrifos, malathion, and carbaryl. A USGS (1996) study monitored 16 sites in Gills Creek in Columbia, South Carolina over four days. This study reported that pesticide detection frequency increased as percent urban land increased.

Wotzka *et al.* (1994) monitored herbicide levels in an urban stream in Minneapolis, Minnesota during more than 40 storms. They found herbicides, such as 2,4-D; dicamba; MCPP; and MCPA in 85% of storm runoff events sampled. Total herbicide EMCs ranged from less than one to 70 µg/l. Ferrari *et al.* (1997) analyzed 463 streams in the mid-Atlantic region for the presence of 127 pesticide compounds. At least one pesticide was detected at more than 90% of the streams sampled.

Diazinon is one of the most commonly detected insecticides in urban stormwater runoff and dry weather flow. Diazinon was detected in 75% of National Water Quality Assessment (NAWQA) samples, 92% of stormflow samples from Texas, and 100% of urban stormflow samples in King County, Washington (Brush *et al.*, 1995 and USGS, 1999b). Diazinon is most frequently measured at concentrations greater than freshwater aquatic life criteria in urban stormwater (USGS, 1999a). USGS reports that diazinon concentrations were generally higher during urban stormflow (Ferrari *et al.,* 1997).

4.11.2 Impacts of Pesticides on Streams

Many pesticides are known or suspected carcinogens and can be toxic to humans and aquatic species. However, many of the known health effects require exposure to higher concentrations than typically found in the environment, while the health effects of chronic exposure to low levels are generally unknown (Ferrari *et al.*, 1997).

Studies that document the toxicity of insecticides and herbicides in urban stormwater have been focused largely on diazinon. Diazinon is responsible for the majority of acute toxicity in stormwater in Alameda County, California and King County, Washington (S.R. Hansen & Associates, 1995). Concentrations of diazinon in King County stormwater frequently exceed the freshwater aquatic life criteria (Figure 38). Similarly, research on Sacramento, California streams revealed acute toxicity for diazinon in 100% of stormwater samples using *Ceriodaphnia* as the test organism (Connor, 1995). Diazinon has a half-life of 42 days and is very soluble in water, which may explain its detection frequency and persistence in urban stormwater. Diazinon is also reported to attach fairly readily to organic carbon; consequently, it is likely re-suspended during storm events.

Insecticide concentrations exceeding acute and chronic toxicity thresholds for test organisms such as *Ceriodaphnia* have frequently been found in urban stormwater in New York, Texas, California, and Washington (Scanlin and Feng, 1997; Brush *et al.*, 1995; USGS, 1999b). The possibility exists that pesticides could have impacts on larger bodies of water, but there is a paucity of data on the subject at this time.

4.11.3 Sources and Source Areas of Pesticides

Sources for pesticides in urban areas include applications by homeowners, landscaping contractors and road maintenance crews. Source areas for pesticides in urban areas include lawns in residential areas; managed turf, such as golf courses, parks, and ball fields; and rights-of-way in nonresidential areas. Storage areas, which are subject to spills and leaks, can also be a source area. A study in San Francisco was able to trace high diazinon concentrations in some streams back to just a few households which had applied the pesticide at high levels (Scanlin and Feng, 1997). Two herbicides, simazine and atrazine, were detected in over 60% of samples in King County, WA stormwater but were not identified as being sold in retail stores. It is likely these herbicides are applied to nonresidential areas such as rights-of-way, parks and recreational areas (USGS, 1999b). Because pesticides are typically applied to turf, IC is not a direct indicator for pesticide concentrations, although they can drift onto paved surfaces and end up in stormwater runoff.

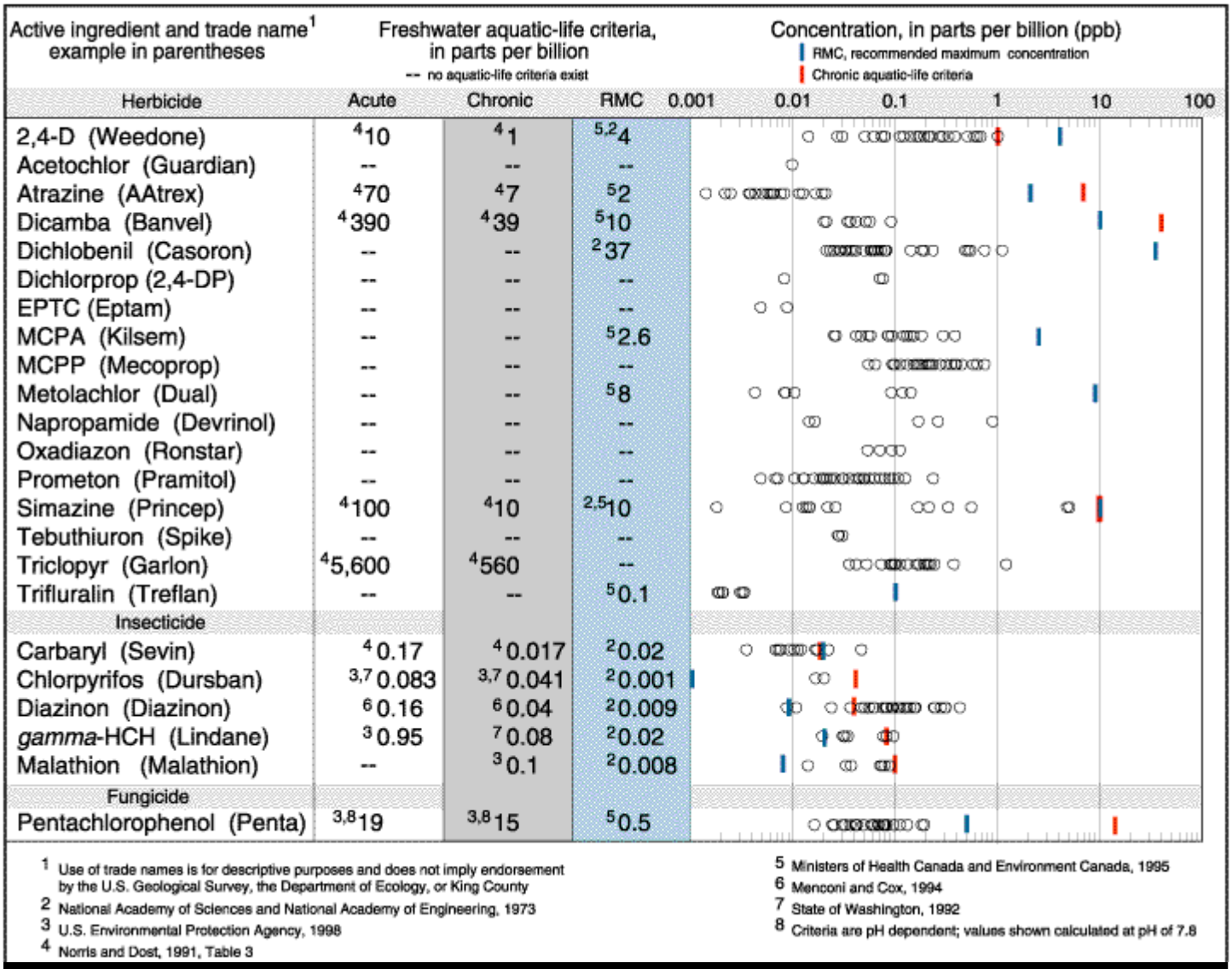

Figure 38: Concentrations of Pesticides in Stormwater in King County, WA (S.R. Hansen & Associates, 1995 and USGS, 1999b)

4.12 Deicers

Deicers are substances used to melt snow and ice to keep roads and walking areas safe. The most commonly used deicer is sodium chloride, although it may also be blended with calcium chloride or magnesium chloride. Other less frequently used deicers include urea and glycol, which are primarily used at airports to deice planes. Table 43 summarizes the composition, use and water quality effects of common deicers.

Chlorides are frequently found in snowmelt and stormwater runoff in most regions that experience snow and ice in the winter months (Oberts, 1994 and Sherman, 1998). Figure 39 shows that the application of deicer salts has increased since 1940 from 200,000 tons to 10 to 20 million tons per year in recent years (Salt Institute, 2001). Several U.S. and Canadian studies indicate severe inputs of road salts on water quality and aquatic life (Environment Canada, 2001 and Novotny *et al.*, 1999).

Table 43: Use and Water Quality Effect of Snowmelt Deicers (Ohrel, 1995; Sills and Blakeslee, 1992)

Deicer	Description	Use	Water Quality Effect
Chlorides	Chloride based deicer usually combined with Na, Ca or Mg	Road Deicer and Residential Use	Cl complexes can release heavy metals, affect soil permeability, impacts to drinking water, potential toxic effects to small streams
Urea	Nitrogen-based fertilizer product	Used as alternative to glycol	Increased nitrogen in water and potential toxicity to organisms
Ethylene Glycol	Petroleum based organic compounds, similar to antifreeze	Used at airports for deicing planes	Toxicity effects, high BOD and COD, hazardous air pollutant

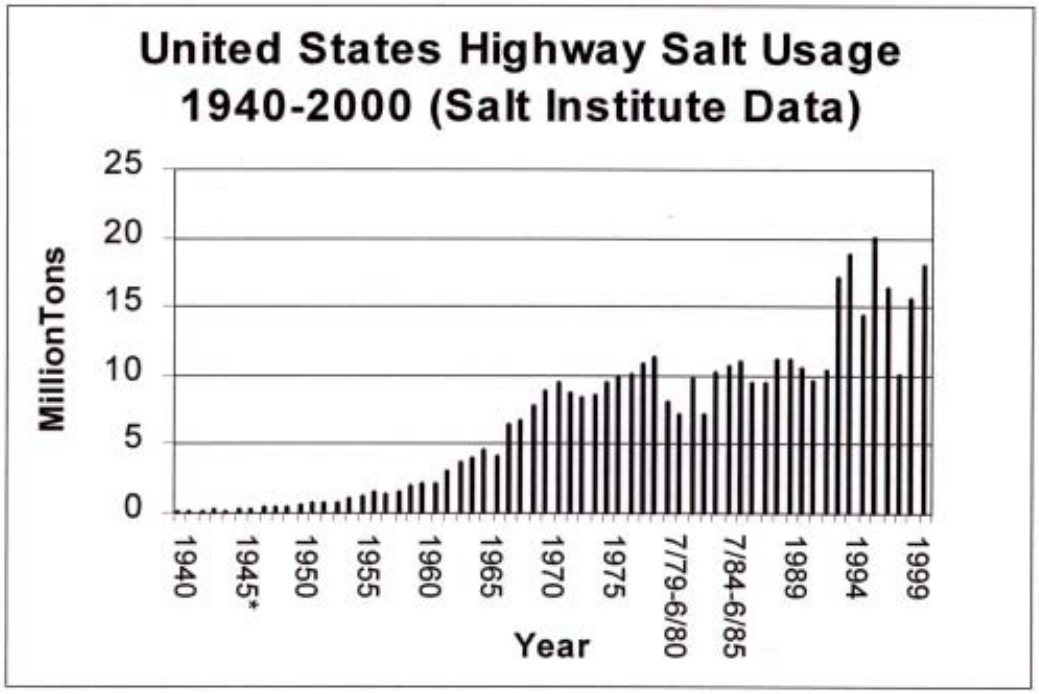

Figure 39: U.S. Highway Salt Usage Data (Salt Institute, 2001)

4.12.1 Concentrations

Chloride concentrations in snowmelt runoff depend on the amount applied and the dilution in the receiving waters. Data for snowmelt and stormwater runoff from several studies are presented in Table 44. For example, chloride concentrations in Lincoln Creek in Wisconsin were 1,612 mg/l in winter snowmelt runoff, as compared to 40 mg/l in non-winter runoff (Novotny *et al.*, 1999 and Masterson and Bannerman, 1994). Chloride concentrations in the range of 2,000 to 5,000 mg/l have been reported for Canadian streams (Environment Canada, 2001). Novotny *et al.* (1999) monitored chloride concentrations in snowmelt near Syracuse, New York and found that residential watersheds had higher chloride concentrations than rural watersheds.

Concentrations of glycol in stormwater runoff are also highly variable and depend on the amount of deicer used, the presence of a recovery system, and the nature of the precipitation event. Corsi *et al*. (2001) monitored streams receiving stormwater runoff from a Wisconsin airport. They found concentrations of propylene glycol as high as 39,000 mg/l at airport outfall sites during deicing operations and concentrations of up to 960 mg/l during low-flow sampling at an airport outfall site.

4.12.2 Impacts of Deicers on Streams

Chloride levels can harm aquatic and terrestrial life and contaminate groundwater and drinking water supplies (Ohrel, 1995). Generally, chloride becomes toxic to many organisms when it reaches concentrations of 500 to1,000 mg/l (Environment Canada, 2001). These concentrations are common in small streams in snow regions, at least for short periods of time. Many plant species are relatively intolerant to high salt levels in wetland swales and roadside corridors. Fish are also negatively affected by high chloride concentrations, with sensitivity as low as 600 mg/l for some species (Scott and Wylie, 1980).

Table 45 compares the maximum chloride concentrations for various water uses in eight states (USEPA, 1988). Snowmelt chloride concentrations typically exceed these levels.

Table 44: EMCs for Chloride in Snowmelt and Stormwater Runoff in Urban Areas

Form of Runoff	EMCs (mg/l)	Number of Events	Sources	Location
	Mean			
Snowmelt	116*	49	Oberts, 1994	MN
	2119	N/R	Sherman, 1998	Ontario
	1267 **R** 474 **U**	N/R	Novotny *et al.*, 1999	NY
	1612	N/R	Masterson and Bannerman, 1994	WI
	397	282	Environment Canada, 2001	Ontario, Canada
Non-winter Storm Event	42	61	Brush *et al.*, 1995	TX
	45	N/R	Sherman, 1998	Ontario
	40.5	N/R	Masterson and Bannerman, 1994	WI

*N/R = Not Reported, R = residential, U = urban, * = Median*

Chloride is a concern in surface drinking water systems because it can interfere with some of the treatment processes and can cause taste problems at concentrations as low as 250 mg/l. Chloride is also extremely difficult to remove once it enters the water.

Glycol-based deicers have been shown to be highly toxic at relatively low concentrations in streams receiving airport runoff. These deicers contain many proprietary agents, which may increase their toxicity and also make it very difficult to set standards for their use (Hartwell *et al.*, 1995). Corsi *et al.* (2001) observed acute toxicity of *Ceriodaphnia dubia*, *Pimephelas promelax*, *Hyalela azteca*, and *Chironimus tentans* in Wisconsin streams that experienced propylene glycol concentrations of 5,000 mg/l or more. Chronic toxicity was observed for *Ceriodaphnia dubia* and *Pimephelas promelax* at propylene glycol concentrations of 1,500 mg/l in the same study. In addition, glycol exerts an extremely high BOD on receiving waters, which can quickly reduce or eliminate dissolved oxygen. Glycol can also be toxic to small animals that are attracted by its sweet taste (Novotny *et al.*, 1999).

As with many urban pollutants, the effects of chloride can be diluted in larger waterbodies. In general, small streams are more likely to experience chloride effects, compared to rivers, which have a greater dilution ability.

4.12.3 Sources and Source Areas of Deicers

The main sources for deicers in urban watersheds include highway maintenance crews, airport deicing operations, and homeowner applications. Direct road application is the largest source of chloride, by far. Source areas include roads, parking lots, sidewalks, storm drains, airport runways, and snow collection areas. Because deicers are applied to paved surfaces, the primary means of transport to streams is through stormwater and meltwater runoff. Therefore, concentrations of deicer compounds are typically associated with factors such as road density or traffic patterns.

Table 45: Summary of State Standards for Salinity of Receiving Waters (USEPA, 1988)

State	Limiting Concentration (mg/l)	Beneficial Use
CO	250*	Drinking water
IL	500	General water supply
	250	Drinking water
IN	500	Drinking water
MA	250	Class A waters
MN	250	Drinking water
	500	Class A fishing and recreation
OH	250	Drinking water
SD	250	Drinking water
	100	Fish propagation
VA	250	Drinking water

** Monthly average*

4.13 Conclusion

IC collects and accumulates pollutants deposited from the atmosphere, leaked from vehicles, or derived from other sources. The pollutants build up over time but are washed off quickly during storms and are often efficiently delivered to downstream waters. This can create water quality problems for downstream rivers, lakes and estuaries.

As a result of local and national monitoring efforts, we now have a much better understanding of the nature and impacts of stormwater pollution. The typical sample of urban stormwater is characterized by high levels of many common pollutants such as sediment, nutrients, metals, organic carbon, hydrocarbons, pesticides, and fecal coliform bacteria. Other pollutants that have more recently become a concern in urban areas include MTBE, deicers, and the pathogens *Cryptosporidium* and *Giardia*. Concentrations of most stormwater pollutants can be characterized, over the long run, by event mean storm concentrations. Monitoring techniques have also allowed researchers to identify source areas for pollutants in the urban environment, including stormwater hotspots, which generate higher pollutant loads than normal development.

In general, most monitoring data shows that mean pollutant storm concentrations are higher in urban watersheds than in non-urban ones. For many urban pollutants, EMCs can be used to predict stormwater pollutant loads for urban watersheds, using IC as the key predictive variable. While a direct relationship between IC and pollutant concentrations does not usually exist, IC directly influences the volume of stormwater and hence, the total load. A few exceptions are worth noting. MTBE, deicers, and PAH appear to be related more to traffic or road density than IC. Additionally, MTBE and PAH concentrations may be greater at hotspot source areas, which are not always widely or uniformly distributed across a watershed. Pesticides, bacteria and pathogens are often associated with turf areas rather than IC. Bacteria and pathogen sources also include direct inputs from wildlife and inappropriate sewage discharges that are not uniformly distributed across a watershed and are not directly related to IC.

Further research into the relationship between stormwater pollutant loads and other watershed indicators may be helpful. For example, it would be interesting to see if turf cover is a good indicator of stream quality for impacted streams. Other important watershed indicators worth studying are the influence of watershed treatment practices, such as stormwater practices and stream buffers.

The direct effects of stormwater pollutants on aquatic systems appears to be a function of the size of the receiving water and the initial health of the aquatic community. For example, a small urban stream receiving high stormwater pollutant concentrations would be more likely to experience impacts than a large river, which is diluted by other land uses. Likewise, organisms in sensitive streams should be more susceptible to stormwater pollutants than pollution-tolerant organisms found in non-supporting streams.

Overall, the following conclusions can be made:

- Sediment, nutrient and trace metal loads in stormwater runoff can be predicted as a function of IC, although concentrations are not tightly correlated with watershed IC.
- Violations of bacteria standards are indirectly associated with watershed IC.
- It is not clear whether loads of hydrocarbons, pesticides or chlorides can be predicted on the basis of IC at the small watershed level.
- More research needs to be conducted to evaluate the usefulness of other watershed indicators to predict stormwater pollutant loads. For example, traffic, road density or hotspots may be useful in predicting MTBE, deicer and hydrocarbon loads. Also, watershed turf cover may be useful in predicting pesticide and bacterial loads.

- Most research on pollutants in stormwater runoff has been conducted at the small watershed level. Additional research is needed to evaluate the impact of watershed treatment, such as stormwater and buffer practices to determine the degree to which these may change stormwater concentrations or loads.
- Regional differences are evident for many stormwater pollutants, and these appear to be caused by either differences in rainfall frequency or snowmelt.

Chapter 5: Biological Impacts of Impervious Cover

This chapter reviews research on the impact of urbanization on the aquatic community, focusing on aquatic insects, fish, amphibians, freshwater mussels, and freshwater wetlands. Specifically, the relationship between the health of the aquatic community and the amount of watershed IC is analyzed within the context of the Impervious Cover Model (ICM).

The chapter is organized as follows:

5.1 Introduction
5.2 Indicators and General Trends
5.3 Effects on Aquatic Insect[1] Diversity
5.4 Effects on Fish Diversity
5.5 Effects on Amphibian Diversity
5.6 Effects on Wetland Diversity
5.7 Effects on Freshwater Mussel Diversity
5.8 Conclusion

5.1 Introduction

A number of studies, crossing different ecoregions and utilizing various techniques, have examined the link between watershed urbanization and its impact on stream and wetland biodiversity. These studies reveal that a relatively small amount of urbanization has a negative effect on aquatic diversity, and that as watersheds become highly urban, aquatic diversity becomes extremely degraded. As documented in prior chapters, hydrologic, physical, and water quality changes caused by watershed urbanization all stress the aquatic community and collectively diminish the quality and quantity of available habitat. As a result, these stressors generally cause a decline in biological diversity, a change in trophic structure, and a shift towards more pollution-tolerant organisms.

Many different habitat conditions are critical for supporting diverse aquatic ecosystems. For example, streambed substrates are vulnerable to deposition of fine sediments, which affects spawning, egg incubation and fry-rearing. Many aquatic insect species shelter in the large pore spaces among cobbles and boulders, particularly within riffles. When fine sediment fills these pore spaces, it reduces the quality and quantity of available habitat. The aquatic insect community is typically the base of the food chain in streams, helps break down organic matter and serves as a food source for juvenile fish.

Large woody debris (LWD) plays a critical role in the habitat of many aquatic insects and fish. For example, Bisson *et al.* (1988) contend that no other structural component is more important to salmon habitat than LWD, especially in the case of juvenile coho salmon. Loss of LWD due to the removal of stream side vegetation can significantly hinder the survival of more sensitive aquatic species. Since LWD creates different habitat types, its quality and quantity have been linked to salmonid rearing habitat and the ability of multiple fish species to coexist in streams.

The number of stream crossings (e.g., roads, sewers and pipelines) has been reported to increase directly in proportion to IC (May *et al*., 1997). Such crossings can become partial or total barriers to upstream fish migration, particularly if the stream bed downcuts below the fixed elevation of a culvert or pipeline. Fish barriers can prevent migration and recolonization of aquatic life in many urban streams.

Urbanization can also increase pollutant levels and stream temperatures. In particular, trace metals and pesticides often bind to sediment particles and may enter the food chain, particularly by aquatic insects that collect and filter particles. While in-stream data is rare, some data are available for ponds. A study of trace

[1] *Throughout this chapter, the term "aquatic insects" is used rather than the more cumbersome but technically correct "benthic macroinvertebrates."*

metal bioaccumulation of three fish species found in central Florida stormwater ponds discovered that trace metal levels were significantly higher in urban ponds than in non-urban control ponds, often by a factor of five to 10 (Campbell, 1995; see also Karouna-Renier, 1995). Although typical stormwater pollutants are rarely acutely toxic to fish, the cumulative effects of sublethal pollutant exposure may influence the stream community (Chapter 4).

Table 46 summarizes some of the numerous changes to streams caused by urbanization that have the potential to alter aquatic biodiversity. For a comprehensive review of the impacts of urbanization on stream habitat and biodiversity, the reader should consult Wood and Armitage (1997) and Hart and Finelli (1999).

Table 46: Review of Stressors to Urban Streams and Effects on Aquatic Life

Stream Change	Effects on Organisms
Increased flow volumes/ Channel forming storms	Alterations in habitat complexity Changes in availability of food organisms, related to timing of emergence and recovery after disturbance Reduced prey diversity Scour-related mortality Long-term depletion of LWD Accelerated streambank erosion
Decreased base flows	Crowding and increased competition for foraging sites Increased vulnerability to predation Increased fine sediment deposition
Increase in sediment transport	Reduced survival of eggs and alevins, loss of habitat due to deposition Siltation of pool areas, reduced macroinvertebrate reproduction
Loss of pools and riffles	Shift in the balance of species due to habitat change Loss of deep water cover and feeding areas
Changes in substrate composition	Reduced survival of eggs Loss of inter-gravel fry refugial spaces Reduced aquatic insect production
Loss of LWD	Loss of cover from predators and high flows Reduced sediment and organic matter storage Reduced pool formation and organic substrate for aquatic insects
Increase in temperature	Changes in migration patterns Increased metabolic activity, increased disease and parasite susceptibility Increased mortality of sensitive fish
Creation of fish blockages	Loss of spawning habitat for adults Inability to reach overwintering sites Loss of summer rearing habitat, Increased vulnerability to predation
Loss of vegetative rooting systems	Decreased channel stability Loss of undercut banks Reduced streambank integrity
Channel straightening or hardening	Increased stream scour Loss of habitat complexity
Reduction in water quality	Reduced survival of eggs and alevins Acute and chronic toxicity to juveniles and adult fish Increased physiological stress
Increase in turbidity	Reduced survival of eggs Reduced plant productivity Physiological stress on aquatic organisms
Algae blooms	Oxygen depletion due to algal blooms, increased eutrophication rate of standing waters

5.2 Indicators and General Trends

Stream indicators are used to gauge aquatic health in particular watersheds. The two main categories of stream indicators are **biotic** and **development** indices. **Biotic** indices use stream diversity as the benchmark for aquatic health and use measures, such as species abundance, taxa richness, EPT Index, native species, presence of pollution-tolerant species, dominance, functional feeding group comparisons, or proportion with disease or anomalies. **Development** indices evaluate the relationship between the degree of watershed urbanization and scores for the biotic indices. Common development indices include watershed IC, housing density, population density, and percent urban land use.

5.2.1 Biological Indicators

Biotic indices are frequently used to measure the health of the aquatic insect or fish community in urban streams. Because many aquatic insects have limited migration patterns or a sessile mode of life, they are particularly well-suited to assess stream impacts over time. Aquatic insects integrate the effects of short-term environmental variations, as most species have a complex but short life cycle of a year or less. Sensitive life stages respond quickly to environmental stressors, but the overall community responds more slowly. Aquatic insect communities are comprised of a broad range of species, trophic levels and pollution tolerances, thus providing strong information for interpreting cumulative effects. Unlike fish, aquatic insects are abundant in most small, first and second order streams. Individuals are relatively easy to identify to family level, and many "intolerant" taxa can be identified to lower taxonomic levels with ease.

Fish are good stream indicators over longer time periods and broad habitat conditions because they are relatively long-lived and mobile. Fish communities generally include a range of species that represents a variety of trophic levels (omnivores, herbivores, insectivores, planktivores, and piscivores). Fish tend to integrate the effects of lower trophic levels; thus, their community structure reflects the prevailing food sources and habitat conditions. Fish are relatively easy to collect and identify to the species level. Most specimens can be sorted and identified in the field by experienced fisheries scientists and subsequently released unharmed.

A review of the literature indicates that a wide variety of metrics are used to measure the aquatic insect and fish community. Community indices, such as the Index of Biotic Integrity (IBI) for fish and the Benthic Index of Biotic Integrity (B-IBI) for the aquatic insect community are a weighted combination of various metrics that typically characterize the community from "excellent" to "poor." Common metrics of aquatic community are often based on a composite of measures, such as species richness, abundance, tolerance, trophic status, and native status. Combined indices (C-IBI) measure both fish and aquatic insect metrics and a variety of physical habitat conditions to classify streams. Table 47 lists several common metrics used in stream assessments. It should be clearly noted that community and combined indices rely on different measurements and cannot be directly compared. For a comprehensive review of aquatic community indicators, see Barbour *et al.*(1999).

5.2.2 Watershed Development Indices

Watershed IC, housing density, population density, and percent urban land have all been used as indices of the degree of watershed development. In addition, reverse indicators such as percent forest cover and riparian continuity have also been used. The majority of studies so far have used IC to explore the relationship between urbanization and aquatic diversity. Percent urban land has been the second most frequently used indicator to describe the impact of watershed development. Table 48 compares the four watershed development indices and the thresholds where significant impacts to aquatic life are typically observed.

Table 47: Examples of Biodiversity Metrics Used to Assess Aquatic Communities

Measurement	Applied to:	Definition of Measurement
Abundance	Fish, Aquatic Insects	Total number of individuals in a sample; sometimes modified to exclude tolerant species.
Taxa Richness	Fish, Aquatic Insects	Total number of unique taxa identified in a sample. Typically, an increase in taxa diversity indicates better water and habitat quality.
EPT Index	Aquatic Insects	Taxa belonging to the following three groups: *Ephemeroptera* (mayflies), *Plecoptera* (stoneflies), *Trichoptera* (caddisflies). Typically, species in these orders are considered to be pollution-intolerant taxa and are generally the first to disappear with stream quality degradation.
Native Status	Fish	Native vs. non-native taxa in the community.
Specific Habitat	Fish	Riffle benthic insectivorous individuals. Total number of benthic insectivores. Often these types of individuals, such as darters, sculpins, and dace are found in high velocity riffles and runs and are sensitive to physical habitat degradation.
		Minnow species Total number of minnow species present. Often used as an indicator of pool habitat quality. Includes all species present in the family Cyprinidae, such as daces, minnows, shiners, stonerollers, and chubs.
Tolerant Species	Fish, Aquatic Insects	The total number of species sensitive to and the number tolerant of degraded conditions. Typically, intolerant species decline with decreasing water quality and stream habitat. A common high pollution-tolerant species that is frequently used is Chironomids.
Dominance	Fish, Aquatic Insects	The proportion of individuals at each station from the single most abundant taxa at that particular station. Typically, a community dominated by a single taxa may be indicative of stream degradation.
Functional Feeding Group Comparisons	Fish	Omnivores/ Generalists: The proportion of individuals characterized as omnivores or generalists to the total number of individuals. Typically, there is a shift away from specialized feeding towards more opportunistic feeders under degraded conditions as food sources become unreliable.
		Insectivores: The proportion of individuals characterized as insectivores to the total number of individuals. Typically, the abundance of insectivores decreases relative to increasing stream degradation.
	Aquatic Insects	Others: The proportion of individuals characterized as shredders, scrapers, or filter feeders to the total number of individuals. Typically, changes in the proportion of functional feeders characterized as shredders can be reflective of contaminated leaf matter. In addition, an overabundance of scrapers over filterers can be indicative of increased benthic algae.
Disease/ Anomalies	Fish	Proportion of individuals with signs of disease or abnormalities. This is ascertained through gross external examination for abnormalities during the field identification process. Typically, this metric assumes that incidence of disease and deformities increases with increasing stream degradation.

** This table is not meant to provide a comprehensive listing of metrics used for diversity indices; it is intended to provide examples of types of measures used in biological stream assessments (see Barbour* et al.*, 1999).*

5.2.3 General Trends

Most research suggests that a decline in both species abundance and diversity begins at or around 10% watershed IC (Schueler, 1994a). However, considerable variations in aquatic diversity are frequently observed from five to 20% IC, due to historical alterations, the effectiveness of watershed management, prevailing riparian conditions, co-occurrence of stressors, and natural biological variation (see Chapter 1).

Figures 40 through 42 display the negative relationship commonly seen between biotic indices and various measures of watershed development. For example, stream research in the Maryland Piedmont indicated that IC was the best predictor of stream condition, based on a combined fish and aquatic insect IBI (MNCPPC, 2000). In general, streams with less than 6% watershed IC were in "excellent" condition, whereas streams in "good" condition had less than 12% IC, and streams in "fair" condition had less than 20%. Figure 40 shows the general boundaries and typical variation seen in MNCPPC stream research.

Figure 41 illustrates that B-IBI scores and Coho Salmon/Cutthroat Trout Ratio are a function of IC for 31 streams in Puget Sound, Washington. The interesting finding was that "good" to "excellent" B-IBI scores (greater than 25) were reported in watersheds that had less than 10% IC, with eight notable outliers. These outliers had greater IC (25 to 35%) but similar B-IBI scores. These outliers are unique in that they had a large upstream wetland and/or a large, intact riparian corridor upstream (i.e. >70% of stream corridor had buffer width >100 feet).

Figure 42 depicts the same negative relationship between watershed urbanization and fish-IBI scores but uses population density as the primary metric of development (Dreher, 1997). The six-county study area included the Chicago metro area and outlying rural watersheds. Significant declines in fish-IBI scores were noted when population density exceeded 1.5 persons per acre.

The actual level of watershed development at which an individual aquatic species begins to decline depends on several variables, but may be lower than that indicated by the ICM. Some researchers have detected impacts for individual aquatic species at watershed IC levels as low as 5%. Other research has suggested that the presence of certain stressors, such as sewage treatment plant discharges (Yoder and Miltner, 2000) or construction sites (Reice, 2000) may alter the ICM and lower the level of IC at which biodiversity impacts become evident.

Table 48: Alternate Land Use Indicators and Significant Impact Levels (Brown, 2000; Konrad and Booth, 2002)

Land Use Indicator	Level at which Significant Impact Observed	Typical Value for Low Density Residential Use	Comments
% IC	10-20%	10%	Most accurate; highest level of effort and cost
Housing Density	>1 unit/acre	1 unit/acre	Low accuracy in areas of substantial commercial or industrial development; less accurate at small scales
Population Density	1.5 to 8+ people/acre	2.5 people/acre	Low accuracy in areas of substantial commercial or industrial development; less accurate at small scales
% Urban Land Use	33% (variable)	10-100%	Does not measure intensity of development; moderately accurate at larger watershed scales
Road Density	5 miles/square mile	2 miles/square mile	Appears to be a potentially useful indicator

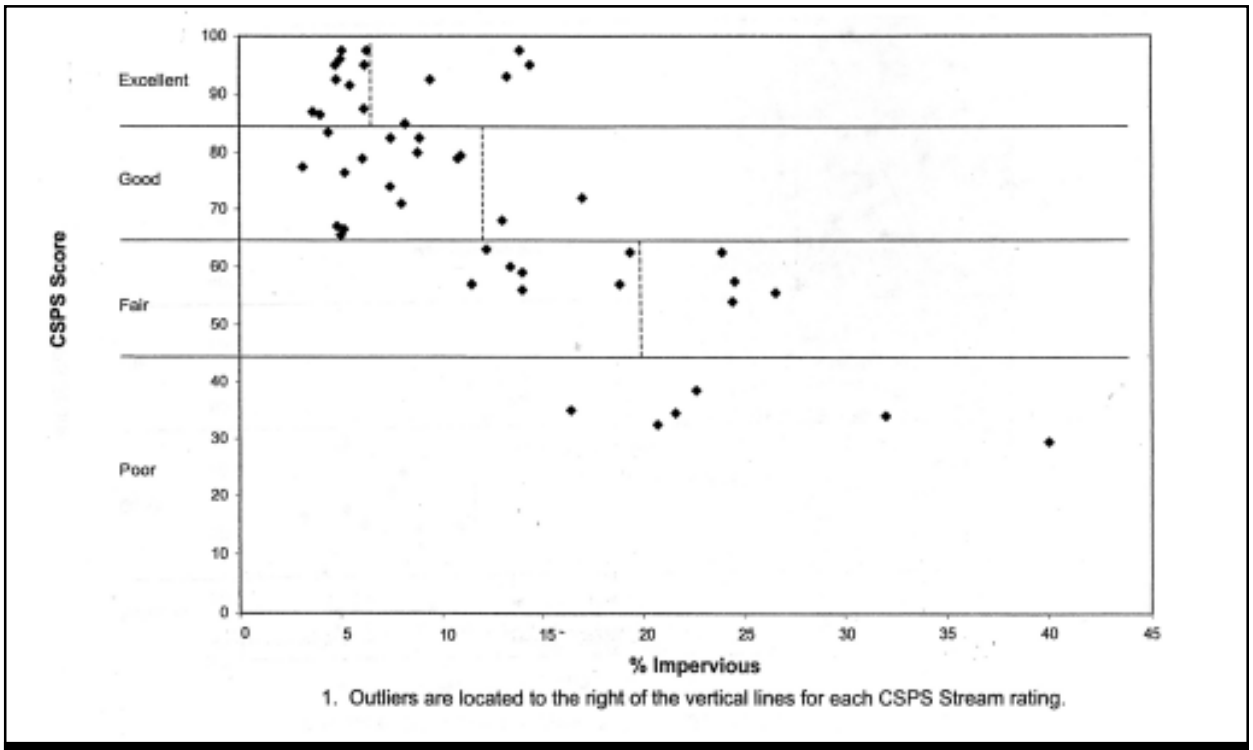

Figure 40: Combined Fish and Benthic IBI vs. IC in Maryland Piedmont Streams (MNCPPC, 2000)

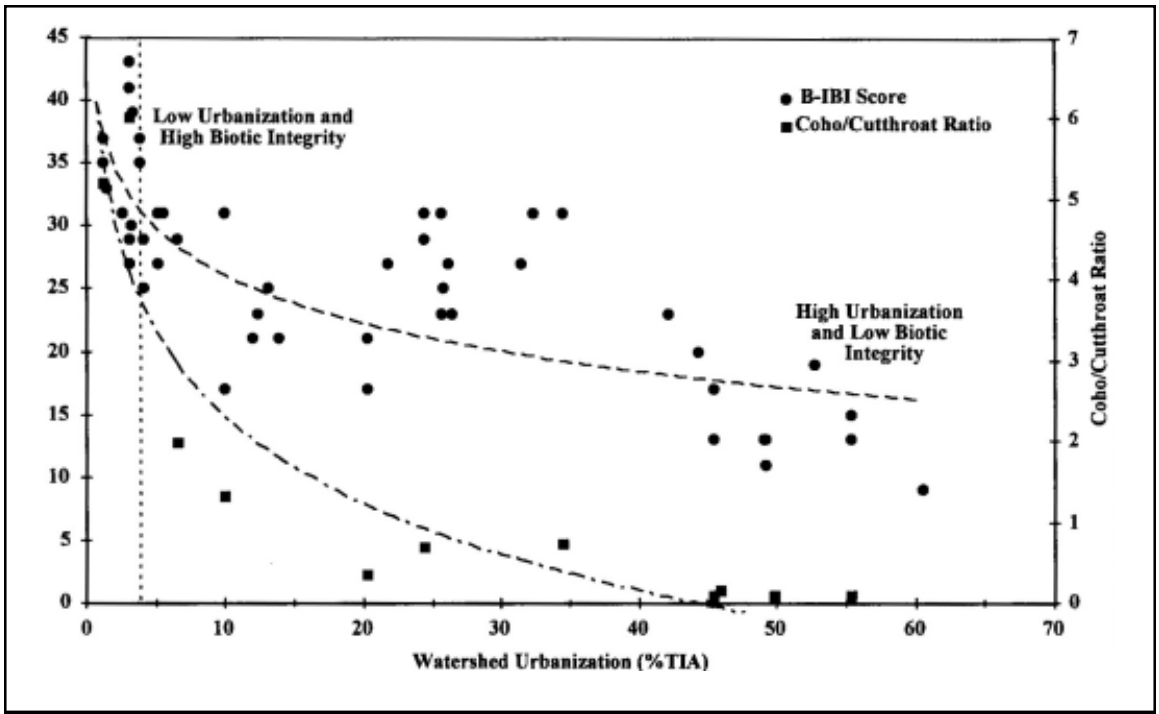

Figure 41: Relationship Between B-IBI, Coho/Cutthroat Ratios, and Watershed IC in Puget Sound Streams (Horner *et al.*, 1997)

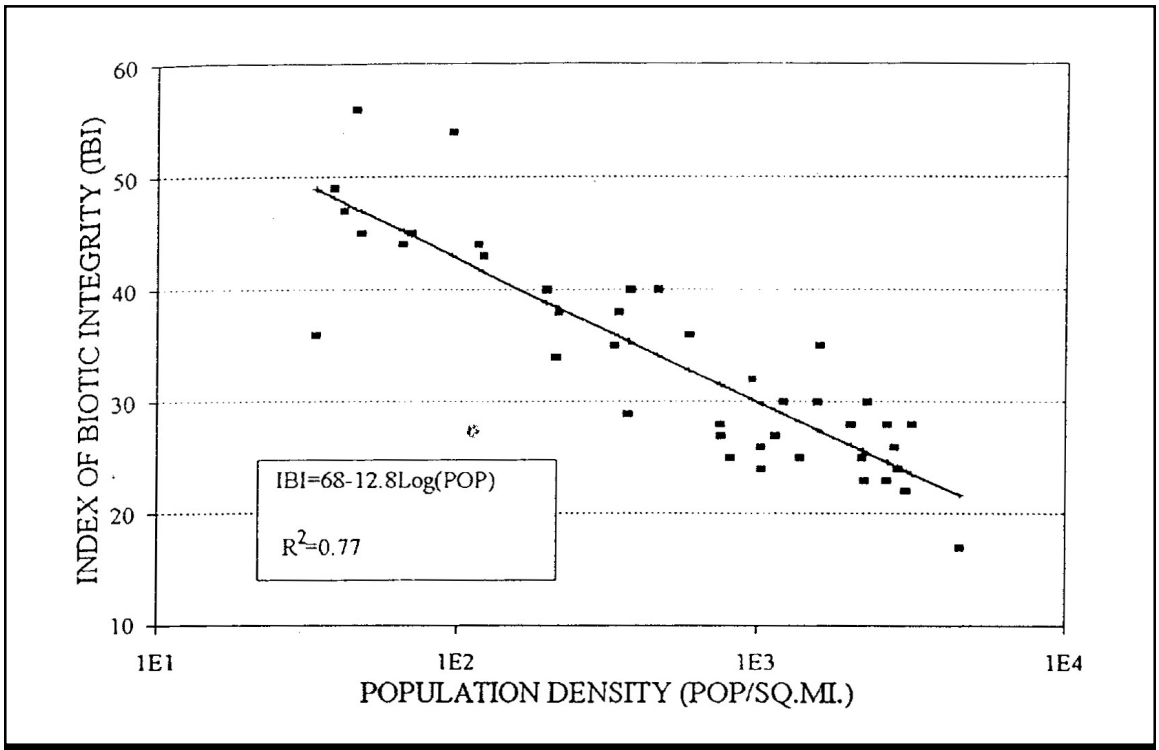

Figure 42: Index for Biological Integrity as a Function of Population Density in Illinois (Dreher, 1997)

5.3 Effects on Aquatic Insect Diversity

The diversity, richness and abundance of the aquatic insect community is frequently used to indicate urban stream quality. Aquatic insects are a useful indicator because they form the base of the stream food chain in most regions of the country. For this reason, declines or changes in aquatic insect diversity are often an early signal of biological impact due to watershed development. The aquatic insect community typically responds to increasing development by losing species diversity and richness and shifting to more pollution-tolerant species. More than 30 studies illustrate how IC and urbanization affect the aquatic insect community. These are summarized in Tables 49 and 50.

5.3.1 Findings Based on IC Indicators

Klein (1979) was one of the first researchers to note that aquatic insect diversity drops sharply in streams where watershed IC exceeded 10 to 15%. While "good" to "fair" diversity was noted in all headwater streams with less than 10% IC, nearly all streams with 12% or more watershed IC recorded "poor" diversity. Other studies have confirmed this general relationship between IC and the decline of aquatic insect species diversity. Their relationships have been an integral part in the development of the ICM. The sharp drop in aquatic insect diversity at or around 12 to 15% IC was also observed in streams in the coastal plain and Piedmont of Delaware (Maxted and Shaver, 1997).

Impacts at development thresholds lower than 10% IC have also been observed by Booth (2000), Davis (2001), Horner *et al.* (1997) and Morse (2001). There seems to be a general recognition that the high levels of variability observed below 10% IC indicate that other factors, such as riparian condition, effluent discharges, and pollution legacy may be better indicators of aquatic insect diversity (Horner and May, 1999; Kennen, 1999; Steedman, 1988; Yoder *et al.*, 1999).

The exact point at which aquatic insect diversity shifts from fair to poor is not known with absolute precision, but it is clear that few, if any, urban streams can support diverse aquatic insect communities with more than 25% IC. Indeed, several researchers failed to find aquatic insect communities with good or excellent diversity in any highly urban stream (Table 52). Indeed, MNCPPC (2000) reported that all streams with more than 20% watershed IC were rated as "poor."

Several good examples of the relationship between IC and B-IBI scores are shown in Figures 43 through 45. Figure 43 depicts the general trend line in aquatic insect diversity as IC increased at 138 stream sites in Northern Virginia (Fairfax County, 2001). The survey study concluded that stream degradation occurred at low levels of IC, and that older developments lacking more efficient site design and stormwater controls tended to have particularly degraded streams. Figures 44 and 45 show similar trends in the relationship between IC and aquatic insect B-IBI scores in Maryland and Washington streams. In particular, note the variability in B-IBI scores observed below 10% IC in both research studies.

Often, shift in the aquatic insect community from pollution-sensitive species to pollution-tolerant species occurs at relatively low IC levels (<10%). This shift is often tracked using the EPT metric, which evaluates sensitive species found in the urban stream community in the orders of *Ephemeroptera* (mayflies), *Plecoptera* (stoneflies), and *Trichoptera* (caddisflies). EPT species frequently disappear in urban streams and are replaced by more pollution-tolerant organisms, such as chironomids, tubificid worms, amphipods and snails.

In undisturbed streams, aquatic insects employ specialized feeding strategies, such as shredding leaf litter, filtering or collecting organic matter that flows by, or preying on other insects. These feeding guilds are greatly reduced in urban streams and are replaced by grazers, collectors and deposit feeders. Maxted and Shaver (1997) found that 90% of sensitive

Table 49: Recent Research Examining the Relationship Between IC and Aquatic Insect Diversity in Streams

Index	Key Finding (s)	Source	Location
Community Index	Three years stream sampling across the state at 1000 sites found that when IC was >15%, stream health was never rated good based on a C-IBI.	Boward *et al.*, 1999	MD
Community Index	Insect community and habitat scores were all ranked as poor in five subwatersheds that were greater than 30% IC.	Black and Veatch, 1994	MD
Community Index	Puget sound study finds that some degradation of aquatic invertebrate diversity can occur at any level of human disturbance (at least as measured by IC). 65% of watershed forest cover usually indicates a healthy aquatic insect community.	Booth, 2000	WA
Community Index	In a Puget Sound study, the steepest decline of B-IBI was observed after 6% IC. There was a steady decline, with approximately 50% reduction in B-IBI at 45% IC.	Horner *et al.*, 1997	WA
Community Index	B-IBI decreases with increasing urbanization in study involving 209 sites, with a sharp decline at 10% IC. Riparian condition helps mitigate effects.	Steedman, 1988	Ontario
Community Index	Wetlands, forest cover and riparian integrity act to mitigate the impact of IC on aquatic insect communities.	Horner *et al.*, 2001	WA, MD, TX
Community Index	B-IBI declines for aquatic insect with increasing IC at more than 200 streams.	Fairfax Co., 2001	VA
Community Index	Two-year stream study of eight Piedmont watersheds reported B-IBI scores declined sharply at an IC threshold of 15-30%.	Meyer and Couch,2000	GA
Community Index	Montgomery County study; subwatersheds with <12% IC generally had streams in good to excellent condition based on a combined fish and aquatic insect IBI. Watersheds with >20% IC had streams in poor condition.	MNCPPC, 2000	MD
Community Index	Study of 1st, 2nd, and 3rd order streams in the Patapsco River Basin showed negative relationship between B-IBI and IC.	Dail *et al.*, 1998	MD
Community Index	While no specific threshold was observed, impacts were seen at even low levels of IC. B-IBI values declined with increasing IC, with high scores observed only in reaches with <5% IC or intact riparian zones or upstream wetlands.	Horner and May, 1999	WA
Community Index	The C-IBI also decreased by 50% at 10-15% IC. These trends were particularly strong at low-density urban sites (0-30% IC).	Maxted and Shaver, 1997	DE
Diversity	In both coastal plain and Piedmont streams, a sharp decline in aquatic insect diversity was found around 10-15% IC.	Shaver *et al.*, 1995	DE
Diversity	In a comparison of Anacostia subwatersheds, there was significant decline in the diversity of aquatic insects at 10% IC.	MWCOG, 1992	DC
Diversity	In several dozen Piedmont headwater streams, aquatic diversity declined significantly beyond 10-12% IC.	Klein, 1979	MD
EPT Value	In a 10 stream study with watershed IC ranging from three to 30%, a significant decline in EPT values was reported as IC increased (r2 = 0.76).	Davis, 2001	MO
Sensitive Species	In a study of 38 wadeable, non-tidal streams in the urban Piedmont, 90% of sensitive organisms were eliminated from the benthic community after watershed IC reaches 10-15%.	Maxted and Shaver, 1997	DE
Species Abundance EPT values	For streams draining 20 catchments across the state, an abrupt decline in species abundance and EPT taxa was observed at approximately 6% IC.	Morse, 2001	ME

Table 50: Recent Research Examining the Relationship of Other Indices of Watershed Development on Aquatic Insect Diversity in Streams

Biotic	Key Finding (s)	Source	Location
Percent Urban Land use			
Community Index	Study of 700 streams in 5 major drainage basins found that the amount of urban land and total flow of municipal effluent were the most significant factors in predicting severe impairment of the aquatic insect community. Amount of forested land in drainage area was inversely related to impairment severity.	Kennen, 1999	NJ
Community Index	All 40 urban sites sampled had fair to very poor B-IBI scores, compared to undeveloped reference sites.	Yoder, 1991	OH
Community Index	A negative correlation between B-IBI and urban land use was noted. Community characteristics show similar patterns between agricultural and forested areas the most severe degradation being in urban and suburban areas.	Meyer and Couch, 2000	GA
EPT Value, Diversity, Community Index	A comparison of three stream types found urban streams had lowest diversity and richness. Urban streams had substantially lower EPT scores (22% vs 5% as number of all taxa, 65% vs 10% as percent abundance) and IBI scores in the poor range.	Crawford and Lenat, 1989	NC
Sensitive Species	Urbanization associated with decline in sensitive taxa, such as mayflies, caddisflies and amphipods while showing increases in oligochaetes.	Pitt and Bozeman, 1982	CA
Sensitive Species	Dramatic changes in aquatic insect community were observed in most urbanizing stream sections. Changes include an abundance of pollution-tolerant aquatic insect species in urban streams.	Kemp and Spotila, 1997	PA
Diversity	As watershed development levels increased, the aquatic insect diversity declined.	Richards *et al.*, 1993	MN
Diversity	Significant negative relationship between number of aquatic insect species and degree of urbanization in 21 Atlanta streams.	Benke *et al.*, 1981	GA
Diversity	Drop in insect taxa from 13 to 4 was noted in urban streams.	Garie and McIntosh, 1986	NJ
Diversity	Aquatic insect taxa were found to be more abundant in non-urban reaches than in urban reaches of the watershed.	Pitt and Bozeman, 1982	CA
Diversity	A study of five urban streams found that as watershed land use shifted from rural to urban, aquatic insect diversity decreased.	Masterson and Bannerman, 1994	WI
Other Land Use Indicators			
Community Index	Most degraded streams were found in developed areas, particularly older developments lacking newer and more efficient stormwater controls.	Fairfax Co., 2001	VA
Diversity	Urban streams had sharply lower aquatic insect diversity with human population above four persons/acre in northern VA.	Jones and Clark, 1987	VA
EPT Value	Monitoring of four construction sites in three varying regulatory settings found that EPT richness was related to enforcement of erosion and sediment controls. The pattern demonstrated that EPT richness was negatively affected as one moved from upstream to at the site, except for one site.	Reice, 2000	NC
Sensitive Species	In a Seattle study, aquatic insect community shifted to chironomid, oligochaetes and amphipod species that are pollution-tolerant and have simple feeding guild.	Pedersen and Perkins,1986	WA

species (based on EPT richness, % EPT abundance, and Hilsenhoff Biotic Index) were eliminated from the aquatic insect community when IC exceeded 10 to 15% in contributing watersheds of Delaware streams (Figure 46). In a recent study of 30 Maine watersheds, Morse (2001) found that reference streams with less than 5% watershed IC had significantly more EPT taxa than more urban streams. He also observed no significant differences in EPT Index values among streams with six to 27% watershed IC (Figure 47).

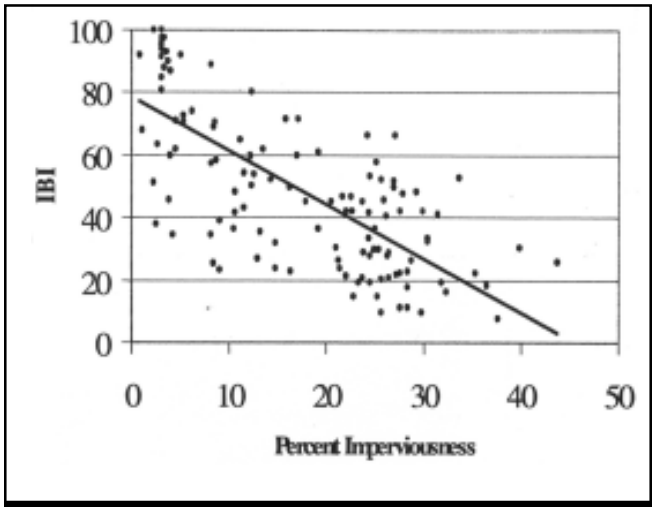

Figure 43: Trend Line Indicating Decline in Benthic IBI as IC Increases in Northern VA Streams (Fairfax County, 2001)

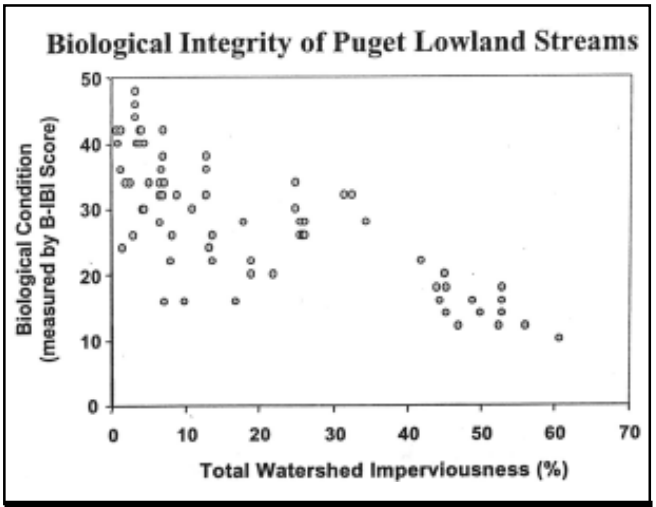

Figure 44: Relationship Between IC and B-IBI Scores in Aquatic Insects in Streams of the Puget Sound Lowlands (Booth, 2000)

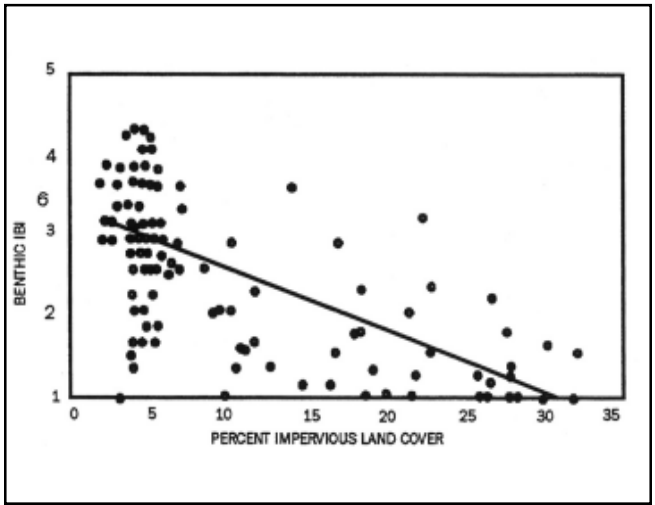

Figure 45: IC and B-IBI at Stream Sites in the Patapsco River Basin, MD (Dail *et al.*, 1998)

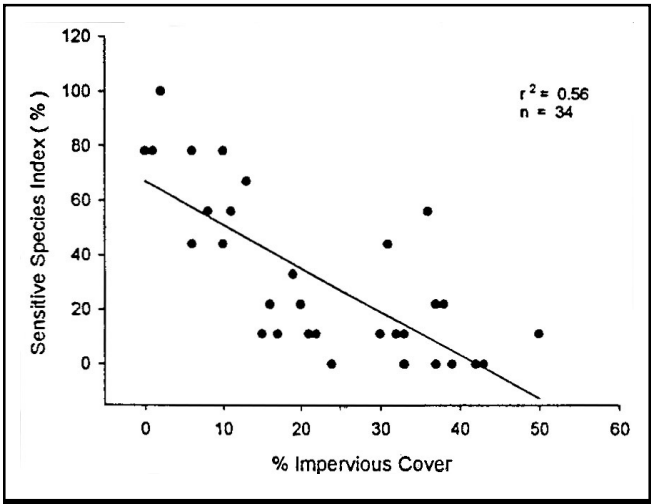

Figure 46: IC vs. Aquatic Insect Sensitivity - EPT Scores in Delaware Streams (Maxted and Shaver, 1997)

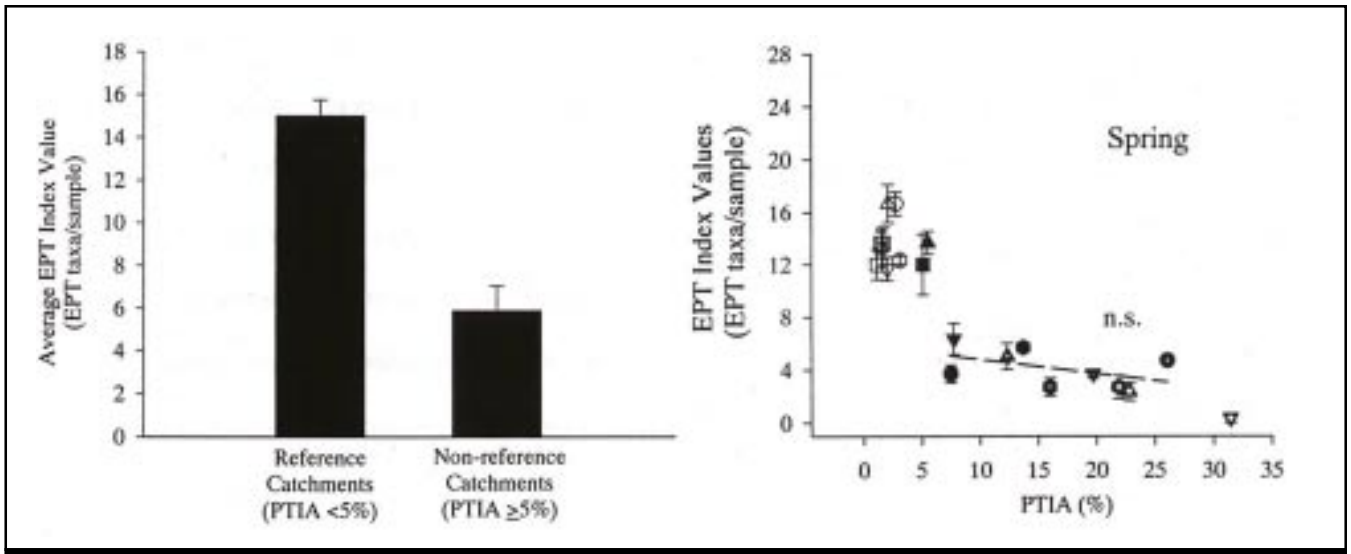

Figure 47: Average and Spring EPT Index Values vs.% IC in 20 Small Watersheds in Maine (Morse, 2001)

5.3.2 Findings Based on Other Development Indicators

Development indices, such as percent urban land use, population density, and forest and riparian cover have also been correlated with changes in aquatic insect communities in urban streams. Declines in benthic IBI scores have frequently been observed in proportion to the percent urban land use in small watersheds (Garie and McIntosh, 1986; Kemp and Spotila, 1997; Kennen, 1999; Masterson and Bannerman, 1994; Richards *et al.*, 1993; USEPA, 1982).

A study in Washington state compared a heavily urbanized stream to a stream with limited watershed development and found that the diversity of the aquatic insect community declined from 13 taxa in reference streams to five taxa in more urbanized streams (Pedersen and Perkins, 1986). The aquatic insect taxa that were lost were poorly suited to handle the variable erosional and depositional conditions found in urban streams. Similarly, a comparison of three North Carolina streams with different watershed land uses concluded the urban watershed had the least taxa and lowest EPT scores and greatest proportion of pollution-tolerant species (Crawford and Lenat, 1989).

Jones and Clark (1987) monitored 22 streams in Northern Virginia and concluded that aquatic insect diversity diminished markedly once watershed population density exceeded four or more people per acre. The population density roughly translates to ½ - 1 acre lot residential use, or about 10 to 20 % IC. Kennen (1999) evaluated 700 New Jersey streams and concluded that the percentage of watershed forest was positively correlated with aquatic insect density. Meyer and Couch (2000) reported a similar cover relationship between aquatic insect diversity and watershed and riparian forest cover for streams in the Atlanta, GA region. A study in the Puget Sound region found that aquatic insect diversity declined in streams once forest cover fell below 65% (Booth, 2000).

5.4 Effects on Fish Diversity

Fish communities are also excellent environmental indicators of stream health. In general, an increase in watershed IC produces the same kind of impact on fish diversity as it does for aquatic insects. The reduction in fish diversity is typified by a reduction in total species, loss of sensitive species, a shift toward more pollution-tolerant species, and decreased survival of eggs and larvae. More than 30 studies have examined the relationship between watershed development and fish diversity; they are summarized in Tables 51 and 52. About half of the research studies used IC as the major index of watershed development, while the remainder used other indices, such as percent urban land use, population density, housing density, and forest cover.

5.4.1 Findings Based on IC Indicators

Recent stream research shows a consistent, negative relationship between watershed development and various measures of fish diversity, such as diversity metrics, species loss and structural changes.

Typically, a notable decline in fish diversity occurs around 10 to 15% watershed IC (Boward *et al.*, 1999; Galli, 1994; Klein, 1979; Limburg and Schmidt, 1990; MNCPPC, 2000; MWCOG, 1992; Steward, 1983). A somewhat higher threshold was observed by Meyer and Couch (2000) for Atlanta streams with 15 to 30% IC; lower thresholds have also been observed (Horner *et al.*, 1997 and May *et al.*, 1997). A typical relationship between watershed IC and fish diversity is portrayed in Figure 48, which shows data from streams in the Patapsco River Basin in Maryland (Dail *et al.*, 1998). Once again, note the variability in fish-IBI scores observed below 10% IC.

Wang *et al.* (1997) evaluated 47 Wisconsin streams and found an apparent threshold around 10% IC. Fish-IBI scores were "good" to "excellent" below this threshold, but were consistently rated as "fair" to "poor." Additionally, Wang documented that the total number of fish species drops sharply when IC increases (Figure 49). Often, researchers also reported that increases in IC were strongly correlated with several fish metrics, such as increases in non-native and pollution-tolerant species in streams in Santa Clara, California (EOA, Inc., 2001).

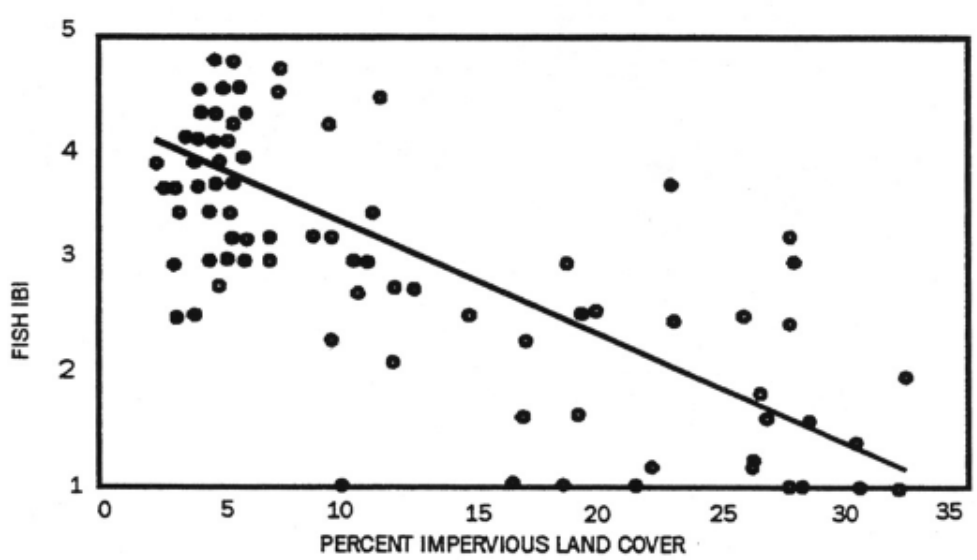

Figure 48: Fish-IBI vs. Watershed IC for Streams in the Patapsco River Basin, MD (Dail *et al.*, 1998)

Table 51: Recent Research Examining the Relationship Between Watershed IC and the Fish Community

Biotic	Key Finding (s)	Source	Location
Abundance	Brown trout abundance and recruitment declined sharply at 10-15% IC.	Galli, 1994	MD
Salmonids	Seattle study showed marked reduction in coho salmon populations noted at 10-15% IC at nine streams.	Steward, 1983	WA
Anadromous Fish Eggs	Resident and anadromous fish eggs and larvae declined in 16 subwatersheds draining to the Hudson River with >10% IC area.	Limburg and Schmidt, 1990	NY
Community Index	1st, 2nd, and 3rd order streams in the Patapsco River Basin showed negative relationship between IBI and IC.	Dail *et al.*, 1998	MD
Community Index	Fish IBI and habitat scores were all ranked as poor in five subwatersheds that were greater than 30% IC.	Black and Veatch, 1994	MD
Community Index	In the Potomac subregion, subwatersheds with < 12% IC generally had streams in good to excellent condition based on a combined fish and aquatic insect IBI. Watersheds with >20% IC had streams in poor condition.	MNCPPC, 2000	MD
Community Index	In a two-year study of Piedmont streams draining eight watersheds representing various land uses in Chattahochee River Basin, fish community quality dropped sharply at an IC threshold of 15-30%.	Meyer and Couch, 2000	GA
Diversity	Of 23 headwater stream stations, all draining <10% IC areas, rated as good to fair; all with >12% were rated as poor. Fish diversity declined sharply with increasing IC between 10-12%.	Schueler and Galli, 1992	MD
Diversity, Sensitive Species	Comparison of 4 similar subwatersheds in Piedmont streams, there was significant decline in the diversity of fish at 10% IC. Sensitive species (trout and sculpin) were lost at 10-12%.	MWCOG, 1992	MD
Diversity, Community Index	In a comparison of watershed land use and fish community data for 47 streams between the 1970s and 1990s, a strong negative correlation was found between number species and IBI scores with effective connected IC. A threshold of 10% IC was observed with community quality highly variable below 10% but consistently low above 10% IC.	Wang *et al.*, 1997	WI
Diversity	In several dozen Piedmont headwater streams fish diversity declined significantly in areas beyond 10-12% IC.	Klein, 1979	MD
Diversity , Abundance, Non-native Species	IC strongly associated with several fisheries species and individual-level metrics, including number of pollution-tolerant species, diseased individuals, native and non-native species and total species present	EOA, Inc., 2001	CA
Juvenile Salmon Ratios	In Puget Sound study, the steepest decline of biological functioning was observed after six percent IC. There was a steady decline, with approximately 50% reduction in initial biotic integrity at 45% IC area.	Horner *et al.*, 1997	WA
Juvenile Salmon Ratio	Physical and biological stream indicators declined most rapidly during the initial phase of the urbanization process as total IC area exceeded the five to 10% range.	May *et al.*, 1997	WA
Salmonoid	Negative effects of urbanization (IC) with the defacto loss of non-structural BMPs (wetland forest cover and riparian integrity) on salmon ratios	Horner *et al.*, 2001	WA, MD, TX
Salmonoid, Sensitive Species	While no specific threshold was observed (impacts seen at even low levels of IC), Coho/cutthroat salmon ratios >2:1 were found when IC was < 5%. Ratios fell below one at IC levels below 20 %.	Horner and May, 1999	WA
Sensitive species, Salmonid	Three years stream sampling across the state (approximately 1000 sites), MBSS found that when IC was >15%, stream health was never rated good based on CBI, and pollution sensitive brook trout were never found in streams with >2% IC.	Boward *et al.*, 1999	MD
Sensitive Species, Salmonids	Seattle study observed shift from less tolerant coho salmon to more tolerant cutthroat trout population between 10 and 15% IC at nine sites.	Luchetti and Feurstenburg 1993	WA

Sensitive fish are defined as species that strongly depend on clean and stable bottom substrates for feeding and/or spawning. Sensitive fish often show a precipitous decline in urban streams. The loss of sensitive fish species and a shift in community structure towards more pollution-tolerant species is confirmed by multiple studies. Figure 50 shows the results of a comparison of four similar subwatersheds in the Maryland Piedmont that were sampled for the number of fish species present (MWCOG, 1992). As the level of watershed IC increased, the number of fish species collected dropped. Two sensitive species, including sculpin, were lost when IC increased from 10 to 12%, and four more species were lost when IC reached 25%. Significantly, only two species remained in the fish community at 55% watershed IC.

Salmonid fish species (trout and salmon) and anadromous fish species appear to be particularly impacted by watershed IC. In a study in the Pacific Northwest, sensitive coho salmon were seldom found in watersheds above 10 or 15% IC (Luchetti and Feurstenburg, 1993 and Steward, 1983). Key stressors in urban streams, such as higher peak flows, lower dry weather flows, and reduction in habitat complexity (e.g. fewer pools, LWD, and hiding places) are believed to change salmon species composition, favoring cutthroat trout populations over the natural coho populations (WDFW, 1997).

A series of studies from the Puget Sound reported changes in the coho/cutthroat ratios of juvenile salmon as watershed IC increased (Figure 51). Horner *et al.* (1999) found Coho/Cutthroat ratios greater than 2:1 in watersheds with less than 5 % IC. Ratios fell below 1:1 when IC exceeded 20%. Similar results were reported by May *et al.* (1997). In the mid-Atlantic region, native trout have stringent temperature and habitat requirements and are seldom present in watersheds where IC exceeds 15% (Schueler, 1994a). Declines in trout spawning success are evident above 10% IC. In a study of over 1,000 Maryland streams, Boward *et al.* (1999) found that sensitive brook trout were never found in streams that had more than 4% IC in their contributing watersheds.

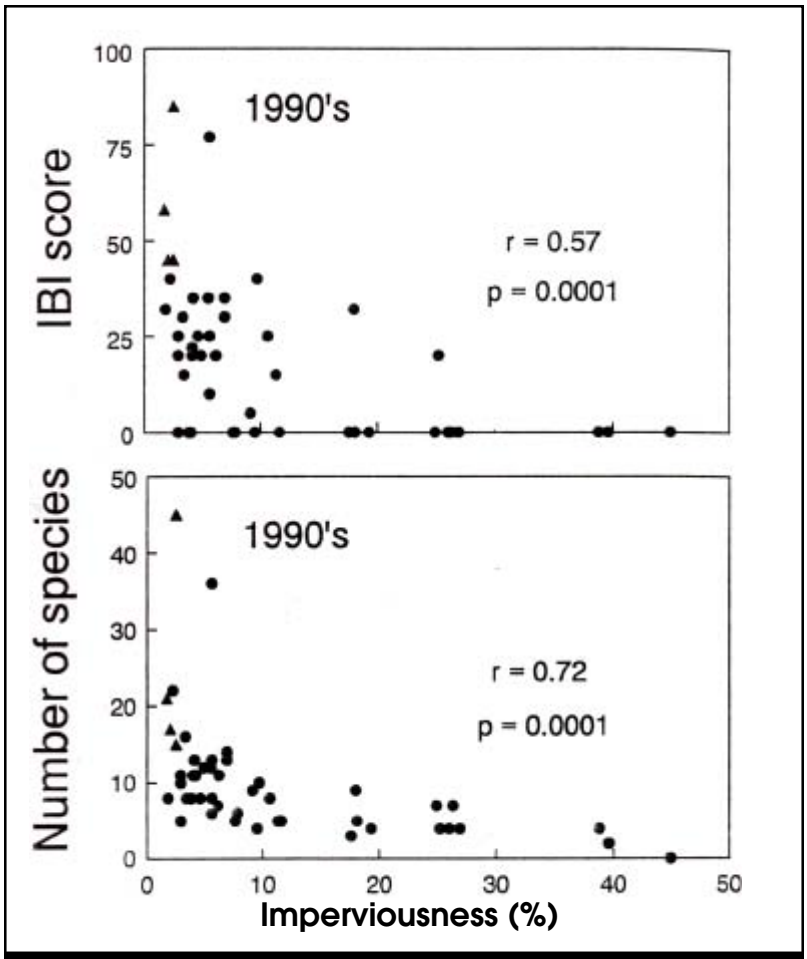

Figure 49: Fish-IBI and Number of Species vs. % IC in Wisconsin Streams (Wang *et al.*, 1997)

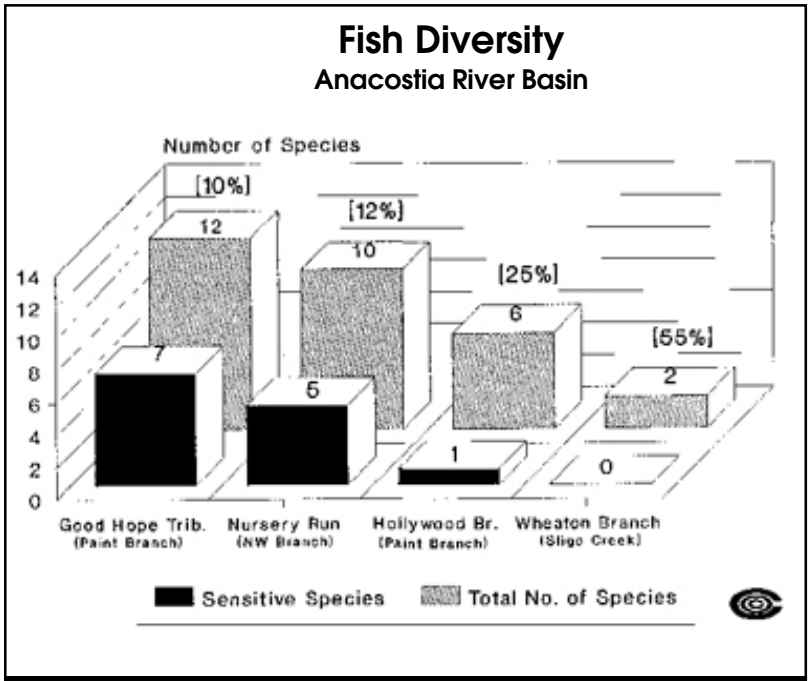

Figure 50: IC and Effects on Fish Species Diversity in Four Maryland Subwatersheds (MWCOG, 1992)

Table 52: Recent Research Examining Urbanization and Freshwater Fish Community Indicators

Biotic	Key Finding (s)	Source	Location
	Urbanization		
Community Index	All 40 urban sites sampled had fair to very poor IBI scores, compared to undeveloped reference sites.	Yoder, 1991	OH
Community Index	Negative correlations between biotic community and riparian conditions and forested areas were found. Similar levels of fish degradation were found between suburban and agricultural; urban areas were the most severe.	Meyer and Couch, 2000	GA
Community Index	Residential urban land use caused significant decrease in fish-IBI scores at 33%. In more urbanized Cuyahoga, a significant drop in IBI scores occurred around 8% urban land use in the watershed. When watersheds smaller than 100mi^2 were analyzed separately, the level of urban land associated with a significant drop in IBI scores occurred at around 15%. Above one du/ac, most sites failed to attain biocriteria regardless of degree of urbanization.	Yoder *et al.*, 1999	OH
Community Index, Abundance	As watershed development increased to about 10%, fish communities simplified to more habitat and trophic generalists and fish abundance and species richness declined. IBI scores for the urbanized stream fell from the good to fair category.	Weaver, 1991	VA
Diversity	A study of five urban streams found that as land use shifted from rural to urban, fish diversity decreased.	Masterson and Bannerman, 1994	WI
Diversity, Community Index	A comparison of three stream types found urban streams had lowest diversity and richness. Urban streams had IBI scores in the poor range.	Crawford and Lenat, 1989	NC
Salmon Spawning, Flooding Frequency	In comparing three streams over a 25-year period (two urbanizing and one remaining forested), increases in flooding frequencies and decreased trends in salmon spawning were observed in the two urbanizing streams, while no changes in flooding or spawning were seen in the forested system.	Moscript and Montgomery, 1997	WA
Sensitive Species	Observed dramatic changes in fish communities in most urbanizing stream sections, such as absence of brown trout and abundance of pollution-tolerant species in urban reaches.	Kemp and Spotila, 1997	PA
Sensitive Species, Diversity	Decline in sensitive species diversity and composition and changes in trophic structure from specialized feeders to generalists was seen in an urbanizing watershed from 1958 to 1990. Low intensity development was found to affect warm water stream fish communities similarly as more intense development.	Weaver and Garman, 1994	VA
Warm Water Habitat Biocriteria	25-30% urban land use defined as the upper threshold where attainment of warm water habitat biocriterion is effectively lost. Non-attainment also may occur at lower thresholds given the co-occurrence of stressors, such as pollution legacy, WTPs and CSOs.	Yoder and Miltner, 2000	OH
Community Index, Habitat	The amount of urban land use upstream of sample sites had a strong negative relationship with biotic integrity, and there appeared to be a threshold between 10 and 20% urban land use where IBI scores declined dramatically. Watersheds above 20% urban land invariably had scores less than 30 (poor to very poor). Habitat scores were not tightly correlated with degraded fish community attributes.	Wang *et al.*, 1997	WI
Community Index	A study in the Patapsco Basin found significant correlation of fish IBI scores with percent urbanized land over all scales (catchment, riparian area, and local area).	Roth *et al.*, 1998	MD

Table 52 (continued): Recent Research Examining Urbanization and Freshwater Fish Community Indicators			
Biotic	**Key Finding (s)**	**Source**	**Location**
Urbanization			
Sensitive Species	Evaluated effects of runoff in both urban and non-urban streams; found that native species dominated the non-urban portion of the watershed but accounted for only seven percent of species found in the urban portions of the watershed.	Pitt, 1982	CA
Other Land Use Indicators			
Community Index, Habitat	Atlanta study found that as watershed population density increased, there was a negative impact on urban fish and habitat. Urban stream IBI scores were inversely related to watershed population density, and once density exceeded four persons/acre, urban streams were consistently rated as very poor.	Couch *et al.*, 1997	GA
Community Index	In an Atlanta stream study, modified IBI scores declined once watershed population density exceeds four persons/acre in 21 urban watersheds	DeVivo *et al.*, 1997	GA
Community Index	In a six-county study (including Chicago, its suburbs and outlying rural/agricultural areas), streams showed a strong correlation between population density and fish community assessments such that as population density increased, community assessment scores went from the better - good range to fair - poor. Significant impacts seen at 1.5 people/acre.	Dreher, 1997	IL
Community Index	Similarly, negative correlations between biotic community and riparian conditions and forested areas were also found. Similar levels of fish degradation were found between suburban and agricultural; urban areas were the most severe.	Meyer and Couch, 2000	GA
Community Index	Amount of forested land in basin directly related to IBI scores for fish community condition.	Roth *et al.*, 1996	MD
Salmonid, Sensitive Species	Species community changes from natural coho salmon to cutthroat trout population with increases in peak flow, lower low flow, and reductions in stream complexity.	WDFW, 1997	WA

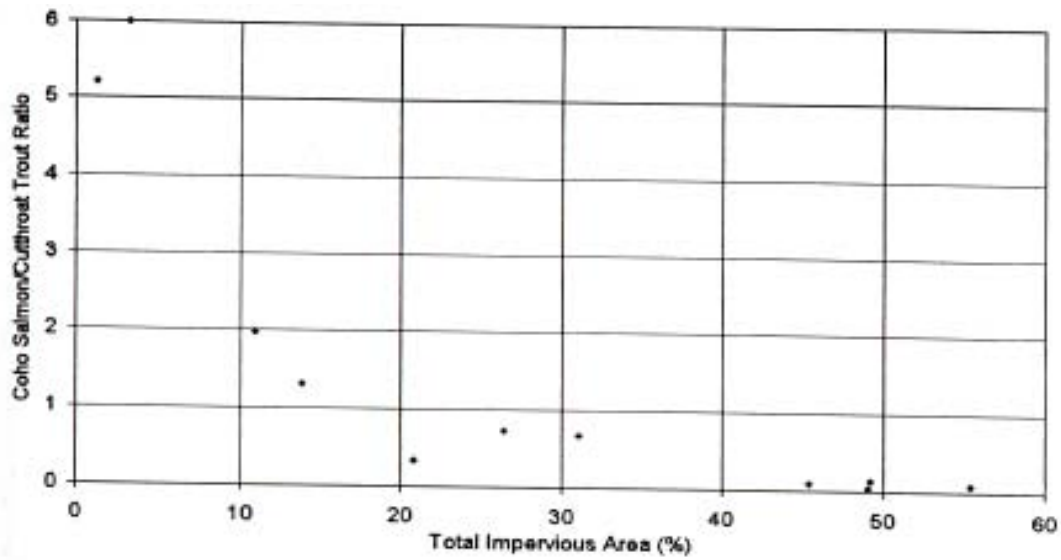

Figure 51: Coho Salmon/Cutthroat Trout Ratio for Puget Sound Streams (Horner *et al.*, 1997)

Many fish species have poor spawning success in urban streams and poor survival of fish eggs and fry. Fish barriers, low intragravel dissolved oxygen, sediment deposition and scour are all factors that can diminish the ability of fish species to successfully reproduce. For example, Limburg and Schmidt (1990) discovered that the density of anadromous fish eggs and larvae declined sharply in subwatersheds with more than 10% IC.

5.4.2 Findings Based on Other Development Indicators

Urban land use has frequently been used as a development indicator to evaluate the impact on fish diversity. Streams in urban watersheds typically had lower fish species diversity and richness than streams located in less developed watersheds. Declines in fish diversity as a function of urban land cover have been documented in numerous studies (Crawford and Lenat, 1989; Masterson and Bannerman, 1994; Roth *et al., 1998;* Yoder, 1991, and Yoder *et al.*, 1999). USEPA (1982) found that native fish species dominated the fish community of non-urban streams, but accounted for only 7% of the fish community found in urban streams. Kemp and Spotila (1997) evaluated streams in Pennsylvania and noted the loss of sensitive species (e.g. brown trout) and the increase of pollution-tolerant species, such as sunfish and creek chub (Figure 52).

Wang *et al.* (1997) cited percentage of urban land in Wisconsin watersheds as a strong negative factor influencing fish-IBI scores in streams and observed strong declines in IBI scores with 10 to 20% urban land use. Weaver and Garman (1994) compared the historical changes in the warm-water fish community of a Virginia stream that had undergone significant urbanization and found that many of the sensitive species present in 1958 were either absent or had dropped sharply in abundance when the watershed was sampled in 1990. Overall abundance had dropped from 2,056 fish collected in 1958 to 417 in 1990. In addition, the 1990 study showed that 67% of the catch was bluegill and common shiner, two species that are habitat and trophic "generalists." This shift in community to more habitat and trophic generalists was observed at 10% urban land use (Weaver, 1991).

Yoder *et al.* (1999) evaluated a series of streams in Ohio and reported a strong decrease in warm-water fish community scores around 33% residential urban land use. In the more urbanized Cuyahoga streams, sharp drops in

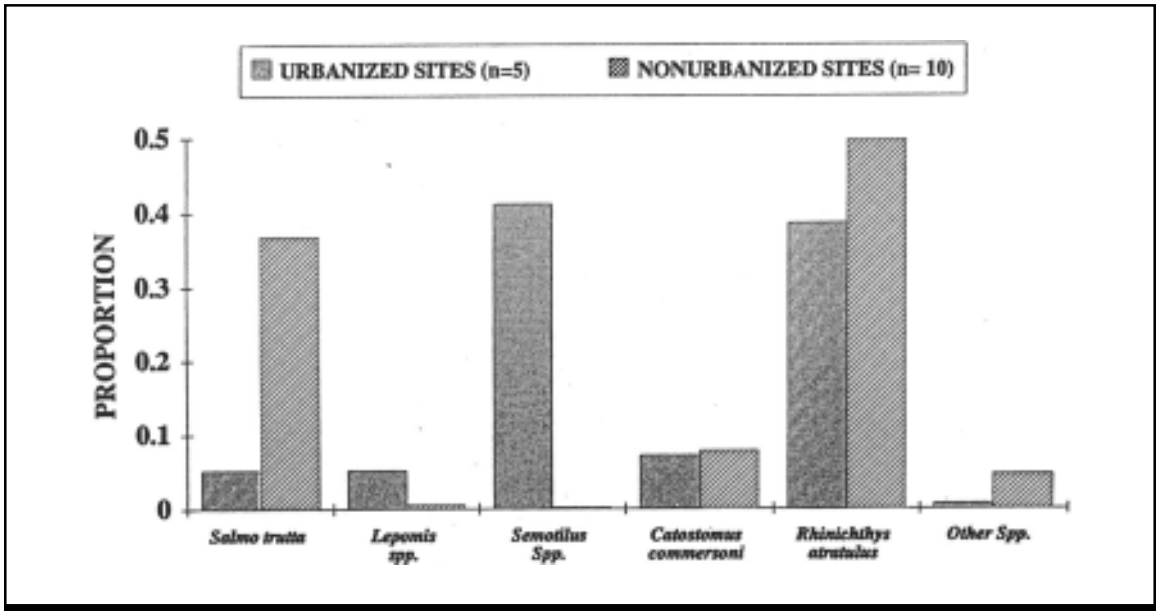

Figure 52: Mean Proportion of Fish Taxa in Urban and Non-Urban Streams, Valley Forge Watershed, PA (Kemp and Spotila, 1997)

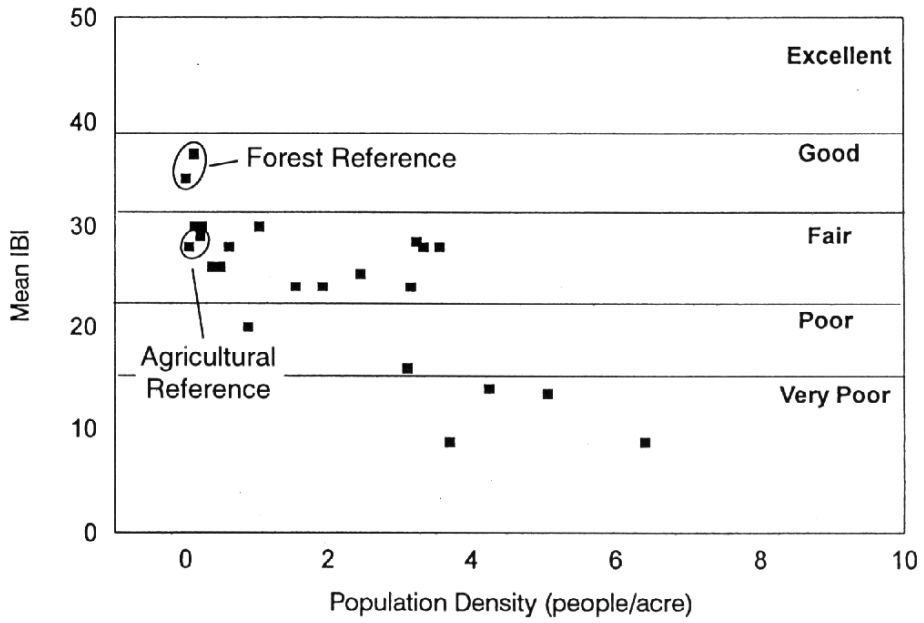

Figure 53: Relationship Between Watershed Population Density and Stream IBI Scores in Georgia Streams (DeVivo *et al.*, 1997)

fish-IBI scores occurred around 8% urban land use, primarily due to certain stressors which functioned to lower the non-attainment threshold. When watersheds smaller than 100mi^2 were analyzed separately, the percentage of urban land use associated with a sharp drop in fish-IBI scores was around 15%. In a later study, Yoder and Miltner (2000) described an upper threshold for quality warm-water fish habitat at 25 to 30% urban land use.

Watershed population and housing density have also been used as indicators of the health of the fish community. In a study of 21 urban watersheds in Atlanta, DeVivo *et al.* (1997) observed a shift in mean fish-IBI scores from "good to fair" to "very poor" when watershed population density exceeded four people/acre (Figure 53). A study of Midwest streams in metropolitan Illinois also found a negative relationship between increase in population density and fish communities, with significant impacts detected at population densities of 1.5 people or greater per acre (Dreher, 1997). In the Columbus and Cuyahoga watersheds in Ohio, Yoder *et al*. (1999) concluded that most streams failed to attain fish biocriteria above one dwelling unit/acre.

5.5 Effects on Amphibian Diversity

Amphibians spend portions of their life cycle in aquatic systems and are frequently found within riparian, wetland or littoral areas. Relatively little research has been conducted to directly quantify the effects of watershed development on amphibian diversity. Intuitively, it would appear that the same stressors that affect fish and aquatic insects would also affect amphibian species, along with riparian wetland alteration. We located four research studies on the impacts of watershed urbanization on amphibian populations; only one was related to streams (Boward *et al.,* 1999), while others were related to wetlands (Table 53).

A primary factor influencing amphibian diversity appears to be water level fluctuations (WLF) in urban wetlands that occur as a result of increased stormwater discharges. Chin (1996) hypothesized that increased WLF and other hydrologic factors affected the abundance of egg clutches and available amphibian breeding habitat, thereby ultimately influencing amphibian richness. Increased WLF can limit reproductive success by eliminating mating habitat and the emergent vegetation to which amphibians attach their eggs.

Taylor (1993) examined the effect of watershed development on 19 freshwater wetlands in King County, WA and concluded that the additional stormwater contributed to greater annual WLF. When annual WLF exceeded about eight inches, the richness of both the wetland plant and amphibian communities dropped sharply. Large increases in WLF were consistently observed in freshwater wetlands when IC in upstream watersheds exceeded 10 to 15%. Further research on streams and wetlands in the Pacific northwest by Horner *et al.* (1997) demonstrated the correlation between watershed IC and diversity of amphibian species. Figure 54 illustrates the relationship between amphibian species abundance and watershed IC, as documented in the study.

Table 53: Recent Research on the Relationship Between Percent Watershed Urbanization and the Amphibian Community

Indicator	Key Finding(s)	Reference Year	Location
% IC			
Reptile and Amphibian Abundance	In a three-year stream sampling across the state (approximately 1000 sites), MBSS found only hardy pollution-tolerant reptiles and amphibians in stream corridors with >25% IC drainage area.	Boward *et al.*, 1999	MD
Amphibian Density	Mean annual water fluctuation inversely correlated to amphibian density in urban wetlands. Declines noted beyond 10% IC.	Taylor, 1993	WA
Other Studies			
Species Richness	In 30 wetlands, species richness of reptiles and amphibians was significantly related to density of paved roads on lands within a two kilometer radius.	Findlay and Houlahan, 1997	Ontario
Species Richness	Decline in amphibian species richness as wetland WLF increased. While more of a continuous decline rather than a threshold, WLF = 22 centimeters may represent a tolerance boundary for amphibian community.	Horner *et al.*, 1997	WA
Amphibian Density	Mean annual water fluctuation inversely correlated to amphibian density in urban wetlands.	Taylor, 1993	WA

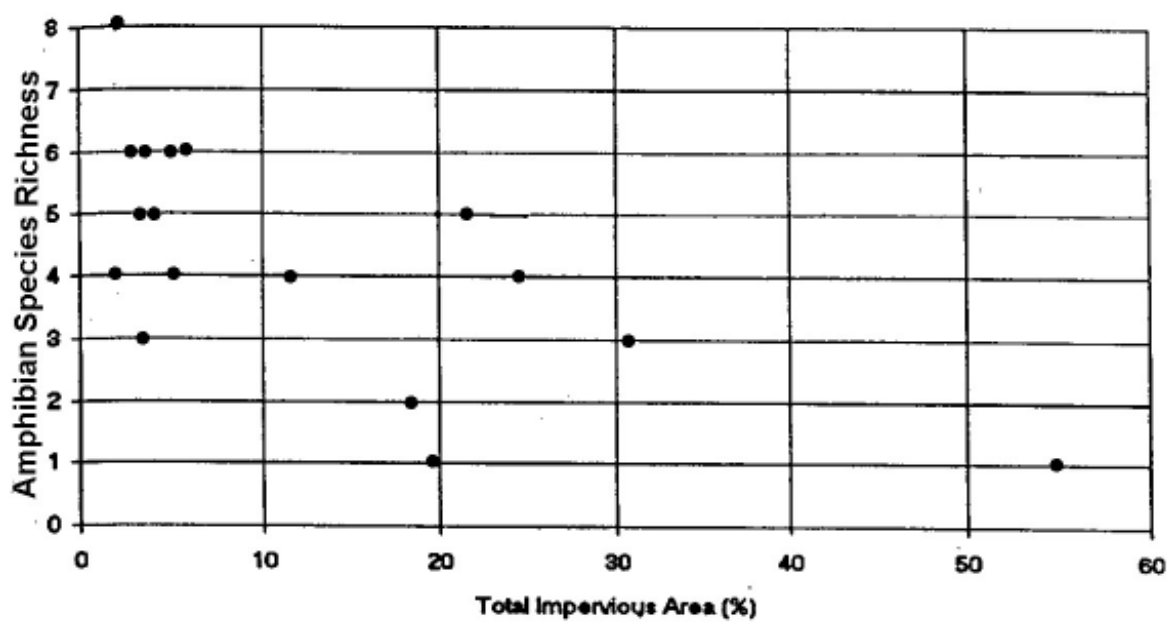

Figure 54: Amphibian Species Richness as a Function of Watershed IC in Puget Sound Lowland Wetlands (Horner *et al.*, 1997)

5.6 Effects on Wetland Diversity

We found a limited number of studies that evaluated the impact of watershed urbanization on wetland plant diversity (Table 54). Two studies used IC as an index of watershed development and observed reduced wetland plant diversity around or below 10% IC (Hicks and Larson, 1997 and Taylor, 1993). WLF and road density were also used as indicators (Findlay and Houlahan, 1997; Horner *et al.*, 1997; Taylor, 1993).

Horner *et al.* (1997) reported a decline in plant species richness in emergent and scrub-shrub wetland zones of the Puget Sound region as WLF increased. They cautioned that species numbers showed a continuous decline rather than a threshold value; however, it was indicated that WLF as small as 10 inches can represent a tolerance boundary for wetland plant communities. Horner further stated that in 90% of the cases where WLF exceeded 10 inches, watershed IC exceeded 21%.

Table 54: Recent Research Examining the Relationship Between Watershed Development and Urban Wetlands

Watershed Indicator Biotic	Key Finding(s)	Reference	Location
% IC			
Insect Community	Significant declines in various indicators of wetland aquatic macro-invertebrate community health were observed as IC increased to 8-9%.	Hicks and Larson, 1997	CT
WLF, Water Quality	There is a significant increase in WLF, conductivity, fecal coliform bacteria, and total phosphorus in urban wetland as IC exceeds 3.5%.	Taylor *et al.*, 1995	WA
Plant Density	Declines in urban wetland plant density noted in areas beyond 10% IC.	Taylor, 1993	WA
Other Watershed Indicators			
Plant Density	Mean annual water fluctuation inversely correlated to plant density in urban wetlands.	Taylor, 1993	WA
Plant Species Richness	Decline in plant species richness in emergent and scrub-shrub wetland zones as WLF increased. While more of a continuous decline, rather than a threshold, WLF=22 centimeters may represent a tolerance boundary for the community	Horner *et al.*, 1997	WA
Plant Species Richness	In 30 wetlands, species richness was significantly related to density of paved roads within a two kilometer radius of the wetland. Model predicted that a road density of 2kilometers per hectare in paved road within 1000 meters of wetland will lead to a 13% decrease in wetland plant species richness.	Findlay and Houlahan,1997	Ontario

5.7 Effects on Freshwater Mussel Diversity

Freshwater mussels are excellent indicators of stream quality since they are filter-feeders and essentially immobile. The percentage of imperiled mussel species in freshwater ecoregions is high (Williams *et al.*, 1993). Of the 297 native mussel species in the United States, 72% are considered endangered, threatened, or of special concern, including 21 mussel species that are presumed to be extinct. Seventy mussel species (24%) are considered to have stable populations, although many of these have declined in abundance and distribution. Modification of aquatic habitats and sedimentation are the primary reasons cited for the decline of freshwater mussels (Williams *et al.,* 1993).

Freshwater mussels are very susceptible to smothering by sediment deposition. Consequently, increases in watershed development and sediment loading are suspected to be a factor leading to reduced mussel diversity. At sublethal levels, silt interferes with feeding and metabolism of mussels in general (Aldridge *et al.*, 1987). Major sources of mortality and loss of diversity in mussels include impoundment of rivers and streams, and eutrophication (Bauer, 1988). Changes in fish diversity and abundance due to dams and impoundments can also influence the availability of mussel hosts (Williams *et al.*, 1992).

Freshwater mussels are particularly sensitive to heavy metals and pesticides (Keller and Zam, 1991). Although the effects of metals and pesticides vary from one species to another, sub-lethal levels of PCBs, DDT, Malathion, Rotenone and other compounds are generally known to inhibit respiratory efficiency and accumulate in tissues (Watters, 1996). Mussels are more sensitive to pesticides than many other animals tested and often act as “first-alerts” to toxicity long before they are seen in other organisms.

We were unable to find any empirical studies relating impacts of IC on the freshwater mussel communities of streams.

5.8 Conclusion

The scientific record is quite strong with respect to the impact of watershed urbanization on the integrity and diversity of aquatic communities. We reviewed 35 studies that indicated that increased watershed development led to declines in aquatic insect diversity and about 30 studies showing a similar impact on fish diversity. The scientific literature generally shows that aquatic insect and freshwater fish diversity declines at fairly low levels of IC (10 to 15%), urban land use (33%), population density (1.5 to eight people/acre) and housing density (>1 du/ac). Many studies also suggest that sensitive elements of the aquatic community are affected at even lower levels of IC. Other impacts include loss of sensitive species and reduced abundance and spawning success. Research supports the ICM, although additional research is needed to establish the upper threshold at which watershed development aquatic biodiversity can be restored.

One area where more research is needed involves determining how regional and climatic variations affect aquatic diversity in the ICM. Generally, it appears that the 10% IC threshold applies to streams in the East Coast and Midwest, with Pacific Northwest streams showing impacts at a slightly higher level. For streams in the arid and semi-arid Southwest, it is unclear what, if any, IC threshold exists given the naturally stressful conditions for these intermittent and ephemeral streams (Maxted, 1999). Southwestern streams are characterized by seasonal bursts of short but intense rainfall and tend to have aquatic communities that are trophically simple and relatively low in species richness (Poff and Ward, 1989).

Overall, the following conclusions can be drawn:

- IC is the most commonly used index to assess the impacts of watershed urbanization on aquatic insect and fish diversity. Percent urban land use is also a common index.

- The ICM may not be sensitive enough to predict biological diversity in watersheds with low IC. For example, below 10% watershed IC, other watershed variables such as riparian continuity, natural forest cover, cropland, ditching and acid rain may be better for predicting stream health.

- More research needs to be done to determine the maximum level of watershed development at which stream diversity can be restored or maintained. Additionally, the capacity of stormwater treatment practices and stream buffers to mitigate high levels of watershed IC warrants more systematic research.

- More research is needed to test the ICM on amphibian and freshwater mussel diversity.

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Glossary

1st order stream: The smallest perennial stream. A stream that carries water throughout the year and does not have permanently flowing tributaries.

2nd order stream: Stream formed by the confluence of two 1st order streams.

3rd order stream: Stream formed by the confluence of two 2nd order streams.

Acute toxicity: Designates exposure to a dangerous substance or chemical with sufficient dosage to precipitate a severe reaction, such as death.

Alluvial: Pertaining to processes or materials associated with transportation or deposition by running water.

Anadromous: Organisms that spawn in freshwater streams but live most of their lives in the ocean.

Annual Pollutant Load: The total mass of a pollutant delivered to a receiving water body in a year.

Bankfull: The condition where streamflow just fills a stream channel up to the top of the bank and at a point where the water begins to overflow onto a floodplain.

Baseflow: Stream discharge derived from ground water that supports flow in dry weather.

Bedload: Material that moves along the stream bottom surface, as opposed to suspended particles.

Benthic Community: Community of organisms living in or on bottom substrates in aquatic habitats, such as streams.

Biological Indicators: A living organism that denotes the presence of a specific environmental condition.

Biological Oxygen Demand (BOD): An indirect measure of the concentration of biologically degradable material present in organic wastes. It usually reflects the amount of oxygen consumed in five days by bacterial processes breaking down organic waste.

Carcinogen: A cancer-causing substance or agent.

Catchment: The smallest watershed management unit. Defined as the area of a development site to its first intersection with a stream, usually as a pipe or open channel outfall.

Chemical Oxygen Demand (COD): A chemical measure of the amount of organic substances in water or wastewater. Non-biodegradable and slowly degrading compounds that are not detected by BOD are included.

Chronic Toxicity: Showing effects only over a long period of time.

Combined Sewer Overflow (CSO): Excess flow (combined wastewater and stormwater runoff) discharged to a receiving water body from a combined sewer network when the capacity of the sewer network and/or treatment plant is exceeded, typically during storm events.

Combined Indices (C-IBI or CSPS): Combined indices that use both fish and aquatic insect metrics and a variety of specific habitat scores to classify streams.

Cryptosporidium parvum: A parasite often found in the intestines of livestock which contaminates water when animal feces interacts with a water source.

Deicer: A compound, such as ethylene glycol, used to melt or prevent the formation of ice.

Dissolved Metals: The amount of trace metals dissolved in water.

Dissolved Phosphorus: The amount of phosphorus dissolved in water.

Diversity: A numerical expression of the evenness and distribution of organisms.

Ecoregion: A continuous geographic area over which the climate is uniform to permit the development of similar ecosystems on sites with similar geophysical properties.

Embeddedness: Packing of pebbles or cobbles with fine-grained silts and clays.

EPT Index: A count of the number of families of each of the three generally pollution-sensitive orders: Ephemeroptera (mayflies), Plecoptera (stoneflies), and Trichoptera (caddisflies).

Escherichia coli (E. coli): A bacteria that inhabits the intestinal tract of humans and other warm-blooded animals. Although it poses no threat to human health, its presence in drinking water does indicate the presence of other, more dangerous bacteria.

Eutrophication: The process of over-enrichment of water bodies by nutrients, often typified by the presence of algal blooms.

Fecal coliform: Applied to E. coli and similar bacteria that are found in the intestinal tract of humans and animals. Coliform bacteria are commonly used as indicators of the presence of pathogenic organisms. Their presence in water indicates fecal pollution and potential contamination by pathogens.

Fecal streptococci: Bacteria found in the intestine of warm-blooded animals. Their presence in water is considered to verify fecal pollution.

Fish Blockages: Infrastructures associated with urbanization, such as bridges, dams, and culverts, that affect the ability of fish to move freely upstream and downstream in watersheds. Can prevent re-colonization of resident fish and block the migration of anadromous fish.

Flashiness: Percent of flows exceeding the mean flow for the year. A flashy hydrograph would have larger, shorter-duration hydrograph peaks.

Geomorphic: The general characteristic of a land surface and the changes that take place in the evolution of land forms.

Giardia lamblia: A flagellate protozoan that causes severe gastrointestinal illness when it contaminates drinking water.

Herbicide: Chemicals developed to control or eradicate plants.

Hotspot: Area where land use or activities generate highly contaminated runoff, with concentrations of pollutants in excess of those typically found in stormwater.

Hydrograph: A graph showing variation in stage (depth) or discharge of a stream of water over a period of time.

Illicit discharge: Any discharge to a municipal separate storm sewer system that is not composed entirely of storm water, except for discharges allowed under an NPDES permit.

Impervious Cover: Any surface in the urban landscape that cannot effectively absorb or infiltrate rainfall.

Impervious Cover Model (ICM): A general watershed planning model that uses percent watershed impervious cover to predict various stream quality indicators. It predicts expected stream quality declines when watershed IC exceeds 10% and severe degradation beyond 25% IC.

Incision: Stream down-cuts and the channel expands in the vertical direction.

Index of Biological Integrity (IBI): Tool for assessing the effects of runoff on the quality of the aquatic ecosystem by comparing the condition of multiple groups of organisms or taxa against the levels expected in a healthy stream.

Infiltration: The downward movement of water from the surface to the subsoil. The infiltration capacity is expressed in terms of inches per hour.

Insecticide: Chemicals developed to control or eradicate insects.

Large Woody Debris (LWD): Fundamental to stream habitat structure. Can form dams and pools; trap sediment and detritus; provide stabilization to stream channels; dissipate flow energy and promote habitat complexity.

Mannings N: A commonly used roughness coefficient; actor in velocity and discharge formulas representing the effect of channel roughness on energy losses in flowing water.

Methyl Tertiary-Butyl Ether: An oxygenate and gasoline additive used to improve the efficiency of combustion engines in order to enhance air quality and meet air pollution standards. MTBE has been found to mix and move more easily in water than many other fuel components, thereby making it harder to control, particularly once it has entered surface or ground waters.

Microbe: Short for microorganism. Small organisms that can be seen only with the aid of a microscope. Most frequently used to refer to bacteria. Microbes are important in the degradation and decomposition of organic materials.

Nitrate: A chemical compound having the formula NO_3. Excess nitrate in surface waters can lead to excessive growth of aquatic plants.

Organic Matter: Plant and animal residues, or substances made by living organisms. All are based upon carbon compounds.

Organic Nitrogen: Nitrogen that is bound to carbon-containing compounds. This form of nitrogen must be subjected to mineralization or decomposition before it can be used by the plant community.

Overbank Flow: Water flow over the top of the bankfull channel and onto the floodplain.

Oxygenate: To treat, combine, or infuse with oxygen.

Peak Discharge: The maximum instantaneous rate of flow during a storm, usually in reference to a specific design storm event.

Pesticides: Any chemical agent used to control specific organisms, for example, insecticides, herbicides, fungicides and rodenticides.

Piedmont: Any plain, zone or feature located at the foot of a mountain. In the United States, the Piedmont (region) is a plateau extending from New Jersey to Alabama and lying east of the Appalachian Mountains.

Pool: A stream feature where there is a region of deeper, slow-moving water with fine bottom materials. Pools are the slowest and least turbulent of the riffle/run/pool category.

Protozoan: Any of a group of single-celled organisms.

Rapid Bioassessment Protocols (RBP): An integrated assessment, comparing habitat, water quality and biological measures with empirically defined reference conditions.

Receiving Waters: Rivers, lakes, oceans, or other bodies of water that receive water from another source.

Riffle: Shallow rocky banks in streams where water flows over and around rocks disturbing the water surface; often associated with whitewater. Riffles often support diverse biological communities due to their habitat niches and increased oxygen levels created by the water disturbance. Riffles are the most swift and turbulent in the riffle/run/pool category.

Roughness: A measurement of the resistance that streambed materials, vegetation, and other physical components contribute to the flow of water in the stream channel and flood-plain. It is commonly measured as the Manning's roughness coefficient (Manning's N).

Run: Stream feature characterized by water flow that is moderately swift flow, yet not particularly turbulent. Runs are considered intermediate in the riffle/run/pool category.

Runoff Coefficient: A value derived from a site impervious cover value that is applied to a given rainfall volume to yield a corresponding runoff volume.

Salmonid: Belonging to the family Salmonidae, which includes trout and salmon.

Sanitary Sewer Overflow (SSO): Excess flow of wastewater (sewage) discharged to a receiving water body when the capacity of the sewer network and/or treatment plant is exceeded, typically during storm events.

Semi-arid: Characterized by a small amount of annual precipitation, generally between 10 and 20 inches.

Simple Method: Technique used to estimate pollutant loads based on the amount of IC found in a catchment or subwatershed.

Sinuosity: A measure of channel curvature, usually quantified as the ratio of the length of the channel to the length of a straight line along the valley axis. It is, in essence, a ratio of the stream's actual running length to its down-gradient length.

Soluble Phosphorus: The amount of phosphorus available for uptake by plants and animals.

Stormwater: The water produced as a result of a storm.

Subwatershed: A smaller geographic section of a larger watershed unit with a drainage area of between two to 15 square miles and whose boundaries include all the land area draining to a point where two 2nd order streams combine to form a 3rd order stream.

Total Dissolved Solids (TDS): A measure of the amount of material dissolved in water (mostly inorganic salts).

Total Kjeldhal Nitrogen (TKN): The total concentration of nitrogen in a sample present as ammonia or bound in organic compounds.

Total Recoverable Metals: The amount of a metal that is in solution after a representative suspended sediment sample has been digested by a method (usually using a dilute acid solution) that results in dissolution of only readily soluble substances).

Total Maximum Daily Load (TMDL): The maximum quantity of a particular water pollutant that can be discharged into a body of water without violating a water quality standard.

Total Nitrogen (Total N): A measure of the total amount of nitrate, nitrite and ammonia concentrations in a body of water.

Total Organic Carbon (TOC): A measure of the amount of organic material suspended or dissolved in water.

Total Phosphorous (Total P): A measure of the concentration of phosphorus contained in a body of water.

Total Suspended Solids (TSS): The total amount of particulate matter suspended in the water column.

Trophic Level: The position of an organism in a food chain or food pyramid.

Turbidity: A measure of the reduced transparency of water due to suspended material which carries water quality and aesthetic implications. Applied to waters containing suspended matter that interferes with the passage of light through the water or in which visual depth is restricted.

Volatile Organic Compounds (VOC): Chemical compounds which are easily transported into air and water. Most are industrial chemicals and solvents. Due to their low water solubility they are commonly found in soil and water.

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United States General Accounting Office 006761

GAO

Report to Congressional Requesters

June 2001

WATER QUALITY

Better Data and Evaluation of Urban Runoff Programs Needed to Assess Effectiveness

GAO

Accountability * Integrity * Reliability

GAO-01-679

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Abbreviations

BMP	best management practices
CSO	combined sewer overflow
DOT	Department of Transportation
DPW	Department of Public Works
EPA	Environmental Protection Agency
FHWA	Federal Highway Administration
MCTT	Multi-Chambered Treatment Tank
MDE	Maryland Department of Environment
MS4	Municipal Separate Storm Sewer System
NPDES	National Pollutant Discharge Elimination System
PAH	polycyclic aromatic hydrocarbons
PCB	polychlorinated biphenyls
TEA-21	Transportation Equity Act for the 21st Century
TMDL	total maximum daily load
USGS	U.S. Geological Survey
WDNR	Wisconsin Department of Natural Resources
WPDES	Wisconsin Pollutant Discharge Elimination System

G A O
Accountability * Integrity * Reliability

United States General Accounting Office
Washington, D.C. 20548

June 29, 2001

The Honorable Olympia Snowe
United States Senate

The Honorable Sherrod Brown
The Honorable Martin Meehan
The Honorable James Oberstar
The Honorable Jack Quinn
House of Representatives

Nonpoint source pollution—that is, pollution from contaminants picked up and carried into surface water by water running over land—is known to be one of the leading causes of water quality problems in the United States. Water that runs over developed areas, including paved surfaces such as roads and parking lots, before reaching a water body is known as urban runoff and is an increasingly important category of water pollution. As urban areas have expanded over the past several decades, the amount of urban runoff has also increased. Although the overall quality of the nation's waters has improved since the passage of the Clean Water Act in 1972, a significant number of water bodies still suffer from poor water quality. Because the act brought discharges from "point sources," such as industrial plants and municipal treatment plants, under control, the continuing pollution of these waters suggests that other sources, including urban runoff, are contributing to water quality problems. As a result, the Environmental Protection Agency (EPA) now classifies urban runoff as a significant cause of impairment to water quality. The Water Quality Act of 1987, which amended the Clean Water Act, required EPA, among other things, to regulate as a point source urban runoff that reaches municipal sewer systems. EPA's National Pollutant Discharge Elimination System Program for storm water requires that certain local governments take measures to control storm water runoff.

Concerned about the degradation of water quality in urban areas, you asked us to report on (1) the amount of runoff from urban areas, particularly from roads, highways, and other impervious surfaces,[1] and its effects on water quality and (2) the programs that federal regulations require local governments to develop to address urban runoff, and the costs and effectiveness of those programs. To address these issues, we reviewed federal and other studies and interviewed experts on the relationship between the amount of paved and other impervious surfaces and the amount of runoff, and on the types of materials typically contained in urban runoff. We also reviewed studies and interviewed experts on the sources of these materials and any actual or potential effects on water quality from urban runoff. We visited five urban areas and organizations that are affiliated with their watersheds[2] to obtain site-specific information about urban runoff problems, programs these areas have implemented in response to federal requirements, and the costs and effectiveness of these programs. Finally, we reviewed studies and estimates of the costs and investment requirements associated with implementing storm water management programs. Because this report focuses on local governments' actions, we did not review the portions of the National Pollutant Discharge Elimination System Storm Water Program that address industrial facilities and construction sites.

We performed our review from August 2000 through May 2001 in accordance with generally accepted government auditing standards.

Results in Brief

The volume of urban storm water runoff increased throughout the United States in the last half of the 20th century because of the growth in impervious surfaces that resulted from the development of urban and suburban areas. According to the U.S. Department of Agriculture, between 1945 and 1997, land devoted to urban areas in the United States has increased by about 327 percent; according to EPA, paved road mileage has increased by 278 percent. Because paved surfaces are almost impervious, they allow little storm water to infiltrate the ground; therefore, the storm water runs off into creeks, rivers, and lakes. As storm water runs across these impervious surfaces and land, it picks up pollutants from these surfaces and carries them to receiving bodies of water—either directly or

[1]An impervious surface keeps water from soaking into soils.

[2]A watershed is an area of land in which all surface water drains to a common point.

through conveyances such as gutters, storm sewers, and culverts. EPA's 1998 *National Water Quality Inventory Report to Congress* showed that certain rivers, streams, lakes, and estuaries are impaired in terms of their ability to support such uses as aquatic life, swimming, and fish consumption, and concluded that urban runoff was a major source of this impairment. Studies have shown that urban runoff and the pollutants it carries can cause increases in sedimentation, water temperature, and pathogen levels and decreases in dissolved oxygen levels in bodies of water. These changes can lead to the degradation of habitat in these water bodies and a decline in diversity of aquatic life and can endanger public health. For example, metals, a pollutant typically found in urban runoff, can be toxic to aquatic organisms. Pathogens, such as bacteria from animal waste, another pollutant commonly found in urban runoff, can pose public health problems when present in waters used for recreational purposes. The magnitude and nature of these effects vary by region, depending on the type and concentration of pollutants in storm water, rainfall characteristics, land use, and other factors.

Local governments are required to address urban runoff through EPA's National Pollutant Discharge Elimination System Storm Water Program. Under permits that EPA and states issue through this program, over 1,000 local governments must meet EPA's requirements to implement storm water management programs to reduce contaminants in storm water to the "maximum extent practicable." EPA recommends that these cities use "best management practices" to reduce contaminants in storm water runoff. The most typical practices included controlling runoff through a combination of structural means, such as detention ponds, and nonstructural means, such as increasing the frequency of street sweeping and educating the public about how to prevent pollutants from reaching storm sewers. Cities also used specialized practices to address specific local runoff problems. For example, Baltimore, Maryland, has focused on reducing the level of nutrients, such as fertilizers, in its runoff because of its proximity to the Chesapeake Bay, which suffers from high nutrient levels.

Neither the overall costs of implementing the storm water program nor the program's effectiveness has been determined. EPA estimated in a 1996 report to congress that the potential need for spending on storm water runoff and overflows of sewage resulting from runoff was over $50 billion over 20 years, but the agency also believes this estimate will increase when it issues its next report in 2002. EPA's regulations require that permitted cities annually report the costs of implementing their storm water

programs, along with the results of their monitoring of storm water runoff and water quality. However, in part because EPA has not established guidelines for reporting costs, these data have not been calculated or reported consistently and, therefore, are not currently useful in characterizing the program's overall cost. EPA, state, and city officials generally believe that managing storm water runoff will reduce the volume of runoff and concentrations of pollutants in the runoff, as well as improve water quality, but no systematic effort to evaluate the program's results has been started. EPA and the states have generally been unsuccessful in developing measurable program goals and in demonstrating program effectiveness through the review of water quality data reported by local governments.

We believe it is time for EPA to begin evaluating this program, which is directed at one of the nation's most significant water quality problems. Therefore, this report includes a recommendation to EPA to work with states to develop program goals, establish standards for reporting on program costs and effectiveness, and review reported water quality data to determine whether the current storm water management programs are having the intended effect of improving the quality of the nation's waters and how much the programs cost. We provided a draft of this report to EPA and the Department of Transportation (DOT). EPA generally agreed with the report and plans to take action to implement several parts of the recommendation; the agency did not comment on the other parts of the recommendation. DOT generally agreed with the report. (See the Agency Comments and Our Evaluation section of this report.)

Background

Nonpoint source pollution can result when water, such as precipitation, runs over land surfaces and into bodies of water. Significant nonpoint sources of pollution can include paved urban areas, agricultural practices, forestry, and mining. However, in urban and suburban areas, this runoff generally enters a sewer system that can be regulated as a point source of water pollution. For example, precipitation from rain or snowmelt may run into a municipal separate storm sewer system (MS4 or storm sewer) that eventually discharges into a body of water. The precipitation may also run into a combined sewer system, which carries a combination of storm water runoff, industrial waste, and raw sewage in a single pipe to a sewage treatment facility for discharge after treatment. Lastly, the precipitation may run off of land or paved surfaces directly into nearby receiving waters.

EPA's Office of Wastewater Management, which is within the Office of Water, implements the National Pollutant Discharge Elimination System (NPDES) Program. The program was created in 1972 with the passage of the Clean Water Act. Created to control water pollution from point sources—those sources, such as a factory or wastewater treatment plant, that contribute pollutants directly into a body of water from a pipe or other conveyance—the NPDES Program did not specifically address storm water discharges. In 1987, the Congress amended the Clean Water Act with the Water Quality Act, which directed EPA to also control storm water discharges that enter MS4s—essentially requiring EPA to treat such storm water as a point source.[3] MS4s are defined as those sewers that collect and convey storm water; are owned or operated by the federal, state, or local government; and are not part of a publicly owned treatment (sewage) facility.

To regulate urban storm water runoff, EPA published regulations in 1990 that established the NPDES Storm Water Program and described permit application requirements. According to EPA, the program's objective, in part, is to preserve, protect, and improve water quality by, among other things, controlling the volume of runoff from paved surfaces and by reducing the level of runoff pollutants to the maximum extent practicable using best management practices (BMP).[4] The 1987 act also authorized EPA to implement a program that provides federal funds and technical assistance to states to develop their own nonpoint source pollution management programs. States can use the federal funds they receive for nonpoint source programs to address nonpoint sources of pollution as well as urban runoff.

Currently, EPA manages NPDES Storm Water programs in six states (Alaska, Arizona, Idaho, Massachusetts, New Hampshire, and New Mexico) and has delegated authority to the remaining 44 states to manage these programs. The storm water program is being implemented in two phases. Local governments meeting the following criteria must comply with EPA's storm water program regulations. First, Phase I of the program requires that municipalities with a population of 100,000 or more obtain a permit for their MS4 system; second, the program requires that entities obtain a

[3]Section 402(p) of the Clean Water Act.

[4]According to EPA, a best management practice is a device, practice, or method for removing, reducing, retarding, or preventing targeted storm water runoff constituents, pollutants, and contaminants from reaching receiving waters.

permit if they discharge storm water from sites with industrial activities, including construction activities that disturb 5 acres or more of land. In addition, NPDES permitting authorities may also bring other municipalities and industrial entities into the program if they deem it necessary. Municipalities that meet these conditions must submit a permit application to EPA or the governing regulatory state agency. In 1990, the regulations specifically identified 220 municipalities throughout the United States that were required to apply for a Phase I permit. According to EPA, as of April 2001, about 256 Phase 1 MS4 permits had been issued and about 17 more still needed to be issued. Because some permits cover more than one municipality, these permits cover about 1,000 medium and large municipalities nationwide.

The final rule for Phase II of the program was issued in December 1999. Phase II extends Phase I efforts by requiring that a storm water discharge permit be obtained by (1) operators of all MS4s not already covered by Phase I of the program in urbanized areas[5] and (2) construction sites that disturb areas equal to or greater than 1 acre and less than 5 acres of land. As with Phase I of the program, permitting authorities may require additional small MS4s and construction sites to obtain a permit if they are a significant contributor of pollutants. Currently, EPA anticipates that about 5,000 municipalities may be subject to permitting requirements under Phase II of the storm water program. These municipalities are required to obtain permits no later than March 10, 2003.

[5]The Bureau of the Census generally defines an urbanized area as a land area comprising one or more places—central place(s)—and the adjacent densely settled surrounding area—urban fringe—that together have a residential population of at least 50,000 and an overall population density of at least 1,000 per square mile.

EPA also regulates combined sewer overflows (CSO) that can be caused by urban storm water runoff. Combined sewer systems, in which storm water enters pipes already carrying sewage, may overflow when rain or snowmelt entering the system exceeds the system's flow capacity. In the CSO that results, the mixture of untreated sewage and runoff bypasses the water treatment facility and is diverted directly into receiving waters. (See fig. 1 for an illustration of combined and separate sewer systems.) These combined systems generally serve the older parts of approximately 900 cities in the United States. Pipes carrying sewage and storm water separately generally serve newer parts of cities. EPA's 1994 CSO policy requires communities with combined sewer systems to take immediate and long-term actions to address CSO problems. The policy contains provisions for developing appropriate, site-specific NPDES permit requirements for all combined sewer systems that overflow because of wet-weather events. The Wet Weather Water Quality Act of 2000 requires that any permit, order, or decree issued for a CSO conform to the 1994 policy. Under this act, EPA is also required to submit a report to the Congress by September 2001 on the status of the program.[6]

[6]Sanitary sewer overflows, which are illegal under the Clean Water Act, can also result from rainfall. A sanitary sewer overflow may occur when rainwater or snowmelt leaks into sanitary sewage pipes, thereby exceeding the pipes' capacity and causing them to overflow. This discharge of raw sewage from municipal sanitary sewer systems can release untreated sewage into places such as streams, basements, and streets. EPA proposed regulations to require municipalities to reduce the number of overflows. However, these regulations have been withdrawn for further review.

Figure 1: Urban Runoff Flows in Different Types of Sewer Systems

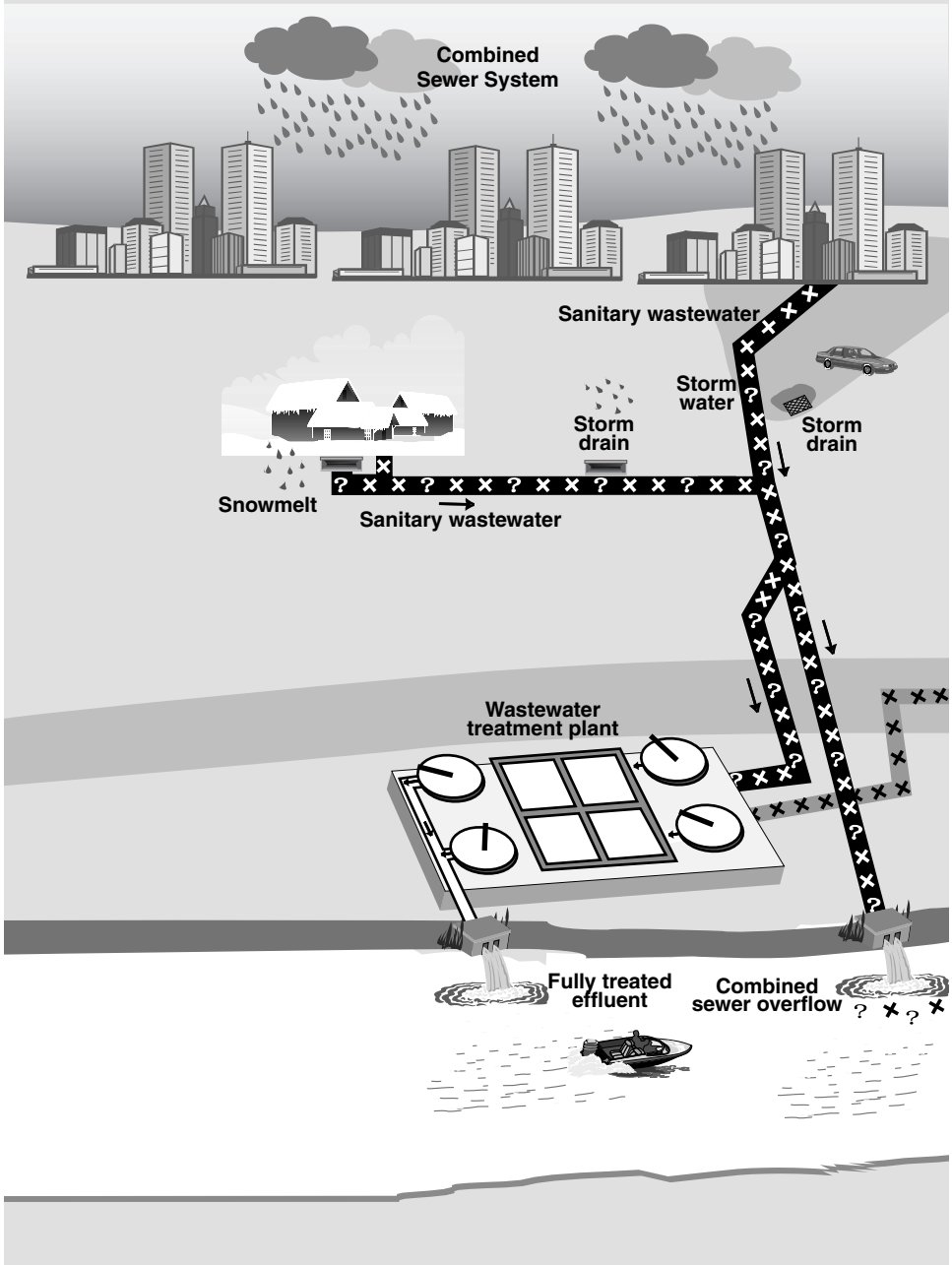

× Sanitary sewage/wastewater
? Storm water runoff with potential contaminants

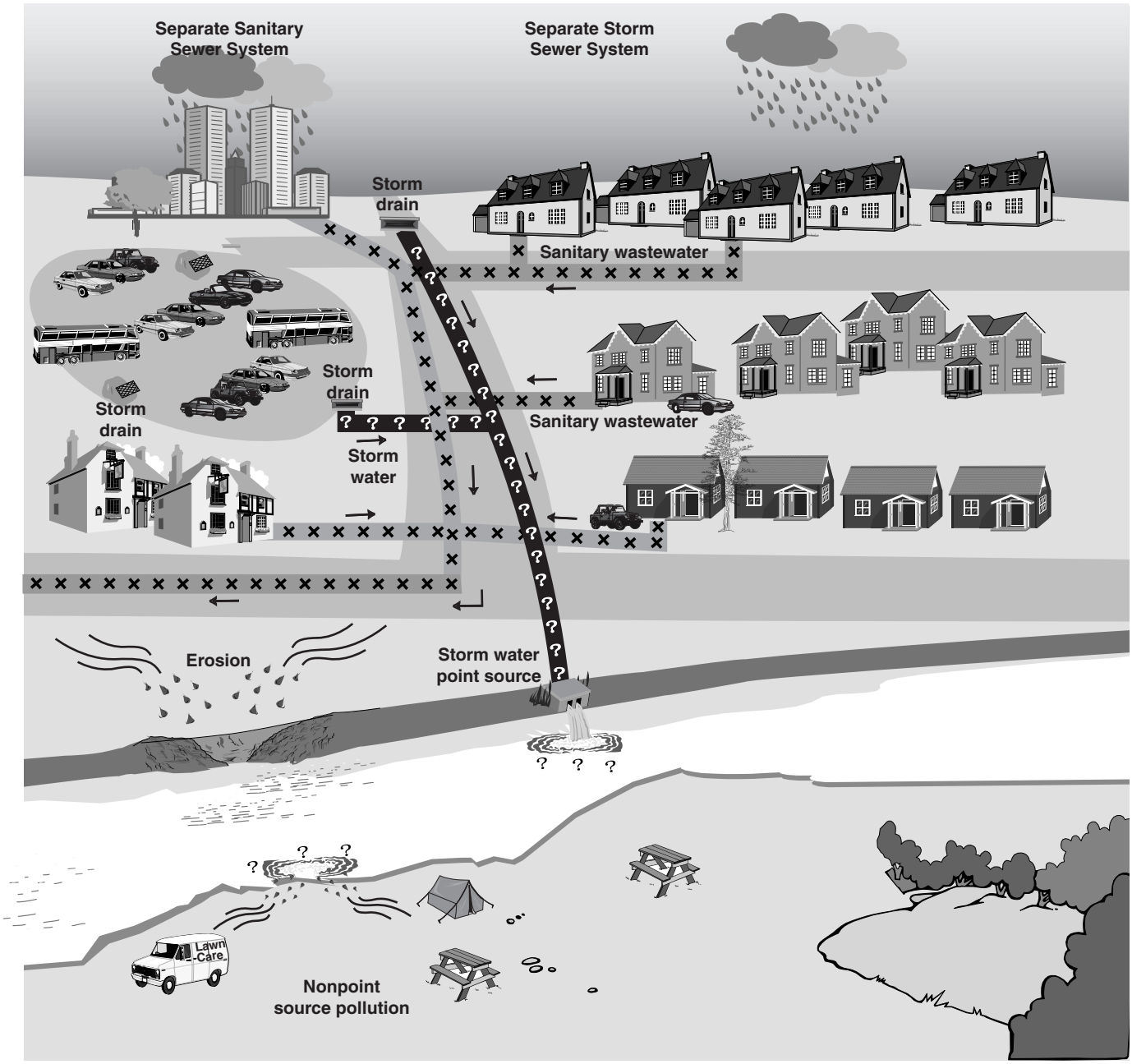

Source: GAO illustration based on EPA data.

The Total Maximum Daily Load (TMDL) Program, established under the Clean Water Act, is intended to address water bodies that do not meet water quality standards because of pollutant loadings from point and nonpoint sources. Currently, it is unclear how and when this program will affect EPA's and states' issuance of storm water permits. A TMDL is a calculation of the maximum amount of a pollutant that a body of water can receive and still meet the water quality standard set by the state. Under EPA's regulations, the state is to allocate this "pollutant load" among the point and nonpoint pollutant sources that flow into the water body and then take steps to ensure that no source exceeds its assigned load. In 1996, EPA issued a policy that outlined an interim approach to including water quality standards in storm water permits. The policy promoted the use of BMPs in the first 5-year term permits, followed by a tailoring of BMPs in the second round of permits as necessary to comply with water quality standards. Until recently, few TMDLs had been established, and citizen organizations sued EPA for its lack of action. EPA issued a new set of regulations for the TMDL Program in 2000, but the Congress prevented EPA from spending money to implement the rule in 2000 and 2001. It is possible that establishing a TMDL for a body of water could result in the application of a numeric effluent limit to outfalls[7] that release storm water into that body of water. Some city officials we spoke with generally felt that numeric effluent limits would significantly increase the cost of managing storm water.

Volume of Urban Runoff Increases With the Expansion of Urban Development and Can Affect Water Quality

Since World War II, urban runoff has increased throughout the United States. This increase is directly related to growth in the amount of impervious surfaces due to urban and suburban development and the construction of roads, highways, and other impervious surfaces. Coinciding with this growth in impervious surfaces has been a reduction in wetlands and in the amount of storm water that infiltrates the ground to recharge aquifers. Moreover, the loss of vegetation due to development and related runoff can cause major erosion. Ultimately, much of this runoff is channeled into gutters, storm drains, and paved channels, and vegetation and sediment removed with the runoff may end up in receiving waters. EPA has identified urban storm water runoff as one of the leading sources of pollution to the nation's rivers, streams, lakes, and estuaries. Runoff from impervious surfaces picks up potentially harmful pollutants and

[7]An outfall is an outlet, such as a pipe, that allows storm water to flow into a river, lake, or other body of water.

carries them into receiving waters. Studies have shown that urban runoff and the pollutants it carries can negatively affect water quality, aquatic life, and public health.

Paved Surfaces Have Increased With Urban and Suburban Expansion and Growth in Automobile Use

According to the U.S. Department of Agriculture, between 1945 and 1997, urban land area increased by almost 327 percent, from 15 million acres to about 64 million acres in the contiguous 48 states. From 1992 through 1997, the annual rate of development averaged about 1 million acres per year. The land developed between 1945 and 1997 came primarily from forestland and pasture and range.[8] For example, according to the Bureau of the Census, between 1960 and 1990, the amount of land used for urban purposes in Baltimore, Maryland, and Washington, D.C., grew by about 170 percent and 177 percent, respectively. As a result, urbanization, with its accompanying expansion of impervious surfaces like sidewalks, roofs, parking lots, and roads, has significantly increased the nation's total developed land and paved surface area.[9] Figure 2 demonstrates the growth in the urbanized areas of Baltimore and Washington, D.C., over the last half of the 20th century.

[8] *Agricultural Resources and Environmental Indicators, 2000,* U.S. Department of Agriculture, Economic Research Service, Resource Economics Division.

[9] *Our Built and Natural Environments, A Technical Review of the Interaction Between Land Use, Transportation and Environmental Quality,* U.S. Environmental Protection Agency (EPA 231-R-00-005, Nov. 2000).

Figure 2: Increase in Urbanized Land in Selected Cities, 1960-90

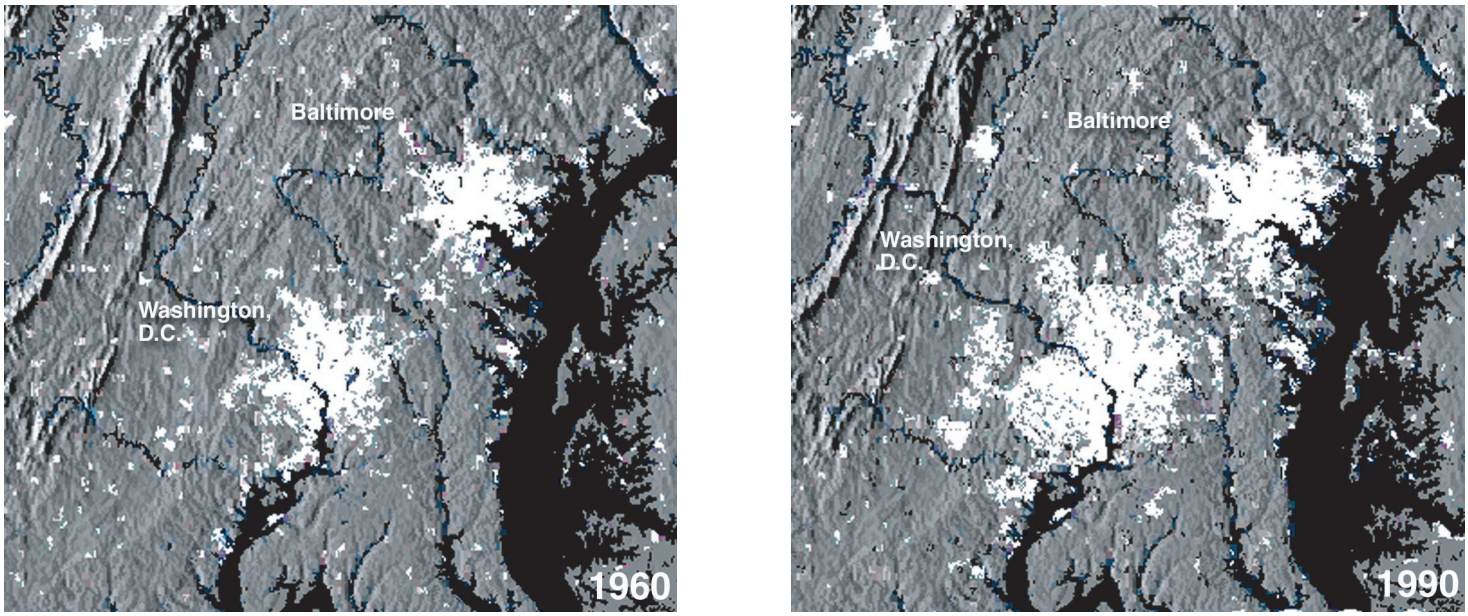

Source: U.S. Geological Survey.

The increase in paved surfaces has been spurred not only by urban and suburban development, but also by a steady increase in the use of automobiles, the primary mode of daily transportation for most Americans. Roads also play an important role in the economy of the United States, since trucks carry about 75 percent of the value of all goods shipped. According to EPA, paved road mileage in the United States increased by 278 percent from 1945 to 1997. In 1945, 19 percent of the public roads in the country were paved; by 1997, that percentage had increased to 61. (See fig. 3.) According to a 1999 study, motor-vehicle infrastructure, such as roads and parking lots, accounts for close to half of the land area in U.S. urban cities.[10]

[10] *Stormwater Strategies, Community Responses to Runoff Pollution,* Natural Resources Defense Council (May 1999).

Figure 3: Percentage of Paved Public Road Miles, 1945-97

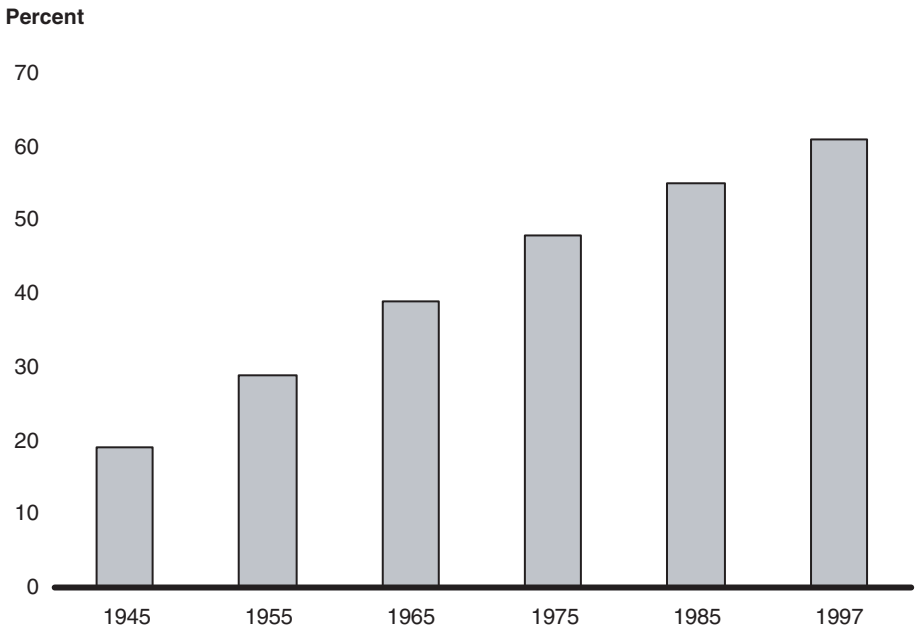

Source: EPA.

Increase in Impervious Surfaces Leads to Increased Runoff

The increase in impervious surfaces over the past several decades has led to an increase in storm water runoff. In part, this has occurred because highways and other developments have reduced the amount of wetlands and other undeveloped land. Wetlands mitigate the effects of storm water runoff by acting as a natural form of flood control, facilitating sediment replenishment, and improving water quality by removing excess nutrients and other chemical contaminants before the contaminants can affect receiving waters. According to a 2000 EPA report,[11] of the 12 states that listed wetland losses, six reported that they had significant losses due to highway construction, and 10 reported that they had significant losses due to residential growth and development. However, the effect of road building on wetland loss has been reduced in recent years. According to a Federal Highway Administration (FHWA) official, since 1996, wetlands have been replaced and restored under the Federal-Aid Highway Program

[11]See footnote 9.

at an average rate of 2.7 acres for every acre lost to highway building. Other undeveloped land with vegetation also performs some of the roles that wetlands play in managing runoff, although to a lesser extent.

Furthermore, as impervious surfaces increase, less storm water is able to infiltrate through the soil to groundwater. Impervious areas allow only a very small amount of initial infiltration compared with unpaved areas whose infiltration capacity varies, depending on the soil type. Figure 4 demonstrates EPA's estimates of the impact of impervious surfaces on the percentages of storm water that runs off, infiltrates the ground, and is lost through evapotranspiration.[12] When natural ground cover is present over an entire site, normally 10 percent of precipitation runs off the land into nearby creeks, rivers, and lakes. In contrast, when a site is 75- to 100-percent impervious, 55 percent of the precipitation runs off into these receiving waters. However, according to an FHWA official, the runoff rates can be reduced if developers take mitigating actions to develop and implement BMPs to control flooding or runoff.

[12]Evapotranspiration represents water loss from evaporation and the absorption and eventual release into the atmosphere of water that plants and trees have collected. The extent to which evapotranspiration occurs is dependent primarily on the solar energy available to vaporize the water. As a result, the effect of evapotranspiration varies greatly across the country.

Figure 4: Impact of Impervious Surfaces on the Amount of Storm Water That Runs Off, Infiltrates, and Evapotranspires

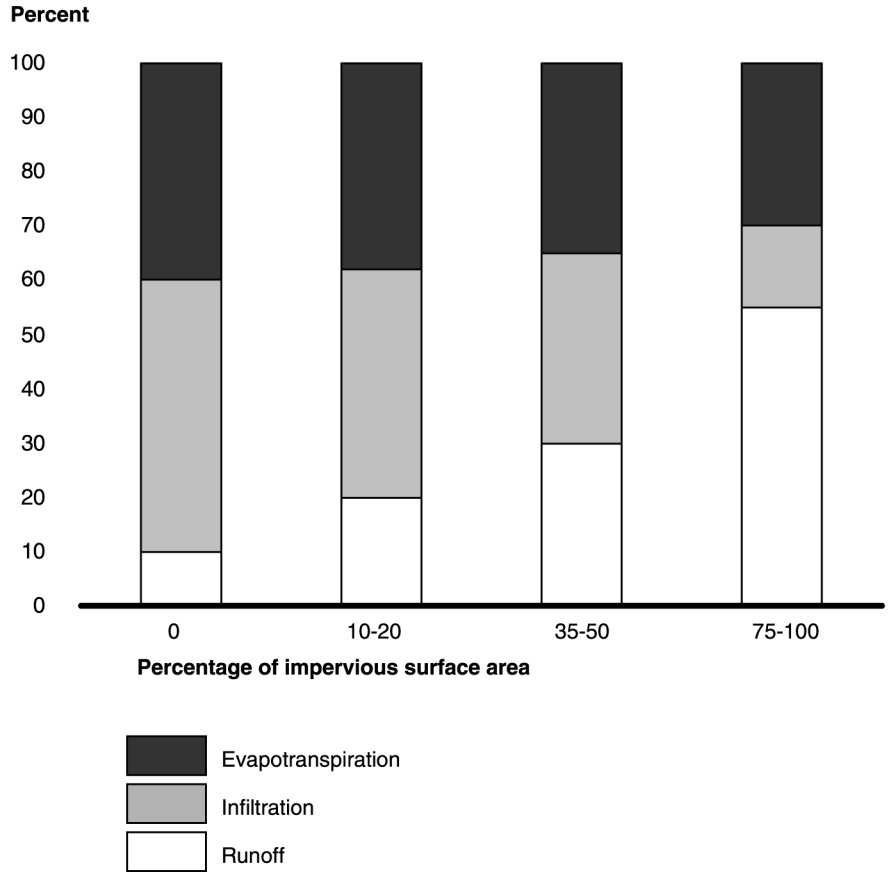

Source: EPA.

The decrease in storm water infiltration that accompanies urbanization also reduces the amount of water that is available to recharge groundwater supplies. For this reason, reduced infiltration may lead to problems with the water table in certain urban areas. For example, a Massachusetts Department of Environmental Protection official noted that a low recharge rate affects water quality because it can result in a loss of wetlands and adversely affect aquatic habitat as water-table levels fall during dry weather.[13] In addition, officials from the Charles River Watershed Association in Massachusetts are concerned that the lack of infiltration might cause some communities to run short of drinking water in the next 20 years.

Urban Runoff Has the Potential to Impair Water Quality and Disrupt Biological Integrity

Urban runoff can adversely affect the quality of the nation's waters, and urban storm water runoff has been identified as one of the leading sources of pollution to rivers, streams, lakes, and estuaries.[14] Section 305(b) of the Clean Water Act requires states and other jurisdictions to report on the quality of their waters to EPA every 2 years. The 1998 *National Water Quality Inventory Report to Congress* showed that 35 percent of assessed river and stream miles, 45 percent of assessed lake acres, and 44 percent of assessed estuarine square miles were impaired in terms of their ability to support uses such as aquatic life, swimming, and fish consumption.[15] The report identified urban storm water runoff as one of the leading sources of impairment to the assessed waters.

[13]Dry weather is defined as a period when rainfall measuring at least 0.10 of an inch has not occurred for 72 hours.

[14]Other leading sources of pollution include agricultural runoff, municipal point sources, hydrologic modifications, and atmospheric deposition.

[15]Information contained in the 1998 report reflects only those waters assessed by states and other jurisdictions and cannot be used to characterize nationwide water quality. Furthermore, water quality standards among states are not identical, and the monitoring design used to collect data differed among states.

Studies have shown that as the percentage of impervious cover increases within a watershed, biodiversity also declines. Research conducted by the Center for Watershed Protection found that, generally speaking, when a watershed has 10 percent or less impervious cover, the associated stream can be categorized as sensitive.[16] Sensitive streams are characterized as having high fish diversity and good water quality. Once the percentage of impervious cover exceeds 25 to 30 percent of the watershed, however, streams tend to become nonsupporting. Nonsupporting streams are highly unstable, have poor diversity of fish and aquatic life, and have poor water quality. For example, one study evaluated the relationship between the extent of impervious cover in watersheds to the number and diversity of fish populations in 47 small streams in southeastern Wisconsin between the 1970s and 1990s.[17] The results revealed that the number of fish species per site was highly variable for drainage areas that had less than 10-percent imperviousness. In contrast, sites that had greater than 10-percent imperviousness had consistently low numbers of fish species.

Other studies have associated urban runoff with basic changes in the receiving body of water. Runoff can carry sediment into surface water, and this sediment can carry contaminants, harm aquatic plants, and smother organisms. Runoff can also be warmed by the impervious surfaces it flows across. When sufficient amounts of warmed runoff enter a water body, the water temperature can rise. Less oxygen is then available for aquatic organisms because water holds less oxygen as it becomes warmer. These combined factors lead to the degradation of aquatic habitat. According to EPA, the common effects of these types of pollution on aquatic life include a decline in biodiversity and an increase in invasive species.

An increase in the volume of storm water runoff also increases the likelihood of erosion, which allows for transport of eroded sediment downstream into receiving waters. For example, during a site visit, we observed extensive erosion along the Gingerville Creek Subbasin in Anne Arundel County, Maryland, that was caused by urban runoff channeled into the creek. Figure 5 depicts the eroded banks and channel of this creek.

[16]"The Importance of Imperviousness," *Watershed Protection Techniques*, v.1:3, Fall, 1994. The article reviews 18 studies on the relationship between urbanization and stream quality.

[17]L. Wang and others, "Watershed Urbanization and Changes in Fish Communities in Southeastern Wisconsin Streams," *Journal of the American Water Resources Association,* Oct. 2000, Vol. 36, No. 5.

Figure 5: Damage Caused by Storm Water Runoff From Urbanized Areas in the Gingerville Creek Subbasin

Source: Anne Arundel County, Maryland, Department of Public Works.

Contaminants in Urban Runoff Can Affect Aquatic Life and Human Health

There have been several efforts to characterize the chemicals and other constituents in urban runoff. The Nationwide Urban Runoff Program, conducted by EPA between 1978 and 1983, examined the characteristics of urban runoff. Another federal effort to characterize urban runoff is an ongoing joint project of the U.S. Geological Survey (USGS) and the FHWA to evaluate guidelines for highway runoff. As table 1 indicates, these studies and others have shown that the principal contaminants found in

urban runoff include nutrients, solids, pathogens, metals, hydrocarbons, organics, salt, and trash. Water flowing over various surfaces, such as streets, parking lots, construction sites, industrial facilities, rooftops, and lawns, carries these pollutants to receiving waters. The contaminants have the potential to impair water quality, degrade aquatic ecosystems, and pose health risks to swimmers.

Table 1: Storm Water Pollutants in Urban Runoff, Including Sources and Potential Impacts

Contaminant	Source	Potential impact
Nutrients		
Nitrogen, phosphorous	Animal waste, fertilizers, failing septic systems, atmospheric deposition,[a] CSOs	Nutrient enrichment can cause an excessive growth of algae. Nuisance levels of algae are associated with dissolved oxygen deficiencies leading to fish kills, loss of submerged aquatic vegetation that serves as a habitat for aquatic organisms, and loss of natural biodiversity.
Solids		
Sediment	Construction sites, other disturbed and/or nonvegetated lands, eroding banks, road sanding	Sediment can cause infection and disease among fish, scour submerged aquatic vegetation, prevent sunlight from reaching aquatic plants, and bury bottom-dwelling aquatic organisms.
Pathogens		
Bacteria, viruses	Animal waste, failing septic systems, illicit connections and discharges to storm sewer system, CSOs	Pathogens entering waters used for recreational purposes can pose human health risks.
Metals		
Lead, cadmium, copper, zinc, mercury, chromium, aluminum, and others	Industrial processes, normal wear of automobile brake linings and tires, automobile emissions, automobile fluid leaks, metal roofs	Metals can cause acute or chronic toxicity for aquatic organisms.
Hydrocarbons		
Oil and grease, polycyclic aromatic hydrocarbons	Industrial processes, automobile wear, automobile emissions, automobile fluid leaks, waste oil	Hydrocarbons have the potential to be acutely toxic for aquatic organisms and several are suspected carcinogens.
Organics		
Pesticides, polychlorinated biphenyls (PCB), synthetic chemicals	Pesticides (herbicides, insecticides, fungicides, rodenticides, etc.), industrial processes	Low concentrations of some organics have the potential to bioaccumulate in the food chain.

(Continued From Previous Page)

Contaminant	Source	Potential impact
Salt		
Sodium Chlorides	Road salting and uncovered salt storage	Salt can damage roadside vegetation, transport high levels of chlorides to receiving waters, and degrade aquatic ecosystems. Chloride can be harmful to some species of fish.
Trash		
	Street refuse and improperly discarded waste material	Trash impairs water quality by inhibiting the growth of aquatic vegetation and conveys nutrients, toxic substances, and other pollutants to aquatic ecosystems.

[a]Atmospheric deposition occurs when pollutants in the air fall on land or water.

Sources: Massachusetts Department of Environmental Protection Stormwater Policy; EPA reports and guidance, including *Preliminary Data Summary of Urban Storm Water Best Management Practices, Combined Sewer Overflow Control Policy, Innovative Urban Wet-Weather Flow Management Systems*, and the 1998 *National Water Quality Inventory Report to Congress*; the California Regional Water Quality Control Board; the Natural Resources Defense Council's *Stormwater Strategies: Community Responses to Runoff Pollution*; "Accretion of Pollutants in Roadway Snow Exposed to Urban Traffic and Winter Storm Maintenance Activities - Part I," Draft;[18] and USGS' National Water Quality Assessment Program.

[18]J.J. Sansalone and D.W. Glenn, "Accretion of Pollutants in Roadway Snow Exposed to Urban Traffic and Winter Storm Maintenance Activities –Part I," DRAFT.

In our visits to cities with Phase I permits and their watersheds, we identified specific instances in which these contaminants had affected water quality. The Chesapeake Bay, for example, has been polluted with the nutrients nitrogen and phosphorus and with excess sediment caused, in part, by urban runoff. The excess nutrients cause algae blooms that block sunlight from reaching bay grasses—which are a source of food, shelter, and nursery grounds for many aquatic species. In an effort to control nutrient pollution in the Chesapeake Bay, the Executive Council of the Chesapeake Bay Program[19] established a goal to reduce the nitrogen and phosphorus entering the Chesapeake Bay by 40 percent, including through control of runoff from urban areas. In addition, an assessment of the status of chemical contaminant effects on living resources in the bay's tidal rivers found "hot spots" of contaminated sediment. As a result, the Baltimore Harbor and the Patapsco River in Maryland; the Anacostia River in Washington, D.C.; and the Elizabeth River in Virginia were designated as "regions of concern." Urban storm water runoff is a significant source of contaminants in the three regions. The Chesapeake Executive Council has committed to reduce by 30 percent the chemicals of concern in the regions of concern by 2010 through pollution prevention measures and other voluntary means.[20]

Pathogens such as bacteria and viruses, which are often present in urban runoff, can pose public health problems. For example, the Santa Monica Bay Restoration Project conducted a study to identify adverse health effects of untreated urban runoff by surveying over 13,000 swimmers at three bay beaches. [21] The study established a positive association between an increased risk of illness and swimming near flowing storm-drain outlets. Table 2 explains health outcome measures at various distances from storm drains. For example, the study found a 1-in-14 chance of fever for swimmers in front of the drain versus a 1-in-22 chance at 400 or more yards away.

[19]The Chesapeake Executive Council includes the governors of Maryland, Pennsylvania, and Virginia; the Administrator of the U.S. Environmental Protection Agency; the mayor of the District of Columbia; and the chair of the Chesapeake Bay Commission.

[20]Chesapeake Bay Program Office, *Toxics 2000 Strategy: A Chesapeake Bay Watershed Strategy for Chemical Contaminant Reduction, Prevention, and Assessment,* Dec. 2000.

[21]R.W. Haile and others, "The Health Effects of Swimming in Ocean Water Contaminated by Storm Drain Runoff," *Epidemiology,* July 1999, Vol. 10, No. 4.

Table 2: Comparative Health Outcomes for Swimming in Front of Drains Versus 400 or More Yards Away

Health outcomes	0 yards	400 or more yards
Fever	1:14	1:22
Chills	1:26	1:42
Ear discharge	1:68	1:143
Coughing with phlegm	1:20	1:33
Significant respiratory disease (fever and nasal congestion, fever and sore throat, and cough with phlegm)	1:12	1:22

Note: This table includes the statistically significant health outcomes.

Source: GAO analysis of data from "The Health Effects of Swimming in Ocean Water Contaminated by Storm Drain Runoff," *Epidemiology*, July 1999, Vol. 10, No. 4.

Metals and polycyclic aromatic hydrocarbons (PAH) in urban runoff can present a threat to aquatic life. Studies have found the following:

- Storm water runoff from an urban area proved to be toxic to sea urchin fertilization in the Santa Monica Bay, and dissolved zinc and copper were determined to be contributors to this toxicity. [22]
- Brown bullheads (a bottom-dwelling catfish) in the Anacostia River developed tumors that were believed to be caused by PAHs associated in part with urban runoff.[23]
- High PAH and heavy metal concentrations were found in crayfish tissue samples from several urban streams in Milwaukee. The study associated these contaminants with storm water runoff.[24]

[22]Southern California Coastal Water Research Project, *Study of the Impact of Stormwater Discharge on Santa Monica Bay –Executive Summary,* Nov. 1, 1999.

[23]Chesapeake Bay Program Office.

[24]J.P. Masterson and R.T. Bannerman, "Impacts of Stormwater Runoff on Urban Streams in Milwaukee County, Wisconsin," *National Symposium on Water Quality, American Water Resources Association,* Nov. 1994.

In addition, USGS tracked trends in the concentrations of PAHs found in sediment in 10 lakes and reservoirs in six metropolitan areas over the last several decades. This study found that PAH concentrations in developed watersheds are increasing and that these increases may be linked to the amount of urban development and vehicle traffic in urban and suburban areas.[25] For example, from 1982 to 1996, PAH concentrations in the sediment core in Town Lake (Austin, Texas) and total miles driven in greater Austin both increased by about 2.5 times. Figure 6 illustrates this correlation.

Figure 6: Comparison of Town Lake PAHs and Traffic Trends

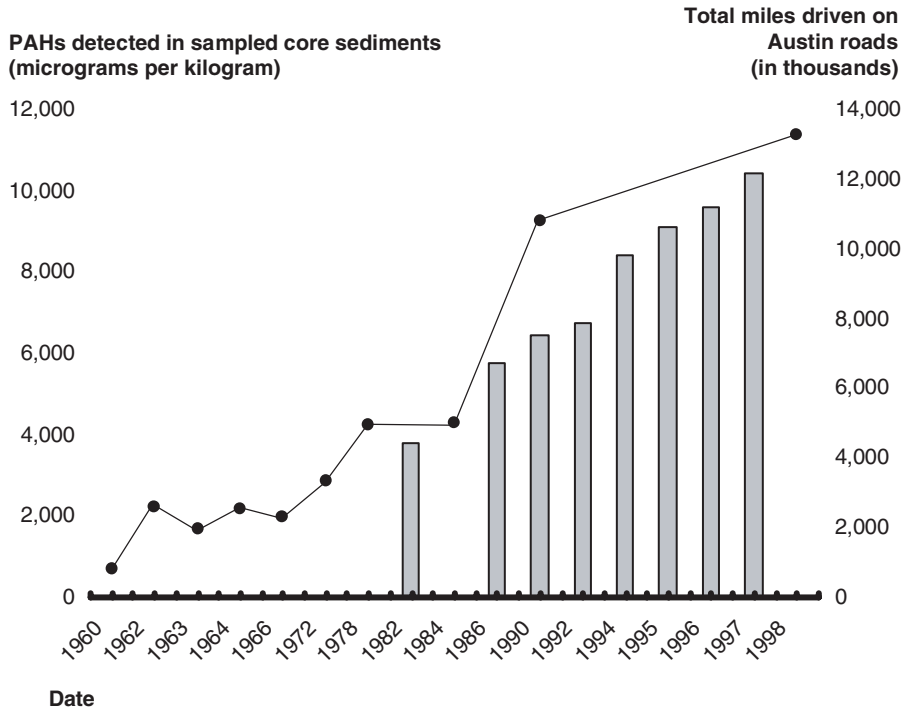

Note: According to USGS, irregularities in the date pattern are due to intervals at which sediment samples were collected.

Source: USGS National Water Quality Assessment Reconstructed Trends Program.

[25]P. Van Metre, B. Mahler, and E. Furlong, "Urban Sprawl Leaves Its PAH Signature," *Environmental Science and Technology,* Vol. 34, No. 19, 2000.

Although the studies we reviewed show that certain contaminants are likely to be present in urban runoff, factors such as land development practices, climate conditions, atmospheric deposition, and traffic characteristics all can affect the characteristics of runoff from a particular area. Therefore, given the diffuse nature of many storm water discharges and the variability of other contributing factors, characterizing the concentrations of pollutants contained in storm water runoff has been challenging. Recent USGS reports also suggest that improvements are needed in the methods used to analyze sediment and metals in runoff.[26]

Local Governments Take Actions to Manage Urban Storm Water Runoff, but Information Is Limited on the Cost and Effectiveness of These Actions

To comply with federal and state storm water management for Phase I permitting requirements, permitted municipalities must create and implement storm water management programs. The three primary activities used in these programs include efforts to characterize storm water runoff; BMPs aimed at reducing pollutants in storm water runoff to the maximum extent practicable; and reporting program activities, monitoring results, and costs of implementing the program. Some BMPs are structural—meaning that they are designed to trap and detain runoff until constituents settle or are filtered out. Other BMPs are nonstructural—meaning that they are designed to prevent contaminants from entering storm water through actions like street sweeping and inspections. Many permitted municipalities use specialized BMPs tailored to address particular runoff problems in their locations. Over 1,000 cities are undertaking these efforts under the NPDES Storm Water Program, but information on the overall costs of managing urban runoff and the effectiveness of the actions taken is limited. EPA's attempts to forecast costs have not encompassed the entire program or are out of date. In addition, the permitted municipal agencies we visited estimated their annual storm water management costs and reported them to state agencies or EPA, but the approaches they used to calculate these estimates varied considerably, making it difficult to draw any conclusions. Although EPA and state agencies believe that the program will be effective in improving water quality, EPA has not made a systematic effort to evaluate the program. Without such an effort, EPA cannot tell what effect the program is having on water quality nationally.

[26]The USGS reports indicate that certain methods used to analyze sediment and metals samples can be unreliable. For example, sample collection and processing methods can have an effect on measured concentrations of metals.

Municipalities Comply With Federal and State Requirements Through Monitoring, Best Management Practices, and Reporting

The NPDES Storm Water Program requires municipalities operating under a Phase I MS4 permit to characterize and monitor storm water runoff, implement BMPs to reduce pollutants to the maximum extent practicable, and report costs and monitoring results to the permitting authorities. Because of these requirements, local governments have generally shifted the focus of their storm water management from water quantity control or flood management to water quality concerns.

Besides following the basic federal requirements, municipalities must follow any additional regulations developed by states that have been delegated the authority to manage the NPDES Storm Water Program. For example, Wisconsin's Department of Natural Resources broadened the requirements for determining which municipalities must get permits. The state requires local governments with storm sewer systems in priority watersheds (based on the significance of storm water runoff as a pollutant source) that serve a populace of 50,000 or more[27] to obtain a permit with requirements similar to those for a Phase I permit. Wisconsin's Department of Natural Resources also requires municipalities that are located in one of the state's five Great Lakes Areas of Concern[28] to obtain a state permit. Furthermore, in line with specific criteria in Wisconsin's Administrative Code, the state requires other municipalities to obtain a permit if the municipality is found to significantly contribute storm water pollutants to waters of the state. These various requirements increased the number of municipalities that must get permits from the two under federal requirements to over 70 under the states' requirements.

The local governments we reviewed were undertaking three primary activities when applying for permits and implementing their storm water management programs. Specifically, these activities were (1) characterizing storm water runoff; (2) developing BMPs to reduce discharges of pollutants to the maximum extent practicable; and (3) reporting program activities, monitoring results, and reporting program costs.

First, to characterize runoff, applicants are to provide quantitative data that describe the volume and quality of discharges from municipal storm

[27]For example, we visited West Allis, Wisconsin, which has a permit even though its population is under 100,000.

[28]Areas of concern have persistent water quality problems, which impair beneficial uses.

sewers. For example, cities must map all storm sewer outfalls—an undertaking that one group representing cities described as significant. After the permit application is approved, additional monitoring is required throughout the life of the permit to facilitate the design of effective storm water management programs and to document the nature of the storm water. The local governments we visited were all monitoring for a variety of purposes, including characterizing runoff from different types of land use in order to target their BMPs, testing the effectiveness of a particular BMP, or establishing a baseline for their storm water quality evaluations.

Second, the storm water management programs that local governments develop focus on implementing BMPs. While active treatment, such as sending storm water through a treatment facility, is a possible BMP, the cities we visited were generally not using active treatment. EPA's February 2000 report[29] on the Phase I program described the program as based on the "use of low-cost, common-sense solutions." The five cities we visited were generally using similar types of structural and nonstructural BMPs, as follows:

- Structural BMPs are designed to separate contaminants from storm water. For example, detention ponds temporarily hold storm water runoff to allow solids and other constituents in the runoff to settle before the water is released at a predetermined rate into receiving waters. In addition, catch-basin inserts, placed in a storm drain, catch trash and other debris, and particle separators, placed beneath the surface of an impervious area such as a parking lot, separate oils from runoff and allow sediment and debris to settle. Structural devices such as these require regular maintenance to function properly and remain effective.
- Nonstructural BMPs are primarily designed to minimize the contaminants that enter storm water. These nonstructural BMPs include
  - "good housekeeping" practices by the local government, such as oil collection and recycling, spill response, household and hazardous waste collection, pesticide controls, flood control management, and street sweeping;

[29] *Report to Congress on the Phase I Storm Water Regulations*, U.S. Environmental Protection Agency, February 2000. This report includes information on the program for local governments, industries, and construction sites.

- public education programs, such as storm-drain stenciling, to remind the public that trash, motor oil, and other pollutants thrown into storm drains end up in nearby receiving waters;[30]
- new ordinances to control pollution sources, such as prohibiting the disposal of lawn clippings in storm drains and requiring pet owners to clean up after their pets;[31]
- requirements that developers comply with storm water regulations and incorporate erosion and sediment controls at all new development sites;
- requirements that runoff from properties owned or activities sponsored by the municipality be properly controlled; and
- efforts to identify and eliminate illicit connections and illegal discharges to the storm sewer systems, such as those from pipes carrying sewage.

We found that the NPDES Program's requirements allowed local governments to tailor their storm water management efforts to prioritize local concerns, such as a particular type of contaminant, a particular climatic condition, or a particular body of water. Some cities also developed specialized BMPs to address these concerns. The following information highlights specific storm water-related concerns in the five cities we visited and the specialized BMPs these municipalities have developed to address these particular concerns. (See apps. I to V for additional information on these cities' storm water management programs.)

[30]Other public education programs we observed included in-school education programs, partnerships with grassroots organizations concerned with water quality issues, and the identification of commercial businesses and industries to educate owners on methods to control storm water runoff.

[31]According to Worcester, Massachusetts' April 2000 *City of Worcester DPW Stormwater Management Program Annual Report*, the city has proposed ordinances that prohibit the disposal of lawn clippings and other yard waste in catch basins and that require pet owners to clean up after their pets. As of April 2001, neither ordinance had been implemented.

- In **Baltimore, Maryland**, excessive levels of nutrients, particularly phosphorus and nitrogen, are among the city's major water quality concerns because of the city's participation in the Chesapeake Bay Program. Baltimore City agreed to assist the state in reaching the Chesapeake Bay Program's goal to reduce nutrients discharged to the bay by 40 percent by the year 2000. According to a Chesapeake Bay Program Office representative,[32] as of March 2001, the program has not met this goal but expects to reach it within the next several years.
- In **Boston, Massachusetts**, the Boston Water and Sewer Commission, which holds the permit for Boston's storm sewer system, is concerned about runoff from roadways, especially runoff containing salt and sand used in the winter months and dissolved metals (copper and zinc) from automobiles. In September 2000, the commission began a 3-year program to develop and implement a citywide catch-basin inspection, cleaning, and preventive maintenance program. The program will also include the development of a database and map that can be linked to the commission's Geographic Information System.
- **Los Angeles County, California**, is responding to a TMDL for trash in the Los Angeles River Watershed that will require the county, over a 10-year period, to eliminate trash in runoff. The county is testing a variety of devices that remove trash from runoff and specialized catch-basin devices that are designed to prevent trash from ever reaching the storm sewers.
- **Milwaukee, Wisconsin**, changed its monitoring and public education activities in its recent permit to test the effectiveness of a BMP targeting public education efforts to a specific community. The new permit also requires a monitoring program aimed at the community, its associated watershed, and city employees who work in the area.
- **Worcester, Massachusetts**, had a significant problem with illicit connections to its storm sewers and with flow in these sewers during dry weather. Worcester's Department of Public Works (DPW) screened 71 of its storm water outfalls and determined that 32 of them had drainage areas that carried both sanitary sewage and storm drainage in separate conduits through common manholes. DPW has retrofitted over 65 percent of the manholes to prevent sewage from mixing with storm water.

[32]The Chesapeake Bay Program Office, U.S. EPA Region III, was founded in 1983 with the formation of the Chesapeake Bay Program. The program is a voluntary regional partnership that leads and directs restoration of the Chesapeake Bay. Members of the Chesapeake Bay Program include Maryland, Pennsylvania, Virginia, the District of Columbia, the Chesapeake Bay Commission (a tristate legislative body), EPA, and participating citizen advisory groups.

Third, local governments participating in the Phase I program are required to report annually to EPA or the state regulatory agency on their storm water programs. These reports are to include a status report on the program; a summary of data, including monitoring results collected during the reporting year; information on annual expenditures on the program and a budget for the coming year; and a description of any water quality improvements or degradation.

Information on the Costs of Addressing Storm Water Runoff Is Limited

Good information about the cost of implementing federal storm water requirements is limited. EPA conducted a survey to estimate the nation's future water infrastructure needs over a 20-year period—from 1996 to 2016. In its 1996 report,[33] EPA estimated that states would require over $50 billion to meet their current (as of 1996) water infrastructure needs. The estimate consists of storm water management needs (at $7.4 billion) and CSO needs (at $44.7 billion).[34] EPA noted, however, that estimated storm water management needs are likely too low and could increase following an analysis of data collected to prepare the agency's 2000 clean water needs survey—to be released in 2002. According to EPA, many cities have implemented the Phase I program since EPA reported to the Congress in 1996, and municipalities should now be better able to provide documented cost data. As a result, EPA will need to rely less on modeled storm water needs than it did in the 1996 needs survey. EPA did not project the costs and benefits of the program when it was initiated; therefore, no initial cost estimates are available. When EPA promulgated the Phase I program regulations in 1990, the agency decided that the storm water program did not meet the requirements for preparing a benefit/cost analysis.

[33] *1996 Clean Water Needs Survey Report to Congress*, U.S. Environmental Protection Agency (Sept. 1997). EPA's estimate represents the estimated capital costs for water quality projects eligible for state revolving fund support.

[34] EPA also estimates that $81.9 billion of its 20-year water infrastructure needs cost can be attributed to sanitary sewer overflows. These overflows may occur when rainwater or snowmelt leaks into sanitary sewage pipes, exceeding the pipes' capacity and causing them to overflow. This overflow can release untreated sewage from municipal sanitary sewer systems into streams, basements, and streets.

The costs to local governments of complying with the Phase I program have generally been portrayed as high. However, because of inconsistencies in cost accounting and reporting practices, we could not determine the cost of the program to several of the cities we visited. Although municipalities are required to provide information on the expenditures that they anticipate will be needed to implement their storm water management programs for each fiscal year covered by the permit, EPA has not issued any cost reporting guidelines. Consequently, while the reported fiscal year 1999 total cost to manage and treat storm water runoff across the five municipalities in our review ranged from less than $1 million (Milwaukee) to $135 million (Los Angeles County),[35] these numbers are not comparable because the municipalities did not have consistent cost accounting and reporting practices and did not fully express storm water management costs.[36] For example, some cities reported only the costs of activities that were funded by the city department that held the permit. Significant activities funded by other city departments were not reported, even if they were important components of the storm water program. Officials in the Milwaukee Department of Infrastructure Services and the Boston Water and Sewer Commission told us that other city departments perform and fund activities such as street sweeping and flood control. The costs of these activities are not reported as storm water program costs because the activities serve other purposes besides preventing storm water pollution.

In addition, according to some city officials, these activities were in place before the permit was issued and, therefore, cannot be characterized solely as storm water costs. The cost of street sweeping can be significant—for fiscal year 1999, Baltimore City and Worcester, which did include street-sweeping costs in their storm water program's cost estimate, stated that their street-sweeping expenses totaled about $9.5 million and $1.2 million, respectively. Similarly, Milwaukee did not report the cost of a significant project related to storm water runoff because it was mostly funded by the state of Wisconsin.

[35]Los Angeles County's cost was projected by the municipal permit holder and represents the cost of the 85 cities covered by the permit.

[36]We were unable to obtain comprehensive information on the total cost to the Boston Water and Sewer Commission of managing storm water, so their fiscal year 1999 costs could not be included in this range.

An EPA official told us that the agency had not yet made a national effort to analyze the information that Phase I permittees submitted on the costs of their storm water programs. This official cited the inconsistent formats of the annual reports as a reason that the information was not readily available at the national level and also indicated that adequate staff are not available to analyze the data. In addition, other EPA officials informed us that the Office of Wastewater Management must divide its resources among a number of issues that will challenge the agency's water program over the next decade.

Several officials in the cities we visited said that their annual costs are likely to increase. A number of factors could affect the costs. For example, a Baltimore City official explained that the anticipated, future program costs depend on several factors, including (1) requirements in watershed-management plans currently being developed, (2) pollution-reduction goals the city will be required to achieve, (3) requirements of the state regulatory agency in future permits, and (4) requirements the city may have to meet if TMDLs or numeric effluent limits are incorporated into NPDES storm water permits. Other city officials also expressed concern about the extent to which TMDLs could affect their future costs. These city officials are concerned that when and if TMDLs are established, their future storm water permits may require that storm water runoff meet specific water quality standards. For example, Los Angeles County's trash TMDL could potentially drive the county's storm water management costs upward, and the county expects additional TMDLs to be imposed. On the other hand, Worcester officials estimated that their future storm water costs would be about the same as they were at the time of our review—about $4.5 million per year.

In a separate analysis, EPA estimated in 1999 that it will cost Phase II municipalities about $848 million to $981 million per year (in 1998 dollars) to manage storm water runoff. Because Phase II permits have not been issued as of May 2001, we did not gather any cost information on them from these cities.

Funding for Managing Storm Water Runoff Is Available From Local and Federal Sources

The five cities we visited had not generally obtained federal funds for their storm water management efforts. They used local sources, including general revenues, bonds, revenue from specifically created storm water utilities, state grants, and inspection and permit fees.

While several sections of the Clean Water Act provide funding that can be used for municipal storm water control, relatively few federal funds have been directed to these types of projects. The most significant source of funds is the state revolving loan funds administered by states.[37] These revolving loan funds provide loans for eligible storm water control projects. In some cases, nonpoint source projects may also qualify for funding when storm water permits are not required or issued. However, municipal storm water management is generally a low priority in these programs. Specifically, in the year 2000, revolving fund loans were made in the "storm sewers" category in the amount of $38.76 million for 44 different projects. These funds represented less than 1 percent of the amounts loaned from these revolving funds that year. Activities eligible for revolving fund loans include constructing BMPs to control runoff, but support for ongoing operations and maintenance is not eligible. Revolving fund loans can also be used for eligible CSO control projects. In 2000, Clean Water State Revolving Fund Program loans were made in the "CSO Correction" category of a national EPA database in the amount of $411.3 million for 69 different projects and could have been used for CSO or sanitary sewer overflow projects. This amount represented about 9 percent of the funds loaned in 2000.

According to EPA, the agency also issues grants to universities and other research institutions to help implement the storm water program. Some of these grants provide training and guidance to Phase I permittees on watershed protection and the proper selection of BMPs.

Other sources of funding may be available to local governments beginning in 2002. In December 2000, the Congress authorized programs for fiscal years 2002 through 2004 to provide grants to local governments for (1) pilot projects for managing municipal CSOs, sanitary sewer overflows, and storm water discharges on a watershed basis and for testing BMPs and (2) controlling pollutants from MS4s to demonstrate and determine cost-effective, innovative technologies for reducing pollutants from storm water discharge. EPA's proposed budget does not request funds for these programs. In addition, the Congress authorized programs for fiscal years 2002 and 2003 to provide grants to local governments for planning, designing, and constructing treatment works to intercept, transport,

[37]Under the Clean Water State Revolving Fund Program, the federal government provides grants to capitalize states' funds. States provide loans to local governments for wastewater projects.

control, or treat municipal CSOs and sanitary sewer overflows. EPA's proposed budget requested $450 million for this program.

EPA, States, and Local Governments Believe the NPDES Storm Water Program Is Effective, but It Has Not Been Evaluated

EPA, state, and municipal officials generally believe that the NPDES Storm Water Program will improve water quality. These officials believe that the program will result in more bodies of water that meet water quality standards, improved aesthetic conditions, reduced risk from bacterial contamination, and improvements attributable to the discovery and management of pollutants in storm water that otherwise would have gone unnoticed. EPA attempted to put a dollar value on these benefits in its benefit/cost analysis prepared for the Phase II storm water regulations, estimating that such benefits could range from $672 million to $1.1 billion per year (in 1998 dollars).[38]

However, little information is currently available on the benefits of the storm water program or its general effectiveness. There is no doubt that it will take time for the results of the Phase I program to be demonstrated. As EPA notes in its February 2000 report to the Congress, pollution control efforts under water quality management programs produce long-term changes, and the agency expects water quality improvements attributable to the Phase I program to become evident in the future, as the program matures. In this report, EPA concluded that the program has improved storm water management at the local level, improved water quality, and decreased pollutant loads in storm water. However, EPA relied on a survey of only nine Phase I cities in making these conclusions and, therefore, also reported that the agency could not provide national estimates on water quality protection and improvements generated by Phase I of the program. To evaluate the entire program, EPA would have to establish goals for the program that are based on its mission; obtain information about the program's results; compare the results with the goals; and make changes to the program, if warranted, to get closer to achieving the agency's goals.

EPA and the states also have not taken advantage of information that is available to evaluate the program. Each city we visited was regularly monitoring its storm water to establish baseline information on pollutant levels and was reporting this information to EPA or the regulatory state agency each year. Although cities with Phase I permits are required to report on their storm water monitoring results and changes in water

[38]Using another method, EPA estimated the benefits at $1.6 billion per year.

quality, overall, EPA and the states have not successfully developed measurable goals for the program or demonstrated its effectiveness through the review of municipal reports. An EPA official said that some states had requested funding to analyze program data because they did not have the resources to do so, and that EPA had provided the funding in a few cases. EPA also has not established any guidelines for how these data should be reported. Therefore, the reports may be as variable as the cost information we obtained in our five site visits.

EPA has not yet taken any of these data-analysis steps because, according to EPA officials, other program challenges within the Office of Wastewater Management compete with storm water management efforts for priority. For example, EPA officials stressed that available resources within the office must address other significant wet-weather pollution problems, such as CSOs and sanitary sewer overflows, and nonpoint source pollution problems, such as agricultural practices, forestry, and mining. One agency official noted that the highest priority is addressing needs that the agency and local governments have identified for improving wastewater infrastructure, such as sewage treatment facilities. The program also has relatively few staff assigned—about five in the headquarters office and about 10 in the regional offices—for the municipal, industrial, and construction portions of the program. In a program plan recently prepared for the storm water program, EPA estimated that nine to 10 staff would be needed in EPA headquarters to evaluate the program and implement other program requirements.

EPA officials described two efforts that may be the first steps in developing better information about the program. First, EPA intends to issue a grant to the University of Alabama in June 2001 to evaluate monitoring data submitted by a sample of municipalities with Phase I permits. This effort will (1) determine the different types of monitoring being conducted by Phase I municipalities, (2) assess water quality in and around permitted municipalities and determine any correlation between program implementation and impacts on water quality, and (3) recommend approaches for improving the effectiveness of municipal storm water monitoring programs. EPA expects the results of this study in 2003. Second, an EPA official stated that the agency would like to establish a system for analyzing program findings, incorporating necessary changes that are based on these findings, and evaluating the program's effectiveness. The agency plans to implement a pilot project in 2001 in the agency's Atlanta Region IV office for analyzing data reported in annual

reports and developing key indicators for the program. If this project is successful and resources are available, the project could be expanded.

Conclusions

EPA regards urban runoff as a significant threat to water quality across the nation and considers it to be one of the most significant reasons that water quality standards are not being met nationwide. Prompted by the Congress, EPA has responded with a variety of programs, including the NPDES Storm Water Program, which requires more than 1,000 local governments to implement storm water management programs. Those municipalities that are currently involved in Phase I of the program have been attempting to reduce pollutants in storm water runoff for several years. It is time to begin evaluating these efforts. However, EPA has not established measurable goals for this program. In addition, the agency has not attempted to evaluate the effectiveness of this program in reducing storm water pollution or to determine its cost. The agency attributes this problem to inconsistent data reporting from permitted municipalities, insufficient staff resources, and other competing priorities within the Office of Wastewater Management. Although Phase I municipalities report monitoring and cost data to EPA or state regulatory agencies annually, these agencies have not reviewed this information to determine whether it can be of use in determining the program's overall effectiveness or cost. Our analysis shows that the reported cost information will be difficult to analyze unless EPA and its state partners set guidelines designed to elicit more standardized reporting. Better data on costs and program effectiveness are needed—especially in light of the Phase II program that will involve thousands more municipalities in 2003. EPA's planned research grant to the University of Alabama and its pilot project in the agency's Region IV to analyze data from annual reports and develop baseline indicators is a step in the right direction and could point the way for a more comprehensive approach.

Recommendation

To determine the extent to which activities undertaken through the NPDES Storm Water Program are reducing pollutants in urban runoff and improving water quality, and the costs of this program to local governments, we recommend that the Administrator, EPA, direct the Assistant Administrator for the Office of Water to

- establish measurable goals for the program;

- establish guidelines for obtaining consistent and reliable data from local governments with Phase I permits, including data on the effects of the program and the costs to these governments;
- review the data submitted by these permittees to determine whether program goals are being met and to identify the costs of the program; and
- assess whether the agency has allocated sufficient resources to oversee and monitor the program.

Agency Comments and Our Evaluation

We provided a draft of this report to EPA and DOT for their review and comment. EPA generally agreed with the report and with the recommendation, although it did not explicitly comment on all parts of it. (EPA's comments appear in app. VI.) In response to our recommendation that EPA set measurable goals for the storm water program, EPA stated that under the second phase of the program, local governments will establish their own goals. Although this is an important activity, EPA will have difficulty evaluating the program's effectiveness at a national level without setting goals that reflect the program's mission of improving water quality. The agency (1) agreed that it should establish guidelines for obtaining consistent and reliable data from local governments about their programs and (2) plans to award grants to two universities for reviews of monitoring data reported by local governments. EPA did not comment on whether local governments should report on the costs of their programs. EPA also agreed that it and its state partners should review data reported by local governments to determine whether the program's goals are being met. In April 2001, EPA officials told us that the agency planned to undertake a project in the Region IV (Atlanta) office to evaluate the methods local governments are using to control storm water. EPA's letter indicates that the agency now plans to implement this project in three regional offices and 10 states. EPA did not comment on the part of our recommendation that the agency review the level of resources devoted to overseeing and monitoring the program. EPA also provided technical comments that we incorporated where appropriate.

DOT generally agreed with the draft report and provided technical comments that we incorporated where appropriate. In particular, DOT suggested that we revise several references in the draft report to paved surface area and its relationship to increases in urban runoff, to emphasize that impervious surfaces, of which paved surfaces are a significant subset, cause increases in runoff. We revised the language in these places.

As agreed with your offices, unless you publicly announce its contents earlier, we plan no further distribution of this report until 7 days after the date of this report. At that time, we will send copies of this report to the Administrator, Environmental Protection Agency, and the Secretary of Transportation. We will make copies available to others on request. If you or your staff have any questions about this report, please call me at (202) 512-2834. Key contributors to this report are listed in appendix VII.

Peter F. Guerrero
Director, Physical Infrastructure Issues

The Storm Water Program in Baltimore City, Maryland

Baltimore City's municipal separate storm sewer system (MS4) is regulated by the Maryland Department of Environment (MDE) and, according to a city official, services the entire city. The city is currently implementing its second, 5-year National Pollutant Discharge Elimination System (NPDES) permit, issued on February 8, 1999. Before obtaining the first NPDES storm water permit in 1993, Baltimore City addressed the adverse affects of storm water runoff by implementing Maryland's Storm Water Management Program and Erosion and Sediment Control Program. According to the 2000 census, Baltimore City's population is about 651,000.

Urban Runoff Problems in Baltimore City

Baltimore City's urban runoff discharges to four major areas—Gwynns Falls, Jones Falls, Herring Run, and the Patapsco River—and then ultimately to the Chesapeake Bay. In 1990, the Environmental Protection Agency's (EPA) 319(a) report[1] implicated urban runoff as the main source of pollution in these waters. Moreover, Baltimore City was one of the areas studied in EPA's Nationwide Urban Runoff Program in the 1980s. This study reported that urban runoff contributed over 60 percent of the total nitrogen, phosphorus, and organic carbon; over 70 percent of the chemical oxygen demand; and over 80 percent of the total suspended solids, lead, and zinc in local water bodies.

An MDE official told us that nutrients, zinc, and suspended solids are among the constituents most commonly found in urban runoff, but the quantitative contribution to water quality impairment in the state's waters was not known. Also, in 1996, the Chesapeake Executive Council designated the Baltimore Harbor as one of three toxic regions of concern in the Chesapeake Bay. The harbor suffers from sediment contaminated by banned substances (such as the termiticide chlordane) and contaminants currently being released (such as metals and organics). Furthermore, according to the Chesapeake Bay Program Office, data collected from Phase I permittees indicate that storm water runoff can be a significant source of metals and organics in the harbor.

A Baltimore City official told us that some portions of Maryland's waters are impaired because of unacceptable levels of nutrients, metals,

[1]Section 319(a) of the Clean Water Act requires, among other things, that states identify and report to EPA the navigable waters that cannot reasonably be expected to maintain water quality standards (e.g., established water body uses) without additional action to control nonpoint source pollution.

suspended sediments, and chlordane. Moreover, this official noted that the state does not consider data that municipalities collect under their NPDES storm water permits during the 303(d) listing process. Therefore, he believes that streams in Maryland are much more impaired than indicated by the listing process.

Baltimore City's Use of Best Management Practices

Like other NPDES storm water permit holders, Baltimore City uses a variety of best management practices (BMP) to reduce the amount of pollutants in runoff to the maximum extent practicable. These BMPs include detention ponds, shallow marshes (which use the biological and naturally occurring chemical processes in water and plants to remove pollutants), sand filter devices, public education programs, and the identification of illicit discharges to the MS4 system. Furthermore, Baltimore City participates in Maryland's effort to reduce nutrient levels in the Chesapeake Bay. Refer to the section of this report describing local government efforts to manage storm water for details concerning this nutrient-reduction goal. One other BMP includes the following:

- Baltimore City has incorporated the *2000 Maryland Storm Water Design Manual's* management policies, principles, methods, and practices into its current NPDES storm water discharge permit. The purpose of the design manual is to (1) protect the waters of the state from the adverse effects of urban storm water runoff; (2) provide design guidance on the most effective structural and nonstructural BMPs for development sites; and (3) improve the quality of BMPs that are constructed in the state, with particular attention to their performance, longevity, safety, ease of maintenance, community acceptance, and environmental benefit.

Costs Associated With Managing Storm Water

We were not able to obtain comprehensive information on the total cost to Baltimore City of managing storm water. Therefore, we do not present that information here.

Funding Sources

Baltimore City funds its storm water management control efforts with city water and sewer user fees and with state funds.

The Storm Water Program in Boston, Massachusetts

The Boston Water and Sewer Commission received a NPDES storm water permit in October 1999. The commission is a separate entity from the city of Boston and, therefore, does not manage some storm water controls that are common in Phase I permits, such as street sweeping, winter deicing, and many of the urban runoff controls required for new developments. Boston has combined sewer systems as well as separate sanitary sewers and storm drains. The commission maintains 206 storm water outfalls and serves approximately 33 percent of the city through its separate MS4 system. In addition to the resident population of about 589,000, this system also almost daily serves 340,000 commuting workers; 70,000 shoppers, tourists, and business people; and 75,000 commuting students. The commission's sanitary and combined flows are transported to the Massachusetts Water Resources Authority at Deer Island. The commission is also the permittee for EPA's Combined Sewer Overflow Program.

Urban Runoff Problems in Boston

The commission considers the identification and elimination of illegal sanitary sewer connections as the most effective means of improving water quality and protecting public health. It is also concerned with the washoff of animal wastes from residential and open land, which is another major contributor to the impairment of water quality because it can cause an increase in coliform levels in the storm water discharges to the receiving waters.

The commission has contracted for various studies to determine the impact of storm water runoff. The following two studies identified sources of bacterial contamination and characterized the quality of storm water discharged from different types of land uses. The studies included metering storm water flows, collecting and analyzing the storm water and receiving water quality samples, and identifying and remediating illegal sewer connections. Observations from the studies include the following:

- A 1996 study determined that pet waste, rather than sanitary sewage, was a key contributor of bacteria to the storm drain system that had possibly led to beach closings in the area.
- A 1998 study identified several illegal connections to the storm drain system. Furthermore, the study showed that deicing and sanding efforts resulted in levels of sodium, chloride, total dissolved solids, and cyanide that exceeded EPA's acute (high dose) toxicity levels.

Boston's Use of Best Management Practices

To meet the NPDES permit's requirements, the commission, like other permittees, continued BMPs, such as identifying illegal connections, and implemented new BMPs aimed at preventing the discharge of pollutants to storm drains and receiving waters. Refer to the section of this report describing local government efforts to manage storm water for details describing the commission's citywide catch-basin inspection cleaning and preventative maintenance program. Other efforts include the following:

- The commission has placed particle separators, which remove oil, grease, and sediments from storm water flows, throughout the city. The commission requires particle separators to be installed by developers on all newly constructed storm drains that serve outdoor parking areas. Fuel-dispensing areas not covered by a canopy or other type of roof enclosure must also have a particle separator.
- The commission requires developers to consider on-site retention of storm water for all new projects, wherever feasible. On-site retention aids in controlling the rate, volume, and quality of storm water discharged to the commission's storm drainage system.

Costs Associated With Managing Storm Water

We were not able to obtain comprehensive information on the total cost to the commission of managing storm water because the commission does not separate the cost of its storm water program from the cost of its sewer operations. Therefore, we do not present that information here.

Funding Sources

The commission funds its storm water management control efforts primarily with city water and sewer user fees and bond proceeds.

The Storm Water Program in Los Angeles County, California

Under the NPDES Storm Water Program, the Los Angeles Regional Water Quality Control Board issues 5-year permits to Los Angeles County for its municipal storm water program. The Los Angeles County permit, issued in July 1996, is the county's second storm water permit. This permit includes Los Angeles County as the principal permittee and 85 cities as permittees. According to the 2000 census, Los Angeles County's population is about 9.5 million.

Urban Runoff Problems in Los Angeles County

The effects of urban runoff on the ocean are of particular concern in southern California. Contaminated sediments, impaired natural resources, and potential human illness could threaten the county's tourism economy, estimated to be about $2 billion a year.

The following three studies have shown that urban runoff can pose health risks to swimmers near storm drains and contribute toxic metals to receiving water sediments:

- The Santa Monica Bay Restoration Project conducted a study to assess the possible adverse health effects of swimming in waters contaminated by urban runoff.[1] This study revealed that there is an increased risk of illness associated with swimming near flowing storm drain outlets and an increased risk of illness associated with swimming in areas with high concentrations of bacteria indicators. Furthermore, illnesses were reported more frequently on days when the samples were positive for enteric viruses. Refer to the section of this report describing the effects of runoff on aquatic life and human health for more details.
- The Southern California Coastal Water Research Project coordinated a study that assessed microbiological water quality and found that the majority of shoreline waters exceeded water quality standards during wet-weather conditions. Furthermore, the ocean waters near storm water outlets demonstrated the worst water quality regardless of the weather.[2]
- The Southern California Coastal Water Research Project also compared the runoff from an urban area and a nonurban area in the Santa Monica

[1]R.W. Haile and others, "The Health Effects of Swimming in Ocean Water Contaminated by Storm Drain Runoff," *Epidemiology,* July 1999, Vol. 10, No. 4.

[2]Southern California Coastal Water Research Project, *Southern California Bight 1998 Regional Monitoring Program, Volume 3: Storm Event Shoreline Microbiology,* 2000.

Bay Watershed.[3] The results of the study indicated that storm water plumes extended up to several miles offshore and persisted for a few days. Furthermore, the runoff from the urban area proved to be toxic to sea urchin fertilization, and dissolved zinc and copper were determined to be contributors to the toxicity. The study also found that in urban areas, sediments offshore generally had higher concentrations of contaminants such as lead and zinc.

Los Angeles County's Use of Best Management Practices

As in the other sites we visited, the county is managing its runoff through the use of conventional BMPs. These BMPs include the elimination of illicit connections and discharges to the storm sewer system, construction control measures, routine inspections, staff training, pollution prevention plans for public vehicle maintenance and material storage facilities, sweeping and cleaning public parking facilities, street sweeping, catch-basin cleaning, and public education.

The Los Angeles Regional Water Quality Control Board recently adopted a Total Maximum Daily Load (TMDL) Program to reduce trash loads to the Los Angeles River. As a result, the county is exploring a number of trash reduction BMPs, which are discussed in the section of this report describing local government efforts to manage storm water.

Costs Associated With Managing Storm Water

Table 3 indicates that the county and the other permittees have allocated significant funding for storm water management activities over the years. For example, for fiscal year 1999,[4] projected funding for storm water management activities for the county and the other permittees amounted to over $134 million.[5] The largest projections for both went toward public agency activities. For example, during fiscal year 1999, the principal permittee and the permittees together projected almost 67 percent of storm water management funds to public agency activities. The activities in this

[3]Southern California Coastal Water Research Project, *Study of the Impact of Stormwater Discharge on Santa Monica Bay –Executive Summary,* Nov. 1, 1999.

[4]The county's fiscal year begins July 1 and ends June 30.

[5]According to an official with the Los Angeles Regional Water Quality Control Board, this figure may also include activities that are outside the scope of the permit.

program include staff training, inspections of construction projects, street sweeping, and catch-basin cleaning.

Table 3: Summary of Fiscal Resources Projected for Los Angeles County and Its Co-permittees, Fiscal Years 1997-99

(Dollars in thousands)[a]

	Fiscal year 1997		Fiscal year 1998		Fiscal year 1999	
Activity	**County**	**Others[b]**	**County**	**Others[b]**	**County**	**Others**
Program Management	$2,225	$6,195	$1,856	$4,874	$1,466	$6,187
Illicit Connection, Illicit Discharge Program	1,620	3,515	1,017	3,075	764	2,901
Development planning and construction	784	6,208	1,300	3,769	1,452	5,743
Public agency activities	38,544	40,915	40,256	31,992	43,316	46,657
Public information and participation	2,840	5,538	4,360	3,856	4,629	6,177
Monitoring	2,018	619	1,768	729	1,598	737
Other	187	13,991	490	8,656	1,318	11,834
Total	**$48,218**	**$76,981**	**$51,048**	**$56,950**	**$54,543**	**$80,237**

[a]Totals may not add up because of rounding.

[b]Does not include 17 permittees for fiscal year 1998 and 13 permittees for fiscal year 1997 for the following reasons: The permittee operated on a different budget cycle, the final document was not available at the time of the annual report, or the information submitted by the permittee was not complete.

Source: GAO's analysis of cost data provided by the Los Angeles County Department of Public Works.

As shown in table 3, the county maintains primary responsibility for monitoring activities, having projected over $2 million for storm water monitoring activities in fiscal year 1997, almost $2 million in fiscal year 1998, and over $1.5 million in fiscal year 1999. Conversely, the permittees' projected funding levels for monitoring activities amounted to only $619,000 in fiscal year 1997, $729,000 in fiscal year 1998, and $737,000 in fiscal year 1999. According to an official with the Los Angeles Regional Water Quality Control Board, the County has consistently maintained primary responsibility for monitoring activities required under the permit.

Funding Sources

The primary source of funds for the county's storm water program is flood control assessments collected throughout the district. Although the county has not applied for any state revolving funds, it has applied for and received approval for federal funds through the Transportation Equity Act for the 21st Century (TEA-21) for a pilot study of an engineering device that would remove trash from storm water. Additionally, the county has received partial funding through Proposition A of the Safe Neighborhood Parks of 1992 and 1996[6] for two Vortex Separation Systems—a Continuous Deflective Separation unit and a Stormceptor unit. Additionally, the county received grant money from the Metropolitan Transit Authority, which partially funded catch-basin screens, a Continuous Deflective Separation unit, and 120 catch-basin inserts.[7]

[6]The Los Angeles County Regional Park and Open Spaces District (a district within the Parks Department) received this funding from Proposition A and, in turn, made grants to the Los Angeles County Department of Public Works for the BMP devices.

[7]The Metropolitan Transit Authority receives TEA-21 funds from the California Department of Transportation.

The Storm Water Program in Milwaukee, Wisconsin

The Wisconsin Department of Natural Resources (WDNR) has the authority to regulate the discharge of storm water from municipalities, construction sites, and industries under Natural Resources Code 216. This rule identifies Wisconsin municipalities that are required to obtain a storm water discharge permit under the Wisconsin Pollutant Discharge Elimination System (WPDES). Milwaukee completed its application process in 1994, and WDNR issued a WPDES permit to the city in October 1994. This was the first municipal storm water permit issued to a municipality in EPA's Region 5 covering the midwest. In July 2000, WDNR reissued Milwaukee's storm water permit. According to the 2000 census, Milwaukee's population is about 597,000.

Urban Runoff Problems in Milwaukee

Milwaukee has a combined sewer system as well as a separate sanitary sewer system. The Milwaukee Metropolitan Sewerage District implemented a rehabilitation program that cost over $2 billion to reduce the number of combined sewer overflow (CSO) events each year. The rehabilitation program involved the construction of deep tunnels to store untreated wastewater and rainwater for later treatment at a wastewater treatment plant. Since 1996, the deep tunnels have significantly reduced the number of overflow events from an average of 50 to 60 per year before the construction to an average of two per year afterwards.

Urban runoff has been identified as a leading source of pollution to the Milwaukee River basin's streams, lakes, and wetlands and the Milwaukee River estuary. To address pollution from urban runoff, WDNR issues storm water permits to municipalities with MS4s serving areas with populations of 100,000 or more, municipalities in Great Lakes "areas of concern" where water quality has been identified as a serious problem, municipalities with populations of 50,000 or more that are located in priority watershed planning areas, and designated municipalities that contribute to the violation of a water-quality standard or are significant contributors of pollutants to state waters.

Milwaukee's Use of Best Management Practices

In addition to BMPs such as the elimination of illicit connections and discharges to the storm sewer system, the reduction of pollutants in storm water runoff from construction sites, public education, catch-basin cleaning, street sweeping, and the use of detention basins, Milwaukee has explored the use of innovative BMPs. Refer to the section of this report describing local government efforts to manage storm water for more

details about an educational campaign directed at a specific watershed. Additional BMPs include the following:

- An innovative storm water control device was installed in a parking lot at a heavily used municipal public works yard that was found to discharge significant amounts of storm water pollutants. Termed the Multi-Chambered Treatment Tank (MCTT), this device is suitable for areas with limited space, cleans up polluted runoff close to its source, removes pollutants that are not susceptible to other treatment methods, and is hidden from view. The MCTT consists of a catch basin, a settling chamber, and a filter. Although the results of the monitoring studies have revealed that the device has a positive effect on water quality, officials with the Department of Public Works explained that it is cost-prohibitive and suitable only for sites with limited space.
- The permittee has also been working with WDNR, the Department of Transportation, the U.S. Geological Survey, and a neighborhood association in a joint effort to develop a storm water monitoring assessment program consisting of two innovative storm water treatment devices. One device removes grit, contaminated sediments, heavy metals, and oily floating pollutants from surface runoff. The other device removes a broad range of pollutants from runoff, such as bacteria, heavy metals, nutrients, petroleum hydrocarbons, and suspended solids. The devices are to be installed along a new reach of the Milwaukee Riverwalk through the third ward of Milwaukee.

Costs Associated With Managing Storm Water

Reliable data on the total cost to manage storm water in Milwaukee were not available and cannot be presented here because certain activities are not reported as program costs in the city's annual report. These activities include street sweeping; leaf collection; catch-basin and inlet cleaning; maintenance of public boulevards, parks, and public green spaces; and the recycling of waste oil and antifreeze. Therefore, the program costs reflected in the annual report do not take into account many of the nonstructural BMPs employed by the city nor do the totals include activities funded through grants. The storm water management activities that were included in the city's 2000 budget request were estimated to cost $460,000.

Funding Sources

Milwaukee's storm water program is primarily funded through the city's sewer maintenance fund. Unlike the general revenue account, which is

based on property taxes, the sewer maintenance fund is based on water consumption. The city has also received supplemental funding from the Wisconsin Nonpoint Source Water Pollution Abatement Program in the form of WDNR grants. The city has received over $1 million since 1991 for a wide variety of storm water management activities.

The Storm Water Program in Worcester, Massachusetts

Worcester's Department of Public Works (DPW) received a NPDES permit on November 1, 1998. The Sewer Operations Division, within the DPW, is directly responsible for operating and maintaining the city's separate storm sewer system, along with the sanitary and combined sewer system. Since 1993, the Sewer Operations Division has had a full-time storm water coordinator, reflecting Worcester's increased emphasis on meeting NPDES program requirements. Worcester has a population of about 173,000. Its water system covers an extensive area, including 371 miles of sanitary sewers, 340 miles of storm sewers, 56 miles of combined sewers, 27,000 manholes, over 14,000 catch basins, and 263 outfalls. Worcester's separate storm drain systems consist of 93 main drainage areas covering approximately 6,680 acres.

Urban Runoff Problems in Worcester

The constituents that are typically found in urban runoff in Worcester are the same as those normally found in urban runoff in older cities. Because virtually all of the paved surfaces in the Worcester area are devoted to the city's transportation infrastructure, the constituents generated include automobile-related petroleum products, such as total petroleum hydrocarbons, oil and grease, along with total suspended solids. Also, coliform, silt, and sediment have been identified in the city's runoff.

Worcester's Use of Best Management Practices

Like other permittees, the DPW has implemented BMPs under the major areas of education outreach, pollution prevention and source controls, storm-drainage system maintenance, regulatory efforts, and storm-drainage system infrastructure. Additionally, to reduce storm water pollution, the DPW has retrofitted a number of twin manholes in the city as discussed below. BMPs that are specific to Worcester include the following:

- The DPW implemented a demonstration project to determine the effectiveness of an oil and grit separator installed on a street drain. The drain is a major surface sewer main that services approximately 226 acres of heavily urbanized area with a typical mix of residential, commercial, and industrial use. The drain discharges into Lake Quinsigamond, which is a large lake used for recreational purposes such as swimming and boating. In its April 2000 annual plan submitted to EPA, the DPW noted that because of drought conditions, it currently did not have sufficient sampling data to determine the effectiveness of the project.

- The DPW has embarked on a comprehensive program to minimize the possibility that sewage and storm water will be mixed in its twin invert manholes. Since the program began, the DPW has installed hold-down devices on over 1,680 of the approximately 2,580 twin invert manholes in the city. The DPW expects to continue the program until all of the manholes have been retrofitted.
- The DPW is also working closely with the Massachusetts Department of Environmental Protection in its ongoing tracking efforts to ensure that industries in Worcester are doing their part to reduce storm water pollution.
- To improve its storm-drainage infrastructure, the city has established a voluntary plan to reduce the number of unpaved private roads. The dirt from these roads, especially after rain storms, causes sediment to build up in the drainage system. The DPW has developed a plan to pave the streets at a lower grade than would be necessary to meet the legal requirements for a public street. Under this plan, residents would not have to pay the additional betterment taxes that are now required to cover the costs of sediment removal and less sediment would be transported in runoff.

Costs Associated With Managing Storm Water

Since 1993, the DPW has allocated significant funding from the water and sewer utility fees it collects for controlling the effects of runoff, especially through catch-basin cleaning, street sweeping, and correcting illegal connections. For example, its fiscal year 1993 budget for storm water programs included about $1.6 million for specific programs and another $1 million for capital improvement programs, such as inflow/infiltration and flood control. The DPW also spent $500,000 to develop and submit its permit application. Furthermore, as shown in table 4, Worcester made extensive capital expenditures during fiscal years 1994 through 1999 on pertinent storm water projects to improve the quality of storm water runoff emanating from the city's storm water sewer system.

Table 4: City of Worcester's Capital Expenditures for Storm Water Management

(Dollars in thousands)

	Fiscal year					
Activity	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**
Sewer construction	$0	$500	$500	$300	$300	$300
Infiltration control	0	400	400	100	100	100
Pump station rehabilitation	200	200	200	200	200	200
Sewer rehabilitation	300	750	300	750	750	1,500
Landfill closeout	150	1,200	200	500	0	0
Belmont Drainage project	0	100	600	100	0	0
Beaver Brook Culvert project	0	500	100	100	300	100
Surface drain control	40	150	200	200	200	200
Geographic Information System	0	0	0	125	125	125
Other	0	70	10	0	0	0
Total	**$690**	**$3,870**	**$2,510**	**$2,375**	**$1,975**	**$2,525**

Note: The Belmont Drainage project involved enlarging the drain to eliminate surcharging and siltation and moving the outfall to eliminate stagnation. The Beaver Brook Culvert project involved repairing the culvert and conducting a study that included a detailed hydraulic analysis of the drainage basin.

Source: Worcester Department of Public Works.

Furthermore, during fiscal year 1999, the DPW spent approximately another $2.1 million to operate and maintain storm water activities. Key expenditures included about $1.2 million for street sweeping, about $617,000 for catch-basin maintenance, $52,000 for root control, and another $48,000 for street paving. Also included was $40,000 per year for sampling five outfalls around the city three times per year as required by the permit. According to a DPW official, in previous fiscal years, the DPW funded the same or similar operation and maintenance activities to help control storm water runoff. As a result, the costs since 1994 were similar to those for 1999, except for annual adjustments for inflation. Therefore, the annual operation and maintenance expenditures ranged from about $1.7 million for 1994 to about $2.1 million for 1999.

According to a DPW official, the department expects to spend from $3 million to $4.5 million annually over the next several years on storm water-

related activities. The amount of the cost increase will depend on whether EPA asks the city to increase its spending.

Funding Sources

The DPW funds its storm water management controls effort from the water and sewer user fees it assesses to homes and businesses.

Comments From the Environmental Protection Agency

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

JUN 14 2001

OFFICE OF WATER

Mr. Peter F. Guerrero
Director, Physical Infrastructure Issues
United States General Accounting Office
Washington, DC 20548

Dear Mr. Guerrero:

Thank you for the opportunity to review your draft report entitled "Better Data and Evaluation of Urban Runoff Needed to Assess Effectiveness." We appreciate the difficulty that assimilating and interpreting such information on an extremely complex subject must have presented. Your report provides a fair and balanced depiction of the Agency's efforts, with the assistance of our State and local partners, to implement a national urban storm water runoff control program.

As the report correctly acknowledges, the Environmental Protection Agency (EPA) believes that urban runoff is a significant threat to water quality and is actively working to control the discharge of pollutants in storm water runoff. EPA's urban storm water control program has been a very successful undertaking to date and we are taking steps to address several of the recommendations identified in the report.

One of the challenges of controlling urban storm water runoff is to be able to address a wide array of complex environmental issues, even within the boundaries of one municipality. EPA's urban storm water program is developed with the understanding that a "one size fits all" approach will not work. For example, existing municipal separate storm sewer system (MS4) permits are tailored to suit the needs of each individual municipality. In fact, the municipalities select the majority of the measures that will be implemented to control storm water runoff. Similarly, EPA's Phase II regulatory framework for small MS4s requires the municipality to identify appropriate BMPs to control runoff and establish measurable goals against which program effectiveness will be measured. These BMPs and measurable goals then become the enforceable permit conditions for that municipality. EPA expects that approximately 5,000 small MS4s will each have a unique set of measurable goals that will define expectations of a successful storm water control program.

While EPA has developed a sound regulatory basis for urban storm water control, competing initiatives have limited our ability to invest sufficient resources to fully evaluate the effectiveness of the program and the associated implementation costs. We believe that the flexibility afforded MS4 permittees provides some assurance that permit requirements do not become onerous or unjustified. Additionally, with the MS4 permits reissued every five years,

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EPA expects that dialogue between MS4s and permitting authorities will better focus on those activities found to be most beneficial.

Over the next year, we will address challenges relating to evaluating the effectiveness of municipal storm water programs. Consistent with the first recommendation, EPA will evaluate storm water monitoring data that has been collected since program inception. Two grantees (UCLA and the University of Alabama) will review monitoring data that has been submitted as part of routine discharge monitoring reports and annual reports. EPA expects these efforts will evaluate the correlation between storm water discharges and trends in water quality impairment. Another anticipated finding from these grants is a compilation of the range of monitoring activities required of municipalities in storm water permits and the identification of the monitoring that appears to be most effective in demonstrating program results.

To meet another challenge, we are evaluating MS4 permit requirements and annual reports to identify the types of storm water control activities in place and the environmental and programmatic results of these activities. Initially, this effort will evaluate MS4s in at least three EPA Regions and 10 states to gather information on the range of methods employed by permitted MS4s to control storm water discharges. Through this effort, EPA expects to determine whether program goals are being met and establish meaningful indicators of program performance. Should this effort prove useful, EPA will expand the evaluation to a national effort that will evaluate MS4 permits and annual reports in all affected EPA Regions and states. In either case, results of this effort will be disseminated nationally to ensure that findings are incorporated into other MS4 programs, as appropriate.

Enclosed are additional comments on terminology and regulatory citations provided in the report. Again, we appreciate the opportunity to review and comment on the draft report. If you have any questions about these comments or would like to discuss urban storm water runoff issues, please contact me or call Jeff Lape, Acting Director of the Water Permits Division, at (202) 564-9545.

Sincerely,

Michael B. Cook
Director
Office of Wastewater Management

Enclosure

Enclosure

Below are several additional comments for your consideration that address terminology and regulatory citations provided in the report:

- The term "nonpoint source" throughout the report, when referring to storm water runoff, is somewhat misleading in that the federal definition of "point source" includes many of the types of storm water discharges discussed in the draft report as "nonpoint source pollution." We recommend clarifying that EPA's NPDES storm water permits regulate point source discharges that include storm water runoff from small, medium, and large municipal separate storm sewer systems. In fact, to avoid confusion between point sources and nonpoint sources in an NPDES context, we recommend that you consider using the term "wet weather discharges" when referring to storm water runoff.

- The third sentence in the first full paragraph on page 3 states that "EPA requires cities to use 'best management practices' to reduce contamination in storm water runoff." We recommend that you change the word "requires" to "recommends." While best management practices are common for reducing storm water contamination, EPA regulations allow MS4s to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques, and system, design, and engineering methods, and such other provisions which are appropriate.

- The last sentence in the second full paragraph on page 3 states that "managing storm water runoff will reduce runoff and improve water quality." We recommend changing this sentence to indicate that "managing storm water runoff will reduce the volume and concentration of pollutants in runoff and improve water quality.

- The last sentence of the same paragraph indicates that "Neither EPA nor states have developed measurable program goals or reviewed municipal reports on the results of storm water programs to determined whether the reports provide information that could demonstrate the program's effectiveness." A similar statement is made in the first full paragraph on page 31. We recommend that these two sentences be revised to indicate that "EPA and states have generally been unsuccessful in developing measurable program goals and in demonstrating program effectiveness through the review of municipal reports." EPA and some states have attempted to determine program effectiveness through the review of municipal reports but, to date, these efforts have been unsuccessful in making this determination.

GAO Contacts and Staff Acknowledgments

GAO Contacts

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Staff Acknowledgments

In addition to those named above, Jennifer Clayborne, Richard LaMore, Sally Coburn, Elizabeth McNally, Charles Bausell, and Timothy Guinane made key contributions to this report.

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Effects of Lawn Fertilizer on Nutrient Concentration in Runoff from Lakeshore Lawns, Lauderdale Lakes, Wisconsin

Introduction

Transport of nutrients (primarily forms of nitrogen and phosphorus) to lakes and resulting accelerated eutrophication are serious concerns for planners and managers of lakes in urban and developing suburban areas of the country. Runoff from urban land surfaces such as streets, lawns, and rooftops has been noted to contain high concentrations of nutrients; lawns and streets were the largest sources of phosphorus in residential areas (Waschbusch, Selbig and Bannerman, 1999). The cumulative contribution from many lawns to the amount of nutrients in lakes is not well understood and potentially could be a large part of the total nutrient contribution.

Why study runoff from lawns?

The shorelines of many lakes are already highly developed, and the potential water-quality effects of this development are increasing. Many lawn-care professionals and homeowners hold a common belief that runoff from lawn surfaces is minimal and that phosphorus movement from lawns is not a problem (Barth, 1995). The homeowners' goal to maintain lush green lawns may conflict with the lake manager's goal to minimize nutrient inputs. In cooperation with the Lauderdale Lakes Lake Management District and the Wisconsin Department of Natural Resources, the U.S. Geological Survey (USGS) conducted a study during 1999–2000 to determine the magnitude of nutrient runoff from nearshore residential lawns surrounding a lake and to determine whether fertilizer application and the type of fertilizer (regular or nonphosphorus types) affect the amount of nutrients in runoff from lawns. Such information is important for developing stormwater best-management practices and for developing or improving shoreland zoning ordinances and other local regulations to protect or improve the water quality of lakes (Wisconsin Department of Natural Resources, Wisconsin Shoreland Management Program, http://www.dnr.state.wi.us/org/water/wm/dsfm/shore/title.htm, accessed February 8, 2002).

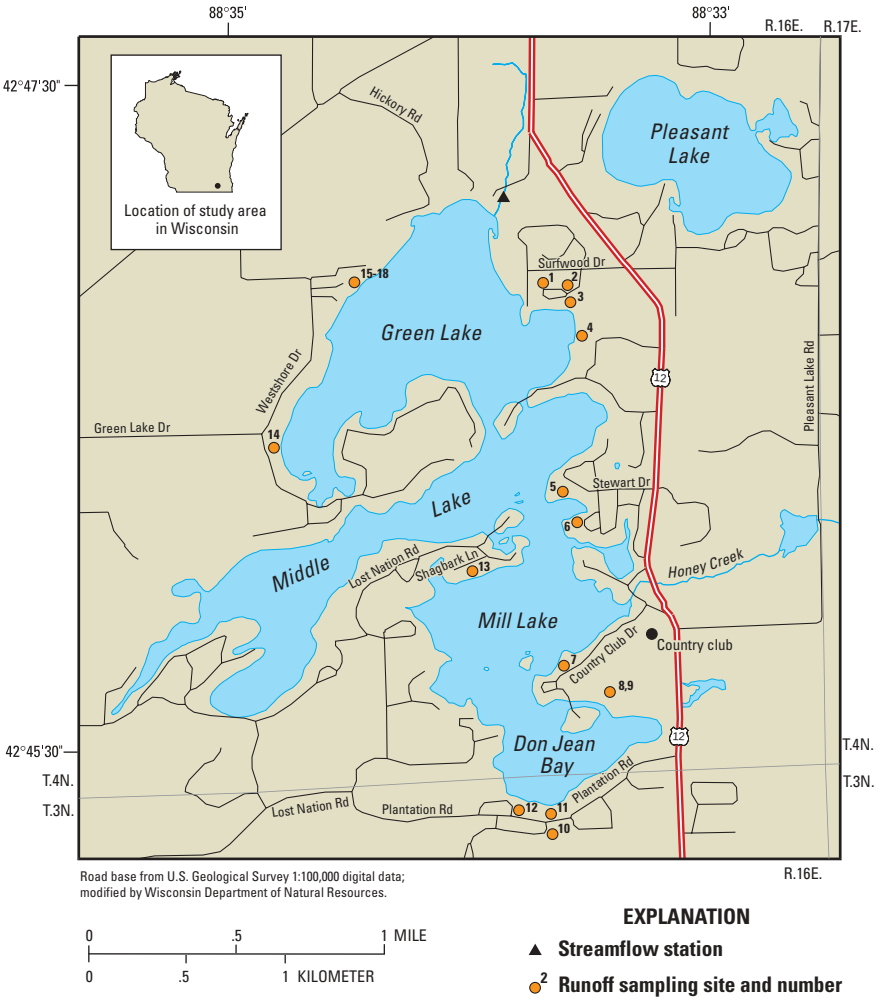

Figure 1. Site locations surrounding Lauderdale Lakes, Wis.

The study area was located at Lauderdale Lakes in Walworth County, a chain of lakes in the more populated southeastern part of Wisconsin (fig. 1). The 15-mile shoreline of the lakes is about 70 percent developed, primarily as single-family housing, and is the focus for additional residential development. Most of the lakefront homes have sloping lawns that are maintained to the water's edge (fig. 2). Information about the specific sources and amounts of phosphorus entering the lakes was needed to develop a plan for reducing the input of phosphorus. The lakes are phosphorus limited, meaning that phosphorus is the nutrient limiting plant growth and affecting lake productivity. A previous study (Garn and others, 1996) found that surface-water inflow from the small nearshore contributing drainage area accounted for only 4 percent of the water inflow to the lake but represented 51 percent of the total annual phosphorus input from all sources. The Lake Management District is in the process of installing

Figure 2. Lakeshore development and lawns at Lauderdale Lakes, Wis.

Figure 3. Tube-type lawn sampler (site 2).

and implementing various measures to reduce the phosphorus input to the lakes, among which is a "lake-friendly" fertilizer program that encourages residents to apply nonphosphorus turf fertilizer. The Lake Management District has been supplying residents with phosphorus-free fertilizer for purchase for about 3 years, and data were needed to evaluate the effectiveness of the program.

Equipment and Methods

In 1999 and spring 2000, lawn samplers designed to collect surface runoff were installed using methods described in Waschbusch, Selbig, and Bannerman (1999, p. 7). The samplers collect runoff through two 5-foot pieces of 1/2-inch-diameter PVC tubing placed flush with the surface of the ground, on a sloping lawn, with an angle of about 150 degrees between the two tubes (fig. 3). Runoff entered the tubing through a 1/8-inch slot cut at intervals along the length of the tube; each tube was then wrapped with fiberglass screen to prevent insects and large debris from entering. The tube was held in place on the lawn surface with wire staples. At the end of each tube, a connecting piece of 1/2-inch silicone tubing directed the collected runoff into a covered 1-quart glass jar placed in the ground in a 4-inch-diameter protective PVC sleeve with a cover.

During the summer of 2000, the original sampler design was modified to increase sample volumes at sites that did not generate sufficient runoff samples and to minimize contamination problems caused by insects and earthworms entering the samples despite the fiberglass screen. One variation to increase runoff-collection efficiency was to enlarge the slots cut in the pipes to 1/4-inch. Another technique used at sites with the least runoff production was to replace the tubing with two lengths of 4-foot-long plastic lawn edging that directed runoff toward the collecting jar (fig. 4); this solution was more effective at increasing captured runoff and minimizing contamination than increasing the slot size.

Clean sample bottles were placed in the lawn samplers before each expected storm or at about 2-week intervals when sites were inspected if there was no rain. Samplers were cleaned and rinsed with deionized water during each visit to remove any accumulated dirt or debris. Notes were kept on volume of runoff in the collection bottle; color and noticeable sediment, debris, or insects in the bottle; and site condition. Sample bottles were collected as soon as possible after each storm (usually within 1 to 5 days) and brought to Madison, where the contents were filtered with a 0.45-micrometer filter, preserved with sulfuric acid, and then delivered to the Wisconsin State Laboratory of Hygiene for nutrient analyses. Samples were analyzed according to standard laboratory methods (Wisconsin State Laboratory of Hygiene, written commun., 2001) for concentrations of total phosphorus (TP), total dissolved phosphorus, total Kjeldahl nitrogen (TKN), dissolved ammonia nitrogen, and dissolved nitrate plus nitrite nitrogen. When insufficient sample volume was collected from a storm to analyze for all nutrients, analyses were done first for total phosphorus.

Figure 4. Edging-type lawn sampler (site 5).

Description of Sampling Sites

The Lauderdale Lakes are a chain of three interconnected lakes with a surface area of 807 acres. The lakes are ground-water drainage lakes in which more than 90 percent of the water inflows are from ground water and direct precipitation. Some surface water enters the lakes by way of a few ephemeral drainageways or as overland flow from the nearshore area. Lake and drainage-basin characteristics are described in detail by Garn and others (1996). Lakeshore developments include about 1,010 single-family homes, of which about 30 percent are year-round residences. Other developments include a golf course, a boat marina, and two recreational camps.

In the lakeshore area within 300 feet of the shoreline, soils consist primarily of the Casco-Rodman Complex (60 percent of the area), Rodman-Casco Complex (12 percent of the area), and Casco-Fox Silt Loam (6 percent of the area). The Casco-Rodman Complex is found on 20–30 percent slopes; surface textures range from loam to silt loam, and subsoils are clay loam to sandy loam. The Rodman-Casco Complex is found on slopes of 30 to 45 percent formed in loamy deposits over sand and gravel. The Casco-Fox soils are found on slopes of 6 to 12 percent and have a silt loam texture (Haszel, 1971). Soil disturbance can be severe during building construction in suburban areas, commonly resulting in subsoil compaction by heavy equipment followed by layering with topsoil. Such disturbance has the potential for greatly increasing runoff and nutrient losses.

Samplers were installed at 18 locations along the lakeshore (fig.1), representing different types of lawn-fertilizer use, undeveloped areas, and one area of mixed land use (part agricultural, ditched paved roads, and lawns). Sites were grouped into three categories: regular-fertilizer sites, nonphosphorus-fertilizer sites, and unfertilized sites. Samplers were installed at 12 sites and operated during the growing season in 1999. In 2000, six additional sites were installed, including two samplers in a swale. Samplers were installed at seven lawn sites where traditional fertilizer was applied, three sites where nonphosphorus fertilizer was applied, and six control sites where no fertilizer was applied (three steep, wooded sites; two lawns; and an undeveloped grass field). Much of the area is wooded, and many of the lawns have an overhead canopy of hardwood trees. Two samplers were installed in a swale area on the south side of Mill Lake (Don Jean Bay) that collected mixed runoff from an agricultural field, lawns, and streets. The drainage area of the upgradient sampler was 8 acres and of the downgradient sampler was 38 acres, of which about 25 percent was cropland.

Property owners were asked to participate in the runoff study. It was assumed that most lawn fertilizer users followed usual manufacturer recommendations of four applications per season made in about April–May, June–July, August–September, and October at 3 to 3.5 pounds per 1,000 square feet. Homeowners applying regular fertilizer fertilized their lawns two or more times per year. Each participant's property was inspected to ensure that lawn slope was at least 20 feet long, grade was at

Table 1. Physical characteristics of sampling sites at Lauderdale Lakes, Wis. [P, phosphorus; ppm, parts per million; %, percent, turf-quality values are defined in text; ft², square feet; --, no data]

Site ID	Station number	Site type	Soil type/texture[a]	Soil P concentration[b] (ppm)	Slope (%)	Vegetative cover density (%)	Turf quality	Runoff area (ft²)	Number of samples	Percentage of storm events
Regular fertilizer application sites										
2	424652088333901	Wooded lawn	Hebron loam, gravelly	68	21	65	6	150	10	67
3	424650088333501	Lawn	Hebron loam	32	9	90	8.5	180	8	80
5	424616088334201	Wooded lawn	Casco-Rodman loam-silt loam	66	20	100	9	114	8	33
8	424541088334602	Golf course lawn	Casco-Rodman loam-silt loam	35	20	100	9.5	250	15	63
9	424541088334601	Golf course lawn	Casco-Rodman loam-silt loam	78	24	100	9.5	186	9	54
10	424514088334001	Swale	Casco-Fox silt loam	--	5	--	--	8 acres	9	69
11	424518088334301	Swale	Casco-Fox silt loam	--	4	--	--	38 acres	10	77
12	424519088334101	Lawn	Casco-Fox silt loam	28	16	100	10	104	1	8
15	424654088343103	Lawn	Fox silt loam	11	11	60	6	152	5	24
Nonphosphorus-fertilizer application sites										
6	424611088334001	Wooded lawn	Casco-Rodman loam-silt loam	20	14	80	7.5	250	18	67
13	424603088340201	Wooded lawn	Casco-Rodman loam-silt loam	21	34	60	5	140	15	54
14	424623088345101	Wooded lawn	Casco-Rodman loam-silt loam	70	14	85	8	225	8	30
Unfertilized sites										
1	424652088334401	Grass field	Fox sandy loam	65	9	100	7	128	2	13
4	424643088333601	Wooded lawn	Casco-Rodman loam-silt loam	38	12	85	8	188	6	47
7	424543088334001	Wooded lawn	Casco-Rodman loam-silt loam	14	22	70	6	209	12	46
16	424654088343101	Wooded	Rodman-Casco loam/sand,gravel	28	41	95	1	200	9	33
17	424654088343102	Wooded	Rodman-Casco loam/sand,gravel	24	33	95	1	300	13	48
18	424654088343104	Wooded	Rodman-Casco sandy, gravelly	16	30	65	2	140	7	28

[a]From Haszel, 1971.

[b]50–75 ppm P optimum recommendation for turfgrass. Analysis by Soil and Plant Laboratory, University of Wisconsin, Madison.

least 5 percent, and sample catchment area was not affected by runoff from rain gutters, driveways, or other lawns or sources. A soil sample collected at the time of sampler installation was analyzed for soil texture, pH, and phosphorus content by the University of Wisconsin Soil and Plant Analysis Laboratory. A visual vegetative soil-cover density, in percent, and a turf-quality rating were assigned to each lawn during visits. Turf quality was based on a 1 to 10 scale: for example, a score of 10 represented 100 percent best-quality green grass cover, 5 represented 50 percent grass cover with bare spots, weeds, and dead grass providing additional cover, and 1 indicated no turfgrass cover, with dead grass, weeds, and other vegetation providing primary soil cover. The more heavily fertilized sites (5, 8, 9, 12) had the best turf-quality ratings. Various physical characteristics of the sampling sites are summarized in table 1.

Nutrient Concentration in Runoff

Rainfall and Runoff

Long-term precipitation records from the National Weather Service stations at Whitewater (about 9 miles northwest of Lauderdale Lakes) and Lake Geneva (about 13 miles southeast) were used to estimate rainfall at Lauderdale Lakes (National Oceanic and Atmospheric Administration, 1999–2000). Data from a recording rain gage at a USGS streamflow-gaging station at Jackson Creek near Elkhorn (9 miles south) was used after the rain gage was installed on May 25, 1999. Rainfall was above the 1961-90 average for April, May, and June 1999 and near or below average the remainder of the season. In 2000, rainfall amounts for May, June, and September were substantially above average (fig. 5). Ten runoff events occurred from 12 storms in the 1999 sampling season and 13 runoff events occurred from 15 storms in 2000; generally, the storms in 2000 were larger than those in 1999. A storm event was defined as more than 0.3 inches of rain, and a runoff event as one that resulted in at least two runoff samples with sufficient volume for analysis (about 100 ml). A summary of the storm dates and precipitation amounts is given in table 2.

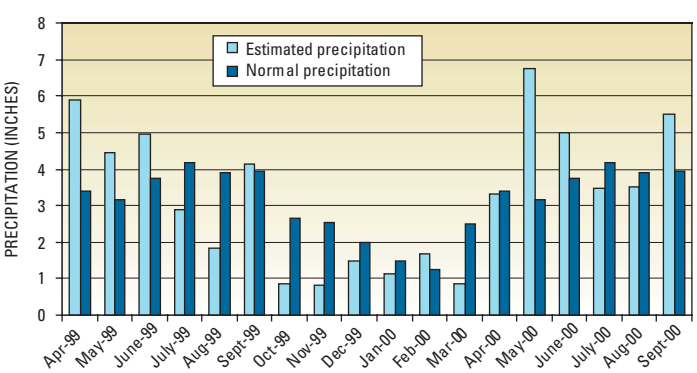

Figure 5. Estimated monthly precipitation at Lauderdale Lakes, Wis., during 1999–2000 compared to normal monthly precipitation.

Although measurement of quantity of runoff was not part of this study, a qualitative evaluation of runoff may be obtained by comparing the

Table 2. Storm information and number of sites with runoff samples at Lauderdale Lakes, Wis., 1999–2000 [est, estimated]

Storm number	Storm start date	Total precip amount (inches)	Number of sites with runoff samples
99S1	4/9/1999	0.86 [a]	4
99S2	4/22/1999	3.73 [a]	9
99S3	5/12/1999	0.63 [a]	3
99S4	5/16/1999	0.80 [a] est	4
99S5	5/17/1999	0.66 [a] est	3
99S6	6/1/1999	0.70	8
99S7	6/10/1999	3.35	6
99S8	7/17/1999	1.11	4
99S9	8/13/1999	0.37	5
99S10	9/27/1999	3.66	11
00S1	2/21/2000	2.0 [b]	11
00S2	4/19/2000	2.59	2
00S3	5/9/2000	1.36	9
00S4	5/18/2000	1.95	5
00S5	5/27/2000	3.85	14
00S6	6/11/2000	1.95	9
00S7	7/2/2000	1.40	12
00S8	7/10/2000	1.33	5
00S9	7/31/2000	1.62	3
00S10	8/5/2000	1.17	16
00S11	8/17/2000	0.70	5
00S12	9/11/2000	1.94	17
00S13	9/22/2000	1.89	9

[a] Measured at Whitewater.
[b] From 6 inches snowmelt and light rain.

Figure 6. Site 12 at Lauderdale Lakes, Wis.—an example of high-quality turfgrass.

number of sites where runoff was sampled for each storm (table 2) and the number of storms sampled at each site (table 1). The magnitude of runoff is dependent on a combination of factors including rainfall amount and intensity, soil-surface storage and detention, and infiltration rate. Infiltration is affected by soil type, vegetative cover, slope, and other factors (Haan, Barfield, and Hayes, 1994, p. 52–54). In general, sites with dense vegetative cover and coarse soils with high infiltration rates produced less runoff. Specifically, site 12 of the fertilized sites (fig. 6), which had the best-quality turf and fertilizer applications of 4 times per year, produced the least runoff (only 8 percent of all storms). Other sites (5, 8, 9) with high turf quality and density produced more frequent runoff samples, possibly because of steeper slopes or other factors. At six of the lawn sites, more than 50 percent of the storm events produced runoff.

The phenomenon of soil-water repellency, or hydrophobicity, was observed at many of the lawn sites, especially after dry periods. Water repellency of soils reduces affinity to water so that the soil resists wetting, thus reducing infiltration capacity, decreasing plant growth, and increasing surface runoff. The phenomenon has been widely accepted as a problem for many soils in seasonally dry climates. Soils with grass cover in temperate climates have recently been found to develop resistance to wetting—a common problem known as "localized dry spot" on golf courses (Doerr, Shakesby and Walsh, 2000; Kostka, 2000). Therefore, water repellency could be an additional factor influencing runoff from residential lawn soils (L.F. DeBano, University of Arizona, oral commun., 2001). At Lauderdale Lakes, there was also some indication that lawn shading by trees and less frequent use of fertilizer (sites 6, 7, and 13) resulted in less dense and patchy turf cover, increasing runoff. In ongoing turf studies at the University of Wisconsin (W.R. Kussow, Department of Soil Science, written commun., 2000), researchers found that not fertilizing turfgrass caused thinning of the turf, increased the amount of runoff, and increased nitrogen and phosphorus loss. Generally, the percentage of storms resulting in surface runoff from many of the lawns was higher than expected. Runoff from lawns may occur more frequently than previously thought because of the complex interaction of many factors.

Nutrient Concentrations in Runoff and Effects of Fertilizer Use

Summary statistics of nutrient concentrations measured in runoff from different site categories are given in table 3 and compared in figure 7. Detailed data for each of the sites were published annually in the U.S. Geological Survey Water-Data Reports (Holmstrom and others, 2000; Garn and others, 2001). There was a wide range in concentration of most nutrients among storms during the study period. Given this variability, geometric means or medians are more meaningful for comparison because they are better estimates of central tendency than arithmetic means. The nonparametric Kruskal-Wallis test was used to test for overall differences in concentration distributions, and the Wilcoxon rank sum test was used to test

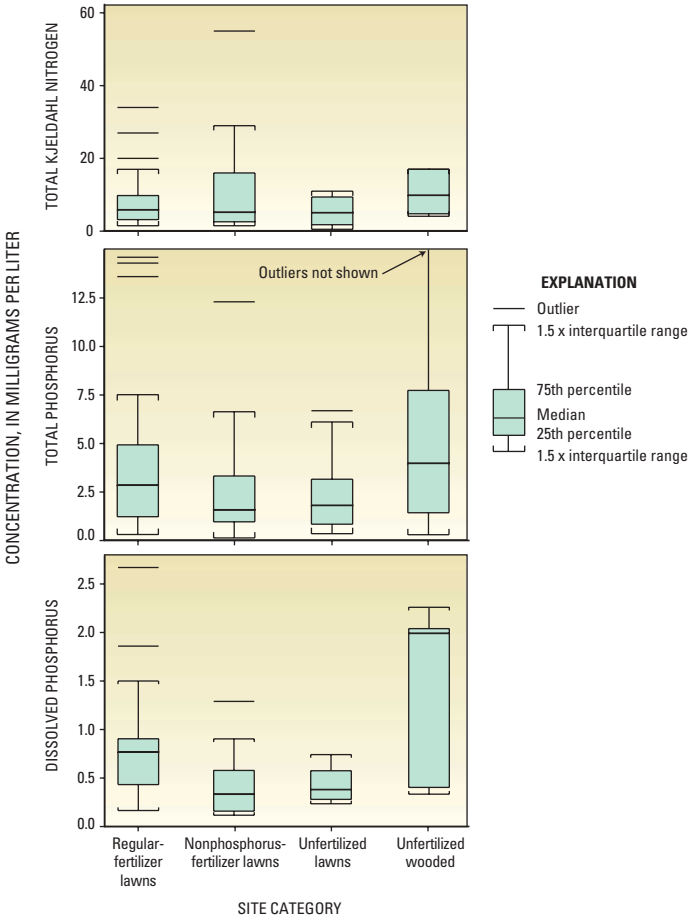

Figure 7. Nutrient concentrations in runoff from different categories of sampling sites at Lauderdale Lakes, Wis.

for differences in medians between pairs of lawn categories (P.W. Rasmussen, Wisconsin Department of Natural Resources, written commun., 2001). A confidence level of 10 percent ($p = 0.10$) was chosen to evaluate the results of the statistical tests. The difference in medians for samples from two different lawn categories was considered statistically significant if p values were less than 0.10.

A quality-control study was done to determine nutrient-concentration effects of grass clippings, earthworms, and insects that managed to get into water samples. All of these contamination sources had a large effect by increasing nitrogen and phosphorus concentrations. Samples that were affected by these contamination sources, identified from field notes, were excluded from data analysis, but the exclusions did not significantly change the overall results.

No significant differences in concentration among lawn categories were found for any of the nitrogen species. Fertilizer use did not affect total nitrogen concentrations in runoff. In addition, nitrite plus nitrate concentrations in runoff were generally low.

Dissolved phosphorus concentrations were significantly different ($p = 0.02$) among the lawn categories. Moreover, the median concentration of dissolved phosphorus from regular-fertilizer sites (0.77 milligram per liter (mg/L)) was significantly greater than that from nonphosphorus-fertilizer sites (0.33 mg/L) and unfertilized lawn sites (0.38 mg/L). Total phosphorus in runoff from regular-fertilizer sites compared to nonphosphorus-fertilizer and to unfertilized-lawn sites had p-values of 0.11 and 0.14, respectively. Thus, median total phosphorus concentrations were not significantly different at $p < 0.1$. Dissolved phosphorus was a fraction of total phosphorus, and its concentrations ranged from 22 to 45 percent of total phosphorus for all lawn categories.

Figure 8. Dense understory vegetation on wooded slope of sites 16 and 17 at Lauderdale Lakes, Wis.

The median dissolved phosphorus concentration in lawn runoff from regular-fertilizer sites was twice that for unfertilized and nonphosphorus-fertilizer sites. Runoff from lawn sites with nonphosphorus-fertilizer applications had a median dissolved phosphorus and total phosphorus concentration that was similar to unfertilized sites. Dissolved phosphorus in runoff is important because it is readily available for plant growth. Although not significant at $p < 0.1$, lawn sites with regular fertilizer applications had a median total phosphorus concentration in runoff that was 1.6 times that for unfertilized sites and 1.8 times that for nonphosphorus-fertilizer sites.

In comparison with other studies, phosphorus concentrations in lawn runoff at Lauderdale Lakes were slightly higher than concentrations found in runoff from urban lawns in Madison, Wis. (Waschbusch, Selbig and Bannerman, 1999), but were similar to those in lawn runoff from suburban lawns in Minneapolis/St. Paul, Minn. (Barten and Jahnke, 1997). Surprisingly, nutrient concentrations in runoff from the unfertilized, steep, wooded hillsides (sites 16, 17, and 18) were higher than those from the lawn sites and thus were separated from the unfertilized lawn sites in the data comparisons. These wooded sites (fig. 8) may be different from other wooded sites because of their steep slopes, thick surface organic and litter layer, and dense understory vegetation (crown vetch) planted for erosion control. Waschbusch, Selbig, and Bannerman (1999) found a direct relation between phosphorus concentration and percentage of overhead tree canopy that could affect source-area concentrations. In the Lauderdale Lakes study, however, all lawn categories contained sites with overhead tree canopy, and the lawn sites treated with regular fertilizer had the fewest trees; therefore, differences between regular-fertilizer sites and the other lawn sites could be even greater if there was an effect from tree cover.

Total phosphorus concentration in lawn runoff had a significant ($p = 0.08$) relation to soil-phosphorus concentration (table 1); total dissolved phosphorus had no significant relation. The low category of soil-phosphorus concentration (0 to 24 parts per million (ppm)) had a significantly lower median concentration of total phosphorus in lawn runoff (about half) than the medians from medium (25-65 ppm) or high (66 ppm or more) soil-phosphorus concentration lawns. There was no significant difference between runoff concentrations from medium and high soil-phosphorus concentration lawns. Barten and Jahnke (1997) also found a significant difference in concentration of phosphorus in runoff from different categories of lawn soil fertility. In their study, total and soluble reactive phosphorus concentrations in runoff from high soil-phosphorus concentration lawns were twice as large as the concentrations in runoff from low soil-phosphorus concentration lawns.

Median nutrient concentrations from the Don Jean Bay swale area with mixed land use were more similar to those from the unfertilized wooded sites and fertilized lawn sites than to those from other lawn sites (table 3). The range in concentrations for ammonia nitrogen and total Kjeldahl nitrogen in runoff from the swale, however, was greater than those for the other sites.

Although it was not within the scope of this study to measure runoff volumes from each of the sites and quantify the mass of nutrients transported offsite, the concentration data will be useful for future computations of unit-area loads (that is, mass of a particular nutrient species per unit contributing area). Concentrations of nutrients from lawns observed in this

Table 3. Statistical summary of nutrient concentrations in runoff from different site categories, Lauderdale Lakes, Wis. [n, number of samples; TKN, total Kjeldahl nitrogen; NO_2, nitrite nitrogen; NO_3, nitrate nitrogen; TP, total phosphorus; Diss P, dissolved phosphorus; all concentrations in milligrams per liter]

	Ammonia N	TKN	$NO_2 + NO_3$	TP	Diss P
Regular-fertilizer lawn sites					
Geometric mean	1.11	5.9	0.09	2.57	0.7
Median	1.07	5.9	0.12	2.85	0.77
Mean	2.18	8.6	0.17	4.02	0.93
Max	14.5	34	0.56	23.2	3.32
Min	0.05	1.5	0.01	0.31	0.17
n	23	23	23	58	23
Nonphosphorus-fertilizer lawn sites					
	Ammonia N	TKN	$NO_2 + NO_3$	TP	Diss P
Geometric mean	1	6.5	0.14	1.89	0.34
Median	0.93	5.2	0.14	1.58	0.33
Mean	3.95	12.2	0.57	3.3	0.45
Max	36.2	55	5.22	23.5	1.29
Min	0.04	1.5	0.14	0.14	0.12
n	14	14	14	38	15
Unfertilized lawn sites					
	Ammonia N	TKN	$NO_2 + NO_3$	TP	Diss P
Geometric mean	0.76	4.08	0.12	1.73	0.4
Median	0.63	5.1	0.14	1.81	0.38
Mean	1.12	5.85	0.17	2.33	0.43
Max	2.98	11	0.4	6.69	0.74
Min	0.22	0.53	0.01	0.36	0.23
n	9	9	9	19	8
Unfertilized wooded sites					
	Ammonia N	TKN	$NO_2 + NO_3$	TP	Diss P
Geometric mean	2.95	12.7	0.16	3.52	1.04
Median	4.38	9.8	0.24	3.98	1.99
Mean	5.33	29.3	0.9	6.78	1.4
Max	11.6	130	2.24	30.6	2.26
Min	0.41	4.1	0.01	0.3	0.33
n	5	6	5	28	5
Don Jean Bay swale sites					
	Ammonia N	TKN	$NO_2 + NO_3$	TP	Diss P
Geometric mean	3.48	14.5	0.06	2.46	0.49
Median	3.96	19	0.04	2.66	0.41
Mean	11.91	31.3	0.15	3.55	0.91
Max	88.1	160	0.6	9.07	3.33
Min	0.56	2	0.01	0.37	0.18
n	11	11	10	19	9

study are much greater (by 3 to 5 times) than the estimated concentrations used to calculate total phosphorus load from surface runoff to Lauderdale Lakes in a previous study by Garn and others (1996, p. 16). All of the nutrient load from lawn runoff may not actually reach or be deposited in the lake because of varying flowpaths, soil permeability, breaks in slope, vegetative buffers, and other obstructions; however, in many cases, lawns extend and slope continuously to the water's edge to provide a direct source of loading.

The annual phosphorus load from the nearshore area of Lauderdale Lakes may be greater than the 430 pounds previously estimated. Using a revised median concentration of 2.3 mg/L for surface runoff from an estimated 220 acres of developed shoreline (67 percent of shoreline) within 200 feet from the edge of water, annual total phosphorus load from residential lawns could be as much as 370 pounds (assuming all of the phosphorus reaches the lake). If a delivery of 50 percent of the load is assumed, and the total surface-water load is recomputed using the surface runoff values from the previous study, the total annual surface-water load from the nearshore drainage area would be 620 pounds, which represents 60 precent of the total annual phosphorus input from all sources. Studies at Lauderdale Lakes and several other ongoing studies by the USGS in Wisconsin will provide additional information on the effects of lawns and shoreline development on nutrient loads to lakes.

Limitations of Results

- Many runoff samples (about 30 percent) overflowed the collecting bottle and may not be truly representative of the mean concentration from each storm. According to T.D. Stuntebeck (U.S. Geological Survey, unpub. data, 2002), overflow samples for suspended solids and total phosphorus had higher concentrations than those from samples that did not overflow the container, but the opposite was true for dissolved phosphorus. Barten and Jahnke (1997) also found that overflow samples had lower concentrations for some constituents. Overflow occurred, however, for all categories of sites, and differences noted could potentially be even greater.
- The number of samples for some categories was relatively small for rigorous statistical analysis, and the small numbers could lead to inconsistencies among comparisons for different pairs of categories.
- Nutrient-concentration data are for onsite runoff and should be used with caution when making offsite interpretations. Not all of the nutrient load from lawn runoff may actually enter the lake.
- Some changes in nutrient species composition affecting dissolved constituents may have occurred in those samples that were not collected within 2 days after a storm.

Conclusions

- A high percentage of storms resulted in surface runoff from many of the lawns. Runoff from lawns may occur relatively frequently, more than 50 percent of the storms for many lawns.
- Fertilizer use did not affect nitrogen concentrations in runoff. Nitrite plus nitrate concentrations in runoff were generally low.
- Total phosphorus concentration in lawn runoff was directly related to the phosphorus concentration of lawn soils.
- Dissolved phosphorus concentrations were significantly different among the lawn categories; the median from regular-fertilizer sites was twice that from unfertilized or nonphosphorus-fertilizer sites.
- Runoff from lawn sites with nonphosphorus fertilizer applications had a median total phosphorus concentration that was similar to that of unfertilized sites, an indication that nonphosphorus fertilizer use may be an effective, low-cost practice for reducing phosphorus in runoff.

Acknowledgments

Thanks are extended to Scott Mason of the Lauderdale Lakes Lake Management District for his assistance in this study; to the lakeshore homeowners that allowed us to install sampling equipment in their lawns; and to the Wisconsin Department of Natural Resources, Lake Protection Grant Program.

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Information

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Printed on recycled paper

From: Mark Olson
To: Chiu, Wayne@Waterboards
Subject: Comment Tentative Order No.R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu
Date: Friday, January 11, 2013 12:57:56 PM
Importance: High

Dear Mr. Chiu:

As a member of the San Diego Regional Chamber of Commerce, I am responding to the San Diego Regional Water Quality Control Board's Tentative Order R9-2012-0011 ("Permit") dated October 31, 2012. After reviewing and speaking with people involved with the proposed Permit, I am concerned it will impose expensive, onerous, and untested regulations on local governments, businesses and residents. These new regulations will impact the region's economy without improving its water quality.

Everyone understands the importance of clean, safe water to the region. As a member of the business community, I too am interested in improving San Diego's water. It is important, however, that we use our limited resources wisely and ensure that our efforts produce the desired outcome of improving water quality.

I applaud the Board's inclusion of Water Quality Improvement Plans (WQIP) as a first step in developing a cost-effective approach to improving our water. Analysis remains a critical component of a successful strategy, and I am glad to see that the Board is committed to finding the best possible solution to water quality improvement.

I am concerned, however, that the costs associated with enforcing and implementing the permit will have a negative impact on my business and San Diego's economy. The four primary areas of concern include: 1) the strict liability for exceeding water quality objectives; 2) the additional and changing requirements for development projects, impacting items such as storm water retention and discharge; 3) the preemption of WQIPs by new and changing regulatory requirements prior to allowing the WQIPs to be developed and implemented; and 4) the lack of reliable funding sources to implement these regulatory changes.

It is necessary to hold individuals, businesses and governments accountable, but it is critical that the accountability measures can be reasonably achieved and are likely to have a significant and positive impact on San Diego's water. Because of these concerns, I respectfully request that the Permit focus on the timely development of effective and enforceable WQIPs, and that each of the WQIPs be developed through a process that ensures public participation. I ask also that the designation of appropriate Best Management Practices in each watershed be determined through the WQIP process rather than the one size fits all strategy currently being proposed in the Permit. I ask further that until the Board adopts a WQIP for a watershed that the provisions of the existing Permit remain in place for that watershed. Finally, in order to avoid unnecessary litigation I request that the Board adopt the WQIPs as Orders implementing the proposed Permit.

I urge you to adopt final permit language that is evidence-based and both environmentally and economically sustainable. Thank you for your consideration. Please contact me at (858) 354-1441, if you have any questions.

Sincerely,

Mark Olson

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January 11, 2013

By E-Mail and Delivery

Wayne Chiu, P.E.
California Regional Water Quality Control Board, San Diego region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Subject: Comment – Tentative Order No. R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu.

Dear Mr. Chiu:

The County of Orange, as Principal Permittee of the Orange County Stormwater Program (Program), appreciates the opportunity to provide comments on *Tentative Order No. R9-2013-0001, NPDES No. CAS0109266, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region (Tentative Order)* issued on October 31, 2012. The south Orange County Permittees (Permittees) were involved in the development of these comments and the Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano have directed that they be recognized as concurring entities on this letter. We have also coordinated our review with permittees in Riverside and San Diego Counties, who have identified many of the same issues with the Tentative Order. We support their comments except where noted otherwise in the attachments to this letter.

The Permittees have been actively engaged in discussions of the prior Administrative Draft of Tentative Order No. R9-2012-0011 (and subsequently on Tentative Order R9-2013-0001). Since April 9, 2012 the Permittees have participated with Board staff in two Orange County-specific meetings, an initial public workshop (April 25), four "focused meetings" (June 27, July 11, July 25 and August 22), a hydromodification workshop (August 30), and a final public workshop (September 5). We also conveyed in writing our concerns regarding the scheduling and appropriateness of this effort (see prior correspondence dated May 10, 2012, May 17, 2012 and July 3, 2012) and submitted extensive comments on the Administrative Draft on September 14, 2012 (all of which are incorporated by reference).

We recognize the significant efforts of Regional Board staff to engage the Permittees and key stakeholders in the development of a regional permit in a collaborative manner. We also recognize that Tentative Order No. R9-2013-0001 reflects a number of changes directly in

response to Permittee comments. The Tentative Order, however, still contains many issues of significant concern and does not, in our view, achieve at this time what Board staff laid out as its intended purpose and approach during the workshop process. Our extensive comments on the Tentative Order are organized and submitted as follows:

- A summary of our overarching concerns with the Tentative Order are included below in this letter
- Attachment A presents detailed comments on the entire permit
- Attachment B presents a redline/strikeout version of recommended changes to the Tentative Order.

The County is aware that Regional Board staff has held a number of meetings and discussions with San Diego Permittees since the release of the Tentative Order R9-2013-0001 on changes they are proposing. The Orange County Permittees would similarly request the opportunity to meet with you and other Regional Board staff to review in detail the changes requested in this comment submittal.

Overarching Issues of Concern with the Tentative Order

I. Failure to Consider Orange County Permittee Programs and Accomplishments

The Orange County Stormwater Program has been regulated under municipal NPDES stormwater permits since the first permit was issued in 1990. Subsequent permits were issued in 1996, 2002, and 2009. Since the inception of the Program the County of Orange and the other 12 Permittees have developed a comprehensive Drainage Area Management Plan (DAMP) that serves as the principal policy and guidance document for the entire Program, Local Implementation Plans (LIPs) that are developed by each Permittee to identify how the program is implemented on a city/jurisdiction basis, and through a series of watershed workplans for each watershed in the San Diego Region. These workplans detail the Permittee efforts to prevent and control pollutants on a watershed level.

The Orange County Stormwater Program is one of the few programs to date to have actively defined a series of performance metrics (headline measures) and use an assessment framework to define the relationships between compliance actions and, ultimately, positive changes in water quality. This assessment process is important because, in the end, the goal of the Program is to reduce urban pollutants and assist in attaining water quality standards.

Looking at the achievements that the Program has had since 1990, several major themes emerge:

- The Orange County Stormwater Program is proactive and a leader within the State
- The Permittees are engaged in the Program and provide valuable input into the process
- The Program uses several separate, but highly inter-related water quality planning processes to address urban sources of pollutants

- The Program recognizes the benefits of watershed-based planning and regional controls and has an increased emphasis to support this as foundational to the success of the Stormwater Program
- The Permittees adaptively manage the Program - the iterative process is actively employed and necessary modifications are proposed, reviewed and incorporated into the Program. Collaborative research is a key tool to understand and characterize sources of pollutants
- The existing framework and implementation of the Program meets or exceeds the permit requirements
- The Program receives significant funding and resources to ensure that it is successful
- Improvements in water quality have been realized including delistings from the 303(d) list

Specific successes include:

- With the 2010 303(d) List, Dana Point Harbor was delisted for indicator bacteria and several shoreline segments were delisted for *Enterococcus*, Fecal Coliform and/or Total Coliform
- In 2012, water quality in Orange County was excellent with 89% A grades and 94% B or better grades as reported by Heal the Bay in their annual beach water quality report card. Wet weather grades were fair (69% A or B grades) but bested the five-year average by 15%. Furthermore, for almost ten months (June 21, 2011 to April 6, 2012) Orange County did not have any beach closures, which is unprecedented. This is the longest stretch of time the county has gone without a single beach closure.
- The Permittees' public education program has changed public awareness as shown by surveys and is clearly promoting behaviors in our residents that are protective of water quality. In 2006 this effort – Project Pollution Prevention – was formally recognized for its excellence on a statewide basis by CASQA. In 2012, the American Public Works Association recognized our Project Pollution Prevention Public Education website as a "model practice." Results from the 2012 Public Awareness Survey of Orange County Residents indicate increased overall knowledge of stormwater issues and willingness to participate in stormwater pollution preventative behaviors in some key areas.
- With respect to land development, in 2012 the OC Engineering Council awarded the County with an Engineering Project Achievement Award for the Technical Guidance Document, which is the companion document to the Model Water Quality Improvement Plan.

There is concern that these achievements and the significant local engagement in the Program are not considered and approaches developed by the Permittees are sometimes overridden by the Tentative Order without support. For example, provisions dealing with land development, Low Impact Development (LID) and hydromodification control are significantly ratcheted up while award-winning permit programs are only just being implemented and/or pending approval and the programmatic successes as demonstrated with the annual effectiveness assessments are not recognized.

II. Lack of Authority to Include the Orange County Permittees in a Regional Permit

The Regional Board lacks the authority to include Orange County Permittees in a Regional Permit because there is no system-wide, jurisdiction-wide, watershed or other basis to do so. Orange County's MS4 does not interconnect with Riverside and San Diego Counties. There is no shared jurisdiction or other regional stormwater management authority that is applying for one permit. Orange County does not drain into a shared watershed, and the County is not adjacent to either county due to large federal lands that isolate Orange County from Riverside and San Diego. In addition, the quantity and nature of pollutants are different between the three counties. Therefore, the Regional Board cannot under federal and state regulations impose a Regional Permit without the Permittees expressly consenting to the Board's jurisdiction, as was done in the San Francisco Bay Area Regional Permit.

When preparing for the next iteration of each permit, the Permittees spend a significant amount of time and energy developing a Report of Waste Discharge (ROWD). The ROWD discusses the Permittee's compliance activities and includes a description of accomplishments, an assessment of program effectiveness using the California Stormwater Quality Program Effectiveness Assessment (CASQA) guidance in conjunction with the iterative process, the necessary programmatic changes that are evident as a result of the assessment, and, finally, a proposed new management program in the form of a draft updated DAMP. In the case of the current Tentative Order, new requirements are being proposed and will be adopted for south Orange County in the absence of a ROWD, since the Permittees are still covered by an existing permit and have not been required to submit one. As noted in previous correspondence, inclusion of south Orange County in a regional permit and in the absence of a ROWD is inappropriate.

III. Consistency in MS4 Permitting

In 2009, your staff committed in the last permit renewal to look at consistency with the State's other MS4 permits, notably those being promulgated by the Santa Ana Regional Board. This commitment represented recognition of the Little Hoover Commission's conclusions on the lack of consistency in MS4 permits as a critical area of concern and USEPA's interest in seeing greater permitting consistency. Nonetheless, while Regional Board staff has stated that the Tentative Order is meant to be a modest incremental update of the current south Orange County permit, it nevertheless escalates the regulatory requirements in many key areas, creates greater variance with the north Orange County permit, and appears to represent a singular rather than statewide vision of the future of MS4 permitting. The Fact Sheet (Attachment F) points to two similarities between the current Santa Ana Regional Board MS4 permit and the Tentative Order, but fails to identify the numerous other areas of inconsistency.

To the extent that the Tentative Order may ease the regulatory burden for your staff, there will be a commensurate increase in the burden for the County other Permittees that are dealing with multiple Regional Board jurisdictions if permitting in California continues to be defined by divergent rather than convergent approaches. We have therefore proposed many changes to the Tentative Order supportive of a more cogent alignment of our countywide Program. This consistency is important to the credibility of our respective efforts to manage urban runoff and is vital to sustaining the obvious cost effectiveness of a coordinated countywide program in

Orange County with promising synergies in other regions at a time of widespread economic distress for many communities.

It should also be noted that the Tentative Order provides no consideration at all for the five Permittees whose jurisdictional area is regulated under separate permits from the Santa Ana and San Diego Regional Boards. Fundamentally different requirements between our two permits, particularly within the same city, damage the credibility of the regulatory framework and confound the ability of local government to cost effectively address key environmental mandates.

IV. Prohibitions and Limitations

The Prohibitions and Limitations language in MS4 permits statewide was recently the subject of a State Water Resources Control Board workshop on November 20, 2012. The County provided testimony at this workshop expressing concern that the new iteration of permit language could expose the Permittees to State and federal enforcement actions, as well as to third party actions under the federal Clean Water Act's citizen suit provisions. This was the case with the recent Ninth Circuit Court of Appeals decision in the case of *Los Angeles County Flood Control District v. Natural Resources Defense Council*, No. 11-460, slip op. (Jan. 8, 2013). The proposed Prohibitions and Limitations provisions in the Tentative Order, as written, could be construed as standalone provisions that could expose the Permittees to Clean Water Act liabilities for discharges that cause or contribute to an exceedance of a water quality standard. Receiving water limitations must provide a compliance mechanism for exceedances of effluent limitations, water quality standards or TMDLs if the Permittees are diligently following an iterative process and implementing BMPs to the MEP standard

The Tentative Order should then reaffirm the iterative process in that compliance is to be achieved over time using improved BMPs. The iterative process is a fundamental aspect of MS4 programs, as envisioned by State Water Board Order 99-05 and later reconfirmed in Order WQ 2001 15 (BIA Order), and is the mechanism by which MS4 Permittees should demonstrate compliance. The County supports this approach and believes that the Regional Board has discretion on the receiving water limitations language beyond what is required to be included per Water Board Order 99-05.

The Permittees envision Water Quality Improvement Plans (WQIPs) as the foundation for an iterative BMP-based compliance approach for the discharge prohibitions and limitations and have provided detailed comments and recommended redline permit language in Attachment A.

V. New Requirements for Land Development

The evolution of MS4 permitting has largely been defined by a focus on land development. In 2009, MS4 programs on a statewide basis started to transition requirements for land development from "treat and release" runoff management to onsite retention with a new emphasis on LID, and hydromodification. Currently, while there is recognition of an emerging paradigm that the future management of urban landscapes should be based upon the principal

of seeking to restore of natural hydrologic processes, there is absolutely no clear consensus on how and where this approach should be effected.

The comments and proposed redline permit language in Attachments A and B are intended to shift the land development program toward an approach based upon nationally accepted LID principles, recognize the uncertainties and need for greater flexibility in hydromodification requirements, and offer a mitigative approach to urban land development that will produce meaningful environmental outcomes. Our revisions would recognize biofiltration as an equal LID BMP; ensure that the significantly more challenging requirements related to hydromodification are not imposed for discharges to channels that are engineered, concrete lined, significantly hardened, and/or are regularly maintained as part of a regional flood control program; and incorporate USEPA green street guidance to provide greater flexibility for land-constrained street, road, and highway projects consistent with other adopted MS4 permits in the State.

Additionally, the County has continued concern that the provisions dealing with land development, LID and hydromodification controls are significantly ratcheted up in the Tentative Order while existing Fourth Term Permit programs are only just being implemented and/or pending approval. The fact sheet and findings provide no foundation for the changes being proposed.

VI. TMDL Incorporation

The Regional Board has adopted two Basin Plan Amendments to establish Total Maximum Daily Loads (TMDLs) where the Permittees are assigned wasteload allocations: (1) Indicator Bacteria in Baby Beach in Dana Point Harbor and (2) Indicator Bacteria, Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek).

There are several fundamental and substantive discrepancies between the adopted TMDL Basin Plan Amendments and the provisions of the Tentative Order. These inconsistencies negate the Basin Plan Amendment process that occurred to establish the TMDLs and clearly contradict the Board's intent for how the TMDLs would be incorporated into the MS4 Permit. The Tentative Order should be revised to ensure that the TMDLs are properly incorporated as mass-based WLAs and not as concentration-based limits and that BMP-based compliance is established for the TMDL provisions. The Tentative Order should also provide an explicit re-opener provision to ensure that any revision to the TMDL is included in the adopted Order.

VII. Complimentary Watershed and Jurisdictional Planning

The WQIP approach represents a significant advance in the development and implementation of stormwater programs. The WQIP framework allows for the identification and development of a program built around the highest priority water quality conditions within a specific watershed. The WQIP also allows for the integration of all program elements and focuses the efforts on the highest priorities for each watershed through the customization of actions and strategies. If positioned correctly, the WQIP can be a significant advance in making the

Tentative Order and corresponding compliance programs truly strategic, adaptive, and synergistic.

The County believes the Tentative Order provisions, especially Provision E, JRMP, deviate from the strategic and adaptive approach to the anachronistic "one-size fits all" approach. For example, the Existing Development provisions dictate that specific BMPs that must be implemented, regardless of the high priority water quality concerns within a watershed. These provisions become "additive" instead of "prioritized" and are not supportive of the overarching WQIP. The Tentative Order should be modified so that the WQIPs and related Jurisdictional Runoff Management Plans can be streamlined and focus on the highest priorities within each watershed.

Thank you for your attention to our comments. Please contact the undersigned directly if you have any questions. For technical questions, please contact Chris Crompton at (714) 955-0630 or Richard Boon at (714) 955-0670.

Very truly yours,

Mary Anne Skorpanich, Manager
OC Watersheds

Ryan M. F. Baron
Senior Deputy County Counsel
Office of County Counsel

Attachments: A – Detailed Comments
B – Redline Version of the Tentative Order

Cc: (Electronic copies only)
David Gibson, San Diego Regional Board
Tony Felix, San Diego Regional Board
South Orange County Permittees
Orange County Technical Advisory Committee
Tony Olmos, Orange County Public Works
Todd Snyder, County of San Diego
Jason Uhley, Riverside County Flood Control and Water Conservation District
Andrew Kleis, City of San Diego

ATTACHMENT A

ORANGE COUNTY DETAILED COMMENTS ON CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD SAN DIEGO REGION TENTATIVE ORDER No. R9-2013-0001 NPDES NO. CAS0109266

This document, Attachment A, contains the detailed legal and technical comments of the County of Orange and the Orange County Flood Control District (collectively, the "**County**") on Tentative Order No. R9-2013-0001 dated October 31, 2012 ("**Tentative Order**"). These comments are divided into three sections (*General*, *Findings*, and *Permit Provisions*) and address issues relating to specific parts of the Tentative Order. At times, the issues and concerns raised will pertain to more than one section of the Tentative Order. In addition to the recommended language changes identified below, Attachment B (the recommended changes to the Tentative Order) also includes some minor edits in order to provide additional clarification where necessary.

The County of Orange, as the Principal Permittee, and the cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Lake Forest, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano collectively refer to themselves as "San Diego Region Permittees" or "Permittees." The Tentative Order refers to the County and incorporated cities of South Orange County as the "Copermittees." As such, the comments below use the term "Copermittees" to be consistent with the terminology of the Tentative Order.

GENERAL

1. Permitting Consistency Is Critical Since Several Copermittees Are Regulated Under Multiple Regional Boards

Although the County of Orange is very supportive of the overall approach that the San Diego Regional Water Quality Control Board (Regional Board) is proposing with the development of the Water Quality Improvement Plans (WQIPs) to guide the Copermittees' jurisdictional runoff management programs (JRMPs) towards the high priority water quality conditions within a watershed to achieve improvements, it is critical that consistency be maintained between Regional Boards, where feasible.

The Orange County stormwater program operates a unified countywide program of 36 Permittees, with five (5) Copermittees split between two (2) Regional Boards. Consequently, a number of our comments are aimed at creating greater uniformity and implementability between the two permits that we operate under. Fundamentally different requirements between our two permits, particularly within the same city, damage the credibility of the regulatory framework and confound the ability of local government to cost effectively address key environmental mandates. To this end, the County of Orange (County) has provided some recommended language changes within this document and Attachment B in order to try to preserve that consistency.

2. Many of the New or Modified Requirements within the Tentative Order Do Not Have Adequate Findings of Fact and/or Technical Justification

In many instances the Findings and/or Fact Sheet provide little or no justification of the need for the new requirement. Although Finding 35 states that the Fact Sheet "contains background information, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of this Order", many of the new or modified requirements within the Tentative Order do not have adequate findings of fact and/or technical justification. In addition, they do not identify the "program deficiency" that warrants the modification. The comments provided herein identify many of the areas where new or modified provisions of the Tentative Order lack factual or technical support in the Findings and/or Fact Sheet. Examples of this include, but are not limited to, the following:

- Basis for including Orange County in the regional municipal stormwater permit;
- Basis for the 10 year timeline to achieve the final numeric goals identified within the Water Quality Improvement Plans (WQIPs);
- Basis for requiring uncontaminated pumped ground water, foundation drains, water from crawl space pumps, and footing drains to obtain coverage under the San Diego Region groundwater extraction permits;
- Basis for including single family residential projects as a category requiring coverage as a Priority Development Project;
- Basis for including U.S. Green Building Council (USGCB) Leadership in Energy and Environmental Design (LEED) as exemption criteria for single family residential projects and for alternative compliance for hydromodification management;
- Basis for requiring conventional BMPs onsite in addition to alternative compliance;
- Basis for hydromodification requirements not considering existing Hydromodification Management Plans and being a one size fits all approach;
- Basis for biofiltration BMPs required to be sized at 1.5 times the design capture volume;
- Basis for biofiltration BMPs not being an effective LID and treatment measure per the requirement to size them at 1.5 times the design capture volume and also require conventional BMPs when they are used.
- Basis for offsite regional BMPs required to be sized at 1.1 times the design capture volume;
- Basis for verification of coverage under all related permits for construction sites;
- Basis for evaluation and retrofit/rehabilitation of stream channel systems;
- Basis for including residential driveways as a category requiring coverage as a Priority Development Project;
- Basis for not incorporating the Total Maximum Daily Load (TMDL) waste load allocations (WLAs) into the Tentative Order; and
- Basis for establishing Water Quality Based Effluent Limits (WQBELs) expressed as numeric effluent limitations, in lieu of WQBELs expressed as BMPs, for the TMDL provisions.

3. The Numbering in the Tentative Order Should Explicitly Identify the Major Sections to Help Guide the Reader

The County is recommending that the Regional Board explicitly identify the numbering system within the Tentative Order subsections in order to assist and orient the reader. For example, within the Provisions (Section II of the Tentative Order):

- The sub-sections within Provision A should be listed as:
  - *A.1 Discharge Prohibitions* instead of *1. Discharge Prohibitions*
  - *A.2 Receiving Water Limitations* instead of *2. Receiving Water Limitations*

- The sub-sections within Provision B should be listed as:
  - *B.1 Watershed Management Areas* instead of *1. Watershed Management Areas*
  - *B.2 Priority Water Quality Conditions* instead of *2. Priority Water Quality Conditions*

Given the styles and formatting currently used within the Tentative Order, these edits were not made within Attachment B.

FINDINGS

4. Finding 2 (Page 1 of 120) – A Regional Permit Cannot Be Issued to Orange County Because There Is No System-wide, Jurisdiction-wide, Watershed or Other Basis to Do So

The Tentative Order is intended to cover Copermittees in three large metropolitan counties – Orange, Riverside and San Diego. In May 2012, Orange and Riverside Counties ("**Counties**") sent letters to Staff Counsel for the Regional Board requesting the legal authority to issue a regional permit to the three counties.[1] The Counties contended that, in accordance with federal regulations, there was no system-wide, jurisdiction-wide or watershed basis to issue a regional permit. The Counties also asserted that the lack of a Report of Waste Discharge (ROWD) process for either county prior to the initial adoption of the Tentative Order prevented the issuance of a regional permit on the grounds that there was a conflict with both federal and state law. On September 7, 2012, Staff Counsel responded to the Counties stating that there was a jurisdiction-wide and watershed basis to impose a regional permit on the Counties, and cited legal authority and examples in the Bay Area and an Alaskan borough where regional permits had been issued.[2]

For the following reasons, the County continues to believe that the Regional Board lacks authority to issue a regional permit to Orange County:

1. Orange County's MS4 system does not interconnect with Riverside and San Diego Counties,
2. There is no jurisdictional basis to issue a regional permit to Orange County,

[1] Letter from Ryan M. F. Baron, Office of County Counsel, County of Orange, to Catherine Hagan, Office of Chief Counsel, State Water Resources Control Board, San Diego Region (May 10, 2012); Letter from David H. K. Huff, Office of County Counsel, County of Riverside, to Catherine Hagan, Office of Chief Counsel, State Water Resources Control Board, San Diego Region (May 21, 2012).

[2] Letter from Jessica Jahr, California Regional Water Quality Control Board, San Diego Region, to Ryan M. F. Baron, Office of County Counsel, County of Orange, and David H. K. Huff, Office of County Counsel, County of Riverside (Sept. 7, 2012).

3. Orange County's MS4 does not drain into a shared watershed, and
4. Orange County's MS4 is not adjacent to Riverside or San Diego's MS4, and the quantity and nature of pollutants differ between the three counties.

Therefore, the Regional Board cannot under federal and state regulations impose a Regional Permit without the Permittees expressly consenting to the Board's jurisdiction.

A. There Is No System-wide, Jurisdiction-Wide, Watershed or Other Basis by Which to Legally Impose a Regional Permit on Orange County

Finding 2 in the Tentative Order states that the legal and regulatory authority for implementing a regional MS4 permit stems from Section 402(p)(3)(B) and 40 CFR 122.26(a)(1)(v). The Tentative Order also cites EPA's Final Rule regarding stormwater discharge permit application procedures that there is flexibility to establish system-wide or region-wide permits.[3] During Focused Meeting Workshops conducted on June 27, 2012 and July 11, 2012, Regional Board staff stated that the reason for a regional permit was to consolidate all three permits into one to lessen the amount of permit writing time for three separate permits and reduce internal costs for writing and issuing permits. The justification at Finding 2 is largely the same although it adds that the "regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall costs savings for the Copermittees and San Diego Water Board."[4]

First, although Orange County geographical boundaries abut San Diego and Riverside Counties, Orange County's MS4 does not interconnect with the counties regulated under the regional permit (see map in **Appendix A-1**). There is substantial undeveloped area between the developed jurisdictions of Orange County and Riverside Counties. The Santa Ana Mountains and the Cleveland National Forest separate Orange and Riverside Counties encompassing tens of thousands of acres of total land separating the two counties. Camp Pendleton military base separates Orange and San Diego Counties totaling over 122,000 acres with no adjacent cities or interconnected MS4s. Clean Water Act (CWA) regulations expressly state that a permit can be issued on a system-wide basis covering all discharges from MS4s within a large or medium municipal storm sewer system. One of the primary considerations in defining a "large or medium municipal separate storm sewer system" is one that has physical interconnections with other municipal separate storm sewers.[5] In this case, there are no physical interconnections.

Secondly, there is no jurisdiction-wide basis to issue a regional permit. 40 CFR 122.26(a)(3)(ii) states that one system-wide permit can cover all discharges from MS4s within a large or medium municipal storm sewer system located within the same jurisdiction. Orange, Riverside and San Diego Counties are separate counties with distinct political and geographical boundaries that do not drain into a common watershed and do not share physical interconnections. The three counties are not within the same political jurisdiction. While Region 9 can be considered one jurisdiction for Regional Water Board purposes, federal regulations state that there has to be one stormwater management regional authority in which to issue a permit, and the Regional Board is not such an authority.[6] Regardless, such a permit can only be issued to a multi-jurisdictional entity upon a permit application and upon there being an

[3] 55 Fed. Reg. 47990, 48039-48042.
[4] Part I.2.
[5] 40 CFR 122.26(b)(4) (defining large systems); 40 CFR 122.26(b)(7) (defining medium systems)
[6] 40 CFR § 122.26(a)(3)(iii)(C).

interconnected MS4 or adjacent MS4. There is no tri-county stormwater management authority, there is no system-wide interconnection and Orange County is not adjacent to San Diego and Riverside Counties due to the large federal lands that separate the County.

Third, Orange County does not drain into a shared watershed with Riverside and San Diego Counties. The Orange County Copermittees drain into various watersheds that drain into the Pacific Ocean. The Riverside County Copermittees drain into the Santa Margarita watershed. San Diego County drains into various watersheds. Orange County's MS4 does not drain into or share one common watershed with either county, and therefore cannot be regulated on this basis.

There is no other basis by which to regulate Orange County in the same permit with Riverside and San Diego Counties. Although it is true that Orange County political boundaries abut the two counties, there are hundreds of thousands of acres of federal land that separate Orange County, and thus, the County's MS4 does not interconnect with and is not adjacent to its neighbors like Orange County is with Los Angeles County. Based on differing permit requirements for the three counties, such as TMDLs, and data filed in annual reports and past ROWDs, the quantity and nature of pollutants are different between the three counties, and do not serve as a basis or determination by which to lump all three counties into a one-size fits all permit (e.g., hydromodification). In addition, federal regulations look to interconnection and similarities between jurisdictions as the basis by which to issue one permit.[7] Federal regulations do not authorize and the EPA Final Rule does not contemplate regional permit issuance based on overall reduced cost savings, and overall cost savings have not been demonstrated in the Tentative Order.[8] And although it may be convenient to ensure consistency of regulation, EPA Final Rule contemplates such consistency within a watershed and not throughout a geographical area the size of the three counties. In fact, the EPA Final Rule does indeed use the term "regional" throughout its analysis in the Response to Comments. A careful examination of the term "regional," however, shows that EPA was analyzing whether individual permits should be issued to individual cities, a county and its incorporated cities, a set of Copermittees with interconnected sewer systems and other infrastructure, one state entity or a regional stormwater management authority. The largest area by which one permit could be issued under the Final Rule was essentially to a state entity or one county and its incorporated cities. There is no factual or technical basis in the Tentative Order that meets this criteria or establishes other bases to regulate Orange County under one unified permit. There is also no statistical basis by which to issue a regional permit as Orange County is comprised of over three million people and is the sixth largest county by population in the U.S. In fact, the U.S. Bureau of Census designates Orange County in a different Metropolitan Statistical Area than San Diego County, and is designated in a Combined Statistical Area with Los Angeles, Ventura and San Bernardino Counties.

Lastly, the letter from Staff Counsel cites examples in the Bay Area and in Alaska where regional permits have been issued. In the Bay Area, various cities and counties under that permit interconnect in some fashion and drain into the San Francisco Bay. The Bay Area is also represented by a joint powers organization or regional watershed management program comprised of 8 municipal stormwater programs that voluntarily agreed to end their existing permits early and enroll in a regional permit. In the case of the Alaska example, a "regional" permit was issued to the Fairbanks North Star Borough, City of Fairbanks, City of the North

[7] 33 USC 1342(p)(3)(B)(i); 40 CFR 122.26(a)(1)(v).
[8] 55 Fed. Reg. 47990-01.

Pole, the Alaska Department of Transportation and the University of Alaska Fairbanks. Further examination of that permit and the stormwater program maps demonstrate, though, that the region regulated is a borough, the Alaskan equivalent of a county. All of the regulated Copermittees are physically interconnected through its storm drain system and roadways, and most drain into one watershed. In short, neither the Bay Area nor the Fairbanks Borough permits provide sufficient examples of a regional permit comparable to the one being issued to Orange County.

B. There Is No Technical Basis to Regulate Orange County Due to the Lack of a Report of Waste Discharge Application.

The ROWD is a federally required application that is the technical basis to draft a new permit for a permittee. The information contained in the ROWD is used to determine prospective provisions of the new permit, including but not limited to monitoring, program strengths and other tools that are assessed in the new permit. In other words, the ROWD is the technical basis or substantial evidence for determining what will be required in the new permit. In the case of the Tentative Order, permit conditions that will apply to Orange County upon the expiration of its current permit in December 2014 or upon early enrollment are not based on any ROWD filed by the County. Thus, there is no technical basis or substantial evidence to regulate Orange County under a regional permit, and therefore, the regional permit terms and conditions are arbitrary and capricious. The initial draft of the Tentative Order did not contain a ROWD requirement for Orange County. The Order was subsequently revised to include a ROWD requirement to determine whether modification to the Order upon enrollment by Orange County is necessary, but the Tentative Order will still be adopted by the Regional Board with terms and conditions that apply to Orange County that are not based on any federally required application or report. Orange County's current Fourth Term permit has been in existence for only two years with programs that have just started, or like hydromodification, have not yet started or are in interim phases. Therefore, the current programs do not provide any meaningful benchmark by which to draft new regional permit terms that apply to the County. And, in addition, the ROWD requirement that is now in the Tentative Order is essentially an after the fact application.

In short, the Tentative Order is drafted and will be initially adopted by the Regional Board with provisions that will generally regulate Orange County Copermittees, along with specific numeric and other requirements that will only apply to Orange County that are not based on an application process or other documented technical basis. There is no substantial evidence or CWA basis by which to impose certain regulations on the County. Thus, the lack of a ROWD requirement prior to initial adoption of a regional permit is in conflict with the CWA, Porter Cologne and the California Administrative Procedure Act.

The County recommends the following language changes:

I. Findings
2. Legal and Regulatory Authority
This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]) adopted by the United States Environmental Protection Agency (USEPA), and chapter 5.5, division 7 of the California Water Code (CWC) (commencing with section 13370). This Order serves as an NPDES permit for discharges from MS4s to surface waters. This Order also serves as waste discharge requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

~~The San Diego Water Board has the legal authority to issue a regional MS4 permit pursuant to its authority under CWA section 402(p)(3)(B) and 40 CFR 122.26(a)(1)(v). The USEPA also made it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide permits (55 Federal Register [FR] 47990, 48039-48042). The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees and San Diego Water Board.~~

The federal regulations make it clear that the Copermittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators (40 CFR 122.26(a)(3)(vi)). This Order does not require the Copermittees to manage storm water outside of their jurisdictional boundaries, but rather to work collectively to improve storm water management within watersheds.

I. Findings
26. Report of Waste Discharge Process
…..The San Diego Water Board understands that each municipality is unique ~~although the Counties share watersheds and geographical boundaries~~. The Order will continue to use the Report of Waste Discharge process prior to initially making Orange County or Riverside County Copermittees subject to the requirements of this Order.

5. Finding 8 (Page 3 of 120) – It Should Not Be Presumed That Discharges From MS4s Always Contain Waste or Pollutants

Discharges may contain waste or pollutants, but it should not be presumed that they necessarily always contain waste or pollutants.

Under current law, the State Board's issuance of the Small MS4 Permit is a quasi-judicial decision.[9] As a quasi-judicial decision, the State Board's action must be supported by legally adequate findings, and those findings must be supported by evidence in the record.[10]

Pursuant to the Supreme Court's decision in *Topanga Association for a Scenic Community v. County of Los Angeles* (1974) 11 Cal.3d 506, findings are intended to "facilitate orderly analysis and ***minimize the likelihood that the agency will randomly leap from evidence to conclusions***."[11] Here, there is no cited evidence that stormwater itself is a pollutant or that in every instance it contains pollutants or waste as those terms are defined by the CWA and Porter Cologne respectively. Absent evidence demonstrating that this is the case, in all cases, the Regional Board cannot make this finding.

Moreover, as a matter of law, the Regional Board lacks the authority to regulate pure stormwater as a pollutant. The CWA and its implementing regulations define the term "pollutant" to mean:

> dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials

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[9] *City of Rancho Cucamonga v. Regional Water Quality Control Board* (2006) 135 Cal.App.4th 1377, 1385.
[10] T*opanga Association for a Scenic Community v. County of Los Angeles* (1974) 11 Cal.3d 506.
[11] *Id*., at 514 [emphasis added].

> (except those regulated under the Atomic Energy Act of 1954, as amended (42 U.S.C. 2011 et seq.)), heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water[12].

Federal regulations further define the term "stormwater" to mean: "storm water runoff, snow melt runoff, and surface runoff and drainage."[13] Notably, the definition of the term "Pollutant" does not include "Stormwater." Moreover, the text of the CWA requires the discharges of *pollutants* to be reduced to the Maximum Extent Practicable (MEP).[14] There is no prohibition on or comparable authority to regulate the discharge of pure *stormwater.*

This rationale was recently adopted by the Eastern District of Virginia, when it held that the EPA has no authority under the Clean Water Act to regulate non-pollutants.[15] Specifically, the Court stated:

> Pollutant is statutorily defined. (33 U.S.C. § 1362(6).) The Court sees no ambiguity in the wording of this statute. EPA is charged with establishing TMDLs for the appropriate pollutants; that does not give them the authority to regulate nonpollutants. The parties agree that sediment is a pollutant under 33 U.S.C. § 1362(6), and stormwater is not. Then how does EPA claim jurisdiction over setting TMDLs for stormwater.[16]

Likewise, Porter Cologne defines the term "Waste" to mean:

> sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal.[17]

While the definition is certainly different and potentially broader than the definition of *Pollutant* under the CWA, the definition of waste does not include stormwater or any other discharge that is not created by human activity. As a matter of law, the Regional Board is therefore without authority to regulate all discharges of stormwater as pollutants or waste.

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[12] 33 U.S.C. § 1362(6); 40 C.F.R. § 122.2.
[13] 40 C.F.R. § 122.26(b)(13).
[14] 33 U.S.C. § 1342(p).
[15] Virginia Dept. of Transportation v. EPA, No. 1:12-CV-775, slip op. (E.D. Va. Jan. 3, 2013).
[16] Id., at 5.

[17] Cal Water Code § 13050(d).

The County recommends the following language changes:

I. Findings

8. Point Source Discharges of Pollutants
Discharges from the MS4s may contain waste, as defined in the CWC, and pollutants that adversely affect the quality of the waters of the state. A discharge from an MS4 is a "discharge of pollutants from a point source" into waters of the U.S. as defined in the CWA. Storm water and non-storm water discharges from the MS4s may contain pollutants that cause or threaten to cause a violation of surface water quality standards, as outlined in the Basin Plan…..

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16. Best Management Practices. Waste and pollutants which are deposited and accumulate in MS4 drainage structures may ~~will~~ be discharged from these structures to waters of the U.S. unless they are removed…..

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17. BMP Implementation. …..Retrofitting areas of existing development with storm water pollutant control and hydromodification management BMPs ~~is~~ may, in many cases be necessary to address storm water discharges from existing development that may cause or contribute to a condition of pollution or a violation of water quality standards.

6. Finding 11 (Page 4 of 120) – Natural Waters Cannot Legally Be Classified as Part of the MS4, and Cannot Be Classified as Both a MS4 and Receiving Water

The Tentative Order states that development often makes use of natural drainage patterns and features as conveyances for runoff. Finding 11 goes on to state that rivers, streams and creeks in developed areas are part of the Copermittees' MS4 whether the river, stream or creek is natural, anthropogenic or partially modified. It further states that these natural water bodies are both an MS4 and a receiving water.

Finding 11 is expressly contradicted by federal regulations and a recent opinion by the U.S. Supreme Court. Natural creeks cannot legally be classified as part of the MS4, and the MS4 and a water of the U.S. cannot be comingled. The flow of water from an improved portion of a navigable waterway into an unimproved portion of the same waterway does not qualify as a "discharge of a pollutant" under the CWA.[18]

In addition, the definition of a *municipal separate storm sewer* means "a conveyance or system of conveyances including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains:

i. Owned or operated by a state, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to state law) ... including special districts under state law such as a sewer district sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the Clean Water Act that discharges into waters of the United States;

[18] *L.A. County Flood Control District v. NRDC*, slip op. (Jan. 8, 2013); *South. Fla. Water Management Dist. V. Miccosukee Tribe*, 541 U.S. 95, 109-112 (holding that the transfer of a polluted water between two parts of the same waterbody does not cause a discharge of pollutants under the CWA).

ii. Designed or used for collecting or conveying stormwater;

iii. Which is not a combined sewer; and

iv. Which is not part of a publicly owned treatment works (POTW) as defined at 40 CFR 122.2."[19]

This definition only includes man-made channels and systems and does not encompass natural water bodies simply because an outfall discharges to a receiving water. Any water quality improvement to a natural river, stream or creek does not mean it is a MS4, but an improved water of the U.S. Moreover, U.S. EPA itself, in the Preamble to its proposed MS4 regulations[20] expressly determined that "streams, wetlands and other water bodies that are waters of the United States are not storm sewers for the purposes of this rule" and that "stream channelization, and stream bed stabilization, which occur in waters of the United States" were not subject to NPDES permits under Section 402 of the CWA[21].

Lastly, municipalities do not own, control or operate natural rivers, streams and creeks. Such water bodies are often administrated by the State of California in the public trust for the right of the people to use such waters for certain purposes or are privately owned.[22] The Legislature, acting within the confines of the common law public trust doctrine, is the ultimate administrator of the trust and may often be the final arbiter of permissible uses of trust lands. Moreover, a municipality obviously cannot "operate" a natural creek or stream.

The County recommends the following language changes:

I. Findings
11. Runoff Discharges to Receiving Waters
….Historic and current development makes use of natural drainage patterns and features as conveyances for runoff. ~~Rivers, streams and creeks in developed areas used in this manner are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and receiving water.~~ Numerous receiving water bodies and water body segments have been designated as impaired by the San Diego Water Board pursuant to CWA section 303(d).

7. Finding 12 (Page 4 of 120) – Copermittees Do Not Accept Free and Open Access to MS4s, and Are Not Responsible for All Discharges not Prohibited

The Tentative Order states that MS4s willingly provide free and open access and convey discharges to waters of the U.S., and that MS4 operators then accept all responsibility for such discharges not prohibited or otherwise controlled. This is simply not the case and is legally unsupportable. An MS4 is designed to accept stormwater for flood control purposes and prevent damage to life and property. Although it is true that the Copermittees have an obligation to effectively prohibit non-stormwater discharges, namely illicit connections and unlawful dumping, it is also true that the discharger into the MS4 is ultimately responsible for a condition of pollution or violation of a water quality standard. And, in accordance with California

[19] 40 CFR 122.26(b)(8).
[20] 53 Fed. Reg. 49416 (Dec. 7, 1988)
[21] 53 Fed. Reg. at 49442.
[22] *Marks v. Whitney* (1971) 6 Cal. 3d 251, 259, 260.

state law, MS4s downstream of upstream flows must accept those flows and cannot attempt to block or divert such flows.[23] Finding 12 attempts to shift all legal responsibility to the MS4s, which is unsupported by federal and State law.

The County recommends the following language changes:

I. Findings
12. Pollutants in Runoff
…. As operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. ~~By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not prohibit or otherwise control.~~ These discharges may cause or contribute to a condition of pollution or a violation of water quality standards.

8. Finding 15 (Page 5 of 120) – The Tentative Order Must Recognize that the Discharge of All Pollutants From the MS4 is Subject to the MEP Standard

Section 402(p)(3)(B)(ii) requires the Copermittees to effectively prohibit non-stormwater discharges <u>into</u> the MS4, namely pollutants generated from illicit connections and unlawful dumping.

The Tentative Order at Finding 15, however, states that non-stormwater discharges are not subject to the MEP standard. This finding is not supported by federal law. While federal law regulates "non-stormwater discharges" <u>into</u> the MS4, Section 402(p)(3)(B)(iii) expressly states that the "discharge of <u>pollutants</u>" shall be reduced to MEP. In drafting this section of the CWA, Congress expressly intended all discharges from MS4s to be subject to MEP as it used the term "pollutant" and did not differentiate between stormwater and nonstormwater, as the Tentative Order attempts to do. Therefore, the duty of the Copermittees to reduce the discharge of pollutants <u>from</u> the MS4 to MEP applies to both stormwater and nonstormwater pollutants.

Furthermore, the focus of the CWA and federal regulations is on a management program that includes a comprehensive planning process to reduce the discharge of pollutants to MEP.[24] One of the elements of the management program is the illicit discharge prevention program.[25] The control and limitation of illicit discharges into the MS4 is intended to achieve the overall MEP standard for discharges from the MS4. This is confirmed by the preamble to EPA regulations that discuss the required elements of the management program. According to EPA:

> [Copermittees are required] to develop management programs for four types of pollutant sources which discharge to large and medium municipal storm sewer systems. Discharges from large and medium municipal storm sewer systems are usually expected to be composed primarily of: (1) Runoff from commercial and residential areas; (2) storm water runoff from industrial areas; (3) runoff from construction sites; and **(4) non-storm water discharges**. Part 2 of the permit application has been designed to allow [Copermittees] the opportunity to propose **MEP control measures for each of these components of the discharge**. 55 Fed Reg at 48052 (emphasis added). *See also* 55 Fed Reg at 48045 (stating "Part 2 of the proposed permit application [which includes the illicit discharge prevention requirement] is designed to . . . provide municipalities with

[23] *Keyes v. Romley* (1966) 64 Cal.2d 396; *Locklin v. City of Lafayette*, (1994) 7 Cal. 4th 327.
[24] 40 CFR 122.26(d)(2)(iv).
[25] 40 CFR 122.26(d)(2)(iv)(B)(1).

> the opportunity of proposing a comprehensive program of structural and non-structural control measures that will **control the discharge of pollutants, to the maximum extent practicable, from municipal storm sewers**.") (Emphasis added).

EPA's position is consistent with existing State Water Resources Control Board policy which states that discharges into the MS4 are to be controlled through an iterative, BMP based approach that is *less* stringent than the MEP standard.[26] The State Board held:

> An NPDES permit is properly issued for "discharge of a pollutant" to waters of the United States. (Clean Water Act § 402(a).) The Clean Water Act defines "discharge of a pollutant" as an "addition" of a pollutant to waters of the United States from a point source. (Clean Water Act section 502(12).) Section 402(p)(3)(B) authorizes the issuance of permits for discharges "from municipal storm sewers."
>
> We find that the permit language is overly broad because it applies the MEP standard not only to discharges "from" MS4s, but also to discharges "into" MS4s. . . [T]he specific language in this prohibition too broadly restricts all discharges "into" an MS4, and does not allow flexibility to use regional solutions, where they could be applied in a manner that fully protects receiving waters. It is important to emphasize that dischargers into MS4s continue to be required to implement a full range of BMPs, including source control. In particular, dischargers subject to industrial and construction permits must comply with all conditions in those permits prior to discharging storm water into MS4s.[27]

The State Board's decision in the Building Industry Association (BIA) matter makes clear that the CWA does not include a blanket prohibition on discharges of non-stormwater into the MS4. To the extent the Tentative Order would hold the dischargers liable in the event that any discharge into the MS4 occurs, the Tentative Order exceeds the requirements of the CWA and violates existing State Board policy.

It is also technically infeasible in some cases to differentiate between non-stormwater or stormwater pollutants discharged from the MS4. Thus, just as the discharge of non-stormwater into the MS4 is subject to the effective prohibition standard, the discharge of pollutants in non-stormwater from the MS4 is subject to the MEP standard. There are several instances where the specific provisions in the Tentative Order need to be modified in order to reflect this approach.

The County recommends the following language changes:

I. Findings
3. CWA NPDES Permit Conditions
….This Order prescribes conditions to assure compliance with the CWA requirements for owners and operators of MS4s to effectively prohibit non-storm water discharges ~~in to~~ <u>into</u> the MS4s, and require controls to reduce the discharge of pollutants in storm water from the MS4s to the MEP.

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[26] Specifically in State Board in Order No. WQ-2001-15, *In the Matter of the Petitions of Building Industry Assoc. of San Diego County and Western States Petroleum Assoc*. (2001).
[27] Id., at 9-10.

I. Findings
15. Non-Storm Water and Storm Water Discharges
The discharge of pollutants from the MS4 is subject to the MEP standard notwithstanding whether the pollutants are transported by stormwater or non-stormwater. ~~Non-storm water discharges from the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard of CWA section 402(p)(3)(B)(iii), which is explicitly for "Municipal … Stormwater Discharges (emphasis added)" from the MS4s.~~ Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s,namely identified illicit discharges and pollutants from unlawful dumping, must be effectively prohibited.

II. Provisions
A. Prohibitions and Limitations
The purpose of this provision is to describe the conditions under which storm water from and non-storm water discharges into ~~and from~~ the MS4s are effectively prohibited or limited.

E. Jurisdictional Runoff Management Programs [Intro]
The purpose of this provision is for each Copermittee to implement a program to control non-stormwater ~~the~~ discharges ~~contribution of pollutants~~ into and ~~the~~ stormwater discharges from the MS4 within its jurisdiction and to focus and prioritize those implementation actions based on the highest water quality priorities identified within the associated Water Quality Improvement Plan……

E. Jurisdictional Runoff Management Programs
1. Legal Authority Establishment and Enforcement
a.(1) Effectively prohibit and eliminate all illicit discharges and illicit connections into its MS4;
a.(2) Control the contribution of pollutants in discharges of runoff associated with industrial and construction activity into its MS4 and control the quality of runoff from industrial and construction sites

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E. Jurisdictional Runoff Management Programs
2. Illicit Discharge Detection and Elimination
a. Non-stormwater Discharges
(3) Discharges of non-storm water into the MS4 from the following categories must be controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means, where there is evidence that those discharges are a source of pollutants to waters of the state. Discharges of non-storm water into the MS4 from the following categories not controlled by the…..

E. Jurisdictional Runoff Management Programs
2. Illicit Discharge Detection and Elimination
b. Prevent and Detect Illicit Discharges and Connections
(3) Each Copermittee must promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges into or from the MS4, including the following methods for public reporting

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E. Jurisdictional Runoff Management Programs
2. Illicit Discharge Detection and Elimination
e. Investigate and Eliminate Illicit Discharges and Connections
(1) Each Copermittee must prioritize and determine when follow-up investigations will be performed in response to visual observations and/or water quality monitoring data collected during an investigation of a detected non-storm water or illicit discharge into or from the MS4

E. Jurisdictional Runoff Management Programs
2. Illicit Discharge Detection and Elimination
e. Investigate and Eliminate Illicit Discharges and Connections
(2)(c) Each Copermittee must investigate and seek to identify the source(s) of ~~discharges of non-stormwater where flows are~~ illicit discharges or illicit connections observed into and from the MS4 during the…

E. Jurisdictional Runoff Management Programs
2. Illicit Discharge Detection and Elimination
e. Investigate and Eliminate Illicit Discharges and Connections
(3)(e) If the Copermittee is unable to identify and document the source of a recurring ~~non-stormwater discharge~~ illicit discharges or connections into or from the MS4, then the….

E. Jurisdictional Runoff Management Programs
5. Existing Development Management
c. Existing Development Inspections
(1)(ii) The frequency of inspections must be appropriate to confirm that BMPs are being implemented to reduce the discharge of pollutants in storm water from the MS4 to the MEP and effectively prohibit non-storm water discharges into the MS4;

9. Finding 28 (Page 9 of 120) – The Requirements in the Tentative Order Are More Stringent Than Federal Law, Requiring An Economic Analysis. In Addition, the Current Economic Analysis Is Insufficient

Finding 28 states that pollutant restrictions are not more stringent than federal law, yet an economic analysis is still conducted pursuant to CWC 13241. Despite the finding that the Tentative Order does not exceed federal law requirements, there are a number of requirements that are more stringent.

However, when you evaluate the economic analysis presented in the Fact Sheet[1] the Regional Water Board staff did not, in fact, fully consider the 13241 factors when they make the finding that the "requirements in this Order are reasonably necessary to protect beneficial uses." There has not been a full consideration of the section 13241 factors, which would include an analysis of the economic impacts that would result from compliance with the existing stormwater permit compared to the costs of complying with the proposed stormwater permit (thereby the costs of complying with the new requirements). Instead, the Order's analysis begins by stating, and without any quantification, that it would more expensive to not fully implement programs. Section 13241 is not satisfied by this inverse analysis.

Additionally, the Tentative Order states that Copermittees have a significant amount of flexibility to choose how to implement BMPs and that "least expensive measures" can be chosen.[28] This

[28] F-17.

statement, however, conflicts with the Order's definition of MEP at C-6 which expressly acknowledges Chief Counsel's 1993 MEP memo that only the Regional and State Boards determine whether BMPs meet MEP, and that selection of the least expensive BMPs will likely not result in meeting the MEP standard.

The Fact Sheet also fails to cite any recent cost benefit numbers but relies on inapplicable cost data such as a 1999 EPA study on household costs.

The analysis of costs contained in the Fact Sheet is deficient in two additional ways. First, the approach to compliance costs is fundamentally deficient because it tells the public nothing at all about the relationship between the cost of any particular control and the pollution control benefits to be achieved by implementing that control. Under this "generalized" approach, extremely costly requirements that bear little or even no relationship (or even a negative relationship) to the pollution control benefits to be achieved could be "justified" as long as the "overall" program costs are within what the Regional Board deems to be an acceptable range. This is not a proper way to determine whether a control reduces the discharge of pollutants from the MS4 to the MEP. A more individualized assessment of cost is required. Otherwise, dischargers may be required to implement very costly controls that have no relationship to pollution control benefits, a result inconsistent with MEP.

This analytical flaw in the Fact Sheet is compounded by the approach taken to assess the benefits of the Tentative Order. Here again, the assessment approach misses the mark because it tells the public nothing about the pollution control benefits to be achieved by implementation of the controls in the Tentative Order. All the Fact Sheet says, in essence, is that people like clean water and in theory may be willing to pay for it, that urban storm water may contribute to beach closures and that such beach closures have an economic impact. This analysis sheds no light on the relationship between a BMP's costs and the pollution control benefits to be achieved by implementing that BMP.

Second, the Fact Sheet contains faulty assumptions and relies upon outdated or inapplicable data. The California State University, Sacramento (CSUS) Cost Survey assessed program costs for Phase I cities. Nothing in the Fact Sheet links any of the actual conditions of the Phase I permits of the Phase I cities studied by CSUS with any of the requirements of the Tentative Order. Therefore, the study tells the public nothing about the costs to implement the Tentative Order. The data included in the Fact Sheet is also from seven years to more than a decade old. In short, the Fact Sheet uses old data from Phase I programs that have no linkage to any conditions of the Tentative Order. The full costs of implementing the entire program required by the Tentative Order in 2013 dollars must be assessed.

Lastly, stormwater agencies cannot readily establish or raise fees to help pay for the BMPs necessary to comply with either the California Toxics Rule (CTR) criteria or proposed Site Specific Objectives (SSOs) due to the requirements of Proposition 218, Proposition 26 and the Mitigation Fee Act. For instance, Proposition 218 requires that property-related fees be put to a vote, so cities cannot assess fees without the consent of a majority (two-thirds) of the property owners. Therefore, the costs associated with the implementation and maintenance of the BMPs are more likely to be covered through the stormwater agency General Funds.

The County recommends the following language changes:

I. Findings

28. Economic Considerations
As noted in the following finding, the San Diego Water Board finds that the requirements in this permit are ~~not~~ more stringent than the minimum federal requirements. Therefore, a CWC section 13241 analysis is ~~not~~ required for permit requirements that implement the effective prohibition on the discharge of non-storm water into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determined appropriate to control such pollutants, as those requirements are mandated by federal law. ~~Not withstanding the above, the San Diego Water Board has developed an economic analysis of the requirements in this Order.~~ The economic analysis is provided in the Fact Sheet.

10. Finding 29 (Page 9 of 120) – The Regional Board has no Legal Ability to Determine Whether a Particular Mandate is Unfunded

The Tentative Order finds that none of the requirements therein constitute an unfunded local mandate. This finding, however, should be stricken as the Regional Board has no legal ability to determine whether a particular mandate is unfunded. The Commission on State Mandates is the only State agency that has the jurisdiction and ability to make that determination.

The Fact Sheet's discussion of unfunded state mandates is not consistent with applicable legal authority or the Tentative Order, as discussed below.

Article XIII B, Section 6(a) of the California Constitution ("Section 6") provides that whenever "any state agency mandates a new program or higher level of service on any local government, the state shall provide a subvention of funds to reimburse that local government for the costs of the program or increased level of service . . . ." Section 6 applies to storm water permits issued by the State Board and the Regional Boards.[29] Thus, Section 6 applies to the Tentative Order.

Section 6 was added to the California Constitution by voter approval in 1979, as part of a larger effort that had as its goal both limiting state and local spending and restricting the ability of local entities to raise revenue. Section 6 must be viewed as a "safety valve" designed to protect local governments from being placed in the untenable position of being required by the state, on the one hand, to implement certain state mandated programs while also, on the other hand, being prohibited from raising the money needed to pay for those state mandated programs.[30] Recognizing that such a situation was neither a fair nor a wise approach to governing, the voters enacted Section 6 to prevent state government from shifting financial responsibility for carrying out governmental functions to local agencies without the state paying for them.

[29] *County of Los Angeles v. Commission on State Mandates* (2007) 150 Cal.App.4th 898, 920.
[30] *Department of Finance v. Commission on State Mandates* (2003) 30 Cal.4th 727, 735; *County of San Diego v. State of California* (1997) 15 Cal.4th 68, 81.

To implement Section 6, the Legislature created the Commission on State Mandates ("Commission"). The Commission has sole and exclusive jurisdiction to determine whether a state law or order of a state agency is an unfunded state mandate.[31] In accordance with Section 6, Government Code section 17500 et seq., and case law, the Commission on State Mandates has determined that an unfunded state mandate exists when: (a) the state imposes a new program or higher level of service that is; (b) mandated by state law, not federal law; and (c) when the local government lacks adequate fee authority to pay for the new program or higher level of service.

Whether and how individual storm water permit conditions constitute unfunded state mandates is currently the subject of pending litigation. In 2009 and 2010, the Commission on State Mandates determined that parts of the Los Angeles Phase I Permit and major components of the San Diego Phase I Permit constituted unfunded state mandates. The State challenged these two decisions in court, and, in the San Diego matter, the court confirmed that only the Commission on State Mandates could make the ultimate determination of whether a permit condition constituted an unfunded state mandate. Specifically, the court in the San Diego case held that the "Commission has exclusive authority to determine whether the Regional Board has imposed a state mandate." The court in the San Diego case further concluded that the Commission on State Mandates should reconsider its decision to assess whether each of the individual permit conditions were required to achieve the MEP standard. Specifically, the court held that "the Commission must determine whether any of the permit conditions exceed the 'maximum extent practicable' standard." (Emphasis added.) Therefore, contrary to the discussion in the Fact Sheet, each permit condition (control) must be assessed to determine whether it is consistent with MEP.

The San Diego Copermittees have appealed the trial court's decision that the Commission on State Mandates revisit its decision. Regardless of the outcome of that appeal, however, the Commission on State Mandates is the entity that must determine whether a condition in the Tentative Order constitutes an unfunded state mandate.

I. Findings

~~*29. Unfunded Mandates*~~

~~*This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following:*~~

a. ~~*This Order implements federally mandated requirements under CWA section 402 (33 USC section 1342(p)(3)(B)).*~~

b. ~~*The local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental and new dischargers who are issued NPDES permits for storm water and non-storm water discharges.*~~

c. ~~*The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order.*~~

d. ~~*The Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section*~~

[31] Government Code §§ 17551 and 17552; *Kinlaw v. State of California* (1991) 54 Cal.3d 326, 331-334.

~~*301(a) (33 USC section 1311(a)) and in lieu of numeric restrictions on their MS4 discharges (i.e. effluent limitations).*~~

e. ~~*The local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under State law predates the enactment of Article XIIIB, Section (6) of the California Constitution.*~~

f. ~~*The provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state develops a TMDL, federal law requires that permits must contain water quality based effluent limitations consistent with the assumptions and requirements of any applicable wasteload allocation (40 CFR 122.44(d)(1)(vii)(B)).*~~

~~*See the Fact Sheet for further discussion of unfunded mandates.*~~

PERMIT PROVISIONS

General

11. The Tentative Order Includes Language That Provides An Overly Broad Interpretation Of The Stormwater Regulations By Requiring MS4s To "Enhance" and/or "Restore" Beneficial Uses Or Habitat

The Tentative Order recognizes that the overarching objective of the CWA is "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters" and that, in order to carry out this objective, the CWA utilizes a number permitting programs and regulatory tools to regulate the discharge of pollutants and other materials to Waters of the United States (Waters of the U.S.).

However, CWA Section 402(p), that section which governs that permitting for municipal and industrial stormwater discharges, is only one regulatory tool within the CWA. Moreover, it requires the MS4s to focus on the quality and impact of their non-stormwater and stormwater discharges, not on the active enhancement and/or restoration of beneficial uses or habitat.

While the Fact Sheet recognizes that the development and implementation of a WQIP will identify the highest priority water quality conditions and that "addressing these threats and/or adverse impacts should restore the physical, chemical, and biological integrity of receiving waters, and result in the restoration and protection of the beneficial uses of the receiving waters in the Watershed Management Area",[32] the Tentative Order should not explicitly require the enhancement or restoration of beneficial uses as the CWA only requires that the Copermittees protect beneficial uses and prevent nuisance.[33]

[32] Fact Sheet, Page F-45
[33] 40 CFR 131.12()(1); CWC 13263(a) and 13050.

This is important from a prioritization and resource allocation perspective because while the Copermittees must control the discharge of pollutants in order to, ultimately, protect the beneficial uses of the receiving waters, they are not required to actively "enhance" or "restore" the beneficial uses and habitat of the receiving waters. It must be recognized that the actions and resources necessary to "protect" the beneficial uses may, in fact, be different than those that would be required to "enhance" or "restore" the beneficial uses of a particular receiving water.

The County recommends the following language changes:

B. Water Quality Improvement Plans
The purpose of this provision is to develop Water Quality Improvement Plans that guide the Copermittees' jurisdictional runoff management programs towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plans is to address the impacts of MS4 discharges so that such discharges do not impair ~~protect, preserve, enhance, and restore the~~ water quality and designated beneficial uses of waters of the state…….

B. Water Quality Improvement Plans
2. Priority Water Quality Conditions
e. Numeric Goals and Schedules
(1) Final numeric goals must be based on measureable criteria or indicators, to be achieved in the receiving waters and/or MS4 discharges for the highest priority water quality conditions which will be capable of demonstrating the ~~achievement of the restoration and/or~~ protection of water quality standards in receiving waters;

B. Water Quality Improvement Plans
3. Water Quality Improvement Strategies and Schedules
The Copermittees must develop specific water quality improvement strategies to address the highest priority water quality conditions identified within a Watershed Management Area. The water quality improvement strategies must address the highest priority water quality conditions by preventing or eliminating non-storm water discharges to and from the MS4, reducing pollutants in storm water discharges from the MS4 to the MEP, and ~~restoring and/or~~ protecting the water quality standards of receiving waters.

D. Monitoring and Assessment Program Requirements
4. Assessment Requirements
a. Receiving Waters Assessment
(2)(b) Identify the most critical beneficial uses that must be protected ~~or restored~~ to ensure overall health of the receiving water;
(2)(c) Determine whether or not those critical beneficial uses are being protected ~~and where those beneficial used must be restored~~;

D. Monitoring and Assessment Program Requirements
4. Assessment Requirements
d. Integrated Assessment of Water Quality Improvement Plan
(1)(d) Identify beneficial uses of the receiving waters that are protected ~~or must be restored~~ in accordance with Provision D.4.a;

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(1)(e) Evaluate the progress toward achieving the interim and final numeric goals for ~~restoring impacted~~ protecting beneficial uses in the receiving waters.
(2)(b) Identify the non-storm water and storm water pollutant load reductions, or other improvements to receiving water or water quality conditions, that are necessary to attain the interim and final numeric goals for ~~restoring impacted~~ protecting beneficial uses in the receiving waters;
(2)(d) Evaluate the progress of the water quality improvement strategies toward achieving the interim and final numeric goals for ~~restoring impacted~~ protecting beneficial uses in the receiving waters.

E. Jurisdictional Runoff Management Program
5. Existing Development Management
e. Strategies to Address the Highest Priority Water Quality Conditions
(3)(b) Candidates for stream, channel, and/or habitat rehabilitation projects may be utilized to address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters, rehabilitate channelized or hydromodified streams, restore wetland and riparian habitat, restore watershed functions, and/or ~~restore~~ protect beneficial uses of receiving waters;

E. Jurisdictional Runoff Management Program
7. Public Education and Participation
b. Public Participation
(3) Opportunities for members of the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or ~~restoration and~~ protection of the quality of receiving waters.

F. Reporting
3. Progress Reporting
c. Regional Monitoring and Assessment Report
(1)(a) The beneficial uses of the receiving waters within the San Diego Region that are protected ~~or must be restored~~;
(1)(b) The progress toward protecting the ~~restoring~~ impacted beneficial uses in the receiving waters within the San Diego Region; and

12. The Tentative Order Includes Language That Provides An Overly Broad Use Of The Term "Prohibit"

Although some changes were made in the Tentative Order language, the Tentative Order should be reviewed for the correct use of the terminology "effectively prohibit" since it appears that there are a couple of cases where this language was not modified.

The term "prohibit" is broader than the CWA requirements, and should be changed to "effectively prohibit." CWA section 402(p) (3) (B) (ii) reads as follows:

> (B) Municipal Discharge – Permits for discharges from municipal storm sewers –
> (ii) shall include a requirement to effectively prohibit non-stormwater discharges into the storm sewer; (Emphasis added)

The Tentative Order shall "effectively prohibit non-stormwater discharges" but may exempt certain discharges that are not significant sources of pollutants from the prohibition. The section does not require a full prohibition but rather an effective prohibition. The operative word is "effective", which recognizes the constraints of owning and operating a stormwater drainage system, which includes hundreds of miles of open channel. The finding/provision should note that non-stormwater discharges are effectively prohibited.[34]

In addition, discharges that are not significant sources of pollutants are exempted from the prohibition. In a practical sense, the use of word "effective" also provides flexibility to assess the impacts of relatively benign discharges such as air condition condensate, individual car washing, and non-emergency fire-fighting flows or non-anthropogenic sources before instituting a prohibition.

The County recommends the following language changes:

Finding 12. Pollutants in Runoff
....By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not effectively prohibit or otherwise control…..

A. Prohibitions and Limitations
The purpose of this provision is to describe the conditions under which storm water from and non-storm water discharges into ~~and from~~ the MS4s are effectively prohibited or limited. The goal of the prohibitions and limitations……

D. Monitoring and Assessment Program Requirements
4. Assessment Requirements
b. MS4 Outfall Discharges Assessments
(1)(a) Each Copermittee must assess and report the progress of its illicit discharge detection and elimination program, required to be implemented pursuant to Provision E.2, toward ~~reducing and~~ effectively prohibiting non-storm water and illicit discharges into the MS4 within its jurisdiction as follows:

E. Jurisdictional Runoff Management Programs
1. Legal authority Establishment and Enforcement
(1) Effectively ~~P~~prohibit and eliminate all illicit discharges and illicit connections into its MS4

COVER PAGE – PERMIT ENROLLMENT

13. Cover Page (Page 1 of 120) – The Tentative Order Should Recognize That The Enrollment Of The Orange County and/or Riverside County Copermittees Must Necessitate Changes To The Order Based On The Report Of Waste Discharge Submittals

The Tentative Order does not account for Orange County's current Fourth Term permit as there is no process for a ROWD prior to initial adoption of the permit by the Regional Board, and thus

[34] Per 402(p)(3)(B)(ii)

there is no technical basis by which to adopt many of the permit terms that apply to Orange County. Instead, the Tentative Order states that the Orange County Copermittees will submit a ROWD and will become subject to the waste discharge requirements set forth within the Tentative Order:

1) After the expiration of their current Permits (Order No. R9-2009-0002 and Order No. R9-2010-0016, respectively); or
2) At a date earlier than the expiration of their current Permits subject to the conditions described in Provision F.6 of the Tentative Order.

Although the cover page of the Tentative Order states "After the San Diego Water Board receives and considers the Orange County Copermittees' Report of Waste Discharge and makes any necessary changes to the Order….", Provision F.6 and Provision H, do not similarly recognize that changes to the Order must be made prior to the enrollment of the Orange County and/or Riverside County Copermittees.

In addition, the Findings and Fact Sheet would need to consider the thorough program analysis that the Copermittees conduct as a part of their preparation of the ROWD and the deficiencies and program modifications that Copermittees themselves identify as necessary for the program.

The County recommends the following language changes:

F. Reporting
6. Application for Early Coverage
a. The Orange County Copermittees, collectively, or Riverside County Copermittees, collectively, may apply for early coverage under this Order by submitting a Report of Waste Discharge Form 200, with a written request for early coverage under this Order and identification of the necessary changes to this Order, if any, that the Copermittees are recommending based on the ROWD submittal.

b. The San Diego Water Board will review the application for early coverage and will make any necessary changes to this Order. A notification of coverage under this Order will be issued to the Copermittees in the respective county by the San Diego Water Board upon completion of the early coverage application requirements and consideration of any necessary changes to this Order. The effective coverage…..

c. The timelines specified within this Order will be initiated based on the effective coverage date (as specified within the notification of coverage).

H. Modification of Programs
5. The San Diego Water Board will review any applications received for early coverage under this Order (Provision F.6) as well as any general applications received for coverage under this Order and will consider any necessary changes to this Order based on the newly-obtained information and/or reports received as a part of the application process. Within the applications for coverage under this Order, the Copermittees shall identify the changes that are proposed to this Order.

PROVISION A – PROHIBITIONS AND LIMITATIONS

14. Provision A (Entire Provision; Begins Page 13 of 120) – A Clear Linkage Between The Compliance Provisions And Prohibitions, Receiving Water Limitations, And Effluent Limitations Must Be Established

The proposed Prohibitions and Limitations provisions may be construed as standalone provisions that could expose the Copermittees to state and federal enforcement actions, as well as to third party actions under the federal Clean Water Act's citizen suit provisions. Consistent with the recent 9th Circuit Court of Appeal decision, each provision of the permit could be read separately, so if Provision A.2.a states that "the MS4 must not cause or contribute to the violation of a water quality standard" then that is the stand-alone provision, and the accompanying language found in A.4 (Compliance with Discharge Prohibitions) regarding compliance may be considered irrelevant. As such, a clear linkage between the compliance provisions and the prohibitions, receiving water limitations, and effluent limitations must be established. This was the subject of a State Water Resources Control Board workshop on November 20, 2012; however the State Board did not make any determinations or provide further direction after a day of testimony.

In addition, compliance with Provisions A.1, A.2 and A.3 should be linked to Provision A.4, Provision B, and Attachment E so that it is clear that the compliance mechanism for A.4 is the WQIP (Provision B) and/or the TMDL (Attachment E), as applicable.

The County recommends the following language changes:

A. Prohibitions and Limitations (Introduction)
[at the end of the introductory paragraph insert this sentence]
The process for determining compliance with the Discharge Prohibitions (A.1), Receiving Water Limitations (A.2), and Effluent Limitations (A.3, including effluent limitations derived from the TMDL requirements – Attachment E) is defined in Provision A.4.

---

1. Discharge Prohibitions
a. Except as provided for in Provisions A.1.e or A.4, ~~D~~discharges from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the state are prohibited.

---

2. Receiving Water Limitations
a. Discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters, including but not limited to all applicable provisions contained in the list below to the extent that they remain in effect and are operative, unless such discharges are being addressed by the Copermittee(s) through the processes set forth in this Order (Provision A.4 and Attachment E). Where a TMDL has been developed and its terms have been incorporated into this Order (in a manner that is consistent with the waste load allocations set forth in the TMDL), a Permittee shall also be considered in compliance with such TMDL-related requirements provided in this Order, if it is timely and in good faith implementing the MEP-compliant control measures otherwise established by this Order.

15. Provision A (Entire Provision; Begins Page 13 of 120) – The Discharge Prohibitions Must Establish A Linkage With The Approved Compliance Schedules For TMDLs That Have Been Incorporated Into The Basin Plan

The Discharge Prohibitions do not establish a sufficient linkage with approved compliance schedules for TMDLs that have been incorporated into the Basin Plan. TMDLs adopted within the region include a schedule to provide MS4 Copermittees the time necessary to develop and implement a plan to achieve water quality standards in impaired waters. The compliance schedules for adopted TMDLs have been incorporated into Attachment E and language is recommended in the Receiving Water Limitations provisions (A.2.c.) and the Effluent Limitations provisions (A.3.b.) pointing to the TMDL compliance schedules.

The Receiving Water Limitations language in the Tentative Order conflicts with TMDL compliance schedules. Language should be included to clarify that in instances where a TMDL is in effect, the Copermittees shall achieve compliance with these provisions as outlined in Attachment E (Specific provisions for TMDLs). Without this change, the Receiving Water Limitations language puts Copermittees in immediate and ongoing non-compliance with the permit, as opposed to incorporating TMDL implementation schedules.

In addition, the footnote to A.2.a.(4)(b) requires Copermittees to not cause or contribute to the more stringent of a water quality objective or a CTR criterion. Instances may exist where it has been determined that one or the other is more appropriate given site specific conditions or analysis (i.e., a TMDL has been established).

The County recommends the following language changes:

1. Discharge Prohibitions
e. For discharges associated with water body pollutant combinations addressed in a TMDL in Attachment E of this Order, the affected Copermittees shall achieve compliance as outlined in Attachment E.

2. Receiving Water Limitations
a. Discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters, including but not limited to all applicable provisions contained in the list below to the extent that they remain in effect and are operative, unless such discharges are being addressed by the Copermittee(s) through the processes set forth in this Order (Provision A.4 and Attachment E). Where a TMDL has been developed and its terms have been incorporated into this Order (in a manner that is consistent with the waste load allocations set forth in the TMDL), a Permittee shall also be considered in compliance with such TMDL-related requirements provided in this Order, if it is timely and in good faith implementing the MEP-compliant control measures otherwise established by this Order.

2. Receiving Water Limitations
c. For receiving water limitations associated with water body pollutant combination addressed in a TMDL in Attachment E of this Order, the affected Copermittees shall achieve compliance as outlined in Attachment E.

Footnote #4 to Provision A.2.a.(4)(b)

[1] If a water quality objective and a CTR criterion are in effect for the same priority pollutant, the more stringent of the two applies, unless a previous regulatory action (i.e., TMDL) has specified otherwise.

16. Provision A (Entire Provision; Begins Page 13 of 120) – The Receiving Water Limitations Language Is Discretionary And Should Be Revised To Provide A Clear Compliance Mechanism

The Copermittees envision WQIPs as the foundation for a BMP-based compliance approach for the Discharge Prohibitions and Receiving Water Limitations language. However, the language in the Provision A.4 describes the WQIPs as a document trail rather than a compliance mechanism. In essence, the language suggests that Copermittees shall expend significant resources to develop and implement WQIPs, but taking the actions in the WQIPs has no effect on the Regional Board's compliance determination.

The Receiving Water Limitations language should be revised to expressly state that if exceedances of a water quality objective, water quality standard or any effluent limitation persist, or a discharge prohibition stated as an effluent limitation is not complied with, notwithstanding implementation of control measures, BMPs or compliance with the other water quality control program requirements of the Order, the Copermittee shall take actions to further reduce its discharges of such pollutants over time by complying with the iterative process, and that diligent implementation of the iterative process (i.e., WQIP) constitutes compliance to MEP.

The iterative process is a fundamental aspect of MS4 programs, as envisioned by State Water Board Order 99-05 and later reconfirmed in Order WQ 2001-15 (BIA Order), and is the mechanism by which MS4 Copermittees should demonstrate compliance. The WQIPs now provide a mechanism to provide the detail and quantitative analyses used to identify pollutant sources and implement BMPs to address those sources.

Language in Provision A.4 should be consistent with the California Stormwater Quality Association (CASQA) proposed receiving water limitation language (see **Attachment B**).

(See the recommended language changes in Provision A.4 of the Attachment B, Tentative Order redline)

PROVISION B – WATER QUALITY IMPROVEMENT PLANS

17. Provision B (Entire Provision; Begins Page 17 of 120) – The Water Quality Improvement Plans Should Be The Foundation For A BMP-Based Compliance Approach [35]

The County strongly supports the Watershed approach as described in the Tentative Order and Fact Sheet, with modifications as discussed below and in Provision E. A watershed-based approach is ideal for the implementation of stormwater programs in the San Diego Region as it allows for the integration of all program elements, focuses efforts on the highest priorities for each watershed through the customization of actions and strategies, and allows for streamlined reporting. This approach also supports the implementation of TMDLs, which are developed and implemented at the watershed scale.

Although the language for the WQIP recognizes the need for the consideration of provisions A.1, A.2, and A.3 as a part of the assessments and identification of water quality priorities, consistent with the intent described in the Fact Sheet, the language within the Tentative Order should explicitly identify that compliance with those provisions is achieved through the development and implementation of the WQIPs and or TMDLs (Attachment E).

In particular, the Fact Sheet states[36]:

> **Provision B includes requirements for the Copermittees to develop and implement Water Quality Improvement Plans to ultimately comply with the prohibitions and limitations under Provision A**. The Water Quality Improvement Plans will provide the Copermittees a comprehensive program that can achieve the requirements of the CWA.

---

[35] Orange County notes that in the recently adopted LA MS4 permit a Reasonable Assurance Analysis (RAA) is required in order for a Copermittee to receive approval of a Watershed Management Program (essentially the same concept as the WQIP) and then utilize the Watershed Management Program as a method of compliance with Receiving Water Limitation provision requirements. Orange County believes that the WQIP process described in the Tentative Order, subject to the County's comments herein, is robust and does not necessitate the addition of a RAA. The WQIPs will provide enforceable, objective, and measurable requirements for the Copermittees, without having to implement an RAA.

To the extent that future proceedings on the Tentative Order contemplate a RAA requirement, Orange County strongly disagrees with such an approach. RAA would impose unnecessary and costly modeling requirements on the Copermittees. Orange County is not covered by TMDLs to the extent that Los Angeles and other counties are, where such models have already been developed and where such modeling efforts have previously been conducted for many pollutant-waterbody combinations. RAA is essentially a "TMDL-lite" process that would shift regulatory obligations from the Regional Board to the Copermittees. Although the Copermittees may choose to work with the Regional Board, as deemed appropriate and necessary in the future, to develop TMDLs collaboratively, the Copermittees object to the obligation to fully assume the Regional Board's regulatory responsibilities. Federal law is clear as to how a TMDL should be established, and RAA would "backdoor" the TMDL process into the WQIP approach without the Regional Board going through the necessary steps to formulate a TMDL. This would be a violation of federal law. There is also no federal or state authority by which a RAA could be required by the Regional Board. Even assuming such authority, a RAA is unnecessary and goes beyond MEP.

[36] Fact Sheet, Page F-42

> Implementation of the Water Quality Improvement Plans will also improve the quality of the receiving waters in the San Diego Region…..
>
> The Water Quality Improvement Plan also incorporates a program to monitor and assess the progress of the Copermittees' jurisdictional runoff management programs toward improving the quality of discharges from the MS4s, as well as tracking improvements to the quality of receiving waters. **A process to adapt and improve the effectiveness of the Water Quality Improvement Plans has also been incorporated into the requirements of Provision B to be consistent with the "iterative approach" required to achieve compliance with discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a, pursuant to the requirements of Provision A.4.**
>
> [Emphasis added]

In other words, the Water Quality Improvement Plan framework, as outlined within the Tentative Order, is established as the compliance mechanism for Provision A.4. In fact, this would complement the existing language in Provision A.4, which states (as modified below):

> Each Copermittee must achieve compliance with Provisions A.1, A.2, and A.3 of this Order through timely implementation of control measures and other actions as specified in Provisions B and E of this Order, including any modifications. The Water Quality Improvement Plans required under Provision B must be designed and adapted to ultimately achieve compliance with Provisions A.1, A2, and A.3.

In addition, the WQIP should identify the high priority water quality issues and conditions and provide direction for the development and implementation of the JRMPs. The goals for the WQIPs should be clearly identified and directly linked to the JURMPs (and the corresponding flexibility provided within the development of the JURMPs) (See also Provision E).

Lastly, although Regional Water Board staff have indicated that the WQIPs, once developed and approved, will functionally replace the CLRPs and BLRPs, the Tentative Order does not formally recognize this. The County recommends that a footnote be added to clarify that this is the case.

The County recommends the following language changes:

B. Water Quality Improvement Plans[1]
The purpose of this provision is to develop Water Quality Improvement Plans that guide the Copermittees' jurisdictional runoff management programs towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plans is to address the impacts of MS4 discharges so that such discharges do not impair ~~protect, preserve, enhance, and restore~~ the water quality and designated beneficial uses of waters of the state. Therefore, implementation of the WQIPs also provides the basis for complying with Provisions II.A.1, II.A.2, and II.A.3, as described in Provision II.A.4. This goal will be accomplished through an adaptive planning and management process that identifies the highest priority water quality conditions within a watershed and implements strategies through the jurisdictional runoff management programs to achieve improvements in the quality of discharges from the MS4s and receiving waters. As such, the requirements outlined in Provision

E may be modified for consistency with the WQIP priorities for the applicable Watershed Management Area, if appropriate justification is provided.

[1] – Once developed and approved, the Water Quality Improvement Plan and corresponding Jurisdictional Runoff Management Plan will functionally replace the Load Reduction Plans.

18. Provision B (Entire Provision; Begins Page 17 of 120) – The WQIP Numeric Goals Are Used To Support The WQIP Implementation And Measure Progress, They Are Not Enforceable Compliance Standards

Similar to the footnotes in Provisions C.1.a and C.2.a, Provision B.2.e should explicitly state that the action levels, interim goals and final goals are not enforceable limitations.

The County recommends the following language changes:

B. Water Quality Improvement Plans
2. Priority Water Quality Conditions
e. Numeric Goals
The Copermittees must develop and incorporate action levels, interim and final numeric goals and schedules into the Water Quality Improvement Plan. Numeric goals must be used to support Water Quality Improvement Plan implementation and measure progress towards addressing the highest priority water quality conditions identified under B.2.c. Actions levels and numeric goals, themselves, are not enforceable compliance standards, effluent limitations, or receiving water limitations. When establishing numeric goals…..

19. Provision B.2 (Page 19 of 120) – The Schedule For The Achievement Of The Final WQIP Numeric Goals Should Be Based On The Results Of The Assessment Conducted As A Part Of The Development Of The WQIP Priority Water Quality Conditions

Provision B.2.e.(3)(e) states that the "final dates for achieving the final numeric goals must not initially extend more than 10 years beyond the effective date of this Order, unless a longer period of time is authorized by the San Diego Water Board Executive Officer or the schedule includes an applicable TMDL…."

In addition, the Fact Sheet notes that this provision is consistent with 40 CFR 122.47(a)(1), which states:

> (1) Time for compliance. Any schedules of compliance under this section shall require compliance as soon as possible, but not later than the applicable statutory deadline under the CWA.

The Fact Sheet provision citing 122.47 is inapplicable, however, and this provision should be deleted, as there are no federal or state statutory deadlines for achieving WQIP final numeric goals. Provision B.2.e(3)(e) expressly states that the Copermittees must develop and incorporate schedules for numeric goals into the WQIP, and compliance schedules for such goals are determined by the Copermittees with certain approvals by the Regional Board or the Executive Officer.

Furthermore, the requirement that the final dates for achieving the final numeric targets must not extend more than 10 years unless authorized by the Executive Officer is one of the most disconcerting requirements in the Tentative Order for several reasons:

- There is no factual or technical basis or other evidence for why a 10 year time period is the timeframe for all of the listed numeric goal, and therefore 10 year is arbitrary;
- Although the assessments that will be conducted pursuant to Provision E.2 will be thorough, they will not take the place of the type(s) of assessments that should be conducted when developing a TMDL and establishing waste load allocations and the timeframes necessary for achieving the allocations;
- Many TMDLs that are developed have longer timeframes than 10 years. There are many implementation schedules that extend out 15 or 20 years depending upon the constituent, sources, and potential compliance options available to the responsible parties.

Instead of a 'one size fits all' timeline of 10 years, the final date for achieving the final goals should be determined by the Copermittees during the development of the WQIP, which undergoes a thorough public review process. It should also be recognized that this date may need to be modified based on additional data and information that is received during the implementation of the WQIP.

Based on conversations with Regional Board staff, it is understood that goals can take a number of forms and the "10 year" requirement is not intended as a requirement to attain all Basin Plan water quality standards within 10 years. However, to ensure this requirement does not cause confusion and is not mis-interpreted by third parties, language should be added to clarify this.

The County recommends the following language changes:

B. Water Quality Improvement Plans
2. Priority Water Quality Conditions
e. Numeric Goals
~~(3)(e) Final dates for achieving the final numeric goals must not initially extend more than 10 years beyond the effective date of this Order, unless a longer period of time is authorized by the San Diego Water Board Executive Officer or the schedule includes an applicable TMDL in Attachment E to this Order.~~

(4) The schedules for achieving the interim and final goals will be evaluated with each annual report [F.3.b.(1)(d)] and/or as a part of the ROWD development [B.5.a] to determine if they should be modified.

PROVISION C – ACTION LEVELS

20. Provision C (Entire Provision; Begins Page 28 of 120) – The Tentative Order Should Clarify The Use Of The Action Levels Within The WQIP And IDDE Program and the Copermittees Should Develop The NALs/SALs Based On The Priorities Of The WQIP and/or the IDDE Program

Although the modifications in this provision have improved from the Administrative Draft, there are a number of outstanding issues related to the proposed language that need to be addressed in order for the Action Levels to be effective and assist with the overall management and assessment of the Stormwater Program. These issues include:

- The differentiation for the Non-stormwater Action Levels (NALs) between the WQIP and Illicit Discharge Detection and Elimination (IDDE) program element; and
- The Copermittees should be allowed to develop or use previously established NALs/Stormwater Action Levels (SALs) instead of the values identified within this provision.

These outstanding issues are discussed in additional detail below.

A. The Tentative Order Needs to Differentiate and Provide a Clear Linkage Between Provisions B and C and Provisions E.2 and C.

Provision C.1 indicates that the NALs will be incorporated into the WQIPs and used to:

a) Support the development and prioritization of water quality improvement strategies for addressing non-stormwater discharges to and from the MS4s;

b) Assess the effectiveness of the water quality improvement strategies toward addressing MS4 non-storm water discharges; and

c) Support the detection and elimination of non-stormwater and illicit discharges to and from the MS4.

Similarly, Provision C.2 indicates that the SALs will be incorporated into the WQIPs and used to:

a) Support the development and prioritization of water quality improvement strategies for reducing pollutants in stormwater discharges from the MS4s;

b) Assess the effectiveness of the water quality improvement strategies toward reducing pollutants in stormwater discharges….

Although the NALs and SALs have these stated objectives, the Tentative Order must provide a clearer linkage and differentiate between

- Provision B (WQIPs) and Provision C (Action Levels) and
- Provision E.2 (Illicit Discharge Detection and Elimination Program [IDDE]) and Provision C.

Examples of what clarification is necessary include the following:

- Provision B does not include any mention of the NALs or SALs even though they are supposed to be incorporated into the WQIPs.
- It should be recognized that the WQIP should guide the customization of the NALs/SALs to meet the highest water quality priorities in a given watershed and that NALs/SALs will be used to assist Copermittees in reaching the goals specified in the WQIP.
- The NALs and SALs developed and incorporated into the WQIP should address the high priority water quality conditions identified. (see comment below)

B. The Copermittees Need to Have the Flexibility to Develop or Use Previously Established Action Levels

Although the Tentative Order states that the Copermittees are to develop and incorporate numeric non-stormwater and numeric stormwater action levels into the Water Quality Improvement Plans (C.1 and C.2, respectively), the Tentative Order then contradicts this approach and mandates that the Copermittees include all of the numeric actions levels as

identified in tables C-1, C-2, C-3, C-4 and C-5.

The mandated action levels are problematic for the following reasons:

1) The NALs for the WQIPs will likely include different constituents and/or values than those values that would be used for the IDDE program.
2) The NALs and SALs will likely include different constituents and/or values between WQIPs depending upon the identified high priority water quality conditions.
3) The NALs set for the IDDE program should not be based on water quality objectives at the 'end of pipe'. Instead, these values should be based on upset values.
4) In Provision B.2.d the Copermittees are required to develop and use interim and final numeric targets/goals to measure progress towards the protection/enhancement of the receiving waters and beneficial uses. The choice of the target/goals of the watershed may be biological, chemical, or physical based and may include multiple criteria and/or indicators. If the mandated values have to be used as action levels within the WQIP, they may not correspond to the highest priority water quality conditions or the metrics that are being used to measure progress. Thus, the chemically based NALs/SALs may direct resources away from the watershed priorities.

As a part of the IDDE program, the County had developed and implemented an innovative Dry Weather Reconnaissance Program, based upon statistically derived benchmarks to identify illegal discharges and illicit connections during the typically dry summer months of May through September using a suite of water quality analyses conducted in the field at designated random and targeted drains. The 2010-11 reporting period marked the ninth season of dry weather monitoring in the San Diego Region. Monitoring in the San Diego Region under the Dry Weather Reconnaissance Program was replaced in August 2011 with the NALs Monitoring Program (pursuant to Order No. R9-2009-0002).

After the implementation of the NAL-based program for a year, some clear differences between the previously established Dry Weather Reconnaissance Program and the NAL-based program have been evident (see the table below).

- Of the 236 site visits conducted in the Dry Weather Reconnaissance Program, there were 77 exceedances that required follow up actions;
- For the Dry Weather Reconnaissance Program, this represented 32% of the discharges samples being prioritized for follow up actions and/or investigations;
- Of the 68 site visits conducted in the NAL program, there were 167 exceedances that required follow up actions (almost 2 x the number of site visits); and
- For the NAL program, there was limited ability to prioritize discharges for follow up since some of the constituents exceeded the NALs 33-91% of the time.

Comparison of NAL Program and Previous Dry Weather Reconnaissance Program

	NAL Exceedances 2011 - 12		DW Reconn Pgm Action Level* Exceedances May-Sep 2010	
Constituent	**Number**	**%**	**Number**	**%**
pH	1	1.5	12	5.1
MBAS	1	1.5	2	0.8
Turbidity	5	11	3	1.3
Dissolved Oxygen	1	1.5	2	0.8
Fecal Coliform	19	42	0	0
Enterococcus	41	91	1	0.4
Total P / Ortho PO4	37	82	6	2.5
Total N / Nitrate	41	91	22	9.3
Nickel	6	13	18	7.6
Cadmium	15	33	11	4.7
Total # of Site Visits	**68**		**236**	

The conclusions from the implementation of the Orange County NAL-based program to date are:

- The NAL program replaced an previously existing and effective program;
- The NAL program has required increased resources and has resulted in everything being a priority;
- There have been many exceedances that have been due to non-IDDE factors such as local geology (especially for nickel and cadmium);
- It has been very difficult to determine the endpoints, the sources, of the various non-stormwater discharges since the discharges are so co-mingled; and
- There is a strong need for a regionally-based prioritization so that there is not a mis-direction of limited resources

The Regional Water Board would be well served to review the results of the Orange County NAL-based program to date and consider the revisions as proposed in order to assist with the prioritization of resources and water quality issues. The Tentative Order should establish the purpose(s) of the action levels and then allow the Copermittees to develop the numeric action levels. The mandated NALs and SALs should only be considered “default” values if the Copermittees do not develop their own NALs/SALs or use previously established values. Previously developed action levels should serve as interim action levels until the WQIPs are completed.

The County recommends the following language changes:

B. Water Quality Improvement Plans
2. Priority Water Quality Conditions
e. Numeric Goals and Schedules
The Copermittees must develop and incorporate action levels, interim and final numeric goals[37] and schedules into the Water Quality Improvement Plan. Numeric goals must be used to support Water Quality Improvement Plan implementation and measure progress towards addressing the highest priority water quality conditions identified under Provision B.2.c. Action levels and numeric goals, themselves, are not enforceable compliance standards, effluent limitations, or receiving water limitations. When establishing numeric goals and corresponding schedules, the Copermittees must consider the following:

C. Action Levels
The purpose of this provision is for the Copermittees to incorporate numeric non-stormwater action levels (NALs) and stormwater action levels (SALs) in the Water Quality Improvement Plans (WQIP) and numeric non-stormwater action levels (NALs) in the Illicit Discharge Detection and Elimination (IDDE) Program.

- *For the purposes of the WQIPs, ~~Water Quality Improvement Plan~~ the goal of the action levels is to guide the implementation efforts and measure progress towards the protection of the high priority water quality conditions and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through monitoring and assessing the quality of the MS4 discharges during the implementation of the Water Quality Improvement Plans.*

- *For the purposes of the IDDE program, the goal of the action levels is to assist in the effective prohibition of non-stormwater discharges into the MS4.*

Action levels will be developed and incorporated into the WQIP (Provision B) and the IDDE Program (Provision E). Depending upon the goals/objectives for the use of the action levels and the priority receiving water conditions, the constituents and values at which they are set may differ between watersheds. Copermittees may develop Watershed Management Area specific numeric action levels for non-stormwater and stormwater MS4 discharges using an approach approved by the Regional Board or use the default non-stormwater and stormwater action levels prescribed in C.1 and C.2 below.

The Copermittees will submit the action levels as a part of the WQIP and JURMP submittals. The action levels currently established will serve as the interim action levels until revised action levels are completed and approved. Exceedances of the action levels are not subject to enforcement or non-compliance actions under this Order.

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[37] Interim and final numeric goals may take a variety of forms such as TMDL established WQBELs, action levels, pollutant concentration, load reductions, number of impaired water bodies delisted from the List of Water Quality Impaired Segments, Index of Biotic Integrity (IBI) scores, or other appropriate metrics. Interim and final numeric goals are not necessarily limited to one criterion or indicator, but may include multiple criteria and/or indicators. Except for TMDL established WQBELs, interim and final numeric goals and corresponding schedules may be revised through the adaptive management process under Provision B.5.

1. *Default Non-Storm Water Action Levels*[38]

~~The Copermittees must develop and incorporate numeric non-storm water action levels (NALs) into the Water Quality Improvement Plan to: 1) support the development and prioritization of water quality improvement strategies for addressing non-storm water discharges to and from the MS4s, 2) assess the effectiveness of the water quality improvement strategies toward addressing MS4 non-storm water discharges, required pursuant to Provision D.4.b.(1), and 3) support the detection and elimination of non-storm water and illicit discharges to and from the MS4, required pursuant to Provision E.2.~~[39]*The following non-stormwater action levels (NALs) must be incorporated in the WQIPs and IDDE program if the Copermittees have not developed their own NALs for the identified high priority constituents using an approach approved by the Regional Board EO.*

~~C.1.c For the NALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary NALs specific to the Watershed Management Area at levels greater than the NALs required by Provisions C.1.a and C.1.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for addressing non-storm water discharges to and from the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and from the MS4. The secondary NALs may be developed using an approach acceptable to the San Diego Water Board.~~

2.Default Storm Water Action Levels[40]

The Copermittees must develop and incorporate numeric storm water action levels (SALs) in the Water Quality Improvement Plans to: 1) support the development and prioritization of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s, and 2) assess the effectiveness of the water quality improvement strategies toward reducing pollutants in storm water discharges, required pursuant to Provision D.4.b.(2)[41]*.*

The following stormwater action levels (SALs) must be incorporated in the WQIPs if the Copermittees have not developed their own SALs for the identified high priority constituents using an approach approved by the Regional Board EO.

~~C.2.c For the SALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary SALs specific to the Watershed Management Area at levels greater than the SALs required by Provisions C.2.a and C.2.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s. The secondary SALs may be developed based on the approaches recommended by the State Water Board's Storm Water Panel~~[42]*~~ or using an approach acceptable to the San Diego Water Board.~~*

[38] NALs are not considered by the San Diego Water Board to be enforceable limitations.

[40] SALs are not considered by the Regional Water Board to be enforceable limitations.

[41] The Copermittees may utilize SALs or other benchmarks currently established by the Copermittees as interim SALs until the WQIPs are accepted by the San Diego Water Board Executive Officer.

PROVISION D – MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS

21. Provision D (Entire Provision; Begins Page 33 of 120) – The Prescribed Receiving Water Program Does Not Incorporate A Question Driven Approach Nor Does The Tentative Order Recognize That The Phase I Municipal NPDES Copermittees Are Not The Sole Dischargers To Receiving Water

Provision D.1.f provides for alternative watershed monitoring requirements that may be fulfilled in addition to or in lieu of the receiving water monitoring program detailed in Provision D.1.b to D.1.d

The Tentative Order contains a modified approach to receiving waters monitoring that has not been implemented in previous Tentative Orders. While this approach provides a welcomed opportunity for the Copermittees to shift their resources towards assessing MS4 contributions, the conceptual basis of the receiving waters programs needs additional consideration. The prescribed receiving water program does not appear to be a question driven approach nor does the Tentative Order recognize that the Phase I municipal NPDES Copermittees are not the sole dischargers to receiving waters and that the contributions from many other regulated and unregulated entities contribute to the overall receiving water conditions.

The Tentative Order should establish an integrated and collaborative receiving water program that is consistent with watershed management area priorities in lieu of individual and uncoordinated efforts. The Regional Board should:

1. Establish a water-body oriented monitoring and assessment workgroup for each Watershed Management Area as outlined in the staff report titled "A Framework for Monitoring and Assessment in the San Diego Region" that establishes a question-driven monitoring program;
2. Establish language that provides an opportunity for all regulated discharges to create pooled resources so that monitoring efforts are singularly focused on receiving waters during both dry and wet weather conditions; and
3. Establish language that provides for an alternate compliance option for the Monitoring and Reporting program in lieu of the prescribed receiving waters monitoring program as previously adopted in R9-2009-0002 that lead to the development of the Orange County Regional Shoreline Monitoring Program.

The County recommends the following changes

D. Monitoring and Assessment Program Requirements
1. Receiving Water Monitoring Requirements
f. Alternate Watershed Monitoring Requirements

The San Diego Water Board may direct the Copermittees to participate in an effort to develop alternative watershed monitoring with other regulated entities, other interested parties, and the San Diego Water Board to refine, coordinate, and implement regional monitoring and assessment programs to determine the status and trends of water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams.

<u>In lieu of the Receiving Water Monitoring Program requirements specified in 1.a to 1.d, the Copermittees may participate in the development and implementation of monitoring for the</u>

collaborative receiving waters monitoring program. It is expected that a regional monitoring will allow for a more effective and efficient receiving waters monitoring program. The regional monitoring plan must be submitted to the Executive Officer for review and approval. Documentation of participation and monitoring shall be included in the annual report.

22. Provision D (Entire Provision; Begins Page 33 of 120) – The Prescribed MS4 Outfall Discharge Monitoring Needs Additional Refinement In Order To Support The Development Of Effective Water Quality Improvement Plans

A. Transitional Wet Weather MS4 Outfall Discharge Monitoring Program

In order to fulfill the jurisdictional and land use requirements for the monitoring and assessment provisions of the Tentative Order, the coordination of the wet weather MS4 program should be scheduled to start at a later date. The rescheduling of the commencement of wet weather MS4 monitoring will provide adequate time to complete the required geo-location and land use analysis of the major MS4 drainage areas.

The County recommends the following changes

2. MS4 Outfall Discharge Monitoring
a. Transitional MS4 Outfall Discharge Monitoring
(3) Transitional Wet Weather MS4 Outfall Discharge Monitoring
(b) Transitional Wet Weather MS4 Outfall Discharge Monitoring Frequency

Each wet weather MS4 outfall discharge monitoring station selected pursuant to Provision D.2.a.(3)(a) must be monitored twice during the wet season (October 1 – April 30). One wet weather monitoring event must be conducted during the first wet weather event of the wet season, and one wet weather monitoring event at least a month after the first wet weather event of the wet season.

Transitional wet weather MS4 outfall discharge monitoring may begin in year 2 of the transitional period once the MS4 outfall discharge monitoring stations have been inventoried and evaluated pursuant to Provision D.2.a.(1)

B. Transitional MS4 Outfall Discharge Analytical Monitoring

The Copermittees need the flexibility to retain consistent monitoring methods between permit cycles in order to maintain the long term trend baselines.

The County recommends the following changes

2. MS4 Outfall Discharge Monitoring
a. Transitional MS4 Outfall Discharge Monitoring
(3) Transitional Wet Weather MS4 Outfall Discharge Monitoring
(e) Transitional Wet Weather MS4 Outfall Discharge Analytical Monitoring

(iv) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

[a] Time-weighted composites collected over the length of the storm event or the first 24 hour period, whichever is shorter, composed of ~~24~~ discrete ~~hourly~~ samples, which may be collected through the use of automated equipment, or
[b] Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or
[c] If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours;

Additionally in Provision D:

2. MS4 Outfall Discharge Monitoring
c. Wet Weather MS4 Outfall Discharge Monitoring
(5) Wet Weather MS4 Outfall Discharge Analytical Monitoring
(d) composite sample requirements

(i) *Time-weighted composites collected over the length of the storm event or the first 24 hour period, whichever is shorter, composed of discrete samples, which may be collected through the use of automated equipment ~~Time weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment~~, or,*
(ii) Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or
(iii) If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours.

***23.* Provision D (Entire Provision; Begins Page 33 of 120) – The Copermittees Need To Have The Flexibility To Develop Or Use Analytical Monitoring Requirements In The Water Quality Improvement Plans Based On Assessments Of Current Sources That May Contribute To The Section 303(d) Water Body Impairments**

The Regional Board should recognize the inherent difficulties associated with monitoring 303(d) constituents such as the legacy pesticides or the monitoring of aquatic toxicity. Many existing developments were never subjected to the application of legacy pesticides such as DDT and, as such, these constituents are highly unlikely to be found in modern communities. The Regional Board should also recognize that laboratory toxicity tests provide a cumulative perspective of pollutant effects that may or may not be sampled as part of a monitoring program.

The Copermittees should be relieved of analytical monitoring requirements if supporting information can be provided to document the current pollutant concentrations or may provide historic information to support the absence of usage of these constituents in the MS4 drainage area. Additionally, the Copermittees should be allowed to develop an alternate approach for monitoring that allows the Copermittees to evaluate and identify the cause of toxicity currently affecting receiving waters and to iteratively adapt the monitoring program to address these chemical stressors in their MS4 outfall discharges through the WQIPs.

The County recommends the following changes

2. MS4 Outfall Discharge Monitoring
a. Transitional MS4 Outfall Discharge Monitoring
(3) Transitional Wet Weather MS4 Outfall Discharge Monitoring
(e) Transitional Wet Weather MS4 Outfall Discharge Analytical Monitoring
(iv) *The samples must be analyzed for the following constituents:*

[a] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List with the exception of toxicity[1]
[b] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and
[c] Constituents listed in in Table D-7.
[e] The Copermittee may be relieved of analytical monitoring requirements [a] to [c] if supporting information can be provided or has historical data that can demonstrate or provide justification that the analysis of the constituent is not necessary.

Footnote to [a]
[1]Copermittees may provide an alternate approach to evaluate and identify the cause of toxicity currently affecting receiving waters and to iteratively adapt the monitoring program to address these chemical stressors in their MS4 outfall discharges in the monitoring plan which is subject to Regional Board approval.

Additionally in Provision D

2. MS4 Outfall Discharge Monitoring
b. Dry Weather MS4 Outfall Discharge Monitoring
(2) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring
(e) Non-Storm Water Persistent Flow MS4 Outfall Discharge Analytical Monitoring
(iii) Collect grab or composite samples to be analyzed for the following constituents:

[a] Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,
[b] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List with the exception of toxicity[1],
[c] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,
[d] Applicable NAL constituents, and
[e] Constituents listed in Table D-8, unless the Copermittee has historical data that can demonstrate or provide justification that the analysis of the constituent is not necessary.
[f] The Copermittee may be relieved of analytical monitoring requirements if supporting information can be provided or has historical data that can demonstrate or provide justification that the analysis of the constituent is not necessary.

Footnote to [b]

[1]Copermittees may provide an alternate approach to evaluate and identify the cause of toxicity currently affecting receiving waters and to iteratively adapt the monitoring program to address these chemical stressors in their MS4 outfall discharges in the monitoring plan which is subject to Regional Board approval.

Additionally in Provision D

2. MS4 Outfall Discharge Monitoring
c. Wet Weather MS4 Outfall Discharge Monitoring
(5) Wet Weather MS4 Outfall Discharge Analytical Monitoring
(f) *Analysis for the following constituents is required:*

(i) *Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,*

(ii) *Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List, with the exception of toxicity[1],*

(iii) *Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and*

(iv) *Applicable SAL constituents.*

(v) *The Copermittee may be relieved of analytical monitoring requirements if supporting information can be provided or has historical data that can demonstrate or provide justification that the analysis of the constituent is not necessary.*

Footnote to [ii]
[1]Copermittees may provide an alternate approach to evaluate and identify the cause of toxicity currently affecting receiving waters and to iteratively adapt the monitoring program to address these chemical stressors in their MS4 outfall discharges in the monitoring plan which is subject to Regional Board approval

Additionally in Provision D

Footnotes Table D-3.
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. E. Coli may be substituted for Total ~~Fecal~~ Coliform at inland receiving water monitoring stations.

Footnotes Table D-7.
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. E. Coli may be substituted for Total ~~Fecal~~ Coliform for discharges to inland surface waters.

Footnotes Table D-8.
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. E. Coli may be substituted for Total ~~Fecal~~ Coliform for discharges to inland surface waters

PROVISION E – JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS

24. Provision E (Entire Provision; Begins Page 64 of 120) – The JRMP Provisions Must Be Modified So As Not To Negate The Very Intent And Purpose Of The Watershed Approach And The Focus On The Highest Priorities Within Each Watershed Management Area

The Tentative Order states that the purpose of the WQIPs is to guide the Copermittees' jurisdictional runoff management programs towards achieving improved water quality by identifying the highest priority water quality conditions within a watershed and implementing strategies through the jurisdictional runoff management programs (Provision B).

Provision E goes on to state that the jurisdictional runoff management programs will be implemented in accordance with the strategies identified in the WQIPs. In addition, the Fact Sheet states:

> "Where the Water Quality Improvement Plan is the '*comprehensive planning process'* on a Watershed Management Area scale, requiring '*intergovernmental coordination'*, the jurisdictional runoff management program document is the '*comprehensive planning process'* on a jurisdictional scale that should be coordinated with the other Copermittees in the Watershed Management Area to achieve the goals of the Water Quality Improvement Plan."[43]

The Fact Sheet also supports this when it states:

> "Based on the economic considerations below, the San Diego Water Board has provided the Copermittees a significant amount of flexibility to choose how to implement the requirements of the Order. This Order also allows the Copermittees to customize their plans, programs, and monitoring requirements. In the end, it is up to the Copermittees to determine the effective BMPs and measures necessary to comply with this Order. The Copermittees can choose to implement the least expensive measures that are effective in meeting the requirements of this Order."[44]

Although the Fact Sheet states that "Implementation of the components of each Copermittee's jurisdictional runoff management program must be consistent with the water quality improvement strategies identified within the Water Quality Improvement Plan,"[45] the Tentative Order then requires the Copermittees to incorporate <u>all</u> of the requirements identified within Provision E regardless of the high priority water quality conditions that have been identified within the WQIP. If the Copermittees are required to implement <u>all</u> of the requirements in Provision E instead of prioritizing and implementing those requirements that directly address the highest priority water quality conditions and support the watershed strategies, then the program becomes additive instead of prioritized and focused. The net result is that the approach in Provision E negates the prioritized and strategic approach outlined in Provision B.

The Tentative Order should provide a clear linkage between Provision B and Provision E and state that the WQIP should guide the customization of the JRMP to meet the highest water quality priorities and strategies in a given watershed.

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[43] Fact Sheet, Page F-71
[44] Fact Sheet, Page F-17
[45] Fact Sheet, Page F-71

(See also the corresponding comments under Provision E.2, E.3. E.4, E.5, and E.7)
The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs [Intro]
The purpose of this provision is for each Copermittee to implement a program to control non-stormwater ~~the~~ discharges ~~contribution of pollutants~~ into and ~~the~~ stormwater discharges from the MS4 within its jurisdiction and to focus and prioritize those implementation actions based on the highest water quality priorities identified within the associated Water Quality Improvement Plan. The goal of the jurisdictional runoff management programs is to implement strategies and actions that effectively prohibit non-storm water discharges into the MS4 and reduce the discharge of pollutants in storm water to the MEP. This goal will be accomplished through implementing the jurisdictional runoff management programs in accordance with the water quality priorities and strategies identified in the Water Quality Improvement Plans.

Each Copermittee must update its jurisdictional runoff management program document, in accordance with Provision F.2.a, to incorporate ~~all~~ the requirements of Provision E consistent with the highest water quality priorities as identified in the corresponding Water Quality Improvement Plan. Until the Copermittee has updated its jurisdictional runoff management program document with the requirements of Provision E, the Copermittee must continue implementing its current jurisdictional runoff management program.

Similarly, the County recommends the following language changes be incorporated into each of the program elements within Provision E as identified below:
The requirements of the jurisdictional runoff management programs as outlined below may be modified and prioritized as appropriate for consistency with the highest water quality priorities as identified in the corresponding Water Quality improvement Plan.

LEGAL AUTHORITY

25. Provision E.1 (Page 64 of 120) – The Copermittees Are Only Responsible For Administering and Enforcing the Codes and Ordinances Applicable To Their Jurisdictions

Provision E.1.a(2) requires the Copermittees to establish the legal authority to control the contribution of pollutants in discharges of runoff associated with industrial and construction activity within their jurisdictions. Since the Copermittees can only administer and enforce their local codes and ordinances, it is unnecessary and confusing to include the language regarding the Statewide Industrial and Construction General Permits. The sites subject to the Statewide Permits (which are administered and enforced by the State and Regional Boards) are already inspected by state staff and are included within the Copermittee inventories, inspection, and enforcement programs.

In addition, language that acknowledges that the local codes and ordinances will include the legal authorities identified within the Tentative Order to the extent permitted by the Constitution should be included.

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
1. Legal Authority Establishment and Enforcement

a.(2) – Control the contribution of pollutants in discharges of runoff associated with industrial and construction activity into its MS4 and control the quality of runoff from industrial and construction sites[1] ~~including industrial and construction sites which have coverage under the statewide General Permit for Discharges of Storm Water Associated with Industrial Activities (Industrial General Permit) or General Permit for Discharges of Storm Water Associated with Construction Activities (Construction General Permit), as well as to those sites which do not~~

[1] - The Copermittees will only be responsible for administering and enforcing the codes and ordinances applicable to their jurisdictions (i.e.: a municipality is not responsible for administering and/or enforcing a permit issued by the State of California).

E. Jurisdictional Runoff Management Programs
1. Legal Authority Establishment and Enforcement
a.(10) Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with its statutes, ordinances, permits, contracts, orders, or similar means and with the requirements of this Order, including the effective prohibition of illicit discharges and connections to its MS4. The Copermittee's ordinance must include adequate legal authority, to the extent permitted by California and Federal Law and subject to the limitations on municipal action under the constitutions of California and the United States. The Copermittee must also have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from industrial facilities, including construction sites, discharging into its MS4.

26. Provision E (Entire Provision; Begins Page 64 of 120) – The Requirement For Third Party BMP Effectiveness Documentation Is Duplicative

The Tentative Order includes a provision that requires the Copermittees to demonstrate that they have the legal authority to require documentation on the effectiveness of BMPs. The County has concerns about this provision for the following reasons:

As it is currently written, this provision broadly applies to any aspect of the stormwater program where BMPs have been implemented – the result is that this provision sets up a process for the establishment of multiple third party monitoring programs and expenditure of a significant amount of funds to monitor the effectiveness of BMPs. If the desire is to document the effectiveness of certain types of BMPs, it would be much more effective and scientifically sound to establish special studies by entities qualified to conduct such sampling instead of requiring potentially hundreds of third parties to conduct a monitoring program for every BMP that is implemented.

This provision is redundant with other requirements in the Tentative Order in that it ignores the fact that the New Development/Significant Redevelopment section of the Drainage Area Management Plan (DAMP) (Section 7.0) establishes a process for the selection, design, and long-term maintenance of permanent BMPs for new development and significant redevelopment projects and requires developers to select BMPs that have been demonstrated as effective for their project category. By going through a thorough process, the Copermittees have determined what BMPs would be effective for a particular project – thus eliminating the need to establish a monitoring program for every BMP implemented.

This provision ignores the fact that the Copermittees have already established legal authority for their development standards so that project proponents have to incorporate and implement the required BMPs.

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
1. Legal Authority Establishment and Enforcement
~~a.(8) Require documentation on the effectiveness of BMPs implemented to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;~~

ILLICIT DISCHARGE DETECTION AND ELIMINATION

27. Provision E.2 (Page 65 of 120) – The Illicit Discharge Detection And Elimination Program Provisions Must Be Modified So As Not To Negate The Very Intent And Purpose Of The Watershed Approach And The Focus On The Highest Priorities Within Each Watershed Management Area

(See the corresponding comments under Provision E – Jurisdictional Runoff Management Programs)

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
2. Illicit Discharge Detection and Elimination [Intro]
….The illicit discharge detection and elimination program must be implemented in accordance with the strategies identified in the Water Quality Improvement Plan ~~and include, at a minimum, the following requirements.~~ The requirements of the jurisdictional runoff management programs as outlined below may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality improvement Plan(s).

Move Provision 2e, "Strategies to Address the Highest Priority Water Quality Conditions" to just after the Introduction to the section. This should become the new Provision 2.a.

E. Jurisdictional Runoff Management Programs
2. Illicit Discharge Detection and Elimination
a. Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the illicit discharge detection and elimination program to address ~~non-stormwater and~~ illicit discharges and connections that the Copermittee has identified as potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) *Provide specific details about how the strategies and/or activities will be implemented (e.g. designate ~~additional~~ BMPs, focus education, and/or increase/decrease frequency of inspections in specific areas); and*

(2) *The strategies and/or activities must be consistent with the requirements of Provisions E.2.a-d and the strategies identified in the Water Quality Improvement Plan.*

28. Provision E.2 (Page 65 of 120) – The Copermittees Should Be Allowed The Flexibility To Prioritize Their IDDE Program To Focus On Those Non-Stormwater Discharges That Are Likely To Be A Source Of Pollutants

Provision E.2.a identifies several categories of discharges that are to be considered "non-stormwater discharges." The categories that are considered to be non-stormwater discharges (do not need to be addressed as an illicit discharge) generally include the following:

- E.2.a.(1) - Those discharges which have coverage under a separate NPDES Permit;
- E.2.a.(2) - Those discharges which have coverage under a separate NPDES Permit
- E.2.a.(3) - Those discharges which are recognized within the federal regulations as acceptable unless they are identified as a source of pollutants to the receiving waters;
- E.2.a.(4) - Those discharges that are addressed by a set of requirements/BMPs; and
- E.2.a.(5) - Firefighting related discharges that are addressed by a set of requirements/BMPs.

In comparison, the Code of Federal Regulations [40CFR122.26(d)(2)(iv)(B)(1)] states that, as a part of an illicit discharge program, that the Copermittees shall incorporate a series of items including the following:

> A description of a program, including inspections, to implement and enforce an ordinance, orders or similar means to prevent illicit discharges to the municipal separate storm sewer system; this program description shall address all types of illicit discharges, <u>however the following category of non-storm water discharges or flows shall be addressed where such discharges are identified by the municipality as sources of pollutants to waters of the United States</u>: [Emphasis added and items re-ordered based on Tentative Order (TO) structure]
>
> - landscape irrigation, [not included in TO]
> - irrigation water, [not included in TO]
> - lawn watering, [not included in TO]
> - street wash water [not included in TO]
> - *uncontaminated pumped ground water, [E.2.a.(1)]*
> - *foundation drains, [E.2.a.(3)]; [E.2.a.(1)]*
> - *water from crawl space pumps, [E.2.a.(1)]*
> - *footing drains, [E.2.a.(3)]; [E.2.a.(1)]*
> - water line flushing, [E.2.a.(2)]
> - diverted stream flows, [E.2.a.(3)]
> - rising ground waters, [E.2.a.(3)]
> - springs, [E.2.a.(3)]
> - uncontaminated ground water infiltration (as defined at 40 CFR 35.2005(20)) to separate storm sewers, [E.2.a.(3)]
> - flows from riparian habitats and wetlands, [E.2.a.(3)]
> - discharges from potable water sources, [E.2.a.(3)]
> - air conditioning condensation, [E.2.a.(4)]
> - individual residential car washing, [E.2.a.(4)]
> - dechlorinated swimming pool discharges, and [E.2.a.(4)]
>
> (program descriptions shall address discharges or flows from fire fighting [E.2.a.(5)] only where such discharges or flows are identified as significant sources of pollutants to waters of the United States);

Although the discharges listed within the Federal Regulations are generally considered to be "conditionally exempt" from the illicit discharge program (unless they are found to be sources of pollutants), the Regional Water Board has determined that the following categories of non-stormwater discharges

- uncontaminated pumped ground water, [E.2.a.(1)]
- foundation drains, [E.2.a.(3)]; [E.2.a.(1)]
- water from crawl space pumps, [E.2.a.(1)]
- footing drains, [E.2.a.(3)]; [E.2.a.(1)]

will be considered to be illicit discharges unless the discharge has coverage under the following two NPDES Permits:

1) NPDES Permit No. CAG919001 (Order No. R9-2007-0034)
General Waste Discharge Requirements for Discharges from Temporary Groundwater Extraction and Similar Waste Discharges to San Diego Bay, Tributaries Thereto Under Tidal Influence, and Storm Drains or Other Conveyance Systems and Tributary Thereto

- Groundwater Extraction defined as (I.A): Existing and proposed discharges of groundwater extraction waste to San Diego Bay from construction groundwater extraction, foundation groundwater extraction, and groundwater extraction related to groundwater remediation cleanup projects (collectively groundwater extraction):

  1. Result from similar operations (all involve extraction and discharge of groundwater);

  2. Are the same type of wastes (<u>all are groundwater containing or potentially containing petroleum hydrocarbons, solvents, or other pollutants</u>);

  3. Require similar effluent limitations for the protection of the beneficial uses of San Diego Bay;

  4. Require similar monitoring; <u>and</u>

  5. Are more appropriately regulated under a WDR rather than individual permits.

- Eligibility Criteria (I.C): This WDR is intended to cover <u>temporary discharges</u> of groundwater extraction wastes to San Diego Bay, and its tributaries under tidal influence, from groundwater extraction <u>due to construction and other groundwater extraction activities</u>.

2) NPDES Permit No. CAG919002 (Order No. R9-2008-002)
General Waste Discharge Requirements for Discharges from Groundwater Extraction and Similar Discharges to Surface Waters Within the San Diego Region Except for San Diego Bay

- Groundwater Extraction defined as (I.A): Existing and proposed discharges of groundwater extraction waste to surface waters within the San Diego Region from construction groundwater extraction, foundation groundwater extraction, and groundwater extraction related to groundwater remediation cleanup projects (collectively groundwater extraction):

  1. Result from similar operations (all involve extraction and discharge of groundwater);

  2. Are the same type of wastes (<u>all are groundwater containing or potentially containing petroleum hydrocarbons, solvents, or other pollutants</u>);

3. Require similar effluent limitations for the protection of the beneficial uses of San Diego Bay;

4. Require similar monitoring; and

5. Are more appropriately regulated under a general permit rather than individual permits.

- Eligibility Criteria (I.C): This WDR is intended to cover all discharges of groundwater extraction wastes to surface waters within the San Diego Region Except San Diego Bay from groundwater extraction due to construction and other groundwater extraction activities, regardless of volume.

However, the County would submit that it is unnecessary to move these discharges (uncontaminated pumped groundwater, foundation drains, water from crawl space pumps, and footing drains) from the E.2.a.(3) category to the E.2.a.(1) category and require them to obtain coverage under one of these two permits for the following reasons:

- There is no technical basis or demonstrated water quality concern that justifies the need for these discharges to obtain coverage under these permits;
- The two permits are clearly defined for groundwater extraction activities where there is groundwater containing or potentially containing petroleum hydrocarbons, solvents, or other pollutants (in fact, one of the categories of discharges required to obtain coverage is 'uncontaminated pumped groundwater');
- One of the permits is clearly defined for temporary discharges, not permanent discharges; and
- The categories of discharges are non-stormwater discharges that are generally not expected to be a source of pollutants to receiving waters.

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
2. Illicit Discharge Detection and Elimination
a. Each Copermittee must address ~~all~~ non-storm water discharges as illicit discharges, where the likelihood exists that they are a source of pollutants to the waters of the state, unless the ~~a non-storm water~~ discharge is either identified as a discharge authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to the following requirements:

Delete Provision 2.a.(1)

Add the following categories from Provision 2.a.(1) to the list of allowable non-stormwater discharges listed in Provision 2.a.(3):

- *Uncontaminated pumped ground water*
- *Discharges from foundation drains*
- *Water from crawl space pumps*
- *Water from footing drains*

E. Jurisdictional Runoff Management Programs
2. Illicit Discharge Detection and Elimination
a.(4) Discharges of non-storm water into the MS4 from the following categories must be controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means, where there is evidence that those discharges are a source of pollutants to waters of the state. Discharges of non-storm water into the MS4 from the following categories not controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means must be addressed by the Copermittee as illicit discharges.

29. Provision E.2.a (Page 65 of 120) – The Fire Fighting BMP Provisions Should Reflect The Language Included In The Current Orange County Permit

Provision E.2.a includes a requirement for the Copermittees to establish BMPs for both emergency and non-emergency firefighting activities. While the Copermittees already have established guidelines for non-emergency firefighting activities, it is unclear why the approach and language in the Tentative Order regarding the emergency firefighting activities has been modified from Order R9-2009-0002. In fact, the language in the Tentative Order is actually inconsistent with the Phase I Final Rule (55 FR 48037), which stated

"In the case of fire fighting it is not the intention of these rules to prohibit in any circumstances the protection of life and public and private property through the use of water or other fire retardants that flow into separate storm sewers." [Emphasis added]

Thus, as stated above, there should not be a circumstance in which the Copermittees or San Diego Water Board would identify emergency firefighting discharges as illicit discharges or a significant source of pollutants to receiving waters. The language previously adopted by the San Diego Regional Board in Order R9-2009-0002 regarding emergency firefighting discharges is recommended.

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
2. Illicit Discharge Detection and Elimination
a. Non-Storm Water Discharges
(5) Firefighting discharges to the MS4 must continue to be addressed by the Copermittees ~~as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a significant source of pollutants to receiving waters. Firefighting discharges to the MS4 not identified as a significant source of pollutants to receiving waters, must be addressed, at a minimum,~~ as follows:

(a) Non-emergency firefighting discharges

(i) *Building fire suppression system maintenance discharges (e.g. sprinkler line flushing) to the MS4 must be addressed as illicit discharges.*

(ii) *Non-emergency firefighting discharges (i.e., discharges from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems) must be addressed by a program, to be developed and implemented by the Copermittee, in conjunction with the local Fire Authority/District, to reduce or eliminate pollutants in such discharges from entering the MS4.*

(b) Emergency firefighting discharges (i.e., flows necessary for the protection of life or property) do not require BMPs and need not be prohibited.

~~*Each Copermittee should develop and encourage implementation of BMPs to reduce or eliminate pollutants in emergency firefighting discharges to the MS4s and receiving waters within its jurisdiction. During emergency situations, priority of efforts should be directed toward life, property, and the environment (in descending order). BMPs should not interfere with immediate emergency response operations or impact public health and safety.*~~

30. Provision E (Entire Provision; Begins Page 64 of 120) – The Tentative Order Should Not Require the Reduction Or Elimination Of All Non-Stormwater Discharges As A Part Of The IDDE Program

Provision E.2.a and E.2.a.(7) require the Copermittees to, as a part of their IDDE program, to address all non-stormwater discharges as illicit discharges, and thus Copermittees must "reduce or eliminate non-stormwater discharges" whether or not the discharges have been identified as illicit discharges.

The rationale within the Fact Sheet states that "Provision E.2.a.(7) is consistent with the requirements of the CWA section 402(p)(3)(B)(ii) and 40CFR 122.26(d)(1)(v)(B)." That, in fact, is not the case. Clean Water Act Section 402(p)(3)(B)(ii) states that the MS4 stormwater permits "shall include a requirement to effectively prohibit non-stormwater discharges into the storm sewers" (emphasis added). Federal regulations include two provisions designed to begin implementation of the "effective prohibition."[46] The first provision requires Copermittees to perform a screening analysis, intended to provide sufficient information to develop priorities for a program to detect and remove illicit discharges[47]. The second provision requires Copermittees to develop a recommended site-specific management plan to detect and remove illicit discharges (or ensure they are covered by an NPDES permit) and to control improper disposal to MS4s.[48] Therefore, Provision E.2.a and E.2.a(7) misapply federal regulations in that Copermittees are required to identify the non-stormwater discharge as an illicit discharge prior to having an obligation to effectively prohibit it. There is not a presumption to reduce or eliminate it otherwise.

> The Code of Federal Regulations 122.26(d)(1)(v)(B) states "A description of the existing program to identify illicit connections to the municipal storm sewer system. The description should include inspection procedures and methods for detecting and preventing illicit discharges, and describe areas where this program has been implemented."

The provision and rationale within the Fact Sheet blur the lines between the need of the Copermittees to "effectively" prohibit non-stormwater discharges and detect and eliminate illicit discharges.

- The requirement is "effectively prohibit" non-stormwater discharges, not "reduce or eliminate" non-stormwater discharges (this is already addressed in Provision A).
- Although the Copermittees are required to have a program to prevent illicit discharges to the MS4, non-stormwater discharges should only be addressed as illicit discharges

[46] 55 Fed. Reg. 47989, 48037 (Nov. 16, 1990).
[47] 40 CFR 122.26(d)(1)(iv)(D).
[48] 40 CFR 122.26(d)(1)(iv)(D) and 122.26(d)(2)(B).

where such discharges are identified as sources of pollutants that may cause or contribute to an exceedance of a water quality objective.

- The IDDE program is established to detect and eliminate "illicit discharges", not non-stormwater discharges in general.

In order to clarify the requirements the following modifications to Provision E.2, which expressly address the Illicit Discharge Detection and Elimination Program are requested.

The County recommends the following language changes:

A. Prohibitions and Limitations
1. Discharge Prohibitions
b. Non-storm water discharges into MS4s are to be effectively prohibited, unless such discharges are either authorized by a separate NPDES permit, or the discharge is a category of non-storm water discharges ~~or flows~~ that must be addressed pursuant to Provisions E.2.a.(1)-(5) of this Order.

E. Jurisdictional Runoff Management Programs
2. Illicit Discharge Detection and Elimination
b. Non-Stormwater Discharges
Each Copermittee must address ~~all~~ non-storm water discharges as illicit discharges, where the likelihood exists that they are a source of pollutants to the waters of the state, unless the ~~a non-stormwater~~ discharge is either identified as a discharge authorized by a separate NPDES permit, or identified as a category of non-storm water discharges ~~or flows~~ that must be addressed pursuant to the following requirements:

E. Jurisdictional Runoff Management Programs
2. Illicit Discharge Detection and Elimination
a. Non-Storm Water Discharges
~~(7) Each Copermittee must, where feasible, reduce or eliminate non-storm water discharges listed under Provisions E.2.a.(1)-(4) into its MS4 whether or not the non-storm water discharge has been identified as an illicit discharge, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit.~~

E. Jurisdictional Runoff Management Programs
2. Illicit Discharge Detection and Elimination
c. Field Screening
Each Copermittee must conduct field screening (i.e. visual observations, field testing, and/or analytical testing) of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect ~~non-stormwater and~~ illicit discharges and connections to the MS4 in accordance with the dry weather MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

E. Jurisdictional Runoff Management Programs
2. Illicit Discharge Detection and Elimination
d. Investigate and Eliminate Illicit Discharges and Connections
[Various – see the suggested changes in the redline of the Tentative Order]

DEVELOPMENT PLANNING

The Tentative Order's land development requirements are some of the most onerous requirements in the Tentative Order, and in many cases lack the necessary technical and legal foundation for adoption. Many of the land development requirements, particularly hydromodification controls, pose federal constitutional issues as well as conflict with the CWA, the State Administrative Procedure Act, California Environmental Quality Act (CEQA), the Mitigation Fee Act and federal court decisions such as the recent U.S. District Court case, *Virginia Dept. of Transportation v. EPA*[49] (holding that EPA has no authority to regulate non-pollutants).

The following discussion examines the overarching legal concerns with the land development requirements, and is followed by specific technical analyses for individual requirements.

A. Land Development Requirements Expose the Copermittees to Significant Litigation Risk And Will Be Largely Unenforceable

Many of the land development requirements, such as hydromodification, pose constitutional issues either exposing municipalities to litigation and/or will result in municipalities being unable and unwilling to implement such requirements. Specifically, but not limited to, Orange County is most concerned with the provisions: 1) requiring Copermittees to compel development projects that have no impact on hydromodification to implement on-site or alternative compliance hydromodification mitigation measures, 2) using pre-development (naturally occurring) runoff reference condition as applied to sites that are, in fact, developed, and 3) stream, channel, and habitat restoration.

Orange County is concerned that implementing these types of requirements would subject the Copermittees to liability under the takings clauses of the U.S. and California Constitutions and the Mitigation Fee Act because of the questionable nexus between a project's impacts on hydromodification and the hydromodification management measures in the Tentative Order. When imposing a condition on a development permit, a local government is required under federal and state constitutions to establish that the condition bears a reasonable relationship to the impacts of the project. This rule applies evenly to legislatively enacted requirements and impact fees or exactions.[50] Moreover, fees imposed on a discretionary ad-hoc basis are subject to heightened scrutiny under a two-part test. First, local governments must show that there is a substantial relationship between the burden created by the impact of development and any fee or exaction[51]. Second, a project's impacts must bear a rough proportionality to any development fee or exaction.[52] Under California law, the *Nollan/Dolan* heightened scrutiny test also applies to in-lieu fees.[53]

The Legislature has memorialized these requirements in the Mitigation Fee Act, which establishes procedures that local governments must follow to impose impact fees.[54] Irrespective of whether the hydromodification management requirements are implemented by

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[49] Virginia Dept. of Transportation v. EPA, No. 1:12-CV-775, slip op. (E.D. Va. Jan. 3, 2013).
[50] *Building Ass'n Industry v. City of Patterson*, 171 Cal. App. 4th 886, 898 (2009).
[51] *Nollan v. Calif. Coastal Comm'n*, 483 U.S. 825, 837 (1987).
[52] *Dolan v. City of Tigard*, 512 U.S. 374, 391 (1994).
[53] *Ehrlich v. City of Culver City*, 12 Cal. 4th 854, 876 (1996).
[54] Gov't Code secs. 66000-66025.

legislative act or on an ad-hoc basis, the Copermittees attempt to enforce them as proposed in the Tentative Order will likely result in claims alleging unconstitutional takings of private property and violations of the Mitigation Fee Act. This is because a developer could argue that limiting hydromodification impacts of already developed property to its naturally occurring state, or requiring hydromodification mitigation measures for impacts not imposed by the project, would not have a legally sufficient nexus to the impact of the development project.

Additionally, CEQA does not allow a local government discretionary approval to require over-mitigation of a project. The CEQA Guidelines provide that "a lead agency for a project has the authority to require feasible changes in any or all activities involved in the project in order to substantially lessen or avoid significant effects on the environment, consistent with applicable constitutional requirements such as the 'nexus' and 'rough proportionality' standards established by case law."[55] Thus, Copermittees would most assuredly be exposed to CEQA challenges, which are the most prevalent lawsuits against projects.

In all likelihood, municipalities will not risk constitutional challenges and the high litigation costs of such challenges, but will instead exempt projects from certain requirements or limit their applicability based on documented technical and legal reasons. Such actions then would only be addressed through a Regional Board audit years after a project has been approved and developed. Therefore, predevelopment runoff reference conditions and stream, channel and habitat restoration requirements should be eliminated in their entirety.

B. <u>Stream, Channel and Habitat Restoration Cannot Be Required Due to Conflicts with Federal and State Laws</u>

The Tentative Order requires stream, channel and habitat restoration and/or retrofitting depending on certain land development projects. The prior analysis above discussed the litigation risk to which municipalities will be exposed. The following discussion focuses on the direct conflicts with federal and state laws that also prohibit such requirements.

The objective of the CWA is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters.[56] In carrying out this objective, Section 402(p) requires municipalities to reduce the discharge of pollutants from the MS4 to the MEP standard. The Tentative Order, however, goes well beyond the Congressional intent of the CWA to only address pollutants by requiring both Copermittees and the property owners to restore and/or retrofit streams, channels and habitat, with no technical evidence as to how this will reduce the discharge of pollutants to MEP or under what legal authority these requirements can be imposed.

Not only do such requirements go beyond MEP, but go beyond the scope of the CWA's focus on pollutant reduction. First, there is no evidence in the Order for how restoration requirements reduce pollutants from leaving the MS4. Second, in a recent decision in the Eastern District of Virginia, a federal court has held that the EPA has no authority under the Clean Water Act to regulate non-pollutants.[57] Restoration as described in the Tentative Order does not regulate pollutants directly, but requires costly over-mitigation by project proponents to do more than address pollutants by restoring streams, channels and habitat to a subjective, predevelopment

[55] Cal. Code Regs. Tit. 14, sec. 15041 (citing *Nollan/Dolan*).
[56] CWA 101(a).
[57] *Virginia Dept. of Transportation v. EPA*, No. 1:12-CV-775, slip op. (E.D. Va. Jan. 3, 2013).

standard. Essentially, the Tentative Order uses restoration as a surrogate for pollutants, and tries to unlawfully regulate the flow of water and not pollutants themselves.

Under state law, the Orange County Flood Control District has been delegated authority by the Legislature to construct lengthy networks of channels and infrastructure for flood control purposes. Under this authority, the Flood Control District has exclusive authority to control the flow of water in these channels. Although the State and Regional Boards may have some ability to impose conditions that impact volumetric flows (which is now called into question by the 4th District court case), this authority does not extend to NPDES permits.[58] Returning channels to natural conditions impinges on municipal flood control authority as removing concrete and performing other restoration efforts would alter the flow of water in those channels.

Engineered channels serve the public health and safety through flood control protection. A significant portion of Orange County lies in a flood plain whereby property owners are required to carry flood insurance. Concrete channels are used to better control the flow of water and minimize flooding and reduce insurance premiums. State courts have long recognized that residents living near flood control improvements have a right to rely on the current standards of a particular channel to protect against flooding.[59] Restoring a stream or channel to a natural state would not ensure against flooding as engineering is used to ensure that stormwater is controlled to certain patterns. Many developments are built up to flood control channels, and thus, restoration would expose residents to threats of flood, potential property damage and loss of life and expose municipalities to claims of inverse condemnation and other torts based on relied upon flood control protections by the public. Restoration in some cases would also require use of eminent domain authority, which the State cannot require municipalities to exercise.

31. Provision E.3 (Page 73 of 120) – The Development Planning Provisions Must Be Modified So As Not To Negate The Very Intent And Purpose Of The Watershed Approach And The Focus On The Highest Priorities Within Each Watershed Management Area

(See the corresponding comments under Provision E – Jurisdictional Runoff Management Programs)

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
3. Development Planning [Intro]
Each Copermittee must use their land use and planning authorities to implement a development planning program in accordance with the strategies identified in the Water Quality Improvement Plan ~~and include, at a minimum, the following requirements.~~ The requirements of the jurisdictional runoff management programs as outlined below may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality improvement Plan(s).

[58] *S.D. Warren Co. v. Me. Bd. of Envtl. Prot.*, 547 U.S. 370 (2006); *PUD No.1 v. Washington Dep't of Ecology*, 511 U.S. 700 (1994).
[59] *Arreola v. County of Monterey*, 99 Cal.App.4th 722 (2002).

Move Provision 3g, "Strategies to Address the Highest Priority Water Quality Conditions" to just after the Introduction to the section and before Provision 3.a.

(1) *Provide specific details about how the strategies and/or activities will be implemented (e.g. designate ~~additional~~ BMPs, focus education, increase frequency of verifications and/or inspections, alternative compliance options);*

32. Provision E.3 (Page 73 of 120) – Clarifying Language For Applying The PDP Requirements For A New Development Project Feature Is Confusing And Should Be Removed

In E.3.b.(1)(a) the Regional Board staff attempts to provide clarifying language which we believe actually makes for more confusion. The purpose of this provision is to state that Priority Development Projects are defined in E.3.b(2). In E.3.b(2) further clarification is provided regarding what is parts of a project are subject to the new development standards. The language provided in E.3.b(1)(a) starting with "where a new …. Requirement" does not add clarification and instead may be construed to be in conflict with E.3.b(2).

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
3. Development Planning
b. Priority Development Projects
(1) Definition of Priority Development Project
(a) All new development projects that fall under the Priority Development Project categories listed under Provision E.3.b.(2)~~. Where a new development project feature, such as a parking lot, falls into a Priority Development Project category, the entire project footprint is subject to Priority Development Project requirements~~; and

33. Provision E.3 (Page 73 of 120) – Portions Of Redevelopment Projects That Already Have Water Quality Treatment BMPs Should Not Be Subject To The New PDP Requirements

Some redevelopment projects already have portions of the project that were subject to previous permit PDP requirements. These portions of redevelopment that were subject to prior PDP requirements should not be subject to the new PDP requirements as these projects already have water quality treatment. Such an approach is consistent with the Los Angeles and Ventura MS4 permits.

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
3. Development Planning
b. Priority Development Projects
(1) Definition of Priority Development Project
(b) Those redevelopment projects that create, add, or replace at least 5,000 square feet of impervious surfaces on an already developed site, or the redevelopment project is a Priority Development Project category listed under Provision E.3.b.(2). Where redevelopment results in an increase of less than fifty percent of the impervious surfaces of a previously existing development, and the existing development was not subject to Priority Development Project

requirements, the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) apply only to the addition or replacement, and not to the entire development.
Where redevelopment results in an increase of more than fifty percent of the impervious surfaces of a previously existing development, and was not subject to previous Priority Project Development requirements, the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) apply to the entire development.

34. Provision E.3.b.2 (Page 76 of 120) – Residential Driveways Should Not Be Subject To The PDP Requirements

Section E.3.b.2.g triggers PDP requirements for development and redevelopment of streets, roads, highways, freeways, and residential driveways over 5,000 square feet. This requirement was present in the prior permit; however, the residential driveways requirement was added under the Tentative Order and will require additional Copermittee effort for treatment control and structural Low Impact Development (LID) BMP inventory, inspections, and maintenance verification and may have potential enforcement issues. The Regional Board has not provided sound technical basis for this provision as there is no evidence provided in the fact sheet that the cumulative impact of residential driveways would be significant and that residential driveways are a significant source of pollutants. Additionally vehicles should be defined as internal combustion vehicles since internal combustion vehicles are the source of pollutants this section is developed for.

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
3. Development Planning
b. Priority Development Projects
(2) Priority Development Project Categories
(g) Streets, roads, highways, and freeways~~, and residential driveways~~. This category is defined as any paved impervious surface that is 5,000 square feet or more used for the transportation of automobiles, trucks, motorcycles, and other internal combustion vehicles.

35. Provision E.3 (Page 73 of 120) – All Municipal Roadway Projects Should Only Be Subject To The USEPA Guidance Regarding Managing Wet Weather With Green Infrastructure: Green Streets

The Ventura County NPDES MS4 Permit, the Santa Ana Region permits for Orange County, San Bernardino County, and Riverside County, and the Greater Los Angeles MS4 Permit provide that streets, roads, and highways follow US EPA guidance regarding *Managing Wet Weather with Green Infrastructure: Green Streets to the maximum extent practicable*. This document is recognized nationwide as the standard for incorporation of LID techniques into roadway projects, which is why it was it is specified in the permits identified above. In April of 2007 the US EPA, National Association of Clean Water Agencies; Natural Resources Defense Council; the Low Impact Development Center; and the Association of State and Interstate Water Pollution Control Administrators signed the Green Infrastructure Statement of Intent. This statement of intent recognized the benefits of green infrastructure and laid the ground work for the development of the USEPA Green Infrastructure Action Strategy. One of the areas of study was the municipal roadways and the result of the study is the US EPA Green Streets Municipal Handbook. The Handbook provides guidance on green street design, different types of LID BMPs that are appropriate for municipal roadways, and implementation hurdles. The Handbook

was specifically developed for incorporating LID techniques into roadway projects as roadways are very different from traditional land development projects.
Roadways are different than other development projects as there are significant constraints to implementation of BMPs that need to be considered such as limited right-of-way, utilities, geotechnical and structural concerns, street trees, parking, and fire truck access among others. The US EPA guidance considers these constraints where the PDP requirements do not. Even in new roadways implementing hydromodification requirements can disturb a significant area of land which has its own environmental impacts including changing the natural hydrology which is antithetical to the LID approach.

In addition, retrofitting of existing alleys is infeasible. In accordance with the Streets & Highways Code, State Controller Gas Tax Expenditure Guidelines and several California Attorney General opinions, alleys are not considered "city streets" or "county highways," and are not certified to the State Controller for gas tax purposes as they do not serve as thoroughfares for the general public. Therefore, section 2150 of the Streets & Highways Code and other State laws prohibit municipalities from expending Road Funds on alleyway rehabilitation, and retrofitting of an alleyway would be an unlawful expenditure. In the case of private development where there is a clear nexus to alleyway improvement, a landowner adjacent to an alley could only be conditioned to retrofit that portion of alleyway in front of the property and could not be conditioned to retrofit an entire alleyway.

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
3. Development Planning
b. Priority Development Projects
(3) Priority Development Project Exemptions
(b) Any impervious surface that is 5,000 square feet or more used for the transportation of automobiles, trucks, motorcycles, and other vehicles that follows the USEPA guidance regarding Managing Wet Weather with Green Infrastructure: Green Streets[1] to the MEP.

[1]:http://water.epa.gov/infrastructure/greeninfrastructure/index.cfm

~~*Retrofitting of existing paved alleys, streets or roads that meet the following criteria:*~~
~~*(i) Must be two lanes or less; AND*~~
~~*(ii) Must be a retrofitting project implemented as part of an alternative compliance project option under Provision E.3.c.(3)(b)(v) to achieve the performance requirements of Provisions E.3.c.(1) and/or E.3.c.(2) for a Priority Development Project; AND*~~
~~*(iii) Designed and constructed in accordance with the USEPA Green Streets guidance.23*~~

36. Provision E.3 (Page 73 of 120) – Exemptions From The Development Planning Requirements Should Be Provided For Certain Types Of Projects

An exemption for PDPs should be provided for driveways and parking lots constructed with permeable surfaces. This exemption is provided to sidewalks, bicycle lanes and trails and should also be provided to driveways and parking lots. The fact sheet identifies that "The exemptions have been provided as an incentive for the Copermittees to encourage and promote the implementation of LID design concepts and green infrastructure and building principles." Permeable surfaces qualify as an LID design concept, which should be recognized in the Tentative Order provisions for driveways and parking lots. The use of permeable surfaces

should be encouraged, which will be accomplished by providing an exemption for driveways and parking lots constructed with permeable surfaces.
The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
3. Development Planning
b. Priority Development Projects
(3) Priority Development Project Exemptions
(a) ~~New paved~~ Sidewalks, bicycle lanes, driveways, parking lots, or trails that meet the following criteria:
(i) Designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas; OR
(ii) Designed and constructed to be hydraulically disconnected from paved streets or roads; OR
(iii) Designed and constructed with permeable pavements or surfaces in accordance with USEPA Green Streets guidance.22

An exemption should also be provided to single family residential projects as single family residential projects should not be subject to PDP requirements as the PDP requirements would put an undue burden on single family residences where it has not been shown that they are significant source of pollutants. There is no technical justification or proof that single family residences are a significant source of pollutants identified in the fact sheet and thus should be provided an exemption. Furthermore the inclusion of the U.S. Green Building Council (USGCB) Leadership in Energy and Environmental Design (LEED) for Homes green building certification program in the Tentative Order is not appropriate as this program encompasses other environmental considerations besides surface water management which are outside the scope of a stormwater permit and outside the authority of the Regional Board. Since the Regional Board has not met the burden of proof that single family residential projects are a significant source of pollutants the exemption should be provided to all single family residential projects and not just in meeting the LEED certification which is inappropriate for the Regional Board to specify.

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
3. Development Planning
b. Priority Development Projects
(3) Priority Development Project Exemptions
(c) Single-family residential projects that are not part of a larger development or proposed subdivision.

~~New single family residences that meet the following criteria:~~
~~(i) Must not be constructed as part of a larger development or proposed subdivision; AND~~
~~(ii) Designed and constructed to be certified under the U.S. Green Building Council (USGCB) Leadership in Energy and Environmental Design (LEED) for Homes green building certification program, receiving at least four (4) Surface Water Management credits under the Sustainable Sites category;24 OR~~
~~(iii) Designed and constructed with structural BMPs that will achieve the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite.~~
~~(d) Redevelopment of existing single family residences that meet the following criteria:~~

~~*(i) Designed and constructed to be certified under the USGCB LEED for Homes green building certification program, receiving at least four (4) Surface Water Management credits under the Sustainable Sites category; 25 OR*~~
~~*(ii) Designed and constructed with structural BMPs that will achieve the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite.*~~

An exemption should be added for the protection of persons and property, particularly as it applies to BMPs not being implemented in waters of the U.S. or state. This language is consistent with Cal. Water Code §13269(c)(1-2). Flood control projects are intended for the protection of public safety and property and are mandated by the Orange County Flood Control Act of 1927. Requiring flood control projects to implement BMPs which are intended for traditional types of development projects is inappropriate and in most cases infeasible. Furthermore requiring flood control projects to implement BMPs may cause flood control projects to be infeasible which in many cases will increase the risk of flooding. If flooding does occur in these areas it would increase the risk of pollutants discharging into receiving waters from the flooded areas. Stream restoration projects are also projects that should not be subject to the PDP requirements as they are projects intended to restore beneficial uses of receiving waters.

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
3. Development Planning
b. Priority Development Projects
(3) Priority Development Project Exemptions
(d)Flood control and stream restoration projects.

An exemption for emergency public safety projects where a delay due to a Standard Stormwater Mitigation Plan (SSMP) would compromise public safety, public health and/or the environment is needed in the permit. Copermittees need an exemption where if public health or safety or environmental protection is threatened the project can proceed without a SSMP. Emergency projects are provided exempt status in many other MS4 permits including the recently adopted LA MS4 permit.

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
3. Development Planning
b. Priority Development Projects
(3) Priority Development Project Exemptions
(e) *Emergency public safety projects in any of the Priority Development Categories may be excluded if the delay caused due to the requirement for a SSMP compromises public safety, public health and/or environmental protection*

37. Provision E.3.c (Page 78 of 120) – Flexibility Should Be Provided To The Structural BMP Performance Standards If Watershed-Specific Performance Standards Are Developed In The Water Quality Improvement Plans

Based on the watershed approach it is conceivable that the Water Quality Improvement Plans may identify that an alternate performance standard than the provisions in E.3.c. may be appropriate for certain watersheds. To fully realize the watershed approach the Copermittees should be given the opportunity to develop alternative BMP performance standards consistent with the goals and objectives developed in the Water Quality Improvement Plans.

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
3. Development Planning
c. Priority Development Project Structural BMP Performance Requirements

In addition to the BMP requirements listed for all development projects under Provision E.3.a, Priority Development Projects must also implement structural BMPs that conform to performance requirements below. <u>If watershed-specific performance requirements are developed as part of a Water Quality Improvement Plan; these requirements would take precedence over the general performance requirements below. The watershed-specific requirement must provide at least equal protection as the general performance requirements below.</u>

38. Provision E.3 (Page 73 of 120) – Terminology Is Inconsistent Especially With The Use Of Low Impact Development BMPs And Should Be Modified

In Provision E.3.c. the Tentative Order specifies the requirements for structural BMPs. Furthermore in Provision E.3.c.(1) the concepts of onsite structural BMPs and LID BMPs are introduced. The County recommends that the Tentative Order be modified to provide more consistency in terminology. The County views LID as a strategy of BMPs that is used to mimic predevelopment water balance. (see Provision E.3.a(3)). Furthermore there is no single definition for LID BMPs that has gained widespread recognition. Although Attachment C includes a definition for LID BMPs, this definition is not widely accepted. LID is rather a concept (the attachment C definition does adequately capture this concept) made up of various non-structural and structural BMPs. While the onsite BMP requirements should be defined (e.g. retention of the 85% storm) the Tentative Order could be greatly simplified by avoiding multiple terms and uses. The County has provided suggested edits throughout the Development Planning provision to provide better consistency.

39. Provision E.3.c (Page 78 of 120) – The Retention Performance Standard Needs Clarification

Clarification is needed regarding both Section E.3.c.(1)(a)(i) and (ii). In Section E.3.c.(1)(a)(i) the section states "The volume of storm water produced…" where it should state "The volume of storm water <u>runoff</u> produced". The Fact Sheet identifies that this design standard is consistent with the Fourth Term Permits for Orange County and Riverside County however in both of these permits the standard is identified "the volume of runoff produced from a from a 24-hour 85th percentile storm event". The word "runoff" needs to be added to the Tentative Order. In Section E.3.c.(1)(a)(ii) the newly added language that provides an alternative method for calculating the design capture volume does not specify a storm threshold or range of storms for the alternative

method for calculating the design capture volume. Clarification is needed to identify the threshold to be used and the County believes that the average annual volume of stormwater runoff is appropriate. Additionally flexibility should be provided as far as the technique to calculate this volume so that other methods besides continuous simulation should be accepted.

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
3. Development Planning
c. Priority Development Project Structural BMP Performance Requirements
(1) Storm Water Pollutant Control BMP Requirements
(a) Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite the pollutants contained in the design capture volume. The design capture volume is equivalent to:
(i) The volume of storm water runoff produced from a 24-hour 85th percentile storm event; OR
(ii) The average annual volume of storm water runoff that would be retained onsite if the site was fully undeveloped and naturally vegetated, as determined using continuous simulation modeling or other techniques based on site-specific soil conditions and typical native vegetative cover.

40. Provision E.3.c (Page 78 of 120) – If Projects Use Alternative Compliance Conventional BMPs Should Not Be Also Required Onsite

Section E.3.c.(1)(c) requires that if projects use alternative compliance that conventional BMPs must also be implemented onsite. Although the Fact Sheet identifies that the intent of this provision is to reduce the pollutants onsite to the MEP there is not adequate technical justification for effectively requiring additional mitigation. This provision requires additional mitigation for projects and in effect requires double mitigation which goes well beyond the MEP standard that is referenced in the Fact Sheet. Providing mitigation offsite for the PDP requirements offsite in itself is adequate to meet the MEP standard.

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
3. Development Planning
c. Priority Development Project Structural BMP Performance Requirements
(1) On-site Storm Water Pollutant Control Structural BMP Requirements
(c) If a Priority Development project is allowed to utilize alternative compliance pursuant to Provisions E.3.c.(1)(b), ~~flow-thru conventional treatment control BMPs must be implemented to treat the portion of the design capture volume that is not retained onsite. Additionally,~~ project applicants must mitigate for the portion of the pollutant load in the design capture volume that is not retained onsite through one or more alternative compliance options under Provision E.3.c.(3). If alternative compliance involves the use of ~~C~~conventional treatment control BMPs, those BMPs must be sized and designed to:

41. Provision E (Entire Provision; Begins Page 64 of 120) – The Hydromodification Management Requirements Should Be Based On A Watershed Management Approach, Be Consistent With The WQIPs, And Consider The Current Copermittee HMPs

Hydromodification management should be based on the conditions of receiving waters and on the impacts and potential impacts from development projects. The basis to make hydromodification management decisions needs to be an understanding of the watershed and receiving waters within a watershed. This understanding of a watershed is achieved through watershed analysis and analysis of the susceptibility of the receiving waters to hydromodification impacts. This approach of watershed analysis is identified in the Southern California Coastal Water Research Project (SCCWRP) Technical Report 667 – Hydromodification Assessment and Management in California **(Appendix A-2).** The SCCWRP report identifies that watershed analysis is the first step and most critical step in the development of watershed hydromodification management. The SCCWRP report, the authors of the SCCWRP report at the Hydromodification Management Meeting in August of 2012, and even State Water Resource Control Board (SWRCB) staff at the recent California Stormwater Quality Association (CASQA) General Meeting in San Francisco on January 10, 2012 identified that hydromodification management is not a one size fits all approach and needs to consider watershed analysis. The Tentative Order hydromodification requirements are however a one size fits all approach as the requirements do not allow consideration of watershed analysis or receiving water information.

The County believes the best way to implement the vision of the SCCWRP Report for development of effective hydromodification management is to develop clear hydromodification management objectives that are watershed specific and developed through a stakeholder process, which is consistent with the approach in the SCCWRP report. The intent of the WQIPs is to improve water quality in the WMAs based on the highest priorities for water quality in the watershed, however unless more is known about the watersheds and their receiving waters including their susceptibility to hydromodification then the appropriate standards and performance criteria cannot be identified to reach the goal of improving water quality. The WQIPs can build on the current Hydromodification Management Plans (HMPs) that have been developed and can use additional watershed and receiving water information to develop appropriate watershed specific hydromodification standards and where they should apply in a specific watershed. Instead of hydromodification requirements that do not consider specific watershed analysis and conditions of receiving waters and that were developed unilaterally by Regional Board staff the County suggests that watershed specific requirements be developed as part of the WQIPs as part of a watershed stakeholder process.

Matching pre-development (naturally occurring) flow rates and duration is identified as the performance standard for hydromodification management. Although it is not stated anywhere in the Tentative Order, it is assumed that the purpose of such a standard is to address the overall objective of the CWA (§101) - to restore the chemical, physical, and biological integrity of the Nation's waters in the Tentative Order's jurisdiction. However, the CWA does not imply or state that its objective is to restore waters to pre-Columbian (pre-development) conditions. Rather the objective must be taken in context of § 402(p) and reflect the stormwater compliance standard to reduce pollutants to the maximum extent practicable. When read in total the hydromodification standard should reflect the developed urban environment. To do otherwise would negate the engineering efforts done to date to protect life and property from floods and create an impractical solution for municipalities. Furthermore the current hydromodification standard as provided for in numerous municipal permits in California is to match post development with "pre-project" conditions. It is unclear to us how the San Diego Regional Board staff has redefined the MEP standard for hydromodification.

Hydromodification effects may also be caused from other sources that are not in the Copermittees' jurisdiction. Initial implementation of the pre-development (naturally occurring) hydromodification performance standard has identified that BMPs to comply with the standard are of significant size even for smaller projects. Implementing the hydromodification requirements can disturb a significant area of land which has its own environmental impacts including changing the natural hydrology which is antithetical to the LID concept. This can also cause a decrease in open space which may be of issue with the Orange County General Plan which requires certain thresholds of open space for developments. For the smaller redevelopment projects and infill projects it may just not be feasible, either physically or due to cost, to build these projects which will represent a lost opportunity to improve water quality through the implementation of the LID requirements.

Furthermore identifying "naturally occurring" conditions for redevelopment sites is difficult and entirely subjective, as in most cases there are no historical records of the natural condition of the site, and begs a technical question as to how far back does one go historically in determining the proper predevelopment timeframe. In cases where natural conditions of a site are not known the best approach is to use an undeveloped natural site in proximity to the re-development site as a reference site. The vegetative cover, soil type, and slope will most affect the hydrology of a site and so approximating these conditions for a re-development site using a natural reference site where these parameters can be measured is a way to approximate the natural conditions of a redevelopment site, however, locating a natural reference site in proximity to a redevelopment site is difficult, as the entire sub-watershed or watershed may be developed. Additionally the conditions of the natural reference site maybe totally different than the "naturally occurring" conditions of the re-development site as vegetative cover, soil type, and slope may have been very different and without historical records there is no way of knowing the actual ""naturally occurring" conditions of a re-development site. The subjectivity of the pre-development approach not only puts municipalities in a position to violate the U.S. and California Constitutions on unlawful takings, but it also conflicts with the Mitigation Fee Act, CEQA and the State Administrative Procedure Act in that the Tentative Order does not contain an adequate record justifying the reasonableness of this standard.

The County is therefore suggesting an approach to hydromodification management that is not a one size fits all approach, is consistent with the watershed approach and the intent of the WQIPs, considers the current Copermittee HMPs, and provides an opportunity to develop watershed specific requirements as part of a watershed stakeholder process that have the best chance of improving water quality.

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
3. Development Planning
c. Priority Development Project Structural BMP Performance Requirements

(2) <u>On-site</u> Hydromodification Management <u>Structural</u> BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite structural BMPs to manage hydromodification <u>to ensure</u> that ~~may be caused~~ ~~by~~ storm water runoff discharged from a project <u>does not cause adverse hydromodification impacts in the downstream receiving waters.</u> ~~as follows:~~

The Copermittees in each Watershed Management Area may establish, as part of the WQIP, watershed specific requirements that will apply to priority development projects based on the susceptibility of the receiving waters to hydromodification impacts and historic receiving water changes from development. If watershed specific requirements are developed they will supersede requirements in the HMP. The watershed specific requirements must include the following:

(a) Post-project runoff flow rates and durations must not exceed ~~pre-development (naturally occurring)~~ the performance standard for runoff flow rates and durations to be determined as part of the development of the WQIPs for each Watershed Management Area by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat conditions downstream of Priority Development Projects).

> *(i) In evaluating the range of flows that results in increased potential for erosion of natural (non-hardened) channels, the lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks.*
>
> *~~(ii) For artificially hardened channels, analysis to identify the lower boundary must use characteristics of a natural stream segment similar to that found in the watershed. The lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or erodes the toe of the channel banks.~~*
>
> *~~(iii)~~(ii) The Copermittees may use monitoring results collected pursuant to Provision D.1.a.(2) to re-define the range of flows resulting in increased potential for erosion, or degraded instream habitat conditions, as warranted by the data.*

(b) Post-project runoff flow rates and durations must compensate for the loss of sediment supply due to the development project, should loss of sediment supply occur as a result of the development project.

(c) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) to comply with the performance requirements of Provisions E.3.c.(2)(a)-(b).

(d) Exemptions

Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provisions E.3.c.(2)(a)-(b) where the project:

> *(i) Discharges storm water runoff into existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;*
>
> *(ii) Discharges storm water runoff into conveyance channels that are engineered for the capacity to convey the 10-year ultimate build out condition flow and are regularly maintained to ensure flow capacity all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean.*

(iii) Discharges to large rivers where large rivers are defined as reaches for which the contributing drainage area exceeds 100 square miles and with a 100-year design flow in excess of 20,000 cfs.

(iv) Discharges from infill redevelopment projects that meet criteria to be established in updates to the Copermittees' HMPs.

(v) Flood control and stream restoration projects.

~~(ii)~~(vi) Is a redevelopment Priority Development Project that meets the alternative compliance requirements of Provision E.3.c.(3)(b)(ii); or

~~(iii)~~(vii) Discharges storm water runoff into other areas identified by the San Diego Water Board as exempt from the requirements of Provisions E.3.c.(2)(a)-(b).

If the Copermittees in a Watershed Management Area select not to develop watershed specific requirements, development projects will be subject to the current Copermittee HMPs inclusive of the exemptions identified in Section E.3.c.(d)(2) that will integrated into updated Copermittee HMPs.

42. Provision E.3.c (Page 78 of 120) – Exemptions For Hydromodification Management Should Include Discharges To Certain Types Of Receiving Waters And Certain Types Of Projects

PDPs that discharge to conveyance channels that are engineered for the capacity to convey the 10-year ultimate build out condition flow and are regularly maintained to ensure flow capacity should be exempt from the hydromodification management requirements. This exemption is similar to the hardened conveyance system exemption, provided in the San Diego HMP and identified in Section D.1.g.(3) of the current San Diego MS4 Permit. Hydromodification requirements are not appropriate for discharges to channels that are designed to accept increased flows from upstream development, as the potential for erosion is non-existent. Studies[60] have shown that hydromodification is caused by the smaller storms up to the 10 year event. Based on these studies those engineered channels designed to convey the 10-year ultimate build out condition will therefore not experience hydromodification impacts. These channels were installed for the purpose of flood control and protection of public safety and property as historically flooding occurred where there is now development. The Permittees in Orange, Riverside and San Diego Counties hosted a workshop on hydromodification management on August 30, 2012. A panel of experts was convened to answer key questions regarding hydromodification to provide the Regional Board Permit team, Copermittee storm water program managers, non-governmental environmental organizations, and the development/business community with a greater understanding of the practice of hydromodification management in the urban watershed. One of the panel expert,s Chris Bowles, PhD, PE, whose qualifications include:

> Chris Bowles, PhD, PE is a registered civil engineer (CA P.E. C76898) specializing in hydraulics, hydrology, geomorphology, water resources, water quality and environmental

[60] *See* Leopold, L.B., M.G. Wolman, J.P. Miller. 1964. Fluvial Processes in Geomorphology. San Francisco, W.H. Freeman and Company. 522 pp. *and* MacRae, C.R. 1993. An Alternate Design Approach for the Control of Instream Erosion Potential in Urbanizing Watersheds. Sixth International Conference on Urban Storm Drainage, Niagara Falls, Ontario.

> restoration. He has over seventeen years of project management experience on a wide variety of large multi-disciplinary, multi-stakeholder projects such as floodplain restoration, sediment studies, watershed hydrology, water quality, river and wetland restoration in California, Nevada, Washington, Oregon, and Florida, and oversees, including projects in the UK and Central America. Thirteen of these years have been spent in practice in the US. His technical expertise spans the range of hydraulic and hydrologic modeling (HEC software and a wide variety of 1D, 2D and 3D hydraulic models), geomorphology, GIS and field data collection (topographic and bathymetric surveying, water quality monitoring, flow gauging and sediment transport measurements). Prior to specializing in environmental hydrology, Dr. Bowles worked initially as a land surveyor and latterly as a site construction supervisor. Dr. Bowles has a doctorate in computational fluid dynamics in the application of fluvial hydraulics and has constructed numerous 1-, 2-, and 3-dimensional hydrodynamic models over his 17 years of experience in environmental engineering.

stated that having to build a storage facility on site to retain stormwater when the site drains into a resilient channel is a "huge waste of money." Dr. Bowles stated that different approaches are needed for different situations (a copy of the video is available at the following link and is incorporated by reference: http://granicus.sandiego.gov/MediaPlayer.php?publish_id=1427 Dr. Bowles statement is at 4:06:24).[61]

Flood control channels cannot be removed as they serve the important and mandated service of flood control. It is also cost prohibitive to think that development can be removed from the floodplain so that these flood control channels could be removed and returned to a natural state. Since removal of these channels is infeasible restoration of these channels to a natural state is also infeasible. In many cases the historic path of the channel went right through where existing development is now and therefore there is no hope of restoration of the channel to its natural state. Since there is no potential for restoration to a natural state and because these channels are designed to be flood control channels they should be allowed to convey the storm events they are designed for. Since there is no potential for removal of these channels there is no environmental benefit to requiring onsite mitigation of hydromodification when these channels are designed and engineered to accept these flows. Although this comment here applies to the hydromodification requirement the County would like to point out that LID concepts will be implemented consistent with the Tentative Order requirements and will have a mitigating effect on hydromodification impacts. Thus between the fact that implementing hydromodification controls on discharges to engineered channel will have no effect on the channel and that LID concepts will be implemented to address the smaller storms there is justification for creating an exemption for discharges to engineered channels.

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
3. Development Planning
c. Priority Development Project Structural BMP Performance Requirements
(2) Hydromodification Management BMP Requirements
(d) Exemptions

[61] Video Presentation of August 30, 2012 Hydromodification Management Workshop: http://granicus.sandiego.gov/MediaPlayer.php?publish_id=1427

(ii) *Discharges storm water runoff into conveyance channels that are engineered for the capacity to convey the 10-year ultimate build out condition flow and are regularly maintained to ensure flow capacity all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;"*

Based on this proposed exemption the County recommends deleting section E.3.c.(2)(a)(ii):

E. Jurisdictional Runoff Management Programs
3. Development Planning
c. Priority Development Project Structural BMP Performance Requirements
(2) Hydromodification Management BMP Requirements
(a)
~~*(ii) For artificially hardened channels, analysis to identify the lower boundary must use characteristics of a natural stream segment similar to that found in the watershed. The lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or erodes the toe of the channel banks.*~~

The San Diego and South Orange County HMPs identified that cumulative watershed impacts are minimal in stream reaches of large depositional rivers. Analysis in the San Diego HMP demonstrated that the effects of cumulative watershed impacts are minimal in those reaches which the drainage area exceeds 100 square miles and with a 100-year design flow in excess of 20,000 cubic feet per second (cfs). An exemption for those reaches that meet these criteria should be included in the exemption provisions of the Tentative Order.

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
3. Development Planning
c. Priority Development Project Structural BMP Performance Requirements
(2) Hydromodification Management BMP Requirements
(d) Exemptions
(iii) *Discharges to large rivers where large rivers are defined as reaches for which the contributing drainage area exceeds 100 square miles and with a 100-year design flow in excess of 20,000 cfs.*

Infill redevelopment projects offer an opportunity for improvement in water quality. Due to the usual tight constraints and limited footprint of infill development projects implementing onsite hydromodification controls is often infeasible. In many cases projects will not be able to meet the hydromodification criteria and so will choose "greenfield" developments where meeting hydromodification criteria are more feasible. To encourage infill development over "urban sprawl" and "greenfield" development, a hydromodification exemption should be provided for infill development projects. This will also provide the benefit of improving water quality as the water quality/LID requirements will still be required to be met. Over time, infill redevelopment projects will address the significant issue of improving water quality from existing development. Without this exemption redevelopment for infill projects will likely not occur as implementing onsite hydromodification will just be too expensive for these types of projects and so the benefits meeting the water quality/LID requirements will not be realized at these sites. Criteria for what projects qualify for the infill development exemption shall be developed by each of the Copermittees as part of updates to their HMPs.

An exemption for infill redevelopment projects comports with a current EPA study that demonstrates the significant environmental benefits that can be attained from infill. *Residential Construction Trends in America's Metropolitan Regions: 2012 Edition*.[62] The lack of an exemption and rigid infill requirements would then be contrary to EPA's support for such projects.

Additionally, the lack of an infill exemption conflicts with State housing element law,[63] guidelines set forth by the California Department of Housing and Community Development and achievement with Regional Housing Needs Assessment (RHNA) numbers issued by the Southern California Area of Governments (SCAG), which require municipalities to quantify and meet their low income housing needs. Infill development is the only means by which affordable housing projects are built. Affordable units cannot be offered at market rates and are heavily subsidized. The lack of an exemption will make it increasingly difficult to construct affordable units due to increased costs, and will likely inhibit municipalities from meeting their RHNA obligations for low income housing. This will have the further effect of making local zoning actions inconsistent with municipal general plans, which may subject municipalities to lawsuits preventing the issuance of building permits.[64]

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
3. Development Planning
c. Priority Development Project Structural BMP Performance Requirements
(2) Hydromodification Management BMP Requirements
(d) Exemptions
(iv) *Discharges from infill redevelopment projects that meet criteria to be established in updates to the Copermittees' HMPs.*

Flood control projects are intended for the protection of public safety and property and are mandated by the Orange County Flood Control Act of 1927. Requiring flood control projects to implement hydromodification controls intended for traditional types of development projects is inappropriate and in most cases infeasible. Furthermore requiring flood control projects to implement hydromodification controls may cause flood control projects to be infeasible which may increase the risk of flooding. If flooding does occur in these areas it would increase the risk of hydromodification impacts to receiving waters from the flooded areas. In-stream restoration projects are designed to restore beneficial use of streams and channels. These projects also serve as a potential option for restoring impacts from hydromodification. It is counterproductive to require mitigation of a stream restoration project.

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
3. Development Planning
c. Priority Development Project Structural BMP Performance Requirements

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[62] EPA Study Available at: http://www.epa.gov/smartgrowth/construction_trends.htm
[63] Gov't Code §§ 65580 et seq.
[64] *Urban Habitat Program v. City of Pleasonton*, No. RG06—293831, Alameda Sup. Ct. (March 12, 2010) (unpublished trial court decision ordering city to cease issuing building permits due to non-compliance with housing element law); *see generally Garat v. City of Riverside*, 2 Cal. App. 4th 259, 286 (1991); *Citizens of Goleta Valley v Board of Supervisors*, 52 Cal. 3d 553, 570 (1990).

(2) Hydromodification Management BMP Requirements
(d) Exemptions
(v) *Flood control and stream restoration projects.*

43. Provision E.3.c (Page 78 of 120) – Biofiltration BMPs Should Be Sized For The Design Capture Volume And If Used For Alternative Compliance Conventional BMPs Should Not Also Be Required

Section E.3.c.(3)(b)(i)[c] requires that if biofiltration is used as an alternative compliance method the biofiltration BMP is required to be sized to 1.5 times the design capture volume, which is an increase from the existing Orange County permit. The Fact Sheet provides no technical justification for the 1.5 factor.

Studies based on work conducted within Orange County by Geosyntec Consultants provide contrary information to the unsupported subjective inclusion of a 1.5 factor. The following documents are submitted for the record [**Appendix A-3 & Appendix A-4**].

Storage and Reuse Systems for Stormwater Management – Preliminary Cost and Performance Estimates for Residential Use in Irvine, CA, Eric Strecker (2009 presentation to Santa Ana Regional Board). Assessed the costs and modeled the performance of harvest and use retention BMPs and compared average annual total suspended solids (TSS) load removed and annual TSS concentrations with BMPs. In both scenarios presented, biofiltration provided superior TSS results to harvest and use.

The Water Report Issue #65: Stormwater Retention on Site, An Analysis of Feasibility and Desirability,[65] The paper identified significant limitations with all retention BMPs and states that "There needs to be a more technical vetting of "retain on site" and stormwater harvest and use before these approaches are made mandatory." The authors also caution that a "one size fits all" approach requiring retention may not be desirable and "in many cases would lead to undesirable results."

Based on the above information, the requirement to oversize biofiltration BMPs should be deleted from the Tentative Order. Biofiltration should be considered equivalent to other retention BMPs and should remain a full part of the LID toolbox without penalization.

Section E.3.c.(3)(b)(i)[d] requires that PDPs that use biofiltration as an alternative compliance option must also implement conventional BMPs. This provision requires additional mitigation for projects and in effect requires double mitigation when it is not needed. Biofiltration BMPs are more effective than conventional BMPs and requiring both does not make any technical sense and this goes well beyond the MEP standard. Furthermore the Fact Sheet provides no technical justification for requiring conventional treatment in addition to biofiltration and this is not the standard in the current Orange County and Riverside permits nor any other permits in California.

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
3. Development Planning

[65] Strecker and Poresky (2009) (reproduced with permission of The Water Report).

c. Priority Development Project Structural BMP Performance Requirements
(3) Alternative Compliance to Onsite Structural BMP Performance Requirements
(b) Alternative Compliance Project Options
(i) Onsite LID Biofiltration Treatment Control BMPs
~~[c] Biofilter at least 1.5 times the design capture volume that is not reliably retained onsite; OR~~
[~~d~~c]Biofilter up to the design capture volume that is not reliably retained onsite, ~~AND 1) treat the remaining portion of the design capture volume not retained onsite with conventional treatment control BMPs in accordance with Provision E.3.c.(1)(c),~~ and ~~2)~~ if necessary, mitigate for the portion of the pollutant load in the design capture volume not retained onsite through one or more alternative compliance project, in-lieu fee and/or water quality credit system options below.

44. Provision E.3.c (Page 78 of 120) – USGBC LEED Certification Is Not An Appropriate Standard In A Stormwater Permit

Provision E.3.c.(3)(b)(ii) allows redevelopment projects to comply with the hydromodification management requirements by achieving LEED Certification. As previously noted inclusion of the USGCB LEED for Homes green building certification program in the Tentative Order is not appropriate as this program encompasses other environmental considerations besides surface water management which are outside the scope of a stormwater permit and outside the authority of the Regional Board.

The County recommends that provision E.3.c.(3)(B)(ii) be deleted from the Tentative Order.

E. Jurisdictional Runoff Management Programs
3. Development Planning
c. Priority Development Project Structural BMP Performance Requirements
(3) Alternative Compliance to Onsite Structural BMP Performance Requirements
(b) Alternative Compliance Project Options
~~(ii) LEED Certified Redevelopment Projects~~
~~The Copermittee may allow redevelopment Priority Development Projects to comply with the hydromodification management BMP performance requirements of Provision E.3.c.(2) where the project is designed and constructed to be certified under the USGCB LEED for New Construction and Major Renovations green building certification program. The Priority Development Project must receive at least one (1) Site Design credit and two (2) Stormwater Design credits under the Sustainable Sites category. In addition, the existing and future configuration of the receiving water must not be unnaturally altered or adversely impacted by storm water flow rates and durations discharged from the site.~~

45. Provision E.3.c (Page 78 of 120) – Offsite Regional BMPs Should Be Sized For The Design Capture Volume

Provision E.3.c.(3)(b)(iv)[a] requires that if an offsite regional BMP is used as an alternative compliance method the offsite regional BMP is required to be sized to 1.1 times the design capture volume, which is an increase from the existing Orange County permit. The Fact Sheet provides no technical justification for the 1.1 factor and so the 1.1 factor should be removed and offsite regional BMPs should only be sized for the design capture volume.

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
3. Development Planning
c. Priority Development Project Structural BMP Performance Requirements
(3) Alternative Compliance to Onsite Structural BMP Performance Requirements
(b) Alternative Compliance Project Options
(iv)Offsite Regional BMPs
[a] The Copermittee may allow Priority Development Projects to utilize offsite regional BMPs to comply with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1) if the offsite regional BMPs have the capacity to receive and retain ~~at least 1.1 times~~ the design capture volume that is not reliably retained onsite.

46. Provision E.3.c (Page 78 of 120) – Alternative Compliance In-Lieu Fee Option Is Inconsistent With State Law

Provision E.3.c.(3)(c)(i) requires the in-lieu fee to be transferred to the Copermittee or an escrow account prior to PDP construction. Development fees however, are collected at the time of building permit issuance, and permits can be issued throughout phases of the development whereby the entire in-lieu fee is not necessarily collected upfront when construction first begins. Furthermore, for large master planned developments, fees are negotiated through a development agreement to be collected based on certain development milestones. Therefore collecting and holding fees prior to construction is not common development practice and there should be flexibility in collecting fees given the timing and phasing of development and the market.

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
3. Development Planning
c. Priority Development Project Structural BMP Performance Requirements
(3) Alternative Compliance to Onsite Structural BMP Performance Requirements
(c) Alternative Compliance In-Lieu Fee Option
(i) The in-lieu fee should ~~must~~ be collected and held in accordance with the Mitigation Fee Act and all other applicable development fee laws. ~~transferred to the Copermittee (for public projects) or an escrow account (for private projects) prior to the date construction of the Priority Development Project is initiated.~~

Provision E.3.c.(3)(c)(ii)[d] requires the in-lieu fee to include the cost to operate and maintain the alternative compliance projects. Development fees however are generally limited to capital costs (design and construction) that go to the useful life of the project of 5 years or more. There are sometimes limitations in State Law on the use of development fees for operations and

maintenance. Operations and maintenance can probably be negotiated with a developer, but a requirement to include operations and maintenance as part of the fee has potential legal issues. *The County recommends the following language be deleted:*

E. Jurisdictional Runoff Management Programs
3. Development Planning
c. Priority Development Project Structural BMP Performance Requirements
(3) Alternative Compliance to Onsite Structural BMP Performance Requirements
(c) Alternative Compliance In-Lieu Fee Option
~~(ii)[d] The in-lieu fee must also include the cost to operate and maintain the offsite alternative compliance projects.~~

47. Provision E.3.c (Page 78 of 120) – The Copermittees Should be Allowed the Flexibility Provided Under EPA Policy to Develop a Trading and Water Quality Credit System

The Copermittees appreciate the flexibility of the Tentative Order to implement a water quality credit system as an alternative compliance schedule. Trading systems create cost-effective, market-based mechanisms for pollutant reduction, and have been successful in other water quality and air quality contexts. The Copermittees do note that any water quality trading system should be implemented in accordance with EPA's 2003 Final Water Quality Trading Policy, which allows for flexibility in generating and trading credits and offsets. The Tentative Order appears to limit a trading system to no net impacts caused by projects meeting the onsite structural BMP performance requirements of Provisions E.3.c(1) and E.3.c(2).

The Copermittees request that this language be stricken and that Copermittees be allowed the flexibility provided under the EPA 2003 Policy. Trading systems differ from program to program and are highly robust and complex credit mechanisms. Therefore, no net impact limitations should be addressed on a case-by-case basis subject to Executive Office approval, and should not immediately be limited by permit language, as certain projects may offer other significant environmental benefits.

The County recommends the following language be deleted:

E. Jurisdictional Runoff Management Programs
3. Development Planning
c. Priority Development Project Structural BMP Performance Requirements
(3) Alternative Compliance to Onsite Structural BMP Performance Requirements
(d) Alternative Compliance Water Quality Credit System Option
The Copermittee may develop and implement an alternative compliance water quality credit system option, individually or with other Copermittees and/or entities. ~~provided that such a credit system clearly exhibits that it will not allow discharges from Priority Development Projects to cause or contribute to a net impact over and above the impact caused by projects meeting the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2).~~ Any credit system that a Copermittee chooses to implement must be submitted to the San Diego Water Board Executive Officer for review and acceptance as part of the Water Quality Improvement Plan.

CONSTRUCTION MANAGEMENT

48. Provision E.4 (Page 90 of 120) – The Construction Management Program Provisions Must Be Modified So As Not To Negate The Very Intent And Purpose Of The Watershed Approach And The Focus On The Highest Priorities Within Each Watershed Management Area

(See the corresponding comments under Provision E – Jurisdictional Runoff Management Programs)

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
4. Construction Management [Intro]
Each Copermittee must implement a construction management program in accordance with the strategies identified in the Water Quality Improvement Plan ~~and include, at a minimum, the following requirements.~~ The requirements of the jurisdictional runoff management programs as outlined below may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality improvement Plan(s).
Move Provision 4f, "Strategies to Address the Highest Priority Water Quality Conditions" to just after the Introduction to the section and before Provision 4.a.

E. Jurisdictional Runoff Management Programs
4. Construction Management
(1) *Provide specific details about how the strategies and/or activities will be implemented (e.g. designate ~~additional~~ BMPs, focus education, and/or increase/decrease frequency of inspections for specific types of sites and/or activities); and*

49. Provision E.4 (Page 90 of 120) – Verification Of Permit Coverage By The Copermittees Should Be For The CGP Only

Per Section 4.a.(4) Copermittees are required to verify that the project applicant has obtained coverage under applicable permits. The fact sheet identifies that "The requirements under Provision E.4. are consistent with the 4th Term Permits for San Diego, Orange, and Riverside Counties", however the requirement of the current Orange County permit is to verify coverage under the Construction General Permit only and so there is not consistency with the 4th Term permits. It is only appropriate to require the Copermittees to verify coverage under the CGP as tracking down the other applicable permits does not assist in ensuring construction management is being implemented correctly. Furthermore, the USACE requires all other permits to be in place prior to issuing the 404 permit. It is not possible to have the 404 permit prior to issuing a grading or building permit.

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
4. Construction Management
a. Project Approval Process

(4) *"Verify that the project applicant has obtained coverage under ~~applicable permits, including, but not limited to~~ the Construction General Permit.~~, Clean Water Act Section 401 Water Qaulity Certification and Section 404 Permit, and California Department of Fish and Game Streambed Alteration Agreement.~~*

50. Provision E.4 (Page 90 of 120) – Maintaining An Inventory Of Construction Sites Should Be Done On A Quarterly Basis

The current language requires monthly update of construction sites. Quarterly update of the inventory is more appropriate to track construction sites as this is a significant burden on the Copermittees. Some information for the construction site inventory will be based on inspections and as inspections for some sites will not be completed monthly it is more appropriate to maintain the inventory on a quarterly basis. These sites are tracked through SMARTS already and, therefore, more frequent tracking is not necessary.

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
4. Construction Management
b. Construction Site Inventory and Tracking
(1) Each Copermittee must maintain and update at least quarterly ~~monthly~~, a watershed-based inventory of all construction projects issued a local permit that allows ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff. The use of an automated database system, such as GIS, is highly recommended. The inventory must include:

51. Provision E.4 (Page 90 of 120) – Identifying The Weather Conditions During An Inspection Is More Appropriate Than Quantifying The Amount Of Rainfall Since The Last Inspection

The current language requires the inspector to quantify the approximate amount of rainfall since the previous inspection. Quantifying the amount of rainfall since the last inspection provides no benefit in the documentation of an inspection. Documentation of the weather conditions at the time of the inspection however does provide some context as to the state of BMPs during the inspections.

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
4. Construction Management
e. Construction Site Inspections
(c) ~~Approximate amount of rainfall since last~~ Weather condition during inspection;

EXISTING DEVELOPMENT

52. Provision E.5 (Page 95 of 120) –The Existing Development Program Provisions Must Be Modified So As Not To Negate The Very Intent And Purpose Of The Watershed Approach And The Focus On The Highest Priorities Within Each Watershed Management Area

(See the corresponding comments under Provision E – Jurisdictional Runoff Management Programs)

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
5. Existing Development Management [Intro]
Each Copermittee must implement an existing development management program in accordance with the strategies identified in the Water Quality Improvement Plan ~~and include, at a minimum, the following requirements.~~ The requirements of the jurisdictional runoff management programs as outlined below may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality improvement Plan(s).

Move Provision 5e, "Strategies to Address the Highest Priority Water Quality Conditions" to just after the Introduction to the section and before Provision 5.a.

(a) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate ~~additional~~ BMPs, focus education, and/or increase/decrease frequency of inspections for specific types of facilities, areas and/or activities);

E. Jurisdictional Runoff Management Programs
5. Existing Development Management
a. Existing Development Inventory and Tracking
Each Copermittee must maintain, and update at least annually, a watershed-based inventory of the existing development within its jurisdiction that may discharge a high priority pollutant load to and from the MS4…….The inventory must, at a minimum, evaluate and include the following if identified as a source of a high priority pollutant ~~include~~:

(1)(c)(vi) Flood management projects and flood control devices and structures;
(1)(c)(xii) Other municipal facilities that the Copermittee determines may contribute a significant high priority pollutant load to the MS4; and
(2)(g) Identification of the high priority pollutants ~~generated and~~ potentially generated by the facility or area;
~~(2)(j) Whether the facility or area contributes or potentially contributes to the highest priority water quality conditions identified in the Water Quality Improvement Plan.~~

E. Jurisdictional Runoff Management Programs
5. Existing Development Management
b. Existing Development BMP Implementation and Maintenance
Each Copermittee must designate a ~~minimum~~ set of BMPs required for all inventoried existing development, including special event venues. The designated ~~minimum~~ BMPs must be specific

to the identified high priority facility or area types and high priority pollutant generating activities, as appropriate.

53. Provision E.5 (Page 95 of 120) – The Tentative Order Should Recognize That Some Channel Rehabilitation Projects May Occur Downstream Of A Copermittee's Jurisdiction

Some minor changes to the Tentative Order language are needed to recognize that channel rehabilitation projects for a Copermittee may occur just downstream of the Copermittee's jurisdiction.

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
5. Existing Development Management
e. Strategies to Address the Highest Priority Water Quality Conditions
(3) Stream, Channel and/or Habitat Rehabilitation in Areas of Existing Development
Each Copermittee must describe in its jurisdictional runoff management program document, a program to rehabilitate streams, channels, and/or habitats in areas of existing development within its jurisdiction or just downstream of its jurisdiction to address the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

54. Provision E.5 (Page 95 of 120) – Remove The Requirement To Evaluate Retrofit Of Stream Channels From The Tentative Order

Requiring Municipalities to take full responsibility for evaluation of stream channels for restoration goes beyond the intent and scope of Section 402 (p) of the Clean Water Act. The fact sheet identifies that "areas of existing development are responsible for poor water quality, degraded habitats, and hydromodified channels", however existing development may not be the only cause and it is not the responsibility of the Copermittees to restore receiving waters but rather reduce the discharge of pollutants in stormwater and non-stormwater to the Maximum Extent Practicable. Restoration and rehabilitation of stream channels is not the responsibility of the Copermittees. Additionally in many instances the channels are flood control facilities which are designed to protect public safety and developments from flooding. In many instances stream restoration or rehabilitation may not be feasible.

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
5. Existing Development Management
e. Strategies to Address the Highest Priority Water Quality Conditions
(3) Stream, Channel and/or Habitat Rehabilitation in Areas of Existing Development
~~*(a) Each Copermittee must identify streams, channels, and/or habitats in areas of existing development as candidates for rehabilitation, focusing on areas where stream, channel, and/or habitat rehabilitation projects will address the highest priority water quality conditions identified in the Water Quality Improvement Plan;*~~

ENFORCEMENT RESPONSE PLANS

55. Provision E.6 (Page 104 of 120) – The Copermittees Should Be Allowed To Utilize Existing Guidelines And Procedures For Enforcement

Provision E.6 requires each Copermittee to develop and implement an Enforcement Response Plan as a part of its jurisdictional runoff management plan. The Fact Sheet notes that the Enforcement Response Plans will serve as a reference to determine if consistent enforcement actions are being implemented in order to achieve timely and effective compliance. Although the County understands the need for this document, the Tentative Order should be modified to allow the Copermittees to continue to utilize and implement established, equivalent guidelines and procedures for enforcement.

As a part of the development and implementation of a robust Illegal Discharge/Illicit Connection (ID/IC) Program, the Orange County Copermittees have developed an *Investigative Guidance Document* and *Enforcement Consistency Guide*. The response procedures generally include record keeping, notifications and response requests, response activities, investigations, clean-up activities, reporting, education, and enforcement/progressive enforcement. As provided for in the *Enforcement Consistency Guide*, when selecting enforcement options, the County's Authorized Inspectors ensure that violations of a similar nature receive a consistent enforcement remedy. More severe enforcement options may be utilized depending on variables such as history of non-compliance or failure to take good faith actions to eliminate continuing violations or to meet a previously imposed compliance schedule.

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
6. Enforcement Response Plans [Intro]
Each Copermittee must develop and implement an Enforcement Response Plan as part of its jurisdictional runoff management program document. The Enforcement Response Plan must describe the applicable approaches and options to enforce its legal authority established pursuant to Provision E.1, as necessary, to achieve compliance with the requirements of this Order. Copermittees may continue to utilize and implement established, equivalent guidelines and procedures for enforcement. The Enforcement Response Plan must include the following:

56. Provision E.6 (Page 104 of 120) – The Term And Definition For "Escalated Enforcement" Should Be Redefined

Although Provision E.6.d requires each Copermittee to include "Escalated Enforcement" in the required Enforcement Response Plan, the definition of what is intended by "Escalated Enforcement" is different within the Tentative Order than the Fact Sheet and may not be enforceable.

The Tentative Order defines "Escalated Enforcement" as "any enforcement scenario where a violation or other non-compliance is determined to cause or contribute to the highest water quality conditions identified in the Water Quality Improvement Plan". This definition seems to indicate that a Copermittee may enforce differently in a particular situation if it involves a high priority pollutant of concern. Not only does the County take exception to the notion that they would enforce differently solely based on the constituent involved, the legality of such an enforcement action is questionable. In fact, when selecting enforcement options, the Co-

Copermittees must ensure that violations of a similar nature are subjected to similar-types of enforcement remedies in order to avoid any claim of selective enforcement of the Ordinance.

However, the Fact Sheet seems to indicate that "Escalated Enforcement" would instead require the Copermittees to "take progressively stricter response to enforce its legal authority and achieve compliance….". The County supports this approach, especially since this is consistent with other ID/IC programs in California and the established guidance that has been developed and implemented by the Copermittees. In fact, the established guidance recognizes that a more severe enforcement option may be selected when a violator has either a history of noncompliance or has failed to take good faith actions to eliminate continuing violations or to meet a previously imposed compliance schedule.

The Tentative Order should be modified as indicated below so that it reflects a standard progressive response approach.

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
6. Enforcement Response Plans
d. ~~Escalated~~ Progressive Enforcement
(1)The Enforcement Response Plan must include a definition of "~~escalated~~ progressive enforcement". ~~Escalated~~ Progressive enforcement must include a series of enforcement actions that match the severity of the violations and include distinct, progressive steps. ~~any enforcement scenario where a violation or other non-compliance is determined to cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan~~. ~~Escalated~~ Progressive enforcement may be defined differently for development planning, construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and/or residential areas.
(2)Where the Copermittee determines progressive ~~escalated~~ enforcement is not required, a rationale must be recorded in the applicable electronic database or tabular system used to track violations.
(3)Progressive ~~Escalated~~ enforcement actions must continue to increase in severity, as necessary, to compel compliance as soon as possible.

Add a definition for "Progressive Enforcement" in Attachment C

PUBLIC EDUCATION

57. Provision E.7 (Page 106 of 120) – The Public Education Program Provisions Must Be Modified So As Not To Negate The Very Intent And Purpose Of The Watershed Approach And The Focus On The Highest Priorities Within Each Watershed Management Area

(See the corresponding comments under Provision E – Jurisdictional Runoff Management Programs)

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
7. Public Education and Participation [Intro]

Each Copermittee must implement, individually or with other Copermittees, a public education and participation program in accordance with the strategies identified in the Water Quality Improvement Plan to promote and encourage the development…. ~~and include, at a minimum, the following requirements.~~ The requirements of the jurisdictional runoff management programs as outlined below may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality improvement Plan(s).

Move Provision 7c, "Strategies to Address the Highest Priority Water Quality Conditions" to just after the Introduction to the section and before Provision 7.a.

B. Public Education
The public education program component implemented within the Copermittee's jurisdiction ~~must~~ may include~~, at a minimum,~~ the following:
(1) Educational activities, public information activities, and other appropriate outreach activities intended to reduce pollutants associated with the ~~application of pesticides, herbicides and fertilizer and other pollutants of concern in storm water discharges to and from its MS4 to the MEP, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed to address the~~ highest priority water quality conditions identified in the Water Quality Improvement Plan;

PROVISION F – REPORTING

58. Provision F (Entire Provision; Begins Page 109 of 120) – The Process For The Development And Updates Of The Various Plans Needs To Be Aligned And Allow For The Time Necessary To Complete The Work

Provision F includes the requirements for the documents and reports that the Copermittees must prepare and provide to the Regional Water Board. This provision incorporates significantly expanded requirements for public participation and involvement in the development and implementation of the WQIPs and JRMPs.

However, the timeframe outlined in this section links each step of the development of the WQIP and JRMP to the commencement of coverage under the Order instead of to the development step that precedes it. The three steps outlined for the development of the WQIP need to be sequential so that the Copermittees have adequate time to complete each step and build the program based on previous comments received. In addition, the timeframe needs to explicitly incorporate adequate time for the Copermittees to review and respond to the comments received on the current action before moving on to the next step of development. For example, it is unclear how the Copermittees would establish their water quality improvement strategies (step 2 of development) at the same time as the establishment of the priority water quality conditions and numeric goals (step 1 of development), however the timelines are concurrent in the Tentative Order.

It should also be noted that this approach appears to establish a heavy workload for the public, Copermittees, and Regional Board. We would submit that a more streamlined approach for the development of the WQIPs should be considered which would provide the Copermittees with the necessary time to develop the final WQIP without extending the overall timeframe. For example, instead of requiring a formal public notice and solicitation of comments by the Regional Board for all three (3) steps of each WQIP, perhaps the Copermittees can work with the local stakeholders to solicit comments for the first two steps of the development of the WQIP

and only require formal public noticing for the final approval of the WQIP. Although this is one approach to streamline the development of the WQIP and recommended by the County, an alternative approach would be to modify the timelines as indicated below.

In addition, it should be noted that the preparation of a regional WQIP may trigger local requirements under CEQA. This should be recognized in setting the timeline as noted within the table below.

A comparison of the current and recommended approach is provided in the table below.

Steps and Timelines	Existing Approach in Tentative Order	Total Time from Effective Date of Order	Recommended Approach (w/ edits provided in Tentative Order)	Total Time from Effective Date of Order
Establish Priority Water Quality Conditions and Numeric Goals	Within 6 months of commencement of coverage	6 months	Within 6 months of commencement of coverage	6 months
Request Public Comments	60 days from posting	8 months	30 days from posting	7 months
Revise Priority Water Quality Conditions and Numeric Goals	Not specified	? months	30 days from receiving comments	8 months
Establish Water Quality Improvement Strategies and Schedules	Within 9 months of commencement of coverage	9 months	Within 3 months of finalizing Priority Water Quality Conditions and Numeric Goals	11 months
Request Public Comments	60 days from posting	11 months	30 days with stakeholders	12 months
Revise Water Quality Improvement Strategies and Schedules	Not specified	? months	30 days from receiving comments	13 months
Develop WQIP	Within 18 months of commencement of coverage	18 months	Within 18 months of commencement of coverage	**18 months (this allows 5 months for the development of the document)**
Request Public Comments	30 days from posting	19 months	30 days from posting	19 months

If no hearing, Regional Board notify Copermittees that the WQIP is accepted	Within 6 months of the public request for comments	25 months	Within 6 months of the public request for comments	25 months
Finalize WQIP	Not specified	? months	60 days from receiving comments (this assumes that it is concurrent with the Regional Board notification above)	? months
Review for CEQA Requirements	*It should be noted that the preparation of a regional WQIP may trigger local requirements under CEQA. This should be recognized in setting the timeline. This would likely take 30-60 days.*			
Posting on Regional Clearinghouse	Within 30 days of acceptance by Regional Board	26 months	Within 30 days of acceptance by Regional Board	26 months

The County recommends the following language changes

F. Reporting
1. Water Quality Improvement Plans
a. Water Quality Improvement Plan Development
(1)(c) Within 6 months after the commencement of coverage under this Order, the Copermittees must develop and submit the Water Quality Improvement Plan requirements of Provision B.2 to the San Diego Water Board. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of ~~6~~30 days.
(1)(d) Within 30 days of receiving the public comments, the Copermittees must revise the priority water quality conditions and numeric goals based on comments received and/or recommendations or direction from the San Diego Water Board Executive Officer.

F. Reporting
1. Water Quality Improvement Plans
a. Water Quality Improvement Plan Development
(2)(b) Within 3 months after the development of the priority water quality conditions and numeric goals, ~~9 months after the commencement of coverage under this Order,~~ the Copermittees must develop and submit the Water Quality Improvement Plan requirements of Provision B.3 to the San Diego Water Board. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of ~~6~~30 days.
(2)(c) Within 30 days of receiving the public comments, the Copermittees must revise the water quality improvement strategies and schedules based on comments received and/or recommendations or direction from the San Diego Water Board Executive Officer.

F. Reporting
1. Water Quality Improvement Plans
b. Water Quality Improvement Plan Submittal

(2) Based on the comments received, the San Diego Water Board will determine whether to hold a public hearing or to limit public input to submittal of written comments. If no hearing is held the San Diego Water Board will notify the Copermittees within 6 months that the Water Quality Improvement Plan has been accepted as complete following its review and determination that the Water Quality Improvement Plan meets the requirements of this Order.
(3) Within 60 days of receiving comments, the Copermittees must revise the Water Quality Improvement Plan based on comments received and/or recommendations or direction from the San Diego Water Board Executive Officer.

(4)The Water Quality Improvement Plan must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of the finalization of the Water Quality Improvement Plan and acceptance by the San Diego Water Board.

F. Reporting
2. Updates
a. Jurisdictional Runoff Management Program Document Updates
(2)Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E no later than 6 ~~18~~ months after the completion of the corresponding Water Quality Improvement Plan and acceptance of the Water Quality Improvement Plan by the San Diego Water Board ~~commencement of coverage under this Order~~.
(3) Each Copermittee must submit updates to its jurisdictional runoff management program, with a rationale for the modifications, either in the Annual Report required pursuant to Provision F.3.b, and/or as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The requested updates are considered accepted by the San Diego Water Board if no response is provided to the Copermittee after 3 months of submitting the request.
(5) Updated jurisdictional runoff management program documents must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of ~~submitting the annual report~~ completing the updates.

F. Reporting
2. Updates
d. BMP Design Manual Updates
(2)Subsequent updates must be consistent with the requirements of Provisions E.3.a-d and must be submitted as part of the Annual Reports required pursuant to Provision F.3.b, and/or as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The requested updates are considered accepted by the San Diego Water Board if no response is provided to the Copermittee after 3 months of submitting the request.

59. Provision F.3 (Page 112 of 120) – The JRMP Annual Report Form Is Not Linked To The Watershed Priorities And Does Not Result In Meaningful Reporting

The Tentative Order states that the purpose of the reporting is to determine and document compliance with the Order and to communicate the implementation status of each jurisdictional runoff management program. This goal is met, in part, through the submittal of the Annual Reports (F.3.b), which includes a requirement for each Copermittee to submit a Jurisdictional Runoff Management Program (JRMP) Annual Report Form (Attachment D). The requirement for the Copermittees to submit Attachment D is problematic for the following reasons:

1. The Form is a significant departure from the current jurisdictional reporting and effectiveness assessment required pursuant to Order R9-2009-002 and will only focus on the *implementation* of the permit provisions instead of the *impact, effectiveness* and potential *modifications* necessary for the program.

2. The jurisdictional reporting should complement the WQIP reporting and be focused on the implementation, impact, and effectiveness assessment of the jurisdictional actions and activities that are being implemented to support the goals, objectives, and high priority water quality issues of the WQIP.

3. The ability of the Copermittees to be able to, on a jurisdictional basis, determine if there are modifications and/or improvements needed to maximize the JRMP and, ultimately, the WQIP effectiveness will be severely limited.

4. The reporting required pursuant to the Form is not linked to the priorities within the WQIP and, is therefore, additive and will require the Copermittees to develop the related data collection and reporting infrastructure without a commensurate benefit for the management of the programs.

5. The Form seems to restrict the reporting capabilities of the Copermittees and requires the compilation of cumbersome and uninformative numbers such as “number of existing developments in residential inventory” and “number of priority development projects in review”.

6. Although the Fact Sheet identifies Attachment D as an “example”, this is not clearly stated within the provisions. If the Copermittees can develop their own JRMP reporting form that would be aligned with the WQIP priorities and strategies, then this should be clarified within the Tentative Order.

As a result, it is unclear how this new reporting requirement will improve upon existing reporting processes and/or provide information that would inform management decisions at the jurisdictional or watershed scale. Allowing the Copermittees to develop their own jurisdictional reporting to support the overarching WQIP will still be consistent with the reporting requirements identified in 40CFR 122.42(c). The County is recommending that the jurisdictional reporting be aligned with the WQIP reporting and either delete Attachment D or make it optional.

The County recommends the following language changes:

F. Reporting
3. Progress Reporting
b. Annual Reports [add the following provision]
(1)(e) For each Water Quality Improvement Plan, the progress of implementing the corresponding Jurisdictional Urban Runoff Management Programs. Each Copermittee should report on the items listed below. The individual JRMP annual reports may be included as attachments to the corresponding WQIP annual report. The JRMP annual report should include, but not be limited to, the following:

(i) The water quality improvement strategies that were implemented and/or no longer implemented by each of the Copermittees during the reporting period and previous reporting periods, and are planned to be implemented during the next reporting period,

(ii) Proposed modifications to the water quality improvement strategies, with public input received and rationale for the proposed modifications,

(iii) Previously proposed modifications or updates incorporated into each Copermittee’s jurisdictional runoff management program document and implemented by the Copermittees in the Watershed Management Area, and

(iv) Proposed modifications or updates to each Copermittee’s jurisdictional runoff management program document;

(f) ~~A completed Jurisdictional Runoff Management Program Annual Report Form (Attachment D or accepted revision) for each Copermittee in the Watershed Management Area, certified by a~~

~~Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative.~~

F. Reporting
3. Progress Reporting
b. Annual Reports
(2) ~~Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (Attachment D or accepted revision) no later than October 31 of each year until the first Annual Report is required to be submitted.~~ Until the Copermittees have updated their jurisdictional runoff management programs consistent with Provision F.2.a, the Copermittees must continue to utilize the current jurisdictional runoff management program annual reporting format. Each Copermittee must submit the information on the Jurisdictional Runoff Management Program Annual Report Form specific to the area within its jurisdiction in each Watershed Management Area.

F. Reporting
3. Progress Reporting
c. Regional Monitoring and Assessment Report

[This provision should be moved to section F.5.c since it is a part of the ROWD assessment]

Delete Attachment D or make it an "example" of what the Copermittees can prepare for each Watershed Management Area.

60. Provision F.3 (Page 112 of 120) – The Annual Reporting Section Should Be Modified To Distinguish Between The Reporting That Is Conducted During The Transitional Period And The Reporting That Is Conducted Afterward

The language in Provision F.3.b should be clarified to provide additional direction to the Copermittees regarding the transitional period annual reporting and the post-transitional annual reporting requirements.

The County recommends the following language changes:

F. Reporting
3. Progress Reporting
b. Annual Reports
(1) Transitional Period JRMP Reports: Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report no later than October 31 of each year prior to the implementation of updated JRMP programs pursuant to F.2.a. Each Copermittee must submit the information on the Jurisdictional Runoff Management Program specific to the area within its jurisdiction in each Watershed Management Area.

(2) Transitional Period Monitoring Report: The transitional period monitoring conducted pursuant to D.1.a and D.2.a. shall be reported in a single report that covers the entire reporting period from the initiation of the transitional period monitoring (as described in D.1.a and D.2.a.), through September 30th following approval of the Water Quality Improvement Plan. The Transitional Period Monitoring Report shall include the assessments required per D.4.a.(1)(a), D.4.b.(1)(a) and D.4.b.(2)(a); and be submitted by January 31st following completion of the above mentioned transitional period.

(3) Post-Transitional Annual Reports – Following the initial transitional period after enrollment into this Order, the Copermittees for each Watershed Management Area must submit a combined Annual Report for each reporting period no later than January 31 of the following year. The annual reporting period consists of two periods: 1) July 1 to June 30 of the following year for the jurisdictional runoff management programs, 2) October 1 to September 30 of the following year for the monitoring and assessment programs. ~~The first Annual Report must be prepared for the reporting period beginning July 1 after commencement of coverage under this Order, and upon San Diego Water Board determination that the Water Quality Improvement Plan meets the requirements of this Order to June 30 in the following year for the jurisdictional runoff management programs, and September 30 in the following year for the monitoring and assessment programs.~~ Annual Reports must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Each Annual Report must include the following:

61. Provision F.4 (Page 115 of 120) –The Copermittees Should Be Able To Define The Geographic Coverage Of And Utilize Established Web-Based Mechanisms As Their Regional Clearinghouse

The Tentative Order requires the Copermittees to develop, update, and maintain an internet-based Regional Clearinghouse, however it does not define what geographic area is covered by a Regional Clearinghouse or if the Copermittees can utilize their existing web-based systems and/or linkages that have been developed over the last four permit terms. The Copermittees should be able to define what geographic area is covered by the Regional Clearinghouse, which could include, but not be limited to, watershed management areas, County jurisdictions and/or the San Diego Regional Water Quality Control Board jurisdiction. In addition, the Copermittees should be able to utilize existing, established mechanisms and linkages, in whole or in part, as their Regional Clearinghouse so that they do not, necessarily, need to expend resources in developing new infrastructure.

The County recommends the following language changes:

F. Reporting
4. Regional Clearinghouse
The Copermittees must develop, update, and maintain an internet-based Regional Clearinghouse that is made available to the public no later than 18 months after the effective date of this Order. The Copermittees may elect to develop and maintain the clearinghouse(s) provided by other Copermittees or agencies.

Add a definition for "Regional Clearinghouse" in Attachment C

ATTACHMENT C
Acronyms, Abbreviations, and Definitions

62. Attachment C (Entire Attachment; Begins Page C-1) – Attachment C Should Clarify The Meaning Or Intent Of Specific Terms Used Within The Order

In addition to the acronyms and abbreviations, Attachment C also includes definitions that may provide an explanation or description of the meaning or intent of specific terms or phrases that are used within the Order. The County recommends the addition and/or modification of the following definitions in order to assist in describing the meaning or intent of these terms and to avoid unnecessary confusion.

The County recommends the following language changes:

This term did not have a definition.

Channel Rehabilitation and Improvement *– Remedial measures or activities for the purpose of improving the environmental health of streams, channels, or river systems. Techniques may vary from in-stream restoration techniques to off-line stormwater management practices installed in the system corridor or upland areas. Rehabilitation techniques may include, but are not limited to the following: riparian zone restoration, constructed wetlands, bank stabilization, channel modifications, and daylighting of drainage systems. Effectiveness may be measured in various manners, including: assessments of habitat, reduced streambank erosion, and/or restoration of water and sediment transport balance.*

This definition should remain consistent with the Federal regulations.

Copermittee *– A permittee to a NPDES permit that is only responsible for permit conditions relating to the discharge for which it is operator [40 CFR 122.26(b)(1)]. For the purposes of this Order, a Copermittee may include the following jurisdictions: a~~A~~n incorporated city within the County of Orange, County of Riverside, or County of San Diego in the San Diego Region, the County of Orange, the County of Riverside, the County of San Diego, the Orange County Flood Control District, the Riverside County Water Conservation and Flood Control District, the San Diego Regional Airport Authority, or the San Diego Unified Port District.*

This definition should provide additional clarification.

Illicit Connection *– Any man-made conveyance or drainage system through which the discharge of any pollutant to the stormwater drainage system occurs or may occur. ~~Any connection to the MS4 that conveys an illicit discharge.~~*

This definition should remain consistent with the Federal regulations.

Illicit Discharge *- Any discharge to a ~~the~~ municipal separate storm sewer ~~MS4~~ that is not composed entirely of storm water except discharges pursuant to a NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer) and discharges resulting from fire fighting activities [40 CFR 122.26(b)(2)].*

This definition should provide additional clarification for the purposes of low impact development.

Infiltration *– Water other than wastewater that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow [40 CFR 35.2005(20)]. In the context of low impact development, infiltration may also be defined as the percolation of water into the ground. Infiltration is often expressed as a rate (inches per hour), which is determined through an infiltration test.*

This term did not have a definition.

Progressive Enforcement *– A series of enforcement actions that increase in severity commensurate with the violation. Such enforcement actions may include verbal and written notices of violation, fines, stop work orders, administrative penalties, criminal penalties, etc.*

This definition should provide additional clarification.

Redevelopment *- The creation, addition, and or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include trenching and resurfacing associated with utility work; parking lots, resurfacing existing roadways; cutting and reconfiguring of surface parking lots; new sidewalk construction, pedestrian ramps, or bike lane on existing roads; and routine replacement of damaged pavement, such as pothole repair.*

This term did not have a definition.

Regional Clearinghouse *– A central location for the collection, classification, and distribution of information including, but not limited to, plans, reports, manuals, data, contact information, and/or links to such documents and information. The clearinghouse(s) may be organized by the following regions: Watershed Management Areas, County jurisdictions, and/or the San Diego Regional Water Quality Control Board jurisdiction.*

This definition should remain consistent with the Federal regulations.

Storm Water *– Per 40 CFR 122.26(b)(13), means storm water runoff, snowmelt runoff and surface runoff and drainage. ~~Surface runoff and drainage pertains to runoff and drainage resulting from precipitation events.~~*

This definition should remain consistent with the State regulations

Waters of the State *- Any ~~water,~~ surface water or groundwater ~~underground~~, including saline waters, within the boundaries of the s~~S~~tate [CWC section 13050 (e)]. The definition of the Waters of the State is broader than that for the Waters of the United States in that all water in the State is considered to be a Waters of the State ~~regardless of circumstances or condition~~.*

This term should clarify that a wet weather period should be preceded by a minimum dry weather period, unless defined differently in another regulatory mechanism.

Wet Weather – *Weather is considered wet if there is a storm event of 0.1 inches and greater ~~and the following~~ preceded by 72 hours of dry weather, unless otherwise defined by another regulatory mechanism, such as a TMDL.*

ATTACHMENT D
Jurisdictional Runoff Management Program Annual Report Form

63. Attachment D (Entire Attachment; Begins Page D-1) – The JRMP Annual Report Form Is Not Linked To The Watershed Priorities And Does Not Result In Meaningful Reporting

(See Comments on Provision F.3.b)

ATTACHMENT E
Specific Provisions for Total Maximum Daily Loads

64. Attachment E (Entire Attachment; Begins Page E-1) – Permit Provisions Must Be Consistent With The Corresponding Basin Plan Amendments (BPAs)

The Regional Board has adopted two Basin Plan Amendments (BPAs) to establish Total Maximum Daily Loads (TMDLs) where the Copermittees are identified as Responsible Parties and assigned wasteload allocations (WLAs): (1) Indicator Bacteria in Baby Beach in Dana Point Harbor[66] and (2) Indicator Bacteria, Project I - Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)[67] (Beaches and Creeks Bacteria TMDL).

However, there are several fundamental and substantive discrepancies between the adopted TMDL BPAs and the provisions of the Tentative Order. These inconsistencies negate the Basin Planning process that occurred to establish the TMDLs and clearly contradict the Board's intent for how the TMDLs would be incorporated into the MS4 Permit. As the TMDLs have been incorporated into the Basin Plan, the TMDLs constitute the "program of implementation needed for achieving water quality objectives"[68] and the provisions in the MS4 Permit must therefore be consistent with the Basin Plan.

For example:

- Both the Baby Beach and Beaches and Creeks TMDLs clearly establish mass-based wasteload allocations. These wasteload allocations are entirely absent from the Tentative Order (see additional comments below for further discussion). Instead, the Tentative Order establishes water quality based effluent limits (WQBELs) based upon an effluent concentration (set equal to the numeric targets).
- For the Beaches and Creeks TMDL, the Tentative Order is not consistent with the compliance schedule approach provided for the comprehensive load reduction plans (CLRPs) established in the BPA. The CLRPs that will be submitted by Copermittees will propose interim compliance dates, as allowed by the BPA, to meet the 50% reduction milestone for dry and wet weather. The CLRPs submitted by Copermittees may not all propose the same interim compliance dates and the Tentative Order should

[66] Resolution R9-2008-0027
[67] Resolution R9-2010-0001
[68] Water Code section 13050(j)

acknowledge the flexibility allowed by the TMDL[69]. In fact, this scheduling flexibility was a primary "incentive" for Copermittees to develop CLRPs instead of Bacteria Load Reduction Plans (BLRPs).

- For the Baby Beach TMDL, the BPA includes two paths for the implementation of the TMDL – one where the beach has been delisted from the 303(d) list and one where the beach remains impaired[70]. Where a beach has been delisted, the BPA requires that Responsible Copermittees monitor and continue implementation of existing implementation actions "to ensure REC-1 water quality objectives are maintained" (i.e., the beach is not placed back on the 303(d) list). Only if the beach is placed back on the 303(d), the NPDES permit is to be revised to include "requirements consistent with these TMDLs." As Baby Beach is not on the most recent 303(d) list for REC-1 bacteria objectives, the requirements for Responsible Copermittees must be limited to monitoring and implementation of existing implementation actions. The Tentative Order does not recognize the approach for delisted beaches or recognize that Baby Beach is delisted.
- For the Beaches and Creeks TMDL, the BPA clearly establishes that no additional actions are required for beaches that are delisted[71]. This language is not included in the Tentative Order.
- Monitoring requirements in the Tentative Order must be consistent with the requirements of the BPAs. Both the Baby Beach TMDL and the Beaches and Creeks TMDL provide certain flexibility in monitoring, via the BLRPs and CLRPs, respectively, and this flexibility is not captured in the Tentative Order.
- Both the Baby Beach TMDL and the Beaches and Creeks TMDL clearly acknowledges that exceedances in the receiving water may not be from the MS4 and contains specific compliance language to address such a situation. This language is not provided in the Tentative Order.

These examples are not exhaustive of the inconsistencies between the BPAs and the Tentative Order (additional inconsistencies are identified and modified language is proposed in **Attachment B**).

During the workshops on the Tentative Order, Regional Board members raised the question of feasibility of attaining the TMDLs. The Basin Plan Amendments included many considerations and requirements that cumulatively result in a more feasible program of implementation. If many of the requirements of the BPAs are modified or not included in the MS4 permit, such as the mass-based WLAs, flexible monitoring programs, no further action for delisted beaches, and reconsideration of the TMDLs through reopeners, the Tentative Order establishes requirements that are not only inconsistent with the BPAs, but that make attainment of the TMDLs infeasible.

*The County recommends that the Regional Board modify the requirements in Attachment E to establish provisions that are consistent with the adopted Basin Plan Amendments. Specific modifications to address these inconsistencies are provided in **Attachment B**. Certain key inconsistencies are noted in the subsequent comments below. Additional inconsistencies are also captured in the modifications detailed in **Attachment B**.*

[69] Page 68 of Attachment A of the Basin Plan Amendment
[70] See BPA pg. A-12
[71] See the Basin Plan Amendment, pgs. A2, A12, A66

65. Attachment E (Entire Attachment; Begins Page E-1) – The Tentative Order's Numeric WQBELs Violate the Requirements of Law Because They are Infeasible

The Tentative Order's numeric WQBELs are not feasible. The 2010 EPA Memorandum on TMDLs[72] recommends "where feasible, the NPDES permitting authority exercise its discretion to include numeric effluent limitations as necessary to meet water quality standards."[73] This position is based on 40 CFR §122.44(k), which authorizes the use of BMPs "when numeric limitations are infeasible." In 1991, the State Board concluded that "numeric effluent limitations are infeasible as a means of reducing pollutants in municipal storm water discharges, at least at this time."[74]

Although this determination was made over twenty years ago, the State Board's position on this issue has not changed since then, as evidenced by its adoption of the Caltrans MS4 permit in September of 2012. Citing the fact sheet for the Caltrans MS4 permit, the State Board affirmed that "it is not feasible at this time to set enforceable numeric effluent criteria for municipal BMPs and in particular urban discharges."[75]

The Caltrans MS4 permit's fact sheet also supports the use of BMP-based WQBELs as a means of meeting TMDLs and other quality standards. The Caltrans MS4 permit is also subject to TMDLs adopted by the Regional Board and USEPA. If this aspect of the Tentative Order is not corrected, Orange County MS4 Copermittees will be compelled to comply strictly with numeric WQBELs and receiving water limitations while Caltrans need only implement WQBEL BMPs to achieve compliance with the same TMDLs. This inconsistency lacks any justification.

66. Attachment E (Entire Attachment; Begins Page E-1) – The Tentative Order's WQBELs Were Improperly Formulated

The Tentative Order fails to provide adequate justification for incorporating numeric water quality based effluent limitations in the Tentative Order for each of the incorporated TMDLs to which they apply. A WQBEL is an enforceable translation in an MS4 permit for attaining compliance with a TMDL WLA, which serves to protect beneficial uses of a receiving water[76]. The Tentative Order fails to establish that an adequate requisite Reasonable Potential Analysis ("RPA") has been conducted.

The Tentative Order fails to establish if discharges from any individual permittee's MS4 have the reasonable potential to cause or contribute to an excursion above any "State water quality standard including State narrative criteria for water quality." Page 2 of the 2010 EPA Memo states:

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[72] U.S. Environmental Protection Agency, Memorandum, *Revisions to the November 22, 2002 Memorandum "Establishing Total Maximum Daily Load (TMDL) Waste d Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs,"* (Nov. 12, 2010) (*2010 EPA Memo*).
[73] EPA Memo, p. 2 (emphasis added).
[74] State Water Resources Control Board Water Quality Order 91-03, page 49.
[75] Fact Sheet for NPDES Permit and Waste Discharges Requirements for State of California Department of Transportation, NPDES Permit No. CAS000003, Order No. 2012-0011-DWQ, September 7, 2012, page 9.
[76] 40 C.F.R. § 130.2.

> "Where the NPDES authority determines that MS4 discharges *have the reasonable potential to cause or contribute to a water quality excursion*, EPA recommends that, where feasible, the NPDES permitting authority exercise its discretion to include numeric effluent limitations as necessary to meet water quality standards."

There are two generally accepted approaches to conducting an RPA. According to USEPA guidance, "A permit writer can conduct a reasonable potential analysis using effluent and receiving water data and modeling techniques, as described above, or using a non-quantitative approach."[77]

Neither the administrative record nor the Tentative Order's fact sheet contains any evidence of that an RPA has been performed in accordance with the two foregoing approaches. Regarding the first approach, such an analysis would in any case have been impossible to perform given that no outfall (effluent) monitoring has been required for any prior Orange County MS4 permit. No modeling appears to have been conducted either.

Beyond this, federal regulations not only require that an RPA be performed to determine if an excursion above a water quality standard occurred, but also that the storm water discharge must be measured against an "allowable" ambient concentration[78].

A WQBEL is a means of attaining a TMDL WLA, a translation of a WLA into prescribed actions or limits which has in the past been typically expressed as a BMP. Before a WQBEL can be developed, however, a need for it must be established. As the Writers' Manual points out:

> The permit writer should always provide justification for the decision to require WQBELs in the permit fact sheet or statement of basis and must do so where required by federal and state regulations. *A thorough rationale is particularly important when the decision to include WQBELs is not based on an analysis of effluent data for the pollutant of concern*. NPDES Permit Writers' Manual, September 2010, page 6-23 (emphasis added).

No such rationale is provided in the Fact Sheet, which in the absence of effluent data derived from outfall monitoring, would have been absolutely necessary to justify the need for a numeric WQBEL.

Finally, the 2010 EPA Memo is clear that reliance on numerics should be coupled with the "disaggregation" of different storm water sources within permits. The Tentative Order fails to adequately disaggregate storm water sources within applicable TMDLs regarding numeric WQBELs and for receiving water limitations, further making the imposition of numeric standards inappropriate.

67. Attachment E (Entire Attachment; Begins Page E-1) – WQBELs Are Incorrect For Both Baby Beach Bacteria TMDL And Beaches And Creeks TMDLs As They Are Inconsistent With The WLAs

Federal regulations require that NPDES permits contain effluent limits consistent with the assumptions and requirements of all available WLAs[79]. As currently established in the

[77] NPDES Permit Writers' Manual, September 2010, page 6-23.
[78] 40 C.F.R. §122.44(d)(iii).
[79] 40 CFR 122.44(d)(1)(vii)(B)

Tentative Order, the WQBELs are not consistent with the WLAs and are therefore not consistent with federal regulations.

The Tentative Order establishes WQBELs based upon the numeric targets (set equal to water quality objectives), not the mass-based WLAs established by the TMDL. To justify this approach, the Fact Sheet states (emphasis added):

> *"Because **numeric targets** for TMDLs typically include a component that will be protective of water quality standards, a TMDL will likely include one or more numeric receiving water limitations and/or effluent limitations as part of the assumptions or requirements of the TMDL. **Any numeric receiving water limitations and/or effluent limitations developed as part of the assumptions or requirements of a TMDL must be incorporated and included as part of a WQBELs for the MS4s.**" Pg. F-38.*

However, federal regulations require that the WLAs, not the numeric targets, are incorporated into the Tentative Order. Further, federal regulations do not require that any receiving water limitation or effluent limitation developed as part of the TMDL must be incorporated. Rather, federal regulations require that the WQBELs are consistent with the assumptions and requirements of the WLAs.

40 CFR 122.44(d)(1)(vii)(B) states (emphasis added).

> *When developing water quality based effluent limits under this paragraph the permitting authority shall ensure that: (B) Effluent limits developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, **are consistent with the assumptions and requirements of any available wasteload allocation** for the discharge prepared by the State and approved by EPA pursuant to 40 CFR 130.7.*

While in most cases the numeric targets are a component of the allocations, there are numerous additional assumptions and requirements of the WLAs that are also a component of the WLAs. Wasteload allocations take into account various considerations, including the multiple sources of a pollutant, flow rates, critical conditions, and margin of safety. By only incorporating the numeric target component of the WLAs, the Tentative Order fails to include all of the other assumptions and requirements of the WLAs, which is required by federal regulations. Only incorporating the numeric targets negates the entire TMDL analysis and Basin Planning process. Otherwise, TMDLs would be as simple as assigning numeric effluent limitations to MS4 discharges equal to the numeric objectives in the Basin Plan, which is essentially what this Tentative Order is proposing to do, and which is explicitly contrary to the TMDLs that have been established in the Basin Plan.

In fact, simply defining the WQBELs as the numeric targets of the TMDL is contrary to the purpose of the Basin Plan itself, which not only requires the establishment of water quality objectives, but also the program of implementation needed to achieve the water quality objectives[80]. A TMDL, once incorporated into the Basin Plan, is exactly that – a program of implementation needed for achieving water quality objectives.

Per the Beaches and Creeks Bacteria TMDL BPA:

[80] See Water Code section 13050(j) and as stated in the Beaches and Creeks Bacteria TMDL (Resolution, Pg.2): "A "Water Quality Control Plan" or "Basin Plan" consists of a designation or establishment for the waters within a specified area of all of the following: (1) Beneficial uses to be protected, (2) Water quality objectives and (3) A program of implementation needed for achieving water quality objectives."

> *"TMDLs must be established at levels necessary to attain and maintain the applicable narrative and numerical water quality standards with seasonal variations and a margin of safety which takes into account any lack of knowledge between effluent limitations and water quality." – Resolution, Pg. 2*

Per the Baby Beach Bacteria TMDL BPA:

> *"The loading capacities are defined as the maximum amount of fecal coliform, total coliform and Enterococcus that the waterbody can receive and still attain water quality objectives necessary for the protection of designated beneficial uses. Each TMDL must accommodate all known sources of a pollutant, whether from natural background, nonpoint sources, or point sources, and must include a margin of safety (MOS) to preclude pollutant loading from exceeding the actual assimilative capacities of the waterbodies. The TMDL calculations also account for seasonal variations and critical conditions and were developed in a manner consistent with guidelines published by USEPA." – Resolution, Pg. 4*

In both the Baby Beach Bacteria TMDL and the Beaches and Creeks Bacteria TMDL, the WLAs clearly take into consideration factors other than the numeric targets, such as flow rates as the WLAs are expressed as mass-based limits. If it was the Regional Board's intent to establish a concentration-based TMDL, then the WLAs would be expressed as a concentration. However, by establishing mass-based WLAs, the TMDL purposefully and explicitly establishes WLAs that incorporate many other factors than just the concentrations of the numeric targets. Therefore, establishing WQBELs that fail to incorporate the mass-based WLAs fails to be consistent with all of the assumptions and requirements of the WLAs as well as failing to be consistent with the intent of the Basin Plan itself.

<u>Baby Beach Bacteria TMDL</u>

In addition to the universal issues identified above, there are additional concerns with the WQBELs specific to the Baby Beach Bacteria TMDL.

Of particular concern are the WQBELs established for wet weather for total coliform (TC) and fecal coliform (FC). The BPA establishes WLAs for those indicators based upon existing conditions as the loading capacity was determined to be greater than the current discharges and clearly states that no further reductions are necessary. The BPA states (pg. A-23)*:*

> *"According to Tables 7-26 and 7-27, no wet weather wasteload reductions are required for total and fecal coliform indicator bacteria. This means that according to the wet weather models for Baby Beach, REC-1 water quality objectives for total and fecal coliform indicator bacteria are not expected to be exceeded due to discharges from the MS4s. The only wet weather wasteload reductions required for MS4s discharging into the receiving waters along the shoreline at Baby Beach is for Enterococcus indicator bacteria.".*

These existing conditions WLAs were based upon a *load assessment, not a concentration assessment* (e.g., the numeric targets). The final compliance date for these WLAs was set equal to the effective date of the TMDL, given that the WLAs were set to existing conditions and no further reductions were required. Therefore, not only are the WLAs in the Tentative Order not incorporated properly as mass-based WQBELs, but the Copermittees are not provided any time to attain these new and inappropriately established concentration-based WQBELs as the effective date, and therefore final compliance date, was 2009.

Beaches and Creeks Bacteria TMDL

In addition to the universal issues identified above, there are additional concerns with the WQBELs specific to the Beaches and Creeks Bacteria TMDL.

Attachment E specifies WQBELs for dry weather flows as both receiving water and effluent limitations, in terms of zero allowable exceedances of the single sample maximum and the 30-day geometric mean. However, the dry weather component of the TMDL only considered the 30-day geometric mean and did not consider the single sample maximum within its calculation. Incorporating single sample effluent limitations into the Tentative Order goes beyond the TMDL requirements.

In addition, if the TMDL had included single sample limits, there would have been a corresponding allowable exceedance frequency, just as for wet weather. The 22% allowable exceedance rate for wet weather was based on a reference beach within the Los Angeles Region, and although not used in the technical approach for the San Diego Beaches and Creeks TMDL, the reference beach also exhibits exceedances during dry weather, which is incorporated into beach TMDLs in the Los Angeles region.

The County recommends that the Tentative Order is modified to be consistent with the assumptions and requirements of the WLAs by incorporating the WLAs into the Permit. See ***Attachment B*** *for the specific requested modifications.*

68. Attachment E (Entire Attachment; Begins Page E-1) – WQBELs Should Only Be Defined as Effluent Limitations

There is a significant legal distinction between the Receiving Water Limitations established in Provision A (Discharge Prohibitions) and the Receiving Water Limitations established as part of the WQBELs in Attachment E (TMDL provisions). As currently (inappropriately) defined, WQBELs include receiving water limitations based on the numeric targets (set equal to WQOs) and not based upon the WLAs.

Ensuring that MS4 discharges do not cause or contribute to exceedance of WQOs is already and more appropriately addressed via Provision A.2. When an exceedance occurs under Provision A (Discharge Prohibitions), there is the potential for enforcement action and the Regional Board has discretion with enforcement (e.g., issuing a Notice of Violation). However, where an exceedance occurs for a WQBEL, the Copermittees may be subject to Mandatory Minimum Penalties (MMPs) where the Regional Board does not have discretion.

As established in comments above, the WQBELs have been inappropriately defined to be based upon concentrations, not the mass-based WLAs. And ensuring that discharges do not cause or contribute to exceedances of WQOs is already addressed via Provision A.2. Therefore, the inclusion of concentration-based receiving water limitations in the definition of the WQBELs is inconsistent with the assumptions and requirements of the WLAs and unnecessarily exposes Copermittees to MMPs without any requisite change to the protection of water quality. Throughout the Beaches and Creeks Bacteria TMDL, the BPA consistently refers to attaining the numeric targets (e.g., the water quality objectives) via receiving water limitations. Therefore, establishing the mass-based WLAs as the WQBELs and the numeric targets as receiving water limitations, is consistent with federal regulations for the incorporation of WLAs and the BPA for establishing the receiving water limitations.

The WQBELs should be defined only as the mass-based effluent limitations, consistent with the WLAs in the BPAs. While the Copermittees prefer that the receiving water limitations are simply addressed with a cross-reference back to Provision A.2, if the Regional Board prefers to keep the receiving water limitations as part of the TMDL provisions, they must be distinct from and excluded from the definition of the WQBELs.

The County recommends that the Tentative Order is modified to be consistent with the assumptions and requirements of the WLAs by incorporating the WLAs into the Tentative Order and defining the WQBELs as equal to the WLAs. Receiving water limitations should be excluded from the definition of WQBELs as they are not part of the WLAs. See ***Attachment B*** *for the specific requested modifications.*

69. Attachment E (Entire Attachment; Begins Page E-1) – Compliance Determination For Final WQBELs Should Be Based On The Implementation Of BMPs And Not Numeric Effluent Limitations

For interim water quality-based effluent limitations and receiving water limitations, A BMP-based path to compliance is provided via the implementation of an approved Water Quality Improvement Plan[81]. The Copermittees greatly appreciate and support this approach as it acknowledges the inherent challenges unique to stormwater management and provides appropriate flexibility to implement the necessary BMPs. However, the same approach is not applied to the final WQBELs.

A. <u>Regional Board has Discretion to Establish BMP-Based Compliance</u>

State and federal law do not require the use of numeric effluent limitations for MS4 Copermittees, but rather encourage flexible implementation of best management practices through an iterative process. Specifically, the choice to include either management practices or numeric limitations in MS4 permits is within the regulatory agency's discretion.

Over the last decade, EPA has issued a succession of policy memoranda and guidance documents regarding the incorporation of TMDLs into stormwater permits, including:

1) *Guidance for Developing TMDLs in California* (EPA Region 9). January 7, 2000
2) *Establishing Total Maximum Daily Load (TMDL) WLAs for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs* (Wayland and Hanlon). November 22, 2002
3) *TMDLs to Stormwater Permit Handbook* (Draft) (EPA). November 2008
4) *Revision to the November 22, 2002 Memorandum "Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs"* (Hanlon and Keehner). November 12, 2010
5) Untitled Letter (Kevin Weiss). March 17, 2011

In each of these EPA documents, EPA allows for discretion on the part of the permitting authority in the use of numeric effluent limitations for stormwater or BMP-based effluent limitations. This flexibility is a key aspect of both Wayland and Hanlon (2002), and Hanlon and Keehner (2010).

[81] Attachment E.5.e.(1)(f)); Attachment E.6.e.(1)(f)

Further, it is important to note that the EPA documents did not identify any differences in how interim and final WQBELs may be addressed by effluent limitations. In particular, the guidance did not limit BMP-based effluent limitation approaches to interim WQBELs.

EPA guidance does emphasize that NPDES provisions implementing TMDLs be enforceable, objective, and measurable. The Hanlon and Keehner memorandum notes that while numeric effluent limitations provide this type of accountability, effluent limitations expressed as BMPs can include objective and measurable elements. Such measurable elements might include as noted on page 3 of Hanlon and Keehner (2010), *"schedule for BMP installation or level of BMP performance"* or *"numeric benchmarks for BMPs and associated monitoring protocols or specific protocols for estimating BMP effectiveness."*

The Tentative Order provides for enforceable, objective, and measurable provisions via the Water Quality Improvement Programs (WQIPs). Establishing an additional compliance path for the final WQBELs would therefore be consistent with the approach already provided in the Tentative Order for interim WQBELs as well as guidance issued by EPA over the last decade in numerous policy memoranda and guidance documents.

B. Compliance Mechanism Matters

The Regional Board has the opportunity to exercise discretion in drafting and approving the compliance language in the Order; however, if the Regional Board continues to opt for numeric effluent limitations for final WQBELs, the Regional Board will no longer have discretion for enforcement decisions during implementation of the Order as Copermittees may be subject to Mandatory Minimum Penalties (MMPs). Such a limit on discretion matters both to Copermittees and the Regional Board.

Take for example a watershed where a group of Copermittees implement a suite of BMPs designed to achieve the final WQBELs. The Copermittees work closely with Regional Board staff and non-governmental organizations in developing and implementing the plan. Implementation of the BMPs achieves a 90% reduction in bacteria loads and results in the delisting of the waterbody from the State's 303(d) list, yet the reductions do not attain the WQBELs. Another Permittee does little to nothing to address the TMDL and achieves no reductions in bacteria loads, the waterbody continues to be listed as impaired on the State's 303(d) list, and the WQBELs are not attained.

If numeric effluent limitations continue as the compliance mechanism for final WQBELs, both Copermittees (the group that achieved the 90% reduction and the Copermittee that did little to nothing) would equally be out of compliance with the Order and equally subject to MMPs. If a BMP-based compliance option is provided for final WQBELs, the Regional Board would have the ability to exercise discretion. The Regional Board could continue to work with the group or Copermittees that are successfully implementing actions and evaluate appropriate additional actions. For the Copermittee that did little to nothing, the Regional Board would still be able to take appropriate enforcement action.

BMP-Based Compliance is not a request to decrease accountability or the efforts of the Copermittees or the commitment to water quality, it is a request for the Regional Board to utilize its discretion to establish Permit provisions that will support and reward actions taken by Copermittees that are achieving the intended purposes of the TMDLs.

C. Consistent with Regional Board Approach to Enforcement

A BMP-based compliance mechanism for final WQBELs is consistent with the Regional Board's stated approach to enforcement (as noted in the BPA establishing the Indicator Bacteria TMDL for Baby Beach):

> *"Regional Board typically implements enforcement through an escalating series of actions to:*
>
> > *(1) assist cooperative dischargers in achieving compliance; (2) compel compliance for repeat violations and recalcitrant violators; and (3) provide a disincentive for noncompliance." Baby Beach Bacteria TMDL BPA, pg. A-20*

The Regional Board can structure the final WQBEL compliance options to achieve this escalating approach to enforcement. A BMP-based compliance option can be provided via the implementation of the WQIPs where discrete milestones and actions are identified. For Copermittees that do not implement the WQIPs, this compliance mechanism would no longer be an option and Copermittees would be compelled to comply via the other mechanisms (essentially, no discharge or numeric effluent limitations). Such an approach achieves all three of the escalating compliance approaches identified by the Regional Board in the Baby Beach Bacteria TMDL, while numeric effluent limitations remove the Regional Board's discretion and will require that the Board treat cooperative dischargers and recalcitrant violators equally.

D. <u>Consistent with Basin Plan Amendments</u>

Establishing a BMP-based compliance path is also consistent with the Basin Plan Amendments for both TMDLs.

Beaches and Creeks TMDL (pg. A-41):

> *"The San Diego Water Board will revise and re-issue the WDRs and NPDES requirements for Phase I MS4s to incorporate the following:*
>
> *WQBELs consistent with the requirements and assumptions of the Municipal MS4 WLAs. WQBELs may be expressed as numeric effluent limitations, when feasible, and/or as a BMP program of expanded or better-tailored BMPs."*

Baby Beach Bacteria TMDL (emphasis added):

> *BPA, pg. A-14: WQBELs consistent with the requirements and assumptions of the bacteria WLAs described in Tables [Insert table numbers] and a schedule of compliance applicable to the MS4 discharges into the impaired shoreline segments described in Tables [Insert table numbers].* ***At a minimum, WQBELs shall include a BMP program to attain the WLAs.***
>
> *BPA, pg. A-15: If the WQBELs consist of BMP programs, then the reporting requirements shall consist of annual progress reports on BMP planning, implementation, and effectiveness in attaining the WQOs in impaired shoreline segments, and annual water quality monitoring reports.*
>
> *BPA, pg. A-19: The BLRPs are the municipal dischargers' opportunity to propose methods for assessing compliance with WQBELs that implement TMDLs.*

Additionally, the compliance schedule[82] anticipates revisions to the TMDL after the final compliance date, potentially through the Natural Sources Exclusion Approach (NSEA). It is inconsistent with the assumptions and requirements of the BPA to require strict compliance via numeric effluent limitations at Year 10 when the TMDL explicitly anticipates revisions occurring after that final date. The intent from the BPA is to have 10 years of implementation, evaluate progress, and assess if additional regulatory options (such as the NSEA) are necessary and/or

[82] BPA, pg. A-24

warranted. This approach can only be accomplished if BMP-based compliance is provided as an option for the final WQBELs.

E. BMP-Based Compliance is Not a "Safe Harbor"

The concept of "safe harbor" implies that Copermittees are not being held accountable, the requirements are not enforceable, and Copermittees will not be obligated to implement actions to address the TMDLs. However, BMP-based compliance can be structured to provide strict accountability and enforceability and require concrete and specific actions to be implemented. In fact, EPA guidance does emphasize that NPDES provisions implementing TMDLs be enforceable, objective, and measurable. The Hanlon and Keehner memorandum notes that effluent limitations expressed as BMPs can include objective and measurable elements. Such measurable elements might include as noted on page 3 of Hanlon and Keehner (2010), *"schedule for BMP installation or level of BMP performance"* or *"numeric benchmarks for BMPs and associated monitoring protocols or specific protocols for estimating BMP effectiveness."*

Additionally, the concept of "safe harbor" was raised during the hearing for the recently adopted Los Angeles Region MS4 Permit. The Regional Board as well as Executive Officer of the Regional Board directly addressed the question if BMP-based compliance, via the implementation of a Watershed Management Program (equivalent to the WQIPs), constituted a "safe harbor." Both the Board and Executive Officer clearly stated that BMP-based compliance was not a "safe harbor" for the Copermittees and the Watershed Management Programs provided objective and measureable elements whereby Copermittees would be required to implement actions and would have clear accountability.

F. Numeric Effluent Limitations are Not Feasible

Finally, in Hanlon and Keehner (2010) (EPA's policy memorandum regarding incorporation of TMDLs into stormwater Permits), states "EPA recommends that, where feasible, the NPDES permitting authority **exercise its discretion** to include numeric effluent limitations as necessary to meet water quality standards." (emphasis added). This statement highlights the basic principle that the Regional Board has discretion in how the WLAs are incorporated into the MS4 Permit. Further, the concept of feasibility relates to *achieving* the numeric effluent limitations, not to *calculating* a numeric effluent limitation. As all TMDLs have numeric WLAs, it would be "feasible" for most all TMDLs, from the very first TMDL ever established, to utilize numeric effluent limitations if simply calculating a WQBEL was the intended definition. As Wayland and Hanlon (2002) (EPA's policy memorandum regarding incorporation of TMDLs into stormwater Permits) noted EPA "expects that most WQBELs for NPDES-regulated municipal and small construction storm water discharges will be in the form of BMPs, and that numeric limits will be used only in rare instances." Therefore, in EPA's policy memoranda, the concept of feasibility is not related to the ability to simply calculate the WQBELs. The concept of "feasibility" really relates to whether or not *achieving* a numeric effluent limitations are feasible for the stormwater permit.

The State Water Resources Control Board convened a Blue Ribbon Panel in 2006 to investigate this very question – are numeric effluent limitations feasible for stormwater permits? This panel of national experts ultimately concluded that numeric limits were generally infeasible across all three stormwater activities (municipal, industrial, and construction), with a few exceptions.[83]

[83] *The Feasibility of Numeric Effluent Limits Applicable to Discharges of Stormwater Associated with Municipal, Industrial and Construction Activities, June 19, 2006*.

Therefore, without providing the BMP-based compliance option for Copermittees, the Tentative Order directly contradicts the State Water Resources Control Board's finding regarding the feasibility of achieving numeric effluent limitations for municipal stormwater discharges.

The County recommends that the Regional Board exercise its discretion and establish a BMP-based compliance path for final WQBELs by adding the following provisions as Attachment E.5.e(2)(f) and as Attachment E.6.e.(2)(e):

> *"The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the final compliance requirements will be achieved by the final compliance dates. A Responsible Copermittee that does not implement its WQIP in accordance with the milestones and compliance schedules shall demonstrate compliance with the final WQBELs pursuant to Attachment E.5.e(2)(a - e)/Attachment E.6.e(2)(a-d)."*

70. Attachment E (Entire Attachment; Begins Page E-1) – An Explicit Re-Opener Provision Is Necessary

In both the Baby Beach TMDL and the Beaches and Creeks TMDL, the BPAs have included an implementation schedule that defines a point at which the TMDL will be reconsidered to incorporate new information and potentially modify targets, allocations and/or implementation requirements. The intent of the approach is clear in both BPAs:

- **Beaches and Creeks TMDL:** There is an entire section of the Basin Plan Amendment that details modifications to the TMDL through a future Basin Plan Amendment. The BPA specifically notes (BPA pg. A49):

  "As the implementation of these TMDLs progress, the San Diego Water Board recognizes that revisions to the Basin Plan may be necessary in the future."

- **Baby Beach TMDL:** The intent to reassess this TMDL is built directly into several sections of the implementation plan as well as the compliance schedule (emphasis added):

  - *"The San Diego Water Board recognizes that there are potential problems associated with using indicator bacteria WQOs to indicate the presence of human pathogens in receiving waters free of sewage discharges. The indicator bacteria WQOs were developed, in part, based on epidemiological studies in waters with sewage inputs. The risk of contracting a water-born illness from contact with urban runoff devoid of sewage, or human-source bacteria is not known. Some pathogens, such as giardia and cryptosporidium can be contracted from animal hosts. Likewise, domestic animals can pass on human pathogens through their feces.* ***These and other uncertainties need to be addressed through special studies and, as a result, revisions to the TMDLs may be appropriate****." – BPA, pg. A-22*

  - *"Ultimately, the San Diego Water Board supports the idea of measuring pathogens (the agents causing impairment of beneficial uses) or an acceptable alternative indicator, rather than indicator bacteria (surrogates for pathogens). However, as stated previously, indicator bacteria have been used to measure water quality historically because measurement of pathogens is both difficult and costly. The San Diego Water Board is supportive of any efforts by the scientific community to perform epidemiological studies and/or investigate the feasibility of measuring pathogens directly.* ***The San Diego Water Board further supports***

subsequent modification of WQOs as a result of such studies. Ultimately, TMDLs will be recalculated if WQOs are modified due to results from future studies*."- BPA, pg. A-23*

- Excerpt from Baby Beach Bacteria TMDL Compliance Schedule. Revisions to the TMDL are anticipated to occur in Year 10+ (after the final compliance date).

Table 1. Excerpt from Baby Beach Bacteria TMDL Compliance Schedule (BPA, pg. A-24). Revisions to the TMDL are anticipated to occur in Year 10+ (after the final compliance date).

Year (after OAL approval)	Required Wasteload Reduction	TMDL Compliance Action
10	100 percent *Enterococcus* reduction	• Water Quality Monitoring • Implement BMPs • Submit request for removal from 303(d) List • (if not requested and removed earlier)
10+	Same as above	• Water Quality Monitoring • Implement BMPs • **Submit request for TMDL revisions based on Natural Sources Exclusion Approach if supported by data (if not requested and recalculated earlier)** • Submit request for removal from 303(d) List (if not requested and removed earlier)

While the County is not advocating for technical revisions to the TMDL as part of the Tentative Order issuance (such revisions would appropriately occur through the Basin Plan Amendment process with any subsequent revisions incorporated into the Permit), there is a well documented level of uncertainty in the BPAs with the existing TMDLs where revisions to the targets, allocations, and implementation plans and schedules may be warranted. Such uncertainty should be incorporated into the provisions via an explicit re-opener in Provision H (Modifications of Programs) of the Tentative Order.

The explicit re-opener provision for the Tentative Order would serve two purposes:

- Provide a trigger to reconsider the compliance mechanism (BMP-based compliance in lieu of numeric effluent limits) prior to any compliance dates; and
- Ensure that the WQBELs are reconsidered, consistent with the intent of the TMDLs to revisit and revise as necessary the targets, allocations, and implementation actions prior to final compliance being required. This aspect is especially critical as the Beaches and Creeks re-opener would occur during this permit term (request must be made by Permittees by 2016) and the Baby Beach TMDL has final WQBELs compliance dates within the permit term (2014 and 2019).

While the County recognizes that the Regional Board has the authority to re-open the Permit at any time, the explicit re-opener captures the Regional Board's intent to revisit and revise as necessary the TMDL provisions, consistent with the assumption and requirements of the BPAs. Based upon the first year data summary for the on-going San Diego Regional Stream

Reference Study[84], such revisions may likely be warranted. The first year data show that during dry weather, the reference systems demonstrated a 34.1% exceedance rate of the single sample maximum and a 71% exceedance rate of the 30 day geometric mean for enterococci. The TMDL currently allows for a 0% exceedance rate during dry weather. During storm events, the reference systems had a 71% - 100% exceedance rate of the single sample maximum for enterococci. The TMDL currently only allows for a 22% exceedance rate during storm events. Providing the explicit reopener in the Permit will ensure that such compelling information, such as the results of the Reference Study, are considered prior to subjecting Copermittees to enforcement actions, such as Mandatory Minimum Penalties.

The explicit re-opener is consistent with the Regional Board's stated approach to enforcement, an escalating enforcement approach that contemplates "cooperative dischargers" as well as "recalcitrant violators." Lastly, such an approach was built into the recently adopted Los Angeles MS4 Permit[85].

The County recommends that an explicit Permit re-opener is provided, to capture the Regional Board's intent to revisit and revise as necessary the TMDL provisions prior to final compliance dates. The following additional language is requested as Provision H.6 and H.7:

> *H.6. Modifications of the Order shall be initiated to incorporate provisions as a result of future amendments to the Basin Plan, such as a new or revised water quality objectives or the adoption or reconsideration of a TMDL, including the program of implementation. As soon as practicable, but no later than 6 months of the effective date of a revised TMDL where the revisions warrant a change to the provisions of this Order, the Regional Water Board shall modify this Order consistent with the assumptions and requirements of the revised WLA(s), including the program of implementation.*
>
> *H.7. Modification to the Order shall be considered 18 months prior to the compliance date for final WQBELs where the compliance mechanism is based upon numeric effluent limitations. The intent of the reconsideration is to include provisions or modifications to WQBELs in Attachment E of this Order prior to the final compliance deadlines, if practicable, that would allow an action-based, BMP compliance demonstration approach with regard to final WQBELs.*

71. Attachment E (Entire Attachment; Begins Page E-1) – Compliance Mechanism Is Necessary Prior To Approval Of The Water Quality Improvement Plans

The Tentative Order currently provides for BMP-based compliance with interim WQBELs via the implementation of the WQIPs (Attachment E.5.e.(1)(f)); Attachment E.6.e.(1)(f)). However, as the BMP-based compliance mechanism is contingent upon implementation of an approved WQIP, the Copermittees are not provided with a BMP-based compliance mechanism during the development of the WQIPs. Without any modifications to the Tentative Order, the Copermittees would be subject to numeric effluent limitations for during WQIP development, then provided BMP-based compliance for interim WQBELs during WQIP implementation. Prior to the approval of the WQIPs, Copermittees should be provided a similar BMP-based compliance

[84] Southern California Coastal Water Research Project (SCCWRP). San Diego Regional Stream Reference Study, Monitoring Progress Report #3 and Year 1 Data Summary, October 2011 through November 2012. January 3, 2013.
[85] R4-2012-0175

mechanism while resources are devoted to plan development and the continuation with the implementation of the existing programs.

Recognizing that the shift to a watershed approach is an important and necessary shift in the management of stormwater, in the recently adopted Los Angeles MS4 Permit[86], such compliance was provided during the plan development phase.

The County recommends that the TO provide BMP-based compliance as a compliance option during the development of the WQIPs, the Copermittees request that the following provisions are added

- *Interim WQBELs Compliance (Attachment E.5.e(1) and Attachment E.6.e(1)):*

  Upon the effective date of this Order, a Copermittee's full compliance with all of the following requirements shall constitute a Copermittee's compliance with provisions pertaining to interim WQBELs with compliance deadlines occurring prior to approval of a WQIP.

  (1) Meets all interim and final deadlines for development of a WQIP,

  (3 Targets implementation of watershed control measures in its existing storm water management program, including watershed control measures to eliminate non-storm water discharges of pollutants through the MS4 to receiving waters, to address known contributions of pollutants from MS4 discharges that cause or contribute to the impairment(s) addressed by the TMDL(s), and

  (4) Receives final approval of its WQIP from the Regional Board.

- *If the Regional Board makes modifications to provide for a BMP-based compliance path for final WQBELs, the same revisions are requested to be added to Attachment E.5.e(2) and Attachment E.6.e(2).*

[86] R4-2012-0175

ATTACHMENT A

**ORANGE COUNTY LEGAL &TECHNICAL COMMENTS ON
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
TENTATIVE ORDER No. R9-2013-0001
NPDES NO. CAS0109266**

Appendix A-1

Regional Map

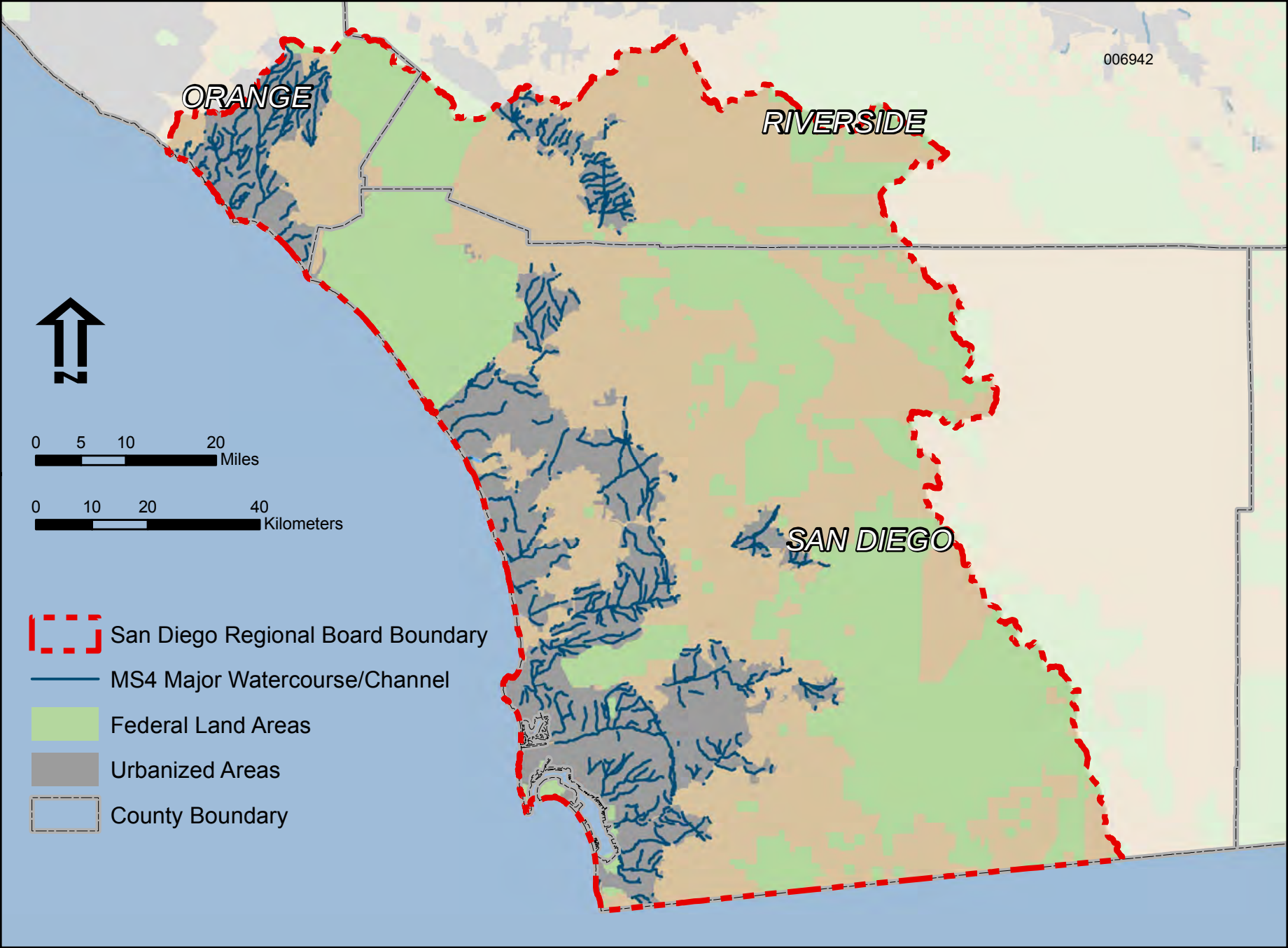
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ORANGE
RIVERSIDE
SAN DIEGO
N
0 5 10 20
Miles
0 10 20 40
Kilometers
San Diego Regional Board Boundary
MS4 Major Watercourse/Channel
Federal Land Areas
Urbanized Areas
County Boundary

ATTACHMENT A

**ORANGE COUNTY LEGAL &TECHNICAL COMMENTS ON
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
TENTATIVE ORDER No. R9-2013-0001
NPDES NO. CAS0109266**

Appendix A-2

SCCWRP Report

006944

HYDROMODIFICATION ASSESSMENT AND MANAGEMENT IN CALIFORNIA

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Southern California Coastal Water Research Project

Technical Report 667 - April 2012

Hydromodification Assessment and Management in California

Commissioned and Sponsored by California State Water Resources Control Board Stormwater Program

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April 2012

Technical Report 667

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EXECUTIVE SUMMARY

Most jurisdictions in California are now required to address the effects of *hydromodification* through either a municipal stormwater permit or the statewide construction general permit. Hydromodification is generally defined as changes in channel form associated with alterations in flow and sediment due to past or proposed future land-use alteration. Hydromodification management has emerged as a prominent issue because degradation of the physical structure of a channel is often indicative of and associated with broader impacts to many beneficial uses, including water supply, water quality, habitat, and public safety. Conversely, reducing hydromodification and its effects has the potential to protect and restore those same beneficial uses. Although hydromodification has the potential to affect all water body types, this document focuses on assessing and managing effects to streams because they are the most prevalent, widely studied, and arguably most responsive type of receiving water.

Hydromodification by definition results from alteration of watershed processes; therefore, correcting the root causes of hydromodification ought to be most effective if based on integrated watershed-scale solutions. To date, such a watershed approach has not been adopted in California; most hydromodification management plans simply consist of site-based runoff control with narrow, local objectives and little coordination between projects within a watershed. Furthermore, each municipality is required to develop its own approach to meeting hydromodification management requirements rather than drawing from standard or recommended approaches that facilitate regional or watershed-scale integration. Long-term reversal of hydromodification effects, however, will require movement away from reliance on such site-based approaches to more integrated watershed-based strategies.

This document has two goals, and hence two audiences. The first goal is to describe the elements of effective hydromodification assessment, management and monitoring. The audience for this goal is primarily the State and Regional Water Boards, since meeting this goal will require integration of watershed and site-scale activities that are likely beyond the responsibility or control of any individual municipality. Success will require fundamental changes in the regulatory and management approach to hydromodification that will likely advance only iteratively and potentially require one or more NPDES permit cycles to fully implement. The second goal of this document is to provide near-term technical assistance for implementing current and pending hydromodification management requirements. This goal can be achieved by municipalities within the construct of existing programs and therefore the primary audience for this aspect of the document is local jurisdictions. Achieving this goal will facilitate greater consistency and effectiveness between hydromodification management strategies, giving them a stronger basis in current scientific understanding.

Watershed analysis should be the foundation of all hydromodification management plans (Figure ES-1). This analysis should begin with a documentation of watershed characteristics and processes, and past, current, and expected future land uses. The analysis should lead to identification of existing opportunities and constraints that can be used to help prioritize areas of greater concern, areas of restoration potential, infrastructure constraints, and pathways for potential cumulative effects. The combination of watershed and site-based analyses should be used to establish clear objectives to guide management actions. These objectives should articulate desired and reasonable physical and biological

conditions for various reaches or portions of the watershed and should prioritize areas for protection, restoration, or management. Strategies to achieve these objectives should be customized based on consideration of current and expected future channel and watershed conditions. A one-size-fits-all approach should be avoided. Even where site-based control measures, such as flow-control basins, are judged appropriate, their location and design standards should be determined in the context of the watershed analysis.

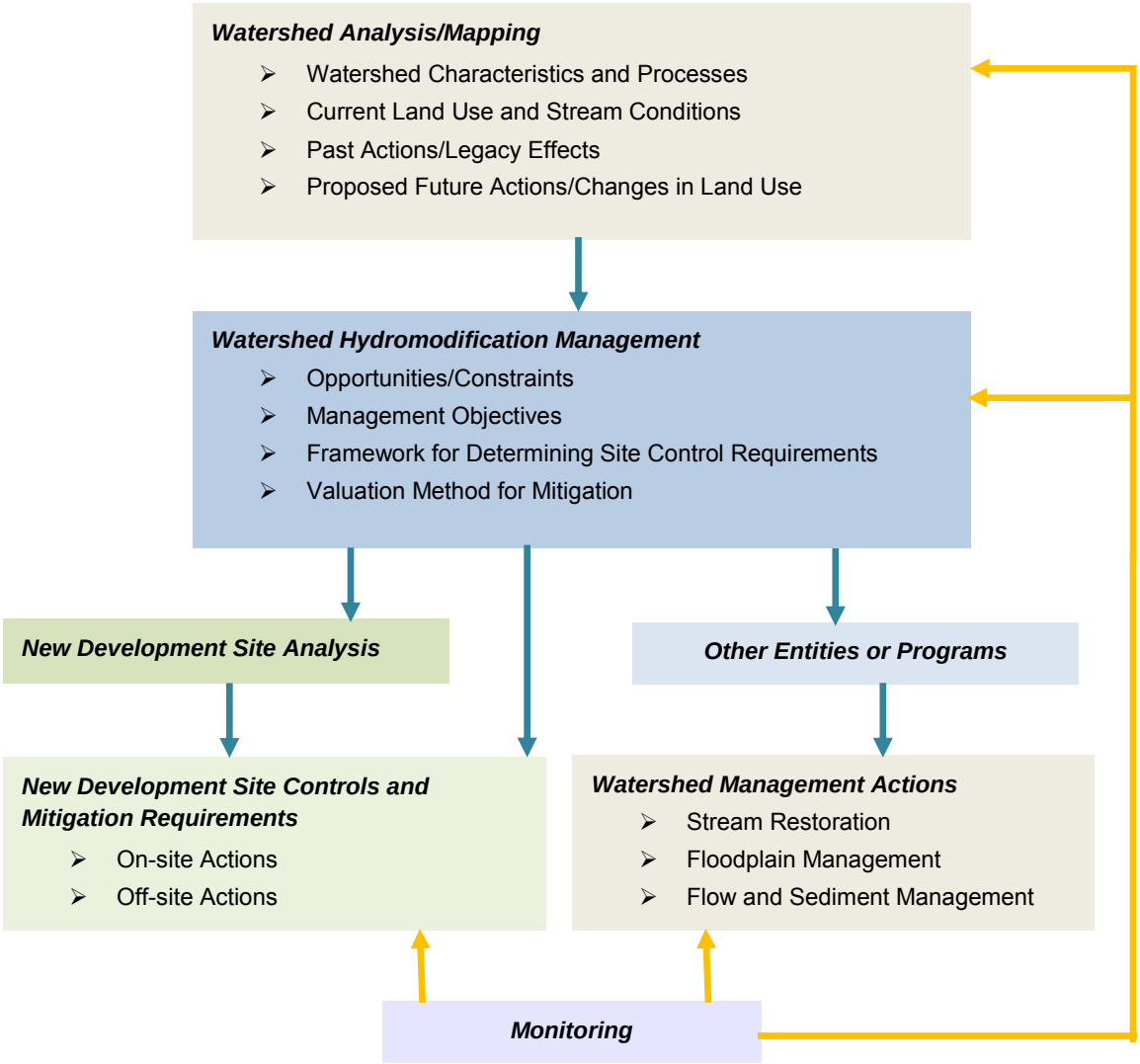

Figure ES-1. Framework for Integrated Hydromodification Management.

An effective management program will likely include combinations of on-site measures (e.g., low-impact development techniques, flow-control basins), in-stream measures (e.g., stream habitat restoration), floodplain and riparian zone actions, and off-site measures. Off-site measures may include compensatory mitigation measures at upstream locations that are designed to help restore and manage flow and sediment yield in the watershed.

Project-specific analysis and design requirements should vary depending on location, discharge point, and size. The range of efforts may include:

- Application of scalable, standardized designs for flow control based on site-specific soil type and drainage design. The assumptions used to develop these scalable designs should be conservative, to account for loss of sediment and uncertainties in the analysis and our understanding of stream impacts.
- Use of an erosion potential metric, based on long-term flow duration analysis and in-stream hydraulic calculations. Guidelines should specify stream reaches where in-stream controls would and would not be allowed to augment on-site flow control.
- Implementation of more detailed hydraulic modeling for projects of significant size or that discharge to reaches of special concern to understand the interaction of sediment supply and flow changes.
- Analysis of the water-balance for projects discharging into streams with sensitive habitat. This may include establishment of requirements for matching metrics such as number of days with flow based on the needs of species present.

Achieving these goals will require that hydromodification management strategies operate across programs beyond those typically regulated by NPDES/MS4 requirements. Successful strategies will need to be developed, coordinated, and implemented through land-use planning, habitat management and restoration, and regulatory programs. Regulatory coordination should include programs administered by the Water Boards, such as non-point source runoff control, Section 401 Water Quality Certifications and Waste Discharge Requirement programs, and traditional stormwater management programs. It should also include other agency programs, such as the Department of Fish and Game Streambed Alteration Program and the Corps of Engineers Section 404 Wetland Regulatory Program. Thus, all levels of the regulatory framework—federal, state, and local—will need to participate in developing and implementing such a program. The integrated watershed-based approach will likely take one or more permit cycles (i.e., at least ten years) to fully implement.

Short- and long-term recommendations for management are summarized in Table ES-1 below.

Table ES-1. Recommendations for implementing watershed-based hydromodification management.

Time Frame	Programmatic: State and Regional Water Boards	Local: City and County Jurisdictions
Short-term (<10 years)	• Establish consistent standards for HMPs • Promote use of watershed approaches in HMPs to move away from reliance on project-based management actions • Develop a valuation method to determine appropriate off-site mitigation • Transition to a broader set of monitoring endpoints including flow, geomorphology, and biology	• Implement watershed analysis of opportunities and constraints related to hydromodification • Implement a broader set of tools to improve on-site management actions • Develop institutional capacity to oversee and review modeling and assessment tools • Develop capacity for information/data management and dissemination
Long-term (1+ decades)	• Develop watershed-based regulatory programs and policies for hydromodification management • Integrate hydromodification management needs into other regulatory programs (e.g. TMDL, 401/WDR)	• Develop institution capacity to implement watershed-based hydromodification programs • Incorporate hydromodification and other water quality management into the land use planning process

To successfully accomplish these various recommendations for implementation, both agencies and private-sector practitioners will need to make use of a range of analytical tools. Such tools generally fall into three categories: descriptive tools, mechanistic models, and empirical/statistical models. Models may be used deterministically and/or in a probabilistic manner. These different types of tools can be selected or combined, depending on the specific objective, such as characterizing stream condition, predicting response, establishing criteria / requirements, or evaluating the effectiveness of management actions. Selection of tools should also consider the type of output, intensity of resource requirements (i.e., data, time, cost), and the extent to which uncertainty is explicitly addressed. It is important to note that deterministic modeling without accompanying probabilistic analysis may mask the uncertainties inherent in predicting hydromodification effects. Short-term and long-term recommendations for the application and improvement of tools to support the management framework are shown in Table ES-2.

Although there is sufficient scientific and engineering understanding of hydromodification causes and effects to begin implementing more effective management approaches now, improvements should be informed and adapted based on subsequent monitoring data. To be useful, monitoring programs should be designed to answer questions and test hypotheses that are implicit in the choice of management actions, such that practices that prove effective can be emphasized in the future (and those that prove ineffective can be abandoned). The focus of monitoring efforts, however, needs to be tailored to the time frame of the questions being addressed and the implementing agency (Table ES-3), reflecting the dual goals and audiences of this document.

Table ES-2. Recommendations for the application and improvement of tools in support of the proposed management framework.

Time Frame	Programmatic: State and Regional Water Boards	Local: City and County Jurisdictions
Short-term (<10 years)	• Develop quality control and standardization for continuous simulation modeling • Perform additional testing and demonstration of probabilistic modeling for geomorphic response • Pursue development of biologically- and physically-based compliance endpoints	• Work cooperatively with adjacent jurisdictions to implement hydromodification risk mapping at the watershed scale • Implement continuous simulation modeling for project impact analysis
Long-term (1+ decades)	• Improve tools for sediment analysis and develop tools for sediment mitigation design • Develop tools for biological response prediction • Improve tools for geomorphic response prediction	• Expand use of probabilistic and statistical modeling for geomorphic response • Apply biological tools for predicting and evaluating waterbody condition

Table ES–3. Recommendations for hydromodification monitoring.

Time Frame	Programmatic: State and Regional Water Boards	Local: City and County Jurisdictions
Short-term (<10 years)	• Define the watershed context for local monitoring (at coarse scale) • Evaluate whether permit requirements are making positive improvements	• Evaluate whether specific projects/ regulations are meeting objectives • Identify the highest priority action(s) to take
Long-term (1+ decades)	• Define watershed context and setting benchmarks for local-scale monitoring (i.e., greater precision, if/as needed) • Demonstrate how permit requirements can improve receiving-water "health," state-wide (and change those requirements, as needed)	• Evaluate and demonstrate whether actions (on-site, instream, and watershed scale) are improving receiving-water conditions • Assess program cost-effectiveness • Identify any critical areas for resource protection

Identifying and, ultimately, achieving the desired conditions in receiving waters requires multiple lines of evidence to characterize condition in an integrative fashion. At their most comprehensive, the chosen metrics should include measures of flow, geomorphic condition, chemistry, and biotic integrity. Biological criteria are key to integrative assessment: in general, biological criteria are more closely related to the designated uses of waterbodies than are physical or chemical measurements. This understanding is reflected in the State's proposed bio-objectives policy, which includes explicit links to hydromodification management.

In summary, transitioning from the current site-based to a more effective watershed-based approach to hydromodification management that addresses both legacy and future impacts will require cooperation between the State and Regional Water Boards and local jurisdictions. Both technical and regulatory/program approaches will need to be updated or revised altogether over the next several permit cycles to realize this long-term goal. Substantial resources will be necessary to realize these goals; therefore, opportunities for joint funding and leveraging of resource should be vigorously pursued from the onset. This cooperative approach should replace the current fragmented efforts among regions and jurisdictions.

1. Overview and Intended Uses of the Document

1.1 Overall Objectives and Intended Audience

Regulation and management of hydromodification is in its infancy in California. As with any new endeavor, initial attempts to meet this need is unproven, inconsistent, and relatively narrow in focus. To improve on existing efforts, the State Water Resources Control Board (SWRCB) has engaged a team of experts to provide technical support to both regulators and permittees for development of Hydromodification Management Plans (HMPs) and their associated permit requirements. This resulting document has two goals and hence two audiences.

The first goal of this document is to provide broad perspectives on what would constitute effective hydromodification assessment, management and monitoring, based on our current best scientific understanding of the topic. The audience for this goal is primarily the State and Regional Water Boards, since meeting this goal will require integration of watershed and site-scale activities that are likely beyond the control or responsibility of any individual municipality. Success will require fundamental changes in the regulatory and management approach to hydromodification that will likely be possible only iteratively and potentially requiring one or more NPDES permit cycles to fully implement. The State and Regional Water Boards will need to provide leadership in implementing these changes, but they will also need to work cooperatively with permittees so that planning, management and monitoring programs can be adapted to operate in a more integrated manner over the broader spatial scales and longer time frames that are necessary to achieve genuine success. Furthermore, hydromodification management plans will need to address preexisting conditions from previous (i.e., legacy) land uses. Clearly, addressing such past effects will require approaches beyond regulation of new development.

This document provides broad perspectives on what would constitute effective hydromodification assessment, management and monitoring, based on our current best scientific understanding of the topic. The document also provides near-term technical assistance for implementing current and pending hydromodification management requirements.

The second goal of this document is to provide near-term technical assistance for implementing current and pending hydromodification management requirements. This goal can be achieved by municipalities within the construct of existing programs, and therefore the primary audience for this aspect of the document is MS4 permittees. Achieving this goal will facilitate greater consistency and effectiveness between HMPs, giving them a stronger basis in current scientific understanding, and will also serve as initial steps toward realizing the broader goal stated above.

1.2 Rationale and Justification

The process of urbanization has the potential to affect stream courses by altering watershed hydrology and geomorphic processes. Development and redevelopment can increase impervious surfaces on formerly undeveloped landscapes and reduce the capacity of remaining pervious surfaces to capture and infiltrate rainfall. The most immediate result is that as a watershed develops, a larger percentage of

rainfall becomes surface runoff during any given storm. In addition, runoff reaches the stream channel much more efficiently, so that the peak discharge rates for floods are higher for an equivalent rainfall than they were prior to development. This process has been termed hydromodification. In some instances, direct channel alteration such as construction of dams and channel armoring has also been termed "hydromodification." Such direct alterations are not the focus of this document. Rather, this document focuses on the geomorphic and biological changes associated with changes in land use in the contributing watershed, which in turn alter patterns and rates of runoff and sediment yield. These changes can result in adverse impacts to channel form, stream habitat, surface water quality, and water supply that can alter habitat and threaten infrastructure, homes, and businesses.

The State and Regional Water Boards have recognized the need to manage and control the effects of hydromodification in order to protect beneficial uses in streams and other receiving water bodies. This recognition has led to the inclusion of requirements for development of "hydromodification management plans" (HMPs) in many Phase 1 and some Phase 2 Municipal Stormwater (MS4) permits. Most HMPs require the permitted municipalities to develop programs and policies to assess the potential effects of hydromodification associated with new development and redevelopment, to require the inclusion of management measures to control the impacts of hydromodification, and to develop monitoring programs to assess the effectiveness of HMP implementation at controlling and/or mitigating the impacts of hydromodification.

Development of HMPs is challenging for several reasons. First, there are few accepted approaches for assessing the impacts of hydromodification. Traditional modeling tools are generally untested and may be difficult to apply or inappropriate for use in some California watersheds and streams. Responses of streams to hydromodification are difficult to assess, given inherent climatic variability and the highly stochastic nature of rainfall and the resulting response of streams to runoff events. There are few local examples or case studies from which to draw experiences or conclusions.

As a result of these challenges, individual HMPs to date have utilized a variety of approaches with little coordination or consistency between them. Little information is available on the relative efficacy of any of these approaches. Furthermore, where approaches and tools developed for HMPs in one region of the State (or even from a different region of the country altogether) have been used in subsequent HMPs elsewhere, there has been little or no consideration of the effect of regional climatological or physiographical differences on the transferability of analytical techniques and tools.

1.3 Need for an Expanded Approach

Current site-based hydromodification management approaches are limited in their ability to address the underlying processes that are responsible for most deleterious impacts of hydromodification. Hydromodification effects, by definition, are watershed-dependent processes that are influenced by water and sediment discharge, movement, and storage patterns that may be occurring up- or downstream of a specific project site. Ideally, then, the first step of any hydromodification management plan (HMP) should be a watershed analysis; management of processes at the site or project scale should be done only in the context of such a watershed analysis. Understanding larger-scale processes

facilitates prioritization of activities in areas of greatest need and allows for management measures to be located where they have the largest potential benefit, even if that is not on or adjacent to the project site where the current impact is occurring. It also allows for expansion of site based management beyond simple flow control and/or channel stabilization toward strategies that consider flow, sediment, and biological conditions as an integrated set of desired endpoints.

Because watershed boundaries are often not the same as geopolitical boundaries of cities or counties, incorporation of watershed analysis will require leadership from the State and Regional Water Boards. Changes to the current regulatory structure may be necessary to accommodate inter-jurisdictional cooperation and regional information sharing. Similarly, program implementation by both large and small municipalities must include mechanisms that allow site-specific decisions to be informed by watershed-scale analysis.

This document is intended to help address some of these challenges and needs by providing technical recommendations, both to state and regional program developers and to local implementing agencies, for assessment, modeling, development of management strategies, and monitoring. This document can support current HMP development and, at the same time, serve as a first step toward achieving the longer term goals of more integrated, watershed-based hydromodification management.

Current site-based approaches are limited in their ability to address the underlying processes that are responsible for hydromodification impacts.

Effective management of hydromodification will require coordinated approaches across programs at the watershed scale that address all aspects of runoff, sediment generation and storage, instream habitat, and floodplain management.

Adopting this broader approach means that managing the effects of hydromodification cannot be the purview of the stormwater (MS4) program alone. Effective management of hydromodification will require coordinated approaches across programs at the watershed scale that address all aspects of runoff, sediment generation and storage, instream habitat, and floodplain management. Various SWRCB programs have the opportunity and ability to contribute to the goals of comprehensive hydromodification management, including the non-point source control program, water quality certifications, waste discharge requirements, basin planning, SWAMP, and the emerging State Wetland Policy and Freshwater Bio-objectives program. Each of these programs can take advantage of the tools and approaches outlined in this paper to contribute to coordinated management of hydromodification in order to protect beneficial uses and meet basin plan objectives. Furthermore, successful control and mitigation of hydromodification effects will support other programs by improving water quality, enhancing groundwater recharge, and protecting habitat. Therefore, hydromodification management can be a unifying element of many programs and support integrated regional watershed planning.

It is important to note that hydromodification has the potential to affect all water body types; therefore, HMPs should address potential effects to all streams and receiving waters. Because streams are most directly affected by hydromodification, they have been the focus of current regulatory requirements and, therefore, most HMPs. Consequently, this document emphasizes tools and approaches applicable

to fluvial systems, which are broadly defined to include wadeable streams, large rivers, headwater streams, intermittent and ephemeral drainages, and alluvial fans (although new specific tools may be necessary for assessment and management of alluvial fans). We recognize, however, that hydromodification can also affect nearshore and coastal environments, including bays, harbors, and estuaries, by altering estuary channel structure, water quality, sand delivery, siltation, and salinity. These effects have been less extensively studied or documented and have received substantially less attention in current hydromodification requirements. Future efforts should more directly address hydromodification effects to all receiving waters, but the information is not presently available to provide equally comprehensive guidance here.

1.4 Scope and Organization

This document is not intended to be prescriptive or to serve as a "cookbook" for development of hydromodification management strategies. Rather, it is a resource to evaluate the utility of existing tools and approaches, and it proposes a framework for integrating multiple approaches for more comprehensive assessment and management. This framework should be used to aid in the development of HMPs that are appropriate for specific regions and settings and take advantage of the best available science. It can also be used to improve consistency in assessment and monitoring approaches so that information collected across regions and programs can be compiled and leveraged to provide more comprehensive assessments of the effectiveness of management actions. Ultimately, such consistency should improve the effectiveness of all programs.

The authors, a team of technical experts, developed the content for this document in consultation with agency staff and regulated entities. The document begins with a brief general discussion of the effects of hydromodification and stream response mechanisms, providing the best available science to support subsequent recommendations. The main body of the document focuses on presenting a proposed new management paradigm where site-based management is nested within an overall watershed assessment that accounts for past, current, and proposed future land use. The body of the document also includes a discussion of existing tools and how they can be used more effectively and appropriately to evaluate potential impacts and guide decisions on selection and design of management practices. The third major section of the document focuses on monitoring that includes evaluation of hydrologic, geomorphic, and biologic conditions with an overriding goal of adaptive management. The document concludes with several technical appendices that offer specific guidance on the appropriate application of tools and models within the existing HMP approaches, and a bibliography of resources.

2. HYDROMODIFICATION SCIENCE

2.1 Introduction

Land-use changes can alter a wide variety of watershed processes, including site water balance, surface and near-surface runoff, groundwater recharge, and sediment delivery and transport. Although alteration to these watershed processes (referred to collectively as hydromodification) can affect many elements of a landscape, the focus of this document is on impacts to stream systems. Furthermore, while this paper will often refer to urbanization, it is recognized that other types of land-use changes (grazing, agricultural, forestry, etc.) can have similar impacts. This section reviews relevant hydrologic processes and summarizes the impact of urbanization on hydrologic, biologic, and geomorphic systems, and it describes our current understanding of the physical mechanisms underlying these impacts. This provides a foundation for establishing assessment tools and predictive models, as well as for developing management and monitoring programs.

Although not addressed by this report, urbanization also has a range of effects on water quality (*Heaney and Huber* 1984, *Brabec et al.* 2002) by increasing pollutant loads (*Owe et al.* 1982), increasing nutrient loads (*Wanielista and Yousef* 1993, *Hubertz and Cahoon* 1999), and diluting dissolved minerals through increased runoff and decreased infiltration and soil contact (*Loucaides et al.* 2007). As a result of both its physical and chemical effects, urbanization also affects the integrity of biota (*Heaney and Huber* 1984) including fishes (*Klein* 1979, *Weaver and Garman* 1994, *Wang et al.* 2000) and invertebrates (*Sonneman et al.* 2001, *Wang and Kanehl* 2003). These impacts are acknowledged and evaluated in the discussion of monitoring Section 4, but the details of their interactions and effects are not otherwise addressed here.

Land-use changes can alter a wide variety of watershed processes, including site water balance, surface and near-surface runoff, groundwater recharge, and sediment delivery and transport. Alteration to these watershed processes are referred to collectively as hydromodification.

2.2 Hydrology Overview

To understand the effects of urbanization, the basic processes of the hydrologic system must be highlighted. A watershed's drainage system consists of all the features of the landscape that water flows over or through (*Booth* 1991). These features include vegetation, soil, underlying bedrock, and stream channels. Urban elements such as roofs, gutters, storm sewers, culverts, pipes, impervious surfaces such as parking lots and roads, and cleared and compacted surfaces fundamentally change the rate and character of hydrologic processes. Generally, the hydrologic changes associated with development and urbanization increases the speed and efficiency with which water enters and moves through the drainage system. In undeveloped watersheds, only a portion of the precipitation that falls ever enters the stream channel. Instead, precipitation may be: 1) evaporated off the ground surface or intercepted by vegetation and evaporated; 2) transpired from the soil; or 3) infiltrated deeply into regional aquifers. For the portion of precipitation that ultimately enters the stream, the rate and processes of delivery vary between watersheds, with important implications for how urbanization will affect runoff.

Flow can be classified as stormflow (or "quickflow") if it enters the stream channel within a day or two of rainfall (*Dunne and Leopold* 1978). Quickflow occurs through 1) infiltration excess (also called "Horton") overland flow, wherever rainfall intensity exceeds the infiltration capacity of the soil and water flows over the ground surface; 2) saturation excess overland flow, where overland flow occurs following filling of all pore space in surface soils; 3) shallow subsurface flow, where water flows relatively quickly through permeable shallow soils (but still more slowly than either Horton or saturation overland flow); and 4) precipitation directly into stream channels. Conversely, water that infiltrates more deeply is classified as delayed flow, because it travels slowly as deep groundwater and emerges into a stream slowly over time.

As a storm progresses, runoff patterns and rates can change, even within the same catchment. For example, surficial soils may become saturated during the course of a storm (or a storm season) as the water table rises, and this can induce a shift in runoff from shallow (or even deep) subsurface flow to the quickflow process of saturation excess overland flow (*Booth* 1991). Even under scenarios in which rainfall intensity exceeds infiltration capacity, Horton overland flow will not be connected to stream channels until surface depressions are filled.

2.3 Impacts of Urbanization

The archetypal model of development involves clearing vegetation; grading, removing, and compacting soils; building roads and stormwater sewers; constructing buildings; and re-landscaping. The specific ways in which these activities alter runoff processes are discussed below. Development may also directly alter stream, such as through channel straightening, levee construction, and flood control reservoirs; however, discussion of the impacts of these alterations is beyond the scope of this document.

2.3.1 Decreased Interception

When rainfall occurs in a watershed, some of the precipitation will be intercepted by vegetation and leaf litter and prevented from entering the stream channel network (Figure 2-1). The percentage of precipitation that can be intercepted varies according to cover type and the character of rainfall (rainfall intensity, storm duration, storm frequency, evaporation conditions) (*Dunne and Leopold* 1978). The effectiveness of interception decreases as a storm progresses because once the surface area of a tree is completely wetted, water will drip off leaves and run down the vegetation as stem flow. Typically, 10-35% of precipitation is intercepted by trees and 5-20% by crops, though these amounts vary widely (*Dunne and Leopold* 1978, *Xiao and McPherson* 2002, *Reid and Lewis* 2009, *Miralles et al.* 2010). In urban environments where vegetative cover is greatly reduced, landscape-scale interception may be lower by an order of magnitude (*Xiao and McPherson* 2002). Precipitation that is not intercepted enters the drainage system. Thus, the mere reduction in interception in urban areas may produce the hydrologic equivalent of a storm that is 10-30% larger.

Figure 2-1. Vegetation reduces runoff by intercepting a portion of the total rainfall and preventing water from entering the drainage system. (Illustration by Jennifer Natali).

The influence of urbanization on climate is complex and varied. For example, urbanization has been shown to increase temperature (*Kalnay and Cai* 2003), increase or decrease wind speeds (*Oke* 1978, *Balling and Brazel* 1987, *Grimmond* 2007), increase pan-evaporation rates (*Balling and Brazel* 1987), and increase shading of the ground surface (*Kalnay and Cai* 2003). In most studies of urban hydrology, the dynamics of evapotranspiration (ET) are typically, explicitly or implicitly, ignored (*Grimmond and Oke* 1999). This exclusion exists because of the widespread assumption that urban ET is negligible compared to rural areas with higher proportions of vegetation-covered soils (*Chandler* 1976, *Oke* 1979). In cases such as urban deforestation in the temperate Eastern United States, it is appropriate to assume a net loss of ET due to urbanization (*Bosch and Hewlett* 1982, *Sun et al.* 2005, *Roy et al.* 2009). However, spatial variability and the site-specific dynamics of climate, vegetation, and land-use should be considered carefully in arid and semi-arid regions where vegetation is limited prior to development. In drier climates (including much of southern California), primary productivity (and ET) may be substantially increased through the irrigation of urban landscaping (*Buyantuyev and Wu* 2008).

2.3.2 Decreased Infiltration

Infiltration in urban areas is decreased due to several factors: impermeable surfaces such as roads, parking lots, and roofs prevent infiltration by blocking water from reaching soils; heavy-equipment construction operations cause soil compaction and degrade soil structures; construction projects may remove surface soils and expose subsurface soils with poorer infiltration capacity; vegetation-clearing and bare-earth construction increase erosion and loss of topsoil (*Pitt et al.* 2008). The effect of impervious surfaces is intuitive, visible, and dramatic (*Booth and Jackson* 1997), but not all impervious areas affect runoff processes equally. For example, if an impervious surface is built over clayey soils with poor infiltration, the overall runoff rates will be less affected than if built over sandy soils with high natural infiltration rates. While the loss of pervious area has received substantial attention within scientific and policy communities, until recent years considerably less attention has been paid to the effects of compaction and the reductions in infiltration capacity of soils (*Pitt et al.* 2008). Commonly, an area of green is assumed to be permeable, but playing fields and even ornamental lawns may have very

low infiltration capacities (*Pitt et al.* 2008). A study of urban runoff in Washington found that impervious areas generated only 20% more runoff than what appeared to be green, pervious areas of lawns (*Wigmosta et al.* 1994). Factors such as excavation and lawn-establishment methods appear to be more significant for infiltration than any other factor including grain size of the original sediments (*Hamilton and Waddington* 1999). Tillage may increase infiltration slightly, while compost or peat soil amendments can increase infiltration by 29 to 50 percent (*Kolsti et al.* 1995).

2.3.3 Increased Connectivity and Efficiency of the Drainage System

Rainfall in urban areas moves quickly as overland flow into storm sewers and the stream channel network (Figure 2-2). The delivery of precipitation into urban stream channels is extremely efficient, transforming essentially all precipitation into stormflow and creating nearly instantaneous runoff. Under natural conditions, in contrast, most runoff to streams is via groundwater paths that typically flow at least one or two orders of magnitude slower than surface water. Thus converting subsurface flow into surface stormflow has dramatic consequences. Furthermore, artificial surfaces such as roofs, pavement, and storm sewers are 1) straight, which shortens the travel distance required for delivery into the channel network; and 2) smooth, which decreases friction and allows flow to travel more quickly than in natural channels (*Hollis* 1975). Storm sewer systems increase the density of "channels," which further shortens runoff travel distances (Figure 2-3). In particular, upland regions that may not have had any surface channels prior to urbanization are frequently fitted with storm sewers, which dramatically increase delivery efficiency into the channel network (*Roy et al.* 2009). In sum, urbanization transforms watershed processes and flow paths that were once slow, circuitous, and disconnected into engineered and non-engineered systems that are highly efficient, direct, and connected.

In contrast to the slow measured runoff to natural streams by surface and subsurface pathways, the delivery of precipitation into urban stream channels is extremely efficient, transforming essentially all precipitation into stormflow and creating nearly instantaneous runoff.

2.3.4 Decreased Infiltration into Stream Beds

Concreting of bed and banks, channel narrowing, and channel straightening limit infiltration from a stream into the ground. Concrete channel margins create infiltration barriers, while channel narrowing and straightening limit the surface area accessible for infiltration and also create a less complex channel. Channel complexity such as pools, riffles, steps, and debris dams create hydraulics that slow flow velocities and also divert water into the subsurface (*Lautz et al.* 2005). In arid and semi-arid watersheds where streams may flow only occasionally, infiltration through bed, banks, and floodplain areas may significantly lower peak flows and may sustain aquifers vital to regional water supplies and natural habitats (*Kresan* 1988, *Dahan et al.* 2008). Increasing recognition is being paid in the scientific literature to the infiltration services provided by natural channels and floodplains (*Macheleidt et al.* 2006, *Schubert* 2006).

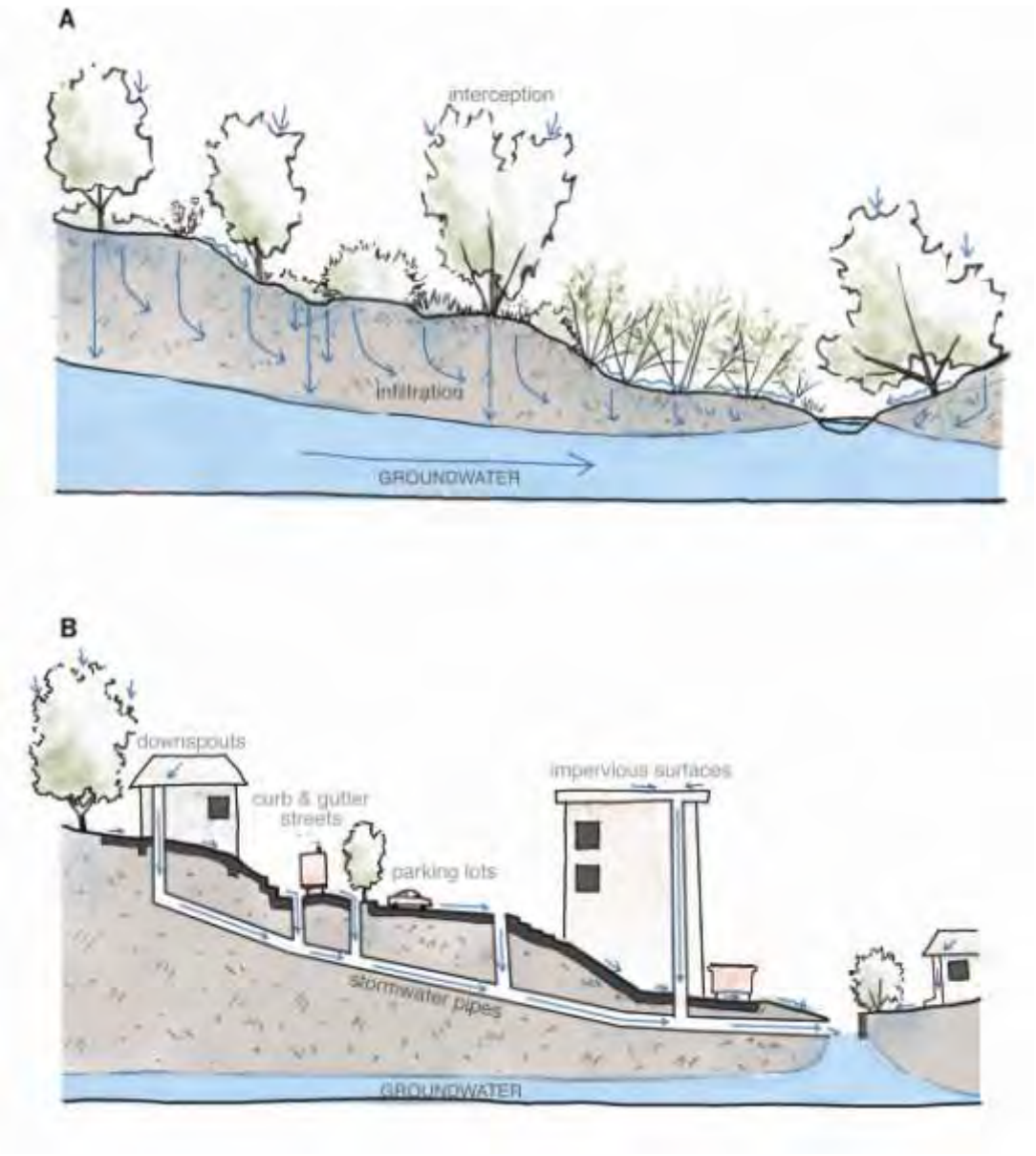

Figure 2-2. Stormwater flowpaths are shortened and quickened through paving, building, soil compaction, and sewer infrastructure. The rapid concentration of streamflow increases storm peaks. Rapid runoff and reduced infiltration prevent groundwater recharge. (Illustration by Jennifer Natali).

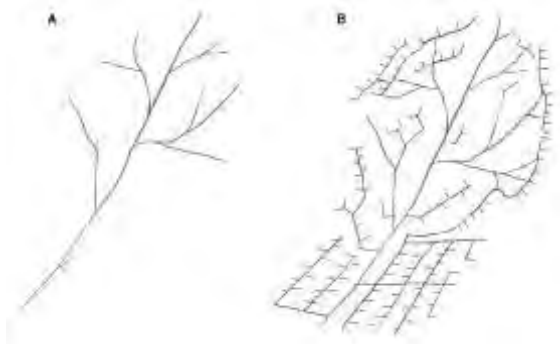

Figure 2-3. Increased surface runoff causes an extension of the channel network. This occurs through increased channel erosion or through constructed networks (to manage increased surface flow). The expanded channel network delivers runoff to downstream reaches much more efficiently. (Illustration by Jennifer Natali).

2.4 Changes in Instream Flow

The instream flow changes resulting from urbanization depend upon site-specific watershed and development characteristics, but typically they include modification of the timing, frequency, magnitude, and duration of both stormflows and baseflow. Urbanization has been shown to increase the magnitude of stormflows, increase the frequency of flood events, decrease the lag time to peak flow, and quicken the flow recession (Figure 2-4; *Hollis* 1975, *Konrad and Booth* 2005, *Walsh et al.* 2005). Because the effects of urbanization manifest differently for different components of the hydrograph, the hydrologic alterations of moderate storms, large storms, and baseflow are discussed individually below.

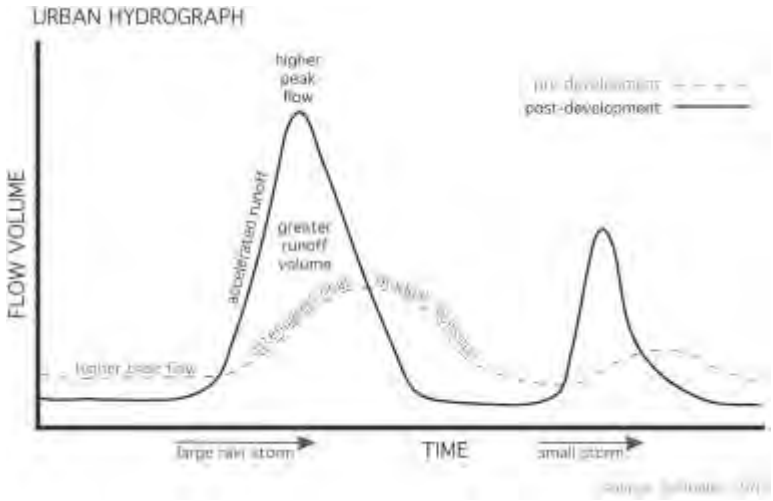

Figure 2-4. Increased runoff efficiency causes higher magnitude peak flows, shorter duration runoff events, decreased baseflow, and dramatic increases in small storms that may have generated little or no runoff under pre-development conditions. (Illustration by Jennifer Natali).

2.4.1 Moderate Stormflow

Urbanization of a watershed can drastically increase the frequency and magnitude of small and moderate flow events (Hawley and Bledsoe 2011). The magnitude of flow amplification increases generally in proportion to the amount of impervious area (*Leopold* 1968, *Hollis* 1975). For example, flows with a return period of one year or longer were shown to be unaffected by paving 5% of the watershed, yet the magnitude of a one-year flow could be more than ten times higher when 20% of a watershed is paved (*Hollis* 1975). In undeveloped watersheds, small storms may not generate any overland flow or streamflow increase at all, because interception, infiltration, soil absorption, and evapotranspiration contain all the precipitation.

Urbanization of a watershed can drastically increase the frequency, duration, and magnitude of small and moderate flow events by factors of 10 or more.

The change to a flashier regime with larger magnitude streamflow generated from small and moderate storms has two primary consequences. First, the stream power and sediment-transport capacity of the stream increase significantly, potentially creating channel erosion and/or stressing instream biota. Second, the season of stormflow is likely to be extended. In undeveloped watersheds, early or late-season storms typically do not generate significant runoff because soils are dry, can effectively absorb most precipitation, and therefore do not generate overland flow or streamflow. Antecedent moisture conditions are less important in urban watersheds where overland flow is generated regardless, and streamflow is generated by even a small storm in a dry watershed. Through magnifying small and moderate storms, urbanization may increase the duration of sediment-transporting and habitat-disturbing flows by factors of 10 or more (*Booth* 1991, *Booth and Jackson* 1997).

2.4.2 Large, Infrequent Storms

In large storms with return intervals of 10 or more years, the influence of urbanization is less pronounced though still present. Whereas a 1-year stormflow may be increased by ten times by paving 20% of the watershed, historical data from humid-region watersheds suggest that the peak magnitude of a 100-year flood would not even be doubled (*Hollis* 1975). The diminishing influence of urbanization on floods of higher recurrence intervals is understood by recognizing that the hydrologic processes of large storms resemble the processes of urban runoff. Essentially, a 100-yr flood is an event that is long in duration, severe in intensity, and likely occurs when soils are already wet. Even in an undeveloped watershed, a storm of this magnitude can typically generate (saturation) overland flow and transport water efficiently into the channel network in a manner more generally comparable to an urban setting.

2.4.3 Baseflow

Urbanization does not affect instream baseflows consistently. Many studies have documented baseflow reductions and/or lowered groundwater levels that have been attributed to decreased infiltration (*Simmons and Reynolds* 1982, *Ferguson and Suckling* 1990) and groundwater extraction (*Postel* 2000). In extreme cases, baseflow in urban watersheds can disappear completely during drought years, dry

seasons, or even between storm events during the wet season. The effect of reducing infiltration may be counteracted in urban and suburban landscapes, however, through irrigation of lawns, parks, golf courses, and other water inputs such as septic systems, leaky pipes, and sewage treatment outflow which typically import water from outside the watershed and contribute to both streamflow and groundwater recharge (*Konrad and Booth* 2005, *Walsh et al.* 2005, *Roy et al.* 2009). Indeed, imported water volumes in very dense cities may be an order of magnitude greater than precipitation. Lerner (2002) judged that leakage in water importation and delivery infrastructure typically ranges from 20-50%, and in general this leakage will increase groundwater recharge in urban areas. Similarly, other studies have found municipal irrigation capable of raising groundwater levels and causing surface flooding (*Rushton and Al-Othman* 1994) and changing ephemeral streams into perennial streams (*Rubin and Hecht* 2006, *Roy et al.* 2009). In summary, the magnitude and direction baseflow and groundwater recharge alteration depends on climate, land use, water use, and the infrastructure system of the watershed. There are no simple "rules."

2.5 Changes in Sediment Yield

The role of watershed sediment yield in the behavior of watersheds was first characterized systematically by Wolman (1967) in a three-part conceptual framework of how rivers respond to urban development, in which 1) pre-development quasi-equilibrium conditions are followed by 2) a period of active construction involving grading, vegetation removal, and bare earth exposed to erosion; and 3) the establishment of an urban landscape consisting of pavement, houses, gutters and sewers etc. The construction period is marked by an increase in sediment (typically 2-10 times pre-development rates) produced from bare surfaces and the disturbances associated with construction (*Chin* 2006). The sediment produced during construction is often deposited within stream channels, initiating aggradation and/or channel widening. Following the construction period, sediment production decreases (Figure 2-5) and runoff increases, resulting in increased transport capacity and the potential for severe channel erosion that can result in channel enlargement of commonly 2-3 (and as much as 15) times the original channel cross-section (*Chin* 2006). Changes in post-construction sediment production rates are not well studied, though case studies have found sediment yields in post-construction watersheds to be somewhat higher than rural, undeveloped basins.

The combination of increased runoff and decreased sediment production can result in channel enlargement of commonly 2-3 (and as much as 15) times the original channel cross-section.

Post-construction sediment loads are typically derived from channel enlargement as a result of increased peak flows and the legacy of construction-phase disturbance (*Trimble* 1997, *Nelson and Booth* 2002). The rate of decline in post-construction sediment yields is therefore predominantly controlled by the degree of channel instability caused by the construction phase and the effect of increased peak flows. If the channel margins are armored, densely vegetated, or otherwise erosion resistant, sediment yields may decline quickly following urbanization. If channel instability ensues, elevated sediment yields may persist for decades or more.

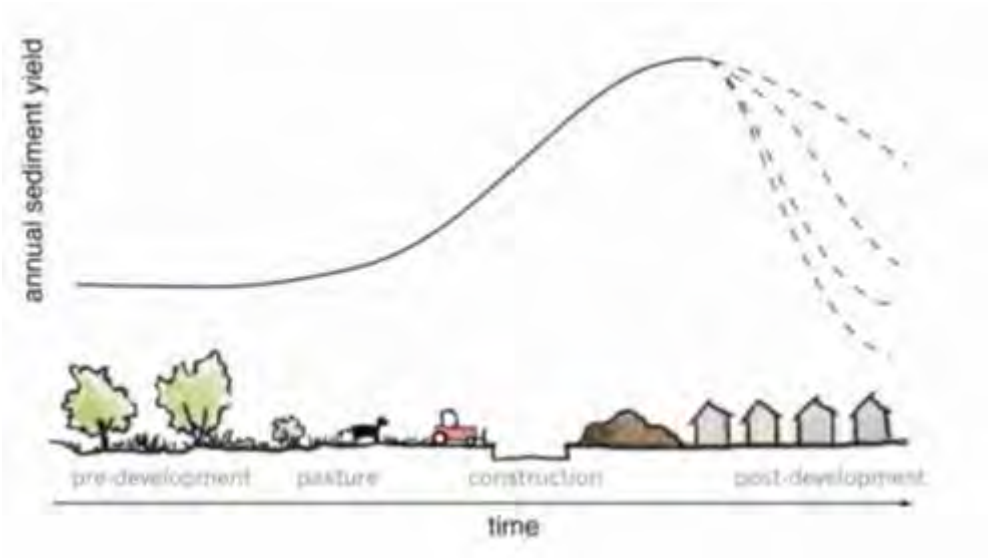

Figure 2-5. Increased sediment yields occur during the land-clearing and construction phases of development. Post-construction sediment yields decrease, though the rate of decrease varies considerably depending on the degree of channel instability caused by the construction phase and by increased runoff. (Illustration by Jennifer Natali).

2.6 Impacts on Channel Form and Stability

Channel form and stability reflect both hydrologic and geomorphic processes. Changes to runoff characteristics and sediment supply can affect all aspects of stream morphology, including planform, cross-sectional geometry, longitudinal profile, bed topography (e.g., pools, riffles), and bed sediment size and mobility. While many factors influence the type and degree of impacts (discussed below), a suite of commonly observed morphological changes due to hydromodification include channel enlargement (incision and widening), decreased bank stability, increased local sediment yield from eroding reaches, overall simplification of stream habitat features such as pools and riffles, changes in bed substrate conditions, loss of connectivity between channel and floodplain (*Segura and Booth* 2010), and changes in sediment delivery to coastal waters (*Jacobson et al.* 2001). Impacts may also propagate upstream as headcuts resulting from reductions in base level due to excess erosion. Likewise, tributaries entering downstream of a developed area may also experience the upstream propagation of headcuts due to base level reductions of the mainstem.

In addition to Jacobson *et al.* (2001), two well-researched literature reviews of morphological impacts (as well impacts to riparian habitat and biota) can be found in: "Impacts of Impervious Cover on Aquatic Systems" by The Center for Watershed Protection (2003) and "Physical Effects of Wet Weather Flows on Aquatic Habitats: Present Knowledge and Research Needs" published by Water Environment Research Foundation (*Roesner and Bledsoe* 2003). Note that these two studies differ significantly in how they

synthesize and interpret the reviewed literature, and the CWP publication acknowledges that it does not necessarily apply to streams in the arid west.

2.6.1 Physical Principles Underlying Channel Impacts

A convenient conceptual framework for the physical impacts of hydromodification on stream morphology is "Lane's Balance" (*Lane* 1955; Figure 2-6). This framework encapsulates a fundamental (albeit qualitative) relationship between the hydrologic and geomorphic processes that balance water flow and sediment in a channel. It expresses the condition of sediment transport capacity, as controlled by water discharge and slope, in broad balance with the supplied load and size of bed sediment for a channel in equilibrium. An increase in streamflow or a decrease in sediment supply (for example) will typically initiate a corresponding decrease in slope and/or increase in grain size in order to reestablish equilibrium. That decrease in slope is expressed by channel incision or degradation. In contrast, an increase in sediment supply or decrease in streamflow will typically result in aggradation and a corresponding increase in slope.

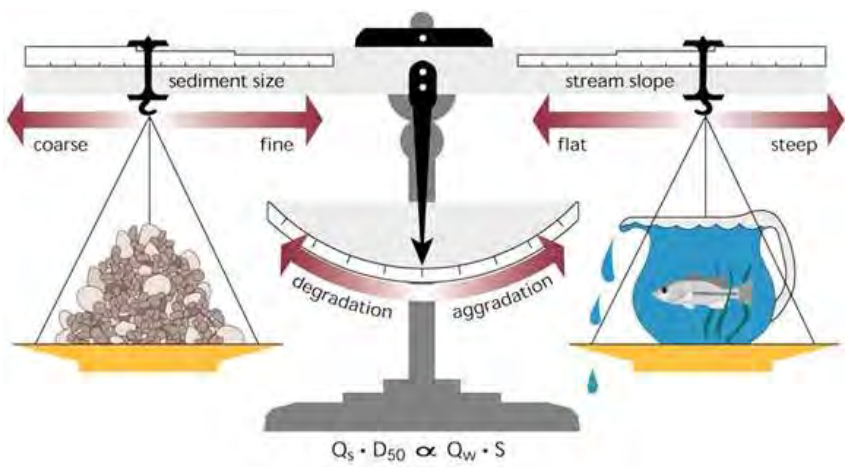

Figure 2-6. Lane's Balance, showing the interrelationship between sediment discharge (Q_s), median bed sediment size (D_{50}), water discharge (Q_w), and channel slope (S).

Slope and grain size are not the only modes of adjustment, as stream channels have many more degrees of freedom in responding to changes in streamflow and sediment supply. For example, Schumm (1969) extended Lane's Balance to include width, depth, sinuosity, and meander wavelength. More quantitatively (and more complexly), adjustments to channel form resulting from hydromodification are controlled by interactions among flow-generated shear stresses (described by hydraulic equations for open channel flow, as a function of channel geometry, roughness, and longitudinal slope), inflowing sediment load, and the shear strength of the bed and bank sediments (a function of their size distribution and cohesiveness).

2.6.2 Natural Variability in Stream Systems

Understanding natural variability in streams is critical to predicting and assessing anthropogenic impacts. A stream may be considered "stable" or "at equilibrium" when its overall planform, cross-section and profile are maintained with no net degradation or aggradation within a range of variance, over extended timeframes (*Mackin* 1948, *Schumm* 1977, *Leopold and Bull* 1979, *Biedenharn et al.* 1997). Such systems can often withstand short-term disturbances without significant change. Even without discrete disturbances, natural streams may be in a state of dynamic equilibrium (*Schumm* 1977), where the channel exhibits stability over the long term even while actively migrating laterally such that erosion of outer banks is accompanied by sediment deposition and bar building on inner banks. Streams may also be fluctuating between aggradation/ degradation/ stability, all within a limited range of conditions. A large-scale event, like a flood or landslide, can cause dramatic changes in channel form, but the channel will often re-established its pre-event planform, geometry and slope over time.

In contrast, a persistent alteration like hydromodification can cause the rate of change to increase. As a result, the channel may begin an evolutionary (or catastrophic) change in morphology, leading to enlargement and instability. A geomorphic threshold is the condition at which there is an abrupt and significant channel adjustment or failure because the channel has evolved to a critical situation. It is the condition at which the proverbial straw breaks the camel's back. Channels that are near a geomorphic threshold can exhibit significant adjustments in response to a relatively small degree of hydromodification. For example, a channel with banks that are near the height and angle for geotechnical failure may widen abruptly due to slight incision.

2.6.3 The Role of Sediment Transport and Flow Frequency in Channel Morphology

Extensive research has been devoted to establishing specific relationships between flow frequency and characteristics of channel morphology. The concept of "effective discharge" was introduced by Wolman and Miller (1960), using a magnitude-frequency analysis to assess the effectiveness of flow events to transport sediment. They concluded that, for the rivers in their analysis, relatively frequent events (occurring on average about 1 times/year) are most effective over the long term in transporting sediment. This concept has formed the basis for a large body of literature (and occasional controversy) over the subsequent five decades relating to the relationships between these flow frequencies and principal channel dimensions (e.g., bankfull stage, width-to-depth ratio), and the application of these relationships to stream design and restoration, as well as prediction and control of hydromodification impacts. Much of the controversy has related to the use of a single event ("dominant discharge" or "bankfull flow") as the basis for such applications, with the implicit assumption that control for that single discharge will result in commensurate channel changes regardless of the distribution of flow frequencies and flow durations over a wider range of discharges.

More recently, the concept of a *range* of moderately frequent, "geomorphically significant" flows that transport the majority of the sediment over the long term (King County 1990, *Bledsoe* 2002, *Roesner and Bledsoe* 2003) was proposed to replace the focus on a single event. The geomorphically significant flow range is considered to be the most influential in determining channel form, as this collective group

of flows typically does the most "work" on the channel boundary over engineering time scales. Controlling changes to the frequency of flows within this range is therefore critical to reducing impacts to stream morphology, and is the scientific basis for the "flow-duration" control criteria discussed in the following sections. A flow-duration criterion aims to match the pre-development volumes, durations, and frequencies of this critical range of sediment transporting flows over a period of many decades. Even this concept, however, relies on the implicit assumption that infrequent large events, no matter how dramatic their effects, typically occur "too infrequently" to reset channel morphology and habitat over the timescales of concern in meeting regulatory requirements. These events are typically managed through traditional flood control practices as opposed to hydromodification management.

A flow-duration management approach aims to match the pre-development volumes, durations, and frequencies of this critical range of sediment transporting flows over a period of many decades.

2.6.4 Applicability to California Streams

The traditional concepts of dynamic equilibrium in streams and geomorphically significant flows, discussed above, derive largely from studies on perennial streams in humid areas. An important question is: to what extent do these concepts apply to managing hydromodification impacts to streams within arid and semi-arid areas (such as large portions of California, and particularly the southern and eastern regions)? In such climate regions, precipitation is highly variable, with low annual totals and episodic, large events. Many streams are ephemeral or intermittent and located in a setting of extremely high sediment production associated with erosive geology resulting from high rates of tectonic uplift, sparse vegetative cover and frequent fires (*Graf* 1988, *Stillwater Sciences* 2007). These streams are often characterized by multi-thread sand-bed channels that are inherently unstable and readily respond to changes in flow conditions. In the ephemeral streams described by Bull (1997), for example, the natural behavior is one of alternating periods and locations of aggradation and degradation, varying both temporally and spatially. In such "episodic" streams, the vast majority of sediment may be moved by extreme, highly infrequent events. The importance of understanding the role of episodic events has been emphasized for semi-arid and arid fluvial systems (e.g., *Wolman and Gerson* 1978, *Brunsden and Thornes* 1979, *Yu and Wolman* 1987). The latter authors reviewed concepts of frequency and magnitude in geomorphology research and noted that episodic behavior hinges on frequency of episodic events relative to the time required to return to an "equilibrium" channel form. Episodic behavior is more prevalent where the average long-term disturbance is low but the year-to-year variability is high, a characteristic of arid and semi-arid climates.

Although the morphology of arid and semi-arid streams may be more strongly influenced by extreme events under natural conditions, hydromodification has nevertheless been shown to cause rapid and significant physical changes in such California streams (*Trimble* 1997, *Coleman et al.* 2005, *Hawley and Bledsoe* 2011). Such dramatic responses to the effects of urbanization on relatively frequent flows, often over periods of a decade or less, have profound implications for aquatic life and physical habitat. Despite the flashy streamflow regimes, high sediment supplies, and steep gradients of many streams in the region, the responses of California streams are controlled by the same physical processes as those in

other regions that have been studied more extensively. As such, the key controls of stream response can be identified and managed to mitigate the chronic effects of hydromodification between infrequent extreme events. However, it is always advisable to ensure that the application of tools and approaches for prediction and assessment should be based on reference data and empirical models (where applicable) drawn from stream types that are similar in both hydrologic and geomorphic characteristics.

2.6.5 Factors Determining Extent of Impacts

The extent and nature of impacts to stream morphology and habitat from a given change in runoff and sediment supply vary widely, depending on the channel geometry, longitudinal slope, channel material type(s) and size(s), and the type and density of channel vegetation (*Center for Watershed Protection* 2003, *Roesner and Bledsoe* 2003). For example, increased flows within a deep, narrow channel may result in significantly higher shear stresses at the bed; this same increase in a wide, shallow channel may become predominantly overbank flow, with less effect on bed shear stress. Where all other factors are equal, fewer impacts would be expected where flows have access to broad overbank areas (i.e., floodplains) during relatively common floods (*Segura and Booth* 2010), channel materials are more resistant, and stabilizing riparian vegetation is present. Conversely, where erosion and bank instability result in the loss of vegetation reinforcement, a positive feedback response may cause erosion to be accelerated. Furthermore, the relative erosive resistance of bed and bank materials will influence the extent of lateral versus vertical channel adjustments (*Simon and Rinaldi* 2006, *Simon et al.* 2007). For example, if bank resistance is lower than bed resistance, then the channel will tend to widen rather than deepen.

The extent and nature of impacts to stream morphology and habitat from a given change in runoff and sediment supply vary widely, depending on the channel geometry, longitudinal slope, channel material type(s) and size(s), and the type and density of channel vegetation, and the spatial and temporal patterns of urban development

The extent of impacts will also depend on the stream's physiographic context and spatial and temporal patterns of urban development within the watershed (Konrad and Booth 2005). Large-scale studies of hydrologic responses to urbanization (Chin 2006, Poff et al. 2006) also highlighted the regional variation in these responses and reinforced the need to understand local watershed and channel characteristics when managing hydromodification impacts. The presence of road crossings and other infrastructure can provide local grade control and create sediment bottlenecks which often translate to exacerbated erosion in the immediately downstream areas.

An additional consideration relates to the pre-development balance between sediment and streamflow, which is dependent on precipitation patterns, the location of a stream reach within the watershed, the associated sediment behavior of that reach (i.e., production, transport or deposition zone), and local rates of sediment production.

While many of these factors may be quantified for a given time and location, stream systems are enormously complex both spatially and temporally. The existence of physical thresholds and feedback systems can cause an incremental change to result in a disproportionately large response (*Schumm* 1977, 1991). Furthermore, there may be significant temporal lags between the point in time at which

land use is altered and when channel impacts are observed (*Trimble* 1995, 1997). In recognition of these effects and the associated uncertainty, predictive models and management tools may present results in terms of probabilities or within the context of a risk-based approach, as discussed further in this document. Such effects also have substantial implications for the design of assessment and monitoring programs.

There may be significant temporal lags between the point in time at which land use is altered and when channel impacts are observed.

2.6.6 Impacts on Other Types of Receiving Waters

Although outside the scope of this document, hydromodification impacts to other water body types are recognizable and should be the subject of additional research and future consideration.

Wetlands, Estuaries, and Coastal Ecosystems. Urbanization can alter water quality, quantity and sediment delivery to wetlands and sensitive coastal ecosystems. Urbanization has led to loss or degradation of wetlands and estuaries as a result of 1) draining and conversion to agriculture (*Dahl*, 1997); 2) upstream alterations to flow and sediment regimes that can change the magnitude, frequency, timing, duration, and rate of change of estuarine salinity, turbidity, freshwater flooding, freshwater baseflow, and groundwater recharge dynamics (*Azous and Horner* 2001); and 3) contaminated runoff from urban areas (*Paul and Meyer* 2001, *J Brown et al.* 2010). Urbanization may also lead to coastal erosion in circumstances where reservoir sediment trapping or post-development decreases in sediment yield reduce the sediment supply to the coast (*Pasternack et al.* 2001, *Syvitski et al.* 2005).

Alluvial Fans. Alluvial fans are dynamic landforms that are under increased development pressure in recent decades, particularly in the expanding cities of the American West. Upstream urbanization, and the resultant flashier flow regime, shortens the time available for infiltration and groundwater recharge in alluvial fans. Furthermore, development on fans themselves results in channel straightening and/or construction of concrete flood conveyance channels that also reduce or eliminate infiltration. The reduction in infiltration amplifies the flood risk further downstream. Additionally, alluvial fans may be more vulnerable than other landscapes to channel instability resulting from hydromodification, because they lack intrinsic geologic controls on channel gradient, and commonly have little vegetation or bank cohesion to provide stability in the purely alluvial deposits (*Chin* 2006).

2.6.7 Influence of Scale

The ability to detect impacts from land-use changes depends upon the spatial and temporal scale at which they are measured. Issues of hydrograph timing and the relative size of the storm system with respect to the watershed area may confound relationships at larger spatial scales. Furthermore, a number of fluvial geomorphic features that are commonly used as metrics of geomorphic condition are scale-dependent. For example, width-depth ratio, tendency toward braiding, and channel depth relative to stable bank height all commonly increase downstream. Other factors, such as the influence of vegetation, depend on protrusion relative to width and rooting depth relative to bank height. The

temporal scale over which channel changes occur will be influenced by precipitation variability, in addition to the many physical factors already discussed.

These scale considerations, as well as previous discussion of factors influencing stream response, are important when determining the choice of both management tools and monitoring approaches. It is generally much easier to predict the direction of response than the magnitude. Accurate, detailed predictions of response are difficult to make, and they are generally only possible when applied to specific locations, using extensive data input, to answer very specific questions; even then they are subject to uncertainty. Policies or assessment methods aimed to address a range of streams and geographic conditions are better suited to probabilistic approaches that explicitly acknowledge uncertainty, as described further in subsequent sections.

2.7 Impacts on Fluvial Riparian Vegetation

Stream channel form and stability is closely linked with the ecology of instream and floodplain habitats (Figure 2-7). Spatial and temporal distributions of plant communities are tied to moisture availability and seasonality. The ability of vegetation to stabilize soils, trap sediments, and reduce flow velocities (*Sandercock et al.* 2007) can create positive feedback that promotes further vegetation establishment and enhancement of these stabilizing features. This can result in a strong influence on channel geometric features, specifically channel narrowing (*Anderson et al.* 2004). The change in frequency of overbank flows resulting from channel incision will also affect riparian processes, including nutrient transfer and seed dispersal. For example, it is believed that *Tamarix* dominance over native species along Western US rivers would be less extensive if not for anthropogenic alteration of streamflow regimes (most recently supported by Merritt and Poff (2010)).

Impacts to stream biota may occur through the alteration of habitat structure and habitat dynamics caused by hydrologic and geomorphic changes, as well as directly from hydrologic alteration.

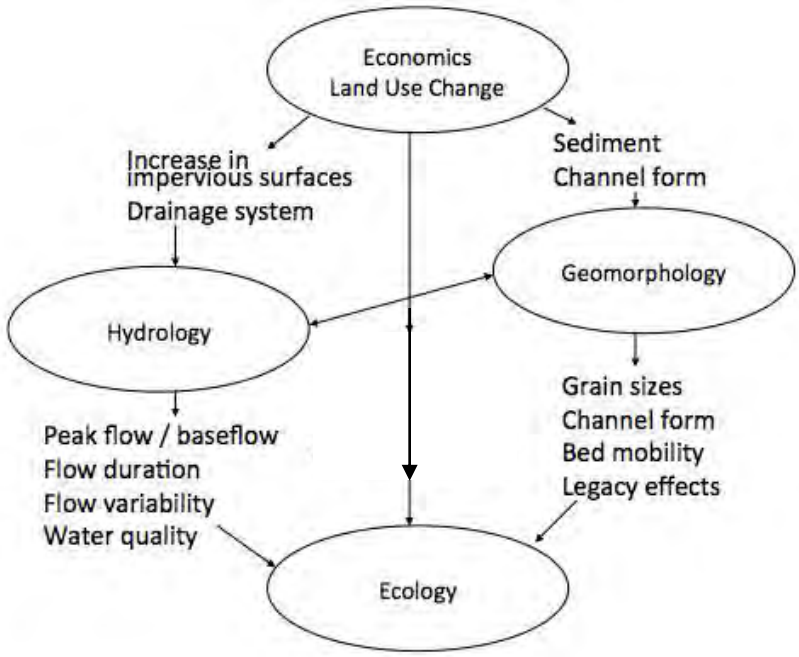

Figure 2-7. Land use changes, hydrology, geomorphology and ecology are closely and complexly interrelated. (Adapted from Palmer *et al.* 2004).

Vegetation changes not only are a result of morphological impacts but also can result directly from changes in streamflow. These findings continue to be supported by recent studies; for example, increases or decreases in baseflow or changes to the seasonal availability of water can determine the extent and type of riparian vegetation capable of thriving in that environment (*White and Greer* 2006). Vegetation changes can have cascading effects on indigenous fauna that require native plants for food or nesting (*Riley et al.* 2005). Channel incision can also result in phreatic draining of adjacent wetland and floodplain habitats and result in loss of key riparian species (*Scott et al.* 2000).

2.8 Impacts on In-Stream Biota

As shown in Figure 2-7, impacts to stream biota may occur through the alteration of habitat structure and habitat dynamics caused by hydrologic and geomorphic changes, as well as directly from hydrologic alteration. (The term biota is used here to refer to a range of non-plant species including algae, macroinvertebrates, amphibians, fishes, etc.) Because of these relationships, the condition of in-stream biota is considered to reflect the effects of all other impacts and has been recommended as an integrative measure of stream health (discussed further in Section 5).

Studies continue to build on Poff *et al.* (1997), who highlighted the importance of the "natural flow regime" and its variability as critical to ecosystem function and native biodiversity. Streamflow pattern or "regime" interacts with the geomorphic context to control the physical and biological response of streams to hydromodification. The basic characteristics of streamflow regimes are typically described in five ways: magnitude, frequency, duration, timing, and rate of change. There is a large body of science

linking one or more of these five elements of flow regimes to geomorphic processes, physical habitat, and ecological structure and function. A few examples of linkages with physical habitat are provided in Table 2-1; these linkages describe the mechanisms by which flow changes can impact stream ecology through morphological alterations.

Table 2-1. Examples of Relationships between Flow Regime Attributes and Physical Habitat Characteristics (adapted from Roesner and Bledsoe 2002).

Flow Attribute	Example Relationships with Physical Habitat
Magnitude	• Determines extent to which erosion/removal thresholds for substrate, banks, vegetation, and structural habitat features are exceeded • Determines whether floodplain inundation/exchange occurs • Habitat refugia may become ineffective during extreme events
Frequency	• Flashiness can affect potential for recovery of quasi-equilibrium channel forms between events, bank stability, and streambank/riparian vegetation assemblages • Frequency of substrate disturbance can act as a major determinant of fish reproductive success and benthic macroinvertebrate abundance and composition
Duration	• Determines the impact of a threshold exceeding event, e.g., scour depths • Urbanization frequently increases the duration of geomorphically effective flows which also affect bank vegetation establishment and maintenance • Extended durations of high suspended sediment concentrations can act as chronic and acute stressors on fish communities
Timing	• The temporal sequence of flow events affects channel form and stability as geomorphic systems may be “primed” for abrupt changes. • Stream biota may use flow timing as a life-cycle cue • Predictability of flow can affect utilization of habitat refugia
Rate of Change	• Affects bank drainage regimes (bank stability) and sedimentation processes, e.g., re-suspended fine sediment concentrations during storm hydrographs, embeddedness, armoring • Rapid drawdown can result in stranding of instream biota • Rise and fall rates control riparian water table dynamics and seedling recruitment

The mechanisms of such impacts are also well detailed by Center for Watershed Protection (2003); for example, increased flows are related to a reduction in habitat diversity and simplification of habitat features such as pools; this in turn reduces the availability of deep-water cover and feeding areas.

Many studies support the conclusion that stream biota are also directly impacted by altered flow regimes, independent of channel instability and erosion. Konrad and Booth (2005) identified four hydrologic changes resulting from urban development that are potentially significant to stream ecosystems: increased frequency of high flows, redistribution of water from baseflow to stormflows,

increased daily variation in streamflow, and reduction in low flow. They caution that ecological benefits of improving physical habitat and water quality may be tempered by persistent effects of altered streamflow and sediment discharge, and that hydrologic effects of urban development must be addressed for restoration of urban streams. Walsh *et al.* (2007) concluded that low-impact watershed drainage design was more important than riparian revegetation with respect to indicators of macroinvertebrate health. Bioengineered bank stabilization can also have positive effects on habitat and macroinvertebrates, but it cannot completely mitigate impacts of urbanization with respect to stream biotic integrity (*Sudduth and Meyer* 2006). Walters and Post (2011) and Brooks *et al.* (2011) found impacts to benthic macroinvertebrates due to upstream water abstractions, including reductions in total biomass of insects and reductions in abundance respectively.

2.9 Conclusions

Alterations in streamflow and sediment transport as a result of land use change can have severe impacts on streams. Common responses include changes in water balance, surface and near-surface runoff timing and magnitude, groundwater recharge, sediment delivery and transport, channel enlargement, widespread incision, and habitat degradation. The extent and consequences of these impacts depend on stream type, watershed context, and local controls on channel adjustment; as such, stream responses to hydromodification are complex and difficult to predict with any precision. Due to the direct impacts of streamflow modification on vegetation and biota, channel morphology cannot be the sole measure of hydromodification impacts. Thus, mitigation efforts that are narrowly focused on channel stability may be insufficient for sustaining key ecological attributes. Likewise, reach-scale stabilization of streams will not necessarily result in the return of comparable habitat quality and complexity (Henshaw and Booth 2000, Roesner and Bledsoe 2003). Hydromodification management should be considered in the context of an overall watershed-scale strategy that targets maintenance and restoration of critical processes in critical locations in the watershed. Furthermore, it is imperative that monitoring and adaptive management be focused on achieving desired objectives for aquatic life and overall stream “health” in addition to simply measures of geomorphic response.

3. Framework for Hydromodification Management

3.1 Introduction and Overview

The current approach to managing hydromodification impacts on a project-by-project basis is not sufficient to protect beneficial uses of streams. This section outlines a comprehensive, alternative framework that begins with watershed analysis and uses the results to guide the site-based management decisions that are the current focus of most hydromodification management strategies. It also recommends the implementation of a compensatory mitigation program in support of hydromodification management objectives identified in the watershed analysis. Figure 3-1 summarizes this approach and illustrates how current site-based management relates to the larger framework.

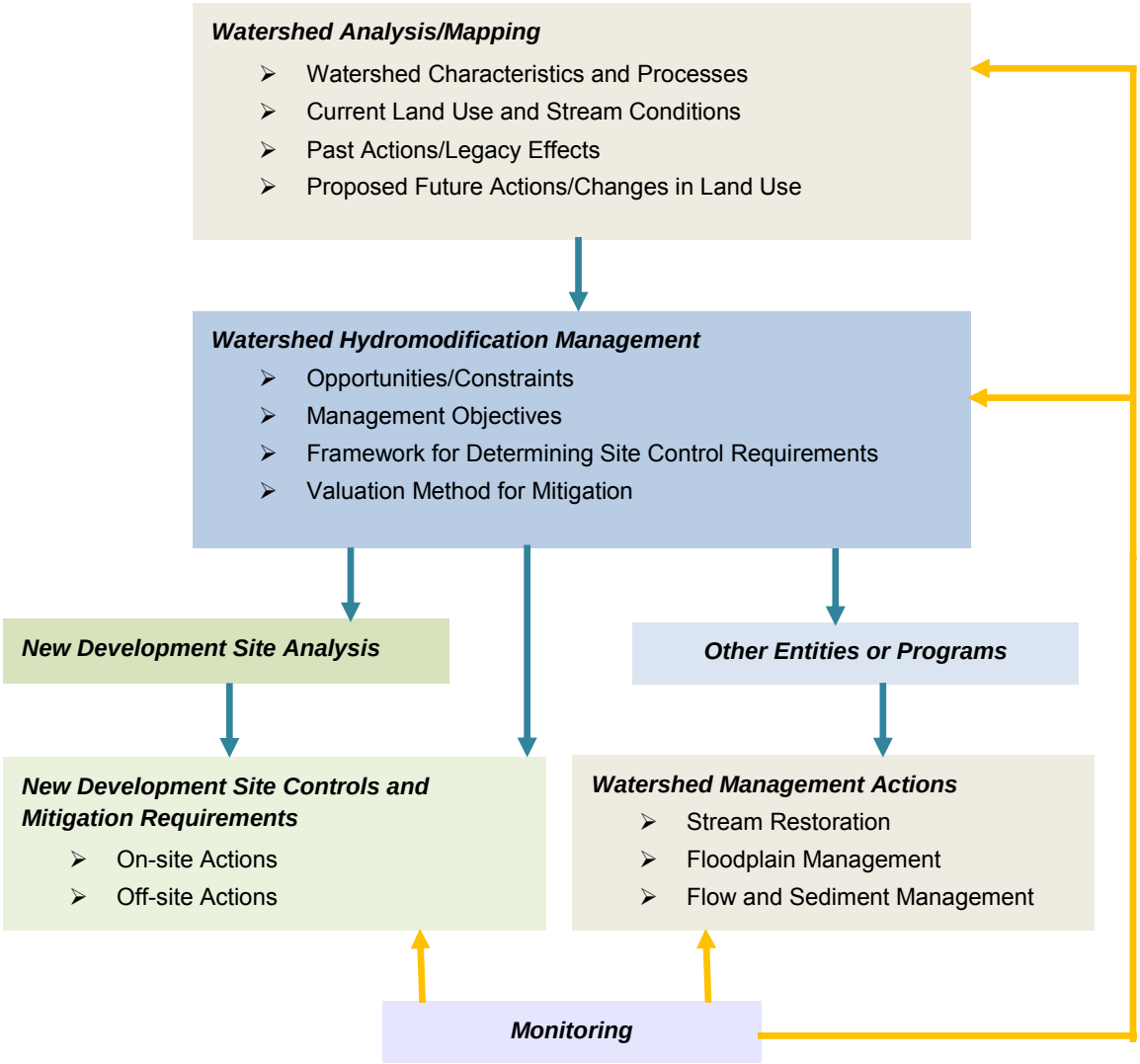

Figure 3-1. Framework for Integrated Hydromodification Management.

This section discusses the details of the integrated framework proposed in Figure 3-1. Key features of this comprehensive approach to hydromodification management are:

- Hydromodification management needs to occur primarily at the watershed scale. The foundation of any hydromodification management approach should be an analysis of existing and proposed future land use and stream conditions that identifies the relative risks, opportunities, and constraints of various portions of the watershed. Site-based control measures should be determined in the context of this analysis.
- Clear objectives should be established to guide management actions. These objectives should articulate desired and reasonable physical and biological conditions for various reaches or portions of the watershed. Management strategies should be customized based on consideration of current and expected future channel and watershed conditions. A one-size-fits-all approach should be avoided.
- An effective management program will likely include combinations of on-site measures (e.g., low-impact development techniques), in-stream measures (e.g., stream habitat restoration), and off-site measures. Off-site measures may include compensatory mitigation measures at upstream locations that are designed to help restore and manage flow and sediment yield in the watershed.
- Management measures should be informed and adapted based on monitoring data. Similarly, monitoring programs should be designed to answer questions and test hypotheses that are implicit in the choice of management measures, such that measures that prove effective can be emphasized in the future (and those that prove ineffective can be abandoned).
- Hydromodification potentially affects all downstream receiving waters; therefore, there generally should be no areas exempted from hydromodification management plans. However, the variety of types and conditions of receiving waters should result in a range of requirements. This also means that objectives, and the management strategies employed to reach them, will need to acknowledge pre-existing impacts associated with historical land uses.

A watershed-based approach to hydromodification management will allow integration of objectives with related programs such as water quality management, groundwater management, and habitat management and restoration through mechanisms such as Integrated Regional Water Resources Management Plans.

Implementation of this approach will likely require changes in the current administration of hydromodification management plans statewide, both in the development and promulgation of regulations by the State and Regional Water Boards and in the administration and execution of those regulations by local jurisdictions (Table 3-1). In the short term, municipalities will need to broaden the approaches to on-site management measures and expand monitoring and adaptive management programs based on the tools described in this document. In the long term, regulatory agencies will need to develop watershed-based programs that allow for implementation of management measures in the locations and manner that will have the greatest impact on controlling hydromodification effects. A

watershed-based approach will also allow the integration of hydromodification management objectives with related programs such as water quality management, groundwater management, and habitat management and restoration through mechanisms such as Integrated Regional Water Resources Management Plans.

Table 3-1. Recommendations for implementation of watershed-based hydromodification management, organized by the scale of implementation and the time frame in which useful results should be anticipated.

Time Frame	Programmatic: State and Regional Water Boards	Local: City and County Jurisdictions
Short-term (<10 years)	• Define the watershed context for local monitoring (at coarse scale) • Evaluate whether permit requirements are making positive improvements	• Evaluate whether specific projects/ regulations are meeting objectives • Identify the highest priority action(s) to take
Long-term (1+ decades)	• Define watershed context and setting benchmarks for local-scale monitoring (i.e., greater precision, if/as needed) • Demonstrate how permit requirements can improve receiving-water "health," state-wide (and change those requirements, as needed)	• Evaluate and demonstrate whether actions (on-site, instream, and watershed scale) are improving receiving-water conditions • Assess program cost-effectiveness • Identify any critical areas for resource protection

3.2 Background on Existing Strategies and Why They are Insufficient

Current hydromodification approaches and strategies, such as flow and sediment-control basins, have been long-recognized as insufficient to fully address hydromodification impacts (e.g., Booth and Jackson 1997, Maxted and Horner 1999). Present understanding of the causes and effects of urbanization suggest that such approaches must be expanded to include integrated flow and sediment management at the watershed scale, along with stream corridor/floodplain restoration (NRC 2009).

Flow management has its origins in flood-control basins intended to reduce peak discharge through stormwater detention (Dunne and Leopold 1978). A key shortcoming of these approaches for hydromodification management is that they do not address (and may exacerbate) cumulative erosive forces on the receiving channel because they trap sediment and release sediment-starved water to downstream areas. Simple detention can increase the frequency and duration with which channels are exposed to erosive effects (McCuen and Moglen 1988, Bledsoe *et al.* 2007), resulting in an increase in the downstream impacts of hydromodification.

Since the late 1980's in parts of the US, hydromodification management plans began to explore "flow-duration" control standards as a way to address this shortcoming. These standards require that the post-project discharge rates *and durations* may not deviate above the pre-project discharge rates and

durations by more than a specific (and typically quite small) percent, across a broad range of discharges at and above the presumed threshold of instream erosion and sediment transport, as averaged over a multi-year period of measured (or simulated) record. This approach is a dramatic improvement over earlier methods, although it does not adequately address the issues of sediment deficit associated with urbanization (Chin 2006). In addition, current flow-duration standards do not fully account for the effects of flow alteration on in-stream habitat and biological functions (e.g., they do not address the seasonality of peak flows, rates of hydrograph rise and recession, low-flow magnitude and duration) and therefore may not be protective of all beneficial uses of downstream waterbodies.

Current strategies are also insufficient with respect to how municipal stormwater permits apply hydromodification standards. Currently, development triggers are established to determine if a project is subject to the standards. These triggers are generally specified by either project land use type in conjunction with size, or by project size alone (e.g., 20 units or more of single family residential housing, or 10,000 square feet or more of new impervious area). The exemption of many small projects from hydromodification controls can result in cumulative impacts to downstream waterbodies (see Booth and Jackson, 1997, for an example from western Washington of the cumulative effects of a small-project exemption); a move to include LID requirements that apply to all projects, regardless of size, is a positive development to begin to address this issue. There is usually also an exemption for projects discharging to hardened channels or waterbodies; however these exemptions may not be supportive of future stream restoration possibilities, and do not address the impacts of hydromodification on lentic and coastal waterbodies (as yet not fully understood). A further limitation of the current permit structure is that there is no consideration of project characteristics such as position within the watershed, sensitivity of the receiving stream reach, or level of coarse sediment production on the proposed project site. Finally, current programs rely solely on regulating new development and re-development to prevent hydromodification impacts without addressing pre-existing conditions which may limit the effectiveness of future management actions.

Shortcoming of current hydromodification standards that may limit their effectiveness include the exemption of many small projects, which can result in cumulative impacts to downstream waterbodies, and the reliance solely on regulating new development and re-development without addressing pre-existing conditions which may limit the effectiveness of future management actions.

When flow-control measures of whatever regulatory standard have failed to protect streams from erosion, hydromodification "management" typically consists of bank or channel armoring, drop structures, and other hard engineering approaches. Although these methods may reduce local hydromodification impacts, it is typically at the expense of other in-stream or riparian functions or beneficial uses. For example, channel armoring can reduce habitat and water conservation functions and services by direct habitat removal, increased bed scour, and decreased connectivity between the channel and its floodplain. In addition to loss of biological and physical stream function, many armoring solutions degrade or fail over time because they address only the localized channel instability rather than the overarching processes that led to the instability (Kondolf and Piegay 2004). For example, drop structures constructed to stabilize a specific channel reach will tend to shift downstream the

consequences of an insufficient sediment load—the reach immediately upstream of the drop structure is "protected," but that immediately downstream is degraded even more severely. In extreme cases, the structure itself can be undermined by downstream erosion and headcutting that is exacerbated by the sudden shift in velocity and associated eddy effects (i.e., hydraulic jump) that often occurs downstream of grade stabilization (Chin 2006). Bank armoring can also fail due to being undermined by erosion at the toe of slope, which can lead to scour (Figure 3-2). In both cases, structural failures often lead to a sequence of incremental increases in the size and extent of the structural solution in an attempt to continually repair increasing channel degradation. In extreme cases, catastrophic failure of bank or grade stabilization can lead to sudden and dramatic changes in channel form, which can be associated with devastating loss of habitat, infrastructure, and property.

Figure 3-2. Undermining of grade control and erosion of banks downstream of structures intended to stabilize a particular stream reach. Left photo is looking upstream at drop structure; right photo is looking downstream from the drop structure.

3.3 Development of Comprehensive Hydromodification Management Approaches

The goal of hydromodification management should be to protect and restore overall receiving water conditions, by maintaining or reestablishing the watershed processes that support those conditions, in the face of urbanization. Achieving these goals will require that hydromodification management strategies operate across programs beyond those typically regulated by NPDES/MS4 requirements. Successful strategies will need to be developed, coordinated, and implemented through land-use planning, non-point source runoff control, and Section 401 Water Quality Certifications and Waste Discharge Requirement programs in addition to traditional stormwater management programs. Thus, all levels of the regulatory framework—federal, state, and local—will need to participate in developing such a program, with program development occurring mainly through regulatory and resource protection agencies and program implementation occurring mainly through local jurisdictions.

As shown in Figure 3-1, watershed-scale hydromodification management should include all of the following key elements:

- Watershed-wide assessment of the condition of key watershed processes, to understand the natural functioning of the watershed and what has been (or is at risk of being) altered by urbanization.
- Watershed-wide assessment of hydromodification risk, to categorize areas based on the likelihood of hydromodification impacts and to identify opportunities for restoration or protection of key reaches or sub-basins.

The goal of hydromodification management should be to protect and restore overall receiving water conditions, by maintaining or reestablishing the watershed processes that support those conditions, in the face of urbanization.

- Appropriate management objectives for various stream reaches and/or portions of the watershed.
- Process for selecting management actions and mitigation measures for project sites and stream reaches.
- Monitoring program that is consistent with the goals of the HMP so that information generated can be used to improve the HMP over time.

3.4 Watershed Mapping and Analysis – Identification of Opportunities and Constraints

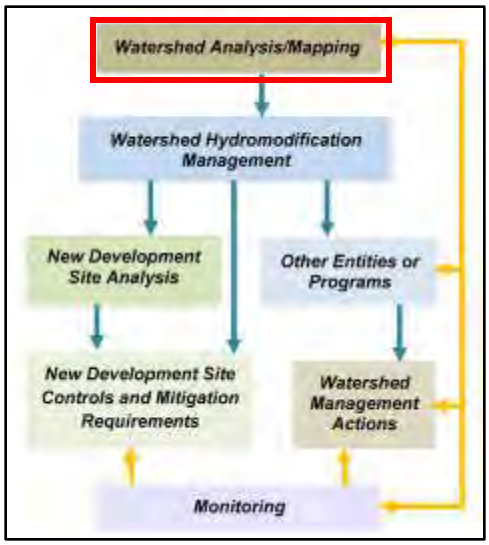

Watershed analysis should be the foundation of all hydromodification management plans. Analysis should identify the nature and distribution of key watershed processes, existing opportunities and constraints in order to help prioritize areas of greater vs. lesser concern, areas.

"Watershed analysis" has several steps, of which the first is mapping. Mapping may occur at the watershed or regional (i.e., multiple watersheds) scale. Mapping should include data layers to facilitate the following analyses. Most of these data layers are freely available as online. Further information on analysis tools is provided in the next section. These maps should be designed for iterative updates over time as new information becomes available:

- Dominant watershed processes – analysis of topography (10-m digital elevation model), hydrology, climate patterns, soil type (NRCS soil classifications) and surficial geology can be used to identify the location and type of dominant watershed processes, such as sediment source areas and areas where infiltration is important or where overland flow likely dominates. This can provide a template for the eventual design of management measures that correspond most

closely to the pre-development conditions, which support processes that promote long-term channel health. The Central Coast Hydromodification Control Program (the "Joint Effort"; see Booth *et al.* 2011) provides an example of this type of analysis.

- Existing stream conditions – At a minimum the National Hydrography Database (NHD) can provide maps of streams and lakes in the watershed. Additional information on stream condition should be included to the extent that it is available. This could include major bed material composition, channel planform, grade control locations and condition, and approximate channel evolution stage. These maps can also be used to conduct general stream power evaluations.
- Current (Past) and anticipated future land use - Current land use and land cover plus proposed changes due to general or specific plans. Historical information on past land use practices or stream conditions should be included if it is readily available. Classified land cover (NLCD 2006) is available from the Multi-Resolution Land Characteristics Consortium (MRLC).
- Potential coarse and fine sediment yield areas – methods such as the Geomorphic Land Use (GLU) approach (Booth *et al.* 2010) can be used that to estimate potential sediment yield areas based on geology, slope and land cover.
- Existing flood control infrastructure and channel structures – maps should include major channels, constrictions, grade control, etc. that affect water and sediment movement through the watershed. Any available information on water quality, flood control or hydromodification management basins should also be included.
- Habitat – both upland and in-stream and riparian habitat should be mapped to help determine areas of focus for both resource protection and restoration. This may be based on readily available maps such as the National Wetlands Inventory and National Land Cover Database, aerial photo interpretation, or detailed local mapping.
- Areas of Particular Management Concern – these may include sensitive biological resources, critical infrastructure, 303(d) listed waterbodies, priority restoration areas or other locations or portions of the watershed that have particular management needs.
- Economic and social opportunities and constraints – comprehensive watershed management includes consideration of opportunities for improving community amenities associated with streams, economic redevelopment zones, etc. Details on this are beyond the scope of this paper, but emphasize the need to include planning agencies in the development of hydromodification management plans.

Substantial resources will be necessary to implement a watershed analysis approach; therefore, opportunities for joint funding and leveraging of resources should be vigorously pursued.

Watershed analysis will be challenging especially for smaller municipalities with limited resources or where their jurisdiction only encompasses a portion of the watershed. Substantial resources will be necessary to implement this approach; therefore, opportunities for joint funding and leveraging of resource should be vigorously pursued. A cooperative approach should replace the current fragmented efforts among regions and jurisdictions. Furthermore, the State and Regional Water Boards should support completion of these maps and common technical tools as the foundation for future hydromodification management actions.

3.5 Defining Management Objectives

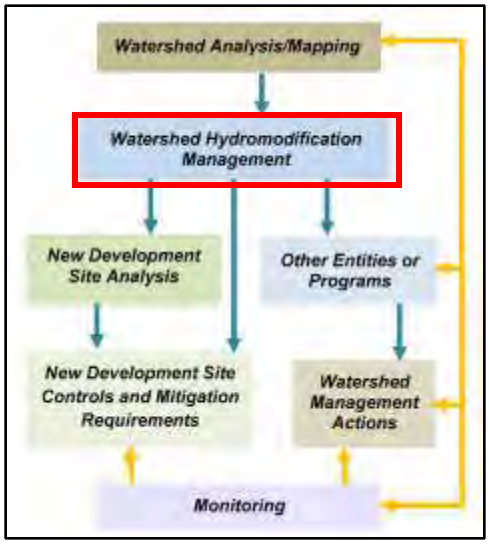

Results of the watershed analysis should be used to determine the most appropriate management actions for specific portions of the watershed. Management strategies should be tailored to meet the objectives, desired future conditions, and constraints of the specific channel reach being addressed.

Decisions should be based on considerations of areas suitable for specific ecosystem services, opportunities, and constraints as described above. Management objectives may be aimed at reducing effects of proposed future land use or mitigating for the effects of past land use, and they may apply to stream reaches or upland areas. Potential management objectives for specific stream reaches may include: protect, restore, or manage as a new channel form.

The specific manifestation of each of these strategies will differ by location, based on constraints of the stream, watershed plan objectives, etc. Decisions about appropriate objectives will need to consider current and future opportunities and constraints in upland, floodplain, and in-stream portions of the watershed. General definitions are provided below as a starting point for case-specific refinement.

Management strategies should be tailored to meet the objectives, desired future conditions, and constraints of the specific channel reach being addressed. Objectives for specific stream reaches may include:

- **Protect**
- **Restore**
- **Manage as a new channel form**

3.5.1 Protect

This approach consists of protecting the functions and services of relatively unimpacted streams in their current form through conservation and anti-degradation programs. This strategy should not be used if streams are degraded, or nearing thresholds of planform adjustment or changes in vegetation community. This strategy may apply following natural disturbances such as floods depending on the condition of the stream reach and the ability for natural rehabilitation to occur (due to how intact

watershed processes are). The goal of this strategy is not to create an artificial preserve (such as a created stream running through an urban park) but rather a naturally function river system. Fully channelized systems are not considered in this framework. Examples of specific actions include:

- Preserving intact channel systems through easements, restrictions, covenants, etc. This should be considered in the watershed context to ensure adequate connectivity with upstream and downstream reaches of similar condition, and to ensure that the watershed processes responsible for creating and maintaining instream conditions will persist.
- Providing appropriate space for channel processes to occur (e.g., floodplain connectivity).
- Establishing transitional riparian and upland buffer zones that are protected from encroachment by infrastructure or development.

3.5.2 Restore

There are many definitions of "restoration". For the purposes of this document, restoration is considered re-establishing the natural processes and characteristics of a stream. The process involves converting an unstable, altered, or degraded stream corridor, including adjacent riparian zone (buffers), uplands, and flood-prone areas, to a natural condition. In most cases, restoration plans should be based on a consideration of watershed processes and their ability to support a desired stream type. The watershed analysis discussed above should be used to determine how and where watershed process should be protected or restored in order to best support stream and stream-corridor restoration. This process should be based on a reference condition/reach for the valley type and includes restoring the appropriate geomorphic dimension (cross-section), pattern (sinuosity), and profile (channel slopes), as well as reestablishing the biological and chemical integrity, including physical processes such as transport of the water and sediment produced by the stream's watershed in order to achieve dynamic equilibrium. Design of restoration structural elements must be based on existing and anticipated upstream land uses, and reflect the modified hydrology resulting from these uses. Restoration should apply to streams that are already on a degradation trajectory where there is a reasonable expectation that a more stable equilibrium condition that reflects previously existing conditions can be recreated and maintained via some intervention. Creating a stream system that differs from "natural conditions" is not considered restoration. All elements of the "protection" strategy should also be included once the restoration actions are complete. Examples of specific actions include:

- Floodplain and in-stream measures that restore natural channel form consistent with current and/or anticipated hydrology and sediment yield. Examples include recontouring, biotechnical slope stabilization, soft-grade control features (e.g., woody debris).
- Revegetation of stream banks and beds, including removal of invasive species.
- Preserving intact channel systems through easements, restrictions, covenants, etc. This should be considered in the watershed context to ensure adequate connectivity with upstream and downstream reaches of similar pristine condition.

- Providing appropriate space for channel processes to occur (e.g. channel migration at allowable levels, floodplain connectivity, and development of self-sustaining riparian vegetation).
- Establishing transitional riparian and upland buffer zones that are protected from encroachment by infrastructure or development.

3.5.3 Manage as New Channel Form

Once a stream channel devolves far enough down the channel evolution sequence, it is extremely difficult to recover and restore without substantial investment of resources. If critical thresholds in key structural elements, such as planform or bank height, are surpassed, streams should be allowed to continue progressing toward a new stable equilibrium condition that is consistent with the current setting and watershed forcing functions, if such progress does not pose a danger to property and infrastructure. Substantial alteration of flow or sediment discharge, slope or floodplain width may make it improbable that a stream can be restored to its previous condition. In such circumstances, it may be preferable to determine appropriate channel form given expected future conditions and "recreate" a new channel to match the appropriate equilibrium state under future conditions. For example, a multi-thread braided system may not be the appropriate planform based on new runoff and sediment pattern; instead, a single-thread channel or step-pool structure may be a more appropriate target. Examples of specific actions include:

- In-channel recontouring or reconstruction of channel form.
- Floodplain recontouring or reconstruction that improves connectivity with the channel.
- In extreme circumstances based on channel condition, position in the watershed, etc. this may involve hardening portions of the channel and focusing "mitigation" measures at off-site measures at a different part of the watershed. Off-site mitigation can be informed by "hydromodification risk mapping".
- Re-establishing longitudinal connectivity for sediment transport and ecological linkages.
- Preserving intact channel systems through easements, restrictions, covenants, etc. This should be considered in the watershed context to ensure adequate connectivity with upstream and downstream reaches of similar pristine condition.
- Providing appropriate space for channel processes to occur (e.g. floodplain connectivity).
- Establishing transitional riparian and upland buffer zones that are protected from encroachment by infrastructure or development.

Several authors have previously noted that in urban systems, natural channel state often can no longer be sustained under changed hydrological conditions. Thus, different management goals are probably appropriate for watersheds at varying stages of development (Booth, 2005) and at varying degrees of adjustment (Chin and Gregory 2005). In this context, identifying which channels are suitable for

protection, restoration, or alternative channel form can be used to guide restoration and management efforts (Booth *et al.* 2004).

Upland objectives should be established to support management objectives for stream reaches. These objectives will have direct implications and will influence site-specific control requirements (discussed below). Potential management objectives for upland areas may include:

- *Conserve open space for infiltration*: Infiltration reduces the magnitude and duration of runoff to the stream channel and allows flow to re-enter the stream through diffuse overland flow, shallow subsurface flow, or groundwater recharge. This in turn reduces the work (energy) on the channel bed and banks and helps promote stability.
- *Conserve open space for stream buffers*: Buffers allow many of the same infiltration processes discussed above to occur. In addition, they provide space for channel migration and overbank flow, both of which function to reduce energy and allow the channel to better withstand potentially erosive forces associated with high flow events.
- *Conserve open space for coarse sediment production*: Course sediment functions to naturally armor the stream bed and reduce the erosive forces associated with high flows. Absence of coarse sediment often results in erosion of in-channel substrate during high flows. In addition, coarse sediment contributes to formation of in-channel habitats necessary to support native flora and fauna.
- *Encourage development on poorly-infiltrating soils*: The difference between pre and post development runoff patterns is less when development occurs on soils that have low infiltration rates and functioned somewhat like paved surfaces. Focusing development on these areas reduces changes in hydrology associated with transition to developed land uses.
- *Encourage urban infill*: Urban infill reduces the effect on watershed processes by concentrating development on previously impacted areas. This reduces disruption of hydrology and sediment process compared to developing on open space or other natural areas.

3.6 Selecting Appropriate Management Objectives

The combination of expected force acting on the stream channel (in terms of higher flow and less sediment) and estimated resistance (in the form of channel and floodplain condition) can be used to inform selection of an appropriate management objective for a specific stream reach, as shown in Figure 3-3. This figure represents a conceptual approach to selecting appropriate management objectives, in which modifications to runoff and sediment are compared against stream reach conditions. By weighing these factors within the context of watershed opportunities, constraints and resources, management objectives and specific actions can be determined. More complete decision support systems or guidance will need to be developed for individual

Selection of appropriate management objectives should consider changes to runoff and sediment, and existing stream reach conditions, within the context of watershed opportunities, constraints and resources.

hydromodification management plans that account for other considerations such as upstream and downstream conditions, cost, infrastructure constraints, availability of floodplain area for restoration, presence of downstream sensitive resources, etc. All decisions should be made in the context of the watershed position of a project site relative to existing opportunities and constraints as discussed above.

A number of tools are available to be used in conjunction with watershed mapping to inform this prioritization process. For example, GLU mapping (Booth *et al.* 2010) and hydromodification risk mapping can be used to assign high, medium or low ratings to watershed resistance (i.e., susceptibility to change). Similarly, field based tools such as the hydromodification screening tool (Bledsoe *et al.* 2010) or European tools such as Fluvial Audit or River Habitat Survey can be used to assign a rating of high, medium or low at the reach scale. In addition to geomorphic assessments, habitat assessments such as the California Rapid Assessment Method (CRAM; Collins *et al.* 2008) or biological evaluations via an index of biotic integrity (IBI; e.g., Ode *et al.* 2005) should be used as measures of biological condition to provide a more complete stream assessment. The next section provides an overview of hydromodification assessment and prediction tools, as well as further details on specific tools to support the selection of management objectives.

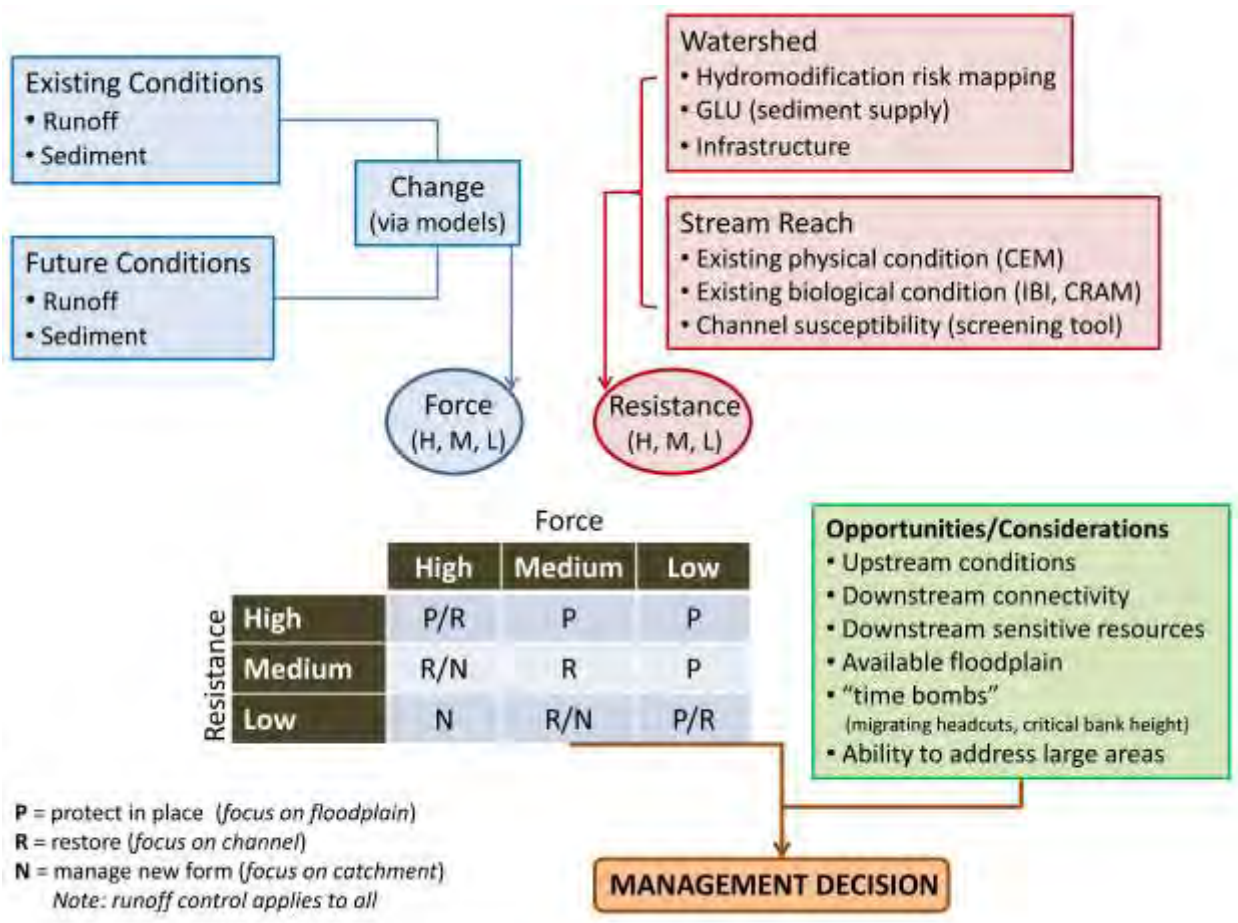

Figure 3-3: Example of a hydromodification management decision-making process.

3.7 Framework for Determining Site-Specific Control Requirements

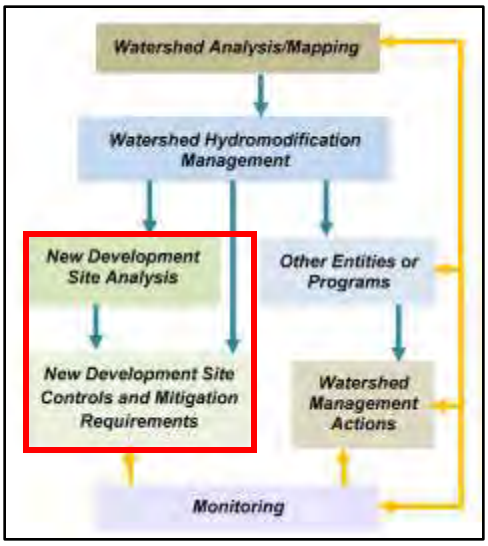

Once the watershed analysis is complete and opportunities, constraints and management objectives have been identified for both upland areas and stream reaches, a framework should be developed for site-specific project analyses and control requirements. The level of detail required for the analysis of proposed projects should be based on a combination of factors including project size, location within the watershed, and point of discharge to receiving waterbody.

The HMP should specify how these factors will be evaluated within the context of the identified management objectives to determine analysis requirements. The HMP should also ideally contain scalable BMP designs (based on conservative assumptions and consistent with prevailing watershed conditions) that can be applied by small projects where appropriate to avoid overly burdensome requirements for site-specific analysis. The framework should include the following components:

- A set of standard on-site management measures/BMPs that should apply to all projects; no projects should be exempted from these measures as they will have broader water quality benefits beyond helping to control the effects of hydromodification. These management actions consist of reducing the effects of urbanization on catchment runoff and sediment yield. On-site management measures should attempt to reduce excess runoff, maintain coarse sediment yield (if possible) and provide for appropriate discharge to receiving streams to support in-stream biological resources. In some cases, common features or facilities may be able to accommodate these objectives. In other cases, separate features or facilities will be necessary to deal with distinct objectives. On-site measures should ***generally be applied in all cases*** as allowed by site-specific geotechnical constraints, with specific management practices informed by the watershed processes most important at particular locations in the watershed, as well as by the nature of downstream receiving waters:
    - Low impact development (LID) practices.
    - Disconnecting impervious cover through infiltration, interception, and diversion.
    - Coarse sediment bypass through avoidance of sediment yield areas or measures that allow coarse sediment to be discharged to the receiving stream.
    - Flow-duration control basins to reduce runoff below a threshold value.

- Specification of the level of analysis detail and design requirements for the project, depending on project location, discharge point, and project size. Levels of analysis and design requirements may include:
    - Application of scalable, standardized designs for flow control based on site-specific soil type and drainage design. The assumptions used to develop these scalable designs should be conservative, to account for loss of sediment and uncertainties in the analysis and our understanding of stream impacts.
    - Use of an erosion potential metric, based on long-term flow duration analysis and in-stream hydraulic calculations. Guidelines should specify stream reaches where in-stream controls would and would not be allowed to augment on-site flow control.
    - Implementation of more detailed hydraulic modeling for projects of significant size or that discharge to reaches of special concern to understand the interaction of sediment supply and flow changes.
    - Analysis of the water-balance for projects discharging into streams with sensitive habitat. This may include establishment of requirements for matching metrics such as number of days with flow based on the needs of species present.
- Guidelines for prioritization of on-site or regional flow and sediment control facilities. Watershed analysis will help identify opportunities for regional flow or sediment control facilities, which may help to mitigate for existing hydromodification impacts.

Appendix A provides detailed guidance on the appropriate application of tools to meet site control requirements.

3.8 Off-site Compensatory Mitigation Measures

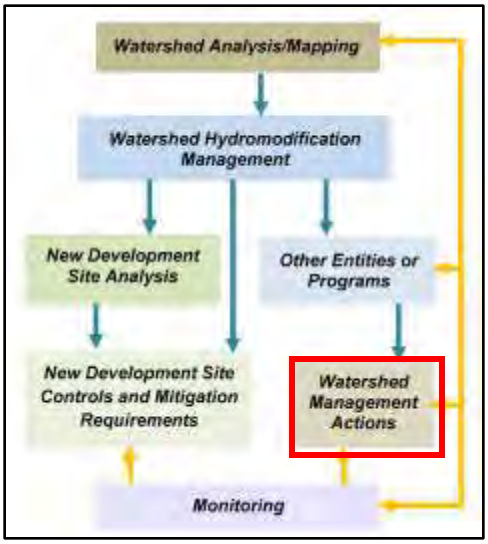

In some cases, on-site control of water and sediment will not be sufficient to offset the effects of hydromodification on receiving waters. In these cases, off-site compensatory mitigation measures will be necessary (similar to the concepts used in the Section 401/404 permitting programs). Off-site measures could be implemented by project proponents or through the use of regional mitigation banks or in-lieu fee programs.

Off-site mitigation may be necessary for several reasons:

- Off-site measures may be more effective at addressing effects or at achieving desired management goals. This may be particularly true for sites near the bottom of a watershed where upstream measures may be preferred

- Off-site measures may be necessary to supply compensation for residual project impacts where on-site measures are limited by site constraints or solutions are beyond the scope of what can be accomplished on an individual site.
- Off-site measures may be necessary where accomplishing specified management objectives is not practical using on-site measures alone. Off-site measures may be desired to remedy legacy effects of prior land use or to achieve desired beneficial uses.

Performance monitoring and adaptive management must be a part of compensatory mitigation given its inherent uncertainty.

The location and type of mitigation should be determined in the context of the watershed analysis and should account for the size and nature of the impact, location in the watershed, pre-existing conditions in the watershed, and uncertainty associated with the success of the proposed mitigation actions. In some cases these measures may be near the project site (e.g., restoring a stream reach downstream of the project site), but in other cases the off-site mitigation may be in the form of in-lieu fee or "mitigation bank" type contributions to a project located in a different portion of the watershed (e.g. upstream grade control, protection of sediment source areas). Such off-site mitigation relatively far from the site will only be possible if conducted in the context of an overall watershed plan, as discussed above. Off-site measures may include:

In cases where on-site control of water and sediment will not be sufficient to offset the effects of hydromodification on receiving waters, off-site compensatory mitigation measures will be necessary. Implementation of this approach will require that the State Water Board develop a valuation method to help determine appropriate off-site mitigation requirements in light of the anticipated impacts of hydromodification on receiving streams.

- Stream corridor restoration
- Purchase, restoration and protection of floodplain/floodway habitat
- Purchase and/or protection of critical sediment source or transport areas
- Regional basins or other retention facilities
- Upstream or downstream natural/bio-engineered grade control
- Retrofit or repair of currently undersized structures (e.g. culverts, bridge crossings)
- Removal or hydrologically disconnecting impervious surfaces

A valuation method will be necessary for assigning appropriate mitigation requirements in light of the anticipated impacts of hydromodification on receiving streams. The valuation method should be developed by the State Water Board.

To support the management approaches discussed above, HMPs should provide general guidance for application of models and other tools based on the questions being asked and the desired outcomes of

the HMP. Models can also be used to help communicate levels of uncertainty in particular management actions and to guide restoration / in-channel management actions. Modeling and other tools are discussed in detail in Section 4 and Appendices A and B.

Finally, management endpoints should articulate the desired physical and biological conditions for various reaches or portions of the watershed. To the extent possible, these desired conditions should be expressed in numeric, quantifiable terms to avoid ambiguity. Additionally, since regulatory strategies will invariably rely on quantifiable measures to determine whether stormwater management actions achieve these desired conditions, identifying appropriate numeric objectives will support determinations of regulatory compliance. As desired physical and biological watershed conditions are expressed in quantifiable terms to the extent possible, a similar need would apply to site control requirements. Control measures should be linked to, a) a desired condition (or goal), b) the parameter(s) that best define that condition, and c) quantifiable measures that serve to evaluate performance of the control measure. Direct measures (e.g., volume of runoff to be retained) as well as indirect or surrogate measures (IBI scores) are appropriate if they are quantifiable.

Management endpoints should articulate the desired physical and biological conditions for various reaches or portions of the watershed. To the extent possible, these desired conditions should be expressed in numeric, quantifiable terms to avoid ambiguity.

4. Overview of Assessment and Prediction Tools

4.1 Introduction

The previous section discussed a number of potential actions for managing hydromodification impacts. These ranged from high-level watershed-scale characterization to the site-specific design of a proposed development. This section provides an overview of the current and emerging assessment and prediction tools available to inform these management actions. An organizing framework helps explain the appropriate application of these tools, as well as their strengths and weaknesses. Specific tools that support the selection of management objectives are also discussed. Examples of "suites" of tools that are commonly used together to predict stream responses and formulate management prescriptions for channels of varying susceptibility are presented in Appendix B. Appendix A provides detailed guidance on the appropriate application of tools to meet site control requirements.

Municipalities are the primary audience for this section, as they select and incorporate these tools into their HMPs. However, the State and Regional Water Boards should be aware of the overall capabilities, appropriate uses, and gaps in our current toolbox. The development of new and improved tools should ideally be coordinated at the State level for optimum cost effectiveness and widest applicability. The table below identifies the key actions necessary at both the programmatic and local level to address the considerations discussed above, within the context of the goals of the framework described in Section 3.

Table 4-1. Recommendations for the application and improvement of tools in support of the proposed management framework.

Time Frame	Programmatic: State and Regional Water Boards	Local: City and County Jurisdictions
Short-term (<10 years)	• Develop quality control and standardization for continuous simulation modeling • Perform additional testing and demonstration of probabilistic modeling for geomorphic response • Pursue development of biologically- and physically-based compliance endpoints	• Work cooperatively with adjacent jurisdictions to implement hydromodification risk mapping at the watershed scale • Implement continuous simulation modeling for project impact analysis
Long-term (1+ decades)	• Improve tools for sediment analysis and develop tools for sediment mitigation design • Develop tools for biological response prediction • Improve tools for geomorphic response prediction	• Expand use of probabilistic and statistical modeling for geomorphic response • Apply biological tools for predicting and evaluating waterbody condition

4.2 Background

In the context of hydromodification, tools and models are typically used to help answer one or more of the following questions involving an assessment of natural and human influences at various spatial and temporal scales:

- How does the stream work in its watershed context?
- Where is the stream going? For example, have past human actions induced channel changes? What are the effects on sediment transport and channel form? What is the magnitude of current and potential channel incision following land use conversion?
- How will the stream likely respond to alterations in runoff and sediment supply?
- How can we manage hydromodification and simultaneously improve the state of the stream?

Previous sections have underscored the variability and complexity of relationships among land use, the hydrologic cycle, and the physical and ecological conditions of stream systems. It follows that the process of assessing stream condition and predicting future conditions is highly challenging and subject to uncertainty. Therefore it is important to understand the inherent strengths and limitations of the available tools, especially with respect to prediction uncertainty and how it is expressed for various tools. Considerable judgment is needed to choose the appropriate model for the question at hand. In addition to prediction uncertainty, considerations in choosing the right model for a particular application include appropriate spatial and temporal detail, cost of calibration and testing, meaningful outputs, and simplicity in application and understanding (NRC 2001; Reckhow 1999a,b).

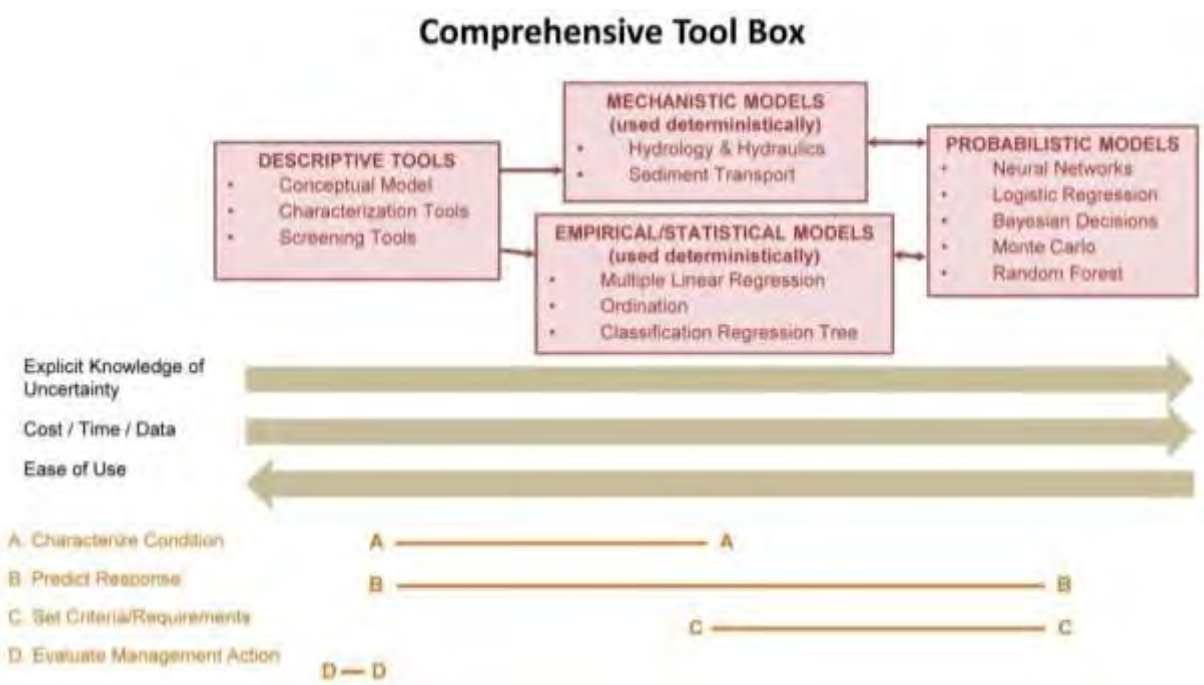

Figure 4-1. Organizing Framework for understanding hydromodification assessment and management tools.

4.3 Organizing Framework

Figure 4-1 presents an organizing framework by which to understand the available tools that may be applied in support of hydromodification management and policy development. Tools fall into three major categories: descriptive tools, mechanistic and empirical/statistical models that are used deterministically, and probabilistic models/predictive assessments with explicitly quantified uncertainty. The organizing framework relates these categories to the types of question the tools are designed to answer, specifically: characterization of stream condition, prediction of response, establishment of criteria/requirements, or evaluation of management actions. The framework also characterizes the tools according to the following features: intensity of resource requirements (i.e., data, time, cost), and the extent to which uncertainty is explicitly addressed. Subsequent sections of this section discuss each of the three major categories in turn, highlighting examples of specific tools within each category.

Given the uncertainty associated with predicting hydromodification impacts, probabilistic models should be incorporated into analysis and design, particularly where resource values or potential consequences of impacts are high.

Tools required to support the management framework presented in Section 3 include watershed characterization and analysis tools and project analysis and design tools. The level of resolution that is required will depend on the point in the planning process. At early stages, descriptive tools will be sufficient, but more precise tools will be required toward the design phase. Currently, most projects rely solely on deterministic models. However, given the uncertainty associated with predicting hydromodification impacts, probabilistic models should be incorporated into analysis and design, particularly where resource values or potential consequences of impacts are high.

4.3.1 Descriptive Tools

Descriptive tools include conceptual models, screening tools, and characterization tools. These tools are used to answer the question: *What is the existing condition of a stream or watershed?* Although descriptive tools are not explicitly predictive, they can be used to assess levels of susceptibility to future stressors by correlation with relationships seen elsewhere. The application of some type of descriptive tool, such as a characterization tool, is almost always necessary before applying a deterministic model. In particular, descriptive tools can aid in understanding the key processes and boundary conditions that may need to be represented in more detailed models.

Conceptual Models. A conceptual model, in the context of river systems, is a written description or a simplified visual representation of the system being examined, such as the relationship between physical or ecological entities, or processes, and the stressors to which they may be exposed. Conceptual models have been used to describe processes in a wide range of physical and ecological fields of study, including stream-channel geomorphology (Bledsoe *et al.* 2008). For example, Channel Evolution Models (CEMs) are conceptual models which describe a series of morphological configurations of a channel, either as a longitudinal progression from the upper to the lower watershed, or as a series at a fixed location over time subsequent to a disturbance. The incised channel CEM developed by

Schumm *et al.* (1984) is one of the most widely known conceptual models within fluvial geomorphology. This CEM documents a sequence of five stages of adjustment and ultimate return to quasi-equilibrium that has been observed and validated in many regions and stream types (ASCE 1998, Simon and Rinaldi 2000). The Schumm *et al.* (1984) CEM has been modified for streams characteristic of southern California, including transitions from single-thread to multi-thread and braided evolutionary endpoints (Hawley et al., in press).

Conceptual models also include planform classifications of braided, meandering and straight, and other general geomorphic classifications, which categorize streams by metrics such as slope, sinuosity, width-to-depth ratio, and bed material size. The qualitative response model described by Lane's diagram (1955), and discussed earlier in this report, is also a conceptual model.

Characterization Tools. Examples of characterization tools include baseline geomorphic assessments, river habitat surveys, and fluvial audits. A fluvial audit uses contemporary field survey, historical map and documentary information and scientific literature resources to gain a comprehensive understanding of the river system and its watershed. Fluvial audits, along with watershed baseline surveys are a standardized basis for monitoring change in fluvial systems. These types of comprehensive assessments are comprised of numerous, more detailed field methodologies, such as morphologic surveys, discharge measurements, and estimates of boundary material critical shear strength through measurements of resistance (for cohesive sediments) or size. Baseline assessments may also draw on empirical relationships such as sediment supply estimation models.

Screening Tools. Screening tools can be used to predict the relative severity of morphologic and physical-habitat changes that may occur due to hydromodification, as a critical first step toward tailoring appropriate management strategies and mitigation measures to different geomorphic settings. However, assessing site-specific stream susceptibility to hydromodification is challenging for several reasons, including the existence of geomorphic thresholds and non-linear responses, spatial and temporal variability in channel boundary materials, time lags, historical legacies, and the large number of interrelated variables that can simultaneously respond to hydromodification (Schumm 1991, Trimble 1995, Richards and Lane 1997).

Screening tools can be used to predict the relative severity of morphologic and physical-habitat changes due to hydromodification, as a critical first step toward tailoring appropriate management strategies and mitigation measures to different geomorphic settings.

Despite the foregoing difficulties, the need for practical tools in stream management have prompted many efforts to develop qualitative or semi-quantitative methods for understanding the potential response trajectories of channels based on their current state. For example, predictors of channel planform can be used to identify pattern thresholds and the potential for planform shifts (e.g., van den Berg 1995, Bledsoe and Watson 2001, Kleinhans and van den Berg 2010).

In addition, regional CEMs (discussed above) can partially address the needs of the hydromodification management community by providing a valuable framework for interpreting past and present response trajectories, identifying the relative severity of potential response sequences, applying appropriate

models in estimating future channel changes, and developing strategies for mitigating the impacts of processes likely to dominate channel response in the future (Simon 1995).

More recent screening-level tools for assessing channel instability and response potential, especially in the context of managing bridge crossings and other infrastructure, have borrowed elements of the CEM approach and combined various descriptors of channel boundary conditions and resisting vs. erosive forces. For example, Simon and Downs (1995) and Johnson *et al.* (1999) developed rapid assessment techniques for alluvial channels based on diverse combinations of metrics describing bed material, CEM stage, existing bank erosion, vegetative resistance, and other controls on channel response. Although based on a strong conceptual foundation of the underlying mechanisms controlling channel form, these specific examples are either overly qualitative with respect to the key processes, or developed with goals and intended applications (e.g., evaluating potential impacts to existing infrastructure such as bridges or culverts) that differ from what is needed by current hydromodification management programs.

SCCWRP has recently proposed a general framework for developing screening-level tools that help assess channel susceptibility to hydromodification, and a new region-specific tool for rapid, field-based assessments in urbanizing watersheds of southern California (Booth *et al.* 2010, Bledsoe *et al.* 2010). The criteria used to assign susceptibility ratings are designed to be repeatable, transparent, and transferable to a wide variety of geomorphic contexts and stream types. The assessment tool is structured as a decision tree with a transparent, process-based flow of logic that yields four categorical susceptibility ratings through a combination of relatively simple but quantitative input parameters derived from both field and GIS data. The screening rating informs the level of data collection, modeling, and ultimate mitigation efforts that can be expected for a particular stream-segment type and geomorphic setting. The screening tool incorporates various measures of stream bed and bank erodibility, probabilistic thresholds of channel instability and bank failure based on regional field data, integration of rapid field assessments with desktop analyses, and separate ratings for channel susceptibility in vertical and lateral dimensions.

An example of a specific analysis component that predicts changes in post-development sediment delivery, and that can be applied within this screening tool framework, is a GIS-based catchment analyses of “Geomorphic Landscape Units” (GLUs). A GLU analysis integrates readily available data on geology, hillslope, and land cover to generate categories of relative sediment production under a watershed’s current configuration of land use. Those areas subject to future development are identified, and corresponding sediment-production levels are determined by substituting developed land cover for the original categories and reassessing the relative sediment production. The resultant maps can be used to aid in planning decisions by indicating areas where changes in land use will likely have the largest (or smallest) effect on sediment yield to receiving channels.

Effective screening tools for assessing the susceptibility of streams to hydromodification necessarily rely on both field and office-based elements to examine local characteristics within their broader watershed context. Proactive mapping of flow energy measures (e.g., specific stream power) throughout drainage networks has the potential to complement field-based assessments in identifying hotspots for channel

instability and sediment discontinuities as streamflows change with land use. Such analyses may partially guide subsequent field reconnaissance; however, this approach also has limitations in that some geomorphic settings are inherently difficult to map using widely available digital elevation data. In particular, maps of stream power in narrow entrenched valleys and low gradient valleys (ca. <1%) with sinuous channels should be carefully field-truthed and used with a level of caution commensurate with the accuracy of the input data.

Moreover, spatial variability in channel boundary materials and form cannot be accurately mapped at present using remotely sensed data. Thus, boundary materials and channel width are typically assumed in watershed-scale mapping efforts, thereby introducing potential inaccuracies. Coupling desktop analysis with a field-based assessment when using such an approach can help resolve variation in site-specific features such as the erodibility of bed and bank materials, channel width, entrenchment, grade control features, and proximity to geomorphic thresholds.

4.3.2 Mechanistic and Empirical/Statistical Models with Deterministic Outputs

Mechanistic/deterministic models are simplified mathematical representations of a system based on physical laws and relationships (*link to next*). Empirical/statistical models use observed input and output data to develop relationships among independent and dependent variables. Statistical analyses determine the extent to which variation in output can be explained by input variables. Both types of models are typically used to generate a single output or answer for a given set of inputs. These tools can be used to help answer such questions as: *What are the expected responses in the stream and watershed given some future conditions? What criteria should be set to prevent future hydromodification impacts?* However, hydromodification modeling embodies substantial uncertainties in terms of both the forcing processes and the stream response. Deterministic representations of processes and responses can therefore mask uncertainties and be misleadingly precise, unless prediction uncertainty is explicitly characterized as described later in this section.

Although valuable, deterministic representations (such as those derived from continuous simulation modeling) of processes and responses can mask uncertainties and be misleadingly precise unless prediction uncertainty is explicitly characterized.

Hydrologic Models are used to simulate watershed hydrologic processes, including runoff and infiltration, using precipitation and other climate variables as inputs. Some models, such as the commonly-used HEC-HMS, can be run for either single-event simulations or in a continuous-simulation mode which tracks soil moisture over months or years. Other hydrologic models that are commonly used for event-based and continuous simulation modeling include HSPF and SWMM. It is widely accepted that continuous simulation modeling, rather than event-based modeling, is required to assess long term changes in geomorphically-significant flow events (Booth and Jackson 1997; Roesner *et al.* 2001).

Several HSPF-based continuous simulation models have been developed specifically for use in hydromodification planning. These include the Western Washington Hydrology Model (WWHM) and

the Bay Area Hydrology Model (BAHM). Hydromodification Management Plans (HMPs) in Contra Costa County, San Diego County and Sacramento County have developed sizing calculators for BMPs based on modeling done using HSPF models. To illustrate the point about uncertainly in mechanistic models, HSPF contains approximately 80 parameters, only about 8 of which are commonly adjusted as part of the calibration process.

Hydraulic Models are used to simulate water-surface profiles, shear stresses, stream power values and other hydraulic characteristics generated by stream flow, using a geometric representation of channel segments. The industry standard hydraulic model is the HEC River Analysis System (HEC-RAS).

Coupled Hydrologic and Hydraulic Models represent a valuable tool in hydromodification management. Because the streamflow regime interacts with its geomorphic context to control physical habitat dynamics and biotic organization, it is often necessary to translate discharge characteristics into hydraulic variables that provide a more accurate physical description of the controls on channel erosion potential, habitat disturbance, and biological response. For example, a sustained discharge of 100 cfs could potentially result in significant incision in a small sand bed channel but have no appreciable effect on the form of a larger channel with a cobble bed. By converting a discharge value into a hydraulic variable (common choices are shear stress, or stream power per unit area of channel relative to bed sediment size), a “common currency” for managing erosion and associated effects can be established and applied across many streams in a region. Such a common currency can improve predictive accuracy across a range of stream types. As opposed to focusing on the shear stress or stream power characteristics of a single discharge, it is usually necessary to integrate the effects of hydromodification on such hydraulic variables over long simulated periods of time (on the order of decades) to fully assess the potential for stream channel changes. By using channel morphology to estimate hydraulic variables across a range of discharges, models like HEC-RAS provides a means of translating hydrologic outputs from continuous simulations in HEC-HMS, SWMM, or HSPF into distributions of shear stress and stream power across the full spectrum of flows.

Sediment Transport Models such as HEC-6T, the sediment transport module in HEC-RAS, CONCEPTS, MIKE 11 and FLUVIAL12, use sediment transport and supply relationships to simulate potential changes in channel morphology (mobile boundary) resulting from imbalances in sediment continuity. This means that hydraulic characteristics are calculated as channel form and cross-section evolve through erosion and deposition over time. Such models have high mechanistic detail but are often difficult to apply effectively. Although it is not a mobile boundary model, the SIAM (Sediment Impact Analysis Method) module in HEC-RAS represents an intermediate complexity model designed to predict sediment imbalances at the stream network scale and to describe likely zones of aggradation and degradation.

Statistical Models use descriptive tools and empirical data to develop relationships that quantify the risk of specific stream behaviors. For example, Hawley (2009) developed a statistical model to explain variance in channel enlargement based on measures of erosive energy and channel features such grade control and median bed sediment size. Such models often include independent variables based on input from the mechanistic models described above; however, a key difference is that statistical models do not explicitly represent actual physical processes in their mathematical structure. Instead, these models

simply express the observed correlations between dependent and independent variables. Like mechanistic models, the output from these models is commonly treated as precise results in management decisions, despite the fact that predictions from most statistical models could be readily (and more accurately) expressed in terms of confidence intervals with a range of uncertainty.

Probabilistic/Risk-based Models integrate many of the tools discussed above, using modeled changes in hydrology as input to hydraulic models, which in turn provide input to various types of statistical models to predict response. However, the predictions are not represented as deterministic outputs, instead, the range of (un)certainty in the likelihood of the predicted response is explicitly quantified. Although not commonly used for hydromodification management at this time, there are well established models based on these principals currently in use in other scientific disciplines. An example of a probabilistic approach that has been used for hydromodification management is a logistic regression analysis that was used to produce a threshold "erosion potential metric" that can be used to quantify the risk of a degraded channel state. More details on this approach are provided in Appendix B.

Risk-based modeling in urbanizing streams provides a more scientifically defensible alternative to standardization of stormwater controls across stream types, and can inform management decisions about acceptable levels of risk.

Risk-based modeling in urbanizing streams provides a more scientifically defensible alternative to standardization of stormwater controls across stream types. A probabilistic representation of possible outcomes also improves understanding of the uncertainty that is inherent in model predictions, and can inform management decisions about acceptable levels of risk.

Predictive Tools for Habitat Quality and Stream Biota. The tools discussed above focus on physical stream impacts; however, as discussed in the preceding chapter, it is recognized that maintenance of stream "stability" does not necessarily conserve habitat quality and biological potential. In general, the knowledge base for biota/habitat associations is not generally adequate to allow for prediction of how whole communities will change in response to environmental alterations associated with urbanization. Making such predictions deterministically requires a thorough knowledge of species-specific environmental responses, as well as an adequate (accurate) characterization of habitat structure and habitat dynamics (both of which are modified by urbanization). However, recent studies have demonstrated that the effects of hydrologic alterations induced by urbanization on selected stream biota can be quantitatively described without a full mechanistic understanding, using stressor-response type relationships and empirical correlations from field-measured conditions (Konrad and Booth 2005, Konrad *et al.* 2008, DeGasperi *et al.* 2009).

In moving beyond a narrow focus on linkages between flow alteration and channel instability, scientific understanding of hydrologic controls on stream ecosystems has recently led to new approaches for assessing the ecological implications of hydromodification. The essential steps in developing quantitative "flow-ecology relationships" have been recently described in the Ecological Limits of Hydrologic Alteration (ELOHA) process (Poff *et al.* 2010), a synthesis of a number of existing hydrologic techniques and environmental flow methods. ELOHA provides a regional framework for elucidating the

key hydrologic influences on biota of interest, and translating that understanding into relationships between hydromodification and biological endpoints that can be used in management decision making. This requires a foundation of hydrologic data provided by modeling and/or monitoring, and sufficient biological data across regional gradients of hydromodification. Although hydrologic–ecological response relationships may be confounded to some extent by factors such as chemical and thermal stressors, there are numerous case studies from the US and abroad in which stakeholders and decision-makers reached consensus in defining regional flow standards for conservation of stream biota and ecological restoration (Poff *et al.* 2010; http://conserveonline.org/workspaces/eloha).

4.3.3 Strengths, Limitations and Uncertainties

The Organizing Framework shown in Figure 4-1 shows the applicability of the three major categories of tools in support of various management actions. This section addresses a range of issues relating to strengths, limitations and uncertainty of the tools discussed above. Detailed analysis of individual models is beyond the scope of this document, but EPA/600/R-05/149 (2005) contains an extensive comparison of functions and features across a wide range of hydrologic and hydraulic models.

Explicit consideration, quantification, and gradual reduction of model uncertainty will be necessary to advance hydromodification management.

The uncertainty inherent to hydromodification modeling underscores the need for carefully designed monitoring and adaptive management programs.

General Considerations. The well-known statistician George Box famously said that "all models are wrong, some are useful." The usefulness of a model for a particular application depends on many factors including prediction accuracy, spatial and temporal detail, cost of calibration and testing, meaningful outputs, and simplicity in application and understanding. There is no cookbook for selecting models with an optimal balance of these characteristics. Models of stream response to land-use change will always be imperfect representations of reality with associated uncertainty in their predictions. In addition to the prediction errors of standard hydrologic models, common limitations and sources of uncertainties include insufficient spatial and/or temporal resolution, and poorly known parameters and boundary conditions. Ultimately, the focus of scientific study in support of decision making should be on the decisions (or objectives) associated with the resource and not on the model or basic science. Each model has limitations in terms of its utility in addressing decisions and objectives of primary concern to stakeholders. Prediction error, not perception of mechanistic correctness, should be the most important criterion reflecting the usefulness of a model (NRC 2001; Reckhow 1999a,b). The predictive models discussed above may be thought of as predictive scientific assessments; that is, a flexible, changeable mix of small mechanistic models, statistical analyses, and expert scientific judgment.

Region-Specific Considerations. Because all models are vulnerable to improper specification and omission of significant processes, caution must be exercised in transferring existing models to new

regional conditions. For example, mobile boundary hydraulic models are mechanistically detailed but not generally well-suited to many southern California streams given the prevalence of near-supercritical flow, braiding and split flow (Dust 2009). In addition, bed armoring and channel widening resulting from both fluvial erosion and mass wasting processes are key influences on channel response in semi-arid environments. These processes are not well-represented and constrained in current mobile boundary models. Accordingly, the appropriateness of existing models for addressing a particular hydromodification management question should be empirically tested and supported with regionally appropriate data from diverse stream settings.

Managing Uncertainty. To date, hydromodification management has generally relied on oversimplified models or deterministic outputs from numerical models that consume considerable resources but yield highly uncertain predictions that can be difficult to apply in management decisions. Numerical models are nevertheless an important part of the hydromodification toolbox, especially in characterizing rainfall-response over decades of land-use change. It is challenging to rigorously quantify the prediction accuracy of these mechanistic numerical models; however, their utility of can be enhanced by addressing prediction uncertainties in number of ways (Cui *et al.* 2011). Candidate models can be subjected to sensitivity analysis to understand their relative efficacy for assessment and prediction of hydromodification effects. Moreover, it should also be demonstrated that selected models can reasonably reproduce background conditions before they are applied in predicting the future. Modeling results that are used in relative comparisons of outcomes are generally much more reliable than predictions of absolute magnitudes of response.

Hydromodification modeling embodies substantial uncertainties in terms of both the forcing processes and stream response. Deterministic representations of processes and responses can mask uncertainties and can be misleading unless prediction uncertainty is explicitly quantified. Errors may be transferred and compounded through coupled hydrologic, geomorphic, and biologic models. Accordingly, explicit consideration, quantification, and gradual reduction of model uncertainty will be necessary to advance hydromodification management. This points to two basic needs. First, there is a need to develop more robust probabilistic modeling approaches that can be systematically updated and refined as knowledge increases over time. Such approaches must be amenable to categorical inputs and outputs, as well as combining data from a mix of sources including mechanistic hydrology models, statistical models based on field surveys of stream characteristics, and expert judgment. Second, the uncertainty inherent to hydromodification modeling underscores the need for carefully designed monitoring and adaptive management programs, as discussed in Section 5.

A risked-based framework can provide a more rational and transparent basis for prediction and decision-making by explicitly recognizing uncertainty in both the reasoning about stream response and the quality of information used to drive the models. Prediction uncertainty can be quantified for any of the types of models described above; however, some types are more amenable to uncertainty analysis than others. For example, performing a Monte Carlo analysis of a coupled hydrologic-hydraulic model is a very demanding task. A simple sensitivity analysis of high, medium, and low values of plausible model parameters is much more tractable and still provides an improved understanding of the potential range of system responses. Such information can be subsequently integrated with other model outputs and

expert judgment into a probabilistic framework. For example, Bayesian probability network approaches can accommodate a mix of inputs from mechanistic and statistical models, and expert judgment to quantify the probability of categorical states of stream response. Such networks also provide an explicit quantification of uncertainty, and lend themselves to continual updating and refinement as information and knowledge increase over time. As such, they have many attractive features for hydromodification management, and are increasingly used in environmental modeling in support of water quality (Reckhow 1999a,b) and stream restoration decision-making (Stewart-Koster *et al.* 2010).

Sediment Supply. As described above, a reduction in sediment supply to a stream may result in instability and impacts, even if pre- and post-land use change flows are perfectly matched. Thus, there is a need to develop management approaches to protect stream channels when sediment supply is reduced, and to refine and simplify tools to support these approaches. This continues to prove challenging because, the effects of urban development on sediment supply in different geologic settings are not well understood and poorly represented in current models. As a starting point, models used to analyze development proposals that reduce sediment supply could be applied with more protective assumptions with respect to parameters and boundary conditions (inflowing sediment loads). Effects of altered sediment supply on stream response could be addressed in a probabilistic framework by adjusting conditional probabilities of stream states to reflect the influence of reductions in important sediment sources due to land use change.

5. MONITORING

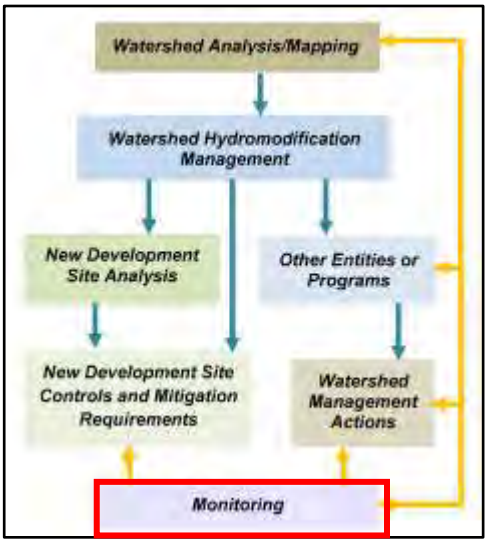

"Monitoring" can cover a tremendous range of activities in the context of stormwater management in general, and of hydromodification in particular. For example, the NPDES Phase 2 general permit for California (SWRCB, 2003 (*www.swrcb.ca.gov/**water**_issues/.../storm**water**/.../final_ms4_**permit**.p...)*, National Pollutant Discharge Elimination System (NPDES) General Permit No. CAS000004, p. 11) notes that the objectives of a monitoring program may include:

- Assessing compliance with the General Permit.
- Measuring and improving the effectiveness of stormwater management plans.
- Assessing the chemical, physical, and biological impacts on receiving waters resulting from urban runoff.
- Characterizing storm water discharges.
- Identifying sources of pollutants.
- Assessing the overall health and evaluating long-term trends in receiving water quality.

These objectives span multiple goals, ranging from verifying of compliance, evaluating effectiveness, characterizing existing conditions, and tracking changes over time. Each would likely require different monitoring methods, duration of measurement, and uses of the resulting data (Table 5-1). This variability emphasizes what we consider the key starting point of any monitoring program: to answer the questions, "What is the purpose of monitoring? How will the data be used?" Even secondary considerations can exert great influence over every aspect of the design of a monitoring program: "How quickly do you need to have an answer?" And, perhaps most influential of all, "What are the resources available to provide that answer?"

Table 5-1. The recommended purpose(s) of monitoring associated with hydromodification control plans, organized by the scale of implementation and the time frame in which useful results should be anticipated.

Time Frame	Programmatic: State and Regional Water Boards	Local: City and County Jurisdictions
Short-term (<10 years)	• Define the watershed context for local monitoring (at coarse scale) • Evaluate whether permit requirements are making positive improvements	• Evaluate whether specific projects/ regulations are meeting objectives • Identify the highest priority action(s) to take
Long-term (1+ decades)	• Define watershed context and setting benchmarks for local-scale monitoring (i.e., greater precision, if/as needed) • Demonstrate how permit requirements can improve receiving-water "health," state-wide (and change those requirements, as needed)	• Evaluate and demonstrate whether actions (on-site, instream, and watershed scale) are improving receiving-water conditions • Assess program cost-effectiveness • Identify any critical areas for resource protection

5.1 The Purpose of Monitoring

In the context of hydromodification assessment and management, we propose three interrelated purposes for monitoring that will guide the discussion and recommendations in this section:

- **Characterizing the conditions** of receiving waters downstream of urban development (including any trends in those conditions over time).
- **Evaluating the effectiveness** of hydromodification controls at protecting or improving the conditions of downstream receiving waters (and modify them, as needed).
- **Setting priorities** on the wide variety of hydromodification control practices, as promulgated by the State and Regional Boards and as implemented by local jurisdictions.

These needs give rise to several interrelated types of monitoring, all common to many watershed and stormwater monitoring programs. They are typically executed at different spatial and temporal scales, and if well-designed and executed they can collectively help guide management actions. We define them here, using terms and definitions that are common to the monitoring literature:

- **Performance monitoring,** by which is normally meant the evaluation of a particular stormwater facility relative to its intended (or designed) performance, but independent of whether that intended design is actually beneficial for downstream receiving waters.
- **Effectiveness monitoring,** by which we mean the assessment of how well specific management actions or suites of actions reduce or eliminate the direct impacts of stormwater on receiving waters. This type of monitoring can answer a question common to stormwater management: does a particular facility actually achieve its intended goal (e.g., flow releases from a stormwater facility protect the stream channel downstream from erosion)? More broadly, monitoring can evaluate the "effectiveness" of a suite of measures or an overall program designed to produce

beneficial outcomes (or avoid negative ones) in downstream receiving waters. In this context, the precise boundaries division between effectiveness monitoring and other types are blurry and unnecessarily artificial.

- **Trends monitoring,** by which we mean an integrative assessment of whether our "endpoint" indicators (physical, chemical, or biological) are showing any consistent, statistically significant change over time. Such monitoring rarely "proves" the direct impacts of a specific stressor on a receiving water, but it is critical to setting and evaluating progress towards integrative assessment endpoints at a regional scale. If well-designed, trend monitoring commonly provides useful information at smaller spatial scales as well, particularly in evaluating response to recent management actions or recovery from a prior disturbance.
- **Characterization monitoring**, by which is commonly meant the identification and (or) the quantification of various parameters in stormwater or a receiving-water body. Characterizing the condition of an outflow discharge or a water body at a particular time and place is always an outcome of the other kinds of monitoring; when it is called out as a goal in-and-of itself, however, it is can be useful to prioritize actions—but only if there is a preexisting standard for what constitutes a "good" or "acceptable" condition (also termed "status monitoring"), and a program to implement (or at least to set the priority for implementing) actions to improve the condition of waterbodies found to be "not good" or "unacceptable."

Without a context for evaluation, characterization monitoring is prone to generate large quantities of rarely used data. We strongly encourage that the purpose of any "characterization" monitoring be clearly articulated in hypothesis testing, priority setting, or systematic trend evaluation. As noted by NRC (2009, p. 508) with respect to this type of monitoring, "…monitoring under all three (NPDES municipal, industrial, and construction) stormwater permits is according to minimum requirements not founded in any particular objective or question. It therefore produces data that cannot be applied to any question that may be of importance to guide management programs, and it is entirely unrelated to the effects being produced in the receiving waters." We seek to proactively avoid this problem.

Monitoring should occur at two scales:

- **Regional or state-wide scale- this will require a time frame of one to several decades**
- **Local scale – this is required to evaluate the performance and effectiveness of specific management measures.**

In this sub-section, we focus our discussion on two interrelated scales at which these various types of monitoring should be applied as outlined in Table 5-1 at the beginning of this section. The first, which here and elsewhere in this document is termed "programmatic," has a regional or state-wide spatial scale; many of its key actions will require a time frame of one to several decades. Monitoring data from this scale should inform the broadly construed "health" of receiving waters to assess whether the range of hydromodification strategies being implemented is maintaining desired conditions across the (state-wide) range of physiography, climate, land-use change, and regulatory approaches of the regional boards. They should be used to identify particularly promising (or particularly ineffective) combinations of control strategies and landscape conditions. Finally, they should provide regionally tailored benchmarks for what constitutes "healthy

watersheds" and "healthy receiving waters" so regulators and permittees alike know what still needs to be done, where it should be done, and how urgently it needs to happen.

The second scale of monitoring data we term "local." It comprises the generation of monitoring data to evaluate the performance and effectiveness of specific management measures (be they structural or nonstructural) at reducing the negative consequences of hydromodification on downstream receiving waters. Useful information at this scale will normally be generated in the time frame of an NPDES permit cycle (i.e., ~5 years) and should provide direct guidance on whether the evaluated management strategies are working, need refinement, or should be abandoned altogether. They should also provide guidance on the degree to which management efforts should be prioritized where regulatory flexibility exists, given the conditions (and, perhaps, the potential responsiveness) of downstream receiving waters. Over longer time frames, monitoring at this scale can also provide public demonstration of the value of regulatory and programmatic efforts, and it can also help identify the most cost-effective mix of publically funded projects and regulatory protection to achieve (or maintain) receiving-water health.

5.2 Programmatic Monitoring at the Regional Scale

5.2.1 Defining Watershed Context

Although not "monitoring" in the strictest sense of this word, establishing a watershed context for the measurement and evaluation of receiving waters is a hallmark of virtually all recommended monitoring strategies (e.g., Beechie *et al.* 2010, Brierley *et al*. 2010). Monitoring programs should be consistent with the watershed perspective that forms the basis for the management framework discussed in Section 3. In California (as in most other states), this can only be executed at a supra-jurisdictional scale, because most watersheds cross one or more city and/or county boundaries. This presents the long-term challenge that many jurisdictions do not have authority over parts of the landscape that can affect the quality of rivers and streams that pass through their boundaries; more immediately, however, it makes an inclusive watershed assessment almost impossible to execute at a local level.

5.2.2 Determining the Effectiveness of Permit Requirements

A second, more challenging contextual need at the regional scale is the definition of thresholds or endpoints against which to compare the results of monitoring or modeling. Both of these "assessment tools" can guide the application of hydromodification control strategies, evaluate their real or likely success, and predict the consequences of hydromodification on downstream receiving waters. However, they provide little insight into the question, "how good is good enough?" Answering this question requires a definition of "assessment endpoints" (borrowing the term from NRC 1994), which in turn requires objective, quantifiable criteria for evaluating progress or outright success.

Most existing HMPs require the permitted municipalities to develop programs and policies to assess the potential effects of hydromodification associated with new development and redevelopment, to include management measures to control the effects of hydromodification, and to implement a monitoring program that assesses the effectiveness of HMP implementation at controlling and/or mitigating the

effects of hydromodification. Yet the appropriate objectives of such management measures, or a basis to evaluate success or failure of the HMP through monitoring data, are rarely provided in consort. Setting these endpoints is beyond the capacity of any but the largest municipalities—and even for those, neither the field of watershed science nor the arena of public policy is so clear that an unequivocally "correct" answer is likely to emerge without much additional work. Any such finding would also lack state-wide applicability; California is far too physically and ecologically diverse for an assessment endpoint developed in one part of the state to transfer everywhere without careful consideration.

For these reasons, we consider this aspect of monitoring at the regional scale to be a long-term, state-wide effort. This reflects the challenge of conducting meaningful characterization (or "status") monitoring: it requires a benchmark against which the measured condition can be compared, and to which an absolute rating ("good," bad," etc.) can be assigned.

In contrast, "trends" monitoring requires no such benchmark, only equivalent measurements undertaken at multiple times coupled with an understanding of what direction of change is desirable. For this reason, evaluating whether permit requirements are making positive improvements is a reasonable (and probably critical) short-term effort, one that can be conducted locally (see below). It should also be integrated and compiled at a regional level, however, the better to inform the continued development of hydromodification requirements.

5.3 Monitoring at the Local Scale

The needs of a monitoring program for local jurisdictions should complement those being satisfied at a regional scale. Showing net improvement is critical to maintaining support for regulatory actions and capital expenditures, but any monitoring program must reflect the typical constraints of showing rapid results while acknowledging constraints on staff resources and expertise (Scholz and Booth 2001). No less urgent is the need to identify what to do "next"—not necessarily establishing a multi-year capital improvement plan, but at least identifying key problems with one or two associated actions that would likely result in significant improvements in receiving-water conditions. Watershed characterization, as discussed above and applied to a specific jurisdiction, can provide useful guidance for such identification; even without it, local knowledge is commonly sufficient in-and-of itself. Targeted monitoring can normally confirm (or refute) such inferences in short order, which is why we place this monitoring application in the "short-term" category.

However, a monitoring program can also provide longer term guidance to local jurisdictions. When supported by the regional context of receiving-water conditions, local monitoring data can demonstrate trends over time that can lend support to (or indicate necessary changes to) hydromodification control plans. In combination with economic data, they can show long-term cost-effectiveness. Finally, site-specific monitoring data, when analyzed in the context of an appropriate scale of watershed characterization, can guide the stratification of less developed and undeveloped watershed areas into those where more assertive protection (or restoration) will be most worthwhile. None of these outcomes depend solely on collecting monitoring data, which is why none of them are presumed to be credible "short-term" applications of monitoring data. However, they have found expression in other

parts of the country having long-term monitoring efforts, and they should provide similar benefits to California as well.

5.4 Developing a Monitoring Plan

"Monitoring" the effects of a management action, whether it is a new regulation, a change in operational procedures, or a constructed project, is commonly included by design or required by regulation. The collection of monitoring data may be seen as a worthwhile activity in its own right, but this discussion uses a more restrictive, implementation-based definition: any "monitoring" needs to demonstrate a direct connection to management actions, such that the results of monitoring are translated into on-the-ground management actions (or changes in management actions). This focus on the *use* of monitoring data requires clear linkages between a management action, the uncertainties associated with that action, the ways in which the effects of that action are expressed (and can be measured) in the world, and the management changes that should be implemented if monitoring results provide unanticipated (or equivocal) resolution to those uncertainties. This is the basis for establishing an "adaptive management" approach to hydromodification monitoring, discussed in more detail in Appendix C. Here, we discuss the design of a monitoring program and outline the variety of measurements that can be made, under the assumption that the intended use(s) of the monitoring data have already been established.

"Stormwater management would benefit most substantially from a well-balanced monitoring program that encompasses chemical, biological, and physical parameters from outfalls to receiving waters" (NRC 2009, p. 257). In pursuit of a comprehensive monitoring program we might also add regular documentation of weather and climate conditions and land-cover changes. As a practical matter, however, monitoring at a site scale is almost never coordinated with other equivalent efforts at other locations, nor placed in a broader spatial context being developed as part of a regional effort. For monitoring data to have greatest value, however, such coordination and context-setting is needed.

Stormwater management would benefit most substantially from a well-balanced monitoring program that encompasses chemical, biological, and physical parameters… (NRC, 2009)

5.4.1 Design of a Monitoring Plan

As noted at the beginning of this section, the overarching question that must be asked and answered at the beginning of any monitoring design effort is "What is its purpose?" The considerations enumerated below cannot be addressed without an explicit answer to this question, because the outcome of those considerations will depend on how the data are to be used. For certain common application of monitoring data we suggest guidance that will be widely appropriate, but there are no recommendations in this section (or any other monitoring guidance document) that apply universally.

Multiple authors have condensed their guidance for designing a monitoring plan into a short list of steps that should precede the first instance of field data collection (e.g., Shaver *et al.* 2007). Although all

differ in details and intended audience, they share significant commonalities that can be distilled as follows:

- Articulate the purpose of the monitoring (the "management question").
- Identify key constraints, in particular the geographic range and scale over which the monitoring can occur, financial/staff resources available, and the time frame in which results must be generated.
- Evaluate existing information, model outputs, and/or regulatory requirements to identify promising metrics and specific sites appropriate to the management question.
- Identify the specifics of the monitoring plan: what parameter(s), where, for how often and for how long. This may include multiple iterations, wherein the guidance of Step 3 must align with the constraints of Step 2.

Most such guidance is written with site-specific, "local" monitoring in mind—the existing literature provides less direction for monitoring that is herein recommended to occur at a regional scale over the next one or more decades. However, the basic principles are the same at all scales: a coherent, explicit purpose needs to be articulated, resource constraints need to be acknowledged, and a credible strategy needs to be developed with its specifics fleshed out. Below we discuss some of the primary considerations in this last step, because they are common across a wide range of monitoring purposes, programmatic constraints, and indicator types.

5.4.2 Constraints (Step 2 of the Monitoring Plan)

Ideally, a monitoring program should be designed to detect trends, assess effectiveness and allow for source identification.

Scale. Ideally, a monitoring program should encompass multiple, nested scales of monitoring that are determined by the question(s) being addressed. For hydromodification applications, the broadest scale of monitoring is that of the integrated effect of stormwater impacts and stormwater management on receiving waters. *Trends monitoring* (and characterization monitoring, if regionally appropriate ranges of quality have been determined) addresses these questions, and it also allows stormwater and resource managers to measure the broad benefits obtained from management investments. Site-specific conditions normally cannot be traced back to specific generators of pollution (NRC 2009), and so monitoring at the broadest scales (i.e., many tens of square miles and larger) should not attempt to do so. Instead, identifying overall conditions and trends requires a broad spatial scale over long time frames (i.e., multiple years), the essence of trends monitoring. This level of effort is recommended as a regional responsibility, because the area(s) of interest will normally far exceed the geographic limits of any single jurisdiction.

If trends monitoring (or long-standing prior knowledge) indicates that there are impacts on beneficial uses, a second (and more site-specific) scale is invoked, that of *effectiveness monitoring:* which of our many stormwater-management actions are achieving the greatest reduction in downstream impacts

(and which are not)? On the whole, such stormwater control measures, both structural and nonstructural, vary by land use—the measures suitable for a residential neighborhood will likely be impractical or ineffective (or both) in an industrial setting. We therefore anticipate that most effectiveness monitoring will be stratified by land use and conducted by individual jurisdictions (see, for example, such an approach in the Nationwide Stormwater Quality Database, which contains water-quality data from more than 8600 events and 100 municipalities throughout the country).

The finest scale of monitoring is that of *source identification*, a form of characterization monitoring: what specific locations and which parts of the landscape generate stormwater of sufficiently deleterious quantity and (or) quality to cause impacts to beneficial uses, be they direct or indirect effects? This question is widely posed in stormwater management programs, and a number of existing monitoring programs seek to provide answers. The science of stormwater already suggests where the greatest attention is probably warranted (NRC 2009), namely a particular focus on areas of well-connected (or "effective") impervious area, high vehicular traffic, and exposure to toxic chemicals. We therefore suggest these categories should define areas of highest priority for this type of targeted investigation, allowing even a resource-constrained jurisdiction to conduct a useful, well-focused monitoring effort with good efficiencies.

Siting. Site selection is most commonly guided by the location of the management action being evaluated while dictated by more mundane considerations of property ownership and access logistics. In general, sites need to meet a few following basic criteria.

- Appropriate scale: the upstream area should be dominated by, or at least significantly affected by, the management action of interest.
- Responsiveness: at the chosen location, the parameters being measured should be amenable to change in response to the management action (e.g., monitoring for geomorphic change in a concrete channel is ill-advised).
- Representativeness: the results at the chosen location should be credibly extrapolated to "similar" sites, and those sites in aggregate should constitute a widespread (or otherwise important) subset of the landscape as a whole.
- Access: the site should be easily reached by the appropriate personnel and equipment, and with a cost of doing so consistent with the frequency of measurements being made. Any equipment left unattended needs to be secure (or well-hidden).

There are institutional considerations in site selection as well. Multiple programs implement monitoring or impose monitoring requirements, and coordination can provide mutual benefits and efficiencies to all. In particular, monitoring driven by management actions at a particular location (i.e., a local scale) will always benefit from information from one or more regional-scale reference sites that can characterize natural or background variability. Local studies will rarely have resources to execute such an effort themselves, again emphasizing the importance of a nested (and coordinated) hierarchy of monitoring programs.

Time and Variability. Evaluating the effectiveness of management actions requires a preliminary judgment of the time frame over which effects can be recognized. For water-quality parameters, storm-specific grab samples or continuous flow-weighted sampling has been most common; for changes in geomorphic form or in the population attributes of benthic macroinvertebrates, one-time annual sampling that presumes to integrate the effects of the past year are typical. Flow metrics are normally extracted from "continuous" (i.e., 5-, 15-, or 60-minute) measurements of discharge. However, every measurement has some degree of variability, a consequence of "natural" variability, measurement errors, and induced change (i.e., the effects of the management action we are trying to perceive). Separating these components is a matter of statistical analysis (see next section) based on repeated measurements, either in time or in space (or both).

We note that many practices common to past monitoring efforts, particularly the use of individual grab samples to characterize stormwater quality, have yielded results with little to no subsequent value: "…to use stormwater data for decision making in a scientifically defensible fashion, grab sampling should be abandoned as a credible stormwater sampling approach for virtually all applications" (NRC 2009, p. 330).

The duration of a monitoring program is commonly determined by the desire for "timely" answers, although normally the ability to generate statistically significant results is a function of the system being evaluated and the indicators being measured. This often creates a conflict between the intended "mission" of the monitoring program and its ability to produce defensible results, a conflict that can only be avoided by a design that identifies meaningful variables to measure, conducts sufficiently frequent measurements to dampen random variability, and must persist~~s~~ for long enough to allow a management "signal" to emerge from the data. This is the essence of the iteration noted above in Step 4 of monitoring-plan design above.

The monitoring program design must persist long enough to a allow management "signal" to emerge from the data. Consequently, long-term records (i.e., one to several decades) will be needed to detect all but the most dramatic of trends in biological indicators.

In one of relatively few quantitative studies of variability in biological indicators, Mazor *et al.* (2009) found that year-to-year variability for the same site sampled in the same season showed a variability (i.e., ±1σ) was typically about 10 points for a benthic IBI. With average scores for their 5 sites ranging from 28–51 (on a 100-point scale), this reflects a coefficient of variation of about 25%. Individual metrics were even more variable. This emphasizes that long-term records (i.e., one to several decades) will be needed to detect all but the most dramatic of trends in biological indicators.

The duration of monitoring also needs to capture the events that are most important to the anticipated responses of the measured system. For evaluating the effects of hydromodification, frequent storms (i.e., those that are normally expected to occur one to several times per year) are commonly judged important and their effects would normally be captured by a monitoring effort of even just one or a few years' duration. Particularly in more semi-arid regions of the state, however, significant channel-altering events may occur only after many decades of relative quiescence and stability, and noticeable (or documentable) response of streams to hydromodification may only occur under certain circumstances or following specific combination of events. Therefore, the lack of channel response on an annual basis

may not necessarily indicate that management actions are effective. Thus a long-term, ongoing monitoring effort is necessary to capture the responses to infrequent, stochastic events, but determining the likely duration of such a program requires some knowledge (or assumptions) of the critical drivers of those responses. It therefore requires a well-posed set of management questions underlying the monitoring effort as well.

For management questions concerning the effectiveness of hydromodification controls, monitoring will almost always benefit from long-term flow monitoring at multiple sites, especially those in the mid to upper watershed (and key tributaries, depending on the scale of the effort). Local rainfall measurements are nearly as essential, since flow data without rainfall data resolved at a similar spatial and temporal scale are useless at best, misleading at worst. Baseline (pre-project) monitoring normally is also invaluable. However, each of these elements will normally require some combination of a multi-scale, long-term, coordinated monitoring program with an investment of at least several years' duration in anticipation of (and follow-up after) a specific management action at a specific location. Despite the value for evaluating the effects of hydromodification (and hydromodification control efforts), such monitoring almost never occurs to this degree. To the extent this remains a practical constraint on implementation, the range of management questions needs to be commensurately narrowed as well.

Statistical Considerations. The statistical design of a monitoring program is beyond the scope of this section, because the range of possible requirements and approaches is tremendously broad. Several general principals are worth articulating, however, because they apply almost universally (and are commonly ignored):

- Although trends can be "suggested" by monitoring data, only statistically rigorous results can be offered as "proof." Thus, ignoring this dimension of monitoring program design severely limits future applicability of the results.
- Most natural parameters display high variability when measured outside a laboratory, and thus the magnitude of change caused by a management action also needs to be great before it can be recognized. There is a trade-off between the relative magnitude of change and the number of samples required to recognize it (i.e., large relative changes require fewer samples), but many monitoring efforts pay little attention to this basic fact. Where sampling can only occur during specified storm conditions or once during the same season each year, the duration of a monitoring campaign sufficient to detect even large changes in naturally variable parameters is likely to be a decade or longer. For many management applications, this is tantamount to generating no useful information at all (but is significantly more costly).
- The level of effort needed can be estimated *a priori* to help guide final monitoring design, but only if the degree of variability and the magnitude of change to be perceived are known or estimated ahead of time. One such example is given below, where the diagonal lines are labeled with the number of independent samples needed to achieve a typical level of statistical power for various combinations of permissible error from the "true" value (x axis), and the intrinsic variability in values across the population being measured (y axis) in Figure 5-1 below.

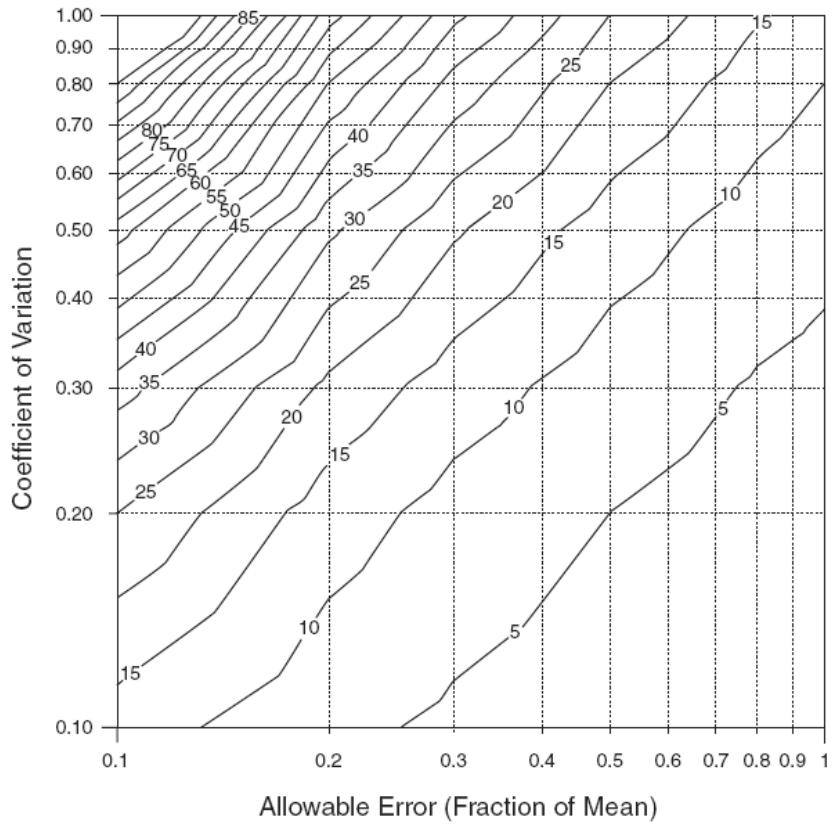

Figure 5-1. Sample requirements for confidence of 95% (α = 0.05) and power of 80% (β = 0.20). Figure from Pitt and Parmer 1995.

5.4.3 What to Monitor (Step 3 of the Monitoring Plan)

The choice of "what to monitor" follows from the choice of assessment endpoints, which in turn depends on the choice of management goals: for example, if "stable stream channels" is the intended outcome of an HMP, then measurement of the physical form of a channel over time would be appropriate. If diagnosing the cause of observed changes is also desired, then some evaluation of potential causal agents (e.g., hydrology, sediment input, or direct disturbance) would also be needed. Because management goals are now commonly (and appropriately) cast more broadly, however, they can embrace less clearly defined endpoints such as "watershed health" or "biological integrity." Many such endpoints fail the test of quantifiable objectivity.

However, these goals invoke a broad scope of concern, embracing not only physical stream conditions but also a range of chemical, hydrologic, and biological attributes. They encompass a broader catalog of receiving waters that may need to be evaluated. Finally, they emphasize the importance of looking more broadly to identify the cause of observed changes—both spatially, to conditions throughout a watershed that may have influence downstream; and temporally, to recognize ongoing adjustments to past disturbance (i.e., legacy effects) and to future environmental changes (e.g., climate change) that commonly lie well beyond the ability of local watershed managers to address. The imprecision of these

goals should not obscure the importance of broadening the scope of stormwater and hydromodification assessments to include not only the traditionally emphasized characterization of selected water-quality constituents and channel stability, but also more integrative measures.

These considerations suggest two broad categories of assessments, which largely but not entirely align with the two scales of implementation (i.e., "programmatic" and "local") defined in Table 4–1:

- Integrative: defining an overall level of "health" of the watershed, as expressed in the condition(s) of its receiving waters. Current scientific consensus suggests that biological indicators are best suited to this scale of evaluation (Karr and Chu 1999), insofar as they integrate the consequences of multiple stressors on aquatic systems and because many management goals (and regulatory requirements) are cast in biological terms. To be meaningful, however, any such indicators need to be suitably chosen and stratified for their particular geo-hydro-climatological region (e.g., "ecoregions"; Omernick and Bailey 1997).
- Targeted: demonstrating the achievement of an established regulatory standard or a designated threshold (typically, a measured or modeled pre-development condition) by a particular parameter, commonly one or more chemical constituents or a specific hydrologic metric of flow. This can be evaluated at the outfall of a single stormwater facility, at the discharge point for a site, or in the receiving water itself. Many of these thresholds are important in their own right—to protect human health, to preserve riparian property from erosion, to avoid flooding of previously non-inundated lands. However, they should be recognized as providing only one-dimensional views of a much broader system. Thus, targeted monitoring can supplement but should not replace more integrative measures.

Integrative assessment endpoints require multiple lines of evidence to characterize receiving-water conditions. At their most comprehensive, they should include measures of flow, geomorphic condition, chemistry, and biotic integrity (Griffith *et al.* 2005, Johnson and Hering 2009). However, biological criteria are generally key to integrative assessment: "In general, biological criteria are more closely related to the designated uses of waterbodies than are physical or chemical measurements" (NRC 2001, p. 8). In most applications, such assessments are compared to one or more reference sites where conditions have been independently judged as "excellent," or where human disturbance is minimal and so best-quality conditions are assumed.

Integrative assessment endpoints require multiple lines of evidence to characterize receiving-water conditions. At their most comprehensive, they should include measures of flow, geomorphic condition, chemistry, and biotic integrity.

The task of identifying and quantifying reference conditions in California streams is presently being carried out by the Reference Condition Management Program (RCMP) of the State Water Board's Surface Water Ambient Monitoring Program (SWAMP; see 2009 Recommendations). About 600 sites have been recognized by this program as "reference" based on having minimal human disturbance, and they have been geographically stratified into the 12 Level III ecoregions mapped for the state of California (by USEPA 2000). The metrics chosen to characterize their biologic conditions should provide an appropriate list for the evaluation of impaired (or potentially impaired) streams.

An equivalent set of reference sites and conditions for other receiving-water types does not presently exist. California also presently lacks a systematic basis for defining relative categories of "poor," "fair," "good," or "excellent" based on numeric values of biological indicators, such as exists in parts of the Pacific Northwest. Several regions, however, now have multimetric biological indicators with defined reference conditions (see below).

Elsewhere, however, there is as yet no context for setting assessment endpoints for biological indicators in California receiving waters. Such an effort is in progress, at least for streams, and its eventual completion to support the management application of more local monitoring results is a key recommendation of this report. Biological assessment endpoints will need to be established region by region on an as-needed basis; in the interim, locally collected data can be very useful for trend monitoring of receiving water but not for defining existing levels of "health."

5.4.3.1 An Example from Washington State

The Puget Sound region of western Washington State provides an instructive example for identifying indicators and establishing desired assessment endpoints. Multiple agencies over the last two decades have sought to measure the overall ecological health of the region and to define targets for recovery. Following the most recent three-year process, the lead agency for the current effort released its set of 20 "dashboard indicators" designed both to express scientific understanding of conditions needed for ecological health and to communicate that understanding in a public-accessible manner (http://www.psp.wa.gov/pm_dashboard.php; accessed September 5, 2011). They cover physical, chemical, and biological indicators: all expressed in terms of relative improvement or quantified conditions to be reached by the year 2020.

This level of target-setting is possible only after extensive study and public discussion; it falls far beyond the scope of the present document. It is instructive for the state of California, however, in several regards as it looks to the future:

- The physiographic scope of the indicators and their target values is well-constrained to a particular geographic region with broadly similar geologic, hydrologic, and climatological attributes. Multiple parallel efforts would almost certainly be needed for a more diverse region (such as the entire state).
- Each indicator has a strong scientific basis for inclusion and at least some scientific basis for specific targets. Their communication value with the public was also an explicit criterion for inclusion.
- The most numerous indicators are biological, and they address multiple levels of the trophic chain from top predators to plants (a planktonic metric, however, was rejected as requiring too much additional scientific study and offering little communication value to the general public).
- Although emphasizing biology, the indicators are broadly distributed amongst biological, chemical, and physical metrics; most are broadly integrative in nature (e.g., reference to "bug populations" (the Puget Sound B-IBI) and a "freshwater quality index").

- The set of physical indicators is most parsimonious for instream conditions, and excluding marine nearshore and estuary conditions is restricted to a single hydrologic metric (chosen for its presumed influence on fish). This stands in stark contrast to most existing hydromodification monitoring plans, which emphasize measures of channel geomorphology and a wider range of hydrologic metrics. Such indicators may provide useful performance measures, but they should not be mistaken for more integrative measures of ecosystem or watershed "health."
- Although each indicator has a specified, numeric goal to be reached by 2020, there are no articulated changes to the current management plan if any of those goals are not reached (or if interim measures suggest that they will not be reached). This is a recognized shortcoming of the present plan but there is no mechanism yet in place to address it. As such, it does not currently meet the test for "adaptive management" (see Appendix C).

In California, such a list of integrative assessment indicators (let alone quantified endpoints for those indicators) cannot presently be defined, except in a few specific localities where data collection and analysis have been ongoing for many years. Thus, we recognize the value of such targets but must guide the present development of monitoring in recognition of their near-complete absence. Rectifying this shortcoming is the central recommendation for long-term program development; in the interim, short-term monitoring at both the regional and local levels need to acknowledge the absence of an integrative context in which to interpret their results.

In California, a list of integrative assessment indicators (let alone quantified endpoints for those indicators) cannot presently be defined, except in a few specific localities. Rectifying this shortcoming is the central recommendation for long-term program development.

Regulatory standards are established on the assumption that "clean water" will result in "healthy streams," but the elements of a watershed are far too complexly interrelated to permit such a simplistic perspective. Although the inverse ("polluted water results in unhealthy streams") is almost always true, the challenge for inferring causality from typical monitoring data is that *many* such stressors can all yield the same, degraded outcome. For this reason, targeted monitoring can provide useful diagnostic information and demonstrate regulatory compliance, but it cannot provide sufficient information to address integrative assessment endpoints.

5.4.3.2 Indicators from Existing Programs

We now turn to some of the most common indicators used in monitoring programs today, recognizing that their suitability in any given application depends on the questions being asked, the characteristics of the natural system being measured, and the practical constraints imposed on the monitoring program.

Hydrologic Indicators. Historically, the effects of urbanization on flow were characterized exclusively in terms of peak flow increases (e.g., Leopold 1968, Hollis 1975). Study since those early works has emphasized the degree to which other attributes of a stream hydrograph are changed by watershed imperviousness, and the importance of assessing the *duration* of moderate flows that are capable of transporting channel sediments and the frequency with which those geomorphically active flows occur

(Section 2). Thus, monitoring relevant to a particular hydromodification management application will likely include a variety of flow metrics (e.g., Konrad and Booth 2005, Degasperi *et al*. 2009).

In moving beyond a narrow focus on linkages between watershed urbanization, flow alteration, and in-stream effects, scientific understanding of hydrologic controls on stream ecosystems has recently led to new approaches for assessing the ecological implications of hydromodification. For example, the ecological limits of hydrologic alteration (ELOHA) framework is a synthesis of a number of existing hydrologic techniques and environmental flow methods that allows water-resource managers and stakeholders to develop socially acceptable goals and standards for streamflow management (Poff *et al.* 2010). The central focus of the ELOHA framework is the development empirically testable relationships between hydrologic alteration and ecological responses for different types of streams. This requires a foundation of hydrologic data provided by gaging and/or monitoring, and sufficient biological data across regional gradients of hydromodification. Although hydrologic–ecological response relationships may be confounded to some extent by factors such as chemical and thermal stressors, there are numerous case studies from the US and abroad in which stakeholders and decision-makers have reached consensus in defining regional flow standards for conservation and ecological restoration of streams and rivers (Poff *et al.* 2010).

Hydrologic monitoring provides essential information needed for establishing flow–geomorphology–ecology relationships, validating conceptual models, and assessing effectiveness of management actions in developing watersheds. Implementing regional flow standards should proceed in an adaptive management context, where collection of monitoring data or targeted field sampling data allows for testing of flow alteration–geomorphic–ecological response relationships. This allows for a fine-tuning of flow management targets based on improved understanding of the actual mechanisms; however, such monitoring can be expensive and it may take many years to adequately characterize the full spectrum of streamflows. Thus, hydrologic monitoring programs should be carefully planned and executed so that they are cost-effective and address the key uncertainties In this paper we primarily focus on indicators that do not require additional, extensive data collection.

Hydrologic indicators provide essential information needed for establishing flow–geomorphology–ecology relationships, validating conceptual models, and assessing effectiveness of management actions in developing watersheds.

Geomorphic indicators have been long-recognized as simple, easy-to-measure, and relatively responsive indicators of changes to the flow regime or sediment supply of a river or stream.

Biological indicators provide an integrative view of river condition, or river health.

Hydrologic monitoring is feasible in the context of a short-term program only if the purpose is to evaluate the engineering performance of a particular facility. For most applications, however, at least two (and commonly many more) years are necessary to measure a range of variable conditions sufficient to capture significant geomorphic and/or biological effects. Measurement of precipitation, generally a less cost-intensive effort than flow monitoring, must occur in consort for the data to be useful. In an effort to minimize the cost of continuous long-term flow modeling, a hydrologic model may be calibrated on one or two years of actual data and then used *in lieu* of further data to predict flow conditions. Whether the level of imprecision so introduced is appropriate will depend on the

management questions being asked, but in general such an approach is normally judged more appropriate for comparative results (e.g., did a specified flow magnitude increase in frequency or duration?) than for absolute results (what is the magnitude of the 2-year discharge?).

Geomorphic Indicators. Geomorphic indicators have been long-recognized as simple, easy-to-measure, and relatively responsive indicators of changes to the flow regime or sediment supply of a river or stream (e.g., Leopold 1968). They require little specialized equipment, many commonly can be measured "in the dry" (or close to it), they typically change little from week-to-week (and so are often measured only once per year), and the morphologic features of interest provide the physical template on which a wide range of biological conditions are expressed.

Scholtz and Booth (2000) recognized five geomorphological "channel features" commonly measured as part of monitoring programs:

- Channel geometry (cross sections, longitudinal profile).
- Channel erosion and bank stability.
- Large woody debris.
- Channel-bed sediment.
- In-stream physical habitat (pools, riffles, etc.).

To this list, others have also added:

- Floodplain connectivity.
- Channel planform (meandering, braiding, rates of channel shifting).

Each metric has well-defined methods for field (or, in some cases, airphoto) measurements that need not be repeated here. However, despite broad agreement on *how* to measure each parameter, there is substantially less agreement on the meaning of particular measurements, or indeed under what circumstances (if any) such measurements should be made at all. Most contentious are the various protocols for assessing instream physical habitat (#5 above)—seemingly the most "relevant" for a host of biological applications and for evaluating restoration success. However, a variety of studies have documented a high level of uncertainty imposed by observer bias:

> "Habitat-unit classification was not designed to quantify or monitor aquatic habitat. At the level necessary for use as a stream habitat monitoring tool, the method is not precise, suffers from poor repeatability, cannot be precisely described or accurately transferred among investigators, can be insensitive to important human land-use activities, is affected by stream characteristics that vary naturally and frequently, and is not based on direct, quantitative measurements of the physical characteristics of interest. Relying on habitat-unit classification as a basis for time-trend monitoring is time-consuming, expensive, and ill-advised." (Poole *et al*. 1997, p. 894)

Other geomorphic metrics, in contrast, can provide a robust, albeit coarse, characterization of the channel boundaries. Some changes, particularly if consistently expressed by multiple adjacent cross-

sections, can provide clear documentation of systematic channel changes over time that can be credibly associated with upstream changes (e.g., increased discharge from urbanization leading to channel enlargement). Other changes, however, may have a more indirect or uncertain association with upstream conditions (e.g., grain-size changes) because of the potential for rapid, ill-described changes over time without a corresponding human "cause." This emphasizes the importance of having a well-crafted purpose for the monitoring program into which the utility of any chosen parameter can be clearly described.

Biological Indicators. Biological indicators have been long-applied in society's evaluation of stream conditions, but historically that application has been rather informal. Observation of major fish kills, for example, is the application of a "biological indicator," but it provides little diagnostic or discriminatory information except in those streams where conditions are so poor that even casual awareness is inescapable. As a more refined assessment tool, however, their application to freshwater streams is only a few decades old. As such, the science is still under construction and some basic principles are still debated.

The rationale behind using biological indicators, however, is relatively undisputed. Karr (1999) has provided a useful summary of that rationale, of which the key elements are:

- Biological monitoring and biological endpoints provide the most integrative view of river condition, or river health.
- Biological monitoring is essential to identify *biological* responses (emphasis added) to human actions.
- Communicating results of biological monitoring to citizens and political leaders is critical if biological monitoring is to influence environmental policies.

Some of the earliest references to biological monitoring are associated with the development of RIVPACS, the River Invertebrate Prediction and Classification System, developed by the Centre for Ecology and Hydrology in the United Kingdom and now applied in a number of countries worldwide to predict instream biological conditions from a suite of watershed and channel variables. Since that beginning, other approaches have been advanced and practiced (e.g., the US Environmental Protection Agency's *Rapid Bioassessment Protocols*) that provide alternative, but likely near-equivalent results (e.g., Herbst and Silldorf 2004).

In this section we compare several biological indicators recently applied in various regions of California. This not intended as a comprehensive comparison of all available approaches potentially applicable to California; rather, it simply provides a few examples that illustrate the differences, and the similarities, of the various approaches. As the comparisons demonstrate, there is no "right" approach—but all share commonalities that are likely to be valuable elements of any biological monitoring program. We focus exclusively on benthic macroinvertebrates (BMI), because these have seen the longest and most widespread application (both in California and worldwide) given their species diversity and their relative geographic immobility. However, a variety of other biological metrics (particularly fish and periphyton) have relevance to biological monitoring and strong advocates in the scientific community. Their

omission here is not a judgment on their value, merely a reflection of the broader applicability and richer scientific development of BMI-based indicators.

Multimetric indices are presently completed for four areas of the state (Eastern Sierra, North Coast, Central Valley, and Southern Coast). They are not standardized or calibrated state-wide (nor should they necessarily be), and they do not provide statewide coverage. In addition, the City of Santa Barbara (Ecology Consultants 2010) has sponsored development of its own BMI index (geographically embedded within the Southern Coast region), with both commonalities and differences between it and the others.

Eastern Sierra Nevada. Herbst and Silldorf (2009) developed an IBI based on streams from the upper Owens River north to the Truckee River. Their purpose was both to provide a region-specific IBI for future use and to evaluate the results of such an approach with others that also make use of BMIs to assess stream conditions. They evaluated the performance of 12-, 10-, and 8-metric indices, recommending the 10-metric index as providing the best overall performance included in the 12-metric index were these 10 and also predator richness and EPT% abundance:

- % tolerant percent richness (% of taxa with TV= 7,8,9,10).
- Richness (total number of taxa).
- Chironomidae Percent Richness (% of taxa that are midges).
- Ephemeroptera (E) Richness (number of mayfly taxa).
- Plecoptera (P) Richness (number of stonefly taxa).
- Trichoptera (T) Richness (number of caddisfly taxa).
- Dominance 3 (proportion of 3 most common taxa)
- Biotic Index (modified Hilsenhoff, composite tolerance).
- Acari richness (number of water mite taxa).
- Percent shredders (% of total number that are shredders).

A statistical analysis suggests that as many as 10 distinct classes can be discriminated using this IBI, although their recommended application uses only five categories of quality.

North Coast. Rehn *et al.* (2005) developed an IBI based on coastal-draining streams from Marin County north to the Oregon border. They evaluated 77 individual metrics, testing them for responsiveness to human disturbance and redundancy, and ultimately settled on eight:

- EPT richness.
- Coleoptera richness.
- Diptera Richness.
- Percent intolerant individuals.

- Percent non-gastropod scraper individuals.
- Percent predator individuals.
- Percent shredder taxa.
- Percent non-insect taxa.

Their statistical analysis indicated that five categories of quality could be discriminated; response was driven most strongly by watershed land cover (natural vs. unnatural) and percent of substrate that was sand-sized or finer. They also suggested a set of thresholds for rejecting potential "reference" sites (Rehn *et al.* 2005; Table 5-2), which was also used in the Southern Coast study (Ode *et al.* 2005; see below):

Table 5-2. Thresholds for rejecting potential "reference" sites.

Stressor	Threshold
Percentage of unnatural land use at the local scale	> 5%
Percentage of urban land use at the local scale	> 3%
Percentage of total agriculture at the local scale	> 5%
Road density at the local scale	> 1.5 km/km^2
Population density (2000 census) at the local scale	> 25 ind./ km^2
Percentage of unnatural land use at the watershed scale	> 5%
Percentage of urban land use at the watershed scale	> 3%
Percentage of total agriculture at the watershed scale	> 5 %
Road density at the watershed scale	> 2.0 km/km^2
Population density (2000 census) at the watershed scale	> 50 ind./ km^2

Central Valley. Rehn *et al.* (2008) also developed an IBI for Central Valley streams, evaluating 80 candidate metrics to yield a final list of five:

- Collector richness.
- Predator richness.
- Percent EPT taxa.
- Percent clinger taxa.
- Shannon diversity (a composite measure of taxonomic richness and evenness of abundance).

They found that reach-scale physical habitat variables were more critical in their data set than water chemistry or land use. They also presented their findings with greater caution than with other regions of the state, noting the difficulty of identifying truly "unimpaired" reference conditions and the geographic concentration of much of their source data.

Southern Coast. Ode *et al.* (2005) developed a BMI index of biological integrity based on 61 potential metrics from reference sites drawn from relatively undisturbed coastal-draining watersheds from Monterey Bay south to the Mexican border. They included seven final metrics:

- Percent tolerant taxa.
- Percent collector-gatherer + collector-filterer individuals.
- Predator richness.
- Percent intolerant individuals.
- EPT richness.
- Percent noninsect taxa.
- Coleoptera richness.

They note that the last two on the list are not common in other multimetric B-IBIs but were statistically appropriate for their data set. They judge that this "SoCal B-IBI" can discriminate 5 categories of condition, using 5 categories evenly divided along a 100-point scale. Particularly strong correlations amongst all seven metrics were displayed in comparison to road density and percent "watershed unnatural."

A portion of the Southern Coast region has also been the subject of independent IBI development over the past decade (Ecology Consultants 2010, 2011). The region of study spans the Santa Barbara coastal streams from the Ventura County line west about 45 miles to Gaviota Creek. Their work led to the development of an IBI using the following 7 metrics:

- # of insect families
- # of EPT families
- % EPT minus Baetidae
- % PT
- Tolerance value average
- % sensitive BMIs
- % predators + shredders

In the course of this work, tolerance values were adjusted for certain taxa based on local observations of presence/absence relative to the level of watershed disturbance. With these changes, they found strong statistical basis for discriminating five categories of biological quality. They also found that considering both watershed-level land use patterns and localized physical habitat conditions were necessary to achieve the best prediction of biological integrity.

Summary. A compilation of the various metrics (Table 5-3) demonstrates only broad commonalities between the various regional IBI's presently available for specific parts of California, suggesting that additional work needs to be done before comprehensive recommendations for biological monitoring can be made. At present, perhaps half(?) of the state's area is covered by existing multimetric indices as noted above, and for these areas they provide the best (indeed, the only) guidance for meaningful collection and interpretation of biological data. Elsewhere, however, only a few general points can be made:

- Biological monitoring in un-assessed regions of the state cannot be used to identify absolute conditions of biological health (i.e., "status" monitoring). However, they will likely be useful for "trends" monitoring, where only the change relative to a prior state is being sought.
- Despite the variability in metric choices amongst the various regions (Table 5-2), some broad commonalities are apparent. In particular, several types of metrics are likely to provide useful indicators of change in a known direction (i.e., an increase or decrease in the metric can be confidently assigned to a change in quality in a known direction):
    - One or more measures of tolerance or intolerance
    - One or more measures of predator prevalence
    - One or more measures of EPT taxa or taxa richness

This list does not purport to describe a true multimetric B-IBI, nor to provide a basis to evaluate instream biological health on an absolute scale (i.e., from "poor" to "excellent"). In the absence of any region-specific guidance, however, changes in one or more of these metrics are each likely to provide some initial, useful indication of temporal trends in biological health until such time as the types of studies referenced above can be conducted.

Table 5-3. Compilation of metrics used in the five regional B-IBI's described in the text.

METRIC	Eastern Sierra	North coast	Central Valley	Southern coast	Santa Barbara
Percent intolerant individuals		X		X	X
% tolerant (% of taxa with TV= 7,8,9,10)	X			X	
Tolerance value average					X
# of insect families					X
Percent non-insect taxa		X		X	
Percent shredders (% of total number that are shredders)	X	X			
Percent predator individuals		X			
% predators + shredders					X
Predator richness			X	X	
Collector richness			X		
Percent non-gastropod scraper individuals		X			
Percent clinger taxa			X		
Percent collector-gatherer + collector-filterer individuals				X	
EPT richness		X		X	X
Percent EPT taxa			X		
% EPT minus Baetidae					X
% PT					X
Ephemeroptera (E) Richness (number of mayfly taxa)	X				
Plecoptera (P) Richness (number of stonefly taxa)	X				
Trichoptera (T) Richness (number of caddisfly taxa)	X				
Coleoptera richness		X		X	
Diptera Richness		X			
Chironomidae Percent Richness (% of taxa that are midges)	X				
Richness (total number of taxa)	X				
Dominance 3 (proportion of 3 most common taxa)	X				
Biotic Index (modified Hilsenhoff, composite tolerance)	X				
Acari richness (number of water mite taxa)	X				
Shannon diversity index			X		

5.5 Recommendations

Based on this review of monitoring theory, current applications, and current needs, the following steps are recommended to advance a state-wide program of monitoring to support the management of hydromodification control plans.

5.5.1 Programmatic Monitoring

Over the next several years, the following actions should be implemented at the state and/or regional level:

- Executing broad-scale, GIS-based watershed characterization;
- Identifying a set of representative indicator watersheds, and a basic suite of regular measurements that are suitable for establishing trends in physical, chemical, and biological indicators;
- Identifying (and multi-metric monitoring within) a relatively small set of watersheds that have implemented recent hydromodification control plans to initiate the long-term evaluation of downstream trends.

Over the course of the next several NPDES permit cycles (i.e., one or more decades), the following actions should also be undertaken as a regional responsibility:

- Setting regionally appropriate endpoints for biological health of receiving waters;
- Identifying particularly promising (or particularly ineffective) combinations of control strategies across a range of different landscape conditions;
- Providing supplemental data collection at reference sites to support trends monitoring by local jurisdictions;
- Compiling local results to guide development and refinement of regionally appropriate hydromodification control strategies.

5.5.2 Local Monitoring

Over the next several years, the following actions should be implemented by local jurisdictions at a local scale:

- Implementing a program of source identification at one or more high-risk locations (e.g., high vehicular traffic, high imperviousness, toxic chemical storage/transport);
- Demonstrating the hydrologic performance of one or more representative hydromodification control facilities;
- Monitoring trends at one or more representative receiving waters, ideally at a regionally identified site (see the second bullet under “Programmatic monitoring,” above);

- Conducting a synoptic evaluation of waterbodies, stratified by watershed type (see the first bullet under “Programmatic monitoring,” above), to identify highest priority systems for protection or rehabilitation, if not already known.

Over the course of the next several NPDES permit cycles, the following long-term actions should also be undertaken as a local responsibility:

- Monitoring representative conditions to evaluate whether management actions are improving overall receiving-water health;
- Evaluating cost-effectiveness of implemented hydromodification control measures;
- Identifying critical areas for resource protection by virtue of existing high-quality conditions.

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APPENDIX A: GUIDANCE FOR APPROPRIATE APPLICATION OF HYDROLOGIC AND HYDRAULIC ANALYSES

Information contained in this document is intended solely for guidance purposes only. It is not intended to be an instruction manual and use of any of the guidance provided herein is at the risk of the user. No other person or entity shall be entitled to rely on the services, opinions, recommendations, plans or specifications provided in the document.

1. INTRODUCTION AND PURPOSE

The purpose of this Appendix is to provide technical guidance on hydrologic and hydraulic analyses, including the use of Continuous Simulation (Hydrologic) Modeling (CSM), in support of hydromodification assessment and mitigation. CSM is the industry standard developed since the early 2000s for use in the assessment and mitigation of hydromodification. The fundamental difference between CSM and peak flow hydrologic modeling, is that CSM considers the full range of flow events over a long period of record, typically 30 years or more, to develop flow duration curves, whereas peak flow hydrologic modeling generally considers synthetically (usually calibrated to measured data) produced event-based hydrographs (2-, 10-, 50-, 100- and 200-year return frequency events). CSM allows flow duration curves and other derived hydraulic metrics to be compared between existing and proposed conditions in order to assess hydromodification impact potential and to develop mitigation strategies. The guidance provided in this appendix is the product of the experience gained in the application of hydromodification management strategies to multiple urban development projects. This appendix is not intended to be an instruction manual but to provide guidance to engineers, planners and regulatory staff on specific modeling elements involved with HMPs.

MODELING METOHDOLOGY REVIEW

Modeling Approaches

A common approach to mitigating hydromodification impacts from development projects is to construct best management practices (BMPs) which capture, infiltrate and retain runoff, where possible. In such cases, the water is detained and released over a period of time at rates which more closely mimic pre-project hydrology. Methods commonly used to size hydromodification BMPs include hydrograph matching (matching pre and post-project flow regimes), volume control and flow duration control. Hydrograph matching is most traditionally used to design flood detention facilities for a specific storm recurrence interval, such as the 100-year storm, whereby the outflow hydrograph for a project area matches the pre-project hydrograph for a design storm. Volume control matches pre- and post-project runoff volume for a project site; however, the frequency and duration of the flows are not controlled. This can result in higher erosive forces during storms. Flow duration control matches both the duration and magnitude of a range of storm events for pre- and post-project runoff. The complete hydrologic record is taken into account, and runoff magnitudes and volumes are matched as closely as possible.

It is generally accepted that flow duration control matching is the most appropriate method to be used in the design of hydromodification BMPs. The flow duration control approach has been used in at least half a dozen HMPs in California, all of which used a CSM to match flow durations. However, differences exist in how the continuous simulation modeling is used between programs.

OVERVIEW OF APPENDIX

This appendix covers the following specific topics, addressed in the order in which they would arise as part of a hydromodification analysis for a major development project:

Section 2 addresses calculation of a flow control range, including identification of an acceptable low flow value, based upon critical flow for incipient motion of the channel material. .

Section 3 addresses the development of evaluation criteria to assess the effectiveness of a proposed mitigation design, including a discussion of flow duration matching and the erosion potential metric.

Section 4 addresses CSM, including precipitation data requirements, hydrologic time steps, model calibration and validation, and other modeling considerations and tips.

2. METHOD FOR SELECTION OF A FLOW CONTROL RANGE

INTRODUCTION TO FLOW CONTROL

Most hydromodification plans (HMPs) in California have adopted a flow control approach, which establishes a range of flow magnitudes discharging from the proposed site that must be controlled. The magnitude of the flow range is commonly expressed in terms of a percentage of the return period flow to which it is equivalent; for example: from 10% of the Q2 to 100% of the Q10. Flow magnitudes within the prescribed range must not occur more frequently under the proposed condition than they do in the existing (or pre-project) condition. Another way of expressing this is that the long term (decadal) cumulative duration of these flows must not be longer in the post-project condition compared to the pre-project condition. Generally, a small exceedance tolerance is allowed. For example, the following is a typical criterion that has been used in HMPs:

> For flow rates ranging from 10% of the pre-project 2-year recurrence interval event (XQ2) to the pre-project 10-year runoff event (Q10), the post-project discharge rates and durations shall not deviate above the pre-project rates and durations by more than 10% over and more than 10% of the length of the flow duration curve. The specific lower flow threshold should be influenced by results from the channel susceptibility assessment.

The rationale behind setting an upper limit is the understanding that when less frequent, high intensity/volume precipitation events occur, the watershed reaches a saturation level and responds in a similar manner for undeveloped and developed conditions. Furthermore, while these less frequent, high magnitude events do induce significant geomorphic change, they occur so infrequently that over a long time period, they comprise only a small portion of the work done on a channel. For example GeoSyntec (2007) used a hydro-geomorphic model to assess cumulative sediment transport on Laguna Creek (near Sacramento) and determined that 95% of the total erosion and sediment transport in the creek is accomplished by flow rates less than Q_{10}.

The purpose of determining a low flow range is one of practical design consideration when meeting a requirement for flow duration matching. The requirement to match flow durations between a pre- and post-project condition requires that runoff be detained and infiltrated within a BMP (e.g. open basin or underground vault). If flow matching is required to be achieved for all flows down to zero, the BMP

volume will be significantly larger (and therefore more costly) than if there were some low flow below which runoff could be discharged at durations longer than in the pre-project condition. A key assumption underlying the concept of a low-flow discharge is that the increase in discharge durations below this rate will not increase channel erosion because the flows are too small to initiate movement of channel materials to any significant extent. Another critical assumption in the flow duration matching approach is that a single discharge value is valid across the range of grain sizes and geometries in the streams to which that low flow value applies.

For a specific set of hydraulic conditions (e.g., cross sectional shape, channel slope, bed and bank roughness), the flow rate can be calculated where the critical shear strength value is reached. Thus with an estimate of the critical shear strength of the materials composing a channel's bed or banks, and the hydraulic conditions occurring at the same location, the critical flow rate can be determined at which transport (or erosion) begins. This critical flow rate (Q_c) can then be compared to the magnitude of a flood peak which occurs every two years (Q_2) to establish the estimate of percent Q_2 to be used as the lower flow threshold.

Thus in order to calculate the lower flow threshold as expressed by a percentage of Q_2, three values must be determined for each analysis location (described in further detail below):

- The critical shear strength (τ_c) of bed and bank materials;
- The critical flow rate (Q_c) at which this critical shear strength is reached and exceeded;
- The magnitude of a flood peak which occurs every two years (Q_2).

In contrast, when using an erosion potential (Ep) metric (rather than flow duration matching) for BMP sizing, the Ep analysis incorporates channel geometry to estimate shear stresses generated at various flow rates, and then compares these to estimated critical shear stresses (i.e., shear stress required to initiate transport) for the grain size distribution within the stream. However, for either flow duration matching or for erosion potential analysis, the first step is to determine the critical shear stress for incipient motion of channel materials.

DETERMINATION OF CRITICAL SHEAR STRESS

The composition and condition of the bed and banks of a stream channel are the best indicators of how a channel will react (i.e., its susceptibility) to hydrologic changes resulting from development projects (i.e., hydromodification). Channels composed of materials more resistant to erosion are less susceptible to excessive erosion due to hydromodification than channels composed of less resistant materials. Channel material type can vary widely between, as well as within, watersheds. Figure 2-1 **Error! Reference source not found.**a. and b. illustrate stream incision through (a) relatively loosely consolidated, non-cohesive sand and gravels, and (b) relatively cohesive silty-clays. The resistance of bed and bank materials is quantified by their critical shear strengths, (τ_c) that is, the value where entrainment or transport begins.

Typical stream erosion in a southern California stream (granular, non-cohesive
(Photo courtesy of Eric Stein, SCCWRP)

Typical stream erosion in a northern California stream (generally cohesive silty clays)
(Photo cbec, inc.)

Notes:	cbec	*Guidance on the Use of Continuous Simulation Hydrologic Modeling* **Examples of Stream Erosion in Southern and Northern California**		
		Project: 11-1001	Created By: CBB	**Figure 2-1**

Figure 2-1. a. Example of a loosely consolidated, non-cohesive sand and gravel stream bed. b. Example of a relatively cohesive silty-clay stream bed.

Several methods are available for the estimation of critical shear stress, including laboratory studies (e.g., flume studies) and field measurements, with different methods utilized for cohesive materials and non-cohesive materials.

Estimating Critical Shear Stress for Non-Cohesive Materials

The most common method for determining the critical shear stress of a non-cohesive material is through the application of the Shields relationship. This relationship is applicable to the calculation of critical shear stress for a uniform size mixture of sediment with a known particle size and specific gravity. Since it was originally proposed by Shields in 1936, the relationship has been tested and further investigated by several other researchers, resulting in a variety of modifications, primarily through variation of the Shields parameter. The original value of the Shields parameter proposed by Shields was 0.06, however, values from 0.03-0.06 have been suggested, with 0.045 acknowledged as a good approximation. Recent research has demonstrated that a value of 0.03 may be more appropriate for estimating incipient motion in streams with gravel beds (Neill 1968, Parker et al. 2008, Wilcock et al. 2009), where D50 estimates are based upon data collected via pebble count. The decision of what value of Shields parameter is used can have a large influence on the resulting τ_c estimate. For example, if a value of 0.06 is used, it results in twice as large of an estimate of τ_c than if a value of 0.03 is used.

While the Shields relationship was developed for a mixture of uniform sized sediment, it can be applied to a mixture of sediment with varying sizes as long as the distribution is uni-modal and does not have a high standard deviation of grain sizes (Wilcock 1993). In contrast, for sediment mixtures which are bimodal (e.g., if there is a large amount of sand in addition to gravel), a different approach (e.g., Wilcock and Crowe 2003) is recommended. For a more in depth discussion of sediment transport and incipient motion, the reader is referred to Wilcock et al. (2009).

In order to apply the Shields relationship to determine τ_c, the median grain size (d50) present on the channel surface must be determined. River channels are often armored; meaning that coarser material is present on the surface than is present underneath the armor layer. However to access and transport the finer material beneath, the surface layer must first be mobilized. The median grain size is determined by analysis of a particle size distribution.

A particle size distribution can take the form of: 1) a cumulative *frequency* distribution which is determined by way of a pebble count or photographic analysis, or 2) a cumulative *weight* distribution. For a cumulative frequency distribution a subset of particles present on the surface are measured, and the frequency of particles within different size class bins is used. **Error! Reference source not found.** shows a sample particle size distribution graph developed from a pebble count. For a cumulative weight distribution, a bulk sample of the surface material is collected, and then sorted using a set of sieves with different screen sizes. The amount of material retained by each sieve is weighed and then used to plot the cumulative weight distribution. Both approaches have advantages and disadvantages.

A pebble count is a relatively straightforward field technique that is easily applied in streams which are wadable. **Error! Reference source not found.** shows photographs of pebble counts being conducted in the field. They can be performed relatively quickly, which means more samples can be collected to better characterize the conditions present in a reach. However, there are a variety of ways a pebble count can be conducted, and there is tremendous opportunity to introduce bias to the measurement. Furthermore, while studies often cite Wolman (1954) as the method employed in data collection, strict adherence to this protocol is not always achieved. Rather than the method suggested by Wolman (1954), a refined, more regimented approach has been suggested by Bundte and Abt (2001a), and is recommended. In addition, it should be noted that pebble counts generally do a poor job of characterizing sand and smaller sized material. In addition to pebble counts, software can be used to process a digital image of an area of the bed. The software samples a subset of particles present in the image, and using assumptions regarding the amount of given particle that is visible, is able to provide a cumulative frequency distribution.

Collecting a bulk sample for sieve analysis is another method frequently employed to determine values for typical characteristic indices of a particle size distribution. In this method a sample is collected from the channel surface, and then the sample is segregated into various size classes with sieves. One advantage of this approach is that it utilizes all the data available from the sampled area (as opposed to a pebble count which uses a subset of the entire population, e.g., ~100 particles as opposed to thousands), however the sampled area is typically smaller than the area sampled within one pebble count. One disadvantage is the size of sample that is necessary. Because the resulting particle size distribution is based upon weight, the largest particles present can have a very large influence on the resulting particle size distribution. Research has suggested that the weight of the entire sample must exceed 100x the weight of the largest particle present to escape this possible bias. This means large (volume and weight) samples are often required. Some sieving can occur on site through the use of shaker sieves, but typically some portion of the sample is also taken back to the lab for further analysis. Thus, bulk samples typically require more effort and equipment to establish a particle size distribution, however they provide a much more accurate estimate, especially when a large fraction of the sample is sand sized (2mm) and smaller.

For a more in depth discussion of sampling methods to determine particle size distributions in wadable streams, the reader is referred to Bunte and Abt (2001).

Estimating Critical Shear Stress for Cohesive Materials

The methods described above are not appropriate for cohesive materials, which due to chemical cohesion between particles exhibit larger τ_c values than would be estimated by consideration of particle size/weight in isolation (i.e., cohesive properties not considered). One method that allows for the determination of τ_c *in situ* is the application of a jet test (ASTM 2007). The jet-testing apparatus and analytical methods were developed by researchers at the USDA Agricultural Research Station (Hanson and Cook 1999; Hanson et al. 2002; Hanson and Cook 2004; ASTM 2007). The method uses a submerged impinging jet of water directed perpendicularly at the material surface, in order to erode the material. As erosion occurs, a scour hole is created. The depth of this hole is measured periodically as time

progresses through the test. As the scour hole increases in depth, the strength of the jet is reduced because it is travelling longer distance through water from the jet orifice to the soil surface. Eventually, the energy of the jet is dissipated enough that it no longer has energy in excess of the material's shear strength and erosion stops. **Error! Reference source not found.** shows a photograph of a jet testing rig deployed in a stream bank.

In addition to jet testing, *in situ* testing of shear strength can be obtained through the application of a field vane shear test (ASTM 2008). This method provides τ_c values based upon the assumption that the bed or bank will fail via large blocks (composed of thousands of particles), as opposed to erosion occurring particle by particle. As such, the values measured by a shear vane are often several orders of magnitude larger than those obtained via testing with the jet-device.

Estimating Critical Shear Stress Through the Use of Literature Values

An alternative to the measurement/calculation of τ_c, is the use of values found in the literature. Indeed, several HMPs have several HMPs have been developed through assumption of material resistance properties found in the literature based upon literature based upon a textural description of the material. An often-cited reference is Fischenich (2001), which provides a (2001), which provides a summary (compiled from the relevant literature) for critical shear strength values for various values for various materials. An extract from this reference is provided in

Figure 2-5.

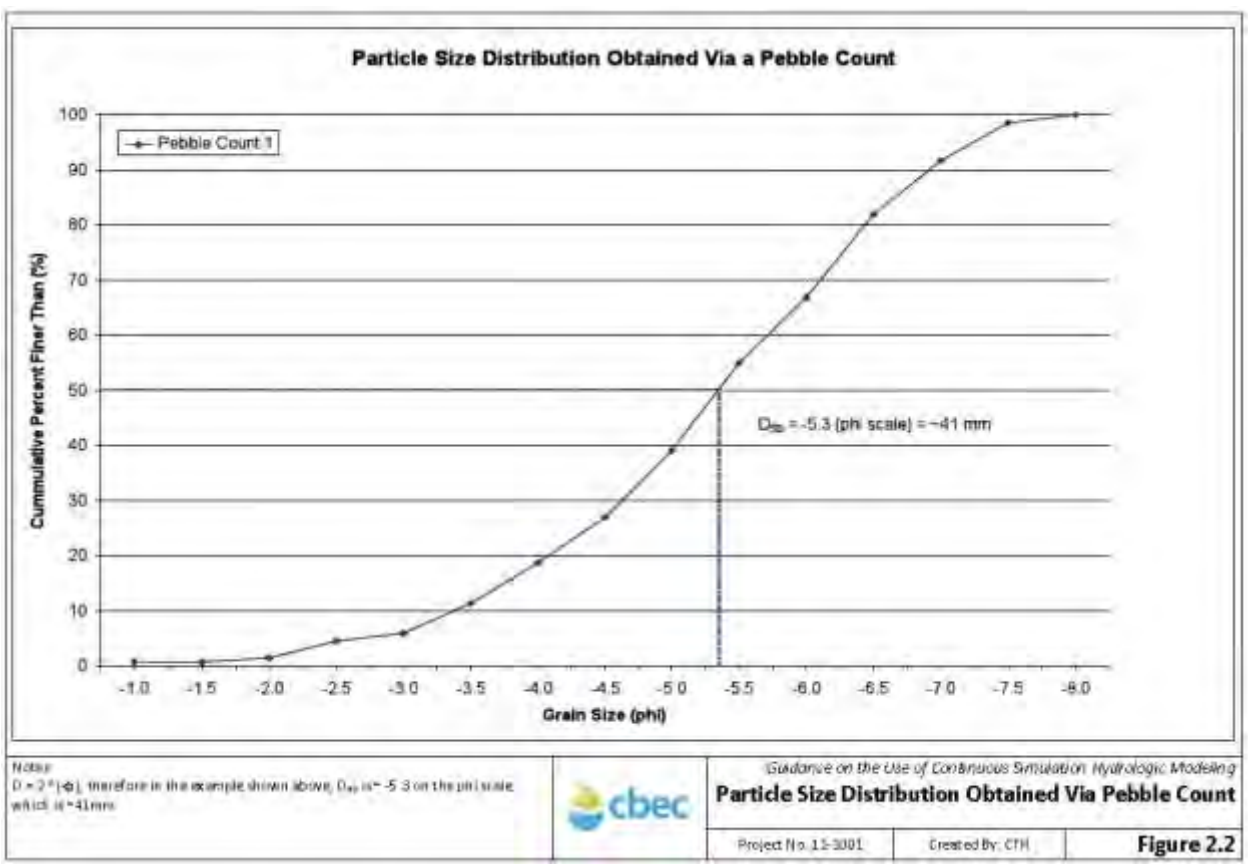

Figure 2-2. Particle Size Distribution Graph Developed from a Pebble Count

Notes:	cbec	*Guidance on the Use of Continuous Simulation Hydrologic Modeling* **Pebble Counts Being Conducted in the Field**		
		Project: 11-1001	Created By: CBB	**Figure 2-3**

Figure 2-3. Pebble Counts Being Conducted in the Field

Typical installation of jet testing equipment in stream bank

Hole created in cohesive bank material by jet impinging on surface

Notes:	cbec	*Guidance on the Use of Continuous Simulation Hydrologic Modeling* **Jet Testing Equipment Deployed in a Stream Bank**		
		Project: 11-1001	Created By: CBB	**Figure 2-4**

Figure 2-4. Jest Testing Equipment Deployed in a Stream

Table 2. Permissible Shear and Velocity for Selected Lining Materials[1]

Boundary Category	Boundary Type	Permissible Shear Stress (lb/sq ft)	Permissible Velocity (ft/sec)	Citation(s)
Soils	Fine colloidal sand	0.02 - 0.03	1.5	A
	Sandy loam (noncolloidal)	0.03 - 0.04	1.75	A
	Alluvial silt (noncolloidal)	0.045 - 0.05	2	A
	Silty loam (noncolloidal)	0.045 - 0.05	1.75 – 2.25	A
	Firm loam	0.075	2.5	A
	Fine gravels	0.075	2.5	A
	Stiff clay	0.26	3 – 4.5	A, F
	Alluvial silt (colloidal)	0.26	3.75	A
	Graded loam to cobbles	0.38	3.75	A
	Graded silts to cobbles	0.43	4	A
	Shales and hardpan	0.67	6	A
Gravel/Cobble	1-in.	0.33	2.5 – 5	A
	2-in.	0.67	3 – 6	A
	6-in.	2.0	4 – 7.5	A
	12-in.	4.0	5.5 – 12	A
Vegetation	Class A turf	3.7	6 - 8	E, N
	Class B turf	2.1	4 - 7	E, N
	Class C turf	1.0	3.5	E, N
	Long native grasses	1.2 – 1.7	4 – 6	G, H, L, N
	Short native and bunch grass	0.7 - 0.95	3 – 4	G, H, L, N
	Reed plantings	0.1-0.6	N/A	E, N
	Hardwood tree plantings	0.41-2.5	N/A	E, N
Temporary Degradable RECPs	Jute net	0.45	1 – 2.5	E, H, M
	Straw with net	1.5 – 1.85	1 – 3	E, H, M
	Coconut fiber with net	2.25	3 - 4	E, M
	Fiberglass roving	2.00	2.5 - 7	E, H, M
Non-Degradable RECPs	Unvegetated	3.00	5 - 7	E, G, M
	Partially established	4.0-6.0	7.5 – 15	E, G, M
	Fully vegetated	8.00	8 – 21	F, L, M
Riprap	6 – in. d_{50}	2.5	5 – 10	H
	9 – in. d_{50}	3.8	7 – 11	H
	12 – in. d_{50}	5.1	10 – 13	H
	18 – in. d_{50}	7.6	12 – 16	H
	24 – in. d_{50}	10.1	14 – 18	E
Soil Bioengineering	Waffles	0.2 – 1.0	3	C, I, J, N
	Reed fascine	0.6-1.25	5	E
	Coir roll	3 - 5	8	E, M, N
	Vegetated coir mat	4 - 8	9.5	E, M, N
	Live brush mattress (initial)	0.4 – 4.1	4	B, E, I
	Live brush mattress (grown)	3.00-8.2	12	B, C, E, I, N
	Brush layering (initial/grown)	0.4 – 6.25	12	E, I, N
	Live fascine	1.25-3.10	6 – 8	C, E, I, J
	Live willow stakes	2.10-3.10	3 – 10	E, N, O
Hard Surfacing	Gabions	10	14 – 19	D
	Concrete	12.5	>18	H

[1] Ranges of values generally reflect multiple sources of data or different testing conditions.

A. Chang, H.H. (1980). B. Florinsth. (1982) C. Gerstgraser, C. (1998) D. Goff, K. (1999). E. Gray, D.H., and Sotir, R.B. (1996). F. Julien, P.Y. (1995). G. Kouwen, N., Li, R. M., and Simons, D.B., (1980). H. Norman, J. N. (1975). I. Schiechtl, H. M. and R. Stern. (1996). J. Schoklitsch, A. (1937) K. Sprague, C.J. (1999). L. Temple, D.M. (1980). M. TXDOT (1999) N. Data from Author (2001) O. USACE (1997)

ERDC TN-EMRRP SR-29 Fischenich, C. 2001. Stability thresholds for stream restoration materials. EMRRP Technical Notes Collection (ERDC TN-EMRRP-SR-29). U.S. Army Engineer Research and Development Center, Vicksburg, MS. 5

Notes:

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Guidance on the Use of Continuous Simulation Hydrologic Modeling

Permissible Shear Strength and Velocity for Selected Lining Materials

Project No:11-1001 | Created By: CBB | **Figure 2-5**

Figure 2-5. Permissible Shear and Velocity for Selected Lining Materials

DETERMINATION OF CRITICAL FLOW (Q_c)

For a specific set of hydraulic conditions at a location (i.e., cross sectional shape, channel slope, bed and bank roughness), the flow rate at which critical shear values are reached can be calculated. These calculations can be made with a programed spreadsheet analysis, or with a hydraulic model (e.g., HEC-RAS, Brunner 2010). Because of their ease of use and the ease at which multiple flow rates can be assessed (in order to determine when τ_c is reached), hydraulic models are typically employed for this part of the analysis. Average boundary shear stress is calculated with the following equation:

$$\tau = \rho g R s$$

where *p* represents the density of water, *g* represents the gravitational constant, R represents the hydraulic radius (defined as the wetted area dived by the wetted perimeter), and *s* represents the slope. For wide channels the value of the hydraulic radius is approximately equal to the average depth of the cross section. The hydraulic model calculates the value for R for a given discharge based on the channel dimensions.

Typically one-dimensional approximations are used for this analysis, which means that the value of Q_c determined is that where the cross sectional average of τ_c is reached, not the highest value which is occurring at the deepest point of the cross section. This is typically considered reasonable because the grain size is determined for the bed of the cross section, not just the shallow or deep area.

Analyses can be conducted at a station, or in other words just looking at one cross section in isolation using normal depth calculations, or within a larger hydraulic model constructed for the entire reach (i.e., multiple distributed cross sections upstream and downstream of the location of interest). The advantage of looking at the cross section of interest within the context of the entire reach is that conditions downstream (e.g. a constriction which causes a backwater condition) may affect the flow depth (or hydraulic radius), yielding different results than would be obtained if the cross-section was analyzed in isolation.

It is important that the determination of τ_c (via pebble count or other means) and the hydraulic calculations to determine Q_c, occur at the same location. Typically the analysis is undertaken at a riffle because these are the high points of a long profile and are what are controlling incision in the system. Bed material characterization in a pool is much more difficult (because of the depth of water), in addition the resulting calculated shear values are typically much higher, because of the added depth.

If HEC-RAS is used (which is typical), the way the bank markers are set can have a dramatic influence on the calculated shear results. The bank markers are used to delineate differences in roughness across the channel and flood plain (typically higher values are used on the lateral margins to include the influence of vegetation roughness in the resulting depth calculations). The shear values calculated by HEC-RAS are segregated by these bank markers, and thus may include values for each of the floodplains as well as the channel. If bank markers are set too wide, and the shear stress calculation may include a portion of the floodplain too, and subsequently the conditions in the actual channel will be greatly underestimated. Remember that the model is essentially using the average depth for the entire cross section (as limited by the bank markers), so including floodplain with shallow depths greatly influences the average depth and thus the resulting calculated shear value.

DETERMINATION OF Q_2

The determination of a value of Q_2 is the third and final piece of the equation used to determine what percent of Q_2 the lower threshold should be. As with the other two pieces, several options are available, and again the decision on what method is used can have a profound influence upon the final results. Q_2 can be determined through the results of a calibrated and validated hydrologic model (e.g., HEC-HMS, HSPF, SWMM, etc.) which uses precipitation, sub basin area, soil conditions, etc. to calculate a runoff hydrograh. This type of model can be used in one of two ways, to simulate a single precipitation event or to simulate a long term (e.g., 50 year) precipitation record. The first approach produces a single runoff hydrograph resulting from a "design" storm, from which the peak magnitude can be determined. As such the results are largely controlled by the precipitation hyetograph, so a good understanding of how that was developed is important. This method has been used considerably less than the approach detailed below. The advantage of this method is that, if any existing model has already been developed (e.g., SacCalc; DFCE 2001), it will be cheaper and easier for an agency to review. However, it can yield different values for Q_2, due to differing assumptions employed in the modeling.

The second method uses a long-term precipitation record for simulation which results in a flow record containing a large number of runoff events of varying magnitudes (i.e., which are subsequently analyzed to determine the magnitude of the 2 year recurrence interval event). This method is more typical for HMP assessments, but again methodical decisions can have a large influence on the results. The rigor of the model calibration and validation has a strong influence. If the model is not representing through simulation what is actually occurring, then the simulation results are questionable.

Assuming the model has been calibrated and satisfactorily validated or verified, the manner in which the simulated runoff record is analyzed is important. The first basic distinction is whether an annual maximum series (AMS) or a partial duration series (PDS) is used. In an AMS analysis, just the single largest flood peak of any given year is used in the analysis, and the second and third largest events of the year are ignored. This is the method typically utilized when analyzing the flood frequency of large, less frequently occurring flood events. In the second approach, PDS, multiple flood events are considered in any given year. This is important when the second or third largest flood events in one year are greater than the annual maximum of another year. Because more large events are included, the resulting estimate of the given return period event (e.g., Q_2) is larger. For example, Langbein (1960) showed that a 1.45 year event determined with PDS is the same magnitude as a 2 year event with an AMS, and a 2 year event determined with PDS is a 2.54 year event with an AMS. Thus the value of Q_2 determined by PDS is larger than the value of Q_2 determined by AMS. While significant differences are apparent for smaller magnitude, more frequently occurring events (e.g., Q_2), for return periods greater than 10 years, there is almost no difference between the results obtained from the AMS and PDS.

When compiling a PDS for a recurrence interval analysis, the manner in which events are identified as independent can also have an effect upon the results. One typical method is to include all flood peaks above a certain base magnitude. This base value is often selected as equal to the lowest annual maximum flood of record, however can also be chosen such that the PDS only contains as many peaks as

there are years of record. Some analysts have established a base value (e.g., 0.002 cfs/acre), and then added a duration below this base value as well (i.e., flow must be below 0.002 cfs/acre for at least 24 hours for events to be considered independent). One additional method is to identify individual events by extracting the highest peak (not just the maximum value) within a moving time window (e.g., 3 days), and therefore determine independence through time, rather than the discharge rate receding to a non-storm condition. With all of these options available, and no prescribed standard, the use of a PDS can have different Q_2 results even if an identical flow time series is used.

SUMMARY

The determination of the lower flow threshold, defined as a percentage of Q_2, is heavily influenced by three primary inputs: τ_c, Q_c, and Q_2. The determination of each of these values is sensitive to a variety of factors determined by the particular methodology. To demonstrate the sensitivity of the lower flow threshold to methodological decisions, a few examples are provided below.

- If 0.06 is used rather than 0.03 for Shields parameter in Shields relationship, τ_c increases, subsequently Q_c increases and ultimately the lower limit increases
- If bank markers are set too wide (including the floodplain and not just the channel) in the hydraulic analysis, a larger value for Q_c is calculated (because of a reduction of the hydraulic radius due to the inclusion of extensive shallow floodplain areas), resulting in an increase of the lower limit.
- If an annual maximum series is used in place of a partial duration series, the calculated Q_2 will be less than that obtained by a PDS analysis, and the ratio of Q_c to Q_2 will be higher if the AMS is used.

3. DEVELOPMENT OF EVALUATION CRITERIA

FLOW DURATION CONTROL AND PEAK FLOW CURVE MATCHING

Flow Duration Control (FDC) and Peak Flow Curve (PFC) matching criteria in their current form for many counties in CA are similar in form to the curve matching criteria from WA (WADOE, 2001). The curve matching criteria typically include a goodness of fit or variance due to the difficulty in achieving a precise match across the range of flows. The criteria are typically applied at the subwatershed scale based on continuous simulation flow results for pre- and post-project conditions to size individual BMP or LID features. In this instance, flow matching at the subwatershed scale assumes that there are no routing or timing effects in the treated runoff when it rejoins the receiving waterbody; however, this may not be true in all cases. For example, if treated runoff is delayed and rejoins the upstream runoff such that there is an increase in flow rates and durations or an increase in the peak flows in the receiving waterbody, then there is the potential to impair the receiving waterbody. To address this potential concern, the FDC and PFC criteria could be applied to the routed flows in the receiving waterbody as a

check.

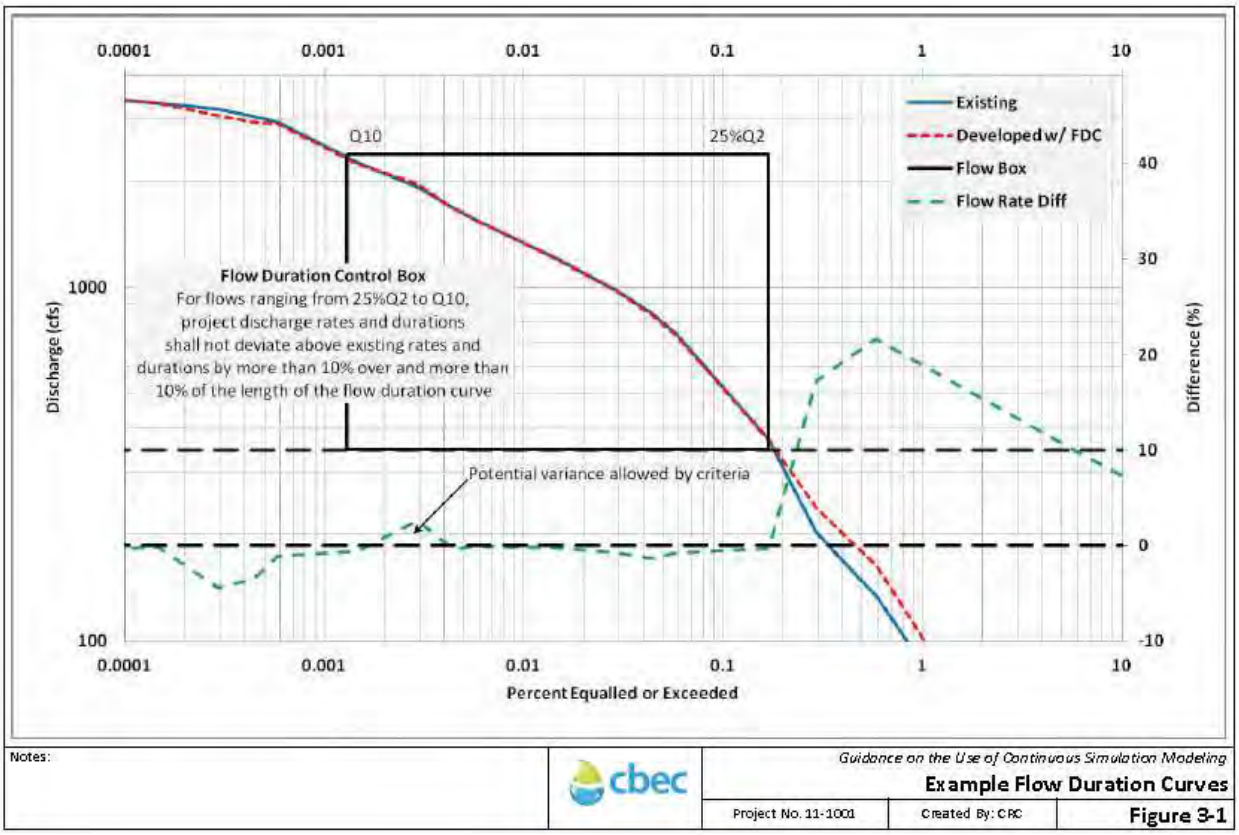

Figure 3-1 shows an example of FDC matching on the routed flows within a receiving waterbody with an example of the variance allowed by the criteria. However, it is cautioned that the FDC variance (e.g., "…by more than 10 percent over and more than 10 percent of the length…") may need to be reduced to something less than 10 percent (perhaps based on a ratio of watershed areas) to account for cumulative effects if there remain the potential for continued development in the watershed.

EROSION POTENTIAL

Erosion Potential (EP) is an index to indicate the impact of increased flows on stream stability and is based on bed mobility and an integration of work (as a function of velocity and excess shear stress in the channel only) over time, expressed as a ratio of post-project work divided by pre-project work in the receiving waterbody. Total work is based on integrating effective stream power as:

$$W = \sum_{i=1}^{n} (\tau_i - \tau_c)^e \cdot V_i \cdot \Delta t_i$$

where W is the total work done (ft-lbf/ft^2), τ is the average channel shear stress, τ_c is the critical shear stress to initiate erosion, e is an exponent varying from 1 to 2.5 to account for the exponential rise in stream power with flow, V is the velocity (ft/sec), and Δt is the numerical time step (sec). The EP index is then calculated as the ratio of W_{dev} / W_{ex} where W_{ex} and W_{dev} is the total work for existing and developed conditions, respectively. EP can be calculated at any location in the waterbody based on

continuous simulation time series of flow, velocity, and excess shear stress in the channel as derived from hydraulic model outputs.

EP criteria are not widely integrated into HMPs. Notably Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP) included EP criteria in their HMP, but in so much as it was used to inform their overall management objective (i.e., post-project runoff shall not exceed estimated pre-project rates and/or durations) and the development of their FDC / PFC criteria. In the SCVURPPP (2005) final HMP, an EP ratio <= 1.0 was recommended as the instream target value to be maintained for stream segments downstream of the point of discharge for HMP management. From a risk management perspective, the chance of a stream becoming unstable at an EP of 1.0 is 9%, meaning that 1 in 11 streams could become unstable even with controls (SCVURPPP, 2005). As such, instream EP must be evaluated considering the effects of the cumulative changes that have or may take place in the watershed.

Even though EP criteria are not widely promoted in county HMPs, that does not preclude analyses based on EP from being used, especially when instream measures permit more robust geomorphic analyses (e.g., SCVURPPP final HMP; SSQP draft HMP). While EP analyses are more time and data intensive, there is the potential outcome to discharge runoff at higher rates and durations than FDC / PFC criteria would allow, thus resulting in possibly smaller onsite measures. The time and data intensiveness of EP analyses stem from the need to evaluate the hydraulic and geomorphic conditions of the receiving waterbody to be protected at multiple locations based on continuous simulation hydraulic model outputs and geomorphic data. Potential hydraulic model considerations when performing EP calculations are addressed below.

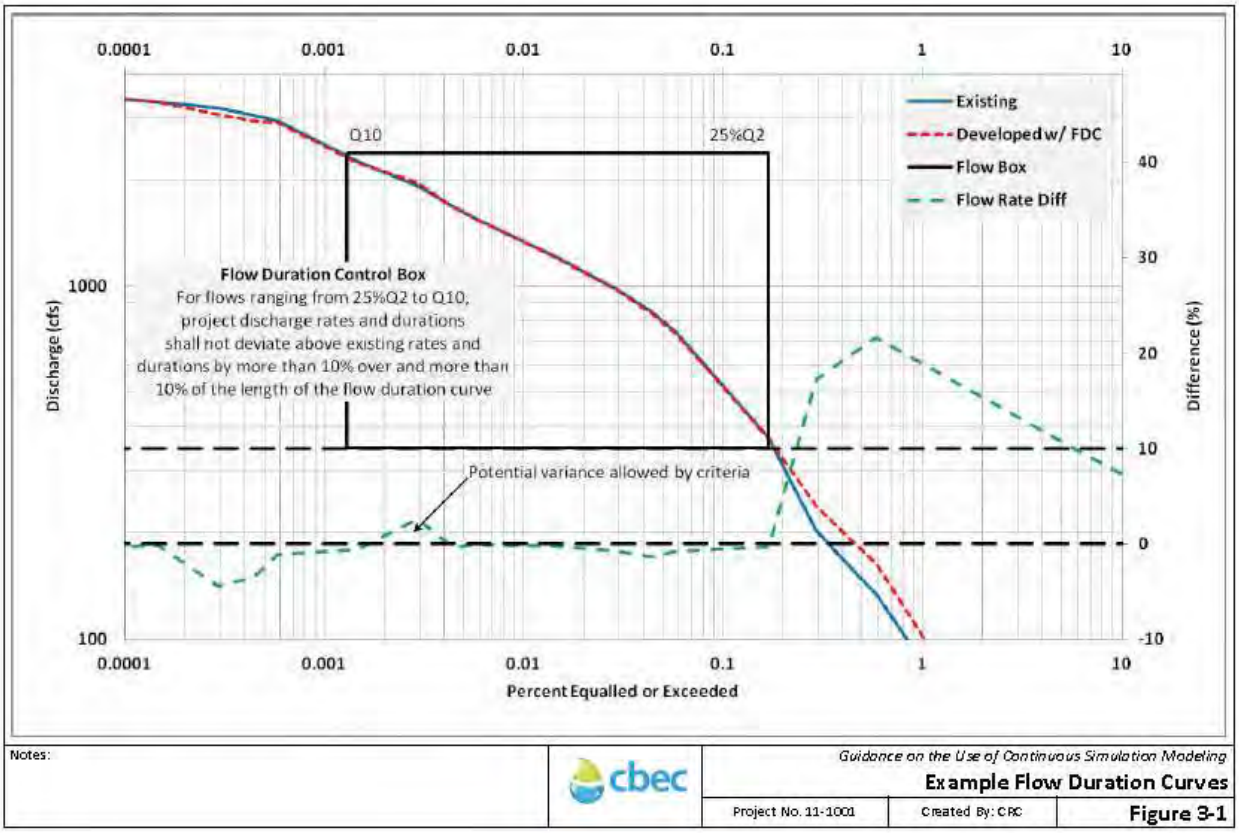

Figure 3-1. Example Flow Duration Curves

4. DATA REQUIREMENTS FOR CSM AND HYDRAULIC ANALYSIS

Hydrologic models capable of performing long-term continuous simulation to support HMPs include, but are not limited to, HSPF, HEC-HMS soil moisture accounting (SMA) method, and other hydrology models, such as the Bay Area Hydrology Model (BAHM). The first two are public domain software models and the third is a proprietary software model customized for specific counties that uses HSPF as its computational engine. A fourth modeling tool based on continuous simulation results, and also using HSPF as its computational engine, are the suite of BMP sizing calculators specifically designed for HMP management for select counties. These have been developed for Contra Costa and San Diego County and Sacramento County (in draft form). All four suites of models use site conditions (i.e., topography, soils, vegetation, and land use) and long-term precipitation data to calculate the various components of the hydrologic cycle (i.e., infiltration, surface runoff, soil moisture, evapotranspiration, percolation, interflow, and groundwater). Specific details about each model and model comparisons (e.g., TetraTech, 2011) are not discussed here, but can be reviewed in available literature.

Following model selection, hydrologic models are created for existing and project conditions based on various considerations, some of which are discussed in subsequent sections. For project conditions, county specific HMP measures need to be specified to manage project runoff to meet the evaluation criteria identified above. The BMP sizing calculators and BAHM-type hydrology models do have optimization routines to size BMP and LID measures. Automatic sizing allows for efficient and quick sizing of such features based on county specific, model specific (e.g., the sizing calculator for San Diego and Contra Costa County is based on pre-defined sizing factors such that site specific continuous simulations do not need to be performed, and is limited to drainage management units of less than 100 acres), and user-defined (e.g., the BAHM-type hydrology models require site specific continuous simulation with a wide selection of measure configurations) assumptions and limitations. As standalone models, HSPF and HEC-HMS offer flexibility as it relates to model configuration, model inputs, and user-defined parameters. However, these models do not have optimization routines to size various BMP and LID measures, thus requiring manual iteration to achieve a satisfactory solution.

PRECIPITATION DATA

Long-term precipitation data in the range of 30 to 50 years is typically needed to generate a sufficiently long flow record from which FDC and PFC analyses and/or subsequent hydraulic analyses can be performed. The precipitation data observation interval should ideally be no coarser than hourly, and if available, can be sub-hourly (e.g., 15 minutes) to coincide with a finer continuous simulation time step.

The precipitation data should ideally be located near the project site, and if needed, scaled to the project site based on a ratio of mean annual precipitation as derived from county specific mapping or regional sources (e.g., PRISM [http://www.prism.oregonstate.edu/]) and reviewed to ensure that it captures key IDF characteristics from county specific mapping or regional sources (e.g., NOAA Atlas 14 [http://www.nws.noaa.gov/oh/hdsc/index.html]). A variety of precipitation data sources exist, and include, but are not limited to:

- ALERT system for individual counties (e.g., Sacramento [http://www.sacflood.org/])
- Western Region Climate Center (WRCC [http://www.wrcc.dri.edu/])
- NOAA National Climatic Data Center (NCDC [http://www.ncdc.noaa.gov/])
- California Irrigation Management Information System (CIMIS [http://wwwcimis.water.ca.gov/])

HYDROLOGIC SIMULATION TIME STEP

The continuous simulation time step and output reporting interval for the four models identified above has traditionally has traditionally been hourly. However, an hourly time step is often significantly larger than the time of concentration for concentration for developed subwatersheds relative to existing subwatersheds, especially those commonly configured commonly configured developed subwatersheds that are limited to less than 100 acres. The sizing calculator and BAHM-type calculator and BAHM-type models are hardwired at hourly, but the public domain software still affords the user to go to a the user to go to a finer time step. As such, a sub-hourly time step and output reporting interval is preferred in order to preferred in order to adequately resolve and sample flow from developed subwatershed elements where time of where time of concentrations are typically less than one hour. As shown by

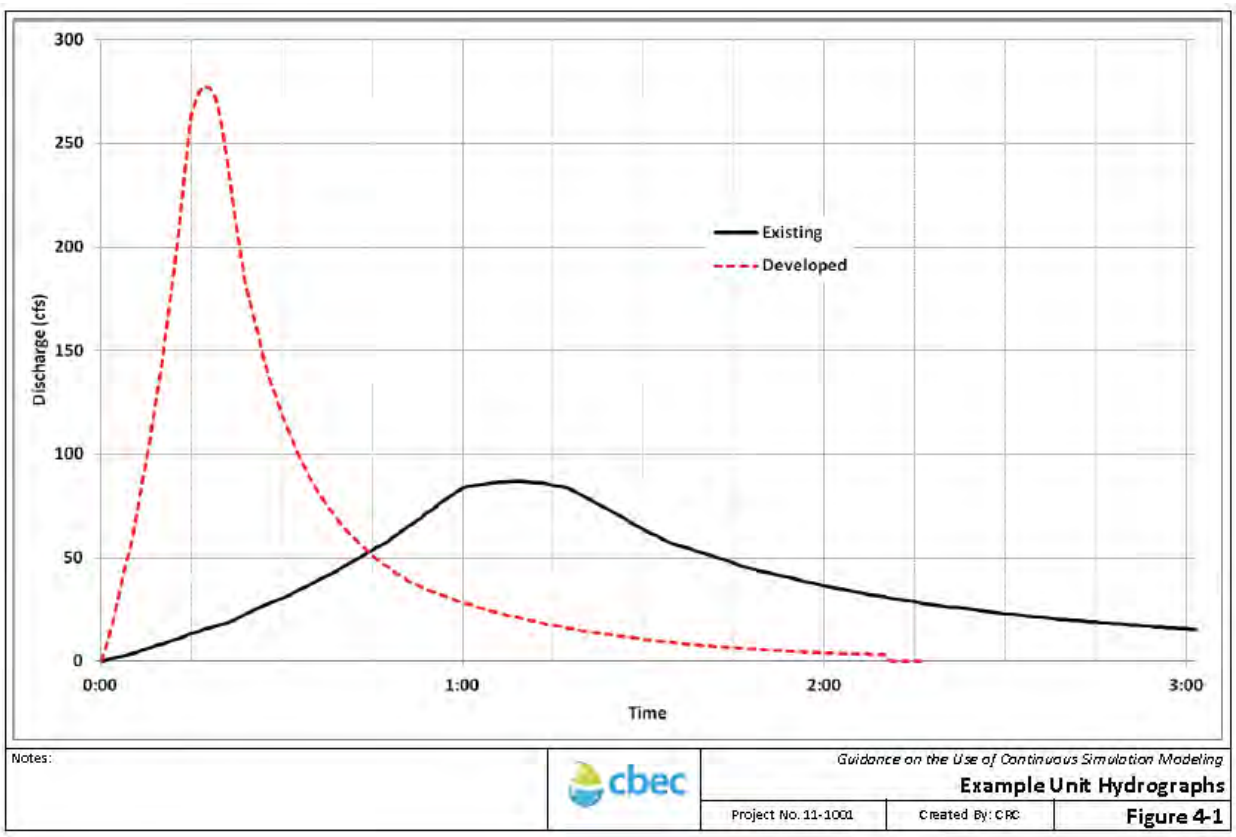

Figure 4-1 for a typical developed subwatershed, the unit hydrograph for developed conditions is flashier, peaks quicker (well within one hour), and the recession limb becomes small quickly. While a sub-hourly time step and output reporting interval may not be desirable due to the volume of model output that will be generated, it is possible to bias the results in favor of the developed condition due to under sampling of the flashier and larger developed flows under an hourly time step.

HYDROLOGIC MODEL CALIBRATION AND VALIDATION

In developing continuous simulation models, the model parameters describing soil characteristics, land use descriptions, and evapotranspiration should be derived from published data (e.g., soil survey, local studies, county standards, etc.). These parameters should be calibrated and validated, where applicable, by comparing modeled flows to measured or observed flows with the receiving waterbody for specific overlapping periods when there is adequate precipitation, evapotranspiration, and flow data. In the absence of site-specific data for calibration and validation, calibrated model parameters from neighboring watersheds within the region could be used so long as proper justification is provided that said parameters are appropriate. However, it is not recommended that local studies rely upon calibrated parameters from other regions where soil characteristics and land use descriptions are markedly different. Rather, when calibration cannot be performed, general review and comparison of continuous simulation model outputs (e.g., hydrograph shape, AMS, etc.) to standardized event-based approaches could be performed to demonstrate that continuous simulation results are generally consistent with local standards and methodologies.

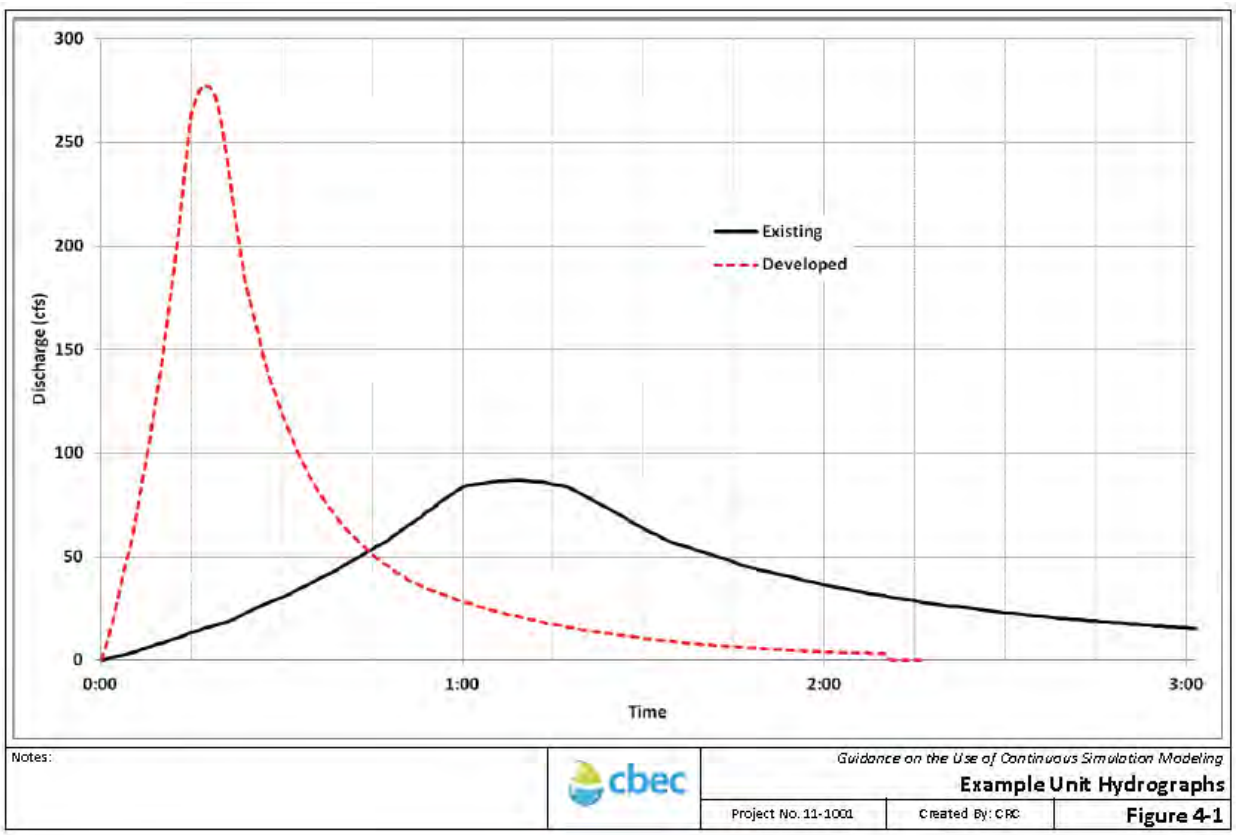

Figure 4-1. Unit Hydrograph Method

For example, continuous simulation modeling in Sacramento County for some developments has relied up conversion of SacCalc (HEC-1 pre- and post-processor) event-based models to the SMA method within HEC-HMS. This conversion often involves retaining the surface infiltration rate determined by SacCalc based on accepted land use descriptions, but parameterizing the subsurface based on soil survey information and local studies, using local potential evapotranspiration data, and reviewing model hydrographs for reasonableness.

HYDRAULIC MODEL CONSIDERATIONS

Sometimes hydraulic models are needed since the basic flow routing within the hydrologic models is not adequate to characterize the potential changes to the hydraulic and geomorphic character of the receiving waterbody, especially when instream measures are suggested or EP is used as the evaluation criteria. Potential considerations and issues encountered when developing and using hydraulic models for continuous simulation include:

1. Low flow instabilities can introduce anomalies into model output (which is commonly encountered in HEC-RAS), so careful hydraulic model selection is important for accuracy and efficiency
2. The sensitivity of the hydraulic model outputs (i.e., velocity and shear stress) to accurate hydraulic description of the receiving waterbody (i.e., cross section geometry (i.e., is it based on LiDAR influenced by vegetation or ground survey), proper definition of channel transitions, proper definition of channel bank markers, appropriate Manning's n-values, etc.)
3. Selection of appropriate compliance points that are representative of the reach and capture flow changes (e.g., downstream of points of discharge and not in backwater areas).

All of these issues have the potential to introduce error and subjectivity into long-term hydraulic analyses and care should be taken to systematically address each source of error.

GENERAL TIPS

A series of general tips are provided as follows. These can be used to increase efficiency and accuracy when performing CSM.

- To shorten the simulation time, the precipitation record can be truncated to only the rainy season (e.g., October through May) by removing the dry summer months from the simulation, especially in ephemeral systems where applicable.
- Hourly precipitation data does not prohibit the continuous simulation model from being run at a sub-hourly time step.
- Subwatershed delineation between existing conditions and developed conditions can often result in relatively large existing subwatersheds compared to relatively small developed subwatersheds. It is commonly known that smaller subwatersheds have flashier flows, so making existing and developed conditions subwatershed sizing consistent is recommended to provide a more meaningful comparison.

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APPENDIX B: APPLICATION OF SUITES OF MODELING AND ASSESSMENT TOOLS

Introduction. This appendix provides a discussion of four example "suites of tools" that can be used to perform predictive scientific assessments and address specific questions related to hydromodification assessment and management. The suites are changeable mixes of mechanistic models, statistical analyses, and expert scientific judgment that incorporate a number of the tools discussed in Chapter 4, combined in various ways. For example, some suites apply a series of cascading models, in which the output from one is used as input to the next; other suites apply a number of models in parallel to develop an assessment based on the weight of evidence. The suites of tools discussed below are used to perform a baseline stability assessment, a channel forming discharge analysis, an erosion potential analysis, and a sediment transport analysis. Most of these standard tools (with the exception of the erosion potential suite) have been widely employed in a variety of stream management activities for decades, and are considered essential components of the broader fluvial geomorphology toolbox. This is far from a comprehensive list of tools, as there are many other important tools (focused on both geomorphic and biologic endpoints) relevant to hydromodification management (Kondolf et al. 2003; Poff et al. 2010); however, the purpose of this appendix is to briefly illustrate how several standard tools can be integrated to answer key questions about stream responses and to provide a stronger technical basis for hydromodification management.

Application of these tools provides basic geomorphic data and knowledge that are typically needed to manage a stream for some desired future state in a watershed with changing land uses. This critical information comes at a cost—the tools require substantially more time and effort to apply than has been the norm in hydromodification management because they involve examining streams within their watershed context with a deeper level of geomorphic analysis. Stormwater management programs typically have made the "practical" assumptions that stream reaches can be managed in isolation from the larger systems of which they are a part, and that effective management prescriptions can be formulated with little or no substantive geomorphic analysis. ***These assumptions are in direct conflict with current understanding in fluvial geomorphology and stream ecology, which indicates that protection of stream integrity is often predicated upon careful assessments of geologic and historical context, performing detailed hydraulic and sedimentation analyses where appropriate, and developing basic understanding of streamflow-ecology linkages***. If hydromodification management policies are to have a reasonable chance of actually achieving their aims, then it will most likely be necessary to reject these simplifying assumptions and instead rely on approaches rooted in current scientific understanding of stream systems.

The suites of tools described below go beyond screening level assessments that are designed, in part, to identify which streams lend themselves to relatively straightforward management prescriptions versus which streams do not. For streams that do not lend themselves to generic management prescriptions, the level of analysis performed with these tools should increase with the level of risk and geomorphic / biologic susceptibility of the streams. This does not mean that every stream will require in-depth analysis by local permitting agencies. It is not possible to carry out sufficient geomorphic analyses with the tools illustrated below on a permit-by-permit basis, and local governments may lack the resources and/or technical capacity to effectively apply these tools. Instead, ***the vital information provided by these tools***

will need to be obtained through proactive regional studies that involve baseline assessments followed by progressively more in-depth analyses as necessary to provide local governments with a sound basis for effective project-by-project decision-making within a broader watershed management framework.

1. **Baseline Stability Assessment**. This suite of tools is designed to answer the following key questions:
   - What is the trajectory of the stream's form over time?
   - How has the channel form responded to changes in water and sediment supply over the years?
   - Is the channel close to a geomorphic threshold that could result in rapid, significant change in response to only minor flow alteration?
   - How can past channel responses provide insight into potential responses to future watershed change, and so aid in prediction of future hydromodification-induced changes?
   - What level of subsequent geomorphic analysis is appropriate given the complexity of the situation and the susceptibility of the streams of interest?

   The goals of a baseline stability assessment are to:
   - Document the historical trends of the system;
   - Establish the present stability status of the system and identify the dominant processes and features within the system;
   - Provide the foundation for projecting future trends with and without proposed project features;
   - Provide critical data for calibration and proper interpretation of models; and
   - Provide a rational basis for identification and design of effective alternatives to meet project goals.

   The key tools that comprise this suite include:
   - GIS mapping of topography, soils, geology, land use/land cover across the contributing watershed (e.g., Thorne 2002)
   - Analysis of hydro-climatic data, e.g. streamflow gauge records, changes in stage-discharge relationships over time (e.g., Thorne 2002)
   - Analysis of aerial photos and historical data (e.g., Thorne 2002)
   - Field reconnaissance (e.g., Thorne 1998)
   - Qualitative response (e.g., Lane 1955b, Schumm 1969, Henderson 1966 relations)
   - Classification systems - (e.g., Thorne 1997; Schumm et al. 1982; and channel evolution model developed for S CA by Hawley et al. in press)
   - Relationships between sediment transport and hydraulic variables
   - Regional hydraulic geometry (e.g., Hawley 2008; Haines in prep)
   - Regional planform and stability predictors (e.g., Hawley et al. in press, Bledsoe et al. in press, Dust and Wohl 2010)

- Bank stability analysis (e.g., BSTEM http://www.ars.usda.gov/Research/docs.htm?docid=5044, Hawley (2009), Bledsoe et al. in press, Osman and Thorne 1988; Thorne et al. 1998)
- Sediment budgets (Booth et al. 2010; Reid and Dunne 1996)
- Fluvial audit (Thorne 2002 – a comprehensive framework for performing baseline assessments)

A baseline assessment is completed by integrating information from all the available data sources and analytical tools. Analysis with each of the individual tools may yield a verdict of aggradation, degradation, or dynamic equilibrium with respect to the channel bed, and stable or unstable with respect to the banks. The individual assessments can produce contradictory results. In this case, one should assign a level of confidence to the various components based on the reliability and availability of the data, and the analyst's own experience level. As is often the case in the management of fluvial systems, there is no "cookbook" answer, and we must always incorporate sound judgment.

A process-based channel evolution model (CEM) is a particularly useful element of the baseline assessment process. A CEM aids in identifying the dominant processes and trends of channel change and provides a framework for subsequent, more detailed modeling (ASCE 2008). In some locations, CEMs have already been developed and calibrated with regional data. For example, the CSU / SCCWRP Screening Tool (Bledsoe et al. 2010) grew out of a regional CEM (Hawley et al. in press) and integrates several baseline assessment tools including regionally-calibrated braiding, incision, and bank stability thresholds, and sediment supply analysis with "Geomorphic Landscape Units" (Booth et al. 2010). In locations where a CEM has not been sufficiently defined, the baseline assessment suite of tools can provide the data and understanding needed to develop a regionally calibrated CEM.

The following are example outputs from a baseline stability assessment, including channel stability and bank stability diagrams associated with key geomorphic thresholds of management concern in the channel evolution sequence (i.e. braiding, incision, and bank failure):

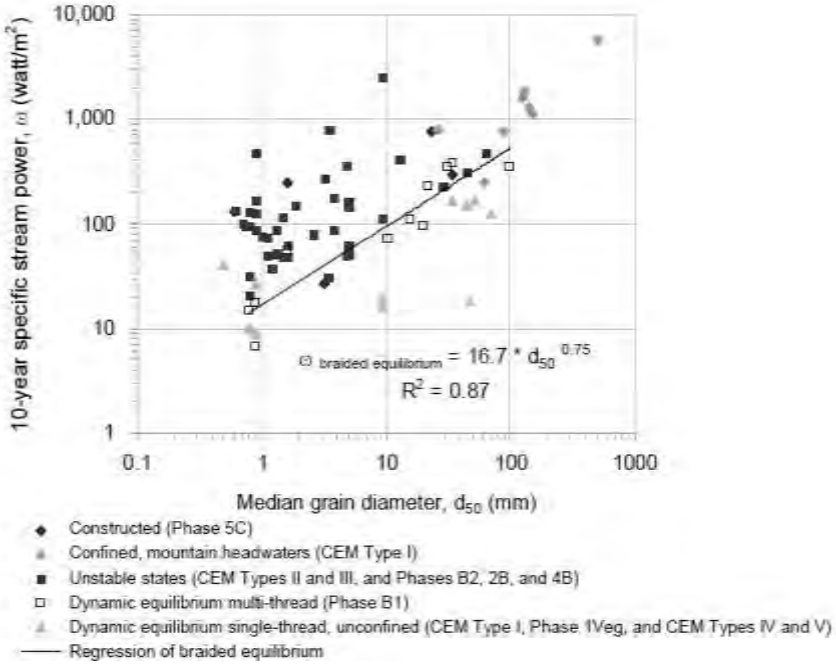

Figure B-1. Stability thresholds for channel types of southern CA, as identified through the development of a regional CEM (Hawley et al., in press).

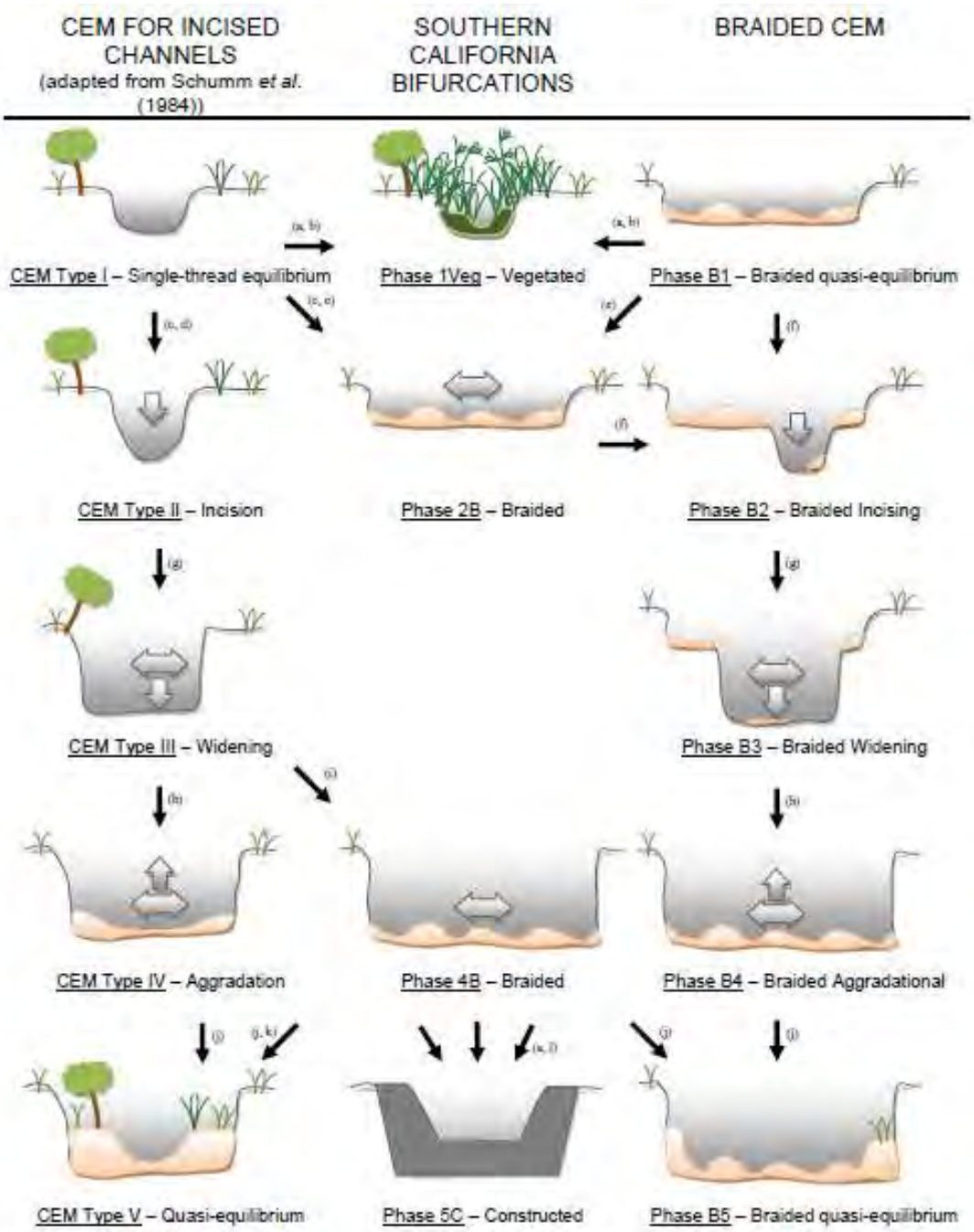

Figure B-2. Channel evolution model of response to hydromodification in southern California (Hawley et al. in press). Red and blue ovals highlight geomorphic thresholds that may be quantified using the baseline assessment suite of tools. By developing a general physical understanding of channel evolution sequences commonly observed in urbanizing watersheds of southern CA, two braiding thresholds and a bank stability threshold of management concern were identified. Channels may shift from single thread to braided planforms if widening is the dominant mode of initial adjustment. Alternatively, single thread channels may become braided after an initial period of incision that triggers geotechnical instability and failure of the banks. Quantitative predictors of these thresholds of braiding, incision, and bank failure can be developed in the baseline assessment process to evaluate the proximity of streams to these critical stages of channel evolution and instability.

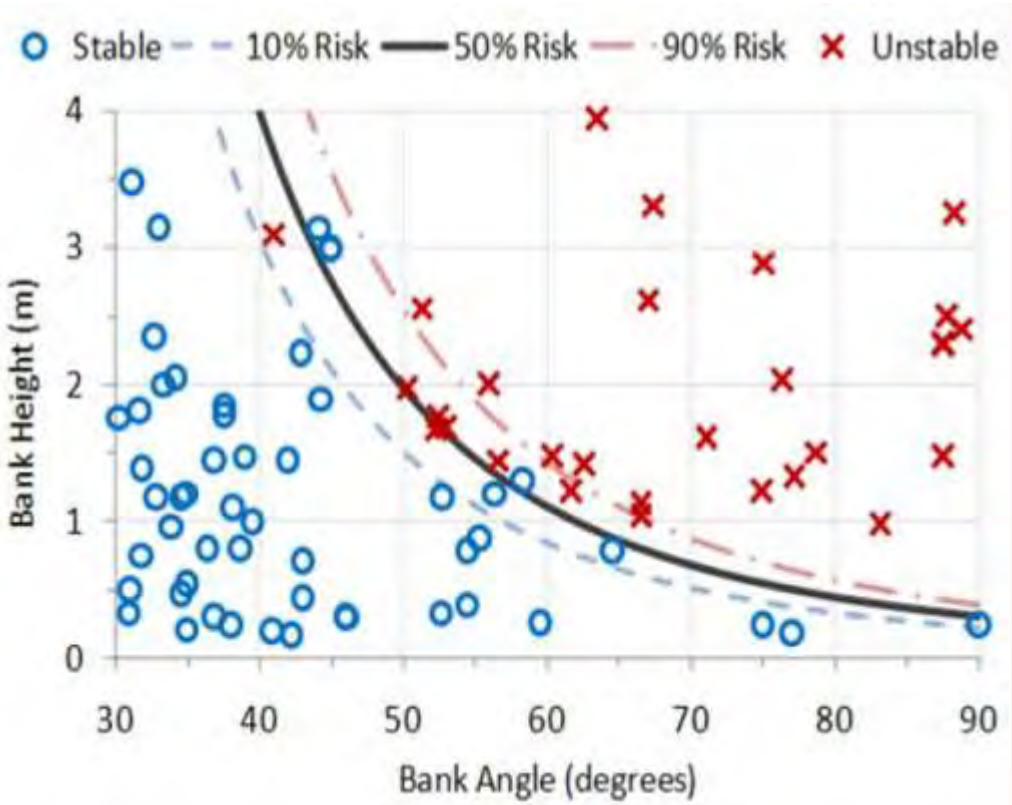

Figure B-3. Bank stability threshold for mass wasting identified through analysis of field data from southern California streams with stable and unstable banks (Bledsoe et al., in press).

2. **Channel-forming discharge suite of tools.** This suite of tools is designed to answer the following key questions:
   - What ranges of discharges are most influential in controlling channel form and processes over decadal time scales?
   - What channel-forming discharge should be used in sediment transport analyses to identify sediment transport capacity, equilibrium slope and geometry, etc.?

   The tools that comprise this suite include the following:
   - Effective discharge computations (e.g., Soar and Thorne 2001; Biedenharn et al. 2000; GeoTools – Bledsoe et al. 2007). An effective discharge analysis directly quantifies the range of discharges that transport the largest portion of the annual sediment yield over a period of many years.
   - Field identification of high water elevations, depositional surfaces, and "bankfull" features
   - Flood frequency analysis
   - Un-gauged site analysis (e.g. USGS StreamStats) http://water.usgs.gov/osw/streamstats/california.html; Hawley and Bledsoe (2011), regional flow duration curve extrapolation – Biedenharn et al. 2000)

This suite incorporates a number of parallel analyses that can be used to establish likely upper and lower bounds to the range of influential discharges, and that can be assessed through a weight-of-evidence evaluation. The following is an example output from the channel forming discharge suite of tools:

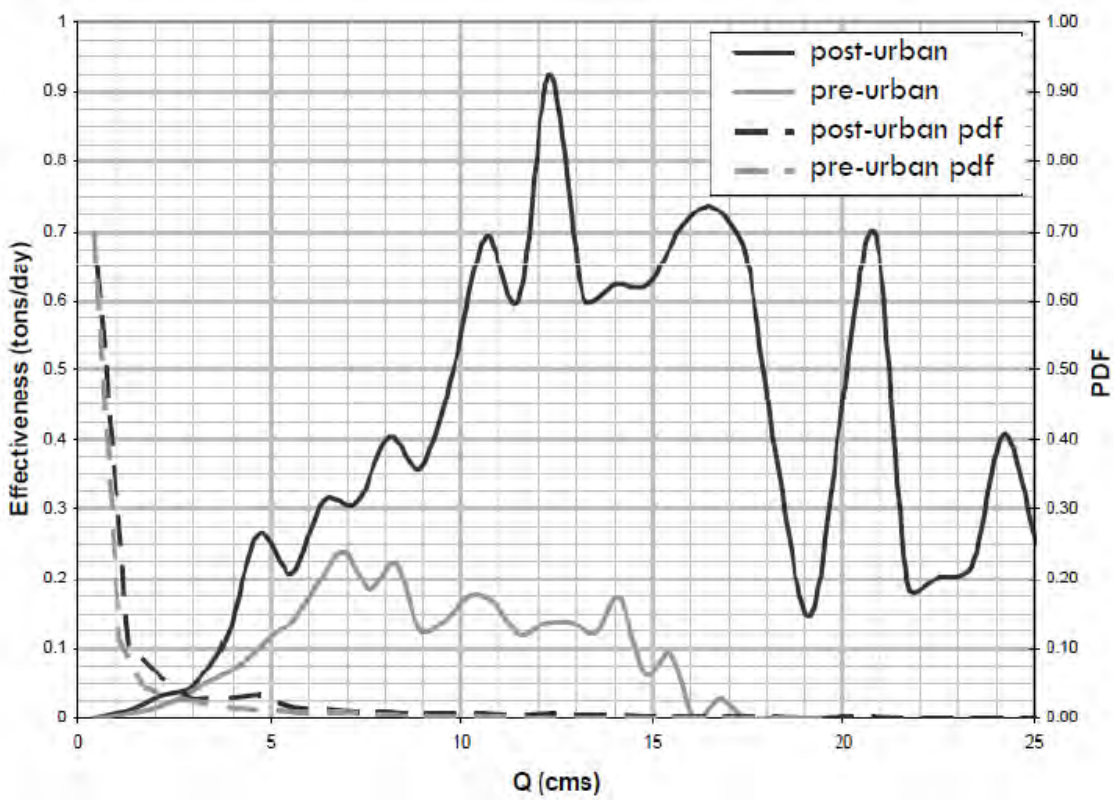

Figure B-4. Flow effectiveness curves for continuous series of pre-urban and post-urban discharges (Biedenharn et al. 2000; Bledsoe et al. 2007). Cumulative sediment yield is approximated by the area under the respective curves. If the stream bed is the most erodible channel boundary, the ratio of areas under these curves would be the erosion potential metric described below in the next suite of tools.

3. **Erosion potential suite of tools.** This suite of tools is designed to answer the following key questions:
   - How do proposed land-use changes or channel alteration affect the capacity of a channel to transport the *most erodible material in its boundary* over a period of many years (erosion potential – Ep)?
   - Do proposed mitigation approaches match the pre- vs. post- development erosion potential over the full spectrum of erosive flows?
   - Do past changes in erosion potential correspond to different states of channel stability and degradation in this region?
   - Does a proposed change in streamflow make it more likely that a channel will enter an alternative / degraded state?

The underlying premise of the erosion potential approach advances the concept of flow duration control (discussed in Chapters 2 and 3) by addressing in-stream processes related to sediment transport. An erosion potential calculation combines flow parameters with stream geometry to assess long term (decadal) changes in the sediment transport capacity. The cumulative distribution of shear stress, specific stream power and sediment transport capacity across the entire range of relevant flows can be calculated and expressed using an erosion potential metric, Ep (e.g., Bledsoe, 2002). This erosion potential metric is a simple ratio of post- vs. pre-development sediment transport capacity over a period of many years. The calculated capacity to transport sediment can be based on the channel bed material or the bank material, depending on which one is more erodible.

This Ep suite of tools has been applied in two primary ways:

a) At a project-level analysis, it has been applied to answer the first two questions above. A municipal stormwater permit may require a project design to achieve an erosion potential (Ep) value of 1.0. This means that a project must be designed so that the long-term erosion potential of the site's stormwater discharge is equal to the erosion potential of the pre-development condition. Section 3.1 below explains the process by which this analysis is conducted.
b) At a regional level, this suite of tools can be applied to answer the third and fourth questions above and to provide further guidance to project-level assessments. For example, practical engineering considerations generally require that a tolerance be permitted around a target design value. It is unlikely that a project design can match an Ep target of 1.0 across all conditions and through all stream reaches, due to variations in a multitude of contributing factors. The selection of an acceptable tolerance or variance from 1.0 is a management decision that should be informed by regional data presented in a risk-based format. Section 3.2 below explains how such a study has been conducted, using the Santa Clara Valley example from northern California.

3.1. *Project-Level Analysis.* As applied to the analysis of project impacts and mitigation design, the steps and associated tools that comprise this suite include the following (Figure B-5):

- Perform continuous simulation of hydrology (e.g. SWMM, HEC-HMS, HSPF) for the project site, for both pre-project condition and post-project condition with the proposed mitigation design.
- Convert discharges and field surveys to hydraulic parameters (shear stress and specific stream power) – e.g., for uniform flow analysis use Manning's equation, GeoTools; for varied flow analysis use HEC-RAS
- Convert hydraulic parameters into sediment transport capacity – e.g., at-a-station hydraulic geometry, HEC-RAS, GeoTools, sediment transport relationships (bedload and total load)
- Integrate Ep over time – e.g., GeoTools

- Compare Ep values for pre-development and post development to determine if the proposed mitigation design is adequate. Adjust stormwater controls as necessary to meet target Ep.

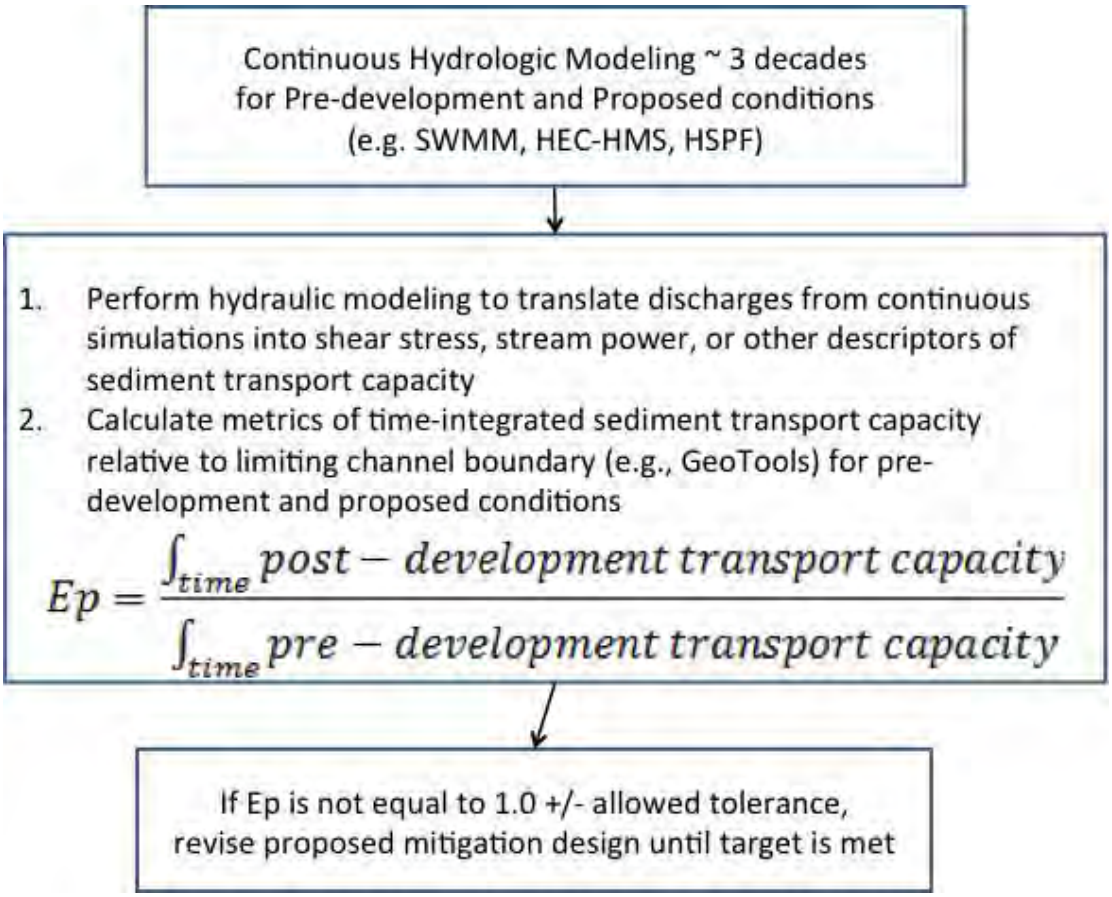

Figure B-5: Steps involved in a project-level Erosion Potential analysis

3.2. *Risk-Based Regional Analysis*. Risk-based modeling estimates the probability of stream geomorphic states. Decision-makers can then choose acceptable risk levels based on an explicit estimate of prediction error. The foundation of risk-based modeling in the context of hydromodification management is the integration of hydrologic and geomorphic data derived from the output of continuous hydrologic simulation models to generate metrics describing expected departures in the most important stream processes. These physical metrics are provided as inputs to probabilistic models that estimate the risk of streams shifting to some undesirable state. Because the decision endpoint is often categorical (e.g., stable, good habitat) the statistical tools of choice

are often logistic regression, classification and regression trees (CART), and/or Bayesian probability networks.

The steps below are used to develop a risk-based framework (Fig. B-6) for assessing how hydromodification may impact streams within a region, and for understanding the relationships between deviation from an Ep of 1.0 and the likelihood of channel instability. Illustrating figures are taken from a risk-based approach was used in the development of the Santa Clara Valley Urban Runoff Program Hydromodification Management Plan (www.SCVURPPP.org). This study demonstrated that a time-integrated index of erosion potential based on continuous hydrologic simulation and an assessment of stream power relative to the erodibility of channel boundary materials could be used to distinguish between channels of a particular regional type that are stable vs. degraded by hydromodification in urban watersheds.

- Perform project-level analysis as described in section 3.1 above for existing developments throughout the study watersheds.
- Perform stream surveys throughout the study watersheds to characterize condition (i.e., stable, unstable)
- Create statistical relationships between Ep and different channel states – e.g., logistic regression in R, SAS, Statistica, Minitab, etc. Note that standard regression techniques are applied when the dependent variable and the explanatory variables are quantitative and continuous. To analyze a binary qualitative variable (e.g., 0 or 1, stable or unstable, healthy or degraded) as a function of a number of explanatory variables, alternative techniques must be used. The regression problem may be revised so that, rather than predicting a binary variable, the regression model predicts a continuous probability of the binary variable that stays within 0–1 bounds. One of the most common regression models that accomplishes this is the logit or logistic regression model (Menard, 1995; Christensen, 1997).

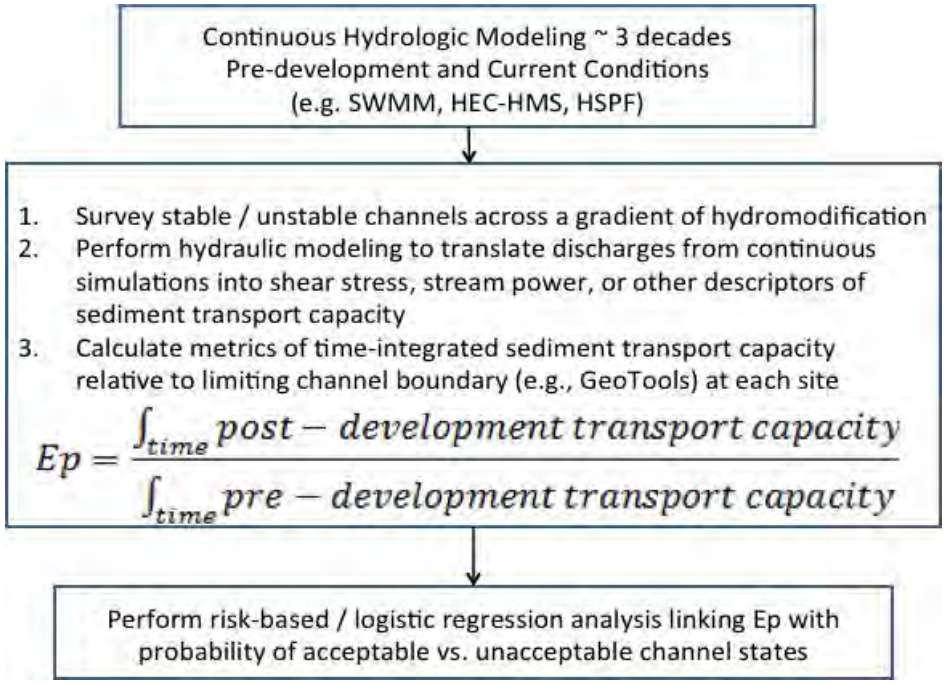

Figure B-6: Steps involved in a Risk-Based Erosion Potential analysis

The variables included in risk-based models of stream response are not limited to erosion potential. Additional multi-scale controls could be included. For example, simple categories of physical habitat condition and ecological integrity could be predicted by augmenting erosion potential metrics with descriptors of the condition of channel banks and riparian zones, geologic influences, floodplain connectedness, hydrologic metrics describing flashiness, proximity to known thresholds of planform change, and BMP types. Furthermore, although most of the emphasis to date has been on predicting geomorphic endpoints, the risk-based approach can be extended to the prediction of biological states in urban streams if the necessary data are available.

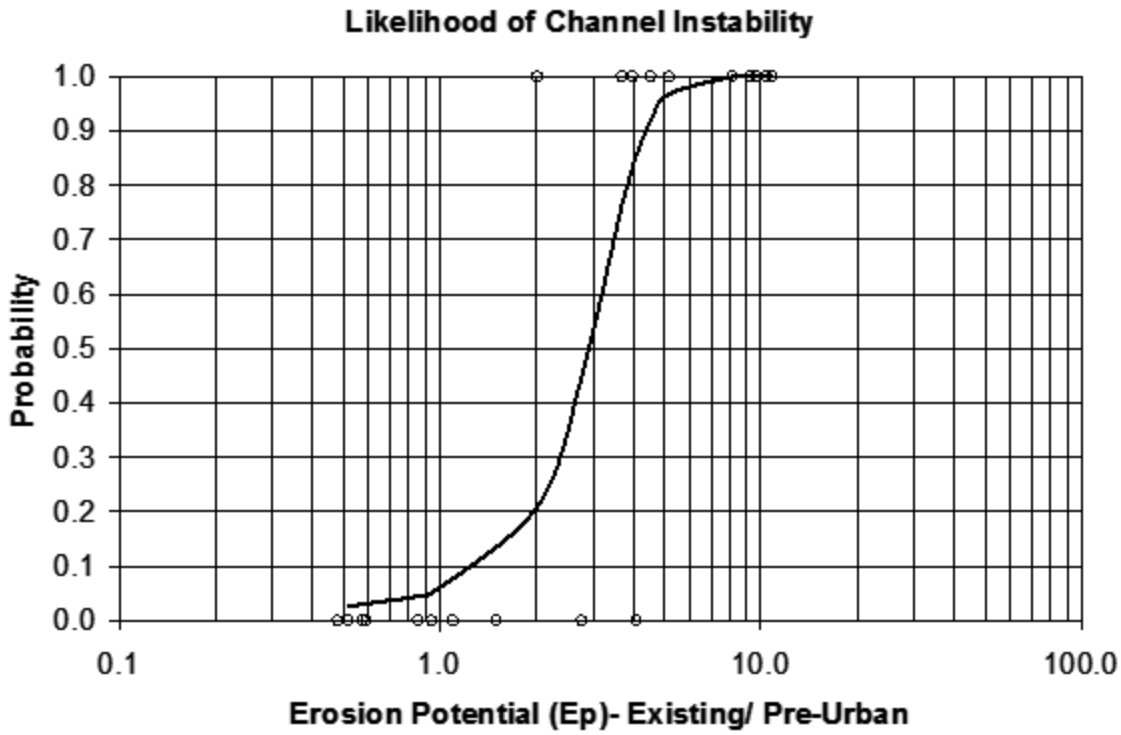

Figure B-7: Example of a logistic regression analysis of stable vs. unstable channels (Bledsoe and Watson, 2001; Bledsoe et al., 2007). The vertical axis represents the probability of stream instability which increases rapidly for channels with sediment transport capacity increased by urban hydromodification (Ep > 1).

3.3. *Strengths and Limitations.* The Erosion Potential approach combines a sound physical basis with probabilistic outputs and requires a substantial modeling effort. Such an effort is necessary to adequately characterize the effects of hydromodification on the stability of streams that are not armored with very coarse material such as large cobbles and boulders. Although policies based on this approach should reduce impacts to channel morphology, they may still fail to protect stream functions and biota. Key simplifying assumptions and prediction uncertainty in the inputs (hydrologic modeling, assumptions of static channel geometry in developing long term series of shear stresses or stream powers, assumptions of stationarity in sediment supply, etc.) have not been rigorously addressed. Its effectiveness also depends on careful stratification of streams in a region such that fundamentally different stream types are not lumped together (e.g. labile sand channels vs. armored threshold channels with grade control) in developing general relationships for instability risk. Endpoints to date have been rather coarse, e.g. stable vs. unstable; as such, they do not provide sufficient resolution for envisioning future stream states. However, the Erosion Potential approach provides

promise as an important tool for hydromodification management; it is recommended that it be refined to address sediment supply changes and to provide more finely resolved endpoints for improved predictive capabilities.

4. **Sediment transport analysis suite of tools.** This suite of tools is designed to answer the following questions:
   - Do I need to incorporate sediment transport analysis in predicting channel response to hydromodification, i.e. what is the sensitivity of channel slope and geometry to inflowing sediment load?
   - At what discharges are different fractions of bed material mobilized in a particular stream segment?
   - What is inflowing sediment load to a stream segment, i.e. what is the water discharge Q(t) and sediment supply rate Qs(t) and grain size D(t) delivered to the upstream end of the channel segment of interest?
   - How will the available flow move the supplied sediment through the segment of interest?
   - What is the new equilibrium slope given some change in streamflow, and how much incision would be necessary to achieve this new slope?
   - What is the sediment transport capacity of the segment of interest *relative to* the inflowing sediment load from *upstream* supply reaches?
   - What is the sediment transport capacity of the segment of interest *relative to* the capacity of *downstream* reaches?
   - At the network scale, where are zones of low vs. high energy, aggradation vs. degradation potential, and coarse sediment constriction located?

   The primary tools that comprise this suite include the following:
   - Tools for estimating watershed sediment supply (Reid and Dunne 1996), including the RUSLE (Renard et al. 1997; http://www.ars.usda.gov/Research/docs.htm?docid=5971) and WEPP (Laflin et al. 1991; http://www.ars.usda.gov/Research/docs.htm?docid=10621) models.
   - Effective discharge analysis (see above)
   - Incipient motion analysis (tractive force, e.g. ASCE 2008; Brown and Caldwell 2011; Buffington and Montgomery 1998; Lane 1955a)
   - Sediment continuity analysis at single dominant discharge with an appropriate sediment transport relation – e.g., HEC-RAS, Bedload Assessment for Gravel-bed Streams (BAGS -Pitlick et al. 2009; GeoTools)
   - Equilibrium slope / geometry analysis e.g., HEC-RAS – Copeland et al. 2001, iSURF-NCED 2011)
   - Sensitivity to inflowing sediment load analysis e.g., Copeland's method in HEC-RAS, iSURF-NCED 2011)
   - Sediment continuity analysis over the entire flow frequency distribution e.g., Capacity-Supply Ratio of Soar and Thorne (2001), BAGS, GeoTools

- Network scale sediment balance – Sediment Impact Analysis Methods (SIAM) module in HEC-RAS

Movable bed / mobile boundary models also provide a mechanistic tool for estimating the trend and magnitude of changes in channel geometry due to hydromodification. However, a recent study evaluated the potential applicability of various movable bed and/or boundary models to streams in southern CA (Dust 2009), including HEC-RAS, CONCEPTS (Langendoen, 2000), and FLUVIAL 12 (Chang, 2006). The results of tests performed on urban streams in southern CA indicate that these models are difficult to apply and have high prediction uncertainty due to flows near critical, split flow conditions, and lack of fidelity to complex widening, bank failure, and armoring processes.

The following figures depict example outputs from an application of the sediment-transport suite of tools:

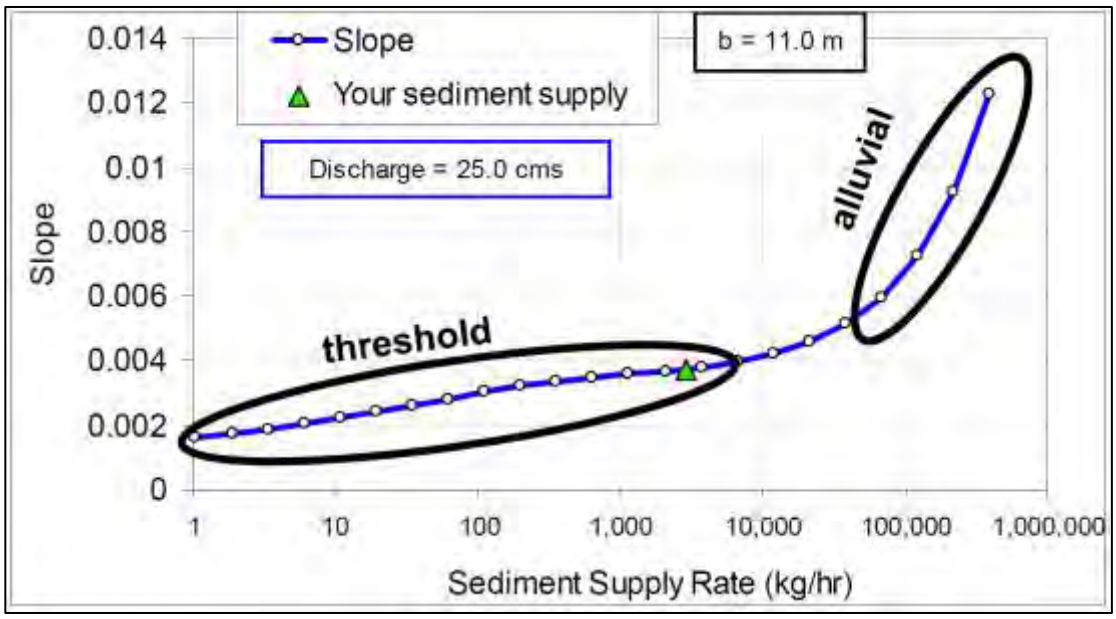

Figure B-8. Sensitivity analysis of equilibrium channel slope to inflowing sediment load (from iSURF, NCED 2011). Slopes of alluvial channels with high sediment supply are much more sensitive than threshold channels with relatively low sediment supply. Channels with beds composed of sand and fine gravels are generally much more geomorphically sensitive to hydromodification than threshold channels in which coarse bed sediments are primarily transported at relatively high flows.

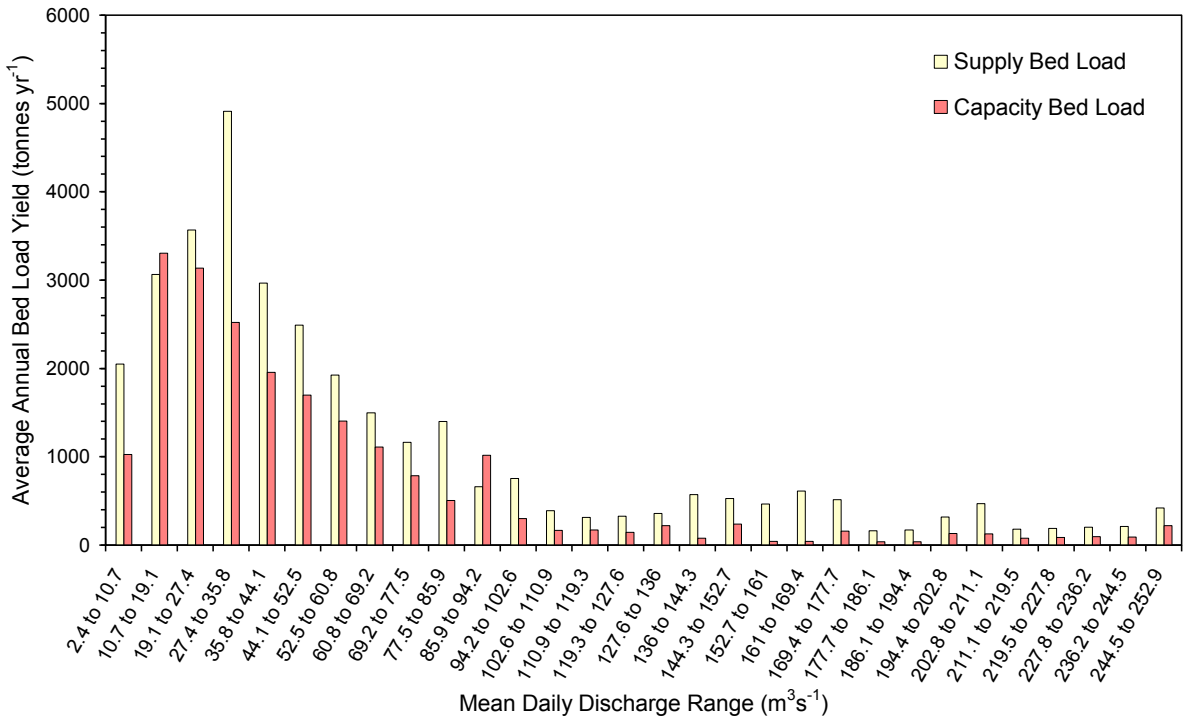

Figure B-9. Analysis of sediment transport capacity vs. inflowing sediment load over the full spectrum of stream discharges (capacity-supply ratio; Soar and Thorne 2001). In this case, the time-integrated capacity to transport bedload is 64% of the supplied bedload and significant aggradation is expected.

5. **Relationship to Management Framework**. These suites of tools could be applied to establish project-specific requirements for hydromodification assessment and mitigation, as recommended in the Management Framework presented in Chapter 3. In the example shown in the diagram below, results of the Baseline Assessment are used as a screening tool to assign high, moderate or low risk levels for stream reaches, in conjunction with the proposed land-use changes. Thus, the Baseline Assessment suite of tools is crucial in determining whether a detailed survey-level assessment and additional suites of tools are necessary for an adequate analysis. The need to apply additional suites of tools in formulating a management approach is commensurate with the level of risk and susceptibility of the stream. More complex and rigorous analysis with multiple suites of tools is necessary in predictive assessments for relatively susceptible stream types such as alluvial channels with sand beds.

   Although a stream may have relatively low susceptibility for overall geomorphic change, it may nevertheless have ecological attributes that are highly susceptible to hydromodification. Thus, suites of tools focused on both geomorphic and biological endpoints must be used to fully assess stream susceptibility to hydromodification. More work will be required to develop tools for prediction of biological response to flow alterations throughout California, as noted in Chapter 3 (see Poff et al., 2010 and http://conserveonline.org/workspaces/eloha).

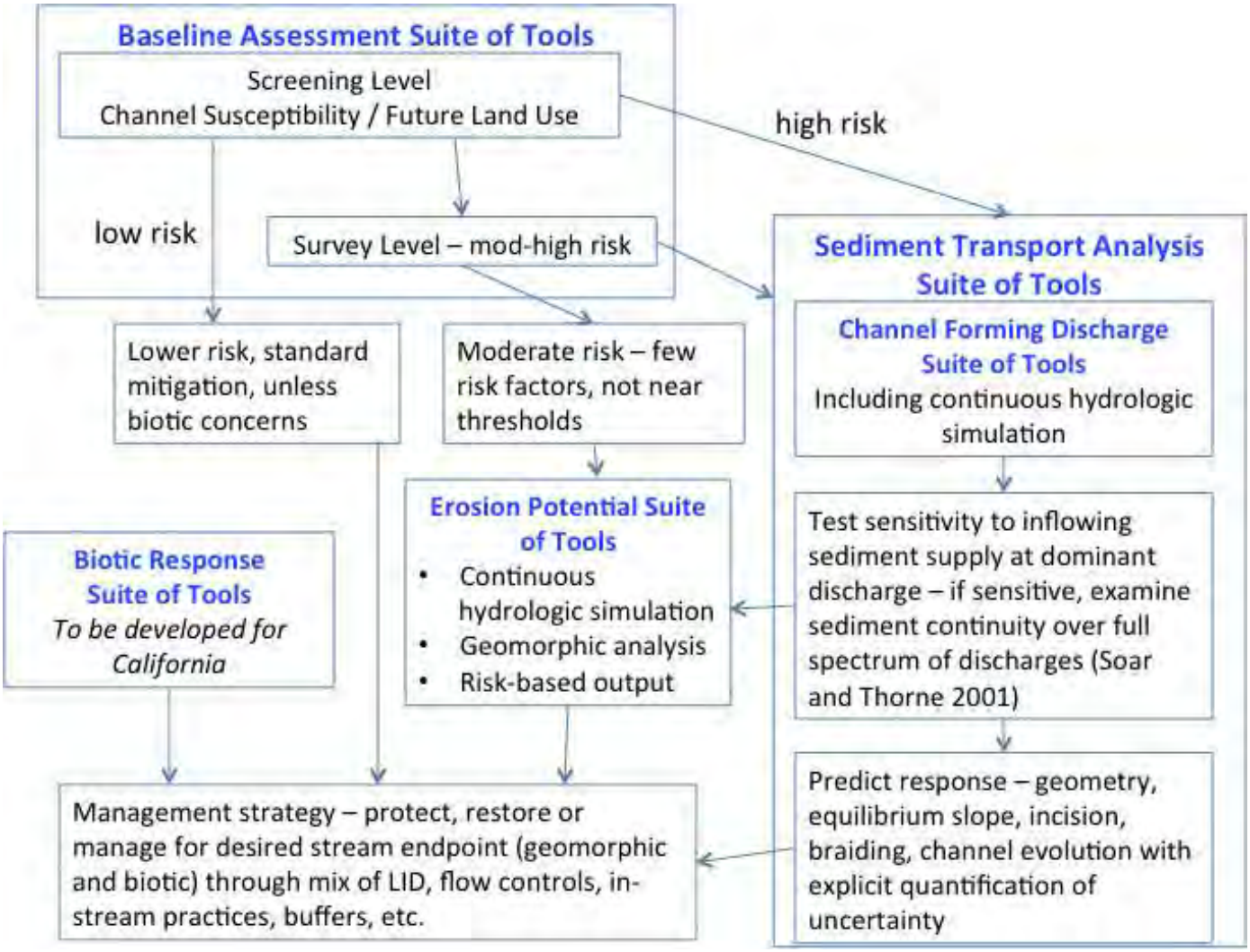

Figure B-10. Conceptual diagram showing relationships among the four suites of existing tools and biotic response tools to be developed in the future. Additional analyses will be required for engineering design.

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APPENDIX C: ADAPTIVE MANAGEMENT

WHAT IS ADAPTIVE MANAGEMENT

Adaptive management is a formalized approach for overcoming the inescapable difficulty in predicting ecological outcomes resulting from natural-resource management actions. It accomplishes this by treating all "management actions" (whether intentional or not) as experimental components within the larger structure of a monitoring program (Holling 1978, Walters 1986, Lee 1999, Ralph and Poole 2003). In other words, specific management actions that may affect ecological processes and functions are systematically evaluated, via "monitoring," to provide the data to affirm or refute the expected outcomes. To the extent that the monitoring results indicate a need to revise the scientific understanding or the management actions built on that understanding, establishing the mechanism to change management actions is a precursor, not an afterthought, of the monitoring program.

Adaptive Management was first articulated over 30 years ago (Holling, 1978) and more recently embraced through various conservation efforts worldwide. Fundamental to this approach is the integration of management and monitoring, recognizing that any management action in the context of a complex ecological system is ultimately experimental, requiring feedback to make progress.

The process of adaptive implementation is iterative and continuous; new knowledge is actively incorporated into revised experiments, a practice best described as "learning while doing" (Lee 1999). The key difference between this approach and other commonly implemented environmental management strategies is the application of scientific principles, such as hypotheses-testing,[is used] to explicitly define the relationships between policy decisions, management actions, and their measured ecological outcomes. Furthermore, this approach provides a means to understand and document these cause-and-effect relationships; it can also point to alternative actions that may produce more desirable outcomes. Uncertainty is embraced and serves as a focal point for defining ever-more specific evaluations.

Scientifically credible and relevant information can only be generated when the management "experiments" are designed with clear hypotheses about the effects of proposed actions or prescriptions. These hypotheses must be testable at multiple scales using available technology and methods (Conquest and Ralph 1998; Currens *et al*. 2000). Hypotheses that cannot be tested, are trivial (e.g., "water flows downhill"), are not credible ("water flows uphill"), or only account for site-specific conditions are not useful in considerations of the singular or cumulative effects of management actions.

In order to retain clear linkages between key questions, hypotheses, and monitoring protocols, the experimental approach must be designed before determining which goals and endpoints are appropriate (Ralph and Poole 2003) since appropriate goals should be *outcomes* of the

effort, not a precondition; and the approach must explicitly tie stated hypotheses to the key ecological questions.

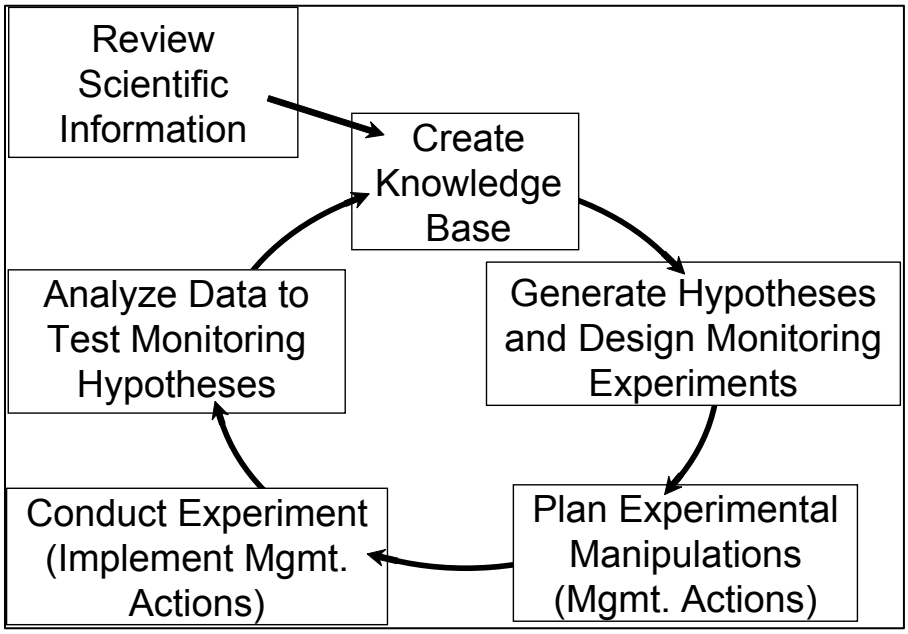

Figure A-1. Framework for an adaptive management program. The key feature of this cycle is the foundation of scientific principles and hypothesis generation; design of the management actions and the monitoring to evaluate their effects are integrated and designed to test assumptions, improve understanding, and reduce uncertainty (modified from Ralph and Poole 2003, Figure 3).

Wagner (2006) asserts that [stormwater] regulatory programs in the past often failed because they were designed in ways that ignored technological and scientific limitations. "Science-based" does not simply mean the monitoring of status and trends followed by responding to imposed benchmarks and goals, but rather that scientific principles must be the foundation of regulatory program design, and that these programs must rely on scientific methods to demonstrate results. Wagner suggests that regulations can still be designed despite incomplete or developing knowledge, but that gaps and limitations must be acknowledged and used to inform ongoing investigations. His argument clearly echoes those of scientists who insist that monitoring experiments and testable hypotheses must frame management decisions and land-use objectives.

WHAT IS *NOT* ADAPTIVE MANAGEMENT, AND WHY IS IT SO PROBLEMATIC?

Unlike the experimental approach embodied by adaptive management, an alternative process traditionally dominates in natural resource management: (1) a problem is identified, but a cause is simultaneously presumed (e.g., "increased sediment inputs into a stream are negatively impacting salmonid survival"); (2) a solution or set of solutions is proposed (e.g., timber harvest is restricted and riparian buffer width is increased), but the prescription is not translated into a testable hypothesis associated with the problem or question; and (3) if the problem is not solved within an arbitrarily reasonable period of time (e.g., a few years) then a different solution is proposed (e.g., "augmented upland and riparian restoration must be implemented"). Although simplified, this outline displays its divergence from adaptive management and from the basic principles of the scientific process—the resulting process is perpetually reactive.

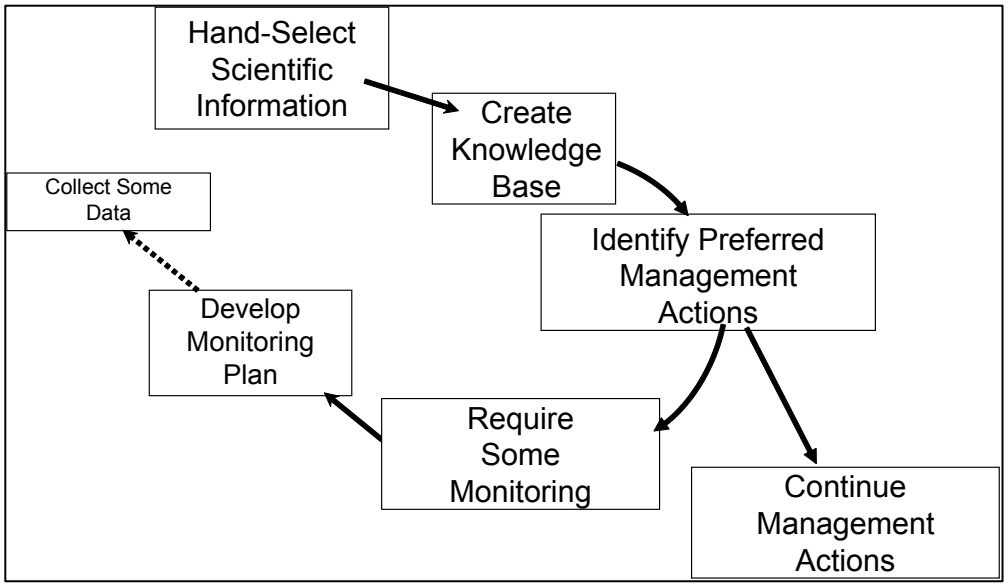

Figure A-2. Common framework for monitoring outside of an adaptive management structure. Management actions are chosen with a presumptive effect on ecological systems, and monitoring is conducted without any feedback to future actions. Even where monitoring is intended to "inform" future management actions, the absence of an explicit experimental design normally limits the utility of any monitoring data to provide meaningful insights.

In its best form, this paradigm has been termed passive adaptive management:

> Restoration planners' current management approach has been described as a "passive" adaptive management approach: science is used to

> develop best-guess predictive models, make policies according to these models, and revise them as data become available. The National Academies advise that every effort be made to take a more "active" adaptive management approach by developing alternative hypotheses for the expected consequences of a particular project and then design the project so the hypotheses can be experimentally tested" (from the summary to *Adaptive Monitoring and Assessment for the Comprehensive Everglades Restoration Plan*, 2003, National Academies Press, 122 pp.).

Ralph and Poole (2003) have aptly named this approach "socio-political adaptive management" (i.e., SPAM).

BARRIERS TO IMPLEMENTING "ACTIVE" ADAPTIVE MANAGEMENT

Although the virtues of active adaptive management are readily articulated, the framework is surprisingly rare in practice. Some of these barriers are practical or logistical, and they include such issues as:

- Longevity and long-term institutionalization of monitoring;
- Effective data management systems that allow managers to readily access data;
- Ability to differentiate effects from natural variability and events, such as flood and fire;
- Cost and technical limitations of necessary data collection.

The most severe impediments, however, are not scientific but social: "We suggest that watershed-scale adaptive management must be recognized as a radical departure from established ways of managing natural resources if it is to achieve its promise... Adaptive management encourages scrutiny of prevailing social and organizational norms and this is unlikely to occur without a change in the culture of natural resource management and research" (Allan et al. 2008).

While science can provide defensible and replicable insights regarding the ecological outcomes of management prescriptions, it cannot offer absolute certainty. Policy can be and should be informed by science but is ultimately based on a variety of considerations that are not always amenable to the spatial, temporal, and technological limitations of the scientific process (Van Cleave et al. 2004). This is an uncomfortable truth for agency managers and elected officials to acknowledge, and it commonly results in funding decisions and public pronouncements using the "language" of science but not its substance.

Although efforts to build large, collaborative programs are commonly characterized by increasing stakeholder involvement and outreach, greater participation does not necessarily

mean that true adaptive management is occurring, or that scientific principals are being applied to either the choice of management actions or their evaluation. These efforts, however, do reflect a movement to extend natural resource management decision-making processes beyond just technical experts in order to reflect evolving social values (Pahl-Wostl *et al*. 2007). If they are successful, this approach can open a path to achieving the best of both realms, namely scientific rigor with a broad base of community support.

ATTRIBUTES OF USEFUL HYPOTHESES FOR AN ADAPTIVE MANAGEMENT PROGRAM

A key element of any adaptive management approach is the set of hypotheses that guide both the management actions and their associated monitoring. Because these management actions are recognized as "experimental" (because in a complex system most outcome(s) cannot be predicted with absolute certainty), their selection must be guided by assumptions about what *might happen,* or what is *expected* to happen. This defines the first attribute of a useful hypothesis: it is **credible**, typically because it is based on prior knowledge or scientific understanding of the system. Indeed, some hypotheses may already be so well evaluated and understood (e.g., "Stormwater runoff from freeways carries measurably elevated concentrations of toxic pollutants") that there is little point in framing them in this structure at all—as new monitoring programs to address such hypotheses are highly unlikely to result in new information or knowledge and might be perceived as an unwise expenditure of scarce monitoring resources.

The second attribute of a useful hypothesis stems from the scientific reality that any experiment, whether conducted in the laboratory or across the landscape, provides value only insofar as its outcomes are measured and the effects are distinguishable from the influence of other, unrelated factors. Thus, the hypothesis that guides the experiment should not only be credible but also **testable**. Otherwise, why bother making measurements at all?

Lastly, these actions and measurements and analyses do not occur in a vacuum. Thus, the final guiding principle for any hypothesis in an adaptive management approach is that it be **actionable**, or that different outcomes, as revealed by monitoring, can (and will) result in different management responses. If no difference occurs, then clearly there is no reason to have made the effort in the first place.

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ATTACHMENT A

**ORANGE COUNTY LEGAL &TECHNICAL COMMENTS ON
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
TENTATIVE ORDER No. R9-2013-0001
NPDES NO. CAS0109266**

Appendix A-3

2009 Presentation to Santa Ana Regional Board

007096

Storage and Reuse Systems for Stormwater Mangement

Preliminary Cost and Performance Estimates for Residential Land Use in Irvine, CA

Eric Strecker, P.E.

Geosyntec consultants

Summary of Study

- Compared hypothetical scenarios for rainwater harvesting and reuse systems (cisterns)
  - single lot scenario
  - 100 ac neighborhood scenario
- Compared resulting costs and for both scenarios
- Performed modeling (long term simulation) analysis for neighborhood scenario
- Evaluated water quality loading differences between rainwater harvesting and reuse systems and typical bioretention installation for single family residential
- Performed preliminary review of applicable codes

Rainwater harvesting and Reuse Systems

Impervious Area

- Roof tops
- Driveways
- Streets

Stormwater Conveyance and Pretreatment

- Pipes
- Filters

Storage

- Cistern
- Storage Basin
- Underground Vault

Treatment

- UV treatment
- Filtration

Pumping and Piping

- Pipes back to house (purple)

Indoor Use and Irrigation

- Toilet flushing
- Yard and Garden irrigation

Geosyntec consultants

Single Lot Scenario

- Two reuse demands were examined: 1) indoor use only (toilet flushing), and 2) indoor and outdoor use (toilets and irrigation)

- Lot Characteristics:
  - 0.1 acres
  - 69% impervious area
    - Roof area - 2400 ft^2
    - Other (patio) - 600 ft^2
  - 3.5 people/house
  - Toilet use/capita = 18.5

- Method assumptions:
  - Rational Method
    - Impervious Runoff Coeff. (0.9)
    - Precipitation Depth – 0.8 in (85th percentile for large parts of Orange County)
    - Toilet use / house = 65 gal/day
    - Irrigation /house = 77 gal/day (Avg. from Irvine Water District data)

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Single Lot Scenario Results

Water Collected From:	Roof	Roof + Other Impervious area
Demand Scenario	**Average Drawdown Time (days)**	
Toilets only	17	21
Both Toilets & Outdoor uses	7.6	9.5

Note: Outdoor demand assumes that irrigation demand is immediate; more sophisticated modeling would allow more accurate characterize of irrigation demand, but for purposes of this analyses, it was assumed to be immediate. This likely significantly overstates the demand for irrigation.

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Neighborhood Scenario

- Two reuse demands were examined: 1) indoor use only (toilet flushing), and 2) indoor and outdoor use (toilets and irrigation)

- Neighborhood Properties:
  - 100 acres – 60 % impervious
  - 0.1 acre lots at 4.5 du/ac = 450 houses
  - 3.5 people/house
  - Toilet use/capita = 18.5
  - Basin used to store runoff

- Method assumptions:
  - Rational Method
    - Impervious Runoff Coeff. (0.9)
    - Precipitation Depth – 0.8 in (85th percentile for large parts of Orange County)
    - Toilet use / house = 65 gal/day
    - Irrigation /house = 77 gal/day (Avg. from Irvine Water District data)

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Neighborhood Scenario Results

Demand Scenario	Average Drawdown Time (days)
Toilets only	45
Both Toilets & Outdoor uses	10

Note: Outdoor demand assumes that irrigation demand is immediate; more sophisticated modeling would allow more accurate characterize of irrigation demand, but for purposes of this analyses, it was assumed to be immediate. This likely significantly overstates the demand for irrigation.

General Cost List

007103

Item	Description	Cost	Reference/Source
TANKS			
Galvanized steel	200 gal	$225	Fairfax County, 2005
Polyethylene	165 gal	$160	Fairfax County, 2005
Fiberglass	350 gal	$660	Fairfax County, 2005
Plastic	800 gal	$400	Plastic-mart.com
Plastic	1100 gal	$550	Plastic-mart.com
Plastic	1350	$600	Plastic-mart.com
Plastic cone	1500 gal w/metal stand	$1500	Plastic-mart.com
Plastic	2500 gal	$900	Plastic-mart.com
Plastic	5000 gal	$3000	Plastic-mart.com
Plastic	10000 gal	$6000	Plastic-mart.com
[1] Dry Det. Basin(1997)	$C = 12.4V^{0.760}$: for 1 ac-ft	$41,600	stormwatercenter.net
[2] Below Ground Vault	$C = 38.1 (V / 0.02832)^{0.6816}$	$55,300	fhwa.dot.gov
Concrete	1,000,000 gal above g. (O&P)	$548,000	RSMeans
Steel	1,000,000 gal above g. (O&P)	$467,000	RSMeans
TREATMENT			
UV (house-scale)	Whole system - 12 gpm	$700-$900	rainwatercollection.com
UV bulb	Life: 10,000 hrs or 14 months	$80-$110	rainwatercollection.com
UV (neighborhood-scale)	Whole system - 200 gpm	$10,000	Bigbrandwater.com
Downspout filter	Placed in Gutter	$20 - $500	many online
1st Flush Diverter	Vertical pipe w/ ball float	$50-$100	raintankdepot.com
PUMP	1 hp (all in one package)	$575 - varies	rainwatercollection.com
PIPING (Purple)			
to Tank (lot)	PVC: 2”-6” (O&P)	$2-$12 / LF	RSMeans
to House (lot)	PVC: 2”-6” (O&P)	$2-$12 / LF	RSMeans
to Tank (neighbor.)	Concrete: 6” – 18” (O&P)	$15-$30 /LF	RSMeans
to House (neighbor.)	HDPE- 4” – 10” (O&P)	$11-$27 / LF	RSMeans
to Irrigation	PVC: 2”-6” (O&P)	$2-$12 / LF	RSMeans
Backflow prev. valve	Each	$100-$200	web
STENCILS	Non-potable water	----	
INSTALLATION	Percentage of material cost	40 % – 50%	

[1] This dry detention cost equation - Brown and Schueler, 1997: C is the construction, design and permitting cost and V is the volume (cu-ft) need to control the 10-year design storm. In this case, the 0.8” storm runoff volume was used in place of the 10-yr design storm volume.

[2] This below ground storage vault equation - Weigand et al., 1986:C is the construction cost estimate (1995 dollars), and V is the runoff volume (cubic meters)

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Single Lot Costs

Item	Description	Cost
TANKS		
Plastic	1100 gal and 1350 gal	$550
TREATMENT		
UV	Whole system - 12 gpm	$800
UV bulb	Life: 10,000 hrs or 14 months	$80-$110
Downspout filter	Placed in Gutter	$250
1st FLUSH DIVERTER	Vertical pipe w/ ball float	$100
PUMP	1 hp (all in one package)	$575
PIPING (Purple)		
to Tank (lot)	PVC: 2”-6” (O&P) 20ft	$8 / LF
to House (lot)	PVC: 2”-6” (O&P) 50ft	$8/ LF
to Irrigation	PVC: 2”-6” (O&P) 50ft	$8 / LF
Backflow prev. valve	each	$200
STENCILS	Non-potable water	----
INSTALLATION	40% of material cost	$1400
TOTAL		**$4,900**

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Neighborhood Costs

Item	Description	Cost	Units Assumed
TANKS			
Dry Det. Basin(1997)	$C = 12.4V^{0.760}$	$119,000	174,000ft^3
Below Ground Vault	$C = 38.1 (V / 0.02832)^{0.6816}$	$142,000	174,000ft^3
TREATMENT			
UV - neighborhood	Whole system - 200 gpm	$10000	
Catch basin filters	1 every 2 acres	$2000	50 catch basins
PUMP		$50,000	
PIPING (Purple)			
to Tank (neighbor.)	Concrete: 6” – 18” (O&P)	$15-$30 /LF	$23 - 14000 ft
to House (neighbor.)	HDPE- 4” – 10” (O&P)	$11-$27 / LF	$19 - 14000 ft
to Irrigation	PVC: 2”-6” (O&P)	$2-$12 / LF	$8 - 60 ft /house
Backflow prev. valve	each	$100-$200	$200 per house
STENCILS	Non-potable water	----	
INSTALLATION	40% of material cost	$470,000	
TOTAL		**$1,650,000**	

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SWMM Modeling Analysis

- Long term (40 yr) analysis of the neighborhood scenario was performed using SWMM. Two scenarios analyzed:
  - 0.8 inch design storm
  - 1.6 inch design storm
- Modeling assumptions:
  1. Toilet flushing – same as scenarios and applied as constant rate
  2. Irrigation – monthly values (from the IRWD) applied as constant rates by month (i.e. demand occurs continuously during and after storm event)
  3. Overflow from tanks considered to be untreated bypass
  4. Same total area and impervious areas in both studies

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SWMM Modeling Results

	Units	Scenario			
		A	**B**	**C**	**D**
		Toilet Flushing Only, 0.8" design storm	Toilet Flushing + Irrigation, 0.8" design storm	Toilet Flushing Only, 1.6" design storm	Toilet Flushing + Irrigation, 1.6" design storm
Average Annual Drawdown Time	**days**	**47**	**8.5**	**94**	**17**
Average Stormwater % Capture and Reuse	**%**	**32%**	**55%**	**41%**	**68%**
Avg Annual Volume of Stormwater Reused	MG | CCF	5.2 | 6,950	8.8 | 11,800	6.5 | 8,700	10.9 | 14,620
Avg % of Total Residential Demand Satisfied	**%**	**6.2%**	**11%**	**7.8%**	**13%**

Note: Outdoor demand assumes that irrigation demand is immediate; more sophisticated modeling would allow more accurate characterize of irrigation demand, but for purposes of this analyses, it was assumed to be immediate. This likely significantly overstates the demand for irrigation.

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Pollutant Loading Example

Assumptions

- Median Runoff EMC for TSS for HSFD: **70 mg/L**
- Median Effluent Concentration for TSS for Media Filters from International BMP Database: **15 mg/L**
- % Captured by cistern per SWMM (Scenario B – 0.8" design storm with toilet and irrigation re-use): **55%**
- % Captured by Bioretention with Underdrains per DAMP requirement: **80%** (requires approx 0.4" design storm)
- Bypass from both BMPs assumed to be untreated

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Pollutant Loading Example

Results – Average Annual TSS Load Removed

Cisterns and Re-Use: **55%**

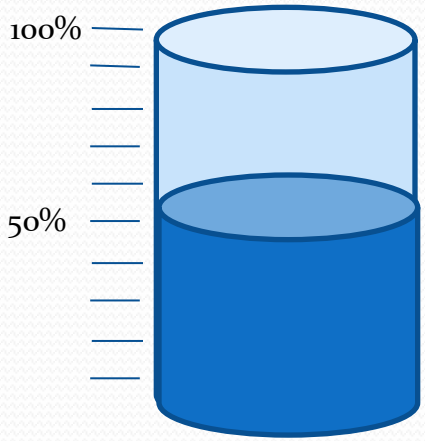

Bioretention with Underdrains: **63%**

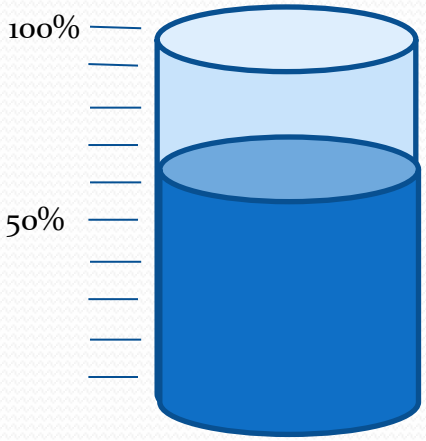

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Pollutant Loading Example

Results – Average Annual TSS Concentration with BMPs

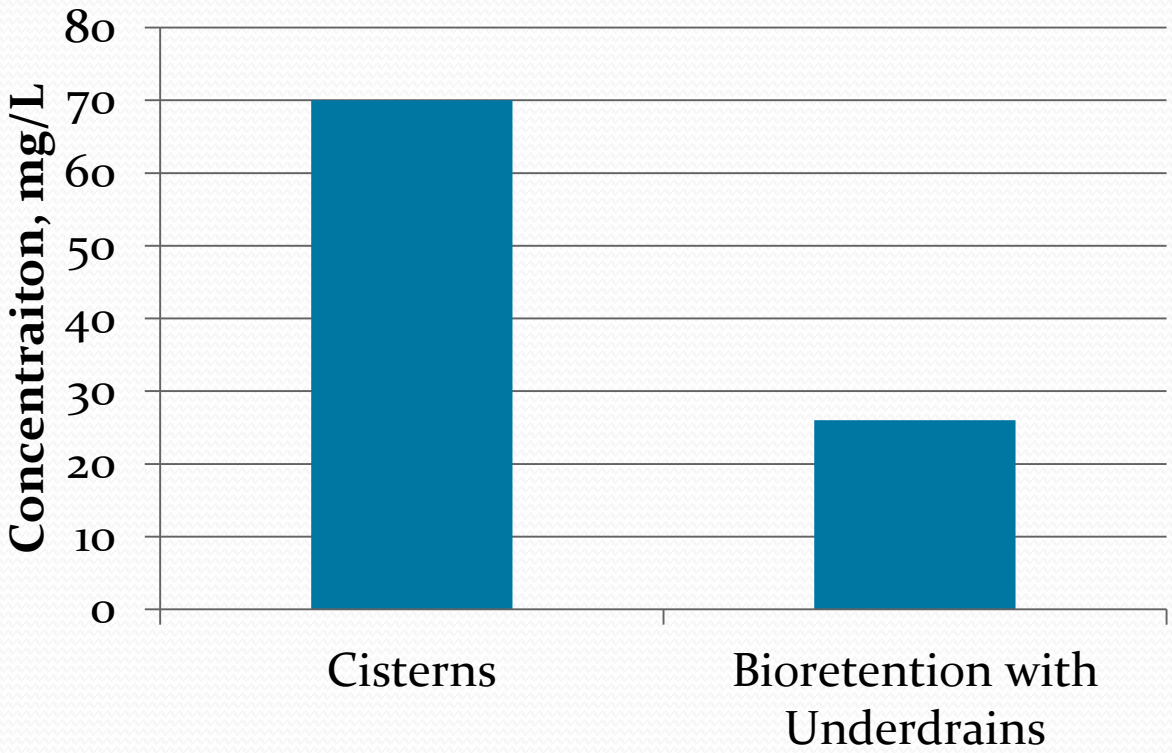

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Rainwater Harvesting - Code and Regulations

Applicable Codes

- Title 24—Building Standards Code (plumbing code)
  - Mechanical design and installation procedures
- Title 22—Social Security (recycled water quality standards)
  - Current technologies can meet this requirement (filtration, UV, and others)
- Title 17—Public Health (public water system cross-connection and backflow prevention)

Preliminary Conclusions

Since state codes do not currently recognize rainwater harvesting and reuse, discretion in approval will likely reside at the county and/or City levels through local codes and ordinances.

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ATTACHMENT A

**ORANGE COUNTY LEGAL &TECHNICAL COMMENTS ON
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
TENTATIVE ORDER No. R9-2013-0001
NPDES NO. CAS0109266**

Appendix A-4

The Water Report Issue #65:
Stormwater Retention on Site, An Analysis Of Feasibility and Desirability, Strecker and Poresky (2009)

007113

The Water Report™

Water Rights, Water Quality & Water Solutions in the West

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Obama Water Policy

Groundwater Decline

Tribal Water Needs

& More!

STORMWATER RETENTION ON SITE

AN ANALYSIS OF FEASIBILITY AND DESIRABILITY

by Eric W. Strecker, PE, and Aaron Poresky, EIT, Geosyntec Consultants (Portland, OR)

INTRODUCTION

Both nationally and in various localities, there is increasing regulatory pressure to maximize or require the retention of stormwater on site with compliance often linked to matching post-development runoff with predevelopment hydrology.

For example, in California the recently adopted Ventura Municipal Separate Storm Sewer System (MS4) NPDES permit requires retention on site — via infiltration, evapotranspiration and/or harvest and "re-use" — of precipitation from storms ranging up in size to the permit-defined "design storm" (Standard Urban Stormwater Mitigation Plan (SUSMP) depth of 3/4 of a inch — "design storms" are events defined in regulation and reflected in stormwater system design). There is an exception allowed where it is not feasible to retain the entire volume: the project may then retain "only" 70 percent of the SUSMP storm on site and mitigate the remaining volume off site. Another example is the North Orange County permit, which requires that infiltration, evapotranspiration, and/or harvest and re-use be employed to manage the water quality design storm, unless infeasible.

Nationally, the recent Energy Independence and Security Act (EISA) Section 438 requires that any Federal project with over 5,000 square feet of impervious area "maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow." Guidance for compliance with this provision allows either retention of the 90th percentile, 24-hour storm event or a model-based evaluation of discharge rates and volumes, matching predevelopment with post-development runoff hydrology. In effect , both of these conditions mandate substantial on site retention.

These permits/regulations have "narrowed" the traditional definition of Low Impact Development (LID) down to only a few elements — i.e., infiltration, evapotranspiration and/or harvest and use. This narrowing precludes management options present in the broader LID definition, such as detention and bio-filtration in vegetation-based facilities that provide incidental infiltration and evapotranspiration, but have a surface discharge point (e.g. bioretention with underdrains).

Nationally, the US Environmental Protection Agency (EPA) has also limited the definition of LID in some of their various guidance documents. For example, *Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices*, December 2007 (EPA 841-F-07-006) includes the definition: "LID comprises a set of approaches and practices that are designed to reduce runoff of water and pollutants from the site at which they are generated. By means of **infiltration, evapotranspiration, and reuse of rainwater**, LID techniques manage water and water pollutants at the source and thereby prevent or reduce the impact of development on rivers, streams, lakes, coastal waters, and ground water." (Emphasis added) It should be noted that other EPA documents include

Stormwater On Site

LID Definitions

Harvested Water

Natural Balance

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definitions with the broader definition of filtration and surface release (see **Table 1**). It also should be noted that even in the guidance that includes the narrowed definition, in most cases the examples and guidance details include filtration and surface release of runoff.

Table 1. Summary of Filtration and Surface Release Inclusion in LID Definitions and associated guidance

Document/Reference	Filtration and Surface Release	
	In Definition	In Guidance/Examples
Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices, December 2007 (EPA 841-F-07-006)	No	Yes
Low Impact Development (LID) Literature Review, October 2000 (EPA-841-B-00-005	Yes	Yes
Low-Impact Development: An Integrated Environmental Design Approach (Prepared by the Prince George's County Maryland Department of Environmental Resources Programs and Planning Division, with assistance from EPA), June 1999	Yes	Yes
Polluted Runoff (Nonpoint Source Pollution) Low Impact Development (LID), Last updated on Thursday, January 15th, 2009 Additional information from linked factsheet: *Design Principles for Stormwater Management on Compacted, Contaminated Soils in Dense Urban Areas*, April 2008 (EPA-560-F-07-231)	Not Clear	Yes
Low Impact Development (LID) and Other Green Design Strategies, Last updated on October 09, 2008	No	Not Clear

To date, the retention of stormwater on site has been primarily been accomplished via infiltration and, to a much more limited extent, evapotranspiration. Only in a few cases has harvest and use (the authors believe that stormwater that is captured and used is not ”re-used”) been employed on a site scale (typically as a part of a Leadership in Energy and Environmental Design (LEED) rating process). Uses for harvested water typically include non-potable uses such as irrigation and toilet flushing and in some cases process water for industrial uses.

The feasibility and desirability of retaining stormwater on site up to some design storm level has not been vetted technically on a national or regional scale. For example, in the EPA *Reducing Stormwater Costs* Guidance referenced above there is virtually no assessment via monitoring or modeling information of the potential results of the case studies presented. It is primarily a compendium of antidotal information. There has been almost no consideration of the natural water balance (i.e., predevelopment conditions) in technical guidance or whether infiltrating more volume than occurs under natural conditions (as would tend to result from matching runoff hydrology without matching evapotranspiration) could, in many cases, cause problems. This paper attempts to present some of the considerations for retaining on site to determine whether it is feasible and/or desirable. It focuses on Southern California examples, but the factors discussed are applicable to much of the West and beyond.

It should be noted that “retaining stormwater on site” in its contemporary usage typically only refers to not having surface discharges result from specific “design storm” events. This usage ignores the fact that infiltrated or evapotranspirated stormwater is not actually “retained” on site — it either enters a deeper aquifer, flows as shallow interflow which may emerge elsewhere or, in the case of evapotranspiration, escapes to rain another day.

The authors believe that, while one should try to maximize the retention of stormwater on site, such retention should not be mandated, as site specific circumstances often indictate wiser alternatives.

PERFORMANCE OF STORMWATER BEST MANAGEMENT PRACTICES (BMPs)

General Considerations

In order to assess the performance of stormwater treatment Best Management Practices (BMPs), it is important to understand the range of factors which may impact BMP performance. BMP performance is effected by: runoff patterns; pollutant types and forms; the storage volume and/or treatment rate; the ability to recover storage capacity (for BMPs that rely on storage); the treatment processes for released flows (to surface waters or groundwaters); and operations and maintenance issues that affect the ability of the BMP to continue operations (Strecker, et. al., 2006). For storage-based BMPs, methods for recovering storage capacity include: surface discharge; evapotranspiration; deeper infiltration; and putting the stored water to use. For systems which include cisterns (harvest and use), one of the most critical factors is the ability to quickly recover storage capacity before the next storm event arrives. Typically, if storage capacity cannot be recovered within two-to-four days, then the amount of runoff bypassing storage becomes significant due to the cistern being partially to nearly full.

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Stormwater On Site

Storage Capacity Recovery

Weather and Resulting Runoff Patterns

In Southern California and the West Coast in general, precipitation patterns in most urban areas are affected by the presence or absence of a high pressure ridge that in essence blocks-out low pressure storm systems. Typically, once the high pressure ridge is absent a series of storms arrives, delivering "back-to-back" storms until a high pressure ridge re-establishes. Storms arrive about every two to three days during this period. If the storage capacity is not quickly recovered, these back-to-back storms can result in storage-based BMPs that are full or partially full when the next storm arrives, which then causes significant bypass or overflow to occur. In Southern California, most precipitation arrives from December to March. **Figure 1** shows the monthly normal rainfall in Irvine California (and monthly **e**vapo**t**ranspiration (ET)). Monthly normals tend to mask the patterns that occur within specific months in the period of record. **Figure 2** shows a typical precipitation pattern for the same gage, which includes the effect of 'back-to-back" storm events on a weekly timescale in an actual year. These weather patterns indicate that the recovery of storage on a sub-weekly time scale is critical to ensure that sequential storms do not result in excessive bypass or overflow of BMPs. Study of typical storm patterns indicates that storage capacity should be regenerated within two-to-three days to maximize the stormwater management performance when harvesting stormwater.

Precipitation v. "ET"

Figure 1. Monthly Precipitation vs. Monthly Evapotranspiration for Irvine, California.

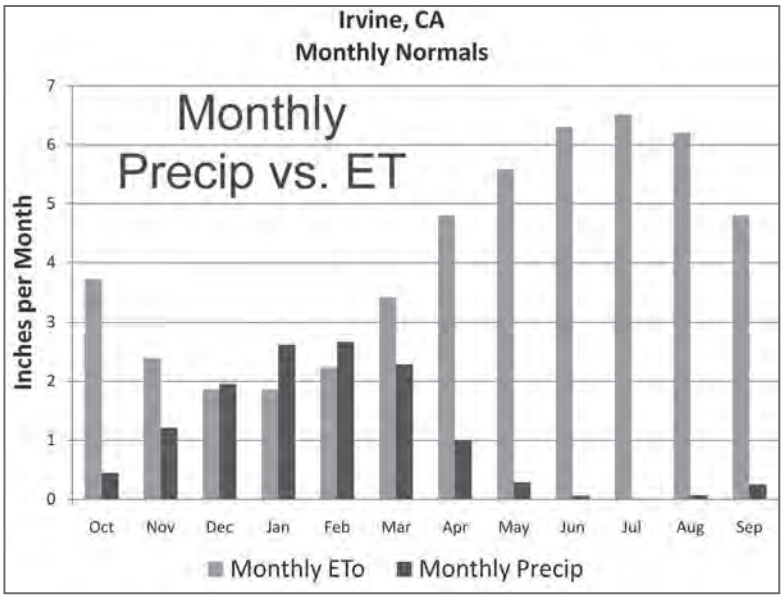

Precipitation Pattern

Figure 2. Typical Precipitation Pattern Showing Back-to-Back Storms at Irvine California for a Near Average Water Year.

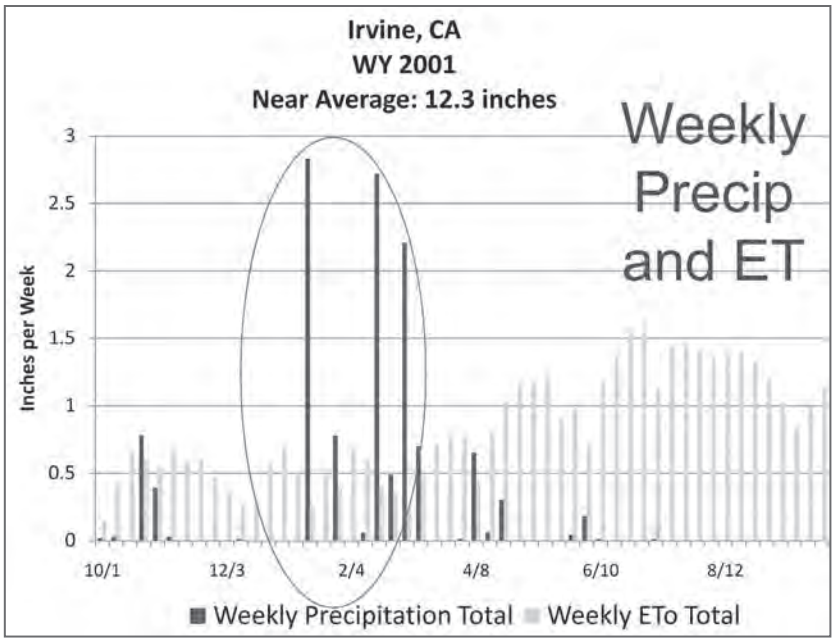

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Stormwater On Site

Infiltration Issues

Soil Factors

Infiltration Rates & Design

Infiltration is the primary method that is employed to retain stormwater on site. This is because, when it can be accomplished, infiltration is the method most likely to be successful. However, the authors believe that three key questions/issues need to be addressed when considering infiltration strategies if unintended, problematic consequences are to be avoided.

Key infiltration considerations include:

- Can you do it?
- Should you do it and, if so, to what extent?
- If you do employ infiltration, what factors need to be addressed to insure a desirable outcome?

Infiltration: Can You Do It?

Underlying soils greatly affect the ability to infiltrate. In much of Southern California (and the West) urban areas are situated atop soils that are difficult for infiltration. Some practitioners have suggested soil amendments as a strategy for increasing infiltration. However, amending soils typically only addresses surface soils, so if underlying soils are still difficult for infiltration, soil amendments may only be increasing the storage available (vs. significantly increasing underlying infiltration rates). **Figure 3** presents a map that shows underling soils for the North Orange County, California permit area. It is expected that, in general, infiltration will only be successful in areas with A and B soil types. Of course, in mapping broader soils groups, there may be pockets where infiltration is more feasible. However, the converse is also true. In this Orange County example, a little over 58% of the permit area has C and D soil types that would be unlikely to promote infiltration at an acceptable rate. Infiltration facilities that ignore low underlying infiltration rates in their design would tend to be full for much of the wet season, resulting in substantial bypass/overflow, thereby greatly reducing retention on site. Infiltration facilities designed with lower infiltration rates in mind would have shallower allowable ponding depths and thus require a greater amount of site area, possibly promoting sprawl. To ascertain feasibility, maps like this should be developed prior to requiring infiltration or on site stormwater retention.

Infiltration: Should You Do It?

The next question is "should you (or how much should you) infiltrate?" In many areas there are unnatural (e.g., solvent) or natural (e.g., selenium) plumes or soil contamination that infiltration could negatively impact by either moving or spreading the contaminants. Infiltration in industrial areas is often not desirable due to general concerns about groundwater contamination resulting from potentially elevated

Figure 3. Soil types for North Orange County MS4 NPDES Permit Area

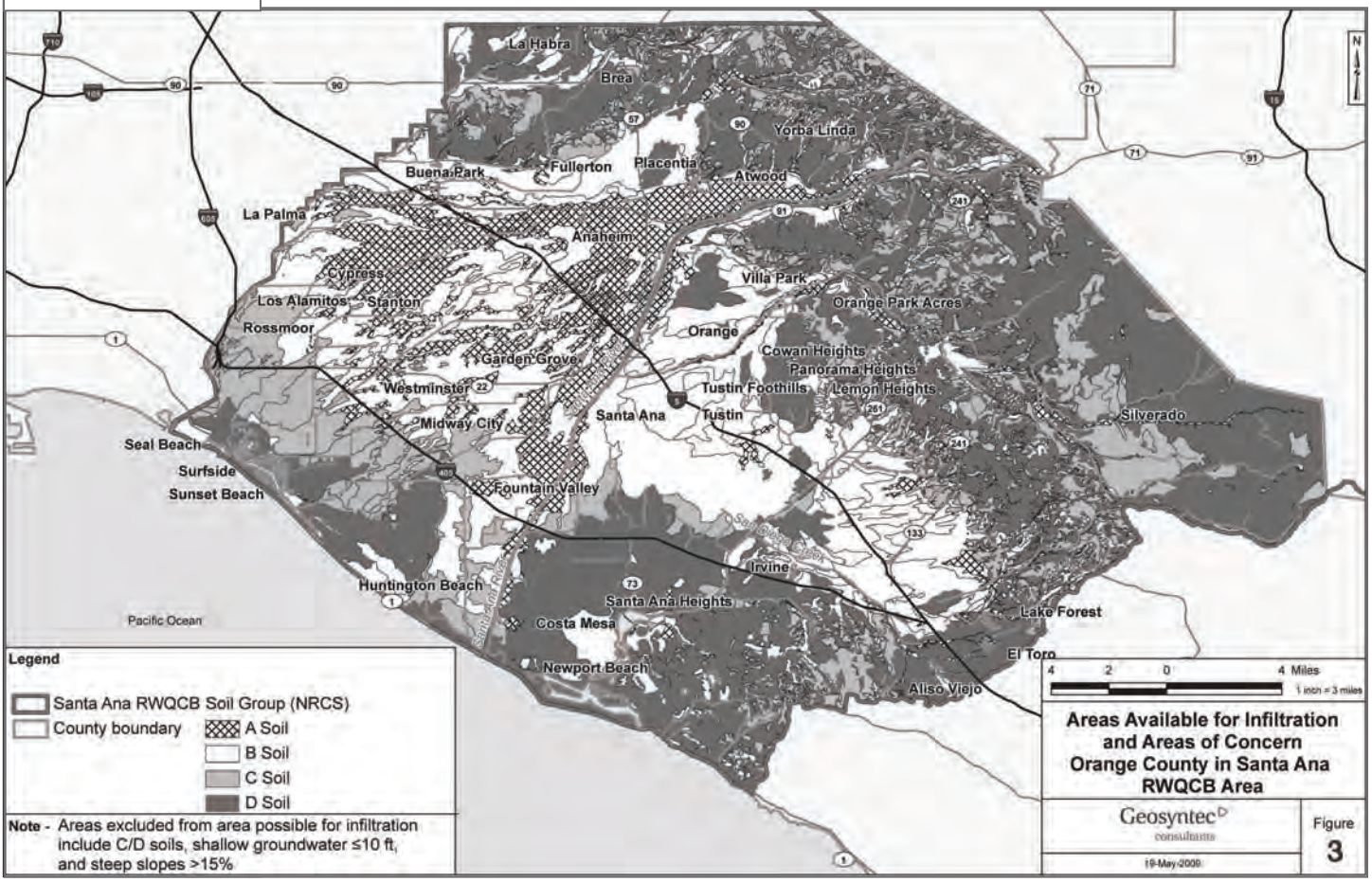

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Stormwater On Site

Water Balance Consequences

pollutant concentrations in industrial stormwater runoff. Geotechnical issues associated with steep slopes or expansive soils may also be an issue for infiltration. Depth to groundwater typically limits infiltration to areas with 10 or more feet of separation from the bottom of infiltration facilities to groundwater. Finally, in some locations upgradient of an ephemeral stream, increased infiltration may cause undesirable habitat type changes downstream of the site due to increased periods of base flows that result in vegetation changes (e.g. conversion of dry wash to a thickly vegetated system). There has been a lack of consideration of the overall water balance consequences that a "retention on site" requirement may have in terms of habitat.

As an example, **Figure 4** presents a map of the North Orange County permit area that shows the areas remaining with good potential for infiltration after consideration of some of the issues covered above. The area remaining within the permit area for consideration of infiltration is less than 23 percent of the permit area, even without considering habitat issues or regulated facilities (small contamination areas shown as dots). There are large urbanized areas where infiltration would not be either feasible or desirable.

Groundwater Quality

Infiltration: Do It Carefully

Finally, infiltration should be done carefully to ensure that groundwater quality is protected and widespread stormwater management facility failure does not occur. Proper treatment of infiltrating water should occur before this water reaches groundwater either via treatment with BMPs or ensuring that soils are adequate to provide treatment while passing infiltrating water. Infiltration facilities have often failed due to poor maintenance and operation of the facilities. One needs to think through how to design infiltration facilities to minimize maintenance issues, including whether widely-distributed infiltration facilities can be maintained as adequately as one centralized facility. Water districts that utilize groundwater should obviously be involved in decisions about where and how to infiltrate stormwater so that groundwater supplies are protected.

Maintenance Issues

Infiltration: Summary

Infiltration must be done carefully to ensure that it can be successful on a long-term basis as well as be protective of water supplies. The best opportunities for successful infiltration are in areas where groundwater is actively managed for water supply. Such areas are unlikely to face as many water balance hindrances or other issues. For example, areas along the Santa Ana River are actively managed for recharge and withdrawals by the Orange County Water District. These localities provide the best opportunity for successful infiltration.

Figure 4. Areas available for infiltration for the North Orange County Permit Area

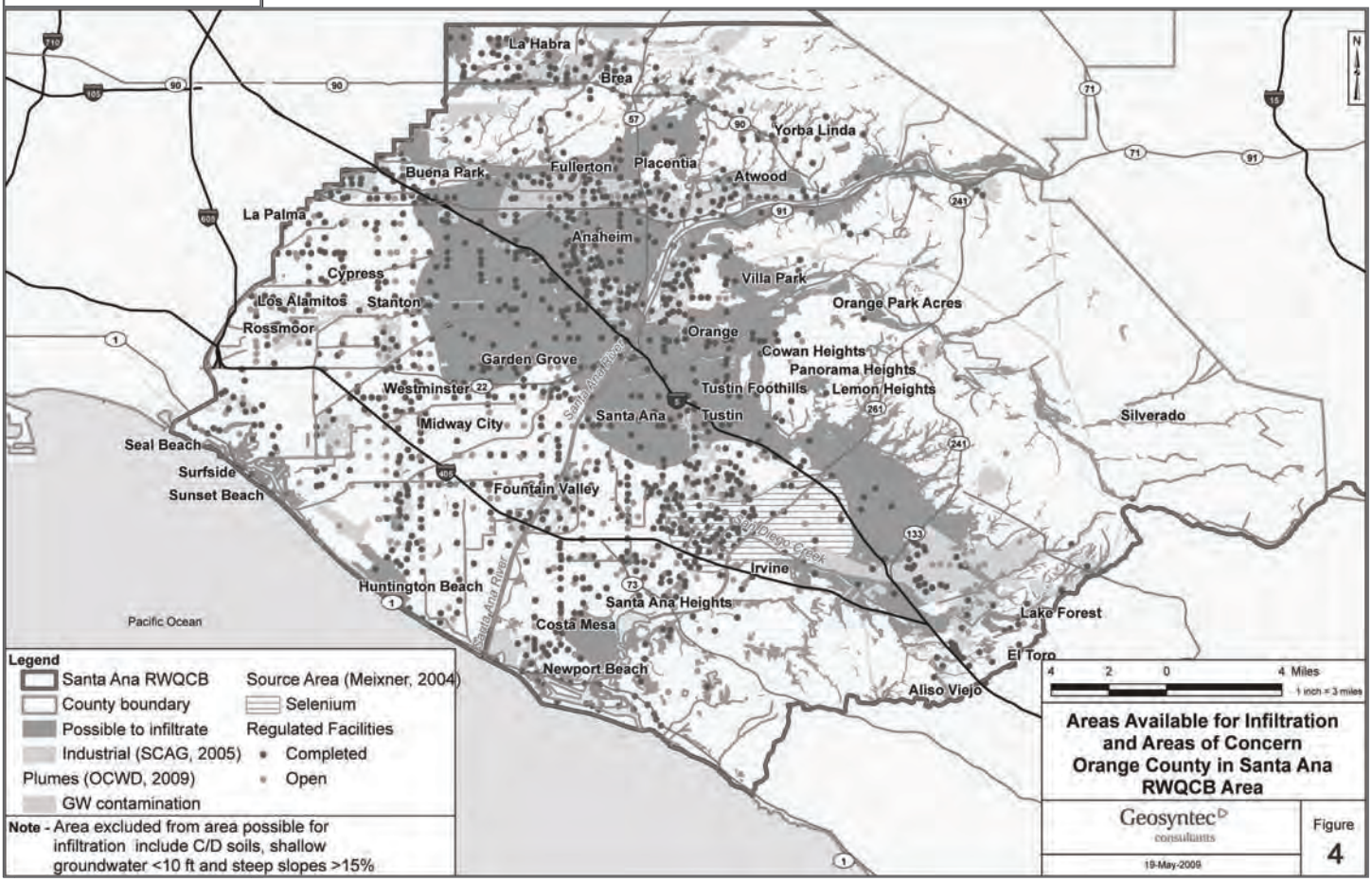

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Stormwater On Site

Development Factors

Precipitation v. ET

In Soil Storage Recovery

Water Balance

EVAPOTRANSPIRATION (ET)

After an area undergoes development there will be less available area for **e**vapo**t**ranspiration (ET)to occur. This holds true even when vegetated roofs, pervious pavements, and other "green" development practices are employed and is especially true for high density projects. Some analysts have compared monthly or seasonal ET to precipitation levels to assess the potential for ET losses as a significant retain-runoff on site measure. This is particularly inappropriate on the West Coast in light of the region's tendency for back-to-back storm events.

Refer again to **Figures 1 and 2** appearing above. **Figure 1** shows monthly normal comparisons of precipitation versus ET, while **Figure 2** shows precipitation and ET as weekly totals for an example year. While the former suggests that ET matches or exceeds precipitation on a monthly normal bases, it does not account for back-to-back storms or the fact that months with higher than normal rainfall would be the same months that correspond to lower than normal ET. **Figure 2** clearly demonstrates that ET cannot keep up with precipitation on a weekly basis in critical periods of the typical back-to-back storms of an average year. During these critical periods, the storage provided in soils would not have recovered in time for subsequent rainfall. While ET of stormwater should be maximized, it almost certainly will not be able to match pre-development levels and is likely a minor component of retaining stormwater on site (without storage and use for irrigation).

ET is a very important consideration when assessing the ability to mimic predevelopment runoff volume. **Figure 5** presents typical arid southwest water balances for: undisturbed areas; areas developed with infiltration facilities (Example Developed with LID – no underdrains); and for areas developed using LID with underdrains. Predevelopment ET can range upwards of 80 to 97 percent of the precipitation on an average annual basis. It is very unlikely that predevelopment ET will be matched by post-development ET due to reduction in vegetated open soils areas. So, the choice for development, particularly high density development, is to either have more runoff than predevelopment or more infiltration, or a combination of the two. This fact and its ramifications have not been considered during the development of on site retention requirements that are focused on surface hydrology versus overall hydrology (including sub-surface).

Figure 5. Typical Water Balance from Precipitation in Arid Southwest Climate

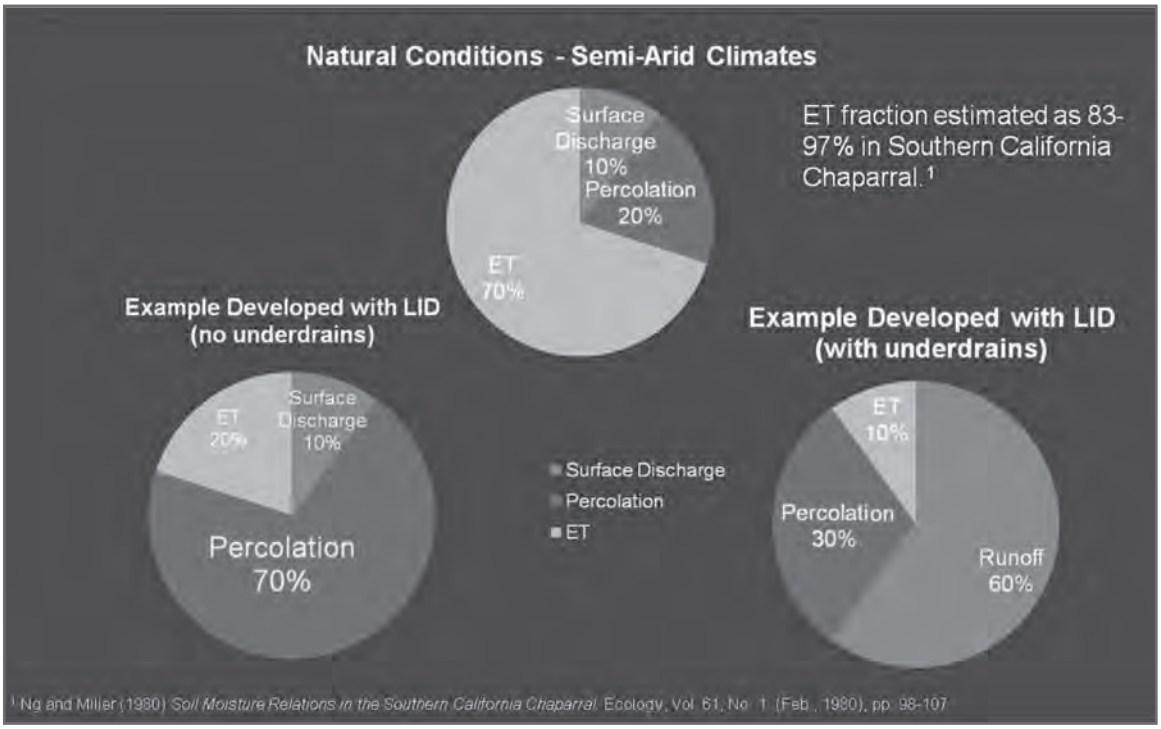

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Stormwater On Site

Harvest Demand

CAPTURE & USE ("RE-USE")

In most all cases where infiltration is not feasible or possible, the only option remaining to meet the retain on site requirements is to capture (harvest) and use the stormwater. In North Orange County, for example, this would be the option in about 77 percent of the permit area or more.

The key factor for success of capture and use of stormwater as a means to retaining water on site is the rate at which storage can be made available for subsequent events. This means having a demand for the captured water that is high enough, especially during the rainy season. The two most obvious uses for captured stormwater are for irrigation and toilet flushing. There are significant code issues with capture and use for internal non-potable demand in many jurisdictions. In addition, there are water rights issues associated with capture of stormwater in some areas (e.g., Colorado and Utah). These limitations are not the focus of this article. Other potential uses include process water for commercial or industrial purposes. A scenario for a residential development was conducted to illustrate the potential for capture and use of stormwater. This scenario is discussed next.

Capture and Use: Residential Scenario

Model Assumptions

Your authors modeled and evaluated a100-acre residential catchment with 60 percent overall impervious area using a continuous simulation model (SWMM) as an example of a capture-and-use scenario. It was assumed that infiltration losses would be minimal (due to shallow groundwater depth, poor soils for infiltration and/or other issues). A tank (above ground storage) of 1.3 million gallons (equivalent to the runoff from the catchment resulting from a 0.8 inch storm event — the water quality design storm) was evaluated with toilet flushing and irrigation uses combined. Toilet flushing assumed 65 gallons per day per dwelling unit at 4.5 units per acre. For simplicity, irrigation demands were assumed to equal the monthly average ET levels for the 30 acres of landscaped areas. It was also assumed that irrigation was always on, even during rainfall (note that irrigation demands during and after rainfall are significantly over-estimated in this analysis). A 21-year hourly long-term simulation model was run to ascertain the potential effectiveness of such a system for retaining runoff on-site. We also evaluated potential pollutant removal results as compared to biofiltration with an underdrain (surface water release).

Capture & Use Levels

Overall the system resulted in an estimated capture and use of stormwater of about 48% of the total runoff volume (52% bypassing with no treatment — though one could treat the bypass as well). The capture and use levels varied annually from less than 30 percent to 100 percent for the 21 water years evaluated (**Figure 6**).

Figure 6. Predicted Annual Runoff and Overflow for Example Cistern System

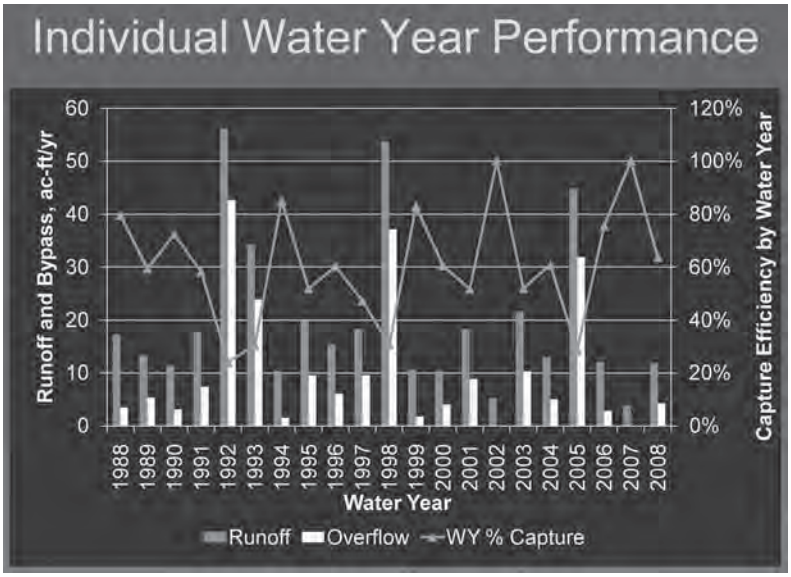

Biofiltration Comparison

Using data from International BMP Database (see: www.bmpdatabase.org), a comparison of total loadings performance to a biofiltration system with underdrains was made. This comparison showed that the biofiltration system reduced **t**otal **s**uspended **s**olids (TSS) loads by about 63% compared to 48% for the cistern scenario for the 21-year simulation. So, in this case the assumption that retain on site is the most effective at reducing pollutant loadings is not valid, unless one also required treatment of the bypassed flows (in essence an additional BMP treatment requirement). Finally, the average annual potable water saved was on the order of about 10 percent of the average annual demand.

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Stormwater On Site

Another scenario was run doubling the size of the cistern tank to 2.6 million gallons (equivalent to a 1.6 inch design storm). Under this scenario, the capture and use level went up to about 57 percent (so doubling the tank size resulted in another nine percent of the runoff being captured and used). Again, this emphasizes the point that being able to drain the cistern relatively rapidly is the key to success for capture and use.

Capture and Use: Limiting Factors

Evaluation Factors

As illustrated in these examples, one should evaluate carefully potential scenarios to help ensure that choices made regarding retention on site requirements actually result in the desired results. Evaluation should consider land use and density assumptions as well as assessment of local precipitation and runoff patterns, irrigation needs, and ability to use water for toilet flushing or other non-potable uses.

Rapid Storage Recovery

For capture and use to work, the storage must be quickly recovered. Irrigation typically is not an effective use for recovering storage quickly as irrigation needs during wet periods are minimal and in some cases (i.e., colder climates) there is no irrigation demand for long periods. In addition, much of the arid southwest is encouraging "xeri-scaping" (drought tolerant plants), which is likely much more effective at reducing potable demand than capture and use for irrigation. Xeriscape plant pallets typically do not like to be saturated for long periods, as would occur via over-irrigation if irrigation use was maximized. Further, use of a water-loving plant palate to maximize the use of captured runoff during normal and wet years could exert an additional demand for potable water during dry years.

Toilet Use Ratio

For toilet flushing to be effective, there needs to be a high enough ratio of Toilet Users To Impervious Area (TUTIA). Perhaps in high-rise condominiums, office buildings, institutional buildings, etc. this ratio would be high enough to drain the tank sufficiently fast and in these cases capture and use should be considered.

However, there would be a "competition" for reclaimed water in much of the arid west. Reclaimed water systems tend to be limited in their ability to distribute water in the wetter and colder periods of the year due to low irrigation demands. In addition, in some locations use of reclaimed water for toilet flushing is required in high density projects. One has to question if the capture and use of stormwater that may result in reclaimed water being discharged is an effective strategy. Under this scenario, the captured stormwater would not be reducing potable water demand.

Infrastructure Needs

Finally, there is significant infrastructure (**Figure 7**) that would be required to employ cistern and use on a site basis, including piping, storage, treatment, pumping, and separate piping (purple pipes). Questions about sustainability for these systems need to be explored and assessed.

Figure 7. Typical Components of a Stormwater Harvest and Use system.

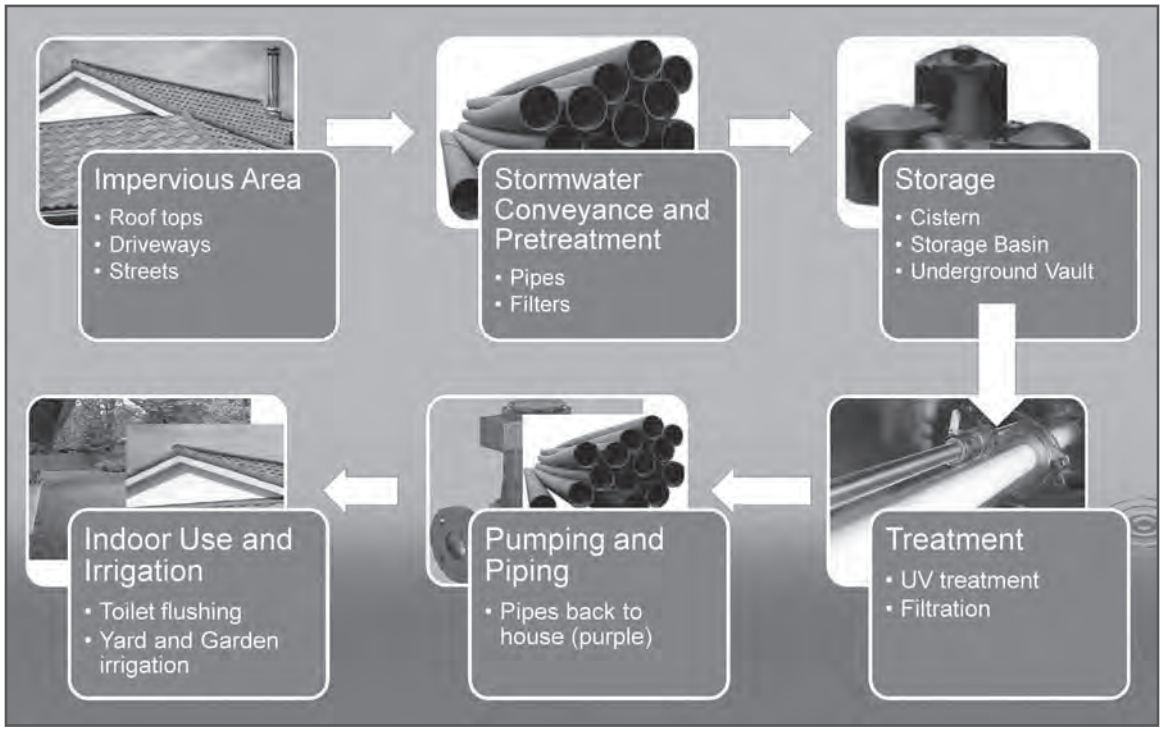

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Stormwater On Site

Key Considerations

Unique Factors

CONCLUSIONS

In Summary:

- Infiltration is often not broadly feasible, effective and/or desirable. While it should be maximized where appropriate, studies are needed to identify suitable areas and also identify areas where infiltration may be feasible but not appropriate.
- Precipitation/runoff patterns in California and much of the West limit the ability of evapotranspiration-based BMPs to achieve retention on site requirements. Evapotranspiration of stormwater should be maximized, but will not be a significant component of retaining stormwater on site in densely developed areas.
- Precipitation/runoff patterns coupled with landscaping and reclaimed water considerations limit the applications where capture and use of runoff can be effective. Generally, only scenarios with high indoor demand and no competing requirements to use reclaimed water can be expected to provide a complete and reliable stormwater solution. Capture and use should be maximized in these cases, but in other cases it should be carefully considered against other options such as biofiltration and discharge to determine which option is most effective in meeting stormwater management goals.
- The overall water balance should be considered when making choices on proper levels of infiltration versus surface runoff.
- There needs to be more technical vetting of "retain on site" and stormwater harvest and use before these approaches are made mandatory.

Each watershed and site has unique soils, topography, groundwater, water quality, land uses, receiving water sensitivities, wastewater strategies, etc. which should be considered when evaluating retention on site as a requirement or strategy. The authors believe that management approaches that are "one size fit all" are not appropriate and in many cases would likely lead to undesirable results.

Proper Stormwater Management Includes:

- Source controls
- Infiltration where feasible and appropriate
- Maximizing ET losses
- Harvest and use where it makes sense
- Capture and treat with effective (i.e. vegetated) BMPs where it makes sense

We believe that significant progress could be made by improving BMP selection and design guidance for all BMPs to better target unit processes (i.e. physical, biological, chemical treatment processes) to the pollutants and parameters of concern for each watershed.

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Aaron Poresky, E.I.T. has more than four years of experience in water resources and urban stormwater management. At Geosyntec, he has been involved in a variety of projects including structural BMP design and evaluation, water quality planning and impact analysis, hydromodification planning and impact analysis, stormwater policy support, and modeling methodology development. Key project areas have included stormwater retrofit planning and design for a variety of municipal and private clients, modeling methodology development and implementation, new development stormwater planning, and regulatory analysis. Mr. Poresky has been an invited speaker on the topics of modeling, BMP design, and stormwater policy.

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CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

TENTATIVE
ORDER NO. R9-2013-0001
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The San Diego County Copermittees in Table 1a are subject to waste discharge requirements set forth in this Order.

Table 1a. San Diego County Copermittees

City of Carlsbad	City of Oceanside
City of Chula Vista	City of Poway
City of Coronado	City of San Diego
City of Del Mar	City of San Marcos
City of El Cajon	City of Santee
City of Encinitas	City of Solana Beach
City of Escondido	City of Vista
City of Imperial Beach	County of San Diego
City of La Mesa	San Diego County Regional Airport Authority
City of Lemon Grove	San Diego Unified Port District
City of National City	

After the San Diego Water Board receives and considers the Orange County Copermittees' Report of Waste Discharge and makes any necessary changes to the Order, the Orange County Copermittees in Table 1b will become subject to waste discharge requirements set forth in this Order after expiration of Order No. R9-2009-0002, NPDES No. CAS0108740 on or after December 16, 2014.

Table 1b. Orange County Copermittees

City of Aliso Viejo	City of Rancho Santa Margarita
City of Dana Point	City of San Clemente
City of Laguna Beach	City of San Juan Capistrano
City of Laguna Hills	City of Laguna Woods
City of Laguna Niguel	County of Orange
City of Lake Forest	Orange County Flood Control District
City of Mission Viejo	

After the San Diego Water Board receives and considers the Riverside County Copermittees' Report of Waste Discharge and makes any necessary changes to this Order, the Riverside County Copermittees in Table 1c will become subject to waste discharge requirements set forth in this Order after expiration of Order No. R9-2010-0016, NPDES No. CAS0108766 on or after November 10, 2015.

Table 1c. Riverside County Copermittees

City of Murrieta	County of Riverside
City of Temecula	Riverside County Flood Control and Water Conservation District
City of Wildomar	

The Orange County Copermittees and Riverside County Copermittees may become subject to the requirements of this Order at a date earlier than the expiration date of their current Orders subject to the conditions described in Provision F.6 of this Order if the Copermittees in the respective county receive a notification of coverage from the San Diego Water Board.

The term Copermittee in this Order refers to any San Diego County, Orange County, or Riverside County Copermittee covered under this Order, unless specified otherwise.

This Order provides permit coverage for the Copermittee discharges described in Table 2.

Table 2. Discharge Locations and Receiving Waters

Discharge Points	Locations throughout San Diego Region
Discharge Description	Municipal Separate Storm Sewer System (MS4) Discharges
Receiving Waters	Inland Surface Waters, Enclosed Bays and Estuaries, and Coastal Ocean Waters of the San Diego Region

Table 3. Administrative Information

This Order was adopted by the San Diego Water Board on:	**Month Day, 2013**
This Order will become effective on:	**Month Day, 2013**
This Order will expire on:	**Month Day, 2018**
The Copermittees must file a Report of Waste Discharge in accordance with Title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than 180 days in advance of the Order expiration date.	

I, David W. Gibson, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on Month Day, 2013.

TENTATIVE

David W. Gibson
Executive Officer

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Attachment B - Standard Permit Provisions and General Provisions B-1
Attachment C - Acronyms, Abbreviations and Definitions C-1
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Attachment F - Fact Sheet / Technical Report for Order No. R9-2013-0001 ..... F-1

I. FINDINGS

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), finds that:

JURISDICTION

1. **MS4 Ownership or Operation.** Each of the Copermittees owns or operates an MS4, through which it discharges storm water and non-storm water into waters of the U.S. within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the U.S.

2. **Legal and Regulatory Authority.** This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]) adopted by the United States Environmental Protection Agency (USEPA), and chapter 5.5, division 7 of the California Water Code (CWC) (commencing with section 13370). This Order serves as an NPDES permit for discharges from MS4s to surface waters. This Order also serves as waste discharge requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

   The federal regulations make it clear that the Copermittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators (40 CFR 122.26(a)(3)(vi)). This Order does not require the Copermittees to manage storm water outside of their jurisdictional boundaries, but rather to work collectively to improve storm water management within watersheds.

3. **CWA NPDES Permit Conditions.** Pursuant to CWA section 402(p)(3)(B), NPDES permits for storm water discharges from MS4s must include requirements to effectively prohibit non-storm water discharges into MS4s, and require controls to reduce the discharge of pollutants in storm water to the maximum extent practicable (MEP), and to require other provisions as the San Diego Water Board determines are appropriate to control such pollutants. This Order prescribes conditions to assure compliance with the CWA requirements for owners and operators of MS4s to effectively prohibit non-storm water discharges into the MS4s, and require controls to reduce the discharge of pollutants in storm water from the MS4s to the MEP.

4. **CWA and CWC Monitoring Requirements.** CWA section 308(a) and 40 CFR 122.41(h),(j)-(l) and 122.48 require that NPDES permits must specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s

Deleted: The San Diego Water Board has the legal authority to issue a regional MS4 permit pursuant to its authority under CWA section 402(p)(3)(B) and 40 CFR 122.26(a)(1)(v). The USEPA also made it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide permits (55 Federal Register [FR] 47990, 48039-48042). The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees and San Diego Water Board.¶

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also specify additional monitoring and reporting requirements in 40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c). CWC section 13383 authorizes the San Diego Water Board to establish monitoring, inspection, entry, reporting and recordkeeping requirements. This Order establishes monitoring and reporting requirements to implement federal and State requirements.

5. **Total Maximum Daily Loads.** CWA section 303(d)(1)(A) requires that "[e]ach state shall identify those waters within its boundaries for which the effluent limitations…are not stringent enough to implement any water quality standard applicable to such waters." The CWA also requires states to establish a priority ranking of impaired water bodies known as Water Quality Limited Segments and to establish Total Maximum Daily Loads (TMDLs) for such waters. This priority list of impaired water bodies is called the Clean Water Act Section 303(d) List of Water Quality Limited Segments, commonly referred to as the 303(d) List. The CWA requires the 303(d) List to be updated every two years.

   TMDLs are numerical calculations of the maximum amount of a pollutant that a water body can assimilate and still meet water quality standards. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point sources (waste load allocations or WLAs) and non-point sources (load allocations or LAs), background contribution, plus a margin of safety. Discharges from MS4s are point source discharges. The federal regulations (40 CFR 122.44(d)(1)(vii)(B)) require that NPDES permits to incorporate water quality based effluent limitations (WQBELs) developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, consistent with the assumptions and requirements of any available WLA for the discharge. Requirements of this Order implement the TMDLs adopted by the San Diego Water Board and approved by USEPA.

6. **Non-Storm Water Discharges.** Pursuant to CWA section 402(p)(3)(B)(ii), this Order requires each Copermittee to effectively prohibit discharges of non-storm water into its MS4. Nevertheless, non-storm water discharges into and from the MS4s continue to be reported to the San Diego Water Board by the Copermittees and other persons. Monitoring conducted by the Copermittees, as well as the 303(d) List, have identified dry weather, non-storm water discharges from the MS4s as a source of pollutants causing or contributing to receiving water quality impairments in the San Diego Region. The federal regulations (40 CFR 122.26(d)(2)(iv)(B)(1)) require the Copermittees to have a program to prevent illicit discharges to the MS4. The federal regulations, however, allow for specific categories of non-storm water discharges to be addressed as illicit discharges only where such discharges are identified as sources of pollutants to waters of the U.S.

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7. **In-Stream Treatment Systems.** Pursuant to federal regulations (40 CFR 131.10(a)), in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S. Authorizing the construction of a runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to

accepting waste assimilation as an appropriate use for that water body. Runoff treatment must occur prior to the discharge of runoff into receiving waters. Treatment control best management practices (BMPs) must not be constructed in waters of the U.S. Construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body.

DISCHARGE CHARACTERISTICS AND RUNOFF MANAGEMENT

8. **Point Source Discharges of Pollutants.** Discharges from the MS4s may contain waste, as defined in the CWC, and pollutants that adversely affect the quality of the waters of the state. A discharge from an MS4 is a "discharge of pollutants from a point source" into waters of the U.S. as defined in the CWA. Storm water and non-storm water discharges from the MS4s may contain pollutants that cause or threaten to cause a violation of surface water quality standards, as outlined in the Water Quality Control Plan for the San Diego Basin (Basin Plan). Storm water and non-storm water discharges from the MS4s are subject to the conditions and requirements established in the Basin Plan for point source discharges.

9. **Potential Beneficial Use Impairment.** The discharge of pollutants and/or increased flows from MS4s may cause or threaten to cause the concentration of pollutants to exceed applicable receiving water quality objectives and impair or threaten to impair designated beneficial uses resulting in a condition of pollution, contamination, or nuisance.

10. **Pollutants Generated by Land Development.** Land development has created and continues to create new sources of non-storm water discharges and pollutants in storm water discharges as human population density increases. This brings higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash. Pollutants from these sources are dumped or washed off the surface by non-storm water or storm water flows into and from the MS4s. When development converts natural vegetated pervious ground cover to impervious surfaces such as paved highways, streets, rooftops, and parking lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving a developed area without BMPs will contain greater pollutant loads and have significantly greater runoff volume, velocity, and peak flow rate than pre-development runoff from the same area.

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11. **Runoff Discharges to Receiving Waters.** The MS4s discharge runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within the eleven hydrologic units comprising the San Diego Region. Historic and current development makes use of natural drainage patterns and features as conveyances for runoff. Numerous receiving water bodies and water body segments have been designated as impaired by the San Diego Water Board pursuant to CWA section 303(d).

Deleted: Rivers, streams and creeks in developed areas used in this manner are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and receiving water.

12. **Pollutants in Runoff.** The most common pollutants in runoff discharged from the MS4s include total suspended solids, sediment, pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., cadmium, copper, lead, and zinc), petroleum products and polynuclear aromatic hydrocarbons, synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus), oxygen-demanding substances (e.g., decaying vegetation, animal waste), detergents, and trash. As operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. These discharges may cause or contribute to a condition of pollution or a violation of water quality standards.

Deleted: By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not prohibit or otherwise control.

13. **Human Health and Aquatic Life Impairment.** Pollutants in runoff discharged from the MS4s can threaten and adversely affect human health and aquatic organisms. Adverse responses of organisms to chemicals or physical agents in runoff range from physiological responses such as impaired reproduction or growth anomalies to mortality. Increased volume, velocity, rate, and duration of storm water runoff greatly accelerate the erosion of downstream natural channels. This alters stream channels and habitats and can adversely affect aquatic and terrestrial organisms.

14. **Water Quality Effects.** The Copermittees' water quality monitoring data submitted to date documents persistent exceedances of Basin Plan water quality objectives for runoff-related pollutants at various watershed monitoring stations. Persistent toxicity has also been observed at several watershed monitoring stations. In addition, bioassessment data indicate that the majority of the monitored receiving waters have Poor to Very Poor Index of Biological Integrity (IBI) ratings. These findings indicate that runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in the San Diego Region. Non-storm water discharges from the MS4s have been shown to contribute significant levels of pollutants and flow in arid, developed Southern California watersheds, and contribute significantly to exceedances of applicable receiving water quality objectives.

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15. **Non-Storm Water and Storm Water Discharges.** The discharge of pollutants from the MS4 is subject to the MEP standard notwithstanding whether the pollutants are transported by stormwater or non-stormwater. Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s, namely identified illicit discharges and pollutants from unlawful dumping, must be effectively prohibited.

Deleted: Non-storm water discharges from the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard of CWA section 402(p)(3)(B)(iii), which is explicitly for "Municipal … *Stormwater Discharges* (emphasis added)" from the MS4s.

16. **Best Management Practices.** Waste and pollutants which are deposited and accumulate in MS4 drainage structures may be discharged from these structures to waters of the U.S. unless they are removed. These discharges may cause or contribute to, or threaten to cause or contribute to, a condition of pollution in receiving waters. For this reason, pollutants in storm water discharges from the MS4s can be and must be effectively reduced in runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Pollution prevention is the reduction or elimination of pollutant generation at its source and is the best "first line of defense". Source control BMPs (both structural and non-structural) minimize the contact between pollutants and runoff, therefore

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keeping pollutants onsite and out of receiving waters. Treatment control BMPs remove pollutants that have been mobilized by storm water or non-storm water flows.

17. **BMP Implementation.** Runoff needs to be addressed during the three major phases of development (planning, construction, and use) in order to reduce the discharge of storm water pollutants to the MEP, effectively prohibit non-storm water discharges, and protect receiving waters. Development which is not guided by water quality planning policies and principles can result in increased pollutant load discharges, flow rates, and flow durations which can negatively affect receiving water beneficial uses. Construction sites without adequate BMP implementation result in sediment runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. Existing development can generate substantial pollutant loads which are discharged in runoff to receiving waters. Retrofitting areas of existing development with storm water pollutant control and hydromodification management BMPs may, in many cases be necessary to address storm water discharges from existing development that may cause or contribute to a condition of pollution or a violation of water quality standards.

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18. **Long Term Planning and Implementation.** Federal regulations require municipal storm water permits to expire 5 years from adoption, after which the permit must be renewed and reissued. The San Diego Water Board recognizes that the degradation of water quality and impacts to beneficial uses of the waters in the San Diego Region occurred over several decades. The San Diego Water Board further recognizes that a decade or more may be necessary to realize demonstrable improvement to the quality of waters in the Region. This Order includes a long term planning and implementation approach that will require more than a single permit term to complete.

WATER QUALITY STANDARDS

19. **Basin Plan.** The San Diego Water Board adopted the Water Quality Control Plan for the San Diego Basin (Basin Plan) on September 8, 1994 that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for receiving waters addressed through the plan. The Basin Plan was subsequently approved by the State Water Resources Control Board (State Water Board) on December 13, 1994. Subsequent revisions to the Basin Plan have also been adopted by the San Diego Water Board and approved by the State Water Board. Requirements of this Order implement the Basin Plan.

The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Process Supply (PROC), Industrial

Service Supply (IND), Ground Water Recharge (GWR), Contact Water Recreation (REC1), Non-contact Water Recreation (REC2), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Freshwater Replenishment (FRSH), Hydropower Generation (POW), and Preservation of Biological Habitats of Special Significance (BIOL). The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region: Navigation (NAV), Commercial and Sport Fishing (COMM), Estuarine Habitat (EST), Marine Habitat (MAR), Aquaculture (AQUA), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN), and Shellfish Harvesting (SHELL).

20. **Ocean Plan.** The State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, and 2005. The State Water Board adopted the latest amendment on April 21, 2005 and it became effective on February 14, 2006. The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean. Requirements of this Order implement the Ocean Plan.

    The Ocean Plan identifies the following beneficial uses of ocean waters of the state to be protected: Industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture; preservation and enhancement of designated Areas of Special Biological Significance; rare and endangered species; marine habitat; fish spawning and shellfish harvesting

21. **Sediment Quality Control Plan**. On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes: 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

22. **National Toxics Rule and California Toxics Rule.** USEPA adopted the National Toxics Rule (NTR) on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the NTR applied in California. On May 18, 2000, USEPA adopted the California Toxics Rule (CTR). The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants.

23. **Antidegradation Policy.** This Order is in conformance with the federal Antidegradation Policy described in 40 CFR 131.12, and State Water Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality*

Waters in California. Federal regulations at 40 CFR 131.12 require that the State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. State Water Board Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies.

CONSIDERATIONS UNDER FEDERAL AND STATE LAW

24. **Coastal Zone Act Reauthorization Amendments.** Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states with approved coastal zone management programs to address non-point source pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point source pollution: agriculture, silviculture, urban, marinas, and hydromodification. This Order addresses the management measures required for the urban category, with the exception of septic systems. The runoff management programs developed pursuant to this Order fulfills the need for coastal cities to develop a runoff non-point source plan identified in the Non-Point Source Program Strategy and Implementation Plan. The San Diego Water Board addresses septic systems through the administration of other programs.

25. **Endangered Species Act.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 USC sections 1531 to 1544). This Order requires compliance with receiving water limits, and other requirements to protect the beneficial uses of waters of the State. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

26. **Report of Waste Discharge Process.** The waste discharge requirements set forth in this Order are based upon the Report of Waste Discharge submitted by the San Diego County Copermittees prior to the expiration of Order No. R9-2007-0001 (NPDES No. CAS0109266). The Orange County and Riverside County Copermittees are not immediately covered by the waste discharge requirements in this Order. The San Diego Water Board understands that each municipality is unique. The Order will continue to use the Report of Waste Discharge process prior to initially making Orange County or Riverside County Copermittees subject to the requirements of this Order.

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The federal regulations (40 CFR 122.21(d)(2)) and CWC section 13376 impose a duty on the Copermittees to reapply for continued coverage through submittal of a Report of Waste Discharge no later than 180 days prior to expiration of a currently effective permit. This requirement is set forth in the Orange County Copermittees'

and Riverside County Copermittees' currently effective permits at Provisions K.2.b and K.2.c, respectively. The Orange County Permit, Order No. R9-2009-0002 (NPDES No. CAS0108740) expires on December 16, 2014 and the Riverside County MS4 Permit, Order No. R9-2010-0016 (NPDES No. CAS0108766) expires on November 10, 2015.

Unless the Orange County or Riverside County Copermittees apply for and receive early coverage under this Order, the Orange County Copermittees' and the Riverside County Copermittees' respective permits will be superseded by this Order upon expiration of their respective permits, subject to any necessary revisions to the requirements of this Order made after the San Diego Water Board considers their respective Reports of Waste Discharge through the public process provided in 40 CFR 124.

27. **Integrated Report and Clean Water Act Section 303(d) List.** The San Diego Water Board and State Water Board submit an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. USEPA issued its *Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act* on July 29, 2005, which advocates the use of a five category approach for classifying the attainment status of water quality standards for water bodies in the Integrated Report. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 in the Integrated Report are placed on the 303(d) List.

Water bodies with available data and/or information that indicate at least one beneficial use is not being supported or is threatened, but a TMDL is not required, are included in Category 4 in the Integrated Report. Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

Implementation of the requirements of this Order may allow the San Diego Water Board to include surface waters impaired by discharges from the Copermittees' MS4s in Category 4 in the Integrated Report for consideration during the next 303(d) List submittal by the State to USEPA.

28. **Economic Considerations.** The California Supreme Court has ruled that although CWC section 13263 requires the State and Regional Water Boards (collectively Water Boards) to consider factors set forth in CWC section 13241 when issuing an NPDES permit, the Water Board may not consider the factors to justify imposing pollutant restrictions that are less stringent than the applicable federal regulations require. (*City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th

613, 618, 626-627.) However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

As noted in the following finding, the San Diego Water Board finds that the requirements in this permit are more stringent than the minimum federal requirements. Therefore, a CWC section 13241 analysis is required for permit requirements that implement the effective prohibition on the discharge of non-storm water into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determined appropriate to control such pollutants, as those requirements are mandated by federal law. The economic analysis is provided in the Fact Sheet.

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Deleted: Notwithstanding the above, the San Diego Water Board has developed an economic analysis of the requirements in this Order.

Deleted: <#>**Unfunded Mandates.** This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following: ¶
¶
<#>This Order implements federally mandated requirements under CWA section 402 (33 USC section 1342(p)(3)(B)). ¶
¶
<#>The local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental and new dischargers who are issued NPDES permits for storm water and non-storm water discharges. ¶
¶
<#>The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order. ¶
¶
<#>The Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)) and in lieu of numeric restrictions on their MS4 discharges (i.e. effluent limitations). ¶
¶
<#>The local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under State law predates the enactment of Article XIIIB, Section (6) of the California Constitution. ¶
¶
<#>The provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state develops a TMDL, federal law requires that permits must contain water quality based effluent limitations consistent with the assumptions and requirements of any applicable wasteload allocation (40 CFR 122.44(d)(1)(vii)(B)). ¶
¶
See the Fact Sheet for further discussion of unfunded mandates.¶

29. **California Environmental Quality Act.** The issuance of waste discharge requirements and an NPDES permit for the discharge of runoff from MS4s to waters of the U.S. is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 et seq.) in accordance with CWC section 13389.

STATE WATER BOARD DECISIONS

30. **Compliance with Prohibitions and Limitations.** The receiving water limitation language specified in this Order is consistent with language recommended by the USEPA and established in State Water Board Order WQ 99-05, *Own Motion Review of the Petition of Environmental Health Coalition to Review Waste Discharge Requirements Order No. 96-03, NPDES Permit No. CAS0108740*, adopted by the State Water Board on June 17, 1999. The receiving water limitation language in this Order requires storm water discharges from MS4s to not cause or contribute to a violation of water quality standards, which is to be achieved through an iterative approach requiring the implementation of improved and better-tailored BMPs over time. Implementation of the iterative approach to comply with receiving water limitations based on applicable water quality standards is necessary to ensure that storm water discharges from the MS4 will not ultimately cause or contribute to violations of water quality standards and will not create conditions of pollution, contamination, or nuisance.

31. **Special Conditions for Areas of Special Biological Significance.** On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving an exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges. State Water Board Resolution No. 2012-0012 requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions

were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject terms and conditions of State Water Board Resolution No. 2012-0012. The Special Protections contained in Attachment B to Resolution No. 2012-0012, applicable to these discharges, are hereby incorporated into this Order as if fully set forth herein.

ADMINISTRATIVE FINDINGS

32. **Executive Officer Delegation of Authority.** The San Diego Water Board by prior resolution has delegated all matters that may legally be delegated to its Executive Officer to act on its behalf pursuant to CWC section 13223. Therefore, the Executive Officer is authorized to act on the San Diego Water Board's behalf on any matter within this Order unless such delegation is unlawful under CWC section 13223 or this Order explicitly states otherwise.

33. **Standard Provisions.** Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR 122.42, are provided in Attachment B to this Order.

34. **Fact Sheet.** The Fact Sheet for this Order contains background information, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of this Order. The Fact Sheet is hereby incorporated into this Order and constitutes part of the Findings of this Order.

35. **Public Notice.** In accordance with State and federal laws and regulations, the San Diego Water Board notified the Copermittees, and interested agencies and persons of its intent to prescribe waste discharge requirements for the control of discharges into and from the MS4s to waters of the U.S. and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet.

36. **Public Hearing.** The San Diego Water Board held a public hearing on Month Day, 2013 and heard and considered all comments pertaining to the terms and conditions of this Order. Details of the public hearing are provided in the Fact Sheet.

37. **Effective Date.** This Order serves as an NPDES permit pursuant to CWA section 401 or amendments thereto, and becomes effective fifty (50) days after the date of its adoption, provided that the Regional Administrator, USEPA, Region IX, does not object to this Order.

38. **Review by the State Water Board.** Any person aggrieved by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with CWC section 13320 and California Code of Regulations, title 23,

sections 2050, et seq. The State Water Board must receive the petition by 5:00 p.m., 30 days after the San Diego Water Board action, except that if the thirtieth day following the action falls on a Saturday, Sunday or State holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

THEREFORE, IT IS HEREBY ORDERED that the Copermittees, in order to meet the provisions contained in division 7 of the CWC and regulations adopted thereunder, and the provisions of the CWA and regulations adopted thereunder, must each comply with the following:

II. PROVISIONS

A. PROHIBITIONS AND LIMITATIONS

The purpose of this provision is to describe the conditions under which storm water from and non-storm water discharges into the MS4s are effectively prohibited or limited. The goal of the prohibitions and limitations is to protect the water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through the implementation of water quality improvement strategies and runoff management programs that effectively prohibit non-storm water discharges into the Copermittees' MS4s, and reduce pollutants in storm water discharges from the Copermittees' MS4s to the MEP. The process for determining compliance with the Discharge Prohibitions (A.1), Receiving Water Limitations (A.2), and Effluent Limitations (A.3, including effluent limitations derived from the TMDL requirements – Attachment E) is defined in Provision A.4.

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1. Discharge Prohibitions

a. Except as provided for in Provisions A.1.e or A.4, discharges from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the state are prohibited.

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b. Non-storm water discharges into MS4s are to be effectively prohibited, unless such discharges are either authorized by a separate NPDES permit, or the discharge is a category of non-storm water discharges that must be addressed pursuant to Provisions E.2.a.(1)-(5) of this Order.

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c. Discharges from MS4s are subject to all waste discharge prohibitions in the Basin Plan, included in Attachment A to this Order.

d. Storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 applicable to these discharges, included in Attachment A to this Order. All other discharges from the Copermittees' MS4s to ASBS are prohibited.

e. For discharges associated with water body pollutant combinations addressed in a TMDL in Attachment E of this Order, the affected Copermittees shall achieve compliance as outlined in Attachment E.

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2. Receiving Water Limitations

a. Discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters, including but not limited to all applicable provisions contained in the list below to the extent that they remain in effect and are operative, unless such discharges are being addressed by the Copermittee(s) through the processes set forth in this Order (Provision A.4 and Attachment E). Where a TMDL has been developed and its terms have been incorporated into this Order (in a manner that is consistent with the waste load allocations set forth in the TMDL), a Permittee shall also be considered in compliance with such TMDL-related requirements provided in this Order, if it is timely and in good faith implementing the MEP-compliant control measures otherwise established by this Order.

(1) The San Diego Water Board's Basin Plan, including beneficial uses, water quality objectives, and implementation plans;

(2) State Water Board plans for water quality control including the following:

(a) Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries (Thermal Plan), and

(b) The Ocean Plan, including beneficial uses, water quality objectives, and implementation plans;

(3) State Water Board policies for water and sediment quality control including the following:

(a) Water Quality Control Policy for the Enclosed Bays and Estuaries of California,

(b) Sediment Quality Control Plan which includes the following narrative objectives for bays and estuaries:

(i) Pollutants in sediments shall not be present in quantities that, alone or in combination, are toxic to benthic communities, and

(ii) Pollutants shall not be present in sediments at levels that will bioaccumulate in aquatic life to levels that are harmful to human health,

(c) The Statement of Policy with Respect to Maintaining High Quality of Waters in California;[1]

[1] State Water Board Resolution No. 68-16

(4) Priority pollutant criteria promulgated by the USEPA through the following:

(a) National Toxics Rule (NTR)[2] (promulgated on December 22, 1992 and amended on May 4, 1995), and

(b) California Toxics Rule (CTR).[3,4]

b. Discharges from MS4s composed of storm water runoff must not alter natural ocean water quality in an ASBS.

c. For receiving water limitations associated with a water body pollutant combination addressed in a TMDL in Attachment E of this Order, the affected Copermittees shall achieve compliance as outlined in Attachment E.

3. Effluent Limitations

a. TECHNOLOGY BASED EFFLUENT LIMITATIONS

Pollutants in storm water discharges from MS4s must be reduced to the MEP.[5]

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

This Order establishes water quality based effluent limitations (WQBELs) consistent with the assumptions and requirements of all available TMDL waste load allocations (WLAs) assigned to discharges from the Copermittees' MS4s. Each Copermittee must comply with applicable WQBELs established for the TMDLs in Attachment E to this Order, pursuant to the applicable TMDL compliance schedules.

4. Compliance with Discharge Prohibitions, Receiving Water Limitations, and Effluent Limitations

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Each Copermittee must achieve compliance with Provisions A.1, A.2, and A.3 of this Order through timely implementation of control measures and other actions as specified in Provisions B and E of this Order, including any modifications. The Water Quality Improvement Plans required under Provision B must be designed and adapted to ultimately achieve compliance with Provisions A.1, A2, and A.3.

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a. Except as provided in Parts 4.c, 4.d, 4.e, or 4.f below, discharges from the MS4

[2] 40 CFR 131.36
[3] 65 Federal Register 31682-31719 (May 18, 2000), adding Section 131.38 to 40 CFR
[4] If a water quality objective and a CTR criterion are in effect for the same priority pollutant, the more stringent of the two applies, unless a previous regulatory action (i.e., TMDL) has specified otherwise.
[5] This does not apply to MS4 discharges which receive subsequent treatment to reduce pollutants in storm water discharges to the MEP prior to entering receiving waters (e.g., low flow diversions to the sanitary sewer). Runoff treatment must occur prior to the discharge of runoff into receiving waters per Finding 7.

for which a Permittee is responsible shall not cause or contribute to an exceedance of any applicable water quality standard.

b. Except as provided in Parts 4.c, 4.d, 4.e, or 4.f below, discharges from the MS4 of storm water, or non-storm water, for which a Permittee is responsible, shall not cause a condition of nuisance.

c. In instances where discharges from the MS4 for which the permittee is responsible (1) causes or contributes to an exceedance of any applicable water quality standard or causes a condition of nuisance in the receiving water; (2) the receiving water is not subject to an approved TMDL that is in effect for the constituent(s) involved; and (3) the constituent(s) associated with the discharge is otherwise not specifically addressed by a provision of this Order (such as specific scheduled actions in a Water Quality Improvement Plan), the Permittee shall comply with the following iterative procedure:

(a) Submit a report to the Regional Water Board that:

(i) Summarizes and evaluates water quality data associated with the pollutant of concern in the context of applicable water quality objectives including the magnitude and frequency of the exceedances.

(ii) Includes a work plan to identify the sources of the constituents of concern (including those not associated with the MS4 such that non-MS4 sources can be pursued).

(iii) Describes the strategy and schedule for implementing best management practices (BMPs) and other controls (including those that are currently being implemented) that will address the Permittee's sources of constituents that are causing or contributing to the exceedances of an applicable water quality standard or causing a condition of nuisance, and are reflective of the severity of the exceedances. The strategy shall demonstrate that the selection of BMPs will address the Permittee's sources of constituents and include a mechanism for tracking BMP implementation. The strategy shall provide for future refinement pending the results of the source identification work plan noted in 4.c.(a)(ii) above.

(iv) Outlines, if necessary, additional monitoring to evaluate improvement in water quality and, if appropriate, special studies that will be undertaken to support future management decisions.

(v) Includes a methodology (ies) that will assess the effectiveness of the BMPs to address the exceedances.

(vi) This report may be submitted in conjunction with the Annual Report unless the Regional Water Board directs an earlier submittal.

Deleted: If exceedance(s) of water quality standards persist in receiving waters notwithstanding implementation of this Order, the Copermittees must comply with the following procedures:

Deleted: <#>For exceedance(s) of a water quality standard in the process of being addressed by the Water Quality Improvement Plan, the Copermittee(s) must implement the Water Quality Improvement Plan as accepted by the San Diego Water Board, and update the Water Quality Improvement Plan, as necessary, pursuant to Provision F.2.c;¶
<#>¶
Upon a determination by either the Copermittees or the San Diego Water Board that discharges from the MS4 are causing or contributing to a new exceedance of an applicable water quality standard not addressed by the Water Quality Improvement Plan, the Copermittees must submit the following updates to the Water Quality Improvement Plan pursuant to Provision F.2.c or as part of the Annual Report required under Provision F.3.b, unless the San Diego Water Board directs an earlier submittal

Deleted: The water quality improvement strategies being implemented that are effective and will continue to be implemented,¶
¶
Section Break (Continuous)
Water quality improvement strategies (i.e. BMPs, retrofitting projects, stream and/or habitat rehabilitation or restoration projects, adjustments to jurisdictional runoff management programs, etc.) that will be implemented to reduce or eliminate any pollutants or conditions that are causing or contributing to the exceedance of water quality standards,¶
¶
Updates to the schedule for implementation of the existing and additional water quality improvement strategies, and¶
¶
Updates to the monitoring and assessment program to track progress toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a of this Order;

(b) Submit any modifications to the report required by the Regional Water Board within 60 days of notification. The report is deemed approved within 60 days of its submission if no response is received from the Regional Water Board.

(c) Implement the actions specified in the report in accordance with the acceptance or approval, including the implementation schedule and any modifications to this Order.

(d) As long as the Permittee has complied with the procedure set forth above and is implementing the actions, the Permittee does not have to repeat the same procedure for continuing or recurring exceedances of the same receiving water limitations unless directed by the Regional Water Board to develop additional BMPs.

(e) The information developed pursuant to A.4.c must be evaluated and incorporated into the Water Quality Improvement Plans and/or the Jurisdictional Runoff Management Plans, as needed.

d. For Receiving Water Limitations associated with waterbody-pollutant combinations addressed in an adopted TMDL that is in effect and that has been incorporated in this Order, a Permittee that is in compliance with Attachment E (Total Maximum Daily Load Provisions) is in compliance with Parts 4.a and 4.b above. For Receiving Water Limitations associated with waterbody-pollutant combinations on the CWA 303(d) list, which are not otherwise addressed by Attachment E or other applicable pollutant-specific provision of this Order, a Permittee that is in compliance with Part 4.c is in compliance with Parts 4.a and 4.b.

e. Alternatively, a Permittee that is in compliance with Provision B (Development and Implementation of Water Quality Improvement Plans) is in compliance with Parts 4.a and 4.b above.

f. If a Permittee is found to have discharges from the MS4 for which it is responsible that causes an exceedance of an applicable water quality standard in the receiving water or causes a condition of nuisance in the receiving water, the Permittee shall be in compliance with Parts 4.a and 4.b above, if the Permittee is in compliance with Parts 4.c, 4.d, or 4.e, or requirements otherwise covered by a provision of this Order specifically addressing the constituent in question, as applicable.

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The San Diego Water Board may require the incorporation of additional modifications to the Water Quality Improvement Plan required under Provision B. The applicable Copermittees must submit any modifications to the update to the Water Quality Improvement Plan within 90 days of notification that additional modifications are required by the San Diego Water Board, or as otherwise directed

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<#>Within 90 days of the San Diego Water Board determination that the update to the Water Quality Improvement Plan meets the requirements of this Order, the applicable Copermittees must revise the jurisdictional runoff management program documents to incorporate the updated water quality improvement strategies that have been and will be implemented, the implementation schedule, and any additional monitoring required; and¶
¶
<#>Each Copermittee must implement the updated Water Quality Improvement Plan.¶

Deleted: The procedure set forth above to achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order do not have to be repeated for continuing or recurring exceedances of the same water quality standard(s) following implementation of scheduled actions unless directed to do otherwise by the San Diego Water Board.

Deleted: Nothing in Provisions A.4.a and A.4.b prevents the San Diego Water Board from enforcing any provision of this Order while the applicable Copermittees prepare and implement the above update to the Water Quality Improvement Plan and jurisdictional runoff management programs.

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PROVISION B: WATER QUALITY IMPROVEMENT PLANS
B.1. Watershed Management Areas

B. WATER QUALITY IMPROVEMENT PLANS[6]

The purpose of this provision is to develop Water Quality Improvement Plans (WQIPs) that guide the Copermittees' jurisdictional runoff management programs towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plans is to address the impacts of MS4 discharges so that such discharges do not impair the water quality and designated beneficial uses of waters of the state. Therefore, implementation of the WQIPs also provides the basis for complying with Provisions II.A.1, II.A.2, and II.A.3, as described in Provision II.A.4. This goal will be accomplished through an adaptive planning and management process that identifies the highest priority water quality conditions within a watershed and implements strategies through the jurisdictional runoff management programs to achieve improvements in the quality of discharges from the MS4s and receiving waters. As such, the requirements outlined in Provision E may be modified for consistency with the WQIP priorities for the applicable Watershed Management Area, if appropriate justification is provided.

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1. Watershed Management Areas

The Copermittees must develop a Water Quality Improvement Plan for each of the Watershed Management Areas in Table B-1. A total of ten Water Quality Improvement Plans must be developed for the San Diego Region.

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
San Juan (901.00)	South Orange County	- Aliso Creek - San Juan Creek - San Mateo Creek - Pacific Ocean - Heisler Park ASBS	- City of Aliso Viejo[1] - City of Dana Point[1] - City of Laguna Beach[1] - City of Laguna Hills[1] - City of Laguna Niguel[1] - City of Laguna Woods[1] - City of Lake Forest[1] - City of Mission Viejo[1] - City of Rancho Santa Margarita[1] - City of San Clemente[1] - City of San Juan Capistrano[1] - County of Orange[1] - Orange County Flood Control District[1]
Santa Margarita (902.00)	Santa Margarita River	- Murrieta Creek - Temecula Creek - Santa Margarita River - Santa Margarita Lagoon - Pacific Ocean	- City of Murrieta[2] - City of Temecula[2] - City of Wildomar[2] - County of Riverside[2] - County of San Diego[3] - Riverside County Flood Control and Water Conservation District[2]

[6] Once developed and approved, the Water Quality Improvement Plan and corresponding Jurisdictional Runoff Management Plan will functionally replace the Load Reduction Plans.

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
San Luis Rey (903.00)	San Luis Rey River	- San Luis Rey River - San Luis Rey Estuary - Pacific Ocean	- City of Oceanside - City of Vista - County of San Diego
Carlsbad (904.00)	Carlsbad	- Loma Alta Slough - Buena Vista Lagoon - Agua Hedionda Lagoon - Batiquitos Lagoon - San Elijo Lagoon - Pacific Ocean	- City of Carlsbad - City of Encinitas - City of Escondido - City of Oceanside - City of San Marcos - City of Solana Beach - City of Vista - County of San Diego
San Dieguito (905.00)	San Dieguito River	- San Dieguito River - San Dieguito Lagoon - Pacific Ocean	- City of Del Mar - City of Escondido - City of Poway - City of San Diego - City of Solana Beach - County of San Diego
Penasquitos (906.00)	Penasquitos	- Los Penasquitos Lagoon - Pacific Ocean	- City of Del Mar - City of Poway - City of San Diego - County of San Diego
	Mission Bay	- Mission Bay - Pacific Ocean - San Diego Marine Life Refuge ASBS	- City of San Diego
San Diego (907.00)	San Diego River	- San Diego River - Pacific Ocean	- City of El Cajon - City of La Mesa - City of San Diego - City of Santee - County of San Diego
Pueblo San Diego (908.00) Sweetwater (909.00) Otay (910.00)	San Diego Bay	- Sweetwater River - Otay River - San Diego Bay - Pacific Ocean	- City of Chula Vista - City of Coronado - City of Imperial Beach - City of La Mesa - City of Lemon Grove - City of National City - City of San Diego - County of San Diego - San Diego County Regional Airport Authority - San Diego Unified Port District
Tijuana (911.00)	Tijuana River	- Tijuana River - Tijuana Estuary - Pacific Ocean	- City of Imperial Beach - City of San Diego - County of San Diego

Notes:
1. The Orange County Copermittees will be covered under this Order after expiration of Order No. R9-2009-0002, or earlier if the Orange County Copermittees meet the conditions in Provision F.6.
2. The Riverside County Copermittees will be covered under this Order after expiration of Order No. R9-2010-0016, or earlier if the Riverside County Copermittees meet the conditions in Provision F.6.
3. The County of San Diego is required to implement the requirements of Provision B for its jurisdiction within the Santa Margarita River Watershed Management Area until the Riverside County Copermittees have been notified of coverage under this Order.

2. Priority Water Quality Conditions

The Copermittees must identify the water quality priorities within each Watershed Management Area that will be addressed by the Water Quality Improvement Plan. Where appropriate, Watershed Management Areas may be separated into subwatersheds to focus water quality prioritization and jurisdictional runoff management program implementation efforts by receiving water.

a. Assessment of Receiving Water Conditions

The Copermittees must consider the following, at a minimum, to identify water quality priorities based on impacts of MS4 discharges on receiving water beneficial uses:

(1) Receiving waters listed as impaired on the CWA Section 303(d) List of Water Quality Limited Segments (303(d) List);

(2) TMDLs adopted and under development by the San Diego Water Board;

(3) Receiving waters recognized as sensitive or highly valued by the Copermittees, including estuaries designated under the National Estuary Program under CWA section 320, wetlands defined by the State or U.S. Fish and Wildlife Service's National Wetlands Inventory as wetlands, and receiving waters identified as ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (Attachment A);

(4) The receiving water limitations of Provision A.2;

(5) Known historical versus current physical, chemical, and biological water quality conditions;

(6) Available, relevant, and appropriately collected and analyzed physical, chemical, and biological receiving water monitoring data, including, but not limited to, data describing:

(a) Chemical constituents,

(b) Water quality parameters (i.e. pH, temperature, conductivity, etc.),

(c) Toxicity Identification Evaluations for both receiving water column and sediment,

(d) Trash impacts,

(e) Bioassessments, and

(f) Physical habitat;

(7) Available evidence of erosional impacts in receiving waters due to accelerated flows (i.e. hydromodification);

(8) Available evidence of adverse impacts to the chemical, physical, and biological integrity of receiving waters; and

(9) The potential improvements in the overall condition of the Watershed Management Area that can be achieved.

b. ASSESSMENT OF IMPACTS FROM MS4 DISCHARGES

The Copermittees must consider the following, at a minimum, to identify the potential impacts to receiving waters that may be caused or contributed to by discharges from the Copermittees' MS4s:

(1) The discharge prohibitions of Provision A.1 and effluent limitations of Provision A.3; and

(2) Available, relevant, and appropriately collected and analyzed storm water and non-storm water monitoring data from the Copermittees' MS4 outfalls;

(3) Locations of each Copermittee's MS4 outfalls that discharge to receiving waters;

(4) Locations of MS4 outfalls that are known to persistently discharge non-storm water to receiving waters likely causing or contributing to impacts on receiving water beneficial uses;

(5) Locations of MS4 outfalls that are known to discharge pollutants in storm water causing or contributing to impacts on receiving water beneficial uses; and

(6) The potential improvements in the quality of discharges from the MS4 that can be achieved.

c. IDENTIFICATION OF PRIORITY WATER QUALITY CONDITIONS

(1) The Copermittees must use the information gathered for Provisions B.2.a and B.2.b to develop a list of priority water quality conditions as pollutants, stressors and/or receiving water conditions that are the highest threat to receiving water quality or that most adversely affect the physical, chemical, and biological integrity of receiving waters. The list must include the following information for each priority water quality condition:

(a) The beneficial use(s) associated with the priority water quality condition;

(b) The geographic extent of the priority water quality condition within the Watershed Management Area, if known;

(c) The temporal extent of the priority water quality condition (e.g., dry weather and/or wet weather);

(d) The Copermittees with MS4s discharges that may cause or contribute to the priority water quality condition; and

(e) An assessment of the adequacy of and data gaps in the monitoring data to characterize the conditions causing or contributing to the priority water quality condition, including a consideration of spatial and temporal variation.

(2) The Copermittees must identify the highest priority water quality conditions to be addressed by the Water Quality Improvement Plan, and provide a rationale for selecting a subset of the water quality conditions identified pursuant to Provision B.2.c.(1) as the highest priorities.

d. IDENTIFICATION OF MS4 SOURCES OF POLLUTANTS AND/OR STRESSORS

The Copermittees must identify and prioritize known and suspected sources of storm water and non-storm water pollutants and/or other stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c. The identification of known and suspected sources of pollutants and/or stressors that cause or contribute to the highest priority water quality conditions as identified for Provision B.2.c must consider the following:

(1) Pollutant generating facilities, areas, and/or activities within the Watershed Management Area, including:

(a) Each Copermittee's inventory of construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas,

(b) Publicly owned parks and/or recreational areas,

(c) Open space areas,

(d) All currently operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste, and

(e) Areas not within the Copermittees' jurisdictions (e.g., Phase II MS4s, tribal lands, state lands, federal lands) that are known or suspected to be discharging to the Copermittees' MS4s;

(2) Locations of the Copermittees' MS4s, including the following:

(a) All MS4 outfalls that discharge to receiving waters, and

(b) Locations of major structural controls for storm water and non-storm water (e.g., retention basins, detention basins, major infiltration devices, etc.);

(3) Other known and suspected sources of non-storm water or pollutants in storm water discharges to receiving waters within the Watershed Management Area, including the following:

(a) Other MS4 outfalls (e.g., Phase II Municipal and Caltrans),

(b) Other NPDES permitted discharges,

(c) Any other discharges that may be considered point sources (e.g., private outfalls), and

(d) Any other discharges that may be considered non-point sources (e.g., agriculture, wildlife or other natural sources);

(4) Review of available data, including but not limited to:

(a) Findings from the Copermittees' illicit discharge detection and elimination programs,

(b) Findings from the Copermittees' MS4 outfall discharge monitoring,

(c) Findings from the Copermittees' receiving water monitoring,

(d) Findings from the Copermittees' MS4 outfall discharge and receiving water assessments, and

(e) Other available, relevant, and appropriately collected data, information, or studies related to pollutant sources and/or stressors that contribute to the highest priority water quality conditions as identified for Provision B.2.c.

(5) The adequacy of the available data to identify and prioritize sources and/or stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c.

e. NUMERIC GOALS AND SCHEDULES

The Copermittees must develop and incorporate action levels, interim and final numeric goals[7] and schedules into the Water Quality Improvement Plan. Numeric goals must be used to support Water Quality Improvement Plan implementation and measure progress towards addressing the highest priority water quality conditions identified under Provision B.2.c. Action levels and numeric goals, themselves, are not enforceable compliance standards, effluent limitations, or receiving water limitations. When establishing numeric goals and corresponding schedules, the Copermittees must consider the following:

(1) Final numeric goals must be based on measureable criteria or indicators, to be achieved in the receiving waters and/or MS4 discharges for the highest priority water quality conditions which will be capable of demonstrating the protection of water quality standards in receiving waters;

(2) Interim numeric goals must be based on measureable criteria or indicators capable of demonstrating incremental progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges; and

(3) Schedules must be adequate for measuring progress toward achieving the interim and final numeric goals required for Provisions B.2.e.(1) and B.2.e.(2). Schedules must incorporate the following:

(a) Interim dates for achieving the interim numeric goals,

(b) Compliance schedules for any applicable TMDLs in Attachment E to this Order,

(c) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A),

(d) Achievement of the final numeric goals in the receiving waters and/or MS4 discharges for the highest water quality priorities must be as soon as possible, and

(4) The schedules for achieving the interim and final goals will be evaluated with each annual report [F.3.b.(1)(d)] and/or as a part of the ROWD development [B.5.a] to determine if they should be modified.

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Final dates for achieving the final numeric goals must not initially extend more than 10 years beyond the effective date of this Order, unless a longer period of time is authorized by the San Diego Water Board Executive Officer or the schedule includes an applicable TMDL in Attachment E to this Order.

[7] Interim and final numeric goals may take a variety of forms such as TMDL established WQBELs, action levels, pollutant concentration, load reductions, number of impaired water bodies delisted from the List of Water Quality Impaired Segments, Index of Biotic Integrity (IBI) scores, or other appropriate metrics. Interim and final numeric goals are not necessarily limited to one criterion or indicator, but may include multiple criteria and/or indicators. Except for TMDL established WQBELs, interim and final numeric goals and corresponding schedules may be revised through the adaptive management process under Provision B.5.

3. Water Quality Improvement Strategies and Schedules

The Copermittees must develop specific water quality improvement strategies to address the highest priority water quality conditions identified within a Watershed Management Area. The water quality improvement strategies must address the highest priority water quality conditions by preventing or eliminating non-storm water discharges to and from the MS4, reducing pollutants in storm water discharges from the MS4 to the MEP, and protecting the water quality standards of receiving waters.

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a. WATER QUALITY IMPROVEMENT STRATEGIES

The Copermittees must identify and prioritize water quality improvement strategies based on their likely effectiveness and efficiency, and implement strategies to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, improve the physical, chemical, and biological receiving water conditions, and achieve the interim and final numeric goals in accordance with the schedules required for Provision B.2.e.(3). The following water quality improvement strategies must be included and described in the Water Quality Improvement Plan:

(1) Specific strategies and/or activities that may be implemented by one or more Copermittees within their jurisdictions through the jurisdictional runoff management programs that will address the highest priority water quality conditions within the Watershed Management Area, in accordance with the following requirements:

(a) Strategies and/or activities must, at a minimum, be described for each jurisdictional runoff management program component where strategies to address the highest priority water quality conditions are required under Provision E;

(b) The Water Quality Improvement Plan must describe the circumstances or conditions when and where the strategies or/activities should be or will be implemented, but specific details about how each Copermittee will implement the strategies and/or activities within its jurisdiction are not required; and

(c) Descriptions of strategies and/or activities must include any monitoring, information collection, special studies, and/or data analysis that is necessary to assess the effectiveness of the strategy and/or activity toward addressing the highest priority water quality conditions.

(2) Additional strategies and/or activities that may be implemented within the Watershed Management Area on a jurisdictional, sub-watershed, or watershed scale by one or more Copermittees, not specifically required under Provision E, which are designed to achieve the interim and final numeric goals identified in Provisions B.2.e.(1) and B.2.e.(2);

b. IMPLEMENTATION SCHEDULES

(1) The Copermittees must develop schedules for implementing the water quality improvement strategies identified under Provision B.3.a to achieve the interim and final numeric goals identified under Provision B.2.e.(1) and B.2.e.(2). Schedules must be developed for both the water quality improvement strategies implemented by each Copermittee within its jurisdiction and for strategies that the Copermittees choose to implement on a collaborative basis.

(2) The Copermittees must incorporate the implementation compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

4. Water Quality Improvement Monitoring and Assessment Program

a. The Copermittees in each Watershed Management Area must develop and incorporate an integrated monitoring and assessment program into the Water Quality Improvement Plan that assesses: 1) the progress toward achieving the numeric goals and schedules, 2) the progress toward addressing the highest priority water quality conditions for each Watershed Management Area, and 3) each Copermittee's overall efforts to implement the Water Quality Improvement Plan.

b. The monitoring and assessment program must incorporate the monitoring and assessment requirements of Provision D, which may allow the Copermittees to modify the program to be consistent with and focus on the highest priority water quality conditions for each Watershed Management Area.

c. For Watershed Management Areas with applicable TMDLs, the monitoring and assessment program must incorporate the specific monitoring and assessment requirements of Attachment E.

d. For Watershed Management Areas with any ASBS, the water quality monitoring and assessment program must incorporate the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

5. Iterative Approach and Adaptive Management Process

The Copermittees in each Watershed Management Area must implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1, A.2, and A.3, and must include the following:

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a. RE-EVALUATION OF PRIORITY WATER QUALITY CONDITIONS

The priority water quality conditions, and numeric goals and corresponding schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.2.c and B.2.e, may be re-evaluated by the Copermittees as needed during the term of this Order as part of the Annual Report. Re-evaluation and recommendations for modifications to the priority water quality conditions, and numeric goals and corresponding schedules must be provided in the Report of Waste Discharge, and must consider the following:

(1) Achieving the outcome of improved water quality in MS4 discharges and receiving waters through implementation of the water quality improvement strategies identified in the Water Quality Improvement Plan;

(2) Progress toward achieving interim and final numeric goals in receiving waters and/or MS4 discharges for the highest priority water quality conditions in the Watershed Management Area,

(3) Progress toward achieving outcomes according to established schedules;

(4) New information developed when the requirements of Provisions B.2.a-c have been re-evaluated;

(5) New policies or regulations that may affect identified numeric goals;

(6) Spatial and temporal accuracy of monitoring data collected to inform prioritization of water quality conditions and implementation strategies to address the highest priority water quality conditions;

(7) Availability of new information and data from sources other than the jurisdictional runoff management programs within the Watershed Management Area that informs the effectiveness of the actions implemented by the Copermittees;

(8) San Diego Water Board recommendations; and

(9) Recommendations for modifications solicited through a public participation process.

b. ADAPTATION OF STRATEGIES AND SCHEDULES

The water quality improvement strategies and schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.3, must be re-evaluated and adapted as new information becomes available to result in more effective and efficient measures to achieve the numeric goals established pursuant to Provision B.2.e. Re-evaluation of and modifications to the water quality improvement strategies must be provided in the Annual Report, and must consider the following:

(1) Modifications to the priority water quality conditions, and numeric goals and corresponding schedules based on Provision B.5.a;

(2) Measurable or demonstrable reductions of non-storm water discharges to and from each Copermittee's MS4;

(3) Measurable or demonstrable reductions of pollutants in storm water discharges from each Copermittee's MS4 to the MEP;

(4) New information developed when the requirements of Provisions B.2.b and B.2.d have been re-evaluated;

(5) Efficiency in implementing the Water Quality Improvement Plan;

(6) San Diego Water Board recommendations; and

(7) Recommendations for modifications solicited through a public participation process.

c. ADAPTATION OF MONITORING AND ASSESSMENT PROGRAM

The water quality improvement monitoring and assessment program, included in the Water Quality Improvement Plan pursuant to Provisions B.4, must be re-evaluated and adapted when new information becomes available. Re-evaluation and recommendations for modifications to the monitoring and assessment program, pursuant to the requirements of Provision D, may be provided in the Annual Report, but must be provided in the Report of Waste Discharge.

6. Water Quality Improvement Plan Submittal, Updates, and Implementation

a. The Copermittees must submit the Water Quality Improvement Plans in accordance with the requirements of Provision F.1.

b. The Copermittees must submit proposed updates to the Water Quality Improvement Plan for acceptance by the San Diego Water Board Executive Officer in accordance with the requirements of Provision F.2.c.

c. The Copermittees must commence with implementation of the Water Quality Improvement Plans immediately after acceptance by the San Diego Water Board, in accordance with the schedules, or subsequently updated schedules, within the Water Quality Improvement Plan.

C. ACTION LEVELS

The purpose of this provision is for the Copermittees to incorporate numeric non-stormwater action levels (NALs) and stormwater action levels (SALs) in the Water Quality Improvement Plans (WQIP) and numeric non-stormwater action levels (NALs) in the Illicit Discharge Detection and Elimination (IDDE) Program.

- For the purposes of the WQIPs, the goal of the action levels is to guide the implementation efforts and measure progress towards the protection of the high priority water quality conditions and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through monitoring and assessing the quality of the MS4 discharges during the implementation of the Water Quality Improvement Plans.

- For the purposes of the IDDE program, the goal of the action levels is to assist in the effective prohibition of non-stormwater discharges into the MS4.

Action levels will be developed and incorporated into the WQIP (Provision B) and the IDDE Program (Provision E). Depending upon the goals/objectives for the use of the action levels and the priority receiving water conditions, the constituents and values at which they are set may differ between watersheds. Copermittees may develop Watershed Management Area specific numeric action levels for non-stormwater and stormwater MS4 discharges using an approach approved by the Regional Board or use the default non-stormwater and stormwater action levels prescribed in C.1 and C.2 below.

The Copermittees will submit the action levels as a part of the WQIP and JURMP submittals. The action levels currently established will serve as the interim action levels until revised action levels are completed and approved. Exceedances of the action levels are not subject to enforcement or non-compliance actions under this Order.

1. Default Non-Storm Water Action Levels[8]

The following non-stormwater action levels (NALs) must be incorporated in the WQIPs and IDDE program if the Copermittees have not developed their own NALs for the identified high priority constituents using an approach approved by the Regional Board EO.

a. The following NALs must be incorporated:

(1) Non-Storm Water Discharges from MS4s to Ocean Surf Zone

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Deleted: The Copermittees must develop and incorporate numeric non-storm water action levels (NALs) into the Water Quality Improvement Plan to: 1) support the development and prioritization of water quality improvement strategies for addressing non-storm water discharges to and from the MS4s, 2) assess the effectiveness of the water quality improvement strategies toward addressing MS4 non-storm water discharges, required pursuant to Provision D.4.b.(1), and 3) support the detection and elimination of non-storm water and illicit discharges to and from the MS4, required pursuant to Provision E.2.

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[8] NALs are not considered by the San Diego Water Board to be enforceable limitations.

Table C-1. Non-Storm Water Action Levels for Discharges from MS4s to Ocean Surf Zone

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Total Coliform	MPN/100 ml	1,000	-	10,000/1,000[1]	OP
Fecal Coliform	MPN/100 ml	200[2]	-	400	OP
Enterococci	MPN/100 ml	35	-	104[3]	OP

Abbreviations/Acronyms
AMAL – average monthly action level
OP – Ocean Plan water quality objective
MDAL – maximum daily action level
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Total coliform density NAL is 1,000 MPN/100 ml when the fecal/total coliform ratio exceeds 0.1.
2. Fecal coliform density NAL is 200 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas."

(2) Non-Storm Water Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Table C-2. Non-Storm Water Action Levels for Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Turbidity	NTU	75	-	225	OP
pH	Units	Within limit of 6.0 to 9.0 at all times			OP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	35	-	104[3]	BP
Priority Pollutants	ug/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
OP – Ocean Plan water quality objective
NTU – Nephelometric Turbidity Units
ug/L – micrograms per liter
MDAL – maximum daily action level
BP – Basin Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas" and is not applicable to waterbodies that are not designated with the water contact recreation (REC-1) beneficial use.

Table C-3. Non-Storm Water Action Levels for Priority Pollutants

Parameter	Units	Freshwater (CTR)		Saltwater (CTR)	
		MDAL	AMAL	MDAL	AMAL
Cadmium	ug/L	**	**	16	8
Copper	ug/L	*	*	5.8	2.9
Chromium III	ug/L	**	**	-	-
Chromium VI	ug/L	16	8.1	83	41
Lead	ug/L	*	*	14	2.9
Nickel	ug/L	**	**	14	6.8
Silver	ug/L	*	*	2.2	1.1
Zinc	ug/L	*	*	95	47

Abbreviations/Acronyms:
CTR – California Toxic Rule
AMAL – average monthly action level
ug/L – micrograms per liter
MDAL – maximum daily action level

Notes:
* Action levels developed on a case-by-case basis (see below)

** Action levels developed on a case-by-case basis (see below), but calculated criteria are not to exceed Maximum Contaminant Levels (MCLs) under the California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64431

The Cadmium, Copper, Chromium (III), Lead, Nickel, Silver and Zinc NALs for MS4 discharges to freshwater receiving waters will be developed on a case-by-case basis because the freshwater criteria are based on site-specific water quality data (receiving water hardness). For these priority pollutants, the following equations (40 CFR 131.38.b.2) will be required:

Cadmium (Total Recoverable)	= exp(0.7852[ln(hardness)] - 2.715)
Chromium III (Total Recoverable)	= exp(0.8190[ln(hardness)] + 0.6848)
Copper (Total Recoverable)	= exp(0.8545[ln(hardness)] - 1.702)
Lead (Total Recoverable)	= exp(1.273[ln(hardness)] - 4.705)
Nickel (Total Recoverable)	= exp(.8460[ln(hardness)] + 0.0584)
Silver (Total Recoverable)	= exp(1.72[ln(hardness)] - 6.52)
Zinc (Total Recoverable)	= exp(0.8473[ln(hardness)] + 0.884)

(3) Non-Storm Water Discharges from MS4s to Inland Surface Waters

Table C-4. Non-Storm Water Action Levels for Discharges from MS4s to Inland Surface Waters

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Dissolved Oxygen	mg/L	Not less than 5.0 in WARM waters and not less than 6.0 in COLD waters			BP
Turbidity	NTU	-	20	See MDAL	BP
pH	Units	Within limit of 6.5 to 8.5 at all times			BP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	33	-	61[3]	BP
Total Nitrogen	mg/L	-	1.0	See MDAL	BP
Total Phosphorus	mg/L	-	0.1	See MDAL	BP
MBAS	mg/L	-	0.5	See MDAL	BP
Iron	mg/L	-	0.3	See MDAL	BP
Manganese	mg/L	-	0.05	See MDAL	BP
Priority Pollutants	ug/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
BP – Basin Plan water quality objective
COLD – cold freshwater habitat beneficial use
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
MDAL – maximum daily action level
WARM – warm freshwater habitat beneficial use
MBAS – Methylene Blue Active Substances
MPN/100 ml – most probable number per 100 milliliters
ug/L – micrograms per liter

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for freshwater "designated beach areas" and is not applicable to waterbodies that are not designated with the water contact recreation (REC-1) beneficial use.

b. If not identified in Provision C.1.a, NALs must be identified, developed and incorporated in the Water Quality Improvement Plan for any pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in waters of the state associated with the highest priority water quality conditions related to non-storm water discharges from the MS4s. NALs must be based on:

(1) Applicable water quality standards which may be dependent upon site-specific or receiving water-specific conditions or assumptions to be identified by the Copermittees; or

(2) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. Dry weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.b may be utilized to develop or revise NALs based on watershed-specific data, subject to San Diego Water Board Executive Officer approval.

Deleted: <#>For the NALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary NALs specific to the Watershed Management Area at levels greater than the NALs required by Provisions C.1.a and C.1.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for addressing non-storm water discharges to and from the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and from the MS4. The secondary NALs may be developed using an approach acceptable to the San Diego Water Board.¶
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2. Default Storm Water Action Levels[10]

The Copermittees must develop and incorporate numeric storm water action levels (SALs) in the Water Quality Improvement Plans to: 1) support the development and prioritization of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s, and 2) assess the effectiveness of the water quality improvement strategies toward reducing pollutants in storm water discharges, required pursuant to Provision D.4.b.(2).[11]

The following stormwater action levels (SALs) must be incorporated in the WQIPs if the Copermittees have not developed their own SALs for the identified high priority constituents using an approach approved by the Regional Board EO.

a. The following SALs for discharges of storm water from the MS4 must be incorporated:

Table C-5. Storm Water Action Levels for Discharges from MS4s to Receiving Waters

Parameter	Units	Action Level
Turbidity	NTU	126
Nitrate & Nitrite (Total)	mg/L	2.6
Phosphorus (Total P)	mg/L	1.46
Cadmium (Total Cd)*	µg/L	3.0
Copper (Total Cu)*	µg/L	127
Lead (Total Pb)*	µg/L	250
Zinc (Total Zn)*	µg/L	976

Abbreviations/Acronyms:
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
ug/L – micrograms per liter

Notes:
* The sampling must include a measure of receiving water hardness at each MS4 outfall. If a total metal concentration exceeds the corresponding metals SAL in Table C-5, that concentration must be compared to the California Toxics Rule criteria and the USEPA 1-hour maximum concentration for the detected level of receiving water hardness associated with that sample. If it is determined that the sample's total metal concentration for that specific metal exceeds that SAL, but does not exceed the applicable USEPA 1-hour maximum concentration criterion for the measured level of hardness, then the sample result will not be considered above the SAL for that measurement.

[10] SALs are not considered by the San Diego Water Board to be enforceable limitations.
[11] The Copermittees may utilize SALs or other benchmarks currently established by the Copermittees as interim SALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

b. If not identified in Provision C.2.a, SALs must be identified, developed and incorporated in the Water Quality Improvement Plan for pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in waters of the state associated with the highest water quality priorities related to storm water discharges from the MS4s. SALs must be based on:

(1) Federal and State water quality guidance and/or water quality standards; and

(2) Site-specific or receiving water-specific conditions; or

(3) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. Wet weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.c may be used to develop or revise SALs based upon watershed-specific data, subject to San Diego Water Board Executive Officer approval.

Deleted: For the SALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary SALs specific to the Watershed Management Area at levels greater than the SALs required by Provisions C.2.a and C.2.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s. The secondary SALs may be developed based on the approaches recommended by the State Water Board's Storm Water Panel

Deleted: [12] or using an approach acceptable to the San Diego Water Board.¶
¶

D. MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS

The purpose of this provision is for the Copermittees to monitor and assess the impact on the chemical, physical, and biological conditions of receiving waters caused by discharges from the Copermittees' MS4s under wet weather and dry weather conditions. The goal of the monitoring and assessment program is to inform the Copermittees about the nexus between the health of receiving waters and the water quality condition of the discharges from their MS4s. This goal will be accomplished through monitoring and assessing the conditions of the receiving waters, discharges from the MS4s, pollutant sources and/or stressors, and effectiveness of the water quality improvement strategies implemented as part of the Water Quality Improvement Plans.

1. Receiving Water Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the condition of the receiving waters in each Watershed Management Area during dry weather and wet weather. Following acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct long-term receiving water monitoring during implementation of the Water Quality Improvement Plan to assess the long term trends and determine if conditions in receiving waters are improving. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following receiving water monitoring procedures:

a. TRANSITIONAL RECEIVING WATER MONITORING

Until the monitoring requirements of Provisions D.1.b-e are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following receiving water monitoring in the Watershed Management Area:

(1) Continue the receiving water monitoring programs required in Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016;

(2) Continue the monitoring in the Hydromodification Management Plans approved by the San Diego Water Board;

(3) Participate in the following regional receiving water monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring,

(b) Southern California Bight Regional Monitoring, and

(c) Sediment Quality Monitoring;

(4) Implement the monitoring programs developed as part of any implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) for the TMDLs in Attachment E to this Order; and

(5) For Watershed Management Areas with ASBS, implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

b. LONG-TERM RECEIVING WATER MONITORING STATIONS

The Copermittees must select at least one long-term receiving water monitoring station from among the existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees to be representative of the receiving water quality in the Watershed Management Area. Additional long-term receiving water monitoring stations must be selected where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

c. DRY WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three dry weather monitoring events at each of the long-term receiving water monitoring stations. At least one monitoring event must be conducted during the dry season (May 1 – September 30) and at least one monitoring event must be conducted during a dry weather period during the wet season (October 1

– April 30), after the first wet weather event of the season, with an antecedent dry period of at least 72 hours following a storm event producing measureable rainfall of greater than 0.1 inch.

(1) Dry Weather Receiving Water Field Observations

For each dry weather monitoring event, the Copermittees must record field observations consistent with Table D-1 at each long-term receiving water monitoring station.

Table D-1. Field Observations for Receiving Water Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) • Station description (i.e. deposits or stains, vegetation condition, structural condition, and observable biology) • Presence and assessment of trash in and around station

(2) Dry Weather Receiving Water Field Monitoring

For each dry weather monitoring event, if conditions allow the collection of the data, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

Table D-2. Field Monitoring Parameters for Receiving Water Monitoring Stations

Parameters
• pH • Temperature • Specific conductivity • Dissolved oxygen • Turbidity

(3) Dry Weather Receiving Water Analytical Monitoring

For each dry weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable NAL constituents, and

(v) Constituents listed in Table D-3.

Table D-3. Analytical Monitoring Constituents for Receiving Water Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Pesticides	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Mercury • Nickel • Selenium • Thallium • Zinc	• Organophosphate Pesticides • Pyrethroid Pesticides	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Total Coliform at inland receiving water monitoring stations.

Deleted: Fecal

(4) Dry Weather Receiving Water Toxicity Monitoring

For each dry weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for toxicity in accordance with Table D-4:

Table D-4. Dry Weather Toxicity Testing for Receiving Water Monitoring Stations

Freshwater Organism	Test Approach	USEPA Protocol[2]
Pimephales promelas	1 acute 1 chronic[1]	EPA-821-R-02-012
Hyalella Azteca	1 acute 1 chronic[1]	EPA-821-R-02-012
Psuedokirchneriella subcapitata	1 acute 1 chronic[1]	EPA-821-R-02-013

Notes:
1. Chronic toxicity testing is not required at receiving water monitoring stations located at mass loading stations if the channel flows are diverted year-round during dry weather conditions to the sanitary sewer for treatment.
2. USEPA protocols must be utilized for toxicity testing unless alternate toxicity testing protocols have been approved by the San Diego Water Board.

(5) Dry Weather Receiving Water Bioassessment Monitoring

Bioassessment monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must conduct bioassessment monitoring during at least one dry weather monitoring event at each long-term receiving water monitoring station as follows:

(a) The following bioassessment samples and measurements must be collected:

(i) Macroinvertebrate samples must be collected in accordance with the "Reachwide Benthos (Multihabitat) Procedure" in the most current Surface Water Ambient Monitoring Program (SWAMP) Bioassessment Standard Operating Procedures (SOP), and amendments, as applicable;[13]

(ii) The "Full" suite of physical habitat characterization measurements must be collected in accordance with the most current SWAMP Bioassessment SOP, and as summarized in the SWAMP Stream Habitat Characterization Form – Full Version;[14] and

(iii) Freshwater algae samples must be collected in accordance with the

[13] Ode, P.R.. 2007. Standard operating procedures for collecting macroinvertebrate samples and associated physical and chemical data for ambient bioassessments in California. California State Water Resources Control Board Surface Water Ambient Monitoring Program (SWAMP) Bioassessment SOP 001. http://www.swrcb.ca.gov/water_issues/programs/swamp/tools.shtml#monitoring
[14] Available at: http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/reports/fieldforms_fullversion052908.pdf

SWAMP Standard Operating Procedures for Collecting Algae Samples.[15] Analysis of samples must include algal taxonomic composition (diatoms and soft algae) and algal biomass.

(b) The bioassessment samples, measurements, and appropriate water chemistry data must be used to calculate the following:

(i) An Index of Biological Integrity (IBI) for macroinvertebrates for each monitoring station where bioassessment monitoring was conducted, based on the most current calculation method;[16] and

(ii) An IBI for algae for each monitoring station where bioassessment monitoring was conducted, when a calculation method is developed.[17]

(c) In lieu of the requirements of Provision D.1.c.(5)(a), the Copermittees may conduct the bioassessment monitoring in accordance with the "Triad" assessment approach[18] to calculate the IBIs required for Provision D.1.c.(5)(b). The Copermittees must conduct sampling, analysis, and reporting of specified in-stream biological and habitat data according to the protocols specified in the SCCWRP Technical Report No. 539, or subsequent protocols, if developed.

(6) Dry Weather Receiving Water Hydromodification Monitoring

In addition to the hydromodification monitoring conducted as part of the Copermittees' Hydromodification Management Plans, hydromodification monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must collect the following hydromodification monitoring observations and measurements within an appropriate domain of analysis during at least one dry weather monitoring event for each long-term receiving water monitoring station:

(a) Channel conditions, including:

(i) Channel dimensions,

[15] Fetscher et al. 2009. Standard Operating Procedures for Collecting Stream Algae Samples and Associated Physical Habitat and Chemical Data for Ambient Bioassessments in California.
[16] The most current calculation method at the time the Order was adopted is outlined in "A Quantitative Tool for Assessing the Integrity of Southern California Coastal Streams" (Ode, et al. 2005. Environmental Management. Vol. 35, No. 1, pp. 1-13). If an updated or new calculation method is developed, either both (i.e. current and updated/new) methods must be used, or historical IBIs must be recalculated with the updated or new calculation method.
[17] When a calculation method is developed, IBIs must be calculated for all available and appropriate historical data.
[18] Stormwater Monitoring Coalition Model Monitoring Technical Committee, 2004. Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California. Technical Report #419. August 2004.

(ii) Hydrologic and geomorphic conditions, and

(iii) Presence and condition of vegetation and habitat;

(b) Location of discharge points;

(c) Habitat integrity;

(d) Photo documentation of existing erosion and habitat impacts, with location (i.e. latitude and longitude coordinates) where photos were taken;

(e) Measurement or estimate of dimensions of any existing channel bed or bank eroded areas, including length, width, and depth of any incisions; and

(f) Known or suspected cause(s) of existing downstream erosion or habitat impact, including flow, soil, slope, and vegetation conditions, as well as upstream land uses and contributing new and existing development.

d. WET WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three wet weather monitoring events at each long-term receiving water monitoring station. At least one wet weather monitoring event must be conducted during the first wet weather event of the wet season (October 1 – April 30), and at least one wet weather monitoring event during a wet weather event that occurs after February 1.

(1) Wet Weather Receiving Water Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each long-term receiving water monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event;

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(c) Station condition (i.e. deposits or stains, vegetation condition, structural

condition, observable biology); and

(d) Presence and assessment of trash in and around station.

(2) Wet Weather Receiving Water Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

(3) Wet Weather Receiving Water Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) Constituents listed in Table D-3.

(4) Wet Weather Receiving Water Toxicity Monitoring

For each wet weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for toxicity in accordance with Table D-5:

Table D-5. Wet Weather Toxicity Testing for Receiving Water Monitoring Stations

Freshwater Organism	Test Approach	USEPA Protocol[1]
Pimephales promelas	1 acute	EPA-821-R-02-012
Hyalella Azteca	1 acute	EPA-821-R-02-012
Psuedokirchneriella subcapitata	1 acute	EPA-821-R-02-013

Notes:
1. USEPA protocols must be utilized for toxicity testing unless alternate toxicity testing protocols have been approved by the San Diego Water Board.

e. OTHER RECEIVING WATER MONITORING REQUIREMENTS

(1) Regional Monitoring

The Copermittees must participate in the following regional receiving waters monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring; and

(b) Southern California Bight Regional Monitoring.

(2) Sediment Quality Monitoring

The Copermittees must perform sediment monitoring to assess compliance with sediment quality receiving water limits applicable to MS4 discharges to enclosed bays and estuaries. The monitoring may be performed either by individual or multiple Copermittees to assess compliance with receiving water limits, or through participation in a water body monitoring coalition. The Copermittees must identify sediment sampling stations that are spatially representative of the sediment within the water body segment or region of interest. Sediment quality monitoring must be conducted in conformance with the monitoring requirements set forth in the State Water Board Sediment Quality Control Plan.

(3) ASBS Monitoring

For Watershed Management Areas with ASBS, the Copermittees must implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

f. ALTERNATIVE WATERSHED MONITORING REQUIREMENTS

The San Diego Water Board may direct the Copermittees to participate in an effort to develop alternative watershed monitoring with other regulated entities, other interested parties, and the San Diego Water Board to refine, coordinate, and implement regional monitoring and assessment programs to determine the status and trends of water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams.

In lieu of the Receiving Water Monitoring Program requirements specified in 1.a to 1.d, the Copermittees may participate in the development and implementation of monitoring for the collaborative receiving waters monitoring program. It is expected that a regional monitoring will allow for a more effective and efficient receiving waters monitoring program. The regional monitoring plan must be submitted to the Executive Officer for review and approval. Documentation of participation and monitoring shall be included in the annual report.

2. MS4 Outfall Discharge Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the discharges from the MS4 outfalls in each Watershed Management Area during dry weather and wet weather. Following acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct MS4 outfall discharge monitoring during implementation of the Water Quality Improvement Plan to assess the effectiveness of their jurisdictional runoff management programs toward effectively prohibiting non-storm water discharges and reducing pollutants in storm water discharges to and from their MS4s. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following MS4 outfall monitoring procedures:

a. TRANSITIONAL MS4 OUTFALL DISCHARGE MONITORING

Until the monitoring requirements of Provisions D.2.b-c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following MS4 outfall discharge monitoring in the Watershed Management Area:

(1) MS4 Outfall Discharge Monitoring Station Inventory

Each Copermittee must identify all major MS4 outfalls that discharge directly to receiving waters within its jurisdiction and geo-locate those outfalls on a map of the MS4 pursuant to Provision E.2.b.(1). This information must be compiled into a MS4 outfall discharge monitoring station inventory, and must include the following information:

(a) Latitude and longitude of MS4 outfall point of discharge;

(b) Watershed Management Area;

(c) Hydrologic subarea;

(d) Outlet size;

(e) Accessibility (i.e. safety and without disturbance of critical habitat);

(f) Approximate drainage area; and

(g) Classification of whether the MS4 outfall is known to have persistent dry weather flows, transient dry weather flows, no dry weather flows, or unknown dry weather flows.

(2) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Until the monitoring requirements of Provision D.2.b are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, each Copermittee must perform dry weather MS4 outfall field screening monitoring to identify non-storm water and illicit discharges within its jurisdiction in accordance with Provision E.2.c, to determine which discharges are transient flows and which are persistent flows, and prioritize the dry weather MS4 discharges that will be investigated and eliminated in accordance with Provision E.2.d. Each Copermittee must conduct the following dry weather MS4 outfall discharge field screening monitoring within its jurisdiction:

(a) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Frequency

Each Copermittee must field screen the MS4 outfalls in its inventory developed pursuant to Provision D.2.a.(1) as follows:

(i) For Copermittees with less than 125 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area,

at least 80 percent of the outfalls must be visually inspected two times per year during dry weather conditions.

(ii) For Copermittees with 125 major MS4 outfalls or more, but less than or equal to 500, that discharge to receiving waters within a Watershed Management Area all the outfalls must be visually inspected at least annually during dry weather conditions.

(iii) For Copermittees with more than 500 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 500 outfalls must be visually inspected at least annually during dry weather conditions. Copermittees with more than 500 major MS4 outfalls within a Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(iv) For Copermittees with more than 500 major MS4 outfalls within its jurisdiction that are located in more than one Watershed Management Area, at least 500 major MS4 outfalls within its inventory must be visually inspected at least annually during dry weather conditions. Copermittees with more than 500 major MS4 outfalls in more than one Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(v) Inspections of major MS4 outfalls conducted in response to public reports and staff or contractor reports and notifications may count toward the required visual inspections of MS4 outfall discharge monitoring stations.

(b) Transitional Dry Weather MS4 Outfall Discharge Field Screening Visual Observations

(i) An antecedent dry period of at least 72 hours following any storm event producing measurable rainfall greater than 0.1 inch is required prior to conducting field screening visual observations during a field screening monitoring event.

(ii) During the field screening monitoring event, each Copermittee must record visual observations consistent with Table D-6 at each MS4 outfall discharge monitoring station inspected.

Table D-6. Field Screening Visual Observations for MS4 Outfall Discharge Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) - Flow source(s) suspected or identified from non-storm water source investigation - Flow source(s) eliminated during non-storm water source identification • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) - Known or suspected source(s) of pooled or ponded water • Station description (i.e. deposits or stains, vegetation condition, structural condition, observable biology) • Presence and assessment of trash in and around station • Evidence or signs of illicit connections or illegal dumping

(iii) Each Copermittee must implement the requirements of Provisions E.2.d.(2)(c)-(e) based on the field observations.

(iv) Each Copermittee must evaluate field observations together with existing information available from prior reports, inspections and monitoring results to determine whether any observed flowing, pooled, or ponded waters are likely to be transient or persistent flow.[19]

(c) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Records

[19] Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

Based upon the results of the transitional dry weather MS4 outfall discharge field screening monitoring conducted pursuant to Provisions D.2.a.(2)(a)-(b), each Copermittee must update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow.

(3) Transitional Wet Weather MS4 Outfall Discharge Monitoring

Until the monitoring requirements of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(a) Transitional Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees must select at least five wet weather MS4 outfall discharge monitoring stations from the inventories developed pursuant to Provision D.2.a.(1) that are representative of storm water discharges from areas consisting primarily of residential, commercial, industrial, and typical mixed-use land uses present within the Watershed Management Area.

(b) Transitional Wet Weather MS4 Outfall Discharge Monitoring Frequency

Each wet weather MS4 outfall discharge monitoring station selected pursuant to Provision D.2.a.(3)(a) must be monitored twice during the wet season (October 1 – April 30). One wet weather monitoring event must be conducted during the first wet weather event of the wet season, and one wet weather monitoring event at least a month after the first wet weather event of the wet season.

Transitional wet weather MS4 outfall discharge monitoring may begin in year 2 of the transitional period once the MS4 outfall discharge monitoring stations have been inventoried and evaluated pursuant to Provision D.2.a.(1)

(c) Transitional Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(i) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and

the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(ii) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(iii) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(iv) Presence and assessment of trash in and around station.

(d) Transitional Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(e) Transitional Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, and indicator bacteria;

(iv) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

[a] Time-weighted composites collected over the length of the storm event or the first 24 hour period, whichever is shorter, composed of discrete samples, which may be collected through the use of automated equipment, or

[b] Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

[c] If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during

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the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours;

(v) Only one analysis of the composite of aliquots is required;

(vi) The samples must be analyzed for the following constituents:

[a] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List with the exception of toxicity[20],

[b] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and

[c] Constituents listed in in Table D-7.

[e] The Copermittee may be relieved of analytical monitoring requirements [a] to [c] if supporting information can be provided or has historical data that can demonstrate or provide justification that the analysis of the constituent is not necessary.

[20] Copermittees may provide an alternate approach to evaluate and identify the cause of toxicity currently affecting receiving waters and to iteratively adapt the monitoring program to address these chemical stressors in their MS4 outfall discharges in the monitoring plan which is subject to Regional Board approval.

Table D-7. Analytical Monitoring Constituents for Wet Weather MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Nickel • Selenium • Thallium • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Total Coliform for dishcarges to inland surface waters.

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(f) Other Transitional Wet Weather MS4 Outfall Discharge Monitoring

The San Diego County Copermittees must continue the wet weather MS4 outfall monitoring program developed under Order No. R9-2007-0001, as approved by the San Diego Water Board, through its planned completion.

b. DRY WEATHER MS4 OUTFALL DISCHARGE MONITORING

Each Copermittee must perform dry weather MS4 outfall monitoring to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. Each Copermittee must conduct the following dry weather MS4 outfall discharge monitoring within its jurisdiction:

(1) Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Each Copermittee must continue to perform the dry weather MS4 outfall discharge field screening monitoring in accordance with the requirements of Provision D.2.a.(2). The Copermittee may adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of persistent flow non-storm water discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of visual inspections performed is equivalent to the number of visual inspections required under Provision D.2.a.(2)(a).

(2) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring

Each Copermittee must perform non-storm water persistent flow MS4 outfall discharge monitoring to determine which persistent non-storm water discharges contain concentrations of pollutants below NALs, and which persistent non-storm water discharges impact receiving water quality during dry weather. Each Copermittee must conduct the following non-storm water persistent flow MS4 outfall discharge monitoring within its jurisdiction:

(a) Prioritization of Non-Storm Water Persistent Flow MS4 Outfalls

Based upon the dry weather MS4 outfall discharge field screening monitoring records developed pursuant to Provision D.2.a.(2)(c), each Copermittee must identify and prioritize the MS4 outfalls with persistent flows based on the highest priority water quality conditions identified in the Water Quality Improvement Plan and any additional criteria developed by the Copermittee, which may include historical data and data from sources other than what the Copermittee collects.

(b) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring Frequency

(i) Based on the prioritization of major MS4 outfalls developed under Provision D.2.b.(2)(a), each Copermittee must identify, at a minimum, the 10 highest priority major MS4 outfalls with non-storm water persistent flows that the Copermittee will monitor within each Watershed Management Area within its jurisdiction. The location of the highest priority non-storm water persistent flow MS4 outfall monitoring stations must be identified on the map required pursuant to Provision E.2.b.(1).

(ii) Each of the highest priority non-storm water persistent flow MS4 outfall monitoring stations identified pursuant to Provision D.2.b.(2)(b)(i) must be monitored under dry weather conditions at least semi-annually until one of the following occurs:

[a] The non-storm water discharges have been effectively eliminated (i.e. no flowing, pooled, or ponded water) for three consecutive dry weather monitoring events; or

[b] The source(s) of the persistent flows has been identified as a category of non-storm water discharges that does not require an NPDES permit and does not have to be addressed as an illicit discharge because it was not identified as a source of pollutants (i.e. constituents in non-storm water discharge do not exceed NALs), and the persistent flow can be re-prioritized to a lower priority; or

[c] The constituents in the persistent flow non-storm water discharge do not exceed NALs, and the persistent flow can be re-prioritized to a lower priority; or

[d] The source(s) of the persistent flows has been identified as a non-storm water discharge authorized by a separate NPDES permit.

(iii) Where the criteria under Provision D.2.b.(2)(c)(ii) are not met, but the threat to water quality has been reduced by the Copermittee, the highest priority persistent flow MS4 outfall monitoring stations may be reprioritized accordingly for continued dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1).

(iv) Each Copermittee must document removal or re-prioritization of the highest priority persistent flow MS4 outfall monitoring stations identified under Provision D.2.b.(2)(b) in the Annual Report. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized MS4 major outfall in the Watershed Management Area within its jurisdiction, unless there are no remaining qualifying major MS4 outfalls within the Copermittee's jurisdiction in the Watershed Management Area.

(c) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Observations

During each semi-annual monitoring event, each Copermittee must record field observations consistent with Table D-6 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(d) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Monitoring

During each semi-annual monitoring event, if conditions allow the collection of the data, each Copermittee must monitor and record the parameters in Table D-2 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(e) Non-Storm Water Persistent Flow MS4 Outfall Discharge Analytical Monitoring

During each semi-annual monitoring event in which measurable flow is present, each Copermittee must collect and analyze samples from each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Collect grab or composite samples to be analyzed for the following constituents:

[a] Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,
[b] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List with the exception of toxicity[21],
[c] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,
[d] Applicable NAL constituents, and
[e] Constituents listed in Table D-8, unless the Copermittee has historical data that can demonstrate or provide justification that the analysis of the constituent is not necessary.
[f] The Copermittee may be relieved of analytical monitoring requirements if supporting information can be provided or has historical data that can demonstrate or provide justification that the analysis of the constituent is not necessary.

Table D-8. Analytical Monitoring Constituents for Persistent Flow MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Total Hardness • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Cadmium • Copper • Lead • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Total Coliform for discharges to inland surface waters.

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[21] Copermittees may provide an alternate approach to evaluate and identify the cause of toxicity currently affecting receiving waters and to iteratively adapt the monitoring program to address these chemical stressors in their MS4 outfall discharges in the monitoring plan which is subject to Regional Board approval.

(iv) If the Copermittee identifies and eliminates the source of the persistent flow non-storm water discharge, analysis of the sample is not required.

c. WET WEATHER MS4 OUTFALL DISCHARGE MONITORING

The Copermittees must perform wet weather MS4 outfall monitoring to identify sources of pollutants in storm water discharges from the MS4s in the Watershed Management Area. The Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(1) Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees may adjust the wet weather MS4 outfall discharge monitoring locations and frequencies in the Watershed Management Area, as needed, to identify sources of pollutants in storm water discharges from MS4s in the Watershed Management Area in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of stations is at least equivalent to the number of stations required under Provision D.2.a.(3)(a).

(2) Wet Weather MS4 Outfall Discharge Monitoring Frequency

The Copermittees must monitor the wet weather MS4 outfall discharge monitoring stations in the Watershed Management Area at an appropriate frequency to identify sources of pollutants in storm water discharges from the MS4s causing or contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan.

(3) Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(d) Presence and assessment of trash in and around station.

(4) Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(5) Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites collected over the length of the storm event or the first 24 hour period, whichever is shorter, composed of discrete samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

(iii) If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours.

(e) Only one analysis of the composite of aliquots is required;

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(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List, with the exception of toxicity[22],

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and

(iv) Applicable SAL constituents.

(v) The Copermittee may be relieved of analytical monitoring requirements if supporting information can be provided or has historical data that can demonstrate or provide justification that the analysis of the constituent is not necessary.

[22] Copermittees may provide an alternate approach to evaluate and identify the cause of toxicity currently affecting receiving waters and to iteratively adapt the monitoring program to address these chemical stressors in their MS4 outfall discharges in the monitoring plan which is subject to Regional Board approval.

3. Special Studies

a. Within the term of this Order, the Copermittees must develop and implement the following special studies:

(1) At least three special studies in each Watershed Management Area to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that cause or contribute to highest priority water quality conditions identified in the Water Quality Improvement Plan.

(2) At least two special studies for the San Diego Region to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that are impacting receiving waters on a regional basis in the San Diego Region.

(3) One of the three special studies in each Watershed Management Area may be replaced by a special study implemented pursuant to Provision D.3.a.(2).

b. The special studies must, at a minimum, be in conformance with the following criteria:

(1) The special studies must be related to the highest priority water quality conditions identified by the Copermittees in the Watershed Management Area and/or for the entire San Diego Region;

(2) The special studies developed pursuant to Provision D.3.a.(1) must:

(a) Be implemented within the applicable Watershed Management Area, and

(b) Require some form of participation by all the Copermittees within the Watershed Management Area;

(3) The special studies developed pursuant to Provision D.3.a.(2) must:

(a) Be implemented within the San Diego Region, and

(b) Require some form of participation by all Copermittees covered under the requirements of this Order.

c. Special studies developed to identify sources of pollutants and/or stressors should be pollutant and/or stressor specific and based on historical monitoring data and monitoring performed pursuant to Provisions D.1 and D.2. Development of source identification special studies should include the following:

(1) A compilation of known information on the specific pollutant and/or stressor, including data on potential sources and movement of the pollutant and/or

stressor within the watershed. Data generated by the Copermittees and others, as well as information available from a literature research on the pollutant and/or stressor should be compiled and analyzed as appropriate.

(2) An identification of data gaps, based on the compiled information generated on the specific pollutant and/or stressor in Provision D.3.d.(1). Source identification special studies should be developed to fill identified data gaps.

(3) A monitoring plan that will collect and provide data the Copermittees can utilize to do the following:

(a) Quantify the relative loading or impact of a pollutant and/or stressor from a particular source or pollutant generating activity;

(b) Improve understanding of the fate of a pollutant and/or stressor in the environment;

(c) Develop an inventory of known and suspected sources of a pollutant and/or stressor in the Watershed Management Area; and/or

(d) Prioritize known and suspected sources of a pollutant and/or stressor based on relative magnitude in discharges, geographical distribution (i.e., regional or localized), frequency of occurrence in discharges, human health risk, and controllability.

d. Special studies initiated prior to the acceptance of the Water Quality Improvement Plan that meet the requirements of Provision D.3.b and are completed during the term of this Order may be utilized to fulfill the special study requirements of Provision D.3.a.

e. The Copermittees must submit the monitoring plans for the special studies in the Water Quality Improvement Plans required pursuant to Provision F.1.

f. The Copermittees are encouraged to share the results of the special studies regionally among the Copermittees to provide information useful in improving and adapting the management of non-storm water and storm water runoff through the implementation of the Water Quality Improvement Plans.

4. Assessment Requirements

Each Copermittee must evaluate the data collected pursuant to Provisions D.1, D.2 and D.3, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E, to assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a. Assessments must be performed as described in the following provisions:

a. RECEIVING WATERS ASSESSMENTS

(1) The Copermittees must assess and report the conditions of the receiving waters in the Watershed Management Area as follows:

(a) Based on data collected pursuant to Provision D.1.a, the assessments under Provision D.4.a.(2) must be included in the first Annual Report required pursuant to Provision F.3.b.(1).

(b) Based on the data collected pursuant to Provisions D.1.a-e, the assessments required under Provision D.4.a.(2) must be included in the Report of Waste Discharge required pursuant to Provision F.5.b.

(2) The Copermittees must assess the status and trends of receiving water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under dry weather and wet weather conditions. For each of the three types of receiving waters in each Watershed Management Area the Copermittees must:

(a) Determine whether or not the conditions of the receiving waters are protective of the designated beneficial uses;

(b) Identify the most critical beneficial uses that must be protected to ensure overall health of the receiving water;

(c) Determine whether or not those critical beneficial uses are being protected;

(d) Identify short-term and/or long-term improvements or degradation of those critical beneficial uses;

(e) Identify data gaps in the monitoring data necessary to assess Provisions D.4.a.(2)(a)-(d).

b. MS4 OUTFALL DISCHARGES ASSESSMENTS

(1) Non-Storm Water Discharges Reduction Assessments

(a) Each Copermittee must assess and report the progress of its illicit discharge detection and elimination program, required to be implemented pursuant to Provision E.2, toward effectively prohibiting non-storm water and illicit discharges into the MS4 within its jurisdiction as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(2), the assessments under Provision D.4.b.(1)(b) must be included in the first Annual Report required pursuant to Provision F.3.b.(1).

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(ii) Based on the data collected pursuant to Provisions D.2.b, the assessments required under Provision D.4.b.(1)(c) must be included in the first Annual Report required pursuant to Provision F.3.b.(1), and annually thereafter.

(iii) Based on the data collected pursuant to Provisions D.2.b, the assessment required under Provision D.4.b.(1)(c) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.a.(2), each Copermittee must assess and report the following:

(i) Identify the known and suspected controllable sources (e.g. facilities, areas, land uses, pollutant generating activities) of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area;

(ii) Identify sources of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area that have been reduced or eliminated; and

(iii) Identify modifications to the field screening monitoring locations and frequencies for the MS4 outfalls in its inventory necessary to identify and eliminate sources of persistent flow non-storm water discharges pursuant to Provision D.2.b.(1).

(c) Based on the dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b, each Copermittee must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(1)(b);

(ii) Based on the data collected and applicable NALs in the Water Quality Improvement Plan, rank the MS4 outfalls in the Copermittee's jurisdiction according to potential threat to receiving water quality, and produce a prioritized list of major MS4 outfalls for follow-up action to update the Water Quality Improvement Plan, with the goal of eliminating persistent flow non-storm water discharges and/or pollutant loads in order of the ranked priority list through targeted programmatic actions and source investigations;

(iii) For the highest priority major MS4 outfalls with persistent flows that are in exceedance of NALs, identify the known and suspected sources within the Copermittee's jurisdiction in the Watershed Management Area that may cause or contribute to the NAL exceedances;

(iv) Each Copermittee must analyze the data collected pursuant to Provision D.2.b, and utilize a model or other method, to calculate or estimate the non-storm water volumes and pollutant loads discharged from all the major MS4s outfalls in its jurisdiction identified as having persistent dry weather flows during the monitoring year. These calculations or estimates must be updated annually. Each Copermittee must calculate or estimate:

[a] Annual non-storm water volumes and pollutant loads discharged from the Copermittee's major MS4 outfalls to receiving waters within the Copermittee's jurisdiction, with an estimate of the percent contribution from each known and suspected source for each MS4 outfall;

[b] Annual non-storm water volumes and pollutant loads from areas or facilities subject to the Copermittee's legal authority that are discharged from the Copermittee's major MS4 outfalls to downstream receiving waters.

(v) Each Copermittee must review the data collected pursuant to Provision D.2.b and findings from the assessments required pursuant to Provision D.4.b.(1)(c)(i)-(iv) on an annual basis to:

[a] Identify reductions and progress in achieving reductions in non-storm water and illicit discharges to the Copermittee's MS4 in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction, with an estimate, if possible, of the non-storm water volume and/or pollutant load reductions attributable to specific water quality strategies implemented by the Copermittee; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittee in the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction.

(vi) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(v).

(2) <u>Storm Water Pollutant Discharges Reduction Assessments</u>

(a) The Copermittees must assess and report the progress of the water quality improvement strategies, required to be implemented pursuant to Provisions B and E, toward reducing pollutants in storm water discharges from the MS4s within the Watershed Management Area as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(3), the assessments under Provision D.4.b.(2)(b) must be included in the first Annual Report required pursuant to Provision F.3.b.(1).

(ii) Based on the data collected pursuant to Provisions D.2.c, the assessments required under Provision D.4.b.(2)(c) must be included in the first Annual Report required pursuant to Provision F.3.b.(1), and annually thereafter.

(iii) Based on the data collected pursuant to Provisions D.2.c, the assessment required under Provisions D.4.b.(2)(c)-(d) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.a.(3) the Copermittees must assess and report the following:

(i) The Copermittees must analyze the monitoring data collected pursuant to Provision D.2.a.(3), and utilize a watershed model or other method, to calculate or estimate storm water volumes and pollutant loads discharged from the MS4s in each Copermittee's jurisdiction within the Watershed Management Area. The Copermittees must calculate or estimate the following for each monitoring year:

[a] The average storm water runoff coefficient for each land use type within the Watershed Management Area;

[b] The volume of storm water discharged from the Copermittee's major MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch;

[c] The pollutant loads discharged from the Copermittee's major MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch; and

[d] The percent contribution of storm water volumes and pollutant loads discharged from each land use type within the drainage basin to the Copermittee's major MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch.

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(ii) Identify modifications to the wet weather MS4 outfall discharge monitoring locations and/or frequencies necessary to identify sources pollutants in storm water discharges from the MS4s in the Watershed Management Area pursuant to Provision D.2.c.(1).

(c) Based on the wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.c the Copermittees must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(2)(b);

(ii) Based on the data collected and applicable SALs in the Water Quality Improvement Plan, rank the MS4 outfalls in the Watershed Management Area according to potential threat to receiving water quality, and produce a prioritized list of major MS4 outfalls for follow-up action to update the Water Quality Improvement Plan;

(iii) The Copermittees must review the data collected pursuant to Provision D.2.c and findings from the assessments required pursuant to Provisions D.4.b.(2)(c)(i)-(ii) on an annual basis to:

[a] Identify reductions or progress in achieving reductions in pollutant concentrations and/or pollutant loads from different land uses and/or drainage areas discharging from the Copermittees' MS4s in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters within the Watershed Management Area to the MEP, with an estimate, if possible, of the pollutant load reductions attributable to specific water quality strategies implemented by the Copermittees; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittees in the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters in the Watershed Management Area to the MEP.

(iv) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(iii).

(d) The Copermittees must evaluate all the data collected pursuant to Provision D.2.c, and incorporate new outfall monitoring data into time series plots for each long-term monitoring constituent for the Watershed Management Area, and perform statistical trends analysis on the cumulative long-term wet weather MS4 outfall discharge water quality data set.

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c. Special Studies Assessments

The Copermittees must annually evaluate the results and findings from the special studies developed and implemented pursuant to Provision D.3, and assess their relevance to the Copermittees' efforts to characterize receiving water conditions, understand sources of pollutants and/or stressors, and control

and reduce the discharges of pollutants from the MS4 outfalls to receiving waters in the Watershed Management Area. The Copermittees must report the results of the special studies assessments applicable to the Watershed Management Area, and identify any necessary modifications or updates to the Water Quality Improvement Plan based on the results in the Annual Reports required pursuant to Provision F.3.b.

d. INTEGRATED ASSESSMENT OF WATER QUALITY IMPROVEMENT PLAN

As part of the iterative approach and adaptive management process required for the Water Quality Improvement Plan pursuant to Provision B.5, the Copermittees in each Watershed Management Area must integrate the data collected pursuant to Provisions D.1-D.3, the findings from the assessments required pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to assess the effectiveness of, and identify necessary modifications to, the Water Quality Improvement Plan as follows:

(1) The Copermittees must re-evaluate the priority water quality conditions and numeric goals for the Watershed Management Area, as needed, during the term of this Order pursuant to Provision B.5.a. The re-evaluation and recommendations for modifications to the priority water quality conditions, and/or numeric goals and corresponding schedules may be provided in the Annual Reports required pursuant to Provision F.3.b, but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The priority water quality conditions and numeric goals for the Watershed Management Area must be re-evaluated as follows:

(a) Re-evaluate the receiving water conditions in the Watershed Management Area in accordance with Provision B.2.a;

(b) Re-evaluate the impacts on receiving waters in the Watershed Management Area from MS4 discharges in accordance with Provision B.2.b;

(c) Re-evaluate the identification of MS4 sources of pollutants and/or stressors in accordance with Provision B.2.d;

(d) Identify beneficial uses of the receiving waters that are protected in accordance with Provision D.4.a;

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(e) Evaluate the progress toward achieving the interim and final numeric goals for protecting beneficial uses in the receiving waters.

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(2) The Copermittees must re-evaluate the water quality improvement strategies for the Watershed Management Area during the term of this Order pursuant to Provision B.5.b. The re-evaluation and recommendations for modifications

to the water quality improvement strategies and schedules must be provided in the Annual Reports required pursuant to Provision F.3.b, and provided in the Report of Waste Discharge pursuant to Provision F.5.b. The water quality improvement strategies for the Watershed Management Area must be re-evaluated as follows:

(a) Identify the non-storm water and storm water pollutant loads from the Copermittees' MS4 outfalls in the Watershed Management Area, calculated or estimated pursuant to Provisions D.4.b;

(b) Identify the non-storm water and storm water pollutant load reductions, or other improvements to receiving water or water quality conditions, that are necessary to attain the interim and final numeric goals for protecting beneficial uses in the receiving waters;

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(c) Identify the non-storm water and storm water pollutant load reductions, or other improvements to the quality of MS4 discharges, that are necessary for the Copermittees to demonstrate that non-storm water and storm water discharges from their MS4s are not causing or contributing to exceedances of receiving water limitations;

(d) Evaluate the progress of the water quality improvement strategies toward achieving the interim and final numeric goals for protecting beneficial uses in the receiving waters.

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(3) The Copermittees must re-evaluate and adapt the water quality monitoring and assessment program for the Watershed Management Area when new information becomes available to improve the monitoring and assessment program pursuant to Provision B.5.c. The re-evaluation and recommendations for modifications to the monitoring and assessment program may be provided in the Annual Reports required pursuant to Provision F.3.b, but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. Modifications to the water quality monitoring and assessment program must be consistent with the requirements of Provision D.1-D.3. The re-evaluation of the water quality monitoring and assessment program for the Watershed Management Area must consider the data gaps identified by the assessments required pursuant to Provisions D.4.a-b, and results of the special studies implemented pursuant to Provision D.4.c.

5. Monitoring Provisions

Each Copermittee must comply with all the monitoring, reporting, and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

E. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS

The purpose of this provision is for each Copermittee to implement a program to control non-stormwater discharges into and stormwater discharges from the MS4 within its jurisdiction and to focus and prioritize those implementation actions based on the highest water quality priorities identified within the associated Water Quality Improvement Plan. The goal of the jurisdictional runoff management programs is to implement strategies and actions that effectively prohibit non-storm water discharges into the MS4 and reduce the discharge of pollutants in storm water to the MEP. This goal will be accomplished through implementing the jurisdictional runoff management programs in accordance with the water quality priorities and strategies identified in the Water Quality Improvement Plans.

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Each Copermittee must update its jurisdictional runoff management program document, in accordance with Provision F.2.a, to incorporate the requirements of Provision E consistent with the highest water quality priorities as identified in the corresponding Water Quality Improvement Plan. Until the Copermittee has updated its jurisdictional runoff management program document with the requirements of Provision E, the Copermittee must continue implementing its current jurisdictional runoff management program.

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1. Legal Authority Establishment and Enforcement

a. Each Copermittee must establish, maintain, and enforce adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 through statute, ordinance, permit, contract, order, or similar means. This legal authority must, at a minimum, authorize the Copermittee to:

(1) Effectively prohibit and eliminate all illicit discharges and illicit connections into its MS4;

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(2) Control the contribution of pollutants in discharges of runoff associated with industrial and construction activity into its MS4 and control the quality of runoff from industrial and construction sites[23].

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(3) Control the discharge of spills, dumping, or disposal of materials other than storm water into its MS4;

(4) Control through interagency agreements among Copermittees the contribution of pollutants from one portion of the MS4 to another portion of the MS4;

(5) Control, by coordinating and cooperating with other owners of the MS4 such

[23] The Copermittees will only be responsible for administering and enforcing the codes and ordinances applicable to their jurisdictions (i.e., a municipality is not responsible for administering and/or enforcing a permit issued by the State of California).

as Caltrans, the U.S. federal government, or sovereign Native American Tribes through interagency agreements, where possible, the contribution of pollutants from their portion of the MS4 to the portion of the MS4 within the Copermittee's jurisdiction;

(6) Require compliance with conditions in its statutes, ordinances, permits, contracts, orders, or similar means to hold dischargers to its MS4 accountable for their contributions of pollutants and flows;

(7) Require the use of BMPs to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(8)

(9) Utilize enforcement mechanisms to require compliance with its statutes, ordinances, permits, contracts, orders, or similar means; and

(10) Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with its statutes, ordinances, permits, contracts, orders, or similar means and with the requirements of this Order, including the effective prohibition of illicit discharges and connections to its MS4. The Copermittee's ordinance must include adequate legal authority, to the extent permitted by California and Federal Law and subject to the limitations on municipal action under the constitutions of California and the United States. The Copermittee must also have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from industrial facilities, including construction sites, discharging into its MS4.

b. With the first Annual Report required pursuant to Provision F.3.b, each Copermittee must submit a statement certified by its Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative that the Copermittee has taken the necessary steps to obtain and maintain full legal authority within its jurisdiction to implement and enforce each of the requirements contained in this Order.

2. Illicit Discharge Detection and Elimination

Each Copermittee must implement a program to actively detect and eliminate illicit discharges and improper disposal into the MS4, or otherwise require the discharger to apply for and obtain a separate NPDES permit. The illicit discharge detection and elimination program must be implemented in accordance with the strategies identified in the Water Quality Improvement Plan. The requirements of the jurisdictional runoff management programs as outlined below may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality Improvement Plan(s).

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a. Strategies to Address the Highest Priority Water Quality Conditions

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the illicit discharge detection and elimination program to address illicit discharges and connections that the Copermittee has identified as potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate BMPs, focus education, and/or increase/decrease frequency of inspections in specific areas); and

(2) The strategies and/or activities must be consistent with the requirements of Provisions E.2.a-d and the strategies identified in the Water Quality Improvement Plan.

b. Non-Storm Water Discharges

Each Copermittee must address non-storm water discharges as illicit discharges, where the likelihood exists that they are a source of pollutants to the waters of the state, unless the discharge is either identified as a discharge authorized by a separate NPDES permit, or identified as a category of non-storm water discharges that must be addressed pursuant to the following requirements:

(1) Discharges of non-storm water from water line flushing and water main breaks to the MS4 must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG 679001 (Order No. R9-2010-0003, or subsequent order). This category includes water line flushing and water main break discharges from water purveyors issued a water supply permit by the California Department of Public Health or federal military installations. Discharges from recycled or reclaimed water lines to the MS4 must be addressed as illicit discharges, unless the discharges have coverage under a separate NPDES permit.

(2) Discharges of non-storm water to the MS4 from the following categories must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a source of pollutants to receiving waters:

(a) Diverted stream flows;

(b) Rising ground waters;

(c) Uncontaminated ground water infiltration to MS4s;

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Deleted: <#>Discharges of non-storm water to the MS4 from the following categories must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG919001 (Order No. R9-2007-0034, or subsequent order) for discharges to San Diego Bay, or NPDES Permit No. CAG919002 (Order No. R9-2008-0002, or subsequent order) for discharges to surface waters other than San Diego Bay: ¶
¶
<#>Uncontaminated pumped ground water;¶
¶
Discharges from foundation drains;

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<#>Water from crawl space pumps; and¶
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<#>Water from footing drains.[19]¶
¶

(d) Uncontaminated pumped ground water;

(e) Discharges from foundation drains;[25]

(f) Springs;

(g) Water from crawl space pumps;

(h) Water from footing drains;[24]

(i) Flows from riparian habitats and wetlands;

(j) Discharges from potable water sources;

(k) Discharges from foundation drains;[26] and

(l) Discharges from footing drains.[26]

(3) Discharges of non-storm water into the MS4 from the following categories must be controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means, where there is evidence that those discharges are a source of pollutants to waters of the state. Discharges of non-storm water into the MS4 from the following categories not controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means must be addressed by the Copermittee as illicit discharges.

(a) Air conditioning condensation

The discharge of air conditioning condensation must be directed to landscaped areas or other pervious surfaces where feasible.

(b) Individual residential vehicle washing

(i) The discharge of wash water must be directed to landscaped areas or other pervious surfaces where feasible; and

(ii) Minimize the use of water for vehicle washing, use as little washing detergent and other vehicle wash products as possible, wash vehicles at commercial wash facilities, and implement other practices or behaviors that will prevent the discharge of pollutants associated

[25] Provision E.2.a.(1) only applies to this category on non-storm water if the system is designed to be located at or below the highest historical groundwater table to actively or passively extract groundwater during any part of the year.

[26] Provision E.2.a.(3) only applies to this category of non-storm water discharge if the system is designed to be located above the highest historical groundwater table at all times of the year, and the system is only expected to discharge non-storm water under unusual circumstances.

with individual residential vehicle washing from entering the MS4.

(c) Dechlorinated swimming pool discharges

(i) Eliminate residual chlorine, algaecide, filter backwash, or other pollutants from swimming pools prior to discharging to the MS4; and

(ii) The discharge of saline swimming pool water must be directed to the sanitary sewer, landscaped areas, or other pervious surfaces that can accommodate the volume of water, unless the saline swimming pool water can be discharged via a pipe or concrete channel directly to a naturally saline water body (e.g. Pacific Ocean).

(4) Firefighting discharges to the MS4 must continue to be addressed by the Copermittees as follows:

(a) Non-emergency firefighting discharges

(i) Building fire suppression system maintenance discharges (e.g. sprinkler line flushing) to the MS4 must be addressed as illicit discharges.

(ii) Non-emergency firefighting discharges (i.e., discharges from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems) must be addressed by a program, to be developed and implemented by the Copermittee in conjunction with the local Fire Authority/District, to reduce or eliminate pollutants in such discharges from entering the MS4.

(b) Emergency firefighting discharges (i.e., flows necessary for the protection of life or property) do not require BMPs and need not be prohibited.

(5) If the Copermittee or San Diego Water Board identifies any category of non-storm water discharges listed under Provisions E.2.a.(1)-(4) as a source of pollutants to receiving waters, the category must be prohibited through ordinance, order, or similar means and addressed as an illicit discharge.

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Each Copermittee should develop and encourage implementation of BMPs to reduce or eliminate pollutants in emergency firefighting discharges to the MS4s and receiving waters within its jurisdiction. During emergency situations, priority of efforts should be directed toward life, property, and the environment (in descending order). BMPs should not interfere with immediate emergency response operations or impact public health and safety.¶

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(7) . Each Copermittee must, where feasible, reduce or eliminate non-storm water discharges listed under Provisions E.2.a.(1)-(4) into its MS4 whether or not the non-storm water discharge has been identified as an illicit discharge, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit.

c. Prevent And Detect Illicit Discharges And Connections

Each Copermittee must include the following measures within its program to prevent and detect illicit discharges to the MS4:

(1) Each Copermittee must maintain an updated map of its entire MS4 and the corresponding drainage areas. The accuracy of the MS4 map must be confirmed during the field screening required pursuant to Provision E.2.c. The MS4 map must be included as part of the jurisdictional runoff management program document. Any geographic information system (GIS)

layers or files used by the Copermittee to maintain the MS4 map must be made available to the San Diego Water Board upon request. The MS4 map must identify the following:

(a) All segments of the MS4 owned, operated, and maintained by the Copermittee;

(b) All known locations of inlets that discharge and/or collect runoff into the Copermittee's MS4;

(c) All known locations of connections with other MS4s not owned or operated by the Copermittee (e.g. Caltrans MS4s);

(d) All known locations of MS4 outfalls and private outfalls that discharge runoff collected from areas within the Copermittee's jurisdiction;

(e) All segments of receiving waters within the Copermittee's jurisdiction that receive and convey runoff discharged from the Copermittee's MS4 outfalls;

(f) Locations of the MS4 outfalls, identified pursuant to Provision D.2.a.(1), within its jurisdiction; and

(g) Locations of the non-storm water persistent flow MS4 outfall discharge monitoring stations, identified pursuant to Provision D.2.b.(2)(b), within its jurisdiction.

(2) Each Copermittee must use Copermittee personnel and contractors to assist in identifying and reporting illicit discharges and connections during their daily employment activities.

(3) Each Copermittee must promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges into or from the MS4, including the following methods for public reporting:

(a) Operate a public hotline, which can be Copermittee-specific or shared by the Copermittees, and must be capable of receiving reports in both English and Spanish 24 hours per day and seven days per week; and

(b) Designate an e-mail address for receiving electronic reports from the public, which can be Copermittee-specific or shared by the Copermittees, and must be prominently displayed on the Copermittee's webpage and the Regional Clearinghouse required pursuant to Provision F.4.

(4) Each Copermittee must implement practices and procedures (including a notification mechanism) to prevent, respond to, contain, and clean up any

spills that may discharge into the MS4 within its jurisdiction from any source. The Copermittee must coordinate, to the extent possible, with spill response teams to prevent entry of spills into the MS4, and prevent contamination of surface water, ground water, and soil. The Copermittee must coordinate spill prevention, containment, and response activities throughout all appropriate Copermittee departments, programs, and agencies.

(5) Each Copermittee must implement practices and procedures to prevent and limit infiltration of seepage from sanitary sewers (including private laterals and failing septic systems) to the MS4.

(6) Each Copermittee must coordinate, when necessary, with upstream Copermittees and/or entities to prevent illicit discharges from upstream sources into the MS4 within its jurisdiction.

d. FIELD SCREENING

Each Copermittee must conduct field screening (i.e. visual observations, field testing, and/or analytical testing) of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect illicit discharges and connections to the MS4 in accordance with the dry weather MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

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e. INVESTIGATE AND ELIMINATE ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to investigate and eliminate illicit discharges to the MS4:

(1) Each Copermittee must prioritize and determine when follow-up investigations will be performed in response to visual observations and/or water quality monitoring data collected during an investigation of a detected non-storm water or illicit discharge into or from the MS4. The criteria for prioritizing investigations must consider the following:

(a) Pollutants identified as causing or contributing to the highest water quality priorities identified in the Water Quality Improvement Plan;

(b) Pollutants identified as causing or contributing, or threatening to cause or contribute to impairments in water bodies on the 303(d) List and/or in environmentally sensitive areas (ESAs), located within its jurisdiction;

(c) Pollutants identified from sources or land uses known to exist within the area, drainage basin, or watershed that discharges to the portion of the MS4 within its jurisdiction included in the investigation;

(d) Pollutants identified as causing or contributing to an exceedance of an

NAL described in Provision C.1; and

(e) Pollutants identified as an immediate and significant threat to human health or the environment.

(2) Each Copermittee must implement procedures to investigate and inspect portions of its MS4 that, based on reports or notifications, field screening, or other appropriate information, indicate a reasonable potential of receiving, containing, or discharging pollutants due to illicit discharges or illicit connections. The procedures must include the following:

(a) Each Copermittee must develop criteria to:

(i) Assess the validity of each report or notification received; and

(ii) Prioritize the response to each report or notification received.

(b) Each Copermittee must prioritize and respond to each valid report or notification (e.g., public reports, staff or contractor reports and notifications, etc.) of an incident in a timely manner.

(c) Each Copermittee must investigate and seek to identify the source(s) of illicit discharges or illicit connections observed into and from the MS4 during the field screening required pursuant to Provision D.2.b.(1) as follows:

(i) Obvious illicit discharges must be immediately investigated to identify the source(s);

(ii) The investigation must include field investigations to identify sources or potential sources for the discharge, unless the source or potential source has already been identified during previous investigations; and

(iii) The investigation may include follow-up field investigations and/or reviewing Copermittee inventories and other land use data to identify potential sources of the discharge.

(d) Each Copermittee must maintain records and a database of the following information:

(i) Location of incident, including hydrologic subarea, portion of MS4 receiving the illicit discharge or connection, and point of discharge or potential discharge from MS4 to receiving water;

(ii) Source of information initiating the investigation (e.g., public reports, staff or contractor reports and notifications, field screening, etc.);

(iii) Date the information used to initiate the investigation was received;

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(iv) Date the investigation was initiated;

(v) Dates of follow-up investigations;

(vi) Identified or suspected source of the illicit discharge or connection, if determined;

(vii) Known or suspected related incidents, if any;

(viii) Result of the investigation; and

(ix) If a source cannot be identified and the investigation is not continued, a rationale for why a discharge does not pose a threat to water quality and/or does not require additional investigation.

(e) Each Copermittee must track and seek to identify the source(s) of illicit discharges or connections from the MS4 where there is evidence of illicit discharges or connections having been discharged into or from the MS4 (e.g., pooled water), in accordance with MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.

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(3) Each Copermittee must initiate the implementation of procedures, in a timely manner, to eliminate all detected and identified illicit discharges and connections within its jurisdiction. The procedures must include the following responses:

(a) Each Copermittee must enforce its legal authority, as required under Provision E.1, to eliminate illicit discharges and connections to the MS4.

(b) If the Copermittee identifies the source as a controllable source, the Copermittee must implement its Enforcement Response Plan pursuant to Provision E.6 and enforce its legal authority to prohibit and eliminate illicit discharges and connections to its MS4.

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(c) If the Copermittee identifies the source of the discharge as a category of non-storm water discharges in Provision E.2.a, and the discharge is in exceedance of the NALs, then the Copermittee must determine if: (1) this is an isolated incident or set of circumstances that will be addressed through its Enforcement Response Plan pursuant to Provision E.6, or (2) the category of discharge must be addressed through the prohibition of that category of discharge as an illicit discharge pursuant to Provision E.2.a.(6).

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(d) If the Copermittee suspects the source of the illicit discharge or connection as natural in origin (i.e. non-anthropogenically influenced) and in conveyance into the MS4, then the Copermittee must document and provide the data and evidence necessary to demonstrate to the San Diego Water Board that it is natural in origin and does not require further investigation.

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(e) If the Copermittee is unable to identify and document the source of a recurring illicit discharges or connections into or from the MS4, then the Copermittee must address the discharge and update its jurisdictional runoff management program to address the common and suspected sources of the discharge within its jurisdiction in accordance with the Copermittee's priorities.

(4) Each Copermittee must submit a summary of the illicit discharges and connections investigated and eliminated within its jurisdiction with each Annual Report required under Provision F.3.b of this Order.

3. Development Planning

Each Copermittee must use their land use and planning authorities to implement a development planning program in accordance with the strategies identified in the Water Quality Improvement Plan. The requirements of the jurisdictional runoff management programs as outlined below may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality Improvement Plan(s).

a. STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the development planning program to address development and redevelopment projects that may become sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate BMPs, focus education, increase frequency of verifications and/or inspections, alternative compliance options);

(2) Each Copermittee must identify areas within its jurisdiction where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting and/or stream, channel, or habitat rehabilitation projects;

(3) Each Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify regional alternative compliance projects that Priority Development Projects may be allowed or should be encouraged to implement or participate in implementing; and

(4) The strategies and/or activities must be consistent with the requirements of Provisions E.3.b-d and E.3.f-g and the strategies identified in the Water Quality Improvement Plan.

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<#>STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS ¶
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Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the illicit discharge detection and elimination program to address non-storm water and illicit discharges and connections that the Copermittee has identified as potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:¶
¶
<#>Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, and/or increase/decrease frequency of inspections in specific areas); and¶
¶
<#>The strategies and/or activities must be consistent with the requirements of Provisions E.2.a-d and the strategies identified in the Water Quality Improvement Plan.¶

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b. BMP REQUIREMENTS FOR ALL DEVELOPMENT PROJECTS

Each Copermittee must prescribe the following BMP requirements during the planning process (i.e. prior to project approval and issuance of local permits) for all development projects (regardless of project type or size), where local permits are issued, including unpaved roads and flood management projects:

(1) General Requirements

(a) Onsite BMPs must be located so as to remove pollutants from runoff prior to its discharge to any receiving waters, and as close to the source as possible; and

(b) Structural BMPs must not be constructed within a waters of the U.S. or waters of the state.

(2) Source Control BMP Requirements

The following source control BMPs must be implemented at all development projects where applicable and feasible:

(a) Prevention of illicit discharges into the MS4;

(b) Storm drain system stenciling or signage;

(c) Properly designed outdoor material storage areas;

(d) Properly designed outdoor work areas;

(e) Properly designed trash storage areas; and

(f) Any additional BMPs necessary to minimize pollutant generation at each project.

(3) Low Impact Development (LID) BMP Requirements

The following LID BMPs must be implemented at all development projects where applicable and feasible:

(a) Maintenance or restoration of natural storage reservoirs and drainage corridors (including topographic depressions, areas of permeable soils, natural swales, and ephemeral and intermittent streams);[27]

[27] Development projects proposing to dredge or fill materials in waters of the U.S. must obtain a CWA Section 401 Water Quality Certification. Projects proposing to dredge or fill waters of the state must obtain waste discharge requirements.

(b) Buffer zones for natural water bodies (where buffer zones are technically infeasible, require project applicant to include other buffers such as trees, access restrictions, etc.);

(c) Conservation of natural areas within the project footprint including existing trees, other vegetation, and soils;

(d) Construction of streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided public safety is not compromised;

(e) Minimization of the impervious footprint of the project;

(f) Minimization of soil compaction to landscaped areas;

(g) Disconnection of impervious surfaces through distributed pervious areas;

(h) Landscaped or other pervious areas designed and constructed to effectively receive and infiltrate, retain and/or treat runoff from impervious areas, prior to discharging to the MS4;

(i) Small collection strategies located at, or as close as possible to, the source (i.e. the point where storm water initially meets the ground) to minimize the transport of runoff and pollutants to the MS4 and receiving waters;

(j) Use of permeable materials for projects with low traffic areas and appropriate soil conditions;

(k) Landscaping with native or drought tolerant species; and

(l) Harvesting and using precipitation.

c. Priority Development Projects

(1) Definition of Priority Development Project

Priority Development Projects include the following:

(a) All new development projects that fall under the Priority Development Project categories listed under Provision E.3.b.(2); and

(b) Those redevelopment projects that create, add, or replace at least 5,000 square feet of impervious surfaces on an already developed site, and the redevelopment project is a Priority Development Project category listed under Provision E.3.b.(2) (where redevelopment results in an increase of less than fifty percent of the impervious surfaces of a previously existing

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development, and the existing development was not subject to Priority Development Project requirements, the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) apply only to the addition or replacement, and not to the entire development; where redevelopment results in an increase of more than fifty percent of the impervious surfaces of a previously existing development, and was not subject to previous Priority Project Development requirements, the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) apply to the entire development).

(2) Priority Development Project Categories

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This category includes commercial, industrial, residential, mixed-use, and public development projects on public or private land which fall under the planning and building authority of the Copermittee.

(b) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

(c) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812), where the land area for development is 5,000 square feet or more.

(d) Hillside development projects. This category includes any development which creates 5,000 square feet or more of impervious surface which is located in an area with known erosive soil conditions, where the development will grade on any natural slope that is twenty-five percent or greater.

(e) Environmentally sensitive areas (ESAs). This category includes any development located within, directly adjacent to, or discharging directly to an ESA, which either creates 2,500 square feet of impervious surface on a proposed project site or increases the area of imperviousness of a proposed project site to 10 percent or more of its naturally occurring condition. “Directly adjacent to” means situated within 200 feet of the ESA. “Discharging directly to” means outflow from a drainage conveyance system that collects runoff from the subject development or redevelopment site and terminates at or in receiving waters within the ESA.

(f) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce that has 5,000 square feet or more of

impervious surface.

(g) Streets, roads, highways, and freeways. This category is defined as any paved impervious surface that is 5,000 square feet or more used for the transportation of automobiles, trucks, motorcycles, and other internal combustion vehicles.

(h) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

(i) Large development projects. This category includes any post-construction pollutant-generating new development projects that result in the disturbance of one acre or more of land.

(3) Priority Development Project Exemptions

Each Copermittee has the discretion to exempt the following projects from being defined as Priority Development Projects:

(a) Sidewalks, bicycle lanes, driveways, parking lots, or trails that meet the following criteria:

(i) Designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas; OR

(ii) Designed and constructed to be hydraulically disconnected from paved streets or roads; OR

(iii) Designed and constructed with permeable pavements or surfaces in accordance with USEPA Green Streets guidance.[28]

(b) Any impervious surface that is 5,000 square feet or more used for the transportation of automobiles, trucks, motorcycles, and other vehicles that follows the USEPA guidance regarding Managing Wet Weather with Green Infrastructure: Green Streets1to the MEP. :

(c) Single-family residential projects that are not part of a larger development or proposed subdivision.

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<#>Must be a retrofitting project implemented as part of an alternative compliance project option under Provision E.3.c.(3)(b)(v) to achieve the performance requirements of Provisions E.3.c.(1) and/or E.3.c.(2) for a Priority Development Project; AND¶
¶
<#>Designed and constructed in accordance with the USEPA Green Streets guidance.[29]¶

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Deleted: <#>Must not be constructed as part of a larger development or proposed subdivision; AND¶
¶
<#>Designed and constructed to be certified under the U.S. Green Building Council (USGCB) Leadership in Energy and Environmental Design (LEED) for Homes green building certification program, receiving at least four (4) Surface Water Management credits under the Sustainable Sites category;[30] OR¶
¶
<#>Designed and constructed with structural BMPs that will achieve the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite.¶

Deleted: [28] See "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).¶

[32] This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals.

(d) Flood control and stream restoration projects.

(e) Emergency public safety projects in any of the Priority Development Categories may be excluded if the delay caused due to the requirement for a SSMP compromises public safety, public health and/or environmental protection.

Deleted: Redevelopment of existing single family residences that meet the following criteria:

Deleted: Designed and constructed to be certified under the USGCB LEED for Homes green building certification program, receiving at least four (4) Surface Water Management credits under the Sustainable Sites category;

Deleted: [31] OR¶
¶
Designed and constructed with structural BMPs that will achieve the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite

d. Priority Development Project Structural BMP Performance Requirements

In addition to the BMP requirements listed for all development projects under Provision E.3.a, Priority Development Projects must also implement structural BMPs that conform to performance requirements below. If watershed-specific performance requirements are developed as part of a Water Quality Improvement Plan; these requirements would take precedence over the general performance requirements below. The watershed-specific requirement must provide at least equal protection as the general performance requirements below.

(1) On-site Storm Water Pollutant Control Structural BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite structural BMPs to control pollutants in storm water that may be discharged from a project as follows:

(a) Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite the pollutants contained in the design capture volume. The design capture volume is equivalent to:

(i) The volume of storm water runoff produced from a 24-hour 85th percentile storm event;[32] OR

(ii) The average annual volume of storm water runoff that would be retained onsite annually if the site was fully undeveloped and naturally vegetated, as determined using continuous simulation modeling or other techniques based on site-specific soil conditions and typical native vegetative cover.

(b) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) to comply with the storm water

[32] This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals.

pollutant control BMP performance requirements of Provision E.3.c.(1)(a).

(c) If a Priority Development project is allowed to utilize alternative compliance pursuant to Provisions E.3.c.(1)(b), flow-thru conventional treatment control BMPs must be implemented to treat the portion of the design capture volume that is not retained onsite. Additionally, project applicants must mitigate for the portion of the pollutant load in the design capture volume that is not retained onsite through one or more alternative compliance options under Provision E.3.c.(3). Conventional treatment control BMPs must be sized and designed to:

(i) Remove pollutants from storm water to the MEP;

(ii) Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;

(iii) Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Conventional treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of conventional treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

(2) On-site Hydromodification Management Structural BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite structural BMPs to manage hydromodification to ensure that storm water runoff discharged from a project does not cause adverse hydromodification impacts in the downstream receiving waters.

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The Copermittees in each Watershed Management Area may establish, as part of the WQIP, watershed specific requirements that will apply to priority development projects based on the susceptibility of the receiving waters to hydromodification impacts and historic receiving water changes from development. If watershed specific requirements are developed they will supersede requirements in the HMP. The watershed specific requirements must include the following:

(a) Post-project runoff flow rates and durations must not exceed the performance standard for runoff flow rates and durations to be determined as part of the development of the WQIPs for each Watershed Management Area by more than 10 percent (for the range of flows that

result in increased potential for erosion, or degraded instream habitat conditions downstream of Priority Development Projects).

(i) In evaluating the range of flows that results in increased potential for erosion of natural (non-hardened) channels, the lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks.

(ii) The Copermittees may use monitoring results collected pursuant to Provision D.1.a.(2) to re-define the range of flows resulting in increased potential for erosion, or degraded instream habitat conditions, as warranted by the data.

Deleted: <#>For artificially hardened channels, analysis to identify the lower boundary must use characteristics of a natural stream segment similar to that found in the watershed. The lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or erodes the toe of the channel banks.¶

(b) Post-project runoff flow rates and durations must compensate for the loss of sediment supply due to the development project, should loss of sediment supply occur as a result of the development project.

(c) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) to comply with the performance requirements of Provisions E.3.c.(2)(a)-(b).

(d) Exemptions

Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provisions E.3.c.(2)(a)-(b) where the project:

(i) Discharges storm water runoff into existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;

(ii) Discharges storm water runoff into conveyance channels that are engineered for the capacity to convey the 10-year ultimate build out condition flow and are regularly maintained to ensure flow capacity all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean.

(iii) Discharges to large rivers where large rivers are defined as reaches for which the contributing drainage area exceeds 100 square miles and with a 100-year design flow in excess of 20,000 cfs.

(iv) Discharges from infill redevelopment projects that meet criteria to be established in updates to the Copermittees' HMPs.

(v) Flood control and stream restoration projects.

(vi) Is a redevelopment Priority Development Project that meets the alternative compliance requirements of Provision E.3.c.(3)(b)(ii); or

(vii) Discharges storm water runoff into other areas identified by the San Diego Water Board as exempt from the requirements of Provisions E.3.c.(2)(a)-(b).

If the Copermittees in a Watershed Management Area select not to develop watershed specific requirements, development projects will be subject to the current Copermitee HMPs inclusive of the exemptions identified in Section E.3.c.(2)(d) that will integrated into updated Copermittee HMPs.

(3) Alternative Compliance to Onsite Structural BMP Performance Requirements

(a) Applicability

At the discretion of each Copermittee, Priority Development Projects may be allowed to utilize an alternative option to comply with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) under the following conditions:

(i) The Copermittee must determine that implementation of the alternative compliance option will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite;

(ii) The alternative compliance options must be designed by a registered professional engineer, geologist, architect, or landscape architect;

(iii) The alternative compliance options must be implemented within the same hydrologic unit as the Priority Development Project, and preferably within the same hydrologic subarea;

(iv) Receiving waters must not be utilized to convey storm water runoff to the alternative compliance options;

(v) The pollutants in storm water runoff from the Priority Development Project must be treated to the MEP by the alternative compliance options prior to being discharged to receiving waters;

(vi) Unless otherwise allowed by Provision E.3.c.(3)(b), the alternative compliance options must have a net result of at least the same level of pollutant removal as would have been achieved if the Priority Development Project had fully complied with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1) onsite;

(vii) Unless otherwise allowed by Provision E.3.c.(3)(b), the alternative

compliance options must have a net result of at least the same level of protection from potential downstream and upstream erosion in the receiving water as would have been achieved if the Priority Development Project had fully complied with the hydromodification management BMP performance requirements of Provision E.3.c.(2) onsite; and

(viii) The alternative compliance options utilized by the Priority Development Project to comply with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) must have reliable sources of funding for operation and maintenance.

(b) Alternative Compliance Project Options

The Copermittee may allow implementation of one or more of the following project options as part of an alternative approach to complying with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2):

(i) *Onsite LID Biofiltration Treatment Control BMPs*

The Copermittee may allow Priority Development Projects to utilize onsite LID biofiltration treatment control BMPs to comply with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1). Onsite LID biofiltration treatment control BMPs must be sized and designed to:

[a] Remove pollutants from storm water to the MEP; AND
[b] Have an appropriate surface loading rate to prevent erosion, scour and channeling within the BMP; AND
[c] Biofilter up to the design capture volume that is not reliably retained onsite, and if necessary, mitigate for the portion of the pollutant load in the design capture volume not retained onsite through one or more alternative compliance project, in-lieu fee and/or water quality credit system options below.

(ii) *Watershed-Based Planned Development Projects*

The Copermittee may allow Priority Development Projects greater than 100 acres in total project size (or smaller than 100 acres in size yet part of a larger common plan of development that is over 100 acres) to comply with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2). The Priority Development Project must comply with the following conditions:

[a] The Priority Development Project was planned utilizing watershed and/or subwatershed based water quality, hydrologic, and fluvial geomorphologic planning principles that implement regional LID BMPs in accordance with the performance and location criteria of

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[c] Biofilter at least 1.5 times the design capture volume that is not reliably retained onsite; OR

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Deleted: AND 1) treat the remaining portion of the design capture volume not retained onsite with conventional treatment control BMPs in accordance with Provision E.3.c.(1)(c),

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Deleted: <#>*LEED Certified Redevelopment Projects*¶
¶
The Copermittee may allow redevelopment Priority Development Projects to comply with the hydromodification management BMP performance requirements of Provision E.3.c.(2) where the project is designed and constructed to be certified under the USGCB LEED for New Construction and Major Renovations green building certification program. The Priority Development Project must receive at least one (1) Site Design credit and two (2) Stormwater Design credits under the Sustainable Sites category.[33] In addition, the existing and future configuration of the receiving water must not be unnaturally altered or adversely impacted by storm water flow rates and durations discharged from the site.¶

this Order and acceptable to the San Diego Water Board;

[b] Regional BMPs may be used provided that the BMPs capture and retain the volume of runoff produced from the design capture volume defined in Provision E.3.c.(1)(a)(i) and that such controls are located upstream of receiving waters;

[c] Regional BMPs must clearly exhibit that they will not result in a net impact from pollutant loadings over and above the impact caused by capture and retention of the design capture volume;

[d] Any portion of the design capture volume that is not retained by the regional BMPs must be treated using biofiltration BMPs; and

[e] Where regional BMPs are demonstrated to the Copermittee as technically infeasible to retain the entire design capture volume, any volume up to and including the design capture volume not retained by regional BMPs, nor treated by biofiltration BMPs, must be treated using conventional treatment control BMPs and the project applicant must implement additional alternative compliance project, in-lieu fee and/or water quality credit system options below.

(iii) *Offsite Regional BMPs*

[a] The Copermittee may allow Priority Development Projects to utilize offsite regional BMPs to comply with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1) if the offsite regional BMPs have the capacity to receive and retain the design capture volume that is not reliably retained onsite.

[b] The Copermittee may allow Priority Development Projects to utilize offsite regional BMPs to comply with the hydromodification management BMP performance requirements of Provision E.3.c.(2) if the offsite regional BMPs have the capacity to manage the storm water flows rates and durations from the site such that the receiving waters are protected from the potential for increased erosion that would be caused if the unmanaged portion of the runoff was discharged from the site.

(iv) *Offsite Retrofitting Projects*

The Copermittee may allow Priority Development Projects to utilize offsite retrofitting projects to comply with the storm water pollutant control and hydromodification management BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) if the retrofitting projects have been identified within the strategies included in the Water Quality Improvement Plan, or identified as potential retrofitting projects by the Copermittee pursuant to Provision E.5.

(v) *Offsite Channel, Stream, or Habitat Rehabilitation Projects*

The Copermittee may allow Priority Development Projects to utilize

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offsite channel, stream, or habitat rehabilitation projects to comply with the hydromodification management BMP performance requirements of Provision E.3.c.(2) if the rehabilitation projects have been identified within the strategies included in the Water Quality Improvement Plan, or identified as potential channel rehabilitation projects by the Copermittee pursuant to Provision E.5. The channel, stream, or habitat rehabilitation project cannot be utilized for pollutant treatment except where artificial wetlands are constructed and located upstream of receiving waters.

(vi) *Offsite Regional Water Supply Augmentation Projects*

The Copermittee may allow Priority Development Projects to utilize offsite regional water supply augmentation projects (i.e. groundwater recharge, recycled water, storm water harvesting) to comply with Provisions E.3.c.(1) and E.3.c.(2) if the projects have been identified within the strategies included in the Water Quality Improvement Plan.

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(vii) *Project Applicant Proposed Alternative Compliance Projects*

The Copermittee may allow one or more Priority Development Project applicant(s) to propose and implement alternative compliance projects to comply with Provisions E.3.c.(1) and E.3.c.(2) if the alternative compliance projects are consistent with, and will address the highest water quality priorities of the Water Quality Improvement Plan, and comply with the requirements of Provision E.3.c.(3)(a).

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(c) Alternative Compliance In-Lieu Fee Option

The Copermittee may develop and implement an alternative compliance in-lieu fee option, individually or with other Copermittees and/or entities, as a means for designing, developing, constructing, operating and maintaining offsite alternative compliance projects under Provision E.3.c.(3)(b). Priority Development Projects allowed to utilize the alternative compliance in-lieu fee option must comply with the following conditions:

(i) The in-lieu fee should be collected and held in accordance with the Mitigation Fee Act and all other applicable development fee laws.

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Deleted: transferred to the Copermittee (for public projects) or an escrow account (for private projects) prior to the date construction of the Priority Development Project is initiated.

(ii) If the in-lieu fee is applied to the development, design and construction of offsite alternative compliance projects, the following conditions must be met:

[a] The offsite alternative compliance projects must allow the Priority Development Project to comply with the onsite BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2);

[b] The offsite alternative compliance projects must be constructed

as soon as possible, but no later than 4 years after the certificate of occupancy is granted for the first Priority Development Project that contributed funds toward the construction of the offsite alternative compliance projects, unless a longer period of time is authorized by the San Diego Water Board Executive Officer;

[c] The in-lieu fee for the Priority Development Project must include mitigation of the pollutant loads and increased storm water flow rates and durations that are allowed to discharge from the site before the offsite alternative compliance projects are constructed; and

[d]

Deleted: The in-lieu fee must also include the cost to operate and maintain the offsite alternative compliance projects.

(iii) If the in-lieu fee is applied to the operation and maintenance of offsite alternative compliance projects that have already been constructed, the offsite alternative compliance projects must allow the Priority Development Project to comply with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2).

(d) Alternative Compliance Water Quality Credit System Option

The Copermittee may develop and implement an alternative compliance water quality credit system option, individually or with other Copermittees and/or entities. Any credit system that a Copermittee chooses to implement must be submitted to the San Diego Water Board Executive Officer for review and acceptance as part of the Water Quality Improvement Plan.

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Deleted: provided that such a credit system clearly exhibits that it will not allow discharges from Priority Development Projects to cause or contribute to a net impact over and above the impact caused by projects meeting the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2).

(4) Long-Term Structural BMP Maintenance

Each Copermittee must require the project applicant to submit proof of the mechanism under which ongoing long-term maintenance of all structural BMPs will be conducted.

(5) Infiltration and Groundwater Protection

(a) Structural BMPs designed to primarily function as large, centralized infiltration devices (such as large infiltration trenches and infiltration basins) must not cause or contribute to an exceedance of an applicable groundwater quality objective. At a minimum, such infiltration BMPs must be in conformance with the design criteria listed below, unless the development project applicant demonstrates to the Copermittee that one or more of the specific design criteria listed below are not necessary to protect groundwater quality. The design criteria listed below do not apply to small infiltration systems dispersed throughout a development project.

(i) Runoff must undergo pretreatment such as sedimentation or filtration

prior to infiltration;

(ii) Pollution prevention and source control BMPs must be implemented at a level appropriate to protect groundwater quality at sites where infiltration BMPs are to be used;

(iii) Infiltration BMPs must be adequately maintained to remove pollutants in storm water to the MEP;

(iv) The vertical distance from the base of any infiltration BMP to the seasonal high groundwater mark must be at least 10 feet. Where groundwater basins do not support beneficial uses, this vertical distance criteria may be reduced, provided groundwater quality is maintained;

(v) The soil through which infiltration is to occur must have physical and chemical characteristics (e.g., appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses;

(vi) Infiltration BMPs must not be used for areas of industrial or light industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee, unless first treated or filtered to remove pollutants prior to infiltration; and

(vii) Infiltration BMPs must be located a minimum of 100 feet horizontally from any water supply wells.

(b) The Copermittee may develop, individually or with other Copermittees, alternative mandatory design criteria to that listed above for infiltration BMPs which are designed to primarily function as centralized infiltration devices. Before implementing the alternative design criteria in the development planning process the Copermitee(s) must:

(i) Notify the San Diego Water Board of the intent to implement the alternative design criteria submitted; and

(ii) Comply with any conditions set by the San Diego Water Board.

e. BMP DESIGN MANUAL UPDATE

Each Copermittee must update its BMP Design Manual[34] pursuant to Provision F.2.b. Until the Copermittee has updated its BMP Design Manual with the requirements of Provisions E.3.a-c, the Copermittee must continue implementing its current BMP Design Manual. Unless directed otherwise by the San Diego Water Board, the Copermittee must implement the BMP Design Manual within 180 days of completing the update. The update of the BMP Design Manual must include the following:

[34] The BMP Design Manual was formerly known as the Standard Storm Water Mitigation Plan under Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016.

(1) Updated procedures to determine the nature and extent of storm water requirements applicable to a potential development or redevelopment projects. These procedures must inform project applicants of the storm water management requirements applicable to their project including, but not limited to, general requirements for all development projects, structural BMP design procedures and requirements, hydromodification management requirements, requirements specific to phased projects, and procedures specific to private developments and public improvement projects;

(2) Updated procedures to identify pollutants and conditions of concern for selecting the most appropriate structural BMPs that consider, at a minimum, the following:

(a) Receiving water quality (including pollutants for which receiving waters are listed as impaired under the CWA section 303(d) List);

(b) Pollutants, stressors, and/or receiving water conditions that cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(c) Land use type of the project and pollutants associated with that land use type; and

(d) Pollutants expected to be present onsite.

(3) Updated procedures for designing structural BMPs, including any updated performance requirements to be consistent with the requirements of Provision E.3.c for all structural BMPs listed in the BMP Design Manual;

(4) Long-term maintenance criteria for each structural BMP listed in the BMP Design Manual; and

(5) Alternative compliance criteria, in accordance with the requirements under Provision E.3.c.(3), if the Copermittee elects to allow Priority Development Projects within its jurisdiction to utilize alternative compliance.

f. PRIORITY DEVELOPMENT PROJECT BMP IMPLEMENTATION AND OVERSIGHT

Each Copermittee must implement a program that requires and confirms structural BMPs on all Priority Development Projects are designed, constructed, and maintained to remove pollutants in storm water to the MEP.

(1) Structural BMP Approval and Verification Process

(a) Each Copermittee must require and confirm that for all Priority Development Project applications that have not received prior lawful approval by the Copermittee by 18 months after the commencement of

coverage under this Order, the requirements of Provision E.3 are implemented. For project applications that have received prior lawful approval by 18 months after the commencement of coverage under this Order, the Copermittee may allow previous land development requirements to apply.

(b) Each Copermittee must identify the roles and responsibilities of various municipal departments in implementing the structural BMP requirements, including each stage of a project from application review and approval through BMP maintenance and inspections.

(c) Each Copermittee must require and confirm that appropriate easements and ownerships are properly recorded in public records and the information is conveyed to all appropriate parties when there is a change in project or site ownership.

(d) Each Copermittee must require and confirm that prior to occupancy and/or intended use of any portion of the Priority Development Project, each structural BMP is inspected to verify that it has been constructed and is operating in compliance with all of its specifications, plans, permits, ordinances, and the requirements of this Order.

(2) Priority Development Project Inventory and Prioritization

(a) Each Copermittee must develop, maintain, and update at least annually, a watershed-based database to track and inventory all Priority Development Projects and associated structural BMPs within its jurisdiction. Inventories must be accurate and complete beginning from January 2002 for the San Diego County Copermittees, February 2003 for the Orange County Copermittees, and July 2005 for the Riverside County Copermittees. The use of an automated database system, such as GIS, is highly recommended. The database must include, at a minimum, the following information:

(i) Priority Development Project location (address and hydrologic subarea);

(ii) Descriptions of structural BMP type(s);

(iii) Date(s) of construction;

(iv) Party responsible for structural BMP maintenance;

(v) Dates and findings of structural BMP maintenance verifications; and

(vi) Corrective actions and/or resolutions.

(b) Each Copermittee must prioritize the Priority Development Projects with structural BMPs within its jurisdiction. The designation of Priority Development Projects as high priority must consider the following:

(i) The highest water quality priorities identified in the Water Quality Improvement Plan;

(ii) Receiving water quality;

(iii) Number and sizes of structural BMPs;

(iv) Recommended maintenance frequency of structural BMPs;

(v) Likelihood of operation and maintenance issues of structural BMPs;

(vi) Land use and expected pollutants generated; and

(vii) Compliance record.

(3) Structural BMP Maintenance Verifications and Inspections

Each Copermittee is required to verify that structural BMPs on each Priority Development Project are adequately maintained, and continue to operate effectively to remove pollutants in storm water to the MEP through inspections, self-certifications, surveys, or other equally effective approaches.

(a) All (100 percent) of the structural BMPs at Priority Development Projects that are designated as high priority must be inspected directly by the Copermittee annually prior to each rainy season;

(b) For verifications performed through a means other than direct Copermittee inspection, adequate documentation must be required by the Copermittee to provide assurance that the required maintenance of structural BMPs at each Priority Development Project has been completed; and

(c) Appropriate follow-up measures (including re-inspections, enforcement, etc.) must be conducted to ensure that structural BMPs at each Priority Development Project continue to reduce pollutants in storm water to the MEP as originally designed.

g. DEVELOPMENT PROJECT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all development projects, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

Deleted: <#>STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS ¶

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Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the development planning program to address development and redevelopment projects that may become sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:¶

¶

<#>Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, increase frequency of verifications and/or inspections, alternative compliance options);¶

¶

<#>Each Copermittee must identify areas within its jurisdiction where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting and/or stream, channel, or habitat rehabilitation projects;¶

¶

<#>Each Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify regional alternative compliance projects that Priority Development Projects may be allowed or should be encouraged to implement or participate in implementing; and¶

¶

<#>The strategies and/or activities must be consistent with the requirements of Provisions E.3.a-c and E.3.e-f and the strategies identified in the Water Quality Improvement Plan.¶

4. Construction Management

Each Copermittee must implement a construction management program in accordance with the strategies identified in the Water Quality Improvement Plan. The requirements of the jurisdictional runoff management programs as outlined below may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality improvement Plan(s).

Deleted: and includes, at a minimum, the following requirements:

a. Strategies to Address the Highest Priority Water Quality Conditions

Comment [K3]: It is recommended that this Provision (4.f) be moved to Provision 4.a

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the construction management program to address construction sites that the Copermittee has identified as potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate BMPs, focus education, and/or increase/decrease frequency of inspections for specific types of sites and/or activities); and

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(2) The strategies and/or activities must be consistent with the requirements of Provisions E.4.c-e and the strategies identified in the Water Quality Improvement Plan.

b. Project Approval Process

Prior to issuance of any local permit(s) that allows the commencement of construction projects that involve ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff, each Copermittee must:

(1) Require a site-specific pollution control, construction BMP, and/or erosion and sediment control plan, to be submitted by the project applicant to the Copermittee;

(2) Confirm the pollution control, construction BMP, and/or erosion and sediment control plan, complies with the local grading ordinance, other applicable local ordinances, and the requirements of this Order;

(3) Confirm the pollution control, construction BMP, and/or erosion and sediment control plan, includes seasonally appropriate and effective BMPs and management measures described in Provision E.4.c, as applicable to the project; and

(4) Verify that the project applicant has obtained coverage under the Construction General Permit.

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c. CONSTRUCTION SITE INVENTORY AND TRACKING

(1) Each Copermittee must maintain, and update at least quarterly, a watershed-based inventory of all construction projects issued a local permit that allows ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff. The use of an automated database system, such as GIS, is highly recommended. The inventory must include:

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(a) Relevant contact information for each site (e.g., name, address, phone, and email for the owner and contractor);

(b) The basic site information including location (address and hydrologic subarea), Waste Discharge Identification (WDID) number (if applicable), size of the site, and approximate area of disturbance;

(c) Whether or not the site is considered a high threat to water quality, as defined in Provision E.4.b.(2) below;

(d) The project start and anticipated completion dates;

(e) Current construction phase;

(f) The required inspection frequency, as defined in the Copermittee's jurisdictional runoff management program document;

(g) The date the Copermittee accepted and/or approved the site-specific pollution control, construction BMP, and/or erosion and sediment control plan; and

(h) Whether or not there are ongoing enforcement actions administered to the site.

(2) Each Copermittee must identify all construction sites within its jurisdiction that represent a high threat to downstream surface water quality. The designation of construction sites as high threat to water quality must consider the following:

(a) Sites located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Sites located within the same hydrologic subarea and tributary to a water body segment listed as impaired for sediment on the CWA section 303(d) List;

(c) Sites located within, directly adjacent to, or discharging directly to a receiving water within an ESA; and

(d) Other sites determined by the Copermittees or the San Diego Water Board as a high threat to water quality.

d. CONSTRUCTION SITE BMP IMPLEMENTATION

Each Copermittee must implement, or require the implementation of effective BMPs to reduce discharges of pollutants in storm water from construction sites to the MEP, and prevent non-storm water discharges from construction sites into the MS4. These BMPs must be site specific, seasonally appropriate, and construction phase appropriate. BMPs must be implemented at each construction site year round. Dry season BMP implementation must plan for and address unseasonal rain events that may occur during the dry season (May 1 through September 30). Copermittees must implement, or require the implementation of, BMPs in the following categories:

(1) Project Planning;

(2) Good Site Management "Housekeeping", including waste management;

(3) Non-storm Water Management;

(4) Erosion Control;

(5) Sediment Control;

(6) Run-on and Run-off Control; and

(7) Active/Passive Sediment Treatment Systems, where applicable.

e. CONSTRUCTION SITE INSPECTIONS

Each Copermittee must conduct construction site inspections to require and confirm compliance with its local permits and applicable local ordinances, and the requirements of this Order. Priority for site inspections must consider threat to water quality pursuant to Provision E.4.b as well as the nature of the construction activity, topography, and the characteristics of soils and receiving water quality.

(1) Inspection Frequency

(a) Each Copermittee must conduct inspections at all inventoried sites, including high threat to water quality sites, at an appropriate frequency for each phase of construction to ensure the site reduces the discharge of pollutants in storm water from construction sites to the MEP, and prevents non-storm water discharges from entering the MS4.

(b) Each Copermittee must establish appropriate inspection frequencies for high threat to water quality sites, and all other sites, for each phase of construction. Inspection frequencies appropriate for addressing the highest water quality priorities identified in the Water Quality Improvement Plan, and for complying with the requirements of this Order must be identified in each Copermittee's jurisdictional runoff management program document.

(c) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e., re-inspection, enforcement) necessary to require and confirm site compliance with its local permits and applicable local ordinances, and the requirements of this Order.

(2) Inspection Content

Inspections of construction sites by the Copermittee must include, at a minimum:

(a) Verification of coverage under the Construction General Permit (Notice of Intent (NOI) and/or WDID number) during initial inspections, when applicable;

(b) Assessment of compliance with its local permits and applicable local ordinances related to pollution prevention, including the implementation and maintenance of applicable BMPs;

(c) Assessment of BMP adequacy and effectiveness;

(d) Visual observations of actual non-storm water discharges;

(e) Visual observations of actual or potential discharge of sediment and/or construction related materials from the site;

(f) Visual observations of actual or potential illicit connections; and

(g) If any violations are found and BMP corrections are needed, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried construction sites. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Site name, location (address and hydrologic subarea), and WDID number (if applicable);

(b) Inspection date;

(c) Weather condition during inspection;

(d) Description of problems observed with BMPs and indication of need for BMP addition/repair/replacement and any scheduled re-inspection, and date of re-inspection;

(e) Descriptions of any other specific inspection comments which must, at a minimum, include rationales for longer compliance time;

(f) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(g) Resolution of problems noted and date problems fixed.

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f. CONSTRUCTION SITE ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried construction sites, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

5. Existing Development Management

Each Copermittee must implement an existing development management program in accordance with the strategies identified in the Water Quality Improvement Plan. The requirements of the jurisdictional runoff management programs as outlined below may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality improvement Plan(s).

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Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the construction management program to address construction sites that the Copermittee has identified as potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:¶
¶
<#>Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, and/or increase/decrease frequency of inspections for specific types of sites and/or activities); and¶
¶
<#>The strategies and/or activities must be consistent with the requirements of Provisions E.4.c-e and the strategies identified in the Water Quality Improvement Plan.¶

a. STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Each Copermittee must implement the water quality improvement strategies, where necessary, to address areas of existing development within its jurisdiction that are identified as sources of pollutants and/or stressors contributing to the highest priority water quality conditions in the Watershed Management Area. For the existing development management program, the following strategies must be implemented:

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(1) Specific Existing Development Management Program Strategies

Comment [K4]: It is recommended that this Provision (5.e) be moved to Provision 5.a

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented within its jurisdiction to address areas of existing development that the Copermittee has identified as sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(a) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate BMPs, focus education, and/or increase/decrease frequency of inspections for specific types of facilities, areas and/or activities);

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(b) The facilities and/or areas within the Copermittee's jurisdiction where the strategies and/or activities will be implemented; and

(c) The strategies and/or activities must be consistent with the requirements of Provisions E.5.b-d and the strategies identified in the Water Quality Improvement Plan.

a. EXISTING DEVELOPMENT INVENTORY AND TRACKING

Each Copermittee must maintain, and update at least annually, a watershed-based inventory of the existing development within its jurisdiction that may discharge a high priority pollutant load to and from the MS4. The use of an automated database system, such as GIS, is highly recommended. The inventory must, at a minimum, evaluate and include the following if identified as a source of a high priority pollutant:

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(1) Name, location (hydrological subarea and address, if applicable) of the following types of existing development with its jurisdiction:

(a) Commercial facilities or areas;

(b) Industrial facilities;

(c) Municipal facilities, including:

(i) MS4 and related structures,[35]

(ii) Roads, streets, and highways,

(iii) Parking facilities,

(iv) Municipal airfields,

(v) Parks and recreation facilities,

[35] The inventory may refer to the MS4 map required to be maintained pursuant to Provision E.2.b.(1).

(vi) Flood management projects and flood control devices and structures,

(vii) Operating or closed municipal landfills,

(viii) Publicly owned treatment works (including water and wastewater treatment plants) and sanitary sewer collection systems,

(ix) Corporate yards, including maintenance and storage yards for materials, waste, equipment, and vehicles,

(x) Hazardous waste collection facilities,

(xi) Other treatment, storage or disposal facilities for municipal waste, and

(xii) Other municipal facilities that the Copermittee determines may contribute a significant high priority pollutant load to the MS4; and

(d) Residential areas, which may be designated by one or more of the following:

(i) Residential management area,

(ii) Drainage basin or area,

(iii) Land use (e.g., single family, multi-family, rural),

(iv) Neighborhood,

(v) Common Interest Area,

(vi) Home Owner Association,

(vii) Mobile home park, and/or

(viii) Other designations accepted by the San Diego Water Board Executive Officer.

(2) A description of the facility or area, including the following information:

(a) Classification as commercial, industrial, municipal, or residential;

(b) Status of facility or area as active or inactive;

(c) Identification if a business is a mobile business;

(d) SIC Code or NAICS Code, if applicable;

(e) Industrial General Permit NOI and/or WDID number, if applicable;

(f) Identification if a residential area is or includes a Common Interest Area / Home Owner Association, or mobile home park;

(g) Identification of the high priority pollutants potentially generated by the facility or area;

(h) Whether the facility or area is adjacent to an ESA;

(i) Whether the facility or area is tributary to and within the same hydrologic subarea as a water body segment listed as impaired on the CWA section 303(d) List and generates pollutants for which the water body segment is impaired; and

(3) An annually updated map showing the location of inventoried existing development, watershed boundaries, and water bodies.

b. EXISTING DEVELOPMENT BMP IMPLEMENTATION AND MAINTENANCE

Each Copermittee must designate a set of BMPs required for all inventoried existing development, including special event venues. The designated BMPs must be specific to the identified high priority facility or area types and high priority pollutant generating activities, as appropriate.

(1) Commercial, Industrial, and Municipal Facilities and Areas

(a) Pollution Prevention

Each Copermittee must require the use of pollution prevention methods by the commercial, industrial, and municipal facilities and areas in its inventoried existing development.

(b) BMP Implementation

Each Copermittee must implement, or require the implementation of, designated BMPs at commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development.

(c) BMP Operation and Maintenance

(i) Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development.

(ii) Each Copermittee must implement a schedule of operation and maintenance activities for its MS4 and related structures (including but not limited to catch basins, storm drain inlets, detention basins, etc.), and verify proper operation of all its municipal structural treatment controls designed to reduce pollutants (including floatables) in storm water discharges to or from its MS4s and related

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<#>Whether the facility or area contributes or potentially contributes to the highest priority water quality conditions identified in the Water Quality Improvement Plan.¶

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drainage structures. Operation and maintenance activities may include, but is not limited to, the following:

[a] Inspections of the MS4 and related structures;
[b] Cleaning of the MS4 and related structures; and
[c] Proper disposal of materials removed from cleaning of the MS4 and related structures.

(iii) Each Copermittee must implement a schedule of operation and maintenance for public streets, unpaved roads, paved roads, and paved highways and freeways within its jurisdiction to minimize pollutants that can be discharged in storm water.

(iv) Each Copermittee must implement controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers. Copermittees that operate both a municipal sanitary sewer system and a MS4 must implement controls and measures to prevent and eliminate seeping sewage from infiltrating the MS4. Copermittees that do not operate both a municipal sanitary sewer system and a MS4 must coordinate with sewering agencies to keep themselves informed of relevant and appropriate maintenance activities and sanitary sewage projects in their jurisdiction that may cause or contribute to seepage of sewage into the MS4.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must implement BMPs, or require the implementation of BMPs, to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development. Such BMPs must include, as appropriate, educational activities, permits, certifications and other measures for applicators and distributors.

(2) Residential Areas

(a) Pollution Prevention

Each Copermittee must promote and encourage the use of pollution prevention methods, where appropriate, by the residential areas in its inventoried existing development.

(b) BMP Implementation

Each Copermittee must promote and encourage the implementation of designated BMPs at residential areas in its inventoried existing development.

(c) BMP Operation and Maintenance

Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at residential areas in its inventoried existing development.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must promote and encourage the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from residential areas in its inventoried existing development.

c. EXISTING DEVELOPMENT INSPECTIONS

Each Copermittee must conduct inspections of inventoried existing development to ensure compliance with applicable local ordinances and permits, and the requirements of this Order.

(1) Inspection Frequency

(a) Each Copermittee must establish appropriate inspection frequencies for inventoried existing development in accordance with the following requirements:

(i) At a minimum, inventoried existing development must be inspected once every five years utilizing one or more of the following methods:

[a] Drive-by inspections by Copermittee municipal and contract staff,
[b] Onsite inspections by Copermittee municipal and contract staff, and/or
[c] Inspections by volunteer monitoring or patrol programs trained by the Copermittee;

(ii) The frequency of inspections must be appropriate to confirm that BMPs are being implemented to reduce the discharge of pollutants in storm water from the MS4 to the MEP and effectively prohibit non-storm water discharges into the MS4;

(iii) The frequency of inspections must be based on the potential for a facility or area to discharge non-storm water and pollutants in storm water, and should reflect the priorities set forth in the Water Quality Improvement Plan;

(iv) Each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried

existing development;[36] and

(v) Inventoried existing development must be inspected by the Copermittee, as needed, in response to valid public complaints and findings from the Copermittee's municipal and contract staff or volunteer monitoring or patrol program inspections.

(b) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e. education and outreach, re-inspection, enforcement) necessary to require and confirm compliance with its applicable local ordinances and permits and the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

(2) Inspection Content

(a) Inspections of existing development by the Copermittee or volunteer monitoring or patrol programs must include, at a minimum:

(i) Visual inspections for actual non-storm water discharges;

(ii) Visual inspections for actual or potential discharge of pollutants;

(iii) Visual inspections for actual or potential illicit connections; and

(iv) Verification that the description of the facility or area in the inventory, required pursuant to Provision E.5.a.(2), has not changed.

(b) Onsite inspections of existing development by the Copermittee must include, at a minimum:

(i) Assessment of compliance with its applicable local ordinances and permits related to non-storm water and storm water discharges and runoff;

(ii) Assessment of the implementation of the designated BMPs;

(iii) Verification of coverage under the Industrial General Permit, when applicable; and

(iv) If any problems or violations are found, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

[36] If any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspection may count toward the total annual inspection requirement. This requirement excludes linear municipal facilities (i.e., MS4, streets, roads and highways).

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried existing development. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Name and location of facility or area (address and hydrologic subarea) consistent with the inventory name and location, pursuant to Provision E.5.a.(1);

(b) Inspection and re-inspection date(s);

(c) Inspection method(s) (i.e. drive-by, onsite);

(d) Observations and findings from the inspection(s);

(e) For onsite inspections of existing development by Copermittee municipal or contract staff, the records must also include, as applicable:

(i) Description of any problems or violations found during the inspection(s),

(ii) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6, and

(iii) The date problems or violations were resolved.

d. EXISTING DEVELOPMENT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried existing development, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

e. RETROFITTING AREAS OF EXISTING DEVELOPMENT

(2) Retrofitting Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to retrofit areas of existing development within its jurisdiction to address identified sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify areas of existing development as candidates for retrofitting, focusing on areas where retrofitting will address

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<#>Specific Existing Development Management Program Strategies¶
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Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented within its jurisdiction to address areas of existing development that the Copermittee has identified as sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:¶
¶
<#>Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, and/or increase/decrease frequency of inspections for specific types of facilities, areas and/or activities); ¶
¶
<#>The facilities and/or areas within the Copermittee's jurisdiction where the strategies and/or activities will be implemented; and¶
¶
<#>The strategies and/or activities must be consistent with the requirements of Provisions E.5.b-d and the strategies identified in the Water Quality Improvement Plan.¶
¶

pollutants and/or stressors that contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for retrofitting projects may be utilized to reduce pollutants that may be discharged in storm water from areas of existing development, and/or address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of retrofitting projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting projects; and

(e) Where retrofitting projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional retrofitting projects (i.e. projects that can receive and/or treat storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment) adjacent to and/or downstream of the areas of existing development.

(3) Stream, Channel and/or Habitat Rehabilitation in Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to rehabilitate streams, channels, and/or habitats in areas of existing development within its jurisdiction or just downstream of its jurisdiction to address the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Candidates for stream, channel, and/or habitat rehabilitation projects may be utilized to address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters, rehabilitate channelized or hydromodified streams, restore wetland and riparian habitat, restore watershed functions, and/or protect beneficial uses of receiving waters;

Deleted: <#>Each Copermittee must identify streams, channels, and/or habitats in areas of existing development as candidates for rehabilitation, focusing on areas where stream, channel, and/or habitat rehabilitation projects will address the highest priority water quality conditions identified in the Water Quality Improvement Plan;¶

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(b) Each Copermittee must develop a strategy to facilitate the implementation of stream, channel, and/or habitat rehabilitation projects in areas of

existing development identified as candidates;

(c) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance stream, channel, and/or habitat rehabilitation projects; and

(d) Where stream, channel, and/or habitat rehabilitation projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional stream, channel, and/or habitat rehabilitation projects (i.e. projects that can receive storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment).

6. Enforcement Response Plans

Each Copermittee must develop and implement an Enforcement Response Plan as part of its jurisdictional runoff management program document. The Enforcement Response Plan must describe the applicable approaches and options to enforce its legal authority established pursuant to Provision E.1, as necessary, to achieve compliance with the requirements of this Order. Copermittees may continue to utilize and implement established, equivalent guidelines and procedures for enforcement. The Enforcement Response Plan must include the following:

a. Enforcement Response Plan Components

The Enforcement Response Plan must include and/or address the following individual components:

(1) Illicit Discharge Detection and Elimination Enforcement Component;

(2) Development Planning Enforcement Component;

(3) Construction Management Enforcement Component; and

(4) Existing Development Enforcement Component.

b. Enforcement Response Approaches and Options

Each component of the Enforcement Response Plan must describe the enforcement response approaches that the Copermittee will implement to compel compliance with its statutes, ordinances, permits, contracts, orders, or similar means, and the requirements of this Order. The description must include the protocols for implementing progressively stricter enforcement responses. The

enforcement response approaches must include appropriate sanctions to compel compliance, including, at a minimum, the following tools or their equivalent:

(1) Verbal and written notices of violation;

(2) Cleanup requirements;

(3) Fines;

(4) Bonding requirements;

(5) Administrative and criminal penalties;

(6) Liens;

(7) Stop work orders; and

(8) Permit and occupancy denials.

c. CORRECTION OF VIOLATIONS

(1) Violations must be corrected in a timely manner with the goal of correcting the violations within 30 calendar days after the violations are discovered, or prior to the next predicted rain event, whichever is sooner.

(2) If more than 30 calendar days are required to achieve compliance, then a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

d. PROGRESSIVE ENFORCEMENT

(1) The Enforcement Response Plan must include a definition of "progressive enforcement". Progressive enforcement must include a series of enforcement actions that match the severity of the violations and include distinct, progressive steps. Progressive enforcement may be defined differently for development planning, construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and/or residential areas.

(2) Where the Copermittee determines progressive enforcement is not required, a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

(3) Progressive enforcement actions must continue to increase in severity, as necessary, to compel compliance as soon as possible.

e. REPORTING OF NON-COMPLIANT SITES

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(1) Each Copermittee must notify the San Diego Water Board in writing within 2 working days of issuing escalated enforcement (as defined in the Copermittee's Enforcement Response Plan) to a construction site that poses a significant threat to water quality as a result of violations or other non-compliance with its permits and applicable local ordinances, and the requirements of this Order. Written notification may be provided electronically by email.

(2) Each Copermittee must notify the San Diego Water Board of non-filers under the Industrial General Permit and Construction General Permit by email to Nonfilers_R9@waterboards.ca.gov.

7. Public Education and Participation

Each Copermittee must implement, individually or with other Copermittees, a public education and participation program in accordance with the strategies identified in the Water Quality Improvement Plan to promote and encourage the development of programs, management practices, and behaviors that reduce the discharge of pollutants in storm water to the MEP, prevent controllable non-storm water discharges from entering the MS4, and protect water quality standards in receiving waters. The requirements of the jurisdictional runoff management programs as outlined below may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality improvement Plan(s).

a. STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Comment [K5]: It is recommended that this Provision (7.c) be moved to Provision 7.a

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented within its jurisdiction, as applicable, to educate the public and encourage public participation to address potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) The target audiences and/or areas within the Copermittee's jurisdiction where the strategies and/or activities will be implemented;

(2) Provide specific details about how the strategies and/or activities will be implemented (e.g. educational topics, materials and/or activities, public outreach and participation programs and/or opportunities);

(3) Each Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify and implement regional public education and participation activities, programs and opportunities;

(4) Each Copermittee must incorporate a mechanism for evaluating and assessing educational and other public outreach activities, as needed, to identify progress and incorporate modifications necessary to increase the effectiveness of the public education and participation program.

B. Public Education

The public education program component implemented within the Copermittee's jurisdiction may include the following:

(1) Educational activities, public information activities, and other appropriate outreach activities intended to reduce pollutants associated with the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(2) Educational activities, public information activities, and other appropriate outreach activities to facilitate the proper management and disposal of used oil and toxic materials; and

(3) Appropriate education and training measures for specific target audiences, such as construction site operators, residents, underserved target audiences and school-aged children, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed, based on high risk behaviors and pollutants of concern.

C. Public Participation

The public participation program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) A process for members of the public to participate in updating the highest priority water quality conditions, numeric goals, and water quality improvement strategies in the Water Quality Improvement Plan.

(2) Opportunities for members of the public to participate in providing the Copermittee recommendations for improving the effectiveness of the water quality improvement strategies implemented within its jurisdiction.

(3) Opportunities for members of the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or protection of the quality of receiving waters.

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<#>Strategies to Address the Highest Priority Water Quality Conditions¶
¶
Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented within its jurisdiction, as applicable, to educate the public and encourage public participation to address potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:¶
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<#>Provide specific details about how the strategies and/or activities will be implemented (e.g. educational topics, materials and/or activities, public outreach and participation programs and/or opportunities);¶
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<#>Each Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify and implement regional public education and participation activities, programs and opportunities;¶
¶
<#>Each Copermittee must incorporate a mechanism for evaluating and assessing educational and other public outreach activities, as needed, to identify progress and incorporate modifications necessary to increase the effectiveness of the public education and participation program.¶

8. Fiscal Analysis

a. Each Copermittee must secure the resources necessary to meet all the

requirements of this Order.

b. Each Copermittee must conduct an annual fiscal analysis of its jurisdictional runoff management program in its entirety. The fiscal analysis must include the following:

(1) Identification of the various categories of expenditures necessary to implement the requirements of this Order, including a description of the specific capital, operation and maintenance, and other expenditure items to be accounted for in each category of expenditures;

(2) The staff resources needed and allocated to meet the requirements of this Order, including any development, implementation, and enforcement activities required;

(3) The estimated expenditures for Provisions E.8.b.(1) and E.8.b.(2) for the current fiscal year; and

(4) The source(s) of funds that are proposed to meet the necessary expenditures described in Provisions E.8.b.(1) and E.8.b.(2), including legal restrictions on the use of such funds, for the current fiscal year and next fiscal year.

c. Each Copermittee must submit a summary of the annual fiscal analysis with each Annual Report required pursuant to Provision F.3.b.

d. Each Copermittee must provide the documentation used to develop the summary of the annual fiscal analysis upon request by the San Diego Water Board.

F. REPORTING

The purpose of this provision is to determine and document compliance with the requirements set forth in this Order. The goal of reporting is to communicate to the San Diego Water Board and the people of the State of California the implementation status of each jurisdictional runoff management program and compliance with the requirements of this Order. This goal is to be accomplished through the submittal of specific deliverables to the San Diego Water Board by the Copermittees.

1. Water Quality Improvement Plans

The Copermittees for each Watershed Management Area must develop and submit the Water Quality Improvement Plan in accordance with the following requirements:

a. WATER QUALITY IMPROVEMENT PLAN DEVELOPMENT

Each Water Quality Improvement Plan must be developed in accordance with the following process:

(1) Priority Water Quality Conditions and Numeric Goals

(a) The Copermittees must implement a public participation process to solicit data and information to be utilized in the development and identification of the priority water quality conditions for the Watershed Management Area.

(b) The Copermittees are encouraged to involve the public and key stakeholders as early and often as possible during the development of the priority water quality conditions and numeric goals to be included in the Water Quality Improvement Plan.

(c) Within 6 months after the commencement of coverage under this Order, the Copermittees must develop and submit the Water Quality Improvement Plan requirements of Provision B.2 to the San Diego Water Board. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of 30 days.

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(d) Within 30 days of receiving the public comments, the Copermittees must revise the priority water quality conditions and numeric goals based on comments received and/or recommendations or direction from the San Diego Water Board Executive Officer.

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(2) Water Quality Improvement Strategies and Schedules

(a) The Copermittees are encouraged to involve the public and key stakeholders as early and often as possible during the development of the water quality improvement strategies and schedules to be included in the Water Quality Improvement Plan.

(b) Within 3 months after the development of the priority water quality conditions and numeric goals, the Copermittees must develop and submit the Water Quality Improvement Plan requirements of Provision B.3 to the San Diego Water Board. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of 30 days.

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(c) Within 30 days of receiving the public comments, the Copermittees must revise the water quality improvement strategies and schedules based on comments received and/or recommendations or direction from the San Diego Water Board Executive Officer.

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b. WATER QUALITY IMPROVEMENT PLAN SUBMITTAL

(1) Within 18 months after the commencement of coverage under this Order, the Copermittees for each Watershed Management Area must submit a complete Water Quality Improvement Plan in accordance with the requirements of Provision B to the San Diego Water Board. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of 30 days.

(2) Based on the comments received, the San Diego Water Board will determine whether to hold a public hearing or to limit public input to submittal of written comments. If no hearing is held the San Diego Water Board will notify the Copermittees within 6 months that the Water Quality Improvement Plan has been accepted as complete following its review and determination that the Water Quality Improvement Plan meets the requirements of this Order.

(3) Within 60 days of receiving comments, the Copermittees must revise the Water Quality Improvement Plan based on comments received and/or recommendations or direction from the San Diego Water Board Executive Officer.

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(4) The Water Quality Improvement Plan must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of the finalization of the Water Quality Improvement Plan and acceptance by the San Diego Water Board.

2. Updates

a. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATES

Each Copermittee must update its jurisdictional runoff management program document in accordance with the following requirements:

(1) Each Copermittee is encouraged to involve the public and key stakeholders as early and often as possible to solicit recommendations for updates to its jurisdictional runoff management program document.

(2) Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E no later than 6 months after the completion of the corresponding Water Quality Improvement Plan and acceptance of the Water Quality Improvement Plan by the San Diego Water Board.

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(3) Each Copermittee must submit updates to its jurisdictional runoff management program, with a rationale for the modifications, either in the Annual Report required pursuant to Provision F.3.b, and/or as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The requested updates are considered accepted by the San Diego Water Board if no response is provided to the Copermittee after 3 months of submitting the request.

(4) The Copermittee must revise the modifications as directed by the San Diego Water Board Executive Officer.

(5) Updated jurisdictional runoff management program documents must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of completing the updates ~~submitting the Annual Report~~.

D. BMP Design Manual Updates

Each Copermittee must update its BMP Design Manual in accordance with the following requirements:

(1) Each Copermittee must update its BMP Design Manual to incorporate the requirements of Provisions E.3.a-d no later than 18 months after the commencement of coverage under this Order.

(2) Subsequent updates must be consistent with the requirements of Provisions E.3.a-d and must be submitted as part of the Annual Reports required pursuant to Provision F.3.b, and/or as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The requested updates are considered accepted by the San Diego Water Board if no response is provided to the Copermittee after 3 months of submitting the request.

(3) Updated BMP Design Manuals must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of completing the updates.

E. WATER QUALITY IMPROVEMENT PLAN UPDATES

The Water Quality Improvement Plans must be updated in accordance with the following process:

(1) The Copermittees must implement a public participation process to solicit data and information to be utilized in updating the Water Quality Improvement Plan.

(2) The Copermittees are encouraged to involve the public and key stakeholders as early and often as possible during the updates to the Water Quality Improvement Plan.

(3) The Copermittees for each Watershed Management Area must submit requested updates to the Water Quality Improvement Plan, with the public input received and the rationale for the requested updates, either in the Annual Reports required pursuant to Provision F.3.b, and/or as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The requested updates are considered accepted by the San Diego Water Board if no response is provided to the Copermittee after 3 months of submitting the request.

(4) The Copermittees must revise the requested updates as directed by the San Diego Water Board Executive Officer.

(5) Updated Water Quality Improvement Plans must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance of the requested updates by the San Diego Water Board.

3. Progress Reporting

a. PROGRESS REPORT PRESENTATIONS

The Copermittees for each Watershed Management Area must appear before the San Diego Water Board, as requested by the San Diego Water Board, to provide progress reports on the implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs.

B. ANNUAL REPORTS

(1) Transitional Period JRMP Reports: Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report no later than October 31 of each year prior to the implementation of updated JRMP programs pursuant to F.2.a. Each Copermittee must submit the information on the Jurisdictional Runoff Management Program specific to the area within its jurisdiction in each Watershed Management Area.

(2) Transitional Period Monitoring Report: The transitional period monitoring conducted pursuant to D.1.a and D.2.a. shall be reported in a single report that covers the entire reporting period from the initiation of the transitional period monitoring (as described in D.1.a and D.2.a.), through September 30th following approval of the Water Quality Improvement Plan. The Transitional Period Monitoring Report shall include the assessments required per D.4.a.(1)(a), D.4.b.(1)(a) and D.4.b.(2)(a); and be submitted by January 31st following completion of the above mentioned transitional period.

(3) Post-Transitional Annual Reports – Following the initial transitional period after enrollment into this Order, the Copermittees for each Watershed Management Area must submit a combined Annual Report for each reporting period no later than January 31 of the following year. The annual reporting period consists of two periods: 1) July 1 to June 30 of the following year for the jurisdictional runoff management programs, 2) October 1 to September 30 of the following year for the monitoring and assessment programs. Annual Reports must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Each Annual Report must include the following:

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Deleted: The first Annual Report must be prepared for the reporting period beginning July 1 after commencement of coverage under this Order, and upon San Diego Water Board determination that the Water Quality Improvement Plan meets the requirements of this Order to June 30 in the following year for the jurisdictional runoff management programs, and September 30 in the following year for the monitoring and assessment programs.

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, summarized and presented in tabular and graphical form;

(b) Progress of the special studies required pursuant to Provision D.3, and the results or findings when a special study, or each phase of a special study, is completed;

(c) The findings from the assessments required pursuant to Provision D.4;

(d) The progress of implementing the Water Quality Improvement Plan, including, but not limited to, the following:

(i) The progress toward achieving the interim and final numeric goals for the highest water quality priorities for the Watershed Management Area,

(ii) The water quality improvement strategies that were implemented and/or no longer implemented by each of the Copermittees during the reporting period and previous reporting periods, and are planned to be implemented during the next reporting period,

(iii) Proposed modifications to the water quality improvement strategies, with public input received and rationale for the proposed modifications,

(iv) Previously proposed modifications or updates incorporated into the Water Quality Improvement Plan and/or each Copermittee's

jurisdictional runoff management program document and implemented by the Copermittees in the Watershed Management Area, and

(v) Proposed modifications or updates to the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document;

(e) For each Water Quality Improvement Plan, the progress of implementing the corresponding Jurisdictional Urban Runoff Management Programs. Each Copermittee should report on the items listed below. The individual JRMP annual reports may be included as attachments to the corresponding WQIP annual report. The JRMP annual report should include, but not be limited to, the following:

(i) The water quality improvement strategies that were implemented and/or no longer implemented by each of the Copermittees during the reporting period and previous reporting periods, and are planned to be implemented during the next reporting period,

(ii) Proposed modifications to the water quality improvement strategies, with public input received and rationale for the proposed modifications,

(iii) Previously proposed modifications or updates incorporated into each Copermittee's jurisdictional runoff management program document and implemented by the Copermittees in the Watershed Management Area, and

(iv) Proposed modifications or updates to each Copermittee's jurisdictional runoff management program document;

(4) Until the Copermittees have updated their jurisdictional runoff management programs consistent with Provision F.2.a, the Copermittees must continue to utilize the current jurisdictional runoff management program annual reporting format. Each Copermittee must submit the information on the Jurisdictional Runoff Management Program Annual Report Form specific to the area within its jurisdiction in each Watershed Management Area.

(5) Each Copermittee must provide any data or documentation utilized in developing the Annual Report upon request by the San Diego Water Board. Any monitoring data utilized in developing the Annual Report must be uploaded to the California Environmental Data Exchange Network (CEDEN).[37] Any monitoring and assessment data utilized in developing the Annual Report must be provided on the Regional Clearinghouse required

Deleted: <#>A completed Jurisdictional Runoff Management Program Annual Report Form (Attachment D or accepted revision) for each Copermittee in the Watershed Management Area, certified by a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative. ¶
¶
Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (Attachment D or accepted revision) no later than October 31 of each year

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[37] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

pursuant to Provision F.4.

F. REGIONAL MONITORING AND ASSESSMENT REPORT

4. Regional Clearinghouse

The Copermittees must develop, update, and maintain an internet-based Regional Clearinghouse that is made available to the public no later than 18 months after the effective date of this Order. The Copermittees may elect to develop and maintain the clearinghouse(s) provided by other Copermittees or agencies.

a. The Copermittees, through the Regional Clearinghouse, must make the following documents and data available, organized by Watershed Management Area, which may be linked to other internet-based data portals and databases where the original documents are stored:

(1) Water Quality Improvement Plan for the Watershed Management Area, and all updated versions with date of update;

(2) Annual Reports for the Watershed Management Area;

(3) Jurisdictional Runoff Management Program document for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(4) BMP Design Manual for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(5) Reports from special studies (e.g. source identification, BMP effectiveness assessment) conducted in the Watershed Management Area;

(6) Monitoring data collected pursuant to Provision D for each Watershed Management Area must be uploaded to CEDEN,[38] with links to the uploaded data; and

(7) Available GIS data, layers, and/or shapefiles used to develop the maps generated and maintained by the Copermittees for the Water Quality Improvement Plans, Annual Reports, and jurisdictional runoff management program documents.

b. The Copermittees, through the Regional Clearinghouse, must make the following information and documents available:

Comment [K6]: This was moved from F.5.c since it is a part of the ROWD.

Deleted: <#>The Copermittees must submit a Regional Monitoring and Assessment Report no later than 180 days in advance of the expiration date of this Order. The Regional Monitoring and Assessment Report may be submitted as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The Copermittees must review the receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, and findings from the assessments required pursuant to Provision D.4, to assess the following:¶
¶
<#>The beneficial uses of the receiving waters within the San Diego Region that are protected or must be restored;¶
¶
<#>The progress toward restoring impacted beneficial uses in the receiving waters within the San Diego Region; and¶
¶
<#>Pollutants or conditions of emerging concern that may impact beneficial uses in the receiving waters within the San Diego Region.¶
¶
<#>The Regional Monitoring and Assessment Report must include recommendations for improving the implementation and assessment of the Water Quality Improvement Plans and jurisdictional runoff management programs. ¶
¶
<#>Each Copermittee must provide any data or documentation utilized in developing the Regional Monitoring and Assessment Report upon request by the San Diego Water Board. Any monitoring and assessment data utilized in developing the Regional Monitoring and Assessment Report must be provided on the Regional Clearinghouse required pursuant to Provision F.4.¶
¶
¶

[38] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

(1) Contact information (point of contact, phone number, email address, and mailing address) for each Copermittee;

(2) Public hotline number for reporting non-storm water and illicit discharges for each Copermittee;

(3) Email address for reporting non-storm water and illicit discharges for each Copermittee;

(4) Link to each Copermittee's website, if available, where the public may find additional information about the Copermittee's storm water management program and for requesting records for the implementation of its program;

(5) Information about opportunities for the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and the protection of the quality of receiving waters; and

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(6) Reports from regional monitoring programs in which the Copermittees participate (e.g. Southern California Monitoring Coalition, Southern California Coastal Water Research Project Bight Monitoring);

(7) Regional Monitoring and Assessment Reports; and

(8) Any other information, data, and documents the Copermittees determine as appropriate for making available to the public.

5. Report of Waste Discharge

a. The Orange County Copermittees and the Riverside County Copermittees are required to submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders. The San Diego Water Board will review and consider the Reports of Waste Discharge to determine whether modification to this Order, pursuant to the requirements of Provision H, will be required prior the Orange County Copermittees and/or Riverside County Copermittees becoming covered under this Order. The current Orders for the Orange County Copermittees and Riverside County Copermittees are rescinded upon notification of coverage under this Order except for enforcement purposes.

b. The Copermittees subject to the requirements of this Order must submit to the San Diego Water Board a complete Report of Waste Discharge as an application for the re-issuance of this Order and NPDES permit. The Report of Waste Discharge must be submitted no later than 180 days in advance of the expiration date of this Order. The Report of Waste Discharge must contain the following minimum information:

(1) Names and addresses of the Copermittees;

(2) Names and titles of the primary contacts of the Copermittees;

(3) Proposed changes to the Copermittees' Water Quality Improvement Plans and the supporting justification;

(4) Proposed changes to the Copermittees' jurisdictional runoff management programs and the supporting justification;

(5) Any other information necessary for the re-issuance of this Order;

(6) Any information to be included as part of the Report of Waste Discharge pursuant to the requirements of this Order; and

(7) Any other information required by federal regulations for NPDES permit reissuance.

c. The Copermittees must submit a Regional Monitoring and Assessment Report no later than 180 days in advance of the expiration date of this Order. The Copermittees must review the receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, and findings from the assessments required pursuant to Provision D.4, to assess the following:

(a) The beneficial uses of the receiving waters within the San Diego Region that are protected;

(b) The progress toward protecting the impacted beneficial uses in the receiving waters within the San Diego Region; and

(c) Pollutants or conditions of concern that may impact beneficial uses in the receiving waters within the San Diego Region.

(1) The Regional Monitoring and Assessment Report must include recommendations for improving the implementation and assessment of the Water Quality Improvement Plans and jurisdictional runoff management programs.

(2) Each Copermittee must provide any data or documentation utilized in developing the Regional Monitoring and Assessment Report upon request by the San Diego Water Board. Any monitoring and assessment data utilized in developing the Regional Monitoring and Assessment Report must be provided on the Regional Clearinghouse required pursuant to Provision F.4.

Comment [K7]: This was moved from F.3.c to this section since it is a part of the ROWD.

Deleted: The Regional Monitoring and Assessment Report may be submitted as part of the Report of Waste Discharge required pursuant to Provision F.5.b.

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PROVISION F: REPORTING
F.6. Application for Early Coverage
F.7. Reporting Provisions

6. Application for Early Coverage

a. The Orange County Copermittees, collectively, or Riverside County Copermittees, collectively, may apply for early coverage under this Order by submitting a Report of Waste Discharge Form 200, with a written request for early coverage under this Order and identification of the necessary changes to this Order, if any, that the Copermittees are recommending based on the ROWD submittal.

b. The San Diego Water Board will review the application for early coverage and will make any necessary changes to this Order. A notification of coverage under this Order will be issued to the Copermittees in the respective county by the San Diego Water Board upon completion of the early coverage application requirements and consideration of any necessary changes to this Order. The effective coverage date will be specified in the notification of coverage. The Copermittees in the respective county are authorized to have MS4 discharges pursuant to the requirements of this Order starting on the effective coverage date specified in the notification of coverage. The existing Order for the respective county is rescinded upon the effective coverage date specified in the notification of coverage except for enforcement purposes.

c. The timelines specified within this Order will be initiated based on the effective coverage date (as specified within the notification of coverage).

7. Reporting Provisions

Each Copermittee must comply with all the reporting and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

G. PRINCIPAL WATERSHED COPERMITTEE RESPONSIBILITIES

1. The Copermittees within each Watershed Management Area must designate a Principal Watershed Copermittee and notify the San Diego Water Board of the name of the Principal Watershed Copermittee. An individual Copermittee should not be designated a Principal Watershed Copermittee for more than two Watershed Management Areas. The notification may be submitted with the Water Quality Improvement Plan required pursuant to Provision F.1 of this Order.

2. The Principal Watershed Copermittee is responsible for, at a minimum, the following:

a. Serving as liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues, and when necessary and appropriate, representing the Copermittees in the Watershed Management Area before the San Diego Water Board.

b. Facilitating the development of the Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order

c. Coordinating the submittal of the deliverables required by Provisions F.1, F.2, F.3.a, and F.3.b of this Order.

d. Coordinating and developing, with the other Principal Watershed Copermittees, the requirements of Provisions F.3.c, F.4, and F.5.b of this Order.

H. MODIFICATION OF PROGRAMS

1. Modifications of the Order may be initiated by the San Diego Water Board or by the Copermittees. Requests by Copermittees must be made to the San Diego Water Board.

2. Minor modifications to the Order may be made by the San Diego Water Board where the proposed modification complies with all the prohibitions and limitations, and other requirements of this Order.

3. Proposed modifications to the Order that are not minor require amendment of this Order in accordance with this Order's rules, policies, and procedures.

4. The San Diego Water Board may re-open and modify this Order at any time prior to its expiration, after opportunity for public comment and a public hearing, if the State Water Board determines that revisions are warranted to those provisions of the Order addressing compliance with water quality standards in the receiving water and/or those provisions of the Order establishing an iterative process for implementation of management practices to assure compliance with water quality standards in the receiving water.

5. The San Diego Water Board will review any applications received for early coverage under this Order (Provision F.6) as well as any general applications received for coverage under this Order and will consider any necessary changes to this Order based on the newly-obtained information and/or reports received as a part of the application process. Within the applications for coverage under this Order, the Copermittees shall identify the changes that are proposed to this Order.

6. Modifications of the Order shall be initiated to incorporate provisions as a result of future amendments to the Basin Plan, such as a new or revised water quality objectives or the adoption or reconsideration of a TMDL, including the program of implementation. As soon as practicable, but no later than 6 months of the effective date of a revised TMDL where the revisions warrant a change to the provisions of this Order, the Regional Water Board shall modify this Order consistent with the assumptions and requirements of the revised WLA(s), including the program of implementation.

7. Modification to the Order shall be considered 18 months prior to the compliance date for WQBELs where the compliance mechanism is based upon numeric effluent limitations. The intent of the reconsideration is to evaluate the inclusion of provisions or modifications to WQBELs in Attachment E of this Order prior to the final compliance deadlines that would allow an action-based, BMP compliance demonstration approach with regard to final WQBELs.

I. STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

Each Copermittee must comply with all the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

ATTACHMENT A

DISCHARGE PROHIBITIONS AND SPECIAL PROTECTIONS

1. Basin Plan Waste Discharge Prohibitions

California Water Code Section 13243 provides that a Regional Water Board, in a water quality control plan, may specify certain conditions or areas where the discharge of waste or certain types of waste is not permitted. The following waste discharge prohibitions in the Water Quality Control Plan for the San Diego Basin (Basin Plan) are applicable to any person, as defined by Section 13050(c) of the California Water Code, who is a citizen, domiciliary, or political agency or entity of California whose activities in California could affect the quality of waters of the state within the boundaries of the San Diego Region.

1. The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in California Water Code Section 13050, is prohibited.

2. The discharge of waste to land, except as authorized by waste discharge requirements or the terms described in California Water Code Section 13264 is prohibited.

3. The discharge of pollutants or dredged or fill material to waters of the United States except as authorized by a National Pollutant Discharge Elimination System (NPDES) permit or a dredged or fill material permit (subject to the exemption described in California Water Code Section 13376) is prohibited.

4. Discharges of recycled water to lakes or reservoirs used for municipal water supply or to inland surface water tributaries thereto are prohibited, unless this San Diego Water Board issues a NPDES permit authorizing such a discharge; the proposed discharge has been approved by the State Department of Health Services (DHS) and the operating agency of the impacted reservoir; and the discharger has an approved fail-safe long-term disposal alternative.

5. The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the San Diego Water Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

6. The discharge of waste in a manner causing flow, ponding, or surfacing on lands not owned or under the control of the discharger is prohibited, unless the discharge is authorized by the San Diego Water Board.

7. The dumping, deposition, or discharge of waste directly into waters of the state, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the San Diego Water Board.

8. Any discharge to a storm water conveyance system that is not composed entirely of "*storm water*" is prohibited unless authorized by the San Diego Water Board. [The federal regulations, 40 CFR 122.26(b)(13), define storm water as storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from fire fighting activities.] [§122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

9. The unauthorized discharge of treated or untreated sewage to waters of the state or to a storm water conveyance system is prohibited.

10. The discharge of industrial wastes to conventional septic tank/subsurface disposal systems, except as authorized by the terms described in California Water Code Section 13264, is prohibited.

11. The discharge of radioactive wastes amenable to alternative methods of disposal into the waters of the state is prohibited.

12. The discharge of any radiological, chemical, or biological warfare agent into waters of the state is prohibited.

13. The discharge of waste into a natural or excavated site below historic water levels is prohibited unless the discharge is authorized by the San Diego Water Board.

14. The discharge of sand, silt, clay, or other earthen materials from any activity, including land grading and construction, in quantities which cause deleterious bottom deposits, turbidity or discoloration in waters of the state or which unreasonably affect, or threaten to affect, beneficial uses of such waters is prohibited.

15. The discharge of treated or untreated sewage from vessels to Mission Bay, Oceanside Harbor, Dana Point Harbor, or other small boat harbors is prohibited.

16. The discharge of untreated sewage from vessels to San Diego Bay is prohibited.

17. The discharge of treated sewage from vessels to portions of San Diego Bay that are less than 30 feet deep at mean lower low water (MLLW) is prohibited.

18. The discharge of treated sewage from vessels, which do not have a properly functioning US Coast Guard certified Type I or Type II marine sanitation device, to portions of San Diego Bay that are greater than 30 feet deep at mean lower low water (MLLW) is prohibited.

2. Attachment B to State Water Board Resolution 2012-0012

Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges

I. PROVISIONS FOR POINT SOURCE DISCHARGES OF STORM WATER AND NONPOINT SOURCE WASTE DISCHARGES

The following terms, prohibitions, and special conditions (hereafter collectively referred to as special conditions) are established as limitations on point source storm water and nonpoint source discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in Areas of Special Biological Significance (ASBS), as required for State Water Quality Protection Areas pursuant to California Public Resources Code Sections 36700(f) and 36710(f). These Special Protections are adopted by the State Water Board as part of the California Ocean Plan (Ocean Plan) General Exception.

The special conditions are organized by category of discharge. The State Water Resources Control Board (State Water Board) and Regional Water Quality Control Boards (Regional Water Boards) will determine categories and the means of regulation for those categories [e.g., Point Source Storm Water National Pollutant Discharge Elimination System (NPDES) or Nonpoint Source].

A. PERMITTED POINT SOURCE DISCHARGES OF STORM WATER

1. General Provisions for Permitted Point Source Discharges of Storm Water

   a. Existing storm water discharges into an ASBS are allowed only under the following conditions:

      (1) The discharges are authorized by an NPDES permit issued by the State Water Board or Regional Water Board;

      (2) The discharges comply with all of the applicable terms, prohibitions, and special conditions contained in these Special Protections; and

      (3) The discharges:

         (i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

         (ii) Are designed to prevent soil erosion;

         (iii) Occur only during wet weather;

         (iv) Are composed of only storm water runoff.

   b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

   c. The discharge of trash is prohibited.

d. Only discharges from existing storm water outfalls are allowed. Any proposed or new storm water runoff discharge shall be routed to existing storm water discharge outfalls and shall not result in any new contribution of waste to an ASBS (i.e., no additional pollutant loading). “Existing storm water outfalls” are those that were constructed or under construction prior to January 1, 2005. “New contribution of waste” is defined as any addition of waste beyond what would have occurred as of January 1, 2005. A change to an existing storm water outfall, in terms of re-location or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges are prohibited except as provided below:

(1) The term “non-storm water discharges” means any waste discharges from a municipal separate storm sewer system (MS4) or other NPDES permitted storm drain system to an ASBS that are not composed entirely of storm water.

(2) (i) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability or occur naturally:

(a) Discharges associated with emergency fire fighting operations.

(b) Foundation and footing drains.

(c) Water from crawl space or basement pumps.

(d) Hillside dewatering.

(e) Naturally occurring groundwater seepage via a storm drain.

(f) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(ii) An NPDES permitting authority may authorize non-storm water discharges to an MS4 with a direct discharge to an ASBS only to the extent the NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

2. Compliance Plans for Inclusion in Storm Water Management Plans (SWMP) and Storm Water Pollution Prevention Plans (SWPPP).

The discharger shall specifically address the prohibition of non-storm water runoff and the requirement to maintain natural water quality for storm water discharges to an ASBS in an ASBS Compliance Plan to be included in its SWMP or a SWPPP, as appropriate to permit type. If a statewide permit includes a SWMP, then the discharger shall prepare a stand-alone compliance plan for ASBS discharges. The ASBS Compliance Plan is subject to approval by the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (for permits issued by Regional Water Boards).

a. The Compliance Plan shall include a map of surface drainage of storm water runoff, showing areas of sheet runoff, prioritize discharges, and describe any structural Best Management Practices (BMPs) already employed and/or BMPs to be employed in the future. Priority discharges are those that pose the greatest water quality threat and which are identified to require installation of structural BMPs. The map shall also show the storm water conveyances in relation to other features such as service areas, sewage conveyances and treatment facilities, landslides, areas prone to erosion, and waste and hazardous material storage areas, if applicable. The SWMP or SWPPP shall also include a procedure for updating the map and plan when changes are made to the storm water conveyance facilities.

b. The ASBS Compliance Plan shall describe the measures by which all non-authorized non-storm water runoff (e.g., dry weather flows) has been eliminated, how these measures will be maintained over time, and how these measures are monitored and documented.

c. For Municipal Separate Storm Sewer System (MS4s), the ASBS Compliance Plan shall require minimum inspection frequencies as follows:

   (1) The minimum inspection frequency for construction sites shall be weekly during rainy season;

   (2) The minimum inspection frequency for industrial facilities shall be monthly during the rainy season;

   (3) The minimum inspection frequency for commercial facilities (e.g., restaurants) shall be twice during the rainy season; and

   (4) Storm water outfall drains equal to or greater than 18 inches (457 mm) in diameter or width shall be inspected once prior to the beginning of the rainy season and once during the rainy season and maintained to remove trash and other anthropogenic debris.

d. The ASBS Compliance Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff, that are necessary to comply with these special conditions, will be achieved through BMPs. Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that such installation would pose a threat to health or safety. BMPs to control storm water runoff discharges (at the end-of-pipe) during a design storm shall be designed to achieve on average the following target levels:

   (1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

   (2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges. The baseline for the reduction is the effective date of the Exception. The baseline for these determinations is the effective date of the Exception, and the

reductions must be achieved and documented within four (4) years of the effective date.

e. The ASBS Compliance Plan shall address erosion control and the prevention of anthropogenic sedimentation in ASBS. The natural habitat conditions in the ASBS shall not be altered as a result of anthropogenic sedimentation.

f. The ASBS Compliance Plan shall describe the non-structural BMPs currently employed and planned in the future (including those for construction activities), and include an implementation schedule. The ASBS Compliance Plan shall include non-structural BMPs that address public education and outreach. Education and outreach efforts must adequately inform the public that direct discharges of pollutants from private property not entering an MS4 are prohibited. The ASBS Compliance Plan shall also describe the structural BMPs, including any low impact development (LID) measures, currently employed and planned for higher threat discharges and include an implementation schedule. To control storm water runoff discharges (at the end-of-pipe) during a design storm, permittees must first consider using LID practices to infiltrate, use, or evapotranspirate storm water runoff on-site.

g. The BMPs and implementation schedule shall be designed to ensure that natural water quality conditions in the receiving water are achieved and maintained by either reducing flows from impervious surfaces or reducing pollutant loading, or some combination thereof.

h. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents in storm water runoff that alter natural ocean water quality and the sources of these constituents.

(2) The report shall describe BMPs that are currently being implemented, BMPs that are identified in the SWMP or SWPPP for future implementation, and any additional BMPs that may be added to the SWMP or SWPPP to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the BMPs.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits), the discharger shall revise its ASBS Compliance Plan to incorporate any new or modified BMPs that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised SWMP or SWPPP, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural ocean water quality conditions due to the same constituent.

(5) Compliance with this section does not excuse violations of any term, prohibition, or condition contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within one year from the effective date of the Exception, the discharger shall submit a written ASBS Compliance Plan to the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that describes its strategy to comply with these special conditions, including the requirement to maintain natural water quality in the affected ASBS. The ASBS Compliance Plan shall include a time schedule to implement appropriate non-structural and structural controls (implementation schedule) to comply with these special conditions for inclusion in the discharger's SWMP or SWPPP, as appropriate to permit type.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these special conditions shall be implemented.

d. Within four (4) years of the effective date of the Exception, any structural controls identified in the ASBS Compliance Plan that are necessary to comply with these special conditions shall be operational.

e. Within four (4) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water, pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data, and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

   If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

   The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

(1) for municipalities, a demonstration of significant hardship to discharger ratepayers, by showing the relationship of storm water fees to annual household income for residents within the discharger's jurisdictional area, and the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or
(2) for other governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process.

B. NONPOINT SOURCE DISCHARGES

[NOT INCLUDED]
[PROVISIONS FOR NONPOINT SOURCE DISCHARGES NOT APPLICABLE]

II. ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES

[NOT INCLUDED]
[ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES NOT APPLICABLE]

III. ADDITIONAL REQUIREMENTS – WATERFRONT AND MARINE OPERATIONS

[NOT INCLUDED]
[ADDITIONAL REQUIREMENTS FOR WATERFRONT AND MARINE OPERATIONS NOT APPLICABLE]

IV. MONITORING REQUIREMENTS

Monitoring is mandatory for all dischargers to assure compliance with the Ocean Plan. Monitoring requirements include both: (A) core discharge monitoring, and (B) ocean receiving water monitoring. The State and Regional Water Boards must approve sampling site locations and any adjustments to the monitoring programs. All ocean receiving water and reference area monitoring must be comparable with the Water Boards' Surface Water Ambient Monitoring Program (SWAMP).

Safety concerns: Sample locations and sampling periods must be determined considering safety issues. Sampling may be postponed upon notification to the State and Regional Water Boards if hazardous conditions prevail.

Analytical Chemistry Methods: All constituents must be analyzed using the lowest minimum detection limits comparable to the Ocean Plan water quality objectives. For metal analysis, all samples, including storm water effluent, reference samples, and ocean receiving water samples, must be analyzed by the approved analytical method with the lowest minimum detection limits (currently Inductively Coupled Plasma/Mass Spectrometry) described in the Ocean Plan.

A. CORE DISCHARGE MONITORING PROGRAM

1. General sampling requirements for timing and storm size:

   Runoff must be collected during a storm event that is greater than 0.1 inch and generates runoff, and at least 72 hours from the previously measurable storm event. Runoff samples shall be collected when post-storm receiving water is sampled, and analyzed for the same constituents as receiving water and reference site samples (see section IV B) as described below.

2. Runoff flow measurements

   a. For municipal/industrial storm water outfalls in existence as of December 31, 2007, 18 inches (457mm) or greater in diameter/width (including multiple outfall pipes in combination having a width of 18 inches, runoff flows must be measured or calculated, using a method acceptable to and approved by the State and Regional Water Boards.
   b. This will be reported annually for each precipitation season to the State and Regional Water Boards.

3. Runoff samples – storm events

   a. For outfalls equal to or greater than 18 inches (0.46m) in diameter or width:

      (1) samples of storm water runoff shall be analyzed during the same storm as receiving water samples for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination, ; and

      (2) samples of storm water runoff shall be analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS

      (3) If an applicant has no outfall greater than 36 inches, then storm water runoff from the applicant's largest outfall shall be further analyzed during the same storm as receiving water samples for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates).

   b. For outfalls equal to or greater than 36 inches (0.91m) in diameter or width:

      (1) samples of storm water runoff shall be analyzed during the same storm as receiving water samples for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

      (2) samples of storm water runoff shall be further analyzed during the same storm as receiving water samples for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates) and

(3) samples of storm water runoff shall be analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

c. For an applicant not participating in a regional monitoring program [see below in Section IV (B)] in addition to (a.) and (b.) above, a minimum of the two largest outfalls or 20 percent of the larger outfalls, whichever is greater, shall be sampled (flow weighted composite samples) at least three times annually during wet weather (storm event) and analyzed for all Ocean Plan Table A constituents, Table B constituents for marine aquatic life protection (except for toxicity, only chronic toxicity for three species shall be required), DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, and Ocean Plan indicator bacteria. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one (the largest) such discharge shall be sampled annually in each Region.

4. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may reduce or suspend core monitoring once the storm runoff is fully characterized. This determination may be made at any point after the discharge is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

B. OCEAN RECEIVING WATER AND REFERENCE AREA MONITORING PROGRAM

In addition to performing the Core Discharge Monitoring Program in Section II.A above, all applicants having authorized discharges must perform ocean receiving water monitoring. In order to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS, dischargers may choose either (1) an individual monitoring program, or (2) participation in a regional integrated monitoring program.

1. Individual Monitoring Program: The requirements listed below are for those dischargers who elect to perform an individual monitoring program to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within the affected ASBS. In addition to Core Discharge Monitoring, the following additional monitoring requirements shall be met:

   a. Three times annually, during wet weather (storm events), the receiving water at the point of discharge from the outfalls described in section (IV)(A)(3)(c) above shall be sampled and analyzed for Ocean Plan Table A constituents, Table B constituents for marine aquatic life, DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, salinity, chronic toxicity (three species), and Ocean Plan indicator bacteria.

      The sample location for the ocean receiving water shall be in the surf zone at the point of discharges; this must be at the same location where storm water runoff is sampled. Receiving water shall be sampled at approximately the same time prior to (pre-storm) and during (or immediately after) the same storm (post storm). Reference water quality shall also be sampled and analyzed for the same constituents pre-storm and post-storm, during the same storms when receiving water is sampled. Reference stations will be determined by the State Water Board's Division of Water Quality and the applicable Regional Water Board(s).

b. Sediment sampling shall occur at least three times during every five (5) year period. The subtidal sediment (sand or finer, if present) at the discharge shall be sampled and analyzed for Ocean Plan Table B constituents for marine aquatic life, DDT, PCBs, PAHs, pyrethroids, and OP pesticides. For sediment toxicity testing, only an acute toxicity test using the amphipod Eohaustorius estuarius must be performed.

c. A quantitative survey of intertidal benthic marine life shall be performed at the discharge and at a reference site. The survey shall be performed at least once every five (5) year period. The survey design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The results of the survey shall be completed and submitted to the State Water Board and Regional Water Board at least six months prior to the end of the permit cycle.

d. Once during each five (5) year period, a bioaccumulation study shall be conducted to determine the concentrations of metals and synthetic organic pollutants at representative discharge sites and at representative reference sites. The study design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The bioaccumulation study may include California mussels (Mytilus californianus) and/or sand crabs (Emerita analoga or Blepharipoda occidentalis). Based on the study results, the Regional Water Board and the State Water Board's Division of Water Quality, may adjust the study design in subsequent permits, or add or modify additional test organisms (such as shore crabs or fish), or modify the study design appropriate for the area and best available sensitive measures of contaminant exposure.

e. Marine Debris: Representative quantitative observations for trash by type and source shall be performed along the coast of the ASBS within the influence of the discharger's outfalls. The design, including locations and frequency, of the marine debris observations is subject to approval by the Regional Water Board and State Water Board's Division of Water Quality.

f. The monitoring requirements of the Individual Monitoring Program in this section are minimum requirements. After a minimum of one (1) year of continuous water quality monitoring of the discharges and ocean receiving waters, the Executive Director of the State Water Board (statewide permits) or Executive officer of the Regional Water Board (Regional Water Board permits) may require additional monitoring, or adjust, reduce or suspend receiving water and reference station monitoring. This determination may be made at any point after the discharge and receiving water is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

2. Regional Integrated Monitoring Program: Dischargers may elect to participate in a regional integrated monitoring program, in lieu of an individual monitoring program, to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS. This regional approach shall characterize natural water quality, pre- and post-storm, in ocean reference areas near the mouths of identified open space watersheds and the effects of the discharges on natural water quality (physical, chemical, and toxicity) in the ASBS receiving waters, and should include benthic marine aquatic life and bioaccumulation components. The design of the ASBS stratum of a regional integrated monitoring program may deviate from the otherwise prescribed individual monitoring approach (in Section IV.B.1) if approved by the State Water Board's Division of Water Quality and the Regional Water Boards.

a. Ocean reference areas shall be located at the drainages of flowing watersheds with minimal development (in no instance more than 10% development), and shall not be located in CWA Section 303(d) listed waterbodies or have tributaries that are 303(d) listed. Reference areas shall be free of wastewater discharges and anthropogenic non-storm water runoff. A minimum of low threat storm runoff discharges (e.g. stream highway overpasses and campgrounds) may be allowed on a case-by-case basis. Reference areas shall be located in the same region as the ASBS receiving water monitoring occurs. The reference areas for each Region are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean reference water samples must be collected from each station, each from a separate storm. A minimum of one reference location shall be sampled for each ASBS receiving water site sampled per responsible party. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

b. ASBS ocean receiving water must be sampled in the surf zone at the location where the runoff makes contact with ocean water (i.e. at "point zero"). Ocean receiving water stations must be representative of worst-case discharge conditions (i.e. co-located at a large drain greater than 36 inches, or if drains greater than 36 inches are not present in the ASBS then the largest drain greater than18 inches.) Ocean receiving water stations are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean receiving water samples must be collected during each storm season from each station, each from a separate storm. A minimum of one receiving water location shall be sampled in each ASBS per responsible party in that ASBS. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

c. Reference and receiving water sampling shall commence during the first full storm season following the adoption of these special conditions, and post-storm samples shall be collected when annual storm water runoff is sampled. Sampling shall occur in a minimum of two storm seasons. For those ASBS dischargers that have already participated in the Southern California Bight 2008 ASBS regional monitoring effort, sampling may be limited to only one storm season.

d. Receiving water and reference samples shall be analyzed for the same constituents as storm water runoff samples. At a minimum, constituents to be sampled and analyzed in reference and discharge receiving waters must include oil and grease, total suspended solids, Ocean Plan Table B metals for protection of marine life, Ocean Plan PAHs, pyrethroids, OP pesticides, ammonia, nitrate, phosphates, and critical life stage chronic toxicity for three species. In addition, within the range of the southern sea otter, indicator bacteria or some other measure of fecal contamination shall be analyzed.

3. Waterfront and Marine Operations: In addition to the above requirements for ocean receiving water monitoring, additional monitoring must be performed for marinas and boat launch and pier facilities:

a. For all marina or mooring field operators, in mooring fields with 10 or more occupied moorings, the ocean receiving water must be sampled for Ocean Plan indicator bacteria,

residual chlorine, copper, zinc, grease and oil, methylene blue active substances (MBAS), and ammonia nitrogen.

(1) For mooring field operators opting for an individual monitoring program (Section IV.B.1 above), this sampling must occur weekly (on the weekend) from May through October.

(2) For mooring field operators opting to participate in a regional integrated monitoring program (Section IV.B.2 above), this sampling must occur monthly from May through October on a high use weekend in each month. The Water Boards may allow a reduction in the frequency of sampling, through the regional monitoring program, after the first year of monitoring.

b. For all mooring field operators, the subtidal sediment (sand or finer, if present) within mooring fields and below piers shall be sampled and analyzed for Ocean Plan Table B metals (for marine aquatic life beneficial use), acute toxicity, PAHs, and tributyltin. For sediment toxicity testing, only an acute toxicity test using the amphipod Eohaustorius estuarius must be performed. This sampling shall occur at least three times during a five (5) year period. For mooring field operators opting to participate in a regional integrated monitoring program, the Water Boards may allow a reduction in the frequency of sampling after the first sampling effort's results are assessed.

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ATTACHMENT B

STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

1. Standard Permit Provisions

Code of Federal Regulations Title 40 Section 122.41 (40 CFR 122.41) includes conditions, or provisions, that apply to all National Pollutant Discharge Elimination System (NPDES) permits. Additional provisions applicable to NPDES permits are in 40 CFR 122.42. All applicable provisions in 40 CFR 122.41 and 40 CFR 122.42 must be incorporated into this Order and NPDES permit. The applicable 40 CFR 122.41 and 40 CFR 122.42 provisions are as follows:

a. DUTY TO COMPLY [40 CFR 122.41(a)]

The Copermittee must comply with all of the provisions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

(1) The Copermittee must comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement. [40 CFR 122.41(a)(1)]

(2) The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to a civil penalty not to exceed $25,000 per day for each violation. The CWA provides that any person who *negligently* violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than 2 years, or both. Any person who *knowingly* violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both. Any person who knowingly violates Section 301, 302, 303, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, and who knows at that time that he thereby places another person in imminent danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of

not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.
[40 CFR 122.41(a)(2)]

(3) Any person may be assessed an administrative penalty by the San Diego Regional Water Quality Control Board (San Diego Water Board), State Water Resources Control Board (State Water Board), or United States Environmental Protection Agency (USEPA) for violating Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.
[40 CFR 122.41(a)(3)]

b. DUTY TO REAPPLY [40 CFR 122.41(b)]

If a Copermittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Copermittee must apply for and obtain a new permit.

c. NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE [40 CFR 122.41(c)]

It shall not be a defense for a Copermittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

d. DUTY TO MITIGATE [40 CFR 122.41(d)]

The Copermittee must take all reasonable steps to minimize or prevent any discharge or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

e. PROPER OPERATION AND MAINTENANCE [40 CFR 122.41(e)]

The Copermittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Copermittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by a Copermittee only when the operation is necessary to achieve compliance with the conditions of this permit.

f. PERMIT ACTIONS [40 CFR 122.41(f)]

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Copermittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

g. PROPERTY RIGHTS [40 CFR 122.41(g)]

This permit does not convey any property rights of any sort, or any exclusive privilege.

h. DUTY TO PROVIDE INFORMATION [40 CFR 122.41(h)]

The Copermittee must furnish to the San Diego Water Board, State Water Board, or USEPA within a reasonable time, any information which the San Diego Water Board, State Water Board, or USPEA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Copermittee must also furnish to the San Diego Water Board, State Water Board, or USPEA upon request, copies of records required to be kept by this permit.

i. INSPECTION AND ENTRY [40 CFR 122.41(i)]

The Copermittee must allow the San Diego Water Board, State Water Board, USEPA, and/or their authorized representative (including an authorized contractor acting as their representative), upon presentation of credentials and other documents as may be required by law, to:

(1) Enter upon the Copermittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit; [40 CFR 122.41(i)(1)]

(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit; [40 CFR 122.41(i)(2)]

(3) Inspect and photograph at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; [40 CFR 122.41(i)(3)] and

(4) Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location. [40 CFR 122.41(i)(4)]

j. MONITORING AND RECORDS [40 CFR 122.41(j)]

(1) Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity. [40 CFR 122.41(j)(1)]

(2) Except for records of monitoring information required by this permit related to the Copermittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five (5) years (or longer as required by 40 CFR Part 503), the

Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time. [40 CFR 122.41(j)(2)]

(3) Records for monitoring information must include: [40 CFR 122.41(j)(3)]

(a) The date, exact place, and time of sampling or measurements; [40 CFR 122.41(j)(3)(i)]
(b) The individual(s) who performed the sampling or measurements; [40 CFR 122.41(j)(3)(ii)]
(c) The date(s) analyses were performed; [40 CFR 122.41(j)(3)(iii)]
(d) The individual(s) who performed the analyses; [40 CFR 122.41(j)(3)(iv)]
(e) The analytical techniques or methods used; [40 CFR 122.41(j)(3)(v)] and
(f) The results of such analyses. [40 CFR 122.41(j)(3)(vi)]

(4) Monitoring must be conducted according to test procedures under 40 CFR Part 136 unless another method is required under 40 CFR Subchapters N or O. [40 CFR 122.41(j)(4)]

In the case of pollutants for which there are no approved methods under 40 CFR Part 136 or otherwise required under 40 CFR Subchapters N and O, monitoring must be conducted according to a test procedure specified in the permit for such pollutants. [40 CFR 122.44(i)(1)(iv)]

(5) The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. [40 CFR 122.41(j)(5)]

k. SIGNATORY REQUIREMENT [40 CFR 122.41(k)]

(1) All applications, reports, or information submitted to the San Diego Water Board, State Water Board, or USEPA must be signed and certified. (See 40 CFR 122.22) [40 CFR 122.41(k)(1)]

(a) *For a municipality, State, Federal, or other public agency.* [All applications must be signed] [b]y either a principal executive officer or ranking elected official. [40 CFR 122.22(a)(3)]

(b) All reports required by permits, and other information requested by the San Diego Water Board, State Water Board, or USEPA must be signed by a person described in paragraph (a) of this section, or by a duly authorized representative of that person. A person is a duly authorized representative only if: [40 CFR 122.22(b)]

(i) The authorization is made in writing by a person described in paragraph (a) of this section; [40 CFR 122.22(b)(1)]

(ii) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company, (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) [40 CFR 122.22(b)(2)] and,

(iii) The written authorization is submitted to the San Diego Water Board and State Water Board. [40 CFR 122.22(b)(3)]

(c) *Changes to authorization.* If an authorization under paragraph (b) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (b) of this section must be submitted to the San Diego Water Board prior to or together with any reports, information, or applications to be signed by an authorized representative. [40 CFR 122.22(c)]

(d) *Certification.* Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." [40 CFR 122.22(d)]

(2) The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both. [40 CFR 122.41(k)(2)]

I. REPORTING REQUIREMENTS [40 CFR 122.41(l)]

(1) *Planned changes.* The Copermittee must give notice to the San Diego Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when: [40 CFR 122.41(l)(1)]

(a) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); [40 CFR 122.41(l)(1)(i)] or

(b) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which

are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1).
[40 CFR 122.41(l)(1)(ii)]

(c) The alteration or addition results in a significant change in the Copermittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. [40 CFR 122.41(l)(1)(iii)]

(2) *Anticipated noncompliance*. The Copermittee must give advance notice to the San Diego Water Board or State Water Board of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.
[40 CFR 122.41(l)(2)]

(3) *Transfers*. This permit is not transferable to any person except after notice to the San Diego Water Board. The San Diego Water Board may require modification or revocation and reissuance of the permit to change the name of the Copermittee and incorporate such other requirements as may be necessary under the CWA.
[40 CFR 122.41(l)(3)]

(4) *Monitoring reports.* Monitoring results must be reported at the intervals specified elsewhere in this permit. [40 CFR 122.41(l)(4)]

(a) Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the San Diego Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices. [40 CFR 122.41(l)(4)(i)]

(b) If the Copermittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or another method required for an industry-specific waste stream under 40 CFR Subchapters N or O, the results of this monitoring must be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the San Diego Water Board or State Water Board.
[40 CFR 122.41(l)(4)(ii)]

(c) Calculations for all limitations which require averaging of measurements must utilize an arithmetic mean unless otherwise specified in the permit.
[40 CFR 122.41(l)(4)(iii)]

(5) *Compliance schedules*. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date. [40 CFR 122.41(l)(5)]

(6) *Twenty-four hour reporting.*

(a) The Copermittee must report any noncompliance that may endanger health or the environment. Any information must be provided orally within 24 hours from the time the Copermittee becomes aware of the circumstances. A written submission must also be provided within five (5) days of the time the Copermittee becomes aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6)(i)]

(b) The following must be included as information which must be reported within 24 hours under this paragraph: [40 CFR 122.41(l)(6)(ii)]

(i) Any unanticipated bypass that exceeds any effluent limitation in the permit (See 40 CFR 122.41(g)). [40 CFR 122.41(l)(6)(ii)(A)]
(ii) Any upset which exceeds any effluent limitation in the permit. [40 CFR 122.41(l)(6)(ii)(B)] and,
(iii) Violation of a maximum daily discharge limitation for any of the pollutants listed by the San Diego Water Board in the permit to be reported within 24 hours. (See 40 CFR 122.44(g)) [40 CFR 122.41(l)(6)(ii)(C)]

(c) The San Diego Water Board may waive the above-required written report on a case-by-case basis if the oral report has been received within 24 hours. [40 CFR 122.41(l)(6)(iii)]

(7) *Other noncompliance.* The Copermittee must report all instances of noncompliance not reported in accordance with the standard provisions required under 40 CFR 122.41(l)(4), (5), and (6), at the time monitoring reports are submitted. The reports must contain the information listed in the standard provisions required under 40 CFR 122.41(l)(6). [40 CFR 122.41(l)(7))]

(8) *Other information.* When the Copermittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the San Diego Water Board, State Water Board, or USEPA, the Copermittee must promptly submit such facts or information. [40 CFR 122.41(l)(8)]

m. BYPASS [40 CFR 122.41(m)]

(1) *Definitions.*

(a) "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. [40 CFR 122.41(m)(1)(i)] or

(b) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be

expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
[40 CFR 122.41(m)(1)(ii)]

(2) *Bypass not exceeding limitations*. The Copermittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the standard provisions required under 40 CFR 122.41(m)(3) and (4).
[40 CFR 122.41(m)(2)]

(3) *Notice.*

(a) *Anticipated bypass*. If the Copermittee knows in advance of the need for a bypass, it must submit a notice, if possible at least ten days before the date of the bypass. [40 CFR 122.41(m)(3)(i)] or

(b) *Unanticipated bypass*. The Copermittee must submit notice of an unanticipated bypass in accordance with the standard provisions required under 40 CFR 122.41(l)(6) (24-hour notice).
[40 CFR 122.41(m)(3)(ii)]

(4) *Prohibition of Bypass.*

(a) Bypass is prohibited, and the San Diego Water Board may take enforcement action against a Copermittee for bypass, unless:
[40 CFR 122.41(m)(4)(i)]

(i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; [40 CFR 122.41(m)(4)(i)(A)]
(ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance;
[40 CFR 122.41(m)(4)(i)(B)] and,
(iii) The Copermittee submitted notice in accordance with the standard provisions required under 40 CFR 122.41(m)(3).
[40 CFR 122.41(m)(4)(i)(C)]

(b) The San Diego Water Board may approve an anticipated bypass, after considering its adverse effects, if the San Diego Water Board determines that it will meet the three conditions listed above.
[40 CFR 122.41(m)(4)(ii)]

n. UPSET [40 CFR 122.41(n)]

(1) *Definition.* "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Copermittee. An upset does not

include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. [40 CFR 122.41(n)(1)]

(2) *Effect of an upset*. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the standard provisions required under 40 CFR 122.41(n)(3) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. [40 CFR 122.41(n)(2)]

(3) *Conditions necessary for a demonstration of upset*. A Copermittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that: [40 CFR 122.41(n)(3)]

(a) An upset occurred and that the Copermittee can identify the cause(s) of the upset; [40 CFR 122.41(n)(3)(i)]
(b) The permitted facility was at the time being properly operated; [40 CFR 122.41(n)(3)(ii)] and
(c) The Copermittee submitted notice of the upset in accordance with the standard provisions required under 40 CFR 122.41(l)(6)(ii)(B) (24-hour notice). [40 CFR 122.41(n)(3)(iii)]
(d) The Copermittee complied with any remedial measures pursuant to the standard provisions required under 40 CFR 122.41(d). [40 CFR 122.41(n)(3)(iii)]

(4) *Burden of proof*. In any enforcement proceeding, the Copermittee seeking to establish the occurrence of an upset has the burden of proof. [40 CFR 122.41(n)(4)]

o. STANDARD PERMIT PROVISIONS FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS [40 CFR 122.42(c)]

The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the San Diego Water Board or State Water Board under 40 CFR 122.26(a)(1)(v) must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report must include:

(1) The status of implementing the components of the storm water management program that are established as permit conditions; [40 CFR 122.42(c)(1)]

(2) Proposed changes to the storm water management programs that are established as permit conditions. Such proposed changes must be consistent with 40 CFR 122.26(d)(2)(iii); [40 CFR 122.42(c)(2)] and

(3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under 40 CFR 122.26(d)(2)(iv) and (v); [40 CFR 122.42(c)(3)]

(4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; [40 CFR 122.42(c)(4)]

(5) Annual expenditures and budget for year following each annual report; [40 CFR 122.42(c)(5)]

(6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; [40 CFR 122.42(c)(6)]

(7) Identification of water quality improvements or degradation. [40 CFR 122.42(c)(7)]

p. STANDARD PERMIT PROVISIONS FOR STORM WATER DISCHARGES [40 CFR 122.42(d)]

The initial permits for discharges composed entirely of storm water issued pursuant to 40 CFR 122.26(e)(7) must require compliance with the conditions of the permit as expeditiously as practicable, but in no event later than three years after the date of issuance of the permit.

2. General Provisions

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. The general provisions applicable to this Order and NPDES permit are as follows:

a. DISCHARGE OF WASTE IS A PRIVILEGE

No discharge of waste into the waters of the State, whether or not such discharge is made pursuant to waste discharge requirements, shall create a vested right to continue such discharge. All discharges of waste into waters of the State are privileges, not rights. [CWC Section 13263(g)]

b. DURATION OF ORDER AND NPDES PERMIT

(1) *Effective date*. This Order and NPDES permit becomes effective on the 50th day after its adoption provided the USEPA has no objection. If the USEPA objects to its issuance, this Order shall not become effective until such objection is withdrawn. This Order supersedes Order No. R9-2007-0001 upon the effective date of this Order, and supersedes Order Nos. R9-2009-0002 and R9-2010-0016 upon their expiration or earlier notice of coverage.

(2) *Expiration*. This Order and NPDES permit expires five years after its effective date. [40 CFR 122.46(a)]

(3) *Continuation of expired order*. After this Order and NPDES permit expires, the terms and conditions of this Order and NPDES permit are automatically continued pending issuance of a new permit if all requirements of the federal NPDES regulations on the continuation of expired permits (40 CFR 122.6) are complied with.

c. AVAILABILITY

A copy of this Order must be kept at a readily accessible location and must be available to on-site personnel at all times.

d. CONFIDENTIALITY OF INFORMATION

Except as provided for in 40 CFR 122.7, no information or documents submitted in accordance with or in application for this Order will be considered confidential, and all such information and documents shall be available for review by the public at the San Diego Water Board office.

Claims of confidentiality for the following information will be denied: [40 CFR 122.7(b)]

(1) The name and address of any permit applicant or Copermittee; [40 CFR 122.7(b)(1)] and

(2) Permit applications and attachments, permits, and effluent data. [40 CFR 122.7(b)(2)]

e. EFFLUENT LIMITATIONS

(1) *Interim effluent limitations*. The Copermittee must comply with any interim effluent limitations as established by addendum, enforcement action, or revised waste discharge requirements which have been, or may be, adopted by the San Diego Water Board.

(2) *Other effluent limitations and standards*. If any applicable toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant and that standard or prohibition is more stringent than any limitation on the pollutant in the permit, the San Diego Water Board shall institute proceedings under these regulations to modify or revoke and reissue the permit to conform to the toxic effluent standard or prohibition. [40 CFR 122.44(b)(1)]

f. DUTY TO MINIMIZE OR CORRECT ADVERSE IMPACTS

The Copermittee must take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this Order, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the noncompliance.

g. PERMIT ACTIONS

The filing of a request by the Copermittee for modification, revocation and reissuance, or termination of this Order, or a notification of planned change in or anticipated noncompliance with this Order does not stay any condition of this Order. (See 40 CFR 122.41(f)) In addition, the following provisions apply to this Order:

(1) Upon application by any affected person, or on its own motion, the San Diego Water Board may review and revise the requirements in this Order. All requirements must be reviewed periodically. [CWC Section 13263(e)]

(2) This Order may be terminated or modified for cause, including, but not limited to, all of the following: [CWC Section 13381]

(a) Violation of any condition contained in the requirements of this Order. [CWC Section 13381(a)]

(b) Obtaining the requirements in this Order by misrepresentation, or failure to disclose fully all relevant facts. [CWC Section 13381(b)]

(c) A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge. [CWC Section 13381(c)]

(3) When this Order is transferred to a new owner or operator, such requirements as may be necessary under the CWC may be incorporated into this Order.

h. NPDES PERMITTED NON-STORM WATER DISCHARGES

The San Diego Water Board has, in prior years, issued a limited number of individual NPDES permits for non-storm water discharges to MS4s. The San Diego Water Board or State Water Board may in the future, upon prior notice to the Copermittee(s), issue an NPDES permit for any non-storm water discharge (or class of non-storm water discharges) to an MS4.

i. MONITORING

In addition to the standard provisions required under 40 CFR 122.41(j) and (l)(4), the following general monitoring provisions apply to this Order:

(1) Where procedures are not otherwise specified in Order, sampling, analysis and quality assurance/quality control must be conducted in accordance with the Quality Assurance Management Plan (QAMP) for the State of California's Surface Water Ambient Monitoring Program (SWAMP), adopted by the State Water Resources Control Board (State Water Board).

(2) Pursuant to 40 CFR 122.41(j)(2) and CWC Section 13383(a), each Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five (5) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time.

(3) All chemical, bacteriological, and toxicity analyses must be conducted at a laboratory certified for such analyses by the California Department of Public Health or a laboratory approved by the San Diego Water Board.

(4) For priority toxic pollutants that are identified in the California Toxics Rule (CTR) (65 Fed. Reg. 31682), the Copermittees must instruct their laboratories to establish calibration standards that are equivalent to or lower than the Minimum Levels (MLs) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP). If a Copermittee can demonstrate that a particular ML is not attainable, in accordance with procedures set forth in 40 CFR Part 136, the lowest quantifiable concentration of the lowest calibration standard analyzed by a specific analytical procedure (assuming that all the method specified sample weights, volumes, and processing steps have been followed) may be used instead of the ML listed in Appendix 4 of the SIP. The Copermittee must submit documentation from the laboratory to the San Diego Water Board for approval prior to raising the ML for any priority toxic pollutant.

j. ENFORCEMENT

(1) The San Diego Water Board is authorized to enforce the terms of this Order under several provisions of the CWC, including, but not limited to, CWC Sections 13385, 13386, and 13387.

(2) Nothing in this Order shall be construed to protect the Copermittee from its liabilities under federal, state, or local laws.

(3) The CWC provides for civil and criminal penalties comparable to, and in some cases greater than, those provided for under the CWA.

(4) Except as provided in the standard conditions required under 40 CFR 122.41(m) and (n), nothing in this Order shall be construed to relieve the Copermittee from civil or criminal penalties for noncompliance.

(5) Nothing in this Order shall be construed to preclude the institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties to which the Copermittee is or may be subject to under Section 311 of the CWA.

(6) Nothing in this Order shall be construed to preclude institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authoring preserved by Section 510 of the CWA.

k. SEVERABILITY

The provisions of this Order are severable, and if any provision of this Order, or the application of any provisions of this Order to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this Order shall not be affected thereby.

l. APPLICATIONS

Any application submitted by a Copermittee for reissuance or modification of this Order must satisfy all applicable requirements specified in federal regulations as well as any additional requirements for submittal of a Report of Waste Discharge specified in the CWC and the California Code of Regulations.

m. IMPLEMENTATION

All plans, reports and subsequent amendments submitted in compliance with this Order must be implemented immediately (or as otherwise specified). All submittals by Copermittees must be adequate to implement the requirements of this Order.

n. REPORT SUBMITTALS

(1) All report submittals must include an executive summary, introduction, conclusion, recommendations, and signed certified statement.

(2) Each Copermittee must submit a signed certified statement covering its responsibilities for each applicable submittal.

(3) The Principal Watershed Copermittee(s) must submit a signed certified statement covering its responsibilities for each applicable submittal and the sections of the submittals for which it is responsible.

(4) Unless otherwise directed, the Copermittees must submit one hard copy and one electronic copy of each report required under this Order to the San Diego Water Board, and one electronic copy to the USEPA.

(5) The Copermittees must submit reports and provide notifications as required by this Order to the following:

EXECUTIVE OFFICER
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
9174 SKY PARK COURT, SUITE 100
SAN DIEGO CA 92123-4340
Telephone: (858) 467-2952 Fax: (858) 571-6972

EUGENE BROMLEY
US ENVIRONMENTAL PROTECTION AGENCY
REGION IX
PERMITS ISSUANCE SECTION (W-5-1)
75 HAWTHORNE STREET
SAN FRANCISCO CA 94105

ATTACHMENT C

ACRONYMS AND ABBREVIATIONS

AMAL	Average Monthly Action Level
ASBS	Area(s) of Special Biological Significance
BMP	Best Management Practice
Basin Plan	Water Quality Control Plan for the San Diego Basin
CEQA	California Environmental Quality Act
CCR	California Code of Regulations
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWC	California Water Code
CZARA	Coastal Zone Act Reauthorization Amendments of 1990
ESAs	Environmentally Sensitive Areas
GIS	Geographic Information System
IBI	Index of Biological Integrity
LID	Low Impact Development
MDAL	Maximum Daily Action Level
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
NAL	Non-Storm Water Action Level
NAICS	North American Industry Classification System
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
ROWD	Report of Waste Discharge (application for NPDES reissuance)
SAL	Storm Water Action Level
San Diego Water Board	California Regional Water Quality Control Board, San Diego Region
SIC	Standard Industrial Classification Code
State Water Board	State Water Resources Control Board
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
WDID	Waste Discharge Identification Number
WLA	Waste Load Allocation
WQBEL	Water Quality Based Effluent Limitation

DEFINITIONS

Active/Passive Sediment Treatment - Using mechanical, electrical or chemical means to flocculate or coagulate suspended sediment for removal from runoff from construction sites prior to discharge.

Anthropogenic Litter – Trash generated from human activities, not including sediment.

Average Monthly Action Level – The highest allowable average of daily discharges over a calendar month.

Beneficial Uses - The uses of water necessary for the survival or wellbeing of man, plants, and wildlife. These uses of water serve to promote tangible and intangible economic, social, and environmental goals. "Beneficial Uses" of the waters of the State that may be protected include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. Existing beneficial uses are uses that were attained in the surface or ground water on or after November 28, 1975; and potential beneficial uses are uses that would probably develop in future years through the implementation of various control measures. "Beneficial Uses" are equivalent to "Designated Uses" under federal law. [California Water Code Section 13050(f)].

Best Management Practices (BMPs) - Defined in 40 CFR 122.2 as schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Bioassessment - The use of biological community information to evaluate the biological integrity of a water body and its watershed. With respect to aquatic ecosystems, bioassessment is the collection and analysis of samples of the benthic macroinvertebrate community together with physical/habitat quality measurements associated with the sampling site and the watershed to evaluate the biological condition (i.e. biotic integrity) of a water body.

Biofiltration - Practices that use vegetation and amended soils to detain and treat runoff from impervious areas. Treatment is through filtration, infiltration, adsorption, ion exchange, and biological uptake of pollutants.

Biological Integrity - Defined in Karr J.R. and D.R. Dudley. 1981. Ecological perspective on water quality goals. *Environmental Management* 5:55-68 as: "A balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitat of the region." Also referred to as ecosystem health.

BMP Design Manual – A plan developed to eliminate, reduce, or mitigate the impacts of runoff from development projects, including Priority Development Projects.

Channel Rehabilitation and Improvement – Remedial measures or activities for the purpose of improving the environmental health of streams, channels, or river systems. Techniques may vary from in-stream restoration techniques to off-line stormwater management practices

installed in the system corridor or upland areas. Rehabilitation techniques may include, but are not limited to the following: riparian zone restoration, constructed wetlands, bank stabilization, channel modifications, and daylighting of drainage systems. Effectiveness may be measured in various manners, including: assessments of habitat, reduced streambank erosion, and/or restoration of water and sediment transport balance.

Clean Water Act Section 303(d) Water Body - An impaired water body in which water quality does not meet applicable water quality standards and/or is not expected to meet water quality standards, even after the application of technology based pollution controls required by the CWA. The discharge of runoff to these water bodies by the Copermittees is significant because these discharges can cause or contribute to violations of applicable water quality standards.

Construction Site – Any project, including projects requiring coverage under the Construction General Permit, that involves soil disturbing activities including, but not limited to, clearing, grading, disturbances to ground such as stockpiling, and excavation.

Contamination - As defined in the Porter-Cologne Water Quality Control Act, contamination is "an impairment of the quality of waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste whether or not waters of the State are affected."

Copermittee – A permittee to a NPDES permit that is only responsible for permit conditions relating to the discharge for which it is operator [40 CFR 122.26(b)(1)]. For the purposes of this Order, a Copermittee may include the following jurisdictions: an incorporated city within the County of Orange, County of Riverside, or County of San Diego in the San Diego Region, the County of Orange, the County of Riverside, the County of San Diego, the Orange County Flood Control District, the Riverside County Water Conservation and Flood Control District, the San Diego Regional Airport Authority, or the San Diego Unified Port District.

Deleted: A

Copermittees – All of the individual Copermittees, collectively.

Critical Channel Flow (Qc) – The channel flow that produces the critical shear stress that initiates bed movement or that erodes the toe of channel banks. When measuring Qc, it should be based on the weakest boundary material – either bed or bank.

Daily Discharge – Defined as either: (1) the total mass of the constituent discharged over the calendar day or any 24 hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g. concentration.)

The Daily Discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day, or other 24 hour period other than a day), or by the arithmetic mean of analytical results from one or more grab samples taken over the course of a day.

Development Projects - Construction, rehabilitation, redevelopment, or reconstruction of any public or private residential project, industrial, commercial, or any other projects.

Dry Season –May 1 to September 30.

Dry Weather – Weather is considered dry if the preceding 72 hours has been without measurable precipitation (>0.1 inch).

Enclosed Bays – Enclosed bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost bay works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays do not include inland surface waters or ocean waters.

Erosion – When land is diminished or worn away due to wind, water, or glacial ice. Often the eroded debris (silt or sediment) becomes a pollutant via storm water runoff. Erosion occurs naturally but can be intensified by land clearing activities such as farming, development, road building, and timber harvesting.

Environmentally Sensitive Areas (ESAs) - Areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; areas designated as preserves or their equivalent under the Natural Communities Conservation Program within the Cities and County of Orange; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.

Estuaries – Waters, including coastal lagoons, located at the mouth of streams that serve as areas of mixing fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and ocean water. Estuaries do not include inland surface waters or ocean waters.

Existing Development – Any area that has been developed and exists for municipal, commercial, industrial, or residential purposes, uses, or activities. May include areas that are not actively used for its originally developed purpose, but may be re-purposed or redeveloped for another use or activity.

Flow Duration – The long-term period of time that flows occur above a threshold that causes significant sediment transport and may cause excessive erosion damage to creeks and streams (not a single storm event duration). The simplest way to visualize this is to consider a histogram of pre- and post-project flows using long-term records of hourly data. To maintain pre-development flow duration means that the total number of hours (counts) within each range of flows in a flow-duration histogram cannot increase between the pre- and post-development condition. Flow duration within the range of geomorphologically significant flows is important for managing erosion.

Grading - The cutting and/or filling of the land surface to a desired slope or elevation.

Hazardous Material – Any substance that poses a threat to human health or the environment due to its toxicity, corrosiveness, ignitability, explosive nature or chemical reactivity. These also include materials named by the USEPA in 40 CFR 116 to be reported if a designated quantity of the material is spilled into the waters of the U.S. or emitted into the environment.

Hazardous Waste - Hazardous waste is defined as "any waste which, under Section 600 of Title 22 of this code, is required to be managed according to Chapter 30 of Division 4.5 of Title 22 of this code" [CCR Title 22, Division 4.5, Chapter 11, Article 1].

Household Hazardous Waste – Paints, cleaning products, and other wastes generated during home improvement or maintenance activities.

Hydromodification – The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

Illicit Connection – Any man-made conveyance or drainage system through which the discharge of any pollutant to the stormwater drainage system occurs or may occur.

Deleted: Any connection to the MS4 that conveys an illicit discharge.

Illicit Discharge - Any discharge to a MS4 that is not composed entirely of storm water except discharges pursuant to a NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer) and discharges resulting from fire fighting activities [40 CFR 122.26(b)(2)].

Deleted: the

Inactive Areas – Areas of construction activity that are not active and those that have been active and are not scheduled to be re-disturbed for at least 14 days.

Infiltration – Water other than wastewater that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow [40 CFR 35.2005(20)]. In the context of low impact development, infiltration may also be defined as the percolation of water into the ground. Infiltration is often expressed as a rate (inches per hour), which is determined through an infiltration test.

Inland Surface Waters – Includes all surface waters of the State that do not include the ocean, enclosed bays, or estuaries.

Jurisdictional Runoff Management Program Document – A written description of the specific jurisdictional runoff management measures and programs that each Copermittee will implement to comply with this Order and ensure that storm water pollutant discharges in runoff are reduced to the MEP and do not cause or contribute to a violation of water quality standards.

Low Impact Development (LID) – A storm water management and land development strategy that emphasizes conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions.

Low Impact Development Best Management Practices (LID BMPs) – LID BMPs include schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States through storm water management and land development strategies that emphasize conservation sand the use of on-site natural features integrated with engineered, small-scale hydrologic controls to

more closely reflect pre-development hydrologic functions. LID BMPs include retention practices that do not allow runoff, such as infiltration, rain water harvesting and reuse, and evapotranspiration. LID BMPs also include flow-through practices such as biofiltration that may have some discharge of storm water following pollutant reduction.

Major Outfall – As defined in the Code of Federal Regulations, a major outfall is a MS4 outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (i.e. discharge from a single conveyance other than a circular pipe which is associated with a drainage are of more than 50 acres); or, for MS4s that receive storm water from lands zoned for industrial activity (based on comprehensive zoning plans or equivalent), a MS4 outfall that discharges from a single pipe with an inside diameter of 12 inches or more or from its equivalent (i.e. discharge from other than a circular pipe associated with a drainage area of 2 acres or more).

Maximum Daily Action Level (MDAL) –The highest allowable daily discharge of a pollutant, over a calendar day (or 24 hour period). For pollutants with action levels expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with action levels expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

Maximum Extent Practicable (MEP) – The technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) for storm water that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) <u>in combination</u> with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than BAT. A definition for MEP is not provided either in the statute or in the regulations. Instead the definition of MEP is dynamic and will be defined by the following process over time: municipalities propose their definition of MEP by way of their runoff management programs. Their total collective and individual activities conducted pursuant to the runoff management programs becomes their proposal for MEP as it applies both to their overall effort, as well as to specific activities (e.g., MEP for street sweeping, or MEP for MS4 maintenance). In the absence of a proposal acceptable to the San Diego Water Board, the San Diego Water Board defines MEP.

In a memo dated February 11, 1993, entitled "Definition of Maximum Extent Practicable," Elizabeth Jennings, Senior Staff Counsel, SWRCB addressed the achievement of the MEP standard as follows:

> "*To achieve the MEP standard, municipalities must employ whatever Best Management Practices (BMPs) are technically feasible (i.e., are likely to be effective) and are not cost prohibitive. The major emphasis is on technical feasibility. Reducing pollutants to the MEP means choosing effective BMPs, and rejecting applicable BMPs only where other effective BMPs will serve the same purpose, or the BMPs would not be technically feasible, or the cost would be prohibitive. In selecting BMPs to achieve the MEP standard, the following factors may be useful to consider:*
>
> *a. Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?*
> *b. Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?*
> *c. Public Acceptance: Does the BMP have public support?*

d. Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?
e. Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc.?

The final determination regarding whether a municipality has reduced pollutants to the maximum extent practicable can only be made by the Regional or State Water Boards, and not by the municipal discharger. If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit derived, it would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs that would address a pollutant source, or to pick a BMP based solely on cost, which would be clearly less effective. In selecting BMPs the municipality must make a serious attempt to comply and practical solutions may not be lightly rejected. In any case, the burden would be on the municipal discharger to show compliance with its permit. After selecting a menu of BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented."

Monitoring Year – October 1 to September 30

Municipal Separate Storm Sewer System (MS4) – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designated or used for collecting or conveying storm water; (iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.26.

National Pollutant Discharge Elimination System (NPDES) - The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the CWA.

Non-Storm Water - All discharges to and from a MS4 that do not originate from precipitation events (i.e., all discharges from a MS4 other than storm water). Non-storm water includes illicit discharges and NPDES permitted discharges.

Nuisance - As defined in the Porter-Cologne Water Quality Control Act, a nuisance is "anything which meets all of the following requirements: 1) Is injurious to health, or is indecent, or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. 2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. 3) Occurs during, or as a result of, the treatment or disposal of wastes."

Ocean Waters – the territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the State Board's California Ocean Plan.

Order – Unless otherwise specified, refers to this Order, Order No. R9-2013-0001 (NPDES No. CAS0109266)

Persistent Flow - Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

Person - A person is defined as an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof [40 CFR 122.2].

Point Source - Any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, landfill leachate collection systems, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

Pollutant - Any agent that may cause or contribute to the degradation of water quality such that a condition of pollution or contamination is created or aggravated.

Pollution - As defined in the Porter-Cologne Water Quality Control Act, pollution is "the alteration of the quality of the waters of the State by waste, to a degree that unreasonably affects the either of the following: 1) The waters for beneficial uses; or 2) Facilities that serve these beneficial uses." Pollution may include contamination.

Pollution Prevention - Pollution prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control BMPs, treatment control BMPs, or disposal.

Pre-Development Runoff Conditions – Runoff conditions that existed onsite before the existing development was constructed, or exists onsite before planned development activities occur.

Priority Development Projects - New development and redevelopment projects defined under Provision E.3.b of Order No. R9-2012-0011.

Progressive Enforcement -. A series of enforcement actions that increase in severity commensurate with the violation. Such enforcement actions may include verbal and written notices of violation, fines, stop work orders, administrative penalties, criminal penalties, etc.

Rainy Season (aka Wet Season) –October 1 to April 30

Receiving Waters – Waters of the United States.

Receiving Water Limitations - Waste discharge requirements issued by the San Diego Water Board typically include both: (1) "Effluent Limitations" (or "Discharge Limitations") that specify the technology-based or water-quality-based effluent limitations; and (2) "Receiving Water

Limitations" that specify the water quality objectives in the Basin Plan as well as any other limitations necessary to attain those objectives. In summary, the "Receiving Water Limitations" provision is the provision used to implement the requirements of CWA section 402(p)(3)(B).

Redevelopment - The creation, addition, and or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include trenching and resurfacing associated with utility work; parking lots, resurfacing existing roadways; cutting and reconfiguring of surface parking lots; new sidewalk construction, pedestrian ramps, or bike lane on existing roads; and routine replacement of damaged pavement, such as pothole repair.

Regional Clearinghouse – A central location for the collection, classification, and distribution of information including, but not limited to, plans, reports, manuals, data, contact information, and/or links to such documents and information. The clearinghouse(s) may be organized by the following regions: Watershed Management Areas, County jurisdictions, and/or the San Diego Regional Water Quality Control Board jurisdiction.

Reporting Period – The period of information that is reported in the Annual Report. The reporting period consists of two components: 1) July 1 to June 30, consistent with the fiscal year, for the implementation of the jurisdictional runoff management programs, and 2) October 1 to September 30, consistent with the monitoring year for the monitoring and assessment programs. Together, these two time periods constitute the reporting year for the Annual Report due January 31 following the end of the monitoring year.

Retain –Keep or hold in a particular place, condition, or position without discharge to surface waters.

Retrofitting – Storm water management practice put into place after development has occurred in watersheds where the practices previously did not exist. Retrofitting of developed areas is intended to improve water quality, protect downstream channels, reduce flooding, or meet other specific objectives. Retrofitting developed areas may include, but is not limited to replacing roofs with green roofs, disconnecting downspouts or impervious surfaces to drain to pervious surfaces, replacing impervious surfaces with pervious surfaces, installing rain barrels, installing rain gardens, and trash area enclosures.

Runoff - All flows in a storm water conveyance system that consists of the following components: (1) storm water (wet weather flows) and (2) non-storm water including dry weather flows.

San Diego Water Board – As used in this document the term "San Diego Water Board" is synonymous with the term "Regional Board" as defined in Water Code section 13050(b) and is intended to refer to the California Regional Water Quality Control Board for the San Diego Region as specified in Water Code Section 13200.

Sediment - Soil, sand, and minerals washed from land into water. Sediment resulting from anthropogenic sources (i.e. human induced land disturbance activities) is considered a pollutant. This Order regulates only the discharges of sediment from anthropogenic sources and does not regulate naturally occurring sources of sediment. Sediment can destroy fish-

nesting areas, clog animal habitats, and cloud waters so that sunlight does not reach aquatic plants.

Source Control BMP – Land use or site planning practices, or structural or nonstructural measures that aim to prevent runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between pollutants and runoff.

Storm Water – Per 40 CFR 122.26(b)(13), means storm water runoff, snowmelt runoff and surface runoff and drainage.

Deleted: Surface runoff and drainage pertains to runoff and drainage resulting from precipitation events.

Stream, Channel, or Habitat Rehabilitation – Measures or activities for the purpose of improving or restoring the environmental health (i.e. physical, chemical and biological integrity) of streams, channels, or river systems. Rehabilitation techniques may include, but are not limited to, riparian zone restoration, constructed wetlands, bank stabilization, channel reconfiguration, and daylighting drainage systems.

Structural BMPs - A subset of BMPs which detains, retains, filters, removes, or prevents the release of pollutants to surface waters from development projects in perpetuity, after construction of a project is completed.

Total Maximum Daily Load (TMDL) - The maximum amount of a pollutant that can be discharged into a water body from all sources (point and non-point) and still maintain water quality standards. Under CWA section 303(d), TMDLs must be developed for all water bodies that do not meet water quality standards after application of technology-based controls.

Toxicity - Adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies). The water quality objectives for toxicity provided in the Basin Plan, state in part…"All waters shall be free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life….The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge".

Treatment Control BMP – Any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media absorption or any other physical, biological, or chemical process.

Unpaved Road – Any long, narrow stretch without pavement used for traveling by motor passenger vehicles between two or more points. Unpaved roads are generally constructed of dirt, gravel, aggregate or macadam and may be improved or unimproved.

Waste - As defined in CWC Section 13050(d), "waste includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal."

Article 2 of CCR Title 23, Chapter 15 (Chapter 15) contains a waste classification system that applies to solid and semi-solid waste, which cannot be discharged directly or indirectly to water of the state and which therefore must be discharged to land for treatment, storage, or disposal in accordance with Chapter 15. There are four classifications of waste (listed in order of highest

to lowest threat to water quality): hazardous waste, designated waste, non-hazardous solid waste, and inert waste.

Water Quality Objective - Numerical or narrative limits on constituents or characteristics of water designated to protect designated beneficial uses of the water. [California Water Code Section 13050 (h)]. California's water quality objectives are established by the State and Regional Water Boards in the Water Quality Control Plans. Numeric or narrative limits for pollutants or characteristics of water designed to protect the beneficial uses of the water. In other words, a water quality objective is the maximum concentration of a pollutant that can exist in a receiving water and still generally ensure that the beneficial uses of the receiving water remain protected (i.e., not impaired). Since water quality objectives are designed specifically to protect the beneficial uses, when the objectives are violated the beneficial uses are, by definition, no longer protected and become impaired. This is a fundamental concept under the Porter Cologne Act. Equally fundamental is Porter Cologne's definition of pollution. A condition of pollution exists when the water quality needed to support designated beneficial uses has become unreasonably affected or impaired; in other words, when the water quality objectives have been violated. These underlying definitions (regarding beneficial use protection) are the reason why all waste discharge requirements implementing the federal NPDES regulations require compliance with water quality objectives. (Water quality objectives are also called water quality criteria in the CWA.)

Water Quality Standards - Water quality standards, as defined in Clean Water Act section 303(c) consist of the beneficial uses (e.g., swimming, fishing, municipal drinking water supply, etc.,) of a water body and criteria (referred to as water quality objectives in the California Water Code) necessary to protect those uses. Under the Water Code, the water boards establish beneficial uses and water quality objectives in water quality control or basin plans. Together with an anti-degradation policy, these beneficial uses and water quality objectives serve as water quality standards under the Clean Water Act. In Clean Water Act parlance, state beneficial uses are called "designated uses" and state water quality objectives are called "criteria." Throughout this Order, the relevant term is used depending on the statutory scheme.

Waters of the State - Any surface water or groundwater, including saline waters, within the boundaries of the State [CWC section 13050 (e)]. The definition of the Waters of the State is broader than that for the Waters of the United States in that all water in the State is considered to be a Waters of the State.

Deleted: water,

Deleted: underground

Deleted: regardless of circumstances or condition

Waters of the United States - As defined in the 40 CFR 122.2, the Waters of the U.S. are defined as: "(a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate "wetlands;" (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters otherwise defined as waters of the United States under this definition: (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial seas; and (g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waters of the United States do not include prior

converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA."

Watershed - That geographical area which drains to a specified point on a water course, usually a confluence of streams or rivers (also known as drainage area, catchment, or river basin).

Wet Season (aka Rainy Season) –October 1 to April 30

Wet Weather – Weather is considered wet if there is a storm event of 0.1 inches and greater preceded by 72 hours of dry weather, unless otherwise defined by another regulatory mechanism, such as a TMDL.

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ATTACHMENT D

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

Comment [K8]: It is recommended that this form be deleted and that the Copermittees use their existing reporting format and structure until the WQIPs and corresponding JRMPs are developed and/or updated.

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JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM
FY _____

I. COPERMITTEE INFORMATION			
Copermittee Name:			
Copermittee Primary Contact Name:			
Copermittee Primary Contact Information: Address: City:	County:	State:	Zip:
Telephone:	Fax:	Email:	

II. LEGAL AUTHORITY		
Has the Copermittee established adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 that complies with Order No. R9-2013-0001?	YES NO	☐ ☐
A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority?	YES NO	☐ ☐

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE		
Was an update of the jurisdictional runoff management program document required or recommended by the San Diego Water Board?	YES NO	☐ ☐
If YES to the question above, did the Copermittee update its jurisdictional runoff management program document and make it available on the Regional Clearinghouse?	YES NO	☐ ☐

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM		
Has the Copermittee implemented a program to actively detect and eliminate illicit discharges and connections to its MS4 that complies with Order No. R9-2013-0001?	YES NO	☐ ☐

Number of non-storm water discharges reported by the public	
Number of non-storm water discharges detected by Copermittee staff or contractors	
Number of non-storm water discharges investigated by the Copermittee	
Number of sources of non-storm water discharges identified	
Number of non-storm water discharges eliminated	
Number of sources of illicit discharges or connections identified	
Number of illicit discharges or connections eliminated	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

V. DEVELOPMENT PLANNING PROGRAM		
Has the Copermittee implemented a development planning program that complies with Order No. R9-2013-0001?	YES NO	☐ ☐
Was an update to the BMP Design Manual required or recommended by the San Diego Water Board?	YES NO	☐ ☐
If YES to the question above, did the Copermittee update its BMP Design Manual and make it available on the Regional Clearinghouse?	YES NO	☐ ☐

Number of proposed development projects in review	
Number of Priority Development Projects in review	
Number of Priority Development Projects approved	
Number of approved Priority Development Projects exempt from any BMP requirements	
Number of approved Priority Development Projects allowed alternative compliance	
Number of Priority Development Projects granted occupancy	

Number of completed Priority Development Projects in inventory	
Number of high priority Priority Development Project structural BMP inspections	
Number of Priority Development Project structural BMP violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM
FY _____

VI. CONSTRUCTION MANAGEMENT PROGRAM

Has the Copermittee implemented a construction management program that complies with Order No. R9-2013-0001?	YES	☐
	NO	☐

Number of construction sites in inventory	
Number of active construction sites in inventory	
Number of inactive construction sites in inventory	
Number of construction sites closed/completed during reporting period	
Number of construction site inspections	
Number of construction site violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

Has the Copermittee implemented an existing development management program that complies with Order No. R9-2013-0001?	YES	☐
	NO	☐

	Municipal	Commercial	Industrial	Residential
Number of facilities or areas in inventory				
Number of existing development inspections				
Number of follow-up inspections				
Number of violations				
Number of enforcement actions issued				
Number of escalated enforcement actions issued				

VIII. PUBLIC EDUCATION AND PARTICIPATION

Has the Copermittee implemented a public education program component that complies with Order No. R9-2013-0001?	YES	☐
	NO	☐
Has the Copermittee implemented a public participation program component that complies with Order No. R9-2013-0001?	YES	☐
	NO	☐

IX. FISCAL ANALYSIS

Has the Copermittee attached to this form a summary of its fiscal analysis that complies with Order No. R9-2013-0001?	YES	☐
	NO	☐

X. CERTIFICATION

I [☐ Principal Executive Officer ☐ Ranking Elected Official ☐ Duly Authorized Representative] certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature	Date
Print Name	Title
Telephone Number	Email

ATTACHMENT E

SPECIFIC PROVISIONS FOR TOTAL MAXIMUM DAILY LOADS APPLICABLE TO ORDER NO. R9-2013-0001

These provisions implement Total Maximum Daily Loads (TMDLs), adopted by the San Diego Water Board and approved by USEPA under Clean Water Act section 303(c), which are applicable to discharges regulated under this Order. The provisions and schedules for implementation of the TMDLs described below must be incorporated into the Water Quality Improvement Plans, required pursuant to Provision B of this Order, for the specified Watershed Management Areas.

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed
2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin
3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed
4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek
5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay
6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2002-0123

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	August 14, 2002
State Water Board Approval Date:	July 16, 2003
Office of Administrative Law Approval Date:	September 11, 2003
US EPA Approval Date:	November 3, 2003

(3) TMDL Effective Date: September 11, 2003

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for Chollas Creek consist of the following:

(1) Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedule under Specific Provision 1.c:

Table 1.1
Receiving Water Limitations as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Diazinon	Acute	0.08 µg/L	1 hour
	Chronic	0.05 µg/L	4 days

(2) Effluent Limitations

Discharges from the MS4s must not contain concentrations that exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 1.c:

Table 1.2
Effluent Limitations as Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation	Averaging Period
Diazinon	Acute	0.072 µg/L	1 hour
	Chronic	0.045 µg/L	4 days

(3) Best Management Practices

The following BMPs for Chollas Creek must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area and implemented by the Responsible Copermittees:

(a) The Responsible Copermittees must implement BMPs to support the achievement of the WQBELs under Specific Provision 1.b for Chollas Creek.

(b) The Responsible Copermittees must implement the Diazinon Toxicity Control Plan and Diazinon Public Outreach/Education Program as described in the report titled, *Technical Report for Total Maximum Daily Load for Diazinon in Chollas Creek Watershed, San Diego County*, dated August 14, 2002, including subsequent modifications, in order to achieve the WQBELs under Specific Provision 1.b.

(c) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans as possible.

c. COMPLIANCE SCHEDULE

The Responsible Copermittees are required to achieve their respective WLAs by December 31, 2010. The Responsible Copermittees must be in compliance with the WQBELs under Specific Provision 1.b.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls for diazinon within the Chollas Creek watershed, and calculate or estimate the annual diazinon loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

e. COMPLIANCE DETERMINATION

Compliance with WQBELs of Specific Provision 1.b may be demonstrated via one of the following methods:

(1) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;

(2) There are no exceedances of the applicable receiving water limitations under Specific Provision 1.b.(1) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(3) There are no violations of the applicable effluent limitations under Specific Provision 1.b.(2) at the Responsible Copermittees' MS4 outfalls.

2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0019

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	September 22, 2005
Office of Administrative Law Approval Date:	December 2, 2005
US EPA Approval Date:	February 8, 2006

(3) TMDL Effective Date: December 2, 2005

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Shelter Island Yacht Basin

(6) Responsible Copermittee: City of San Diegot

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for Shelter Island Yacht Basin consist of the following:

(1) Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedule under Specific Provision 2.c:

Table 2.1
Receiving Water Limitations as Concentrations in Shelter Island Yacht Basin

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Dissolved Copper	Acute	4.8 µg/L	1 hour
	Chronic	3.1 µg/L	4 days

(2) Effluent Limitations

Discharges from the MS4s must not contain pollutant loads that exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 2.c:

Table 2.2
Effluent Limitations as Annual Loads in MS4 Discharges to Shelter Island Yacht Basin

Constituent	Effluent Limitation
Dissolved Copper	30 kg/yr

(3) Best Management Practices

The Responsible Copermittee must implement BMPs to support the achievement of the WQBELs under Specific Provision 2.b for Shelter Island Yacht Basin

c. COMPLIANCE SCHEDULE

The Responsible Copermittee is required to achieve the MS4 WLA by December 2, 2005. The Responsible Copermittee must be in compliance with the WQBELs under Specific Provision 2.b.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

The Responsible Copermittee must monitor the effluent of its MS4 outfalls for dissolved copper, and calculate or estimate the monthly and annual dissolved copper loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.(b)(2)of this Order. The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

e. COMPLIANCE DETERMINATION

Compliance with WQBELs of Specific Provision 2.b may be demonstrated via one of the following methods:

(1) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water;

(2) There are no exceedances of the applicable receiving water limitations under Specific Provision 2.b.(1) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(3) There are no violations of the applicable effluent limitations under Specific Provision 2.b.(2) at the Responsible Copermittee's MS4 outfalls.

3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0036

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	November 16, 2005
Office of Administrative Law Approval Date:	February 1, 2006
US EPA Approval Date:	March 22, 2006

(3) TMDL Effective Date: February 1, 2006

(4) Watershed Management Area: Santa Margarita River

(5) Water Body: Rainbow Creek

(6) Responsible Copermittee: County of San Diego

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for Rainbow Creek consist of the following

(1) Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedule under Specific Provision 3.c.(1):

Table 3.1
Receiving Water Limitations as Concentrations in Rainbow Creek

Constituent	Receiving Water Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(2) Effluent Limitations

(a) Discharges from the MS4s must not contain concentrations that exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 3.c.(1):

Table 3.2
Effluent Limitations as Concentrations in MS4 Discharges to Rainbow Creek

Constituent	Effluent Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(b) Pollutant loads from given land uses discharging to and from the MS4s must not exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 3.c.(1):

Table 3.3
Effluent Limitations as Annual Loads in MS4 Discharges to Rainbow Creek

Land Use	Total N	Total P
Commercial nurseries	116 kg/yr	3 kg/yr
Park	3 kg/yr	0.1 kg/yr
Residential areas	149 kg/yr	12 kg/yr
Urban areas	27 kg/yr	6 kg/yr

Interim effluent limitations expressed as pollutant loads are given in the compliance schedule under Specific Provision 3.0.

(3) Best Management Practices

(a) The Responsible Copermittee must implement BMPs to support the achievement of the WQBELs under Specific Provision 3.b for Rainbow Creek.

(b) The Responsible Copermittee should coordinate any BMPs implemented to address this TMDL with Caltrans and other sources as possible.

c. COMPLIANCE SCHEDULE

(1) Compliance Date

The Responsible Copermittee must be in compliance with the WQBELs under Specific Provision 3.b, by December 31, 2021.

(2) Interim Compliance Requirements

Table 3.4
Interim Effluent Limitations as Annual Loads in MS4 Discharges from Specific Land Uses to Rainbow Creek

	Total N Interim Effluent Limitations (kg/yr)			Total P Interim Effluent Limitations (kg/yr)		
	Interim Compliance Date			Interim Compliance Date		
Land Use	**2009**	**2013**	**2017**	**2009**	**2013**	**2017**
Commercial nurseries	390	299	196	20	16	10
Park	5	3	3	0.15	0.10	0.10
Residential areas	507	390	260	99	74	47
Urban areas	40	27	27	9	6	6

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

The Responsible Copermittee must implement the Sampling and Analysis Plan for Rainbow Creek Nutrient Reduction TMDL Implementation Water Quality Monitoring, dated January 2010. The results of any monitoring conducted during the reporting period, and assessment of whether the interim and final WQBELs have been achieved must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

e. COMPLIANCE DETERMINATION

(1) Compliance with interim compliance requirements of Specific Provision 3.c.(2) may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water;

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 3.b.(1) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls;

(c) There are no violations of the applicable effluent limitations under Specific Provision 3.b.(2)(a) at the Responsible Copermittee's MS4 outfalls;

(d) The pollutant loads from given land uses discharging to and from the MS4s do not exceed the applicable effluent limitations under Specific Provision 3.b.(2)(b); OR

(e) The Responsible Copermittee has submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim compliance requirements will be achieved by the interim compliance dates.

(2) Compliance with WQBELs of Specific Provision 3.b may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water;

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 3.b.(1) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls;

(c) There are no violations of the applicable effluent limitations under Specific Provision 3.b.(2)(a) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant loads from given land uses discharging to and from the MS4s do not exceed the applicable effluent limitations under Specific Provision 3.b.(2)(b).

4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2007-0043

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2007
State Water Board Approval Date:	July 15, 2008
Office of Administrative Law Approval Date:	October 22, 2008
US EPA Approval Date:	December 18, 2008

(3) TMDL Effective Date: October 22, 2008

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for Chollas Creek consist of the following:

(1) Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedule under Specific Provision 4.c.(1):

Table 4.1
Receiving Water Limitations as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$(0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$(0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$(0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$(0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER.

(2) Effluent Limitations

Discharges from the MS4s must not contain pollutant loads that exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 4.c.(1):

Table 4.2
Effluent Limitations as Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER.

(3) Best Management Practices

(a) The Responsible Copermittees must implement BMPs to support the achievement of the WQBELs under Specific Provision 4.b for Chollas Creek.

(b) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans and the U.S. Navy as possible.

c. Compliance Schedule

(1) WLA Compliance Date

The Responsible Copermittees are required to achieve the WLA, thus must be in compliance with the WQBELs under Specific Provision 4.b, by October 22, 2028.

(2) Interim Compliance Requirements

The Responsible Copermittee must comply with the following interim WQBELs by the interim compliance date:

Table 4.3
Interim Effluent Limitations as Concentrations in MS4 Discharges to Chollas Creek

Interim Compliance Date	Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
October 22, 2018	Dissolved Copper	Acute	1.2 x 90% x (0.96) x $e^{[0.9422 \times \ln(\text{hardness}) - 1.700]}$ x WER*	1 hour
		Chronic	1.2 x 90% x (0.96) x $e^{[0.8545 \times \ln(\text{hardness}) - 1.702]}$ x WER*	4 days
	Dissolved Lead	Acute	1.2 x 90% x [1.46203 – 0.145712 x ln(hardness)] x $e^{[1.273 \times \ln(\text{hardness}) - 1.460]}$ x WER*	1 hour
		Chronic	1.2 x 90% x [1.46203 – 0.145712 x ln(hardness)] x $e^{[1.273 \times \ln(\text{hardness}) - 4.705]}$ x WER*	4 days
	Dissolved Zinc	Acute	1.2 x 90% x (0.978) x $e^{[0.8473 \times \ln(\text{hardness}) + 0.884]}$ x WER*	1 hour
		Chronic	1.2 x 90% x (0.986) x $e^{[0.8473 \times \ln(\text{hardness}) + 0.884]}$ x WER*	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER.

d. Specific Monitoring and Assessment Requirements

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*, when it is amended to include monitoring requirements for the Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls discharging to Chollas Creek for dissolved copper, lead, and zinc, and calculate or estimate the monthly and annual dissolved copper, lead, and zinc loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2)of this Order. The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

e. COMPLIANCE DETERMINATION

(1) Compliance with interim compliance requirements of Specific Provision 4.c.(2) may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 4.b.(1) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls;

(c) There are no violations of the applicable effluent limitations under Specific Provision 4.b.(2) at the Responsible Copermittees' MS4 outfalls; OR

(d) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim compliance requirements will be achieved by the interim compliance dates.

(2) Compliance with WQBELs of Specific Provision 4.b may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 4.b.(1) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(c) There are no violations of the applicable effluent limitations under Specific Provision 4.b.(2) at the Responsible Copermittees' MS4 outfalls.

5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2008-0027

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 11, 2008
State Water Board Approval Date:	June 16, 2009
Office of Administrative Law Approval Date:	September 15, 2009
US EPA Approval Date:	October 26, 2009

(3) TMDL Effective Date: September 15, 2009

(4) Watershed Management Areas: See Table 5.0

(5) Water Bodies: See Table 5.0

(6) Responsible Copermittees: See Table 5.0

Table 5.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County	Dana Point Harbor	Baby Beach	-City of Dana Point -County of Orange
San Diego Bay	San Diego Bay	Shelter Island Shoreline Park	- San Diego Unified Port District

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for segments or areas of the water bodies listed in Table 5.0[39] consist of the following:

(1) Interim WQBELs – Effluent Limitations

The Responsible Copermittees for MS4 discharges to Baby Beach must comply with the following interim WQBELs by the interim compliance dates identified in Provision 5.d.(1)(b):

Table 5.1
Interim Effluent Limitations as Loads in MS4 Discharges to Baby Beach

Constituent	Effluent Limitation: Dry Weather Interim Effluent Limitation (Billion MPN/day)	Effluent Limitation: Wet Weather Interim Effluent Limitation (Billion MPN/30 days)
Total Coliform	4.50	NA
Fecal Coliform	0.50	NA
Enterococcus	0.40	
		150.5

(2) Final WQBELs - Effluent Limitations

(a) Discharges from the MS4s must not exceed the following mass-based effluent limitations by the end of the compliance schedules under Specific Provision 5.d.(1)(a) to demonstrate the discharge is not causing or contributing to a violation of receiving water quality standards:

Table 5.2
Effluent Limitations as Mass-Based limits in MS4 Discharges to the Water Body

Constituent	Effluent Limit: Dry Weather Billion MPN/Day	Effluent Limit: Wet Weather Billon MPN/30 days
Total Coliform	0.86	3,254
Fecal Coliform	0.17	112
Enterococcus	0.03	114

(b) If the final WQBELs are not met in the MS4 discharges, the Responsible Copermittees must demonstrate that the discharges from the MS4s are

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<#>Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedules under Specific Provisions 5.c.(1)(a) and 5.c.(2):¶
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Table 5.1¶
Receiving Water Limitations as Bacteria Densities in the Water Body¶ ...

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[39] Per Resolution R9-2008-0027, the interim and final WQBELs only apply to waterbodies that remain on the 303(d) list for REC-1 water quality objectives due to impacts from controllable sources of bacteria. If waterbodies are put back on the list or delisted in subsequent iterations, the San Diego Water Board will revise the current NPDES requirements and/or issue additional waste discharge requirements to be consistent with these TMDLs.

not causing or contributing to the exceedance of receiving water limitations. Such demonstration may be achieved by (1) demonstrating the attainment of the Receiving Water Limitations in Provision 5.c.(1), or (2) demonstrating that the natural and background sources appear to be the sole source of the continued impairment. The natural sources exclusion approach (NSEA) may be applied. The Municipal Dischargers are responsible for collection of the data to support the application of the NSEA to recalculate the TMDL.

(3) Best Management Practices

(a) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 5.0 must incorporate the Bacteria Load Reduction Plan (BLRP) required to be developed pursuant to Resolution No. R9-2008-0027.

(b) The Responsible Copermittee must implement BMPs to support the achievement of the WQBELs under Specific Provision 5.b for the segments or areas of the water bodies listed in Table 5.0

Deleted: Interim effluent limitations expressed as pollutant loads are given in the compliance schedule under Specific Provision 5.c.

c. Receiving Water Limitations

The Receiving Water Limitations for segments or areas of the water bodies listed in Table 5.0[40] consist of the following:

(1) Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedules under Specific Provisions 5.d.(1)(a):

Table 5.3

Receiving Water Limitations as Bacteria Densities in the Water Body

Constituent	Receiving Water Limitations	
	Single Sample Maximum[1,2]	30-Day Geometric Mean[2]
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.

(2) If the above receiving water limitations are not met in the receiving water, the Responsible Copermittees must demonstrate that the discharges from the MS4s are not causing or contributing to the exceedance of receiving water

[40] Per Resolution R9-2008-0027, the Receiving Water Limitations only apply to waterbodies that remain on the 303(d) list for REC-1 water quality objectives due to impacts from controllable sources of bacteria. If waterbodies are put back on the list or delisted in subsequent iterations, the San Diego Water Board will revise the current NPDES requirements and/or issue additional waste discharge requirements to be consistent with these TMDLs.

limitations. Such demonstration may be achieved by demonstrating the attainment of the final WQBELs in Provision 5.b.(2).

(3) Best Management Practices

(c) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 5.0 must incorporate the Bacteria Load Reduction Plan (BLRP) required to be developed pursuant to Resolution No. R9-2008-0027.

(d) The Responsible Copermittee must implement BMPs to support the achievement of the Receiving Water Limitations under Specific Provision 5.0 for the segments or areas of the water bodies listed in Table 5.0

d. COMPLIANCE SCHEDULE

(1) Baby Beach in Dana Point Harbor

(a) Final Compliance Dates

The Responsible Copermittees for MS4 discharges to Baby Beach are required to achieve the WLA, thus must be in compliance with the WQBELs under Specific Provision 5.0, according to the following compliance schedule:

Table 5.4
Compliance Schedule Dates to Achieve Baby Beach WLAs

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform	September 15, 2014	September 15, 2009
Fecal Coliform		September 15, 2009
Enterococcus		September 15, 2019

(b) Interim Compliance Dates

The Responsible Copermittees for MS4 discharges to Baby Beach must comply with the following interim WQBELs by the interim compliance date:

Table 5.5
Compliance Schedule Dates to Achieve Interim WQBELs

Constituent	Interim Dry Weather Compliance Date	Interim Wet Weather Compliance Date
Total Coliform	September 15, 2012	NA
Fecal Coliform		NA
Enterococcus		September 15, 2016

(2) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park is required to achieve the WLA, thus must be in compliance with the

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Table 5.4¶
Interim Effluent Limitations as Loads in MS4 Discharges to Baby Beach¶
Constituent ...

WQBELs under Specific Provision 5.0, by December 31, 2012.

e. Specific Monitoring and Assessment Requirements

The BLRPs to be submitted by the Responsible Copermittees and approved by the Regional Board Executive Officer contain monitoring programs. Implementation of those Regional Board-approved monitoring programs constitutes compliance with the Monitoring Station and Monitoring Procedure requirements described below.

(1) Monitoring Stations

(a) Monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.41 If sources of bacteria from the MS4 persist at levels that exceed the applicable receiving water limitations, additional monitoring locations and/or other source identification methods shall be implemented to identify the controllable sources causing the chronic contamination.

(b) If natural and background sources appear to be the sole source of the impairment, Responsible Copermittees may select collect and provide additional data and the application of the NSEA to revise the TMDLs may be appropriate. Such revisions would be made to the TMDL via a Basin Plan Amendment and then subsequently incorporated into this Order consistent with Provision H.5.

(2) Monitoring Procedures

(a) The Responsible Copermittees must conduct the dry and wet weather monitoring consistent with the monitoring and reporting program developed as part of the BLRP. Dry weather samples collected from additional monitoring stations established to support application of the NSEA must be collected at an appropriate frequency to demonstrate bacteria loads from the identified controllable anthropogenic sources have been addressed and do not indicate a health risk.

(b) The Responsible Copermittees must collect wet weather monitoring samples within the first 24 hours of a storm event[42] of the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to support the application of the NSEA must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have

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[41] Commonly referred to as AB 411 monitoring

[42] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

been addressed and do not indicate a health risk.

(c) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs have been achieved.

(b) The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

f. COMPLIANCE DETERMINATION

(1) Compliance with interim compliance requirements of Specific Provision 5.(b)(1) may be demonstrated via one of the following methods:

(a) There is no discharge from the Responsible Copermittees' MS4s to the receiving water; OR

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 5.c in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(c) There are no violations of the applicable effluent limitations under Specific Provision 5.b.(2) at the Responsible Copermittees' MS4 outfalls; OR

(d) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the applicable effluent limitations under Specific Provision 5.b.(2); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the applicable receiving water limitations under Specific Provision 5.c. in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4 are not causing or contributing to the exceedances; OR

(f) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim compliance requirements will be achieved by the interim compliance dates.

(g) Upon the effective date of this Order, a Copermittee's full compliance with all of the following requirements shall constitute a Copermittee's compliance with provisions pertaining to interim WQBELs with compliance

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deadlines occurring prior to approval of a WQIP.

(i) Meets all interim and final deadlines for development of a WQIP,

(ii) Targets implementation of watershed control measures in its existing storm water management program, including watershed control measures to eliminate non-storm water discharges of pollutants through the MS4 to receiving waters, to address known contributions of pollutants from MS4 discharges that cause or contribute to the impairment(s) addressed by the TMDL(s), and

(iii) Receives final approval of its WQIP from the Regional Board.

(2) Compliance with final WQBELs of Specific Provision 5.b.(2) may be demonstrated via one of the following methods:

(a) There is no discharge from the Responsible Copermittees' MS4s to the receiving water;

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 5.c. in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls;

(c) There are no violations of the applicable effluent limitations under Specific Provision 5.b.(2) at the Responsible Copermittees' MS4 outfalls;

(d) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the applicable effluent limitations under Specific Provision 5.b.(2); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the applicable receiving water limitations under Specific Provision 5.c in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4 are not causing or contributing to the exceedances.

(f) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the final compliance requirements will be achieved by the final compliance dates. A Responsible Copermittee that does not implement its WQIP in accordance with the milestones and compliance schedules shall demonstrate compliance with the final WQBELs pursuant to Provision 5.f(2)(a – e).

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45. Total Maximum Daily Loads for Dissolved Copper, Lead,Indicator Bacteria, Baby Beach in Dana Point Harbor and Zinc
Shelter Island Shoreline Park in Chollas CreekSan Diego Bay

6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2010-0001

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 10, 2010
State Water Board Approval Date:	December 14, 2010
Office of Administrative Law Approval Date:	April 4, 2011
US EPA Approval Date:	June 22, 2011

(3) TMDL Effective Date: April 4, 2011

(4) Watershed Management Areas: See Table 6.0

(5) Water Bodies: See Table 6.0

(6) Responsible Copermittees: See Table 6.0

Table 6.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area	Water Body[1]	Segment or Area	Responsible Copermittees
South Orange County	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	-City of Laguna Beach -County of Orange -Orange County Flood Control District
		at Heisler Park - North	
	Pacific Ocean Shoreline	at Main Laguna Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Woods -County of Orange -Orange County Flood Control District
		Laguna Beach at Ocean Avenue	
		Laguna Beach at Cleo Street	
		Arch Cove at Bluebird Canyon Road	
		Laguna Beach at Dumond Drive	
	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Hills -City of Laguna Niguel -City of Laguna Woods -City of Lake Forest -City of Mission Viejo -County of Orange -Orange County Flood Control District
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	

	Aliso Creek Mouth	at mouth	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County (cont'd)	Pacific Ocean Shoreline	Aliso Beach at West Street	-City of Dana Point -City of Laguna Beach -City of Laguna Niguel -County of Orange -Orange County Flood Control District
		Aliso Beach at Table Rock Drive	
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)	
		at Salt Creek (large outlet)	
		Salt Creek Beach at Salt Creek service road	
		Salt Creek Beach at Strand Road	
	Pacific Ocean Shoreline	at San Juan Creek	-City of Dana Point -City of Laguna Hills -City of Laguna Niguel -City of Mission Viejo -City of Rancho Santa Margarita -City of San Juan Capistrano -County of Orange -Orange County Flood Control District
	San Juan Creek	lower 1 mile	
	San Juan Creek Mouth	at mouth	
	Pacific Ocean Shoreline	at Poche Beach	-City of Dana Point -City of San Clemente -County of Orange -Orange County Flood Control District
		Ole Hanson Beach Club Beach at Pico Drain	
		San Clemente City Beach at El Portal Street Stairs	
		San Clemente City Beach at Mariposa Street	
		San Clemente City Beach at Linda Lane	
		San Clemente City Beach at South Linda Lane	
		San Clemente City Beach at Lifeguard Headquarters	
		under San Clemente Municipal Pier	
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	
		San Clemente State Beach at Riviera Beach	
		Can Clemente State Beach at Cypress Shores	

San Luis Rey River	Pacific Ocean Shoreline	at San Luis Rey River mouth	-City of Oceanside -City of Vista -County of San Diego

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
Carlsbad	Pacific Ocean Shoreline	at Moonlight State Beach	-City of Carlsbad -City of Encinitas -City of Escondido -City of San Marcos -County of San Diego
San Dieguito River	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	-City of Del Mar -City of Escondido -City of Poway -City of San Diego -City of Solana Beach -County of San Diego
Penasquitos	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	-City of Del Mar -City of Poway -City of San Diego -County of San Diego
Mission Bay	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	-City of San Diego
		La Jolla Shores Beach at Caminito del Oro	
		La Jolla Shores Beach at Vallecitos	
		La Jolla Shores Beach at Avenida de la Playa	
		at Casa Beach, Children's Pool	
		South Casa Beach at Coast Boulevard	
		Whispering Sands Beach at Ravina Street	
		Windansea Beach at Vista de la Playa	
		Windansea Beach at Bonair Street	
		Windansea Beach at Playa del Norte	
		Windansea Beach at Palomar Avenue	
		at Tourmaline Surf Park	
		Pacific Beach at Grand Avenue	
	Tecolote Creek	Entire reach and tributaries	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I- Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
San Diego River	Forrester Creek	lower 1 mile	-City of El Cajon -City of Santee -County of San Diego
	San Diego River	lower 6 miles	-City of El Cajon -City of La Mesa -City of San Diego -City of Santee -County of San Diego
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	
San Diego Bay	Chollas Creek	lower 1.2 miles	-City of La Mesa -City of Lemon Grove -City of San Diego -County of San Diego - San Diego Unified Port District

1 These TMDL provisions do not apply to waterbodies, segments, or areas removed from the 303(d) list for REC-1 indicator bacteria numeric objectives, consistent with the assumptions and requirements of the Basin Plan Amendment. If the waterbodies are subsequently placed back on the 303(d) list for exceedances of the REC-1 indicator bacteria numeric objectives, all TMDL provisions will apply to those waterbodies and the Responsible Copermittees for those waterbodies.

b. WATER QUALITY BASED EFFLUENT LIMITATIONS[43]

The WQBELs for segments or areas of the water bodies listed in Table 6.0 consist of the following:

(1) Final Dry Weather WQBELs – Effluent Limitations

Table 6.1
Final Dry Weather WQBELs Expressed as Mass-Based Limits

Waterbody	Effluent Limitation		
	Total Coliform Billion MPN/month	Fecal Coliform Billion MPN/month	Enterococcus Billion MPN/month
San Joaquin Hills/ Laguna Hills HSAs (901.11 and 901.12)	1,134	227	40
Aliso HSA (901.13)	1,208	242	40
Dana Point HSA (901.14)	462	92	16

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[43] The Water Quality Based Effluent Limitations, both interim and final, do not apply to the waterbodies and the associated Responsible Copermittees for that waterbody if the waterbody segment in Table 6.0 is not on the 303(d) list for exceedances of the REC-1 numeric objectives for indicator bacteria. If the waterbody is subsequently placed back on the 303(d) for exceedances of the REC-1 numeric objectives for indicator bacteria, the WQBELs, both interim and final, will apply to the associated Responsible Copermittees for that waterbody.

Lower San Juan HSA (901.27)	8,342	1,665	275
San Clemente HA (901.30)		192	

(2) Final Wet Weather WQBELs – Effluent Limitations

Table 6.2
Final Wet Weather WQBELs Expressed as Mass-Based Limits

	Effluent Limitation		
Waterbody	**Total Coliform Billion MPN/year**	**Fecal Coliform Billion MPN/year**	**Enterococcus Billion MPN/year**
San Joaquin Hills/ Laguna Hills HSAs (901.11 and 901.12)	880,652	37,167	66,417
Aliso HSA (901.13)	8,923,264	477,069	735,490
Dana Point HSA (901.14)	3,404,008	152,446	219,528
Lower San Juan HSA (901.27)	16,093,160	1,156,419	1,385,094
San Clemente HA (901.30)	3,477,739	192,653	295,668

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(3) Best Management Practices

(a) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 6.0 must incorporate the Bacteria Load Reduction Plans (BLRPs) or Comprehensive Load Reduction Plans (CLRPs) required to be developed pursuant to Resolution No. R9-2010-0001. For segments or areas in Table 6.0 that have been delisted from the Clean Water Act Section 303(d) List of Water Quality Limited Segments, a BLRP and/or CLRP is not required.

(b) The Responsible Copermittee must implement BMPs to support the achievement of the WQBELs under Specific Provision 6. for the segments or areas of the water bodies listed in Table 6.0.

(c) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans and owners/operators of small MS4s as possible.

c. Receiving Water Limitations

(1) Interim Dry Weather Receiving Water Limitations

The Responsible Copermittee must calculate the "existing" exceedance frequencies of the 30-day geometric mean water quality objectives for each of the indicator bacteria by analyzing the available monitoring data collected between January 1, 1996 and December 31, 2002. "Existing" exceedance

frequencies may be calculated by segment or area of a water body, or by water body, and/or by Watershed Management Area listed in Table 6.0. Separate "existing" exceedance frequencies must be calculated for beaches and creeks/creek mouths.

The Responsible Copermittees must achieve a 50 percent reduction in the "existing" exceedance frequency of the 30-day geometric mean Receiving Water Limitation for the segments or areas of the water bodies listed in Table 6.0[44]. A 50 percent reduction in the "existing" exceedance frequency is equivalent to half of the "existing" exceedance frequency of the 30-day geometric mean final Receiving Water Limitations.

The "existing" exceedance frequencies and the interim dry weather allowable exceedance frequencies (i.e. interim dry weather Receiving Water Limitations) calculated by the Responsible Copermittees must be included in the Water Quality Improvement Plans for the applicable Watershed Management Areas. Consistent with the assumptions and requirements of the Basin Plan Amendment, the Responsible Copermittees may provide evidence that indicates another controllable or uncontrollable source is responsible for the exceedances in the receiving waters. Responsible Copermittees may therefore include such demonstrations (including but not limited to reference system exceedance frequencies, natural source exclusion approach) as part of the "existing" exceedance frequency calculation.

The schedule for attaining the interim Receiving Water Limitations is specified in Provision 6.d.(3).

(2) Interim Wet Weather Receiving Water Limitations

The Responsible Copermittees must achieve a 50 percent reduction in the "existing" exceedance frequency of the applicable wet weather Receiving Water Limitation for the segments or areas of the water bodies listed in Table 6.0**Error! Bookmark not defined.**. A 50 percent reduction in the "existing" exceedance frequency is equivalent to half of the "existing" exceedance frequency of the applicable final Receiving Water Limitations. The exceedance frequency estimated to be equivalent to a 50 percent reduction in the "existing" exceedance frequency is shown in Table 6.4. Unless the Responsible Copermittees calculate a revised "existing" exceedance frequency that is part of an approved WQIP, the allowable existing exceedance frequencies in Table 6.3 shall apply.

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[44] The interim Receiving Water Limitations requirements do not apply to waterbodies that are not on the 303(d) list for exceedances of the REC-1 indicator bacteria numeric objectives. Consistent with the assumptions and requirements of the Basin Plan Amendment, no further action is required for these waterbodies. If the waterbodies are subsequently placed back on the 303(d) list for exceedances of the REC-1 indicator bacteria numeric objectives, all TMDL provisions will apply to these waterbodies and the Responsible Copermittees for those waterbodies.

As the wet weather Receiving Water Limitations include an allowable exceedance frequency, the 50 percent reduction shall not require Responsible Permittees to attain an exceedance frequency less than the final allowable exceedance frequency.

Where Responsible Copermittees elect to calculate a revised "existing" exceedance frequency, the "existing" exceedance frequencies and the interim wet weather allowable exceedance frequencies (i.e. interim wet weather Receiving Water Limitations) calculated by the Responsible Copermittees must be included in the Water Quality Improvement Plans for the applicable Watershed Management Areas. Consistent with the assumptions and requirements of the Basin Plan Amendment, the Responsible Copermittees may provide evidence that indicates another controllable or uncontrollable source is responsible for the exceedances in the receiving waters. Responsible Copermittees may therefore include such demonstrations (including but not limited to reference system antidegradation approach or natural source exclusion approach) as part of the "existing" exceedance frequency calculation.

The schedule for attaining the interim Receiving Water Limitations is specified in Provision 6.d(3).

Table 6.3

Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies[45]

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Watershed Management Area	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies: Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	38%	37%	39%
		at Heisler Park - North			
	Pacific Ocean Shoreline	at Main Laguna Beach			
		Laguna Beach at Ocean Avenue			
		Laguna Beach at Cleo Street			
		Arch Cove at Bluebird Canyon Road			
		Laguna Beach at Dumond Drive			

[45] Responsible Copermittees may submit interim wet weather allowable exceedance frequencies as part of the WQIP. Upon approval of the WQIP, the interim allowable exceedance frequencies shall supersede the applicable exceedance frequencies in Table 6.3.

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	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	41%	41%	42%
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	41%	41%	42%
	Aliso Creek Mouth	at mouth	41%	41%	42%
	Pacific Ocean Shoreline	Aliso Beach at West Street	36%	36%	36%
		Aliso Beach at Table Rock Drive			
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)			
		at Salt Creek (large outlet)			
		Salt Creek Beach at Salt Creek service road			
		Salt Creek Beach at Strand Road			

Table 6.3 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

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Watershed Management Area	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County (cont'd)	Pacific Ocean Shoreline	at San Juan Creek	44%	44%	48%
	San Juan Creek	lower 1 mile	44%	44%	47%
	San Juan Creek Mouth	at mouth	44%	44%	47%
	Pacific	at Poche Beach	35%	35%	36%

	Ocean Shoreline	Ole Hanson Beach Club Beach at Pico Drain			
		San Clemente City Beach at El Portal Street Stairs			
		San Clemente City Beach at Mariposa Street			
		San Clemente City Beach at Linda Lane			
		San Clemente City Beach at South Linda Lane			
		San Clemente City Beach at Lifeguard Headquarters			
		under San Clemente Municipal Pier			
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)			
		San Clemente State Beach at Riviera Beach			
		Can Clemente State Beach at Cypress Shores			
San Luis Rey River	Pacific Ocean Shoreline	at San Luis Rey River mouth	45%	44%	47%
Carlsbad	Pacific Ocean Shoreline	at Moonlight State Beach	40%	40%	41%
San Dieguito River	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	33%	33%	36%

(3) Final Receiving Water Limitations[46]

(a) Discharges from the MS4s must not cause or contribute to the violation of the receiving water limitations in Table 6.4 by the end of the compliance schedules under Specific Provision 6.d.(2), unless the Responsible Copermittees provide evidence that indicates another controllable or

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[46] The Final Receiving Water Limitations requirements do not apply to waterbodies that are not on the 303(d) list for exceedances of the REC-1 indicator bacteria numeric objectives. Consistent with the assumptions and requirements of the Basin Plan Amendment, no further action is required for these waterbodies. If the waterbodies are subsequently placed back on the 303(d) list for exceedances of the REC-1 indicator bacteria numeric objectives, all TMDL provisions will apply to these waterbodies and the Responsible Copermittees for those waterbodies.

uncontrollable source is responsible for the exceedances in the receiving waters (a described in E.6.(3)(b)).

Table 6.4

Final Receiving Water Limitations as Bacteria Densities and Allowable Exceedance Frequencies in the Water Body

Constituent	Receiving Water Limitations: Single Sample Maximum[1,2] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[3]	30-Day Geometric Mean[2] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform[7]	10,000	22% / 0%	1,000	0%
Fecal Coliform	400	22% / 0%	200	0%
Enterococcus	104[4,6] / 61[5]	22% / 0%	35[4] / 33[5]	0%

Notes:
1. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved. (the geometric mean does not apply to wet weather days)
2. During dry weather days, only the 30-day geometric mean receiving water limitations are required to be achieved (the single sample maximum does not apply to dry weather days)..
3. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. The 0% single sample maximum allowable exceedance frequency applies to dry weather days.
4. This *Enterococcus* receiving water limitation applies to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
5. This *Enterococcus* receiving water limitations applies to segments or areas of creeks or creek mouths listed in Table 6.0.
6. A wet weather receiving water limitation for Enterococcus of 104 MPN/100mL may be applied as a receiving water limitation for creeks, instead of 61 MPN/100mL, if one or more of the creeks addressed by these TMDLs (San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek, San Diego River, and/or Chollas Creek) is designated with a "moderately to lightly used area" or less frequent usage frequency in the Basin Plan. Otherwise, the wet weather receiving water limitation of 61 MPN/100mL for Enterococcus will be used to assess compliance with the wet weather allowable exceedance frequency.
7. Total Coliform Receiving Water Limitations only apply to the Pacific Ocean Shoreline segments listed in Table 6.0 and do not apply to the creeks or creek mouths listed in Table 6.0.

(b) If the above receiving water limitations are not met in the receiving water, the Responsible Copermittees must demonstrate that the discharges from the MS4s are not causing or contributing to the violation of receiving water limitations. Such demonstration may be achieved by (1) demonstrating that the discharges from the MS4s are meeting the effluent limitations under Specific Provision 6.b.(1) for dry weather discharges and Specific Provision 6.b.(2) for wet weather discharges, (2) through the attainment of the final WQBELs in Specific Provision 6.b.(1) for dry weather discharges and Specific Provision 6.b.(2) for wet weather discharges, (3) by providing data from their discharge points to the receiving waters, (4) by providing data collected at jurisdictional boundaries, and/or (5) by using other methods accepted by the San Diego Water Board, which may include but are not limited to the reference system antidegradation approach (RSAA) or natural sources exclusion approach (NSEA)[47]..

(4) Best Management Practices

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Discharges from the MS4s must not contain densities that exceed the following effluent limitations by the end of the compliance schedules under Specific Provision 6.c.(1) to demonstrate the discharge is not causing or contributing to a violation of receiving water quality standards:¶
¶
Table 6.2¶
Effluent Limitations as Bacteria Densities and Allowable Exceedance Frequencies ¶
in MS4 Discharges to the Water Body¶ ...

[47] Resolution R9-2008-0028

(a) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 6.0 must incorporate the Bacteria Load Reduction Plans (BLRP) or Comprehensive Load Reduction Plans (CLRPs) required to be developed pursuant to Resolution No. R9-2010-0001. For segments or areas in Table 6.0 that have been delisted from the Clean Water Act Section 303(d) List of Water Quality Limited Segments, a BLRP and/or CLRP is not required.

(b) The Responsible Copermittee must implement BMPs to support the achievement of the Receiving Water Limitations under Specific Provision 6.c for the segments or areas of the water bodies listed in Table 6.0.

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(c) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans and owners/operators of small MS4s as possible.

d. Compliance Schedule

(1) WQBELs Compliance Dates

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The Responsible Copermittees for MS4 discharges to a segment or area of the water bodies listed in Table 6.0[48] are required to achieve the Wasteload Allocations (WLAs) defined as the WQBELs under Specific Provision 6.b, according to the following compliance schedule:

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Table 6.5

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Compliance Schedule Dates to Achieve Indicator Bacteria WLAs

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform*	April 4, 2021	April 4, 2031
Fecal Coliform		
Enterococcus		

* Total coliform receiving water limitations only apply to segments or areas of Pacific Ocean Shoreline listed in Table 6.0.

(2) Final Receiving Water Limitations Compliance Requirements

The Responsible Copermittees for MS4 discharges to a segment or area of the water bodies listed in Table 6.0[49] are required to achieve the Final

[48] The WQBELs (WLAs) do not apply to waterbodies that are not on the 303(d) list for exceedances of the REC-1 indicator bacteria numeric objectives. Consistent with the assumptions and requirements of the Basin Plan Amendment, no further action is required for these waterbodies. If the waterbodies are subsequently placed back on the 303(d) list or delisted in subsequent iterations, the San Diego Water Board will revise the current NPDES requirements and/or issue additional waste discharge requirements to be consistent with these TMDLs.

[49] The WQBELs (WLAs) do not apply to waterbodies that are not on the 303(d) list for exceedances of the REC-1 indicator bacteria numeric objectives. Consistent with the assumptions and requirements of the Basin Plan Amendment, no further action is required for these waterbodies. If the waterbodies are subsequently placed back on the 303(d) list for exceedances of the REC-1 indicator bacteria numeric

Receiving Water Limitations according to the following compliance schedule:

Table 6.6
Compliance Schedule Dates to Achieve Indicator Bacteria WLAs

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform*	April 4, 2021	April 4, 2031
Fecal Coliform		
Enterococcus		

* Total coliform receiving water limitations only apply to segments or areas of Pacific Ocean Shoreline listed in Table 6.0.

(3) Interim Receiving Water Limitations Compliance Requirements

The Responsible Copermittees must comply with the Interim Receiving Water Limitations by the interim compliance dates specified within the Regional Board approved CLRPs or BLRPs.

(4) Submittals to Support TMDL Basin Plan Amendment

The Responsible Copermittees are encouraged to submit data to support the TMDL reopener scheduled for April 2016 including but not limited to data related to implementation of the reference system antidegradation approach (RSAA), the natural sources exclusion approach (NSEA), reference watershed monitoring and beneficial use usage frequency.

e. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) Monitoring and Assessment Requirements for Beaches

The BLRPs and CLRPs to be submitted by the Copermittees and approved by the Regional Board Executive Officer contain monitoring programs. Implementation of those Regional Board-approved monitoring programs constitutes compliance with the Monitoring Station and Monitoring Procedure requirements, described below.

Waterbodies that have been delisted are not required to develop and/or implement a BLRP or CLRP, including additional monitoring. Therefore, the monitoring requirements of this provision do not apply to delisted waterbodies. Delisted waterbodies shall continue monitoring consistent with Provision D.

(a) Monitoring Stations

For beaches addressed by the TMDL, monitoring locations should consist

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<#>Interim Dry Weather Receiving Water Limitations¶
¶
The Responsible Copermittee must calculate the "existing" exceedance frequencies of the 30-day geometric mean water quality objectives for each of the indicator bacteria by analyzing the available monitoring data collected between January 1, 1996 and December 31, 2002. "Existing" exceedance frequencies may be calculated by segment or area of a water body, or by water body, and/or by Watershed Management Area listed in Table 6.0. Separate "existing" exceedance frequencies must be calculated for beaches and creeks/creek mouths. ¶
¶
The Responsible Copermittees must achieve a 50 percent reduction in the "existing" exceedance frequency of the 30-day geometric mean WQBELs for the segments or areas of the water bodies listed in Table 6.0 by the interim compliance dates for achieving the interim dry weather WQBELs given in Table 6.5. A 50 percent reduction in the "existing" exceedance frequency is equivalent to half of the "existing" exceedance frequency of the 30-day geometric mean WQBELs.¶
¶
The "existing" exceedance frequencies and the interim dry weather allowable exceedance frequencies (i.e. interim dry weather WQBELs) calculated by the Responsible Copermittees must be included in the Water Quality Improvement Plans for the applicable Watershed Management Areas.¶
¶
¶
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<#>Interim Wet Weather Receiving Water Limitations¶
¶
The Responsible Copermittees must achieve the interim wet weather receiving water limitations in Table 6.4, expressed as interim allowable exceedance frequencies, by the interim compliance dates for achieving the interim wet weather WQBELs given in Table 6.5.¶
¶
Table 6.4¶
Interim Wet Weather Receiving Water Limitations Expressed as ¶
Interim Wet Weather Allowable Exceedance Frequencies¶
Watershed ...

objectives, all TMDL provisions will apply to these waterbodies and the Responsible Copermittees for those waterbodies.

of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[50] If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations at least once within the first 24 hours of the end of a storm event[51] of the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer in exceedance of the allowable exceedance frequencies in the receiving waters.

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(iii) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs for the Pacific Ocean Shoreline segments or areas listed in

[50] Commonly referred to as AB 411 monitoring

[51] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

Table 6.0 have been achieved.

(ii) The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

(2) Monitoring and Assessment Requirements for Creeks and Creek Mouths

The BLRPs and CLRPs to be submitted by the Copermittees and approved by the Regional Board Executive Officer contain monitoring programs. Implementation of those Regional Board-approved monitoring programs constitutes compliance with the Monitoring Station and Monitoring Procedure requirements, described below.

Waterbodies that have been delisted are not required to develop and/or implement a BLRP or CLRP, including additional monitoring. Therefore, the monitoring requirements of this provision do not apply to delisted waterbodies. Delisted waterbodies shall continue monitoring consistent with Provision D.

(a) Monitoring Stations

For creeks addressed by the TMDL, monitoring locations should consist of, at a minimum, a location at or near the mouth of the creek (e.g. Mass Loading Station or Mass Emission Station) and one or more locations upstream of the mouth (e.g. Watershed Assessment Station). If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations in accordance with the requirements of Provision D.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations within 24 hours of the end of a storm event[52] of the rainy season (i.e. October 1 through April 30).

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[52] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(iii) Samples collected from receiving water monitoring stations must be analyzed for fecal coliform and *Enterococcus* indicator bacteria.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the receiving water monitoring data to assess whether the interim and final receiving water WQBELs for the creeks and creek mouths listed in Table 6.0 have been achieved.

(ii) The Responsible Copermittee must identify and incorporate additional MS4 outfall and receiving water monitoring stations and/or adjust monitoring frequencies to identify sources causing exceedances of the receiving water WQBELs.

(iii) The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

f. COMPLIANCE DETERMINATION

(1) Compliance with interim compliance requirements of Specific Provision 6.c.(1) and Provision 6.c.(2) may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water; OR

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 6.c.(1) or Provision 6.c.(2) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(c) There are no violations of the applicable effluent limitations under Specific Provision 6.b.(1) or Provision 6.b.(2) at the Responsible Copermittees' MS4 outfalls; OR

(d) There are no exceedances of the applicable interim receiving water limitations under Specific Provision 6.c.(1) or Provision 6.c.(2) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(e) The Responsible Copermittees can demonstrate that exceedances of the applicable interim or final receiving water limitations under Specific Provision 6.c. in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4 are not causing or contributing to the exceedances; OR

(f) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim compliance requirements will be achieved by the interim compliance dates. OR

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(g) Upon the effective date of this Order, a Copermittee's full compliance with all of the following requirements shall constitute a Copermittee's compliance with provisions pertaining to interim WQBELs with compliance deadlines occurring prior to approval of a WQIP.

(i) Meets all interim and final deadlines for development of a WQIP,

(ii) Targets implementation of watershed control measures in its existing storm water management program, including watershed control measures to eliminate non-storm water discharges of pollutants through the MS4 to receiving waters, to address known contributions of pollutants from MS4 discharges that cause or contribute to the impairment(s) addressed by the TMDL(s), and

(iii) Receives final approval of its WQIP from the Regional Board.

(2) Compliance with WQBELs of Specific Provision 6.b may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water; OR

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 6.c.(3) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(c) There are no violations of the applicable effluent limitations under Specific Provision 6.b.(1) at the Responsible Copermittees' MS4 outfalls; OR

(d) The Responsible Copermittees can demonstrate that exceedances of the applicable final receiving water limitations under Specific Provision 6.c.(3) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4 are not causing or contributing to the exceedances, OR

(e) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the final compliance requirements will be achieved by the final compliance dates. A Responsible Copermittee that does not implement its WQIP in accordance with the milestones and compliance schedules shall demonstrate compliance with the final WQBELs pursuant to Provisions 6.f(2)(a-d).

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OMPOA

Otay Mesa Property Owners Association

January 11, 2013

Mr. Wayne Chiu, P.E.
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego California 92123-4340

SUBJECT: Comment – Tentative Order No.R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu

Dear Mr. Chui:

Everyone, from every edge of the political and economic spectrum, supports improved water quality and environmentally healthy watersheds. The Otay Mesa Property Owners Association ("OMPOA"), who represents the major landowners within the City portion of Otay Mesa, support the California Regional Water Quality Control Board's ("Board") goal of clean water for all users in the region.

However, after listening to public testimony at recent board workshops, and being briefed by co-permittees on the proposed Tentative Order No. R9-2013-0001, Regional MS4 Permit ("Tentative Order"), we are writing to express our significant reservations on the Tentative Order. In brief, our concerns fall into these broad categories:

1. **Existing Tentative Order No. R9-2007-0001**-- Over the last several years, local governments in San Diego have worked together with your staff and a host of technical experts to develop a Hydromodification Management Plan with reasonable and scientifically based standards. Your Board recently approved that Plan in July 2010. This draft permit ignores all of the good work invested in that Plan, which was developed at a significant cost to the public. The existing Plan has only been in effect for 2 years, with 3 years remaining prior to its expiration. Given the short timeframe that the existing Plan has been in practice, we do not yet have adequate data to determine if the measures within the existing Plan are sufficient. Pursuing a new tentative order at this time has not been scientifically validated and is premature.

2. **Legal Issues**--The attempt by Board staff to mandate a proposed in lieu fee for watershed and hydrologic unit improvements to projects that have no impacts and therefore, no nexus to the watershed or unit improvements is a direct violation of CEQA, according to multiple city attorneys who spoke to the issue at the December 12, 2012 public hearing. On such a key issue as a CEQA violation, why didn't Board counsel catch this error in advance in the draft permit?

3. **Clarity on Pre-Development vs. Pre-Project Conditions--**We are at a loss to find a definition of the term pre-development conditions in the Tentative Order. For such a significant determination and impact, the lack of clarity on this matter is concerning. In the most current public workshop on December 12, 2012, when a Board member

OMPOA

Otay Mesa Property Owners Association

pressed staff on this issue, the staff member was unable to clearly define what the term meant, how far back was a reasonable gauge of pre-development conditions and finally, when pressed about the source of a soils database found on the internet that would be used as a key determinant of compliance, staff was unable to describe the accuracy or source documents for the website's database.

4. **Hydromodification**--We disagree with the proposed deletion of the current exemption in the hydromodification permit approved by the Board in July of 2010 for projects that discharge stormwater into lined or engineered channels. Speaker after speaker in the public comment period of the December 12th workshop representing co-permittees and other stakeholders, gave numerous examples of the conflict they had with Board staff on this issue. Further, the potential waste of public and private dollars and man-hours spent on already approved permits under the current hydromod scheme would be shocking. And this leads to our next point.

5. **Fiscal Impact**--Why is there no credible economic analysis on the potential cost to the co-permittees and the public for the implementation of the Tentative Order? For a regulator, or staff, to propose such broad and sweeping changes to public policy, without any consequence to the cost of their grand ideal, is irresponsible.

6. **Coordination with neighboring regional boards and publication of previous similar experiences**--According to public testimony at the December 12th workshop, the neighboring regional water boards in North Orange County and the Inland Empire have already dealt with several of the issues contemplated in the San Diego Board's Tentative Order. Specific examples include pre-development vs. pre-project conditions. Why hasn't the experience of the neighboring boards on these critical issues been shared with the public so our decision could benefit from their experience?

When the total cost of environmental compliance from local, state and federal agencies is placed upon the backs of landowners in Otay Mesa and other parts of our region with other habitat and environmental mandates, the financial return on economic development will simply not pencil out. Proposed projects will not develop, jobs will not be created, economies will not grow and the dream of an emerging economy will die hard. The cost of doing business in California has already pushed many businesses and developers out of the state and disincentive developers further would be a catastrophic loss to California.

If implemented as written, this Tentative Order, and the actions of the Board, will further degrade San Diego's economy. We will have an economy based on sand and suntan oil, with a lower income workforce to match, instead of a healthy and diverse economic base with well-paying jobs for all San Diegans.

We urge the Board to delay implementation of the Proposed Order and revisit the untimely, unfunded mandate, poorly drafted terminology, the lack of key definitions, the apparent CEQA violations and unjust burden on industry and the economy. The Tentative Order is not ready for implementation and should not be considered until data from the existing 2010 Plan is fully understood. It would be a public travesty and irresponsible act by the Board to enact the Tentative Order in its current form at this premature stage.

3111 Camino del Rio North, Ste. 100
San Diego, CA 92108

OMPOA

Otay Mesa Property Owners Association

Sincerely,

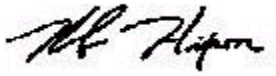

Rob Hixson, Chairman
OMPOA

cc: Mayor Bob Filner
Mr. Allen Jones
Councilmember David Alvarez

3111 Camino del Rio North, Ste. 100
San Diego, CA 92108

From: Peter M. Hekman, Jr.
To: Chiu, Wayne@Waterboards
Subject: Comment - Tentative Order No. R9-2013-001, Regional MS$ Permit, Place ID: 786088Wchiu
Date: Friday, January 11, 2013 3:55:56 PM

This message is for Vice Chairman Strawn of the San Diego Regional Water Quality Control Board, and is submitted as a Citizen's Comment.
Please forward promptly. Thank you.

For:

Mr. Gary Strawn
Vice Chairman
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

RE: Comment – Tentative Order No. R9-2013-001, Regional MS4 Permit,

Place ID: 786088Wchiu

Dear Vice Chairman Strawn,

I am a private businessman, a sole proprietor, a 40 year military veteran, and an Engineer with a history of years of experience in environmental matters, both in industry as a company president involved almost totally in environmental matters and as a senior executive (Vice Admiral)in both the Navy and the Department of Energy (Senior Executive Corps ES-6) involved in major environmental issues. I presently serve as a volunteer on the SD Chamber of Commerce Military Affairs Committee, and work as a consultant in the field of environmental remediation and contaminant prevention.

I have reviewed the Tentative Order and find it very over-reaching in almost every instance. Moreover, it pits one citizen against another in a manner similar to the tactics utilized by totalitarian governments. Both the costs and the turmoil that will be brought about through your proposed enforcement mechanisms will prove to be extremely deleterious to the competitive viability of the business community of San Diego, and to its ordinary citizens, who will actually bear the costs, for nearly un-measurably small benefit.

I fully believe in, and support initiatives, to ensure clean, safe water in our region, and endorse attempts to do so both effectively and affordably. But this ill-thought out one-size-fits-all plan does neither. You need to go back to the drawing boards on this one that is "evidence-based" rather than "ideologically-based", and one that has the support of the entire community. Its time to start over. Yours is a bad plan whose time has not come.

Respectfully,

Peter M. Hekman, Jr., Consultant
5021 Via Papel, San Diego, CA 92122
858-546-1155 (O); 858-204-5744 (cel)
Phekman1@san.rr.com

PROJECT DESIGN CONSULTANTS | 701 B Street, Suite 800 San Diego, CA 92101 | 619.235.6471 tel 619.234.0349 fax | www.projectdesign.com

January 11, 2013

Mr. Wayne Chiu, P.E.
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, SAN DIEGO REGION
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

SUBJECT: Comment-Tentative Order No. R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu

Dear Wayne Chiu:

Project Design Consultants (PDC) appreciates the opportunity to provide comments on the subject of the Draft Regional MS4 Permit Tentative Order No. R9-2013-0001 (Draft MS4 permit). PDC is a multidisciplinary planning and engineering design firm with extensive technical experience designing stormwater controls for a wide variety of new development and redevelopment projects throughout San Diego and Riverside Counties. We are committed to the Regional Board's goal of improving water quality through cost-effective and innovative strategies.

We would like to acknowledge and thank Regional Board staff for conducting additional meetings for this Draft MS4 permit, and we are optimistic that Regional Board staff will make significant changes and improvements to the draft permit after receiving comments from the technical experts in the development community through the public comment process. We hope that Regional Board staff will rely heavily on the permit revisions suggested by the technical experts within this region in order to optimize the chance of success for water quality improvement.

Our overarching comments on the Draft MS4 permit are summarized below.

Comment #1 [Draft MS4 Permit Provision E.3.]: Overall, we would like to see permit language that appropriately prioritizes projects according to stormwater quality risk, instead of applying the same requirements to very small and very large projects. If almost every construction project is a priority project, then nothing is really prioritized. Small and medium sized projects should be subject to less restrictive treatment and hydromodification requirements than larger projects. Further, more distinctions and more flexibility should be made to accommodate alternative compliance mechanisms for different types of development (urban infill redevelopment, roadways, rail and transit projects, utility projects, etc.).

Comment #2 [Draft MS4 Permit Provision E.3.]: Overall, many of the permit provisions discourage redevelopment, and this is discouraging because redevelopment is preferred from an environmental perspective compared to new greenfield development.

Comment #3 [Draft MS4 Permit Provision E.3.b.(1).b]: In order to eliminate onerous requirements for redevelopment projects that propose very minor increases to existing levels of site imperviousness, revise the trigger for redevelopment priority development projects to be "<u>at least a net increase</u> of <u>x</u> square feet of impervious surfaces <u>above pre-project conditions</u>" instead of the creation, addition, or replacement of at least x square feet of impervious surfaces.

Comment #4 [Draft MS4 Permit Provision E.3.b.(2).a]: If priority development requirements are triggered for the threshold of 10,000 square feet of impervious area for *new* development, this

threshold should be the same for redevelopment projects per Provision E.3.b.(2).b, and restaurant projects per Provision E.3.b.(2).c, and hillside projects per Provision E.3.b.(2).d, and parking lots and street projects per Provisions E.3.b.(2).f and E.3.b.(2).g. We recommend changing 5,000 square feet throughout the permit to 10,000 square feet or larger.

Comment #5 [Draft MS4 Permit Provision E.3.b.(2).i]: Since stormwater pollution is highly correlated with high levels of imperviousness, the project category of "one acre of disturbance or more" should be removed as a priority project category so that projects that add extremely low amounts of impervious surfaces would not be required to comply with priority project requirements.

Comment #6 [Draft MS4 Permit Provision E.3.b.(3).a]: This section should be removed or revised. The current (R9-2007-0001 permit) version of the exemption for sidewalk and bicycle lane improvements should remain for the new permit. Particularly for redevelopment and retrofit projects, most sidewalk and bike lane improvement projects cannot be constructed to be hydraulically disconnected from adjacent streets and still be in compliance with public standards. Additionally, implementing hydromodification controls for these projects in urban areas is often times infeasible.

Comment #7 [Draft MS4 Permit Provision E.3.b.(3).b]: This exemption needs to be re-worded to allow more flexibility. Reconfiguring existing streets for the goal of increasing traffic safety should not trigger priority project requirements just because the project slightly increases the imperviousness above pre-project conditions. Due to the linear nature of roadways, hydromodification and treatment controls are much more difficult due to the large amount of run-on and limited spatial constraints. It would be more cost-effective to focus treatment efforts on other types of projects with larger stormwater quality impacts.

Comment #8 [Draft MS4 Permit Provision E.3.c.(1).a]: Most LID best management practices (BMPs) (for example, bioretention areas) are sized by rate instead of by volume. Therefore, a requirement of retention of the 24-hour 85th percentile water quality volume is not applicable to all LID BMPs.

Comment #9 [Draft MS4 Permit Provision E.3.c]: Given our region's predominance of clay and silt soils, retention should not be the default method of compliance. We propose that the designation of the menu of appropriate BMPs be determined by the Water Quality Improvement Plan (WQIP) process rather than a "one size fits all" strategy currently being proposed in the Draft MS4 permit.

Comment #10 [Draft MS4 Permit Provision E.3.c]: The draft language for all of the various compliance options (and alternative options including offsite options) should be revised to clarify the regulatory intent to reduce the confusion throughout the entire section.

Comment #11 [Draft MS4 Permit Provision E.3.c.(2).a]: Hydromodification requirements should reference *pre-project* instead of *pre-development* conditions. This distinction is crucial and the draft MS4 permit language requiring redevelopment sites to mimic pre-development conditions is an unrealistic standard without technical basis.

Comment #12 [Draft MS4 Permit Provision E.3.c.(2).a.ii]: Remove this impractical requirement for artificially hardened channels.

Comment #13 [Draft MS4 Permit Provision E.3.c.(2).b]: Remove this impractical requirement for sediment supply matching.

Comment #14 [Draft MS4 Permit Provision E.3.c.(2).d]: The current exemptions outlined in the current County of San Diego's Hydromodification Management Plan (HMP) should not be removed.

Rather, they should be expanded and added to in order to increase the flexibility of the program. The current HMP needs to be revised to make the requirements workable for real world projects. In addition, the low-flow thresholds need to be revised. The schedule for development of the HMP was extremely rushed and we felt that input from the technical experts was ignored during the development and approval of the HMP. We would like to see this plan be revised and then incorporated into the new permit in order for it to be reasonably applied to real-world development projects. Most designers agree that the final hydromodification requirements of the current HMP are unreasonable and/or infeasible to implement for most priority development projects. The climate, rainfall patterns, and soil conditions within Southern California are significantly different from other areas in the United States. Therefore, the stormwater regulations for treatment control BMPs and hydromodification controls need to be tailored to the local conditions and cannot be based on "one size fits all" approaches developed for other areas with different climates.

Comment #15 [Draft MS4 Permit Provision E.3.c.(3).b.i.c]: LID bioretention areas are sized by rate instead of volume. Therefore, a requirement of 1.5 times the design capture volume is erroneous and is not scientifically based.

Comment #16 [Draft MS4 Permit Provision E.3.c.(3).b.iv.a]: Revise condition to state that the regional BMP may treat the runoff, either by a volume-based or a flow-based BMP. The requirement of 1.1 times the design capture volume is confusing and is not scientifically based.

We appreciate the opportunity to comment on the Draft MS4 permit. We would welcome the opportunity to answer any questions or discuss the above or other issues.

Sincerely,

PROJECT DESIGN CONSULTANTS

Debby Reece

Debby Reece, MS, PE, LEED AP, QSD
Vice President - Engineering

Chelisa A. Pack

Chelisa A. Pack, MS, PE, QSD
Project Engineer

Cc: file

SAN DIEGO CANYONLANDS

San Diego Canyonlands

◆ 3552 Bancroft Street San Diego, CA 92104 ◆ 619-284-9399 ◆
◆www.sdcanyonlands.org◆

January 11, 2013

Via e-mail to Wayne Chiu wchiu@waterboards.ca.gov
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

RE: Comments on Tentative Order Number: R9-2013-0001

Dear Mr. Chiu:

San Diego Canyonlands respectfully submits the following comments on the draft San Diego Regional Municipal Separate Storm Sewer System permit. Urban runoff is the San Diego region's most urgent pollution problem. In a region known for its beaches and strong tourism economy, polluted runoff makes our beaches and waterways unsafe for swimming, fishing and other recreation for at least 72 hours after every rain event. Even in dry weather, our "urban drool" from residents and businesses becomes a major pollution source.

By working together as a community, we can solve this challenging public health problem. The Water Quality Improvement Plans proposed in the draft permit have the potential to become powerful tools to help us improve water quality within our watersheds. However, the Copermittees cannot be tasked with creating these plans alone. Specifically:

- The Permit should require formation of a stakeholder advisory group for each watershed that includes representatives of environmental groups with knowledge of the watershed.
- This stakeholder advisory group should work closely with the Copermittees and a regional board staff member while the Water Quality Improvement Plans are being developed to ensure these plans aggressively pursue water quality gains.
- The stakeholder advisory process should include accountability and measureable milestones to ensure the goals of the Permit are being met.

By taking advantage of the knowledge and resources of diverse stakeholders like municipalities, businesses, non-profits and residents, our region can be on the cutting-edge of addressing urban runoff and creating healthier communities and watersheds. But this can only be achieved if these diverse voices are impacting the planning process in a meaningful way.

San Diego Canyonlands recognizes the challenge urban runoff presents to our region and we want to do our part to solve the problem. San Diego Canyonlands is interested in participating in a Water Quality Improvement Plan development process for all City of San Diego watersheds. San Diego Canyonlands urges the Regional Board to enhance the stakeholder participation opportunities during Water Quality Improvement Plan development and then approve the permit.

Respectfully Submitted,

Eric Bowlby

Eric Bowlby
Executive Director
San Diego Canyonlands
eric@sdcanyonlands.org

San Diego County Taxpayers Association

Targeting Waste • Promoting Efficiency

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January 11, 2013

Mr. Wayne Chiu, P.E.
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, # 100
San Diego, CA 92123

Re: Comment - Draft Regional MS4 Permit - Tentative Order No.R9-2013-0001

Dear Mr. Chiu:

The San Diego County Taxpayers Association urges you and the San Diego Regional Water Quality Control Board to amend Tentative Order No.R9-2013-0001, the Draft Regional MS4 Permit, so that it encompasses reasonable, cost effective and scientifically based water quality improvement standards.

While we recognize the importance of clean and safe beaches and creeks, and place significant value in protecting water quality, it is critical that taxpayer investments be made based on demonstrated scientific methods. Appropriate thresholds of bacteria should be supported with well documented scientific evidence.

Currently, approximately $120 million of public money is spent annually to comply with the current Municipal Storm Water Permit. County of San Diego staff estimates the costs of attempting to comply with the proposed Bacteria TMDL requirements at between $2.6 billion and $4.9 billion over the next 18 years which raises serious concerns regarding the feasibility of achieving the draft compliance requirements. Requiring exorbitant spending to chase goals that may be unattainable is irresponsible. Until it can be stated with reasonable certainty that the Bacteria TMDL requirement can be met, it should not be incorporated into the MS4 Permit. In this time of fiscal challenge, the cost of complying with new unfunded mandates will no doubt come at the expense of core government services.

If you have any questions, please feel free to contact me at (619) 234-6423 or lani@sdcta.org.

Sincerely,

Lani Lutar
President and CEO

LL/sdk

CC: Members, California Regional Water Quality Control Board, San Diego Region
David Gibson, CA Regional Water Quality Control Board, San Diego Region Executive Officer

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Environmental Programs Manager
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(T) 858-654-1279 (F) 858-637-3700

January 11, 2013

Mr. Wayne Chiu, P.E.
California Regional Water Quality Control Board
San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

VIA E-Mail: wchiu@waterboards.ca.gov

2013 JAN 11 P 1:45
SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD

Re: Comment – Tentative Order No. R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu

Dear Mr. Chiu and Board Members:

The San Diego Gas & Electric Company (SDG&E) provides transmission and distribution of natural gas and electricity throughout San Diego County and southern Orange County. Delivery of these essential public services requires routine and emergency construction, operation and maintenance of its linear utility infrastructure. A primary mandate to utilities and other entities with linear facilities regulated by the California Public Utilities Commission and/ or other state and federal regulatory agencies is to provide safe and reliable service. The above-referenced draft MS4 permit (draft Permit) would impact SDG&E facilities in our service territory, which is located primarily within Region 9.

Our comments and recommended revisions to specific issues in the draft Permit are provided below.

<u>Non-Storm Water Discharges</u>

There is still confusion in the draft Permit regarding which non-storm water discharges are effectively prohibited and must be eliminated and those that are authorized. The draft Permit both states that it authorizes and prohibits non-storm water discharges but it is not always clear which are authorized and which are prohibited. In multiple locations (e.g. Finding 15), the draft Permit states that non-stormwater discharges into the MS4s must be "effectively prohibited" or eliminated. These sections conflict with other sections (Section II.A.1.b., for example), which state, consistent with EPA's regulations, that non-stormwater discharges authorized by a NPDES permit are authorized to be discharged to the MS4 system. One change that would help to clarify this issue would be to revise Finding 15 as follows:

> **Non-Storm Water and Storm Water Discharges.** Non-storm water discharges from the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard of CWA section 402(p)(3)(B)(iii), which is explicitly for "Municipal ... *Stormwater Discharges* (emphasis added)" from the MS4s. Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s must be effectively prohibited. ***However, consistent with EPA's regulations, the draft Permit authorizes discharges of non-storm water to MS4s that are either authorized by a separate NPDES permit, or the discharge is a category of non-storm water discharges or flows that must be addressed pursuant to Provisions <u>E.2.a.(1)-(5)</u> of this Order.***

Prohibition of Non-Storm Waters

Section E.2.a.6. would prohibit any category of non-stormwater under Section E.2.a.1-4. if it is found by the co-permittee or the Regional Board to be a source of pollutants to receiving waters. We recommend that this section be revised to also allow the co-permittees to designate different and/ or additional BMPs to be implemented as opposed to prohibiting the category of non-stormwater and suggest the following language:

> If the Copermittee or San Diego Water Board identifies any category of non-storm water discharges listed under Provisions E.2.a.(1)-(4) as a source of pollutants to receiving waters, the category must be prohibited through ordinance, order, or similar means and addressed as an illicit discharge. ***Alternately, the Copermittee can designate different and/ or additional BMPs to be implemented as opposed to prohibiting the category of non-stormwater.***

Building Fire Suppression System Maintenance Discharges

Section E.2.a.5.a.1. would require the co-permittees to treat building fire suppression system maintenance discharges (e.g., sprinkler line testing and flushing) as an illicit discharge. These discharges have historically been allowed under existing MS4 permits and municipal ordinances with the use of appropriate BMPs. These activities are mandated by code and insurance companies and are essential to maintain a safe and reliable fire water delivery system. Changing existing systems to discharge to the sewer may not be feasible and/ or be expensive due to the existing plumbing configurations. These discharges should continue to be authorized with the implementation of appropriate BMPs as determined by the MS4. If existing BMPs are found to be inadequate, different and/ or additional BMPs could be required to be implemented by the MS4.

Discharges to Areas of Special Biological Significance

The draft Permit should clarify that non-storm water discharges (e.g., potable hydrotest dewatering, groundwater dewatering discharges, etc.) made pursuant to NPDES permits to MS4 systems that discharge to Areas of Special Biological Significance (ASBS) are authorized. These types of discharges are critical to on-going infrastructure development, maintenance and operation and the State Water Board's March 2012 "Exceptions to the Ocean Plan for Discharges to Areas of Biological Significance" provides that the NPDES permitting authority can authorize these discharges to ASBS by making an appropriate finding in the applicable MS4 permit. **We urge the RWQCB to include the following language as part of Finding 32:**

> ***"The ASBS exception authorizes the discharge of non-stormwater to a MS4 when an NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS. Accordingly, the RWQCB finds that since NPDES permits for non-stormwater discharges contain conditions and requirements to protect water quality and many of these permits are for short-term and/ or intermittent discharges (e.g., discharges from utility vaults and underground structures, construction groundwater dewatering, hydrostatic test water discharges, potable water discharges), these discharges will not alter natural ocean water quality and herein authorizes their discharge to MS4 systems that discharge to ASBS."***

Further, the following Sections need to be revised to ensure consistency and support the above finding:

- Section II.A.1.d.:

  "Storm water discharges ***and non-stormwater discharges made pursuant to NPDES permits*** from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 applicable

to these discharges, included in Attachment A to this Order. All other discharges from the Copermittees' MS4s to ASBS are prohibited."

- Section 2.I.A.1.e.2.ii. in Attachment A needs to be revised to reference the above finding:

  "An NPDES permitting authority may authorize non-storm water discharges to an MS4 with a direct discharge to an ASBS only to the extent the NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS ***(see Permit Finding 32)***."

Non-stormwater Action Levels

The draft Permit should not subject non-stormwater discharges made pursuant to NPDES permits to action levels. Section II.C.1. would subject non-stormwater discharges to action levels. However, non-stormwater discharges that have NPDES permits are subject to their own discharge requirements. Setting additional, perhaps conflicting, requirements on these discharges is unnecessary and will lead to confusion. **We therefore urge the RWQCB to revise the draft Permit to clarify that the proposed non-stormwater action levels are not applicable to non-stormwater discharges that have NPDES permits.**

Development Planning

The draft Permit should not subject linear underground/ overhead (utility) projects (or LUPs) to permanent post-construction requirements. Section E.3. requires permanent BMPs for all development projects. LUP construction projects are regulated pursuant to the State Water Board's Stormwater Construction General Permit (CGP). Finding 76 in the CGP specifically excludes LUPs from permanent post-construction requirements due the nature of their construction. For consistency with the CGP, the draft Permit needs to clarify that Section E.3. is not applicable to LUPs as defined in the CGP. **We urge the RWQCB to make the following revisions:**

- Finding 10

  Pollutants Generated by Land Development. Land development has created and continues to create new sources of non-storm water discharges and pollutants in storm water discharges as human population density increases. This brings higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash. Pollutants from these sources are dumped or washed off the surface by non-storm water or storm water flows into and from the MS4s. When development converts natural vegetated pervious ground cover to impervious surfaces such as paved highways, streets, rooftops, and parking lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving a developed area without BMPs that can maintain pre-development conditions will contain greater pollutant loads and have significantly greater runoff volume, velocity, and peak flow rate than pre-development runoff from the same area. ***The nature of linear underground/ overhead projects (LUPs) is to return project sites to pre-construction conditions. Therefore, consistent with Finding 76 in the SWRCB's Storm Water Construction General Permit[1], LUPs are not subject to post-construction requirements.***

  [1] Order 2009-0009-DWQ, as amended by Orders 2010-0014-DWQ and 2012-0006-DWQ, contains the definition of Linear Underground/ Overhead Projects.

- Definition of "Development Project"

  "**Development Projects** - Construction, rehabilitation, redevelopment, or reconstruction of any public or private residential project, industrial, commercial, or any other projects. ***Development Projects do not include linear underground/ overhead projects as defined in the SWRCB Storm Water Construction General Permit (Order 2009-0009-DWQ, as amended by Orders 2010-0014-DWQ and 2012-0006-DWQ).***

The enclosed comments are in reference to the actual draft Permit language. We request that revisions consistent with these comments also be made to the draft Permit's Fact Sheet/ Technical Report.

Please call Fred Jacobsen at 858-637-3723 if you have any questions regarding our comments.

Thank you for this opportunity to provide you with our comments.

Sincerely,

Susan M Hector

Susan M. Hector
Environmental Programs Manager

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January 11, 2013

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San Diego, CA 92123-4340

Re: **Comments - Tentative Order No. R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu**

Dear Mr. Chiu:

The San Diego Unified Port District (Port) submits the following comments to the revised Tentative Order No. R9-2013-0001, NPDES No. CAS0109266, *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4) Draining the Watersheds within the San Diego Region* (the Permit). Except to any extent inconsistent with the comments below and other comments submitted directly on behalf of the Port, the Port concurs with the San Diego Copermittees' comments throughout the process. The Port wishes to separately address several issues in the current draft Permit. The Port continues to support the objectives of the Permit and welcomes any opportunity to work with the Regional Board to improve the Permit.

1. Establish Connection between Discharge Prohibitions/Receiving Water Limitations and TMDL Compliance Schedules

The Permit as currently drafted includes specific provisions and schedules for implementation of total maximum daily loads (TMDLs) that have been incorporated into the Water Quality Control Plan for the San Diego Basin. *See* Permit, Attachment E. These compliance schedules have been incorporated into the Effluent Limitations provision of the Permit. Permit, II.A.3.b. ("Each Copermittee must comply with applicable WQBELs established from the TMDLs in Attachment E to this Order, pursuant to the applicable TMDL compliance schedule.").

However, no similar language is included in the Discharge Prohibitions (II.A.1.) or the Receiving Water Limitations (II.A.2.) provisions. The absence of similar language regarding TMDL compliance schedules in these provisions could potentially result in Copermittees being in violation of the Permit even though the TMDL implementation dates have not passed. In order for a Copermittee to be in compliance when the Permit becomes effective, it must also be in compliance with the applicable TMDL compliance schedule. Where a TMDL is in place, the Permit establishes compliance schedules for Discharge Prohibitions and Receiving Water Limitations that are in conflict with the TMDL compliance schedules.

The Port requests that the Discharge Prohibitions and Receiving Water Limitations provisions of the Permit be revised to make clear that the Copermittee shall not be in violation of these provisions when the Copermittee is complying with the applicable TMDL compliance schedule. Provision II.A.2.c., which appeared in the previous permit draft contains appropriate language linking the TMDL compliance schedules with the compliance schedules for Discharge Prohibitions and Receiving Water Limitations. The Port requests that similar language be included in Provisions II.A.1. and II.A.2. of the Permit.

2. Permit Compliance Should be Based on the Iterative Process and Implementing Provisions of TMDL and the WQIP Rather than Numeric Limits

The Permit provides that the Copermittees must be in compliance with numeric limits in order to meet water quality standards and to avoid violating the Permit. *See* Permit, II.A.1.a., II.A.1.c., II.A.2.a. The Permit also provides that each Copermittee must engage in an iterative process to implement water quality improvement strategies should water quality exceedances occur to achieve compliance with the discharge prohibitions and receiving water limitations. Permit, II.A.4. However, the Permit states that these provisions are "independently applicable, meaning that compliance with one provision does not provide a 'safe harbor' where there is no compliance with another provision." Permit, Fact Sheet, F-39.

Currently, the Permit creates a situation where the Copermittees may be in violation of the Permit the moment it goes into effect. There may be non-compliance with the Permit by a Copermittee where it is shown that a Copermittee is causing or contributing to an exceedance of water quality standards, even if that Copermittee is actively engaged in the iterative process.

While the Port acknowledges that the Regional Board may choose not to strictly enforce these permit conditions, the Copermittees remain potentially subject to an enforcement action by the Regional Board or a third-party citizen suit unless this point of compliance is clarified. The Regional Board has clear authority under the CWA and State Board policy to issue an MS4 permit that allows for iterative Best Management Practices (BMPs), rather than requiring strict adherence to water quality standards through numeric effluent limitations. *See* State Water Resources Control Board Order No. 2001-15, at pg. 8; *see also Defenders of Wildlife v. Browner,* 191 F.3d 1159, 1163, 165 (9th Cir. 1999).

Accordingly, the Permit should be revised to allow the Copermittees to achieve compliance by actively engaging in a BMP-based iterative process and by complying with implementation provisions of applicable TMDLs. The Port supports using the Receiving Water Limitations Language proposed by the California Stormwater Quality Association (CASQA), attached as Exhibit 1.

3. The Permit Should Clarify the Limits and Basis for Copermittee Liability for Any Exceedances

As noted, the Permit should clarify that Copermittee compliance is achieved through compliance with iterative approaches as set forth in the WQIP and any applicable BMPs, rather than any numeric limits. However, if numeric limits remain in the Permit, certain modifications should be made to avoid improper imposition of liability on Copermittees, consistent with the CWA. As discussed in the Port's comments to the previous draft of the Permit, dated September 14, 2012, the Permit should be revised to make clear that a Copermittee is only responsible for exceedances introduced into portions of MS4 facilities that it owns or operates, not merely discharges into or from all MS4 facilities within that Copermittee's geographical jurisdictional boundaries. There are numerous MS4 facilities and outfalls within the Port's tidelands jurisdictions which the Port does not own or operate. The language of the CWA, repeated in the Permit, confirms that a Copermittee is only responsible for MS4 facilities that it operates. (40 CFR 122.26(a)(3)(vi).)

For this reason, the Port cannot properly be liable for discharges into or from an MS4 facility merely because it is within the Port's tidelands jurisdiction – it must own or operate that MS4 facility. To clarify this point, the Port proposes adding the following language, which could be placed in the cover for the Permit, immediately preceding Table 2:

"The location of an MS4 facility within any Copermittee's jurisdiction boundaries does not, of itself, make the Copermittee an owner or operator of that MS4 facility."

Furthermore, the Permit must include additional provisions that ensure a Copermittee is not improperly held liable for discharges attributable to other Copermittees' MS4 inputs. Of key concern is the specter of liability for downstream MS4 operators. As one of the farthest downstream jurisdictions, the Port faces greater risk of being downstream of other Copermittees' input and discharges into the upstream MS4 facilities. The Permit should be revised to clarify that each Copermittee is liable for any input and discharges into and from its MS4 that may exceed numeric limits, but not for the input and discharges by other Copermittees, whether upstream or downstream. Unless such provisions are included, Copermittees such as the Port will face the risk of legally improper "end of the pipe" liability, even if it did not contribute any pollutants.

As written, the Permit lacks clarity regarding the appropriate basis for determining that any Copermittee has actually caused or contribute to an exceedance of water quality standards. As the Permit states, "[e]ach of the Copermittees owns or operates an MS4, through which it discharges storm water and non-storm water into water of the U.S. within the San Diego Region." Permit, Findings, I.1. It further states:

> The federal regulations make it clear that the Copermittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators (40 CFR 122.26(a)(3)(vi)). This Order does not require Copermittees to manage storm water outside of their jurisdiction boundaries, but rather to work collectively to improve storm water management within watersheds.

Permit, Findings, I.2. While this language is consistent with the CWA, additional provisions are needed to ensure that one Copermittee does not become liable for input and discharges from other Copermittees. The Port requests that the Permit include language clarifying that each Copermittee is only liable for its share of the excess pollutants that it introduces into its MS4 facilities and which result in exceedances of the receiving water limits.

Such a provision is necessary since a Copermittee on an MS4 permit is only responsible for its own discharges or those over which it has control, not discharges or inputs by other Copermittees. *Jones v. E.R. Shell Contractor, Inc.*, 333 F.Supp.2d 1344, 1348 (N.D. Ga. 2004). Similarly, both the California Water Code and the Clean Water Act contemplates that liability for violations shall fall upon the "person" responsible for the violations. *See* Cal. Water Code §§ 13263(f), 13350(a); 33 U.S.C. § 1319. A Copermittee that does not generate or add pollutants to its MS4 facilities cannot credibly be characterized as having discharged pollutants. Likewise, a Copermittee cannot properly be subject to liability for excess pollutants introduced into segments of the MS4 outside its jurisdiction. Copermittees cannot control such MS4 facilities and the CWA clearly does not require a Copermittee to exert such control.

To alleviate this problem and to ensure compliance with the applicable statutes and case law, the Port requests that the Permit be revised to explicitly state the each Copermittee is only liable for the portion of any excess pollutants that cause or contribute to any violations of the Permit that are introduced into the portion of the MS4 owned or operated by that Copermittee.

a. <u>The Permit Should Include the Appropriate Regional Board Burden of Proof to Establish Liability of a Copermittee for MS4 Discharges</u>

The Permit should also include provisions that will ensure one Copermittee is not held liable for pollutant discharges generated by or introduced into the MS4 facilities by other Copermittees. Without delineating the basis for assigning and/or apportioning liability among the Copermittees, there is an unacceptable risk that "end of pipe" Copermittees may be held liable for violations caused by pollutants generated and introduced into MS4 facilities primarily,

or even exclusively, by "upstream" Copermittees. In particular, as the trustee of the tidelands of the San Diego Bay, the Port is one of the Copermittees located farthest downstream. There is an attendant increased risk that in the event any pollutants are discharged into the San Diego Bay, such pollutants would not have originated from any Port MS4 facilities but from MS4 facilities farther upstream.

To ensure that the Regional Board does not hold Copermittees such as the Port responsible for pollutants introduced into or originating from other Copermittees' MS4 facilities, the Permit must be revised to include and clarify the Regional Board's burden of proof for establishing a particular Copermittees' liability. *See Rapanos v. United States*, 547 U.S. 715, 745 (2006); *see also Sackett v. E.P.A,* 622 F.3d 1139, 1145-1147 (9th Cir. 2010), reversed on other grounds, *Sackett v. E.P.A.* (2012) 132 S. Ct. 1367 ("We further interpret the CWA to require that penalties for noncompliance with a compliance order be assessed only after the EPA proves, in district court, and according to traditional rule of evidence and burdens of proof, that defendants violated the CWA in the manner alleged in the compliance order."). The Regional Board must have the affirmative duty to prove that a Copermittee introduced pollutants into the MS4 that are discharged in the violation of the Permit.

In contrast to this legally required approach, the Permit presently states that the Copermittees must comply with certain procedures to come into compliance in the event an exceedance occurs. *See* Permit, II.A.4.a. The language would effectively impose liability on all Copermittees until a Copermittee could prove that it did not contribute to the excess pollutants in the discharge, even though the Regional Board would not have raised, and would not legally be entitled to, a rebuttable presumption that the exceedance resulted from that particular Copermittee's actions. To prevent a Copermittee being put in the legally untenable position of having to prove its innocence in the first instance, the Regional Board should have an initial burden of proving that the exceedances relate to contribution by a particular Copermittee.

Accordingly, the Port requests that Section II.A.4.a. is revised to read:

> If exceedance(s) of water quality standards persist in receiving waters notwithstanding implementation of this Order, *upon a showing by the Regional Board by a preponderance of the evidence that the discharges of pollutant from the MS4 for which each Copermittee is an owner or operator caused or contributed to the exceedance(s) of the water quality standards, those* Copermittees must comply with the following procedures: (emphasis added).

b. <u>Monitoring Requirements Should be Revised to Include Monitoring that Will Ensure Jurisdiction Accountability</u>

As a further necessary safeguard against improperly broad or joint and several liability for discharges, the Permit must include provisions that will allow the Regional Board and the

Copermittees to determine the sources of any exceedances discharged to receiving waters. Unless the Permit requires such monitoring, there remains the risk that downstream Copermittees will be held liable for upstream discharges. This issue of identifying and establishing a Copermittee's violation of an MS4 permit is critical and has been the subject of recent judicial attention. The Port requests that the Permit include a monitoring program that meets and satisfies the evidentiary standards discussed in *Los Angeles County Flood Control District v. Natural Resources Defense Council, Inc., et al.*, No. 11-460 (U.S. Jan. 8, 2013) and *Natural Resources Defense Council, Inc. v. County of Los Angeles*, 673 F.3d 880 (9th Cir. 2011), necessary to establish a particular Copermittee's discharges and/or violations of the Permit. Without such monitoring, the risk persists that "end of pipe" Copermittees will be held liable for upstream jurisdictional discharges, without proper jurisdictional accountability.

We again emphasize that the Port is dedicated to the protection and enhancement of water quality and that the Port strongly supports the objectives of the Permit. We welcome the opportunity to work with the Regional Board in order to achieve our mutual goals. Please contact us if you have any questions or would like any clarification of the Port's position.

Very truly yours,

Scott E. Patterson

SEP/BPS
cc: William D. McMinn, Esq.

EXHIBIT 1

CASQA Proposal for Receiving Water Limitation Provision

D. RECEIVING WATER LIMITATIONS

1. Except as provided in Parts D.3, D.4, and D.5 below, discharges from the MS4 for which a Permittee is responsible shall not cause or contribute to an exceedance of any applicable water quality standard.

2. Except as provided in Parts D.3, D.4 and D.5, discharges from the MS4 of storm water, or non-storm water, for which a Permittee is responsible, shall not cause a condition of nuisance.

3. In instances where discharges from the MS4 for which the permittee is responsible (1) causes or contributes to an exceedance of any applicable water quality standard or causes a condition of nuisance in the receiving water; (2) the receiving water is not subject to an approved TMDL that is in effect for the constituent(s) involved; and (3) the constituent(s) associated with the discharge is otherwise not specifically addressed by a provision of this Order, the Permittee shall comply with the following iterative procedure:

    a. Submit a report to the State or Regional Water Board (as applicable) that:

        i. Summarizes and evaluates water quality data associated with the pollutant of concern in the context of applicable water quality objectives including the magnitude and frequency of the exceedances.

        ii. Includes a work plan to identify the sources of the constituents of concern (including those not associated with the MS4to help inform Regional or State Water Board efforts to address such sources).

        iii. Describes the strategy and schedule for implementing best management practices (BMPs) and other controls (including those that are currently being implemented) that will address the Permittee's sources of constituents that are causing or contributing to the exceedances of an applicable water quality standard or causing a condition of nuisance, and are reflective of the severity of the exceedances. The strategy shall demonstrate that the selection of BMPs will address the Permittee's sources of constituents and include a mechanism for tracking BMP implementation. The strategy shall provide for future refinement pending the results of the source identification work plan noted in D.3. ii above.

        iv. Outlines, if necessary, additional monitoring to evaluate improvement in water quality and, if appropriate, special studies that will be undertaken to support future management decisions.

        v. Includes a methodology (ies) that will assess the effectiveness of the BMPs to address the exceedances.

        vi. This report may be submitted in conjunction with the Annual Report unless the State or Regional Water Board directs an earlier submittal.

b. Submit any modifications to the report required by the State of Regional Water Board within 60 days of notification. The report is deemed approved within 60 days of its submission if no response is received from the State or Regional Water Board.

c. Implement the actions specified in the report in accordance with the acceptance or approval, including the implementation schedule and any modifications to this Order.

d. As long as the Permittee has complied with the procedure set forth above and is implementing the actions, the Permittee does not have to repeat the same procedure for continuing or recurring exceedances of the same receiving water limitations unless directed by the State Water Board or the Regional Water Board to develop additional BMPs.

4. For Receiving Water Limitations associated with waterbody-pollutant combinations addressed in an adopted TMDL that is in effect and that has been incorporated in this Order, the Permittees shall achieve compliance as outlined in Part XX (Total Maximum Daily Load Provisions) of this Order. For Receiving Water Limitations associated with waterbody-pollutant combinations on the CWA 303(d) list, which are not otherwise addressed by Part XX or other applicable pollutant-specific provision of this Order, the Permittees shall achieve compliance as outlined in Part D.3 of this Order.

5. If a Permittee is found to have discharges from its MS4 causing or contributing to an exceedance of an applicable water quality standard or causing a condition of nuisance in the receiving water, the Permittee shall be deemed in compliance with Parts D.1 and D.2 above, unless it fails to implement the requirements provided in Parts D.3 and D.4 or as otherwise covered by a provision of this order specifically addressing the constituent in question, as applicable.

SAN DIEGO™ REGIONAL CHAMBER OF COMMERCE

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067355

January 11, 2012

Mr. Gary Strawn
Vice Chairman
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9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Re: Comment—Tentative Order No. R9-2013-001, Regional MS4 Permit, Place ID: 786088Wchiu

Dear Vice Chair Strawn:

I am writing on behalf of the San Diego Regional Chamber of Commerce in response to the San Diego Regional Water Quality Control Board's Tentative Order R9-2012-0011 ("Permit") dated October 31, 2012. After reviewing the Permit, the Chamber and its members are concerned that it will impose expensive and untested regulations on local governments and businesses.

Clean, safe water is vital to the region's economy. The tourism industry is one of San Diego's largest. Maintaining its economic health requires clean water in our beaches and streams. It is important, however, that we use our limited resources wisely, and ensure that our efforts produce the desired outcome of improving water quality.

We applaud the Board's inclusion of Water Quality Improvement Plans (WQIP) as a first step in developing a cost-effective approach to improving our water. Analysis remains a critical component of a successful strategy, and we are glad to see that the Board is committed to finding the best possible solution to water quality improvement.

We are concerned, however, that the costs associated with enforcing and implementing the permit will have a negative impact on San Diego's economy. Our three primary areas of concern include: 1) the strict liability for exceeding water quality objectives; 2) the preemption of WQIPs by new and changing regulatory requirements prior to allowing the WQIPs to be developed and implemented; and 3) the lack of reliable funding sources to implement these regulatory changes.

It is necessary to hold individuals, businesses, and governments accountable, but it is critical that accountability measures are practical and have a demonstrable, positive benefit to the region's water. Because of these concerns, we respectfully request that the Permit focus on the timely development of effective and enforceable WQIPs, and that each of the WQIPs be developed through a process that ensures public participation. We ask also that the designation of appropriate Best Management Practices in each watershed be determined through the WQIP

process rather than the one size fits all strategy currently being proposed in the Permit. We ask further that until the Board adopts a WQIP for a watershed that the provisions of the existing Permit remain in place for that watershed. Finally, in order to avoid unnecessary litigation, we request that the Board adopt the WQIPs as Orders implementing the proposed Permit.

We urge you to adopt final permit language that is evidence-based and both environmentally and economically sustainable. Thank you for your consideration. Please contact Leah Hemze at lhemze@sdchamber.org if you have any questions.

Sincerely,

Mark Leslie
Interim President & CEO

CC: Mr. Wayne Chiu, California Regional Water Quality Control Board, San Diego

Unified Port of San Diego

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January 11, 2013

Mr. Wayne Chiu
San Diego Regional Water Quality Control Board
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San Diego, CA 92123-4340

Submitted via email: wchiu@waterboards.ca.gov

Subject: Comment – Tentative Order No. R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu

Dear Mr. Chiu,

The San Diego Unified Port District (Port) respectfully submits this comment letter regarding Tentative Order R9-2013-0001 National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) in the San Diego Region (Tentative Order).

The Port has been actively involved in the development process of the Tentative Order and we support the Regional Board's Water Quality Improvement Plan (WQIP) concept in the Tentative Order with its proposed flexibility to focus resources on the priority problems in the watershed. However, the Tentative Order also contains prescriptive requirements that are in addition to the WQIP and would be very costly and at times infeasible to implement. With constrained budgets and staff resources, these additional costs may unintentionally limit the ability to conduct other water quality efforts having greater environmental benefits for the Bay.

The Port has worked alongside the other San Diego County Municipal Copermitees (Copermitees) to collectively submit a red-line strikeout document recommending changes to the permit language. With the exception of the proposed WQIP-based compliance option, the Port fully supports the recommendations provided in the Copermittee red-line strike-out. This document will be submitted through the County of San Diego. The changes help to clarify permit compliance points and provide a more efficient monitoring program to support the end goal of improving water quality. We strongly encourage you to consider the Copermittee's proposal and the Port's comments listed below.

1. Jurisdictional Accountability

The Port is committed to our role as an environmental steward of San Diego Bay. That commitment is reflected in a number of programs both regulatory driven and beyond compliance, that are focused on protecting and rehabilitating the Bay's resources. The

Port's Stormwater Program is an important part of this effort. At the same time we recognize that discharges from upstream jurisdictions impact our efforts to protect bay water quality. San Diego Bay is the receiving water body for a large watershed in which the Port is located at the extreme end. We are aware that most discharges from the MS4 to San Diego Bay are from storm drain easements under the authority of other jurisdictions. With this in mind, we support jurisdictional accountability throughout the watershed and we encourage the Regional Board to incorporate these concepts throughout the Permit.

2. WQIP-based Compliance and Modifications to Provision A

The Regional Board staff has presented the WQIP as an iterative process that allows for adaptive management so that compliance with water quality standards is achieved over time. It is the Port's opinion that the WQIP process, as currently proposed in the Tentative Order, adequately allows for compliance based upon WQIP implementation. However, what is missing is the linkage between the Discharge Prohibitions, Effluent Limitations, and Receiving Water Limitations in Provision A and the iterative process set forth in the WQIPs.

Modifications to Provision A are required to ensure implementation of that iterative process. Without a modification, jurisdictions are potentially open to third-party lawsuits and their resources may be directed to addressing a one-time exceedance. The Port requests that the Permit establishes a clear linkage between compliance with Provision A to compliance with the WQIP and the other Provisions of the Permit.

3. WQIP Development Timeline

The Tentative Order proposes an aggressive schedule for WQIP development and JURMP program updates. The timeline for WQIP development (9 months) does not allow for adequate time between due dates for required deliverables. Concerns with the timeline are as follows:

- Formal agreements such as a Memorandum of Understanding and/or Cost Share agreements will be required within the watershed groups. Although the preliminary work may begin before permit adoption, the process cannot be completed until the Permit is adopted and the requirements are known. These agreements are integral to upholding jurisdictional accountability within the watershed groups. This process will take an estimated three months.

- The water quality priorities and goals are due within the first six months, followed by a two month public comment period. While this first deliverable deadline may be feasible, potential modifications to the priorities and goals may be necessary as a result of the public comments received. Should modifications to the priorities and goals be required, there will be little time to develop the strategies and schedules.

- Time is needed to address comments from the public or Regional Board throughout the process and to obtain management and jurisdictional governing body approvals. Governing body approvals take an average of three months.

The Port requests that the timeframe for permit deliverables is extended as outlined in the Copermittee's revised WQIP development schedule in the red-line strike-out submittal.

4. Illegal Discharges: Air Conditioning Condensation

The Tentative Order requires air conditioning condensation to be directed to landscaped areas or other pervious surfaces where feasible. Substantial structural modifications may be required to meet this requirement and discharges of this type may not be a priority pollutant source that is identified in the WQIP. The Port requests that the requirement to direct air conditioning condensation to landscaping be encouraged and not required.

5. Retention Requirement for Priority Development Projects

As proposed in the Tentative Order, Priority Development Projects are to implement BMPs to retain the volume of runoff equivalent to the design capture volume or the estimated volume that would be retained if the site was fully undeveloped. Due to the Port's location at the headwaters of San Diego Bay, a high groundwater table and existing soils with low infiltration rates, retention is not technically feasible on Port tidelands. The Port is at the bottom of the watershed so consequently retained runoff must be stored for a longer period of time after the peak of a storm. Large underground storage tanks to store the runoff would be infeasible because most tanks would have significant design constraints due to the high groundwater table, flat topography, and high receiving water elevation, making gravity flow drainage systems nearly impossible. Above ground storage tanks would be infeasible because most of Port tidelands are built-out and there is limited room for these facilities. Also, above ground storage tanks pose a vector hazard and a visual nuisance.

Similarly, the proposed alternative compliance options such as an offsite mitigation option or increasing the treatment area onsite also is not feasible for the Port. The land within the Port is largely built-out and area to use for additional treatment is extremely limited. Meeting this requirement would come at a cost to proposed projects that would make them infeasible. Furthermore, mitigation outside of the Port's jurisdiction is also not an option because the Port would not have the authority to enforce the implementation and maintenance of BMPs outside of its jurisdiction. The Port requests that the retention requirement be removed from the permit.

6. Predevelopment Design Reference Used for Hydromodification Controls

The Tentative Order requires the use of "**pre-development** (naturally occurring)" as a runoff reference condition for hydromodification controls. Establishing the

pre-development condition of a site requires a reference start date, which is not outlined in the draft, and also requires accepted and defensible references to the **pre-development** soils, vegetation and topography which are also not identified in the permit. This requirement will also create additional and unnecessary costs to each jurisdiction and to the project without additional water quality benefits. A recommended alternative would be the use of a "**pre-project**" runoff reference. This reference point is already being used by the Copermittees in the current MS4 permit and has been used in other MS4 permits in the State. The Port requests that the **pre-development** design reference in the permit is replaced with **pre-project**.

7. Hydromodification Exemption

An exemption to hydromodification requirements that is in the current MS4 permit has been removed in the Tentative Order. The exemption applies to projects that discharge to conveyance channels that are stabilized (i.e. concrete lined) all the way to the receiving water. Hydromodification requirements are included in the permit to mitigate for potential erosion and channel degradation downstream of a development project. Projects that discharge to a stabilized conveyance channel do not present potential erosive impacts downstream or channel degradation therefore, the imposition of hydromodification requirements on such projects is unnecessary and will not provide water quality benefits. The Port requests that the hydromodification exemption for projects that discharge to stabilized conveyance systems be reinserted in the permit.

On behalf of the Port, I wanted to thank you for providing us the opportunity to engage with you and the other stakeholders through the public workshops, and the ability to submit comments on the Tentative Order. Please contact Allison Vosskuhler at (619) 686-6434 or avosskuhler@portofsandiego.org if you have any questions or would like additional clarification on the information provided.

Sincerely,

Randa Coniglio

Randa Coniglio,
Executive Vice President, Operations
San Diego Unified Port District

cc: Paul Fanfera
Bill McMinn
Karen Holman
Allison Vosskuhler

DM#557567

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File Number: 0100-092378

January 11, 2013

Mr. Wayne Chiu, P.E.
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Re: Comment – Tentative Order No.R9-2013-0001, Regional MS4 Permit,
Place ID: 786088Wchiu

Dear Mr. Chiu:

This letter comments on the San Diego Regional Water Quality Control Board's Tentative Order R9-2012-0011 ("Permit") dated October 31, 2012. After reviewing the proposed Permit, I am convinced that the benefits of the Permit as drafted overreachs in a way that will result in detrimental consequences that cannot be overriden by the theoretical benefits hoped to be achieved. The Permit as currently drafted imposes expensive, onerous, and untested regulations on local governments, businesses, and residents. These new regulations will impact the region's economy in a way that far exceeds whatever water quality benefit may result.

I understand the importance of clean, safe water to the region. As a member of the business community, I too am interested in improving San Diego's water. It is important, however, that we use our limited resources wisely, and ensure that our efforts produce the desired outcome of improving water quality without shutting down our economy or placing unreasonable and infeasible burdens on our local governments, businesses and residents.

I applaud the Board's inclusion of Water Quality Improvement Plans (WQIP) as a first step in developing a cost-effective approach to improving our water. Analysis remains a critical component of a successful strategy, and I am glad to see that the Board is committed to finding the best possible solution to water quality improvement.

I am concerned, however, that the costs associated with enforcing and implementing the permit will have a negative impact on my business and San Diego's economy. The four primary areas of concern include: 1) the strict liability for exceeding water quality objectives; 2) the additional and changing requirements for development projects, impacting items such as storm water retention and discharge; 3) the preemption of WQIPs by new and changing regulatory requirements prior to allowing the WQIPs to be developed and implemented; and 4) the lack of reliable funding sources to implement these regulatory changes.

SheppardMullin

It is necessary to hold individuals, businesses and governments accountable, but it is critical that the accountability measures can be reasonably achieved and are likely to have a significant and positive impact on San Diego's water. Because of these concerns, I respectfully request that the Permit focus on the timely development of effective and enforceable WQIPs, and that each of the WQIPs be developed through a process that ensures public participation. I ask also that the designation of appropriate Best Management Practices in each watershed be determined through the WQIP process rather than the one size fits all strategy currently being proposed in the Permit. I ask further that until the Board adopts a WQIP for a watershed that the provisions of the existing Permit remain in place for that watershed. Finally, in order to avoid unnecessary litigation I request that the Board adopt the WQIPs as Orders implementing the proposed Permit.

I urge you to adopt final permit language that is evidence-based and both environmentally and economically sustainable. Thank you for your consideration. Please contact me if you have any questions.

Very truly yours,

Donna Jones

Donna D. Jones
for SHEPPARD, MULLIN, RICHTER & HAMPTON LLP

SMRH:407690211.1

cc: Leah Hemze

Southern California Gas Company

A Sempra Energy utility®

January 11, 2013

Mr. Wayne Chiu, P.E.
California Regional Water Quality Control Board
San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

VIA E-Mail: wchiu@waterboards.ca.gov

Re: Comment – Tentative Order No. R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu

Dear Mr. Chiu and Board Members:

The Southern California Gas Company (SCG) provides transmission and distribution of natural gas throughout San Diego County and southern Orange County. Delivery of these essential public services requires routine and emergency construction, operation and maintenance of its linear utility infrastructure. A primary mandate to utilities and other entities with linear facilities regulated by the California Public Utilities Commission and/ or other state and federal regulatory agencies is to provide safe and reliable service. The above-referenced draft MS4 permit (draft Permit) would impact SCG facilities in our service territory within Region 9.

Our comments and recommended revisions to specific issues in the draft Permit are provided below.

Non-Storm Water Discharges

There is still confusion in the draft Permit regarding which non-storm water discharges are prohibited and must be eliminated and those discharges that are authorized. The draft Permit both states that it authorizes and prohibits non-storm water discharges but it is not always clear which are authorized and which are prohibited. In multiple locations (e.g. Finding 15), the draft Permit states that non-stormwater discharges into the MS4s must be "effectively prohibited" or eliminated. This section conflicts with other sections (Section II.A.1.b., for example), which state, consistent with EPA's regulations, that non-stormwater discharges authorized by a NPDES permit are authorized to be discharged to the MS4 system. One change that would help to clarify this issue would be to revise Finding 15 as follows:

> **Non-Storm Water and Storm Water Discharges.** Non-storm water discharges from the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard of CWA section 402(p)(3)(B)(iii), which is explicitly for "Municipal … *Stormwater Discharges* (emphasis added)" from the MS4s. Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s must be effectively prohibited. ***However, consistent with EPA's regulations, the draft Permit authorizes discharges of non-storm water to MS4s that are either authorized by a separate NPDES permit, or the discharge is a category of non-storm water discharges or flows that must be addressed pursuant to Provisions E.2.a.(1)-(5) of this Order.***

Prohibition of Non-Storm Waters

Section E.2.a.6. would prohibit any category of non-stormwater under Section E.2.a.1-4. if it is found by the co-permittee or the Regional Board to be a source of pollutants to receiving waters. We recommend that this section be revised to also allow the co-permittees to designate different and/ or additional BMPs to be implemented as opposed to prohibiting the category of non-stormwater and suggest the following language:

> If the Copermittee or San Diego Water Board identifies any category of non-storm water discharges listed under Provisions E.2.a.(1)-(4) as a source of pollutants to receiving waters, the category must be prohibited through ordinance, order, or similar means and addressed as an illicit discharge. ***Alternately, the Copermittee can designate different and/ or additional BMPs to be implemented as opposed to prohibiting the category of non-stormwater.***

Building Fire Suppression System Maintenance Discharges

Section E.2.a.5.a.1. would require the co-permittees to treat building fire suppression system maintenance discharges (e.g., sprinkler line testing and flushing) as an illicit discharge. These discharges have historically been allowed under existing MS4 permits and municipal ordinances with the use of appropriate BMPs. These activities are mandated by code and insurance companies and are essential to maintain a safe and reliable fire water delivery system. Changing existing systems to discharge to the sewer may not be feasible and/ or be expensive due to the existing plumbing configurations. These discharges should continue to be authorized with the implementation of appropriate BMPs as determined by the MS4. If existing BMPs are found to be inadequate, different and/ or additional BMPs could be required to be implemented by the MS4.

Discharges to Areas of Special Biological Significance

The draft Permit should clarify that non-storm water discharges (e.g., potable hydrotest dewatering, groundwater dewatering discharges, etc.) made pursuant to NPDES permits to MS4 systems that discharge to Areas of Special Biological Significance (ASBS) are authorized. These types of discharges are critical to on-going infrastructure development, maintenance and operation and the State Water Board's March 2012 "Exceptions to the Ocean Plan for Discharges to Areas of Biological Significance" provides that the NPDES permitting authority can authorize these discharges to ASBS by making an appropriate finding in the applicable MS4 permit. **We urge the RWQCB to include the following language as part of Finding 32:**

> ***"The ASBS exception authorizes the discharge of non-stormwater to a MS4 when an NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS. Accordingly, the RWQCB finds that since NPDES permits for non-stormwater discharges contain conditions and requirements to protect water quality and many of these permits are for short-term and/ or intermittent discharges (e.g., discharges from utility vaults and underground structures, construction groundwater dewatering, hydrostatic test water discharges, potable water discharges), these discharges will not alter natural ocean water quality and herein authorizes their discharge to MS4 systems that discharge to ASBS."***

Further, the following Sections need to be revised to ensure consistency and support the above finding:

- **Section II.A.1.d.:**

  "Storm water discharges ***and non-stormwater discharges made pursuant to NPDES permits*** from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special

Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 applicable to these discharges, included in Attachment A to this Order. All other discharges from the Copermittees' MS4s to ASBS are prohibited."

- **Section 2.I.A.1.e.2.ii**. in Attachment A needs to be revised to reference the above finding:

  "An NPDES permitting authority may authorize non-storm water discharges to an MS4 with a direct discharge to an ASBS only to the extent the NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS ***(see Permit Finding 32)***."

Non-stormwater Action Levels

The draft Permit should not subject non-stormwater discharges made pursuant to NPDES permits to action levels. Section II.C.1. would subject non-stormwater discharges to action levels. However, non-stormwater discharges that have NPDES permits are subject to their own discharge requirements. Setting additional, perhaps conflicting, requirements on these discharges is unnecessary and will lead to confusion. **We therefore urge the RWQCB to revise the draft Permit to clarify that the proposed non-stormwater action levels are not applicable to non-stormwater discharges that have NPDES permits**.

Development Planning

The draft Permit should not subject linear underground/ overhead (utility) projects (or LUPs) to permanent post-construction requirements. Section E.3. requires permanent BMPs for all development projects. LUP construction projects are regulated pursuant to the State Water Board's Stormwater Construction General Permit (CGP). Finding 76 in the CGP specifically excludes LUPs from permanent post-construction requirements due the nature of their construction. For consistency with the CGP, the draft Permit needs to clarify that Section E.3. is not applicable to LUPs as defined in the CGP. **We urge the RWQCB to make the following revisions:**

- **Finding 10**

  Pollutants Generated by Land Development. Land development has created and continues to create new sources of non-storm water discharges and pollutants in storm water discharges as human population density increases. This brings higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash. Pollutants from these sources are dumped or washed off the surface by non-storm water or storm water flows into and from the MS4s. When development converts natural vegetated pervious ground cover to impervious surfaces such as paved highways, streets, rooftops, and parking lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving a developed area without BMPs that can maintain pre-development conditions will contain greater pollutant loads and have significantly greater runoff volume, velocity, and peak flow rate than pre-development runoff from the same area. ***The nature of linear underground/ overhead projects (LUPs) is to return project sites to pre-construction conditions. Therefore, consistent with Finding 76 in the SWRCB's Storm Water Construction General Permit[1], LUPs are not subject to post-construction requirements.***

  [1] Order 2009-0009-DWQ, as amended by Orders 2010-0014-DWQ and 2012-0006-DWQ, contains the definition of Linear Underground/ Overhead Projects.

- **Definition of "Development Project"**

  "**Development Projects** - Construction, rehabilitation, redevelopment, or reconstruction of any public or private residential project, industrial, commercial, or any other projects. ***Development Projects do not include linear underground/ overhead projects as defined in the SWRCB Storm Water Construction General Permit (Order 2009-0009-DWQ, as amended by Orders 2010-0014-DWQ and 2012-0006-DWQ).***

The enclosed comments are in reference to the language found in the draft Permit. We request that these revisions also be made to the draft Permit's Fact Sheet/Technical Report.

Thank you for this opportunity to provide you with our comments. Please call Dianne Franks at 213-215-7583 if you have any questions concerning this letter.

Sincerely,

Crystal Yancey-York
Environmental Programs Manager

Via e-mail to *wchiu@waterboards.ca.gov* January 11, 2013

Wayne Chiu
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100

San Diego, CA 92123-4340

RE: Comments on Tentative Order Number: R9-2013-0001

The South Laguna Civic Association, established in 1946, supports comments and recommendations submitted September 14, 2012 by the "Environmental Groups" regarding the administrative draft of the San Diego Regional Municipal Separate Storm Sewer System (MS4) Permit, Tentative Order No. R9-2013-0001 ("Administrative Draft Permit").

While a regional permit can provide improved levels of efficiency, smaller, high value habitats and coastal receiving waters established as critical marine life recovery areas may be overlooked. The Aliso Watershed in south Orange County represents an area requiring closer consideration.

Aliso Creek discharges 1 to 5 million gallons per day of dry weather urban runoff from known inland MS4 point sources. Twenty years of monitoring reports and over $20 million have clearly

identified at least one dozen offending storm drains with daily dry weather flows exceeding 150,000 gallons per day (GPD). Only one storm drain in Laguna Niguel has received a Clean-up and Abatement Order during this period.

As recently as 1982, surveys of Aliso Creek indicated no flows throughout the dry season. In fact, early ranching of Aliso Canyon with subsequent destruction of critical native trees and vegetation led to long drought conditions and widespread, fatal dehydration of cattle.

Today, the primary source of elevated creek flows originates exclusively from inland over-irrigation and careless discharges of recycled water. Non-native creek flows transport a toxic variety of pollutants and carcinogens from residential, commercial and municipal known point sources with measurable quantities of herbicide, pesticide, fertilizer, automotive and similar residues to protected creek, estuary and coastal receiving waters. Aliso Beach is permanently posted for contaminated water and remains a risk to public health and safety.
(Please see Exhibit A – 2011 Aliso Creek Daily Flow/e.g., August 1, 2011 @ 7.6cfs = 4.9 MGD)

Economics of Water Pollution

Water Districts profit significantly from the sales of recycled water yet fail to be held accountable by the SDRWQCB for illicit discharges generated specifically by careless over-irrigation. Over-irrigation produces hundreds of thousands of dollars in excess revenues each year to inland Water Districts that persistently ignore the impact of their product water. Profiting from water pollution discharges to protected receiving waters is illegal as adjudicated by Friends of the Earth v Laidlaw (2000) and other statutes and regulations.

"District Court found that Laidlaw had gained a total economic benefit of $1,092,581 as a result of its extended period of noncompliance with the permit's mercury discharge limit; nevertheless, the court concluded that a civil penalty of $405,800 was appropriate. In particular, the District Court found that the judgment's "total deterrent effect" would be adequate to forestall future violations..." (Friends of Earth, Inc. v. Laidlaw Environmental Services (TOC), Inc. - 528 U.S. 167 (1999)

In the Aliso Watershed, recycled water sold for irrigation and over watering produces an average creek discharge flow of 3 MGD during the nine month dry season. Sold at $1000 per Acre Foot (AF), this irrigation product water yields revenues to inland Water Districts of over $10 million during the five year MS4 Permit cycle. (calculation: 3 MGD = 9 AF x $1000/AF x 300 days = $ 2.7/year x 5 year permit cycle = $10 mil+).

Lacking effective enforcement measures by the SDRWQCB, these excessive and illegal profits encourage increased sales of irrigation water without any accountability for the obvious impacts of water products to protected creek and coastal receiving waters. The Irvine Ranch Water District, El Toro Water District, Santa Margarita Water District and Moulton Niguel Water District must not be allowed to profit from water pollution.

Persistent violations of MS4 requirements are acknowledged by all parties yet the SDRWQCB refuses to invoke effective enforcement measures and fines. Without economic disincentives, offending Water Districts gain illegal profits while inland cities accumulate tax property revenues from poorly

engineered development projects. Citations against the more egregious offending storm drain dischargers can release funds for effective mitigation measures and support incentives for regional MS4 compliance.

Environmentally Sensitive Areas (ESA)

The Aliso Watershed is a compact 34 square mile area suffering decades of neglect and pollution originating from poorly engineered residential developments among inland cities. Plans to add 17,000 new houses to South Orange County in the coming years will exacerbate the water pollution crisis facing Laguna Beach. Runoff management plans fail to control dry weather urban runoff and knowingly contribute directly to increased flows and erosion during routine storm events.

The Aliso Creek Wilderness Park remains degraded from erosion impacts to streambed habitat and threatens to expose critical sewage infrastructure transporting 10 to 15 million gallons of secondary sewage to the Aliso Creek Ocean Outfall only 1.2 miles offshore. A recent study by TetraTech for the South Orange County Wastewater Authority (SOCWA) determined the integrity of creek infrastructure to be capable of failure in as little as 5 years. Coastal receiving waters at the mouth of Aliso Creek are impaired by polluted urban runoff flowing at 1 to 5 million gallons per day (GPD). Aliso Creek is listed as a 303(d) Impaired Water Body by the Clean Water Act and continues to fail to meet present and previous MS4 Permit requirements. (Exhibit B – Aliso Creek Watershed 303(d) Impaired Waterbodies)

All Co-Permitees, as signatories to the MS4 Permit, are legally responsible for water quality in terms of coastal receiving waters. The regulatory and legal nexus is clear between unpermitted discharges by inland Co-Permitees, creek erosion and infrastructure damage, ocean pollution and public health hazards associated with these contaminated daily flows.

Aliso Beach, at the mouth of the federally listed contaminated creek, is permanently posted. However, coastal receiving waters are protected as the Laguna Beach State Marine Conservation Area established unanimously by the California Fish & Game Commission on January 1, 2012.

Laguna Beach State Marine Reserve

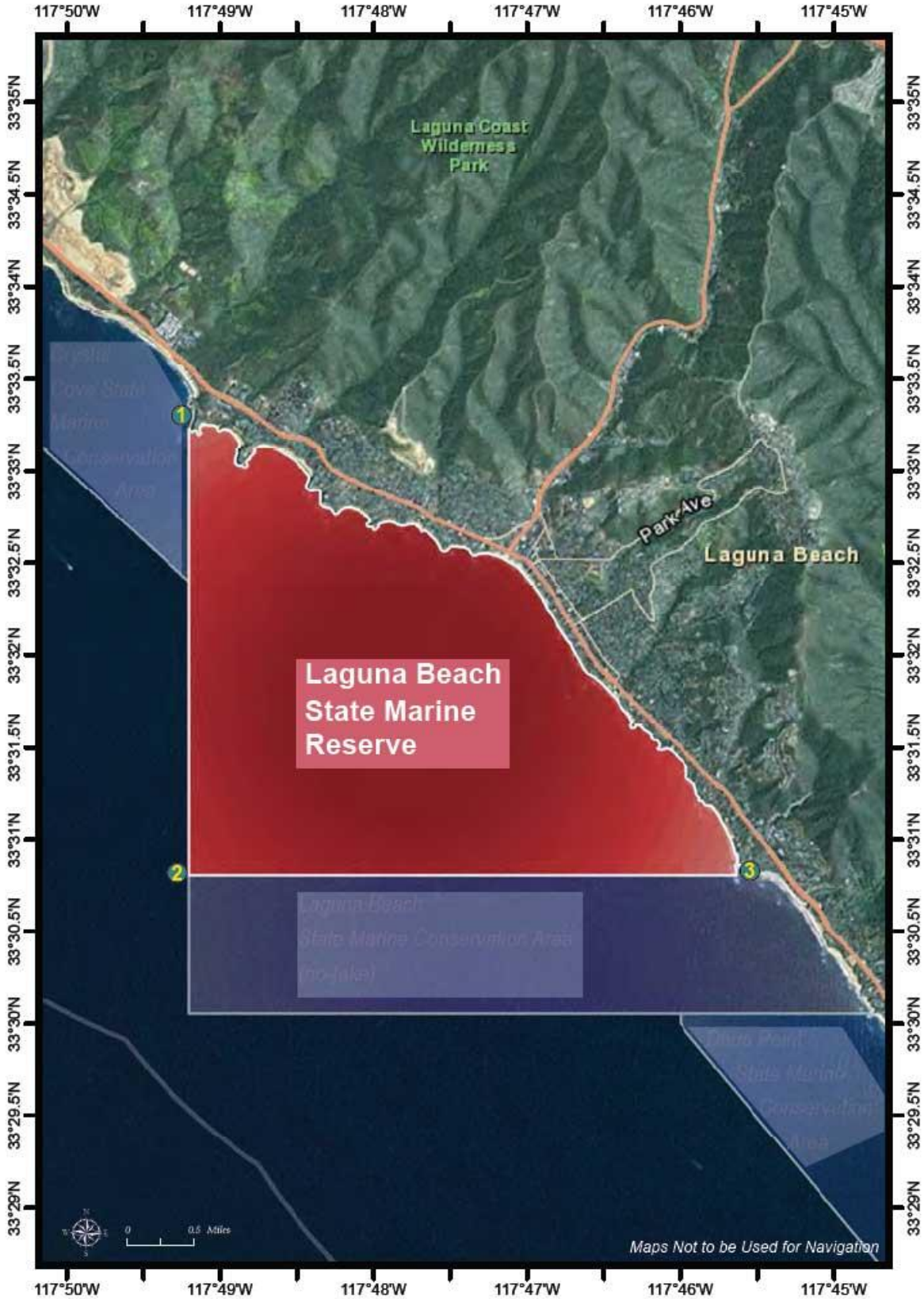

The proposed MS4 Permit does not adequately address efficacious measures to protect creek and coastal receiving waters while allowing contaminated discharges to persist without adequate enforcement actions. Lacking meaningful enforcement actions, inland cities as Co-Permitees, persist in ignoring or circumventing water quality regulations with impunity while creek and coastal receiving waters and ESA habitats continue to be incrementally degraded by polluted dry weather flows. Damage to coastal habitats is cumulative and potentially expensive in terms of restoration.

Likewise, failed Best Management Practices (BMP) stormwater facilities required as a Condition of Approval for inland residential, industrial and municipal developments are inadequately engineered devices incapable of mitigating elevated flows from stormwater events directed to creek and coastal receiving waters. The cumulative impacts of contaminated dry weather discharges and elevated stormwater flows have destroyed the functions of the Aliso Estuary (a protected coastal wetland), tidepools, fish nurseries and local kelp forests.

Shellfish areas in California receive the highest water quality protection standards. The economic value of shellfish to the economy is well established and place names such as Abalone Point, Mussel Cove, Shellfish Beach, etc. along Laguna Beach's coastal receiving waters suggests the prominence of shellfish habitat in the local area. Routine underwater surveys of mussel grounds near the mouth of Aliso Creek reveal large areas of dead shellfish likely exposed to the urban runoff plume. Dry weather discharges and elevated stormwater flows to Laguna Beach's coastal receiving waters are incompatible with protection of ESA Shellfish habitat and should be vigorously regulated and prohibited in the proposed MS4 Permit.

Laguna's coastal receiving waters are prime foraging grounds for protected marine life including coastal dolphins, gray whales and blue whales.

Safari/Marc Carpenter, via Associated Press

A blue whale surfacing at 1000 Steps, South Laguna

The California Coastal Act is specific in protecting the health and welfare of marine mammals among other species. Therefore, the proposed MS4 Permit must address water quality inconsistencies among regulating agencies.

1. California Coastal Act, Article 4, Section 30230. Recent summer sightings of federally protected Blue Fin Whales feeding at the location of the Aliso Ocean Outfall suggest the need for compliance with the Coastal Act. The unseasonal presence of marine mammals feeding on krill indicates the presence of phytoplankton populations sustained by nutrient rich urban runoff and offshore sewage discharge plumes migrating to surface waters. New research also highlights the presence of hormonal endocrine disruptors in recycled water and sewage discharges as a contributing factor in the feminization of male fish.

2. California Coastal Act, Article 4, Section 30231. The SDRWQCB overlooks requirements for "the biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of waste water discharges and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface water flow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams."

3. Water Reuse Law, Water Code Sections 461-465 and Water Reclamation Law, Water Code Sections 13500-13556 requiring beneficial reuse of inland water product to implement recycled water throughout Laguna Beach in achieving a State mandated 20% reduction in imported water by 2020.

The recent Army Corp of Engineers Study Area Map recognizes the relationship of MS4 regulated areas by incorporating the coastal receiving waters for lower Aliso Creek project considerations. No similar map or chart is available to track and monitor regulated coastal receiving waters subjected to the contaminated urban runoff "freshwater lens".

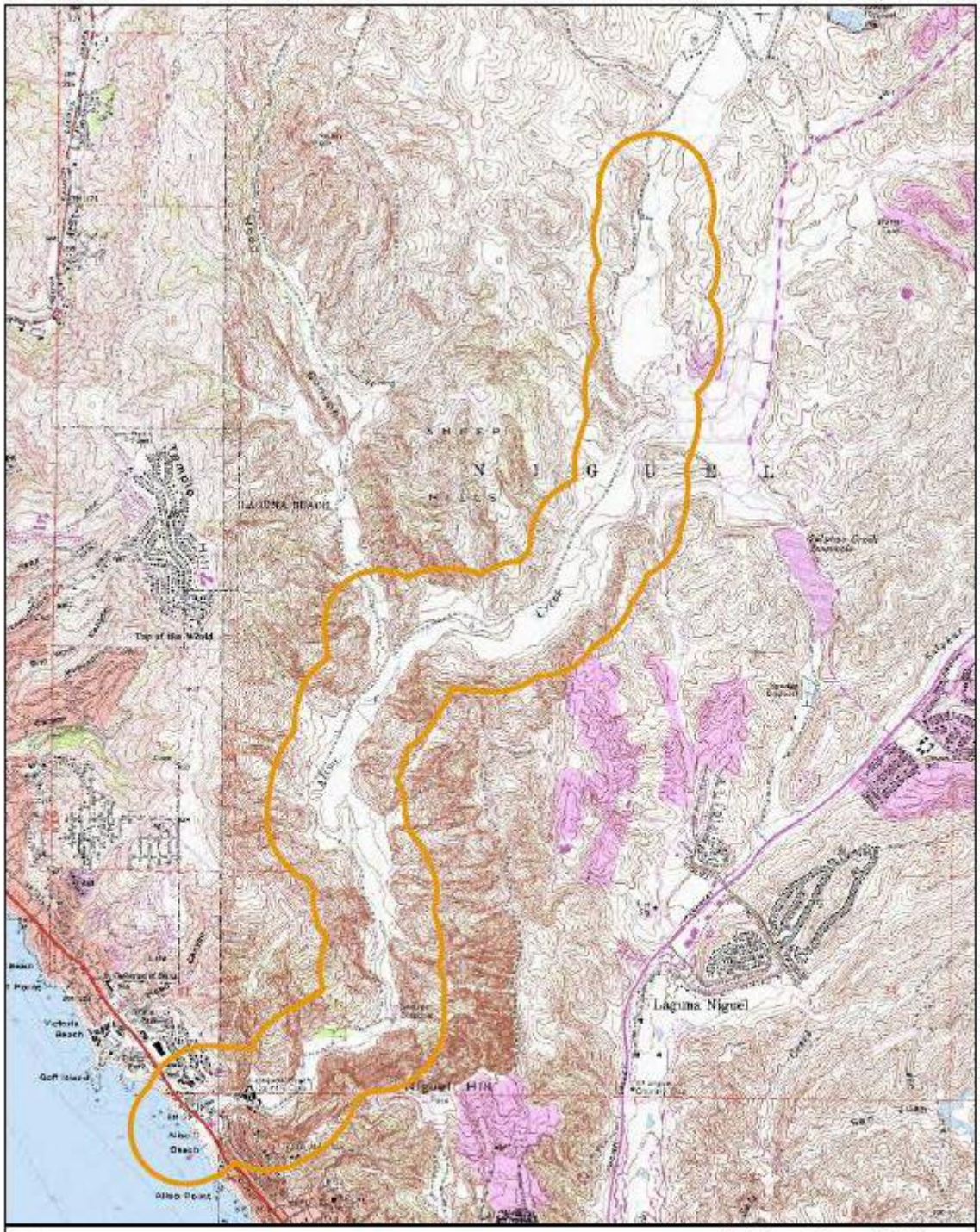

N

CDM

Legend

Study Area Boundary

0.25 0 0.25
Miles

U.S. Army Corps of Engineers
Aliso Creek Ecosystem
Restoration Study
USGS Topographic Map

Figure 2.1-1

Urban Runoff, Secondary Sewage Discharges & Ocean Upwelling

Coastal receiving waters at the mouth of Aliso Creek are protected as the Laguna State Marine Conservation Area (SMCA). These important tidepool, rocky shore and kelp forest habitats, however, are subjected to multiple water pollution impacts from the combined urban creek urban runoff plume and Aliso Creek Ocean Outfall.

Ocean upwelling transports contaminates from the offshore sewage discharges to shore and mix with the visible creek urban runoff freshwater plume. Harmful algae blooms fed by these "nutrient rich" discharges plague coastal receiving waters and contribute to the destruction of kelp forests and shoreline fish nurseries. Beach visitors, often from regional low-income disadvantaged communities, suffer exposure to severe public health threats.

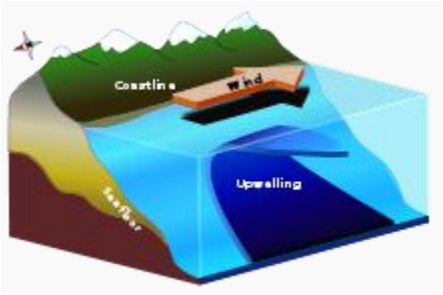

Multiple requests to South Coast Wastewater Authority for a comprehensive interactive map of the Aliso Creek coastal discharge plume and the Aliso Creek Ocean Outfall Plume are routinely ignored. An accurate map will identify protected coastal receiving water resources including tidepools, rocky fish nurseries and shellfish habitats, kelp forests, dolphin birthing and foraging grounds, as well as near shore whale migration routes. Charting dominant littoral currents and counter currents will reveal distribution patterns of urban runoff induced Harmful Algae Blooms and thermal plumes. Lacking such basic information, assurances of safe ocean water quality are presented without a fundamental scientific understanding of coastal dynamics.

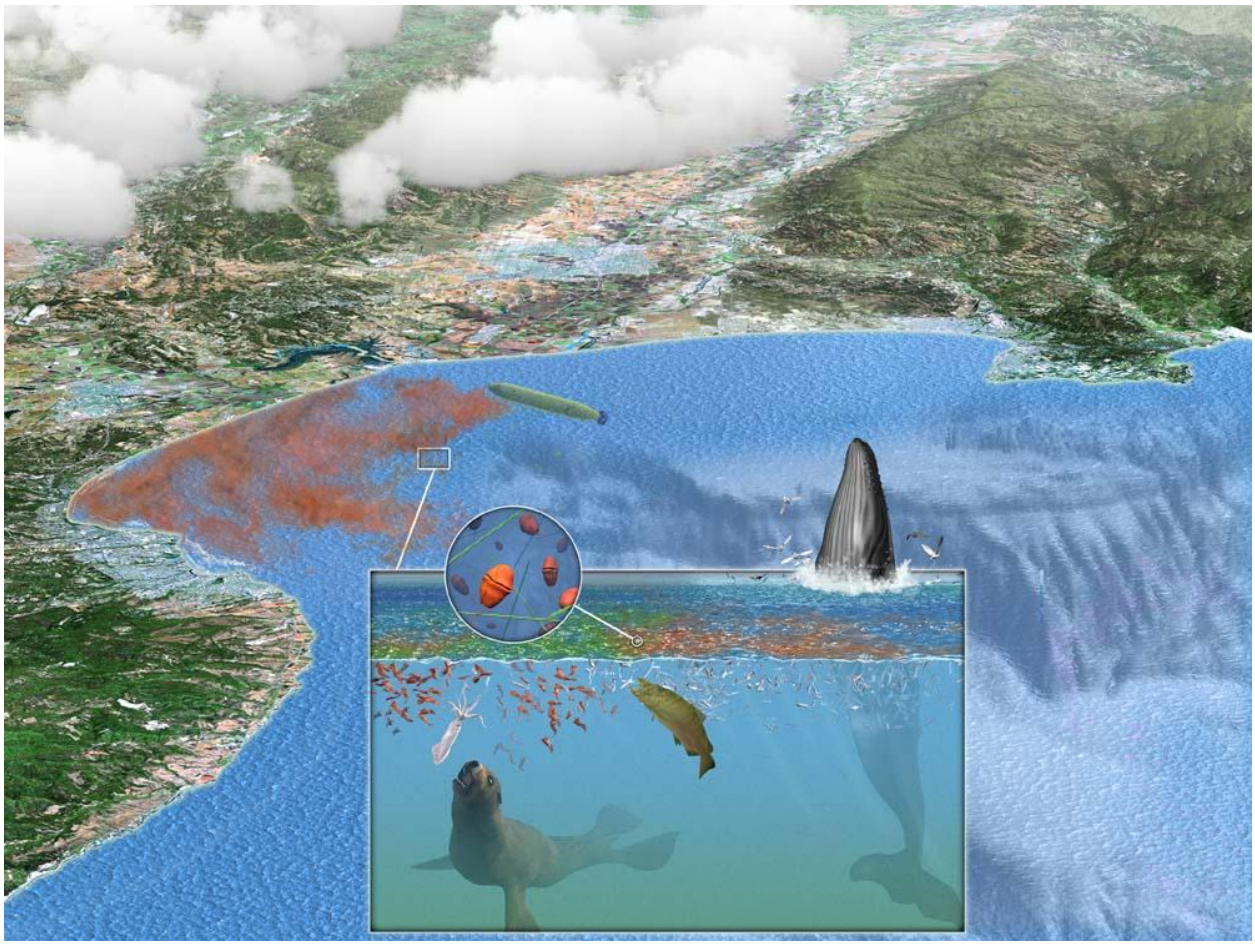

Dry weather urban runoff plumes to Laguna's coastal receiving waters feed summer-long Harmful Algae Blooms (HABs) contributing to domoic acid poisoning of sea lions, whales, shellfish and fishing resources.

Hydromodification

The rapid regional development of residential tracts over the past few decades has been accomplished using grading techniques to create long, flat terraced building sites. In an effort to simplify construction on flat sites, natural contours are replaced with cut and fill earthworks removing natural top soils before paving over hydric substrates and native deep root vegetation. These practices expose expansive clay soils.

Developers avoid expensive deep caissons to bedrock or multiple dewatering wells and simply pour concrete pads over unstable clay substrate. City leaders seeking increased tax revenues and development fees utilize engineers unfamiliar with local clay soils and the semi-arid ecology to approve massive grading plans that ultimately fail.

Unsuspecting homeowners subsequently experience extensive expansion and contraction of clay subsoils following annual storm events. As foundations fail, water supply lines, sewage lines and

related infrastructure become compromised requiring expensive repairs. By this time, however, developers have either moved or filed for bankruptcy protection leaving thousands of present homeowners without remediation opportunities. Engineers, city planners and elected officials, while complicit, are not held accountable through enforcement by the SDRWQCB. Poorly engineered residential developments with substandard clay soils continue to be approved to aggravate the condition and burden taxpayers for expensive repairs.

The Aliso Watershed is a clear example of faulty hydromodification design. Beginning with the construction of the federal Chet Holfield Ziggerat Complex, large areas of the native creek with valuable hydric soils were paved over for massive parking lots. The channelized creek lost critical inland wetlands and groundwater percolation sites with the removal of over 1500 feet of the creek ox bow. This wetland site historically provided water, fish and double canopy vegetative cover for the early "Nigueli"... the name of a Juaneno Native American village once located near a lagoon along Aliso Creek. The City of Laguna Niguel derives its name from the Spanish designation of this critical creek ox bow area.

Systematic destruction of vast native watershed trees and vegetation to support early ranching activities continue to plague the effectiveness of this and many watersheds in the San Diego region. Developers and complacent city planners exploiting degraded ranchlands simply continue the “biodegradation” while avoiding the true costs to the environment and taxpayers for their profiteering urbanization schemes. Facing unrelenting pressure from developers, water districts and municipalities, regulatory agencies charged with protecting critical creek and coastal receiving waters, fail to invoke effective enforcement with measurable water quality benefits.

Recommended Actions

Poorly engineered projects can be re-engineered to achieve mandated water quality objectives.

1. Maps of all creek and coastal receiving waters indicating water quality impacts can be created by SCCWRP, Scripps, NOAA or any number of competent university or regulatory groups. A Bioregional Watershed Map will identify degraded land elements, offending storm drain outlets and candidate areas for re-forestation and estuarine/coastal restoration.

2. On an annual basis, citations against the primary six known storm drain point sources in each watershed can incrementally compel clean-up and abatement throughout a given watershed bioregion without the burden of costs to abate all points of contamination at once. Failed Best Management Practices (BMPs) urban runoff facilities, required as a Condition of Approval for inland residential developments, can be retrofitted with dry weather diversions to local Publically Owned Treatment Works (POTWs) or, alternatively, re-engineered with deep groundwater injection wells.

3. Fines must be allocated to re-vegetate impaired watersheds and kelp forests to restore the native functions of semi-arid creeks and protected coastal receiving waters. A re-forested Aliso Canyon with a canopy similar to San Mateo Creek will qualify for California Cap and Trade

funding to offset costs. Restoration of natural habitats is demonstrated to be the best, most cost effective measure for improving watershed water quality.

4. Restoration of high value coastal wetlands and estuaries will guarantee protection of natural beach sand berms and provide measurable improvement to coastal receiving waters. Funds from the California Coastal Conservancy and other wetland recovery resources can offset costs.

5. Watershed restoration will offer multiple community benefits by reducing destructive stormwater flows, eliminating pollutants and increasing eco-tourist revenues to surrounding cities. Large street cisterns incorporating designs proposed by GeoSynTech for the re-development of the Aliso Golf Course can serve as a model for extensive rainwater harvest/reuse systems. Restoration of some or all of the 1500 foot Aliso Creek Ox Bow in Laguna Niguel can restore hydric soils to reduce stormwater impacts.

6. Increased use of recycled water for wildland fire suppression along the entire Highway 73 Toll Road bisecting the Laguna Greenbelt will maintain a healthy, fire safe wilderness area. Orange County Measure M and State Proposition funds are available to offset costs. Increased use of recycled water reduces ocean discharges to the Laguna State Marine Conservation Area.

7. A citywide network of recycled water for all of Laguna Beach will reduce imported water demand significantly and increase water security, disaster preparedness and fire suppression resources. Revenues from routine use for irrigation mandated Fuel Modification Zones will provide new revenue streams. Laguna Beach is the only Orange County city without a comprehensive recycled water program and remains a "once use" community of valuable imported water.

The MS4 Permit Renewal process offers the opportunity to advance beyond failed measures and begin the renewal of the region's unique watershed and coastal ecology. All Stakeholders can benefit through proactive initiatives and, as the overall watershed ecology improves, the cost savings from stormwater damage, water pollution, protracted litigation and public health threats will become evident. The South Laguna Civic Association has offered constructive, critical information and suggestions during the previous MS4 Permit cycle which have been largely ignored to the public's detriment.
(Exhibit C – SLCA Comments on Tentative Order No. R9-2007-0002 NPDES, No. CAS0108740)

Cooperation and courage are essential and the South Laguna Civic Association remains committed to working towards real, measurable, sustainable solutions. On behalf of our community and the many visitors from throughout the world to our shores, we thank you for your review and support of our recommended actions.

Michael Beanan

Vice President
South Laguna Civic Association

mike@southlaguna.org

Attachments

Exhibit A - Daily Mean Discharge in Cubic Feet/Second - Water Year Jul 2011 to Jan 30, 2012
Exhibit B - Aliso Creek Watershed 303(d) Impaired Waterbodies)
Exhibit C – SLCA Comments to Tentative Order No. R9-2007-0002 NPDES, No. CAS0108740

Exhibit A - Daily Mean Discharge in Cubic Feet/Second Water Year Jul 2011 to Jan 30, 2012

Day	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
1	5.5	7.6	5.7	4.9	4.9	4.9	5.6		
2	5.4	6.3	5.6	4.6	4.8	4.8	5.6		
3	5.3	5.6	5.6	4.6	4.8	5.2	5.7		
4	5.8	5.4	5.5	12	26	4.9	5.6		
5	5.8	5.4	5.9	145	13	5	5.9		
6	5.5	5.4	6	28	20	5.4	5.8		
7	5.4	5.5	5.6	10	11	5.7	5.7		
8	5.5	5.4	5.4	6.9	6.9	6	7.1		
9	5.8	5.7	5.4	5.8	5.7	6.5	6		
10	5.7	5.6	8.4	5.3	5.2	5.9	5.6		
11	5.7	6	7.8	5	5.1	5.7	5.7		
12	5.8	5.8	7.1	5	36	22	5.7		
13	5.7	5.8	5.7	5.1	18	16	5.8		
14	5.8	5.7	5.2	5.1	8.7	8	5.4		
15	6	5.6	5.2	4.9	6.3	38	5.5		
16	5.9	5.7	5.1	4.9	5.5	18	19		
17	5.9	5.7	5.4	5	5.3	8.2	7.4		
18	5.9	5.4	5.3	5.3	5.2	6.9	6.1		
19	5.9	5.7	5.1	5.4	5.1	6.3	5.7		
20	5.8	5.7	5.1	5.4	86	6.4	5.5		

21	5.8	5.6	5	5.6	36	6		69	
22	6	5.6	5	5.3	10	5.5		16	
23	5.9	5.8	5.1	5.5	7.2	5.4		56	
24	5.9	5.8	5.1	5.5	6.1	5.5		19	
25	6	5.7	5.1	5.6	5.6	5.5		9.2	
26	5.6	5.8	5.1	5.3	5.4	5.7		7.3	
27	5.6	5.6	5.2	4.9	5.3	5.8		6.6	
28	5.7	5.6	5	4.9	5	5.7		6.1	
29	5.9	5.6	5	4.7	5.1	5.5		5.9	
30	5.7	5.8	5	4.7	5.1	5.7		------	
							------	------	---
31	8.9	5.8	------	4.8	------	5.9		---	

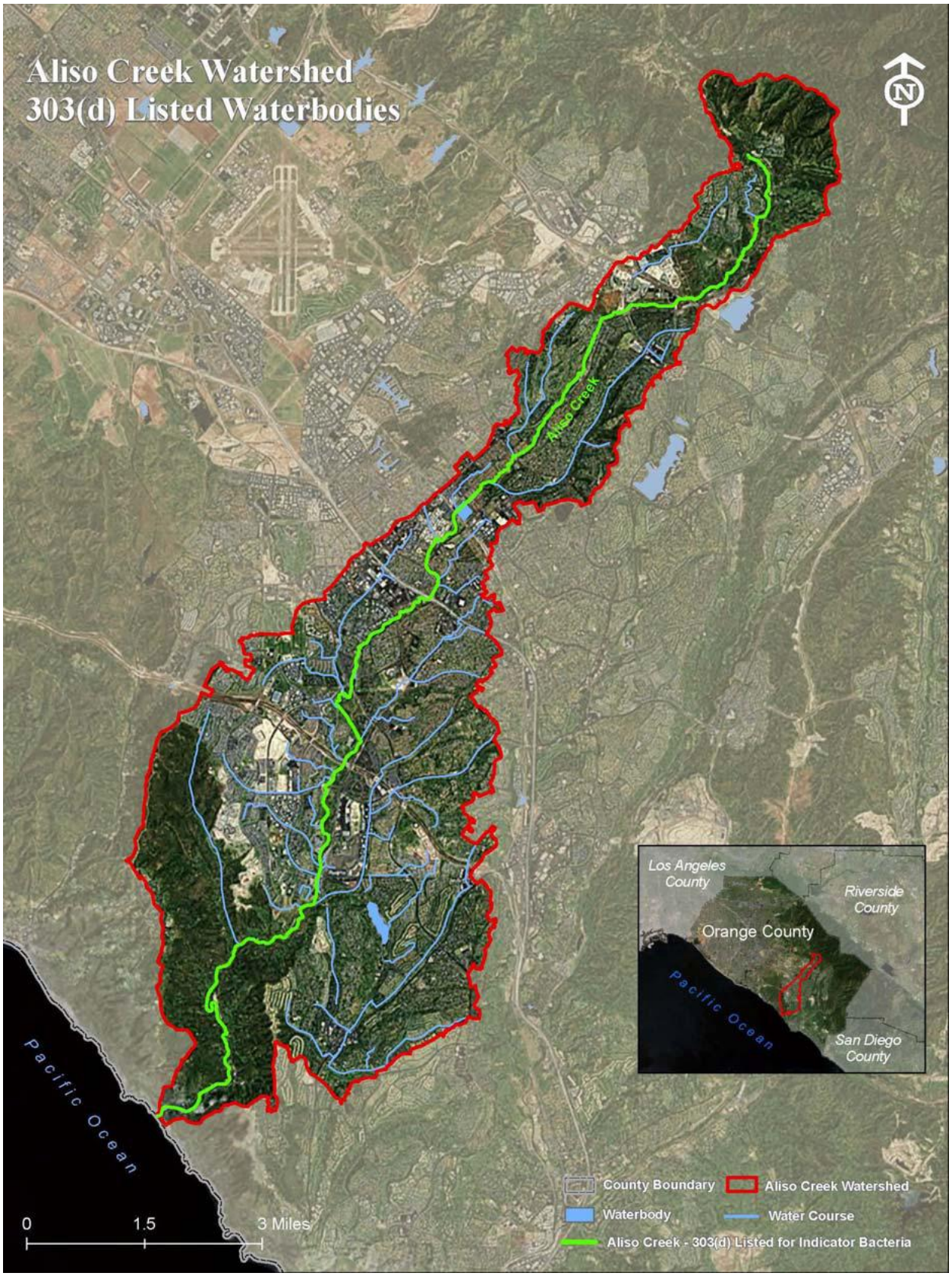
Aliso Creek Watershed
303(d) Listed Waterbodies
N
Aliso Creek
Pacific Ocean
Los Angeles County
Riverside County
Orange County
Pacific Ocean
San Diego County
0
1.5
3 Miles
County Boundary
Aliso Creek Watershed
Waterbody
Water Course
Aliso Creek - 303(d) Listed for Indicator Bacteria

Exhibit C - SLCA Comments to 2007 MS4 Permit

Jeremy Haas April 11, 2007
California Regional Water Quality Control Board
San Diego Region 9
9174 Sky Park Court, Suite 100
San Diego, CA 92123
RE: Tentative Order No. R9-2007-0002 NPDES, No. CAS0108740

The members of the community of South Laguna represented by the South Laguna Civic Association, established in 1946, recognizes urban runoff from dry weather flows continues to be discharged through regional storm drain systems permitted exclusively to convey rain water.

The proposed SDRWQCB Tentative Order No. R9-2007-0002 knowingly, willfully and intentionally perpetuates a threat to health and safety while contributing to degradation of local creek and coastal water resources by allowing MS4 storm drain systems to transport polluted water originating from the imported water supply industry.

Dry weather flow rates in the subject watershed presently exceed all previous flow rates and are recognized as the principle source of nutrient loading and ocean pollution. Chemical fingerprinting analysis of urban runoff by the Santa Margarita Water District attributes the source of 60% to 90% of urban runoff dry weather flows as originating from imported water sources in either Northern California or Colorado. Dry weather flows to storm drains are from anthropogenic influences rather than natural storm events.

Seminal research by the University of Southern California and others concludes urban runoff is responsible for feeding prolonged, destructive algae blooms along the Southern California Bight. In conveying inland sources of fertilizer and phosphates nutrients, dry weather urban runoff estimated at 5,000,000 gallons per day in the Aliso Watershed alone is causing increased outbreaks of domoic acid poisoning and deaths among sea mammals in Laguna Beach. The SDRWQCB fails to take into consideration impacts of uncontrolled dry season urban runoff on the health and welfare of coastal receiving waters. In spite of repeated requests, the SDRWQCB and Co-Permitees to not incorporate the urban runoff ocean plume into the watershed mapping procedure rendering decision making ineffective and monitoring activities scientifically incomplete.

As indicated in Staff Reports, the SDRWQCB, South Orange County Wastewater Authority (SOCWA), inland cities and County Co-Permitees continue to fail to Cleanup and Abate contaminated dry weather urban runoff flows and thereby violate key statues of the Porter-Cologne Act and Clean Water Act.
In allowing the County and City Co-Permitees to continue to discharge polluted urban runoff water flows, the members of the SLCA and the general public are denied access to safe, unpolluted coastal recreational opportunities while exposing them to known respiratory and digestive illnesses. The incremental and cumulative discharge from Aliso Watershed storm drains also knowingly and willfully contributes to potential health risks from consuming local fish.

Likewise, potential private property values are threatened by disclosures during real estate transactions of public health hazards emanating from polluted coastal waters.

Residences at the mouth of Aliso Creek are permanently damaged by summer urban runoff from erosion and stagnant ponds. Damage from urban runoff pollution to critical kelp habitats and marine mammals characteristic of South Laguna Marine Reserve off of Aliso Beach are well documented in the scientific literature.

The Aliso Watershed has more than 64 storm drains with elevated fecal coliform levels and excessive flow rates. The inability of the SDRWQCB over the past 20 years to control illegal dry weather discharges suggests a pattern of failed interventions portending a dangerous precedent of chronic future water pollution to the community of South Laguna with a population of 5,000 residents and the general beach visiting public.

The South Laguna Civic Association (SLCA) seeks a thorough review of the laws, regulations and facts pertaining to mismanagement of the subject MS4 Storm Drain Permit. Verifiable action capable of significant reductions in dry weather flow rates must be implemented. Numerical flow rate reduction, specific performance benchmark deadlines and significant penalties for non-compliance must be incorporated into any credible permitting process. Interception of urban runoff flows at known inland point sources is technologically feasible through deployment of approved Best Available Control Technologies presently used by the development, military and oil industries. If necessary, a watershed Cleanup and Abatement Order can accelerate permitting and fast track measures until such time full compliance is achieved.

Failure to mitigate or comply requires the SDRWQCB to be directed to California Water Code Section 13304(a) and following to seek an injunction against the County and offending cities or perform the work itself. Concurrent with the present evaluation of Tentative Order No. R9-2007-0002, the SLCA seeks emergency action due to significant, immediate and potential harm from known health risks associated with dry weather urban runoff conveying elevated levels of fecal coliform and other contaminates to South Laguna since:

1. Substantial harm to the community of South Laguna will continue to occur this summer from exposure to dry-weather flows of contaminated urban runoff in the subject watershed. The approval of a systematically flawed MS4 Storm Drain Program will establish a dangerous precedent in the Aliso Creek Watershed and other impaired watersheds in the State of California to the detriment of South Laguna's public health and safety as well as the protection of natural resources.

2. Neither the inland cities, County, SDRWQCB, SOCWA nor public will incur substantial harm from issuance of a comprehensive dry weather storm drain management program. The South Laguna Civic Association, in fact, will benefit from incremental reduction of contaminated flows from inland storm drains into creek and coastal receiving waters. Establishing a pattern of enforcement and full compliance with cleanup and abatement laws will initiate additional timely actions by the SDRWQCB to improve water quality in the Aliso Watershed and elsewhere. Costs associated with a comprehensive program to control dry weather flows can be minimized by fines, deployment of cost saving water conservation measures and revenues generated from beneficial reuse opportunities of 5 million gallons of urban runoff per day in the Aliso Watershed.

3. As indicated in this and other communications, substantial questions of fact and law are associated with the proposed Tentative Order No. R9-2007- 0002. The fact remains that immediate compliance and cessation of dry weather urban runoff is technologically and economically feasible as demonstrated by earlier diversions to the Moulton Niguel Water District's sewer treatment facility and, later, short term operation of mobilized urban runoff filtration units.

The narrative below cites a number of laws pertaining to enforcement of Cleanup and Abatement Orders (California Water Code Section 13304); the SWRCB Water Quality Enforcement Policy (February 19, 2002; pages 3,4,11,26, 39,42); regulations and policies governing Environmental Justice (Government Code Section 65040.12 and Public Resources Code Section 72000).

The County and City Co-Permitees concede their failure to Cleanup and Abate elevated levels of fecal coliform and increased urban runoff flow rates in the Aliso Watershed. The SDRWQCB does not comply with California Water Code Section 13304. Indeed, during the past 20 years, the Regional Board has failed to effectively intervene.

California Water Code Section 213300-13308, Chapter 5, provides the SDRWQCB Enforcement authority to issue a Cleanup and Abatement Order to remedy dry weather urban runoff.

Section 13304(a) "Upon failure of any person to comply with a cleanup and abatement order, the attorney general, at the request of the board, shall petition the Superior Court of the County for an issuance of an injunction requiring the person to comply with the order."

The SDRWQCB unwillingness to enforce compliance also violates Section 13304 (1)(b);(2)(a), (c), (e) to expend available money themselves to perform cleanup, abatement or remedial work; to intervene to perform the work itself; recover costs for cleanup and abatement work; and protect or prevent threatened probability of harm to persons, property or natural resources.

It is again worth noting, temporary compliance was achieved in 2003 utilizing mobilized water filtration units recognized among Best Management Practices (BMP). During its brief period of operation, the above BMP treated over 14 million gallons at JO3PO2 to reduce fecal coliform from 10,000 cfu's to less than 1. The SDRWQCB, SOCWA, Moulton Niguel Water District, City of Laguna Niguel and County dischargers arbitrarily elected to terminate this effective technology to experiment with low cost constructed wetlands, which ultimately failed to reach compliance levels for fecal coliform at the JO3PO2 outlet and took no effort to remove flows originating from abandoned imported water sources.

The SWRCB Water Quality Enforcement Policy (February 19, 2002; pages 3,4,11,26, 39,42) specifically directs the Regional Board to take action against the following:

- Any knowing, willful, or intentional violation of the (Porter Cologne Act)
- Any violation of (the Porter Cologne Act) that enables the violator to benefit economically from noncompliance, either by realizing reduced costs or by gaining a competitive edge advantage.
- Any violation that is a chronic violation or that is committed by a recalcitrant violator.
- Any violation that cannot be corrected in 30 days.

The SDRWQCB has taken no action pursuant to the above policies while proceeding to accommodate City and County Co-Permitees, Water Districts, SOCWA and developers at the expense of and detriment to the members of the SLCA and the general public.

Section 13350(m) of the Porter-Cologne Clean Water Act defines nuisance as anything which meets all of the following requirements:

1. Is injurious to health, or is indecent of offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life and property.

2. Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal.

3. Occurs during, or as a result of, the treatment or disposal of wastes.

Dry weather urban runoff meets and exceeds the legal definition of "nuisance" by virtue of it's widespread impacts to water quality variables. "Waste" refers to "waste water" knowingly and willfully generated by imported and reclaimed water sold at reduced rates that ignore significant post-irrigation dry weather urban runoff impacts.

Members of the South Laguna Civic Association are at particular risk of injurious health from frequent exposure to pollution in Aliso Creek and recreational coastal water activities. Such threats and illnesses create an obstruction to the free use of public property at local County parks, protect State Marine Reserves and beaches to thereby interfere with the comfortable enjoyment of life and property.
The extent of annoyance and damage is unequal with increasing harm to individuals such as swimmers, surfers, SCUBA divers, etc. with more frequent contact to polluted creek and ocean waters according to recent studies by the University of California, Irvine. Young children playing long hours at the beach and pregnant women are particularly high-risk populations.

The casual relationship occurring with the discharge of contaminated urban runoff wastewater with elevated fecal coliform levels is well established in scientific and medical literature as to impose a viable threat to the community of South Laguna. Government Code Section 65040.12 and Public Resources Code Section 72000 states:

"…the fair treatment of people of all races, cultures and income with respect to the development, adoption, implementation and enforcement of environmental laws, regulations and policies"

The proposed Tentative Order No. R9-2007-0002 is discriminatory and violates the State of California's definition of Environmental Justice.

As previously noted, the community of South Laguna and visitors to the Aliso Creek Watershed and Aliso Creek County Beach have entreated the SDRWQCB for decades for relief from polluted urban runoff flows resulting from the non-regulation or enforcement of the County/City's chronic storm drain discharges of dry season urban runoff. Local low income and working class residents have suffered damages to health, safety and liberty in their access to Aliso Creek and the Pacific Ocean.

Despite the obvious tangible and verifiable nature of these damages, South Laguna and the general public have yet to receive any effective regulatory assistance either from the State or Regional Water Boards. This failure to provide relief is not due to any lack of knowledge or information. The SDRWQCB has repeatedly and extensively investigated the mechanism by which storm drains physically convey fecal coliform bacteria and other contaminants downstream into the Aliso/Woods Canyon Regional Wilderness Park, South Laguna and the Aliso Creek County Beach. There remains no doubt that the City/County dry weather storm drain discharges are the cause of summer beach and ocean pollution.

Despite this clear and present causal relationship, the SDRWQCB and Staff have denied pleas from the public for remedial action in the form of abatement of nonseasonal storm drain urban runoff, beneficial reuse for sustainable treatment projects, water conservation and immediate temporary mobilized emergency capture/treatment options common among petrochemical, agribusiness and development economic sectors. In addition, the SDRWCB has not supplied a contingency emergency plan to protect our community and the public from current and summer dry weather MS4 storm drain discharges.

Instead, the Regional Board has relied on promulgating more general directives and future contamination tables, which may or may not be effective in abating polluted urban runoff. The proposed Tentative Order No. R9-2007-0002 is to accommodate the failures of inland Water Districts, SOCWA, Cities and County at the expense of the community, public and ocean ecology.

The SDRWQCB action when combined with the Staff and City/County history of ineffective action towards the residents and visitors of South Laguna, have the cumulative effect of giving second class status to the physical health and safety needs of the public in the Aliso Watershed. Thus any action by the Regional Board to approve the use of MS4 Storm Drain System to knowingly convey dry weather urban runoff flows is discriminatory and violates the State of California's definition of Environmental Justice.

Conclusion

The general regulations, requirements and studies pertaining to the Aliso Creek Watershed and associated MS4 Storm Drain System are clearly not effective in controlling water pollution or the effects of artificially elevated flow rates during the area's annual ten month dry season.

More than twenty years and $20 million dedicated to achieve compliance in a relatively small, compact 34 square miles residential development watershed is an enormous investment and, ultimately, waste of taxpayer revenues. The failure to achieve compliance represents a lost opportunity to demonstrate effective interventions to protect communities like South Laguna from polluted urban runoff and sends a message to the public that urban runoff pollution cannot be controlled.

Despite the various failed efforts over two decades, the fact remains numerous State laws are being violated by the SDRWCB for allowing the discharge of dry weather flows with elevated fecal coliform and related contaminate levels to continue to pollute daily the protected receiving waters of Aliso Creek and the Pacific Ocean. By this communication, the SLCA reserves the right to appeal any unfavorable decision perpetuating dry season urban runoff flows to Aliso Beach, South Laguna to the SWRCB and State Attorney General for timely relief.

The South Laguna Civic Association appreciates the efforts by the San Diego Regional Water Quality Control Board to consider the enormous impacts of uncontrolled dry weather urban runoff pollution before approving a genuinely effective Storm Drain Permit Program for the Aliso Watershed.

Respectfully submitted,

Michael Beanan, Director
South Laguna Civic Association
PO Box 9668
South Laguna, California, 92651

From: Colin F. MacKinnon
To: Chiu, Wayne@Waterboards
Subject: Public Comment on Water Permit
Date: Friday, January 11, 2013 1:32:52 PM

Mr. Gary Strawn
Vice Chairman
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Re: Comment—Tentative Order No. R9-2013-001, Regional MS4 Permit, Place ID: 786088Wchiu

Dear Vice Chair Strawn:
I am responding to the San Diego Regional Water Quality Control Board's Tentative Order R9-2012-0011 ("Permit") dated October 31, 2012. After reviewing the proposed Permit, I am concerned it will impose expensive, onerous, and untested regulations on local governments, businesses, and residents.

Everyone understands the importance of clean, safe water to the region. As a member of the business community, I too am interested in improving San Diego's water. It is important, however, that we use our limited resources wisely, and ensure that our efforts produce the desired outcome of improving water quality.

I applaud the Board's inclusion of Water Quality Improvement Plans (WQIP) as a first step in developing a cost-effective approach to improving our water. Analysis remains a critical component of a successful strategy, and I am glad to see that the Board is committed to finding the best possible solution to water quality improvement.

I am concerned, however, that the costs associated with enforcing and implementing the permit will have a negative impact on my business and San Diego's economy. The three primary areas of concern include:

1) the strict liability for exceeding water quality objectives;
2) the preemption of WQIPs by new and changing regulatory requirements prior to allowing the WQIPs to be developed and implemented; and
3) the lack of reliable funding sources to implement these regulatory changes.

It is necessary to hold individuals, businesses and governments accountable, but it is critical that accountability measures are practical with demonstrable, positive effects on water quality. Because of these concerns, I respectfully request that the Permit focus on the timely development of effective and enforceable WQIPs, and that each of the WQIPs be developed through a process that ensures public participation. I ask also that the designation of appropriate Best Management Practices in each watershed be determined through the WQIP process rather than the one size fits all strategy currently being proposed in the Permit. I ask further that until the Board adopts a WQIP for a watershed that the provisions of the existing Permit remain in place for that watershed. Finally, in order to avoid unnecessary litigation I request that the Board adopt the WQIPs as Orders implementing the proposed Permit.

I urge you to adopt final permit language that is evidence-based and both

environmentally and economically sustainable. Thank you for your consideration. Please contact me if you have any questions.

Sincerely,

Colin F. MacKinnon, CEO
Transition IT, LLC
619-517-2167

Transition IT
TransXfer
Cloud Blog

From: lyris@swrcb18.waterboards.ca.gov
To: Chiu, Wayne@Waterboards
Subject: Web Posting of Written Comments on Tentative Order R9-2013-0001
Date: Thursday, January 17, 2013 11:26:06 AM

Greetings,

Thank you to all who submitted written comments to the San Diego Water Board on Tentative Order R9-2013-0001, *National Pollutant Discharge Elimination System (NPDES) Permit And Waste Discharge Requirements For Discharges From The Municipal Separate Storm Sewer Systems (MS4s) Draining The Watersheds Within The San Diego Region*.

All written comment letters received by January 11, 2013 on Tentative Order R9-2013-0001 are now posted on the San Diego Water Boards website at http://www.waterboards.ca.gov/rwqcb9/water_issues/programs/stormwater/index.shtml

The written comment letters are organized into Groups. Clicking on the Group heading will get you to an expanded list of the individual letters included in that Group.

If you submitted a letter to the San Diego Water Board by January 11, 2013 and you do not see it posted or there is an error with the posting, please let me know.

Laurie Walsh, PE
Water Resource Control Engineer
San Diego Regional Water Quality Control Board
Tel. 858-467-2970

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD
www.waterboards.ca.gov/sandiego/

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From: lyris@swrcb18.waterboards.ca.gov
To: Chiu, Wayne@Waterboards
Subject: POSTED - Revised Tentative Order R9-2013-0001 and Responses to Comments
Date: Wednesday, March 27, 2013 5:14:45 PM

This is a message from the California Regional Water Quality Control Board, San Diego Region (9).

Regional MS4 Copermittees and Interested Stakeholders,

The San Diego Water Board posted all documents to be considered by the Board at its April 10 and 11, 2013 Board Meeting on its website at http://www.waterboards.ca.gov/sandiego/board_info/agendas/2013/Apr/Apr10.shtml

For your added convenience you may access the documents directly from the links below:

- Executive Officer Summary Report
- Supporting Document No. 1 - Map
- Supporting Document No. 2 - Tentative Order, released on October 31, 2012
- Supporting Document No. 3 - Regional MS4 Permit Development Timeline
- Supporting Document No. 4 - Notice of Public Review and Comment for Tentative Order No. R9-2013-0001, dated October 31, 2012
- Supporting Document No. 5 - Comments Received by January 11, 2013
- Supporting Document No. 6 - San Diego Water Board Responses to Comments
- Supporting Document No. 7 - Revised Tentative Order No. R9-2013-0001 with Changes in Redline/Strikeout, released March 27, 2013
- Supporting Document No. 8 - Notice of Public Hearing, dated March 5, 2013, Hearing Procedures and Order of Proceedings, dated March 15, 2013

Please be patient when accessing Supporting Document No. 5 as it is quite large (2270 pages=all comment letters received with their attachments). You can access each individual comment letter the San Diego Water Board received by January 11, 2013 on the Boards Storm Water Webpage at http://www.waterboards.ca.gov/rwqcb9/water_issues/programs/stormwater/index.shtml.

Should you have any questions, please contact any member of the Permit Team.

Wayne Chiu, PE wchiu@waterboards.ca.gov 858-637-5558
Christina Arias, PE carias@waterboards.ca.gov 858-627-3931
Eric Becker, PE ebecker@waterboards.ca.gov 858-492-1785

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San Diego Regional Water Quality Control Board
Tel. 858-467-2970

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
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California Regional Water Quality Control Board
San Diego Region

Response to Comments Report

Tentative Order No. R9-2013-0001
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT
AND
WASTE DISCHARGE REQUIREMENTS FOR
DISCHARGES FROM THE
MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s)
DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

March 27, 2013

INDEX OF COMMENT SUMMARIES AND RESPONSES ON TENTATIVE ORDER NO. R9-2013-0001

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GENERAL COMMENTS
Gnl-1: *Implementation of the Tentative Order and its burdensome, untested regulations will be too costly.*

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

Gnl-1	GENERAL	
	COMMENT: *Implementation of the Tentative Order and its burdensome, untested regulations will be too costly.* Comments were submitted by members of the Building Industry, Community Planning Groups, Copermittees, Engineering/Design Consultants, State Government, Societies/Associations/Coalitions, and Other Entities generally expressing concerns with costs to implement requirements. Commenters also generally expressed support for practical, cost-effective, and scientifically based regulation.	**Building Industry / Industry** Associated General Contractors of America **Community Planning Groups** Jamul Dulzura Community Planning Group Julian Community Planning Group Pala Pauma Valley Community Sponsor Group Ramona Community Planning Group **Copermittees** County of San Diego San Diego County Fire Authority San Diego Unified Port District **Environmental Organizations** Clean Water Now **Engineering/Design Consultants** Latitude 33 Planning and Engineering **State/Federal Government** Senator Mark Wyland **Societies/Associations/Coalitions** BIOCOM East Otay Mesa Property Owners Association Otay Mesa Property Owners Association San Diego Association of Realtors San Diego County Taxpayers Association South County Economic Development Council **Other Entities** Carol Crossman Continental Maritime of San Diego Gable PR Hughes Marino Marston+Marston, Inc. National Enterprises Inc. Nuffer, Smith, Tucker, Inc. Peter Hekman Jr. San Diego Regional Chamber of Commerce Sheppard, Mullin, Richter & Hampton LLP Southern Cross Property Consultants Transition IT

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

Gnl-1	GENERAL	
	RESPONSE: The San Diego Water Board understands the concerns expressed by the commenters about the potential costs to implement the requirements, but disagrees that the requirements are burdensome and untested. Most of the requirements in the Tentative Order are not new to the San Diego Region. The Tentative Order incorporates many existing requirements from the MS4 permits for Orange and Riverside Counties. The San Diego Water Board has put considerable effort into developing a draft Regional MS4 permit (referred to as the Tentaitve Order) that that will jointly cover thirty-nine (39) municipal, county government, and special district entities (Copermittees) in San Diego County , southern Orange County abnd southwest Riverside County. The Tentaitve Order significantly modifies the prescriptive action-based regulatory approach of the current municipal storm water permits to an outcome-based approach, with a focus on measuring and achieving improvements in MS4 discharges and receiving water quality. A key feature of the Tentaitve Order is that it provides an adaptive management pathway for the Copermittees to select and address the highest priority water quality issues through a non-punitive iterative process. The proposed adaptive management permit provisions have great promise and will allow the Copermittees to more flexibly deploy resources to achieve goals that will yield the greatest water quality improvements in the most effective and efficient manner to restore and protect the quality of the San Diego Region's receiving waters. The regional approach of the Tentaitve Order offers the opportunity to better achieve regulatory consistency as well as maximum efficiency and economy of resources for both the San Diego Water Board and the Copermittees. The San Diego Water Board has carefully considered costs of both the Tentative Order and the TMDLs included in the Tentative Order and found them to be necessary. Consideration of costs is discussed under the Economic Considerations in Section IV of the Fact Sheet. The commenters assert that the Tentative Order is too expensive, but do not consider the costs of not addressing impacts from discharges from the MS4. In addition, the San Diego Water Board has significantly modified the structure and focus of the requirements in the Tentative Order to allow the Copermittees to more efficiently and cost effectively utilize their resources, which is expected to result in the realization of significant cost savings that could not be realized in the existing MS4 permits. The Tentative Order was developed over a two year period beginning in February 2011 through a participatory approach designed to actively engage key stakeholders, The transparent and comprehensive stakeholder participation process has resulted in a Tentative Order designed to be a strategic, cost-effective, and water	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

Gnl-1	GENERAL	
	quality outcome based permit. Strategic in that it allows for identifying the highest priority water quality conditions to be addressed first. Cost-effective in that the Copermittees are allowed to use their limited resources on the highest priority water quality conditions and can look for efficiencies on a watershed scale. The Tentative Order is water quality outcome based in that it has a clearly defined iterative and adaptive management process that fccuses on measuring and achieving improvements in MS4 discharges and receiving water quality. The Tenaitve Order evaluates success based on water quality monitoring data and assessment, not just completing a minimum number of actions without consideration if these actions are succeeding in improving water quality.	

Gnl-2: *Allow current permit requirements to remain in effect until Water Quality Improvement Plans are developed.*

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

Gnl-2	GENERAL	
	COMMENT: *Allow current permit requirements to remain in effect until Water Quality Improvement Plans are developed.* Comments were submitted by members of the Building Industry, Engineering/Design Consultants, Societies/Associations/Coalitions, and Other Entities generally requesting that the Copermittees be allowed to continue implementing the current permit requirements until Water Quality Improvement Plans are developed and implemented.	**Building Industry / Industry** Associated General Contractors of America Otay Land Company **Engineering/Design Consultants** Latitude 33 Planning and Engineering **Societies/Associations/Coalitions** BIOCOM San Diego Association of Realtors **Other Entities** Carol Crossman Continental Maritime of San Diego Gable PR Hughes Marino Marston+Marston, Inc. Nuffer, Smith, Tucker, Inc. San Diego Regional Chamber of Commerce Sheppard, Mullin, Richter & Hampton LLP Southern Cross Property Consultants Transition IT
	RESPONSE: The San Diego Water Board agrees that the jurisdictional runoff management program requirements of the current permits should remain in effect until the Water Quality Improvement Plans are developed and accepted. The jurisdictional runoff management program requirements of the existing MS4 permits will remain in effect until the Water Quality Improvement Plans are developed and implemented. The introductory paragraph to Provision E states, "*Until the Copermittee has updated its jurisdictional runoff management program document with the requirements of Provision E, the Copermittee must continue implementing its current jurisdictional runoff management program*." This includes the development planning requirements. The Copermittees, however, will be required to comply with the prohibitions and limitations, and implement the transitional monitoring requirements, transitional reporting requirements, and TMDL requirements upon adoption of the Tentative Order.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

Gnl-3	GENERAL	
	COMMENT: *Regional MS4 Permit approach allowing prioritization may result in the neglect of parts of the watershed.* The Environmental Groups and the South Laguna Civic Association submitted comments expressing support for the Regional MS4 Permit allowing the Copermittees to focus on priorities, but they also expressed concern that the approach may also result in the neglect of parts of the watersheds. The South Laguna Civic Association are particularly concerned that high value habitats and coastal receiving waters of the Aliso Creek watershed will continue to be impacted by runoff from residential developments. The Environmental Groups are concerned that there will be "orphaned" priorities, or one jurisdiction will carry most of the burden of implementing the water quality improvement strategies within the watershed.	**Environmental Organizations** Environmental Groups South Laguna Civic Association
	RESPONSE: The San Diego Water Board understands the concerns, but disagrees that the approach of the Regional MS4 Permit will result in the neglect of parts of the watershed. The San Diego Water Board developed the approach of the Regional MS4 Permit because the Copermittees are no longer focused on achieving outcomes of improved water quality, but compliance with actions that must be implemented. In effect, the current approach is actually resulting in the neglect of the entire watershed because of the "everything, everywhere" approach. When everything is a priority, nothing is a priority. In contrast, the approach of the Regional MS4 Permit is to re-focus the Copermittees' efforts toward achieving outcomes that will result in improvements in MS4 discharges and receiving water quality. While not all priorities will be addressed immediately, all priorities will be addressed at some point. In allowing the Copermittees to focus on the highest priorities, lower priorities may also be addressed by the strategies being implemented to address the highest priorities. The requirements of the Tentative Order also include several elements that are intended to provide the San Diego Water Board and the public the information necessary to determine if each Copermittee is participating in implementing the Water Quality Improvement Plans. The San Diego Water Board encourages the Environmental Organizations to remain involved during the development and implementation of the Water Quality Improvement Plans to provide recommendations to the Copermittees for the priority water quality conditions that should be addressed. By remaining involved, the environmental organizations can also understand the opportunities and constraints that are identified during the prioritization process.	

Gnl-4: *Meaningful enforcement of permit requirements is necessary to protect receiving waters.*

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

Gnl-4	GENERAL	
	COMMENT: *Meaningful enforcement of permit requirements is necessary to protect receiving waters.* The San Diego Green Building Council, Laguna Bluebelt Association, and South Laguna Civic Association each submitted comments that the Tentative Order must include requirements that result in meaningful enforcement actions. Without requirements for meaningful enforcement actions, the commenters are concerned that discharges from the MS4 and dry weather flows will continue to degrade water quality.	**Building Industry / Industry** San Diego Green Building Council **Environmental Organizations** Laguna Bluebelt Coalition South Laguna Civic Association
	RESPONSE: The San Diego Water Board agrees that meaningful enforcement actions are necessary to protect receiving waters. The requirements of the Tentative Order are all intended to result in the protection of the quality of receiving waters from MS4 discharges. The Tentative Order also includes requirements for the Copermittees to demonstrate that they are issuing enforcement actions in a timely manner to obtain compliance from sources that are discharging to their MS4s. Enforcement of the requirements of the Tentative Order by the San Diego Water Board may be necessary to compel the Copermittees to properly implement and enforce their legal authorities to adequately protect water quality. By issuing the Regional MS4 Permit, the San Diego Water Board expects to be able to reallocate its resources to better enforce permit requirements instead of developing permits and permit requirements.	

Gnl-5: *Include requirements to develop maps or charts to track and monitor coastal receiving waters subject to MS4 runoff flows and impacts.*

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

Gnl-5	GENERAL	
	COMMENT: *Include requirements to develop maps or charts to track and monitor coastal receiving waters subject to MS4 runoff flows and impacts.* The Laguna Bluebelt Coalition and South Laguna Civic Association expressed support for the creation of maps to show water quality impacted areas of all creeks and coastal receiving waters within the region. The South Laguna Civic Association would like an interactive map that identifies protected coastal receiving water resources and dominant littoral currents and counter currents to help identify distribution patterns of urban runoff induced algal plumes and thermal plumes.	**Environmental Organizations** Laguna Bluebelt Coalition South Laguna Civic Association
	RESPONSE: The San Diego Water Board has considered the concept, but does not agree this requirement is appropriate or necessary to be included in the requirements of the Tentative Order. The San Diego Water Board understands the desire for such spatial and temporal information to be available in a visual format. However, the creation and maintenance of such map would require the collection and processing of data that is beyond the scope of what is required to be measured and reported for the purposes of the Tentative Order.	

Gnl-6: *Increase use of recycled water to reduce need for imported water and discharges from MS4s.*

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

Gnl-6	GENERAL	
	COMMENT: *Increase use of recycled water to reduce need for imported water and discharges from MS4s.* The Laguna Bluebelt Coalition and South Laguna Civic Association expressed support for the increasing the use of recycled water to reduce imported water demand. The commenters contend that increasing recycled water use will reduce discharges to the ocean.	**Environmental Organizations** Laguna Bluebelt Coalition South Laguna Civic Association
	RESPONSE: The San Diego Water Board supports and promotes the use of recycled water. The Tentative Order does not prohibit the use of recycled water, but does limit the discharge of recycled water to receiving waters. The requirements of the Tentative Order do not specifically encourage the use of recycled water, nor is it appropriate for the Tentative Order to do so. Recycled water and the discharge of recycled water are regulated by the San Diego Water Board under separate regulatory mechanisms. The San Diego Water Board agrees that the recycling of wastewater, as well as recycling non-storm water discharges and retaining and using storm water runoff has the potential to reduce the need to import water to the San Diego Region. The San Diego Water Board encourages the Environmental Organizations to remain involved during the development and implementation of the Water Quality Improvement Plans to provide recommendations to the Copermittees for identifying opportunities to promote recycled water use and recycling of non-storm water and storm water discharges to and from the MS4.	

Gnl-7: *Portions of San Diego County in the Colorado River Region should not be subject to requirements of San Diego Region.*

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

Gnl-7	GENERAL	
	COMMENT: *Portions of San Diego County in the Colorado River Region should not be subject to requirements of San Diego Region.* The Julian Community Planning Group submitted a comment stating that the portion of San Diego County under the jurisdiction of the Colorado River Water Board should not be subject to the requirements of the Tentative Order.	**Community Planning Groups** Julian Community Planning Group
	RESPONSE: The San Diego Water Board agrees. The requirements of the Tentative Order are only applicable to the portion of San Diego County within the jurisdiction of the San Diego Water Board.	

Gnl-8: *Urban runoff is the San Diego Region's most urgent pollution problem.*

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

Gnl-8	GENERAL	
	COMMENT: *Urban runoff is the San Diego Region's most urgent pollution problem.* Several Environmental Organizations, the San Diego Green Building Council, and Other Entities submitted comments stating that urban runoff is the San Diego Region's most urgent problem. Most of the commenters also acknowledged that it is a difficult problem to solve, but they are willing to work together to help solve the problem.	**Building Industry / Industry** San Diego Green Building Council **Environmental Organizations** The Escondido Creek Conservancy Friends of Rose Canyon Creek / Rose Creek Watershed Alliance Laguna Bluebelt Coalition Los Penasquitos Lagoon Foundation Natural Resources Defense Council San Diego Canyonlands San Elijo Lagoon Conservancy **Other Entities** Curious Company Hector Valtierra
	RESPONSE: The San Diego Water Board agrees that runoff from developed and developing areas pose a significant problem to protecting water quality in the San Diego Region. The San Diego Water Board has developed the Regional MS4 Permit approach to allow the Copermittees to tap into the community and the resources the community is willing to provide to help address the problems associated with runoff from developed and developing areas. The San Diego Water Board encourages the community to remain involved during the development and implementation of the Water Quality Improvement Plans to provide recommendations to the Copermittees for identifying opportunities to the public for addressing problems associated with runoff from developed and developing areas.	

Gnl-9: *The term "prohibit" should be changed to "effectively prohibit" throughout Tentative Order when referring to non-storm water discharges.*

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

Gnl-9	GENERAL	
	COMMENT: *The term "prohibit" should be changed to "effectively prohibit" throughout Tentative Order when referring to non-storm water discharges.* The Orange County, Riverside County and San Diego County Copermittees each submitted comments requesting that the language of the Tentative Order be revised to "effectively prohibit" non-storm water discharges to the MS4 instead of just "prohibit" to be consistent with the language of the Clean Water Act. The Natural Resources Defense Council submitted comments that assert that the Clean Water Act and the Code of Federal Regulation require an absolute prohibition of non-storm water discharges, in any amount, to the MS4.	**Copermittees** Orange County Copermittees Riverside County Copermittees San Diego County Copermittees **Environmental Organizations** Natural Resources Defense Council
	RESPONSE: The San Diego Water Board agrees that the language of the Tentative Order should be consistent with the Clean Water Act and Code of Federal Regulations. The Clean Water Act requires MS4 permits to include a requirement that non-storm water discharges are to be "effectively prohibited" to the MS4. The Code of Federal Regulations requires each Copermittee to have the legal authority to "prohibit" non-storm water discharges to the MS4. The Phase I Final Rule clarifies what "effectively prohibit" means (55 FR 47995): "*Section 402(p)(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit (other than the permit for the discharge from the municipal separate storm sewer.)*" Where appropriate, the language in the Tentative Order has been revised to be consistent with the language of the Clean Water Act to include the term "effectively prohibit" instead of "prohibit" or "reduce and eliminate." In other cases, the language has been maintained to be consistent with the requirements of the Code of Federal Regulations requiring the Copermittees to establish the legal authority to "prohibit" non-storm water discharges to their MS4s and enforce that legal authority. The establishment and enforcement of the legal authority to "prohibit" non-storm water discharges to their MS4s is how the Copermittees will "effectively prohibit" non-storm water discharges to their MS4s.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

Gnl-10	GENERAL	
	COMMENT: *The requirements of the Tentative Order do not allow Copermittees to adaptively manage their programs.* The Riverside County Copermittees submitted comments contending that the requirements of the Tentative Order will not allow the Copermittees to adaptively manage their programs. In particular, the Riverside County Copermittees cite the prohibitions and limitations of Provision A and the development planning requirements of Provision E.3 as requirements that will limit their ability to adaptively manage.	**Copermittees** Riverside County Copermittees
	RESPONSE: The San Diego Water Board disagrees that the requirements of the Tentative Order will not allow the Copermittees to adaptively manage their programs. The approach used in developing the requirements in the Tentative Order departs significantly from the approach used in developing the requirements of previous and current permits. The current MS4 permits essentially prescribe the programs that must be implemented by each Copermittee, resulting in a focus on complying with the implementation of required actions. The current permits provide the Copermittees little or no ability to adaptively manage the programs to become more focused on achieving outcomes. In contrast, the requirements of the Tentative Order allow the Copermittees to strategically plan by identifying the highest priority pollutants or conditions in a specific watershed, goals and strategies to address those pollutants or conditions, and resources to implement the strategies. Furthermore, the Copermittees are provided the monitoring and assessment information that allows them to determine when those priorities, goals and strategies should be adjusted or are no longer appropriate. The Tentative Order is predicated on a new emphasis on water quality based outcomes (i.e., restoration or protection of water quality and beneficial uses) instead of a prescriptive action based regulatory approach (e.g., implementation of programs). The flexibility that is provided in the Tentative Order should not be mistaken as the San Diego Water Board wishing to grant full autonomy to the Copermittees to implement their jurisdictional runoff management programs. The requirements of the Clean Water Act and the Code of Federal Regulations must still be incorporated into the requirements of the Tentative Order. The Code of Federal Regulations includes several program components that must be implemented by the Copermittees. The USEPA has also provided guidance as to what minimum requirements should be included in those programs. The San Diego Water Board must balance the Copermittees' desire to have more flexibility to adjust their	

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Gnl-10	GENERAL	
	programs with the statutory requirements of the Clean Water Act and the California Water Code which hold the Copermittees accountable for compliance with a minimum set of requirements that are enforceable. Given that the Tentative Order already provides the Copermittees great latitude in adjusting their programs to focus their resources on achieving improved water quality, the San Diego Water Board has extended that flexibility further by incorporating additional opportunities into the revised Tentative Order for identifying and implementing more watershed-specific requirements in areas of the Tentative Order where the Copermittees perceive and assert there is little to no flexibility provided. Please see responses to comments A-1 and E3c-2.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

Gnl-11	GENERAL	
	COMMENT: *Implementation of current permit requirements and accomplishments of Orange and Riverside County Copermittees not being considered.* The Orange County and Riverside County Copermittees each submitted comments expressing concern that the Tentative Order has been developed without considering the programs and plans being developed under their current permit requirements, and does not acknowledge the accomplishments achieved by the Copermittees during the previous and current permit terms. In addition, the Orange County and Riverside County Copermittees each submitted comments that they must have an opportunity to propose changes to the requirements of the Tentative Order through the Report of Waste Discharge. The San Diego Green Building Council recommended that the Tentative Order also take into account successes that have been achieved in other jurisdictions outside of the San Diego Region.	**Building Industry / Industry** San Diego Green Building Council **Copermittees** Orange County Copermittees Riverside County Copermittees
	RESPONSE: The San Diego Water Board disagrees that the Tentative Order does not consider the implementation of current permit requirements, and accomplishments and successes of the Orange County and Riverside County Copermittees and other jurisdictions. Most of the requirements included in the Tentative Order are also in the current permits issued to the Orange County and Riverside Copermittees (Order Nos. R9-2009-0002 and R9-2010-0016). The current permits issued to the Orange County and Riverside County Copermittees include prohibitions and limitations, numeric action levels, and the same jurisdictional runoff management program components. The structural BMP performance standards (i.e. storm water pollutant control retention and hydromodification management) are effectively the same as in the Orange County and Riverside County MS4 permits. The Watershed Workplans of the current permits are very similar to, and are expected to serve as the basis of the Water Quality Improvement Plans. The monitoring program requirements are very similar, with potential reductions of monitoring requirements in several instances. The reporting requirements in the Tentative Order have actually been significantly reduced compared to the current permits. The San Diego Water Board expects the Orange County and Riverside County Copermittees' implementation of their current permit requirements will make the transition from to the Tentative Order much easier than the San Diego County Copermittees because so many of the MS4 permit requirements are similar, and in many cases more prescriptive, than the requirements of the Tentative Order. The flexibility of the requirements of the Tentative Order compared to their current permit requirements will provide the Orange County and Riverside	

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March 27, 2013

Gnl-11	GENERAL	
	County Copermittees many opportunities to identify more effective and efficient ways to utilize their resources to improve water quality. However, until the Orange County and Riverside County Copermittees obtain coverage under the Tentative Order, they will remain subject to the more prescriptive requirements of their current permits. Furthermore, the requirements of the Tentative Order were developed with a strong consideration of the current permit requirements being implemented by the Orange County and Riverside County Copermittees, as well the accomplishments of all the Copermittees in the San Diego Region. In fact, the Tentative Order was developed and improved based on comments received from the Orange County and Riverside County Copermittees during the 18 month administrative draft focused meeting and comment process. The Tentative Order was also developed considering the accomplishments and successes of other jurisdictions outside of the San Diego Region. The basis of incorporating an allowance for implementing a true iterative and adaptive management process is because of the accomplishments, successes, and failures observed by the San Diego Region's Copermittees, as well as those observed in other jurisdictions within California and other states. By allowing a true iterative and adaptive management process to be implemented, the San Diego Water Board expects the Copermittees to not only learn from each other's successes and failures within the San Diego Region, but the successes and failures from other jurisdictions outside the San Diego Region. The fact of the matter is that the requirements of the Tentative Order are more similar to the current permits issued to the Orange County and Riverside Copermittees than the current permit issued to the San Diego County Copermittees (Order No. R9-2007-0001). This is because most of these elements in the Tentative Order were developed based on the requirements in the current Orange County and Riverside County MS4 permits. The Tentative Order also allows the Orange County and Riverside County Copermittees to provide additional recommendations and propose changes for consideration by the Board based on their experiences and successes when they submit their Report of Waste Discharge for coverage under the Regional MS4 Permit.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

Gnl-12	GENERAL	
	COMMENT: *Updating the Basin Plan needs to be a priority of the San Diego Water Board.* The Riverside County Copermittees commented that the San Diego Water Board should make updating the Basin Plan with water quality objectives based on background conditions, beneficial uses of specific water bodies, and specific conditions that influence the water bodies a priority. The Riverside County Copermittees contend that without the updates, the desired outcomes the Copermittees include in the Water Quality Improvement Plans will be arbitrary and may not achieve desired beneficial use improvements, or be appropriate.	**Copermittees** Riverside County Copermittees
	RESPONSE: The San Diego Water Board agrees that updating the Basin Plan should be a priority. Updating the Basin Plan, however, is not within the scope of developing and issuing the Tentative Order. On many occasions, dischargers have asserted that the water quality standards are not achievable, and because they are not achievable they are not appropriate. The San Diego Water Board disagrees. The water quality standards in the Basin Plan are protective of water quality and are therefore appropriate. The San Diego Water Board maintains that because they are appropriate, they must be achieved to protect water quality. If the Copermittees believe a different water quality objective is appropriate and will protect water quality, the San Diego Water Board recommends that the Copermittees collect the data and develop the evidence to support a different water quality objective to be incorporated into the Basin Plan through an amendment to the Basin Plan. Until then, the water quality standards in the Basin Plan are considered appropriate and must be implemented in MS4 permits.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

Gnl-13	GENERAL	
	COMMENT: *"Clarify" responsibilities of the Copermittees under the Tentative Order.* The Orange County, Riverside County and San Diego County Copermittees each submitted comments requesting that the requirements of the Tentative Order "clarify" the responsibilities of the Copermittees, consistent with the requirements of the Clean Water Act. The Copermittees requested revisions throughout the requirements of the Tentative Order to specify that the Copermittees must "effectively prohibit" non-storm water discharges "into the MS4" instead of "into and from the MS4," and control the discharge of "pollutants" not "pollutants in storm water" from the MS4 to the MEP. The Copermittees also requested including several qualifying phrases that the Copermittees could only operate "to the extent allowable" or "as applicable" or other such phrases to "clarify" the Copermittees were only responsible for implementing requirements subject to their legal authority The Natural Resources Defense Council (NRDC) expressed concern that the non-storm water action levels (NALs) may violate the effective prohibition of non-storm water discharges to the MS4. The NRDC requested that the Tentative Order be very clear that the Copermittees are responsible for prohibiting non-storm water discharges to the MS4. The Orange County and Riverside County Copermittees objected to language in the Tentative Order that implied the Copermittees were responsible for "enhancing" and "restoring" water quality in receiving waters, contending that they are only responsible for the discharges from their MS4s. The Orange County Copermittees also objected to the requirements for the Copermittees to evaluate stream channels for restoration, asserting the Copermittees are not responsible for restoring stream channels. The San Diego Unified Port District supported including requirements that result in jurisdictional accountability, recognizing that most of the discharges from the MS4 to San Diego Bay originate from upstream jurisdictions. The San Diego Unified Port District also provided requests for modifications to specify the downstream owners and operators of the MS4 are not responsible and should not be held liable for discharges and pollutants in discharges originating from upstream MS4s. The San Diego Unified Port District requested that the Tentative Order include requirements for the San Diego Water Board to demonstrate a Copermittee caused or contributed to an exceedance of water quality standards. The San Diego Unified Port District also encouraged the San Diego Water Board to include additional monitoring to ensure jurisdictional accountability.	**Copermittees** Orange County Copermittees Riverside County Copermittees San Diego County Copermittees San Diego Unified Port District San Diego Unified Port District / Brown and Winters **Environmental Organizations** Natural Resources Defense Council

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

Gnl-13	GENERAL	
	RESPONSE: The San Diego Water Board reviewed and considered the recommendations and requests. The San Diego Water Board has revised the language in the Tentative Order to emphasize the Copermittees are responsible for "effectively prohibiting" non-storm water discharges "to the MS4." The language has not been revised from the control of "pollutants in storm water" to "pollutants" from the MS4 to the MEP. The San Diego Water Board maintains that the Copermittees are required to control "pollutants in storm water" to the MEP. Pollutants in non-storm water discharges are controlled through the effective prohibition of non-storm water discharges to the MS4. Please see the response to comments Gnl-9 and Fnd-3. The Tentative Order has also been revised to replace any language of "restoring water quality standards in receiving waters" to "protecting water quality standards in receiving waters from MS4 discharges." The San Diego Water Board generally did not revise the language with the qualifying phrases requested by the Copermittees. The Copermittees are required to establish the legal authority to implement the requirements of the Tentative Order. The Tentative Order does not require the Copermittees to implement requirements outside of their jurisdictions or outside of their legal authority. Please see response to comments E1-1 and E1-2. The San Diego Water Board appreciates the support expressed for the requirements that result in jurisdictional accountability. The San Diego Water Board agrees that the requirements of the Tentative Order must provide the San Diego Water Board the information necessary to account for each individual Copermittee's contribution toward improving or degrading water quality. This information will allow the San Diego Water Board to provide support to improve the Copermittee's programs, where needed, and the evidence necessary to enforce the requirements of the Tentative Order, when appropriate. The San Diego Water Board generally disagreed with the modifications to the Tentative Order requested by the San Diego Unified Port District. The San Diego Water Board maintains that the Copermittees are responsible for the discharges from their MS4s to receiving waters. If there are sources that originate from outside a Copermittee's jurisdiction, it is the Copermittee's responsibility to demonstrate to the San Diego Water Board that the source is outside of the Copermittee's legal authority to control. The San Diego Water Board considered the request by the San Diego Unified Port District for additional monitoring to ensure jurisdictional accountability. The San Diego Water Board included additional monitoring for this purpose. Please see response to comment D-5.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

Gnl-14	GENERAL	
	COMMENT: *Request for consistency in MS4 permit requirements for Copermittees under the jurisdiction of multiple Regional Water Boards.* The Orange County Copermittees submitted comments requesting that the requirements in the Tentative Order be as consistent as possible with requirements in MS4 permits from other Regional Water Boards. The Orange County Copermittees include 5 municipalities that are split between 2 Regional Water Boards. The Orange County Copermittees provided recommended revisions to the Tentative Order aimed at creating greater uniformity and implementability for these 5 municipalities under two MS4 permits.	**Copermittees** Orange County Copermittees
	RESPONSE: The San Diego Water Board has reviewed and considered the recommended revisions. The San Diego Water Board understands implementing requirements that are not consistent between multiple Regional Water Board permits can present some challenges for a Copermittee. The requirements in the Tentative Order provide significantly more flexibility that will allow a Copermittee to align the implementation of its programs with the requirements of different permit requirements. The San Diego Water Board, however, has not and will not modify any requirements in the Tentative Order to reduce the accountability, enforceability or protectiveness to be more consistent with another Regional Water Board's permit requirements. For those areas of the MS4 permits where there are inconsistent requirements, the solution for the Copermittee would be to develop jurisdictional runoff management programs that implement the most protective elements of both Regional Water Boards' permit requirements and apply them throughout its jurisdiction. In doing so, the Copermittee will be in compliance with the requirements of both MS4 permits and have programs that will be most protective of water quality.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

Gnl-15	GENERAL	
	COMMENT: *Findings and Fact Sheet do not provide adequate justification for new or modified requirements.* The Building Industry Association of Southern California and the Orange County Copermittees submitted comments asserting that the Findings and the Fact Sheet do not provide adequate justification for the new or modified requirements in the Tentative Order. The Building Industry Association of Southern California is particularly interested in the justification for the development planning structural BMP performance standards. The Orange County Copermittees provided examples of several specific requirements in the Tentative Order that they assert were not adequately justified.	**Building Industry / Industry** Building Industry Association of Southern California **Copermittees** Orange County Copermittees
	RESPONSE: The San Diego Water Board disagrees that the Findings and Fact Sheet do not provide adequate justification for the new or modified requirements in the Tentative Order. The San Diego Water Board understands that the commenters may not be satisfied with the justification for the requirements of the Tentative Order provided in the Findings and Fact Sheet. The San Diego Water Board maintains that the Findings and the Fact Sheet provide the background information, regulatory and legal citations, references and additional explanatory information and data in support of all the Findings and requirements in the Tentative Order.	

Gnl-16: *Recommendation for revising numbering system in the Tentative Order.*

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

Gnl-16	GENERAL	
	COMMENT: *Recommendation for revising numbering system in the Tentative Order.* The Orange County Copermittees submitted comments recommending that the numbering system of the provisions in the Tentative Order provide the full number of the provision (e.g. A.1 instead of 1). The recommended revisions would assist and better orient the reader.	**Copermittees** Orange County Copermittees
	RESPONSE: The San Diego Water Board appreciates the recommendation. The San Diego Water Board understands that the length and the numerous subsections of the provisions in the Tentative Order can be difficult to navigate at times. The San Diego Water Board has included footers to assist the reader in navigating through the provisions of the Tentative Order. Additionally, the electronic PDF version of the Tentative Order will have bookmarks for the major provisions to assist in navigating the requirements of the Tentative Order.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

Gnl-17	GENERAL	
	COMMENT: *Requests for changes to schedules and deadlines in the Tentative Order.* The Orange County, Riverside County and San Diego County Copermittees each submitted comments requesting changes to the schedules and deadlines for developing, submitting, and implementing several requirements in the Tentative Order. In particular, the requests were focused on additional time for developing the Water Quality Improvement Plans. The San Diego Unified Port District supported the requests. The BIA Regulated Community Coalition and Environmental Groups each submitted comments with recommendations to include more time for public participation during the development of the Water Quality Improvement Plans. The commenters provided several recommendations for modifications to the schedules and deadlines in the Tentative Order that would result in more time to develop and implement the Water Quality Improvement Plans and the monitoring and assessment programs.	**Building Industry / Industry** BIA Regulated Community Coalition **Copermittees** Orange County Copermittees Riverside County Copermittees San Diego County Copermittees San Diego Unified Port District **Environmental Organizations** Environmental Groups
	RESPONSE: The San Diego Water Board reviewed and considered the recommendations to change the schedules and deadlines in the Tentative Order. The San Diego Water Board generally agrees that additional time should be provided to develop the Water Quality Improvement Plans, to allow for a robust public participation process and to provide enough time to implement the optional requirements that have been included in the revised Tentative Order if the Copermittees choose to do so. The San Diego Water Board modified many of the schedules to provide additional flexibility in scheduling the development of several deliverables, as well as including later deadlines for submitting several deliverables. The requirements have also been modified to allow the Copermittees more control in developing the schedules for implementing the monitoring requirements in the Water Quality Improvement Plans. Please see the revisions to Provisions B.3 and F.1 in the revised Tentative Order, as well as the responses to comments B-3 and F1-1.	

Gnl-18: *Requests for additional opportunities to provide comments.*

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

Gnl-18	GENERAL	
	COMMENT: *Requests for additional opportunities to provide comments.* The Riverside County Copermittees, Clean Water Now, and Environmental Groups each submitted comments expressing interest in additional opportunities to provide comments. The Riverside County Copermittees requested an additional public review and comment period after the Tentative Order is revised and the responses to comments are released by the San Diego Water Board. Clean Water Now expressed disappointment with the focused meeting process used in the development of the Tentative Order, and the lack of time available to have protracted discussions. The Environmental Groups requested additional opportunities for the public to participate and provide comments during the development of the Water Quality Improvement Plans.	**Copermittees** Riverside County Copermittees **Environmental Organizations** Clean Water Now Environmental Groups
	RESPONSE: The San Diego Water Board considered the requests for additional opportunities to provide comments. The San Diego Water Board disagrees that an additional public review and comment period needs to be provided after the revised Tentative Order and responses to comments are released. Federal regulations only require that the San Diego Water Board provide at least 30 days for public comment on the Tentative Order. The lengthy public review and comment period that was provided for the Tentative Order complies with and exceeds the statutory and regulatory requirements for bringing the Tentative Order before the Board for consideration and adoption. The San Diego Water Board released an administrative draft of the Tentative Order in April 2012, which went through a 5 month review and comment period, with several focused meetings to discuss the requirements. The administrative draft of the Tentative Order was significantly revised based on the comments and information received during the focused meetings and written comments received. The Tentative Order was released in October 2012 and the public comment period was closed in January 2013. The revised Tentative Order will be the third draft of the permit, with a second round of revisions, and revisions reflected in it were made in direct response to written comments received by the San Diego Water Board. The San Diego Water Board has already provided multiple opportunities to comment on the Tentative Order. An additional opportunity to submit written comments is not required or necessary. There will be an opportunity to make oral comments on the revisions to the Tentative Order at the San Diego Water Board hearing. The San Diego Water Board understands that the commenter wished to have more lengthy discussions during the focused meetings that were held during the administrative draft review and comment period. With the exception of the commenter, the San Diego Water Board has received very positive feedback on the focused	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

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Gnl-18	GENERAL	
	meetings that were held. The focused meeting process was above and beyond what is required and the discussions that did take place were more inclusive than previous permit renewal processes. At each focused meeting the San Diego Water Board also extended invitations to everyone present for additional meetings outside the focused meetings. The San Diego Water Board had multiple additional in depth discussions with several groups outside of the focused meeting process on specific topics. If the commenter had contacted the San Diego Water Board for an additional meeting, the San Diego Water Board could have scheduled a meeting with the commenter to have more in depth discussions. The San Diego Water Board agrees that additional opportunities should be provided to the public to participate and comment during the development of the Water Quality Improvement Plans. The San Diego Water Board disagrees that Water Quality Improvement Plans are equivalent in meaning to “water quality control plans” as defined in Water Code section 13050, subdivision (j), requiring a public hearing for the acceptance of the Water Quality Improvement Plans. Please see response to comment B-3.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

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Gnl-19	GENERAL	
	COMMENT: *The maximum extent practicable (MEP) standard is the floor, not the limit, for MS4 permit requirements.* The Natural Resources Defense Council (NRDC) submitted comments asserting that the San Diego Water Board has the authority to include MS4 permit requirements that are more stringent than the MEP standard if necessary to ensure that discharges from the Copermittees' MS4s do not cause or contribute to exceedances of water quality standards in receiving waters. The NRDC cited several court decisions that support their position that the MEP standard is the floor for MS4 permit requirements, and the San Diego Water Board has the authority to impose additional more stringent requirements over and above MEP as determined to be appropriate.	**Environmental Organizations** Natural Resources Defense Council
	RESPONSE: The San Diego Water Board agrees that the MEP standard is the floor for permit requirements. In concept, the MEP standard is supposed to evolve and improve and become more stringent over time through an iterative process. In reality, in the current and previous permits issued by the San Diego Water Board, the MEP standard was essentially defined by the requirements of the MS4 permit and the iterative process only occurred when an MS4 permit was renewed by incorporating additional and more stringent requirements. Thus, the MEP standard became static rather than dynamic for each permit term, and only advanced with each permit renewal. This has resulted in multiple MS4 permits by the San Diego Water Board that have different requirements, each a little more stringent that the last one issued. In the Tentative Order the San Diego Water Board has incorporated a new regulatory approach that is expected to result in a more dynamic iterative process to advance the MEP standard during the permit term. Instead of dictating the actions that must be implemented by the Copermittees, and defining the MEP "floor" of requirements that will be utilized to determine compliance, the requirements of the Tentative Order define the iterative process that must be implemented to achieve water quality improvement outcomes through an ever advancing and improving MEP standard. With the exception of the TMDL requirements, the San Diego Water Board disagrees it is necessary to include requirements that are more stringent that the MEP standard. The approach incorporated into the Tentative Order redefines the MEP "floor" from being a "static floor" to a "dynamic floor" that is expected to rise as the Copermittees learn from their failures and successes while working toward achieving tangible improvements in water quality.	

Gnl-20: *Include graphical representation of areas covered by the Tentative Order.*

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Gnl-20	GENERAL	
	COMMENT: *Include graphical representation of areas covered by the Tentative Order.* The San Diego Green Building Council submitted comments recommending that the final permit include a graphic representation of both the political and natural boundaries related to the area under the jurisdiction of the Order.	**Building Industry / Industry** San Diego Green Building Council
	RESPONSE: The San Diego Water Board appreciates the recommendation. Including a graphical representation of the area under the jurisdiction of the Tentative Order is not necessary. The Tentative Order is expected to cover all the Phase I municipalities in the San Diego Region in a phased manner. The Tentative Order will no longer be issued to three separate counties or include requirements separated by political boundaries.	

Gnl-21: *Federal regulations require that the term of the Tentative Order not exceed five years.*

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Gnl-21	GENERAL	
	COMMENT: *Federal regulations require that the term of the Tentative Order not exceed five years.* The USEPA submitted comments that expressed concern that the San Diego Water Board was considering a permit term longer than five years. The USEPA supported a permit term that does not exceed five years.	**State/Federal Government** USEPA
	RESPONSE: The San Diego Water Board agrees that the term of the permit will not exceed five years.	

Gnl-22: *Identification of grammatical and typographical errors.*

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Gnl-22	GENERAL	
	COMMENT: *Identification of grammatical and typographical errors.* The San Diego County Copermittees submitted comments noting several grammatical and typographical errors in the text of the Tentative Order that should be corrected.	**Copermittees** San Diego County Copermittees
	RESPONSE: The San Diego Water Board appreciates the identification of grammatical and typographical errors. The San Diego Water Board has corrected the grammatical and typographical errors identified by the commenter. The San Diego Water Board has corrected any grammatical and typographical errors to the extent possible in the revised Tentative Order. If there are additional grammatical and typographical errors identified in the revised Tentative Order after adoption, the San Diego Water Board can correct them without re-opening the adopted Order if they are considered minor modifications pursuant to the requirements of Provision H.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

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Lgl-1	LEGAL	
	COMMENT: *Concerns with strict liability for exceedances of water quality standards and receiving water limitations.* Comments were submitted by members of the Community Planning Groups, Copermittees, Engineering/Design Consultants, State Government, Societies/Associations/Coalitions, and Other Entities generally expressed concerns with the strict liability that the Copermittees are exposed to for exceedances of the water quality standards and receiving water limitations. The Copermittees submitted several comments that a recent Ninth Circuit Court of Appeals decision resulted in a new interpretation of precedential receiving water limitations language, or that it creates any new third party liability risks.	**Community Planning Groups** Jamul Dulzura Community Planning Group Ramona Community Planning Group **Copermittees** City of Dana Point City of Imperial Beach City of Laguna Hills City of Lake Forest City of Mission Viejo City of Rancho Santa Margarita City of San Juan Capistrano County of San Diego County of San Diego Office of County Counsel Orange County Copermittees Riverside County Copermittees San Diego Unified Port District / Brown and Winters **Engineering/Design Consultants** Latitude 33 Planning and Engineering **State/Federal Government** Senator Mark Wyland **Societies/Associations/Coalitions** BIOCOM San Diego Association of Realtors South County Economic Development Council **Other Entities** Carol Crossman Continental Maritime of San Diego Gable PR Hughes Marino Marston+Marston, Inc. Nuffer, Smith, Tucker, Inc. San Diego Regional Chamber of Commerce Sheppard, Mullin, Richter & Hampton LLP Southern Cross Property Consultants Transition IT
	RESPONSE: The San Diego Water Board disagrees that the recent Ninth Circuit Court of Appeals decision in NRDC v. County of Los Angeles (*Natural Resources Defense Council v. County of Los Angeles, et al.* (673 F.3d	

Lgl-1	LEGAL	
	1235 (9th Cir. 2011) (revd. on other grounds and remanded,*Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013))), adopted a new interpretation of precedential receiving water limitations language or that it creates any new third party liability risks. Rather the Ninth Circuit's interpretation is consistent with the San Diego Water Board's interpretation of the precedential receiving water limitations language that affords the San Diego Water Board with discretion to take enforcement action for violations of receiving water limitations and discharge prohibitions and also allows for citizen suit enforcement – in other words, engagement in the iterative process does not create a safe harbor from liability for violations of water quality standards. In precedential orders, the State Water Board exercised its discretion to require compliance with water quality standards by directing that MS4 permits contain provision requiring discharges of pollutants in storm water to be controlled so as not to cause or contribute to exceedances of water quality standards in receiving waters. (State Water Baord Order WQ-98-01 (*Environmental Heatlh Coalition*), and WQ 99-05 (*Environmental Health Coalition*.) Consistent with federal law, the State Water Board also found it appropriate to implement best management practices (BMPs) in lieu of imposing numeric water quality-based effluent limitations to meet water quality standards. (See SWRCB Orders WQ 91-03 (*Citizens for a Better Environment*), WQ 98-01 (*Environmental Health Coalition*), WQ 2001-15 (*Building Industry Association of San Diego County*); See also 40 CFR sec. 122.44(k); Interim Permitting Approach for Water Quality-Based Effluent Limitations in Storm Water Permits, USEPA, September 1995.) In these orders and USEPA guidance, the State Water Board and USEPA recognize that the storm water program will evolve over time to incorporate more stringent limitations, including improved BMPs, to meet water quality standards or numeric water quality based effluent limitations. While the State Water Board and San Diego Water Board in its recent MS4 permits have directed MS4 dischargers to achieve compliance with water quality standards through an "iterative process," using the State Water Board's precedential receiving water limitations language, the Water Boards have never interpreted the iterative process to provide a "safe harbor" for MS4 dischargers. Thus, the Ninth Circuit's recent opinion is consistent with the Water Boards' interpretation and does not create any new uncertainty or third party liability risks that did not previously exist. The San Diego Water Board recognizes and will continue to follow the State Water Board's process (commenced with a public workshop in November 2012) for reconsidering the precedential receiving water limits language and the possibility of creating a "safe harbor" from enforcement for violations of water quality	

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Lgl-1	LEGAL	
	standards while an MS4 discharger engages in an iterative process of improving its controls and practices. However, the Tentative Order has been revised to provide a discharge prohibitions and receiving water limitations compliances option. Please see response to comment A-1.	

Lgl-2: Concerns with the Copermittees' legal authority to impose requirements on development projects where a nexus between impact on the receiving water and the project cannot be established.

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

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Lgl-2	LEGAL	
	COMMENT: *Concerns with the Copermittees' legal authority to impose requirements on development projects where a nexus between impact on the receiving water and the project cannot be established.* Comments were submitted by members of the Copermittees, Societies/ Associations/Coalitions, and Other Entities generally expressed concerns with the Copermittees' legal authority to imposed requirements on development projects where a nexus between impact on the receiving water and the project cannot be established. The Copermittees assert that they would be subject to liability under takings clauses of the US and California Constitutions and the Mitigation Fee Act for requiring hydromodification management BMP requirements on new development or redevelopment projects that discharge to hardened channels where a hydromodification impact would be questionable and difficult to establish. Comments from the Societies/ Associations/Coalitions assert that allowing an in lieu fee for improvements to Priority Development Projects that do not cause hydromodification impacts is a direct violation of CEQA. In contrast, the South Laguna Civic Association asserts that the regulatory and legal nexus is clear between MS4 discharges and creek erosion and infrastructure damage, ocean pollution and public health hazards.	**Copermittees** City of Dana Point City of Imperial Beach City of Rancho Santa Margarita City of San Diego City Attorney County of San Diego Office of County Counsel Orange County Copermittees Riverside County Copermittees San Diego County Copermittees **Environmental Organizations** South Laguna Civic Association **Societies/Associations/Coalitions** East Otay Mesa Property Owners Association Otay Mesa Property Owners Association **Other Entities** National Enterprises Inc.
	RESPONSE: The San Diego Water Board recognizes the concerns of about the Copermittees' legal authority to impose hydromodification management requirements on development that causes no hydromodification impacts. Federal law mandates that permits issued to MS4s require management practices that will result in reducing pollutants to the maximum extent practicable. The state is required, by law, to select the BMPs. (See *NRDC v. USEPA* (9th Cir. 1992) 966 F.2d 1292; *Environmental Defense Center v. USEPA* (9th Cir. 2002) 344 F.3d 832, 855; *Rancho Cucamonga v. Regional Water Quality Control Bd., Santa Ana Region* (2006) 135 Cal.App.4th 1377, 1389.) The Tentative Order's requirements for Low Impact Development and hydromodification management controls are authorized by federal law. Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(2) provides that Copermittees develop and implement a management program which is to include "*A description of planning procedures including a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal separate storm sewers which receive discharges from areas of new development and significant redevelopment. Such plans shall address controls to reduce pollutants in discharges from municipal separate storm sewers after construction is completed*." The Tentative Order does not impose land use regulations, nor does it restrict or control local land-use decision-	

Lgl-2	LEGAL	
	making authority. Rather, the Tentative Order requires the permittees to fulfill Clean Water Act requirements and protect water quality in their land use decisions. The requirements in the Tentative Order allow for flexibility in compliance options to the extent allowable under the Clean Water Act. The substantive regulatory requirements of the Clean Water Act are a valid exercise of the federal government's enumerated powers and authority over navigable waters. (*NRDC v. USEPA* (9th Cir. 1998) 863 F.2d 1420, 1436.) Environmental regulation is not land use regulation, and therefore does not infringe upon local authority over land use decisions. (*California Coastal Commission v. Granite Rock* (1987) 480 U.S. 572. In addition, local land use planning must be consistent with general statewide laws. (*County of Los Angeles v.California State Water Resources Control Board* (2006) 143 Cal.App.4th 985, 1003.) Article 11, section 7, of the California Constitution states that a county or city may not enact laws that conflict with general laws. The Porter-Cologne Water Quality Control Act contains the California Legislature's finding that water quality is a matter of state-wide concern, requiring a statewide program administered at a regional level. (See, e.g., Wat. Code, § 13000; see also generally *Southern California Edison v. State Water Resources Control Board* (1981) 116 Cal.App.3d 751, 758.) Section 101 of the CWA has a companion policy statement, where Congress found that water quality is a matter of federal concern. The Tentative Order also does not dictate specific methods of compliance or dictate the manner in which the Copermittees use their land. Where the Tentative Order includes detailed requirements, it is to comply with the Clean Water Act and its regulations. USEPA's regulations mandate that certain requirements be included in MS4 permits in order to achieve the requirements of the Clean Water Act. Thus, federal law mandates that permits issued for MS4s require certain actions that will result in the elimination or reduction of pollutants to receiving waters and the state is required, by federal law, to select the controls necessary to meet this standard. (See *NRDC v. USEPA* (9th Cir. 1992) 966 F .2d 1292, 1308; *City of Rancho Cucamonga v. Regional Water Quality Control Bd., Santa Ana Region* (2006) 135 Cal.App.4th 1377, 1389-90.) The requirement that the Copermittees require Priority Development Projects to control post-project runoff flow rates and durations so that they do not exceed pre-development runoff flow rates and durations by more than ten percent is appropriate and necessary to reduce erosion and the discharge of pollutants into receiving waters. It does not require mitigation beyond redevelopment project impacts because the requirement lessens (although does not eliminate) the perpetuating impacts that originated upon initial land alteration (i.e., the project would continue to cause accelerated erosion) absent improved controls of post-project runoff flow rates and durations. The San Diego Water Board maintains that the Copermittees have authority to implement this	

Lgl-2	LEGAL	
	requirement, and that if implemented it would not rise to the level of a taking of private property. The pre-development condition provision is also consistent with the requirements in both the current Orange County and Riverside County MS4 permits. Please see response to comment E3c2-2. However, to remove the question of the nexus between a project's impact on an already hardened channel, the San Diego Water Board has included a hydromodification management exemption for projects that discharge to conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean. Please see response to comment E3c2-3. The hydromodification management requirements that may be imposed on projects with no hydromodification impacts has been modified, but in any case would not have violated CEQA because the mitigation requirement was not imposed as a result of a CEQA analysis.	

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Lgl-3	LEGAL	
	COMMENT: *The Tentative Order must address water quality inconsistencies with the California Coastal Act and California Water Code.* The South Laguna Civic Association submitted comments that asserts the Tentative Order is inconsistent with the California Coastal Act and the water reclamation requirements of the California Water Code. The commenter asserts that the Tentative Order must address the water quality inconsistencies.	**Environmental Organizations** South Laguna Civic Association
	RESPONSE: The Tentative Order is not issued pursuant to the requirements of the California Coastal Act. The Tentative Order is issued pursuant to and consistent with the requirements of the federal Clean Water Act, Code of Federal Regulations, and the California Water Code for discharges of non-storm water and discharges of pollutants in storm water from the Copermittees' MS4s to receiving waters. Compliance with the requirements of the Tentative Order should also allow the Copermittees to be in compliance with the requirements of the California Coastal Act. When and where applicable, however, the Copermittees may be required to comply with the California Coastal Act under other regulatory mechanisms. The Tentative Order is not required to implement the requirements of the California Coastal Act. The Tentative Order also is not the appropriate regulatory mechanism for implementing the water reclamation requirements of the California Water Code. The water reclamation requirements of the California Water Code are implemented by the San Diego Water Board under separate regulatory mechanisms.	

Lgl-4	LEGAL	
	COMMENT: *San Diego Water Board has legal authority to not incorporate the Beaches and Creeks Bacteria TMDLs into the Tentative Order.* The County of San Diego and the County of San Diego Office of County Counsel each submitted comments that assert that the San Diego Water Board has the authority to not incorporate the Beaches and Creeks Bacteria TMDLs into the Tentative Order. The comments from the County cite the MEP standard, *Defenders of Wildlife v. Browner*, and a November 2010 USEPA memorandum as providing the the basis for the legal authority. The City of Lake Forest submitted comments that also cited *Defenders of Wildlife v. Browner* as providing the the basis for the legal authority to not incorporate TMDLs into the Tentative Order. The comments from the County also assert that the scientific basis of the Beaches and Creeks Bacteria TMDLs is flawed, the requirements of the TMDLs are not achievable, and the costs to implement the requirements of the TMDLs are not worth the benefits that may be achieved. The County requested that the San Diego Water Board elect not to include the Beaches and Creeks Bacteria TMDLs in the Tentative Order and re-evaluate the TMDL. Clean Water Now submitted comments alluded to "recent legal renderings" that called into question the TMDL provisions included in the Tentative Order. Conversely, the USEPA submitted comments in support of the the San Diego Water Board's approach for incorporating applicable TMDL requirements into the Tentative Order.	**Copermittees** City of Lake Forest County of San Diego County of San Diego Office of County Counsel **Environmental Organizations** Clean Water Now **State/Federal Government** USEPA
	RESPONSE: The San Diego Water Board disagrees that it has the legal authority to not incorporate the requirements of the Beaches and Creeks Bacteria TMDLs into the Tentative Order. Federal regulations under 40 CFR 122.44(d)(1)(vii)(B) require that NPDES permit requirements incorporate water quality based effluent limitations (WQBELs) that must be consistent with the requirements and assumptions of any available wasteload allocations (WLAs) developed under TMDLs. The federal regulations do not provide the option or discretion to not incorporate these WQBELs into NPDES permits. The San Diego Water Board is required to adopt and implement TMDLs through the MS4 permit, where the Copermittees' MS4 discharges are a source of the impairment. TMDLs are adopted by the San Diego Water Board pursuant to CWA section 303(d) and CWC sections 13240 and 13242. TMDL implementation programs consist of a description of the nature of actions that are necessary to achieve the WLAs (and LAs), a time schedule for the actions to be taken, and a description of the monitoring and reporting to be undertaken to	

Lgl-4	LEGAL	
	determine compliance with the WLAs. Because TMDLs and their programs of implementation are adopted through the Basin Plan amendment process in California, the TMDL implementation program contained in a regional water board's basin plan becomes a regulation upon approval by the State of California Office of Administrative Law. All permits must implement the applicable water quality control plan (i.e. Basin Plan), including any applicable TMDL implementation programs (CWA §§ 303(d), 402(p)(3)(B)(iii); Cal. Water Code §§ 13263, 13377). These Basin Plan provisions thus become the applicable regulations that authorize an MS4 permit to include compliance schedules to achieve effluent limitations derived from TMDL WLAs. It is unclear whether the commenters understand that the TMDL implementation programs are the basis for the compliance schedules and, without the TMDL implementation program, Copermittees would be required to comply with final WQBELs immediately. Further, USEPA has set forth guidance regarding MS4 permits, that such permits must require compliance with applicable TMDLs to meet water quality standards. (See "Revisions to the November 22, 2002 Memorandum 'Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) (for Storm Water Sources and NPDES Requirements Based on Those WLAs.'" (USEPA Office of Water, Nov. 10, 2010.) "*Where a TMDL has been established and there is an accompanying implementation plan that provides a schedule for an MS4 to implement the TMDL, the permitting authority* [in this case, the Regional Water Board] *should consider the schedule as it decides whether and how to establish enforceable interim requirements and interim dates in the permit*." (Id.) The San Diego Water Board is aware that the USEPA memorandum is not legally binding, but finds it very instructive and it is appropriate to consider USEPA guidance, even if that guidance *may* be modified in some manner in the future. NPDES permits are intended to support the objective of the federal Clean Water Act "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*" (Clean Water Act section 101(a)). Water quality standards, which are the basis for the receiving water limitations in the Tentative Order, are the foundation for achieving this objective. To ensure that discharges do not cause or contribute to exceedances of water quality standards, receiving water limitations provisions are included in all NPDES permits issued pursuant to CWA section 402. Further, Clean Water Act section 402(p)(3)(B)(iii) requires permits for discharges from municipal storm sewers to "require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design, and engineering methods, *and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." [Emphasis added.] In its Phase I Stormwater Regulations, Final Rule, USEPA elaborated on these requirements, stating that, "permits for discharges from municipal separate storm sewer systems must require	

Lgl-4	LEGAL	
	controls to reduce the discharge of pollutants to the maximum extent practicable, and where necessary, water quality-based controls." (See 55 Fed. Reg. 47990, 47994 (Nov. 16, 1990).) USEPA reiterated in its Phase II Stormwater Regulations, Final Rule, that MS4 "permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL." The Clean Water Act provides the San Diego Water Board, to the same extent as the Administrator of USEPA, the discretion to determine what controls are appropriate to protect water quality and achieve the objectives of the Clean Water Act. (See *Defenders of Wildlife v. Browner* (1999) 191 F.3d 1159, 1166.) As explained in the Tentative Order, compliance with the WLAs established in TMDLs is necessary to achieve compliance with water quality standards. The State Water Board and the San Diego Water Board have previously concluded that discharges from the MS4 contain pollutants that have the reasonable potential to cause or contribute to excursion above water quality standards. As such, receiving water limitations are included in the Tentative Order to ensure that individual and collective discharges from the MS4 do not cause or contribute to exceedances of water quality standards necessary to protect the beneficial uses of the receiving waters. Compliance with the WLAs established in TMDLs is necessary to achieve compliance with water quality standards. In recognition of the purpose of the NPDES program in supporting the objective of the Clean Water Act and utilizing its authority provided by CWA section 402(p)(3)(B)(iii), and considering USEPA's statements and guidance, the State Water Board has determined that MS4 permits must include compliance with water quality standards. (See State Water Board Order Nos. WQ91-03, WQ 98-01, WQ 99-05 and WQ 2001-15.) Accordingly, the provisions contained in 40 CFR 122.44(d), are applicable to MS4 permits. The San Diego Water Board also disagrees that incorporation of TMDL requirements is based on state law provisions of the Porter Cologne Water Quality Control Act and that consideration of the factors under Water Code section 13241 is required before the requirements may be implemented. TMDLs implement existing water quality objectives that are designed to protect designated beneficial uses. Numeric targets used by TMDLs to implement water quality standards are not designed to re-balance the policy interests underlying those standards. While policy considerations are important in developing water quality standards in the first instance, they are less important in formulating TMDLs that implement them. The statutory directive to adopt TMDLs in the first instance is to "implement the applicable water quality standards with seasonal variations and a margin of safety." (33 U.S.C. § 1313(c)(2)(A). See also 40 CFR §§ 131.10-13.) While consideration of economic	

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	factors may be appropriate in adopting TMDLs, a section 13241 economic analysis is not required either in the adoption of TMDLs or in the implementation through an NPDES permit. Additionally, the implementation plan included as part of the Beaches and Creeks Bacteria TMDLs requires the San Diego Water Board to incorporate the requirements of the TMDLs into the appropriate regulatory mechanisms to implement the TMDL requirements. If the requirements of the Beaches and Creeks Bacteria TMDLs are not incorporated into any regulatory mechanisms (e.g. NPDES permits), the TMDL requirements will not be implemented and will not be enforceable. Implementation of the TMDL requirements in regulatory mechanisms must be initiated as soon as possible to achieve the requirements of the TMDL within the compliance schedules of the TMDL. The San Diego Water Board is obligated to incorporate the requirements into the MS4 permit. Otherwise, the San Diego Water Board would be in conflict with its own implementation plan requirements within the Basin Plan as well as the requirements of the Code of Federal Regulations. Please also see response to comment Lgl-10.	

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Lgl-5	LEGAL	
	COMMENT: *San Diego Water Board does not have the legal authority to issue a regional MS4 permit.* The Orange County and Riverside County Copermittees each submitted comments asserting that the San Diego Water Board does not have the authority to issue a regional MS4 permit under the Clean Water Act. The Orange County Copermittees argue that while it geographically abuts San Diego County, there is extensive federal land separating MS4s within its county from other MS4s and the federal regulations to not allow the issuance of a regional MS4 permit without a "connection." The commenters also raised concerns over the regulatory requirement to file a Report of Waste Discharge before obtaining coverage under the Tentative Order.	**Copermittees** Orange County Copermittees Riverside County Copermittees
	RESPONSE: The San Diego Water Board disagrees that the federal regulations do not authorize the issuance of a region-wide MS4 permit coextensive with the jurisdictional boundaries of the San Diego Region. Despite the geographic separation, the San Diego Water Board has legal authority to issue a regional MS4 permti through its authority in the Clean Water Act. (See Attachement No. 2, September 7, 2012 Letter from San Diego Water Board Counsel on Legal Authority Supporting Issuance of a Regional MS4 Permit) Section 402, subpart (p)(3)(B) of the Clean Water Act states that "Permits for discharges from municipal storm sewers – (i) may be issued on a system- or jurisdiction-wide basis . . . ." The federal storm water regulations in 40 CFR at Part 122.26, subdivision (a)(1)(v) also state that the Director (the San Diego Water Board) may designate dischargers from municipal separate storm sewers on a system-wide or jurisdiction-wide basis, taking into consideration the following factors: (A) location of the the discharge with respect to waters of the United States; (B) the size of the discharge; (C) the quantity and nature of the pollutants discharged to waters of the United States and (D) other relevant factors. Consideration of these factors provides wide discretion to the San Diego Water Board in issuing MS4 permits. More specifically, the regulations permit issuance of system-wide permits covering all MS4s in "adjacent . . . large or medium separate storm sewer systems." (See 40 CFR sec. 122.26(a)(3)(iv). The regulations also support issuance of MS4 permits on watershed or "other basis" contemplating that such permits may "specify different conditions relating to different discharges covered by the permit, including different management programs for different drainage areas . . . ." (40 CFR Part 122.26(a)(3)(v).) The USEPA responses to comments for the above regulations also make clear that the permitting authority, in this case, the San Diego Water Board, has flexibility to establish system- or region-wide permits. In the Final	

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Lgl-5	LEGAL	
	Rule published in the Federal Register and containing USEPA's responses to comments, USEPA notes that paragraph (iv) of section 122.26(a)(3) would allow an entire system in a geographical region under the purview of a state agency to be designated under a permit. (National Pollutant Discharge Elimination System Permit Application Regulations for Storm Water Discharges, 55 Fed.Reg. 47990, 48030-48042 (Nov. 16, 1990).) It is important to note that a regional MS4 permit does not expand the requirements for each municipality beyond its borders as the federal regulations make clear that MS4 permittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators. (40 CFR Part 122.26(a)(3)(vi).) See also September 7, 2012, memorandum from Jessica Jahr and Catherine Hagan, State Water Board's Office of Chief Counsel, to Ryan Baron and David Huff, counsels for Orange and Riverside Counties, respectively which is incorporated into this response. The other objection commenters raise concerns the regulatory requirement to file a Report of Waste Discharge (ROWD). The Tentative Order does not cover or become effective for either the Orange County or Riverside County Copermittees until the earlier of (1) either or both Counties voluntarily seeks to be covered by the permit, once adopted, or (2) Orange or Riverside County timely submits its respective ROWD proposing changes or other recommendations to the Tentative Order and appropriate changes are made concurrent with permit coverage becoming effective as to one or each County. In other words, the obligation to submit a ROWD and for the San Diego Water Board to consider an ROWD has not been abandoned and the Tentative Order reflects that the San Diego Water Board will rely on the ROWD process to frame prospective revisions to the permit. And while neither county has yet filed its next ROWD, both have been provided with ample and extensive opportunities to participate fully in the development of this Tentative Order.	

Lgl-6	LEGAL	
	COMMENT: *The requirements of the Tentative Order are more stringent that Federal law and require a CWC 13241 analysis.* The Orange County and Riverside County Copermittees, City of Lake Forest, and the Building Industry Association of Southern California assert that several requirements of the Tentative Order go beyond the requirements of Federal law, thus an analysis pursuant to California Water code section 13241 is required. The commenters also make several assertions about the deficiencies they perceive with the economic considerations discussed in the Fact Sheet, and assert that a cost-benefit analysis needs to be included in the Fact Sheet discussion.	**Building Industry / Industry** Building Industry Association of Southern California **Copermittees** City of Lake Forest Orange County Copermittees Riverside County Copermittees
	RESPONSE: The San Diego Water Board disagrees that there are "many requirements in the Draft Permit which exceed the federal MEP standard." The San Diego Water Board is charged with construction of and administration of the Clean Water Act in the San Diego Region. In issuing MS4 permits, "*[t]he permitting agency has discretion to decide what practices, techniques, methods and other provisions are appropriate and necessary to control the discharge of pollutants*." (*City of Rancho Cucamonga v. Regional Water Quality Control Board-Santa Ana Region* (2006) 135 Cal.App.4th 1377,1389.) However, the "*Regional Board must comply with federal law requiring detailed conditions for NPDES permits*." (*Ibid.*) Further, USEPA expects the permitting authority to develop the specific practices that comply with the Clean Water Act on a permit-by-permit basis. (*NRDC v. USEPA* (9th Cir. 1992) 966 F.2d 1292, 1308.) To the extent the Board is exercising discretion in including certain permit requirements, the Board is exercising discretion required and/or authorized by federal law, not state law. (See *City of Rancho Cucamonga, supra,* 135 Cal.App.4th at 1389*; Building Industry Association of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 882-883.) Further, the MEP standard is a flexible standard that balances a number of considerations, including technical feasibility, cost, public acceptance, regulatory compliance, and effectiveness. (*Id.* at pp. 873, 874, 889.) Such considerations change over time with advances in technology and with experience gained in storm water management. (55 Fed. Reg. 47990, 48052 (Nov. 16, 1990).) Accordingly, a determination of whether the conditions contained in Tentative Order exceed the requirements of federal law cannot be based on a point by point comparison of the permit conditions with federal law. The appropriate focus is whether the permit conditions as a whole exceed the MEP standard. The commenters have failed to cite any evidence that demonstrates how requirements in the Tentative Order exceed the MEP	

Lgl-6	LEGAL	
	standard or applicable requriements of federal law. The commenters assert that provisions of the Tentative Order are more stringent than the requirements of the Clean Water Act and therefore require an analysis of the factors, including economic considerations, in Water Code section 13241 before the San Diego Water Board can approve such provisions. As indicated above, the San Diego Water Board disagrees that provisions of the Tentative Order are more stringent than requirements of the Clean Water Act. Because the Tentative Order is not more stringent than federal law, its adoption does not require the San Diego Water Board to consider Water Code section 13241 factors. The California Supreme Court in *City of Burbank v. State Water Resources Control Board, et al.,* ((2005) 35 Cal.4th 613) (*Burbank*), held: [Water Code s]ection 13377 specifies that wastewater discharge permits must meet the federal standards set by federal law. In effect, section 13377 forbids a regional board's consideration of any economic hardship on the part of the permit holder if doing so would result in the dilution of the requirements set by Congress in the Clean Water Act. That act prohibits the discharge of pollutants into the navigable waters of the United States unless there is compliance with federal law (33 U.S.C. § 1322(a)), and publicly operated wastewater treatment plants such as those before us here must comply with the act's clean water standards, regardless of cost [citations]. Because [Water Code] section 13263 cannot authorize what federal law forbids, it cannot authorize a regional board, when issuing a wastewater discharge permit, to use compliance costs to justify pollutant restrictions that do not comply with federal clean water standards." (*Burbank,* 35 Cal.4th at 625.) While the *Burbank* decision does require an analysis of Water Code section 13241 factors when the state adopts permit conditions that are more stringent than federal law (*id.* at 618) the Tentative Order reflects that all of the challenged provisions are necessary to implement federal law. Thus, the San Diego Water Board is not required to consider economic information to justify a "dilution of the requirements" established in federal law. Even when applicable, consideration of economic information pursuant to section 13241 does not require a cost-benefit analysis, as some commenters suggest. And section 13241 neither specifies how regional water boards must consider its enumerated factors nor does it require that regional water boards may specific findings documenting consideration of the factors. (See *California Ass'n of Sanitation Agencies, et al. v. State Water Resources Control Board, et al.,* (208 Cal.App.4th 1438, 1464 (2012).) Nonetheless, the Fact Sheet and Response to Comments reflect economic information that has either been developed or gathered by the San Diego Water Board or has been submitted by Copermittees or others as part of this proceeding. To the extent that economic information in connection with compliance and other costs associated with challenged permit provisions, the San Diego Water Board has fully considered this information. Under these circumstances, *Burbank* does not require more.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

Lgl-7	LEGAL	
	COMMENT: *The San Diego Water Board cannot determine whether a particular mandate is unfunded.* The Orange County, Riverside County and San Diego County Copermittees each submitted comments asserting that the San Diego Water Board does not have the legal authority to determine whether any provisions in the Tentative Order constitute a state mandate, and only the Commission on State Mandates can make the determination.	**Copermittees** Orange County Copermittees Riverside County Copermittees San Diego County Copermittees
	RESPONSE: The San Diego Water Board does not dispute that the Commission on State Mandate ultimately has jurisdiction to determine whether the State has imposed a mandate requiring state subvention. However, it is entirely appropriate for the San Diego Water Board to set forth its legal basis to support the provisions in the Tentative Order, finding them to be necessary and appropriate to meet the federal Clean Water Act standards. While the Commission may be expert in state mandates, it has no expertise in the field of water law. As indicated in response to comment Lgl-6, above, the San Diego Water Board does not agree that provisions in the Tentative Order exceed federal requirements of the Clean Water Act. The San Diego Water Board is charged by law with administering and constructing the Clean Water Act's requirements and is entitled to considerable deference in its interpretation of the Act. (See *Buidling Industry Ass'n of San Diego, supra,* 124 Cal.App.5th at pp. 873, 879 fn.9; *County of Los Angeles v. California State Water Resources Control Bd.* (2006) 143 Cal.App.4th 985, 997.) In issuing MS4 permits, "[t]he permitting agency has discretion to decide what practices, techniques, methods and other provisions are appropriate and necessary to control the discharge of pollutants." (*City of Rancho Cucamonga v. Regional Water Quality Control Board-Santa Ana Region* (2006) 135 Cal.App.4th 1377,1389.) However, the "Regional Board must comply with federal law requiring detailed conditions for NPDES permits." (*Ibid.*) Further, USEPA expects the permitting authority to develop the specific practices that comply with the Clean Water Act on a permit-by-permit basis. (*NRDC v. USEPA* (9th Cir. 1992) 966 F.2d 1292, 1308.) To the extent the Board is exercising discretion in including certain permit requirements, the Board is exercising discretion required and/or authorized by federal law, not state law. (See *City of Rancho Cucamonga, supra,* 135 Cal.App.4th at 1389*; Building Industry Association of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 882-883.) Further, the MEP standard is a flexible standard that balances a number of considerations, including technical feasibility, cost, public acceptance, regulatory compliance, and effectiveness. (*Id.* at pp. 873, 874, 889.) Such considerations change over time with advances in technology and with experience gained in storm water management. (55 Fed. Reg. 47990, 48052 (Nov. 16, 1990).) The San Diego Water Board's findings are the	

Lgl-7	LEGAL	
	expert conclusions of the principal state agency charged with implementing the NPDES program in California. (Cal. Wat. Code §§ 13001, 13370.) The San Diego Water Board is not precluded from including provisions in the Tentative Order which commenters may contend are state mandates and it is well within the San Diego Water Board's authority to conclude, based on its expertise in administering the Clean Water Act, the the Tentative Order does not exceed federal law and is therefore not a state mandate subject to subvention.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

Lgl-8	LEGAL	
	COMMENT: *"Waters of the state" should be revised to "waters of the U.S" or "receiving waters" throughout the Tentative Order.* The Riverside County and San Diego County Copermittees each submitted comments objecting to applying the requirements of the Tentative Order to "waters of the state" instead of "waters of the U.S." which is consistent with the Clean Water Act, or "receiving waters." The Copermittees are concerned that "waters of the state" may include groundwater, which exceeds federal requirements. The Copermittees requested several revisions throughout the Tentative Order reflecting this comment.	**Copermittees** Riverside County Copermittees San Diego County Copermittees
	RESPONSE: The San Diego Water Board agrees that certain requirements of the Tentative Order should be revised to "waters of the U.S." or "receiving waters." Where applicable and appropriate, the San Diego Water Board revised "waters of the state" to "waters of the U.S." or "receiving waters" to limit the application of a requirement to surface waters. However, because the Tentative Order also serves as waste discharge requirements and incorporates the water quality standards of the Basin Plan (i.e. discharge prohibition A.1.a), the term "waters of the state" remains appropriate where the phrase exists in the applicable Basin Plan provision, incorporated into the Tentative Order. Because the Tentative Order regulates discharges of pollutants to waters of the United States, the San Diego Water Board does not anticipate there being any MS4 discharges to groundwaters that could violate the prohibition as to waters of the state. Additionaly, such provisions are not new to San Diego Region MS4 permits. .	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

Lgl-9	LEGAL	
	COMMENT: *The Tentative Order cannot include requirements to regulate storm water flow.* The Riverside County and San Diego County Copermittees, the City of Lake Forest, and the BIA Regulated Community Coalition each submitted comments that assert the Tentative Order cannot include requirements (i.e. hydromodification management requirements) to regulate storm water flow. The commenters cite a recent court decision from Virgina (*Virginia Dept. of Transp. v. U.S. Environmental Protection* Agency) as the basis for this assertion. In contrast, the Los Penasquitos Lagoon Foundation requests that the Tentative Order finds discharges (i.e. flow) from the MS4s can generate and/or contribute to discharges of pollutants downstream of the MS4 outfalls (e.g. discharge of sediment due to scouring of the natural channels).	**Building Industry / Industry** BIA Regulated Community Coalition **Copermittees** City of Lake Forest Riverside County Copermittees San Diego County Copermittees **Environmental Organizations** Los Penasquitos Lagoon Foundation
	RESPONSE: The San Diego Water Board disagrees that the Tentative Order cannot include requirements that will result in decreasing the impact of pollutants in storm water runoff discharged from the MS4s on the physical, chemical, and biological integrity of receiving waters to the maximum extent practicable (MEP). The Tentative Order includes requirements to effectively prohibit non-storm water discharges to the MS4, and control the discharge of pollutants from the MS4 to the MEP, consistent with the requirements of the Clean Water Act and Code of Federal Regulations. If non-storm water discharges are effectively prohibited to the MS4s, there should be little to no flow from the MS4s to receiving waters. Thus, the Tentative Order already includes requirements to regulate non-storm water flow to and from the MS4s. In contrast, the MEP standard is a technologically based effluent limitation (TBEL) that applies specifically to storm water discharges from the MS4s. The Tentative Order includes development planning structural BMP requirements that act as BMP-based TBELs to implement the MEP standard for new development and significant redevelopment projects. While the development planning structural BMP requirements are separated into "*storm water pollutant control*" and "*hydromodification management*" BMP requirements, they are both for the control of pollutants in storm water discharges from the MS4 to the MEP. The hydromodification management BMP requirements of the Tentative Order do, to a significant extent, regulate flow. However, the primary purpose of the hydromodification management BMP requirements still stems from the requirement that MS4 permits include controls to reduce the discharge of pollutants in storm water from the MS4s to receiving waters. The increases in flows and durations caused by new development	

Lgl-9	LEGAL	
	and significant redevelopment also results in increases to pollutants that are discharged in storm water from the MS4s to the receiving waters. The pollutants discharged will always be in excess of what would be generated in a natural environment, even with controls in place. Those increased pollutant loads associated with increased flows and durations of storm water discharging from the MS4s impact the chemical integrity (e.g. salinity, temperature, toxic pollutants), biological integrity (e.g. biological toxicity, supportable flora and fauna, habitat alteration), and physical integrity (e.g. destabilization of stream channels, excessive sediment deposition) of receiving waters. Thus, the hydromodification management BMP requirements of the Tentative Order are necessary to control the discharge of pollutants generated by new development and significant redevelopment projects in storm water discharges from the MS4 to the MEP, even if they do result in the regulation of flow. The recent district court decision from the Eastern District of Virginia (*Virginia Dept. of Transportation, et al. v. United States Environmental Protection Agency,* et al. (2013 WL 53741 (E.D.Va.) (Virginia Decision)) cited by commenters does not support their argument in the context of the Tentative Order. In the Virginia Decision, USEPA had established a TMDL limiting the flow rate of stormwater into a creek to 681.8 ft/acre-day. USEPA characterized the flow rate as a "surrogate" for sediment, a pollutant. USEPA recognized that flow in and of itself is not a pollutant. As some commenters acknowledge, the Virginia Decision is not precedential and does not bind the San Diego Water Board. More importantly, the decision is inapposite as it concerns section 303(d) of the Clean Water Act concerning total daily maximum loads (TMDLs) which sets forth a very specific requirement that for impaired water bodies, states must establish numeric loads "for those *pollutants* which the Administrator identifies under section 1314(a)(2) of this title are suitable for such calculation." Instead of setting a load for a pollutant, USEPA calculated a load for flow as a surrogate for the relevant pollutant. In contrast, as explained above, section 402(p) of the Clean Water Act provides that states issuing MS4 permits shall "require *controls* to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants." (CWA, § 402(p)(3)(B)(iii).) Following the directives of this section of the Clean Water Act, the Tentative Order establishes controls discussed above such as best management practices to remove pollutants in storm water, source control and restrictions on the flow rate and duration of post-construction runoff, the latter of which not only can	

Lgl-9	LEGAL	
	contain pollutants but can affect the discharge of pollutants in the runoff. (See State Water Board Order No. WQ 2000-11 (p. 5) (*Cities of Bellflower, et al.*,) and State Water Board Order WQ 2001-15 (fn.23) (*Building Industry Association of San Diego).*). One commenter also cites to the Virginia Decision in requesting that the San Diego Water Board conform the TMDL provisions in the Tentative Order to the Virginia Decision. It is unclear how the commenter believes the Virginia Decision applies to the TMDL provisions in the Tentative Order, but as indicated above, the decision is not binding on the San Diego Water Board and any concerns with the loads established in TMDLs should most appropriately be raised in the context of the TMDL approval proceeding.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

Lgl-10	LEGAL	
	COMMENT: *The numeric WQBELs violate requirements of law because they are infeasible.* The Orange County Copermittees submitted comments that object to the incorporation of numeric WQBELs for TMDLs, and assert that the inclusion of the numeric WQBELs violate the law because they are infeasible (presumably, to achieve). The Copermittees assert that the WQBELs should be BMP-based and not numeric. The Copermittees cite a 2010 USEPA memorandum, 40 CFR 122.44(k), and the Caltrans MS4 permit as justification for BMP-based instead of numeric WQBELs in the Tentative Order.	**Copermittees** Orange County Copermittees
	RESPONSE: The San Diego Water Board disagrees that including numeric WQBELs for the TMDLs in the Tentative Order violate the requirements of law. The federal regulations under 40 CFR 122.44(d)(1)(vii)(B) require that NPDES permit requirements incorporate WQBELs that must be consistent with the requirements and assumptions of any available wasteload allocations (WLAs) developed under TMDLs. The federal regulations under 40 CFR 122.44(k) do not require WQBELs to be BMP-based if numeric effluent limitations are infeasible, but only that WQBELs that implement WLAs may be expressed in the form of BMPs. BMP-based WQBELs may be allowed if BMPs alone adequately implement WLAs, and additional controls are not necessary. This is consistent with a 2002 USEPA memorandum for "*Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs*." WQBELs are required for point source discharges that have the reasonable potential to cause or contribute to an excursion of water quality standards and technology based effluent limitations or standards are not sufficient to achieve water quality standards. Where a WLA has been assigned to a discharge in a TMDL, it is concluded that there is reasonable potential for the discharger to cause or contribute to an excursion of water quality standards. The 2010 USEPA memorandum for "*Revisions to the November 22, 2002 Memoradum 'Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs'"* cited by the Copermittees states, "*For the purpose of this memorandum, numeric WQBELs use numeric parameters such as pollutant concentrations, pollutant loads, or numeric parameters actings as surrogates for pollutants […].*" The memorandum goes on to recommend, "*Where the NPDES authority determine that MS4 discharges have a reasonable potential to cause or contribute to a water quality standard excursion, EPA recommends that, where feasible, the NPDES permitting authority exercise its discretion to include numeric effluent limitations necessary to meet water quality standards*." The "where feasible" in the memorandum applies to the NPDES permitting authority's discretion to include numeric effluent	

Lgl-10	LEGAL	
	limitations necessary to meet water quality standards, not to the feasibility of achieving the numeric effluent limitations. The State Water Board, in Order WQ 2006-0012 (Boeing), has made clear that "infeasibility" in the context of numeric effluent limitations refers to "the ability or propriety of establishing" numeric limits, as opposed to the feasibility of compliance. Please also see response to comment Lgl-4. The Caltrans MS4 permit is issued by the State Water Board. Even though the Caltrans MS4 permit may allow for BMP-based WQBELs, this does not require the San Diego Water Board to include BMP-based WQBELs in the Tentative Order regardless of any potential or apparent conflict. The San Diego Water Board will issue additional requirements to Caltrans with numeric WQBELs when and where warranted. The San Diego Water Board considered the feasibility of incorporating numeric WQBELs to implement the requirements of each of the TMDLs and has determined that they are feasible, and necessary, to include to meet water quality standards, consistent with the 2010 USEPA memorandum. Numeric WQBELs are also "additional controls" necessary to implement the WLAs, consistent with the 2002 USEPA memorandum. Each of the TMDLs in the Tentative Order, however, includes BMP-based WQBELs which must be implemented to achieve the numeric WQBELs. The Tentative Order requires the Copermittees to implement the BMP-based WQBELs to achieve the numeric WQBELs. This is consistent with the 40 CFR 122.44(d)(1)(vii)(B) and 40 CFR 122.44(k), and the recommendations of the 2010 USEPA memorandum. The Tentative Order has also been revised to include interim and final TMDL compliance determination options that allow the Copermittees to demonstrate that the BMP-based WQBELs will achieve the numeric WQBELs. The numeric WQBELs are necessary for the Copermittees to quantitatively demonstrate that the BMPs implemented are achieving the WLAs of the TMDLs. Please see response to comments AttE-1 and AttE-3. Thus, the Tentative Order appropriately includes numeric WQBELs and does not violate any requirements of law.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

Lgl-11	LEGAL	
	COMMENT: *Storm water pollutant control retention requirements of the Tentative Order conflict with Rainwater Capture Act of 2012 (AB 1750).* The BIA Regulated Community Coalition commented that the Rainwater Capture Act does not provide the authority to collect and retain storm water from impervious surfaces other than rooftops. Thus, the BIA Regulated Community Coalition asserts that the storm water pollutant control retention requirements of the Tentative Order may be in conflict with the Rainwater Capture Act and the retention requirements of the Tentative Order should not be enforced.	**Building Industry / Industry** BIA Regulated Community Coalition
	RESPONSE: The San Diego Water Board disagrees that the storm water pollutant control retention requirements of the Tentative Order are in conflict with the Rainwater Capture Act. The Rainwater Capture Act provides additional clarification that the collection of rainwater from rooftops does not require a water right permit. The Rainwater Capture Act does not address collection of water from other surfaces, nor does it modify or alter existing law pertaining to appropriative water rights. Retention of rainwater or diffuse surface flow before it flows into a watercourse does not require a water right permit. The storm water pollutant control retention requirements of the Tentative Order are not in conflict with the Rainwater Capture Act or existing water rights law.	

FINDINGS
Fnd-1: *Requests for additional findings.*

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

Fnd-1	FINDINGS	
	COMMENT: *Requests for additional findings.* The Riverside County Copermittees requested several additional findings be included in the Tentative Order associated with water law, flooding, flood control acts, and limitations on legal authority. The County of San Diego and the County of San Diego Department of Environmental Health requested a finding with vector-related language.	**Copermittees** County of San Diego County of San Diego Department of Environmental Health Riverside County Copermittees
	RESPONSE: The San Diego Water Board considered the requests for the additional findings and determined that including the additional findings is not necessary. The requirements of the Tentative Order are consistent with the federal Clean Water Act, Code of Federal Regulations, and the California Water Code. The additional findings requested associated with water law, flooding, flood control acts, limitations on legal authority and vector-related issues are not necessary to establish that the requirements of the Tentative Order are consistent the federal Clean Water Act, Code of Federal Regulations, and the California Water Code. The San Diego Water Board did not include any additional findings as requested by the commenters. The San Diego Water Board did, however, incorporate an additional requirement under the general requirements of all development projects (new Provision E.3.a.(1)(c)) to avoid the creation of nuisance or pollution associated with vectors. Subsequently, additional discussion was also included in the Fact Sheet to encourage the design and implementation of BMPs in consultation with local vector control agencies and the California Department of Public Health.	

Fnd-2: *Findings 2 and 26: Remove language that states the San Diego Water Board has the authority to issue a regional MS4 permit.*

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

Fnd-2	FINDINGS	
	COMMENT: *Findings 2 and 26: Remove language that states the San Diego Water Board has the authority to issue a regional MS4 permit.* The Orange County and Riverside County Copermittees each submitted comments asserting that Findings 2 and 26 were inaccurate and the San Diego Water Board does not have the authority to issues a regional MS4 permit under the Clean Water Act.	**Copermittees** Orange County Copermittees Riverside County Copermittees
	RESPONSE: The San Diego Water Board disagrees that it does not have the authority to issue a regional MS4 permit. The San Diego Water Board maintains Findings 2 and 26 are accurate and the San Diego Water Board has the authority to issue a regional MS4 permit. Please see the response to comment Lgl-5.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

Fnd-3	FINDINGS	
	COMMENT: *Finding 3 and 15 (and elsewhere in the Tentative Order): Remove "in storm water" from "reduce discharges of pollutants in storm water to the maximum extent practicable."* The Riverside County and San Diego County Copermittees each submitted comments that objected to requiring the control of pollutants "in storm water" to the MEP. The Copermittees assert that the Tentative Order is inconsistent with the Clean Water Act and the control of pollutants to the MEP applies to both storm water and non-storm water. The BIA Regulated Community Coalition cited a recent court decision that they assert calls into question several findings, including Findings 3 and 15. Clean Water Now supported the BIA Regulated Community Coalition concerns and also alluded to court decisions that call into question several findings. In both cases, the commenters requested that the Tentative Order be delayed until a definitive interpretation of the legal decisions is made available.	**Building Industry / Industry** BIA Regulated Community Coalition **Copermittees** Riverside County Copermittees San Diego County Copermittees **Environmental Organizations** Clean Water Now
	RESPONSE: The San Diego Water Board disagrees that there is any inconsistency with the requirements of the Clean Water Act, or that the adoption of the Tentative Order should be delayed. Comments received assert that the "plain language" of the Clean Water Act states that the MEP standard applies to all pollutants discharged from the MS4, not just pollutants in storm water. The commenter, however, fails to acknowledge the "plain language" of the Clean Water Act that specifically makes a clear distinction that non-storm water discharges are to be effectively prohibited from entering the MS4. Since the "plain language" of the Clean Water Act states that non-storm water discharges to the MS4 are to be effectively prohibited (CWA section 402(p)(3)(B)(ii)), then no pollutants in non-storm water will enter the MS4 if the discharger is in compliance with this requirement. If no pollutants are entering the MS4 because non-storm water discharges are not entering the MS4, then clearly the very next requirement to control pollutant discharges from the MS4 be reduced to the MEP (CWA section 402(p)(3)(B)(iii)) intends that the discharge of pollutants only apply to storm water. Provisions A.1.b and A.3.a are consistent with CWA section 402(p)(3)(B)(ii) and CWA section 402(p)(3)(B)(iii), respectively, and the Fact Sheet further clarifies this distinction between non-storm water discharges and pollutants in storm water discharges. Findings 3 and 15 are consistent with the Clean Water Act have not be modified. The United States Supreme Court decision, *Los Angeles County Flood Control v. Natural Resources Defense Council* (2013) 133 S.Ct. 710 does not require any modifications to the Tentative Order.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

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Fnd-4	FINDINGS	
	COMMENT: *Finding 7: Finding should be modified to support construction of BMPs in receiving waters.* The BIA Regulated Community Coalition submitted comments requesting revisions to Finding 7 to support the construction of BMPs in receiving waters. The commenter is concerned that the Tentative Order will not allow the construction of BMPs, or implementation of retrofitting or rehabilitation projects in waters of the U.S. or waters of the state to treat pollutants in storm water from areas of existing development. The commenter also requested a revision to Provision E.3.a.(1)(b) to reflect the requested revision to Finding 7.	**Building Industry / Industry** BIA Regulated Community Coalition
	RESPONSE: The San Diego Water Board disagrees revisions to Finding 7 are appropriate or necessary. Finding 7 correctly provides that pursuant to federal regulations under 40 CFR 131.10(a) waste transport or waste assimilation cannot be a designated use for any waters of the U.S. Thus, waters of the U.S. cannot be utilized for the treatment of pollutants in storm water discharges from the MS4s, and treatment control BMPs must not be constructed in waters of the U.S. to treat pollutants in storm water discharges from the MS4s. Finding 7 does not, however, include construction of BMPs for the treatment of pollutants in waters of the state. Thus, the San Diego Water Board has revised Provision E.3.a.(1)(b) to limit the prohibition of constructing structural BMPs in only waters of the U.S. consistent with 40 CFR 131.10(a).	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

Fnd-5	FINDINGS	
	COMMENT: *Findings 8, 16 and 17: Findings should not include presumption that discharges from MS4s always contain waste or pollutants.* The Orange County and San Diego County Copermittees objected to Finding 8 stating that discharges from the MS4s contain waste, and does not acknowledge that there may not be pollutants in the discharges from the MS4s. The Copermittees requested revisions to Findings 8, 16 and 17 to reflect this position. The BIA Regulated Community Coalition cited a recent court decision that they assert calls into question several findings, including Finding 8. Clean Water Now supported the BIA Regulated Community Coalition concerns and also alluded to court decisions that call into question several findings. In both cases, the commenters requested that the Tentative Order be delayed until a definitive interpretation of the legal decisions is made available. In contrast, the Los Penasquitos Lagoon Foundation recommended that Finding 8 should also acknowledge pollutant discharges that are caused as a result of discharges from the MS4s (e.g. sediment discharged due to scouring of the receiving waters).	**Building Industry / Industry** BIA Regulated Community Coalition **Copermittees** Orange County Copermittees San Diego County Copermittees **Environmental Organizations** Clean Water Now Los Penasquitos Lagoon Foundation
	RESPONSE: The San Diego Water Board disagrees that Findings 8, 16, or 17 are inaccurate, or that the adoption of the Tentative Order should be delayed. The Tentative Order is implementing the requirements of the California Water Code as well as the requirements of the Clean Water Act. Under the California Water Code section 13376, any person discharging waste, or proposing to discharge wastes to waters of the state is not authorized to discharge waste unless issued waste discharge requirements. The requirements of the Clean Water Act, specific to discharges of pollutants to waters of the U.S. are also included in the California Water Code, Chapter 5.5 of Division 7. Thus, under the California Water Code, any person discharging pollutants, or proposing to discharge pollutants to waters of the U.S. is not authorized to discharge pollutants unless issued waste discharge requirements that include NPDES requirements. Waste discharge requirements that include NPDES requirements is also an NPDES permit under the Clean Water Act. The Clean Water Act requires municipalities to obtain NPDES permits to authorize discharges of pollutants from their MS4s. Commenters cite the definition of "waste" in the California Water Code to assert that the definition does not include storm water or any discharge that is not created by human activity. Comments received also assert that	

Fnd-5	FINDINGS	
	waste discharge requirements and NPDES permits cannot regulate the discharge of "pure storm water" and that not all discharges from the MS4 contain pollutants. Discharges from the MS4 are not "pure storm water." Storm water that flows over the surface of any developed area, which includes the MS4 itself, do not enter or discharge from the MS4 without coming into contact with pollutants or constituents that alter the storm water such that it is no longer "pure storm water." Thus, storm water discharges from the MS4 contains pollutants and contain waste. It is well-known and documented that urban runoff and storm water contains pollutants. (See, e.g., State Water Board Order WQ 2001-015 ("As we stated in Board Order WQ 95-2, the requirement to adopt permits for urban runoff is undisputed, and Regional Water Boards are not required to obtain any information on the impacts of runoff prior to issuing a permit (citation). It is also undisputed that urban runoff contains 'waste' within the meaning of Water code section 13050(d), and that the federal regulations define 'discharge of a polltuant' to include 'additions of pollutants into waters of the United States from surface runoff which is collected or channeled by man.' (40 C.F.R. § 122.2.) But it is the waste or pollutants in the runoff that meet these definitions of 'waste' and 'pollutant.' And not the runoff itself. [fn]. (p. 5.)) The Tentative Order is not regulating "pure storm water" but the discharge of storm water that is being discharged as a waste and contains pollutants. Finding 8 accurately states that discharges from the MS4s contain waste, as defined in the California Water Code. Finding 8 also accurately states that discharges from the MS4s contain pollutants that adversely affect the quality of waters of the state. Findings 16 and 17 also accurately conclude that BMPs and implementation of BMPs are necessary to remove waste and pollutants in storm water discharges from the MS4s. The San Diego Water Board does not understand the comments concerning the recent United States Supreme Court decision in Los Angeles County Flood Control District v. NRDC (133 S.Ct 710 (2013). The San Diego Water Board has reviewed the opinion and does not believe the opinion necessitates any changes to the Tentative Order.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

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Fnd-6	FINDINGS	
	COMMENT: *Finding 10: Finding should be modified to specify linear underground projects (LUPs) should not be subject to permanent post construction BMP requirements.* San Diego Gas and Electric and the Southern California Gas Company each submitted comments requesting revisions to Finding 10 to specify that linear underground/overhead (utility) projects (LUPs) are not subject to post construction requirements to be consistent with the State Water Board Construction General Permit findings.	**Building Industry / Industry** San Diego Gas and Electric Southern California Gas Company
	RESPONSE: The San Diego Water Board disagrees that revisions to Finding 10 are appropriate or necessary. Finding 10 accurately states that pollutants are generated by land development. Finding 10 discusses the generation of pollutants by land development in broad and general terms, and does not specify types of land development activities. Incorporating language into Finding 10 specific to LUPs is inappropriate and not necessary.	

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Fnd-7	FINDINGS	
	COMMENT: *Finding 11: Finding should not classify natural waters as part of the MS4, and cannot be classified as both an MS4 and receiving water.* The Orange County, Riverside County, and San Diego County Copermittees each submitted comments asserting that Finding 11 was inaccurate and the San Diego Water Board cannot classify natural waters as part of the MS4. The BIA Regulated Community Coalition cited a recent court decision that they assert calls into question several findings, including Finding 11. Clean Water Now supported the BIA Regulated Community Coalition concerns and also alluded to court decisions that call into question several findings. In both cases, the commenters requested that the Tentative Order be delayed until a definitive interpretation of the legal decisions is made available. In contrast, the Los Penasquitos Lagoon Foundation recommended that the language of Finding 11 should be maintained.	**Building Industry / Industry** BIA Regulated Community Coalition **Copermittees** Orange County Copermittees Riverside County Copermittees San Diego County Copermittees **Environmental Organizations** Clean Water Now Los Penasquitos Lagoon Foundation
	RESPONSE: The San Diego Water Board disagrees that Finding 11 is inaccurate, or that the adoption of the Tentative Order should be delayed. An MS4 is defined in the federal regulations as a conveyance or system of conveyances owned or operated by a Copermittee, and designed or used for collecting or conveying runoff. Therefore, the San Diego Water Board considers natural drainages that are used by the Copermittees as conveyances of runoff, as both part of the MS4 and as receiving waters. The State Water Board supports this approach. In reviewing a Petition on Order No. R9-2001-0001, the State Water Board stated "*We also agree with the Regional Water Board's concern, as stated in its response, that there may be instances where MS4s use 'waters of the United States as part of their sewer system* [...]" State Water Resources Control Board Order WQ 2001-15. Furthermore, the U.S. Supreme Court's 2006 *Rapanos* decision supports the conclusion that natural streams in developed areas can be both receiving waters and MS4s by confirming that ephemeral and intermittent streams can be waters of the U.S. subject to regulation under Clean Water Act section 404 and also be considered point sources of pollution discharges regulated under Clean Water Act section 402. (See *Rapanos, et al. v. United*	

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Fnd-7	FINDINGS	
	States and Carabell et al. v. United States Army Corps of Engineers, et al. (2006) 547 U.S. 715, 743-744.) Finding 11 is accurate and consistent with the Clean Water Act and NPDES regulations.	

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Fnd-8	FINDINGS	
	COMMENT: *Finding 12: Finding should not state that Copermittees provide free and open access to MS4s; Copermittees are not responsible for all discharges not prohibited.* The Orange County and Riverside County Copermittees each submitted comments objecting to Finding 12 stating that the Copermittees provide free and open access to MS4s. The Riverside County Copermittees also objected to Finding 12 stating that the Copermittees cannot passively receive and discharge pollutants from third parties. The Copermittees assert that they are not responsible for discharges from their MS4s that are from third parties that are subject to the jurisdiction of the San Diego Water Board.	**Copermittees** Orange County Copermittees Riverside County Copermittees
	RESPONSE: The San Diego Water Board disagrees that Finding 12 is inaccurate. The Copermittees have the option to request the authority to discharge from their MS4s under an NPDES permit or comply with the complete prohibition against the discharge of pollutants pursuant to Clean Water Act section 301(a) (33 U.S.C. § 1311(a)). These choices are provided by the federal Clean Water Act, not state laws. The Copermittees have opted to discharge from their MS4s under an NPDES permit. In doing so, they are responsible for discharges from the MS4s. Thus, Finding 12 correctly provides that the Copermittees provide free and open access to their MS4s and they are responsible for discharges into the MS4 that they do not prohibit or otherwise control. Finding 12 also correctly provides that the Copermittees cannot passively receive and discharge pollutants from third parties. The Copermittees have the responsibility of identifying the sources of discharges and pollutants from their MS4s. If the Copermittees are not actively identifying sources and cannot identify sources of discharges and pollutants to and from their MS4s, then the Copermittees are the source of the MS4s discharges and pollutants to receiving waters, even if they believe third parties are responsible for the discharges and pollutants. If, however, the Copermittees identify the sources of discharges and pollutants to or from the MS4s as outside of their legal authority to prohibit or otherwise control, then they are not passively receiving and discharging pollutants, even if they are providing free and open access to the MS4s. The data and information that the Copermittees collect to identify the third party sources can provide the evidence that the Copermittees are not responsible for the discharges and pollutants from the MS4s that can be attributed to third parties. Until the data and information are provided to identify those third parties, and demonstrate those parties are not subject to the Copermittees' legal authority, then the Copermittees are responsible for all of the discharges to and from their MS4s unless such discharges are authorized by a separate NPDES permit.	

Fnd-9: *Finding 15: Finding should state that the maximum extent practicable standard applies to both non-storm water and storm water, not just storm water.*

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Fnd-9	FINDINGS	
	COMMENT: *Finding 15: Finding should state that the maximum extent practicable standard applies to both non-storm water and storm water, not just storm water.* The Orange County, Riverside County and San Diego County Copermittees each submitted comments that assert Finding 15 is inaccurate. The Copermittees assert that the Tentative Order is inconsistent with the Clean Water Act and the MEP standard applies to both non-storm and water storm water, not just storm water. The BIA Regulated Community Coalition cited a recent court decision that they assert calls into question several findings, including Finding 15. Clean Water Now supported the BIA Regulated Community Coalition concerns and also alluded to court decisions that call into question several findings. In both cases, the commenters requested that the Tentative Order be delayed until a definitive interpretation of the legal decisions is made available. San Diego Gas and Electric and the Southern California Gas Company each submitted comments requesting revisions to Finding 15 to clarify that non-storm water discharge authorized by a NPDES permit are authorized to be discharged to the MS4s.	**Building Industry / Industry** BIA Regulated Community Coalition San Diego Gas and Electric Southern California Gas Company **Copermittees** Orange County Copermittees Riverside County Copermittees San Diego County Copermittees **Environmental Organizations** Clean Water Now
	RESPONSE: The San Diego Water Board disagrees that the MEP standard applies to both non-storm water and storm water. The San Diego Water Board also disagrees that Finding 15 should be revised. Finding 15 accurately states the requirements of the Clean Water Act. The San Diego Water Board maintains that MEP standard only applies to pollutants in storm water. The San Diego Water Board also maintains that Finding 15 does not need to be clarified to state that non-storm water discharge authorized by a NPDES permit are authorized to be discharged to the MS4s. Please see the responses to comments Fnd-3 and Fnd-8, and also see Memorandum from San Diego Water Board Counsel to San Diego Water Board dated 5 November 2009, incorporated by reference herein.	

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Fnd-10	FINDINGS	
	COMMENT: *Finding 27: Finding should state that implementation of the requirements of the Tentative Order "will" not "may" allow the San Diego Water Board to re-categorize impaired water bodies to Category 4 in the Integrated Report.* The San Diego County Copermittees requested that Finding 27 be revised to state that the requirements of the Tentative Order "will" allow the San Diego Water Board to re-categorize impaired water bodies to Category 4 in the Integrated Report, as opposed to only "may" allow the re-categorization.	**Copermittees** San Diego County Copermittees
	RESPONSE: The San Diego Water Board disagrees that revising Finding 27 is appropriate. Finding 27 is accurate to state that the implementation of the Water Quality Improvement Plan "may" allow the San Diego Water Board to re-categorize an impaired water body in Category 4 in the Integrated Report meaning a TMDL is not required. The Integrated Report is ultimately approved by the USEPA. The USEPA may not allow the San Diego Water Board to re-categorize an impaired water body from Category 5 (i.e. TMDL required) to Category 4 (i.e. TMDL not required) if they do not agree that the implementation of the requirements of the Tentative Order will result in attainment of the water quality standards.	

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Fnd-11	FINDINGS	
	COMMENT: *Finding 28: Finding should state that the requirements of the Tentative Order are more stringent than Federal law and require a CWC 13241 analysis.* The Orange County and Riverside County Copermittees each submitted comments objecting to Finding 28. The Copermittees assert that several requirements of the Tentative Order go beyond the requirements of Federal law, thus an analysis pursuant to California Water code section 13241 is required. The Copermittees make several assertions about the deficiencies they perceive with the economic considerations discussed in the Fact Sheet. The Copermittees assert that a cost-benefit analysis needs to be included in the Fact Sheet discussion. The BIA Regulated Community Coalition cited a recent court decision that they assert calls into question several findings, including Finding 28. Clean Water Now supported the BIA Regulated Community Coalition concerns and also alluded to court decisions that call into question several findings. In both cases, the commenters requested that the Tentative Order be delayed until a definitive interpretation of the legal decisions is made available.	**Building Industry / Industry** BIA Regulated Community Coalition **Copermittees** Orange County Copermittees Riverside County Copermittees **Environmental Organizations** Clean Water Now
	RESPONSE: The San Diego Water Board disagrees that provisions of the Tentative Order go beyond the requirements of the Clean Water Act or Code of Federal Regulations, or that the adoption of the Tentative Order should be delayed. The San Diego Water Board considered economic information in developing the Tentative Order using the best available information, but did not do so in accordance with an analysis pursuant to California Water code section 13241. The provisions of the Tentative Order are based on and fully supported by federal requirements, as demonstrated by the legal authority provided by the Clean Water Act and Code of Federal Regulations sections cited in the Fact Sheet. Thus, the San Diego Water Board maintains that an analysis pursuant to California Water code section 13241 is not required. Federal NPDES regulations do not require that the San Diego Water Board conduct a cost-benefit analysis. Please also see response to comment Lgl-6.	

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Fnd-12	FINDINGS	
	COMMENT: *Finding 29: San Diego Water Board cannot determine what is a state mandate.* The Orange County, Riverside County and San Diego County Copermittees each submitted comments objecting to Finding 29 generally asserting that the San Diego Water Board does not have the legal authority to determine whether any provisions in the Tentative Order constitute a state mandate, and only the Commission on State Mandates can make the determination. The County of San Diego also submitted a similar comment.	**Copermittees** County of San Diego Orange County Copermittees Riverside County Copermittees San Diego County Copermittees
	RESPONSE: The San Diego Water Board agrees that the Commission on State Mandates ultimately has jurisdiction to determine that a provision in the Tentative Order constitutes a state mandate. Finding 29 is, nonetheless, appropriate and necessary to express and support the San Diego Water Board's position that the Tentative Order is the result of a federal and not a state mandate. Please see the response to comment Lgl-7.	

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Fnd-13	FINDINGS	
	COMMENT: *Finding 31: Finding should support implementation of the iterative process to comply with prohibitions and limitations.* The Riverside County Copermittees submitted a comment related to Finding 31 requesting that the Tentative Order be revised to support the iterative process as a means to comply with the discharge prohibitions and receiving water limitations of Provision A. The Copermittees did not request or recommend any revisions to Finding 31, but requested revisions to Provision A to support implementation of the iterative process to comply with the discharge prohibitions and receiving water limitations.	**Copermittees** Riverside County Copermittees
	RESPONSE: The San Diego Water Board agrees that implementation of the iterative process is necessary to achieve compliance with the discharge prohibitions and receiving water limitations of Provision A. The San Diego Water Board did not make any revisions to Finding 31 or Provision A as requested by the commenter. The San Diego Water Board did, however, include an option as part of the Water Quality Improvement Plan requirements that each Copermittee may choose to implement to demonstrate compliance with the discharge prohibitions and receiving water limitations of Provision A. Please see response to comment A-1.	

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Fnd-14	FINDINGS	
	COMMENT: *Finding 32: Finding should clarify that NPDES permitted discharges to MS4s that discharge to ASBS are authorized.* San Diego Gas and Electric and Southern California Gas Company requested modifications to Finding 32 to specify that the San Diego Water Board finds that NPDES-permitted discharges to the MS4 that subsequently discharge to ASBS will not alter ocean water quality and the Tentative Order authorizes these NPDES-permitted discharges. The commenters are concerned that the Tentative Order does not clearly state that NPDES permitted discharges to the Copermittees' MS4s that then discharge to ASBS are authorized. The BIA Regulated Community Coalition cited a recent court decision that they assert calls into question several findings, including Finding 32. Clean Water Now supported the BIA Regulated Community Coalition concerns and also alluded to court decisions that call into question several findings. In both cases, the commenters requested that the Tentative Order be delayed until a definitive interpretation of the legal decisions is made available.	**Building Industry / Industry** BIA Regulated Community Coalition San Diego Gas and Electric Southern California Gas Company **Environmental Organizations** Clean Water Now
	RESPONSE: The San Diego Water Board disagrees that revisions to Finding 32 are appropriate or necessary, or that the adoption of the Tentative Order should be delayed. The Tentative Order requires discharges from the Copermittees' MS4 to be consistent with the requirements of Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 (Special Protections). The Tentative Order includes provisions that apply to the Copermittees' MS4 discharges to ASBS, thus the Copermittees are subject to the requirements of the Special Protections. Incorporating the requested language into Finding 32 to find that the San Diego Water Board authorizes discharges of other NPDES-permitted discharges to the MS4 is inappropriate and not necessary.	

PROVISION A: PROHIBITIONS AND LIMITATIONS
A-1: *Revise Provision A to clarify how compliance with prohibitions and limitations can be achieved.*

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A-1	PROVISION A: PROHIBITIONS AND LIMITATIONS	
	COMMENT: *Revise Provision A to clarify how compliance with prohibitions and limitations can be achieved*. The Orange County, Riverside County and San Diego County Copermittees each submitted comments requesting that the requirements of Provision A be modified to provide a clear linkage between the prohibitions and limitations of Provisions A.1 to A.3 with the iterative process required under Provision A.4 to be demonstrated through the implementation of the Water Quality Improvement Plans. The Copermittees are concerned that the language of Provision A, if not modified, will be interpreted as requiring strict and immediate compliance with the prohibitions and limitations, and the implementation of the iterative process would not be enough the demonstrate compliance with the prohibitions and limitations. Among the many recommended modifications to the requirements of Provision A, the Copermittees are generally requesting that the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c and A.2.a specifically state that implementation of Provision A.4 constitutes compliance. Furthermore, the Copermittees have requested that Provision A.4 explicitly state that the implementation of the iterative process constitutes compliance with any of the prohibitions and limitations under Provision A.1 to A.3, including compliance with the effective prohibitions of non-storm water discharges to the MS4s, the special protections for ASBS, and the TMDL requirements. Many Copermittees submitted separate comments in support of the requested modifications. One commenter from the Building Industry also requested similar modifications to the requirements of Provision A. In contrast, commenters from Environmental Organizations were strongly in support of maintaining the existing language and asserted that modifications to Provision A that would "weaken" the requirements, or provide "safe harbor" and would violate federal anti-backsliding requirements.	**Building Industry / Industry** BIA Regulated Community Coalition **Copermittees** City of Del Mar City of Imperial Beach City of Laguna Hills City of Lake Forest City of Mission Viejo City of Rancho Santa Margarita City of San Diego City of San Juan Capistrano County of San Diego County of San Diego Office of County Counsel Orange County Copermittees Riverside County Copermittees San Diego County Copermittees San Diego Unified Port District / Brown and Winters **Environmental Organizations** Environmental Groups Natural Resources Defense Council
	RESPONSE: The San Diego Water Board agrees with the comments from the Copermittees and their supporters, as well as the Environmental Organizations. The San Diego Water Board understands the concerns that the Copermittees have expressed regarding the requirements of Provision A and the apparent lack of a linkage between the iterative process under Provision A.4 and the strict compliance with the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c and A.2.a. This language, however, is consistent with the precedential language that was issued under State Water Board Order WQ-1999-05 and has been implemented in all MS4 permits issued by the San Diego Water Board since 2001. The State Water Board has not issued an order or taken other action to supersede the	

A-1	PROVISION A: PROHIBITIONS AND LIMITATIONS	
	precedential language. Under the Porter-Cologne Water Quality Control Act, waste discharge requirements must implement applicable water quality control plans, including water quality objectives. The discharge prohibitions and receiving water limitations of Provision A.1.a, A.1.c and A.2.a are consistent with this requirement, and are included in all NPDES permits and Waste Discharge Requirements issued by the San Diego Water Board. These are the fundamental requirements that protect water quality by ensuring that discharges comply with applicable water quality standards to ensire protection of receving water benficial uses. The San Diego Water Board does recognize an increasing body of monitoring data indicates that water quality standards are in fact not being met by many of the Copermitees' MS4 discharges. The San Diego Water Board has as a matter of practice chosen not to enforce the discharge prohibitions and receiving water limitations of Provision A.1.a, A.1.c or A.2.a if the Copermittees are actively engaged in implementing the other requirements of the MS4 permit. The focus of the previous MS4 permits and the San Diego Water Board has been on compliance with implementation of the actions required by the permit, rather than the water quality outcomes that are expected to be achieved. The San Diego Water Board has initiated enforcement against the Copermittees on several occasions for noncompliance with permit requirements. As noted by the Copermittees, however, the approach of the Tentative Order is a significant departure from the approach of previous MS4 permits. Previous MS4 permits did not provide the Copermittees enough flexibility to truly implement an iterative process to adaptively manage their programs to identify innovative new ways to improve the quality of discharges from their MS4s or in the receiving waters, because the actions required by the permit were relatively fixed and prescriptive. In contrast, the Tentative Order is structured to allow the Copermittees to take advantage of the iterative process and adaptively manage their programs to focus on achieving outcomes. The Tentative Order has been revised to provde an optional pathaway for the Copermittees to demonstrate compliance with the discharge prohibitions and receiving water limitations of Provision A.1.a, A.1.c or A.2.a through implementation of technically supported iterative and adaptive management processes applicable to specific pollutant/waterbodiy combinations. The appropriate location in the Tentative Order for providing this "compliance mechanism," however, is not under Provision A. Instead, the appropriate location is under Provision B. Under the requirements of Provision B for the development of the Water Quality Improvement Plans, the San Diego Water Board has added Provision B.3.c. Provision B.3.c explicitly provides that a Copermittee will be in compliance with the requirements of Provision A.1.a, A.1.c and A.2.a if a specific set of	

A-1	PROVISION A: PROHIBITIONS AND LIMITATIONS	
	requirements are incorporated and implemented as part of an accepted Water Quality Improvement Plan. Under this option, a Copermittee can demonstrate compliance with the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c and A.2.for specifc pollutant/waterbody combinations if the Water Quality Improvement Plan demonstrates through a robust technical analysis that the water quality improvement strategies the Copermittee plans on implementing will achieve applicable water quality stand based numeric goals by a certain date. The implementation must be verified through monitoring and assessments, and the goals, strategies and schedules in the plan can be adjusted accordingly based on those results. The more specific planning, implementation, monitoring and assessment program required under Provision B.3.c, combined with a clear set of numeric goals, strategies, and schedules that the Copermittee demonstrates will achieve compliance through, becomes the iterative and adaptive management process that the San Diego Water Board may accept as being in compliance with Provisions A.1.a, A.1.c and A.2.a, as well as Provision A.4. As recommended by the Environmental Organizations, the San Diego Water Board did not revise Provisions A.1.a, A.1.c, A.2.a and A.4, and the language of Provision A remains consistent with State Water Board Order WQ 1999-05. The addition of Provision B.3.c provides the linkage for compliance with the discharge prohibitions and receiving water limitations through the iterative process that the Copermittees and their supporters requested. The San Diego Water Board did modify Provision A.1.b to clarify how to demonstrate compliance with the effective prohibition of non-storm water discharges to the MS4s. The San Diego Water Board recognizes that the effective prohibition of non-storm water discharges to the MS4 is specifically required by the federal regulations to be achieved through the implementation of an illicit discharge detection and elimination program as specified under 40CFR122.26(d)(2)(iv)(B). Provision A.1.b has been revised to refer to Provision E.2, which is the illicit discharge detection and elimination program requirements that must be implemented by each Copermittee within its jurisdiction to effectively prohibit non-storm water discharges to its MS4. As for the requests to modify the requirements of Provision A to allow the Copermittees to utilize the Water Quality Improvement Plan to demonstrate compliance with the other requirements of Provision A pertaining to the special protections for ASBS and the TMDL requirements, the San Diego Water Board generally did not agree to modify the requirements as requested.	

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A-1	PROVISION A: PROHIBITIONS AND LIMITATIONS	
	The linkage for compliance with the ASBS requirements is provided under Provision A.1.d. Provision A.1.d specifies that discharges from MS4s to ASBS are authorized subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012. The provisions of the Special Protections are provided in Attachment A to the Order for easy reference, but the Special Protections are actually part of the Ocean Plan. The requirements for the Water Quality Improvement Plan take into account the requirements for the Special Protections. The development and implementation of the Water Quality Improvement Plans should allow the Copermittees that discharge to ASBS to demonstrate that they are in compliance with the Special Protections. As for the linkage for compliance with the TMDL requirements, the linkage is provided under Provision A.3.b. The Copermittees are required to comply with the WQBELs for the TMDLs in Attachment E. The requirements for the Water Quality Improvement Plan take into account the requirements for the TMDLs. The requirements of the TMDLs in Attachment E must be incorporated into the Water Quality Improvement Plan. The development and implementation of the Water Quality Improvement Plans should allow the Copermittees subject to TMDL requirements to demonstrate that they are in compliance with the WQBELs.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

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A-2	PROVISION A: PROHIBITIONS AND LIMITATIONS	
	COMMENT: *The maximum extent practicable (MEP) standard applies to both non-storm water and storm water.* The Riverside County Copermittees submitted comments asserting that the MEP standard of the Clean Water Act and federal regulations applies to reducing pollutants in non-storm water discharges as well as in storm water discharges. Accordingly, non-storm water discharges are authorized to be discharged if pollutants in non-storm water are reduced to the MEP. The Riverside County Copermittees requested that the language be revised to reflect this concept throughout the Tentative Order. In contrast, the Natural Resources Defense Council (NRDC) submitted comments that the non-storm water action levels (NALs) in the permit may contradict the effective prohibition of non-storm water discharges to the MS4. The NRDC is concerned that stating that the NALs are not considered by the San Diego Water Board to be enforceable limitations could be interpreted as an authorization for discharges of non-storm water, which would be in conflict with the effective prohibition requirements of the Clean Water Act for non-storm water discharges to the MS4.	**Copermittees** Riverside County Copermittees **Environmental Organizations** Natural Resources Defense Council
	RESPONSE: The San Diego Water Board disagrees that the MEP standard applies to both non-storm water and storm water. Building on the effective prohibition against non-storm water discharges, the Clean Water Act requirement to reduce pollutants discharged from the MS4 to the MEP standard necessarily is limited to storm water discharges. (See Attachment 1 November 5, 2009 Memorandum from San Diego Water Board Counsel, Non-Storm Water Discharges) The San Diego Water Board disagrees that including the NALs in the permit may contradict the effective prohibition of non-storm water discharges to the MS4. Please see the responses to comments Fnd-3 and C-1.	

A-3: *The Copermittees should only be subject to "applicable" prohibitions and water quality standards in the Basin Plan, plans and policies.*

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

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A-3	PROVISION A: PROHIBITIONS AND LIMITATIONS	
	COMMENT: *The Copermittees should only be subject to "applicable" prohibitions and water quality standards in the Basin Plan, plans and policies.* The Riverside County Copermittees are concerned that there are prohibitions and water quality standards included in Provisions A.1.c and A.2.a that do not apply to their jurisdictions. Thus those prohibitions or water quality standards should be deleted or clarified to state that they are only applicable if those discharges or water bodies are within their jurisdictions.	**Copermittees** Riverside County Copermittees
	RESPONSE: The San Diego Water Board does not agree that it is necessary to delete or clarify any of the requirements under Provisions A.1.c or A.2.a. If there are discharge prohibitions that are not applicable, then there should not be any violations of those discharge prohibitions. Likewise, if there are water quality standards that are not applicable, there should not be any violations of those water quality standards. If, however, any of those prohibitions or water quality standards is applicable, the Copermittees are required to comply or demonstrate compliance with those prohibitions and water quality standards.	

PROVISION A.1: Discharge Prohibitions
A1-1: *MS4 discharges to environmentally sensitive area (ESA) shellfish habitat should be prohibited.*

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A1-1	PROVISION A.1: Discharge Prohibitions	
	COMMENT: *MS4 discharges to environmentally sensitive area (ESA) shellfish habitat should be prohibited.* The South Laguna Civic Association commented that dry weather discharges and elevated storm water flows are incompatible with the protection of ESA shellfish habitat and should be vigorously regulated and prohibited in the Tentative Order.	**Environmental Organizations** South Laguna Civic Association
	RESPONSE: The San Diego Water Board agrees that dry weather discharges and storm water flows should be regulated to protect ESA shellfish habitats. Provision A.1.a prohibits discharges from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the state. Provision A.2.c requires that discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters. And, specifically for dry weather discharges, Provision A.1.b requires the Copermittees to effectively prohibit non-storm water discharges to the MS4s. Thus, the Tentative Order includes requirements for MS4 discharges that are protective of ESAs.	

A1-2: *Specify that NPDES permitted discharges to MS4s discharging to ASBS are authorized.*

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A1-2	PROVISION A.1: Discharge Prohibitions	
	COMMENT: *Specify that NPDES permitted discharges to MS4s discharging to ASBS are authorized.* San Diego Gas and Electric and Southern California Gas Company requested modifications to Provision A.1.d to specify that storm water and non-storm water discharges from the Copermittees MS4s from ASBS "made pursuant to NPDES permit" are authorized under the Tentative Order. The commenters are concerned that the Tentative Order does not clearly state that NPDES permitted discharges to the Copermittees' MS4s that then discharge to ASBS are authorized.	**Building Industry / Industry** San Diego Gas and Electric Southern California Gas Company
	RESPONSE: The San Diego Water Board disagrees that it is necessary to revise Provision A.1.d. Provision A.1.d requires discharges from the Copermittees' MS4 to be consistent with the requirements of Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 (Special Protections). Provision A.1.d applies to the Copermittees' MS4 discharges to ASBS, thus the Copermittees are subject to the requirements of the Special Protections. If storm water and non-storm water discharges are authorized under an NPDES permit and discharged to a Copermittee's MS4, the Copermittee is responsible for identifying this NPDES permitted discharge to its MS4 that then discharges to ASBS. If the NPDES permitted discharge does not allow the Copermittees to be consistent with the requirements of the Special Protections, the Copermittees should notify the NPDES permitted discharger and/or the San Diego Water Board that the discharge must be brought into compliance with the requirements of the Special Protections. Additionally, please see the response to comment Fnd-14.	

PROVISION B: WATER QUALITY IMPROVEMENT PLANS
B-1: *Link compliance with prohibitions and limitations to development and implementation of Water Quality Improvement Plans.*

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

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B-1	PROVISION B: WATER QUALITY IMPROVEMENT PLANS	
	COMMENT: *Link compliance with prohibitions and limitations to development and implementation of Water Quality Improvement Plans.* The Orange County, Riverside County and San Diego County Copermittees each submitted comments requesting that they be allowed to utilize the development and implementation of the Water Quality Improvement Plans as a compliance mechanism for the prohibitions and limitations of Provisions A.1 to A.3. Several Copermittees submitted separate comments in support of the request. Comments submitted by the Environmental Groups were not in support of such an approach, but did support incorporating numeric goals into the Water Quality Improvement Plans that are based on water quality standards and using the Water Quality Improvement Plans to hold the Copermittees accountable for achieving the water quality standards.	**Copermittees** City of Del Mar City of Poway Orange County Copermittees Riverside County Copermittees San Diego County Copermittees San Diego Unified Port District **Environmental Organizations** Environmental Groups
	RESPONSE: The San Diego Water Board agrees with the comments from the Copermittees and the Environmental Organizations. The San Diego Water Board has added Provision B.3.c to provide a "pathway" to compliance with the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c and A.2.a. Please see the response to comment A-1. Several commenters indicated that including an analysis to demonstrate that the implementation of the water quality improvement strategies would achieve compliance with the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c and A.2.a is not necessary. The San Diego Water Board disagrees that the analysis is not necessary. Without the analysis, the San Diego Water Board would not be able to make a determination that the implementation of the water quality improvement strategies would result in the achievement of and compliance with Provisions A.1.a, A.1.c and A.2.a for specific pollutant /waterboady combinations. In addition, the required analysis provides another level of transparency that would allow the public to make a determination that the Copermittees are in fact implementing strategies that are making progress toward achieving the requirements of Provisions A.1.a, A.1.c and A.2.a. Thus, the analysis has been incorporated into the requirements of Provision B.3.c.	

B-2: *Support for the Water Quality Improvement Plan approach.*

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

B-2	PROVISION B: WATER QUALITY IMPROVEMENT PLANS	
	COMMENT: *Support for the Water Quality Improvement Plan approach.* Comments were submitted by members of the Building Industry, Industry, the Copermittees, Environmental Organizations, Engineering/Design Consultants, Societies/Associations/Coalitions, and Other Entities generally supporting the approach in the Tentative Order to utilize the Water Quality Improvement development and implementation process as a more strategic, cost effective, holistic approach to improving water quality in the San Diego Region.	**Building Industry / Industry** American Society of Landscape Architects Associated General Contractors of America BIA Regulated Community Coalition Industrial Environmental Association Otay Land Company Otay Ranch New Homes **Copermittees** Orange County Copermittees Riverside County Copermittees San Diego Unified Port District **Environmental Organizations** The Escondido Creek Conservancy Friends of Rose Canyon Creek / Rose Creek Watershed Alliance Laguna Bluebelt Coalition San Diego Canyonlands San Elijo Lagoon Conservancy **Engineering/Design Consultants** Latitude 33 Planning and Engineering **Societies/Associations/Coalitions** BIOCOM San Diego Association of Realtors **Other Entities** Carol Crossman Continental Maritime of San Diego Curious Company Hector Valtierra Hughes Marino Marston+Marston, Inc. Nuffer, Smith, Tucker, Inc. San Diego Regional Chamber of Commerce Sheppard, Mullin, Richter & Hampton Southern Cross Property Consultants Transition IT
	RESPONSE: The San Diego Water Board appreciates the support expressed by the commenters for the Water Quality Improvement Plan and the more structured iterative and adaptive management process.	

B-3: *Ensure adequate public participation in the development and updating of the Water Quality Improvement Plans.*

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

B-3	PROVISION B: WATER QUALITY IMPROVEMENT PLANS	
	COMMENT: *Ensure adequate public participation in the development and updating of the Water Quality Improvement Plans.* Comments were submitted by members of the Building Industry, Environmental Organizations, Engineering/Design Consultants, USEPA, Societies/Associations/Coalitions, and Other Entities requesting the requirements of the Tentative Order ensure that there is adequate public participation during the development of the Water Quality Improvement Plans. Comments from the Environmental Organizations, the San Diego Green Building Council, and a joint comment letter from San Diego Coastkeeper and the BIA, requested that the Tentative Order require the Copermittees to form a stakeholder advisory group with knowledge of the watersheds. The comments from the Environmental Groups recommending several additional requirements for public participation during the development of the Water Quality Improvement Plans, including: 1) Requiring the Copermittees to create a schedule for developing the Water Quality Improvement Plans, 2) Modifying the required formal public review requirements to occur after identifying priorities, after identifying strategies, and after identifying goals and assessment methods, 3) Requiring Water Quality Improvement Plans to be developed consecutively instead of concurrently, 4) Require approval of the Water Quality Improvement Plans at a public hearing, and 5) Require public participation during the adaptive management process.	**Building Industry / Industry** American Society of Landscape Architects Associated General Contractors of America BIA Regulated Community Coalition San Diego Green Building Council **Environmental Organizations** Environmental Groups The Escondido Creek Conservancy Friends of Rose Canyon Creek / Rose Creek Watershed Alliance Laguna Bluebelt Coalition Los Penasquitos Lagoon Foundation Natural Resources Defense Council San Diego Canyonlands San Diego Coastkeeper and BIA San Elijo Lagoon Conservancy **Engineering/Design Consultants** Latitude 33 Planning and Engineering **State/Federal Government** USEPA **Societies/Associations/Coalitions** BIOCOM San Diego Association of Realtors **Other Entities** Continental Maritime of San Diego Hector Valtierra Curious Company Carol Crossman Gable PR Marston+Marston, Inc. Nuffer, Smith, Tucker, Inc. San Diego Regional Chamber of Commerce Sheppard, Mullin, Richter & Hampton Southern Cross Property Consultants Transition IT
	RESPONSE: The San Diego Water Board agrees that the Tentative Order should ensure adequate public participation during the development and updating of the Water Quality Improvement Plans. The public participation requirements for the development and updates of the Water Quality Improvement Plan	

B-3	PROVISION B: WATER QUALITY IMPROVEMENT PLANS	
	are contained in Provisions F.1 and F.2.c. The San Diego Water Board has revised Provisions F.1 and F.2.c to include several of the elements into the public participation requirements as recommended by the commenters, and provide additional time for a robust public participation process to be included in the development of the Water Quality Improvement Plans. Provision F.1.a has been modified to include a set of public participation requirements for the development of the Water Quality Improvement Plan under Provision F.1.a.(1). Included in Provision F.1.a.(1) are requirements to: a) develop a publicly available and noticed schedule of the opportunities for the public to participate and provide comments during the development of the Water Quality Improvement Plan; b) form a Water Quality Improvement Consultation Panel that will consist of at least one San Diego Water Board staff, one representative of the environmental community, and one representative of the development community; and c) coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public as much time and opportunity as possible to participate during the development of the Water Quality Improvement Plans. The role of the Water Quality Improvement Consultation Panel is similar to the requested stakeholder advisory group, which will review the elements that the Copermittees propose to include in the Water Quality Improvement Plan after the public is provided an opportunity to provide data, information and recommendations for each element. The elements of the Water Quality Improvement Plan that require public review and comment remain the same, but have been revised and reorganized under Provisions F.1.a.(2) and F.1.a.(3). The Tentative Order required a public review of the priorities and goals and then a public review of the strategies and schedules. The revised Tentative Order has been modified to first require a public review of the priorities and potential water quality improvement strategies and then a review of the goals, strategies that Copermittees plan on implementing, and the schedules. In each case, the public will be provided an opportunity to provide data, information and recommendations and the Water Quality Improvement Consultation Panel will review the elements required to be developed with the Copermittees to provide recommendations or concurrence prior to submitting to the San Diego Water Board for a public review and comment period. Provisions B.2 and B.3 were also revised and reorganized to be consistent with revisions made to Provisions F.1.a.(2) and F.1.a.(3). Provision B.2.e was revised to require the Copermittees to identify the “potential” water quality improvement strategies that could be implemented to address the highest priority water quality conditions	

B-3	PROVISION B: WATER QUALITY IMPROVEMENT PLANS	
	identified by the Copermittees. The requirements for identifying numeric goals and schedules for achieving the goals were moved to Provision B.3. Thus the requirements of Provision B.2 will be subject to the public participation and development process requirements of Provision F.1.a.(2), and the requirements of Provision B.3 will be subject to the public participation and development process requirements of Provision F.1.a.(3). Provision F.1.b has also been revised to clarify the completed Water Quality Improvement Plan public review and acceptance process. The San Diego Water Board will make the determination if a public hearing to accept the Water Quality Improvement Plans will be required, or if public input will be limited to written comments. Provision F.1.b has been revised to clarify when the Water Quality Improvement Plans will be considered accepted. Finally, Provision F.2.c has been revised to clarify the requirements for public participation during the updates of the Water Quality Improvement Plans. The public will be provided an opportunity to provide data, information and recommendations and the Water Quality Improvement Consultation Panel will review the elements required to be developed with the Copermittees to provide recommendations or concurrence prior to submitting the requested updates to the San Diego Water Board.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

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B-4	PROVISION B: WATER QUALITY IMPROVEMENT PLANS	
	COMMENT: *Allow current permit requirements to remain in place until Water Quality Improvement Plans are developed.* Comments were submitted by members of the Building Industry, Engineering/Design Consultants, State Government, Societies/Associations/Coalitions, and Other Entities requesting the Tentative Order allow the requirements of the current permits to remain in place until the Water Quality Improvement Plans were developed. There was general concern that enforcement and implementation of the new requirements of the Tentative Order would preempt the Water Quality Improvement Plans before the Water Quality Improvement Plans had a chance to be developed.	**Building Industry / Industry** Associated General Contractors of America Otay Land Company Otay Ranch New Homes **Engineering/Design Consultants** Latitude 33 Planning and Engineering **State/Federal Government** Senator Mark Wyland **Societies/Associations/Coalitions** BIOCOM San Diego Association of Realtors **Other Entities** Continental Maritime of San Diego Carol Crossman Gable PR Hughes Marino Marston+Marston, Inc. Nuffer, Smith, Tucker, Inc. San Diego Regional Chamber of Commerce Sheppard, Mullin, Richter & Hampton Southern Cross Property Consultants Transition IT
	RESPONSE: The San Diego Water Board agrees that the jurisdictional runoff management program requirements should remain in place until the Water Quality Improvement Plans are developed and accepted by the San Diego Water Board. According to the second paragraph of the opening to Provision E, "*Until the Copermittee has updated its jurisdictional runoff management program document with the requirements of Provision E the Copermittee must continue implementing its current jurisdictional runoff management program*." Provision F.2.c does not require the jurisdictional runoff management program documents to be updated until 3 months after the acceptance of the Water Quality Improvement Plan. The Copermittees will be subject to requirements of Provision A (Prohibitions and Limitations), and responsible for implementing the requirements of Provision D (Monitoring and Assessment Program Requirements), Provision F (Reporting), and Attachment E (Specific Provisions for TMDLs) upon the effective date of the Tentative Order.	

B-5: *Adopt Water Quality Improvement Plans as Orders to implement the permit requirements.*

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

B-5	PROVISION B: WATER QUALITY IMPROVEMENT PLANS	
	COMMENT: *Adopt Water Quality Improvement Plans as Orders to implement the requirements of the Tentative Order.* Comments were submitted by Engineering/Design Consultants, Societies/Associations/Coalitions, and Other Entities requesting that the San Diego Water Board adopt the Water Quality Improvement Plans as Orders to implement the requirements of the Tentative Order.	**Engineering/Design Consultants** Latitude 33 Planning and Engineering **Societies/Associations/Coalitions** BIOCOM San Diego Association of Realtors **Other Entities** Continental Maritime of San Diego Carol Crossman Gable PR Hughes Marino Marston+Marston, Inc. Nuffer, Smith, Tucker, Inc. San Diego Regional Chamber of Commerce Sheppard, Mullin, Richter & Hampton Southern Cross Property Consultants Transition IT
	RESPONSE: The San Diego Water Board disagrees with adopting the Water Quality Improvement Plans as Orders to implement the requirements of the Tentative Order. The Tentative Order, when adopted by the San Diego Water Board, is an Order issued to the Copermittees to implement the requirements of the Clean Water Act and Code of Federal Regulations. The Tentative Order includes specific requirements that must be included in the Water Quality Improvement Plans, which are to be developed by the Copermittees. The Water Quality Improvement Plans themselves, therefore, cannot and should not be adopted as Orders issued by the San Diego Water Board.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

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B-6	PROVISION B: WATER QUALITY IMPROVEMENT PLANS	
	COMMENT*: Align Water Quality Improvement Plan requirements with the Jurisdictional Runoff Management Program requirements.* The Orange County, Riverside County and San Diego County Copermittees each submitted comments requesting that requirements in Provision E be allowed to be modified based on what is proposed in the Water Quality Improvement Plans. The Copermittees assert that the jurisdictional runoff management program requirements of Provision E are a "one size fits all" set of requirements, and the requirements of the Water Quality Improvement Plan become "additive" rather than "complimentary." Several Copermittees submitted separate comment letters supporting the concept by requesting the San Diego Water Board align the development and implementation of the Water Quality Improvement Plan better with the jurisdictional runoff management program requirements. The BIA Regulated Community Coalition also submitted comments supporting the concept. The Environmental Groups are concerned with the flexibility of the jurisdictional runoff management program requirements and commented that the Water Quality Improvement Plan should include a detailed list of activities and what activities each Copermittee will implement within its jurisdiction. The Environmental Groups are concerned that without this specificity in the Water Quality Improvement Plans, and the flexibility that is provided in the jurisdictional runoff management program requirements, would result in the burden of achieving water quality improvement within a watershed falling to only one or two Copermittees. The Environmental Groups would like to see a clearer commitment of what will be implemented by each Copermittee either in the Water Quality Improvement Plan or in the jurisdictional runoff management program documents for each Copermittee.	**Building Industry / Industry** BIA Regulated Community Coalition **Copermittees** City of Dana Point City of Laguna Hills City of Lake Forest City of Mission Viejo City of Rancho Santa Margarita City of San Juan Capistrano Orange County Copermittees Riverside County Copermittees San Diego County Copermittees **Environmental Organizations** Environmental Groups
	RESPONSE: The San Diego Water Board agrees that the Water Quality Improvement Plans and jurisdictional runoff management program requirements should be better aligned and clearly present the water quality improvement strategies that each Copermittee will implement within its jurisdiction. The San Diego Water Board does not agree that the jurisdictional runoff management program requirements of Provision E should be allowed to be modified by the Water Quality Improvement Plan. The revised Tentative Order requires the Copermittees to clearly present the water quality improvement strategies that each Copermittees will implement within its jurisdiction in the Water Quality Improvement Plan. Each Copermittee must incorporate the strategies that the Copermittee commits to implement, as identified in the Water Quality Improvement Plan, into its jurisdictional runoff management program document. Please see the response to comment E-1.	

B-7: *Recommendations for revisions to the introductory paragraph of Provision B.*

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

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B-7	PROVISION B: WATER QUALITY IMPROVEMENT PLANS	
	COMMENT: *Recommendations for revisions to the introductory paragraph of Provision B.* The Orange County, Riverside County and San Diego County Copermittees each submitted comments recommending revisions to the introductory paragraph under Provision B. The Copermittees recommended revising the goal statement to be focused more on MS4 discharges and not on receiving waters. The Copermittees also recommended adding a statement about the linkage between the Water Quality Improvement Plan and compliance with the prohibitions and limitations of Provision A.	**Copermittees** Orange County Copermittees Riverside County Copermittees San Diego County Copermittees
	RESPONSE: The San Diego Water Board disagrees with the recommended revisions to the introductory paragraph of Provision B. The recommended revisions by the Copermittees were not necessary and not appropriate for the introductory paragraph to Provision B. After considering the comments and recommendations from the Copermittees, however, the San Diego Water Board did make one minor revision to the introductory paragraph of Provision B. Please see the revised Tentative Order for the revision to the introductory paragraph to Provision B.	

PROVISION B.1: Watershed Management Areas
B1-1: *Allow San Diego County to use WURMP for the Santa Margarita River Watershed Management Area until the Riverside County Copermittees are covered under the Tentative Order.*

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

B1-1	PROVISION B.1: Watershed Management Areas	
	COMMENT: *Allow San Diego County to use Watershed Urban Runoff Management Plan (WURMP) for the Santa Margarita River Watershed Management Area until the Riverside County Copermittees are covered under the Tentative Order.* The County of San Diego and the San Diego County Copermittees requested that the requirement to develop a Water Quality Improvement Plan for the Santa Margarita River Watershed Management Area be postponed until the Riverside County Copermittees become covered by the Tentative Order. The Riverside County Copermittees supported the request.	**Copermittees** County of San Diego Riverside County Copermittees San Diego County Copermittees
	RESPONSE: The San Diego Water Board agrees with the request. The San Diego Water Board has revised the footnote to Table B-1 to state that the County of San Diego is not required to develop a Water Quality Improvement Plan for the Santa Margarita River Watershed Management Area until the Riverside County Copermittees receive notification of coverage under the Tentative Order. Until then, the County of San Diego will be required to implement their jurisdictional runoff management program in conformance with the requirements of Order No. R9-2007-0001, and implement the transitional monitoring and assessment requirements of Provision D, the transitional reporting requirements of Provisions F.3.b, and the TMDL requirements in Attachment E.	

PROVISION B.2.e: Numeric Goals and Schedules
B2e-1: *Clearly state that numeric goals are enforceable or not enforceable limitations.*

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

B2e-1	PROVISION B.2.e: Numeric Goals and Schedules	
	COMMENT: *Clearly state that numeric goals are enforceable or not enforceable limitations.* The Orange County, Riverside County and San Diego County Copermittees each submitted comments requesting that the Tentative Order specify that numeric goals are not enforceable limitations. In contrast, the USEPA recommended that the Tentative Order or Fact Sheet clarify that the numeric goals (and the schedule for attainment of the goals) would become enforceable requirements once the Water Quality Improvement Plans are accepted by the San Diego Water Board.	**Copermittees** Orange County Copermittees Riverside County Copermittees San Diego County Copermittees **State/Federal Government** USEPA
	RESPONSE: The San Diego Water Board disagrees that additional revisions are necessary to specify the numeric goals are not enforceable limitations. The San Diego Water Board agrees with the USEPA interpretation, but disagrees with the recommendation. The San Diego Water Board did not modify the language of Provision B.2.e (now Provision B.3.a.(1) in the revised Tentative Order) because the San Diego Water Board will utilize the numeric goals to determine if the Copermittees are making progress toward improving water quality. As part of the iterative and adaptive management process, the Copermittees are allowed to modify the numeric goals and the schedules for achieving the goals if the monitoring and assessments provide the rationale to do so. If, however, the Copermittees did not modify the numeric goals or the schedules to achieve the goals, and an interim or final goal was not achieved pursuant to the schedule, the San Diego Water Board would consider the failure to achieve the numeric goal a point of non-compliance. The non-compliance would include the failure to achieve the numeric goal within the schedule, the failure to implement the iterative and adaptive management process, and a demonstration that one or more prohibitions or limitations under Provision A have been violated. Thus, the numeric goals and schedules are enforceable.	

B2e-2: *Remove or modify the language for the 10 year limitation of the schedules to achieve numeric goals.*

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

B2e-2	PROVISION B.2.e: Numeric Goals and Schedules	
	COMMENT: *Remove or modify the language for the 10 year limitation of the schedules to achieve numeric goals.* The Orange County and San Diego County Copermittees each submitted comments requesting modifications to the requirement to achieve the numeric goals within 10 years of the effective date of the Tentative Order. The Orange County Copermittees provided several reasons for removing the 10 year requirement. The San Diego County Copermittees requested that the Tentative Order clarify that the 10 year requirement be limited to achieving a goal that represents progress toward attainment of water quality standards.	**Copermittees** Orange County Copermittees San Diego County Copermittees
	RESPONSE: The San Diego Water Board agrees with the request to remove the requirement. The San Diego Water Board has removed the requirement that the Copermittees must include the final dates for achieving the numeric goals that do not initially extend more than 10 years beyond the effective date of the Tentative Order. In its place, the Copermittees must develop a schedule to achieve the numeric goals within a "reasonable period of time" that can be identified during the public participation process required for the development of the Water Quality Improvement Plans. The modifications are provided under Provision B.3.a.(2) of the revised Tentative Order.	

PROVISION B.3: Water Quality Improvement Strategies and Schedules
B3-1: *Provide a mechanism for compliance with the prohibitions and limitations in Provision A through the Water Quality Improvement Plan.*

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

B3-1	PROVISION B.3: Water Quality Improvement Strategies and Schedules	
	COMMENT*: Provide a mechanism for compliance with the prohibitions and limitations in Provision A through the Water Quality Improvement Plan.* The San Diego County Copermittees proposed modifications to the requirements of Provision B.3 to include a compliance mechanism that could be included in the Water Quality Improvement Plan to demonstrate compliance with the prohibitions and limitations in Provision A. The San Diego County Copermittees proposed including an option to perform a Reasonable Assurance Analysis to demonstrate that the water quality improvement strategies will attain discharge prohibitions, receiving water limitations, and effluent limitations. The San Diego Unified Port District submitted separate comments that did not support the inclusion of a compliance option utilizing the Water Quality Improvement Plan. The Orange County and Riverside County Copermittees supported the concept of allowing the Copermittees to demonstrate that the water quality improvement strategies in the Water Quality Improvement Plan will attain discharge prohibitions, receiving water limitations, and effluent limitations, but objected to requiring a Reasonable Assurance Analysis.	**Copermittees** Orange County Copermittees Riverside County Copermittees San Diego County Copermittees San Diego Unified Port District
	RESPONSE: The San Diego Water Board agrees with including an optional mechanism for compliance with the prohibitions and limitations in Provision A as part of Provision B.3. The San Diego Water Board has added Provision B.3.c as an optional mechanism that the Copermittees may utilize to demonstrate compliance with the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c and A.2.a. Please see the responses to comments A-1 and B-1.	

B3-2: *Allow Copermittees to "reduce" instead of "prevent and eliminate" non-storm water discharges through Water Quality Improvement Plan.*

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

B3-2	PROVISION B.3: Water Quality Improvement Strategies and Schedules	
	COMMENT: *Allow the Copermittees to "reduce" instead of "prevent and eliminate" non-storm water discharges through the Water Quality Improvement Plan.* Comments from the Building Industry included a recommendation to modify the language of Provision B.3 to allow the Copermittees to "reduce" non-storm water discharges instead of "prevent and eliminate" these discharges to the MS4.	**Building Industry / Industry** BIA Regulated Community Coalition
	RESPONSE: The San Diego Water Board disagrees with the proposed recommendations. The Clean Water Act requires MS4 permits to include a requirement that the MS4 dischargers must "effectively prohibit" non-storm water discharges to the MS4, not just "reduce" non-storm water discharges to the MS4. Provision B.3 included the phrase "prevent and eliminate" to specify what "effectively prohibit" means. To be consistent with the language in the Clean Water Act, the San Diego Water Board has revised "prevent and eliminate" to "effectively prohibit" in Provision B.3.	

PROVISION B.5: Iterative Approach and Adaptive Management Process
B5-1: *Recommendations for minor revisions to the language under iterative and adaptive management process requirements.*

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

B5-1	PROVISION B.5: Iterative Approach and Adaptive Management Process	
	COMMENT: *Recommendations for minor revisions to the language under iterative and adaptive management process requirements.* The Riverside County and San Diego County Copermittees each submitted comments recommending minor revisions to the language under Provision B.5 to "clarify" the requirements or to be consistent with their comments regarding non-storm water discharges (see comment Gnl-13).	**Copermittees** Riverside County Copermittees San Diego County Copermittees
	RESPONSE: The San Diego Water Board disagrees with the recommended revisions to Provision B.5. The San Diego Water Board did not make any of the minor revisions recommended by the Copermittees as they were not necessary, not appropriate, or changed the intent of the requirement. The San Diego Water Board did, however, make several revisions to Provision B.5 to be consistent with the revisions made to Provisions B.2 and B.3, as discussed in the response to comment B-3.	

PROVISION B.6: Water Quality Improvement Plan Submittal, Updates, and Implementation
B6-1: *Clarify that the implementation of Water Quality Improvement Plans may demonstrate TMDLs are not required.*

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

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B6-1	PROVISION B.6: Water Quality Improvement Plan Submittal, Updates, and Implementation	
	COMMENT: *Clarify that the implementation of Water Quality Improvement Plans may demonstrate TMDLs are not required.* The San Diego County Copermittees requested that the Tentative Order, under Finding 27, clarify that the implementation of the requirements "will" not "may" allow the San Diego Water Board to include an impaired water body in Category 4 in the Integrated Report (i.e. TMDL not required). The USEPA recommended including language in the Fact Sheet to clarify that the monitoring and assessments implemented as part of the Water Quality Improvement Plan may demonstrate that TMDLs are not necessary for water bodies listed on the 303(d) List.	**Copermittees** San Diego County Copermittees **State/Federal Government** USEPA
	RESPONSE: The San Diego Water Board disagrees with the request by the Copermittees. The San Diego Water Board agrees with the recommendation from the USEPA. Finding 27 is correct to state that the implementation of the Water Quality Improvement Plan "may" allow the San Diego Water Board to re-categorize an impaired water body in Category 4 in the Integrated Report meaning a TMDL is not required. Please see the response to comment Fnd-8. The San Diego Water Board has modified the Fact Sheet discussion for Provision B.6 as recommended by the USEPA.	

PROVISION C: ACTION LEVELS
C-1: *Clarify that action levels are enforceable or not enforceable limitations.*

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

C-1	PROVISION C: ACTION LEVELS	
	COMMENT: *Clarify that action levels are enforceable or not enforceable limitations.* The Orange County, Riverside County and San Diego County Copermittees each submitted comments requesting that the Tentative Order clarify that the non-storm water action levels (NALs) and storm water action levels (SALs) developed pursuant to Provision C are not enforceable limitations. San Diego Gas and Electric and the Southern California Gas Company requested that the permit clarify that the NALs and SALs are not applicable to non-storm water discharges that have NPDES permits. The Natural Resources Defense Council is concerned that stating that the NALs are not considered by the San Diego Water Board to be enforceable limitations could be interpreted as an authorization for discharges of non-storm water, which would be in conflict with the effective prohibition requirements of the Clean Water Act for non-storm water discharges to the MS4. The USEPA also expressed concern that action levels based on wasteload allocations (WLAs) established as WQBELs in the TMDL requirements of Attachment E may be interpreted as not enforceable.	**Building Industry / Industry** San Diego Gas and Electric Southern California Gas Company **Copermittees** Orange County Copermittees Riverside County Copermittees San Diego County Copermittees **Environmental Organizations** Natural Resources Defense Council **State/Federal Government** USEPA
	RESPONSE: The San Diego Water Board agrees that additional clarification of the enforceability of the action levels is necessary. The San Diego Water Board did not revise the footnotes as requested by the Copermittees, but did revise the footnotes to clarify that NALs and SALs are not enforceable limitations unless they are based on WQBELs expressed as interim or final effluent limitations for any TMDLs in Attachment E and the interim or final compliance dates have passed. The San Diego Water Board also revised the introductory paragraph under Provision C.1 to specify that the NALs must be incorporated into the Water Quality Improvement Plans to support the development and prioritization of water quality improvement strategies for “effectively prohibiting” not just “addressing” non-storm water discharges to the MS4, consistent with the requirements of the Clean Water Act. Finally, the San Diego Water Board did not revise the requirements of Provision C to clarify that NALs do not apply to non-storm water discharges that have NPDES permits. The requirements of the Tentative Order, including the NALs and SALs, apply to the Copermittees’ MS4 discharges, not to other NPDES permitted discharges, thus it is not necessary or appropriate to specify that the NALs are not applicable to other NPDES permitted discharges.	

C-2: *Allow the Copermittees to develop action levels instead of prescribing required action levels.*

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C-2	PROVISION C: ACTION LEVELS	
	COMMENT: *Allow the Copermittees to develop action levels instead of prescribing required action levels.* The Orange County, Riverside County and San Diego County Copermittees each submitted comments requesting that they be allowed to develop or propose non-storm water action levels (NALs) and storm water action levels (SALs) as part of the Water Quality Improvement Plan development process rather than being required to include a prescribed set of NALs and SALs in addition to other NALs and SALs that may be developed as part of the Water Quality Improvement Plan. The Copermittees expressed concern that requiring the prescribed NALs and SALs under Provision C would result in unnecessary analyses for constituents that are not a priority identified in the Water Quality Improvement Plan. The Orange County and San Diego County Copermittees are concerned that the inclusion of the chemically-based prescribed action levels under Provision C may not be the best metric to measure progress toward protection and enhancement of receiving waters if the numeric goals are biologically- or physically-based.	**Copermittees** Orange County Copermittees Riverside County Copermittees San Diego County Copermittees
	RESPONSE: The San Diego Water Board disagrees with the request to remove the requirements to include the prescribed NALs and SALs in the Water Quality Improvement Plans. The NALs and SALs under Provision C have been included to support the development and prioritization of the water quality strategies that will be implemented based on the highest priority water quality conditions identified by the Copermittees in the Water Quality Improvement Plans. The NALs and SALs have been included as a tool that the Copermittees and the San Diego Water Board can utilize to determine if the Copermittees are implementing the requirements of the Clean Water Act for MS4 permits, which is to *effectively prohibit non-storm water discharges to the MS4* and *reduce pollutants in storm water discharges from the MS4 to the MEP*. The NALs and SALs are not new, and are included in both of the current MS4 permits issued to Orange County (Order No. R9-2009-0002) and Riverside County (Order No. R9-2010-0016). The Copermittees are required to effectively prohibit non-storm water discharges to their MS4s, which in turn should result in little to no discharges from their MS4s to receiving waters. If there are non-storm water discharges from the Copermittees' MS4s to receiving waters, those discharges should only be NPDES permitted discharges. Even if those discharges are NPDES permitted discharges, the Copermittees are responsible for demonstrating that those discharges are not illicit discharges by identifying the sources as	

C-2	PROVISION C: ACTION LEVELS	
	NPDES permitted discharges. The prescribed NALs in Table C-1 through C-4 are associated with most if not all the pollutants that are known or suspected to be causing or contributing to impairments in water bodies on the 303(d) List for the San Diego Region. The NALs are appropriately based on water quality objectives because non-storm water discharges that do not contain pollutants at levels in exceedance of the NALs are not expected to cause or contribute to exceedances of water quality standards in receiving waters. Thus, the prescribed NALs have been included to allow the Copermittees to prioritize their efforts in effectively prohibiting unpermitted non-storm water discharges to their MS4s, demonstrate that they have effectively prohibited non-storm water discharges to their MS4s that could cause or contribute to exceedances of water quality standards, or identify NPDES permitted sources that are resulting in discharges from their MS4s that are causing or contributing to exceedances of water quality standards in receiving waters. In any case, the prescribed NALs are necessary to allow the San Diego Water Board to determine if the Copermittees are effectively prohibiting non-storm water discharges to the MS4. In contrast, the prescribed SALs are not based on water quality objectives, but set at higher levels because the San Diego Water Board recognizes that reducing pollutants in wet weather discharges from the MS4s to water quality objectives is difficult. The prescribed SALs, however, will allow the Copermittees to prioritize their efforts in reducing pollutants in storm water discharges from their MS4s, and allow the San Diego Water Board to determine if the Copermittees are reducing pollutants in storm water discharges from their MS4s to the MEP. The San Diego Water Board disagrees with the concerns about monitoring for constituents that are not associated with the highest priority water quality conditions. Periodically analyzing non-storm water and storm water discharges from the Copermittees' MS4 for other pollutants other than those associated with the highest priority water quality conditions is necessary if the Copermittees would like to re-prioritize or identify new priority water quality conditions that will be addressed. The San Diego Water Board does recognize that there is a cost associated with analyzing for additional constituents. Thus, the San Diego Water Board has modified the MS4 outfall monitoring requirements to reduce the number of dry weather MS4 outfall monitoring stations that must be analyzed (see Provision D.2.b.(2)(b) of the revised Tentative Order), and provided the Copermittees some flexibility to modify the analytes for the wet weather MS4 outfall monitoring stations (see Provision D.2.c.(5)(f) of the revised Tentative Order).	

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C-2	PROVISION C: ACTION LEVELS	
	As for the concerns about the chemically-based NALs and the biologically- or physically-based numeric goals for receiving waters, the San Diego Water Board disagrees that they cannot be linked or may be incompatible. Biologically- or physically-based numeric goals will likely be measured in the receiving waters. The chemically-based NALs apply to the MS4 outfalls. The quality of the MS4 discharges and the improvement of biological or physical measurements can be linked. Both are likely necessary to demonstrate that MS4 discharges are either not causing or contributing to a biological or physical impairment of the receiving water, or an improvement in MS4 discharges is resulting in improvements in the biological or physical conditions of the receiving water. The San Diego Water Board did not revise Provision C as requested by the Copermittees.	

C-3: *Notes to Table C-3 should refer to CTR instead of including equations.*

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C-3	PROVISION C: ACTION LEVELS	
	COMMENT: *Notes to Table C-3 should refer to the California Toxics Rule (CTR) instead of including equations.* The San Diego County Copermittees recommended removing the equations to calculate the non-storm water action levels (NALs) for the priority pollutants from the notes under Table C-3 and instead refer to the CTR under 40 CFR 131.38(b)(2), where the equations can be found.	**Copermittees** San Diego County Copermittees
	RESPONSE: The San Diego Water Board agrees with the recommendations. The San Diego Water Board has revised the notes under Table C-3 to refer to 40 CFR 131.38(b)(2).	

C-4: *Action levels should be included for insecticides.*

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C-4	PROVISION C: ACTION LEVELS	
	COMMENT: *Action levels should be included for insecticides.* The Los Penasquitos Lagoon Foundation recommended specifying action levels for insecticides.	**Environmental Organizations** Los Penasquitos Lagoon Foundation
	RESPONSE: The San Diego Water Board disagrees with this recommendation. Provision C includes numeric actions levels for specific pollutants consistent with Order Nos. R9-2009-0002 and R9-2010-0016. Provisions C.1.b and C.2.b require the Copermittees to develop additional numeric action levels for pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance associated with the highest water quality priorities related to non-storm water and storm water discharges from the MS4s, respectively. If insecticides cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan, the Copermittees are required to incorporate numeric action levels into the Water Quality Improvement Plan for insecticides. The San Diego Water Board did not revise Provision C to specify action levels for insecticides.	

PROVISION D: MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS
D-1: *Revise monitoring and assessment requirements as recommended by San Diego County Copermittees.*

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D-1	PROVISION D: MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS	
	COMMENT: *Revise monitoring and assessment requirements as recommended by San Diego County Copermittees.* The San Diego County, Orange County, and Riverside County Copermittees designed a question driven monitoring and assessment program that would allow the Copermittees to adaptively manage their storm water programs more effectively and efficiently based on the monitoring data collected and the program assessments. The monitoring and reporting program in Provision D of the Tentative Order largely includes the monitoring and assessment program designed by the Copermittees. The commenters requested further revisions be made to the monitoring and assessment program in Provision D of the Tentative Order. Commenters from Environmental Organizations and Industry support the monitoring and assessment program in Provision D, however stress the importance of the Tentative Order requiring enough monitoring so that the Copermittees are able to track specific short, medium, and long term progress towards detecting and eliminating illicit discharges and improving water quality throughout the San Diego Region. Failing to require enough monitoring puts at risk a Copermittee's ability to detect increases in pollutant discharges and their effects on receiving water conditions.	**Building Industry / Industry** Industrial Environmental Association **Copermittees** City of San Diego City of Imperial Beach City of National City **Environmental Organizations** Environmental Groups
	RESPONSE: The San Diego Water Board agrees with the comments from the Copermittees as well as the Environmental Organizations and Industry. Provision D largely includes the question driven monitoring and assessment program collectively designed by the Copermittees. The program requires a sufficient amount of monitoring such that the Copermittees are able to track specific short, medium, and long term progress towards the goals established in the Water Quality Improvement Plan. Through development of the Water Quality Improvement Plans, the monitoring and assessment program required in Provision D can be modified to address specific needs and strategies developed to address the highest priority water quality conditions within each jurisdiction in each Watershed Management Area. The monitoring approach in Provision D has been further refined, based on the specific comments received on the Tentative Order, to allow Copermittees to more efficiently and effectively address the critical questions necessary to adaptively manage their storm water programs and achieve improved water quality within their jurisdiction and each watershed throughout the San Diego Region.	

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D-2	PROVISION D: MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS	
	COMMENT: *Include requirements to track and monitor progress toward watershed goals and health of watersheds.* The Coastal Environmental Rights Foundation, Environmental Health Coalition, and the San Diego Coastkeeper jointly provided comments expressing concern that the monitoring and assessment requirements of the Tentative Order are not robust enough to: 1) support the Copermittees' ability to track progress towards achieving the goals and requirements of the Clean Water Act and the San Diego Basin Plan (i.e. effectively prohibiting non-storm water discharges, reducing pollutants in storm water to the maximum extent practicable, supporting the beneficial uses of the receiving waters), 2) enable the San Diego Water Board to determine compliance with the requirements of the Tentative Order, and 3) inform the public of the Copermittees' compliance with the requirements of the Tentative Order and progress towards achieving its goals. Other commenters from the Environmental Organizations expressed their support to include more monitoring in the Tentative Order, specifically requesting monitoring that provides assurances that Copermittees are able to detect any increase in pollutant discharges from their MS4 systems and be better able to address them sooner rather than later. Commenters from Industry requested the monitoring approach be iterative, strategic, cost-effective and question–driven so that it can provide the Copermittees with cost-effective informed data to guide their future storm water program actions through coordination with the San Diego Water Board staff. Several other commenters provided topic specific comments related to the need for mapping of coastal receiving waters and creeks. The USEPA commented on the need to bring the toxicity sampling requirements up to date with those recently adopted in other general and regional MS4 permits, as well as clarification to the monitoring locations required for determining compliance with TMDLs.	**Building Industry / Industry** Industrial Environmental Association **Environmental Organizations** South Laguna Civic Association CERF, EHC and SDCK Environmental Groups Laguna Bluebelt Coalition **State/Federal Government** USEPA
	RESPONSE: The San Diego Water Board disagrees with commenters from the Environmental Organizations that the monitoring and assessment requirements of the Tentative Order are not robust enough to support the Copermittees' ability to track progress towards achieving goals and requirements of the Clean Water Act (CWA), the California Water Code (CWC), and the San Diego Basin Plan (i.e. effectively prohibiting non-storm water discharges, reducing pollutants in storm water to the maximum extent practicable, and supporting the beneficial uses of the receiving waters). Provision D includes a monitoring program structure that is expected to be refined through the Water Quality	

D-2	PROVISION D: MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS	
	Improvement Plan. The Provision D monitoring and assessment program should be customized to achieve the desired outcomes of the Water Quality Improvement Plan and ultimately the CWA and the CWC. The desired outcomes of the CWA and the CWC are about conditions in water bodies (chemical, physical, and biological integrity), and information about conditions in water bodies is essential to help guide the work of protection and restoration. The Tentative Order's monitoring and assessment program requires collection of chemical, physical, and biological data from outfalls and receiving waters designed to inform the Copermittees, the San Diego Water Board, and the public about the condition of the discharge and the conditions of the water bodies in the San Diego Region. The Tentative Order's assessment requirements are designed to take the data collected from the monitoring program and convert it to useful information about the successfulness of the Copermittees' storm water management programs to achieve the desired outcomes of the CWA and the CWC. The San Diego Water Board agrees with comments from Industry that the monitoring program needs to be iterative, strategic, cost-effective and question–driven. As part of the iterative approach and adaptive management requirements of the Tentative Order, Provision D.4 requires the Copermittees to integrate: 1) the data collected pursuant to Provision D.1 through D.3; 2) the assessment findings required pursuant to Provision D.4a-c; and, 3) information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to assess the effectiveness of, and any necessary modifications to, the Water Quality Improvement Plans. The requirements of the Tentative Order allow the Copermittees to adapt the monitoring based on watershed specific priority conditions within the confines of a robust Water Quality Improvement Plan development and implementation process. The San Diego Water Board agrees that the Tentative Order should be modified to increase clarity of what is required of each Copermittee, thus enabling the San Diego Water Board to better determine compliance. Several commenters provided suggested improvements to Provision D language. Selected modifications to Provision D of the Tentative Order were made to increase clarity of what is expected of the Copermittees throughout the iterative monitoring approach in efforts to increase specificity of what is minimally required and how compliance with the Tentative Order will be determined. The San Diego Water Board also agrees that the Tentative Order should be modified to increase the public's awareness of the Copermittees' compliance and progress towards achieving the goals of the Water Quality Improvement Plans. Provision F.1.a was modified to require the Copermittees implement a robust public participation process with multiple opportunities for public participation throughout the development of each component of the Water Quality Improvement Plan. Provision F.1.b provides the public another opportunity to	

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D-2	PROVISION D: MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS	
	submit comments on the Water Quality Improvement Plan during the acceptance process. The Copermittees are also required to include public participation during any updates to the Water Quality Improvement Plan. Finally, the data and information collected from monitoring, and the findings from the assessments will be reported in the Water Quality Improvement Plan Annual Reports. The San Diego Water Board has revised Provision D to be consistent with the toxicity sampling requirements included in the most recently adopted State Water Board and other Regional Water Board MS4 permits. Modifications were also made to Provision D requirements to clarify the monitoring locations for determining compliance with TMDLs.	

D-3: *Requests for changes to schedules for monitoring and monitoring reports.*

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D-3	PROVISION D: MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS	
	COMMENT: *Requests for changes to schedules for monitoring and monitoring reports*. The San Diego County Copermittees submitted comments requesting an extension to the duration of the transitional monitoring program to accommodate the acceptance process of the Water Quality Improvement Plan and municipal program budget cycles. The Orange County Copermittees also submitted a comment requesting the commencement of the wet weather transitional outfall monitoring be delayed to year 2 of the transitional period to allow time to inventory and evaluate MS4 outfalls as required by Provision D.2.a.(1).	**Copermittees** Orange County Copermittees San Diego County Copermittees
	RESPONSE: The San Diego Water Board agrees with the comment that the transitional monitoring program should be continued until such time that the monitoring program within a Water Quality Improvement Plan is accepted by the San Diego Water Board. Provision D.1.a. Receiving Water, D.2.a. MS4 Outfall Discharge Monitoring, D.2.a.(2) Dry Weather MS4 Outfall Discharge Field Screening, and D.2.a.(3) Wet Weather MS4 Outfall Discharge Monitoring have been revised to require the Copermittees to conduct the transitional monitoring program until the Water Quality Improvement Plan is accepted. The San Diego Water Board disagrees with the recommendation to begin wet weather transitional monitoring in year two of the transitional period. Municipalities have already mapped the location of their MS4s for operation and maintenance reasons. Municipalities are also already aware of the majority of information listed in Provision D.2.a.(1), therefore delaying the commencement of the transitional wet weather MS4 outfall monitoring is not appropriate and no change to the Tentative Order was necessary.	

D-4: Require the Copermittees to utilize monitoring data from third party sources.

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D-4	PROVISION D: MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS	
	COMMENT: *Require the Copermittees to utilize monitoring data from third party sources.* Comments submitted by Environmental Groups support the position that the Tentative Order should require the Copermittees to use third party data that meets particular criteria in their efforts to assess the watersheds and progress towards achieving water quality standards. The particular criteria would require third parties to maintain and make available for review the quality assurance plan, list of methods used, and standard operating procedures for the data. Additionally, the commenters requested the Tentative Order specify that data is "appropriate" if it has been collected using the latest Standard Methods of Water and Wastewater Analysis. The commenters further requested the Tentative Order require the Copermittees to solicit and evaluate third party data that meets the Tentative Order's criteria for collection, not just the data collected pursuant to Provisions D.1, D.2, and D.3 when evaluating the causes of water quality conditions. Lastly, the commenters support the position that the Copermittees should be allowed to partner with environmental groups or other third parties to complete regional special studies.	**Environmental Organizations** Environmental Groups
	RESPONSE: The San Diego Water Board agrees that the Copermittees should be required to use appropriately collected data from third parties during their efforts to assess conditions of the watershed. During development of the Water Quality Improvement Plan, the Copermittees are required under Provision B.2.a.(6) and Provision B.2.d.(4)(e) to consider available, relevant, and appropriately collected and analyzed data, information, or studies during their efforts to identify water quality priorities based on impacts of MS4 discharges on receiving waters and pollutant sources and/or stressors that contribute to the highest priority water quality conditions. Provision B.2.a.(6) and Provision B.2.d.(4)(e) allow the Copermittees to consider other data, not just data collected by the Copermittees. Additionally, Provision D.2 allows any data, "*not collected specifically for the Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of the Order*" to be used by the Copermittees in their MS4 outfall monitoring program. Lastly, the assessments required under Provision D.4 require evaluation of the data collected pursuant to Provisions D.1, D.2, and D.3, which isn't restricted to that data which is collected solely by the Copermittees, and which will be heavily influenced by the Water Quality Improvement Plans which are required to use "*other available, relevant, and appropriately collected data, information, and studies*." The San Diego Water Board agrees that the Copermittees should be allowed to partner with Environmental Groups or other third parties to complete regional special studies and additional language has been added to Provision D.3.	

D-5: *Include monitoring that will ensure compliance and jurisdictional accountability.*

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D-5	PROVISION D: MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS	
	COMMENT: *Include monitoring that will ensure compliance and jurisdictional accountability*. The Coastal Environmental Rights Foundation (CERF), Environmental Health Coalition (EHC), and the San Diego Coastkeeper (SDCK) collectively submitted comments in support of increasing the nature, frequency, and amount of monitoring in the Tentative Order. The commenters expressed concern that the "lax approach" to monitoring currently in the Tentative Order is not adequate to assess compliance with the requirements. The USEPA requested the Tentative Order be more specific with regards to required monitoring locations and minimum monitoring frequencies to determine compliance with the TMDLs in Attachment E. The San Diego Unified Port District specifically requested additional jurisdictional outfall monitoring be required to support the San Diego Water Board's and the Copermittees' ability to determine the sources of any exceedances(s) of water quality standard(s) in receiving waters.	**Copermittees** San Diego Unified Port District / Brown and Winters **Environmental Organizations** CERF, EHC and SDCK **State/Federal Government** USEPA
	RESPONSE: The San Diego Water Board generally disagrees with the comments from the Environmental Organizations that the monitoring approach in Tentative Order is too "lax." However, the San Diego Water Board agrees that certain monitoring provisions need additional specificity requiring minimum monitoring frequencies and monitoring at specific locations to track compliance with the TMDLs in Attachment E to the Tentative Order. The monitoring and assessment program in the Tentative Order is a question-driven monitoring approach largely designed to place monitoring resources where they are most needed. In order to answer the questions and accomplish efficiencies, the monitoring approach for non-storm water includes screenings, prioritization, and collection of data through visual observations. The Environmental Organizations call specific attention to the MS4 outfall screening required during the transitional monitoring period and monitoring the 10 highest priority non-storm water persistent flow MS4 outfall locations during the post transitional monitoring period. The San Diego Water Board considers this MS4 outfall screening approach necessary for the Copermittees to identify the highest priority non-storm water persistent flows and eliminate them. Elimination of non-storm water flows is a priority of the Tentative Order because eliminating non-storm water flows is consistent with the Clean Water Act requirement to effectively prohibit non-storm water discharges to the MS4. Elimination of non-storm water flows is the most effective way to prevent 100 percent of the pollutants in the non-storm water discharges from causing or contributing to exceedances in receiving water quality	

D-5	PROVISION D: MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS	
	standards. Therefore, the Tentative Order requires more attention (monitoring, screening, and sampling) at the outfalls to eliminate non-storm water flows. That attention is based on a prioritization to address the outfalls causing or contributing to the very highest priority water quality conditions first. The monitoring and assessment program is designed to be dynamic with collection of data during both wet and dry weather at the MS4 outfalls and in the receiving water. The San Diego Water Board has made revisions in response to comments to ensure the monitoring program in the Tentative Order will be sufficient to inform all stakeholders and the San Diego Water Board on the Copermittees' progress to effectively eliminate non-storm water flows, reduce pollutants in storm water to the maximum extent practicable, and protect conditions in the receiving waters from MS4 discharges. The monitoring and assessment program is adaptable through the Water Quality Improvement Plan to allow the Copermittees to address the highest water quality priorities in a focused manner, directing resources towards those areas or sources within their jurisdiction causing and contributing to the priority water quality conditions. To address the comment on public transparency, the San Diego Water Board has modified the Water Quality Improvement Plan Development process of Provision F.1.a to require the Copermittees to identify the opportunities for public involvement in the development of the Water Quality Improvement Plans. Provision F.4 requires Copermittees to place data and information available to the public on the Regional Clearinghouse. Additional public participation and notification requirements can be found in Provision F that address comments regarding the public access to information concerning the nexus between the health of the receiving waters and the water quality conditions of the discharges from the Copermittees' MS4s. The USEPA requested the Tentative Order to be more specific with regards to the monitoring required to determine compliance with the TMDLs in Attachment E. Provision D.2.c.(2) now requires wet weather outfall monitoring be conducted at least once per year (during the transitional monitoring the Copermittees are still required to sample twice per year), with a requirement that the Copermittees may need to increase the frequency of monitoring to identify pollutants in storm water discharges from the MS4s in order to, among other things, determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E. Additionally, language in Provision D.2.b.(2)(b) has been modified to require the Copermittees to consider, notwithstanding all other priorities, compliance with applicable TMDLs in Attachment E when selecting MS4 outfall monitoring locations. The San Diego Unified Port District specifically requested additional jurisdictional outfall monitoring be required	

D-5	PROVISION D: MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS	
	to support the San Diego Water Board's and the Copermittees' ability to determine the sources of any exceedances(s) of water quality standard(s) in receiving waters. The San Diego Water Board modified Provisions D.2.b.(2)(b) and D.2.c.(1)-(2) in response to USEPA's comments, thereby specifying a minimum frequency for MS4 outfall monitoring during wet weather and requiring both MS4 outfall and receiving water monitoring station locations be suitable to determine compliance with TMDLs in Attachment E, as well as suitable to determine progress towards achieving the goals of the Water Quality Improvement Plans. Provision D.4.b requires the Copermittees to utilize a watershed model to calculate or estimate the total flow volume and pollutant loadings during wet weather and dry weather discharges from the Copermittee's jurisdiction within the Watershed Management Area. These modifications to Provision D, along with the newly revised Water Quality Improvement Plan development process, address the comments on requiring more monitoring to determine compliance. Additionally, the Tentative Order does not preclude a Copermittee from collecting additional monitoring above what is required, if they deem it necessary to demonstrate that the sources are outside of their jurisdictional legal authority to control.	

D-6: *Provide the County of San Diego an alternative transitional monitoring and assessment program for the Santa Margarita River Watershed Management Area until the Riverside County Copermittees are covered under the permit.*

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D-6	PROVISION D: MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS	
	COMMENT: *Provide the County of San Diego an alternative transitional monitoring and assessment program for the Santa Margarita River Watershed Management Area until the Riverside County Copermittees are covered under the permit.* The monitoring and assessment program requirements should account for the phased coverage of the Riverside County Copermittees at a later date than the San Diego County Copermittees with regards to the Santa Margarita River Watershed Management Area.	**Copermittees** County of San Diego
	RESPONSE: The San Diego Water Board agrees with the commenter. Footnote 3 in Table B-1 of Provision B and Provision D.2.a.(3)(a)(iii), have been revised to allow the County of San Diego to delay development of the Water Quality Improvement Plan for the Santa Margarita River Watershed Management Area until the Riverside County Copermittees have been notified of coverage under the Tentative Order. Footnote 3 in Table B-1 of Provision B clarifies that the County of San Diego is not required to implement the requirements of Provision B until the Riverside County Copermittees have been notified of coverage, but are required to implement the requirements of Provision D and Attachment E for its jurisdiction within the Santa Margarita River Watershed Management Area. Additionally, Provision D.2.a.(3)(a)(iii) was added to specify that the County of San Diego must select at least two (2) wet weather MS4 outfall discharge monitoring stations, reduced from the 5 stations required in Provision D.2.a.(3)(a)(i), for the portion of the Santa Margarita River Watershed Management Area within its jurisdiction until the Riverside Copermittees are notified of coverage. After the Riverside Copermittees are notified of coverage, the County of San Diego in concert with the County of Riverside Copermittees must comply with Provision B requirements and prepare a Water Quality Improvement Plan and implement the monitoring and assessment requirements according to Provision D for the Santa Margarita River Watershed Management Area.	

PROVISION D.1: Receiving Water Monitoring Requirements
D1-1: *Requests for "clarifications" of receiving water monitoring requirements.*

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D1-1	PROVISION D.1: Receiving Water Monitoring Requirements	
	COMMENT: *Requests for "clarifications" of receiving water monitoring requirements.* The Riverside County Copermittees provided suggested changes to the language in Provision D to clarify that the receiving water monitoring required pursuant to Provision D.1.a.(3) and D.1.e must be conducted as applicable to the Watershed Management Area and the Copermittees' MS4 discharges. The Riverside County Copermittees want a distinction written into the requirements because some of the monitoring requirements only apply to MS4 discharges to certain water bodies and not all Copermittees within a Watershed Management Area will have discharges to that water body. The USEPA requested the Tentative Order be more specific with regards to the transitional and post transitional receiving water monitoring required (frequency and station location) to determine compliance with the TMDLs in Attachment E.	**Copermittees** Riverside County Copermittees **State/Federal Government** USEPA
	RESPONSE: The San Diego Water Board disagrees with the requested changes to Provisions D.1.a.(3) and D.1.e. The requested changes to Provision D.1.a.(3) were not incorporated because the intent is to require the Copermittees, during the transitional monitoring period, to participate in regional receiving water monitoring programs, as applicable to the Watershed Management Area, including participation in (a) Storm Water Monitoring Coalition Regional Monitoring, (b) Southern California Bight Regional Monitoring, and (c) Sediment Quality Monitoring. Provision D.1.a.(3) correctly conditions the requirement by stating, 'as applicable' to the Watershed Management Area. For example, the expectation is that the Riverside County Flood Control and Water Conservation District, a current member of the Southern California Stormwater Monitoring Coalition (SMC), participate in SMC monitoring within the Watershed Management Area(s), in which their jurisdiction lies. The SMC was formed in 2001 by cooperative agreement of the Phase I municipal storm water NPDES lead Copermittees (including the Riverside County Flood Control and Water Conservation District), the NPDES regulatory agencies in southern California (including the San Diego Water Board) and the Southern California Coastal Water Research Project. It is the goal of the SMC to develop the technical information necessary to better understand storm water mechanisms and impacts, and then develop the tools that will effectively and efficiently improve storm water management decision-making. The SMC develops and funds cooperative projects to improve knowledge of storm water quality management for all throughout the San Diego Region.	

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D1-1	PROVISION D.1: Receiving Water Monitoring Requirements	
	The requested changes to Provision D.1.e were not incorporated because the existing language is appropriate. Provision D.2.c.(2) has been revised to require wet weather MS4 outfall monitoring be conducted at least once per year after the Water Quality Improvement Plans are accepted, with a requirement that Copermittees may need to increase the frequency of monitoring in order to identify pollutants in storm water discharges from the MS4s in order to, among other things, determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E. During the transitional monitoring period, the Copermittees are still required to conduct wet weather MS4 outfall monitoring twice per year. Additionally, the language in Provision D.2.b.(2)(b) has been modified to require the Copermittees to consider, notwithstanding all other priorities, compliance with applicable TMDLs in Attachment E when selecting MS4 outfall monitoring locations.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

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D1-2	PROVISION D.1: Receiving Water Monitoring Requirements	
	COMMENT: *Requests for modifications to receiving water monitoring stations, frequency, and data collection requirements.* Comments submitted by the Copermittees ranged from a broad request to remove the entire coastal storm drain monitoring program from the receiving water monitoring requirements (San Diego County), adding an alternate compliance option in lieu of the receiving waters monitoring program previously adopted in their current permit (Orange County), to very specific additions to what is recorded during receiving water station field observations (Riverside County). Multiple Environmental Organizations supported the need to increase the amount of monitoring in order to 1) better inform the Copermittees of the nexus between the health of receiving waters and the water quality condition of their discharge, 2) be sufficient to fulfill the San Diego Water Board's need to assess compliance, and 3) be sufficient to fulfill the public's need to stay informed. The USEPA commented on the need for the receiving water requirements to include minimum monitoring frequencies and a minimum number of station locations to measure compliance with the WLAs and associated water quality based effluent limitations of the TMDLs in the Order. The Los Penasquitos Lagoon Foundation requested continuous flow monitoring at the base of tributaries to 303(d) listed water bodies and monitoring of groundwater seepages into 303(d) listed water bodies be added to the monitoring requirements of the Watershed Management Area including the Los Penasquitos Lagoon.	**Copermittees** Orange County Copermittees Riverside County Copermittees San Diego County Copermittees **Environmental Organizations** CERF, EHC, SDCK Los Penasquitos Lagoon Foundation **State / Federal Government** USEPA
	RESPONSE: The San Diego Water Board agrees with the request to discontinue the coastal storm drain monitoring program and has replaced it with the receiving water monitoring program of Provision D.1 along with the transitional outfall monitoring screening and post-transitional outfall monitoring program (Provision D.2). The San Diego Water Board disagrees with the requested changes to the field screening observations required in Tables D-1 and D-6. The requests included adding the requirement to record any observed connectivity between MS4 outfall discharges and flowing receiving waters during receiving water and outfall field screening efforts. This was not added to the required observations listed in Tables D-1 or D-6 because the observations are already required as part of the illicit connection and illegal discharge requirements of Provision E.2. Pursuant to Provision D.1.f Alternative Watershed Monitoring Requirements, the San Diego Water Board may	

D1-2	PROVISION D.1: Receiving Water Monitoring Requirements	
	direct the Copermittees to participate in an effort to develop alternative watershed monitoring with other regulated entities, other interested parties, and the San Diego Water Board to refine, coordinate, and implement regional monitoring and assessment programs to determine status and trends in receiving waters. This requirement calls attention to the San Diego Water Board's plan to involve the Copermittees in the development of regional monitoring and assessment programs. It further calls attention to the San Diego Waters Board's position that a regional monitoring and assessment program must include other regulated entities in addition to the Phase I Copermittees. The Draft Framework for Monitoring and Assessment in the San Diego Region lays out the San Diego Water Board's framework to develop a regional receiving water monitoring program. Prior to development and required implementation of a regional receiving water monitoring program, and to maintain historical water quality monitoring trends, the requirements of Provision D.1.a-f require Copermittees to continue the receiving water monitoring required by their current storm water permits until coverage under the Tentative Order commences, and the Water Quality Improvement Plans are accepted. The monitoring program in Provision D has been modified to include minimums (removing the language "as appropriate"). Required monitoring minimums also address concerns regarding the Copermittees' and the San Diego Water Board's ability to determine compliance with the requirements of the Tentative Order (including TMDLs). Additionally, the Water Quality Improvement Plan development process has been significantly changed to include more public participation. Furthermore, the Tentative Order recognizes that each Copermittee should evaluate the need to increase its monitoring above what is minimally required to the appropriate level necessary to achieve the goals of the Water Quality Improvement Plan. Within the process for a Copermittee to get a Water Quality Improvement Plan developed and accepted by the San Diego Water Board, the Environmental Organizations and the public at large will have opportunities to contribute their expertise and provide comments on the nature and extent of monitoring needed to measure progress towards achieving the goals of the Water Quality Improvement Plans. Each Copermittee must establish a public participation process to solicit data, information, and recommendations to be utilized in the development of the Water Quality Improvement Plan. The Tentative Order also requires the Copermittees to form a Water Quality Improvement Consultation Panel (Panel) to provide recommendations on the priorities, goals, and strategies of the Water Quality Improvement Plan. The Panel must include a member of the environmental community, a member of the development community, and a member of the San Diego Water Board staff. Any recommendations for monitoring specific to a particular Watershed Management Area, receiving water body, pollutant, or stressor could be provided by the Panel and	

D1-2	PROVISION D.1: Receiving Water Monitoring Requirements	
	addressed in the Water Quality Improvement Plan. The minimum monitoring required plus the monitoring needed to attain goals established in the Water Quality Improvement Plans will be sufficient to inform the Copermittees, the San Diego Water Board, the environmental groups, and the public on the nexus between the health of receiving waters and the water quality condition of the discharges, compliance with TMDLs, and progress towards achieving the goals of the Clean Water Act.	

D1-3: *Require Test of Significant Toxicity to be consistent with other recent MS4 permits.*

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

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D1-3	PROVISION D.1: Receiving Water Monitoring Requirements	
	COMMENT: *Require Test of Significant Toxicity to be consistent with other recent MS4 permits.* The USEPA commented that the toxicity monitoring requirements should be modified and to be consistent with the requirements in MS4 permits recently issued by the State Water Resources Control Board (Caltrans MS4 Permit) and the Los Angeles Regional Water Quality Control Board (Los Angeles County MS4 Permit).	**State/Federal Government** USEPA
	RESPONSE: The San Diego Water Board agrees that the toxicity testing and data analysis requirements in the Tentative Orders should be consistent with other recently adopted MS4 Permits. The recently adopted Caltrans and Los Angeles County MS4 Permits include updated toxicity data collection procedures and data analysis methods that are consistent with the Draft State Water Resources Control Board Policy for Toxicity Assessment and Control, June 2012 (Draft State Board Toxicity Policy). Provision D has been updated to remove the acute toxicity test requirements, and only require chronic toxicity test biological endpoint data be analyzed using the Test of Significant Toxicity t-test approach specified in National Pollutant Discharge Elimination System Test of Significant Toxicity Document (USEPA, EPA 833-R-10-003, 2010), and other minor changes to make the Tentative Order consistent with recently adopted MS4 permits.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

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D2-1	PROVISION D.2: MS4 Outfall Discharge Monitoring Requirements	
	COMMENT: *Requests for "clarifications" of MS4 outfall discharge monitoring requirements.* The San Diego County and Riverside County Copermittees requested the dry weather MS4 outfall field screening language in Provision D.2.a.(2) be modified to clarify the number of visual inspections at major outfall locations required per jurisdiction per Watershed Management Area. The Riverside County Copermittees additionally requested that the field screening only apply to those MS4 outfalls in a Copermittee's inventory that are 'accessible,' and clarification to the definition of persistent flow. USEPA supports the Copermittees' comments to improve clarity with respect to identification of MS4 outfall monitoring locations. USEPA further requested language specific enough to assure MS4 outfall monitoring locations are selected to include compliance points for the TMDLs in Attachment E.	**Copermittees** Riverside County Copermittees San Diego County Copermittees **State and Federal Government** USEPA
	RESPONSE: The San Diego Water Board generally agrees with comments from the Copermittees and USEPA. Additional language has been added to improve the clarity of Provision D.2.a.(2) for those jurisdictions with equal to or greater than 500 major MS4 outfalls within their inventory that are located within multiple Watershed Management Areas. The San Diego Water Board specifically retained language to allow for the Copermittees to conduct more than the minimum amount of visual inspections of their major MS4 outfalls should increased inspections be a part of the strategies specified to meet the goals of any Water Quality Improvement Plan. The San Diego Water Board disagrees with the comments requesting modifications to the persistent flow definition in Footnote 19. The San Diego Water Board maintains that the definition, as written, accomplishes the intent of the requested revision and does not need to be explicitly stated. Existing language in Provision D.2.a.(1)(e) addresses the comment about field screening "accessible" inventoried MS4 outfalls. The Copermittees can field screen an MS4 outfall location by screening a manhole just upgradient of the discharge where access is safe. Provisions D.2.b.(2)(b)(i) and D.2.c.(1) were modified to require additional outfall monitoring locations if the 5 chosen MS4 outfall locations were not sufficient to determine compliance with the TMDLs in the Tentative Order.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

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D2-2	PROVISION D.2: MS4 Outfall Discharge Monitoring Requirements	
	COMMENT: *Requests for modifications to MS4 outfall monitoring stations, frequency, and data collection requirements.* The Orange County, Riverside County and San Diego County Copermittees each requested modifications to the MS4 outfall monitoring stations, frequency, and data collection requirements. The San Diego County Copermittees requested the MS4 outfall discharge monitoring requirements be changed for the Santa Margarita River Watershed Management Area until the Riverside County Copermittees become covered under the Tentative Order, a reduction to the frequency of outfall sampling during the transitional period from annually to once per 2-year transitional period, a modification to the requirement to sample the 'first flush' during wet weather, a reduction to the number of dry weather outfall monitoring locations from 10 to 5, and an allowance for analytical testing to be reduced if demonstrated by supporting data. The Orange County and Riverside County Copermittees supported most of San Diego County Copermittees' requested revisions. Additionally, the Riverside County Copermittees commented on the disproportionality of the persistent flow MS4 outfall monitoring requirements, and the need to de-emphasize MS outfall monitoring locations if the discharge does not reach a receiving water due to infiltration, evaporation, or treatment. Environmental Organizations supported the need to increase the amount of monitoring in order to better inform the Copermittees of the nexus between the health of receiving waters and the water quality condition of their discharge, be sufficient to fulfill the San Diego Water Board's need to assess compliance, and be sufficient to fulfill the public's need to stay informed. The USEPA commented on the need for the MS4 outfall monitoring requirements to include minimum monitoring frequencies and a minimum number of MS4 outfall locations to measure compliance with the TMDLs.	**Copermittees** Orange County Copermittees Riverside County Copermittees San Diego County Copermittees **Environmental Organizations** CERF, EHC, SDCK **State / Federal Government** USEPA
	RESPONSE: The San Diego Water Board agreed with several of the requested modifications. Revisions to Provision D.2 were made where appropriate. The requirement to monitor at least 10 major outfalls was reduced to monitoring at least 5 major outfalls with persistent flows. To address comments from the USEPA, this requirement was also modified to require additional MS4 outfall monitoring locations, if the 5 chosen outfall locations were not sufficient to determine compliance with the TMDLs. If a smaller jurisdiction has less than 5 major MS4 outfalls with persistent flow,	

D2-2	PROVISION D.2: MS4 Outfall Discharge Monitoring Requirements	
	they would be required to monitor all the MS4 outfalls with persistent flow until such time that they identify and terminate the discharge or met another criteria of Provision D.2.(2)(b)(ii). If any Copermittee eliminates all persistent flows from all of its MS4 outfalls, they would not be required to conduct dry weather MS4 outfall monitoring. The San Diego Water Board accepted most of the requested revisions from the Orange County Copermittees, except those concerning toxicity sampling and coliform sampling. Toxicity sampling was modified in response to comments provided by USEPA to make the toxicity requirements more consistent with recently adopted MS4 permits (i.e. Caltrans and Los Angeles County MS4 Permits). Please see the response to comment D1-3.	

PROVISION D.3: Special Studies
D3-1: *Request to reduce the number of special studies required.*

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D3-1	PROVISION D.3: Special Studies	
	COMMENT: *Request to reduce the number of special studies required.* The San Diego County Copermittees submitted a comment requesting a reduction in the number of required special studies from three to two per Watershed Management Area, and from two to one for the San Diego Region to account for the time and resources required to plan and develop the special studies, and integrate the plans for the special studies into the monitoring and assessment programs of the Water Quality Improvement Plans. This comment was supported by the Riverside County Copermittees.	**Copermittees** Riverside County Copermittees San Diego County Copermittees
	RESPONSE: The San Diego Water Board agrees with the commenters. Provision D.3 has been modified to reduce the number of required special studies from three to two per Watershed Management Area, and from two to one for the San Diego Region.	

D3-2: *Allow special studies initiated priorto the term of the Tentative Order to count toward required special studies.*

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D3-2	PROVISION D.3: Special Studies	
	COMMENT: *Allow special studies initiated prior to the term of the Tentative Order to count toward the required special studies.* The San Diego County Copermittees submitted a comment requesting that the special studies initiated prior to the term of the Tentative Order be allowed to count towards the special studies required in Provision D.3, citing that special studies are typically multi-year efforts that require multi-stage planning, funding approval/allocation, and analysis. This comment was supported by the Riverside County Copermittees.	**Copermittees** Riverside County Copermittees San Diego County Copermittees
	RESPONSE: The San Diego Water Board agrees with the commenters. Provision D.3 has been modified to allow the use of special studies initiate prior to adoption of the Tentative Order to comply with the requirements of Provision D.3.	

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D4-1	PROVISION D.4: Assessment Requirements	
	COMMENT: *Requests for "clarifications" of assessment requirements.* The San Diego County and Riverside County Copermittees submitted comments requesting clarifications be made to the assessment requirements of Provisions D.4.b.(1)-(2). The Copermittees concurred that the timing of reporting be compatible with completion of the assessments. The Riverside County Copermittees requested specific revisions to Provision D.4.b.(1)(c)(iv) concerning extrapolation of calculated flow volumes and pollutant loads; and assessment of jurisdictional accountability.	**Copermittees** Riverside County Copermittees San Diego County Copermittees
	RESPONSE: The San Diego Water Board agrees with the commenters. The San Diego Water Board modified Provision D.4.b.(1)(a) to add an annual assessment of data collected during the transition period and reporting as part of the Transitional Monitoring and Assessment Program Annual Report (Provision F.3.b.2). Provision D.4.b.(2)(a) requires assessment of MS4 outfall data collected after the transitional period and reporting as part of the Water Quality Improvement Plan Annual Report (Provision F.3.b.(3)). Requiring an annual report during the transitional years before the acceptance of the Water Quality Improvement Plan will allow Copermittees to perform 'complete' assessments and report on the progress for that year, whether it be a year within the transitional monitoring period or a year in which monitoring is conducted in accordance with the Water Quality Improvement Plan. Provisions D.4.b.(2)(c)(iv)[a]-[b] were modified to address comments concerning extrapolation of calculated flow volume and pollutant loads to outfalls that were not actually monitored. The assessment now requires the use of a model or other method to calculate or estimate the non-storm water volumes and pollutant loads collectively discharged from all the major MS4 outfalls in its jurisdiction identified as having persistent dry weather flows. To address the issue of jurisdictional accountability, the Copermittees are now required to identify and quantify (i.e. volume and pollutant loads) sources of non-storm water not subject to the Copermittee's legal authority that are discharged from the Copermittee's major MS4 outfalls to downstream receiving waters. The San Diego Water Board generally disagrees with the comment to require calculation of pollutant loads only for those priority water quality constituents identified in the Water Quality Improvement Plan. Calculation of all pollutant loads are required until a Copermittee collects sufficient data or other supporting information pursuant to Provision D.2.b.(2)(e)(iii)[e] to demonstrate analysis of a constituent is not necessary.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

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D4-1	PROVISION D.4: Assessment Requirements	
	The San Diego Water Board agrees with the comment that MS4 outfall assessments are to be done for the area covered by each Copermittee and that the data to be used by each Copermittee would include the data collected from any Flood Control District MS4 operated within its jurisdiction. The San Diego Water Board has not modified any language within Provision D.4 to address this comment because the language adequately addresses the comment without further modifications.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

D4-2	PROVISION D.4: Assessment Requirements	
	COMMENT: *Requests for modifications to assessment requirements.* The San Diego County Copermittees commented on the need for a longer assessment term (once per permit term rather than annually) to provide meaningful analysis of the annual pollutant load and flow calculations from MS4 outfalls during dry weather. The Copermittees further commented on the need to modify the requirements to calculate jurisdictional loads during wet weather, as well as modifications to clarify assessments necessary to track jurisdictional accountability. The Riverside County Copermittees agreed in large part with the comments provided by the San Diego County Copermittees. The Riverside County Copermittees also expressed a desire to clarify MS4 outfall assessments are to be done by each municipal Copermittee and that the data to be used by each municipal Copermittee include the data collected from any flood control district within its jurisdiction. Additionally, the Riverside County Copermittees expressed concern that the assessment requirements were requiring evaluations beyond their expertise and suggested pollutant loads only be calculated for priority pollutants. The Los Penasquitos Lagoon Foundation requested that the Tentative Order require the Copermittees to work with local land managers to assess the status and trends of receiving water quality conditions.	**Copermittees** Riverside County Copermittees San Diego County Copermittees **Environmental Organizations** Los Penasquitos Lagoon Foundation
	RESPONSE: The San Diego Water Board generally agreed with the need for a longer assessment term (once per permit term rather than annually) to provide meaningful analysis of the annual pollutant load and flow calculations from MS4 outfalls during dry weather and the need to modify the requirements to calculate jurisdictional loads during wet weather to the added area-based jurisdictional computational approach. The San Diego Water Board generally modified the Tentative Order where there was agreement with the comments. The San Diego Water Board, however, disagrees with the requests regarding MS4 outfall assessments for flood control districts, assessment requirements related to critical receiving water beneficial uses, and the suggestion that pollutant loads only be calculated for priority pollutants. The San Diego Water Board agrees with the comments provided by the Los Penasquitos Lagoon Foundation and required increased public participation and formation of a Water Quality Improvement Plan Consultation Panel in Provision F.1.a.	

PROVISION E: JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS
E-1: *Align the Jurisdictional Runoff Management Program requirements with the Water Quality Improvement Plan requirements.*

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

E-1	PROVISION E: JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS	
	COMMENT: *Align the Jurisdictional Runoff Management Program requirements with the Water Quality Improvement Plan requirements.* The Orange County, Riverside County and San Diego County Copermittees each submitted comments requesting the requirements in Provision E be allowed to be modified based on what is proposed in the Water Quality Improvement Plans. The Copermittees assert that the requirements of Provision E are a "one size fits all" set of requirements, and the requirements of the Water Quality Improvement Plan become "additive" rather than "complimentary." Several Copermittees submitted separate comment letters supporting the concept by requesting the San Diego Water Board align the development and implementation of the Water Quality Improvement Plan better with the jurisdictional runoff management program requirements. The BIA Regulated Community Coalition also submitted comments supporting the concept. The Environmental Groups submitted comments expressing concern with the flexibility of the jurisdictional runoff management program requirements and requested that the Water Quality Improvement Plan include a detailed list of activities and what activities each Copermittee will implement within its jurisdiction. The Environmental Groups are concerned that without this specificity in the Water Quality Improvement Plans, and the flexibility that is provided in the jurisdictional runoff management program requirements would result in the burden of achieving water quality improvement within a watershed falling to only one or two Copermittees. The Environmental Groups would like to see a clearer commitment of what will be implemented by each Copermittee either in the Water Quality Improvement Plan or in the jurisdictional runoff management program documents for each Copermittee. The USEPA is also concerned with the flexibility that is provided by the requirements of Provision E. The USEPA prefers jurisdictional runoff management program requirements that include specific inspection frequencies.	**Building Industry / Industry** BIA Regulated Community Coalition **Copermittees** City of Dana Point City of Laguna Hills City of Lake Forest City of Mission Viejo City of Rancho Santa Margarita City of San Juan Capistrano Orange County Copermittees Riverside County Copermittees San Diego County Copermittees **Environmental Organizations** Environmental Groups **State/Federal Government** USEPA
	RESPONSE: The San Diego Water Board agrees that the Water Quality Improvement Plans and jurisdictional runoff management program requirements should be better aligned and clearly present the water quality improvement strategies that each Copermittee will implement within its jurisdiction. The San Diego Water Board does not agree that the jurisdictional runoff management program requirements of Provision E should be allowed to be modified by the Water Quality Improvement Plan.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

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E-1	PROVISION E: JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS	
	The San Diego Water Board has revised Provision B.3.b in the revised Tentative Order (formerly Provision B.3.a in the Tentative Order) to require the Copermittees to specify which water quality improvement strategies each Copermittee will commit to implementing within its jurisdiction as part of its jurisdictional runoff management program requirements under Provisions E.2-E-7, and the optional water quality improvement strategies that will be implemented by the Copermittee within its jurisdiction when necessary to achieve the numeric goals. The optional water quality improvement strategies are to be implemented by the Copermittee as necessary to contribute toward achieving the numeric goals. Provision B.3.b in the revised Tentative Order also includes requirements for the Copermittees to identify optional Watershed Management Area strategies that the Copermittees will implement when necessary to achieve the numeric goals. Each Copermittee must specify BMPs, education programs, inspection frequencies, incentive and enforcement programs that will be implemented within its jurisdiction as part of its jurisdictional runoff management program requirements under Provisions E.2-E-7. Provisions E.2.e, E.3.g, E.4.f, E.5.e.(1), and E.7.c were removed in the revised Tentative Order, and the introductory paragraphs of Provisions E.2-E.7 were revised to state that each component must be implemented in accordance with the jurisdictional strategies identified in the Water Quality Improvement Plan. These revisions were made to better align the requirements of the Water Quality Improvement Plans and the jurisdictional runoff management programs, and provide an additional layer of transparency to the public for the strategies that the Copermittees will be committing to implement versus those strategies that will be implemented only when necessary to achieve the numeric goals. The San Diego Water Board has not modified the inspection frequency requirements in Provisions E.2-E.7. The inspection frequency requirements provide a sufficient level of guidance and flexibility for allowing the Copermittees to develop appropriate inspection frequencies that will be committed to in the Water Quality Improvement Plans, and a minimum level of effort that is expected for areas associated with the highest priority water quality conditions. The inspection frequencies that the Copermittees commit to implementing as part of the Water Quality Improvement Plans will be utilized by the San Diego Water Board during its audits of the Copermittees' programs to determine compliance with the requirements of the Tentative Order.	

E-2: Allow San Diego County to use WURMP to guide jurisdictional runoff management program for the Santa Margarita River Watershed Management Area until the Riverside County Copermittees are covered under the permit.

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

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E-2	PROVISION E: JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS	
	COMMENT: *Allow San Diego County to use the Watershed Urban Runoff Management Plan (WURMP) to guide its jurisdictional runoff management program for the Santa Margarita River Watershed Management Area until the Riverside County Copermittees are covered under the Tentative Order.* The County of San Diego and the San Diego County Copermittees requested that the requirement to develop a Water Quality Improvement Plan and implementation of the requirements of Provision E for the Santa Margarita River Watershed Management Area be postponed until the Riverside County Copermittees become covered under the Tentative Order.	**Copermittees** County of San Diego San Diego County Copermittees
	RESPONSE: The San Diego Water Board agrees with the request. The second introductory paragraph of Provision E states, "*Until the Copermittee has updated its jurisdictional runoff management program document with the requirements of Provision E, the Copermittee must continue implementing its current jurisdictional runoff management program*." The County of San Diego will continue to implement the jurisdictional runoff management program requirements of Order No. R9-2007-0001 until the Riverside County Copermittees are notified of coverage under the Order and a Water Quality Improvement Plan is developed pursuant to the requirements of this Order. The County of San Diego may use its WURMP for the Santa Margarita River Watershed to guide its jurisdictional runoff management program until the Water Quality Improvement Plan is developed and accepted. Please also see the response to comment B1-1.	

PROVISION E.1: Legal Authority Establishment and Enforcement
E1-1: *Specify that the legal authority established by Copermittees only applies to the Copermittees' jurisdictions.*

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E1-1	PROVISION E.1: Legal Authority Establishment and Enforcement	
	COMMENT: *Specify that the legal authority established by the Copermittees only applies to the Copermittees' jurisdictions.* The Orange County, Riverside County and San Diego County Copermittees each submitted comments requesting that the requirements of Provision E.1 be modified to specify that the legal authority established by the Copermittees only apply "to the extent allowable by law" and only applies to discharges within their jurisdiction. The Julian Community Planning Group also commented that there are jurisdictions that a Copermittee has no authority to require compliance.	**Community Planning Groups** Julian Community Planning Group **Copermittees** Orange County Copermittees Riverside County Copermittees San Diego County Copermittees
	RESPONSE: The San Diego Water Board disagrees that it is necessary to specify that the legal authority established by the Copermittees is only applicable to their jurisdictions. The requirements of Provision E.1 are consistent with the requirements under 40CFR122.26(d)(2)(i)(A)-(F) and do not go beyond those requirements. The legal authority that each Copermittee is required to establish for its jurisdiction is logically only expected to apply to its jurisdiction. Provision E.1.a.(2) is consistent with 40CFR122.26(d)(2)(i)(A), which requires the Copermittee to "*Control through ordinance, permit, contract, order or similar means, the contribution of pollutants to the municipal storm sewer by storm water discharges associated with industrial activity and the quality of storm water discharged from sites of industrial activity*." 40CFR122.26(d)(2)(i)(A) does not make a distinction between industrial activity (which includes construction activity according to 40 CFR 122.26(b)(14)(x)) that is regulated by an NPDES permit, such as the Statewide Industrial and Construction General Permits, and those that are not. Even if there are industrial and construction sites regulated by the Statewide Industrial or Construction General Permits, those sites are still subject to the Copermittees ordinances and the Copermittee must have the legal authority to control discharges from those sites. Provisions E.1.a.(4) is consistent with 40CFR122.26(d)(2)(i)(D), which requires the Copermittee to "*Control through interagency agreements among coapplicants the contribution of pollutants from one portion of the municipal system to another portion of the municipal system*." The federal regulations require the Copermittees to enter into interagency agreements to control pollutants from one Copermittee's jurisdiction to another Copermittee's jurisdiction. Provision E.1.a.(4) does not require anything outside of the federal requirements.	

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E1-1	PROVISION E.1: Legal Authority Establishment and Enforcement	
	Provision E.1.a.(5) is consistent with the requirements in the Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016. The Copermittees should be working with other entities outside of their jurisdiction to reduce or eliminate pollutants being discharged into their jurisdictions and MS4s, especially if those are significant sources of pollutants. The "where possible" qualifier in the requirement gives the Copermittees some flexibility in working with other entities, but Provision E.1.a.(5) does not require the Copermittees to impose their legal authority upon entities outside their jurisdictions. Provision E.1.a.(10) is consistent with 40CFR122.26(d)(2)(i)(F), which requires the Copermittee to "*Carry out all inspection, surveillance and monitoring procedures necessary to determine compliance and noncompliance with permit conditions including the prohibition on illicit discharges to the municipal separate storm sewer*." The San Diego Water Board did not make revisions to the requirements of Provision E.1 requested by the Copermittees.	

E1-2: *Requests for "clarifications" for legal authority requirements.*

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

E1-2	PROVISION E.1: Legal Authority Establishment and Enforcement	
	COMMENT: *Requests for "clarifications" for legal authority requirements.* The Orange County, Riverside County and San Diego County Copermittees each submitted comments requesting several "clarification" to requirements of Provision E.1.a to be "consistent" with the requirements under 40CFR122.26(d)(2)(i)(A)-(F).	**Copermittees** Orange County Copermittees Riverside County Copermittees San Diego County Copermittees
	RESPONSE: The San Diego Water Board disagrees that the legal authority requirements under Provision E.1.a are not consistent with the requirements under 40CFR122.26(d)(2)(i)(A)-(F). The requirements of Provision E.1.a are consistent with the requirements under 40CFR122.26(d)(2)(i)(A)-(F) and do not go beyond those requirements. The requirements under 40CFR122.26(d)(2)(i)(A)-(F) apply to both non-storm water discharges *to* the MS4 and pollutants in storm water discharges *from* the MS4. Provision E.1.a.(1) is consistent with 40CFR122.26(d)(2)(i)(B), which requires the Copermittee to "[*operate pursuant to legal authority established…which authorizes or enables the applicant at a minimum to*…] *Prohibit through ordinance, order or similar means, illicit discharges to the municipal separate storm sewer*." The requirement under 40CFR122.26(d)(2)(i)(B) does not include the term "*effectively* prohibit" only "prohibit" illicit discharges to the MS4. Provision E.1.a.(2) is consistent with 40CFR122.26(d)(2)(i)(A), which requires the Copermittee to "[*operate pursuant to legal authority established…which authorizes or enables the applicant at a minimum to*…] *Control through ordinance, permit, contract, order or similar means, the contribution of pollutants to the municipal storm sewer by storm water discharges associated with industrial activity and the quality of storm water discharged from sites of industrial activity*." The requirement under 40CFR122.26(d)(2)(i)(A) does not make a distinction between industrial activity (which includes construction activity according to 40 CFR 122.26(b)(14)(x)) that is regulated by an NPDES permit, such as the Statewide Industrial and Construction General Permits, and those that are not. Provision E.1.a.(3) is consistent with 40CFR122.26(d)(2)(i)(C), which requires the Copermittee to ""[*operate pursuant to legal authority established…which authorizes or enables the applicant at a minimum to*…] *Control through ordinance, order or similar means the discharge to a municipal separate storm sewer of spills, dumping or disposal of materials other than storm water*."	

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E1-2	PROVISION E.1: Legal Authority Establishment and Enforcement	
	Provisions E.1.a.(6)-(9) are consistent with 40CFR122.26(d)(2)(i)(E), which requires the Copermittee to "[*operate pursuant to legal authority established…which authorizes or enables the applicant at a minimum to*…] *Require compliance with conditions in ordinances, permits, contracts or orders*." Provisions E.1.a.(6)-(9) provide more specificity about what "compliance with conditions in ordinances, permits, contracts or orders" includes. Provision E.1.a.(10) is consistent with 40CFR122.26(d)(2)(i)(F), which requires the Copermittee to ""[*operate pursuant to legal authority established…which authorizes or enables the applicant at a minimum to*…] *Carry out all inspection, surveillance and monitoring procedures necessary to determine compliance and noncompliance with permit conditions including the prohibition on illicit discharges to the municipal separate storm sewer*." The San Diego Water Board did not make revisions to the requirements of Provision E.1.a requested by the Copermittees.	

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E2-1	PROVISION E.2: Illicit Discharge Detection and Elimination	
	COMMENT: *Non-storm water discharges must be addressed because of the impacts dry weather flows have on receiving waters.* The Los Penasquitos Lagoon Foundation and the South Laguna Civic Association each submitted comments expressing concerns about the impacts on receiving water due to dry weather flows. The Los Penasquitos Lagoon Foundation noted that dry weather discharges can create serious impacts to the beneficial uses of receiving waters that support salt marsh habitats. The South Laguna Civic Association noted that elevated creek flows originating from over-irrigation result in the discharge of several pollutants to protected creek, estuary and coastal receiving waters. The Los Penasquitos Lagoon Foundation requested that the Tentative Order provide mechanisms to allow the Copermittees to address dry weather flows regardless of whether or not constituents of concern are present in the flows. The South Laguna Civic Association advocated for effective enforcement measures by the San Diego Water Board to reduce discharges generated by over-irrigation.	**Environmental Organizations** Los Penasquitos Lagoon Foundation South Laguna Civic Association
	RESPONSE: The San Diego Water Board agrees that non-storm water discharges must be addressed. The approach to regulating non-storm water discharges in the Tentative Order has been modified compared to earlier permits. The Tentative Order focuses on "effectively prohibiting" or preventing and eliminating all non-NPDES-permitted non-storm water discharges to the MS4. The Tentative Order also requires the Copermittees to prohibit non-storm discharges associated with over-irrigation to the MS4. These two changes are expected to result in more actions implemented by the Copermittees to "effectively prohibit" non-storm water discharges to the MS4s and thereby non-storm water and pollutants from the MS4s to receiving waters. The San Diego Water Board agrees that the San Diego Water Board must enforce permit requirements more effectively. By issuing the Tentative Order, the San Diego Water Board expects to be able to reallocate its resources to better enforce permit requirements instead of developing permits and permit requirements. However, the San Diego Water Board also expects the public to provide data, information and evidence that will allow the San Diego Water Board to enforce the requirements of the Tentative Order.	

E2-2: Requests for "clarifications" of illicit discharge detection and elimination requirements.

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E2-2	PROVISION E.2: Illicit Discharge Detection and Elimination	
	COMMENT: *Requests for "clarifications" of illicit discharge detection and elimination requirements.* The Riverside County and San Diego County Copermittees, the Industrial Environmental Association, the BIA Regulated Community Coalition, and the Los Penasquitos Lagoon Foundation each submitted comment letters recommending minor revisions to the language under Provision E.2 to "clarify" the requirements, or to be consistent the comments regarding non-storm water discharges (see comment Gnl-13).	**Building Industry / Industry** Industrial Environmental Association BIA Regulated Community Coalition **Copermittees** Riverside County Copermittees San Diego County Copermittees **Environmental Organizations** Los Penasquitos Lagoon Foundation
	RESPONSE: The San Diego Water Board reviewed and considered the requests for minor revisions to "clarify" the requirements under Provision E.2. Where the San Diego Water Board determined a revision requested by a commenter was appropriate and necessary to clarify a requirement, clarify a linkage to another requirement, or make it consistent with other revisions made in the Tentative Order, the San Diego Water Board made a revision under Provision E.2. In many cases, the requested revision was not appropriate, not necessary, or both. In such cases, the San Diego Water Board did not revise the language as requested. Please see Provision E.2 in the revised Tentative Order to see where revisions were made. Please also see the responses to the comments that follow, associated with Provision E.2, for revisions that were made for specific parts under Provision E.2.	

E2-3: *Requests to more clearly define the responsibility of each Copermittee to address sources non-storm water discharges originating outside of a Copermittee's jurisdiction or control.*

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E2-3	PROVISION E.2: Illicit Discharge Detection and Elimination	
	COMMENT: *Requests to more clearly define the responsibility of each Copermittee to address sources non-storm water discharges originating outside of a Copermittee's jurisdiction or control.* The Riverside County and San Diego County Copermittees each submitted comments requesting modifications to the language under Provisions E.2.b and E.2.d to better define or more clearly define the responsibilities of each Copermittee to address sources of non-storm water discharges originating outside of a Copermittee's jurisdiction or control. The San Diego County Copermittees requested a minor revision to Provision E.2.b.(6) changing "must" to "shall." The San Diego County Copermittees also requested a minor revision to Provision E.2.d.(1)(d) to include a consideration for natural sources in its prioritization of investigations. The Riverside County Copermittees did not include the comments in their comment letter, but did include similar revisions in a track changes version of the Tentative Order provided with their comments. The Riverside County Copermittees requested additions to Provision E.2.d.(3) to specify that a Copermittee is no longer responsible for eliminating a non-storm water discharge to its jurisdiction if the source is in an upstream jurisdiction, and allowing the Copermittee to charge the San Diego Water Board for identifying non-storm water discharges subject to the regulatory authority of the San Diego Water Board.	**Copermittees** Riverside County Copermittees San Diego County Copermittees
	RESPONSE: The San Diego Water Board disagrees with the requests. Revision of Provision E.2.b.(6) to change "must" to "shall" is unnecessary. In either case, the San Diego Water Board would interpret the language as the Copermittee is required to implement Provision E.2.b.(6). Revision of Provision E.2.d.(1)(d) is unnecessary. Provisions E.2.d.(1)(a)-(e) are the criteria that the Copermittee must consider in its prioritization of follow-up investigations. Nothing in Provisions E.2.d.(1)(a)-(e) prohibit the Copermittee from considering natural sources as part of its prioritization of follow-up investigations. The recommended revisions to Provision E.2.d.(3) are not necessary or appropriate. Provision E.2.b.(6) already requires the Copermittee to coordinate with upstream Copermittees to prevent illicit discharges to the MS4 within its jurisdiction. In addition, Provision E.1.a.(4) requires the Copermittee to "*Control through interagency agreements among coapplicants the contribution of pollutants from one portion of the municipal system to another portion of the municipal system*." The federal regulations require the Copermittees to enter into	

E2-3	PROVISION E.2: Illicit Discharge Detection and Elimination	
	interagency agreements to control pollutants from one Copermittee's jurisdiction to another Copermittee's jurisdiction. The request to allow a Copermittee to charge the San Diego Water Board for implementing an investigation of non-storm water discharges to its MS4 is inappropriate. Each Copermittee is required to effectively prohibit non-storm water discharges to their MS4s by enforcing its legal authority, unless a non-storm water discharge is authorized under an NPDES permit. If a non-storm water discharge originates from a source that is subject to the San Diego Water Board's authority and requires an NPDES permit, then the Copermittee is still responsible for identifying the source if it is resulting in a non-storm water discharge into and from the Copermittee's MS4. If the non-storm water discharge is not authorized under an NPDES permit, then it is an illicit discharge. The Copermittee must either eliminate the illicit discharge or require the discharger to obtain authorization from the San Diego Water Board under an NPDES permit. If a non-storm water discharge to the Copermittee's MS4 is an NPDES permitted discharge, then the Copermittee is responsible for demonstrating that the non-storm water discharge is not an illicit discharge by identifying the source as an NPDES permitted discharge. The Copermittee must provide the data and documentation to demonstrate that non-storm water discharges from its MS4 are authorized under separate NPDES requirements. Until the Copermittee demonstrates that a non-storm water discharge is an NPDES-permitted discharge, the Copermittee is responsible for the non-storm water discharge. The non-storm water source investigation and identification are part of the Copermittee's responsibility to demonstrate compliance with the requirements in the Tentative Order. The San Diego Water Board did not revise Provisions E.2.b or E.2.d.	

PROVISION E.2.a: Non-Storm Water Discharges
E2a-1: *Request to allow the Copermittees to "encourage" instead of "require" air conditioning condensate non-storm water discharges be directed to landscaped areas or other impervious surfaces.*

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E2a-1	PROVISION E.2.a: Non-Storm Water Discharges	
	COMMENT: *Request to allow the Copermittees to "encourage" instead of "require" air conditioning condensate non-storm water discharges be directed to landscaped areas or other impervious surfaces*. The City of National City, the San Diego County Copermittees, the San Diego Unified Port District, and the San Diego Port Tenants Association each submitted comments expressing concerns with requiring air conditioning condensate non-storm water discharges to be directed to landscaped areas or other permeable surfaces, if feasible. The City of National City, the San Diego County Copermittees, and the San Diego Unified Port District requested the language of Provision E.2.a.(4)(a) be revised to encourage instead of require air conditioning condensate non-storm water discharges be directed to landscaped areas or other permeable surfaces. The San Diego County Copermittees also requested the addition of "or to the sanitary sewer" at the end of the requirement. The City of National City opposed this addition. The San Diego Port Tenants Association requested that the requirement be limited to development or re-development projects.	**Copermittees** City of National City San Diego County Copermittees San Diego Unified Port District **Societies/Associations/Coalitions** San Diego Port Tenants Association
	RESPONSE: The San Diego Water Board agrees to revise the requirements to encourage instead of require air conditioning condensate non-storm water discharges be directed to landscaped areas or other permeable surfaces. The San Diego Water Board also agrees to add "to the sanitary sewer" as an additional option. The San Diego Water Board disagrees with limiting the requirement to development or re-development projects. Air conditioning condensate non-storm water discharges originate primarily from existing development, and the Clean Water Act requires the Copermittees to effectively prohibit non-storm water discharges to the MS4. Please see Provision E.2.a.(4)(a) in the revised Tentative Order to see the revisions.	

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E2a-2	PROVISION E.2.a: Non-Storm Water Discharges	
	COMMENT: *Requests for modifications to requirements of fire-fighting non-storm water discharges.* The Orange County, Riverside County, and San Diego County Copermittees each submitted comments objecting to the requirement to encourage the implementation of BMPs for emergency firefighting discharges and/or the requirement to address non-emergency firefighting discharges from building fire suppression systems as illicit discharges. The County of San Diego and San Diego County Fire Authority also objected to the requirement to encourage implementation of BMPs for emergency firefighting discharges. San Diego Gas and Electric, the Southern California Gas Company, and the San Diego Port Tenants Association also objected to the requirement to address non-emergency firefighting discharges from building fire suppression systems as illicit discharges. The Orange County and Riverside County Copermittees recommended removing Provision E.2.a.(5)(b) and specifying that emergency firefighting non-storm water discharges do not require BMPs and are not prohibited. The San Diego County Fire Authority recommended maintaining the existing requirements in Order No. R9-2007-0001, which is supported by the County of San Diego. The San Diego County Copermittees recommended revising Provision E.2.a.(5)(a)(i) to require the Copermittees to address non-emergency firefighting discharges from building fire suppression systems as illicit discharges "unless BMPs are implemented to prevent the discharge of pollutants to the MS4." The Riverside County Copermittees, County of San Diego, San Diego County Fire Authority, San Diego Gas and Electric, Southern California Gas Company, and San Diego Port Tenants Association supported the recommendation. The Orange County Copermittees did not provide a similar comment, but recommended that other non-emergency firefighting discharges be addressed by a program developed and implemented by the Copermittee "in conjunction with the local Fire Authority/District."	**Building Industry / Industry** San Diego Gas and Electric Southern California Gas Company **Copermittees** County of San Diego Orange County Copermittees Riverside County Copermittees San Diego County Copermittees San Diego County Fire Authority **Societies/Associations/Coalitions** San Diego Port Tenants Association
	RESPONSE: The San Diego Water Board has review and considered the recommendations from the commenters. The San Diego Water Board disagrees that the language in Provision E.2.a.(5)(b) requires the implementation of BMPs for emergency fire fighting discharges, or prohibits emergency fire fighting discharges to the MS4. Provision E.2.a.(5)(b) only requires the Copermittees to "encourage" the implementation of BMPs. Provision E.2.a.(5)(b) is a recommendation for the Copermittees to implement, not a requirement for compliance.	

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E2a-2	PROVISION E.2.a: Non-Storm Water Discharges	
	The San Diego Water Board agrees to the recommended revision to Provision E.2.a.(5)(a)(i). The San Diego Water Board does not agree that the recommended revision to Provision E.2.a.(5)(a)(ii) is necessary. The Copermittees would have to develop and implement the program to address non-emergency fire fighting discharges in conjunction or coordination with the local fire authority or fire district. Please see Provision E.2.a.(5) in the revised Tentative Order to see the revisions.	

E2a-3: *Clarify that non-storm water discharges authorized by a separate NPDES permit are authorized to be discharged to the MS4.*

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E2a-3	PROVISION E.2.a: Non-Storm Water Discharges	
	COMMENT: *Clarify that non-storm water discharges authorized by a separate NPDES permit are authorized to be discharged to the MS4.* The San Diego Port Tenants Association, San Diego Gas and Electric, and the Southern California Gas Company each submitted comments requesting language in the Tentative Order to specify that non-storm water discharges authorized by separate NPDES permits are authorized to discharge to the MS4.	**Building Industry / Industry** San Diego Gas and Electric Southern California Gas Company **Societies/Associations/Coalitions** San Diego Port Tenants Association
	RESPONSE: The San Diego Water Board disagrees that revision to the language in the Tentative Order are necessary or appropriate. Provision A.1.b has been revised to refer to Provision E.2, which is the illicit discharge detection and elimination program requirements that must be implemented by each Copermittee within its jurisdiction to effectively prohibit non-storm water discharges to its MS4. Provision A.1.b also specifies that the Copermittees are required to effectively prohibit non-storm water discharges to the MS4 *unless* such discharges are authorized by a separate NPDES permit. The San Diego Water Board did not revise the Tentative Order to include additional language.	

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E2a-4	PROVISION E.2.a: Non-Storm Water Discharges	
	COMMENT: *Objections to addressing non-storm water discharges related to extraction of groundwater as illicit discharges.* The Orange County, Riverside County, and San Diego County Copermittees each submitted comments objecting to the requirements to address non-storm water discharges related to extraction of groundwater as illicit discharges if they are not identified as sources of pollutants. The City of National City also submitted a comment with a similar objection. The Copermittees also objected to requiring non-storm water discharges related to extraction of groundwater to be enrolled under the General Groundwater Extraction NPDES Permits issued by the San Diego Water Board. The Copermittees recommended several revisions to Provisions E.2.a.(1) and E.2.a.(3) to modify, remove, and/or reorganize the requirements pertaining to non-storm water discharges related to groundwater extraction.	**Copermittees** City of National City Orange County Copermittees Riverside County Copermittees San Diego County Copermittees
	RESPONSE: The San Diego Water Board disagrees with the recommendations. The Clean Water Act requires NPDES permit for MS4s to effectively prohibit non-storm water discharges to the MS4. As explained in the Fact Sheet, the Phase I Final Rule clarifies that non-storm water discharges through an MS4 are not authorized under the CWA (55 FR 47995): "*Today's rule defines the term "illicit discharge" to describe any discharge through a municipal separate storm sewer system that is not composed entirely of storm water and that is not covered by an NPDES permit. Such illicit discharges are not authorized under the Clean Water Act. Section 402(p(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit*." Thus, all non-storm water discharges that do not have authorization under an NPDES permit must ultimately be removed (i.e. prevented or eliminated) from the MS4 or become subject to an NPDES permit. The requirements under Provisions E.2.a.(1) and E.2.a.(3) are consistent with the Clean Water Act, the Code of Federal Regulations and the clarification in the Phase I Final Rule for non-storm water discharges. The non-storm water categories listed under Provision E.2.a.(1) can be authorized by an NPDES permit because they are extracting groundwater for the purpose of dewatering, and the San Diego Water Board has two NPDES permits that can authorize these types of non-storm water discharges. These are not "conditionally exempt"	

E2a-4	PROVISION E.2.a: Non-Storm Water Discharges	
	non-storm water discharges as the Copermittees have asserted. If there are non-storm water discharges that result from groundwater extraction for dewatering and do not have authorization under an NPDES permit, the discharge is an illicit discharge. The non-storm water categories listed under Provision E.2.a.(3) generally are expected to be discharged from natural, uncontrollable, or unanticipated sources. Non-storm water discharges from foundation drains and footing drains designed to be above the groundwater table are not generally expected to occur. If they do occur, the Copermittee is expected to implement its illicit discharge detection and elimination program to determine if the discharge is transient or persistent, a source of pollutants or not, and whether the discharge must be eliminated in accordance with its priorities. In general, the requirements under Provision E.2 are focused on the ultimate removal of unauthorized non-storm water discharges to the MS4 to "effectively prohibit" non-storm water discharges to the MS4, as required by the Clean Water Act. The San Diego Water Board is not requiring the Copermittee to enforce any NPDES permits issued by the San Diego Water Board or State Water Board. The Copermittees are only required to enforce their legal authority to prohibit illicit discharges to their MS4s established pursuant to Provision E.1.a.(1). The San Diego Water Board did not revise Provisions E.2.a.(1) or E.2.a.(3).	

E2a-5: *Request to allow the Copermittees to focus on elimination of "non-storm water discharges that are a source of pollutants" not "non-storm water discharges."*

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E2a-5	PROVISION E.2.a: Non-Storm Water Discharges	
	COMMENT: *Request to allow the Copermittees to focus on elimination of "non-storm water discharges that are a source of pollutants" not "non-storm water discharges."* The Orange County and Riverside County Copermittees each requested that the requirements under Provision E.2.a be revised to allow the Copermittees to focus on eliminating non-storm water discharges that are a source of pollutants and not require the elimination of all non-storm water discharges. In contrast, the Los Penasquitos Lagoon Foundation requested that the requirements under Provision E.2 provide the Copermittees a mechanism to address illicit discharges regardless of whether or not constituents of concern are present within the flows.	**Copermittees** Orange County Copermittees Riverside County Copermittees **Environmental Organizations** Los Penasquitos Lagoon Foundation
	RESPONSE: The San Diego Water Board disagrees with the Copermittees' request. Provision E.2 does provide the Copermittees a mechanism to address illicit discharges regardless of whether or not constituents of concern are present within the flows. However, the Copermittees are required to prioritize the non-storm water discharges that they will address, and eliminate the highest priority non-storm water discharges first. Please see the response to comment E2a-4.	

E2a-6: *Request to allow the Copermittees to encourage the control of residential car washing non-storm water discharges through public education.*

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E2a-6	PROVISION E.2.a: Non-Storm Water Discharges	
	COMMENT: *Request to allow the Copermittees to encourage the control of residential car washing non-storm water discharges through public education.* The San Diego County Copermittees submitted a comment requesting the requirements of Provision E.2.a.(4)(b) be revised to allow the Copermittees to encourage the control of residential car washing non-storm water discharges through public education.	**Copermittees** San Diego County Copermittees
	RESPONSE: The San Diego Water Board reviewed and considered the requested revisions. The San Diego Water Board did not revise Provision E.2.a.(4)(b) as requested, but did make revisions to provide the flexibility to encourage the control of residential car washing non-storm water discharges through public education.	

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E2a-7	PROVISION E.2.a: Non-Storm Water Discharges	
	COMMENT*: Request for modification to requirements for swimming pool non-storm water discharges.* The San Diego County Copermittees requested a minor modification to Provision E.2.a.(4)(c) to add the phrase "should be managed as to:" for the non-storm water discharge requirements related to dechlorinated swimming pool discharges.	**Copermittees** San Diego County Copermittees
	RESPONSE: The San Diego Water Board reviewed and considered the requested revision. The revision to Provision E.2.a.(4)(c) does not provide any additional clarify and is not necessary. The San Diego Water Board did not revise Provision E.2.a.(4)(c) as requested.	

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E2a-8	PROVISION E.2.a: Non-Storm Water Discharges	
	COMMENT: *Objections to requiring the prohibition of over-irrigation non-storm water discharges.* The Riverside County Copermittees and the County of San Diego each submitted comments objecting to eliminating the non-storm water discharge categories associated with over-irrigation, which results in requiring the Copermittees to prohibit over-irrigation non-storm water discharges to the Copermittees' MS4s. The Copermittees requested that the non-storm water discharge categories associated with over-irrigation be put back into Provision E.2.a. In contrast, the Los Penasquitos Lagoon Foundation and the South Laguna Civic Association each submitted comments expressing concerns about the impacts on receiving water due to dry weather flows associated with over-irrigation. The Los Penasquitos Lagoon Foundation noted that dry weather discharges can create serious impacts to the beneficial uses of receiving waters that support salt marsh habitats. The South Laguna Civic Association noted that elevated creek flows originating from over-irrigation result in the discharge of several pollutants to protected creek, estuary and coastal receiving waters.	**Copermittees** County of San Diego Riverside County Copermittees **Environmental Organizations** Los Penasquitos Lagoon Foundation South Laguna Civic Association
	RESPONSE: The San Diego Water Board disagrees with the Copermittees' request. The Riverside County Copermittees assert that the Copermittees must identify the categories that are sources of pollutants that should be prohibited, not the San Diego Water Board. The San Diego Water Board disagrees. This is the responsibility of both the San Diego Water Board and/or the discharger. Either the San Diego Water Board or the discharger may identify categories that should be prohibited. The Phase I Rule (55 FR 48037) specifies that "*the Director [i.e. San Diego Water Board] may include permit conditions that either require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*." In this case, the San Diego Water Board has identified non-storm water runoff from landscape irrigation, irrigation water, and lawn watering (collectively, "over-irrigation") as a significant source of pollutants discharging to the MS4. The Fact Sheet cites a number of documents, from the state and all three counties of the San Diego Region, to justify the removal of these categories from the list of categories of non-storm water discharges into the MS4 not required to be prohibited. The San Diego Water Board maintains that the documentation cited in the Fact Sheet supports that removal of these categories. However, the comments from the Los Penasquitos Lagoon Foundation and the South Laguna Civic Association also support this conclusion. In addition, the removal of the non-storm water discharge categories associated with over-irrigation has already	

E2a-8	PROVISION E.2.a: Non-Storm Water Discharges	
	been adopted in the Orange County and Riverside County MS4 Permits (Order Nos. R9-2009-0002 and R9-2016-0016). The Riverside County Copermittees are already subject to the requirement to prohibit non-storm water discharge categories associated with over-irrigation, so the removal of these categories in the Tentative Order is consistent with their current requirements. Furthermore, the removal of the non-storm water discharge categories associated with over-irrigation is consistent with what is already required to be implemented by the Copermittees. The prohibition is consistent with the Water Conservation in Landscaping Act (AB1881), which required cities and counties to adopt landscape water conservation ordinances prohibiting runoff from inefficient landscape irrigation by January 1, 2010. The cities and counties were required to adopt ordinances that prohibit runoff from "the target landscape" to "adjacent property, non-irrigated areas, walks, roadways, parking lots, or structures." The Copermittees should have already adopted these ordinances and are required to enforce these ordinances to prohibit runoff associated with over-irrigation. The San Diego Water Board did not revise Provision E.2.a to include the non-storm water discharge categories associated with over-irrigation.	

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E2a-9	PROVISION E.2.a: Non-Storm Water Discharges	
	COMMENT: *Objection to requirement to reduce or eliminate non-storm water discharges whether or not a non-storm water discharge has been identified as an illicit discharge.* The Orange County, Riverside County, and San Diego County Copermittees each submitted comments objecting the requirement under Provision E.2.a.(7) to reduce or eliminate non-storm water discharges whether or not a non-storm water discharge has been identified as an illicit discharge. The San Diego County Copermittees recommended removing the phrase "whether or not the non-storm water discharge has been identified as an illicit discharge" and the Orange County and Riverside County Copermittees recommended removing Provision E.2.a.(7). In contrast, the Los Penasquitos Lagoon Foundation requested that the requirements under Provision E.2 provide the Copermittees a mechanism to address illicit discharges regardless of whether or not constituents of concern are present within the flows. The Los Penasquitos Lagoon Foundation noted that dry weather freshwater flows themselves can create serious impacts to the beneficial uses of receiving waters that support salt marsh habitats, especially when those flows have been changed from ephemeral to perennial.	**Copermittees** Orange County Copermittees Riverside County Copermittees San Diego County Copermittees **Environmental Organizations** Los Penasquitos Lagoon Foundation
	RESPONSE: The San Diego Water Board disagrees with the request to remove Provision E.2.a.(7), but agrees to modify the language. Provision E.2.a.(7) is consistent with Clean Water Act, the Code of Federal Regulations and the clarification in the Phase I Final Rule for non-storm water discharges. Please see response to comment E2a-4. The San Diego Water Board has revised Provision E.2.a.(7). Please see the revisions in the revised Tentative Order.	

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E2a-10	PROVISION E.2.a: Non-Storm Water Discharges	
	COMMENT: *Request for modifications to the requirements for water line flushing and water main breaks non-storm water discharges.* The Metropolitan Water District of Southern California submitted a request to modify Provision E.2.a.(2) to specify that non-storm water discharges from water purveyors and community water systems are authorized discharges and not illicit discharge if enrolled or regulated under NPDES Permit No. CAG 679001 (Order No. R9-2010-0003).	**Other Entities** Metropolitan Water District of Southern California
	RESPONSE: The San Diego Water Board disagrees with the request. Provision E.2.a.(2) is specific to the requirement for the Copermittees to identify whether or not a non-storm water discharge resulting from water line flushing or water main breaks are illicit discharges. These are two non-storm water discharge categories specifically identified in the Code of Federal Regulations that the Copermittees are required to address as illicit discharges if they are identified as a source of pollutants. The introductory paragraph to Provision E.2.a already specifies that non-storm water discharges authorized by a separate NPDES permit is not required to be addressed as an illicit discharge. Provision E.2.a.(2) further specifies that water line flushing and water main breaks covered under NPDES Permit No. CAG 679001 (Order No. R9-2010-0003) are not illicit discharges. The San Diego Water Board did not revise Provision E.2.a.(2).	

E2a-11: Request to allow the Copermittees to designate BMPs to be implemented if a category of non-storm water discharges is found to be a source of pollutants instead of requiring a prohibition of the category of non-storm water discharges.

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E2a-11	PROVISION E.2.a: Non-Storm Water Discharges	
	COMMENT: *Request to allow the Copermittees to designate BMPs to be implemented if a category of non-storm water discharges is found to be a source of pollutants instead of requiring a prohibition of the category of non-storm water discharges.* San Diego Gas and Electric and the Southern California Gas Company each submitted comments requesting Provision E.2.a.(6) be modified to provide an alternative that would allow the Copermittees to designate BMPs to be implemented if a category of non-storm water discharges is found to be source of pollutants, instead of requiring a prohibition of the category of non-storm water discharges.	**Building Industry / Industry** San Diego Gas and Electric Southern California Gas Company
	RESPONSE: The San Diego Water Board reviewed and considered the requested revision. The San Diego Water Board has revised Provision E.2.a.(6) to allow the Copermittees to propose controls to be implemented if a category of non-storm water discharges is found to be a source of pollutants. Please see Provision E.2.a.(6) in the revised Tentative Order.	

PROVISION E.3: Development Planning
E3-1: *Requests for "clarifications" for development planning requirements.*

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E3-1	PROVISION E.3: Development Planning	
	COMMENT: *Requests for "clarifications" for development planning requirements.* The Copermittees and others have submitted numerous recommendations for revisions to provide "clarity," improve readability, or correct the language in Provision E.3 of the Tentative Order.	**Building Industry / Industry** Building Industry Association of Southern California San Diego Green Building Council **Copermittees** City of Chula Vista Orange County Copermittees Riverside County Copermittees San Diego County Copermittees **Engineering/Design Consultants** Contech Engineered Solutions
	RESPONSE: The San Diego Water Board has reviewed and considered all the recommendations submitted by the commenters. In cases where the San Diego Water Board agreed that the recommendations would improve readability and were consistent with the intent of language or requirement, the recommendations were incorporated. In instances where the San Diego Water Board disagreed with the recommendations, the language in the Tentative Order was not changed.	

E3-2: *Requests for revisions to allow the construction of BMPs in waters of the state.*

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E3-2	PROVISION E.3: Development Planning	
	COMMENT: *Requests for revisions to allow the construction of BMPs in waters of the state.* The San Diego County Copermittees and the BIA Regulated Community Coalition have requested that Provision E.3.a.(1)(b) be revised to allow the implementation of structural BMPs within waters of the state, since the definition of waters of the state is broad and could be interpreted to prohibit storm drain inserts and other common BMPs. The requested revision that "BMPs must not be constructed within a waters of the U.S. unless authorized by the San Diego Water Board Executive Officer" is consistent with the San Diego Water Board's 401 Certification Program and would protect natural receiving waters from construction and the use of such waters to transport pollutants.	**Building Industry / Industry** BIA Regulated Community Coalition **Copermittees** City of Chula Vista San Diego County Copermittees
	RESPONSE: The San Diego Water Board agrees with this comment and has modified the language in the Tentative Order accordingly.	

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E3-3	PROVISION E.3: Development Planning	
	COMMENT: *Requests for revisions to Priority Development Project inventory requirements.* The San Diego County Copermittees have requested that the Tentative Order be revised such that updates to Priority Development Project databases occur "regularly" instead of "at least annually." Additionally, the City of Chula Vista requested the start date for Priority Development Project inventory begin December 2002 instead of January 2002, to reflect the start date for the San Diego County Copermittees' regulatory oversight process pursuant to Order No. 2001-01.	**Copermittees** City of Chula Vista San Diego County Copermittees
	RESPONSE: The San Diego Water Board disagrees that the frequency of updates to project inventories should be less frequent than on an annual basis. However, the San Diego Water Board agrees with the request that the start date be changed for San Diego County Copermittees and has revised the language in the Tentative Order appropriately.	

PROVISION E.3.b: Priority Development Projects
E3b-1: *Requests for revisions to development planning requirements to include different requirements for transportation projects.*

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E3b-1	PROVISION E.3.b: Priority Development Projects	
	COMMENT: *Requests for revisions to development planning requirements to include different requirements for transportation projects.* The San Diego County and Orange County Copermittees, the Riverside County Transportation Department, and others commented that transportation projects should be exempt from the requirement to implement pollutant control and hydromodification management BMPs set forth in the Tentative Order. Commenters contend that transportation projects should be allotted special consideration because, unlike other types of projects, they must also consider various design constraints having to do with limited right-of-way, utilities, street trees, fire truck access, and general public safety. Commenters recommended that transportation projects be held to USEPA Green Streets guidance as the design requirement.	**Building Industry / Industry** San Diego Green Building Council **Copermittees** City of Dana Point City of Imperial Beach Orange County Copermittees Riverside County Transportation Department
	RESPONSE: The San Diego Water Board generally agrees with the commenters regarding the unique constraints associated with existing roadways. The Tentative Order has been revised to provide an exemption from the Priority Development Project designation for projects where retrofitting of existing paved alleys, streets, or roads are designed and constructed in accordance with USEPA Green Street guidance. However, this exemption is only allowed for existing road and not new ones. This is because new roads are not yet spatially constrained and should be able to incorporate the pollutant control and hydromodification management BMPs during the planning stages. The Tentative Order also allows the Copermittees to incorporate alternative compliance options during the planning stages of the new road projects. The San Diego Water Board maintains that controlling pollutants and managing flows coming from roads is critical because roads are significant sources of pollutants and add significant new impervious surfaces. Commenters should also note that routine maintenance activities associated with transportation projects such as maintaining original line and grade, or repairing potholes, is not considered a Priority Development Project and is not subject to any structural BMP requirements.	

E3b-2: *Request for a clear definition of "directly discharges to" an Environmentally Sensitive Area (ESA).*

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E3b-2	PROVISION E.3.b: Priority Development Projects	
	COMMENT: *Request for a clear definition of "directly discharges to" an Environmentally Sensitive Area (ESA).* The San Diego County Copermittees and the City of Imperial Beach have requested that Provision B.3.b.(1) be revised to clearly define "directly discharges to" an ESA. The Copermittees are concerned that language in the Tentative Order is confusing and can be misinterpreted.	**Copermittees** City of Imperial Beach San Diego County Copermittees
	RESPONSE: The San Diego Water Board agrees with the comment. The San Diego Water Board revised the language in Provision B.3.b.(1) to more clearly define "directly discharges to."	

E3b-3	PROVISION E.3.b: Priority Development Projects	
	COMMENT: *Requests for modifications to the types of projects defined as Priority Development Projects and subject to the storm water pollutant control and hydromodification management structural BMP requirements.* The San Diego County, Orange County, and Riverside County Copermittees, several individual Copermittees, members of the Building Industry, Industry, Clean Water Now, and Engineering/Design Consultants submitted comments regarding the types of projects defined as Priority Development Projects. Clean Water Now expressed concern with the types of projects that are considered Priority Development Projects. The Copermittees, Building Industry, and Engineering/Design Consultants provided recommendations for the types of projects that should be defined as Priority Development Projects and therefore subject to the storm water pollutant control and hydromodification management structural BMP requirements, and the types of projects that should be exempt from those requirements. The Copermittees made several comments on this topic, which are summarized below: • Single family residences should be exempt because the requirements are complex and difficult for the regular homeowner to understand, and that the potential for pollutant generation is considerably less than an industrial or commercial site; • Driveways should not be included as Priority Development Projects because, unlike roads, driveways experience low daily trips. The Copermittees suggest implementing a lower performance standard for BMPs implemented on driveways than other Priority Development Projects; • The Tentative Order should include qualifiers for parking lots that would trigger Priority Development Project status only if they were uncovered; • Maintenance access roads should be exempt; • The Tentative Order should allow exemptions for parking lots and other projects that are constructed with permeable surfaces; • The Tentative Order should allow exemptions for flood control and emergency projects; • The exemptions allowed for LEED certified single family residences is inappropriate because the program encompasses other environmental considerations, and are outside the scope of storm water permitting; • Triggers for Priority Development status should be simultaneously based on soil type and square footage of impervious surface; • The Tentative Order should allow exemptions for "Watershed Protection Projects" that are undertaken to rehabilitate or prevent environmental, social, and economic damage to the watershed;	**Building Industry / Industry** American Society of Landscape Architects San Diego Green Building Council San Diego Gas and Electric Company Southern California Gas Company **Copermittees** City of Chula Vista City of Imperial Beach City of Poway Orange County Copermittees Riverside County Copermittees San Diego County Copermittees **Environmental Organizations** Clean Water Now **Engineering/Design Consultants** Contech Engineered Solutions Project Design Consultants

E3b-3	PROVISION E.3.b: Priority Development Projects	
	• The hillside development category should be removed because it is not needed. Some Engineering/Design Consultants suggested that Priority Development Projects be exempt if they are designed and constructed with specific materials or a voluntary certification program. San Diego Gas and Electric and the Southern California Gas Company commented that linear underground/overhead (utility) projects should be exempt from Priority Development Project status due to the nature of their construction.	
	RESPONSE: The San Diego Water Board generally disagrees with the requests to remove some project categories from Provision E.3.b, or to exempt certain types of projects from the requirement to implement storm water pollutant control and hydromodification management BMPs. Such BMPs are needed to protect water quality. The list of project categories in Provision E.3.b represents projects that result in the creation of significant areas of impervious surface and/or are pollutant generating in nature, which in turn contributes to pollutants in storm water discharges and altered flow regimes that cause accelerated erosion of channel bed and banks, and consequently degraded stream conditions. With the exception of driveways, the Priority Development Project categories have not changed substantially in San Diego Water MS4 permits. Provision E.3.b of the Tentative Order is consistent with the Fourth Term MS4 permits adopted by the San Diego Water Board for Orange County and Riverside County. Driveways were added as to the Priority Development Project categories because, although they experience much less traffic than roads, they still generate pollutants and create significant impervious surfaces that can impact downstream receiving waters, and must be mitigated. Similarly, even covered parking lots cause impacts for which mitigation is needed because rooftops also add to the impervious surface footprint. Research shows that even incremental increases in impervious surface, as low as 3-5 percent of the watershed area in the semi-arid climate of southern California, can result in degradation of receiving streams (Stein, E. and Zaleski, S., 2005. Technical Report 475, Managing Runoff to Protect Natural Streams: The Latest Development on Investigation and Management of Hydromodification in California. December 30, 2005.). Creation of impervious surface is a concern to the San Diego Water Board and construction with pervious materials that allow infiltration and other natural hydrologic processes are preferred. There is no need to exempt parking lots and other projects constructed with pervious materials from Priority Development Project status because they are not considered Priority Development Projects in the first place. Similarly, maintenance access roads as well as the majority of linear utility projects are not Priority Development Projects because they do not necessarily result in the placement of impervious surfaces above the threshold square footages	

E3b-3	PROVISION E.3.b: Priority Development Projects	
	associated with Priority Development Projects. Priority Development Project status is based on both the type of project being built and associated pollutants anticipated to be generated, and a threshold for the creation or replacement of impervious surface. Soil type comes into play in terms of meeting the retention requirement, which is discussed in the response to comment E3c1-1. The San Diego Water Board disagrees with the recommendation to define Priority Development Projects by soil type because this is accounted for in the size and type of BMPs as dictated by the retention requirement. The San Diego Water Board disagrees that hillside development projects should be exempt. These projects are susceptible to causing accelerated erosion and therefore must implement structural BMPs. The San Diego Water Board further disagrees that there should be exemptions for emergency projects or flood control projects. Provision E.3 describes requirements that pertain to development planning. Emergency situations, by definition, are not planning exercises and therefore do not involve the design and construction of a building or structure. The San Diego Water Board believes that it may be suitable to relax the structural BMP standards for, or exempt flood control projects, but not before projects are evaluated on a case-by-case basis. In many instances, environmentally friendly practices may be appropriate for implementation in flood control projects, but a variety of options would not be evaluated if the Tentative Order provided a blanket exemption. The San Diego Water Board disagrees that an exemption from the Priority Development Project structural BMP requirements should be provided for all single family residences. The definition of Priority Development Projects in the Tentative Order already excludes a majority of single family residences that may be developed or redeveloped. New single family residences must create 10,000 square feet or more of impervious surface, or 5,000 square feet or more of impervious surface as a Hillside Development, or 2,500 square feet or more of impervious surface if discharging directly to an Environmental Sensitive Area to be defined as a Priority Development Project. Redevelopment single family residence projects must create or replace 5,000 square feet or more of impervious surface, or 2,500 square feet or more of impervious surface if discharging directly to an Environmental Sensitive Area to be defined as a Priority Development Project. Single family residences that are defined as Priority Development Projects can have a significant impact on receiving water quality and it is appropriate for these projects to implement the Priority Development Project structural BMP requirements. The San Diego Water Board removed language pertaining to the option for single family residences to be designed and constructed with LEED certification to qualify as exempt from Priority Development Project status.	

E3b-3	PROVISION E.3.b: Priority Development Projects	
	This is because several commenters stated that including this requirements was outside the scope of water quality regulation, and that the LEED program was too specific of a certification requirement. To avoid any inconsistency regarding equivalent certification programs and for more streamlined requirements, this option, and hence the exemption allowed for single family residences, was removed. Single family residences large enough to trigger the size thresholds associated with Priority Development Projects are a source of pollutants and altered flow regimes, and therefore must be required to implement structural BMPs. The Copermittees must inspect such BMPs as part of their oversight programs to ensure that homeowners are properly maintaining the BMPs and the BMPs continue to operate as designed in order for the Copermittees to meet the MEP standard of the Clean Water Act. Finally, the San Diego Water Board disagrees that there should be an exemption for "Watershed Protection Projects." The commenters should note that Priority Development Projects are not only defined by square footage of impervious surface, but also the type of project being constructed. The types of projects described in the comment, such as erosion mitigation, restoration of rivers and ecosystems, or groundwater recharge, do not need to be explicitly provided exemptions because they would not be considered Priority Development Projects in the first place if they do not create or replace impervious surface in exceedance of the thresholds in the Tentative Order. The San Diego Water Board has also revised the Tentative Order to allow the Copermittees to provide exemptions for all types of projects. The Copermittees have the ability to exempt projects from meeting the hydromodification management requirements in areas where they have deemed it appropriate to do so. However, in order to utilize this option, Copermittees must first perform the optional Watershed Management Area Analysis described in Provision B.3.b.(4). Please see the response to Comment E3c-2 for further discussion of this option.	

E3b-4: *Redevelopment Priority Development Projects that were subject to previous structural BMP requirements should not be subject to new structural BMP requirements.*

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E3b-4	PROVISION E.3.b: Priority Development Projects	
	COMMENT: *Redevelopment Priority Development Projects that were subject to previous structural BMP requirements should not be subject to new structural BMP requirements*. The San Diego County, Orange County, and Riverside County Copermittees each submitted comments requesting that language be added to the Tentative Order that would specify structural BMP requirements are not applicable to Priority Development Projects (or portions thereof) if the project already has implemented structural BMPs pursuant to requirements of prior MS4 permits.	**Copermittees** Orange County Copermittees Riverside County Copermittees San Diego County Copermittees
	RESPONSE: The San Diego Water Board disagrees in concept with the Copermittees' request. Although some projects may already have structural BMPs onsite, the performance requirements of those BMPs do not necessarily meet the requirements of the Tentative Order. Order No. R9-2007-0001 does not have the numerical storm water pollutant control retention performance standard, therefore redevelopment sites that were subject to Order No. R9-2007-0001 must update their BMPs during the design phase. In some cases, redevelopment projects will already have BMPs that meet the storm water pollutant control and hydromodification management BMP requirements. In these instances, the requirements of the Tentative Order are met and there is no need to change the language.	

PROVISION E.3.c: Priority Development Project Structural BMP Performance Requirements
E3c-1: *The Tentative Order ignores regional comprehensive plans developed by municipalities and SANDAG.*

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E3c-1	PROVISION E.3.c: Priority Development Project Structural BMP Performance Requirements	
	COMMENT: *The Tentative Order ignores regional comprehensive plans developed by municipalities and SANDAG.* The Jamul Dulzura Community Planning Group and Julian Community Planning Group assert that the requirements in the Tentative Order are contradictory to plans developed by SANDAG and subsequently included in General Plans that include sound principles such as encouraging redevelopment. The Tentative Order's requirements amount to punishing or dis-incentivizing urban infill projects.	**Community Planning Groups** Jamul Dulzura Community Planning Group Julian Community Planning Group
	RESPONSE: The San Diego Water Board strongly disagrees that the requirements in the Tentative Order are contradictory to principles advocated in regional planning documents. In fact, the Tentative Order is heavily based on planning at the watershed scale, as represented in the Water Quality Improvement Plan requirements. The Tentative Orders increases flexibility for the Copermittees to address urban infill and redevelopment projects by not mandating only on-site BMPs. Redevelopment projects will be required to implement structural BMP requirements that are needed to protect downstream water quality. However, if a Copermittee finds that implementation of the required BMPs fully onsite will not result in meaningful improvements in either pollutant control or hydromodification management, then that Copermittee has the option to allow compliance elsewhere in the watershed where more substantial improvements can take place. There are no additional requirements for redevelopment projects versus new projects, therefore redevelopment projects are not being penalized, as suggested by the commenters. Furthermore, the Tentative Order has been revised to include an exemption from hydromodification management BMP requirements for Priority Development Projects that discharge to conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean. Additionally, more exemptions could be included on a watershed-specific basis if the Copermittees in the Watershed Management Area elect to perform the optional Watershed Management Area Analysis as described in Provision B.3.b.(4). Please see the response to Comment E3c-2 for further discussion of these options.	

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E3c-2	PROVISION E.3.c: Priority Development Project Structural BMP Performance Requirements	
	COMMENT: *Request for requirements that allow development of watershed-specific structural BMP performance standards in Water Quality Improvement Plans.* The Orange County and San Diego County Copermittees assert that the Tentative Order requires a "one-size-fits-all" approach and request that the Tentative Order allows for watershed-specific performance requirements for structural BMPs. Members of the Building Industry, the City of Imperial Beach, Engineering/Design Consultants, Societies/Associations/Coalitions, and Other Entities requested or expressed support for a similar concept. The Environmental Groups support including alternative compliance options that provide "off-ramps" for the baseline "one size fits all" structural BMP performance requirements.	**Building Industry / Industry** American Society of Landscape Architects **Copermittees** City of Imperial Beach Orange County Copermittees San Diego County Copermittees **Environmental Organizations** Environmental Groups **Engineering/Design Consultants** Latitude 33 Planning and Engineering Project Design Consultants **Societies/Associations/Coalitions** BIOCOM **Other Entities** Carol Crossman Gable PR Hughes Marino Marston+Marston Nuffer, Smith, and Tucker San Diego Regional Chamber of Commerce Sheppard, Mullin, Richter & Hampton LLP Southern Cross Property Consultants Transition IT
	RESPONSE: The San Diego Water Board disagrees that the Tentative Order requires a "one-size-fits-all" approach for the implementation of structural BMPs. For the Priority Development Project structural BMP performance requirements, site specific conditions must be taken into account upon selecting appropriate BMPs. Provision E.3.c.(1)(a), which describes requirements for storm water pollutant control, the Tentative Order states that: *"Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapostranspire) onsite the volume of storm water runoff produced from a 24-hour 85th percentile storm event (design capture volume)."* While each Priority Development Project must retain the volume of storm water runoff produced from the 24-hour 85th percentile storm, the actual volume retained will vary based on site specific factors, namely soil type and associated infiltration rates. The requirement to retain the volume of water associated with this size storm is appropriate for the reasons stated in the response to comment E3c1-1.	

E3c-2	PROVISION E.3.c: Priority Development Project Structural BMP Performance Requirements	
	Similarly, Provision E.3.c.(2)(a), which describes requirements for hydromodification management, states that: "*Post-project runoff flow rates and durations must not exceed pre-development runoff flow rates and durations by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat conditions downstream of Priority Development Projects).*" This requirement involves implementing BMPs for "the range of flows that result in increased potential for erosion,…" which is necessarily a site-specific requirement. The range of flows that cause downstream erosion from one Priority Development Project may be different than the range of flows that cause erosion from another Priority Development Project located in a different area in the watershed. Therefore, very different BMPs might be required from the two sites. The San Diego Water Board agrees that greater improvements to water quality in the watersheds may be realized if Priority Development Projects were allowed to implement some requirements offsite, as opposed to strictly onsite. For this reason, the Tentative Order allows for "alternative compliance" in instances where the Copermittee determines that offsite measures will have a greater overall water quality benefit for the Watershed Management Area than if the Priority Development Project were to implement structural BMPs onsite. Consequently, watershed-specific structural BMP requirements are present in the Tentative Order in the form of allowable compliance offsite. The "alternative compliance program" has been substantially re-written for simplicity, and also to better align this program with the planning efforts of the Copermittees in the Water Quality Improvement Plans. The alternative compliance program, which is described in Provision E.3.c.(3), is an option for Priority Development Projects where the Copermittee has participated in the development of a Watershed Management Area Analysis as part of the Water Quality Improvement Plan (described in Provision B.3.b.(4)). Such an approach is consistent with the latest findings in hydromodification management by the scientific community. In the Southern California Coastal Water Research Project (SCCWRP) Technical Report No. 667, authors state: "*An effective [hydromodification] management program will likely include combinations of on-site measures (e.g., low-impact development techniques, flow-control basins), in-stream measures (e.g., stream habitat restoration), floodplain and riparian zone actions, and off-site measures. Off-site measures may include compensatory mitigation measures at upstream locations that are designed to help restore and manage flow and sediment yield in the watershed.*" Consistent with the ideas brought forth by the SCCWRP report, in the Watershed Management Area Analysis of Provision B.3.b.(4), which is optional, the Copermittees will develop watershed maps that include as much detail	

E3c-2	PROVISION E.3.c: Priority Development Project Structural BMP Performance Requirements	
	about factors that affect the hydrology of the watersheds as is available. Such factors included identification of areas suitable for infiltration, coarse sediment supply areas, and locating stream channel structures and constrictions. Once these factors are mapped and studied, the Copermittees can identify areas in the watersheds where "candidate projects" may be implemented that are expected to improve water quality in the watershed by providing more opportunity for infiltration, slowing down storm water flows, or attenuation of pollutants naturally via healthy stream habitat. These projects may be in the form of retrofitting existing development, rehabilitating degraded stream segments, identifying regional BMPs, purchasing land to preserve valuable floodplain functions, and any other projects that the Copermittees identify. Under the alternative compliance program, Priority Development Projects may be allowed to fund, partially fund, or implement a candidate project, in lieu of implementing structural BMPs onsite, if they enter into a voluntary agreement with the Copermittee permitting this arrangement. If compliance involves funding or implementing a project that is outside the jurisdiction of the Copermittee, then that Copermittee may enter into an inter-agency agreement with the appropriate jurisdiction(s). In response to several comments, the Tentative Order has been revised to include an exemption from hydromodification management BMP requirements for Priority Development Projects that discharge to conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean. Provision B.2.b.(4) provides an optional Watershed Management Area Analysis that may allow the Copermittees to identify additional areas within the watershed where it is appropriate to exempt Priority Development Projects from implementing hydromodification management BMPs. Exemptions other than the ones specified in the Tentative Order, then, would be applicable on a watershed basis, and would require supporting rationale. In summary, the Tentative Order includes requirements for site-specific structural BMP requirements and exemptions. In order for them to be realized, the Copermittees must perform up-front analysis to support both the alternative compliance program and watershed-specific hydromodification management BMP exemptions. The San Diego Water Board believes that this approach will allow for meaningful improvement to water quality in the watersheds, as well as the efficient use of resources for innovative projects, as opposed to requiring structural BMPs to be fully implemented on all sites.	

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E3c-3	PROVISION E.3.c: Priority Development Project Structural BMP Performance Requirements	
	COMMENT: *Request for modifications to Priority Development Project structural BMP infiltration and groundwater protection pre-treatment requirements.* The San Diego County Copermittees and the City of National City commented that pre-treatment for infiltration BMPs on areas of industrial or light industrial activity should only be required if significant pollutant levels are present or if source control BMPs will not provide pre-treatment. Contech Engineer Solutions expressed concern that without clear and specific pre-treatment standards for infiltration BMPs, the Copermittees will accept pre-treatment systems that will require significant maintenance to ensure proper operation. Contech Engineer Solutions recommended very specific design standards for pre-treatment systems.	**Copermittees** City of National City San Diego County Copermittees **Engineering/Design Consultants** Contech Engineered Solutions
	RESPONSE: The San Diego Water Board agrees with the Copermittees comments. The San Diego Water Board conceptually agrees with Contech Engineered Solutions, but disagrees that including such specific design standards are necessary. The San Diego Water Board has revised Provision E.3.c.(5)(a)(vi) to allow infiltration BMPs on industrial or light industrial areas if source control BMPs will not expose groundwater to activities that are a high threat. The San Diego Water Board did not revise Provision E.3.c.(5)(a)(i). The Copermittees are required to inspect BMPs at Priority Development Projects to confirm they continue to operate as designed. If structural BMPs on Priority Development Projects are not properly maintained, the Copermittees must enforce its ordinances to achieve compliance with its ordinances and the requirements of the Tentative Order.	

E3c-4: *General concerns associated with development planning structural BMP performance requirements.*

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E3c-4	PROVISION E.3.c: Priority Development Project Structural BMP Performance Requirements	
	COMMENT: *General concerns associated with the development planning structural BMP performance requirements.* Comments from members of the Building Industry, Community Planning Groups, the Copermittees, Environmental Organizations, State Government, Societies/Associations/Coalitions, and Other Entities expressed various concerns about the development planning structural BMP performance requirements for Priority Development Projects. Several commenters expressed concerns with the potential costs associated with enforcing and implementing the changing requirements for development projects, or the uncertainty of the impacts of those new requirements. The South Laguna Civic Association expressed concern that the current development planning requirements are already resulting in the degradation and destruction of creeks, wetlands, and coastal habitats. David Akers, P.E., expressed concern with current practices and supports requirements that will result in sustainable development. The City of Chula Vista questioned what should be done water collected in rain barrels and other retention facilities if there is a lack of demand during the rainy season.	**Building Industry / Industry** Associated General Contractors of America **Community Planning Groups** Julian Community Planning Group Ramona Community Planning Group **Copermittees** City of Chula Vista County of San Diego Orange County Copermittees **Environmental Organizations** Clean Water Now South Laguna Civic Association **Engineering/Design Consultants** David J. Akers, P.E. **State/Federal Government** Senator Mark Wyland **Societies/Associations/Coalitions** San Diego Association of Realtors South County Economic Development Council **Other Entities** Carol Crossman Continental Maritime of San Diego Nuffer, Smith, and Tucker Sheppard, Mullin, Richter & Hampton LLP Southern Cross Property Consultants
	RESPONSE: The San Diego Water Board understands the concerns that have been expressed by the commenters. Most of the requirements in the Tentative Order are not new to the San Diego Region. The Tentative Order incorporates many existing requirements from the MS4 permits in Orange and Riverside Counties. However, the Tentative Order also provides the Copermittees with more flexibility to use their limited resources in the most effective and efficient manner to protect the quality of the San Diego Region's receiving waters. The commenters generally are concerned with the costs of implementing the development planning structural BMP performance requirements, but do not consider the costs of not addressing impacts that have been caused by existing development, and may be caused by future development. The San Diego Water Board has significantly modified the structure and focus of the requirements in the Tentative Order to allow the	

E3c-4	PROVISION E.3.c: Priority Development Project Structural BMP Performance Requirements	
	Copermittees to more efficiently and cost effectively utilize their resources, which is expected to result in the realization of significant cost savings that could not be realized in the existing MS4 permits. The development planning structural BMP performance requirements have also evolved significantly since 2001 because of the degradation and destruction of creeks, wetlands, and coastal habitats that have been observed as developed areas have expanded. Thus, the Tentative Order not only includes development planning requirements to protect against impacts to receiving waters that may be caused by future development, but also includes requirements that begin to address impacts that are being caused by existing development. The Tentative Order will allow the Copermittees to address existing development and new develop with a watershed-scale approach that is expected to lead to more sustainable configurations of the watersheds in the San Diego Region over the long term. The question posed regarding the use of retained storm water if there is a lack of demand is not new. The municipalities and several agencies in the San Diego Region have also posed questions about what can be done to address the sustainable water supply concerns that are being expressed as the population grows and demand for water increases. There may be ways to potentially link the two issues to create solutions to address the problems. The Tentative Order was developed to provide the flexibility that will allow the Copermittees to work with other agencies to perhaps identify solutions with mutual benefits.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

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E3c1-1	PROVISION E.3.c.(1): Storm Water Pollutant Control BMP Requirements	
	COMMENT: *Objections with storm water pollutant control retention BMP performance requirements for Priority Development Projects.* The San Diego County, Orange County, and Riverside County Copermittees and Engineering/Design Consultants contend that the storm water pollutant control retention requirement is infeasible for many Priority Development Projects due to poor soil types and other factors. The Industrial Environmental Association asserts that the Tentative Order does not provide sufficient detail for consistency among Copermittees in evaluating conditions for technical infeasibility. The Copermittees have requested that the term "runoff" be included in the description of "design capture volume." Other commenters stated that the retention standard will result in runoff "starved" receiving waters. Commenters also stated that the requirement to increase bioretention by 25 percent is arbitrary and without basis. Conversely, Natural Resources Defense Council argues that retention of the 85th percentile storm event is an appropriate performance standard and should be required at all sites, regardless of the specific site conditions. David Aker, P.E., also supports the requirement to retain storm water and contends that it is essential for sustainable development.	**Building Industry / Industry** BIA Regulated Community Coalition Building Industry Association of Southern California, Inc. Industrial Environmental Association Otay Land Company Otay Ranch New Homes San Diego Green Building Council **Copermittees** City of Chula Vista City of Vista County of San Diego Orange County Copermittees Riverside County Copermittees San Diego County Copermittees San Diego Unified Port District **Environmental Organizations** Natural Resources Defense Council **Engineering/Design Consultants** Contech Engineered Solutions David J. Akers, P.E. **State/Federal Government** USEPA
	RESPONSE: The San Diego Water Board disagrees with the Copermittees that the retention standard, as written in the Tentative Order, is inappropriate. The San Diego Water Board has recognized that the retention of the 85th percentile storm event is MEP, and already incorporated the performance standard in both the Orange County and Riverside County MS4 permits. Other MS4 permits in southern California (e.g., Ventura County, Los Angeles County) incorporate similar performance standards, and it is supported by USEPA. Commenters should note that under the Alternative Compliance Program described in Provision E.3.c.(3), Priority Development Projects will have the option to perform mitigation offsite "*if the Copermittee determines that the offsite project will have a greater overall water quality benefit for the Watershed Management Area than implementing BMPs onsite*." Theoretically, a Priority Development Project could make the case that retention of the design capture storm is not feasible, or that doing so would result in an unnatural water balance, therefore	

E3c1-1	PROVISION E.3.c.(1): Storm Water Pollutant Control BMP Requirements	
	offsite compliance is preferred. This option is only available to the Priority Development Project if the Copermittee elects to offer it. The San Diego Water Board disagrees that the Tentative Order should provide detail on what constitutes infeasibility because the Copermittees have the experience to make these determinations, and are free to develop consistency standards if the need arises. Language regarding the application of a site specific retention standard was removed because several commenters argued, and the San Diego Water Board agreed, that the analyses could be subjective and introduce uncertainty for the Copermittees in terms of determining compliance. Moreover, comparing the volume of runoff produced from an undeveloped site to that of a Priority Development Project would not be comparing equivalent pollutant levels, because the pollutants expected to be generated from a Priority Development Project would not have been present in runoff from undeveloped land. For simplicity, the language pertaining to site specific retention standards was removed. The word “runoff” was added to the description of “design capture volume” per the Copermittees’ requests. Similarly, the language pertaining to biofiltration LID BMPs was removed because the Alternative Compliance Program was restructured to better coincide with the Copermittee’s planning efforts in the Water Quality Improvement Plan.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

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E3c2-1	PROVISION E.3.c.(2): Hydromodification Management BMP Requirements	
	COMMENT: *Allow San Diego Copermittees to continue implementation of current San Diego Hydromodification Management Plan, as approved under Resolution No. R9-2010-0066.* The San Diego County Copermittees and several other commenters have requested that the *Hydromodification Management Plan for San Diego County* (HMP), which was approved by the San Diego Water Board in 2010 under Resolution No. R9-2010-0066, be memorialized in the Tentative Order as the standard for hydromodification management.	**Building Industry / Industry** Building Industry Association of Southern California, Inc. Otay Land Company Otay Ranch New Homes **Community Planning Groups** Jamul Dulzura Community Planning Group Pala Pauma Valley Community Sponsor Group **Copermittees** City of Chula Vista City of Del Mar City of Poway City of San Diego County of San Diego County of San Diego Office of County Counsel San Diego County Copermittees **Societies/Associations/Coalitions** East Otay Mesa Property Owners Association Otay Mesa Property Owners Association **Other Entities** National Enterprises Inc.
	RESPONSE: The San Diego Water Board disagrees with commenters that it is appropriate to reference the San Diego County HMP in the Tentative Order. The San Diego HMP does not include standards that are currently included in the Fourth Term MS4 permits for Orange and Riverside Counties. However, commenters should note that the requirements in the Tentative Order allow the San Diego Copermittees to use the information and analysis that was used to develop the San Diego HMP. In addition, the San Diego HMP will remain in effect until the Water Quality Improvement Plans are accepted by the San Diego Water Board. The San Diego Water Board is aware that the San Diego County Copermittees spent over $1 million to develop the HMP. This investment is not lost because the Tentative Order allows the Copermittees to build upon the	

E3c2-1	PROVISION E.3.c.(2): Hydromodification Management BMP Requirements	
	findings in the HMP; thus, the information developed is not irrelevant. For example, the San Diego HMP used an analysis to determine the range of flows for which Priority Development Projects must implement hydromodification management BMPs. This analysis includes evaluation of site specific conditions, including the level of susceptibility of the downstream receiving water to erosion. Further, the analysis includes a mechanism for Priority Development Projects to determine appropriately sized BMPs, depending on the condition of the downstream receiving water. This analysis is the crux of the San Diego HMP, and the Tentative Order allows its continued use. There are two important changes in the Tentative Order from Order No. R9-2007-0001 that the San Diego County HMP must make adjustments for. Firstly, the Tentative Order includes a requirement that Priority Development Projects use the "predevelopment" condition for evaluating the baseline hydrology for a specific site. The San Diego HMP, as written, can still be used because this requirement only affects the input variables used in the analysis. The San Diego Water Board is requiring the use of the pre-development condition for the reasons discussed in the Response to Comment E3c2-2. Secondly, in response to several comments, the Tentative Order has been revised to include an exemption from hydromodification management requirements for Priority Development Projects that discharge to conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean. Additional exemptions may be allowed on a watershed-basis only if the Copermittees perform a watershed-specific analysis, as part of the Water Quality Improvement Plan that justifies inclusion of exemptions. Much of this work has already been done by the San Diego County Copermittees in the HMP, as the HMP contains many exemptions above and beyond those described in Order No. R9-2007-0001. Again, the investment made in the HMP is not lost; the Copermittees must develop the Watershed Management Area Analysis described in Provision B.3.b.(4) of the Tentative Order and include the exemptions and rationale therein. Finally, the San Diego County Copermittees were notified before completion of the HMP that requirements pertaining to hydromodification management would likely change. As part of the development of the HMP, the Copermittees submitted a first draft on May 1, 2009. In a comment letter dated June 29, 2009, the San Diego Water Board stated that: "*Although the Permit (R9-2007-0001) does not specifically interpret "pre-project" conditions to reference pre-development (naturally occurring) conditions, the Copermittees are not restricted from implementing this more conservative standard. Tentative Order No. R9-2009-0002 (the draft Orange County Municipal Permit) dated June 18, 2009 contains this more restrictive language. The San Diego*	

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E3c2-1	PROVISION E.3.c.(2): Hydromodification Management BMP Requirements	
	Copermittees should be aware that the next iteration of the Permit may contain similar language. Additionally, the exceptions for hydromodification management measures included in the Permit (provision D.1.g.(3) for discharges into hardened channels will also likely be eliminated." Although this quote referred to text in the draft Orange County MS4 Permit, the requirements for using the pre-development baseline hydrology for hydromodification management were eventually included in the final versions of the MS4 permits for both Orange and Riverside Counties. Therefore the San Diego County Copermittees were well aware of the evolving requirements before their HMP was finalized.	

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E3c2-2	PROVISION E.3.c.(2): Hydromodification Management BMP Requirements	
	COMMENT: *Objections with requiring pre-development versus pre-project hydrology for hydromodification management BMP performance standards.* Comments submitted by Copermittees, Building Industry, Community Planning Groups, Engineering/Design Consultants, Societies/Associations/Coalitions, and Other Entities objected to the use of pre-development hydrology as a baseline for hydrograph matching (and therefore, BMP design) in the case of redevelopment projects, and that the pre-project design standard is the appropriate standard. Commenters argue that including the pre-development standard would be tantamount to requiring a Priority Development Project to mitigate beyond its impacts.	**Building Industry / Industry** San Diego Green Building Council **Community Planning Groups** Julian Community Planning Group Pala Pauma Valley Community Sponsor Group **Copermittees** City of National City City of Poway City of San Diego City of San Diego City Attorney County of San Diego County of San Diego Office of County Counsel Orange County Copermittees Riverside County Copermittees San Diego County Copermittees San Diego Unified Port District **Engineering/Design Consultants** Project Design Consultants **Societies/Associations/Coalitions** East Otay Mesa Property Owners Association Otay Mesa Property Owners Association **Other Entities** National Enterprises Inc.
	RESPONSE: The San Diego Water Board disagrees with the commenters that pre-project hydrology should be used as the baseline hydrology for redevelopment projects. The "pre-development" language in the Tentative Order has not been removed, but the qualifier "naturally occurring" has been removed from the text because some commenters stated that it caused confusion rather than providing clarity. The definition for "pre-development runoff condition" has been revised in Attachment C and discussion pertaining to this definition and how the San Diego Water Board expects Copermittees to interpret this phrase has been added to the Fact Sheet. Fundamentally, the San Diego Water Board believes that using a hydrology baseline that approximates that of an undeveloped, natural watershed is the only way to facilitate the return of more natural hydrological conditions	

E3c2-2	PROVISION E.3.c.(2): Hydromodification Management BMP Requirements	
	to already built-out watersheds. Using the pre-project hydrology as a baseline for redevelopment projects results in propagating the unnatural hydrology of urbanized areas, which is largely made up of impervious surfaces. Flows from impervious surfaces are highly erosive and consequently have detrimental effects on receiving waters in the San Diego Region. Furthermore, propagating the urbanized flow regime does not support conditions for restoring degraded or channelized stream segments, and would forever sentence such streams to the degraded state. Rehabilitating or restoring degraded stream segments is a critical component of the Tentative Order and is expected to be incorporated into Copermittee's strategies for improving water quality in the watersheds. Finally, the predevelopment standard is not requiring Priority Development Projects to mitigate beyond its impacts because the project would be perpetuating impacts that originated upon initial land alteration (i.e., the project would continue to cause accelerated erosion). Commenters have stated that it is impracticable to require hydromodification management BMPs to mimic the "pre-Columbian" hydrology because it would be impossible to know the historical conditions with any certainty. However, estimating the conditions of historical conditions is not the intent of this requirement. Rather, using the characteristics of a more natural hydrological condition than that of an urbanized setting is the intent. In terms of using a pre-development condition for the baseline hydrology, a Priority Development Project has a number of options for estimating this condition when it is not known. For example, a Priority Development Project may consult soil maps, such as those published by the National Resources Conservation Service (NRCS). These readily available maps show the soil types in a given area, regardless of whether or not the land has been developed. This information, along with information regarding existing grade, constitute sufficient data needed to approximate the pre-development condition and intent of the Tentative Order. Another option is for Priority Development Projects to use characteristics of a nearby open space area as an equivalent baseline. Or, a Priority Development Project may be able to research the geotechnical report associated with a structure upon its development. In any case, the San Diego Water Board asserts that the pre-development hydrology of the area in question can be roughly estimated. However, using the hydrology of a more natural condition, even if not precisely known, will provide significant benefit to receiving waters over using the hydrology associated with pervious (developed) surfaces. Therefore in order to support the basic objectives of the Clean Water Act, which are to *restore* and maintain the chemical, *physical*, and biological integrity of the nation's waters [emphasis added], the most appropriate standard to use for hydromodification management is the standard associated with the pre-development runoff condition.	

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E3c2-3	PROVISION E.3.c.(2): Hydromodification Management BMP Requirements	
	COMMENT: *Include exemptions from the implementation of hydromodification management BMPs where there is no threat of erosion to downstream receiving waters or there are special circumstances.* The Copermittees, Building Industry, Engineering/Design Consultants, and others have commented that the Tentative Order should restore exemptions for the implementation of hydromodification management BMPs where there is no threat of erosion to downstream receiving waters, such as concrete-lined or otherwise hardened channels. Commenters also argue that exemptions should be allowed for emergency projects or flood control projects.	**Building Industry / Industry** BIA Regulated Community Coalition Building Industry Association of Southern California **Copermittees** City of Chula Vista City of Dana Point City of Del Mar City of Imperial Beach City of Laguna Hills City of Lake Forest City of Mission Viejo City of Rancho Santa Margarita City of San Juan Capistrano Orange County Copermittees Riverside County Copermittees San Diego County Copermittees San Diego Unified Port District **Engineering/Design Consultants** Contech Engineered Solutions Project Design Consultants **Societies/Associations/Coalitions** East Otay Mesa Property Owners Association Otay Mesa Property Owners Association South County Economic Development Council **Other Entities** National Enterprises Inc.
	RESPONSE: The San Diego Water Board disagrees conceptually that blanket exemptions from hydromodification management BMP requirements should be granted to all redevelopment projects that discharge to hardened channels. Although the San Diego Water Board has not been advocating for the implementation of expensive BMPs to protect stream reaches that are not susceptible to erosion, the idea was to use the resources obtained from these low-threat Priority Development Projects on separate projects located elsewhere in the watershed, where protection from hydromodification is critical. In the most recent findings regarding hydromodification management, found in Southern California Coastal Water Research Project (SCCWRP) Technical Report No. 667, authors state: "*The exemption of many small projects from hydromodification controls can result in cumulative impacts to downstream waterbodies…*"	

E3c2-3	PROVISION E.3.c.(2): Hydromodification Management BMP Requirements	
	SCCWRP Technical Report No. 667 further states that: "*An effective management program will likely include combinations of on-site measures (e.g., low-impact development techniques, flow-control basins), in-stream measures (e.g., stream habitat restoration), floodplain and riparian zone actions, and off-site measures. Off-site measures may include compensatory mitigation measures at upstream locations that are designed to help restore and manage flow and sediment yield in the watershed* [Emphasis added]." The Tentative Order released on October 31, 2012 was written to incorporate these important watershed-based concepts. Nevertheless, several commenters voiced concern over the elimination of exemptions to hardened channels and other non-susceptible receiving waters. After careful consideration, the San Diego Water Board revised the Tentative Order to accommodate the re-introduction of exemptions. Provision E.3.c.(2) has been revised to include an exemption from hydromodification management requirements for Priority Development Projects that discharge to conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean. Additional exemptions may be allowed; however, they would occur on a watershed-specific basis, and must be defined and defended by the Copermittees. Under the newly created Provision B.3.b.(4), the Copermittees have been provided the option to perform a Watershed Management Area Analysis for the purpose of 1) characterizing the watersheds, 2) identifying alternative compliance projects that Priority Development Projects may use in lieu of implementing structural BMPs onsite, and 3) identifying areas within the watershed where it is appropriate to exempt Priority Development Projects from implementing hydromodification management BMPs. Exemptions, then, would be applicable on a watershed-specific basis, and would require supporting rationale. One reason why the San Diego Water Board has reservations regarding the idea of blanket exemptions is that allowing them without some sort of analysis is short-sighted. SCCWRP Technical Report 667 discusses the importance of watershed-based planning. The report states: "*There is usually also an exemption for projects discharging to hardened channels or waterbodies; however these exemptions may not be supportive of future stream restoration possibilities…*" Although the San Diego Water Board understands that hardened channels may sometimes provide essential flood control, there are situations where stream rehabilitation can take place, and concrete segments can be removed. For this reason, if the Copermittees choose to perform the Watershed Management Area Analysis,	

E3c2-3	PROVISION E.3.c.(2): Hydromodification Management BMP Requirements	
	they may be able to differentiate between hardened stream segments where the concrete will likely never be removed, and other stream segments where there is a possibility for future rehabilitation. Nevertheless, an exemption for concrete-lined channels has been added to the Tentative Order. Finally, the Copermittees commented that there should be exemptions allowed for emergency projects or flood control projects. The San Diego Water Board disagrees with the Copermittees in either case. Provision E.3 describes requirements that pertain to development planning. Emergency situations, by definition, are not planning exercises and therefore do not involve the design, approval, and construction of a building or structure. The San Diego Water Board believes that it may be appropriate to relax the structural BMP standards for, or altogether exempt flood control projects, but not before projects are evaluated on a case-by-case basis. In many instances, environmentally friendly practices may be appropriate for implementation in flood control projects, but a variety of options would not be evaluated by the project proponent if the Tentative Order allowed a blanket exemption.	

E3c2-4: *Objections with requirements to compensate for sediment supply.*

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E3c2-4	PROVISION E.3.c.(2): Hydromodification Management BMP Requirements	
	COMMENT: *Objections with requirements to compensate for sediment supply*. The Copermittees, Building Industry, and Engineering/Design Consultants have commented that management of sediment supply is a complicated and challenging issue, and more direction regarding the Tentative Order's intent should be provided. Commenters have also stated that it is inappropriate to require analysis of sediment supply on a site-by-site basis, and that it is better addressed at the regional level.	**Building Industry / Industry** BIA Regulated Community Coalition **Copermittees** City of Chula Vista County of San Diego San Diego County Copermittees **Engineering/Design Consultants** Contech Engineered Solutions Project Design Consultants
	RESPONSE: The San Diego Water Board agrees with the commenters that addressing the sediment supply issue when a Priority Development Project is under review is complicated and challenging. The intent of the Tentative Order is to protect the coarse sediment supply and ensure that Priority Development Projects will not impact the supply. Therefore, language pertaining to "compensating for" sediment supply has been removed. Instead, where a Copermittee is aware of areas where coarse sediment is naturally discharged to downstream receiving waters, then the San Diego Water Board expects the Copermittee to ensure the protection of this natural process by conditioning the Priority Development Project to either avoid the area, or implement measures that would allow the natural hydrologic process to continue. Please see Provision E.3.c.(2)(b) in the revised Tentative Order for the revisions.	

E3c2-5: *Monitoring and assessment program requirements will not provide information necessary to re-define the range of flows causing erosion.*

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E3c2-5	PROVISION E.3.c.(2): Hydromodification Management BMP Requirements	
	COMMENT: *Monitoring and assessment program requirements will not provide information necessary to re-define the range of flows causing erosion.* The City of Chula Vista commented that water quality monitoring as described in Provision D of the Tentative Order will not provide the necessary information to re-define the range of flows thought to cause erosion to receiving waters.	**Copermittees** City of Chula Vista
	RESPONSE: The San Diego Water Board disagrees that the monitoring and assessment program requirements cannot provide information necessary to re-evaluate or re-define the range of flows causing erosion. The water quality monitoring described in Provision D.1.a.(2) represents the minimum level of monitoring needed to comply with the Tentative Order. If the Copermittees elect to re-evaluate the range of flows that are thought to cause erosion to downstream receiving waters, as defined in the San Diego County HMP, then they may design a monitoring program that will provide the necessary information to do so.	

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E3c2-6	PROVISION E.3.c.(2): Hydromodification Management BMP Requirements	
	COMMENT: *The low-flow thresholds included in the San Diego County HMP need to be revised.* Project Design Consultants submitted comments suggesting that the schedule for development of the San Diego County HMP was extremely rushed, and technical expertise was ignored. The HMP should be revised and included in the Tentative Order.	**Engineering/Design Consultants** Project Design Consultants
	RESPONSE: The San Diego Water Board does not object to revising the low-flow thresholds included in the San Diego County HMP, provided that revisions are based on data acquired by the Copermittees. However, the process for updating this design standard in the HMP will occur on an ad-hoc basis and need not be referenced in the Tentative Order.	

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E3c2-7	PROVISION E.3.c.(2): Hydromodification Management BMP Requirements	
	COMMENT: *The hydromodification management BMP performance standards should allow the use of the erosion potential (Ep) method and in-stream metrics for compliance.* The Building Industry Association of Southern California requests that the performance standards for hydromodification management allow the use of the Ep method. Requiring project-by-project flow duration control may not be as effective as a regionally-coordinated approach that combines upland control with in-stream remedies.	**Building Industry / Industry** Building Industry Association of Southern California
	RESPONSE: The San Diego Water Board considered the request and found that changes are not necessary. Although the language in Provision E.3.c.(2) does not specifically reference the concept of erosion potential, the Copermittees are not prohibited from using such an approach. Provision E.3.c.(2)(a) requires the Copermittees to require implementation of BMPs to ensure that post-project runoff flow rates and durations do not exceed pre-development runoff flow rates and durations by more than 10 percent (for the range of flows that are deemed to cause erosion). However, Provision E.3.c.(2)(c) allows a Priority Development Project to utilize the alternative compliance program in lieu of complying with the requirement to implement structural BMPs onsite. Priority Development Projects are allowed to comply with the hydromodification management requirements by funding, partially funding, or implementing an offsite project, such as stream rehabilitation (which can include stream stabilization). The San Diego Water Board agrees that a regionally-coordinated approach that includes in-stream remedies is more effective than requiring flow duration control BMPs on every Priority Development Project, and for this reason has written the Tentative Order to allow these metrics. However, ultimately, administration of the Alternative Compliance Program is at the discretion of the Copermittees. If the Copermittees find that administering the Alternative Compliance Program is too difficult, costly, or is not in a Copermittee's best interest, than they are not obligated to do so.	

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E3c2-8	PROVISION E.3.c.(2): Hydromodification Management BMP Requirements	
	COMMENT: *There is insufficient data to suggest a need to change the hydromodification management requirements.* The City of Mission Viejo, Orange County and San Diego County Copermittees have commented that there is no need to include new requirements for hydromodification management, as no new data has emerged suggesting a need for change and the Copermittees have only begun to implement their current HMPs.	**Copermittees** City of Mission Viejo Orange County Copermittees San Diego County Copermittees
	RESPONSE: The San Diego Water Board disagrees that there have been any fundamental changes to the hydromodification management requirements from those included in the Fourth Term storm water permits. The basic premise, which is requiring hydromodification management for erosive flows as defined by the Copermittees, has not changed. The San Diego County Copermittees spent considerable funds and effort to define the range of flows that cause erosive effects, and the Tentative Order does not trump those efforts. The San Diego Water Board disagrees with the notion that no new data has emerged regarding hydromodification management. Several commenters have referenced Southern California Coastal Water Research Project's latest findings in *Hydromodification Assessment and Management in California* (Technical Report 667). SCCWRP Technical Report 667 clearly states that: "*An effective management program will likely include combinations of on-site measures…in-stream measures…and offsite measures….*" Further, SCCWRP Technical Report 667 states that: "*The exemption of many small projects from hydromodification controls can result in cumulative impacts to downstream waterbodies.*" The requirements in the Tentative Order are consistent with the findings in this report and MS4 permits in Orange and Riverside Counties. The San Diego Water Board agrees with the underlying premise advocated in this report, which is that effective hydromodification programs begin with watershed-scale analysis and planning. Although the Copermittees have just recently begun implanting their HMPs, the changes needed to incorporate the requirements of the Tentative Order will not undermine the mechanics of the HMPs and therefore will not require substantial revisions. The incorporation of the pre-development baseline standards and inclusion of only qualified exemptions, resulting from thorough watershed analyses, is essential for protecting receiving streams from erosion caused by altered flow regimes.	

PROVISION E.3.c.(3): Alternative Compliance to Onsite Structural BMP Performance Requirements
E3c3-1: *Objections to the onsite LID biofiltration treatment control BMP performance standards.*

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E3c3-1	PROVISION E.3.c.(3): Alternative Compliance to Onsite Structural BMP Performance Requirements	
	COMMENT: *Objections to the onsite LID biofiltration treatment control BMP performance standards*. The San Diego County, Orange County, and Riverside County Copermittees and Engineering/Design Consultants have commented that there is no need to include a 1.5 times multiplier on biofiltration LID BMPs, and that doing so is technically unjustified.	**Building Industry / Industry** Building Industry Association of Southern California **Copermittees** City of Vista Orange County Copermittees Riverside County Copermittees **Engineering/Design Consultants** Contech Engineered Solutions Project Design Consultants
	RESPONSE: Provision E.3.c.(3) describing the Alternative Compliance Program has been substantially revised so that it coincides better with the watershed planning efforts of the Copermittees in the Water Quality Improvement Plans. As a result, the requirements related to LID biofiltration BMPs has been removed.	

E3c3-2: *Modify requirements to implement alternative compliance options.*

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E3c3-2	PROVISION E.3.c.(3): Alternative Compliance to Onsite Structural BMP Performance Requirements	
	COMMENT: *Modify requirements and process to implement alternative compliance options.* The San Diego County, Orange County, and Riverside County Copermittees, Engineering/Design Consultants, and Environmental Organizations have expressed concern with the process associated with the Alternative Compliance Program to Onsite Structural BMP Implementation. The Copermittees assert that this program should be administered by the San Diego Water Board, that more time than 4 years should be granted for alternative compliance project completion, and that the administrative costs would be prohibitive. The Environmental Organizations suggest that language be added to the Tentative Order to clearly indicate that the Copermittees are responsible for ensuring that alternative compliance projects are completed within the 4 year timeframe, and also expressed concerns as to whether the alternative compliance project would provide equal water quality benefits as implementing structural BMPs onsite. Engineering/Design Consultants submitted recommendations regarding how administration of the Alternative Compliance Program would work.	**Building Industry / Industry** American Society of Landscape Architects BIA Regulated Community Coalition Building Industry Association of Southern California San Diego Green Building Council **Copermittees** City of Imperial Beach County of San Diego Orange County Copermittees Riverside County Copermittees San Diego County Copermittees **Environmental Organizations** Environmental Groups Natural Resources Defense Council **Engineering/Design Consultants** Project Design Consultants
	RESPONSE: The San Diego Water Board disagrees with the Copermittees that the Alternative Compliance Program should be administered by the San Diego Water Board and not by the Copermittees. The Alternative Compliance Program is provided as an option to the Copermittees. The Copermittees are not required to implement the Alternative Compliance Program. If, however, the Copermittees do implement the Alternative Compliance Program, it is expected to coincide with the Copermittees' watershed planning efforts and assist the Copermittees in reaching their goals of reducing pollutants in storm water runoff leaving their MS4s. This is because the alternative compliance projects consist of projects such as retrofitting existing development, where pollutant treatment can be an added benefit where no treatment currently exists; or stream rehabilitation, where natural attenuation of pollutants can occur as an ancillary benefit to improved stream habitat. Other example projects are regional BMPs that receive runoff from multiple areas, or the preservation or purchase of critical floodplain land. The Tentative Order establishes requirements for the Copermittees and not the San Diego Water Board. Therefore, it would inappropriate for the San Diego Water Board administer this program, but could assist in its implementation by streamlining permits for stream rehabilitation and restoration... The San Diego Water Board understands that the initial costs for administering this program could be significant; however, there are fiscal benefits in that Priority Development Projects could provide the funding for projects that are expected to improve water quality, thereby negating the need for Copermittees to expend their resources on BMPs to accomplish the	

E3c3-2	PROVISION E.3.c.(3): Alternative Compliance to Onsite Structural BMP Performance Requirements	
	same thing. Finally, the Copermittees are not required to administer this program and can elect to administer BMPs strictly onsite. Provision E.3.c.(3) has been substantially revised for simplicity and to better coincide with the Copermittees' planning efforts, and all references to LEED certification have been removed. The San Diego Water Board further disagrees that more than 4 years should be granted for alternative compliance project completion. First of all, pollutants from the Priority Development Project are being discharged without treatment and there is not necessarily any equivalent treatment until the alternative compliance project is constructed (although temporal mitigation is required when there is a lag between the two projects). Second of all, the Tentative Order explicitly allows more time for projects where the Executive Officer approves additional time. The San Diego Water Board disagrees with the recommendation that the Tentative Order specify that the Copermittees are responsible for ensuring that the alternative compliance projects are completed within the 4 year time frame. The Tentative Order is issued to the San Diego County, Orange County, and Riverside County Copermittees; therefore all of these entities are responsible for complying with the requirements, and further discussion would be redundant. Finally, the San Diego Water Board agrees that the alternative compliance program presents some uncertainty regarding "greater water quality benefit" expected to come from these projects versus implementation of structural BMPs onsite. If the Copermittees elect to implement an Alternative Compliance Program, they are required to develop a list of potential candidate projects that can be implemented with the Watershed Management Area. The candidate projects will be included in the Water Quality Improvement Plans, which will be reviewed by the public and the San Diego Water Board before implementation takes place. The water quality benefits that can be achieved by implementing those candidate projects will likely be made evident during the public participation process in the development of the Water Quality Improvement Plans.	

E3c3-3: *Request for modifications to the alternative compliance water quality credit system option.*

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E3c3-3	PROVISION E.3.c.(3): Alternative Compliance to Onsite Structural BMP Performance Requirements	
	COMMENT: *Request for modifications to the alternative compliance water quality credit system option*. The Orange County Copermittees have requested that language pertaining to the water quality credit system be revised to remove the no-net impact limitations because certain projects may offer significant environmental benefits that are not necessarily related to water quality. The BIA Regulated Community Coalition recommended that any water quality credit system exercised by the Copermittees be included in the Water Quality Improvement Plans and be approved by the San Diego Water Board and not by its Executive Officer.	**Building Industry / Industry** BIA Regulated Community Coalition **Copermittees** Orange County Copermittees
	RESPONSE: The San Diego Water Board disagrees with the Orange County Copermittees that the no-net impact language should be removed from the Tentative Order. The optional credit system described in Provision E.3.c.(3)(d) is based on meeting the structural BMP performance standards as they pertain to protecting and improving water quality. A credit system that would allow other environmental benefits cannot necessarily ensure that water quality would be protected to the MEP standard, for which the performance standards are structured to achieve. The San Diego Water Board disagrees that a water quality credit system requires approval from San Diego Water Board instead of the Executive Officer because the provisions for such a credit system are clearly outlined in the Tentative Order. The Executive Officer will be able to determine whether or not the Copermittee has met the requirements as dictated in the Tentative Order. However, the public may request that any action taken by the Executive Officer be considered by the San Diego Water Board at any time.	

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E3c3-4	PROVISION E.3.c.(3): Alternative Compliance to Onsite Structural BMP Performance Requirements	
	COMMENT: *Define a list of preferred or "best-in-class" BMPs and include specific guidance regarding evaluation of treatment systems in the Tentative Order.* The San Diego Green Building Council commented that the Tentative Order should clearly define the best-in-class BMPs and require the creation of a system to catalogue the implementation strategies used by the various Copermittees, and that the database should include the measured water quality impacts from each site. Such information can be used as a resource for future projects and development. Contech Engineered Solutions recommended that the Tentative Order include specific guidance regarding evaluation of proprietary treatment systems, and that the Copermittees need to conduct a performance and feasibility assessment of such systems.	**Building Industry / Industry** San Diego Green Building Council **Engineering/Design Consultants** Contech Engineered Solutions
	RESPONSE: The San Diego Water Board disagrees with this comments because 1) the San Diego Water Board cannot dictate the manner of compliance with any requirements or regulation for any of the programs it administers, and 2) a "best-in-class" BMP cannot be concretely defined because the MEP standard is dynamic (see Appendix C for the definition of MEP). The Copermittees may choose to share information regarding BMP performance and evaluation of proprietary treatment systems via the Regional Clearinghouse or other mechanism. The Copermittees have the experience and expertise to define what are the appropriate BMPs.	

E3c3-5: *Mitigation should not be required if flow-thru biofiltration LID BMPs are used.*

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E3c3-5	PROVISION E.3.c.(3): Alternative Compliance to Onsite Structural BMP Performance Requirements	
	COMMENT: *Mitigation should not be required if flow-thru biofiltration LID BMPs are used.* The Building Industry Association of Southern California submitted comments stating that the Tentative Order should not require mitigation for the portion of the design storm volume that is not retained onsite if this volume is treated by biofiltration LID BMPs prior to discharge. This requirement penalizes and dis-incentivizes the use of these BMPs.	**Building Industry / Industry** Building Industry Association of Southern California
	RESPONSE: The San Diego Water Board has included the requirement that mitigation is necessary for the portion of the design storm volume that is not retained onsite because, although this remaining volume of storm water would be treated, the MEP standard as represented by the structural BMP performance requirements would not have been met. The requirement for mitigation is not limited to the use of biofiltration BMPs; mitigation is required no matter what type of flow-thru treatment BMP is utilized by the Priority Development Project. Therefore the San Diego Water Board disagrees that this requirement is penalizing the Priority Development Project for the use of biofiltration LID BMPs, as suggested by the commenter. Retention of the 85th percentile storm is clearly the MEP standard for storm water pollutant control, as represented by the Tentative Order and recently adopted MS4 permits in the San Diego Region, other areas of southern California, and elsewhere in the United States. Retention of anything less than the design storm volume must be mitigated because the MEP standard has not been met.	

PROVISION E.4: Construction Management
E4-1: *Requests for "clarifications" for construction management requirements.*

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E4-1	PROVISION E.4: Construction Management	
	COMMENT: *Requests for "clarifications" for construction management requirements.* The San Diego County and Riverside County Copermittees submitted requests for specific modifications to the language of Provision E.4 attempting to increase clarity to what is required of the Copermittees and what the Copermittees are to require of private party construction sites within their jurisdiction. The USEPA provided general comments on the need for the construction requirements to include enough specificity to determine compliance with the Tentative Order.	**Copermittees** Riverside County Copermittees San Diego County Copermittees **State and Federal Government** USEPA
	RESPONSE: The San Diego Water Board generally agreed with the specific language modifications requested by the Copermittees and in many instances adjusted the language of Provision E.4 as requested. Specific changes were made to Provision E.4 to: 1) Remove the requirement for the Copermittees to verify a project applicant has obtained coverage under permits, other than the State Water Board's General Construction Storm Water Permit, 2) Use the term 'pollution control plan' consistently; 3) Require the Copermittees to conduct inspections and require BMPs at inventoried construction sites (based on the priority set in Provision E.4.b.2) to 'confirm' rather than 'ensure' the controls at the site reduce the discharge of pollutants in storm water from the site to the MEP; and 4) Require the Copermittees to conduct inspections and require BMPs at inventoried construction sites (based on the priority set in Provision E.4.b.2) that effectively prohibits non-storm water discharges from the site from entering the MS4. Modifications were also made to the opening paragraph of Provision E.4 requiring each Copermittee to implement a construction management program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1). Additionally, the San Diego Water Board made adjustments to Provision E.4 requirements setting minimum inspection frequencies equivalent to the amount required to confirm compliance with the Clean Water Act. Provision E.4.d(1)(a) specifically requires the Copermittees to conduct inspections at all inventoried sites, including high threat to water quality sites, at an frequency appropriate to confirm the site reduces the discharge of pollutants in storm water from the construction site to the MEP, and effectively prohibits non-storm water	

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E4-1	PROVISION E.4: Construction Management	
	discharges from entering the MS4. The San Diego Water Board supports the adaptive management approach in the Tentative Order and has structured the construction inspections to focus on those sites that represent a high priority to maintaining or protecting downstream surface water quality.	

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E4-2	PROVISION E.4: Construction Management	
	COMMENT: *Requests for modifications to construction site inventory, tracking, recordkeeping requirements.* The Orange County, Riverside County and San Diego County Copermittees each submitted comments requesting changes to the construction management requirements that specific construction sites to be inventoried would include only those sites that involve any ground disturbance or soil disturbing activities, include a process for confirming adequate BMP implementation on inventoried sites, specify project 'completion' date not "anticipated completion" date; and 'weather condition during inspection' not 'approximate amount of rainfall since last inspection' on inspection forms, and require construction inventories to be updated quarterly not monthly. The Riverside County Copermittees provided recommended revisions to the construction requirements.	**Copermittees** Orange County Copermittees Riverside County Copermittees San Diego County Copermittees
	RESPONSE: The San Diego Water Board agreed with most of the changes requested by the commenters and modified Provision E.4 accordingly. However, the request to remove the requirement to include 'approximate amount of rainfall since last inspection' on the inspection forms, and the suggestion to include a process for confirming adequate construction BMP implementation for non-inventoried construction site were not incorporated into the revised Tentative Order. The San Diego Water Board is interested in site conditions after a significant rain event(s) therefore documenting the approximate amount of rainfall since the last inspection is required rather than the weather conditions during the inspection. A process for confirming adequate construction BMP implementation for non-inventoried sites can be developed and included in the jurisdictional program, but is not a requirement of the Tentative Order. The San Diego Water Board reviewed all of the recommended revisions provided by the Riverside County Copermittees. See Provision E.4 for those requested revisions that were incorporated into the Tentative Order.	

E4-3: *Request to only require verification of coverage under Construction General Permit, not "applicable permits."*

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E4-3	PROVISION E.4: Construction Management	
	COMMENT: *Request to only require verification of coverage under Construction General Permit, not "applicable permits."* The Copermittees commented that the requirement to verify permits other than the State Water Board's Construction General Permit is unnecessary because applicable permits are included as attachments to a construction projects SWPPP, and redundant with other environmental regulations.	**Copermittees** City of Chula Vista Orange County Copermittees Riverside County Copermittees San Diego County Copermittees
	RESPONSE: The San Diego Water Board agrees with the commenters. The San Diego Water Board modified the language in Provision E.4.a to require verification that the project applicant has obtained coverage under the Construction General Permit, only.	

PROVISION E.5: Existing Development Management
E5-1: *Concerns with inspections by volunteers.*

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E5-1	PROVISION E.5: Existing Development Management	
	COMMENT: *Concerns with inspections by volunteers.* The San Diego County Copermittees expressed concern with exposure to significant liability should a volunteer be injured in the course of an unauthorized inspection, or if private property is damaged during that inspection, or other unforeseen legal issues that result from volunteer groups conducting inspections of inventoried existing developments sites. Similar concerns were expressed by the Industrial Environmental Association and the San Diego Port Tenants Association.	**Building Industry / Industry** Industrial Environmental Association **Copermittees** San Diego County Copermittees **Societies/Associations/Coalitions** San Diego Port Tenants Association
	RESPONSE: The San Diego Water Board understands the position presented by the commenters and agrees that changes to the language in Provision E.5.c are necessary. Provision E.5.c was modified to restrict the use of Copermittee-trained volunteer monitoring or patrol programs to visual inspections of those inventoried facilities or areas that are publicly accessible. Additionally, the San Diego Water Board incorporated the Industrial Environmental Association's suggested change to the language of Provision E.5.c.(2). The ability of the Copermittee to use volunteer monitoring or patrol programs was included in the Tentative Order to give the Copermittees additional resources to accomplish the inspection requirements of Provision E.5.c. The Copermittees retain sole discretion on using volunteer monitoring or patrol programs to augment their inspection programs. The Copermittees also retain sole discretion to stipulate conditions (insurance, training, etc.) for which a volunteer monitoring or patrol program must comply in order assist them with inspections.	

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E5-2	PROVISION E.5: Existing Development Management	
	COMMENT: *Requests for modifications to existing development inventory and tracking requirements.* The San Diego County Copermittees and City of Santee each requested removal of 'mobile home parks' from the list of residential areas that should be included in its existing development inventory, citing the Mobile Home Park Act preempts a municipality's ability to regulate within the mobile home park. The Copermittees further requested modification to the language of Provision E.5.a to replace the phrase 'may discharge pollutants' with 'has the reasonable potential to discharge pollutants," claiming that the term 'may' is too broad and limits the Copermittees' ability to focus on those sites in their inventories identified as jurisdictional and watershed priorities. A specific comment was submitted by the City of Chula Vista asking that the Tentative Order allow use of more than one data management system to track the required information.	**Copermittees** City of Chula Vista City of Santee San Diego County Copermittees
	RESPONSE: The San Diego Water Board understands that a city does not have full access to regulate mobile home parks pursuant to the Mobile Home Park Act, but disagrees that the Copermittees do not have the legal authority to regulate discharges from and require BMPs at mobile home parks to their MS4s. The requirements of the Tentative Order are that each Copermittee maintain an inventory of its existing development that may discharge a pollutant load to and from the MS4. If a Copermittee has mobile home parks in its jurisdiction it must be included in its inventory so that the mobile home park gets considered in the Water Quality Improvement Plan priorities and strategies to address sources of pollutants. The comments included a description of what a city is allowed to regulate via its police powers, at mobile home parks. This list included access 'streets and roads' and parking. These are areas where potentially BMPs could be located if, through the Water Quality Improvement Plan process, it was determined that pollutants discharged from mobile home parks were a high priority water quality condition. Additionally, other scenarios could exist where discharges from mobile home parks are not considered a high priority, and inspections would occur much less often. Therefore, mobile home parks must remain within a Copermittee's existing development inventories, but can be dealt with according to the priorities, schedules and goals of the Water Quality Improvement Plan. Therefore, no change to the Tentative Order was made. The San Diego Water Board disagrees with the comment that the term 'may' should be replaced with 'reasonable potential.' The term 'may' is used to indicate possibility or probability that a pollutant load is discharged from an inventoried existing development facility or area. The term reasonable potential can imply the need to conduct a reasonable potential analysis, which is a far more involved process than a Copermittee making the determination that a facility possibly or probably discharges a pollutant load into its MS4. Nothing in	

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E5-2	PROVISION E.5: Existing Development Management	
	the Tentative Order prevents a Copermittee from conducting a more robust analysis of the potential for pollutant loads to be discharged from its inventoried existing facilities or areas. Therefore, no change to the Tentative Order was made. The use of a GIS database to track inventoried facilities is only “highly recommended” in the Tentative Order, it is not explicitly required. Therefore a Copermittee can use one or more than one data management system to track the required information.	

E5-3: *Requests for modifications to existing development BMP implementation and maintenance requirements.*

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E5-3	PROVISION E.5: Existing Development Management	
	COMMENT: *Requests for modifications to existing development BMP implementation and maintenance requirements.* The Riverside County and San Diego County Copermittees submitted comments requesting a modification to the language of Provision E.5.b to specify each Copermittee only be required to designate a minimum set of BMPs for all inventoried existing development with the reasonable potential to discharge pollutant loads to their MS4. Commenters further suggest clarifying language for the required use of pollutant prevention methods (i.e. designated BMPs) in Provision E.5.b. A specific comment was made by the City of Chula Vista to removed 'freeways' from list of existing facilities the Copermittees are required to properly operate and maintain BMPs. The City of Chula Vista notes that freeways are under the jurisdiction of Caltrans, not a city.	**Copermittees** City of Chula Vista Riverside County Copermittees San Diego County Copermittees
	RESPONSE: The San Diego Water Board disagrees with the commenters request to modify the language of Provision E.5.b to specify each Copermittee only be required to designate a minimum set of BMPs for all inventoried existing development with the reasonable potential to discharge pollutant loads to their MS4. Provision E.5.b states that each Copermittee must designate a minimum set of BMPs required for all inventoried existing development, including special event venues. Any existing development that gets inventoried has been identified as a facility that may generate pollutant loads to and from the MS4 under Provision E.5.a. Therefore, if a facility is on the inventory, a Copermittee has already made the determination that the existing development possibly or probably generates a pollutant load. Therefore, no change to the Tentative Order was made. The San Diego Water Board agrees with the requests to clarify the language in Provisions E.5.b.(1)(b) and (d) to specify when a Copermittee must require implementation of BMPs at inventoried existing development not owned by the Copermittee, and when a Copermittee must implement BMPs on their own municipal facilities. The San Diego Water Board also agrees with the City of Chula Vista's request to remove 'freeways' from the list of existing facilities the Copermittees are required to properly operate and maintain BMPs.	

E5-4: *Requests for modifications to existing development inspection requirements.*

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E5-4	PROVISION E.5: Existing Development Management	
	COMMENT: *Requests for modifications to existing development inspection requirements.* The County of San Diego commented on the need for an exemption from the minimum annual inspection requirement of 20 percent for inventoried linear municipal facilities. Riverside County Copermittees requested the requirement to inspect at least 20 percent of its existing development inventory be deleted. The Tentative Order requires each inventoried existing development be inspected once every five years. Both San Diego County and Riverside County Copermittees commented on this minimum. San Diego County Copermittees want it changed to once per permit term, conversely Riverside County Copermittees support existing language of once per five years. The USEPA does not support relaxation to inspection frequencies because it weakens enforceability and the ability to determine compliance. The San Diego County Copermittees requested clarifying language be added to what must be included in a visual inspection of existing development.	**Copermittees** County of San Diego Riverside County Copermittees San Diego County Copermittees **State and Federal Government** USEPA
	RESPONSE: The San Diego Water Board agrees with the County of San Diego's comment concerning the need for exempting linear municipal facilities from the existing development annual inspection requirements due to the number of inspections required if such facilities are considered when calculating 20 percent of the existing development inventory. To address their comments, the language in Provision E.5.c.(1)(a)(iv) includes a footnote, which excludes linear municipal facilities (i.e. MS4 linear channels, sanitary sewer collections systems, streets, roads, and highways). MS4 inlets and basins are not mentioned in this footnote and are still required to be considered when determining 20 percent of inventoried development for the purposes of annual inspections. The San Diego Water Board expects MS4 inlets and basins to be inspected in order to confirm that BMPs are being implemented and maintained to reduce the discharge of pollutants in storm water from the MS4 to the MEP. Comments provided by the USEPA support leaving MS4 inlets and basins in the existing development inventory to strengthen permit enforceability and compliance determinations. The San Diego Water Board kept the existing development minimum inspection requirement of once every five years. This requirement is consistent with comments received by USEPA to include minimum requirements to strengthen permit enforceability and compliance determinations.	

E5-5: *Requests to limit existing development requirements to existing development with "reasonable potential" to discharge pollutants.*

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E5-5	PROVISION E.5: Existing Development Management	
	COMMENT: *Requests to limit existing development requirements to existing development with "reasonable potential" to discharge pollutants.* The San Diego County Copermittees requested the existing development requirements be limited to those existing facilities and areas of development with "reasonable potential" to discharge pollutants.	**Copermittees** San Diego County Copermittees
	RESPONSE: The San Diego Water Board disagrees that replacing the term 'may' with the phrase 'reasonable potential' in Provisions E.5.a-c will give a Copermittee more flexibility to focus on jurisdictional and watershed priorities. The Water Quality Improvement Plan will establish the priority water quality conditions within a Watershed Management Area to which a Copermittee will customize its jurisdictional program (i.e. inspection location and frequencies, pollutant reduction efforts (BMP implementation), retrofit opportunities, etc.). The term 'may' is used to indicate possibility or probability that a pollutant load is discharged from an inventoried existing development facility or area. The term 'reasonable potential' can imply the need to conduct a reasonable potential analysis, which is a far more involved process than a Copermittee making the determination that a facility or developed area possibly or probably discharges a pollutant load into its MS4. Nothing in the Tentative Order prevents a Copermittee from conducting a more robust analysis of the potential for existing development to discharge pollutant loads to and from the MS4. Therefore, no change to the Tentative Order was made.	

E5-6: *Request to allow the Copermittees to reallocate resources required for monitoring for retrofit and/or rehabilitation projects.*

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E5-6	PROVISION E.5: Existing Development Management	
	COMMENT: *Request to allow the Copermittees to reallocate resources required for monitoring for retrofit and/or rehabilitation projects.* The San Diego County Copermittees requested an addition to the requirements of Provision E.5.e to allow the Copermittees to reallocate resources required for monitoring for retrofit and/or rehabilitation projects.	**Copermittees** Riverside County Copermittees San Diego County Copermittees
	RESPONSE: The San Diego Water Board disagrees with the request and no change to the Tentative Order was made. Temporarily suspending the monitoring requirements of Provision D to fund a retrofit and/or rehabilitation process is inappropriate. The monitoring requirements in Provision D are the minimum necessary for the Copermittees to demonstrate that the water quality improvement strategies being implemented as part of the Water Quality Improvement Plan are making progress toward achieving the numeric goals.	

PROVISION E.5.e.(2): Retrofitting Areas of Existing Development
E5e2-1: *Retrofit existing development to improve water quality.*

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E5e2-1	PROVISION E.5.e.(2): Retrofitting Areas of Existing Development	
	COMMENT: *Retrofit existing development to improve water quality.* The San Diego Green Building Council and South Laguna Civic Association support retrofitting areas of existing development as a means to achieve mandated water quality objectives.	**Building Industry / Industry** San Diego Green Building Council **Environmental Organizations** South Laguna Civic Association
	RESPONSE: The San Diego Water Board agrees with the commenters and has developed requirements to encourage retrofitting to achieve reductions in pollutants discharged from MS4s and improved water quality conditions in the receiving waters.	

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E5e2-2	PROVISION E.5.e.(2): Retrofitting Areas of Existing Development	
	COMMENT: *Requests to remove or modify retrofitting of existing development requirements.* The Riverside County Copermittees generally requested the removal of the retrofit and stream/channel/habitat rehabilitation project requirements. However, the Riverside County Copermittees also submitted requests for specific retrofit language changes.	**Copermittees** Riverside County Copermittees
	RESPONSE: The San Diego Water Board disagrees with the requests to remove or modify the retrofitting of existing development requirements. The San Diego Water Board reviewed the requested language changes and did not make any of the revisions recommended as they were not necessary or changed the intent of the requirement. The requirements in the Tentative Order do not require any Copermittee to implement or require the implementation of a retrofitting project. The Tentative Order requires each Copermittee to describe a program that identifies those areas (public, private, or both) as good candidates for retrofitting. In areas where retrofitting projects within certain areas of existing development cannot be implemented by the Copermittee because of ownership (i.e. private property) or permitting, the Copermittee must develop strategies to facilitate the implementation of retrofitting projects if and when the opportunities become available. The San Diego Water Board did not remove or modify the requirements of Provision E.5.e.(2), but the requirements are now under Provision E.5.e.(1) in the revised Tentative Order.	

PROVISION E.5.e.(3): Stream, Channel and/or Habitat Rehabilitation in Areas of Existing Development
E5e3-1: *Rehabilitate receiving waters to improve water quality.*

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E5e3-1	PROVISION E.5.e.(3): Stream, Channel and/or Habitat Rehabilitation in Areas of Existing Development	
	COMMENT: *Rehabilitate receiving waters to improve water quality.* The Laguna Bluebelt Coalition and South Laguna Civic Association expressed support for rehabilitating high value coastal receiving waters to improve water quality.	**Environmental Organizations** Laguna Bluebelt Coalition South Laguna Civic Association
	RESPONSE: The San Diego Water Board agrees with the commenters that rehabilitation of coastal wetlands and estuaries are important to the improvement of water quality within the San Diego Region.	

E5e3-2: *Create map to identify creeks and coastal receiving waters impacted by discharges from storm drains and candidate areas for restoration.*

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E5e3-2	PROVISION E.5.e.(3): Stream, Channel and/or Habitat Rehabilitation in Areas of Existing Development	
	COMMENT: *Create map to identify creeks and coastal receiving waters impacted by discharges from storm drains and candidate areas for restoration.* The Laguna Bluebelt Coalition and South Laguna Civic Association expressed support for the creation of maps to show water quality impacted areas of all creeks and coastal receiving waters within the region. The commenters also supported identifying degraded land elements, offending storm drain outlets and candidate areas for re-forestation and estuarine/coastal restoration.	**Environmental Organizations** Laguna Bluebelt Coalition South Laguna Civic Association
	RESPONSE: The San Diego Water Board agrees that maps identifying candidate areas for restoration would be useful. The Copermittees have been provided an opportunity to create maps to assist in their efforts to comply with the requirements of the Tentative Order. Specifically, the Copermittees will have the option to generate a map and list of candidate projects, including stream, channel and habitat rehabilitation projects, which could potentially be used as alternative compliance options for Priority Development Projects, to be implemented in lieu of onsite structural BMP performance requirements. The optional Watershed Management Area Analysis is provided in Provision B.3.b.(4).	

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E5e3-3	PROVISION E.5.e.(3): Stream, Channel and/or Habitat Rehabilitation in Areas of Existing Development	
	COMMENT: *Request for modifications to existing development stream, channel and/or habitat rehabilitation requirements.* The Orange County Copermittees requested a modification to the requirements of Provision E.5.e.(3) to allow a Copermittee to identify stream, channel, and/or habitat rehabilitation projects downstream of its jurisdiction. The Orange County Copermittees also requested the removal of Provision E.5.e.(3)(a) requiring each Copermittee to identify streams, channels, and/or habitats in areas of existing development as candidates for rehabilitation.	**Copermittees** Orange County Copermittees
	RESPONSE: The San Diego Water Board disagrees with the requests. The requirements of Provision E.5.e.(3) are to be implemented by each Copermittee within its jurisdiction. Allowing a Copermittee to identify stream, channel, and/or habitat rehabilitation projects downstream of its jurisdiction is not appropriate for this requirement. The Copermittee will, however, be able to identify stream, channel, and/or habitat rehabilitation projects downstream of its jurisdiction as potential alternative compliance options for Priority Development Projects if the Copermittees in the Watershed Management Area perform the optional Watershed Management Area Analysis and include it in the Water Quality Improvement Plan. The removal of Provision E.5.e.(3)(a) is not appropriate because without this requirement, the subsequent requirements could not be implemented by the Copermittee. The San Diego Water Board did not modify the requirements of Provision E.5.e.(3), but the requirements are now under Provision E.5.e.(2) in the revised Tentative Order.	

PROVISION E.6: Enforcement Response Plans
E6-1: *Specify criminal penalties are limited to intentional or criminally negligent acts.*

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E6-1	PROVISION E.6: Enforcement Response Plans	
	COMMENT: *Specify criminal penalties are limited to intentional or criminally negligent acts.* The Riverside County and San Diego County Copermittees each submitted comments requesting Provision E.6.b.(5) be modified to specify criminal penalties are limited to intentional or criminally negligent acts.	**Copermittees** Riverside County Copermittees San Diego County Copermittees
	RESPONSE: The San Diego Water Board disagrees that the revision is necessary. Provision E.6.b requires each Copermittee to list the enforcement response approaches that the Copermittee will implement within its jurisdiction to compel compliance with its statutes, ordinances, permits, contracts, order, or similar means, and the requirements of the Order. The Copermittee may specify in its Enforcement Response Plan that criminal penalties are limited to intentional or criminally negligent acts. The San Diego Water Board did not revise Provision E.6.b.(5).	

E6-2: *Notification to San Diego Water Board for "escalated" enforcement should be consistent with Construction General Permit.*

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

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E6-2	PROVISION E.6: Enforcement Response Plans	
	COMMENT: *Notification to San Diego Water Board for "escalated" enforcement should be consistent with Construction General Permit.* The Riverside County and San Diego County Copermittees each submitted comments requesting Provision E.6.e.(1) be modified to be consistent with the notification requirements of the Construction General Permit.	**Copermittees** Riverside County Copermittees San Diego County Copermittees
	RESPONSE: The San Diego Water Board agrees with the request. Provision E.6.e.(1) has been revised as requested.	

E6-3: *Revise the term "escalated enforcement" to "progressive enforcement."*

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E6-3	PROVISION E.6: Enforcement Response Plans	
	COMMENT: *Revise the term "escalated enforcement" to "progressive enforcement."* The Orange County and Riverside County Copermittees each submitted comments requesting Provision E.6.d be modified to be "Progressive Enforcement" instead of "Escalated Enforcement" because the term is more appropriate.	**Copermittees** Orange County Copermittees Riverside County Copermittees
	RESPONSE: The San Diego Water Board disagrees with the request. The Copermittees are expected to implement "progressive enforcement" in all cases of enforcement. For enforcement issues that are associated with the highest priority water quality conditions identified by the Copermittees in the Watershed Management Area, the Copermittees are expected to implement the enforcement more swiftly, meaning escalating its enforcement measures and resources to compel compliance with its statutes, ordinances, permits, contracts, order, or similar means, and the requirements of the Order as soon as possible. The term "escalated enforcement" correctly reflects this added level of urgency and focus to compel compliance. The San Diego Water Board did not revise Provision E.6.d.	

E6-4: *Allow the Copermittees to utilize existing guidelines and procedures for enforcement.*

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E6-4	PROVISION E.6: Enforcement Response Plans	
	COMMENT: *Allow the Copermittees to utilize existing guidelines and procedures for enforcement.* The Orange County and Riverside County Copermittees each submitted comments requesting the introductory paragraph of Provision E.6 be modified to specify that a Copermittee may utilize and implement established, equivalent guidelines and procedures for enforcement.	**Copermittees** Orange County Copermittees Riverside County Copermittees
	RESPONSE: The San Diego Water Board disagrees with the request. The Copermittees are allowed to utilize and implement their existing procedures if they meet the requirements of Provision E.6. Provision E.6, however, requires each Copermittee to develop an Enforcement Response Plan, included as part of its jurisdictional runoff management program document, which the San Diego Water Board and the public may utilize to determine if the Copermittee is indeed implementing its enforcement program according to its procedures. The Enforcement Response Plan is expected to be a tool the Copermittee can refer to when issuing enforcement actions to compel compliance with its statutes, ordinances, permits, contracts, order, or similar means, and the requirements of the Order. The Enforcement Response Plan is also expected to result in more consistent enforcement and enforcement actions by the Copermittee within its jurisdiction. The San Diego Water Board did not revise the introductory paragraph to Provision E.6.	

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E7a-1	PROVISION E.7.a: Public Education	
	COMMENT: *Requests for modifications to public education requirements.* The Orange County, Riverside County and San Diego County Copermittees each submitted comments requesting the requirements in Provision E.7.a be modified to allow the Copermittees to focus their public education efforts on the highest priority water quality conditions, and remove or reduce the emphasis in the language that focuses on pesticides, herbicides and fertilizers.	**Copermittees** Orange County Copermittees Riverside County Copermittees San Diego County Copermittees
	RESPONSE: The San Diego Water Board disagrees with the requested modifications. The public education requirements under Provision E.7.a provide the Copermittees the flexibility to focus their public education efforts on the highest priority water quality conditions, while being consistent with federal regulations. Provision E.7.a.(1) is consistent with 40CFR122.26(d)(2)(iv)(A)(6), which requires each Copermittee to provide "*A description of a program to reduce to the maximum extent practicable, pollutants in discharges from municipal separate storm sewers associated with the application of pesticides, herbicides and fertilizer which will include…educational activities…*" Provision E.7.a.(1) has been expanded to include "*other pollutants of concern…as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed to address the highest priority water quality conditions…*" To be consistent with 40CFR122.26(d)(2)(iv)(A)(6), however, each Copermittee must have a program of educational activities to reduce pollutants associated with pesticides, herbicides and fertilizers to the MEP. The San Diego Water Board did not modify Provision E.7.a.	

PROVISION E.8: Fiscal Analysis
E8-1: *Request to remove requirement to secure resources to meet requirements of the permit.*

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E8-1	PROVISION E.8: Fiscal Analysis	
	COMMENT: *Request to remove requirement to secure resources to meet requirements of the Tentative Order.* The Riverside County Copermittees requested that Provision E.8.a, requiring each Copermittee to secure the resources necessary to meet all the requirements of the Order, be removed. The Riverside County Copermittees assert this requirement exceeds the requirements of the Clean Water Act.	**Copermittees** Riverside County Copermittees
	RESPONSE: The San Diego Water Board disagrees with the request. The Copermittees are responsible for securing the resources necessary to meet the requirements of the Tentative Order. Without securing the resources necessary to meet all requirements of the Tentative Order, the Copermittee would be unable to meet the requirements of the Tentative Order. Additionally, CWA section 402(p)(3)(B)(iii) requires that NPDES permits for storm water discharges from MS4s to "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable* [MEP], *including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." The requirement for each Copermittee to secure the resources necessary to meet all the requirements of the Order is considered "*such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." The San Diego Water Board did not remove the requirement.	

PROVISION F.1: Water Quality Improvement Plans
F1-1: *Requests for modifications to Water Quality Improvement Plan development process and schedule.*

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F1-1	PROVISION F.1: Water Quality Improvement Plans	
	COMMENT: *Requests for modifications to Water Quality Improvement Plan development process and schedule.* Comments from the Building Industry and the Copermittees requested modifications to the schedules for developing and updating the Water Quality Improvement Plans. Generally, the requests were for more time because of several different factors. The San Diego County Copermittees also requested several modifications to the content of the submittal required for each element of the Water Quality Improvement Plan. Comments from the Environmental Groups and USEPA were primarily concerned with the public participation process during the development of the Water Quality Improvement Plans. The concern was that the requirements of the Tentative Order did not allow for enough public participation, and they requested that additional opportunities be provided during the Water Quality Improvement Plan development and updates. The Environmental Groups also requested that the Water Quality Improvement Plans be required to be developed consecutively instead of concurrently.	**Building Industry / Industry** BIA Regulated Community Coalition **Copermittees** Orange County Copermittees Riverside County Copermittees San Diego County Copermittees San Diego Unified Port District **Environmental Organizations** Environmental Groups **State/Federal Government** USEPA
	RESPONSE: The San Diego Water Board agrees with the request to provide additional time to develop the Water Quality Improvement Plans, but disagrees with requiring the Water Quality Improvement Plans to be developed consecutively instead of concurrently. The San Diego Water Board also agrees with including additional opportunities for public participation during the Water Quality Improvement Plan development and update processes. The San Diego Water Board has modified the requirements of Provision F.1 to provide the Copermittees up to 24 months, instead of 18 months, to develop the Water Quality Improvement Plans. The schedules for developing and submitting the elements of the Water Quality Improvement Plan have also been modified to provide additional time, and additional flexibility to stagger the development of the Water Quality Improvement Plans to provide the public sufficient opportunity to provide data, information and recommendations. Please also see the response to comment B-3.	

PROVISION F.3.b: Annual Reports
F3b-1: *Recommendations for modifications to Annual Report requirements.*

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F3b-1	PROVISION F.3.b: Annual Reports	
	COMMENT: *Recommendations for modifications to Annual Report requirements.* Several commenters provided recommendations for modifications to the Annual Report requirements to clarify the requirements, include different requirements, or remove requirements. Ecolayers and the San Diego County Copermittees are concerned with the requirements related to uploading data to the California Environmental Data Exchange Network (CEDEN). Uploading data to CEDEN is not necessary according to Ecolayers. The Copermittees would like to limit the data uploads only to data generated by the Copermittees and not third parties. The Orange County, Riverside County, and San Diego County Copermittees all expressed concern about the transitional reporting period between the time the Tentative Order becomes effective and the date that the first Water Quality Improvement Plan Annual Reports are required. The Orange County Copermittees also expressed concern with the use of the Jurisdictional Runoff Management Program Annual Report Form (Form) in Attachment D to the Tentative Order. The Orange County Copermittees requested continuing the use of the current jurisdictional runoff management program annual reporting format instead of the Form. The Environmental Groups also expressed concern with the Form. The Environmental Groups are concerned that the Form would not adequately reflect the activities that each Copermittee was implementing within its jurisdiction and allow the public to understand how the Copermittees were implementing effective water quality improvement strategies.	**Copermittees** Orange County Copermittees Riverside County Copermittees San Diego County Copermittees **Environmental Organizations** Environmental Groups **Other Entities** Ecolayers
	RESPONSE: The San Diego Water Board agrees that modifying the Annual Report requirements is necessary to clarify transitional reporting requirements and Water Quality Improvement Plan reporting requirements. The San Diego Water Board does not agree that uploading data to CEDEN is unnecessary. Finally, the San Diego Water Board disagrees with replacing the Form with the current jurisdictional runoff management program annual reporting format. The San Diego Water Board has revised the Annual Report requirements under Provision F.3.b to include (1) Transitional Jurisdictional Runoff Management Program Annual Reports, (2) Transitional Monitoring and Assessment Program Annual Reports, and (3) Water Quality Improvement Plan Annual Reports. The Transitional Jurisdictional Runoff Management Program Annual Reports and Transitional Monitoring and	

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F3b-1	PROVISION F.3.b: Annual Reports	
	Assessment Program Annual Reports will be submitted by the Copermittees until the first Water Quality Improvement Plan Annual Reports are required. The Form is required for each Copermittee within each Watershed Management Area during the transitional reporting permit. Each Copermittee has the option to continue utilizing the current jurisdictional runoff management program annual reporting format in addition to the Form until the Water Quality Improvement Plan Annual Reports are required. The Form will continue to be required as part of the Water Quality Improvement Plan Annual Reports, but they are expected to be included as an appendix or attachment to the report. The San Diego Water Board will review the Forms to ensure that the Copermittees have certified that they are implementing their jurisdictional runoff management programs in compliance with the requirements. The San Diego Water Board will also utilize the Forms during audits of the Copermittees' jurisdictional runoff management programs and their records. The Water Quality Improvement Plan Annual Reports will provide the information that the Environmental Groups are interested in seeing as part of the annual reporting requirements. Provision F.3.b.(3)(d) requires each Copermittee to report the water quality improvement strategies that were implemented and/or no longer implemented by each of the Copermittees during the reporting period and previous reporting periods, and are planned to be implemented during the next reporting period. Finally, the San Diego Water Board has not removed the requirements to upload data to CEDEN, but has limited the data that is required to be uploaded to CEDEN to just data generated by the Copermittees.	

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F3c-1	PROVISION F.3.c: Regional Monitoring and Assessment Report	
	COMMENT: *Requests for modifications to Regional Monitoring and Assessment Report requirements.* The Riverside County and San Diego County Copermittees each submitted requests for modifications to the Regional Monitoring and Assessment Report requirements. The Riverside County Copermittees recommended aligning the requirements with the Integrated Assessment of the Water Quality Improvement Plans. The San Diego County Copermittees recommended removing the requirement for the Regional Monitoring and Assessment Report as it appears to be duplicative with the Integrated Assessment of the Water Quality Improvement Plans. The San Diego County Copermittees also requested, if the Regional Monitoring and Assessment Report requirements remain, that data uploaded to the Regional Clearinghouse be limited only to data generated by the Copermittees and not third parties.	**Copermittees** Riverside County Copermittees San Diego County Copermittees
	RESPONSE: The San Diego Water Board disagrees with the requests to modify the Regional Monitoring and Assessment Report requirements. The San Diego Water Board agrees with limiting the data uploaded to the Regional Clearinghouse only to data generated by the Copermittees. The Regional Monitoring and Assessment Report is for the entire San Diego Region, not specific to each Watershed Management Area. The Regional Monitoring and Assessment Report may utilize the findings from the Integrated Assessments of the Water Quality Improvement Plans, but the Regional Monitoring and Assessment Report is intended to provide a “snapshot” of the conditions of the entire San Diego Region. The San Diego Water Board did not remove Provision F.3.c from the requirements. The San Diego Water Board did, however, revise Provision F.3.c.(3) to limit the data that is required to be uploaded to the Regional Clearinghouse to just data generated by the Copermittees.	

PROVISION F.4: Regional Clearinghouse
F4-1: *Request to allow the Copermittees to utilize existing mechanisms and linkages as part of the Regional Clearinghouse.*

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F4-1	PROVISION F.4: Regional Clearinghouse	
	COMMENT: *Request to allow the Copermittees to utilize existing mechanisms and linkages as part of the Regional Clearinghouse.* The Orange County and San Diego County Copermittees each submitted comments requesting the requirements in Provision F.4 be modified to allow the Copermittees to utilize their existing web-based systems. The Orange County and San Diego County Copermittees requested that language be added to Provision F.4 that specifies a Copermittee may elect to develop and maintain clearinghouses provided by other Copermittees or agencies.	**Copermittees** Orange County Copermittees San Diego County Copermittees
	RESPONSE: The San Diego Water Board agrees that the Copermittees should be allowed to utilize their existing web-based systems. Provision F.4.a allows the Copermittees to link the Regional Clearinghouse "*to other internet-based data portals and databases where the original documents are stored*." The Regional Clearinghouse, however, must be a single website that is linked to the other web-based systems. Provision G.2.d requires the Principal Watershed Copermittees to coordinate and develop the Regional Clearinghouse. The San Diego Water Board has added a footnote to the opening paragraph of Provision F.4 as requested by the San Diego County Copermittees, which is consistent with the language requested by the Orange County Copermittees.	

PROVISION G: PRINCIPAL WATERSHED COPERMITTEE RESPONSIBILITIES
G-1: *Request for "clarifications" of Copermittee responsibilities.*

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G-1	PROVISION G: PRINCIPAL WATERSHED COPERMITTEE RESPONSIBILITIES	
	COMMENT: *Request for "clarifications" of Copermittee responsibilities.* The San Diego County Copermittees requested that Provision G "clarifies" that all Copermittees have some responsibilities to implement the requirements of the permit, not just the Principal Watershed Copermittees. The San Diego County Copermittees also requested removal of the language recommending that an individual Copermittee should not be designated a Principal Watershed Copermittee for more than two Watershed Management Areas.	**Copermittees** San Diego County Copermittees
	RESPONSE: The San Diego Water Board agrees to clarify that all Copermittees are responsible for implementing the requirements. The San Diego Water Board disagrees that it is necessary to remove the recommendation that an individual Copermittee should not be designated a Principal Watershed Copermittee for more than two Watershed Management Areas. Provision G states that an individual Copermittee "should not" be designated a Principal Watershed Copermittee for more than two Watershed Management Areas. "Should not" indicates that it is a recommendation, not a requirement. The recommendation has been included to express the San Diego Water Board's desire for, as well as encourage, more Copermittees to assume leadership positions in developing Water Quality Improvement Plans and coordinating water quality improvement strategies among Copermittees in a Watershed Management Area and in the San Diego Region. The recommendation is not a requirement. Removal of a recommendation is not necessary. The San Diego Water Board has added Provision G.3 to specify that the Principal Watershed Copermittees are not responsible for ensuring that the other Copermittees in the Watershed Management Area are in compliance with the requirements, and that each Copermittee is responsible for implementing the requirements of the Tentative Order.	

PROVISION H: MODIFICATION OF PROGRAMS
H-1: *Request for an explicit re-opener provision in permit for TMDLs.*

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H-1	PROVISION H: MODIFICATION OF PROGRAMS	
	COMMENT: *Request for an explicit re-opener provision in permit for TMDLs.* The Orange County and San Diego County Copermittees and several individual Copermittees requested an explicit re-opener provision be included in the Tentative Order for when TMDLs may be amended.	**Copermittees** City of Dana Point City of Imperial Beach City of Laguna Niguel City of Mission Viejo City of Poway City of Rancho Santa Margarita City of San Diego Orange County Copermittees San Diego County Copermittees
	RESPONSE: The San Diego Water Board agrees with the request. The San Diego Water Board has revised Provision H.4 to explicitly state when the San Diego Water Board will re-open the Order for modifications. Provision H.4.c explicitly states that the San Diego Water Board will re-open the Order if any of the TMDLs in Attachment E are amended in the Basin Plan by the San Diego Water Board, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA.	

H-2: *Request to include language that the permit may be amended outside of the Water Quality Improvement Plan process.*

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H-2	PROVISION H: MODIFICATION OF PROGRAMS	
	COMMENT: *Request to include language that the permit may be amended outside of the Water Quality Improvement Plan process.* The San Diego County Copermittees have requested the San Diego Water Board include language in Provision H.3 that explicitly states the Tentative Order may be modified outside of the Water Quality Improvement Plan development and implementation process. The San Diego County Copermittees indicated that there may be frequent modifications to the permit requirements based on the Water Quality Improvement Plan development and implementation process.	**Copermittees** San Diego County Copermittees
	RESPONSE: The San Diego Water Board disagrees with the request. The Tentative Order has been structured to allow the iterative and adaptive management process to occur within the Water Quality Improvement Plan development and implementation process. The San Diego Water Board does not anticipate any need to modify the Order's requirements as a result of the implementation of the Water Quality Improvement Plans. In the event that the Order's requirements do need to be modified, the language currently in Provision H.3 is adequate for this purpose. Thus, the San Diego Water Board did not revise Provision H.3 as requested by the San Diego County Copermittees.	

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AttA-1	ATTACHMENT A: Discharge Prohibitions and Special Protections	
	COMMENT: *Requests for modifications to Areas of Special Biological Significance (ASBS) Special Protections requirements.* San Diego Gas and Electric and Southern California Gas Company requested modifications to Provision I.A.1.e.(2)(ii) of the Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges (Special Protections) in Attachment A to the Order. San Diego Gas and Electric and Southern California Gas Company requested Provision I.A.1.e.(2)(ii) be revised to include a reference to Finding 32 of the Order to be consistent with their comments regarding authorized non-storm water discharges to MS4s that discharge to ASBS (see comment Fnd-14).	**Building Industry / Industry** San Diego Gas and Electric Southern California Gas Company
	RESPONSE: The San Diego Water Board disagrees with the request. The Special Protections in Attachment A to the Tentative Order were adopted under Resolution No. 2012-0012 by the State Water Board, and are provided verbatim as a reference. Revising the provisions of the Special Protections, which are part of a resolution issued by the State Water Board, is not appropriate or necessary. The San Diego Water Board did not revise the Special Protections in Attachment A.	

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AttB-1	ATTACHMENT B: Standard Permit Provisions and General Provisions	
	COMMENT: *Requests for modifications to Standard Permit Provisions.* The Riverside County and San Diego County Copermittees each submitted comments requesting Standard Permit Provision 1.m be removed from the Standard Permit Provisions in Attachment B. The Copermittees are concerned that the bypass provisions of Standard Permit Provision 1.m would require the Copermittees to notify the San Diego Water Board whenever there is an anticipated or unanticipated bypass of storm water treatment BMPs.	**Copermittees** Riverside County Copermittees San Diego County Copermittees
	RESPONSE: The San Diego Water Board disagrees with the request. The Standard Permit Provisions in Attachment B are required to be included in all NPDES permits. Thus, it is inappropriate to remove any of the Standard Permit Provisions. Standard Permit Provision 1.m(1)(a) defines a bypass as the intentional diversion of waste streams from any portion of a treatment facility. As most storm water treatment BMPs are not expected to be attended and expected to operate without oversight, there are unlikely to be "intentional" diversions of waste streams. If, however, one or more Copermittees operate a storm water treatment control BMP that requires an "intentional" diversion of the waste stream, the San Diego Water Board expects the Copermittee(s) to comply with the requirements of Standard Permit Provision 1.m. The San Diego Water Board did not revise the Standard Permit Provisions in Attachment B.	

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AttB-2	ATTACHMENT B (Standard Permit Provisions and General Provisions)	
	COMMENT: *Requests for "clarifications" to the General Provisions.* The Riverside County and San Diego County Copermittees each submitted comments requesting "clarifications" to the General Provisions in Attachment B. The Copermittees requested that General Provision 2.h include language that specifies the Copermittees are not responsible for pollutants in its MS4 discharges originating from an NPDES-permitted non-storm water discharge. The Copermittees also requested that recordkeeping requirements of General Provision 2.i.(2) be deleted or revised to be consistent with Standard Permit Provision 1.j.(2).	**Copermittees** Riverside County Copermittees San Diego County Copermittees
	RESPONSE: The San Diego Water Board disagrees with the requests. Discharges to the Copermittees' MS4s authorized by a separate NPDES permit do not have to be prohibited, as specified in the requirements of Provisions A.1.b and E.2. The Copermittees, however, are responsible for identifying the sources of the discharges from its MS4 if it causes or contributes to exceedances of water quality standards in receiving waters. Please see the response to comment E2-3. The recordkeeping requirements of General Provision 2.i.(2) are not inconsistent with Standard Permit Provision 1.j.(2). Standard Permit Provision 1.j.2 requires records to be kept for a minimum of 3 years unless the San Diego Water Board extends this period, consistent with the Code of Federal Regulations requirement. The San Diego Water Board has extended the recordkeeping requirements of Standard Permit Provision 1.j.(2) with General Provision 2.i.(2) to a period of 5 years. Thus, there is no conflict or inconsistency. The San Diego Water Board did not revise the General Provisions in Attachment B.	

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AttC-1	ATTACHMENT C: Acronyms, Abbreviations, and Definitions	
	COMMENT: *Requests for additional or modified definitions.* Several comments were submitted by the Copermittees and Building Industry / Industry requesting modifications to existing definitions and/or the addition of new definitions to Attachment C to the Tentative Order.	**Building Industry / Industry** BIA Regulated Community Coalition San Diego Gas and Electric Southern California Gas Company **Copermittees** City of Chula Vista Orange County Copermittees Riverside County Copermittees San Diego County Copermittees
	RESPONSE: The San Diego Water Board reviewed and considered the requested modifications to existing definitions and additional definitions. Where the San Diego Water Board determined a modification to a definition requested by a commenter was appropriate and necessary to clarify a definition or make it consistent with other revisions made in the Tentative Order, the San Diego Water Board made a revision. Where the San Diego Water Board determined the addition of a definition requested by a commenter was appropriate and necessary, the San Diego Water Board added the definition. In several cases, the requested modification or addition was not appropriate, not necessary, or both. In such cases, the San Diego Water Board did not modify or add the definition as requested. Please see Attachment C in the revised Tentative Order to see the revisions that were made.	

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AttE-1	ATTACHMENT E: Specific Provisions for Total Maximum Daily Loads	
	COMMENT: *Link compliance with TMDL requirements to development and implementation of Water Quality Improvement Plans.* The San Diego County Copermittees submitted comments requesting that the development and implementation of the Water Quality Improvement Plans be a compliance mechanism for the TMDL requirements of Attachment E. The San Diego Unified Port District submitted separate comments in support of the request. The Orange County Copermittees submitted comments requesting that Provision A.1 and A.2 include language that specifies that compliance with the discharge prohibitions and receiving water limitations will be achieved through implementing the requirements of Attachment E. Comments from Environmental Groups were not in support of allowing compliance with the TMDL requirements through a "reasonable assurance analysis" included in the Water Quality Improvement Plan.	**Copermittees** City of San Diego Orange County Copermittees San Diego County Copermittees San Diego Unified Port District **Environmental Organizations** Environmental Groups
	RESPONSE: The San Diego Water Board agrees with the comments from the Copermittees. The San Diego Water Board disagrees with the comments from the Environmental Groups. The San Diego Water Board acknowledges that monitoring all MS4 outfalls or all receiving waters at all times to demonstrate compliance with the final WQBELs is difficult, likely to be cost prohibitive, and likely to be infeasible. Thus, the San Diego Water Board has included an option to the Compliance Determination requirements allowing the utilization of the Water Quality Improvement Plan to demonstrate compliance with the interim and final TMDL requirements. The compliance determination option provides the Copermittees a mechanism through an analysis to demonstrate that there is "reasonable assurance" that the interim and final numeric WQBELs are being achieved through the implementation of BMPs. Because the Water Quality Improvement Plans will undergo a public participation and review process, the San Diego Water Board is confident that a Water Quality Improvement Plan that includes such an analysis will allow the Copermittees to demonstrate that the final TMDL requirements are being achieved and will be acceptable to the public and the San Diego Water Board. For the interim TMDL compliance determination requirements, the Copermittees are allowed to demonstrate compliance by implementing a Water Quality Improvement Plan that has been accepted by the San Diego Water Board, with a "reasonable assurance" that the implementation of the BMPs will achieve the interim TMDL WQBELs within the interim compliance dates. The Copermittees will be provided considerable flexibility for	

AttE-1	ATTACHMENT E: Specific Provisions for Total Maximum Daily Loads	
	demonstrating compliance with achieving the interim WQBELs. For the final TMDL compliance determination requirements, the Copermittees are allowed to demonstrate compliance with the final WQBELs by implementing a Water Quality Improvement Plan that includes an analysis to demonstrate that the implementation of the BMPs required by the TMDL achieves compliance with one or more of the final numeric WQBELs. The Water Quality Improvement Plan must include monitoring and assessments to confirm that the Water Quality Improvement Plan is achieving the final TMDL requirement. The San Diego Water Board must accept and continue to accept the Water Quality Improvement Plan and analysis, and the Copermittees must continue to implement the BMPs and demonstrate through the analysis that the final numeric WQBELs are being achieved.	

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AttE-2	ATTACHMENT E: Specific Provisions for Total Maximum Daily Loads	
	COMMENT: *Requests for including TMDL requirements consistent with the TMDLs as developed or "as originally intended."* Several Copermittees submitted comments that the TMDLs have not been incorporated "as originally written and intended" or somehow inconsistent with the TMDLs as they were developed. The Orange County Copermittees specifically referred to the Baby Beach Bacteria TMDLs and the Beaches and Creeks Bacteria TMDLs, noting examples that they identified as "inconsistent" with the TMDLs in the Basin Plan. A comment from Clean Water Now seemed to imply that there was some inconsistencies present in the TMDL requirements "in light of recent legal renderings" though no specific legal interpretations or decisions were provided. The USEPA noted that the Beaches and Creeks Bacteria TMDLs included additional WLAs and compliance endpoints that were not included in Attachment E.	**Copermittees** City of Dana Point City of Imperial Beach City of Laguna Hills City of Lake Forest City of Mission Viejo City of Rancho Santa Margarita City of San Juan Capistrano Orange County Copermittees San Diego Unified Port District **Environmental Organizations** Clean Water Now **State/Federal Government** USEPA
	RESPONSE: The San Diego Water Board disagrees that the TMDL requirements in Attachment E are inconsistent with the TMDLs as developed or "as originally intended." The comments from the Copermittees and USEPA noted that several aspects of the TMDLs as they are in the Basin Plan are not included in the Tentative Order. The omission of those aspects of the TMDLs, however, does not mean that the TMDL requirements in Attachment E are inconsistent with the TMDLs as developed or "as originally intended." The TMDLs as developed are all intended to restore the water quality standards in receiving waters impaired by specific pollutants. The WLAs and LAs as developed are all intended to ensure that discharges from point and nonpoint sources to receiving waters will not cause or contribute to exceedances of water quality standards in receiving waters. The TMDL requirements in Attachment E are consistent with the intent of the TMDLs, and the WLAs for MS4s. In other words, the TMDL requirements in Attachment E are intended to ensure that discharges from the Responsible Copermittees' MS4s will not cause or contribute, and will continue to not cause or contribute to exceedances of water quality standards in receiving waters. According to each TMDL, when all point sources and nonpoint sources achieve their WLAs and LAs, including the WLAs for MS4s, the water quality standards in receiving waters will be restored. The San Diego Water Board included TMDL requirements in Attachment E that are entirely consistent with the requirements of the TMDLs as adopted and incorporated into the Basin Plan. The implementation plans of the	

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AttE-2	ATTACHMENT E: Specific Provisions for Total Maximum Daily Loads	
	TMDLs in the Basin Plan are essentially "instructions" for the San Diego Water Board to incorporate the requirements into the regulatory mechanisms that will implement the requirements of the TMDL to attain the water quality standards that are being impaired by a pollutant in a water body. In each case, the "instructions" provide the permit writer considerable flexibility in how to express the WLAs as WQBELs in the permit, but not as much flexibility in the compliance schedules for achieving the WLAs. Nonetheless, the San Diego Water Board has revised the TMDL requirements in Attachment E to include some of the additional aspects of the TMDLs as developed and included in the Basin Plan. Please see the following responses to comments pertaining to Attachment E.	

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AttE-3	ATTACHMENT E: Specific Provisions for Total Maximum Daily Loads	
	COMMENT: *Objections with how the Water Quality Based Effluent Limitations are included or expressed in the Tentative Order.* The Orange County and San Diego County Copermittees each submitted comments that objected to how the WQBELs for the TMDLs in Attachment E are included or expressed. The San Diego County Copermittees object to including receiving water limitations as a component of the WQBELs, and requested a clearer linkage between receiving water limitations and effluent limitations. The Orange County Copermittees had a similar objection. The San Diego County Copermittees also requested that the WQBELs expressed as effluent limitations specify that the concentration-based effluent limitations be applied on a watershed basis and not outfall by outfall. The Orange County Copermittees questioned the feasibility of the numeric WQBELs, and asserted that compliance with WQBELs should be based on implementation of BMPs. The Orange County Copermittees assert that a Reasonable Potential Analysis (RPA) is required before including WQBELs into the permit. The Orange County Copermittees also assert that the WQBELs for the Baby Beach Bacteria TMDLs and Beaches and Creeks Bacteria TMDLs are not consistent with the assumptions and requirements of the WLAs. In contrast, the USEPA generally supported the San Diego Water Board's approach for incorporating the TMDL requirements into the Tentative Order.	**Copermittees** Orange County Copermittees San Diego County Copermittees **State/Federal Government** USEPA
	RESPONSE: The San Diego Water Board has included WQBELs that are consistent with the requirements and assumptions of the TMDLs. WQBELs can be expressed as (1) conditions in receiving waters that are to be attained to restore or protect water quality standards in receiving waters, (2) conditions in discharges that will not cause or contribute to exceedances of water quality standards in receiving waters, (3) BMPs that will ensure discharges will not cause or contribute to exceedances of water quality standards in receiving waters, or (4) a combination of one or more of (1)-(3). The San Diego Water Board has incorporated (1)-(3) under the WQBEL requirements for each of the TMDLs in Attachment E. In most cases, if the WQBEL expressed as a receiving water limitation is achieved, the discharges from the MS4s are assumed to be in compliance with the TMDL requirements. If not, then the	

AttE-3	ATTACHMENT E: Specific Provisions for Total Maximum Daily Loads	
	Copermittees must demonstrate that discharges from the MS4s are not causing or contributing to the exceedances in the receiving waters by achieving the WQBELs expressed as effluent limitations. In every case, the Copermittees are required to implement BMPs to ensure that discharges from their MS4s do not cause or contribute to exceedances of water quality standards in receiving waters. Because there are TMDLs in the Basin Plan that have identified the MS4s as causing or contributing to exceedances of water quality standards, an RPA is not necessary to establish WQBELs. RPAs are only necessary if the San Diego Water Board decides to develop and incorporate WQBELs into an NPDES permit absent a TMDL. The WQBELs are also consistent with the assumptions and requirements of the WLAs. In each case, the WLAs are calculated based on numeric targets that are assumed to be able to restore or protect water quality standards in receiving waters and/or ensure discharges from the Responsible Copermittees' MS4s will not cause or contribute to exceedances of water quality standards in receiving waters. The numeric targets are required to be based on water quality objectives in the Basin Plan. Discharges from the MS4s are required to achieve the numeric targets for their discharges to protect water quality standards in receiving waters to meet the WLAs. The WQBELs for the TMDLs in Attachment E are consistent with the numeric targets, and thus consistent with the underlying assumptions and requirements of the numeric targets that are the basis of the WLAs. For the Baby Beach Bacteria TMDLs and Beaches and Creeks Bacteria TMDLs, the San Diego Water Board has not revised the concentration-based WQBELs, but has included WQBELs expressed as load-based effluent limitations. The Copermittees may utilize the load-based effluent limitations to demonstrate that the BMPs they are implementing are achieving their effluent limitations and not causing or contributing to exceedances of water quality standards in receiving waters. Please see the response to comment AttE-1.	

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AttE-4	ATTACHMENT E: Specific Provisions for Total Maximum Daily Loads	
	COMMENT: *Recommendation to reorganize the Specific Provisions for the TMDLs.* The San Diego County Copermittees recommended reorganizing the Specific Provisions of the TMDLs in Attachment E. To clearly outline the interim and final requirements and schedules, the San Diego County Copermittees recommended organizing the compliance dates, WQBELs, and compliance determination by final TMDL requirements and interim TMDL requirements.	**Copermittees** San Diego County Copermittees
	RESPONSE: The San Diego Water Board agrees with the recommendation. The San Diego Water Board reorganized the Specific Provisions for the TMDLs in Attachment E as recommended.	

AttE-5: *The San Diego Water Board does not have the authority to establish TMDLs for non-pollutants (surrogates).*

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AttE-5	ATTACHMENT E: Specific Provisions for Total Maximum Daily Loads	
	COMMENT: *The San Diego Water Board does not have the authority to establish TMDLs for non-pollutants (surrogates).* The BIA Regulated Community Coalition requested that that San Diego Water Board revise the TMDLs to conform with a U.S. District Court for the Eastern District of Virginia decision that TMDLs could not be established to regulate non-pollutants as surrogates for pollutants.	**Building Industry / Industry** BIA Regulated Community Coalition
	RESPONSE: The San Diego Water Board disagrees that the TMDLs need to be revised. The TMDLs in Attachment E are all based on reducing pollutant loads in MS4 discharges to ensure the Copermittees' MS4s will not cause or contribute to exceedances of water quality standards in receiving waters. The TMDLs in Attachment E do not establish any requirements to regulate non-pollutants as surrogates for pollutants.	

AttE-6: *Recommendation to add a provision to address TMDLs approved during the term of the Tentative Order.*

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AttE6-1	ATTACHMENT E: Specific Provisions for Total Maximum Daily Loads	
	COMMENT: *Recommendation to add a provision to address TMDLs approved during the term of the Tentative Order.* The USEPA recommended adding a provision to the requirements of the Tentative Order to address TMDLs approved during the term of the permit to expedite implementation of the TMDLs by the Copermittees.	**State/Federal Government** USEPA
	RESPONSE: The San Diego Water Board agrees with the recommendation. The San Diego Water Board has revised Provision F.2.c to include a requirement for the Copermittees to initiate an update to the applicable Water Quality Improvement Plans to incorporate the requirements of any TMDL Basin Plan amendments, applicable to the Copermittees, approved by the Office of Administrative Law and USEPA within the term of the Tentative Order.	

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AttE1-1	ATTACHMENT E 1: Chollas Creek Diazinon TMDL	
	COMMENT: *Request to revise WQBELs for Chollas Creek Diazinon TMDL based on recalculated criteria.* The San Diego County Copermittees assert that the Chollas Creek Diazinon TMDL is based on erroneous numeric targets due to an error discovered in the criteria used to develop the TMDL. The San Diego County Copermittees requested that the WQBELs for the Chollas Creek Diazinon TMDL be revised based on recalculated criteria, or remove the TMDL until the WQBELs can be "corrected."	**Copermittees** San Diego County Copermittees
	RESPONSE: The San Diego Water Board disagrees with the request. The Chollas Creek Diazinon TMDL was incorporated into the Basin Plan in September 2003. Until the Basin Plan is revised to include the "corrected" criteria as part of the numeric targets, the San Diego Water Board is required to include the TMDL requirements in the Tentative Order consistent with the requirements of the TMDL in the Basin Plan. The criteria utilized in the development of the Chollas Creek Diazinon TMDL are more protective than the "corrected" criteria cited by the commenter. Implementation of the Chollas Creek Diazinon TMDL with the WQBELs consistent with the numeric targets in the TMDL in the Basin Plan is protective of the water quality standards in receiving waters. According to the commenter, the "corrected" criteria were discovered in 2004. The commenter has had almost 9 years to approach the San Diego Water Board to request a revision to the TMDL in the Basin Plan. If the commenter would like to revise the numeric targets of the TMDL in the Basin Plan, the commenter must approach the TMDL and Basin Planning staff of the San Diego Water Board to request the change. Requesting the change through the MS4 permit development process is not the appropriate forum. The WQBELs for the Chollas Creek Diazinon TMDL were not revised.	

ATTACHMENT E 2: Shelter Island Yacht Basin Dissolved Copper TMDLs
AttE2-1: *Request to include San Diego Unified Port District as MS4 operator in SIYB Dissolved Copper TMDL.*

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AttE2-1	ATTACHMENT E 2: Shelter Island Yacht Basin Dissolved Copper TMDLs	
	COMMENT: *Request to include San Diego Unified Port District as MS4 operator in SIYB Dissolved Copper TMDL.* The City of San Diego requested that the San Diego Unified Port District be listed as a Responsible Copermittee under the dissolved copper TMDL for Shelter Island Yacht Basin.	**Copermittees** City of San Diego
	RESPONSE: The San Diego Water Board disagrees that the San Diego Unified Port District should be listed as a Responsible Copermittee under the Shelter Island Yacht Basin dissolved copper TMDL. The Shelter Island Yacht Basin dissolved copper TMDL adopted under Resolution No. R9-2005-0019 only listed the City of San Diego as an owner or operator of an MS4 that discharges to Shelter Island Yacht Basin. The TMDL provides a wasteload allocation (WLA) of 30 kg/yr for MS4 discharges by the City of San Diego only. This means that if the San Diego Unified Port District does in fact have MS4 discharges to Shelter Island Yacht Basin, the TMDL currently has assigned MS4 discharges from the San Diego Unified Port District a WLA of 0 kg/yr. Any discharge of dissolved copper from MS4s owned or operated by the San Diego Unified Port District to Shelter Island Yacht Basin would be in violation of its WLA and WQBELs expressed as effluent limitations.	

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AttE2-2	ATTACHMENT E 2: Shelter Island Yacht Basin Dissolved Copper TMDLs	
	COMMENT: *Request to revise WQBELs expressed as receiving water limitations for the Shelter Island Yacht Basin Dissolved Copper TMDL to include Water Effects Ratio.* The San Diego County Copermittees noted that the Water Effects Ratio (WER) term was incorporated into the Chollas Creek Dissolved Metals TMDLs and requested that the WQBELs expressed as receiving water limitations for the Shelter Island Yacht Basin Dissolved Copper TMDL include the WER term.	**Copermittees** San Diego County Copermittees
	RESPONSE: The San Diego Water Board agrees with the request. The San Diego Water Board has included a WER multiplier to the WQBELs expressed as receiving water limitations for the Shelter Island Yacht Basin Dissolved Copper TMDL. The WER is assumed to be 1.0 unless there is a site-specific and chemical-specific WER. The WER must be incorporated into the Basin Plan before it can be utilized in the calculation for the WQBELs expressed as receiving water limitations. The footnote includes this clarification. The San Diego Water Board also revised the footnotes for the WER term in the Chollas Creek Dissolved Metals TMDLs to clarify that the WER is assumed to be 1.0 unless a site-specific and chemical-specific WER is provided in the Basin Plan.	

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AttE2-3	ATTACHMENT E 2: Shelter Island Yacht Basin Dissolved Copper TMDLs	
	COMMENT: *Revise Shelter Island Yacht Basin Dissolved Copper TMDL requirements to allow for BMP-based compliance.* The San Diego County Copermittees requested that the Shelter Island Yacht Basin Dissolved Copper TMDL requirements be revised to allow for BMP-based compliance.	**Copermittees** San Diego County Copermittees
	RESPONSE: The San Diego Water Board agrees with the request to include a BMP-based compliance determination option. Please see the response to comment AttE-1.	

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AttE3-1	ATTACHMENT E 3: Rainbow Creek Total Nitrogen and Total Phosphorus TMDLs	
	COMMENT: *Request to remove the Rainbow Creek Total Nitrogen and Total Phosphorus TMDLs from the Tentative Order.* The County of San Diego and San Diego County Copermittees requested the Rainbow Creek Total Nitrogen and Total Phosphorus TMDLs be removed from Attachment E to the Tentative Order. The Copermittees noted that the TMDL, as it is incorporated in the Basin Plan, only identified a wasteload allocation (WLA) for Caltrans. The TMDL only assigns load allocation (LAs) for land uses to the County of San Diego. The Copermittees assert that only requirements for WLAs can be incorporated into an NPDES permit. The San Diego County Copermittees also requested, if the Rainbow Creek Total Nitrogen and Total Phosphorus TMDLs are not removed from Attachment E, that one of the compliance determination options allow the Responsible Copermittee to demonstrate compliance by "using its legal authority to reduce nutrient discharges from the land uses identified…to the maximum extent practicable."	**Copermittees** County of San Diego San Diego County Copermittees
	RESPONSE: The San Diego Water Board disagrees with the request to remove the Rainbow Creek Total Nitrogen and Total Phosphorus TMDLs from Attachment E. The San Diego Water Board also disagrees with allowing compliance by only achieving MEP. The Basin Plan states in the Rainbow Creek Total Nitrogen and Total Phosphorus TMDLs, "*In the event that a nonpoint source becomes a permitted discharge, the portion of the load allocation that is associated with the source can become a wasteload allocation*" (page 7-17 of the Basin Plan). The Rainbow Creek Total Nitrogen and Total Phosphorus TMDLs include several LAs that have been assigned to land uses that fall within the jurisdiction of the County of San Diego and discharge non-storm water and storm water to and from its MS4. Because these "nonpoint sources" are discharges subject to the requirements of an NPDES permit, they are permitted discharges. Thus they are effectively and appropriately considered WLAs that must be incorporated into the Tentative Order. The San Diego Water Board has revised and reorganized the format of the TMDL requirements in Attachment E, as requested by the Copermittees (see response to comment AttE-4). The reformatting and reorganization also resulted in the removal of the WLA term from the TMDL requirements. The introductory paragraph has been revised to specify that the TMDLs in Attachment E incorporate provisions that implement the LAs and WLAs applicable to discharges regulated under the Tentative Order.	

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AttE3-1	ATTACHMENT E 3: Rainbow Creek Total Nitrogen and Total Phosphorus TMDLs	
	The request by the Copermittees to include a compliance determination option of allowing compliance only by achieving MEP is not appropriate for a TMDL. TMDLs require the achievement of WQBELs when technology-based effluent limitations (TBELs) cannot achieve the attainment of water quality standards in receiving waters. The MEP standard is a TBEL. The Responsible Copermittee must achieve the WQBELs to either restore or protect water quality standards in receiving waters, or ensure discharges from the MS4 do not cause or contribute to exceedances of water quality standards in receiving waters. The San Diego Water Board did not remove the Rainbow Creek Total Nitrogen and Total Phosphorus TMDLs from Attachment E. The San Diego Water Board did not include a compliance determination option that allows compliance only by achieving MEP.	

ATTACHMENT E 4: Chollas Creek Dissolved Copper, Lead, and Zinc TMDLs
AttE4-1: *Request to revise the Chollas Creek Dissolved Copper, Lead, and Zinc TMDL requirements to allow for BMP-based compliance.*

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AttE4-1	ATTACHMENT E 4: Chollas Creek Dissolved Copper, Lead, and Zinc TMDLs	
	COMMENT: *Request to revise the Chollas Creek Dissolved Copper, Lead, and Zinc TMDL requirements to allow for BMP-based compliance.* The San Diego County Copermittees requested that the Chollas Creek Dissolved Copper, Lead, and Zinc TMDL requirements be revised to allow for BMP-based compliance.	**Copermittees** San Diego County Copermittees
	RESPONSE: The San Diego Water Board agrees with the request to include a BMP-based compliance determination option. Please see the response to comment AttE-1.	

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AttE5-1	ATTACHMENT E 5: Baby Beach and Shelter Island Shoreline Park Bacteria TMDLs	
	COMMENT: *Request to revise the WQBELs of the Baby Beach and Shelter Island Shoreline Park Bacteria TMDL requirements to allow for load-based compliance.* The Orange County and San Diego County Copermittees, Environmental Groups, and the USEPA each commented that the bacteria TMDLs included load-based WLAs, expressed as mass loads, percent load reductions, or both, and recommended including load-based WQBELs. The Orange County and San Diego County Copermittees requested the WQBELs include load-based effluent limitations and allow compliance to be demonstrated with load-based effluent limitations instead of concentration-based effluent limitations. The Environmental Groups did not support allowing compliance determination solely through mass-loading numbers.	**Copermittees** Orange County Copermittees San Diego County Copermittees **Environmental Organizations** Environmental Groups **State/Federal Government** USEPA
	RESPONSE: The San Diego Water Board agrees with the request to include requirements that allow for load-based compliance with the Baby Beach and Shelter Island Shoreline Park Bacteria TMDLs. Please see the responses to comment AttE-1 and AttE-3.	

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AttE6-1	ATTACHMENT E 6: Beaches and Creeks Bacteria TMDLs	
	COMMENT: *Water bodies no longer listed on the 303(d) List should not be required to implement or comply with the requirements of the Beaches and Creeks Bacteria TMDLs.* The Orange County and San Diego County Copermittees and the Cities of Carlsbad, Del Mar and Encinitas submitted comments noting that the Beaches and Creeks Bacteria TMDLs included language that beach segments that were delisted from the 303(d) list are not subject to further action and not required to submit Bacteria Load Reduction Plans (BLRPs) or Comprehensive Load Reduction Plans (CLRPs) as long as monitoring continues to support compliance with REC-1 water quality standards. The Copermittees requested that the Beaches and Creeks Bacteria TMDLs be modified so the beach segments that are not included on the 303(d) list are not required to implement or comply with the Beaches and Creek Bacteria TMDLs requirements.	**Copermittees** City of Carlsbad City of Del Mar City of Encinitas Orange County Copermittees San Diego County Copermittees
	RESPONSE: The San Diego Water Board disagrees that beach segments that are not on the 303(d) List should not be required to implement or comply with the Beaches and Creek Bacteria TMDLs requirements. The Beaches and Creeks Bacteria TMDLs have been incorporated into the Basin Plan and apply to all the water bodies listed in the TMDL. The Copermittees cite the following from the introduction to the Beaches and Creeks TMDLs: "*Specific beach segments from some of the Pacific Ocean shorelines listed in the above table have been delisted from the 2008 303(d) list that was approved by the San Diego Board on December 16, 2009, and therefore are not subject to any further action as long as monitoring data continues to support compliance with water quality standards*" (Basin Plan page 7-60). This does not mean that the TMDLs do not apply to these segments, only that the current BMPs are working and additional actions (i.e. additional BMPs) are not necessary at this time. Under the TMDL Compliance Schedule for the Beaches and Creeks Bacteria TMDLs, the Basin Plan states: "*The TMDLs that address the Pacific Ocean shorelines identified in the 2002 303(d) List are assumed to be applicable to all the beaches located on the shorelines of the hydrologic subareas (HSAs), hydrologic areas (HAs), and hydrologic units (HUs) listed above, or as listed individually in the 2008 and future 303(d) Lists*" (Basin Plan page 7-106). This means that the TMDLs apply to the entire Pacific Ocean Shorelines identified in the TMDL and is not only where there are beach segments that are listed on the 303(d) List. Thus, it does not matter if a particular segment has been delisted, the TMDLs still apply to the entire Pacific Ocean Shoreline identified in the TMDL.	

AttE6-1	ATTACHMENT E 6: Beaches and Creeks Bacteria TMDLs	
	The TMDL Compliance Schedule also states, "*In some cases, receiving water limitations are already being met, resulting in the delisting of those segments or areas from the 2006 and/or 2008 303(d) Lists. The protection of the REC-1 beneficial use of those delisted segments or areas, however, must also be maintained, and those segments or areas must remain off future iterations of the 303(d) List… If receiving water limitations are exceeded in the future in those locations, the BLRPs or CLRPs must include the implementation of a BMP program that will ensure that the TMDLs will be achieved by the end of the TMDL compliance schedules*." (Basin Plan page 7-106). The Basin Plan continues, "*For watersheds in Table 7-52 where there are no longer any impairments listed on the 2008 303(d) List, the Phase I MS4s and Caltrans are not required to submit a BLRP or CLRP within 18 months of the effective date of these TMDLs. If, however, any segment of a waterbody for the watershed (Pacific Ocean shoreline, creek, or mouth as shown in Table7-36) is re-listed on a future 303(d) List for any type of indicator bacteria, the Phase I MS4s and Caltrans will be required to submit a BLRP or CLRP within 6 months of the adoption of the 303(d) List by the San Diego Regional Board*" (page 7-107). This means that a BLRP or CLRP is not required by the Basin Plan to be submitted within 18 months of the effective date of the TMDLs, but it also does not mean that the San Diego Water Board cannot require a BLRP or CLRP to be submitted. The Beaches and Creeks Bacteria TMDLs were developed when it was unknown when the Orange County and San Diego County MS4 Permits would be renewed to incorporate the requirements of the TMDLs. At the time the TMDLs were adopted, the Orange County MS4 Permit had just been renewed in 2009, and the San Diego County MS4 Permit was unlikely to be renewed before 2012. The San Diego Water Board wanted the implementation of the TMDLs to begin with the submittal of BLRPs or CLRPs, before the Orange County and San Diego County MS4 permits were expected to be renewed. Thus, the TMDL included the 18 month period of time for the Copermittees to develop the BLRPs or CLRPs to be required by the San Diego Water Board through an appropriate regulatory mechanism. The regulatory mechanism to compel the submittal of the BLRPs or CLRPs from the Copermittees could have been in the form of an investigative order, enforcement action, or a modification to the existing MS4 permits. The San Diego Water Board removed the 18 month BLRP or CLRP submittal requirement only for the watersheds where there were no bacteria impairments on the 2008 303(d) List because there was not the same level of urgency to begin implementation of the TMDL requirements as for those watersheds where there continue to be bacteria impairments. The removal of the 18 month BLRP or CLRP submittal requirement did not mean that a BLRP or CLRP would not be required to be developed as part of the TMDL requirements in the MS4 permit.	

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AttE6-1	ATTACHMENT E 6: Beaches and Creeks Bacteria TMDLs	
	The fact that the Beaches and Creeks Bacteria TMDLs are now part of the Basin Plan means that the TMDLs and the requirements of the TMDLs must be implemented through a regulatory mechanism to restore water quality standards in receiving waters and/or ensure discharges are not causing or contributing to exceedances of water quality standards in receiving waters. In this case, the Tentative Order is the regulatory mechanism that is implementing the requirements of the Beaches and Creeks Bacteria TMDLs to ensure that discharges from the Copermittees' MS4s will comply with the WLAs in the TMDL and not cause or contribute to exceedances of water quality standards in receiving waters. For segments or areas where there is no bacteria impairment identified on the 303(d) List, implementation of the Beaches and Creeks Bacteria TMDL requirements in the Tentative Order will ensure that discharges from the Copermittees' MS4s will continue to not cause or contribute to exceedances of water quality standards in receiving waters and remain off the 303(d) List. The Copermittees will be required to include the monitoring and assessments that are necessary to demonstrate that discharges from the Copermittees MS4s continue to not cause or contribute to exceedances of water quality standards in receiving waters and remain off the 303(d) List. The Copermittees will not be required to include additional BMPs in the Water Quality Improvement Plans if the existing BMPs are allowing the Copermittees to achieve the bacteria TMDL requirements. If, however, bacteria impairments result in the re-listing of any of these beach segments on the 303(d) List, the incorporation of the TMDL requirements in the Water Quality Improvement Plan will fulfill the CLRP requirements, and the Copermittees will be required to update the Water Quality Improvement Plan to ensure that discharges from the Copermittees' MS4s will not cause or contribute to exceedances of water quality standards in receiving waters by the final TMDL compliance date.	

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AttE6-2	ATTACHMENT E 6: Beaches and Creeks Bacteria TMDLs	
	COMMENT: *Estimated costs to implement Beaches and Creeks Bacteria TMDLs are very high, and TMDLs may not be attainable.* Several community planning groups, the County of San Diego and the San Diego Taxpayers Association expressed concerns with the estimated costs of implementing the Beaches and Creeks Bacteria TMDLs. There were also concerns expressed about the feasibility of attaining the TMDLs. The commenters generally objected to including the Beaches and Creeks Bacteria TMDLs in the Tentative Order until there was some certainty that the expenses associated with implementing the TMDLs will result in the achievement of the TMDLs.	**Community Planning Groups** Pala Pauma Valley Community Sponsor Group Jamul Dulzura Community Planning Group Ramona Community Planning Group Julian Community Planning Group **Copermittees** County of San Diego County of San Diego Office of County Counsel **Societies/Associations/Coalitions** San Diego Taxpayers Association
	RESPONSE: The San Diego Water Board understands the concerns with the potential costs of implementing the requirements of the TMDLs, as well as the concerns with the feasibility of attaining the TMDLs. The costs associated with achieving the requirements of the Beaches and Creeks Bacteria TMDLs were considered during Basin Plan amendment process. The Beaches and Creeks Bacteria TMDL Basin Plan amendment was made available for public review and comment on several occasions. The San Diego Water Board adopted the Beaches and Creeks Bacteria TMDLs after considering the potential costs. The State Water Board, Office of Administrative Law, and the USEPA also approved the Beaches and Creeks Bacteria TMDLs. At this time it is difficult to predict the actual costs of complying with the Beaches and Creeks Bacteria TMDL requirements. Even the estimates that have been provided by the County of San Diego and the City of San Diego in their Comprehensive Load Reduction Plans acknowledge there is significant uncertainty in their cost estimates. While the cost estimates do provide some idea of the magnitudes of the potential costs for implementing BMPs and programs to achieve the TMDLs, the cost estimates fail to include or consider the potential cost savings or cost benefits that may be achieved or realized by implementing the Beaches and Creeks Bacteria TMDLs. The Beaches and Creeks Bacteria TMDL requirements provide the Copermittees a compliance schedule of up to 20 years. The Copermittees have not truly begun implementing the requirements of the TMDLs and have only questioned and raised concerns over the potential costs and feasibility of attaining the TMDLs before developing any information to demonstrate the TMDLs cannot, in fact, be attained or that the costs exceed the benefits of implementing the TMDLs.	

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AttE6-2	ATTACHMENT E 6: Beaches and Creeks Bacteria TMDLs	
	The San Diego Water Board is implementing the requirements of the federal Clean Water Act. The incorporation of the requirements of the Beaches and Creeks Bacteria TMDLs in the Tentative Order is required to implement the WLAs that have been assigned to the MS4s, which is supported by the USEPA. The San Diego Water Board has not removed the Beaches and Creeks Bacteria TMDLs from Attachment E to the Order.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

AttE6-3	ATTACHMENT E 6: Beaches and Creeks Bacteria TMDLs	
	COMMENT: *Request to revise the WQBELs of the Beaches and Creeks Bacteria TMDL requirements to allow for load-based compliance.* The Orange County and San Diego County Copermittees, the City of Laguna Niguel, Environmental Groups, and the USEPA each commented that the bacteria TMDLs included load-based WLAs, expressed as mass loads, percent load reductions, or both, and recommended including load-based WQBELs. Several Copermittees submitted separate letters that supported the inclusion load-based WQBELs. The Orange County and San Diego County Copermittees requested the WQBELs include load-based effluent limitations and allow compliance to be demonstrated with load-based effluent limitations instead of concentration-based effluent limitations. The Environmental Groups did not support allowing compliance determination solely through mass-loading numbers.	**Copermittees** City of Dana Point City of Imperial Beach City of Laguna Niguel City of Mission Viejo City of Poway City of Rancho Santa Margarita City of San Diego Orange County Copermittees San Diego County Copermittees **Environmental Organizations** Environmental Groups **State/Federal Government** USEPA
	RESPONSE: The San Diego Water Board agrees with the request to include requirements that allow for load-based compliance with the Beaches and Creeks Bacteria TMDLs. Please see the responses to comment AttE-1 and AttE-3.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

AttE6-4	ATTACHMENT E 6: Beaches and Creeks Bacteria TMDLs	
	COMMENT: *Request to revise the Beaches and Creeks Bacteria TMDL requirements to allow for BMP-based compliance.* The Orange County and San Diego County Copermittees requested that the Beaches and Creeks Bacteria TMDL requirements be revised to allow for BMP-based compliance. Several Copermittees submitted separate comments supporting the concept. Comments from Environmental Groups were not in support of allowing BMP-based compliance with the TMDL requirements through a "reasonable assurance analysis."	**Copermittees** City of Imperial Beach City of Poway City of San Diego Orange County Copermittees San Diego County Copermittees **Environmental Organizations** Environmental Groups
	RESPONSE: The San Diego Water Board agrees with the Copermittees' request. The San Diego Water Board disagrees with the Environmental Groups that BMP-based compliance option should not be provided. Please see the response to comment AttE-1.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

AttE6-5	ATTACHMENT E 6: Beaches and Creeks Bacteria TMDLs	
	COMMENT: *Request to revise the Beaches and Creeks Bacteria TMDL requirements to allow for adjustment of interim TMDL compliance dates.* The Orange County and San Diego County Copermittees and the City of San Diego submitted comments noting that the Beaches and Creeks Bacteria TMDL included a provision that allows for the Copermittees to propose interim compliance dates if they develop a Comprehensive Load Reduction Plan, and requested the TMDL requirements be modified to allow for the interim TMDL compliance dates to be adjusted. The City of Imperial Beach supported the concept. The Environmental Groups requested that there be an assessment of progress toward achieving the interim goals within the term of the permit.	**Copermittees** City of Imperial Beach City of San Diego Orange County Copermittees San Diego County Copermittees **Environmental Organizations** Environmental Groups
	RESPONSE: The San Diego Water Board agrees with the Copermittees to allow for the interim TMDL compliance dates to be adjusted. The San Diego Water Board also agrees that there should be an assessment or progress toward achieving interim goals within the term of the permit. The Water Quality Improvement Plan is essentially the same as a CLRP. Including language allowing the Copermittees to adjust the interim TMDL compliance dates in the Water Quality Improvement Plan would not be inconsistent with the requirements of the Beaches and Creeks Bacteria TMDLs in the Basin Plan. Thus, the San Diego Water Board has included language in Specific Provision 6.c.(1) of the revised Tentative Order that allows the Copermittees to propose alternative interim TMDL compliance dates in the Water Quality Improvement Plan. The requirements of Provision B.3.a.(2)(b) in the revised Tentative Order also require the Copermittees to establish an interim goal that the Copermittees will work toward achieving within the term of the permit.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

AttE6-6	ATTACHMENT E 6: Beaches and Creeks Bacteria TMDLs	
	COMMENT: *Requests to revise the WQBELs of the Beaches and Creeks Bacteria TMDLs requirements.* The City of Laguna Niguel submitted comments with information from a study being conducted by the Southern California Coastal Waters Research Project (SCCWRP) in cooperation with the Copermittees regarding bacteria loads that can be attributed to natural sources. The information provided by the City of Laguna Niguel was provided to support a request to include load-based WQBELs based on load reductions. The City of Laguna Niguel also requested that the load reductions be calculated using a baseline of 1996-2002 data instead of 2002-2011 data. The San Diego County Copermittees submitted comments noting that the total coliform water quality objectives only apply to ocean waters and should not be applied to creeks. The San Diego County Copermittees requested that the WQBELs expressed as receiving water limitations specify that the total coliform receiving water limitations only apply to beaches and not creeks.	**Copermittees** City of Laguna Niguel San Diego County Copermittees
	RESPONSE: The San Diego Water Board agrees with the requests from the City of Laguna Niguel and the San Diego County Copermittees. The San Diego Water Board has incorporated WQBELs expressed as load-based effluent limitations based on percent load reductions. Please see the response to comments AttE-1 and AttE-3. The San Diego Water Board revised the tables with the WQBELs expressed as receiving water limitations to be consistent with the tables in the Beaches and Creeks Bacteria TMDLs.	

AttE6-7: *Request to revise the Beaches and Creeks Bacteria TMDLs monitoring and assessment requirements to be consistent with TMDL Basin Plan amendment.*

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

AttE6-7	ATTACHMENT E 6: Beaches and Creeks Bacteria TMDLs	
	COMMENT: *Request to revise the Beaches and Creeks Bacteria TMDLs monitoring and assessment requirements to be consistent with TMDL Basin Plan amendment.* The San Diego County Copermittees submitted comments requesting that the Beaches and Creeks Bacteria TMDLs monitoring and assessment requirements in the Order include the procedures to calculate wet weather exceedance frequencies as provided in the TMDL Basin Plan amendment.	**Copermittees** San Diego County Copermittees
	RESPONSE: The San Diego Water Board agrees with the request. Specific Provisions 6.d.(1)(c) and 6.d.(2)(c) have been modified to include the procedures for calculating the dry weather and wet weather exceedance frequencies for beaches and creeks.	

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California Regional Water Quality Control Board

San Diego Region

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TO: Chairman Wright and San Diego Regional Water Quality Control Board Members

FROM: Catherine George Hagan, Senior Staff Counsel
Office of Chief Counsel

DATE: 5 November 2009

SUBJECT: Regulatory Authority for Imposing Numeric Effluent Limits on Dry Weather, Non-Storm Water Discharges, in Municipal Storm Water Permits

At the July 1, 2009, San Diego Regional Board Meeting, Regional Board members received public comments regarding the inclusion of regulations specific to non-storm water discharges in Tentative Order No. R9-2009-002, the reissuance of National Pollutant Discharge Elimination System (NPDES) Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) draining the watersheds of Orange County within the San Diego Region (South Orange County Municipal Storm Water Requirements). At the July meeting, Regional Board members requested that Board Counsel respond to public comments and Board member questions regarding the Regional Board regulation of non-storm water discharges. Commenters assert that the definition of "storm water" in the federal regulations includes drainage and surface runoff entirely unrelated to precipitation events. They also comment that regardless of whether a discharge is composed entirely of storm water or non-storm water, any pollutants discharged *from* an MS4 are subject to the maximum extent practicable (MEP) standard and related iterative process, despite the Clean Water Act's (CWA) requirement that discharges of non-storm water into an MS4 be "effectively prohibited." As a result, commenters assert that numeric effluent limitations on dry weather, non-storm water discharges are inappropriate. Board members also sought clarity on the claims by copermittees that many provisions in the Tentative Order are unfunded state mandates, requiring reimbursement by the State. This memorandum addresses both the non-storm water and unfunded mandate issues.

I. Regulatory Background

The Clean Water Act (CWA) employs the strategy of prohibiting the discharge of any pollutant from a point source into waters of the United States unless the discharger of the pollutant(s) obtains a NPDES permit pursuant to Section 402 of the Clean Water Act. The 1987 amendment to the CWA includes provision 402(p) that specifically addresses NPDES permitting requirements for storm water discharges from MS4s. Section 402(p) prohibits the discharge of pollutants from specified MS4s to waters of the United States except as authorized by an NPDES permit and identifies two substantive standards for MS4 storm

water permits. MS4 permits (1) "shall include a requirement to effectively prohibit non-stormwater discharges into the storm sewers[ ]" and (2) "shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or State determines appropriate for the control of such pollutants." (CWA Section 402(p)(3)(B)(ii-iii).)

On November 16, 1990, USEPA published regulations addressing storm water discharges from MS4s. (Vol. 55 Federal Register (Fed. Reg.) 47990 and following (Nov. 16, 1990).) The regulations establish minimum requirements for MS4 permits, and generally focus on the requirement that MS4s implement programs to reduce the amount of pollutants found in storm water discharges to the maximum extent practicable. However, the regulations also require the MS4's program to include an element to detect and remove illicit discharges and improper disposal into the storm sewer. (40 CFR § 122.26(d)(2)(iv)(B).) "Illicit discharges" defined in the regulations is the most closely applicable definition of "non-storm water" contained in federal law and the terms are often used interchangeably. The State Water Board has concluded that "U.S. EPA added the illicit discharge program requirement with the stated intent of implementing the Clean Water Act's provision requiring permits to 'effectively prohibit non-storm water discharges.'" (State Board Order WQ 2009-0008 (*County of Los Angeles)*, p. 4.)

II. Definition of Storm Water and Non-Storm Water

Federal regulations define "storm water" as "storm water runoff, snow melt runoff, and surface runoff and drainage." (40 C.F.R. § 122.26(b)(13).) While "surface runoff and drainage" is not defined in federal law, USEPA's preamble to the federal regulations demonstrates that the term is related to precipitation events such as rain and/or snowmelt. (55 Fed. Reg. 47990, 47995-96.) For example, USEPA states: "In response to the comments [on the proposed rule] which requested EPA to define the term 'storm water' broadly to include a number of classes of discharges which are not in any way related to precipitation events, EPA believes that this rulemaking is not an appropriate forum for addressing the appropriate regulation under the NPDES program of such non-storm water discharges . . . . Consequently, the final definition of storm water has not been expanded from what was proposed." (*Ibid.*) The State Water Board recently considered and rejected in its precedential *Los Angeles County* order, WQ 2009-0008, the very arguments made here by commenters that storm water includes dry weather flows, completely unrelated to precipitation events. The State Water Board concluded that "U.S. EPA has previously rejected the notion that 'storm water,' as defined at 40 Code of Federal Regulations section 122.26(b)(13), includes dry weather flows. In U.S. EPA's preamble to the storm water regulations, U.S. EPA rejected an attempt to define storm water to include categories of discharges 'not in any way related to precipitation events.' [Citations.]" (*County of Los Angeles,* Order WQ 2009-0008, p. 7.)

The storm water regulations themselves identify numerous categories of discharges including landscape irrigation, diverted stream flows, discharges from potable water sources, foundation drains, air conditioning condensation, irrigation water, springs, water from crawl space pumps, footing drains, lawn watering, individual residential car washing, and street

wash water as "non-storm water." While these types of discharges may be regulated under storm water permits, they are not considered storm water discharges. (40 CFR § 122.26(d)(2)(iv)(B).) Applicable regulations do not prohibit these and other categories of non-storm water discharges that are not expected to be a source of pollutants. But where, as in the Tentative Permit, certain categories of non-storm water discharges have been identified by the municipality to be sources of pollutants, they are no longer exempt and become subject to the effective prohibition requirement in section 402(p)(3)(B)(ii). This process would be wholly unnecessary if MEP were the governing standard for these non-storm water discharges.

Not only does a review of the storm water regulations and USEPA's discussion of the definition of storm water in its preamble to these regulations strongly support the interpretation that storm water includes only precipitation-related discharges, the Regional Board is bound to follow the State Water Board's interpretation of the definition of "storm water" set forth in the precedential State Water Board Order WQ 2009-0008 which rejects the commenters' interpretation. Therefore, while commenters assert that dry weather, non-precipitation related discharges are nonetheless storm water discharges (and therefore subject to the MEP standard in CWA section 402(p)(3)(B)(iii)), their interpretation is not supported and does not conform to applicable State Water Board precedent.

III. Non-Storm Water Regulation

Oral and written comments received by the Regional Board throughout this proceeding assert that the *discharge* of non-storm water, like storm water, from the MS4 is subject to the MEP standard and may not be regulated appropriately with numeric effluent limitations. Several commenters assert that once pollutants contained in prohibited non-storm water enter the MS4, the MEP standard and related iterative approach to storm water regulation is the most stringent means available to require those discharges to comply with water quality standards. In other words, the commenters assert that it is inappropriate for a Regional Board to regulate non-storm water discharges with numeric effluent limitations. As explained below, this interpretation is incorrect. Building on the effective prohibition against non-storm water discharges, the Clean Water Act requirement to reduce pollutants discharged from the MS4 to the MEP standard necessarily is limited to storm water discharges.

The Clean Water Act's municipal storm water MEP standard does not require storm water discharges to strictly meet water quality standards, as is required for other NPDES permitted discharges. This distinction reflects Congress's recognition that variability in flow and intensity of storm events render difficult strict compliance with water quality standards by MS4 permittees. In describing the controls that permits must include to reduce pollutants in storm water discharges to the MEP, the statute states that the controls shall include: "management practices, control techniques and system, design and engineering methods, and such other provisions as the [permit writer] determines appropriate for the control of such pollutants." (CWA § 402(p)(3)(B)(iii).)

In contrast, non-storm water discharges from the MS4 that are not authorized by separate NPDES permits, nor specifically exempted, are subject to requirements under the NPDES program, including discharge prohibitions, technology-based effluent limitations and water quality-based effluent limitations. (40 C.F.R. § 122.44.) USEPA's preamble to the storm

water regulations also supports the interpretation that regulation of non-storm water discharges through an MS4 is not limited to the MEP standard in CWA section 402(p)(3)(B)(iii):

> "Today's rule defines the term "illicit discharge" to describe any discharge through a municipal separate storm sewer system that is not composed entirely of storm water and that is not covered by an NPDES permit. Such illicit discharges are not authorized under the Clean Water Act. Section 402(p(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit." (55 Fed. Reg. 47990, 47995.)

USEPA has recently affirmed its support for the Tentative Order's regulatory approach to non-storm water discharges in comments submitted in this proceeding. As noted above, the State Water Board concluded in its recent Order WQ 2009-0008 that "U.S. EPA added the illicit discharge program requirement with the stated intent of implementing the Clean Water Act's provision requiring permits to 'effectively prohibit non-storm water discharges.'" (State Board Order WQ 2009-0008 (*County of Los Angeles)*, p. 4.) Along these same lines, the State Water Board also explained that "the Clean Water Act and the federal storm water regulations assign different performance requirements for storm water and non-storm water discharges. These distinctions in the guidance document . . . , the Clean Water Act, and the storm water regulations make it clear that a regulatory approach for storm water - such as the iterative approach we have previously endorsed - is not necessarily appropriate for non-storm water." (State Water Board Order WQ 2009-0008, *County of Los Angeles),* p. 9.)

Some commenters place extensive reliance on various State Water Board water quality orders, the State Water Board's expert storm water panel (also known as the "Blue Ribbon Panel") report entitled, *The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities* (June 2006), and other references, to assert that it is inappropriate to include numeric effluent limitations for dry weather non-storm water discharges from the MS4. It is important to note that the Blue Ribbon Panel neither considered nor made any determination on how non-storm water discharges from MS4s that adversely affect receiving waters are to be addressed. The discussion of the feasibility of numeric and/or narrative water quality-based effluent limitations and the MEP standard within these documents is applicable to discharges of storm water from MS4 systems, and does not pertain to non-storm water discharges from the MS4. Similarly, commenters also identify a superior court ruling in (*Cities of Arcadia, et al., v. State Water Resources Control Board* (Super. Ct. Orange County, 2007, No. 06CC02974)) (*Arcadia II*) to support its interpretation that numeric effluent limitations are not legally appropriate for the non-storm water discharges identified in the Tentative Order. Again, these references pertain to storm water and not non-storm water discharges and are inapposite here.

Federal law mandates that permits issued to MS4s must require management practices that will result in reducing storm water pollutants to the MEP yet at the same time requires that non-storm water discharges be effectively prohibited from entering the MS4.

Consistent with USEPA's position, the State Water Board has clearly indicated that Regional Boards are not limited by the iterative approach to storm water regulations in crafting appropriate regulations for non-storm water discharges. (State Water Board Order WQ 2009-0008, *County of Los Angeles),* p. 9.) The argument that non-storm water discharges, prohibited from entry into the MS4 in the first instance, should be held to comply with only the less stringent MEP standard developed for storm water discharges in recognition of the variable quality of storm events, is contrary to and potentially renders the "effectively prohibit" requirement in section 402(p)(3)(B)(ii) meaningless. While water quality based effluent limits, expressed as numeric effluent limitations, are not *required* to be imposed on dry weather, non-storm water discharges from the MS4, it is legally permissible to do so.[1]

IV. Water Code Section 13241

Many commenters assert that provisions in the Tentative Order, including NELs, storm water action levels (SALs), and implementation of the Baby Beach TMDL requirements, are new permit terms that exceed federal law. Therefore, the commenters argue that the Regional Board is required, but has failed, to consider Water Code section 13241 factors, including economic considerations, prior to approving any of these provisions. The City of Dana Point cites extensively to the California Supreme Court case, *City of Burbank v. State Water Resources Control Board, et al.* ((2005) 35 Cal.4th 613) (*Burbank*), particularly the concurring opinion of Justice Brown, as supportive of its assertions.

The *Burbank* court stated: "[Water Code s]ection 13377 specifies that wastewater discharge permits must meet the federal standards set by federal law. In effect, section 13377 forbids a regional board's consideration of any economic hardship on the part of the permit holder if doing so would result in the dilution of the requirements set by Congress in the Clean Water Act. That act prohibits the discharge of pollutants into the navigable waters of the United States unless there is compliance with federal law (33 U.S.C. § 1322(a)), and publicly operated wastewater treatment plants such as those before us here must comply with the act's clean water standards, regardless of cost [citations]. Because [Water Code] section 13263 cannot authorize what federal law forbids, it cannot authorize a regional board, when issuing a wastewater discharge permit, to use compliance costs to justify pollutant restrictions that do not comply with federal clean water standards." (*Burbank,* 35 Cal.4th at 625.*)*

While the Burbank decision does require an analysis of Water Code section 13241 factors when the state adopts permit conditions that are more stringent than federal law (*id. at 618*) the Tentative Order reflects that all of the challenged provisions are required to implement federal law. Thus, the Regional Board is not required to consider economic information to justify a "dilution of the requirements" established in federal law. Nonetheless, as staff has

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[1] Commenters have also claimed that TMDLs are inappropriately included as numeric effluent limitations on both dry and wet weather discharges. This is not the case. The Tentative Order requires the Copermittees to implement BMPs capable of achieving the interim and final Waste Load Allocations (WLA) and Numeric Targets in the approved TMDL. The BMPs apply to the discharges, while compliance with the WLAs and Numeric Targets occurs in receiving waters. Further, the Copermittees have 10 years to meet the final allocations and targets established for wet weather. Finally, these provisions within the Tentative Order comply with federal regulations [40 CFR 122.33(d)(1)(vii)(B)] by being consistent with the assumptions and requirements of the Waste Load Allocations of an adopted and applicable TMDL.

noted extensively in responses to comments, to the extent that economic information has been provided in connection with compliance and other costs associated with challenged permit provisions, staff has fully considered this information. Under these circumstances, the *Burbank* case does not require more.

V. Unfunded State Mandates

Both prior to and at the July 1, 2009, Regional Board meeting on an earlier version of the Tentative Order, commenters raised the issue of unfunded state mandates in connection with many of the proposed permit provisions. Board members indicated that they would appreciate clarification about the subject of unfunded state mandates. In recently submitted written comments, the City of Dana Point and others again assert that a number of the provisions in the Tentative Order go beyond what is required under federal law and therefore constitute unfunded state mandates that may not be imposed absent necessary funding first being made available to Permittees.

Commenters are correct that one factor to be considered in determining whether a requirement is an unfunded state mandate is whether the requirement goes beyond, or exceeds, what is required by federal law. However, the commenters are incorrect that the provisions in the Tentative Order exceed federal law. Moreover, there are a number of other factors that also must be established before a requirement will be found to be an unfunded state mandate warranting state reimbursement. Finally, unless and until a particular provision is determined by the State of California, Commission on State Mandates (Commission) to be an unfunded state mandate for which reimbursement is required, the Regional Board is not, as some commenters assert, precluded from adopting such provisions.

<u>State Mandate Law</u>

Article XIIIB, Section 6 of the California Constitution requires subvention of funds to reimburse local governments for state-mandated programs in specified situations. The process for establishing that a requirement is subject to reimbursement as an unfunded state mandate involves the filing by a local agency of a Test Claim with the Commission on State Mandates. There are several exceptions and limitations to the subvention requirements that provide bases for the Commission to determine that one or more provisions in a Test Claim are not subject to subvention. Article XIIIB, Section 6 provides, "Whenever the Legislature or any state agency mandates a new program or higher level of service on any local government, the State shall provide a subvention of funds to reimburse that local government for the costs of the program or increased level of service." Implementing statutes clarify that no subvention of funds is required if: (1) the mandate imposes a requirement that is mandated by a federal law or regulation and results in costs mandated by the federal government, unless the statute or executive order mandates costs that exceed the mandate in that federal law or regulation (Govt. Code, § 17556, subd. (c)); or (2) the local agency proposed the mandate (*id.*, subd. (a)); or (3) the local agency has the authority to levy service charges, fees, or assessments sufficient to pay (*id.*, subd. (d)).

Numerous judicial decisions have further defined limitations on the requirements for subvention of funds. Specifically, subvention is only required if expenditure of tax monies is

required, and not if the costs can be reallocated or paid for with fees. *(County of Los Angeles v. Commission on State Mandates* (2003) 110 Cal.App.4th 1176; *Redevelopment Agency v. Commission on State Mandates* (1997) 55 Cal.App.4th 976.) In addition, reimbursement to local agencies is required only for the costs involved in carrying out functions peculiar to government, not for expenses incurred by local agencies as an incidental impact of laws that apply generally to all state residents and entities. Laws of general application are not entitled to subvention. *County of Los Angeles v. State of California* (1987) 43 Cal.3d 46. The fact that a requirement may single out local governments is not dispositive; where local agencies are required to perform the same functions as private industry, no subvention is required. *City of Richmond v. Commission on State Mandates* (1998) 64 Cal.App.4th 1190.

If the Commission determines that provisions in a permit in fact constitute reimbursable state mandates, the determination may be challenged through the judicial process. There also exists a Commission process for determining appropriate reimbursement of state mandates. If a determination that a provision constitutes an unfunded state mandate is upheld, the State likely would decide whether to reimburse the local agency for the program or the Regional Board could decide to withdraw a provision from a permit.

Recent Commission Proceedings

Recently, the Commission issued a Final Statement of Decision in a storm water permit Test Claim filed by the County of Los Angeles and several additional co-permittee test claimants. (*Municipal Storm Water and Urban Runoff Discharges,* 03-TC-04, 03-TC-19, 03-TC-20, and 03-TC-21 (Los Angeles Regional Water Quality Control Board Order No. 01-182 (July 31, 2009) (County of Los Angeles Test Claim).) In the Commission's Statement of Decision, the Commission found that all but one of the challenged provisions issued by the Los Angeles Water Board in its MS4 permit did not qualify as unfunded state mandates as they did "not impose costs mandated by the state within the meaning of article XIII B, section 6 of the California Constitution because the claimants have fee authority (under Cal. Const. article XI, § 7) within the meaning of Government Code section 17556, subdivision (d), sufficient to pay for the activities in those parts of the permit." (County of Los Angeles Test Claim, Statement of Decision, p. 2.)

As you know, on June 20, 2008, the County of San Diego filed a Test Claim with the State of California, Commission on State Mandates (Commission), challenging multiple provisions in Order No. R9-2007-001 (National Pollutant Discharge Elimination System (NPDES) No. CAS0108758), Waste Discharge Requirements for Discharges of Urban Runoff From the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego County, the San Diego Unified Port District, and the San Diego County Regional Airport Authority), adopted on January 24, 2007 (2007 MS4 Permit). The County filed the Test Claim on behalf of 18 of the 20 MS4 Co-permittees (Claimants). Only the San Diego Unified Port District and the San Diego County Regional Airport Authority did not join in the Test Claim. The San Diego Water Board and State Water Board responded to the Test Claim. It is still pending and a draft staff analysis has not yet been issued for comment.

A similar process would need to be followed by the Orange County permittees in order to establish that any of the Tentative Order's provisions constitute unfunded state mandates entitling them to reimbursement by the state.

CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

September 7, 2012

Via U.S. Mail and E-Mail

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Subject: May 10, 2012, Letter from County of Orange, County Counsel and May 21, 2012, Letter from County of Riverside, County Counsel Re Regional Municipal Separate Storm Sewer System Permit

Messrs. Baron and Huff:

This letter responds to legal concerns raised in a May 10, 2012, letter from the County of Orange and the Orange County Flood Control District (collectively Orange County) and in a May 21, 2012, letter from the County of Riverside and Riverside County Flood Control & Water Conservation District (collectively Riverside County). Both letters question whether legal authority exists to support a Regional Municipal Separate Storm Sewer System (MS4) Permit (Regional MS4 Permit), as is under development by the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board). Orange County questions whether and how a regional MS4 permit application process is consistent with and can satisfy the individual permit application requirements in federal law as neither County is yet required to submit, nor has submitted a Report of Waste Discharge (ROWD) for the discharges covered under their respective MS4 Permits.

As a foundation for their concerns, the Counties maintain that the three groups of Copermittees (San Diego County, portions of Orange County and portions of Riverside County) presently regulated under three separate MS4 permits do not share an interconnected MS4, are not under common jurisdiction, contain separate and distinct watersheds, are

characterized by different hydrologic and climatic conditions and possess distinctly different water quality concerns.

The San Diego Water Board has the legal authority to issue a regional MS4 permit through its authority in the Clean Water Act. Section 402, subpart (p)(3)(B) of the Clean Water Act states that "Permits for discharges from municipal storm sewers—(i) may be issued on a system- or jurisdiction-wide basis . . . ." The federal storm water regulations in 40 Code of Federal Regulations (CFR) at Part 122.26, subdivision (a)(1)(v) also state that the Director may designate dischargers from municipal separate storm sewers on a system-wide or jurisdiction-wide basis. In making this determination, the Director may consider the following factors: (A) the location of the discharge with respect to waters of the United States; (B) the size of the discharge; (c) the quantity and nature of the pollutants discharged to waters of the United States; and (D) other relevant factors. (40 CFR Part 122.26(a)(1)(v).)

More specifically, the federal regulations provide that for large and medium MS4 systems, the San Diego Water Board may issue a regional permit. Specifically, the regulations provide:

> "(ii) The Director may either issue one system-wide permit covering all discharges from municipal separate storm sewers within a large or medium municipal storm sewer system or issue distinct permits for appropriate categories of discharges within a large or municipal separate storm sewer system including, but not limited to: all discharges owned or operated by the same municipality; located within the same jurisdiction; all discharges within a system that discharge to the same watershed; discharges within a system that are similar in nature; or for individual discharges from municipal separate storm sewers within the system.
>
> (iii) The operator of a discharge from a municipal separate storm sewer which is part of a large or medium municipal separate storm sewer system must either: (A) Participate in a permit application (to be a permittee or a co-permittee) with one or more other operator of discharges from the large or medium municipal storm sewer system which covers all, or a portion of all, discharges from the municipal separate storm sewer system; (B) Submit a distinct permit application which only covers discharges from the municipal separate storm sewers for which the operator is responsible; or (C) A regional authority may be responsible for submitting a permit application under the following guidelines . . . .
>
> (iv) One permit application may be submitted for all or a portion of all municipal separate storm sewers within adjacent or interconnected large or medium municipal separate storm sewer systems. The Director may issue one system-wide permit covering all, or a portion of all municipal separate storm sewers in adjacent or interconnected large or medium municipal separate storm sewer systems.
>
> (v) Permits for all or a portion of all discharges from large or medium municipal separate storm sewer systems that are issued on a system-wide, jurisdiction-

> wide, watershed or other basis may specify different conditions relating to different discharges covered by the permit, including different management programs for different drainage areas which contribute storm water to the system."

(40 CFR Part 122.26 (a)(3)(ii)-(v).)[1]

These regulations make it clear that the San Diego Water Board may issue a regional MS4 permit. The regulations also clarify that the permit may include different conditions for separate discharges covered by the permit. This allows the San Diego Water Board to ensure that suitable water quality conditions and provisions are identified for each watershed.

The United States Environmental Protection Agency's (USEPA) responses to comments for the above-mentioned regulations also make it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide permits. In the Final Rule published in the Federal Register and containing the responses to comments, USEPA notes that that paragraph (iv) (40 CFR § 122.26(a)(3)(iv)) would allow an entire system in a geographical region under the purview of a State agency to be designated under a permit. (National Pollutant Discharge Elimination System Permit Application Regulations for Storm Water Discharges, 55 FR 47990-01, 48042.) USEPA also states that many commenters wanted to allow the permitting authority broad discretion to establish system-wide permits, and that EPA believes that paragraphs (a)(1)(v) and (a)(3)(ii) allow for such broad discretion. (*Id.*, 47990-01, 48039-48042.)

Not only is it legally allowable for the San Diego Water Board to issue a regional MS4 permit, it is also appropriate for the San Diego Water Board to do so. Orange County argues that the three large metropolitan counties "do not share an interconnected municipal storm sewer system, are not under common jurisdiction, and contain separate and distinct watersheds."[2] However, the counties are connected through shared watersheds and/or are adjacent to each other. For example, the Santa Margarita watershed begins in Riverside County but drains into San Diego County. The Regional MS4 Permit creates watershed requirements that apply to multiple counties, which will ensure consistency of regulations in a watershed and result in overall cost savings for the Copermittees due to reduced redundancy in water quality monitoring. Even if the MS4s were not interconnected, the regulations make it clear the San Diego Water Board can require one permit for all MS4s that are adjacent. (40 CFR Part 122.26(a)(3)(iv).) Managing storm water on a watershed basis is expected to result in improved water quality, as the Regional MS4 Permit focuses the monitoring and management practices necessary to improve each watershed rather than arbitrary political boundaries. A single permit also allows San Diego Water Board staff to expend fewer resources developing multiple permits and more resources working cooperatively with all three current groups of Copermittees to ensure implementation of the permit results in improved water quality.

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[1] These regulations are applicable to California's NPDES program. (40 CFR §123.25.)

[2] Letter from the County of Orange, dated May 10, 2012, on page 1.

A regional MS4 permit also does not expand the requirements for each municipality beyond its borders as each municipality is only responsible for discharge within its jurisdictional boundaries. The federal regulations make it clear that Copermittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators. (40 CFR Part 122.26(a)(3)(vi).) The Administrative Draft Regional MS4 Permit does not require the Counties to manage storm water outside of their jurisdictional boundaries, but rather to work collectively to improve storm water management within watersheds.

The San Francisco region-wide permit from the Regional Water Quality Control Board, San Francisco Region, provides an example of a regional MS4 permit. Neither the USEPA nor the State Water Resources Control Board (State Water Board) objected to the San Francisco regional MS4 permit. While that permit was developed with consensus among the Copermittees, the Federal Regulations make it clear that the San Diego Water Board may impose a regional MS4 permit without a consensus. Another example of a regional MS4 permit is in Alaska, where the City of Fairbanks, the City of North Pole, the University of Alaska, and Department of Transportation and Public Facilities received a single permit, NPDES Permit No. AKS-053406.

The Regional MS4 Permit will continue to use the ROWD process prior to initially enrolling any Orange or Riverside County Copermittee into the Regional MS4 Permit or renewing the permit. The San Diego Water Board understands that each municipality is unique although the Counties share watersheds and geographical boundaries. As provided in their current MS4 permits, the Orange and Riverside County Copermittees will submit a ROWD no later than 180 days prior to expiration of their current permits. Staff at the San Diego Water Board will review the ROWDs to determine whether the Copermittees should be enrolled in the Regional MS4 Permit, what changes to the Regional MS4 Permit proposed in the ROWD are appropriate, and what is the proper level of public process for consideration of the issues raised in the ROWDs. The regional MS4 permit will continue to rely on the ROWD process to frame prospective revisions to the permit. Prior to release of the Public Comment Draft Permit, San Diego Water Board staff will consider whether changes to the text of the Administrative Draft are necessary for consistency with the intent to fully evaluate the ROWDs submitted by the Orange and Riverside County Copermittees as outlined above.

Please contact either me at 916-341-5168 or by e-mail at Jessica.jahr@waterboards.ca.gov or Catherine George Hagan at 858-467-2958 or by e-mail at catherine.hagan@waterboards.ca.gov if you have questions.

Respectfully,

Catherine George Hagan for

Jessica Jahr

cc: See next page

cc: David W. Gibson, Executive Officer (via e-mail only)
San Diego Water Board Interested Persons List (via e-mail only)

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

TENTATIVE
ORDER NO. R9-2013-0001
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The San Diego County Copermittees in Table 1a are subject to waste discharge requirements set forth in this Order.

Table 1a. San Diego County Copermittees

City of Carlsbad	City of Oceanside
City of Chula Vista	City of Poway
City of Coronado	City of San Diego
City of Del Mar	City of San Marcos
City of El Cajon	City of Santee
City of Encinitas	City of Solana Beach
City of Escondido	City of Vista
City of Imperial Beach	County of San Diego
City of La Mesa	San Diego County Regional Airport Authority
City of Lemon Grove	San Diego Unified Port District
City of National City	

After the San Diego Water Board receives and considers the Orange County Copermittees' Report of Waste Discharge and makes any necessary changes to this~~e~~ Order, the Orange County Copermittees in Table 1b will become subject to waste discharge requirements set forth in this Order after expiration of Order No. R9-2009-0002, NPDES No. CAS0108740 on or after December 16, 2014.

Table 1b. Orange County Copermittees

City of Aliso Viejo	City of Rancho Santa Margarita
City of Dana Point	City of San Clemente
City of Laguna Beach	City of San Juan Capistrano
City of Laguna Hills	City of Laguna Woods
City of Laguna Niguel	County of Orange
City of Lake Forest	Orange County Flood Control District
City of Mission Viejo	

After the San Diego Water Board receives and considers the Riverside County Copermittees' Report of Waste Discharge and makes any necessary changes to this Order, the Riverside County Copermittees in Table 1c will become subject to waste discharge requirements set forth in this Order after expiration of Order No. R9-2010-0016, NPDES No. CAS0108766 on or after November 10, 2015.

Table 1c. Riverside County Copermittees

City of Murrieta	County of Riverside
City of Temecula	Riverside County Flood Control and Water Conservation District
City of Wildomar	

The Orange County Copermittees and Riverside County Copermittees may become subject to the requirements of this Order at a date earlier than the expiration date of their current Orders subject to the conditions described in Provision F.6 of this Order if the Copermittees in the respective county receive a notification of coverage from the San Diego Water Board.

The term Copermittee in this Order refers to any San Diego County, Orange County, or Riverside County Copermittee covered under this Order, unless specified otherwise.

This Order provides permit coverage for the Copermittee discharges described in Table 2.

Table 2. Discharge Locations and Receiving Waters

Discharge Points	Locations throughout San Diego Region
Discharge Description	Municipal Separate Storm Sewer System (MS4) Discharges
Receiving Waters	Inland Surface Waters, Enclosed Bays and Estuaries, and Coastal Ocean Waters of the San Diego Region

Table 3. Administrative Information

This Order was adopted by the San Diego Water Board on:	**Month Day, 2013**
This Order will become effective on:	**Month Day, 2013**
This Order will expire on:	**Month Day, 2018**
The Copermittees must file a Report of Waste Discharge in accordance with Title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than 180 days in advance of the Order expiration date.	

I, David W. Gibson, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on Month Day, 2013.

TENTATIVE

David W. Gibson
Executive Officer

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Attachment B - Standard Permit Provisions and General Provisions B-1
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Attachment F - Fact Sheet / Technical Report for Order No. R9-2013-0001 ..... F-1

I. FINDINGS

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), finds that:

JURISDICTION

1. **MS4 Ownership or Operation.** Each of the Copermittees owns or operates an MS4, through which it discharges storm water and non-storm water into waters of the U.S. within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the U.S.

2. **Legal and Regulatory Authority.** This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]) adopted by the United States Environmental Protection Agency (USEPA), and chapter 5.5, division 7 of the California Water Code (CWC) (commencing with section 13370). This Order serves as an NPDES permit for discharges from MS4s to surface waters. This Order also serves as waste discharge requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

   The San Diego Water Board has the legal authority to issue a regional MS4 permit pursuant to its authority under CWA section 402(p)(3)(B) and 40 CFR 122.26(a)(1)(v). The USEPA also made it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide permits (55 Federal Register [FR] 47990, 48039-48042). The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees and San Diego Water Board.

   The federal regulations make it clear that the Copermittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators (40 CFR 122.26(a)(3)(vi)). This Order does not require the Copermittees to manage storm water outside of their jurisdictional boundaries, but rather to work collectively to improve storm water management within watersheds.

3. **CWA NPDES Permit Conditions.** Pursuant to CWA section 402(p)(3)(B), NPDES permits for storm water discharges from MS4s must include requirements to effectively prohibit non-storm water discharges into MS4s, and require controls to reduce the discharge of pollutants in storm water to the maximum extent practicable (MEP), and to require other provisions as the San Diego Water Board determines are appropriate to control such pollutants. This Order prescribes conditions to assure compliance with the CWA requirements for owners and operators of MS4s to

effectively prohibit non-storm water discharges in-to the MS4s, and require controls to reduce the discharge of pollutants in storm water from the MS4s to the MEP.

4. **CWA and CWC Monitoring Requirements.** CWA section 308(a) and 40 CFR 122.41(h),(j)-(l) and 122.48 require that NPDES permits must specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s also specify additional monitoring and reporting requirements in 40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c). CWC section 13383 authorizes the San Diego Water Board to establish monitoring, inspection, entry, reporting and recordkeeping requirements. This Order establishes monitoring and reporting requirements to implement federal and State requirements.

5. **Total Maximum Daily Loads.** CWA section 303(d)(1)(A) requires that "[e]ach state shall identify those waters within its boundaries for which the effluent limitations…are not stringent enough to implement any water quality standard applicable to such waters." The CWA also requires states to establish a priority ranking of impaired water bodies known as Water Quality Limited Segments and to establish Total Maximum Daily Loads (TMDLs) for such waters. This priority list of impaired water bodies is called the Clean Water Act Section 303(d) List of Water Quality Limited Segments, commonly referred to as the 303(d) List. The CWA requires the 303(d) List to be updated every two years.

   TMDLs are numerical calculations of the maximum amount of a pollutant that a water body can assimilate and still meet water quality standards. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point sources (waste load allocations or WLAs) and non-point sources (load allocations or LAs), background contribution, plus a margin of safety. Discharges from MS4s are point source discharges. The federal regulations (40 CFR 122.44(d)(1)(vii)(B)) require that NPDES permits ~~to~~ incorporate water quality based effluent limitations (WQBELs) developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, consistent with the assumptions and requirements of any available WLA for the discharge. Requirements of this Order implement the TMDLs adopted by the San Diego Water Board and approved by USEPA as of the time this Order is issued. This Order establishes WQBELs consistent with the assumptions and requirements of all available TMDL WLAs assigned to discharges from the Copermittees' MS4s.

6. **Non-Storm Water Discharges.** Pursuant to CWA section 402(p)(3)(B)(ii), this Order requires each Copermittee to effectively prohibit discharges of non-storm water into its MS4. Nevertheless, non-storm water discharges into and from the MS4s continue to be reported to the San Diego Water Board by the Copermittees and other persons. Monitoring conducted by the Copermittees, as well as the 303(d) List, have identified dry weather, non-storm water discharges from the MS4s as a source of pollutants causing or contributing to receiving water quality impairments in the San Diego Region. The federal regulations (40 CFR 122.26(d)(2)(iv)(B)(1)) require the Copermittees to have a program to prevent illicit discharges to the MS4.

The federal regulations, however, allow for specific categories of non-storm water discharges or flows to be addressed as illicit discharges only where such discharges are identified as sources of pollutants to waters of the U.S.

7. **In-Stream Treatment Systems.** Pursuant to federal regulations (40 CFR 131.10(a)), in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S. Authorizing the construction of a runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to accepting waste assimilation as an appropriate use for that water body. Runoff treatment must occur prior to the discharge of runoff into receiving waters. Treatment control best management practices (BMPs) must not be constructed in waters of the U.S. Construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body.

DISCHARGE CHARACTERISTICS AND RUNOFF MANAGEMENT

8. **Point Source Discharges of Pollutants.** Discharges from the MS4s contain waste, as defined in the CWC, and pollutants that adversely affect the quality of the waters of the state. A discharge from an MS4 is a "discharge of pollutants from a point source" into waters of the U.S. as defined in the CWA. Storm water and non-storm water discharges from the MS4s contain pollutants that cause or threaten to cause a violation of surface water quality standards, as outlined in the Water Quality Control Plan for the San Diego Basin (Basin Plan). Storm water and non-storm water discharges from the MS4s are subject to the conditions and requirements established in the Basin Plan for point source discharges.

9. **Potential Beneficial Use Impairment.** The discharge of pollutants and/or increased flows from MS4s may cause or threaten to cause the concentration of pollutants to exceed applicable receiving water quality objectives and impair or threaten to impair designated beneficial uses resulting in a condition of pollution, contamination, or nuisance.

10. **Pollutants Generated by Land Development.** Land development has created and continues to create new sources of non-storm water discharges and pollutants in storm water discharges as human population density increases. This brings higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash. Pollutants from these sources are dumped or washed off the surface by non-storm water or storm water flows into and from the MS4s. When development converts natural vegetated pervious ground cover to impervious surfaces such as paved highways, streets, rooftops, and parking lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving a developed area without BMPs that can maintain pre-development runoff conditions will contain greater pollutant loads and have significantly greater runoff volume, velocity, and peak flow rate than pre-development runoff conditions from the same area.

11. **Runoff Discharges to Receiving Waters.** The MS4s discharge runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within the eleven hydrologic units comprising the San Diego Region. Historic and current development makes use of natural drainage patterns and features as conveyances for runoff. Rivers, streams and creeks in developed areas used in this manner are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and receiving water. Numerous receiving water bodies and water body segments have been designated as impaired by the San Diego Water Board pursuant to CWA section 303(d).

12. **Pollutants in Runoff.** The most common pollutants in runoff discharged from the MS4s include total suspended solids, sediment, pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., cadmium, copper, lead, and zinc), petroleum products and polynuclear aromatic hydrocarbons, synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus), oxygen-demanding substances (e.g., decaying vegetation, animal waste), detergents, and trash. As operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not prohibit or otherwise control. These discharges may cause or contribute to a condition of pollution or a violation of water quality standards.

13. **Human Health and Aquatic Life Impairment.** Pollutants in runoff discharged from the MS4s can threaten and adversely affect human health and aquatic organisms. Adverse responses of organisms to chemicals or physical agents in runoff range from physiological responses such as impaired reproduction or growth anomalies to mortality. Increased volume, velocity, rate, and duration of storm water runoff greatly accelerate the erosion of downstream natural channels. This alters stream channels and habitats and can adversely affect aquatic and terrestrial organisms.

14. **Water Quality Effects.** The Copermittees' water quality monitoring data submitted to date documents persistent exceedances of Basin Plan water quality objectives for runoff-related pollutants at various watershed monitoring stations. Persistent toxicity has also been observed at several watershed monitoring stations. In addition, bioassessment data indicate that the majority of the monitored receiving waters have Poor to Very Poor Index of Biological Integrity (IBI) ratings. These findings indicate that runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in the San Diego Region. Non-storm water discharges from the MS4s have been shown to contribute significant levels of pollutants and flow in arid, developed Southern California watersheds, and contribute significantly to exceedances of applicable receiving water quality objectives.

15. **Non-Storm Water and Storm Water Discharges.** Non-storm water discharges from the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard of CWA section 402(p)(3)(B)(iii), which is explicitly for "Municipal … *Stormwater Discharges* (emphasis added)" from the MS4s. Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s must be effectively prohibited.

16. **Best Management Practices.** Waste and pollutants which are deposited and accumulate in MS4 drainage structures will be discharged from these structures to waters of the U.S. unless they are removed. These discharges may cause or contribute to, or threaten to cause or contribute to, a condition of pollution in receiving waters. For this reason, pollutants in storm water discharges from the MS4s can be and must be effectively reduced in runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Pollution prevention is the reduction or elimination of pollutant generation at its source and is the best "first line of defense". Source control BMPs (both structural and non-structural) minimize the contact between pollutants and runoff, therefore keeping pollutants onsite and out of receiving waters. Treatment control BMPs remove pollutants that have been mobilized by storm water or non-storm water flows.

17. **BMP Implementation.** Runoff needs to be addressed during the three major phases of development (planning, construction, and use) in order to reduce the discharge of storm water pollutants to the MEP, effectively prohibit non-storm water discharges, and protect receiving waters. Development which is not guided by water quality planning policies and principles can result in increased pollutant load discharges, flow rates, and flow durations which can negatively affect receiving water beneficial uses. Construction sites without adequate BMP implementation result in sediment runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. Existing development can generate substantial pollutant loads which are discharged in runoff to receiving waters. Retrofitting areas of existing development with storm water pollutant control and hydromodification management BMPs is necessary to address storm water discharges from existing development that may cause or contribute to a condition of pollution or a violation of water quality standards.

18. **Long Term Planning and Implementation.** Federal regulations require municipal storm water permits to expire 5 years from adoption, after which the permit must be renewed and reissued. The San Diego Water Board recognizes that the degradation of water quality and impacts to beneficial uses of the waters in the San Diego Region occurred over several decades. The San Diego Water Board further recognizes that a decade or more may be necessary to realize demonstrable improvement to the quality of waters in the Region. This Order includes a long term planning and implementation approach that will require more than a single permit term to complete.

WATER QUALITY STANDARDS

19. **Basin Plan.** The San Diego Water Board adopted the Water Quality Control Plan for the San Diego Basin (Basin Plan) on September 8, 1994 that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for receiving waters addressed through the plan. The Basin Plan was subsequently approved by the State Water Resources Control Board (State Water Board) on December 13, 1994. Subsequent revisions to the Basin Plan have also been adopted by the San Diego Water Board and approved by the State Water Board. Requirements of this Order implement the Basin Plan.

    The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Process Supply (PROC), Industrial Service Supply (IND), Ground Water Recharge (GWR), Contact Water Recreation (REC1), Non-contact Water Recreation (REC2), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Freshwater Replenishment (FRSH), Hydropower Generation (POW), and Preservation of Biological Habitats of Special Significance (BIOL). The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region: Navigation (NAV), Commercial and Sport Fishing (COMM), Estuarine Habitat (EST), Marine Habitat (MAR), Aquaculture (AQUA), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN), and Shellfish Harvesting (SHELL).

20. **Ocean Plan.** The State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, and 2005. The State Water Board adopted the latest amendment on April 21, 2005 and it became effective on February 14, 2006. The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean. Requirements of this Order implement the Ocean Plan.

    The Ocean Plan identifies the following beneficial uses of ocean waters of the state to be protected: Industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture; preservation and enhancement of designated Areas of Special Biological Significance; rare and endangered species; marine habitat; fish spawning and shellfish harvesting

21. **Sediment Quality Control Plan**. On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes: 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health,

and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

22. **National Toxics Rule and California Toxics Rule.** USEPA adopted the National Toxics Rule (NTR) on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the NTR applied in California. On May 18, 2000, USEPA adopted the California Toxics Rule (CTR). The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants.

23. **Antidegradation Policy.** This Order is in conformance with the federal Antidegradation Policy described in 40 CFR 131.12, and State Water Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality Waters in California*. Federal regulations at 40 CFR 131.12 require that the State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. State Water Board Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies.

24. **Anti-Backsliding Requirements.** Section 402(o)(2) of the CWA and federal regulations at 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations may be relaxed. All effluent limitations in this Order are at least as stringent as effluent limitations in the previous permits.

CONSIDERATIONS UNDER FEDERAL AND STATE LAW

25. **Coastal Zone Act Reauthorization Amendments.** Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states with approved coastal zone management programs to address non-point source pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point source pollution: agriculture, silviculture, urban, marinas, and hydromodification. This Order addresses the management measures required for the urban category, with the exception of septic systems. The runoff management programs developed pursuant to this Order fulfills the need for coastal cities to develop a runoff non-point source plan identified in the Non-Point Source Program Strategy and Implementation Plan. The San Diego Water Board addresses septic systems through the administration of other programs.

26. **Endangered Species Act.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 USC sections 1531 to 1544). This Order requires compliance with receiving water limits, and other requirements to protect the beneficial uses of waters of the State. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

27. **Report of Waste Discharge Process.** The waste discharge requirements set forth in this Order are based upon the Report of Waste Discharge submitted by the San Diego County Copermittees prior to the expiration of Order No. R9-2007-0001 (NPDES No. CAS0109266). The Orange County and Riverside County Copermittees are not immediately covered by the waste discharge requirements in this Order. The San Diego Water Board understands that each municipality is unique although the Counties share watersheds and/or geographical boundaries. The Order will continue to use the Report of Waste Discharge process prior to initially making Orange County or Riverside County Copermittees subject to the requirements of this Order.

The federal regulations (40 CFR 122.21(d)(2)) and CWC section 13376 impose a duty on the Copermittees to reapply for continued coverage through submittal of a Report of Waste Discharge no later than 180 days prior to expiration of a currently effective permit. This requirement is set forth in the Orange County Copermittees' and Riverside County Copermittees' currently effective permits at Provisions K.2.b and K.2.c, respectively. The Orange County Permit, Order No. R9-2009-0002 (NPDES No. CAS0108740) expires on December 16, 2014 and the Riverside County MS4 Permit, Order No. R9-2010-0016 (NPDES No. CAS0108766) expires on November 10, 2015.

Unless the Orange County or Riverside County Copermittees apply for and receive early coverage under this Order, the Orange County Copermittees' and the Riverside County Copermittees' respective permits will be superseded by this Order upon expiration of their respective permits, subject to any necessary revisions to the requirements of this Order made after the San Diego Water Board considers their respective Reports of Waste Discharge through the public process provided in 40 CFR Part 124.

28. **Integrated Report and Clean Water Act Section 303(d) List.** The San Diego Water Board and State Water Board submit an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. USEPA issued its *Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act* on July 29, 2005, which advocates the use of a five category approach for classifying the attainment status of water quality standards for water bodies in the Integrated Report. Water bodies included in Category 5 in the Integrated Report

indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 in the Integrated Report are placed on the 303(d) List.

Water bodies with available data and/or information that indicate at least one beneficial use is not being supported or is threatened, but a TMDL is not required, are included in Category 4 in the Integrated Report. Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

Implementation of the requirements of this Order may allow the San Diego Water Board to include surface waters impaired by discharges from the Copermittees' MS4s in Category 4 in the Integrated Report for consideration during the next 303(d) List submittal by the State to USEPA.

29. **Economic Considerations.** The California Supreme Court has ruled that although CWC section 13263 requires the State and Regional Water Boards (collectively Water Boards) to consider factors set forth in CWC section 13241 when issuing an NPDES permit, the Water Board may not consider the factors to justify imposing pollutant restrictions that are less stringent than the applicable federal regulations require. (*City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 618, 626-627.) However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

As noted in the following finding, the San Diego Water Board finds that the requirements in this permit are not more stringent than the minimum federal requirements. Therefore, a CWC section 13241 analysis is not required for permit requirements that implement the effective prohibition on the discharge of non-storm water into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determined appropriate to control such pollutants, as those requirements are mandated by federal law. Notwithstanding the above, the San Diego Water Board has developed an economic analysis of the requirements in this Order. The economic analysis is provided in the Fact Sheet.

30. **Unfunded Mandates.** This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following:

a. This Order implements federally mandated requirements under CWA section 402 (33 USC section 1342(p)(3)(B)).

b. The local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental and new dischargers who are issued NPDES permits for storm water and non-storm water discharges.

c. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order.

d. The Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)) and in lieu of numeric restrictions on their MS4 discharges (i.e. effluent limitations).

e. The local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under State law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

f. The provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state develops a TMDL, federal law requires that permits must contain water quality based effluent limitations consistent with the assumptions and requirements of any applicable wasteload allocation (40 CFR 122.44(d)(1)(vii)(B)).

See the Fact Sheet for further discussion of unfunded mandates.

31. California Environmental Quality Act. The issuance of waste discharge requirements and an NPDES permit for the discharge of runoff from MS4s to waters of the U.S. is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 et seq.) in accordance with CWC section 13389.

STATE WATER BOARD DECISIONS

32. Compliance with Prohibitions and Limitations. The receiving water limitation language specified in this Order is consistent with language recommended by the USEPA and established in State Water Board Order WQ 99-05, *Own Motion Review of the Petition of Environmental Health Coalition to Review Waste Discharge Requirements Order No. 96-03, NPDES Permit No. CAS0108740*, adopted by the State Water Board on June 17, 1999. The receiving water limitation language in this Order requires storm water discharges from MS4s to not cause or contribute to a violation of water quality standards, which is to be achieved through an iterative approach requiring the implementation of improved and better-tailored BMPs over time. Implementation of the iterative approach to comply with receiving water limitations based on applicable water quality standards is necessary to ensure that storm water discharges from the MS4 will not ultimately cause or contribute to

violations of water quality standards and will not create conditions of pollution, contamination, or nuisance.

33. **Special Conditions for Areas of Special Biological Significance.** On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving an exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges. State Water Board Resolution No. 2012-0012 requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject terms and conditions of State Water Board Resolution No. 2012-0012. The Special Protections contained in Attachment B to Resolution No. 2012-0012, applicable to these discharges, are hereby incorporated into this Order as if fully set forth herein.

ADMINISTRATIVE FINDINGS

34. **Executive Officer Delegation of Authority.** The San Diego Water Board by prior resolution has delegated all matters that may legally be delegated to its Executive Officer to act on its behalf pursuant to CWC section 13223. Therefore, the Executive Officer is authorized to act on the San Diego Water Board's behalf on any matter within this Order unless such delegation is unlawful under CWC section 13223 or this Order explicitly states otherwise.

35. **Standard Provisions.** Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR 122.42, are provided in Attachment B to this Order.

36. **Fact Sheet.** The Fact Sheet for this Order contains background information, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of this Order. The Fact Sheet is hereby incorporated into this Order and constitutes part of the Findings of this Order.

37. **Public Notice.** In accordance with State and federal laws and regulations, the San Diego Water Board notified the Copermittees, and interested agencies and persons of its intent to prescribe waste discharge requirements for the control of discharges into and from the MS4s to waters of the U.S. and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet.

38. **Public Hearing.** The San Diego Water Board held a public hearing on Month Day, 2013 and heard and considered all comments pertaining to the terms and conditions of this Order. Details of the public hearing are provided in the Fact Sheet.

39. **Effective Date.** This Order serves as an NPDES permit pursuant to CWA section 401 or amendments thereto, and becomes effective fifty (50) days after the date of its adoption, provided that the Regional Administrator, USEPA, Region IX, does not object to this Order.

40. **Review by the State Water Board.** Any person aggrieved by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with CWC section 13320 and California Code of Regulations, title 23, sections 2050, et seq. The State Water Board must receive the petition by 5:00 p.m., 30 days after the San Diego Water Board action, except that if the thirtieth day following the action falls on a Saturday, Sunday or State holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

THEREFORE, IT IS HEREBY ORDERED that the Copermittees, in order to meet the provisions contained in division 7 of the CWC (commencing with section 13000) and regulations adopted thereunder, and the provisions of the CWA and regulations adopted thereunder, must each comply with the ~~following:~~ the requirements of this Order. This action in no way prevents the San Diego Water Board from taking enforcement action for past violations of the previous Order. If any part of this Order is subject to a temporary stay of enforcement, unless otherwise specified, the Copermittees must comply with the analogous portions of the previous Order, which will remain in effect for all purposes during the pendency of the stay.

II. PROVISIONS

A. PROHIBITIONS AND LIMITATIONS

The purpose of this provision is to describe the conditions under which storm water and non-storm water discharges into and from MS4s are prohibited or limited. The goal of the prohibitions and limitations is to protect the water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through the implementation of water quality improvement strategies and runoff management programs that effectively prohibit non-storm water discharges into the Copermittees' MS4s, and reduce pollutants in storm water discharges from the Copermittees' MS4s to the MEP.

1. Discharge Prohibitions

a. Discharges from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the state are prohibited.

b. Non-storm water discharges into MS4s are to be effectively prohibited, through the implementation of Provision E.2, unless such discharges are ~~either~~ authorized by a separate NPDES permit~~, or the discharge is a category of non-storm water discharges or flows that must be addressed pursuant to Provisions E.2.a.(1)-(5) of this Order~~.

c. Discharges from MS4s are subject to all waste discharge prohibitions in the Basin Plan, included in Attachment A to this Order.

d. Storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 applicable to these discharges, included in Attachment A to this Order. All other discharges from the Copermittees' MS4s to ASBS are prohibited.

2. Receiving Water Limitations

a. Discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters, including but not limited to all applicable provisions contained in:

(1) The San Diego Water Board's Basin Plan, including beneficial uses, water quality objectives, and implementation plans;

(2) State Water Board plans for water quality control including the following:

(a) Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries (Thermal Plan), and

(b) The Ocean Plan, including beneficial uses, water quality objectives, and implementation plans;

(3) State Water Board policies for water and sediment quality control including the following:

(a) Water Quality Control Policy for the Enclosed Bays and Estuaries of California,

(b) Sediment Quality Control Plan which includes the following narrative objectives for bays and estuaries:

(i) Pollutants in sediments shall not be present in quantities that, alone or in combination, are toxic to benthic communities, and

(ii) Pollutants shall not be present in sediments at levels that will bioaccumulate in aquatic life to levels that are harmful to human health,

(c) The Statement of Policy with Respect to Maintaining High Quality of Waters in California;[1]

(4) Priority pollutant criteria promulgated by the USEPA through the following:

(a) National Toxics Rule (NTR)[2] (promulgated on December 22, 1992 and amended on May 4, 1995), and

(b) California Toxics Rule (CTR).[3,4]

b. Discharges from MS4s composed of storm water runoff must not alter natural ocean water quality in an ASBS.

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[1] State Water Board Resolution No. 68-16
[2] 40 CFR 131.36
[3] 65 Federal Register 31682-31719 (May 18, 2000), adding Section 131.38 to 40 CFR
[4] If a water quality objective and a CTR criterion are in effect for the same priority pollutant, the more stringent of the two applies.

3. Effluent Limitations

a. Technology Based Effluent Limitations

Pollutants in storm water discharges from MS4s must be reduced to the MEP.[5]

b. Water Quality Based Effluent Limitations

~~This Order establishes water quality based effluent limitations (WQBELs) consistent with the assumptions and requirements of all available TMDL waste load allocations (WLAs) assigned to discharges from the Copermittees' MS4s.~~ Each Copermittee must comply with applicable WQBELs established for the TMDLs in Attachment E to this Order, pursuant to the applicable TMDL compliance schedules.

4. Compliance with Discharge Prohibitions and Receiving Water Limitations

Each Copermittee must achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order through timely implementation of control measures and other actions as specified in Provisions B and E of this Order, including any modifications. The Water Quality Improvement Plans required under Provision B must be designed and adapted to ultimately achieve compliance with Provisions A.1.a, A.1.c and A.2.a.

a. If exceedance(s) of water quality standards persist in receiving waters notwithstanding implementation of this Order, the Copermittees must comply with the following procedures:

(1) For exceedance(s) of a water quality standard in the process of being addressed by the Water Quality Improvement Plan, the Copermittee(s) must implement the Water Quality Improvement Plan as accepted by the San Diego Water Board, and update the Water Quality Improvement Plan, as necessary, pursuant to Provision F.2.c;

(2) Upon a determination by either the Copermittees or the San Diego Water Board that discharges from the MS4 are causing or contributing to a new exceedance of an applicable water quality standard not addressed by the Water Quality Improvement Plan, the Copermittees must submit the following updates to the Water Quality Improvement Plan pursuant to Provision F.2.c or as part of the Water Quality Improvement Plan Annual Report required under Provision F.3.b, unless the San Diego Water Board directs an earlier submittal:

[5] This does not apply to MS4 discharges which receive subsequent treatment to reduce pollutants in storm water discharges to the MEP prior to entering receiving waters (e.g., low flow diversions to the sanitary sewer). Runoff treatment must occur prior to the discharge of runoff into receiving waters per Finding 7.

(a) The water quality improvement strategies being implemented that are effective and will continue to be implemented,

(b) Water quality improvement strategies (i.e. BMPs, retrofitting projects, stream and/or habitat rehabilitation ~~or restoration~~ projects, adjustments to jurisdictional runoff management programs, etc.) that will be implemented to reduce or eliminate any pollutants or conditions that are causing or contributing to the exceedance of water quality standards,

(c) Updates to the schedule for implementation of the existing and additional water quality improvement strategies, and

(d) Updates to the monitoring and assessment program to track progress toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a of this Order;

(3) The San Diego Water Board may require the incorporation of additional modifications to the Water Quality Improvement Plan required under Provision B. The applicable Copermittees must submit any modifications to the update to the Water Quality Improvement Plan within 90 days of notification that additional modifications are required by the San Diego Water Board, or as otherwise directed;

(4) Within 90 days of the San Diego Water Board determination that the update to the Water Quality Improvement Plan meets the requirements of this Order, the applicable Copermittees must revise the jurisdictional runoff management program documents to incorporate the updated water quality improvement strategies that have been and will be implemented, the implementation schedule, and any additional monitoring required; and

(5) Each Copermittee must implement the updated Water Quality Improvement Plan.

b. The procedure set forth above to achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order do not have to be repeated for continuing or recurring exceedances of the same water quality standard(s) following implementation of scheduled actions unless directed to do otherwise by the San Diego Water Board.

c. Nothing in Provisions A.4.a and A.4.b prevents the San Diego Water Board from enforcing any provision of this Order while the applicable Copermittees prepare and implement the above update to the Water Quality Improvement Plan and jurisdictional runoff management programs.

B. WATER QUALITY IMPROVEMENT PLANS

The purpose of this provision is to develop Water Quality Improvement Plans that guide the Copermittees' jurisdictional runoff management programs towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plans is to protect, preserve, and enhance~~, and restore~~ the water quality and designated beneficial uses of waters of the state. This goal will be accomplished through an adaptive planning and management process that identifies the highest priority water quality conditions within a watershed and implements strategies through the jurisdictional runoff management programs to achieve improvements in the quality of discharges from the MS4s and receiving waters.

1. Watershed Management Areas

The Copermittees must develop a Water Quality Improvement Plan for each of the Watershed Management Areas in Table B-1. A total of ten Water Quality Improvement Plans must be developed for the San Diego Region.

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
San Juan (901.00)	South Orange County	- Aliso Creek - San Juan Creek - San Mateo Creek - Pacific Ocean - Heisler Park ASBS	- City of Aliso Viejo[1] - City of Dana Point[1] - City of Laguna Beach[1] - City of Laguna Hills[1] - City of Laguna Niguel[1] - City of Laguna Woods[1] - City of Lake Forest[1] - City of Mission Viejo[1] - City of Rancho Santa Margarita[1] - City of San Clemente[1] - City of San Juan Capistrano[1] - County of Orange[1] - Orange County Flood Control District[1]
Santa Margarita (902.00)	Santa Margarita River	- Murrieta Creek - Temecula Creek - Santa Margarita River - Santa Margarita Lagoon - Pacific Ocean	- City of Murrieta[2] - City of Temecula[2] - City of Wildomar[2] - County of Riverside[2] - County of San Diego[3] - Riverside County Flood Control and Water Conservation District[2]
San Luis Rey (903.00)	San Luis Rey River	- San Luis Rey River - San Luis Rey Estuary - Pacific Ocean	- City of Oceanside - City of Vista - County of San Diego

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
Carlsbad (904.00)	Carlsbad	- Loma Alta Slough - Buena Vista Lagoon - Agua Hedionda Lagoon - Batiquitos Lagoon - San Elijo Lagoon - Pacific Ocean	- City of Carlsbad - City of Encinitas - City of Escondido - City of Oceanside - City of San Marcos - City of Solana Beach - City of Vista - County of San Diego
San Dieguito (905.00)	San Dieguito River	- San Dieguito River - San Dieguito Lagoon - Pacific Ocean	- City of Del Mar - City of Escondido - City of Poway - City of San Diego - City of Solana Beach - County of San Diego
Penasquitos (906.00)	Penasquitos	- Los Penasquitos Lagoon - Pacific Ocean	- City of Del Mar - City of Poway - City of San Diego - County of San Diego
	Mission Bay	- Mission Bay - Pacific Ocean - San Diego Marine Life Refuge ASBS	- City of San Diego
San Diego (907.00)	San Diego River	- San Diego River - Pacific Ocean	- City of El Cajon - City of La Mesa - City of San Diego - City of Santee - County of San Diego
Pueblo San Diego (908.00) Sweetwater (909.00) Otay (910.00)	San Diego Bay	- Sweetwater River - Otay River - San Diego Bay - Pacific Ocean	- City of Chula Vista - City of Coronado - City of Imperial Beach - City of La Mesa - City of Lemon Grove - City of National City - City of San Diego - County of San Diego - San Diego County Regional Airport Authority - San Diego Unified Port District
Tijuana (911.00)	Tijuana River	- Tijuana River - Tijuana Estuary - Pacific Ocean	- City of Imperial Beach - City of San Diego - County of San Diego

Notes:
1. The Orange County Copermittees will be covered under this Order after expiration of Order No. R9-2009-0002, or earlier if the Orange County Copermittees meet the conditions in Provision F.6.
2. The Riverside County Copermittees will be covered under this Order after expiration of Order No. R9-2010-0016, or earlier if the Riverside County Copermittees meet the conditions in Provision F.6.
3. The County of San Diego is not required to implement the requirements of Provision B for its jurisdiction within the Santa Margarita River Watershed Management Area until the Riverside County Copermittees have been notified of coverage under this Order. The County of San Diego is required to implement the requirements of Provisions D, F.3.b, and Attachment E until the Riverside County Copermittees have been notified of coverage under this Order.

2. Priority Water Quality Conditions

The Copermittees must identify the water quality priorities within each Watershed Management Area that will be addressed by the Water Quality Improvement Plan. Where appropriate, Watershed Management Areas may be separated into subwatersheds to focus water quality prioritization and jurisdictional runoff management program implementation efforts by receiving water.

a. Assessment of Receiving Water Conditions

The Copermittees must consider the following, at a minimum, to identify water quality priorities based on impacts of MS4 discharges on receiving water beneficial uses:

(1) Receiving waters listed as impaired on the CWA Section 303(d) List of Water Quality Limited Segments (303(d) List);

(2) TMDLs adopted and under development by the San Diego Water Board;

(3) Receiving waters recognized as sensitive or highly valued by the Copermittees, including estuaries designated under the National Estuary Program under CWA section 320, wetlands defined by the State or U.S. Fish and Wildlife Service's National Wetlands Inventory as wetlands, waters having the Preservation of Biological Habitats of Special Significance (BOIL) beneficial use designation, and receiving waters identified as ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (Attachment A);

(4) The receiving water limitations of Provision A.2;

(5) Known historical versus current physical, chemical, and biological water quality conditions;

(6) Available, relevant, and appropriately collected and analyzed physical, chemical, and biological receiving water monitoring data, including, but not limited to, data describing:

(a) Chemical constituents,

(b) Water quality parameters (i.e. pH, temperature, conductivity, etc.),

(c) Toxicity Identification Evaluations for both receiving water column and sediment,

(d) Trash impacts,

(e) Bioassessments, and

(f) Physical habitat;

(7) Available evidence of erosional impacts in receiving waters due to accelerated flows (i.e. hydromodification);

(8) Available evidence of adverse impacts to the chemical, physical, and biological integrity of receiving waters; and

(9) The potential improvements in the overall condition of the Watershed Management Area that can be achieved.

b. ASSESSMENT OF IMPACTS FROM MS4 DISCHARGES

The Copermittees must consider the following, at a minimum, to identify the potential impacts to receiving waters that may be caused or contributed to by discharges from the Copermittees' MS4s:

(1) The discharge prohibitions of Provision A.1 and effluent limitations of Provision A.3; and

(2) Available, relevant, and appropriately collected and analyzed storm water and non-storm water monitoring data from the Copermittees' MS4 outfalls;

(3) Locations of each Copermittee's MS4 outfalls that discharge to receiving waters;

(4) Locations of MS4 outfalls that are known to persistently discharge non-storm water to receiving waters likely causing or contributing to impacts on receiving water beneficial uses;

(5) Locations of MS4 outfalls that are known to discharge pollutants in storm water causing or contributing to impacts on receiving water beneficial uses; and

(6) The potential improvements in the quality of discharges from the MS4 that can be achieved.

c. IDENTIFICATION OF PRIORITY WATER QUALITY CONDITIONS

(1) The Copermittees must use the information gathered for Provisions B.2.a and B.2.b to develop a list of priority water quality conditions as pollutants, stressors and/or receiving water conditions that are the highest threat to receiving water quality or that most adversely affect the ~~physical, chemical, and biological integrity~~ quality of receiving waters. The list must include the following information for each priority water quality condition:

(a) The beneficial use(s) associated with the priority water quality condition;

(b) The geographic extent of the priority water quality condition within the Watershed Management Area, if known;

(c) The temporal extent of the priority water quality condition (e.g., dry weather and/or wet weather);

(d) The Copermittees with MS4s discharges that may cause or contribute to the priority water quality condition; and

(e) An assessment of the adequacy of and data gaps in the monitoring data to characterize the conditions causing or contributing to the priority water quality condition, including a consideration of spatial and temporal variation.

(2) The Copermittees must identify the highest priority water quality conditions to be addressed by the Water Quality Improvement Plan, and provide a rationale for selecting a subset of the water quality conditions identified pursuant to Provision B.2.c.(1) as the highest priorities.

d. IDENTIFICATION OF MS4 SOURCES OF POLLUTANTS AND/OR STRESSORS

The Copermittees must identify and prioritize known and suspected sources of storm water and non-storm water pollutants and/or other stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c. The identification of known and suspected sources of pollutants and/or stressors that cause or contribute to the highest priority water quality conditions as identified for Provision B.2.c must consider the following:

(1) Pollutant generating facilities, areas, and/or activities within the Watershed Management Area, including:

(a) Each Copermittee's inventory of construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas,

(b) Publicly owned parks and/or recreational areas,

(c) Open space areas,

(d) All currently operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste, and

(e) Areas not within the Copermittees' jurisdictions (e.g., Phase II MS4s, tribal lands, state lands, federal lands) that are known or suspected to be

discharging to the Copermittees' MS4s;

(2) Locations of the Copermittees' MS4s, including the following:

(a) All MS4 outfalls that discharge to receiving waters, and

(b) Locations of major structural controls for storm water and non-storm water (e.g., retention basins, detention basins, major infiltration devices, etc.);

(3) Other known and suspected sources of non-storm water or pollutants in storm water discharges to receiving waters within the Watershed Management Area, including the following:

(a) Other MS4 outfalls (e.g., Phase II Municipal and Caltrans),

(b) Other NPDES permitted discharges,

(c) Any other discharges that may be considered point sources (e.g., private outfalls), and

(d) Any other discharges that may be considered non-point sources (e.g., agriculture, wildlife or other natural sources);

(4) Review of available data, including but not limited to:

(a) Findings from the Copermittees' illicit discharge detection and elimination programs,

(b) Findings from the Copermittees' MS4 outfall discharge monitoring,

(c) Findings from the Copermittees' receiving water monitoring,

(d) Findings from the Copermittees' MS4 outfall discharge and receiving water assessments, and

(e) Other available, relevant, and appropriately collected data, information, or studies related to pollutant sources and/or stressors that contribute to the highest priority water quality conditions as identified for Provision B.2.c.

(5) The adequacy of the available data to identify and prioritize sources and/or stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c.

e. Identification of Potential Water Quality Improvement Strategies

The Copermittees must evaluate the findings identified under Provisions B.2.a-d, and identify potential strategies that can result in improvements to water quality in MS4 discharges and/or receiving waters within the Watershed Management Area. Potential water quality improvement strategies that may be implemented

within the Watershed Management Area must include the following:

(1) Structural BMPs, non-structural BMPs, incentives, or programs that can potentially be implemented to address the highest priority water quality conditions identified under Provision B.2.c, or MS4 sources of pollutants or stressors identified under Provision B.2.d,

(2) Retrofitting projects in areas of existing development within the Watershed Management Area that can potentially be implemented to reduce MS4 sources of pollutants or stressors identified under Provision B.2.d causing or contributing to the highest priority water quality conditions identified under Provision B.2.c, and

(3) Stream, channel, and/or habitat rehabilitation projects within the Watershed Management Area that can potentially be implemented to protect and/or improve conditions in receiving waters from MS4 pollutants and/or stressors identified under Provision B.2.d causing or contributing to the highest priority water quality conditions identified under Provision B.2.c.

3. Water Quality Improvement Goals, Strategies and Schedules

The Copermittees must identify and develop specific water quality improvement goals and strategies to address the highest priority water quality conditions identified within a Watershed Management Area. The water quality improvement goals and strategies must address the highest priority water quality conditions by effectively prohibiting non-storm water discharges to the MS4, reducing pollutants in storm water discharges from the MS4 to the MEP, and protecting the water quality standards of receiving waters.

a. WATER QUALITY IMPROVEMENT ~~NUMERIC~~ GOALS AND SCHEDULES

(1) Numeric Goals

The Copermittees must develop and incorporate ~~interim and final~~ numeric goals[6] ~~and schedules~~ into the Water Quality Improvement Plan. Numeric goals must be used to support Water Quality Improvement Plan implementation and measure reasonable progress towards addressing the highest priority water quality conditions identified under Provision B.2.c. ~~When establishing numeric goals and corresponding schedules, t~~The Copermittees must ~~consider~~ establish and incorporate the following numeric

[6] Interim and final numeric goals may take a variety of forms such as TMDL established WQBELs, action levels, pollutant concentration, load reductions, number of impaired water bodies delisted from the List of Water Quality Impaired Segments, Index of Biotic Integrity (IBI) scores, or other appropriate metrics. Interim and final numeric goals are not necessarily limited to one criterion or indicator, but may include multiple criteria and/or indicators. Except for TMDL established WQBELs, interim and final numeric goals and corresponding schedules may be revised through the adaptive management process under Provision B.5.

goals in the Water Quality Improvement Plan:

~~(1)~~ (a) Final numeric goals must be based on measureable criteria or indicators capable of demonstrating one or more of the following:~~, to be achieved in the receiving waters and/or MS4 discharges for the highest priority water quality conditions which will be capable of demonstrating the achievement of the restoration and/or protection of water quality standards in receiving waters; and~~

(i) Discharges from the Copermittees' MS4s will not cause or contribute to exceedances of water quality standards in receiving waters, AND/OR

(ii) The conditions of receiving waters and associated habitat are protected from MS4 discharges, AND/OR

(iii) Beneficial uses of receiving waters are protected from MS4 discharges and will be supported.

~~(2)~~ (b) Interim numeric goals must be based on measureable criteria or indicators capable of demonstrating reasonable incremental progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges as follows:~~; and~~

(i) One or more interim numeric goals may be established to demonstrate progress toward achieving each final numeric goal,

(ii) For each final numeric goal, at least one interim numeric goal must be expressed as a reasonable increment toward achievement of the final numeric goal,

(iii) For each final numeric goal, reasonable interim numeric goals must be established to be accomplished during each 5 year period between the acceptance of the Water Quality Improvement Plan and the achievement of the final numeric goals.

~~(3)~~
(2) Schedules for Achieving Numeric Goals

The Copermittees must develop and incorporate schedules for achieving the numeric goals into the Water Quality Improvement Plan. The ~~S~~schedules must ~~be~~ demonstrate reasonable ~~adequate for measuring~~ progress toward achieving the ~~interim and~~ final numeric goals required for Provision~~s~~ B.3.a.(1) ~~B.2.e.(1) and B.2.e.(2)~~. The Copermittees must incorporate the ~~S~~schedules for achieving the numeric goals into the Water Quality Improvement Plan based on the following considerations ~~must incorporate the following~~:

(a) Final dates for achieving all final numeric goals must be established considering the following: ~~Interim dates for achieving the interim numeric~~

goals,

(b) (i) Final Ccompliance dates schedules for any applicable TMDLs in Attachment E to this Order;,

(c) (ii) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);,

(d) (iii) Achievement of the final numeric goals in the receiving waters and/or MS4 discharges for the highest water quality priorities must be as soon as possible;, and

(e) (iv) Final dates for achieving the final numeric goals must reflect a realistic assessment of the shortest practicable time required based on the temporal and spatial extent and factors associated with the highest priority water quality conditions identified under Provision B.2.c, and taking into account the time reasonably required to implement the water quality improvement strategies required pursuant to Provision B.3.b not initially extend more than 10 years beyond the effective date of this Order, unless a longer period of time is authorized by the San Diego Water Board Executive Officer or the schedule includes an applicable TMDL in Attachment E to this Order.

(b) Interim dates for achieving all interim numeric goals must be established considering the following:

(i) Interim compliance dates for any applicable TMDLs in Attachment E to this Order;

(ii) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(iii) Interim dates for achieving the interim numeric goals must reflect a realistic assessment of the shortest practicable time reasonably required, taking into account the time needed to implement new or significantly expanded programs and securing financing, if necessary; and

(iv) For each final numeric goal, at least one interim numeric goal must be established that the Copermittees will work toward achieving within the term of this Order.

3. Water Quality Improvement Strategies and Schedules

The Copermittees must develop specific water quality improvement strategies to address the highest priority water quality conditions identified within a Watershed Management Area. The water quality improvement strategies must address the highest priority water quality conditions by preventing or eliminating non-storm water

~~discharges to and from the MS4, reducing pollutants in storm water discharges from the MS4 to the MEP, and restoring and/or protecting the water quality standards of receiving waters.~~

b. WATER QUALITY IMPROVEMENT STRATEGIES AND SCHEDULES

Based on the likely effectiveness and efficiency of the potential water quality improvement strategies identified under Provision B.2.e to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a, ~~T~~the Copermittees must identify ~~and prioritize water quality improvement~~ the strategies ~~based on their likely effectiveness and efficiency, and implement strategies to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, improve the physical, chemical, and biological receiving water conditions, and achieve the interim and final numeric goals in accordance with the schedules required for Provision B.2.e.(3). The following water quality improvement strategies must be included and described in the Water Quality Improvement Plan~~ that will be implemented in each Watershed Management Area as follows:

(1) Jurisdictional Strategies

~~Specific strategies and/or activities that may be implemented by one or more Copermittees within their jurisdictions through the jurisdictional runoff management programs that will address the highest priority water quality conditions within the Watershed Management Area, in accordance with the following requirements:~~

(a) Each Copermittee in the Watershed Management Area must identify the strategies that will be implemented within its jurisdiction ~~Strategies and/or activities~~as part of its jurisdictional runoff management program requirements under Provisions E.2 through E.7, including descriptions of the following: ~~must, at a minimum, be described for each jurisdictional runoff management program component where strategies to address the highest priority water quality conditions are required under Provision E;~~

(i) For each of the inventories developed for its jurisdiction, as required under Provisions D.2.a.(1), E.3.e.(2), E.4.c, and E.5.a, each Copermittee must identify the known and suspected areas or sources causing or contributing to the highest priority water quality conditions in the Watershed Management Area that the Copermittee will focus on in its efforts to effectively prohibit non-storm water discharges to its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, and achieve the interim and final numeric goals identified

under Provision B.3.a;

(ii) BMPs that each Copermittee will implement, or require to be implemented, as applicable, for those areas or sources within its jurisdiction;

(iii) Education programs that each Copermittee will implement, as applicable, for those areas or sources within its jurisdiction;

(iv) Frequencies that each Copermittee will conduct inspections on those areas or sources within its jurisdiction;

(v) Incentive and enforcement programs that each Copermittee will implement, as applicable, for those areas or sources within its jurisdiction; and

(vi) Any other BMPs, incentives, or programs that each Copermittee will implement for those areas or sources within its jurisdiction.

(b) Identify the optional jurisdictional strategies that each Copermittee will implement within its jurisdiction, as necessary, to effectively prohibit non-storm water discharges to its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. Descriptions of the optional jurisdictional strategies must include: ~~The Water Quality Improvement Plan must describe the circumstances or conditions when and where the strategies or/activities should be or will be implemented, but specific details about how each Copermittee will implement the strategies and/or activities within its jurisdiction are not required; and~~

(i) BMPs, incentives, or programs that may be implemented by the Copermittee within its jurisdiction in addition to the requirements of Provisions B.3.b.(1)(a);

(ii) Incentives or programs that may be implemented by the Copermittee to encourage or implement projects to retrofit areas of existing development within its jurisdiction;

(iii) Incentives or programs that may be implemented by the Copermittee to encourage or implement projects that will rehabilitate the conditions of channels or habitats within its jurisdiction;

(iv) The funds and/or resources that must be secured by the Copermittee to implement the optional strategies described for Provisions E.3.b.(1)(b)(i)-(iii) within its jurisdiction; and

(v) The circumstances necessary to trigger implementation of the optional jurisdictional strategies, in addition to the requirements of Provisions B.3.b.(1)(a), to achieve the interim and final numeric goals within the schedules established under Provision B.3.a.

(c) Identify the strategies that will be implemented by the Copermittee in coordination with or with the cooperation of other agencies (e.g. Caltrans, water districts, school districts) and/or entities (e.g. non-governmental organizations) within its jurisdiction. ~~Descriptions of strategies and/or activities must include any monitoring, information collection, special studies, and/or data analysis that is necessary to assess the effectiveness of the strategy and/or activity toward addressing the highest priority water quality conditions.~~

(2) Watershed Management Area Strategies

The Copermittees must identify the optional regional or multi-jurisdictional strategies that will be implemented in the Watershed Management Area, as necessary, to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. Descriptions of the optional regional or multi-jurisdictional strategies must include: ~~Additional strategies and/or activities that may be implemented within the Watershed Management Area on a jurisdictional, sub-watershed, or watershed scale by one or more Copermittees, not specifically required under Provision E, which are designed to achieve the interim and final numeric goals identified in Provisions B.2.e.(1) and B.2.e.(2);~~

(a) Regional or multi-jurisdictional BMPs, incentives, or programs that may be implemented by the Copermittees in the Watershed Management Area;

(b) Incentives or programs that may be implemented by the Copermittees in the Watershed Management Area to encourage or implement regional or multi-jurisdictional projects to retrofit areas of existing development;

(c) Incentives or programs that may be implemented by the Copermittees to encourage or implement regional or multi-jurisdictional projects that will rehabilitate the conditions of channels, streams, or habitats within the Watershed Management Area;

(d) The funds and/or resources that must be secured by the Copermittees to implement the optional strategies described for Provisions E.3.b.(2)(a)-(c) within the Watershed Management Area; and

(e) The circumstances necessary to trigger implementation of the optional regional or multi-jurisdictional strategies to achieve the interim and final numeric goals within the schedules established under Provision B.3.a.

~~c. IMPLEMENTATION SCHEDULES~~

~~(1)~~
(3) Schedules for Implementing Strategies

The Copermittees must develop reasonable schedules for implementing the water quality improvement strategies identified under Provisions B.3.b.(1) and B.3.b.(2)(a) ~~B.3.a~~ to achieve the interim and final numeric goals identified and schedules established under Provision B.3.a ~~B.2.e.(1) and B.2.e.(2)~~. The Copermittees must incorporate the schedules to implement the water quality improvement strategies into the Water Quality Improvement Plan as follows:

(a) ~~Schedules~~ Each Copermittee must ~~be~~ develop~~ed~~ schedules for ~~both~~ the ~~water quality improvement~~ jurisdictional strategies ~~implemented by each Copermittee within its jurisdiction~~ identified pursuant to Provisions B.3.b.(1)(a)-(b). Each schedule must specify: ~~and for strategies that the Copermittees choose to implement on a collaborative basis.~~

(i) If each jurisdictional strategy identified pursuant to Provision B.3.b.(1)(a) will or will not be initiated upon acceptance of the Water Quality Improvement Plan;

(ii) For each jurisdictional strategy identified pursuant to Provision B.3.b.(1)(a) that will not be initiated upon approval of the Water Quality Improvement Plan, the shortest practicable time in which each jurisdictional strategy will be initiated after acceptance of the Water Quality Improvement Plan;

(iii) For each optional jurisdictional strategy identified pursuant to Provision B.3.b.(1)(b), a realistic assessment of the shortest practicable time required to:

[a] Secure the resources needed to fund the optional jurisdictional strategy, and
[b] Procure the resources, materials, labor, and applicable permits necessary to initiate implementation of the optional jurisdictional strategy;

(iv) If each jurisdictional strategy identified pursuant to Provisions B.3.b.(1)(a)-(b) is expected to be continuously implemented (e.g. inspections) or completed within a schedule (e.g. construction of structural BMP); and

(v) If a jurisdictional strategy identified pursuant to Provisions B.3.b.(1)(a)-(b) is expected to be completed within a schedule, the anticipated time to complete based on a realistic assessment of the shortest practicable time required.

(b) The Copermittees in the Watershed Management Area must develop schedules for the regional or multi-jurisdictional strategies identified pursuant to Provision B.3.b.(2). Each schedule must specify:

(i) A realistic assessment of the shortest practicable time to:

[a] Secure the resources needed to fund the optional regional or multi-jurisdictional strategy, and
[b] Procure the resources, materials, labor, and permits necessary to initiate the implementation of the optional regional or multi-jurisdictional strategy;

(ii) If each regional or multi-jurisdictional strategy identified pursuant to Provision B.3.b.(2) is expected to be continuously implemented (e.g. inspections) or completed within a schedule (e.g. construction of structural BMP); and

(iii) If a regional or multi-jurisdictional strategy and/or activity identified pursuant to Provisions B.3.b.(2) is expected to be completed within a schedule, the anticipated time to complete based on a realistic assessment of the shortest practicable time required.

~~(1) The Copermittees must incorporate the implementation compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).~~

(4) Optional Watershed Management Area Analysis

(a) For each Watershed Management Area, the Copermittees have the option to perform a Watershed Management Area Analysis for the purpose of developing watershed-specific requirements for structural BMP implementation, as described in Provision E.3.c.(3). The Watershed Management Area Analysis must include GIS layers (maps) as output. The analysis must include the following information, to the extent it is available, in order to characterize the Watershed Management Areas:

(i) A description of dominant hydrologic processes, such as areas where infiltration or overland flow likely dominates;

(ii) A description of existing streams in the watershed, including bed material and composition, and if they are perennial or ephemeral;

(iii) Current and anticipated future land uses;

(iv) Potential coarse sediment yield areas; and

(v) Locations of existing flood control structures and channel structures, such as stream armoring, constrictions, grade control structures, and hydromodification or flood management basins.

(b) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify and compile a list of candidate projects that could potentially be used as

alternative compliance options for Priority Development Projects, to be implemented in lieu of onsite structural BMP performance requirements described in Provisions E.3.c.(1) and E.3.c.(2). Specifically, the Copermittees must identify in each Watershed Management Area:

(i) Opportunities for stream or riparian area rehabilitation;

(ii) Opportunities for retrofitting existing infrastructure to incorporate storm water retention or treatment;

(iii) Opportunities for regional BMPs;

(iv) Opportunities for groundwater recharge projects;

(v) Opportunities for water supply augmentation projects; and

(vi) Opportunities for land purchases to preserve floodplain functions.

(c) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify areas within the Watershed Management Area where it is appropriate to allow Priority Development Projects to be exempt from the hydromodification management BMP performance requirements described in Provision E.3.c.(2), including supporting rationale.

c. Discharge Prohibitions and Receiving Water Limitations Compliance Option

(1) The Copermittees may utilize implementation of the water quality improvement strategies in the Water Quality Improvement Plan to demonstrate compliance with the requirements of Provisions A.1.a, A.1.c and A.2.a. For each Copermittee in the Watershed Management Area that chooses to utilize this option, the Copermittee will be in compliance with Provisions A.1.a, A.1.c and A.2.a if:

(a) Numeric goals and schedules developed pursuant to Provision B.3.a include the following numeric goals:

(i) WQBELs expressed as concentration-based or load-based effluent limitations applicable to the Watershed Management Area established by the TMDLs in Attachment E to this Order; and

(ii) Numeric goals applicable to the Copermittee's MS4 discharges expressed as concentration-based or load-based effluent limitations for all other pollutants listed on the Clean Water Act Section 303(d) List of Water Quality Impaired Segments[7] for the receiving waters in the Watershed Management Area that do not have a TMDL developed; and

[7] 2002 and subsequent 303(d) Lists

(iii) Numeric goals for receiving waters that will protect the conditions of the receiving waters and attain water quality standards.

(b) An analysis utilizing a watershed model or other watershed analytical tools is performed. The results must be included in the Water Quality Improvement Plan to quantitatively demonstrate that the implementation of the water quality improvement strategies required under Provision B.3.b will achieve the numeric goals within the established schedules required under Provision B.3.a. The analysis may be performed individually or jointly by the Copermittees choosing to utilize this option in the Watershed Management Area, and must be updated as part of the iterative approach and adaptive management process required under Provisions B.5.a-b.

(c) The Water Quality Improvement Plan specifies the monitoring and assessments (i.e. MS4 outfall discharge, receiving water, and/or special studies) that will be performed by the Copermittee to confirm the implementation of the water quality improvement strategies within its jurisdiction is making progress toward achieving the numeric goals in accordance with the established schedules developed pursuant to Provision B.3.c.(1)(a). The monitoring and assessments must be incorporated into the monitoring and assessment program required pursuant to Provision B.4. The monitoring and assessments must be updated as part of the iterative approach and adaptive management process required under Provision B.5.c.

(d) The numeric goals proposed pursuant to Provision B.3.c.(1)(a), the analysis performed pursuant to Provision B.3.c.(1)(b) and the specific monitoring and assessments proposed pursuant to Provision B.3.c.(1)(c) have been reviewed and receive concurrence by a majority of the Water Quality Improvement Consultation Panel (see Provision F.1.a.(1)(b)). Updates must also receive concurrence by a majority of the Water Quality Improvement Consultation Panel.

(2) Each Copermittee that chooses to utilize this option will, for the pollutant/water body combinations covered by the analysis, be in compliance with Provisions A.1.a, A.1.c and A.2.a when the Water Quality Improvement Plan, incorporating the requirements of Provision B.3.c.(1), is accepted by the San Diego Water Board.

(3) The Copermittee will, for the pollutant/water body combinations covered by the analysis, remain in compliance with Provisions A.1.a, A.1.c and A.2.a during the term of this Order as long as:

(a) The results of the analysis performed pursuant to Provision B.3.c.(1)(d) is accepted and continues to be accepted by the San Diego Water Board Executive Officer as part of the Water Quality Improvement Plan; AND

(b) The Copermittee continues to implement the water quality improvement strategies within its jurisdiction developed pursuant to Provision B.3.b.(1) in accordance with the schedules for implementing the strategies established pursuant to Provision B.3.b.(3)(a); AND

(c) The Copermittee continues to perform the monitoring and assessments specified in the Water Quality Improvement Plan, developed and implemented pursuant to Provision B.3.c.(1)(c), to demonstrate its progress toward achieving the numeric goals applicable to its MS4 discharges in accordance with the interim and final dates for achieving the numeric goals established pursuant to Provision B.3.a.(2); AND

(d) The Copermittees in the Watershed Management Area continue to implement the requirements of Provision A.4.a.

4. Water Quality Improvement Monitoring and Assessment Program

a. The Copermittees in each Watershed Management Area must develop and incorporate an integrated monitoring and assessment program into the Water Quality Improvement Plan that assesses: 1) the progress toward achieving the numeric goals and schedules, 2) the progress toward addressing the highest priority water quality conditions for each Watershed Management Area, and 3) each Copermittee's overall efforts to implement the Water Quality Improvement Plan.

b. The monitoring and assessment program must incorporate the monitoring and assessment requirements of Provision D, which may allow the Copermittees to modify the program to be consistent with and focus on the highest priority water quality conditions for each Watershed Management Area.

c. For Watershed Management Areas with applicable TMDLs, the monitoring and assessment program must incorporate the specific monitoring and assessment requirements of Attachment E.

d. For Watershed Management Areas with any ASBS, the water quality monitoring and assessment program must incorporate the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

5. Iterative Approach and Adaptive Management Process

The Copermittees in each Watershed Management Area must implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a, and must include the following:

a. RE-EVALUATION OF PRIORITY WATER QUALITY CONDITIONS

The priority water quality conditions and potential water quality improvement strategies~~, and numeric goals and corresponding schedules,~~ included in the Water Quality Improvement Plan pursuant to Provision~~s~~ B.2.c ~~and B.2.e~~, may be re-evaluated by the Copermittees as needed during the term of this Order as part of the Water Quality Improvement Plan Annual Report. Re-evaluation and recommendations for modifications to the priority water quality conditions and potential water quality improvement strategies~~, and numeric goals and corresponding schedules~~ must be provided in the Report of Waste Discharge, and must consider the following:

(1) Achieving the outcome of improved water quality in MS4 discharges and receiving waters through implementation of the water quality improvement strategies identified in the Water Quality Improvement Plan;

~~(2) Progress toward achieving interim and final numeric goals in receiving waters and/or MS4 discharges for the highest priority water quality conditions in the Watershed Management Area,~~

~~(3) Progress toward achieving outcomes according to established schedules;~~

(2~~4~~) New information developed when the requirements of Provisions B.2.a-c have been re-evaluated;

~~(5) New policies or regulations that may affect identified numeric goals;~~

(3~~6~~) Spatial and temporal accuracy of monitoring data collected to inform prioritization of water quality conditions and implementation strategies to address the highest priority water quality conditions;

(4~~7~~) Availability of new information and data from sources other than the jurisdictional runoff management programs within the Watershed Management Area that informs the effectiveness of the actions implemented by the Copermittees;

(5~~8~~) San Diego Water Board recommendations; and

(6~~9~~) Recommendations for modifications solicited through a public participation process.

b. ADAPTATION OF GOALS, STRATEGIES AND SCHEDULES

The water quality improvement goals, strategies and schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.3, must be re-evaluated and adapted as new information becomes available to result in more effective and efficient measures to ~~achieve the numeric goals established~~ address the highest priority water quality conditions identified pursuant to

Provision B.2.c~~e~~. Re-evaluation of and modifications to the water quality improvement goals, strategies and schedules must be provided in the Water Quality Improvement Plan Annual Report, and must consider the following:

(1) Modifications to the priority water quality conditions~~, and numeric goals and corresponding schedules~~ based on Provision B.5.a;

(2) Progress toward achieving interim and final numeric goals in receiving waters and MS4 discharges for the highest priority water quality conditions in the Watershed Management Area,

(3) Progress toward achieving outcomes according to established schedules;

(4) New policies or regulations that may affect identified numeric goals;

~~(2)~~
(5) Measurable or demonstrable reductions of non-storm water discharges to and from each Copermittee's MS4;

~~(3)~~
(6) Measurable or demonstrable reductions of pollutants in storm water discharges from each Copermittee's MS4 to the MEP;

~~(4)~~
(7) New information developed when the requirements of Provisions B.2.b and B.2.d have been re-evaluated;

~~(5)~~
(8) Efficiency in implementing the Water Quality Improvement Plan;

~~(6)~~
(9) San Diego Water Board recommendations; and

~~(7)~~
(10) Recommendations for modifications solicited through a public participation process.

c. Adaptation of Monitoring and Assessment Program

The water quality improvement monitoring and assessment program, included in the Water Quality Improvement Plan pursuant to Provision~~s~~ B.4, must be re-evaluated and adapted when new information becomes available. Re-evaluation and recommendations for modifications to the monitoring and assessment program, pursuant to the requirements of Provision D, may be provided in the Water Quality Improvement Plan Annual Report, but must be provided in the Report of Waste Discharge.

6. Water Quality Improvement Plan Submittal, Updates, and Implementation

a. The Copermittees must submit and commence implementation of the Water Quality Improvement Plans in accordance with the requirements of Provision F.1.

b. The Copermittees must submit proposed updates to the Water Quality Improvement Plan for acceptance by the San Diego Water Board Executive Officer in accordance with the requirements of Provision F.2.c.

~~**c.** The Copermittees must commence with implementation of the Water Quality Improvement Plans immediately after acceptance by the San Diego Water Board, in accordance with the schedules, or subsequently updated schedules, within the Water Quality Improvement Plan.~~

C. ACTION LEVELS

The purpose of this provision is for the Copermittees to incorporate numeric action levels in the Water Quality Improvement Plans. The goal of the action levels is to guide Water Quality Improvement Plan implementation efforts and measure progress towards the protection of water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through monitoring and assessing the quality of the MS4 discharges during the implementation of the Water Quality Improvement Plans.

1. Non-Storm Water Action Levels[8]

The Copermittees must develop and incorporate numeric non-storm water action levels (NALs) into the Water Quality Improvement Plan to: 1) support the development and prioritization of water quality improvement strategies for ~~addressing~~ effectively prohibiting non-storm water discharges to ~~and from~~ the MS4s, 2) assess the effectiveness of the water quality improvement strategies toward addressing MS4 non-storm water discharges, required pursuant to Provision D.4.b.(1), and 3) support the detection and elimination of non-storm water and illicit discharges to ~~and from~~ the MS4, required pursuant to Provision E.2.[9]

a. The following NALs must be incorporated:

(1) Non-Storm Water Discharges from MS4s to Ocean Surf Zone

Table C-1. Non-Storm Water Action Levels for Discharges from MS4s to Ocean Surf Zone

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Total Coliform	MPN/100 ml	1,000	-	10,000/1,000[1]	OP
Fecal Coliform	MPN/100 ml	200[2]	-	400	OP
Enterococci	MPN/100 ml	35	-	104[3]	OP

Abbreviations/Acronyms
AMAL – average monthly action level
MDAL – maximum daily action level
OP – Ocean Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Total coliform density NAL is 1,000 MPN/100 ml when the fecal/total coliform ratio exceeds 0.1.
2. Fecal coliform density NAL is 200 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas."

[8] NALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, unless the NAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed.

[9] The Copermittees may utilize NALs or other benchmarks currently established by the Copermittees as interim NALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

(2) Non-Storm Water Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Table C-2. Non-Storm Water Action Levels for Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Turbidity	NTU	75	-	225	OP
pH	Units	Within limit of 6.0 to 9.0 at all times			OP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	35	-	104[3]	BP
Priority Pollutants	ug/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
OP – Ocean Plan water quality objective
NTU – Nephelometric Turbidity Units
ug/L – micrograms per liter
MDAL – maximum daily action level
BP – Basin Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas" and is not applicable to waterbodies that are not designated with the water contact recreation (REC-1) beneficial use.

Table C-3. Non-Storm Water Action Levels for Priority Pollutants

Parameter	Units	Freshwater (CTR)		Saltwater (CTR)	
		MDAL	AMAL	MDAL	AMAL
Cadmium	ug/L	**	**	16	8
Copper	ug/L	*	*	5.8	2.9
Chromium III	ug/L	**	**	-	-
Chromium VI	ug/L	16	8.1	83	41
Lead	ug/L	*	*	14	2.9
Nickel	ug/L	**	**	14	6.8
Silver	ug/L	*	*	2.2	1.1
Zinc	ug/L	*	*	95	47

Abbreviations/Acronyms:
CTR – California Toxic Rule
AMAL – average monthly action level
ug/L – micrograms per liter
MDAL – maximum daily action level

Notes:
* Action levels developed on a case-by-case basis (see below)
** Action levels developed on a case-by-case basis (see below), but calculated criteria are not to exceed Maximum Contaminant Levels (MCLs) under the California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64431

The Cadmium, Copper, Chromium (III), Lead, Nickel, Silver and Zinc NALs for MS4 discharges to freshwater receiving waters will be developed on a case-by-case basis ~~because the freshwater criteria are~~ based on site-specific water quality data (receiving water hardness). For these priority pollutants, ~~the following equations (~~ refer to 40 CFR 131.38 ~~(~~b~~)~~ ~~(~~2~~)~~ ~~will be required:~~.

~~Cadmium (Total Recoverable) = exp(0.7852[ln(hardness)] - 2.715)~~
~~Chromium III (Total Recoverable) = exp(0.8190[ln(hardness)] + 0.6848)~~
~~Copper (Total Recoverable) = exp(0.8545[ln(hardness)] - 1.702)~~
~~Lead (Total Recoverable) = exp(1.273[ln(hardness)] - 4.705)~~
~~Nickel (Total Recoverable) = exp(.8460[ln(hardness)] + 0.0584)~~
~~Silver (Total Recoverable) = exp(1.72[ln(hardness)] - 6.52)~~
~~Zinc (Total Recoverable) = exp(0.8473[ln(hardness)] + 0.884)~~

(3) Non-Storm Water Discharges from MS4s to Inland Surface Waters

Table C-4. Non-Storm Water Action Levels for Discharges from MS4s to Inland Surface Waters

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Dissolved Oxygen	mg/L	Not less than 5.0 in WARM waters and not less than 6.0 in COLD waters			BP
Turbidity	NTU	-	20	See MDAL	BP
pH	Units	Within limit of 6.5 to 8.5 at all times			BP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	33	-	61[3]	BP
Total Nitrogen	mg/L	-	1.0	See MDAL	BP
Total Phosphorus	mg/L	-	0.1	See MDAL	BP
MBAS	mg/L	-	0.5	See MDAL	BP
Iron	mg/L	-	0.3	See MDAL	BP
Manganese	mg/L	-	0.05	See MDAL	BP
Priority Pollutants	ug/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
BP – Basin Plan water quality objective
COLD – cold freshwater habitat beneficial use
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
MDAL – maximum daily action level
WARM – warm freshwater habitat beneficial use
MBAS – Methylene Blue Active Substances
MPN/100 ml – most probable number per 100 milliliters
ug/L – micrograms per liter

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for freshwater "designated beach areas" and is not applicable to waterbodies that are not designated with the water contact recreation (REC-1) beneficial use.

b. If not identified in Provision C.1.a, NALs must be identified, developed and incorporated in the Water Quality Improvement Plan for any pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in receiving waters ~~of the state~~ associated with the highest priority water quality conditions related to non-storm water discharges from the MS4s. NALs must be based on:

(1) Applicable water quality standards which may be dependent upon site-specific or receiving water-specific conditions or assumptions to be identified by the Copermittees; or

(2) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the NALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary NALs specific to the Watershed Management Area at levels greater than the NALs required by Provisions C.1.a and C.1.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for ~~addressing~~ effectively prohibiting non-storm water discharges to ~~and from~~ the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and

from the MS4. The secondary NALs may be developed using an approach acceptable to the San Diego Water Board.

d. Dry weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.b may be utilized to develop or revise NALs based on watershed-specific data, subject to San Diego Water Board Executive Officer approval.

2. Storm Water Action Levels[10]

The Copermittees must develop and incorporate numeric storm water action levels (SALs) in the Water Quality Improvement Plans to: 1) support the development and prioritization of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s, and 2) assess the effectiveness of the water quality improvement strategies toward reducing pollutants in storm water discharges, required pursuant to Provision D.4.b.(2).[11]

a. The following SALs for discharges of storm water from the MS4 must be incorporated:

Table C-5. Storm Water Action Levels for Discharges from MS4s to Receiving Waters

Parameter	Units	Action Level
Turbidity	NTU	126
Nitrate & Nitrite (Total)	mg/L	2.6
Phosphorus (Total P)	mg/L	1.46
Cadmium (Total Cd)*	µg/L	3.0
Copper (Total Cu)*	µg/L	127
Lead (Total Pb)*	µg/L	250
Zinc (Total Zn)*	µg/L	976

Abbreviations/Acronyms:
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
ug/L – micrograms per liter

Notes:
* The sampling must include a measure of receiving water hardness at each MS4 outfall. If a total metal concentration exceeds the corresponding metals SAL in Table C-5, that concentration must be compared to the California Toxics Rule criteria and the USEPA 1-hour maximum concentration for the detected level of receiving water hardness associated with that sample. If it is determined that the sample's total metal concentration for that specific metal exceeds that SAL, but does not exceed the applicable USEPA 1-hour maximum concentration criterion for the measured level of hardness, then the sample result will not be considered above the SAL for that measurement.

[10] SALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, unless the SAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed.

[11] The Copermittees may utilize SALs or other benchmarks currently established by the Copermittees as interim SALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

b. If not identified in Provision C.2.a, SALs must be identified, developed and incorporated in the Water Quality Improvement Plan for pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in receiving waters ~~of the state~~ associated with the highest priority water quality ~~priorities~~ conditions related to storm water discharges from the MS4s. SALs must be based on:

(1) Federal and State water quality guidance and/or water quality standards; and

(2) Site-specific or receiving water-specific conditions; or

(3) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the SALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary SALs specific to the Watershed Management Area at levels greater than the SALs required by Provisions C.2.a and C.2.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s. The secondary SALs may be developed based on the approaches recommended by the State Water Board's Storm Water Panel[12] or using an approach acceptable to the San Diego Water Board.

d. Wet weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.c may be used to develop or revise SALs based upon watershed-specific data, subject to San Diego Water Board Executive Officer approval.

[12] Storm Water Panel Recommendations to the California State Water Resources Control Board: The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities (June 2006)

D. MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS

The purpose of this provision is for the Copermittees to monitor and assess the impact on the ~~chemical, physical, and biological~~ conditions of receiving waters caused by discharges from the Copermittees' MS4s under wet weather and dry weather conditions. The goal of the monitoring and assessment program is to inform the Copermittees about the nexus between the health of receiving waters and the water quality condition of the discharges from their MS4s. This goal will be accomplished through monitoring and assessing the conditions of the receiving waters, discharges from the MS4s, pollutant sources and/or stressors, and effectiveness of the water quality improvement strategies implemented as part of the Water Quality Improvement Plans.

1. Receiving Water Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the condition of the receiving waters in each Watershed Management Area during dry weather and wet weather. Following San Diego Water Board acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct long-term receiving water monitoring during implementation of the Water Quality Improvement Plan to assess the long term trends and determine if conditions in receiving waters are improving. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following receiving water monitoring procedures:

a. TRANSITIONAL RECEIVING WATER MONITORING

Until the monitoring requirements and schedules of Provisions D.1.b-e are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following receiving water monitoring in the Watershed Management Area:

(1) Continue the receiving water monitoring programs required in Order Nos. R9-2007-0001 (Monitoring and Reporting Program No. R9-2007-0001 Sections II.A.1-A.5), R9-2009-0002, and R9-2010-0016;

(2) Continue the monitoring in the Hydromodification Management Plans approved by the San Diego Water Board;

(3) Participate in the following regional receiving water monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring,

(b) Southern California Bight Regional Monitoring, and

(c) Sediment Quality Monitoring;

(4) Implement the monitoring programs developed as part of any implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) for the TMDLs in Attachment E to this Order; and

(5) For Watershed Management Areas with ASBS, implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

b. LONG-TERM RECEIVING WATER MONITORING STATIONS

The Copermittees must select at least one long-term receiving water monitoring station from among the existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees to be representative of the receiving water quality in the Watershed Management Area. Additional long-term receiving water monitoring stations must be selected where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

c. DRY WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three dry weather monitoring events at each of the long-term receiving water monitoring stations. At least one monitoring event must be conducted during the dry season (May 1 – September 30) and at least one monitoring event must be conducted during a dry weather period during the wet season (October 1 – April 30), after the first wet weather event of the season, with an antecedent dry period of at least 72 hours following a storm event producing measureable rainfall of greater than 0.1 inch.

(1) Dry Weather Receiving Water Field Observations

For each dry weather monitoring event, the Copermittees must record field observations consistent with Table D-1 at each long-term receiving water monitoring station.

Table D-1. Field Observations for Receiving Water Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) • Station description (i.e. deposits or stains, vegetation condition, structural condition, and observable biology) • Presence and assessment of trash in and around station

(2) Dry Weather Receiving Water Field Monitoring

For each dry weather monitoring event, if conditions allow the collection of the data, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

Table D-2. Field Monitoring Parameters for Receiving Water Monitoring Stations

Parameters
• pH • Temperature • Specific conductivity • Dissolved oxygen • Turbidity

(3) Dry Weather Receiving Water Analytical Monitoring

For each dry weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable NAL constituents, and

(v) Constituents listed in Table D-3.

Table D-3. Analytical Monitoring Constituents for Receiving Water Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Pesticides	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Mercury • Nickel • Selenium • Thallium • Zinc	• Organophosphate Pesticides • Pyrethroid Pesticides	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(4) Dry Weather Receiving Water Toxicity Monitoring

For each dry weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for aquatic toxicity in accordance with Table D-4.~~:~~ When the State Water Board's Policy for Toxicity Assessment and Control (Toxicity Policy) is approved and in effect, the San Diego Water Board Executive Officer may direct the Copermittees to replace current toxicity program elements with standardized procedures in the Toxicity Policy.

Table D-4. Dry Weather Chronic[1] Toxicity Testing for Receiving Water Monitoring Stations

~~Freshwater~~ Organism	Units	Test ~~Approach~~	USEPA Protocol[2]
Freshwater			
Pimephales promelas (Fathead Minnow)	Pass / Fail	Larval Survival and Growth ~~1 acute 1 chronic~~[1]	EPA-821-R-02-013~~2~~
Ceriodaphnia dubia ~~*Hyalella Azteca*~~ (Daphnid)	Pass / Fail	Survival and Production ~~1 acute 1 chronic~~[1]	EPA-821-R-02-013~~2~~
Selenastrum capricornutum ~~*Psuedokirchneriella subcapitata*~~ (Green Algae)	Pass / Fail	Growth ~~1 acute 1 chronic~~[1]	EPA-821-R-02-013
Marine and Estuarine			
Strongylocentrotus purpuratus (Purple Sea Urchin)	Pass / Fail	Embryo-Larval Development	EPA-600-R-95-136

Notes:
1. Chronic toxicity testing is not required at receiving water monitoring stations located at mass loading stations if the channel flows are diverted year-round during dry weather conditions to the sanitary sewer for treatment.
~~2. USEPA protocols must be utilized for toxicity testing unless alternate toxicity testing protocols have been approved by the San Diego Water Board.~~

(a) Freshwater Test Species and Methods: If samples are collected in receiving waters with salinity less than 1 ppt, the Copermittees must follow the methods for chronic toxicity tests as established in 40 CFR 136.3 using a single-concentration test design for routine monitoring, or a five-concentration test design for additional toxicity testing if the limitation is exceeded. The Copermittees must estimate the critical life stage chronic toxicity on undiluted samples in accordance with species and short term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms (EPA-821-R-02-013; Table IA, 40 CFR 136). Additional test species may be used by the Copermittees if approved by the San Diego Water Board Executive Officer. The Copermittees must conduct:

(i) A static renewal toxicity test with the fathead minnow, *Pimephales promelas* (Larval Survival and Growth Test Method 1000.0);

(ii) A static renewal toxicity test with the daphnid, *Ceriodaphnia dubia* (Survival and Reproduction Test Method 1002.0); and

(iii) A static renewal toxicity test with the green alga, *Selenastrum capricornutum* (also named *Raphidocelis subcapitata*) (Growth Test Method 1003.0).

(b) Marine and Estuarine Test Species and Methods: If samples are collected in receiving waters with salinity greater or equal to 1 ppt, the Copermittees must follow the methods for chronic toxicity tests as established in 40 CFR 136.3 using a single-concentration test design for routine monitoring, or a five-concentration test design for additional toxicity testing if the limitation is exceeded. The Copermittees must conduct the following critical life state chronic toxicity tests on undiluted samples in accordance with species and short term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms (EPA-600-R-95-136; 1995). Artificial sea salts must be used to increase sample salinity. The Copermittees must conduct a static non-renewal toxicity test with the purple sea urchin, *Strongylocentrotus purpuratus* (Embryo-larval Development Test Method). Additional species may be used by the Copermittees if approved by the San Diego Water Board Executive Officer.

(c) Holding Times: All toxicity tests must be conducted as soon as possible following sample collection. The 36-hour sample holding time for test initiation shall be targeted. However, no more than 72 hours shall elapse before the conclusion of sample collection and test initiation.

(d) Test Species Sensitivity Screening: To determine the most sensitive test species for freshwater, the Copermittees must screen 2 wet weather and 2 dry weather toxicity tests with a vertebrate, an invertebrate, and a plant species. After this screening period, subsequent monitoring must be conducted using the most sensitive test species. Alternatively, if a sensitive test species has already been determined, or if there is prior knowledge of potential toxicant(s) and a test species is sensitive to such toxicant(s), then monitoring must be conducted using only that test species. Sensitive test species determinations must also consider the most sensitive test species used for proximal receiving water monitoring. Rescreening must occur once each permit term.

(e) Chronic toxicity test biological endpoint data must be analyzed using the Test of Significant Toxicity t-test approach specified in *National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document* (USEPA, Office of Wastewater Management, Washington, D.C., EPA-833-R-10-003, 2010). For this monitoring program, the critical chronic instream waste concentration (IWC) is set at 100 percent receiving water (i.e. no dilution) for receiving water samples. A 100 percent

receiving water and a control must be tested.

(f) Toxicity Identification Evaluation (TIE) / Toxicity Reduction Evaluation (TRE): If chronic toxicity is detected in receiving waters, the Copermittees must discuss the need for conducting a TIE/TRE in the assessments required under Provision D.4.a.(2), and develop a plan for implementing the TIE/TRE to be incorporated in the Water Quality Improvement Plan.

(5) Dry Weather Receiving Water Bioassessment Monitoring

Bioassessment monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must conduct bioassessment monitoring during at least one dry weather monitoring event at each long-term receiving water monitoring station as follows:

(a) The following bioassessment samples and measurements must be collected:

(i) Macroinvertebrate samples must be collected in accordance with the "Reachwide Benthos (Multihabitat) Procedure" in the most current Surface Water Ambient Monitoring Program (SWAMP) Bioassessment Standard Operating Procedures (SOP), and amendments, as applicable;[13]

(ii) The "Full" suite of physical habitat characterization measurements must be collected in accordance with the most current SWAMP Bioassessment SOP, and as summarized in the SWAMP Stream Habitat Characterization Form – Full Version;[14] and

(iii) Freshwater algae samples must be collected in accordance with the SWAMP Standard Operating Procedures for Collecting Algae Samples.[15] Analysis of samples must include algal taxonomic composition (diatoms and soft algae) and algal biomass.

(b) The bioassessment samples, measurements, and appropriate water chemistry data must be used to calculate the following:

(i) An Index of Biological Integrity (IBI) for macroinvertebrates for each monitoring station where bioassessment monitoring was conducted,

[13] Ode, P.R.. 2007. Standard operating procedures for collecting macroinvertebrate samples and associated physical and chemical data for ambient bioassessments in California. California State Water Resources Control Board Surface Water Ambient Monitoring Program (SWAMP) Bioassessment SOP 001. http://www.swrcb.ca.gov/water_issues/programs/swamp/tools.shtml#monitoring
[14] Available at: http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/reports/fieldforms_fullversion052908.pdf
[15] Fetscher et al. 2009. Standard Operating Procedures for Collecting Stream Algae Samples and Associated Physical Habitat and Chemical Data for Ambient Bioassessments in California.

based on the most current calculation method;[16] and

(ii) An IBI for algae for each monitoring station where bioassessment monitoring was conducted, when a calculation method is developed.[17]

(c) In lieu of the requirements of Provision D.1.c.(5)(a), the Copermittees may conduct the bioassessment monitoring in accordance with the "Triad" assessment approach[18] to calculate the IBIs required for Provision D.1.c.(5)(b). The Copermittees must conduct sampling, analysis, and reporting of specified in-stream biological and habitat data according to the protocols specified in the SCCWRP Technical Report No. 539, or subsequent protocols, if developed.

(6) Dry Weather Receiving Water Hydromodification Monitoring

In addition to the hydromodification monitoring conducted as part of the Copermittees' Hydromodification Management Plans, hydromodification monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must collect the following hydromodification monitoring observations and measurements within an appropriate domain of analysis during at least one dry weather monitoring event for each long-term receiving water monitoring station:

(a) Channel conditions, including:

(i) Channel dimensions,

(ii) Hydrologic and geomorphic conditions, and

(iii) Presence and condition of vegetation and habitat;

(b) Location of discharge points;

(c) Habitat integrity;

(d) Photo documentation of existing erosion and habitat impacts, with location (i.e. latitude and longitude coordinates) where photos were taken;

[16] The most current calculation method at the time the Order was adopted is outlined in "A Quantitative Tool for Assessing the Integrity of Southern California Coastal Streams" (Ode, et al. 2005. Environmental Management. Vol. 35, No. 1, pp. 1-13). If an updated or new calculation method is developed, either both (i.e. current and updated/new) methods must be used, or historical IBIs must be recalculated with the updated or new calculation method.

[17] When a calculation method is developed, IBIs must be calculated for all available and appropriate historical data.

[18] Stormwater Monitoring Coalition Model Monitoring Technical Committee, 2004. Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California. Technical Report #419. August 2004.

(e) Measurement or estimate of dimensions of any existing channel bed or bank eroded areas, including length, width, and depth of any incisions; and

(f) Known or suspected cause(s) of existing downstream erosion or habitat impact, including flow, soil, slope, and vegetation conditions, as well as upstream land uses and contributing new and existing development.

d. WET WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three wet weather monitoring events at each long-term receiving water monitoring station. At least one wet weather monitoring event must be conducted during the first wet weather event of the wet season (October 1 – April 30), and at least one wet weather monitoring event during a wet weather event that occurs after February 1.

(1) Wet Weather Receiving Water Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each long-term receiving water monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event;

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(d) Presence and assessment of trash in and around station.

(2) Wet Weather Receiving Water Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

(3) Wet Weather Receiving Water Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) Constituents listed in Table D-3.

(4) Wet Weather Receiving Water Toxicity Monitoring

For each wet weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for chronic aquatic toxicity in accordance with Provisions D.1.c.(4)(a)-(f). ~~Table D-5:~~

~~**Table D-5. Wet Weather Toxicity Testing for Receiving Water Monitoring Stations**~~

~~Freshwater Organism~~	~~Test Approach~~	~~USEPA Protocol[1]~~
~~*Pimephales promelas*~~	~~1 acute~~	~~EPA-821-R-02-012~~
~~*Hyalella Azteca*~~	~~1 acute~~	~~EPA-821-R-02-012~~
~~*Psuedokirchneriella subcapitata*~~	~~1 acute~~	~~EPA-821-R-02-013~~

~~Notes:~~
~~1. USEPA protocols must be utilized for toxicity testing unless alternate toxicity testing protocols have been approved by the San Diego Water Board.~~

e. OTHER RECEIVING WATER MONITORING REQUIREMENTS

(1) Regional Monitoring

The Copermittees must participate in the following regional receiving waters monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring; and

(b) Southern California Bight Regional Monitoring.

(2) Sediment Quality Monitoring

The Copermittees must perform sediment monitoring to assess compliance with sediment quality receiving water limits applicable to MS4 discharges to enclosed bays and estuaries. The monitoring may be performed either by individual or multiple Copermittees to assess compliance with receiving water limits, or through participation in a water body monitoring coalition. ~~The Copermittees must identify sediment sampling stations that are spatially representative of the sediment within the water body segment or region of interest. Sediment quality monitoring must be conducted in conformance with the monitoring requirements set forth in the State Water Board Sediment Quality Control Plan.~~ A Sediment Monitoring Plan which satisfies the requirements of the State Water Board's Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part 1 Sediment Quality (Sediment Control Plan) must be submitted as part of the monitoring and assessment program in the Water Quality Improvement Plan.

(a) The Sediment Monitoring Plan design must include the following:

(i) The elements required under Section VII.D (Receiving Water Limits

Monitoring Frequency) and Section VII.E (Sediment Monitoring) of the Sediment Control Plan;

(ii) A Quality Assurance Project Plan (QAPP) describing the project objectives and organization, functional activities, and quality assurance/quality control protocols for the water and sediment monitoring; and

(iii) A schedule for completion of all sample collection and analysis activities and submission of Sediment Monitoring Reports.

(b) The Copermittees must implement the Sediment Monitoring Plan in accordance with the schedule contained in the Sediment Monitoring Plan, unless otherwise directed in writing by the San Diego Water Board Executive Officer.

(c) The Copermittees must incorporate a Sediment Monitoring Report as part of the Water Quality Improvement Plan Annual Report in accordance with the schedule contained in the Sediment Monitoring Plan, unless otherwise directed in writing by the San Diego Water Board Executive Officer. The Sediment Monitoring Report must contain the following information:

(i) Analysis: An evaluation, interpretation and tabulation of the water and sediment monitoring data, including interpretations and conclusions as to whether applicable Receiving Water Limitations in this Order have been attained at each sample station;

(ii) Sample Location Map: The locations, type, and number of samples shall be identified and shown on a site map; and

(iii) California Environmental Data Exchange Network: A statement certifying that the monitoring data and results have been uploaded into the California Environmental Data Exchange Network (CEDEN).

(d) Based on the Sediment Monitoring Report conclusions the San Diego Water Board may require a human health risk assessment to determine if the human health objective contained in Receiving Water Limitations in Provision A.2.a.(3)(b)(ii) has been attained at each sample station. In conducting a risk assessment, the Copermittees must consider any applicable and relevant information, including California Environmental Protection Agency's (Cal/EPA) Office of Environmental Health Hazard Assessment (OEHHA) policies for fish consumption and risk assessment, Cal/EPA's Department of Toxic Substances Control (DTSC) Risk Assessment, and USEPA Human Health Risk Assessment policies.

(3) ASBS Monitoring

For Watershed Management Areas with ASBS, the Copermittees must implement the monitoring requirements of Attachment B to State Water Board

Resolution No. 2012-0012, included in Attachment A to this Order.

f. ALTERNATIVE WATERSHED MONITORING REQUIREMENTS

The San Diego Water Board may direct the Copermittees to participate in an effort to develop alternative watershed monitoring with other regulated entities, other interested parties, and the San Diego Water Board to refine, coordinate, and implement regional monitoring and assessment programs to determine the status and trends of water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams.

2. MS4 Outfall Discharge Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the discharges from the MS4 outfalls in each Watershed Management Area during dry weather and wet weather. Following San Diego Water Board acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct MS4 outfall discharge monitoring during implementation of the Water Quality Improvement Plan to assess the effectiveness of their jurisdictional runoff management programs toward effectively prohibiting non-storm water discharges into the MS4 and reducing pollutants in storm water discharges ~~to and~~ from their MS4s to the MEP. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following MS4 outfall monitoring procedures:

a. TRANSITIONAL MS4 OUTFALL DISCHARGE MONITORING

Until the monitoring requirements and schedules of Provisions D.2.b-c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following MS4 outfall discharge monitoring in the Watershed Management Area:

(1) MS4 Outfall Discharge Monitoring Station Inventory

Each Copermittee must identify all major MS4 outfalls that discharge directly to receiving waters within its jurisdiction and geo-locate those outfalls on a map of the MS4 pursuant to Provision E.2.b.(1). This information must be compiled into a MS4 outfall discharge monitoring station inventory, and must include the following information:

(a) Latitude and longitude of MS4 outfall point of discharge;

(b) Watershed Management Area;

(c) Hydrologic subarea;

(d) Outlet size;

(e) Accessibility (i.e. safety and without disturbance of critical habitat);

(f) Approximate drainage area; and

(g) Classification of whether the MS4 outfall is known to have persistent dry weather flows, transient dry weather flows, no dry weather flows, or unknown dry weather flows.

(2) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Until the monitoring requirements and schedules of Provision D.2.b are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, each Copermittee must perform dry weather MS4 outfall field screening monitoring to identify non-storm water and illicit discharges within its jurisdiction in accordance with Provision E.2.c, to determine which discharges are transient flows and which are persistent flows, and prioritize the dry weather MS4 discharges that will be investigated and eliminated in accordance with Provision E.2.d. ~~Each Copermittee must conduct the following dry weather MS4 outfall discharge field screening monitoring within its jurisdiction:~~

(a) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Frequency

Each Copermittee must field screen the MS4 outfalls in its inventory developed pursuant to Provision D.2.a.(1) as follows:

(i) For Copermittees with less than 125 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 80 percent of the outfalls must be visually inspected two times per year during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls see Provision D.2.a.(2)(a)(iv).

(ii) For Copermittees with 125 major MS4 outfalls or more, but less than or equal to 500, that discharge to receiving waters within a Watershed Management Area all the outfalls must be visually inspected at least annually during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls see Provision D.2.a.(2)(a)(iv).

(iii) For Copermittees with more than 500 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 500 outfalls must be visually inspected at least annually during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls see Provision D.2.a.(2)(a)(iv). Copermittees with more than 500 major MS4 outfalls within a Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(iv) For any Copermittee~~s~~ with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major MS4 outfalls within its jurisdiction ~~that are located in more than one Watershed Management Area~~, at least 500 major MS4 outfalls within its inventory must be visually inspected at least annually during dry weather conditions. Copermittees with more than 500 major MS4 outfalls in more than one Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(v) Inspections of major MS4 outfalls conducted in response to public reports and staff or contractor reports and notifications may count toward the required visual inspections of MS4 outfall discharge monitoring stations.

(b) Transitional Dry Weather MS4 Outfall Discharge Field Screening Visual Observations

(i) An antecedent dry period of at least 72 hours following any storm event producing measurable rainfall greater than 0.1 inch is required

prior to conducting field screening visual observations during a field screening monitoring event.

(ii) During the field screening monitoring event, each Copermittee must record visual observations consistent with Table D-5~~6~~ at each MS4 outfall discharge monitoring station inspected.

Table D-5~~6~~. Field Screening Visual Observations for MS4 Outfall Discharge Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) - Flow source(s) suspected or identified from non-storm water source investigation - Flow source(s) eliminated during non-storm water source identification • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) - Known or suspected source(s) of pooled or ponded water • Station description (i.e. deposits or stains, vegetation condition, structural condition, observable biology) • Presence and assessment of trash in and around station • Evidence or signs of illicit connections or illegal dumping

(iii) Each Copermittee must implement the requirements of Provisions E.2.d.(2)(c)-(e) based on the field observations.

(iv) Each Copermittee must evaluate field observations together with existing information available from prior reports, inspections and monitoring results to determine whether any observed flowing, pooled, or ponded waters are likely to be transient or persistent flow.[19]

(c) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Records

Based upon the results of the transitional dry weather MS4 outfall discharge field screening monitoring conducted pursuant to Provisions D.2.a.(2)(a)-(b), each Copermittee must update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow.

[19] Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

(3) Transitional Wet Weather MS4 Outfall Discharge Monitoring

Until the monitoring requirements and schedules of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(a) Transitional Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees must select wet weather MS4 outfall discharge monitoring stations from the inventories developed pursuant to Provision D.2.a.(1) for each Watershed Management Area as follows:

(i) ~~a~~At least five wet weather MS4 outfall discharge monitoring stations ~~from the inventories developed pursuant to Provision D.2.a.(1)~~ that are representative of storm water discharges from areas consisting primarily of residential, commercial, industrial, and typical mixed-use land uses present within the Watershed Management Area;~~.~~

(ii) At least one wet weather MS4 outfall discharge monitoring station for each Copermittee within the Watershed Management Area; and

(iii) The County of San Diego may select at least two (2) wet weather MS4 outfall discharge monitoring stations for the portion of the Santa Margarita River Watershed Management Area within its jurisdiction to be monitored during the transitional period until the Riverside County Copermittees are notified of coverage under this Order. After the Riverside County Copermittees are notified of coverage under this Order, the Copermittees in the Watershed Management Area must select wet weather MS4 outfall discharge monitoring stations consistent with the requirements above.

(b) Transitional Wet Weather MS4 Outfall Discharge Monitoring Frequency

Each wet weather MS4 outfall discharge monitoring station selected pursuant to Provision D.2.a.(3)(a) must be monitored twice during the wet season (October 1 – April 30). ~~One~~ The wet weather monitoring events must be selected to be representative of the range of hydrological conditions experienced in the region. At least 10 percent of samples must be conducted during the first wet weather event of the wet season, ~~and one wet weather monitoring event at least a month after the first wet weather event of the wet season~~ to include at least one such sample in each Watershed Management Area..

(c) Transitional Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(i) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(ii) The flow rates and volumes measured or estimated from the MS4 outfall (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

~~(iii) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and~~

~~(iv) Presence and assessment of trash in and around station.~~

(d) Transitional Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(e) Transitional Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, and indicator bacteria;

(iv) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

[a] Time-weighted composites collected over the length of the storm event or the first 24 hour period whichever is shorter, composed

of ~~24~~ discrete ~~hourly~~ samples, which may be collected through the use of automated equipment, or

[b] Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

[c] If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours;

(v) Only one analysis of the composite of aliquots is required;

(vi) The samples must be analyzed for the following constituents:

[a] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

[b] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and

[c] Constituents listed in in Table D-6~~7~~.

Table D-6~~7~~. Analytical Monitoring Constituents for Wet Weather MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Nickel • Selenium • Thallium • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(f) Other Transitional Wet Weather MS4 Outfall Discharge Monitoring

The San Diego County Copermittees must continue the wet weather MS4 outfall monitoring program developed under Order No. R9-2007-0001, as approved by the San Diego Water Board, through its planned completion.

b. DRY WEATHER MS4 OUTFALL DISCHARGE MONITORING

Each Copermittee must perform dry weather MS4 outfall monitoring to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. Each Copermittee must conduct the following dry weather MS4 outfall discharge monitoring within its jurisdiction:

(1) Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Each Copermittee must continue to perform the dry weather MS4 outfall discharge field screening monitoring in accordance with the requirements of Provision D.2.a.(2). The Copermittee may adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of persistent flow non-storm water discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of visual inspections performed is equivalent to the number of visual inspections required under Provision D.2.a.(2)(a).

(2) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring

Each Copermittee must perform non-storm water persistent flow MS4 outfall discharge monitoring to determine which persistent non-storm water discharges contain concentrations of pollutants below NALs, and which persistent non-storm water discharges impact receiving water quality during dry weather. Each Copermittee must conduct the following non-storm water persistent flow MS4 outfall discharge monitoring within its jurisdiction:

(a) Prioritization of Non-Storm Water Persistent Flow MS4 Outfalls

Based upon the dry weather MS4 outfall discharge field screening monitoring records developed pursuant to Provision D.2.a.(2)(c), each Copermittee must identify and prioritize the MS4 outfalls with persistent flows based on the highest priority water quality conditions identified in the Water Quality Improvement Plan and any additional criteria developed by the Copermittee, which may include historical data and data from sources other than what the Copermittee collects.

(b) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring Frequency

(i) Based on the prioritization of major MS4 outfalls developed under Provision D.2.b.(2)(a), each Copermittee must identify, at a minimum, the ~~10~~ 5 highest priority major MS4 outfalls with non-storm water persistent flows that the Copermittee will monitor within its jurisdiction in each Watershed Management Area ~~within its jurisdiction~~. For Responsible Copermittees identified by a TMDL in Attachment E of this Order, if the 5 chosen outfall locations are not sufficient to determine compliance with the TMDL(s), then each Responsible Copermittee must identify additional MS4 outfall monitoring locations within its jurisdiction sufficient to address compliance with the TMDL(s). If a Copermittee has less than 5 major outfalls within a Watershed Management Area, then the Copermittee must monitor all of its major MS4 outfalls with persistent flows within each Watershed Management Area. The location of the highest priority non-storm water persistent flow MS4 outfall monitoring stations must be identified on the map required pursuant to Provision E.2.b.(1). The map must specify which MS4 outfalls are being monitored for compliance with a TMDL.

(ii) Each of the highest priority non-storm water persistent flow MS4 outfall monitoring stations identified pursuant to Provision D.2.b.(2)(b)(i) must be monitored under dry weather conditions at least semi-annually until one of the following occurs:

[a] The non-storm water discharges have been effectively eliminated (i.e. no flowing, pooled, or ponded water) for three consecutive dry weather monitoring events; or
[b] The source(s) of the persistent flows has been identified as a category of non-storm water discharges that does not require an NPDES permit and does not have to be addressed as an illicit discharge because it was not identified as a source of pollutants (i.e. constituents in non-storm water discharge do not exceed NALs), and the persistent flow can be re-prioritized to a lower priority; or
[c] The constituents in the persistent flow non-storm water discharge do not exceed NALs, and the persistent flow can be re-prioritized to a lower priority; or
[d] The source(s) of the persistent flows has been identified as a non-storm water discharge authorized by a separate NPDES permit.

(iii) Where the criteria under Provision D.2.b.(2)(c)(ii) are not met, but the threat to water quality has been reduced by the Copermittee, the highest priority persistent flow MS4 outfall monitoring stations may be reprioritized accordingly for continued dry weather MS4 outfall

discharge field screening monitoring required pursuant to Provision D.2.b.(1).

(iv) Each Copermittee must document removal or re-prioritization of the highest priority persistent flow MS4 outfall monitoring stations identified under Provision D.2.b.(2)(b) in the Water Quality Improvement Plan Annual Report. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized major MS4 ~~major~~ outfall in the Watershed Management Area within its jurisdiction, unless there are no remaining qualifying major MS4 outfalls within the Copermittee's jurisdiction in the Watershed Management Area.

(c) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Observations

During each semi-annual monitoring event, each Copermittee must record field observations consistent with Table D-5~~6~~ at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(d) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Monitoring

During each semi-annual monitoring event, if conditions allow the collection of the data, each Copermittee must monitor and record the parameters in Table D-2 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(e) Non-Storm Water Persistent Flow MS4 Outfall Discharge Analytical Monitoring

During each semi-annual monitoring event in which measurable flow is present, each Copermittee must collect and analyze samples from each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Collect grab or composite samples to be analyzed at a qualified laboratory for the following constituents:

[a] Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

[b] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section

303(d) List,

[c] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

[d] Applicable NAL constituents, and

[e] Constituents listed in Table D-7~~8~~.~~,~~ ~~unless t~~The Copermittees ~~has~~ may adjust the list of constituents for the Watershed Management Area if historical data or supporting information can be provided that ~~can~~ demonstrates or ~~provide~~ justifies~~cation that~~ the analysis of ~~the~~ a constituent is not necessary.

Table D-7~~8~~. Analytical Monitoring Constituents for Persistent Flow MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Total Hardness • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Cadmium • Copper • Lead • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(iv) If the Copermittee identifies and eliminates the source of the persistent flow non-storm water discharge, analysis of the sample is not required.

c. WET WEATHER MS4 OUTFALL DISCHARGE MONITORING

The Copermittees must perform wet weather MS4 outfall monitoring to identify ~~sources of~~ pollutants in storm water discharges from the MS4s ~~in the Watershed Management Area~~, to guide pollutant source identification efforts, and to determine compliance with the WQBELs associated with the applicable TMDLs in Attachments E of this Order. The Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(1) Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees may adjust the wet weather MS4 outfall discharge monitoring locations ~~and frequencies~~ in the Watershed Management Area, as needed, to identify ~~sources of~~ pollutants in storm water discharges from

MS4s, to guide pollutant source identification efforts, and to determine compliance with the WQBELs associated with the applicable TMDLs in Attachments E of this Order ~~in the Watershed Management Area~~ in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of stations is at least equivalent to the number of stations required under Provision D.2.a.(3)(a). Additional outfall monitoring locations, above the minimum per jurisdiction, may be required to demonstrate compliance with the WQBELs associated with the applicable TMDLs in Attachments E.

(2) Wet Weather MS4 Outfall Discharge Monitoring Frequency

The Copermittees must monitor the wet weather MS4 outfall discharge monitoring stations in the Watershed Management Area ~~at an appropriate frequency~~ at least once (1) per year. The Copermittees may need to increase the frequency of monitoring in order to identify ~~sources of~~ pollutants in storm water discharges from the MS4s causing or contributing to the highest priority water quality conditions, to guide pollutant source identification efforts, or to determine compliance with the WQBELs associated with the applicable TMDLs in Attachments E of this Order ~~identified in the Water Quality Improvement Plan~~.

(3) Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

~~(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and~~

~~(d) Presence and assessment of trash in and around station.~~

(4) Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(5) Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites collected over the length of the storm event or the first 24 hour period, whichever is shorter , composed of ~~24~~ discrete ~~hourly~~ samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

(iii) If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours.

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d)

List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, ~~and~~

(iv) Applicable SAL constituents, ~~.~~ and

(v) The Copermittees may adjust the analytical monitoring required for the Watershed Management Area, if the Copermittees have historical data or supporting information that can demonstrate or provide justification that the analysis of a constituent is not necessary.

3. Special Studies

a. Within the term of this Order, the Copermittees must ~~develop and implement~~ initiate the following special studies:

(1) At least two ~~three~~ special studies in each Watershed Management Area to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that cause or contribute to highest priority water quality conditions identified in the Water Quality Improvement Plan.

(2) At least one ~~two~~ special study~~ies~~ for the San Diego Region to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that are impacting receiving waters on a regional basis in the San Diego Region.

(3) One of the two ~~three~~ special studies in each Watershed Management Area may be replaced by a special study implemented pursuant to Provision D.3.a.(2).

b. The special studies must, at a minimum, be in conformance with the following criteria:

(1) The special studies must be related to the highest priority water quality conditions identified by the Copermittees in the Watershed Management Area and/or for the entire San Diego Region;

(2) The special studies developed pursuant to Provision D.3.a.(1) must:

(a) Be implemented within the applicable Watershed Management Area, and

(b) Require some form of participation by all the Copermittees within the Watershed Management Area;

(3) The special studies developed pursuant to Provision D.3.a.(2) must:

(a) Be implemented within the San Diego Region, and

(b) Require some form of participation by all Copermittees covered under the requirements of this Order.

(4) The Copermittees are encouraged to partner with environmental groups or third parties knowledgeable of watershed conditions to complete the required special studies.

c. Special studies developed to identify sources of pollutants and/or stressors should be pollutant and/or stressor specific and based on historical monitoring data and monitoring performed pursuant to Provisions D.1 and D.2. Development of source identification special studies should include the following:

(1) A compilation of known information on the specific pollutant and/or stressor, including data on potential sources and movement of the pollutant and/or stressor within the watershed. Data generated by the Copermittees and others, as well as information available from a literature research on the pollutant and/or stressor should be compiled and analyzed as appropriate.

(2) An identification of data gaps, based on the compiled information generated on the specific pollutant and/or stressor in Provision D.3.d.(1). Source identification special studies should be developed to fill identified data gaps.

(3) A monitoring plan that will collect and provide data the Copermittees can utilize to do the following:

(a) Quantify the relative loading or impact of a pollutant and/or stressor from a particular source or pollutant generating activity;

(b) Improve understanding of the fate of a pollutant and/or stressor in the environment;

(c) Develop an inventory of known and suspected sources of a pollutant and/or stressor in the Watershed Management Area; and/or

(d) Prioritize known and suspected sources of a pollutant and/or stressor based on relative magnitude in discharges, geographical distribution (i.e., regional or localized), frequency of occurrence in discharges, human health risk, and controllability.

d. Special studies initiated prior to ~~the acceptance of the Water Quality Improvement Plan~~ the effective date of this Order that meet the requirements of Provision D.3.b and are ~~completed~~ implemented during the term of this Order as part of the Water Quality Improvement Plan may be utilized to fulfill the special

study requirements of Provision D.3.a. Special studies completed before the Water Quality Improvement Plan is accepted by the San Diego Water Board cannot be utilized to fulfill the special study requirements of Provision D.3.a.

e. The Copermittees must submit the monitoring plans for the special studies in the Water Quality Improvement Plans required pursuant to Provision F.1.

f. The Copermittees are encouraged to share the results of the special studies regionally among the Copermittees to provide information useful in improving and adapting the management of non-storm water and storm water runoff through the implementation of the Water Quality Improvement Plans.

4. Assessment Requirements

Each Copermittee must evaluate the data collected pursuant to Provisions D.1, D.2 and D.3, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E, to assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a. Assessments must be performed as described in the following provisions:

a. RECEIVING WATERS ASSESSMENTS

(1) The Copermittees must assess and report the conditions of the receiving waters in the Watershed Management Area as follows:

(a) Based on data collected pursuant to Provision D.1.a, the assessments under Provision D.4.a.(2) must be included in the ~~first Annual~~ Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2~~1~~).

(b) Based on the data collected pursuant to Provisions D.1.a-e, the assessments required under Provision D.4.a.(2) must be included in the Report of Waste Discharge required pursuant to Provision F.5.b.

(2) The Copermittees must assess the status and trends of receiving water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under dry weather and wet weather conditions. For each of the three types of receiving waters in each Watershed Management Area the Copermittees must:

(a) Determine whether or not the conditions of the receiving waters are meeting the numeric goals established pursuant to Provision B.3.a ~~protective of the designated beneficial uses~~;

(b) Identify the most critical beneficial uses that must be protected ~~or restored~~

to ensure overall health of the receiving water;

(c) Determine whether or not those critical beneficial uses are being protected ~~and where those beneficial used must be restored~~;

(d) Identify short-term and/or long-term improvements or degradation of those critical beneficial uses;

(e) Determine whether or not the strategies established in the Water Quality Improvement Plan contribute towards progress in achieving the interim and final numeric goals of the Water Quality Improvement Plan; and

(f) Identify data gaps in the monitoring data necessary to assess Provisions D.4.a.(2)(a)-(e~~d~~).

b. MS4 OUTFALL DISCHARGES ASSESSMENTS

(1) Non-Storm Water Discharges Reduction Assessments

(a) Each Copermittee must assess and report the progress of its illicit discharge detection and elimination program, required to be implemented pursuant to Provision E.2, toward ~~reducing and~~ effectively prohibiting non-storm water and illicit discharges into the MS4 within its jurisdiction as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(2), the assessments under Provision D.4.b.(1)(b) must be included in the ~~first Annual~~ Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2~~1~~).

(ii) Based on the data collected pursuant to Provisions D.2.b, the assessments required under Provision D.4.b.(1)(c) must be included in the ~~first~~ Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3~~1~~)~~, and annually thereafter~~.

(iii) Based on the data collected pursuant to Provisions D.2.b, the assessment required under Provision D.4.b.(1)(c) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.a.(2), each Copermittee must assess and report the following:

(i) Identify the known and suspected controllable sources (e.g. facilities, areas, land uses, pollutant generating activities) of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area;

(ii) Identify sources of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area that have been reduced or eliminated; and

(iii) Identify modifications to the field screening monitoring locations and frequencies for the MS4 outfalls in its inventory necessary to identify and eliminate sources of persistent flow non-storm water discharges pursuant to Provision D.2.b.(1).

(c) Based on the dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b, each Copermittee must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(1)(b);

(ii) Based on the data collected and applicable NALs in the Water Quality Improvement Plan, rank the MS4 outfalls in the Copermittee's jurisdiction according to potential threat to receiving water quality, and produce a prioritized list of major MS4 outfalls for follow-up action to update the Water Quality Improvement Plan, with the goal of eliminating persistent flow non-storm water discharges and/or pollutant loads in order of the ranked priority list through targeted programmatic actions and source investigations;

(iii) For the highest priority major MS4 outfalls with persistent flows that are in exceedance of NALs, identify the known and suspected sources within the Copermittee's jurisdiction in the Watershed Management Area that may cause or contribute to the NAL exceedances;

(iv) Each Copermittee must analyze the data collected pursuant to Provision D.2.b, and utilize a model or other method, to calculate or estimate the non-storm water volumes and pollutant loads collectively discharged from all the major MS4s outfalls in its jurisdiction identified as having persistent dry weather flows during the monitoring year. These calculations or estimates must be updated annually. ~~Each Copermittee must calculate or estimate:~~

[a] Each Copermittee must calculate or estimate the ~~A~~annual non-storm water volumes and pollutant loads collectively discharged from the Copermittee's major MS4 outfalls to receiving waters within the Copermittee's jurisdiction, with an estimate of the percent contribution from each known ~~and suspected~~ source for each MS4 outfall;

[b] Each Copermittee must ~~A~~annually identify and quantify (i.e. volume and pollutant loads) sources of non-storm water ~~volumes and pollutant loads from areas or facilities~~ not subject to the Copermittee's legal authority that are discharged from the

Copermittee's major MS4 outfalls to downstream receiving waters.

(v) Each Copermittee must review the data collected pursuant to Provision D.2.b and findings from the assessments required pursuant to Provision D.4.b.(1)(c)(i)-(iv) ~~on an annual basis~~ at least once during the term of this Order to:

[a] Identify reductions and progress in achieving reductions in non-storm water and illicit discharges to the Copermittee's MS4 in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction, with an estimate, if possible, of the non-storm water volume and/or pollutant load reductions attributable to specific water quality strategies implemented by the Copermittee; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittee in the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction.

(vi) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(v).

(2) Storm Water Pollutant Discharges Reduction Assessments

(a) The Copermittees must assess and report the progress of the water quality improvement strategies, required to be implemented pursuant to Provisions B and E, toward reducing pollutants in storm water discharges from the MS4s within the Watershed Management Area as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(3), the assessments under Provision D.4.b.(2)(b) must be included in the ~~first Annual~~ Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2~~1~~).

(ii) Based on the data collected pursuant to Provisions D.2.c, the assessments required under Provision D.4.b.(2)(c) must be included in the ~~first~~ Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(1)~~, and annually thereafter~~.

(iii) Based on the data collected pursuant to Provisions D.2.c, the assessment required under Provisions D.4.b.(2)(c)-(d) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.a.(3) the Copermittees must assess and report the following:

(i) The Copermittees must analyze the monitoring data collected pursuant to Provision D.2.a.(3), and utilize a watershed model or other method, to calculate or estimate ~~storm water volumes and pollutant loads discharged from the MS4s in each Copermittee's jurisdiction within the Watershed Management Area. The Copermittees must calculate or estimate~~ the following for each monitoring year:

[a] The average storm water runoff coefficient for each land use type within the Watershed Management Area;

[b] The volume of storm water and pollutant loads discharged from each of the Copermittee's ~~major~~ monitored MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch;

[c] The total flow volume and pollutant loadings discharged from the Copermittee's jurisdiction within the Watershed Management Area over the course of the wet season, extrapolated from the data produced from the monitored MS4 outfalls; ~~The pollutant loads discharged from each of the Copermittee's major MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch;~~ and

[d] The percent contribution of storm water volumes and pollutant loads discharged from each land use type within the drainage basin to each of the Copermittee's major MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch.

(ii) Identify modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify ~~sources~~ pollutants in storm water discharges from the MS4s in the Watershed Management Area pursuant to Provision D.2.c.(1).

(c) Based on the wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.c the Copermittees must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(2)(b);

(ii) Based on the data collected and applicable SALs in the Water Quality Improvement Plan, ~~rank the MS4 outfalls in the Watershed Management Area according to potential threat to receiving water~~

~~quality, and produce a prioritized list of major MS4 outfalls~~ analyze and compare the monitoring data to the analyses and assumptions used to develop the Water Quality Improvement Plans, including strategies developed pursuant to Provision B.3, and evaluate whether those analyses and assumptions should be updated as a component of the adaptive management efforts pursuant to Provision B.5 for follow-up action to update the Water Quality Improvement Plan;

(iii) The Copermittees must review the data collected pursuant to Provision D.2.c and findings from the assessments required pursuant to Provisions D.4.b.(2)(c)(i)-(ii) ~~on an annual basis~~ at least once during the term of this Order to:

[a] Identify reductions ~~and~~ or progress in achieving reductions in pollutant concentrations and/or pollutant loads from different land uses and/or drainage areas discharging from the Copermittees' MS4s in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters within the Watershed Management Area to the MEP, with an estimate, if possible, of the pollutant load reductions attributable to specific water quality strategies implemented by the Copermittees; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittees in the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters in the Watershed Management Area to the MEP.

(iv) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(iii).

(d) The Copermittees must evaluate all the data collected pursuant to Provision D.2.c, and incorporate new outfall monitoring data into time series plots for each long-term monitoring constituent for the Watershed Management Area, and perform statistical trends analysis on the cumulative long-term wet weather MS4 outfall discharge water quality data set.

c. Special Studies Assessments

The Copermittees must annually evaluate the results and findings from the special studies developed and implemented pursuant to Provision D.3, and assess their relevance to the Copermittees' efforts to characterize receiving water conditions, understand sources of pollutants and/or stressors, and control and reduce the discharges of pollutants from the MS4 outfalls to receiving waters

in the Watershed Management Area. The Copermittees must report the results of the special studies assessments applicable to the Watershed Management Area, and identify any necessary modifications or updates to the Water Quality Improvement Plan based on the results in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.

d. INTEGRATED ASSESSMENT OF WATER QUALITY IMPROVEMENT PLAN

As part of the iterative approach and adaptive management process required for the Water Quality Improvement Plan pursuant to Provision B.5, the Copermittees in each Watershed Management Area must integrate the data collected pursuant to Provisions D.1-D.3, the findings from the assessments required pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to assess the effectiveness of, and identify necessary modifications to, the Water Quality Improvement Plan as follows:

(1) The Copermittees must re-evaluate the priority water quality conditions and numeric goals for the Watershed Management Area, as needed, during the term of this Order pursuant to Provision B.5.a. The re-evaluation and recommendations for modifications to the priority water quality conditions, and/or numeric goals and corresponding schedules may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b, but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The priority water quality conditions and numeric goals for the Watershed Management Area must be re-evaluated as follows:

(a) Re-evaluate the receiving water conditions in the Watershed Management Area in accordance with Provision B.2.a;

(b) Re-evaluate the impacts on receiving waters in the Watershed Management Area from MS4 discharges in accordance with Provision B.2.b;

(c) Re-evaluate the identification of MS4 sources of pollutants and/or stressors in accordance with Provision B.2.d;

(d) Identify beneficial uses of the receiving waters that are protected ~~or must be restored~~ in accordance with Provision D.4.a;

(e) Evaluate the progress toward achieving the interim and final numeric goals for ~~restoring~~ protecting impacted beneficial uses in the receiving waters.

(2) The Copermittees must re-evaluate the water quality improvement strategies for the Watershed Management Area during the term of this Order pursuant to Provision B.5.b. The re-evaluation and recommendations for modifications

to the water quality improvement strategies and schedules ~~must~~ may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b, ~~and~~ but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The water quality improvement strategies for the Watershed Management Area must be re-evaluated as follows:

(a) Identify the non-storm water and storm water pollutant loads from the Copermittees' MS4 outfalls in the Watershed Management Area, calculated or estimated pursuant to Provisions D.4.b;

(b) Identify the non-storm water and storm water pollutant load reductions, or other improvements to receiving water or water quality conditions, that are necessary to attain the interim and final numeric goals identified in the Water Quality Improvement Plan for ~~restoring impacted~~ protecting beneficial uses in the receiving waters;

(c) Identify the non-storm water and storm water pollutant load reductions, or other improvements to the quality of MS4 discharges, that are necessary for the Copermittees to demonstrate that non-storm water and storm water discharges from their MS4s are not causing or contributing to exceedances of receiving water limitations;

(d) Evaluate the progress of the water quality improvement strategies toward achieving the interim and final numeric goals identified in the Water Quality Improvement Plan for ~~restoring impacted~~ protecting beneficial uses in the receiving waters.

(3) The Copermittees must re-evaluate and adapt the water quality monitoring and assessment program for the Watershed Management Area when new information becomes available to improve the monitoring and assessment program pursuant to Provision B.5.c. The re-evaluation and recommendations for modifications to the monitoring and assessment program may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b, but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. Modifications to the water quality monitoring and assessment program must be consistent with the requirements of Provision D.1-D.3. The re-evaluation of the water quality monitoring and assessment program for the Watershed Management Area must consider the data gaps identified by the assessments required pursuant to Provisions D.4.a-b, and results of the special studies implemented pursuant to Provision D.4.c.

5. Monitoring Provisions

Each Copermittee must comply with all the monitoring, reporting, and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

E. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS

The purpose of this provision is for each Copermittee to implement a program to control the contribution of pollutants to and the discharges from the MS4 within its jurisdiction. The goal of the jurisdictional runoff management programs is to implement strategies that effectively prohibit non-storm water discharges to the MS4 and reduce the discharge of pollutants in storm water to the MEP. This goal will be accomplished through implementing the jurisdictional runoff management programs in accordance with the strategies identified in the Water Quality Improvement Plans.

Each Copermittee must update its jurisdictional runoff management program document, in accordance with Provision F.2.a, to incorporate all the requirements of Provision E. Until the Copermittee has updated its jurisdictional runoff management program document with the requirements of Provision E, the Copermittee must continue implementing its current jurisdictional runoff management program.

1. Legal Authority Establishment and Enforcement

a. Each Copermittee must establish, maintain, and enforce adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 through statute, ordinance, permit, contract, order, or similar means. This legal authority must, at a minimum, authorize the Copermittee to:

(1) Prohibit and eliminate all illicit discharges and illicit connections to its MS4;

(2) Control the contribution of pollutants in discharges of runoff associated with industrial and construction activity to its MS4 and control the quality of runoff from industrial and construction sites, including industrial and construction sites which have coverage under the statewide General Permit for Discharges of Storm Water Associated with Industrial Activities (Industrial General Permit) or General Permit for Discharges of Storm Water Associated with Construction Activities (Construction General Permit), as well as to those sites which do not;

(3) Control the discharge of spills, dumping, or disposal of materials other than storm water into its MS4;

(4) Control through interagency agreements among Copermittees the contribution of pollutants from one portion of the MS4 to another portion of the MS4;

(5) Control, by coordinating and cooperating with other owners of the MS4 such as Caltrans, the U.S. federal government, or sovereign Native American Tribes through interagency agreements, where possible, the contribution of pollutants from their portion of the MS4 to the portion of the MS4 within the Copermittee's jurisdiction;

(6) Require compliance with conditions in its statutes, ordinances, permits, contracts, orders, or similar means to hold dischargers to its MS4 accountable for their contributions of pollutants and flows;

(7) Require the use of BMPs to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(8) Require documentation on the effectiveness of BMPs implemented to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(9) Utilize enforcement mechanisms to require compliance with its statutes, ordinances, permits, contracts, orders, or similar means; and

(10) Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with its statutes, ordinances, permits, contracts, orders, or similar means and with the requirements of this Order, including the prohibition of illicit discharges and connections to its MS4; the Copermittee must also have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from industrial facilities, including construction sites, discharging into its MS4.

b. With the first Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b, each Copermittee must submit a statement certified by its Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative that the Copermittee has taken the necessary steps to obtain and maintain full legal authority within its jurisdiction to implement and enforce each of the requirements contained in this Order.

2. Illicit Discharge Detection and Elimination

Each Copermittee must implement a program to actively detect and eliminate illicit discharges and improper disposal into the MS4, or otherwise require the discharger to apply for and obtain a separate NPDES permit. The illicit discharge detection and elimination program must be implemented in accordance with the strategies ~~identified~~ in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include, at a minimum, the following requirements:

a. Non-Storm Water Discharges

Each Copermittee must address all non-storm water discharges as illicit discharges, unless a non-storm water discharge is either identified as a discharge authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to the following requirements:

(1) Discharges of non-storm water to the MS4 from the following categories must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG919001 (Order No. R9-2007-0034, or subsequent order) for discharges to San Diego Bay, or NPDES Permit No. CAG919002 (Order No. R9-2008-0002, or subsequent order) for discharges to surface waters other than San Diego Bay:

(1) Uncontaminated pumped ground water;

(2) Discharges from foundation drains;[20]

(3) Water from crawl space pumps; and

(4) Water from footing drains.[20]

(2) Discharges of non-storm water from water line flushing and water main breaks to the MS4 must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG 679001 (Order No. R9-2010-0003, or subsequent order). This category includes water line flushing and water main break discharges from water purveyors issued a water supply permit by the California Department of Public Health or federal military installations. Discharges from recycled or reclaimed water lines to the MS4 must be addressed as illicit discharges, unless the discharges have coverage under a separate NPDES permit.

(3) Discharges of non-storm water to the MS4 from the following categories must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a source of pollutants to receiving waters:

(a) Diverted stream flows;

(b) Rising ground waters;

(c) Uncontaminated ground water infiltration to MS4s;

(d) Springs;

(e) Flows from riparian habitats and wetlands;

(f) Discharges from potable water sources;

[20] Provision E.2.a.(1) only applies to this category of~~n~~ non-storm water if the system is designed to be located at or below the ~~highest historical~~ groundwater table to actively or passively extract groundwater during any part of the year.

(g) Discharges from foundation drains;[21] and

(h) Discharges from footing drains.[21]

(4) Discharges of non-storm water to the MS4 from the following categories must be controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means. Discharges of non-storm water to the MS4 from the following categories not controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means must be addressed by the Copermittee as illicit discharges.

(a) Air conditioning condensation

The discharge of air conditioning condensation ~~must~~ should be directed to landscaped areas or other pervious surfaces, or to the sanitary sewer, where feasible.

(b) Individual residential vehicle washing

(i) The discharge of wash water ~~must~~ should be directed to landscaped areas or other pervious surfaces where feasible; and

(ii) ~~Minimize t~~The ~~use~~ minimization of water ~~for vehicle washing, use as little~~, washing detergent and other vehicle wash products used for residential vehicle washing ~~as possible, wash vehicles at commercial wash facilities~~, and the implementation of other practices or behaviors that will prevent the discharge of pollutants associated with individual residential vehicle washing from entering the MS4 must be encouraged.

(c) Dechlorinated swimming pool discharges

(i) ~~Eliminate r~~Residual chlorine, algaecide, filter backwash, or other pollutants from swimming pools must be eliminated prior to discharging to the MS4; and

(ii) The discharge of saline swimming pool water must be directed to the sanitary sewer, landscaped areas, or other pervious surfaces that can accommodate the volume of water, unless the saline swimming pool water can be discharged via a pipe or concrete channel directly to a naturally saline water body (e.g. Pacific Ocean).

(5) Firefighting discharges to the MS4 must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a significant source of pollutants to receiving

[21] Provision E.2.a.(3) only applies to this category of non-storm water discharge if the system is designed to be located above the ~~highest historical~~ groundwater table at all times of the year, and the system is only expected to discharge non-storm water under unusual circumstances.

waters. Firefighting discharges to the MS4 not identified as a significant source of pollutants to receiving waters, must be addressed, at a minimum, as follows:

(a) Non-emergency firefighting discharges

(i) Building fire suppression system maintenance discharges (e.g. sprinkler line flushing) to the MS4 must be addressed as illicit discharges unless BMPs are implemented to prevent pollutants associated with such discharges to the MS4.

(ii) Non-emergency firefighting discharges (i.e., discharges from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems) must be addressed by a program, to be developed and implemented by the Copermittee, to reduce or eliminate pollutants in such discharges from entering the MS4.

(b) Emergency firefighting discharges

Each Copermittee should develop and encourage implementation of BMPs to reduce or eliminate pollutants in emergency firefighting discharges to the MS4s and receiving waters within its jurisdiction. During emergency situations, priority of efforts should be directed toward life, property, and the environment (in descending order). BMPs should not interfere with immediate emergency response operations or impact public health and safety.

(6) If the Copermittee or San Diego Water Board identifies any category of non-storm water discharges listed under Provisions E.2.a.(1)-(4) as a source of pollutants to receiving waters, the category must be prohibited through ordinance, order, or similar means and addressed as an illicit discharge. Alternatively, the Copermittee may propose controls to be implemented for the category of non-storm water discharges as part of the Water Quality Improvement Plan instead of prohibiting the category of non-storm water discharges, and implement the controls if accepted by the San Diego Water Board as part of the Water Quality Improvement Plan.

(7) Each Copermittee must, where feasible and priorities and resources allow, reduce or eliminate non-storm water discharges listed under Provisions E.2.a.(1)-(4) into its MS4 ~~whether or not the non-storm water discharge has been identified as an illicit discharge~~, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit.

b. PREVENT AND DETECT ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to prevent and detect illicit discharges to the MS4:

(1) Each Copermittee must maintain an updated map of its entire MS4 and the corresponding drainage areas. The accuracy of the MS4 map must be confirmed during the field screening required pursuant to Provision E.2.c. The MS4 map must be included as part of the jurisdictional runoff management program document. Any geographic information system (GIS) layers or files used by the Copermittee to maintain the MS4 map must be made available to the San Diego Water Board upon request. The MS4 map must identify the following:

(a) All segments of the MS4 owned, operated, and maintained by the Copermittee;

(b) All known locations of inlets that discharge and/or collect runoff into the Copermittee's MS4;

(c) All known locations of connections with other MS4s not owned or operated by the Copermittee (e.g. Caltrans MS4s);

(d) All known locations of MS4 outfalls and private outfalls that discharge runoff collected from areas within the Copermittee's jurisdiction;

(e) All segments of receiving waters within the Copermittee's jurisdiction that receive and convey runoff discharged from the Copermittee's MS4 outfalls;

(f) Locations of the MS4 outfalls, identified pursuant to Provision D.2.a.(1), within its jurisdiction; and

(g) Locations of the non-storm water persistent flow MS4 outfall discharge monitoring stations, identified pursuant to Provision D.2.b.(2)(b), within its jurisdiction.

(2) Each Copermittee must use Copermittee personnel and contractors to assist in identifying and reporting illicit discharges and connections during their daily employment activities.

(3) Each Copermittee must promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges to or from the MS4, including the following methods for public reporting:

(a) Operate a public hotline, which can be Copermittee-specific or shared by the Copermittees, and must be capable of receiving reports in both English and Spanish 24 hours per day and seven days per week; and

(b) Designate an e-mail address for receiving electronic reports from the

public, which can be Copermittee-specific or shared by the Copermittees, and must be prominently displayed on the Copermittee's webpage and the Regional Clearinghouse required pursuant to Provision F.4.

(4) Each Copermittee must implement practices and procedures (including a notification mechanism) to prevent, respond to, contain, and clean up any spills that may discharge into the MS4 within its jurisdiction from any source. The Copermittee must coordinate, to the extent possible, with spill response teams to prevent entry of spills into the MS4, and prevent contamination of surface water, ground water, and soil. The Copermittee must coordinate spill prevention, containment, and response activities throughout all appropriate Copermittee departments, programs, and agencies.

(5) Each Copermittee must implement practices and procedures to prevent and limit infiltration of seepage from sanitary sewers (including private laterals and failing septic systems) to the MS4.

(6) Each Copermittee must coordinate, when necessary, with upstream Copermittees and/or entities to prevent illicit discharges from upstream sources into the MS4 within its jurisdiction.

c. Field Screening

Each Copermittee must conduct field screening (i.e. visual observations, field testing, and/or analytical testing) of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4 in accordance with the dry weather MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

d. Investigate and Eliminate Illicit Discharges And Connections

Each Copermittee must include the following measures within its program to investigate and eliminate illicit discharges to the MS4:

(1) Each Copermittee must prioritize and determine when follow-up investigations will be performed in response to visual observations and/or water quality monitoring data collected during an investigation of a detected non-storm water or illicit discharge to or from the MS4. The criteria for prioritizing investigations must consider the following:

(a) Pollutants identified as causing or contributing to the highest water quality priorities identified in the Water Quality Improvement Plan;

(b) Pollutants identified as causing or contributing, or threatening to cause or contribute to impairments in water bodies on the 303(d) List and/or in environmentally sensitive areas (ESAs), located within its jurisdiction;

(c) Pollutants identified from sources or land uses known to exist within the area, drainage basin, or watershed that discharges to the portion of the MS4 within its jurisdiction included in the investigation;

(d) Pollutants identified as causing or contributing to an exceedance of a NAL in the Water Quality Improvement Plan; and

(e) Pollutants identified as a threat to human health or the environment.

(2) Each Copermittee must implement procedures to investigate and inspect portions of its MS4 that, based on reports or notifications, field screening, or other appropriate information, indicate a reasonable potential of receiving, containing, or discharging pollutants due to illicit discharges, illicit connections, or other sources of non-storm water. The procedures must include the following:

(a) Each Copermittee must develop criteria to:

(i) Assess the validity of each report or notification received; and

(ii) Prioritize the response to each report or notification received.

(b) Each Copermittee must prioritize and respond to each valid report or notification (e.g., public reports, staff or contractor reports and notifications, etc.) of an incident in a timely manner.

(c) In accordance with the requirements of Provision E.2.d.(1), ~~E~~each Copermittee must investigate and seek to identify the source(s) of discharges of non-storm water where flows are observed in and from the MS4 during the field screening required pursuant to Provision D.2.b.(1) as follows:

(i) Obvious illicit discharges must be immediately investigated to identify the source(s) of non-storm water discharges;

(ii) The investigation must include field investigations to identify sources or potential sources for the discharge, unless the source or potential source has already been identified during previous investigations; and

(iii) The investigation may include follow-up field investigations and/or reviewing Copermittee inventories and other land use data to identify potential sources of the discharge.

(d) Each Copermittee must maintain records and a database of the following information:

(i) Location of incident, including hydrologic subarea, portion of MS4

receiving the non-storm water or illicit discharge, and point of discharge or potential discharge from MS4 to receiving water;

(ii) Source of information initiating the investigation (e.g., public reports, staff or contractor reports and notifications, field screening, etc.);

(iii) Date the information used to initiate the investigation was received;

(iv) Date the investigation was initiated;

(v) Dates of follow-up investigations;

(vi) Identified or suspected source of the illicit discharge or connection, if determined;

(vii) Known or suspected related incidents, if any;

(viii) Result of the investigation; and

(ix) If a source cannot be identified and the investigation is not continued, document the response pursuant to the requirements of Provision E.2.d.(3) ~~a rationale for why a discharge does not pose a threat to water quality and/or does not require additional investigation~~.

(e) Each Copermittee must ~~track~~ maintain records and, in accordance with the priorities of the Water Quality Improvement Plan, seek to identify the source(s) of non-storm water discharges from the MS4 where there is evidence of non-storm water having been discharged into or from the MS4 (e.g., pooled water), in accordance with MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.

(3) Each Copermittee must initiate the implementation of procedures, in a timely manner, to eliminate all detected and identified illicit discharges and connections within its jurisdiction. The procedures must include the following responses:

(a) Each Copermittee must enforce its legal authority, as required under Provision E.1, to eliminate illicit discharges and connections to the MS4.

(b) If the Copermittee identifies the source as a controllable source of non-storm water or illicit discharge or connection, the Copermittee must implement its Enforcement Response Plan pursuant to Provision E.6 and enforce its legal authority to prohibit and eliminate illicit discharges and connections to its MS4.

(c) If the Copermittee identifies the source of the discharge as a category of non-storm water discharges in Provision E.2.a, and the discharge is in exceedance of NALs in the Water Quality Improvement Plan, then the Copermittee must determine if: (1) this is an isolated incident or set of circumstances that will be addressed through its Enforcement Response Plan pursuant to Provision E.6, or (2) the category of discharge must be

addressed through the prohibition of that category of discharge as an illicit discharge pursuant to Provision E.2.a.(6).

(d) If the Copermittee suspects the source of the non-storm water discharge as natural in origin (i.e. non-anthropogenically influenced) and in conveyance into the MS4, then the Copermittee must document and provide the data and evidence necessary to demonstrate to the San Diego Water Board that it is natural in origin and does not require further investigation.

(e) If the Copermittee is unable to identify and document the source of a recurring non-storm water discharge to or from the MS4, then the Copermittee must address the discharge as an illicit discharge and update its jurisdictional runoff management program to address the common and suspected sources of the non-storm water discharge within its jurisdiction in accordance with the Copermittee's priorities.

(4) Each Copermittee must submit a summary of the non-storm water discharges and illicit discharges and connections investigated and eliminated within its jurisdiction with each Water Quality Improvement Plan Annual Report required under Provision F.3.b of this Order.

~~e. STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS~~

~~Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the illicit discharge detection and elimination program to address non-storm water and illicit discharges and connections that the Copermittee has identified as potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:~~

~~(1) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, and/or increase/decrease frequency of inspections in specific areas); and~~

~~(2) The strategies and/or activities must be consistent with the requirements of Provisions E.2.a-d and the strategies identified in the Water Quality Improvement Plan.~~

3. Development Planning

Each Copermittee must use their land use and planning authorities to implement a development planning program in accordance with the strategies ~~identified~~ in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. BMP Requirements for All Development Projects

Each Copermittee must prescribe the following BMP requirements during the planning process (i.e. prior to project approval and issuance of local permits) for all development projects (regardless of project type or size), where local permits are issued, including unpaved roads and flood management projects:

(1) General Requirements

(a) Onsite BMPs must be located so as to remove pollutants from runoff prior to its discharge to any receiving waters, and as close to the source as possible; ~~and~~

(b) Structural BMPs must not be constructed within a waters of the U.S. ~~or waters of the state.~~

(c) Onsite BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors (e.g. mosquitos, rodents, or flies).

(2) Source Control BMP Requirements

The following source control BMPs must be implemented at all development projects where applicable and feasible:

(a) Prevention of illicit discharges into the MS4;

(b) Storm drain system stenciling or signage;

(c) Protect ~~Properly designed~~ outdoor material storage areas from rainfall, run-on, runoff, and wind dispersal;

(d) Protect materials stored in ~~Properly designed~~ outdoor work areas from rainfall, run-on, runoff, and wind dispersal;

(e) Protect ~~Properly designed~~ trash storage areas from rainfall, run-on, runoff, and wind dispersal; and

(f) Any additional BMPs determined to be necessary by the Copermittee to minimize pollutant generation at each project.

(3) Low Impact Development (LID) BMP Requirements

The following LID BMPs must be implemented at all development projects where applicable and feasible:

(a) Maintenance or restoration of natural storage reservoirs and drainage

corridors (including topographic depressions, areas of permeable soils, natural swales, and ephemeral and intermittent streams);[22]

(b) Buffer zones for natural water bodies (where buffer zones are technically infeasible, require project applicant to include other buffers such as trees, access restrictions, etc.);

(c) Conservation of natural areas within the project footprint including existing trees, other vegetation, and soils;

(d) Construction of streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided public safety is not compromised;

(e) Minimization of the impervious footprint of the project;

(f) Minimization of soil compaction to landscaped areas;

(g) Disconnection of impervious surfaces through distributed pervious areas;

(h) Landscaped or other pervious areas designed and constructed to effectively receive and infiltrate, retain and/or treat runoff from impervious areas, prior to discharging to the MS4;

(i) Small collection strategies located at, or as close as possible to, the source (i.e. the point where storm water initially meets the ground) to minimize the transport of runoff and pollutants to the MS4 and receiving waters;

(j) Use of permeable materials for projects with low traffic areas and appropriate soil conditions;

(k) Landscaping with native or drought tolerant species; and

(l) Harvesting and using precipitation.

b. PRIORITY DEVELOPMENT PROJECTS

Priority Development Projects are land development projects that fall under the planning and building authority of the Copermittee for which the Copermittee must impose specific requirements, in addition to those described in Provision E.3.a, including the implementation of structural BMPs to meet the performance requirements described in Provisions E.3.c.

[22] Development projects proposing to dredge or fill materials in waters of the U.S. must obtain a CWA Section 401 Water Quality Certification. Projects proposing to dredge or fill waters of the state must obtain waste discharge requirements.

(1) Definition of Priority Development Project

Priority Development Projects include the following:

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site), or redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site). This category includes commercial, industrial, residential, mixed-use, and public development projects on public or private land. ~~All new development projects that fall under the Priority Development Project categories listed under Provision E.3.b.(2) (where a new development project feature, such as a parking lot, falls into a Priority Development Project category, the entire project footprint is subject to Priority Development Project requirements); and~~

(b) New projects that create 5,000 square feet or more of impervious surface (collectively over the entire project site), and support one or more of the following uses: ~~Those redevelopment projects that create, add, or replace at least 5,000 square feet of impervious surfaces on an already developed site, and the redevelopment project is a Priority Development Project category listed under Provision E.3.b.(2) (where redevelopment results in an increase of less than fifty percent of the impervious surfaces of a previously existing development, and the existing development was not subject to Priority Development Project requirements, the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) apply only to the addition or replacement, and not to the entire development; where redevelopment results in an increase of more than fifty percent of the impervious surfaces of a previously existing development, the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) apply to the entire development).~~

~~(2) Priority Development Project Categories~~

~~(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This category includes commercial, industrial, residential, mixed-use, and public development projects on public or private land which fall under the planning and building authority of the Copermittee.~~

~~(b) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.~~

~~(c)~~ (i) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for

immediate consumption (SIC code 5812)~~, where the land area for development is 5,000 square feet or more~~.

~~(d)~~ (ii) Hillside development projects. This category includes ~~any~~ development ~~which creates 5,000 square feet or more of impervious surface which is located in an area with known erosive soil conditions, where the development will grade~~ on any natural slope that is twenty-five percent or greater.

~~(e) Environmentally sensitive areas (ESAs). This category includes any development located within, directly adjacent to, or discharging directly to an ESA, which either creates 2,500 square feet of impervious surface on a proposed project site or increases the area of imperviousness of a proposed project site to 10 percent or more of its naturally occurring condition. "Directly adjacent to" means situated within 200 feet of the ESA. "Discharging directly to" means outflow from a drainage conveyance system that collects runoff from the subject development or redevelopment site and terminates at or in receiving waters within the ESA.~~

~~(f)~~ (iii) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce ~~that has 5,000 square feet or more of impervious surface~~.

~~(g)~~ (iv) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface ~~that is 5,000 square feet or more~~ used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

~~(h) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.~~

~~(i) Large development projects. This category includes any post-construction pollutant-generating new development projects that result in the disturbance of one acre or more of land.~~

(c) New or redevelopment projects that create or replace 2,500 square feet or more of impervious surface (collectively over the entire project site), and discharging directly to an Environmentally Sensitive Area (ESA). "Discharging directly to" includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands).

(d) New development projects that support one or more of the following uses:

(i) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial

Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

(ii) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

(e) New or redevelopment projects that result in the disturbance of one or more acre of land and are expected to generate pollutants post construction.

(2) Special Considerations for Redevelopment Projects

The structural BMP performance requirements of Provisions E.3.c. are applicable to redevelopment Priority Development Projects, as defined in E.3.b.(1), as follows:

(a) Where redevelopment results in the creation or replacement of impervious surface in an amount of less than fifty percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provisions E.3.c apply only to the creation or replacement of impervious surface, and not the entire development; or

(b) Where redevelopment results in the creation or replacement of impervious surface in an amount of more than fifty percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provisions E.3.c apply to the entire development.

(3) Priority Development Project Exemptions

Each Copermittee has the discretion to exempt the following projects from being defined as Priority Development Projects:

(a) New or retrofit paved sidewalks, bicycle lanes, or trails that meet the following criteria:

(i) Designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas; OR

(ii) Designed and constructed to be hydraulically disconnected from paved streets or roads; OR

(iii) Designed and constructed with permeable pavements or surfaces in accordance with USEPA Green Streets guidance.[23]

[23] See "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).

(b) Retrofitting of existing paved alleys, streets or roads that ~~meet the following criteria:~~ are designed and constructed in accordance with the USEPA Green Streets guidance.[24]

~~(i) Must be two lanes or less; AND~~

~~(ii) Must be a retrofitting project implemented as part of an alternative compliance project option under Provision E.3.c.(3)(b)(v) to achieve the performance requirements of Provisions E.3.c.(1) and/or E.3.c.(2) for a Priority Development Project; AND~~

~~(iii) Designed and constructed in accordance with the USEPA Green Streets guidance.~~

~~(c) New single family residences that meet the following criteria:~~

~~(i) Must not be constructed as part of a larger development or proposed subdivision; AND~~

~~(ii) Designed and constructed to be certified under the U.S. Green Building Council (USGCB) Leadership in Energy and Environmental Design (LEED) for Homes green building certification program, receiving at least four (4) Surface Water Management credits under the Sustainable Sites category;[25] OR~~

~~(iii) Designed and constructed with structural BMPs that will achieve the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite.~~

~~(d) Redevelopment of existing single family residences that meet the following criteria:~~

~~(i) Designed and constructed to be certified under the USGCB LEED for Homes green building certification program, receiving at least four (4) Surface Water Management credits under the Sustainable Sites category;[26] OR~~

~~(ii) Designed and constructed with structural BMPs that will achieve the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite.~~

c. Priority Development Project Structural BMP Performance Requirements

In addition to the BMP requirements listed for all development projects under

[24] Ibid.
~~[25] See LEED for Homes rating system at http://www.usgbc.org~~
~~[26] See LEED for Homes rating system at http://www.usgbc.org~~

Provision E.3.a, Priority Development Projects must also implement structural BMPs that conform to performance requirements described below.

(1) Storm Water Pollutant Control BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite structural BMPs to control pollutants in storm water that may be discharged from a project as follows:

(a) Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite 100 percent of the pollutants contained in the volume of storm water runoff produced from a 24-hour 85th percentile storm event (design capture volume);[27]. ~~The design capture volume is equivalent to:~~

~~(i) The volume of storm water produced from a 24-hour 85th percentile storm event; OR~~

~~(ii) The volume of storm water that would be retained onsite if the site was fully undeveloped and naturally vegetated, as determined using continuous simulation modeling techniques based on site-specific soil conditions and typical native vegetative cover.~~

(b) If a Copermittee determines that implementing BMPs to retain the full design capture volume onsite for a Priority Development Project is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize flow-thru treatment control BMPs to achieve the equivalent pollutant load removal described in Provision E.3.c.(1)(a). Biofiltration LID BMPs must be considered as a first option before other types of flow-thru treatment control BMPs may be considered.

(c) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) ~~to comply~~ in lieu of complying with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1)(a). The Priority Development Project must mitigate for the portion of the pollutant load in the design capture volume not retained onsite if Provision E.3.(c)(3) is utilized.

(d) If a Priority Development project is allowed to utilize alternative

[27] This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals.

compliance ~~pursuant to Provisions E.3.c.(1)(b)~~, flow-thru ~~conventional~~ treatment control BMPs must be implemented to treat the portion of the design capture volume that is not retained onsite. ~~Additionally, project applicants must mitigate for the portion of the pollutant load in the design capture volume that is not retained onsite through one or more alternative compliance options under Provision E.3.c.(3). Conventional~~ Flow-thru treatment control BMPs must be sized and designed to:

(i) Remove pollutants from storm water to the MEP;

(ii) Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;

(iii) Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. ~~Conventional~~ Flow-thru treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of ~~conventional~~ flow-thru treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

(2) Hydromodification Management BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite ~~structural~~ BMPs to manage hydromodification that may be caused by storm water runoff discharged from a project as follows:

(a) Post-project runoff conditions (flow rates and durations) must not exceed pre-development ~~(naturally occurring)~~ runoff conditions ~~flow rates and durations~~ by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat ~~conditions~~ downstream of Priority Development Projects).

(i) In evaluating the range of flows that results in increased potential for erosion of natural (non-hardened) channels, the lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks.

~~(ii) For artificially hardened channels, analysis to identify the lower boundary must use characteristics of a natural stream segment similar to that found in the watershed. The lower boundary must correspond with the critical channel flow that produces the critical~~

~~shear stress that initiates channel bed movement or erodes the toe of the channel banks.~~

~~(iii)~~

(ii) The Copermittees may use monitoring results collected pursuant to Provision D.1.a.(2) to re-define the range of flows resulting in increased potential for erosion, or degraded instream habitat conditions, as warranted by the data.

(b) Each Priority Development Project must avoid known critical sediment yield areas or implement measures that allow coarse sediment to be discharged to receiving waters, such that the sediment supply is unaffected by the project. ~~Post-project runoff flow rates and durations must compensate for the loss of sediment supply due to the development project, should loss of sediment supply occur as a result of the development project.~~

(c) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) ~~to comply~~ in lieu of complying with the performance requirements of Provision~~s~~ E.3.c.(2)(a)~~-(b)~~. The Priority Development Project must mitigate for the post-project runoff conditions not fully managed onsite if Provision E.3.(c)(3) is utilized.

(d) Exemptions

Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provisions E.3.c.(2)(a)~~-(b)~~ where the project discharges storm water runoff to:

(i) ~~Discharges storm water runoff into e~~Existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;

(ii) Conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; ~~Is a redevelopment Priority Development Project that meets the alternative compliance requirements of Provision E.3.c.(3)(b)(ii);~~ or

(iii) An area identified by the Copermittees as appropriate for an exemption by the Watershed Management Area Analysis incorporated into the Water Quality Improvement Plan pursuant to Provision B.3.b.(4). ~~Discharges storm water runoff into other areas identified by the San Diego Water Board as exempt from the requirements of Provisions E.3.c.(2)(a)-(b).~~

(3) Alternative Compliance Program to Onsite Structural BMP Implementation ~~Performance Requirements~~

~~(a) Applicability~~

At the discretion of each Copermittee, Priority Development Projects may be allowed to ~~utilize an alternative option to comply with~~ participate in an alternative compliance program in lieu of implementing the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2), provided that the Water Quality Improvement Plan includes the optional Watershed Management Area Analysis described in Provision B.3.b.(4). The alternative compliance program is available to a Priority Development Project only if the Priority Development Project applicant enters into a voluntary agreement with the Copermittee authorizing this arrangement. In addition to the voluntary agreement, relief from implementing structural BMPs onsite may be authorized by the Copermittee under the following conditions:

(a) Watershed Management Area Analysis Candidate Projects

The Priority Development Project applicant agrees to fund, contribute funds to, or implement a candidate project identified by the Copermittees in the Watershed Management Area Analysis included in the Water Quality Improvement Plan, pursuant to Provisions B.3.b.(4) subject to the following conditions:

(i) The Copermittee must determine that implementation of the ~~alternative compliance option~~ candidate project will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite;

(ii) If the Priority Development Project applicant chooses to fully or partially fund a candidate project, then the in-lieu fee structure described in Provision E.3.c.(3)(c) must be followed;

(iii) If the Priority Development Project applicant chooses to fully or partially fund a candidate project, then the Copermittee must ensure that the funds to be obtained from the Priority Development Project applicant are sufficient to mitigate for impacts caused by not fully implementing structural BMPs onsite, pursuant to the performance requirements described in Provisions E.3.c.(1) and E.3.c.(2);

(iv) If the Priority Development Project applicant chooses to implement a candidate project, then the Copermittee must ensure that pollutant control and/or hydromodification management within the candidate project are sufficient to mitigate for impacts caused by not implementing structural BMPs fully onsite, pursuant to the performance requirements described in Provisions E.3.c.(1) and E.3.c.(2);

(v) The voluntary agreement to fund, partially fund, or implement a candidate project must include reliable sources of funding for operation and maintenance of the candidate project;

(vi) Design of the candidate project must be conducted under ~~by~~ an appropriately qualified ~~registered professional~~ engineer, geologist, architect, ~~or~~ landscape architect, or other professional, licenses where applicable, and competent and proficient in the fields pertinent to the candidate project design;

~~(ii) The alternative compliance options must be implemented within the same hydrologic unit as the Priority Development Project, and preferably within the same hydrologic subarea;~~

(vii) The candidate project must be constructed as soon as possible, but no later than 4 years after the certificate of occupancy is granted for the first Priority Development Project that contributed funds toward the construction of the candidate project, unless a longer period of time is authorized by the San Diego Water Board Executive Officer;

(viii) If the candidate project is constructed after the Priority Development Project is constructed, the Copermittee must require temporal mitigation for pollutant loads and altered flows that are discharged from the Priority Development Project; and

(ix) Receiving waters must not be utilized to convey untreated storm water runoff from the Priority Development Project to the ~~alternative compliance options~~ candidate project;

~~(iii) The pollutants in storm water runoff from the Priority Development Project must be treated to the MEP by the alternative compliance options prior to being discharged to receiving waters;~~

~~(iv) Unless otherwise allowed by Provision E.3.c.(3)(b), the alternative compliance options must have a net result of at least the same level of pollutant removal as would have been achieved if the Priority Development Project had fully complied with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1) onsite;~~

~~(v) Unless otherwise allowed by Provision E.3.c.(3)(b), the alternative compliance options must have a net result of at least the same level of protection from potential downstream and upstream erosion in the receiving water as would have been achieved if the Priority Development Project had fully complied with the hydromodification management BMP performance requirements of Provision E.3.c.(2) onsite; and~~

~~(vi) The alternative compliance options utilized by the Priority Development Project to comply with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) must have reliable sources of~~

~~funding for operation and maintenance.~~

~~(b) Alternative Compliance Project Options~~
(b) Project Applicant Proposed Alternative Compliance Projects

The Copermittee may allow a Priority Development Project applicant to propose and fund, contribute funds to, or implement an alternative compliance project not identified by the Watershed Management Area Analysis included in the Water Quality Improvement Plan pursuant to Provisions B.3.b.(4). This option is allowed provided the Copermittee determines that implementation of the alternative compliance project will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite, and is subject to the requirements described in Provisions E.3.c.(3)(a)(ii)-(ix). ~~implementation of one or more of the following project options as part of an alternative approach to complying with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2):~~

~~(i) *Onsite LID Biofiltration Treatment Control BMPs*~~

~~The Copermittee may allow Priority Development Projects to utilize onsite LID biofiltration treatment control BMPs to comply with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1). Onsite LID biofiltration treatment control BMPs must be sized and designed to:~~

~~[a] Remove pollutants from storm water to the MEP; AND~~
~~[b] Have an appropriate surface loading rate to prevent erosion, scour and channeling within the BMP; AND~~
~~[c] Biofilter at least 1.5 times the design capture volume that is not reliably retained onsite; OR~~
~~[d] Biofilter up to the design capture volume that is not reliably retained onsite, AND 1) treat the remaining portion of the design capture volume not retained onsite with conventional treatment control BMPs in accordance with Provision E.3.c.(1)(c), and 2) if necessary, mitigate for the portion of the pollutant load in the design capture volume not retained onsite through one or more alternative compliance project, in-lieu fee and/or water quality credit system options below.~~

~~(ii) *LEED Certified Redevelopment Projects*~~

~~The Copermittee may allow redevelopment Priority Development Projects to comply with the hydromodification management BMP performance requirements of Provision E.3.c.(2) where the project is designed and constructed to be certified under the USGCB LEED for New Construction and Major Renovations green building certification program. The Priority Development Project must receive at least one~~

~~(1) Site Design credit and two (2) Stormwater Design credits under the Sustainable Sites category.[28] In addition, the existing and future configuration of the receiving water must not be unnaturally altered or adversely impacted by storm water flow rates and durations discharged from the site.~~

~~(iii) *Watershed-Based Planned Development Projects*~~

~~The Copermittee may allow Priority Development Projects greater than 100 acres in total project size (or smaller than 100 acres in size yet part of a larger common plan of development that is over 100 acres) to comply with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2). The Priority Development Project must comply with the following conditions:~~

~~[a] The Priority Development Project was planned utilizing watershed and/or subwatershed based water quality, hydrologic, and fluvial geomorphologic planning principles that implement regional LID BMPs in accordance with the performance and location criteria of this Order and acceptable to the San Diego Water Board;~~

~~[b] Regional LID BMPs may be used provided that the BMPs capture and retain the volume of runoff produced from the design capture volume defined in Provision E.3.c.(1)(a)(i) and that such controls are located upstream of receiving waters;~~

~~[c] Regional LID BMPs must clearly exhibit that they will not result in a net impact from pollutant loadings over and above the impact caused by capture and retention of the design capture volume;~~

~~[d] Any portion of the design capture volume that is not retained by the regional LID BMPs must be treated using biofiltration BMPs; and~~

~~[e] Where regional LID BMPs are demonstrated to the Copermittee as technically infeasible to retain the entire design capture volume, any volume up to and including the design capture volume not retained by regional LID BMPs, nor treated by biofiltration BMPs, must be treated using conventional treatment control BMPs and the project applicant must implement additional alternative compliance project, in-lieu fee and/or water quality credit system options below.~~

~~(iv) *Offsite Regional BMPs*~~

~~[a] The Copermittee may allow Priority Development Projects to utilize offsite regional BMPs to comply with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1) if the offsite regional BMPs have the capacity to receive~~

~~[28] See LEED for New Construction and Major Renovations rating system at http://www.usgbc.org~~

~~and retain at least 1.1 times the design capture volume that is not reliably retained onsite.~~

~~[b] The Copermittee may allow Priority Development Projects to utilize offsite regional BMPs to comply with the hydromodification management BMP performance requirements of Provision E.3.c.(2) if the offsite regional BMPs have the capacity to manage the storm water flows rates and durations from the site such that the receiving waters are protected from the potential for increased erosion that would be caused if the unmanaged portion of the runoff was discharged from the site.~~

~~(v) *Offsite Retrofitting Projects*~~

~~The Copermittee may allow Priority Development Projects to utilize offsite retrofitting projects to comply with the storm water pollutant control and hydromodification management BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) if the retrofitting projects have been identified within the strategies included in the Water Quality Improvement Plan, or identified as potential retrofitting projects by the Copermittee pursuant to Provision E.5.~~

~~(vi) *Offsite Channel, Stream, or Habitat Rehabilitation Projects*~~

~~The Copermittee may allow Priority Development Projects to utilize offsite channel, stream, or habitat rehabilitation projects to comply with the hydromodification management BMP performance requirements of Provision E.3.c.(2) if the rehabilitation projects have been identified within the strategies included in the Water Quality Improvement Plan, or identified as potential channel rehabilitation projects by the Copermittee pursuant to Provision E.5. The channel, stream, or habitat rehabilitation project cannot be utilized for pollutant treatment except where artificial wetlands are constructed and located upstream of receiving waters.~~

~~(vii) *Offsite Regional Water Supply Augmentation Projects*~~

~~The Copermittee may allow Priority Development Projects to utilize offsite regional water supply augmentation projects (i.e. groundwater recharge, recycled water, storm water harvesting) to comply with the storm water pollutant control and hydromodification management BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) if the projects have been identified within the strategies included in the Water Quality Improvement Plan.~~

~~(viii) *Project Applicant Proposed Alternative Compliance Projects*~~

~~The Copermittee may allow one or more Priority Development Project applicant(s) to propose and implement alternative compliance projects to comply with the storm water pollutant control and hydromodification management BMP performance requirements of~~

~~Provisions E.3.c.(1) and E.3.c.(2) if the alternative compliance projects are consistent with, and will address the highest water quality priorities of the Water Quality Improvement Plan, and comply with the requirements of Provision E.3.c.(3)(a).~~

(c) Alternative Compliance In-Lieu Fee Structure ~~Option~~

If a Copermittee chooses to allow a Priority Development Project applicant to fund, or partially fund a candidate project or an alternative compliance project, then the Copermittee must develop and implement an in-lieu fee structure. ~~The Copermittee may develop and implement an alternative compliance in-lieu fee option,~~ This may be developed individually or with other Copermittees and/or entities, as a means for designing, developing, constructing, operating and maintaining offsite alternative compliance projects. The in-lieu fee must be transferred to the Copermittee (for public projects) or an escrow account (for private projects) prior to the construction of the Priority Development Project. ~~under Provision E.3.c.(3)(b). Priority Development Projects allowed to utilize the alternative compliance in-lieu fee option must comply with the following conditions:~~

~~(i) The in-lieu fee must be transferred to the Copermittee (for public projects) or an escrow account (for private projects) prior to the date construction of the Priority Development Project is initiated.~~

~~(ii) If the in-lieu fee is applied to the development, design and construction of offsite alternative compliance projects, the following conditions must be met:~~

~~[a] The offsite alternative compliance projects must allow the Priority Development Project to comply with the onsite BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2);~~

~~[b] The offsite alternative compliance projects must be constructed as soon as possible, but no later than 4 years after the certificate of occupancy is granted for the first Priority Development Project that contributed funds toward the construction of the offsite alternative compliance projects, unless a longer period of time is authorized by the San Diego Water Board Executive Officer;~~

~~[c] The in-lieu fee for the Priority Development Project must include mitigation of the pollutant loads and increased storm water flow rates and durations that are allowed to discharge from the site before the offsite alternative compliance projects are constructed; and~~

~~[d] The in-lieu fee must also include the cost to operate and maintain the offsite alternative compliance projects.~~

~~(iii) If the in-lieu fee is applied to the operation and maintenance of offsite~~

~~alternative compliance projects that have already been constructed, the offsite alternative compliance projects must allow the Priority Development Project to comply with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2).~~

(d) Alternative Compliance Water Quality Credit System Option

The Copermittee may develop and implement an alternative compliance water quality credit system option, individually or with other Copermittees and/or entities, provided that such a credit system clearly exhibits that it will not allow discharges from Priority Development Projects to cause or contribute to a net impact over and above the impact caused by projects meeting the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2). Any credit system that a Copermittee chooses to implement must be submitted to the San Diego Water Board Executive Officer for review and acceptance as part of the Water Quality Improvement Plan.

(4) Long-Term Structural BMP Maintenance

Each Copermittee must require the project applicant to submit proof of the mechanism under which ongoing long-term maintenance of all structural BMPs will be conducted.

(5) Infiltration and Groundwater Protection

(a) Structural BMPs designed to primarily function as large, centralized infiltration devices (such as large infiltration trenches and infiltration basins) must not cause or contribute to an exceedance of an applicable groundwater quality objective. At a minimum, such infiltration BMPs must be in conformance with the design criteria listed below, unless the development project applicant demonstrates to the Copermittee that one or more of the specific design criteria listed below are not necessary to protect groundwater quality. The design criteria listed below do not apply to small infiltration systems dispersed throughout a development project.

(i) Runoff must undergo pretreatment such as sedimentation or filtration prior to infiltration;

(ii) Pollution prevention and source control BMPs must be implemented at a level appropriate to protect groundwater quality at sites where infiltration BMPs are to be used;

(iii) Infiltration BMPs must be adequately maintained to remove pollutants in storm water to the MEP;

(iv) The vertical distance from the base of any infiltration BMP to the seasonal high groundwater mark must be at least 10 feet. Where

groundwater basins do not support beneficial uses, this vertical distance criteria may be reduced, provided groundwater quality is maintained;

(v) The soil through which infiltration is to occur must have physical and chemical characteristics (e.g., appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses;

(vi) Infiltration BMPs must not be used for areas of industrial or light industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee, unless source control BMPs to prevent exposure of high threat activities are implemented, or runoff from such activities is first treated or filtered to remove pollutants prior to infiltration; and

(vii) Infiltration BMPs must be located a minimum of 100 feet horizontally from any water supply wells.

(b) The Copermittee may develop, individually or with other Copermittees, alternative mandatory design criteria to that listed above for infiltration BMPs which are designed to primarily function as centralized infiltration devices. Before implementing the alternative design criteria in the development planning process the Copermitee(s) must:

(i) Notify the San Diego Water Board of the intent to implement the alternative design criteria submitted; and

(ii) Comply with any conditions set by the San Diego Water Board.

d. BMP DESIGN MANUAL UPDATE

Each Copermittee must update its BMP Design Manual[29] pursuant to Provision F.2.b. Until the Copermittee has updated its BMP Design Manual with the requirements of Provisions E.3.a-c, the Copermittee must continue implementing its current BMP Design Manual. Unless directed otherwise by the San Diego Water Board, the Copermittee must implement the BMP Design Manual within 180 days of completing the update. The update of the BMP Design Manual must include the following:

(1) Updated procedures to determine the nature and extent of storm water requirements applicable to a potential development or redevelopment projects. These procedures must inform project applicants of the storm water management requirements applicable to their project including, but not limited to, general requirements for all development projects, structural BMP design procedures and requirements, hydromodification management requirements,

[29] The BMP Design Manual was formerly known as the Standard Storm Water Mitigation Plan under Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016.

requirements specific to phased projects, and procedures specific to private developments and public improvement projects;

(2) Updated procedures to identify pollutants and conditions of concern for selecting the most appropriate structural BMPs that consider, at a minimum, the following:

(a) Receiving water quality (including pollutants for which receiving waters are listed as impaired under the CWA section 303(d) List);

(b) Pollutants, stressors, and/or receiving water conditions that cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(c) Land use type of the project and pollutants associated with that land use type; and

(d) Pollutants expected to be present onsite.

(3) Updated procedures for designing structural BMPs, including any updated performance requirements to be consistent with the requirements of Provision E.3.c for all structural BMPs listed in the BMP Design Manual;

(4) Long-term maintenance criteria for each structural BMP listed in the BMP Design Manual; and

(5) Alternative compliance criteria, in accordance with the requirements under Provision E.3.c.(3), if the Copermittee elects to allow Priority Development Projects within its jurisdiction to utilize alternative compliance.

e. PRIORITY DEVELOPMENT PROJECT BMP IMPLEMENTATION AND OVERSIGHT

Each Copermittee must implement a program that requires and confirms structural BMPs on all Priority Development Projects are designed, constructed, and maintained to remove pollutants in storm water to the MEP.

(1) Structural BMP Approval and Verification Process

(a) Each Copermittee must require and confirm that for all Priority Development Project applications that have not received prior lawful approval by the Copermittee by 18 months after the commencement of coverage under this Order, the requirements of Provision E.3 are implemented. For project applications that have received prior lawful approval by 18 months after the commencement of coverage under this Order, the Copermittee may allow previous land development requirements to apply.

(b) Each Copermittee must identify the roles and responsibilities of its various

municipal departments in implementing the structural BMP requirements, including each stage of a project from application review and approval through BMP maintenance and inspections.

(c) Each Copermittee must require and confirm that appropriate easements and ownerships are properly recorded in public records and the information is conveyed to all appropriate parties when there is a change in project or site ownership.

(d) Each Copermittee must require and confirm that prior to occupancy and/or intended use of any portion of the Priority Development Project, each structural BMP is inspected to verify that it has been constructed and is operating in compliance with all of its specifications, plans, permits, ordinances, and the requirements of this Order.

(2) Priority Development Project Inventory and Prioritization

(a) Each Copermittee must develop, maintain, and update at least annually, a watershed-based database to track and inventory all Priority Development Projects and associated structural BMPs within its jurisdiction. Inventories must be accurate and complete beginning from ~~January~~ December 2002 for the San Diego County Copermittees, February 2003 for the Orange County Copermittees, and July 2005 for the Riverside County Copermittees. The use of an automated database system, such as GIS, is highly recommended. The database must include, at a minimum, the following information:

(i) Priority Development Project location (address and hydrologic subarea);

(ii) Descriptions of structural BMP type(s);

(iii) Date(s) of construction;

(iv) Party responsible for structural BMP maintenance;

(v) Dates and findings of structural BMP maintenance verifications; and

(vi) Corrective actions and/or resolutions, when applicable.

(b) Each Copermittee must prioritize the Priority Development Projects with structural BMPs within its jurisdiction. The designation of Priority Development Projects as high priority must consider the following:

(i) The highest water quality priorities identified in the Water Quality Improvement Plan;

(ii) Receiving water quality;

(iii) Number and sizes of structural BMPs;

(iv) Recommended maintenance frequency of structural BMPs;

(v) Likelihood of operation and maintenance issues of structural BMPs;

(vi) Land use and expected pollutants generated; and

(vii) Compliance record.

(3) Structural BMP Maintenance Verifications and Inspections

Each Copermittee is required to verify that structural BMPs on each Priority Development Project are adequately maintained, and continue to operate effectively to remove pollutants in storm water to the MEP through inspections, self-certifications, surveys, or other equally effective approaches.

(a) All (100 percent) of the structural BMPs at Priority Development Projects that are designated as high priority must be inspected directly by the Copermittee annually prior to each rainy season;

(b) For verifications performed through a means other than direct Copermittee inspection, adequate documentation must be required by the Copermittee to provide assurance that the required maintenance of structural BMPs at each Priority Development Project has been completed; and

(c) Appropriate follow-up measures (including re-inspections, enforcement, etc.) must be conducted to ensure that structural BMPs at each Priority Development Project continue to reduce pollutants in storm water to the MEP as originally designed.

f. DEVELOPMENT PROJECT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all development projects, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

~~g. STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS~~

~~Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the development planning program to address development and redevelopment projects that may become sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:~~

~~(1) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, increase frequency of verifications and/or inspections, alternative compliance options);~~

~~(2) Each Copermittee must identify areas within its jurisdiction where Priority~~

~~Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting and/or stream, channel, or habitat rehabilitation projects;~~

~~(3) Each Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify regional alternative compliance projects that Priority Development Projects may be allowed or should be encouraged to implement or participate in implementing; and~~

~~(4) The strategies and/or activities must be consistent with the requirements of Provisions E.3.a-c and E.3.e-f and the strategies identified in the Water Quality Improvement Plan.~~

4. Construction Management

Each Copermittee must implement a construction management program in accordance with the strategies ~~identified~~ in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. Project Approval Process

Prior to issuance of any local permit(s) that allows the commencement of construction projects that involve ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff, each Copermittee must:

(1) Require a ~~site-specific~~ pollution control plan, construction BMP plan, and/or an erosion and sediment control plan, to be submitted by the project applicant to the Copermittee;

(2) Confirm the pollution control plan, construction BMP plan, and/or erosion and sediment control plan, complies with the local grading ordinance, other applicable local ordinances, and the requirements of this Order;

(3) Confirm the pollution control, construction BMP, and/or erosion and sediment control plan, includes seasonally appropriate and effective BMPs and management measures described in Provision E.4.c, as applicable to the project; and

(4) Verify that the project applicant has obtained coverage under ~~applicable permits, including, but not limited to~~ the statewide Construction General Permit~~, Clean Water Act Section 401 Water Quality Certification and Section 404 Permit, and California Department of Fish and Game Streambed Alteration Agreement~~.

b. CONSTRUCTION SITE INVENTORY AND TRACKING

(1) Each Copermittee must maintain~~,~~ and update, at least ~~monthly~~ quarterly, a watershed-based inventory of all construction projects issued a local permit that allows ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff. The use of an automated database system, such as GIS, is highly recommended. The inventory must include:

(a) Relevant contact information for each site (e.g., name, address, phone, and email for the owner and contractor);

(b) The basic site information including location (address and hydrologic subarea), Waste Discharge Identification (WDID) number (if applicable), size of the site, and approximate area of disturbance;

(c) Whether or not the site is considered a high threat to water quality, as defined in Provision E.4.b.(2) below;

(d) The project start and ~~anticipated~~ completion dates;

~~(e) Current construction phase;~~

~~(f)~~
(e) The required inspection frequency, as defined in the Copermittee's jurisdictional runoff management program document;

~~(g)~~
(f) The date the Copermittee accepted ~~and/~~or approved the ~~site-specific~~ pollution control plan, construction BMP plan, and/or erosion and sediment control plan; and

~~(h)~~
(g) Whether or not there are ongoing enforcement actions administered to the site.

(2) Each Copermittee must identify all construction sites within its jurisdiction that represent a high threat to downstream surface water quality. The designation of construction sites as high threat to water quality must consider the following:

(a) Sites located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Sites located within the same hydrologic subarea and tributary to a water body segment listed as impaired for sediment on the CWA section 303(d) List;

(c) Sites located within, directly adjacent to, or discharging directly to a receiving water within an ESA; and

(d) Other sites determined by the Copermittees or the San Diego Water Board as a high threat to water quality.

c. CONSTRUCTION SITE BMP IMPLEMENTATION

Each Copermittee must implement, or require the implementation of effective BMPs to reduce discharges of pollutants in storm water from construction sites to the MEP, and ~~prevent~~ effectively prohibit non-storm water discharges from construction sites into the MS4. These BMPs must be site specific, seasonally appropriate, and construction phase appropriate. BMPs must be implemented at each construction site year round. Dry season BMP implementation must plan for and address unseasonal rain events that may occur during the dry season (May 1 through September 30). Copermittees must implement, or require the implementation of, BMPs in the following categories:

(1) Project Planning;

(2) Good Site Management "Housekeeping", including waste management;

(3) Non-storm Water Management;

(4) Erosion Control;

(5) Sediment Control;

(6) Run-on and Run-off Control; and

(7) Active/Passive Sediment Treatment Systems, where applicable.

d. CONSTRUCTION SITE INSPECTIONS

Each Copermittee must conduct construction site inspections to require and confirm compliance with its local permits and applicable local ordinances, and the requirements of this Order. Priority for site inspections must consider threat to water quality pursuant to Provision E.4.b as well as the nature of the construction activity, topography, and the characteristics of soils and receiving water quality.

(1) Inspection Frequency

(a) Each Copermittee must conduct inspections at all inventoried sites, including high threat to water quality sites, at an appropriate frequency for each phase of construction to ~~ensure~~ confirm the site reduces the discharge of pollutants in storm water from construction sites to the MEP, and ~~prevents~~ effectively prohibits non-storm water discharges from entering the MS4.

(b) Each Copermittee must establish appropriate inspection frequencies for high threat to water quality sites, and all other sites, for each phase of construction. Inspection frequencies appropriate for addressing the highest water quality priorities identified in the Water Quality Improvement Plan, and for complying with the requirements of this Order must be identified in each Copermittee's jurisdictional runoff management program document.

(c) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e., re-inspection, enforcement) necessary to require and confirm site compliance with its local permits and applicable local ordinances, and the requirements of this Order.

(2) Inspection Content

Inspections of construction sites by the Copermittee must include, at a minimum:

(a) Verification of coverage under the Construction General Permit (Notice of Intent (NOI) and/or WDID number) during initial inspections, when applicable;

(b) Assessment of compliance with its local permits and applicable local ordinances related to pollution prevention, including the implementation and maintenance of applicable BMPs;

(c) Assessment of BMP adequacy and effectiveness;

(d) Visual observations of actual non-storm water discharges;

(e) Visual observations of actual or potential discharge of sediment and/or construction related materials from the site;

(f) Visual observations of actual or potential illicit connections; and

(g) If any violations are found and BMP corrections are needed, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried construction sites. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Site name, location (address and hydrologic subarea), and WDID number (if applicable);

(b) Inspection date;

(c) Approximate amount of rainfall since last inspection;

(d) Description of problems observed with BMPs and indication of need for BMP addition/repair/replacement and any scheduled re-inspection, and date of re-inspection;

(e) Descriptions of any other specific inspection comments which must, at a minimum, include rationales for longer compliance time;

(f) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(g) Resolution of problems noted and date problems fixed.

e. CONSTRUCTION SITE ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried construction sites, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

~~**f. STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS**~~

~~Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the construction management program to address construction sites that the Copermittee has identified as potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:~~

~~(1) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, and/or increase/decrease frequency of inspections for specific types of sites and/or activities); and~~

~~(2) The strategies and/or activities must be consistent with the requirements of Provisions E.4.c-e and the strategies identified in the Water Quality Improvement Plan.~~

5. Existing Development Management

Each Copermittee must implement an existing development management program in accordance with the strategies ~~identified~~ in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. Existing Development Inventory and Tracking

Each Copermittee must maintain, and update at least annually, a watershed-based inventory of the existing development within its jurisdiction that may discharge a pollutant load to and from the MS4. The use of an automated database system, such as GIS, is highly recommended. The inventory must, at a minimum, include:

(1) Name, location (hydrological subarea and address, if applicable) of the following types of existing development with its jurisdiction:

(a) Commercial facilities or areas;

(b) Industrial facilities;

(c) Municipal facilities, including:

(i) MS4 and related structures,[30]

(ii) Roads, streets, and highways,

(iii) Parking facilities,

(iv) Municipal airfields,

(v) Parks and recreation facilities,

(vi) Flood management facilities, ~~and~~ flood control devices and structures,

(vii) Operating or closed municipal landfills,

(viii) Publicly owned treatment works (including water and wastewater treatment plants) and sanitary sewer collection systems,

(ix) Corporate yards, including maintenance and storage yards for materials, waste, equipment, and vehicles,

(x) Hazardous waste collection facilities,

(xi) Other treatment, storage or disposal facilities for municipal waste, and

[30] The inventory may refer to the MS4 map required to be maintained pursuant to Provision E.2.b.(1).

(xii) Other municipal facilities that the Copermittee determines may contribute a significant pollutant load to the MS4; and

(d) Residential areas, which may be designated by one or more of the following:

(i) Residential management area,

(ii) Drainage basin or area,

(iii) Land use (e.g., single family, multi-family, rural),

(iv) Neighborhood,

(v) Common Interest Area,

(vi) Home Owner Association,

(vii) Mobile home park, and/or

(viii) Other designations accepted by the San Diego Water Board Executive Officer.

(2) A description of the facility or area, including the following information:

(a) Classification as commercial, industrial, municipal, or residential;

(b) Status of facility or area as active or inactive;

(c) Identification if a business is a mobile business;

(d) SIC Code or NAICS Code, if applicable;

(e) Industrial General Permit NOI and/or WDID number, if applicable;

(f) Identification if a residential area is or includes a Common Interest Area / Home Owner Association, or mobile home park;

(g) Identification of pollutants generated and potentially generated by the facility or area;

(h) Whether the facility or area is adjacent to an ESA;

(i) Whether the facility or area is tributary to and within the same hydrologic subarea as a water body segment listed as impaired on the CWA section 303(d) List and generates pollutants for which the water body segment is impaired; and

~~(j) Whether the facility or area contributes or potentially contributes to the highest priority water quality conditions identified in the Water Quality~~

~~Improvement Plan.~~

(3) An annually updated map showing the location of inventoried existing development, watershed boundaries, and water bodies.

b. EXISTING DEVELOPMENT BMP IMPLEMENTATION AND MAINTENANCE

Each Copermittee must designate a minimum set of BMPs required for all inventoried existing development, including special event venues. The designated minimum BMPs must be specific to facility or area types and pollutant generating activities, as appropriate.

(1) Commercial, Industrial, and Municipal Facilities and Areas

(a) Pollution Prevention

Each Copermittee must require the use of pollution prevention methods by the commercial, industrial, and municipal facilities and areas in its inventoried existing development to address the priorities and strategies in the Water Quality Improvement Plan.

(b) BMP Implementation

Each Copermittee must ~~implement, or~~ require the implementation of~~,~~ designated BMPs at commercial facilities and areas, industrial facilities, and implement designated BMPs at municipal facilities in its inventoried existing development.

(c) BMP Operation and Maintenance

(i) Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development.

(ii) Each Copermittee must implement a schedule of operation and maintenance activities for its MS4 and related structures (including but not limited to catch basins, storm drain inlets, detention basins, etc.), and verify proper operation of all its municipal structural treatment controls designed to reduce pollutants (including floatables) in storm water discharges to or from its MS4s and related drainage structures. Operation and maintenance activities may include, but is not limited to, the following:

[a] Inspections of the MS4 and related structures;
[b] Cleaning of the MS4 and related structures; and
[c] Proper disposal of materials removed from cleaning of the MS4 and related structures.

(iii) Each Copermittee must implement a schedule of operation and maintenance for public streets, unpaved roads, paved roads, and paved highways ~~and freeways~~ within its jurisdiction to minimize pollutants that can be discharged in storm water.

(iv) Each Copermittee must implement controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers. Copermittees that operate both a municipal sanitary sewer system and a MS4 must implement controls and measures to prevent and eliminate seeping sewage from infiltrating the MS4. Copermittees that do not operate both a municipal sanitary sewer system and a MS4 must coordinate with sewering agencies to keep themselves informed of relevant and appropriate maintenance activities and sanitary sewage projects in their jurisdiction that may cause or contribute to seepage of sewage into the MS4.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must ~~implement BMPs, or~~ require the implementation of BMPs~~,~~ to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from commercial facilities and areas~~,~~ and industrial facilities, and implement BMPs at municipal facilities in its inventoried existing development. Such BMPs must include, as appropriate, educational activities, permits, certifications and other measures for applicators and distributors.

(2) Residential Areas

(a) Pollution Prevention

Each Copermittee must promote and encourage the use of pollution prevention methods, where appropriate, by the residential areas in its inventoried existing development.

(b) BMP Implementation

Each Copermittee must promote and encourage the implementation of designated BMPs at residential areas in its inventoried existing development.

(c) BMP Operation and Maintenance

Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at residential areas in its inventoried existing development.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must promote and encourage the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from residential areas in its inventoried existing development.

c. EXISTING DEVELOPMENT INSPECTIONS

Each Copermittee must conduct inspections of inventoried existing development to ensure compliance with applicable local ordinances and permits, and the requirements of this Order.

(1) Inspection Frequency

(a) Each Copermittee must establish appropriate inspection frequencies for inventoried existing development in accordance with the following requirements:

(i) At a minimum, inventoried existing development must be inspected once every five years utilizing one or more of the following methods:

[a] Drive-by inspections by Copermittee municipal and contract staff,
[b] Onsite inspections by Copermittee municipal and contract staff, and/or
[c] Visual ~~I~~inspections of publicly accessible inventoried facilities or areas by volunteer monitoring or patrol programs that have been trained by the Copermittee;

(ii) The frequency of inspections must be appropriate to confirm that BMPs are being implemented to reduce the discharge of pollutants in storm water from the MS4 to the MEP and effectively prohibit non-storm water discharges to the MS4;

(iii) The frequency of inspections must be based on the potential for a facility or area to discharge non-storm water and pollutants in storm water, and should reflect the priorities set forth in the Water Quality Improvement Plan;

(iv) Each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development;[31] and

[31] If any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspection may count toward the total annual inspection requirement.

(v) Inventoried existing development must be inspected by the Copermittee, as needed, in response to valid public complaints ~~and findings from the Copermittee's municipal and contract staff or volunteer monitoring or patrol program inspections~~.

(b) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e. education and outreach, re-inspection, enforcement) necessary to require and confirm compliance with its applicable local ordinances and permits and the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

(2) Inspection Content

(a) Inspections of existing development ~~by the Copermittee or volunteer monitoring or patrol programs~~ must include, at a minimum:

(i) Visual inspections for the presence of actual non-storm water discharges;

(ii) Visual inspections for the presence of actual or potential discharge of pollutants;

(iii) Visual inspections for the presence of actual or potential illicit connections; and

(iv) Verification that the description of the facility or area in the inventory, required pursuant to Provision E.5.a.(2), has not changed.

(b) Onsite inspections of existing development by the Copermittee must include, at a minimum:

(i) Assessment of compliance with its applicable local ordinances and permits related to non-storm water and storm water discharges and runoff;

(ii) Assessment of the implementation of the designated BMPs;

(iii) Verification of coverage under the Industrial General Permit, when applicable; and

(iv) If any problems or violations are found, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

This requirement excludes linear municipal facilities (i.e., MS4 linear channels, sanitary sewer collection systems, streets, roads and highways).

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried existing development. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Name and location of facility or area (address and hydrologic subarea) consistent with the inventory name and location, pursuant to Provision E.5.a.(1);

(b) Inspection and re-inspection date(s);

(c) Inspection method(s) (i.e. drive-by, onsite);

(d) Observations and findings from the inspection(s);

(e) For onsite inspections of existing development by Copermittee municipal or contract staff, the records must also include, as applicable:

(i) Description of any problems or violations found during the inspection(s),

(ii) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6, and

(iii) The date problems or violations were resolved.

d. EXISTING DEVELOPMENT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried existing development, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

e. RETROFITTING AND REHABILITATING AREAS OF EXISTING DEVELOPMENT ~~STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS~~

~~Each Copermittee must implement the water quality improvement strategies, where necessary, to address areas of existing development within its jurisdiction that are identified as sources of pollutants and/or stressors contributing to the highest priority water quality conditions in the Watershed Management Area. For the existing development management program, the following strategies must be implemented:~~

~~(1) Specific Existing Development Management Program Strategies~~

~~Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented within its jurisdiction to address areas of existing development that the Copermittee has identified as sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:~~

~~(a) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, and/or increase/decrease frequency of inspections for specific types of facilities, areas and/or activities);~~

~~(b) The facilities and/or areas within the Copermittee's jurisdiction where the strategies and/or activities will be implemented; and~~

~~(c) The strategies and/or activities must be consistent with the requirements of Provisions E.5.b-d and the strategies identified in the Water Quality Improvement Plan.~~

~~(2)~~
(1) Retrofitting Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to retrofit areas of existing development within its jurisdiction to address identified sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify areas of existing development as candidates for retrofitting, focusing on areas where retrofitting will address pollutants and/or stressors that contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for retrofitting projects may be utilized to reduce pollutants that may be discharged in storm water from areas of existing development, and/or address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of retrofitting projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting projects; and

(e) Where retrofitting projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional retrofitting projects (i.e. projects that can receive and/or treat storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment) adjacent to and/or downstream of the areas of existing development.

~~(3)~~
(2) Stream, Channel and/or Habitat Rehabilitation in Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to rehabilitate streams, channels, and/or habitats in areas of existing development within its jurisdiction to address the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify streams, channels, and/or habitats in areas of existing development as candidates for rehabilitation, focusing on areas where stream, channel, and/or habitat rehabilitation projects will address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for stream, channel, and/or habitat rehabilitation projects may be utilized to address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters, rehabilitate channelized or hydromodified streams, restore wetland and riparian habitat, restore watershed functions, and/or restore beneficial uses of receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of stream, channel, and/or habitat rehabilitation projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance stream, channel, and/or habitat rehabilitation projects; and

(e) Where stream, channel, and/or habitat rehabilitation projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with

other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional stream, channel, and/or habitat rehabilitation projects (i.e. projects that can receive storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment).

6. Enforcement Response Plans

Each Copermittee must develop and implement an Enforcement Response Plan as part of its jurisdictional runoff management program document. The Enforcement Response Plan must describe the applicable approaches and options to enforce its legal authority established pursuant to Provision E.1, as necessary, to achieve compliance with the requirements of this Order. The Enforcement Response Plan must be in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include the following:

a. Enforcement Response Plan Components

The Enforcement Response Plan must include the following individual components:

(1) Illicit Discharge Detection and Elimination Enforcement Component;

(2) Development Planning Enforcement Component;

(3) Construction Management Enforcement Component; and

(4) Existing Development Enforcement Component.

b. Enforcement Response Approaches and Options

Each component of the Enforcement Response Plan must describe the enforcement response approaches that the Copermittee will implement to compel compliance with its statutes, ordinances, permits, contracts, orders, or similar means, and the requirements of this Order. The description must include the protocols for implementing progressively stricter enforcement responses. The enforcement response approaches must include appropriate sanctions to compel compliance, including, at a minimum, the following tools or their equivalent:

(1) Verbal and written notices of violation;

(2) Cleanup requirements;

(3) Fines;

(4) Bonding requirements;

(5) Administrative and criminal penalties;

(6) Liens;

(7) Stop work orders; and

(8) Permit and occupancy denials.

c. CORRECTION OF VIOLATIONS

(1) Violations must be corrected in a timely manner with the goal of correcting the violations within 30 calendar days after the violations are discovered, or prior to the next predicted rain event, whichever is sooner.

(2) If more than 30 calendar days are required to achieve compliance, then a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

d. ESCALATED ENFORCEMENT

(1) The Enforcement Response Plan must include a definition of "escalated enforcement." Escalated enforcement must include any enforcement scenario where a violation or other non-compliance is determined to cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan. Escalated enforcement may be defined differently for development planning, construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas.

(2) Where the Copermittee determines escalated enforcement is not required, a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

(3) Escalated enforcement actions must continue to increase in severity, as necessary, to compel compliance as soon as possible.

e. REPORTING OF NON-COMPLIANT SITES

(1) Each Copermittee must notify the San Diego Water Board in writing within ~~2 working~~ five (5) calendar days of issuing escalated enforcement (as defined in the Copermittee's Enforcement Response Plan) to a construction site that poses a significant threat to water quality as a result of violations or other non-compliance with its permits and applicable local ordinances, and the requirements of this Order. Written notification may be provided electronically by email to the appropriate San Diego Water Board staff.

(2) Each Copermittee must notify the San Diego Water Board ~~of non-filers~~ any

persons required to obtain coverage under the statewide Industrial General Permit and Construction General Permit and failing to do so, within five (5) calendar days from the time the Copermittee become aware of the circumstances. Written notification may be provided electronically by email to Nonfilers_R9@waterboards.ca.gov.

7. Public Education and Participation

Each Copermittee must implement, individually or with other Copermittees, a public education and participation program in accordance with the strategies identified in the Water Quality Improvement Plan to promote and encourage the development of programs, management practices, and behaviors that reduce the discharge of pollutants in storm water to the MEP, prevent controllable non-storm water discharges from entering the MS4, and protect water quality standards in receiving waters. The public education and participation program must be implemented in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include, at a minimum, the following requirements:

a. Public Education

The public education program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) Educational activities, public information activities, and other appropriate outreach activities intended to reduce pollutants associated with the application of pesticides, herbicides and fertilizer and other pollutants of concern in storm water discharges to and from its MS4 to the MEP, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed to address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(2) Educational activities, public information activities, and other appropriate outreach activities to facilitate the proper management and disposal of used oil and toxic materials; and

(3) Appropriate education and training measures for specific target audiences, such as construction site operators, residents, underserved target audiences and school-aged children, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed, based on high risk behaviors and pollutants of concern.

b. Public Participation

The public participation program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) A process for members of the public to participate in updating the highest priority water quality conditions, numeric goals, and water quality improvement strategies in the Water Quality Improvement Plan.

(2) Opportunities for members of the public to participate in providing the Copermittee recommendations for improving the effectiveness of the water quality improvement strategies implemented within its jurisdiction.

(3) Opportunities for members of the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or ~~restoration and~~ protection of the quality of receiving waters.

~~c. STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS~~

~~Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented within its jurisdiction, as applicable, to educate the public and encourage public participation to address potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:~~

~~(1) The target audiences and/or areas within the Copermittee's jurisdiction where the strategies and/or activities will be implemented;~~

~~(2) Provide specific details about how the strategies and/or activities will be implemented (e.g. educational topics, materials and/or activities, public outreach and participation programs and/or opportunities);~~

~~(3) Each Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify and implement regional public education and participation activities, programs and opportunities;~~

~~(4) Each Copermittee must incorporate a mechanism for evaluating and assessing educational and other public outreach activities, as needed, to identify progress and incorporate modifications necessary to increase the effectiveness of the public education and participation program.~~

8. Fiscal Analysis

a. Each Copermittee must secure the resources necessary to meet all the requirements of this Order.

b. Each Copermittee must conduct an annual fiscal analysis of its jurisdictional runoff management program in its entirety. The fiscal analysis must include the

following:

(1) Identification of the various categories of expenditures necessary to implement the requirements of this Order, including a description of the specific capital, operation and maintenance, and other expenditure items to be accounted for in each category of expenditures;

(2) The staff resources needed and allocated to meet the requirements of this Order, including any development, implementation, and enforcement activities required;

(3) The estimated expenditures for Provisions E.8.b.(1) and E.8.b.(2) for the current fiscal year; and

(4) The source(s) of funds that are proposed to meet the necessary expenditures described in Provisions E.8.b.(1) and E.8.b.(2), including legal restrictions on the use of such funds, for the current fiscal year and next fiscal year.

c. Each Copermittee must submit a summary of the annual fiscal analysis with each Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.

d. Each Copermittee must provide the documentation used to develop the summary of the annual fiscal analysis upon request by the San Diego Water Board.

F. REPORTING

The purpose of this provision is to determine and document compliance with the requirements set forth in this Order. The goal of reporting is to communicate to the San Diego Water Board and the people of the State of California the implementation status of each jurisdictional runoff management program and compliance with the requirements of this Order. This goal is to be accomplished through the submittal of specific deliverables to the San Diego Water Board by the Copermittees.

1. Water Quality Improvement Plans

The Copermittees for each Watershed Management Area must develop and submit the Water Quality Improvement Plan in accordance with the following requirements:

a. WATER QUALITY IMPROVEMENT PLAN DEVELOPMENT

Each Water Quality Improvement Plan must be developed in accordance with the following process:

(1) Public Participation Process

The Copermittees must implement a public participation process to solicit data, information, and recommendations to be utilized in the development of the Water Quality Improvement Plan. The public participation process must include the following:

(a) The Copermittees must develop a publicly available and noticed schedule of the opportunities for the public to participate and provide comments during the development of the Water Quality Improvement Plan. The schedule may be adjusted as necessary by the Copermittees, provided the public is provided timely notification of the changes to the schedule.

(b) The Copermittees must form a Water Quality Improvement Consultation Panel to provide recommendations during the development of the Water Quality Improvement Plan. The Water Quality Improvement Consultation Panel must consist of at least the following members:

(i) A representative of the San Diego Water Board,

(ii) A representative of the environmental community familiar with the water quality conditions of concern of the receiving waters in the Watershed Management Area, preferably from an environmental interest group associated with a water body within the Watershed Management Area, and

(iii) A representative of the development community familiar with the opportunities and constraints for implementing structural BMPs, retrofitting projects, and stream, channel or habitat rehabilitation

projects in the Watershed Management Area, preferably with relevant engineering, hydrology, and/or geomorphology experience in the Watershed Management Area.

(c) The Copermittees must coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public as much time and opportunity as possible to participate during the development of the Water Quality Improvement Plans.

~~(1)~~
(2) Priority Water Quality Conditions ~~and Numeric Goals~~

(a) The Copermittees must ~~implement a public participation process to~~ solicit data, ~~and~~ information and recommendations from the public to be utilized in the development and identification of the priority water quality conditions and potential water quality improvement strategies for the Watershed Management Area.

(b) The Copermittees ~~are encouraged to involve the public and key stakeholders as early and often as possible during the development of~~ must review the priority water quality conditions ~~and numeric goals to be~~ the Copermittees plan on including~~ed~~ in the Water Quality Improvement Plan with the Water Quality Improvement Consultation Panel to receive recommendations or concurrence.

(c) The Copermittees must consider revisions to the priority water quality conditions based on recommendations from the Water Quality Improvement Consultation Panel.

(d) The Copermittees must include all the potential water quality improvement strategies identified by the public and the Water Quality Improvement Consultation Panel with the submittal of the priority water quality conditions to the San Diego Water Board.

~~(c)~~
(e) ~~Within 6 months after the commencement of coverage under this Order, t~~The Copermittees must ~~develop and~~ submit the Water Quality Improvement Plan requirements of Provision B.2 to the San Diego Water Board as early as 6 months and no later than 12 months after the commencement of coverage under this Order. Upon receipt, ~~T~~the San Diego Water Board will issue a public notice and ~~solicit public comments on the Water Quality Improvement Plan~~ release the proposed priority water quality conditions and potential water quality improvement strategies for public review and comment for a minimum of 30 ~~60~~ days.

~~(d)~~
(f) The Copermittees must ~~revise~~ consider revisions to the priority water

quality conditions and ~~numeric goals~~ potential water quality improvement strategies developed pursuant to Provision B.2 based on public comments received by the close of the comment period ~~and/or recommendations or direction from the San Diego Water Board Executive Officer~~.

~~(2)~~
(3) Water Quality Improvement Goals, Strategies and Schedules

(a) The Copermittees must solicit recommendations from the public on potential numeric goals for the highest priority water quality conditions identified for the Watershed Management Area, and recommendations on the strategies that should be implemented to achieve the potential numeric goals.

~~(a)~~
(b) The Copermittees ~~are encouraged to involve the public and key stakeholders as early and often as possible during the development of the water quality improvement strategies and schedules to be included in the Water Quality Improvement Plan.~~must consult with the Water Quality Improvement Consultation Panel and consider revisions to the following items based on the Panel's recommendations:

(i) The numeric goals and schedules the Copermittees propose to include in the Water Quality Improvement Plan;

(ii) The water quality improvement strategies and schedules the Copermittees propose to implement in the Watershed Management Area and include in the Water Quality Improvement Plan;

(iii) If the Copermittees choose to implement Provision B.3.b.(4), the results of the Watershed Management Area Analysis the Copermittees proposed to incorporate into the Water Quality Improvement Plan; and

(iv) If the Copermittees choose to implement Provision B.3.c, the numeric goals proposed pursuant to Provision B.3.c.(1), the analysis performed pursuant to Provision B.3.c.(2) and the specific monitoring and assessments proposed pursuant to Provision B.3.c.(3).

~~(b)~~
(c) ~~Within 9 months after the commencement of coverage under this Order, t~~The Copermittees must ~~develop and~~ submit the Water Quality Improvement Plan requirements of Provision B.3 to the San Diego Water Board as early as 9 months and no later than 18 months after the commencement of coverage under this Order. Upon receipt, ~~T~~the San Diego Water Board will issue a public notice ~~and solicit public comments on the Water Quality Improvement Plan~~ release the proposed water quality improvement goals, strategies and schedules for public review and

comment for a minimum of 30 ~~60~~ days.

~~(c)~~
(d) The Copermittees must ~~revise~~ consider revisions to the water quality improvement goals, strategies and schedules developed pursuant to Provision B.3 based on public comments received by the close of the comment period ~~and/or recommendations or direction from the San Diego Water Board Executive Officer~~.

b. WATER QUALITY IMPROVEMENT PLAN SUBMITTAL AND IMPLEMENTATION

(1) Within ~~18~~ 24 months after the commencement of coverage under this Order, the Copermittees for each Watershed Management Area must submit a complete Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order to the San Diego Water Board. The San Diego Water Board will issue a public notice and ~~solicit public comments on~~ release the Water Quality Improvement Plan for public review and comment for a minimum of 30 days.

(2) The Copermittees must consider revisions to the Water Quality Improvement Plan based on written comments received by the close of the public comment period.

(3) The Copermittees must promptly submit any revisions to the Water Quality Improvement Plan to the San Diego Water Board no later than 60 days of the close of the public comment period.

~~(2)~~
(4) If issues concerning the Water Quality Improvement Plan are resolved informally through discussions among the Copermittees, the San Diego Water Board and interested parties, the San Diego Water Board Executive Officer may provide written certification to the Copermittees that the Water Quality Improvement Plan meets the requirements of Provision B. However, if the Executive Officer determines that significant issues with the Water Quality Improvement Plan remain, the matter will be scheduled for San Diego Water Board consideration at a public meeting. ~~Based on the comments received, the San Diego Water Board will determine whether to hold a public hearing or to limit public input to submittal of written comments. If no hearing is held the San Diego Water Board will notify the Copermittees within 6 months that the Water Quality Improvement Plan has been accepted as complete following its review and determination that the Water Quality Improvement Plan meets the requirements of this Order.~~

(5) The Copermittees must commence with implementation of the Water Quality Improvement Plan, in accordance with the water quality improvement strategies and schedules therein, upon written notification of concurrence with

the Water Quality Improvement Plan by the San Diego Water Board Executive Officer.

(7) During implementation of the Water Quality Improvement Plan after implementation the Copermittees must correct any deficiencies in the Plan identified by the San Diego Water Board no later than 90 days following a request by the Board to do so.

(8) The Water Quality Improvement Plan must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of ~~acceptance~~ receiving notification of concurrence with the Water Quality Improvement Plan by the San Diego Water Board Executive Officer.

2. Updates

a. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATES

Each Copermittee must update its jurisdictional runoff management program document in accordance with the following requirements:

(1) Each Copermittee is encouraged to ~~involve the~~ seek public and key stakeholder participation and comments, as early and often as possible ~~to solicit recommendations for~~ during the process of developing updates to its jurisdictional runoff management program document.

(2) Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E no later than ~~18~~ 3 months after San Diego Water Board notification of concurrence with the Water Quality Improvement Plan ~~the commencement of coverage under this Order~~.

(3) Each Copermittee must submit updates to its jurisdictional runoff management program, with ~~a~~ the supporting rationale for the modifications, either in the Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge required pursuant to Provision F.5.b.

(4) The Copermittee must revise ~~the~~ proposed modifications to its jurisdictional runoff management program as directed by the San Diego Water Board Executive Officer.

(5) Updated jurisdictional runoff management program documents must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of submitting the Water Quality Improvement Plan Annual Report.

b. BMP DESIGN MANUAL UPDATES

Each Copermittee must update its BMP Design Manual in accordance with the following requirements:

(1) Each Copermittee must update its BMP Design Manual to incorporate the requirements of Provisions E.3.a-d no later than ~~18~~ 3 months after San Diego Water Board notification of concurrence with the Water Quality Improvement Plan by the San Diego Water Board Executive Officer ~~the commencement of coverage under this Order~~.

(2) Subsequent updates to the BMP Design Manual must be consistent with the requirements of Provisions E.3.a-d and must be submitted as part of the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge required pursuant to Provision F.5.b.

(3) Updated BMP Design Manuals must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of completing the update.

c. WATER QUALITY IMPROVEMENT PLAN UPDATES

(1) The Water Quality Improvement Plans must be updated in accordance with the following process:

~~(1)~~ (a) The Copermittees must develop and implement a public participation process to ~~solicit~~ obtain data, ~~and~~ information and recommendations ~~to be utilized in~~ for updating the Water Quality Improvement Plan. The public participation process must provide for a publicly available and noticed schedule of opportunities for the public to participate and provide comments during the development of updates to the Water Quality Improvement Plan.

~~(2)~~ (b) The Copermittees ~~are encouraged to involve the public and key stakeholders as early and often as possible during the~~ must consult with the Water Quality Improvement Consultation Panel on proposed updates ~~to~~ of the Water Quality Improvement Plan, and consider the Water Quality Improvement Consultation Panel's recommendations in finalizing the proposed updates.

~~(3)~~ (c) The Copermittees for each Watershed Management Area must submit ~~requested~~ 1) proposed updates to the Water Quality Improvement Plan and supporting rationale, ~~with the public input~~ and 2) recommendations received from the public and the Water Quality Improvement Consultation Panel and the rationale for the requested updates, either in the Water

Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The ~~requested~~ updates submitted will be deemed accepted for inclusion in the Water Quality Improvement Plan ninety (90) days after submission unless otherwise directed in writing by the San Diego Water Board Executive Officer ~~are considered accepted by the San Diego Water Board if no response is provided to the Copermittee after 3 months of submitting the request~~.

~~(4)~~ (d) The Copermittees must revise the requested updates as directed by the San Diego Water Board Executive Officer.

~~(5)~~ (e) Updated Water Quality Improvement Plans must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance of the requested updates by the San Diego Water Board.

(2) No later that six months following Office of Administrative Law and USEPA approval of any TMDL Basin Plan amendment with wasteload allocations (WLAs) assigned to the Copermittees during the term of this Order, the Copermittees must initiate an update to the applicable Water Quality Improvement Plans in accordance with Provision F.1 or Provision F.2.c.(1) to incorporate the requirements of the TMDL WLAs.

3. Progress Reporting

a. Progress Report Presentations

The Copermittees for each Watershed Management Area must periodically appear before the San Diego Water Board, as requested by the ~~San Diego Water~~ Board, to provide progress reports on the implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs.

b. Annual Reports

(1) Transitional Jurisdictional Runoff Management Program Annual Reports

(a) Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D of this Order or a revised form accepted by the San Diego Water Board) no later than October 31 of each year for each jurisdictional runoff management program reporting period (i.e. July 1 to June 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted.

(b) Each Copermittee must submit the information on the Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D of

this Order or a revised form accepted by the San Diego Water Board) specific to the area within its jurisdiction in each Watershed Management Area.

(c) In addition to submitting the Jurisdictional Runoff Management Program Annual Report Form during the transitional reporting period, each Copermittee may continue to utilize and submit the jurisdictional runoff management program annual reporting format of its previous NPDES permit until the first Water Quality Improvement Plan Annual Report is required to be submitted.

(2) Transitional Monitoring and Assessment Program Annual Reports

The Copermittees for each Watershed Management Area must submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted under this Order. The Transitional Monitoring and Assessment Program Annual Reports must include:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1.a and D.2.a, summarized and presented in tabular and graphical form; and

(b) The findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

(3) Water Quality Improvement Plan Annual Reports

The Copermittees for each Watershed Management Area must submit a~~n~~ Water Quality Improvement Plan Annual Report for each reporting period no later than January 31 of the following year. The annual reporting period consists of two different periods: 1) July 1 to June 30 of the following year for the jurisdictional runoff management programs, 2) October 1 to September 30 of the following year for the monitoring and assessment programs. ~~The first Annual Report must be prepared for the reporting period beginning July 1 after commencement of coverage under this Order, and upon San Diego Water Board determination that the Water Quality Improvement Plan meets the requirements of this Order to June 30 in the following year for the jurisdictional runoff management programs, and September 30 in the following year for the monitoring and assessment programs.~~ The Water Quality Improvement Plan Annual Reports must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Each Annual Report must include the following:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, summarized and presented in tabular and graphical form;

(b) The ~~P~~progress of the special studies required pursuant to Provision D.3, and the ~~results or~~ findings, interpretations and conclusions of ~~when~~ a special study, or each phase of a special study, upon its completion ~~is completed~~;

(c) The findings, interpretations and conclusions from the assessments required pursuant to Provision D.4;

(d) The progress of implementing the Water Quality Improvement Plan, including, but not limited to, the following:

(i) The progress toward achieving the interim and final numeric goals for the highest water quality priorities for the Watershed Management Area,

(ii) The water quality improvement strategies that were implemented and/or no longer implemented by each of the Copermittees during the reporting period and previous reporting periods,

(iii) The water quality improvement strategies ~~and are~~ planned ~~to be~~ for implemention~~ed~~ during the next reporting period,

~~(iii)~~
(iv) Proposed modifications to the water quality improvement strategies, ~~with~~ the public ~~input~~ comments received and the supporting rationale for the proposed modifications,

~~(iv)~~
(v) Previous~~ly proposed~~ modifications or updates incorporated into the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document and implemented by the Copermittees in the Watershed Management Area, and

~~(v)~~
(vi) Proposed modifications or updates to the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document;

(e) A completed Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D of this Order or a revised form accepted ~~revision~~ by the San Diego Water Board) for each Copermittee in the Watershed Management Area, certified by a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative.

(f) Each Copermittee must provide any data or documentation utilized in developing the Water Quality Improvement Plan Annual Report upon request by the San Diego Water Board. Any Copermittee monitoring data utilized in developing the Water Quality Improvement Plan Annual Report must be uploaded to the California Environmental Data Exchange Network (CEDEN).[32] Any Copermittee monitoring and assessment data utilized in developing the Water Quality Improvement Plan Annual Report must be available for access on the Regional Clearinghouse required pursuant to Provision F.4.

~~(2) Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (Attachment D or accepted revision) no later than October 31 of each year until the first Annual Report is required to be submitted. Each Copermittee must submit the information on the Jurisdictional Runoff Management Program Annual Report Form specific to the area within its jurisdiction in each Watershed Management Area.~~

~~(3) Each Copermittee must provide any data or documentation utilized in developing the Annual Report upon request by the San Diego Water Board. Any monitoring data utilized in developing the Annual Report must be uploaded to the California Environmental Data Exchange Network (CEDEN). Any monitoring and assessment data utilized in developing the Annual Report must be provided on the Regional Clearinghouse required pursuant to Provision F.4.~~

c. Regional Monitoring and Assessment Report

(1) The Copermittees must submit a Regional Monitoring and Assessment Report no later than 180 days ~~in advance of~~ prior to the expiration date of this Order. The Regional Monitoring and Assessment Report may be submitted as part of the Report of Waste Discharge required pursuant to Provision F.5.b. ~~The~~ In preparing the report the Copermittees must ~~review~~ consider the receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, and the findings, interpretations and conclusions from the assessments required pursuant to Provision D.4.~~, to~~ Based on the consideration the report must assess the following:

(a) The beneficial uses of the receiving waters within the San Diego Region that are ~~protected~~ supported and not adversely affected by the Copermittees' MS4 discharges ~~or must be restored~~;

[32] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

(b) The beneficial uses of the receiving waters within the San Diego Region that are adversely impacted by the Copermittees' MS4 discharges;

~~(b)~~
(c) The progress toward ~~restoring impacted~~ protecting the beneficial uses in the receiving waters within the San Diego Region from the Copermittees' discharges; and

~~(c)~~
(d) Pollutants or conditions of emerging concern that may impact beneficial uses in the receiving waters within the San Diego Region.

(2) The Regional Monitoring and Assessment Report must include recommendations for improving the implementation and assessment of the Water Quality Improvement Plans and jurisdictional runoff management programs.

(3) Each Copermittee must provide any data or documentation utilized in developing the Regional Monitoring and Assessment Report upon request by the San Diego Water Board. Any Copermittee monitoring and assessment data utilized in developing the Regional Monitoring and Assessment Report must be ~~provided~~ available for access on the Regional Clearinghouse required pursuant to Provision F.4.

4. Regional Clearinghouse

The Copermittees must develop, update, and maintain an internet-based Regional Clearinghouse that is made available to the public no later than 18 months after the effective date of this Order.[33]

a. The Copermittees, through the Regional Clearinghouse, must make the following documents and data available for access, and organized by Watershed Management Area.~~, which~~ The documents and data may be linked to other internet-based data portals and databases where the original documents are stored:

(1) Water Quality Improvement Plan for the Watershed Management Area, and all updated versions with date of update;

(2) Annual Reports for the Watershed Management Area;

(3) Jurisdictional Runoff Management Program document for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

[33] The Copermittees may develop, update and maintain the clearinghouse(s) of other Copermittees or agencies.

(4) BMP Design Manual for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(5) Reports from special studies (e.g. source identification, BMP effectiveness assessment) conducted in the Watershed Management Area;

(6) Monitoring data collected pursuant to Provision D for each Watershed Management Area must be uploaded to CEDEN,[34] with links to the uploaded data; and

(7) Available GIS data, layers, and/or shapefiles used to develop the maps generated and maintained by the Copermittees for the Water Quality Improvement Plans, Annual Reports, and jurisdictional runoff management program documents.

b. The Copermittees, through the Regional Clearinghouse, must make the following information and documents available for access:

(1) Contact information (point of contact, phone number, email address, and mailing address) for each Copermittee;

(2) Public hotline number for reporting non-storm water and illicit discharges for each Copermittee;

(3) Email address for reporting non-storm water and illicit discharges for each Copermittee;

(4) Link to each Copermittee's website, if available, where the public may find additional information about the Copermittee's storm water management program and for requesting records for the implementation of its program;

(5) Information about opportunities for the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or ~~restoration and~~ protection of the quality of receiving waters; and

(6) Reports from regional monitoring programs in which the Copermittees participate (e.g. Southern California Monitoring Coalition, Southern California Coastal Water Research Project Bight Monitoring);

(7) Regional Monitoring and Assessment Reports; and

(8) Any other information, data, and documents the Copermittees determine as appropriate for making available to the public.

[34] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

5. Report of Waste Discharge

a. The Orange County Copermittees and the Riverside County Copermittees are required to submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders. The San Diego Water Board will review and consider the Reports of Waste Discharge to determine whether modification to this Order, pursuant to the requirements of Provision H, will be required prior to the Orange County Copermittees and/or Riverside County Copermittees ~~becoming covered~~ obtaining coverage under this Order. The current Orders for the Orange County Copermittees and Riverside County Copermittees are rescinded upon ~~notification~~ the date of effective coverage under this Order except for enforcement purposes.

b. The Copermittees subject to the requirements of this Order must submit to the San Diego Water Board a complete Report of Waste Discharge as an application for the re-issuance of this Order and NPDES permit. The Report of Waste Discharge must be submitted no later than 180 days in advance of the expiration date of this Order. The Report of Waste Discharge must contain the following minimum information:

(1) Names and addresses of the Copermittees;

(2) Names and titles of the primary contacts of the Copermittees;

(3) Proposed changes to the Copermittees' Water Quality Improvement Plans and the supporting justification;

(4) Proposed changes to the Copermittees' jurisdictional runoff management programs and the supporting justification;

(5) Any other information necessary for the re-issuance of this Order;

(6) Any information to be included as part of the Report of Waste Discharge pursuant to the requirements of this Order; and

(7) Any other information required by federal regulations for NPDES permit reissuance.

6. Application for Early Coverage

a. The Orange County Copermittees, collectively, or Riverside County Copermittees, collectively, may apply for early coverage under this Order by submitting a Report of Waste Discharge Form 200, with a written request for early coverage under this Order.

b. The San Diego Water Board will review the application for early coverage. A notification of coverage under this Order will be issued to the Copermittees in the respective county by the San Diego Water Board upon completion of the early

coverage application requirements. The effective coverage date will be specified in the notification of coverage. The Copermittees in the respective county are authorized to have MS4 discharges pursuant to the requirements of this Order starting on the effective coverage date specified in the notification of coverage. The existing Order for the respective county is rescinded upon the effective coverage date specified in the notification of coverage except for enforcement purposes.

7. Reporting Provisions

Each Copermittee must comply with all the reporting and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

G. PRINCIPAL WATERSHED COPERMITTEE RESPONSIBILITIES

1. The Copermittees within each Watershed Management Area must designate a Principal Watershed Copermittee and notify the San Diego Water Board of the name of the Principal Watershed Copermittee. An individual Copermittee should not be designated a Principal Watershed Copermittee for more than two Watershed Management Areas. The notification may be submitted with the Water Quality Improvement Plan required pursuant to Provision F.1 of this Order.

2. The Principal Watershed Copermittee is responsible for, at a minimum, the following:

a. Serving as liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues, and when necessary and appropriate, representing the Copermittees in the Watershed Management Area before the San Diego Water Board.

b. Facilitating the development of the Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order

c. Coordinating the submittal of the deliverables required by Provisions F.1, F.2, F.3.a, and F.3.b of this Order.

d. Coordinating and developing, with the other Principal Watershed Copermittees, the requirements of Provisions F.3.c, F.4, and F.5.b of this Order.

3. The Principal Watershed Copermittee is not responsible for ensuring that the other Copermittees within the Watershed Management Area are in compliance with the requirements of this Order. Each Copermittee within the Watershed Management Area is responsible for complying with the requirements of this Order.

H. MODIFICATION OF ORDER ~~PROGRAMS~~

1. Modifications of the Order may be initiated by the San Diego Water Board or by the Copermittees. Requests by Copermittees must be made to the San Diego Water Board.

2. Minor modifications to the Order may be made by the San Diego Water Board where the proposed modification complies with all the prohibitions and limitations, and other requirements of this Order.

3. This Order may also be re-opened and modified, revoked and, reissued or terminated in accordance with the provisions of 40 CFR 122.44, 122.62 to 122.64, and 124.5. Causes for taking such actions include, but are not limited to, failure to comply with any condition of this Order and permit, and endangerment to human health or the environment resulting from the permitted activity. ~~Proposed modifications to the Order that are not minor require amendment of this Order in accordance with this Order's rules, policies, and procedures.~~

4. ~~The San Diego Water Board may re-open and modify t~~This Order ~~at any time prior to its expiration, after opportunity for public comment and a public hearing,~~ may be re-opened for modification for cause including but not limited to the following:

   a. ~~if t~~The State Water Board determines that revisions are warranted, and the San Diego Water Board concurs that revisions are necessary to those provisions of the Order addressing compliance with water quality standards in the receiving water and/or those provisions of the Order establishing an iterative process for implementation of management practices to assure compliance with water quality standards in the receiving water;

   b. An application for early coverage under this Order is received pursuant to Provision F.6;

   c. Any of the TMDLs in Attachment E to this Order are amended in the Basin Plan by San Diego Water Board, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA;

   d. The Basin Plan is amended by San Diego Water Board to incorporate a new TMDL, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA; or

   e. Updating or revising the monitoring and reporting requirements is determined to be necessary, at the discretion of the San Diego Water Board. Such modification(s) may include, but is (are) not limited to, revision(s) to: (i) implement recommendations from Southern California Coastal Water Research Project (SCCWRP), (ii) develop, refine, implement, and/or coordinate a regional monitoring program, (iii) develop and implement improved monitoring and

assessment programs in keeping with San Diego Water Board Resolution No. R9-2012-0069, Resolution in Support of a Regional Monitoring Framework, and/or (iv) add provisions to require the Copermittees to evaluate and provide information on cost and values of the monitoring and reporting program..

5. The San Diego Water Board, after opportunity for public comment and a public hearing, will re-open and consider modifications to this Order when the Orange County Copermittees or the Riverside County Copermittees submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders.

I. STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

Each Copermittee must comply with all the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

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ATTACHMENT A

DISCHARGE PROHIBITIONS AND SPECIAL PROTECTIONS

1. Basin Plan Waste Discharge Prohibitions

California Water Code Section 13243 provides that a Regional Water Board, in a water quality control plan, may specify certain conditions or areas where the discharge of waste or certain types of waste is not permitted. The following waste discharge prohibitions in the Water Quality Control Plan for the San Diego Basin (Basin Plan) are applicable to any person, as defined by Section 13050(c) of the California Water Code, who is a citizen, domiciliary, or political agency or entity of California whose activities in California could affect the quality of waters of the state within the boundaries of the San Diego Region.

1. The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in California Water Code Section 13050, is prohibited.

2. The discharge of waste to land, except as authorized by waste discharge requirements or the terms described in California Water Code Section 13264 is prohibited.

3. The discharge of pollutants or dredged or fill material to waters of the United States except as authorized by a National Pollutant Discharge Elimination System (NPDES) permit or a dredged or fill material permit (subject to the exemption described in California Water Code Section 13376) is prohibited.

4. Discharges of recycled water to lakes or reservoirs used for municipal water supply or to inland surface water tributaries thereto are prohibited, unless this San Diego Water Board issues a NPDES permit authorizing such a discharge; the proposed discharge has been approved by the State Department of Health Services (DHS) and the operating agency of the impacted reservoir; and the discharger has an approved fail-safe long-term disposal alternative.

5. The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the San Diego Water Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

6. The discharge of waste in a manner causing flow, ponding, or surfacing on lands not owned or under the control of the discharger is prohibited, unless the discharge is authorized by the San Diego Water Board.

7. The dumping, deposition, or discharge of waste directly into waters of the state, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the San Diego Water Board.

8. Any discharge to a storm water conveyance system that is not composed entirely of "*storm water*" is prohibited unless authorized by the San Diego Water Board. [The federal regulations, 40 CFR 122.26(b)(13), define storm water as storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from fire fighting activities.] [§122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

9. The unauthorized discharge of treated or untreated sewage to waters of the state or to a storm water conveyance system is prohibited.

10. The discharge of industrial wastes to conventional septic tank/subsurface disposal systems, except as authorized by the terms described in California Water Code Section 13264, is prohibited.

11. The discharge of radioactive wastes amenable to alternative methods of disposal into the waters of the state is prohibited.

12. The discharge of any radiological, chemical, or biological warfare agent into waters of the state is prohibited.

13. The discharge of waste into a natural or excavated site below historic water levels is prohibited unless the discharge is authorized by the San Diego Water Board.

14. The discharge of sand, silt, clay, or other earthen materials from any activity, including land grading and construction, in quantities which cause deleterious bottom deposits, turbidity or discoloration in waters of the state or which unreasonably affect, or threaten to affect, beneficial uses of such waters is prohibited.

15. The discharge of treated or untreated sewage from vessels to Mission Bay, Oceanside Harbor, Dana Point Harbor, or other small boat harbors is prohibited.

16. The discharge of untreated sewage from vessels to San Diego Bay is prohibited.

17. The discharge of treated sewage from vessels to portions of San Diego Bay that are less than 30 feet deep at mean lower low water (MLLW) is prohibited.

18. The discharge of treated sewage from vessels, which do not have a properly functioning US Coast Guard certified Type I or Type II marine sanitation device, to portions of San Diego Bay that are greater than 30 feet deep at mean lower low water (MLLW) is prohibited.

2. Attachment B to State Water Board Resolution 2012-0012

Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges

I. PROVISIONS FOR POINT SOURCE DISCHARGES OF STORM WATER AND NONPOINT SOURCE WASTE DISCHARGES

The following terms, prohibitions, and special conditions (hereafter collectively referred to as special conditions) are established as limitations on point source storm water and nonpoint source discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in Areas of Special Biological Significance (ASBS), as required for State Water Quality Protection Areas pursuant to California Public Resources Code Sections 36700(f) and 36710(f). These Special Protections are adopted by the State Water Board as part of the California Ocean Plan (Ocean Plan) General Exception.

The special conditions are organized by category of discharge. The State Water Resources Control Board (State Water Board) and Regional Water Quality Control Boards (Regional Water Boards) will determine categories and the means of regulation for those categories [e.g., Point Source Storm Water National Pollutant Discharge Elimination System (NPDES) or Nonpoint Source].

A. PERMITTED POINT SOURCE DISCHARGES OF STORM WATER

1. General Provisions for Permitted Point Source Discharges of Storm Water

   a. Existing storm water discharges into an ASBS are allowed only under the following conditions:

      (1) The discharges are authorized by an NPDES permit issued by the State Water Board or Regional Water Board;

      (2) The discharges comply with all of the applicable terms, prohibitions, and special conditions contained in these Special Protections; and

      (3) The discharges:

         (i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

         (ii) Are designed to prevent soil erosion;

         (iii) Occur only during wet weather;

         (iv) Are composed of only storm water runoff.

   b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

   c. The discharge of trash is prohibited.

d. Only discharges from existing storm water outfalls are allowed. Any proposed or new storm water runoff discharge shall be routed to existing storm water discharge outfalls and shall not result in any new contribution of waste to an ASBS (i.e., no additional pollutant loading). “Existing storm water outfalls” are those that were constructed or under construction prior to January 1, 2005. “New contribution of waste” is defined as any addition of waste beyond what would have occurred as of January 1, 2005. A change to an existing storm water outfall, in terms of re-location or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges are prohibited except as provided below:

(1) The term “non-storm water discharges” means any waste discharges from a municipal separate storm sewer system (MS4) or other NPDES permitted storm drain system to an ASBS that are not composed entirely of storm water.

(2) (i) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability or occur naturally:

(a) Discharges associated with emergency fire fighting operations.

(b) Foundation and footing drains.

(c) Water from crawl space or basement pumps.

(d) Hillside dewatering.

(e) Naturally occurring groundwater seepage via a storm drain.

(f) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(ii) An NPDES permitting authority may authorize non-storm water discharges to an MS4 with a direct discharge to an ASBS only to the extent the NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

2. Compliance Plans for Inclusion in Storm Water Management Plans (SWMP) and Storm Water Pollution Prevention Plans (SWPPP).

The discharger shall specifically address the prohibition of non-storm water runoff and the requirement to maintain natural water quality for storm water discharges to an ASBS in an ASBS Compliance Plan to be included in its SWMP or a SWPPP, as appropriate to permit type. If a statewide permit includes a SWMP, then the discharger shall prepare a stand-alone compliance plan for ASBS discharges. The ASBS Compliance Plan is subject to approval by the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (for permits issued by Regional Water Boards).

a. The Compliance Plan shall include a map of surface drainage of storm water runoff, showing areas of sheet runoff, prioritize discharges, and describe any structural Best Management Practices (BMPs) already employed and/or BMPs to be employed in the future. Priority discharges are those that pose the greatest water quality threat and which are identified to require installation of structural BMPs. The map shall also show the storm water conveyances in relation to other features such as service areas, sewage conveyances and treatment facilities, landslides, areas prone to erosion, and waste and hazardous material storage areas, if applicable. The SWMP or SWPPP shall also include a procedure for updating the map and plan when changes are made to the storm water conveyance facilities.

b. The ASBS Compliance Plan shall describe the measures by which all non-authorized non-storm water runoff (e.g., dry weather flows) has been eliminated, how these measures will be maintained over time, and how these measures are monitored and documented.

c. For Municipal Separate Storm Sewer System (MS4s), the ASBS Compliance Plan shall require minimum inspection frequencies as follows:

   (1) The minimum inspection frequency for construction sites shall be weekly during rainy season;

   (2) The minimum inspection frequency for industrial facilities shall be monthly during the rainy season;

   (3) The minimum inspection frequency for commercial facilities (e.g., restaurants) shall be twice during the rainy season; and

   (4) Storm water outfall drains equal to or greater than 18 inches (457 mm) in diameter or width shall be inspected once prior to the beginning of the rainy season and once during the rainy season and maintained to remove trash and other anthropogenic debris.

d. The ASBS Compliance Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff, that are necessary to comply with these special conditions, will be achieved through BMPs. Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that such installation would pose a threat to health or safety. BMPs to control storm water runoff discharges (at the end-of-pipe) during a design storm shall be designed to achieve on average the following target levels:

   (1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

   (2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges. The baseline for the reduction is the effective date of the Exception. The baseline for these determinations is the effective date of the Exception, and the

reductions must be achieved and documented within four (4) years of the effective date.

e. The ASBS Compliance Plan shall address erosion control and the prevention of anthropogenic sedimentation in ASBS. The natural habitat conditions in the ASBS shall not be altered as a result of anthropogenic sedimentation.

f. The ASBS Compliance Plan shall describe the non-structural BMPs currently employed and planned in the future (including those for construction activities), and include an implementation schedule. The ASBS Compliance Plan shall include non-structural BMPs that address public education and outreach. Education and outreach efforts must adequately inform the public that direct discharges of pollutants from private property not entering an MS4 are prohibited. The ASBS Compliance Plan shall also describe the structural BMPs, including any low impact development (LID) measures, currently employed and planned for higher threat discharges and include an implementation schedule. To control storm water runoff discharges (at the end-of-pipe) during a design storm, permittees must first consider using LID practices to infiltrate, use, or evapotranspirate storm water runoff on-site.

g. The BMPs and implementation schedule shall be designed to ensure that natural water quality conditions in the receiving water are achieved and maintained by either reducing flows from impervious surfaces or reducing pollutant loading, or some combination thereof.

h. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents in storm water runoff that alter natural ocean water quality and the sources of these constituents.

(2) The report shall describe BMPs that are currently being implemented, BMPs that are identified in the SWMP or SWPPP for future implementation, and any additional BMPs that may be added to the SWMP or SWPPP to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the BMPs.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits), the discharger shall revise its ASBS Compliance Plan to incorporate any new or modified BMPs that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised SWMP or SWPPP, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural ocean water quality conditions due to the same constituent.

(5) Compliance with this section does not excuse violations of any term, prohibition, or condition contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within one year from the effective date of the Exception, the discharger shall submit a written ASBS Compliance Plan to the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that describes its strategy to comply with these special conditions, including the requirement to maintain natural water quality in the affected ASBS. The ASBS Compliance Plan shall include a time schedule to implement appropriate non-structural and structural controls (implementation schedule) to comply with these special conditions for inclusion in the discharger's SWMP or SWPPP, as appropriate to permit type.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these special conditions shall be implemented.

d. Within four (4) years of the effective date of the Exception, any structural controls identified in the ASBS Compliance Plan that are necessary to comply with these special conditions shall be operational.

e. Within four (4) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water, pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data, and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

   If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

   The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

(1) for municipalities, a demonstration of significant hardship to discharger ratepayers, by showing the relationship of storm water fees to annual household income for residents within the discharger's jurisdictional area, and the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or
(2) for other governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process.

B. NONPOINT SOURCE DISCHARGES

[NOT INCLUDED]
[PROVISIONS FOR NONPOINT SOURCE DISCHARGES NOT APPLICABLE]

II. ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES

[NOT INCLUDED]
[ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES NOT APPLICABLE]

III. ADDITIONAL REQUIREMENTS – WATERFRONT AND MARINE OPERATIONS

[NOT INCLUDED]
[ADDITIONAL REQUIREMENTS FOR WATERFRONT AND MARINE OPERATIONS NOT APPLICABLE]

IV. MONITORING REQUIREMENTS

Monitoring is mandatory for all dischargers to assure compliance with the Ocean Plan. Monitoring requirements include both: (A) core discharge monitoring, and (B) ocean receiving water monitoring. The State and Regional Water Boards must approve sampling site locations and any adjustments to the monitoring programs. All ocean receiving water and reference area monitoring must be comparable with the Water Boards' Surface Water Ambient Monitoring Program (SWAMP).

Safety concerns: Sample locations and sampling periods must be determined considering safety issues. Sampling may be postponed upon notification to the State and Regional Water Boards if hazardous conditions prevail.

Analytical Chemistry Methods: All constituents must be analyzed using the lowest minimum detection limits comparable to the Ocean Plan water quality objectives. For metal analysis, all samples, including storm water effluent, reference samples, and ocean receiving water samples, must be analyzed by the approved analytical method with the lowest minimum detection limits (currently Inductively Coupled Plasma/Mass Spectrometry) described in the Ocean Plan.

A. CORE DISCHARGE MONITORING PROGRAM

1. General sampling requirements for timing and storm size:

   Runoff must be collected during a storm event that is greater than 0.1 inch and generates runoff, and at least 72 hours from the previously measurable storm event. Runoff samples shall be collected when post-storm receiving water is sampled, and analyzed for the same constituents as receiving water and reference site samples (see section IV B) as described below.

2. Runoff flow measurements

   a. For municipal/industrial storm water outfalls in existence as of December 31, 2007, 18 inches (457mm) or greater in diameter/width (including multiple outfall pipes in combination having a width of 18 inches, runoff flows must be measured or calculated, using a method acceptable to and approved by the State and Regional Water Boards.
   b. This will be reported annually for each precipitation season to the State and Regional Water Boards.

3. Runoff samples – storm events

   a. For outfalls equal to or greater than 18 inches (0.46m) in diameter or width:

      (1) samples of storm water runoff shall be analyzed during the same storm as receiving water samples for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination, ; and

      (2) samples of storm water runoff shall be analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS

      (3) If an applicant has no outfall greater than 36 inches, then storm water runoff from the applicant's largest outfall shall be further analyzed during the same storm as receiving water samples for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates).

   b. For outfalls equal to or greater than 36 inches (0.91m) in diameter or width:

      (1) samples of storm water runoff shall be analyzed during the same storm as receiving water samples for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

      (2) samples of storm water runoff shall be further analyzed during the same storm as receiving water samples for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates) and

(3) samples of storm water runoff shall be analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

c. For an applicant not participating in a regional monitoring program [see below in Section IV (B)] in addition to (a.) and (b.) above, a minimum of the two largest outfalls or 20 percent of the larger outfalls, whichever is greater, shall be sampled (flow weighted composite samples) at least three times annually during wet weather (storm event) and analyzed for all Ocean Plan Table A constituents, Table B constituents for marine aquatic life protection (except for toxicity, only chronic toxicity for three species shall be required), DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, and Ocean Plan indicator bacteria. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one (the largest) such discharge shall be sampled annually in each Region.

4. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may reduce or suspend core monitoring once the storm runoff is fully characterized. This determination may be made at any point after the discharge is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

B. OCEAN RECEIVING WATER AND REFERENCE AREA MONITORING PROGRAM

In addition to performing the Core Discharge Monitoring Program in Section II.A above, all applicants having authorized discharges must perform ocean receiving water monitoring. In order to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS, dischargers may choose either (1) an individual monitoring program, or (2) participation in a regional integrated monitoring program.

1. Individual Monitoring Program: The requirements listed below are for those dischargers who elect to perform an individual monitoring program to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within the affected ASBS. In addition to Core Discharge Monitoring, the following additional monitoring requirements shall be met:

   a. Three times annually, during wet weather (storm events), the receiving water at the point of discharge from the outfalls described in section (IV)(A)(3)(c) above shall be sampled and analyzed for Ocean Plan Table A constituents, Table B constituents for marine aquatic life, DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, salinity, chronic toxicity (three species), and Ocean Plan indicator bacteria.

      The sample location for the ocean receiving water shall be in the surf zone at the point of discharges; this must be at the same location where storm water runoff is sampled. Receiving water shall be sampled at approximately the same time prior to (pre-storm) and during (or immediately after) the same storm (post storm). Reference water quality shall also be sampled and analyzed for the same constituents pre-storm and post-storm, during the same storms when receiving water is sampled. Reference stations will be determined by the State Water Board's Division of Water Quality and the applicable Regional Water Board(s).

b. Sediment sampling shall occur at least three times during every five (5) year period. The subtidal sediment (sand or finer, if present) at the discharge shall be sampled and analyzed for Ocean Plan Table B constituents for marine aquatic life, DDT, PCBs, PAHs, pyrethroids, and OP pesticides. For sediment toxicity testing, only an acute toxicity test using the amphipod Eohaustorius estuarius must be performed.

c. A quantitative survey of intertidal benthic marine life shall be performed at the discharge and at a reference site. The survey shall be performed at least once every five (5) year period. The survey design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The results of the survey shall be completed and submitted to the State Water Board and Regional Water Board at least six months prior to the end of the permit cycle.

d. Once during each five (5) year period, a bioaccumulation study shall be conducted to determine the concentrations of metals and synthetic organic pollutants at representative discharge sites and at representative reference sites. The study design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The bioaccumulation study may include California mussels (Mytilus californianus) and/or sand crabs (Emerita analoga or Blepharipoda occidentalis). Based on the study results, the Regional Water Board and the State Water Board's Division of Water Quality, may adjust the study design in subsequent permits, or add or modify additional test organisms (such as shore crabs or fish), or modify the study design appropriate for the area and best available sensitive measures of contaminant exposure.

e. Marine Debris: Representative quantitative observations for trash by type and source shall be performed along the coast of the ASBS within the influence of the discharger's outfalls. The design, including locations and frequency, of the marine debris observations is subject to approval by the Regional Water Board and State Water Board's Division of Water Quality.

f. The monitoring requirements of the Individual Monitoring Program in this section are minimum requirements. After a minimum of one (1) year of continuous water quality monitoring of the discharges and ocean receiving waters, the Executive Director of the State Water Board (statewide permits) or Executive officer of the Regional Water Board (Regional Water Board permits) may require additional monitoring, or adjust, reduce or suspend receiving water and reference station monitoring. This determination may be made at any point after the discharge and receiving water is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

2. Regional Integrated Monitoring Program: Dischargers may elect to participate in a regional integrated monitoring program, in lieu of an individual monitoring program, to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS. This regional approach shall characterize natural water quality, pre- and post-storm, in ocean reference areas near the mouths of identified open space watersheds and the effects of the discharges on natural water quality (physical, chemical, and toxicity) in the ASBS receiving waters, and should include benthic marine aquatic life and bioaccumulation components. The design of the ASBS stratum of a regional integrated monitoring program may deviate from the otherwise prescribed individual monitoring approach (in Section IV.B.1) if approved by the State Water Board's Division of Water Quality and the Regional Water Boards.

a. Ocean reference areas shall be located at the drainages of flowing watersheds with minimal development (in no instance more than 10% development), and shall not be located in CWA Section 303(d) listed waterbodies or have tributaries that are 303(d) listed. Reference areas shall be free of wastewater discharges and anthropogenic non-storm water runoff. A minimum of low threat storm runoff discharges (e.g. stream highway overpasses and campgrounds) may be allowed on a case-by-case basis. Reference areas shall be located in the same region as the ASBS receiving water monitoring occurs. The reference areas for each Region are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean reference water samples must be collected from each station, each from a separate storm. A minimum of one reference location shall be sampled for each ASBS receiving water site sampled per responsible party. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

b. ASBS ocean receiving water must be sampled in the surf zone at the location where the runoff makes contact with ocean water (i.e. at "point zero"). Ocean receiving water stations must be representative of worst-case discharge conditions (i.e. co-located at a large drain greater than 36 inches, or if drains greater than 36 inches are not present in the ASBS then the largest drain greater than18 inches.) Ocean receiving water stations are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean receiving water samples must be collected during each storm season from each station, each from a separate storm. A minimum of one receiving water location shall be sampled in each ASBS per responsible party in that ASBS. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

c. Reference and receiving water sampling shall commence during the first full storm season following the adoption of these special conditions, and post-storm samples shall be collected when annual storm water runoff is sampled. Sampling shall occur in a minimum of two storm seasons. For those ASBS dischargers that have already participated in the Southern California Bight 2008 ASBS regional monitoring effort, sampling may be limited to only one storm season.

d. Receiving water and reference samples shall be analyzed for the same constituents as storm water runoff samples. At a minimum, constituents to be sampled and analyzed in reference and discharge receiving waters must include oil and grease, total suspended solids, Ocean Plan Table B metals for protection of marine life, Ocean Plan PAHs, pyrethroids, OP pesticides, ammonia, nitrate, phosphates, and critical life stage chronic toxicity for three species. In addition, within the range of the southern sea otter, indicator bacteria or some other measure of fecal contamination shall be analyzed.

3. Waterfront and Marine Operations: In addition to the above requirements for ocean receiving water monitoring, additional monitoring must be performed for marinas and boat launch and pier facilities:

a. For all marina or mooring field operators, in mooring fields with 10 or more occupied moorings, the ocean receiving water must be sampled for Ocean Plan indicator bacteria, residual chlorine, copper, zinc, grease and oil, methylene blue active substances (MBAS), and ammonia nitrogen.

   (1) For mooring field operators opting for an individual monitoring program (Section IV.B.1 above), this sampling must occur weekly (on the weekend) from May through October.

   (2) For mooring field operators opting to participate in a regional integrated monitoring program (Section IV.B.2 above), this sampling must occur monthly from May through October on a high use weekend in each month. The Water Boards may allow a reduction in the frequency of sampling, through the regional monitoring program, after the first year of monitoring.

b. For all mooring field operators, the subtidal sediment (sand or finer, if present) within mooring fields and below piers shall be sampled and analyzed for Ocean Plan Table B metals (for marine aquatic life beneficial use), acute toxicity, PAHs, and tributyltin. For sediment toxicity testing, only an acute toxicity test using the amphipod Eohaustorius estuarius must be performed. This sampling shall occur at least three times during a five (5) year period. For mooring field operators opting to participate in a regional integrated monitoring program, the Water Boards may allow a reduction in the frequency of sampling after the first sampling effort's results are assessed.

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ATTACHMENT B

STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

1. Standard Permit Provisions

Code of Federal Regulations Title 40 Section 122.41 (40 CFR 122.41) includes conditions, or provisions, that apply to all National Pollutant Discharge Elimination System (NPDES) permits. Additional provisions applicable to NPDES permits are in 40 CFR 122.42. All applicable provisions in 40 CFR 122.41 and 40 CFR 122.42 must be incorporated into this Order and NPDES permit. The applicable 40 CFR 122.41 and 40 CFR 122.42 provisions are as follows:

a. DUTY TO COMPLY [40 CFR 122.41(a)]

The Copermittee must comply with all of the provisions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

(1) The Copermittee must comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement. [40 CFR 122.41(a)(1)]

(2) The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to a civil penalty not to exceed $25,000 per day for each violation. The CWA provides that any person who *negligently* violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than 2 years, or both. Any person who *knowingly* violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both. Any person who knowingly violates Section 301, 302, 303, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, and who knows at that time that he thereby places another person in imminent danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of

not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.
[40 CFR 122.41(a)(2)]

(3) Any person may be assessed an administrative penalty by the San Diego Regional Water Quality Control Board (San Diego Water Board), State Water Resources Control Board (State Water Board), or United States Environmental Protection Agency (USEPA) for violating Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.
[40 CFR 122.41(a)(3)]

b. DUTY TO REAPPLY [40 CFR 122.41(b)]

If a Copermittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Copermittee must apply for and obtain a new permit.

c. NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE [40 CFR 122.41(c)]

It shall not be a defense for a Copermittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

d. DUTY TO MITIGATE [40 CFR 122.41(d)]

The Copermittee must take all reasonable steps to minimize or prevent any discharge or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

e. PROPER OPERATION AND MAINTENANCE [40 CFR 122.41(e)]

The Copermittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Copermittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by a Copermittee only when the operation is necessary to achieve compliance with the conditions of this permit.

f. PERMIT ACTIONS [40 CFR 122.41(f)]

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Copermittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

g. PROPERTY RIGHTS [40 CFR 122.41(g)]

This permit does not convey any property rights of any sort, or any exclusive privilege.

h. DUTY TO PROVIDE INFORMATION [40 CFR 122.41(h)]

The Copermittee must furnish to the San Diego Water Board, State Water Board, or USEPA within a reasonable time, any information which the San Diego Water Board, State Water Board, or USPEA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Copermittee must also furnish to the San Diego Water Board, State Water Board, or USPEA upon request, copies of records required to be kept by this permit.

i. INSPECTION AND ENTRY [40 CFR 122.41(i)]

The Copermittee must allow the San Diego Water Board, State Water Board, USEPA, and/or their authorized representative (including an authorized contractor acting as their representative), upon presentation of credentials and other documents as may be required by law, to:

(1) Enter upon the Copermittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit; [40 CFR 122.41(i)(1)]

(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit; [40 CFR 122.41(i)(2)]

(3) Inspect and photograph at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; [40 CFR 122.41(i)(3)] and

(4) Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location. [40 CFR 122.41(i)(4)]

j. MONITORING AND RECORDS [40 CFR 122.41(j)]

(1) Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity. [40 CFR 122.41(j)(1)]

(2) Except for records of monitoring information required by this permit related to the Copermittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five (5) years (or longer as required by 40 CFR Part 503), the

Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time. [40 CFR 122.41(j)(2)]

(3) Records for monitoring information must include: [40 CFR 122.41(j)(3)]

(a) The date, exact place, and time of sampling or measurements; [40 CFR 122.41(j)(3)(i)]
(b) The individual(s) who performed the sampling or measurements; [40 CFR 122.41(j)(3)(ii)]
(c) The date(s) analyses were performed; [40 CFR 122.41(j)(3)(iii)]
(d) The individual(s) who performed the analyses; [40 CFR 122.41(j)(3)(iv)]
(e) The analytical techniques or methods used; [40 CFR 122.41(j)(3)(v)] and
(f) The results of such analyses. [40 CFR 122.41(j)(3)(vi)]

(4) Monitoring must be conducted according to test procedures under 40 CFR Part 136 unless another method is required under 40 CFR Subchapters N or O. [40 CFR 122.41(j)(4)]

In the case of pollutants for which there are no approved methods under 40 CFR Part 136 or otherwise required under 40 CFR Subchapters N and O, monitoring must be conducted according to a test procedure specified in the permit for such pollutants. [40 CFR 122.44(i)(1)(iv)]

(5) The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. [40 CFR 122.41(j)(5)]

k. SIGNATORY REQUIREMENT [40 CFR 122.41(k)]

(1) All applications, reports, or information submitted to the San Diego Water Board, State Water Board, or USEPA must be signed and certified. (See 40 CFR 122.22) [40 CFR 122.41(k)(1)]

(a) *For a municipality, State, Federal, or other public agency.* [All applications must be signed] [b]y either a principal executive officer or ranking elected official. [40 CFR 122.22(a)(3)]

(b) All reports required by permits, and other information requested by the San Diego Water Board, State Water Board, or USEPA must be signed by a person described in paragraph (a) of this section, or by a duly authorized representative of that person. A person is a duly authorized representative only if: [40 CFR 122.22(b)]

(i) The authorization is made in writing by a person described in paragraph (a) of this section; [40 CFR 122.22(b)(1)]

(ii) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company, (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) [40 CFR 122.22(b)(2)] and,

(iii) The written authorization is submitted to the San Diego Water Board and State Water Board. [40 CFR 122.22(b)(3)]

(c) *Changes to authorization.* If an authorization under paragraph (b) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (b) of this section must be submitted to the San Diego Water Board prior to or together with any reports, information, or applications to be signed by an authorized representative. [40 CFR 122.22(c)]

(d) *Certification.* Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." [40 CFR 122.22(d)]

(2) The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both. [40 CFR 122.41(k)(2)]

I. REPORTING REQUIREMENTS [40 CFR 122.41(l)]

(1) *Planned changes.* The Copermittee must give notice to the San Diego Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when: [40 CFR 122.41(l)(1)]

(a) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); [40 CFR 122.41(l)(1)(i)] or

(b) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which

are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1).
[40 CFR 122.41(l)(1)(ii)]

(c) The alteration or addition results in a significant change in the Copermittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. [40 CFR 122.41(l)(1)(iii)]

(2) *Anticipated noncompliance*. The Copermittee must give advance notice to the San Diego Water Board or State Water Board of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.
[40 CFR 122.41(l)(2)]

(3) *Transfers*. This permit is not transferable to any person except after notice to the San Diego Water Board. The San Diego Water Board may require modification or revocation and reissuance of the permit to change the name of the Copermittee and incorporate such other requirements as may be necessary under the CWA.
[40 CFR 122.41(l)(3)]

(4) *Monitoring reports.* Monitoring results must be reported at the intervals specified elsewhere in this permit. [40 CFR 122.41(l)(4)]

(a) Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the San Diego Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices. [40 CFR 122.41(l)(4)(i)]

(b) If the Copermittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or another method required for an industry-specific waste stream under 40 CFR Subchapters N or O, the results of this monitoring must be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the San Diego Water Board or State Water Board.
[40 CFR 122.41(l)(4)(ii)]

(c) Calculations for all limitations which require averaging of measurements must utilize an arithmetic mean unless otherwise specified in the permit.
[40 CFR 122.41(l)(4)(iii)]

(5) *Compliance schedules*. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date. [40 CFR 122.41(l)(5)]

(6) *Twenty-four hour reporting.*

(a) The Copermittee must report any noncompliance that may endanger health or the environment. Any information must be provided orally within 24 hours from the time the Copermittee becomes aware of the circumstances. A written submission must also be provided within five (5) days of the time the Copermittee becomes aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6)(i)]

(b) The following must be included as information which must be reported within 24 hours under this paragraph: [40 CFR 122.41(l)(6)(ii)]

(i) Any unanticipated bypass that exceeds any effluent limitation in the permit (See 40 CFR 122.41(g)). [40 CFR 122.41(l)(6)(ii)(A)]
(ii) Any upset which exceeds any effluent limitation in the permit. [40 CFR 122.41(l)(6)(ii)(B)] and,
(iii) Violation of a maximum daily discharge limitation for any of the pollutants listed by the San Diego Water Board in the permit to be reported within 24 hours. (See 40 CFR 122.44(g)) [40 CFR 122.41(l)(6)(ii)(C)]

(c) The San Diego Water Board may waive the above-required written report on a case-by-case basis if the oral report has been received within 24 hours. [40 CFR 122.41(l)(6)(iii)]

(7) *Other noncompliance.* The Copermittee must report all instances of noncompliance not reported in accordance with the standard provisions required under 40 CFR 122.41(l)(4), (5), and (6), at the time monitoring reports are submitted. The reports must contain the information listed in the standard provisions required under 40 CFR 122.41(l)(6). [40 CFR 122.41(l)(7))]

(8) *Other information.* When the Copermittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the San Diego Water Board, State Water Board, or USEPA, the Copermittee must promptly submit such facts or information. [40 CFR 122.41(l)(8)]

m. BYPASS [40 CFR 122.41(m)]

(1) *Definitions.*

(a) "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. [40 CFR 122.41(m)(1)(i)] or

(b) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be

expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
[40 CFR 122.41(m)(1)(ii)]

(2) *Bypass not exceeding limitations*. The Copermittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the standard provisions required under 40 CFR 122.41(m)(3) and (4).
[40 CFR 122.41(m)(2)]

(3) *Notice.*

(a) *Anticipated bypass*. If the Copermittee knows in advance of the need for a bypass, it must submit a notice, if possible at least ten days before the date of the bypass. [40 CFR 122.41(m)(3)(i)] or

(b) *Unanticipated bypass*. The Copermittee must submit notice of an unanticipated bypass in accordance with the standard provisions required under 40 CFR 122.41(l)(6) (24-hour notice).
[40 CFR 122.41(m)(3)(ii)]

(4) *Prohibition of Bypass.*

(a) Bypass is prohibited, and the San Diego Water Board may take enforcement action against a Copermittee for bypass, unless:
[40 CFR 122.41(m)(4)(i)]

(i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; [40 CFR 122.41(m)(4)(i)(A)]
(ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance;
[40 CFR 122.41(m)(4)(i)(B)] and,
(iii) The Copermittee submitted notice in accordance with the standard provisions required under 40 CFR 122.41(m)(3).
[40 CFR 122.41(m)(4)(i)(C)]

(b) The San Diego Water Board may approve an anticipated bypass, after considering its adverse effects, if the San Diego Water Board determines that it will meet the three conditions listed above.
[40 CFR 122.41(m)(4)(ii)]

n. UPSET [40 CFR 122.41(n)]

(1) *Definition.* "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Copermittee. An upset does not

include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. [40 CFR 122.41(n)(1)]

(2) *Effect of an upset*. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the standard provisions required under 40 CFR 122.41(n)(3) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. [40 CFR 122.41(n)(2)]

(3) *Conditions necessary for a demonstration of upset*. A Copermittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that: [40 CFR 122.41(n)(3)]

(a) An upset occurred and that the Copermittee can identify the cause(s) of the upset; [40 CFR 122.41(n)(3)(i)]
(b) The permitted facility was at the time being properly operated; [40 CFR 122.41(n)(3)(ii)] and
(c) The Copermittee submitted notice of the upset in accordance with the standard provisions required under 40 CFR 122.41(l)(6)(ii)(B) (24-hour notice). [40 CFR 122.41(n)(3)(iii)]
(d) The Copermittee complied with any remedial measures pursuant to the standard provisions required under 40 CFR 122.41(d). [40 CFR 122.41(n)(3)(iii)]

(4) *Burden of proof*. In any enforcement proceeding, the Copermittee seeking to establish the occurrence of an upset has the burden of proof. [40 CFR 122.41(n)(4)]

o. STANDARD PERMIT PROVISIONS FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS [40 CFR 122.42(c)]

The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the San Diego Water Board or State Water Board under 40 CFR 122.26(a)(1)(v) must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report must include:

(1) The status of implementing the components of the storm water management program that are established as permit conditions; [40 CFR 122.42(c)(1)]

(2) Proposed changes to the storm water management programs that are established as permit conditions. Such proposed changes must be consistent with 40 CFR 122.26(d)(2)(iii); [40 CFR 122.42(c)(2)] and

(3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under 40 CFR 122.26(d)(2)(iv) and (v); [40 CFR 122.42(c)(3)]

(4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; [40 CFR 122.42(c)(4)]

(5) Annual expenditures and budget for year following each annual report; [40 CFR 122.42(c)(5)]

(6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; [40 CFR 122.42(c)(6)]

(7) Identification of water quality improvements or degradation. [40 CFR 122.42(c)(7)]

p. STANDARD PERMIT PROVISIONS FOR STORM WATER DISCHARGES [40 CFR 122.42(d)]

The initial permits for discharges composed entirely of storm water issued pursuant to 40 CFR 122.26(e)(7) must require compliance with the conditions of the permit as expeditiously as practicable, but in no event later than three years after the date of issuance of the permit.

2. General Provisions

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. The general provisions applicable to this Order and NPDES permit are as follows:

a. DISCHARGE OF WASTE IS A PRIVILEGE

No discharge of waste into the waters of the State, whether or not such discharge is made pursuant to waste discharge requirements, shall create a vested right to continue such discharge. All discharges of waste into waters of the State are privileges, not rights. [CWC Section 13263(g)]

b. DURATION OF ORDER AND NPDES PERMIT

(1) *Effective date*. This Order and NPDES permit becomes effective on the 50th day after its adoption provided the USEPA has no objection. If the USEPA objects to its issuance, this Order shall not become effective until such objection is withdrawn. This Order supersedes Order No. R9-2007-0001 upon the effective date of this Order, and supersedes Order Nos. R9-2009-0002 and R9-2010-0016 upon their expiration or earlier notice of coverage.

(2) *Expiration*. This Order and NPDES permit expires five years after its effective date. [40 CFR 122.46(a)]

(3) *Continuation of expired order*. After this Order and NPDES permit expires, the terms and conditions of this Order and NPDES permit are automatically continued pending issuance of a new permit if all requirements of the federal NPDES regulations on the continuation of expired permits (40 CFR 122.6) are complied with.

c. AVAILABILITY

A copy of this Order must be kept at a readily accessible location and must be available to on-site personnel at all times.

d. CONFIDENTIALITY OF INFORMATION

Except as provided for in 40 CFR 122.7, no information or documents submitted in accordance with or in application for this Order will be considered confidential, and all such information and documents shall be available for review by the public at the San Diego Water Board office.

Claims of confidentiality for the following information will be denied:
[40 CFR 122.7(b)]

(1) The name and address of any permit applicant or Copermittee; [40 CFR 122.7(b)(1)] and

(2) Permit applications and attachments, permits, and effluent data. [40 CFR 122.7(b)(2)]

e. EFFLUENT LIMITATIONS

(1) *Interim effluent limitations*. The Copermittee must comply with any interim effluent limitations as established by addendum, enforcement action, or revised waste discharge requirements which have been, or may be, adopted by the San Diego Water Board.

(2) *Other effluent limitations and standards*. If any applicable toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant and that standard or prohibition is more stringent than any limitation on the pollutant in the permit, the San Diego Water Board shall institute proceedings under these regulations to modify or revoke and reissue the permit to conform to the toxic effluent standard or prohibition. [40 CFR 122.44(b)(1)]

f. DUTY TO MINIMIZE OR CORRECT ADVERSE IMPACTS

The Copermittee must take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this Order, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the noncompliance.

g. PERMIT ACTIONS

The filing of a request by the Copermittee for modification, revocation and reissuance, or termination of this Order, or a notification of planned change in or anticipated noncompliance with this Order does not stay any condition of this Order. (See 40 CFR 122.41(f)) In addition, the following provisions apply to this Order:

(1) Upon application by any affected person, or on its own motion, the San Diego Water Board may review and revise the requirements in this Order. All requirements must be reviewed periodically. [CWC Section 13263(e)]

(2) This Order may be terminated or modified for cause, including, but not limited to, all of the following: [CWC Section 13381]

(a) Violation of any condition contained in the requirements of this Order. [CWC Section 13381(a)]

(b) Obtaining the requirements in this Order by misrepresentation, or failure to disclose fully all relevant facts. [CWC Section 13381(b)]

(c) A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge. [CWC Section 13381(c)]

(3) When this Order is transferred to a new owner or operator, such requirements as may be necessary under the CWC may be incorporated into this Order.

h. NPDES Permitted Non-Storm Water Discharges

The San Diego Water Board has, in prior years, issued a limited number of individual NPDES permits for non-storm water discharges to MS4s. The San Diego Water Board or State Water Board may in the future, upon prior notice to the Copermittee(s), issue an NPDES permit for any non-storm water discharge (or class of non-storm water discharges) to an MS4.

i. Monitoring

In addition to the standard provisions required under 40 CFR 122.41(j) and (l)(4), the following general monitoring provisions apply to this Order:

(1) Where procedures are not otherwise specified in Order, sampling, analysis and quality assurance/quality control must be conducted in accordance with the Quality Assurance Management Plan (QAMP) for the State of California's Surface Water Ambient Monitoring Program (SWAMP), adopted by the State Water Resources Control Board (State Water Board).

(2) Pursuant to 40 CFR 122.41(j)(2) and CWC Section 13383(a), each Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five (5) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time.

(3) All chemical, bacteriological, and toxicity analyses must be conducted at a laboratory certified for such analyses by the California Department of Public Health or a laboratory approved by the San Diego Water Board.

(4) For priority toxic pollutants that are identified in the California Toxics Rule (CTR) (65 Fed. Reg. 31682), the Copermittees must instruct their laboratories to establish calibration standards that are equivalent to or lower than the Minimum Levels (MLs) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP). If a Copermittee can demonstrate that a particular ML is not attainable, in accordance with procedures set forth in 40 CFR Part 136, the lowest quantifiable concentration of the lowest calibration standard analyzed by a specific analytical procedure (assuming that all the method specified sample weights, volumes, and processing steps have been followed) may be used instead of the ML listed in Appendix 4 of the SIP. The Copermittee must submit documentation from the laboratory to the San Diego Water Board for approval prior to raising the ML for any priority toxic pollutant.

j. ENFORCEMENT

(1) The San Diego Water Board is authorized to enforce the terms of this Order under several provisions of the CWC, including, but not limited to, CWC Sections 13385, 13386, and 13387.

(2) Nothing in this Order shall be construed to protect the Copermittee from its liabilities under federal, state, or local laws.

(3) The CWC provides for civil and criminal penalties comparable to, and in some cases greater than, those provided for under the CWA.

(4) Except as provided in the standard conditions required under 40 CFR 122.41(m) and (n), nothing in this Order shall be construed to relieve the Copermittee from civil or criminal penalties for noncompliance.

(5) Nothing in this Order shall be construed to preclude the institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties to which the Copermittee is or may be subject to under Section 311 of the CWA.

(6) Nothing in this Order shall be construed to preclude institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authoring preserved by Section 510 of the CWA.

k. SEVERABILITY

The provisions of this Order are severable, and if any provision of this Order, or the application of any provisions of this Order to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this Order shall not be affected thereby.

l. APPLICATIONS

Any application submitted by a Copermittee for reissuance or modification of this Order must satisfy all applicable requirements specified in federal regulations as well as any additional requirements for submittal of a Report of Waste Discharge specified in the CWC and the California Code of Regulations.

m. IMPLEMENTATION

All plans, reports and subsequent amendments submitted in compliance with this Order must be implemented immediately (or as otherwise specified). All submittals by Copermittees must be adequate to implement the requirements of this Order.

n. REPORT SUBMITTALS

(1) All report submittals must include an executive summary, introduction, conclusion, recommendations, and signed certified statement.

(2) Each Copermittee must submit a signed certified statement covering its responsibilities for each applicable submittal.

(3) The Principal Watershed Copermittee(s) must submit a signed certified statement covering its responsibilities for each applicable submittal and the sections of the submittals for which it is responsible.

(4) Unless otherwise directed, the Copermittees must submit one hard copy and one electronic copy of each report required under this Order to the San Diego Water Board, and one electronic copy to the USEPA.

(5) The Copermittees must submit reports and provide notifications as required by this Order to the following:

EXECUTIVE OFFICER
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
9174 SKY PARK COURT, SUITE 100
SAN DIEGO CA 92123-4340
Telephone: (858) 467-2952 Fax: (858) 571-6972

EUGENE BROMLEY
US ENVIRONMENTAL PROTECTION AGENCY
REGION IX
PERMITS ISSUANCE SECTION (W-5-1)
75 HAWTHORNE STREET
SAN FRANCISCO CA 94105

ATTACHMENT C

ACRONYMS AND ABBREVIATIONS

AMAL	Average Monthly Action Level
ASBS	Area(s) of Special Biological Significance
BMP	Best Management Practice
Basin Plan	Water Quality Control Plan for the San Diego Basin
CEQA	California Environmental Quality Act
CCR	California Code of Regulations
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWC	California Water Code
CZARA	Coastal Zone Act Reauthorization Amendments of 1990
ESAs	Environmentally Sensitive Areas
GIS	Geographic Information System
IBI	Index of Biological Integrity
LID	Low Impact Development
MDAL	Maximum Daily Action Level
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
NAL	Non-Storm Water Action Level
NAICS	North American Industry Classification System
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
ROWD	Report of Waste Discharge (application for NPDES reissuance)
SAL	Storm Water Action Level
San Diego Water Board	California Regional Water Quality Control Board, San Diego Region
SIC	Standard Industrial Classification Code
State Water Board	State Water Resources Control Board
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
WDID	Waste Discharge Identification Number
WLA	Waste Load Allocation
WQBEL	Water Quality Based Effluent Limitation

DEFINITIONS

Active/Passive Sediment Treatment - Using mechanical, electrical or chemical means to flocculate or coagulate suspended sediment for removal from runoff from construction sites prior to discharge.

Anthropogenic Litter – Trash generated from human activities, not including sediment.

Average Monthly Action Level – The highest allowable average of daily discharges over a calendar month.

Beneficial Uses - The uses of water necessary for the survival or wellbeing of man, plants, and wildlife. These uses of water serve to promote tangible and intangible economic, social, and environmental goals. "Beneficial Uses" of the waters of the State that may be protected include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. Existing beneficial uses are uses that were attained in the surface or ground water on or after November 28, 1975; and potential beneficial uses are uses that would probably develop in future years through the implementation of various control measures. "Beneficial Uses" are equivalent to "Designated Uses" under federal law. [California Water Code Section 13050(f)].

Best Management Practices (BMPs) - Defined in 40 CFR 122.2 as schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Bioassessment - The use of biological community information to evaluate the biological integrity of a water body and its watershed. With respect to aquatic ecosystems, bioassessment is the collection and analysis of samples of the benthic macroinvertebrate community together with physical/habitat quality measurements associated with the sampling site and the watershed to evaluate the biological condition (i.e. biotic integrity) of a water body.

Biofiltration - Practices that use vegetation and amended soils to detain and treat runoff from impervious areas. Treatment is through filtration, infiltration, adsorption, ion exchange, and biological uptake of pollutants.

Biological Integrity - Defined in Karr J.R. and D.R. Dudley. 1981. Ecological perspective on water quality goals. *Environmental Management* 5:55-68 as: "A balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitat of the region." Also referred to as ecosystem health.

BMP Design Manual – A plan developed to eliminate, reduce, or mitigate the impacts of runoff from development projects, including Priority Development Projects.

Chronic Toxicity – A measurement of sublethal effect (e.g. reduced growth, reproduction) to experimental test organisms exposed to an effluent or receiving waters compared to that of the control organisms.

Clean Water Act Section 303(d) Water Body - An impaired water body in which water quality does not meet applicable water quality standards and/or is not expected to meet water quality standards, even after the application of technology based pollution controls required by the CWA. The discharge of runoff to these water bodies by the Copermittees is significant because these discharges can cause or contribute to violations of applicable water quality standards.

Construction Site – Any project, including projects requiring coverage under the Construction General Permit, that involves soil disturbing activities including, but not limited to, clearing, grading, disturbances to ground such as stockpiling, and excavation.

Contamination - As defined in the Porter-Cologne Water Quality Control Act, contamination is "an impairment of the quality of waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste whether or not waters of the State are affected."

Copermittee – A permittee to a NPDES permit that is only responsible for permit conditions relating to the discharge for which it is operator [40 CFR 122.26(b)(1)]. For the purposes of this Order, a Copermittee is one of the individual permittees identified in Tables 1a-1c of this Order. ~~An incorporated city within the County of Orange, County of Riverside, or County of San Diego in the San Diego Region, the County of Orange, the County of Riverside, the County of San Diego, the Orange County Flood Control District, the Riverside County Water Conservation and Flood Control District, the San Diego Regional Airport Authority, or the San Diego Unified Port District.~~

Copermittees – All of the individual Copermittees, collectively.

Critical Channel Flow (Qc) – The channel flow that produces the critical shear stress that initiates bed movement or that erodes the toe of channel banks. When measuring Qc, it should be based on the weakest boundary material – either bed or bank.

Daily Discharge – Defined as either: (1) the total mass of the constituent discharged over the calendar day or any 24 hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g. concentration.)

The Daily Discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day, or other 24 hour period other than a day), or by the arithmetic mean of analytical results from one or more grab samples taken over the course of a day.

Development Projects - Construction, rehabilitation, redevelopment, or reconstruction of any public or private ~~residential project, industrial, commercial, or any other~~ projects.

Dry Season –May 1 to September 30.

Dry Weather – Weather is considered dry if the preceding 72 hours has been without measurable precipitation (>0.1 inch).

Enclosed Bays – Enclosed bays are indentations along the coast that enclose an area of

oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost bay works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays do not include inland surface waters or ocean waters.

Erosion – When land is diminished or worn away due to wind, water, or glacial ice. Often the eroded debris (silt or sediment) becomes a pollutant via storm water runoff. Erosion occurs naturally but can be intensified by land clearing activities such as farming, development, road building, and timber harvesting.

Environmentally Sensitive Areas (ESAs) - Areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; areas designated as preserves or their equivalent under the Natural Communities Conservation Program within the Cities and County of Orange; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.

Estuaries – Waters, including coastal lagoons, located at the mouth of streams that serve as areas of mixing fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and ocean water. Estuaries do not include inland surface waters or ocean waters.

Existing Development – Any area that has been developed and exists for municipal, commercial, industrial, or residential purposes, uses, or activities. May include areas that are not actively used for its originally developed purpose, but may be re-purposed or redeveloped for another use or activity.

Flow Duration – The long-term period of time that flows occur above a threshold that causes significant sediment transport and may cause excessive erosion damage to creeks and streams (not a single storm event duration). The simplest way to visualize this is to consider a histogram of pre- and post-project flows using long-term records of hourly data. To maintain pre-development flow duration means that the total number of hours (counts) within each range of flows in a flow-duration histogram cannot increase between the pre- and post-development condition. Flow duration within the range of geomorphologically significant flows is important for managing erosion.

Grading - The cutting and/or filling of the land surface to a desired slope or elevation.

Groundwater – Subsurface water that occurs beneath the water table in soils and geologic formations that are fully saturated.

Hazardous Material – Any substance that poses a threat to human health or the environment due to its toxicity, corrosiveness, ignitability, explosive nature or chemical reactivity. These also include materials named by the USEPA in 40 CFR 116 to be reported if a designated quantity of the material is spilled into the waters of the U.S. or emitted into the environment.

Hazardous Waste - Hazardous waste is defined as "any waste which, under Section 600 of Title 22 of this code, is required to be managed according to Chapter 30 of Division 4.5 of Title 22 of this code" [CCR Title 22, Division 4.5, Chapter 11, Article 1].

Household Hazardous Waste – Paints, cleaning products, and other hazardous wastes generated during home improvement or maintenance activities.

Hydromodification – The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

Illicit Connection – Any man-made conveyance or drainage system through which a non-storm water discharge to the stormwater drainage system occurs or may occur. Any connection to the MS4 that conveys an illicit discharge.

Illicit Discharge - Any discharge to the MS4 that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from fire fighting activities [40 CFR 122.26(b)(2)].

Inactive Areas – Areas of construction activity that are not active and those that have been active and are not scheduled to be re-disturbed for at least 14 days.

Infiltration – In the context of low impact development, infiltration is defined as the percolation of water into the ground. Infiltration is often expressed as a rate (inches per hour), which is determined through an infiltration test. In the context of non-storm water, infiltration is ~~W~~water other than wastewater that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow [40 CFR 35.2005(20)].

Inland Surface Waters – Includes all surface waters of the State that do not include the ocean, enclosed bays, or estuaries.

Jurisdictional Runoff Management Program Document – A written description of the specific jurisdictional runoff management measures and programs that each Copermittee will implement to comply with this Order and ensure that storm water pollutant discharges in runoff are reduced to the MEP and do not cause or contribute to a violation of water quality standards.

Low Impact Development (LID) – A storm water management and land development strategy that emphasizes conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions.

Low Impact Development Best Management Practices (LID BMPs) – LID BMPs include schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States through storm water management and land development strategies that emphasize conservation sand

the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions. LID BMPs include retention practices that do not allow runoff, such as infiltration, rain water harvesting and reuse, and evapotranspiration. LID BMPs also include flow-through practices such as biofiltration that may have some discharge of storm water following pollutant reduction.

Major Outfall – As defined in the Code of Federal Regulations, a major outfall is a MS4 outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (i.e. discharge from a single conveyance other than a circular pipe which is associated with a drainage area of more than 50 acres); or, for MS4s that receive storm water from lands zoned for industrial activity (based on comprehensive zoning plans or equivalent), a MS4 outfall that discharges from a single pipe with an inside diameter of 12 inches or more or from its equivalent (i.e. discharge from other than a circular pipe associated with a drainage area of 2 acres or more).

Maximum Daily Action Level (MDAL) –The highest allowable daily discharge of a pollutant, over a calendar day (or 24 hour period). For pollutants with action levels expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with action levels expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

Maximum Extent Practicable (MEP) – The technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) for storm water that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) in combination with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than BAT. A definition for MEP is not provided either in the statute or in the regulations. Instead the definition of MEP is dynamic and will be defined by the following process over time: municipalities propose their definition of MEP by way of their runoff management programs. Their total collective and individual activities conducted pursuant to the runoff management programs becomes their proposal for MEP as it applies both to their overall effort, as well as to specific activities (e.g., MEP for street sweeping, or MEP for MS4 maintenance). In the absence of a proposal acceptable to the San Diego Water Board, the San Diego Water Board defines MEP.

In a memo dated February 11, 1993, entitled "Definition of Maximum Extent Practicable," Elizabeth Jennings, Senior Staff Counsel, SWRCB addressed the achievement of the MEP standard as follows:

> "*To achieve the MEP standard, municipalities must employ whatever Best Management Practices (BMPs) are technically feasible (i.e., are likely to be effective) and are not cost prohibitive. The major emphasis is on technical feasibility. Reducing pollutants to the MEP means choosing effective BMPs, and rejecting applicable BMPs only where other effective BMPs will serve the same purpose, or the BMPs would not be technically feasible, or the cost would be prohibitive. In selecting BMPs to achieve the MEP standard, the following factors may be useful to consider:*
>
> *a. Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?*
> *b. Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?*

c. *Public Acceptance: Does the BMP have public support?*
d. *Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?*
e. *Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc.?*

The final determination regarding whether a municipality has reduced pollutants to the maximum extent practicable can only be made by the Regional or State Water Boards, and not by the municipal discharger. If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit derived, it would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs that would address a pollutant source, or to pick a BMP based solely on cost, which would be clearly less effective. In selecting BMPs the municipality must make a serious attempt to comply and practical solutions may not be lightly rejected. In any case, the burden would be on the municipal discharger to show compliance with its permit. After selecting a menu of BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented."

Monitoring Year – October 1 to September 30

Municipal Separate Storm Sewer System (MS4) – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designated or used for collecting or conveying storm water; (iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.26.

National Pollutant Discharge Elimination System (NPDES) - The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the CWA.

Non-Storm Water - All discharges to and from a MS4 that do not originate from precipitation events (i.e., all discharges from a MS4 other than storm water). Non-storm water includes illicit discharges and NPDES permitted discharges.

Nuisance - As defined in the Porter-Cologne Water Quality Control Act, a nuisance is "anything which meets all of the following requirements: 1) Is injurious to health, or is indecent, or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. 2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. 3) Occurs during, or as a result of, the

treatment or disposal of wastes."

Ocean Waters – ~~t~~The territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the State Board's California Ocean Plan.

Order – Unless otherwise specified, refers to this Order, Order No. R9-2013-0001 (NPDES No. CAS0109266)

Outfall - Outfall means a point source as defined by 40 CFR 122.2 at the point where a municipal separate storm sewer discharges to waters of the US and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels or other conveyances which connect segments of the same stream or other waters of the US and are used to convey waters of the US.

Persistent Flow - Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

Person - A person is defined as an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof [40 CFR 122.2].

Point Source - Any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, landfill leachate collection systems, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

Pollutant - Any agent that may cause or contribute to the degradation of water quality such that a condition of pollution or contamination is created or aggravated.

Pollution - As defined in the Porter-Cologne Water Quality Control Act, pollution is "the alteration of the quality of the waters of the State by waste, to a degree that unreasonably affects the either of the following: 1) The waters for beneficial uses; or 2) Facilities that serve these beneficial uses." Pollution may include contamination.

Pollution Prevention - Pollution prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control BMPs, treatment control BMPs, or disposal.

Pre-Development Runoff Conditions – Approximate flow rates and durations that exist or existed onsite before land development occurs. For new development projects, this equates to runoff conditions immediately before project construction. For redevelopment projects, this equates to runoff conditions from the project footprint assuming infiltration characteristics of the underlying soil, and existing grade. Runoff coefficients of concrete or asphalt must not be used. A redevelopment Priority Development Project must use available information pertaining to existing underlying soil type and onsite existing grade to estimate pre-development runoff conditions. ~~Runoff conditions that existed onsite before the existing development was constructed, or exists onsite before planned development activities occur.~~

Priority Development Projects - New development and redevelopment projects defined under Provision E.3.b of Order No. R9-2013-0001~~-2012-0011~~.

Rainy Season (aka Wet Season) –October 1 to April 30

Receiving Waters – Waters of the United States.

Receiving Water Limitations - Waste discharge requirements issued by the San Diego Water Board typically include both: (1) "Effluent Limitations" (or "Discharge Limitations") that specify the technology-based or water-quality-based effluent limitations; and (2) "Receiving Water Limitations" that specify the water quality objectives in the Basin Plan as well as any other limitations necessary to attain those objectives. In summary, the "Receiving Water Limitations" provision is the provision used to implement the requirements of CWA section 402(p)(3)(B).

Redevelopment - The creation~~, addition,~~ and/or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include trenching and resurfacing associated with utility work; resurfacing existing roadways; new sidewalk construction, pedestrian ramps, or bike lane on existing roads; and routine replacement of damaged pavement, such as pothole repair.

Regional Clearinghouse – A central location for the collection and distribution of information developed and maintained by the Copermittees including, but not limited to, plans, reports, manuals, data, contact information, and/or links to such documents and information.

Rehabilitation - Remedial measures or activities for the purpose of improving or restoring the beneficial uses of streams, channels or river systems. Techniques may vary from in-stream restoration techniques to off-linestormwater management practices installed in the system corridor or upland areas, or a combination of in-stream and out of stream techniques. Rehabilitation techniques may include, but are not limited to the following: riparian zone restoration, constructed wetlands, channel modifications that improve habitat and stability, and daylighting of drainage systems.

Reporting Period – The period of information that is reported in the Water Quality Improvement Plan Annual Report. The reporting period consists of two components: 1) July 1 to June 30, consistent with the fiscal year, for the implementation of the jurisdictional runoff management programs, and 2) October 1 to September 30, consistent with the monitoring year for the monitoring and assessment programs. Together, these two time periods constitute the reporting year for the Water Quality Improvement Plan Annual Report due January 31 following the end of the monitoring year.

Retain –Keep or hold in a particular place, condition, or position without discharge to surface waters.

Retrofitting – Storm water management practice put into place after development has occurred in watersheds where the practices previously did not exist or are ineffective. Retrofitting of developed areas is intended to improve water quality, protect downstream channels, reduce flooding, or meet other specific objectives. Retrofitting developed areas may include, but is not limited to replacing roofs with green roofs, disconnecting downspouts or impervious surfaces to

drain to pervious surfaces, replacing impervious surfaces with pervious surfaces, installing rain barrels, installing rain gardens, and trash area enclosures.

Runoff - All flows in a storm water conveyance system that consists of the following components: (1) storm water (wet weather flows) and (2) non-storm water including dry weather flows.

San Diego Water Board – As used in this document the term "San Diego Water Board" is synonymous with the term "Regional Board" as defined in Water Code section 13050(b) and is intended to refer to the California Regional Water Quality Control Board for the San Diego Region as specified in Water Code Section 13200.

Sediment - Soil, sand, and minerals washed from land into water. Sediment resulting from anthropogenic sources (i.e. human induced land disturbance activities) is considered a pollutant. This Order regulates only the discharges of sediment from anthropogenic sources and does not regulate naturally occurring sources of sediment. Sediment can destroy fish-nesting areas, clog animal habitats, and cloud waters so that sunlight does not reach aquatic plants.

Source Control BMP – Land use or site planning practices, or structural or nonstructural measures that aim to prevent runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between pollutants and runoff.

Storm Water – Per 40 CFR 122.26(b)(13), means storm water runoff, snowmelt runoff and surface runoff and drainage. Surface runoff and drainage pertains to runoff and drainage resulting from precipitation events.

~~**Stream, Channel, or Habitat Rehabilitation** – Measures or activities for the purpose of improving or restoring the environmental health (i.e. physical, chemical and biological integrity) of streams, channels, or river systems. Rehabilitation techniques may include, but are not limited to, riparian zone restoration, constructed wetlands, bank stabilization, channel reconfiguration, and daylighting drainage systems.~~

Structural BMPs - A subset of BMPs which detains, retains, filters, removes, or prevents the release of pollutants to surface waters from development projects in perpetuity, after construction of a project is completed.

Test of Significant Toxicity (TST) - A statistical approach used to analyze toxicity test data. The TST incorporates a restated null hypothesis, Welch's t-test, and biological effect thresholds for chronic and acute toxicity.

Total Maximum Daily Load (TMDL) - The maximum amount of a pollutant that can be discharged into a water body from all sources (point and non-point) and still maintain water quality standards. Under CWA section 303(d), TMDLs must be developed for all water bodies that do not meet water quality standards after application of technology-based controls.

Toxicity - Adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies). The water quality objectives for toxicity provided in the Basin Plan, state in part…"All waters shall be free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life….The survival of aquatic life in

surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge".

Toxicity Identification Evaluation (TIE) - A set of procedures for identifying the specific chemical(s) responsible for toxicity. These procedures are performed in three phases (characterization, identification, and confirmation) using aquatic organism toxicity tests).

Toxicity Reduction Evaluation (TRE) - A study conducted in a step-wise process designed to identify the causative agents of effluent or ambient toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in toxicity. The first steps of the TRE consist of the collection of data relevant to the toxicity, including additional toxicity testing, and an evaluation of facility operations and maintenance practices, and best management practices. A Toxicity Identification Evaluation (TIE) may be required as part of the TRE, if appropriate.

Treatment Control BMP – Any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media absorption or any other physical, biological, or chemical process.

Unpaved Road – Any long, narrow stretch without pavement used for traveling by motor passenger vehicles between two or more points. Unpaved roads are generally constructed of dirt, gravel, aggregate or macadam and may be improved or unimproved.

Waste - As defined in CWC Section 13050(d), "waste includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal."

Article 2 of CCR Title 23, Chapter 15 (Chapter 15) contains a waste classification system that applies to solid and semi-solid waste, which cannot be discharged directly or indirectly to water of the state and which therefore must be discharged to land for treatment, storage, or disposal in accordance with Chapter 15. There are four classifications of waste (listed in order of highest to lowest threat to water quality): hazardous waste, designated waste, non-hazardous solid waste, and inert waste.

Water Quality Objective - Numerical or narrative limits on constituents or characteristics of water designated to protect designated beneficial uses of the water. [California Water Code Section 13050 (h)]. California's water quality objectives are established by the State and Regional Water Boards in the Water Quality Control Plans. Numeric or narrative limits for pollutants or characteristics of water designed to protect the beneficial uses of the water. In other words, a water quality objective is the maximum concentration of a pollutant that can exist in a receiving water and still generally ensure that the beneficial uses of the receiving water remain protected (i.e., not impaired). Since water quality objectives are designed specifically to protect the beneficial uses, when the objectives are violated the beneficial uses are, by definition, no longer protected and become impaired. This is a fundamental concept under the Porter Cologne Act. Equally fundamental is Porter Cologne's definition of pollution. A condition of pollution exists when the water quality needed to support designated beneficial uses has become unreasonably affected or impaired; in other words, when the water quality objectives have been violated. These underlying definitions (regarding beneficial use protection) are the reason why all waste discharge requirements implementing the federal NPDES regulations

require compliance with water quality objectives. (Water quality objectives are also called water quality criteria in the CWA.)

Water Quality Standards - Water quality standards, as defined in Clean Water Act section 303(c) consist of the beneficial uses (e.g., swimming, fishing, municipal drinking water supply, etc.,) of a water body and criteria (referred to as water quality objectives in the California Water Code) necessary to protect those uses. Under the Water Code, the water boards establish beneficial uses and water quality objectives in water quality control or basin plans. Together with an anti-degradation policy, these beneficial uses and water quality objectives serve as water quality standards under the Clean Water Act. In Clean Water Act parlance, state beneficial uses are called "designated uses" and state water quality objectives are called "criteria." Throughout this Order, the relevant term is used depending on the statutory scheme.

Waters of the State - Any water, surface or underground, including saline waters within the boundaries of the State [CWC section 13050 (e)]. The definition of the Waters of the State is broader than that for the Waters of the United States in that all water in the State is considered to be a Waters of the State regardless of circumstances or condition.

Waters of the United States - As defined in the 40 CFR 122.2, the Waters of the U.S. are defined as: "(a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate "wetlands;" (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters otherwise defined as waters of the United States under this definition: (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial seas; and (g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA."

Watershed - That geographical area which drains to a specified point on a water course, usually a confluence of streams or rivers (also known as drainage area, catchment, or river basin).

Wet Season (aka Rainy Season) –October 1 to April 30

Wet Weather – Weather is considered wet up to 72 hours after ~~if there is~~ a storm event of 0.1 inches and greater ~~and the following 72 hours~~, unless otherwise defined by another regulatory mechanism (e.g. a TMDL).

ATTACHMENT D

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

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JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

FY _____

I. COPERMITTEE INFORMATION

Copermittee Name:

Copermittee Primary Contact Name:

Copermittee Primary Contact Information:
Address:
City: County: State: Zip:
Telephone: Fax: Email:

II. LEGAL AUTHORITY

Has the Copermittee established adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐
A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority?	**YES**	☐
	NO	☐

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

Was an update of the jurisdictional runoff management program document required or recommended by the San Diego Water Board?	**YES**	☐
	NO	☐
If YES to the question above, did the Copermittee update its jurisdictional runoff management program document and make it available on the Regional Clearinghouse?	**YES**	☐
	NO	☐

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

Has the Copermittee implemented a program to actively detect and eliminate illicit discharges and connections to its MS4 that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

Number of non-storm water discharges reported by the public	
Number of non-storm water discharges detected by Copermittee staff or contractors	
Number of non-storm water discharges investigated by the Copermittee	
Number of sources of non-storm water discharges identified	
Number of non-storm water discharges eliminated	
Number of sources of illicit discharges or connections identified	
Number of illicit discharges or connections eliminated	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

V. DEVELOPMENT PLANNING PROGRAM

Has the Copermittee implemented a development planning program that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐
Was an update to the BMP Design Manual required or recommended by the San Diego Water Board?	**YES**	☐
	NO	☐
If YES to the question above, did the Copermittee update its BMP Design Manual and make it available on the Regional Clearinghouse?	**YES**	☐
	NO	☐

Number of proposed development projects in review	
Number of Priority Development Projects in review	
Number of Priority Development Projects approved	
Number of approved Priority Development Projects exempt from any BMP requirements	
Number of approved Priority Development Projects allowed alternative compliance	
Number of Priority Development Projects granted occupancy	

Number of completed Priority Development Projects in inventory	
Number of high priority Priority Development Project structural BMP inspections	
Number of Priority Development Project structural BMP violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM
FY _____

VI. CONSTRUCTION MANAGEMENT PROGRAM

Has the Copermittee implemented a construction management program that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

Number of construction sites in inventory	
Number of active construction sites in inventory	
Number of inactive construction sites in inventory	
Number of construction sites closed/completed during reporting period	
Number of construction site inspections	
Number of construction site violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

Has the Copermittee implemented an existing development management program that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

	Municipal	Commercial	Industrial	Residential
Number of facilities or areas in inventory				
Number of existing development inspections				
Number of follow-up inspections				
Number of violations				
Number of enforcement actions issued				
Number of escalated enforcement actions issued				

VIII. PUBLIC EDUCATION AND PARTICIPATION

Has the Copermittee implemented a public education program component that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐
Has the Copermittee implemented a public participation program component that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

IX. FISCAL ANALYSIS

Has the Copermittee attached to this form a summary of its fiscal analysis that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

X. CERTIFICATION

I [☐ Principal Executive Officer ☐ Ranking Elected Official ☐ Duly Authorized Representative] certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature	Date
Print Name	Title
Telephone Number	Email

ATTACHMENT E

SPECIFIC PROVISIONS FOR TOTAL MAXIMUM DAILY LOADS APPLICABLE TO ORDER NO. R9-2013-0001

These provisions implement load allocations (LAs) and wasteload allocations (WLAs) of the Total Maximum Daily Loads (TMDLs)~~,~~ adopted by the San Diego Water Board and approved by USEPA under Clean Water Act section 303(c), ~~which are~~ applicable to discharges regulated under this Order. The provisions and schedules for implementation of the TMDLs described below must be incorporated into the Water Quality Improvement Plans, required pursuant to Provision B of this Order, for the specified Watershed Management Areas.

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed
2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin
3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed
4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek
5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay
6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2002-0123

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	August 14, 2002
State Water Board Approval Date:	July 16, 2003
Office of Administrative Law Approval Date:	September 11, 2003
US EPA Approval Date:	November 3, 2003

(3) TMDL Effective Date: September 11, 2003

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS ~~WATER QUALITY BASED EFFLUENT LIMITATIONS~~

The ~~WQBELs~~ final diazinon TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must be in compliance with the final TMDL compliance requirements as of December 31, 2010.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the ~~violation~~ exceedance of the following receiving water limitations ~~by the end of the compliance schedule under Specific Provision 1.c~~:

Table 1.1
Final Receiving Water Limitations Expressed as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Diazinon	Acute	0.08 µg/L	1 hour
	Chronic	0.05 µg/L	4 days

(b) Final Effluent Limitations

Discharges from the MS4s ~~must not~~ containing concentrations that do not exceed the following effluent limitations will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 1.b.(3)(a) ~~by the end of the compliance schedule under Specific Provision 1.c~~:

Table 1.2
Final Effluent Limitations Expressed as Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation	Averaging Period
Diazinon	Acute	0.072 µg/L	1 hour
	Chronic	0.045 µg/L	4 days

(c) Best Management Practices

The following BMPs for Chollas Creek must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area and implemented by the Responsible Copermittees:

(i) The Responsible Copermittees must implement BMPs to ~~support the~~ achieve~~ment of~~ the ~~WQBELs~~ receiving water limitations under Specific Provision 1.b.(2)(a) and/or the effluent limitations under Specific Provision 1.b.(2)(b) for Chollas Creek.

(ii) The Responsible Copermittees must implement the Diazinon Toxicity Control Plan and Diazinon Public Outreach/Education Program as described in the report titled, *Technical Report for Total Maximum Daily Load for Diazinon in Chollas Creek Watershed, San Diego County*, dated August 14, 2002, including subsequent modifications, in order to achieve the ~~WQBELs under Specific Provision 1.b~~ receiving water limitations under Specific Provision 1.b.(2)(a) and/or the effluent limitations under Specific Provision 1.b.(2)(b).

(iii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 1.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 1.b.(2)(b) at the Responsible Copermittees' MS4 outfalls; OR

(d) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 1.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 1.b.(2)(c) achieves compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 1.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 1.d, to demonstrate compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c).

c. INTERIM TMDL COMPLIANCE ~~SCHEDULE~~ REQUIREMENTS

The Responsible Copermittees must be in compliance with the final diazinon TMDL compliance requirements as of December 31, 2010.~~The Responsible Copermittees are required to achieve their respective WLAs by December 31, 2010. The Responsible Copermittees must be in compliance with the WQBELs under Specific Provision 1.b.~~

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls for diazinon within the Chollas Creek watershed, and calculate or estimate the annual diazinon loads, in accordance with the requirements of Provisions D.2,

D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

~~e. COMPLIANCE DETERMINATION~~

~~Compliance with WQBELs of Specific Provision 1.b may be demonstrated via one of the following methods:~~

~~(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;~~

~~(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 1.b.(1) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR~~

~~(c) There are no violations of the applicable effluent limitations under Specific Provision 1.b.(2) at the Responsible Copermittees' MS4 outfalls.~~

2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0019

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	September 22, 2005
Office of Administrative Law Approval Date:	December 2, 2005
US EPA Approval Date:	February 8, 2006

(3) TMDL Effective Date: December 2, 2005

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Shelter Island Yacht Basin

(6) Responsible Copermittee: City of San Diego~~t~~

b. FINAL TMDL COMPLIANCE REQUIREMENTS ~~WATER QUALITY BASED EFFLUENT LIMITATIONS~~

The ~~WQBELs~~ final dissolved copper TMDL compliance requirements for Shelter Island Yacht Basin consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittee must be in compliance with the final TMDL compliance requirements as of December 2, 2005.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the ~~violation~~ exceedance of the following receiving water limitations ~~by the end of the compliance schedule under Specific Provision 2.c~~:

Table 2.1
Final Receiving Water Limitations Expressed as Concentrations in Shelter Island Yacht Basin

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Dissolved Copper	Acute	4.8 µg/L x WER*	1 hour
	Chronic	3.1 µg/L x WER*	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(b) Final Effluent Limitations

Discharges from the MS4s ~~must not~~ containing pollutant loads that do not exceed the following effluent limitations will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 2.b.(3)(a) ~~by the end of the compliance schedule under Specific Provision 2.c~~:

Table 2.2
Final Effluent Limitations as Expressed as Annual Loads in MS4 Discharges to Shelter Island Yacht Basin

Constituent	Effluent Limitation
Dissolved Copper	30 kg/yr

(c) Best Management Practices

The Responsible Copermittee must implement BMPs to ~~support the~~ achieve~~ment of~~ the ~~WQBELs under Specific Provision 2.b~~ receiving water limitations under Specific Provision 2.b.(2)(a) and/or the effluent limitations under Specific Provision 2.b.(2)(b) for Shelter Island Yacht Basin. The BMPs must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 2.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 2.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittee develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 2.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision

2.b.(2)(c) achieves compliance with Specific Provisions 2.b.(3)(a), 2.b.(3)(b) and/or 2.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 2.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 2.d, to demonstrate compliance with Specific Provisions 2.b.(3)(a), 2.b.(3)(b) and/or 2.b.(3)(c).

c. INTERIM TMDL COMPLIANCE ~~SCHEDULE~~ REQUIREMENTS

The Responsible Copermittees must be in compliance with the final dissolved copper TMDL compliance requirements as of December 2, 2005. ~~The Responsible Copermittee is required to achieve the MS4 WLA by December 2, 2005. The Responsible Copermittee must be in compliance with the WQBELs under Specific Provision 2.b.~~

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

The Responsible Copermittee must monitor the effluent of its MS4 outfalls for dissolved copper, and calculate or estimate the monthly and annual dissolved copper loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.(b)(2)of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

~~e. COMPLIANCE DETERMINATION~~

~~Compliance with WQBELs of Specific Provision 2.b may be demonstrated via one of the following methods:~~

~~(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water;~~

~~(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 2.b.(1) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR~~

~~(c) There are no violations of the applicable effluent limitations under Specific Provision 2.b.(2) at the Responsible Copermittee's MS4 outfalls.~~

3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0036

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	November 16, 2005
Office of Administrative Law Approval Date:	February 1, 2006
US EPA Approval Date:	March 22, 2006

(3) TMDL Effective Date: February 1, 2006

(4) Watershed Management Area: Santa Margarita River

(5) Water Body: Rainbow Creek

(6) Responsible Copermittee: County of San Diego

b. FINAL TMDL COMPLIANCE REQUIREMENTS ~~WATER QUALITY BASED EFFLUENT LIMITATIONS~~

The ~~WQBELs~~ final total nitrogen and total phosphorus TMDL compliance requirements for Rainbow Creek consist of the following

(1) Final TMDL Compliance Date

The Responsible Copermittee must comply with final TMDL compliance requirements by December 31, 2021.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the ~~violation~~ exceedance of the following receiving water limitations by the ~~end of the~~ compliance ~~schedule~~ date under Specific Provision 3.b.(1)~~c.(1)~~:

Table 3.1
Final Receiving Water Limitations Expressed as Concentrations in Rainbow Creek

Constituent	Receiving Water Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(b) Final Effluent Limitations

(i) Discharges from the MS4s ~~must not~~ containing concentrations that do not exceed the following effluent limitations by the ~~end of the~~ compliance date ~~schedule~~ under Specific Provision 3.b.(1)~~c.(1)~~ will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 3.b.(2)(a):

Table 3.2
Final Effluent Limitations Expressed as Concentrations in MS4 Discharges to Rainbow Creek

Constituent	Effluent Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 ~~0.1~~ mg/L

(ii) Annual ~~P~~pollutant loads from given land uses discharging to and from the MS4s ~~must~~ that do not exceed the following ~~effluent limitations~~ annual loads by the ~~end of the~~ compliance ~~schedule~~ date under Specific Provision 3.b.(1)~~c.(1)~~ will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 3.b.(2)(a):

Table 3.3
Final Effluent Limitations Expressed as Annual Loads in MS4 Discharges to Rainbow Creek

Land Use	Total N	Total P
Commercial nurseries	116 kg/yr	3 kg/yr
Park	3 kg/yr	0.1 kg/yr
Residential areas	149 kg/yr	12 kg/yr
Urban areas	27 kg/yr	6 kg/yr

~~Interim effluent limitations expressed as pollutant loads are given in the compliance schedule under Specific Provision 3.0.~~

(c) Best Management Practices

(i) The Responsible Copermittee must implement BMPs to ~~support the~~ achieve~~ment of~~ the ~~WQBELs under Specific Provision 3.b~~ receiving water limitations under Specific Provision 3.b.(2)(a) and/or the effluent limitations under Specific Provision 3.b.(2)(b) for Rainbow Creek.

(ii) The Responsible Copermittee should coordinate any BMPs implemented to address this TMDL with Caltrans and other sources as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance

date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 3.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 3.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the final effluent limitations under Specific Provision 3.b.(2)(b)(ii); OR

(e) The Responsible Copermittee develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 3.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 2.b.(2)(c) achieves compliance with Specific Provisions 3.b.(3)(a), 3.b.(3)(b), 3.b.(3)(c) and/or 3.b.(3)(d),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 3.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 3.d, to demonstrate compliance with Specific Provisions 3.b.(3)(a), 3.b.(3)(b), 3.b.(3)(c) and/or 3.b.(3)(d).

c. INTERIM TMDL COMPLIANCE ~~SCHEDULE~~ REQUIREMENTS

The interim total nitrogen and total phosphorus TMDL compliance requirements for Rainbow Creek consist of the following:

(1) Interim Compliance Dates and WQBELs

The Responsible Copermittee must ~~be in compliance~~ comply with the interim WQBELs, expressed as annual loads, by December 31 of the interim compliance year given in Table 3.4 ~~under Specific Provision 3.b, by~~

~~December 31, 2021~~.

~~(1) Interim Compliance Requirements~~

Table 3.4
Interim Water Quality Based Effluent Limitations Expressed as Annual Loads in MS4 Discharges from Specific Land Uses to Rainbow Creek

	Total N Interim Effluent Limitations (kg/yr)			Total P Interim Effluent Limitations (kg/yr)		
	Interim Compliance Date			Interim Compliance Date		
Land Use	**2009**	**2013**	**2017**	**2009**	**2013**	**2017**
Commercial nurseries	390	299	196	20	16	10
Park	5	3	3	0.15	0.10	0.10
Residential areas	507	390	260	99	74	47
Urban areas	40	27	27	9	6	6

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 3.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 3.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the final effluent limitations under Specific Provision 3.b.(2)(b)(ii); OR

(e) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the interim effluent limitations under Specific Provision 3.c.(1); OR

(f) The Responsible Copermittee has submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

d. Specific Monitoring and Assessment Requirements

(1) The Responsible Copermittee must incorporate into the Water Quality Improvement Plan and implement the Sampling and Analysis Plan for

Rainbow Creek Nutrient Reduction TMDL Implementation Water Quality Monitoring, dated January 2010.

(2) The results of any monitoring conducted during the reporting period, and assessment of whether the interim and final ~~WQBELs~~ TMDL compliance requirements have been achieved must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

~~e. COMPLIANCE DETERMINATION~~

~~(1) Compliance with interim compliance requirements of Specific Provision 3.c.(2) may be demonstrated via one of the following methods:~~

~~(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water;~~

~~(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 3.b.(1) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls;~~

~~(c) There are no violations of the applicable effluent limitations under Specific Provision 3.b.(2)(a) at the Responsible Copermittee's MS4 outfalls;~~

~~(d) The pollutant loads from given land uses discharging to and from the MS4s do not exceed the applicable effluent limitations under Specific Provision 3.b.(2)(b); OR~~

~~(e) The Responsible Copermittee has submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim compliance requirements will be achieved by the interim compliance dates.~~

~~(2) Compliance with WQBELs of Specific Provision 3.b may be demonstrated via one of the following methods:~~

~~(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water;~~

~~(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 3.b.(1) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls;~~

~~(c) There are no violations of the applicable effluent limitations under Specific Provision 3.b.(2)(a) at the Responsible Copermittee's MS4 outfalls; OR~~

~~(d) The pollutant loads from given land uses discharging to and from the MS4s do not exceed the applicable effluent limitations under Specific Provision 3.b.(2)(b).~~

4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2007-0043

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2007
State Water Board Approval Date:	July 15, 2008
Office of Administrative Law Approval Date:	October 22, 2008
US EPA Approval Date:	December 18, 2008

(3) TMDL Effective Date: October 22, 2008

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS ~~WATER QUALITY BASED EFFLUENT LIMITATIONS~~

The ~~WQBELs~~ final dissolved copper, lead, and zinc TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must comply with the final TMDL compliance requirements by October 22, 2028.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the ~~violation~~ exceedance of the following receiving water limitations by the ~~end of the~~ compliance ~~schedule~~ date under Specific Provision 4.b.(1)~~c.(1)~~:

Table 4.1
Final Receiving Water Limitations Expressed as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$(0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$(0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$(0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$(0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(b) Final Effluent Limitations

Discharges from the MS4s ~~must not~~ containing pollutant loads that do not exceed the following effluent limitations by the ~~end of the~~ compliance date ~~schedule~~ under Specific Provision 4.b.(1)~~c.(1)~~ will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 4.b.(2)(a):

Table 4.2
Final Effluent Limitations as Expressed Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(c) Best Management Practices

(i) The Responsible Copermittees must implement BMPs to ~~support the~~ achieve~~ment of~~ the ~~WQBELs under Specific Provision 4.b~~ receiving water limitations under Specific Provision 4.b.(2)(a) and/or the

effluent limitations under Specific Provision 4.b.(2)(b) for Chollas Creek.

(ii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans and the U.S. Navy as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 4.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 4.b.(2)(b) at the Responsible Copermittees' MS4 outfalls; OR

(d) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 4.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 4.b.(2)(c) achieves compliance with Specific Provisions 4.b.(3)(a), 4.b.(3)(b) and/or 4.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 4.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 4.d, to demonstrate compliance with Specific Provisions 4.b.(3)(a), 4.b.(3)(b) and/or 4.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS ~~SCHEDULE~~

The interim dissolved copper, lead, and zinc TMDL compliance requirements for Chollas Creek consist of the following:

(1) Interim Compliance Date and WQBELs ~~Requirements~~

The Responsible Copermittee must comply with the ~~following~~ interim WQBELs, expressed as concentrations, by the interim compliance date given in Table 4.3:

Table 4.3
Interim Water Quality Based Effluent Limitations Expressed as Concentrations in MS4 Discharges to Chollas Creek

Interim Compliance Date	Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
October 22, 2018	Dissolved Copper	Acute	1.2 x 90% x (0.96) x $e^{[0.9422 \times \ln(\text{hardness}) - 1.700]}$ x WER*	1 hour
		Chronic	1.2 x 90% x (0.96) x $e^{[0.8545 \times \ln(\text{hardness}) - 1.702]}$ x WER*	4 days
	Dissolved Lead	Acute	1.2 x 90% x [1.46203 – 0.145712 x ln(hardness)] x $e^{[1.273 \times \ln(\text{hardness}) - 1.460]}$ x WER*	1 hour
		Chronic	1.2 x 90% x [1.46203 – 0.145712 x ln(hardness)] x $e^{[1.273 \times \ln(\text{hardness}) - 4.705]}$ x WER*	4 days
	Dissolved Zinc	Acute	1.2 x 90% x (0.978) x $e^{[0.8473 \times \ln(\text{hardness}) + 0.884]}$ x WER*	1 hour
		Chronic	1.2 x 90% x (0.986) x $e^{[0.8473 \times \ln(\text{hardness}) + 0.884]}$ x WER*	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water; OR

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 4.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 4.b.(2)(b) at the Responsible Copermittees' MS4 outfalls; OR

(d) There are no exceedances of the interim effluent limitations under Specific Provision 4.c.(1) at the Responsible Copermittees' MS4 outfalls; OR

(e) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water

Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance date.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*, when it is amended to include monitoring requirements for the Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls discharging to Chollas Creek for dissolved copper, lead, and zinc, and calculate or estimate the monthly and annual dissolved copper, lead, and zinc loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2)of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

~~**e. COMPLIANCE DETERMINATION**~~

~~(1) Compliance with interim compliance requirements of Specific Provision 4.c.(2) may be demonstrated via one of the following methods:~~

~~(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;~~

~~(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 4.b.(1) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls;~~

~~(c) There are no violations of the applicable effluent limitations under Specific Provision 4.b.(2) at the Responsible Copermittees' MS4 outfalls; OR~~

~~(d) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim compliance requirements will be achieved by the interim compliance dates.~~

~~(2) Compliance with WQBELs of Specific Provision 4.b may be demonstrated via~~

~~one of the following methods:~~

~~(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;~~

~~(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 4.b.(1) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR~~

~~(c) There are no violations of the applicable effluent limitations under Specific Provision 4.b.(2) at the Responsible Copermittees' MS4 outfalls.~~

5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2008-0027

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 11, 2008
State Water Board Approval Date:	June 16, 2009
Office of Administrative Law Approval Date:	September 15, 2009
US EPA Approval Date:	October 26, 2009

(3) TMDL Effective Date: September 15, 2009

(4) Watershed Management Areas: See Table 5.0

(5) Water Bodies: See Table 5.0

(6) Responsible Copermittees: See Table 5.0

Table 5.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County	Dana Point Harbor	Baby Beach	-City of Dana Point -County of Orange
San Diego Bay	San Diego Bay	Shelter Island Shoreline Park	- San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS ~~WATER QUALITY BASED EFFLUENT LIMITATIONS~~

The ~~WQBELs~~ final indicator bacteria TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Final TMDL Compliance Dates

(a) Baby Beach in Dana Point Harbor

The Responsible Copermittees for MS4 discharges to Baby Beach must be in compliance with the final TMDL compliance requirements according to the following compliance dates:

Table 5.1
Compliance Dates to Achieve Final TMDL Compliance Requirements For Baby Beach in Dana Point Harbor

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform	September 15, 2014	September 15, 2009
Fecal Coliform		September 15, 2009
Enterococcus		September 15, 2019

(b) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park must be in compliance with the final TMDL compliance requirements as of December 31, 2012.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

~~(a)~~

Discharges from the MS4s must not cause or contribute to the ~~violation~~ exceedance of the following receiving water limitations by the ~~end of the~~ compliance ~~schedules~~ dates under Specific Provision~~s~~ 5.b.(1)~~c.(1)(a) and 5.c.(2)~~:

Table 5.2~~1~~
Final Receiving Water Limitations Expressed as Bacteria Densities in the Water Body

Constituent	Receiving Water Limitations	
	Single Sample Maximum[1,2]	30-Day Geometric Mean[2]
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.

~~(b) If the above receiving water limitations are not met in the receiving water, the Responsible Copermittees must demonstrate that the discharges from the MS4s are not causing or contributing to the exceedance of receiving water limitations.~~

(b) Final Effluent Limitations

(i) Discharges from the MS4s ~~must not~~ containing indicator bacteria densities that do not exceed the following effluent limitations by the ~~end of the~~ compliance dates ~~schedules~~ under Specific Provision~~s~~ 5.b.(1)~~c.(1)(a) and 5.c.(2) to demonstrate the discharge~~ will not cause or contribute to exceedances of the receiving water limitations under

Specific Provision 5.b.(2)(a) ~~is not causing or contributing to a violation of receiving water quality standards~~:

Table 5.3a~~2~~
Final Effluent Limitations as Expressed as Bacteria Densities in MS4 Discharges to the Water Body

Constituent	Effluent Limitations	
	Single Sample Maximum[1,2]	30-Day Geometric Mean[2]
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.

~~Interim effluent limitations expressed as pollutant loads are given in the compliance schedule under Specific Provision 5.c.~~

(ii) Discharges from the MS4s containing indicator bacteria loads that do not exceed the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.4a
Final Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to the Baby Beach in Dana Point Harbor

Constituent	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	0.86×10^9 MPN/day	$3{,}254 \times 10^9$ MPN/30days
Fecal Coliform	0.17×10^9 MPN/day	112×10^9 MPN/30days
Enterococcus	0.03×10^9 MPN/day	114×10^9 MPN/30days

Table 5.4b
Final Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to the Shelter Island Shoreline Park in San Diego Bay

Constituent	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	0 MPN/day	198×10^9 MPN/30days
Fecal Coliform	0 MPN/day	8×10^9 MPN/30days
Enterococcus	0 MPN/day	26×10^9 MPN/30days

(iii) Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.5a
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to ~~the~~ Baby Beach in Dana Point Harbor*

Constituent	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	90.4%	0%
Fecal Coliform	82.7%	0%
Enterococcus	96.2%	62.4%

Notes:
* The percent load reductions are relative to data collected between 1996-2002. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittees' MS4s must not exceed the loads in Table 5.4a, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the water body.

Table 5.5b
*Final Effluent Limitations Expressed as Percent Load Reductions** in MS4 Discharges to ~~the~~ Shelter Island Shoreline Park in San Diego Bay*

Constituent	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	0%	0%
Fecal Coliform	0%	0%
Enterococcus	0%	0%

Notes:
* The percent load reductions are relative to data collected between 1999-2004. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittee's MS4s must not exceed the loads in Table 5.4b, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the water body.

(c) Best Management Practices

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 5.0 must incorporate the Bacteria Load Reduction Plan (BLRP) required to be developed pursuant to Resolution No. R9-2008-0027.

(ii) The Responsible Copermittee must implement BMPs to ~~support the~~ achieve~~ment of~~ the ~~WQBELs under Specific Provision 5.0~~ receiving water limitations under Specific Provision 5.b.(2)(a) and/or the effluent limitations under Specific Provision 5.b.(2)(b) for the segments or areas of the water bodies listed in Table 5.0

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible Copermittees' MS4 outfalls; OR

(d) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.c.(2)(b)(ii); OR

(e) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 5.c.(2)(b)(iii); OR

(f) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(g) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 5.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 5.b.(2)(c) achieves compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 5.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 5.d, to demonstrate compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f).

c. INTERIM TMDL COMPLIANCE ~~SCHEDULE~~ REQUIREMENTS

The interim indicator bacteria TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Baby Beach in Dana Point Harbor

(a) Interim ~~WLA~~ TMDL Compliance Dates and WQBELs

~~The Responsible Copermittees for MS4 discharges to Baby Beach are required to achieve the WLA, thus must be in compliance with the WQBELs under Specific Provision 5.0, according to the following compliance schedule:~~

~~**Table 5.3**~~
~~*Compliance Schedule Dates to Achieve Baby Beach WLAs*~~

~~Constituent~~	~~Dry Weather WLA Compliance Date~~	~~Wet Weather WLA Compliance Date~~
~~Total Coliform~~	~~September 15, 2014~~	~~September 15, 2009~~
~~Fecal Coliform~~		~~September 15, 2009~~
~~*Enterococcus*~~		~~September 15, 2019~~

~~(b) Interim Compliance Requirements~~

The Responsible Copermittees for MS4 discharges to Baby Beach must comply with the following interim WQBELs by the interim compliance dates given in Tables 5.6a~~5~~ and/or 5.6b:

Table 5.6a~~4~~
Interim Water Quality Based Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to Baby Beach in Dana Point Harbor

Constituent	Interim Compliance Dates	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	4.93×10^9 MPN/day	$3{,}254 \times 10^9$ MPN/30days* ~~NA*~~
Fecal Coliform	September 15, 2012	0.59×10^9 MPN/day	112×10^9 MPN/30days* ~~NA*~~
Enterococcus	September 15, 2012	0.42×10^9 MPN/day	301×10^9 MPN/30days* ~~NA**~~
	September 15, 2016	0.03×10^9 MPN/day ~~NA*~~	207×10^9 MPN/30days

Notes:
* Same as the final effluent limitations in Table 5.4a.~~The WQBELs under Specific Provision 5.b.(2) must already be achieved by the given interim compliance date.~~
~~** There is no corresponding interim WQBEL for the given interim compliance date.~~

Table 5.6b
Interim Water Quality Based Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to Baby Beach in Dana Point Harbor*

Constituent	Interim Compliance Dates	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	45.2%	0%**
Fecal Coliform	September 15, 2012	41.4%	0%**
Enterococcus	September 15, 2012	48.1%	0%**
	September 15, 2016	96.2%**	31.2%

Notes:
* The percent load reductions are relative to data collected between 1996-2002. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittees' MS4s must not exceed the loads in Table 5.6a, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's

MS4s to the waterbody.
** Same as the final effluent limitations in Table 5.5a.

(b) Interim Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(i) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water; OR

(ii) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(iii) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible Copermittees' MS4 outfalls; OR

(iv) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.b(2)(b)(ii); OR

(v) The Responsible Copermittees can demonstrate that exceedances of the applicable receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(vi) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the interim effluent limitations under Table 5.6a of Specific Provision 5.c.(1)(a); OR

(vii) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the interim effluent limitations under Table 5.6b of Specific Provision 5.c.(1)(a); OR

(viii) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

(2) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park ~~is required to achieve the WLA, thus~~ must be in compliance with the ~~WQBELs under Specific Provision 5.0, by~~ final indicator bacteria TMDL requirements as of December 31, 2012.

d. Specific Monitoring and Assessment Requirements

(1) Monitoring Stations

Monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[35] If discharges of bacteria from the MS4 exceed~~ances of~~ the applicable interim or final WQBELs ~~receiving water limitations are observed in the monitoring data~~, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(2) Monitoring Procedures

(a) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) The Responsible Copermittees must collect wet weather monitoring samples within the first 24 hours of ~~the first~~ a storm event[36] of the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(c) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(3) Assessment and Reporting Requirements

[35] Commonly referred to as AB 411 monitoring
[36] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(a) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs have been achieved.

(b) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to correlate elevated bacteria levels with known or suspected sewage spills from wastewater collection systems and treatment plants or boats.

(c) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

~~e. COMPLIANCE DETERMINATION~~

~~(1) Compliance with interim compliance requirements of Specific Provision 5.c.(1)(b) may be demonstrated via one of the following methods:~~

~~(i) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;~~

~~(ii) There are no exceedances of the applicable receiving water limitations under Specific Provision 5.b.(1)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls;~~

~~(iii) There are no violations of the applicable effluent limitations under Specific Provision 5.b.(2) at the Responsible Copermittees' MS4 outfalls;~~

~~(iv) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the applicable effluent limitations under Specific Provision 5.c.(1)(b);~~

~~(v) The Responsible Copermittees can demonstrate that exceedances of the applicable receiving water limitations under Specific Provision 5.b.(1)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4 are not causing or contributing to the exceedances; OR~~

~~(vi) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim compliance requirements will be achieved by the interim compliance dates.~~

~~(2) Compliance with WQBELs of Specific Provision 5.b may be demonstrated via one of the following methods:~~

~~(i) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;~~

~~(ii) There are no exceedances of the applicable receiving water limitations under Specific Provision 5.b.(1)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls;~~

~~(iii) There are no violations of the applicable effluent limitations under Specific Provision 5.b.(2) at the Responsible Copermittees' MS4 outfalls;~~

~~(iv) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the applicable effluent limitations under Specific Provision 5.c.(1)(b); OR~~

~~(v) The Responsible Copermittees can demonstrate that exceedances of the applicable receiving water limitations under Specific Provision 5.b.(1)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4 are not causing or contributing to the exceedances.~~

6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2010-0001

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 10, 2010
State Water Board Approval Date:	December 14, 2010
Office of Administrative Law Approval Date:	April 4, 2011
US EPA Approval Date:	June 22, 2011

(3) TMDL Effective Date: April 4, 2011

(4) Watershed Management Areas: See Table 6.0

(5) Water Bodies: See Table 6.0

(6) Responsible Copermittees: See Table 6.0

Table 6.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	-City of Laguna Beach -County of Orange -Orange County Flood Control District
		at Heisler Park - North	
	Pacific Ocean Shoreline	at Main Laguna Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Woods -County of Orange -Orange County Flood Control District
		Laguna Beach at Ocean Avenue	
		Laguna Beach at Cleo Street	
		Arch Cove at Bluebird Canyon Road	
		Laguna Beach at Dumond Drive	
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Hills -City of Laguna Niguel -City of Laguna Woods -City of Lake Forest -City of Mission Viejo -County of Orange -Orange County Flood Control District
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	
	Aliso Creek Mouth	at mouth	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
South Orange County ~~(cont'd)~~ Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	-City of Dana Point -City of Laguna Beach -City of Laguna Niguel -County of Orange -Orange County Flood Control District
		Aliso Beach at Table Rock Drive	
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)	
		at Salt Creek (large outlet)	
		Salt Creek Beach at Salt Creek service road	
		Salt Creek Beach at Strand Road	
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	-City of Dana Point -City of Laguna Hills -City of Laguna Niguel -City of Mission Viejo -City of Rancho Santa Margarita -City of San Juan Capistrano -County of Orange -Orange County Flood Control District
	San Juan Creek	lower 1 mile	
	San Juan Creek Mouth	at mouth	
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	-City of Dana Point -City of San Clemente -County of Orange -Orange County Flood Control District
		Ole Hanson Beach Club Beach at Pico Drain	
		San Clemente City Beach at El Portal Street Stairs	
		San Clemente City Beach at Mariposa Street	
		San Clemente City Beach at Linda Lane	
		San Clemente City Beach at South Linda Lane	
		San Clemente City Beach at Lifeguard Headquarters	
		under San Clemente Municipal Pier	
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	
		San Clemente State Beach at Riviera Beach	
		Can Clemente State Beach at Cypress Shores	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	-City of Oceanside -City of Vista -County of San Diego
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	-City of Carlsbad -City of Encinitas -City of Escondido -City of San Marcos -County of San Diego
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	-City of Del Mar -City of Escondido -City of Poway -City of San Diego -City of Solana Beach -County of San Diego
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	-City of Del Mar -City of Poway -City of San Diego -County of San Diego
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	-City of San Diego
		La Jolla Shores Beach at Caminito del Oro	
		La Jolla Shores Beach at Vallecitos	
		La Jolla Shores Beach at Avenida de la Playa	
		at Casa Beach, Children's Pool	
		South Casa Beach at Coast Boulevard	
		Whispering Sands Beach at Ravina Street	
		Windansea Beach at Vista de la Playa	
		Windansea Beach at Bonair Street	
		Windansea Beach at Playa del Norte	
		Windansea Beach at Palomar Avenue	
		at Tourmaline Surf Park	
		Pacific Beach at Grand Avenue	
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I- Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	-City of El Cajon -City of Santee -County of San Diego
	San Diego River	lower 6 miles	-City of El Cajon -City of La Mesa -City of San Diego -City of Santee -County of San Diego
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	-City of La Mesa -City of Lemon Grove -City of San Diego -County of San Diego - San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS~~WATER QUALITY BASED EFFLUENT LIMITATIONS~~

The ~~WQBELs~~ final indicator bacteria TMDL compliance requirements for ~~segments or areas of~~ the water bodies listed in Table 6.0 consist of the following:

(1) Final TMDL Compliance Dates

The Responsible Copermittees for MS4 discharges to the water bodies listed in Table 6.0 must be in compliance with the final TMDL compliance requirements according to the following compliance dates:

Table 6.1
Compliance Dates to Achieve Final TMDL Compliance Requirements

Constituent	Dry Weather TMDL Compliance Date	Wet Weather TMDL Compliance Date
Total Coliform	April 4, 2021	April 4, 2031
Fecal Coliform		
Enterococcus		

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations
~~(a)~~

Discharges from the MS4s must not cause or contribute to the ~~violation~~ exceedance of the following receiving water limitations by the ~~end of the~~ compliance ~~schedules~~ dates under Specific Provision 6.b.(1)~~c.(1)~~:

~~**Table 6.21**~~
~~*Final Receiving Water Limitations as Expressed as Bacteria Densities and*~~

~~*Allowable Exceedance Frequencies in the Water Body*~~

~~Constituent~~	~~Receiving Water Limitations~~			
	~~Single Sample Maximum[1,2] (MPN/100mL)~~	~~Single Sample Maximum Allowable Exceedance Frequency[3]~~	~~30-Day Geometric Mean[2] (MPN/100mL)~~	~~30-Day Geometric Mean Allowable Exceedance Frequency~~
~~Total Coliform[4]~~	~~10,000~~	~~22% / 0%~~	~~1,000~~	~~0%~~
~~Fecal Coliform~~	~~400~~	~~22% / 0%~~	~~200~~	~~0%~~
~~*Enterococcus*~~	~~104[54] / 61[65]~~	~~22% / 0%~~	~~35[54] / 33[65]~~	~~0%~~

~~Notes:~~

~~1. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.~~
~~2. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.~~
~~3. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. The 0% single sample maximum allowable exceedance frequency applies to dry weather days.~~
~~4. This *Enterococcus* receiving water limitation applies to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.~~
~~5. This *Enterococcus* receiving water limitations applies to segments or areas of creeks or creek mouths listed in Table 6.0.~~

Table 6.2a

Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Beaches

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform	10,000	22% / 0%	1,000	0%
Fecal Coliform	400	22% / 0%	200	0%
Enterococcus	104	22% / 0%	35	0%

Notes:

a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. The 0% single sample maximum allowable exceedance frequency applies to dry weather days.

Table 6.2b

Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Creeks

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Fecal Coliform	400	22% / 0%	200	0%
Enterococcus	61 (104)[d]	22% / 0%	33	0%

Notes:

a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. The 0% single sample maximum allowable exceedance frequency applies to dry weather days.
d. A single sample maximum of 104 MPN/100ml for *Enterococcus* may be applied as a receiving water limitation for creeks, instead of 60 MPN/100mL, if one or more of the creeks addressed by these TMDLs (San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek, San Diego River, and/or Chollas Creek) is designated with a "moderately to lightly used area" or less frequent usage frequency in the Basin Plan. Otherwise, the single sample axmimum of 61 MPN/100mL for *Enterococcus* must be used to assess compliance with the allowable exceedance frequency.

~~Interim receiving water limitations expressed as allowable exceedance frequencies are given in the compliance schedule under Specific Provision 6.c.~~

~~(a) If the above receiving water limitations are not met in the receiving water, the Responsible Copermittees must demonstrate that the discharges from the MS4s are not causing or contributing to the violation of receiving water limitations. The Copermittee must provide data that demonstrate the discharges from the MS4s are meeting the effluent limitations under Specific Provision 6.b.(2).~~

(b) Final Effluent Limitations

(i) Discharges from the MS4s ~~must not~~ containing indicator bacteria densities that do not exceed the following effluent limitations by the ~~end of the~~ compliance dates ~~schedules~~ under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a) ~~to demonstrate the discharge is not causing or contributing to a violation of receiving water quality standards~~:

Table 6.2
Final Effluent Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies in MS4 Discharges to the Water Body

Constituent	Concentration-Based Effluent Limitations			
	Single Sample Maximum[~~1,2~~a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[~~3~~c]	30-Day Geometric Mean[~~2~~b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform[d]	10,000	22% / 0%	1,000	0%
Fecal Coliform	400	22% / 0%	200	0%
Enterococcus	104[e~~4~~] / 61[f~~5~~]	22% / 0%	35[e~~4~~] / 33[f~~5~~]	0%

Notes:
a~~1~~. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
b~~2~~. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.
c~~3~~. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. The 0% single sample maximum allowable exceedance frequency applies to dry weather days
d~~4~~. Total coliform effluent limitations only apply to MS4 outfalls that discharge to the Pacific Ocean Shorelines and creek mouths listed in Table 6.0.
e. This *Enterococcus* effluent limitation applies to MS4 discharges to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
f~~5~~. This *Enterococcus* effluent limitation applies to MS4 discharges to segments or areas of creeks or creek mouths listed in Table 6.0.

(ii) Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the compliance dates under Specific Provision 6.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a):

Table 6.3
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watershed and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
South Orange County	San Joaquin Hills HSA (901.11) and Laguna Hills HSA (901.12) - Pacific Ocean Shoreline	91.78%	91.72%	98.28%	46.85%	52.07%	51.26%
	Aliso HSA (901.13) - Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	95.47%	95.58%	99.13%	25.29%	26.62%	27.52% (27.37%)**
	Dana Point HSA (901.14) - Pacific Ocean Shoreline	95.04%	95.03%	98.98%	13.15%	14.86%	15.16%
	Lower San Juan HSA (901.27) - Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	72.96%	74.21%	94.94%	19.21%	12.82%	27.12% (26.90%)**
	San Clemente HA (901.30) - Pacific Ocean Shoreline	94.28%	94.23%	98.83%	23.85%	24.58%	25.26%
San Luis Rey River	San Luis Rey HU (903.00) - Pacific Ocean Shoreline	38.13%	39.09%	87.38%	5.62%	3.12%	11.69%

Table 6.3 (Cont'd)
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watershed and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
Carlsbad	**San Marcos HA** (904.50) - Pacific Ocean Shoreline	82.82%	82.55%	96.03%	18.47%	18.98%	20.19%
San Dieguito River	**San Dieguito HU** (905.00) - Pacific Ocean Shoreline	14.39%	20.72%	83.48%	4.29%	1.46%	7.72%
Penasquitos	**Miramar Reservoir HA** (906.10) - Pacific Ocean Shoreline	96.50%	96.59%	99.42%	1.61%	1.99%	1.93%
Mission Bay	**Scripps HA** (906.30) - Pacific Ocean Shoreline	96.44%	96.42%	99.25%	16.32%	21.14%	18.82%
	Tecolote HA (906.50) - Tecolote Creek	94.51%	94.59%	98.94%	16.51%	20.47%	18.15% (18.08%)**
San Diego River	**Mission San Diego HSA** (907.11) and **Santee HSA** (907.12) - Pacific Ocean Shoreline - Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles)	74.03%	69.44%	93.96%	38.14%	53.22%	42.74% (42.47%)**
San Diego Bay	**Chollas HSA** (908.22) - Chollas Creek	92.06%	92.15%	98.46%	17.82%	24.84%	21.46% (21.36%)**

Notes:
* The percent load reductions are based on reducing loads compared to pollutant loads from 2001 to 2002.
** The alternative *Enterococcus* percent load reduction was calculated based on a numeric target of 104 MPN/100mL instead of 61 MPN/100mL, protective of the REC-1 "moderately to lightly used area" usage frequency that is protective of freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative pollutant load reductions can be utilized.

~~Interim effluent limitations expressed as allowable exceedance frequencies are given in the compliance schedule under Specific Provision 6.c.~~

(c) Best Management Practices

(i) The Water Quality Improvement Plans for the applicable Watershed

Management Areas in Table 6.0 must incorporate the Comprehensive Load Reduction Plans (CLRPs) required to be developed pursuant to Resolution No. R9-2010-0001. ~~For segments or areas in Table 6.0 that have been delisted from the Clean Water Act Section 303(d) List of Water Quality Limited Segments, a CLRP is not required.~~

(ii) The Responsible Copermittee must implement BMPs to ~~support the~~ achieve~~ment of~~ the ~~WQBELs under Specific Provision 6.b~~ receiving water limitations under Specific Provision 6.b.(2)(a) and/or the effluent limitations under Specific Provision 6.b.(2)(b) for the segments or areas of the water bodies listed in Table 6.0.

(iii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans, ~~and~~ owners/operators of small MS4s, and agricultural dischargers as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible Copermittees' MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(f) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 6.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 6.b.(2)(c) achieves compliance with Specific Provisions 6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), and/or 6.b.(3)(e),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 6.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 6.d, to demonstrate compliance with Specific Provisions 5.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), 6.b.(3)(e) and/or 6.b.(3)(f).

c. INTERIM TMDL COMPLIANCE ~~SCHEDULE~~ REQUIREMENTS

The interim indicator bacteria TMDL compliance requirements for the water bodies listed in Table 6.0 consist of the following:

(1) ~~WLA~~ Interim TMDL Compliance Dates

The Responsible Copermittees must achieve compliance with the interim TMDL compliance requirements, as determined in accordance with Specific Provision 6.c.(3), by the interim compliance dates given in Table 6.4, unless alternative interim compliance dates are accepted by the San Diego Water Board Executive Officer as part of the Water Quality Improvement Plan.

Table 6.4
Interim Compliance Dates to Achieve Interim TMDL Compliance Requirements

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	April 4, 2016	April 4, 2021
		at Heisler Park - North		
	Pacific Ocean Shoreline	at Main Laguna Beach	April 4, 2016	April 4, 2021
		Laguna Beach at Ocean Avenue		
		Laguna Beach at Cleo Street		
		Arch Cove at Bluebird Canyon Road		
		Laguna Beach at Dumond Drive		
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	April 4, 2016	April 4, 2021
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	April 4, 2018	April 4, 2021
	Aliso Creek Mouth	at mouth	April 4, 2018	April 4, 2021
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	April 4, 2016	April 4, 2021
		Aliso Beach at Table Rock Drive		
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)		
		at Salt Creek (large outlet)		
		Salt Creek Beach at Salt Creek service road	April 4, 2017	April 4, 2021
		Salt Creek Beach at Strand Road	April 4, 2017	April 4, 2021

Table 6.4 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates	
			Interim Dry Weather WQBELs	Interim Wet Weather WQBELs
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	April 4, 2016	April 4, 2021
	San Juan Creek	lower 1 mile	April 4, 2018	April 4, 2021
	San Juan Creek Mouth	at mouth	April 4, 2016	April 4, 2021
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	April 4, 2016	April 4, 2021
		Ole Hanson Beach Club Beach at Pico Drain	April 4, 2016	April 4, 2021
		San Clemente City Beach at El Portal Street Stairs	April 4, 2017	April 4, 2021
		San Clemente City Beach at Mariposa Street		
		San Clemente City Beach at Linda Lane	April 4, 2016	April 4, 2021
		San Clemente City Beach at South Linda Lane	April 4, 2018	April 4, 2021
		San Clemente City Beach at Lifeguard Headquarters	April 4, 2017	April 4, 2021
		under San Clemente Municipal Pier		
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	April 4, 2018	April 4, 2021
		San Clemente State Beach at Riviera Beach	April 4, 2016	April 4, 2021
		Can Clemente State Beach at Cypress Shores	April 4, 2017	April 4, 2021
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	April 4, 2017	April 4, 2021
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	April 4, 2016	April 4, 2021
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	April 4, 2016	April 4, 2021

Table 6.4 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates	
			Interim Dry Weather WQBELs	Interim Wet Weather WQBELs
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	April 4, 2016	April 4, 2021
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	April 4, 2016	April 4, 2021
		La Jolla Shores Beach at Caminito del Oro		
		La Jolla Shores Beach at Vallecitos		
		La Jolla Shores Beach at Avenida de la Playa		
		at Casa Beach, Children's Pool		
		South Casa Beach at Coast Boulevard		
		Whispering Sands Beach at Ravina Street		
		Windansea Beach at Vista de la Playa		
		Windansea Beach at Bonair Street		
		Windansea Beach at Playa del Norte		
		Windansea Beach at Palomar Avenue		
		at Tourmaline Surf Park		
		Pacific Beach at Grand Avenue		
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries		
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	April 4, 2018	April 4, 2021
	San Diego River	lower 6 miles		
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach		
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	April 4, 2018	April 4, 2021

~~The Responsible Copermittees for MS4 discharges to a segment or area of the water bodies listed in Table 6.0 are required to achieve the WLA, thus~~

~~must be in compliance with the WQBELs under Specific Provision 6.b, according to the following compliance schedule:~~

~~**Table 6.3**~~
~~*Compliance Schedule Dates to Achieve Indicator Bacteria WLAs*~~

~~Constituent~~	~~Dry Weather WLA Compliance Date~~	~~Wet Weather WLA Compliance Date~~
~~Total Coliform*~~	~~April 4, 2021~~	~~April 4, 2031~~
~~Fecal Coliform~~		
~~*Enterococcus*~~		

~~* Total coliform receiving water limitations only apply to segments or areas of Pacific Ocean Shoreline listed in Table 6.0.~~

(2) Interim Water Quality Based Effluent Limitations ~~Compliance Requirements~~

The Responsible Copermittees for discharges to the water bodies in Table 6.0 must comply with the following interim WQBELs by the interim compliance dates given in Specific Provision 6.c.(1):

(a) Interim ~~Dry Weather~~ Receiving Water Limitations

(i) *Interim Dry Weather Receiving Water Limitations*

The Responsible Copermittee must calculate the "existing" exceedance frequencies of the 30-day geometric mean water quality objectives for each of the indicator bacteria by analyzing the available monitoring data collected between January 1, 1996 and December 31, 2002. "Existing" exceedance frequencies may be calculated by ~~segment or area of a water body, or by~~ water body~~,~~ and/or by Watershed Management Area listed in Table 6.0. Separate "existing" exceedance frequencies must be calculated for beaches and creeks/creek mouths.

The Responsible Copermittees must achieve a 50 percent reduction in the "existing" exceedance frequency of the 30-day geometric mean WQBELs for ~~the segments or areas of~~ the water bodies listed in Table 6.0 by the interim compliance dates ~~for achieving the interim dry weather WQBELs~~ given in Table 6.5. A 50 percent reduction in the "existing" exceedance frequency is equivalent to half of the "existing" exceedance frequency of the 30-day geometric mean WQBELs.

The "existing" exceedance frequencies and the interim dry weather allowable exceedance frequencies (i.e. interim dry weather receiving water limitations ~~WQBELs~~) calculated by the Responsible Copermittees must be included in the Water Quality Improvement Plans for the applicable Watershed Management Areas.

(ii) *Interim Wet Weather Receiving Water Limitations*

The Responsible Copermittees must achieve the interim wet weather receiving water limitations in Table 6.5~~4~~, expressed as interim wet

weather allowable exceedance frequencies, by the interim compliance dates ~~for achieving the interim wet weather WQBELs~~ given in Table 6.4~~5~~.

Table 6.5~~4~~
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	38%	37%	39%
		at Heisler Park - North			
	Pacific Ocean Shoreline	at Main Laguna Beach			
		Laguna Beach at Ocean Avenue			
		Laguna Beach at Cleo Street			
		Arch Cove at Bluebird Canyon Road			
		Laguna Beach at Dumond Drive			
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	41%	41%	42%
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	41%	41%	42%
	Aliso Creek Mouth	at mouth	41%	41%	42%
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	36%	36%	36%
		Aliso Beach at Table Rock Drive			
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)			
		at Salt Creek (large outlet)			
		Salt Creek Beach at Salt Creek service road			
		Salt Creek Beach at Strand Road			

Table 6.54 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County ~~(cont'd)~~ Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	44%	44%	48%
	San Juan Creek	lower 1 mile	44%	44%	47%
	San Juan Creek Mouth	at mouth	44%	44%	47%
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	35%	35%	36%
		Ole Hanson Beach Club Beach at Pico Drain			
		San Clemente City Beach at El Portal Street Stairs			
		San Clemente City Beach at Mariposa Street			
		San Clemente City Beach at Linda Lane			
		San Clemente City Beach at South Linda Lane			
		San Clemente City Beach at Lifeguard Headquarters			
		under San Clemente Municipal Pier			
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)			
		San Clemente State Beach at Riviera Beach			
		Can Clemente State Beach at Cypress Shores			
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	45%	44%	47%
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	40%	40%	41%
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	33%	33%	36%

Table 6.54 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	26%	26%	26%
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	37%	37%	37%
		La Jolla Shores Beach at Caminito del Oro			
		La Jolla Shores Beach at Vallecitos			
		La Jolla Shores Beach at Avenida de la Playa			
		at Casa Beach, Children's Pool			
		South Casa Beach at Coast Boulevard			
		Whispering Sands Beach at Ravina Street			
		Windansea Beach at Vista de la Playa			
		Windansea Beach at Bonair Street			
		Windansea Beach at Playa del Norte			
		Windansea Beach at Palomar Avenue			
		at Tourmaline Surf Park			
		Pacific Beach at Grand Avenue			
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries	49%	49%	51%
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	46%	43%	49%
	San Diego River	lower 6 miles	46%	43%	49%
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	46%	43%	51%
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	41%	41%	43%

(b) Interim Effluent Limitations

Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the interim compliance dates under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.c.(2)(a):

Table 6.6
Interim Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watersheds and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
South Orange County	San Joaquin Hills HSA (901.11) and Laguna Hills HSA (901.12) - Pacific Ocean Shoreline	45.89%	45.86%	49.14%	23.43%	26.04%	25.63%
	Aliso HSA (901.13) - Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	47.74%	47.79%	49.57%	12.65%	13.31%	13.76% (13.69%)**
	Dana Point HSA (901.14) - Pacific Ocean Shoreline	47.52%	47.52%	49.49%	6.58%	7.43%	7.58%
	Lower San Juan HSA (901.27) - Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	36.48%	37.11%	47.47%	9.61%	6.41%	13.56% (13.45%)**
	San Clemente HA (901.30) - Pacific Ocean Shoreline	47.14%	47.12%	49.42%	11.93%	12.29%	12.63%
San Luis Rey River	San Luis Rey HU (903.00) - Pacific Ocean Shoreline	19.07%	19.55%	43.69%	2.81%	1.56%	5.85%
Carlsbad	San Marcos HA (904.50) - Pacific Ocean Shoreline	41.41%	41.28%	48.02%	9.24%	9.49%	10.10%

Table 6.6 (Cont'd)
Interim Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watersheds and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
San Dieguito River	**San Dieguito HU** (905.00) - Pacific Ocean Shoreline	7.20%	10.36%	41.74%	2.15%	0.73%	3.86%
Penasquitos	**Miramar Reservoir HA** (906.10) - Pacific Ocean Shoreline	48.25%	48.30%	49.71%	0.81%	1.00%	0.97%
Mission Bay	**Scripps HA** (906.30) - Pacific Ocean Shoreline	48.22%	48.21%	49.63%	8.16%	10.57%	9.41%
	Tecolote HA (906.50) - Tecolote Creek	47.26%	47.30%	49.47%	8.26%	10.24%	9.08% (9.04%)**
San Diego River	**Mission San Diego HSA** (907.11) and **Santee HSA** (907.12) - Pacific Ocean Shoreline - Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles)	37.02%	34.72%	46.98%	19.07%	26.61%	21.37% (21.24%)**
San Diego Bay	**Chollas HSA** (908.22) - Chollas Creek	46.03%	46.08%	49.23%	8.91%	12.42%	10.73% (10.68%)**

Notes:
* The percent load reductions are based on reducing loads compared to pollutant loads from 2001 to 2002.
** The alternative *Enterococcus* percent load reduction was calculated based on a numeric target of 104 MPN/100mL instead of 61 MPN/100mL, protective of the REC-1 "moderately to lightly used area" usage frequency that is protective of freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative pollutant load reductions can be utilized.

~~(b) Interim Compliance Dates~~

~~The Responsible Copermittees must achieve the interim receiving water limitations under Specific Provisions 6.c.(2)(a) and 6.c.(2)(b) by the interim compliance dates given in Table 6.5.~~

~~Table 6.5~~
~~Interim Compliance Dates to Achieve Interim WQBELs~~

~~Watershed Management Area~~	~~Water Body~~	~~Segment or Area~~	~~Interim Compliance Dates~~ ~~Interim Dry Weather WQBELs~~	~~Interim Wet Weather WQBELs~~
~~South Orange County~~	~~Pacific Ocean Shoreline~~	~~Cameo Cove at Irvine Cove Drive – Riviera Way~~	~~April 4, 2016~~	~~April 4, 2021~~
		~~at Heisler Park – North~~		
	~~Pacific Ocean Shoreline~~	~~at Main Laguna Beach~~	~~April 4, 2016~~	~~April 4, 2021~~
		~~Laguna Beach at Ocean Avenue~~		
		~~Laguna Beach at Cleo Street~~		
		~~Arch Cove at Bluebird Canyon Road~~		
		~~Laguna Beach at Dumond Drive~~		
	~~Pacific Ocean Shoreline~~	~~Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach~~	~~April 4, 2016~~	~~April 4, 2021~~
	~~Aliso Creek~~	~~Entire reach (7.2 miles) and associated tributaries:~~ ~~- Aliso Hills Channel~~ ~~- English Canyon Creek~~ ~~- Dairy Fork Creek~~ ~~- Sulfur Creek~~ ~~- Wood Canyon Creek~~	~~April 4, 2018~~	~~April 4, 2021~~
	~~Aliso Creek Mouth~~	~~at mouth~~	~~April 4, 2018~~	~~April 4, 2021~~
	~~Pacific Ocean Shoreline~~	~~Aliso Beach at West Street~~	~~April 4, 2016~~	~~April 4, 2021~~
		~~Aliso Beach at Table Rock Drive~~		
		~~100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)~~		
		~~at Salt Creek (large outlet)~~		
		~~Salt Creek Beach at Salt Creek service road~~	~~April 4, 2017~~	~~April 4, 2021~~
		~~Salt Creek Beach at Strand Road~~	~~April 4, 2017~~	~~April 4, 2021~~

~~**Table 6.5** (Cont'd)~~
~~*Interim Compliance Dates to Achieve Interim WQBELs*~~

~~Watershed Management Area~~	~~Water Body~~	~~Segment or Area~~	~~Interim Compliance Dates~~ ~~Interim Dry Weather WQBELs~~	~~Interim Wet Weather WQBELs~~
~~South Orange County (cont'd)~~	~~Pacific Ocean Shoreline~~	~~at San Juan Creek~~	~~April 4, 2016~~	~~April 4, 2021~~
	~~San Juan Creek~~	~~lower 1 mile~~	~~April 4, 2018~~	~~April 4, 2021~~
	~~San Juan Creek Mouth~~	~~at mouth~~	~~April 4, 2016~~	~~April 4, 2021~~
	~~Pacific Ocean Shoreline~~	~~at Poche Beach~~	~~April 4, 2016~~	~~April 4, 2021~~
		~~Ole Hanson Beach Club Beach at Pico Drain~~	~~April 4, 2016~~	~~April 4, 2021~~
		~~San Clemente City Beach at El Portal Street Stairs~~	~~April 4, 2017~~	~~April 4, 2021~~
		~~San Clemente City Beach at Mariposa Street~~		
		~~San Clemente City Beach at Linda Lane~~	~~April 4, 2016~~	~~April 4, 2021~~
		~~San Clemente City Beach at South Linda Lane~~	~~April 4, 2018~~	~~April 4, 2021~~
		~~San Clemente City Beach at Lifeguard Headquarters~~	~~April 4, 2017~~	~~April 4, 2021~~
		~~under San Clemente Municipal Pier~~		
		~~San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)~~	~~April 4, 2018~~	~~April 4, 2021~~
		~~San Clemente State Beach at Riviera Beach~~	~~April 4, 2016~~	~~April 4, 2021~~
		~~Can Clemente State Beach at Cypress Shores~~	~~April 4, 2017~~	~~April 4, 2021~~
~~San Luis Rey River~~	~~Pacific Ocean Shoreline~~	~~at San Luis Rey River mouth~~	~~April 4, 2017~~	~~April 4, 2021~~
~~Carlsbad~~	~~Pacific Ocean Shoreline~~	~~at Moonlight State Beach~~	~~April 4, 2016~~	~~April 4, 2021~~
~~San Dieguito River~~	~~Pacific Ocean Shoreline~~	~~at San Dieguito Lagoon mouth~~	~~April 4, 2016~~	~~April 4, 2021~~

~~**Table 6.5** (Cont'd)~~
~~*Interim Compliance Dates to Achieve Interim WQBELs*~~

~~Watershed Management Area~~	~~Water Body~~	~~Segment or Area~~	~~Interim Compliance Dates~~ ~~Interim Dry Weather WQBELs~~	~~Interim Wet Weather WQBELs~~
~~Penasquitos~~	~~Pacific Ocean Shoreline~~	~~Torrey Pines State Beach at Del Mar (Anderson Canyon)~~	~~April 4, 2016~~	~~April 4, 2021~~
~~Mission Bay~~	~~Pacific Ocean Shoreline~~	~~La Jolla Shores Beach at El Paseo Grande~~	~~April 4, 2016~~	~~April 4, 2021~~
		~~La Jolla Shores Beach at Caminito del Oro~~		
		~~La Jolla Shores Beach at Vallecitos~~		
		~~La Jolla Shores Beach at Avenida de la Playa~~		
		~~at Casa Beach, Children's Pool~~		
		~~South Casa Beach at Coast Boulevard~~		
		~~Whispering Sands Beach at Ravina Street~~		
		~~Windansea Beach at Vista de la Playa~~		
		~~Windansea Beach at Bonair Street~~		
		~~Windansea Beach at Playa del Norte~~		
		~~Windansea Beach at Palomar Avenue~~		
		~~at Tourmaline Surf Park~~		
		~~Pacific Beach at Grand Avenue~~		
	~~Tecolote Creek~~	~~Entire reach and tributaries~~		
~~San Diego River~~	~~Forrester Creek~~	~~lower 1 mile~~	~~April 4, 2018~~	~~April 4, 2021~~
	~~San Diego River~~	~~lower 6 miles~~		
	~~Pacific Ocean Shoreline~~	~~at San Diego River mouth at Dog Beach~~		
~~San Diego Bay~~	~~Chollas Creek~~	~~lower 1.2 miles~~	~~April 4, 2018~~	~~April 4, 2021~~

(3) Interim TMDL Compliance Determination

Compliance with the interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible Copermittees' MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(f) There are no exceedances of the interim receiving water limitations under Specific Provision 6.c.(2)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(g) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the interim effluent limitations under Specific Provision 6.c.(2)(b); OR

(h) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) Monitoring and Assessment Requirements for Beaches

(a) Monitoring Stations

For beaches addressed by the TMDL, monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[37] If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

[37] Commonly referred to as AB 411 monitoring

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations at least once within the first 24 hours of the end of ~~first~~ a storm event[38] ~~of~~ during the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer in exceedance of the allowable exceedance frequencies in the receiving waters.

(iii) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs for the Pacific Ocean Shoreline segments or areas listed in Table 6.0 have been achieved.

(ii) Dry weather exceedance frequencies must be calculated as follows:

[a] 30-day geometric means must be calculated from the results of any dry weather samples collected from the segments or areas for each water body listed in Table 6.0;

[b] The method and number of samples need for calculating the 30-day geometric means must be consistent with the number of samples required by the Ocean Plan;

[c] Where there are multiple segments or areas associated with a water body listed in Table 6.0, the Copermittees may calculate geometric means for each segment or area, or combine the dry weather monitoring data from all the segments or areas to

[38] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

calculate geometric means for the water body;

[d] The exceedance frequency must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the dry season.

(iii) Wet weather exceedance frequencies must be calculated as follows:

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;

[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;

[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the highest bacteria density result reported from wet weather samples collected; and

[d] The single sample maximum exceedance frequency must be calculated by dividing the number of wet weather days that exceed the single sample maximum receiving water limitations in Table 6.2 by the total number of wet weather days during the rainy season.

[e] The data collected for dry weather must be used in addition to the data collected for wet weather to calculate the wet weather 30-day geometric means. The exceedance frequency of the wet weather 30-day geometric means must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the wet season.

(iv) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) Monitoring and Assessment Requirements for Creeks and Creek Mouths

(a) Monitoring Stations

For creeks addressed by the TMDL, monitoring locations should consist of, at a minimum, a location at or near the mouth of the creek (e.g. Mass Loading Station or Mass Emission Station) and one or more locations

upstream of the mouth (e.g. Watershed Assessment Station). If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations in accordance with the requirements of Provision D.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations within the first 24 hours of the end of ~~first~~ a storm event[39] ~~of~~ during the rainy season (i.e. October 1 through April 30).

(iii) Samples collected from receiving water monitoring stations must be analyzed for fecal coliform and *Enterococcus* indicator bacteria.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the receiving water monitoring data to assess whether the interim and final receiving water WQBELs for the creeks and creek mouths listed in Table 6.0 have been achieved.

(ii) Dry weather exceedance frequencies must be calculated as follows:

[a] 30-day geometric means must be calculated from the results of any dry weather samples collected from the segment or area for each water body listed in Table 6.0;
[b] The method and number of samples need for calculating the 30-day geometric means must be consistent with the number of samples required by the Basin Plan;
[c] The exceedance frequency must be calculated by dividing the number of 30-day geometric means that exceed the 30-day geometric mean receiving water limitations in Table 6.2 by the total number of 30-day geometric means calculated from samples collected during the dry season.

(iii) Wet weather exceedance frequencies must be calculated as follows:

[39] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;

[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;

[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the highest bacteria density result reported from wet weather samples collected; and

[d] The exceedance frequency must be calculated by dividing the number of wet weather days that exceed the single sample maximum receiving water limitations in Table 6.2 by the total number of wet weather days during the rainy season.

[e] The data collected for dry weather must be used in addition to the data collected for wet weather to calculate the wet weather 30-day geometric means. The exceedance frequency of the wet weather 30-day geometric means must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the wet season.

(iv) The Responsible Copermittee must identify and incorporate additional MS4 outfall and receiving water monitoring stations and/or adjust monitoring frequencies to identify sources causing exceedances of the receiving water WQBELs.

(v) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

~~e. COMPLIANCE DETERMINATION~~

~~(1) Compliance with interim compliance requirements of Specific Provision 6.c.(2) may be demonstrated via one of the following methods:~~

~~(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;~~

~~(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 6.b.(1) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls;~~

~~(c) There are no violations of the applicable effluent limitations under Specific Provision 6.b.(2) at the Responsible Copermittees' MS4 outfalls;~~

~~(d) There are no exceedances of the applicable interim receiving water limitations under Specific Provision 6.c.(2) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls;~~

~~(e) The Responsible Copermittees can demonstrate that exceedances of the applicable interim or final receiving water limitations under Specific Provision 6.b.(1)(a) or 6.c.(2) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4 are not causing or contributing to the exceedances; OR~~

~~(f) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim compliance requirements will be achieved by the interim compliance dates.~~

~~(2) Compliance with WQBELs of Specific Provision 6.b may be demonstrated via one of the following methods:~~

~~(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;~~

~~(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 6.b.(1) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls;~~

~~(c) There are no violations of the applicable effluent limitations under Specific Provision 6.b.(2) at the Responsible Copermittees' MS4 outfalls; OR~~

~~The Responsible Copermittees can demonstrate that exceedances of the applicable final receiving water limitations under Specific Provision 6.b.(1)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4 are not causing or contributing to the exceedances.~~

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ATTACHMENT F

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

FACT SHEET / TECHNICAL REPORT

FOR

TENTATIVE
ORDER NO. R9-2013-0001
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

MONTH DAY, 2013

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I. FACT SHEET FORMAT

This Fact Sheet briefly sets forth the principal facts and the significant factual, legal, methodological, and policy questions that the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) considered in preparing Order No. R9-2013-0001 (Order). In accordance with the Code of Federal Regulations (CFR) Title 40 Parts 124.8 and 124.56 (40 CFR 124.8 and 40 CFR 124.56), this Fact Sheet includes, but is not limited to, the following information:

1. Contact information
2. Public process and notification procedures
3. Background of municipal storm water permits
4. Regional MS4 Permit approach
5. Economic considerations
6. Applicable statutes, regulations, plans and policies
7. Discussion of the provisions in the Order

Tentative Order No. R9-2013-0001 was distributed for public review on October 31, 2012. The San Diego Water Board accepted written comments on the Tentative Order until January 11, 2013. A public hearing was subsequently held on ~~Month Day~~April 10 and 11, 2013 to receive oral comments from interested persons.

The San Diego Water Board files applicable to the issuance of Order No. R9-2013-0001 are incorporated into the administrative record in support of the findings and requirements of the Order.

II. CONTACT INFORMATION

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The Order and other related documents can be downloaded from the San Diego Water Board website at

http://www.swrcb.ca.gov/rwqcb9/water_issues/programs/stormwater/index.shtml

The documents referenced in this Fact Sheet and in Order No. R9-2013-0001 are available for public review at the San Diego Water Board office, located at the address listed above. Public records are available for inspection during regular business hours, from 8:00 am to 5:00 pm Monday through Friday. To schedule an appointment to inspect public records, contact the San Diego Water Board Records Management Officer at 858-467-2952.

COPERMITTEES

Orange County Copermittees

- County of Orange
  - City of Aliso Viejo
  - City of Dana Point
  - City of Laguna Beach
  - City of Laguna Hills
  - City of Laguna Niguel
  - City of Laguna Woods
  - City of Lake Forest
  - City of Mission Viejo
  - City of Ranch Santa Margarita
  - City of San Clemente
  - City of San Juan Capistrano
  - Orange County Flood Control District

Riverside County Copermittees

- County of Riverside
  - City of Murrieta
  - City of Temecula
  - City of Wildomar
  - Riverside County Flood Control and Water Conservation District

San Diego County Copermittees

- County of San Diego
  - City of Carlsbad
  - City of Chula Vista
  - City of Coronado
  - City of Del Mar
  - City of El Cajon
  - City of Encinitas
  - City of Escondido
  - City of Imperial Beach
  - City of La Mesa
  - City of Lemon Grove
  - City of National City
  - City of Oceanside
  - City of Poway
  - City of San Diego
  - City of San Marcos
  - City of Santee
  - City of Solana Beach
  - City of Vista
  - San Diego County Regional Airport Authority
  - San Diego Unified Port District

III. PUBLIC PROCESS AND NOTIFICATION PROCEDURES

The San Diego Water Board followed the schedule listed below for the preparation of Order No. R9-2013-0001:

1. On February 8, 2011, the San Diego Water Board met with the San Diego County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No. R9-2007-0001.

2. Between February and May 2011, the San Diego Water Board met with select San Diego County, Orange County, and Riverside County Copermittees, as well as representatives of the environmental community to discuss concepts and receive recommendations for elements to be incorporated in a Regional Municipal Separate Storm Sewer System Permit (Regional MS4 Permit).

3. On June 27, 2011 the San Diego Water Board received the Report of Waste Discharge from the San Diego County Copermittees for the renewal of their NPDES permit, Order No. R9-2007-0001.

4. On April 9, 2012, the San Diego Water Board released an administrative draft of Tentative Order No. R9-2013-0001 for preliminary informal comments and feedback.

5. On April 25, 2012, the San Diego Water Board held an informal public workshop to present the administrative draft of Tentative Order No. R9-2013-0001 and receive verbal comments.

6. Between June and August 2012, the San Diego Water Board held four (4) focused meetings with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community, and USEPA) to discuss and receive preliminary comments and feedback about specific elements in the administrative draft of Tentative Order No. R9-2013-0001.

7. On September 5, 2012, the San Diego Water Board held an informal public workshop to present the modifications that were expected to be incorporated into the Tentative Order based on the preliminary comments and feedback received during the focused meetings held between June and August 2012.

8. Informal written comments on the administrative draft of Tentative Order No. R9-2013-0001 were accepted until September 14, 2012.

9. On October 12, 2012, the San Diego Water Board released a revised administrative draft of Tentative Order No. R9-2013-0001.

10. On October 24, 2012, the San Diego Water Board held a focused meeting with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community, and USEPA) to discuss modifications incorporated into the administrative draft of Tentative Order No. R9-2013-0001.

11. On October 31, 2012, the San Diego Water Board released Tentative Order No. R9-2013-0001 for formal public review and comment.

12. On November 13, 2012 and December 12, 2012, the San Diego Water Board held a formal public Board workshop to present the public draft of Tentative Order No. R9-2013-0001 and receive verbal comments.

13. Formal written comments on the public draft of Tentative Order No. R9-2013-0001 were accepted until January 11, 2013.

14. A public hearing of Tentative Order No. R9-2013-0001 was conducted on ~~Month Day~~April 10 and 11, 2013.

IV. BACKGROUND OF THE SAN DIEGO REGION MUNICIPAL STORM WATER PERMITS

In developed and developing areas, storm water runoff is commonly transported through municipal separate storm sewer systems (MS4s) and discharged into local receiving water bodies. As the storm water runs off and flows over the land or impervious surfaces (e.g., paved streets, parking lots, and building rooftops), it accumulates debris, chemicals, sediment, and other pollutants that can adversely affect receiving water quality if discharged untreated. The United States Environmental Protection Agency (USEPA) recognizes wet weather flows from urban areas as the number one source of estuarine pollution in coastal communities,[1] such as those within the San Diego Region.

The federal Clean Water Act (CWA) was amended in 1987 to address and regulate discharges of storm water associated with industrial activities and from municipal storm sewers. With the amendments, many municipalities throughout the United States were obligated for the first time to obtain National Pollutant Discharge Elimination System (NPDES) permits for discharges of storm water from their MS4s.

In response to the CWA 1987 amendment, as well as the pending federal NPDES regulations which would implement the amendment, the San Diego Water Board issued "early" MS4 permits. The San Diego Water Board adopted and issued Order Nos. 90-38, 90-42, and 90-46 to regulate storm water discharges from the MS4s in Orange County, San Diego County, and Riverside County, respectively, within the San Diego Region on July 16, 1990.

The "early" MS4 permits, or First Term Permits, were issued prior to the November 1990 promulgation of the final federal NPDES storm water regulations. By issuing these First Term Permits before the federal regulations took effect, the San Diego Water Board was able to provide the Copermittees additional flexibility in addressing and managing storm water discharges. The First Term Permits contained the essentials of the 1990 regulations, and required the Copermittees to develop and implement runoff management programs, but provided little specificity about what was required to be included in or actually achieved by those programs.

The flexibility provided in the First Term Permits was generally continued through the Second Term Permits. The combination of the lack of specificity in the First and Second Term Permits, a general lack of meaningful action by the Copermittees and a general lack of corresponding reaction (i.e. enforcement) by the San Diego Water Board during the first ten years of the storm water program, resulted in few substantive steps towards achieving improvements in the quality of receiving waters or storm water discharges from the MS4s.

[1] US EPA. 1999. 40 CFR Parts 9, 122, 123, and 124. National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. 64 FR 68727.

From 2001, the regulatory approach incorporated into Third Term Permits was a significant departure from the regulatory approach of the First and Second Term Permits. The Third Term Permits issued by the San Diego Water Board included more detailed requirements that outlined the minimum level of implementation required for the Copermittees' programs to meet the maximum extent practicable (MEP) standard for storm water. The Third Term Permits included more detail to emphasize and enhance the jurisdictional runoff management programs developed by the Copermittees and introduced requirements for developing and implementing watershed-based programs.

The Third Term Permits also incorporated two precedent setting decisions by the State Water Board. In Order WQ 99-05, the State Water Board established receiving water limitation language to be included in all MS4 permits. The State Water Board's precedential language clarified that municipal storm water permits must include provisions requiring discharges to be controlled to attain water quality standards in receiving waters. Unlike previously adopted versions of the receiving water limitation language in the First and Second Term Permits, the language no longer stated that "*violations of water quality standards are not violations of the municipal storm water permit under certain conditions*." In addition, the receiving water limitation language no longer indicated that the "*implementation of best management practices is the 'functional equivalent' of meeting water quality standards*." State Water Board Order WQ 99-05 specifically requires language in MS4 permits for the Copermittees to comply with water quality standards based discharge prohibitions and receiving water limitations through timely implementation of control measures and other actions to reduce pollutants in discharges. (See State Water Board Order WQ 99-05 (*Environmental Health Coalition*)).

In Order WQ 2000-11, also a precedential decision, the State Water Board addressed design standards for structural post-construction best management practices (BMPs) for new development and significant redevelopment. The State Water Board found that the design standards, which require that runoff generated by 85 percent of storm events from specific development categories be infiltrated or treated, reflect the MEP standard. State Water Board Order WQ 2000-11 also found that the post-construction BMP provisions, or Standard Storm Water Mitigation Plan (SSMP) provisions, constitute MEP for addressing storm water pollutant discharges resulting from specific development categories.

The Third Term San Diego County and Orange County Permits (Order Nos. 2001-01 and R9-2002-0001, respectively) were appealed to the State Water Board. Minor modifications were made by the State Water Board, but the requirements were largely upheld. In State Water Board Order WQ 2001-15, the State Water Board upheld the Third Term San Diego County Permit requirements with certain modifications. The State Water Board removed the prohibition of storm water discharges *into* the MS4 that cause or contribute to exceedances of water quality objectives. The revision allows for treatment of pollutants in storm water runoff after the pollutants have entered the MS4. State Water Board Order WQ 2001-15 otherwise upheld all the other requirements of the permit.

In addition to the modification to the discharge prohibition in Order WQ 2001-15, the State Water Board refined Order WQ 99-05 by making clear that the Copermittees may use an iterative approach to achieving compliance with water quality standards that involves ongoing assessments and revisions. Thus, the language for the discharge prohibitions and receiving water limitations was revised to explicitly require the Copermittees to implement an iterative process of assessments and revisions to comply with the discharge prohibitions and receiving water limitations. The San Diego Water Board retained the authority to enforce receiving water limitations and discharge prohibitions even if the Copermittee is engaged in the iterative process.

The Third Term San Diego County Permit was subsequently challenged in the Superior Court of the State of California and the Court of Appeal~~s~~, Fourth Appellate District. The Court of Appeal~~s~~, Fourth Appellate District, found that the approach of the Third Term San Diego County Permit to regulating discharges into the MS4 was appropriate (*Building Industry Ass'n. v. State Water Resources Control Bd., et al.,* 124 Cal.App.4th 866 (2004)). The State of California Supreme Court denied review sought by the Building Industry Association in March 2005.

The Fourth Term Permits, or current MS4 permits, began with the adoption of Order No. R9-2007-0001 issued to the Copermittees of San Diego County in January 2007. Order Nos. R9-2009-0002 and R9-2010-0016 were subsequently issued to the Copermittees of Orange County and Riverside County. The Fourth Term Permits continued to include more detailed requirements to be implemented by each Copermittee's jurisdictional runoff management program. The Fourth Term Permits also include requirements to further emphasize a watershed management approach and for more coordination among jurisdictional runoff management programs. In addition, the Fourth Term Permits included more requirements for assessing the effectiveness of the runoff management programs being implemented by the Copermittees. The intent of the inclusion of additional requirements was to enhance and better define elements of the permit that were expected to be incorporated into the iterative process for managing runoff from each Copermittee's jurisdiction and within the watersheds of the San Diego Region.

The Fourth Term Permits include several new and emerging approaches for managing storm water runoff and discharges. Low impact development (LID) requirements are included for development and significant redevelopment to reduce pollutants in storm water runoff from sites through more natural processes such as infiltration and biofiltration closer to the source, rather than utilizing conventional mechanical end-of-pipe treatment systems. Hydrograph modification (hydromodification) management requirements also are included to mitigate the potential for increased erosion in receiving waters due to increased runoff rates and durations often caused by development and increased impervious surfaces. The Fourth Term Orange County and Riverside County Permits introduced requirements to identify areas of existing development where retrofitting with LID projects would be feasible and could be implemented to reduce storm water runoff and pollutants in storm water discharges.

The Fourth Term Orange County and Riverside County Permits included a clearer distinction between storm water and non-storm water discharges. The term “urban runoff” was completely removed, and a distinction between storm water (wet weather) runoff and non-storm water (dry weather) runoff was emphasized. This clarification was made to prevent any potential misunderstanding that regulation under the MS4 permits is limited only to urbanized areas, and to prevent non-storm water runoff from being managed in the same manner as storm water runoff. The term “urban runoff” is not defined in the Code of Federal Regulations (CFR) or Federal Register (FR) in the regulation of MS4 discharges. According to the CWA 402(p)(3)(B)(ii), MS4 permits must include a requirement to effectively prohibit non-storm water discharges into the MS4s.

Finally, for the Fourth Term Orange County and Riverside County Permits the San Diego Water Board found that non-storm water discharges to the MS4 from over application of irrigation water are sources of pollutants. The San Diego Water Board found that non-storm water discharges resulting from over-irrigation must be prohibited from entering the MS4 in accordance with the requirements of the CWA and pursuant to 40 CFR 122.26(d)(2)(iv)(B)(1).

The requirements of the Fourth Term Permits issued to the Copermittees in each county within the San Diego Region now have substantively the same core requirements such as discharge prohibitions, receiving water limitations, jurisdictional runoff management program components, and monitoring program requirements. There are, however, several inconsistencies that exist among the three Fourth Term Permits which complicate oversight and implementation of the permits by the San Diego Water Board.

The Fourth Term San Diego County Permit expired in January 2012. The Fourth Term Orange County and Riverside County Permits will expire in December 2014 and November 2015, respectively. Issuing the Fifth Term Permits within five years for three counties under three different permits would require the San Diego Water Board to expend significant time and resources for the issuance of the permits through three separate public proceedings, thereby greatly reducing the time and resources available to oversee implementation and compliance. Multiple permits also create confusion for determining compliance among regulated entities, especially for the land development community.

The San Diego Water Board has acknowledged that issuing a single MS4 permit for all the Copermittees in the San Diego Region can and is expected to result in more consistent implementation, improve communication among agencies within watersheds crossing multiple jurisdictions, and minimize resources spent with each permit renewal process. Within the findings of the Fourth Term Riverside County Permit issued in November 2010, the San Diego Water Board notified the public of its intent to develop and issue a single Regional MS4 Permit.

V. REGIONAL MS4 PERMIT APPROACH

The Fifth Term Permit, or Regional MS4 Permit, shifts the focus of the permit requirements from a minimum level of actions to be implemented by the Copermittees to identifying outcomes to be achieved by those actions. Order No. R9-2013-0001 represents an important paradigm shift in the approach for MS4 permits within the San Diego Region.

Historical Permitting Approach

The First and Second Term Permits were very broad and provided little specificity about what was required to be developed and implemented by the Copermittees. The Third Term Permits began to become more specific about the minimum level of implementation required by the Copermittees. The Fourth Term Permits, or current permits, subsequently increased in specificity. The MS4 permits have progressively become more detailed and focused on specifying the minimum level of actions expected to be implemented by the Copermittees. As detailed and specific as the MS4 permits have become, however, they include very little detail about what the desired outcomes of the required actions are expected to achieve. Compliance with the permit requirements has essentially been tracking numbers of actions and reporting, not tracking progress or actual improvements in the quality of receiving waters or discharges from the MS4s. The result has been an increase in actions being implemented by the Copermittees with little or no ability or expectations to determine whether or not improvements in water quality are being achieved.

The Fourth Term Permits result in significant resource expenditure by the Copermittees to report permit compliance information to the San Diego Water Board in the form of annual jurisdictional runoff management program, watershed program, and monitoring program reports. The San Diego Water Board must then expend much of its limited resources on reviewing more than 50 voluminous reports submitted annually by the Copermittees. The information currently reported by the Copermittees is of limited value when trying to measure progress toward achieving improvements in the quality of receiving waters or discharges from the MS4s. Oversight of the MS4 permits is further complicated by the inconsistencies among the requirements issued to the Orange County, San Diego County, and Riverside County Copermittees under three separate MS4 permits.

Under the Fourth Term Permits, the Copermittees must expend a significant portion of their limited resources collecting data of limited value, and putting together reports to submit that information to the San Diego Water Board. Likewise, the San Diego Water Board must expend most of its limited resources reviewing reports, and developing permits instead of working directly with the Copermittees to identify solutions to problems causing impacts to water quality. This is an unsustainable course that will continue to demand more resources from the Copermittees and the San Diego Water Board, and would continue to result in unknown water quality benefits.

New Permitting Approach

The goal of the Regional MS4 Permit is twofold: 1) bring a consistent set of MS4 permit requirements to all of the Copermittees within the San Diego Region; and, 2) provide an MS4 permit with requirements that will allow the Copermittees to focus their efforts and resources on achieving goals and desired outcomes toward the improvement of water quality rather than completing specific actions.

The overall approach included in the Regional MS4 Permit with respect to the jurisdictional runoff management programs will not differ significantly from the current permits. The general requirements for the jurisdictional runoff management program components and compliance with those requirements will remain and be applied consistently throughout the San Diego Region under the Regional MS4 Permit.

The most significant difference in the new permitting approach is the specific manner of implementation for those jurisdictional runoff management programs. Implementation will be based on decisions made by the Copermittees in accordance with what they have identified as their highest priority water quality conditions. In other words, the Copermittees will have significant control in how to implement the jurisdictional runoff management programs to best utilize their available resources in addressing a specific set of priorities effectively, instead of trying to address all the water quality priorities ineffectively.

The Copermittees are given the responsibility of identifying their highest priority water quality conditions that they intend to address. The Copermittees will develop goals that can be used to measure and demonstrate progress or improvements toward addressing those priorities. In addition to the goals, the Copermittees will provide a schedule for achieving the goals for those highest priorities. The measurement of progress toward achieving the goals for those highest priorities requires a better defined and more focused program of monitoring and assessment than under the Fourth Term Permits.

The monitoring and assessment program must be designed to inform the Copermittees of their progress, and the need for modifications in their jurisdictional runoff management programs and schedules to achieve their goals to improve water quality. The monitoring and assessment program requirements will have a more central role in the Regional MS4 Permit than in earlier permits. The monitoring and assessment requirements must also be designed to enable the Copermittees to focus and direct their efforts in implementing their jurisdictional runoff management programs toward their stated desired outcomes to improve the quality of receiving waters and/or discharges from the MS4s.

By providing an MS4 permit that allows the Copermittees to make more decisions about how to utilize and focus their resources, along with a better defined monitoring and assessment program to inform their water quality management decisions, the Copermittees will have the opportunity to:

1) *Plan strategically*. The Copermittees must have the ability to identify their available resources and develop and implement long term plans that can organize, collect, and use those resources in the most strategically advantageous and efficient manner possible. This ability to develop long term plans will allow the Copermittees to focus and utilize their resources in a more concerted way over the short term and long term to address specific water quality priorities through stated desired outcomes.

2) *Manage adaptively*. The Copermittees must be given the ability to modify their plans as additional information and data are collected from the monitoring and assessment programs. The Copermittees' plans may require modifications to the programs, priorities, goals, strategies, and/or schedules in order for the Copermittees to achieve a stated desired outcome.

3) *Identify synergies*. The Copermittees must be given more flexibility to identify efficiencies within and among their jurisdictional runoff management programs as the strategies are developed and implemented to increase the Copermittees' collective effectiveness. The Copermittees must also be able to identify and utilize resources available from other agencies and entities to further augment and enhance their jurisdictional runoff management programs and/or to collectively work with those other agencies and entities toward achieving a stated desired outcome.

The Regional MS4 Permit requirements will provide the Copermittees the flexibility and responsibility to decide what actions will be necessary to achieve an outcome that is tailored and designed by the Copermittees to improve specific prioritized water quality conditions. The San Diego Water Board expects the approach of the Regional MS4 Permit to give the Copermittees a greater sense of ownership for restoring the quality of receiving waters in the San Diego Region by becoming an integral part of the decision making process in identifying water quality conditions to be addressed, as well as determining the best use of their resources.

VI. ECONOMIC CONSIDERATIONS

Statutory Considerations

California Water Code (CWC) section 13241 requires the San Diego Water Board to consider certain factors, including economic considerations, in the adoption of water quality objectives. CWC section 13263 requires the San Diego Water Board to take into consideration the provisions of CWC section 13241 in adopting waste discharge requirements.

In *City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, the California Supreme Court considered whether Regional Water Boards must comply with CWC section 13241 when issuing waste discharge requirements under CWC section 13263(a) by taking into account the costs a permittee will incur in complying with the permit requirements. The Court concluded that whether it is necessary to consider such cost information "*depends on whether those restrictions meet or exceed the requirements of the federal Clean Water Act.*" (*Id.* at p. 627.) The Court ruled that Regional Water Boards may not consider the factors in CWC section 13241, including economics, to justify imposing pollutant restrictions that are less stringent than applicable federal law requires. (*Id.* At pp. 618, 626-627 ["*[Water Code section 13377 specifies that [] discharge permits issued by California's regional boards must meet the federal standards set by federal law. In effect, section 13377 forbids a regional board's consideration of any economic hardship on the part of the permit holder if doing so would result in the dilution of the requirements set by Congress in the Clean Water Act...Because CWC section 13263 cannot authorize what federal law forbids, it cannot authorize a regional board, when issuing a [] discharge permit, to use compliance costs to justify pollutant restrictions that do not comply with federal clean water standards*."]). However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Regional Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

As discussed in Section VII.F, Unfunded State Mandates, the San Diego Water Board finds that the requirements in this Order are not more stringent than the minimum federal requirements. Among other requirements, federal law requires MS4 permits to include requirements to effectively prohibit non-storm water discharges into the MS4s, in addition to requiring controls to reduce the discharge of pollutants in storm water to the MEP, and other provisions as USEPA or the State determines are appropriate for the control of pollutants in MS4 discharges.

The requirements in this Order may be more specific or detailed than those enumerated in federal regulations under 40 CFR 122.26 or in the USEPA guidance. However, the requirements have been designed to be consistent with and within the federal statutory mandates described in CWA section 402(p)(3)(B)(ii) and (iii) and the related federal regulations and guidance. Consistent with federal law, all of the

conditions in this Order could have been included in a permit adopted by USEPA in the absence of the in lieu authority of California to issue NPDES permits.

Moreover, the inclusion of numeric WQBELs in this Order does not cause this Order to be more stringent than federal law. Federal law authorizes both narrative and numeric effluent limitations to meet state water quality standards. The inclusion of WQBELs as discharge specifications in an NPDES permit in order to achieve compliance with water quality standards is not a more stringent requirement than the inclusion of BMP based permit limitations to achieve water quality standards (State Water Board Order No. WQ 2006-0012 (*Boeing*)). Therefore, consideration of the factors set forth in CWC section 13241 is not required for permit requirements to implement the effective prohibition on the discharge of non-storm water discharges into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determine appropriate to control such pollutants, as those requirements are mandated by federal law.

Included in the provisions of the Order are monitoring and reporting requirements that are designed to demonstrate that the Copermittees are implementing programs to comply with the CWA municipal storm water requirements. CWA section 308(a) and 40 CFR 122.41(h), (j)-(l), 122.44(i) and 122.48 require that all NPDES permits specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s (40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c)) also specify additional monitoring and reporting requirements. In addition to the federal requirements of the CWA, the San Diego Water Board also has the authority in CWC 13383 to establish monitoring, reporting, and recordkeeping requirements that implement federal and state laws and regulations through NPDES permits. .

The monitoring and assessment information that will be reported to the San Diego Water Board is necessary to determine if the Copermittees are making progress toward achieving compliance with the discharge prohibitions, receiving water limitations, and effluent limitations under Provision A of the Order. The monitoring and assessment information that will be reported is also expected to be key to the iterative approach and adaptive management process that is required to be implemented by the Copermittees if they cannot meet the discharge prohibitions and receiving water limitations under the present conditions, which is also part of the requirements under Provision A of the Order.

Notwithstanding the above, the San Diego Water Board has considered cost information in issuing this Order, as discussed below. The San Diego Water Board has also considered all of the evidence that has been presented to the San Diego Water Board regarding the CWC section 13241 factors in adopting this Order. The San Diego Water Board finds that the requirements in this Order are reasonably necessary to protect beneficial uses identified in the Basin Plan and the economic information related to costs of compliance and other CWC section 13241 factors are not sufficient to justify failing to protect those beneficial uses. Where appropriate, the

San Diego Water Board has provided or will consider providing the Copermittees with additional time to implement control measures to achieve final WQBELs and/or water quality standards.

Cost Information

Discussions of the financial and economic ramifications of municipal storm water management programs tend to focus on the significant costs incurred by municipalities in developing and implementing the programs. When considering the cost of implementing the programs, however, it is also important to consider the alternative costs that are incurred when programs are not fully implemented, as well as the economic benefits which result from effective program implementation.

The recent financial and economic conditions have amplified the concerns about the costs incurred by the municipalities in developing and implementing their programs. The reduction in resources resulting from the recent financial and economic conditions has been cited by many of the Copermittees as a justification for reducing the requirements that must be met by their programs. While the recent conditions are a cause for concern in the short term, these programs also have an opportunity to identify and implement improvements and efficiencies before the next period of growth and development, resulting in more effective and sustainable programs over the long term.

In addition, it is very difficult to ascertain the true cost of implementation of the Copermittees' management programs because of inconsistencies in reporting by the Copermittees. Reported costs of compliance for the same program element can vary widely from city to city, often by a very wide margin that is not easily explained.[2] Despite these problems, efforts have been made to identify management program costs, which can be helpful in understanding the costs of program implementation.

The San Diego Water Board recognizes that the Copermittees will incur costs in implementing this Order, potentially above and beyond the costs from the Copermittees' prior permits. The San Diego Water Board also recognizes that, due to California's current economic condition, many Copermittees currently have limited staff and resources to implement actions to address its MS4 discharges. Based on the economic considerations below, the San Diego Water Board has provided the Copermittees a significant amount of flexibility to choose how to implement the requirements of the Order.

The Order also allows the Copermittees to customize their plans, programs, and monitoring requirements. In the end, it is up to the Copermittees to determine the effective BMPs and measures necessary to comply with this Order. The Copermittees can choose to implement the least expensive measures that are effective in meeting the requirements of this Order. This Order also does not require the Copermittees to

[2] LARWQCB, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.

fully implement all requirements within a single permit term. Where appropriate, the Board has provided the Copermittees with additional time outside of the permit term to implement control measures to achieve final WQBELs and/or water quality standards.

The San Diego Water Board has considered available cost information associated with compliance with this Order. It is not possible to predict accurately the cost impact of the requirements that involve an unknown level of implementation or that depend on environmental variables that are as yet undefined. Only general conclusions can be drawn from this information.

Estimated Municipal Storm Water Program Implementation Costs

The USEPA, the State Water Board, and the California Regional Water Quality Control Boards (Regional Water Boards) have attempted to evaluate the costs of implementing municipal storm water programs. The assessments have demonstrated that the true costs are difficult to ascertain and reported costs vary widely. In addition, reported fiscal analyses tend to neglect the costs incurred to municipalities when storm water and non-storm water runoff is not effectively managed, which are incurred as a result of pollution, contamination, nuisance, and damage to ecosystems, property, and human health. Nonetheless, they provide a useful context for considering the costs of requirements within Order No. R9-2013-0001.

In 1999, the USEPA reported on multiple studies it conducted to determine the cost of management programs. A study of Phase II municipalities determined that the annual cost of the Phase II program was expected to be $9.16 per household. The USEPA also studied 35 Phase I municipalities, finding costs to be $9.08 per household annually, similar to those anticipated for Phase II municipalities.[3]

The State Water Board commissioned a study by the California State University, Sacramento to assess costs of the Phase I MS4 program. This study includes an assessment of costs incurred by Phase I MS4s throughout the state to implement their programs. Annual cost per household in the study ranged from $18 to $46, with the Fresno-Clovis Metropolitan Area representing the lower end of the range, and the City of Encinitas (in San Diego County) representing the upper end of the range.[4]

A study on Phase I MS4 program costs was also conducted by the California Regional Water Quality Control Board, Los Angeles Region (Los Angeles Water Board), where program costs reported in the municipalities' annual reports were assessed. The Los Angeles Water Board estimated that average per household cost to implement the MS4 program in Los Angeles County was $12.50. [5]

[3] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791-68792.
[4] State Water Board, 2005. NPDES Stormwater Cost Survey. P. ii.
[5] Los Angeles Water Board, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.

It is important to note that reported program costs are not all attributable to solely complying with MS4 permits. Many program components, and their associated costs, existed before any MS4 permits were ever issued. For example, street sweeping and trash collection costs cannot be solely or even principally attributable to MS4 permit compliance, since these practices have long been expected from and implemented by municipalities.

Therefore, true program cost resulting from MS4 permit requirements is some fraction of reported costs. The California State University, Sacramento study found that only 38 percent of program costs are new costs fully attributable to MS4 permits. The remainder of the program costs was either pre-existing or resulted from enhancement of pre-existing programs.[6] In 2000, the County of Orange found that even lower amounts of program costs are solely attributable to MS4 permit compliance, reporting that the amount attributable to implement the County or Orange Drainage Area Management Plan (DAMP), was less than 20 percent of the total budget. The remaining 80 percent was attributable to pre-existing programs.[7] More current data from the County of Orange is not used in this discussion because the County of Orange no longer reports such information.

Estimated Value of Healthy Water Quality

Economic considerations of municipal storm water management programs cannot be limited only to program costs. Evaluation of programs must also consider information on the benefits derived from environmental protection and improvement.[8] Attention is often focused on municipal storm water management program costs, but the programs must also be viewed in terms of their value to the public.

Placing a value on healthy receiving waters is very difficult. Often the value of receiving waters with good water quality manifests in other forms, such as tourism, recreational opportunities, and/or increased property values. When surface water bodies are degraded, thereby degrading the habitat within and adjacent to the water bodies, the public loses the value and benefits associated with being able to use the area in and around the water bodies. Surface waters that are able to support the beneficial uses designated in the Basin Plan can sustain plants and wildlife that can attract visitors and residents, providing aesthetic, recreational, as well as monetary value to the public. At this time, however, there have been no studies for the San Diego Region to quantify the added value that surface waters with healthy water quality can provide.

[6] State Water Board, 2005. NPDES Stormwater Cost Survey. P. 58.
[7] County of Orange, 2000. A NPDES Annual Progress Report. P. 60.
[8] Ribaudo M.O. and D. Heelerstein. 1992, *Estimating Water Quality Benefits: Theoretical and Methodological Issues.* U.S. Department of Agriculture. Technical Bulletin No. 1808.

USEPA has estimated that household willingness to pay for improvements in fresh water quality for fishing and boating is approximately $158-$210.[9] This estimate can be considered conservative, since it does not include important considerations such as marine waters benefits, wildlife benefits, or flood control benefits. Another study conducted by California State University, Sacramento reported that the annual household willingness to pay for statewide clean water is approximately $180.[10]

A study conducted by the University of Southern California and University of California, Los Angeles assessed the costs and benefits of implementing various approaches for achieving compliance with the MS4 permits in the Los Angeles region. The study found that non-structural systems would cost $2.8 billion but provide $5.6 billion in benefit. If structural systems were determined to be needed, the study found that total costs would be $5.7 to $7.4 billion, while benefits could reach $18 billion.[11] Costs are anticipated to be borne over many years, probably at least ten years.

As can be seen, the benefits of the municipal storm water management programs are expected to considerably exceed their costs. Such findings are corroborated by USEPA, which found that the benefits of implementation of its Phase II storm water rule would also outweigh the costs.[12]

[9] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68793.
[10] State Water Board, 2005. NPDES Stormwater Cost Survey. P. iv.
[11] Los Angeles Water Board, 2004. Alternative Approaches to Stormwater Control.
[12] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791.

VII. APPLICABLE STATUTES, REGULATIONS, PLANS AND POLICIES

A. Legal Authorities – Federal Clean Water Act and California Water Code

This Order is issued pursuant to section 402 of the CWA and implementing regulations adopted by the USEPA and chapter 5.5, division 7 of the CWC (commencing with section 13370). This Order serves as an NPDES permit for point source discharges to surface waters. This Order also serves as waste discharge requirements pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

The objective of the CWA is "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*." To carry out this objective, the CWA requires the implementation of permit programs to regulate the discharge of pollutants and dredged or fill material to the navigable waters of the U.S. and to regulate the use and disposal of sewage sludge. CWA section 402 provides the legal authority to issue a permit for the discharge of pollutants to waters of the U.S. under the NPDES. The CWA provides that NPDES permits may be issued by states which are authorized to implement the provisions of that act. California became authorized to implement the NPDES permit program on May 14, 1973.

The Porter-Cologne Water Quality Control Act (Division 7, commencing with CWC section 13000) established the State Water Resources Control Board (State Water Board) and nine Regional Water Quality Control Boards (Regional Water Boards) as the principal state agencies with primary responsibility for the coordination and control of water quality. CWC section 13200(f) established the San Diego Water Board, which has the primary responsibility for the coordination and control of water quality in the San Diego Region, which includes all the basins draining into the Pacific Ocean between the southern boundary of the Santa Ana Region and the California-Mexico boundary. The San Diego Water Board implements the CWA through Chapter 5.5 of the CWC, commencing with section 13370. CWC section 13377 provides the San Diego Water Board the legal authority to issue waste discharge requirements to ensure compliance with all applicable provisions of the CWA and acts amendatory thereof or supplementary, thereto, to implement water quality control plans, or for the protection of beneficial uses, or to prevent nuisance.

CWA section 402(p) requires the USEPA or authorized state to issue NPDES permits for storm water discharges from municipal separate storm sewer systems (MS4s) to waters of the U.S. CWA section 402(p)(3)(B)(ii) requires that NPDES permits for storm water discharges from MS4s "*effectively prohibit non-storm water discharges*" into the MS4s. CWA section 402(p)(3)(B)(iii) requires that NPDES permits for storm water discharges from MS4s to "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable* [MEP], *including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control*

of such pollutants."

The USEPA published implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]), which prescribe permit application requirements for storm water discharges from MS4s pursuant to CWA 402(p), on November 16, 1990. The USEPA published an Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems, which provided guidance on permit application requirements for regulated MS4s, on May 17, 1996. The federal regulations in 40 CFR 122 and guidance issued by USEPA serve as the foundation for the provisions of Order No. R9-2013-0001. The legal authorities provided by the above statutes and regulations are included as part of the discussions in Section VIII of this Fact Sheet.

B. Legal Authority for the Permit Issued on a Region-wide Basis

CWA section 402(p)(3)(B) provides the San Diego Water Board the legal authority to issue an NPDES permit for the San Diego Region as compared to separate MS4 permits based upon County- and partial County-wide boundaries as they exist within the San Diego Region. CWA section 402(p)(3)(B) states that "*Permits for discharges from municipal storm sewers- (i) may be issued on a system- or jurisdiction-wide basis ....*" The federal regulations in 40 CFR 122.26(a)(1)(v) also state that the San Diego Water Board "*may designate dischargers from municipal separate storm sewers on a system-wide or jurisdiction-wide basis. In making this determination, the [San Diego Water Board] may consider the following factors: (A) the location of the discharge with respect to waters of the United States; (B) the size of the discharge; (C) the quantity and nature of the pollutants discharged to waters of the United States; and (D) other relevant factors*."

More specifically, the federal regulations provide that for large and medium MS4 systems, the San Diego Water Board may issue a regional permit. Specifically, the federal regulation in 40 CFR 122.26(a)(3) provide:

"*(ii) The Director may either issue one system-wide permit covering all discharges from municipal separate storm sewers within a large or medium municipal storm sewer system or issue distinct permits for appropriate categories of discharges within a large or municipal separate storm sewer system including, but not limited to: all discharges owned or operated by the same municipality; located within the same jurisdiction; all discharges within a system that discharge to the same watershed; discharges within a system that are similar in nature; or for individual discharges from municipal separate storm sewers within the system.*

(iii) The operator of a discharge from a municipal separate storm sewer which is part of a large or medium municipal separate storm sewer system must either: (A) Participate in a permit application (to be a permittee or a co-permittee) with one or more other operator of discharges from the large or medium municipal storm sewer system which covers all, or a portion of all, discharges from the

municipal separate storm sewer system; (B) Submit a distinct permit application which only covers discharges from the municipal separate storm sewers for which the operator is responsible; or (C) A regional authority may be responsible for submitting a permit application under the following guidelines....

(iv) One permit application may be submitted for all or a portion of all municipal separate storm sewers within adjacent or interconnected large or medium municipal separate storm sewer systems. The Director may issue one systemwide permit covering all, or a portion of all municipal separate storm sewers in adjacent or interconnected large or medium municipal separate storm sewer systems.

(v) Permits for all or a portion of all discharges from large or medium municipal separate storm sewer systems that are issued on a system-wide, jurisdiction-wide, watershed or other basis may specify different conditions relating to different discharges covered by the permit, including different management programs for different drainage areas which contribute storm water to the system."

Based on these regulations, the San Diego Water Board may issue a region-wide MS4 permit. The regulations also clarify that the permit may include different conditions for separate discharges covered by the permit. This allows the San Diego Water Board to ensure that suitable water quality conditions and provisions are identified for each watershed.

The USEPA's responses to comments in the Final Rule for the above-mentioned regulations also make it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide, permits. In the Final Rule published in the Federal Register and containing the responses to comments, USEPA notes that 40 CFR 122.26(a)(3)(iv) would allow an entire system in a geographical region under the purview of a State agency to be designated under a permit.[13] USEPA also states that many commenters wanted to allow the permitting authority broad discretion to establish system-wide permits, and that EPA believes that paragraphs 40 CFR 122.26 (a)(1)(v) and (a)(3)(ii) allow for such broad discretion.[14]

This Order creates watershed requirements that apply to multiple counties. The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees. Managing storm water on a regional and watershed basis is expected to result in improved water quality, as the Order focuses on monitoring and management practices necessary to improve each watershed rather than political boundaries. A single permit also allows the San Diego Water Board staff to expend fewer resources developing successive multiple permits and allows more resources to be devoted to working cooperatively with all three current groups of Copermittees to ensure implementation of this Order results in improved water quality.

[13] 55 Federal Register 47990-01, 48042
[14] Ibid

C. Federal and California Endangered Species Acts

This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2115.5) or the Federal Endangered Species Act (16 United States Code [USC] sections 1531 to 1544). This Order requires compliance with requirements to protect the beneficial uses of waters of the U.S. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

D. California Environmental Quality Act

The action to adopt an NPDES Permit is exempt from the provisions of Chapter 3 of the California Environmental Quality Act (CEQA) (Public Resources Code section 21100, et seq.) pursuant to CWC section 13389. (*County of Los Angeles v. Cal. Water Boards* (2006) 143 Cal.App.4th 985.)

E. State and Federal Regulations, Plans and Policies

The legal authority provided by the following regulations, plans, and policies are also included as part of the discussions in Section VIII of this Fact Sheet.

Water Quality Control Plan for the San Diego Basin

The CWA requires the San Diego Water Board to establish water quality standards for each water body in its region. Water quality standards include beneficial uses, water quality objectives and criteria that are established at levels sufficient to protect beneficial uses, and an antidegradation policy to prevent degrading of waters. On September 8, 1994, the San Diego Water Board adopted the *Water Quality Control Plan for the San Diego Basin (*Basin Plan). The Basin Plan designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters in the San Diego Region. The San Diego Water Board has amended the Basin Plan on multiple occasions since 1994. In addition, the Basin Plan implements State Water ~~Water~~ Board Resolution No. 88-63, which established state policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply. Beneficial uses applicable to the surface water bodies that receive discharges from the MS4s within the San Diego Region generally include those listed below:

The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region:

- Municipal and Domestic Supply (MUN)
- Agricultural Supply (AGR)
- Industrial Process Supply (PROC)
- Industrial Service Supply (IND)
- Ground Water Recharge (GWR)
- Contact Water Recreation (REC1)
- Non-contact Water Recreation (REC2)
- Warm Freshwater Habitat (WARM)
- Cold Freshwater Habitat (COLD)
- Wildlife Habitat (WILD)
- Rare, Threatened, or Endangered Species (RARE)
- Freshwater Replenishment (FRSH)
- Hydropower Generation (POW)
- Preservation of Biological Habitats of Special Significance (BIOL)

The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region:

- Navigation (NAV)
- Commercial and Sport Fishing (COMM)
- Estuarine Habitat (EST)
- Marine Habitat (MAR)
- Aquaculture (AQUA)
- Migration of Aquatic Organisms (MIGR)
- Spawning, Reproduction, and/or Early Development (SPWN)
- Shellfish Harvesting (SHELL)

Pursuant to Water Code sections 13263 and 13377, the requirements of this Order implement the Basin Plan.

<u>Water Quality Control Plan for Ocean Waters of California, California Ocean Plan</u>

In 1972, the State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan). The State Water Board adopted the most recent amended Ocean Plan on September 15, 2009. The Office of Administrative Law approved it on March 10, 2010. On October 8, 2010, USEPA approved the 2009 Ocean Plan. The Ocean Plan is applicable, in its entirety, to ocean waters of the State. In order to protect beneficial uses, the Ocean Plan establishes water quality objectives and a program of implementation. Pursuant to Water Code sections 13263 and 13377, the requirements of this Order implement the Ocean Plan. The Ocean Plan identifies the beneficial uses of ocean waters of the State to be protected as summarized below:

- Industrial water supply
- Water contact and non-contact recreation, including aesthetic enjoyment;

navigation
- Commercial and sport fishing
- Mariculture
- Preservation and enhancement of designated Areas of Special Biological Significance
- Rare and endangered species
- Marine habitat
- Fish spawning and shellfish harvesting

On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving an exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges. The State Water Board Resolution No. 2012-0012 requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject terms and conditions of State Water Board Resolution No. 2012-0012. The Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 applicable to these discharges are hereby incorporated in this Order as if fully set forth herein. Requirements of this Order implement the Ocean Plan.

Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality

On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

Antidegradation Policy

Federal regulations (40 CFR 131.12) require that the state water quality standards include an antidegradation policy consistent with the federal antidegradation policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16 ("Statement of Policy with Respect to Maintaining the Quality of the Waters of the State"). State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law.

The San Diego Water Board's Basin Plan implements and incorporates by reference

both the State and federal antidegradation policies. State Water Board Resolution No. 68-16 and 40 CFR 131.12 require the San Diego Water Board to maintain high quality waters of the State until it is demonstrated that any change in quality will be consistent with maximum benefit to the people of the State, will not unreasonably affect beneficial uses, and will not result in water quality less than that described in the San Diego Water Boards' policies. State Water Board Resolution No. 68-16 requires that discharges of waste be regulated to meet best practicable treatment or control to assure that pollution or nuisance will not occur and the highest water quality consistent with the maximum benefit to the people of the State be maintained.

The discharges permitted in this Order are consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Board Resolution No. 68-16. Many of the water bodies within the area covered by this Order are of high quality. The Order requires the Copermittees to meet best practicable treatment or control to meet water quality standards. As required by 40 CFR 122.44(a), the Copermittees must comply with the "maximum extent practicable" technology-based standard set forth in CWA section 402(p) for discharges of pollutants in storm water from the MS4s.

Many of the waters within the area covered by this Order are impaired and listed on the State's CWA Section 303(d) List and the San Diego Water Board has established TMDLs to address the impairments. This Order requires the Copermittees to comply with permit provisions to implement the WLAs set forth in the TMDLs in order to restore the beneficial uses of the impaired water bodies consistent with the assumptions and requirements of the TMDLs. This Order includes requirements to develop and implement storm water management programs, achieve WQBELs, and effectively prohibit non-storm water discharges into the MS4. The issuance of this Order does not authorize an increase in the amount of discharge of waste.

Anti-Backsliding Requirements

CWA sections 402(o) and 303(d)(4) and 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations or conditions may be relaxed. All effluent limitations and other conditions in this Order are at least as stringent as the effluent limitations in the previous permits issued to the San Diego County Copermittees, the Orange County Copermittees and the Riverside County Copermittees.

Clean Water Act Section 303(d) List

CWA section 303(d)(1) requires each State to identify specific water bodies within its boundaries where water quality standards are not being met or are not expected to be met after implementation of technology-based effluent limitations on point sources. Water bodies that do not meet water quality standards are considered impaired and are placed on the state's "303(d) List." Periodically, USEPA approves the State's 303(d) List.

Most recently, USEPA approved the State's 2010 303(d) List of impaired water bodies on October 11, 2011, which includes certain receiving waters in the San Diego Region. For each listed water body, the state or USEPA is required to establish a TMDL of each pollutant impairing the water quality standards in that water body. A TMDL is a tool for implementing water quality standards and is based on the relationship between pollution sources and in-stream water quality conditions. The TMDL establishes the allowable pollutant loadings for a water body and thereby provides the basis to establish water quality-based controls. These controls should provide the pollution reduction necessary for a water body to meet water quality standards.

A TMDL is the sum of the allowable pollutant loads of a single pollutant from all contributing point sources (the waste load allocations or WLAs) and non-point sources (load allocations of LAs) plus the contribution from background sources and a margin of safety (40 CFR 130.2(i)). MS4 discharges are considered point source discharges. For 303(d)-listed water bodies and pollutants in the San Diego Region, the San Diego Water Board or USEPA develops and adopts TMDLs that specify these requirements.

Since 2002, the San Diego Water Board has established six (6) TMDLs to remedy water quality impairments in various water bodies within the San Diego Region (see Attachment E to the Order). These TMDLs identify MS4 discharges as a source of pollutants to these water bodies, and, as required, establish WLAs for MS4 discharges to reduce the amount of pollutant discharged to receiving waters. CWA section 402(p)(3)(B)(iii) requires the San Diego Water Board to impose permit conditions, including: "management practices, control techniques and system, design and engineering methods, and *such other provisions as the Administrator or the State determines appropriate for the control of such pollutants."* (Emphasis added.) CWA section 402(a)(1) also requires states to issue permits with conditions necessary to carry out the provisions of the CWA. Federal regulations also require that NDPES permits contain WQBELs consistent with the assumptions and requirements of all available WLAs (40 CFR 122.44(d)(1)(vii)(B)). CWC section 13377 also requires that NPDES permits include limitations necessary to implement water quality control plans. Therefore, this Order includes WQBELs and other provisions to implement the TMDL WLAs assigned to Copermittees regulated by this Order.

<u>Other Regulations, Plans and Policies</u>

This Order implements all other applicable federal regulations and State regulations, plans and policies, including the California Toxics Rule at 40 CFR 131.38 (Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California Rule [California Toxics Rule or CTR]), and State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP).

F. Unfunded State Mandates

Article XIII B, Section 6(a) of the California Constitution provides that whenever "*any state agency mandates a new program or higher level of service on any local government, the state shall provide a subvention of funds to reimburse that local government for the costs of the program or increased level of service*." The requirements of this Order do not constitute state mandates that are subject to a subvention of funds for several reasons, including, but not limited to, the following.

First, the requirements of this Order do not constitute a new program or a higher level of service as compared to the requirements contained in the previous Fourth Term Permits. The overarching requirement to impose controls to reduce the pollutants in discharges from MS4s is dictated by the CWA and is not new to this permit cycle (33 USC section 1342(p)(3)(B)). The inclusion of new and advanced measures as the MS4 programs evolve and mature over time is anticipated under the CWA (55 FR 47990, 48052 (Nov. 16, 1990)), and to the extent requirements in this Order are interpreted as new advanced measures, they do not constitute a new program or higher level of service.

Second, and more broadly, mandates imposed by federal law, rather than by a state agency, are exempt from the requirement that the local agency's expenditures be reimbursed (Cal. Const., art. XIII B, section 9, subd. (b)). This Order implements federally mandated requirements under the CWA and its requirements are therefore not subject to subvention of funds. This includes federal requirements to effectively prohibit non-storm water discharges, to reduce the discharge of pollutants in storm water to the MEP, and to include such other provisions as the Administrator or the State determines appropriate for the control of such pollutants (33 USC section 1342(p)(3)(B)). Federal cases have held these provisions require the development of permits and permit provisions on a case-by-case basis to satisfy federal requirements. (*Natural Resources Defense Council, Inc., v. USEPA* (9th Cir. 1992) 966 F.2d 1292, 1308, fn. 17.)

The authority exercised under this Order is not reserved state authority under the CWA's savings clause (cf. *Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 627-628 [relying on 33 USC section 1370, which allows a state to develop requirements which are not "less stringent" than federal requirements]), but instead is part of a federal mandate to develop pollutant reduction requirements for municipal separate storm sewer systems. To this extent, it is entirely federal authority that forms the legal basis to establish the permit provisions. (See, *City of Rancho Cucamonga v. Regional Water Quality Control Board, Santa Ana Region* (2006) 135 Cal.App.4th 1377, 1389; *Building Industry Ass'n of San Diego Co. v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 882-883.)

The MEP standard is a flexible standard that balances a number of considerations, including technical feasibility, cost, public acceptance, regulatory compliance, and effectiveness. (*Building Ind. Ass'n., supra,* 124 Cal.App.4th at pp. 873-874, 889.) Such considerations change over time with advances in technology and with experience

gained in storm water management (55 FR 47990, 48052 (Nov. 16, 1990)). Accordingly, a determination of whether the conditions contained in this Order exceed the requirements of federal law cannot be based on a point by point comparison of the permit conditions and the ~~sic~~ minimum control measures that are required "at a minimum" to reduce pollutants to the maximum extent practicable and to protect water quality (40 CFR 122.34). Rather, the appropriate focus is whether the permit conditions, as a whole, exceed the MEP standard.

In recent months, the County of Los Angeles and County of Sacramento Superior Courts have granted writs setting aside decisions of the Commission on State Mandates that held certain requirements in Phase I permits constituted unfunded mandates. In both cases, the courts have found that the correct analysis in determining whether an MS4 permit constituted a state mandate was to evaluate whether the permit as a whole ~~– and not a specific permit provision –~~ exceeds the MEP standard. (*State of Cal. v~~V~~. Comm. on State Mandates* (Super. Ct. Sacramento County, 2012, No. 34-2010-80000604), *State of California v. County of Los Angeles* (Super. Ct. Los Angeles County, 2011, No. BS130730.) Both cases are currently pending appeal.

The requirements of the Order, taken as a whole rather than individually, are necessary to reduce the discharge of pollutants to the MEP and to protect water quality. The San Diego Water Board finds that the requirements of the Order are practicable, do not exceed federal law, and thus do not constitute an unfunded mandate. These findings are the expert conclusions of the principal state agency charged with implementing the NPDES program in California (CWC sections 13001, 13370).

It should also be noted that the provisions in this Order to effectively prohibit non-storm water discharges are also mandated by the CWA (33 USC section 1342(p)(3)(B)(ii)). Likewise, the provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state establishes or adopts a TMDL, federal law requires that permits must contain effluent limitations consistent with the assumptions and requirements of any applicable waste load allocation in a TMDL (40 CFR 122.44(d)(1)(vii)(B)).

Third, the local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental dischargers who are issued NPDES permits for storm water discharges. With a few inapplicable exceptions, the CWA regulates the discharge of pollutants from point sources (33 USC section 1342) and the Porter-Cologne Act regulates the discharge of waste (CWC section 13263), both without regard to the source of the pollutant or waste. As a result, the "costs incurred by local agencies" to protect water quality reflect an overarching regulatory scheme that places similar requirements on governmental and non-governmental dischargers. (See *County of Los Angeles v. State of California* (1987) 43 Cal.3d 46, 57-58 [finding comprehensive workers' compensation scheme did not create a cost for local agencies that was subject to state subvention].)

The CWA and the Porter-Cologne Act largely regulate storm water with an even hand, but to the extent there is any relaxation of this even-handed regulation, it is in favor of the local agencies. Generally, the CWA requires point source dischargers, including dischargers of storm water associated with industrial or construction activity, to comply strictly with water quality standards (33 USC section 1311(b)(1)(C); *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159, 1164-1165 [noting that industrial discharges must strictly comply with water quality standards]). As discussed in prior State Water Board decisions, certain provisions of this Order do not require strict compliance with water quality standards (State Water Board Order No. WQ 2001-0015, p. 7). Those provisions of this Order regulate the discharge of waste in municipal storm water under the CWA's MEP standard, not the BAT/BCT standard that applies to other types of discharges. These provisions, therefore, regulate the discharge of waste in municipal storm water more leniently than the discharge of waste from non-governmental sources.

Fourth, the Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)). To the extent that the local agency Copermittees have voluntarily availed themselves of the permit, the program is not a state mandate. (Accord, *County of San Diego v. State of California* (1997) 15 Cal.4th 68, 107-108.)

Fifth, the local agency Copermittees' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under state law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

Finally, even if any of the permit provisions could be considered unfunded mandates, under Government Code section 17556, subdivision (d), a state mandate is not subject to reimbursement if the local agency has the authority to charge a fee. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order, subject to certain voting requirements contained in the California Constitution. (See Cal. Const., Art. XIII D, section 6, subd. (c); see also *Howard Jarvis Taxpayers Ass'n v. City of Salinas* (2002) 98 Cal.App.4th 1351, 1358-1359.) The Fact Sheet demonstrates that numerous activities contribute to the pollutant loading in the MS4. Local agencies can levy service charges, fees, or assessments on these activities, independent of real property ownership. (See, e.g., *Apartment Ass'n of Los Angeles County, Inc., v. City of Los Angeles* (2001(24 Cal.4th 830, 842 [upholding inspection fees associated with renting property].) The authority and ability of a local agency to defray the cost of a program without raising taxes indicates that a program does not entail a cost subject to subvention. (*Clovis Unified School Dist. V. Chiang* (2010) 188 Cal.App.4th 794, 812, citing *Connell v. Sup. Ct.* (1997) 59 Cal.App.4th 382, 401; *County of Fresno v. State of California* (1991) 53 Cal. 3d. 482, 487-488.)

VIII. PROVISIONS

The provisions (i.e. NPDES permit requirements) of the Order are discussed below.

A. Prohibitions and Limitations

Purpose: Provision A includes the prohibitions and limitations requirements that are the foundation of all the subsequent requirements included in the Order. Compliance with the prohibitions and limitations will restore and protect receiving waters from impacts that may be caused by discharges into and from the Copermittees' MS4s and ultimately achieve the objective of the CWA.

In meeting the requirements set forth in the Order, the Copermittees must be cognizant that the prohibitions and limitations exist and will be the standard by which the San Diego Water Board will be measuring the progress and success of their implementation of the NPDES permit requirements.

***Discussion*:** The objective of the CWA is to "*restore and maintain the chemical, physical, and biological integrity of the Nation's waters*." The CWA requires the implementation of NPDES permit programs to regulate discharges of pollutants and dredged or fill material to the navigable waters of the U.S. For discharges into and from MS4s, the CWA requires the NPDES permits to "*effectively prohibit non-stormwater discharges into the storm sewers*" and "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable.*"

Provision A includes limitations, consistent with the requirements of the CWA for discharges from MS4s. Provision A expresses these limitations as discharge prohibitions, receiving water limitations, and effluent limitations. Compliance with the discharge prohibitions and receiving water limitations is also explicitly described, in conformance with precedential State Water Board Orders.

More specific and detailed discussions of the requirements of Provision A are provided below.

Provision A.1 (Discharge Prohibitions) prohibits the discharge of specific types of waste into and/or from the Copermittees' MS4s.

Provision A.1.a restates and reiterates Basin Plan Waste Discharge Prohibition 1, by prohibiting discharges into and from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the

state. The terms pollution,[15] contamination,[16] and nuisance[17] are defined under CWC 13050. Provision A.1.c incorporates all the waste discharge prohibitions of the Basin Plan into the requirements of the Order. The waste discharge prohibitions from the Basin Plan have been reproduced and provided in Attachment A to the Order.

Provision A.1.b requires non-storm water discharges into the MS4s to be effectively prohibited, consistent with the requirements of the CWA for MS4 permits to "*effectively prohibit non-stormwater discharges into the storm sewers*." The effective prohibition is required to be implemented by each Copermittee within its jurisdiction through the illicit discharge detection and elimination requirements under Provision E.2. The prohibition does not apply to NPDES permitted discharges into the Copermittees' MS4s. ~~The prohibition also refers to the requirements of Provisions E.2.a.(1)-(5), which has specific requirements for the Copermittees to address certain types of non-storm water discharges if they enter the MS4.~~

The CWA employs the strategy of prohibiting the discharge of any pollutant from a point source into waters of the United States unless the discharger of the pollutant(s) obtains an NPDES permit pursuant to CWA Section 402. The 1987 amendment to the CWA includes provision 402(p) that specifically addresses NPDES permitting requirements for storm water discharges from MS4s. CWA section 402(p) prohibits the discharge of pollutants from specified MS4s to waters of the U.S. except as authorized by an NPDES permit and identifies two substantive standards for MS4 storm water permits. MS4 permits (1) "*shall include a requirement to effectively prohibit nonstormwater discharges into the storm sewers*" and (2) "*shall require controls to reduce the discharge of pollutants to~~,~~ the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or State determines appropriate for the control of such pollutants*." (CWA section 402(p)(3)(B)(ii-iii).)

In November 1990, the USEPA published regulations addressing storm water discharges from MS4s (55 FR 47990 and following (Nov. 16, 1990) (Phase I Final Rule)). The regulations establish minimum requirements for MS4 permits, and generally focus on the requirement that MS4s implement programs to reduce the amount of pollutants found in storm water discharges to the MEP. The CWA's

[15] CWC 13050(l): "(1) 'Pollution' means an alteration of the quality of waters of the state by waste to a degree which unreasonably affects either of the following: (A) The water for beneficial uses. (B) Facilities which serve beneficial uses. (2) 'Pollution' may include "contamination.

[16] CWC 13050(k): "Contamination' means an impairment of the quality of waters of the state by waste to a degree which creates a hazard to public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste, whether or not waters of the state are affected."

[17] CWC 13050(m): "Nuisance' means anything which meets all of the following requirements: (1) Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. (2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. (3) Occurs during, or as a result of, the treatment or disposal of wastes."

municipal storm water MEP standard does not require storm water discharges to strictly meet water quality standards, as is required for other NPDES permitted discharges. Compliance is achieved through an iterative approach of continuous implementation of improved BMPs. This distinction reflects Congress's recognition that variability in flow and intensity of storm events render difficult strict compliance with water quality standards by MS4 permittees. In describing the controls that permits must include to reduce pollutants in storm water discharges to the MEP, the statute (CWA section 402(p)(3)(B)(iii)) states that the controls shall include: "*management practices, control techniques and system, design and engineering methods, and such other provisions as the [permit writer] determines appropriate for the control of such pollutants*."

In contrast, non-storm water discharges from the MS4 that are not authorized by separate NPDES permits~~, nor specifically included in a category of non-storm water discharges only required to be addressed if identified as a source of pollutants (see 40 CFR 122.26(d)(2)(iv)(B)),~~ are subject to requirements under the NPDES program, including discharge prohibitions, technology based effluent limitations and water quality-based effluent limitations (40 CFR 122.44). The regulations also require the Copermittee's program to include an element to detect and remove illicit discharges and improper disposal into the storm sewer (40 CFR 122.26(d)(2)(iv)(B)).

While "non-storm water" is not defined in the CWA or federal regulations, the federal regulations (at 40 CFR 122.26(b)(2)) define "*illicit discharge*" as *"any discharge to a municipal separate storm sewer that is not composed entirely of storm water and that is not covered by an NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer and discharges resulting from fire fighting activities)*." This definition is the most closely applicable definition of "non-storm water" contained in federal law. As stated in the Phase I Final Rule, USEPA added the illicit discharge program requirement to begin implementation of the 'effective prohibition' requirement to detect and control non-storm water discharges to their municipal system.

Thus, federal law mandates that permits issued to MS4s must require management practices that will result in reducing storm water pollutants to the MEP yet at the same time requires that non-storm water discharges be effectively prohibited from entering the MS4. "Effectively" prohibit does not mean that non-storm water discharges are authorized to be discharged into and from the Copermittees' MS4s. The Phase I Final Rule clarifies what "effectively prohibit" means (55 FR 47995):

> "*Section 402(p)(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit (other than the permit for the discharge from the municipal separate storm sewer)~~.~~*" [Emphasis added].

Consistent with federal law, unless non-storm water discharges to the MS4 are authorized by a separate NPDES permit ~~or are specifically included in a category of non-storm water discharges only required to be addressed if identified as a source of pollutants under federal regulations~~, non-storm water discharges are appropriately subject to the effective prohibition requirement in the CWA and Regional Water Boards are not limited by the iterative MEP approach to storm water regulation in crafting appropriate regulations for non-storm water discharges.

The federal regulations (40CFR122.26(d)(2)(i)(B)) require the Copermittees to establish the legal authority which authorizes or enables the Copermittees to prohibit illicit discharges to the MS4s. The federal regulations (40 CFR 122.26(d)(2)(vi)(B)(1)) require the Copermittees to "*implement and enforce an ordinance, order or similar means*" to prevent non-storm water discharges to their MS4s. Thus, the Copermittees are required to "*effectively*" prohibit non-storm water discharges to their MS4s through enforcing their legal authority established under "*ordinance, order or similar means*" and either remove those discharges to their MS4s, or require those discharges to obtain coverage under a separate NPDES permit. More detail about the program that must be implemented to "*effectively*" prohibit non-storm water discharges to the Copermittees' MS4s is provided under the discussion for Provision E.2.

Provision A.1.d was included to be consistent Resolution No. 2012-0012, adopted by the State Water Board on March 20, 2012. Provision A.1.d prohibits discharges from MS4s to Areas of Special Biological Significance (ASBS), except for storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach to the Heisler Park ASBS subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012. The pertinent Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 are provided in Attachment A to the Order.

Provision A.2 (Receiving Water Limitations) specifies the condition of the receiving waters that must be achieved when there are discharges from the Copermittees' MS4s. Receiving water limitations are included in all NPDES permits issued pursuant to the CWA section 402. CWA section 402(p)(3)(B)(iii) authorizes the inclusion of "*such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." This requirement gives USEPA or the State permitting authority, in this case the San Diego Water Board, discretion to determine what permit conditions are necessary to control pollutants.

In its Phase I Final Rule (see 55 FR 47990, 47994 (Nov. 16, 1990)), USEPA elaborated on these requirements, stating that, "*permits for discharges from municipal separate storm sewer systems must require controls to reduce the discharge of pollutants to the maximum extent practicable, and where necessary water quality-based controls*." USEPA reiterated in its Phase II Final Rule (64 FR 68722, 68737), that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a*

TMDL, and timing requirements for implementation of a TMDL." CWC section 13377 also requires that NPDES permits include limitations necessary to implement water quality control plans. Both the State Water Board and the San Diego Water Board have previously concluded that discharges from the MS4 contain pollutants that have the reasonable potential to cause or contribute to excursions above water quality standards. As such, inclusion of receiving water limitations is appropriate to control MS4 discharges.

The inclusion of receiving water limitations is also consistent with the Ninth Circuit Court of Appeals' ruling in *Defenders of Wildlife v. Browner* (191 F.3d 1159, 1166 (1999)) that the permitting authority has discretion regarding the nature and timing of requirements that it includes as MS4 permit conditions to attain water quality standards. The Ninth Circuit Court of Appeals recently explained that, "*[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*" (*Natural Resources Defense Council v. County of Los Angeles* (9th Cir. 2011) 673 F.3d 880, 886 (~~review granted by the Supreme Court on other grounds).)~~revd. On other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013)))

The receiving water limitations included in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan or in water quality control plans or policies adopted by the State Water Board, including State Water Board Resolution No. 68-16, or in federal regulations, including but not limited to 40 CFR 131.12 and 131.38. The water quality objectives in the Basin Plan and other State Water Board plans and policies have been approved by USEPA and combined with designated beneficial uses constitute the water quality standards required under federal law.

Provision A.2.a requires that discharges from the Copermittees' MS4s must not cause or contribute to the violation of water quality standards in receiving waters. The water quality standards of the receiving waters must be protected from the impacts that may be caused by the Copermittees' MS4 discharges. Water quality standards applicable to the surface waters in the San Diego Region must be achieved through meeting the technology based standard of MEP through an iterative process of improved management actions. Provision A.2.a is also consistent with State Water Board Order WQ 99-05 precedent-setting language requiring discharges from MS4s to attain receiving water quality standards. The water quality control plans and policies with water quality standards applicable to the waters in the San Diego Region are included under Provision A.2.a.

Provisions A.2.b was included to be consistent with the requirements of State Water Board Resolution No. 2012-0012, adopted on March 20, 2012.

Provision A.3 (Effluent Limitations) specifies the condition of the discharges from the Copermittees' MS4s that must be achieved if and when there are discharges.

Consistent with CWA section 301(b)(1)(A) and 40 CFR 122.44(a), Provision A.3.a includes the technology-based effluent limitations that must be included in the Order. The technology-based effluent limits, representing the minimum level of control that must be imposed in a permit under CWA section 402, requires that pollutants in discharges of storm water from the Copermittees' MS4s be reduced to the MEP. This provision applies specifically to storm water discharges. Non-storm water discharges must be effectively prohibited, as required under Provision A.1.b. Non-storm water (dry weather) discharges from the MS4 are not considered storm water (wet weather) discharges and therefore are not subject to the MEP standard.

The technology-based MEP standard is an ever-evolving, flexible, and advancing concept. Neither Congress nor USEPA has specifically defined the term "maximum extent practicable." Congress established this flexible MEP standard so that the administrative bodies would have "*the tools to meet the fundamental goals of the Clean Water Act in the context of storm water pollution*." (*Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 884.) As knowledge about controlling storm water runoff and discharges continues to evolve, so does the knowledge which constitutes MEP. Reducing the discharge of pollutants in storm water from the MS4 to the MEP requires the Copermittees to assess each program component and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP.

The San Diego Water Board or the State Water Board ultimately define MEP, and may include requirements that provide specific guidance on what is expected to demonstrate MEP. It is the responsibility of the Copermittees to propose actions that implement BMPs to reduce storm water pollution to the MEP. In other words, the Copermittees' runoff management programs developed and implemented under the Order are the Copermittees' proposals ~~of~~ for achieving MEP. Their total collective and individual activities conducted pursuant to their runoff management programs become their proposal for achieving MEP as it applies both to their overall effort, as well as to specific activities. Provisions B through E of the Order provides a minimum framework to guide the Copermittees in achieving the MEP standard for discharges of pollutants in storm water.

Provision A.3.b incorporates any water quality based effluent limitations (WQBELs) applicable to the MS4s established for TMDLs adopted and approved for the San Diego Region and requires the Copermittees to comply with those WQBELs. This is consistent with 40 CFR 122.44(d)(1)(vii)(B), which requires that NPDES permits to incorporate WQBELs "*developed to protect a narrative water quality criterion, a numeric water quality criterion, or both…consistent with the assumptions and requirements of any available wasteload allocation for the discharge...*"

Pursuant to CWA section 303(d), for surface water bodies identified as impaired by one or more pollutants, the San Diego Water Board is required to establish TMDLs "*at a level necessary to implement the applicable water quality standards with seasonal variations and a margin of safety which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality*." The TMDLs identify sources of the pollutants causing the impairments and assign portions of the TMDL as WLAs to point sources, which include MS4s.

WLAs must be expressed in NPDES permits as WQBELs, which may include one or more numeric components such as numeric effluent limits, and/or receiving water limitations, and/or BMP requirements. Because numeric targets for TMDLs typically include a component that will be protective of water quality standards, a TMDL will likely include one or more numeric receiving water limitations and/or effluent limitations as part of the assumptions or requirements of the TMDL. Any numeric receiving water limitations and/or effluent limitations developed as part of the assumptions or requirements of a TMDL must be incorporated and included as part of ~~a~~ WQBELs for the MS4s.

Because the development and approval of new TMDLs, or modification of existing TMDLs, may occur during the term of this Order, the specific provisions of those TMDLs, including effluent limitations applicable to MS4s are provided within Attachment E to the Order. Attachment E will be updated with new TMDLs and modifications to existing TMDLs in a timely manner as they occur.

Provision A.4 (Compliance with Discharge Prohibitions and Receiving Water Limitations) describes the process required to be implemented by the Copermittees if compliance with the discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a are not being achieved under current conditions.

In its Phase II Stormwater Regulations, Final Rule, USEPA states that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL.*"[18] In a series of comment letters on MS4 permits issued by various Regional Water Boards, USEPA has also reiterated that MS4 discharges must meet water quality standards.[19] In addition, the Ninth Circuit Court of Appeals explained in a recent ruling that, *"[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*"[20]

[18] Phase II Stormwater Regulations, Final Rule, 64 Fed. Reg. 68722, 68737.
[19] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.
[20] NRDC v. County of Los Angeles (9th Cir. 2011), 673 F.3d 880, 886 (revd. on other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133

Water quality standards for the San Diego Region are established in the Basin Plan. The water quality standards of the Basin Plan are incorporated into this Order as the discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a. The discharge prohibitions and receiving water limitations in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations or prohibitions to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan, water quality control plans or policies adopted by the State Water Board, including Resolution No. 68-16, or federal regulations, including but not limited to, 40 CFR 131.12 and 131.38. The waste discharge prohibitions and water quality objectives in the Basin Plan have been approved by USEPA and combined with the designated beneficial uses constitute the water quality standards required under federal law.

Under federal law (CWA section 402(p)(3)(B)(iii)), an MS4 permit must include "*controls to reduce the discharge of pollutants to the maximum extent practicable...and such other provision as...the State determines appropriate for control of such pollutants*." The State Water Board has previously determined that limitations necessary to meet water quality standards are appropriate for the control of pollutants discharged by MS4s and must be included in MS4 permits. (State Water Board Orders WQ 91-03, 98-01, 99-05, 2001-15; see also *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159.) This Order prohibits discharges that cause or contribute to violations of water quality standards.

The discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a are included in this Order to ensure that discharges from the MS4s do not cause or contribute to exceedances of water quality objectives necessary to protect the beneficial uses of the receiving waters.

Provision A.4 is consistent with the precedent-setting language in State Water Board Order WQ 99-05 required to be included in municipal storm water permits. State Water Board Order WQ 2001-15 refined Order WQ 99-05 by requiring an iterative approach to compliance with water quality standards involving ongoing assessments and revisions, as referred to as the "iterative process." The "iterative process" is a fundamental NPDES requirement for municipal storm water permits to achieve the objectives of the CWA.

The State Water Board and Regional Water Boards have stated that the provisions under Provisions A.1.a, A.1.c, A.2.a, and A.4 are independently applicable, meaning that compliance with one provision does not provide a "safe harbor" where there is non-compliance with another provision (i.e., compliance with the Provision A.4 does

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S.Ct. 710 (2013))). ~~On July 13, 2012, the United States Supreme Court granted review of this case on other grounds.~~ See also, *Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 884-886, citing *Defenders of Wildlife v. Browning,* (9th Cir. 1999) 191 F.3d 1159.)

not shield a Copermittee who may have violated Provision A.1.a, A.1.c, or A.2.a from an enforcement action). The intent of Provision A.4 is to ensure that the Copermittees have the necessary storm water management programs and controls in place, and that they are modified by the Copermittees in a timely fashion when necessary, so that compliance with Provisions A.1.a, A.1.c, and/or A.2.a is achieved as soon as possible. USEPA expressed the importance of this independent applicability in a series of comment letters on MS4 permits proposed by various Regional Water Boards. At that time, USEPA expressly objected to certain MS4 permits that included language stating, *"permittees will not be in violation of this [receiving water limitation] provision … [if certain steps are taken to evaluate and improve the effectiveness of the jurisdictional runoff management programs],"* concluding that this phrase would not comply with the CWA.[21]

The Ninth Circuit held in *Natural Resources Defense Council v. County of Los Angeles* (2011) 673 F3d. 880, 886 (~~certiorari granted on other grounds)~~revd. on other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013))) that engagement in the iterative process does not provide a safe harbor from liability for violations of permit terms prohibiting exceedances of water quality standards. The Ninth Circuit holding is consistent with the position of the State and Regional Water Boards that exceedances of water quality standards in an MS4 permit constitute violations of permit terms subject to enforcement by the Water Boards or through a citizen suit. While the Water Boards have generally directed dischargers to achieve compliance by improving control measures through the iterative process, the San Diego Water Board retains the discretion to take other appropriate enforcement and the iterative process does not shield dischargers from citizen suits under the CWA.

The requirements of Provision A.4, therefore, are required to be implemented until the water quality standards expressed under Provisions A.1.a, A.1.c, and A.2.a are achieved. The CWA requires MS4 permits to "*require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." The requirements of this Order have been deemed or determined to be "appropriate" to achieve water quality standards in receiving waters.

Part of the "*controls*" required by the Order is the process described in Provision A.4. Provision A.4 includes the process that is ultimately expected to achieve compliance with the requirement that discharges from the MS4 do not cause or contribute to violations of water quality standards in the receiving waters. The implementation of Provision A.4 is required when the Copermittees or the San Diego Water Board have

[21] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.

determined that discharges from the MS4 are causing or contributing to violations of water quality standards in the receiving waters.

The Copermittees must effectively prohibit non-storm water discharges into the MS4s, reduce the discharge of pollutants in storm water from the MS4s to the MEP, and ensure that their MS4 discharges do not cause or contribute to violations of water quality standards. If the Copermittees have effectively prohibited non-storm water discharges and reduced storm water pollutant discharges to the MEP, but their discharges are still causing or contributing to violations of water quality standards, Provision A.4 provides a clear "iterative process" for the Copermittees to follow.

Provision A.4 essentially requires the Copermittees to implement additional BMPs until MS4 discharges no longer cause or contribute to a violation of water quality standards.

In assessing compliance and potential enforcement actions, the San Diego Water Board looks at the Copermittees' efforts in total to meet the requirements of Provisions A.1.a, A.1.c, A.2.a and Provision A.4. The Copermittees need to demonstrate that they are making improvements to their programs and making progress toward achieving the discharge prohibitions and receiving water limitations in Provisions A.1.a, A.1.c, and A.2.a by implementing the requirements of Provision A.4. The San Diego Water Board would consider these efforts prior to strictly enforcing the requirements of Provisions A.1.a, A.1.c, and A.2.a. Causes of exceedances of the receiving water limitations can often be more difficult to identify and attribute solely to the Copermittees' MS4s. The intent of the Order is to provide the Copermittees more clarity and flexibility in addressing these exceedances through the iterative approach and adaptive management process until the requirements under Provisions A.1.a, A.1.c, and A.2.a are fully achieved.

An exception to the iterative approach and adaptive management process would be in receiving waters subject to adopted and approved TMDLs. For TMDLs that are incorporated into the Order, there is a specific date for compliance to be achieved, after which the iterative approach and adaptive management process required under Provision A.4 no longer provides the flexibility to achieve compliance. Where compliance dates for a TMDL have passed, compliance with the WQBELs incorporated into the Order ~~to be consistent with the assumptions and requirements of a WLA~~ established by a TMDL in Attachment E to protect water quality standards is required. Thus, after the interim or final compliance dates for a TMDL have passed, if the discharges from the Copermittees' MS4s are causing or contributing to a violation of WQBELs, exceedances of WQBELs must be strictly enforced by the San Diego Water Board. In the meantime, however, the Copermittees are in compliance with the interim or final TMDL requirements in Attachment E as long as the interim or final WQBELs are being achieved in accordance with the interim or final compliance dates.

The San Diego Water Board recognizes that there is an apparent disparity between the Copermittees being able to demonstrate and be in compliance with the TMDLs in Attachment E and the discharge prohibitions and receiving water limitations in

Provisions A.1.a, A.1.c, and A.2.a. Thus, similar to the TMDL requirements in Attachment E, the Order establishes a process under Provision B.3.c that the Copermittees may choose to utilize to demonstrate and be in compliance with the discharge prohibitions and receiving water limitations in Provisions A.1.a, A.1.c, and A.2.a. This process is described in more detail under the discussion for Provision B.3.

B. Water Quality Improvement Plans

Purpose: Provision B includes requirements for the Copermittees to develop and implement Water Quality Improvement Plans to ultimately comply with the prohibitions and limitations under Provision A. The Water Quality Improvement Plans will provide the Copermittees a comprehensive program that can achieve the requirements of the CWA. Implementation of the Water Quality Improvement Plans will also improve the quality of the receiving waters in the San Diego Region.

The Water Quality Improvement Plan is the backbone of the Regional MS4 Permit requirements. Provision B provides the guidance, criteria, and minimum expectations and requirements for the elements of the Water Quality Improvement Plan to be developed and implemented by the Copermittees. The Water Quality Improvement Plans will be implemented in the Watershed Management Area by the Copermittees within their jurisdictions through their jurisdictional runoff management programs.

The Water Quality Improvement Plan also incorporates a program to monitor and assess the progress of the Copermittees' jurisdictional runoff management programs toward improving the quality of discharges from the MS4s, as well as tracking improvements to the quality of receiving waters. A process to adapt and improve the effectiveness of the Water Quality Improvement Plans has also been incorporated into the requirements of Provision B to be consistent with the "iterative approach" required to achieve compliance with discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a, pursuant to the requirements of Provision A.4.

The Water Quality Improvement Plans have also been structured to incorporate the requirements of any TMDLs that have been adopted for the San Diego Region. Incorporating the requirements of the TMDLs into the requirements of Provision B allows the Copermittees to develop a single plan, instead of separate plans, to coordinate their non-storm water and storm water runoff management programs. The Water Quality Improvement Plans allow the Copermittees to meet the requirements of this Order, as well as fulfill the requirements of the TMDLs ~~WLAs that have been assigned to discharges from the MS4s~~.

As an added benefit, if the Copermittees demonstrate that impaired water bodies within the Watershed Management Area listed on the 303(d) List will be addressed with their Water Quality Improvement Plans in a reasonable period of time, the San Diego Water Board may be able to remove the water bodies from the 303(d) List, which would greatly reduce the need for the San Diego Water Board to develop additional TMDLs that would have to be incorporated into the Order and implemented by the Copermittees.

***Discussion*:** The federal NPDES regulations require the Copermittees to develop a proposed management program (40 CFR 122.26(d)(2)(iv)). The proposed

management program must include "*a comprehensive planning process*" and "*where necessary intergovernmental coordination*" for the "*duration of the permit.*" The Water Quality Improvement Plan is the Copermittees' "*comprehensive planning process*" document for the proposed management program that will be implemented within a Watershed Management Area. Implementation of the Water Quality Improvement Plan requires "*intergovernmental coordination*" among the Copermittees for at least the "*duration of the permit*," and likely into and beyond the next iteration of the permit.

Developing Water Quality Improvement Plans based upon watersheds is consistent with federal regulations that support the development of permit conditions, as well as implementation of storm water management programs, at a watershed scale (40 CFR 122.26(a)(3)(ii), 122.26(a)(3)(v), and 122.26(d)(2)(iv)). In 2003, USEPA issued a Watershed-Based NPDES Permitting Policy Statement (USEPA, 2003) that defines watershed-based permitting as an approach that produces NPDES permits that are issued to point sources on a geographic or watershed basis. In this policy statement, USEPA explains that "*[t]he utility of this tool relies heavily on a detailed, integrated, and inclusive watershed planning process*." USEPA identifies a number of important benefits of watershed permitting, including more environmentally effective results, the ability to emphasize measuring the effectiveness of targeted actions on improvements in water quality, reduced cost of improving the quality of the nation's waters and more effective implementation of watershed plans, including TMDLs, among others.

An emphasis on watersheds is appropriate at this stage in the San Diego Region's MS4 program to shift the focus to more targeted, water quality driven planning and implementation. Addressing discharges on a watershed scale focuses on water quality results by emphasizing the receiving waters in the watershed. The conditions of the receiving waters drive management actions, which in turn focus measures to address pollutant contributions from MS4 discharges.

The Water Quality Improvement Plan gives the Copermittees the responsibility of developing a comprehensive plan to coordinate the efforts of their jurisdictional runoff management programs for addressing the problems related to MS4 discharges causing impacts to water quality in the Watershed Management Area. The development of the plan provides the Copermittees the opportunity to provide significant input on how to implement their jurisdictional runoff management programs, and how to best utilize their available resources in addressing a focused set of priorities that they believe will result in measureable improvements to water quality within the Watershed Management Area.

The Copermittees are encouraged to separate the Watershed Management Area into subwatersheds, as appropriate. This allows the Copermittees to identify priorities applicable to a subset of the Copermittees or specific water bodies or areas within the Watershed Management Area.

Included in the requirements for the elements to be included in the Water Quality Improvement Plan are monitoring and assessment requirements that are necessary to

implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order. In addition to the federal requirements of the CWA section 308(a) and 40 CFR 122.26(d), the San Diego Water Board has the authority to establish monitoring, reporting, and recordkeeping requirements for NPDES permits under CWC 13383.

More specific and detailed discussions of the requirements of Provision B are provided below.

Provision B.1 (Watershed Management Areas) requires the Copermittees to develop a Water Quality Improvement Plan for each of the Watershed Management Areas defined by the San Diego Water Board.

Pursuant to 40 CFR 122.26(d)(2)(iv), proposed management programs "*may impose controls on a…watershed basis…*" The Water Quality Improvement Plan is the Copermittees' proposed management program. A Water Quality Improvement Plan must be developed for each Watershed Management Area identified in the Order.

The Watershed Management Areas are identified in Table B-1. Table B-1 establishes ten (10) Watershed Management Areas, and identifies the Copermittees that are responsible for developing and implementing the Water Quality Improvement Plan for each Watershed Management Area.

The Copermittees from each of the three counties within the San Diego Region are expected to be phased in as their respective NPDES municipal storm water permits expire. Because Order No. R9-2007-0001 expired in January 2012, the San Diego County Copermittees are covered under the Regional MS4 Permit on the effective date of the Order.

After San Diego Water Board receives and considers the Reports of Waste Discharge required to be submitted by the Orange County Copermittees and Riverside County Copermittees pursuant to the requirements of their current permits, and make any necessary changes to the Order, the Orange County Copermittees and Riverside County Copermittees will be covered under the Regional MS4 Permit after Order No. R9-2009-0002 expires in November 2014, and Order No. R9-2010-0016 expires in December 2015, respectively.

The Orange County Copermittees and Riverside County Copermittees also have the option to obtain coverage under the Regional MS4 Permit earlier than their respective permit expiration dates. The process to apply for early coverage is described Provision F.6.

Because the Santa Margarita River Watershed Management Area includes Copermittees from both San Diego County and Riverside County, a footnote to Table B-1 has been included to specify that the requirements of Provision B ~~must be~~ are not required to be implemented by the County of San Diego until the Riverside County

Copermittees have received a notice of coverage under the Order ~~Regional MS4 Permit~~. Until the Riverside County Copermittees are notified of coverage under the Order, the County of San Diego is subject to the prohibitions and limitations under Provision A, responsible for continuing to implement its existing jurisdictional runoff management program, and responsible for implementing the transitional monitoring and assessment requirements of Provision D, the transitional annual reporting requirements of Provision F.3.b, and the TMDL requirements of Attachment E to the Order.

Provision B.2 (Priority Water Quality Conditions) requires the Copermittees in each Watershed Management Area to identify the highest priority water quality conditions which will be the focus of the Water Quality Improvement Plan implementation.

Provisions B.2.a and B.2.b provide the criteria that must be assessed when characterizing the receiving water quality and potential impacts from MS4 discharges of the receiving waters within the Watershed Management Area. The criteria are based primarily on the requirements in 40 CFR 122.26(d)(1)(iv)(C) and (C)(1)-(9). Characterizing the receiving water quality and identifying the potential impacts caused by MS4 discharges to receiving waters in the Watershed Management Area is necessary to identify the impacts to receiving waters associated with MS4 discharges that are of the most concern to the Copermittees.

Based on the information required to be considered under Provisions B.2.a and B.2.b, Provision B.2.c requires to Copermittees to identify the highest priority water quality conditions related to discharges from the MS4s that will be the primary focus of the Water Quality Improvement Plan in the Watershed Management Area. Addressing and improving these highest priority water quality conditions will become the focus of each Copermittee's jurisdictional runoff management program as the Water Quality Improvement Plan is implemented in the Watershed Management Area. The highest priority water quality conditions are expected to include source of pollutants and/or stressors, and/or receiving water conditions, that the Copermittees consider the highest threats or most likely to have adverse impacts on the physical, chemical, and biological integrity of receiving waters. Addressing these threats and/or adverse impacts should restore the physical, chemical, and biological integrity of receiving waters, and result in the restoration and protection of the beneficial uses of the receiving waters in the Watershed Management Area.

Provision B.2.d requires the Copermittees to identify known and suspected sources of pollutants and/or stressors contributing to the highest priority water quality conditions. The requirements of Provision B.2.d are based primarily on the requirements in 40 CFR 122.26(d)(1)(iii)(B)(1)-(6). The Copermittees are required to evaluate several factors in the identification of those sources. The Copermittees must consider and evaluate the following: (1) the land uses that may contribute toward impacts to receiving waters, (2) the locations of the Copermittees' MS4s that can convey and discharge runoff and pollutants to receiving waters, (3) other sources that discharge into the Copermittees' MS4s and receiving waters, and (4) other information and data

that can help the Copermittees to evaluate the relative importance of or contribution from those sources toward the highest priority water quality conditions. Identifying the known and suspected sources, and their relative contribution toward the highest priority water quality conditions, will help the Copermittees to focus, direct, and prioritize their resources and implementation efforts within their jurisdictions.

Provision B.2.e requires the Copermittees to identify potential strategies that can result in improvements to water quality in MS4 discharges and/or receiving waters within the Watershed Management Area. Potential water quality improvement strategies will not necessarily be implemented by the Copermittees, but provide a "menu" of options that the Copermittees will consider for implementation. The public participation process that will be implemented during the development of the Water Quality Improvement Plan is where the potential water quality improvement strategies will be identified.

Provision B.3 (Water Quality Improvement Goals, Strategies and Schedules) requires the Copermittees in each Watershed Management Area to identify the goals that the Copermittees' jurisdictional runoff management programs will work toward achieving to address and improve the highest priority water quality conditions identified under Provision B.2.c; the strategies that will be implemented by the Copermittees within their jurisdictions and the Watershed Management Area to achieve the goals; and, the schedules for implementing the strategies and achieving the goals. The element of the Water Quality Improvement Plan required under Provision B.3 is where the "*comprehensive planning*" and "*intergovernmental coordination*" [40 CFR 122.26(d)(2)(iv)] of the Copermittees' actions for the proposed management programs within the Watershed Management Area is required to be described.

Provision ~~B.2.e~~ B.3.a requires the Copermittees to identify interim and final numeric goals, and schedules to achieve those goals as part of the Water Quality Improvement Plans. Provision ~~B.2.e~~ B.3.a.(1) requires the Copermittees to identify two types of numeric goals to be achieved:

(1) Final numeric goals in the receiving waters and/or MS4 discharges that will ~~be able to restore and~~ result in the protection of the water quality standards of the receiving waters for the highest priority water quality conditions identified by the Copermittees for Provision B.2.c. These final numeric goals are the ultimate goals for the Water Quality Improvement Plan, and the achievement and maintenance of these final numeric goals will indicate that one or more beneficial uses have been successfully restored and/or protected from MS4 discharges.

(2) Interim numeric goals that can be used by the Copermittees to demonstrate progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges for the highest priority water quality conditions in the Watershed Management Area. Achievement of the interim numeric goals will demonstrate to the San Diego Water Board that the Copermittees' implementation efforts are progressing toward achieving the final numeric goals.

Provision ~~B.2.e~~ B.3.a.(1) does not specify what the interim and final numeric goals must be based on, ~~. The numeric goals~~ but they essentially must be designed to achieve compliance with water quality standards in the receiving waters. To that end, the interim goals must be based on measureable criteria or indicators capable of demonstrating progress toward achieving the numeric goals."

The interim and final numeric goals can be based on the water quality objectives in the Basin Plan. The water quality objectives in the Basin Plan, however, consist of numeric and narrative water quality objectives. Numeric water quality objectives can be directly used as numeric goals. Narrative water quality objectives, on the other hand, will require some interpretation to identify numeric goals. The achievement of multiple numeric goals based on the water quality objectives, used in combination, may be necessary to demonstrate that beneficial uses have been restored and/or protected.

The Copermittees could also propose other numeric goals that are not necessarily water quality objectives from the Basin Plan. For example, the Copermittees could propose a numeric goal that consists of achieving some percent improvement of a measureable indicator, such as acreage of a specific habitat or increase in a specific plant or animal species population. Other examples may include pollutant load reductions, number of impaired waterbodies delisted from the List of Water Quality Impaired Segments, Index of Biological Integrity (IBI) scores, etc.

The Copermittees may choose to develop interim numeric goals based on the final numeric goals they develop, such as incremental steps toward ultimately achieving the final numeric goals. The Copermittees may also choose to develop interim numeric goals that are based on other measureable indicators that can indirectly indicate improvements and progress toward the final numeric goals.

There are no limits to the types of interim numeric goals that could be proposed by the Copermittees, other than the goals must be based on measureable criteria or indicators capable of demonstrating progress toward achieving the numeric goals. Likewise, there are no limits to the types of final numeric goals that could be proposed by the Copermittees, other than the goals must "*restore and protect the water quality standards of the receiving waters.*"

Finally, Provision ~~B.2.e~~ B.3.a.(2) also requires the Copermittees to develop schedules for measuring progress and achieving the interim and final numeric goals. Several criteria are included for the development of the schedules, but the Copermittees are required to achieve the numeric goals as soon as possible, consistent with federal NPDES regulations (40 CFR 122.47(a)(1)).

The Copermittees are also required ~~by~~ to incorporate any compliance schedules ~~that are included in~~ for any applicable ASBS or TMDL requirements. Applicable ASBS and TMDL compliance schedules are set forth in Attachment A and Attachment E to the Order, respectively. The information provided by the Copermittees under Provision

~~B.2.e~~ B.3.a.(2) will be used by the Copermittees and the San Diego Water Board to gauge and track the progress of the Copermittees' efforts in addressing the highest priority water quality conditions identified in the Water Quality Improvement Plan.

~~Provision B.3 (Water Quality Improvement Strategies) requires the Copermittees in each Watershed Management Area to identify the strategies which will be implemented by the Copermittees' jurisdictional runoff management programs to address and improve the highest priority water quality conditions identified under Provision B.2. The element of the Water Quality Improvement Plan required under Provision B.3 is where the "*comprehensive planning*" and "*intergovernmental coordination*" [40 CFR 122.26(d)(2)(iv)] of the Copermittees' actions for the proposed management programs within the Watershed Management Area is expected to be described.~~

Provision B.3.b requires the Copermittees to identify the strategies and schedules to implement those strategies as part of the Water Quality Improvement Plans. Provision B.3.b requires the Copermittees to identify the water quality improvement strategies that will be and may be implemented within the Watershed Management Area to 1) reduce of pollutants in storm water discharged from the MS4 to the MEP, 2) ~~prevent or eliminate controllable~~ effectively prohibit non-storm water discharges from entering the MS4, ~~3) achieve of demonstrable improvements in the physical, chemical, and biological receiving water conditions, 4~~3) ~~restore and~~ protect water quality standards in receiving waters by controlling MS4 discharges so that they do not cause or contribute to exceedances of receiving water limitations, and ~~5~~4) achieve applicable WQBELs that implement TMDLs. The Copermittees will select the strategies to be implemented based on the likely effectiveness and efficiency of the potential water quality improvement strategies identified under Provision B.2.e to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, and/or achieve the interim and final numeric goals identified under Provision B.3.a.

Provision B.3.b.(1) requires each Copermittee to identify the strategies that will be or may be implemented within its jurisdiction. Each Copermittee is required to describe the strategies it is committed to implementing as part of its jurisdictional runoff management requirements under Provisions E.2 through E.7, and the optional jurisdictional strategies that the Copermittee will implement, as necessary, to achieve the numeric goals.

Each Copermittee is expected to implement the optional jurisdictional strategies identified under Provisions B.3.b.(1)(b) when the jurisdictional strategies it has committed to implement under Provision B.3.b.(2)(a) are not making adequate progress toward the interim and final numeric goals in accordance with the schedules established under Provision B.3.a. Provision B.3.b.(1)(b)(v) requires each Copermittee to describe the circumstances necessary to trigger implementation of the optional jurisdictional strategies, in addition to the requirements of Provisions B.3.b.(1)(a).

The San Diego Water Board recognizes that there may be optional jurisdictional strategies that will likely require funding and/or resources for planning, permitting, procurement of labor and materials, and implementation. Thus, Provision B.3.b.(1)(b)(iv) requires each Copermittee to describe the funding and/or resources that are necessary to implement these optional jurisdictional strategies. This information may provide interested groups and members of the public an understanding of the resources that they could provide or assist in obtaining to implement these optional jurisdictional strategies.

~~The Copermittees are expected to provide a description of all the actions and potential actions that they will implement over the course of a schedule that they develop. The implementation actions may include, but are not limited to, inspection and enforcement strategies, resource identification and development efforts, non-structural and structural controls, retrofitting projects, stream and habitat rehabilitation/restoration projects, and agency and department coordination efforts. Water quality improvement strategies that will be implemented within the Watershed Management Area may need to be different within each Copermittees' jurisdiction. The descriptions in the Water Quality Improvement Plan are not expected to specify exactly what strategies each Copermittee will implement within its jurisdiction, but enough information to allow the San Diego Water Board to determine when and where the strategies may be or should be implemented. Specific information about how those strategies will be implemented will be provided in each Copermittee's jurisdictional runoff management program document.~~

Provision B.3.b.(2) requires the Copermittees in the Watershed Management Area to identify the regional or multi-jurisdictional strategies that may be implemented, as necessary, to achieve the numeric goals. Similar to the requirements of Provision B.3.b.(1)(b), these regional or multi-jurisdictional strategies will likely require funding and/or resources for planning, permitting, procurement of labor and materials, and implementation, and San Diego Water Board recognizes that these strategies may be difficult to implement with only Copermittee resources. Thus, Provision B.3.b.(2)(d) requires the Copermittees to describe the funding and/or resources necessary to implement these optional regional or multi-jurisdictional strategies. This information may provide interested groups and members of the public an understanding of the resources that they could provide or assist in obtaining to implement these optional regional or multi-jurisdictional strategies.

Provision B.3.b.(3) requires ~~T~~the Copermittees ~~must also~~ to develop and include schedules in the Water Quality Improvement Plan for implementing the water quality improvement strategies identified under Provisions B.3.b.(1) and B.3.b.(2). The schedule for implementing the water quality improvement strategies will be used by the Copermittees and San Diego Water Board to measure and demonstrate the progress of the Copermittees' implementation efforts toward reducing pollutants in storm water discharged from the MS4 to the MEP, and eliminating illicit non-storm water discharges from entering the MS4.

Provision B.3.b.(4) provides the Copermittees in each Watershed Management Area the option of implementing watershed-specific structural BMP requirements for Priority Development Projects. Historically, storm water permits have included very specific performance standards for permanent, structural BMPs. These standards describe the expectation for the capture or treatment of pollutants and control of excessive flow before storm water is discharged from a site. The Copermittees were also allowed to develop waiver programs for Priority Development Projects to avoid implementing the structural BMPs; however, the waiver programs were not necessarily tied into any sort of holistic watershed strategy. The result is that implementation of BMP requirements is largely done on a site-by-site basis. This requires proper design on the part of the Priority Development Project and strict oversight on the part of the Copermittee.

Provision B.3.b.(4) promotes the evaluation of multiple strategies for water quality improvement, in addition to the implementation of permanent structural BMPs, on a watershed-scale versus the site-by-site approach. In a report issued by the Southern California Coastal Water Research Project (SCCWRP) and several other research institutions, the report emphasized that a successful hydromodification management program will involve watershed analysis as a first step, and that integrating multiple watershed-based strategies is preferable over a site-by-site approach. Indeed, the report states that the watershed analysis "…*should lead to identification of existing opportunities and constraints that can be used to help prioritize areas of greater concern, areas of restoration potential, infrastructure constraints, and pathways for potential cumulative effects*."[22] Provision B.3.b.(4) promotes the findings and recommendations of the report by providing a pathway for Copermittees to develop an integrated approach to their land development programs.

Under Provision B.3.b.(4), the Copermittees in a Watershed Management Area must first perform an analysis by gathering as much information pertaining to the physical characteristics of the Watershed Management Area as possible. This includes, for example, identifying potential areas of coarse sediment supply, present and anticipated future land uses, and locations of physical structures within receiving streams and upland areas that affect the watershed hydrology (such as bridges, culverts, and flood management basins). Once this information is collected, the Copermittees must produce GIS layers (maps) that include this information.

From there, the Copermittees must use the results of the Watershed Management Area Analysis to identify and compile a list of candidate projects that could potentially be used as alternative compliance options for Priority Development Projects. Such projects include, for example, opportunities for stream or riparian area rehabilitation, opportunities for retrofitting existing infrastructure to incorporate storm water retention or treatment, and opportunities for regional BMPs, among others. Once these candidate projects are identified, Copermittees may allow Priority Development

[22] 2012. ED Stein, F Federico, DB Booth, BP Bledsoe, C Bowles, Z Rubin, GM Kondolf, A Sengupta. Technical Report 667. Southern California Coastal Water Research Project. Costa Mesa, CA.

Projects to fund, partially fund, or completely implement these candidate projects. The Copermittees must first find that implementing such a candidate project would provide greater overall benefit to the watershed than requiring implementation of the structural BMPs onsite, and also enter into a voluntary agreement with the Priority Development Project that authorizes this arrangement. The Copermittees may use Provision B.3.b.(4) as both 1) a mechanism to reach their stated goals of the Water Quality Improvement Plan by using Priority Development Projects to either fund or implement projects that will provide water quality benefit, and 2) an alternative to requiring strict adherence to the structural BMP design standards.

Additionally, Provision B.3.b.(4) allows the Copermittees to use the results of the Watershed Management Area Analysis to identify areas within the Watershed Management Area where it is appropriate to allow Priority Development Projects to be exempt from the hydromodification management BMP performance requirements. Provision E.3.c.(2) already allows exemptions for Priority Development Projects that discharge to a conveyance channel whose bed and bank are concrete lined from the point of discharge to an enclosed embayment or the Pacific Ocean. However, there may be cases where further exemptions are warranted. The Copermittees may identify such cases on a watershed basis and include them in the Watershed Management Area Analysis; however, they must provide the supporting rationale to support all claims for exemptions.

Provision B.3.b.(4) provides an innovative pathway for Copermittees to regulate their land development programs by allowing alternative compliance in lieu of implementing structural BMPs on each and every Priority Development Project. This approach facilitates the integration of watershed-scale solutions for improving overall water quality and assisting Copermittees to achieve their stated goals of the Water Quality Improvement Plan. The San Diego Water Board understands, however, that undertaking this approach, which involves extensive planning, could be resource intensive for the Copermittees. Therefore, the Watershed Management Area Analysis is optional and not a requirement. The Copermittees can choose not to perform the watershed planning and mapping exercise described in Provision B.3.b.(4), and instead choose to require strict implementation of the structural BMPs onsite, pursuant to Provision E.3.b.

Finally, Provision B.3.c has been included to provide the Copermittees an option to demonstrate and be in compliance with the requirements of Provisions A.1.a, A.1.c and A.2.a. One or more Copermittees within a Watershed Management Area can choose to implement this option. This option is only expected to be utilized by the Copermittees that wish to clearly demonstrate and be in compliance with the requirements of Provisions A.1.a, A.1.c and A.2.a.

In order for a Copermittee to utilize this option, the Copermittee is required to include three components in the Water Quality Improvement Plan. The first component is a comprehensive set of numeric goals that will demonstrate the requirements of Provisions A.1.a, A.1.c and A.2.a will be achieved. The criteria provided in the Order

will require the Copermittee to demonstrate that the discharges from its MS4s will not cause or contribute to exceedances of water quality objectives in the receiving waters, and the receiving waters will be protected from the Copermittee's MS4 discharges.

The second component is an analysis utilizing a watershed model or other watershed analytical tools. The analysis must demonstrate that the implementation of the water quality improvement strategies required under Provision B.3.b will achieve the numeric goals within the established schedules required under Provision B.3.a. Because the development of the analysis may require significant resources, the Order allows the Copermittees in each Watershed Management Area that choose to implement this option to perform the analysis individually, or pool their resources for the analysis collectively.

The San Diego Water Board does not expect the analysis to be a "guarantee" that the water quality improvement strategies will achieve the numeric goals within the established schedules. The analysis, however, must "reasonably" and "quantitatively" demonstrate that the implementation of the water quality improvement strategies can achieve the numeric goals within the established schedules. However, as more data and information are collected to demonstrate progress toward achieving the numeric goals, the numeric goals, water quality improvement strategies and schedules may need to be updated. When these updates occur, the Copermittees that choose to utilize this option must also update the analysis.

Thus, the third component is the key component that will allow a Copermittee to demonstrate the implementation of the water quality improvement strategies within its jurisdiction is making progress toward achieving the numeric goals. Each Copermittee must specify the monitoring and assessments that will be performed to confirm the implementation of the water quality improvement strategies are making progress toward achieving the numeric goals within the established schedules.

These three components must then be reviewed by the Water Quality Improvement Consultation Panel. The Water Quality Improvement Consultation Panel is required to be formed as part of the public participation process for the development of the Water Quality Improvement Plans. The Water Quality Improvement Consultation Panel is described under Provision F.1.a.(1)(b). Review by the Water Quality Improvement Consultation Panel has been included to provide an additional layer of input, support, and accountability for the implementation of this option.

Compliance with the requirements of Provisions A.1.a, A.1.c and A.2.a begins when the Water Quality Improvement Plan, incorporating the requirements of Provision B.3.c.(1), is accepted by the San Diego Water Board. Each Copermittee that chooses to implement and continues to implement this option will be in compliance with the requirements of Provisions A.1.a, A.1.c and A.2.a as long as the San Diego Water Board continues to accept the analysis, and subsequent updates, and the Copermittee continues to implement the strategies, monitoring and assessments as incorporated in the Water Quality Improvement Plan in accordance with Provision B.3.c.(1).

Provision B.4 (Water Quality Improvement Monitoring and Assessment) requires the Copermittees to develop an integrated monitoring and assessment program to track the progress of the Water Quality Improvement Plan toward meeting the implementation goals and schedules, and improving the water quality of the Watershed Management Area. Provision B.4 is the part of the Water Quality Improvement Plan where the Copermittees describe the monitoring data that will be collected, which is not only necessary to implement the "iterative approach" required by Provision A.4, but inform the adaptive management and "*comprehensive planning process*" that allows the Copermittees to make adjustments and modifications to the Water Quality Improvement Plans and the jurisdictional runoff management programs.

Provision B.4 requires the Copermittees, at a minimum, to include the requirements of Provision D as part of the water quality improvement monitoring and assessment program for the Water Quality Improvement Plan. The Copermittees, however, are not limited to the requirements of Provision D and may include additional monitoring and assessment methods to track progress toward improving water quality in the Watershed Management Area.

In addition to incorporating the requirements of Provision D, the water quality improvement monitoring and assessment program must incorporate any monitoring and assessment requirements specified for any applicable TMDLs included in Attachment E to the Order, and the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 for Watershed Management Areas with ASBS.

The monitoring and assessments required to be incorporated into the Water Quality Improvement Plan are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order.

Provision B.5 (Iterative Approach and Adaptive Management Process) requires the Copermittees to implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a.

Provision B.5 requires the Copermittees in each Watershed Management Area to re-evaluate the highest priority water quality conditions and potential water quality improvement strategies ~~numeric goals~~, the water quality improvement goals, strategies and schedules, and the water quality improvement monitoring and assessment program and provide recommendations for modifying those elements to improve the effectiveness of the Water Quality Improvement Plan. The re-evaluation of the Water Quality Improvement Plan is part of the assessment requirements of Provision D.

Provision B.6 (Water Quality Improvement Plan Submittal, Updates, and Implementation) requires to Copermittees to submit, update, and implement the Water Quality Improvement Plans.

The requirements for the process to develop and submit the Water Quality Improvement Plans is described in more detail under the discussion for Provision F.1. The process will include several opportunities for the public to provide input during the development of the Water Quality Improvement Plans. The process for updating the Water Quality Improvement Plans is described in more detail under the discussion for Provision F.3.c. Upon acceptance of the Water Quality Improvement Plan and updates, the Copermittees are required to immediately begin implementing the Water Quality Improvement Plan and subsequent updates.

The Water Quality Improvement Plan is expected to be a dynamic document that will evolve over time. The Water Quality Improvement Plan is also expected to be a long term plan that focuses the Copermittees' efforts and resources on a limited set of priority water quality conditions, with the ultimate goal of protecting all the beneficial uses of the receiving waters within the Watershed Management Area from impacts that may be caused or contributed to by MS4 discharges. As the Copermittees collect data, implement their jurisdictional runoff management programs, and review the results from their water quality improvement monitoring and assessment program, the Water Quality Improvement Plan is expected to be continually reviewed and updated until compliance with Provisions A.1.a, A.1.b, and A.2.a is achieved.

However, in specific cases supported by robust analytical documentation the ~~I~~implementation of the Water Quality Improvement Plans may ~~also~~ demonstrate that TMDLs are not ~~required~~ necessary for identified impaired water bodies within the Watershed Management Area if the analytical record demonstrates that~~. Impaired water bodies are not required to be placed on the 303(d) List, thus do not require a TMDL, if~~ technology-based effluent limitations required by the CWA, more stringent effluent limitations required by state, local, or federal authority, and/or other pollution control requirements (e.g., best management practices) required by local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time.[23]

The San Diego Water Board submits an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. According to USEPA guidance for the Integrated Report,[24] water bodies are placed in one of five categories. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 are placed on the 303(d) List.

[23] 40 CFR 130.7(b)(1)
[24] USEPA, 2005. Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act

Category 4 in the Integrated Report is for water bodies where available data and/or information indicate that at least one beneficial use is not being supported or is threatened, but a TMDL is not needed.[25] Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

Impaired water bodies can be included in Category 4a if a TMDL has been adopted and approved. The TMDLs in Attachment E to the Order implement the requirements of the TMDLs adopted by the San Diego Water Board, and approved by the State Water Board and USEPA. The water bodies in Attachment E will be included in Category 4a in the Integrated Report and removed from the 303(d) List.

Impaired water bodies can be included in Category 4b if there are *acceptable* "pollution control requirements" required by a local, state or federal authority stringent enough to implement applicable water quality standards within a reasonable period of time (e.g., a compliance date is set). When evaluating whether a particular set of pollution controls are "requirements," the USEPA considers a number of factors, including: (1) the authority (local, state, federal) under which the controls are required and will be implemented with respect to sources contributing to the water quality impairment (examples may include: self-executing state or local regulations, permits, and contracts and grant/funding agreements that require implementation of necessary controls), (2) existing commitments made by the sources and completion or soon to be completed implementation of the controls (including an analysis of the amount of actual implementation that has already occurred), (3) the certainty of dedicated funding for the implementation of the controls, and (4) other relevant factors as determined by USEPA depending on case-specific circumstances.[26]

Impaired water bodies can be included in Category 4c if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution. Pollution, as defined by the CWA is "the man-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of water."[27] In other cases, pollution does not result from a pollutant and a TMDL is not required. Examples of circumstances where an impaired segment may be placed in Category 4c include segments impaired solely due to lack of adequate flow, stream channelization, or hydromodification. In these situations, there may be water quality management actions that can address the cause(s) of the impairment, but a TMDL may not be required to implement the actions.

[25] Ibid
[26] Ibid
[27] CWA section 502(19)

The Water Quality Improvement Plans will require the implementation of pollution controls and water quality management actions (i.e. water quality improvement strategies) which can result in the attainment of water quality standards in water bodies impaired by discharges from the Copermittees' MS4s. The Water Quality Improvement Plans also include requirements that are expected to attain water quality standards in a reasonable period of time. The San Diego Water Board considers the Water Quality Improvement Plans to be a commitment by the Copermittees to develop, plan, budget for, and implement pollution controls that will attain water quality standards in receiving waters in a reasonable period of time, or as soon as possible. The results of the Copermittees' efforts in implementing the Water Quality Improvement Plans can be used to re-evaluate the condition of the impaired water bodies during the next update to the 303(d) List.

After the Copermittees submit the Water Quality Improvement Plans and demonstrate that water quality standards are being attained or will be attained in a reasonable period of time, the San Diego Water Board may re-evaluate the water bodies on the 303(d) List. These water bodies on the 303(d) List may be re-evaluated and placed into Category 4b or Category 4c in the Integrated Report. The water bodies placed in Category 4b or Category 4c in the Integrated Report must show a record that the water bodies are attaining water quality standards or supporting the identified beneficial uses, or will attain water quality standards or support identified beneficial uses in a reasonable period of time, in order for the water bodies to be appropriately removed from the 303(d) List.

C. Action Levels

Purpose: Provision C includes requirements for the Copermittees to identify and include numeric action levels in the Water Quality Improvement Plan to direct and focus the Copermittees' jurisdictional runoff management program implementation efforts for controlling MS4 discharges to receiving waters.

***Discussion*:** Under Provision C, the numeric action levels required are for non-storm water discharges and storm water discharges. The non-storm water action levels (NALs) are applicable to non-storm water discharges from the Copermittees' MS4s, which can occur year-round. The storm water action levels (SALs) are applicable to storm water discharges from the Copermittees' MS4s, which occur during the rainy season defined as the period between October 1 and April 30.

The action levels required by Provision C are based on the action level requirements that were developed and incorporated into Order Nos. R9-2009-0002 and R9-2010-0016, the Orange County and Riverside County MS4 Permits, respectively. The Fact Sheets for these Orders provide detailed discussions about the development of the numeric NALs and SALs included in this Order.

Order Nos. R9-2009-0002 and R9-2010-0016 required the Copermittees to perform prescribed actions if the NALs or SALs are exceeded. The actions required under Order Nos. R9-2009-0002 and R9-2010-0016 generally included conducting additional monitoring and source investigations when a discharge from the MS4 is observed to exceed one or more NALs and/or SALs.

For this Order, however, the action levels of Provision C are to be used by the Copermittees to prioritize the actions to be implemented as part of the Water Quality Improvement Plan. Monitoring data collected by the Copermittees from MS4 outfalls will be compared with the NALs and SALs. Exceedances of the NALs and SALs will not require the Copermittees to immediately identify sources causing exceedances, but will provide some numeric indicator levels that can give the Copermittees a way to measure the relative severity of a pollutant contributing to receiving water quality impacts.

NALs and SALs must be included in the Water Quality Improvement Plans to be used by the Copermittees in directing and focusing their water quality improvement strategies. The Copermittees are expected to utilize the NALs and SALs to help focus their implementation efforts on addressing pollutants that have the most significant potential or observed impacts to receiving waters. The NALs and SALs will be used as part of the MS4 discharges assessments required under Provision D.4.b. The NALs and SALs may also be used by the Copermittees as the numeric goals to be achieved in MS4 discharges and/or receiving waters as the Water Quality Improvement Plans are implemented.

More specific and detailed discussions of the requirements of Provision C are provided below.

Provision C.1 (Non-storm Water Action Levels) requires the Copermittees to incorporate NALs into the Water Quality Improvement Plan for pollutants and/or constituents that are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions identified in the Water Quality Improvement Plan related to non-storm water discharges from the MS4s. NALs generally must be consistent with the water quality objectives found within the Basin Plan.

The NALs have been included to ensure that the Copermittees are implementing and complying with several requirements of the MS4 permit. The federal CWA requires permits for municipal storm sewer systems to "*effectively prohibit non-storm water discharges into the storm sewers*." The federal NPDES regulations, which were promulgated to implement the CWA requirements for discharges from municipal storm sewers, require a program to address illicit discharges, which are non-storm water discharges. Provision A.1.b prohibits "*[n]on-storm water discharges into MS4s*" unless the non-storm water discharge authorized by a separate NPDES permit~~, or is a category of non-storm water specified in Provisions E.2.a.(1)-(5) that does not need to be addressed through ordinance, order or similar means and is not a source of pollutants~~. The NALs will be used as part of the illicit discharge detection and elimination program required pursuant to Provision E.2, as well as part of the MS4 discharges assessments required pursuant to Provision D.4.b.

Provision A.1.a prohibits non-storm water discharges from the MS4 from "*causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state.*" In addition, pursuant to Provision A.2.a, non-storm water discharges "*must not cause or contribute to the violation of water quality standards in any receiving waters*."

Ideally, the Copermittees' jurisdictional runoff management programs will eliminate all non-storm water discharges entering the MS4s within their jurisdictions. The complete elimination of non-storm water discharges to the Copermittees' MS4s would be in compliance with the CWA requirements for non-storm water discharges, as well as the prohibitions and limitations of Provisions A.1.a and A.2.a.

The federal regulations, however, also refer to several non-storm water discharge categories that must be addressed as illicit discharges if they are found to be a source of pollutants. The federal regulations thus identify some non-storm water discharges that are not required to be addressed as illicit discharges if they are not a source of pollutants (e.g. non-storm water discharges specified in Provisions E.2.a.(1)-(5)). Thus, these regulations imply that some non-storm water discharges into and from the MS4 may occur even if non-storm water discharges are "effectively" prohibited by the Copermittees.

If the source of a non-storm water discharge is identified as a category of non-storm water specified in Provisions E.2.a.(1)-(5), the NALs can be used to determine the category of non-storm water discharges is a source of pollutants. For other non-storm water discharges not specified in Provisions E.2.a.(1)-(5), the CWA requires those discharges to be "*effectively"* prohibited by removing the discharge to the MS4 through enforcement of the Copermittees' legal authority established under "*ordinance, order or similar means*~~.~~" to prohibit illicit discharges to the MS4s.

If there are non-storm water discharges that are not required to be addressed as illicit discharges~~, however~~, those discharges must comply, at a minimum, with the discharge prohibitions and receiving water limitations of Provision A. Thus, the non-storm water discharges from the MS4 must be at levels that will not cause or contribute to a condition of pollution, contamination, or nuisance (Provision A.1.a), and must not cause or contribute to a violation of water quality standards in receiving waters (Provision A.2.a) to be consistent with the discharge prohibitions and receiving water limitations of Provisions A.1.a and A.2.a.

Furthermore, the San Diego Region has predominantly intermittent and ephemeral rivers and streams which vary in flow volume and duration at spatial and temporal scales. For most of these river and stream systems, non-storm water discharges from the MS4 are likely to be the most significant or the only source contributing to surface flows present within the receiving water, especially during the dry season.

Therefore, because of the prohibitions and limitations of Provision A.1.a and A.2.a, and the likelihood that non-storm water discharges from the MS4 are the most significant or only source contributing to surface flows present within the receiving water, NALs generally must be consistent with the water quality objectives found within the Basin Plan. Non-storm water discharges that are meeting the NALs would not be expected to cause or contribute to an exceedance of water quality objectives in receiving waters, which would be consistent with the discharge prohibitions and receiving water limitations of Provisions A.1.a and A.2.a.

Exceedances of the NALs would then provide an indication of the relative severity of a pollutant in non-storm water discharges from the MS4 contributing to potential or observed receiving water quality impacts. The relative severity or significance of a pollutant in non-storm water discharges from the MS4 will provide the Copermittees a valuable source of information that can be used to identify priority water quality conditions within a Watershed Management Area and within each Copermittee's jurisdiction.

Tables C-1 through C-4 under Provision C.1.a specify numeric NALs for several parameters or pollutant constituents for non-storm water discharges from the MS4 to several water body types. The NALs for MS4 discharges given under Provision C.1.a are based on the water quality objectives for inland surface waters in the Basin Plan, and the water quality objectives for ocean waters in the Ocean Plan. The NALs for most of the metals were calculated based on the State Policy for Implementation of

Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP). The NALs provided in Tables C-1 through C-4 must be included in the Water Quality Improvement Plans required to be developed pursuant to Provision B.

Provision C.1.b requires the Copermittees to identify NALs for pollutants and/or constituents, not specified in Provision C.1.a, which are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions of the Watershed Management Area related to non-storm water discharges from the MS4s. The NALs must be based on the water quality objectives in the Basin Plan. The NALs identified under Provision C.1.b must be included in the Water Quality Improvement Plan.

The San Diego Water Board recognizes that some of the NALs required pursuant to Provisions C.1.a and C.1.b may be exceeded more frequently than not. Thus, Provision C.1.c has been included in the Order to provide the Copermittees the option to develop secondary NALs that are set at levels greater than the levels required pursuant to Provisions C.1.a and C.1.b to further refine the prioritization and assessment of water quality improvement strategies for addressing non-storm water discharges to and from the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and from the MS4.

Provision C.2 (Storm Water Action Levels) requires the Copermittees to incorporate SALs into the Water Quality Improvement Plan for pollutants and/or constituents causing or contributing, or may be causing or contributing, to the highest priority water quality conditions identified in the Water Quality Improvement Plan related to storm water discharges from the MS4s.

The SALs have been included to ensure that the Copermittees are implementing and complying with several requirements of the MS4 permit. Provision A.1.a prohibits storm water discharges from the MS4 from "*causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state.*" In addition, pursuant to Provision A.2.a, storm water discharges "*must not cause or contribute to the violation of water quality standards in any receiving waters*."

Provision A.3.a, however, implicitly acknowledges that compliance with Provisions A.1.a and A.2.a cannot be achieved immediately for discharges of storm water from the MS4 by applying the MEP standard. Thus, Provision A.4 requires the Copermittees to implement an iterative approach to demonstrate that MEP is being achieved. This approach is supported by USEPA.

The federal CWA requires permits for municipal storm sewer systems to "*require controls to reduce the discharge of pollutants [in storm water] to the maximum extent practicable*, *including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State*

determines appropriate for the control of such pollutants." MEP is an ever-evolving, flexible, and advancing concept. As knowledge about controlling storm water runoff and discharges evolves, so does the knowledge which constitutes MEP. Reducing the discharge of storm water pollutants from the MS4 to the MEP requires the Copermittees to assess their jurisdictional runoff management programs and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP. The SALs provide the Copermittees measureable goals that may be used to demonstrate the achievement of MEP for reducing pollutants in storm water discharges from the MS4. The SALs will be used as part of the MS4 discharges assessments required under Provision D.4.a.

In June of 2006, the State Water Board's Blue Ribbon Storm Water Panel released its report titled "*The Feasibility of Numerical Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities*." In the recommendations, the Blue Ribbon panel proposed storm water effluent limitations which are computed using statistical based population approaches. The SALs specified in Table C-5 under Provision C.2.a were developed from a regional subset of nationwide Phase I MS4 data by using USEPA Rain Zone 6 (arid west) data.[28] Additionally, utilization of regional data is appropriate due to the addition of data into the nationwide Phase I MS4 monitoring dataset in February 2008. This additional data increased the number of USEPA Rain Zone 6 samples to more than 400, and included additional monitoring events within Southern California.

Utilizing data from USEPA Rain Zone 6 resulted in SALs which closely reflect the environmental conditions experienced in the San Diego Region. The localized subset of data includes sampling events from multiple Southern California locations including Orange, San Diego, Riverside, Los Angeles, and San Bernardino Counties. The dataset includes samples taken from highly built-out impervious areas and from storm events representative of Southern California conditions.

The SALs for cadmium, copper, lead and zinc require the measurement of hardness and to provide more specificity in the assessment of samples with SALs for total metal concentrations. While USEPA Rain Zone 6 data include a large sample size for concentrations of total metals, the impact the concentration will have on receiving waters will vary with receiving water hardness. Since it is the goal of the SALs, through the iterative process and MEP standard, to have MS4 storm water discharges meet all applicable water quality objectives, the hardness of the receiving water should be used when assessing the total metal concentration of a sample.

Thus, when there is an exceedance of a SAL for a metal, the Copermittee must determine if that exceedance is above the existing applicable water quality objectives based upon the hardness of the receiving water. The water quality objectives Copermittees must use to assess total metal SAL exceedances are the California Toxic Rule (CTR) and USEPA National Recommended Water Quality Criteria for

[28] Data used to develop SAL were obtained from http://rpitt.eng.ua.edu/Research/ms4/mainms4.shtml

Freshwater Aquatic Life 1 hour maximum concentrations. The 1 hour maximum concentration is to be used for comparison since it is expected to most replicate the impacts to waters of the State from the first flush following a precipitation event.

The statistically calculated SALs given in Table C-5 are at levels greater than the water quality objectives in the Basin Plan or Ocean Plan. Because the objective of the CWA is to "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*", meaning eventually pollutants in storm water discharges must be reduced to a level that cannot cause or contribute to an exceedance of water quality objectives in receiving waters, over time the SALs are expected to be reduced to a level that is based on the water quality objectives rather than statistical calculations. The San Diego Water Board will review the SALs as more data for discharges of storm water from the MS4s are collected, and revise them as conditions improve and the MEP standard advances. For the Water Quality Improvement Plans required under this Order, the SALs identified under Provision C.2.a must be included.

Provision C.2.b requires the Copermittees to identify SALs for pollutants and/or constituents, not specified in Provision C.2.a, which are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions of the Watershed Management Area related to storm water discharges from the MS4s. The SALs identified under Provision C.2.b must be included in the Water Quality Improvement Plan.

The San Diego Water Board recognizes that some of the SALs required pursuant to Provisions C.2.a and C.2.b may be exceeded more frequently than not. Thus, Provision C.2.c has been included in the Order to provide the Copermittees the option to develop secondary SALs that are set at levels greater than the levels required pursuant to Provisions C.2.a and C.2.b to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s.

D. Monitoring and Assessment Program Requirements

Purpose: Provision D includes minimum monitoring and assessment requirements that must be developed and implemented by the Copermittees as part of the Water Quality Improvement Plans. Implementation of the monitoring and assessment requirements of Provision D will allow the Copermittees to demonstrate that the requirements of the CWA to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP are being achieved. Implementation of the monitoring and assessment requirements of Provision D will also allow the Copermittees and the San Diego Water Board to track improvements to the water quality in the San Diego Region. The monitoring and assessment program requirements are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order.

***Discussion*:** The San Diego Water Board recognized that changes to the monitoring and assessment requirements of the Fourth Term Permit were necessary to improve the usefulness and usability of monitoring data collected by the Copermittees to support their jurisdictional storm water programs more efficiently and with increased effectiveness. The data collected are needed to better inform the Copermittees' understanding of the physical, chemical, and biological condition of the receiving waters and the quality of the MS4 discharges. The monitoring program needs to provide opportunities for the Copermittees to integrate regional monitoring efforts into municipal storm water monitoring requirements to provide a cost-effective approach to monitoring and avoid duplication of efforts.

The requirements in Provision D were largely recommended by the Copermittees as an outcome of the San Diego Water Boards Focused Meeting process. The monitoring and assessment program requirements now require collection of more specific information necessary for each Copermittee to adapt its jurisdictional runoff management program in such a way that focuses resources on a watershed's highest priority water quality conditions. The monitoring and assessment program will require the Copermittees to collect data that can be utilized to answer both watershed level management questions (e.g. Are the chemical, physical, and biological conditions of a receiving water protective, or likely protective of beneficial uses?), and specific jurisdictional runoff management program activity questions (e.g. Are the water quality improvement strategies of the jurisdictional program effectively eliminating non-storm water discharges to the MS4?).

The monitoring data collected and assessment information that will be reported to the San Diego Water Board are necessary to determine if the Copermittees are complying with the prohibitions and limitations of Provision A. The required monitoring and assessments that must be reported to the San Diego Water Board will be utilized for three purposes:

(1) Inform the Copermittees, San Diego Water Board, and the public on the progress

of the Copermittees' efforts to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP;

(2) Inform the Copermittees, San Diego Water Board, and the public on the condition of water bodies receiving discharges from the Copermittees' MS4, and the progress of the Copermittees' water quality improvement implementation efforts toward improving the receiving water quality; and

(3) Inform the Copermittees, the San Diego Water Board, and the public on the effectiveness of the Water Quality Improvement Plan toward achieving (1) and (2).

The monitoring and assessment information reported pursuant to Provision F is also expected to be key to the iterative approach and adaptive management process required under Provision A.4 and implemented through the Water Quality Improvement Plan required under Provision B. As required by Provision A.4, the iterative approach and adaptive management process is required if the Copermittees cannot meet the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c, and/or A.2.a under the present conditions.

Provision D provides the minimum monitoring and assessment requirements that must be included in each Water Quality Improvement Plan to be developed and implemented by the Copermittees. The Copermittees, however, are not limited to the requirements of Provision D and may include additional methods to track progress toward improving water quality in a Watershed Management Area.

More specific and detailed discussions of the requirements of Provision D are provided below.

<u>Provision D.1 (Receiving Water Monitoring Requirements)</u> specifies the minimum receiving water monitoring that the Copermittees must conduct within the Watershed Management Area and include as part of the Water Quality Improvement Plan.

Provision D.1 establishes minimum monitoring requirements that must be conducted by the Copermittees within each Watershed Management Area. Provision D.1 requires the Copermittees to collect and develop the data and information necessary to determine potential impacts to the beneficial uses in the receiving waters due to discharges from the MS4s. The monitoring required under Provision D.1 will also provide the data that will allow the Copermittees to gauge the effectiveness and progress of its Water Quality Improvement Plan implementation efforts toward improving the quality of receiving waters.

The receiving water monitoring requirements of Provision D.1 are focused primarily on monitoring the conditions and response of the receiving waters to the Copermittees' collective implementation efforts to reduce receiving water impacts that may be

caused by the discharges from the MS4s. The preference of the San Diego Water Board is for the Copermittees to spend their resources achieving tangible and observable improvements in receiving water conditions instead of collecting samples and analyzing data that has consistently indicated that receiving water conditions are degraded and require improvement. In general, the ability to measure potential improvements in receiving water conditions due to any actions implemented by the Copermittees as part of the Water Quality Improvement Plan may require several years before a response can be observed. Thus, the frequency of collecting receiving water monitoring data has been kept to a minimum.

During the transitional period between adoption of this Order and San Diego Water Board acceptance of a Water Quality Improvement Plan, the Copermittees must conduct receiving water monitoring in accordance with Provision D.1.a. This approach to collecting receiving water data is different from what was required in the Fourth Term Permits, but one that truly embraces the concept of an integrated, cost-effective, streamlined receiving water monitoring approach.

Provision D.1.a requires Copermittees to continue performing the receiving water monitoring programs required in Order Nos. R-2007-0001, R9-2009-002, and R9-2010-0016; plus participation in: hydromodification management plan monitoring approved by the San Diego Water Board, monitoring plans as part of load reduction plans (either Bacteria Load Reduction Plans or Comprehensive Load Reduction Plans) for TMDLs in Attachment E of the Order, Storm Water Monitoring Coalition Regional Monitoring, Southern California Bight Regional Monitoring, Sediment Quality Monitoring, and ASBS Monitoring as applicable to a Watershed Management Area.

Provision D.1.a also provides an opportunity for the Copermittees to use third party data to meet receiving water monitoring requirements where feasible. Allowing the Copermittees to use the data currently collected through its participation in existing regional receiving water programs and that of third parties provides an efficiency of resources in obtaining the data necessary to inform the Copermittees and the San Diego Water Board about the physical, chemical, and biological conditions of the receiving waters, which can also help to focus the receiving water monitoring during the implementation of the Water Quality Improvement Plan. Once a Water Quality Improvement Plan is developed for a Watershed Management Area in compliance with Provision B of this Order, the transitional period is over and Copermittees are required to conduct receiving water monitoring according to the requirements of Provision D.1.b-e.

Provision D.1.b requires each Copermittee to identify at least one long term receiving water monitoring station to be representative of receiving water quality within each Watershed Management Area. Long term receiving water monitoring stations can be located at any existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees. The requirements under Provision D.1.b. are consistent with 40 CFR 122.26(d)(2)(iii)(D), which specifies that a "*monitoring program*

for representative data collection for the term of the permit" may include "*instream locations.*" For each Watershed Management Area, at least one long term watershed monitoring station is required to be established and monitored. The Copermittees may choose to establish additional long term monitoring stations where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

Provision D.1.b. requires the Copermittees to locate the long term receiving water monitoring station at one of these existing receiving water monitoring stations to provide the Copermittees an opportunity to experience monitoring cost savings while continuing to collect the necessary data to assess the status and trends of receiving water quality conditions in 1) coastal water, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under both dry weather and wet weather conditions. Ideally these stations will continue to be monitored as part of the receiving water monitoring for each Watershed Management Area to maintain a consistent set of locations and a period of data that can be built upon with the monitoring required under this Order.

The receiving water monitoring requirements are separated into monitoring required during dry weather conditions pursuant to Provision D.1.c, and wet weather conditions pursuant to Provision D.1.d.

At each long term monitoring station the Copermittees must conduct at least three dry weather monitoring events as required pursuant to Provision D.1.c and at least three wet weather monitoring events as required pursuant to Provision D.1.d per permit term. Provision D.1.c and D.1.d require the Copermittees to monitor priority water quality conditions identified in the Water Quality Improvement Plan, constituents listed as causing impairment of receiving waters in the Watershed Management Area, applicable NALs, toxicity, constituents listed in Tables D-2 and D-3, and constituents for implementation plans (e.g. Bacteria Load Reduction Plans and Comprehensive Load Reduction Plans). Required toxicity monitoring was changed to reflect an updated understanding of the unique challenges associated with sampling storm water for toxicity. Copermittees are required to sample storm water for toxicity during each dry weather and each wet weather event pursuant to Provision D.1.c.(4) and D.1.d.(4). Required toxicity monitoring is now consistent with the State Water Resources Control Board Policy for Toxicity Assessment and Control (Draft june2012) and recently adopted MS4 permits for Caltrans and Los Angeles Water Board. Receiving water monitoring efforts in this Order have been streamlined to redirect resources to monitoring efforts that better support pollutant reduction solutions with an increasing emphasis on MS4 outfall monitoring, source identification and source abatement activities.

In addition to the receiving water monitoring requirements under Provisions D.1.b-d, Provision D.1.e requires the Copermittees participate in and/or conduct other types of receiving water monitoring. As recommended and requested by the Copermittees, Provision D.1.e.(1) requires the Copermittees to participate in existing regional monitoring, as applicable to each Watershed Management Area. Existing regional monitoring includes monitoring conducted by the Storm Water Monitoring Coalition

and for the Southern California Bight. Participation in and use of monitoring data collected from these existing regional water quality monitoring programs provide the Copermittees a greater opportunity for efficiency in the use of their resources to manage their storm water programs and those controllable discharges under their authority.

The State Water Resources Control Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part 1 Sediment Quality which became effective August 25, 2009 (Sediment Quality Monitoring Policy). Provision D.1.e.(2) requires any Copermittees with MS4 discharges to an enclosed bay or estuary to monitoring the sediments in the enclosed bay or estuary receiving water in accordance with the sediment quality monitoring procedures as prescribed in the Sediment Quality Monitoring Policy.

The State Water Board adopted Resolution No. 2012-0012 which approved exceptions to the California Ocean Plan for selected discharges into Areas of Special Biological Significance (ASBS), including special protections for beneficial uses. State Board Resolution No. 2012-0012 became effective on March 20, 2012, and Attachment B to the Resolution established limitations on point source storm water discharges to ASBS. Copermittees with MS4s that discharge to an ASBS must monitor its discharge to assure compliance with State Board Resolution No. 2012-0012 as required pursuant to Provision D.1.e.(3).

The San Diego Water Board is currently developing a regional monitoring strategy to assess the conditions of receiving waters in the San Diego Region. The monitoring requirements of Provision D.1 are expected to be incorporated or serve as a foundation of this regional monitoring strategy, but may require some modifications. When the San Diego Water Board develops an alternative regional monitoring strategy, the Copermittees will be required to participate in the development and implementation of the alternative regional monitoring program pursuant to Provision D.1.f.

Provision D.2 (MS4 Outfall Discharge Monitoring Requirements) specifies the minimum MS4 outfall discharge monitoring requirements that the Copermittees must incorporate and implement as part of the Water Quality Improvement Plan.

The dry weather MS4 outfall discharge monitoring requirements are included under Provisions D.2.a.(2) and D.2.b. The dry weather MS4 outfall discharge monitoring requirements are part of the "*program, including a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer*" required by 40 CFR 122.26(d)(2)(iv)(B), which is expected to achieve compliance with the CWA section 402(p)(3)(B)(ii) statutory requirement for municipal storm water permits to require the Copermittees to "*effectively prohibit non-storm water discharges into the storm sewers*." The dry weather MS4 outfall discharge monitoring data

collection requirements are based on requirements under 40 CFR 122.26(d)(1)(iv)(D) and 122.26(d)(2)(iv)(B)(3).

The dry weather MS4 outfall discharge monitoring requirements are designed to provide wide spatial and temporal coverage of each jurisdiction to better understand the extent and magnitude of non-storm water discharges to receiving waters, and make a distinction between persistent and transient non-storm water flows. This information is expected to allow each Copermittee to focus its resources on eliminating and controlling the highest priority threats to receiving water quality, as well as integrating other elements of the storm water programs (e.g. complaint call response) and third party data to efficiently and effectively assist in efforts to eliminate non-storm water discharges.

The dry weather MS4 outfall discharge monitoring requirements of Provision D.2.a.(2) and D.2.b are separated into monitoring required before and after the San Diego Water Board accepts the Copermittees' Water Quality Improvement Plan. Outfall monitoring conducted prior to acceptance of the Water Quality Improvement Plan is referred to in the Order as Transitional MS4 Outfall Discharge Monitoring. Provision D.2.a.(2) includes the transitional dry weather MS4 outfall discharge monitoring requirements.

The requirements under Provision D.2.a.(2) are based on the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B), which include the requirements for a monitoring program to identify, detect, and eliminate illicit connections and illegal discharges to the MS4s. The federal regulations (40 CFR 122.26(d)(1)(iv)(D)) require the monitoring program to include "*a field screening analysis for illicit connections and illegal dumping [that]…[a]t a minimum, include[s] a narrative description, for either each field screening point or major outfall, of visual observations made during dry weather periods.*" The federal regulations (40 CFR 122.26(d)(1)(v)(B)) require the monitoring program to include "*inspection procedures and methods for detecting and preventing illicit discharges, and describe areas where this program has been implemented.*" Furthermore, the monitoring program is required by federal regulations (40 CFR 122.26(d)(2)(iv)(B)) to include "*a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer.*"

Dry weather transitional MS4 outfall discharge monitoring requires each Copermittee to field screen (inspect) its major MS4 outfalls to classify the MS4 outfall locations as having persistent dry weather flows, transient dry weather flows, or no dry weather flows. To account for the variance in size of the 39 jurisdictions covered under this Order, the Copermittees recommended a tiered approach to the number of major MS4 outfalls that must be inspected. Provision D.2.a.(2)(a) provides a tiered approach to the number of major MS4 outfalls that must be visually inspected per jurisdiction as well as a minimum frequency each Copermittee must inspect each major MS4 outfall per year. This tiered approach is based on the total number of major MS4 outfalls within a Copermittees jurisdiction within each Watershed Management Area.

Based on the field screening, each Copermittee is required to make a determination whether any observed flowing, pooled, or ponded waters are transient or persistent flows. Based on this field screening information, other jurisdictional program information, and third party information, each Copermittee is required to prioritize the MS4 outfalls within its jurisdiction for follow up investigation and elimination of the non-storm water discharge, as part of its illicit discharge detection and elimination program required pursuant to Provision E.2. In accordance with the requirements of Provision E.2, each Copermittee is required to immediately investigate obvious illicit discharges (e.g. outfall discharges with unusual color, unusual odor, or high flows).

This approach allows a Copermittee to use all of its resources, as well as leverage resources and information provided by third parties, to effectively eliminate non-storm water discharges from its MS4 outfalls. If the source of the non-storm water discharge cannot be immediately eliminated, the Copermittee uses the persistent flow or transient flow classification along with other programmatic implementation data to prioritize the MS4 outfalls for future investigation. In accordance with the adaptive management approach deployed throughout this Order, Provision D.2.a.(2)(c) requires each Copermittee to update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow. The requirement of Provision D.2.a.(2)(c) assures that each Copermittee is collecting data that can be used to demonstrate compliance with the CWA requirement that each Copermittee must implement a program to "*effectively prohibit non-storm water discharges into the [MS4]*" and with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

Provision D.2.b describes the dry weather MS4 outfall discharge monitoring required to be incorporated and implemented as part of the Water Quality Improvement Plan. Dry weather MS4 outfall discharge monitoring must be performed by each Copermittee to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to E.2.d~~3~~. The emphasis of the dry weather MS4 outfall discharge monitoring required pursuant to Provision D.2.b is consistent with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

Provision D.2.b.(1) requires each Copermittee to continue field screening its major MS4 outfalls and identifying those with persistent flows and transient flows, as conducted during the transitional period (i.e. before the Water Quality Improvement Plan was developed). However, each Copermittee now has the flexibility to adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of non-storm water persistent flow discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan. In order to ensure a minimum number of outfalls are inspected, Provision D.2.b.(1) requires the number of visual

inspections be equal to the number of visual inspections required in the tiered inspection program pursuant to Provision D.2.a.(2)(a).

Provision D.2.b.(2)(b) requires each Copermittee to monitor a minimum of ~~10~~ 5 major MS4 outfalls with persistent flows identified as the highest priorities within a Copermittee's jurisdiction, ~~and~~ within each Watershed Management Area. In other words, Copermittees located in more than one Watershed Management Area must identify at least ~~10~~ 5 major MS4 outfalls with persistent flows ~~per~~ in its jurisdiction in each Watershed Management Area. If a Copermittee is located in more than one Watershed Management Area, ~~but there are~~ and they have less than ~~10~~ 5 major MS4 outfalls with persistent flows ~~within the area of its jurisdiction located in the~~ per jurisdictional area per Watershed Management Area, all of the ~~those~~ major MS4 outfalls must be identified as ~~the~~ high~~est~~ priority dry weather persistent flow MS4 outfalls. The Copermittees identified as Responsible Copermittees by a TMDL in Attachment E of the Order may need to monitor more than 5 dry weather major MS4 outfall locations to determine compliance with the requirements of the TMDL(s).

Monitoring must occur at the highest priority outfall locations at least semi-annually until the non-storm water discharges have been eliminated for three consecutive dry weather monitoring events; identified to be authorized by a separate NPDES Permit; or reprioritized to a lower priority. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized MS4 major outfall in the Copermittee's jurisdiction within the Watershed Management Area, unless there are no remaining qualifying major MS4 outfalls within the Copermittees jurisdiction. The Copermittees must continually update their dry weather persistent flow MS4 outfall discharge monitoring locations with the next highest priority non-storm water flow that have yet to be eliminated until all persistent and transient flows are eliminated or its threat reduced.

Non-storm water persistent flow MS4 outfall discharge monitoring data collected during each semi-annual monitoring event, must be collected and analyzed according to the requirements of Provision D.2.b.(2)(b)–(e). These monitoring requirements are consistent with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

The wet weather MS4 outfall discharge monitoring requirements are included under Provisions D.2.a.(3) and D.2.c. The wet weather MS4 outfall discharge monitoring requirements are necessary for the Copermittees to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable, using management practices, control techniques and system, design and engineering methods, and such other provisions which are appropriate*" required by 40CFR 122.26(d)(2)(iv), which is expected to achieve compliance with the CWA section 402(p)(3)(B)(iii) statutory requirement for municipal storm water permits to require "*controls to reduce the discharge of pollutants [in storm water] to the maximum extent practicable*." The wet weather MS4 outfall discharge monitoring data collection

requirements are based on requirements under 40 CFR 122.26(d)(2)(iii), 122.26(d)(2)(iii)(A) and 122.26(d)(2)(iii)(A)(1)-(4), and 40 CFR 122.21(g)(7)(i)-(ii).

The wet weather MS4 outfall discharge monitoring requirements of Provision D.2.a.(3) and D.2.c are separated into monitoring required before and after the San Diego Water Board accepts the Copermittees' Water Quality Improvement Plan. Outfall monitoring conducted prior to acceptance of the Water Quality Improvement Plan is referred to in the Order as Transitional MS4 Outfall Discharge Monitoring. Provision D.2.a.(3) includes the transitional wet weather MS4 outfall discharge monitoring requirements.

Until the wet weather MS4 outfall discharge monitoring requirements of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board, the Copermittees must comply with the requirements of transitional wet weather MS4 outfall monitoring requirements pursuant to Provision D.2.a.(3). Provision D.2.a.(3) requires each Copermittee to sample, at least five of the major MS4 outfalls inventoried pursuant to Provision D.2.a.(1) twice per wet season for the monitoring data required to be collected pursuant to Provision D.2.a.(3)(c)-(e).

At a minimum, the five sampling locations chosen must be representative of storm water discharges from residential, commercial, industrial, and typical mixed-use land uses present within a Watershed Management Area. The San Diego Water Board expects the Copermittees to extrapolate from these data to similar land uses throughout the Watershed Management Area to better inform the Water Quality Improvement Plan development process by prioritizing drainages for implementation of storm water control efforts required pursuant to Provision E.

Provision D.2.c describes the wet weather MS4 outfall discharge monitoring required to be included and implemented as part of the Water Quality Improvement Plan. Provision D.2.c provides the Copermittees the flexibility to adjust the wet weather MS4 outfall discharge monitoring locations and frequencies in the Watershed Management Area, as needed, to identify sources of pollutants in storm water discharges from MS4s in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan.

Although Provision D.2.c.(1) allows the Copermittees to adaptively manage the wet weather MS4 outfall discharge monitoring locations and frequencies, the provision requires a minimum of at least five wet weather outfall stations to be monitored. Provision D.2.c.(2) further ~~requires~~ allows the Copermittees to modify the monitoring frequency at each wet weather MS4 outfall station to meet the goals of the Water Quality Improvement Plan as long as the monitoring frequency occurs at least once per year and is at an appropriate frequency to identify sources of pollutants in storm water discharges, guide pollutant source identification efforts, or determine compliance with the requirements of the applicable TMDLs in Attachment E to the Order.

The wet weather MS4 outfall discharge monitoring requirements of Provisions D.2.c.(3) and D.2.c.(4) are the same as the transitional wet weather MS4 outfall discharge monitoring. In contrast, the requirements of Provision D.2.c.(5) are focused on collecting analytical data specific to the highest priority water quality conditions in the Watershed Management Area identified in the Water Quality Improvement Plan. The wet weather MS4 outfall discharge monitoring data collection requirements are consistent with the requirements under 40 CFR 122.26(d)(2)(iii), 122.26(d)(2)(iii)(A) and 122.26(d)(2)(iii)(A)(1)-(4), and 40 CFR 122.21(g)(7)(i)-(ii).

Provision D.3 (Special Studies) requires the Copermittees to develop special studies that will be conducted for each Watershed Management Area and the entire San Diego Region. Data collected pursuant to Provision D.3 is to be used by the Copermittees to improve the effectiveness of the strategies implemented by the jurisdictional runoff management programs toward achieving the numeric goals identified in the Water Quality Improvement Plans and ultimately achieve compliance with the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c, and A.2.a, which is consistent with the requirements of Provision A.4.

Special studies are often necessary to fill data gaps or provide more refined information that allow the Copermittees to better manage the generation or elimination of pollutants and discharges to and from the MS4. In the Fourth Term Permits, the Copermittees have been required to implement special studies as directed by the San Diego Water Board. The special studies required by this Order provide the Copermittees more flexibility to identify and implement special studies that will be most useful to improving the effectiveness of their jurisdictional runoff management programs.

Provision D.3.a.(1) requires the Copermittees to develop and conduct at least ~~three~~ two special studies per Watershed Management Area, to be determined by the Copermittees. One of the ~~three~~ two special studies may be accomplished through participation in a Regional Special Study required under Provision D.3.a.(2). The requirements provide the Copermittees great latitude in identifying and developing the special studies. Watershed Management Area special studies are required, at a minimum, to: (a) relate in some way to the highest water quality priorities identified by the Copermittees in the Water Quality Improvement Plan, (b) be conducted within the Watershed Management Area, and (c) include some form of participation (e.g. contribution of funds, personnel services, project management) by all the responsible Copermittees within the Watershed Management Area.

Examples of Watershed Management Area special studies might include, but are not limited to: (1) focused pollutant source identification studies, (2) BMP effectiveness and/or comparison studies, (3) pilot tests for new or emerging pollutant control methods, (4) receiving water pollutant or stressor source identification and/or mitigation studies, or (5) pollutant fate and transport studies. The Watershed Management Area special studies are expected to provide data that can be utilized by the Copermittees to improve the Water Quality Improvement Plan or implementation of

the Copermittees' jurisdictional runoff management programs to address the highest priority water quality conditions.

Provision D.3.a.(2) requires the Copermittees to develop at least one special study~~ies~~ that will be conducted for the entire San Diego region. The regional special study~~ies~~ ~~are~~ is expected to provide data that can be utilized by the Copermittees to improve the Water Quality Improvement Plan or implementation of the Copermittees' jurisdictional runoff management programs to identify or address regional water quality concerns and priorities.

An example of a regional special study would be to develop and establish allowable exceedance frequencies of the bacteria water quality objectives for several types of water bodies, during different wet and dry weather conditions the San Diego region. The special study would be related to bacteria, which is a priority for the San Diego region due to the adoption of "*Bacteria TMDL Project I – Beaches and Creeks in the San Diego Region*." The study results could be used to inform the Copermittees and the San Diego Water Board about the indictor bacteria water quality objective exceedance frequencies that occur in natural or reference watersheds.

Provision D.4 (Assessment Requirements) specifies the assessments that the Copermittees are required to perform, based on the monitoring data collected, and will be reported as part of the Annual Report for the Water Quality Improvement Plan implementation. Provision D.4 requires the Copermittees assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c, and A.2.a.

Provision D.4 specifies the assessments that Copermittees must perform for each Watershed Management Area to assess the effectiveness of each Copermittee's jurisdictional runoff management program and the Water Quality Improvement Plan. The effectiveness of each Copermittee's jurisdictional runoff management program and Water Quality Improvement Plan is measured through these types of assessments: (a) Receiving Waters Assessments (b) MS4 Outfall Discharges Assessments, (c) Special Studies Assessments, and (d) Integrated Assessment of Water Quality Improvement Plan.

Provision D.4.a requires the Copermittees to assess the status of receiving water conditions annually during the transitional monitoring period (during development of the Water Quality Improvement Plan) and after acceptance of the Water Quality Improvement Plan. The monitoring data collected pursuant to Provision D.1 will be evaluated, among other information, to assess the condition of a Watershed Management Area's streams, coastal waters, enclosed bays, harbors, estuaries, and lagoons. The focus of the receiving waters assessments is to measure progress toward the objective of the CWA to "*restore and maintain the chemical, physical, and biological integrity of the Nation's waters*" as the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program are implemented within a Watershed Management Area. Provision D.4.a is consistent with 40 CFR

122.42(c)(7) which requires the Copermittees to annually report the *"[i]dentification of water quality improvements or degradation."*

Provision D.4.b includes the MS4 outfall discharges assessment requirements. The focus of MS4 outfall discharges assessments is to determine if the Copermittees' are implementing programs that comply with the requirements of the CWA for MS4 permits to "*effectively prohibit non-stormwater discharges into the storm sewers*" and "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable.*" The monitoring data collected pursuant to Provisions D.2 will be evaluated, among other information, to assess the effectiveness of the transitional MS4 outfall field screening monitoring, the implementation of the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program. The MS4 outfall discharge assessments consist of Non-Storm Water Discharges Reduction Assessments and Storm Water Pollutant Discharges Reduction Assessments.

The Non-Storm Water Discharges Reduction Assessments are how each Copermittee will demonstrate that its jurisdictional runoff management program implementation efforts are achieving the CWA requirement to "*effectively prohibit non-stormwater discharges into the storm sewers.*" Provision D.4.b.(1) requires each Copermittee to assess and report on its illicit discharge detection and elimination program required pursuant to Provision E.2 to reduce and effectively prohibit non-storm water and illicit discharges into the MS4 within its jurisdiction. The Non-Storm Water Discharges Reduction Assessments include specific assessment requirements applicable to each Copermittee.

As each Copermittee collects and analyzes the data collected pursuant to dry weather MS4 outfall discharges monitoring requirements of Provisions D.2.a.(2) and D.2.b, Provision D.4.b.(1) requires each Copermittee to assess the progress, assess the effectiveness of its current actions, and identify modifications necessary to increase the effectiveness of its actions toward reducing and eliminating non-storm water and illicit discharges to its MS4. The findings from these assessments are expected to be utilized by the Copermittee as part of its procedures to prioritize the non-storm water discharges that will be addressed by its Illicit Discharge Detection and Elimination program required pursuant to Provision E.2.

The assessment requirements of Provision D.4.a.(1) are consistent with 40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(3) which require "*procedures…to investigate portions of the separate storm sewer system that, <u>based on the results of the field screen, or other appropriate information</u> [emphasis added], indicate a reasonable potential of contain illicit discharges or other sources of non-storm water*" as part of a "*program…to detect and remove…illicit discharges and improper disposal into the storm sewer.*" The assessment requirements of Provision D.4.a.(1) are also consistent with 40 CFR122.42(c)(1) requires the Copermittees to annually report the "*status of implementing the components of the storm water management program that are established as permit conditions.*"

The Storm Water Pollutant Discharges Reduction Assessment is how the Copermittees in each Watershed Management Area will demonstrate that their jurisdictional runoff management program implementation efforts are achieving the CWA requirement to "*reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable*." Provision D.4.b.(2) requires the Copermittees in each Watershed Management Area to assess and report the progress of the Copermittees' efforts to reduce pollutants in storm water discharges from the MS4s to the MEP. The Storm Water Pollutant Discharges Reduction Assessments include specific assessment requirements during both the transitional monitoring period and after acceptance of the Water Quality Improvement Plan applicable to the Watershed Management Area and each Copermittee.

As the Copermittees collect and analyze the data collected pursuant to wet weather MS4 outfall discharges monitoring requirements of Provisions D.2.a.(3) and D.2.c, Provision D.4.b.(2) requires the Copermittees to assess runoff conditions during the transitional period, and the progress of the Water Quality Improvement Plan strategies toward reducing pollutants in storm water from the MS4 to the MEP. The findings from these assessments are expected to be utilized by the Copermittees to identify any modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify sources of pollutants in storm water discharges from the MS4s, as well as focus, modify, and improve the water quality improvement strategies implemented by each Copermittee within its jurisdiction to reduce pollutants in storm water discharges to the MEP.

The assessment requirements of Provision ~~D.4.a.(1)~~ D.4.b.(2) are consistent with 40 CFR 122.26(d)(2)(iii)(B) which requires "*[e]stimates of the annual pollutant load of the cumulative discharges to waters of the United States from all identified municipal outfalls…during a storm event…accompanied by a description of the procedures for estimating constituent loads and concentrations, including any modeling, data analysis, and calculation methods.*" The assessment requirements of Provision D.4.a.(2) are consistent with 40 CFR 122.26(d)(2)(v) which requires that each Copermittee assesses the *"estimated reductions in loadings of pollutants from discharges of municipal storm sewer constituents from municipal storm sewer systems expected as the result of the municipal storm water quality management program."* The assessment requirements of Provision ~~D.4.a.(2)~~ D.4.b.(2) are also consistent with 40 CFR122.42(c)(1) requires the Copermittees to annually report the "*status of implementing the components of the storm water management program that are established as permit conditions.*"

Provision D.4.c includes the special studies assessment requirements. Performing special studies are how the Copermittees will address data gaps identified during the development of and updates to the Water Quality Improvement Plan The relevant findings from the special studies assessments are expected to be incorporated as part of the applicable receiving water assessments, MS4 outfall discharge assessments,

and integrated water quality improvement assessments required in Provision D.4.a, D.4.b, and D.4.d, respectively.

The assessment requirements in Provision D.4.d are part of the iterative approach and adaptive management process required by Provision A.4. The Copermittees are required to integrate the data collected pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision D to re-evaluate the Water Quality Improvement Plan.

The monitoring data collected pursuant to Provisions D.1 and D.2, and the results of the assessment required pursuant to Provisions D.4.a-c, will be used to determine whether the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program are effective, or require modifications or improvements to become more effective to achieve the requirements of the CWA. The assessments required by Provision D.4.d are consistent with 40 CFR 122.42(c)(1) which requires that the Copermittees to report the *"[t]he status of implementing the components of the storm water management program that are established as permit conditions."*

E. Jurisdictional Runoff Management Programs

Purpose: Provision E includes the requirements for the jurisdictional runoff management programs to be implemented by each of the Copermittees. Compliance with the requirements for the jurisdictional runoff management programs will allow the Copermittees to demonstrate that they are implementing programs to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP. The jurisdictional runoff management program document prepared by each Copermittee will also provide the details for implementing the water quality improvement strategies identified in the Water Quality Improvement Plan specifically within its jurisdiction.

***Discussion*:** Implementation of the jurisdictional runoff management program requirements under Provision E is how the Copermittees "*effectively prohibit non-stormwater discharges into the storm sewers*", and outlines the "*controls to reduce the discharge of pollutants to the maximum extent practicable"* consistent with the federal regulations under 40 CFR 122.26. The jurisdictional runoff management program is part of the "*comprehensive planning process*" that is required pursuant to 40 CFR 122.26(d)(2)(iv). Where the Water Quality Improvement Plan is the "*comprehensive planning process*" on a Watershed Management Area scale, requiring "*intergovernmental coordination*", the jurisdictional runoff management program document is the "*comprehensive planning process*" on a jurisdictional scale that should be coordinated with the other Copermittees in the Watershed Management Area to achieve the goals of the Water Quality Improvement Plan.

The jurisdictional runoff management program requirements are included to provide each Copermittee criteria that can be used to demonstrate that its storm water management program is implementing the "*comprehensive planning process*" within its jurisdiction to "*effectively prohibit non-stormwater discharges into the storm sewers*", and to identify and implement the most effective "*controls to reduce the discharge of pollutants to the maximum extent practicable"* in accordance with the performance standards given in the CWA.

Provision E includes the requirements for each of the components that must be included in the Copermittee's jurisdictional runoff management program document that will be implemented by the Copermittee within its jurisdiction. Implementation of the components of each Copermittee's jurisdictional runoff management program must ~~be consistent with~~ incorporate the water quality improvement strategies identified by each Copermittee in the Water Quality Improvement Plans, described pursuant to Provision B.3.b.(1)(a).

More specific and detailed discussions of the requirements of Provision E are provided below.

Provision E.1 (Legal Authority Establishment and Enforcement) requires to each Copermittee to establish and enforce sufficient legal authority to control discharges to the MS4 within its jurisdiction.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system*" and be able to demonstrate that it can "*operate pursuant to legal authority established by statute, ordinance or series of contracts.*" Provision E.1.a describes the minimum legal authorities each Copermittee must establish for itself within its jurisdiction to control discharges to its MS4 The requirements of Provision E.1.a are consistent with the requirements set forth in 40 CFR 122.26(d)(2)(i)(A)-(F).

The certification statement required from each Copermittee by Provision E.1.b is included to provide the San Diego Water Board additional documentation that each Copermittee has established the legal authorities consistent with Provision E.1.a and 40 CFR 122.26(d)(2)(i)(A)-(F), and the Copermittee can "*operate pursuant to legal authority established by statute, ordinance or series of contracts.*"

Provision E.2 (Illicit Discharge Detection and Elimination) requires each to Copermittee to implement an illicit discharge detection and elimination program to effectively prohibit non-storm water discharges to the MS4 by actively detecting and eliminating illicit discharges and disposal into its MS4.

Provision E.2 establishes the minimum requirements that each Copermittee must implement within its jurisdiction to ~~prevent and eliminate illicit discharges, and~~ effectively prohibit non-storm water discharges~~,~~ from entering its MS4. The federal CWA requires permits for municipal storm sewer systems to "*effectively prohibit non-storm water discharges into the storm sewers*." The federal regulations (40CFR122.26(d)(2)(i)(B)) require each Copermitee to establish the legal authority to prohibit illicit discharges to its MS4s. Under 40 CFR 122.26(d)(2)(iv)(B), each Copermittee must implement a "*program…to detect and remove…illicit discharges and improper disposal into the storm sewer.*" The federal NPDES regulations, under 40 CFR 122.26(b)(2), define illicit discharges as "*any discharge to a municipal separate storm sewer that is not composed entirely of storm water*. Thus, non-storm water discharges are not authorized to enter the MS4 and are considered to be illicit discharges, unless authorized by a separate NPDES permit.

The Phase I Final Rule clarifies that non-storm water discharges through an MS4 are not authorized under the CWA (55 FR 47995):

> "*Today's rule defines the term "illicit discharge" to describe any discharge through a municipal separate storm sewer system that is not composed entirely of storm water and that is not covered by an NPDES permit. Such illicit discharges are not authorized under the Clean Water Act. Section 402(p(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm*

> *sewer…Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit*."

The federal NPDES requirements for the program to address illicit discharges must include "*inspections, to implement and enforce an ordinance, orders, or other similar means to prevent illicit discharges to the MS4*." The federal NPDES regulations also reference several categories of "*non-storm water discharges or flows* [which] *shall be addressed where such discharges are identified…as sources of pollutants to waters of the United States*." The Phase I Final Rule (55 FR 48037) further clarified the requirements of 40 CFR 122.26(d)(2)(iv)(B)(1) as follows:

> "*EPA is clarifying that section 402(p)(3)(B) of the CWA (which requires permits for municipal separate storm sewers to 'effectively' prohibit non-storm water discharges) does not require permits for municipalities to prohibit certain discharges or flows of nonstorm water to waters of the United States through municipal separate storm sewers in all cases*."

In previous iterations of the municipal storm water permits for the San Diego Region, these categories were simply listed and referred to as categories of non-storm water discharges "not prohibited" unless identified as a source of pollutants. The Copermittees have often referred to these categories as "exempt" discharges. In both cases, however, the language is inconsistent with the federal CWA and NPDES regulations. And, the clarification provided in the Phase I Final Rule does not specifically state that such discharges are "not prohibited" or "exempt" or in any way authorized. The federal NPDES regulations do, however, state that specific categories of non-storm water discharges must be "*addressed*" if identified as "*sources of pollutants to waters of the United States*."

The language of Provision E.2.a has been revised to be fully consistent with the language of the CWA and the requirements of the federal regulations under 40 CFR 122.26(d)(2)(iv)(B)(1). Provision E.2.a requires each Copermittee to address <u>all</u> types of non-storm water discharges into its MS4 as illicit discharges, <u>unless</u> the discharge is authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to Provisions E.2.a.(1) through E.2.a.(5). Only non-NPDES-permitted non-storm water discharges identified as a category of non-storm water discharges under Provisions E.2.a.(1) through E.2.a.(5) <u>and</u> *not identified as a source of pollutants* do not have to be addressed as illicit discharges. <u>Categories of non-storm water discharges that meet the requirements of Provisions E.2.a.(1) through E.2.a.(5) do not have to be addressed by the Copermittee as illicit discharges.</u>

Several of the non-storm water categories listed in 40 CFR 122.26(d)(2)(iv)(B)(1) have not been included in Provisions E.2.a.(1) through E.2.a.(5), including: street wash water, landscape irrigation, irrigation water, and lawn watering. Because these are no longer included within the categories listed under Provisions E.2.a.(1) through

E.2.a.(5), the Copermittees must prohibit these types of non-storm water discharges from entering the MS4. This is consistent with the clarification of 40 CFR 122.26(d)(2)(iv)(B)(1) in the Phase I Final Rule (55 FR 48037), which states:

> "*[T]he Director may include permit conditions that either require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*."

Street wash water is a category of non-storm water discharges that was removed when the Third Term Permits were issued. Street wash water is a source of several pollutants (e.g., metals, oil and grease, petroleum hydrocarbons, chlorinated solvents, sediment) which are generated during the street washing process. The removal of this category requires the Copermittees to prohibit this type of non-storm water discharge from entering the MS4.

The landscape irrigation, irrigation water, and lawn watering categories, collectively referred to hereafter as "over-irrigation" discharges, were removed from the list of non-storm water discharge categories in the Fourth Term Orange County and Riverside County Permits. Non-storm water discharges resulting from over-irrigation have been found to be a source of several types of pollutants (e.g., nutrients, bacteria, pesticides, sediment) in receiving waters. The San Diego Water Board and the Copermittees have identified categories of non-storm water discharges associated with over-irrigation as a source of pollutants and conveyance of pollutants to the MS4 and waters of the United States in the following documents:

- **SmartTimer/Edgescape Evaluation Program (SEEP) Grant Application**

  The State Water Board allocated grant funding to the SEEP project grant application submitted in 2006, which targeted irrigation runoff by retrofitting areas of existing development and documenting the conservation and runoff improvements. The basis of this grant project is that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 is a source and conveyance of pollutants. In addition, the grant application indicated that this alteration of natural flows is impacting the beneficial uses of waters of the state and U.S. Results from the study indicate that that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 *is* a source and conveyance of pollutants. The results of this study can be applied broadly to any area where over-irrigation takes place. The grant application included the following statements:

  > "*Irrigation runoff contributes flow & pollutant loads to creeks and beaches that are 303(d) listed for bacteria indicators.*"
  >
  > "*Regional program managers agree that the reduction and/or elimination of irrigation-related urban flows and associated pollutant loads may be key to successful attainment of water quality and beneficial use goals as outlined in the San Diego Basin Plan and Bacteria TMDL over the long term.*"

"*Elevated dry-weather storm drain flows, composed primarily … of landscape irrigation water wasted as runoff, carry pollutants that impair recreational use and aquatic habitats all along Southern California's urbanized coastline. Storm drain systems carry the wasted water, along with landscape derived pollutants such as bacteria, nutrients and pesticides, to local creeks and the ocean. Given the local Mediterranean climate, excessive perennial dry season stream flows are an unnatural hydrologic pattern, causing species shifts in local riparian communities and warm, unseasonal contaminated freshwater plumes in the near-shore marine environment.*"

- **2006-2007 Orange County Watershed Action Plan Annual Reports**

The Watershed Action Plan Annual Reports for the 2006-2007 reporting period were submitted by the County of Orange, Orange County Flood Control District and Copermittees within the San Juan Creek, Laguna Coastal Streams, Aliso Creek, and Dana Point Coastal Streams Watersheds. San Juan Creek, Laguna Coastal Streams, Aliso Creek and Dana Point Coastal Streams are all currently 303(d) listed as impaired for indicator bacteria within their watersheds and/or in the Pacific Ocean at the discharge points of their watersheds. The Orange County Copermittees, within their Watershed Action Strategy Table for fecal indicator bacteria included the following:

"*Support programs to reduce or eliminate the discharge of anthropogenic dry weather nuisance flow throughout the…watershed. Dry weather flow is the transport medium for bacteria and other 303(d) constituents of concern.*"

Additionally, they state that "*conditions in the MS4 contribute to high seasonal bacteria propagation in-pipe during warm weather. Landscape irrigation is a major contributor to dry weather flow, both as surface runoff due to over-irrigation and overspray onto pavements; and as subsurface seepage that finds its way into the MS4*."

- **Fiscal Year 2008 Carlsbad Watershed Urban Runoff Management Program Annual Report**

The Carlsbad Watershed Urban Runoff Management Program Annual Report for Fiscal Year 2008 was submitted by the Carlsbad Watershed Copermittees (Cities of Carlsbad, Encinitas, Escondido, Oceanside, San Marcos, Solana Beach, and Vista, and the County of San Diego). In the Annual Report, the Carlsbad Watershed Copermittees stated the following:

"The Carlsbad Watershed Management Area (WMA) collective watershed strategy identifies bacteria, sediment, and nutrients as high priority water quality pollutants in the Agua Hedionda (904.3 – bacteria and sediment), Buena Vista (904.2 – bacteria), and San Marcos Creek (904.5 – nutrients) Hydrologic Areas.

Bacteria, sediment, and nutrients have been identified as potential discharges from over-irrigation."

- **2007-2008 San Diego Bay Watershed Urban Runoff Management Program Annual Report**

  The San Diego Bay Watershed Urban Runoff Management Program 2007-2008 Annual Report was submitted by the San Diego Bay Watershed Copermittees (Cities of Chula Vista, Coronado, Imperial Beach, La Mesa, Lemon Grove, National City, and San Diego, the County of San Diego, the Port of San Diego, and the San Diego County Airport Authority). In Appendix D of the Annual Report, titled "Likely Sources of Pollutants", the San Diego Bay Watershed Copermittees identified over-irrigation of lawns as a pollutant generating activity from business and/or residential land uses for bacteria, pesticides, and sediment.

- **Copermittee Public Education Materials**

  The Orange County Public Works *Tips for Landscape & Gardening* public education brochure states: "*Fertilizers, pesticides and other chemicals that are left on yards or driveways can be blown or washed into storm drains that flow to the ocean. Overwatering lawns can also send materials into storm drains*."

  The Riverside County Flood Control and Water Conservation District *Landscape and Garden* public education brochure states: *"Soil, yard wastes, over-watering and garden chemicals become part of the urban runoff mix that winds its way through streets, gutters and storm drains before entering lakes, rivers, streams, etc. Urban runoff pollution contaminates water and harms aquatic life!"*

- **Los Penasquitos Lagoon Sedimentation/Siltation TMDL Technical Report**

  The Los Penasquitos Lagoon Sedimentation/Siltation TMDL technical report was prepared for the City of San Diego and USEPA in October 2010. The technical report was included as a technical supporting document attached to the Sediment TMDL for Los Penasquitos Lagoon staff report prepared by the San Diego Water Board, dated June 13, 2012. Under the Source Assessment section, the technical report states the following:

  "*Dry weather loading is dominated by nuisance flows from urban land use activities such as car washing, sidewalk washing, and lawn over-irrigation, which pick up and transport sediment into receiving waters.*"

These documents confirm that non-storm water discharges associated with over-irrigation are a source of pollutants and should be addressed as illicit discharges to the MS4. Prohibiting non-storm water discharges associated with over-irrigation, however,

is not a new requirement for the Copermittees because it is also consistent with and required by the Water Conservation in Landscaping Act (AB 1881, Laird).

The Water Conservation in Landscaping Act required the Department of Water Resources (DWR) to prepare a Model Water Efficient Landscape Ordinance for use by local agencies (e.g. the Copermittees). All local agencies were required to adopt a water efficient landscape ordinance by January 1, 2010. Local agencies could adopt the Water Efficient Landscape Ordinance developed by DWR, or an ordinance considered at least as effective as the Model Ordinance. The Water Efficient Landscape Ordinance includes a requirement that local agencies prohibit runoff from irrigation (§ 493.2):

> "*Local agencies shall prevent water waste resulting from inefficient landscape irrigation by* <u>*prohibiting runoff from leaving the target landscape*</u> *[emphasis added] due to low head drainage, overspray, or other similar conditions where water flows onto adjacent property, non-irrigated areas, walks, roadways, parking lots, or structures. Penalties for violation of these prohibitions shall be established locally*."

Furthermore, non-storm water discharges from over-irrigation not only transport and discharge pollutants to receiving waters, but are also a likely source of the dry weather flows causing changes to habitat within and along the receiving water bodies. Examples of habitat changes from the dry weather flows include perennialization of ephemeral streams, and conversion of saltwater and brackish water marsh habitats to freshwater marsh habitats (e.g. Los Penasquitos Lagoon). Both of these examples have resulted in the promotion of invasive species in several areas of the San Diego Region.

The removal of the over-irrigation discharges categories does not require the Copermittees to strictly prohibit lawn and landscape irrigation, but does require the prohibition of excessive irrigation water that results in non-storm water discharges to the MS4. Non-storm water discharges to the MS4 from over-irrigation must be addressed as illicit discharges by the Copermittees pursuant to the requirements of Provision E.2.

The remaining non-storm water categories listed in 40 CFR 122.26(d)(2)(iv)(B)(1) are listed under Provisions E.2.a.(1) through E.2.a.(5) and generally fall into four categories: (1) non-storm water discharges subject to existing San Diego Water Board waste discharge requirements and NPDES permits; (2) non-storm water discharges generally not expected to be a source of pollutants to receiving waters; (3) non-storm water discharges likely to contain pollutants requiring some form of control to address the pollutants prior to discharging to the MS4; and (4) non-storm water discharges or flows associated with firefighting.

Provisions E.2.a.(1) and E.2.a.(2) include several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) for which the San Diego Water Board already has developed general waste discharge requirements and NPDES

permits to address the discharges. The Copermittees are only required to address these types of non-storm water discharges as illicit discharges if the Copermittees or the San Diego Water Board identifies these non-storm water discharges not having coverage under the applicable NPDES permit~~ or as a source of pollutants to receiving waters~~. ~~Generally, if these types of non-storm water discharges have coverage under an NPDES permit and are identified as a source of pollutants to receiving waters, the Copermittees would be expected to identify the responsible dischargers and report their identities to the San Diego Water Board. The San Diego Water Board would then have the responsibility to enforce the NPDES permit and/or waste discharge requirements.~~

Provision E.2.a.(3) includes several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) which are generally not expected to be a source of pollutants to receiving waters, many of which originate from what are typically natural, uncontrollable sources. The Copermittees are only required to address these types of non-storm water discharges as illicit discharges if the Copermittees or the San Diego Water Board identifies these non-storm water discharges as a source of pollutants to receiving waters. Because many of these sources are generally uncontrollable, enforcing a prohibition may not be a possibility for the Copermittees. The Copermittees would be able to address these non-storm water discharges by preventing these non-storm water discharges from entering the MS4. This could potentially be achieved by sealing their MS4 structures so the discharges cannot enter the MS4.

Provision E.2.a.(4) includes several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) that are likely to contain pollutants requiring some form of control to address the pollutants prior to discharging to the MS4. At this time, an outright prohibition of these types of non-storm water discharges does not yet appear to be warranted. Thus, Provision E.2.a.(4) has includes several requirements for the Copermittees to control the pollutants from these types of non-storm water discharges. This is consistent with the clarification of the federal regulations in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board has the authority to require the Copermittees to "*control any of these types of discharges where appropriate*."

Unlike non-storm water discharges from over-irrigation, these types of non-storm water discharges are not expected to occur in close proximity to each other or very frequently. Provided these types of non-storm water discharges are controlled as required in Provision E.2.a.(4), the Copermittees would only be required to address these types of non-storm water discharges as illicit discharges if the Copermittee or the San Diego Water Board identifies these non-storm water discharges as a source of pollutants to receiving waters.

Provision E.2.a.(5) includes specific requirements for fire fighting discharges and flows. The requirements for non-storm water discharges and flows associated with fire

fighting have been separated into requirements for: a) non-emergency fire fighting discharges and flows, and b) emergency fire fighting discharges and flows.

The San Diego Water Board has found that discharges from building fire suppression system maintenance (e.g. fire sprinklers) contain waste and potentially a significant source of pollutants to receiving waters. As such, the San Diego Water Board is requiring these discharges be addressed as illicit discharges by the Copermittees. Thus, the discharges to the MS4 are to be prohibited via ordinance, order or similar means. For other non-emergency fire fighting discharges and flows (i.e., flows from controlled or practice blazes, fire fighting training, and maintenance activities not associated with building fire suppression systems), the Copermittees are required to develop and implement a program to address pollutants in these non-storm water discharges and flows. This is consistent with the clarification of the federal regulations in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board has the authority to require the Copermittees to "*control any of these types of discharges where appropriate*."

For emergency fire fighting discharges and flows, the Phase I Final Rule (55 FR 48037) has clarified the requirements of 40 CFR 122.26(d)(2)(iv)(B)(1) pertaining to emergency fire fighting flows and discharges, which states:

> "*In the case of fire fighting it is not the intention of these rules to prohibit in any circumstances the protection of life and public or private property through the use of water or other fire retardants that flow into separate storm sewers*."

Thus, the requirements have been made to be consistent with the guidance provided by the Phase I Final Rule. The Order recommends that the Copermittees develop and encourage implementation of BMPs to reduce or eliminate the discharge of pollutants from emergency fire fighting flows to the MS4s and receiving waters. The Order does not include any requirements that should be interpreted as requiring the implementation of BMPs for emergency fire fighting flows to the MS4s and receiving waters.

The Copermittees are expected to review the dry weather MS4 outfall discharge monitoring data they collect to determine if and when there are non-storm water discharges to or from their MS4s that are a source of pollutants to receiving waters. If the Copermittees identify one of the types of non-storm water discharges listed in Provisions E.2.a.(1) through E.2.a.(4) as a source of pollutants to receiving waters based on the review and evaluation of monitoring data, Provision E.2.a.(6) requires the Copermittees to prohibit those categories of discharges from entering the MS4 through ordinance, order or similar means. In addition, Provision E.2.a.(6) ~~also~~ clarifies that the San Diego Water Board may identify categories of non-storm water discharges or flows listed under Provisions E.2.a.(1) through E.2.a.(4) that must be prohibited.

Provision E.2.a.(6) also provides the Copermittees an option to propose controls to be implemented for the category of non-storm water discharges as part of the Water

Quality Improvement Plan instead of prohibiting the category of non-storm water discharges. If the Water Quality Improvement Plan is accepted by the San Diego Water Board with the proposed controls, the Copermittees will not be required to prohibit the category of non-storm water discharges to their MS4s as long as the controls are implemented. This is consistent with the clarification of 40 CFR 122.26(d)(2)(iv)(B)(1) in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board may "*require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*."

Finally, Provision E.2.a.(7) has been included in the requirements for non-storm water discharges to clarify that any non-storm water discharges to the Copermittee's MS4, even those identified pursuant to Provisions E.2.a.(1) through E.2.a.(4), must be reduced or eliminated, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit. Provision E.2.a.(7) is consistent with the requirements of CWA section 402(p)(3)(B)(ii) and 40 CFR 122.26(d)(1)(v)(B), as clarified in the Phase I Final Rule (55 FR 47995) that "*[u]ltimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit*." However, the reduction or elimination of those non-storm water discharges are expected to be achieved as feasible, in accordance with the priorities in the Water Quality Improvement Plan and when the resources are available to the Copermittee.

Consistent with 40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(1), each Copermittee must implement a "*program…to prevent illicit discharges to the municipal storm sewer system*" and "*detect…illicit discharges and improper disposal into the storm sewer.*" Provision E.2.b requires each Copermittee to implement measures to prevent and detect illicit discharges and connections to its MS4 as part of its illicit discharge detection and elimination program.

As part of the program to prevent and detect illicit discharges to the MS4, 40 CFR 122.26(d)(2)(iv)(B)(2) requires "*procedures to conduct on-going field screening activities during the life of the permit, including areas or locations that will be evaluated by such field screens*." As part of the procedures, each Copermittee is required to maintain an updated map of its entire MS4 and the corresponding drainage areas within its jurisdiction. Having knowledge about where inlets, access points, connections with other MS4s, and outfalls are located is necessary for each Copermittees to track, identify, and eliminate illicit discharges and connections. Thus, Provision E.2.b.(1) of the Order specifies that the map must include the segments of the storm sewer system owned, operated, and maintained by the Copermittee, and include locations of all known inlets, connections with other MS4s, and outfalls to the Copermittee's MS4. The remaining requirements of Provision E.2.b are consistent with the requirements of 40 CFR 122.26(d)(2)(iv)(B)(3)-(7) related to implementing measures to prevent and detect illicit discharges and connections to the MS4.

Provision E.2.c requires each Copermittee to conduct field screening and monitoring of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm

water and illicit discharges and connections to the MS4. Field screening is a required element of the program to detect and eliminate illicit discharges and connections to the MS4, pursuant to 40 CFR 122.26(d)(2)(iv)(B)(2). The field screening requirement will be implemented through the dry weather MS4 outfall discharge monitoring required under Provisions D.2.a.(2) and D.2.b.(1).

Provision E.2.d specifies the measures each Copermittee must implement to eliminate illicit discharges and connections to its MS4. Elimination of illicit discharges and connections to the MS4 is consistent with the requirement of 40 CFR 122.26(d)(2)(iv)(B) "*to detect and remove [emphasis added]…illicit discharges and improper disposal into the storm sewer*" and will achieve the CWA requirement for MS4 permits to "*effectively prohibit non-storm water discharges into the storm sewers*."

Generally, each Copermittee is responsible for prioritizing its efforts to eliminate non-storm water and illicit discharges or connections to its MS4 based on field screening and monitoring data, NALs, illicit discharge investigation records, and the known or suspected sources. Sources of non-storm water and illicit discharges or connections must be eliminated by enforcing the legal authority established by each Copermittee pursuant to Provision E.1.

~~Finally, Provision E.2.e requires the Copermittee to include the strategies and/or activities identified in the Water Quality Improvement Plan that the Copermittee will implement as part of the illicit discharge detection and elimination program within its jurisdiction. The Water Quality Improvement Plan is expected to include several strategies and options that the Copermittee can and should implement within its jurisdiction. The Copermittee is expected to describe and provide the details of when, where, and how those strategies will be implemented within its jurisdiction.~~

~~The San Diego Water Board will utilize the information provided in the jurisdictional runoff management program document pursuant to Provision E.2.e to gauge and assess the Copermittee's efforts in trying to address the highest priority water quality conditions identified in the Water Quality Improvement Plan within its jurisdiction.~~

Provision E.3 (Development Planning) requires each Copermittee to use its land use and planning authority to implement a development planning program to control and reduce the discharge of pollutants in storm water from new development and significant redevelopment to the MEP. Proper implementation of the development planning program will also contribute toward effectively prohibiting non-storm water discharges from development projects to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." As part of the management program, 40 CFR 122.26(d)(2)(iv)(A)(2) requires "*planning procedures including a comprehensive master plan to develop, implement and enforce controls to*

reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment."

Land ~~D~~development ~~typically includes the construction of impervious surfaces such as sidewalks, driveways, roads, and rooftops~~ generally alters the natural conditions of the land by removing vegetative cover, compacting soil, and/or placement of concrete, asphalt, or other impervious surfaces. These impervious surfaces ~~generate and~~ concentrate urban pollutants (such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not found in high concentrations in the natural environment. Pollutants that accumulate on impervious surfaces are not easily biodegraded nor ~~not~~ subject to natural treatment processes. ~~When it rains, these pollutants are transported in storm water runoff from these impervious surfaces into receiving waters, resulting in poor water quality and degradation of beneficial uses.~~

~~In addition to the generation of pollutants, development generally alters the natural conditions of the land by removing vegetative cover, reducing the perviousness of the surface, and reducing the capacity of storm water that can be intercepted, captured, stored, infiltrated, evaporated, and/or evapotranspired. The alteration of the natural conditions and addition of impervious surfaces associated with development causes water quality problems. Hydrograph modification, or hydromodification, is the change in the natural watershed hydrologic processes and runoff characteristics caused by development or other land use changes that result in increased stream flows, altered sediment transport, and morphological changes to channels receiving the runoff.~~

Impervious surfaces greatly affect the natural hydrology of the land because they do not allow natural infiltration and treatment of storm water runoff to take place. Instead, storm water runoff from impervious surfaces is typically directed through pipes, curbs, gutters, and other hardscape into receiving waters, with little treatment, at significantly increased volumes and accelerated flow rates over what would occur naturally. The increased pollutant loads, storm water volume, discharge rates and velocities, and discharge durations from the MS4 adversely impact stream habitat by causing accelerated, unnatural erosion and scouring within creek bed and banks. Placement of impervious surfaces also encapsulates "good" sediment (such as sand, gravel, rocks and cobbles) that would normally replenish creek beds and banks to help stabilize them. Collectively, these changes to natural hydrologic processes are termed hydrograph modification, or hydromodification.

Hydromodification, which is caused by both altered storm water flow and altered sediment flow regimes, is largely responsible for degradation of creeks, streams, and associated habitats in the San Diego Region. In an ongoing study by the Stormwater Monitoring Coalition to assess the health of streams throughout Southern California, researchers found that three of the four highest risk stressors to creeks (percent sands and fines present, channel alteration, and riparian disturbance) were related to physical habitat.[29] Researchers studying flood frequencies in Riverside County have

[29] Assessing the Health of Southern California Streams, Stormwater Monitoring Coalition, Fact Sheet

found that increases in watershed imperviousness of only 9-22 percent can result in increases in peak flow rates for the two-year storm event of up to 100 percent.[30] Such changes in runoff have significant impacts on channel morphology.

In addition, a technical report issued by the Southern California Coastal Water Research Project (SCCWRP) stated that "*[r]ecent studies indicate that California's intermittent and ephemeral streams are more susceptible to the effects of hydromodification than streams from other parts of the United States. Physical degradation of stream channels in the central and eastern United States can initially be detected when watershed impervious cover approaches 10 percent, although biological effects (which may be more difficult to detect) may occur at lower levels. In contrast, initial response of streams in the semi-arid portions of California appears to occur between 3 and 5 percent impervious cover*."[31] These studies highlight the extent to which impacts originating from impervious surfaces created by land development are responsible for the degradation of creek and stream habitat.

This is consistent with what USEPA has noted, that "*[m]ost stormwater runoff is the result of the man-made hydrologic modifications that normally accompany development. The addition of impervious surfaces, soil compaction, and tree and vegetation removal result in alterations to the movement of water through the environment. As interception, evapotranspiration, and infiltration are reduced and precipitation is converted to overland flow, these modifications affect not only the characteristics of the developed site but also the watershed in which the development is located. Stormwater has been identified as one of the leading sources of pollution for all waterbody types in the United States. Furthermore, the impacts of stormwater pollution are not static; they usually increase with more development and urbanization*."[32]

Reducing the impact from the increased pollutant loads and flows generated by impervious surfaces ~~added to~~ within a watershed is essential to protecting and restoring the integrity of the receiving waters. Provision E.3 includes the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment*." The requirements of Provision E.3 will 1) minimize the generation and discharge of pollutants in storm water from the MS4, and 2) minimize the potential of storm water discharges from the MS4 from causing altered flow regimes and excessive downstream erosion in receiving waters.

[30] Schueler and Holland, 2000. Storm Water Strategies for Arid and Semi-Arid Watersheds (Article 66). The Practice of Watershed Protection.
[31] Stein, E. and Zaleski, S., 2005. Technical Report 475, Managing Runoff to Protect Natural Streams: The Latest Development on Investigation and Management of Hydromodification in California. December 30, 2005.
[32] USEPA, 2007. Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices, December 2007.

~~Provision E.3 is based on the requirements of the Fourth Term Permits for Orange County and Riverside County, and do not differ significantly from the Fourth Term Permit for San Diego County. Provision E.3 has been modified to allow the more holistic, long-term planning approach of the Water Quality Improvement Plan to be incorporated into each Copermitee's development planning. The result will be greater pollutant removal from storm water runoff, and improvements and/or rehabilitation of the functionality and hydrologic regimes of a Watershed Management Area. Alternative compliance options have been included in Provision E.3, which will result in multiple beneficial outcomes within a jurisdiction, a subwatershed, a receiving water body, and/or a Watershed Management Area.~~

~~Incorporating a holistic and long-term planning approach into each Copermittee's development planning program is essential to reducing the impact of development on receiving waters. Development projects that convert natural open space areas into urbanized areas result in the generation and discharge of pollutants associated with anthropogenic activities, and significant modifications to the hydrologic flow regimes. Both adversely affect the chemical, physical, and biological conditions of receiving waters. Redevelopment projects, on the other hand, are opportunities to reduce the generation of pollutants and restore more natural hydrologic flow regimes in areas of existing development, which can contribute toward restoring or rehabilitating the chemical, physical, and biological conditions of impacted and/or impaired receiving waters.~~

~~To improve the health and functionality of the receiving waters in a Watershed Management Area, planning and land use practices must change to reduce the various impacts due to hydromodification and pollutants associated with storm water runoff from developing and developed areas. Planning principles to preserve, enhance, and restore the functionality and hydrologic regimes were incorporated into the development planning provisions of all the Third and Fourth Term Permits within the San Diego Region. Provision E.3 of this Order focuses on mitigating the effects of development by continuing to include these principles, as well as promote the concept of utilizing storm water as a resource. By doing so, pollutants in storm water runoff generated within developing and developed areas will be treated more naturally, and storm water will be discharged to receiving waters at discharge rates that are not unnaturally erosive, thereby resulting in conditions that are more supportive of healthy and sustainable water bodies.~~

The requirements of Provision E.3.a ~~are~~ include the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment*" applicable to all development projects, regardless of size or purpose of development. ~~These requirements are based on and consistent with the requirements for all development projects in the Fourth Term Permits for San Diego, Orange, and Riverside Counties (Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016, respectively).~~ In general, all development projects must implement onsite

BMPs to remove pollutants from runoff prior to its discharge to any receiving waters, as close to the pollutant generating source as possible, and structural BMPs must not be constructed within waters of the U.S.

Furthermore, the onsite BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors (e.g. mosquitos, rodents, and flies). If not properly designed or maintained, certain BMPs implemented or required by municipalities may create a habitat for vectors. Monitoring studies conducted by the California Department of Public Health (CDPH) have documented that mosquitoes opportunistically breed in structural storm water BMPs, particularly those that hold standing water for over 96 hours. Certain site design features that hold standing water may similarly produce mosquitoes.

Structural BMPs and site design features should incorporate design, construction, and maintenance principles to promote drainage within 96 hours to minimize standing water available to mosquitoes. Nuisances and public health impacts resulting from vector breeding can be prevented with close collaboration and cooperative effort between municipalities and local vector control agencies and the CDPH during the development and implementation of storm water runoff management programs. The CDPH also has issued guidance for BMP implementation that will minimize potential nuisances and public health impacts resulting from vector breeding.[33]

All development projects are required to implement source control BMPs that will minimize the generation of pollutants. Additionally, each development project must implement, where applicable and feasible, low impact development (LID) BMPs to mimic the natural hydrology of the site and retain and/or treat pollutants in storm water runoff prior to discharging to and from the MS4.

The LID Center defines LID as "*a comprehensive land planning and engineering design approach with a goal of maintaining and enhancing the pre-development hydrologic regime of urban and developing watersheds.*"[34] LID designs seek to control storm water at the source, using small-scale integrated site design and management practices to mimic the natural hydrology of a site, retain storm water runoff by minimizing soil compaction and impervious surfaces, and disconnect storm water runoff from conveyances to the storm drain system.

LID BMPs may utilize interception, storage, evaporation, evapotranspiration, infiltration, and filtration processes to retain and/or treat pollutants in storm water before it is discharged from a site. Because of these numerous options, the San Diego Water Board expects that every development project will be able to implement

[33] California Department of Public Health, 2012. Best Management Practices for Mosquito Control in California. (http://www.cdph.ca.gov/HealthInfo/discond/Documents/BMPforMosquitoControl07-12.pdf)
[34] www.lowimpactdevelopment.org

some form of LID BMPs. Examples of LID BMPs include using permeable pavements, rain gardens, rain barrels, grassy swales, soil amendments, and native plants.

Provision E.3.a also includes requirements for all development projects to, where feasible, landscape with native and/or low water use plants to minimize the discharge of non-storm water discharges associated with excessive irrigation, as well as harvest (i.e., storage) and use precipitation to promote the concept of utilizing storm water as a resource.

While all development projects are subject to the requirements of Provision E.3.a, Provision E.3.b identifies Priority Development Projects that exceed given size thresholds and/or fit under specific use categories. Priority Development Projects are required to incorporate specific performance criteria for structural BMPs ~~incorporated~~ into the project plan to reduce the generation of pollutants, and address potential impacts from hydromodification.

The Priority Development Project categories are based on the requirements of the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), and do not differ significantly from the Fourth Term Permit for San Diego County. Furthermore, the Priority Development Project categories are consistent with Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), and Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit).

~~Priority Development Projects generally include new development and significant redevelopment projects that can generate large amounts of pollutants, or have large areas of impervious surface that will contribute to adverse impacts in receiving waters. Placement of impervious surfaces within the environment not only generates and accumulates significant amounts of pollutants that will be transported in storm water runoff, but also drastically modifies the natural hydrologic processes within the watersheds.~~

~~Impervious surfaces do not allow natural infiltration and treatment of storm water runoff to take place. Instead, storm water runoff from impervious surfaces have typically been directed through pipes, curbs, gutters, and other hardscape into receiving waters, with little treatment at significantly increased volumes and accelerated flow rates over what would occur naturally. The increased pollutant loads, storm water volume, discharge rates and velocities, and discharge durations discharged from the MS4 adversely impacts the flora and fauna of receiving waters, and causes increased, unnatural erosion and scouring within creek bed and banks. Placement of impervious surfaces also encapsulates "good" sediment (such as sand, gravel, rocks and cobbles) that would normally replenish creek beds and banks to help stabilize them.~~

~~This increased and unnatural erosion, which is caused by both altered storm water flow and altered sediment flow regimes, is largely responsible for degradation of creeks, streams, and associated habitats in the San Diego Region. In an ongoing~~

~~study by the Stormwater Monitoring Coalition to assess the health of streams throughout Southern California, researchers found that three of the four highest risk stressors to creeks (percent sands and fines present, channel alteration, and riparian disturbance) were related to physical habitat.[35] Researchers studying flood frequencies in Riverside County have found that increases in watershed imperviousness of only 9-22 percent can result in increases in peak flow rates for the two-year storm event of up to 100 percent.[36] Such changes in runoff have significant impacts on channel morphology.~~

~~In addition, a technical report issued by the Southern California Coastal Water Research Project (SCCWRP) stated that "*[r]ecent studies indicate that California's intermittent and ephemeral streams are more susceptible to the effects of hydromodification than streams from other parts of the United States. Physical degradation of stream channels in the central and eastern United States can initially be detected when watershed impervious cover approaches 10 percent, although biological effects (which may be more difficult to detect) may occur at lower levels. In contrast, initial response of streams in the semi-arid portions of California appears to occur between 3 and 5 percent impervious cover.*"[37] These studies highlight the extent to which impacts originating from impervious surfaces created by development are responsible for the degradation and hydromodification of creeks and streams.~~

Because of the impact of relatively small increases in watershed impervious surfaces ~~in a watershed can have on~~ to receiving waters, Provision ~~E.3.b.(2)(g)~~ E.3.b.(1)(b)(iv) has been updated to include large driveways that are 5,000 square feet or more. ~~Although they generally do not carry heavy traffic, paved, impervious driveways that are 5,000 square feet or more create significant areas of impervious surface that contribute to altered flow regimes, and are also sometimes used for storage of motor vehicles that can generate significant amounts of pollutants.~~ The San Diego Water Board finds that large driveways can exacerbate altered flow regimes if not properly controlled.

Provision E.3.b.(3) describes projects that are exempt from Priority Development Project status. These include new or retrofit paved sidewalks, bicycle lanes, or trails that are designed and constructed to direct runoff to vegetated areas or be hydraulically disconnected from paved areas. The exemptions have been provided to encourage these types of projects because they provide multiple environmental benefits, such as promoting walking rather than driving, which will in turn improve air quality. Additionally, retrofitting of existing alleys, streets, or roads are exempt from Priority Development Project status if they are constructed using USEPA Green

~~[35] Assessing the Health of Southern California Streams, Stormwater Monitoring Coalition, Fact Sheet~~
~~[36] Schueler and Holland, 2000. Storm Water Strategies for Arid and Semi-Arid Watersheds (Article 66). The Practice of Watershed Protection.~~
~~[37] Stein, E. and Zaleski, S., 2005. Technical Report 475, Managing Runoff to Protect Natural Streams: The Latest Development on Investigation and Management of Hydromodification in California. December 30, 2005.~~

Streets guidance[38]. By doing so, retrofitting of these types of projects is encouraged. The San Diego Water Board recognizes that there are spatial constraints associated with these projects, and implementation of structural BMPs are not always feasible.

~~The Copermittees have identified several types of projects that they assert would be cost prohibitive if they were categorized as Priority Development Projects, and would discourage development or redevelopment within their jurisdictions. Many of these types of projects may not pose a threat when considered individually. However, collectively and cumulatively, several of these projects would likely cause significant impacts to receiving waters if they were all located within a subwatershed, watershed, and/or Watershed Management Area. Thus, these types of development projects should be required to implement structural BMPs that Priority Development Projects are required to implement to be protective of water quality.~~

~~Provision E.3.b.(3), however, does provide exemptions for several of these types of development projects identified by the Copermittees from being defined as Priority Development Projects. Development projects that are not Priority Development Projects are not required to be included in the inventory of Priority Development Projects that must be maintained by each Copermittee pursuant to Provision E.3.e.(2). In addition, structural BMPs on development projects that are not Priority Development Projects are not required to be inspected pursuant to Provision E.3.e.(3). Inspections of development projects that are not Priority Development Projects, however, will be performed as part of the existing development inspections required pursuant to Provision E.5.c.~~

~~The exemptions under Provision E.3.b.(3) are provided for development projects that meet certain conditions. The exemptions have been provided as an incentive for the Copermittees to encourage and promote the implementation of LID design concepts and green infrastructure and building principles. The conditions for allowing those exemptions have been included to provide an incentive for developers to implement LID design concepts and green infrastructure and building principles. Development projects that meet the conditions of Provision E.3.b.(3) are not expected to be cost prohibitive and also expected to be protective of water quality.~~

For development projects identified as Priority Development Projects, the requirements of Provision E.3.c are the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment.*" Provisions E.3.c.(1)-(3) describe the performance criteria for the structural BMPs that must be implemented for each Priority Development Project defined by Provision E.3.b.

[38] "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).

~~Provisions E.3.c.(1)-(3) and emphasize preserving natural watershed hydrology by requiring retention of storm water and management of flows to maintain or mimic the natural hydrology of a site. The holistic and long-term planning approach of the Water Quality Improvement Plans is incorporated into Provisions E.3.c.(1)-(3) by encouraging the Copermittees to improve or rehabilitate watershed functionality and flow regimes with a combination of strategies.~~

Provision E.3.c.(1) describes the storm water pollutant control BMP requirements that must be implemented by all Priority Development Projects. The purpose of Provision E.3.c.(1) is to reduce pollutants in storm water runoff to the MEP from Priority Development Projects before it is discharged to the MS4. Of all the available treatment processes available, retention of storm water, and therefore capture of the pollutants in the storm water, will achieve 100 percent pollutant removal efficiency for the volume of storm water retained. No other method of treatment can achieve 100 percent pollutant removal efficiency. Thus, retention of as much storm water onsite is the most effective way to reduce pollutants in storm water discharges to, and consequently from the MS4, and controls pollutants in storm water discharges from a site to the MEP.

Under Provision E.3.c.(1)(a)~~(i)~~, retention of the pollutants in the runoff produced from the 85th percentile storm event ("design capture volume") is the ~~default~~ design standard ~~that~~ to which Priority Development Projects must comply ~~use to implement to mimic the pre-development retention volume ("design capture volume")~~. Since the 85th percentile storm event has previously been used as the numeric design standard for treatment control BMPs, ~~the~~ this same size storm event ~~has been applied~~ is used as the numeric design standard for ~~the~~ storm water retention ~~pollutant control BMP requirements~~. This is the MEP standard recognized by the San Diego Water Board and is consistent with the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), as well as Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), ~~and~~ Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit), and Los Angeles Water Board Order No. R4-2012-0175 (Los Angeles County MS4 Permit).

The 85th percentile storm event is the event that has a precipitation total greater than or equal to 85 percent of all storm events over a given period of record in a specific area or location. For example, to determine what the 85th percentile storm event is in a specific location, all 24 hour storms that have recorded values over a 30 year period would be tabulated and a 85th percentile storm would be determined from this record (i.e., 15 percent of the storms would be greater than the number determined to be the 85th percentile storm). Most jurisdictions in the San Diego Region have already developed isopluvial maps that can provide this type of information. The 85th percentile storm might be determined to be a number such as 1.0 inch, and this would be multiplied by the total area of the project footprint producing runoff to calculate the design capture volume. The Priority Development Project designer would then select a system of BMPs that would retain (i.e. intercept, store, infiltrate, ~~store,~~ evaporate, or

evapotranspire~~, or harvest and use~~) 100 percent of the pollutants contained in the design capture volume~~, based on the 85th percentile storm event,~~ onsite.

~~Retention of all storm water and all pollutants in storm water onsite for the 85th percentile storm event, however, may not always mimic the natural pre-development retention volume. Retention of the volume generated by the 85th percentile storm event also may not be practical, nor desirable, as storm water flows are a necessary component of the natural hydrologic processes in a watershed.~~

~~The optimum amount of storm water retained onsite would mimic the pre-development retention volume of the project site. Mimicking the pre-development retention volume is an approach USEPA allows for federal development projects. USEPA issued guidance on implementing storm water runoff requirements for federal projects that requires the retention of the 95th percentile storm event as the default design standard to mimic the pre-development hydrology of a project site.[39] The USEPA guidance also provided an option to develop a site-specific design standard. Similar to the USEPA guidance for federal facilities, Provision E.3.c.(1)(a)(ii) provides an option to develop a site specific design capture volume that would mimic the pre-development retention volume of the project site.~~

Retention BMPs ~~be designed to capture a specific volume, and may take some time for the intercepted or captured storm water to infiltrate, evaporate, evapotranspire, or be used. Retention of the design capture volume, however, will capture and retain a significant portion of the pollutants generated and accumulated on~~ are necessary to capture and retain pollutants generated from a Priority Development Project. In a recent study performed by SCCWRP in the Los Angeles Region, they found "*that the magnitude of constituent load associated with storm water runoff depends, at least in part, on the amount of time available for pollutant build-up on land surfaces. The extended dry period that typically occurs in arid climates such as southern California maximizes the time for constituents to build-up on land surfaces, resulting in proportionally higher concentrations and loads during initial storms of the season*."[40] This implies that the "first flush" of a rainy season and the first storm events after long antecedent dry periods tend to have the highest pollutant loads. Capturing and retaining the pollutant loads of the "first flush" of a rainy season and the first storm events after long antecedent dry periods will reduce a significant portion of the pollutants in storm water discharged to and from the MS4.

The San Diego Water Board, however, acknowledges that in some situations ~~retaining~~ retention of the full design capture volume ~~fully~~ onsite may not be technically feasible.~~,~~ In this event, the Copermittee may allow the Priority Development Project to utilize

~~[39] USEPA, 2009. Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act, EPA 841-B-09-001. December 2009.~~

[40] Stein, E.D., Tiefenthaler, L.L., and Schiff, K.C., 2007. Technical Report 510, Sources, Patterns and Mechanisms of Storm Water Pollutant Loading from Watershed and Land Uses of the Greater Los Angeles Area, California, USA. March 20, 2007.

flow-thru treatment control BMPs to achieve the equivalent pollutant load removal that would have been achieved if the design capture volume were fully retained onsite, pursuant to Provision E.3.c.(1)(b). Biofiltration LID BMPs must be considered as a first option before other types of flow-thru treatment control BMPs may be considered because of the ancillary benefits they provide, such as reduction in flow rates and creation of habitat. In any event, no matter what types of BMPs (or combination of BMPs) are chosen, 100 percent of the pollutants contained in the design capture volume must not be allowed to be discharged from the Priority Development Project.

The San Diego Water Board further recognizes that, in addition to not being technically feasible, retention of the full design capture storm onsite may be cost prohibitive, or may not provide ~~any overall~~ as much water quality benefit~~s~~ to the Watershed Management Area as would implementing BMPs elsewhere in the watershed. Thus, Provision E.3.c.(1)(c~~b~~) allows for the use of a combination of onsite retention BMPs, and the implementation of an ~~alternative compliance options~~ Alternative Compliance Program described in Provision E.3.c.(3). Provision E.3.c.(3) is discussed in more detail below.

If the full design capture volume is not retained onsite because a Copermittee grants ~~the~~ a Priority Development Project permission to utilize the Alternative Compliance Program ~~is allowed to implement alternative compliance options~~, then the pollutants in the portion of the design capture volume that are not reliably retained onsite must still be reduced to the MEP. Thus, flow-thru ~~conventional~~ treatment control BMPs are required to be implemented on Priority Development Projects in addition to the retention BMPs ~~and/or biofiltration BMPs~~. The requirements of Provision E.3.c.(1)(d~~c~~) include the performance standards for flow-thru ~~conventional~~ treatment control BMPs, consistent with the Fourth Term Permits in the San Diego Region.

Where~~as~~ the purpose of the requirements under Provision E.3.c.(1) is to reduce pollutants in storm water runoff to the MEP, the purpose of the requirements under Provision E.3.c.(2) is to maintain or restore more natural hydrologic flow regimes to prevent ~~increased~~ accelerated, unnatural erosion in downstream receiving waters, also to the MEP standard. Provision E.3.c.(2) describes hydromodification management BMP requirements that must be implemented by all Priority Development Projects.

~~The development planning requirements under the Fourth Term Permits required the Copermittees in San Diego County, Orange County, and Riverside County to develop Hydromodification Management Plans (HMPs). Because the Copermittees have already developed HMPs, there is no longer a requirement to develop these plans. The Copermittees in each county, however, must update to their respective HMPs, as needed, to incorporate the hydromodification management BMP requirements of Provision E.3.c.(2).~~

The performance criteria for the implementation of hydromodification management BMPs on Priority Development Projects are consistent with the requirements in the Fourth Term Permits for Orange and Riverside Counties (Order Nos. R9-2009-0002

and R9-2010-0016, respectively). Modifications to the Orange County and Riverside County Hydromodification Management Plans (HMPs) will likely be minor, or may not be necessary. The HMP for San Diego County~~, however,~~ will likely require some minor modifications to incorporate the requirements of Provision E.3.c.(2) and become consistent with the Orange County and Riverside County HMPs. The San Diego Water Board does not, however, expect that it will be necessary for the San Diego County Copermittees to develop a new approach or significantly re-write the San Diego County HMP. This is because the premise of the hydromodification management BMP requirements, which are to control storm water runoff conditions (flow rates and durations) for Copermittee-defined range of flows, is unchanged from all Fourth Term Permits in the San Diego Region.

Provision E.3.c.(2)(a) requires that post-project ~~flow rates and durations~~ runoff conditions mimic the *pre-development* runoff conditions, and not the *pre-project* runoff conditions~~ of the Fourth Term San Diego County Permit~~. ~~This includes assuming artificially hardened channels receiving storm water discharges from a Priority Development Project have the characteristics of a natural stream segment similar to that found in the watershed. Provision E.3.c.(2)(a) will primarily apply to redevelopment projects and artificially hardened channels, whose pre-project conditions have already significantly altered the natural hydrologic regime. This will allow more natural hydrologic flow regimes to eventually be restored in the developed areas of the Watershed Management Areas, which can in turn allow hydromodified streams and creeks to eventually be restored or rehabilitated.~~ Fundamentally, the San Diego Water Board believes that using a hydrology baseline that approximates that of an undeveloped, natural watershed is the only way to facilitate the return of more natural hydrological conditions to already built-out watersheds, and ultimately improved stream health. On the other hand, using the *pre-project* hydrology as a baseline for redevelopment projects results in propagating the unnatural hydrology of urbanized areas. Propagating the urbanized flow regime does not support conditions for restoring degraded or channelized stream segments, and would forever sentence such streams to the degraded state. Furthermore, reducing the volume of storm water runoff associated with the urbanized flow regime will also result in reducing the discharge of pollutants into receiving waters, since storm water runoff from impervious surfaces contains untreated pollutants.

The San Diego Water Board understands that approximating the pre-development runoff condition associated with a redevelopment site is not necessarily straightforward because factors such as natural grade and native vegetation for the site cannot be precisely known. Therefore, the San Diego Water Board does not expect project designers to estimate historical conditions associated with redevelopment sites. Rather, the San Diego Water Board expects project designers and the Copermittees to approximate pre-development runoff conditions using the parameters of a *pervious* area rather than an *impervious* area. This means that for redevelopment sites, approximating pre-development runoff conditions equates to using existing onsite grade and assuming the infiltration characteristics of the underlying soil. A redevelopment Priority Development Project must not use runoff coefficients of

concrete or asphalt to estimate pre-development runoff conditions. Rather, redevelopment projects must use available information pertaining to existing underlying soil type (such as soil maps published by the National Resource Conservation Service), onsite existing grade, and any other readily available pertinent information to estimate pre-development runoff conditions.

The San Diego Water Board understands, indeed asserts, that the pre-development hydrology of an area in question can only be roughly estimated and cannot be precisely known. However, using the hydrology of a natural condition, even if not precisely known, will provide significant benefit to receiving waters over using the hydrology associated with pervious (developed) surfaces. Therefore in order to achieve the goals of the Clean Water Act, which are to "***restore*** *and maintain the chemical,* ***physical****, and biological integrity of the nation's waters* [emphasis added]," the most appropriate standard to use for hydromodification management is the standard associated with the pre-development condition.

Provision E.3.c.(2)(b) requires ~~hydromodification management BMPs to compensate for sediment loss in cases where the development would cause loss of sediment supply as a result of the project. Maintaining the pre-development flows and durations from a Priority Development Project will significantly reduce the potential for increased erosion caused by development. Loss of natural sediment because pervious areas covered by the impervious surfaces on the Priority Development Project, however, can still cause increased, unnatural erosion in receiving waters. Runoff that is discharged from a Priority Development Project that lacks sediment becomes "sediment hungry" and can result in increased erosion upstream and downstream from the point of discharge~~ Priority Development Projects to avoid known critical sediment yield areas or implement measures that would allow coarse sediment to be discharged to receiving waters, such that the natural sediment supply is unaffected by the project. This is necessary because coarse sediment supply is as much an issue for causing erosive conditions to receiving streams as are accelerated flows.

The San Diego Water Board recognizes that in some situations implementing the hydromodification management BMP requirements fully onsite may not be technically feasible, may be cost prohibitive, or may not provide any overall water quality benefits to the Watershed Management Area. Thus, Provision E.3.c.(2)(c) allows for the use of a combination of onsite hydromodification management BMPs and alternative compliance options described in Provision E.3.c.(3). ~~The San Diego County Copermittees may incorporate the alternative compliance options into their HMP. Provision E.3.c.(3) is discussed in more detail below.~~

Provision E.3.c.(3) allows for "alternative compliance" in instances where the Copermittee determines that offsite measures will have a greater overall water quality benefit for the Watershed Management Area than if the Priority Development Project were to implement structural BMPs onsite. Consequently, watershed-specific structural BMP requirements are present in this Order in the form of allowable compliance offsite. The Alternative Compliance Program to Onsite Structural BMP Implementation

Provision is intended to integrate with the Copermittees' planning efforts in the Water Quality Improvement Plans.

The Alternative Compliance Program is an option for Priority Development Projects where the governing Copermittee has participated in the development of a Watershed Management Area Analysis as part of the Water Quality Improvement Plan (described in Provision B.3.b.(4)). Such an approach is consistent with the latest findings in hydromodification management by the scientific community. In a Technical Report entitled *Hydromodification Assessment and Management in California,*[41] the report state:

> *"An effective [hydromodification] management program will likely include combinations of on-site measures (e.g., low-impact development techniques, flow-control basins), in-stream measures (e.g., stream habitat restoration), floodplain and riparian zone actions, and off-site measures. Off-site measures may include compensatory mitigation measures at upstream locations that are designed to help restore and manage flow and sediment yield in the watershed."*

Consistent with the ideas brought forth in the report, in the Watershed Management Area Analysis of Provision B.3.b.(4), which is optional, the Copermittees will develop watershed maps that include as much detail about factors that affect the hydrology of the watersheds as is available. Such factors included identification of areas suitable for infiltration, coarse sediment supply areas, and locating stream channel structures and constrictions. Once these factors are mapped and studied, the Copermittees can identify areas in the watersheds where "candidate projects" may be implemented that are expected to improve water quality in the watershed by providing more opportunity for infiltration, slowing down storm water flows, or attenuation of pollutants naturally via healthy stream habitat. These projects may be in the form of retrofitting existing development, rehabilitating degraded stream segments, identifying regional BMPs, purchasing land to preserve valuable floodplain functions, and any other projects that the Copermittees identify.

Under the Alternative Compliance Program, Priority Development Projects may be allowed to fund, partially fund, or implement a candidate project, in lieu of implementing structural BMPs onsite, if they enter into a voluntary agreement with the governing Copermittee permitting this arrangement. Project proponents may also propose an alternative project not previously identified by the Copermittees. In either case, whether a project proponent implements a candidate project identified by the Copermittees or a separate alternative compliance project, the governing Copermittee must determine that implementation of the project will have a greater overall water quality benefit for the Watershed Management Area than fully implementing structural BMPs onsite. If alternative compliance involves funding or implementing a project that

[41] 2012. ED Stein, F Federico, DB Booth, BP Bledsoe, C Bowles, Z Rubin, GM Kondolf, A Sengupta. Technical Report 667. Southern California Coastal Water Research Project. Costa Mesa, CA.

is outside the jurisdiction of the governing Copermittee, then that Copermittee may enter into an inter-agency agreement with the appropriate jurisdiction.

Finally, Provision E.3.c.(2)(d) allows Priority Development Projects to be exempt from the hydromodification management BMP requirements ~~under Provisions E.3.c.(3)(a)-(b) if a limited set of conditions are met~~ if there is no threat of erosion to downstream receiving waters, i.e. the receiving stream is concrete lined from the point of discharge all the way to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean. If the Copermittees believe that more exemptions are warranted, then they must perform the optional Watershed Management Area Analysis of Provision B.2.b.(4). Additional exemptions other than those specified in this Order may be established on a watershed basis, provided the Copermittees perform the analysis, provide supporting rationale for the exemptions, and complete the Water Quality Improvement Plan approval process pursuant to Provision F.1.

~~Provision E.3.c.(3) describes the alternative compliance options that each Copermittee may allow Priority Development Projects within its jurisdiction to utilize to meet the structural BMP performance criteria of Provisions E.3.c.(1) and E.3.c.(2). Such allowances are not required and are at the discretion of each Copermittee. Provision E.3.c.(3) was included because the San Diego Water Board recognizes that various site specific conditions can make complying with the structural BMP performance criteria requirements fully onsite difficult or impractical, and implementing the alternative compliance options can potentially realize or achieve greater water quality benefits for the Watershed Management Area.~~

~~Provision E.3.c.(3)(a) includes the conditions that must be met for a Copermittee to allow a Priority Development Project to utilize the alternative compliance options to comply with the structural BMP performance criteria of Provisions E.3.c.(1) and E.3.c.(2). Priority Development Projects that cannot comply with the requirements of Provision E.3.c.(3)(a) must be required by the Copermittee to comply with the requirements of Provisions E.3.c.(1) and E.3.c.(2) fully onsite.~~

~~Provisions E.3.c.(3)(b)-(d) describe the alternative compliance options that the Copermittee may develop and/or allow to be implemented by Priority Development Projects. The descriptions include the conditions that must be met for the alternative compliance option to be allowed to be utilized by a Priority Development Project. For the alternative compliance project options under Provision E.3.c.(3)(b), the descriptions also specify if the alternative compliance options may only be implemented to comply with the storm water pollutant control BMP requirements of Provision E.3.c.(1), hydromodification management BMP requirements of Provision E.3.c.(2), or both.~~

Provisions E.3.c.(4) and E.3.c.(5) were included under the BMP requirements applicable to all development projects in the Fourth Term Permits for San Diego, Orange, and Riverside Counties (Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016, respectively). In this Order, the long-term BMP maintenance and

infiltration and groundwater protection requirements ~~were move under the structural BMP performance requirements of Provision E.3.c and only~~ apply to structural BMPs implemented by Priority Development Projects only.

Provision E.3.d requires the Copermittees to update their BMP Design Manual as needed to incorporate the requirements of Provision E.3. The BMP Design Manual is formerly known as the Standard Storm Water Mitigation Plan, or SSMP, and was renamed so that the title has a more accurate description of the document content. The contents of the BMP Design Manual are largely unchanged from the previous Standard Storm Water Mitigation Plans required under the Fourth Term Permits. The BMP Design Manual fulfills the 40 CFR 122.26(d)(2)(iv)(A)(2) requirement that the Copermittee's development planning program includes "*a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment*."

As part of the "*planning procedures*", 40 CFR 122.26(d)(2)(iv)(A)(2) requires the procedures to "*address controls to reduce pollutants in discharges from municipal separate storm sewers after construction is completed*." The requirements applicable to the implementation and oversight of structural BMPs at Priority Development Projects are provided under Provision E.3.e.

Proper installation of the structural BMPs approved for a Priority Development Project is necessary to ensure that pollutants in storm water discharges will be reduced to the MEP after the project is completed. In addition to the proper installation of structural BMPs, the maintenance of structural BMPs on Priority Development Projects is necessary to ensure that pollutants in storm water discharges will continue to be reduced to the MEP. Provision E.3.e.(1) includes the minimum requirements that each Copermittee must implement to ensure structural BMPs are properly installed and will be properly maintained.

The requirements under Provision E.3.e.(2)-(3) are necessary to demonstrate each Copermittee is implementing a program that complies with Provisions E.3.b-c and E.3.e.(1), and ensure structural BMPs at Priority Development Project will continue to be able to reduce pollutants in storm water discharges to the MEP.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary for any development projects to compel compliance with the requirements of Provision E.3 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.3.f requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

~~Finally, Provision E.3.g requires the Copermittee to include the strategies and/or activities identified in the Water Quality Improvement Plan that the Copermittee will implement as part of the development planning program within its jurisdiction. The Water Quality Improvement Plan is expected to include several strategies and options that the Copermittee can and should implement within its jurisdiction. The Copermittee is expected to describe and provide the details of when, where, and how those strategies will be implemented within its jurisdiction.~~

~~Provision E.3.g specifically requires the Copermittee to identify areas within its jurisdiction where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting and/or stream, channel, or habitat rehabilitation projects. This requirement has been included to promote and encourage cooperation between the Copermittees and the development community to implement projects that can reduce pollutants in storm water runoff from areas of existing development, and stabilize or rehabilitate channels, stream and/or habitats that have been hydromodified because of existing development.~~

~~Furthermore, Provision E.3.g encourages the Copermittee to collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify regional alternative compliance projects that Priority Development Projects may be allowed or should be encouraged to implement or participate in implementing. This requirement has been included to promote and encourage more collaboration and coordination, as well as long term planning, among Copermittees and other entities in the Watershed Management Area.~~

~~The San Diego Water Board will utilize the information provided in the jurisdictional runoff management program document pursuant to Provision E.3.g to gauge and assess the Copermittee's efforts in trying to address the highest priority water quality conditions identified in the Water Quality Improvement Plan within its jurisdiction.~~

<u>Provision E.4 (Construction Management)</u> requires each Copermittee to implement a construction management program to control and reduce the discharge of pollutants in storm water from construction sites to the MEP. Proper implementation of the construction management program will also contribute toward effectively prohibiting non-storm water discharges from construction sites to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." As part of the management program, 40 CFR 122.26(d)(2)(iv)(D) requires "*a program to implement and maintain structural and non-structural best management practices to reduce pollutants in storm water runoff from construction sites to the municipal storm sewer system.*"

Construction sites can be significant sources of sediment, trash, and other pollutants to receiving waters. Although sediment is naturally occurring in the natural environment, the discharge of sediment under unnatural conditions is problematic to receiving waters. Fine sediment in creeks causes high turbidity that interferes with the functionality of native flora and fauna in local creeks. For example, turbidity interferes with both photosynthesis of water-philic plants, as well as successful foraging and reproduction of benthic macroinvertebrates. Sediment can also make it difficult for fish to breathe because it clogs fish gills. Other pollutants such as heavy metals or pesticides can adhere to sediment and are transported to receiving waters during storm events, where they dissolve in the water column and become bioavailable to aquatic organisms. Sediment is recognized as a major stressor to surface waters and is responsible for the impairment of several lagoons and creeks in the San Diego Region.

Provision E.4 includes requirements that each Copermittee must implement to minimize the discharge of sediment and other pollutants from construction sites to the MS4 within its jurisdiction. The requirements under Provision E.4 are consistent with the Fourth Term Permits for San Diego, Orange, and Riverside Counties. Therefore, Copermittees are expected to implement the requirements seamlessly, with minimal changes to their existing construction management programs. The Copermittees, however, are given more flexibility to run their programs as needed to maximize efficiency, and also to be consistent with the Water Quality Improvement Plan for the Watershed Management Area.

As part of the construction management program, 40 CFR 122.26(d)(2)(iv)(D)(1) requires "*procedures for site planning which incorporate consideration of potential water quality impacts.*" Provision E.4.a describes the minimum elements each Copermittee is required to include as part of the construction site planning and project approval process. The construction site planning and approval process is based primarily on ensuring each project had an adequate site-specific pollution control, construction BMP, and/or erosion and sediment control plan that will be implemented to minimize the discharge of pollutants in storm water to the MEP, and minimize impacts to receiving waters.

The requirements under Provision E.4.b provide the data and information necessary to identify "*priorities for inspecting sites and enforcing control measures*" required pursuant to 40 CFR 122.26(d)(2)(iv)(D)(3). Under Provision E.4.b, each Copermittee must identify construction sites that are considered a high threat to downstream surface waters. Designation of "high threat to water quality" construction sites will necessitate the Copermittees to develop criteria to identify such sites. Provision E.4.b.(2) describes a list of factors that must be considered when the Copermittee considers threat to water quality. For example, a Copermittee must identify sites as "high threat to water quality" if it is located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions, according to the Water Quality Improvement Plan. This ensures that construction

management program implementation is compatible with the Copermittee's identified highest priority water quality conditions.

Pursuant to 40 CFR 122.26(d)(2)(iv)(D)(2) each Copermittee is required describe "*requirements for nonstructural and structural best management practices*" at construction sites. Provision E.4.c includes the types of construction site BMPs that the Copermittees must implement, or require the implementation of, at each construction site to reduce pollutants in storm water discharges to the MEP.

Each Copermittee is expected to require the implementation of appropriate BMPs given specific site conditions, the season and likelihood of rain events, and construction phase (i.e. grading vs. vertical construction). This means that throughout the life of the project construction, the appropriate BMPs will vary, especially if the construction of the project spans multiple wet seasons. As opposed to describing specific minimum BMPs that must be implemented, the Order describes major BMP categories that should be considered for each site.

Each Copermittee is expected to use its 20 years of storm water experience and knowledge to require implementation of appropriate BMPs from the various categories at each construction site within its jurisdiction. For example, the San Diego Water Board expects that each site will be required to implement erosion control and sediment control ~~at each construction site~~. The San Diego Water Board also expects each Copermittee to require implementation of active/passive sediment treatment systems at sites where other BMPs have been tried and are known to be inadequate, and discharges of sediment are causing or contributing to water quality impairment downstream. Each Copermittee is granted flexibility in specifying the minimum level of BMP requirements at each site, but the San Diego Water Board expects each site to be capable of controlling pollutants in storm water discharges to the MEP and preventing illicit discharges.

The requirements under Provision E.4.d are necessary to demonstrate that each Copermittee is implementing a program that complies with Provisions E.4.a and E.4.c and ensure BMPs at construction sites will reduce pollutants in storm water discharges to the MEP.

Provision E.4.d does not include minimum required inspection frequencies for construction sites. Each Copermittee must use its experience and knowledge to specify an appropriate inspection frequency for both high priority and lower priority sites in their jurisdictional runoff management program documents, and in accordance with the Water Quality Improvement Plan. Appropriate inspection frequencies may vary by Copermittee, but the San Diego Water Board expects that the stated frequency will be adequate for each Copermittee to properly oversee the construction sites within its jurisdiction, confirm BMPs are implemented to reduce pollutants in storm water discharges from constructions sites to the MEP, and make needed changes to its program on an ongoing basis as necessary.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary for any development projects to compel compliance with the requirements of Provision E.4 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.4.e requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

~~Finally, Provision E.4.f requires the Copermittee to include the strategies and/or activities identified in the Water Quality Improvement Plan that the Copermittee will implement as part of the construction management program within its jurisdiction. The Water Quality Improvement Plan is expected to include several strategies and options that the Copermittee can and should implement within its jurisdiction. The Copermittee is expected to describe and provide the details of when, where, and how those strategies will be implemented within its jurisdiction.~~

~~The San Diego Water Board will utilize the information provided in the jurisdictional runoff management program document pursuant to Provision E.4.f to gauge and assess the Copermittee's efforts in trying to address the highest priority water quality conditions identified in the Water Quality Improvement Plan within its jurisdiction.~~

Provision E.5 (Existing Development Management) requires each Copermittee to implement an existing development management program to control and reduce the discharge of pollutants in storm water from areas of existing development to the MEP. Proper implementation of the existing development management program will also contribute toward effectively prohibiting non-storm water discharges from areas of existing development to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." Within 40 CFR 122.26(d)(2)(iv)(A) and (C), the management program is required to reduce impacts on receiving waters and reduce pollutants in storm water discharges to the MEP from commercial and residential areas, industrial facilities, and municipal facilities.

Commercial and residential areas, industrial facilities, and municipal facilities must be addressed by each Copermittee with the existing development management program required under Provision E.5. All other areas within each Copermittee's jurisdiction should be either undeveloped open space, or areas that are being developed or under construction. Areas being developed or under construction will be addressed by the Copermittee under the requirements of Provision E.3 (Development Planning) or Provision E.4 (Construction Management).

Areas of existing development typically include impervious surfaces such as sidewalks, driveways, roads, and rooftops, which generate and concentrate pollutants (such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not found in high concentrations in the natural environment. Pollutants that accumulate on impervious surfaces are not easily biodegraded or not subject to natural treatment processes. When it rains, these pollutants are transported in storm water runoff from these impervious surfaces into receiving waters, resulting in poor water quality and degradation of beneficial uses.

In addition to the generation of pollutants, areas of existing development have generally altered the natural conditions of the land and removed vegetative cover, reduced the perviousness of the surface, and reduced the capacity of storm water that can be intercepted, captured, stored, infiltrated, evaporated, and/or evapotranspired. The alteration of the natural conditions and the impervious surfaces associated with areas of existing development causes water quality problems due to the alteration of natural flow regimes within the watersheds;~~,~~ resulting in hydromodification of channels, streams, and habitats that exist within or adjacent to the areas of existing development.

Thus, storm water discharges from areas of existing development are responsible for poor water quality, degraded habitats, and hydromodified channels throughout the developed portions of the watersheds in the San Diego Region. To improve the health and functionality of the receiving waters in a Watershed Management Area, land use practices and the amount of impervious surfaces in areas of existing development must change to reduce the various impacts caused by hydromodification and pollutants from storm water runoff generated in developed areas. Each Copermittee must be aggressive ~~in tackling~~ to address pollutant sources and runoff from areas of existing development to be able to reduce pollutants in storm water discharges from the MS4 to the MEP.

There is some overlap in the requirements under Provision E.5 with the requirements under Provisions E.2 (Illicit Discharge Detection and Elimination), E.3 (Development Planning), and E.4 (Construction Management). Illicit discharges frequently originate from areas of existing development. New development projects, when completed will become some type of residential, commercial, industrial or municipal existing development. Redevelopment projects are, by definition, redeveloping areas of existing development. And, redevelopment projects become construction sites located in areas of existing development. Much of the data and information collected, inspections performed, and enforcement actions taken for the requirements under Provisions E.2 to E.4 may also be utilized by the existing development management program. The requirements under Provision E.5, however, are focused primarily on reducing pollutants generated in areas of existing development that can be transported in storm water runoff and discharged to and from the MS4.

The requirements under Provision E.5 build upon existing program elements being implemented by the Copermittees. Provision E.5 is generally consistent with the

existing development requirements of the Fourth Term Permits for Orange and Riverside Counties (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), but modified to provide more flexibility to implement the programs so resources can be better focused toward addressing the highest priority water quality conditions identified in the Water Quality Improvement Plans.

For a Copermittee to properly manage areas of existing development, having knowledge of what development exists within its jurisdiction is essential. ~~The requirements under~~ Provision E.5.a ~~for~~ require each Copermittee to maintain a watershed-based inventory of all the existing development within its jurisdiction. ~~are~~ This requirement is necessary for each Copermittee to implement the requirements of Provision E.5.b-e.

As opposed to just maintaining separate inventories based on the type of site, each Copermittee must maintain a watershed-based inventory that includes all types of existing development within its jurisdiction. By utilizing a watershed-based inventory, the Copermittees within a Watershed Management Area can combine their inventories and review the inventories by watershed in addition to by jurisdiction. Pollutant sources and strategies for abatement can then be evaluated on a watershed level, as opposed to evaluating sources and strategies strictly by type of site.

Provision E.5.a includes the information that must be included in the inventory. Provision E.5.a.(1) specifies what facilities or areas must be included in the inventory. A commercial type of existing development may be identified in the inventory as a facility (e.g. individual building, individual business) or an area (e.g. shopping center, commercial zone). An industrial type of existing development must be identified in the inventory by facility (e.g. individual industrial entity). A municipal type of existing development must be identified in the inventory by facility, with a list of specific municipal facilities that must be included in the inventory. A residential type of existing development must be identified by areas to be designated by the Copermittee. For each of the facilities and areas identified in the Copermittee's inventory developed pursuant to Provision E.5.a.(1), Provision E.5.a.(2) specifies the information that must be included in the description for the facility or area.

Provision E.5.a.(3) requires each Copermittee to maintain an updated map showing the location of inventoried existing development, watershed boundaries, and water bodies. This requirement was included because this information is expected to help the Copermittees in a Watershed Management Area identify and prioritize sources of pollutants and/or stressors in areas of existing development that contribute toward the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Knowledge of the ~~sources of~~ existing development that are likely to be sources of pollutants contributing to the highest priority water quality conditions is expected to be a key element in the Copermittees' development of the water quality improvement strategies that will be included in the Water Quality Improvement Plans. The

strategies described in the Water Quality Improvement Plans will direct efforts within the existing development management programs implemented by each Copermittee.

Pursuant to 40 CFR 122.26(d)(2)(iv)(A) each Copermittee is required describe "*structural and source control measures to reduce pollutants*" in storm water runoff discharged from areas of existing development. Provision E.5.b includes the BMP implementation and maintenance requirements that the each Copermittee must require at areas of existing development to reduce pollutants in storm water discharges to the MEP. The San Diego Water Board, however, recognizes that BMP implementation and maintenance for residential areas will require much more education and encouragement through less authoritative measures than for commercial, industrial and municipal facilities and areas. Thus, the BMP implementation and maintenance requirements have been separated between requirements under Provision E.5.b.(1) for commercial, industrial and municipal facilities and areas, and Provision E.5.b.(2) for residential areas.

Most of the requirements in Provision E.5.b are consistent with the related requirements in the Fourth Term Permits. The level of specificity, however, has been changed to allow each Copermittee the flexibility to implement its program to achieve maximum efficiency, and to perform functions that will address the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Each Copermittee is expected to require the implementation of appropriate BMPs to address the expected pollutants from each facility or area. The Third and Fourth Term Permits described specific minimum BMPs that must be implemented at various sites. This Order, however, requires each Copermittee to designate minimum BMPs themselves and require implementation. Consistent with the Fourth Term Permits, each Copermittee is required to maintain, or require the maintenance of, all BMPs as needed.

The BMP implementation and maintenance requirements include a schedule of operation and maintenance activities for the MS4 and related structures (such as catch basins, storm drain inlets, and detention basins), as well as public streets and roads. Public streets and roads specifically include public unpaved roads. The San Diego Water Board identified, through investigations and complaints, sediment discharges from unpaved roads as a significant source of water quality problems in the San Diego Region. ~~Enforcement and i~~Inspection activities conducted by the San Diego Water Board since the Third Term Permits ~~were issued~~ have found a lack of source control for many unpaved roads within the jurisdiction of the Copermittees.

Unpaved roads are a source of sediment that can be discharged in runoff to receiving waters, especially during storm events. Erosion of unpaved roadways occurs when soil particles are loosened and carried away from the roadway base, ditch, or road bank by water, wind, traffic, or other transport means. Exposed soils, high runoff velocities and volumes, sandy or silty soil types, and poor compaction increase the potential for erosion.

Road construction, culvert installation, and other maintenance activities can disturb the soil and drainage patterns to streams in undeveloped areas, causing excess runoff and thereby erosion and the release of sediment. Poorly designed unpaved roads can act as preferential drainage pathways that carry runoff and sediment into natural streams, impacting water quality. In addition, other public works activities along unpaved roads have the potential to significantly affect sediment discharge and transport within streams and other waterways, which can degrade the beneficial uses of those waterways.

USEPA also recognizes that discharges from unpaved roads pose a significant potential threat to water quality. USEPA guidance[42] emphasizes the threat of unpaved roads to water quality:

> "*Dirt and gravel roads are a major potential source of these pollutants [sediment] and pollutants that bind to sediment such as oils, nutrients, pesticides, herbicides, and other toxic substances. Many roads have unstable surfaces and bases. Roads act like dams, concentrating flows that accelerate erosion of road materials and roadsides. Both unstable surfaces and accelerated erosion then lead to sediment and dust.*"

There are several guidance documents, developed by the USEPA,[43] the US Forest Service,[44] the University of California,[45] and others, that include design and construction specifications and BMPs that are readily available for implementation by public entities. Implementing design and other source control BMPs for unpaved roads in the region is necessary to reduce and minimize the impacts of sediment discharged during storm events from unpaved roads to the MS4s and receiving waters.

Provision E.5.c describes existing development site inspection frequency, content, and tracking that each Copermittee must incorporate into their existing development management programs. The requirements under Provision E.5.c are necessary to demonstrate each Copermittee is implementing a program that complies with Provision E.5.b and ensure BMPs implemented in areas of existing development will reduce pollutants in storm water discharges to the MEP. Provision E.5.c has been modified to include a minimum of once every 5 years for all inventoried facilities and areas of existing development, utilizing one or more methods of inspection.

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[42] USEPA, 2006. Environmentally Sensitive Maintenance for Dirt and Gravel Roads. Gesford and Anderson, USEPA-PA-2005.
[43] Ibid
[44] US Forest Service, 1996. Forest Service Specifications for Construction of Roads & Bridges. EM-7720-100. Revised August 1996.
[45] University of California Division of Agriculture and Natural Resources, 2007. Rural Roads: A Construction and Maintenance Guide of California Landowners. Publication 8262.

In addition to onsite inspections, the methods of inspection have been expanded to include drive-by inspections. Inspections may be performed by the Copermittee's municipal and contract staff, or by volunteer monitoring or patrol programs. Volunteer monitoring or patrol programs are not expected to enforce the Copermittee's ordinances, or to inspect areas or facilities where members of the public are not allowed access. Volunteer monitoring or patrol programs must be trained by the Copermittee, and are only expected to collect visual observations. By utilizing drive-by inspections and volunteer monitoring or patrol programs, the Copermittees will be able to maximize and efficiently use their resources to identify and address sources of pollutants in areas of existing development.

The municipal and contract staff of each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial, industrial, and municipal facilities and areas in its inventoried existing development pursuant to Provision E.5.c.(1)(a)(iv). An "equivalent" of at least 20 percent means if any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspection may count toward the total annual inspection requirement. Linear municipal facilities (i.e., MS4 linear channels, sanitary sewer collection systems, streets, roads and highways) in the Copermittee's existing development inventory are not subject to the inspection frequency requirement of Provision E.5.c.(1)(a)(iv).

The inspection content specified in Provision E.5.c.(2)(a) includes the information required to be collected during an inspection by any method. The inspection content specified in Provision E.5.c.(2)(a) includes additional information that must be collected when a Copermittee's municipal or contract staff perform an onsite inspection. Provision E.5.c.(3) specifies the information that each Copermittee must maintain in its existing development inspection records.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary to compel compliance with the requirements of Provision E.5 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.5.d requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

~~Finally, Provision E.5.e requires the Copermittee to include the strategies and/or activities identified in the Water Quality Improvement Plan that the Copermittee will implement as part of the existing development management program within its jurisdiction. The Water Quality Improvement Plan is expected to include several strategies and options that the Copermittee can and should implement within its jurisdiction. The Copermittee is expected to describe and provide the details of when, where, and how those strategies will be implemented within its jurisdiction.~~

Provisions ~~E.5.e.(2)-(3)~~ E.5.e.(1)-(2) specifically require the Copermittee to identify areas of existing development as candidates for retrofitting, and streams, channels, and/or habitats as candidates for rehabilitation. Provisions ~~E.5.e.(2)-(3)~~ E.5.e.(1)-(2) are based on the retrofitting requirements of the Fourth Term Permits for Orange and Riverside Counties, but modified to also include identifying projects to rehabilitate channels within areas of existing development. The requirements have also been modified to be more focused on utilizing these types of projects for addressing the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Interest and opportunity to retrofit areas of existing development and rehabilitate channels located in areas of existing development has been observed in several programs the San Diego Water Board oversees (e.g., CWA Section 401 Water Quality Certification program, supplemental environmental projects, and grant programs). Each jurisdiction has miles and miles of streets that could be retrofitted to become green streets. Reshaping landscaped areas from convex to concave configurations can detain storm water instead of directing runoff as quickly as possible to the MS4. Retrofit projects could also include simply replacing impervious surfaces with permeable surfaces.

Retrofitting projects do not necessarily have to be expensive. Retrofitting projects could be as simple as redirecting downspouts from roofs to pervious or landscaped areas instead of to hardscaped areas discharging directly to the MS4, providing rain barrels to harvest storm water from downspouts for use at a later time, or planting more trees in areas with little vegetation to provide canopy that can intercept storm water. The San Diego Water Board encourages the Copermittees to identify simple, low-cost retrofitting opportunities that can be easily implemented, in addition to other more expensive retrofitting and channel rehabilitation projects.

Rehabilitation of channels, streams, and/or habitat will require more significant planning and resources to implement. There are, however, also abundant opportunities to rehabilitate channels, streams and/or habitats in or adjacent to areas of existing development. Each Watershed Management Area likely has several creeks and stream reaches that have been undergrounded, artificially hardened, or hydromodified that could be rehabilitated to be more sustainably configured, which would slow down storm water flows and potentially have more assimilative capacity for pollutants while still being supportive of designated beneficial uses.

The San Diego Water Board recognizes that it may be infeasible to implement retrofitting or channel rehabilitation projects within certain areas of a Copermittee's jurisdictions. For such areas, the Copermittee must instead identify, develop, and implement regional retrofitting and channel rehabilitation projects (i.e. projects that can retain and/or treat storm water from one or more areas of existing development) adjacent to and/or downstream of the areas of existing development.

Provisions ~~E.5.e.(2) (3)~~ E.5.e.(1)-(2) do not require the implementation of retrofitting and rehabilitation projects, but do require the Copermittee to develop a program with strategies~~y~~ to facilitate the implementation of these types of projects in areas of existing development. The strategies~~y~~ ~~is~~ are expected to include allowing and encouraging Priority Development Projects to implement ~~these~~ retrofitting types of projects ~~to comply~~ as a means of compliance with the structural BMP performance criteria requirements of Provisions E.3.c.(1) and E.3.c.(2).

~~The San Diego Water Board will utilize the information provided in the jurisdictional runoff management program document pursuant to Provision E.5.e to gauge and assess the Copermittee's efforts in trying to address the highest priority water quality conditions identified in the Water Quality Improvement Plan within its jurisdiction.~~

Provision E.6 (Enforcement Response Plans) requires each Copermittee to develop an Enforcement Response Plan as part of its jurisdictional runoff management program document. Proper implementation of the Enforcement Response Plans is necessary to effectively prohibit non-storm water discharges to the MS4, and reduce the discharge of pollutants in storm water from the MS4 to the MEP.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system*" and be able to demonstrate that it can "*operate pursuant to legal authority established by statute, ordinance or series of contracts*" to control the discharge of non-storm water and pollutants in storm water to and from its MS4. Pursuant to 40 CFR 122.26(d)(2)(i)(E) each Copermittee is specifically required to have the legal authority to "*[r]equire compliance with conditions in ordinances, permits, contracts or order*s."

The requirements under Provision E.6 are necessary to demonstrate that each Copermittee can enforce its legal authority to *"effectively prohibit non-stormwater discharges"* and "*reduce the discharge of pollutants to the maximum extent practicable*" as well as "*[r]equire compliance with conditions in ordinances, permits, contracts or order*."

The Enforcement Response Plan required under Provision E.6 will serve as a reference for the Copermittee and the San Diego Water Board to determine if consistent enforcement actions are being implemented to achieve timely and effective compliance from all public and private entities that are not in compliance with the Copermittee's ordinances, permits, or other requirements. The Enforcement Response Plan must contain clear direction for the Copermittee to take immediate enforcement action, when appropriate and necessary, in their illicit discharge detection and elimination, development planning, construction management, and existing development management programs.

If the entities subject to the Copermittee's legal authority do not implement appropriate corrective actions in a timely manner, or if violations repeat, the Copermittee must take

progressively stricter responses to enforce its legal authority and achieve compliance with its ordinances, permits, or other requirements to *"effectively prohibit non-stormwater discharges"* and "*reduce the discharge of pollutants to the maximum extent practicable.*"

Provision E.7 (Public Education and Participation) requires each Copermittee to implement a public education and participation program. Proper implementation of the public education and participation program as part of its jurisdictional runoff management program will contribute toward effectively prohibiting non-storm water discharges to the MS4, and toward the reduction of pollutants in storm water from the MS4 to the MEP.

Provision E.7 establishes the minimum requirements that each Copermittee must implement to engage members of the public as part of its jurisdictional runoff management program. In the Fourth Term Permits, the public education program requirements and the public participation requirements were included as separate jurisdictional runoff management program components. In this Order, the public education requirements have been consolidated with the public participation requirements, as both sets of requirements are related to the engagement of the public by each Copermittee. Engagement of the public is critical for the success of each Copermittee's jurisdictional runoff management program.

The Copermittees have been implementing public education programs for the last 20 years, which are now well established. The specificity of expected public education program elements of the Fourth Term Permits has been removed. For the most part, the public education program requirements in Provision E.7.a have been reduced to a set of requirements that are specifically included in the federal regulations under 40 CFR 122.26(d)(2)(iv)(A)(6), 122.26(d)(2)(B)(6) and 122.26(d)(2)(D)(4), which should already be incorporated into each Copermittee's existing public education program. Each Copermittee is expected to utilize the information and data collected from the monitoring and assessments conducted within the Watershed Management Area, and from its inventories and inspections to best direct its public education program resources toward addressing the highest priority water quality conditions identified within the Water Quality Improvement Plan.

According to 40 CFR 122.26(d)(2)(iv), public participation is required to be included as part of the "*comprehensive planning process*", which includes the development and implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs. The requirements under Provision E.7.b specify the opportunities that the public must be provided to be involved in the "*comprehensive planning process*", as required by to 40 CFR 122.26(d)(2)(iv).

Provision E.8 (Fiscal Analysis) requires each Copermittee to secure the resources and provide an analysis of the resources that will be necessary to implement the requirements of the Order. Adequate fiscal resources are necessary for a jurisdictional runoff management program to effectively prohibit non-storm water

discharges to the MS4, and reduce pollutants in storm water from the MS4 to the MEP.

According to 40 CFR 122.26(d)(2)(vi), each Copermittee is responsible for providing "*a fiscal analysis of the necessary capital and operation and maintenance expenditures necessary to accomplish the activities*" required by this Order, including "*a description of the source of funds that are proposed to meet the necessary expenditures, including legal restrictions on the use of such funds.*" The fiscal analysis requirements of Provision E.8 are consistent with 40 CFR 122.26(d)(2)(vi).

The San Diego Water Board has chosen not to require a description of fiscal benefits realized from implementation of the jurisdictional runoff management programs. This is a recommendation from the National Association of Flood and Stormwater Management Agencies.[46] For instance, the fiscal analysis requirements do not address city-wide fiscal benefits of protection (e.g., public health, tourism, property values, economic activity, beneficial uses, etc.), even though many costs currently reported to the San Diego Water Board are for related activities. This type of assessment may help Copermittees improve the allocation of resources and it may help the Copermittees secure adequate funding for the program. Qualitative assessments, however, could be overly subjective and most Copermittees likely lack the ability to provide accurate quantitative assessments. The San Diego Water Board encourages the Copermittees to consider means for conducting assessments of fiscal benefits derived from the programs. Such assessments could be conducted on a regional scale similar to studies of program costs conducted by the State Water Board.[47]

[46] National Association of Flood and Stormwater Management Agencies. 2006. *Guidance for Municipal Stormwater Funding.* Prepared under a grant provided by the USEPA.
[47] State Water Board, 2005. NPDES Stormwater Cost Survey.

F. Reporting

Purpose: Provision F includes the requirements for the documents and reports that the Copermittees must prepare and provide to the San Diego Water Board. The documents prepared by the Copermittees and provided to the San Diego Water Board and made available to the public will provide the documentation that the Copermittees are complying with the requirements of the Order.

***Discussion*:** Provision F requires the Copermittees to prepare several documents and reports that must be provided to the San Diego Water Board and made available to the public. The reporting requirements have been significantly reduced compared to the Fourth Term Permit reporting requirements. The reduction in reporting requirements was recommended by the San Diego County Copermittees in the Report of Water Discharge submitted in June 2011.

More specific and detailed discussions of the requirements of Provision F are provided below.

Provision F.1 (Water Quality Improvement Plans) requires the Copermittees in each Watershed Management Area to develop and submit a Water Quality Improvement Plan in accordance with the requirements of Provision B.

Of all the requirements of Provision F, the Water Quality Improvement Plans will likely be the documents requiring the most significant effort to develop. The content of the Water Quality Improvement Plans, however, is expected to include content that should already have been developed for the Watershed Plans and several elements that are included in the Monitoring and Reporting Programs required under the Fourth Term Permits.

Because the Water Quality Improvement Plan is part of the "*comprehensive planning process*~~" requiring~~ *which involves public participation*," Provision F.1 includes requirements to give multiple opportunities to the public to provide input on the content of the plans.

Provision F.1.a.(1) specifies the elements that the Copermittees must include in the public participation process for the development of the Water Quality Improvement Plans. In order for the public to be aware of the opportunities to provide input, Provision F.1.a.(1)(a) requires the Copermittees to develop a publicly available and noticed schedule of the opportunities for the public to participate and provide comments during the development of the Water Quality Improvement Plan. These opportunities are when the public can provide the data, information, and recommendations that the Copermittees can consider during the development of the Water Quality Improvement Plans.

The San Diego Water Board recognizes, however, that the Copermittees cannot be expected to incorporate all the data, information, and recommendations that the public may provide into the Water Quality Improvement Plans. The Copermittees will have to review the data, information, and recommendations received and make some decisions on what to incorporate into the Water Quality Improvement Plans. Before the Copermittees finalize their decisions, members of the public should be allowed to review the Copermittees' decisions. Thus, Provision F.1.a.(1)(b) requires the Copermittees to form a Water Quality Improvement Consultation Panel (Panel).

The Panel will consist of a member from the environmental community and a member from the development community familiar with the Watershed Management Area. A representative from the San Diego Water Board staff will also be part of the Panel. The Copermittees may choose to include additional members, but the Panel is only required to include three panel members.

The Panel will serve as an additional public participation and input mechanism during the development of the Water Quality Improvement Plans. The knowledge and expertise from these Panel members are expected to provide the Copermittees valuable direction during their decision-making process. The Copermittees will review the content of their planned submittals with the Panel members to receive recommendations or concurrence. If the Panel provides recommendations, the Copermittees must consider revisions to the Water Quality Improvement Plan submittals.

The San Diego Water Board recognizes that the development of multiple Water Quality Improvement Plans concurrently may limit the ability of the public to review and provide comments to the Copermittees. Thus, Provision F.1.a.(1)(c) requires the Copermittees to coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public as much time and opportunity as possible to participate during the development of the Water Quality Improvement Plans.

Provision F.1.a.(2) requires the Copermittees to develop and submit the first Water Quality Improvement Plan component, in accordance with the requirements of Provision B.2, which includes the identification of the priority water quality conditions and potential water quality improvement strategies. The public must be provided an opportunity to provide data, information and recommendations from the public to be utilized in the development and identification of the priority water quality conditions and potential water quality improvement strategies for the Watershed Management Area. The Copermittees must consult with the Panel and consider making revisions. The Copermittees may submit the requirements of Provision B.2 as early as 6 months and no later than 12 months after the commencement of coverage under this Order. After the requirements of Provision B.2 are submitted to the San Diego Water Board, the public will be provided another opportunity to provide comments.

Provision F.1.a.(3) requires the Copermittees to develop and submit the second Water Quality Improvement Plan component, in accordance with the requirements of Provision B.3, which includes the identification of the numeric goals for the highest priority water quality conditions identified for the Watershed Management Area, and the strategies that will be implemented to achieve the potential numeric goals. The Copermittees may also develop the Optional Watershed Management Area Analysis, in accordance with the requirements of Provision B.2.b.(4), and/or Discharge Prohibitions and Receiving Water Limitations Compliance Option, in accordance with the requirements of Provision B.3.c, as part of this submittal. The public must be provided an opportunity to provide data, information and recommendations to be utilized in the development and identification of the numeric goals and water quality improvement strategies for the Watershed Management Area. The Copermittees must consult with the Panel and consider making revisions. The Copermittees may submit the requirements of Provision B.3 as early as 9 months and no later than 18 months after the commencement of coverage under this Order. After the requirements of Provision B.3 are submitted to the San Diego Water Board, the public will be provided another opportunity to provide comments.

Finally, Provision F.1.b describes the process for the submittal and implementation of the Water Quality Improvement Plans. The complete Water Quality Improvement Plans are required to be submitted by the Copermittees within ~~18~~ 24 months after ~~adoption of~~ the commencement of coverage under this Order. The San Diego Water Board will provide the public an opportunity to provide comments on each complete Water Quality Improvement Plan.

The San Diego Water Board will review each Water Quality Improvement Plan and the public comments received to determine if the Copermittees have submitted a Water Quality Improvement Plan that meets the requirements of Provision B. If a Water Quality Improvement Plan does not meet the requirements of Provision B, the Copermittees will be considered out of compliance and directed in writing by the San Diego Water Board Executive Officer to correct the deficiencies.

When a Water Quality Improvement Plan meets the requirements of Provision B, the San Diego Water Board will determine whether to hold a public hearing or to limit public input to submittal of written comments before accepting the Water Quality Improvement Plan. Implementation of the Water Quality Improvement Plan must begin within 30 days of acceptance.

The San Diego Water Board expects that any deficiencies in the Water Quality Improvement Plan will be identified either in the public comments or during the review by the San Diego Water Board before implementation begins. In the event any deficiencies are identified after the implementation of the Water Quality Improvement Plan, Provision F.1.b.(7) clarifies that the San Diego Water Board maintains the right to require the Copermittees to correct any deficiencies that may be identified.

Provision F.2 (Updates) requires the Copermittees to update specific documents that the Copermittees will utilize to implement the requirements of this Order.

Each Copermittee is required to continue implementing a jurisdictional runoff management program, as required under Provision E. Implementation of each Copermittee's jurisdictional runoff management program is directed by its jurisdictional runoff management program document. Provision F.2.a requires each Copermittee to update its jurisdictional runoff management program document to be consistent with the requirements of Provision E within ~~18~~ 3 months after the acceptance of the Water Quality Improvement Plan ~~adoption of this Order~~.

Likewise, each Copermittee must continue to require new development and redevelopment projects to implement BMPs to control pollutants in storm water runoff. The control of pollutants in storm water runoff from development and redevelopment projects within each Copermittee's jurisdiction is guided and directed by its BMP Design Manual, formerly known as a Standard Storm Water Mitigation Plan (SSMP). Provision F.2.b requires each Copermittee to update its BMP Design Manual to be consistent with the requirements of Provision E.3 within ~~18~~ 3 months after the acceptance of the Water Quality Improvement Plan ~~adoption of this Order~~.

In general, the requirements of the Order should not necessitate a complete rewrite of each Copermittee's jurisdictional runoff management program document or BMP Design Manual, as was required by the Third Term Permits. The jurisdictional runoff management program and BMP Design Manual requirements of this Order are not significantly different than the requirements of the Fourth Term Permits. Thus, only sections of the Order which are new or have been significantly changed should warrant revisions to specific sections of the Copermittee's jurisdictional runoff management program document and BMP Design Manual.

Finally, the Water Quality Improvement Plans are expected to require updates as the iterative approach and adaptive management process included in the Water Quality Improvement Plan, as required under Provision B.5, is implemented by the Copermittees. Provision F.2.c.(1) requires the Copermittees to implement a public participation process for the proposed updates, review the proposed updates with the Panel, and submit the updates to the Water Quality Improvement Plan as part of the Annual Reports required under Provision F.3.b.

Also, because TMDLs are likely to be developed, adopted and approved during the term of the Order, Provision F.2.c.(2) has been included to expedite the incorporation of TMDLs into the Copermittees' Water Quality Improvement Plans as part of the update process, potentially before the Order is re-opened to incorporated the requirements of the new TMDLs.

Provision F.3 (Progress Reporting) requires the Copermittees to report on the progress of implementing the Water Quality Improvement Plans.

The requirements of Provision F.3 are to report the progress toward improving water quality that the Copermittees are achieving with the implementation of the Water Quality Improvement Plans and each Copermittee's jurisdictional runoff management program. The Progress Report Presentations required under Provision F.3.a are included to provide the Copermittees an opportunity to communicate directly with the San Diego Water Board and the public. The Progress Report Presentations will also provide the members of the San Diego Water Board and members of the public an opportunity to become more acquainted with the Copermittees and their projects and programs to address non-storm water and storm water discharges into and from their MS4s.

The Annual Report requirements of Provision F.3.b are a consolidation of several reporting requirements from the Fourth Term Permits, including the Jurisdictional Runoff Management Program Annual Reports, the Watershed Annual Reports, and the Monitoring and Reporting Program Annual Reports. Furthermore, the Annual Report requirements are consistent with the requirements under 40 CFR 122.42(c).

Pursuant to 40 CFR 122.42(c), "*[t]he operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the Director…must submit an annual report*", which must include the following:

(1) *The status of implementing the components of the storm water management program that are established as permit conditions* [40 CFR 122.42(c)(1)];

(2) *Proposed changes to the storm water management programs that are established as permit conditions* [40 CFR 122.42(c)(2)];

(3) *Revisions, if necessary, to the assessment of controls and fiscal analysis* [40 CFR 122.42(c)(3)];

(4) *A summary of data, including monitoring data, that is accumulated throughout the reporting year* [40 CFR 122.42(c)(4)];

(5) *Annual expenditures and budget for year following each annual report* [40 CFR 122.42(c)(5)];

(6) *A summary describing the number and nature of enforcement actions, inspections, and public education programs* [40 CFR 122.42(c)(6)];

(7) *Identification of water quality improvements or degradation* [40 CFR 122.42(c)(7)].

Under the Fourth Term Permits, each Copermittee is responsible for submitting a Jurisdictional Runoff Management Program Annual Report; the Copermittees in each designated watershed are responsible for submitting a Watershed Annual Report; and the Copermittees from each county are responsible for submitting a Monitoring and Reporting Program Annual Report.

There are 39 Copermittees in the San Diego Region, each required to prepare and submit a Jurisdictional Runoff Management Program Annual Report. There are 9 designated watersheds in San Diego County, 6 designated watersheds in Orange County, and 1 designated watershed in Riverside County for a total of 16 designated watersheds, each requiring a Watershed Annual Report. There are 3 sets of Copermittees in 3 counties in the San Diego Region, requiring Copermittees from each county to prepare and submit a Monitoring and Reporting Program Annual Report. Thus each Copermittee is currently required to prepare, or participate in the preparation of at least 3 annual reports. In addition, the San Diego County Copermittees are required to prepare and submit a Regional Urban Runoff Management Plan Annual Report.

In total, there are 59 annual reports that are prepared by the Copermittees and submitted to the San Diego Water Board for the Fourth Term Permits. The preparation of these annual reports requires significant time and resources from each Copermittee, which could otherwise be expended on actions that could improve water quality within its jurisdiction. In turn, significant time and resources are required from the San Diego Water Board staff to review these reports, which could otherwise be expended on working directly with the Copermittees to improve their implementation efforts toward restoring and protecting water quality.

Until the Water Quality Improvement Plans are developed, there will be a transitional period during which the Copermittees will continue to implement their existing jurisdictional runoff management programs. There will also be a transitional period during which the Copermittees will implement the transitional monitoring and assessment requirements of Provision D. During the transitional period, the Copermittees will submit annual reports pursuant to the requirements of Provisions F.3.b.(1) and F.3.b.(2).

Provision F.3.b.(1) includes the transitional annual reporting requirements for each Copermittee's jurisdictional runoff management program. The reporting of the jurisdictional runoff management program implementation efforts have been reduced to a single 2-page form. Each Copermittee is required to complete and submit a Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D or a revised form accepted by the San Diego Water Board) no later than October 31 of each year for each jurisdictional runoff management program reporting period (i.e. July 1 to June 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted. The Jurisdictional Runoff Management Program Annual Report Form will certify that each Copermittee has implemented its jurisdictional runoff management program in accordance with the requirements of Provision E. Each Copermittee may choose to continue to utilize and submit the jurisdictional runoff management program annual reporting format of its current Order until the first Water Quality Improvement Plan Annual Report is required to be submitted.

Provision F.3.b.(2) includes the transitional annual reporting requirements for the transitional monitoring and assessment program for each Watershed Management Area. The Copermittees in the Watershed Management Area are required to submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted. The Transitional Monitoring and Assessment Program Annual Report is required to include the transitional period monitoring data collected pursuant to Provisions D.1.a and D.2.a, and the findings from the transitional period findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

Provision F.3.b.(3) includes the Water Quality Improvement Plan Annual Report requirements. ~~only requires~~ Only one Water Quality Improvement Plan Annual Report is required for each of the 10 Watershed Management Areas designated under Provision B.1, which is a significant reduction in the number of annual reports required to be prepared and submitted by the Copermittees. The Water Quality Improvement Plan Annual Report will document the Copermittees' efforts to implement the Water Quality Improvement Plan. Each Water Quality Improvement Plan Annual Report will be focused primarily on reporting the analysis of the monitoring data collected pursuant to Provisions D.1-D.3 during the reporting period, and the assessments that are required pursuant to Provision D.4 based on the data. The monitoring data analyses and the assessments that are provided in the Water Quality Improvement Plan Annual Report will be the core of the report. The reporting of the jurisdictional runoff management program implementation efforts have been reduced to a single 2-page form, and will no longer be the primary focus of the reporting requirements as in the Third and Fourth Term Permits.

~~The~~ Each Copermittee will continue to prepare and submit a Jurisdictional Runoff Management Program Annual Report Form ~~(see Attachment D to the Order) will~~ as part of the Water Quality Improvement Plan Annual Report to certify that each Copermittee has implemented its jurisdictional runoff management program in accordance with the requirements of Provision E. Instead of reviewing a voluminous report from each Copermittee, as was required under the Third and Fourth Term Permits, the San Diego Water Board will conduct audits of each Copermittee's jurisdictional runoff management program to investigate and confirm the information provided by each Copermittee on its Jurisdictional Runoff Management Program Annual Report Form. The audits will allow the San Diego Water Board to become more familiar with the each Copermittee's jurisdictional runoff management program, and each Copermittee will become more informed about the expectations of the San Diego Water Board.

The reduction in the number and content of the Water Quality Improvement Plan Annual Reports should result in significant time, cost and resource savings for the Copermittees, as well as the San Diego Water Board. Those savings should offset a significant portion of any additional costs that may be incurred to develop the Water

Quality Improvement Plans and to implement the monitoring and assessment program requirements of Provision D.

The reporting period for the Water Quality Improvement Plan Annual Reports consists of two periods. Because the jurisdictional runoff management programs are typically budgeted and implemented during a fiscal year, the information provided on the Jurisdictional Runoff Management Program Annual Report Forms will cover the period from July 1 to June 30 of the following year.

The Water Quality Improvement Plan Annual Reports, however, are focused primarily on the monitoring data and the assessments based on the monitoring data. The monitoring data is collected during the monitoring year, which begins October 1 and ends September 30 of the following year. The monitoring year begins after the beginning of the fiscal year and ends after the end of the fiscal year. Therefore, to accommodate and capture the information collected during the fiscal year and the monitoring year, the Annual Report reporting period incorporates both periods.

Finally, Provision F.3.c requires the Copermittees to develop and submit a Regional Monitoring and Assessment Report. The Regional Monitoring and Assessment Report is similar to the Long Term Effectiveness Assessment required under the Fourth Term San Diego County Permit. The Regional Monitoring and Assessment Report is expected to utilize the entire body of data and information collected by the Copermittees during the term of this Order to assess improvements to water quality on a regional scale.

Provision F.4 (Regional Clearinghouse) requires the Copermittees to develop, update, and maintain an internet-based Regional Clearinghouse that can be used to store, disseminate, and share the Copermittees' documents, monitoring data, special studies, and any other data or information.

Most of the documents and data that are generated by the Copermittees can be provided in electronic format, and made available to the San Diego Water Board and the public on the internet. The San Diego Water Board has been gradually transitioning its document submittal requirements to electronic submittals. Provision F.4 has been included to further these efforts.

Provision F.4 has also been included to improve the exchange and availability of information among the Copermittees, as well as between the Copermittees and the San Diego Water Board. Provision F.4 will also make the information generated during the implementation of the Order more accessible to the public.

Provision F.5 (Report of Waste Discharge) requires the Copermittees to submit a Report of Waste Discharge to reapply for renewal of the Order prior to its expiration, in accordance with 40 CFR 122.21(d)(2) and CWC section 13376.

Because the Orange County and Riverside County Copermittees will not be subject to the requirements of this Order until they are notified of coverage, Provision F.5.a describes the process of submitting their Reports of Waste Discharge pursuant to the requirements of their current permits to obtain coverage under this Order.

For the Copermittees subject to the requirements of this Order, Provision F.5.b requires the Copermittees to submit a Report of Waste Discharge 180 days in advance of the expiration of this Order Provision F.5.b also describes the minimum information to be included in the Report of Waste Discharge, based on USEPA guidance "Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems", dated May 17, 1996.

Provision F.6 (Application for Early Coverage) describes the process that would allow the Orange County and/or Riverside County Copermittees to obtain coverage under this Order earlier than the expiration of their current Orders.

If the Orange County and/or Riverside County Copermittees choose to obtain coverage under this Order earlier than the expiration of their current Orders, the preparation and submittal of a Report of Waste Discharge, as required by the Fourth Term Permits, will not be necessary. The existing Order for the respective county will be rescinded upon the effective coverage date under this Order, except for enforcement purposes.

G. Principal Watershed Copermittee Responsibilities

Purpose: Provision G includes the requirements for the Principal Watershed Copermittee designated by the Copermittees in each Watershed Management Area.

***Discussion*:** Unlike previous NPDES requirements, there will no longer be a single Principal Copermittee. Provision G.1 requires the Copermittees to designate a Principal Watershed Copermittee for each Watershed Management Area. There are ten (10) Watershed Management Areas in the San Diego Region, as defined in Table B-1 under Provision B.1 of the Order. An individual Copermittee should not be the Principal Watershed Copermittee for more than two (2) Watershed Management Areas. There could be up to 10 Principal Water Copermittees designated for the Watershed Management Areas in the San Diego Region.

Provision G.2 describes the minimum responsibilities of each Principal Watershed Copermittee. The primary responsibility of the Principal Watershed Copermittees is to serve as the liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues. Ideally, the Principal Watershed Copermittee can represent the interests of all the Copermittees within a Watershed Management Area during discussions or meetings to facilitate communication with the San Diego Water Board. The Principal Watershed Copermittees are also responsible for facilitating and coordinating the implementation efforts of the Copermittees and submittals of required documents and reports.

The Principal Watershed Copermittee is responsible for facilitating the efforts of the Copermittees within the Watershed Management Area to develop the Water Quality Improvement Plan required under Provision B, and submit it for approval in accordance with Provision F.1. The Principal Watershed Copermittee is also responsible for coordinating the submittal of the document updates, Progress Report Presentations, and Annual Reports required from the Copermittees within each Watershed Management Area under Provisions F.2, F.3.a, and F.3.b. The Principal Watershed Copermittees are responsible for coordinating with each other to develop and submit the Regional Clearinghouse, Regional Monitoring and Assessment Report, and the Report of Waste Discharge required under Provisions F.3.c, F.4, and F.5.

The designated Principal Watershed Copermittee for each Watershed Management Area does not necessarily have to serve as the Principal Watershed Copermittee for the entire term of the Order. If the Copermittees in a Watershed Management Area choose to designate a new Principal Watershed Copermittee, the change may be submitted as part of the Annual Report required under Provision F.3.b, with an update to the Water Quality Improvement Plan in accordance with Provision F.2.c.

Provision G.3 specifies that the Principal Watershed Copermittee is not responsible for ensuring that the other Copermittees within the Watershed Management Area are in compliance with the requirements of this Order

H. Modification of Order ~~Programs~~

Purpose: Provision H provides the conditions under which modifications to Order No. R9-2013-0001 may occur.

***Discussion*:** Provision H allows for modifications to Order No. R9-2013-0001. Minor modifications may be made by the San Diego Water Board Executive Officer without a public notice or public hearing. Minor modifications are defined under 40 CFR 122.63. Minor modifications under 40 CFR 122.63 potentially applicable to this Order are the following:

- Correcting typographical errors;
- Requiring more frequent monitoring or reporting by the Copermittees;
- Changing an interim compliance date in a schedule of compliance, provided the new date is not more than 120 days after the date specified in the existing permit and does not interfere with attainment of the final compliance date requirement.

Modifications that are not one of the above minor modifications will require re-opening the Order, subject to the requirements of 40 CFR 122.44, 122.62 to 122.64, and 124.5~~(c)(1)-(3)~~, but only for the specific provisions subject to the modification. Modifications of the Order that are not minor require a draft Order with the proposed modifications made available for public review, a public notice and comment period, and a public hearing. Comments on the provisions not subject to the proposed modifications are not required to be considered in the San Diego Water Board's responses to comments or during the public hearing.

Provision H.4 was included ~~specifically to allow for~~ to specify that the Order ~~to~~ will be re-opened for modifications if ~~to make modifications to the requirements of Provision A should new language addressing compliance with water quality standards in the receiving waters be developed and issued by~~ the State Water Board determines revisions to Provision A are warranted, an application for early coverage under the Order is received pursuant to Provision F.6, the Basin Plan is amended to modify an existing TMDL or incorporate a new TMDL, or the monitoring and assessment program requirements need to be updated or revised.

Provision H.5 was included to specify that the San Diego Water Board will re-open and consider modifications to this Order when the Orange County Copermittees or the Riverside County Copermittees submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders

I. Standard Permit Provisions and General Provisions

Purpose: Provision I incorporates the standard permit provisions required to be included in all NPDES permits, as well as several other general provisions.

***Discussion*:** Provision I refers to Attachment B to the Order. Attachment B expressly incorporates the conditions applicable to all NPDES permits as provided under 40 CFR 122.41(a)-(n), as well as the applicable conditions for MS4s and storm water discharges provided under 40 CFR 122.42(c) and 40 CFR 122.42(d), respectively. Attachment B also includes several general provisions that are typically included in or applicable to waste discharge requirements issued by the San Diego Water Board.

IX. ATTACHMENTS

The attachments to the Order are discussed below. The discussions describe the content of the attachments.

Attachment A – Discharge Prohibitions and Special Protections

Section 1 of Attachment A includes the Waste Discharge Prohibitions from the Basin Plan. They have been provided verbatim in their entirety.

Section 2 of Attachment A includes the "*Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges*" applicable to permitted point source discharges of storm water, adopted under State Water Board Resolution No. 2012-0012. The terms, prohibitions, and special conditions (collectively referred to as special conditions) are established as limitations on point source storm water discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in ASBS, as required for State Water Quality Protection Areas pursuant to California Public Resources Code sections 36700(f) and 36710(f). These Special Protections were adopted by the State Water Board as part of the Ocean Plan General Exception.

Attachment B – Standard Permit Provisions and General Provisions

Conditions applicable to all NPDES permits, as required under 40 CFR 122.41, and conditions applicable to MS4s and storm water discharges, as required under 40 CFR 122.42(c) and 122.42(d), respectively are provided in Attachment B to the Order. They have been provided expressly in their entirety.

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. These general provisions are typically included in or applicable to waste discharge requirements issued by the San Diego Water Board. Many of the general provisions were developed by the State Water Board. Where a general provision is derived from statute or regulation, a citation of the statute or regulation section is provided. General provisions that do not provide a citation are included under the authority provided CWC 13377.

Attachment C – Acronyms, Abbreviations and Definitions

The acronyms and abbreviations that are used in the Order are provided in Attachment C. Attachment C also includes definitions that may provide an explanation or description of the meaning or intent of specific terms or phrases included in the Order.

Attachment D – Jurisdictional Runoff Management Program Annual Report Form

An example of the Jurisdictional Runoff Management Program Annual Report Form required to be submitted by each Copermittee as part of the Annual Reports required under Provision F.3.b.(1)(e) is provided as Attachment D to the Order. An electronic version of the form will be available from the San Diego Water Board after the adoption of the Order.

The Jurisdictional Runoff Management Program Annual Report Form includes the minimum information necessary to demonstrate that the Copermittee is implementing and in compliance with the requirements of Provision E, and includes much of the information required to be reported pursuant to 40 CFR 122.42(c).

The information that must be provided on the Jurisdictional Runoff Management Program Annual Report Form is limited to the fiscal year, which begins July 1 and ends June 30 of the following year. The information expected to be provided by the Copermittees in each section of the Jurisdictional Runoff Management Program Annual Report Form is discussed below.

I. COPERMITTEE INFORMATION

The name of the Copermittee (e.g. name of city, county, or special district) and the contact information for the storm water program manager are provided under this section.

II. LEGAL AUTHORITY

The Copermittee must confirm whether or not the legal authorities under Provision E.1.a have been established for itself within its jurisdiction.

The Copermittee must also confirm whether or not a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority, as required under Provision E.1.b. The certification statement required by Provision E.1.b is only required to be submitted with the first Annual Report required under Provision F.3.b.

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

The Copermittee must inform the San Diego Water Board whether or not an update to its jurisdictional runoff management program document was required or recommended by the San Diego Water Board during the reporting period. An update to the jurisdictional runoff management program is required under Provision F.2.a. The San Diego Water Board may recommend modifications to the jurisdictional runoff management program as part of the iterative approach and adaptive management process required under Provision B.5, which may result in an update that is necessary for the Copermittee's jurisdictional runoff management document.

If an update was required or recommended, the Copermittee must confirm whether or not the update was completed and made available on the Regional Clearinghouse within the reporting period. If no update was required or recommended, an answer is not required. If the answer is NO, meaning the required or recommended update was not completed and/or made available on the Regional Clearinghouse, the Copermittee must attach a schedule for the completion of the update and/or posting of the updated document on the Regional Clearinghouse.

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

The Copermittee must confirm whether or not a program was implemented during the fiscal year to actively detect and eliminate illicit discharges and connections in accordance with the requirements under Provision E.2.

In addition to confirming that a program to detect and eliminate illicit discharges was implemented during the reporting period, the Copermittee is also required to report on several items related to the program. The information that must be reported is limited to the fiscal year for the Annual Report.

All non-storm water discharges are considered illicit discharges unless the source is identified as one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5). If a non-storm water discharge is identified as one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5), the discharge is a non-storm water discharge, but not an illicit discharge. If a non-storm water discharge is identified but in not one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5), the discharge is both a non-storm water discharge and an illicit discharge.

V. DEVELOPMENT PLANNING PROGRAM

The Copermittee must confirm whether or not a development planning program was implemented during the fiscal year in accordance with the requirements under Provision E.3.

The Copermittee must also inform the San Diego Water Board whether or not an update to its BMP Design Manual was required or recommended by the San Diego Water Board during the fiscal year. An update to the BMP Design Manual is required under Provision F.2.b. The San Diego Water Board may recommend modifications to the BMP Design Manual, which may result in an update that is necessary for Copermittee's the BMP Design Manual.

If an update was required or recommended, the Copermittee must confirm whether or not the update was completed and made available on the Regional Clearinghouse within the reporting period. If no update was required or recommended, an answer is not required. If the answer is NO, meaning the required or recommended update was not completed and/or made available on the Regional Clearinghouse, the Copermittee must attach a schedule for the completion of the update and/or posting of the updated document on the Regional Clearinghouse.

The Copermittee is also required to report on several items related to the program. For the development and redevelopment projects that are reviewed under the program, the Copermittee must report the total number projects submitted for review during the fiscal year. Of those projects, the Copermittee must report the number that are Priority Development Projects, as defined under Provision E.3.b.(1). The Copermittee must also report the number of Priority Development Projects that were approved and/or granted occupancy during the fiscal year, regardless of when the project was originally submitted for review. Any projects that were approved during the fiscal year and granted any exemptions from the BMP Design Manual requirements and/or allowed to implement alternative compliance options in accordance with Provision E.3.c.(3) must be reported.

Finally, the Copermittee must also report on several items related to its oversight of permanent BMPs on Priority Development Projects within its jurisdiction, as required under Provision E.3.e. The information that must be reported is limited to the fiscal year for the Annual Report.

VI. CONSTRUCTION MANAGEMENT PROGRAM

The Copermittee must confirm whether or not a construction management program was implemented during the fiscal year in accordance with the requirements under Provision E.4.

The Copermittee is also required to report on several items related to its oversight construction projects within its jurisdiction. The information that must be reported is limited to the fiscal year for the Annual Report.

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

The Copermittee must confirm whether or not an existing development management program was implemented during the fiscal year in accordance with the requirements under Provision E.5.

The Copermittee is also required to report on several items related to its oversight in areas of existing development within its jurisdiction. The information that must be reported is limited to the fiscal year for the Annual Report. The information must also be separated into four categories of existing development: municipal, commercial, industrial, and residential.

VIII. PUBLIC EDUCATION AND PARTICIPATION

The Copermittee must confirm whether or not a public education program component was implemented during the fiscal year in accordance with the requirements under Provision E.7.a.

The Copermittee must also confirm whether or not a public participation program component was implemented during the fiscal year in accordance with the requirements under Provision E.7.b.

IX. FISCAL ANALYSIS

The Copermittee must confirm a summary of its fiscal analysis, conducted in accordance with the requirements under Provision E.8, has been attached to the form.

X. CERTIFICATION

A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative must sign and certify the Jurisdictional Runoff Management Program Annual Report Form. The appropriate box must be checked to indicate the whether the a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative is signing the form.

Attachment E – Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2013-0001

Attachment E provides specific provisions for implementing the load allocations (LAs) and wasteload allocations (WLAs) of Total Maximum Daily Loads (TMDLs) adopted by the San Diego Water Board and approved by USEPA in which the Copermittees are identified as responsible for discharges subject to the requirements of the TMDLs ~~meeting an assigned wasteload allocation (WLA)~~. Federal regulations require that NPDES requirements incorporate water quality based effluent limitations (WQBELs) that must be consistent with the requirements and assumptions of any available WLAs,[48] which may be expressed as numeric effluent limitations, when feasible, and/or as a best management practice (BMP) program of expanded or better-tailored BMPs.[49] Where the TMDL includes WLAs that provide numeric pollutant load or pollutant parameter objectives, the WLA has been, where feasible, translated into numeric WQBELs.[50]

For each TMDL in Attachment E, ~~five~~ four sections are included:

a. Applicability: This section provides the resolution under which the TMDL Basin Plan amendment was adopted and approved, with the applicable adoption and approval dates. This section also gives the effective date of the TMDL and where the TMDL is applicable (i.e. Watershed Management Area and water body). The Copermittees that are responsible for implementing the specific provisions are also given in this section.

b. Final TMDL Compliance Requirements~~Water Quality Based Effluent Limitations~~: For each TMDL, the final TMDL compliance requirements consist of the final TMDL compliance date(s), the final WQBELs, and the final TMDL compliance determination requirements. ~~t~~The final WQBELs are expressed in terms of receiving water limitations, effluent limitations, and/or best management practices (BMPs). The final WQBELs for the TMDLs are incorporated by reference into Provision A of the Order. The final WQBELs become enforceable when the final TMDL compliance dates have passed. Applicable BMPs within the final WQBELs must be incorporated into the Water Quality Improvement Plans. Compliance with the final WQBELs will be determined in accordance with the options provided under the final TMDL compliance determination requirements.

c. Interim TMDL Compliance Requirements~~Compliance Schedule~~: ~~The final date for compliance with the WLA assigned to the Copermittees is provided in this section.~~ If the final TMDL compliance date has not passed and there are interim TMDL compliance requirements, they are included in this section ~~as well~~. ~~The WQBELs become enforceable when the final compliance date has passed.~~ If there are interim WQBELs with interim compliance dates, the interim WQBELs become enforceable when the corresponding interim compliance dates have passed. Compliance with the interim WQBELs will be determined in accordance with the options provided under the interim TMDL compliance determination requirements.

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[48] 40 CFR 122.44(d)(1)(vii)(B)
[49] 40 CFR 122.44(k)(2) and 40 CFR 122.44(k)(3)
[50] November 12, 2010 Memorandum from the USEPA, Revisions to the November 22, 2002 Memorandum "Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLA""

d. Specific Monitoring and Assessment Requirements: If there are specific monitoring and assessment requirements that cannot be met with the monitoring and assessment program requirements under Provision D of the Order, the additional requirements are included in this section.

~~**e.** Compliance Determination: There may be several options to demonstrate compliance with the WQBELs. If there is more than one option to demonstrate compliance with the WQBELs, the options are provided in this section.~~

The requirements of the TMDLs are based on and consistent with the assumptions and requirements of any available ~~WLAs for~~ adopted and approved TMDLs that have been incorporated into the Basin Plan. Modifications to the requirements for the TMDLs in Attachment E cannot be made unless the TMDLs are modified in the Basin Plan.

A modification to any aspect of a TMDL in the Basin Plan requires a Basin Plan amendment. A Basin Plan amendment to modify a TMDL will require the San Diego Water Board to adopt a resolution to amend the Basin Plan, which includes a separate public process. When the San Diego Water Board adopts a Basin Plan amendment, it subsequently requires approval from the State Water Board, the Office of Administrative Law, and the USEPA before it becomes effective.

If and when the TMDLs are a modified in the Basin Plan, the San Diego Water Board will revise the requirements of the TMDL in accordance with the Basin Plan amendment. When a Basin Plan amendment to modify a TMDL becomes effective, the San Diego Water Board will modify the requirements of the TMDL pursuant to the requirements of Provision H.4 of the Order as soon as possible.

From: lyris@swrcb18.waterboards.ca.gov
To: Chiu, Wayne@Waterboards
Subject: Word Version of Tentative Order No. R9-2013-0001
Date: Wednesday, April 03, 2013 2:18:41 PM

This is a message from the California Regional Water Quality Control Board, San Diego Region (9).

A Word version of the Tentative Order is now available on the San Diego Water Boards Website.

http://www.waterboards.ca.gov/rwqcb9/water_issues/programs/stormwater/index.shtml

Laurie Walsh, PE
Water Resource Control Engineer
San Diego Regional Water Quality Control Board
Tel. 858-467-2970

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From: lyris@swrcb18.waterboards.ca.gov
To: Chiu, Wayne@Waterboards
Subject: Notice of Public Hearing to consider adoption of Tentative Order R9-2013-0001
Date: Wednesday, March 06, 2013 5:11:03 PM
Attachments: 2013-0306 _Final Regional MS4 Public Notice 2 Day.pdf

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This is a message from the California Regional Water Quality Control Board, San Diego Region (9).

Copermittees and Interested Persons;

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) is scheduled to hold a public hearing to consider adoption of Tentative Order No. R9-2013-0001, NPDES No. CAS0109266, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region.

The public hearing on this matter is scheduled on April 10 and 11, 2013 in the Board Room, San Diego Water Board, 9174 Sky Park Court, Suite 100, San Diego, CA 92123-4340. This item will be heard during the meetings that will start at 9:00 A.M. on each day.

Attached to this email is a copy of the public hearing notice. This notice was sent via US Mail on March 6, 2013 to the cc'd list of Copermittees and Resource Agencies. A copy of the public hearing notice can also be found on the San Diego Water Board's Website at http://www.waterboards.ca.gov/rwqcb9/

A more detailed Notice of Public Hearing will be available on or about March 15, 2013.

Laurie Walsh, PE
Water Resource Control Engineer
San Diego Regional Water Quality Control Board
Tel. 858-467-2970

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD
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This Notice was sent via US Mail on 3/06/2013 to the list of cc'd Copermittees and Resource Agencies.

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CALIFORNIA Water Boards

EDMUND G. BROWN JR. GOVERNOR

MATTHEW RODRIQUEZ SECRETARY FOR ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

NOTICE OF PUBLIC HEARING

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) is scheduled to hold a public hearing to consider adoption of Tentative Order No. R9-2013-0001, NPDES No. CAS0109266, *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Tentative Order).

The Tentative Order is a regional MS4 permit that proposes to jointly cover all 39 Copermittees within the San Diego Region (i.e., South Orange County, Southwestern Riverside County, and San Diego County), in a phased manner as their current MS4 permits expire or upon request for earlier coverage prior to permit expiration. The Tentative Order covers multiple discharge points to multiple receiving waters throughout the San Diego Water Board Region. All MS4 Copermittees in the San Diego Region are therefore on notice that they may ultimately be regulated under the Tentative Order, if adopted.

The public hearing on this matter is scheduled on April 10 and 11, 2013 in the Board Room, San Diego Water Board, 9174 Sky Park Court, Suite 100, San Diego, CA 92123-4340. The item will be heard during the meetings that will start at 9:00 A.M. on each day. The location, however, may be changed prior to the meetings. The meeting agendas, which will indicate any changes, will be posted at http://www.waterboards.ca.gov/sandiego/board_info/agendas/, at least two weeks prior to the meeting dates.

All written comments including testimony, technical documentation and factual information pertaining to the terms and conditions of the Tentative Order to be considered by the San Diego Water Board were required to be submitted **by 5:00 pm on January 11, 2013**. The scope of oral testimony at the public hearing will be strictly limited to summarizing the previously submitted written comments, commenting on revisions to the Tentative Order made in response to comments, and making policy statements. No additional written materials will be accepted or provided to the San Diego Water Board Members.

Information related to this matter, including the Tentative Order is available and may be reviewed at the San Diego Water Board's office or on the San Diego Water Board's web page at: http://www.waterboards.ca.gov/rwqcb9/water_issues/programs/stormwater/index.shtml

A more detailed Notice of Public Hearing will be available on or about March 15, 2013.

Please contact Wayne Chiu at (858) 637-5558 or wchiu@waterboards.ca.gov for questions or comments regarding this hearing notice.

Please bring the foregoing to the attention of any person known to you who would be interested in this matter.

DAVID W. GIBSON
Executive Officer
March 5, 2013

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U-T San Diego

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AFFIDAVIT OF PUBLICATION

CALIFORNIA NEWSPAPER SERVICE
P.O. BOX 60460
LOS ANGELES, CA 90060

STATE OF CALIFORNIA} ss.
County of San Diego}

The Undersigned, declares under penalty of perjury under the laws of the State of California: That she is a resident of the County of San Diego. That she is and at all times herein mentioned was a citizen of the United States, over the age of twenty-one years, and that she is not a party to, nor interested in the above entitled matter; that she is Chief Clerk for the publisher of

The San Diego Union-Tribune

a newspaper of general circulation , printed and published daily in the City of San Diego, County of San Diego, and which newspaper is published for the dissemination of local news and intelligence of a general character, and which newspaper at all the times herein mentioned had and still has a bona fide subscription list of paying subscribers, and which newspaper has been established, printed and published at regular intervals in the said City of San Diego, County of San Diego, for a period exceeding one year next preceding the date of publication of the notice hereinafter referred to, and which newspaper is not devoted to nor published for the interests, entertainment or instruction of a particular class, profession, trade, calling, race, or denomination, or any number of same; that the notice of which the annexed is a printed copy, has been published in said newspaper in accordance with the instructions of the person(s) requesting publication, and not in any supplement thereof on the following dates, to wit:

Mar 7, 2013

Chief Clerk for the Publisher

3/8/13

Date

Affidavit of Publication of

Legal Advertisement
Ad # 0010724299#
ORDERED BY: IRENE

A0000030103 29

CALIFORNIA REGIONAL WATER QUALITY CONTORL BOARD SAN DIEGO REGION NOTICE OF PUBLIC HEARING

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) is scheduled to hold a public hearing to consider adoption of Tentative Order No. R9-2013-0001, NPDES No. CAS0109266, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region (Tentative Order).

The Tentative Order is a regional MS4 permit that proposes to jointly cover all 39 Copermittees within the San Diego Region (i.e., South Orange County, Southwestern Riverside County, and San Diego County), in a phased manner as their current MS4 permits expire or upon request for earlier coverage prior to permit expiration. The Tentative Order covers multiple discharge points to multiple receiving waters throughout the San Diego Water Board Region. All MS4 Copermittees in the San Diego Region are therefore on notice that they may ultimately be regulated under the Tentative Order, if adopted.

The public hearing on this matter is scheduled on April 10 and 11, 2013 in the Board Room, San Diego Water Board, 9174 Sky Park Court, Suite 100, San Diego, CA 92123-4340. The item will be heard during the meetings that will start at 9:00 A.M. on each day. The location, however, may be changed prior to the meetings. The meeting agendas, which will indicate any changes, will be posted at http://www.waterboards.ca.gov/sandiego/board_info/agendas/, at least two weeks prior to the meeting dates.

All written comments including testimony, technical documentation and factual information pertaining to the terms and conditions of the Tentative Order to be considered by the San Diego Water Board were required to be submitted by 5:00 pm on January 11, 2013. The scope of oral testimony at the public hearing will be strictly limited to summarizing the previously submitted written comments, commenting on revisions to the Tentative Order made in response to comments, and making policy statements. No additional written materials will be accepted or provided to the San Diego Water Board Members.

Information related to this matter, including the Tentative Order is available and may be reviewed at the San Diego Water Board's office or on the San Diego Water Board's web page at: http://www.waterboards.ca.gov/rwqcb9/water_issues/programs/stormwater/index.shtml

A more detailed Notice of Public Hearing will be available on or about March 15, 2013.

Please contact Wayne Chiu at (858) 637-5558 or wchiu@waterboards.ca.gov for questions or comments regarding this hearing notice.

Please bring the foregoing to the attention of any person known to you who would be interested in this matter.

DAVID W. GIBSON
Executive Officer
March 5, 2013
3/7/13
CNS-2455040#

THE REGISTER

This space for filing stamp only

625 N GRAND AVE, SANTA ANA, CA 92701
Telephone (714) 796-7000 / Fax (714) 796-6059

PROOF OF PUBLICATION

(2015.5 C.C.P.)

State of California)
County of ORANGE) ss

Notice Type: GPN - GOVT PUBLIC NOTICE

Ad Description:
Regional MS4 Tentative Order-Public Notice

I am a citizen of the United States and a resident of the State of California; I am over the age of eighteen years, and not a party to or interested in the above entitled matter. I am the principal clerk of the printer and publisher of the THE REGISTER, a newspaper published in the English language in the city of SANTA ANA, county of ORANGE, and adjudged a newspaper of general circulation as defined by the laws of the State of California by the Superior Court of the County of ORANGE, State of California, under date 11/19/1905, Case No. A21046. That the notice, of which the annexed is a printed copy, has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to-wit:

03/07/2013

Executed on: 03/07/2013
At SANTA ANA, California

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Angel Bates

Signature

CNS#: 2455041

CALIFORNIA REGIONAL WATER QUALITY CONTORL BOARD SAN DIEGO REGION NOTICE OF PUBLIC HEARING

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) is scheduled to hold a public hearing to consider adoption of Tentative Order No. R9-2013-0001, NPDES No. CAS0109266, *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Tentative Order).

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All written comments including testimony, technical documentation and factual information pertaining to the terms and conditions of the Tentative Order to be considered by the San Diego Water Board were required to be submitted **by 5:00 pm on January 11, 2013**. The scope of oral testimony at the public hearing will be strictly limited to summarizing the previously submitted written comments, commenting on revisions to the Tentative Order made in response to comments, and making policy statements. No additional written materials will be accepted or provided to the San Diego Water Board Members.

Information related to this matter, including the Tentative Order is available and may be reviewed at the San Diego Water Board's office or on the San Diego Water Board's web page at: http://www.waterboards.ca.gov/rwqcb9/water_issues/programs/stormwater/index.shtml

A more detailed Notice of Public Hearing will be available on or about March 15, 2013.

Please contact Wayne Chiu at (858) 637-5558 or wchiu@waterboards.ca.gov for questions or comments regarding this hearing notice.

Please bring the foregoing to the attention of any person known to you who would be interested in this matter.

DAVID W. GIBSON
Executive Officer
March 5, 2013
3/7/13
CNS-2455041#
THE REGISTER

* A 0 0 0 0 0 2 9 9 9 1 5 7 *

THE PRESS-ENTERPRISE

3450 Fourteenth Street
Riverside, CA 92501-3878
951-684-1200
951-368-9018 FAX

PROOF OF PUBLICATION
(2010, 2015.5 C.C.P)

Publication(s): The Press-Enterprise

PROOF OF PUBLICATION OF

Ad Desc.: / 2455039

I am a citizen of the United States. I am over the age of eighteen years and not a party to or interested in the above entitled matter. I am an authorized representative of THE PRESS-ENTERPRISE, a newspaper in general circulation, printed and published daily in the County of Riverside, and which newspaper has been adjudicated a newspaper of general circulation by the Superior Court of the County of Riverside, State of California, under date of April 25, 1952, Case Number 54446, under date of March 29, 1957, Case Number 65673, under date of August 25, 1995, Case Number 267864, and under date of February 4, 2013, Case Number RIC 1215735; that the notice, of which the annexed is a printed copy, has been published in said newspaper in accordance with the instructions of the person(s) requesting publication, and not in any supplement thereof on the following dates, to wit:

03/08/2013

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Date: March 08, 2013
At: Riverside, California

CALIF NEWSPAPER SERV BUREAU, LGL AGENCY
PO BOX 60460
LOS ANGELES, CA 90060

Ad Number: 0001004360-01

P.O. Number: 2455039

Ad Copy:

CALIFORNIA REGIONAL WATER QUALITY CONTORL BOARD SAN DIEGO REGION NOTICE OF PUBLIC HEARING

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) is scheduled to hold a public hearing to consider adoption of Tentative Order No. R9-2013-0001, NPDES No. CAS0109266, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region (Tentative Order).

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The public hearing on this matter is scheduled on April 10 and 11, 2013 in the Board Room, San Diego Water Board, 9174 Sky Park Court, Suite 100, San Diego, CA 92123-4340. The item will be heard during the meetings that will start at 9:00 A.M. on each day. The location, however, may be changed prior to the meetings. The meeting agendas, which will indicate any changes, will be posted at http://www.waterboards.ca.gov/sandiego/board_info/agendas/, at least two weeks prior to the meeting dates. All written comments including testimony, technical documentation and factual information pertaining to the terms and conditions of the Tentative Order to be considered by the San Diego Water Board were required to be submitted by **5:00 pm on January 11, 2013.** The scope of oral testimony at the public hearing will be strictly limited to summarizing the previously submitted written comments, commenting on revisions to the Tentative Order made in response to comments, and making policy statements. No additional written materials will be accepted or provided to the San Diego Water Board Members.

Information related to this matter, including the Tentative Order is available and may be reviewed at the San Diego Water Board's office or on the San Diego Water Board's web page at: http://www.waterboards.ca.gov/rwqcb9/water_issues/programs/stormwater/index.shtml

A more detailed Notice of Public Hearing will be available on or about March 15, 2013.

Please contact Wayne Chiu at (858) 637-5558 or wchiu@waterboards.ca.gov for questions or comments regarding this hearing notice.

Please bring the foregoing to the attention of any person known to you who would be interested in this matter.

DAVID W. GIBSON
Executive Officer
March 5, 2013
3/8/13
CNS-2455039#
THE PRESS ENTERPRISE

008059

CALIFORNIA Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

HEARING PROCEDURES AND ORDER OF PROCEEDINGS

Public Hearing to Consider Adoption of Tentative Order No. R9-2013-0001, NPDES No. CAS01092662 and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds Within the San Diego Region

April 10 and 11, 2013
Beginning at 9:00 a.m. Each Day
California Regional Water Quality Control Board, San Diego Region
Regional Water Board Room
San Diego Water Board Office Building
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

By prior public notice dated March 5, 2013, the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) announced its intent to conduct a public hearing on April 10 and 11, 2013, to receive testimony and comments and consider adoption of Tentative Order No. R9-2013-0001, NPDES No. CAS0109266, *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Tentative Order). This Order of Proceedings sets forth additional details on the procedures and order of presentations the San Diego Water Board will follow at the public hearing.

SCOPE OF HEARING

The Tentative Order was released for public review and comment on October 31, 2012. The written comment period ended January 11, 2013. All timely written comments received are posted on the San Diego Water Board website, at http://www.waterboards.ca.gov/rwqcb9/water_issues/programs/stormwater/index.shtml. No subsequently filed written comments have been accepted into the record at this time. Other than speaker cards and copies of electronic presentations (see below) no new written materials will be accepted into the record at the April 10-11, 2013 hearing. As indicated in prior notices, the scope of oral testimony at the public hearing will be strictly limited to summarizing the previously submitted written comments, commenting on revisions to the Tentative Order made since the written comment period closed, and making policy statements. No new issues may be raised at the hearing.

HEARING PROCESS

During the public hearing, San Diego Water Board staff will present an overview of the Tentative Order, written responses to comments received and recommended revisions to the Tentative Order. For this proceeding, San Diego Water Board staff will begin, followed by representatives of the following parties: 1) the San Diego County, Orange County and Riverside County Copermittees; 2) U.S. Environmental Protection Agency; 3) Environmental Non-governmental Organizations (NGOs); and 4) Building Industry Groups.[1] Participants within these groups are encouraged to consolidate their presentations to save hearing time and/or avoid duplication.

After these presentations, the San Diego Water Board will hear from the public (interested persons), subject to times certain (see below). Interested persons with similar concerns or opinions are encouraged to choose one representative to speak, and are encouraged to coordinate their presentations with each other and to summarize their written comments. Interested persons may not cede their unused time to others, but the Chair will entertain requests for extra time from interested persons speaking on behalf of multiple interested persons.

Speakers will be interrupted not earlier than 4:00 p.m. on April 10 so that the San Diego Water Board can hear from interested persons other than representatives of the groups identified by name in this order of proceedings. At 9:15 a.m. on April 11, or as soon thereafter as practicable, elected officials will be invited to speak.

ORDER OF PROCEEDINGS

Chair's opening remarks, introductory items, administration of the oath to persons who intend to testify	**10 minutes**
San Diego Water Board Staff Presentation	**1.5 Hours**
San Diego County, Orange County and Riverside County Copermittees	**3 Hours (Total)**
US Environmental Protection Agency	**30 Minutes (Total)**
Environmental NGOs – (The Escondido Creek Conservancy, Coastkeeper, San Diego Canyonlands, Natural Resources Defense Council, Los Penasquitos Lagoon Foundation, Laguna Bluebelt Coalition, Friends of Rose Canyon Creek, Clean Water Now, Coastal Environmental Rights Foundation, Environmental Health Coalition, San Elijo Lagoon Conservancy, South Laguna Civic Association)	**1 Hour (Total)**

[1] These participants have been identified based upon prior participation through written comments, stakeholder meetings and public workshops held in November and December 2012.

Building Industry/Industry- (Association of General Contractors, Otay Land Company, Otay Ranch New Homes, American Society of Landscape Architects, BIA Regulated Coalition, BIA of Southern California, Industrial Environmental Association, San Diego Gas & Electric, San Diego Green Building Council, Southern California Gas Company)	**1 Hour (Total)**
Interested Persons (Time Certain at 4 p.m. on April 10, 2013)	**3 Minutes Each**
Elected Officials' comments (Time Certain at 9:15 a.m. on April 11, 2013)	**5 Minutes Each**

This allocated time includes time for any opening statement, main presentation, rebuttal and/or closing argument. San Diego Water Board Members and Counsel may ask questions at any time. Time for questions and answers will not count against the above time limits.

OBJECTIONS TO PROCEDURES

Other than as provided in this document, the San Diego Water Board intends to conduct this public hearing in a generally informal manner. Participants requesting alternative procedures, with procedural requests outside of the scope of this notice, or requesting more time to speak, must submit their requests or objections in writing to the San Diego Water Board staff member identified below no later than 5:00 pm on March 22, 2013. The San Diego Water Board will endeavor to accommodate reasonable requests and to respond to procedural objections and requests prior to the hearing. Untimely objections will be deemed waived.

POWER POINT AND OTHER COMPUTER DISPLAYS

Participants may use PowerPoint and other computer displays during their presentation to convey information electronically on the San Diego Water Board's computer. These displays will only be accepted if they summarize the information contained in documents that were timely submitted in compliance with deadlines cited above and in prior notices. They will not be accepted if they contain any new testimony or evidence. Please note that any person planning to use an electronic presentation at the hearing is required to provide a sufficient number of printed copies of the presentation for distribution to board members and staff and a reasonable number of copies to be available for the public to access during the hearing. An electronic copy of any presentation used during the hearing must be left with the San Diego Water Board's Executive Assistant for inclusion in the record. Electronic presentations will be posted on the San Diego Water Board's website as soon as practicable.

DOCUMENT AVAILABILITY

The Tentative Order, and attachments thereto, timely received comment letters on the Tentative Order, and other information and documents relied upon are posted on the San Diego Water Board website at: http://www.waterboards.ca.gov/rwqcb9/water_issues/programs/stormwater/index.shtml. A revised Tentative Order reflecting revisions since the written comment deadline and a

responses to comments document will be available shortly. Parties and interested persons will be notified by e-mail when those documents are posted on the Board's website.

These documents are also available for inspection and copying between the hours of 8:00 a.m. and 5:00 p.m. at the following address:

California Regional Water Quality Control Board
San Diego Region
9174 Sky Park Court, Suite 100,
San Diego, California 92123-4340

Arrangements for file review and/or obtaining copies of documents in the Administrative Record may be made by contacting the San Diego Water Board at (858) 467-2952. Appointments are encouraged so the documents can be readily available upon arrival. All timely received comment letters on the Tentative Order and responses to comments and other subsequent relevant documents will be available online as they are generated.

Staff Contact for Further Information
For questions or comments concerning this notice, please contact Wayne Chiu by phone at (858) 637-5558, or by email at wchiu@waterboards.ca.gov.

James G. Smith, AEO
for David W. Gibson

March 15, 2013

cc:
Distribution via email:
(see attached address list)

San Diego County Copermittees
Orange County Copermittees
Riverside County Copermittees
Resource Agencies

Distribution list via email:

San Diego County MS4 Permit Lyris List
Riverside County MS4 Permit Lyris List
Orange County MS4 Permit Lyris List
San Diego Water Board Agenda Lyris List

Tech Staff Info & Use	
Order No.	R9-2013-0001
Party (GT/CIWQS) ID	536787
File No.	n/a
WDID	n/a
NPDES No.	CAS0109266
Reg. Measure ID	387335
Place ID	786088
Person ID	n/a
Inspection ID	n/a

San Diego County Copermittees

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Tim D'Zmura
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tdzmura@cityofwildomar.org

SAN DIEGO REGIONAL
WATER QUALITY
CONTROL BOARD
2013 MAR 15 PM 3 55

City of San Diego

County of San Diego

March 15, 2013

COPY

Mr. David Gibson
California Regional Water Quality Control Board
San Diego Region 9
9174 Sky Park Court, Suite 100
San Diego, CA 92123

NOTICE OF PUBLIC HEARING – NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WATER DISCHARGE REQUIREMENTS FOR DISCHARGES OF URBAN RUNOFF FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4S) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

Dear Mr. Gibson:

On March 6, 2013 the San Diego Regional Water Quality Control Board (Regional Board) announced that hearings for the proposed Municipal Storm Water Permit for the San Diego Region would be held on April 10 and 11, 2013. The City of San Diego (City) and the County of San Diego (County) submitted lengthy written comments during the public comment period for the draft permit and is concerned that the hearings will be held without our respective jurisdictions being given an opportunity to review responses to their comments. Furthermore, we believe that it would be prudent to postpone any approval of the Municipal Storm Water Permit until the California State Water Resources Control Board provides guidance on the Receiving Waters Limitation language, which if not included in the initial approval of our regional permit, could necessitate that the Regional Board amend its regulations in the immediate future.

The City and the County appreciate the difficulties and challenges in implementing such complex regulatory matters as the Municipal Storm Water Permit, but as copermittees regulated by this permit, we are concerned that the Regional Board has decided to move this hearing forward without providing sufficient time to appropriately respond to and address stakeholders' concerns.

Locally and on a statewide level there continue to be numerous outstanding issues with this proposed permit. We believe it would be inappropriate and irresponsible to rush adoption

without continued dialog between the stakeholders and Regional Board staff. The City and County are committed to the goal of improving water quality through the storm water management programs that have been developed in conjunction with the Regional Board, but the current proposed permit include provisions that are flawed and need to be addressed.

Considering the significant financial burden this permit will have on so many local governments, we believe it is more important to create a permit that incorporates sound regulation than to needlessly rush toward an arbitrary deadline. The Regional Board staff has acknowledged on the record that the impacts of some of the proposed standards and regulations are not fully understood. We do not even know that compliance can be achieved with the tools and science available today. However, we do know for certain, based on the Regional Board's own studies, that significant cost in the range of billions of dollars will be incurred as a result of copermittees trying to comply with the proposed regulations if implemented.

As stewards entrusted with managing public tax dollars, we do not believe it is prudent to implement policy without having a clear understanding of whether it will mitigate the problem it was created to address. The City and the County believe it would be more productive to postpone any hearing in order to step back and continue working with all stakeholders to clearly define goals that are achievable and do not have such detrimental financial impacts to local governmental services.

Thank you for your consideration of this request. If the Regional Board does choose to move forward with holding the hearing in April, the City and County respectfully request to speak at the designated meeting to have the record reflect our respective positions on this matter. We would also respectfully request a time certain be allocated at the beginning of such hearing so that the City and County representatives can provide testimony.

If you have any questions, please contact Richard Crompton, County of San Diego Director of Public Works at (858) 694-2233 or Kip Sturdevan, City of San Diego Director of Transportation and Storm Water at (619) 236-6594.

Respectfully,

Hon. Bob Filner
Mayor
City of San Diego

Hon. Greg Cox
Chairman
San Diego County Board of Supervisors

From: lyris@swrcb18.waterboards.ca.gov
To: Chiu, Wayne@Waterboards
Subject: Hearing Procedures and Order of Proceedings - Tent Order No. R9-2013-0001 - Regional MS4 Permit
Date: Monday, March 18, 2013 9:29:29 AM
Attachments: Supp Hearing Procedures and Order of Proceedings Sig.pdf

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This is a message from the California Regional Water Quality Control Board, San Diego Region (9).

The attached notice of Hearing Procedures and Order of Proceedings sets forth additional details on the procedures and order of presentations the San Diego Water Board will follow at the public hearing on April 10 and 11, 2013 to consider adoption of Tentative Order No. R9-2013-0001 – the Regional MS4 Permit.

Respectfully,

David Barker
San Diego Water Board

David T. Barker, P.E.
Supervising Engineer
California Regional Water Quality Control Board
San Diego Region
(858) 467-2989
e-Mail: dbarker@waterboards.ca.gov

You are currently subscribed to reg9_sandiegoco_ms4permit as: wchiu@waterboards.ca.gov.

To unsubscribe click here: leave-454899-508208.cee2a373662e566393e62f0af18d11cf@swrcb18.waterboards.ca.gov

California Water Boards

Edmund G. Brown Jr.
Governor

Matthew Rodriquez
Secretary for
Environmental Protection

California Regional Water Quality Control Board, San Diego Region

HEARING PROCEDURES AND ORDER OF PROCEEDINGS

Public Hearing to Consider Adoption of Tentative Order No. R9-2013-0001, NPDES No. CAS01092662 and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds Within the San Diego Region

April 10 and 11, 2013
Beginning at 9:00 a.m. Each Day
California Regional Water Quality Control Board, San Diego Region
Regional Water Board Room
San Diego Water Board Office Building
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

By prior public notice dated March 5, 2013, the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) announced its intent to conduct a public hearing on April 10 and 11, 2013, to receive testimony and comments and consider adoption of Tentative Order No. R9-2013-0001, NPDES No. CAS0109266, *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Tentative Order). This Order of Proceedings sets forth additional details on the procedures and order of presentations the San Diego Water Board will follow at the public hearing.

SCOPE OF HEARING

The Tentative Order was released for public review and comment on October 31, 2012. The written comment period ended January 11, 2013. All timely written comments received are posted on the San Diego Water Board website, at http://www.waterboards.ca.gov/rwqcb9/water_issues/programs/stormwater/index.shtml. No subsequently filed written comments have been accepted into the record at this time. Other than speaker cards and copies of electronic presentations (see below) no new written materials will be accepted into the record at the April 10-11, 2013 hearing. As indicated in prior notices, the scope of oral testimony at the public hearing will be strictly limited to summarizing the previously submitted written comments, commenting on revisions to the Tentative Order made since the written comment period closed, and making policy statements. No new issues may be raised at the hearing.

HEARING PROCESS

During the public hearing, San Diego Water Board staff will present an overview of the Tentative Order, written responses to comments received and recommended revisions to the Tentative Order. For this proceeding, San Diego Water Board staff will begin, followed by representatives of the following parties: 1) the San Diego County, Orange County and Riverside County Copermittees; 2) U.S. Environmental Protection Agency; 3) Environmental Non-governmental Organizations (NGOs); and 4) Building Industry Groups.[1] Participants within these groups are encouraged to consolidate their presentations to save hearing time and/or avoid duplication.

After these presentations, the San Diego Water Board will hear from the public (interested persons), subject to times certain (see below). Interested persons with similar concerns or opinions are encouraged to choose one representative to speak, and are encouraged to coordinate their presentations with each other and to summarize their written comments. Interested persons may not cede their unused time to others, but the Chair will entertain requests for extra time from interested persons speaking on behalf of multiple interested persons.

Speakers will be interrupted not earlier than 4:00 p.m. on April 10 so that the San Diego Water Board can hear from interested persons other than representatives of the groups identified by name in this order of proceedings. At 9:15 a.m. on April 11, or as soon thereafter as practicable, elected officials will be invited to speak.

ORDER OF PROCEEDINGS

Chair's opening remarks, introductory items, administration of the oath to persons who intend to testify	**10 minutes**
San Diego Water Board Staff Presentation	**1.5 Hours**
San Diego County, Orange County and Riverside County Copermittees	**3 Hours (Total)**
US Environmental Protection Agency	**30 Minutes (Total)**
Environmental NGOs – (The Escondido Creek Conservancy, Coastkeeper, San Diego Canyonlands, Natural Resources Defense Council, Los Penasquitos Lagoon Foundation, Laguna Bluebelt Coalition, Friends of Rose Canyon Creek, Clean Water Now, Coastal Environmental Rights Foundation, Environmental Health Coalition, San Elijo Lagoon Conservancy, South Laguna Civic Association)	**1 Hour (Total)**

[1] These participants have been identified based upon prior participation through written comments, stakeholder meetings and public workshops held in November and December 2012.

Building Industry/Industry- (Association of General Contractors, Otay Land Company, Otay Ranch New Homes, American Society of Landscape Architects, BIA Regulated Coalition, BIA of Southern California, Industrial Environmental Association, San Diego Gas & Electric, San Diego Green Building Council, Southern California Gas Company)	**1 Hour (Total)**
Interested Persons (Time Certain at 4 p.m. on April 10, 2013)	**3 Minutes Each**
Elected Officials' comments (Time Certain at 9:15 a.m. on April 11, 2013)	**5 Minutes Each**

This allocated time includes time for any opening statement, main presentation, rebuttal and/or closing argument. San Diego Water Board Members and Counsel may ask questions at any time. Time for questions and answers will not count against the above time limits.

OBJECTIONS TO PROCEDURES

Other than as provided in this document, the San Diego Water Board intends to conduct this public hearing in a generally informal manner. Participants requesting alternative procedures, with procedural requests outside of the scope of this notice, or requesting more time to speak, must submit their requests or objections in writing to the San Diego Water Board staff member identified below no later than 5:00 pm on March 22, 2013. The San Diego Water Board will endeavor to accommodate reasonable requests and to respond to procedural objections and requests prior to the hearing. Untimely objections will be deemed waived.

POWER POINT AND OTHER COMPUTER DISPLAYS

Participants may use PowerPoint and other computer displays during their presentation to convey information electronically on the San Diego Water Board's computer. These displays will only be accepted if they summarize the information contained in documents that were timely submitted in compliance with deadlines cited above and in prior notices. They will not be accepted if they contain any new testimony or evidence. Please note that any person planning to use an electronic presentation at the hearing is required to provide a sufficient number of printed copies of the presentation for distribution to board members and staff and a reasonable number of copies to be available for the public to access during the hearing. An electronic copy of any presentation used during the hearing must be left with the San Diego Water Board's Executive Assistant for inclusion in the record. Electronic presentations will be posted on the San Diego Water Board's website as soon as practicable.

DOCUMENT AVAILABILITY

The Tentative Order, and attachments thereto, timely received comment letters on the Tentative Order, and other information and documents relied upon are posted on the San Diego Water Board website at: http://www.waterboards.ca.gov/rwqcb9/water_issues/programs/stormwater/index.shtml. A revised Tentative Order reflecting revisions since the written comment deadline and a

responses to comments document will be available shortly. Parties and interested persons will be notified by e-mail when those documents are posted on the Board's website.

These documents are also available for inspection and copying between the hours of 8:00 a.m. and 5:00 p.m. at the following address:

California Regional Water Quality Control Board
San Diego Region
9174 Sky Park Court, Suite 100,
San Diego, California 92123-4340

Arrangements for file review and/or obtaining copies of documents in the Administrative Record may be made by contacting the San Diego Water Board at (858) 467-2952. Appointments are encouraged so the documents can be readily available upon arrival. All timely received comment letters on the Tentative Order and responses to comments and other subsequent relevant documents will be available online as they are generated.

Staff Contact for Further Information
For questions or comments concerning this notice, please contact Wayne Chiu by phone at (858) 637-5558, or by email at wchiu@waterboards.ca.gov.

James G. Smith, AEO
for David W. Gibson

March 15, 2013

cc:
Distribution via email:
(see attached address list)

San Diego County Copermittees
Orange County Copermittees
Riverside County Copermittees
Resource Agencies

Distribution list via email:

San Diego County MS4 Permit Lyris List
Riverside County MS4 Permit Lyris List
Orange County MS4 Permit Lyris List
San Diego Water Board Agenda Lyris List

Tech Staff Info & Use	
Order No.	R9-2013-0001
Party (GT/CIWQS) ID	536787
File No.	n/a
WDID	n/a
NPDES No.	CAS0109266
Reg. Measure ID	387335
Place ID	786088
Person ID	n/a
Inspection ID	n/a

San Diego County Copermittees

San Diego Co. Reg. Airport Authority
Richard Gilb
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Wildomar, CA 92595
tdzmura@cityofwildomar.org

From:	Roger Butow
To:	Gibson, David@Waterboards
Cc:	Smith, James@Waterboards; Barker, David@Waterboards; Chiu, Wayne@Waterboards; Walsh, Laurie@Waterboards; Becker, Eric@Waterboards; Hagan, Catherine@Waterboards
Subject:	Clarification re allotted time
Date:	Monday, March 18, 2013 10:28:25 AM
Attachments:	Supp Hearing Procedures and Order of Proceedings Sig.pdf

SDRWQCB staff:

CWN wishes to avoid a repeat of last October's staff rollout/presentation to the Board.

We felt marginalized, given short shrift and especially experienced gruff disrespect shown by the Chair.

We made our feelings known to the Board, staff and attendees at that time and are seeking a path that doesn't stir up yet more animosity or enmity.

EX.: It was ridiculous to be forced to watch Jill Witkowski give a time-consuming, redundant PP that included her personal recreational activities. What's next, baby pictures of NGO personnel's children?

Ms. Witkowski, as we pointed out, was given preferential positioning and extended time that could have been spent in a more valuable, a more pertinent way.

We are seeking a more egalitarian approach by staff and Board in the future. One that is indiscriminate and treats **ALL** interested parties more alike instead of the preferential auspice given to enviro-NGOs with hefty budgets and intern attorneys galore that we now observe.

CWN is **NOT** aligned with, nor working conjunctively with any of the NGOs listed in this procedural notification. Presently, going through our 1 year reorganization, it might eventually produce such collaborations---but not right now.

As we build out our new board, re-prioritize our goals, etc., we are carefully reviewing who we wish to be engaged in dialogue with.....Thus we are an anomaly, we have no communication or negotiation mechanism to get our properly deserved slot. So we won't be **"consolidating"** as the notice encourages.

Question: As only 1 hour total is allotted on April 10th for ALL enviro-NGOs, under the circumstances, how might CWN procure an assured speaking timeframe and what is our guaranteed minimum allotted time for comments?

Thanks in advance for your considered attention and timely response,

Roger E. Bütow
Executive Director
Clean Water Now

Phone: (949) 715.1912
Address: PO Box 4711 Laguna Beach CA 92652

Email: roger@clean-water-now.org
Web: www.clean-water-now.org

CLEAN WATER NOW is an innovative, science-based organization committed to solution-oriented collaboration as a means of developing safe, sustainable water supplies and preserving healthy ecosystems.

From: Roger Butow
To: Gibson, David@Waterboards
Cc: Smith, James@Waterboards; Barker, David@Waterboards; Chiu, Wayne@Waterboards; Walsh, Laurie@Waterboards; Becker, Eric@Waterboards; Hagan, Catherine@Waterboards
Subject: 5-6 Minutes
Date: Monday, March 18, 2013 4:07:55 PM

I have left a VM @ both office & cell numbers for Asst. XO & Ombudsman James Smith requesting 5-6 minutes maximum.....There are about 12 NGOs on your list, many have already **"consolidated"** presentations in prior sessions/written submissions/testimony, so our proposed proportional share is estimated by my Board at approximately that number of minutes anyway.

I would appreciate an email response that confirms that amount of approved minutes in advance and we'll consider it agreed upon.
To assure us that others don't run on and (once again) use up or run into our dedicated allotment, we'll agree to **"bat leadoff"** (go first).
Please confirm that as well.
Done deal.

On Mar 18, 2013, at 10:28 AM, Roger Butow wrote:

> SDRWQCB staff:
>
> CWN wishes to avoid a repeat of last October's staff rollout/presentation to the Board.
>
> We felt marginalized, given short shrift and especially experienced gruff disrespect shown by the Chair.
>
> We made our feelings known to the Board, staff and attendees at that time and are seeking a path that doesn't stir up yet more animosity or enmity.
>
> EX.: It was ridiculous to be forced to watch Jill Witkowski give a time-consuming, redundant PP that included her personal recreational activities. What's next, baby pictures of NGO personnel's children?
>
> Ms. Witkowski, as we pointed out, was given preferential positioning and extended time that could have been spent in a more valuable, a more pertinent way.
>
> We are seeking a more egalitarian approach by staff and Board in the future. One that is indiscriminate and treats **ALL** interested parties more alike instead of the preferential auspice given to enviro-NGOs with hefty budgets and intern attorneys galore that we now observe.
>
> CWN is **NOT** aligned with, nor working conjunctively with any of the NGOs listed in this procedural notification. Presently, going through our 1 year reorganization, it might eventually produce such collaborations---but not right now.
>
> As we build out our new board, re-prioritize our goals, etc., we are carefully reviewing who we wish to be engaged in dialogue with.....Thus we are an anomaly, we have no communication or negotiation mechanism to get our properly deserved slot. So we won't be

"consolidating" as the notice encourages.

Question: As only 1 hour total is allotted on April 10th for ALL enviro-NGOs, under the circumstances, how might CWN procure an assured speaking timeframe and what is our guaranteed minimum allotted time for comments?

<Supp Hearing Procedures and Order of Proceedings Sig.pdf>

Thanks in advance for your considered attention and timely response,

Roger E. Bütow
Executive Director
Clean Water Now

Phone: (949) 715.1912
Address: PO Box 4711 Laguna Beach CA 92652
Email: **roger@clean-water-now.org**
Web: **www.clean-water-now.org**

CLEAN WATER NOW is an innovative, science-based organization committed to solution-oriented collaboration as a means of developing safe, sustainable water supplies and preserving healthy ecosystems.

From: sdcampaigncoordinator@gmail.com on behalf of Julia Chunn
To: Chiu, Wayne@Waterboards
Subject: correction for Hearing Procedures and Order of Proceedings - Tent Order No. R9-2013-0001 - Regional MS4 Permit
Date: Monday, March 18, 2013 3:06:14 PM
Attachments: Supp Hearing Procedures and Order of Proceedings Sig.pdf

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Hi Wayne,

I spoke with Katherine last week, and we really appreciate the Board's willingness to take public comment at the time certain time of 4pm on April 10th! Our members will appreciate it, and it facilities their participation in the process.

I noticed one small error on the notice, and that is, that Surfrider Foundation is not listed under the group of NGOs even though we submitted a joint comment letter with Coastkeeper and some of the other groups mentioned there. I just wanted to bring it to your attention to ensure that it does not cause a procedure issue.

We will be coordinating with the other NGOs to decide how to divide up the hour we were allotted.

Thanks for assistance with this matter.

Sincerely,
--
Julia Chunn-Heer
Campaign Coordinator
Surfrider Foundation, San Diego Chapter
julia@surfridersd.org

Help protect your oceans, waves and beaches by becoming a Surfrider Foundation member today!
---------- Forwarded message ----------
From: <lyris@swrcb18.waterboards.ca.gov>
Date: Mon, Mar 18, 2013 at 9:24 AM
Subject: Hearing Procedures and Order of Proceedings - Tent Order No. R9-2013-0001 - Regional MS4 Permit
To: Julia Chunn-Heer <julia@surfridersd.org>

This is a message from the California Regional Water Quality Control Board, San Diego Region (9).

The attached notice of Hearing Procedures and Order of Proceedings sets forth additional details on the procedures and order of presentations the San Diego Water Board will follow at the public hearing on April 10 and 11, 2013 to consider adoption of Tentative Order No. R9-2013-0001 – the Regional MS4 Permit.

Respectfully,

David Barker

San Diego Water Board

David T. Barker, P.E.

Supervising Engineer

California Regional Water Quality Control Board

San Diego Region

(858) 467-2989

e-Mail: dbarker@waterboards.ca.gov

You are currently subscribed to reg9_sandiegoco_ms4permit as: julia@surfridersd.org.

To unsubscribe click here: leave-454899-529747.85311a0683fbe7803484b4f897a53397@swrcb18.waterboards.ca.gov

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Julia Chunn-Heer
Campaign Coordinator
Surfrider Foundation, San Diego Chapter
julia@surfridersd.org

Help protect your oceans, waves and beaches by becoming a Surfrider Foundation member today!

Pa NAP Neill

008083

COUNTY OF RIVERSIDE

SAN DIEGO REGIONAL
WATER QUALITY
CONTROL BOARD
2013 MAR 25 AM 9 49

Board of Supervisors

District 1	Kevin Jeffries 951-955-1010
District 2	John F. Tavaglione 951-955-1020
District 3	Jeff Stone 951-955-1030
District 4	John Benoit 951-955-1040
District 5	Marion Ashley 951-955-1050

March 20, 2013

Mr. David Gibson
Executive Officer
California Regional Water Quality
Control Board, San Diego Region
9174 Skypark Court, Suite 100
San Diego, CA 92123

Re: Notice of Public Hearing – National Pollutant Discharge Elimination System NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds Within the San Diego Region

Dear Mr. Gibson:

We are writing as members of the Riverside County Board of Supervisors and the Riverside County Flood Control and Water Conservation District Board of Supervisors whose districts include the Cities of Murrieta, Temecula and Wildomar as well as unincorporated areas of Riverside County, which are proposed to be covered by the above-referenced Municipal Storm Water Permit (Permit). We understand that Regional Board staff has scheduled the public hearing for adoption of the Permit on April 10 and 11, 2013.

We are writing to request that these dates be continued, as the current hearing dates do not provide the Riverside County stakeholders sufficient time to review proposed changes in the Permit or the responses of your staff to the substantive and substantial comments made by stakeholders. To date, neither the draft Permit nor the response to comments has been released by Board staff.

We understand that the Regional Board had previously informed stakeholders of its strong desire to solicit and incorporate stakeholder comments during the development of the Permit. Unfortunately, with neither the final proposed Permit language nor staff's responses to stakeholder comments, the Regional Board is stifling the public review and comment process by not allowing sufficient time to review comment responses and any resultant changes in the draft Permit before holding the adoption hearing. This raises significant due process concerns, as well as concerns as to the treatment of local governments by a state agency.

Stormwater permits have become increasingly complex and expensive over time, and require local governments (including those in Riverside County) to undertake significant activities with no or minimal state and federal funding. Given the financial pressures on local governments, state agencies must provide every opportunity for local government input to ensure that Permit requirements are aligned with local programs, resources and conditions so as to minimize unintended and unnecessary negative impacts on residents, business and local government services. The regional nature of this Permit, which proposes to cover municipalities in three counties and multiple watersheds, adds additional complexities for comment coordination beyond a typical permit renewal process and also requires new levels of coordination between local agencies after permit adoption. It is thus vitally important that local governments, and all stakeholders, have a full opportunity both to review the final draft Permit language and the comment responses in order to provide informed and complete testimony to the Regional Board.

Given the short time between now and April 10, and without even final permit language or responses to comments to review, the stakeholders, including those in Riverside County, will not have this opportunity.

We therefore request that the Regional Board re-schedule the hearing on the proposed Permit from the April 10 - 11, 2013 current scheduled dates to a later date and also provide a minimum of 45 days opportunity for the stakeholders to review and, if appropriate, comment on significant changes from the earlier draft of the Permit. We also understand that the Riverside County stakeholders also have specific concerns with the proposed hearing procedures for Permit adoption, which will be set forth in a separate letter.

Sincerely,

Supervisor Kevin Jeffries
District 1

Supervisor Jeff Stone
Vice-Chairman, Board of Supervisors
District 3

cc: George Johnson, Executive Office
Steven Horn, Executive Office
Pam Walls, County Counsel
Dusty Williams, Flood Control
Jason Uhley, Flood Control
Juan Perez, TLMA
David W. Burhenn & Gest LLP

From: Garrison, Noah
To: Chiu, Wayne@Waterboards
Cc: Jill Witkowski (jill@sdcoastkeeper.org); Colin Kelly (colin@coastkeeper.org); Arias, Christina@Waterboards
Subject: Hearing Procedure for San Diego MS4 Permit hearing April 10-11 - request for time for presentation
Date: Thursday, March 21, 2013 3:47:34 PM

Dear Mr. Chiu,

I am writing to you with regard to the recently released letter on Hearing Procedure and Order of Proceedings for the April 10-11 hearing on the draft San Diego MS4 permit. While we understand the Board's interest in ensuring that the hearing proceeds in an orderly and timely fashion, NRDC in concerned with the manner in which the Board has allotted time for presentation to "Environmental NGOs" at the hearing. In particular, the Board has given a lump sum of time for presentation to these groups of 1-hour, to be parceled out among organizations that NRDC neither coordinates with, nor necessarily holds the same positions as on any or all issues related to adoption of the Regional MS4 permit. We further note that "Coastkeeper," could refer to either or both of two different organizations that have a longstanding interest in the proceeding—San Diego Coastkeeper and Orange County Coastkeeper.

NRDC is interested in coordinating a presentation with the two Coastkeeper organizations in order to ensure that the hearing proceeds efficiently, but we ask that our 3 groups, which have been deeply involved in the permitting process, be allotted a total of 40 minutes of time for presentation, separate from time allotted to any other Environmental NGOs that may wish to present independently of NRDC and the Coastkeepers.

Thank you for your attention to this matter, please do not hesitate to contact me with any questions you may have.

Sincerely,

Noah Garrison

Noah Garrison | Project Attorney - Water Program | Natural Resources Defense Council
Office: 310-434-2300 | 1314 2nd Street, Santa Monica, CA 90401
ngarrison@nrdc.org | www.nrdc.org |
Admitted in California

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From: Uhley, Jason
To: Chiu, Wayne@Waterboards
Cc: Garcia, David; Lomeli, Eric; Horn, Steven; Watts-Bazan, Karin
Subject: Request for alternate hearing procedures for April 10/11 Hearing
Date: Thursday, March 21, 2013 5:38:47 PM
Attachments: Hearing Procedures - Proposal Regional MS4 Permit.pdf

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Wayne,

At this time, and pursuant to March 18, 2013 Hearing Notice, please find enclosed a respectful request for alternative hearing procedures for the April 10/11 Regional Permit Hearing. The District may modify this request at a later date pending review of the revised tentative order and response to comments.

The original should arrive via fed-ex tomorrow.

Please feel free to call if you have any questions.

Regards,

Jason Uhley
Chief of Watershed Protection
Riverside County Flood Control and Water Conservation District
1995 Market Street
Riverside, CA 92501
951.955.1273

WARREN D. WILLIAMS
General Manager-Chief Engineer

1995 MARKET STREET
RIVERSIDE, CA 92501
951.955.1200
FAX 951.788.9965
www.rcflood.org

RIVERSIDE COUNTY FLOOD CONTROL
AND WATER CONSERVATION DISTRICT

March 21, 2013

Emailed this date to:
wchiu@waterboards.ca.gov with e-mail
subject line: Hearing Procedures – Proposed Regional MS4 Permit

Wayne Chiu, P.E.
WRC Engineer
California Regional Water
Quality Control Board - San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123

Dear Mr. Chiu:

Re: Hearing Procedures – Proposed Regional MS4 Permit

I am writing on behalf of the Riverside County Flood Control and Water Conservation District (District) with regard to the Hearing Notice and Order of Proceedings (Hearing Notice) released on March 18, 2013 governing the proposed adoption of Tentative Order No. R9-2013-0001 (Tentative Order). The District, in consultation with the other Co-permittees within the Santa Margarita Region (the County of Riverside and the Cities of Murrieta, Temecula and Wildomar), is sending this letter in response to the requirement in the Hearing Notice for request for alternative procedures to those set forth in the Hearing Notice. The District notes that this letter does not waive the District's previously expressed objection to coverage under the proposed Tentative Order in the absence of a Report of Waste Discharge, or questions regarding the Water Board's jurisdiction to issue a regional permit.

Before addressing the specific items set forth in this letter, I draw your attention to the letter to Executive Officer David Gibson from Riverside County Supervisors Kevin Jeffries and Jeff Stone dated March 20, 2013, which requested a continuance of the April 10-11 hearing and also a 45-day opportunity for stakeholders to review and comment on changes to the revised Tentative Order (which has not been released). The comments and concerns expressed in this letter relate in large part to the very short time between the anticipated release dates of the Tentative Order and staff's responses to comments and the hearing dates.

Scope of Hearing

The District first notes that the adoption of an NPDES permit or waste discharge requirement is subject to the formal adjudicatory proceedings set forth in the California Administrative Procedure Act (APA) (Govt. Code Sections 11400 *et seq.*), Evidence Code Ssections 801-805, Govt. Code Section 11513 and title 23 of the California Code of Regulations, Sections 648 *et seq.* At this time, the District requests that a formal adjudicatory process, in accordance with the requirements of those statutory and regulatory provisions, be conducted for the adoption of the Tentative Order, and respectfully objects to having the hearing conducted in the "generally informal manner" set forth in the Hearing Notice.

The District also objects to the limitation in the Hearing Notice and in the earlier hearing notice dated March 6, 2013 regarding the scope of oral testimony or Powerpoint/computer displays at the hearing. Under the above-noted statutory and regulatory provisions, testimony and exhibits cannot be limited to summarizing earlier written comments, commenting on revisions to the Tentative Order and making policy statements. Any testimony will, of course, need to be relevant to the issues before the Board. Additionally, those provisions provide stakeholders with the opportunity to provide exhibits as part of their testimony, and to the extent that the Hearing Notice purports to limit that right, the District objects.

Hearing Process

With regard to the Hearing Process, the District requests that the order of proceedings follow the model set forth in Title 23 Cal. Code Reg. Section 648.5. This model provides an efficient and orderly process for the taking of testimony, and the District, therefore, requests that it be substituted for the order of proceedings set forth in the Hearing Notice.

Additionally, the District requests that the US Environmental Protection Agency's (USEPA) presentation be scheduled after that of the Water Board staff and prior to that of the stakeholders. Since the USEPA, like the Water Board, is a regulatory agency, its presentation should follow that of Water Board staff.

With regard to the amount of time required for the District's testimony, due to the current unavailability of the revised Tentative Order or staff's responses to comments, the District is now requesting at least two hours to make its presentation (including testimony, rebuttal, cross-examination, and opening and closing statements). This estimate is subject to revision following receipt of the revised Tentative Order and staff's responses to comments. The Riverside County Co-permittees may also require additional time.

The Hearing Notice requests that participants within each of the major party groups (permittees, NGOs, building industry) to "consolidate their presentations to save hearing time and/or avoid duplication". While the District agrees that such consolidation would be preferable, the short time between the release of the revised Tentative Order, and response to comments and the hearing will make it impossible for such coordination to occur. If the Water Board continues the hearing dates, as requested by Supervisors Jeffries and Stone (and by other stakeholder representatives), we believe that such coordination can be done.

As a final comment, the District has no objection to the scheduling of elected official testimony for a time certain. However, given such officials' busy schedules, we request that the Board agree to hear elected officials outside of that time slot, as appropriate to accommodate those schedules.

Thank you for your consideration of these issues.

Very truly yours,

Steve Thomas

FOR WARREN D. WILLIAMS
General Manager–Chief Engineer

DB:JU:bjp:cw
P8/152274

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COUNTY OF ORANGE
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ADRIENNE SAURO HECKMAN
KAREN R. PRATHER
GEOFFREY K. HUNT
CHRISTOPHER J. MILLER
JOHN H. ABBOTT
JANELLE B. PRICE
ANN E. FLETCHER
MARGARET E. EASTMAN
MARK R. HOWE
DANA J. STITS
MARIANNE VAN RIPER
JAMES C. HARMAN
JULIE J. AGIN
LAURIE A. SHADE
DANIEL H. SHEPHARD
JOYCE RILEY
PAULA A. WHALEY
THOMAS A. MILLER
STEVEN C. MILLER
CAROLYN S. FROST
ROBERT N. ERVAIS
LAURA D. KNAPP
ROGER P. FREEMAN
NICOLE A. SIMS
NIKHIL G. DAFTARY
JEANNIE SU
JAMES C. HARVEY
WENDY J. PHILLIPS
TERI L. MAKSOUDIAN
LEON J. PAGE
ANGELICA CASTILLO DAFTARY
KAREN L. CHRISTENSEN
MICHAEL A. HAUBERT
RYAN M. F. BARON
BRAD R. POSIN
SAUL REYES
AURELIO TORRE
MARK D. SERVINO
DEBBIE TORREZ
JACQUELINE GUZMAN
ANDREA COLLER
PAUL M. ALBARIAN
D. KEVIN DUNN
LORI A. TORRISI
MASSOUD SHAMEL
SHARON VICTORIA DURBIN
REBECCA S. LEEDS
NICOLE M. WALSH
MARISA MATSUMURA
ELIZABETH A. PEJEAU
LAUREN C. BAUER
GABRIEL J. BOWNE
JULIA C. WOO
LAUREL M. TIPPETT
MARK A. BATARSE
ADAM C. CLANTON
KRISTEN K. LECONG
ERIC A. DIVINE
COURTNEY S. WUCETICH
JAMES D. P. STEINMANN
VANESSA D. ATKINS
SUZANNE E. SHOAI
DEBORAH B. MORSE
DEPUTIES

Wayne Chiu
San Diego Water Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Re: Tentative Order – Formal Adjudicatory Proceedings

Dear Mr. Chiu:

Our office is writing you on behalf of the County of Orange and the Orange County Flood Control District ("County") regarding the Hearing Notice and Order of Proceedings (Hearing Notice) released on March 18, 2013 governing the proposed adoption of Tentative Order No. R9-2013-0001 (Tentative Order).

We are concerned that the co-permittees have not been provided basic due process in the Hearing Notice and have not had adequate opportunity to provide written comment. While an adoption hearing has been scheduled for April 10 and 11, a revised Tentative Order and a response to comments have not been released. The Hearing Notice encourages co-permittees to consolidate their presentations, but given the extremely short time frame between the time those documents might be released and the informal hearing, such coordination is impossible. Furthermore, we are concerned that the Hearing Notice improperly attempts to limit the oral presentations to the original prior written comments of the permittees, and that there may be material additions to a revised Tentative Order that are not a logical outgrowth of the originally circulated Order that could necessitate additional written comments.

For these reasons, the County is concerned that comments will be inadequately limited in the record due to the informality of the current proceeding. We also note that our detailed written comments submitted on January 11, 2013 demonstrated strong factual and legal opposition to numerous provisions in the Tentative Order. As such, our office requests that a formal adjudicatory proceeding be conducted in accordance with California Administrative Procedure Act (APA) (Govt. Code sections 11400 *et seq.*), Evidence Code sections 801-805, Govt. Code section 11513 and title 23 of the California Code of Regulations, sections 648 *et seq.*, and that the order of proceedings follow the model set forth in title 23 Cal. Code Reg. section 648.5. The County

requests that a minimum of three to four hours be set aside for the County to call witnesses, introduce evidence, cross examine Water Board staff and designated parties and conduct open and closing arguments and other presentations. The County reserves the right to modify the request for time depending on the timing and substance of the revised Tentative Order and Response to Comments.

We believe this request is consistent with the August 2, 2006 Memo from Chief Counsel regarding the Summary of Regulations Governing Adjudicative Proceedings before the California Water Boards.

Very truly yours,

NICHOLAS S. CHRISOS
COUNTY COUNSEL

By _____
Ryan M.F. Baron

RMFB:po

From: Odette Diaz
To: Chiu, Wayne@Waterboards
Cc: Chiu, Wayne@Waterboards
Subject: FW: Public Hearing to Consider Adoption of Tentative Order R9-2013-0001
Date: Friday, March 22, 2013 1:09:05 PM
Attachments: S0130961.pdf

Per Ms. Devaney's request, please see attached. Kindly note this transmission will follow via U.S. Mail as well.

Kindly reply back to confirm receipt of the attachment.

Odette Diaz on behalf of
Leslie E. Devaney
Attorney at Law
Stutz Artiano Shinoff & Holtz
2488 Historic Decatur Road, Suite 200
San Diego, CA 92106
P: 619.232.3122
D: 619.881.1321
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E: ldevaney@stutzartiano.com

City of Del Mar

March 22, 2013

Mr. David Gibson
Executive Officer
Regional Water Quality Control Board
San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340
dgibson@waterboards.ca.gov

Re: Public Hearing to Consider Adoption of Tentative Order R9-2013-0001
NPDES No. CAS01092662

Dear Mr. Gibson:

On behalf of our client the City of Del Mar, we formally object to the "Hearing Procedures and Order of Proceedings" dated March 15, 2013, and received on March 18, 2013 ("Hearing Procedures"). The proposed Hearing Procedures are not in compliance with the California Government Code, California Code of Regulations, and the Code of Federal Regulations applicable to NPDES Permit adoption proceedings. There are two main issues with the Hearing Procedures: 1) the Tentative Order has not been released, so no informed decision with regard to formal/informal proceedings can be made; and 2) the proposed process has significant limitations on what can be presented to the RWQCB ("Board") and how the public may interact. Specifically, the Hearing Procedures limit the time for all parties to present and be heard and it limits the scope of what may be presented:

> "…the scope of oral testimony at the public hearing will be strictly limited to summarizing the previously submitted written comments, commenting on revisions to the Tentative Order made since the written comment period closed, and making policy statements. No new issues may be raised at the hearing." [emphasis added]

Given the level of interest and potential controversy in this proceeding, the prohibition of additional written comments and the ability to raise new issues based on the yet-to-be-released Tentative Order, the Board violates the provisions of state and federal law with respect to due process by barring their right to comment for the administrative record. Any "new" issues raised by the Tentative Order (which has not yet been issued) would be deemed waived, and deprive the City of Del Mar the opportunity to be heard and present evidence based on the to-be released Tentative Order. In addition, the proposed time limitations are inappropriate and inconsistent with the City of Del Mar's rights and obligations to create an administrative record for review.

Because of the (i) potentially significant changes made to the prior draft permit as a result of public comment and testimony, (ii) the proposed limitations on written comments, and (iii) proposed ban on raising new issues at the hearing and the informal hearing process as proposed, the City of Del Mar requests the following:

1. The public hearing on April 10 and 11, 2013, to receive testimony and comments and consider adoption of Tentative Order No. R9-2013-0001, NPDES No. CAS0109266 be postponed and/or continued to allow a reasonable review of the proposed permit language and requirements by the permitee(s).

City of Del Mar

Mr. David Gibson
Executive Officer
Regional Water Quality Control Board
San Diego Region
March 22, 2013

2. The limitations on the time for all parties to present and be heard and the prohibition of new issues to be presented based on the new/revised permit must be removed. However, because the revised Permit has not been issued, the City does not know at this time whether a formal or an informal hearing process would be necessary and/or appropriate. The City of Del Mar specifically requests a formal hearing pursuant to 23 CCR § 648.7 as a reservation of its rights to such formal proceedings.

Thank you for your consideration of the above.

STUTZ ARTIANO SHINOFF & HOLTZ
A Professional Corporation

Leslie E. Devaney
City Attorney of Del Mar

cc: Scott Huth, Del Mar City Manager *(shuth@delmar.ca.us)*
Wayne Chiu, RWQCB San Diego Region *(atwchiu@waterboards.ca.gov)*

1050 Camino Del Mar, Del Mar, California 92014-2698. Telephone: (858) 755-9313.Fax: (858) 755-2794
www.delmar.ca.us

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008094

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SAN DIEGO REGIONAL
WATER QUALITY
CONTROL BOARD

2013 MAR 26 PM 2 43

Sam Abed
Mayor
201 North Broadway, Escondido, CA 92025
Phone: 760-839-4610 Fax: 760-839-4578

March 22, 2013

Mr. David Gibson
California Regional Water Quality Control Board
San Diego Region 9
9174 Sky Park Court, Suite 100
San Diego, CA 92123

Notice of Public Hearing to Consider Adoption - National Pollutant Discharge Elimination System (NPDES) Permit and Waste Water Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining Watersheds within the San Diego Region – ORDER NO. R9-2013-0001 (Tentative Order)

Mr. Gibson:

The City of Escondido (City) received the recent release of the "Notice of Public Hearing to Consider Adoption of the Tentative Order" on March 6, 2013. The City co-drafted comments which appeared with comments from other jurisdictions in San Diego County's letter regarding the Administrative Draft Order. Additionally, several similar letters were submitted to the San Diego Regional Water Quality Control Board (Regional Board) from the Building Industry, Community Planning Groups, Environmental Organizations, Engineering Organizations, and the State and Federal Governments among others. Overall, approximately 90 letters from a broad range of interested parties were submitted to the Regional Board voicing concerns and questions regarding the Administrative Draft Order.

To date, the newest edition of the Tentative Order (third edition), which will be proposed for adoption on April 10-11, has not been released for public review. Depending on the timing of the Tentative Order's release, copermittees will have no more than a few weeks to review it prior to the public hearing to consider adoption.

The City greatly appreciated the Administrative Draft Order public review process (i.e., workshops) employed in 2012. This process allowed for all interested stakeholders to discuss the Administrative Draft Order with Regional Board Staff, the building industry, MS4 Dischargers, and environmental organizations. The City believes the workshop process should continue with the next draft of the Tentative Order to address the unresolved issues raised by all parties. The City is committed to the goal of improving water quality through NPDES permit programs that have been developed by the

Regional Board. However, dialog between the stakeholders and Regional Board staff is critical at this stage and adoption of the order without further collaboration will affect the success of the program.

The financial burden of this Order is significant. As disclosed by the Regional Board's own studies, compliance with the proposed Tentative Order will cost the region's tax payers billions of dollars. The City strives to manage tax dollars efficiently, and believes that compliance with the most recent draft of the Order is not an efficient or effective use of tax payer money.

The City believes it is very important to develop a MS4 permit that incorporates justified regulations which work to meet the overall goals of the program. Previous collaboration efforts (i.e., 2012 workshops) among stakeholders and regulators during the drafting period produced an excellent template for accomplishing these goals.

The City believes that adoption of the proposed Tentative Order should be postponed, and that the Regional Board should reestablish open communication and collaboration with all applicable stakeholders (i.e., workshops). This will allow for all parties to define goals that are achievable, streamline permit development, and will lessen the financial impact of the Tentative Order.

The City thanks you for your consideration of this request. If you have any questions please contact Mr. Jeff Warner, acting Stormwater Program Manager, at 760-839-4528 or jwarner@escondido.org.

Respectfully,

Sam Abed

Sam Abed
Mayor

Chiu, Wayne@Waterboards

From: Stroud, Heather <HStroud@sandiego.gov>
Sent: Friday, March 22, 2013 1:37 PM
To: Gibson, David@Waterboards
Cc: Hagan, Catherine@Waterboards; McFadden, Kris
Subject: Objection to Hearing Procedures and Order of Proceedings
Attachments: City of San Diego Objection to Hearing Procedures.pdf

Dear Mr. Gibson:

Please find attached the City of San Diego's letter of objection to the hearing procedures and order of proceedings.

Thank you,
Heather

_____

Heather L. Stroud
Deputy City Attorney
Office of the San Diego City Attorney
1200 Third Avenue, Suite 1100
San Diego, California 92101

(619) 533-5872 (phone)
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hstroud@sandiego.gov

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MARY JO LANZAFAME
ASSISTANT CITY ATTORNEY

HEATHER L. STROUD
DEPUTY CITY ATTORNEY

OFFICE OF

THE CITY ATTORNEY

CITY OF SAN DIEGO

Jan I. Goldsmith
City Attorney

CIVIL ADVISORY DIVISION
1200 THIRD AVENUE, SUITE 1100
SAN DIEGO, CALIFORNIA 92101-4100
TELEPHONE (619) 533-5800
FAX (619) 533-5856

March 22, 2013

VIA E-MAIL

David W. Gibson
San Diego Regional Water Quality Control Board
9174 Sky Park Ct., Suite 100
San Diego, CA 92123-4340
DGibson@waterboards.ca.gov

RE: Objection to Hearing Procedures and Order of Proceedings

Dear Mr. Gibson:

The City of San Diego has serious concerns about the Hearing Procedures and Order of Proceedings for the Municipal Separate Storm Sewer System (MS4) permit hearing, which we received on March 18, 2013. We were hoping to be able to review the forthcoming revisions to the Tentative Order before deciding whether to file this formal objection, but unfortunately the revised Tentative Order is not yet available. Given the warning in the notice that objections made after today will be "deemed waived," the City files this objection to preserve its due process rights. Specifically, the City objects to the following:

1. **Limitations on Testimony and Evidence.** The City objects to the attempt to limit the parties' ability to present testimony and evidence. This permit hearing is an adjudicative proceeding.[1] Under the State Board's own regulations, a party to an adjudicative hearing has a right to submit any "relevant" oral or written evidence.[2] Further, under the Clean Water Act regulations, the comment period must remain open until the close of the public hearing.[3] This provision is applicable to state permit proceedings.

Contrary to these regulations, the notice states: "the scope of oral testimony will be strictly limited to summarizing the previously submitted comments, commenting on revisions to the Tentative Order made since the written comment period closed, and making policy statements. No new issues may be raised at the hearing." The notice further states that

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[1] Memorandum from Office of Chief Counsel to State Water Resources Control Board and California Regional Water Quality Control Boards, regarding Summary of Regulations Governing Adjudicative Proceedings Before the California Water Boards (Aug. 2, 2006).
[2] *Id.*; 23 Cal. Code Regs. § 648.5.1; Gov't Code § 11513(c).
[3] 40 C.F.R. § 124.12(c).

PowerPoint presentations "will not be accepted if they contain any new testimony or evidence." The parties have a right to submit any relevant evidence and testimony prior to the close of the public hearing. The Regional Board must honor this vital due process right.

2. **Limitations on Submission of Written Comments on Permit Revisions.** The City objects to the proposal to limit the parties to the written comments already submitted on the prior version of the Tentative Order, which we understand has undergone substantial revision. The City requests a limited 30-day written comment period to allow the parties to address revisions to the Tentative Order. This will allow for a more complete administrative record, a more orderly permit adoption hearing, and more informed decision-making by the Regional Board.

3. **Order of Proceedings.** The City objects to the informal hearing procedures proposed, and requests that hearing be conducted according to the formal hearing procedures in Section 648.5 of Title 23 of the California Code of Regulations. Specifically, the City reserves its right to present any relevant evidence, cross-examine witnesses, and present a closing statement. The Regional Board must grant this request because the State Board regulations provide that "[a] matter shall not be heard pursuant to an informal hearing procedure over timely objection . . . unless an informal hearing is authorized under subdivision (a), (b), or (d) of section 11445.20 of the Government Code."[4] None of those exceptions apply here.

Further, the three hours allotted for thirty-nine Copermittees to share is unacceptable. This works out to less than five minutes per Copermittee. The City would have liked to coordinate its presentation with the other Copermittees as we have done in the past, but the late release of the revised Tentative Order and responses to comments has limited our ability to do so. We understand that the revised Tentative Order may not be available until the meeting agenda packet is mailed, which could give us less than two weeks to prepare for the hearing. Should the hearing go forth on April 10 and 11 as proposed, the City requests its own block of time of one hour, with 30 minutes for a staff presentation and presentation of evidence and 30 minutes for cross examination and a closing statement, if necessary.

4. **Timing of Hearing.** The City objects to holding the permit adoption hearing on April 10 and 11. The City believes that delaying the hearing to provide the parties time to digest the forthcoming revised Tentative Order may remedy many of the City's concerns and result in a more orderly and productive hearing. The City also understands that two new Regional Board members may be appointed soon, and delaying the hearing would give them time to settle into their duties before being asked to rule on an extremely complicated and controversial permit with serious fiscal and legal implications on the Copermittees. It would also be appropriate to delay the hearing to allow the State Board to provide guidance on the Receiving Waters Limitations language, as urged in the letter from Mayor Filner dated March 15, 2013.

---

[4] 23 Cal. Code Regs. § 648.7.

For all of these reasons, the City respectfully requests that the Regional Board issue a revised Hearing Procedures and Order of Proceedings that complies with the Clean Water Act and State Board regulations.

Sincerely yours,

JAN I. GOLDSMITH, City Attorney

By

Heather L. Stroud
Deputy City Attorney

HLS:cw

Enclosures: Memorandum from Office of Chief Counsel to State Water Resources Control Board and California Regional Water Quality Control Boards, regarding Summary of Regulations Governing Adjudicative Proceedings Before the California Water Boards (Aug. 2, 2006).
Letter from Mayor Bob Filner and San Diego County Board of Supervisors Chair Greg Cox to David Gibson (Mar. 15, 2013).

cc: Kris McFadden, Deputy Director, City of San Diego Transportation & Storm Water Department
Catherine Hagan, Esq., San Diego Regional Water Quality Control Board Counsel

Doc. No.: 535085

Linda S. Adams
Secretary for Environmental Protection

State Water Resources Control Board

Office of Chief Counsel
1001 I Street, 22nd Floor, Sacramento, California 95814
P.O. Box 100, Sacramento, California 95812-0100
(916) 341-5161 ♦ FAX (916) 341-5199 ♦ http://www.waterboards.ca.gov

Arnold Schwarzenegger
Governor

TO: [via e-mail and U.S. Mail]
Board Members
STATE WATER RESOURCES CONTROL BOARD AND CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARDS

FROM: Michael A.M. Lauffer
Chief Counsel
OFFICE OF CHIEF COUNSEL

DATE: August 2, 2006

SUBJECT: SUMMARY OF REGULATIONS GOVERNING ADJUDICATIVE PROCEEDINGS BEFORE THE CALIFORNIA WATER BOARDS

This memorandum outlines and reinforces some of the primary requirements that apply when the State Water Resources Control Board (State Water Board) and the nine California Regional Water Quality Control Boards conduct adjudicative proceedings. Adjudicative proceedings are the evidentiary hearings used to determine the facts by which a water board reaches a decision that determines the rights and duties of a particular person or persons. Adjudicative proceedings include, but are not limited to, enforcement actions and permit issuance.

Background

The California Water Boards perform a variety of functions. The boards set broad policy consistent with the laws passed by Congress and the Legislature. The boards also routinely determine the rights and duties of individual dischargers or even a class of dischargers. In this regard, the boards perform a judicial function. The judicial function manifests itself when the boards adopt permits and conditional waivers or take enforcement actions.

Different rules apply depending on the type of action pending before a water board. One of the distinctions between the two types of proceedings is the prohibition against ex parte communications. A prohibition on ex parte communications only applies to adjudicative proceedings.[1] Besides the ex parte communications prohibition, additional rules, procedures, and participant rights adhere in adjudicative proceedings. This memorandum outlines some of the more important procedural mechanisms associated with adjudicative proceedings.

[1] The Office of Chief Counsel addressed ex parte communications in a July 25, 2006 memorandum and questions and answers document.

Adjudicative Proceedings

What is an adjudicative proceeding?
Adjudicative proceedings are the evidentiary hearings used to determine the facts by which a water board reaches a decision that determines the rights and duties of a particular person or persons. Generally, this includes permitting and enforcement actions, but does not include planning and general regulatory functions such as Basin Plan amendments and Total Maximum Daily Loads.

Below is a partial list of common water board actions that are of an adjudicative nature:

- National Pollutant Discharge Elimination System (NPDES) permits;
- Waste discharge requirements (WDRs);
- Water right permits and requests for reconsideration;
- Orders conditionally waiving waste discharge requirements;
- Administrative civil liability (ACL) orders;
- Cease and desist orders;
- Cleanup and abatement orders;
- Water quality certification orders (401 certification);
- Permit revocations.

What laws govern adjudicative proceedings?
Adjudicative proceedings are governed by Chapter 4.5 of the Administrative Procedure Act[2] and by regulations adopted by the State Water Board[3]. By regulation, the State Water Board has chosen not to apply several sections of the Administrative Procedure Act to the California Water Boards' proceedings. These sections are Language Assistance, Emergency Decisions, Declaratory Decision, and Code of Ethics. All other sections and provisions of Administrative Procedure Act Chapter 4.5 apply.

Who are the parties to an adjudicative proceeding?
Parties to an adjudicative proceeding are any person or persons to whom a water board's action is directed as well as any other person or persons that the board chooses to designate as a party. In some cases, certain members of a water board's staff will be a party to an adjudicative proceeding. If some water board staff are designated as a party, other staff will be assigned to advise the board members. Anyone who is not a party, but who participates in the proceedings (other than staff advisers to the water board), is considered an interested person. The process for deciding who is a party is left to the discretion of a water board. A hearing may be held on the issue or the chair may be delegated to make such determinations. When a party is designated, the chair should provide notice in advance of the hearing to the water board staff and the discharger.

What is a formal hearing?
Most of the time an adjudicative proceeding will be a formal hearing in which a water board requires parties to follow a pre-determined process that may include such procedural issues as

[2] Gov. Code, § 11400 et seq.

[3] Cal. Code Regs., tit. 23, §§ 648-648.8.

submittal of the names of witnesses, qualifications of experts, exhibits, proposed testimony, and legal argument. A hearing notice will be drafted spelling out the requirements and the timeframes. The terms and conditions of the notice are left to the discretion of the water board conducting the proceeding, though it is suggested that some level of formality is useful in preserving decorum and fostering efficiency. A hearing under Chapter 4.5 of the Administrative Procedure Act and the State Water Board's regulations is considered a "formal hearing," even if it does not have some attributes of hearing formality, unless it is officially designated as an "informal hearing" under Government Code section 11445.20 and California Code of Regulations, title 23, section 648.7.

The order of proceedings is within the discretion of a water board as well. However, the regulations suggest a specific order and should generally be followed unless the facts and circumstances of a particular case indicate otherwise. Normally, the proceedings begin with an opening statement by the chair followed by the administration of the oath to those indicating that they intend to participate. Then the parties make their presentations through testimony and the introduction of exhibits. Typically, witnesses may be cross-examined by other parties but the timing of such cross-examination is within the discretion of the regional board. If the re-direct examination has been specified in the notice, re-direct examination follows cross-examination. A water board should decide in advance how it would like to handle questions from board members. Interruptions and questions by board members should not count against time allotted to a party. At some point during the proceeding, comments from interested persons must be admitted. Thereafter, the regulations anticipate a closing statement from each party.

What are the rules of evidence in an adjudicative proceeding?
The rules of evidence are not those that apply in the courtroom. Any relevant evidence will be admitted if it is the sort of evidence on which responsible persons are accustomed to rely in the conduct of serious affairs, no matter what the statutory or customary rule may be. Hearsay evidence is admissible, but only for the purpose of supplementing or explaining other evidence. If an objection is raised that certain testimony constitutes hearsay evidence, the chair should note for the record that the evidence will be admitted but that it cannot, by itself, support a finding. If no other evidence is introduced in support of that finding, a water board must ignore the hearsay evidence and decline to make such a finding.

A water board may accept evidence by taking official notice of certain things such as laws, court decisions, regulations, and facts and propositions that are common knowledge or not in reasonable dispute.

What are informal hearings?
Informal hearings may be used in place of formal hearings in some instances, if a water board thinks it advisable. Generally, this process can be used where significant facts are not in issue and the proceeding held is to determine only what consequences flow from those facts. In deciding whether to use the informal process, a water board should consider how many parties are involved, whether any of the parties have requested a more formal process, how many interested persons there are, how complex the issues facing the water board may be, and how important a formal record may be if petitions and appeals result. If any party objects to the informality of the process, a water board or its chair must address and resolve the objections before proceeding.

Because of the flexibility the regulations provide for formal hearings, a water board may find it advisable to conduct its hearings as formal hearings with streamlined procedures, as opposed to conducting an informal hearing. The regulations provide that a water board may waive any of the regulatory requirements that are not required by a statute. While this is certainly within the prerogative of a water board, caution should be exercised before any such waiver. These regulations generally seek to preserve the fairness of the process and omission of any of these provisions may result in unnecessary disputes over procedural issues.

How can the chair control the conduct of the adjudicative proceeding?
A water board need not tolerate disruption of an adjudicative proceeding. The Administrative Procedure Act and State Water Board regulations provide that a water board may cite for contempt any person who defies a lawful order, refuses to take an oath, obstructs or interrupts a meeting by disorderly conduct or breach of the peace, violates the ex parte communication rules, or refuses to comply with a subpoena or similar order of a water board. No immediate action can be taken, but the matter may be referred to the local Superior Court for action, including sanctions and attorneys fees.

cc: [All via e-mail only]

Celeste Cantú, EXEC
Tom Howard, EXEC
Beth Jines, EXEC
All Division Deputy Directors
All Executive Officers
Regional Water Boards
All Assistant Executive Officers
Regional Water Boards, Branch Offices
All Office of Chief Counsel attorneys

SAN DIEGO REGIONAL
WATER QUALITY
CONTROL BOARD
2013 MAR 15 PM 3 55

City of San Diego

County of San Diego

March 15, 2013

Mr. David Gibson
California Regional Water Quality Control Board
San Diego Region 9
9174 Sky Park Court, Suite 100
San Diego, CA 92123

NOTICE OF PUBLIC HEARING – NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WATER DISCHARGE REQUIREMENTS FOR DISCHARGES OF URBAN RUNOFF FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4S) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

Dear Mr. Gibson:

On March 6, 2013 the San Diego Regional Water Quality Control Board (Regional Board) announced that hearings for the proposed Municipal Storm Water Permit for the San Diego Region would be held on April 10 and 11, 2013. The City of San Diego (City) and the County of San Diego (County) submitted lengthy written comments during the public comment period for the draft permit and is concerned that the hearings will be held without our respective jurisdictions being given an opportunity to review responses to their comments. Furthermore, we believe that it would be prudent to postpone any approval of the Municipal Storm Water Permit until the California State Water Resources Control Board provides guidance on the Receiving Waters Limitation language, which if not included in the initial approval of our regional permit, could necessitate that the Regional Board amend its regulations in the immediate future.

The City and the County appreciate the difficulties and challenges in implementing such complex regulatory matters as the Municipal Storm Water Permit, but as copermittees regulated by this permit, we are concerned that the Regional Board has decided to move this hearing forward without providing sufficient time to appropriately respond to and address stakeholders' concerns.

Locally and on a statewide level there continue to be numerous outstanding issues with this proposed permit. We believe it would be inappropriate and irresponsible to rush adoption

without continued dialog between the stakeholders and Regional Board staff. The City and County are committed to the goal of improving water quality through the storm water management programs that have been developed in conjunction with the Regional Board, but the current proposed permit include provisions that are flawed and need to be addressed.

Considering the significant financial burden this permit will have on so many local governments, we believe it is more important to create a permit that incorporates sound regulation than to needlessly rush toward an arbitrary deadline. The Regional Board staff has acknowledged on the record that the impacts of some of the proposed standards and regulations are not fully understood. We do not even know that compliance can be achieved with the tools and science available today. However, we do know for certain, based on the Regional Board's own studies, that significant cost in the range of billions of dollars will be incurred as a result of copermittees trying to comply with the proposed regulations if implemented.

As stewards entrusted with managing public tax dollars, we do not believe it is prudent to implement policy without having a clear understanding of whether it will mitigate the problem it was created to address. The City and the County believe it would be more productive to postpone any hearing in order to step back and continue working with all stakeholders to clearly define goals that are achievable and do not have such detrimental financial impacts to local governmental services.

Thank you for your consideration of this request. If the Regional Board does choose to move forward with holding the hearing in April, the City and County respectfully request to speak at the designated meeting to have the record reflect our respective positions on this matter. We would also respectfully request a time certain be allocated at the beginning of such hearing so that the City and County representatives can provide testimony.

If you have any questions, please contact Richard Crompton, County of San Diego Director of Public Works at (858) 694-2233 or Kip Sturdevan, City of San Diego Director of Transportation and Storm Water at (619) 236-6594.

Respectfully,

Hon. Bob Filner
Mayor
City of San Diego

Hon. Greg Cox
Chairman
San Diego County Board of Supervisors

From:	Wendy House
To:	Gibson, David@Waterboards
Cc:	Chiu, Wayne@Waterboards; jgriffin@san-marcos.net; MEdwards@san-marcos.net; mbabaki@san-marcos.net; ERyan@san-marcos.net; Helen Peak
Subject:	Public Hearing to Consider Tentative Order No. R9-2013-0001, NPDES No. CAS0109266
Date:	Friday, March 22, 2013 2:00:24 PM
Attachments:	City of San Marcos Ltr RE Public Hearing 03222013.pdf

Mr. Gibson:

Attached please find a letter from the City of San Marcos regarding the upcoming public hearing to consider Tentative Order No. R9-2013-0001, NPDES No. CAS0109266.

Please confirm that you received this email and the attachment. The original version will follow via U.S. mail. Thank you – Wendy

Wendy L. House
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22 March 2013

David W. Gibson, Executive Officer
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

RE: Public Hearing to Consider Tentative Order R9-2013-0001, NPDES No. CAS0109266

Dear Mr. Gibson:

I write to you in my capacity as City Attorney of the City of San Marcos ("City"). The purpose of this letter is to respond to the Notice of Public Hearing and subsequent Hearing Procedures and Order of Proceedings (collectively, the "Public Hearing Documents") issued by the California Regional Water Quality Control Board, San Diego Region ("Board"). The Public Hearing Documents relate to the Board's intent to conduct an informal public hearing ("Public Hearing") scheduled for April 10-11, 2013 to receive testimony and consider adoption of Tentative Order No. R9-2013-001, NPDES No. CAS0109266, *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds Within the San Diego Region.*

The City believes that the dates for the Public Hearing should be postponed, and hereby submits its request for such a postponement, as the currently-scheduled dates do not provide sufficient time to evaluate the revisions to the draft Regional Municipal Separate Storm Sewer System Storm Water NPDES Permit ("Permit"). The revised Permit has not yet been released, and it is our understanding that it is not expected to be available until March 27, 2013 at the earliest. Twelve days is not enough time to review and prepare a response to the Permit for the Public Hearing.

Additionally, the Public Hearing Documents state that the Public Hearing will be conducted in a "generally informal manner". However, because the revised Permit has not been issued, the City does not know at this time whether formal adjudicatory proceedings as set forth in the California Administrative Procedure Act, rather than an informal hearing process, would be necessary and/or appropriate. This letter serves as notice that the City reserves its right to object to the informal hearing process for the Public Hearing following its receipt and review of the revised Permit.

Lastly, the Public Hearing Documents state that municipal Co-permittees from San Diego, Orange and Riverside Counties are limited to three (3) hours total to address the Board during the Public Hearing. The Public Hearing Documents also provide that those participants requesting additional time to speak may submit their written requests to the Board. This letter also serves as a request by the City to seek additional time for City comments given the truncated time period specified for consolidated presentations by Co-permittees. If that time is not extended significantly, the City presently anticipates that it will need approximately forty-five (45) minutes to address the Board during the Public Hearing. If the Co-permittees' comment period is extended, we anticipate we will be able to coordinate our comments in a consolidated fashion with Co-permittees.

Thank you for your consideration of the foregoing issues raised by the City relating to the Public Hearing. Please do not hesitate to contact me if you have any questions.

Sincerely,

Wendy L. House

FOR: HELEN HOLMES PEAK
City Attorney

cc: Wayne Chiu, P.E., WRC Engineer, Regional Water Quality Control Board
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SAN DIEGO REGIONAL
WATER QUALITY
CONTROL BOARD
2013 MAR 22 PM 4 07

March 22, 2013

Wayne Chiu
WRC Engineer D
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Re: Public Hearing to Consider Adoption of Tentative Order R9-2013-0001
NPDES No. CAS01092662

Dear Mr. Chui:

Best Best & Krieger serves as city attorney for the cities of Lake Forest, Aliso Viejo and Santee, California (the "Cities"). This letter provides the Cities' formal objection to the "Hearing Procedures and Order of Proceedings" dated March 15, 2013 ("Proposed Hearing Procedures"), and their request for a formal hearing according to procedures set forth in California Government Code section 11500 et seq. and State Water Resources Control Board regulations.

The San Diego Regional Water Quality Control Board ("Regional Board") is planning to use the Proposed Hearing Procedures at the April 10 and 11, 2013, hearing during which the Regional Board will consider adoption of Tentative Order No. R9-2013-0001, NPDES No. CAS01092662, Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region ("Tentative Order").

The Cities object to the Proposed Hearing Procedures on the grounds that they violate applicable provisions of the California Government Code, the California Code of Regulations and the Code of Federal Regulations. Specifically, under California Government Code section 11513(b), during the hearing on the Tentative Order, the cities are entitled to:

- call and examine witnesses;
- introduce exhibits;
- cross-examine opposing witnesses on any matter relevant to the issues even though that matter was not covered in the direct examination;
- impeach any witness regardless of which party first called him or her to testify; and
- rebut the evidence presented by the Regional Board.

BEST BEST & KRIEGER LLP
ATTORNEYS AT LAW

The Cities hereby request the opportunity and sufficient time to conduct the introduction of evidence and cross-examination to which they are statutorily entitled. The Cities will need at least forty-five (45) minutes each to present evidence and cross-examine witnesses. The Cities additionally object to the order of proceedings set forth in the Proposed Hearing Procedures and request that their presentation of evidence follow the United States Environmental Protection Agency.

Lastly, the Cities object to the fact that they have yet to see the provisions of the Tentative Order as of today, twenty (20) days before the hearing. The Cities request that the Regional Board continue the proposed hearing dates a minimum of thirty (30) days to provide the Cities with an appropriate amount of time to review the Tentative Order and prepare for the hearing. If the Cities are given this additional time it is possible they will not need the forty-five (45) minutes for presentation of evidence and rebuttal requested herein.

Thank you for your attention to this matter. If you have any questions on the Cities position on the Tentative Order, and the matters discussed herein, please do not hesitate to contact us.

Very truly yours,

Shawn Hagerty
of BEST BEST & KRIEGER LLP

SXH:djg

cc: David W. Gibson, Executive Officer
Catherine Hagan, Esq., SWRCB Counsel

THOMAS E. MONTGOMERY
COUNTY COUNSEL

DEBORAH A. McCARTHY
ASSISTANT COUNTY COUNSEL

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March 22, 2013

David W. Gibson, Executive Officer
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, California 92123-4340

VIA HAND DELIVERY

Re: Public Hearing to Consider Adoption of Tentative Order R9-2013-0001
NPDES No. CAS01092662

Dear Mr. Gibson:

On behalf of the County of San Diego, we formally object to the "Hearing Procedures and Order of Proceedings" dated March 15, 2013 and received on March 18, 2013. We find this document does not comply with the provisions of the California Government Code, California Code of Regulations and the Code of Federal Regulations applicable to this NPDES Permit adoption proceeding. Specifically, we call to your attention the following:

1. **Proposed Limitation on Written Comments.** Your Board has issued a notice of public hearing on the permit adoption, certainly appropriate given the level of interest in this proceeding. However, in purporting to ban additional written comment, you would violate 40 C.F.R. § 124.12(c), which provides that, "The public comment period under §124.10 shall automatically be extended to the close of any public hearing under this section." This provision applies to state permit proceedings. Because we understand significant changes will be made to the prior draft permit as a result of public comment and testimony at your November workshop, a refusal to permit additional written comment for the record will violate procedural due process by not accepting written comment for the administrative record on those substantive permit changes.

2. **Proposed Ban on Raising New Issues at the Hearing.** Under well-established legal precedent, parties to an administrative proceeding must raise and address all issues for review by an administrative body or court in the proceeding, or risk being deemed to have waived those issues. It is very likely that the anticipated changes in the draft permit will present new issues for the County that must be addressed in this proceeding. Your purported ban on "new" issues could effectively deprive the County of its right (and obligation) to present objections to the provisions of the revised Tentative Order at the hearing. We believe this rule would also violate procedural due process rights and the above-cited C.F.R. provisions.

3. **Conducting an Informal Proceeding.** California Government Code § 11513(b) provides that parties shall have certain rights as specified therein. Those rights are not being provided in your planned hearing procedures and restrictions. The March 15, 2013 notice's stated procedures and limitations, and intention to proceed informally in what is clearly an adjudicative proceeding, appears to conflict with the provisions of Division 3 of Title 23 of the California Code of Regulations (see 23 C.C.R. § 648 et seq.).

Accordingly, on behalf of the County of San Diego, we respectfully request that this proceeding be conducted under formal hearing procedures. We make this timely request pursuant to 23 C.C.R. § 648.7 and Gov't Code §§ 11445.20 and 11445.30.

We respectfully submit that the "Order of Proceedings" time limitations are understated because of parties' rights to present witnesses, exhibits, and conduct cross-examination. Given the likelihood that a permit this controversial will be appealed or otherwise challenged, it is imperative that your procedures provide our client with its opportunity to confront witnesses and otherwise create a complete record, including any additional written comments it may have on the Tentative Order.

At this point in time, without having seen the Tentative Order, and assuming that the formal hearing request from the County will be granted, we respectfully request that the County of San Diego be allotted two hours for presentation of its witnesses, evidence and summary statements. This request may be modified by the County, dependent upon the Tentative Order provisions and whether or not the proceedings are continued to a later date to permit time for coordination of presentations among the parties.

If, however, the County's request for formal hearing procedures is not granted, and your Board still intends to proceed informally and with the limitations described, the County of San Diego still requests its own block of time of at least 30 minutes for its presentation under that format, in addition to participating with other co-permittees as already allotted.

We continue to object to the fact that our client has yet to see the provisions of the Tentative Order as of today, 19 days before a hearing on a lengthy, complex and controversial permit. Your staff has requested co-permittees to coordinate and consolidate presentations within the blocks of allotted time. That seems logical and desirable, but it is going to be impossible given the extremely short window you are creating to review and react to the Tentative Order, whenever it is issued.

We request that you revise your procedure and order of proceedings to comply with applicable provisions of law and regulation, as well as practical realities. Given the County's formal hearing request, and the need to better define the parameters of the adoption hearing procedures, the County requests that you postpone the April 10 and 11 dates in order to properly conduct the proceeding at least at the May meeting or some other later date. We suggest using the April 10 regular meeting to discuss hearing procedures with designated parties, and to try to reach a consensus on the conduct of the eventual hearing.

Thank you in advance for considering the above objections and request.

Very truly yours,

THOMAS E. MONTGOMERY, County Counsel

By James R. O'Day

James R. O'Day, Senior Deputy

JRO/tlm
12-00802

cc: Wayne Chiu, P.E., (via E-mail)
Catherine Hagan, Esq., SWRCB Counsel (via E-mail)

SAN DIEGO COUNTY
REGIONAL AIRPORT AUTHORITY

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March 22, 2013

Mr. Wayne Chiu, P.E.
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

RE: Public Hearing to Consider Adoption of Tentative Order R9-2013-0001 NPDES No. CAS01092662 ("Tentative Order")

Dear Mr. Chiu:

The undersigned represents the San Diego County Regional Airport Authority ("Authority") concerning the above-referenced matter. This letter constitutes: (1) the Authority's formal objection to the Hearing Procedures and Order of Proceedings ("Procedures") dated March 15, 2013, issued by the California Regional Water Quality Control Board, San Diego Region ("San Diego Water Board"); and (2) a formal request for an evidentiary hearing in accordance with Cal. Code Regs., Tit. 23 § 648, *et seq.*

The San Diego Water Board's Meeting Notice and Agenda sets the hearing on this matter for April 10 and 11, 2013. To date, however, the San Diego Water Board has not issued the revised Tentative Order that is the subject of that hearing. The Procedures further require participants to file any objections or requests for alternative procedures no later than 5:00 pm on March 22, 2013. The aggressive hearing schedule and proposed Procedures are antithetical to the most basic tenants of due process: adequate notice and an opportunity to be heard. They also run contrary to the spirit of collaboration, which has been the principle championed by the San Diego Water Board throughout this process. Without the benefit of knowing what revisions, if any, have been made to the Tentative Order, the Authority is compelled to preserve its due process rights.

1. <u>Banning Additional Substantive Comment Violates The Code of Federal Regulations.</u>

Under the heading "Scope of Hearing," the proposed Procedures purport to severely restrict the substantive content and format of additional comment on the

Tentative Order. Such restrictions are contrary to 40 C.F.R. § 124.12 (c), which states, in relevant part: "The public comment period under § 124.10 shall automatically be extended to the close of any public hearing under this section." Because the San Diego Water Board has yet to publish the revised Tentative Order, it is impossible for the Authority to know whether additional written or oral comment will be necessary at this time. Accordingly, to preserve its right to a complete administrative record in this matter, the Authority objects to these purported limitations.

2. The Authority requests a formal evidentiary hearing in accordance with Cal. Code Regs. Tit. 23 § 648, *et seq.*

The Procedures state that the San Diego Water Board intends to conduct this hearing in an "informal manner". The Authority respectfully submits that both the time and procedural limitations proposed are inappropriate for a Tentative Order of this magnitude and complexity. This matter is currently set for hearing in less than three weeks and the stakeholders have not yet been afforded an opportunity to review the Tentative Order. Without knowing what is contained in the Tentative Order, the Authority is compelled to preserve its right to, and hereby requests, a formal hearing on this matter conducted in accordance with Cal. Code Regs, Tit. 23 § 648, *et seq.*, and Cal. Govt. Code § 11513.

Because it does not know the contents of the revised Tentative Order at this time and will not have adequate time to coordinate the presentation of evidence with other co-permittees, the Authority respectfully requests a minimum of one (1) hour for the presentation of oral evidence, introduction of witnesses, cross examination of witnesses, rebuttal testimony and other rights afforded by Cal. Govt. Code § 11513.

The Authority requests the San Diego Water Board reconsider its decision to hold the hearing now scheduled to begin on April 10, 2013, and instead postpone it for a minimum of forty-five (45) days from the date of issuance of the revised Tentative Order. In that way, stakeholders will have an opportunity to review/analyze it, to coordinate the presentation of common concerns and to generally present comments and evidence in a more efficient way.

Sincerely,

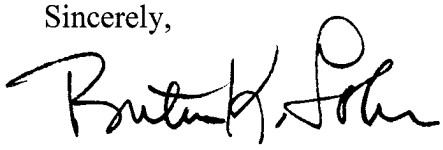

Breton K. Lobner
General Counsel

cc: David Gibson, Executive Officer
Catherine Hagan, SWRCB Counsel

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SAN DIEGO REGIONAL
WATER QUALITY
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March 22, 2013

Mr. David Gibson
California Regional Water Quality Control Board ~ San Diego Region 9
9174 Sky Park Court, Suite 100
San Diego, CA 92123

SUBJECT: Municipal Storm Water Permit

Dear Mr. Gibson:

The Vista Chamber of Commerce believes that it would be prudent to postpone any approval of the Municipal Storm Water Permit until the California State Water Resources Control Board provides direction on the Receiving Waters Limitation wording.

Locally and on a statewide level there continue to be numerous outstanding issues with this proposed permit. Our particular concerns involve the requirement to retain onsite almost all storm water runoff; the removal or modification of hydromodification management exemptions; the prohibition of discharges that "cause or contribute" to an exceedance of a water quality objective (based on a Basin Plan for the Region that is outdated); and others.

It is questionable as to whether these water quality objectives are even achievable. However, we do know for certain, based on the Regional Board's own studies, that significant cost in the range of billions of dollars will be incurred as a result of copermittees trying to comply with the proposed regulations if implemented. The provision creates strict liability for the Copermittees, subject to mandatory minimum penalties. As such, the Regional Water Board does not have discretion to ignore these violations. Moreover, because this permit is also an NPDES permit, these strict liability provisions are also enforceable by Citizen Suit.

The Vista Chamber believes it would be more productive to postpone any hearing in order to continue working with all stakeholders to define goals that are achievable and do not have detrimental financial impacts to local businesses and governmental services.

Sincerely,

Bret Schanzenbach
Chief Executive Officer

Chiu
008117

OCEANSIDE
CHAMBER OF
COMMERCE

SAN DIEGO REGIONAL
WATER QUALITY
CONTROL BOARD
2013 APR 3 PM 12 31

March 26, 2013

Mr. David Gibson
California Regional Water Quality Control Board
San Diego Region 9
9174 Sky Park Court, Ste. 100
San Diego, CA 92123

April 2013 Public Hearing - Municipal Storm Water Permit Proposed Changes

Dear Mr. Gibson:

Many public and private parties responded to the Board's draft permit late last year and early this year. We are concerned that there has been insufficient time for review of the Regional Board's responses to that input.

We are also concerned that the proposed new regulations will result in billions of dollars in new costs to copermittees, land owners and tax payers of the State of California. Another concern is that the proposed regulations have not had the benefit of a serious environmental review, so that the full impact of these changes is not known.

A task of this magnitude requires that we consider the best possible and most effective method of achieving the result of cleaner storm water. We feel that there are other more practical methods of treating storm water runoff that would address a larger portion of the hydrologic drainage basins at a lower cost to the taxpayer.

We realize that the task of improving storm water quality is a serious and complex challenge. Further dialogue between all of the stakeholders could result in area wide or community wide solutions that would be both practical and effective. For this reason, we urge the Board to postpone any hearing on the matter.

Sincerely,

David L. Nydegger
President and CEO
Oceanside Chamber of Commerce

928 North Coast Highway • Oceanside, California 92054
phone (760) 722-1534 • fax (760) 722-8336 • www.oceansidechamber.com

COUNTY OF ORANGE

BOARD OF SUPERVISORS

ROBERT E. THOMAS HALL OF ADMINISTRATION
10 CIVIC CENTER PLAZA
P. O. BOX 687
SANTA ANA, CA 92702-0687

March 26, 2013

David Gibson, Executive Officer
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4353

Subject: Notice of Public Hearing – National Pollutant Discharge Elimination System Permit and Waste Discharge Requirements for the Municipal Separate Storm Sewer Systems Draining the Watersheds within the San Diego Region

Dear Mr. Gibson:

In keeping with our staff's comments at your meeting of March 13, the County of Orange wishes to express its serious concerns about the approach your Board is taking for the adoption of the subject permit. Because the municipal stormwater permit has wide-reaching impacts on the County, the Orange County Flood Control District, and our constituents, it deserves careful and deliberate consideration by all parties.

The public hearing for adoption of the permit is scheduled for April 10 and 11, 2013. However, your Board has not yet released the revised permit or your staff's response to comments for review by permittees and public. In the interest of providing all parties sufficient time to prepare thoughtful comments and to ensure a meaningful public process, we respectfully request the hearing be postponed to allow a minimum 45-day public comment period once the upcoming draft and response to comments are posted.

We also take exception to your Board's moves to restrict public comments at this stage of the process. The ability of interested parties to submit written comments is a standard operating procedure for public agencies throughout the state and a key principle of good governance. Likewise, the ability to present both oral and written comments pertinent to the item under consideration without restrictions on the content is standard operating procedure for all public agencies.

It is our hope that the San Diego Regional Board will consider both the letter of the law and the spirit of the law with respect to due process in this important regulatory action.

We seek to have a fully open, transparent, and participatory public process but require revised procedures and scheduled for the upcoming permit adoption.

Respectfully,

Shawn Nelson
Chairman of the Board
Fourth District Supervisor

Patricia C. Bates
Vice-Chairman of the Board
Fifth District Supervisor

From: lyris@swrcb18.waterboards.ca.gov
To: Chiu, Wayne@Waterboards
Subject: San Diego Water Board Counsel Memorandum Regarding Designated Party Status during the April 10 and 11, 2013 Public Hearing on Tentative Order R9-2013-0001
Date: Wednesday, March 27, 2013 5:40:45 PM
Attachments: 032713memo.pdf

This is a message from the California Regional Water Quality Control Board, San Diego Region (9).

Regional MS4 Copermittees and Interested Stakeholders,

Please see the attached San Diego Water Board Counsel Memorandum dated March 27, 2013, regarding requests for designated party status during the April 10 and 11, 2013 Public Hearing on Tentative Order R9-2013-0001, NPDES No. CAS0109266, *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges of Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region.*

Laurie Walsh, PE
lwalsh@waterboards.ca.gov
Water Resource Control Engineer
San Diego Regional Water Quality Control Board
Tel. 858-467-2970

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD
www.waterboards.ca.gov/sandiego/

You are currently subscribed to reg9_sandiegoco_ms4permit as: wchiu@waterboards.ca.gov.

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CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

TO: Parties and Interested Persons, Tentative Order No. R9-2013-0001, Via Lyris List

FROM: Catherine George Hagan, Senior Staff Counsel

DATE: March 27, 2013

SUBJECT: **Requests for Designated Party Status**

The San Diego Water Board received numerous requests for alternate procedures and objections to the March 15, 2013, "Hearing Procedures and Order of Proceedings." The San Diego Water Board is currently considering the requests, including the requests for additional time to make presentations at the upcoming hearing.

Participants in this proceeding are identified as either "designated parties" or "interested persons." It is not necessary to be designated as a party in order to participate in the hearing for this proceeding. Both interested persons and designated parties will have the opportunity to present oral comments, to make arguments about the appropriateness, wisdom or utility of all or portions of the Tentative Order, and to comment on revisions to the Tentative Order. Both interested persons and designated parties may be asked to respond to clarifying questions from the San Diego Water Board, staff, or others, at the discretion of the San Diego Water Board. However, interested persons may not present evidence and are not subject to cross-examination. An interested person may request more time to speak than is typically allotted to interested persons and such requests may be granted at the Chair's discretion.

San Diego County, Riverside County and Orange County Copermittees are already designated as parties in this proceeding under the applicable State Water Resources Control Board's regulations set forth in California Code of Regulations, title 23, article 2, section 648, et seq. (See Cal. Code Regs., *tit.* 23, § 648.1(a).) The San Diego Water Board has discretion to determine who, in addition to the Copermittees, should be designated as a party for purposes of this proceeding. Factors the San Diego Water Board considers when deciding whom to designate include a person's history of involvement in the proceeding, how a person (or an entity's members) may be affected by the outcome of the proceeding, and/or to what extent a person's interests are different from or are not adequately represented by the interests of other designated parties.[1] Determinations are based on the extent to

[1] The San Diego Water Board staff is not a party to the proceeding. This is a proceeding to consider adoption of a permit, which does not involve investigative, prosecutorial or advocacy functions. Staff's proposals, recommendations and participation in this proceeding are for the purpose of advising and assisting the San Diego Water Board in considering the Tentative Order.

which participation as a designated party will further the development of the issues before the San Diego Water Board.

In light of the requests for additional procedures received on March 22, 2013, persons (other than the Copermittees) who wish to be designated as a party to the proceeding for the purposes of presenting evidence and participating in cross-examination must inform the Board, in writing, of their request and the reasons supporting their request not later than **10 a.m. on April 2, 2013**. Requests must be received by 10:00 a.m. and may be submitted electronically to Wayne Chiu, wchiu@waterboards.ca.gov and to Catherine George Hagan, Catherine.hagan@waterboards.ca.gov.

The San Diego Water Board will resolve the March 22, 2013, objections and requests for alternate procedures, as well as any requests for designated party status, promptly after receipt of designated party status requests.

Brownstein Hyatt
Farber Schreck

April 1, 2013

Lisabeth D. Rothman
Attorney at Law
310.500.4616 tel
310.500.4602 fax
LRothman@bhfs.com

VIA ELECTRONIC MAIL
wchiu@waterboards.ca.gov
Catherine.hagan@waterboards.ca.gov

Wayne Chiu, P.E., Water Resource Control Engineer
Catherine George Hagan, Senior Staff Counsel
California Regional Water Quality
Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4353

RE: Revised Tentative Order R9-2013-0001 Published March 26, 2013

Dear Mr. Chiu and Ms. Hagan:

This firm represents members of the Coalition that have participated in the process of the San Diego Regional Water Quality Control Board, Region 9's (RWQCB) development of Revised Tentative Order R9-2013-0001, published March 26, 2013. The Coalition consists of the following trade and professional associations, known as the regulated community: Building Industry Association of San Diego County (BIASD), Business Leadership Alliance (BLA), Associated General Contractors, San Diego (AGC), NAIOP (National Association of Industrial & Office Properties), Associated Builders & Contractors (ABC), the San Diego Regional Chamber of Commerce (SDRRC), the San Diego Association of Realtors® (SDAR), the Alliance for Habitat Conservation, the Building Owners & Managers Association (BOMA), and the San Diego Chapter of the American Society of Landscape Architects. The Coalition respectfully requests that the RWQCB provide additional time to review, consider, and comment upon Revised Tentative Order R9-2013-0001, and postpone the hearing on the Revised Tentative Order currently scheduled for April 10 and 11, 2013.

The Coalition experts and counsel have spent hundreds of hours reviewing and commenting on previous drafts of the permit. The Coalition became aware that the most current version of the permit, consisting of approximately 338 pages, was available for review March 27, 2013, at approximately 4:30 PM. Almost every substantive provision in the draft permit has been substantially revised. Concurrent with the release of this new draft permit, the RWQCB staff released 272 pages of responses to comments dealing with the staff's rationale for revising or not revising almost every substantive portion of the permit. The comment period on the previous draft of the permit closed on January 11, 2013. Thus, at least four RWQCB full-time staff have dedicated the last 69 days to review the comments and consider changes to the permit while the public and RWQCB board members working on a volunteer basis have been allotted just six business days to review over 600 pages of materials and analyze the potential effects of those changes. The Coalition strongly recommends that the RWQCB postpone the public hearing on the draft permit for at least 60 days to allow sufficient time for board members, affected parties, and the public to review and consider the major changes to water quality strategies and regulation envisioned in this permit, and provide comments to the

RWQCB. This is without doubt a situation that requires a comment period extension. *See* 40 C.F.R. §124.14(a)(4), (b).

Section 124.14(b) of Title 40 of the Code of Federal Regulations, prescribing decision-making procedures for NPDES permits, provides that, if any data information or arguments submitted during the public comment period appear to raise substantial new questions concerning a permit, the permit writer may prepare a new draft permit, appropriately modified, or may prepare a revised fact sheet and reopen the comment period on the same. With the substantial revisions to the draft permit and changes to the Fact Sheet, this provision requires reopening the comment period. *See also* 40 C.F.R. §124.10 (requiring notice and at least 30 days for public comment for a draft permit). Water Code section 13167.5 requires that the Regional Water Quality Control Boards provide notice and a period of at least 30 days for public comment prior to the adoption of waste discharge requirements. When a Regional Water Quality Control Board modifies a Water Quality Control Plan, it must comply with the California Administrative Procedure Act, including its notice and recirculation requirements. *State Water Resources Control Board v. Office of Administrative Law* (1993) 12 Cal.App.4th 697. As described above, the RWQCB's release of its modified permit, along with over 200 pages of response to comments regarding the proposed changes, should be considered, in effect, the preparation of a modified draft permit and revised fact sheet, with fewer than two working weeks to review these revisions prior to the meetings at which the RWQCB will consider the Revised Tentative Order for adoption. Under the authority cited above, the release of this modified permit must be accompanied by a corresponding additional comment period on the significantly revised draft Order.

Thank you for considering the Coalition's request. Please let us know at your earliest convenience whether you will allow additional written comments on the revised draft permit, when the deadline for submission of such comments will be, and whether you will postpone a final hearing on adoption of the permit.

Sincerely,

Lisabeth D. Rothman MD

LDR:mld
030009\0112\53843.1

April 1, 2013

Via electronic mail

Mr. David Gibson
Executive Officer and Members of the Board
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123
Email: wchiu@waterboards.ca.gov

Re: Request of NRDC, San Diego Coastkeeper, and Orange County Coastkeeper/Inland Empire Waterkeeper for Party Status and Request for San Diego Regional Board to Delay Hearing on the San Diego Regional MS4 Permit and Reissue the Permit for Public Comment.

Dear Mr. Gibson:

On behalf of the Natural Resources Defense Council ("NRDC"), the San Diego Coastkeeper ("SDCK"), and the Orange County Coastkeeper ("OCCK")/Inland Empire Waterkeeper ("IEWK"), we are writing with regard to the San Diego Regional Water Quality Control Board ("Regional Board") Hearing on the Tentative National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds Within the San Diego Region, Tentative Order No. R9-2013-0001, NPDES Permit No. CAS0109266 ("Tentative Order"), scheduled for April 10-11, 2013 ("Permit Hearing").

I. NRDC, SDCK, and OCCK Request Party Status for the Permit Hearing

Pursuant to Public Notice issued by the Regional Board on March 27, 2013 for the April 10-11, 2013 hearing on the Tentative Order, the NRDC, SDCK, and OCCK/IEWK (collectively, "Environmental Groups") each hereby request party status. Environmental Groups have been deeply involved with the permit process for the draft Tentative Order and have been among the most active public interest organizations in the stormwater and urban runoff field in southern California, particularly in San Diego, Orange, and Riverside Counties, investing an enormous effort over many years to reduce water quality degradation related to stormwater runoff.

A. NRDC, SDCK, and OCCK/IEWK Have Direct and Substantial Interests in This Proceeding that Justify Their Designation as Parties

First, Environmental Groups represent members who recreate in the waters to which the Tentative Order regulates discharges of stormwater runoff. The groups' members are impacted by pollution in stormwater runoff and its resulting health impacts, and by beach closures which restrict the ability of residents and visitors in San Diego, Orange, and Riverside Counties to use the beach and other local waters for recreation and other purposes.

Second, Environmental Groups submitted extensive written comments and expert analysis on the Tentative Order on January 11, 2013. NRDC and SDCK additionally submitted written comments on prior staff working proposals for the permit on September 14, 2012. Environmental Groups also presented testimony at the Regional Board Meeting on the draft Tentative Order on November 13, 2012, and SDCK and OCCK/IEWK participated in the Regional Board meeting on the Tentative Order on December 12, 2012, and in stakeholder discussions convened by Regional Board staff on the Tentative Order on July 11, July 25, and August 22, 2012. SDCK participated in additional stakeholder discussions on June 27 and October 24, 2012. Each of our organizations have also met with other stakeholders, representatives of the building industry, permittees, elected officials, and Regional Board staff to discuss draft permit terms on numerous additional occasions in 2012 and 2013. We have worked throughout the drafting process to ensure the adopted Order will meet the requirements of federal and state law, and achieve relevant requirements for water quality in San Diego, Orange, and Riverside Counties.

Third, Environmental Groups have a long history of working to adopt, strengthen and enforce prior MS4 permits for San Diego, Orange, and Riverside Counties, the TMDLs these permits implement, and the water quality standards that they are designed to achieve. For example, SDCK and NRDC successfully intervened in a lawsuit filed by the Building Industry Association of San Diego County against the Regional Board challenging the 2001 San Diego County MS4 permit, including the permit's application of water quality standards to stormwater. (See, *Building Industry Association of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866.) The California Appellate Court rejected the Building Industry's arguments and found that the Permit's restrictions on pollutant discharges were lawful. (*Id.*)

NRDC and SDCK were both active in Regional Board proceedings regarding the 2007 San Diego MS4 Permit and subsequent adoption process for the San Diego Countywide SUSMP, attending stakeholder meetings, submitting written comments and expert reports, and presenting testimony at Regional Board hearings.[1] NRDC additionally

[1] See, e.g., NRDC and SDCK letters to Regional Board on Nov. 7, 2008 letter to San Diego County, and Feb. 23, 2009 letter to Regional Board re: Countywide SUSMP.

petitioned the adoption of the 2007 San Diego MS4 Permit before the State Board in 2007, though voluntarily dismissed the petition in 2010.

NRDC participated in proceedings before the Regional Board for the adoption of the 2009 Orange County MS4 Permit for Region 9, including submitting comments, participating in stakeholder meetings convened by the Regional Board, and presenting testimony at Board hearings on the Permit.[2] NRDC also submitted written comments on the 2010 Permit for Riverside County within Region 9.[3] OCCK/IEWK have additionally brought approximately 40 third-party civil actions in federal court in the surrounding region over the past decade, focused on improving water quality and enforcement of the federal Clean Water Act. Our organizations have substantial interest in the quality of the region's waters generally, and in this proceeding specifically.

B. Without Party Status, the Action of the Board May Impair Environmental Groups' Ability to Protect Their Interests

The disposition of this action may impair or impede Environmental Groups' ability to protect their interests in several ways. Most notably, Environmental Groups members recreate in the waters the Tentative Order regulates discharges of stormwater discharges for. As detailed above, Environmental Groups have a long history of working to adopt and strengthen the same stormwater permits now proposed for coverage under the Tentative Order, as well as the Tentative Order itself, both in the administrative arena before this Board and as a party in other actions. In the event we are denied party status, and additional substantive changes to the Tentative Order are made at the hearing that contravene the interests of Environmental Groups, or in the event that provisions in the Order which fail to meet the requirements of state or federal law are not corrected at the Permit Hearing, our participation to this point will have been rendered a meaningless exercise. This action's disposition may further directly affect Environmental Groups' ability to protect their interests as they relate to further administrative proceedings concerning the implementation of the Tentative Order or TMDLs incorporated within it, or our interests related to any potential action challenging the Tentative Order before the State Board or in Superior Court.

Clean Water Act regulations explicitly require that agencies shall "provide for, encourage, and assist the participation of the public" and use "all feasible means to create opportunities for public participation, and to stimulate and support public participation." (40 C.F.R. §§ 25.3(a), (c)(7).) Given Environmental Groups' clear past and present

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[2] See, e.g., NRDC letters to Regional Board on Aug. 22, 2007, May 15, 2009, June 19, 2009, Sept. 28, 2009, and Dec. 12, 2009, regarding the draft MS4 Permit for South Orange County.

[3] See NRDC letter to Regional Board on August 13, 2010 re: draft MS4 Permit for Riverside County.

interests in the adoption and enforcement of the Tentative Order, the Regional Board should grant our request for Party Status.

C. Environmental Groups' Interests Are Not Adequately Represented by the Existing Parties to this Hearing

The current parties to these permit proceedings are municipal and county entities that will be regulated under the Tentative Order and ultimately responsible for implementing the requirements it imposes. Conversely, Environmental Groups are nonprofit organizations focused on protecting San Diego, Orange, and Riverside Counties' aquatic resources and its inland waterway users and beachgoers. Environmental Groups have throughout the Tentative Order drafting process presented, and undoubtedly will at the hearing present, arguments that are in opposition to positions taken by the existing parties and will add necessary elements to the hearing that the existing parties will likely neglect. These include full discussion of the impacts and costs of failing to adequately reduce pollution in stormwater runoff; providing discussion of federal and state legal requirements that mandate many of the terms contained in the Tentative Order, including the Order's Receiving Water Limitations ("RWLs"), TMDL, and Low Impact Development Requirements; discussion of the federal process for adoption of the permit and that this process cannot be undercut by state law; and presentation of case studies, scientific research, and other documentation demonstrating the feasibility of terms in the Tentative Order or of additional provisions that are currently lacking in the Tentative Order. As no existing or other party will adequately represent the Environmental Groups and their unique interests, they are properly given party status here.

Environmental Groups are regular, consistent participants in water quality matters large and small before the Regional Board, State Board, as well as in litigation related to water quality issues, including directly involving the MS4 permit for San Diego County. We have been deeply involved with the adoption process for the draft Tentative Order for nearly a year. As such, we each request designation as a party to the proceeding.

II. <u>Environmental Groups Request 50 minutes for Presentation and Hearing Practice</u>

Environmental Groups request that the Regional Board allocate to them a total of fifty (50) minutes of time for presentation, cross examination, and rebuttal as necessary. This time would be divided roughly as follows: Presentation (35 minutes); Cross-Examination of Staff/Witnesses/Other Parties (as needed, 10 minutes) and time for rebuttal or remaining hearing practice (5 minutes). This amount of time is necessary to ensure a proper vetting of the issues and complexities raised by the Tentative Order and comments submitted by permittees.

III. Environmental Groups Request that the Regional Board Designate a Time or Date Certain for Public Comment at the Permit Hearing

Environmental Groups appreciate the Regional Board's past effort to establish a date certain for their presentation at the Permit Hearing. However, in light of the potential changes to the hearing procedure signaled by the Regional Board in its March 27, 2013 letter, and in order to accommodate the travel and lodging needs of representatives of the Environmental Groups, we respectfully request that, to the extent possible, the Regional Board confirm the date certain no later than Friday, April 5, 2013.

IV. Designated Contact for Receipt of Notices About this Proceeding

Communications related to this proceeding or to the Environmental Groups' request for Party Status may be directed to:

Noah Garrison
Natural Resources Defense Counsel
1314 Second Street
Santa Monica, CA 90405
Tel: 310-434-2300 / Email: ngarrison@nrdc.org

Jill Witkowski
San Diego Coastkeeper
2825 Dewey Rd., Suite 200
San Diego, CA 92106
Tel: 619-758-7743 / Email: jill@sdcoastkeeper.org

Colin Kelly
Orange County Coastkeeper/Inland Empire Waterkeeper
3151 Airway Ave, Suite F-110
Coast Mesa, CA 92626
Tel: 714-850-1965 / Email: colin@coastkeeper.org

V. Environmental Groups Object to the Potential Adoption of the Tentative Order at the Permit Hearing, and Request that the Regional Board Reissue the Tentative Order for Public Comment.

On March 27, 2013, the Regional Board released a revised draft Tentative Order that contained sweeping, substantive changes from the previously issued draft released for public comment on October 31, 2012. Courts have found that where a "final rule deviates too sharply from the proposal," interested or "affected parties will have been deprived of notice and an opportunity to respond to the rule." (*Natural Resources Defense Council, Inc. v. U.S.EPA.* (9th Cir. 1988) 863 F.2d 1420, 1429.) Such a situation is presented here. In particular, changes to the Tentative Order's Water Quality

Improvement Plan requirements under section II.B., including a "safe harbor" provision under section II.B.3.c., which renders the permit's overarching receiving water limitation's prohibition against discharges that "cause or contribute to the violation of water quality standards in any receiving waters" inoperative in certain circumstances, represent a significant change from the prior version of the Tentative Order.

The potential repercussions of this new language, which involve complex, technical matters that entirely alter the overall framework for enforcement of the Tentative Order, cannot be properly evaluated or responded to in the short time frame remaining prior to the currently specified Permit Hearing dates of April 10-11. Should the Regional Board elect to proceed with adoption of the Tentative Order on April 10-11, Environmental Groups, as well as other affected parties will be deprived of proper opportunity to respond to the proposed permit provisions. As a result, we respectfully request that the Regional Board delay the proceeding, and reissue the permit for additional public comment.

VI. Conclusion

Environmental Groups request party status to the April 10-11 Hearing on the Tentative Order. However, Environmental Groups also request that the Regional Board delay this proceeding, and reissue the Tentative Order for further public comment. Environmental Groups further reserve our right to raise objections on procedural or other grounds that may arise during, or prior to, the Permit Hearing. Thank you for your attention to this matter, and please do not hesitate to contact us with any questions you might have.

Sincerely,

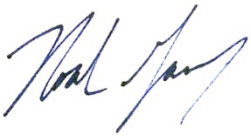

Noah Garrison
Project Attorney
Natural Resources Defense Council

/s/
Jill Witkowski
Waterkeeper
San Diego Coastkeeper

/s/
Colin Kelly
Staff Attorney
Orange County Coastkeeper
Inland Empire Waterkeeper

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Scott Hermes
Sheraton San Diego Hotel & Marina
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Dole Fresh Fruit Co.
Jennifer Klein
BNSF Railway
Eric Leslie
Harbor Island West Marina
Giovanni LoCoco
Knight & Carver
Russell McCarthy
Continental Maritime
Mac McLaughlin
USS Midway Museum
Jack Monger
Industrial Environmental Association
Reyna Novelo
Chesapeake Fish Company
Steve Pagano
San Diego Marriott Marquis & Marina
* **George Palermo**
Flagship Cruises & Events
John Pasha
Pasha Automotive Services
* **Edward Plant**
Harborside Refrigerated Services
* **H.P. "Sandy" Purdon**
Shelter Cove Marina
Bill Roberts
Shelter Island Boatyard
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Claudia Valenzuela
SDG&E
Bruce Walton
Terramar Retail Centers
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Staff
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President
Sophie Silvestri
Director of Operations

* **SDPTA Past Chairmen**

008131

SAN DIEGO REGIONAL
WATER QUALITY
CONTROL BOARD

San Diego Port Tenants Association

2013 APR 11 PM 2 08

April 9, 2013

Mr. David Gibson, Executive Director
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA92123

Dear Mr. Gibson:

Subject: Request for delay in adoption of MS4 Stormwater Permit to allow for more dialog and understanding among stakeholders

On March 6, 2013 the San Diego Regional Water Quality Control Board (Regional Board) announced that hearings for the proposed Municipal Storm Water Permit for the San Diego Region would be held on April 10 and 11, 2013. The San Diego Port Tenants Association is particularly concerned with this permit, as the association represents businesses that lease land from the San Diego Unified Port District; their operations are on Port Tidelands surrounding San Diego Bay, and range from hospitality & tourism to maritime, marine industrial and marine recreation. We strongly believe that it would be prudent to postpone any approval of the Municipal Storm Water Permit until the California State Water Resources Control Board provides guidance on the Receiving Waters Limitation language, which if not included in the initial approval of this regional permit, could necessitate that the Regional Board amend its regulations in the immediate future. Secondly, we are concerned that the Regional Board has decided to move this hearing forward without providing sufficient time to appropriately respond to and address stakeholders' concerns. The Port Tenants wish for more time to fully understand this permit as it relates to their business operations, future development, sustainable practices and liability. Locally, and on a statewide level, there continue to be numerous outstanding issues with this proposed permit. We believe it would be inappropriate and irresponsible to rush adoption without continued dialog between the stakeholders and Regional Board staff. Considering the significant financial burden this permit will have on so many local governments, we believe it is more important to create a permit that incorporates sound regulation than to needlessly rush toward an arbitrary deadline.

The Regional Board staff has acknowledged on the record that the impacts of some of the proposed standards and regulations are not fully understood. We do not even know that compliance can be achieved with the tools and science available today. However, we do know for certain, based on the Regional Board's own studies, that significant cost in the range of billions of dollars will be incurred as a result of copermittees trying to comply with the proposed regulations if implemented.

Respectfully,

Sharon Bernie-Cloward

Sharon Bernie-Cloward, President
San Diego Port Tenants Association

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Water Boards

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California Regional Water Quality Control Board, San Diego Region

TO: Parties and Interested Persons, Tentative Order No. R9-2013-0001, Via Lyris List

FROM: Tomas Morales, Chair
SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD

DATE: April 3, 2013

SUBJECT: Ruling on Objections, Requests for Alternative Procedures, and Requests for Designation as Additional Parties to the Proceeding

The San Diego Water Board received numerous objections and/or requests for alternative procedures from many Copermittees as well as from Natural Resources Defense Council, San Diego Coastkeeper, Orange County Coastkeeper, Inland Empire Waterkeeper and Clean Water Now.[1] The objections and requests for alternative procedures are addressed below. In addition, the San Diego Water Board received two sets of requests from entities seeking party status in this proceeding. As explained below, the requests for party status are granted. Finally, the San Diego Water Board has prepared a revised Hearing Procedures and Order of Proceedings to reflect modifications to the procedures for the upcoming hearing based upon requests from the parties. The Revised Hearing Procedures and Order of Proceedings document is attached.

OBJECTIONS TO HEARING PROCEDURES AND ORDER OF PROCEEDINGS AND REQUESTS FOR ALTERNATIVE PROCEDURES

The objections to the hearing procedures and requests for alternate process can generally be grouped into five categories.

1. Requests to Postpone the April 10/11 Hearing/Requests for Additional Written Comment Period and Opportunity to Introduce New Issues and Evidence

The revisions to the Tentative Order do not rise to the level of significance that require a new notice and comment period and therefore do not warrant postponement of the hearing. The revisions were made in response to written and oral comments received by the Board and concern matters that the Parties and interested persons knew to be at issue. Both state and federal law require a notice and comment

[1] The San Diego Water Board received late objections from the Orange County Board of Supervisors (March 26, 2013) and a Coalition of trade and industry organizations including Building Industry Association of San Diego County and others (April 1, 2013). These late comments are not accepted into the record, however neither comment letter raises novel objections and this ruling addresses the issues raised therein.

period prior to the adoption of an NPDES permit. California Water Code section 13167.5 prescribes a notice and public comment period of at least thirty days prior to the adoption of waste discharge requirements, including NPDES permits. The section explicitly states, however, that it does not require the regional board "to provide more than one notice or more than one public comment period prior to the adoption of waste discharge requirements . . . ." State law therefore does not require a new notice and comment period.

Federal regulations promulgated pursuant to the Clean Water Act also require a thirty day public comment period on draft NPDES permits. As stated in section 124.10(b) of title 40 of the Code of Federal Regulations (40 C.F.R.), "public notice of the preparation of a draft permit shall allow at least 30 days for public comment." Nowhere do the regulations suggest that revisions to a draft permit, however significant, require an additional public comment period. In fact, 40 C.F.R. section 124.14(b) grants discretion to the EPA Regional Administrator to either "reopen or extend the comment period," "prepare a new draft permit, appropriately modified," or both – "if any data, information, or arguments submitted during the public comment period . . . appear to raise substantial new questions concerning a permit." Although not directly controlling on the States' authority, section 124.14 illustrates that the decision to reopen the comment period is discretionary, even if the comments raise substantial new questions concerning the permit.

Though the comments may trigger permit drafters to modify the permit, as was the case here, a new comment period is permissible but not required. (*See, e.g., In re Dominion Energy Brayton Point, L.L.C.* (Feb. 1, 2006, NPDES Appeal 03-12, 2006 WL 3361084.) In the context of administrative rulemaking, revisions to a proposed rule only require a new comment period if the modifications are not the "logical outgrowth" of the rule as it was initially proposed. (*NRDC v. USEPA* (9th Cir. 2002) 279 F.3d 1180, 1186-1188.) Even a substantial variation does not necessitate a new comment period so long as the final regulation is "in character with the original proposal." (*Id.,* quoting *Hodge v. Dalton* (9th Cir. 1997) 107 F.3d 705, 712.) Analagously, in the context of a permit proceeding, a new comment period is only required if the revised permit is essentially a new draft permit because the revisions are not the "logical outgrowth of" or "in character with" the permit as initially proposed. Here, the revisions to the Tentative Order are the direct consequence of the written and oral comments received during the written comment period and the two board workshops held in November and December 2012. As reflected by the tracked changes, the revisions to the Tentative Order address particular comments and do not fundamentally alter the character of the Tentative Order.

The purpose of the notice and comment requirements is not to lead to the circular result that agency proceedings are subject to a new round of written comments with every substantive revision. This scenario would result in an endless loop of comments and revisions. Rather, the public has a one-time right to comment on the issues raised by the Tentative Order. One of the purposes of the comment period is to provide the agency with additional information upon which it may choose to revise the draft language. Where the character and issues raised by the tentative permit remain substantially the same, however, and as is true here, there is no additional right to comment on those revisions. (*See Rybachek v. USEPA* (9th Cir. 1990) 904 F.2d 1276, 1286.)

Some parties assert that the Board is obligated to extend the public comment period to the close of the public hearing in this matter, citing 40 C.F.R., section 124.12(c). Reliance on section 124.12, subsection (c) is misplaced as it is inapplicable to the San Diego Water Board. (See 40 C.F.R. § 123.25.) Nonetheless, the parties and interested persons will have an opportunity to comment on the revisions to the Tentative Order at the hearing. At that time, commenters will have an opportunity to orally address the Board with concerns or other comments regarding the revisions. The parties are on notice that the Board is not obligated to and will not allow the introduction of new issues that do not concern the revisions to the Tentative Order.

Because a new written comment period is unnecessary, the San Diego Water Board will not postpone the hearing scheduled for April 10 and 11. The San Diego Water Board provided more than 70 days to review and submit written comments on the Tentative Order. Federal regulations only require that the Board provide at least 30 days for public comment. Accordingly, Parties and interested persons were provided with more time than the federal law requires. The Board has made extraordinary efforts to make the Tentative Order development process open, transparent, and inclusive. The permit development process began almost two years ago. Since that time, the Board has provided countless opportunities for Copermittees and stakeholders to raise concerns, ask questions, and engage in dialogue with Board staff regarding permit provisions. There were numerous facilitated staff-level stakeholder workshops. As a result, the draft Tentative Order was revised to address many of the concerns raised by Parties during meetings. The Tentative Order that was released on October 31, 2012 reflected these changes. Recent revisions to the Tentative Order are based upon oral comments at two public board-level workshops in November and December 2012 and on extensive written public comment received in January 2013.

While not specifically raised in written objections, neither applicable regulations nor due process require the Board to provide more time for parties and interested persons to review and respond to responses to comments prepared by San Diego Water Board staff. Federal regulations at 40 C.F.R. section 124.17 address responding to comments. 40 C.F.R. section 124.17(a) specifies that the response to comments must be issued when a final permit is issued and the "response shall: (1) Specify which provisions, if any, of the draft permit have been changed in the final permit decision, and the reasons for the change; and (2) Briefly describe and respond to all significant comments on the draft permit . . . raised during the public comment period, or during any hearing. Section 124.17(c) requires that the response to comments "shall be available to the public." Nowhere do the regulations require that the Board's response to comments be provided in advance with opportunity to review and comment. As required by applicable regulations, the San Diego Water Board has prepared and made available to the public a response to significant comments on the draft permit received during the written comment period. Staff will respond orally to significant comments raised during the hearing.

2. Objection to Informal Process and Requests for Additional Process Including Cross-Examination, Rebuttal Testimony and Introduction of Exhibits

Many of the Copermittees object to the San Diego Water Board's proposed use of the streamlined or generally "informal" process the Board ordinarily uses for adjudicative proceedings at which it considers adoption of permits (as opposed to prosecutorial proceedings such as those imposing administrative civil liability). One group of Copermittees requests that the Board invoke the processes in Chapter 5 of the Administrative Procedures Act.[2] In general, the Copermittees request the procedures that are enumerated under section 11513 of the Government Code, which is incorporated by reference in the applicable State Water Board regulations governing adjudicative proceedings (commencing with section 648 of title 23 of the California Code of Regulations). The Parties object to procedures for this hearing that do not specifically allow for parties to make opening or closing statements, present witnesses, submit exhibits, conduct cross-examination and provide rebuttal testimony.

After considering the specific requests, the Board will allow parties to use their allocated presentation times to complete their main presentation, opening or closing statements, introduce exhibits, present witnesses, present rebuttal testimony, and conduct cross-examination of other Parties. Questions from

[2] Other than section 11513, Chapter 5 of the Administrative Procedures Act (Gov. Code section 11500 et seq.) is inapplicable to San Diego Water Board proceedings. See Cal. Code Regs., *tit.* 23, § 648(c).

the Board and the time to answer them will not be charged against the Parties' time. If groups of designated parties sharing time wish to conduct cross-examination, they shall appoint a single person to do cross examination so the Board does not have multiple individual attorneys lined up to ask one or a handful of questions each. Additionally, Parties are reminded that direct testimony by party witnesses, if any, should be in narrative form to expedite the hearing process. Since the written comment period already closed, parties are also reminded that they may use exhibits as long as they are graphic depictions of evidence already in the record and are not a vehicle for seeking to introduce new evidence.

3. Requests for More Time to Make Presentations and for Individual Copermittee Time Allocations

Many of the Copermittees requested that they be allocated individual blocks of time in which to make their presentations asserting that coordination with other parties was not possible because, at the time objections and requests for alternate procedures were due, the revised Tentative Order and response to comments had not been released. In light of the extensive opportunities for participation in the development of this Tentative Order and the limited scope of revisions to the Tentative Order (responding directly to stakeholder comments), it is not necessary to allocate additional time to the Parties. Nonetheless, the Board has considered the requests and number of Parties to this proceeding and will increase the previous allocations of time to Parties and some interested persons. The Hearing Procedures and Order of Proceedings will be revised to reflect that Copermittees will have four hours instead of three in which to coordinate their presentations, the Coalition of trade and industry groups (see Ruling on Designated Party Requests, below) will have 1.5 hours in which to make its presentation and the Environmental Group consisting of NRDC, San Diego Coastkeeper, Orange County Coastkeeper and Inland Empire Waterkeeper will have one hour in which to complete its presentation. Clean Water Now, although not a designated party, will have its requested six minutes in which to make its presentation and may comment prior to the coordinated Environmental Group.

4. Objections to Order of Proceedings/Presentations and Request for Greater Accommodation for Elected Officials

Several Parties requested that the United States Environmental Protection Agency speak in the order of presentations immediately after Board staff. This request is reasonable and will be granted. One Party requested that the Board follow the order of proceedings set forth in section 648.5 of title 23 of the California Code of Regulations. The Board retains discretion to conduct the hearing in the manner it determines is most suitable to this particular matter, given the number and complexity of issues, parties and available hearing time. The Board declines to follow the Order of Proceedings set forth in section 648.5. Finally, one Party requests more flexibility to accommodate the different schedules of elected officials so that they may be heard other than at the 9:15 a.m. time certain established for April 11. The Board encourages elected officials wishing to speak to appear during the time certain established by the Board. If some elected officials are not able to attend during the time certain, they may speak along with other interested persons beginning at 4 p.m. on April 10 or may request the Board's permission to speak at a different time. The Board will endeavor to accommodate special requests while minimizing disruption to the orderly conduct of the hearing.

5. The Hearing Procedures and Order of Proceedings, including refusal to Postpone the Hearing, Violate the Parties' Rights to Due Process

The Hearing Procedures, particularly as modified today, are not unfair and do not violate the Administrative Procedures Act or due process. Government Code section 11425.10, subdivision (a)(1), requires that an administrative agency provide "the person to which the agency action is directed notice

and an opportunity to be heard, including the opportunity to present and rebut evidence." The Law Revision Commission Comments to that subdivision further state: "Subdivision (a)(1), providing a person the opportunity to present and rebut evidence, is subject to reasonable control and limitation by the agency conducting the hearing, including the manner of presentation of evidence, whether oral, written, or electronic, limitation on lengthy or repetitious testimony or other evidence, and other controls or limitations appropriate to the character of the hearing." Government Code section 11425.10, subdivision (a)(1), also does not equate any specific procedures with an "opportunity." (*Drummey v. State Bd. Of Funeral Directors* (1939) 13 Cal.2d 75, 80-81.) Rather, in administrative adjudicative proceedings, hearing officers are conferred substantial discretion and explicit authority to waive any requirement relating to adjudicative proceedings, except where in conflict with statutory or constitutional guarantees. (Cal. Code Regs., tit. 23, section 648, subd. (d); Cal. Code Regs., tit. 23, section 648.5, subd. (a). ["Adjudicative proceedings shall be conducted in a manner as the Board deems most suitable to the particular case with a view towards securing relevant information expeditiously without unnecessary delay and expense to the parties and to the Board."] This regulatory flexibility to control a proceeding is completely consistent with the statutory right to "notice and opportunity to be heard." Courts have likewise acknowledged the ability of agencies to streamline hearings, while preserving the right to notice and comment. As the U.S. Supreme Court has noted, what constitutes a fair hearing before an administrative body varies with the circumstances. (*Gilbert v. Homer* (1997) 520 U.S. 924, 930.) Courts should also give "substantial weight" to the good-faith judgments of the hearing officer. (*Zuckerman v. State Bd. Of Chiropractic Examiners* (2002) 29 Cal.4th 32, 46.) This is particularly true where the permit process, which grants a privilege, is only subject to minimal due process. (See, e.g., *Sucn. Suarez v. Gelabert* (D.P.R. 1982) 541 F.Supp. 1253, 1264 [citing *Mathews v. Eldridge* (1976) 424 U.S. 319, 335]; see also Wat. Code § 13263, ["All discharges of waste into waters of the state are privileges, not rights."].) Consistent with these standards, the Parties have had and will continue to have notice and opportunity to be heard at the hearing.

RULING ON REQUESTS FOR DESIGNATION AS PARTIES

On April 2, 2013, the San Diego Water Board received two separate sets of requests for designation as parties to the proceeding. For the reasons explained below, the requests are granted.

Request by Environmental Groups

The requests made by the Natural Resources Defense Council, the San Diego Coastkeeper, and Orange County Coastkeeper and Inland Empire Waterkeeper (collectively the Environmental Group) are granted. The Environmental Groups are each hereby designated as additional parties to this proceeding, pursuant to section 648.1(a) of title 23 of the California Code of Regulations. In their request, the Environmental Groups note that they have been deeply involved in the development of the Tentative Order and have been extremely active as public interest organizations in storm water efforts. They state that they represent numerous members who recreate in the waters affected by the discharges regulated by the Tentative Order and who are impacted by pollution in storm water runoff and its resulting health impacts. Like other designated parties, the Environmental Groups have an interest in, and will be affected by, the Board's decision in this proceeding. The Environmental Groups also have demonstrated that their interests are not adequately represented by existing Parties to the proceeding. Accordingly, the Board finds that the Environmental Groups' perspective and participation as a party will be beneficial to further develop the issues before the Board. In addition, because all parties and interested persons will be subject to reasonable time limits to make presentations, there is no impact on the efficient conduct of the hearing itself.

While the members of the Environmental Group are each designated as parties, the Board expects the Environmental Group to complete their presentations (including opening/closing statements, argument, presentation of any witnesses, cross examination, presentation of evidence and/or rebuttal testimony)

within the requested allocation of one hour. Other than Clean Water Now (see below) non-governmental organizations and environmental entities with similar interests in the outcome of the proceeding but not included in the membership of the Environmental Groups may speak as interested persons.

Clean Water Now, represented by Roger Butow, has not formally requested designated party status but has requested that it have six minutes to speak. The request for six minutes just prior to the commencement of the Environmental Groups joint presentation is granted.

Request by Coalition of Trade and Professional Associations (Building Industry Coalition)
The second set of requests for designation as parties is from a group of trade and professional associations referring to itself as the Coalition. The Board will refer to this coalition as the Building Industry Coalition for purposes of participation in this proceeding. The Building Industry Coalition consists of (1) Building Industry Association of San Diego County (BIASD), (2) Building Industry Association of Southern California (BIASC), (3) Associated General Contractors, San Diego (AGC), (4) San Diego Regional Chamber of Commerce (SDRCC), (5) Building Owners and Managers Association (BOMA), (6) San Diego County Apartment Association (SDCAA), (7) San Diego Association of Realtors (SDAR), (8) Alliance for Habitat Conservation, (9) San Diego Chapter of the American Association of Landscape Architects, (10) Associated Builders and Contractors (ABC), (11) Business Leadership Alliance (BLA) and (12) National Association of Industrial and Office Properties. The Coalition is a not a legal entity but instead is a group of trade and professional associations sharing similar interests in the outcome of this proceeding. Like the Environmental Groups, the Building Industry Coalition's membership has participated extensively in the development of this Tentative Order. The Coalition's request for designation as a party cites that its 20,000 members will be significantly and directly affected by the outcome of these proceedings. The Building Industry Coalition has also distinguished its interests in the proceedings from existing Parties and from the Environmental Groups identified above. Accordingly, the Board finds that the Building Coalition's perspective and participation as a party will be beneficial to further develop the issues before the board. In addition, because all parties and interested persons will be subject to reasonable time limits to make presentations, there is no impact on the efficient conduct of the hearing itself.

While the members of the Coalition are each designated as Parties, the Board expects the Coalition and its members to share allocated time for making presentations of one hour for its complete presentation (including opening/closing statements, argument, presentation of witnesses, cross-examination and presentation of evidence). Other entities with similar interests in the outcome of the proceeding but not included in the membership of the Coalition may speak as interested persons.

Attachment: Revised Hearing Procedures and Order of Proceedings, April 3, 2013

cc:	Distribution via email:	San Diego County Copermittees
	(see attached address list)	Orange County Copermittees
		Riverside County Copermittees
		Resource Agencies
	Distribution list via email:	San Diego County MS4 Permit Lyris List
		Orange County MS4 Permit Lyris List
		Riverside County MS4 Permit Lyris List
		San Diego Water Board Agenda Lyris List

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California Water Boards

Edmund G. Brown Jr., Governor

Matthew Rodriquez, Secretary for Environmental Protection

California Regional Water Quality Control Board, San Diego Region

REVISED[1] HEARING PROCEDURES AND ORDER OF PROCEEDINGS

Public Hearing to Consider Adoption of Tentative Order No. R9-2013-0001, NPDES No. CAS01092662 and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds Within the San Diego Region

April 10 and 11, 2013
Beginning at 9:00 a.m. Each Day
California Regional Water Quality Control Board, San Diego Region
Regional Water Board Room
San Diego Water Board Office Building
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

By prior public notice dated March 5, 2013, the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) announced its intent to conduct a public hearing on April 10 and 11, 2013, to receive testimony and comments and consider adoption of Tentative Order No. R9-2013-0001, NPDES No. CAS0109266, *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Tentative Order). After consideration of all requests, taking into account that oral comments are limited to revisions to the Tentative Order, that the revisions were made in response to oral and written comments, the complexity and number of issues under consideration, the extent to which parties have coordinated, the number of parties and members of the public participating, the opportunity to submit written comments that are part of the administrative record, the extent to which the parties have identified unique interests, the time available for the hearing, and to allow the Board ample time to ask questions and deliberate, the following Procedures and Order of Proceedings, including time allocated to each Party or group of Parties and members of the public, will be followed at the April 10 and 11, 2013, public hearing.~~This Order of Proceedings sets forth additional details on the procedures and order of presentations the San Diego Water Board will follow at the public hearing.~~

[1] The applicable Hearing Procedures and Order of Proceedings are revised to reflect procedural rulings made on April 3, 2013.

SCOPE OF HEARING

The Tentative Order was released for public review and comment on October 31, 2012. The written comment period ended January 11, 2013. All timely written comments received are posted on the San Diego Water Board website, at http://www.waterboards.ca.gov/rwqcb9/water_issues/programs/stormwater/index.shtml. No subsequently filed written comments have been accepted into the record at this time. Other than speaker cards and copies of electronic presentations or exhibits (see below) no new written materials will be accepted into the record at the April 10-11, 2013 hearing. As indicated in prior notices, the scope of oral testimony at the public hearing will be ~~strictly~~ limited to summarizing the previously submitted written comments, commenting on revisions to the Tentative Order~~-~~ made since the written comment period closed, and making policy statements. ~~No new issues may be raised at the hearing.~~As determined by the Board in Rulings issued April 3, 2013, within the above constraints, Parties to the proceeding will also be allowed to use their presentation time to present witnesses, introduce exhibits, conduct cross-examination and offer rebuttal testimony. Parties are reminded that testimony and exhibits may not include the introduction of new evidence.

PARTICIPANTS IN THIS PROCEEDING

Participants in this proceeding are identified as either "Parties" or "interested persons." It is not necessary to be designated as a party in order to participate in the hearing for this proceeding. Both interested persons and Parties will have the opportunity to present oral comments, to make arguments about the appropriateness, wisdom or utility of all or portions of the Tentative Order, and to comment on revisions to the Tentative Order. Both interested persons and Parties may be asked to respond to clarifying questions from the San Diego Water Board, staff, or others, at the discretion of the San Diego Water Board. However, interested persons may not present evidence and are not subject to cross-examination. An interested person may request more time to speak than is typically allotted to interested persons and such requests may be granted at the Chair's discretion.

San Diego County, Riverside County and Orange County Copermittees are designated as parties in this proceeding under the applicable State Water Resources Control Board's regulations set forth in California Code of Regulations, title 23, article 2, section 648, et seq. (See Cal. Code Regs., *tit.* 23, § 648.1(a).) The San Diego Water Board has discretion to determine who, in addition to the Copermittees, should be designated as a party for purposes of this proceeding. In its Ruling issued April 3, 2013, the Board has determined that the following entities are appropriate additional Parties to this proceeding.[2]

[2] The San Diego Water Board staff is not a party to the proceeding. This is a proceeding to consider adoption of a permit, which does not involve investigative, prosecutorial or advocacy functions. Staff's proposals, recommendations and participation in this proceeding are for the purpose of advising and assisting the San Diego Water Board in considering the Tentative Order.

Additional Parties:

1. Natural Resources Defense Council
2. San Diego Coastkeeper
3. Orange County Coastkeeper
4. Inland Empire Waterkeeper

(Additional Parties 1 through 4 are collectively referred to as the Environmental Group)

5. Building Industry Association of San Diego County (BIASD)
6. Building Industry Association of Southern California
7. Associated General Contractors, San Diego
8. San Diego Regional Chamber of Commerce
9. Building Owners and Managers Association
10. San Diego County Apartment Association
11. San Diego Association of Realtors
12. Alliance for Habitat Conservation
13. San Diego Chapter of the American Association of Landscape Architects
14. Associated Builders and Contractors
15. Business Leadership Alliance
16. National Association of Industrial and Office Properties

(Additional Parties 5 through 16 are collectively referred to as the Building Industry Coalition)

HEARING PROCESS

During the public hearing, San Diego Water Board staff will present an overview of the Tentative Order, written responses to comments received and recommended revisions to the Tentative Order. -For this proceeding, San Diego Water Board staff will begin, followed by representatives of the following Pparties or interested persons: 1) U.S. Environmental Protection Agencythe San Diego County, Orange County and Riverside County Copermittees; 2) U.S. Environmental Protection Agency the San Diego County, Orange County and Riverside County Copermittees; 3) Clean Water Now 4) the Environmental Group consisting of Natural Resources Defense Council, San Diego Coastkeeper, Orange County Coastkeeper and Inland Empire Waterkeeper,Non-governmental Organizations (NGOs); and 54) a Coalition of Building Industry trade and professional associations (Building Industry Coalition)Building Industry Groups.[34] Participants within these groups are encouraged to consolidate their presentations to save hearing time and/or avoid duplication.

[3] The groups within the Building Industry Coalition are: (1) Building Industry Association of San Diego County (BIASD), (2) Building Industry Association of Southern California, (3) Associated General Contractors, San Diego, (4) San Diego Regional Chamber of Commerce, (5) Building Owners and Managers Association, (6) San Diego County Apartment Association, (7) San Diego Association of Realtors, (8) Alliance for Habitat Conservation, (9) San Diego Chapter of the American Association of Landscape Architects, (10) Associated Builders and Contractors, (11) Business Leadership Alliance and (12) National Association of Industrial and Office Properties.

[4] These participants have been identified based upon prior participation through written comments, stakeholder meetings and public workshops held in November and December 2012.

For Parties, the allocated times below include time for any opening statement, main presentation, presentation of witnesses, introduction of exhibits, cross-examination, rebuttal and/or closing argument. Direct testimony should be presented in narrative format. To facilitate the orderly conduct of the hearing, to the extent Parties within a consolidated Group wish to cross-examine other Parties' witnesses, they should designate one representative to conduct the cross-examination.

After these presentations, the San Diego Water Board will hear from the public (interested persons) and elected officials, subject to times certain (see below). Interested persons with similar concerns or opinions are encouraged to choose one representative to speak, and are encouraged to coordinate their presentations with each other and to summarize their written comments. Interested persons may not cede their unused time to others, but the Chair will entertain requests for extra time from interested persons speaking on behalf of multiple interested persons.

Speakers will be interrupted not earlier than 4:00 p.m. on April 10 so that the San Diego Water Board can hear from interested persons other than representatives of the groups identified by name in this order of proceedings. At 9:15 a.m. on April 11, ~~or as soon thereafter as practicable,~~ elected officials will be invited to comment.[5] ~~elected officials will be invited to speak.~~
Interested persons may present comments and arguments about the appropriateness, wisdom or utility of all or portions of the Tentative Order, and may comment on revisions to the Tentative Order. However, interested persons may not present evidence and are not subject to cross-examination.

ORDER OF PROCEEDINGS

Chair's opening remarks, introductory items, administration of the oath to persons who intend to testify	**10 minutes**
San Diego Water Board Staff Presentation	**1.5 Hours**
US Environmental Protection Agency ~~San Diego County, Orange County and Riverside County Copermittees~~	**30 Minutes~~3 Hours (Total)~~**
~~US Environmental Protection Agency~~ San Diego County, Orange County and Riverside County Copermittees	**4~~3~~ Hours ~~0 Minutes~~ (Total)**
Clean Water Now	**6 minutes (Total)**

[5] If elected officials wishing to speak are unable to attend at this time certain, they may speak with interested persons on April 10 beginning at 4 p.m. and will be provided 5 minutes each. They may ask the chair to accommodate their schedule if they are unable to speak at either of these times certain.

Environmental Group~~NGOs~~ (Natural Resources Defense Council, San Diego Coastkeeper, Orange County Coastkeeper, Inland Empire Waterkeeper~~ – (The Escondido Creek Conservancy, Coastkeeper, San Diego Canyonlands, Natural Resources Defense Council, Los Penasquitos Lagoon Foundation, Laguna Bluebelt Coalition, Friends of Rose Canyon Creek, Clean Water Now, Coastal Environmental Rights Foundation, Environmental Health Coalition, San Elijo Lagoon Conservancy, South Laguna Civic Association)~~	**1 Hour (Total)**
Building Industry Coalition: (1) Building Industry Association of San Diego County (BIASD), (2) Building Industry Association of Southern California, (3) Associated General Contractors, San Diego, (4) San Diego Regional Chamber of Commerce, (5) Building Owners and Managers Association, (6) San Diego County Apartment Association, (7) San Diego Association of Realtors, (8) Alliance for Habitat Conservation, (9) San Diego Chapter of the American Association of Landscape Architects, (10) Associated Builders and Contractors, (11) Business Leadership Alliance and (12) National Association of Industrial and Office Properties ~~Building Industry/Industry- (Association of General Contractors, Otay Land Company, Otay Ranch New Homes, American Society of Landscape Architects, BIA Regulated Coalition, BIA of Southern California, Industrial Environmental Association, San Diego Gas & Electric, San Diego Green Building Council, Southern California Gas Company)~~	**1.5 Hours (Total)**
Interested Persons (Time Certain at 4 p.m. on April 10, 2013)	**3 Minutes Each**
Elected Officials' comments (Time Certain at 9:15 a.m. on April 11, 2013)	**5 Minutes Each**

San Diego Water Board Members and Counsel may ask questions of Parties or interested persons at any time. Time for questions and answers will not count against the above time limits.
~~This allocated time includes time for any opening statement, main presentation, rebuttal and/or closing argument. San Diego Water Board Members and Counsel may ask questions at any time. Time for questions and answers will not count against the above time limits.~~

OBJECTIONS TO PROCEDURES

Other than as provided in this document, the San Diego Water Board intends to conduct this public hearing in a generally informal manner. Participants requesting alternative procedures, with procedural requests outside of the scope of this notice, or requesting more time to speak, must submit their requests or objections in writing to the San Diego Water Board staff member identified below no later than 5:00 pm on March 22, 2013. The San Diego Water Board will

endeavor to accommodate reasonable requests and to respond to procedural objections and requests prior to the hearing. Untimely objections will be deemed waived. The San Diego Water Board retains the discretion to modify the procedures set forth herein for good cause.

EXHIBITS, POWER POINT AND OTHER COMPUTER DISPLAYS

Participants may introduce Exhibits or use PowerPoint and other computer displays during their presentation to convey information electronically on the San Diego Water Board's computer. These displays will only be accepted if they summarize the information contained in documents that were timely submitted~~ in compliance with deadlines cited above and in prior notices~~. They will not be accepted if they contain any new testimony or evidence. Please note that any person planning to use an electronic presentation at the hearing is required to provide a sufficient number of printed copies of the presentation for distribution to board members and staff and a reasonable number of copies to be available for the public to access during the hearing. An electronic copy of any exhibit or presentation used during the hearing must be left with the San Diego Water Board's Executive Assistant for inclusion in the record. Electronic presentations will be posted on the San Diego Water Board's website as soon as practicable.

DOCUMENT AVAILABILITY

The Tentative Order, and attachments thereto, timely received comment letters on the Tentative Order, the Revised Tentative Order, Response to Comments, and other information and documents relied upon are posted on the San Diego Water Board website at: http://www.waterboards.ca.gov/rwqcb9/water_issues/programs/stormwater/index.shtml. A revised Tentative Order reflecting revisions since the written comment deadline and a responses to comments document will be available shortly. Parties and interested persons will be notified by e-mail when those documents are posted on the Board's website.

These documents are also available for inspection and copying between the hours of 8:00 a.m. and 5:00 p.m. at the following address:

California Regional Water Quality Control Board
San Diego Region
9174 Sky Park Court, Suite 100,
San Diego, California 92123-4340

Arrangements for file review and/or obtaining copies of documents in the Administrative Record may be made by contacting the San Diego Water Board at (858) 467-2952. Appointments are encouraged so the documents can be readily available upon arrival. All timely received comment letters on the Tentative Order and responses to comments and other subsequent relevant documents will be available online as they are generated.

Staff Contact for Further Information

For questions or comments concerning this notice, please contact Wayne Chiu by phone at (858) 637-5558, or by email at wchiu@waterboards.ca.gov.

April 3, 2013

cc:

Distribution via email:
(see attached address list)

San Diego County Copermittees
Orange County Copermittees
Riverside County Copermittees
Resource Agencies

Distribution list via email:

San Diego County MS4 Permit Lyris List
Riverside County MS4 Permit Lyris List
Orange County MS4 Permit Lyris List

San Diego Water Board Agenda Lyris List

Tech Staff Info & Use	
Order No.	R9-2013-0001
Party (GT/CIWQS) ID	536787
File No.	n/a
WDID	n/a
NPDES No.	CAS0109266
Reg. Measure ID	387335
Place ID	786088
Person ID	n/a
Inspection ID	n/a

San Diego County Copermittees

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STATE OF CALIFORNIA
REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

REVISED MEETING NOTICE AND AGENDA[1]

Wednesday, April 10, 2013 and Thursday, April 11, 2013
9:00 a.m.

Water Quality Control Board
Board Meeting Room
9174 Sky Park Court
San Diego, California

The purpose of this meeting is for the San Diego Water Board to obtain testimony and information from concerned and affected persons and to make decisions based on the information received. Persons who want to submit written comments or evidence on any agenda item must comply with the procedures described in the agenda and agenda notes. Persons wishing to speak at the meeting should complete an attendance card (see Note F, attached to this Notice). The San Diego Water Board requests that all lengthy comments be submitted in writing in advance of the meeting date. To ensure that the San Diego Water Board members and staff have the opportunity to review and consider written material, comments should be received in the San Diego Water Board's office no later than noon on Tuesday, March 26, 2013* and should indicate the agenda item to which it is applicable. If the submitted written material is more than 5 pages or contains foldouts, color graphics, maps, etc., 15 copies must be submitted for distribution to the Board members and staff. Written material submitted after 5:00 P.M. on Tuesday, April 2, 2013, will not be provided to the Board members and may not be considered by the San Diego Water Board (See Note D, attached to this Notice).

****PLEASE NOTE THAT SOME ITEMS ON THE AGENDA MAY HAVE BEEN PREVIOUSLY NOTICED WITH EARLIER DEADLINES FOR SUBMITTING WRITTEN COMMENTS OR MAY HAVE A SEPARATE HEARING PROCEDURES DOCUMENT THAT ESTABLISHES DIFFERENT DEADLINES OR PROCEDURES FOR SUBMITTING WRITTEN MATERIALS. IN THOSE CASES THE DIFFERENT DEADLINES OR PROCEDURES APPLY.***

Comments on agenda items will be accepted by E-mail subject to the same conditions set forth for other written submissions as long as the total submittal (including attachments) does not exceed five printed pages in length. E-mail must be submitted to: rb9agenda@waterboards.ca.gov. Type the word “Agenda” in the subject line.

Pursuant to Title 23, California Code of Regulations, section 648.4, the San Diego Water Board may refuse to admit written testimony or evidence into the record if it is not submitted

[1] Versión en español disponible también en:
http://www.waterboards.ca.gov/sandiego/board_info/agendas/2013/Apr/AgendaApr2013_Spanish_revised.pdf

to the San Diego Water Board in a timely manner and shall refuse to do so if admitting it would prejudice any party or the board, unless the proponent demonstrates that compliance with the deadline would create an unreasonable hardship.

NOTE D, attached to this Notice, refers to the procedures that will be followed by the San Diego Water Board in contested adjudicatory matters if a separate Hearing Procedures Document has not been issued for a particular agenda item. Parties requesting an alternate hearing process must do so in accord with the directions in NOTE D. Any such request, together with supporting material, must be received in the San Diego Water Board's office no later than noon on Tuesday, March 26, 2013.

Copies of the agenda items to be considered by the San Diego Water Board are posted on the San Diego Water Board's website at http://www.waterboards.ca.gov/sandiego/board_info/agendas

Items showing times will begin no sooner than indicated. Items are numbered for identification purposes only and may not be considered in order. They may, however, be delayed by previous items. Items scheduled for the first day of a multi-day meeting may be delayed or continued to the next day of the meeting. Closed session items may be considered on either or both days.

Wednesday, April 10, 2013 – 9:00 a.m.

1. Roll Call and Introductions.

2. PUBLIC FORUM: Any person may address the Board regarding a matter within the Board's jurisdiction that is not related to an item on this Meeting agenda and is not scheduled for a future Meeting. **Comments will generally be limited to three minutes, unless otherwise directed by the Board Chairperson**. Any person wishing to make a longer presentation should contact the Executive Officer at least ten days prior to the meeting.

3. Minutes of Board Meeting: March 13, 2013.

4. Chairman's, Board Members', State Board liaison's and Executive Officer's Reports: These items are for Board discussion only. No public testimony will be allowed, and the Board will take no formal action.

5. Recognition: Resolution of Appreciation for former Chairman Grant Destache (Tentative Resolution No. R9-2013-0061). (*David Gibson*)

Consent Calendar: Items 5 through 6 are considered non-controversial issues. (NOTE: If there is public interest, concern or discussion regarding any consent calendar item or a request for a public hearing, then the item(s) will be removed from the consent calendar and considered after all other agenda items have been completed.)

6. NPDES Permit Amendment: Waste Discharge Requirements for SeaWorld Parks & Entertainment, Inc., a Delaware Corporation, SeaWorld, LLC, DBA SeaWorld San Diego (Tentative Order No. R9-2013-0034). (*Michelle Mata*)

7. Adoption of Emergency, Abandoned, and Recalcitrant Annual Priority Site List: Former Santa Ysabel Chevron Service Station (Tentative Resolution No. R9-2013-0010). (*Sue Pease*)

Remainder of the Agenda (Non-Consent Items):

8. Public Hearing: Issuance of a NPDES Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region (Tentative Order No. R9-2013-0001, NPDES No. CAS0109266 (*Wayne Chiu, Laurie Walsh, Christina Arias*).

CLOSED SESSION

The Board may meet in closed session to consider personnel matters [Authority: Government Code section 11126(a)]; to deliberate on a decision to be reached based upon evidence introduced in a hearing [Authority: Government Code section 11126(c)(3)]; or to discuss matters in litigation, including discussion of initiated litigation, significant exposure to litigation, or decisions to initiate litigation [Authority: Government Code section 11126(e)]. Litigation items that may be discussed are listed below by the type of item:

Civil Actions (Judicial and Administrative, other than Petitions for Review filed with the State Water Board)

a. *People of the State of California Ex Rel. the Regional Water Quality Control Board, San Diego Region v. Edward Drusina, an individual in his capacity as Commissioner of the International Boundary and Water Commission, United States Section, et al.,* Complaint for Violations of the Clean Water Act and Related State Law Claims. United States District Court, Southern District of California, Case No. 01-CV-027BTM(JFS) (filed February 2001). *(David Gibson)*

b. *In re: Test Claim on California Regional Water Quality Control Board, San Diego Region, Order No. R9-2007-001, (NPDES No. CAS0108758) Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego County, the San Diego Unified Port District, and the San Diego County Regional Airport Authority adopted on January 24, 2007. Test Claim filed by San Diego County, et al., with*

Commission on State Mandates, No. 07-TC-09 (filed June 2008). *(Catherine George Hagan)*

c. *California Regional Water Quality Control Board, San Diego Region v. Bill and Heidi Dickerson, Larry and Penelope Gunning and Perry & Papenhausen, Inc.* Complaint for Damages for Breach of Contract and for Specific Performance. San Diego County Superior Court, Case No. 37-2010-00096011-CU-CO-CTL (filed July 2010). *(Jeremy Haas)*

d. *State of California Department of Finance, State Water Resources Control Board, And California Regional Water Quality Control Board, San Diego Region v. Commission on State Mandates.* Petition for Writ of Administrative Mandamus. Sacramento County Superior Court, Case No. 34-2010-80000604 (filed July 2010). *(Catherine George Hagan)*

e. *In re: Citizens Development Corporation, Debtor and Debtor in Possession*, Case No. 10-15142-LT11. United States Bankruptcy Court, Southern District of California. (San Diego Water Board Claim in Bankruptcy) (filed June 2011). (*Catherine George Hagan*)

f. *Test Claim on California Regional Water Quality Control Board, San Diego Region, Order No. R9-2009-0002, (NPDES No. CAS0108740) Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of Orange, the Incorporated Cities of the County of Orange, and the Orange County Flood Control District adopted on December 16, 2009. Test Claim filed by County of Orange, et al., with Commission on State Mandates, No. 10-TC-11* (filed June 2011). *(Catherine George Hagan)*

g. *Test Claim on California Regional Water Quality Control Board, San Diego Region, Order No. R9-2010-0016 (NPDES No. CAS0108766) adopted November 10, 2010, County of Riverside, Riverside County Flood Control and Water Conservation District, and the Cities of Murrieta, Temecula and Wildomar, Co-Claimants, filed with Commission on State Mandates, No. 11-TC-03 (filed November 2011). (Catherine George Hagan)*

Petitions for Review Pending Before State Water Resources Control Board[2]

h. Petitions of the National Fireworks Association and Fireworks & Stage FX America Inc., Coastal Environmental Rights Foundation, and San Diego Coastkeeper (General National Pollutant Discharge Elimination System (NPDES) Permit Order No. R9-2011-0022 (NPDES No. CAG999002) for Residual Firework Pollutant Waste Discharges to Waters of the United States in the San Diego Region from the Public Display of Fireworks), SWRCB/OCC Files A-2164(a)-(c), filed June and July 2011. *(Michelle Mata)*

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[2] Petitions for review of San Diego Water Board actions or inactions filed with the State Water Board being held in abeyance by the State Water Board are not listed in the agenda. The titles of these matters are available at the San Diego Water Board. Please contact Catherine George Hagan at chagan@waterboards.ca.gov or 858-467-2958 for more information.

i. Petition of Citizens Development Corporation (Water Code Section 13267 Investigative Order No. R9-2011-0033 dated September 14, 2011, Requiring Submission of Technical Reports Pertaining to Investigation of Lake San Marcos Nutrient Impairment, San Diego County), SWRCB/OCC File A-2185, filed October 2011. (*Laurie Walsh*)

j. Petition of City of San Diego (Time Schedule Order No. R9-2011-0052 dated September 14, 2011, for the Kinder Morgan Energy Partners, Mission Valley Terminal Remediation Dewatering Discharge to Murphy Canyon Creek, San Diego County), SWRCB/OCC File A-2186, filed October 2011. (*Ben Neill*)

k. Petition of Jack Eitzen (Administrative Assessment of Civil Liability Order Nos. R9-2011-0048 and R9-2011-0049 against Jack Eitzen for 38175 and 38155 Via Vista Grande, Murrieta, Riverside County), issued October 12, 2011), SWRCB/OCC File A-2193, filed November 2011. (*Rebecca Stewart*)

l. Petitions for Review of San Diego Bay Shipyard Sediment Cleanup and Abatement Order No. R9-2012-0024 for National Steel and Shipbuilding Company (NASSCO), BAE Systems, San Diego Ship Repair (BAE Systems), Campbell Industries, City of San Diego, San Diego Gas & Electric (SDG&E) and San Diego Unified Port District (Port District) issued March 14, 2012. Petitions for Review and Requests for Stay filed by NASSCO, BAE Systems and City of San Diego. Petitions for Review w/o requests for stay filed by SDG&E, Star & Crescent Boat Company and Port District. SWRCB/OCC File A-2205(a) – (e), filed April 2012. (*Frank Melbourn)*

m. Petition of NASSCO for Review of Resolution No. R9-2012-0025 (Certifying Final Environmental Impact Report for San Diego Bay Shipyard Sediment Cleanup and Abatement Order No. R9-2012-0024), adopted March 14, 2012, SWRCB/OCC File A-XXXX, filed April 2012. (*Frank Melbourn)*

n. Petition of South Laguna Civic Association for Review of Order No. R9-2012-0013, NPDES No. CA0107611, NPDES Permit Reissuance: South Orange County Waste Authority, Discharges to the Pacific Ocean via Aliso Creek Ocean Outfall, adopted April 11, 2012, SWRCB/OCC File A-2211, filed May 2012. (*Joann Lim*)

o. Petition of City of San Diego for Review of Resolution No. R9-2012-0045, re NPDES Permit Notice of Enrollment Amendment for Kinder Morgan Energy Partners, June 13, 2012, SWRCB/OCC File A-XXXX, filed July 2012. (*Ben Neill*)

Thursday, April 11, 2013 – 9:00 a.m., Regular Meeting Continued.

9. Roll Call and Introductions.

10. PUBLIC FORUM: Any person may address the Board regarding a matter within the Board's jurisdiction that is not related to an item on this Meeting agenda and is not scheduled for a future Meeting. **Comments will generally be limited to three minutes, unless otherwise directed by the Board Chairperson**. Any person

wishing to make a longer presentation should contact the Executive Officer at least ten days prior to the meeting.

11. Continuation of non-consent Agenda items from April 10, 2013

12. Arrangements for Next Meeting and Adjournment:
    Wednesday, May 8, 2013 - 9:00 a.m.
    Water Quality Control Board
    Regional Board Meeting Room
    9174 Sky Park Court
    San Diego, California

CLOSED SESSION

The Board may meet in closed session to consider personnel matters [Authority: Government Code section 11126(a)]; to deliberate on a decision to be reached based upon evidence introduced in a hearing [Authority: Government Code section 11126(c)(3)]; or to discuss matters in litigation, including discussion of initiated litigation, significant exposure to litigation, or decisions to initiate litigation [Authority: Government Code section 11126(e)]. Litigation items that may be discussed are listed above in the agenda for April 10, 2013.

NOTIFICATIONS

A. **Follow the Board Meeting on Twitter**: Updates on the progress of the San Diego Water Board meeting will be posted on Twitter at www.twitter.com/SDWaterBoard. The San Diego Water Board's use of Twitter is a courtesy and is for informational purposes only. It is not always reliable, and is not a substitute for personal attendance at a Board meeting.

DIRECTIONS TO MEETING

From Downtown: I-15 north – take the Aero Drive exit – turn left (west). Proceed to the 3rd stoplight, which is Ruffin Road – turn right. Turn left on Sky Park Court (stoplight). Our building is located at the end of the court – veer to the right into the parking lot.

From the North: I-15 south – take the Balboa Ave. exit – turn right (west). Proceed to the 2nd stoplight, which is Ruffin Road – turn left. Turn right onto Sky Park Court (stoplight). Our building is located at the end of the court – veer to the right into the parking lot.

State of California
Regional Water Quality Control Board
San Diego Region

EXECUTIVE OFFICER SUMMARY REPORT
April 10 and 11, 2013

ITEM: 8

SUBJECT: Public Hearing: Issuance of an NPDES Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region (Tentative Order No. R9-2013-0001, NPDES No. CAS0109266) (*Wayne Chiu, Laurie Walsh, Christina Arias*).

PURPOSE: To receive public testimony and consider adoption of Tentative Order No. R9-2013-0001 (Tentative Order).

RECOMMENDATION: Adoption of the revised Tentative Order No. R9-2013-0001 is recommended.

KEY ISSUES:

1. Provision E.3 of the Tentative Order includes design standards for post-construction structural best management practices (BMPs) that are required to be implemented by Priority Development Projects. This includes requirements to implement structural BMPs to retain pollutants and manage impacts caused by hydromodification. Several stakeholders object to the Tentative Order's exclusion of any exemptions from the hydromodification management requirements. Stakeholders also object to the requirement that redevelopment projects must implement BMPs to replicate the hydrology associated with the *pre-development* runoff condition rather than the *pre-project* runoff condition.

2. Pursuant to the federal Clean Water Act and regulations adopted thereunder, Attachment E of the Tentative Order incorporates water quality based effluent limitations (WQBELs) derived from Total Maximum Daily Loads (TMDLs). The municipal entities regulated under the Tentative Order (Copermittees) object to the inclusion of WQBELs because they do not believe the WQBELs are achievable. The County of San Diego further asserts that the San Diego Water Board is vested with the discretion

to elect to not incorporate the Beaches and Creeks Bacteria TMDL provisions in the Tentative Order at this time.

3. The Tentative Order includes discharge prohibitions and receiving water limitations in Provision A that require discharges to be controlled so as not to cause or contribute to exceedances of water quality standards in receiving waters. The Copermittees assert that they are increasingly vulnerable to San Diego Water Board enforcement action(s) and citizen suits if they are shown to be causing or contributing to an exceedance of water quality standards in violation of Provision A. The Copermittees assert that the Tentative Order should be modified to provide a partial or complete exemption from enforcement for violations of Provision A while a Copermittee engages in an iterative process of improving controls. A provision of this type is commonly referred to as a "safe harbor" provision.

DISCUSSION:

Thirty-nine municipal, county government, and special district entities (Copermittees) located in San Diego County, southern Orange County and southwest Riverside County (**Supporting Document 1**) own and operate large MS4s which discharge storm water (wet weather) runoff and non-storm water (dry weather) runoff to surface waters throughout the San Diego Water Board's jurisdiction. The MS4 discharges of wet weather and dry weather runoff are a leading cause and contributor to adverse impacts on receiving waters throughout the San Diego Region, consequently impairing their beneficial uses. The most recent Clean Water Act sections 303(d) and 305(b) update of the State's Integrated Report was completed in 2010 and listed approximately 450 distinct pollutant/waterbody combinations within the San Diego Region as impaired. Impairments were due to elevated levels of bacteria, sediment, nutrients, various metals, pesticides, and other stressors commonly found in MS4 runoff. Although the specific causes of many of the impairments for the San Diego Region are not yet known, it is known that most of the impairments are downstream of, or within, urbanized settings, and therefore directly affected by dry weather and wet weather runoff. The dimensions of the dry weather and wet weather runoff problem clearly highlight the continuing need for comprehensive, creative and effective storm water regulation.

The Tentative Order **(Supporting Document 2)** is a regional MS4 NPDES permit that proposes to jointly cover all 39 Copermittees in a phased manner as their current MS4 permits expire, or upon request for earlier coverage prior to permit expiration. The Tentative Order covers multiple MS4 discharge points to receiving waters throughout the San Diego Region. All MS4 Copermittees in the San Diego Region have been previously notified that they may ultimately be regulated under the Tentative Order. Copermittees covered by the current San Diego County MS4 permit (Order No. R9-2007-0001) will be subject to the Tentative Order following its adoption. Copermittees covered by the Orange County and Riverside County MS4 permits (Order Nos. R9-2009-0002 and R9-2010- 0016, respectively), will be subject to the Tentative Order at a later date after the San Diego Water Board receives and considers their Report of Waste Discharge and makes any necessary changes to the Order.

The Tentative Order implements the NPDES permitting requirements in the federal Clean Water Act, the Code of Federal Regulations, and the California Water Code. Attachment F of the Tentative Order is a detailed Fact Sheet that comprehensively sets forth the principal background information and facts, regulatory and legal citations, references, and additional explanatory information in support of the proposed requirements. If adopted, the Tentative Order will remain in effect for a five-year fixed term.

Comprehensive Stakeholder Process

The Tentative Order was developed over a two-year period beginning in February 2011 through a participatory approach designed to actively engage key stakeholders (i.e. USEPA, environmental organizations, business groups, the building industry, and Copermittees). This transparent and comprehensive stakeholder participation process included workshops, meetings, presentations, and extensive opportunities for stakeholders to review various drafts of the Tentative Order and provide written comments (**Supporting Document 3**). As a result, the Tentative Order has gone through many substantial revisions over this time period and now incorporates many stakeholder recommendations throughout the document.

The Tentative Order was noticed and released for formal public review on October 31, 2012 for a 71-day comment period (**Supporting Document 4**). A total of 89 timely comment letters were received by the end of the comment period on January 11, 2013 (**Supporting Document 5**). The San Diego Water Board has provided written responses to these comments (**Supporting Document 6**). Additionally, the Tentative Order has been revised in response to these comments. The revisions are highlighted in redline/strikeout text in the revised Tentative Order (**Supporting Document 7**).

Need for Innovative Permitting Approach

Since 1990, the San Diego Water Board has issued four iterations of MS4 permits to the Copermittees in each county within the San Diego Region. The MS4 permit requirements have progressively become more prescriptive and include very little detail about what the desired outcomes of the required actions are expected to achieve. Compliance with the MS4 permit requirements has essentially been reduced to tracking numbers of actions rather than tracking progress towards actual improvements in the quality of receiving waters or discharges from the MS4s. The result has been an increase in actions being implemented by the Copermittees, with little or no ability to determine any corresponding improvements to receiving water quality.

In contrast, the Tentative Order significantly modifies the prescriptive action-based regulatory approach of the current MS4 permits to an outcome-based approach, with a focus on measuring and achieving improvements in MS4 discharges and receiving water quality. A key feature of the Tentative Order is that it provides an adaptive management pathway for the Copermittees to select and address the highest priority water quality issues through a non-punitive iterative process. This process is incorporated in watershed-specific Water Quality Improvement Plans, which are described in Provision B of the Tentative Order. The Water Quality Improvement Plans must be developed through a collaborative effort by the Copermittees in each Watershed Management Area, and other key stakeholders, including representatives from the San Diego Water Board. The Water Quality Improvement Plans must include descriptions of the highest priority pollutants or conditions in a specific watershed, goals and strategies to address those pollutants

or conditions, and time schedules associated with those goals and strategies. By allowing the Copermittees to expend their resources to address the highest priority issues, they will no longer be required to address "all pollutants, all of the time," as was the premise of previous storm water permits. In this sense, the Tentative Order is strategic, cost-effective, and water quality outcome-based.

The San Diego Water Board believes the concept of the Water Quality Improvement Plan has great promise and will allow the Copermittees to more flexibly deploy resources to achieve goals that will yield the greatest water quality improvements. In general, stakeholders overwhelmingly support the concept. Twenty-nine individual stakeholders submitted comments in support of the Water Quality Improvement Plan concept (summarized in Comment number B-2). The San Diego Water Board did not receive a single comment opposing the concept.

Flexible Land Development Requirements

The Tentative Order establishes San Diego Region-wide structural BMP standards for both pollutant control and hydromodification management, to be included on all new and redevelopment Priority Development Projects. These requirements are necessary to ensure that receiving waters are protected from altered flow regimes and pollutant loads associated with land development.

The Copermittees and several building industry and engineering design consultants commented that the Tentative Order should include site-specific structural BMP requirements because, in some cases, implementation would be infeasible due to site specific factors, and in other cases, there would be little water quality benefit from implementing BMPs on each and every project. Commenters objected to the exclusion of any exemptions from the hydromodification management requirements (specifically, projects that discharge to channels lined with concrete along their beds and banks). Commenters also objected to the requirement to use the *pre-development* runoff conditions as baselines for BMP design as opposed to the *pre-project* runoff conditions. Finally, the San Diego County Copermittees and some engineering design consultants argue that the Tentative Order is requiring substantial revisions of the San Diego County

Hydromodification Management Plan (HMP; adopted by the San Diego Water Board in Resolution No. R9-2010-0066), even though the Copermittees have just begun to implement the HMP and spent over $1 million for its development.

In response to comments received, the Tentative Order was substantially revised (**Supporting Document 7**). Firstly, an exemption from the hydromodification management requirements was added for projects discharging to concrete-lined channels that are lined along bed and banks from the point of discharge all the way to an enclosed embayment or the Pacific Ocean. Secondly, the Tentative Order was revised to include a new provision allowing the possibility of offsite compliance in lieu of implementing structural BMPs onsite. Provision B.3.b.(4) of the revised Tentative Order describes an optional Watershed Management Area Analysis that the Copermittees may choose to undertake in order to identify candidate offsite projects and additional exemptions from hydromodification management requirements. The analysis promoted in Provision B.3.b.(4) is expected to result in innovative opportunities for water quality improvements and is supported by the latest research pertaining to hydromodification management. Provision E.3 of the Tentative Order describes specific requirements for land development and how they interrelate to the optional Watershed Management Area Analysis. Additional information on this issue is located in section VIII of the Fact Sheet and the response to Comment number E3c-2.

Thirdly, Attachment C to the Tentative Order (Definitions) has been revised to include a definition for “Pre-Development Runoff Conditions” to clarify the expectations associated with a redevelopment project subject to this requirement (**Supporting Document 7**). The intent of using a “pre-development” standard is not to replicate the historical hydrology thought to have existed at a site at some point in time. The intent is that developers estimate the runoff conditions from a site using characteristics of the underlying soil, not the runoff conditions associated with impervious surfaces. The result will be post-project runoff conditions that contain fewer pollutants, and are less likely to cause erosion to downstream receiving waters, which may in turn allow the receiving water to recover from the impacts caused by hydromodification. This is discussed thoroughly in the response to Comment number E3c2-2.

Finally, contrary to comments received by the San Diego County Copermittees and others, the San Diego County HMP will not require significant revision to meet the requirements of the Tentative Order. This is because the premise of the hydromodification management BMP requirements, which are to control storm water runoff conditions for Copermittee-defined range of flows, is unchanged. The San Diego County HMP will need updating to incorporate the pre-development baseline standard discussed above, but the methodology, assumptions, and computer modeling used to develop the San Diego County HMP will not require revision.

Appropriately Incorporates TMDLs

Federal regulations at 40 CFR 122.44(d)(1)(vii)(B) require that NPDES permit conditions be consistent with the assumptions and requirements of wasteload allocations (WLAs) in adopted TMDLs. Because the Tentative Order is an NPDES permit, Attachment E incorporates provisions that implement TMDLs. The load allocations (LAs), WLAs, and compliance schedules established in the TMDLs were developed as Basin Plan amendments and are duly adopted regulations of the San Diego Water Board.

The proceedings for developing the TMDLs involved extensive opportunities for public participation, review and comment, as well as scientific peer review. The proceedings included consideration of the dischargers' ability to comply with the LAs and WLAs, development of appropriate compliance time schedules, and economic considerations (e.g., costs to implement and comply with the TMDLs). The various TMDLs were then adopted by the San Diego Water Board in 2002, 2005, 2007, 2008 and 2010 as amendments to the Basin Plan and were subsequently approved by the State Water Resources Control Board, State Office of Administrative Law and USEPA. TMDLs are not independently enforceable. The Tentative Order simply implements the WLAs assigned to the Copermittees as required by federal regulations, but does so in a manner that provides the Copermittees with maximum flexibility to demonstrate compliance. Additional information on this issue is located in the Tentative Order at section IX of the Fact Sheet.

The Copermittees also submitted comments stating that the TMDLs should not be included in the Tentative Order until the water quality objectives for which they are based are amended to be "achievable." They also asked for specific provisions to be included, such as a re-opener provision in the event that TMDLs are eventually amended. Additionally, they asked for the inclusion of load-based water quality based effluent limits (WQBELs; which are derived from WLAs), adjustable interim TMDL compliance dates, and additional TMDL compliance determination options.

In response to the Copermittees' comments, the Tentative Order was revised to include several of the Copermittees' requests. An explicit re-opener provision was added, as well as load-based WQBELs, adjustable interim TMDL compliance dates, and additional TMDL compliance determination options. However, wholesale exclusion of the TMDLs or WQBELs themselves from the Tentative Order is not an option under the Federal NPDES Permit Regulations. Further, any adjustments that are warranted to the TMDLs, or the water quality objectives on which they are based, must be made through the Basin Plan Amendment process, which is outside the proceedings for adoption of the Tentative Order.

Receiving Water Limitations

Provision A of the Tentative Order includes discharge prohibitions and receiving water limitations language that are consistent with State Water Board Order WQ 99-05. In this precedential Order, the State Water Board prescribed an iterative process whereby an exceedance of a water quality standard triggers a process of BMP improvements. Order WQ 99-05 also directed that MS4 permits contain separately enforceable receiving water limitation provisions requiring discharges to be controlled so as not to cause or contribute to exceedances of water quality standards in receiving waters. Under this approach, when a discharger is shown to be causing or contributing to an exceedance of water quality standards, that discharger is in violation of the relevant discharge prohibitions and receiving water limitations of the permit and potentially subject to enforcement by the Water Boards or through a citizen suit, even if the discharger is actively engaged in the iterative process. The Copermittees commented extensively that they are increasingly vulnerable

to San Diego Water Board enforcement action(s) and citizen suits if they are shown to be causing or contributing to an exceedance of water quality standards in violation of Provision A of the Tentative Order. The vulnerability to enforcement action and citizen suits despite engagement in the iterative process was highlighted in a recent Ninth Circuit Court of Appeals decision. They have subsequently requested the addition of a "safe harbor" provision whereby implementation of the Water Quality Improvement Plan would constitute compliance with Provision A.

In response to these concerns, the revised Tentative Order (**Supporting Document 7**) now includes an alternative compliance option for the Copermittees, which, if properly implemented, would constitute compliance with Provision A. Newly created Provision B.3.c describes a compliance option designed to ensure that interim strategies proposed by the Copermittees to meet water quality standards must be verified by technically robust analyses demonstrating that the proposed strategies will be sufficient to result in attainment of water quality standards in receiving waters by a certain date. The revised Tentative Order clearly states that a Copermittee will be in compliance with receiving water limitations (i.e. the requirements of Provision A.1.a, A.1.c and A.2.a of the Prohibition and Limitations), if the specific set of requirements described in Provision B.3.c are incorporated and implemented as part of an accepted Water Quality Improvement Plan. Additional information on this issue is located in section VIII of the Fact Sheet (Attachment F to the Tentative Order) and in the response to Comment number A-1.

SIGNIFICANT CHANGES

As previously mentioned, the Tentative Order has been substantially revised to address concerns expressed by the Copermittees and other stakeholders. These revisions include:

1. A provision for exemptions from the hydromodification management requirements for land development projects discharging to concrete-lined channels;
2. The addition of an optional Watershed Management Area Analysis with provisions that will allow compliance with the structural BMP requirements to take place offsite, and provisions for identifying additional exemptions from the hydromodification management requirements;

3. Clarification of expectations associated with the requirement that redevelopment projects match the "pre-development" runoff conditions;
4. An explicit re-opener provision to incorporate changes to TMDL permit provisions in the event TMDLs are amended through the Basin Planning process;
5. The addition of load-based WQBELs to the requirements for the bacteria-related TMDLs;
6. The addition of a provision allowing the Copermittees to propose interim TMDL compliance dates for the Beaches and Creeks Bacteria TMDL;
7. Additional TMDL compliance determination options; and
8. The addition of a compliance option for Copermittees seeking unequivocal compliance with Provision A, Prohibitions and Limitations.

LEGAL CONCERNS: Responses to legal comments received during the public comment period are included in the Response to Comments document at Lgl-1 through Lgl-11 and Fnd-1 through Fnd-14.

SUPPORTING DOCUMENTS:

1. Regional MS4 Permit Map
2. Tentative Order No. R9-2013-0001, version released October 31, 2012 (On CD only)
3. Regional MS4 Permit Timeline
4. Notice of Public Review and Comment for Tentative Order No. R9-2013-0001, dated October 31, 2012
5. Comments Received by January 11, 2013 (On CD only)
6. San Diego Water Board Responses to Comments
7. Revised Tentative Order No. R9-2013-0001 with Changes in Redline/Strikeout, released March 27, 2013 Version
8. Notice of Public Hearing, dated March 5, 2013, Hearing Procedures and Order of Proceedings, dated March 15, 2013

PUBLIC NOTICE: The Notice of Public Hearing was mailed to all Copermittees and Natural Resource Agencies, e-mailed to interested persons, and posted on the San Diego Water Board website on March 6, 2013 (**Supporting Document 8**). A Notice of this Public Hearing was also published in San Diego, Orange, and Riverside County newspapers on March 7 and 8, 2013. Notice was also provided in the Meeting Notice and Agenda for the April 10 and 11, 2013 Board meeting, which is posted on the San Diego Water Board's website.

Regional MS4 Permit Boundaries

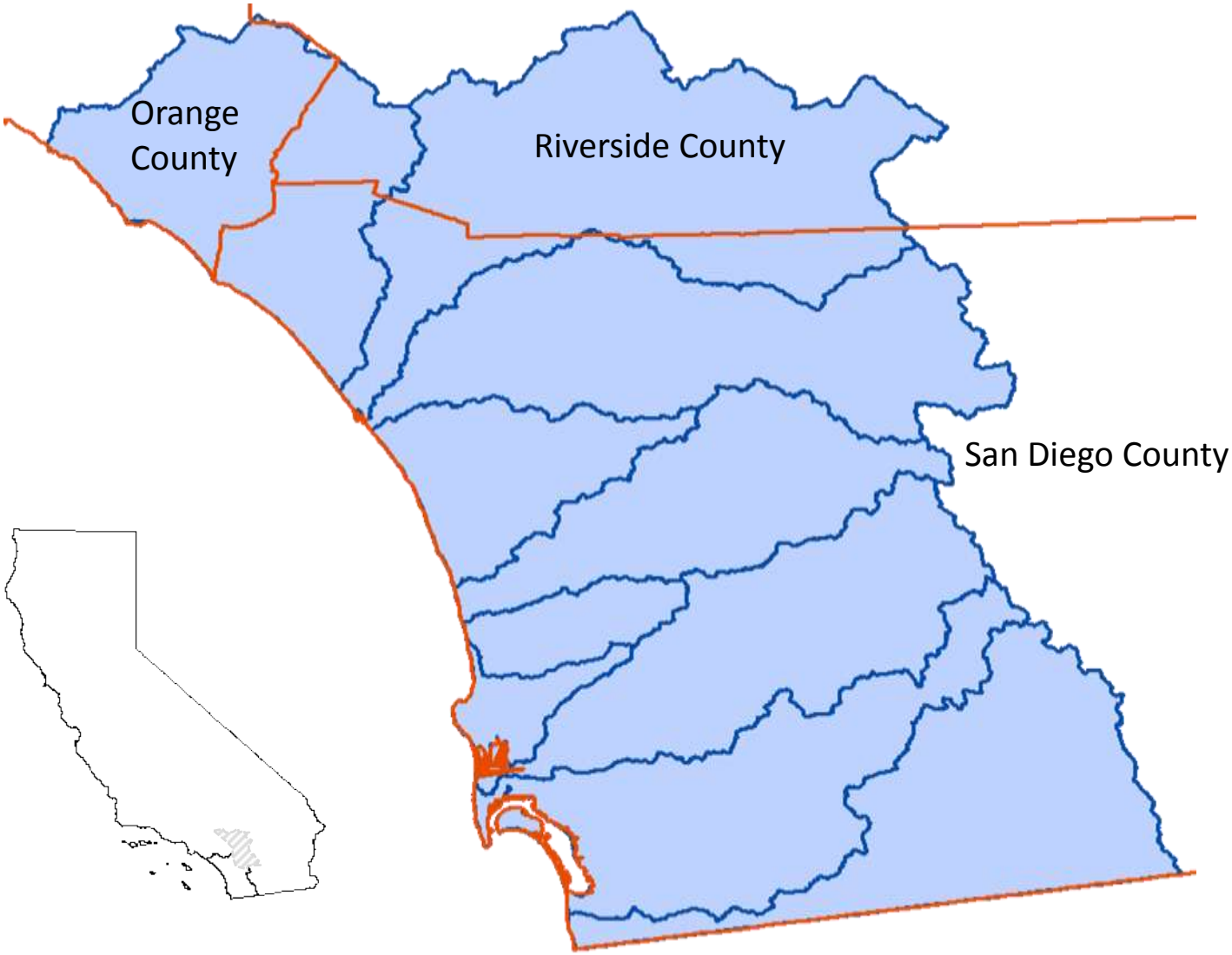

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

TENTATIVE
ORDER NO. R9-2013-0001
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The San Diego County Copermittees in Table 1a are subject to waste discharge requirements set forth in this Order.

Table 1a. San Diego County Copermittees

City of Carlsbad	City of Oceanside
City of Chula Vista	City of Poway
City of Coronado	City of San Diego
City of Del Mar	City of San Marcos
City of El Cajon	City of Santee
City of Encinitas	City of Solana Beach
City of Escondido	City of Vista
City of Imperial Beach	County of San Diego
City of La Mesa	San Diego County Regional Airport Authority
City of Lemon Grove	San Diego Unified Port District
City of National City	

After the San Diego Water Board receives and considers the Orange County Copermittees' Report of Waste Discharge and makes any necessary changes to the Order, the Orange County Copermittees in Table 1b will become subject to waste discharge requirements set forth in this Order after expiration of Order No. R9-2009-0002, NPDES No. CAS0108740 on or after December 16, 2014.

Table 1b. Orange County Copermittees

City of Aliso Viejo	City of Rancho Santa Margarita
City of Dana Point	City of San Clemente
City of Laguna Beach	City of San Juan Capistrano
City of Laguna Hills	City of Laguna Woods
City of Laguna Niguel	County of Orange
City of Lake Forest	Orange County Flood Control District
City of Mission Viejo	

After the San Diego Water Board receives and considers the Riverside County Copermittees' Report of Waste Discharge and makes any necessary changes to this Order, the Riverside County Copermittees in Table 1c will become subject to waste discharge requirements set forth in this Order after expiration of Order No. R9-2010-0016, NPDES No. CAS0108766 on or after November 10, 2015.

Table 1c. Riverside County Copermittees

City of Murrieta	County of Riverside
City of Temecula	Riverside County Flood Control and Water Conservation District
City of Wildomar	

The Orange County Copermittees and Riverside County Copermittees may become subject to the requirements of this Order at a date earlier than the expiration date of their current Orders subject to the conditions described in Provision F.6 of this Order if the Copermittees in the respective county receive a notification of coverage from the San Diego Water Board.

The term Copermittee in this Order refers to any San Diego County, Orange County, or Riverside County Copermittee covered under this Order, unless specified otherwise.

This Order provides permit coverage for the Copermittee discharges described in Table 2.

Table 2. Discharge Locations and Receiving Waters

Discharge Points	Locations throughout San Diego Region
Discharge Description	Municipal Separate Storm Sewer System (MS4) Discharges
Receiving Waters	Inland Surface Waters, Enclosed Bays and Estuaries, and Coastal Ocean Waters of the San Diego Region

Table 3. Administrative Information

This Order was adopted by the San Diego Water Board on:	**Month Day, 2013**
This Order will become effective on:	**Month Day, 2013**
This Order will expire on:	**Month Day, 2018**
The Copermittees must file a Report of Waste Discharge in accordance with Title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than 180 days in advance of the Order expiration date.	

I, David W. Gibson, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on Month Day, 2013.

TENTATIVE

David W. Gibson
Executive Officer

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ATTACHMENTS

Attachment A - Discharge Prohibitions and Special Protections A-1
Attachment B - Standard Permit Provisions and General Provisions B-1
Attachment C - Acronyms, Abbreviations and Definitions C-1
Attachment D - Jurisdictional Runoff Management Program Annual Report Form D-1
Attachment E - Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2013-0001 ..... E-1
Attachment F - Fact Sheet / Technical Report for Order No. R9-2013-0001 ..... F-1

I. FINDINGS

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), finds that:

JURISDICTION

1. **MS4 Ownership or Operation.** Each of the Copermittees owns or operates an MS4, through which it discharges storm water and non-storm water into waters of the U.S. within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the U.S.

2. **Legal and Regulatory Authority.** This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]) adopted by the United States Environmental Protection Agency (USEPA), and chapter 5.5, division 7 of the California Water Code (CWC) (commencing with section 13370). This Order serves as an NPDES permit for discharges from MS4s to surface waters. This Order also serves as waste discharge requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

   The San Diego Water Board has the legal authority to issue a regional MS4 permit pursuant to its authority under CWA section 402(p)(3)(B) and 40 CFR 122.26(a)(1)(v). The USEPA also made it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide permits (55 Federal Register [FR] 47990, 48039-48042). The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees and San Diego Water Board.

   The federal regulations make it clear that the Copermittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators (40 CFR 122.26(a)(3)(vi)). This Order does not require the Copermittees to manage storm water outside of their jurisdictional boundaries, but rather to work collectively to improve storm water management within watersheds.

3. **CWA NPDES Permit Conditions.** Pursuant to CWA section 402(p)(3)(B), NPDES permits for storm water discharges from MS4s must include requirements to effectively prohibit non-storm water discharges into MS4s, and require controls to reduce the discharge of pollutants in storm water to the maximum extent practicable (MEP), and to require other provisions as the San Diego Water Board determines are appropriate to control such pollutants. This Order prescribes conditions to assure

compliance with the CWA requirements for owners and operators of MS4s to effectively prohibit non-storm water discharges in to the MS4s, and require controls to reduce the discharge of pollutants in storm water from the MS4s to the MEP.

4. **CWA and CWC Monitoring Requirements.** CWA section 308(a) and 40 CFR 122.41(h),(j)-(l) and 122.48 require that NPDES permits must specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s also specify additional monitoring and reporting requirements in 40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c). CWC section 13383 authorizes the San Diego Water Board to establish monitoring, inspection, entry, reporting and recordkeeping requirements. This Order establishes monitoring and reporting requirements to implement federal and State requirements.

5. **Total Maximum Daily Loads.** CWA section 303(d)(1)(A) requires that "[e]ach state shall identify those waters within its boundaries for which the effluent limitations…are not stringent enough to implement any water quality standard applicable to such waters." The CWA also requires states to establish a priority ranking of impaired water bodies known as Water Quality Limited Segments and to establish Total Maximum Daily Loads (TMDLs) for such waters. This priority list of impaired water bodies is called the Clean Water Act Section 303(d) List of Water Quality Limited Segments, commonly referred to as the 303(d) List. The CWA requires the 303(d) List to be updated every two years.

   TMDLs are numerical calculations of the maximum amount of a pollutant that a water body can assimilate and still meet water quality standards. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point sources (waste load allocations or WLAs) and non-point sources (load allocations or LAs), background contribution, plus a margin of safety. Discharges from MS4s are point source discharges. The federal regulations (40 CFR 122.44(d)(1)(vii)(B)) require that NPDES permits to incorporate water quality based effluent limitations (WQBELs) developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, consistent with the assumptions and requirements of any available WLA for the discharge. Requirements of this Order implement the TMDLs adopted by the San Diego Water Board and approved by USEPA.

6. **Non-Storm Water Discharges.** Pursuant to CWA section 402(p)(3)(B)(ii), this Order requires each Copermittee to effectively prohibit discharges of non-storm water into its MS4. Nevertheless, non-storm water discharges into and from the MS4s continue to be reported to the San Diego Water Board by the Copermittees and other persons. Monitoring conducted by the Copermittees, as well as the 303(d) List, have identified dry weather, non-storm water discharges from the MS4s as a source of pollutants causing or contributing to receiving water quality impairments in the San Diego Region. The federal regulations (40 CFR 122.26(d)(2)(iv)(B)(1)) require the Copermittees to have a program to prevent illicit discharges to the MS4. The federal regulations, however, allow for specific categories of non-storm water discharges or flows to be addressed as illicit discharges only where such discharges

are identified as sources of pollutants to waters of the U.S.

7. **In-Stream Treatment Systems.** Pursuant to federal regulations (40 CFR 131.10(a)), in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S. Authorizing the construction of a runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to accepting waste assimilation as an appropriate use for that water body. Runoff treatment must occur prior to the discharge of runoff into receiving waters. Treatment control best management practices (BMPs) must not be constructed in waters of the U.S. Construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body.

DISCHARGE CHARACTERISTICS AND RUNOFF MANAGEMENT

8. **Point Source Discharges of Pollutants.** Discharges from the MS4s contain waste, as defined in the CWC, and pollutants that adversely affect the quality of the waters of the state. A discharge from an MS4 is a “discharge of pollutants from a point source” into waters of the U.S. as defined in the CWA. Storm water and non-storm water discharges from the MS4s contain pollutants that cause or threaten to cause a violation of surface water quality standards, as outlined in the Water Quality Control Plan for the San Diego Basin (Basin Plan). Storm water and non-storm water discharges from the MS4s are subject to the conditions and requirements established in the Basin Plan for point source discharges.

9. **Potential Beneficial Use Impairment.** The discharge of pollutants and/or increased flows from MS4s may cause or threaten to cause the concentration of pollutants to exceed applicable receiving water quality objectives and impair or threaten to impair designated beneficial uses resulting in a condition of pollution, contamination, or nuisance.

10. **Pollutants Generated by Land Development.** Land development has created and continues to create new sources of non-storm water discharges and pollutants in storm water discharges as human population density increases. This brings higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash. Pollutants from these sources are dumped or washed off the surface by non-storm water or storm water flows into and from the MS4s. When development converts natural vegetated pervious ground cover to impervious surfaces such as paved highways, streets, rooftops, and parking lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving a developed area without BMPs that can maintain pre-development conditions will contain greater pollutant loads and have significantly greater runoff volume, velocity, and peak flow rate than pre-development runoff from the same area.

11. **Runoff Discharges to Receiving Waters.** The MS4s discharge runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within the eleven hydrologic units comprising the San Diego Region. Historic and current development makes use of natural drainage patterns and features as conveyances for runoff. Rivers, streams and creeks in developed areas used in this manner are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and receiving water. Numerous receiving water bodies and water body segments have been designated as impaired by the San Diego Water Board pursuant to CWA section 303(d).

12. **Pollutants in Runoff.** The most common pollutants in runoff discharged from the MS4s include total suspended solids, sediment, pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., cadmium, copper, lead, and zinc), petroleum products and polynuclear aromatic hydrocarbons, synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus), oxygen-demanding substances (e.g., decaying vegetation, animal waste), detergents, and trash. As operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not prohibit or otherwise control. These discharges may cause or contribute to a condition of pollution or a violation of water quality standards.

13. **Human Health and Aquatic Life Impairment.** Pollutants in runoff discharged from the MS4s can threaten and adversely affect human health and aquatic organisms. Adverse responses of organisms to chemicals or physical agents in runoff range from physiological responses such as impaired reproduction or growth anomalies to mortality. Increased volume, velocity, rate, and duration of storm water runoff greatly accelerate the erosion of downstream natural channels. This alters stream channels and habitats and can adversely affect aquatic and terrestrial organisms.

14. **Water Quality Effects.** The Copermittees' water quality monitoring data submitted to date documents persistent exceedances of Basin Plan water quality objectives for runoff-related pollutants at various watershed monitoring stations. Persistent toxicity has also been observed at several watershed monitoring stations. In addition, bioassessment data indicate that the majority of the monitored receiving waters have Poor to Very Poor Index of Biological Integrity (IBI) ratings. These findings indicate that runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in the San Diego Region. Non-storm water discharges from the MS4s have been shown to contribute significant levels of pollutants and flow in arid, developed Southern California watersheds, and contribute significantly to exceedances of applicable receiving water quality objectives.

15. **Non-Storm Water and Storm Water Discharges.** Non-storm water discharges from the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard of CWA section 402(p)(3)(B)(iii), which is explicitly for "Municipal … *Stormwater Discharges* (emphasis added)" from the MS4s. Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s must be effectively prohibited.

16. **Best Management Practices.** Waste and pollutants which are deposited and accumulate in MS4 drainage structures will be discharged from these structures to waters of the U.S. unless they are removed. These discharges may cause or contribute to, or threaten to cause or contribute to, a condition of pollution in receiving waters. For this reason, pollutants in storm water discharges from the MS4s can be and must be effectively reduced in runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Pollution prevention is the reduction or elimination of pollutant generation at its source and is the best "first line of defense". Source control BMPs (both structural and non-structural) minimize the contact between pollutants and runoff, therefore keeping pollutants onsite and out of receiving waters. Treatment control BMPs remove pollutants that have been mobilized by storm water or non-storm water flows.

17. **BMP Implementation.** Runoff needs to be addressed during the three major phases of development (planning, construction, and use) in order to reduce the discharge of storm water pollutants to the MEP, effectively prohibit non-storm water discharges, and protect receiving waters. Development which is not guided by water quality planning policies and principles can result in increased pollutant load discharges, flow rates, and flow durations which can negatively affect receiving water beneficial uses. Construction sites without adequate BMP implementation result in sediment runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. Existing development can generate substantial pollutant loads which are discharged in runoff to receiving waters. Retrofitting areas of existing development with storm water pollutant control and hydromodification management BMPs is necessary to address storm water discharges from existing development that may cause or contribute to a condition of pollution or a violation of water quality standards.

18. **Long Term Planning and Implementation.** Federal regulations require municipal storm water permits to expire 5 years from adoption, after which the permit must be renewed and reissued. The San Diego Water Board recognizes that the degradation of water quality and impacts to beneficial uses of the waters in the San Diego Region occurred over several decades. The San Diego Water Board further recognizes that a decade or more may be necessary to realize demonstrable improvement to the quality of waters in the Region. This Order includes a long term planning and implementation approach that will require more than a single permit term to complete.

WATER QUALITY STANDARDS

19. **Basin Plan.** The San Diego Water Board adopted the Water Quality Control Plan for the San Diego Basin (Basin Plan) on September 8, 1994 that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for receiving waters addressed through the plan. The Basin Plan was subsequently approved by the State Water Resources Control Board (State Water Board) on December 13, 1994. Subsequent revisions to the Basin Plan have also been adopted by the San Diego Water Board and approved by the State Water Board. Requirements of this Order implement the Basin Plan.

    The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Process Supply (PROC), Industrial Service Supply (IND), Ground Water Recharge (GWR), Contact Water Recreation (REC1), Non-contact Water Recreation (REC2), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Freshwater Replenishment (FRSH), Hydropower Generation (POW), and Preservation of Biological Habitats of Special Significance (BIOL). The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region: Navigation (NAV), Commercial and Sport Fishing (COMM), Estuarine Habitat (EST), Marine Habitat (MAR), Aquaculture (AQUA), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN), and Shellfish Harvesting (SHELL).

20. **Ocean Plan.** The State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, and 2005. The State Water Board adopted the latest amendment on April 21, 2005 and it became effective on February 14, 2006. The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean. Requirements of this Order implement the Ocean Plan.

    The Ocean Plan identifies the following beneficial uses of ocean waters of the state to be protected: Industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture; preservation and enhancement of designated Areas of Special Biological Significance; rare and endangered species; marine habitat; fish spawning and shellfish harvesting

21. **Sediment Quality Control Plan**. On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes: 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health,

and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

22. **National Toxics Rule and California Toxics Rule.** USEPA adopted the National Toxics Rule (NTR) on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the NTR applied in California. On May 18, 2000, USEPA adopted the California Toxics Rule (CTR). The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants.

23. **Antidegradation Policy.** This Order is in conformance with the federal Antidegradation Policy described in 40 CFR 131.12, and State Water Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality Waters in California*. Federal regulations at 40 CFR 131.12 require that the State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. State Water Board Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies.

CONSIDERATIONS UNDER FEDERAL AND STATE LAW

24. **Coastal Zone Act Reauthorization Amendments.** Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states with approved coastal zone management programs to address non-point source pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point source pollution: agriculture, silviculture, urban, marinas, and hydromodification. This Order addresses the management measures required for the urban category, with the exception of septic systems. The runoff management programs developed pursuant to this Order fulfills the need for coastal cities to develop a runoff non-point source plan identified in the Non-Point Source Program Strategy and Implementation Plan. The San Diego Water Board addresses septic systems through the administration of other programs.

25. **Endangered Species Act.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 USC sections 1531 to 1544). This Order requires compliance with receiving water limits, and other requirements to protect the beneficial uses of waters of the State. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

26. **Report of Waste Discharge Process.** The waste discharge requirements set forth in this Order are based upon the Report of Waste Discharge submitted by the San Diego County Copermittees prior to the expiration of Order No. R9-2007-0001 (NPDES No. CAS0109266). The Orange County and Riverside County Copermittees are not immediately covered by the waste discharge requirements in this Order. The San Diego Water Board understands that each municipality is unique although the Counties share watersheds and geographical boundaries. The Order will continue to use the Report of Waste Discharge process prior to initially making Orange County or Riverside County Copermittees subject to the requirements of this Order.

    The federal regulations (40 CFR 122.21(d)(2)) and CWC section 13376 impose a duty on the Copermittees to reapply for continued coverage through submittal of a Report of Waste Discharge no later than 180 days prior to expiration of a currently effective permit. This requirement is set forth in the Orange County Copermittees' and Riverside County Copermittees' currently effective permits at Provisions K.2.b and K.2.c, respectively. The Orange County Permit, Order No. R9-2009-0002 (NPDES No. CAS0108740) expires on December 16, 2014 and the Riverside County MS4 Permit, Order No. R9-2010-0016 (NPDES No. CAS0108766) expires on November 10, 2015.

    Unless the Orange County or Riverside County Copermittees apply for and receive early coverage under this Order, the Orange County Copermittees' and the Riverside County Copermittees' respective permits will be superseded by this Order upon expiration of their respective permits, subject to any necessary revisions to the requirements of this Order made after the San Diego Water Board considers their respective Reports of Waste Discharge through the public process provided in 40 CFR 124.

27. **Integrated Report and Clean Water Act Section 303(d) List.** The San Diego Water Board and State Water Board submit an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. USEPA issued its *Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act* on July 29, 2005, which advocates the use of a five category approach for classifying the attainment status of water quality standards for water bodies in the Integrated Report. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 in the Integrated Report are placed on the 303(d) List.

    Water bodies with available data and/or information that indicate at least one beneficial use is not being supported or is threatened, but a TMDL is not required, are included in Category 4 in the Integrated Report. Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal

authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

Implementation of the requirements of this Order may allow the San Diego Water Board to include surface waters impaired by discharges from the Copermittees' MS4s in Category 4 in the Integrated Report for consideration during the next 303(d) List submittal by the State to USEPA.

28. **Economic Considerations.** The California Supreme Court has ruled that although CWC section 13263 requires the State and Regional Water Boards (collectively Water Boards) to consider factors set forth in CWC section 13241 when issuing an NPDES permit, the Water Board may not consider the factors to justify imposing pollutant restrictions that are less stringent than the applicable federal regulations require. (*City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 618, 626-627.) However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

    As noted in the following finding, the San Diego Water Board finds that the requirements in this permit are not more stringent than the minimum federal requirements. Therefore, a CWC section 13241 analysis is not required for permit requirements that implement the effective prohibition on the discharge of non-storm water into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determined appropriate to control such pollutants, as those requirements are mandated by federal law. Notwithstanding the above, the San Diego Water Board has developed an economic analysis of the requirements in this Order. The economic analysis is provided in the Fact Sheet.

29. **Unfunded Mandates.** This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following:

    a. This Order implements federally mandated requirements under CWA section 402 (33 USC section 1342(p)(3)(B)).

    b. The local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental and new dischargers who are issued NPDES permits for storm water and non-storm water discharges.

    c. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order.

    d. The Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)) and in lieu of numeric restrictions on

their MS4 discharges (i.e. effluent limitations).

e. The local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under State law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

f. The provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state develops a TMDL, federal law requires that permits must contain water quality based effluent limitations consistent with the assumptions and requirements of any applicable wasteload allocation (40 CFR 122.44(d)(1)(vii)(B)).

See the Fact Sheet for further discussion of unfunded mandates.

30. **California Environmental Quality Act.** The issuance of waste discharge requirements and an NPDES permit for the discharge of runoff from MS4s to waters of the U.S. is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 et seq.) in accordance with CWC section 13389.

STATE WATER BOARD DECISIONS

31. **Compliance with Prohibitions and Limitations.** The receiving water limitation language specified in this Order is consistent with language recommended by the USEPA and established in State Water Board Order WQ 99-05, *Own Motion Review of the Petition of Environmental Health Coalition to Review Waste Discharge Requirements Order No. 96-03, NPDES Permit No. CAS0108740*, adopted by the State Water Board on June 17, 1999. The receiving water limitation language in this Order requires storm water discharges from MS4s to not cause or contribute to a violation of water quality standards, which is to be achieved through an iterative approach requiring the implementation of improved and better-tailored BMPs over time. Implementation of the iterative approach to comply with receiving water limitations based on applicable water quality standards is necessary to ensure that storm water discharges from the MS4 will not ultimately cause or contribute to violations of water quality standards and will not create conditions of pollution, contamination, or nuisance.

32. **Special Conditions for Areas of Special Biological Significance.** On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving an exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges. State Water Board Resolution No. 2012-0012 requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions

were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject terms and conditions of State Water Board Resolution No. 2012-0012. The Special Protections contained in Attachment B to Resolution No. 2012-0012, applicable to these discharges, are hereby incorporated into this Order as if fully set forth herein.

ADMINISTRATIVE FINDINGS

33. **Executive Officer Delegation of Authority.** The San Diego Water Board by prior resolution has delegated all matters that may legally be delegated to its Executive Officer to act on its behalf pursuant to CWC section 13223. Therefore, the Executive Officer is authorized to act on the San Diego Water Board's behalf on any matter within this Order unless such delegation is unlawful under CWC section 13223 or this Order explicitly states otherwise.

34. **Standard Provisions.** Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR 122.42, are provided in Attachment B to this Order.

35. **Fact Sheet.** The Fact Sheet for this Order contains background information, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of this Order. The Fact Sheet is hereby incorporated into this Order and constitutes part of the Findings of this Order.

36. **Public Notice.** In accordance with State and federal laws and regulations, the San Diego Water Board notified the Copermittees, and interested agencies and persons of its intent to prescribe waste discharge requirements for the control of discharges into and from the MS4s to waters of the U.S. and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet.

37. **Public Hearing.** The San Diego Water Board held a public hearing on Month Day, 2013 and heard and considered all comments pertaining to the terms and conditions of this Order. Details of the public hearing are provided in the Fact Sheet.

38. **Effective Date.** This Order serves as an NPDES permit pursuant to CWA section 401 or amendments thereto, and becomes effective fifty (50) days after the date of its adoption, provided that the Regional Administrator, USEPA, Region IX, does not object to this Order.

39. **Review by the State Water Board.** Any person aggrieved by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with CWC section 13320 and California Code of Regulations, title 23,

sections 2050, et seq. The State Water Board must receive the petition by 5:00 p.m., 30 days after the San Diego Water Board action, except that if the thirtieth day following the action falls on a Saturday, Sunday or State holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

THEREFORE, IT IS HEREBY ORDERED that the Copermittees, in order to meet the provisions contained in division 7 of the CWC and regulations adopted thereunder, and the provisions of the CWA and regulations adopted thereunder, must each comply with the following:

II. PROVISIONS

A. PROHIBITIONS AND LIMITATIONS

The purpose of this provision is to describe the conditions under which storm water and non-storm water discharges into and from MS4s are prohibited or limited. The goal of the prohibitions and limitations is to protect the water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through the implementation of water quality improvement strategies and runoff management programs that effectively prohibit non-storm water discharges into the Copermittees' MS4s, and reduce pollutants in storm water discharges from the Copermittees' MS4s to the MEP.

1. Discharge Prohibitions

a. Discharges from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the state are prohibited.

b. Non-storm water discharges into MS4s are to be effectively prohibited, unless such discharges are either authorized by a separate NPDES permit, or the discharge is a category of non-storm water discharges or flows that must be addressed pursuant to Provisions E.2.a.(1)-(5) of this Order.

c. Discharges from MS4s are subject to all waste discharge prohibitions in the Basin Plan, included in Attachment A to this Order.

d. Storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 applicable to these discharges, included in Attachment A to this Order. All other discharges from the Copermittees' MS4s to ASBS are prohibited.

2. Receiving Water Limitations

a. Discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters, including but not limited to all applicable provisions contained in:

(1) The San Diego Water Board's Basin Plan, including beneficial uses, water quality objectives, and implementation plans;

(2) State Water Board plans for water quality control including the following:

(a) Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries (Thermal Plan), and

(b) The Ocean Plan, including beneficial uses, water quality objectives, and implementation plans;

(3) State Water Board policies for water and sediment quality control including the following:

(a) Water Quality Control Policy for the Enclosed Bays and Estuaries of California,

(b) Sediment Quality Control Plan which includes the following narrative objectives for bays and estuaries:

(i) Pollutants in sediments shall not be present in quantities that, alone or in combination, are toxic to benthic communities, and

(ii) Pollutants shall not be present in sediments at levels that will bioaccumulate in aquatic life to levels that are harmful to human health,

(c) The Statement of Policy with Respect to Maintaining High Quality of Waters in California;[1]

(4) Priority pollutant criteria promulgated by the USEPA through the following:

(a) National Toxics Rule (NTR)[2] (promulgated on December 22, 1992 and amended on May 4, 1995), and

(b) California Toxics Rule (CTR).[3,4]

b. Discharges from MS4s composed of storm water runoff must not alter natural ocean water quality in an ASBS.

[1] State Water Board Resolution No. 68-16
[2] 40 CFR 131.36
[3] 65 Federal Register 31682-31719 (May 18, 2000), adding Section 131.38 to 40 CFR
[4] If a water quality objective and a CTR criterion are in effect for the same priority pollutant, the more stringent of the two applies.

3. Effluent Limitations

a. Technology Based Effluent Limitations

Pollutants in storm water discharges from MS4s must be reduced to the MEP.[5]

b. Water Quality Based Effluent Limitations

This Order establishes water quality based effluent limitations (WQBELs) consistent with the assumptions and requirements of all available TMDL waste load allocations (WLAs) assigned to discharges from the Copermittees' MS4s. Each Copermittee must comply with applicable WQBELs established for the TMDLs in Attachment E to this Order, pursuant to the applicable TMDL compliance schedules.

4. Compliance with Discharge Prohibitions and Receiving Water Limitations

Each Copermittee must achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order through timely implementation of control measures and other actions as specified in Provisions B and E of this Order, including any modifications. The Water Quality Improvement Plans required under Provision B must be designed and adapted to ultimately achieve compliance with Provisions A.1.a, A.1.c and A.2.a.

a. If exceedance(s) of water quality standards persist in receiving waters notwithstanding implementation of this Order, the Copermittees must comply with the following procedures:

(1) For exceedance(s) of a water quality standard in the process of being addressed by the Water Quality Improvement Plan, the Copermittee(s) must implement the Water Quality Improvement Plan as accepted by the San Diego Water Board, and update the Water Quality Improvement Plan, as necessary, pursuant to Provision F.2.c;

(2) Upon a determination by either the Copermittees or the San Diego Water Board that discharges from the MS4 are causing or contributing to a new exceedance of an applicable water quality standard not addressed by the Water Quality Improvement Plan, the Copermittees must submit the following updates to the Water Quality Improvement Plan pursuant to Provision F.2.c or as part of the Annual Report required under Provision F.3.b, unless the San Diego Water Board directs an earlier submittal:

[5] This does not apply to MS4 discharges which receive subsequent treatment to reduce pollutants in storm water discharges to the MEP prior to entering receiving waters (e.g., low flow diversions to the sanitary sewer). Runoff treatment must occur prior to the discharge of runoff into receiving waters per Finding 7.

(a) The water quality improvement strategies being implemented that are effective and will continue to be implemented,

(b) Water quality improvement strategies (i.e. BMPs, retrofitting projects, stream and/or habitat rehabilitation or restoration projects, adjustments to jurisdictional runoff management programs, etc.) that will be implemented to reduce or eliminate any pollutants or conditions that are causing or contributing to the exceedance of water quality standards,

(c) Updates to the schedule for implementation of the existing and additional water quality improvement strategies, and

(d) Updates to the monitoring and assessment program to track progress toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a of this Order;

(3) The San Diego Water Board may require the incorporation of additional modifications to the Water Quality Improvement Plan required under Provision B. The applicable Copermittees must submit any modifications to the update to the Water Quality Improvement Plan within 90 days of notification that additional modifications are required by the San Diego Water Board, or as otherwise directed;

(4) Within 90 days of the San Diego Water Board determination that the update to the Water Quality Improvement Plan meets the requirements of this Order, the applicable Copermittees must revise the jurisdictional runoff management program documents to incorporate the updated water quality improvement strategies that have been and will be implemented, the implementation schedule, and any additional monitoring required; and

(5) Each Copermittee must implement the updated Water Quality Improvement Plan.

b. The procedure set forth above to achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order do not have to be repeated for continuing or recurring exceedances of the same water quality standard(s) following implementation of scheduled actions unless directed to do otherwise by the San Diego Water Board.

c. Nothing in Provisions A.4.a and A.4.b prevents the San Diego Water Board from enforcing any provision of this Order while the applicable Copermittees prepare and implement the above update to the Water Quality Improvement Plan and jurisdictional runoff management programs.

B. WATER QUALITY IMPROVEMENT PLANS

The purpose of this provision is to develop Water Quality Improvement Plans that guide the Copermittees' jurisdictional runoff management programs towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plans is to protect, preserve, enhance, and restore the water quality and designated beneficial uses of waters of the state. This goal will be accomplished through an adaptive planning and management process that identifies the highest priority water quality conditions within a watershed and implements strategies through the jurisdictional runoff management programs to achieve improvements in the quality of discharges from the MS4s and receiving waters.

1. Watershed Management Areas

The Copermittees must develop a Water Quality Improvement Plan for each of the Watershed Management Areas in Table B-1. A total of ten Water Quality Improvement Plans must be developed for the San Diego Region.

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
San Juan (901.00)	South Orange County	- Aliso Creek - San Juan Creek - San Mateo Creek - Pacific Ocean - Heisler Park ASBS	- City of Aliso Viejo[1] - City of Dana Point[1] - City of Laguna Beach[1] - City of Laguna Hills[1] - City of Laguna Niguel[1] - City of Laguna Woods[1] - City of Lake Forest[1] - City of Mission Viejo[1] - City of Rancho Santa Margarita[1] - City of San Clemente[1] - City of San Juan Capistrano[1] - County of Orange[1] - Orange County Flood Control District[1]
Santa Margarita (902.00)	Santa Margarita River	- Murrieta Creek - Temecula Creek - Santa Margarita River - Santa Margarita Lagoon - Pacific Ocean	- City of Murrieta[2] - City of Temecula[2] - City of Wildomar[2] - County of Riverside[2] - County of San Diego[3] - Riverside County Flood Control and Water Conservation District[2]
San Luis Rey (903.00)	San Luis Rey River	- San Luis Rey River - San Luis Rey Estuary - Pacific Ocean	- City of Oceanside - City of Vista - County of San Diego

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
Carlsbad (904.00)	Carlsbad	- Loma Alta Slough - Buena Vista Lagoon - Agua Hedionda Lagoon - Batiquitos Lagoon - San Elijo Lagoon - Pacific Ocean	- City of Carlsbad - City of Encinitas - City of Escondido - City of Oceanside - City of San Marcos - City of Solana Beach - City of Vista - County of San Diego
San Dieguito (905.00)	San Dieguito River	- San Dieguito River - San Dieguito Lagoon - Pacific Ocean	- City of Del Mar - City of Escondido - City of Poway - City of San Diego - City of Solana Beach - County of San Diego
Penasquitos (906.00)	Penasquitos	- Los Penasquitos Lagoon - Pacific Ocean	- City of Del Mar - City of Poway - City of San Diego - County of San Diego
	Mission Bay	- Mission Bay - Pacific Ocean - San Diego Marine Life Refuge ASBS	- City of San Diego
San Diego (907.00)	San Diego River	- San Diego River - Pacific Ocean	- City of El Cajon - City of La Mesa - City of San Diego - City of Santee - County of San Diego
Pueblo San Diego (908.00) Sweetwater (909.00) Otay (910.00)	San Diego Bay	- Sweetwater River - Otay River - San Diego Bay - Pacific Ocean	- City of Chula Vista - City of Coronado - City of Imperial Beach - City of La Mesa - City of Lemon Grove - City of National City - City of San Diego - County of San Diego - San Diego County Regional Airport Authority - San Diego Unified Port District
Tijuana (911.00)	Tijuana River	- Tijuana River - Tijuana Estuary - Pacific Ocean	- City of Imperial Beach - City of San Diego - County of San Diego

Notes:
1. The Orange County Copermittees will be covered under this Order after expiration of Order No. R9-2009-0002, or earlier if the Orange County Copermittees meet the conditions in Provision F.6.
2. The Riverside County Copermittees will be covered under this Order after expiration of Order No. R9-2010-0016, or earlier if the Riverside County Copermittees meet the conditions in Provision F.6.
3. The County of San Diego is required to implement the requirements of Provision B for its jurisdiction within the Santa Margarita River Watershed Management Area until the Riverside County Copermittees have been notified of coverage under this Order.

2. Priority Water Quality Conditions

The Copermittees must identify the water quality priorities within each Watershed Management Area that will be addressed by the Water Quality Improvement Plan. Where appropriate, Watershed Management Areas may be separated into subwatersheds to focus water quality prioritization and jurisdictional runoff management program implementation efforts by receiving water.

a. Assessment of Receiving Water Conditions

The Copermittees must consider the following, at a minimum, to identify water quality priorities based on impacts of MS4 discharges on receiving water beneficial uses:

(1) Receiving waters listed as impaired on the CWA Section 303(d) List of Water Quality Limited Segments (303(d) List);

(2) TMDLs adopted and under development by the San Diego Water Board;

(3) Receiving waters recognized as sensitive or highly valued by the Copermittees, including estuaries designated under the National Estuary Program under CWA section 320, wetlands defined by the State or U.S. Fish and Wildlife Service's National Wetlands Inventory as wetlands, and receiving waters identified as ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (Attachment A);

(4) The receiving water limitations of Provision A.2;

(5) Known historical versus current physical, chemical, and biological water quality conditions;

(6) Available, relevant, and appropriately collected and analyzed physical, chemical, and biological receiving water monitoring data, including, but not limited to, data describing:

(a) Chemical constituents,

(b) Water quality parameters (i.e. pH, temperature, conductivity, etc.),

(c) Toxicity Identification Evaluations for both receiving water column and sediment,

(d) Trash impacts,

(e) Bioassessments, and

(f) Physical habitat;

(7) Available evidence of erosional impacts in receiving waters due to accelerated flows (i.e. hydromodification);

(8) Available evidence of adverse impacts to the chemical, physical, and biological integrity of receiving waters; and

(9) The potential improvements in the overall condition of the Watershed Management Area that can be achieved.

b. ASSESSMENT OF IMPACTS FROM MS4 DISCHARGES

The Copermittees must consider the following, at a minimum, to identify the potential impacts to receiving waters that may be caused or contributed to by discharges from the Copermittees' MS4s:

(1) The discharge prohibitions of Provision A.1 and effluent limitations of Provision A.3; and

(2) Available, relevant, and appropriately collected and analyzed storm water and non-storm water monitoring data from the Copermittees' MS4 outfalls;

(3) Locations of each Copermittee's MS4 outfalls that discharge to receiving waters;

(4) Locations of MS4 outfalls that are known to persistently discharge non-storm water to receiving waters likely causing or contributing to impacts on receiving water beneficial uses;

(5) Locations of MS4 outfalls that are known to discharge pollutants in storm water causing or contributing to impacts on receiving water beneficial uses; and

(6) The potential improvements in the quality of discharges from the MS4 that can be achieved.

c. IDENTIFICATION OF PRIORITY WATER QUALITY CONDITIONS

(1) The Copermittees must use the information gathered for Provisions B.2.a and B.2.b to develop a list of priority water quality conditions as pollutants, stressors and/or receiving water conditions that are the highest threat to receiving water quality or that most adversely affect the physical, chemical, and biological integrity of receiving waters. The list must include the following information for each priority water quality condition:

(a) The beneficial use(s) associated with the priority water quality condition;

(b) The geographic extent of the priority water quality condition within the Watershed Management Area, if known;

(c) The temporal extent of the priority water quality condition (e.g., dry weather and/or wet weather);

(d) The Copermittees with MS4s discharges that may cause or contribute to the priority water quality condition; and

(e) An assessment of the adequacy of and data gaps in the monitoring data to characterize the conditions causing or contributing to the priority water quality condition, including a consideration of spatial and temporal variation.

(2) The Copermittees must identify the highest priority water quality conditions to be addressed by the Water Quality Improvement Plan, and provide a rationale for selecting a subset of the water quality conditions identified pursuant to Provision B.2.c.(1) as the highest priorities.

d. IDENTIFICATION OF MS4 SOURCES OF POLLUTANTS AND/OR STRESSORS

The Copermittees must identify and prioritize known and suspected sources of storm water and non-storm water pollutants and/or other stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c. The identification of known and suspected sources of pollutants and/or stressors that cause or contribute to the highest priority water quality conditions as identified for Provision B.2.c must consider the following:

(1) Pollutant generating facilities, areas, and/or activities within the Watershed Management Area, including:

(a) Each Copermittee's inventory of construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas,

(b) Publicly owned parks and/or recreational areas,

(c) Open space areas,

(d) All currently operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste, and

(e) Areas not within the Copermittees' jurisdictions (e.g., Phase II MS4s, tribal lands, state lands, federal lands) that are known or suspected to be discharging to the Copermittees' MS4s;

(2) Locations of the Copermittees' MS4s, including the following:

(a) All MS4 outfalls that discharge to receiving waters, and

(b) Locations of major structural controls for storm water and non-storm water (e.g., retention basins, detention basins, major infiltration devices, etc.);

(3) Other known and suspected sources of non-storm water or pollutants in storm water discharges to receiving waters within the Watershed Management Area, including the following:

(a) Other MS4 outfalls (e.g., Phase II Municipal and Caltrans),

(b) Other NPDES permitted discharges,

(c) Any other discharges that may be considered point sources (e.g., private outfalls), and

(d) Any other discharges that may be considered non-point sources (e.g., agriculture, wildlife or other natural sources);

(4) Review of available data, including but not limited to:

(a) Findings from the Copermittees' illicit discharge detection and elimination programs,

(b) Findings from the Copermittees' MS4 outfall discharge monitoring,

(c) Findings from the Copermittees' receiving water monitoring,

(d) Findings from the Copermittees' MS4 outfall discharge and receiving water assessments, and

(e) Other available, relevant, and appropriately collected data, information, or studies related to pollutant sources and/or stressors that contribute to the highest priority water quality conditions as identified for Provision B.2.c.

(5) The adequacy of the available data to identify and prioritize sources and/or stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c.

e. NUMERIC GOALS AND SCHEDULES

The Copermittees must develop and incorporate interim and final numeric goals[6] and schedules into the Water Quality Improvement Plan. Numeric goals must be used to support Water Quality Improvement Plan implementation and measure progress towards addressing the highest priority water quality conditions identified under Provision B.2.c. When establishing numeric goals and corresponding schedules, the Copermittees must consider the following:

(1) Final numeric goals must be based on measureable criteria or indicators, to be achieved in the receiving waters and/or MS4 discharges for the highest priority water quality conditions which will be capable of demonstrating the achievement of the restoration and/or protection of water quality standards in receiving waters;

(2) Interim numeric goals must be based on measureable criteria or indicators capable of demonstrating incremental progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges; and

(3) Schedules must be adequate for measuring progress toward achieving the interim and final numeric goals required for Provisions B.2.e.(1) and B.2.e.(2). Schedules must incorporate the following:

(a) Interim dates for achieving the interim numeric goals,

(b) Compliance schedules for any applicable TMDLs in Attachment E to this Order,

(c) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A),

(d) Achievement of the final numeric goals in the receiving waters and/or MS4 discharges for the highest water quality priorities must be as soon as possible, and

(e) Final dates for achieving the final numeric goals must not initially extend more than 10 years beyond the effective date of this Order, unless a longer period of time is authorized by the San Diego Water Board Executive Officer or the schedule includes an applicable TMDL in Attachment E to this Order.

[6] Interim and final numeric goals may take a variety of forms such as TMDL established WQBELs, action levels, pollutant concentration, load reductions, number of impaired water bodies delisted from the List of Water Quality Impaired Segments, Index of Biotic Integrity (IBI) scores, or other appropriate metrics. Interim and final numeric goals are not necessarily limited to one criterion or indicator, but may include multiple criteria and/or indicators. Except for TMDL established WQBELs, interim and final numeric goals and corresponding schedules may be revised through the adaptive management process under Provision B.5.

3. Water Quality Improvement Strategies and Schedules

The Copermittees must develop specific water quality improvement strategies to address the highest priority water quality conditions identified within a Watershed Management Area. The water quality improvement strategies must address the highest priority water quality conditions by preventing or eliminating non-storm water discharges to and from the MS4, reducing pollutants in storm water discharges from the MS4 to the MEP, and restoring and/or protecting the water quality standards of receiving waters.

a. Water Quality Improvement Strategies

The Copermittees must identify and prioritize water quality improvement strategies based on their likely effectiveness and efficiency, and implement strategies to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, improve the physical, chemical, and biological receiving water conditions, and achieve the interim and final numeric goals in accordance with the schedules required for Provision B.2.e.(3). The following water quality improvement strategies must be included and described in the Water Quality Improvement Plan:

(1) Specific strategies and/or activities that may be implemented by one or more Copermittees within their jurisdictions through the jurisdictional runoff management programs that will address the highest priority water quality conditions within the Watershed Management Area, in accordance with the following requirements:

(a) Strategies and/or activities must, at a minimum, be described for each jurisdictional runoff management program component where strategies to address the highest priority water quality conditions are required under Provision E;

(b) The Water Quality Improvement Plan must describe the circumstances or conditions when and where the strategies or/activities should be or will be implemented, but specific details about how each Copermittee will implement the strategies and/or activities within its jurisdiction are not required; and

(c) Descriptions of strategies and/or activities must include any monitoring, information collection, special studies, and/or data analysis that is necessary to assess the effectiveness of the strategy and/or activity toward addressing the highest priority water quality conditions.

(2) Additional strategies and/or activities that may be implemented within the Watershed Management Area on a jurisdictional, sub-watershed, or watershed scale by one or more Copermittees, not specifically required under Provision E, which are designed to achieve the interim and final numeric goals identified in Provisions B.2.e.(1) and B.2.e.(2);

b. IMPLEMENTATION SCHEDULES

(1) The Copermittees must develop schedules for implementing the water quality improvement strategies identified under Provision B.3.a to achieve the interim and final numeric goals identified under Provision B.2.e.(1) and B.2.e.(2). Schedules must be developed for both the water quality improvement strategies implemented by each Copermittee within its jurisdiction and for strategies that the Copermittees choose to implement on a collaborative basis.

(2) The Copermittees must incorporate the implementation compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

4. Water Quality Improvement Monitoring and Assessment Program

a. The Copermittees in each Watershed Management Area must develop and incorporate an integrated monitoring and assessment program into the Water Quality Improvement Plan that assesses: 1) the progress toward achieving the numeric goals and schedules, 2) the progress toward addressing the highest priority water quality conditions for each Watershed Management Area, and 3) each Copermittee's overall efforts to implement the Water Quality Improvement Plan.

b. The monitoring and assessment program must incorporate the monitoring and assessment requirements of Provision D, which may allow the Copermittees to modify the program to be consistent with and focus on the highest priority water quality conditions for each Watershed Management Area.

c. For Watershed Management Areas with applicable TMDLs, the monitoring and assessment program must incorporate the specific monitoring and assessment requirements of Attachment E.

d. For Watershed Management Areas with any ASBS, the water quality monitoring and assessment program must incorporate the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

5. Iterative Approach and Adaptive Management Process

The Copermittees in each Watershed Management Area must implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a, and must include the following:

a. Re-Evaluation of Priority Water Quality Conditions

The priority water quality conditions, and numeric goals and corresponding schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.2.c and B.2.e, may be re-evaluated by the Copermittees as needed during the term of this Order as part of the Annual Report. Re-evaluation and recommendations for modifications to the priority water quality conditions, and numeric goals and corresponding schedules must be provided in the Report of Waste Discharge, and must consider the following:

(1) Achieving the outcome of improved water quality in MS4 discharges and receiving waters through implementation of the water quality improvement strategies identified in the Water Quality Improvement Plan;

(2) Progress toward achieving interim and final numeric goals in receiving waters and/or MS4 discharges for the highest priority water quality conditions in the Watershed Management Area,

(3) Progress toward achieving outcomes according to established schedules;

(4) New information developed when the requirements of Provisions B.2.a-c have been re-evaluated;

(5) New policies or regulations that may affect identified numeric goals;

(6) Spatial and temporal accuracy of monitoring data collected to inform prioritization of water quality conditions and implementation strategies to address the highest priority water quality conditions;

(7) Availability of new information and data from sources other than the jurisdictional runoff management programs within the Watershed Management Area that informs the effectiveness of the actions implemented by the Copermittees;

(8) San Diego Water Board recommendations; and

(9) Recommendations for modifications solicited through a public participation process.

b. Adaptation of Strategies and Schedules

The water quality improvement strategies and schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.3, must be re-evaluated and adapted as new information becomes available to result in more effective and efficient measures to achieve the numeric goals established pursuant to Provision B.2.e. Re-evaluation of and modifications to the water quality improvement strategies must be provided in the Annual Report, and must consider the following:

(1) Modifications to the priority water quality conditions, and numeric goals and corresponding schedules based on Provision B.5.a;

(2) Measurable or demonstrable reductions of non-storm water discharges to and from each Copermittee's MS4;

(3) Measurable or demonstrable reductions of pollutants in storm water discharges from each Copermittee's MS4 to the MEP;

(4) New information developed when the requirements of Provisions B.2.b and B.2.d have been re-evaluated;

(5) Efficiency in implementing the Water Quality Improvement Plan;

(6) San Diego Water Board recommendations; and

(7) Recommendations for modifications solicited through a public participation process.

c. ADAPTATION OF MONITORING AND ASSESSMENT PROGRAM

The water quality improvement monitoring and assessment program, included in the Water Quality Improvement Plan pursuant to Provisions B.4, must be re-evaluated and adapted when new information becomes available. Re-evaluation and recommendations for modifications to the monitoring and assessment program, pursuant to the requirements of Provision D, may be provided in the Annual Report, but must be provided in the Report of Waste Discharge.

6. Water Quality Improvement Plan Submittal, Updates, and Implementation

a. The Copermittees must submit the Water Quality Improvement Plans in accordance with the requirements of Provision F.1.

b. The Copermittees must submit proposed updates to the Water Quality Improvement Plan for acceptance by the San Diego Water Board Executive Officer in accordance with the requirements of Provision F.2.c.

c. The Copermittees must commence with implementation of the Water Quality Improvement Plans immediately after acceptance by the San Diego Water Board, in accordance with the schedules, or subsequently updated schedules, within the Water Quality Improvement Plan.

C. ACTION LEVELS

The purpose of this provision is for the Copermittees to incorporate numeric action levels in the Water Quality Improvement Plans. The goal of the action levels is to guide Water Quality Improvement Plan implementation efforts and measure progress towards the protection of water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through monitoring and assessing the quality of the MS4 discharges during the implementation of the Water Quality Improvement Plans.

1. Non-Storm Water Action Levels[7]

The Copermittees must develop and incorporate numeric non-storm water action levels (NALs) into the Water Quality Improvement Plan to: 1) support the development and prioritization of water quality improvement strategies for addressing non-storm water discharges to and from the MS4s, 2) assess the effectiveness of the water quality improvement strategies toward addressing MS4 non-storm water discharges, required pursuant to Provision D.4.b.(1), and 3) support the detection and elimination of non-storm water and illicit discharges to and from the MS4, required pursuant to Provision E.2.[8]

a. The following NALs must be incorporated:

(1) Non-Storm Water Discharges from MS4s to Ocean Surf Zone

Table C-1. Non-Storm Water Action Levels for Discharges from MS4s to Ocean Surf Zone

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Total Coliform	MPN/100 ml	1,000	-	10,000/1,000[1]	OP
Fecal Coliform	MPN/100 ml	200[2]	-	400	OP
Enterococci	MPN/100 ml	35	-	104[3]	OP

Abbreviations/Acronyms
AMAL – average monthly action level
MDAL – maximum daily action level
OP – Ocean Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Total coliform density NAL is 1,000 MPN/100 ml when the fecal/total coliform ratio exceeds 0.1.
2. Fecal coliform density NAL is 200 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas."

[7] NALs are not considered by the San Diego Water Board to be enforceable limitations.
[8] The Copermittees may utilize NALs or other benchmarks currently established by the Copermittees as interim NALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

(2) Non-Storm Water Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Table C-2. Non-Storm Water Action Levels for Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Turbidity	NTU	75	-	225	OP
pH	Units	Within limit of 6.0 to 9.0 at all times			OP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	35	-	104[3]	BP
Priority Pollutants	ug/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
OP – Ocean Plan water quality objective
NTU – Nephelometric Turbidity Units
ug/L – micrograms per liter
MDAL – maximum daily action level
BP – Basin Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas" and is not applicable to waterbodies that are not designated with the water contact recreation (REC-1) beneficial use.

Table C-3. Non-Storm Water Action Levels for Priority Pollutants

Parameter	Units	Freshwater (CTR)		Saltwater (CTR)	
		MDAL	AMAL	MDAL	AMAL
Cadmium	ug/L	**	**	16	8
Copper	ug/L	*	*	5.8	2.9
Chromium III	ug/L	**	**	-	-
Chromium VI	ug/L	16	8.1	83	41
Lead	ug/L	*	*	14	2.9
Nickel	ug/L	**	**	14	6.8
Silver	ug/L	*	*	2.2	1.1
Zinc	ug/L	*	*	95	47

Abbreviations/Acronyms:
CTR – California Toxic Rule
AMAL – average monthly action level
ug/L – micrograms per liter
MDAL – maximum daily action level

Notes:
* Action levels developed on a case-by-case basis (see below)
** Action levels developed on a case-by-case basis (see below), but calculated criteria are not to exceed Maximum Contaminant Levels (MCLs) under the California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64431

The Cadmium, Copper, Chromium (III), Lead, Nickel, Silver and Zinc NALs for MS4 discharges to freshwater receiving waters will be developed on a case-by-case basis because the freshwater criteria are based on site-specific water quality data (receiving water hardness). For these priority pollutants, the following equations (40 CFR 131.38.b.2) will be required:

Cadmium (Total Recoverable) = exp(0.7852[ln(hardness)] - 2.715)
Chromium III (Total Recoverable) = exp(0.8190[ln(hardness)] + 0.6848)
Copper (Total Recoverable) = exp(0.8545[ln(hardness)] - 1.702)
Lead (Total Recoverable) = exp(1.273[ln(hardness)] - 4.705)
Nickel (Total Recoverable) = exp(.8460[ln(hardness)] + 0.0584)
Silver (Total Recoverable) = exp(1.72[ln(hardness)] - 6.52)
Zinc (Total Recoverable) = exp(0.8473[ln(hardness)] + 0.884)

(3) Non-Storm Water Discharges from MS4s to Inland Surface Waters

Table C-4. Non-Storm Water Action Levels for Discharges from MS4s to Inland Surface Waters

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Dissolved Oxygen	mg/L	Not less than 5.0 in WARM waters and not less than 6.0 in COLD waters			BP
Turbidity	NTU	-	20	See MDAL	BP
pH	Units	Within limit of 6.5 to 8.5 at all times			BP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	33	-	61[3]	BP
Total Nitrogen	mg/L	-	1.0	See MDAL	BP
Total Phosphorus	mg/L	-	0.1	See MDAL	BP
MBAS	mg/L	-	0.5	See MDAL	BP
Iron	mg/L	-	0.3	See MDAL	BP
Manganese	mg/L	-	0.05	See MDAL	BP
Priority Pollutants	ug/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
BP – Basin Plan water quality objective
COLD – cold freshwater habitat beneficial use
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
MDAL – maximum daily action level
WARM – warm freshwater habitat beneficial use
MBAS – Methylene Blue Active Substances
MPN/100 ml – most probable number per 100 milliliters
ug/L – micrograms per liter

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for freshwater "designated beach areas" and is not applicable to waterbodies that are not designated with the water contact recreation (REC-1) beneficial use.

b. If not identified in Provision C.1.a, NALs must be identified, developed and incorporated in the Water Quality Improvement Plan for any pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in waters of the state associated with the highest priority water quality conditions related to non-storm water discharges from the MS4s. NALs must be based on:

(1) Applicable water quality standards which may be dependent upon site-specific or receiving water-specific conditions or assumptions to be identified by the Copermittees; or

(2) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the NALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary NALs specific to the Watershed Management Area at levels greater than the NALs required by Provisions C.1.a and C.1.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for addressing non-storm water discharges to and from the MS4s, as well as the detection and

elimination of non-storm water and illicit discharges to and from the MS4. The secondary NALs may be developed using an approach acceptable to the San Diego Water Board.

d. Dry weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.b may be utilized to develop or revise NALs based on watershed-specific data, subject to San Diego Water Board Executive Officer approval.

2. Storm Water Action Levels[9]

The Copermittees must develop and incorporate numeric storm water action levels (SALs) in the Water Quality Improvement Plans to: 1) support the development and prioritization of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s, and 2) assess the effectiveness of the water quality improvement strategies toward reducing pollutants in storm water discharges, required pursuant to Provision D.4.b.(2).[10]

a. The following SALs for discharges of storm water from the MS4 must be incorporated:

Table C-5. Storm Water Action Levels for Discharges from MS4s to Receiving Waters

Parameter	Units	Action Level
Turbidity	NTU	126
Nitrate & Nitrite (Total)	mg/L	2.6
Phosphorus (Total P)	mg/L	1.46
Cadmium (Total Cd)*	µg/L	3.0
Copper (Total Cu)*	µg/L	127
Lead (Total Pb)*	µg/L	250
Zinc (Total Zn)*	µg/L	976

Abbreviations/Acronyms:
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
ug/L – micrograms per liter

Notes:
* The sampling must include a measure of receiving water hardness at each MS4 outfall. If a total metal concentration exceeds the corresponding metals SAL in Table C-5, that concentration must be compared to the California Toxics Rule criteria and the USEPA 1-hour maximum concentration for the detected level of receiving water hardness associated with that sample. If it is determined that the sample's total metal concentration for that specific metal exceeds that SAL, but does not exceed the applicable USEPA 1-hour maximum concentration criterion for the measured level of hardness, then the sample result will not be considered above the SAL for that measurement.

[9] SALs are not considered by the San Diego Water Board to be enforceable limitations.
[10] The Copermittees may utilize SALs or other benchmarks currently established by the Copermittees as interim SALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

b. If not identified in Provision C.2.a, SALs must be identified, developed and incorporated in the Water Quality Improvement Plan for pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in waters of the state associated with the highest water quality priorities related to storm water discharges from the MS4s. SALs must be based on:

(1) Federal and State water quality guidance and/or water quality standards; and

(2) Site-specific or receiving water-specific conditions; or

(3) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the SALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary SALs specific to the Watershed Management Area at levels greater than the SALs required by Provisions C.2.a and C.2.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s. The secondary SALs may be developed based on the approaches recommended by the State Water Board's Storm Water Panel[11] or using an approach acceptable to the San Diego Water Board.

d. Wet weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.c may be used to develop or revise SALs based upon watershed-specific data, subject to San Diego Water Board Executive Officer approval.

[11] Storm Water Panel Recommendations to the California State Water Resources Control Board: The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities (June 2006)

D. MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS

The purpose of this provision is for the Copermittees to monitor and assess the impact on the chemical, physical, and biological conditions of receiving waters caused by discharges from the Copermittees' MS4s under wet weather and dry weather conditions. The goal of the monitoring and assessment program is to inform the Copermittees about the nexus between the health of receiving waters and the water quality condition of the discharges from their MS4s. This goal will be accomplished through monitoring and assessing the conditions of the receiving waters, discharges from the MS4s, pollutant sources and/or stressors, and effectiveness of the water quality improvement strategies implemented as part of the Water Quality Improvement Plans.

1. Receiving Water Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the condition of the receiving waters in each Watershed Management Area during dry weather and wet weather. Following acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct long-term receiving water monitoring during implementation of the Water Quality Improvement Plan to assess the long term trends and determine if conditions in receiving waters are improving. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following receiving water monitoring procedures:

a. TRANSITIONAL RECEIVING WATER MONITORING

Until the monitoring requirements of Provisions D.1.b-e are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following receiving water monitoring in the Watershed Management Area:

(1) Continue the receiving water monitoring programs required in Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016;

(2) Continue the monitoring in the Hydromodification Management Plans approved by the San Diego Water Board;

(3) Participate in the following regional receiving water monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring,

(b) Southern California Bight Regional Monitoring, and

(c) Sediment Quality Monitoring;

(4) Implement the monitoring programs developed as part of any implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) for the TMDLs in Attachment E to this Order; and

(5) For Watershed Management Areas with ASBS, implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

b. LONG-TERM RECEIVING WATER MONITORING STATIONS

The Copermittees must select at least one long-term receiving water monitoring station from among the existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees to be representative of the receiving water quality in the Watershed Management Area. Additional long-term receiving water monitoring stations must be selected where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

c. DRY WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three dry weather monitoring events at each of the long-term receiving water monitoring stations. At least one monitoring event must be conducted during the dry season (May 1 – September 30) and at least one monitoring event must be conducted during a dry weather period during the wet season (October 1 – April 30), after the first wet weather event of the season, with an antecedent dry period of at least 72 hours following a storm event producing measureable rainfall of greater than 0.1 inch.

(1) Dry Weather Receiving Water Field Observations

For each dry weather monitoring event, the Copermittees must record field observations consistent with Table D-1 at each long-term receiving water monitoring station.

Table D-1. Field Observations for Receiving Water Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) • Station description (i.e. deposits or stains, vegetation condition, structural condition, and observable biology) • Presence and assessment of trash in and around station

(2) Dry Weather Receiving Water Field Monitoring

For each dry weather monitoring event, if conditions allow the collection of the data, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

Table D-2. Field Monitoring Parameters for Receiving Water Monitoring Stations

Parameters
• pH • Temperature • Specific conductivity • Dissolved oxygen • Turbidity

(3) Dry Weather Receiving Water Analytical Monitoring

For each dry weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable NAL constituents, and

(v) Constituents listed in Table D-3.

Table D-3. Analytical Monitoring Constituents for Receiving Water Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Pesticides	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Mercury • Nickel • Selenium • Thallium • Zinc	• Organophosphate Pesticides • Pyrethroid Pesticides	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(4) Dry Weather Receiving Water Toxicity Monitoring

For each dry weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for toxicity in accordance with Table D-4:

Table D-4. Dry Weather Toxicity Testing for Receiving Water Monitoring Stations

Freshwater Organism	Test Approach	USEPA Protocol[2]
Pimephales promelas	1 acute 1 chronic[1]	EPA-821-R-02-012
Hyalella Azteca	1 acute 1 chronic[1]	EPA-821-R-02-012
Psuedokirchneriella subcapitata	1 acute 1 chronic[1]	EPA-821-R-02-013

Notes:
1. Chronic toxicity testing is not required at receiving water monitoring stations located at mass loading stations if the channel flows are diverted year-round during dry weather conditions to the sanitary sewer for treatment.
2. USEPA protocols must be utilized for toxicity testing unless alternate toxicity testing protocols have been approved by the San Diego Water Board.

(5) Dry Weather Receiving Water Bioassessment Monitoring

Bioassessment monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must conduct bioassessment monitoring during at least one dry weather monitoring event at each long-term receiving water monitoring station as follows:

(a) The following bioassessment samples and measurements must be collected:

(i) Macroinvertebrate samples must be collected in accordance with the "Reachwide Benthos (Multihabitat) Procedure" in the most current Surface Water Ambient Monitoring Program (SWAMP) Bioassessment Standard Operating Procedures (SOP), and amendments, as applicable;[12]

(ii) The "Full" suite of physical habitat characterization measurements must be collected in accordance with the most current SWAMP Bioassessment SOP, and as summarized in the SWAMP Stream Habitat Characterization Form – Full Version;[13] and

(iii) Freshwater algae samples must be collected in accordance with the SWAMP Standard Operating Procedures for Collecting Algae

[12] Ode, P.R.. 2007. Standard operating procedures for collecting macroinvertebrate samples and associated physical and chemical data for ambient bioassessments in California. California State Water Resources Control Board Surface Water Ambient Monitoring Program (SWAMP) Bioassessment SOP 001. http://www.swrcb.ca.gov/water_issues/programs/swamp/tools.shtml#monitoring
[13] Available at: http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/reports/fieldforms_fullversion052908.pdf

Samples.[14] Analysis of samples must include algal taxonomic composition (diatoms and soft algae) and algal biomass.

(b) The bioassessment samples, measurements, and appropriate water chemistry data must be used to calculate the following:

(i) An Index of Biological Integrity (IBI) for macroinvertebrates for each monitoring station where bioassessment monitoring was conducted, based on the most current calculation method;[15] and

(ii) An IBI for algae for each monitoring station where bioassessment monitoring was conducted, when a calculation method is developed.[16]

(c) In lieu of the requirements of Provision D.1.c.(5)(a), the Copermittees may conduct the bioassessment monitoring in accordance with the "Triad" assessment approach[17] to calculate the IBIs required for Provision D.1.c.(5)(b). The Copermittees must conduct sampling, analysis, and reporting of specified in-stream biological and habitat data according to the protocols specified in the SCCWRP Technical Report No. 539, or subsequent protocols, if developed.

(6) Dry Weather Receiving Water Hydromodification Monitoring

In addition to the hydromodification monitoring conducted as part of the Copermittees' Hydromodification Management Plans, hydromodification monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must collect the following hydromodification monitoring observations and measurements within an appropriate domain of analysis during at least one dry weather monitoring event for each long-term receiving water monitoring station:

(a) Channel conditions, including:

(i) Channel dimensions,

[14] Fetscher et al. 2009. Standard Operating Procedures for Collecting Stream Algae Samples and Associated Physical Habitat and Chemical Data for Ambient Bioassessments in California.
[15] The most current calculation method at the time the Order was adopted is outlined in "A Quantitative Tool for Assessing the Integrity of Southern California Coastal Streams" (Ode, et al. 2005. Environmental Management. Vol. 35, No. 1, pp. 1-13). If an updated or new calculation method is developed, either both (i.e. current and updated/new) methods must be used, or historical IBIs must be recalculated with the updated or new calculation method.
[16] When a calculation method is developed, IBIs must be calculated for all available and appropriate historical data.
[17] Stormwater Monitoring Coalition Model Monitoring Technical Committee, 2004. Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California. Technical Report #419. August 2004.

(ii) Hydrologic and geomorphic conditions, and

(iii) Presence and condition of vegetation and habitat;

(b) Location of discharge points;

(c) Habitat integrity;

(d) Photo documentation of existing erosion and habitat impacts, with location (i.e. latitude and longitude coordinates) where photos were taken;

(e) Measurement or estimate of dimensions of any existing channel bed or bank eroded areas, including length, width, and depth of any incisions; and

(f) Known or suspected cause(s) of existing downstream erosion or habitat impact, including flow, soil, slope, and vegetation conditions, as well as upstream land uses and contributing new and existing development.

d. WET WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three wet weather monitoring events at each long-term receiving water monitoring station. At least one wet weather monitoring event must be conducted during the first wet weather event of the wet season (October 1 – April 30), and at least one wet weather monitoring event during a wet weather event that occurs after February 1.

(1) Wet Weather Receiving Water Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each long-term receiving water monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event;

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(d) Presence and assessment of trash in and around station.

(2) Wet Weather Receiving Water Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

(3) Wet Weather Receiving Water Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) Constituents listed in Table D-3.

(4) Wet Weather Receiving Water Toxicity Monitoring

For each wet weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for toxicity in accordance with Table D-5:

Table D-5. Wet Weather Toxicity Testing for Receiving Water Monitoring Stations

Freshwater Organism	Test Approach	USEPA Protocol[1]
Pimephales promelas	1 acute	EPA-821-R-02-012
Hyalella Azteca	1 acute	EPA-821-R-02-012
Psuedokirchneriella subcapitata	1 acute	EPA-821-R-02-013

Notes:
1. USEPA protocols must be utilized for toxicity testing unless alternate toxicity testing protocols have been approved by the San Diego Water Board.

e. Other Receiving Water Monitoring Requirements

(1) Regional Monitoring

The Copermittees must participate in the following regional receiving waters monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring; and

(b) Southern California Bight Regional Monitoring.

(2) Sediment Quality Monitoring

The Copermittees must perform sediment monitoring to assess compliance with sediment quality receiving water limits applicable to MS4 discharges to enclosed bays and estuaries. The monitoring may be performed either by individual or multiple Copermittees to assess compliance with receiving water limits, or through participation in a water body monitoring coalition. The Copermittees must identify sediment sampling stations that are spatially representative of the sediment within the water body segment or region of interest. Sediment quality monitoring must be conducted in conformance with the monitoring requirements set forth in the State Water Board Sediment Quality Control Plan.

(3) ASBS Monitoring

For Watershed Management Areas with ASBS, the Copermittees must implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

f. ALTERNATIVE WATERSHED MONITORING REQUIREMENTS

The San Diego Water Board may direct the Copermittees to participate in an effort to develop alternative watershed monitoring with other regulated entities, other interested parties, and the San Diego Water Board to refine, coordinate, and implement regional monitoring and assessment programs to determine the status and trends of water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams.

2. MS4 Outfall Discharge Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the discharges from the MS4 outfalls in each Watershed Management Area during dry weather and wet weather. Following acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct MS4 outfall discharge monitoring during implementation of the Water Quality Improvement Plan to assess the effectiveness of their jurisdictional runoff management programs toward effectively prohibiting non-storm water discharges and reducing pollutants in storm water discharges to and from their MS4s. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following MS4 outfall monitoring procedures:

a. TRANSITIONAL MS4 OUTFALL DISCHARGE MONITORING

Until the monitoring requirements of Provisions D.2.b-c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following MS4 outfall discharge monitoring in the Watershed Management Area:

(1) MS4 Outfall Discharge Monitoring Station Inventory

Each Copermittee must identify all major MS4 outfalls that discharge directly to receiving waters within its jurisdiction and geo-locate those outfalls on a map of the MS4 pursuant to Provision E.2.b.(1). This information must be compiled into a MS4 outfall discharge monitoring station inventory, and must include the following information:

(a) Latitude and longitude of MS4 outfall point of discharge;

(b) Watershed Management Area;

(c) Hydrologic subarea;

(d) Outlet size;

(e) Accessibility (i.e. safety and without disturbance of critical habitat);

(f) Approximate drainage area; and

(g) Classification of whether the MS4 outfall is known to have persistent dry weather flows, transient dry weather flows, no dry weather flows, or unknown dry weather flows.

(2) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Until the monitoring requirements of Provision D.2.b are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, each Copermittee must perform dry weather MS4 outfall field screening monitoring to identify non-storm water and illicit discharges within its jurisdiction in accordance with Provision E.2.c, to determine which discharges are transient flows and which are persistent flows, and prioritize the dry weather MS4 discharges that will be investigated and eliminated in accordance with Provision E.2.d. Each Copermittee must conduct the following dry weather MS4 outfall discharge field screening monitoring within its jurisdiction:

(a) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Frequency

Each Copermittee must field screen the MS4 outfalls in its inventory developed pursuant to Provision D.2.a.(1) as follows:

(i) For Copermittees with less than 125 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 80 percent of the outfalls must be visually inspected two times per year during dry weather conditions.

(ii) For Copermittees with 125 major MS4 outfalls or more, but less than or equal to 500, that discharge to receiving waters within a Watershed Management Area all the outfalls must be visually inspected at least annually during dry weather conditions.

(iii) For Copermittees with more than 500 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 500 outfalls must be visually inspected at least annually

during dry weather conditions. Copermittees with more than 500 major MS4 outfalls within a Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(iv) For Copermittees with more than 500 major MS4 outfalls within its jurisdiction that are located in more than one Watershed Management Area, at least 500 major MS4 outfalls within its inventory must be visually inspected at least annually during dry weather conditions. Copermittees with more than 500 major MS4 outfalls in more than one Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(v) Inspections of major MS4 outfalls conducted in response to public reports and staff or contractor reports and notifications may count toward the required visual inspections of MS4 outfall discharge monitoring stations.

(b) Transitional Dry Weather MS4 Outfall Discharge Field Screening Visual Observations

(i) An antecedent dry period of at least 72 hours following any storm event producing measurable rainfall greater than 0.1 inch is required prior to conducting field screening visual observations during a field screening monitoring event.

(ii) During the field screening monitoring event, each Copermittee must record visual observations consistent with Table D-6 at each MS4 outfall discharge monitoring station inspected.

Table D-6. Field Screening Visual Observations for MS4 Outfall Discharge Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) - Flow source(s) suspected or identified from non-storm water source investigation - Flow source(s) eliminated during non-storm water source identification • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) - Known or suspected source(s) of pooled or ponded water • Station description (i.e. deposits or stains, vegetation condition, structural condition, observable biology) • Presence and assessment of trash in and around station • Evidence or signs of illicit connections or illegal dumping

(iii) Each Copermittee must implement the requirements of Provisions E.2.d.(2)(c)-(e) based on the field observations.

(iv) Each Copermittee must evaluate field observations together with existing information available from prior reports, inspections and monitoring results to determine whether any observed flowing, pooled, or ponded waters are likely to be transient or persistent flow.[18]

(c) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Records

Based upon the results of the transitional dry weather MS4 outfall discharge field screening monitoring conducted pursuant to Provisions D.2.a.(2)(a)-(b), each Copermittee must update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow.

(3) Transitional Wet Weather MS4 Outfall Discharge Monitoring

Until the monitoring requirements of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following

[18] Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(a) Transitional Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees must select at least five wet weather MS4 outfall discharge monitoring stations from the inventories developed pursuant to Provision D.2.a.(1) that are representative of storm water discharges from areas consisting primarily of residential, commercial, industrial, and typical mixed-use land uses present within the Watershed Management Area.

(b) Transitional Wet Weather MS4 Outfall Discharge Monitoring Frequency

Each wet weather MS4 outfall discharge monitoring station selected pursuant to Provision D.2.a.(3)(a) must be monitored twice during the wet season (October 1 – April 30). One wet weather monitoring event must be conducted during the first wet weather event of the wet season, and one wet weather monitoring event at least a month after the first wet weather event of the wet season.

(c) Transitional Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(i) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(ii) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(iii) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(iv) Presence and assessment of trash in and around station.

(d) Transitional Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(e) Transitional Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, and indicator bacteria;

(iv) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

[a] Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or
[b] Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or
[c] If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours;

(v) Only one analysis of the composite of aliquots is required;

(vi) The samples must be analyzed for the following constituents:

[a] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,
[b] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and
[c] Constituents listed in in Table D-7.

Table D-7. Analytical Monitoring Constituents for Wet Weather MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Nickel • Selenium • Thallium • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(f) Other Transitional Wet Weather MS4 Outfall Discharge Monitoring

The San Diego County Copermittees must continue the wet weather MS4 outfall monitoring program developed under Order No. R9-2007-0001, as approved by the San Diego Water Board, through its planned completion.

b. Dry Weather MS4 Outfall Discharge Monitoring

Each Copermittee must perform dry weather MS4 outfall monitoring to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. Each Copermittee must conduct the following dry weather MS4 outfall discharge monitoring within its jurisdiction:

(1) Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Each Copermittee must continue to perform the dry weather MS4 outfall discharge field screening monitoring in accordance with the requirements of Provision D.2.a.(2). The Copermittee may adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of persistent flow non-storm water discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of visual inspections performed is equivalent to the number of visual inspections required under Provision D.2.a.(2)(a).

(2) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring

Each Copermittee must perform non-storm water persistent flow MS4 outfall discharge monitoring to determine which persistent non-storm water discharges contain concentrations of pollutants below NALs, and which persistent non-storm water discharges impact receiving water quality during dry weather. Each Copermittee must conduct the following non-storm water persistent flow MS4 outfall discharge monitoring within its jurisdiction:

(a) Prioritization of Non-Storm Water Persistent Flow MS4 Outfalls

Based upon the dry weather MS4 outfall discharge field screening monitoring records developed pursuant to Provision D.2.a.(2)(c), each Copermittee must identify and prioritize the MS4 outfalls with persistent flows based on the highest priority water quality conditions identified in the Water Quality Improvement Plan and any additional criteria developed by the Copermittee, which may include historical data and data from sources other than what the Copermittee collects.

(b) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring Frequency

(i) Based on the prioritization of major MS4 outfalls developed under Provision D.2.b.(2)(a), each Copermittee must identify, at a minimum, the 10 highest priority major MS4 outfalls with non-storm water persistent flows that the Copermittee will monitor within each Watershed Management Area within its jurisdiction. The location of the highest priority non-storm water persistent flow MS4 outfall monitoring stations must be identified on the map required pursuant to Provision E.2.b.(1).

(ii) Each of the highest priority non-storm water persistent flow MS4 outfall monitoring stations identified pursuant to Provision D.2.b.(2)(b)(i) must be monitored under dry weather conditions at least semi-annually until one of the following occurs:

[a] The non-storm water discharges have been effectively eliminated (i.e. no flowing, pooled, or ponded water) for three consecutive dry weather monitoring events; or

[b] The source(s) of the persistent flows has been identified as a category of non-storm water discharges that does not require an NPDES permit and does not have to be addressed as an illicit discharge because it was not identified as a source of pollutants (i.e. constituents in non-storm water discharge do not exceed NALs), and the persistent flow can be re-prioritized to a lower priority; or

[c] The constituents in the persistent flow non-storm water discharge do not exceed NALs, and the persistent flow can be re-prioritized to a lower priority; or

[d] The source(s) of the persistent flows has been identified as a non-storm water discharge authorized by a separate NPDES permit.

(iii) Where the criteria under Provision D.2.b.(2)(c)(ii) are not met, but the threat to water quality has been reduced by the Copermittee, the highest priority persistent flow MS4 outfall monitoring stations may be reprioritized accordingly for continued dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1).

(iv) Each Copermittee must document removal or re-prioritization of the highest priority persistent flow MS4 outfall monitoring stations identified under Provision D.2.b.(2)(b) in the Annual Report. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized MS4 major outfall in the Watershed Management Area within its jurisdiction, unless there are no remaining qualifying major MS4 outfalls within the Copermittee's jurisdiction in the Watershed Management Area.

(c) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Observations

During each semi-annual monitoring event, each Copermittee must record field observations consistent with Table D-6 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(d) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Monitoring

During each semi-annual monitoring event, if conditions allow the collection of the data, each Copermittee must monitor and record the parameters in Table D-2 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(e) Non-Storm Water Persistent Flow MS4 Outfall Discharge Analytical Monitoring

During each semi-annual monitoring event in which measurable flow is present, each Copermittee must collect and analyze samples from each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Collect grab or composite samples to be analyzed for the following constituents:

[a] Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,
[b] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,
[c] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,
[d] Applicable NAL constituents, and
[e] Constituents listed in Table D-8, unless the Copermittee has historical data that can demonstrate or provide justification that the analysis of the constituent is not necessary.

Table D-8. Analytical Monitoring Constituents for Persistent Flow MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Total Hardness • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Cadmium • Copper • Lead • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(iv) If the Copermittee identifies and eliminates the source of the persistent flow non-storm water discharge, analysis of the sample is not required.

c. Wet Weather MS4 Outfall Discharge Monitoring

The Copermittees must perform wet weather MS4 outfall monitoring to identify sources of pollutants in storm water discharges from the MS4s in the Watershed Management Area. The Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(1) Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees may adjust the wet weather MS4 outfall discharge monitoring locations and frequencies in the Watershed Management Area, as needed, to identify sources of pollutants in storm water discharges from MS4s in the Watershed Management Area in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of stations is at least equivalent to the number of stations required under Provision D.2.a.(3)(a).

(2) Wet Weather MS4 Outfall Discharge Monitoring Frequency

The Copermittees must monitor the wet weather MS4 outfall discharge monitoring stations in the Watershed Management Area at an appropriate frequency to identify sources of pollutants in storm water discharges from the MS4s causing or contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan.

(3) Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(d) Presence and assessment of trash in and around station.

(4) Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(5) Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

(iii) If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours.

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and

(iv) Applicable SAL constituents.

3. Special Studies

a. Within the term of this Order, the Copermittees must develop and implement the following special studies:

(1) At least three special studies in each Watershed Management Area to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that cause or contribute to highest priority water quality conditions identified in the Water Quality Improvement Plan.

(2) At least two special studies for the San Diego Region to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that are impacting receiving waters on a regional basis in the San Diego Region.

(3) One of the three special studies in each Watershed Management Area may be replaced by a special study implemented pursuant to Provision D.3.a.(2).

b. The special studies must, at a minimum, be in conformance with the following criteria:

(1) The special studies must be related to the highest priority water quality conditions identified by the Copermittees in the Watershed Management Area and/or for the entire San Diego Region;

(2) The special studies developed pursuant to Provision D.3.a.(1) must:

(a) Be implemented within the applicable Watershed Management Area, and

(b) Require some form of participation by all the Copermittees within the Watershed Management Area;

(3) The special studies developed pursuant to Provision D.3.a.(2) must:

(a) Be implemented within the San Diego Region, and

(b) Require some form of participation by all Copermittees covered under the requirements of this Order.

c. Special studies developed to identify sources of pollutants and/or stressors should be pollutant and/or stressor specific and based on historical monitoring data and monitoring performed pursuant to Provisions D.1 and D.2. Development of source identification special studies should include the following:

(1) A compilation of known information on the specific pollutant and/or stressor, including data on potential sources and movement of the pollutant and/or stressor within the watershed. Data generated by the Copermittees and others, as well as information available from a literature research on the pollutant and/or stressor should be compiled and analyzed as appropriate.

(2) An identification of data gaps, based on the compiled information generated on the specific pollutant and/or stressor in Provision D.3.d.(1). Source identification special studies should be developed to fill identified data gaps.

(3) A monitoring plan that will collect and provide data the Copermittees can utilize to do the following:

(a) Quantify the relative loading or impact of a pollutant and/or stressor from a particular source or pollutant generating activity;

(b) Improve understanding of the fate of a pollutant and/or stressor in the environment;

(c) Develop an inventory of known and suspected sources of a pollutant and/or stressor in the Watershed Management Area; and/or

(d) Prioritize known and suspected sources of a pollutant and/or stressor based on relative magnitude in discharges, geographical distribution (i.e., regional or localized), frequency of occurrence in discharges, human health risk, and controllability.

d. Special studies initiated prior to the acceptance of the Water Quality Improvement Plan that meet the requirements of Provision D.3.b and are completed during the term of this Order may be utilized to fulfill the special study requirements of Provision D.3.a.

e. The Copermittees must submit the monitoring plans for the special studies in the Water Quality Improvement Plans required pursuant to Provision F.1.

f. The Copermittees are encouraged to share the results of the special studies regionally among the Copermittees to provide information useful in improving and adapting the management of non-storm water and storm water runoff through the implementation of the Water Quality Improvement Plans.

4. Assessment Requirements

Each Copermittee must evaluate the data collected pursuant to Provisions D.1, D.2 and D.3, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E, to assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a. Assessments must be performed as described in the following provisions:

a. Receiving Waters Assessments

(1) The Copermittees must assess and report the conditions of the receiving waters in the Watershed Management Area as follows:

(a) Based on data collected pursuant to Provision D.1.a, the assessments under Provision D.4.a.(2) must be included in the first Annual Report required pursuant to Provision F.3.b.(1).

(b) Based on the data collected pursuant to Provisions D.1.a-e, the assessments required under Provision D.4.a.(2) must be included in the Report of Waste Discharge required pursuant to Provision F.5.b.

(2) The Copermittees must assess the status and trends of receiving water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under dry weather and wet weather conditions. For each of the three types of receiving waters in each Watershed Management Area the Copermittees must:

(a) Determine whether or not the conditions of the receiving waters are protective of the designated beneficial uses;

(b) Identify the most critical beneficial uses that must be protected or restored to ensure overall health of the receiving water;

(c) Determine whether or not those critical beneficial uses are being protected and where those beneficial used must be restored;

(d) Identify short-term and/or long-term improvements or degradation of those critical beneficial uses;

(e) Identify data gaps in the monitoring data necessary to assess Provisions D.4.a.(2)(a)-(d).

b. MS4 Outfall Discharges Assessments

(1) Non-Storm Water Discharges Reduction Assessments

(a) Each Copermittee must assess and report the progress of its illicit discharge detection and elimination program, required to be implemented pursuant to Provision E.2, toward reducing and effectively prohibiting non-storm water and illicit discharges into the MS4 within its jurisdiction as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(2), the assessments under Provision D.4.b.(1)(b) must be included in the first Annual Report required pursuant to Provision F.3.b.(1).

(ii) Based on the data collected pursuant to Provisions D.2.b, the assessments required under Provision D.4.b.(1)(c) must be included in the first Annual Report required pursuant to Provision F.3.b.(1), and annually thereafter.

(iii) Based on the data collected pursuant to Provisions D.2.b, the assessment required under Provision D.4.b.(1)(c) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.a.(2), each Copermittee must assess and report the following:

(i) Identify the known and suspected controllable sources (e.g. facilities, areas, land uses, pollutant generating activities) of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area;

(ii) Identify sources of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area that have been reduced or eliminated; and

(iii) Identify modifications to the field screening monitoring locations and frequencies for the MS4 outfalls in its inventory necessary to identify and eliminate sources of persistent flow non-storm water discharges pursuant to Provision D.2.b.(1).

(c) Based on the dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b, each Copermittee must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(1)(b);

(ii) Based on the data collected and applicable NALs in the Water Quality Improvement Plan, rank the MS4 outfalls in the Copermittee's

jurisdiction according to potential threat to receiving water quality, and produce a prioritized list of major MS4 outfalls for follow-up action to update the Water Quality Improvement Plan, with the goal of eliminating persistent flow non-storm water discharges and/or pollutant loads in order of the ranked priority list through targeted programmatic actions and source investigations;

(iii) For the highest priority major MS4 outfalls with persistent flows that are in exceedance of NALs, identify the known and suspected sources within the Copermittee's jurisdiction in the Watershed Management Area that may cause or contribute to the NAL exceedances;

(iv) Each Copermittee must analyze the data collected pursuant to Provision D.2.b, and utilize a model or other method, to calculate or estimate the non-storm water volumes and pollutant loads discharged from all the major MS4s outfalls in its jurisdiction identified as having persistent dry weather flows during the monitoring year. These calculations or estimates must be updated annually. Each Copermittee must calculate or estimate:

[a] Annual non-storm water volumes and pollutant loads discharged from the Copermittee's major MS4 outfalls to receiving waters within the Copermittee's jurisdiction, with an estimate of the percent contribution from each known and suspected source for each MS4 outfall;

[b] Annual non-storm water volumes and pollutant loads from areas or facilities subject to the Copermittee's legal authority that are discharged from the Copermittee's major MS4 outfalls to downstream receiving waters.

(v) Each Copermittee must review the data collected pursuant to Provision D.2.b and findings from the assessments required pursuant to Provision D.4.b.(1)(c)(i)-(iv) on an annual basis to:

[a] Identify reductions and progress in achieving reductions in non-storm water and illicit discharges to the Copermittee's MS4 in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction, with an estimate, if possible, of the non-storm water volume and/or pollutant load reductions attributable to specific water quality strategies implemented by the Copermittee; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittee in the Watershed Management Area toward reducing

or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction.

(vi) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(v).

(2) Storm Water Pollutant Discharges Reduction Assessments

(a) The Copermittees must assess and report the progress of the water quality improvement strategies, required to be implemented pursuant to Provisions B and E, toward reducing pollutants in storm water discharges from the MS4s within the Watershed Management Area as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(3), the assessments under Provision D.4.b.(2)(b) must be included in the first Annual Report required pursuant to Provision F.3.b.(1).

(ii) Based on the data collected pursuant to Provisions D.2.c, the assessments required under Provision D.4.b.(2)(c) must be included in the first Annual Report required pursuant to Provision F.3.b.(1), and annually thereafter.

(iii) Based on the data collected pursuant to Provisions D.2.c, the assessment required under Provisions D.4.b.(2)(c)-(d) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.a.(3) the Copermittees must assess and report the following:

(i) The Copermittees must analyze the monitoring data collected pursuant to Provision D.2.a.(3), and utilize a watershed model or other method, to calculate or estimate storm water volumes and pollutant loads discharged from the MS4s in each Copermittee's jurisdiction within the Watershed Management Area. The Copermittees must calculate or estimate the following for each monitoring year:

[a] The average storm water runoff coefficient for each land use type within the Watershed Management Area;
[b] The volume of storm water discharged from each of the Copermittee's major MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch;
[c] The pollutant loads discharged from each of the Copermittee's major MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch; and

[d] The percent contribution of storm water volumes and pollutant loads discharged from each land use type within the drainage basin to each of the Copermittee's major MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch.

(ii) Identify modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify sources pollutants in storm water discharges from the MS4s in the Watershed Management Area pursuant to Provision D.2.c.(1).

(c) Based on the wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.c the Copermittees must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(2)(b);

(ii) Based on the data collected and applicable SALs in the Water Quality Improvement Plan, rank the MS4 outfalls in the Watershed Management Area according to potential threat to receiving water quality, and produce a prioritized list of major MS4 outfalls for follow-up action to update the Water Quality Improvement Plan;

(iii) The Copermittees must review the data collected pursuant to Provision D.2.c and findings from the assessments required pursuant to Provisions D.4.b.(2)(c)(i)-(ii) on an annual basis to:

[a] Identify reductions and progress in achieving reductions in pollutant concentrations and/or pollutant loads from different land uses and/or drainage areas discharging from the Copermittees' MS4s in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters within the Watershed Management Area to the MEP, with an estimate, if possible, of the pollutant load reductions attributable to specific water quality strategies implemented by the Copermittees; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittees in the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters in the Watershed Management Area to the MEP.

(iv) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(iii).

(d) The Copermittees must evaluate all the data collected pursuant to Provision D.2.c, and incorporate new outfall monitoring data into time series plots for each long-term monitoring constituent for the Watershed Management Area, and perform statistical trends analysis on the cumulative long-term wet weather MS4 outfall discharge water quality data set.

c. Special Studies Assessments

The Copermittees must annually evaluate the results and findings from the special studies developed and implemented pursuant to Provision D.3, and assess their relevance to the Copermittees' efforts to characterize receiving water conditions, understand sources of pollutants and/or stressors, and control and reduce the discharges of pollutants from the MS4 outfalls to receiving waters in the Watershed Management Area. The Copermittees must report the results of the special studies assessments applicable to the Watershed Management Area, and identify any necessary modifications or updates to the Water Quality Improvement Plan based on the results in the Annual Reports required pursuant to Provision F.3.b.

d. Integrated Assessment of Water Quality Improvement Plan

As part of the iterative approach and adaptive management process required for the Water Quality Improvement Plan pursuant to Provision B.5, the Copermittees in each Watershed Management Area must integrate the data collected pursuant to Provisions D.1-D.3, the findings from the assessments required pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to assess the effectiveness of, and identify necessary modifications to, the Water Quality Improvement Plan as follows:

(1) The Copermittees must re-evaluate the priority water quality conditions and numeric goals for the Watershed Management Area, as needed, during the term of this Order pursuant to Provision B.5.a. The re-evaluation and recommendations for modifications to the priority water quality conditions, and/or numeric goals and corresponding schedules may be provided in the Annual Reports required pursuant to Provision F.3.b, but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The priority water quality conditions and numeric goals for the Watershed Management Area must be re-evaluated as follows:

(a) Re-evaluate the receiving water conditions in the Watershed Management Area in accordance with Provision B.2.a;

(b) Re-evaluate the impacts on receiving waters in the Watershed Management Area from MS4 discharges in accordance with Provision B.2.b;

(c) Re-evaluate the identification of MS4 sources of pollutants and/or stressors in accordance with Provision B.2.d;

(d) Identify beneficial uses of the receiving waters that are protected or must be restored in accordance with Provision D.4.a;

(e) Evaluate the progress toward achieving the interim and final numeric goals for restoring impacted beneficial uses in the receiving waters.

(2) The Copermittees must re-evaluate the water quality improvement strategies for the Watershed Management Area during the term of this Order pursuant to Provision B.5.b. The re-evaluation and recommendations for modifications to the water quality improvement strategies and schedules must be provided in the Annual Reports required pursuant to Provision F.3.b, and provided in the Report of Waste Discharge pursuant to Provision F.5.b. The water quality improvement strategies for the Watershed Management Area must be re-evaluated as follows:

(a) Identify the non-storm water and storm water pollutant loads from the Copermittees' MS4 outfalls in the Watershed Management Area, calculated or estimated pursuant to Provisions D.4.b;

(b) Identify the non-storm water and storm water pollutant load reductions, or other improvements to receiving water or water quality conditions, that are necessary to attain the interim and final numeric goals for restoring impacted beneficial uses in the receiving waters;

(c) Identify the non-storm water and storm water pollutant load reductions, or other improvements to the quality of MS4 discharges, that are necessary for the Copermittees to demonstrate that non-storm water and storm water discharges from their MS4s are not causing or contributing to exceedances of receiving water limitations;

(d) Evaluate the progress of the water quality improvement strategies toward achieving the interim and final numeric goals for restoring impacted beneficial uses in the receiving waters.

(3) The Copermittees must re-evaluate and adapt the water quality monitoring and assessment program for the Watershed Management Area when new information becomes available to improve the monitoring and assessment program pursuant to Provision B.5.c. The re-evaluation and recommendations for modifications to the monitoring and assessment program may be provided in the Annual Reports required pursuant to Provision F.3.b, but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. Modifications to the water quality monitoring and assessment program must be consistent with the

requirements of Provision D.1-D.3. The re-evaluation of the water quality monitoring and assessment program for the Watershed Management Area must consider the data gaps identified by the assessments required pursuant to Provisions D.4.a-b, and results of the special studies implemented pursuant to Provision D.4.c.

5. Monitoring Provisions

Each Copermittee must comply with all the monitoring, reporting, and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

E. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS

The purpose of this provision is for each Copermittee to implement a program to control the contribution of pollutants to and the discharges from the MS4 with its jurisdiction. The goal of the jurisdictional runoff management programs is to implement strategies that effectively prohibit non-storm water discharges to the MS4 and reduce the discharge of pollutants in storm water to the MEP. This goal will be accomplished through implementing the jurisdictional runoff management programs in accordance with the strategies identified in the Water Quality Improvement Plans.

Each Copermittee must update its jurisdictional runoff management program document, in accordance with Provision F.2.a, to incorporate all the requirements of Provision E. Until the Copermittee has updated its jurisdictional runoff management program document with the requirements of Provision E, the Copermittee must continue implementing its current jurisdictional runoff management program.

1. Legal Authority Establishment and Enforcement

a. Each Copermittee must establish, maintain, and enforce adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 through statute, ordinance, permit, contract, order, or similar means. This legal authority must, at a minimum, authorize the Copermittee to:

(1) Prohibit and eliminate all illicit discharges and illicit connections to its MS4;

(2) Control the contribution of pollutants in discharges of runoff associated with industrial and construction activity to its MS4 and control the quality of runoff from industrial and construction sites, including industrial and construction sites which have coverage under the statewide General Permit for Discharges of Storm Water Associated with Industrial Activities (Industrial General Permit) or General Permit for Discharges of Storm Water Associated with Construction Activities (Construction General Permit), as well as to those sites which do not;

(3) Control the discharge of spills, dumping, or disposal of materials other than storm water into its MS4;

(4) Control through interagency agreements among Copermittees the contribution of pollutants from one portion of the MS4 to another portion of the MS4;

(5) Control, by coordinating and cooperating with other owners of the MS4 such as Caltrans, the U.S. federal government, or sovereign Native American Tribes through interagency agreements, where possible, the contribution of pollutants from their portion of the MS4 to the portion of the MS4 within the Copermittee's jurisdiction;

(6) Require compliance with conditions in its statutes, ordinances, permits, contracts, orders, or similar means to hold dischargers to its MS4 accountable for their contributions of pollutants and flows;

(7) Require the use of BMPs to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(8) Require documentation on the effectiveness of BMPs implemented to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(9) Utilize enforcement mechanisms to require compliance with its statutes, ordinances, permits, contracts, orders, or similar means; and

(10) Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with its statutes, ordinances, permits, contracts, orders, or similar means and with the requirements of this Order, including the prohibition of illicit discharges and connections to its MS4; the Copermittee must also have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from industrial facilities, including construction sites, discharging into its MS4.

b. With the first Annual Report required pursuant to Provision F.3.b, each Copermittee must submit a statement certified by its Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative that the Copermittee has taken the necessary steps to obtain and maintain full legal authority within its jurisdiction to implement and enforce each of the requirements contained in this Order.

2. Illicit Discharge Detection and Elimination

Each Copermittee must implement a program to actively detect and eliminate illicit discharges and improper disposal into the MS4, or otherwise require the discharger to apply for and obtain a separate NPDES permit. The illicit discharge detection and elimination program must be implemented in accordance with the strategies identified in the Water Quality Improvement Plan and include, at a minimum, the following requirements:

a. Non-Storm Water Discharges

Each Copermittee must address all non-storm water discharges as illicit discharges, unless a non-storm water discharge is either identified as a discharge authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to the following requirements:

(1) Discharges of non-storm water to the MS4 from the following categories must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG919001 (Order No. R9-2007-0034, or subsequent order) for discharges to San Diego Bay, or NPDES Permit No. CAG919002 (Order No. R9-2008-0002, or subsequent order) for discharges to surface waters other than San Diego Bay:

(a) Uncontaminated pumped ground water;

(b) Discharges from foundation drains;[19]

(c) Water from crawl space pumps; and

(d) Water from footing drains.[19]

(2) Discharges of non-storm water from water line flushing and water main breaks to the MS4 must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG 679001 (Order No. R9-2010-0003, or subsequent order). This category includes water line flushing and water main break discharges from water purveyors issued a water supply permit by the California Department of Public Health or federal military installations. Discharges from recycled or reclaimed water lines to the MS4 must be addressed as illicit discharges, unless the discharges have coverage under a separate NPDES permit.

(3) Discharges of non-storm water to the MS4 from the following categories must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a source of pollutants to receiving waters:

(a) Diverted stream flows;

(b) Rising ground waters;

(c) Uncontaminated ground water infiltration to MS4s;

(d) Springs;

(e) Flows from riparian habitats and wetlands;

(f) Discharges from potable water sources;

[19] Provision E.2.a.(1) only applies to this category on non-storm water if the system is designed to be located at or below the highest historical groundwater table to actively or passively extract groundwater during any part of the year.

(g) Discharges from foundation drains;[20] and

(h) Discharges from footing drains.[20]

(4) Discharges of non-storm water to the MS4 from the following categories must be controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means. Discharges of non-storm water to the MS4 from the following categories not controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means must be addressed by the Copermittee as illicit discharges.

(a) Air conditioning condensation

The discharge of air conditioning condensation must be directed to landscaped areas or other pervious surfaces where feasible.

(b) Individual residential vehicle washing

(i) The discharge of wash water must be directed to landscaped areas or other pervious surfaces where feasible; and

(ii) Minimize the use of water for vehicle washing, use as little washing detergent and other vehicle wash products as possible, wash vehicles at commercial wash facilities, and implement other practices or behaviors that will prevent the discharge of pollutants associated with individual residential vehicle washing from entering the MS4.

(c) Dechlorinated swimming pool discharges

(i) Eliminate residual chlorine, algaecide, filter backwash, or other pollutants from swimming pools prior to discharging to the MS4; and

(ii) The discharge of saline swimming pool water must be directed to the sanitary sewer, landscaped areas, or other pervious surfaces that can accommodate the volume of water, unless the saline swimming pool water can be discharged via a pipe or concrete channel directly to a naturally saline water body (e.g. Pacific Ocean).

(5) Firefighting discharges to the MS4 must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a significant source of pollutants to receiving waters. Firefighting discharges to the MS4 not identified as a significant source of pollutants to receiving waters, must be addressed, at a minimum, as follows:

[20] Provision E.2.a.(3) only applies to this category of non-storm water discharge if the system is designed to be located above the highest historical groundwater table at all times of the year, and the system is only expected to discharge non-storm water under unusual circumstances.

(a) Non-emergency firefighting discharges

(i) Building fire suppression system maintenance discharges (e.g. sprinkler line flushing) to the MS4 must be addressed as illicit discharges.

(ii) Non-emergency firefighting discharges (i.e., discharges from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems) must be addressed by a program, to be developed and implemented by the Copermittee, to reduce or eliminate pollutants in such discharges from entering the MS4.

(b) Emergency firefighting discharges

Each Copermittee should develop and encourage implementation of BMPs to reduce or eliminate pollutants in emergency firefighting discharges to the MS4s and receiving waters within its jurisdiction. During emergency situations, priority of efforts should be directed toward life, property, and the environment (in descending order). BMPs should not interfere with immediate emergency response operations or impact public health and safety.

(6) If the Copermittee or San Diego Water Board identifies any category of non-storm water discharges listed under Provisions E.2.a.(1)-(4) as a source of pollutants to receiving waters, the category must be prohibited through ordinance, order, or similar means and addressed as an illicit discharge.

(7) Each Copermittee must, where feasible, reduce or eliminate non-storm water discharges listed under Provisions E.2.a.(1)-(4) into its MS4 whether or not the non-storm water discharge has been identified as an illicit discharge, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit.

b. PREVENT AND DETECT ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to prevent and detect illicit discharges to the MS4:

(1) Each Copermittee must maintain an updated map of its entire MS4 and the corresponding drainage areas. The accuracy of the MS4 map must be confirmed during the field screening required pursuant to Provision E.2.c. The MS4 map must be included as part of the jurisdictional runoff management program document. Any geographic information system (GIS) layers or files used by the Copermittee to maintain the MS4 map must be made available to the San Diego Water Board upon request. The MS4 map must identify the following:

(a) All segments of the MS4 owned, operated, and maintained by the Copermittee;

(b) All known locations of inlets that discharge and/or collect runoff into the Copermittee's MS4;

(c) All known locations of connections with other MS4s not owned or operated by the Copermittee (e.g. Caltrans MS4s);

(d) All known locations of MS4 outfalls and private outfalls that discharge runoff collected from areas within the Copermittee's jurisdiction;

(e) All segments of receiving waters within the Copermittee's jurisdiction that receive and convey runoff discharged from the Copermittee's MS4 outfalls;

(f) Locations of the MS4 outfalls, identified pursuant to Provision D.2.a.(1), within its jurisdiction; and

(g) Locations of the non-storm water persistent flow MS4 outfall discharge monitoring stations, identified pursuant to Provision D.2.b.(2)(b), within its jurisdiction.

(2) Each Copermittee must use Copermittee personnel and contractors to assist in identifying and reporting illicit discharges and connections during their daily employment activities.

(3) Each Copermittee must promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges to or from the MS4, including the following methods for public reporting:

(a) Operate a public hotline, which can be Copermittee-specific or shared by the Copermittees, and must be capable of receiving reports in both English and Spanish 24 hours per day and seven days per week; and

(b) Designate an e-mail address for receiving electronic reports from the public, which can be Copermittee-specific or shared by the Copermittees, and must be prominently displayed on the Copermittee's webpage and the Regional Clearinghouse required pursuant to Provision F.4.

(4) Each Copermittee must implement practices and procedures (including a notification mechanism) to prevent, respond to, contain, and clean up any spills that may discharge into the MS4 within its jurisdiction from any source. The Copermittee must coordinate, to the extent possible, with spill response teams to prevent entry of spills into the MS4, and prevent contamination of surface water, ground water, and soil. The Copermittee must coordinate spill

prevention, containment, and response activities throughout all appropriate Copermittee departments, programs, and agencies.

(5) Each Copermittee must implement practices and procedures to prevent and limit infiltration of seepage from sanitary sewers (including private laterals and failing septic systems) to the MS4.

(6) Each Copermittee must coordinate, when necessary, with upstream Copermittees and/or entities to prevent illicit discharges from upstream sources into the MS4 within its jurisdiction.

c. Field Screening

Each Copermittee must conduct field screening (i.e. visual observations, field testing, and/or analytical testing) of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4 in accordance with the dry weather MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

d. Investigate and Eliminate Illicit Discharges And Connections

Each Copermittee must include the following measures within its program to investigate and eliminate illicit discharges to the MS4:

(1) Each Copermittee must prioritize and determine when follow-up investigations will be performed in response to visual observations and/or water quality monitoring data collected during an investigation of a detected non-storm water or illicit discharge to or from the MS4. The criteria for prioritizing investigations must consider the following:

(a) Pollutants identified as causing or contributing to the highest water quality priorities identified in the Water Quality Improvement Plan;

(b) Pollutants identified as causing or contributing, or threatening to cause or contribute to impairments in water bodies on the 303(d) List and/or in environmentally sensitive areas (ESAs), located within its jurisdiction;

(c) Pollutants identified from sources or land uses known to exist within the area, drainage basin, or watershed that discharges to the portion of the MS4 within its jurisdiction included in the investigation;

(d) Pollutants identified as causing or contributing to an exceedance of a NAL in the Water Quality Improvement Plan; and

(e) Pollutants identified as a threat to human health or the environment.

(2) Each Copermittee must implement procedures to investigate and inspect portions of its MS4 that, based on reports or notifications, field screening, or other appropriate information, indicate a reasonable potential of receiving, containing, or discharging pollutants due to illicit discharges, illicit connections, or other sources of non-storm water. The procedures must include the following:

(a) Each Copermittee must develop criteria to:

(i) Assess the validity of each report or notification received; and

(ii) Prioritize the response to each report or notification received.

(b) Each Copermittee must prioritize and respond to each valid report or notification (e.g., public reports, staff or contractor reports and notifications, etc.) of an incident in a timely manner.

(c) Each Copermittee must investigate and seek to identify the source(s) of discharges of non-storm water where flows are observed in and from the MS4 during the field screening required pursuant to Provision D.2.b.(1) as follows:

(i) Obvious illicit discharges must be immediately investigated to identify the source(s) of non-storm water discharges;

(ii) The investigation must include field investigations to identify sources or potential sources for the discharge, unless the source or potential source has already been identified during previous investigations; and

(iii) The investigation may include follow-up field investigations and/or reviewing Copermittee inventories and other land use data to identify potential sources of the discharge.

(d) Each Copermittee must maintain records and a database of the following information:

(i) Location of incident, including hydrologic subarea, portion of MS4 receiving the non-storm water or illicit discharge, and point of discharge or potential discharge from MS4 to receiving water;

(ii) Source of information initiating the investigation (e.g., public reports, staff or contractor reports and notifications, field screening, etc.);

(iii) Date the information used to initiate the investigation was received;

(iv) Date the investigation was initiated;

(v) Dates of follow-up investigations;

(vi) Identified or suspected source of the illicit discharge or connection, if

determined;

(vii) Known or suspected related incidents, if any;

(viii) Result of the investigation; and

(ix) If a source cannot be identified and the investigation is not continued, a rationale for why a discharge does not pose a threat to water quality and/or does not require additional investigation.

(e) Each Copermittee must track and seek to identify the source(s) of non-storm water discharges from the MS4 where there is evidence of non-storm water having been discharged into or from the MS4 (e.g., pooled water), in accordance with MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.

(3) Each Copermittee must initiate the implementation of procedures, in a timely manner, to eliminate all detected and identified illicit discharges and connections within its jurisdiction. The procedures must include the following responses:

(a) Each Copermittee must enforce its legal authority, as required under Provision E.1, to eliminate illicit discharges and connections to the MS4.

(b) If the Copermittee identifies the source as a controllable source of non-storm water or illicit discharge or connection, the Copermittee must implement its Enforcement Response Plan pursuant to Provision E.6 and enforce its legal authority to prohibit and eliminate illicit discharges and connections to its MS4.

(c) If the Copermittee identifies the source of the discharge as a category of non-storm water discharges in Provision E.2.a, and the discharge is in exceedance of NALs in the Water Quality Improvement Plan, then the Copermittee must determine if: (1) this is an isolated incident or set of circumstances that will be addressed through its Enforcement Response Plan pursuant to Provision E.6, or (2) the category of discharge must be addressed through the prohibition of that category of discharge as an illicit discharge pursuant to Provision E.2.a.(6).

(d) If the Copermittee suspects the source of the non-storm water discharge as natural in origin (i.e. non-anthropogenically influenced) and in conveyance into the MS4, then the Copermittee must document and provide the data and evidence necessary to demonstrate to the San Diego Water Board that it is natural in origin and does not require further investigation.

(e) If the Copermittee is unable to identify and document the source of a recurring non-storm water discharge to or from the MS4, then the Copermittee must address the discharge as an illicit discharge and update

its jurisdictional runoff management program to address the common and suspected sources of the non-storm water discharge within its jurisdiction in accordance with the Copermittee's priorities.

(4) Each Copermittee must submit a summary of the non-storm water discharges and illicit discharges and connections investigated and eliminated within its jurisdiction with each Annual Report required under Provision F.3.b of this Order.

e. STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the illicit discharge detection and elimination program to address non-storm water and illicit discharges and connections that the Copermittee has identified as potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, and/or increase/decrease frequency of inspections in specific areas); and

(2) The strategies and/or activities must be consistent with the requirements of Provisions E.2.a-d and the strategies identified in the Water Quality Improvement Plan.

3. Development Planning

Each Copermittee must use their land use and planning authorities to implement a development planning program in accordance with the strategies identified in the Water Quality Improvement Plan and includes, at a minimum, the following requirements:

a. BMP REQUIREMENTS FOR ALL DEVELOPMENT PROJECTS

Each Copermittee must prescribe the following BMP requirements during the planning process (i.e. prior to project approval and issuance of local permits) for all development projects (regardless of project type or size), where local permits are issued, including unpaved roads and flood management projects:

(1) <u>General Requirements</u>

(a) Onsite BMPs must be located so as to remove pollutants from runoff prior to its discharge to any receiving waters, and as close to the source as possible; and

(b) Structural BMPs must not be constructed within a waters of the U.S. or waters of the state.

(2) Source Control BMP Requirements

The following source control BMPs must be implemented at all development projects where applicable and feasible:

(a) Prevention of illicit discharges into the MS4;

(b) Storm drain system stenciling or signage;

(c) Properly designed outdoor material storage areas;

(d) Properly designed outdoor work areas;

(e) Properly designed trash storage areas; and

(f) Any additional BMPs necessary to minimize pollutant generation at each project.

(3) Low Impact Development (LID) BMP Requirements

The following LID BMPs must be implemented at all development projects where applicable and feasible:

(a) Maintenance or restoration of natural storage reservoirs and drainage corridors (including topographic depressions, areas of permeable soils, natural swales, and ephemeral and intermittent streams);[21]

(b) Buffer zones for natural water bodies (where buffer zones are technically infeasible, require project applicant to include other buffers such as trees, access restrictions, etc.);

(c) Conservation of natural areas within the project footprint including existing trees, other vegetation, and soils;

(d) Construction of streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided public safety is not compromised;

(e) Minimization of the impervious footprint of the project;

(f) Minimization of soil compaction to landscaped areas;

[21] Development projects proposing to dredge or fill materials in waters of the U.S. must obtain a CWA Section 401 Water Quality Certification. Projects proposing to dredge or fill waters of the state must obtain waste discharge requirements.

(g) Disconnection of impervious surfaces through distributed pervious areas;

(h) Landscaped or other pervious areas designed and constructed to effectively receive and infiltrate, retain and/or treat runoff from impervious areas, prior to discharging to the MS4;

(i) Small collection strategies located at, or as close as possible to, the source (i.e. the point where storm water initially meets the ground) to minimize the transport of runoff and pollutants to the MS4 and receiving waters;

(j) Use of permeable materials for projects with low traffic areas and appropriate soil conditions;

(k) Landscaping with native or drought tolerant species; and

(l) Harvesting and using precipitation.

b. PRIORITY DEVELOPMENT PROJECTS

(1) Definition of Priority Development Project

Priority Development Projects include the following:

(a) All new development projects that fall under the Priority Development Project categories listed under Provision E.3.b.(2) (where a new development project feature, such as a parking lot, falls into a Priority Development Project category, the entire project footprint is subject to Priority Development Project requirements); and

(b) Those redevelopment projects that create, add, or replace at least 5,000 square feet of impervious surfaces on an already developed site, and the redevelopment project is a Priority Development Project category listed under Provision E.3.b.(2) (where redevelopment results in an increase of less than fifty percent of the impervious surfaces of a previously existing development, and the existing development was not subject to Priority Development Project requirements, the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) apply only to the addition or replacement, and not to the entire development; where redevelopment results in an increase of more than fifty percent of the impervious surfaces of a previously existing development, the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) apply to the entire development).

(2) Priority Development Project Categories

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This category includes commercial, industrial, residential, mixed-use, and public development projects on public or private land which fall under the planning and building authority of the Copermittee.

(b) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

(c) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812), where the land area for development is 5,000 square feet or more.

(d) Hillside development projects. This category includes any development which creates 5,000 square feet or more of impervious surface which is located in an area with known erosive soil conditions, where the development will grade on any natural slope that is twenty-five percent or greater.

(e) Environmentally sensitive areas (ESAs). This category includes any development located within, directly adjacent to, or discharging directly to an ESA, which either creates 2,500 square feet of impervious surface on a proposed project site or increases the area of imperviousness of a proposed project site to 10 percent or more of its naturally occurring condition. “Directly adjacent to” means situated within 200 feet of the ESA. “Discharging directly to” means outflow from a drainage conveyance system that collects runoff from the subject development or redevelopment site and terminates at or in receiving waters within the ESA.

(f) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce that has 5,000 square feet or more of impervious surface.

(g) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface that is 5,000 square feet or more used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

(h) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

(i) Large development projects. This category includes any post-construction pollutant-generating new development projects that result in the disturbance of one acre or more of land.

(3) Priority Development Project Exemptions

Each Copermittee has the discretion to exempt the following projects from being defined as Priority Development Projects:

(a) New paved sidewalks, bicycle lanes, or trails that meet the following criteria:

(i) Designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas; OR

(ii) Designed and constructed to be hydraulically disconnected from paved streets or roads; OR

(iii) Designed and constructed with permeable pavements or surfaces in accordance with USEPA Green Streets guidance.[22]

(b) Retrofitting of existing paved alleys, streets or roads that meet the following criteria:

(i) Must be two lanes or less; AND

(ii) Must be a retrofitting project implemented as part of an alternative compliance project option under Provision E.3.c.(3)(b)(v) to achieve the performance requirements of Provisions E.3.c.(1) and/or E.3.c.(2) for a Priority Development Project; AND

(iii) Designed and constructed in accordance with the USEPA Green Streets guidance.[23]

(c) New single family residences that meet the following criteria:

(i) Must not be constructed as part of a larger development or proposed subdivision; AND

(ii) Designed and constructed to be certified under the U.S. Green Building Council (USGCB) Leadership in Energy and Environmental Design (LEED) for Homes green building certification program, receiving at least four (4) Surface Water Management credits under the Sustainable Sites category;[24] OR

[22] See "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).
[23] Ibid.
[24] See LEED for Homes rating system at http://www.usgbc.org

(iii) Designed and constructed with structural BMPs that will achieve the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite.

(d) Redevelopment of existing single family residences that meet the following criteria:

(i) Designed and constructed to be certified under the USGCB LEED for Homes green building certification program, receiving at least four (4) Surface Water Management credits under the Sustainable Sites category; [25] OR

(ii) Designed and constructed with structural BMPs that will achieve the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite.

c. PRIORITY DEVELOPMENT PROJECT STRUCTURAL BMP PERFORMANCE REQUIREMENTS

In addition to the BMP requirements listed for all development projects under Provision E.3.a, Priority Development Projects must also implement structural BMPs that conform to performance requirements below.

(1) Storm Water Pollutant Control BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite structural BMPs to control pollutants in storm water that may be discharged from a project as follows:

(a) Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite the pollutants contained in the design capture volume. The design capture volume is equivalent to:

(i) The volume of storm water produced from a 24-hour 85th percentile storm event;[26] OR

(ii) The volume of storm water that would be retained onsite if the site was fully undeveloped and naturally vegetated, as determined using continuous simulation modeling techniques based on site-specific soil conditions and typical native vegetative cover.

[25] See LEED for Homes rating system at http://www.usgbc.org

[26] This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals.

(b) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) to comply with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1)(a).

(c) If a Priority Development project is allowed to utilize alternative compliance pursuant to Provisions E.3.c.(1)(b), flow-thru conventional treatment control BMPs must be implemented to treat the portion of the design capture volume that is not retained onsite. Additionally, project applicants must mitigate for the portion of the pollutant load in the design capture volume that is not retained onsite through one or more alternative compliance options under Provision E.3.c.(3). Conventional treatment control BMPs must be sized and designed to:

(i) Remove pollutants from storm water to the MEP;

(ii) Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;

(iii) Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Conventional treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of conventional treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

(2) <u>Hydromodification Management BMP Requirements</u>

Each Copermittee must require each Priority Development Project to implement onsite structural BMPs to manage hydromodification that may be caused by storm water runoff discharged from a project as follows:

(a) Post-project runoff flow rates and durations must not exceed pre-development (naturally occurring) runoff flow rates and durations by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat conditions downstream of Priority Development Projects).

(i) In evaluating the range of flows that results in increased potential for erosion of natural (non-hardened) channels, the lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks.

(ii) For artificially hardened channels, analysis to identify the lower boundary must use characteristics of a natural stream segment similar to that found in the watershed. The lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or erodes the toe of the channel banks.

(iii) The Copermittees may use monitoring results collected pursuant to Provision D.1.a.(2) to re-define the range of flows resulting in increased potential for erosion, or degraded instream habitat conditions, as warranted by the data.

(b) Post-project runoff flow rates and durations must compensate for the loss of sediment supply due to the development project, should loss of sediment supply occur as a result of the development project.

(c) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) to comply with the performance requirements of Provisions E.3.c.(2)(a)-(b).

(d) Exemptions

Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provisions E.3.c.(2)(a)-(b) where the project:

(i) Discharges storm water runoff into existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;

(ii) Is a redevelopment Priority Development Project that meets the alternative compliance requirements of Provision E.3.c.(3)(b)(ii); or

(iii) Discharges storm water runoff into other areas identified by the San Diego Water Board as exempt from the requirements of Provisions E.3.c.(2)(a)-(b).

(3) <u>Alternative Compliance to Onsite Structural BMP Performance Requirements</u>

(a) Applicability

At the discretion of each Copermittee, Priority Development Projects may be allowed to utilize an alternative option to comply with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) under the following conditions:

(i) The Copermittee must determine that implementation of the alternative compliance option will have a greater overall water quality

benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite;

(ii) The alternative compliance options must be designed by a registered professional engineer, geologist, architect, or landscape architect;

(iii) The alternative compliance options must be implemented within the same hydrologic unit as the Priority Development Project, and preferably within the same hydrologic subarea;

(iv) Receiving waters must not be utilized to convey storm water runoff to the alternative compliance options;

(v) The pollutants in storm water runoff from the Priority Development Project must be treated to the MEP by the alternative compliance options prior to being discharged to receiving waters;

(vi) Unless otherwise allowed by Provision E.3.c.(3)(b), the alternative compliance options must have a net result of at least the same level of pollutant removal as would have been achieved if the Priority Development Project had fully complied with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1) onsite;

(vii) Unless otherwise allowed by Provision E.3.c.(3)(b), the alternative compliance options must have a net result of at least the same level of protection from potential downstream and upstream erosion in the receiving water as would have been achieved if the Priority Development Project had fully complied with the hydromodification management BMP performance requirements of Provision E.3.c.(2) onsite; and

(viii) The alternative compliance options utilized by the Priority Development Project to comply with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) must have reliable sources of funding for operation and maintenance.

(b) Alternative Compliance Project Options

The Copermittee may allow implementation of one or more of the following project options as part of an alternative approach to complying with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2):

(i) *Onsite LID Biofiltration Treatment Control BMPs*

The Copermittee may allow Priority Development Projects to utilize onsite LID biofiltration treatment control BMPs to comply with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1). Onsite LID biofiltration treatment control BMPs must be sized and designed to:

[a] Remove pollutants from storm water to the MEP; AND
[b] Have an appropriate surface loading rate to prevent erosion, scour and channeling within the BMP; AND
[c] Biofilter at least 1.5 times the design capture volume that is not reliably retained onsite; OR
[d] Biofilter up to the design capture volume that is not reliably retained onsite, AND 1) treat the remaining portion of the design capture volume not retained onsite with conventional treatment control BMPs in accordance with Provision E.3.c.(1)(c), and 2) if necessary, mitigate for the portion of the pollutant load in the design capture volume not retained onsite through one or more alternative compliance project, in-lieu fee and/or water quality credit system options below.

(ii) *LEED Certified Redevelopment Projects*

The Copermittee may allow redevelopment Priority Development Projects to comply with the hydromodification management BMP performance requirements of Provision E.3.c.(2) where the project is designed and constructed to be certified under the USGCB LEED for New Construction and Major Renovations green building certification program. The Priority Development Project must receive at least one (1) Site Design credit and two (2) Stormwater Design credits under the Sustainable Sites category.[27] In addition, the existing and future configuration of the receiving water must not be unnaturally altered or adversely impacted by storm water flow rates and durations discharged from the site.

(iii) *Watershed-Based Planned Development Projects*

The Copermittee may allow Priority Development Projects greater than 100 acres in total project size (or smaller than 100 acres in size yet part of a larger common plan of development that is over 100 acres) to comply with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2). The Priority Development Project must comply with the following conditions:

[a] The Priority Development Project was planned utilizing watershed and/or subwatershed based water quality, hydrologic, and fluvial geomorphologic planning principles that implement regional LID BMPs in accordance with the performance and location criteria of this Order and acceptable to the San Diego Water Board;
[b] Regional LID BMPs may be used provided that the BMPs capture and retain the volume of runoff produced from the design capture volume defined in Provision E.3.c.(1)(a)(i) and that such controls are located upstream of receiving waters;

[27] See LEED for New Construction and Major Renovations rating system at http://www.usgbc.org

[c] Regional LID BMPs must clearly exhibit that they will not result in a net impact from pollutant loadings over and above the impact caused by capture and retention of the design capture volume;

[d] Any portion of the design capture volume that is not retained by the regional LID BMPs must be treated using biofiltration BMPs; and

[e] Where regional LID BMPs are demonstrated to the Copermittee as technically infeasible to retain the entire design capture volume, any volume up to and including the design capture volume not retained by regional LID BMPs, nor treated by biofiltration BMPs, must be treated using conventional treatment control BMPs and the project applicant must implement additional alternative compliance project, in-lieu fee and/or water quality credit system options below.

(iv) *Offsite Regional BMPs*

[a] The Copermittee may allow Priority Development Projects to utilize offsite regional BMPs to comply with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1) if the offsite regional BMPs have the capacity to receive and retain at least 1.1 times the design capture volume that is not reliably retained onsite.

[b] The Copermittee may allow Priority Development Projects to utilize offsite regional BMPs to comply with the hydromodification management BMP performance requirements of Provision E.3.c.(2) if the offsite regional BMPs have the capacity to manage the storm water flows rates and durations from the site such that the receiving waters are protected from the potential for increased erosion that would be caused if the unmanaged portion of the runoff was discharged from the site.

(v) *Offsite Retrofitting Projects*

The Copermittee may allow Priority Development Projects to utilize offsite retrofitting projects to comply with the storm water pollutant control and hydromodification management BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) if the retrofitting projects have been identified within the strategies included in the Water Quality Improvement Plan, or identified as potential retrofitting projects by the Copermittee pursuant to Provision E.5.

(vi) *Offsite Channel, Stream, or Habitat Rehabilitation Projects*

The Copermittee may allow Priority Development Projects to utilize offsite channel, stream, or habitat rehabilitation projects to comply with the hydromodification management BMP performance requirements of Provision E.3.c.(2) if the rehabilitation projects have been identified within the strategies included in the Water Quality

Improvement Plan, or identified as potential channel rehabilitation projects by the Copermittee pursuant to Provision E.5. The channel, stream, or habitat rehabilitation project cannot be utilized for pollutant treatment except where artificial wetlands are constructed and located upstream of receiving waters.

(vii) *Offsite Regional Water Supply Augmentation Projects*

The Copermittee may allow Priority Development Projects to utilize offsite regional water supply augmentation projects (i.e. groundwater recharge, recycled water, storm water harvesting) to comply with the storm water pollutant control and hydromodification management BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) if the projects have been identified within the strategies included in the Water Quality Improvement Plan.

(viii) *Project Applicant Proposed Alternative Compliance Projects*

The Copermittee may allow one or more Priority Development Project applicant(s) to propose and implement alternative compliance projects to comply with the storm water pollutant control and hydromodification management BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) if the alternative compliance projects are consistent with, and will address the highest water quality priorities of the Water Quality Improvement Plan, and comply with the requirements of Provision E.3.c.(3)(a).

(c) Alternative Compliance In-Lieu Fee Option

The Copermittee may develop and implement an alternative compliance in-lieu fee option, individually or with other Copermittees and/or entities, as a means for designing, developing, constructing, operating and maintaining offsite alternative compliance projects under Provision E.3.c.(3)(b). Priority Development Projects allowed to utilize the alternative compliance in-lieu fee option must comply with the following conditions:

(i) The in-lieu fee must be transferred to the Copermittee (for public projects) or an escrow account (for private projects) prior to the date construction of the Priority Development Project is initiated.

(ii) If the in-lieu fee is applied to the development, design and construction of offsite alternative compliance projects, the following conditions must be met:

[a] The offsite alternative compliance projects must allow the Priority Development Project to comply with the onsite BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2);

[b] The offsite alternative compliance projects must be constructed as soon as possible, but no later than 4 years after the certificate of occupancy is granted for the first Priority Development Project that contributed funds toward the construction of the offsite alternative compliance projects, unless a longer period of time is authorized by the San Diego Water Board Executive Officer;

[c] The in-lieu fee for the Priority Development Project must include mitigation of the pollutant loads and increased storm water flow rates and durations that are allowed to discharge from the site before the offsite alternative compliance projects are constructed; and

[d] The in-lieu fee must also include the cost to operate and maintain the offsite alternative compliance projects.

(iii) If the in-lieu fee is applied to the operation and maintenance of offsite alternative compliance projects that have already been constructed, the offsite alternative compliance projects must allow the Priority Development Project to comply with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2).

(d) Alternative Compliance Water Quality Credit System Option

The Copermittee may develop and implement an alternative compliance water quality credit system option, individually or with other Copermittees and/or entities, provided that such a credit system clearly exhibits that it will not allow discharges from Priority Development Projects to cause or contribute to a net impact over and above the impact caused by projects meeting the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2). Any credit system that a Copermittee chooses to implement must be submitted to the San Diego Water Board Executive Officer for review and acceptance as part of the Water Quality Improvement Plan.

(4) Long-Term Structural BMP Maintenance

Each Copermittee must require the project applicant to submit proof of the mechanism under which ongoing long-term maintenance of all structural BMPs will be conducted.

(5) Infiltration and Groundwater Protection

(a) Structural BMPs designed to primarily function as large, centralized infiltration devices (such as large infiltration trenches and infiltration basins) must not cause or contribute to an exceedance of an applicable groundwater quality objective. At a minimum, such infiltration BMPs must be in conformance with the design criteria listed below, unless the development project applicant demonstrates to the Copermittee that one

or more of the specific design criteria listed below are not necessary to protect groundwater quality. The design criteria listed below do not apply to small infiltration systems dispersed throughout a development project.

(i) Runoff must undergo pretreatment such as sedimentation or filtration prior to infiltration;

(ii) Pollution prevention and source control BMPs must be implemented at a level appropriate to protect groundwater quality at sites where infiltration BMPs are to be used;

(iii) Infiltration BMPs must be adequately maintained to remove pollutants in storm water to the MEP;

(iv) The vertical distance from the base of any infiltration BMP to the seasonal high groundwater mark must be at least 10 feet. Where groundwater basins do not support beneficial uses, this vertical distance criteria may be reduced, provided groundwater quality is maintained;

(v) The soil through which infiltration is to occur must have physical and chemical characteristics (e.g., appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses;

(vi) Infiltration BMPs must not be used for areas of industrial or light industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee, unless first treated or filtered to remove pollutants prior to infiltration; and

(vii) Infiltration BMPs must be located a minimum of 100 feet horizontally from any water supply wells.

(b) The Copermittee may develop, individually or with other Copermittees, alternative mandatory design criteria to that listed above for infiltration BMPs which are designed to primarily function as centralized infiltration devices. Before implementing the alternative design criteria in the development planning process the Copermitee(s) must:

(i) Notify the San Diego Water Board of the intent to implement the alternative design criteria submitted; and

(ii) Comply with any conditions set by the San Diego Water Board.

d. BMP Design Manual Update

Each Copermittee must update its BMP Design Manual[28] pursuant to Provision F.2.b. Until the Copermittee has updated its BMP Design Manual with the

[28] The BMP Design Manual was formerly known as the Standard Storm Water Mitigation Plan under Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016.

requirements of Provisions E.3.a-c, the Copermittee must continue implementing its current BMP Design Manual. Unless directed otherwise by the San Diego Water Board, the Copermittee must implement the BMP Design Manual within 180 days of completing the update. The update of the BMP Design Manual must include the following:

(1) Updated procedures to determine the nature and extent of storm water requirements applicable to a potential development or redevelopment projects. These procedures must inform project applicants of the storm water management requirements applicable to their project including, but not limited to, general requirements for all development projects, structural BMP design procedures and requirements, hydromodification management requirements, requirements specific to phased projects, and procedures specific to private developments and public improvement projects;

(2) Updated procedures to identify pollutants and conditions of concern for selecting the most appropriate structural BMPs that consider, at a minimum, the following:

(a) Receiving water quality (including pollutants for which receiving waters are listed as impaired under the CWA section 303(d) List);

(b) Pollutants, stressors, and/or receiving water conditions that cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(c) Land use type of the project and pollutants associated with that land use type; and

(d) Pollutants expected to be present onsite.

(3) Updated procedures for designing structural BMPs, including any updated performance requirements to be consistent with the requirements of Provision E.3.c for all structural BMPs listed in the BMP Design Manual;

(4) Long-term maintenance criteria for each structural BMP listed in the BMP Design Manual; and

(5) Alternative compliance criteria, in accordance with the requirements under Provision E.3.c.(3), if the Copermittee elects to allow Priority Development Projects within its jurisdiction to utilize alternative compliance.

e. Priority Development Project BMP Implementation and Oversight

Each Copermittee must implement a program that requires and confirms structural BMPs on all Priority Development Projects are designed, constructed, and maintained to remove pollutants in storm water to the MEP.

(1) Structural BMP Approval and Verification Process

(a) Each Copermittee must require and confirm that for all Priority Development Project applications that have not received prior lawful approval by the Copermittee by 18 months after the commencement of coverage under this Order, the requirements of Provision E.3 are implemented. For project applications that have received prior lawful approval by 18 months after the commencement of coverage under this Order, the Copermittee may allow previous land development requirements to apply.

(b) Each Copermittee must identify the roles and responsibilities of various municipal departments in implementing the structural BMP requirements, including each stage of a project from application review and approval through BMP maintenance and inspections.

(c) Each Copermittee must require and confirm that appropriate easements and ownerships are properly recorded in public records and the information is conveyed to all appropriate parties when there is a change in project or site ownership.

(d) Each Copermittee must require and confirm that prior to occupancy and/or intended use of any portion of the Priority Development Project, each structural BMP is inspected to verify that it has been constructed and is operating in compliance with all of its specifications, plans, permits, ordinances, and the requirements of this Order.

(2) Priority Development Project Inventory and Prioritization

(a) Each Copermittee must develop, maintain, and update at least annually, a watershed-based database to track and inventory all Priority Development Projects and associated structural BMPs within its jurisdiction. Inventories must be accurate and complete beginning from January 2002 for the San Diego County Copermittees, February 2003 for the Orange County Copermittees, and July 2005 for the Riverside County Copermittees. The use of an automated database system, such as GIS, is highly recommended. The database must include, at a minimum, the following information:

(i) Priority Development Project location (address and hydrologic subarea);

(ii) Descriptions of structural BMP type(s);

(iii) Date(s) of construction;

(iv) Party responsible for structural BMP maintenance;

(v) Dates and findings of structural BMP maintenance verifications; and

(vi) Corrective actions and/or resolutions.

(b) Each Copermittee must prioritize the Priority Development Projects with structural BMPs within its jurisdiction. The designation of Priority Development Projects as high priority must consider the following:

(i) The highest water quality priorities identified in the Water Quality Improvement Plan;

(ii) Receiving water quality;

(iii) Number and sizes of structural BMPs;

(iv) Recommended maintenance frequency of structural BMPs;

(v) Likelihood of operation and maintenance issues of structural BMPs;

(vi) Land use and expected pollutants generated; and

(vii) Compliance record.

(3) Structural BMP Maintenance Verifications and Inspections

Each Copermittee is required to verify that structural BMPs on each Priority Development Project are adequately maintained, and continue to operate effectively to remove pollutants in storm water to the MEP through inspections, self-certifications, surveys, or other equally effective approaches.

(a) All (100 percent) of the structural BMPs at Priority Development Projects that are designated as high priority must be inspected directly by the Copermittee annually prior to each rainy season;

(b) For verifications performed through a means other than direct Copermittee inspection, adequate documentation must be required by the Copermittee to provide assurance that the required maintenance of structural BMPs at each Priority Development Project has been completed; and

(c) Appropriate follow-up measures (including re-inspections, enforcement, etc.) must be conducted to ensure that structural BMPs at each Priority Development Project continue to reduce pollutants in storm water to the MEP as originally designed.

f. DEVELOPMENT PROJECT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all development projects, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

g. STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the development planning program to address development and redevelopment projects that may become sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, increase frequency of verifications and/or inspections, alternative compliance options);

(2) Each Copermittee must identify areas within its jurisdiction where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting and/or stream, channel, or habitat rehabilitation projects;

(3) Each Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify regional alternative compliance projects that Priority Development Projects may be allowed or should be encouraged to implement or participate in implementing; and

(4) The strategies and/or activities must be consistent with the requirements of Provisions E.3.a-c and E.3.e-f and the strategies identified in the Water Quality Improvement Plan.

4. Construction Management

Each Copermittee must implement a construction management program in accordance with the strategies identified in the Water Quality Improvement Plan and includes, at a minimum, the following requirements:

a. PROJECT APPROVAL PROCESS

Prior to issuance of any local permit(s) that allows the commencement of construction projects that involve ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff, each Copermittee must:

(1) Require a site-specific pollution control, construction BMP, and/or erosion and sediment control plan, to be submitted by the project applicant to the Copermittee;

(2) Confirm the pollution control, construction BMP, and/or erosion and sediment control plan, complies with the local grading ordinance, other applicable local ordinances, and the requirements of this Order;

(3) Confirm the pollution control, construction BMP, and/or erosion and sediment control plan, includes seasonally appropriate and effective BMPs and management measures described in Provision E.4.c, as applicable to the project; and

(4) Verify that the project applicant has obtained coverage under applicable permits, including, but not limited to the Construction General Permit, Clean Water Act Section 401 Water Quality Certification and Section 404 Permit, and California Department of Fish and Game Streambed Alteration Agreement.

b. CONSTRUCTION SITE INVENTORY AND TRACKING

(1) Each Copermittee must maintain, and update at least monthly, a watershed-based inventory of all construction projects issued a local permit that allows ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff. The use of an automated database system, such as GIS, is highly recommended. The inventory must include:

(a) Relevant contact information for each site (e.g., name, address, phone, and email for the owner and contractor);

(b) The basic site information including location (address and hydrologic subarea), Waste Discharge Identification (WDID) number (if applicable), size of the site, and approximate area of disturbance;

(c) Whether or not the site is considered a high threat to water quality, as defined in Provision E.4.b.(2) below;

(d) The project start and anticipated completion dates;

(e) Current construction phase;

(f) The required inspection frequency, as defined in the Copermittee's jurisdictional runoff management program document;

(g) The date the Copermittee accepted and/or approved the site-specific pollution control, construction BMP, and/or erosion and sediment control plan; and

(h) Whether or not there are ongoing enforcement actions administered to the site.

(2) Each Copermittee must identify all construction sites within its jurisdiction that represent a high threat to downstream surface water quality. The designation of construction sites as high threat to water quality must consider the following:

(a) Sites located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Sites located within the same hydrologic subarea and tributary to a water body segment listed as impaired for sediment on the CWA section 303(d) List;

(c) Sites located within, directly adjacent to, or discharging directly to a receiving water within an ESA; and

(d) Other sites determined by the Copermittees or the San Diego Water Board as a high threat to water quality.

c. CONSTRUCTION SITE BMP IMPLEMENTATION

Each Copermittee must implement, or require the implementation of effective BMPs to reduce discharges of pollutants in storm water from construction sites to the MEP, and prevent non-storm water discharges from construction sites into the MS4. These BMPs must be site specific, seasonally appropriate, and construction phase appropriate. BMPs must be implemented at each construction site year round. Dry season BMP implementation must plan for and address unseasonal rain events that may occur during the dry season (May 1 through September 30). Copermittees must implement, or require the implementation of, BMPs in the following categories:

(1) Project Planning;

(2) Good Site Management "Housekeeping", including waste management;

(3) Non-storm Water Management;

(4) Erosion Control;

(5) Sediment Control;

(6) Run-on and Run-off Control; and

(7) Active/Passive Sediment Treatment Systems, where applicable.

d. CONSTRUCTION SITE INSPECTIONS

Each Copermittee must conduct construction site inspections to require and confirm compliance with its local permits and applicable local ordinances, and the requirements of this Order. Priority for site inspections must consider threat to water quality pursuant to Provision E.4.b as well as the nature of the construction activity, topography, and the characteristics of soils and receiving water quality.

(1) Inspection Frequency

(a) Each Copermittee must conduct inspections at all inventoried sites, including high threat to water quality sites, at an appropriate frequency for each phase of construction to ensure the site reduces the discharge of pollutants in storm water from construction sites to the MEP, and prevents non-storm water discharges from entering the MS4.

(b) Each Copermittee must establish appropriate inspection frequencies for high threat to water quality sites, and all other sites, for each phase of construction. Inspection frequencies appropriate for addressing the highest water quality priorities identified in the Water Quality Improvement Plan, and for complying with the requirements of this Order must be identified in each Copermittee's jurisdictional runoff management program document.

(c) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e., re-inspection, enforcement) necessary to require and confirm site compliance with its local permits and applicable local ordinances, and the requirements of this Order.

(2) Inspection Content

Inspections of construction sites by the Copermittee must include, at a minimum:

(a) Verification of coverage under the Construction General Permit (Notice of Intent (NOI) and/or WDID number) during initial inspections, when applicable;

(b) Assessment of compliance with its local permits and applicable local ordinances related to pollution prevention, including the implementation and maintenance of applicable BMPs;

(c) Assessment of BMP adequacy and effectiveness;

(d) Visual observations of actual non-storm water discharges;

(e) Visual observations of actual or potential discharge of sediment and/or construction related materials from the site;

(f) Visual observations of actual or potential illicit connections; and

(g) If any violations are found and BMP corrections are needed, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried construction sites. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Site name, location (address and hydrologic subarea), and WDID number (if applicable);

(b) Inspection date;

(c) Approximate amount of rainfall since last inspection;

(d) Description of problems observed with BMPs and indication of need for BMP addition/repair/replacement and any scheduled re-inspection, and date of re-inspection;

(e) Descriptions of any other specific inspection comments which must, at a minimum, include rationales for longer compliance time;

(f) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(g) Resolution of problems noted and date problems fixed.

e. CONSTRUCTION SITE ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried construction sites, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

f. STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the construction management program to address construction sites that the Copermittee has identified as potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, and/or increase/decrease frequency of inspections for specific types of sites and/or activities); and

(2) The strategies and/or activities must be consistent with the requirements of Provisions E.4.c-e and the strategies identified in the Water Quality Improvement Plan.

5. Existing Development Management

Each Copermittee must implement an existing development management program in accordance with the strategies identified in the Water Quality Improvement Plan and includes, at a minimum, the following requirements:

a. Existing Development Inventory and Tracking

Each Copermittee must maintain, and update at least annually, a watershed-based inventory of the existing development within its jurisdiction that may discharge a pollutant load to and from the MS4. The use of an automated database system, such as GIS, is highly recommended. The inventory must, at a minimum, include:

(1) Name, location (hydrological subarea and address, if applicable) of the following types of existing development with its jurisdiction:

(a) Commercial facilities or areas;

(b) Industrial facilities;

(c) Municipal facilities, including:

(i) MS4 and related structures,[29]

(ii) Roads, streets, and highways,

(iii) Parking facilities,

(iv) Municipal airfields,

(v) Parks and recreation facilities,

(vi) Flood management and flood control devices and structures,

(vii) Operating or closed municipal landfills,

(viii) Publicly owned treatment works (including water and wastewater treatment plants) and sanitary sewer collection systems,

(ix) Corporate yards, including maintenance and storage yards for materials, waste, equipment, and vehicles,

(x) Hazardous waste collection facilities,

[29] The inventory may refer to the MS4 map required to be maintained pursuant to Provision E.2.b.(1).

(xi) Other treatment, storage or disposal facilities for municipal waste, and

(xii) Other municipal facilities that the Copermittee determines may contribute a significant pollutant load to the MS4; and

(d) Residential areas, which may be designated by one or more of the following:

(i) Residential management area,

(ii) Drainage basin or area,

(iii) Land use (e.g., single family, multi-family, rural),

(iv) Neighborhood,

(v) Common Interest Area,

(vi) Home Owner Association,

(vii) Mobile home park, and/or

(viii) Other designations accepted by the San Diego Water Board Executive Officer.

(2) A description of the facility or area, including the following information:

(a) Classification as commercial, industrial, municipal, or residential;

(b) Status of facility or area as active or inactive;

(c) Identification if a business is a mobile business;

(d) SIC Code or NAICS Code, if applicable;

(e) Industrial General Permit NOI and/or WDID number, if applicable;

(f) Identification if a residential area is or includes a Common Interest Area / Home Owner Association, or mobile home park;

(g) Identification of pollutants generated and potentially generated by the facility or area;

(h) Whether the facility or area is adjacent to an ESA;

(i) Whether the facility or area is tributary to and within the same hydrologic subarea as a water body segment listed as impaired on the CWA section 303(d) List and generates pollutants for which the water body segment is impaired; and

(j) Whether the facility or area contributes or potentially contributes to the highest priority water quality conditions identified in the Water Quality Improvement Plan.

(3) An annually updated map showing the location of inventoried existing development, watershed boundaries, and water bodies.

b. EXISTING DEVELOPMENT BMP IMPLEMENTATION AND MAINTENANCE

Each Copermittee must designate a minimum set of BMPs required for all inventoried existing development, including special event venues. The designated minimum BMPs must be specific to facility or area types and pollutant generating activities, as appropriate.

(1) Commercial, Industrial, and Municipal Facilities and Areas

(a) Pollution Prevention

Each Copermittee must require the use of pollution prevention methods by the commercial, industrial, and municipal facilities and areas in its inventoried existing development.

(b) BMP Implementation

Each Copermittee must implement, or require the implementation of, designated BMPs at commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development.

(c) BMP Operation and Maintenance

(i) Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development.

(ii) Each Copermittee must implement a schedule of operation and maintenance activities for its MS4 and related structures (including but not limited to catch basins, storm drain inlets, detention basins, etc.), and verify proper operation of all its municipal structural treatment controls designed to reduce pollutants (including floatables) in storm water discharges to or from its MS4s and related drainage structures. Operation and maintenance activities may include, but is not limited to, the following:

[a] Inspections of the MS4 and related structures;
[b] Cleaning of the MS4 and related structures; and
[c] Proper disposal of materials removed from cleaning of the MS4 and related structures.

(iii) Each Copermittee must implement a schedule of operation and maintenance for public streets, unpaved roads, paved roads, and paved highways and freeways within its jurisdiction to minimize pollutants that can be discharged in storm water.

(iv) Each Copermittee must implement controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers. Copermittees that operate both a municipal sanitary sewer system and a MS4 must implement controls and measures to prevent and eliminate seeping sewage from infiltrating the MS4. Copermittees that do not operate both a municipal sanitary sewer system and a MS4 must coordinate with sewering agencies to keep themselves informed of relevant and appropriate maintenance activities and sanitary sewage projects in their jurisdiction that may cause or contribute to seepage of sewage into the MS4.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must implement BMPs, or require the implementation of BMPs, to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development. Such BMPs must include, as appropriate, educational activities, permits, certifications and other measures for applicators and distributors.

(2) <u>Residential Areas</u>

(a) Pollution Prevention

Each Copermittee must promote and encourage the use of pollution prevention methods, where appropriate, by the residential areas in its inventoried existing development.

(b) BMP Implementation

Each Copermittee must promote and encourage the implementation of designated BMPs at residential areas in its inventoried existing development.

(c) BMP Operation and Maintenance

Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at residential areas in its inventoried existing development.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must promote and encourage the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from residential areas in its inventoried existing development.

c. EXISTING DEVELOPMENT INSPECTIONS

Each Copermittee must conduct inspections of inventoried existing development to ensure compliance with applicable local ordinances and permits, and the requirements of this Order.

(1) Inspection Frequency

(a) Each Copermittee must establish appropriate inspection frequencies for inventoried existing development in accordance with the following requirements:

(i) At a minimum, inventoried existing development must be inspected once every five years utilizing one or more of the following methods:

[a] Drive-by inspections by Copermittee municipal and contract staff,
[b] Onsite inspections by Copermittee municipal and contract staff, and/or
[c] Inspections by volunteer monitoring or patrol programs trained by the Copermittee;

(ii) The frequency of inspections must be appropriate to confirm that BMPs are being implemented to reduce the discharge of pollutants in storm water from the MS4 to the MEP and effectively prohibit non-storm water discharges to the MS4;

(iii) The frequency of inspections must be based on the potential for a facility or area to discharge non-storm water and pollutants in storm water, and should reflect the priorities set forth in the Water Quality Improvement Plan;

(iv) Each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development;[30] and

(v) Inventoried existing development must be inspected by the Copermittee, as needed, in response to valid public complaints and

[30] If any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspection may count toward the total annual inspection requirement. This requirement excludes linear municipal facilities (i.e., MS4, streets, roads and highways).

findings from the Copermittee's municipal and contract staff or volunteer monitoring or patrol program inspections.

(b) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e. education and outreach, re-inspection, enforcement) necessary to require and confirm compliance with its applicable local ordinances and permits and the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

(2) Inspection Content

(a) Inspections of existing development by the Copermittee or volunteer monitoring or patrol programs must include, at a minimum:

(i) Visual inspections for actual non-storm water discharges;

(ii) Visual inspections for actual or potential discharge of pollutants;

(iii) Visual inspections for actual or potential illicit connections; and

(iv) Verification that the description of the facility or area in the inventory, required pursuant to Provision E.5.a.(2), has not changed.

(b) Onsite inspections of existing development by the Copermittee must include, at a minimum:

(i) Assessment of compliance with its applicable local ordinances and permits related to non-storm water and storm water discharges and runoff;

(ii) Assessment of the implementation of the designated BMPs;

(iii) Verification of coverage under the Industrial General Permit, when applicable; and

(iv) If any problems or violations are found, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried existing development. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Name and location of facility or area (address and hydrologic subarea) consistent with the inventory name and location, pursuant to Provision E.5.a.(1);

(b) Inspection and re-inspection date(s);

(c) Inspection method(s) (i.e. drive-by, onsite);

(d) Observations and findings from the inspection(s);

(e) For onsite inspections of existing development by Copermittee municipal or contract staff, the records must also include, as applicable:

(i) Description of any problems or violations found during the inspection(s),

(ii) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6, and

(iii) The date problems or violations were resolved.

d. EXISTING DEVELOPMENT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried existing development, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

e. STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Each Copermittee must implement the water quality improvement strategies, where necessary, to address areas of existing development within its jurisdiction that are identified as sources of pollutants and/or stressors contributing to the highest priority water quality conditions in the Watershed Management Area. For the existing development management program, the following strategies must be implemented:

(1) Specific Existing Development Management Program Strategies

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented within its jurisdiction to address areas of existing development that the Copermittee has identified as sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(a) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, and/or increase/decrease frequency of inspections for specific types of facilities, areas and/or activities);

(b) The facilities and/or areas within the Copermittee's jurisdiction where the strategies and/or activities will be implemented; and

(c) The strategies and/or activities must be consistent with the requirements of Provisions E.5.b-d and the strategies identified in the Water Quality Improvement Plan.

(2) Retrofitting Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to retrofit areas of existing development within its jurisdiction to address identified sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify areas of existing development as candidates for retrofitting, focusing on areas where retrofitting will address pollutants and/or stressors that contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for retrofitting projects may be utilized to reduce pollutants that may be discharged in storm water from areas of existing development, and/or address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of retrofitting projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting projects; and

(e) Where retrofitting projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional retrofitting projects (i.e. projects that can receive and/or treat storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment) adjacent to and/or downstream of the areas of existing development.

(3) Stream, Channel and/or Habitat Rehabilitation in Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to rehabilitate streams, channels, and/or habitats in areas of existing development within its jurisdiction to address the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify streams, channels, and/or habitats in areas of existing development as candidates for rehabilitation, focusing on areas where stream, channel, and/or habitat rehabilitation projects will address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for stream, channel, and/or habitat rehabilitation projects may be utilized to address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters, rehabilitate channelized or hydromodified streams, restore wetland and riparian habitat, restore watershed functions, and/or restore beneficial uses of receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of stream, channel, and/or habitat rehabilitation projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance stream, channel, and/or habitat rehabilitation projects; and

(e) Where stream, channel, and/or habitat rehabilitation projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional stream, channel, and/or habitat rehabilitation projects (i.e. projects that can receive storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment).

6. Enforcement Response Plans

Each Copermittee must develop and implement an Enforcement Response Plan as part of its jurisdictional runoff management program document. The Enforcement Response Plan must describe the applicable approaches and options to enforce its legal authority established pursuant to Provision E.1, as necessary, to achieve compliance with the requirements of this Order. The Enforcement Response Plan must include the following:

a. Enforcement Response Plan Components

The Enforcement Response Plan must include the following individual components:

(1) Illicit Discharge Detection and Elimination Enforcement Component;

(2) Development Planning Enforcement Component;

(3) Construction Management Enforcement Component; and

(4) Existing Development Enforcement Component.

b. Enforcement Response Approaches and Options

Each component of the Enforcement Response Plan must describe the enforcement response approaches that the Copermittee will implement to compel compliance with its statutes, ordinances, permits, contracts, orders, or similar means, and the requirements of this Order. The description must include the protocols for implementing progressively stricter enforcement responses. The enforcement response approaches must include appropriate sanctions to compel compliance, including, at a minimum, the following tools or their equivalent:

(1) Verbal and written notices of violation;

(2) Cleanup requirements;

(3) Fines;

(4) Bonding requirements;

(5) Administrative and criminal penalties;

(6) Liens;

(7) Stop work orders; and

(8) Permit and occupancy denials.

c. CORRECTION OF VIOLATIONS

(1) Violations must be corrected in a timely manner with the goal of correcting the violations within 30 calendar days after the violations are discovered, or prior to the next predicted rain event, whichever is sooner.

(2) If more than 30 calendar days are required to achieve compliance, then a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

d. ESCALATED ENFORCEMENT

(1) The Enforcement Response Plan must include a definition of "escalated enforcement." Escalated enforcement must include any enforcement scenario where a violation or other non-compliance is determined to cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan. Escalated enforcement may be defined differently for development planning, construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas.

(2) Where the Copermittee determines escalated enforcement is not required, a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

(3) Escalated enforcement actions must continue to increase in severity, as necessary, to compel compliance as soon as possible.

e. REPORTING OF NON-COMPLIANT SITES

(1) Each Copermittee must notify the San Diego Water Board in writing within 2 working days of issuing escalated enforcement (as defined in the Copermittee's Enforcement Response Plan) to a construction site that poses a significant threat to water quality as a result of violations or other non-compliance with its permits and applicable local ordinances, and the requirements of this Order. Written notification may be provided electronically by email.

(2) Each Copermittee must notify the San Diego Water Board of non-filers under the Industrial General Permit and Construction General Permit by email to Nonfilers_R9@waterboards.ca.gov.

7. Public Education and Participation

Each Copermittee must implement, individually or with other Copermittees, a public education and participation program in accordance with the strategies identified in the Water Quality Improvement Plan to promote and encourage the development of programs, management practices, and behaviors that reduce the discharge of pollutants in storm water to the MEP, prevent controllable non-storm water discharges from entering the MS4, and protect water quality standards in receiving waters.

a. PUBLIC EDUCATION

The public education program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) Educational activities, public information activities, and other appropriate outreach activities intended to reduce pollutants associated with the application of pesticides, herbicides and fertilizer and other pollutants of concern in storm water discharges to and from its MS4 to the MEP, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed to address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(2) Educational activities, public information activities, and other appropriate outreach activities to facilitate the proper management and disposal of used oil and toxic materials; and

(3) Appropriate education and training measures for specific target audiences, such as construction site operators, residents, underserved target audiences and school-aged children, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed, based on high risk behaviors and pollutants of concern.

b. PUBLIC PARTICIPATION

The public participation program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) A process for members of the public to participate in updating the highest priority water quality conditions, numeric goals, and water quality improvement strategies in the Water Quality Improvement Plan.

(2) Opportunities for members of the public to participate in providing the Copermittee recommendations for improving the effectiveness of the water quality improvement strategies implemented within its jurisdiction.

(3) Opportunities for members of the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or restoration and protection of the quality of receiving waters.

c. STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented within its jurisdiction, as applicable, to educate the public and encourage public participation to address potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) The target audiences and/or areas within the Copermittee's jurisdiction where the strategies and/or activities will be implemented;

(2) Provide specific details about how the strategies and/or activities will be implemented (e.g. educational topics, materials and/or activities, public outreach and participation programs and/or opportunities);

(3) Each Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify and implement regional public education and participation activities, programs and opportunities;

(4) Each Copermittee must incorporate a mechanism for evaluating and assessing educational and other public outreach activities, as needed, to identify progress and incorporate modifications necessary to increase the effectiveness of the public education and participation program.

8. Fiscal Analysis

a. Each Copermittee must secure the resources necessary to meet all the requirements of this Order.

b. Each Copermittee must conduct an annual fiscal analysis of its jurisdictional runoff management program in its entirety. The fiscal analysis must include the following:

(1) Identification of the various categories of expenditures necessary to implement the requirements of this Order, including a description of the specific capital, operation and maintenance, and other expenditure items to be accounted for in each category of expenditures;

(2) The staff resources needed and allocated to meet the requirements of this Order, including any development, implementation, and enforcement activities required;

(3) The estimated expenditures for Provisions E.8.b.(1) and E.8.b.(2) for the current fiscal year; and

(4) The source(s) of funds that are proposed to meet the necessary expenditures described in Provisions E.8.b.(1) and E.8.b.(2), including legal restrictions on the use of such funds, for the current fiscal year and next fiscal year.

c. Each Copermittee must submit a summary of the annual fiscal analysis with each Annual Report required pursuant to Provision F.3.b.

d. Each Copermittee must provide the documentation used to develop the summary of the annual fiscal analysis upon request by the San Diego Water Board.

F. REPORTING

The purpose of this provision is to determine and document compliance with the requirements set forth in this Order. The goal of reporting is to communicate to the San Diego Water Board and the people of the State of California the implementation status of each jurisdictional runoff management program and compliance with the requirements of this Order. This goal is to be accomplished through the submittal of specific deliverables to the San Diego Water Board by the Copermittees.

1. Water Quality Improvement Plans

The Copermittees for each Watershed Management Area must develop and submit the Water Quality Improvement Plan in accordance with the following requirements:

a. WATER QUALITY IMPROVEMENT PLAN DEVELOPMENT

Each Water Quality Improvement Plan must be developed in accordance with the following process:

(1) Priority Water Quality Conditions and Numeric Goals

(a) The Copermittees must implement a public participation process to solicit data and information to be utilized in the development and identification of the priority water quality conditions for the Watershed Management Area.

(b) The Copermittees are encouraged to involve the public and key stakeholders as early and often as possible during the development of the priority water quality conditions and numeric goals to be included in the Water Quality Improvement Plan.

(c) Within 6 months after the commencement of coverage under this Order, the Copermittees must develop and submit the Water Quality Improvement Plan requirements of Provision B.2 to the San Diego Water Board. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of 60 days.

(d) The Copermittees must revise the priority water quality conditions and numeric goals based on comments received and/or recommendations or direction from the San Diego Water Board Executive Officer.

(2) Water Quality Improvement Strategies and Schedules

(a) The Copermittees are encouraged to involve the public and key stakeholders as early and often as possible during the development of the water quality improvement strategies and schedules to be included in the Water Quality Improvement Plan.

(b) Within 9 months after the commencement of coverage under this Order, the Copermittees must develop and submit the Water Quality Improvement Plan requirements of Provision B.3 to the San Diego Water Board. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of 60 days.

(c) The Copermittees must revise the water quality improvement strategies and schedules based on comments received and/or recommendations or direction from the San Diego Water Board Executive Officer.

b. WATER QUALITY IMPROVEMENT PLAN SUBMITTAL

(1) Within 18 months after the commencement of coverage under this Order, the Copermittees for each Watershed Management Area must submit a complete Water Quality Improvement Plan in accordance with the requirements of Provision B to the San Diego Water Board. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of 30 days.

(2) Based on the comments received, the San Diego Water Board will determine whether to hold a public hearing or to limit public input to submittal of written comments. If no hearing is held the San Diego Water Board will notify the Copermittees within 6 months that the Water Quality Improvement Plan has been accepted as complete following its review and determination that the Water Quality Improvement Plan meets the requirements of this Order.

(3) The Copermittees must revise the Water Quality Improvement Plan based on comments received and/or recommendations or direction from the San Diego Water Board Executive Officer.

(4) The Water Quality Improvement Plan must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance by the San Diego Water Board.

2. Updates

a. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATES

Each Copermittee must update its jurisdictional runoff management program document in accordance with the following requirements:

(1) Each Copermittee is encouraged to involve the public and key stakeholders as early and often as possible to solicit recommendations for updates to its jurisdictional runoff management program document.

(2) Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E no later than 18 months after the commencement of coverage under this Order.

(3) Each Copermittee must submit updates to its jurisdictional runoff management program, with a rationale for the modifications, either in the Annual Report required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge required pursuant to Provision F.5.b.

(4) The Copermittee must revise the modifications as directed by the San Diego Water Board Executive Officer.

(5) Updated jurisdictional runoff management program documents must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of submitting the Annual Report.

b. BMP DESIGN MANUAL UPDATES

Each Copermittee must update its BMP Design Manual in accordance with the following requirements:

(1) Each Copermittee must update its BMP Design Manual to incorporate the requirements of Provisions E.3.a-d no later than 18 months after the commencement of coverage under this Order.

(2) Subsequent updates must be consistent with the requirements of Provisions E.3.a-d and must be submitted as part of the Annual Reports required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge required pursuant to Provision F.5.b.

(3) Updated BMP Design Manuals must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of completing the update.

c. WATER QUALITY IMPROVEMENT PLAN UPDATES

The Water Quality Improvement Plans must be updated in accordance with the following process:

(1) The Copermittees must implement a public participation process to solicit data and information to be utilized in updating the Water Quality Improvement Plan.

(2) The Copermittees are encouraged to involve the public and key stakeholders as early and often as possible during the updates to the Water Quality Improvement Plan.

(3) The Copermittees for each Watershed Management Area must submit requested updates to the Water Quality Improvement Plan, with the public input received and the rationale for the requested updates, either in the Annual Reports required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The requested updates are considered accepted by the San Diego Water Board if no response is provided to the Copermittee after 3 months of submitting the request.

(4) The Copermittees must revise the requested updates as directed by the San Diego Water Board Executive Officer.

(5) Updated Water Quality Improvement Plans must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance of the requested updates by the San Diego Water Board.

3. Progress Reporting

a. Progress Report Presentations

The Copermittees for each Watershed Management Area must appear before the San Diego Water Board, as requested by the San Diego Water Board, to provide progress reports on the implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs.

b. Annual Reports

(1) The Copermittees for each Watershed Management Area must submit an Annual Report for each reporting period no later than January 31 of the following year. The annual reporting period consists of two periods: 1) July 1 to June 30 of the following year for the jurisdictional runoff management programs, 2) October 1 to September 30 of the following year for the monitoring and assessment programs. The first Annual Report must be prepared for the reporting period beginning July 1 after commencement of coverage under this Order, and upon San Diego Water Board determination that the Water Quality Improvement Plan meets the requirements of this Order to June 30 in the following year for the jurisdictional runoff management programs, and September 30 in the following year for the monitoring and assessment programs. Annual Reports must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Each Annual Report must include the following:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, summarized and presented in tabular and graphical form;

(b) Progress of the special studies required pursuant to Provision D.3, and the results or findings when a special study, or each phase of a special study, is completed;

(c) The findings from the assessments required pursuant to Provision D.4;

(d) The progress of implementing the Water Quality Improvement Plan, including, but not limited to, the following:

(i) The progress toward achieving the interim and final numeric goals for the highest water quality priorities for the Watershed Management Area,

(ii) The water quality improvement strategies that were implemented and/or no longer implemented by each of the Copermittees during the reporting period and previous reporting periods, and are planned to be implemented during the next reporting period,

(iii) Proposed modifications to the water quality improvement strategies, with public input received and rationale for the proposed modifications,

(iv) Previously proposed modifications or updates incorporated into the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document and implemented by the Copermittees in the Watershed Management Area, and

(v) Proposed modifications or updates to the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document;

(e) A completed Jurisdictional Runoff Management Program Annual Report Form (Attachment D or accepted revision) for each Copermittee in the Watershed Management Area, certified by a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative.

(2) Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (Attachment D or accepted revision) no later than October 31 of each year until the first Annual Report is required to be submitted. Each Copermittee must submit the information on the Jurisdictional Runoff Management Program Annual Report Form specific to the area within its jurisdiction in each Watershed Management Area.

(3) Each Copermittee must provide any data or documentation utilized in developing the Annual Report upon request by the San Diego Water Board. Any monitoring data utilized in developing the Annual Report must be

uploaded to the California Environmental Data Exchange Network (CEDEN).[31] Any monitoring and assessment data utilized in developing the Annual Report must be provided on the Regional Clearinghouse required pursuant to Provision F.4.

c. Regional Monitoring and Assessment Report

(1) The Copermittees must submit a Regional Monitoring and Assessment Report no later than 180 days in advance of the expiration date of this Order. The Regional Monitoring and Assessment Report may be submitted as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The Copermittees must review the receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, and findings from the assessments required pursuant to Provision D.4, to assess the following:

(a) The beneficial uses of the receiving waters within the San Diego Region that are protected or must be restored;

(b) The progress toward restoring impacted beneficial uses in the receiving waters within the San Diego Region; and

(c) Pollutants or conditions of emerging concern that may impact beneficial uses in the receiving waters within the San Diego Region.

(2) The Regional Monitoring and Assessment Report must include recommendations for improving the implementation and assessment of the Water Quality Improvement Plans and jurisdictional runoff management programs.

(3) Each Copermittee must provide any data or documentation utilized in developing the Regional Monitoring and Assessment Report upon request by the San Diego Water Board. Any monitoring and assessment data utilized in developing the Regional Monitoring and Assessment Report must be provided on the Regional Clearinghouse required pursuant to Provision F.4.

[31] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

4. Regional Clearinghouse

The Copermittees must develop, update, and maintain an internet-based Regional Clearinghouse that is made available to the public no later than 18 months after the effective date of this Order.

a. The Copermittees, through the Regional Clearinghouse, must make the following documents and data available, organized by Watershed Management Area, which may be linked to other internet-based data portals and databases where the original documents are stored:

(1) Water Quality Improvement Plan for the Watershed Management Area, and all updated versions with date of update;

(2) Annual Reports for the Watershed Management Area;

(3) Jurisdictional Runoff Management Program document for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(4) BMP Design Manual for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(5) Reports from special studies (e.g. source identification, BMP effectiveness assessment) conducted in the Watershed Management Area;

(6) Monitoring data collected pursuant to Provision D for each Watershed Management Area must be uploaded to CEDEN,[32] with links to the uploaded data; and

(7) Available GIS data, layers, and/or shapefiles used to develop the maps generated and maintained by the Copermittees for the Water Quality Improvement Plans, Annual Reports, and jurisdictional runoff management program documents.

b. The Copermittees, through the Regional Clearinghouse, must make the following information and documents available:

(1) Contact information (point of contact, phone number, email address, and mailing address) for each Copermittee;

(2) Public hotline number for reporting non-storm water and illicit discharges for each Copermittee;

[32] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

(3) Email address for reporting non-storm water and illicit discharges for each Copermittee;

(4) Link to each Copermittee's website, if available, where the public may find additional information about the Copermittee's storm water management program and for requesting records for the implementation of its program;

(5) Information about opportunities for the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or restoration and protection of the quality of receiving waters; and

(6) Reports from regional monitoring programs in which the Copermittees participate (e.g. Southern California Monitoring Coalition, Southern California Coastal Water Research Project Bight Monitoring);

(7) Regional Monitoring and Assessment Reports; and

(8) Any other information, data, and documents the Copermittees determine as appropriate for making available to the public.

5. Report of Waste Discharge

a. The Orange County Copermittees and the Riverside County Copermittees are required to submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders. The San Diego Water Board will review and consider the Reports of Waste Discharge to determine whether modification to this Order, pursuant to the requirements of Provision H, will be required prior the Orange County Copermittees and/or Riverside County Copermittees becoming covered under this Order. The current Orders for the Orange County Copermittees and Riverside County Copermittees are rescinded upon notification of coverage under this Order except for enforcement purposes.

b. The Copermittees subject to the requirements of this Order must submit to the San Diego Water Board a complete Report of Waste Discharge as an application for the re-issuance of this Order and NPDES permit. The Report of Waste Discharge must be submitted no later than 180 days in advance of the expiration date of this Order. The Report of Waste Discharge must contain the following minimum information:

(1) Names and addresses of the Copermittees;

(2) Names and titles of the primary contacts of the Copermittees;

(3) Proposed changes to the Copermittees' Water Quality Improvement Plans and the supporting justification;

(4) Proposed changes to the Copermittees' jurisdictional runoff management programs and the supporting justification;

(5) Any other information necessary for the re-issuance of this Order;

(6) Any information to be included as part of the Report of Waste Discharge pursuant to the requirements of this Order; and

(7) Any other information required by federal regulations for NPDES permit reissuance.

6. Application for Early Coverage

a. The Orange County Copermittees, collectively, or Riverside County Copermittees, collectively, may apply for early coverage under this Order by submitting a Report of Waste Discharge Form 200, with a written request for early coverage under this Order.

b. The San Diego Water Board will review the application for early coverage. A notification of coverage under this Order will be issued to the Copermittees in the respective county by the San Diego Water Board upon completion of the early coverage application requirements. The effective coverage date will be specified in the notification of coverage. The Copermittees in the respective county are authorized to have MS4 discharges pursuant to the requirements of this Order starting on the effective coverage date specified in the notification of coverage. The existing Order for the respective county is rescinded upon the effective coverage date specified in the notification of coverage except for enforcement purposes.

7. Reporting Provisions

Each Copermittee must comply with all the reporting and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

G. PRINCIPAL WATERSHED COPERMITTEE RESPONSIBILITIES

1. The Copermittees within each Watershed Management Area must designate a Principal Watershed Copermittee and notify the San Diego Water Board of the name of the Principal Watershed Copermittee. An individual Copermittee should not be designated a Principal Watershed Copermittee for more than two Watershed Management Areas. The notification may be submitted with the Water Quality Improvement Plan required pursuant to Provision F.1 of this Order.

2. The Principal Watershed Copermittee is responsible for, at a minimum, the following:

a. Serving as liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues, and when necessary and appropriate, representing the Copermittees in the Watershed Management Area before the San Diego Water Board.

b. Facilitating the development of the Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order

c. Coordinating the submittal of the deliverables required by Provisions F.1, F.2, F.3.a, and F.3.b of this Order.

d. Coordinating and developing, with the other Principal Watershed Copermittees, the requirements of Provisions F.3.c, F.4, and F.5.b of this Order.

H. MODIFICATION OF PROGRAMS

1. Modifications of the Order may be initiated by the San Diego Water Board or by the Copermittees. Requests by Copermittees must be made to the San Diego Water Board.

2. Minor modifications to the Order may be made by the San Diego Water Board where the proposed modification complies with all the prohibitions and limitations, and other requirements of this Order.

3. Proposed modifications to the Order that are not minor require amendment of this Order in accordance with this Order's rules, policies, and procedures.

4. The San Diego Water Board may re-open and modify this Order at any time prior to its expiration, after opportunity for public comment and a public hearing, if the State Water Board determines that revisions are warranted to those provisions of the Order addressing compliance with water quality standards in the receiving water and/or those provisions of the Order establishing an iterative process for implementation of management practices to assure compliance with water quality standards in the receiving water.

I. STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

Each Copermittee must comply with all the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

ATTACHMENT A

DISCHARGE PROHIBITIONS AND SPECIAL PROTECTIONS

1. Basin Plan Waste Discharge Prohibitions

California Water Code Section 13243 provides that a Regional Water Board, in a water quality control plan, may specify certain conditions or areas where the discharge of waste or certain types of waste is not permitted. The following waste discharge prohibitions in the Water Quality Control Plan for the San Diego Basin (Basin Plan) are applicable to any person, as defined by Section 13050(c) of the California Water Code, who is a citizen, domiciliary, or political agency or entity of California whose activities in California could affect the quality of waters of the state within the boundaries of the San Diego Region.

1. The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in California Water Code Section 13050, is prohibited.

2. The discharge of waste to land, except as authorized by waste discharge requirements or the terms described in California Water Code Section 13264 is prohibited.

3. The discharge of pollutants or dredged or fill material to waters of the United States except as authorized by a National Pollutant Discharge Elimination System (NPDES) permit or a dredged or fill material permit (subject to the exemption described in California Water Code Section 13376) is prohibited.

4. Discharges of recycled water to lakes or reservoirs used for municipal water supply or to inland surface water tributaries thereto are prohibited, unless this San Diego Water Board issues a NPDES permit authorizing such a discharge; the proposed discharge has been approved by the State Department of Health Services (DHS) and the operating agency of the impacted reservoir; and the discharger has an approved fail-safe long-term disposal alternative.

5. The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the San Diego Water Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

6. The discharge of waste in a manner causing flow, ponding, or surfacing on lands not owned or under the control of the discharger is prohibited, unless the discharge is authorized by the San Diego Water Board.

7. The dumping, deposition, or discharge of waste directly into waters of the state, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the San Diego Water Board.

8. Any discharge to a storm water conveyance system that is not composed entirely of "*storm water*" is prohibited unless authorized by the San Diego Water Board. [The federal regulations, 40 CFR 122.26(b)(13), define storm water as storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from fire fighting activities.] [§122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

9. The unauthorized discharge of treated or untreated sewage to waters of the state or to a storm water conveyance system is prohibited.

10. The discharge of industrial wastes to conventional septic tank/subsurface disposal systems, except as authorized by the terms described in California Water Code Section 13264, is prohibited.

11. The discharge of radioactive wastes amenable to alternative methods of disposal into the waters of the state is prohibited.

12. The discharge of any radiological, chemical, or biological warfare agent into waters of the state is prohibited.

13. The discharge of waste into a natural or excavated site below historic water levels is prohibited unless the discharge is authorized by the San Diego Water Board.

14. The discharge of sand, silt, clay, or other earthen materials from any activity, including land grading and construction, in quantities which cause deleterious bottom deposits, turbidity or discoloration in waters of the state or which unreasonably affect, or threaten to affect, beneficial uses of such waters is prohibited.

15. The discharge of treated or untreated sewage from vessels to Mission Bay, Oceanside Harbor, Dana Point Harbor, or other small boat harbors is prohibited.

16. The discharge of untreated sewage from vessels to San Diego Bay is prohibited.

17. The discharge of treated sewage from vessels to portions of San Diego Bay that are less than 30 feet deep at mean lower low water (MLLW) is prohibited.

18. The discharge of treated sewage from vessels, which do not have a properly functioning US Coast Guard certified Type I or Type II marine sanitation device, to portions of San Diego Bay that are greater than 30 feet deep at mean lower low water (MLLW) is prohibited.

2. Attachment B to State Water Board Resolution 2012-0012

Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges

I. PROVISIONS FOR POINT SOURCE DISCHARGES OF STORM WATER AND NONPOINT SOURCE WASTE DISCHARGES

The following terms, prohibitions, and special conditions (hereafter collectively referred to as special conditions) are established as limitations on point source storm water and nonpoint source discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in Areas of Special Biological Significance (ASBS), as required for State Water Quality Protection Areas pursuant to California Public Resources Code Sections 36700(f) and 36710(f). These Special Protections are adopted by the State Water Board as part of the California Ocean Plan (Ocean Plan) General Exception.

The special conditions are organized by category of discharge. The State Water Resources Control Board (State Water Board) and Regional Water Quality Control Boards (Regional Water Boards) will determine categories and the means of regulation for those categories [e.g., Point Source Storm Water National Pollutant Discharge Elimination System (NPDES) or Nonpoint Source].

A. PERMITTED POINT SOURCE DISCHARGES OF STORM WATER

1. General Provisions for Permitted Point Source Discharges of Storm Water

   a. Existing storm water discharges into an ASBS are allowed only under the following conditions:

      (1) The discharges are authorized by an NPDES permit issued by the State Water Board or Regional Water Board;

      (2) The discharges comply with all of the applicable terms, prohibitions, and special conditions contained in these Special Protections; and

      (3) The discharges:

         (i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

         (ii) Are designed to prevent soil erosion;

         (iii) Occur only during wet weather;

         (iv) Are composed of only storm water runoff.

   b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

   c. The discharge of trash is prohibited.

d. Only discharges from existing storm water outfalls are allowed. Any proposed or new storm water runoff discharge shall be routed to existing storm water discharge outfalls and shall not result in any new contribution of waste to an ASBS (i.e., no additional pollutant loading). “Existing storm water outfalls” are those that were constructed or under construction prior to January 1, 2005. “New contribution of waste” is defined as any addition of waste beyond what would have occurred as of January 1, 2005. A change to an existing storm water outfall, in terms of re-location or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges are prohibited except as provided below:

(1) The term “non-storm water discharges” means any waste discharges from a municipal separate storm sewer system (MS4) or other NPDES permitted storm drain system to an ASBS that are not composed entirely of storm water.

(2) (i) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability or occur naturally:

(a) Discharges associated with emergency fire fighting operations.

(b) Foundation and footing drains.

(c) Water from crawl space or basement pumps.

(d) Hillside dewatering.

(e) Naturally occurring groundwater seepage via a storm drain.

(f) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(ii) An NPDES permitting authority may authorize non-storm water discharges to an MS4 with a direct discharge to an ASBS only to the extent the NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

2. Compliance Plans for Inclusion in Storm Water Management Plans (SWMP) and Storm Water Pollution Prevention Plans (SWPPP).

The discharger shall specifically address the prohibition of non-storm water runoff and the requirement to maintain natural water quality for storm water discharges to an ASBS in an ASBS Compliance Plan to be included in its SWMP or a SWPPP, as appropriate to permit type. If a statewide permit includes a SWMP, then the discharger shall prepare a stand-alone compliance plan for ASBS discharges. The ASBS Compliance Plan is subject to approval by the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (for permits issued by Regional Water Boards).

a. The Compliance Plan shall include a map of surface drainage of storm water runoff, showing areas of sheet runoff, prioritize discharges, and describe any structural Best Management Practices (BMPs) already employed and/or BMPs to be employed in the future. Priority discharges are those that pose the greatest water quality threat and which are identified to require installation of structural BMPs. The map shall also show the storm water conveyances in relation to other features such as service areas, sewage conveyances and treatment facilities, landslides, areas prone to erosion, and waste and hazardous material storage areas, if applicable. The SWMP or SWPPP shall also include a procedure for updating the map and plan when changes are made to the storm water conveyance facilities.

b. The ASBS Compliance Plan shall describe the measures by which all non-authorized non-storm water runoff (e.g., dry weather flows) has been eliminated, how these measures will be maintained over time, and how these measures are monitored and documented.

c. For Municipal Separate Storm Sewer System (MS4s), the ASBS Compliance Plan shall require minimum inspection frequencies as follows:

   (1) The minimum inspection frequency for construction sites shall be weekly during rainy season;

   (2) The minimum inspection frequency for industrial facilities shall be monthly during the rainy season;

   (3) The minimum inspection frequency for commercial facilities (e.g., restaurants) shall be twice during the rainy season; and

   (4) Storm water outfall drains equal to or greater than 18 inches (457 mm) in diameter or width shall be inspected once prior to the beginning of the rainy season and once during the rainy season and maintained to remove trash and other anthropogenic debris.

d. The ASBS Compliance Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff, that are necessary to comply with these special conditions, will be achieved through BMPs. Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that such installation would pose a threat to health or safety. BMPs to control storm water runoff discharges (at the end-of-pipe) during a design storm shall be designed to achieve on average the following target levels:

   (1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

   (2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges. The baseline for the reduction is the effective date of the Exception. The baseline for these determinations is the effective date of the Exception, and the

reductions must be achieved and documented within four (4) years of the effective date.

e. The ASBS Compliance Plan shall address erosion control and the prevention of anthropogenic sedimentation in ASBS. The natural habitat conditions in the ASBS shall not be altered as a result of anthropogenic sedimentation.

f. The ASBS Compliance Plan shall describe the non-structural BMPs currently employed and planned in the future (including those for construction activities), and include an implementation schedule. The ASBS Compliance Plan shall include non-structural BMPs that address public education and outreach. Education and outreach efforts must adequately inform the public that direct discharges of pollutants from private property not entering an MS4 are prohibited. The ASBS Compliance Plan shall also describe the structural BMPs, including any low impact development (LID) measures, currently employed and planned for higher threat discharges and include an implementation schedule. To control storm water runoff discharges (at the end-of-pipe) during a design storm, permittees must first consider using LID practices to infiltrate, use, or evapotranspirate storm water runoff on-site.

g. The BMPs and implementation schedule shall be designed to ensure that natural water quality conditions in the receiving water are achieved and maintained by either reducing flows from impervious surfaces or reducing pollutant loading, or some combination thereof.

h. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents in storm water runoff that alter natural ocean water quality and the sources of these constituents.

(2) The report shall describe BMPs that are currently being implemented, BMPs that are identified in the SWMP or SWPPP for future implementation, and any additional BMPs that may be added to the SWMP or SWPPP to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the BMPs.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits), the discharger shall revise its ASBS Compliance Plan to incorporate any new or modified BMPs that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised SWMP or SWPPP, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural ocean water quality conditions due to the same constituent.

(5) Compliance with this section does not excuse violations of any term, prohibition, or condition contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within one year from the effective date of the Exception, the discharger shall submit a written ASBS Compliance Plan to the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that describes its strategy to comply with these special conditions, including the requirement to maintain natural water quality in the affected ASBS. The ASBS Compliance Plan shall include a time schedule to implement appropriate non-structural and structural controls (implementation schedule) to comply with these special conditions for inclusion in the discharger's SWMP or SWPPP, as appropriate to permit type.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these special conditions shall be implemented.

d. Within four (4) years of the effective date of the Exception, any structural controls identified in the ASBS Compliance Plan that are necessary to comply with these special conditions shall be operational.

e. Within four (4) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water, pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data, and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

   If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

   The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

(1) for municipalities, a demonstration of significant hardship to discharger ratepayers, by showing the relationship of storm water fees to annual household income for residents within the discharger's jurisdictional area, and the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or
(2) for other governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process.

B. NONPOINT SOURCE DISCHARGES

[NOT INCLUDED]
[PROVISIONS FOR NONPOINT SOURCE DISCHARGES NOT APPLICABLE]

II. ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES

[NOT INCLUDED]
[ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES NOT APPLICABLE]

III. ADDITIONAL REQUIREMENTS – WATERFRONT AND MARINE OPERATIONS

[NOT INCLUDED]
[ADDITIONAL REQUIREMENTS FOR WATERFRONT AND MARINE OPERATIONS NOT APPLICABLE]

IV. MONITORING REQUIREMENTS

Monitoring is mandatory for all dischargers to assure compliance with the Ocean Plan. Monitoring requirements include both: (A) core discharge monitoring, and (B) ocean receiving water monitoring. The State and Regional Water Boards must approve sampling site locations and any adjustments to the monitoring programs. All ocean receiving water and reference area monitoring must be comparable with the Water Boards' Surface Water Ambient Monitoring Program (SWAMP).

Safety concerns: Sample locations and sampling periods must be determined considering safety issues. Sampling may be postponed upon notification to the State and Regional Water Boards if hazardous conditions prevail.

Analytical Chemistry Methods: All constituents must be analyzed using the lowest minimum detection limits comparable to the Ocean Plan water quality objectives. For metal analysis, all samples, including storm water effluent, reference samples, and ocean receiving water samples, must be analyzed by the approved analytical method with the lowest minimum detection limits (currently Inductively Coupled Plasma/Mass Spectrometry) described in the Ocean Plan.

A. CORE DISCHARGE MONITORING PROGRAM

1. General sampling requirements for timing and storm size:

   Runoff must be collected during a storm event that is greater than 0.1 inch and generates runoff, and at least 72 hours from the previously measurable storm event. Runoff samples shall be collected when post-storm receiving water is sampled, and analyzed for the same constituents as receiving water and reference site samples (see section IV B) as described below.

2. Runoff flow measurements

   a. For municipal/industrial storm water outfalls in existence as of December 31, 2007, 18 inches (457mm) or greater in diameter/width (including multiple outfall pipes in combination having a width of 18 inches, runoff flows must be measured or calculated, using a method acceptable to and approved by the State and Regional Water Boards.
   b. This will be reported annually for each precipitation season to the State and Regional Water Boards.

3. Runoff samples – storm events

   a. For outfalls equal to or greater than 18 inches (0.46m) in diameter or width:

      (1) samples of storm water runoff shall be analyzed during the same storm as receiving water samples for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination, ; and

      (2) samples of storm water runoff shall be analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS

      (3) If an applicant has no outfall greater than 36 inches, then storm water runoff from the applicant's largest outfall shall be further analyzed during the same storm as receiving water samples for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates).

   b. For outfalls equal to or greater than 36 inches (0.91m) in diameter or width:

      (1) samples of storm water runoff shall be analyzed during the same storm as receiving water samples for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

      (2) samples of storm water runoff shall be further analyzed during the same storm as receiving water samples for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates) and

(3) samples of storm water runoff shall be analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

c. For an applicant not participating in a regional monitoring program [see below in Section IV (B)] in addition to (a.) and (b.) above, a minimum of the two largest outfalls or 20 percent of the larger outfalls, whichever is greater, shall be sampled (flow weighted composite samples) at least three times annually during wet weather (storm event) and analyzed for all Ocean Plan Table A constituents, Table B constituents for marine aquatic life protection (except for toxicity, only chronic toxicity for three species shall be required), DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, and Ocean Plan indicator bacteria. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one (the largest) such discharge shall be sampled annually in each Region.

4. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may reduce or suspend core monitoring once the storm runoff is fully characterized. This determination may be made at any point after the discharge is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

B. OCEAN RECEIVING WATER AND REFERENCE AREA MONITORING PROGRAM

In addition to performing the Core Discharge Monitoring Program in Section II.A above, all applicants having authorized discharges must perform ocean receiving water monitoring. In order to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS, dischargers may choose either (1) an individual monitoring program, or (2) participation in a regional integrated monitoring program.

1. Individual Monitoring Program: The requirements listed below are for those dischargers who elect to perform an individual monitoring program to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within the affected ASBS. In addition to Core Discharge Monitoring, the following additional monitoring requirements shall be met:

   a. Three times annually, during wet weather (storm events), the receiving water at the point of discharge from the outfalls described in section (IV)(A)(3)(c) above shall be sampled and analyzed for Ocean Plan Table A constituents, Table B constituents for marine aquatic life, DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, salinity, chronic toxicity (three species), and Ocean Plan indicator bacteria.

      The sample location for the ocean receiving water shall be in the surf zone at the point of discharges; this must be at the same location where storm water runoff is sampled. Receiving water shall be sampled at approximately the same time prior to (pre-storm) and during (or immediately after) the same storm (post storm). Reference water quality shall also be sampled and analyzed for the same constituents pre-storm and post-storm, during the same storms when receiving water is sampled. Reference stations will be determined by the State Water Board's Division of Water Quality and the applicable Regional Water Board(s).

b. Sediment sampling shall occur at least three times during every five (5) year period. The subtidal sediment (sand or finer, if present) at the discharge shall be sampled and analyzed for Ocean Plan Table B constituents for marine aquatic life, DDT, PCBs, PAHs, pyrethroids, and OP pesticides. For sediment toxicity testing, only an acute toxicity test using the amphipod Eohaustorius estuarius must be performed.

c. A quantitative survey of intertidal benthic marine life shall be performed at the discharge and at a reference site. The survey shall be performed at least once every five (5) year period. The survey design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The results of the survey shall be completed and submitted to the State Water Board and Regional Water Board at least six months prior to the end of the permit cycle.

d. Once during each five (5) year period, a bioaccumulation study shall be conducted to determine the concentrations of metals and synthetic organic pollutants at representative discharge sites and at representative reference sites. The study design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The bioaccumulation study may include California mussels (Mytilus californianus) and/or sand crabs (Emerita analoga or Blepharipoda occidentalis). Based on the study results, the Regional Water Board and the State Water Board's Division of Water Quality, may adjust the study design in subsequent permits, or add or modify additional test organisms (such as shore crabs or fish), or modify the study design appropriate for the area and best available sensitive measures of contaminant exposure.

e. Marine Debris: Representative quantitative observations for trash by type and source shall be performed along the coast of the ASBS within the influence of the discharger's outfalls. The design, including locations and frequency, of the marine debris observations is subject to approval by the Regional Water Board and State Water Board's Division of Water Quality.

f. The monitoring requirements of the Individual Monitoring Program in this section are minimum requirements. After a minimum of one (1) year of continuous water quality monitoring of the discharges and ocean receiving waters, the Executive Director of the State Water Board (statewide permits) or Executive officer of the Regional Water Board (Regional Water Board permits) may require additional monitoring, or adjust, reduce or suspend receiving water and reference station monitoring. This determination may be made at any point after the discharge and receiving water is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

2. Regional Integrated Monitoring Program: Dischargers may elect to participate in a regional integrated monitoring program, in lieu of an individual monitoring program, to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS. This regional approach shall characterize natural water quality, pre- and post-storm, in ocean reference areas near the mouths of identified open space watersheds and the effects of the discharges on natural water quality (physical, chemical, and toxicity) in the ASBS receiving waters, and should include benthic marine aquatic life and bioaccumulation components. The design of the ASBS stratum of a regional integrated monitoring program may deviate from the otherwise prescribed individual monitoring approach (in Section IV.B.1) if approved by the State Water Board's Division of Water Quality and the Regional Water Boards.

a. Ocean reference areas shall be located at the drainages of flowing watersheds with minimal development (in no instance more than 10% development), and shall not be located in CWA Section 303(d) listed waterbodies or have tributaries that are 303(d) listed. Reference areas shall be free of wastewater discharges and anthropogenic non-storm water runoff. A minimum of low threat storm runoff discharges (e.g. stream highway overpasses and campgrounds) may be allowed on a case-by-case basis. Reference areas shall be located in the same region as the ASBS receiving water monitoring occurs. The reference areas for each Region are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean reference water samples must be collected from each station, each from a separate storm. A minimum of one reference location shall be sampled for each ASBS receiving water site sampled per responsible party. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

b. ASBS ocean receiving water must be sampled in the surf zone at the location where the runoff makes contact with ocean water (i.e. at "point zero"). Ocean receiving water stations must be representative of worst-case discharge conditions (i.e. co-located at a large drain greater than 36 inches, or if drains greater than 36 inches are not present in the ASBS then the largest drain greater than18 inches.) Ocean receiving water stations are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean receiving water samples must be collected during each storm season from each station, each from a separate storm. A minimum of one receiving water location shall be sampled in each ASBS per responsible party in that ASBS. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

c. Reference and receiving water sampling shall commence during the first full storm season following the adoption of these special conditions, and post-storm samples shall be collected when annual storm water runoff is sampled. Sampling shall occur in a minimum of two storm seasons. For those ASBS dischargers that have already participated in the Southern California Bight 2008 ASBS regional monitoring effort, sampling may be limited to only one storm season.

d. Receiving water and reference samples shall be analyzed for the same constituents as storm water runoff samples. At a minimum, constituents to be sampled and analyzed in reference and discharge receiving waters must include oil and grease, total suspended solids, Ocean Plan Table B metals for protection of marine life, Ocean Plan PAHs, pyrethroids, OP pesticides, ammonia, nitrate, phosphates, and critical life stage chronic toxicity for three species. In addition, within the range of the southern sea otter, indicator bacteria or some other measure of fecal contamination shall be analyzed.

3. Waterfront and Marine Operations: In addition to the above requirements for ocean receiving water monitoring, additional monitoring must be performed for marinas and boat launch and pier facilities:

a. For all marina or mooring field operators, in mooring fields with 10 or more occupied moorings, the ocean receiving water must be sampled for Ocean Plan indicator bacteria,

residual chlorine, copper, zinc, grease and oil, methylene blue active substances (MBAS), and ammonia nitrogen.

(1) For mooring field operators opting for an individual monitoring program (Section IV.B.1 above), this sampling must occur weekly (on the weekend) from May through October.

(2) For mooring field operators opting to participate in a regional integrated monitoring program (Section IV.B.2 above), this sampling must occur monthly from May through October on a high use weekend in each month. The Water Boards may allow a reduction in the frequency of sampling, through the regional monitoring program, after the first year of monitoring.

b. For all mooring field operators, the subtidal sediment (sand or finer, if present) within mooring fields and below piers shall be sampled and analyzed for Ocean Plan Table B metals (for marine aquatic life beneficial use), acute toxicity, PAHs, and tributyltin. For sediment toxicity testing, only an acute toxicity test using the amphipod Eohaustorius estuarius must be performed. This sampling shall occur at least three times during a five (5) year period. For mooring field operators opting to participate in a regional integrated monitoring program, the Water Boards may allow a reduction in the frequency of sampling after the first sampling effort's results are assessed.

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ATTACHMENT B

STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

1. Standard Permit Provisions

Code of Federal Regulations Title 40 Section 122.41 (40 CFR 122.41) includes conditions, or provisions, that apply to all National Pollutant Discharge Elimination System (NPDES) permits. Additional provisions applicable to NPDES permits are in 40 CFR 122.42. All applicable provisions in 40 CFR 122.41 and 40 CFR 122.42 must be incorporated into this Order and NPDES permit. The applicable 40 CFR 122.41 and 40 CFR 122.42 provisions are as follows:

a. DUTY TO COMPLY [40 CFR 122.41(a)]

The Copermittee must comply with all of the provisions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

(1) The Copermittee must comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement. [40 CFR 122.41(a)(1)]

(2) The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to a civil penalty not to exceed $25,000 per day for each violation. The CWA provides that any person who *negligently* violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than 2 years, or both. Any person who *knowingly* violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both. Any person who knowingly violates Section 301, 302, 303, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, and who knows at that time that he thereby places another person in imminent danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of

not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.
[40 CFR 122.41(a)(2)]

(3) Any person may be assessed an administrative penalty by the San Diego Regional Water Quality Control Board (San Diego Water Board), State Water Resources Control Board (State Water Board), or United States Environmental Protection Agency (USEPA) for violating Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.
[40 CFR 122.41(a)(3)]

b. DUTY TO REAPPLY [40 CFR 122.41(b)]

If a Copermittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Copermittee must apply for and obtain a new permit.

c. NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE [40 CFR 122.41(c)]

It shall not be a defense for a Copermittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

d. DUTY TO MITIGATE [40 CFR 122.41(d)]

The Copermittee must take all reasonable steps to minimize or prevent any discharge or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

e. PROPER OPERATION AND MAINTENANCE [40 CFR 122.41(e)]

The Copermittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Copermittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by a Copermittee only when the operation is necessary to achieve compliance with the conditions of this permit.

f. PERMIT ACTIONS [40 CFR 122.41(f)]

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Copermittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

g. PROPERTY RIGHTS [40 CFR 122.41(g)]

This permit does not convey any property rights of any sort, or any exclusive privilege.

h. DUTY TO PROVIDE INFORMATION [40 CFR 122.41(h)]

The Copermittee must furnish to the San Diego Water Board, State Water Board, or USEPA within a reasonable time, any information which the San Diego Water Board, State Water Board, or USPEA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Copermittee must also furnish to the San Diego Water Board, State Water Board, or USPEA upon request, copies of records required to be kept by this permit.

i. INSPECTION AND ENTRY [40 CFR 122.41(i)]

The Copermittee must allow the San Diego Water Board, State Water Board, USEPA, and/or their authorized representative (including an authorized contractor acting as their representative), upon presentation of credentials and other documents as may be required by law, to:

(1) Enter upon the Copermittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit; [40 CFR 122.41(i)(1)]

(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit; [40 CFR 122.41(i)(2)]

(3) Inspect and photograph at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; [40 CFR 122.41(i)(3)] and

(4) Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location. [40 CFR 122.41(i)(4)]

j. MONITORING AND RECORDS [40 CFR 122.41(j)]

(1) Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity. [40 CFR 122.41(j)(1)]

(2) Except for records of monitoring information required by this permit related to the Copermittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five (5) years (or longer as required by 40 CFR Part 503), the

Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time. [40 CFR 122.41(j)(2)]

(3) Records for monitoring information must include: [40 CFR 122.41(j)(3)]

(a) The date, exact place, and time of sampling or measurements; [40 CFR 122.41(j)(3)(i)]
(b) The individual(s) who performed the sampling or measurements; [40 CFR 122.41(j)(3)(ii)]
(c) The date(s) analyses were performed; [40 CFR 122.41(j)(3)(iii)]
(d) The individual(s) who performed the analyses; [40 CFR 122.41(j)(3)(iv)]
(e) The analytical techniques or methods used; [40 CFR 122.41(j)(3)(v)] and
(f) The results of such analyses. [40 CFR 122.41(j)(3)(vi)]

(4) Monitoring must be conducted according to test procedures under 40 CFR Part 136 unless another method is required under 40 CFR Subchapters N or O. [40 CFR 122.41(j)(4)]

In the case of pollutants for which there are no approved methods under 40 CFR Part 136 or otherwise required under 40 CFR Subchapters N and O, monitoring must be conducted according to a test procedure specified in the permit for such pollutants. [40 CFR 122.44(i)(1)(iv)]

(5) The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. [40 CFR 122.41(j)(5)]

k. SIGNATORY REQUIREMENT [40 CFR 122.41(k)]

(1) All applications, reports, or information submitted to the San Diego Water Board, State Water Board, or USEPA must be signed and certified. (See 40 CFR 122.22) [40 CFR 122.41(k)(1)]

(a) *For a municipality, State, Federal, or other public agency.* [All applications must be signed] [b]y either a principal executive officer or ranking elected official. [40 CFR 122.22(a)(3)]

(b) All reports required by permits, and other information requested by the San Diego Water Board, State Water Board, or USEPA must be signed by a person described in paragraph (a) of this section, or by a duly authorized representative of that person. A person is a duly authorized representative only if: [40 CFR 122.22(b)]

(i) The authorization is made in writing by a person described in paragraph (a) of this section; [40 CFR 122.22(b)(1)]

(ii) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company, (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) [40 CFR 122.22(b)(2)] and,

(iii) The written authorization is submitted to the San Diego Water Board and State Water Board. [40 CFR 122.22(b)(3)]

(c) *Changes to authorization.* If an authorization under paragraph (b) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (b) of this section must be submitted to the San Diego Water Board prior to or together with any reports, information, or applications to be signed by an authorized representative. [40 CFR 122.22(c)]

(d) *Certification.* Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." [40 CFR 122.22(d)]

(2) The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both. [40 CFR 122.41(k)(2)]

I. REPORTING REQUIREMENTS [40 CFR 122.41(l)]

(1) *Planned changes.* The Copermittee must give notice to the San Diego Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when: [40 CFR 122.41(l)(1)]

(a) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); [40 CFR 122.41(l)(1)(i)] or

(b) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which

are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1).
[40 CFR 122.41(l)(1)(ii)]

(c) The alteration or addition results in a significant change in the Copermittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. [40 CFR 122.41(l)(1)(iii)]

(2) *Anticipated noncompliance*. The Copermittee must give advance notice to the San Diego Water Board or State Water Board of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.
[40 CFR 122.41(l)(2)]

(3) *Transfers*. This permit is not transferable to any person except after notice to the San Diego Water Board. The San Diego Water Board may require modification or revocation and reissuance of the permit to change the name of the Copermittee and incorporate such other requirements as may be necessary under the CWA.
[40 CFR 122.41(l)(3)]

(4) *Monitoring reports.* Monitoring results must be reported at the intervals specified elsewhere in this permit. [40 CFR 122.41(l)(4)]

(a) Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the San Diego Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices. [40 CFR 122.41(l)(4)(i)]

(b) If the Copermittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or another method required for an industry-specific waste stream under 40 CFR Subchapters N or O, the results of this monitoring must be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the San Diego Water Board or State Water Board.
[40 CFR 122.41(l)(4)(ii)]

(c) Calculations for all limitations which require averaging of measurements must utilize an arithmetic mean unless otherwise specified in the permit.
[40 CFR 122.41(l)(4)(iii)]

(5) *Compliance schedules*. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date. [40 CFR 122.41(l)(5)]

(6) *Twenty-four hour reporting.*

(a) The Copermittee must report any noncompliance that may endanger health or the environment. Any information must be provided orally within 24 hours from the time the Copermittee becomes aware of the circumstances. A written submission must also be provided within five (5) days of the time the Copermittee becomes aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6)(i)]

(b) The following must be included as information which must be reported within 24 hours under this paragraph: [40 CFR 122.41(l)(6)(ii)]

(i) Any unanticipated bypass that exceeds any effluent limitation in the permit (See 40 CFR 122.41(g)). [40 CFR 122.41(l)(6)(ii)(A)]
(ii) Any upset which exceeds any effluent limitation in the permit. [40 CFR 122.41(l)(6)(ii)(B)] and,
(iii) Violation of a maximum daily discharge limitation for any of the pollutants listed by the San Diego Water Board in the permit to be reported within 24 hours. (See 40 CFR 122.44(g)) [40 CFR 122.41(l)(6)(ii)(C)]

(c) The San Diego Water Board may waive the above-required written report on a case-by-case basis if the oral report has been received within 24 hours. [40 CFR 122.41(l)(6)(iii)]

(7) *Other noncompliance.* The Copermittee must report all instances of noncompliance not reported in accordance with the standard provisions required under 40 CFR 122.41(l)(4), (5), and (6), at the time monitoring reports are submitted. The reports must contain the information listed in the standard provisions required under 40 CFR 122.41(l)(6). [40 CFR 122.41(l)(7))]

(8) *Other information.* When the Copermittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the San Diego Water Board, State Water Board, or USEPA, the Copermittee must promptly submit such facts or information. [40 CFR 122.41(l)(8)]

m. BYPASS [40 CFR 122.41(m)]

(1) *Definitions.*

(a) "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. [40 CFR 122.41(m)(1)(i)] or

(b) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be

expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
[40 CFR 122.41(m)(1)(ii)]

(2) *Bypass not exceeding limitations*. The Copermittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the standard provisions required under 40 CFR 122.41(m)(3) and (4).
[40 CFR 122.41(m)(2)]

(3) *Notice.*

(a) *Anticipated bypass*. If the Copermittee knows in advance of the need for a bypass, it must submit a notice, if possible at least ten days before the date of the bypass. [40 CFR 122.41(m)(3)(i)] or

(b) *Unanticipated bypass*. The Copermittee must submit notice of an unanticipated bypass in accordance with the standard provisions required under 40 CFR 122.41(l)(6) (24-hour notice).
[40 CFR 122.41(m)(3)(ii)]

(4) *Prohibition of Bypass.*

(a) Bypass is prohibited, and the San Diego Water Board may take enforcement action against a Copermittee for bypass, unless:
[40 CFR 122.41(m)(4)(i)]

(i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; [40 CFR 122.41(m)(4)(i)(A)]
(ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance;
[40 CFR 122.41(m)(4)(i)(B)] and,
(iii) The Copermittee submitted notice in accordance with the standard provisions required under 40 CFR 122.41(m)(3).
[40 CFR 122.41(m)(4)(i)(C)]

(b) The San Diego Water Board may approve an anticipated bypass, after considering its adverse effects, if the San Diego Water Board determines that it will meet the three conditions listed above.
[40 CFR 122.41(m)(4)(ii)]

n. UPSET [40 CFR 122.41(n)]

(1) *Definition.* "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Copermittee. An upset does not

include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. [40 CFR 122.41(n)(1)]

(2) *Effect of an upset*. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the standard provisions required under 40 CFR 122.41(n)(3) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. [40 CFR 122.41(n)(2)]

(3) *Conditions necessary for a demonstration of upset*. A Copermittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that: [40 CFR 122.41(n)(3)]

(a) An upset occurred and that the Copermittee can identify the cause(s) of the upset; [40 CFR 122.41(n)(3)(i)]
(b) The permitted facility was at the time being properly operated; [40 CFR 122.41(n)(3)(ii)] and
(c) The Copermittee submitted notice of the upset in accordance with the standard provisions required under 40 CFR 122.41(l)(6)(ii)(B) (24-hour notice). [40 CFR 122.41(n)(3)(iii)]
(d) The Copermittee complied with any remedial measures pursuant to the standard provisions required under 40 CFR 122.41(d). [40 CFR 122.41(n)(3)(iii)]

(4) *Burden of proof*. In any enforcement proceeding, the Copermittee seeking to establish the occurrence of an upset has the burden of proof. [40 CFR 122.41(n)(4)]

o. STANDARD PERMIT PROVISIONS FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS [40 CFR 122.42(c)]

The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the San Diego Water Board or State Water Board under 40 CFR 122.26(a)(1)(v) must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report must include:

(1) The status of implementing the components of the storm water management program that are established as permit conditions; [40 CFR 122.42(c)(1)]

(2) Proposed changes to the storm water management programs that are established as permit conditions. Such proposed changes must be consistent with 40 CFR 122.26(d)(2)(iii); [40 CFR 122.42(c)(2)] and

(3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under 40 CFR 122.26(d)(2)(iv) and (v); [40 CFR 122.42(c)(3)]

(4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; [40 CFR 122.42(c)(4)]

(5) Annual expenditures and budget for year following each annual report; [40 CFR 122.42(c)(5)]

(6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; [40 CFR 122.42(c)(6)]

(7) Identification of water quality improvements or degradation. [40 CFR 122.42(c)(7)]

p. STANDARD PERMIT PROVISIONS FOR STORM WATER DISCHARGES [40 CFR 122.42(d)]

The initial permits for discharges composed entirely of storm water issued pursuant to 40 CFR 122.26(e)(7) must require compliance with the conditions of the permit as expeditiously as practicable, but in no event later than three years after the date of issuance of the permit.

2. General Provisions

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. The general provisions applicable to this Order and NPDES permit are as follows:

a. DISCHARGE OF WASTE IS A PRIVILEGE

No discharge of waste into the waters of the State, whether or not such discharge is made pursuant to waste discharge requirements, shall create a vested right to continue such discharge. All discharges of waste into waters of the State are privileges, not rights. [CWC Section 13263(g)]

b. DURATION OF ORDER AND NPDES PERMIT

(1) *Effective date*. This Order and NPDES permit becomes effective on the 50th day after its adoption provided the USEPA has no objection. If the USEPA objects to its issuance, this Order shall not become effective until such objection is withdrawn. This Order supersedes Order No. R9-2007-0001 upon the effective date of this Order, and supersedes Order Nos. R9-2009-0002 and R9-2010-0016 upon their expiration or earlier notice of coverage.

(2) *Expiration*. This Order and NPDES permit expires five years after its effective date. [40 CFR 122.46(a)]

(3) *Continuation of expired order*. After this Order and NPDES permit expires, the terms and conditions of this Order and NPDES permit are automatically continued pending issuance of a new permit if all requirements of the federal NPDES regulations on the continuation of expired permits (40 CFR 122.6) are complied with.

c. AVAILABILITY

A copy of this Order must be kept at a readily accessible location and must be available to on-site personnel at all times.

d. CONFIDENTIALITY OF INFORMATION

Except as provided for in 40 CFR 122.7, no information or documents submitted in accordance with or in application for this Order will be considered confidential, and all such information and documents shall be available for review by the public at the San Diego Water Board office.

Claims of confidentiality for the following information will be denied:
[40 CFR 122.7(b)]

(1) The name and address of any permit applicant or Copermittee; [40 CFR 122.7(b)(1)] and

(2) Permit applications and attachments, permits, and effluent data. [40 CFR 122.7(b)(2)]

e. EFFLUENT LIMITATIONS

(1) *Interim effluent limitations*. The Copermittee must comply with any interim effluent limitations as established by addendum, enforcement action, or revised waste discharge requirements which have been, or may be, adopted by the San Diego Water Board.

(2) *Other effluent limitations and standards*. If any applicable toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant and that standard or prohibition is more stringent than any limitation on the pollutant in the permit, the San Diego Water Board shall institute proceedings under these regulations to modify or revoke and reissue the permit to conform to the toxic effluent standard or prohibition. [40 CFR 122.44(b)(1)]

f. DUTY TO MINIMIZE OR CORRECT ADVERSE IMPACTS

The Copermittee must take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this Order, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the noncompliance.

g. PERMIT ACTIONS

The filing of a request by the Copermittee for modification, revocation and reissuance, or termination of this Order, or a notification of planned change in or anticipated noncompliance with this Order does not stay any condition of this Order. (See 40 CFR 122.41(f)) In addition, the following provisions apply to this Order:

(1) Upon application by any affected person, or on its own motion, the San Diego Water Board may review and revise the requirements in this Order. All requirements must be reviewed periodically. [CWC Section 13263(e)]

(2) This Order may be terminated or modified for cause, including, but not limited to, all of the following: [CWC Section 13381]

(a) Violation of any condition contained in the requirements of this Order. [CWC Section 13381(a)]

(b) Obtaining the requirements in this Order by misrepresentation, or failure to disclose fully all relevant facts. [CWC Section 13381(b)]

(c) A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge. [CWC Section 13381(c)]

(3) When this Order is transferred to a new owner or operator, such requirements as may be necessary under the CWC may be incorporated into this Order.

h. NPDES Permitted Non-Storm Water Discharges

The San Diego Water Board has, in prior years, issued a limited number of individual NPDES permits for non-storm water discharges to MS4s. The San Diego Water Board or State Water Board may in the future, upon prior notice to the Copermittee(s), issue an NPDES permit for any non-storm water discharge (or class of non-storm water discharges) to an MS4.

i. Monitoring

In addition to the standard provisions required under 40 CFR 122.41(j) and (l)(4), the following general monitoring provisions apply to this Order:

(1) Where procedures are not otherwise specified in Order, sampling, analysis and quality assurance/quality control must be conducted in accordance with the Quality Assurance Management Plan (QAMP) for the State of California's Surface Water Ambient Monitoring Program (SWAMP), adopted by the State Water Resources Control Board (State Water Board).

(2) Pursuant to 40 CFR 122.41(j)(2) and CWC Section 13383(a), each Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five (5) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time.

(3) All chemical, bacteriological, and toxicity analyses must be conducted at a laboratory certified for such analyses by the California Department of Public Health or a laboratory approved by the San Diego Water Board.

(4) For priority toxic pollutants that are identified in the California Toxics Rule (CTR) (65 Fed. Reg. 31682), the Copermittees must instruct their laboratories to establish calibration standards that are equivalent to or lower than the Minimum Levels (MLs) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP). If a Copermittee can demonstrate that a particular ML is not attainable, in accordance with procedures set forth in 40 CFR Part 136, the lowest quantifiable concentration of the lowest calibration standard analyzed by a specific analytical procedure (assuming that all the method specified sample weights, volumes, and processing steps have been followed) may be used instead of the ML listed in Appendix 4 of the SIP. The Copermittee must submit documentation from the laboratory to the San Diego Water Board for approval prior to raising the ML for any priority toxic pollutant.

j. ENFORCEMENT

(1) The San Diego Water Board is authorized to enforce the terms of this Order under several provisions of the CWC, including, but not limited to, CWC Sections 13385, 13386, and 13387.

(2) Nothing in this Order shall be construed to protect the Copermittee from its liabilities under federal, state, or local laws.

(3) The CWC provides for civil and criminal penalties comparable to, and in some cases greater than, those provided for under the CWA.

(4) Except as provided in the standard conditions required under 40 CFR 122.41(m) and (n), nothing in this Order shall be construed to relieve the Copermittee from civil or criminal penalties for noncompliance.

(5) Nothing in this Order shall be construed to preclude the institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties to which the Copermittee is or may be subject to under Section 311 of the CWA.

(6) Nothing in this Order shall be construed to preclude institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authoring preserved by Section 510 of the CWA.

k. SEVERABILITY

The provisions of this Order are severable, and if any provision of this Order, or the application of any provisions of this Order to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this Order shall not be affected thereby.

l. APPLICATIONS

Any application submitted by a Copermittee for reissuance or modification of this Order must satisfy all applicable requirements specified in federal regulations as well as any additional requirements for submittal of a Report of Waste Discharge specified in the CWC and the California Code of Regulations.

m. IMPLEMENTATION

All plans, reports and subsequent amendments submitted in compliance with this Order must be implemented immediately (or as otherwise specified). All submittals by Copermittees must be adequate to implement the requirements of this Order.

n. REPORT SUBMITTALS

(1) All report submittals must include an executive summary, introduction, conclusion, recommendations, and signed certified statement.

(2) Each Copermittee must submit a signed certified statement covering its responsibilities for each applicable submittal.

(3) The Principal Watershed Copermittee(s) must submit a signed certified statement covering its responsibilities for each applicable submittal and the sections of the submittals for which it is responsible.

(4) Unless otherwise directed, the Copermittees must submit one hard copy and one electronic copy of each report required under this Order to the San Diego Water Board, and one electronic copy to the USEPA.

(5) The Copermittees must submit reports and provide notifications as required by this Order to the following:

EXECUTIVE OFFICER
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
9174 SKY PARK COURT, SUITE 100
SAN DIEGO CA 92123-4340
Telephone: (858) 467-2952 Fax: (858) 571-6972

EUGENE BROMLEY
US ENVIRONMENTAL PROTECTION AGENCY
REGION IX
PERMITS ISSUANCE SECTION (W-5-1)
75 HAWTHORNE STREET
SAN FRANCISCO CA 94105

ATTACHMENT C

ACRONYMS AND ABBREVIATIONS

AMAL	Average Monthly Action Level
ASBS	Area(s) of Special Biological Significance
BMP	Best Management Practice
Basin Plan	Water Quality Control Plan for the San Diego Basin
CEQA	California Environmental Quality Act
CCR	California Code of Regulations
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWC	California Water Code
CZARA	Coastal Zone Act Reauthorization Amendments of 1990
ESAs	Environmentally Sensitive Areas
GIS	Geographic Information System
IBI	Index of Biological Integrity
LID	Low Impact Development
MDAL	Maximum Daily Action Level
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
NAL	Non-Storm Water Action Level
NAICS	North American Industry Classification System
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
ROWD	Report of Waste Discharge (application for NPDES reissuance)
SAL	Storm Water Action Level
San Diego Water Board	California Regional Water Quality Control Board, San Diego Region
SIC	Standard Industrial Classification Code
State Water Board	State Water Resources Control Board
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
WDID	Waste Discharge Identification Number
WLA	Waste Load Allocation
WQBEL	Water Quality Based Effluent Limitation

DEFINITIONS

Active/Passive Sediment Treatment - Using mechanical, electrical or chemical means to flocculate or coagulate suspended sediment for removal from runoff from construction sites prior to discharge.

Anthropogenic Litter – Trash generated from human activities, not including sediment.

Average Monthly Action Level – The highest allowable average of daily discharges over a calendar month.

Beneficial Uses - The uses of water necessary for the survival or wellbeing of man, plants, and wildlife. These uses of water serve to promote tangible and intangible economic, social, and environmental goals. "Beneficial Uses" of the waters of the State that may be protected include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. Existing beneficial uses are uses that were attained in the surface or ground water on or after November 28, 1975; and potential beneficial uses are uses that would probably develop in future years through the implementation of various control measures. "Beneficial Uses" are equivalent to "Designated Uses" under federal law. [California Water Code Section 13050(f)].

Best Management Practices (BMPs) - Defined in 40 CFR 122.2 as schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Bioassessment - The use of biological community information to evaluate the biological integrity of a water body and its watershed. With respect to aquatic ecosystems, bioassessment is the collection and analysis of samples of the benthic macroinvertebrate community together with physical/habitat quality measurements associated with the sampling site and the watershed to evaluate the biological condition (i.e. biotic integrity) of a water body.

Biofiltration - Practices that use vegetation and amended soils to detain and treat runoff from impervious areas. Treatment is through filtration, infiltration, adsorption, ion exchange, and biological uptake of pollutants.

Biological Integrity - Defined in Karr J.R. and D.R. Dudley. 1981. Ecological perspective on water quality goals. *Environmental Management* 5:55-68 as: "A balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitat of the region." Also referred to as ecosystem health.

BMP Design Manual – A plan developed to eliminate, reduce, or mitigate the impacts of runoff from development projects, including Priority Development Projects.

Clean Water Act Section 303(d) Water Body - An impaired water body in which water quality does not meet applicable water quality standards and/or is not expected to meet water quality standards, even after the application of technology based pollution controls required by the

CWA. The discharge of runoff to these water bodies by the Copermittees is significant because these discharges can cause or contribute to violations of applicable water quality standards.

Construction Site – Any project, including projects requiring coverage under the Construction General Permit, that involves soil disturbing activities including, but not limited to, clearing, grading, disturbances to ground such as stockpiling, and excavation.

Contamination - As defined in the Porter-Cologne Water Quality Control Act, contamination is "an impairment of the quality of waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste whether or not waters of the State are affected."

Copermittee – An incorporated city within the County of Orange, County of Riverside, or County of San Diego in the San Diego Region, the County of Orange, the County of Riverside, the County of San Diego, the Orange County Flood Control District, the Riverside County Water Conservation and Flood Control District, the San Diego Regional Airport Authority, or the San Diego Unified Port District.

Copermittees – All of the individual Copermittees, collectively.

Critical Channel Flow (Qc) – The channel flow that produces the critical shear stress that initiates bed movement or that erodes the toe of channel banks. When measuring Qc, it should be based on the weakest boundary material – either bed or bank.

Daily Discharge – Defined as either: (1) the total mass of the constituent discharged over the calendar day or any 24 hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g. concentration.)

The Daily Discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day, or other 24 hour period other than a day), or by the arithmetic mean of analytical results from one or more grab samples taken over the course of a day.

Development Projects - Construction, rehabilitation, redevelopment, or reconstruction of any public or private residential project, industrial, commercial, or any other projects.

Dry Season –May 1 to September 30.

Dry Weather – Weather is considered dry if the preceding 72 hours has been without measurable precipitation (>0.1 inch).

Enclosed Bays – Enclosed bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost bay works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays do not include inland surface waters or ocean waters.

Erosion – When land is diminished or worn away due to wind, water, or glacial ice. Often the eroded debris (silt or sediment) becomes a pollutant via storm water runoff. Erosion occurs naturally but can be intensified by land clearing activities such as farming, development, road building, and timber harvesting.

Environmentally Sensitive Areas (ESAs) - Areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; areas designated as preserves or their equivalent under the Natural Communities Conservation Program within the Cities and County of Orange; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.

Estuaries – Waters, including coastal lagoons, located at the mouth of streams that serve as areas of mixing fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and ocean water. Estuaries do not include inland surface waters or ocean waters.

Existing Development – Any area that has been developed and exists for municipal, commercial, industrial, or residential purposes, uses, or activities. May include areas that are not actively used for its originally developed purpose, but may be re-purposed or redeveloped for another use or activity.

Flow Duration – The long-term period of time that flows occur above a threshold that causes significant sediment transport and may cause excessive erosion damage to creeks and streams (not a single storm event duration). The simplest way to visualize this is to consider a histogram of pre- and post-project flows using long-term records of hourly data. To maintain pre-development flow duration means that the total number of hours (counts) within each range of flows in a flow-duration histogram cannot increase between the pre- and post-development condition. Flow duration within the range of geomorphologically significant flows is important for managing erosion.

Grading - The cutting and/or filling of the land surface to a desired slope or elevation.

Hazardous Material – Any substance that poses a threat to human health or the environment due to its toxicity, corrosiveness, ignitability, explosive nature or chemical reactivity. These also include materials named by the USEPA in 40 CFR 116 to be reported if a designated quantity of the material is spilled into the waters of the U.S. or emitted into the environment.

Hazardous Waste - Hazardous waste is defined as “any waste which, under Section 600 of Title 22 of this code, is required to be managed according to Chapter 30 of Division 4.5 of Title 22 of this code” [CCR Title 22, Division 4.5, Chapter 11, Article 1].

Household Hazardous Waste – Paints, cleaning products, and other wastes generated during home improvement or maintenance activities.

Hydromodification – The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

Illicit Connection – Any connection to the MS4 that conveys an illicit discharge.

Illicit Discharge - Any discharge to the MS4 that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from fire fighting activities [40 CFR 122.26(b)(2)].

Inactive Areas – Areas of construction activity that are not active and those that have been active and are not scheduled to be re-disturbed for at least 14 days.

Infiltration – Water other than wastewater that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow [40 CFR 35.2005(20)].

Inland Surface Waters – Includes all surface waters of the State that do not include the ocean, enclosed bays, or estuaries.

Jurisdictional Runoff Management Program Document – A written description of the specific jurisdictional runoff management measures and programs that each Copermittee will implement to comply with this Order and ensure that storm water pollutant discharges in runoff are reduced to the MEP and do not cause or contribute to a violation of water quality standards.

Low Impact Development (LID) – A storm water management and land development strategy that emphasizes conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions.

Low Impact Development Best Management Practices (LID BMPs) – LID BMPs include schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States through storm water management and land development strategies that emphasize conservation sand the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions. LID BMPs include retention practices that do not allow runoff, such as infiltration, rain water harvesting and reuse, and evapotranspiration. LID BMPs also include flow-through practices such as biofiltration that may have some discharge of storm water following pollutant reduction.

Major Outfall – As defined in the Code of Federal Regulations, a major outfall is a MS4 outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (i.e. discharge from a single conveyance other than a circular pipe which is associated with a drainage are of more than 50 acres); or, for MS4s that receive storm water from lands zoned for industrial activity (based on comprehensive zoning plans or equivalent), a MS4 outfall that discharges from a single pipe with an inside diameter of 12 inches or more or from its equivalent

(i.e. discharge from other than a circular pipe associated with a drainage area of 2 acres or more).

Maximum Daily Action Level (MDAL) –The highest allowable daily discharge of a pollutant, over a calendar day (or 24 hour period). For pollutants with action levels expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with action levels expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

Maximum Extent Practicable (MEP) – The technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) for storm water that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) in combination with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than BAT. A definition for MEP is not provided either in the statute or in the regulations. Instead the definition of MEP is dynamic and will be defined by the following process over time: municipalities propose their definition of MEP by way of their runoff management programs. Their total collective and individual activities conducted pursuant to the runoff management programs becomes their proposal for MEP as it applies both to their overall effort, as well as to specific activities (e.g., MEP for street sweeping, or MEP for MS4 maintenance). In the absence of a proposal acceptable to the San Diego Water Board, the San Diego Water Board defines MEP.

In a memo dated February 11, 1993, entitled "Definition of Maximum Extent Practicable," Elizabeth Jennings, Senior Staff Counsel, SWRCB addressed the achievement of the MEP standard as follows:

> "*To achieve the MEP standard, municipalities must employ whatever Best Management Practices (BMPs) are technically feasible (i.e., are likely to be effective) and are not cost prohibitive. The major emphasis is on technical feasibility. Reducing pollutants to the MEP means choosing effective BMPs, and rejecting applicable BMPs only where other effective BMPs will serve the same purpose, or the BMPs would not be technically feasible, or the cost would be prohibitive. In selecting BMPs to achieve the MEP standard, the following factors may be useful to consider:*
>
> *a. Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?*
> *b. Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?*
> *c. Public Acceptance: Does the BMP have public support?*
> *d. Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?*
> *e. Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc.?*
>
> *The final determination regarding whether a municipality has reduced pollutants to the maximum extent practicable can only be made by the Regional or State Water Boards, and not by the municipal discharger. If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would*

exceed any benefit derived, it would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs that would address a pollutant source, or to pick a BMP based solely on cost, which would be clearly less effective. In selecting BMPs the municipality must make a serious attempt to comply and practical solutions may not be lightly rejected. In any case, the burden would be on the municipal discharger to show compliance with its permit. After selecting a menu of BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented."

Monitoring Year – October 1 to September 30

Municipal Separate Storm Sewer System (MS4) – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designated or used for collecting or conveying storm water; (iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.26.

National Pollutant Discharge Elimination System (NPDES) - The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the CWA.

Non-Storm Water - All discharges to and from a MS4 that do not originate from precipitation events (i.e., all discharges from a MS4 other than storm water). Non-storm water includes illicit discharges and NPDES permitted discharges.

Nuisance - As defined in the Porter-Cologne Water Quality Control Act, a nuisance is "anything which meets all of the following requirements: 1) Is injurious to health, or is indecent, or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. 2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. 3) Occurs during, or as a result of, the treatment or disposal of wastes."

Ocean Waters – the territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the State Board's California Ocean Plan.

Order – Unless otherwise specified, refers to this Order, Order No. R9-2013-0001 (NPDES No. CAS0109266)

Persistent Flow - Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

Person - A person is defined as an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof [40 CFR 122.2].

Point Source - Any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, landfill leachate collection systems, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

Pollutant - Any agent that may cause or contribute to the degradation of water quality such that a condition of pollution or contamination is created or aggravated.

Pollution - As defined in the Porter-Cologne Water Quality Control Act, pollution is "the alteration of the quality of the waters of the State by waste, to a degree that unreasonably affects the either of the following: 1) The waters for beneficial uses; or 2) Facilities that serve these beneficial uses." Pollution may include contamination.

Pollution Prevention - Pollution prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control BMPs, treatment control BMPs, or disposal.

Pre-Development Runoff Conditions – Runoff conditions that existed onsite before the existing development was constructed, or exists onsite before planned development activities occur.

Priority Development Projects - New development and redevelopment projects defined under Provision E.3.b of Order No. R9-2012-0011.

Rainy Season (aka Wet Season) –October 1 to April 30

Receiving Waters – Waters of the United States.

Receiving Water Limitations - Waste discharge requirements issued by the San Diego Water Board typically include both: (1) "Effluent Limitations" (or "Discharge Limitations") that specify the technology-based or water-quality-based effluent limitations; and (2) "Receiving Water Limitations" that specify the water quality objectives in the Basin Plan as well as any other limitations necessary to attain those objectives. In summary, the "Receiving Water Limitations" provision is the provision used to implement the requirements of CWA section 402(p)(3)(B).

Redevelopment - The creation, addition, and or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include trenching and resurfacing associated with utility work; resurfacing existing roadways; new sidewalk construction, pedestrian ramps, or bike lane on existing roads; and routine replacement of damaged pavement, such as pothole repair.

Reporting Period – The period of information that is reported in the Annual Report. The reporting period consists of two components: 1) July 1 to June 30, consistent with the fiscal year, for the implementation of the jurisdictional runoff management programs, and 2) October 1 to September 30, consistent with the monitoring year for the monitoring and assessment programs. Together, these two time periods constitute the reporting year for the Annual Report due January 31 following the end of the monitoring year.

Retain –Keep or hold in a particular place, condition, or position without discharge to surface waters.

Retrofitting – Storm water management practice put into place after development has occurred in watersheds where the practices previously did not exist. Retrofitting of developed areas is intended to improve water quality, protect downstream channels, reduce flooding, or meet other specific objectives. Retrofitting developed areas may include, but is not limited to replacing roofs with green roofs, disconnecting downspouts or impervious surfaces to drain to pervious surfaces, replacing impervious surfaces with pervious surfaces, installing rain barrels, installing rain gardens, and trash area enclosures.

Runoff - All flows in a storm water conveyance system that consists of the following components: (1) storm water (wet weather flows) and (2) non-storm water including dry weather flows.

San Diego Water Board – As used in this document the term "San Diego Water Board" is synonymous with the term "Regional Board" as defined in Water Code section 13050(b) and is intended to refer to the California Regional Water Quality Control Board for the San Diego Region as specified in Water Code Section 13200.

Sediment - Soil, sand, and minerals washed from land into water. Sediment resulting from anthropogenic sources (i.e. human induced land disturbance activities) is considered a pollutant. This Order regulates only the discharges of sediment from anthropogenic sources and does not regulate naturally occurring sources of sediment. Sediment can destroy fish-nesting areas, clog animal habitats, and cloud waters so that sunlight does not reach aquatic plants.

Source Control BMP – Land use or site planning practices, or structural or nonstructural measures that aim to prevent runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between pollutants and runoff.

Storm Water – Per 40 CFR 122.26(b)(13), means storm water runoff, snowmelt runoff and surface runoff and drainage. Surface runoff and drainage pertains to runoff and drainage resulting from precipitation events.

Stream, Channel, or Habitat Rehabilitation – Measures or activities for the purpose of improving or restoring the environmental health (i.e. physical, chemical and biological integrity) of streams, channels, or river systems. Rehabilitation techniques may include, but are not limited to, riparian zone restoration, constructed wetlands, bank stabilization, channel reconfiguration, and daylighting drainage systems.

Structural BMPs - A subset of BMPs which detains, retains, filters, removes, or prevents the release of pollutants to surface waters from development projects in perpetuity, after construction of a project is completed.

Total Maximum Daily Load (TMDL) - The maximum amount of a pollutant that can be discharged into a water body from all sources (point and non-point) and still maintain water quality standards. Under CWA section 303(d), TMDLs must be developed for all water bodies that do not meet water quality standards after application of technology-based controls.

Toxicity - Adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies). The water quality objectives for toxicity provided in the Basin Plan, state in part…"All waters shall be free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life….The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge".

Treatment Control BMP – Any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media absorption or any other physical, biological, or chemical process.

Unpaved Road – Any long, narrow stretch without pavement used for traveling by motor passenger vehicles between two or more points. Unpaved roads are generally constructed of dirt, gravel, aggregate or macadam and may be improved or unimproved.

Waste - As defined in CWC Section 13050(d), "waste includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal."

Article 2 of CCR Title 23, Chapter 15 (Chapter 15) contains a waste classification system that applies to solid and semi-solid waste, which cannot be discharged directly or indirectly to water of the state and which therefore must be discharged to land for treatment, storage, or disposal in accordance with Chapter 15. There are four classifications of waste (listed in order of highest to lowest threat to water quality): hazardous waste, designated waste, non-hazardous solid waste, and inert waste.

Water Quality Objective - Numerical or narrative limits on constituents or characteristics of water designated to protect designated beneficial uses of the water. [California Water Code Section 13050 (h)]. California's water quality objectives are established by the State and Regional Water Boards in the Water Quality Control Plans. Numeric or narrative limits for pollutants or characteristics of water designed to protect the beneficial uses of the water. In other words, a water quality objective is the maximum concentration of a pollutant that can exist in a receiving water and still generally ensure that the beneficial uses of the receiving water remain protected (i.e., not impaired). Since water quality objectives are designed specifically to protect the beneficial uses, when the objectives are violated the beneficial uses are, by definition, no longer protected and become impaired. This is a fundamental concept under the Porter Cologne Act. Equally fundamental is Porter Cologne's definition of pollution. A condition of pollution exists when the water quality needed to support designated beneficial uses has become unreasonably affected or impaired; in other words, when the water quality objectives

have been violated. These underlying definitions (regarding beneficial use protection) are the reason why all waste discharge requirements implementing the federal NPDES regulations require compliance with water quality objectives. (Water quality objectives are also called water quality criteria in the CWA.)

Water Quality Standards - Water quality standards, as defined in Clean Water Act section 303(c) consist of the beneficial uses (e.g., swimming, fishing, municipal drinking water supply, etc.,) of a water body and criteria (referred to as water quality objectives in the California Water Code) necessary to protect those uses. Under the Water Code, the water boards establish beneficial uses and water quality objectives in water quality control or basin plans. Together with an anti-degradation policy, these beneficial uses and water quality objectives serve as water quality standards under the Clean Water Act. In Clean Water Act parlance, state beneficial uses are called "designated uses" and state water quality objectives are called "criteria." Throughout this Order, the relevant term is used depending on the statutory scheme.

Waters of the State - Any water, surface or underground, including saline waters within the boundaries of the State [CWC section 13050 (e)]. The definition of the Waters of the State is broader than that for the Waters of the United States in that all water in the State is considered to be a Waters of the State regardless of circumstances or condition.

Waters of the United States - As defined in the 40 CFR 122.2, the Waters of the U.S. are defined as: "(a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate "wetlands;" (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters otherwise defined as waters of the United States under this definition: (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial seas; and (g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA."

Watershed - That geographical area which drains to a specified point on a water course, usually a confluence of streams or rivers (also known as drainage area, catchment, or river basin).

Wet Season (aka Rainy Season) –October 1 to April 30

Wet Weather – Weather is considered wet if there is a storm event of 0.1 inches and greater and the following 72 hours, unless otherwise defined by another regulatory mechanism.

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ATTACHMENT D

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

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JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

FY _____

I. COPERMITTEE INFORMATION

Copermittee Name:

Copermittee Primary Contact Name:

Copermittee Primary Contact Information:
Address:
City: County: State: Zip:
Telephone: Fax: Email:

II. LEGAL AUTHORITY

Has the Copermittee established adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐
A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority?	**YES**	☐
	NO	☐

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

Was an update of the jurisdictional runoff management program document required or recommended by the San Diego Water Board?	**YES**	☐
	NO	☐
If YES to the question above, did the Copermittee update its jurisdictional runoff management program document and make it available on the Regional Clearinghouse?	**YES**	☐
	NO	☐

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

Has the Copermittee implemented a program to actively detect and eliminate illicit discharges and connections to its MS4 that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

Number of non-storm water discharges reported by the public	
Number of non-storm water discharges detected by Copermittee staff or contractors	
Number of non-storm water discharges investigated by the Copermittee	
Number of sources of non-storm water discharges identified	
Number of non-storm water discharges eliminated	
Number of sources of illicit discharges or connections identified	
Number of illicit discharges or connections eliminated	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

V. DEVELOPMENT PLANNING PROGRAM

Has the Copermittee implemented a development planning program that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐
Was an update to the BMP Design Manual required or recommended by the San Diego Water Board?	**YES**	☐
	NO	☐
If YES to the question above, did the Copermittee update its BMP Design Manual and make it available on the Regional Clearinghouse?	**YES**	☐
	NO	☐

Number of proposed development projects in review	
Number of Priority Development Projects in review	
Number of Priority Development Projects approved	
Number of approved Priority Development Projects exempt from any BMP requirements	
Number of approved Priority Development Projects allowed alternative compliance	
Number of Priority Development Projects granted occupancy	

Number of completed Priority Development Projects in inventory	
Number of high priority Priority Development Project structural BMP inspections	
Number of Priority Development Project structural BMP violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM
FY _____

VI. CONSTRUCTION MANAGEMENT PROGRAM

Has the Copermittee implemented a construction management program that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

Number of construction sites in inventory	
Number of active construction sites in inventory	
Number of inactive construction sites in inventory	
Number of construction sites closed/completed during reporting period	
Number of construction site inspections	
Number of construction site violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

Has the Copermittee implemented an existing development management program that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

	Municipal	Commercial	Industrial	Residential
Number of facilities or areas in inventory				
Number of existing development inspections				
Number of follow-up inspections				
Number of violations				
Number of enforcement actions issued				
Number of escalated enforcement actions issued				

VIII. PUBLIC EDUCATION AND PARTICIPATION

Has the Copermittee implemented a public education program component that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐
Has the Copermittee implemented a public participation program component that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

IX. FISCAL ANALYSIS

Has the Copermittee attached to this form a summary of its fiscal analysis that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

X. CERTIFICATION

I [☐ Principal Executive Officer ☐ Ranking Elected Official ☐ Duly Authorized Representative] certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature	Date
Print Name	Title
Telephone Number	Email

ATTACHMENT E

SPECIFIC PROVISIONS FOR TOTAL MAXIMUM DAILY LOADS APPLICABLE TO ORDER NO. R9-2013-0001

These provisions implement Total Maximum Daily Loads (TMDLs), adopted by the San Diego Water Board and approved by USEPA under Clean Water Act section 303(c), which are applicable to discharges regulated under this Order. The provisions and schedules for implementation of the TMDLs described below must be incorporated into the Water Quality Improvement Plans, required pursuant to Provision B of this Order, for the specified Watershed Management Areas.

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed
2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin
3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed
4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek
5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay
6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2002-0123

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	August 14, 2002
State Water Board Approval Date:	July 16, 2003
Office of Administrative Law Approval Date:	September 11, 2003
US EPA Approval Date:	November 3, 2003

(3) TMDL Effective Date: September 11, 2003

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for Chollas Creek consist of the following:

(1) Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedule under Specific Provision 1.c:

Table 1.1
Receiving Water Limitations as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Diazinon	Acute	0.08 µg/L	1 hour
	Chronic	0.05 µg/L	4 days

(2) Effluent Limitations

Discharges from the MS4s must not contain concentrations that exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 1.c:

Table 1.2
Effluent Limitations as Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation	Averaging Period
Diazinon	Acute	0.072 µg/L	1 hour
	Chronic	0.045 µg/L	4 days

(3) Best Management Practices

The following BMPs for Chollas Creek must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area and implemented by the Responsible Copermittees:

(a) The Responsible Copermittees must implement BMPs to support the achievement of the WQBELs under Specific Provision 1.b for Chollas Creek.

(b) The Responsible Copermittees must implement the Diazinon Toxicity Control Plan and Diazinon Public Outreach/Education Program as described in the report titled, *Technical Report for Total Maximum Daily Load for Diazinon in Chollas Creek Watershed, San Diego County*, dated August 14, 2002, including subsequent modifications, in order to achieve the WQBELs under Specific Provision 1.b.

(c) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans as possible.

c. Compliance Schedule

The Responsible Copermittees are required to achieve their respective WLAs by December 31, 2010. The Responsible Copermittees must be in compliance with the WQBELs under Specific Provision 1.b.

d. Specific Monitoring and Assessment Requirements

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls for diazinon within the Chollas Creek watershed, and calculate or estimate the annual diazinon loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

e. COMPLIANCE DETERMINATION

Compliance with WQBELs of Specific Provision 1.b may be demonstrated via one of the following methods:

(1) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;

(2) There are no exceedances of the applicable receiving water limitations under Specific Provision 1.b.(1) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(3) There are no violations of the applicable effluent limitations under Specific Provision 1.b.(2) at the Responsible Copermittees' MS4 outfalls.

2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0019

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	September 22, 2005
Office of Administrative Law Approval Date:	December 2, 2005
US EPA Approval Date:	February 8, 2006

(3) TMDL Effective Date: December 2, 2005

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Shelter Island Yacht Basin

(6) Responsible Copermittee: City of San Diegot

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for Shelter Island Yacht Basin consist of the following:

(1) Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedule under Specific Provision 2.c:

Table 2.1
Receiving Water Limitations as Concentrations in Shelter Island Yacht Basin

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Dissolved Copper	Acute	4.8 µg/L	1 hour
	Chronic	3.1 µg/L	4 days

(2) Effluent Limitations

Discharges from the MS4s must not contain pollutant loads that exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 2.c:

Table 2.2
Effluent Limitations as Annual Loads in MS4 Discharges to Shelter Island Yacht Basin

Constituent	Effluent Limitation
Dissolved Copper	30 kg/yr

(3) Best Management Practices

The Responsible Copermittee must implement BMPs to support the achievement of the WQBELs under Specific Provision 2.b for Shelter Island Yacht Basin

c. Compliance Schedule

The Responsible Copermittee is required to achieve the MS4 WLA by December 2, 2005. The Responsible Copermittee must be in compliance with the WQBELs under Specific Provision 2.b.

d. Specific Monitoring and Assessment Requirements

The Responsible Copermittee must monitor the effluent of its MS4 outfalls for dissolved copper, and calculate or estimate the monthly and annual dissolved copper loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.(b)(2)of this Order. The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

e. Compliance Determination

Compliance with WQBELs of Specific Provision 2.b may be demonstrated via one of the following methods:

(1) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water;

(2) There are no exceedances of the applicable receiving water limitations under Specific Provision 2.b.(1) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(3) There are no violations of the applicable effluent limitations under Specific Provision 2.b.(2) at the Responsible Copermittee's MS4 outfalls.

3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0036

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	November 16, 2005
Office of Administrative Law Approval Date:	February 1, 2006
US EPA Approval Date:	March 22, 2006

(3) TMDL Effective Date: February 1, 2006

(4) Watershed Management Area: Santa Margarita River

(5) Water Body: Rainbow Creek

(6) Responsible Copermittee: County of San Diego

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for Rainbow Creek consist of the following

(1) Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedule under Specific Provision 3.c.(1):

Table 3.1
Receiving Water Limitations as Concentrations in Rainbow Creek

Constituent	Receiving Water Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(2) Effluent Limitations

(a) Discharges from the MS4s must not contain concentrations that exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 3.c.(1):

Table 3.2
Effluent Limitations as Concentrations in MS4 Discharges to Rainbow Creek

Constituent	Effluent Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(b) Pollutant loads from given land uses discharging to and from the MS4s must not exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 3.c.(1):

Table 3.3
Effluent Limitations as Annual Loads in MS4 Discharges to Rainbow Creek

Land Use	Total N	Total P
Commercial nurseries	116 kg/yr	3 kg/yr
Park	3 kg/yr	0.1 kg/yr
Residential areas	149 kg/yr	12 kg/yr
Urban areas	27 kg/yr	6 kg/yr

Interim effluent limitations expressed as pollutant loads are given in the compliance schedule under Specific Provision 3.0.

(3) Best Management Practices

(a) The Responsible Copermittee must implement BMPs to support the achievement of the WQBELs under Specific Provision 3.b for Rainbow Creek.

(b) The Responsible Copermittee should coordinate any BMPs implemented to address this TMDL with Caltrans and other sources as possible.

c. Compliance Schedule

(1) Compliance Date

The Responsible Copermittee must be in compliance with the WQBELs under Specific Provision 3.b, by December 31, 2021.

(2) Interim Compliance Requirements

Table 3.4
Interim Effluent Limitations as Annual Loads in MS4 Discharges from Specific Land Uses to Rainbow Creek

	Total N Interim Effluent Limitations (kg/yr)			Total P Interim Effluent Limitations (kg/yr)		
	Interim Compliance Date			Interim Compliance Date		
Land Use	**2009**	**2013**	**2017**	**2009**	**2013**	**2017**
Commercial nurseries	390	299	196	20	16	10
Park	5	3	3	0.15	0.10	0.10
Residential areas	507	390	260	99	74	47
Urban areas	40	27	27	9	6	6

d. Specific Monitoring and Assessment Requirements

The Responsible Copermittee must implement the Sampling and Analysis Plan for Rainbow Creek Nutrient Reduction TMDL Implementation Water Quality Monitoring, dated January 2010. The results of any monitoring conducted during the reporting period, and assessment of whether the interim and final WQBELs have been achieved must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

e. Compliance Determination

(1) Compliance with interim compliance requirements of Specific Provision 3.c.(2) may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water;

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 3.b.(1) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls;

(c) There are no violations of the applicable effluent limitations under Specific Provision 3.b.(2)(a) at the Responsible Copermittee's MS4 outfalls;

(d) The pollutant loads from given land uses discharging to and from the MS4s do not exceed the applicable effluent limitations under Specific Provision 3.b.(2)(b); OR

(e) The Responsible Copermittee has submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim compliance requirements will be achieved by the interim compliance dates.

(2) Compliance with WQBELs of Specific Provision 3.b may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water;

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 3.b.(1) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls;

(c) There are no violations of the applicable effluent limitations under Specific Provision 3.b.(2)(a) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant loads from given land uses discharging to and from the MS4s do not exceed the applicable effluent limitations under Specific Provision 3.b.(2)(b).

4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2007-0043

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2007
State Water Board Approval Date:	July 15, 2008
Office of Administrative Law Approval Date:	October 22, 2008
US EPA Approval Date:	December 18, 2008

(3) TMDL Effective Date: October 22, 2008

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for Chollas Creek consist of the following:

(1) Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedule under Specific Provision 4.c.(1):

Table 4.1
Receiving Water Limitations as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$(0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$(0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$(0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$(0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER.

(2) Effluent Limitations

Discharges from the MS4s must not contain pollutant loads that exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 4.c.(1):

Table 4.2
Effluent Limitations as Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER.

(3) Best Management Practices

(a) The Responsible Copermittees must implement BMPs to support the achievement of the WQBELs under Specific Provision 4.b for Chollas Creek.

(b) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans and the U.S. Navy as possible.

c. Compliance Schedule

(1) WLA Compliance Date

The Responsible Copermittees are required to achieve the WLA, thus must be in compliance with the WQBELs under Specific Provision 4.b, by October 22, 2028.

(2) Interim Compliance Requirements

The Responsible Copermittee must comply with the following interim WQBELs by the interim compliance date:

Table 4.3
Interim Effluent Limitations as Concentrations in MS4 Discharges to Chollas Creek

Interim Compliance Date	Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
October 22, 2018	Dissolved Copper	Acute	$1.2 \times 90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
	Dissolved Lead	Acute	$1.2 \times 90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
	Dissolved Zinc	Acute	$1.2 \times 90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER.

d. Specific Monitoring and Assessment Requirements

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*, when it is amended to include monitoring requirements for the Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls discharging to Chollas Creek for dissolved copper, lead, and zinc, and calculate or estimate the monthly and annual dissolved copper, lead, and zinc loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2)of this Order. The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

e. COMPLIANCE DETERMINATION

(1) Compliance with interim compliance requirements of Specific Provision 4.c.(2) may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 4.b.(1) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls;

(c) There are no violations of the applicable effluent limitations under Specific Provision 4.b.(2) at the Responsible Copermittees' MS4 outfalls; OR

(d) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim compliance requirements will be achieved by the interim compliance dates.

(2) Compliance with WQBELs of Specific Provision 4.b may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 4.b.(1) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(c) There are no violations of the applicable effluent limitations under Specific Provision 4.b.(2) at the Responsible Copermittees' MS4 outfalls.

5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2008-0027

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 11, 2008
State Water Board Approval Date:	June 16, 2009
Office of Administrative Law Approval Date:	September 15, 2009
US EPA Approval Date:	October 26, 2009

(3) TMDL Effective Date: September 15, 2009

(4) Watershed Management Areas: See Table 5.0

(5) Water Bodies: See Table 5.0

(6) Responsible Copermittees: See Table 5.0

Table 5.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County	Dana Point Harbor	Baby Beach	-City of Dana Point -County of Orange
San Diego Bay	San Diego Bay	Shelter Island Shoreline Park	- San Diego Unified Port District

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Receiving Water Limitations

(a) Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedules under Specific Provisions 5.c.(1)(a) and 5.c.(2):

Table 5.1
Receiving Water Limitations as Bacteria Densities in the Water Body

	Receiving Water Limitations	
Constituent	**Single Sample Maximum[1,2]**	**30-Day Geometric Mean[2]**
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.

(b) If the above receiving water limitations are not met in the receiving water, the Responsible Copermittees must demonstrate that the discharges from the MS4s are not causing or contributing to the exceedance of receiving water limitations.

(2) Effluent Limitations

Discharges from the MS4s must not contain densities that exceed the following effluent limitations by the end of the compliance schedules under Specific Provisions 5.c.(1)(a) and 5.c.(2) to demonstrate the discharge is not causing or contributing to a violation of receiving water quality standards:

Table 5.2
Effluent Limitations as Bacteria Densities in MS4 Discharges to the Water Body

	Effluent Limitations	
Constituent	**Single Sample Maximum[1,2]**	**30-Day Geometric Mean[2]**
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.

Interim effluent limitations expressed as pollutant loads are given in the compliance schedule under Specific Provision 5.c.

(3) Best Management Practices

(a) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 5.0 must incorporate the Bacteria Load Reduction Plan (BLRP) required to be developed pursuant to Resolution No. R9-2008-0027.

(b) The Responsible Copermittee must implement BMPs to support the achievement of the WQBELs under Specific Provision 5.0 for the segments or areas of the water bodies listed in Table 5.0

c. COMPLIANCE SCHEDULE

(1) Baby Beach in Dana Point Harbor

(a) WLA Compliance Dates

The Responsible Copermittees for MS4 discharges to Baby Beach are required to achieve the WLA, thus must be in compliance with the WQBELs under Specific Provision 5.0, according to the following compliance schedule:

Table 5.3
Compliance Schedule Dates to Achieve Baby Beach WLAs

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform	September 15, 2014	September 15, 2009
Fecal Coliform		September 15, 2009
Enterococcus		September 15, 2019

(b) Interim Compliance Requirements

The Responsible Copermittees for MS4 discharges to Baby Beach must comply with the following interim WQBELs by the interim compliance date:

Table 5.4
Interim Effluent Limitations as Loads in MS4 Discharges to Baby Beach

Constituent	Interim Compliance Date	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	4.93×10^9 MPN/day	NA*
Fecal Coliform	September 15, 2012	0.59×10^9 MPN/day	NA*
Enterococcus	September 15, 2012	0.42×10^9 MPN/day	NA**
	September 15, 2016	NA*	207×10^9 MPN/30days

Notes:
* The WQBELs under Specific Provision 5.b must already be achieved by the given interim compliance date.
** There is no corresponding interim WQBEL for the given interim compliance date.

(2) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park is required to achieve the WLA, thus must be in compliance with the WQBELs under Specific Provision 5.0, by December 31, 2012.

d. Specific Monitoring and Assessment Requirements

(1) Monitoring Stations

Monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[33] If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(2) Monitoring Procedures

(a) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) The Responsible Copermittees must collect wet weather monitoring samples within the first 24 hours of the first storm event[34] of the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(c) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs have been achieved.

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[33] Commonly referred to as AB 411 monitoring

[34] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(b) The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

e. COMPLIANCE DETERMINATION

(1) Compliance with interim compliance requirements of Specific Provision 5.c.(1)(b) may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 5.b.(1)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls;

(c) There are no violations of the applicable effluent limitations under Specific Provision 5.b.(2) at the Responsible Copermittees' MS4 outfalls;

(d) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the applicable effluent limitations under Specific Provision 5.c.(1)(b);

(e) The Responsible Copermittees can demonstrate that exceedances of the applicable receiving water limitations under Specific Provision 5.b.(1)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4 are not causing or contributing to the exceedances; OR

(f) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim compliance requirements will be achieved by the interim compliance dates.

(2) Compliance with WQBELs of Specific Provision 5.b may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 5.b.(1)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls;

(c) There are no violations of the applicable effluent limitations under Specific Provision 5.b.(2) at the Responsible Copermittees' MS4 outfalls;

(d) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the applicable effluent limitations under Specific Provision 5.c.(1)(b); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the applicable receiving water limitations under Specific Provision 5.b.(1)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4 are not causing or contributing to the exceedances.

6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2010-0001

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 10, 2010
State Water Board Approval Date:	December 14, 2010
Office of Administrative Law Approval Date:	April 4, 2011
US EPA Approval Date:	June 22, 2011

(3) TMDL Effective Date: April 4, 2011

(4) Watershed Management Areas: See Table 6.0

(5) Water Bodies: See Table 6.0

(6) Responsible Copermittees: See Table 6.0

Table 6.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	-City of Laguna Beach -County of Orange -Orange County Flood Control District
		at Heisler Park - North	
	Pacific Ocean Shoreline	at Main Laguna Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Woods -County of Orange -Orange County Flood Control District
		Laguna Beach at Ocean Avenue	
		Laguna Beach at Cleo Street	
		Arch Cove at Bluebird Canyon Road	
		Laguna Beach at Dumond Drive	
	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Hills -City of Laguna Niguel -City of Laguna Woods -City of Lake Forest -City of Mission Viejo -County of Orange -Orange County Flood Control District
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	
	Aliso Creek Mouth	at mouth	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County (cont'd)	Pacific Ocean Shoreline	Aliso Beach at West Street	-City of Dana Point -City of Laguna Beach -City of Laguna Niguel -County of Orange -Orange County Flood Control District
		Aliso Beach at Table Rock Drive	
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)	
		at Salt Creek (large outlet)	
		Salt Creek Beach at Salt Creek service road	
		Salt Creek Beach at Strand Road	
	Pacific Ocean Shoreline	at San Juan Creek	-City of Dana Point -City of Laguna Hills -City of Laguna Niguel -City of Mission Viejo -City of Rancho Santa Margarita -City of San Juan Capistrano -County of Orange -Orange County Flood Control District
	San Juan Creek	lower 1 mile	
	San Juan Creek Mouth	at mouth	
	Pacific Ocean Shoreline	at Poche Beach	-City of Dana Point -City of San Clemente -County of Orange -Orange County Flood Control District
		Ole Hanson Beach Club Beach at Pico Drain	
		San Clemente City Beach at El Portal Street Stairs	
		San Clemente City Beach at Mariposa Street	
		San Clemente City Beach at Linda Lane	
		San Clemente City Beach at South Linda Lane	
		San Clemente City Beach at Lifeguard Headquarters	
		under San Clemente Municipal Pier	
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	
		San Clemente State Beach at Riviera Beach	
		Can Clemente State Beach at Cypress Shores	
San Luis Rey River	Pacific Ocean Shoreline	at San Luis Rey River mouth	-City of Oceanside -City of Vista -County of San Diego

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
Carlsbad	Pacific Ocean Shoreline	at Moonlight State Beach	-City of Carlsbad -City of Encinitas -City of Escondido -City of San Marcos -County of San Diego
San Dieguito River	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	-City of Del Mar -City of Escondido -City of Poway -City of San Diego -City of Solana Beach -County of San Diego
Penasquitos	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	-City of Del Mar -City of Poway -City of San Diego -County of San Diego
Mission Bay	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	-City of San Diego
		La Jolla Shores Beach at Caminito del Oro	
		La Jolla Shores Beach at Vallecitos	
		La Jolla Shores Beach at Avenida de la Playa	
		at Casa Beach, Children's Pool	
		South Casa Beach at Coast Boulevard	
		Whispering Sands Beach at Ravina Street	
		Windansea Beach at Vista de la Playa	
		Windansea Beach at Bonair Street	
		Windansea Beach at Playa del Norte	
		Windansea Beach at Palomar Avenue	
		at Tourmaline Surf Park	
		Pacific Beach at Grand Avenue	
	Tecolote Creek	Entire reach and tributaries	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I- Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
San Diego River	Forrester Creek	lower 1 mile	-City of El Cajon -City of Santee -County of San Diego
	San Diego River	lower 6 miles	-City of El Cajon -City of La Mesa -City of San Diego -City of Santee -County of San Diego
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	
San Diego Bay	Chollas Creek	lower 1.2 miles	-City of La Mesa -City of Lemon Grove -City of San Diego -County of San Diego - San Diego Unified Port District

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for segments or areas of the water bodies listed in Table 6.0 consist of the following:

(1) Receiving Water Limitations

(a) Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedules under Specific Provision 6.c.(1):

Table 6.1
Receiving Water Limitations as Bacteria Densities and Allowable Exceedance Frequencies in the Water Body

Receiving Water Limitations				
Constituent	Single Sample Maximum[1,2] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[3]	30-Day Geometric Mean[2] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform	10,000	22% / 0%	1,000	0%
Fecal Coliform	400	22% / 0%	200	0%
Enterococcus	104[4] / 61[5]	22% / 0%	35[4] / 33[5]	0%

Notes:
1. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
3. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. The 0% single sample maximum allowable exceedance frequency applies to dry weather days.
4. This *Enterococcus* receiving water limitation applies to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
5. This *Enterococcus* receiving water limitations applies to segments or areas of creeks or creek mouths listed in Table 6.0.

Interim receiving water limitations expressed as allowable exceedance frequencies are given in the compliance schedule under Specific Provision 6.c.

(b) If the above receiving water limitations are not met in the receiving water, the Responsible Copermittees must demonstrate that the discharges from the MS4s are not causing or contributing to the violation of receiving water limitations. The Copermittee must provide data that demonstrate the discharges from the MS4s are meeting the effluent limitations under Specific Provision 6.b.(2).

(2) Effluent Limitations

Discharges from the MS4s must not contain densities that exceed the following effluent limitations by the end of the compliance schedules under Specific Provision 6.c.(1) to demonstrate the discharge is not causing or contributing to a violation of receiving water quality standards:

Table 6.2
Effluent Limitations as Bacteria Densities and Allowable Exceedance Frequencies in MS4 Discharges to the Water Body

	Effluent Limitations			
Constituent	**Single Sample Maximum[1,2] (MPN/100mL)**	**Single Sample Maximum Allowable Exceedance Frequency[3]**	**30-Day Geometric Mean[2] (MPN/100mL)**	**30-Day Geometric Mean Allowable Exceedance Frequency**
Total Coliform	10,000	22% / 0%	1,000	0%
Fecal Coliform	400	22% / 0%	200	0%
Enterococcus	104[4] / 61[5]	22% / 0%	35[4] / 33[5]	0%

Notes:
1. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.
3. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. The 0% single sample maximum allowable exceedance frequency applies to dry weather days
4. This *Enterococcus* effluent limitation applies to MS4 discharges to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
5. This *Enterococcus* effluent limitation applies to MS4 discharges to segments or areas of creeks or creek mouths listed in Table 6.0.

Interim effluent limitations expressed as allowable exceedance frequencies are given in the compliance schedule under Specific Provision 6.c.

(3) Best Management Practices

(a) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 6.0 must incorporate the Comprehensive Load Reduction Plans (CLRPs) required to be developed pursuant to Resolution No. R9-2010-0001. For segments or areas in Table 6.0 that have been delisted from the Clean Water Act Section 303(d) List of Water Quality Limited Segments, a CLRP is not required.

(b) The Responsible Copermittee must implement BMPs to support the achievement of the WQBELs under Specific Provision 6.b for the segments or areas of the water bodies listed in Table 6.0.

(c) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans and owners/operators of small MS4s as possible.

c. COMPLIANCE SCHEDULE

(1) WLA Compliance Dates

The Responsible Copermittees for MS4 discharges to a segment or area of the water bodies listed in Table 6.0 are required to achieve the WLA, thus must be in compliance with the WQBELs under Specific Provision 6.b, according to the following compliance schedule:

Table 6.3
Compliance Schedule Dates to Achieve Indicator Bacteria WLAs

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform*	April 4, 2021	April 4, 2031
Fecal Coliform		
Enterococcus		

* Total coliform receiving water limitations only apply to segments or areas of Pacific Ocean Shoreline listed in Table 6.0.

(2) Interim Compliance Requirements

The Responsible Copermittees must comply with the following interim WQBELs by the interim compliance dates:

(a) Interim Dry Weather Receiving Water Limitations

The Responsible Copermittee must calculate the "existing" exceedance frequencies of the 30-day geometric mean water quality objectives for each of the indicator bacteria by analyzing the available monitoring data collected between January 1, 1996 and December 31, 2002. "Existing" exceedance frequencies may be calculated by segment or area of a water body, or by water body, and/or by Watershed Management Area listed in Table 6.0. Separate "existing" exceedance frequencies must be calculated for beaches and creeks/creek mouths.

The Responsible Copermittees must achieve a 50 percent reduction in the "existing" exceedance frequency of the 30-day geometric mean WQBELs for the segments or areas of the water bodies listed in Table 6.0 by the interim compliance dates for achieving the interim dry weather WQBELs given in Table 6.5. A 50 percent reduction in the "existing" exceedance frequency is equivalent to half of the "existing" exceedance frequency of the 30-day geometric mean WQBELs.

The "existing" exceedance frequencies and the interim dry weather allowable exceedance frequencies (i.e. interim dry weather WQBELs) calculated by the Responsible Copermittees must be included in the Water Quality Improvement Plans for the applicable Watershed Management Areas.

(b) Interim Wet Weather Receiving Water Limitations

The Responsible Copermittees must achieve the interim wet weather receiving water limitations in Table 6.4, expressed as interim allowable exceedance frequencies, by the interim compliance dates for achieving the interim wet weather WQBELs given in Table 6.5.

Table 6.4
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	38%	37%	39%
		at Heisler Park - North			
	Pacific Ocean Shoreline	at Main Laguna Beach			
		Laguna Beach at Ocean Avenue			
		Laguna Beach at Cleo Street			
		Arch Cove at Bluebird Canyon Road			
		Laguna Beach at Dumond Drive			
	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	41%	41%	42%
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	41%	41%	42%
	Aliso Creek Mouth	at mouth	41%	41%	42%
	Pacific Ocean Shoreline	Aliso Beach at West Street	36%	36%	36%
		Aliso Beach at Table Rock Drive			
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)			
		at Salt Creek (large outlet)			
		Salt Creek Beach at Salt Creek service road			
		Salt Creek Beach at Strand Road			

Table 6.4 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County (cont'd)	Pacific Ocean Shoreline	at San Juan Creek	44%	44%	48%
	San Juan Creek	lower 1 mile	44%	44%	47%
	San Juan Creek Mouth	at mouth	44%	44%	47%
	Pacific Ocean Shoreline	at Poche Beach	35%	35%	36%
		Ole Hanson Beach Club Beach at Pico Drain			
		San Clemente City Beach at El Portal Street Stairs			
		San Clemente City Beach at Mariposa Street			
		San Clemente City Beach at Linda Lane			
		San Clemente City Beach at South Linda Lane			
		San Clemente City Beach at Lifeguard Headquarters			
		under San Clemente Municipal Pier			
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)			
		San Clemente State Beach at Riviera Beach			
		Can Clemente State Beach at Cypress Shores			
San Luis Rey River	Pacific Ocean Shoreline	at San Luis Rey River mouth	45%	44%	47%
Carlsbad	Pacific Ocean Shoreline	at Moonlight State Beach	40%	40%	41%
San Dieguito River	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	33%	33%	36%

Table 6.4 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
Penasquitos	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	26%	26%	26%
Mission Bay	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	37%	37%	37%
		La Jolla Shores Beach at Caminito del Oro			
		La Jolla Shores Beach at Vallecitos			
		La Jolla Shores Beach at Avenida de la Playa			
		at Casa Beach, Children's Pool			
		South Casa Beach at Coast Boulevard			
		Whispering Sands Beach at Ravina Street			
		Windansea Beach at Vista de la Playa			
		Windansea Beach at Bonair Street			
		Windansea Beach at Playa del Norte			
		Windansea Beach at Palomar Avenue			
		at Tourmaline Surf Park			
		Pacific Beach at Grand Avenue			
	Tecolote Creek	Entire reach and tributaries	49%	49%	51%
San Diego River	Forrester Creek	lower 1 mile	46%	43%	49%
	San Diego River	lower 6 miles	46%	43%	49%
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	46%	43%	51%
San Diego Bay	Chollas Creek	lower 1.2 miles	41%	41%	43%

(c) Interim Compliance Dates

The Responsible Copermittees must achieve the interim receiving water limitations under Specific Provisions 6.c.(2)(a) and 6.c.(2)(b) by the interim compliance dates given in Table 6.5.

Table 6.5
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs
South Orange County	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	April 4, 2016	April 4, 2021
		at Heisler Park - North		
	Pacific Ocean Shoreline	at Main Laguna Beach	April 4, 2016	April 4, 2021
		Laguna Beach at Ocean Avenue		
		Laguna Beach at Cleo Street		
		Arch Cove at Bluebird Canyon Road		
		Laguna Beach at Dumond Drive		
	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	April 4, 2016	April 4, 2021
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	April 4, 2018	April 4, 2021
	Aliso Creek Mouth	at mouth	April 4, 2018	April 4, 2021
	Pacific Ocean Shoreline	Aliso Beach at West Street	April 4, 2016	April 4, 2021
		Aliso Beach at Table Rock Drive		
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)		
		at Salt Creek (large outlet)		
		Salt Creek Beach at Salt Creek service road	April 4, 2017	April 4, 2021
		Salt Creek Beach at Strand Road	April 4, 2017	April 4, 2021

Table 6.5 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs
South Orange County (cont'd)	Pacific Ocean Shoreline	at San Juan Creek	April 4, 2016	April 4, 2021
	San Juan Creek	lower 1 mile	April 4, 2018	April 4, 2021
	San Juan Creek Mouth	at mouth	April 4, 2016	April 4, 2021
	Pacific Ocean Shoreline	at Poche Beach	April 4, 2016	April 4, 2021
		Ole Hanson Beach Club Beach at Pico Drain	April 4, 2016	April 4, 2021
		San Clemente City Beach at El Portal Street Stairs	April 4, 2017	April 4, 2021
		San Clemente City Beach at Mariposa Street		
		San Clemente City Beach at Linda Lane	April 4, 2016	April 4, 2021
		San Clemente City Beach at South Linda Lane	April 4, 2018	April 4, 2021
		San Clemente City Beach at Lifeguard Headquarters	April 4, 2017	April 4, 2021
		under San Clemente Municipal Pier		
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	April 4, 2018	April 4, 2021
		San Clemente State Beach at Riviera Beach	April 4, 2016	April 4, 2021
		Can Clemente State Beach at Cypress Shores	April 4, 2017	April 4, 2021
San Luis Rey River	Pacific Ocean Shoreline	at San Luis Rey River mouth	April 4, 2017	April 4, 2021
Carlsbad	Pacific Ocean Shoreline	at Moonlight State Beach	April 4, 2016	April 4, 2021
San Dieguito River	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	April 4, 2016	April 4, 2021

Table 6.5 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs
Penasquitos	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	April 4, 2016	April 4, 2021
Mission Bay	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	April 4, 2016	April 4, 2021
		La Jolla Shores Beach at Caminito del Oro		
		La Jolla Shores Beach at Vallecitos		
		La Jolla Shores Beach at Avenida de la Playa		
		at Casa Beach, Children's Pool		
		South Casa Beach at Coast Boulevard		
		Whispering Sands Beach at Ravina Street		
		Windansea Beach at Vista de la Playa		
		Windansea Beach at Bonair Street		
		Windansea Beach at Playa del Norte		
		Windansea Beach at Palomar Avenue		
		at Tourmaline Surf Park		
		Pacific Beach at Grand Avenue		
	Tecolote Creek	Entire reach and tributaries		
San Diego River	Forrester Creek	lower 1 mile	April 4, 2018	April 4, 2021
	San Diego River	lower 6 miles		
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach		
San Diego Bay	Chollas Creek	lower 1.2 miles	April 4, 2018	April 4, 2021

d. Specific Monitoring and Assessment Requirements

(1) Monitoring and Assessment Requirements for Beaches

(a) Monitoring Stations

For beaches addressed by the TMDL, monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[35] If exceedances

[35] Commonly referred to as AB 411 monitoring

of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations at least once within the first 24 hours of the first storm event[36] of the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer in exceedance of the allowable exceedance frequencies in the receiving waters.

(iii) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs for the Pacific Ocean Shoreline segments or areas listed in Table 6.0 have been achieved.

(ii) The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

[36] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(2) Monitoring and Assessment Requirements for Creeks and Creek Mouths

(a) Monitoring Stations

For creeks addressed by the TMDL, monitoring locations should consist of, at a minimum, a location at or near the mouth of the creek (e.g. Mass Loading Station or Mass Emission Station) and one or more locations upstream of the mouth (e.g. Watershed Assessment Station). If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations in accordance with the requirements of Provision D.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations within the first 24 hours of the first storm event[37] of the rainy season (i.e. October 1 through April 30).

(iii) Samples collected from receiving water monitoring stations must be analyzed for fecal coliform and *Enterococcus* indicator bacteria.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the receiving water monitoring data to assess whether the interim and final receiving water WQBELs for the creeks and creek mouths listed in Table 6.0 have been achieved.

(ii) The Responsible Copermittee must identify and incorporate additional MS4 outfall and receiving water monitoring stations and/or adjust monitoring frequencies to identify sources causing exceedances of the receiving water WQBELs.

(iii) The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

[37] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

e. COMPLIANCE DETERMINATION

(1) Compliance with interim compliance requirements of Specific Provision 6.c.(2) may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 6.b.(1) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls;

(c) There are no violations of the applicable effluent limitations under Specific Provision 6.b.(2) at the Responsible Copermittees' MS4 outfalls;

(d) There are no exceedances of the applicable interim receiving water limitations under Specific Provision 6.c.(2) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls;

(e) The Responsible Copermittees can demonstrate that exceedances of the applicable interim or final receiving water limitations under Specific Provision 6.b.(1)(a) or 6.c.(2) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4 are not causing or contributing to the exceedances; OR

(f) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim compliance requirements will be achieved by the interim compliance dates.

(2) Compliance with WQBELs of Specific Provision 6.b may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 6.b.(1) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls;

(c) There are no violations of the applicable effluent limitations under Specific Provision 6.b.(2) at the Responsible Copermittees' MS4 outfalls; OR

(d) The Responsible Copermittees can demonstrate that exceedances of the applicable final receiving water limitations under Specific Provision 6.b.(1)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4 are not causing or contributing to the exceedances.

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ATTACHMENT F

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

DRAFT
FACT SHEET / TECHNICAL REPORT

FOR

TENTATIVE
ORDER NO. R9-2013-0001
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

MONTH DAY, 2013

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I. FACT SHEET FORMAT

This Fact Sheet briefly sets forth the principal facts and the significant factual, legal, methodological, and policy questions that the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) considered in preparing Order No. R9-2013-0001 (Order). In accordance with the Code of Federal Regulations (CFR) Title 40 Parts 124.8 and 124.56 (40 CFR 124.8 and 40 CFR 124.56), this Fact Sheet includes, but is not limited to, the following information:

1. Contact information
2. Public process and notification procedures
3. Background of municipal storm water permits
4. Regional MS4 Permit approach
5. Economic considerations
6. Applicable statutes, regulations, plans and policies
7. Discussion of the provisions in the Order

Tentative Order No. R9-2013-0001 was distributed for public review on October 31, 2012. The San Diego Water Board accepted written comments on the Tentative Order until January 11, 2013. A public hearing was subsequently held on Month Day, 2013 to receive oral comments from interested persons.

The San Diego Water Board files applicable to the issuance of Order No. R9-2013-0001 are incorporated into the administrative record in support of the findings and requirements of the Order.

II. CONTACT INFORMATION

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The Order and other related documents can be downloaded from the San Diego Water Board website at

http://www.swrcb.ca.gov/rwqcb9/water_issues/programs/stormwater/index.shtml

The documents referenced in this Fact Sheet and in Order No. R9-2013-0001 are available for public review at the San Diego Water Board office, located at the address listed above. Public records are available for inspection during regular business hours, from 8:00 am to 5:00 pm Monday through Friday. To schedule an appointment to inspect public records, contact the San Diego Water Board Records Management Officer at 858-467-2952.

COPERMITTEES

Orange County Copermittees

- County of Orange
  - City of Aliso Viejo
  - City of Dana Point
  - City of Laguna Beach
  - City of Laguna Hills
  - City of Laguna Niguel
  - City of Laguna Woods
  - City of Lake Forest
  - City of Mission Viejo
  - City of Ranch Santa Margarita
  - City of San Clemente
  - City of San Juan Capistrano
  - Orange County Flood Control District

Riverside County Copermittees

- County of Riverside
  - City of Murrieta
  - City of Temecula
  - City of Wildomar
  - Riverside County Flood Control and Water Conservation District

San Diego County Copermittees

- County of San Diego
  - City of Carlsbad
  - City of Chula Vista
  - City of Coronado
  - City of Del Mar
  - City of El Cajon
  - City of Encinitas
  - City of Escondido
  - City of Imperial Beach
  - City of La Mesa
  - City of Lemon Grove
  - City of National City
  - City of Oceanside
  - City of Poway
  - City of San Diego
  - City of San Marcos
  - City of Santee
  - City of Solana Beach
  - City of Vista
  - San Diego County Regional Airport Authority
  - San Diego Unified Port District

III. PUBLIC PROCESS AND NOTIFICATION PROCEDURES

The San Diego Water Board followed the schedule listed below for the preparation of Order No. R9-2013-0001:

1. On February 8, 2011, the San Diego Water Board met with the San Diego County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No. R9-2007-0001.

2. Between February and May 2011, the San Diego Water Board met with select San Diego County, Orange County, and Riverside County Copermittees, as well as representatives of the environmental community to discuss concepts and receive recommendations for elements to be incorporated in a Regional Municipal Separate Storm Sewer System Permit (Regional MS4 Permit).

3. On June 27, 2011 the San Diego Water Board received the Report of Waste Discharge from the San Diego County Copermittees for the renewal of their NPDES permit, Order No. R9-2007-0001.

4. On April 9, 2012, the San Diego Water Board released an administrative draft of Tentative Order No. R9-2013-0001 for preliminary informal comments and feedback.

5. On April 25, 2012, the San Diego Water Board held an informal public workshop to present the administrative draft of Tentative Order No. R9-2013-0001 and receive verbal comments.

6. Between June and August 2012, the San Diego Water Board held four (4) focused meetings with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community, and USEPA) to discuss and receive preliminary comments and feedback about specific elements in the administrative draft of Tentative Order No. R9-2013-0001.

7. On September 5, 2012, the San Diego Water Board held an informal public workshop to present the modifications that were expected to be incorporated into the Tentative Order based on the preliminary comments and feedback received during the focused meetings held between June and August 2012.

8. Informal written comments on the administrative draft of Tentative Order No. R9-2013-0001 were accepted until September 14, 2012.

9. On October 12, 2012, the San Diego Water Board released a revised administrative draft of Tentative Order No. R9-2013-0001.

10. On October 24, 2012, the San Diego Water Board held a focused meeting with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community, and USEPA) to discuss modifications incorporated into the administrative draft of Tentative Order No. R9-2013-0001.

11. On October 31, 2012, the San Diego Water Board released Tentative Order No. R9-2013-0001 for formal public review and comment.

12. On November 13, 2012, the San Diego Water Board held a formal public Board workshop to present the public draft of Tentative Order No. R9-2013-0001 and receive verbal comments.

13. Formal written comments on the public draft of Tentative Order No. R9-2013-0001 were accepted until January 11, 2013.

14. A public hearing of Tentative Order No. R9-2013-0001 was conducted on Month Day, 2013.

IV. BACKGROUND OF THE SAN DIEGO REGION MUNICIPAL STORM WATER PERMITS

In developed and developing areas, storm water runoff is commonly transported through municipal separate storm sewer systems (MS4s) and discharged into local receiving water bodies. As the storm water runs off and flows over the land or impervious surfaces (e.g., paved streets, parking lots, and building rooftops), it accumulates debris, chemicals, sediment, and other pollutants that can adversely affect receiving water quality if discharged untreated. The United States Environmental Protection Agency (USEPA) recognizes wet weather flows from urban areas as the number one source of estuarine pollution in coastal communities,[1] such as those within the San Diego Region.

The federal Clean Water Act (CWA) was amended in 1987 to address and regulate discharges of storm water associated with industrial activities and from municipal storm sewers. With the amendments, many municipalities throughout the United States were obligated for the first time to obtain National Pollutant Discharge Elimination System (NPDES) permits for discharges of storm water from their MS4s.

In response to the CWA 1987 amendment, as well as the pending federal NPDES regulations which would implement the amendment, the San Diego Water Board issued "early" MS4 permits. The San Diego Water Board adopted and issued Order Nos. 90-38, 90-42, and 90-46 to regulate storm water discharges from the MS4s in Orange County, San Diego County, and Riverside County, respectively, within the San Diego Region on July 16, 1990.

The "early" MS4 permits, or First Term Permits, were issued prior to the November 1990 promulgation of the final federal NPDES storm water regulations. By issuing these First Term Permits before the federal regulations took effect, the San Diego Water Board was able to provide the Copermittees additional flexibility in addressing and managing storm water discharges. The First Term Permits contained the essentials of the 1990 regulations, and required the Copermittees to develop and implement runoff management programs, but provided little specificity about what was required to be included in or actually achieved by those programs.

The flexibility provided in the First Term Permits was generally continued through the Second Term Permits. The combination of the lack of specificity in the First and Second Term Permits, a general lack of meaningful action by the Copermittees and a general lack of corresponding reaction (i.e. enforcement) by the San Diego Water Board during the first ten years of the storm water program, resulted in few substantive steps towards achieving improvements in the quality of receiving waters or storm water discharges from the MS4s.

[1] US EPA. 1999. 40 CFR Parts 9, 122, 123, and 124. National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. 64 FR 68727.

From 2001, the regulatory approach incorporated into Third Term Permits was a significant departure from the regulatory approach of the First and Second Term Permits. The Third Term Permits issued by the San Diego Water Board included more detailed requirements that outlined the minimum level of implementation required for the Copermittees' programs to meet the maximum extent practicable (MEP) standard for storm water. The Third Term Permits included more detail to emphasize and enhance the jurisdictional runoff management programs developed by the Copermittees and introduced requirements for developing and implementing watershed-based programs.

The Third Term Permits also incorporated two precedent setting decisions by the State Water Board. In Order WQ 99-05, the State Water Board established receiving water limitation language to be included in all MS4 permits. The State Water Board's precedential language clarified that municipal storm water permits must include provisions requiring discharges to be controlled to attain water quality standards in receiving waters. Unlike previously adopted versions of the receiving water limitation language in the First and Second Term Permits, the language no longer stated that "*violations of water quality standards are not violations of the municipal storm water permit under certain conditions*." In addition, the receiving water limitation language no longer indicated that the "*implementation of best management practices is the 'functional equivalent' of meeting water quality standards*." State Water Board Order WQ 99-05 specifically requires language in MS4 permits for the Copermittees to comply with water quality standards based discharge prohibitions and receiving water limitations through timely implementation of control measures and other actions to reduce pollutants in discharges. (See State Water Board Order WQ 99-05 (*Environmental Health Coalition*)).

In Order WQ 2000-11, also a precedential decision, the State Water Board addressed design standards for structural post-construction best management practices (BMPs) for new development and significant redevelopment. The State Water Board found that the design standards, which require that runoff generated by 85 percent of storm events from specific development categories be infiltrated or treated, reflect the MEP standard. State Water Board Order WQ 2000-11 also found that the post-construction BMP provisions, or Standard Storm Water Mitigation Plan (SSMP) provisions, constitute MEP for addressing storm water pollutant discharges resulting from specific development categories.

The Third Term San Diego County and Orange County Permits (Order Nos. 2001-01 and R9-2002-0001, respectively) were appealed to the State Water Board. Minor modifications were made by the State Water Board, but the requirements were largely upheld. In State Water Board Order WQ 2001-15, the State Water Board upheld the Third Term San Diego County Permit requirements with certain modifications. The State Water Board removed the prohibition of storm water discharges *into* the MS4 that cause or contribute to exceedances of water quality objectives. The revision allows for treatment of pollutants in storm water runoff after the pollutants have entered the MS4. State Water Board Order WQ 2001-15 otherwise upheld all the other requirements of the permit.

In addition to the modification to the discharge prohibition in Order WQ 2001-15, the State Water Board refined Order WQ 99-05 by making clear that the Copermittees may use an iterative approach to achieving compliance with water quality standards that involves ongoing assessments and revisions. Thus, the language for the discharge prohibitions and receiving water limitations was revised to explicitly require the Copermittees to implement an iterative process of assessments and revisions to comply with the discharge prohibitions and receiving water limitations. The San Diego Water Board retained the authority to enforce receiving water limitations and discharge prohibitions even if the Copermittee is engaged in the iterative process.

The Third Term San Diego County Permit was subsequently challenged in the Superior Court of the State of California and the Court of Appeal, Fourth Appellate District. The Court of Appeals, Fourth Appellate District, found that the approach of the Third Term San Diego County Permit to regulating discharges into the MS4 was appropriate (*Building Industry Ass'n. v. State Water Resources Control Bd., et al.,* 124 Cal.App.4th 866 (2004)). The State of California Supreme Court denied review sought by the Building Industry Association in March 2005.

The Fourth Term Permits, or current MS4 permits, began with the adoption of Order No. R9-2007-0001 issued to the Copermittees of San Diego County in January 2007. Order Nos. R9-2009-0002 and R9-2010-0016 were subsequently issued to the Copermittees of Orange County and Riverside County. The Fourth Term Permits continued to include more detailed requirements to be implemented by each Copermittee's jurisdictional runoff management program. The Fourth Term Permits also include requirements to further emphasize a watershed management approach and for more coordination among jurisdictional runoff management programs. In addition, the Fourth Term Permits included more requirements for assessing the effectiveness of the runoff management programs being implemented by the Copermittees. The intent of the inclusion of additional requirements was to enhance and better define elements of the permit that were expected to be incorporated into the iterative process for managing runoff from each Copermittee's jurisdiction and within the watersheds of the San Diego Region.

The Fourth Term Permits include several new and emerging approaches for managing storm water runoff and discharges. Low impact development (LID) requirements are included for development and significant redevelopment to reduce pollutants in storm water runoff from sites through more natural processes such as infiltration and biofiltration closer to the source, rather than utilizing conventional mechanical end-of-pipe treatment systems. Hydrograph modification (hydromodification) management requirements also are included to mitigate the potential for increased erosion in receiving waters due to increased runoff rates and durations often caused by development and increased impervious surfaces. The Fourth Term Orange County and Riverside County Permits introduced requirements to identify areas of existing development where retrofitting with LID projects would be feasible and could be implemented to reduce storm water runoff and pollutants in storm water discharges.

The Fourth Term Orange County and Riverside County Permits included a clearer distinction between storm water and non-storm water discharges. The term "urban runoff" was completely removed, and a distinction between storm water (wet weather) runoff and non-storm water (dry weather) runoff was emphasized. This clarification was made to prevent any potential misunderstanding that regulation under the MS4 permits is limited only to urbanized areas, and to prevent non-storm water runoff from being managed in the same manner as storm water runoff. The term "urban runoff" is not defined in the Code of Federal Regulations (CFR) or Federal Register (FR) in the regulation of MS4 discharges. According to the CWA 402(p)(3)(B)(ii), MS4 permits must include a requirement to effectively prohibit non-storm water discharges into the MS4s.

Finally, for the Fourth Term Orange County and Riverside County Permits the San Diego Water Board found that non-storm water discharges to the MS4 from over application of irrigation water are sources of pollutants. The San Diego Water Board found that non-storm water discharges resulting from over-irrigation must be prohibited from entering the MS4 in accordance with the requirements of the CWA and pursuant to 40 CFR 122.26(d)(2)(iv)(B)(1).

The requirements of the Fourth Term Permits issued to the Copermittees in each county within the San Diego Region now have substantively the same core requirements such as discharge prohibitions, receiving water limitations, jurisdictional runoff management program components, and monitoring program requirements. There are, however, several inconsistencies that exist among the three Fourth Term Permits which complicate oversight and implementation of the permits by the San Diego Water Board.

The Fourth Term San Diego County Permit expired in January 2012. The Fourth Term Orange County and Riverside County Permits will expire in December 2014 and November 2015, respectively. Issuing the Fifth Term Permits within five years for three counties under three different permits would require the San Diego Water Board to expend significant time and resources for the issuance of the permits through three separate public proceedings, thereby greatly reducing the time and resources available to oversee implementation and compliance. Multiple permits also create confusion for determining compliance among regulated entities, especially for the land development community.

The San Diego Water Board has acknowledged that issuing a single MS4 permit for all the Copermittees in the San Diego Region can and is expected to result in more consistent implementation, improve communication among agencies within watersheds crossing multiple jurisdictions, and minimize resources spent with each permit renewal process. Within the findings of the Fourth Term Riverside County Permit issued in November 2010, the San Diego Water Board notified the public of its intent to develop and issue a single Regional MS4 Permit.

V. REGIONAL MS4 PERMIT APPROACH

The Fifth Term Permit, or Regional MS4 Permit, shifts the focus of the permit requirements from a minimum level of actions to be implemented by the Copermittees to identifying outcomes to be achieved by those actions. Order No. R9-2013-0001 represents an important paradigm shift in the approach for MS4 permits within the San Diego Region.

Historical Permitting Approach

The First and Second Term Permits were very broad and provided little specificity about what was required to be developed and implemented by the Copermittees. The Third Term Permits began to become more specific about the minimum level of implementation required by the Copermittees. The Fourth Term Permits, or current permits, subsequently increased in specificity. The MS4 permits have progressively become more detailed and focused on specifying the minimum level of actions expected to be implemented by the Copermittees. As detailed and specific as the MS4 permits have become, however, they include very little detail about what the desired outcomes of the required actions are expected to achieve. Compliance with the permit requirements has essentially been tracking numbers of actions and reporting, not tracking progress or actual improvements in the quality of receiving waters or discharges from the MS4s. The result has been an increase in actions being implemented by the Copermittees with little or no ability or expectations to determine whether or not improvements in water quality are being achieved.

The Fourth Term Permits result in significant resource expenditure by the Copermittees to report permit compliance information to the San Diego Water Board in the form of annual jurisdictional runoff management program, watershed program, and monitoring program reports. The San Diego Water Board must then expend much of its limited resources on reviewing more than 50 voluminous reports submitted annually by the Copermittees. The information currently reported by the Copermittees is of limited value when trying to measure progress toward achieving improvements in the quality of receiving waters or discharges from the MS4s. Oversight of the MS4 permits is further complicated by the inconsistencies among the requirements issued to the Orange County, San Diego County, and Riverside County Copermittees under three separate MS4 permits.

Under the Fourth Term Permits, the Copermittees must expend a significant portion of their limited resources collecting data of limited value, and putting together reports to submit that information to the San Diego Water Board. Likewise, the San Diego Water Board must expend most of its limited resources reviewing reports, and developing permits instead of working directly with the Copermittees to identify solutions to problems causing impacts to water quality. This is an unsustainable course that will continue to demand more resources from the Copermittees and the San Diego Water Board, and would continue to result in unknown water quality benefits.

New Permitting Approach

The goal of the Regional MS4 Permit is twofold: 1) bring a consistent set of MS4 permit requirements to all of the Copermittees within the San Diego Region; and, 2) provide a MS4 permit with requirements that will allow the Copermittees to focus their efforts and resources on achieving goals and desired outcomes toward the improvement of water quality rather than completing specific actions.

The overall approach included in the Regional MS4 Permit with respect to the jurisdictional runoff management programs will not differ significantly from the current permits. The general requirements for the jurisdictional runoff management program components and compliance with those requirements will remain and be applied consistently throughout the San Diego Region under the Regional MS4 Permit.

The most significant difference in the new permitting approach is the specific manner of implementation for those jurisdictional runoff management programs. Implementation will be based on decisions made by the Copermittees in accordance with what they have identified as their highest priority water quality conditions. In other words, the Copermittees will have significant control in how to implement the jurisdictional runoff management programs to best utilize their available resources in addressing a specific set of priorities effectively, instead of trying to address all the water quality priorities ineffectively.

The Copermittees are given the responsibility of identifying their highest priority water quality conditions that they intend to address. The Copermittees will develop goals that can be used to measure and demonstrate progress or improvements toward addressing those priorities. In addition to the goals, the Copermittees will provide a schedule for achieving the goals for those highest priorities. The measurement of progress toward achieving the goals for those highest priorities requires a better defined and more focused program of monitoring and assessment than under the Fourth Term Permits.

The monitoring and assessment program must be designed to inform the Copermittees of their progress, and the need for modifications in their jurisdictional runoff management programs and schedules to achieve their goals to improve water quality. The monitoring and assessment program requirements will have a more central role in the Regional MS4 Permit than in earlier permits. The monitoring and assessment requirements must also be designed to enable the Copermittees to focus and direct their efforts in implementing their jurisdictional runoff management programs toward their stated desired outcomes to improve the quality of receiving waters and/or discharges from the MS4s.

By providing a MS4 permit that allows the Copermittees to make more decisions about how to utilize and focus their resources, along with a better defined monitoring and assessment program to inform their water quality management decisions, the Copermittees will have the opportunity to:

1) *Plan strategically*. The Copermittees must have the ability to identify their available resources and develop and implement long term plans that can organize, collect, and use those resources in the most strategically advantageous and efficient manner possible. This ability to develop long term plans will allow the Copermittees to focus and utilize their resources in a more concerted way over the short term and long term to address specific water quality priorities through stated desired outcomes.

2) *Manage adaptively*. The Copermittees must be given the ability to modify their plans as additional information and data are collected from the monitoring and assessment programs. The Copermittees' plans may require modifications to the programs, priorities, goals, strategies, and/or schedules in order for the Copermittees to achieve a stated desired outcome.

3) *Identify synergies*. The Copermittees must be given more flexibility to identify efficiencies within and among their jurisdictional runoff management programs as the strategies are developed and implemented to increase the Copermittees' collective effectiveness. The Copermittees must also be able to identify and utilize resources available from other agencies and entities to further augment and enhance their jurisdictional runoff management programs and/or to collectively work with those other agencies and entities toward achieving a stated desired outcome.

The Regional MS4 Permit requirements will provide the Copermittees the flexibility and responsibility to decide what actions will be necessary to achieve an outcome that is tailored and designed by the Copermittees to improve specific prioritized water quality conditions. The San Diego Water Board expects the approach of the Regional MS4 Permit to give the Copermittees a greater sense of ownership for restoring the quality of receiving waters in the San Diego Region by becoming an integral part of the decision making process in identifying water quality conditions to be addressed, as well as determining the best use of their resources.

VI. ECONOMIC CONSIDERATIONS

Statutory Considerations

California Water Code (CWC) section 13241 requires the San Diego Water Board to consider certain factors, including economic considerations, in the adoption of water quality objectives. CWC section 13263 requires the San Diego Water Board to take into consideration the provisions of CWC section 13241 in adopting waste discharge requirements.

In *City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, the California Supreme Court considered whether Regional Water Boards must comply with CWC section 13241 when issuing waste discharge requirements under CWC section 13263(a) by taking into account the costs a permittee will incur in complying with the permit requirements. The Court concluded that whether it is necessary to consider such cost information "*depends on whether those restrictions meet or exceed the requirements of the federal Clean Water Act.*" (*Id.* at p. 627.) The Court ruled that Regional Water Boards may not consider the factors in CWC section 13241, including economics, to justify imposing pollutant restrictions that are less stringent than applicable federal law requires. (*Id.* At pp. 618, 626-627 ["*[Water Code section 13377 specifies that [] discharge permits issued by California's regional boards must meet the federal standards set by federal law. In effect, section 13377 forbids a regional board's consideration of any economic hardship on the part of the permit holder if doing so would result in the dilution of the requirements set by Congress in the Clean Water Act...Because CWC section 13263 cannot authorize what federal law forbids, it cannot authorize a regional board, when issuing a [] discharge permit, to use compliance costs to justify pollutant restrictions that do not comply with federal clean water standards*."]). However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Regional Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

As discussed in Section VII.F, Unfunded State Mandates, the San Diego Water Board finds that the requirements in this Order are not more stringent than the minimum federal requirements. Among other requirements, federal law requires MS4 permits to include requirements to effectively prohibit non-storm water discharges into the MS4s, in addition to requiring controls to reduce the discharge of pollutants in storm water to the MEP, and other provisions as USEPA or the State determines are appropriate for the control of pollutants in MS4 discharges.

The requirements in this Order may be more specific or detailed than those enumerated in federal regulations under 40 CFR 122.26 or in the USEPA guidance. However, the requirements have been designed to be consistent with and within the federal statutory mandates described in CWA section 402(p)(3)(B)(ii) and (iii) and the related federal regulations and guidance. Consistent with federal law, all of the

conditions in this Order could have been included in a permit adopted by USEPA in the absence of the in lieu authority of California to issue NPDES permits.

Moreover, the inclusion of numeric WQBELs in this Order does not cause this Order to be more stringent than federal law. Federal law authorizes both narrative and numeric effluent limitations to meet state water quality standards. The inclusion of WQBELs as discharge specifications in an NPDES permit in order to achieve compliance with water quality standards is not a more stringent requirement than the inclusion of BMP based permit limitations to achieve water quality standards (State Water Board Order No. WQ 2006-0012 (*Boeing*)). Therefore, consideration of the factors set forth in CWC section 13241 is not required for permit requirements to implement the effective prohibition on the discharge of non-storm water discharges into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determine appropriate to control such pollutants, as those requirements are mandated by federal law.

Included in the provisions of the Order are monitoring and reporting requirements that are designed to demonstrate that the Copermittees are implementing programs to comply with the CWA municipal storm water requirements. CWA section 308(a) and 40 CFR 122.41(h), (j)-(l), 122.44(i) and 122.48 require that all NPDES permits specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s (40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c)) also specify additional monitoring and reporting requirements. In addition to the federal requirements of the CWA, the San Diego Water Board also has the authority in CWC 13383 to establish monitoring, reporting, and recordkeeping requirements that implement federal and state laws and regulations through NPDES permits. .

The monitoring and assessment information that will be reported to the San Diego Water Board is necessary to determine if the Copermittees are making progress toward achieving compliance with the discharge prohibitions, receiving water limitations, and effluent limitations under Provision A of the Order. The monitoring and assessment information that will be reported is also expected to be key to the iterative approach and adaptive management process that is required to be implemented by the Copermittees if they cannot meet the discharge prohibitions and receiving water limitations under the present conditions, which is also part of the requirements under Provision A of the Order.

Notwithstanding the above, the San Diego Water Board has considered cost information in issuing this Order, as discussed below. The San Diego Water Board has also considered all of the evidence that has been presented to the San Diego Water Board regarding the CWC section 13241 factors in adopting this Order. The San Diego Water Board finds that the requirements in this Order are reasonably necessary to protect beneficial uses identified in the Basin Plan and the economic information related to costs of compliance and other CWC section 13241 factors are not sufficient to justify failing to protect those beneficial uses. Where appropriate, the

San Diego Water Board has provided or will consider providing the Copermittees with additional time to implement control measures to achieve final WQBELs and/or water quality standards.

Cost Information

Discussions of the financial and economic ramifications of municipal storm water management programs tend to focus on the significant costs incurred by municipalities in developing and implementing the programs. When considering the cost of implementing the programs, however, it is also important to consider the alternative costs that are incurred when programs are not fully implemented, as well as the economic benefits which result from effective program implementation.

The recent financial and economic conditions have amplified the concerns about the costs incurred by the municipalities in developing and implementing their programs. The reduction in resources resulting from the recent financial and economic conditions has been cited by many of the Copermittees as a justification for reducing the requirements that must be met by their programs. While the recent conditions are a cause for concern in the short term, these programs also have an opportunity to identify and implement improvements and efficiencies before the next period of growth and development, resulting in more effective and sustainable programs over the long term.

In addition, it is very difficult to ascertain the true cost of implementation of the Copermittees' management programs because of inconsistencies in reporting by the Copermittees. Reported costs of compliance for the same program element can vary widely from city to city, often by a very wide margin that is not easily explained.[2] Despite these problems, efforts have been made to identify management program costs, which can be helpful in understanding the costs of program implementation.

The San Diego Water Board recognizes that the Copermittees will incur costs in implementing this Order, potentially above and beyond the costs from the Copermittees' prior permits. The San Diego Water Board also recognizes that, due to California's current economic condition, many Copermittees currently have limited staff and resources to implement actions to address its MS4 discharges. Based on the economic considerations below, the San Diego Water Board has provided the Copermittees a significant amount of flexibility to choose how to implement the requirements of the Order.

The Order also allows the Copermittees to customize their plans, programs, and monitoring requirements. In the end, it is up to the Copermittees to determine the effective BMPs and measures necessary to comply with this Order. The Copermittees can choose to implement the least expensive measures that are effective in meeting the requirements of this Order. This Order also does not require the Copermittees to

[2] LARWQCB, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.

fully implement all requirements within a single permit term. Where appropriate, the Board has provided the Copermittees with additional time outside of the permit term to implement control measures to achieve final WQBELs and/or water quality standards.

The San Diego Water Board has considered cost information associated with compliance with this Order. It is not possible to predict accurately the cost impact of the requirements that involve an unknown level of implementation or that depend on environmental variables that are as yet undefined. Only general conclusions can be drawn from this information.

Estimated Municipal Storm Water Program Implementation Costs

The USEPA, the State Water Board, and the California Regional Water Quality Control Boards (Regional Water Boards) have attempted to evaluate the costs of implementing municipal storm water programs. The assessments have demonstrated that the true costs are difficult to ascertain and reported costs vary widely. In addition, reported fiscal analyses tend to neglect the costs incurred to municipalities when storm water and non-storm water runoff is not effectively managed, which are incurred as a result of pollution, contamination, nuisance, and damage to ecosystems, property, and human health. Nonetheless, they provide a useful context for considering the costs of requirements within Order No. R9-2013-0001.

In 1999, the USEPA reported on multiple studies it conducted to determine the cost of management programs. A study of Phase II municipalities determined that the annual cost of the Phase II program was expected to be $9.16 per household. The USEPA also studied 35 Phase I municipalities, finding costs to be $9.08 per household annually, similar to those anticipated for Phase II municipalities.[3]

The State Water Board commissioned a study by the California State University, Sacramento to assess costs of the Phase I MS4 program. This study includes an assessment of costs incurred by Phase I MS4s throughout the state to implement their programs. Annual cost per household in the study ranged from $18 to $46, with the Fresno-Clovis Metropolitan Area representing the lower end of the range, and the City of Encinitas (in San Diego County) representing the upper end of the range.[4]

A study on Phase I MS4 program costs was also conducted by the California Regional Water Quality Control Board, Los Angeles Region (Los Angeles Water Board), where program costs reported in the municipalities' annual reports were assessed. The Los Angeles Water Board estimated that average per household cost to implement the MS4 program in Los Angeles County was $12.50. [5]

[3] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791-68792.
[4] State Water Board, 2005. NPDES Stormwater Cost Survey. P. ii.
[5] Los Angeles Water Board, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.

It is important to note that reported program costs are not all attributable to solely complying with MS4 permits. Many program components, and their associated costs, existed before any MS4 permits were ever issued. For example, street sweeping and trash collection costs cannot be solely or even principally attributable to MS4 permit compliance, since these practices have long been expected from and implemented by municipalities.

Therefore, true program cost resulting from MS4 permit requirements is some fraction of reported costs. The California State University, Sacramento study found that only 38 percent of program costs are new costs fully attributable to MS4 permits. The remainder of the program costs was either pre-existing or resulted from enhancement of pre-existing programs.[6] In 2000, the County of Orange found that even lower amounts of program costs are solely attributable to MS4 permit compliance, reporting that the amount attributable to implement the County or Orange Drainage Area Management Plan (DAMP), was less than 20 percent of the total budget. The remaining 80 percent was attributable to pre-existing programs.[7] More current data from the County of Orange is not used in this discussion because the County of Orange no longer reports such information.

Estimated Value of Healthy Water Quality

Economic considerations of municipal storm water management programs cannot be limited only to program costs. Evaluation of programs must also consider information on the benefits derived from environmental protection and improvement.[8] Attention is often focused on municipal storm water management program costs, but the programs must also be viewed in terms of their value to the public.

Placing a value on healthy receiving waters is very difficult. Often the value of receiving waters with good water quality manifests in other forms, such as tourism, recreational opportunities, and/or increased property values. When surface water bodies are degraded, thereby degrading the habitat within and adjacent to the water bodies, the public loses the value and benefits associated with being able to use the area in and around the water bodies. Surface waters that are able to support the beneficial uses designated in the Basin Plan can sustain plants and wildlife that can attract visitors and residents, providing aesthetic, recreational, as well as monetary value to the public. At this time, however, there have been no studies for the San Diego Region to quantify the added value that surface waters with healthy water quality can provide.

USEPA has estimated that household willingness to pay for improvements in fresh water quality for fishing and boating is approximately $158-$210.[9] This estimate can be considered conservative, since it does not include important considerations such as

[6] State Water Board, 2005. NPDES Stormwater Cost Survey. P. 58.
[7] County of Orange, 2000. A NPDES Annual Progress Report. P. 60.
[8] Ribaudo M.O. and D. Heelerstein. 1992, *Estimating Water Quality Benefits: Theoretical and Methodological Issues.* U.S. Department of Agriculture. Technical Bulletin No. 1808.
[9] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68793.

marine waters benefits, wildlife benefits, or flood control benefits. Another study conducted by California State University, Sacramento reported that the annual household willingness to pay for statewide clean water is approximately $180.[10]

A study conducted by the University of Southern California and University of California, Los Angeles assessed the costs and benefits of implementing various approaches for achieving compliance with the MS4 permits in the Los Angeles region. The study found that non-structural systems would cost $2.8 billion but provide $5.6 billion in benefit. If structural systems were determined to be needed, the study found that total costs would be $5.7 to $7.4 billion, while benefits could reach $18 billion.[11] Costs are anticipated to be borne over many years, probably at least ten years.

As can be seen, the benefits of the municipal storm water management programs are expected to considerably exceed their costs. Such findings are corroborated by USEPA, which found that the benefits of implementation of its Phase II storm water rule would also outweigh the costs.[12]

[10] State Water Board, 2005. NPDES Stormwater Cost Survey. P. iv.
[11] Los Angeles Water Board, 2004. Alternative Approaches to Stormwater Control.
[12] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791.

VII. APPLICABLE STATUTES, REGULATIONS, PLANS AND POLICIES

A. Legal Authorities – Federal Clean Water Act and California Water Code

This Order is issued pursuant to section 402 of the CWA and implementing regulations adopted by the USEPA and chapter 5.5, division 7 of the CWC (commencing with section 13370). This Order serves as an NPDES permit for point source discharges to surface waters. This Order also serves as waste discharge requirements pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

The objective of the CWA is "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*." To carry out this objective, the CWA requires the implementation of permit programs to regulate the discharge of pollutants and dredged or fill material to the navigable waters of the U.S. and to regulate the use and disposal of sewage sludge. CWA section 402 provides the legal authority to issue a permit for the discharge of pollutants to waters of the U.S. under the NPDES. The CWA provides that NPDES permits may be issued by states which are authorized to implement the provisions of that act. California became authorized to implement the NPDES permit program on May 14, 1973.

The Porter-Cologne Water Quality Control Act (Division 7, commencing with CWC section 13000) established the State Water Resources Control Board (State Water Board) and nine Regional Water Quality Control Boards (Regional Water Boards) as the principal state agencies with primary responsibility for the coordination and control of water quality. CWC section 13200(f) established the San Diego Water Board, which has the primary responsibility for the coordination and control of water quality in the San Diego Region, which includes all the basins draining into the Pacific Ocean between the southern boundary of the Santa Ana Region and the California-Mexico boundary. The San Diego Water Board implements the CWA through Chapter 5.5 of the CWC, commencing with section 13370. CWC section 13377 provides the San Diego Water Board the legal authority to issue waste discharge requirements to ensure compliance with all applicable provisions of the CWA and acts amendatory thereof or supplementary, thereto, to implement water quality control plans, or for the protection of beneficial uses, or to prevent nuisance.

CWA section 402(p) requires the USEPA or authorized state to issue NPDES permits for storm water discharges from municipal separate storm sewer systems (MS4s) to waters of the U.S. CWA section 402(p)(3)(B)(ii) requires that NPDES permits for storm water discharges from MS4s "*effectively prohibit non-storm water discharges*" into the MS4s. CWA section 402(p)(3)(B)(iii) requires that NPDES permits for storm water discharges from MS4s to "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable* [MEP], *including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control*

of such pollutants."

The USEPA published implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]), which prescribe permit application requirements for storm water discharges from MS4s pursuant to CWA 402(p), on November 16, 1990. The USEPA published an Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems, which provided guidance on permit application requirements for regulated MS4s, on May 17, 1996. The federal regulations in 40 CFR 122 and guidance issued by USEPA serve as the foundation for the provisions of Order No. R9-2013-0001. The legal authorities provided by the above statutes and regulations are included as part of the discussions in Section VIII of this Fact Sheet.

B. Legal Authority for the Permit Issued on a Region-wide Basis

CWA section 402(p)(3)(B) provides the San Diego Water Board the legal authority to issue an NPDES permit for the San Diego Region as compared to separate MS4 permits based upon County- and partial County-wide boundaries as they exist within the San Diego Region. CWA section 402(p)(3)(B) states that "*Permits for discharges from municipal storm sewers- (i) may be issued on a system- or jurisdiction-wide basis ....*" The federal regulations in 40 CFR 122.26(a)(1)(v) also state that the San Diego Water Board "*may designate dischargers from municipal separate storm sewers on a system-wide or jurisdiction-wide basis. In making this determination, the [San Diego Water Board] may consider the following factors: (A) the location of the discharge with respect to waters of the United States; (B) the size of the discharge; (C) the quantity and nature of the pollutants discharged to waters of the United States; and (D) other relevant factors*."

More specifically, the federal regulations provide that for large and medium MS4 systems, the San Diego Water Board may issue a regional permit. Specifically, the federal regulation in 40 CFR 122.26(a)(3) provide:

"*(ii) The Director may either issue one system-wide permit covering all discharges from municipal separate storm sewers within a large or medium municipal storm sewer system or issue distinct permits for appropriate categories of discharges within a large or municipal separate storm sewer system including, but not limited to: all discharges owned or operated by the same municipality; located within the same jurisdiction; all discharges within a system that discharge to the same watershed; discharges within a system that are similar in nature; or for individual discharges from municipal separate storm sewers within the system.*

(iii) The operator of a discharge from a municipal separate storm sewer which is part of a large or medium municipal separate storm sewer system must either: (A) Participate in a permit application (to be a permittee or a co-permittee) with one or more other operator of discharges from the large or medium municipal storm sewer system which covers all, or a portion of all, discharges from the

municipal separate storm sewer system; (B) Submit a distinct permit application which only covers discharges from the municipal separate storm sewers for which the operator is responsible; or (C) A regional authority may be responsible for submitting a permit application under the following guidelines....

(iv) One permit application may be submitted for all or a portion of all municipal separate storm sewers within adjacent or interconnected large or medium municipal separate storm sewer systems. The Director may issue one systemwide permit covering all, or a portion of all municipal separate storm sewers in adjacent or interconnected large or medium municipal separate storm sewer systems.

(v) Permits for all or a portion of all discharges from large or medium municipal separate storm sewer systems that are issued on a system-wide, jurisdiction-wide, watershed or other basis may specify different conditions relating to different discharges covered by the permit, including different management programs for different drainage areas which contribute storm water to the system."

Based on these regulations, the San Diego Water Board may issue a region-wide MS4 permit. The regulations also clarify that the permit may include different conditions for separate discharges covered by the permit. This allows the San Diego Water Board to ensure that suitable water quality conditions and provisions are identified for each watershed.

The USEPA's responses to comments in the Final Rule for the above-mentioned regulations also make it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide, permits. In the Final Rule published in the Federal Register and containing the responses to comments, USEPA notes that 40 CFR 122.26(a)(3)(iv) would allow an entire system in a geographical region under the purview of a State agency to be designated under a permit.[13] USEPA also states that many commenters wanted to allow the permitting authority broad discretion to establish system-wide permits, and that EPA believes that paragraphs 40 CFR 122.26 (a)(1)(v) and (a)(3)(ii) allow for such broad discretion.[14]

This Order creates watershed requirements that apply to multiple counties. The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees. Managing storm water on a regional and watershed basis is expected to result in improved water quality, as the Order focuses on monitoring and management practices necessary to improve each watershed rather than political boundaries. A single permit also allows the San Diego Water Board staff to expend fewer resources developing successive multiple permits and allows more resources to be devoted to working cooperatively with all three current groups of Copermittees to ensure implementation of this Order results in improved water quality.

[13] 55 Federal Register 47990-01, 48042
[14] Ibid

C. Federal and California Endangered Species Acts

This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2115.5) or the Federal Endangered Species Act (16 United States Code [USC] sections 1531 to 1544). This Order requires compliance with requirements to protect the beneficial uses of waters of the U.S. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

D. California Environmental Quality Act

The action to adopt an NPDES Permit is exempt from the provisions of Chapter 3 of the California Environmental Quality Act (CEQA) (Public Resources Code section 21100, et seq.) pursuant to CWC section 13389. (*County of Los Angeles v. Cal. Water Boards* (2006) 143 Cal.App.4th 985.)

E. State and Federal Regulations, Plans and Policies

The legal authority provided by the following regulations, plans, and policies are also included as part of the discussions in Section VIII of this Fact Sheet.

Water Quality Control Plan for the San Diego Basin

The CWA requires the San Diego Water Board to establish water quality standards for each water body in its region. Water quality standards include beneficial uses, water quality objectives and criteria that are established at levels sufficient to protect beneficial uses, and an antidegradation policy to prevent degrading of waters. On September 8, 1994, the San Diego Water Board adopted the *Water Quality Control Plan for the San Diego Basin (*Basin Plan). The Basin Plan designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters in the San Diego Region. The San Diego Water Board has amended the Basin Plan on multiple occasions since 1994. In addition, the Basin Plan implements State Water Water Board Resolution No. 88-63, which established state policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply. Beneficial uses applicable to the surface water bodies that receive discharges from the MS4s within the San Diego Region generally include those listed below:

The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region:

- Municipal and Domestic Supply (MUN)
- Agricultural Supply (AGR)
- Industrial Process Supply (PROC)
- Industrial Service Supply (IND)
- Ground Water Recharge (GWR)
- Contact Water Recreation (REC1)
- Non-contact Water Recreation (REC2)
- Warm Freshwater Habitat (WARM)
- Cold Freshwater Habitat (COLD)
- Wildlife Habitat (WILD)
- Rare, Threatened, or Endangered Species (RARE)
- Freshwater Replenishment (FRSH)
- Hydropower Generation (POW)
- Preservation of Biological Habitats of Special Significance (BIOL)

The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region:

- Navigation (NAV)
- Commercial and Sport Fishing (COMM)
- Estuarine Habitat (EST)
- Marine Habitat (MAR)
- Aquaculture (AQUA)
- Migration of Aquatic Organisms (MIGR)
- Spawning, Reproduction, and/or Early Development (SPWN)
- Shellfish Harvesting (SHELL)

Pursuant to Water Code sections 13263 and 13377, the requirements of this Order implement the Basin Plan.

Water Quality Control Plan for Ocean Waters of California, California Ocean Plan

In 1972, the State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan). The State Water Board adopted the most recent amended Ocean Plan on September 15, 2009. The Office of Administrative Law approved it on March 10, 2010. On October 8, 2010, USEPA approved the 2009 Ocean Plan. The Ocean Plan is applicable, in its entirety, to ocean waters of the State. In order to protect beneficial uses, the Ocean Plan establishes water quality objectives and a program of implementation. Pursuant to Water Code sections 13263 and 13377, the requirements of this Order implement the Ocean Plan. The Ocean Plan identifies the beneficial uses of ocean waters of the State to be protected as summarized below:

- Industrial water supply
- Water contact and non-contact recreation, including aesthetic enjoyment;

navigation
- Commercial and sport fishing
- Mariculture
- Preservation and enhancement of designated Areas of Special Biological Significance
- Rare and endangered species
- Marine habitat
- Fish spawning and shellfish harvesting

On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving an exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges. The State Water Board Resolution No. 2012-0012 requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject terms and conditions of State Water Board Resolution No. 2012-0012. The Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 applicable to these discharges are hereby incorporated in this Order as if fully set forth herein. Requirements of this Order implement the Ocean Plan.

Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality

On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

Antidegradation Policy

Federal regulations (40 CFR 131.12) require that the state water quality standards include an antidegradation policy consistent with the federal antidegradation policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16 ("Statement of Policy with Respect to Maintaining the Quality of the Waters of the State"). State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law.

The San Diego Water Board's Basin Plan implements and incorporates by reference

both the State and federal antidegradation policies. State Water Board Resolution No. 68-16 and 40 CFR 131.12 require the San Diego Water Board to maintain high quality waters of the State until it is demonstrated that any change in quality will be consistent with maximum benefit to the people of the State, will not unreasonably affect beneficial uses, and will not result in water quality less than that described in the San Diego Water Boards' policies. State Water Board Resolution No. 68-16 requires that discharges of waste be regulated to meet best practicable treatment or control to assure that pollution or nuisance will not occur and the highest water quality consistent with the maximum benefit to the people of the State be maintained.

The discharges permitted in this Order are consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Board Resolution No. 68-16. Many of the water bodies within the area covered by this Order are of high quality. The Order requires the Copermittees to meet best practicable treatment or control to meet water quality standards. As required by 40 CFR 122.44(a), the Copermittees must comply with the "maximum extent practicable" technology-based standard set forth in CWA section 402(p) for discharges of pollutants in storm water from the MS4s.

Many of the waters within the area covered by this Order are impaired and listed on the State's CWA Section 303(d) List and the San Diego Water Board has established TMDLs to address the impairments. This Order requires the Copermittees to comply with permit provisions to implement the WLAs set forth in the TMDLs in order to restore the beneficial uses of the impaired water bodies consistent with the assumptions and requirements of the TMDLs. This Order includes requirements to develop and implement storm water management programs, achieve WQBELs, and effectively prohibit non-storm water discharges into the MS4. The issuance of this Order does not authorize an increase in the amount of discharge of waste.

Anti-Backsliding Requirements

CWA sections 402(o) and 303(d)(4) and 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations or conditions may be relaxed. All effluent limitations and other conditions in this Order are at least as stringent as the effluent limitations in the previous permits issued to the San Diego County Copermittees, the Orange County Copermittees and the Riverside County Copermittees.

Clean Water Act Section 303(d) List

CWA section 303(d)(1) requires each State to identify specific water bodies within its boundaries where water quality standards are not being met or are not expected to be met after implementation of technology-based effluent limitations on point sources. Water bodies that do not meet water quality standards are considered impaired and are placed on the state's "303(d) List." Periodically, USEPA approves the State's 303(d) List.

Most recently, USEPA approved the State's 2010 303(d) List of impaired water bodies on October 11, 2011, which includes certain receiving waters in the San Diego Region. For each listed water body, the state or USEPA is required to establish a TMDL of each pollutant impairing the water quality standards in that water body. A TMDL is a tool for implementing water quality standards and is based on the relationship between pollution sources and in-stream water quality conditions. The TMDL establishes the allowable pollutant loadings for a water body and thereby provides the basis to establish water quality-based controls. These controls should provide the pollution reduction necessary for a water body to meet water quality standards.

A TMDL is the sum of the allowable pollutant loads of a single pollutant from all contributing point sources (the waste load allocations or WLAs) and non-point sources (load allocations of LAs) plus the contribution from background sources and a margin of safety (40 CFR 130.2(i)). MS4 discharges are considered point source discharges. For 303(d)-listed water bodies and pollutants in the San Diego Region, the San Diego Water Board or USEPA develops and adopts TMDLs that specify these requirements.

Since 2002, the San Diego Water Board has established six (6) TMDLs to remedy water quality impairments in various water bodies within the San Diego Region (see Attachment E to the Order). These TMDLs identify MS4 discharges as a source of pollutants to these water bodies, and, as required, establish WLAs for MS4 discharges to reduce the amount of pollutant discharged to receiving waters. CWA section 402(p)(3)(B)(iii) requires the San Diego Water Board to impose permit conditions, including: "management practices, control techniques and system, design and engineering methods, and *such other provisions as the Administrator or the State determines appropriate for the control of such pollutants."* (Emphasis added.) CWA section 402(a)(1) also requires states to issue permits with conditions necessary to carry out the provisions of the CWA. Federal regulations also require that NDPES permits contain WQBELs consistent with the assumptions and requirements of all available WLAs (40 CFR 122.44(d)(1)(vii)(B)). CWC section 13377 also requires that NPDES permits include limitations necessary to implement water quality control plans. Therefore, this Order includes WQBELs and other provisions to implement the TMDL WLAs assigned to Copermittees regulated by this Order.

Other Regulations, Plans and Policies

This Order implements all other applicable federal regulations and State regulations, plans and policies, including the California Toxics Rule at 40 CFR 131.38 (Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California Rule [California Toxics Rule or CTR]), and State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP).

F. Unfunded State Mandates

Article XIII B, Section 6(a) of the California Constitution provides that whenever "*any state agency mandates a new program or higher level of service on any local government, the state shall provide a subvention of funds to reimburse that local government for the costs of the program or increased level of service*." The requirements of this Order do not constitute state mandates that are subject to a subvention of funds for several reasons, including, but not limited to, the following.

First, the requirements of this Order do not constitute a new program or a higher level of service as compared to the requirements contained in the previous Fourth Term Permits. The overarching requirement to impose controls to reduce the pollutants in discharges from MS4s is dictated by the CWA and is not new to this permit cycle (33 USC section 1342(p)(3)(B)). The inclusion of new and advanced measures as the MS4 programs evolve and mature over time is anticipated under the CWA (55 FR 47990, 48052 (Nov. 16, 1990)), and to the extent requirements in this Order are interpreted as new advanced measures, they do not constitute a new program or higher level of service.

Second, and more broadly, mandates imposed by federal law, rather than by a state agency, are exempt from the requirement that the local agency's expenditures be reimbursed (Cal. Const., art. XIII B, section 9, subd. (b)). This Order implements federally mandated requirements under the CWA and its requirements are therefore not subject to subvention of funds. This includes federal requirements to effectively prohibit non-storm water discharges, to reduce the discharge of pollutants in storm water to the MEP, and to include such other provisions as the Administrator or the State determines appropriate for the control of such pollutants (33 USC section 1342(p)(3)(B)). Federal cases have held these provisions require the development of permits and permit provisions on a case-by-case basis to satisfy federal requirements. (*Natural Resources Defense Council, Inc., v. USEPA* (9th Cir. 1992) 966 F.2d 1292, 1308, fn. 17.)

The authority exercised under this Order is not reserved state authority under the CWA's savings clause (cf. *Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 627-628 [relying on 33 USC section 1370, which allows a state to develop requirements which are not "less stringent" than federal requirements]), but instead is part of a federal mandate to develop pollutant reduction requirements for municipal separate storm sewer systems. To this extent, it is entirely federal authority that forms the legal basis to establish the permit provisions. (See, *City of Rancho Cucamonga v. Regional Water Quality Control Board, Santa Ana Region* (2006) 135 Cal.App.4th 1377, 1389; *Building Industry Ass'n of San Diego Co. v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 882-883.)

The MEP standard is a flexible standard that balances a number of considerations, including technical feasibility, cost, public acceptance, regulatory compliance, and effectiveness. (*Building Ind. Ass'n., supra,* 124 Cal.App.4th at pp. 873-874, 889.) Such considerations change over time with advances in technology and with experience

gained in storm water management (55 FR 47990, 48052 (Nov. 16, 1990)). Accordingly, a determination of whether the conditions contained in this Order exceed the requirements of federal law cannot be based on a point by point comparison of the permit conditions and the sic minimum control measures that are required "at a minimum" to reduce pollutants to the maximum extent practicable and to protect water quality (40 CFR 122.34). Rather, the appropriate focus is whether the permit conditions, as a whole, exceed the MEP standard.

In recent months, the County of Los Angeles and County of Sacramento Superior Courts have granted writs setting aside decisions of the Commission on State Mandates that held certain requirements in Phase I permits constituted unfunded mandates. In both cases, the courts have found that the correct analysis in determining whether an MS4 permit constituted a state mandate was to evaluate whether the permit as a whole – and not a specific permit provision – exceeds the MEP standard. (*State of Cal. V. Comm. on State Mandates* (Super. Ct. Sacramento County, 2012, No. 34-2010-80000604), *State of California v. County of Los Angeles* (Super. Ct. Los Angeles County, 2011, No. BS130730.) Both cases are currently pending appeal.

The requirements of the Order, taken as a whole rather than individually, are necessary to reduce the discharge of pollutants to the MEP and to protect water quality. The San Diego Water Board finds that the requirements of the Order are practicable, do not exceed federal law, and thus do not constitute an unfunded mandate. These findings are the expert conclusions of the principal state agency charged with implementing the NPDES program in California (CWC sections 13001, 13370).

It should also be noted that the provisions in this Order to effectively prohibit non-storm water discharges are also mandated by the CWA (33 USC section 1342(p)(3)(B)(ii)). Likewise, the provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state establishes or adopts a TMDL, federal law requires that permits must contain effluent limitations consistent with the assumptions and requirements of any applicable waste load allocation in a TMDL (40 CFR 122.44(d)(1)(vii)(B)).

Third, the local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental dischargers who are issued NPDES permits for storm water discharges. With a few inapplicable exceptions, the CWA regulates the discharge of pollutants from point sources (33 USC section 1342) and the Porter-Cologne Act regulates the discharge of waste (CWC section 13263), both without regard to the source of the pollutant or waste. As a result, the "costs incurred by local agencies" to protect water quality reflect an overarching regulatory scheme that places similar requirements on governmental and non-governmental dischargers. (See *County of Los Angeles v. State of California* (1987) 43 Cal.3d 46, 57-58 [finding comprehensive workers' compensation scheme did not create a cost for local agencies that was subject to state subvention].)

The CWA and the Porter-Cologne Act largely regulate storm water with an even hand, but to the extent there is any relaxation of this even-handed regulation, it is in favor of the local agencies. Generally, the CWA requires point source dischargers, including dischargers of storm water associated with industrial or construction activity, to comply strictly with water quality standards (33 USC section 1311(b)(1)(C); *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159, 1164-1165 [noting that industrial discharges must strictly comply with water quality standards]). As discussed in prior State Water Board decisions, certain provisions of this Order do not require strict compliance with water quality standards (State Water Board Order No. WQ 2001-0015, p. 7). Those provisions of this Order regulate the discharge of waste in municipal storm water under the CWA's MEP standard, not the BAT/BCT standard that applies to other types of discharges. These provisions, therefore, regulate the discharge of waste in municipal storm water more leniently than the discharge of waste from non-governmental sources.

Fourth, the Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)). To the extent that the local agency Copermittees have voluntarily availed themselves of the permit, the program is not a state mandate. (Accord, *County of San Diego v. State of California* (1997) 15 Cal.4th 68, 107-108.)

Fifth, the local agency Copermittees' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under state law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

Finally, even if any of the permit provisions could be considered unfunded mandates, under Government Code section 17556, subdivision (d), a state mandate is not subject to reimbursement if the local agency has the authority to charge a fee. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order, subject to certain voting requirements contained in the California Constitution. (See Cal. Const., Art. XIII D, section 6, subd. (c); see also *Howard Jarvis Taxpayers Ass'n v. City of Salinas* (2002) 98 Cal.App.4th 1351, 1358-1359.) The Fact Sheet demonstrates that numerous activities contribute to the pollutant loading in the MS4. Local agencies can levy service charges, fees, or assessments on these activities, independent of real property ownership. (See, e.g., *Apartment Ass'n of Los Angeles County, Inc., v. City of Los Angeles* (2001(24 Cal.4th 830, 842 [upholding inspection fees associated with renting property].) The authority and ability of a local agency to defray the cost of a program without raising taxes indicates that a program does not entail a cost subject to subvention. (*Clovis Unified School Dist. V. Chiang* (2010) 188 Cal.App.4th 794, 812, citing *Connell v. Sup. Ct.* (1997) 59 Cal.App.4th 382, 401; *County of Fresno v. State of California* (1991) 53 Cal. 3d. 482, 487-488.)

VIII. PROVISIONS

The provisions (i.e. NPDES permit requirements) of the Order are discussed below.

A. Prohibitions and Limitations

Purpose: Provision A includes the prohibitions and limitations requirements that are the foundation of all the subsequent requirements included in the Order. Compliance with the prohibitions and limitations will restore and protect receiving waters from impacts that may be caused by discharges into and from the Copermittees' MS4s and ultimately achieve the objective of the CWA.

In meeting the requirements set forth in the Order, the Copermittees must be cognizant that the prohibitions and limitations exist and will be the standard by which the San Diego Water Board will be measuring the progress and success of their implementation of the NPDES permit requirements.

***Discussion*:** The objective of the CWA is to "*restore and maintain the chemical, physical, and biological integrity of the Nation's waters*." The CWA requires the implementation of NPDES permit programs to regulate discharges of pollutants and dredged or fill material to the navigable waters of the U.S. For discharges into and from MS4s, the CWA requires the NPDES permits to "*effectively prohibit non-stormwater discharges into the storm sewers*" and "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable.*"

Provision A includes limitations, consistent with the requirements of the CWA for discharges from MS4s. Provision A expresses these limitations as discharge prohibitions, receiving water limitations, and effluent limitations. Compliance with the discharge prohibitions and receiving water limitations is also explicitly described, in conformance with precedential State Water Board Orders.

More specific and detailed discussions of the requirements of Provision A are provided below.

Provision A.1 (Discharge Prohibitions) prohibits the discharge of specific types of waste into and/or from the Copermittees' MS4s.

Provision A.1.a restates and reiterates Basin Plan Waste Discharge Prohibition 1, by prohibiting discharges into and from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the

state. The terms pollution,[15] contamination,[16] and nuisance[17] are defined under CWC 13050. Provision A.1.c incorporates all the waste discharge prohibitions of the Basin Plan into the requirements of the Order. The waste discharge prohibitions from the Basin Plan have been reproduced and provided in Attachment A to the Order.

Provision A.1.b requires non-storm water discharges into the MS4s to be effectively prohibited, consistent with the requirements of the CWA for MS4 permits to "*effectively prohibit non-stormwater discharges into the storm sewers*." The prohibition does not apply to NPDES permitted discharges into the Copermittees' MS4s. The prohibition also refers to the requirements of Provisions E.2.a.(1)-(5), which has specific requirements for the Copermittees to address certain types of non-storm water discharges if they enter the MS4.

The CWA employs the strategy of prohibiting the discharge of any pollutant from a point source into waters of the United States unless the discharger of the pollutant(s) obtains an NPDES permit pursuant to CWA Section 402. The 1987 amendment to the CWA includes provision 402(p) that specifically addresses NPDES permitting requirements for storm water discharges from MS4s. CWA section 402(p) prohibits the discharge of pollutants from specified MS4s to waters of the U.S. except as authorized by an NPDES permit and identifies two substantive standards for MS4 storm water permits. MS4 permits (1) "*shall include a requirement to effectively prohibit nonstormwater discharges into the storm sewers*" and (2) "*shall require controls to reduce the discharge of pollutants to,the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or State determines appropriate for the control of such pollutants*." (CWA section 402(p)(3)(B)(ii-iii).)

In November 1990, the USEPA published regulations addressing storm water discharges from MS4s (55 FR 47990 and following (Nov. 16, 1990) (Phase I Final Rule)). The regulations establish minimum requirements for MS4 permits, and generally focus on the requirement that MS4s implement programs to reduce the amount of pollutants found in storm water discharges to the MEP. The CWA's municipal storm water MEP standard does not require storm water discharges to strictly meet water quality standards, as is required for other NPDES permitted discharges. Compliance is achieved through an iterative approach of continuous implementation of improved BMPs. This distinction reflects Congress's recognition that

[15] CWC 13050(l): "(1) 'Pollution' means an alteration of the quality of waters of the state by waste to a degree which unreasonably affects either of the following: (A) The water for beneficial uses. (B) Facilities which serve beneficial uses. (2) 'Pollution' may include "contamination.
[16] CWC 13050(k): "Contamination' means an impairment of the quality of waters of the state by waste to a degree which creates a hazard to public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste, whether or not waters of the state are affected."
[17] CWC 13050(m): "Nuisance' means anything which meets all of the following requirements: (1) Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. (2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. (3) Occurs during, or as a result of, the treatment or disposal of wastes."

variability in flow and intensity of storm events render difficult strict compliance with water quality standards by MS4 permittees. In describing the controls that permits must include to reduce pollutants in storm water discharges to the MEP, the statute (CWA section 402(p)(3)(B)(iii)) states that the controls shall include: "*management practices, control techniques and system, design and engineering methods, and such other provisions as the [permit writer] determines appropriate for the control of such pollutants*."

In contrast, non-storm water discharges from the MS4 that are not authorized by separate NPDES permits, nor specifically included in a category of non-storm water discharges only required to be addressed if identified as a source of pollutants (see 40 CFR 122.26(d)(2)(iv)(B)), are subject to requirements under the NPDES program, including discharge prohibitions, technology based effluent limitations and water quality-based.effluent limitations (40 CFR 122.44). The regulations also require the Copermittee's program to include an element to detect and remove illicit discharges and improper disposal into the storm sewer (40 CFR 122.26(d)(2)(iv)(B)).

While "non-storm water" is not defined in the CWA or federal regulations, the federal regulations (at 40 CFR 122.26(b)(2)) define "*illicit discharge*" as *"any discharge to a municipal separate storm sewer that is not composed entirely of storm water and that is not covered by an NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer and discharges resulting from fire fighting activities)*." This definition is the most closely applicable definition of "non-storm water" contained in federal law. As stated in the Phase I Final Rule, USEPA added the illicit discharge program requirement to begin implementation of the 'effective prohibition' requirement to detect and control non-storm water discharges to their municipal system.

Thus, federal law mandates that permits issued to MS4s must require management practices that will result in reducing storm water pollutants to the MEP yet at the same time requires that non-storm water discharges be effectively prohibited from entering the MS4. "Effectively" prohibit does not mean that non-storm water discharges are authorized to be discharged into and from the Copermittees' MS4s. The Phase I Final Rule clarifies what "effectively prohibit" means (55 FR 47995):

> "*Section 402(p)(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit (other than the permit for the discharge from the municipal separate storm sewer)*."

Consistent with federal law, unless non-storm water discharges to the MS4 are authorized by a separate NPDES permit or are specifically included in a category of non-storm water discharges only required to be addressed if identified as a source of pollutants under federal regulations, non-storm water discharges are appropriately

subject to the effective prohibition requirement in the CWA and Regional Water Boards are not limited by the iterative MEP approach to storm water regulation in crafting appropriate regulations for non-storm water discharges.

The federal regulations (40 CFR 122.26(d)(vi)(B)(1)) require the Copermittees to "*implement and enforce an ordinance, order or similar means*" to prevent non-storm water discharges to their MS4s. Thus, the Copermittees are required to "*effectively*" prohibit non-storm water discharges to their MS4s through enforcing their "*ordinance, order or similar means*" and remove those discharges to their MS4s, or require those discharges to obtain coverage under a separate NPDES permit. More detail about the program that must be implemented to "*effectively*" prohibit non-storm water discharges to the Copermittees' MS4s is provided under the discussion for Provision E.2.

Provision A.1.d was included to be consistent Resolution No. 2012-0012, adopted by the State Water Board on March 20, 2012. Provision A.1.d prohibits discharges from MS4s to Areas of Special Biological Significance (ASBS), except for storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach to the Heisler Park ASBS subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012. The pertinent Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 are provided in Attachment A to the Order.

Provision A.2 (Receiving Water Limitations) specifies the condition of the receiving waters that must be achieved when there are discharges from the Copermittees' MS4s. Receiving water limitations are included in all NPDES permits issued pursuant to the CWA section 402. CWA section 402(p)(3)(B)(iii) authorizes the inclusion of "*such other provisions as the Administrator or the State determines appropriate for the control of [] pollutants*." This requirement gives USEPA or the State permitting authority, in this case the San Diego Water Board, discretion to determine what permit conditions are necessary to control pollutants.

In its Phase I Final Rule (see 55 FR 47990, 47994 (Nov. 16, 1990)), USEPA elaborated on these requirements, stating that, "*permits for discharges from municipal separate storm sewer systems must require controls to reduce the discharge of pollutants to the maximum extent practicable, and where necessary water quality-based controls*." USEPA reiterated in its Phase II Final Rule (64 FR 68722, 68737), that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL*." CWC section 13377 also requires that NPDES permits include limitations necessary to implement water quality control plans. Both the State Water Board and the San Diego Water Board have previously concluded that discharges from the MS4 contain pollutants that have the reasonable potential to cause or contribute to excursions above water quality standards. As such, inclusion of receiving water limitations is appropriate to control MS4 discharges.

The inclusion of receiving water limitations is also consistent with the Ninth Circuit Court of Appeals' ruling in *Defenders of Wildlife v. Browner* (191 F.3d 1159, 1166 (1999)) that the permitting authority has discretion regarding the nature and timing of requirements that it includes as MS4 permit conditions to attain water quality standards. The Ninth Circuit Court of Appeals recently explained that, "*[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*" (*Natural Resources Defense Council v. County of Los Angeles* (9th Cir. 2011) 673 F.3d 880, 886 (review granted by the Supreme Court on other grounds).)

The receiving water limitations included in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan or in water quality control plans or policies adopted by the State Water Board, including State Water Board Resolution No. 68-16, or in federal regulations, including but not limited to 40 CFR 131.12 and 131.38. The water quality objectives in the Basin Plan and other State Water Board plans and policies have been approved by USEPA and combined with designated beneficial uses constitute the water quality standards required under federal law.

Provision A.2.a requires that discharges from the Copermittees' MS4s must not cause or contribute to the violation of water quality standards in receiving waters. The water quality standards of the receiving waters must be protected from the impacts that may be caused by the Copermittees' MS4 discharges. Water quality standards applicable to the surface waters in the San Diego Region must be achieved through meeting the technology based standard of MEP through an iterative process of improved management actions. Provision A.2.a is also consistent with State Water Board Order WQ 99-05 precedent-setting language requiring discharges from MS4s to attain receiving water quality standards. The water quality control plans and policies with water quality standards applicable to the waters in the San Diego Region are included under Provision A.2.a.

Provisions A.2.b was included to be consistent with the requirements of State Water Board Resolution No. 2012-0012, adopted on March 20, 2012.

<u>Provision A.3 (Effluent Limitations)</u> specifies the condition of the discharges from the Copermittees' MS4s that must be achieved if and when there are discharges.

Consistent with CWA section 301(b)(1)(A) and 40 CFR 122.44(a), Provision A.3.a includes the technology-based effluent limitations that must be included in the Order. The technology-based effluent limits, representing the minimum level of control that must be imposed in a permit under CWA section 402, requires that pollutants in discharges of storm water from the Copermittees' MS4s be reduced to the MEP. This provision applies specifically to storm water discharges. Non-storm water discharges

must be effectively prohibited, as required under Provision A.1.b. Non-storm water (dry weather) discharges from the MS4 are not considered storm water (wet weather) discharges and therefore are not subject to the MEP standard.

The technology-based MEP standard is an ever-evolving, flexible, and advancing concept. Neither Congress nor USEPA has specifically defined the term "maximum extent practicable." Congress established this flexible MEP standard so that the administrative bodies would have "*the tools to meet the fundamental goals of the Clean Water Act in the context of storm water pollution*." (*Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 884.) As knowledge about controlling storm water runoff and discharges continues to evolve, so does the knowledge which constitutes MEP. Reducing the discharge of pollutants in storm water from the MS4 to the MEP requires the Copermittees to assess each program component and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP.

The San Diego Water Board or the State Water Board ultimately define MEP, and may include requirements that provide specific guidance on what is expected to demonstrate MEP. It is the responsibility of the Copermittees to propose actions that implement BMPs to reduce storm water pollution to the MEP. In other words, the Copermittees' runoff management programs developed and implemented under the Order are the Copermittees' proposals of achieving MEP. Their total collective and individual activities conducted pursuant to their runoff management programs become their proposal for achieving MEP as it applies both to their overall effort, as well as to specific activities. Provisions B through E of the Order provides a minimum framework to guide the Copermittees in achieving the MEP standard for discharges of pollutants in storm water.

Provision A.3.b incorporates any water quality based effluent limitations (WQBELs) applicable to the MS4s established for TMDLs adopted and approved for the San Diego Region and requires the Copermittees to comply with those WQBELs. This is consistent with 40 CFR 122.44(d)(1)(vii)(B), which requires that NPDES permits to incorporate WQBELs "*developed to protect a narrative water quality criterion, a numeric water quality criterion, or both…consistent with the assumptions and requirements of any available wasteload allocation for the discharge...*"

Pursuant to CWA section 303(d), for surface water bodies identified as impaired by one or more pollutants, the San Diego Water Board is required to establish TMDLs "*at a level necessary to implement the applicable water quality standards with seasonal variations and a margin of safety which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality*." The TMDLs identify sources of the pollutants causing the impairments and assign portions of the TMDL as WLAs to point sources, which include MS4s.

WLAs must be expressed in NPDES permits as WQBELs, which may include one or more numeric components such as numeric effluent limits, and/or receiving water

limitations, and/or BMP requirements. Because numeric targets for TMDLs typically include a component that will be protective of water quality standards, a TMDL will likely include one or more numeric receiving water limitations and/or effluent limitations as part of the assumptions or requirements of the TMDL. Any numeric receiving water limitations and/or effluent limitations developed as part of the assumptions or requirements of a TMDL must be incorporated and included as part of a WQBELs for the MS4s.

Because the development and approval of new TMDLs, or modification of existing TMDLs, may occur during the term of this Order, the specific provisions of those TMDLs, including effluent limitations applicable to MS4s are provided within Attachment E to the Order. Attachment E will be updated with new TMDLs and modifications to existing TMDLs in a timely manner as they occur.

Provision A.4 (Compliance with Discharge Prohibitions and Receiving Water Limitations) describes the process required to be implemented by the Copermittees if compliance with the discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a are not being achieved under current conditions.

In its Phase II Stormwater Regulations, Final Rule, USEPA states that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL.*"[18] In a series of comment letters on MS4 permits issued by various Regional Water Boards, USEPA has also reiterated that MS4 discharges must meet water quality standards.[19] In addition, the Ninth Circuit Court of Appeals explained in a recent ruling that, *"[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*"[20]

Water quality standards for the San Diego Region are established in the Basin Plan. The water quality standards of the Basin Plan are incorporated into this Order as the discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a. The discharge prohibitions and receiving water limitations in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations or prohibitions to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan, water quality control plans or policies adopted by the State Water Board, including Resolution No.

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[18] Phase II Stormwater Regulations, Final Rule, 64 Fed. Reg. 68722, 68737.
[19] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.
[20] NRDC v. County of Los Angeles (9th Cir. 2011), 673 F.3d 880, 886. On July 13, 2012, the United States Supreme Court granted review of this case on other grounds. See also, *Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 884-886, citing *Defenders of Wildlife v. Browning,* (9th Cir. 1999) 191 F.3d 1159.)

68-16, or federal regulations, including but not limited to, 40 CFR 131.12 and 131.38. The waste discharge prohibitions and water quality objectives in the Basin Plan have been approved by USEPA and combined with the designated beneficial uses constitute the water quality standards required under federal law.

Under federal law (CWA section 402(p)(3)(B)(iii)), an MS4 permit must include "*controls to reduce the discharge of pollutants to the maximum extent practicable...and such other provision as...the State determines appropriate for control of such pollutants*." The State Water Board has previously determined that limitations necessary to meet water quality standards are appropriate for the control of pollutants discharged by MS4s and must be included in MS4 permits. (State Water Board Orders WQ 91-03, 98-01, 99-05, 2001-15; see also *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159.) This Order prohibits discharges that case or contribute to violations of water quality standards.

The discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a are included in this Order to ensure that discharges from the MS4s do not cause or contribute to exceedances of water quality objectives necessary to protect the beneficial uses of the receiving waters.

Provision A.4 is consistent with the precedent-setting language in State Water Board Order WQ 99-05 required to be included in municipal storm water permits. State Water Board Order WQ 2001-15 refined Order WQ 99-05 by requiring an iterative approach to compliance with water quality standards involving ongoing assessments and revisions, as referred to as the "iterative process." The "iterative process" is a fundamental NPDES requirement for municipal storm water permits to achieve the objectives of the CWA.

The State Water Board and Regional Water Boards have stated that the provisions under Provisions A.1.a, A.1.c, A.2.a, and A.4 are independently applicable, meaning that compliance with one provision does not provide a "safe harbor" where there is non-compliance with another provision (i.e., compliance with the Provision A.4 does not shield a Copermittee who may have violated Provision A.1.a, A.1.c, or A.2.a from an enforcement action). The intent of Provision A.4 is to ensure that the Copermittees have the necessary storm water management programs and controls in place, and that they are modified by the Copermittees in a timely fashion when necessary, so that compliance with Provisions A.1.a, A.1.c, and/or A.2.a is achieved as soon as possible. USEPA expressed the importance of this independent applicability in a series of comment letters on MS4 permits proposed by various Regional Water Boards. At that time, USEPA expressly objected to certain MS4 permits that included language stating, *"permittees will not be in violation of this [receiving water limitation] provision … [if certain steps are taken to evaluate and improve the effectiveness of the*

jurisdictional runoff management programs]," concluding that this phrase would not comply with the CWA.[21]

The Ninth Circuit held in *Natural Resources Defense Council v. County of Los Angeles* (2011) 673 F3d. 880, 886 (certiorari granted on other grounds) that engagement in the iterative process does not provide a safe harbor from liability for violations of permit terms prohibiting exceedances of water quality standards. The Ninth Circuit holding is consistent with the position of the State and Regional Water Boards that exceedances of water quality standards in an MS4 permit constitute violations of permit terms subject to enforcement by the Water Boards or through a citizen suit. While the Water Boards have generally directed dischargers to achieve compliance by improving control measures through the iterative process, the San Diego Water Board retains the discretion to take other appropriate enforcement and the iterative process does not shield dischargers from citizen suits under the CWA.

The requirements of Provision A.4, therefore, are required to be implemented until the water quality standards expressed under Provisions A.1.a, A.1.c, and A.2.a are achieved. The CWA requires MS4 permits to "*require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." The requirements of this Order have been deemed or determined to be "appropriate" to achieve water quality standards in receiving waters.

Part of the "*controls*" required by the Order is the process described in Provision A.4. Provision A.4 includes the process that is ultimately expected to achieve compliance with the requirement that discharges from the MS4 do not cause or contribute to violations of water quality standards in the receiving waters. The implementation of Provision A.4 is required when the Copermittees or the San Diego Water Board have determined that discharges from the MS4 are causing or contributing to violations of water quality standards in the receiving waters.

The Copermittees must effectively prohibit non-storm water discharges into the MS4s, reduce the discharge of pollutants in storm water from the MS4s to the MEP, and ensure that their MS4 discharges do not cause or contribute to violations of water quality standards. If the Copermittees have effectively prohibited non-storm water discharges and reduced storm water pollutant discharges to the MEP, but their discharges are still causing or contributing to violations of water quality standards, Provision A.4 provides a clear "iterative process" for the Copermittees to follow.

Provision A.4 essentially requires the Copermittees to implement additional BMPs until MS4 discharges no longer cause or contribute to a violation of water quality standards.

[21] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.

In assessing compliance and potential enforcement actions, the San Diego Water Board looks at the Copermittees' efforts in total to meet the requirements of Provisions A.1.a, A.1.c, A.2.a and Provision A.4. The Copermittees need to demonstrate that they are making improvements to their programs and making progress toward achieving the discharge prohibitions and receiving water limitations in Provisions A.1.a, A.1.c, and A.2.a by implementing the requirements of Provision A.4. The San Diego Water Board would consider these efforts prior to strictly enforcing the requirements of Provisions A.1.a, A.1.c, and A.2.a. Causes of exceedances of the receiving water limitations can often be more difficult to identify and attribute solely to the Copermittees' MS4s. The intent of the Order is to provide the Copermittees more clarity and flexibility in addressing these exceedances through the iterative approach and adaptive management process until the requirements under Provisions A.1.a, A.1.c, and A.2.a are fully achieved.

An exception to the iterative approach and adaptive management process would be in receiving waters subject to adopted and approved TMDLs. For TMDLs that are incorporated into the Order, there is a specific date for compliance to be achieved, after which the iterative approach and adaptive management process required under Provision A.4 no longer provides the flexibility to achieve compliance. Where compliance dates for a TMDL have passed, compliance with the WQBELs incorporated into the Order to be consistent with the assumptions and requirements of a WLA established by a TMDL to protect water quality standards is required. Thus, after the interim or final compliance dates for a TMDL have passed, if the discharges from the Copermittees' MS4s are causing or contributing to a violation of WQBELs, exceedances of WQBELs must be strictly enforced by the San Diego Water Board.

B. Water Quality Improvement Plans

Purpose: Provision B includes requirements for the Copermittees to develop and implement Water Quality Improvement Plans to ultimately comply with the prohibitions and limitations under Provision A. The Water Quality Improvement Plans will provide the Copermittees a comprehensive program that can achieve the requirements of the CWA. Implementation of the Water Quality Improvement Plans will also improve the quality of the receiving waters in the San Diego Region.

The Water Quality Improvement Plan is the backbone of the Regional MS4 Permit requirements. Provision B provides the guidance, criteria, and minimum expectations and requirements for the elements of the Water Quality Improvement Plan to be developed and implemented by the Copermittees. The Water Quality Improvement Plans will be implemented in the Watershed Management Area by the Copermittees within their jurisdictions through their jurisdictional runoff management programs.

The Water Quality Improvement Plan also incorporates a program to monitor and assess the progress of the Copermittees' jurisdictional runoff management programs toward improving the quality of discharges from the MS4s, as well as tracking improvements to the quality of receiving waters. A process to adapt and improve the effectiveness of the Water Quality Improvement Plans has also been incorporated into the requirements of Provision B to be consistent with the "iterative approach" required to achieve compliance with discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a, pursuant to the requirements of Provision A.4.

The Water Quality Improvement Plans have also been structured to incorporate the requirements of any TMDLs that have been adopted for the San Diego Region. Incorporating the requirements of the TMDLs into the requirements of Provision B allows the Copermittees to develop a single plan, instead of separate plans, to coordinate their non-storm water and storm water runoff management programs. The Water Quality Improvement Plans allow the Copermittees to meet the requirements of this Order, as well as fulfill the requirements of the WLAs that have been assigned to discharges from the MS4s.

As an added benefit, if the Copermittees demonstrate that impaired water bodies within the Watershed Management Area listed on the 303(d) List will be addressed with their Water Quality Improvement Plans in a reasonable period of time, the San Diego Water Board may be able to remove the water bodies from the 303(d) List, which would greatly reduce the need for the San Diego Water Board to develop additional TMDLs that would have to be incorporated into the Order.

***Discussion*:** The federal NPDES regulations require the Copermittees to develop a proposed management program (40 CFR 122.26(d)(2)(iv)). The proposed management program must include "*a comprehensive planning process*" and "*where*

necessary intergovernmental coordination" for the "*duration of the permit.*" The Water Quality Improvement Plan is the Copermittees' "*comprehensive planning process*" document for the proposed management program that will be implemented within a Watershed Management Area. Implementation of the Water Quality Improvement Plan requires "*intergovernmental coordination*" among the Copermittees for at least the "*duration of the permit*," and likely into and beyond the next iteration of the permit.

Developing Water Quality Improvement Plans based upon watersheds is consistent with federal regulations that support the development of permit conditions, as well as implementation of storm water management programs, at a watershed scale (40 CFR 122.26(a)(3)(ii), 122.26(a)(3)(v), and 122.26(d)(2)(iv)). In 2003, USEPA issued a Watershed-Based NPDES Permitting Policy Statement (USEPA, 2003) that defines watershed-based permitting as an approach that produces NPDES permits that are issued to point sources on a geographic or watershed basis. In this policy statement, USEPA explains that "*[t]he utility of this tool relies heavily on a detailed, integrated, and inclusive watershed planning process*." USEPA identifies a number of important benefits of watershed permitting, including more environmentally effective results, the ability to emphasize measuring the effectiveness of targeted actions on improvements in water quality, reduced cost of improving the quality of the nation's waters and more effective implementation of watershed plans, including TMDLs, among others.

An emphasis on watersheds is appropriate at this stage in the San Diego Region's MS4 program to shift the focus to more targeted, water quality driven planning and implementation. Addressing discharges on a watershed scale focuses on water quality results by emphasizing the receiving waters in the watershed. The conditions of the receiving waters drive management actions, which in turn focus measures to address pollutant contributions from MS4 discharges.

The Water Quality Improvement Plan gives the Copermittees the responsibility of developing a comprehensive plan to coordinate the efforts of their jurisdictional runoff management programs for addressing the problems related to MS4 discharges causing impacts to water quality in the Watershed Management Area. The development of the plan provides the Copermittees the opportunity to provide significant input on how to implement their jurisdictional runoff management programs, and how to best utilize their available resources in addressing a focused set of priorities that they believe will result in measureable improvements to water quality within the Watershed Management Area.

The Copermittees are encouraged to separate the Watershed Management Area into subwatersheds, as appropriate. This allows the Copermittees to identify priorities applicable to a subset of the Copermittees or specific water bodies or areas within the Watershed Management Area.

Included in the requirements for the elements to be included in the Water Quality Improvement Plan are monitoring and assessment requirements that are necessary to implement, as well as ensure the Copermittees are in compliance with, the

requirements of the Order. In addition to the federal requirements of the CWA section 308(a) and 40 CFR 122.26(d), the San Diego Water Board has the authority to establish monitoring, reporting, and recordkeeping requirements for NPDES permits under CWC 13383.

More specific and detailed discussions of the requirements of Provision B are provided below.

Provision B.1 (Watershed Management Areas) requires the Copermittees to develop a Water Quality Improvement Plan for each of the Watershed Management Areas defined by the San Diego Water Board.

Pursuant to 40 CFR 122.26(d)(2)(iv), proposed management programs "*may impose controls on a…watershed basis…*" The Water Quality Improvement Plan is the Copermittees' proposed management program. A Water Quality Improvement Plan must be developed for each Watershed Management Area identified in the Order.

The Watershed Management Areas are identified in Table B-1. Table B-1 establishes ten (10) Watershed Management Areas, and identifies the Copermittees that are responsible for developing and implementing the Water Quality Improvement Plan for each Watershed Management Area.

The Copermittees from each of the three counties within the San Diego Region are expected to be phased in as their respective NPDES municipal storm water permits expire. Because Order No. R9-2007-0001 expired in January 2012, the San Diego County Copermittees are covered under the Regional MS4 Permit on the effective date of the Order.

After San Diego Water Board receives and considers the Reports of Waste Discharge required to be submitted by the Orange County Copermittees and Riverside County Copermittees pursuant to the requirements of their current permits, and make any necessary changes to the Order, the Orange County Copermittees and Riverside County Copermittees will be covered under the Regional MS4 Permit after Order No. R9-2009-0002 expires in November 2014, and Order No. R9-2010-0016 expires in December 2015, respectively.

The Orange County Copermittees and Riverside County Copermittees also have the option to obtain coverage under the Regional MS4 Permit earlier than their respective permit expiration dates. The process to apply for early coverage is described Provision F.6.

Because the Santa Margarita River Watershed Management Area includes Copermittees from both San Diego County and Riverside County, a footnote to Table B-1 has been included to specify that the requirements of Provision B must be implemented by the County of San Diego until the Riverside County Copermittees have received a notice of coverage under the Regional MS4 Permit.

Provision B.2 (Priority Water Quality Conditions) requires the Copermittees in each Watershed Management Area to identify the highest priority water quality conditions which will be the focus of the Water Quality Improvement Plan implementation.

Provisions B.2.a and B.2.b provide the criteria that must be assessed when characterizing the receiving water quality and potential impacts from MS4 discharges of the receiving waters within the Watershed Management Area. The criteria are based primarily on the requirements in 40 CFR 122.26(d)(1)(iv)(C) and (C)(1)-(9). Characterizing the receiving water quality and identifying the potential impacts caused by MS4 discharges to receiving waters in the Watershed Management Area is necessary to identify the impacts to receiving waters associated with MS4 discharges that are of the most concern to the Copermittees.

Based on the information required to be considered under Provisions B.2.a and B.2.b, Provision B.2.c requires to Copermittees to identify the highest priority water quality conditions related to discharges from the MS4s that will be the primary focus of the Water Quality Improvement Plan in the Watershed Management Area. Addressing and improving these highest priority water quality conditions will become the focus of each Copermittee's jurisdictional runoff management program as the Water Quality Improvement Plan is implemented in the Watershed Management Area. The highest priority water quality conditions are expected to include source of pollutants and/or stressors, and/or receiving water conditions, that the Copermittees consider the highest threats or most likely to have adverse impacts on the physical, chemical, and biological integrity of receiving waters. Addressing these threats and/or adverse impacts should restore the physical, chemical, and biological integrity of receiving waters, and result in the restoration and protection of the beneficial uses of the receiving waters in the Watershed Management Area.

Provision B.2.d requires the Copermittees to identify known and suspected sources of pollutants and/or stressors contributing to the highest priority water quality conditions. The requirements of Provision B.2.d are based primarily on the requirements in 40 CFR 122.26(d)(1)(iii)(B)(1)-(6). The Copermittees are required to evaluate several factors in the identification of those sources. The Copermittees must consider and evaluate the following: (1) the land uses that may contribute toward impacts to receiving waters, (2) the locations of the Copermittees' MS4s that can convey and discharge runoff and pollutants to receiving waters, (3) other sources that discharge into the Copermittees' MS4s and receiving waters, and (4) other information and data that can help the Copermittees to evaluate the relative importance of or contribution from those sources toward the highest priority water quality conditions. Identifying the known and suspected sources, and their relative contribution toward the highest priority water quality conditions, will help the Copermittees to focus, direct, and prioritize their resources and implementation efforts within their jurisdictions.

Provision B.2.e requires the Copermittees to identify interim and final numeric goals, and schedules to achieve those goals as part of the Water Quality Improvement Plans.

Provision B.2.e requires the Copermittees to identify two types of numeric goals to be achieved:

(1) Final numeric goals in the receiving waters and/or MS4 discharges that will be able to restore and protect the water quality standards of the receiving waters for the highest priority water quality conditions identified by the Copermittees for Provision B.2.c. These final numeric goals are the ultimate goals for the Water Quality Improvement Plan, and the achievement and maintenance of these final numeric goals will indicate that one or more beneficial uses have been successfully restored and/or protected.

(2) Interim numeric goals that can be used by the Copermittees to demonstrate progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges for the highest priority water quality conditions in the Watershed Management Area. Achievement of the interim numeric goals will demonstrate to the San Diego Water Board that the Copermittees' implementation efforts are progressing toward achieving the final numeric goals.

Provision B.2.e does not specify what the interim and final numeric goals must be based on. The numeric goals must be designed to achieve compliance with water quality standards in the receiving waters. To that end, the interim goals must be based on measureable criteria or indicators capable of demonstrating progress toward achieving the numeric goals."

The interim and final numeric goals can be based on the water quality objectives in the Basin Plan. The water quality objectives in the Basin Plan, however, consist of numeric and narrative water quality objectives. Numeric water quality objectives can be directly used as numeric goals. Narrative water quality objectives, on the other hand, will require some interpretation to identify numeric goals. The achievement of multiple numeric goals based on the water quality objectives, used in combination, may be necessary to demonstrate that beneficial uses have been restored and/or protected.

The Copermittees could also propose other numeric goals that are not necessarily water quality objectives from the Basin Plan. For example, the Copermittees could propose a numeric goal that consists of achieving some percent improvement of a measureable indicator, such as acreage of a specific habitat or increase in a specific plant or animal species population. Other examples may include pollutant load reductions, number of impaired waterbodies delisted from the List of Water Quality Impaired Segments, Index of Biological Integrity (IBI) scores, etc.

The Copermittees may choose to develop interim numeric goals based on the final numeric goals they develop, such as incremental steps toward ultimately achieving the final numeric goals. The Copermittees may also choose to develop interim numeric goals that are based on other measureable indicators that can indirectly indicate improvements and progress toward the final numeric goals.

There are no limits to the types of interim numeric goals that could be proposed by the Copermittees, other than the goals must be based on measureable criteria or indicators capable of demonstrating progress toward achieving the numeric goals. Likewise, there are no limits to the types of final numeric goals that could be proposed by the Copermittees, other than the goals must "*restore and protect the water quality standards of the receiving waters.*"

Finally, Provision B.2.e also requires the Copermittees to develop schedules for measuring progress and achieving the interim and final numeric goals. Several criteria are included for the development of the schedules, but the Copermittees are required to achieve the numeric goals as soon as possible, consistent with federal NPDES regulations (40 CFR 122.47(a)(1)).

The Copermittees are also required by to incorporate any compliance schedules that are included in any applicable TMDLs. Applicable TMDL compliance schedules are set forth in Attachment E to the Order. The information provided by the Copermittees under Provision B.2.e will be used by the Copermittees and the San Diego Water Board to gauge and track the progress of the Copermittees' efforts in addressing the highest priority water quality conditions identified in the Water Quality Improvement Plan.

Provision B.3 (Water Quality Improvement Strategies) requires the Copermittees in each Watershed Management Area to identify the strategies which will be implemented by the Copermittees' jurisdictional runoff management programs to address and improve the highest priority water quality conditions identified under Provision B.2. The element of the Water Quality Improvement Plan required under Provision B.3 is where the "*comprehensive planning*" and "*intergovernmental coordination*" [40 CFR 122.26(d)(2)(iv)] of the Copermittees' actions for the proposed management programs within the Watershed Management Area is expected to be described.

Provision B.3 requires the Copermittees to identify the water quality improvement strategies that will be implemented within the Watershed Management Area to 1) reduce of pollutants in storm water discharged from the MS4 to the MEP, 2) prevent or eliminate controllable non-storm water discharges from entering the MS4, 3) achieve of demonstrable improvements in the physical, chemical, and biological receiving water conditions, 4) restore and protect water quality standards in receiving waters by controlling discharges so that they do not cause or contribute to exceedances of receiving water limitations, and 5) achieve applicable WQBELs that implement TMDLs.

The Copermittees are expected to provide a description of all the actions and potential actions that they will implement over the course of a schedule that they develop. The implementation actions may include, but are not limited to, inspection and enforcement strategies, resource identification and development efforts, non-structural and structural controls, retrofitting projects, stream and habitat rehabilitation/restoration

projects, and agency and department coordination efforts. Water quality improvement strategies that will be implemented within the Watershed Management Area may need to be different within each Copermittees' jurisdiction. The descriptions in the Water Quality Improvement Plan are not expected to specify exactly what strategies each Copermittee will implement within its jurisdiction, but enough information to allow the San Diego Water Board to determine when and where the strategies may be or should be implemented. Specific information about how those strategies will be implemented will be provided in each Copermittee's jurisdictional runoff management program document.

The Copermittees must also develop and include schedules in the Water Quality Improvement Plan for implementing the water quality improvement strategies. The schedule for implementing the water quality improvement strategies will be used by the Copermittees and San Diego Water Board to measure and demonstrate the progress of the Copermittees' implementation efforts toward reducing pollutants in storm water discharged from the MS4 to the MEP, and eliminating non-storm water discharges from entering the MS4.

Provision B.4 (Water Quality Improvement Monitoring and Assessment) requires the Copermittees to develop an integrated monitoring and assessment program to track the progress of the Water Quality Improvement Plan toward meeting the implementation goals and schedules, and improving the water quality of the Watershed Management Area. Provision B.4 is the part of the Water Quality Improvement Plan where the Copermittees describe the monitoring data that will be collected, which is not only necessary to implement the "iterative approach" required by Provision A.4, but inform the adaptive management and "*comprehensive planning process*" that allows the Copermittees to make adjustments and modifications to the Water Quality Improvement Plans and the jurisdictional runoff management programs.

Provision B.4 requires the Copermittees, at a minimum, to include the requirements of Provision D as part of the water quality improvement monitoring and assessment program for the Water Quality Improvement Plan. The Copermittees, however, are not limited to the requirements of Provision D and may include additional monitoring and assessment methods to track progress toward improving water quality in the Watershed Management Area.

In addition to incorporating the requirements of Provision D, the water quality improvement monitoring and assessment program must incorporate any monitoring and assessment requirements specified for any applicable TMDLs included in Attachment E to the Order, and the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 for Watershed Management Areas with ASBS.

The monitoring and assessments required to be incorporated into the Water Quality Improvement Plan are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order.

Provision B.5 (Iterative Approach and Adaptive Management Process) requires the Copermittees to implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a.

Provision B.5 requires the Copermittees in each Watershed Management Area to re-evaluate the highest priority water quality conditions and numeric goals, the water quality improvement strategies, and the water quality improvement monitoring and assessment program and provide recommendations for modifying those elements to improve the effectiveness of the Water Quality Improvement Plan. The re-evaluation of the Water Quality Improvement Plan is part of the assessment requirements of Provision D.

Provision B.6 (Water Quality Improvement Plan Submittal, Updates, and Implementation) requires to Copermittees to submit, update, and implement the Water Quality Improvement Plans.

The requirements for the process to develop and submit the Water Quality Improvement Plans is described in more detail under the discussion for Provision F.1. The process will include several opportunities for the public to provide input during the development of the Water Quality Improvement Plans. The process for updating the Water Quality Improvement Plans is described in more detail under the discussion for Provision F.3.c. Upon acceptance of the Water Quality Improvement Plan and updates, the Copermittees are required to immediately begin implementing the Water Quality Improvement Plan and subsequent updates.

The Water Quality Improvement Plan is expected to be a dynamic document that will evolve over time. The Water Quality Improvement Plan is also expected to be a long term plan that focuses the Copermittees' efforts and resources on a limited set of priority water quality conditions, with the ultimate goal of protecting all the beneficial uses of the receiving waters within the Watershed Management Area from impacts that may be caused or contributed to by MS4 discharges. As the Copermittees collect data, implement their jurisdictional runoff management programs, and review the results from their water quality improvement monitoring and assessment program, the Water Quality Improvement Plan is expected to be continually reviewed and updated until compliance with Provisions A.1.a, A.1.b, and A.2.a is achieved.

Implementation of the Water Quality Improvement Plans may also demonstrate that TMDLs are not required for impaired water bodies within the Watershed Management Area. Impaired water bodies are not required to be placed on the 303(d) List, thus do not require a TMDL, if technology-based effluent limitations required by the CWA, more stringent effluent limitations required by state, local, or federal authority, or other pollution control requirements (e.g., best management practices) required by local, state or federal authority are stringent enough to implement applicable water quality

standards within a reasonable period of time.[22]

The San Diego Water Board submits an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. According to USEPA guidance for the Integrated Report,[23] water bodies are placed in one of five categories. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 are placed on the 303(d) List.

Category 4 in the Integrated Report is for water bodies where available data and/or information indicate that at least one beneficial use is not being supported or is threatened, but a TMDL is not needed.[24] Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

Impaired water bodies can be included in Category 4a if a TMDL has been adopted and approved. The TMDLs in Attachment E to the Order implement the requirements of the TMDLs adopted by the San Diego Water Board, and approved by the State Water Board and USEPA. The water bodies in Attachment E will be included in Category 4a in the Integrated Report and removed from the 303(d) List.

Impaired water bodies can be included in Category 4b if there are *acceptable* "pollution control requirements" required by a local, state or federal authority stringent enough to implement applicable water quality standards within a reasonable period of time (e.g., a compliance date is set). When evaluating whether a particular set of pollution controls are "requirements," the USEPA considers a number of factors, including: (1) the authority (local, state, federal) under which the controls are required and will be implemented with respect to sources contributing to the water quality impairment (examples may include: self-executing state or local regulations, permits, and contracts and grant/funding agreements that require implementation of necessary controls), (2) existing commitments made by the sources and completion or soon to be completed implementation of the controls (including an analysis of the amount of actual implementation that has already occurred), (3) the certainty of dedicated funding for the implementation of the controls, and (4) other relevant factors as determined by USEPA depending on case-specific circumstances.[25]

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[22] 40 CFR 130.7(b)(1)
[23] USEPA, 2005. *Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act*
[24] Ibid
[25] Ibid

Impaired water bodies can be included in Category 4c if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution. Pollution, as defined by the CWA is "the man-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of water."[26] In other cases, pollution does not result from a pollutant and a TMDL is not required. Examples of circumstances where an impaired segment may be placed in Category 4c include segments impaired solely due to lack of adequate flow, stream channelization, or hydromodification. In these situations, there may be water quality management actions that can address the cause(s) of the impairment, but a TMDL may not be required to implement the actions.

The Water Quality Improvement Plans will require the implementation of pollution controls and water quality management actions (i.e. water quality improvement strategies) which can result in the attainment of water quality standards in water bodies impaired by discharges from the Copermittees' MS4s. The Water Quality Improvement Plans also include requirements that are expected to attain water quality standards in a reasonable period of time. The San Diego Water Board considers the Water Quality Improvement Plans to be a commitment by the Copermittees to develop, plan, budget for, and implement pollution controls that will attain water quality standards in receiving waters in a reasonable period of time, or as soon as possible. The results of the Copermittees' efforts in implementing the Water Quality Improvement Plans can be used to re-evaluate the condition of the impaired water bodies during the next update to the 303(d) List.

After the Copermittees submit the Water Quality Improvement Plans and demonstrate that water quality standards are being attained or will be attained in a reasonable period of time, the San Diego Water Board may re-evaluate the water bodies on the 303(d) List. These water bodies on the 303(d) List may be re-evaluated and placed into Category 4b or Category 4c in the Integrated Report. The water bodies placed in Category 4b or Category 4c in the Integrated Report must show a record that the water bodies are attaining water quality standards or supporting the identified beneficial uses, or will attain water quality standards or support identified beneficial uses in a reasonable period of time, in order for the water bodies to be appropriately removed from the 303(d) List.

[26] CWA section 502(19)

C. Action Levels

Purpose: Provision C includes requirements for the Copermittees to identify and include numeric action levels in the Water Quality Improvement Plan to direct and focus the Copermittees' jurisdictional runoff management program implementation efforts for controlling MS4 discharges to receiving waters.

***Discussion*:** Under Provision C, the numeric action levels required are for non-storm water discharges and storm water discharges. The non-storm water action levels (NALs) are applicable to non-storm water discharges from the Copermittees' MS4s, which can occur year-round. The storm water action levels (SALs) are applicable to storm water discharges from the Copermittees' MS4s, which occur during the rainy season defined as the period between October 1 and April 30.

The action levels required by Provision C are based on the action level requirements that were developed and incorporated into Order Nos. R9-2009-0002 and R9-2010-0016, the Orange County and Riverside County MS4 Permits, respectively. The Fact Sheets for these Orders provide detailed discussions about the development of the numeric NALs and SALs included in this Order.

Order Nos. R9-2009-0002 and R9-2010-0016 required the Copermittees to perform prescribed actions if the NALs or SALs are exceeded. The actions required under Order Nos. R9-2009-0002 and R9-2010-0016 generally included conducting additional monitoring and source investigations when a discharge from the MS4 is observed to exceed one or more NALs and/or SALs.

For this Order, however, the action levels of Provision C are to be used by the Copermittees to prioritize the actions to be implemented as part of the Water Quality Improvement Plan. Monitoring data collected by the Copermittees from MS4 outfalls will be compared with the NALs and SALs. Exceedances of the NALs and SALs will not require the Copermittees to immediately identify sources causing exceedances, but will provide some numeric indicator levels that can give the Copermittees a way to measure the relative severity of a pollutant contributing to receiving water quality impacts.

NALs and SALs must be included in the Water Quality Improvement Plans to be used by the Copermittees in directing and focusing their water quality improvement strategies. The Copermittees are expected to utilize the NALs and SALs to help focus their implementation efforts on addressing pollutants that have the most significant potential or observed impacts to receiving waters. The NALs and SALs will be used as part of the MS4 discharges assessments required under Provision D.4.b. The NALs and SALs may also be used by the Copermittees as the numeric goals to be achieved in MS4 discharges and/or receiving waters as the Water Quality Improvement Plans are implemented.

More specific and detailed discussions of the requirements of Provision C are provided below.

Provision C.1 (Non-storm Water Action Levels) requires the Copermittees to incorporate NALs into the Water Quality Improvement Plan for pollutants and/or constituents that are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions identified in the Water Quality Improvement Plan related to non-storm water discharges from the MS4s. NALs generally must be consistent with the water quality objectives found within the Basin Plan.

The NALs have been included to ensure that the Copermittees are implementing and complying with several requirements of the MS4 permit. The federal CWA requires permits for municipal storm sewer systems to "*effectively prohibit non-storm water discharges into the storm sewers*." The federal NPDES regulations, which were promulgated to implement the CWA requirements for discharges from municipal storm sewers, require a program to address illicit discharges, which are non-storm water discharges. Provision A.1.b prohibits "*[n]on-storm water discharges into MS4s*" unless the non-storm water discharge authorized by a separate NPDES permit, or is a category of non-storm water specified in Provisions E.2.a.(1)-(5) that does not need to be addressed through ordinance, order or similar means and is not a source of pollutants. The NALs will be used as part of the illicit discharge detection and elimination program required pursuant to Provision E.2, as well as part of the MS4 discharges assessments required pursuant to Provision D.4.b.

Provision A.1.a prohibits non-storm water discharges from the MS4 from "*causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state.*" In addition, pursuant to Provision A.2.a, non-storm water discharges "*must not cause or contribute to the violation of water quality standards in any receiving waters*."

Ideally, the Copermittees' jurisdictional runoff management programs will eliminate all non-storm water discharges entering the MS4s within their jurisdictions. The complete elimination of non-storm water discharges to the Copermittees' MS4s would be in compliance with the CWA requirements for non-storm water discharges, as well as the prohibitions and limitations of Provisions A.1.a and A.2.a.

The federal regulations, however, also refer to several non-storm water discharge categories that must be addressed as illicit discharges if they are found to be a source of pollutants. The federal regulations thus identify some non-storm water discharges that are not required to be addressed as illicit discharges if they are not a source of pollutants (e.g. non-storm water discharges specified in Provisions E.2.a.(1)-(5)). Thus, these regulations imply that some non-storm water discharges into and from the MS4 may occur even if non-storm water discharges are "effectively" prohibited by the Copermittees.

If the source of a non-storm water discharge is identified as a category of non-storm water specified in Provisions E.2.a.(1)-(5), the NALs can be used to determine the category of non-storm water discharges is a source of pollutants. For other non-storm water discharges not specified in Provisions E.2.a.(1)-(5), the CWA requires those discharges to be "*effectively"* prohibited by removing the discharge to the MS4 through enforcement of "*ordinance, order or similar means*."

If there are non-storm water discharges, however, those discharges must comply, at a minimum, with the discharge prohibitions and receiving water limitations of Provision A. Thus, the non-storm water discharges from the MS4 must be at levels that will not cause or contribute to a condition of pollution, contamination, or nuisance (Provision A.1.a), and must not cause or contribute to a violation of water quality standards in receiving waters (Provision A.2.a) to be consistent with the discharge prohibitions and receiving water limitations of Provisions A.1.a and A.2.a.

Furthermore, the San Diego Region has predominantly intermittent and ephemeral rivers and streams which vary in flow volume and duration at spatial and temporal scales. For most of these river and stream systems, non-storm water discharges from the MS4 are likely to be the most significant or the only source contributing to surface flows present within the receiving water, especially during the dry season.

Therefore, because of the prohibitions and limitations of Provision A.1.a and A.2.a, and the likelihood that non-storm water discharges from the MS4 are the most significant or only source contributing to surface flows present within the receiving water, NALs generally must be consistent with the water quality objectives found within the Basin Plan. Non-storm water discharges that are meeting the NALs would not be expected to cause or contribute to an exceedance of water quality objectives in receiving waters, which would be consistent with the discharge prohibitions and receiving water limitations of Provisions A.1.a and A.2.a.

Exceedances of the NALs would then provide an indication of the relative severity of a pollutant in non-storm water discharges from the MS4 contributing to potential or observed receiving water quality impacts. The relative severity or significance of a pollutant in non-storm water discharges from the MS4 will provide the Copermittees a valuable source of information that can be used to identify priority water quality conditions within a Watershed Management Area and within each Copermittee's jurisdiction.

Tables C-1 through C-4 under Provision C.1.a specify numeric NALs for several parameters or pollutant constituents for non-storm water discharges from the MS4 to several water body types. The NALs for MS4 discharges given under Provision C.1.a are based on the water quality objectives for inland surface waters in the Basin Plan, and the water quality objectives for ocean waters in the Ocean Plan. The NALs for most of the metals were calculated based on the State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP). The NALs provided in Tables C-1

through C-4 must be included in the Water Quality Improvement Plans required to be developed pursuant to Provision B.

Provision C.1.b requires the Copermittees to identify NALs for pollutants and/or constituents, not specified in Provision C.1.a, which are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions of the Watershed Management Area related to non-storm water discharges from the MS4s. The NALs must be based on the water quality objectives in the Basin Plan. The NALs identified under Provision C.1.b must be included in the Water Quality Improvement Plan.

The San Diego Water Board recognizes that some of the NALs required pursuant to Provisions C.1.a and C.1.b may be exceeded more frequently than not. Thus, Provision C.1.c has been included in the Order to provide the Copermittees the option to develop secondary NALs that are set at levels greater than the levels required pursuant to Provisions C.1.a and C.1.b to further refine the prioritization and assessment of water quality improvement strategies for addressing non-storm water discharges to and from the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and from the MS4.

Provision C.2 (Storm Water Action Levels) requires the Copermittees to incorporate SALs into the Water Quality Improvement Plan for pollutants and/or constituents causing or contributing, or may be causing or contributing, to the highest priority water quality conditions identified in the Water Quality Improvement Plan related to storm water discharges from the MS4s.

The SALs have been included to ensure that the Copermittees are implementing and complying with several requirements of the MS4 permit. Provision A.1.a prohibits storm water discharges from the MS4 from "*causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state.*" In addition, pursuant to Provision A.2.a, storm water discharges "*must not cause or contribute to the violation of water quality standards in any receiving waters*."

Provision A.3.a, however, implicitly acknowledges that compliance with Provisions A.1.a and A.2.a cannot be achieved immediately for discharges of storm water from the MS4 by applying the MEP standard. Thus, Provision A.4 requires the Copermittees to implement an iterative approach to demonstrate that MEP is being achieved. This approach is supported by USEPA.

The federal CWA requires permits for municipal storm sewer systems to "*require controls to reduce the discharge of pollutants [in storm water] to the maximum extent practicable*, *including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants.*" MEP is an ever-evolving, flexible, and advancing concept. As knowledge about controlling storm water runoff

and discharges evolves, so does the knowledge which constitutes MEP. Reducing the discharge of storm water pollutants from the MS4 to the MEP requires the Copermittees to assess their jurisdictional runoff management programs and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP. The SALs provide the Copermittees measureable goals that may be used to demonstrate the achievement of MEP for reducing pollutants in storm water discharges from the MS4. The SALs will be used as part of the MS4 discharges assessments required under Provision D.4.a.

In June of 2006, the State Water Board's Blue Ribbon Storm Water Panel released its report titled "*The Feasibility of Numerical Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities*." In the recommendations, the Blue Ribbon panel proposed storm water effluent limitations which are computed using statistical based population approaches. The SALs specified in Table C-5 under Provision C.2.a were developed from a regional subset of nationwide Phase I MS4 data by using USEPA Rain Zone 6 (arid west) data.[27] Additionally, utilization of regional data is appropriate due to the addition of data into the nationwide Phase I MS4 monitoring dataset in February 2008. This additional data increased the number of USEPA Rain Zone 6 samples to more than 400, and included additional monitoring events within Southern California.

Utilizing data from USEPA Rain Zone 6 resulted in SALs which closely reflect the environmental conditions experienced in the San Diego Region. The localized subset of data includes sampling events from multiple Southern California locations including Orange, San Diego, Riverside, Los Angeles, and San Bernardino Counties. The dataset includes samples taken from highly built-out impervious areas and from storm events representative of Southern California conditions.

The SALs for cadmium, copper, lead and zinc require the measurement of hardness and to provide more specificity in the assessment of samples with SALs for total metal concentrations. While USEPA Rain Zone 6 data include a large sample size for concentrations of total metals, the impact the concentration will have on receiving waters will vary with receiving water hardness. Since it is the goal of the SALs, through the iterative process and MEP standard, to have MS4 storm water discharges meet all applicable water quality objectives, the hardness of the receiving water should be used when assessing the total metal concentration of a sample.

Thus, when there is an exceedance of a SAL for a metal, the Copermittee must determine if that exceedance is above the existing applicable water quality objectives based upon the hardness of the receiving water. The water quality objectives Copermittees must use to assess total metal SAL exceedances are the California Toxic Rule (CTR) and USEPA National Recommended Water Quality Criteria for Freshwater Aquatic Life 1 hour maximum concentrations. The 1 hour maximum

[27] Data used to develop SAL were obtained from http://rpitt.eng.ua.edu/Research/ms4/mainms4.shtml

concentration is to be used for comparison since it is expected to most replicate the impacts to waters of the State from the first flush following a precipitation event.

The statistically calculated SALs given in Table C-5 are at levels greater than the water quality objectives in the Basin Plan or Ocean Plan. Because the objective of the CWA is to "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*", meaning eventually pollutants in storm water discharges must be reduced to a level that cannot cause or contribute to an exceedance of water quality objectives in receiving waters, over time the SALs are expected to be reduced to a level that is based on the water quality objectives rather than statistical calculations. The San Diego Water Board will review the SALs as more data for discharges of storm water from the MS4s are collected, and revise them as conditions improve and the MEP standard advances. For the Water Quality Improvement Plans required under this Order, the SALs identified under Provision C.2.a must be included.

Provision C.2.b requires the Copermittees to identify SALs for pollutants and/or constituents, not specified in Provision C.2.a, which are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions of the Watershed Management Area related to storm water discharges from the MS4s. The SALs identified under Provision C.2.b must be included in the Water Quality Improvement Plan.

The San Diego Water Board recognizes that some of the SALs required pursuant to Provisions C.2.a and C.2.b may be exceeded more frequently than not. Thus, Provision C.2.c has been included in the Order to provide the Copermittees the option to develop secondary SALs that are set at levels greater than the levels required pursuant to Provisions C.2.a and C.2.b to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s.

D. Monitoring and Assessment Program Requirements

Purpose: Provision D includes minimum monitoring and assessment requirements that must be developed and implemented by the Copermittees as part of the Water Quality Improvement Plans. Implementation of the monitoring and assessment requirements of Provision D will allow the Copermittees to demonstrate that the requirements of the CWA to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP are being achieved. Implementation of the monitoring and assessment requirements of Provision D will also allow the Copermittees and the San Diego Water Board to track improvements to the water quality in the San Diego Region. The monitoring and assessment program requirements are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order.

***Discussion*:** The San Diego Water Board recognized that changes to the monitoring and assessment requirements of the Fourth Term Permit were necessary to improve the usefulness and usability of monitoring data collected by the Copermittees to support their jurisdictional storm water programs more efficiently and with increased effectiveness. The data collected are needed to better inform the Copermittees' understanding of the physical, chemical, and biological condition of the receiving waters and the quality of the MS4 discharges. The monitoring program needs to provide opportunities for the Copermittees to integrate regional monitoring efforts into municipal storm water monitoring requirements to provide a cost-effective approach to monitoring and avoid duplication of efforts.

The requirements in Provision D were largely recommended by the Copermittees as an outcome of the San Diego Water Boards Focused Meeting process. The monitoring and assessment program requirements now require collection of more specific information necessary for each Copermittee to adapt its jurisdictional runoff management program in such a way that focuses resources on a watershed's highest priority water quality conditions. The monitoring and assessment program will require the Copermittees to collect data that can be utilized to answer both watershed level management questions (e.g. Are the chemical, physical, and biological conditions of a receiving water protective, or likely protective of beneficial uses?), and specific jurisdictional runoff management program activity questions (e.g. Are the water quality improvement strategies of the jurisdictional program effectively eliminating non-storm water discharges to the MS4?).

The monitoring data collected and assessment information that will be reported to the San Diego Water Board are necessary to determine if the Copermittees are complying with the prohibitions and limitations of Provision A. The required monitoring and assessments that must be reported to the San Diego Water Board will be utilized for three purposes:

(1) Inform the Copermittees, San Diego Water Board, and the public on the progress

of the Copermittees' efforts to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP;

(2) Inform the Copermittees, San Diego Water Board, and the public on the condition of water bodies receiving discharges from the Copermittees' MS4, and the progress of the Copermittees' water quality improvement implementation efforts toward improving the receiving water quality; and

(3) Inform the Copermittees, the San Diego Water Board, and the public on the effectiveness of the Water Quality Improvement Plan toward achieving (1) and (2).

The monitoring and assessment information reported pursuant to Provision F is also expected to be key to the iterative approach and adaptive management process required under Provision A.4 and implemented through the Water Quality Improvement Plan required under Provision B. As required by Provision A.4, the iterative approach and adaptive management process is required if the Copermittees cannot meet the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c, and/or A.2.a under the present conditions.

Provision D provides the minimum monitoring and assessment requirements that must be included in each Water Quality Improvement Plan to be developed and implemented by the Copermittees. The Copermittees, however, are not limited to the requirements of Provision D and may include additional methods to track progress toward improving water quality in a Watershed Management Area.

More specific and detailed discussions of the requirements of Provision D are provided below.

<u>Provision D.1 (Receiving Water Monitoring Requirements)</u> specifies the minimum receiving water monitoring that the Copermittees must conduct within the Watershed Management Area and include as part of the Water Quality Improvement Plan.

Provision D.1 establishes minimum monitoring requirements that must be conducted by the Copermittees within each Watershed Management Area. Provision D.1 requires the Copermittees to collect and develop the data and information necessary to determine potential impacts to the beneficial uses in the receiving waters due to discharges from the MS4s. The monitoring required under Provision D.1 will also provide the data that will allow the Copermittees to gauge the effectiveness and progress of its Water Quality Improvement Plan implementation efforts toward improving the quality of receiving waters.

The receiving water monitoring requirements of Provision D.1 are focused primarily on monitoring the conditions and response of the receiving waters to the Copermittees' collective implementation efforts to reduce receiving water impacts that may be

caused by the discharges from the MS4s. The preference of the San Diego Water Board is for the Copermittees to spend their resources achieving tangible and observable improvements in receiving water conditions instead of collecting samples and analyzing data that has consistently indicated that receiving water conditions are degraded and require improvement. In general, the ability to measure potential improvements in receiving water conditions due to any actions implemented by the Copermittees as part of the Water Quality Improvement Plan may require several years before a response can be observed. Thus, the frequency of collecting receiving water monitoring data has been kept to a minimum.

During the transitional period between adoption of this Order and San Diego Water Board acceptance of a Water Quality Improvement Plan, the Copermittees must conduct receiving water monitoring in accordance with Provision D.1.a. This approach to collecting receiving water data is different from what was required in the Fourth Term Permits, but one that truly embraces the concept of an integrated, cost-effective, streamlined receiving water monitoring approach.

Provision D.1.a requires Copermittees to continue performing the receiving water monitoring programs required in Order Nos. R-2007-0001, R9-2009-002, and R9-2010-0016; plus participation in: hydromodification management plan monitoring approved by the San Diego Water Board, monitoring plans as part of load reduction plans (either Bacteria Load Reduction Plans or Comprehensive Load Reduction Plans) for TMDLs in Attachment E of the Order, Storm Water Monitoring Coalition Regional Monitoring, Southern California Bight Regional Monitoring, Sediment Quality Monitoring, and ASBS Monitoring as applicable to a Watershed Management Area.

Provision D.1.a also provides an opportunity for the Copermittees to use third party data to meet receiving water monitoring requirements where feasible. Allowing the Copermittees to use the data currently collected through its participation in existing regional receiving water programs and that of third parties provides an efficiency of resources in obtaining the data necessary to inform the Copermittees and the San Diego Water Board about the physical, chemical, and biological conditions of the receiving waters, which can also help to focus the receiving water monitoring during the implementation of the Water Quality Improvement Plan. Once a Water Quality Improvement Plan is developed for a Watershed Management Area in compliance with Provision B of this Order, the transitional period is over and Copermittees are required to conduct receiving water monitoring according to the requirements of Provision D.1.b-e.

Provision D.1.b requires each Copermittee to identify at least one long term receiving water monitoring station to be representative of receiving water quality within each Watershed Management Area. Long term receiving water monitoring stations can be located at any existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees. The requirements under Provision D.1.b. are consistent with 40 CFR 122.26(d)(2)(iii)(D), which specifies that a "*monitoring program*

for representative data collection for the term of the permit" may include "*instream locations.*" For each Watershed Management Area, at least one long term watershed monitoring station is required to be established and monitored. The Copermittees may choose to establish additional long term monitoring stations where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

Provision D.1.b. requires the Copermittees to locate the long term receiving water monitoring station at one of these existing receiving water monitoring stations to provide the Copermittees an opportunity to experience monitoring cost savings while continuing to collect the necessary data to assess the status and trends of receiving water quality conditions in 1) coastal water, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under both dry weather and wet weather conditions. Ideally these stations will continue to be monitored as part of the receiving water monitoring for each Watershed Management Area to maintain a consistent set of locations and a period of data that can be built upon with the monitoring required under this Order.

The receiving water monitoring requirements are separated into monitoring required during dry weather conditions pursuant to Provision D.1.c, and wet weather conditions pursuant to Provision D.1.d.

At each long term monitoring station the Copermittees must conduct at least three dry weather monitoring events as required pursuant to Provision D.1.c and at least three wet weather monitoring events as required pursuant to Provision D.1.d per permit term. Provision D.1.c and D.1.d require the Copermittees to monitor priority water quality conditions identified in the Water Quality Improvement Plan, constituents listed as causing impairment of receiving waters in the Watershed Management Area, applicable NALs, constituents listed in Tables D-2 and D-3, and constituents for implementation plans (e.g. Bacteria Load Reduction Plans and Comprehensive Load Reduction Plans). Receiving water monitoring efforts in this Order have been streamlined to redirect resources to monitoring efforts that better support pollutant reduction solutions with an increasing emphasis on MS4 outfall monitoring, source identification and source abatement activities.

In addition to the receiving water monitoring requirements under Provisions D.1.b-d, Provision D.1.e requires the Copermittees participate in and/or conduct other types of receiving water monitoring. As recommended and requested by the Copermittees, Provision D.1.e.(1) requires the Copermittees to participate in existing regional monitoring, as applicable to each Watershed Management Area. Existing regional monitoring includes monitoring conducted by the Storm Water Monitoring Coalition and for the Southern California Bight. Participation in and use of monitoring data collected from these existing regional water quality monitoring programs provide the Copermittees a greater opportunity for efficiency in the use of their resources to manage their storm water programs and those controllable discharges under their authority.

The State Water Resources Control Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part 1 Sediment Quality which became effective August 25, 2009 (Sediment Quality Monitoring Policy). Provision D.1.e.(2) requires any Copermittees with MS4 discharges to an enclosed bay or estuary to monitoring the sediments in the enclosed bay or estuary receiving water in accordance with the sediment quality monitoring procedures as prescribed in the Sediment Quality Monitoring Policy.

The State Water Board adopted Resolution No. 2012-0012 which approved exceptions to the California Ocean Plan for selected discharges into Areas of Special Biological Significance (ASBS), including special protections for beneficial uses. State Board Resolution No. 2012-0012 became effective on March 20, 2012, and Attachment B to the Resolution established limitations on point source storm water discharges to ASBS. Copermittees with MS4s that discharge to an ASBS must monitor its discharge to assure compliance with State Board Resolution No. 2012-0012 as required pursuant to Provision D.1.e.(3).

The San Diego Water Board is currently developing a regional monitoring strategy to assess the conditions of receiving waters in the San Diego Region. The monitoring requirements of Provision D.1 are expected to be incorporated or serve as a foundation of this regional monitoring strategy, but may require some modifications. When the San Diego Water Board develops an alternative regional monitoring strategy, the Copermittees will be required to participate in the development and implementation of the alternative regional monitoring program pursuant to Provision D.1.f.

Provision D.2 (MS4 Outfall Discharge Monitoring Requirements) specifies the minimum MS4 outfall discharge monitoring requirements that the Copermittees must incorporate and implement as part of the Water Quality Improvement Plan.

The dry weather MS4 outfall discharge monitoring requirements are included under Provisions D.2.a.(2) and D.2.b. The dry weather MS4 outfall discharge monitoring requirements are part of the "*program, including a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer*" required by 40 CFR 122.26(d)(2)(iv)(B), which is expected to achieve compliance with the CWA section 402(p)(3)(B)(ii) statutory requirement for municipal storm water permits to require the Copermittees to "*effectively prohibit non-storm water discharges into the storm sewers*." The dry weather MS4 outfall discharge monitoring data collection requirements are based on requirements under 40 CFR 122.26(d)(1)(iv)(D) and 122.26(d)(2)(iv)(B)(3).

The dry weather MS4 outfall discharge monitoring requirements are designed to provide wide spatial and temporal coverage of each jurisdiction to better understand the extent and magnitude of non-storm water discharges to receiving waters, and make a distinction between persistent and transient non-storm water flows. This

information is expected to allow each Copermittee to focus its resources on eliminating and controlling the highest priority threats to receiving water quality, as well as integrating other elements of the storm water programs (e.g. complaint call response) and third party data to efficiently and effectively assist in efforts to eliminate non-storm water discharges.

The dry weather MS4 outfall discharge monitoring requirements of Provision D.2.a.(2) and D.2.b are separated into monitoring required before and after the San Diego Water Board accepts the Copemittees' Water Quality Improvement Plan. Outfall monitoring conducted prior to acceptance of the Water Quality Improvement Plan is referred to in the Order as Transitional MS4 Outfall Discharge Monitoring. Provision D.2.a.(2) includes the transitional dry weather MS4 outfall discharge monitoring requirements.

The requirements under Provision D.2.a.(2) are based on the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B), which include the requirements for a monitoring program to identify, detect, and eliminate illicit connections and illegal discharges to the MS4s. The federal regulations (40 CFR 122.26(d)(1)(iv)(D)) require the monitoring program to include "*a field screening analysis for illicit connections and illegal dumping [that]…[a]t a minimum, include[s] a narrative description, for either each field screening point or major outfall, of visual observations made during dry weather periods.*" The federal regulations (40 CFR 122.26(d)(1)(v)(B)) require the monitoring program to include "*inspection procedures and methods for detecting and preventing illicit discharges, and describe areas where this program has been implemented.*" Furthermore, the monitoring program is required by federal regulations (40 CFR 122.26(d)(2)(iv)(B)) to include "*a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer.*"

Dry weather transitional MS4 outfall discharge monitoring requires each Copermittee to field screen (inspect) its major MS4 outfalls to classify the MS4 outfall locations as having persistent dry weather flows, transient dry weather flows, or no dry weather flows. To account for the variance in size of the 39 jurisdictions covered under this Order, the Copermittees recommended a tiered approach to the number of major MS4 outfalls that must be inspected. Provision D.2.a.(2)(a) provides a tiered approach to the number of major MS4 outfalls that must be visually inspected per jurisdiction as well as a minimum frequency each Copermittee must inspect each major MS4 outfall per year. This tiered approach is based on the total number of major MS4 outfalls within a Copermittees jurisdiction within each Watershed Management Area.

Based on the field screening, each Copermittee is required to make a determination whether any observed flowing, pooled, or ponded waters are transient or persistent flows. Based on this field screening information, other jurisdictional program information, and third party information, each Copermittee is required to prioritize the MS4 outfalls within its jurisdiction for follow up investigation and elimination of the non-storm water discharge, as part of its illicit discharge detection and elimination program

required pursuant to Provision E.2. In accordance with the requirements of Provision E.2, each Copermittee is required to immediately investigate obvious illicit discharges (e.g. outfall discharges with unusual color, unusual odor, or high flows).

This approach allows a Copermittee to use all of its resources, as well as leverage resources and information provided by third parties, to effectively eliminate non-storm water discharges from its MS4 outfalls. If the source of the non-storm water discharge cannot be immediately eliminated, the Copermittee uses the persistent flow or transient flow classification along with other programmatic implementation data to prioritize the MS4 outfalls for future investigation. In accordance with the adaptive management approach deployed throughout this Order, Provision D.2.a.(2)(c) requires each Copermittee to update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow. The requirement of Provision D.2.a.(2)(c) assures that each Copermittee is collecting data that can be used to demonstrate compliance with the CWA requirement that each Copermittee must implement a program to "*effectively prohibit non-storm water discharges into the [MS4]*" and with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

Provision D.2.b describes the dry weather MS4 outfall discharge monitoring required to be incorporated and implemented as part of the Water Quality Improvement Plan. Dry weather MS4 outfall discharge monitoring must be performed by each Copermittee to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to E.3. The emphasis of the dry weather MS4 outfall discharge monitoring required pursuant to Provision D.2.b is consistent with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

Provision D.2.b.(1) requires each Copermittee to continue field screening its major MS4 outfalls and identifying those with persistent flows and transient flows, as conducted during the transitional period (i.e. before the Water Quality Improvement Plan was developed). However, each Copermittee now has the flexibility to adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of non-storm water persistent flow discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan. In order to ensure a minimum number of outfalls are inspected, Provision D.2.b.(1) requires the number of visual inspections be equal to the number of visual inspections required in the tiered inspection program pursuant to Provision D.2.a.(2)(a).

Provision D.2.b.(2)(b) requires each Copermittee to monitor a minimum of 10 major MS4 outfalls with persistent flows identified as the highest priorities within a Copermittee's jurisdiction, and within each Watershed Management Area. In other words, Copermittees located in more than one Watershed Management Area must identify at least 10 major MS4 outfalls with persistent flows per Watershed

Management Area. If a Copermittee is located in more than one Watershed Management Area, but there are less than 10 major MS4 outfalls with persistent flows within the area of its jurisdiction located in the Watershed Management Area, all the those major MS4 outfalls must be identified as the highest priority dry weather persistent flow MS4 outfalls.

Monitoring must occur at the highest priority outfall locations at least semi-annually until the non-storm water discharges have been eliminated for three consecutive dry weather monitoring events; identified to be authorized by a separate NPDES Permit; or reprioritized to a lower priority. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized MS4 major outfall in the Copermittee's jurisdiction within the Watershed Management Area, unless there are no remaining qualifying major MS4 outfalls within the Copermittees jurisdiction. The Copermittees must continually update their dry weather persistent flow MS4 outfall discharge monitoring locations with the next highest priority non-storm water flow that have yet to be eliminated until all persistent and transient flows are eliminated or its threat reduced.

Non-storm water persistent flow MS4 outfall discharge monitoring data collected during each semi-annual monitoring event, must be collected and analyzed according to the requirements of Provision D.2.b.(2)(b)–(e). These monitoring requirements are consistent with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

The wet weather MS4 outfall discharge monitoring requirements are included under Provisions D.2.a.(3) and D.2.c. The wet weather MS4 outfall discharge monitoring requirements are necessary for the Copermittees to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable, using management practices, control techniques and system, design and engineering methods, and such other provisions which are appropriate*" required by 40CFR 122.26(d)(2)(iv), which is expected to achieve compliance with the CWA section 402(p)(3)(B)(iii) statutory requirement for municipal storm water permits to require "*controls to reduce the discharge of pollutants [in storm water] to the maximum extent practicable*." The wet weather MS4 outfall discharge monitoring data collection requirements are based on requirements under 40 CFR 122.26(d)(2)(iii), 122.26(d)(2)(iii)(A) and 122.26(d)(2)(iii)(A)(1)-(4), and 40 CFR 122.21(g)(7)(i)-(ii).

The wet weather MS4 outfall discharge monitoring requirements of Provision D.2.a.(3) and D.2.c are separated into monitoring required before and after the San Diego Water Board accepts the Copemittees' Water Quality Improvement Plan. Outfall monitoring conducted prior to acceptance of the Water Quality Improvement Plan is referred to in the Order as Transitional MS4 Outfall Discharge Monitoring. Provision D.2.a.(3) includes the transitional wet weather MS4 outfall discharge monitoring requirements.

Until the wet weather MS4 outfall discharge monitoring requirements of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board, the Copermittees must comply with the requirements of transitional wet weather MS4 outfall monitoring requirements pursuant to Provision D.2.a.(3). Provision D.2.a.(3) requires each Copermittee to sample, at least five of the major MS4 outfalls inventoried pursuant to Provision D.2.a.(1) twice per wet season for the monitoring data required to be collected pursuant to Provision D.2.a.(3)(c)-(e).

At a minimum, the five sampling locations chosen must be representative of storm water discharges from residential, commercial, industrial, and typical mixed-use land uses present within a Watershed Management Area. The San Diego Water Board expects the Copermittees to extrapolate from these data to similar land uses throughout the Watershed Management Area to better inform the Water Quality Improvement Plan development process by prioritizing drainages for implementation efforts required pursuant to Provision E.

Provision D.2.c describes the wet weather MS4 outfall discharge monitoring required to be included and implemented as part of the Water Quality Improvement Plan. Provision D.2.c provides the Copermittees the flexibility to adjust the wet weather MS4 outfall discharge monitoring locations and frequencies in the Watershed Management Area, as needed, to identify sources of pollutants in storm water discharges from MS4s in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan.

Although Provision D.2.c.(1) allows the Copermittees to adaptively manage the wet weather MS4 outfall discharge monitoring locations and frequencies, the provision requires a minimum of at least five wet weather outfall stations to be monitored. Provision D.2.c.(2) further requires the Copermittees to modify the monitoring frequency at each wet weather MS4 outfall station at an appropriate frequency to identify sources of pollutants in storm water discharges.

The wet weather MS4 outfall discharge monitoring requirements of Provisions D.2.c.(3) and D.2.c.(4) are the same as the transitional wet weather MS4 outfall discharge monitoring. In contrast, the requirements of Provision D.2.c.(5) are focused on collecting analytical data specific to the highest priority water quality conditions in the Watershed Management Area identified in the Water Quality Improvement Plan. The wet weather MS4 outfall discharge monitoring data collection requirements are consistent with the requirements under 40 CFR 122.26(d)(2)(iii), 122.26(d)(2)(iii)(A) and 122.26(d)(2)(iii)(A)(1)-(4), and 40 CFR 122.21(g)(7)(i)-(ii).

<u>Provision D.3 (Special Studies)</u> requires the Copermittees to develop special studies that will be conducted for each Watershed Management Area and the entire San Diego Region. Data collected pursuant to Provision D.3 is to be used by the Copermittees to improve the effectiveness of the strategies implemented by the jurisdictional runoff management programs toward achieving the numeric goals identified in the Water Quality Improvement Plans and ultimately achieve compliance

with the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c, and A.2.a, which is consistent with the requirements of Provision A.4.

Special studies are often necessary to fill data gaps or provide more refined information that allow the Copermittees to better manage the generation or elimination of pollutants and discharges to and from the MS4. In the Fourth Term Permits, the Copermittees have been required to implement special studies as directed by the San Diego Water Board. The special studies required by this Order provide the Copermittees more flexibility to identify and implement special studies that will be most useful to improving the effectiveness of their jurisdictional runoff management programs.

Provision D.3.a.(1) requires the Copermittees to develop and conduct at least three special studies per Watershed Management Area, to be determined by the Copermittees. One of the three special studies may be accomplished through participation in a Regional Special Study required under Provision D.3.a.(2). The requirements provide the Copermittees great latitude in identifying and developing the special studies. Watershed Management Area special studies are required, at a minimum, to: (a) relate in some way to the highest water quality priorities identified by the Copermittees in the Water Quality Improvement Plan, (b) be conducted within the Watershed Management Area, and (c) include some form of participation (e.g. contribution of funds, personnel services, project management) by all the responsible Copermittees within the Watershed Management Area.

Examples of Watershed Management Area special studies might include, but are not limited to: (1) focused pollutant source identification studies, (2) BMP effectiveness and/or comparison studies, (3) pilot tests for new or emerging pollutant control methods, (4) receiving water pollutant or stressor source identification and/or mitigation studies, or (5) pollutant fate and transport studies. The Watershed Management Area special studies are expected to provide data that can be utilized by the Copermittees to improve the Water Quality Improvement Plan or implementation of the Copermittees' jurisdictional runoff management programs to address the highest priority water quality conditions.

Provision D.3.a.(2) requires the Copermittees to develop special studies that will be conducted for the entire San Diego region. The regional special studies are expected to provide data that can be utilized by the Copermittees to improve the Water Quality Improvement Plan or implementation of the Copermittees' jurisdictional runoff management programs to identify or address regional water quality concerns and priorities.

An example of a regional special study would be to develop and establish allowable exceedance frequencies of the bacteria water quality objectives for several types of water bodies, during different wet and dry weather conditions the San Diego region. The special study would be related to bacteria, which is a priority for the San Diego region due to the adoption of "*Bacteria TMDL Project I – Beaches and Creeks in the*

San Diego Region." The study results could be used to inform the Copermittees and the San Diego Water Board about the indictor bacteria water quality objective exceedance frequencies that occur in natural or reference watersheds.

Provision D.4 (Assessment Requirements) specifies the assessments that the Copermittees are required to perform, based on the monitoring data collected, and will be reported as part of the Annual Report for the Water Quality Improvement Plan implementation. Provision D.4 requires the Copermittees assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c, and A.2.a.

Provision D.4 specifies the assessments that Copermittees must perform for each Watershed Management Area to assess the effectiveness of each Copermittee's jurisdictional runoff management program and the Water Quality Improvement Plan. The effectiveness of each Copermittee's jurisdictional runoff management program and Water Quality Improvement Plan is measured through these types of assessments: (a) Receiving Waters Assessments (b) MS4 Outfall Discharges Assessments, (c) Special Studies Assessments, and (d) Integrated Assessment of Water Quality Improvement Plan.

Provision D.4.a requires the Copermittees to assess the status of receiving water conditions. The monitoring data collected pursuant to Provision D.1 will be evaluated, among other information, to assess the condition of a Watershed Management Area's streams, coastal waters, enclosed bays, harbors, estuaries, and lagoons. The focus of the receiving waters assessments is to measure progress toward the objective of the CWA to "*restore and maintain the chemical, physical, and biological integrity of the Nation's waters*" as the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program are implemented within a Watershed Management Area. Provision D.4.a is consistent with 40 CFR 122.42(c)(7) which requires the Copermittees to annually report the *"[i]dentification of water quality improvements or degradation."*

Provision D.4.b includes the MS4 outfall discharges assessment requirements. The focus of MS4 outfall discharges assessments is to determine if the Copermittees' are implementing programs that comply with the requirements of the CWA for MS4 permits to "*effectively prohibit non-stormwater discharges into the storm sewers*" and "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable.*" The monitoring data collected pursuant to Provisions D.2 will be evaluated, among other information, to assess the effectiveness of the implementation of the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program. The MS4 outfall discharge assessments consist of Non-Storm Water Discharges Reduction Assessments and Storm Water Pollutant Discharges Reduction Assessments.

The Non-Storm Water Discharges Reduction Assessments are how each Copermittee will demonstrate that its jurisdictional runoff management program implementation

efforts are achieving the CWA requirement to "*effectively prohibit non-stormwater discharges into the storm sewers.*" Provision D.4.b.(1) requires each Copermittee to assess and report on its illicit discharge detection and elimination program required pursuant to Provision E.2 to reduce and effectively prohibit non-storm water and illicit discharges into the MS4 within its jurisdiction. The Non-Storm Water Discharges Reduction Assessments include specific assessment requirements applicable to each Copermittee.

As each Copermittee collects and analyzes the data collected pursuant to dry weather MS4 outfall discharges monitoring requirements of Provisions D.2.a.(2) and D.2.b, Provision D.4.b.(1) requires each Copermittee to assess the progress, assess the effectiveness of its current actions, and identify modifications necessary to increase the effectiveness of its actions toward reducing and eliminating non-storm water and illicit discharges to its MS4. The findings from these assessments are expected to be utilized by the Copermittee as part of its procedures to prioritize the non-storm water discharges that will be addressed by its Illicit Discharge Detection and Elimination program required pursuant to Provision E.2.

The assessment requirements of Provision D.4.a.(1) are consistent with 40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(3) which require "*procedures…to investigate portions of the separate storm sewer system that, <u>based on the results of the field screen, or other appropriate information</u> [emphasis added], indicate a reasonable potential of contain illicit discharges or other sources of non-storm water*" as part of a "*program…to detect and remove…illicit discharges and improper disposal into the storm sewer.*" The assessment requirements of Provision D.4.a.(1) are also consistent with 40 CFR122.42(c)(1) requires the Copermittees to annually report the "*status of implementing the components of the storm water management program that are established as permit conditions.*"

The Storm Water Pollutant Discharges Reduction Assessment is how the Copermittees in each Watershed Management Area will demonstrate that their jurisdictional runoff management program implementation efforts are achieving the CWA requirement to "*reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable*." Provision D.4.b.(2) requires the Copermittees in each Watershed Management Area to assess and report the progress of the Copermittees' efforts to reduce pollutants in storm water discharges from the MS4s to the MEP. The Storm Water Pollutant Discharges Reduction Assessments include specific assessment requirements applicable to the Watershed Management Area and each Copermittee.

As the Copermittees collect and analyze the data collected pursuant to wet weather MS4 outfall discharges monitoring requirements of Provisions D.2.a.(3) and D.2.c, Provision D.4.b.(2) requires the Copermittees to assess the progress of the Water Quality Improvement Plan strategies toward reducing pollutants in storm water from the MS4 to the MEP. The findings from these assessments are expected to be utilized by the Copermittees to identify any modifications to the wet weather MS4 outfall

discharge monitoring locations and frequencies necessary to identify sources of pollutants in storm water discharges from the MS4s, as well as focus, modify, and improve the water quality improvement strategies implemented by each Copermittee within its jurisdiction to reduce pollutants in storm water discharges to the MEP.

The assessment requirements of Provision D.4.a.(1) are consistent with 40 CFR 122.26(d)(2)(iii)(B) which requires "*[e]stimates of the annual pollutant load of the cumulative discharges to waters of the United States from all identified municipal outfalls…during a storm event…accompanied by a description of the procedures for estimating constituent loads and concentrations, including any modeling, data analysis, and calculation methods.*" The assessment requirements of Provision D.4.a.(2) are consistent with 40 CFR 122.26(d)(2)(v) which requires that each Copermittee assesses the *"estimated reductions in loadings of pollutants from discharges of municipal storm sewer constituents from municipal storm sewer systems expected as the result of the municipal storm water quality management program."* The assessment requirements of Provision D.4.a.(2) are also consistent with 40 CFR122.42(c)(1) requires the Copermittees to annually report the "*status of implementing the components of the storm water management program that are established as permit conditions.*"

Provision D.4.c includes the special studies assessment requirements. Performing special studies are how the Copermittees will address data gaps identified during the development of and updates to the Water Quality Improvement Plan The relevant findings from the special studies assessments are expected to be incorporated as part of the applicable receiving water assessments, MS4 outfall discharge assessments, and integrated water quality improvement assessments required in Provision D.4.a, D.4.b, and D.4.d, respectively.

The assessment requirements in Provision D.4.d are part of the iterative approach and adaptive management process required by Provision A.4. The Copermittees are required to integrate the data collected pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision D to re-evaluate the Water Quality Improvement Plan.

The monitoring data collected pursuant to Provisions D.1 and D.2, and the results of the assessment required pursuant to Provisions D.4.a-c, will be used to determine whether the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program are effective, or require modifications or improvements to become more effective to achieve the requirements of the CWA. The assessments required by Provision D.4.d are consistent with 40 CFR 122.42(c)(1) which requires that the Copermittees to report the *"[t]he status of implementing the components of the storm water management program that are established as permit conditions."*

E. Jurisdictional Runoff Management Programs

Purpose: Provision E includes the requirements for the jurisdictional runoff management programs to be implemented by each of the Copermittees. Compliance with the requirements for the jurisdictional runoff management programs will allow the Copermittees to demonstrate that they are implementing programs to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP. The jurisdictional runoff management program document prepared by each Copermittee will also provide the details for implementing the water quality improvement strategies identified in the Water Quality Improvement Plan specifically within its jurisdiction.

***Discussion*:** Implementation of the jurisdictional runoff management program requirements under Provision E is how the Copermittees "*effectively prohibit non-stormwater discharges into the storm sewers*", and outlines the "*controls to reduce the discharge of pollutants to the maximum extent practicable"* consistent with the federal regulations under 40 CFR 122.26. The jurisdictional runoff management program is part of the "*comprehensive planning process*" that is required pursuant to 40 CFR 122.26(d)(2)(iv). Where the Water Quality Improvement Plan is the "*comprehensive planning process*" on a Watershed Management Area scale, requiring "*intergovernmental coordination*", the jurisdictional runoff management program document is the "*comprehensive planning process*" on a jurisdictional scale that should be coordinated with the other Copermittees in the Watershed Management Area to achieve the goals of the Water Quality Improvement Plan.

The jurisdictional runoff management program requirements are included to provide each Copermittee criteria that can be used to demonstrate that its storm water management program is implementing the "*comprehensive planning process*" within its jurisdiction to "*effectively prohibit non-stormwater discharges into the storm sewers*", and to identify and implement the most effective "*controls to reduce the discharge of pollutants to the maximum extent practicable"* in accordance with the performance standards given in the CWA.

Provision E includes the requirements for each of the components that must be included in the Copermittee's jurisdictional runoff management program document that will be implemented by the Copermittee within its jurisdiction. Implementation of the components of each Copermittee's jurisdictional runoff management program must be consistent with the water quality improvement strategies identified in the Water Quality Improvement Plans.

More specific and detailed discussions of the requirements of Provision E are provided below.

Provision E.1 (Legal Authority Establishment and Enforcement) requires to each Copermittee to establish and enforce sufficient legal authority to control discharges to the MS4 within its jurisdiction.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system*" and be able to demonstrate that it can "*operate pursuant to legal authority established by statute, ordinance or series of contracts.*" Provision E.1.a describes the minimum legal authorities each Copermittee must establish for itself within its jurisdiction to control discharges to its MS4 The requirements of Provision E.1.a are consistent with the requirements set forth in 40 CFR 122.26(d)(2)(i)(A)-(F).

The certification statement required from each Copermittee by Provision E.1.b is included to provide the San Diego Water Board additional documentation that each Copermittee has established the legal authorities consistent with Provision E.1.a and 40 CFR 122.26(d)(2)(i)(A)-(F), and the Copermittee can "*operate pursuant to legal authority established by statute, ordinance or series of contracts.*"

Provision E.2 (Illicit Discharge Detection and Elimination) requires each to Copermittee to implement an illicit discharge detection and elimination program to effectively prohibit non-storm water discharges to the MS4 by actively detecting and eliminating illicit discharges and disposal into its MS4.

Provision E.2 establishes the minimum requirements that each Copermittee must implement within its jurisdiction to prevent and eliminate illicit discharges, and effectively prohibit non-storm water discharges, from entering its MS4. The federal CWA requires permits for municipal storm sewer systems to "*effectively prohibit non-storm water discharges into the storm sewers*." Under 40 CFR 122.26(d)(2)(iv)(B), each Copermittee must implement a "*program…to detect and remove…illicit discharges and improper disposal into the storm sewer.*" The federal NPDES regulations, under 40 CFR 122.26(b)(2), define illicit discharges as "*any discharge to a municipal separate storm sewer that is not composed entirely of storm water*. Thus, non-storm water discharges are not authorized to enter the MS4 and are considered to be illicit discharges, unless authorized by a separate NPDES permit.

The Phase I Final Rule clarifies that non-storm water discharges through an MS4 are not authorized under the CWA (55 FR 47995):

> "*Today's rule defines the term "illicit discharge" to describe any discharge through a municipal separate storm sewer system that is not composed entirely of storm water and that is not covered by an NPDES permit. Such illicit discharges are not authorized under the Clean Water Act. Section 402(p(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…Ultimately, such non-storm water discharges through a municipal separate*

storm sewer must either be removed from the system or become subject to an NPDES permit."

The federal NPDES requirements for the program to address illicit discharges must include "*inspections, to implement and enforce an ordinance, orders, or other similar means to prevent illicit discharges to the MS4*." The federal NPDES regulations also reference several categories of "*non-storm water discharges or flows* [which] *shall be addressed where such discharges are identified…as sources of pollutants to waters of the United States*." The Phase I Final Rule (55 FR 48037) further clarified the requirements of 40 CFR 122.26(d)(2)(iv)(B)(1) as follows:

"*EPA is clarifying that section 402(p)(3)(B) of the CWA (which requires permits for municipal separate storm sewers to 'effectively' prohibit non-storm water discharges) does not require permits for municipalities to prohibit certain discharges or flows of nonstorm water to waters of the United States through municipal separate storm sewers in all cases*."

In previous iterations of the municipal storm water permits for the San Diego Region, these categories were simply listed and referred to as categories of non-storm water discharges "not prohibited" unless identified as a source of pollutants. The Copermittees have often referred to these categories as "exempt" discharges. In both cases, however, the language is inconsistent with the federal CWA and NPDES regulations. And, the clarification provided in the Phase I Final Rule does not specifically state that such discharges are "not prohibited" or "exempt" or in any way authorized. The federal NPDES regulations do, however, state that specific categories of non-storm water discharges must be "*addressed*" if identified as "*sources of pollutants to waters of the United States*."

The language of Provision E.2.a has been revised to be fully consistent with the language of the CWA and the requirements of the federal regulations under 40 CFR 122.26(d)(2)(iv)(B)(1). Provision E.2.a requires each Copermittee to address <u>all</u> types of non-storm water discharges into its MS4 as illicit discharges, <u>unless</u> the discharge is authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to Provisions E.2.a.(1) through E.2.a.(5). Only non-NPDES-permitted non-storm water discharges identified as a category of non-storm water discharges under Provisions E.2.a.(1) through E.2.a.(5) <u>and</u> *not identified as a source of pollutants* do not have to be addressed as illicit discharges.

Several of the non-storm water categories listed in 40 CFR 122.26(d)(2)(iv)(B)(1) have not been included in Provisions E.2.a.(1) through E.2.a.(5), including: street wash water, landscape irrigation, irrigation water, and lawn watering. Because these are no longer included within the categories listed under Provisions E.2.a.(1) through E.2.a.(5), the Copermittees must prohibit these types of non-storm water discharges from entering the MS4. This is consistent with the clarification of 40 CFR 122.26(d)(2)(iv)(B)(1) in the Phase I Final Rule (55 FR 48037), which states:

"*[T]he Director may include permit conditions that either require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*."

Street wash water is a category of non-storm water discharges that was removed when the Third Term Permits were issued. Street wash water is a source of several pollutants (e.g., metals, oil and grease, petroleum hydrocarbons, chlorinated solvents, sediment) which are generated during the street washing process. The removal of this category requires the Copermittees to prohibit this type of non-storm water discharge from entering the MS4.

The landscape irrigation, irrigation water, and lawn watering categories, collectively referred to hereafter as "over-irrigation" discharges, were removed from the list of non-storm water discharge categories in the Fourth Term Orange County and Riverside County Permits. Non-storm water discharges resulting from over-irrigation have been found to be a source of several types of pollutants (e.g., nutrients, bacteria, pesticides, sediment) in receiving waters. The San Diego Water Board and the Copermittees have identified categories of non-storm water discharges associated with over-irrigation as a source of pollutants and conveyance of pollutants to the MS4 and waters of the United States in the following documents:

- **SmartTimer/Edgescape Evaluation Program (SEEP) Grant Application**

  The State Water Board allocated grant funding to the SEEP project grant application submitted in 2006, which targeted irrigation runoff by retrofitting areas of existing development and documenting the conservation and runoff improvements. The basis of this grant project is that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 is a source and conveyance of pollutants. In addition, the grant application indicated that this alteration of natural flows is impacting the beneficial uses of waters of the state and U.S. Results from the study indicate that that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 *is* a source and conveyance of pollutants. The results of this study can be applied broadly to any area where over-irrigation takes place. The grant application included the following statements:

  "*Irrigation runoff contributes flow & pollutant loads to creeks and beaches that are 303(d) listed for bacteria indicators.*"

  "*Regional program managers agree that the reduction and/or elimination of irrigation-related urban flows and associated pollutant loads may be key to successful attainment of water quality and beneficial use goals as outlined in the San Diego Basin Plan and Bacteria TMDL over the long term.*"

  "*Elevated dry-weather storm drain flows, composed primarily … of landscape irrigation water wasted as runoff, carry pollutants that impair recreational use and aquatic habitats all along Southern California's urbanized coastline. Storm*

drain systems carry the wasted water, along with landscape derived pollutants such as bacteria, nutrients and pesticides, to local creeks and the ocean. Given the local Mediterranean climate, excessive perennial dry season stream flows are an unnatural hydrologic pattern, causing species shifts in local riparian communities and warm, unseasonal contaminated freshwater plumes in the near-shore marine environment."

- **2006-2007 Orange County Watershed Action Plan Annual Reports**

The Watershed Action Plan Annual Reports for the 2006-2007 reporting period were submitted by the County of Orange, Orange County Flood Control District and Copermittees within the San Juan Creek, Laguna Coastal Streams, Aliso Creek, and Dana Point Coastal Streams Watersheds. San Juan Creek, Laguna Coastal Streams, Aliso Creek and Dana Point Coastal Streams are all currently 303(d) listed as impaired for indicator bacteria within their watersheds and/or in the Pacific Ocean at the discharge points of their watersheds. The Orange County Copermittees, within their Watershed Action Strategy Table for fecal indicator bacteria included the following:

"*Support programs to reduce or eliminate the discharge of anthropogenic dry weather nuisance flow throughout the…watershed. Dry weather flow is the transport medium for bacteria and other 303(d) constituents of concern.*"

Additionally, they state that "*conditions in the MS4 contribute to high seasonal bacteria propagation in-pipe during warm weather. Landscape irrigation is a major contributor to dry weather flow, both as surface runoff due to over-irrigation and overspray onto pavements; and as subsurface seepage that finds its way into the MS4*."

- **Fiscal Year 2008 Carlsbad Watershed Urban Runoff Management Program Annual Report**

The Carlsbad Watershed Urban Runoff Management Program Annual Report for Fiscal Year 2008 was submitted by the Carlsbad Watershed Copermittees (Cities of Carlsbad, Encinitas, Escondido, Oceanside, San Marcos, Solana Beach, and Vista, and the County of San Diego). In the Annual Report, the Carlsbad Watershed Copermittees stated the following:

"The Carlsbad Watershed Management Area (WMA) collective watershed strategy identifies bacteria, sediment, and nutrients as high priority water quality pollutants in the Agua Hedionda (904.3 – bacteria and sediment), Buena Vista (904.2 – bacteria), and San Marcos Creek (904.5 – nutrients) Hydrologic Areas. Bacteria, sediment, and nutrients have been identified as potential discharges from over-irrigation."

- **2007-2008 San Diego Bay Watershed Urban Runoff Management Program Annual Report**

  The San Diego Bay Watershed Urban Runoff Management Program 2007-2008 Annual Report was submitted by the San Diego Bay Watershed Copermittees (Cities of Chula Vista, Coronado, Imperial Beach, La Mesa, Lemon Grove, National City, and San Diego, the County of San Diego, the Port of San Diego, and the San Diego County Airport Authority). In Appendix D of the Annual Report, titled "Likely Sources of Pollutants", the San Diego Bay Watershed Copermittees identified over-irrigation of lawns as a pollutant generating activity from business and/or residential land uses for bacteria, pesticides, and sediment.

- **Copermittee Public Education Materials**

  The Orange County Public Works *Tips for Landscape & Gardening* public education brochure states: "*Fertilizers, pesticides and other chemicals that are left on yards or driveways can be blown or washed into storm drains that flow to the ocean. Overwatering lawns can also send materials into storm drains*."

  The Riverside County Flood Control and Water Conservation District *Landscape and Garden* public education brochure states: *"Soil, yard wastes, over-watering and garden chemicals become part of the urban runoff mix that winds it way through streets, gutters and storm drains before entering lakes, rivers, streams, etc. Urban runoff pollution contaminates water and harms aquatic life!"*

- **Los Penasquitos Lagoon Sedimentation/Siltation TMDL Technical Report**

  The Los Penasquitos Lagoon Sedimentation/Siltation TMDL technical report was prepared for the City of San Diego and USEPA in October 2010. The technical report was included as a technical supporting document attached to the Sediment TMDL for Los Penasquitos Lagoon staff report prepared by the San Diego Water Board, dated June 13, 2012. Under the Source Assessment section, the technical report states the following:

  > "*Dry weather loading is dominated by nuisance flows from urban land use activities such as car washing, sidewalk washing, and lawn over-irrigation, which pick up and transport sediment into receiving waters.*"

These documents confirm that non-storm water discharges associated with over-irrigation are a source of pollutants and should be addressed as illicit discharges to the MS4. Prohibiting non-storm water discharges associated with over-irrigation, however, is not a new requirement for the Copermittees because it is also consistent with and required by the Water Conservation in Landscaping Act (AB 1881, Laird).

The Water Conservation in Landscaping Act required the Department of Water Resources (DWR) to prepare a Model Water Efficient Landscape Ordinance for use by local agencies (e.g. the Copermittees). All local agencies were required to adopt a water efficient landscape ordinance by January 1, 2010. Local agencies could adopt the Water Efficient Landscape Ordinance developed by DWR, or an ordinance considered at least as effective as the Model Ordinance. The Water Efficient Landscape Ordinance includes a requirement that local agencies prohibit runoff from irrigation (§ 493.2):

> "*Local agencies shall prevent water waste resulting from inefficient landscape irrigation by* <u>*prohibiting runoff from leaving the target landscape*</u> *[emphasis added] due to low head drainage, overspray, or other similar conditions where water flows onto adjacent property, non-irrigated areas, walks, roadways, parking lots, or structures. Penalties for violation of these prohibitions shall be established locally*."

Furthermore, non-storm water discharges from over-irrigation not only transport and discharge pollutants to receiving waters, but are also a likely source of the dry weather flows causing changes to habitat within and along the receiving water bodies. Examples of habitat changes from the dry weather flows include perennialization of ephemeral streams, and conversion of saltwater and brackish water marsh habitats to freshwater marsh habitats (e.g. Los Penasquitos Lagoon). Both of these examples have resulted in the promotion of invasive species in several areas of the San Diego Region.

The removal of the over-irrigation discharges categories does not require the Copermittees to strictly prohibit lawn and landscape irrigation, but does require the prohibition of excessive irrigation water that results in non-storm water discharges to the MS4. Non-storm water discharges to the MS4 from over-irrigation must be addressed as illicit discharges by the Copermittees pursuant to the requirements of Provision E.2.

The remaining non-storm water categories listed in 40 CFR 122.26(d)(2)(iv)(B)(1) are listed under Provisions E.2.a.(1) through E.2.a.(5) and generally fall into four categories: (1) non-storm water discharges subject to existing San Diego Water Board waste discharge requirements and NPDES permits; (2) non-storm water discharges generally not expected to be a source of pollutants to receiving waters; (3) non-storm water discharges likely to contain pollutants requiring some form of control to address the pollutants prior to discharging to the MS4; and (4) non-storm water discharges or flows associated with firefighting.

Provisions E.2.a.(1) and E.2.a.(2) include several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) for which the San Diego Water Board already has developed general waste discharge requirements and NPDES permits to address the discharges. The Copermittees are only required to address these types of non-storm water discharges as illicit discharges if the Copermittees or the San Diego Water Board identifies these non-storm water discharges not having

coverage under the applicable NPDES permit or as a source of pollutants to receiving waters. Generally, if these types of non-storm water discharges have coverage under an NPDES permit and are identified as a source of pollutants to receiving waters, the Copermittees would be expected to identify the responsible dischargers and report their identities to the San Diego Water Board. The San Diego Water Board would then have the responsibility to enforce the NPDES permit and/or waste discharge requirements.

Provision E.2.a.(3) includes several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) which are generally not expected to be a source of pollutants to receiving waters, many of which originate from what are typically natural, uncontrollable sources. The Copermittees are only required to address these types of non-storm water discharges as illicit discharges if the Copermittees or the San Diego Water Board identifies these non-storm water discharges as a source of pollutants to receiving waters. Because many of these sources are generally uncontrollable, enforcing a prohibition may not be a possibility for the Copermittees. The Copermittees would be able to address these non-storm water discharges by preventing these non-storm water discharges from entering the MS4. This could potentially be achieved by sealing their MS4 structures so the discharges cannot enter the MS4.

Provision E.2.a.(4) includes several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) that are likely to contain pollutants requiring some form of control to address the pollutants prior to discharging to the MS4. At this time, an outright prohibition of these types of non-storm water discharges does not yet appear to be warranted. Thus, Provision E.2.a.(4) has includes several requirements for the Copermittees to control the pollutants from these types of non-storm water discharges. This is consistent with the clarification of the federal regulations in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board has the authority to require the Copermittees to "*control any of these types of discharges where appropriate*."

Unlike non-storm water discharges from over-irrigation, these types of non-storm water discharges are not expected to occur in close proximity to each other or very frequently. Provided these types of non-storm water discharges are controlled as required in Provision E.2.a.(4), the Copermittees would only be required to address these types of non-storm water discharges as illicit discharges if the Copermittee or the San Diego Water Board identifies these non-storm water discharges as a source of pollutants to receiving waters.

Provision E.2.a.(5) includes specific requirements for fire fighting discharges and flows. The requirements for non-storm water discharges and flows associated with fire fighting have been separated into requirements for: a) non-emergency fire fighting discharges and flows, and b) emergency fire fighting discharges and flows.

The San Diego Water Board has found that discharges from building fire suppression system maintenance (e.g. fire sprinklers) contain waste and potentially a significant source of pollutants to receiving waters. As such, the San Diego Water Board is requiring these discharges be addressed as illicit discharges by the Copermittees. Thus, the discharges to the MS4 are to be prohibited via ordinance, order or similar means. For other non-emergency fire fighting discharges and flows (i.e., flows from controlled or practice blazes, fire fighting training, and maintenance activities not associated with building fire suppression systems), the Copermittees are required to develop and implement a program to address pollutants in these non-storm water discharges and flows. This is consistent with the clarification of the federal regulations in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board has the authority to require the Copermittees to "*control any of these types of discharges where appropriate*."

For emergency fire fighting discharges and flows, the Phase I Final Rule (55 FR 48037) has clarified the requirements of 40 CFR 122.26(d)(2)(iv)(B)(1) pertaining to emergency fire fighting flows and discharges, which states:

> "*In the case of fire fighting it is not the intention of these rules to prohibit in any circumstances the protection of life and public or private property through the use of water or other fire retardants that flow into separate storm sewers*."

Thus, the requirements have been made to be consistent with the guidance provided by the Phase I Final Rule. The Order recommends that the Copermittees develop and encourage implementation of BMPs to reduce or eliminate the discharge of pollutants from emergency fire fighting flows to the MS4s and receiving waters.

The Copermittees are expected to review the dry weather MS4 outfall discharge monitoring data they collect to determine if and when there are non-storm water discharges to or from their MS4s that are a source of pollutants to receiving waters. If the Copermittees identify one of the types of non-storm water discharges listed in Provisions E.2.a.(1) through E.2.a.(4) as a source of pollutants to receiving waters based on the review and evaluation of monitoring data, Provision E.2.a.(6) requires the Copermittees to prohibit those categories of discharges from entering the MS4 through ordinance, order or similar means.

Provision E.2.a.(6) also clarifies that the San Diego Water Board may identify categories of non-storm water discharges or flows listed under Provisions E.2.a.(1) through E.2.a.(4) that must be prohibited. This is consistent with the clarification of 40 CFR 122.26(d)(2)(iv)(B)(1) in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board may "*require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*."

Finally, Provision E.2.a.(7) has been included in the requirements for non-storm water discharges to clarify that any non-storm water discharges to the Copermittee's MS4, even those identified pursuant to Provisions E.2.a.(1) through E.2.a.(4), must be

reduced or eliminated. Provision E.2.a.(7) is consistent with the requirements of CWA section 402(p)(3)(B)(ii) and 40 CFR 122.26(d)(1)(v)(B), as clarified in the Phase I Final Rule (55 FR 47995) that "*[u]ltimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit*."

Consistent with 40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(1), each Copermittee must implement a "*program…to prevent illicit discharges to the municipal storm sewer system*" and "*detect…illicit discharges and improper disposal into the storm sewer.*" Provision E.2.b requires each Copermittee to implement measures to prevent and detect illicit discharges and connections to its MS4 as part of its illicit discharge detection and elimination program.

As part of the program to prevent and detect illicit discharges to the MS4, 40 CFR 122.26(d)(2)(iv)(B)(2) requires "*procedures to conduct on-going field screening activities during the life of the permit, including areas or locations that will be evaluated by such field screens*." As part of the procedures, each Copermittee is required to maintain an updated map of its entire MS4 and the corresponding drainage areas within its jurisdiction. Having knowledge about where inlets, access points, connections with other MS4s, and outfalls are located is necessary for each Copermittees to track, identify, and eliminate illicit discharges and connections. Thus, Provision E.2.b.(1) of the Order specifies that the map must include the segments of the storm sewer system owned, operated, and maintained by the Copermittee, and include locations of all known inlets, connections with other MS4s, and outfalls to the Copermittee's MS4. The remaining requirements of Provision E.2.b are consistent with the requirements of 40 CFR 122.26(d)(2)(iv)(B)(3)-(7) related to implementing measures to prevent and detect illicit discharges and connections to the MS4.

Provision E.2.c requires each Copermittee to conduct field screening and monitoring of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4. Field screening is a required element of the program to detect and eliminate illicit discharges and connections to the MS4, pursuant to 40 CFR 122.26(d)(2)(iv)(B)(2). The field screening requirement will be implemented through the dry weather MS4 outfall discharge monitoring required under Provisions D.2.a.(2) and D.2.b.(1).

Provision E.2.d specifies the measures each Copermittee must implement to eliminate illicit discharges and connections to its MS4. Elimination of illicit discharges and connections to the MS4 is consistent with the requirement of 40 CFR 122.26(d)(2)(iv)(B) "*to detect and <u>remove</u> [emphasis added]…illicit discharges and improper disposal into the storm sewer*" and will achieve the CWA requirement for MS4 permits to "*effectively prohibit non-storm water discharges into the storm sewers*."

Generally, each Copermittee is responsible for prioritizing its efforts to eliminate non-storm water and illicit discharges or connections to its MS4 based on field screening and monitoring data, NALs, illicit discharge investigation records, and the known or

suspected sources. Sources of non-storm water and illicit discharges or connections must be eliminated by enforcing the legal authority established by each Copermittee pursuant to Provision E.1.

Finally, Provision E.2.e requires the Copermittee to include the strategies and/or activities identified in the Water Quality Improvement Plan that the Copermittee will implement as part of the illicit discharge detection and elimination program within its jurisdiction. The Water Quality Improvement Plan is expected to include several strategies and options that the Copermittee can and should implement within its jurisdiction. The Copermittee is expected to describe and provide the details of when, where, and how those strategies will be implemented within its jurisdiction.

The San Diego Water Board will utilize the information provided in the jurisdictional runoff management program document pursuant to Provision E.2.e to gauge and assess the Copermittee's efforts in trying to address the highest priority water quality conditions identified in the Water Quality Improvement Plan within its jurisdiction.

Provision E.3 (Development Planning) requires each Copermittee to use its land use and planning authority to implement a development planning program to control and reduce the discharge of pollutants in storm water from new development and significant redevelopment to the MEP. Proper implementation of the development planning program will also contribute toward effectively prohibiting non-storm water discharges from development projects to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." As part of the management program, 40 CFR 122.26(d)(2)(iv)(A)(2) requires "*planning procedures including a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment*."

Development typically includes the construction of impervious surfaces such as sidewalks, driveways, roads, and rooftops. These impervious surfaces generate and concentrate pollutants (such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not found in high concentrations in the natural environment. Pollutants that accumulate on impervious surfaces are not easily biodegraded or not subject to natural treatment processes. When it rains, these pollutants are transported in storm water runoff from these impervious surfaces into receiving waters, resulting in poor water quality and degradation of beneficial uses.

In addition to the generation of pollutants, development generally alters the natural conditions of the land by removing vegetative cover, reducing the perviousness of the surface, and reducing the capacity of storm water that can be intercepted, captured, stored, infiltrated, evaporated, and/or evapotranspired. The alteration of the natural

conditions and addition of impervious surfaces associated with development causes water quality problems. Hydrograph modification, or hydromodification, is the change in the natural watershed hydrologic processes and runoff characteristics caused by development or other land use changes that result in increased stream flows, altered sediment transport, and morphological changes to channels receiving the runoff.

This is consistent with what USEPA has noted, that "*[m]ost stormwater runoff is the result of the man-made hydrologic modifications that normally accompany development. The addition of impervious surfaces, soil compaction, and tree and vegetation removal result in alterations to the movement of water through the environment. As interception, evapotranspiration, and infiltration are reduced and precipitation is converted to overland flow, these modifications affect not only the characteristics of the developed site but also the watershed in which the development is located. Stormwater has been identified as one of the leading sources of pollution for all waterbody types in the United States. Furthermore, the impacts of stormwater pollution are not static; they usually increase with more development and urbanization*."[28]

Reducing the impact from the increased pollutant loads and flows generated by impervious surfaces added to a watershed is essential to protecting and restoring the integrity of the receiving waters. Provision E.3 includes the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment*." The requirements of Provision E.3 will 1) minimize the generation and discharge of pollutants in storm water from the MS4, and 2) minimize the potential of storm water discharges from causing altered flow regimes and excessive downstream erosion in receiving waters.

Provision E.3 is based on the requirements of the Fourth Term Permits for Orange County and Riverside County, and do not differ significantly from the Fourth Term Permit for San Diego County. Provision E.3 has been modified to allow the more holistic, long-term planning approach of the Water Quality Improvement Plan to be incorporated into each Copermitee's development planning. The result will be greater pollutant removal from storm water runoff, and improvements and/or rehabilitation of the functionality and hydrologic regimes of a Watershed Management Area. Alternative compliance options have been included in Provision E.3, which will result in multiple beneficial outcomes within a jurisdiction, a subwatershed, a receiving water body, and/or a Watershed Management Area.

Incorporating a holistic and long-term planning approach into each Copermittee's development planning program is essential to reducing the impact of development on receiving waters. Development projects that convert natural open space areas into

[28] USEPA, 2007. Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices, December 2007.

urbanized areas result in the generation and discharge of pollutants associated with anthropogenic activities, and significant modifications to the hydrologic flow regimes. Both adversely affect the chemical, physical, and biological conditions of receiving waters. Redevelopment projects, on the other hand, are opportunities to reduce the generation of pollutants and restore more natural hydrologic flow regimes in areas of existing development, which can contribute toward restoring or rehabilitating the chemical, physical, and biological conditions of impacted and/or impaired receiving waters.

To improve the health and functionality of the receiving waters in a Watershed Management Area, planning and land use practices must change to reduce the various impacts due to hydromodification and pollutants associated with storm water runoff from developing and developed areas. Planning principles to preserve, enhance, and restore the functionality and hydrologic regimes were incorporated into the development planning provisions of all the Third and Fourth Term Permits within the San Diego Region. Provision E.3 of this Order focuses on mitigating the effects of development by continuing to include these principles, as well as promote the concept of utilizing storm water as a resource. By doing so, pollutants in storm water runoff generated within developing and developed areas will be treated more naturally, and storm water will be discharged to receiving waters at discharge rates that are not unnaturally erosive, thereby resulting in conditions that are more supportive of healthy and sustainable water bodies.

The requirements of Provision E.3.a are the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment*" applicable to all development projects, regardless of size or purpose of development. These requirements are based on and consistent with the requirements for all development projects in the Fourth Term Permits for San Diego, Orange, and Riverside Counties (Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016, respectively). All development projects are required to implement source control BMPs that will minimize the generation of pollutants. Additionally, each development project must implement, where applicable and feasible, LID BMPs to mimic the natural hydrology of the site and retain and/or treat pollutants in storm water runoff prior to discharging to and from the MS4.

The LID Center defines LID as "*a comprehensive land planning and engineering design approach with a goal of maintaining and enhancing the pre-development hydrologic regime of urban and developing watersheds.*"[29] LID designs seek to control storm water at the source, using small-scale integrated site design and management practices to mimic the natural hydrology of a site, retain storm water runoff by

[29] www.lowimpactdevelopment.org

minimizing soil compaction and impervious surfaces, and disconnect storm water runoff from conveyances to the storm drain system.

LID BMPs may utilize interception, storage, evaporation, evapotranspiration, infiltration, and filtration processes to retain and/or treat pollutants in storm water before it is discharged from a site. Because of these numerous options, the San Diego Water Board expects that every development project will be able to implement some form of LID BMPs. Examples of LID BMPs include using permeable pavements, rain gardens, rain barrels, grassy swales, soil amendments, and native plants.

Provision E.3.a also includes requirements for all development projects to, where feasible, landscape with native and/or low water use plants to minimize the discharge of non-storm water discharges associated with excessive irrigation, as well as harvest (i.e., storage) and use precipitation to promote the concept of utilizing storm water as a resource.

While all development projects are subject to the requirements of Provision E.3.a, Provision E.3.b identifies Priority Development Projects that exceed given size thresholds and/or fit under specific use categories. Priority Development Projects are required to incorporate specific performance criteria for structural BMPs incorporated into the project plan to reduce the generation of pollutants, and address potential impacts from hydromodfication.

The Priority Development Project categories are based on the requirements of the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), and do not differ significantly from the Fourth Term Permit for San Diego County. Furthermore, the Priority Development Project categories are consistent with Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), and Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit).

Priority Development Projects generally include new development and significant redevelopment projects that can generate large amounts of pollutants, or have large areas of impervious surface that will contribute to adverse impacts in receiving waters. Placement of impervious surfaces within the environment not only generates and accumulates significant amounts of pollutants that will be transported in storm water runoff, but also drastically modifies the natural hydrologic processes within the watersheds.

Impervious surfaces do not allow natural infiltration and treatment of storm water runoff to take place. Instead, storm water runoff from impervious surfaces have typically been directed through pipes, curbs, gutters, and other hardscape into receiving waters, with little treatment at significantly increased volumes and accelerated flow rates over what would occur naturally. The increased pollutant loads, storm water volume, discharge rates and velocities, and discharge durations discharged from the MS4 adversely impacts the flora and fauna of receiving waters, and causes increased,

unnatural erosion and scouring within creek bed and banks. Placement of impervious surfaces also encapsulates "good" sediment (such as sand, gravel, rocks and cobbles) that would normally replenish creek beds and banks to help stabilize them.

This increased and unnatural erosion, which is caused by both altered storm water flow and altered sediment flow regimes, is largely responsible for degradation of creeks, streams, and associated habitats in the San Diego Region. In an ongoing study by the Stormwater Monitoring Coalition to assess the health of streams throughout Southern California, researchers found that three of the four highest risk stressors to creeks (percent sands and fines present, channel alteration, and riparian disturbance) were related to physical habitat.[30] Researchers studying flood frequencies in Riverside County have found that increases in watershed imperviousness of only 9-22 percent can result in increases in peak flow rates for the two-year storm event of up to 100 percent.[31] Such changes in runoff have significant impacts on channel morphology.

In addition, a technical report issued by the Southern California Coastal Water Research Project (SCCWRP) stated that "*[r]ecent studies indicate that California's intermittent and ephemeral streams are more susceptible to the effects of hydromodification than streams from other parts of the United States. Physical degradation of stream channels in the central and eastern United States can initially be detected when watershed impervious cover approaches 10 percent, although biological effects (which may be more difficult to detect) may occur at lower levels. In contrast, initial response of streams in the semi-arid portions of California appears to occur between 3 and 5 percent impervious cover*."[32] These studies highlight the extent to which impacts originating from impervious surfaces created by development are responsible for the degradation and hydromodification of creeks and streams.

Because the impact relatively small increases in impervious surfaces in a watershed can have on receiving waters, Provision E.3.b.(2)(g) has been updated to include large driveways. Although they generally do not carry heavy traffic, paved, impervious driveways that are 5,000 square feet or more create significant areas of impervious surface that contribute to altered flow regimes, and are also sometimes used for storage of motor vehicles that can generate significant amounts of pollutants.

The Copermittees have identified several types of projects that they assert would be cost prohibitive if they were categorized as Priority Development Projects, and would discourage development or redevelopment within their jurisdictions. Many of these types of projects may not pose a threat when considered individually. However, collectively and cumulatively, several of these projects would likely cause significant impacts to receiving waters if they were all located within a subwatershed, watershed,

[30] Assessing the Health of Southern California Streams, Stormwater Monitoring Coalition, Fact Sheet
[31] Schueler and Holland, 2000. Storm Water Strategies for Arid and Semi-Arid Watersheds (Article 66). The Practice of Watershed Protection.
[32] Stein, E. and Zaleski, S., 2005. Technical Report 475, Managing Runoff to Protect Natural Streams: The Latest Development on Investigation and Management of Hydromodification in California. December 30, 2005.

and/or Watershed Management Area. Thus, these types of development projects should be required to implement structural BMPs that Priority Development Projects are required to implement to be protective of water quality.

Provision E.3.b.(3), however, does provide exemptions for several of these types of development projects identified by the Copermittees from being defined as Priority Development Projects. Development projects that are not Priority Development Projects are not required to be included in the inventory of Priority Development Projects that must be maintained by each Copermittee pursuant to Provision E.3.e.(2). In addition, structural BMPs on development projects that are not Priority Development Projects are not required to be inspected pursuant to Provision E.3.e.(3). Inspections of development projects that are not Priority Development Projects, however, will be performed as part of the existing development inspections required pursuant to Provision E.5.c.

The exemptions under Provision E.3.b.(3) are provided for development projects that meet certain conditions. The exemptions have been provided as an incentive for the Copermittees to encourage and promote the implementation of LID design concepts and green infrastructure and building principles. The conditions for allowing those exemptions have been included to provide an incentive for developers to implement LID design concepts and green infrastructure and building principles. Development projects that meet the conditions of Provision E.3.b.(3) are not expected to be cost prohibitive and also expected to be protective of water quality.

For development projects identified as Priority Development Projects, the requirements of Provision E.3.c are the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment.*" Provisions E.3.c.(1)-(3) describe the performance criteria for the structural BMPs that must be implemented for each Priority Development Project defined by Provision E.3.b.

Provisions E.3.c.(1)-(3) and emphasize preserving natural watershed hydrology by requiring retention of storm water and management of flows to maintain or mimic the natural hydrology of a site. The holistic and long-term planning approach of the Water Quality Improvement Plans is incorporated into Provisions E.3.c.(1)-(3) by encouraging the Copermittees to improve or rehabilitate watershed functionality and flow regimes with a combination of strategies.

Provision E.3.c.(1) describes the storm water pollutant control BMP requirements that must be implemented by all Priority Development Projects. The purpose of Provision E.3.c.(1) is to reduce pollutants in storm water runoff to the MEP from Priority Development Projects before it is discharged to the MS4. Of all the available treatment processes available, retention of storm water, and therefore capture of the pollutants in the storm water, will achieve 100 percent pollutant removal efficiency for

the volume of storm water retained. No other method of treatment can achieve 100 percent pollutant removal efficiency. Thus, retention of as much storm water onsite is the most effective way to reduce pollutants in storm water discharges to and from the MS4, and controls pollutants in storm water discharges from a site to the MEP.

Under Provision E.3.c.(1)(a)(i), retention of the 85th percentile storm event is the default design standard that Priority Development Projects must use to implement to mimic the pre-development retention volume ("design capture volume"). Since the 85th percentile storm event has previously been used as the numeric design standard for treatment control BMPs, the same size storm event has been applied as the numeric design standard for the storm water pollutant control BMP requirements. This is consistent with the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), as well as Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), and Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit).

The 85th percentile storm event is the event that has a precipitation total greater than or equal to 85 percent of all storm events over a given period of record in a specific area or location. For example, to determine what the 85th percentile storm event is in a specific location, all 24 hour storms that have recorded values over a 30 year period would be tabulated and a 85th percentile storm would be determined from this record (i.e., 15 percent of the storms would be greater than the number determined to be the 85th percentile storm). Most jurisdictions in the San Diego Region have already developed isopluvial maps that can provide this type of information. The 85th percentile storm might be determined to be a number such as 1.0 inch, and this would be multiplied by the total area of the project footprint to calculate the design capture volume. The Priority Development Project designer would then select a system of BMPs that would retain (i.e. intercept, infiltrate, store, evaporate, evapotranspire, or harvest and use) the design capture volume, based on the 85th percentile storm event, onsite.

Retention of all storm water and all pollutants in storm water onsite for the 85th percentile storm event, however, may not always mimic the natural pre-development retention volume. Retention of the volume generated by the 85th percentile storm event also may not be practical, nor desirable, as storm water flows are a necessary component of the natural hydrologic processes in a watershed.

The optimum amount of storm water retained onsite would mimic the pre-development retention volume of the project site. Mimicking the pre-development retention volume is an approach USEPA allows for federal development projects. USEPA issued guidance on implementing storm water runoff requirements for federal projects that requires the retention of the 95th percentile storm event as the default design standard

to mimic the pre-development hydrology of a project site.[33] The USEPA guidance also provided an option to develop a site-specific design standard. Similar to the USEPA guidance for federal facilities, Provision E.3.c.(1)(a)(ii) provides an option to develop a site specific design capture volume that would mimic the pre-development retention volume of the project site.

Retention BMPs will be designed to capture a specific volume, and may take some time for the intercepted or captured storm water to infiltrate, evaporate, evapotranspire, or be used. Retention of the design capture volume, however, will capture and retain a significant portion of the pollutants generated and accumulated on a Priority Development Project. In a recent study performed by SCCWRP in the Los Angeles Region, they found "*that the magnitude of constituent load associated with storm water runoff depends, at least in part, on the amount of time available for pollutant build-up on land surfaces. The extended dry period that typically occurs in arid climates such as southern California maximizes the time for constituents to build-up on land surfaces, resulting in proportionally higher concentrations and loads during initial storms of the season*."[34] This implies that the "first flush" of a rainy season and the first storm events after long antecedent dry periods tend to have the highest pollutant loads. Capturing and retaining the pollutant loads of the "first flush" of a rainy season and the first storm events after long antecedent dry periods will reduce a significant portion of the pollutants in storm water discharged to and from the MS4.

The San Diego Water Board, however, acknowledges that in some situations retaining the design capture volume fully onsite may not be technically feasible, may be cost prohibitive, or may not provide any overall water quality benefits to the Watershed Management Area. Thus, Provision E.3.c.(1)(b) allows for the use of a combination of onsite retention BMPs, and alternative compliance options described in Provision E.3.c.(3). Provision E.3.c.(3) is discussed in more detail below.

If the design capture volume is not retained onsite because the Priority Development Project is allowed to implement alternative compliance options, the pollutants in the portion of the design capture volume not reliably retained onsite must still be reduced to the MEP. Thus, flow-thru conventional treatment control BMPs are required to be implemented on Priority Development Projects in addition to the retention BMPs and/or biofiltration BMPs. The requirements of Provision E.3.c.(1)(c) include the performance standards for flow-thru conventional treatment control BMPs, consistent with the Fourth Term Permits in the San Diego Region.

Where the purpose of the requirements under Provision E.3.c.(1) is to reduce pollutants in storm water runoff to the MEP, the purpose of the requirements under Provision E.3.c.(2) is to maintain or restore more natural hydrologic flow regimes to

[33] USEPA, 2009. Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act, EPA 841-B-09-001. December 2009.
[34] Stein, E.D., Tiefenthaler, L.L., and Schiff, K.C., 2007. Technical Report 510, Sources, Patterns and Mechanisms of Storm Water Pollutant Loading from Watershed and Land Uses of the Greater Los Angeles Area, California, USA. March 20, 2007.

prevent increased, unnatural erosion in downstream receiving waters to the MEP. Provision E.3.c.(2) describes hydromodification management BMP requirements that must be implemented by all Priority Development Projects.

The development planning requirements under the Fourth Term Permits required the Copermittees in San Diego County, Orange County, and Riverside County to develop Hydromodification Management Plans (HMPs). Because the Copermittees have already developed HMPs, there is no longer a requirement to develop these plans. The Copermittees in each county, however, must update to their respective HMPs, as needed, to incorporate the hydromodification management BMP requirements of Provision E.3.c.(2).

The performance criteria for the implementation of hydromodification management BMPs on Priority Development Projects are consistent with the requirements in the Fourth Term Permits for Orange and Riverside Counties (Order Nos. R9-2009-0002 and R9-2010-0016, respectively). Modifications to the Orange County and Riverside County HMPs will likely be minor, or may not be necessary. The HMP for San Diego County, however, will likely require some modifications to incorporate the requirements of Provision E.3.c.(2) and become consistent with the Orange County and Riverside County HMPs. The San Diego Water Board does not, however, expect that it will be necessary for the San Diego County Copermittees to develop a new approach or significantly re-write the San Diego County HMP.

Provision E.3.c.(2)(a) requires that post-project flow rates and durations mimic the *pre-development* condition, and not the *pre-project* condition of the Fourth Term San Diego County Permit. This includes assuming artificially hardened channels receiving storm water discharges from a Priority Development Project have the characteristics of a natural stream segment similar to that found in the watershed. Provision E.3.c.(2)(a) will primarily apply to redevelopment projects and artificially hardened channels, whose pre-project conditions have already significantly altered the natural hydrologic regime. This will allow more natural hydrologic flow regimes to eventually be restored in the developed areas of the Watershed Management Areas, which can in turn allow hydromodified streams and creeks to eventually be restored or rehabilitated.

Provision E.3.c.(2)(b) requires hydromodification management BMPs to compensate for sediment loss in cases where the development would cause loss of sediment supply as a result of the project. Maintaining the pre-development flows and durations from a Priority Development Project will significantly reduce the potential for increased erosion caused by development. Loss of natural sediment because pervious areas covered by the impervious surfaces on the Priority Development Project, however, can still cause increased, unnatural erosion in receiving waters. Runoff that is discharged from a Priority Development Project that lacks sediment becomes “sediment hungry” and can result in increased erosion upstream and downstream from the point of discharge.

The San Diego Water Board recognizes that in some situations implementing the hydromodification management BMP requirements fully onsite may not be technically feasible, may be cost prohibitive, or may not provide any overall water quality benefits to the Watershed Management Area. Thus, Provision E.3.c.(2)(c) allows for the use of a combination of onsite hydromodification management BMPs and alternative compliance options described in Provision E.3.c.(3). The San Diego County Copermittees may incorporate the alternative compliance options into their HMP. Provision E.3.c.(3) is discussed in more detail below.

Finally, Provision E.3.c.(2)(d) allows Priority Development Projects to be exempt from the hydromodification management BMP requirements under Provisions E.3.c.(3)(a)-(b) if a limited set of conditions are met.

Provision E.3.c.(3) describes the alternative compliance options that each Copermittee may allow Priority Development Projects within its jurisdiction to utilize to meet the structural BMP performance criteria of Provisions E.3.c.(1) and E.3.c.(2). Such allowances are not required and are at the discretion of each Copermittee. Provision E.3.c.(3) was included because the San Diego Water Board recognizes that various site specific conditions can make complying with the structural BMP performance criteria requirements fully onsite difficult or impractical, and implementing the alternative compliance options can potentially realize or achieve greater water quality benefits for the Watershed Management Area.

Provision E.3.c.(3)(a) includes the conditions that must be met for a Copermittee to allow a Priority Development Project to utilize the alternative compliance options to comply with the structural BMP performance criteria of Provisions E.3.c.(1) and E.3.c.(2). Priority Development Projects that cannot comply with the requirements of Provision E.3.c.(3)(a) must be required by the Copermittee to comply with the requirements of Provisions E.3.c.(1) and E.3.c.(2) fully onsite.

Provisions E.3.c.(3)(b)-(d) describe the alternative compliance options that the Copermittee may develop and/or allow to be implemented by Priority Development Projects. The descriptions include the conditions that must be met for the alternative compliance option to be allowed to be utilized by a Priority Development Project. For the alternative compliance project options under Provision E.3.c.(3)(b), the descriptions also specify if the alternative compliance options may only be implemented to comply with the storm water pollutant control BMP requirements of Provision E.3.c.(1), hydromodification management BMP requirements of Provision E.3.c.(2), or both.

Provisions E.3.c.(4) and E.3.c.(5) were included under the BMP requirements applicable to all development projects in the Fourth Term Permits for San Diego, Orange, and Riverside Counties (Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016, respectively). In this Order, the long-term BMP maintenance and infiltration and groundwater protection requirements were move under the structural

BMP performance requirements of Provision E.3.c and only apply to structural BMPs implemented by Priority Development Projects.

Provision E.3.d requires the Copermittees to update their BMP Design Manual as needed to incorporate the requirements of Provision E.3. The BMP Design Manual is formerly known as the Standard Storm Water Mitigation Plan, or SSMP, and was renamed so that the title has a more accurate description of the document content. The contents of the BMP Design Manual are largely unchanged from the previous Standard Storm Water Mitigation Plans required under the Fourth Term Permits. The BMP Design Manual fulfills the 40 CFR 122.26(d)(2)(iv)(A)(2) requirement that the Copermittee's development planning program includes "*a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment*."

As part of the "*planning procedures*", 40 CFR 122.26(d)(2)(iv)(A)(2) requires the procedures to "*address controls to reduce pollutants in discharges from municipal separate storm sewers after construction is completed*." The requirements applicable to the implementation and oversight of structural BMPs at Priority Development Projects are provided under Provision E.3.e.

Proper installation of the structural BMPs approved for a Priority Development Project is necessary to ensure that pollutants in storm water discharges will be reduced to the MEP after the project is completed. In addition to the proper installation of structural BMPs, the maintenance of structural BMPs on Priority Development Projects is necessary to ensure that pollutants in storm water discharges will continue to be reduced to the MEP. Provision E.3.e.(1) includes the minimum requirements that each Copermittee must implement to ensure structural BMPs are properly installed and will be properly maintained.

The requirements under Provision E.3.e.(2)-(3) are necessary to demonstrate each Copermittee is implementing a program that complies with Provisions E.3.b-c and E.3.e.(1), and ensure structural BMPs at Priority Development Project will continue to be able to reduce pollutants in storm water discharges to the MEP.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary for any development projects to compel compliance with the requirements of Provision E.3 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.3.f requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Finally, Provision E.3.g requires the Copermittee to include the strategies and/or activities identified in the Water Quality Improvement Plan that the Copermittee will

implement as part of the development planning program within its jurisdiction. The Water Quality Improvement Plan is expected to include several strategies and options that the Copermittee can and should implement within its jurisdiction. The Copermittee is expected to describe and provide the details of when, where, and how those strategies will be implemented within its jurisdiction.

Provision E.3.g specifically requires the Copermittee to identify areas within its jurisdiction where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting and/or stream, channel, or habitat rehabilitation projects. This requirement has been included to promote and encourage cooperation between the Copermittees and the development community to implement projects that can reduce pollutants in storm water runoff from areas of existing development, and stabilize or rehabilitate channels, stream and/or habitats that have been hydromodified because of existing development.

Furthermore, Provision E.3.g encourages the Copermittee to collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify regional alternative compliance projects that Priority Development Projects may be allowed or should be encouraged to implement or participate in implementing. This requirement has been included to promote and encourage more collaboration and coordination, as well as long term planning, among Copermittees and other entities in the Watershed Management Area.

The San Diego Water Board will utilize the information provided in the jurisdictional runoff management program document pursuant to Provision E.3.g to gauge and assess the Copermittee's efforts in trying to address the highest priority water quality conditions identified in the Water Quality Improvement Plan within its jurisdiction.

Provision E.4 (Construction Management) requires each Copermittee to implement a construction management program to control and reduce the discharge of pollutants in storm water from construction sites to the MEP. Proper implementation of the construction management program will also contribute toward effectively prohibiting non-storm water discharges from construction sites to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." As part of the management program, 40 CFR 122.26(d)(2)(iv)(D) requires "*a program to implement and maintain structural and non-structural best management practices to reduce pollutants in storm water runoff from construction sites to the municipal storm sewer system.*"

Construction sites can be significant sources of sediment, trash, and other pollutants to receiving waters. Although sediment is naturally occurring in the natural

environment, the discharge of sediment under unnatural conditions is problematic to receiving waters. Fine sediment in creeks causes high turbidity that interferes with the functionality of native flora and fauna in local creeks. For example, turbidity interferes with both photosynthesis of water-philic plants, as well as successful foraging and reproduction of benthic macroinvertebrates. Sediment can also make it difficult for fish to breathe because it clogs fish gills. Other pollutants such as heavy metals or pesticides can adhere to sediment and are transported to receiving waters during storm events, where they dissolve in the water column and become bioavailable to aquatic organisms. Sediment is recognized as a major stressor to surface waters and is responsible for the impairment of several lagoons and creeks in the San Diego Region.

Provision E.4 includes requirements that each Copermittee must implement to minimize the discharge of sediment and other pollutants from construction sites to the MS4 within its jurisdiction. The requirements under Provision E.4 are consistent with the Fourth Term Permits for San Diego, Orange, and Riverside Counties. Therefore, Copermittees are expected to implement the requirements seamlessly, with minimal changes to their existing construction management programs. The Copermittees, however, are given more flexibility to run their programs as needed to maximize efficiency, and also to be consistent with the Water Quality Improvement Plan for the Watershed Management Area.

As part of the construction management program, 40 CFR 122.26(d)(2)(iv)(D)(1) requires "*procedures for site planning which incorporate consideration of potential water quality impacts.*" Provision E.4.a describes the minimum elements each Copermittee is required to include as part of the construction site planning and project approval process. The construction site planning and approval process is based primarily on ensuring each project had an adequate site-specific pollution control, construction BMP, and/or erosion and sediment control plan that will be implemented to minimize the discharge of pollutants in storm water to the MEP, and minimize impacts to receiving waters.

The requirements under Provision E.4.b provide the data and information necessary to identify "*priorities for inspecting sites and enforcing control measures*" required pursuant to 40 CFR 122.26(d)(2)(iv)(D)(3). Under Provision E.4.b, each Copermittee must identify construction sites that are considered a high threat to downstream surface waters. Designation of "high threat to water quality" construction sites will necessitate the Copermittees to develop criteria to identify such sites. Provision E.4.b.(2) describes a list of factors that must be considered when the Copermittee considers threat to water quality. For example, a Copermittee must identify sites as "high threat to water quality" if it is located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions, according to the Water Quality Improvement Plan. This ensures that construction management program implementation is compatible with the Copermittee's identified highest priority water quality conditions.

Pursuant to 40 CFR 122.26(d)(2)(iv)(D)(2) each Copermittee is required describe "*requirements for nonstructural and structural best management practices*" at construction sites. Provision E.4.c includes the types of construction site BMPs that the Copermittees must implement, or require the implementation of, at each construction site to reduce pollutants in storm water discharges to the MEP.

Each Copermittee is expected to require the implementation of appropriate BMPs given specific site conditions, the season and likelihood of rain events, and construction phase (i.e. grading vs. vertical construction). This means that throughout the life of the project construction, the appropriate BMPs will vary, especially if the construction of the project spans multiple wet seasons. As opposed to describing specific minimum BMPs that must be implemented, the Order describes major BMP categories that should be considered for each site.

Each Copermittee is expected to use its 20 years of storm water experience and knowledge to require implementation of appropriate BMPs from the various categories at each construction site within its jurisdiction. For example, the San Diego Water Board expects that each site will be required to implement erosion control and sediment control at each construction site. The San Diego Water Board also expects each Copermittee to require implementation of active/passive sediment treatment systems at sites where other BMPs have been tried and are known to be inadequate, and discharges of sediment are causing or contributing to water quality impairment downstream. Each Copermittee is granted flexibility in specifying the minimum level of BMP requirements at each site, but the San Diego Water Board expects each site to be capable of controlling pollutants in storm water discharges to the MEP and preventing illicit discharges.

The requirements under Provision E.4.d are necessary to demonstrate that each Copermittee is implementing a program that complies with Provisions E.4.a and E.4.c and ensure BMPs at construction sites will reduce pollutants in storm water discharges to the MEP.

Provision E.4.d does not include minimum required inspection frequencies for construction sites. Each Copermittee must use its experience and knowledge to specify an appropriate inspection frequency for both high priority and lower priority sites in their jurisdictional runoff management program documents, and in accordance with the Water Quality Improvement Plan. Appropriate inspection frequencies may vary by Copermittee, but the San Diego Water Board expects that the stated frequency will be adequate for each Copermittee to properly oversee the construction sites within its jurisdiction, confirm BMPs are implemented to reduce pollutants in storm water discharges from constructions sites to the MEP, and make needed changes to its program on an ongoing basis as necessary.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary for any development projects

to compel compliance with the requirements of Provision E.4 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.4.e requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Finally, Provision E.4.f requires the Copermittee to include the strategies and/or activities identified in the Water Quality Improvement Plan that the Copermittee will implement as part of the construction management program within its jurisdiction. The Water Quality Improvement Plan is expected to include several strategies and options that the Copermittee can and should implement within its jurisdiction. The Copermittee is expected to describe and provide the details of when, where, and how those strategies will be implemented within its jurisdiction.

The San Diego Water Board will utilize the information provided in the jurisdictional runoff management program document pursuant to Provision E.4.f to gauge and assess the Copermittee's efforts in trying to address the highest priority water quality conditions identified in the Water Quality Improvement Plan within its jurisdiction.

Provision E.5 (Existing Development Management) requires each Copermittee to implement an existing development management program to control and reduce the discharge of pollutants in storm water from areas of existing development to the MEP. Proper implementation of the existing development management program will also contribute toward effectively prohibiting non-storm water discharges from areas of existing development to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." Within 40 CFR 122.26(d)(2)(iv)(A) and (C), the management program is required to reduce impacts on receiving waters and reduce pollutants in storm water discharges to the MEP from commercial and residential areas, industrial facilities, and municipal facilities.

Commercial and residential areas, industrial facilities, and municipal facilities must be addressed by each Copermittee with the existing development management program required under Provision E.5. All other areas within each Copermittee's jurisdiction should be either undeveloped open space, or areas that are being developed or under construction. Areas being developed or under construction will be addressed by the Copermittee under the requirements of Provision E.3 (Development Planning) or Provision E.4 (Construction Management).

Areas of existing development typically include impervious surfaces such as sidewalks, driveways, roads, and rooftops, which generate and concentrate pollutants (such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not found in high concentrations in the natural environment. Pollutants that

accumulate on impervious surfaces are not easily biodegraded or not subject to natural treatment processes. When it rains, these pollutants are transported in storm water runoff from these impervious surfaces into receiving waters, resulting in poor water quality and degradation of beneficial uses.

In addition to the generation of pollutants, areas of existing development have generally altered the natural conditions of the land and removed vegetative cover, reduced the perviousness of the surface, and reduced the capacity of storm water that can be intercepted, captured, stored, infiltrated, evaporated, and/or evapotranspired. The alteration of the natural conditions and the impervious surfaces associated with areas of existing development causes water quality problems due to the alteration of natural flow regimes within the watersheds, resulting in hydromodification of channels, streams and habitats that exist within or adjacent to areas of existing development.

Thus, storm water discharges from areas of existing development are responsible for poor water quality, degraded habitats, and hydromodified channels throughout the developed portions of the watersheds in the San Diego Region. To improve the health and functionality of the receiving waters in a Watershed Management Area, land use practices and the amount of impervious surfaces in areas of existing development must change to reduce the various impacts caused by hydromodification and pollutants from storm water runoff generated in developed areas. Each Copermittee must be aggressive in tackling pollutant sources and runoff from areas of existing development to be able to reduce pollutants in storm water discharges from the MS4 to the MEP.

There is some overlap in the requirements under Provision E.5 with the requirements under Provisions E.2 (Illicit Discharge Detection and Elimination), E.3 (Development Planning), and E.4 (Construction Management). Illicit discharges frequently originate from areas of existing development. New development projects, when completed will become some type of residential, commercial, industrial or municipal existing development. Redevelopment projects are, by definition, redeveloping areas of existing development. And, redevelopment projects become construction sites located in areas of existing development. Much of the data and information collected, inspections performed, and enforcement actions taken for the requirements under Provisions E.2 to E.4 may also be utilized by the existing development management program. The requirements under Provision E.5, however, are focused primarily on reducing pollutants generated in areas of existing development that can be transported in storm water runoff and discharged to and from the MS4.

The requirements under Provision E.5 build upon existing program elements being implemented by the Copermittees. Provision E.5 is generally consistent with the existing development requirements of the Fourth Term Permits for Orange and Riverside Counties (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), but modified to provide more flexibility to implement the programs so resources can be better focused toward addressing the highest priority water quality conditions identified in the Water Quality Improvement Plans.

For a Copermittee to properly manage areas of existing development, having knowledge of what development exists within its jurisdiction is essential. The requirements under Provision E.5.a for each Copermittee to maintain a watershed-based inventory of all the existing development within its jurisdiction are necessary for each Copermittee to implement the requirements of Provision E.5.b-e.

As opposed to just maintaining separate inventories based on the type of site, each Copermittee must maintain a watershed-based inventory that includes all types of existing development within its jurisdiction. By utilizing a watershed-based inventory, the Copermittees within a Watershed Management Area can combine their inventories and review the inventories by watershed in addition to by jurisdiction. Pollutant sources and strategies for abatement can then be evaluated on a watershed level, as opposed to evaluating sources and strategies strictly by type of site.

Provision E.5.a includes the information that must be included in the inventory. Provision E.5.a.(1) specifies what facilities or areas must be included in the inventory. A commercial type of existing development may be identified in the inventory as a facility (e.g. individual building, individual business) or an area (e.g. shopping center, commercial zone). An industrial type of existing development must be identified in the inventory by facility (e.g. individual industrial entity). A municipal type of existing development must be identified in the inventory by facility, with a list of specific municipal facilities that must be included in the inventory. A residential type of existing development must be identified by areas to be designated by the Copermittee. For each of the facilities and areas identified in the Copermittee's inventory developed pursuant to Provision E.5.a.(1), Provision E.5.a.(2) specifies the information that must be included in the description for the facility or area.

Provision E.5.a.(3) requires each Copermittee to maintain an updated map showing the location of inventoried existing development, watershed boundaries, and water bodies. This requirement was included because this information is expected to help the Copermittees in a Watershed Management Area identify and prioritize sources of pollutants and/or stressors in areas of existing development that contribute toward the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Knowledge of the sources of existing development likely contributing to the highest priority water quality conditions is expected to be a key element in the Copermittees' development of the water quality improvement strategies that will be included in the Water Quality Improvement Plans. The strategies described in the Water Quality Improvement Plans will direct the existing development management programs implemented by each Copermittee.

Pursuant to 40 CFR 122.26(d)(2)(iv)(A) each Copermittee is required describe "*structural and source control measures to reduce pollutants*" in storm water runoff discharged from areas of existing development. Provision E.5.b includes the BMP

implementation and maintenance requirements that the each Copermittee must require at areas of existing development to reduce pollutants in storm water discharges to the MEP. The San Diego Water Board, however, recognizes that BMP implementation and maintenance for residential areas will require much more education and encouragement through less authoritative measures than for commercial, industrial and municipal facilities and areas. Thus, the BMP implementation and maintenance requirements have been separated between requirements under Provision E.5.b.(1) for commercial, industrial and municipal facilities and areas, and Provision E.5.b.(2) for residential areas.

Most of the requirements in Provision E.5.b are consistent with the related requirements in the Fourth Term Permits. The level of specificity, however, has been changed to allow each Copermittee the flexibility to implement its program to achieve maximum efficiency, and to perform functions that will address the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Each Copermittee is expected to require the implementation of appropriate BMPs to address the expected pollutants from each facility or area. The Third and Fourth Term Permits described specific minimum BMPs that must be implemented at various sites. This Order, however, requires each Copermittee to designate minimum BMPs themselves and require implementation. Consistent with the Fourth Term Permits, each Copermittee is required to maintain, or require the maintenance of, all BMPs as needed.

The BMP implementation and maintenance requirements include a schedule of operation and maintenance activities for the MS4 and related structures (such as catch basins, storm drain inlets, and detention basins), as well as public streets and roads. Public streets and roads specifically include public unpaved roads. The San Diego Water Board identified, through investigations and complaints, sediment discharges from unpaved roads as a significant source of water quality problems in the San Diego Region. Enforcement and inspection activities conducted by the San Diego Water Board since the Third Term Permits were issued have found a lack of source control for many unpaved roads within the jurisdiction of the Copermittees.

Unpaved roads are a source of sediment that can be discharged in runoff to receiving waters, especially during storm events. Erosion of unpaved roadways occurs when soil particles are loosened and carried away from the roadway base, ditch, or road bank by water, wind, traffic, or other transport means. Exposed soils, high runoff velocities and volumes, sandy or silty soil types, and poor compaction increase the potential for erosion.

Road construction, culvert installation, and other maintenance activities can disturb the soil and drainage patterns to streams in undeveloped areas, causing excess runoff and thereby erosion and the release of sediment. Poorly designed unpaved roads can act as preferential drainage pathways that carry runoff and sediment into natural streams, impacting water quality. In addition, other public works activities along

unpaved roads have the potential to significantly affect sediment discharge and transport within streams and other waterways, which can degrade the beneficial uses of those waterways.

USEPA also recognizes that discharges from unpaved roads pose a significant potential threat to water quality. USEPA guidance[35] emphasizes the threat of unpaved roads to water quality:

> "*Dirt and gravel roads are a major potential source of these pollutants [sediment] and pollutants that bind to sediment such as oils, nutrients, pesticides, herbicides, and other toxic substances. Many roads have unstable surfaces and bases. Roads act like dams, concentrating flows that accelerate erosion of road materials and roadsides. Both unstable surfaces and accelerated erosion then lead to sediment and dust.*"

There are several guidance documents, developed by the USEPA,[36] the US Forest ervice,[37] the University of California,[38] and others, that include design and construction specifications and BMPs that are readily available for implementation by public entities. Implementing design and other source control BMPs for unpaved roads in the region is necessary to reduce and minimize the impacts of sediment discharged during storm events from unpaved roads to the MS4s and receiving waters.

Provision E.5.c describes existing development site inspection frequency, content, and tracking that each Copermittee must incorporate into their existing development management programs. The requirements under Provision E.5.c are necessary to demonstrate each Copermittee is implementing a program that complies with Provision E.5.b and ensure BMPs implemented in areas of existing development will reduce pollutants in storm water discharges to the MEP. Provision E.5.c has been modified to include a minimum of once every 5 years for all inventoried facilities and areas of existing development, utilizing one or more methods of inspection.

In addition to onsite inspections, the methods of inspection have been expanded to include drive-by inspections. Inspections may be performed by the Copermittee's municipal and contract staff, or by volunteer monitoring or patrol programs. Volunteer monitoring or patrol programs are not expected to enforce the Copermittee's ordinances, or to inspect areas or facilities where members of the public are not allowed access. Volunteer monitoring or patrol programs must be trained by the Copermittee, and are only expected to collect visual observations. By utilizing drive-by inspections and volunteer monitoring or patrol programs, the Copermittees will be able

[35] USEPA, 2006. Environmentally Sensitive Maintenance for Dirt and Gravel Roads. Gesford and Anderson, USEPA-PA-2005.
[36] Ibid
[37] US Forest Service, 1996. Forest Service Specifications for Construction of Roads & Bridges. EM-7720-100. Revised August 1996.
[38] University of California Division of Agriculture and Natural Resources, 2007. Rural Roads: A Construction and Maintenance Guide of California Landowners. Publication 8262.

to maximize and efficiently use their resources to identify and address sources of pollutants in areas of existing development.

The municipal and contract staff of each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial, industrial, and municipal facilities and areas in its inventoried existing development pursuant to Provision E.5.c.(1)(a)(iv). An "equivalent" of at least 20 percent means if any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspection may count toward the total annual inspection requirement. Linear municipal facilities (i.e., MS4, streets, roads and highways) in the Copermittee's existing development inventory are not subject to the inspection frequency requirement of Provision E.5.c.(1)(a)(iv).

The inspection content specified in Provision E.5.c.(2)(a) includes the information required to be collected during an inspection by any method. The inspection content specified in Provision E.5.c.(2)(a) includes additional information that must be collected when a Copermittee's municipal or contract staff perform an onsite inspection. Provision E.5.c.(3) specifies the information that each Copermittee must maintain in its existing development inspection records.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary to compel compliance with the requirements of Provision E.5 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.5.d requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Finally, Provision E.5.e requires the Copermittee to include the strategies and/or activities identified in the Water Quality Improvement Plan that the Copermittee will implement as part of the existing development management program within its jurisdiction. The Water Quality Improvement Plan is expected to include several strategies and options that the Copermittee can and should implement within its jurisdiction. The Copermittee is expected to describe and provide the details of when, where, and how those strategies will be implemented within its jurisdiction.

Provisions E.5.e.(2)-(3) specifically require the Copermittee to identify areas of existing development as candidates for retrofitting, and streams, channels, and/or habitats as candidates for rehabilitation. Provisions E.5.e.(2)-(3) are based on the retrofitting requirements of the Fourth Term Permits for Orange and Riverside Counties, but modified to also include identifying projects to rehabilitate channels within areas of existing development. The requirements have also been modified to be more focused on utilizing these types of projects for addressing the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Interest and opportunity to retrofit areas of existing development and rehabilitate channels located in areas of existing development has been observed in several programs the San Diego Water Board oversees (e.g., CWA Section 401 Water Quality Certification program, supplemental environmental projects, and grant programs). Each jurisdiction has miles and miles of streets that could be retrofitted to become green streets. Reshaping landscaped areas from convex to concave configurations can detain storm water instead of directing runoff as quickly as possible to the MS4. Retrofit projects could also include simply replacing impervious surfaces with permeable surfaces.

Retrofitting projects do not necessarily have to be expensive. Retrofitting projects could be as simple as redirecting downspouts from roofs to pervious or landscaped areas instead of to hardscaped areas discharging directly to the MS4, providing rain barrels to harvest storm water from downspouts for use at a later time, or planting more trees in areas with little vegetation to provide canopy that can intercept storm water. The San Diego Water Board encourages the Copermittees to identify simple, low-cost retrofitting opportunities that can be easily implemented, in addition to other more expensive retrofitting and channel rehabilitation projects.

Rehabilitation of channels, streams, and/or habitat will require more significant planning and resources to implement. There are, however, also abundant opportunities to rehabilitate channels, streams and/or habitats in or adjacent to areas of existing development. Each Watershed Management Area likely has several creeks and stream reaches that have been undergrounded, artificially hardened, or hydromodified that could be rehabilitated to be more sustainably configured, which would slow down storm water flows and potentially have more assimilative capacity for pollutants while still being supportive of designated beneficial uses.

The San Diego Water Board recognizes that it may be infeasible to implement retrofitting or channel rehabilitation projects within certain areas of a Copermittee's jurisdictions. For such areas, the Copermittee must instead identify, develop, and implement regional retrofitting and channel rehabilitation projects (i.e. projects that can retain and/or treat storm water from one or more areas of existing development) adjacent to and/or downstream of the areas of existing development.

Provisions E.5.e.(2)-(3) do not require the implementation of retrofitting and rehabilitation projects, but do require the Copermittee to develop a strategy to facilitate the implementation of these types of projects in areas of existing development. The strategy is expected to include allowing and encouraging Priority Development Projects to implement these types of projects to comply with the structural BMP performance criteria requirements of Provisions E.3.c.(1) and E.3.c.(2).

The San Diego Water Board will utilize the information provided in the jurisdictional runoff management program document pursuant to Provision E.5.e to gauge and assess the Copermittee's efforts in trying to address the highest priority water quality conditions identified in the Water Quality Improvement Plan within its jurisdiction.

Provision E.6 (Enforcement Response Plans) requires each Copermittee to develop an Enforcement Response Plan as part of its jurisdictional runoff management program document. Proper implementation of the Enforcement Response Plans is necessary to effectively prohibit non-storm water discharges to the MS4, and reduce the discharge of pollutants in storm water from the MS4 to the MEP.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system*" and be able to demonstrate that it can "*operate pursuant to legal authority established by statute, ordinance or series of contracts*" to control the discharge of non-storm water and pollutants in storm water to and from its MS4. Pursuant to 40 CFR 122.26(d)(2)(i)(E) each Copermittee is specifically required to have the legal authority to "*[r]equire compliance with conditions in ordinances, permits, contracts or order*s."

The requirements under Provision E.6 are necessary to demonstrate that each Copermittee can enforce its legal authority to *"effectively prohibit non-stormwater discharges"* and "*reduce the discharge of pollutants to the maximum extent practicable*" as well as "*[r]equire compliance with conditions in ordinances, permits, contracts or order*."

The Enforcement Response Plan required under Provision E.6 will serve as a reference for the Copermittee and the San Diego Water Board to determine if consistent enforcement actions are being implemented to achieve timely and effective compliance from all public and private entities that are not in compliance with the Copermittee's ordinances, permits, or other requirements. The Enforcement Response Plan must contain clear direction for the Copermittee to take immediate enforcement action, when appropriate and necessary, in their illicit discharge detection and elimination, development planning, construction management, and existing development management programs.

If the entities subject to the Copermittee's legal authority do not implement appropriate corrective actions in a timely manner, or if violations repeat, the Copermittee must take progressively stricter responses to enforce its legal authority and achieve compliance with its ordinances, permits, or other requirements to *"effectively prohibit non-stormwater discharges"* and "*reduce the discharge of pollutants to the maximum extent practicable.*"

Provision E.7 (Public Education and Participation) requires each Copermittee to implement a public education and participation program. Proper implementation of the public education and participation program as part of its jurisdictional runoff management program will contribute toward effectively prohibiting non-storm water discharges to the MS4, and toward the reduction of pollutants in storm water from the MS4 to the MEP.

Provision E.7 establishes the minimum requirements that each Copermittee must implement to engage members of the public as part of its jurisdictional runoff management program. In the Fourth Term Permits, the public education program requirements and the public participation requirements were included as separate jurisdictional runoff management program components. In this Order, the public education requirements have been consolidated with the public participation requirements, as both sets of requirements are related to the engagement of the public by each Copermittee. Engagement of the public is critical for the success of each Copermittee's jurisdictional runoff management program.

The Copermittees have been implementing public education programs for the last 20 years, which are now well established. The specificity of expected public education program elements of the Fourth Term Permits has been removed. For the most part, the public education program requirements in Provision E.7.a have been reduced to a set of requirements that are specifically included in the federal regulations under 40 CFR 122.26(d)(2)(iv)(A)(6), 122.26(d)(2)(B)(6) and 122.26(d)(2)(D)(4), which should already be incorporated into each Copermittee's existing public education program. Each Copermittee is expected to utilize the information and data collected from the monitoring and assessments conducted within the Watershed Management Area, and from its inventories and inspections to best direct its public education program resources toward addressing the highest priority water quality conditions identified within the Water Quality Improvement Plan.

According to 40 CFR 122.26(d)(2)(iv), public participation is required to be included as part of the "*comprehensive planning process*", which includes the development and implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs. The requirements under Provision E.7.b specify the opportunities that the public must be provided to be involved in the "*comprehensive planning process*", as required by to 40 CFR 122.26(d)(2)(iv).

Provision E.8 (Fiscal Analysis) requires each Copermittee to secure the resources and provide an analysis of the resources that will be necessary to implement the requirements of the Order. Adequate fiscal resources are necessary for a jurisdictional runoff management program to effectively prohibit non-storm water discharges to the MS4, and reduce pollutants in storm water from the MS4 to the MEP.

According to 40 CFR 122.26(d)(2)(vi), each Copermittee is responsible for providing "*a fiscal analysis of the necessary capital and operation and maintenance expenditures necessary to accomplish the activities*" required by this Order, including "*a description of the source of funds that are proposed to meet the necessary expenditures, including legal restrictions on the use of such funds.*" The fiscal analysis requirements of Provision E.8 are consistent with 40 CFR 122.26(d)(2)(vi).

The San Diego Water Board has chosen not to require a description of fiscal benefits realized from implementation of the jurisdictional runoff management programs. This

is a recommendation from the National Association of Flood and Stormwater Management Agencies.[39] For instance, the fiscal analysis requirements do not address city-wide fiscal benefits of protection (e.g., public health, tourism, property values, economic activity, beneficial uses, etc.), even though many costs currently reported to the San Diego Water Board are for related activities. This type of assessment may help Copermittees improve the allocation of resources and it may help the Copermittees secure adequate funding for the program. Qualitative assessments, however, could be overly subjective and most Copermittees likely lack the ability to provide accurate quantitative assessments. The San Diego Water Board encourages the Copermittees to consider means for conducting assessments of fiscal benefits derived from the programs. Such assessments could be conducted on a regional scale similar to studies of program costs conducted by the State Water Board.[40]

[39] National Association of Flood and Stormwater Management Agencies. 2006. *Guidance for Municipal Stormwater Funding*. Prepared under a grant provided by the USEPA.
[40] State Water Board, 2005. NPDES Stormwater Cost Survey.

F. Reporting

Purpose: Provision F includes the requirements for the documents and reports that the Copermittees must prepare and provide to the San Diego Water Board. The documents prepared by the Copermittees and provided to the San Diego Water Board and made available to the public will provide the documentation that the Copermittees are complying with the requirements of the Order.

***Discussion*:** Provision F requires the Copermittees to prepare several documents and reports that must be provided to the San Diego Water Board and made available to the public. The reporting requirements have been significantly reduced compared to the Fourth Term Permit reporting requirements. The reduction in reporting requirements was recommended by the San Diego County Copermittees in the Report of Water Discharge submitted in June 2011.

More specific and detailed discussions of the requirements of Provision F are provided below.

Provision F.1 (Water Quality Improvement Plans) requires the Copermittees in each Watershed Management Area to develop and submit a Water Quality Improvement Plan in accordance with the requirements of Provision B.

Of all the requirements of Provision F, the Water Quality Improvement Plans will likely be the documents requiring the most significant effort to develop. The content of the Water Quality Improvement Plans, however, is expected to include content that should already have been developed for the Watershed Plans and several elements that are included in the Monitoring and Reporting Programs required under the Fourth Term Permits.

Because the Water Quality Improvement Plan is part of the "*comprehensive planning process*" requiring public participation, Provision F.1 includes requirements to give multiple opportunities to the public to provide input on the content of the plans. The Water Quality Improvement Plans are required to be submitted by the Copermittees within 18 months after adoption of this Order.

Provision F.2 (Updates) requires the Copermittees to update specific documents that the Copermittees will utilize to implement the requirements of this Order.

Each Copermittee is required to continue implementing a jurisdictional runoff management program, as required under Provision E. Implementation of each Copermittee's jurisdictional runoff management program is directed by its jurisdictional runoff management program document. Provision F.2.a requires each Copermittee to update its jurisdictional runoff management program document to be consistent with the requirements of Provision E within 18 months after the adoption of this Order.

Likewise, each Copermittee must continue to require new development and redevelopment projects to implement BMPs to control pollutants in storm water runoff. The control of pollutants in storm water runoff from development and redevelopment projects within each Copermittee's jurisdiction is guided and directed by its BMP Design Manual, formerly known as a Standard Storm Water Mitigation Plan (SSMP). Provision F.2.b requires each Copermittee to update its BMP Design Manual to be consistent with the requirements of Provision E.3 within 18 months after the adoption of this Order.

In general, the requirements of the Order should not necessitate a complete rewrite of each Copermittee's jurisdictional runoff management program document or BMP Design Manual, as was required by the Third Term Permits. The jurisdictional runoff management program and BMP Design Manual requirements of this Order are not significantly different than the requirements of the Fourth Term Permits. Thus, only sections of the Order which are new or have been significantly changed should warrant revisions to specific sections of the Copermittee's jurisdictional runoff management program document and BMP Design Manual.

Finally, the Water Quality Improvement Plans are expected to require updates as the iterative approach and adaptive management process included in the Water Quality Improvement Plan, as required under Provision B.5, is implemented by the Copermittees. Provision F.2.c requires the Copermittees to submit the updates to the Water Quality Improvement Plan as part of the Annual Reports required under Provision F.3.b.

Provision F.3 (Progress Reporting) requires the Copermittees to report on the progress of implementing the Water Quality Improvement Plans.

The requirements of Provision F.3 are to report the progress toward improving water quality that the Copermittees are achieving with the implementation of the Water Quality Improvement Plans and each Copermittee's jurisdictional runoff management program. The Progress Report Presentations required under Provision F.3.a are included to provide the Copermittees an opportunity to communicate directly with the San Diego Water Board and the public. The Progress Report Presentations will also provide the members of the San Diego Water Board and members of the public an opportunity to become more acquainted with the Copermittees and their projects and programs to address non-storm water and storm water discharges into and from their MS4s.

The Annual Report requirements of Provision F.3.b are a consolidation of several reporting requirements from the Fourth Term Permits, including the Jurisdictional Runoff Management Program Annual Reports, the Watershed Annual Reports, and the Monitoring and Reporting Program Annual Reports. Furthermore, the Annual Report requirements are consistent with the requirements under 40 CFR 122.42(c).

Pursuant to 40 CFR 122.42(c), "*[t]he operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the Director…must submit an annual report*", which must include the following:

(1) *The status of implementing the components of the storm water management program that are established as permit conditions* [40 CFR 122.42(c)(1)];

(2) *Proposed changes to the storm water management programs that are established as permit conditions* [40 CFR 122.42(c)(2)];

(3) *Revisions, if necessary, to the assessment of controls and fiscal analysis* [40 CFR 122.42(c)(3)];

(4) *A summary of data, including monitoring data, that is accumulated throughout the reporting year* [40 CFR 122.42(c)(4)];

(5) *Annual expenditures and budget for year following each annual report* [40 CFR 122.42(c)(5)];

(6) *A summary describing the number and nature of enforcement actions, inspections, and public education programs* [40 CFR 122.42(c)(6)];

(7) *Identification of water quality improvements or degradation* [40 CFR 122.42(c)(7)].

Under the Fourth Term Permits, each Copermittee is responsible for submitting a Jurisdictional Runoff Management Program Annual Report; the Copermittees in each designated watershed are responsible for submitting a Watershed Annual Report; and the Copermittees from each county are responsible for submitting a Monitoring and Reporting Program Annual Report.

There are 39 Copermittees in the San Diego Region, each required to prepare and submit a Jurisdictional Runoff Management Program Annual Report. There are 9 designated watersheds in San Diego County, 6 designated watersheds in Orange County, and 1 designated watershed in Riverside County for a total of 16 designated watersheds, each requiring a Watershed Annual Report. There are 3 sets of Copermittees in 3 counties in the San Diego Region, requiring Copermittees from each county to prepare and submit a Monitoring and Reporting Program Annual Report. Thus each Copermittee is currently required to prepare, or participate in the preparation of at least 3 annual reports. In addition, the San Diego County Copermittees are required to prepare and submit a Regional Urban Runoff Management Plan Annual Report.

In total, there are 59 annual reports that are prepared by the Copermittees and submitted to the San Diego Water Board for the Fourth Term Permits. The preparation of these annual reports requires significant time and resources from each Copermittee, which could otherwise be expended on actions that could improve water

quality within its jurisdiction. In turn, significant time and resources are required from the San Diego Water Board staff to review these reports, which could otherwise be expended on working directly with the Copermittees to improve their implementation efforts toward restoring and protecting water quality.

Provision F.3.b only requires one Annual Report for each of the 10 Watershed Management Areas designated under Provision B.1, which is a significant reduction in the number of annual reports required to be prepared and submitted by the Copermittees. The Annual Report will document the Copermittees' efforts to implement the Water Quality Improvement Plan. Each Annual Report will be focused primarily on reporting the analysis of the monitoring data collected pursuant to Provisions D.1-D.3 during the reporting period, and the assessments that are required pursuant to Provision D.4 based on the data. The monitoring data analyses and the assessments that are provided in the Annual Report will be the core of the report. The reporting of the jurisdictional runoff management program implementation efforts have been reduced to a single 2-page form, and will no longer be the primary focus of the reporting requirements as in the Third and Fourth Term Permits.

The Jurisdictional Runoff Management Program Annual Report Form (see Attachment D to the Order) will certify that each Copermittee has implemented its jurisdictional runoff management program in accordance with the requirements of Provision E. Instead of reviewing a voluminous report from each Copermittee, as was required under the Third and Fourth Term Permits, the San Diego Water Board will conduct audits of each Copermittee's jurisdictional runoff management program to investigate and confirm the information provided by each Copermittee on its Jurisdictional Runoff Management Program Annual Report Form. The audits will allow the San Diego Water Board to become more familiar with the each Copermittee's jurisdictional runoff management program, and each Copermittee will become more informed about the expectations of the San Diego Water Board.

The reduction in the number and content of the Annual Reports should result in significant time, cost and resource savings for the Copermittees, as well as the San Diego Water Board. Those savings should offset a significant portion of any additional costs that may be incurred to develop the Water Quality Improvement Plans and to implement the monitoring and assessment program requirements of Provision D.

The reporting period for the Annual Reports consists of two periods. Because the jurisdictional runoff management programs are typically budgeted and implemented during a fiscal year, the information provided on the Jurisdictional Runoff Management Program Annual Report Forms will cover the period from July 1 to June 30 of the following year.

The Annual Reports, however, are focused primarily on the monitoring data and the assessments based on the monitoring data. The monitoring data is collected during the monitoring year, which begins October 1 and ends September 30 of the following year. The monitoring year begins after the beginning of the fiscal year and ends after

the end of the fiscal year. Therefore, to accommodate and capture the information collected during the fiscal year and the monitoring year, the Annual Report reporting period incorporates both periods.

Finally, Provision F.3.c requires the Copermittees to develop and submit a Regional Monitoring and Assessment Report. The Regional Monitoring and Assessment Report is similar to the Long Term Effectiveness Assessment required under the Fourth Term San Diego County Permit. The Regional Monitoring and Assessment Report is expected to utilize the entire body of data and information collected by the Copermittees during the term of this Order to assess improvements to water quality on a regional scale.

Provision F.4 (Regional Clearinghouse) requires the Copermittees to develop, update, and maintain an internet-based Regional Clearinghouse that can be used to store, disseminate, and share the Copermittees' documents, monitoring data, special studies, and any other data or information.

Most of the documents and data that are generated by the Copermittees can be provided in electronic format, and made available to the San Diego Water Board and the public on the internet. The San Diego Water Board has been gradually transitioning its document submittal requirements to electronic submittals. Provision F.4 has been included to further these efforts.

Provision F.4 has also been included to improve the exchange and availability of information among the Copermittees, as well as between the Copermittees and the San Diego Water Board. Provision F.4 will also make the information generated during the implementation of the Order more accessible to the public.

Provision F.5 (Report of Waste Discharge) requires the Copermittees to submit a Report of Waste Discharge to reapply for renewal of the Order prior to its expiration, in accordance with 40 CFR 122.21(d)(2) and CWC section 13376.

Because the Orange County and Riverside County Copermittees will not be subject to the requirements of this Order until they are notified of coverage, Provision F.5.a describes the process of submitting their Reports of Waste Discharge pursuant to the requirements of their current permits to obtain coverage under this Order.

For the Copermittees subject to the requirements of this Order, Provision F.5.b requires the Copermittees to submit a Report of Waste Discharge 180 days in advance of the expiration of this Order Provision F.5.b also describes the minimum information to be included in the Report of Waste Discharge, based on USEPA guidance "Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems", dated May 17, 1996.

Provision F.6 (Application for Early Coverage) describes the process that would allow the Orange County and/or Riverside County Copermittees to obtain coverage under this Order earlier than the expiration of their current Orders.

If the Orange County and/or Riverside County Copermittees choose to obtain coverage under this Order earlier than the expiration of their current Orders, the preparation and submittal of a Report of Waste Discharge, as required by the Fourth Term Permits, will not be necessary. The existing Order for the respective county will be rescinded upon the effective coverage date under this Order, except for enforcement purposes.

G. Principal Watershed Copermittee Responsibilities

Purpose: Provision G includes the requirements for the Principal Watershed Copermittee designated by the Copermittees in each Watershed Management Area.

***Discussion*:** Unlike previous NPDES requirements, there will no longer be a single Principal Copermittee. Provision G.1 requires the Copermittees to designate a Principal Watershed Copermittee for each Watershed Management Area. There are ten (10) Watershed Management Areas in the San Diego Region, as defined in Table B-1 under Provision B.1 of the Order. An individual Copermittee should not be the Principal Watershed Copermittee for more than two (2) Watershed Management Areas. There could be up to 10 Principal Water Copermittees designated for the Watershed Management Areas in the San Diego Region.

Provision G.2 describes the minimum responsibilities of each Principal Watershed Copermittee. The primary responsibility of the Principal Watershed Copermittees is to serve as the liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues. Ideally, the Principal Watershed Copermittee can represent the interests of all the Copermittees within a Watershed Management Area during discussions or meetings to facilitate communication with the San Diego Water Board. The Principal Watershed Copermittees are also responsible for facilitating and coordinating the implementation efforts of the Copermittees and submittals of required documents and reports.

The Principal Watershed Copermittee is responsible for facilitating the efforts of the Copermittees within the Watershed Management Area to develop the Water Quality Improvement Plan required under Provision B, and submit it for approval in accordance with Provision F.1. The Principal Watershed Copermittee is also responsible for coordinating the submittal of the document updates, Progress Report Presentations, and Annual Reports required from the Copermittees within each Watershed Management Area under Provisions F.2, F.3.a, and F.3.b. The Principal Watershed Copermittees are responsible for coordinating with each other to develop and submit the Regional Clearinghouse, Regional Monitoring and Assessment Report, and the Report of Waste Discharge required under Provisions F.3.c, F.4, and F.5.

The designated Principal Watershed Copermittee for each Watershed Management Area does not necessarily have to serve as the Principal Watershed Copermittee for the entire term of the Order. If the Copermittees in a Watershed Management Area choose to designate a new Principal Watershed Copermittee, the change may be submitted as part of the Annual Report required under Provision F.3.b, with an update to the Water Quality Improvement Plan in accordance with Provision F.2.c.

H. Modification of Programs

Purpose: Provision H provides the conditions under which modifications to Order No. R9-2013-0001 may occur.

***Discussion*:** Provision H allows for modifications to Order No. R9-2013-0001. Minor modifications may be made by the San Diego Water Board Executive Officer without a public notice or public hearing. Minor modifications are defined under 40 CFR 122.63. Minor modifications under 40 CFR 122.63 potentially applicable to this Order are the following:

- Correcting typographical errors;
- Requiring more frequent monitoring or reporting by the Copermittees;
- Changing an interim compliance date in a schedule of compliance, provided the new date is not more than 120 days after the date specified in the existing permit and does not interfere with attainment of the final compliance date requirement.

Modifications that are not one of the above minor modifications will require re-opening the Order, subject to the requirements of 40 CFR 122.62 and 124.5(c)(1)-(3), but only for the specific provisions subject to the modification. Modifications of the Order that are not minor require a draft Order with the proposed modifications made available for public review, a public notice and comment period, and a public hearing. Comments on the provisions not subject to the proposed modifications are not required to be considered in the San Diego Water Board's responses to comments or during the public hearing.

Provision H.4 was included specifically to allow for the Order to be re-opened to make modifications to the requirements of Provision A should new language addressing compliance with water quality standards in the receiving waters be developed and issued by the State Water Board.

I. Standard Permit Provisions and General Provisions

Purpose: Provision I incorporates the standard permit provisions required to be included in all NPDES permits, as well as several other general provisions.

***Discussion*:** Provision I refers to Attachment B to the Order. Attachment B expressly incorporates the conditions applicable to all NPDES permits as provided under 40 CFR 122.41(a)-(n), as well as the applicable conditions for MS4s and storm water discharges provided under 40 CFR 122.42(c) and 40 CFR 122.42(d), respectively. Attachment B also includes several general provisions that are typically included in or applicable to waste discharge requirements issued by the San Diego Water Board.

IX. ATTACHMENTS

The attachments to the Order are discussed below. The discussions describe the content of the attachments.

Attachment A – Discharge Prohibitions and Special Protections

Section 1 of Attachment A includes the Waste Discharge Prohibitions from the Basin Plan. They have been provided verbatim in their entirety.

Section 2 of Attachment A includes the "*Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges*" applicable to permitted point source discharges of storm water, adopted under State Water Board Resolution No. 2012-0012. The terms, prohibitions, and special conditions (collectively referred to as special conditions) are established as limitations on point source storm water discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in ASBS, as required for State Water Quality Protection Areas pursuant to California Public Resources Code sections 36700(f) and 36710(f). These Special Protections were adopted by the State Water Board as part of the Ocean Plan General Exception.

Attachment B – Standard Permit Provisions and General Provisions

Conditions applicable to all NPDES permits, as required under 40 CFR 122.41, and conditions applicable to MS4s and storm water discharges, as required under 40 CFR 122.42(c) and 122.42(d), respectively are provided in Attachment B to the Order. They have been provided expressly in their entirety.

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. These general provisions are typically included in or applicable to waste discharge requirements issued by the San Diego Water Board. Many of the general provisions were developed by the State Water Board. Where a general provision is derived from statute or regulation, a citation of the statute or regulation section is provided. General provisions that do not provide a citation are included under the authority provided CWC 13377.

Attachment C – Acronyms, Abbreviations and Definitions

The acronyms and abbreviations that are used in the Order are provided in Attachment C. Attachment C also includes definitions that may provide an explanation or description of the meaning or intent of specific terms or phrases included in the Order.

Attachment D – Jurisdictional Runoff Management Program Annual Report Form

An example of the Jurisdictional Runoff Management Program Annual Report Form required to be submitted by each Copermittee as part of the Annual Reports required under Provision F.3.b.(1)(e) is provided as Attachment D to the Order. An electronic version of the form will be available from the San Diego Water Board after the adoption of the Order.

The Jurisdictional Runoff Management Program Annual Report Form includes the minimum information necessary to demonstrate that the Copermittee is implementing and in compliance with the requirements of Provision E, and includes much of the information required to be reported pursuant to 40 CFR 122.42(c).

The information that must be provided on the Jurisdictional Runoff Management Program Annual Report Form is limited to the fiscal year, which begins July 1 and ends June 30 of the following year. The information expected to be provided by the Copermittees in each section of the Jurisdictional Runoff Management Program Annual Report Form is discussed below.

I. COPERMITTEE INFORMATION

The name of the Copermittee (e.g. name of city, county, or special district) and the contact information for the storm water program manager are provided under this section.

II. LEGAL AUTHORITY

The Copermittee must confirm whether or not the legal authorities under Provision E.1.a have been established for itself within its jurisdiction.

The Copermittee must also confirm whether or not a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority, as required under Provision E.1.b. The certification statement required by Provision E.1.b is only required to be submitted with the first Annual Report required under Provision F.3.b.

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

The Copermittee must inform the San Diego Water Board whether or not an update to its jurisdictional runoff management program document was required or recommended by the San Diego Water Board during the reporting period. An update to the jurisdictional runoff management program is required under Provision F.2.a. The San Diego Water Board may recommend modifications to the jurisdictional runoff management program as part of the iterative approach and adaptive management process required under Provision B.5, which may result in an update that is necessary for the Copermittee's jurisdictional runoff management document.

If an update was required or recommended, the Copermittee must confirm whether or not the update was completed and made available on the Regional Clearinghouse within the reporting period. If no update was required or recommended, an answer is not required. If the answer is NO, meaning the required or recommended update was not completed and/or made available on the Regional Clearinghouse, the Copermittee must attach a schedule for the completion of the update and/or posting of the updated document on the Regional Clearinghouse.

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

The Copermittee must confirm whether or not a program was implemented during the fiscal year to actively detect and eliminate illicit discharges and connections in accordance with the requirements under Provision E.2.

In addition to confirming that a program to detect and eliminate illicit discharges was implemented during the reporting period, the Copermittee is also required to report on several items related to the program. The information that must be reported is limited to the fiscal year for the Annual Report.

All non-storm water discharges are considered illicit discharges unless the source is identified as one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5). If a non-storm water discharge is identified as one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5), the discharge is a non-storm water discharge, but not an illicit discharge. If a non-storm water discharge is identified but in not one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5), the discharge is both a non-storm water discharge and an illicit discharge.

V. DEVELOPMENT PLANNING PROGRAM

The Copermittee must confirm whether or not a development planning program was implemented during the fiscal year in accordance with the requirements under Provision E.3.

The Copermittee must also inform the San Diego Water Board whether or not an update to its BMP Design Manual was required or recommended by the San Diego Water Board during the fiscal year. An update to the BMP Design Manual is required under Provision F.2.b. The San Diego Water Board may recommend modifications to the BMP Design Manual, which may result in an update that is necessary for Copermittee's the BMP Design Manual.

If an update was required or recommended, the Copermittee must confirm whether or not the update was completed and made available on the Regional Clearinghouse within the reporting period. If no update was required or recommended, an answer is not required. If the answer is NO, meaning the required or recommended update was not completed and/or made available on the Regional Clearinghouse, the Copermittee must attach a schedule for the completion of the update and/or posting of the updated document on the Regional Clearinghouse.

The Copermittee is also required to report on several items related to the program. For the development and redevelopment projects that are reviewed under the program, the Copermittee must report the total number projects submitted for review during the fiscal year. Of those projects, the Copermittee must report the number that are Priority Development Projects, as defined under Provision E.3.b.(1). The Copermittee must also report the number of Priority Development Projects that were approved and/or granted occupancy during the fiscal year, regardless of when the project was originally submitted for review. Any projects that were approved during the fiscal year and granted any exemptions from the BMP Design Manual requirements and/or allowed to implement alternative compliance options in accordance with Provision E.3.c.(3) must be reported.

Finally, the Copermittee must also report on several items related to its oversight of permanent BMPs on Priority Development Projects within its jurisdiction, as required under Provision E.3.e. The information that must be reported is limited to the fiscal year for the Annual Report.

VI. CONSTRUCTION MANAGEMENT PROGRAM

The Copermittee must confirm whether or not a construction management program was implemented during the fiscal year in accordance with the requirements under Provision E.4.

The Copermittee is also required to report on several items related to its oversight construction projects within its jurisdiction. The information that must be reported is limited to the fiscal year for the Annual Report.

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

The Copermittee must confirm whether or not an existing development management program was implemented during the fiscal year in accordance with the requirements under Provision E.5.

The Copermittee is also required to report on several items related to its oversight in areas of existing development within its jurisdiction. The information that must be reported is limited to the fiscal year for the Annual Report. The information must also be separated into four categories of existing development: municipal, commercial, industrial, and residential.

VIII. PUBLIC EDUCATION AND PARTICIPATION

The Copermittee must confirm whether or not a public education program component was implemented during the fiscal year in accordance with the requirements under Provision E.7.a.

The Copermittee must also confirm whether or not a public participation program component was implemented during the fiscal year in accordance with the requirements under Provision E.7.b.

IX. FISCAL ANALYSIS

The Copermittee must confirm a summary of its fiscal analysis, conducted in accordance with the requirements under Provision E.8, has been attached to the form.

X. CERTIFICATION

A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative must sign and certify the Jurisdictional Runoff Management Program Annual Report Form. The appropriate box must be checked to indicate the whether the a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative is signing the form.

Attachment E – Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2013-0001

Attachment E provides specific provisions for implementing the Total Maximum Daily Loads (TMDLs) adopted by the San Diego Water Board and approved by USEPA in which the Copermittees are identified as responsible for meeting an assigned wasteload allocation (WLA). Federal regulations require that NPDES requirements incorporate water quality based effluent limitations (WQBELs) that must be consistent with the requirements and assumptions of any available WLAs,[41] which may be expressed as numeric effluent limitations, when feasible, and/or as a best management practice (BMP) program of expanded or better-tailored BMPs.[42] Where the TMDL includes WLAs that provide numeric pollutant load or pollutant parameter objectives, the WLA has been, where feasible, translated into numeric WQBELs.[43]

For each TMDL in Attachment E, five sections are included:

1) Applicability: This section provides the resolution under which the TMDL Basin Plan amendment was adopted and approved, with the applicable adoption and approval dates. This section also gives the effective date of the TMDL and where the TMDL is applicable (i.e. Watershed Management Area and water body). The Copermittees that are responsible for implementing the specific provisions are also given in this section.

2) Water Quality Based Effluent Limitations: For each TMDL, the WQBELs are expressed in terms of receiving water limitations, effluent limitations, and/or best management practices (BMPs). The WQBELs for the TMDLs are incorporated by reference into Provision A of the Order. The WQBELs when the compliance dates have passed. Applicable BMPs within the WQBELs must be incorporated into the Water Quality Improvement Plans.

3) Compliance Schedule: The final date for compliance with the WLA assigned to the Copermittees is provided in this section. If there are interim compliance requirements, they are included in this section as well. The WQBELs become enforceable when the final compliance date has passed. If there are interim WQBELs with interim compliance dates, the interim WQBELs become enforceable when the corresponding interim compliance dates have passed.

4) Specific Monitoring and Assessment Requirements: If there are specific monitoring and assessment requirements that cannot be met with the monitoring and assessment program requirements under Provision D of the Order, the additional requirements are included in this section.

5) Compliance Determination: There may be several options to demonstrate compliance with the WQBELs. If there is more than one option to demonstrate compliance with the WQBELs, the options are provided in this section.

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[41] 40 CFR 122.44(d)(1)(vii)(B)
[42] 40 CFR 122.44(k)(2) and 40 CFR 122.44(k)(3)
[43] November 12, 2010 Memorandum from the USEPA, Revisions to the November 22, 2002 Memorandum "Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLA""

The requirements of the TMDLs are based on the assumptions and requirements of any available WLAs for adopted and approved TMDLs that have been incorporated into the Basin Plan. Modifications to the requirements for the TMDLs in Attachment E cannot be made unless the TMDLs are modified in the Basin Plan.

A modification to any aspect of a TMDL in the Basin Plan requires a Basin Plan amendment. A Basin Plan amendment to modify a TMDL will require the San Diego Water Board to adopt a resolution to amend the Basin Plan, which includes a separate public process. When the San Diego Water Board adopts a Basin Plan amendment, it subsequently requires approval from the State Water Board, the Office of Administrative Law, and the USEPA before it becomes effective.

If and when the TMDLs are a modified in the Basin Plan, the San Diego Water Board will revise the requirements of the TMDL in accordance with the Basin Plan amendment. When a Basin Plan amendment to modify a TMDL becomes effective, the San Diego Water Board will modify the requirements of the TMDL pursuant to the requirements of Provision H of the Order as soon as possible.

Regional Permit Development Process Timeline

April 10 and 11, 2013
Item No. 8 008495
Supporting Document No. 3

Pre- Administrative Draft Period
1 year 2 months

- February 8, 2011 → Meet with Copermittees to discuss Report of Waste Discharge
- **Attended 21 Meetings with Copermittees & Stakeholders**: to listen and discuss regional permit approach
- January10, 2012 → Present General Concept & Approach to USEPA
- February 14, 2012 → USEPA provides comments on Pre-Administrative Draft

Administrative Draft Period
9 months

- April 2012 → Release Administrative Draft of requirements to public
- May 2012 → **Public Workshop** on Administrative Draft
- Focused Meeting # 1 June 27, 2012
- Focused Meeting # 2 July 11, 2013
- Focused Meeting # 3 July 25, 2012
- Focused Meeting # 4 August 22, 2012
- Focused Meetings Wrap Up September 5, 2012 → **Public Workshop** Wrap-Up Focused Meetings Process
- **Additional 20 Meetings with Copermittees & Stakeholders**: to receive feedback & answer questions & provide additional information about requirements in Administrative Draft

Tentative Order Period
5 months

- October 31, 2012 → Tentative Order released and public comment period begins
- November 13, 2012 → **Public Workshop** on Tentative Order
- December 12, 2012 → **Public Workshop Continued** on Tentative Order
- **Additional 11 Meetings with Copermittees & Stakeholders**: to receive feedback & answer questions on the Tentative Order requirements
- January 11, 2013 → Tentative Order public comment period ends (71 days)
- March 27, 2013 → Anticipated Revised Tentative Order Release
- April 10, 11 2013 → Scheduled Board Adoption Hearing

Regional MS4 Storm Water Permit Timeline		
	Date	**Event Description**
Existing Permit Adoptions	January 24, 2007	Order No. R9-2007-0001, San Diego County Municipal Separate Storm Sewer System (MS4) Storm Water Permit adopted by San Diego Water Board.
	December 16, 2009	Order No. R9-2009-0002, Orange County MS4 Storm Water Permit adopted by San Diego Water Board.
	November 10, 2010	Order No. R9-2010-0016, Riverside County MS4 Storm Water Permit adopted by San Diego Water Board. Order No. R9-2010-0016 includes finding that announces San Diego Water Board's plans to develop a Regional Storm Water Permit (Regional MS4 Permit). Finding E.12 states: *The San Diego Water Board recognizes that issuing a single MS4 permit for all Phase I entities in the San Diego Region will provide consistent implementation, improve communication among agencies within watersheds crossing multiple jurisdictions, and minimize staff resources spent with each permit renewal. The San Diego Water Board plans to develop a single regional MS4 permit prior to the expiration of this Order that will transfer the Copermittees' enrollment to the regional permit upon expiration of this Order.*
Pre-Administrative Draft Period 1 year 2 mos.	February 8, 2011	Meeting with San Diego County Copermittees. Meeting attended by EO and AEO. Purpose of the meeting was to discuss the expectations for the Copermittees' Report of Waste Discharge and the Copermittees' concerns about Regional MS4 Permit.
	February 15, 2011	Meeting with the Cities of Carlsbad, Encinitas, Poway, and San Marcos (together). Purpose of the meeting was to solicit feedback, criticisms, and recommendations for improving the permit requirements in the Regional MS4 Permit.
	February 17, 2011	Meetings with the City of Santee and the City of San Diego (separately). Purpose of the meetings was to solicit feedback, criticisms, and recommendations for improving the permit requirements in the Regional MS4 Permit.
	February 22, 2011	Meeting with the City of Chula Vista. Purpose of the meeting was to solicit feedback, criticisms, and recommendations for improving the permit requirements in the Regional MS4 Permit.
	March 10, 2011	Meetings with the City of Laguna Niguel and the City of Laguna Beach (separately). Purpose of the meetings was to solicit feedback, criticisms, and recommendations for improving the permit requirements in the Regional MS4 Permit.
	March 15, 2011	Meeting with the San Diego Unified Port District. Purpose of the meetings was to review their 2009-2010 JURMP Annual Report. During the meeting, solicited feedback about effectiveness assessment and watershed management requirements of the permit.
	March 22, 2011	Meeting with environmental interest groups (San Diego Coastkeeper, Coast Law Group, Environmental Health Coalition) (together). Purpose of the meetings was to solicit feedback, criticisms, and recommendations for improving the permit requirements in the Regional MS4 Permit.
	April 6, 2011	Meeting with San Diego County Copermittees' Watershed (Visioning) Workgroup representatives. Purpose of the meeting was to discuss the Copermittees' watershed vision and goals and how it might be incorporated into the ROWD and Regional MS4 Permit.

Regional MS4 Storm Water Permit Timeline		
	Date	**Event Description**
Pre-Administrative Draft Period 1 year 2 mos.	April 19, 2011	Meeting with San Diego County Copermittees' Monitoring Workgroup representatives. Purpose of the meeting was to discuss potential elements to be included in the monitoring requirements of the Regional MS4 Permit.
	April 21, 2011	Meeting with San Diego Coastkeeper monitoring program. Purpose of the meeting was to discuss Coastkeeper's monitoring program and how it may be used for regional monitoring.
	April 27, 2011	Meeting with Orange County. Purpose of the meeting was to discuss the Orange County Copermittees' monitoring program and potential elements to be included in the monitoring requirements of the Regional MS4 Permit.
	May 5, 2011	Meeting with Riverside County. Purpose of the meeting was to discuss the County of Riverside's jurisdictional program and to solicit feedback, criticisms, and recommendations for improving the jurisdictional management program permit requirements in the Regional MS4 Permit.
	May 5, 2011	Executive Officer Report about the San Diego Water Board's intent to develop the Regional MS4 Permit.
	May 10, 2011	Meeting with the City of Murrieta. Purpose of the meeting was to discuss the City of Murrieta's jurisdictional program and to solicit feedback, criticisms, and recommendations for improving the jurisdictional management program permit requirements in the Regional MS4 Permit.
	June 1, 2011	Teleconference with staff from San Francisco Bay Water Board. Purpose of the meeting was to discuss San Francisco Bay Water Board's experiences with and recommendations for developing a Regional MS4 Permit.
	June 27, 2011	San Diego County Copermittees submit Report of Waste Discharge for renewal of MS4 Permit.
	October 5, 2011	Presentation at the San Diego IRWM RAC Meeting to provide an overview of the integration of TMDLs with the Regional MS4 Permit.
	November 1, 2011	Meeting with the Southern California Water Committee's Stormwater Task Force. Purpose of the meeting was to discuss ways to increase the use of storm water as a resource for water supply purposes and permit requirements that support or impede its use as a resource.
	January 10, 2012	Meeting with USEPA. Purpose of the meeting was to present the proposed concepts and approaches incorporated into the Regional MS4 Permit, and answer questions.
	January 19, 2012	Presentation at the San Diego County Copermittees Management Meeting to provide an overview of the changes to the permit requirements that can be expected in the Regional MS4 Permit, and the target date for adoption.
	January 31, 2012	Preliminary draft of Regional MS4 Permit provided to USEPA for review and comments.
	February 14, 2012	USEPA provided written comments on preliminary draft of Regional MS4 Permit.
	February 16, 2012	Meeting with USEPA to discuss their comments provided on preliminary draft of Regional MS4 Permit.

Regional MS4 Storm Water Permit Timeline		
	Date	**Event Description**
Pre-Administrative Draft Period 1 year 2 mos.	February 28, 2012	Presentation of the Regional MS4 Permit concept and approach at the Clean Water Environment Association (CWEA) Pretreatment, Pollution Prevention and Stormwater (P3S) Training Conference in Huntington Beach as part of USEPA's Stormwater Regulatory Outlook session.
	February 29, 2012	Presentation to the North County Civil Engineers and Land Surveying Association. Part of the presentation included providing a preview of what to expect in the Regional MS4 Permit pertaining to development and construction.
Administrative Draft Period 9 months	April 2, 2012	Notice of Public Workshop for the administrative draft of the Regional MS4 Permit posted on the San Diego Water Board website and sent to the Lyris email lists for the San Diego County, Orange County, and Riverside County MS4 Permits.
	April 9, 2012	Administrative draft of the Regional MS4 Permit posted on the San Diego Water Board website.
	April 25, 2012	Public Workshop for the administrative draft of the Regional MS4 Permit held at the San Diego Water Board.
	May 2, 2012	Meeting with San Diego County Copermittees. Purpose of the meeting was to receive feedback and recommendations on the focused meeting process, and answer questions and provide additional information about the provisions in the administrative draft Regional MS4 Permit.
	May 8, 2012	Presentation to the San Diego Regional Chamber of Commerce regarding the development of the Regional MS4 Permit.
	May 9, 2012	Meeting with Riverside County Copermittees. Purpose of the meeting was to receive feedback and recommendations on the focused meeting process, and answer questions and provide additional information about the provisions in the administrative draft Regional MS4 Permit.
	May 14, 2012	Meeting with Orange County Copermittees. Purpose of the meeting was to receive feedback and recommendations on the focused meeting process, and answer questions and provide additional information about the provisions in the administrative draft Regional MS4 Permit.
	June 7, 2012	Executive Officer Report about the release of the administrative draft Regional MS4 Permit, the public workshop, and the planned focused meetings.
	June 14, 2012	Meeting with Orange County, Riverside County, and San Diego County Principle Copermittees. Purpose of the meeting was to inform the Copermittees of the revised focused meeting process and schedule and receive additional input.
	June 21, 2012	Notice of Revised Administrative Draft Regional Municipal Separate Storm Sewer System (MS4) Permit Focused Meeting Procedures and Schedule posted on the San Diego Water Board website and sent to the Lyris email lists for the San Diego County, Orange County, and Riverside County MS4 Permits.
	June 27, 2012	Focused Meeting to discuss the Assessment and Planning concepts in the administrative draft Regional MS4 Permit with stakeholders. Meeting was held at the San Luis Rey Wastewater Treatment Plant in Oceanside.
	July 11, 2012	Focused Meeting to discuss the Assessment and Planning concepts in the administrative draft Regional MS4 Permit with stakeholders. Meeting was held at the City Hall of Escondido.

Regional MS4 Storm Water Permit Timeline		
	Date	**Event Description**
Administrative Draft Period 9 months	July 17, 2012	Meeting with representatives of San Diego County Copermittees Monitoring Workgroup. Purpose of the meeting was for the Monitoring Workgroup to provide an overview of their proposed monitoring approach and get input and feedback from the Regional Permit Team.
	July 20, 2012	Meeting with representatives of San Diego County Copermittees. Purpose of the meeting was to discuss and provide feedback about the Copermittees' alternative proposals, concepts, and ideas that could be incorporated into the Regional MS4 Permit.
	July 24, 2012	Meeting with the San Diego County Copermittees Land Development Workgroup. Purpose of the meeting was to provide additional information about the development planning and construction requirements of the Regional MS4 Permit.
	July 25, 2012	Focused Meeting to discuss the Assessment and Monitoring concepts in the administrative draft Regional MS4 Permit with stakeholders. Meeting was held at the Faraday Center in Carlsbad.
	July 31, 2012	Meeting with San Diego County Copermittees HMP Monitoring Sub-workgroup. Purpose of the meeting was to present the Copermittees' findings from their first year of monitoring and to solicit recommendations from the State Water Board (Eric Bernstein) and San Diego Water Board for modifications to monitoring plan.
	August 1, 2012	Meeting with representatives of the San Diego County Copermittees Existing Development Workgroup. Purpose of the meeting was to provide additional information about the existing development requirements of the Regional MS4 Permit.
	August 2, 2012	Meeting with representatives of San Diego County Copermittees Monitoring Workgroup. Purpose of the meeting was to discuss and provide feedback about specific elements of the Copermittees' proposed monitoring approach.
	August 3, 2012	Meeting with representatives of the Building Industry Association (BIA). Purpose of the meeting was to discuss and provide additional information about the non-storm water and development planning requirements of the Regional MS4 Permit.
	August 3, 2012	Presentation to the San Dieguito River Valley Regional Open Space Park Citizens Advisory Committee regarding the development of the Regional MS4 Permit. Participated as part of a panel with the County of San Diego and the Building Industry Association to provide information about the Regional MS4 Permit.
	August 7, 2012	Meeting with representatives of the Orange County Copermittees. Purpose of the meeting was to discuss and provide additional information about the requirements of the Regional MS4 Permit.
	August 9, 2012	Meeting with representatives of the San Diego County Copermittees Land Development Workgroup. Purpose of the meeting was to discuss and provide feedback about the Copermittees' alternative proposals, concepts, and ideas that could be incorporated into the development planning requirements.

Regional MS4 Storm Water Permit Timeline		
	Date	**Event Description**
Administrative Draft Period 9 months	August 10, 2012	Meeting with representatives of the San Diego County Copermittees Existing Development Workgroup. Purpose of the meeting was to discuss and provide feedback about the Copermittees' alternative proposals, concepts, and ideas that could be incorporated into the existing development requirements.
	August 17, 2012	Meeting with representatives of the BIA. Purpose of the meeting was to discuss the non-storm water and development planning requirements of the Regional MS4 Permit.
	August 20, 2012	Meeting with representatives of San Diego County Copermittees. Purpose of the meeting was to discuss and provide feedback about the Copermittees' alternative proposals, concepts, and ideas that could be incorporated into the Regional MS4 Permit.
	August 22, 2012	Focused Meeting to discuss the Planning and Implementation concepts in the administrative draft Regional MS4 Permit with stakeholders. Meeting was held at the City of Vista.
	August 23, 2012	Meeting with representatives of San Diego County Copermittees Monitoring Workgroup. Purpose of the meeting was to discuss and provide feedback about specific elements of the Copermittees' proposed monitoring approach.
	August 30, 2012	Regional Permit Team attended Hydromodification Management Meeting/Symposium organized by the Copermittees. Meeting was held at the City of San Diego Concourse.
	August 31, 2012	Meeting with representatives of San Diego Coastkeeper and Green Building Association. Purpose of the meeting was to discuss the role of green building principles in development planning.
	September 5, 2012	Focused Meeting Wrap Up Workshop held at the San Diego Water Board. Purpose of the workshop was to inform the stakeholders about concepts and information provided during the Focused Meetings would likely result in revisions to the Administrative Draft Regional MS4 Permit.
	September 14, 2012	Final date for submitting written comments on the Administrative Draft Regional MS4 Permit.
	October 12, 2012	Revised administrative draft Regional MS4 Permit with tracked changes posted on the San Diego Water Board website.
	October 12, 2012	Notice of Public Workshop for Tentative Order No. R9-2013-0001 posted on the San Diego Water Board website and sent to the Lyris email lists for the San Diego County, Orange County, and Riverside County MS4 Permits.
	October 19, 2012	"Clean" version of revised administrative draft Regional MS4 Permit posted on the San Diego Water Board website.
	October 24, 2012	Final Focused Meeting to present and discuss revisions made to the administrative daft Regional MS4 Permit.
	October 31, 2012	Tentative Order No. R9-2013-0001 posted on the San Diego Water Board website. Notice of Public Review and Comment posted on the San Diego Water Board website, sent to the Lyris email lists for the San Diego County, Orange County and Riverside County MS4 Permits, and Board Meeting Agenda, and mailed to San Diego County, Orange County and Riverside County Copermittees, and Resource Agencies.

Regional MS4 Storm Water Permit Timeline		
	Date	**Event Description**
Tentative Order Period 5 months	October 31, 2012	Tentative Order No. R9-2013-0001 posted on the San Diego Water Board website. Notice of Public Review and Comment posted on the San Diego Water Board website, sent to the Lyris email lists for the San Diego County, Orange County and Riverside County MS4 Permits, and Board Meeting Agenda, and mailed to San Diego County, Orange County and Riverside County Copermittees, and Resource Agencies.
	November 13,2012	Public Workshop for Tentative Order No. R9-2013-0001 conducted during of the November 2012 Board Meeting.
	November 26,2012	Meeting with representatives of San Diego County Copermittees Monitoring Workgroup. Purpose of the meeting was to discuss and provide additional information about the monitoring and assessment requirements of Tentative Order No. R9-2013-0001.
	November 27,2012	Meeting with representatives of San Diego County Copermittees. Purpose of the meeting was to discuss the requirements for the Beaches and Creeks Bacteria TMDLs.
	November 29,2012	Participated in Water Quality Improvement Plan Mock Plan Development Workshop (Day 1) conducted by the Los Penasquitos Watershed Management Area Copermittees.
	November 30,2012	Participated in Water Quality Improvement Plan Mock Plan Development Workshop (Day 2) conducted by the Los Penasquitos Watershed Management Area Copermittees.
	December 5, 2012	Meeting with representatives of San Diego County Copermittees. Purpose of the meeting was to discuss the requirements for the Beaches and Creeks Bacteria TMDLs.
	December 7, 2012	Meeting with representative of the Industrial Environmental Association (IEA). Purpose of the meeting was to discuss and provide additional information about the requirements of Tentative Order No. R9-2013-0001.
	December 12,2012	Continuation of November 13, 2012 Public Workshop for Tentative Order No. R9-2013-0001 conducted during of the December 2012 Board Meeting.
	December 13,2012	Meeting with representatives of San Diego County Copermittees Monitoring Workgroup. Purpose of the meeting was to discuss the monitoring and assessment requirements of Tentative Order No. R9-2013-0001.
	December 13,2012	Participated in Water Quality Improvement Plan Mock Plan Development Workshop (Day 3) conducted by the Los Penasquitos Watershed Management Area Copermittees.
	January 9, 2013	Meeting with representatives of the San Diego County Copermittees Land Development Workgroup. Purpose of the meeting was to discuss the development planning hydromodification management requirements.
	January 10, 2013	Participated in CASQA Annual Federal and State Stormwater and Regulatory Programs Updates Meeting as part of the panel on Developments in Stormwater Permit Design.
	January 11, 2013	Final date for submitting written public comments on the Tentative Order No. R9-2013-0001.
	March 20, 2013	Meeting with representatives of the Building Industry Association (BIA). Purpose of the meeting was to discuss and provide additional information about the non-storm water and development planning requirements of the Regional MS4 Permit.

April 10 and 11, 2013
Item No. 8
Supporting Document No. 4

008502

CALIFORNIA Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

October 31, 2012

San Diego County Copermittees
Orange County Copermittees
Riverside County Copermittees

In reply refer to / attn:
Place ID: 786088Wchiu

Subject: Tentative Order No. R9-2013-0001
San Diego Region MS4 Permit Reissuance

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) is pleased to release for public review and comment Tentative Order No. R9-2013-0001, NPDES No. CAS0109266, *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Tentative Order). Notice is hereby given that the San Diego Water Board will receive written comments on the Tentative Order in accordance with title 40 Code of Federal Regulations section 124.10 and Water Code section 13167.5.

The Tentative Order is a regional MS4 permit that proposes to jointly cover all 39 Copermittees within the San Diego Region (i.e., South Orange County, Southwestern Riverside County, and San Diego County), in a phased manner as their current MS4 permits expire or upon request for earlier coverage prior to permit expiration. The Tentative Order covers multiple discharge points to multiple receiving waters throughout the San Diego Water Board Region. All MS4 Copermittees in the San Diego Region are therefore on notice that they may ultimately be regulated under the Tentative Order, if adopted. Copermittees covered by the San Diego County MS4 permit (Order No. R9-2007-0001) must submit any written comments on the Tentative Order during the comment period described below. Copermittees covered by the Orange County and Riverside County MS4 permits (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), for which Reports of Waste Discharge have not yet been filed, are strongly encouraged to submit written comments on the Tentative Order during the comment period described below.

The Tentative Order includes in Attachment F, a Fact Sheet pursuant to title 40 code of Federal Regulations section 124.8 (a) that sets forth the principal background information and facts, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of the Tentative Order.

Document Availability
The Tentative Order, and attachments thereto, are available on the San Diego Water Board website at:
http://www.waterboards.ca.gov/rwqcb9/water_issues/programs/stormwater/index.shtml

You may also receive a copy of the Tentative Order by contacting Wayne Chiu at (858) 637-5558 or wchiu@waterboards.ca.gov or by visiting the San Diego Water Board's office at 9174 Sky Park Court, Suite 100, San Diego, California 92123-4340, weekdays between 8:00 a.m. and 5:00 p.m., telephone 858-467-2952.

Submission of Written Comments
Copermittees or interested persons wishing to submit comments on the Tentative Order must submit them so that they are received no later than **5:00 p.m. on Friday, January 11, 2013.** Written comments should be submitted to:

Wayne Chiu, P.E.
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego California 92123-4340

The early submission of written comments on the Tentative Order is encouraged. Electronic written comments are acceptable and should be submitted via e-mail to the attention of Wayne Chiu at wchiu@waterboards.ca.gov.

Please indicate in the subject line of all written comments "Comment – Tentative Order No. R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu." If the submitted written comments exceed five pages in length or contain foldouts, color graphics, or maps, 15 hard copies must be submitted for distribution to the San Diego Water Board members and staff.

The submission of written comments is the opportunity for Copermittees and interested persons to raise and comment on issues pertaining to the terms and conditions of the Tentative Order. All written comments including testimony, technical documentation and factual information pertaining to the terms and conditions of the Tentative Order to be considered by the San Diego Water Board at the as yet unscheduled public hearing must be received by 5:00 pm on January 11, 2013. At a later date following submittal of written comments, the San Diego Water Board will convene a public hearing to hear testimony and policy statements from the Copermittees and interested persons summarizing their written comments and to consider adoption of the Tentative Order. The scope of oral testimony at the public hearing will be strictly limited to summarizing the previously submitted written comments and making policy statements. No new issues may be raised at the hearing.

Consistent with State Water Board regulations that apply to this proceeding, written comments received after the close of the comment period will not be accepted and will not be incorporated into the administrative record if doing so would prejudice any party. Written comments received by the close of the comment period will be provided to the San Diego

Water Board members for their review in advance of a public hearing to consider adoption of the Tentative Order. All timely written comments will also be posted as they are received on the San Diego Water Board website at:

http://www.waterboards.ca.gov/rwqcb9/water_issues/programs/stormwater/index.shtml

Public Hearing for Consideration of Tentative Order Adoption
The San Diego Water Board will issue a separate notice announcing a public hearing to receive oral comments and consider adoption of the Tentative Order at a later date. Notice of the public hearing will be provided to the Copermittees and interested persons at least thirty (30) days in advance of the hearing. Participants will have an opportunity to address the San Diego Water Board members subject to reasonable limitations prior to the Board taking action on the Tentative Order.

The public notice providing the specific date for the San Diego Water Board adoption meeting and any other public notices related to the Tentative Order will be distributed through the Lyris e-mail list server and posted on the San Diego Water Board website at:

http://www.waterboards.ca.gov/rwqcb9/water_issues/programs/stormwater/index.shtml

Any person desiring to receive future public notices regarding this Tentative Order can subscribe to one of the electronic mail lists (i.e. Lyris List) titled “Orange County MS4 Permit”, “Riverside County MS4 Permit”, or “San Diego MS4 Permit ”, located on the San Diego Water Board website at:

http://www.waterboards.ca.gov/resources/email_subscriptions/reg9_subscribe.shtml

Contact for further Information
For questions or comments concerning this notice, please contact Wayne Chiu by phone at (858) 637-5558, or by email at wchiu@waterboards.ca.gov.

Respectfully,

David W. Gibson
Executive Officer
San Diego Regional Water Quality Control Board

DWG:dtb esb:law:wc

cc:

Distribution via US Mail and email: (see attached address list)	San Diego County Copermittees Orange County Copermittees Riverside County Copermittees Resource Agencies
Distribution list via email:	San Diego County MS4 Permit Lyris List Riverside County MS4 Permit Lyris List Orange County MS4 Permit Lyris List San Diego Water Board Agenda Lyris List

Tech Staff Info & Use	
Order No.	R9-2013-0001
Party (GT/CIWQS) ID	536787
File No.	n/a
WDID	n/a
NPDES No.	CAS0109266
Reg. Measure ID	387335
Place ID	786088
Person ID	n/a
Inspection ID	n/a

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Natural Resource Agencies

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November 2, 2012

Grant Destache, Chairman
California Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4353

Re: Receiving Water Limitations Language (Provision A) in Draft Regional MS4 Permit

Dear Mr. Destache:

On November 13, 2012, the San Diego Regional Board will hold a workshop on the proposed Regional MS4 Permit. A major policy issue for the Regional Board to consider at the workshop is how the Permit should address compliance with water quality standards in receiving waters. Consistent with the Clean Water Act and prior decisions of the State Board, such compliance for MS4 discharges should be achieved over time, through an adaptive management approach. However, the 9th Circuit Court of Appeal has recently interpreted receiving water limitations language similar to that proposed in Provision A as requiring strict and immediate compliance with water quality standards. To respond to this recent interpretation of similar language, the Regional Board should realign Provision A to reflect the original policy goal of compliance through an adaptive management approach.

The purpose of this letter is to stress that the Regional Board has the discretion to make the policy decision to realign the language of Provision A to reflect the adaptive management approach. For the following key legal reasons, the Regional Board has this authority:

- It is settled law that the Clean Water Act does not require MS4 discharges to strictly comply with water quality standards. (Defenders of Wildlife v. Browner

(9th Circuit) 191 F.3d 1159.) In 1987, when Congress created the MS4 permitting system, it expressly treated MS4 discharges differently than all other MS4 discharges. As Courts have affirmed, Congress unambiguously decided that strict compliance with water quality standards was not required for MS4 discharges.

- The State Board has developed standard receiving water limitations language and has expressly interpreted that language as not requiring strict compliance with water quality standards. (State Board Order 2001-15.) To the contrary, the State Board has explained that "compliance is to be achieved over time, through an iterative approach requiring improved BMPs."

- Other MS4 permits issued by U.S. EPA directly or approved by U.S. EPA have employed the adaptive management approach as the basis for compliance with water quality standards. These permits have not required strict and immediate compliance with water quality standards for MS4 discharges.

Because the Clean Water Act does not demand that MS4 discharges strictly comply with water quality standards, and because the State Board has confirmed that compliance is to be achieved over time through the iterative process, the Regional Board should revise Provision A to realign the language with this policy approach. In light of the unique nature of MS4 discharges, as recognized by Congress, strict and immediate compliance with water quality standards is generally not feasible or appropriate.

Although the State Board has scheduled a November 20, 2012 workshop to discuss the receiving water limitations language, the Regional Board should provide policy direction on this issue now. It is requested that the Regional Board provide direction to staff to revise the language of Provision A to reflect the adaptive management approach as the basis for compliance. It is also requested that the Regional Board provide direction to staff to work with the State Board to support State Board language based on the adaptive management process. Addressing this issue now is particularly important for the Regional Permit because a failure to address the issue will undermine the value and acceptability of the watershed-based approach reflected in the Permit. The innovative approach taken in the Permit may be undermined entirely by the rigid language in Provision A. To support and allow dischargers to embrace the watershed-based approach, Provision A must be realigned with the adaptive management process.

We ask that this letter be provided to the full Board in advance of the workshop. It has been authored and signed below by our office and by counsel on behalf of the City of San Diego and City of Santee.

Very truly yours,

THOMAS E. MONTGOMERY, County Counsel

By

James R. O'Day, Senior Deputy

JAN I. GOLDSMITH, City Attorney, City of San Diego

By

Heather Stroud, Deputy City Attorney

CITY OF SANTEE

Shawn Hagerty
BEST BEST & KRIEGER LLP

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Very truly yours,

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CITY OF SANTEE

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Mr. Destache

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Very truly yours,

THOMAS E. MONTGOMERY, County Counsel

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James R. O'Day, Senior Deputy

JAN I. GOLDSMITH, City Attorney, City of San Diego

By
Heather Stroud, Deputy City Attorney

CITY OF SANTEE

Shawn Hagerty
BEST BEST & KRIEGER LLP

CITY OF
CARLSBAD
Office of the City Manager

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November 5, 2012

Honorable Grant Destache, Chair
Honorable Board Members
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123

Re: TENTATIVE ORDER R9-2013-0001 REGIONAL NPDES PERMIT FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS OF WITHIN THE SAN DIEGO REGION

Dear Chairman Destache and Board Members:

On behalf of the City of Carlsbad (City), please accept the information contained in this letter as formal comment to Tentative Order R9-2013-0001 Regional NPDES permit for Municipal Separate Storm Sewer Systems (MS4s) draining the watersheds within the San Diego Region, in preparation for the Regional Board Member workshop on November 13, 2012.

The City would like to take this opportunity to thank the San Diego Regional Water Quality Control Board (RWQCB) personnel for their progressive approach to stakeholder involvement in drafting the Tentative Order in the past six months. Overall, the focused meetings have been successful and have resulted in an improved permit. However, there are a few areas that warrant further refinement to ensure the permit is implementable, effective at improving water quality where needed, and sustainable from a social, environmental, and economic perspective.

The San Diego Copermittees will be providing verbal comments during the workshop which are supported by the City.

The City is also a Responsible Party in the San Marcos Hydrologic Area (SMHA), and therefore subject to the Bacteria Beaches and Creeks TMDL regulations included in Attachment E of Tentative Order R9-2012-0001. The City of Encinitas, as the lead for the SMHA Responsible Parties has submitted a comment letter on behalf of the Responsible Parties, which is also supported by the City of Carlsbad. We look forward to your thorough review of both sets of comments.

City Hall
1200 Carlsbad Village Drive, Carlsbad, CA 92008-1949 T 760-434-2821 F 760-720-9461

We appreciate the opportunity to work with the Regional Board and stakeholders in the development of regulations to improve water quality in our region. If you have any questions or need further clarification, please do not hesitate to contact Elaine Lukey, Environmental Manager, at (760) 602-7582.

Sincerely,

John Coates

John Coates
Acting City Manager

cc: Ronald Kemp, Assistant City Attorney
Cynthia Haas, Deputy City Manager
David Hauser, Director Property and Environmental Management
Elaine Lukey, Environmental Manager

City of Del Mar

November 5, 2012

Honorable Chairman Grant Destache and Board Members
California Regional Water Quality Control Board
San Diego – Region 9
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

SUBJECT: TENTATIVE ORDER R9-2013-0001 REGIONAL NPDES PERMIT FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4S) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

Dear Chairman Destache and Board Members:

The City of Del Mar has been pleased with the progressive process used to engage the regional Copermittees and stakeholders in the MS4 Permit reissuance process. RWQCB staff deserves commendation for their efforts to accommodate the Copermittees' written and verbal comments received into the Tentative Order in a quick and timely manner. This effort demonstrates the shared commitment of the RWQCB staff and Copermittees to develop an implementable, cost effective Permit that leads to improvements in water quality conditions. In light of the upcoming Public Workshop on November 13th, 2012 for the NPDES MS4 permit reissuance, the City of Del Mar would like to take the opportunity to address some key issues regarding Tentative Order R9-2013-0001.

In addition to those identified above, the City would like to highlight some of the valued outcomes of the permit reissuance process thus far, namely the Water Quality Improvement Plans (WQIP) as watershed planning documents and the requirement of adaptive management. We also agree with the intended approach for points of compliance with the Permit, as stated by RWQCB staff at the June 27th, 2012 focused meeting with stakeholders. Staff indicated that compliance would be based on the submission of complete Water Quality Improvement Plans (WQIP) and also the implementation and assessment of those WQIPs. Assessment includes adaptation to improve programs and plans to meet the established WQIP goals and ultimately water quality standards.

However, there are areas within the Tentative Order that we feel continue to warrant further consideration. This letter identifies the three primary areas of utmost importance where the process thus far appears to have reached an impasse. For these three topics, the RWQCB staff states that they are either not willing or, contrary to our understanding, not allowed to make further changes. The specific areas include:

I. Receiving Water Limitations language in **Provision A** of the Tentative Order;

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II. Expression of Total Maximum Daily Load compliance is **Attachment E** of the Tentative Order, and;

III. Applicability of hydromodificaiton management requirements in **Provision E** of the Tentative Order.

A technical memorandum is attached with details on these topics of concern.

Our recommendations on these three issues are as follows:

I. Provision A Language Should Be Revised
The City urges you to provide direction to your staff to take an active and lead role on this extremely important issue. The new paradigm shift (WQIPs and required adaptive management) in the Tentative Order should be supported by revised state and local policies that encourage complete participation in the WQIP and adaptive management approach. Receiving water limitations language is driven by state and local policy and with a new standard of permitting upon us, the policies should reflect this new paradigm.

II. TMDL Compliance Should Be Consistent
The City of Del Mar urges you to direct staff to correct this apparent conflict between the RWQCB adopted Bacteria TMDL and the compliance requirements of the Tentative Order, Attachment E, Section 6.

III. Hydromodification Management BMPs Should Be Applied To Mitigate Hydromodification Impacts
The City of Del Mar respectfully requests you as RWQCB Members to direct RWQCB staff to include within the permit, the exemptions that were included in the HMP that RWQCB Members approved by Resolution No. R9-2010-0066 in 2010.

In summary, the City of Del Mar respectfully requests that RWQCB Staff and Copermittees work cooperatively on these three issues to find consensus and resolution. We appreciate your attention to our concerns, and we trust that this letter will be entered into the record at the November 13, 2012 meeting.

Sincerely,

Carl Hilliard
Mayor

cc: Del Mar City Council Members

Attachment: Technical Memo of November 1, 2012

City of Del Mar Memorandum

TO: Scott Huth, City Manager
Kathleen Garcia, Planning and Community Development Director

FROM: Mikhail Ogawa, Clean Water Manager

DATE: November 1, 2012

SUBJECT: San Diego Regional Water Quality Control Board Tentative Order R9-2013-0001

BACKGROUND

The San Diego Regional Water Quality Control Board (RWQCB) issues Municipal Separate Storm Sewer (MS4) permits to the Cities within San Diego County, the County of San Diego, the San Diego County Regional Airport Authority and San Diego Unified Port District (Copermittees). These permits are extensions of the federal Clean Water Act.

In April 2012, the RWQCB staff initiated an informal process by releasing an Administrative Draft of the forthcoming permit. The intent was to engage the Copermittees and stakeholders through focused meetings to allow the opportunity for a dialog to occur. The focused meeting process included five focused meetings, two public workshops, and a workshop sponsored by Orange County Copermittees focused on Hydromodification Management. The process has culminated in the release of a Tentative Order for public review on October 31, 2012. Public comments on the Tentative Order must be submitted by January 11, 2013. In addition, the RWQCB will hold a public workshop as a part of their regularly scheduled Board meeting on November 13th, 2012 to receive input from the public.

Two outcomes of the permit reissuance process thus far include Water Quality Improvement Plans (WQIP) as watershed planning documents and the requirement of adaptive management. The use of WQIPs as planning documents and allowing modifications to MS4 implementation programs, the Tentative Order offers a paradigm shift from previous prescriptive permits that may have led to unfocused programs not directed towards improvements in water quality.

In abridged terms, the WQIPs will be watershed planning documents intended to direct program implementation to focus on the highest of watershed specific water quality issues. The WQIP process requires Copermittees to establish interim and final goals where the objective is to bring MS4 discharges and waterbodies into compliance with water quality standards. The goals must be measureable so that progress towards them can be demonstrated. The WQIPs require schedules to be established for achievement of the interim and final goals. In some cases, these schedules may extend beyond the intended five-year life of the MS4 permit. Specific programmatic strategies are also prescribed to identify the means of achieving the established goals within the schedules. Lastly, the WQIPs also require adaptive management, so that Copermittees may learn from special studies and past efforts to use the most efficient and effective strategies and Best Management Practices to achieve water quality goals. The stated intent of the Permit is to have compliance based on the development, implementation and

adaptation of the strategies in WQIPs to meet the established goals and ultimately water quality standards.

CONCERNS REGARDING TENTATIVE ORDER

Provision A – Prohibitions and Limitations

The present use of the limitations in Provision A of the Tentative Order presents a dichotomy between requiring adaptive management BMP programs (i.e., WQIPs) and including receiving water limitations that prohibit discharges from the MS4s causing or contributing to violations of water quality standards[1]. The dichotomy may discourage the City from supporting the WQIP process, including adaptive management, if there is enforcement exposure based on the prohibition of discharges from the MS4s causing or contributing to violations of water quality standards. The City could be in violation immediately and continuously regardless of the efforts put towards the WQIPs and therefore may be discouraged from funding and participating in the adaptive management process that could ultimately work towards achieving water quality standards.

Board staff has verbalized that they have the discretion as to whether or not to enforce the receiving water limitations provision and intend not enforce this provision as long as the Copermittees demonstrate adequate progress through WQIP implementation and adaptation of program strategies. Furthermore, Board staff stated they have been directed to take a passive role and allow the State process[2] to be completed prior to making changes to the San Diego Regional MS4 Permit.

Attachment E – Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2013-0001

The Bacteria TMDL[3] states that for watersheds where there are no longer any impairments listed on the 2008 303(d) List (for REC-1 water quality standards), the Phase I MS4s are not required to submit a load reduction plan and are not subject to any further action under the TMDL as long as monitoring continues to support compliance with REC-1 water quality standards. However, if the impairment returns for REC-1 water quality standards, the Responsible Parties will be required to submit a load reduction plan to the RWQCB.

The City of Del Mar and other Responsible Parties in the San Dieguito and Los Peñasquitos watersheds demonstrated to the RWQCB that the two watersheds are within this scenario where the Pacific Ocean Shoreline of the two watersheds are no longer listed as impaired for indicator bacteria under REC-1 water quality standards. The Responsible Copermittees received written confirmation (see attached two email) that they are "not subject to further action under Resolution No. R9-2010-0001 as long as monitoring data continues to support compliance with the REC-1 water quality standards." This scenario essentially places our two watersheds in a "dormant TMDL", unless the Pacific Ocean shoreline of the one or both of the watersheds are relisted on future 303(d) lists for indicator bacteria[4].

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[1] Tentative Order R9-2013-0001 Provision A.2.a.

[2] State Water Resources Control Board is holding a Public Workshop on MS4 permits Receiving Water Limitations (RWL) Language on November 20, 2012. There is currently no schedule as to when and if the SWRCB will develop revised positions on RWL for MS4 permits.

[3] Revised TMDL for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek) adopted by SDRWQCB Resolution No. R9-2010-0001

[4] Page A66 of SDRWQCB Resolution No. R9-2010-0001

Attachment E, Section 6[5] of the Tentative Order requires, amongst other provisions, the compliance with Water Quality Based Effluent Limitations (WQBELs). The WQBELs as described in the Tentative Order are expressed as Receiving Water Limitations, Effluent Limitations and as Best Management Practices requirements. As written, the Responsible Copermittees in the two watersheds are required to meet the listed WQBELs even while under the "dormant TMDL" condition.

There is a conflict between relisting of the Pacific Ocean shoreline and the more strict WQBEL limitations. Relisting of the Pacific Ocean shoreline would be done under the criteria established in the 2004 SWRCB Listing Policy[6] which allows for a certain number of water quality standard exceedances prior to listing. The WQBEL limitations allow **zero** water quality standard exceedances under dry weather conditions – a much higher bar with which to comply. If the WQBELs are included in the final adopted Permit, at a minimum, the WQBEL compliance is only applicable when the TMDL is in an active phase – i.e., the waterbody is impaired and listed on the 303(d) list as specified in the Bacteria TMDL (SDRWQCB Resolution R9-2010-0001). Otherwise, the Copermittees will be required to focus intense resources to address bacteria at the Pacific Ocean shorelines where water quality monitoring has demonstrated that it is not an issue. This ironic paradox would be contradictory to the watershed based adaptive management process where the objective is to focus limited resources on the highest water quality issues.

Provision E.3.c.(2) Hydromodification Management BMP Requirements
The Tentative Order defines hydromodification as:

> The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

The Tentative Order requires that priority development projects, including redevelopment projects, are required to control post-project runoff flow rates and durations so as not to result in increased potential for erosion, or degraded instream habitat conditions downstream of the projects. There are several explicit exemptions for these requirements identified in the Tentative Order. However, these exemptions are not inclusive of many of the exemptions identified in the San Diego Regional Copermittees Final Hydromodification Management Plan[7] (HMP). The exemptions identified in the HMP include, but are not limited to, projects that discharges to an exempt river reach, or a tidally-influenced area and other areas where there was little or no increased potential for erosion, or degraded instream habitat conditions downstream of the projects.

Over 95% of the City of Del Mar's MS4 system drains directly to either the Pacific Ocean or to tidally influenced areas of the San Dieguito estuary and river. The areas that drain to the Pacific

[5] Attachment E, Section 6 of the Tentative Order is the Specific Provisions for Total Maximum Daily Loads Applicable to Order R9-2013-0001 for the Revised TMDL for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)
[6] State Water Resources Control Board – Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List, adopted September 2004
[7] Approved on July 14, 2010 by San Diego RWQCB Resolution No. 2010-0066

Scott Huth
SDRWQCB Tentative Order R9-2013-0001
November 1, 2012

Ocean will remain exempt per the Tentative Order, however, those areas that drain to tidally influenced areas of the San Dieguito estuary and river will not be exempt even though they have no Hydromodification impacts. The City will be forced to require priority development projects to mitigate for impacts they will not have.

City of
Encinitas

November 5, 2012

Honorable Grant Destache, Chair
Honorable Board Members
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, California 92123-4340

SUBJECT: TENTATIVE ORDER R9-2013-0001 REGIONAL NPDES PERMIT FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS OF WITHIN THE SAN DIEGO REGION

Dear Chairman Destache and Board Members,

As it relates to the forthcoming Public Workshop on November 13th, 2012 please accept this letter on behalf of the City of Encinitas and the responsible parties of the San Marcos Hydrologic Area (HA) including the Cities of Carlsbad, Escondido, San Marcos, and the County of San Diego, as identified in Resolution No. R9-2010-0001 incorporating into the San Diego Basin Plan the *Revised Total Maximum Daily Loads (TMDL) for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)* (Bacteria TMDL).

At the November 13, 2012 Public Workshop, two significant and interrelated regulatory Orders will converge that individually deserve careful consideration, and even more so collectively. Tentative Order No. R9-2013-0001 includes *Attachment E – Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2013-0001*, and specific provisions for implementing the TMDLs adopted by the San Diego Water Board. Included in *Attachment E* are compliance requirements specific to the Bacteria TMDL[1], including the San Marcos HA.

The Bacteria TMDL states that for watersheds where there are no longer any impairments listed on the 2008 303(d) List (for REC-1 water quality standards), the Phase I MS4s are not required to submit a load reduction plan and are <u>not subject to any further action under the TMDL as long as monitoring continues to</u>

[1] Revised TMDL for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek) adopted by SDRWQCB Resolution No. R9-2010-0001

support compliance with REC-1 water quality standards. However, if the impairment returns for REC-1 water quality standards, the Responsible Parties will be required to submit a load reduction plan to the RWQCB.

The City of Encinitas and the San Marcos HA Responsible Parties have demonstrated to the RWQCB that this hydrologic area is consistent with the scenario described in the Bacteria TMDL, as the Pacific Ocean Shoreline Segment at Moonlight Beach in Encinitas (in the San Marcos HA) is no longer listed as impaired for indicator bacteria under REC-1 water quality standards. The Responsible Parties received written confirmation (*See Attached E-Mail dated Wednesday, May 16, 2012)* that they are "*not subject to further action under Resolution No. R9-2010-0001 as long as monitoring data continues to support compliance with the REC-1 water quality standards.*" This scenario effectively places the San Marcos HA in a "dormant TMDL" status, unless the Pacific Ocean shoreline of the San Marcos HA is relisted on future 303(d) lists for indicator bacteria[2] and REC-1 impairment.

Attachment E, Section 6[3] of the Tentative Order requires, amongst other provisions, compliance with Water Quality Based Effluent Limitations (WQBELs). The WQBELs as described in the Tentative Order are expressed as Receiving Water Limitations, Effluent Limitations and as Best Management Practices requirements. As *Attachment E* of the Tentative Order is currently written, the Responsible Copermittees in the San Marcos HA are required to meet the listed WQBELs even while under the "dormant TMDL" condition.

Further exacerbating this conflict, there is a disparity between relisting of the Pacific Ocean shoreline and the more strict WQBEL limitations presented in the Tentative Order. If future conditions and monitoring data were to support a re-listing of the Pacific Ocean shoreline at Moonlight Beach, this would be done under the criteria established in the 2004 SWRCB Listing Policy[4] which allows for a certain number of water quality standard exceedances prior to listing. In clear contrast, the WQBEL limitations in the Tentative Order allow **zero** water quality standard exceedances under dry weather conditions – a much higher bar with which to comply than the listing criteria. In effect, San Marcos HA Responsible Parties will be required to focus intense resources to address bacteria at this Pacific Ocean shoreline segment where water quality monitoring has demonstrated an impairment does not exist.

---

[2] Page A66 of SDRWQCB Resolution No. R9-2010-0001
[3] Attachment E, Section 6 of the Tentative Order is the Specific Provisions for Total Maximum Daily Loads Applicable to Order R9-2013-0001 for the Revised TMDL for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)
[4] State Water Resources Control Board – Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List, adopted September 2004

In summary and in consideration of this involved and complex set of issues it is important to acknowledge the following facts:

- Per the 2010 303(d) list, the Pacific Ocean shoreline at Moonlight Beach (San Marcos HA) is NOT impaired for REC-1 Beneficial Uses (Moonlight Beach is the location that is the basis for including the San Marcos HA in the Bacteria TMDL).
- Per the 2010 303(d) list, the listing at Moonlight Beach for total coliform is based upon the water quality objectives for the SHELL beneficial use only, and as stated above, is not listed for REC-1.
- Per Resolution No. R9-2010-0001, the TMDL applies only to REC-1 and does not apply to SHELL impairments

  Pg. 4, footnote 17: "waterbodies with SHELL beneficial use impairments will be addressed in a separate TMDL project and/or standards action."

Based upon this background information and the conclusions presented above, at this time the Responsible Parties of the San Marcos HA would like to request your direction to RWQCB staff to address the conflict between the RWQCB adopted Bacteria TMDL and the compliance requirements of Tentative Order R9-2013-0001.

Sincerely,

Gus Vina,
City Manager, City of Encinitas

cc: Erik Steenblock, City of Encinitas
Todd Snyder, County of San Diego
Elaine Lukey, City of Carlsbad
Cheryl Filar, City of Escondido
Erica Ryan, City of San Marcos

Attachment A

Erik Steenblock

From: Deborah Jayne [djayne@waterboards.ca.gov]

Sent: Wednesday, May 16, 2012 5:27 PM

To: elaine.lukey@carlsbadca.gov; Erik Steenblock; vina@cityofencinitas.org; constantine_kontaxis@dot.ca.gov; cfilar@escondido.org; eryan@san-marcos.net; Todd.Snyder@sdcounty.ca.gov

Cc: David Barker; Deborah Woodward; Eric Becker; Jeremy Haas; Lisa Honma; Wayne Chiu

Subject: Your April 23, 2012 Letter Regarding Bacteria TMDLs and Moonlight State Beach

Dear Mr. Vina et al,
Thank you for your letter dated April 23, 2012 requesting written acknowledgment of your conclusions regarding the applicability of the Bacteria TMDLs to Moonlight State Beach and the requirement for submittal of a Bacteria (or Comprehensive) Load Reduction Plan (BLRP or CLRP).

The REC-1 TMDLs adopted under Resolution R9-2010-0001 remain in effect and applicable at Moonlight State Beach. However you are correct that the Responsible Parties (RPs) are not required to submit a BLRP or CLRP (specific to this beach segment) within 18 months of the effective date of the Bacti I TMDLs because this beach segment is not currently impaired/listed for REC-1. Furthermore, the Moonlight State Beach segment is not subject to further action under Resolution No. R9-2010-0001 as long as monitoring data continues to support compliance with the REC-1 water quality standards (Resolution No. R9-2010-0001 page A2). If, however, the segment is re-listed on a future 303(d) List for a REC-1 impairment, the RPs will be required to submit a BLRP or CLRP for this beach segment within 6 months of the adoption of the 303(d) List by the San Diego Regional Board (Resolution No. R9-2010-0001 page A66).

I trust this email adequately addresses your inquiry regarding TMDL applicability and BLRP or CLRP submittal. Regarding ongoing monitoring requirements, please refer to your MS4 permit for the general requirements and direct any specific monitoring questions to Mr. Wayne Chiu at wchiu@waterboards.ca.gov . Please feel free to contact me or Wayne at any time if additional clarification is needed.

Sincerely,

Deborah Jayne
Senior Environmental Scientist
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, California 92123-4340
Office: (858) 467-2972
Fax: (858) 571-6972
e-mail: djayne@waterboards.ca.gov

THE CITY OF SAN DIEGO

December 4, 2012

VIA EMAIL to: rb9agenda@waterboards.ca.gov

Mr. Gary Strawn
Acting Chair
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123

Subject: Tentative Order No. R9-2013-0001, December 12, 2012 Regional Board Meeting Agenda Item No. 11

Dear Mr. Strawn:

Thank you for the opportunity to participate in the Regional Water Quality Control Board's (Regional Board) December 12, 2012 workshop regarding the Tentative Order No. R9-2013-0001 hereinafter referred to as the "Tentative Order." This letter is being submitted to communicate the City of San Diego's (City) concerns regarding the Tentative Order for discussion at the Regional Board's December 12th meeting. A summary of the key issues is provided below. In addition, the City participated with the Copermittees in the San Diego region to develop written responses to the questions raised by the Regional Board at the November 13, 2012 workshop. The City requests that the Regional Board direct staff to work with the Copermittees to address these remaining issues before considering approval of the Tentative Order.

- *Revise the Tentative Order to allow a Copermittee to achieve compliance with Receiving Water Limitations, Areas of Special Biological Significance (ASBS) and Total Maximum Daily Load (TMDL) requirements, if the Copermittee is implementing an approved Water Quality Improvement Plan.* The City is committed to protecting and improving water quality in the San Diego Region. To that end, it is the City's objective for the Tentative Order to allow for the City to efficiently integrate its TMDL, ASBS and Municipal Permit requirements into an adaptive management program that allows the City to achieve compliance through implementation and iterative improvement of programs designed to achieve water quality goals. The mechanics and structure of the Water Quality Improvement Plan developed by Regional Board staff provide an innovative, thoughtful, and strategic framework for such an approach. However, the Tentative Order still does not provide a pathway for the City to achieve compliance with ASBS and TMDL regulations and the

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Hotline (619) 235-1000 Fax (858) 541-4350

Tentative Order's receiving water limitations while implementing the Water Quality Improvement Plans. Without these linkages, there remains little incentive for the City to undertake the significant increases in investments that would be required to implement the Water Quality Improvement Plans.

- *Revise the Bacteria TMDL requirements to allow for load- and BMP-based compliance, per the adopted Bacteria I TMDL.* The Bacteria I TMDL Basin Plan Amendment included options for concentration and load-based methods of calculating Waste Load Allocations. In addition, the Basin Plan Amendment allowed for the possibility of BMP-based compliance with the Bacteria I TMDL provided certain criteria and assurances were acceptable to Regional Board staff. These options should be included in the Tentative Order.

- *Revise the Tentative Order to uphold the previously adopted San Diego Hydromodification Management Plan (San Diego HMP), Resolution No. R9-2010-0066.* This plan has been in effect for less than two years. The San Diego HMP was developed by an expert consultant team that utilized extensive scientific studies, analysis and modeling to determine the appropriate hydromodification control criteria. Additionally, the San Diego Copermittees have embarked upon a $1.5 million, 5 year monitoring plan to validate the parameters and design criteria. There have been no scientific advances in the last 2 years to justify revisions to the San Diego HMP, therefore we request allowing the Copermittees to continue implementation of the current San Diego HMP.

- *Replace the monitoring and assessment requirements in the Draft Permit (Provision D.4) with the strategic monitoring approach developed collectively by the Copermittees.* The Copermittees' approach will more efficiently and effectively address critical questions necessary to adaptively manage the City's programs and realize our storm water quality goals.

We appreciate this opportunity to share our comments and look forward to continued discussions in finding ways to improve and protect water quality. If you have any questions please contact Drew Kleis, Program Manager at (858) 541-4329.

Sincerely,

Kris McFadden
Deputy Director

KM:dk

cc: David Gibson, Executive Officer, San Diego Regional Water Quality Control Board
Heather Stroud, City Attorney's Office
Bill Harris, Transportation & Storm Water Department
Sumer Hasenin, Transportation & Storm Water Department
Ruth Kolb, Transportation & Storm Water Department
Andre Sonksen, Transportation & Storm Water Department

RECEIVED
COUNTY OF SAN DIEGO
DEC 17 2012
DEPT. OF PUBLIC WORKS
ADMINISTRATIVE OFFICE

Pala Pauma Valley Community Sponsor Group
P O Box 1273, Pauma Valley, CA 92061
760.481.4201

By: USPS

Monday, December 10, 2012

Mr. Rich Crompton, Director
County of San Diego Department of Public Works
5510 Overland Ave, Ste 410
San Diego, CA 92123

Dear Mr. Crompton,

Re: Comment – Tentative Order No.R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu

At its December 4, 2012 meeting the Pala Pauma Community Sponsor Group ("PPCSG") voted unanimously to support the action of San Diego County to protect water quality while controlling the mounting and unsubstantiated costs of increased regulation on local governments, business and industry. In particular, PPCSG supports the view that regulation based upon unproven science used in pursuit of parametric objectives that are apparently unattainable is poor governance and detrimamential to the interests of our community.

PPCSG believes that it is incumbent upon regulatory agencies to ensure that their enacted regulations are practical, cost-effective, and scientifically based. We are concerned that, otherwise, public funds may have to be spent to comply with requirements that are not proven nor effective, and that this will ultimately reduce the funding available for community projects and essential public services and increase the costs absorbed by trade and industry thereby inhibiting badly needed economic growth.

It appears that, as written, the Tentative Order will result in a significant and unprecedented level of regulation and cost without clear scientific basis or environmental benefit. The three main areas of concern in the draft permit are: i.) a far-reaching Bacteria Total Maximum Daily Load ("BTMDL"), ii.) additional requirements for development projects, and iii.) performance standards that unnecessarily expose municipalities to third-party lawsuits

PPCSG understands that the cost to comply with the Bacteria TMDL is estimated to be between $2.6 billion and $4.9 billion for the named watersheds in the region over the 20 year TMDL compliance timeline, of which only 18 years remain. The numeric targets in this TMDL may never be attainable even if government agencies were to spend billions in public resources, thereby increasing the costs of business and trade. PPCSG understand that available technology does not exist to return urbanized watersheds back to pristine, "reference" conditions.

Additionally, the Tentative Order requires that new and re-development projects return site hydrology to pre-development conditions as opposed to pre-project conditions. Returning urban infill projects to conditions that existed under "natural", pre-urban conditions would be a substantial constraint to re-development to the disadvantage of general Plans that seek to use infill development as a way of reducing urban sprawl. Further, the Tentative Order ignores all of the good work invested in the Hydromodification Management Plan developed at a significant cost to the public over the past years between the County and Regional Board staff and apparently seeks to impose a new, one-size-fits-all requirements standard that is unrealistic and without scientific justification. The result of all these changes is that the structures built to mitigate development impacts will need to be bigger and will cost significantly more than under the currently approved program.

PPCSG understands that receiving water limitations language is contrary to the intent of the Federal Clean Water Act, which is to assure municipal agencies will be regulated to a reasonable standard resulting in State and Regional Water Boards having the responsibility to ensure that water quality regulations are applied in a context that results in economic and environmental sustainability. PPCSG further understands that the 21 Co-permittees in our region (the County, 18 cities, Port District, and Airport Authority) already spend close to $120 million a year to comply with current regulations. PPCSG would like to see the Regional Board adopt Permit standards that will be cost neutral in a way that local municipalities will have the flexibility to apply funding to priority areas.

PPCSG is hopeful that the final permit language will result in programs that are rational from both environmental and economic standpoints -regulation within reason- and not impose upon our community the crippling disadvantages of regulation without reason.

Yours sincerely,

Charles Mathews, Chair,
Pala Pauma Valley Community Sponsor Group.

Copy: PPCSG members
Gary Strawn, Vice Chairman
Eric Anderson, SD RWQCB
Henry Abarbanel, SD RWQCB
Tomas Morales, SD RWQCB
David Gibson, SD RWQCB
Wayne Chiu, SD RWQCB
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego California 92123-4340
Stephanie Gaines, DPW Watershed Protection Program (by email)

Via e-mail to lwalsh@waterboards.ca.gov

San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

December 10, 2012

RE: Supplemental Comments for Aliso Watershed in South Orange County
San Diego Regional Municipal Separate Storm Sewer System (MS4) Permit,
Tentative Order No. R9-2012-0011

The South Laguna Civic Association, established in 1946, supports comments and recommendations submitted September 14, 2012 by the "Environmental Groups" regarding the administrative draft of the San Diego Regional Municipal Separate Storm Sewer System (MS4) Permit, Tentative Order No. R9-2012-0011 ("Administrative Draft Permit").

While a regional permit can provide improved levels of efficiency, smaller, high value habitats and coastal receiving waters established as critical marine life recovery areas may be overlooked. The Aliso Watershed in south Orange County represents an area requiring closer consideration.

Aliso Creek discharges 1 to 5 million gallons per day of dry weather urban runoff from known inland MS4 point sources. Twenty years of monitoring reports and over $20 million have clearly

identified at least one dozen offending storm drains with daily dry weather flows exceeding 150,000 gallons per day (GPD). Only one storm drain in Laguna Niguel has received a Clean-up and Abatement Order during this period.

As recently as 1982, surveys of Aliso Creek indicated no flows throughout the dry season. In fact, early ranching of Aliso Canyon with subsequent destruction of critical native trees and vegetation led to long drought conditions and widespread, fatal dehydration of cattle.

Today, the primary source of elevated creek flows originates exclusively from inland over-irrigation and careless discharges of recycled water. Non-native creek flows transport a toxic variety of pollutants and carcinogens from residential, commercial and municipal known point sources with measurable quantities of herbicide, pesticide, fertilizer, automotive and similar residues to protected creek, estuary and coastal receiving waters. Aliso Beach is permanently posted for contaminated water and remains a risk to public health and safety.
(Please see Exhibit A – 2011 Aliso Creek Daily Flow/e.g., August 1, 2011 @ 7.6cfs = 4.9 MGD)

Economics of Water Pollution

Water Districts profit significantly from the sales of recycled water yet fail to be held accountable by the SDRWQCB for illicit discharges generated specifically by careless over-irrigation. Over-irrigation produces hundreds of thousands of dollars in excess revenues each year to inland Water Districts that persistently ignore the impact of their product water. Profiting from water pollution discharges to protected receiving waters is illegal as adjudicated by Friends of the Earth v Laidlaw (2000) and other statutes and regulations.

"District Court found that Laidlaw had gained a total economic benefit of $1,092,581 as a result of its extended period of noncompliance with the permit's mercury discharge limit; nevertheless, the court concluded that a civil penalty of $405,800 was appropriate. In particular, the District Court found that the judgment's "total deterrent effect" would be adequate to forestall future violations..." (Friends of Earth, Inc. v. Laidlaw Environmental Services (TOC), Inc. - 528 U.S. 167 (1999)

In the Aliso Watershed, recycled water sold for irrigation and over watering produces an average creek discharge flow of 3 MGD during the nine month dry season. Sold at $1000 per Acre Foot (AF), this irrigation product water yields revenues to inland Water Districts of over $10 million during the five year MS4 Permit cycle. (calculation: 3 MGD = 9 AF x $1000/AF x 300 days = $ 2.7/year x 5 year permit cycle = $10 mil+).

Lacking effective enforcement measures by the SDRWQCB, these excessive and illegal profits encourage increased sales of irrigation water without any accountability for the obvious impacts of water products to protected creek and coastal receiving waters. The Irvine Ranch Water District, El Toro Water District, Santa Margarita Water District and Moulton Niguel Water District must not be allowed to profit from water pollution.

Persistent violations of MS4 requirements are acknowledged by all parties yet the SDRWQCB refuses to invoke effective enforcement measures and fines. Without economic disincentives, offending Water Districts gain illegal profits while inland cities accumulate tax property revenues from poorly

engineered development projects. Citations against the more egregious offending storm drain dischargers can release funds for effective mitigation measures and support incentives for regional MS4 compliance.

Environmentally Sensitive Areas (ESA)

The Aliso Watershed is a compact 34 square mile area suffering decades of neglect and pollution originating from poorly engineered residential developments among inland cities. Plans to add 17,000 new houses to South Orange County in the coming years will exacerbate the water pollution crisis facing Laguna Beach. Runoff management plans fail to control dry weather urban runoff and knowingly contribute directly to increased flows and erosion during routine storm events.

The Aliso Creek Wilderness Park remains degraded from erosion impacts to streambed habitat and threatens to expose critical sewage infrastructure transporting 10 to 15 million gallons of secondary sewage to the Aliso Creek Ocean Outfall only 1.2 miles offshore. A recent study by TetraTech for the South Orange County Wastewater Authority (SOCWA) determined the integrity of creek infrastructure to be capable of failure in as little as 5 years. Coastal receiving waters at the mouth of Aliso Creek are impaired by polluted urban runoff flowing at 1 to 5 million gallons per day (GPD). Aliso Creek is listed as a 303(d) Impaired Water Body by the Clean Water Act and continues to fail to meet present and previous MS4 Permit requirements. (Exhibit B – Aliso Creek Watershed 303(d) Impaired Waterbodies)

All Co-Permitees, as signatories to the MS4 Permit, are legally responsible for water quality in terms of coastal receiving waters. The regulatory and legal nexus is clear between unpermitted discharges by inland Co-Permitees, creek erosion and infrastructure damage, ocean pollution and public health hazards associated with these contaminated daily flows.

Aliso Beach, at the mouth of the federally listed contaminated creek, is permanently posted. However, coastal receiving waters are protected as the Laguna Beach State Marine Conservation Area established unanimously by the California Fish & Game Commission on January 1, 2012.

Laguna Beach State Marine Reserve

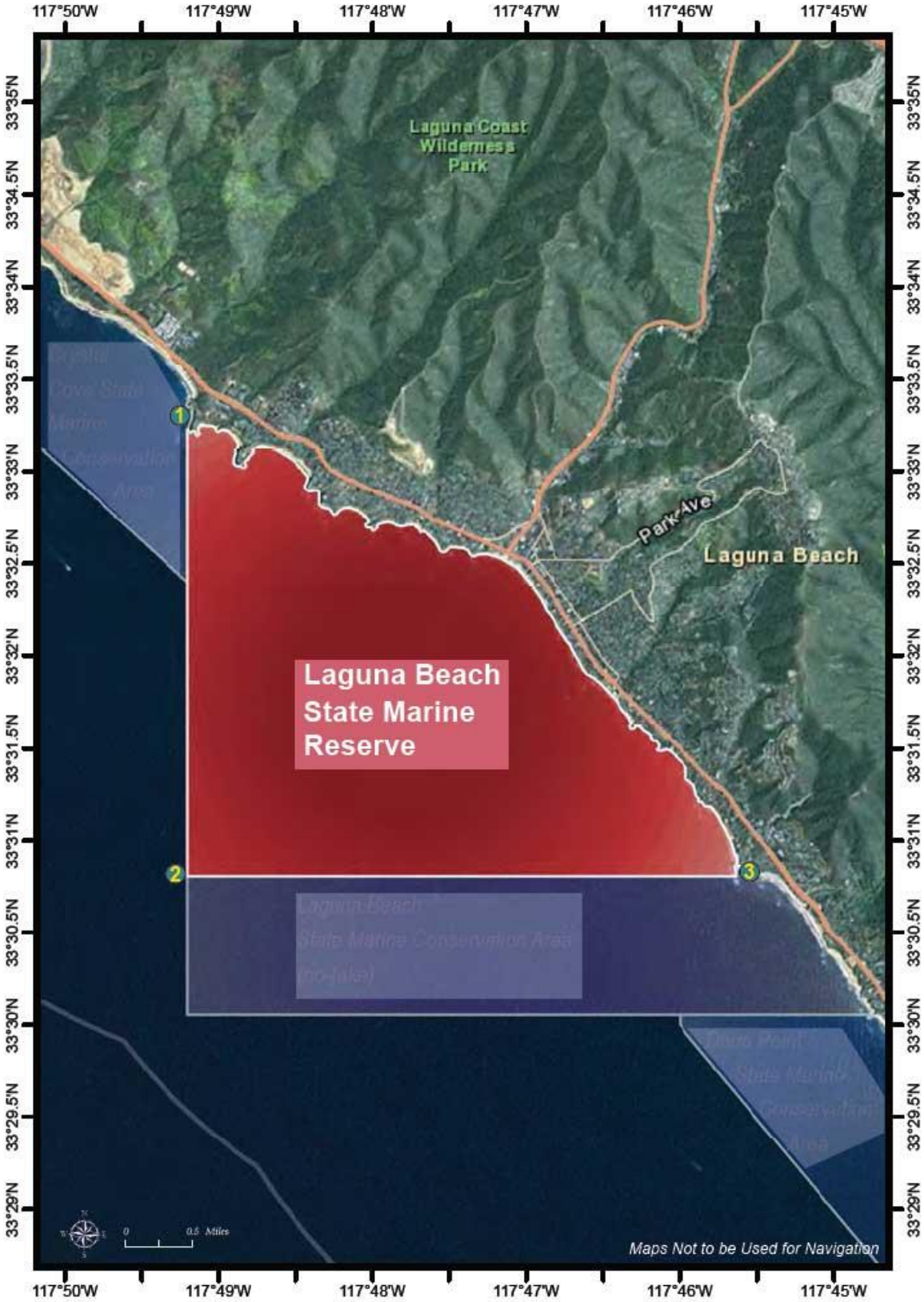

The proposed MS4 Permit does not adequately address efficacious measures to protect creek and coastal receiving waters while allowing contaminated discharges to persist without adequate enforcement actions. Lacking meaningful enforcement actions, inland cities as Co-Permitees, persist in ignoring or circumventing water quality regulations with impunity while creek and coastal receiving waters and ESA habitats continue to be incrementally degraded by polluted dry weather flows. Damage to coastal habitats is cumulative and potentially expensive in terms of restoration.

Likewise, failed Best Management Practices (BMP) stormwater facilities required as a Condition of Approval for inland residential, industrial and municipal developments are inadequately engineered devices incapable of mitigating elevated flows from stormwater events directed to creek and coastal receiving waters. The cumulative impacts of contaminated dry weather discharges and elevated stormwater flows have destroyed the functions of the Aliso Estuary (a protected coastal wetland), tidepools, fish nurseries and local kelp forests.

Shellfish areas in California receive the highest water quality protection standards. The economic value of shellfish to the economy is well established and place names such as Abalone Point, Mussel Cove, Shellfish Beach, etc. along Laguna Beach's coastal receiving waters suggests the prominence of shellfish habitat in the local area. Routine underwater surveys of mussel grounds near the mouth of Aliso Creek reveal large areas of dead shellfish likely exposed to the urban runoff plume. Dry weather discharges and elevated stormwater flows to Laguna Beach's coastal receiving waters are incompatible with protection of ESA Shellfish habitat and should be vigorously regulated and prohibited in the proposed MS4 Permit.

Laguna's coastal receiving waters are prime foraging grounds for protected marine life including coastal dolphins, gray whales and blue whales.

Safari/Marc Carpenter, via Associated Press

A blue whale surfacing at 1000 Steps, South Laguna

The California Coastal Act is specific in protecting the health and welfare of marine mammals among other species. Therefore, the proposed MS4 Permit must address water quality inconsistencies among regulating agencies.

1. California Coastal Act, Article 4, Section 30230. Recent summer sightings of federally protected Blue Fin Whales feeding at the location of the Aliso Ocean Outfall suggest the need for compliance with the Coastal Act. The unseasonal presence of marine mammals feeding on krill indicates the presence of phytoplankton populations sustained by nutrient rich urban runoff and offshore sewage discharge plumes migrating to surface waters. New research also highlights the presence of hormonal endocrine disruptors in recycled water and sewage discharges as a contributing factor in the feminization of male fish.

2. California Coastal Act, Article 4, Section 30231. The SDRWQCB overlooks requirements for "the biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of waste water discharges and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface water flow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams."

3. Water Reuse Law, Water Code Sections 461-465 and Water Reclamation Law, Water Code Sections 13500-13556 requiring beneficial reuse of inland water product to implement recycled water throughout Laguna Beach in achieving a State mandated 20% reduction in imported water by 2020.

The recent Army Corp of Engineers Study Area Map recognizes the relationship of MS4 regulated areas by incorporating the coastal receiving waters for lower Aliso Creek project considerations. No similar map or chart is available to track and monitor regulated coastal receiving waters subjected to the contaminated urban runoff "freshwater lens".

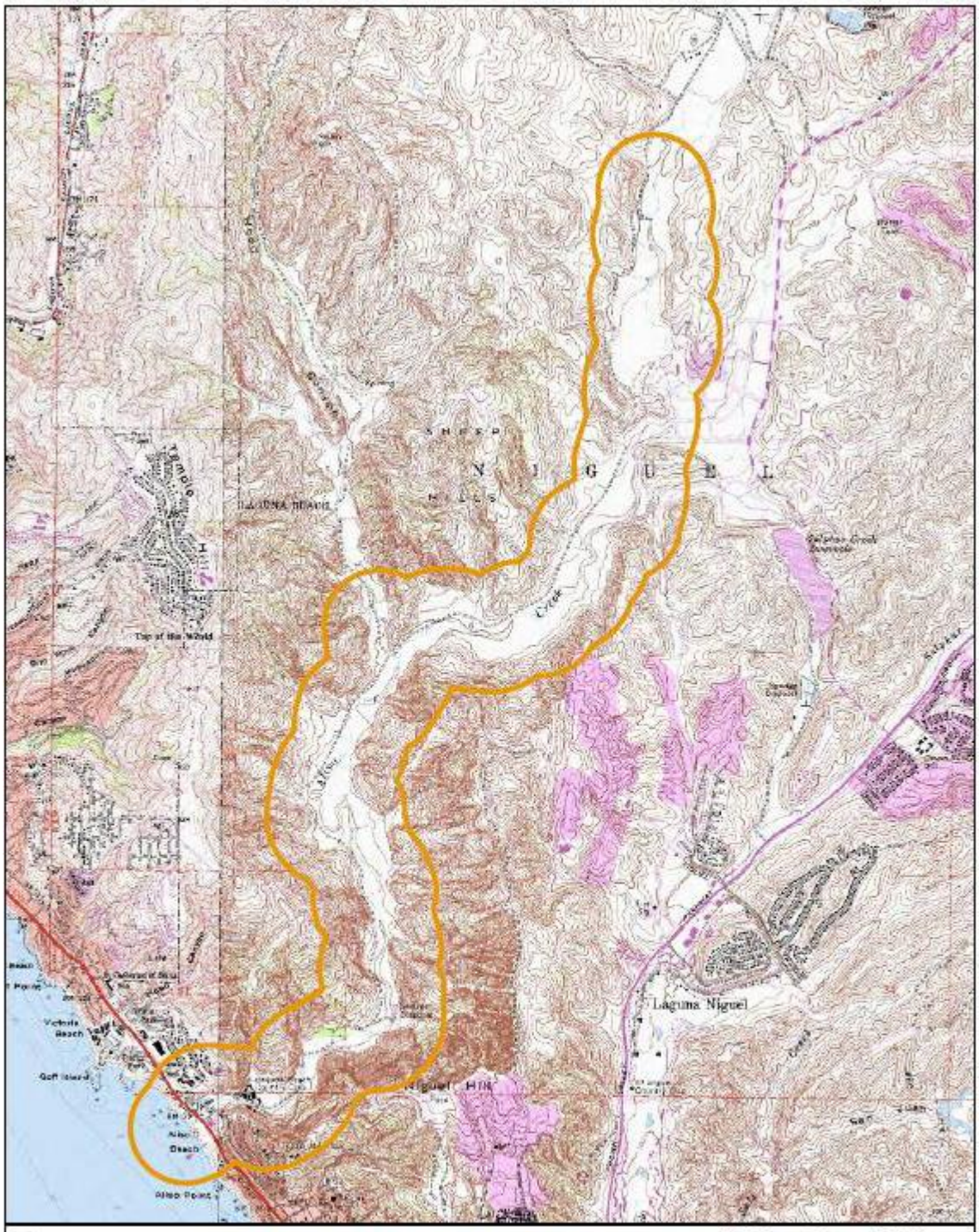

N

CDM

Legend

Study Area Boundary

0.25 0 0.25
Miles

U.S. Army Corps of Engineers
Aliso Creek Ecosystem Restoration Study
USGS Topographic Map

Figure 2.1-1

Urban Runoff, Secondary Sewage Discharges & Ocean Upwelling

Coastal receiving waters at the mouth of Aliso Creek are protected as the Laguna State Marine Conservation Area (SMCA). These important tidepool, rocky shore and kelp forest habitats, however, are subjected to multiple water pollution impacts from the combined urban creek urban runoff plume and Aliso Creek Ocean Outfall.

Ocean upwelling transports contaminates from the offshore sewage discharges to shore and mix with the visible creek urban runoff freshwater plume. Harmful algae blooms fed by these "nutrient rich" discharges plague coastal receiving waters and contribute to the destruction of kelp forests and shoreline fish nurseries. Beach visitors, often from regional low-income disadvantaged communities, suffer exposure to severe public health threats.

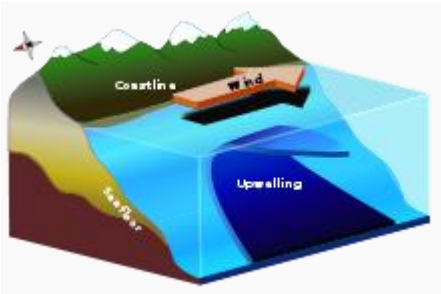

Multiple requests to South Coast Wastewater Authority for a comprehensive interactive map of the Aliso Creek coastal discharge plume and the Aliso Creek Ocean Outfall Plume are routinely ignored. An accurate map will identify protected coastal receiving water resources including tidepools, rocky fish nurseries and shellfish habitats, kelp forests, dolphin birthing and foraging grounds, as well as near shore whale migration routes. Charting dominant littoral currents and counter currents will reveal distribution patterns of urban runoff induced Harmful Algae Blooms and thermal plumes. Lacking such basic information, assurances of safe ocean water quality are presented without a fundamental scientific understanding of coastal dynamics.

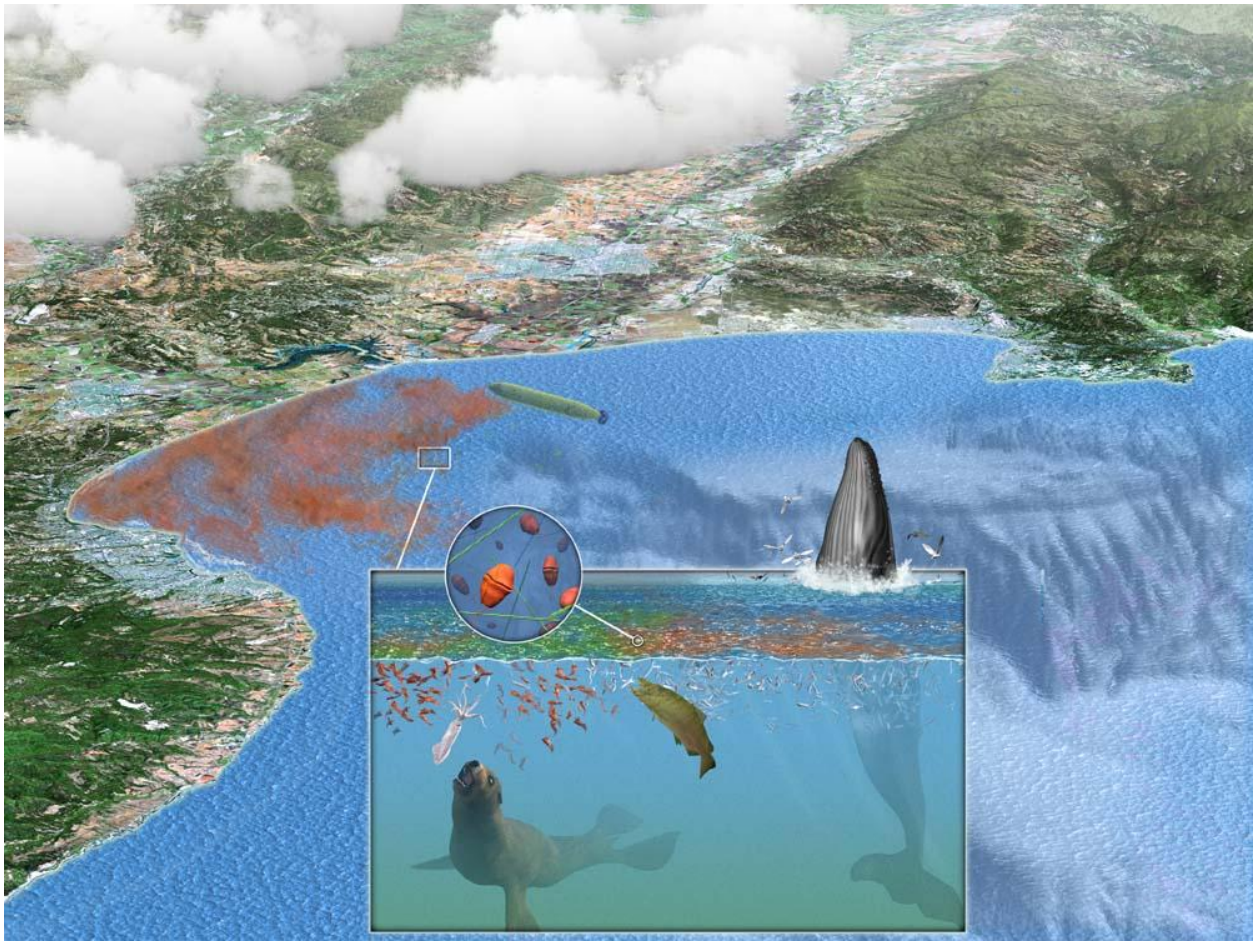

Dry weather urban runoff plumes to Laguna's coastal receiving waters feed summer-long Harmful Algae Blooms (HABs) contributing to domoic acid poisoning of sea lions, whales, shellfish and fishing resources.

Hydromodification

The rapid regional development of residential tracts over the past few decades has been accomplished using grading techniques to create long, flat terraced building sites. In an effort to simplify construction on flat sites, natural contours are replaced with cut and fill earthworks removing natural top soils before paving over hydric substrates and native deep root vegetation. These practices expose expansive clay soils.

Developers avoid expensive deep caissons to bedrock or multiple dewatering wells and simply pour concrete pads over unstable clay substrate. City leaders seeking increased tax revenues and development fees utilize engineers unfamiliar with local clay soils and the semi-arid ecology to approve massive grading plans that ultimately fail.

Unsuspecting homeowners subsequently experience extensive expansion and contraction of clay subsoils following annual storm events. As foundations fail, water supply lines, sewage lines and

related infrastructure become compromised requiring expensive repairs. By this time, however, developers have either moved or filed for bankruptcy protection leaving thousands of present homeowners without remediation opportunities. Engineers, city planners and elected officials, while complicit, are not held accountable through enforcement by the SDRWQCB. Poorly engineered residential developments with substandard clay soils continue to be approved to aggravate the condition and burden taxpayers for expensive repairs.

The Aliso Watershed is a clear example of faulty hydromodification design. Beginning with the construction of the federal Chet Holfield Ziggerat Complex, large areas of the native creek with valuable hydric soils were paved over for massive parking lots. The channelized creek lost critical inland wetlands and groundwater percolation sites with the removal of over 1500 feet of the creek ox bow. This wetland site historically provided water, fish and double canopy vegetative cover for the early "Nigueli"... the name of a Juaneno Native American village once located near a lagoon along Aliso Creek. The City of Laguna Niguel derives its name from the Spanish designation of this critical creek ox bow area.

Systematic destruction of vast native watershed trees and vegetation to support early ranching activities continue to plague the effectiveness of this and many watersheds in the San Diego region. Developers and complacent city planners exploiting degraded ranchlands simply continue the "biodegradation" while avoiding the true costs to the environment and taxpayers for their profiteering urbanization schemes. Facing unrelenting pressure from developers, water districts and municipalities, regulatory agencies charged with protecting critical creek and coastal receiving waters, fail to invoke effective enforcement with measurable water quality benefits.

Recommended Actions

Poorly engineered projects can be re-engineered to achieve mandated water quality objectives.

1. Maps of all creek and coastal receiving waters indicating water quality impacts can be created by SCCWRP, Scripps, NOAA or any number of competent university or regulatory groups. A Bioregional Watershed Map will identify degraded land elements, offending storm drain outlets and candidate areas for re-forestation and estuarine/coastal restoration.

2. On an annual basis, citations against the primary six known storm drain point sources in each watershed can incrementally compel clean-up and abatement throughout a given watershed bioregion without the burden of costs to abate all points of contamination at once. Failed Best Management Practices (BMPs) urban runoff facilities, required as a Condition of Approval for inland residential developments, can be retrofitted with dry weather diversions to local Publically Owned Treatment Works (POTWs) or, alternatively, re-engineered with deep groundwater injection wells.

3. Fines must be allocated to re-vegetate impaired watersheds and kelp forests to restore the native functions of semi-arid creeks and protected coastal receiving waters. A re-forested Aliso Canyon with a canopy similar to San Mateo Creek will qualify for California Cap and Trade

funding to offset costs. Restoration of natural habitats is demonstrated to be the best, most cost effective measure for improving watershed water quality.

4. Restoration of high value coastal wetlands and estuaries will guarantee protection of natural beach sand berms and provide measurable improvement to coastal receiving waters. Funds from the California Coastal Conservancy and other wetland recovery resources can offset costs.

5. Watershed restoration will offer multiple community benefits by reducing destructive stormwater flows, eliminating pollutants and increasing eco-tourist revenues to surrounding cities. Large street cisterns incorporating designs proposed by GeoSynTech for the re-development of the Aliso Golf Course can serve as a model for extensive rainwater harvest/reuse systems. Restoration of some or all of the 1500 foot Aliso Creek Ox Bow in Laguna Niguel can restore hydric soils to reduce stormwater impacts.

6. Increased use of recycled water for wildland fire suppression along the entire Highway 73 Toll Road bisecting the Laguna Greenbelt will maintain a healthy, fire safe wilderness area. Orange County Measure M and State Proposition funds are available to offset costs. Increased use of recycled water reduces ocean discharges to the Laguna State Marine Conservation Area.

7. A citywide network of recycled water for all of Laguna Beach will reduce imported water demand significantly and increase water security, disaster preparedness and fire suppression resources. Revenues from routine use for irrigation mandated Fuel Modification Zones will provide new revenue streams. Laguna Beach is the only Orange County city without a comprehensive recycled water program and remains a "once use" community of valuable imported water.

The MS4 Permit Renewal process offers the opportunity to advance beyond failed measures and begin the renewal of the region's unique watershed and coastal ecology. All Stakeholders can benefit through proactive initiatives and, as the overall watershed ecology improves, the cost savings from stormwater damage, water pollution, protracted litigation and public health threats will become evident. The South Laguna Civic Association has offered constructive, critical information and suggestions during the previous MS4 Permit cycle which have been largely ignored to the public's detriment.
(Exhibit C – SLCA Comments on Tentative Order No. R9-2007-0002 NPDES, No. CAS0108740)

Cooperation and courage are essential and the South Laguna Civic Association remains committed to working towards real, measurable, sustainable solutions. On behalf of our community and the many visitors from throughout the world to our shores, we thank you for your review and support of our recommended actions.

Michael Beanan

Vice President
South Laguna Civic Association

mike@southlaguna.org

Attachments

Exhibit A - Daily Mean Discharge in Cubic Feet/Second - Water Year Jul 2011 to Jan 30, 2012
Exhibit B - Aliso Creek Watershed 303(d) Impaired Waterbodies)
Exhibit C – SLCA Comments to Tentative Order No. R9-2007-0002 NPDES, No. CAS0108740

Exhibit A - Daily Mean Discharge in Cubic Feet/Second Water Year Jul 2011 to Jan 30, 2012

Day	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
1	5.5	7.6	5.7	4.9	4.9	4.9	5.6		
2	5.4	6.3	5.6	4.6	4.8	4.8	5.6		
3	5.3	5.6	5.6	4.6	4.8	5.2	5.7		
4	5.8	5.4	5.5	12	26	4.9	5.6		
5	5.8	5.4	5.9	145	13	5	5.9		
6	5.5	5.4	6	28	20	5.4	5.8		
7	5.4	5.5	5.6	10	11	5.7	5.7		
8	5.5	5.4	5.4	6.9	6.9	6	7.1		
9	5.8	5.7	5.4	5.8	5.7	6.5	6		
10	5.7	5.6	8.4	5.3	5.2	5.9	5.6		
11	5.7	6	7.8	5	5.1	5.7	5.7		
12	5.8	5.8	7.1	5	36	22	5.7		
13	5.7	5.8	5.7	5.1	18	16	5.8		
14	5.8	5.7	5.2	5.1	8.7	8	5.4		
15	6	5.6	5.2	4.9	6.3	38	5.5		
16	5.9	5.7	5.1	4.9	5.5	18	19		
17	5.9	5.7	5.4	5	5.3	8.2	7.4		
18	5.9	5.4	5.3	5.3	5.2	6.9	6.1		
19	5.9	5.7	5.1	5.4	5.1	6.3	5.7		
20	5.8	5.7	5.1	5.4	86	6.4	5.5		

21	5.8	5.6	5	5.6	36	6		69	
22	6	5.6	5	5.3	10	5.5		16	
23	5.9	5.8	5.1	5.5	7.2	5.4		56	
24	5.9	5.8	5.1	5.5	6.1	5.5		19	
25	6	5.7	5.1	5.6	5.6	5.5		9.2	
26	5.6	5.8	5.1	5.3	5.4	5.7		7.3	
27	5.6	5.6	5.2	4.9	5.3	5.8		6.6	
28	5.7	5.6	5	4.9	5	5.7		6.1	
29	5.9	5.6	5	4.7	5.1	5.5		5.9	
30	5.7	5.8	5	4.7	5.1	5.7		------	
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31	8.9	5.8	------	4.8	------	5.9		---	

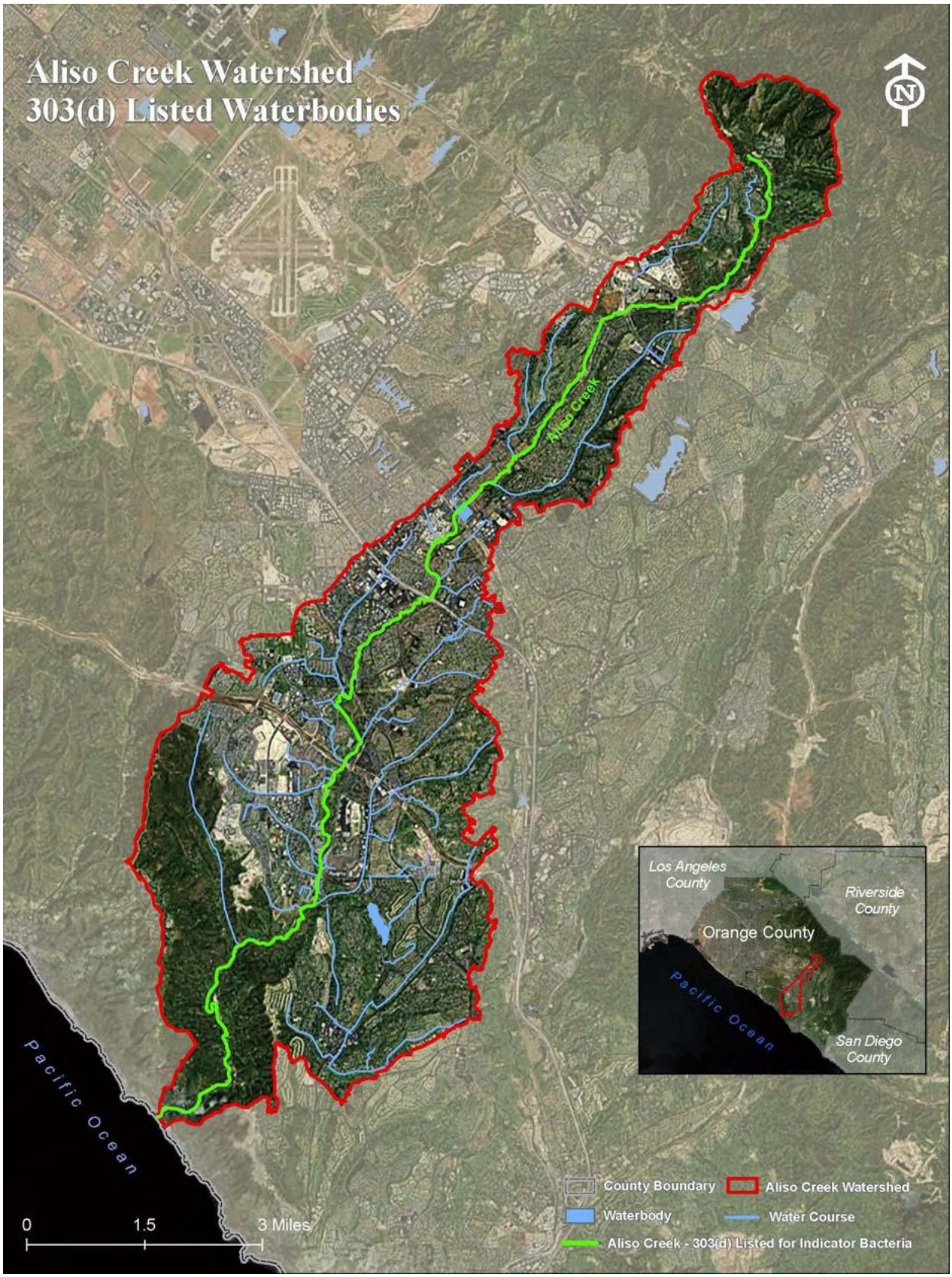
Aliso Creek Watershed
303(d) Listed Waterbodies
N
Aliso Creek
Pacific Ocean
Los Angeles County
Riverside County
Orange County
Pacific Ocean
San Diego County
0
1.5
3 Miles
County Boundary
Aliso Creek Watershed
Waterbody
Water Course
Aliso Creek - 303(d) Listed for Indicator Bacteria

Exhibit C - SLCA Comments to 2007 MS4 Permit

Jeremy Haas April 11, 2007
California Regional Water Quality Control Board
San Diego Region 9
9174 Sky Park Court, Suite 100
San Diego, CA 92123
RE: Tentative Order No. R9-2007-0002 NPDES, No. CAS0108740

The members of the community of South Laguna represented by the South Laguna Civic Association, established in 1946, recognizes urban runoff from dry weather flows continues to be discharged through regional storm drain systems permitted exclusively to convey rain water.

The proposed SDRWQCB Tentative Order No. R9-2007-0002 knowingly, willfully and intentionally perpetuates a threat to health and safety while contributing to degradation of local creek and coastal water resources by allowing MS4 storm drain systems to transport polluted water originating from the imported water supply industry.

Dry weather flow rates in the subject watershed presently exceed all previous flow rates and are recognized as the principle source of nutrient loading and ocean pollution. Chemical fingerprinting analysis of urban runoff by the Santa Margarita Water District attributes the source of 60% to 90% of urban runoff dry weather flows as originating from imported water sources in either Northern California or Colorado. Dry weather flows to storm drains are from anthropogenic influences rather than natural storm events.

Seminal research by the University of Southern California and others concludes urban runoff is responsible for feeding prolonged, destructive algae blooms along the Southern California Bight. In conveying inland sources of fertilizer and phosphates nutrients, dry weather urban runoff estimated at 5,000,000 gallons per day in the Aliso Watershed alone is causing increased outbreaks of domoic acid poisoning and deaths among sea mammals in Laguna Beach. The SDRWQCB fails to take into consideration impacts of uncontrolled dry season urban runoff on the health and welfare of coastal receiving waters. In spite of repeated requests, the SDRWQCB and Co-Permitees to not incorporate the urban runoff ocean plume into the watershed mapping procedure rendering decision making ineffective and monitoring activities scientifically incomplete.

As indicated in Staff Reports, the SDRWQCB, South Orange County Wastewater Authority (SOCWA), inland cities and County Co-Permitees continue to fail to Cleanup and Abate contaminated dry weather urban runoff flows and thereby violate key statues of the Porter-Cologne Act and Clean Water Act.
In allowing the County and City Co-Permitees to continue to discharge polluted urban runoff water flows, the members of the SLCA and the general public are denied access to safe, unpolluted coastal recreational opportunities while exposing them to known respiratory and digestive illnesses. The incremental and cumulative discharge from Aliso Watershed storm drains also knowingly and willfully contributes to potential health risks from consuming local fish.

Likewise, potential private property values are threatened by disclosures during real estate transactions of public health hazards emanating from polluted coastal waters.

Residences at the mouth of Aliso Creek are permanently damaged by summer urban runoff from erosion and stagnant ponds. Damage from urban runoff pollution to critical kelp habitats and marine mammals characteristic of South Laguna Marine Reserve off of Aliso Beach are well documented in the scientific literature.

The Aliso Watershed has more than 64 storm drains with elevated fecal coliform levels and excessive flow rates. The inability of the SDRWQCB over the past 20 years to control illegal dry weather discharges suggests a pattern of failed interventions portending a dangerous precedent of chronic future water pollution to the community of South Laguna with a population of 5,000 residents and the general beach visiting public.

The South Laguna Civic Association (SLCA) seeks a thorough review of the laws, regulations and facts pertaining to mismanagement of the subject MS4 Storm Drain Permit. Verifiable action capable of significant reductions in dry weather flow rates must be implemented. Numerical flow rate reduction, specific performance benchmark deadlines and significant penalties for non-compliance must be incorporated into any credible permitting process. Interception of urban runoff flows at known inland point sources is technologically feasible through deployment of approved Best Available Control Technologies presently used by the development, military and oil industries. If necessary, a watershed Cleanup and Abatement Order can accelerate permitting and fast track measures until such time full compliance is achieved.

Failure to mitigate or comply requires the SDRWQCB to be directed to California Water Code Section 13304(a) and following to seek an injunction against the County and offending cities or perform the work itself. Concurrent with the present evaluation of Tentative Order No. R9-2007-0002, the SLCA seeks emergency action due to significant, immediate and potential harm from known health risks associated with dry weather urban runoff conveying elevated levels of fecal coliform and other contaminates to South Laguna since:

1. Substantial harm to the community of South Laguna will continue to occur this summer from exposure to dry-weather flows of contaminated urban runoff in the subject watershed. The approval of a systematically flawed MS4 Storm Drain Program will establish a dangerous precedent in the Aliso Creek Watershed and other impaired watersheds in the State of California to the detriment of South Laguna's public health and safety as well as the protection of natural resources.

2. Neither the inland cities, County, SDRWQCB, SOCWA nor public will incur substantial harm from issuance of a comprehensive dry weather storm drain management program. The South Laguna Civic Association, in fact, will benefit from incremental reduction of contaminated flows from inland storm drains into creek and coastal receiving waters. Establishing a pattern of enforcement and full compliance with cleanup and abatement laws will initiate additional timely actions by the SDRWQCB to improve water quality in the Aliso Watershed and elsewhere. Costs associated with a comprehensive program to control dry weather flows can be minimized by fines, deployment of cost saving water conservation measures and revenues generated from beneficial reuse opportunities of 5 million gallons of urban runoff per day in the Aliso Watershed.

3. As indicated in this and other communications, substantial questions of fact and law are associated with the proposed Tentative Order No. R9-2007- 0002. The fact remains that immediate compliance and cessation of dry weather urban runoff is technologically and economically feasible as demonstrated by earlier diversions to the Moulton Niguel Water District's sewer treatment facility and, later, short term operation of mobilized urban runoff filtration units.

The narrative below cites a number of laws pertaining to enforcement of Cleanup and Abatement Orders (California Water Code Section 13304); the SWRCB Water Quality Enforcement Policy (February 19, 2002; pages 3,4,11,26, 39,42); regulations and policies governing Environmental Justice (Government Code Section 65040.12 and Public Resources Code Section 72000).

The County and City Co-Permitees concede their failure to Cleanup and Abate elevated levels of fecal coliform and increased urban runoff flow rates in the Aliso Watershed. The SDRWQCB does not comply with California Water Code Section 13304. Indeed, during the past 20 years, the Regional Board has failed to effectively intervene.

California Water Code Section 213300-13308, Chapter 5, provides the SDRWQCB Enforcement authority to issue a Cleanup and Abatement Order to remedy dry weather urban runoff.

Section 13304(a) "Upon failure of any person to comply with a cleanup and abatement order, the attorney general, at the request of the board, shall petition the Superior Court of the County for an issuance of an injunction requiring the person to comply with the order."

The SDRWQCB unwillingness to enforce compliance also violates Section 13304 (1)(b);(2)(a), (c), (e) to expend available money themselves to perform cleanup, abatement or remedial work; to intervene to perform the work itself; recover costs for cleanup and abatement work; and protect or prevent threatened probability of harm to persons, property or natural resources.

It is again worth noting, temporary compliance was achieved in 2003 utilizing mobilized water filtration units recognized among Best Management Practices (BMP). During its brief period of operation, the above BMP treated over 14 million gallons at JO3PO2 to reduce fecal coliform from 10,000 cfu's to less than 1. The SDRWQCB, SOCWA, Moulton Niguel Water District, City of Laguna Niguel and County dischargers arbitrarily elected to terminate this effective technology to experiment with low cost constructed wetlands, which ultimately failed to reach compliance levels for fecal coliform at the JO3PO2 outlet and took no effort to remove flows originating from abandoned imported water sources.

The SWRCB Water Quality Enforcement Policy (February 19, 2002; pages 3,4,11,26, 39,42) specifically directs the Regional Board to take action against the following:

- Any knowing, willful, or intentional violation of the (Porter Cologne Act)
- Any violation of (the Porter Cologne Act) that enables the violator to benefit economically from noncompliance, either by realizing reduced costs or by gaining a competitive edge advantage.
- Any violation that is a chronic violation or that is committed by a recalcitrant violator.
- Any violation that cannot be corrected in 30 days.

The SDRWQCB has taken no action pursuant to the above policies while proceeding to accommodate City and County Co-Permitees, Water Districts, SOCWA and developers at the expense of and detriment to the members of the SLCA and the general public.

Section 13350(m) of the Porter-Cologne Clean Water Act defines nuisance as anything which meets all of the following requirements:

1. Is injurious to health, or is indecent of offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life and property.

2. Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal.

3. Occurs during, or as a result of, the treatment or disposal of wastes.

Dry weather urban runoff meets and exceeds the legal definition of "nuisance" by virtue of it's widespread impacts to water quality variables. "Waste" refers to "waste water" knowingly and willfully generated by imported and reclaimed water sold at reduced rates that ignore significant post-irrigation dry weather urban runoff impacts.

Members of the South Laguna Civic Association are at particular risk of injurious health from frequent exposure to pollution in Aliso Creek and recreational coastal water activities. Such threats and illnesses create an obstruction to the free use of public property at local County parks, protect State Marine Reserves and beaches to thereby interfere with the comfortable enjoyment of life and property.
The extent of annoyance and damage is unequal with increasing harm to individuals such as swimmers, surfers, SCUBA divers, etc. with more frequent contact to polluted creek and ocean waters according to recent studies by the University of California, Irvine. Young children playing long hours at the beach and pregnant women are particularly high-risk populations.

The casual relationship occurring with the discharge of contaminated urban runoff wastewater with elevated fecal coliform levels is well established in scientific and medical literature as to impose a viable threat to the community of South Laguna. Government Code Section 65040.12 and Public Resources Code Section 72000 states:

"…the fair treatment of people of all races, cultures and income with respect to the development, adoption, implementation and enforcement of environmental laws, regulations and policies"

The proposed Tentative Order No. R9-2007-0002 is discriminatory and violates the State of California's definition of Environmental Justice.

As previously noted, the community of South Laguna and visitors to the Aliso Creek Watershed and Aliso Creek County Beach have entreated the SDRWQCB for decades for relief from polluted urban runoff flows resulting from the non-regulation or enforcement of the County/City's chronic storm drain discharges of dry season urban runoff. Local low income and working class residents have suffered damages to health, safety and liberty in their access to Aliso Creek and the Pacific Ocean.

Despite the obvious tangible and verifiable nature of these damages, South Laguna and the general public have yet to receive any effective regulatory assistance either from the State or Regional Water Boards. This failure to provide relief is not due to any lack of knowledge or information. The SDRWQCB has repeatedly and extensively investigated the mechanism by which storm drains physically convey fecal coliform bacteria and other contaminants downstream into the Aliso/Woods Canyon Regional Wilderness Park, South Laguna and the Aliso Creek County Beach. There remains no doubt that the City/County dry weather storm drain discharges are the cause of summer beach and ocean pollution.

Despite this clear and present causal relationship, the SDRWQCB and Staff have denied pleas from the public for remedial action in the form of abatement of nonseasonal storm drain urban runoff, beneficial reuse for sustainable treatment projects, water conservation and immediate temporary mobilized emergency capture/treatment options common among petrochemical, agribusiness and development economic sectors. In addition, the SDRWCB has not supplied a contingency emergency plan to protect our community and the public from current and summer dry weather MS4 storm drain discharges.

Instead, the Regional Board has relied on promulgating more general directives and future contamination tables, which may or may not be effective in abating polluted urban runoff. The proposed Tentative Order No. R9-2007-0002 is to accommodate the failures of inland Water Districts, SOCWA, Cities and County at the expense of the community, public and ocean ecology.

The SDRWQCB action when combined with the Staff and City/County history of ineffective action towards the residents and visitors of South Laguna, have the cumulative effect of giving second class status to the physical health and safety needs of the public in the Aliso Watershed. Thus any action by the Regional Board to approve the use of MS4 Storm Drain System to knowingly convey dry weather urban runoff flows is discriminatory and violates the State of California's definition of Environmental Justice.

Conclusion

The general regulations, requirements and studies pertaining to the Aliso Creek Watershed and associated MS4 Storm Drain System are clearly not effective in controlling water pollution or the effects of artificially elevated flow rates during the area's annual ten month dry season.

More than twenty years and $20 million dedicated to achieve compliance in a relatively small, compact 34 square miles residential development watershed is an enormous investment and, ultimately, waste of taxpayer revenues. The failure to achieve compliance represents a lost opportunity to demonstrate effective interventions to protect communities like South Laguna from polluted urban runoff and sends a message to the public that urban runoff pollution cannot be controlled.

Despite the various failed efforts over two decades, the fact remains numerous State laws are being violated by the SDRWCB for allowing the discharge of dry weather flows with elevated fecal coliform and related contaminate levels to continue to pollute daily the protected receiving waters of Aliso Creek and the Pacific Ocean. By this communication, the SLCA reserves the right to appeal any unfavorable decision perpetuating dry season urban runoff flows to Aliso Beach, South Laguna to the SWRCB and State Attorney General for timely relief.

The South Laguna Civic Association appreciates the efforts by the San Diego Regional Water Quality Control Board to consider the enormous impacts of uncontrolled dry weather urban runoff pollution before approving a genuinely effective Storm Drain Permit Program for the Aliso Watershed.

Respectfully submitted,

Michael Beanan, Director
South Laguna Civic Association
PO Box 9668
South Laguna, California, 92651

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Executive Vice President

December 12, 2012

Wayne Chiu, P.E.
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, California 92123-4340

Re: Comment – Tentative Order No. R9-2013-001 – Regional MS4 Permit - Place ID: 786088Wchiu

Dear Mr. Chiu:

This letter is written in response to the San Diego Regional Water Quality Control Board's Tentative Order R9-2012-0011 ("Permit") dated October 31, 2012. We have reviewed the draft of the Permit; there is no question if the Permit, as now proposed, goes into effect, it will impose excessively expensive and onerous regulations not only on local governments but on regional businesses and the public at large. The regulations, as written, are untested with no proof of improved water quality.

The Associated General Contractors of America ("AGC"), San Diego Chapter, represents over 1,000 firms that build the region's industrial, commercial, institutional, heavy highway and general engineering construction projects. We understand the importance of a clean, safe water supply; we want that for our region and for our families. However, it is imperative the regulations put in place to achieve this goal are reasonable, tested and known, to the extent possible, to produce the outcome of improving water quality.

The use of Water Quality Improvement Plans ("WQIP") is an excellent way to develop a cost-effective approach to improved water quality. We would encourage the Board to allow the WQIPs to be developed, ensuring public

participation, and implemented before moving forward with enforcement of new regulatory requirements.

Other serious concerns are the stringent new proposal for stormwater retention and discharge and the non-existing source of funding to execute the proposed changes.

Our request is for the Regional Water Quality Control Board to allow the current Permit to remain in effect until WQIPs are developed for the 10 watersheds in District 9. This District needs to develop a Regional Permit that is based on rules and regulations known to be sustainable and effective. The development and use of WQIP's will give our communities that opportunity without the imposition of impossible regulation at horrendous economic cost to our regional cities, local businesses and the residents of our communities.

Thank you for hearing our concerns. If you have questions, please contact me at 858.558.7444.

Sincerely,

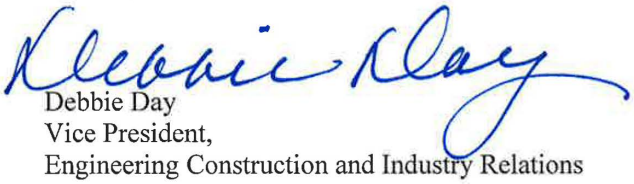

Debbie Day
Vice President,
Engineering Construction and Industry Relations

Continental Maritime of San Diego

SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD

2012 DEC 18 PM 12 39

12DEC12
CMSD Serial Number: 237-12

Mr. Wayne Chiu, P.E.
Place ID: 786088Wchiu
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Re: Comment - Tentative Order No. R9-2013-001, Regional MS4 Permit

Dear Mr. Chiu:

As a member of the San Diego Port Tenants Association, I am responding to the San Diego Regional Water Quality Control Board's Tentative Order R9-2012-0011 ("Permit") dated October 31, 2012. After reviewing the proposed Permit, I am concerned it will impose expensive and untested regulations on local governments, businesses, and residents. The new permit will impact the region without improving water quality.

I do understand the importance of clean, safe water to the region and as a member of the business community I am interested in improving San Diego's water. It is important, however, that we use our limited resources wisely, and ensure that our efforts produce the desired outcome of improving water quality. I applaud the Board's inclusion of Water Quality Improvement Plans (WQIP) as a first step in developing a cost-effective approach to improving our water. Analysis remains a critical component of a successful strategy, and I am glad to see that the Board is committed to finding the best possible solution to water quality improvement.

I am concerned however that the costs associated with enforcing and implementing the permit will have a negative impact on my business and San Diego's economy. The four primary areas of concern include: 1) the strict liability for exceeding water quality objectives; 2) the additional and changing requirements for development projects, impacting items such as storm water retention and discharge; 3) the preemption of WQIPs by new and changing regulatory requirements prior to allowing the WQIPs to be developed and implemented; and 4) the lack of reliable funding sources to implement these regulatory changes.

While it is necessary to hold individuals, businesses and governments accountable these measures must be reasonably achieved and provide a significant and positive impact on San Diego's water. I respectfully request that the Permit focus on the timely development of effective and enforceable WQIPs, and that each of these be developed through a process that ensures public participation. I also ask that the designation of Best Management Practices in each watershed be determined through the WQIP process rather than the one size fits all strategy currently proposed in the Permit. I ask further that, until the Board adopts a WQIP for a watershed, the provisions of the existing Permit remain in place for that watershed. Finally, in order to avoid unnecessary litigation I request that the Board adopt the WQIPs as Orders implementing the proposed Permit.

I urge you to adopt final permit language that is evidence-based and both environmentally and economically sustainable. Please contact me using the number below, X236, with questions. Thank you for your consideration.

Sincerely,

Dewey Youngerman
Manager, EH&S

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Cc: Sharon Cloward, San Diego Port Tenants Association

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SAN DIEGO REGIONAL
WATER QUALITY
CONTROL BOARD
2012 DEC 17 PM 3 46

David J. Akers, P.E.
Fellow - American Society of Civil Engineers, Fellow – American Concrete Institute
Consulting Concrete and Materials Engineer
5841 Amaro Drive, San Diego, CA 92124
858-437-1445

December 12, 2012

California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Reference: **ORDER NO. R9-2013-0001/NPDES NO. CAS0109266**

Subject: Sustainable Structural Source Control Storm Water BMPs

Board Members:

Water is the most precious resource next to clean air that we have in southern California. Without a safe, reliable source clean water for drinking, cooking, bathing, and commercial uses (high-tech research and manufacturing), the habitability of our region is seriously degraded. As you prepare the referenced order, I urge you to strongly consider the implementation and use of sustainable, structural source control BMPs that will capture, treat, and infiltrate storm and landscape water in-place.

Sustainability is defined as practices that allow the present generation to meet our needs without compromising the ability of the succeeding generations to meet their needs. Founded on economic, environmental, and social principles, sustainability ties together low-cost infrastructure to solve environmental issues in everyone's best interest.

The paper "California's Water Energy Relationship" prepared by the California Energy Commission noted that 19% of the state's electrical usage plus huge quantities of natural gas and diesel fuel were used in development, transportation, and usage of California's water. Of this nearly one-fifth of an already constrained resource, 22% is used in moving water from northern to southern California (10,300 GWh or 4.1% of the total electrical usage). Four percent is used in wastewater processing. A first line of defense is needed to reduce the need for more imported water and reduce the amount of water being processed and decrease the demand on an already overstressed electrical system.

Until "toilet to tap" becomes socially accepted, systems that naturally capture, treat, and slowly release storm and landscape water into the shallow and deep aquifers and waterways are needed. Such low-impact development systems are more sustainable and less costly than large storm water treatment plants that ultimately discharge huge plumes of clean water into

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the ocean. Examples of these LIDs are pervious concrete, permeable interlocking pavers, rain-gardens, storm detention basins, and porous asphalt.

Pervious concrete is in the simplest terms conventional concrete that is made without the inclusion of sand. It contains only cementitious material (portland cement and perhaps fly ash a recycled industrial by-product), water, and coarse aggregate. The concrete has a void content of 18% to 25% and is typically placed over a 6-inch to 10-inch recharge basin of 1-inch maximum size aggregate. Pervious concrete can be designed to accept the water from the parking lot, building roof, and hardscape so that even in the slowest draining soils, no water will leave the site.

Permeable interlocking pavers are small precast concrete blocks that portions of their corners removed. The ½-inch square opening at the intersection of four blocks is filled with small aggregate which allows water to infiltrate into a permeable base under the pavers. Their performance is very similar to pervious concrete.

The pre-infiltration storage capacity of one acre of PV/PIPs is approximately 9,600 cf or 2.7-in of storm water. The water that passes through PV/PIPs is cleaned by naturally occurring micro-organisms as it infiltrates the soil. Once in the soil, the water stays in a shallow aquifer where it available to surface vegetation or it eventually replenishes local waterways or it continues to deeper aquifers where it can be removed by pumping for domestic and commercial uses. Pervious concrete and permeable interlocking pavers will provide a 20 to 30-year service life with minimal maintenance. The uses of PC/PIPs are generally in parking lots, but they have also been used in sidewalks, nature trails, low-volume streets, and gutters. Caltrans has used pervious concrete in rest stop parking lots and on highway shoulders.

PC/PIPs used in parking lots free space for additional economic and recreational development. Development is constrained by the amount of parking that is available. When storm detention basins are used, valuable land is consumed in constructing an "attractive nuisance" that fills with trash during dry periods and breeds mosquitoes when wet. PV/PIPs are storm detention basins that have dual uses. An example of pervious concrete replacing a storm detention basin is Stratford Place, a 19 unit sub-division in Sultan, WA, where two detention basins were replaced with pervious concrete streets, sidewalks, and driveways allowing the developer to construct two additional homes with overall construction savings of $260,000. The completed site hydraulically mimicked the natural state. The Kaiser Hospital organization is now using pervious concrete for parking lots in its new projects.

PV/PIPs are energy efficient. Once constructed, the energy requirement is possibly an occasional sweeping to keep the surface voids open.

Rain gardens are attractive methods for capturing and treating storm water, but have a limited capacity compared to PV/PIPs. Detention basins can store large quantities of water, but are generally attractive nuisances. Porous asphalt pavement is similar to pervious concrete in that fine aggregate is removed to create the voided interstitial structure. The major drawback to PAP is that asphalt is a flexible material that is subject to weathering of the organic structural

material. In hot weather, the PAP can be shoved by traffic closing the surface voids. Ultraviolet radiation degrades the asphalt surface (oil). Typical asphalt pavement surfaces are rejuvenated by spraying with fresh oil or a slurry seal. Neither option is viable for PAP since the surface voids would be closed. Further, as the price of oil rises and refining techniques are improved, the amount of asphalt oil is reduced and its price is increasing compared to portland cement which has been relatively stable.

In closing, a sustainable first line of defense is needed to capture, treat, and infiltrate storm and landscape water back into our natural system. Wyatt Troxell, a former board member of the Inland Empire Utility Agency, commented after a pervious concrete presentation that "for every acre of ground that covered by streets or buildings, we must import an acre-foot of water forever." Capturing, treating, and re-using water is essential.

Respectfully,

David J. Akers, P.E.
Civil Engineer

SAN DIEGO ASSOCIATION OF REALTORS®

The Trusted Voice of San Diego Real Estate

December 12, 2012

Mr. Wayne Chiu, P.E.
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Re: Comment—Tentative Order No. R9-2013-001, Regional MS4 Permit,

Place ID: 786088Wchiu

Dear Mr. Chiu:

As President of the Greater San Diego Association of REALTORS® (SDAR), the largest trade association in San Diego County representing over 12,000 members, I am responding to the San Diego Regional Water Quality Control Board's Tentative Order R9-2012-0011 ("Permit") dated October 31, 2012. After reviewing the proposed Permit, we are concerned it will impose expensive, onerous, and untested regulations on local governments, businesses, and residents. These new regulations will impact the region's economy without improving its water quality.

Everyone understands the importance of clean, safe water to the region. As a member of the business community, I too am interested in improving San Diego's water. It is important, however, that we use our limited resources wisely. We must ensure that our efforts produce the desired outcome of improving water quality.

SDAR applauds the Board's inclusion of Water Quality Improvement Plans (WQIP) as a first step in developing a cost-effective approach to improving our water. Analysis remains a critical component of a successful strategy. Furthermore, we are glad to see that the Board is committed to finding the best possible solution to water quality improvement.

We are concerned, however, that the costs associated with enforcing and implementing the permit will have a negative impact on my business and San Diego's economy. The four primary areas of concern include: 1) the strict liability for exceeding water quality objectives; 2) the additional and changing requirements for development projects, impacting items such as storm water retention and discharge; 3) the preemption of WQIPs by new and changing regulatory requirements prior to allowing the WQIPs to be developed and implemented; and 4) the lack of reliable funding sources to implement these regulatory changes.

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It is necessary to hold individuals, businesses and governments accountable. However, it is critical that the accountability measures can be reasonably achieved and are likely to have a significant and positive impact on San Diego's water. Due to these concerns, we respectfully request that the Permit focus on the timely development of effective and enforceable WQIPs. We also request that each of the WQIPs be developed through a process that ensures public participation. We ask also that the designation of appropriate Best Management Practices in each watershed be determined through the WQIP process rather than the one size fits all strategy currently being proposed in the Permit. We further request that until the Board adopts a WQIP for a watershed that the provisions of the existing Permit remain in place for that watershed. Finally, in order to avoid unnecessary litigation, we request that the Board adopt the WQIPs as Orders implementing the proposed Permit.

On behalf of SDAR, I urge you to adopt final permit language that is evidence-based and as well as environmentally and economically sustainable. Thank you for your consideration. Please contact Jordan Marks, SDAR Director of Government Affairs, at 858-715-8012 if you have any questions.

Sincerely,

Donna Sanfilippo
President
Greater San Diego Association of REALTORS®

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TRANSPORTATION & HOUSING

December 12, 2012

Mr. Wayne Chiu, P.E.
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Re: Comment—Tentative Order No. R9-2013-001, Regional MS4 Permit, Place ID: 786088Wchiu

Dear Mr. Chiu:

I am responding to the San Diego Regional Water Quality Control Board's Tentative Order R9-2012-0011 ("Permit") dated October 31, 2012. After reviewing the proposed permit, I am concerned it will impose expensive and burdensome regulations on local governments, businesses, and residents throughout San Diego County. As a member of the legislature, I too am interested in improving our regional water quality. However, we must use our limited resources wisely, and ensure that our efforts produce the desired outcome of improving water quality.

I applaud the Board's inclusion of Water Quality Improvement Plans (WQIP) as a first step in developing a cost-effective approach. However, I am concerned that the costs associated with enforcing and implementing the permit will have a negative impact on many businesses within the region. My concerns include: 1) the strict liability for exceeding water quality objectives; 2) the additional and changing requirements for development projects, impacting items such as storm water retention and discharge; 3) the preemption of WQIPs by new and changing regulatory requirements prior to allowing the WQIPs to be developed and implemented; and 4) the lack of reliable funding sources to implement these regulatory changes.

I urge you to adopt final permit language that is evidence-based and both environmentally and economically sustainable. Thank you for your consideration.

Sincerely,

Mark Wyland

MARK WYLAND
Senator, 38th District

JAMUL DULZURA
COMMUNITY PLANNING GROUP
P.O. Box 613
Jamul, California 91935

December 14, 2012

Mr. Rich Crompton, Director
County of San Diego Department of Public Works
5510 Overland Ave, Ste 410
San Diego, CA 92123

SUBJECT: Comment – Tentative Order No.R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu

Dear Mr. Crompton,

The Jamul Dulzura Community Planning Group feels compelled to provide written comments on the draft San Diego Regional MS4 Permit to ensure that water quality regulations are practical, cost-effective, and scientifically based. While we are not directly regulated by the Regional MS4 Permit, we are concerned that public funds may have to be spent to comply with requirements that are not proven or effective, and that this will ultimately reduce the funding available for community projects and essential public services.

It is vital that the resources required to implement regulations are balanced with other public and environmental programs. For this reason we have joined the County's call to action to protect water quality while controlling the mounting and unsubstantiated costs of increased regulation on local governments, business and industry. As written, the Tentative Order will result in a significant and unprecedented level of regulation and cost without clear scientific basis or environmental benefit. The three main areas of concern in the draft permit are: 1) a far-reaching Bacteria Total Maximum Daily Load (TMDL), 2) additional requirements for development projects, and 3) performance standards that unnecessarily expose municipalities to third-party lawsuits. These requirements needlessly increase costs for regulated parties and may further constrain development in the region.

The cost to comply with the Bacteria TMDL is estimated between $2.6 billion and $4.9 billion for the named watersheds in the region over the 20 year TMDL compliance timeline, of which only 18 years remain. The numeric targets in this TMDL may never be attainable even if the County and other municipalities were to spend billions in public resources. This puts us in an untenable situation with the public, who will ultimately fund this effort. Technology simply does not exist to return urbanized watersheds back to pristine, "reference" conditions. The TMDL compliance targets must be attainable. The Bacteria TMDL requirement should not be incorporated into the MS4 Permit until there are more practical goals to work toward. We cannot ask the public to fund a program that will not succeed.

The cost of doing business in California has already pushed many businesses and developers out of the state. The draft permit will impose significant hardships on development. Permit requirements would require almost all development projects in the County to comply with hydromodification requirements, regardless of whether the projects themselves contribute to the problem. It also requires that new and re-development projects return site hydrology to pre-development conditions as opposed to pre-project conditions. Returning urban infill projects to conditions that existed under "natural", pre-urban conditions would be a substantial constraint to re-development. Over the last several years, local governments in San Diego have worked together with Regional Board staff and a host of technical experts to develop a Hydromodification Management Plan with reasonable and scientifically based standards. The

Regional Board recently approved that Plan. This draft permit ignores all of the good work invested in that Plan, which was developed at a significant cost to the public. In its place, it would impose new, one-size-fits-all requirements that impose a standard that is unrealistic and without scientific justification. The result of all these changes is that the structures built to mitigate development impacts will need to be bigger and will cost significantly more than the current approved program. Implementing these requirements would be an economic burden to our region and, are targeted at an unobtainable endpoint.

Accordingly, we would like for the Regional Board to honor existing plans, including the Hydromodification Management Plan. SANDAG has worked for many years through a comprehensive public process to develop the Regional Transportation Plan and Regional Comprehensive Plan that provides the framework for local General Plans. These plans recognize regional smart growth opportunity areas, including infill development. These are sound principals. Urban infill reduces aerial deposition which then reduces pollutant loading in urban runoff. Re-development is considered an environmentally preferable method of development. The MS4 permit should encourage re-development, retrofit landscapes, and green streets, through greater flexibility and reduced requirements rather than penalizing it with additional cost and constraints. To this end, any new regulations must be integrated into approved plans and must not be a burdensome, additional layer.

Finally, the draft permit includes performance standards that should be amended so that regulated municipalities are not unnecessarily exposed to third-party litigation. This Permit's receiving water limitations language is contrary to the intent of the federal Clean Water Act, which is to assure municipal agencies will be regulated to a reasonable standard. The State and Regional Water Boards have the discretion and a responsibility to ensure that water quality regulations are applied in a context that results in economic and environmental sustainability. It is imperative to reduce the threat of litigation when a municipality is engaged in a good faith effort to comply. The current receiving water provisions do not serve the environment, the public or the permittees. Public funds should be used to implement comprehensive programs that are proactive and adaptive to promote clean water goals.

Local government must have the flexibility to make policy decisions for the good of our residents. The 21 Copermittees in our region (the County, 18 cities, Port District, and Airport Authority) already spend close to $120 million a year to comply with current permit requirements. Heal the Bay's own report cards show that water quality at local beaches is improving. We would like to see the Regional Board adopt a permit that will be cost neutral and that local municipalities will have the flexibility to apply funding to priority areas.

We are hopeful that the final permit language will result in programs that make sense from both an environmental and economic standpoint. Please contact me if you have questions or would like to discuss our concerns.

Sincerely,

Michael Casinelli, Chair
Jamul Dulzura Community Planning Group

CC:
Vice Chairman Gary Strawn, San Diego Regional Water Quality Control Board (SD RWQCB)
Board Member Eric Anderson, SD RWQCB
Board Member Henry Abarbanel, SD RWQCB
Board Member Tomas Morales, SD RWQCB
Executive Officer David Gibson, SD RWQCB
Mr. Wayne Chiu, SD RWQCB

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Richard Tomlinson

Kevin Wallace

December 14, 2012

Mr. Rich Crompton, Director
County of San Diego Department of Public Works
5510 Overland Ave, Ste 410
San Diego, CA 92123

Dear Mr. Crompton,

SUBJECT: Comment – Tentative Order No.R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu

As the Ramona Community Planning Group, a land use advisory group to the County of San Diego for land use issues in Ramona, we feel compelled to provide written comments on the draft San Diego Regional MS4 Permit to ensure that water quality regulations are practical, cost-effective, and scientifically based. While we are not directly regulated by the Regional MS4 Permit, we are concerned that public funds may have to be spent to comply with requirements that are not proven or effective, and that this will ultimately reduce the funding available for community projects and essential public services.

It is vital that the resources required to implement regulations are balanced with other public and environmental programs. For this reason we have joined the County's call to action to protect water quality while controlling the mounting and unsubstantiated costs of increased regulation on local governments, business and industry. As written, the Tentative Order will result in a significant and unprecedented level of regulation and cost without clear scientific basis or environmental benefit. The three main areas of concern in the draft permit are: 1) a far-reaching Bacteria Total Maximum Daily Load (TMDL), 2) additional requirements for development projects, and 3) performance standards that unnecessarily expose municipalities to third-party lawsuits. These requirements needlessly increase costs for regulated parties and may further constrain development in the region.

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ADMINISTRATIVE OFFICE

Tentative Order No.R9-2013-0001 **December 14, 2012**

Finally, the draft permit includes performance standards that should be amended so that regulated municipalities are not unnecessarily exposed to third-party litigation. This Permit's receiving water limitations language is contrary to the intent of the federal Clean Water Act, which is to assure municipal agencies will be regulated to a reasonable standard. The State and Regional Water Boards have the discretion and a responsibility to ensure that water quality regulations are applied in a context that results in economic and environmental sustainability. It is imperative to reduce the threat of litigation when a municipality is engaged in a good faith effort to comply. The current receiving water provisions do not serve the environment, the public or the permittees. Public funds should be used to implement comprehensive programs that are proactive and adaptive to promote clean water goals.

Local government must have the flexibility to make policy decisions for the good of our residents. The 21 Copermittees in our region (the County, 18 cities, Port District, and Airport Authority) already spend close to $120 million a year to comply with current permit requirements. Heal the Bay's own report cards show that water quality at local beaches is improving. We would like to see the Regional Board adopt a permit that will be cost neutral and that local municipalities will have the flexibility to apply funding to priority areas.

We are hopeful that the final permit language will result in programs that make sense from both an environmental and economic standpoint. Please contact Jim Piva if you have questions or would like to discuss our concerns.

Sincerely,

Jim Piva

JIM PIVA, Chair
Ramona Community Planning Group

CC:
Vice Chairman Gary Strawn, San Diego Regional Water Quality Control Board (SD RWQCB)
Board Member Eric Anderson, SD RWQCB
Board Member Henry Abarbanel, SD RWQCB
Board Member Tomas Morales, SD RWQCB
Executive Officer David Gibson, SD RWQCB
Mr. Wayne Chiu, SD RWQCB

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Jan I. Goldsmith
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December 19, 2012

VIA EMAIL AND U.S. MAIL

Catherine Hagen, Esq.
San Diego Regional Water Quality Control Board
9174 Sky Park Ct., Suite 100
San Diego, CA 92123-4340

RE: Hydromodification Management Requirements of Draft Tentative Order No. R9-2013-0001 (San Diego Regional MS4 Permit)

Dear Ms. Hagen:

The purpose of this letter is to further address the nexus issue raised by members of the Regional Board at the Municipal Separate Storm Sewer Systems (MS4) permit workshop held on December 12, 2012. As the Copermittees commented at the workshop, we are concerned that the hydromodification management requirements would expose the Copermittees to significant litigation risk and may be unenforceable. Specifically, we are concerned with the provisions: (1) requiring Copermittees to compel development projects that have no impact on hydromodification to implement on-site or "alternative compliance" hydromodification mitigation measures; and (2) using "pre-development (naturally occurring)" runoff reference condition as applied to sites that are, in fact, developed. These requirements are located in Provision E(3)(c) of the Draft Tentative Order.

We are concerned that implementing these requirements would subject the Copermittees to liability under the takings clauses of the U.S. and California Constitutions and the Mitigation Fee Act because of the questionable nexus between a project's impacts on hydromodification and the hydromodification management measures in the Draft Tentative Order. When imposing a condition on a development permit, a local government is required under the federal and state constitutions to establish that the condition bears a reasonable relationship to the impacts of the project. This rule applies even to legislatively enacted requirements and impact fees or exactions.[1] Moreover, fees imposed on a discretionary ad hoc basis are subject to heightened scrutiny under a two-part test. First, local governments must show that there is a substantial relationship between the burden created by the impact of development and any fee or exaction.[2] Second, a project's impacts must bear a "rough proportionality" to any development fee or

[1] *Building Indus. Ass'n v. City of Patterson*, 171 Cal. App. 4th 886, 898 (2009).
[2] *Nollan v. California Coastal Comm'n*, 483 U.S. 825, 837 (1987).

exaction.[3] Under California law, the *Nollan/Dolan* heightened scrutiny test also applies to in-lieu fees.[4]

The Legislature has memorialized these requirements in the Mitigation Fee Act which establishes procedures that local governments must follow to impose impact fees.[5] Irrespective of whether the hydromodification management requirements are implemented by legislative act or on an ad hoc basis, the Copermittees' attempt to enforce them as proposed in the Tentative Order would likely result in claims alleging unconstitutional takings of private property and violations of the Mitigation Fee Act. This is because a developer could argue that limiting hydromodification impacts of already developed property to its "naturally occurring" state, or requiring hydromodification mitigation measures for impacts not imposed by the project, would not have a legally sufficient nexus to the impact of the development project.

Based on these concerns, we respectfully request that these provisions be modified. The Copermittees will be submitting comments on this issue and a redline of the Draft Tentative Order prior to the close of the public comment period on January 11, 2013. In the meantime, we are available to meet with you to discuss this important issue.

Sincerely yours,

JAN I. GOLDSMITH, City Attorney

By
Heather L. Stroud
Deputy City Attorney

COUNTY OF ORANGE
Nicholas S. Chrisos, County Counsel

By 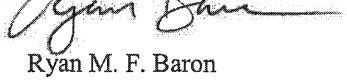
Ryan M. F. Baron
Senior Deputy County Counsel

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[3] *Dolan v. City of Tigard*, 512 U.S. 374, 391 (1994).
[4] *Ehrlich v. City of Culver City*, 12 Cal. 4th 854, 876 (1996).
[5] Cal. Gov't Code §§ 66000-66025.

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By
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By
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Attorneys for City of Santee

CITY OF LAKE FOREST

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Attorneys for City of Lake Forest

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Sophie Silvestri
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* SDPTA Past Chairmen

SAN DIEGO PORT TENANTS ASSOCIATION

December 19, 2012

Mr. David Gibson, Executive Officer
California Regional Water Quality Control Board
San Diego Region
9174 Sky Park Court, Ste. 100
San Diego, CA 92123-4340

Dear Mr. Gibson,

I am contacting you on behalf of the San Diego Port Tenant's Association (SDPTA). The Association was formed in 1989 as a non-profit mutual benefit corporation and is made up of over 250 members that include Tideland's businesses that are tenants of the Unified Port District. On behalf of the Board of Directors of the San Diego Port Tenants Association, please allow me to offer the follow comments and suggestions in regard to the Regional MS4 Permit:

Monitoring and Assessment. With regard to the use of members of the public to support volunteer monitoring, SDPTA is very concerned about the possibility for mis-interpretation of this provision. Well-intentioned but overly-aggressive parties may interpret this provision to allow volunteers to enter private property, via the public right-of-way, looking for unlawful or improper discharges. This raises several legal concerns and poses significant liability issues for copermitees should a volunteer be injured in the course of an unauthorized inspection, or if private property is damaged, or if manufacturing processes are adversely affected as a result of the unauthorized intrusion.

We recommend that the language governing the use of volunteers be very explicit regarding the intent of the Board which we believe is to help

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www.sdpta.com

copermitees reduce monitoring costs by utilizing volunteers to monitor properties that are part of the public right-of-way.

Non-Storm Water Discharges. The Regional MS4 Permit currently specifies that air conditioner condensation is a non-storm water discharge that must be directed to landscaped areas or other pervious surfaces, where feasible. SDPTA is concerned about the cost of compliance for this particular. Re-routing condensation lines in existing buildings, more often than not is very expensive. We would suggest that the new requirements be limited to development/re-development. In addition, discharges from fire suppression equipment maintenance activities can be treated with BMPs and in such cases should not be considered an illicit discharge.

Finally, The Regional MS4 Permit Generally specifies that all non-storm water discharges must be terminated rather than making a distinction that discharges with permits are actually authorized. SDPTA recommends that the Regional Board add language for clarification, something like the following:

> *Each Copermittee shall effectively prohibit all types of non-storm water discharges into its MS4 nless such discharges are authorized by a separate National Pollutant Discharge Elimination system (NPDES) Permit.*

On behalf of SDPTA, I want to thank the Regional Board and Staff for the very collaborative nature of this process. We thank you for the opportunity to submit these comments, and appreciate your consideration.

Best regards,

Sharon Cloward

Sharon Cloward
President, San Diego Port Tenants Association

Cc: SDPTA Board of Directors
Port Chair, Lou Smith, San Diego Unified Port District
Port President, Wayne Darbeau, San Diego Unified Port District

Julian Community
Planning Group
P.O. Box 249, Julian, CA 92036

January 4, 2013

Ms. Stephanie Gaines, Land Use/Environmental Planner
DPW/Watershed Protection Program (M.S. 0326)
5510 Overland Avenue, Suite 410
San Diego CA 921123

Dear Stephanie;

First I want to thank you for meeting with our Planning Group to discuss the reissuance process regarding the region NPDES Permit (MS4 Storm Water) with particular focus on the Total Maximum Daily Load plan (TMDL) and the effects that may have on our community.

After reviewing the documents provided to us, discussing the issue with you, and considerable discussion by our Group, the following statement has been prepared to express the position of the Julian Community Planning Group:

1) As written, the tentative order MS4 will result in a significant, unprecedented and likely unattainable level of regulation and unsustainable cost. The tentative order includes:

A. Far reaching water quality improvements.

B. Performance standards that cannot conceivably be attained.

C. Transferring the state's responsibility of cost to the local agencies, including testing, liability, and enforcement.

D. Ignoring of existing plans developed by other agencies.

E. Requiring the co-permittee to comply with unknown conditions.

The far reaching water quality improvements likely never can be attained, especially in urban developed areas. Will the Regional Water Quality Control Board remove legal conforming residences to obtain pre-development conditions; or require all existing developments to retrofit in order to attain the requested standards?
There are also jurisdictions over which the co-permittee has no authority and therefore can not require compliance. Those include Caltrans, State lands and parks, Federal lands and parks, and Indian Reservations.

2) The San Diego Regional Water Quality Control Board is attempting to pass all cost and responsibility to the co-permittee. Why would any agency accept these liabilities and costs? The County of San Diego has estimated the cost to comply with the Bacteria TMDL alone to be between 2.6 and 4.9 million dollars.

3) The County of San Diego, Cities and SanDag have worked extensively to develop Transportation plans, regional comprehensive plans and general plans that address the concerns shown in the tentative order MS4. The San Diego Regional Water Quality Control Board has ignored this effort in the new proposed regulation.

4) The proposed MS4 permit requires the co-permittees to accept new regulation without knowledge of what they are or their impacts.

5) The requirement of returning all watersheds back to pristine reference level is just not practical nor feasible.

6) The County of San Diego should not require the portion of the County in the Colorado River Basin to comply with San Diego County Water Quality Control Board requirements. The issues and conditions in the Colorado River Basin are not similar to those in the western coastal portion of the County.

Thank you for including our comments in your presentation to the San Diego Region Water Quality Control Board.

Sincerely

Jack D. Shelver, Chair
Julian Community Planning Group

Walsh

OTAY LAND COMPANY

SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD

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Promoting Chula Vista's future by preserving its past.

January 4, 2013

San Diego Water Board
9174 Sky Park Circle
Suite 100
San Diego, CA 92123
Attn: Mr. Tomas Morales

Subject: Tentative order No. R9-2013-0001
Municipal Separated Storm Sewer Systems (MS4s)
Draining the Watersheds within the San Diego Region

Dear Mr. Morales,

I would like to thank you for hosting the two recent public workshops on the Tentative Order No. R9-2013-0001 regarding MS4s Draining the Watersheds within the San Diego Region. They were very informative and I appreciated the opportunity to address the Board at both hearings.

Our company is close to completing our entitlements for a sustainable, walkable, "green" master planned community in Otay Ranch. Our property is adjacent to Otay River west of Otay Lakes. We have spent thousands of man hours and millions of dollars planning a community that takes the environment into consideration, including water quality.

As I mentioned when I addressed the Board, the Otay River Valley west of the dam is barren and full of invasive plant species that literally suck the water out of the ground. In following the hydromodification requirements that were implemented only about a year ago, we have devised a plan that will clean our storm water runoff prior to introducing it into the Otay River. Once the water is reintroduced into the river we will remove the invasive plants and establish wetland varieties which will flourish and bring the river valley back to what it once was many years ago. We are able to accomplish this because the Otay River west of the dam is currently exempt from hydromodification requirements.

This exemption was put into place based on scientific research and technical expertise of the Hydromodification Task Force. This committee, representing environmental and engineering experts determined that limiting runoff to certain bodies of water and rivers

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within your jurisdiction would not be beneficial to the health of those watersheds. Due to the influence of the Otay Lakes and Dam upstream of our project, the Otay River was determined to be one of the bodies of water that would benefit from the exemption.

If the exemption for the Otay River is deleted from the new Tentative Order, our land plan will be altered and our restoration efforts will not be put in place.

In addition, the proposed Tentative Order also calls for retention onsite of the 24 hour 85th percentile storm event. Similar to the issue of hydromodification, retention of flows from the majority of storm events will adversely impact this watershed that is described as being "starved" for runoff in the Otay River Watershed Management Plan. Since infiltration is infeasible on our site due to soil conditions, the permit proposes to arbitrarily increase our bioretention facilities by 25%, a number that does not appear to have any scientific basis.

We applaud the new permit for looking at regional solutions through the implementation of the Watershed Improvement Plans. However, we should be allowed to operate under the current permit until the Watershed Improvement Plans determine the best regional solutions for the health of each watershed. Specifically, we request that the hydromodification exemptions be left in place and the retention requirements not be added to the permit until the Watershed Improvement Plans determine whether retention is beneficial to the watersheds.

Sincerely,

Jeff O'Connor
Director of Operations

Cc: Paul Borden
Kent Aden

County of San Diego

HERMAN REDDICK
PROGRAM MANAGER
(858) 974-5813
FAX (858) 974-5928

PUBLIC SAFETY GROUP
SAN DIEGO COUNTY FIRE AUTHORITY
5510 Overland Ave, Suite 250, San Diego, CA 92123

KEN MILLER & RALPH STEINHOFF
FIRE SERVICES COORDINATOR
(858) 974-5920
FAX (858) 974-5928

January 4, 2013

Mr. Wayne Chiu, P.E.
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego California 92123-4340

Dear Mr. Chiu,

SUBJECT: Amendment of Draft Permit Language for Fire Fighting Activities – Tentative Order No.R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu

As a local authority affected by the most recent MS4 Draft Permit we feel compelled to provide written comments to ensure that water quality regulations are practical, cost-effective, and scientifically justified. Since the County Fire Authority will be directly regulated by the Regional MS4 Permit, we are concerned that public funds and critical personnel may have to be spent or resourced to comply with requirements that are unnecessary, and that this will ultimately reduce the emergency personnel and funding available for essential public services.

It is vital that the resources required to keep our communities safe from the threat of fire be solely purposed for that task. For this reason the 15 rural fire agencies within San Diego County have joined the County Fire Authority's call to action to protect water quality while controlling the mounting and unsubstantiated costs of increased regulation on local governments, business, and industry. As written, the Tentative Order will result in a significant and unprecedented level of regulation and cost without clear scientific basis or environmental benefit. The Fire Authority along with the 15 rural agencies believe that the language incorporated in a re-issued permit should not deviate from the current permit unless the RWQCB can provide clear evidence that emergency fire fighting activities and fire sprinkler line flushing significantly impact stormwater runoff, and that the increased costs associated with proposed changes are justified and feasible. Accordingly, we ask that the Regional Board honor the language in the existing permit and make no changes at this time.

In order to provide the best service possible the Fire Authority and its 15 participating agencies must be focused on emergency activities and not with implementing BMPs or removing debris caused by the emergency after the fact. This should be the sole responsibility of the entities owning or operating the sites or facilities for which the fire agencies are responding. The Fire Authority also believes that existing requirements are sufficient to ensure that the flushing of fire sprinkler systems has minimal impact to storm water quality and should not be prohibited. These activities exist for the safety of the public and the environment and should be continued in their current fashion pursuant to existing permit requirements.

We are hopeful that the final permit language will result in programs that make sense from a public safety, environmental and economic standpoint. Please contact Greg Schreiner, Fire Marshal, if you have questions or would like to discuss our concerns. His number is 858-495-5425, email is greg.schreiner@sdcounty.ca.gov

Sincerely,

Herman Reddick,
Program Manager

CC:
Acting Chairman Gary Strawn, San Diego Regional Water Quality Control Board (SD RWQCB)
Board Member Eric Anderson, SD RWQCB
Board Member Henry Abarbanel, SD RWQCB
Board Member Tomas Morales, SD RWQCB
Board Member Sharon Kalemkiarian, SD RWQCB
Executive Officer David Gibson, SD RWQCB

January 5, 2013

Via e-mail to wchiu@waterboards.ca.gov
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

RE: Comments on Tentative Order Number: R9-2013-0001

Dear Mr. Chiu:

I am a professor of microbiology and general biology for San Diego County Community Colleges and a member of the San Diego Coastkeeper Community Advisory Council. I respectfully submit the following comments on the draft San Diego Regional Municipal Separate Storm Sewer System permit, Tentative Order No. R9-2013-0001.

Urban runoff is the San Diego region's most urgent pollution problem. Arguably, it is the most difficult to solve. In a region known for its beaches and strong tourism economy, polluted runoff makes our beaches and waterways unsafe for swimming, fishing and other recreation for at least 72 hours after a rain event. Even in dry weather, our "urban drool" from residents and businesses overwatering lawns becomes a major pollution source. A recent scientific article by Viswanathan *et al.* delineated 'urban runoff' as a problem in almost every watershed in San Diego County:

Watersheds and Description of Associated Concerns

Name of watersheds	Water quality concerns	Impacts
Carlsbad	Surface water quality degradation, beach closures, sedimentation, habitat degradation, and eutrophication	Urban runoff, agricultural runoff, sewage spills, domestic animals, and livestock
Otay	Surface water quality degradation, sedimentation, habitat degradation, and loss	Urban runoff, agricultural runoff, resource extraction, septic systems, and marinas
Penasquitos	Decline in surface water quality, beach closures, sedimentation, habitat degradation, and eutrophication	Urban runoff, sewage spills, dredging, and landfill leachate
Pueblo San Diego	Decline in surface water quality, habitat degradation, and toxins	Urban runoff
San Diego	Decline in surface water quality, degrading habitats, sediment, and eutrophication	Urban runoff, agricultural runoff, mining operations, sewage spills, and sand mining
San Dieguito	High levels of coliform bacteria, nutrients and sediment, resulting in declining surface water quality and habitat degradation	Urban runoff, agricultural runoff, and domestic animals
San Juan	Decline in water quality and habitat loss	Urban runoff, agricultural runoff, and military operations from Camp Pendleton are the major sources of pollution in this watershed
San Luis Rey	High levels of coliform bacteria, nutrients and sediment, resulting in declining surface water quality and habitat degradation	Agriculture and orchards, livestock, urban runoff, sand mining, and septic systems
Santa Margarita	Surface and groundwater quality degradation; habitat loss	Excessive sedimentation from development and agricultural areas
Sweetwater	Declining surface and groundwater quality and habitat degradation	Agricultural and urban runoff
Tijuana	Most severely impacted watershed in San Diego Basin	Urban runoff, sewage spills, industrial discharges, agricultural, livestock, and septic systems

The good news is by working together as a community, we can solve this challenging public health problem. The Water Quality Improvement Plans proposed in the draft permit have the potential to become powerful tools to help us improve water quality within our watersheds. However, the Copermittees cannot be tasked with creating these plans alone. Specifically:

- The Permit should require formation of a stakeholder advisory group for each watershed that includes representatives of environmental groups with knowledge of the watershed.
- This stakeholder advisory group should work closely with the Copermittees and a regional board staff member while the Water Quality Improvement Plans are being developed to ensure these plans aggressively pursue water quality gains.
- The stakeholder advisory process should include accountability and measureable milestones to ensure the goals of the Permit are being met.

By taking advantage of the knowledge and resources of diverse stakeholders like municipalities, businesses and residents, our region can be on the cutting-edge of addressing urban runoff and creating healthier communities and watersheds. But this can only be achieved if these diverse voices are impacting the planning process in a meaningful way. The impacts of reaching our goals together are two-fold, resulting in a win-win situation for the environment and society as described by Dearborn and Kark :

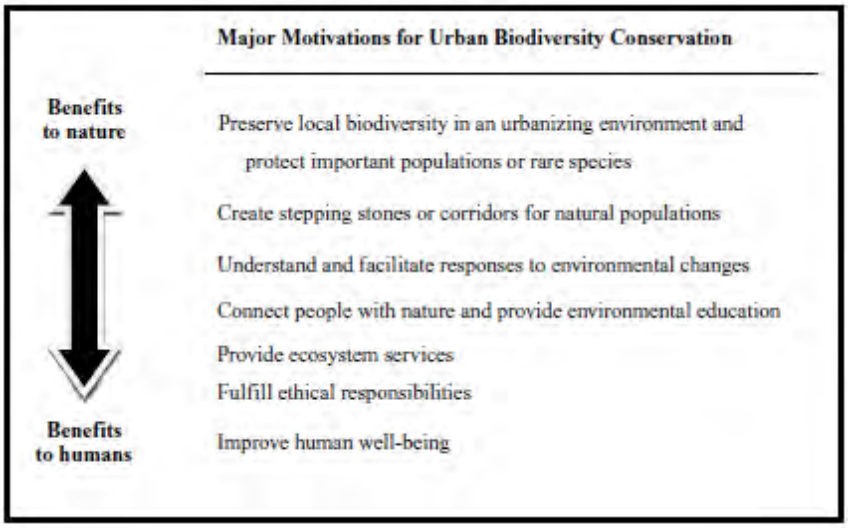

As San Diego continues to grow at 10% annually, it is imperative that we "understand and facilitate responses to environmental changes" as not only an 'ethical responsibility', but to improve our own human well-being. I've seen constant growth (even in the past 4 years of "recession") in the East County, including a steady degradation of the biodiversity of the San Diego River despite the best conservation efforts of San Diego Mission Trails and other county and city parks. What occurs upstream is beyond the control of parks and land set aside for conservation. Urban runoff is a major contributor to this.

San Diego County Community Colleges and the San Diego Coastkeeper Community Advisory Council recognize the challenge urban runoff presents to our region, and we want to do our part to solve the problem. San Diego County Community Colleges and the San Diego Coastkeeper Community Advisory Council are interested in participating in a Water Quality Improvement Plan development process for the San Diego River watershed.

San Diego County Community Colleges the San Diego Coastkeeper Community Advisory Council urges the Regional Board to enhance the stakeholder participation opportunities as Water Quality Improvement Plans are developed and then approve the permit.

Respectfully submitted,

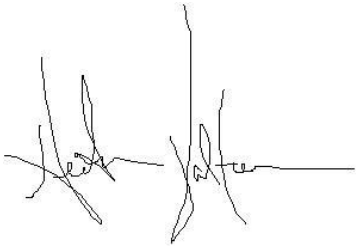

Professor Hector Valtierra,
M.A. (Liberal Arts), M.S. (Biochemistry), MPH (Public Health)
San Diego County Community Colleges
San Diego Coastkeeper Community Advisory Council

References

Dearborn DC and Kark S. **Motivations for Conserving Urban Biodiversity**. *Conservation Biology*. April 2010. Vol. 24, No. 2; pgs. 432 – 440.

Viswanathan S, Voss KA, Alex Pohlman, Gibson D, and Purohit J. **Evaluation of the Biocriteria of Streams in the San Diego Hydrologic Region**. *Journal of Environmental Engineering*. June 2010. Vol. 136; pgs. 627 - 637.

THE CITY OF SAN DIEGO

January 7, 2013

VIA EMAIL TO: wchiu@waterboards.ca.gov

Wayne Chiu, P.E.
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego California 92123-4340

Dear Mr. Chiu:

Subject: Draft Municipal Storm Water Permit, Tentative Order No. R9-2013-0001

Thank you for the opportunity to comment on the San Diego Regional Water Quality Control Board's (Regional Board) draft Municipal Storm Water Permit (Tentative Order No. R9-2013-0001, hereinafter referred to as "Tentative Order"). The City of San Diego (City) participated with the twenty one permittees in the San Diego region subject to the current Municipal Permit (Copermittees) to develop a collective set of comments on the Tentative Order. The Copermittee comments were submitted separately by the County of San Diego and are supported by the City. In addition, the City submits this letter to provide additional comments on the Tentative Order.

- *Revise the Tentative Order to allow for compliance with Discharge Prohibitions, Receiving Water Limitations, and Areas of Special Biological Significance (ASBS) and Total Maximum Daily Load (TMDL) requirements if a Copermittee is implementing an approved Water Quality Improvement Plan (WQIP) that includes a reasonable assurance analysis.* The City's objective is for the Tentative Order to allow the City to efficiently integrate its TMDL, ASBS and Municipal Permit requirements into a program that allows for compliance through implementation. The WQIP developed by Regional Board staff provides an innovative, thoughtful, and strategic framework for such an approach. However, the Tentative Order does not provide a mechanism for the City to achieve compliance with ASBS and TMDL regulations and the Tentative Order's prohibitions and limitations while implementing the WQIPs. The City supports the proposed process offered by the San Diego Copermittees which links compliance to the WQIPs provided that a reasonable assurance analysis is provided which demonstrates that water quality goals will be met if the WQIP is implemented. The City requests inclusion of the Copermittee's "WQIP-Based Compliance" option in the Tentative Order.

- *Incorporate 4 options from the adopted Bacteria I TMDL into the Tentative Order.* The following options are included in the Bacteria I TMDL and consistent with federal regulations. These options should be included in the Tentative Order because they encourage

efforts to target the highest polluting outfalls, address multiple pollutants comprehensively, and improve best management practices through adaptive management.

1. Mass (load)-based method for complying with Water Quality Based Effluent Limits (WQBELs). A mass (load)-based approach would allow the City to achieve water quality improvements more quickly and efficiently by targeting the highest polluting outfalls in each watershed.
2. BMP-based method for complying with WQBELs. The Bacteria I TMDL allows for BMP-based WQBELs, and is supported by federal regulations provided that measurable goals are set and efforts are iteratively adapted if water quality targets are not initially met. The WQIP-Based Compliance framework proposed by the Copermittees in their comment letter qualifies as a BMP-based program, consistent with federal regulations.
3. Adjusting interim Bacteria I TMDL compliance dates. The Bacteria I TMDL allows for Copermittees to propose alternative interim dry and wet weather compliance dates if the Copermittee proposes to address multiple pollutants (in addition to bacteria) through a comprehensive approach.
4. TMDL Re-opener. The Bacteria I TMDL states that the TMDL will be re-opened within 5 years after the effective date or later as new information becomes available to improve the science supporting the TMDL. The Tentative Order should include a corresponding acknowledgement that the adopted Order will be re-opened if the Bacteria I TMDL is amended.

- *Revise the Tentative Order to uphold the previously adopted San Diego Hydromodification Management Plan (San Diego HMP), Resolution No. R9-2010-0066.* This plan has been in effect for less than two years. The San Diego HMP was developed by an expert consultant team that utilized extensive scientific studies, analysis and modeling to determine the appropriate hydromodification control criteria. Additionally, the Copermittees have embarked upon a $1.5 million, 5 year monitoring plan to validate the parameters and design criteria. There have been no scientific advances in the last 2 years to justify revisions to the San Diego HMP. Therefore, we request allowing the Copermittees to continue implementation of the current San Diego HMP. Additionally, the Tentative Order expands the application of HMP controls beyond a project's impact by: 1) imposing HMP requirements on sites that have no potential of causing erosion downstream; and 2) setting pre-development as a baseline for HMP mitigation. The City requests limiting the HMP requirements to only the project's impact.

- *Replace the monitoring and assessment requirements in the Tentative Order (Provision D.4) with the strategic monitoring approach developed collectively by the Copermittees.* The Copermittees' approach will more efficiently and effectively address critical questions necessary to adaptively manage the City's programs and realize our storm water quality goals.

- *Add the San Diego Unified Port District (Port) as a Municipal Separate Stormwater Sewer System (MS4) Operator to the Shelter Island Yacht Basin Copper TMDL.* The Port should be

listed as an MS4 Operator because the Port is responsible for storm drains in parking lots within the Port's jurisdiction that drain to the Shelter Island Yacht Basin.

Thank you for the opportunity to comment. We look forward to continued discussions in finding ways to improve and protect water quality. If you have any questions please contact Drew Kleis, Program Manager at (858) 541-4329.

Sincerely,

Kris McFadden
Deputy Director

KM:dk

cc: Heather Stroud, Deputy City Attorney, City Attorney's Office
Sumer Hasenin, Senior Civil Engineer, Storm Water Division
Drew Kleis, Program Manager, Storm Water Division
Ruth Kolb, Program Manager, Storm Water Division
Andre Sonksen, Program Manager, Storm Water Division

Wayne Chiu

January 8, 2013

SAN DIEGO REGIONAL
WATER QUALITY
CONTROL BOARD
2013 JAN 11 PM 12 17

Wayne Chiu, P.E.
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego California 92123-4340

Subject: City of Imperial Beach comments on the proposed Tentative Order No. R9-2013-0001

Dear Mr. Chiu:

The City of Imperial Beach appreciates this opportunity to provide comments on the Tentative Order No. R9-2013-0001. We recognize the effort made by RWQCB staff to consider and discuss the various stakeholder positions for this new permit and agree that developing a new permit through a series of focused meetings was innovative and successful in getting the stakeholders to understand each other's positions for achieving the same end goal of improved water quality. We hope that similar efforts for collaboration are continued at the water board.

The City of Imperial Beach has been actively involved in the focus meeting process and subsequent special workshops held on the new permit. The City also participated in the development of the San Diego Regional Copermittees response to the new permit and support the redline draft being proposed by the Copermittees. The comments on the new permit below are provided in addition to the comments being made by the San Diego Copermittees. We look forward to working with the RWQCB on the final development of this new storm water permit and are optimistic that this new permit will allow for the more efficient use of community resources to implement a successful storm water management program.

Comments by the City of Imperial Beach on Tentative Order R9-2013-0001:

- Provision A: The point of jurisdictional compliance under provision A is vague and presents the potential for unintended 3rd party lawsuits. If the regional board truly embraces an adaptive approach to address priority pollutants then that needs to be explicitly clear in the new permit. It is not clear if compliance means meeting the water quality objective or implementing an adaptive WQIP. We recognize the position by the Regional Board to not get ahead of the State Water Board especially in light of the recent November 20th workshop in Sacramento to discuss concerns on the limitations of receiving water limitations in municipal storm water permits, however, we want to strongly emphasize the importance of preventing unnecessary and costly 3rd party lawsuits in the new permit.
- Provision D: We strongly support the San Diego County Copermittee's recommended changes to the monitoring program in Provision D. The Copermittees met with RWQCB staff on multiple occasions after the focus meetings to discuss recommended changes. Please incorporate a monitoring program such as the one suggested by the Copermittees that uses a scientific and question driven monitoring approach that most effectively uses public funding to demonstrate any statistically significant changes in water quality.
- E.3.B.2.e Priority Development Project Categories: The definition for a priority development project that "discharges directly to" an Environmental Sensitive Area was changed in this permit. The clarifying language from the last permit specified flows that "discharge directly to" <u>as outflow from a drainage conveyance systems that is comprised entirely of flows from the subject development and not commingled with flows from adjacent lands</u>. It is my understanding from the RWQCB that their intent was not to change the definition for discharging to an Environmentally Sensitive Area and request that the clarifying language from the old permit is reintroduced for clarity.

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- E.3.B.3.b Priority Development Project Exemptions: Major maintenance on roads, alleys, and sidewalks should be treated different than other redevelopment projects because design standards and public safety take priority over water quality regulations. It is not practical to incorporate green streets and LIDs into every street retrofit project due to site feasibility, conflicting design standards, and increased project costs; however, the Copermittees should be allowed the flexibility to consider the application of green streets and LIDs into street retrofit projects whenever and wherever feasible.
- E.3.B.3.c Priority Development Project Exemptions: Single family residential redevelopment projects should not be held to the specific design standards for regular priority development projects because it discourages redevelopment of old properties. LID and HMP sizing criteria requires hydrology reports and engineered BMP design plans that captures the 24-hr 85th percentile storm event and prevents not more than 10 percent of the naturally occurring flow off the site, which is beyond the normal scope of many single family residential projects. These regulations are complex and hard to understand for the regular home owner and general contractor. Requiring costly engineered BMP plans for single family residential redevelopment projects disproportionally impacts lower income communities like Imperial Beach that already have a hard time encouraging new development. We support permit language that does not require engineered BMP solutions for single family residential projects such as the disconnection of impervious surfaces, improved landscaped areas with 12" of loamy soil, and incorporation of LID concepts into the project area.
- E.3.C.2 Hydromodification Management BMP Requirements: We strongly support the recommended HMP changes discussed at length by the San Diego Copermittees. Most importantly the City requests the HMP exemptions that were removed from the previous permit be reintroduced. The entire City of Imperial Beach discharges into a tidally influenced area and does not contribute to downstream erosion. Requiring HMP on project sites in the City does not make any sense and furthermore, requiring offsite mitigation somewhere in the watershed essentially translates into a tax on development that does not mitigate for any downstream flow impacts from the project site.
- E.3.C.3.b Alternative Compliance Project Options: It does not seem appropriate for the RWQCB or any government agency to regulate alternative compliance based on LEED Certified Redevelopment projects when there are other green building certification programs on the market. Being LEED Certified does not necessarily modify storm water runoff pollution. LEED accreditation is a noteworthy building accomplishment but it is bad policy to write LEED into the regulations.
- Attachment E Provisions for TMDLs: We support the comments made by the County of San Diego related to incorporating the requirements of existing TMDLs into this new permit.

Sincerely,

Chris Helmer
Environmental Programs Manger

cc: Gary Brown – City Manager; Greg Wade – Assistant City Manager; Hank Levien – Public Works Director

From: Jessica Toth
To: Chiu, Wayne@Waterboards
Subject: Comments on Tentative Order No. R9-2013-0001
Date: Tuesday, January 08, 2013 12:55:28 PM

January 8, 2013

San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

RE: Comments on Tentative Order Number: R9-2013-0001

Dear Mr. Chiu:

Curious Company respectfully submits the following comments on the draft San Diego Regional Municipal Separate Storm Sewer System permit, Tentative Order No. R9-2013-0001.

Urban runoff is the San Diego region's most urgent pollution problem. Arguably, it is the most difficult to solve. In a region known for its beaches and strong tourism economy, polluted runoff makes our beaches and waterways unsafe for swimming, fishing and other recreation for at least 72 hours after a rain event. Even in dry weather, our "urban drool" from residents and businesses overwatering lawns becomes a major pollution source.

The good news is by working together as a community, we can solve this challenging public health problem. The Water Quality Improvement Plans proposed in the draft permit have the potential to become powerful tools to help us improve water quality within our watersheds. However, the Co-permittees cannot be tasked with creating these plans alone. Specifically:

* The Permit should require formation of a stakeholder advisory group for each watershed that includes representatives of environmental groups with knowledge of the watershed.
* This stakeholder advisory group should work closely with the Co-permittees and a regional board staff member while the Water Quality Improvement Plans are being developed to ensure these plans aggressively pursue water quality gains.
* The stakeholder advisory process should include accountability and measureable milestones to ensure the goals of the Permit are being met.

By taking advantage of the knowledge and resources of diverse stakeholders like municipalities, businesses and residents, our region can be on the cutting-edge of addressing urban runoff and creating healthier communities and watersheds. But this can only be achieved if these diverse voices are impacting the planning process in a meaningful way.

Curious Company recognizes the challenge urban runoff presents to our region, and we want to do our part to solve the problem. Curious Company is interested in participating in a Water Quality Improvement Plan development process for San Dieguito Watershed.

Curious Company urges the Regional Board to enhance the stakeholder participation opportunities as Water Quality Improvement Plans are developed and then approve the permit.

Respectfully submitted,
Jessica Toth
Curious Company

Jessica Toth
Curious Company
www.curiousco.com
(760) 809-1143

January 8, 2013

Wayne Chiu, P.E.
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego California 92123-4340

Subject: Comment – Tentative Order No. R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu.

Topic: Requirement to upload data to CEDEN

Section F.3.b.(3) of the Tentative Order requires that, "Any monitoring data utilized in developing the Annual Report must be uploaded to the California Environmental Data Exchange Network (CEDEN)."

We ask the RWQCB to either remove this requirement or make it optional. We see the following problems with the above requirement:

1. At its core, this new permit relies on Water Quality Improvement Plans which are to be prepared on a watershed by watershed basis. Bifurcating the reporting of monitoring information from the goals and objectives of the WQIPs makes the data unintelligible and superfluous to the public. Data should be reported through independent data warehouses associated with each of the ten WQIPs.

2. The phrase "any monitoring data" is ambiguous and creates a compliance burden on co-permittees that CEDEN currently does not support. As seen in the screen shot below, CEDEN supports only Chemistry, Field, and Toxicity data. The overall monitoring task under the Order includes a much larger data set.

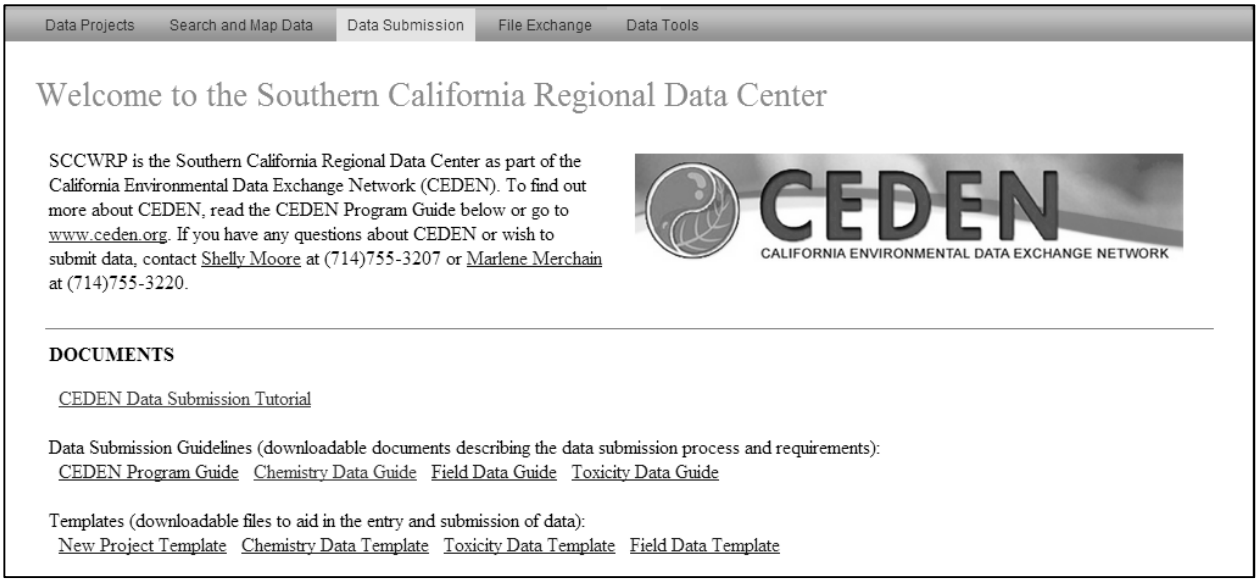

3. Uploading data to CEDEN seems redundant since the Order is also asking co-permittees, "Any monitoring and assessment data utilized in developing the Annual Report must be provided on the Regional Clearinghouse required pursuant to Provision F.4." A WMA-based data warehouse is a more practical and comprehensive source of data for the RWQCB, other co-permitees, and public.

4. In practical terms, uploading "any monitoring data" to CEDEN is unnecessary. CEDEN, through its data upload process, basically provides data standardization. However, the Order already requires that all monitoring data be compatible with SWAMP, the Surface Water Ambient Monitoring Program adopted by the State Water Board. So CEDEN formats must be identical to SWAMP, which happens to be the case, nullifying the value added by CEDEN. Co-permittees should not be burdened with this additional cost and statutory obligation.

   The California Department of Water Resources or the State Water Board requires that grant funded projects submit their monitoring data to CEDEN. The primary recipients of these grants are non-government organizations employing citizen volunteers, and projects that do not have any legal obligation to meet stormwater permit requirements. Since their monitoring programs may not meet statutory standards, achieving some level of standardization through CEDEN in these situations is a reasonable objective. However, this is not the case with stormwater permittees.

Respectfully yours,

Joe

Joe Purohit
EcoLayers, Inc.

Phone: 858 240 2340
Email: joe@ecolayers.com

OTAY RANCH NEW HOMES
HOME BUILDER SINCE 1990

SAN DIEGO REGIONAL
WATER QUALITY
CONTROL BOARD
2013 JAN 10 AM 11 28

January 8, 2013

Ms. Laurie Walsh
San Diego Regional Water Quality Control Board
9174 Sky Park Circle, Suite 100
San Diego, CA 92123

RE: Tentative Order No. R9-2013-0001/Municipal Separated Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region

Dear Ms. Walsh:

Thank for the opportunity to provide comments on Tentative Order No. R-9-2013-0001. Our company is close to completing entitlements for a sustainable, walkable master planned community within the Otay Ranch. We have been processing these entitlements for the past four years and have expended millions of dollars planning a community that protects the environment, and specifically, water quality.

Our project is located north of the Otay River Valley and has been designed consistent with the permit approved by the Board just a year ago. In following the requirements in the current permit, we have devised a plan that cleans all project storm water runoff prior to introducing into the Otay River. This plan is contingent upon maintaining the hydromodification exemption for the Otay River.

The Otay River exemption was put into place based on the scientific and technical expertise of the Hydromodification Task Force. This committee, representing environmental and engineering experts, determined that limiting runoff to certain bodies of water and rivers within your jurisdiction would not be beneficial to the health of those watersheds. Due to the influence of the Otay Lakes and Dam upstream of our project, your Board approved an exemption for the Otay River.

If the Otay River exemption is removed from the new Tentative Order, our land plan would need to be dramatically altered, in effect, wiping out years of planning, engineering and environmental work.

1392 East Palomar Street, Ste. 202 • Chula Vista, California 91913• 619-210-0560

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The proposed Tentative Order also calls for retention of the 24 hour 85th percentile storm event onsite. Retention flows from the majority of storm events will adversely impact the Otay River watershed that is described as being "starved" for runoff in the Otay River Watershed Management Plan. Since infiltration is infeasible on our site due to soil conditions, the new permit proposes to arbitrarily increase our bio-retention facilities by 25%, a number that does not appear to have any scientific basis but would severely impact our land plans.

We certainly appreciate efforts to identify regional solutions through implementation of the Watershed Improvement Plans; however, we must be allowed to operate under the current permit until the Watershed Improvements Plans determine the best regional solutions for each watershed. Specifically, we ask that the Otay River hydromodification exemption remain in place and the retention requirements not be added to the permit until and if the Watershed Improvement Plans determine if retention is beneficial to the Otay River watershed.

Thank you for your consideration.

Sincerely,

Ranie L. Hunter
Executive Vice President

County of San Diego

RICHARD E. CROMPTON
DIRECTOR

DEPARTMENT OF PUBLIC WORKS

5510 OVERLAND AVE, SUITE 410
SAN DIEGO, CALIFORNIA 92123-1237

(858) 694-2212 FAX: (858) 694-3597
Web Site: www.sdcounty.ca.gov/dpw/

January 8, 2013

Wayne Chiu, P.E.
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Dear Mr. Chiu:

SAN DIEGO COPERMITTEE COMMENT SUBMITTAL – TENTATIVE ORDER NO. R9-2013-0001, REGIONAL MS4 PERMIT, PLACE ID 786088WCHIU

Thank you for the opportunity to comment on Tentative Order No. R9-2013-0001, NPDES No. CAS0109266, *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Tentative Order). The County of San Diego, as Principal Permittee, submits the attached comments on behalf of the 21 Copermittees subject to Regional Water Quality Control Board (Regional Board) Order 2007-0001, the existing San Diego County MS4 Permit.

These comments were developed jointly with the San Diego Copermittees and should be considered to represent a general group consensus. However, although we have strived to obtain unanimity in our comments and proposed permit revisions, individual Copermittees do sometimes have differing opinions. These will be expressed in separate written comments provided by individual Copermittees.

We greatly appreciate the public process employed to date toward the development of a new and improved permit for the San Diego Region, as well as the openness of staff and Regional Water Quality Control Board (Regional Board) members in listening to the issues and concerns put forth by the County and numerous other interested parties. The San Diego Copermittees' recommended edits to the Tentative Order are attached. The supporting rationale for each is provided in a separate comment table. Most edits are in the form of redline-strikeout changes.

Again, thank you for the opportunity to participate in the development of a new permit for the San Diego Region. We look forward to continued discussion of the issues raised above. If you have questions, please contact Todd Snyder, Land Use & Environmental Planning Manager, at (858) 694-3482, or todd.snyder@sdcounty.ca.gov.

Sincerely,

CID TESORO, Manager
Department of Public Works

CT:js

Attachments: San Diego Copermittee Recommended Edits to Tentative Order R9-2013-0001
San Diego Copermittee Comment Table

CC: Todd Snyder, Department of Public Works

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

TENTATIVE
ORDER NO. R9-2013-0001
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The San Diego County Copermittees in Table 1a are subject to waste discharge requirements set forth in this Order.

Table 1a. San Diego County Copermittees

City of Carlsbad	City of Oceanside
City of Chula Vista	City of Poway
City of Coronado	City of San Diego
City of Del Mar	City of San Marcos
City of El Cajon	City of Santee
City of Encinitas	City of Solana Beach
City of Escondido	City of Vista
City of Imperial Beach	County of San Diego
City of La Mesa	San Diego County Regional Airport Authority
City of Lemon Grove	San Diego Unified Port District
City of National City	

After the San Diego Water Board receives and considers the Orange County Copermittees' Report of Waste Discharge and makes any necessary changes to the Order, the Orange County Copermittees in Table 1b will become subject to waste discharge requirements set forth in this Order after expiration of Order No. R9-2009-0002, NPDES No. CAS0108740 on or after December 16, 2014.

Table 1b. Orange County Copermittees

City of Aliso Viejo	City of Rancho Santa Margarita
City of Dana Point	City of San Clemente
City of Laguna Beach	City of San Juan Capistrano
City of Laguna Hills	City of Laguna Woods
City of Laguna Niguel	County of Orange
City of Lake Forest	Orange County Flood Control District
City of Mission Viejo	

After the San Diego Water Board receives and considers the Riverside County Copermittees' Report of Waste Discharge and makes any necessary changes to this Order, the Riverside County Copermittees in Table 1c will become subject to waste discharge requirements set forth in this Order after expiration of Order No. R9-2010-0016, NPDES No. CAS0108766 on or after November 10, 2015.

Table 1c. Riverside County Copermittees

City of Murrieta	County of Riverside
City of Temecula	Riverside County Flood Control and Water Conservation District
City of Wildomar	

The Orange County Copermittees and Riverside County Copermittees may become subject to the requirements of this Order at a date earlier than the expiration date of their current Orders subject to the conditions described in Provision F.6 of this Order if the Copermittees in the respective county receive a notification of coverage from the San Diego Water Board.

The term Copermittee in this Order refers to any San Diego County, Orange County, or Riverside County Copermittee covered under this Order, unless specified otherwise.

This Order provides permit coverage for the Copermittee discharges described in Table 2.

Table 2. Discharge Locations and Receiving Waters

Discharge Points	Locations throughout San Diego Region
Discharge Description	Municipal Separate Storm Sewer System (MS4) Discharges
Receiving Waters	Inland Surface Waters, Enclosed Bays and Estuaries, and Coastal Ocean Waters of the San Diego Region

Table 3. Administrative Information

This Order was adopted by the San Diego Water Board on:	**Month Day, 2013**
This Order will become effective on:	**Month Day, 2013**
This Order will expire on:	**Month Day, 2018**
The Copermittees must file a Report of Waste Discharge in accordance with Title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than 180 days in advance of the Order expiration date.	

I, David W. Gibson, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on Month Day, 2013.

TENTATIVE

David W. Gibson
Executive Officer

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I. FINDINGS

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), finds that:

JURISDICTION

1. **MS4 Ownership or Operation.** Each of the Copermittees owns or operates an MS4, through which it discharges storm water and non-storm water into waters of the U.S. within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the U.S.

2. **Legal and Regulatory Authority.** This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]) adopted by the United States Environmental Protection Agency (USEPA), and chapter 5.5, division 7 of the California Water Code (CWC) (commencing with section 13370). This Order serves as an NPDES permit for discharges from MS4s to surface waters. This Order also serves as waste discharge requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

   The San Diego Water Board has the legal authority to issue a regional MS4 permit pursuant to its authority under CWA section 402(p)(3)(B) and 40 CFR 122.26(a)(1)(v). The USEPA also made it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide permits (55 Federal Register [FR] 47990, 48039-48042). The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees and San Diego Water Board.

   The federal regulations make it clear that the Copermittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators (40 CFR 122.26(a)(3)(vi)). This Order does not require the Copermittees to manage storm water outside of their jurisdictional boundaries, but rather to work collectively to improve storm water management within watersheds.

3. **CWA NPDES Permit Conditions.** Pursuant to CWA section 402(p)(3)(B), NPDES permits for storm water discharges from MS4s must include requirements to effectively prohibit non-storm water discharges into MS4s, and require controls to reduce the discharge of pollutants ~~in storm water~~ to the maximum extent practicable (MEP), and to require other provisions as the San Diego Water Board determines are appropriate to control such pollutants. This Order prescribes conditions to assure

compliance with the CWA requirements for owners and operators of MS4s to effectively prohibit non-storm water discharges in to the MS4s, and require controls to reduce the discharge of pollutants in storm water from the MS4s to the MEP.

4. **CWA and CWC Monitoring Requirements.** CWA section 308(a) and 40 CFR 122.41(h),(j)-(l) and 122.48 require that NPDES permits must specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s also specify additional monitoring and reporting requirements in 40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c). CWC section 13383 authorizes the San Diego Water Board to establish monitoring, inspection, entry, reporting and recordkeeping requirements. This Order establishes monitoring and reporting requirements to implement federal and State requirements.

5. **Total Maximum Daily Loads.** CWA section 303(d)(1)(A) requires that "[e]ach state shall identify those waters within its boundaries for which the effluent limitations…are not stringent enough to implement any water quality standard applicable to such waters." The CWA also requires states to establish a priority ranking of impaired water bodies known as Water Quality Limited Segments and to establish Total Maximum Daily Loads (TMDLs) for such waters. This priority list of impaired water bodies is called the Clean Water Act Section 303(d) List of Water Quality Limited Segments, commonly referred to as the 303(d) List. The CWA requires the 303(d) List to be updated every two years.

   TMDLs are numerical calculations of the maximum amount of a pollutant that a water body can assimilate and still meet water quality standards. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point sources (waste load allocations or WLAs) and non-point sources (load allocations or LAs), background contribution, plus a margin of safety. Discharges from MS4s are point source discharges. The federal regulations (40 CFR 122.44(d)(1)(vii)(B)) require that NPDES permits to incorporate water quality based effluent limitations (WQBELs) developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, consistent with the assumptions and requirements of any available WLA for the discharge. Requirements of this Order implement the TMDLs adopted by the San Diego Water Board and approved by USEPA.

6. **Non-Storm Water Discharges.** Pursuant to CWA section 402(p)(3)(B)(ii), this Order requires each Copermittee to effectively prohibit discharges of non-storm water into its MS4. Nevertheless, non-storm water discharges into and from the MS4s continue to be reported to the San Diego Water Board by the Copermittees and other persons. Monitoring conducted by the Copermittees, as well as the 303(d) List, have identified dry weather, non-storm water discharges from the MS4s as a source of pollutants causing or contributing to receiving water quality impairments in the San Diego Region. The federal regulations (40 CFR 122.26(d)(2)(iv)(B)(1)) require the Copermittees to have a program to prevent illicit discharges to the MS4. The federal regulations, however, allow for specific categories of non-storm water discharges or flows to be addressed as illicit discharges only where such discharges

are identified as sources of pollutants to waters of the U.S.

7. **In-Stream Treatment Systems.** Pursuant to federal regulations (40 CFR 131.10(a)), in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S. Authorizing the construction of a runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to accepting waste assimilation as an appropriate use for that water body. Runoff treatment must occur prior to the discharge of runoff into receiving waters. Treatment control best management practices (BMPs) must not be constructed in waters of the U.S. Construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body.

DISCHARGE CHARACTERISTICS AND RUNOFF MANAGEMENT

8. **Point Source Discharges of Pollutants.** Discharges from the MS4s may contain waste, as defined in the CWC, and pollutants that adversely affect the quality of the waters of the state. A discharge from an MS4 is a "discharge of pollutants from a point source" into waters of the U.S. as defined in the CWA. Storm water and non-storm water discharges from the MS4s may contain pollutants that cause or threaten to cause a violation of surface water quality standards, as outlined in the ~~Water Quality Control Plan for the San Diego Basin (~~Basin Plan~~). Storm water and non-storm water discharges from the MS4s are subject to the conditions and requirements established in the Basin Plan for point source discharges~~.

9. **Potential Beneficial Use Impairment.** The discharge of pollutants and/or increased flows from MS4s may cause or threaten to cause the concentration of pollutants to exceed applicable receiving water quality objectives and impair or threaten to impair designated beneficial uses resulting in a condition of pollution, contamination, or nuisance.

10. **Pollutants Generated by Land Development.** Land development has created and continues to create new sources of non-storm water discharges and pollutants in storm water discharges as human population density increases. This brings higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash. Pollutants from these sources are dumped or washed off the surface by non-storm water or storm water flows into and from the MS4s. When development converts natural vegetated pervious ground cover to impervious surfaces such as paved highways, streets, rooftops, and parking lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving a developed area without BMPs that can maintain pre-development conditions will contain greater pollutant loads and have significantly greater runoff volume, velocity, and peak flow rate than pre-development runoff from the same area.

11. **Runoff Discharges to Receiving Waters.** The MS4s discharge runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within the eleven hydrologic units comprising the San Diego Region. Historic and current development makes use of natural drainage patterns and features as conveyances for runoff. ~~Rivers, streams and creeks in developed areas used in this manner are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and receiving water.~~ Numerous receiving water bodies and water body segments have been designated as impaired by the San Diego Water Board pursuant to CWA section 303(d).

12. **Pollutants in Runoff.** The most common pollutants in runoff discharged from the MS4s include total suspended solids, sediment, pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., cadmium, copper, lead, and zinc), petroleum products and polynuclear aromatic hydrocarbons, synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus), oxygen-demanding substances (e.g., decaying vegetation, animal waste), detergents, and trash. As operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not effectively prohibit or otherwise control. These discharges may cause or contribute to a condition of pollution or a violation of water quality standards.

13. **Human Health and Aquatic Life Impairment.** Pollutants in runoff discharged from the MS4s can threaten and adversely affect human health and aquatic organisms. Adverse responses of organisms to chemicals or physical agents in runoff range from physiological responses such as impaired reproduction or growth anomalies to mortality. Increased volume, velocity, rate, and duration of storm water runoff greatly accelerate the erosion of downstream natural channels. This alters stream channels and habitats and can adversely affect aquatic and terrestrial organisms.

14. **Water Quality Effects.** The Copermittees' water quality monitoring data submitted to date documents persistent exceedances of Basin Plan water quality objectives for runoff-related pollutants at various watershed monitoring stations. Persistent toxicity has also been observed at several watershed monitoring stations. In addition, bioassessment data indicate that the majority of the monitored receiving waters have Poor to Very Poor Index of Biological Integrity (IBI) ratings. These findings indicate that runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in the San Diego Region. Non-storm water discharges from the MS4s have been shown to contribute significant levels of pollutants and flow in arid, developed Southern California watersheds, and contribute significantly to exceedances of applicable receiving water quality objectives.

15. **Non-Storm Water and Storm Water Discharges.** ~~Non-storm water discharges from the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard of CWA section 402(p)(3)(B)(iii), which is explicitly for "Municipal … *Stormwater Discharges* (emphasis added)" from the MS4s.~~ Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s must be effectively prohibited. "Permits for discharges from municipal storm sewers… shall require controls to reduce the discharge of pollutants to the maximum extent practicable…" 402(p)(3)(B)(iii).

16. **Best Management Practices.** Waste and pollutants which are deposited and accumulate in MS4 drainage structures will be discharged from these structures to waters of the U.S. unless they are removed. These discharges may cause or contribute to, or threaten to cause or contribute to, a condition of pollution in receiving waters. For this reason, pollutants in storm water discharges from the MS4s can be and must be effectively reduced in runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Pollution prevention is the reduction or elimination of pollutant generation at its source and is the best "first line of defense". Source control BMPs (both structural and non-structural) minimize the contact between pollutants and runoff, therefore keeping pollutants onsite and out of receiving waters. Treatment control BMPs remove pollutants that have been mobilized by storm water or non-storm water flows.

17. **BMP Implementation.** Runoff needs to be addressed during the three major phases of development (planning, construction, and use) in order to reduce the discharge of storm water pollutants to the MEP, effectively prohibit non-storm water discharges, and protect receiving waters. Development which is not guided by water quality planning policies and principles can result in increased pollutant load discharges, flow rates, and flow durations which can negatively affect receiving water beneficial uses. Construction sites without adequate BMP implementation result in sediment runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. Existing development can generate substantial pollutant loads which are discharged in runoff to receiving waters. Retrofitting areas of existing development with storm water pollutant control and hydromodification management BMPs is necessary to address storm water discharges from existing development that may cause or contribute to a condition of pollution or a violation of water quality standards.

18. **Long Term Planning and Implementation.** Federal regulations require municipal storm water permits to expire 5 years from adoption, after which the permit must be renewed and reissued. The San Diego Water Board recognizes that the degradation of water quality and impacts to beneficial uses of the waters in the San Diego Region occurred over several decades. The San Diego Water Board further recognizes that a decade or more may be necessary to realize demonstrable improvement to the quality of waters in the Region. This Order includes a long term planning and implementation approach that will require more than a single permit term to complete.

WATER QUALITY STANDARDS

19. **Basin Plan.** The San Diego Water Board adopted the Water Quality Control Plan for the San Diego Basin (Basin Plan) on September 8, 1994 that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for receiving waters addressed through the plan. The Basin Plan was subsequently approved by the State Water Resources Control Board (State Water Board) on December 13, 1994. Subsequent revisions to the Basin Plan have also been adopted by the San Diego Water Board and approved by the State Water Board. Requirements of this Order implement the Basin Plan.

    The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Process Supply (PROC), Industrial Service Supply (IND), Ground Water Recharge (GWR), Contact Water Recreation (REC1), Non-contact Water Recreation (REC2), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Freshwater Replenishment (FRSH), Hydropower Generation (POW), and Preservation of Biological Habitats of Special Significance (BIOL). The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region: Navigation (NAV), Commercial and Sport Fishing (COMM), Estuarine Habitat (EST), Marine Habitat (MAR), Aquaculture (AQUA), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN), and Shellfish Harvesting (SHELL).

20. **Ocean Plan.** The State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, and 2005. The State Water Board adopted the latest amendment on April 21, 2005 and it became effective on February 14, 2006. The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean. Requirements of this Order implement the Ocean Plan.

    The Ocean Plan identifies the following beneficial uses of ocean waters of the state to be protected: Industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture; preservation and enhancement of designated Areas of Special Biological Significance; rare and endangered species; marine habitat; fish spawning and shellfish harvesting

21. **Sediment Quality Control Plan**. On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan

establishes: 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

22. **National Toxics Rule and California Toxics Rule.** USEPA adopted the National Toxics Rule (NTR) on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the NTR applied in California. On May 18, 2000, USEPA adopted the California Toxics Rule (CTR). The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants.

23. **Antidegradation Policy.** This Order is in conformance with the federal Antidegradation Policy described in 40 CFR 131.12, and State Water Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality Waters in California*. Federal regulations at 40 CFR 131.12 require that the State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. State Water Board Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies.

CONSIDERATIONS UNDER FEDERAL AND STATE LAW

24. **Coastal Zone Act Reauthorization Amendments.** Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states with approved coastal zone management programs to address non-point source pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point source pollution: agriculture, silviculture, urban, marinas, and hydromodification. This Order addresses the management measures required for the urban category, with the exception of septic systems. The runoff management programs developed pursuant to this Order fulfills the need for coastal cities to develop a runoff non-point source plan identified in the Non-Point Source Program Strategy and Implementation Plan. The San Diego Water Board addresses septic systems through the administration of other programs.

25. **Endangered Species Act.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 USC sections 1531 to 1544). This Order requires compliance with receiving water limits, and other requirements to protect the beneficial uses of

waters of the State. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

26. **Report of Waste Discharge Process.** The waste discharge requirements set forth in this Order are based upon the Report of Waste Discharge submitted by the San Diego County Copermittees prior to the expiration of Order No. R9-2007-0001 (NPDES No. CAS0109266). The Orange County and Riverside County Copermittees are not immediately covered by the waste discharge requirements in this Order. The San Diego Water Board understands that each municipality is unique although the Counties share watersheds and geographical boundaries. The Order will continue to use the Report of Waste Discharge process prior to initially making Orange County or Riverside County Copermittees subject to the requirements of this Order.

    The federal regulations (40 CFR 122.21(d)(2)) and CWC section 13376 impose a duty on the Copermittees to reapply for continued coverage through submittal of a Report of Waste Discharge no later than 180 days prior to expiration of a currently effective permit. This requirement is set forth in the Orange County Copermittees' and Riverside County Copermittees' currently effective permits at Provisions K.2.b and K.2.c, respectively. The Orange County Permit, Order No. R9-2009-0002 (NPDES No. CAS0108740) expires on December 16, 2014 and the Riverside County MS4 Permit, Order No. R9-2010-0016 (NPDES No. CAS0108766) expires on November 10, 2015.

    Unless the Orange County or Riverside County Copermittees apply for and receive early coverage under this Order, the Orange County Copermittees' and the Riverside County Copermittees' respective permits will be superseded by this Order upon expiration of their respective permits, subject to any necessary revisions to the requirements of this Order made after the San Diego Water Board considers their respective Reports of Waste Discharge through the public process provided in 40 CFR 124.

27. **Integrated Report and Clean Water Act Section 303(d) List.** The San Diego Water Board and State Water Board submit an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. USEPA issued its *Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act* on July 29, 2005, which advocates the use of a five category approach for classifying the attainment status of water quality standards for water bodies in the Integrated Report. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 in the Integrated Report are placed on the 303(d) List.

    Water bodies with available data and/or information that indicate at least one beneficial use is not being supported or is threatened, but a TMDL is not required, are included in Category 4 in the Integrated Report. Impaired surface water bodies

may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

Implementation of the requirements of this Order will~~may~~ allow the San Diego Water Board to include surface waters impaired by discharges from the Copermittees' MS4s in Category 4 in the Integrated Report for consideration during the next 303(d) List submittal by the State to USEPA.

28. Economic Considerations. The California Supreme Court has ruled that although CWC section 13263 requires the State and Regional Water Boards (collectively Water Boards) to consider factors set forth in CWC section 13241 when issuing an NPDES permit, the Water Board may not consider the factors to justify imposing pollutant restrictions that are less stringent than the applicable federal regulations require. (*City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 618, 626-627.) However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

As noted in the following finding, the San Diego Water Board finds that the requirements in this permit are not more stringent than the minimum federal requirements. Therefore, a CWC section 13241 analysis is not required for permit requirements that implement the effective prohibition on the discharge of non-storm water into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determined appropriate to control such pollutants, as those requirements are mandated by federal law. Notwithstanding the above, the San Diego Water Board has developed an economic analysis of the requirements in this Order. The economic analysis is provided in the Fact Sheet.

~~**29. Unfunded Mandates.** This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following:~~

~~**a.** This Order implements federally mandated requirements under CWA section 402 (33 USC section 1342(p)(3)(B)).~~

~~**b.** The local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental and new dischargers who are issued NPDES permits for storm water and non-storm water discharges.~~

~~**c.** The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order.~~

~~**d.** The Copermittees have requested permit coverage in lieu of compliance with the~~

~~complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)) and in lieu of numeric restrictions on their MS4 discharges (i.e. effluent limitations).~~

~~**e.** The local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under State law predates the enactment of Article XIIIB, Section (6) of the California Constitution.~~

~~**f.** The provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state develops a TMDL, federal law requires that permits must contain water quality based effluent limitations consistent with the assumptions and requirements of any applicable wasteload allocation (40 CFR 122.44(d)(1)(vii)(B)).~~

~~See the Fact Sheet for further discussion of unfunded mandates.~~

~~30.~~29. **California Environmental Quality Act.** The issuance of waste discharge requirements and an NPDES permit for the discharge of runoff from MS4s to waters of the U.S. is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 et seq.) in accordance with CWC section 13389.

STATE WATER BOARD DECISIONS

~~31.~~30. **Compliance with Prohibitions and Limitations.** The receiving water limitation language specified in this Order is consistent with language recommended by the USEPA and established in State Water Board Order WQ 99-05, *Own Motion Review of the Petition of Environmental Health Coalition to Review Waste Discharge Requirements Order No. 96-03, NPDES Permit No. CAS0108740*, adopted by the State Water Board on June 17, 1999. The receiving water limitation language in this Order requires storm water discharges from MS4s to not cause or contribute to a violation of water quality standards, which is to be achieved through an iterative approach requiring the implementation of improved and better-tailored BMPs over time. Implementation of the iterative approach to comply with receiving water limitations based on applicable water quality standards is necessary to ensure that storm water discharges from the MS4 will not ultimately cause or contribute to violations of water quality standards and will not create conditions of pollution, contamination, or nuisance.

~~32.~~31. **Special Conditions for Areas of Special Biological Significance.** On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving an exception to the Ocean Plan effective prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges. State Water Board Resolution No. 2012-0012 requires monitoring and

testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, effective prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject terms and conditions of State Water Board Resolution No. 2012-0012. The Special Protections contained in Attachment B to Resolution No. 2012-0012, applicable to these discharges, are hereby incorporated into this Order as if fully set forth herein.

ADMINISTRATIVE FINDINGS

~~33.~~32. **Executive Officer Delegation of Authority.** The San Diego Water Board by prior resolution has delegated all matters that may legally be delegated to its Executive Officer to act on its behalf pursuant to CWC section 13223. Therefore, the Executive Officer is authorized to act on the San Diego Water Board's behalf on any matter within this Order unless such delegation is unlawful under CWC section 13223 or this Order explicitly states otherwise.

~~34.~~33. **Standard Provisions.** Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR 122.42, are provided in Attachment B to this Order.

~~35.~~34. **Fact Sheet.** The Fact Sheet for this Order contains background information, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of this Order. The Fact Sheet is hereby incorporated into this Order and constitutes part of the Findings of this Order.

~~36.~~35. **Public Notice.** In accordance with State and federal laws and regulations, the San Diego Water Board notified the Copermittees, and interested agencies and persons of its intent to prescribe waste discharge requirements for the control of discharges into and from the MS4s to waters of the U.S. and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet.

~~37.~~36. **Public Hearing.** The San Diego Water Board held a public hearing on Month Day, 2013 and heard and considered all comments pertaining to the terms and conditions of this Order. Details of the public hearing are provided in the Fact Sheet.

~~38.~~37. **Effective Date.** This Order serves as an NPDES permit pursuant to CWA section 401 or amendments thereto, and becomes effective fifty (50) days after the date of its adoption, provided that the Regional Administrator,

USEPA, Region IX, does not object to this Order.

~~39.~~38. **Review by the State Water Board.** Any person aggrieved by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with CWC section 13320 and California Code of Regulations, title 23, sections 2050, et seq. The State Water Board must receive the petition by 5:00 p.m., 30 days after the San Diego Water Board action, except that if the thirtieth day following the action falls on a Saturday, Sunday or State holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

THEREFORE, IT IS HEREBY ORDERED that the Copermittees, in order to meet the provisions contained in division 7 of the CWC and regulations adopted thereunder, and the provisions of the CWA and regulations adopted thereunder, must each comply with the following:

II. PROVISIONS

A. PROHIBITIONS AND LIMITATIONS

The purpose of this provision is to describe the conditions under which storm water and non-storm water discharges into and from MS4s are effectively prohibited or limited. The goal of the effective prohibitions and limitations is to protect the water quality and designated beneficial uses of waters of the ~~state~~ U.S. from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through the implementation of water quality improvement strategies and runoff management programs that effectively prohibit non-storm water discharges into the Copermittees' MS4s, and reduce pollutants in storm water discharges from the Copermittees' MS4s to the MEP. The process for determination of compliance with the Discharge Prohibitions (A.1), Receiving Water Limitations (A.2), and Effluent Limitations (A.3) is defined in Provision A.4.

1. Discharge Prohibitions

a. Discharges from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the ~~state~~ U.S. are effectively prohibited, unless such discharges are addressed by the Copermittee through A.1.d, A.3.b or A.4.

b. Non-storm water discharges into MS4s are to be effectively prohibited, unless such discharges are either authorized by a separate NPDES permit, or the discharge is a category of non-storm water discharges or flows that must be addressed pursuant to Provisions E.2.a.(1)-(5) of this Order.

c. Discharges from MS4s are subject to all waste discharge prohibitions in the Basin Plan, included in Attachment A to this Order, unless such discharges are addressed by the Copermittee through A.1.d, A.3.b, or A.4.

d. Storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 applicable to these discharges, included in Attachment A to this Order. All other discharges from the Copermittees' MS4s to ASBS are prohibited.

2. Receiving Water Limitations

a. Discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters, ~~including but not limited to~~ set forth in all applicable provisions ~~contained in:~~ below, unless such discharges are addressed by the Copermittee through A.1.d, A.3.b, or A.4:

(1) The San Diego Water Board's Basin Plan, including beneficial uses, water quality objectives, and implementation plans;

(2) State Water Board plans for water quality control including the following:

(a) Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries (Thermal Plan), and

(b) The Ocean Plan, including beneficial uses, water quality objectives, and implementation plans;

(3) State Water Board policies for water and sediment quality control including the following:

(a) Water Quality Control Policy for the Enclosed Bays and Estuaries of California,

(b) Sediment Quality Control Plan which includes the following narrative objectives for bays and estuaries:

(i) Pollutants in sediments shall not be present in quantities that, alone or in combination, are toxic to benthic communities, and

(ii) Pollutants shall not be present in sediments at levels that will bioaccumulate in aquatic life to levels that are harmful to human health,

(c) The Statement of Policy with Respect to Maintaining High Quality of Waters in California;[1]

(4) Priority pollutant criteria promulgated by the USEPA through the following:

(a) National Toxics Rule (NTR)[2] (promulgated on December 22, 1992 and amended on May 4, 1995), and

(b) California Toxics Rule (CTR).[3,4]

[1] State Water Board Resolution No. 68-16
[2] 40 CFR 131.36
[3] 65 Federal Register 31682-31719 (May 18, 2000), adding Section 131.38 to 40 CFR

b. Discharges from MS4s composed of storm water runoff must not alter natural ocean water quality in an ASBS.

[4] If a water quality objective and a CTR criterion are in effect for the same priority pollutant, the more stringent of the two applies.

3. Effluent Limitations

a. Technology Based Effluent Limitations

Pollutants in ~~storm water~~ discharges from MS4s must be reduced to the MEP.[5]

b. Water Quality Based Effluent Limitations

This Order establishes water quality based effluent limitations (WQBELs) consistent with the assumptions and requirements of all available TMDL waste load allocations (WLAs) assigned to discharges from the Copermittees' MS4s. Each Copermittee must comply with applicable WQBELs established for the TMDLs in Attachment E to this Order, pursuant to the applicable TMDL compliance schedules.

4. Compliance with Discharge Prohibitions and Receiving Water Limitations

Each Copermittee must achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order through timely implementation of strategies, control measures and other actions as specified in Provisions B and E of this Order, including any modifications. The Water Quality Improvement Plans required under Provision B must be designed and adapted to ultimately achieve compliance with Provisions A.1.a, A.1.c and A.2.a, and may be used for compliance determination as described in Provision B.3.a.(3).

a. If exceedance(s) of water quality standards persist in receiving waters notwithstanding implementation of this Order, the Copermittees must comply with the following procedures:

(1) For exceedance(s) of a water quality standard in the process of being addressed by the Water Quality Improvement Plan, the Copermittee(s) must implement the Water Quality Improvement Plan as accepted by the San Diego Water Board, and update the Water Quality Improvement Plan, as necessary, pursuant to Provision F.2.c;

(2) Upon a determination by either the Copermittees or the San Diego Water Board that discharges from the MS4 are causing or contributing to ~~a new~~ persistent indications of an exceedance of an applicable water quality standard not addressed by the Water Quality Improvement Plan, the Copermittees must submit the following updates to the Water Quality Improvement Plan pursuant to Provision F.2.c or as part of the Annual Report

[5] This does not apply to MS4 discharges which receive subsequent treatment to reduce pollutants in ~~storm water~~ discharges to the MEP prior to entering receiving waters (e.g., low flow diversions to the sanitary sewer). Runoff treatment must occur prior to the discharge of runoff into receiving waters per Finding 7.

required under Provision F.3.b, unless the San Diego Water Board directs an earlier submittal:

(a) The water quality improvement strategies being implemented that are effective and will continue to be implemented,

(b) Water quality improvement strategies (i.e. BMPs, retrofitting projects, stream and/or habitat rehabilitation or restoration projects, adjustments to jurisdictional runoff management programs, etc.) that will be implemented to reduce or eliminate any pollutants or conditions that are causing or contributing to the exceedance of water quality standards,

(c) For Copermittees who are implementing the Water Quality Improvement Plan compliance option pursuant to Provision B.3.a.(3), the updated Water Quality Improvement Plan must provide reasonable assurance the updated strategies will address the new exceedance(s),

~~(c)~~(d) Updates to the schedule for implementation of the existing and additional water quality improvement strategies, and

~~(d)~~(e) Updates to the monitoring and assessment program to track progress toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a of this Order;

(3) The San Diego Water Board may require the incorporation of additional modifications to the Water Quality Improvement Plan required under Provision B. The applicable Copermittees must submit any modifications to the update to the Water Quality Improvement Plan within 90 days of notification that additional modifications are required by the San Diego Water Board, or as otherwise directed;

(4) Within 90 days of the San Diego Water Board determination that the update to the Water Quality Improvement Plan meets the requirements of this Order, the applicable Copermittees must revise the jurisdictional runoff management program documents to incorporate the updated water quality improvement strategies that have been and will be implemented, the implementation schedule, and any additional monitoring required; and

(5) Each Copermittee must implement the updated Water Quality Improvement Plan.

b. The procedure set forth above to achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order do not have to be repeated for continuing or recurring exceedances of the same water quality standard(s) following implementation of scheduled actions unless directed to do otherwise by the San Diego Water Board.

~~**c.** Nothing in Provisions A.4.a and A.4.b prevents the San Diego Water Board from enforcing any provision of this Order while the applicable Copermittees prepare and implement the above update to the Water Quality Improvement Plan and jurisdictional runoff management programs.~~

B. WATER QUALITY IMPROVEMENT PLANS

The purpose of this provision is to develop Water Quality Improvement Plans that guide the Copermittees' jurisdictional runoff management programs towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plans is to ~~protect, preserve, enhance~~1) effectively prohibit non-storm water discharges into the MS4s, 2) reduce pollutants in discharges from the MS4s to the MEP, and ~~restore the~~ 3) support the attainment and reasonable protection, preservation, and enhancement of water quality and designated beneficial uses of waters of the state. This goal will be accomplished through an adaptive planning and management process that identifies the highest priority water quality conditions within a watershed and implements strategies through the jurisdictional runoff management programs to achieve improvements in the quality of discharges from the MS4s and receiving waters. Therefore, implementation of the Water Quality Improvement Plans also provides the basis for complying with Provisions A.1, A.2 and A.3, as described in Provision B.3.a.(3).

1. Watershed Management Areas

The Copermittees must develop a Water Quality Improvement Plan for each of the Watershed Management Areas in Table B-1. A total of ten Water Quality Improvement Plans must be developed for the San Diego Region.

Development of the Water Quality Improvement Plan for the Santa Margarita River Watershed Management Area shall commence upon notification of coverage of the Riverside County Copermittees under this Order. Until this time, the County of San Diego shall use the water quality priorities in the Santa Margarita River Watershed Urban Runoff Management Plan, developed pursuant to Order No. R9-2007-0001, to guide implementation of Provisions D and E within its jurisdiction.

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
San Juan (901.00)	South Orange County	- Aliso Creek - San Juan Creek - San Mateo Creek - Pacific Ocean - Heisler Park ASBS	- City of Aliso Viejo[1] - City of Dana Point[1] - City of Laguna Beach[1] - City of Laguna Hills[1] - City of Laguna Niguel[1] - City of Laguna Woods[1] - City of Lake Forest[1] - City of Mission Viejo[1] - City of Rancho Santa Margarita[1] - City of San Clemente[1] - City of San Juan Capistrano[1] - County of Orange[1] - Orange County Flood Control District[1]

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
Santa Margarita (902.00)	Santa Margarita River	- Murrieta Creek - Temecula Creek - Santa Margarita River - Santa Margarita Lagoon - Pacific Ocean	- City of Murrieta[2] - City of Temecula[2] - City of Wildomar[2] - County of Riverside[2] - County of San Diego[3] - Riverside County Flood Control and Water Conservation District[2]
San Luis Rey (903.00)	San Luis Rey River	- San Luis Rey River - San Luis Rey Estuary - Pacific Ocean	- City of Oceanside - City of Vista - County of San Diego
Carlsbad (904.00)	Carlsbad	- Loma Alta Slough - Buena Vista Lagoon - Agua Hedionda Lagoon - Batiquitos Lagoon - San Elijo Lagoon - Pacific Ocean	- City of Carlsbad - City of Encinitas - City of Escondido - City of Oceanside - City of San Marcos - City of Solana Beach - City of Vista - County of San Diego
San Dieguito (905.00)	San Dieguito River	- San Dieguito River - San Dieguito Lagoon - Pacific Ocean	- City of Del Mar - City of Escondido - City of Poway - City of San Diego - City of Solana Beach - County of San Diego
Penasquitos (906.00)	Penasquitos	- Los Penasquitos Lagoon - Pacific Ocean	- City of Del Mar - City of Poway - City of San Diego - County of San Diego
	Mission Bay	- Mission Bay - Pacific Ocean - San Diego Marine Life Refuge ASBS	- City of San Diego
San Diego (907.00)	San Diego River	- San Diego River - Pacific Ocean	- City of El Cajon - City of La Mesa - City of San Diego - City of Santee - County of San Diego
Pueblo San Diego (908.00) Sweetwater (909.00) Otay (910.00)	San Diego Bay	- Sweetwater River - Otay River - San Diego Bay - Pacific Ocean	- City of Chula Vista - City of Coronado - City of Imperial Beach - City of La Mesa - City of Lemon Grove - City of National City - City of San Diego - County of San Diego - San Diego County Regional Airport Authority - San Diego Unified Port District
Tijuana (911.00)	Tijuana River	- Tijuana River - Tijuana Estuary - Pacific Ocean	- City of Imperial Beach - City of San Diego - County of San Diego

Notes:
1. The Orange County Copermittees will be covered under this Order after expiration of Order No. R9-2009-0002, or earlier if the Orange County Copermittees meet the conditions in Provision F.6.
2. The Riverside County Copermittees will be covered under this Order after expiration of Order No. R9-2010-0016, or earlier if the Riverside County Copermittees meet the conditions in Provision F.6.
3. The County of San Diego is required to implement the requirements of Provision B for its jurisdiction within the Santa

Margarita River Watershed Management Area until the Riverside County Copermittees have been notified of coverage under this Order.

2. Priority Water Quality Conditions

The Copermittees must identify the water quality priorities within each Watershed Management Area that will be addressed by the Water Quality Improvement Plan. Where appropriate, Watershed Management Areas may be separated into subwatersheds to focus water quality prioritization and jurisdictional runoff management program implementation efforts by receiving water.

a. Assessment of Receiving Water Conditions

The Copermittees must consider the following, at a minimum, to identify water quality priorities based on impacts of MS4 discharges on receiving water beneficial uses:

(1) Receiving waters listed as impaired on the CWA Section 303(d) List of Water Quality Limited Segments (303(d) List);

(2) TMDLs adopted and under development by the San Diego Water Board;

(3) Receiving waters recognized as sensitive or highly valued by the Copermittees, including estuaries designated under the National Estuary Program under CWA section 320, wetlands defined by the State or U.S. Fish and Wildlife Service's National Wetlands Inventory as wetlands, and receiving waters identified as ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (Attachment A);

(4) The receiving water limitations of Provision A.2;

(5) Known historical versus current physical, chemical, and biological water quality conditions;

(6) Available, relevant, and appropriately collected and analyzed physical, chemical, and biological receiving water monitoring data, including, but not limited to, data describing:

(a) Chemical constituents,

(b) Water quality parameters (i.e. pH, temperature, conductivity, etc.),

(c) Toxicity Identification Evaluations for both receiving water column and sediment,

(d) Trash impacts,

(e) Bioassessments, and

(f) Physical habitat;

(7) Available evidence of erosional impacts in receiving waters due to accelerated flows (i.e. hydromodification);

(8) Available evidence of adverse impacts to the chemical, physical, and biological integrity of receiving waters; and

(9) The potential improvements in the overall condition of the Watershed Management Area that can be achieved.

b. ASSESSMENT OF IMPACTS FROM MS4 DISCHARGES

The Copermittees must consider the following, at a minimum, to identify the potential impacts to receiving waters that may be caused or contributed to by discharges from the Copermittees' MS4s:

(1) The discharge prohibitions of Provision A.1 and effluent limitations of Provision A.3; and

(2) Available, relevant, and appropriately collected and analyzed storm water and non-storm water monitoring data from the Copermittees' MS4 outfalls;

(3) Locations of each Copermittee's MS4 outfalls that discharge to receiving waters;

(4) Locations of MS4 outfalls that are known to persistently discharge non-storm water to receiving waters likely causing or contributing to impacts on receiving water beneficial uses;

(5) Locations of MS4 outfalls that are known to discharge pollutants in storm water causing or contributing to impacts on receiving water beneficial uses; and

(6) The potential improvements in the quality of discharges from the MS4 that can be achieved.

c. IDENTIFICATION OF PRIORITY WATER QUALITY CONDITIONS

(1) The Copermittees must use the information gathered for Provisions B.2.a and B.2.b to develop a list of priority water quality conditions as pollutants, stressors and/or receiving water conditions that are the highest threat to receiving water quality or that most adversely affect the physical, chemical, and biological integrity of receiving waters. The list must include the following information for each priority water quality condition:

(a) The beneficial use(s) associated with the priority water quality condition;

(b) The geographic extent of the priority water quality condition within the Watershed Management Area, if known;

(c) The temporal extent of the priority water quality condition (e.g., dry weather and/or wet weather);

(d) The Copermittees with MS4s discharges that may cause or contribute to the priority water quality condition; and

(e) An assessment of the adequacy of and data gaps in the monitoring data to characterize the conditions causing or contributing to the priority water quality condition, including a consideration of spatial and temporal variation.

(2) The Copermittees must identify the highest priority water quality conditions to be addressed by the Water Quality Improvement Plan, and provide a rationale for selecting a subset of the water quality conditions identified pursuant to Provision B.2.c.(1) as the highest priorities.

d. IDENTIFICATION OF MS4 SOURCES OF POLLUTANTS AND/OR STRESSORS

The Copermittees must identify and prioritize known and suspected sources of storm water and non-storm water pollutants and/or other stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c. The identification of known and suspected sources of pollutants and/or stressors that cause or contribute to the highest priority water quality conditions as identified for Provision B.2.c must consider the following:

(1) Pollutant generating facilities, areas, and/or activities within the Watershed Management Area, including:

(a) Each Copermittee's inventory of construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas,

(b) Publicly owned parks and/or recreational areas,

(c) Open space areas, and

(d) All currently operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste~~, and~~.

~~(e) Areas not within the Copermittees' jurisdictions (e.g., Phase II MS4s, tribal lands, state lands, federal lands) that are known or suspected to be discharging to the Copermittees' MS4s;~~

(2) Locations of the Copermittees' MS4s, including the following:

(a) All MS4 outfalls that discharge to receiving waters, and

(b) Locations of major structural controls for storm water and non-storm water (e.g., retention basins, detention basins, major infiltration devices, etc.);

~~(3) Other known and suspected sources of non-storm water or pollutants in storm water discharges to receiving waters within the Watershed Management Area, including the following:~~

~~(a) Other MS4 outfalls (e.g., Phase II Municipal and Caltrans),~~

~~(b) Other NPDES permitted discharges,~~

~~(c) Any other discharges that may be considered point sources (e.g., private outfalls), and~~

~~(d) Any other discharges that may be considered non-point sources (e.g., agriculture, wildlife or other natural sources);~~

~~(4)~~(3) Review of available data, including but not limited to:

(a) Findings from the Copermittees' illicit discharge detection and elimination programs,

(b) Findings from the Copermittees' MS4 outfall discharge monitoring,

(c) Findings from the Copermittees' receiving water monitoring,

(d) Findings from the Copermittees' MS4 outfall discharge and receiving water assessments, and

(e) Other available, relevant, and appropriately collected data, information, or studies related to pollutant sources and/or stressors that contribute to the highest priority water quality conditions as identified for Provision B.2.c.

~~(5)~~(4) The adequacy of the available data to identify and prioritize sources and/or stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c.

e. NUMERIC GOALS AND SCHEDULES

The Copermittees must develop and incorporate interim and final numeric goals[6] and schedules into the Water Quality Improvement Plan. Numeric goals must be used to support Water Quality Improvement Plan implementation and measure progress towards addressing the highest priority water quality conditions identified under Provision B.2.c. Numeric goals are not enforceable compliance standards, effluent limitations, or receiving water limitations. When establishing numeric goals and corresponding schedules, the Copermittees must consider the following:

(1) Final numeric goals must be based on measureable criteria or indicators, to be achieved in the receiving waters and/or MS4 discharges for the highest priority water quality conditions which will be capable of demonstrating the achievement of the restoration and/or protection of water quality standards in receiving waters;[7]

(2) Interim numeric goals must be based on measureable criteria or indicators capable of demonstrating incremental progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges; and

(3) Schedules must be adequate for measuring progress toward achieving the interim and final numeric goals required for Provisions B.2.e.(1) and B.2.e.(2). Schedules must incorporate the following:

(a) Interim dates for achieving the interim numeric goals,

(b) Compliance schedules for any applicable TMDLs in Attachment E to this Order,

(c) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A),

(d) Achievement of the final numeric goals in the receiving waters and/or MS4 discharges for the highest water quality priorities must be as soon as possible, and

[6] Interim and final numeric goals may take a variety of forms such as TMDL established WQBELs, action levels, pollutant concentration, load reductions, number of impaired water bodies delisted from the List of Water Quality Impaired Segments, Index of Biotic Integrity (IBI) scores, or other appropriate metrics. Interim and final numeric goals are not necessarily limited to one criterion or indicator, but may include multiple criteria and/or indicators. Except for TMDL established WQBELs, interim and final numeric goals and corresponding schedules may be revised through the adaptive management process under Provision B.5.

[7] Achievement of final numeric goals within 10 years represents progress towards attainment of water quality standards, but is not a requirement to fully attain all applicable water quality standards or all priority receiving water conditions within 10 years.

(e) Final dates for achieving the final numeric goals must not initially extend more than 10 years beyond the effective date of this Order, unless a longer period of time is authorized by the San Diego Water Board Executive Officer or the schedule includes an applicable TMDL in Attachment E to this Order.

3. Water Quality Improvement Strategies and Schedules

The Copermittees must develop specific water quality improvement strategies to address the highest priority water quality conditions identified within a Watershed Management Area. The water quality improvement strategies must address the highest priority water quality conditions by ~~preventing or eliminating~~ effectively prohibiting non-storm water discharges to ~~and from~~ the MS4, reducing pollutants in ~~storm water~~ discharges from the MS4 to the MEP, and restoring and/or protecting the water quality standards of receiving waters.

a. WATER QUALITY IMPROVEMENT STRATEGIES

The Copermittees must identify and prioritize water quality improvement strategies based on their likely effectiveness and efficiency, and implement strategies to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in ~~storm water~~ discharges from the MS4 to the MEP, improve the physical, chemical, and biological receiving water conditions, and achieve the interim and final numeric goals in accordance with the schedules required for Provision B.2.e.(3). The following water quality improvement strategies must be included and described in the Water Quality Improvement Plan:

(1) Specific strategies and/or activities that may be implemented by one or more Copermittees within their jurisdictions through the jurisdictional runoff management programs that will address the highest priority water quality conditions within the Watershed Management Area, in accordance with the following requirements:

(a) Strategies and/or activities must, at a minimum, be described for each jurisdictional runoff management program component where strategies to address the highest priority water quality conditions are required under Provision E;

(b) The Water Quality Improvement Plan must describe the circumstances or conditions when and where the strategies or/activities should be or will be implemented, but specific details about how each Copermittee will implement the strategies and/or activities within its jurisdiction are not required; and

(c) Descriptions of strategies and/or activities must include any monitoring, information collection, special studies, and/or data analysis that is necessary to assess the effectiveness of the strategy and/or activity toward addressing the highest priority water quality conditions.

(2) Additional strategies and/or activities that may be implemented within the Watershed Management Area on a jurisdictional, sub-watershed, or watershed scale by one or more Copermittees, not specifically required under Provision E, which are designed to achieve the interim and final numeric goals identified in Provisions B.2.e.(1) and B.2.e.(2);

(3) Copermittees may elect to develop their Water Quality Improvement Plan to serve as an iterative, implementation-based compliance mechanism for the discharge prohibitions (A.1), receiving water limitations (A.2), and effluent limitations (A.3). To utilize the Water Quality Improvement Plan-based compliance option, Permittees shall conduct a Reasonable Assurance Analysis. The objective of the Reasonable Assurance Analysis shall be to demonstrate the strategies and activities of the Water Quality Improvement Plan will ultimately result in attainment of the discharge prohibitions (A.1), receiving water limitations (A.2), and effluent limitations (A.3).

In order for a Copermittee to utilize the Water Quality Improvement Plan-based compliance option, the Regional Board Executive Officer must determine the following conditions are met:

(a) The Copermittee requests that the Water Quality Improvement Plan be approved as the basis for compliance with the discharge prohibitions (A.1), receiving water limitations (A.2), and/or effluent limitations (A.3) in the letter of submittal to the San Diego Water Board as described in Provision F.1.(a); AND

(b) The submitted Water Quality Improvement Plan includes a Reasonable Assurance Analysis that demonstrates that the strategies and activities in the Water Quality Improvement Plan will attain the applicable discharge prohibitions (A.1), receiving water limitations (A.2), and/or effluent limitations (A.3); AND

(c) The submitted Water Quality Improvement Plan includes a schedule as outlined in Provision B.3.b that provides sufficient detail regarding the strategies and activities to be implemented to allow the Regional Board to use the schedule for compliance determination in a clear, specific, measurable, and enforceable manner.

If a Water Quality Improvement Plan-based compliance option is approved by the Regional Board Executive Officer, then in instances when the discharge prohibitions (A.1), receiving water limitations (A.2), and/or effluent limitations (A.3) are not met, the implementation of the strategies and activities contained in the Water Quality Improvement Plan will be used for determination of compliance with Provision A. That is, any determination of a

Copermittee's compliance with Provision A shall be based on the following conditions:

(a) The strategies and activities of the Water Quality Improvement Plan are implemented per the approved schedule outlined pursuant to Provision B.3.b and adapted pursuant to Provisions B.5, F.1, and F.2; AND

(b) If exceedances persist notwithstanding implementations of the strategies and activities in the approved Water Quality Improvement Plan, then Responsible Copermittees revise the Water Quality Improvement Plan pursuant to Provision A.4.a, and implement the revised Water Quality Improvement Plan including additional or alternative activities per the schedule submitted with the revised Water Quality Improvement Plan.

For cases when applicable discharge prohibitions (A.1), receiving water limitations (A.2), or effluent limitations (A.3) are not attained during the time period between a Copermittee's notification of intent to utilize a Water Quality Improvement Plan-based compliance option, pursuant to Provision F.1.(a), and Regional Board Executive Officer approval of the submitted Water Quality Improvement Plan, determination of a Copermittee's compliance with Provision A shall be based on the following conditions:

(a) All deadlines for development of a Water Quality Improvement Plan pursuant to Provision F.1.(a) and (b) are met; AND

(b) The Water Quality Improvement Plan ultimately receives final approval.

b. IMPLEMENTATION SCHEDULES

(1) The Copermittees must develop schedules for implementing the water quality improvement strategies identified under Provision B.3.a to achieve the interim and final numeric goals identified under Provision B.2.e.(1) and B.2.e.(2). Schedules must be developed for both the water quality improvement strategies implemented by each Copermittee within its jurisdiction and for strategies that the Copermittees choose to implement on a collaborative basis.

(2) The Copermittees must incorporate the implementation compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

4. Water Quality Improvement Monitoring and Assessment Program

a. The Copermittees in each Watershed Management Area must develop and incorporate an integrated monitoring and assessment program into the Water Quality Improvement Plan that assesses: 1) the progress toward achieving the numeric goals and schedules, 2) the progress toward addressing the highest priority water quality conditions for each Watershed Management Area, and 3) each Copermittee's overall efforts to implement the Water Quality Improvement Plan.

b. The monitoring and assessment program must incorporate the monitoring and assessment requirements of Provision D, which may allow the Copermittees to modify the program to be consistent with and focus on the highest priority water quality conditions for each Watershed Management Area.

c. For Watershed Management Areas with applicable TMDLs, the monitoring and assessment program must incorporate the specific monitoring and assessment requirements of Attachment E.

d. For Watershed Management Areas with any ASBS, the water quality monitoring and assessment program must incorporate the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

5. Iterative Approach and Adaptive Management Process

The Copermittees in each Watershed Management Area must implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a, and must include the following:

a. RE-EVALUATION OF PRIORITY WATER QUALITY CONDITIONS

The priority receiving water quality conditions, and numeric goals and corresponding schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.2.c and B.2.e, may be re-evaluated by the Copermittees as needed during the term of this Order as part of the Annual Report. Re-evaluation and recommendations for modifications to the priority water quality conditions, and numeric goals and corresponding schedules must be provided in the Report of Waste Discharge, and must consider the following:

(1) Achieving the outcome of improved water quality in MS4 discharges and receiving waters through implementation of the water quality improvement strategies identified in the Water Quality Improvement Plan;

(2) Progress toward achieving interim and final numeric goals in receiving waters and/or MS4 discharges for the highest priority water quality conditions in the

Watershed Management Area,

(3) Progress toward achieving outcomes according to established schedules;

(4) New information developed when the requirements of Provisions B.2.a-c have been re-evaluated;

(5) New policies or regulations that may affect identified numeric goals;

(6) Spatial and temporal accuracy of monitoring data collected to inform prioritization of water quality conditions and implementation strategies to address the highest priority water quality conditions;

(7) Availability of new information and data from sources other than the jurisdictional runoff management programs within the Watershed Management Area that informs the effectiveness of the actions implemented by the Copermittees;

(8) San Diego Water Board recommendations; and

(9) Recommendations for modifications solicited through a public participation process.

b. ADAPTATION OF STRATEGIES AND SCHEDULES

The water quality improvement strategies and schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.3, must be re-evaluated and adapted as new information becomes available to result in more effective and efficient measures to achieve the numeric goals established pursuant to Provision B.2.e. Re-evaluation of and modifications to the water quality improvement strategies must be provided in the Annual Report, and must consider the following:

(1) Modifications to the priority water quality conditions, and numeric goals and corresponding schedules based on Provision B.5.a;

(2) Measurable or demonstrable reductions of non-storm water discharges to ~~and from~~ each Copermittee's MS4;

(3) Measurable or demonstrable reductions of pollutants in ~~storm water~~ discharges from each Copermittee's MS4 to the MEP;

(4) New information developed when the requirements of Provisions B.2.b and B.2.d have been re-evaluated;

(5) Efficiency in implementing the Water Quality Improvement Plan;

(6) San Diego Water Board recommendations; and

(7) Recommendations for modifications solicited through a public participation process.

c. ADAPTATION OF MONITORING AND ASSESSMENT PROGRAM

The water quality improvement monitoring and assessment program, included in the Water Quality Improvement Plan pursuant to Provisions B.4, must be re-evaluated and adapted when new information becomes available. Re-evaluation and recommendations for modifications to the monitoring and assessment program, pursuant to the requirements of Provision D, may be provided in the Annual Report, but must be provided in the Report of Waste Discharge.

6. Water Quality Improvement Plan Submittal, Updates, and Implementation

a. The Copermittees must submit the Water Quality Improvement Plans in accordance with the requirements of Provision F.1.

b. The Copermittees must submit proposed updates to the Water Quality Improvement Plan for acceptance by the San Diego Water Board Executive Officer in accordance with the requirements of Provision F.2.c.

c. The Copermittees must commence with implementation of the Water Quality Improvement Plans immediately after acceptance by the San Diego Water Board, in accordance with the schedules, or subsequently updated schedules, within the Water Quality Improvement Plan.

C. ACTION LEVELS

The purpose of this provision is for the Copermittees to incorporate numeric action levels in the Water Quality Improvement Plans. The goal of the action levels is to guide Water Quality Improvement Plan implementation efforts and measure progress towards the protection of water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through monitoring and assessing the quality of the MS4 discharges during the implementation of the Water Quality Improvement Plans.

1. Non-Storm Water Action Levels[8]

The Copermittees must develop and incorporate numeric non-storm water action levels (NALs) into the Water Quality Improvement Plan to: 1) support the development and prioritization of water quality improvement strategies for addressing non-storm water discharges to and from the MS4s, 2) assess the effectiveness of the water quality improvement strategies toward addressing MS4 non-storm water discharges, required pursuant to Provision D.4.b.(1), and 3) support the detection and elimination of non-storm water and illicit discharges to and from the MS4, required pursuant to Provision E.2.[9]

a. The following NALs must be incorporated if the Copermittees do not establish numeric action levels within the Water Quality Improvement Plan based on watershed priorities:

(1) Non-Storm Water Discharges from MS4s to Ocean Surf Zone

Table C-1. Non-Storm Water Action Levels for Discharges from MS4s to Ocean Surf Zone

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Total Coliform	MPN/100 ml	1,000	-	10,000/1,000[1]	OP
Fecal Coliform	MPN/100 ml	200[2]	-	400	OP
Enterococci	MPN/100 ml	35	-	104[3]	OP

Abbreviations/Acronyms
AMAL – average monthly action level
OP – Ocean Plan water quality objective
MDAL – maximum daily action level
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Total coliform density NAL is 1,000 MPN/100 ml when the fecal/total coliform ratio exceeds 0.1.
2. Fecal coliform density NAL is 200 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas."

[8] NALs are not considered ~~by the San Diego Water Board~~ to be enforceable limitations.
[9] The Copermittees may utilize NALs or other benchmarks currently established by the Copermittees as interim NALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

(2) Non-Storm Water Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Table C-2. Non-Storm Water Action Levels for Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Turbidity	NTU	75	-	225	OP
pH	Units	Within limit of 6.0 to 9.0 at all times			OP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	35	-	104[3]	BP
Priority Pollutants	ug/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
OP – Ocean Plan water quality objective
NTU – Nephelometric Turbidity Units
ug/L – micrograms per liter
MDAL – maximum daily action level
BP – Basin Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas" and is not applicable to waterbodies that are not designated with the water contact recreation (REC-1) beneficial use.

Table C-3. Non-Storm Water Action Levels for Priority Pollutants

Parameter	Units	Freshwater (CTR)		Saltwater (CTR)	
		MDAL	AMAL	MDAL	AMAL
Cadmium	ug/L	**	**	16	8
Copper	ug/L	*	*	5.8	2.9
Chromium III	ug/L	**	**	-	-
Chromium VI	ug/L	16	8.1	83	41
Lead	ug/L	*	*	14	2.9
Nickel	ug/L	**	**	14	6.8
Silver	ug/L	*	*	2.2	1.1
Zinc	ug/L	*	*	95	47

Abbreviations/Acronyms:
CTR – California Toxic Rule
AMAL – average monthly action level
ug/L – micrograms per liter
MDAL – maximum daily action level

Notes:
* Action levels developed on a case-by-case basis (see below)
** Action levels developed on a case-by-case basis (see below), but calculated criteria are not to exceed Maximum Contaminant Levels (MCLs) under the California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64431

The Cadmium, Copper, Chromium (III), Lead, Nickel, Silver and Zinc NALs for MS4 discharges to freshwater receiving waters will be developed on a case-by-case basis because the freshwater criteria are based on site-specific water quality data (receiving water hardness). For these priority pollutants, refer to ~~the following equations (~~40 CFR 131.38.b.2~~) will be required~~ for details:

~~Cadmium (Total Recoverable) = exp(0.7852[ln(hardness)] - 2.715)~~
~~Chromium III (Total Recoverable) = exp(0.8190[ln(hardness)] + 0.6848)~~
~~Copper (Total Recoverable) = exp(0.8545[ln(hardness)] - 1.702)~~
~~Lead (Total Recoverable) = exp(1.273[ln(hardness)] - 4.705)~~
~~Nickel (Total Recoverable) = exp(.8460[ln(hardness)] + 0.0584)~~
~~Silver (Total Recoverable) = exp(1.72[ln(hardness)] - 6.52)~~
~~Zinc (Total Recoverable) = exp(0.8473[ln(hardness)] + 0.884)~~

(3) Non-Storm Water Discharges from MS4s to Inland Surface Waters

Table C-4. Non-Storm Water Action Levels for Discharges from MS4s to Inland Surface Waters

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Dissolved Oxygen	mg/L	Not less than 5.0 in WARM waters and not less than 6.0 in COLD waters			BP
Turbidity	NTU	-	20	See MDAL	BP
pH	Units	Within limit of 6.5 to 8.5 at all times			BP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	33	-	61[3]	BP
Total Nitrogen	mg/L	-	1.0	See MDAL	BP
Total Phosphorus	mg/L	-	0.1	See MDAL	BP
MBAS	mg/L	-	0.5	See MDAL	BP
Iron	mg/L	-	0.3	See MDAL	BP
Manganese	mg/L	-	0.05	See MDAL	BP
Priority Pollutants	ug/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
BP – Basin Plan water quality objective
COLD – cold freshwater habitat beneficial use
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
MDAL – maximum daily action level
WARM – warm freshwater habitat beneficial use
MBAS – Methylene Blue Active Substances
MPN/100 ml – most probable number per 100 milliliters
ug/L – micrograms per liter

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for freshwater "designated beach areas" and is not applicable to waterbodies that are not designated with the water contact recreation (REC-1) beneficial use.

b. ~~If not identified in Provision C.1.a,~~ NALs must be identified, developed and incorporated in the Water Quality Improvement Plan for any pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in waters of the state associated with the highest priority water quality conditions related to non-storm water discharges from the MS4s. NALs must be based on:

(1) Applicable water quality standards which may be dependent upon site-specific or receiving water-specific conditions or assumptions to be identified by the Copermittees; or

(2) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the NALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary NALs specific to the Watershed Management Area at levels greater than the NALs required by Provisions C.1.a and C.1.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for addressing non-storm water discharges to and from the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and from the MS4. The secondary NALs may be developed using an approach acceptable to the San Diego Water Board.

d. Dry weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.b may be utilized to develop or revise NALs based on watershed-specific data, subject to San Diego Water Board Executive Officer approval.

2. Storm Water Action Levels[10]

The Copermittees must develop and incorporate numeric storm water action levels (SALs) in the Water Quality Improvement Plans to: 1) support the development and prioritization of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s, and 2) assess the effectiveness of the water quality improvement strategies toward reducing pollutants in storm water discharges, required pursuant to Provision D.4.b.(2).[11]

a. The following SALs for discharges of storm water from the MS4 must be incorporated if the Copermittees do not establish numeric action levels within the Water Quality Improvement Plan based on watershed priorities:

Table C-5. Storm Water Action Levels for Discharges from MS4s to Receiving Waters

Parameter	Units	Action Level
Turbidity	NTU	126
Nitrate & Nitrite (Total)	mg/L	2.6
Phosphorus (Total P)	mg/L	1.46
Cadmium (Total Cd)*	µg/L	3.0
Copper (Total Cu)*	µg/L	127
Lead (Total Pb)*	µg/L	250
Zinc (Total Zn)*	µg/L	976

Abbreviations/Acronyms:
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
ug/L – micrograms per liter

Notes:
* The sampling must include a measure of receiving water hardness at each MS4 outfall. If a total metal concentration exceeds the corresponding metals SAL in Table C-5, that concentration must be compared to the California Toxics Rule criteria and the USEPA 1-hour maximum concentration for the detected level of receiving water hardness associated with that sample. If it is determined that the sample's total metal concentration for that specific metal exceeds that SAL, but does not exceed the applicable USEPA 1-hour maximum concentration criterion for the measured level of hardness, then the sample result will not be considered above the SAL for that measurement.

b. ~~If not identified in Provision C.2.a,~~ SALs must be identified, developed and incorporated in the Water Quality Improvement Plan for pollutants or waste

[10] SALs are not considered ~~by the San Diego Water Board~~ to be enforceable limitations.
[11] The Copermittees may utilize SALs or other benchmarks currently established by the Copermittees as interim SALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in waters of the state associated with the highest water quality priorities related to storm water discharges from the MS4s. SALs must be based on:

(1) Federal and State water quality guidance and/or water quality standards; and

(2) Site-specific or receiving water-specific conditions; or

(3) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the SALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary SALs specific to the Watershed Management Area at levels greater than the SALs required by Provisions C.2.a and C.2.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s. The secondary SALs may be developed based on the approaches recommended by the State Water Board's Storm Water Panel[12] or using an approach acceptable to the San Diego Water Board.

d. Wet weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.c may be used to develop or revise SALs based upon watershed-specific data, subject to San Diego Water Board Executive Officer approval.

[12] Storm Water Panel Recommendations to the California State Water Resources Control Board: The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities (June 2006)

D. MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS

The purpose of this provision is for the Copermittees to monitor and assess the impact on the chemical, physical, and biological conditions of receiving waters caused by discharges from the Copermittees' MS4s under wet weather and dry weather conditions. The goal of the monitoring and assessment program is to inform the Copermittees about the nexus between the health of receiving waters and the water quality condition of the discharges from their MS4s. This goal will be accomplished through monitoring and assessing the conditions of the receiving waters, discharges from the MS4s, pollutant sources and/or stressors, and effectiveness of the water quality improvement strategies implemented as part of the Water Quality Improvement Plans.

1. Receiving Water Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the condition of the receiving waters in each Watershed Management Area during dry weather and wet weather. Following acceptance of the Water Quality Improvement Plans and schedule for implementation of monitoring for each Watershed Management Area, the Copermittees must conduct long-term receiving water monitoring during implementation of the Water Quality Improvement Plan to assess the long term trends and determine if conditions in receiving waters are improving. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following receiving water monitoring procedures:

a. TRANSITIONAL RECEIVING WATER MONITORING

Until the monitoring requirements and implementation schedule for monitoring of Provisions D.1.b-e are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following receiving water monitoring in the Watershed Management Area:

(1) Continue the receiving water monitoring programs required in Order Nos. R9-2007-0001 (Attachment A, Section II. A. 1-5), R9-2009-0002, and R9-2010-0016;

(2) Continue the monitoring in the Hydromodification Management Plans approved by the San Diego Water Board;

(3) Participate in the following regional receiving water monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring,

(b) Southern California Bight Regional Monitoring, and

(c) Sediment Quality Monitoring;

(4) Implement the monitoring programs developed as part of any implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) for the TMDLs in Attachment E to this Order; and

(5) For Watershed Management Areas with ASBS, implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

b. LONG-TERM RECEIVING WATER MONITORING STATIONS

The Copermittees must select at least one long-term receiving water monitoring station from among the existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees to be representative of the receiving water quality in the Watershed Management Area. Additional long-term receiving water monitoring stations must be selected where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

c. DRY WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three dry weather monitoring events at each of the long-term receiving water monitoring stations. At least one monitoring event must be conducted during the dry season (May 1 – September 30) and at least one monitoring event must be conducted during a dry weather period during the wet season (October 1 – April 30), after the first wet weather event of the season, with an antecedent dry period of at least 72 hours following a storm event producing measureable rainfall of greater than 0.1 inch.

(1) Dry Weather Receiving Water Field Observations

For each dry weather monitoring event, the Copermittees must record field observations consistent with Table D-1 at each long-term receiving water monitoring station.

Table D-1. Field Observations for Receiving Water Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) • Station description (i.e. deposits or stains, vegetation condition, structural condition, and observable biology) • Presence and assessment of trash in and around station

(2) Dry Weather Receiving Water Field Monitoring

For each dry weather monitoring event, if conditions allow the collection of the data, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

Table D-2. Field Monitoring Parameters for Receiving Water Monitoring Stations

Parameters
• pH • Temperature • Specific conductivity • Dissolved oxygen • Turbidity

(3) Dry Weather Receiving Water Analytical Monitoring

For each dry weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable NAL constituents, and

(v) Constituents listed in Table D-3.

Table D-3. Analytical Monitoring Constituents for Receiving Water Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Pesticides	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Mercury • Nickel • Selenium • Thallium • Zinc	• Organophosphate Pesticides • Pyrethroid Pesticides	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(4) Dry Weather Receiving Water Toxicity Monitoring

For each dry weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for toxicity in accordance with Table D-4:

Table D-4. Dry Weather Toxicity Testing for Receiving Water Monitoring Stations

Freshwater Organism	Test Approach	USEPA Protocol[2]
Pimephales promelas	1 acute 1 chronic[1]	EPA-821-R-02-012
Hyalella Azteca	1 acute 1 chronic[1]	EPA-821-R-02-012
Psuedokirchneriella subcapitata	1 acute 1 chronic[1]	EPA-821-R-02-013

Notes:
1. Chronic toxicity testing is not required at receiving water monitoring stations located at mass loading stations if the channel flows are diverted year-round during dry weather conditions to the sanitary sewer for treatment.
2. USEPA protocols must be utilized for toxicity testing unless alternate toxicity testing protocols have been approved by the San Diego Water Board.

(5) Dry Weather Receiving Water Bioassessment Monitoring

Bioassessment monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must conduct bioassessment monitoring during at least one dry weather monitoring event at each long-term receiving water monitoring station as follows:

(a) The following bioassessment samples and measurements must be collected:

(i) Macroinvertebrate samples must be collected in accordance with the "Reachwide Benthos (Multihabitat) Procedure" in the most current Surface Water Ambient Monitoring Program (SWAMP) Bioassessment Standard Operating Procedures (SOP), and amendments, as applicable;[13]

(ii) The "Full" suite of physical habitat characterization measurements must be collected in accordance with the most current SWAMP Bioassessment SOP, and as summarized in the SWAMP Stream Habitat Characterization Form – Full Version;[14] and

(iii) Freshwater algae samples must be collected in accordance with the SWAMP Standard Operating Procedures for Collecting Algae

[13] Ode, P.R.. 2007. Standard operating procedures for collecting macroinvertebrate samples and associated physical and chemical data for ambient bioassessments in California. California State Water Resources Control Board Surface Water Ambient Monitoring Program (SWAMP) Bioassessment SOP 001. http://www.swrcb.ca.gov/water_issues/programs/swamp/tools.shtml#monitoring
[14] Available at: http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/reports/fieldforms_fullversion052908.pdf

Samples.[15] Analysis of samples must include algal taxonomic composition (diatoms and soft algae) and algal biomass.

(b) The bioassessment samples, measurements, and appropriate water chemistry data must be used to calculate the following:

(i) An Index of Biological Integrity (IBI) for macroinvertebrates for each monitoring station where bioassessment monitoring was conducted, based on the most current calculation method;[16] and

(ii) An IBI for algae for each monitoring station where bioassessment monitoring was conducted, when a calculation method is developed.[17]

(c) In lieu of the requirements of Provision D.1.c.(5)(a), the Copermittees may conduct the bioassessment monitoring in accordance with the "Triad" assessment approach[18] to calculate the IBIs required for Provision D.1.c.(5)(b). The Copermittees must conduct sampling, analysis, and reporting of specified in-stream biological and habitat data according to the protocols specified in the SCCWRP Technical Report No. 539, or subsequent protocols, if developed.

(6) Dry Weather Receiving Water Hydromodification Monitoring

In addition to the hydromodification monitoring conducted as part of the Copermittees' Hydromodification Management Plans, hydromodification monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must collect the following hydromodification monitoring observations and measurements within an appropriate domain of analysis during at least one dry weather monitoring event for each long-term receiving water monitoring station:

(a) Channel conditions, including:

(i) Channel dimensions,

[15] Fetscher et al. 2009. Standard Operating Procedures for Collecting Stream Algae Samples and Associated Physical Habitat and Chemical Data for Ambient Bioassessments in California.
[16] The most current calculation method at the time the Order was adopted is outlined in "A Quantitative Tool for Assessing the Integrity of Southern California Coastal Streams" (Ode, et al. 2005. Environmental Management. Vol. 35, No. 1, pp. 1-13). If an updated or new calculation method is developed, either both (i.e. current and updated/new) methods must be used, or historical IBIs must be recalculated with the updated or new calculation method.
[17] When a calculation method is developed, IBIs must be calculated for all available and appropriate historical data.
[18] Stormwater Monitoring Coalition Model Monitoring Technical Committee, 2004. Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California. Technical Report #419. August 2004.

(ii) Hydrologic and geomorphic conditions, and

(iii) Presence and condition of vegetation and habitat;

(b) Location of discharge points;

(c) Habitat integrity;

(d) Photo documentation of existing erosion and habitat impacts, with location (i.e. latitude and longitude coordinates) where photos were taken;

(e) Measurement or estimate of dimensions of any existing channel bed or bank eroded areas, including length, width, and depth of any incisions; and

(f) Known or suspected cause(s) of existing downstream erosion or habitat impact, including flow, soil, slope, and vegetation conditions, as well as upstream land uses and contributing new and existing development.

d. WET WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three wet weather monitoring events at each long-term receiving water monitoring station. At least one wet weather monitoring event must be conducted during the first wet weather event of the wet season (October 1 – April 30), and at least one wet weather monitoring event during a wet weather event that occurs after February 1.

(1) Wet Weather Receiving Water Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each long-term receiving water monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event;

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(d) Presence and assessment of trash in and around station.

(2) Wet Weather Receiving Water Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

(3) Wet Weather Receiving Water Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) Constituents listed in Table D-3.

(4) Wet Weather Receiving Water Toxicity Monitoring

For each wet weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for toxicity in accordance with Table D-5:

Table D-5. Wet Weather Toxicity Testing for Receiving Water Monitoring Stations

Freshwater Organism	Test Approach	USEPA Protocol[1]
Pimephales promelas	1 acute	EPA-821-R-02-012
Hyalella Azteca	1 acute	EPA-821-R-02-012
Psuedokirchneriella subcapitata	1 acute	EPA-821-R-02-013

Notes:
1. USEPA protocols must be utilized for toxicity testing unless alternate toxicity testing protocols have been approved by the San Diego Water Board.

e. Other Receiving Water Monitoring Requirements

(1) Regional Monitoring

The Copermittees must participate in the following regional receiving waters monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring; and

(b) Southern California Bight Regional Monitoring.

(2) Sediment Quality Monitoring

The Copermittees must perform sediment monitoring to assess compliance with sediment quality receiving water limits applicable to MS4 discharges to enclosed bays and estuaries. The monitoring may be performed either by individual or multiple Copermittees to assess compliance with receiving water limits, or through participation in a water body monitoring coalition. The Copermittees must identify sediment sampling stations that are spatially representative of the sediment within the water body segment or region of interest. Sediment quality monitoring must be conducted in conformance with the monitoring requirements set forth in the State Water Board Sediment Quality Control Plan.

(3) ASBS Monitoring

For Watershed Management Areas with ASBS, the Copermittees must implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

f. ALTERNATIVE WATERSHED MONITORING REQUIREMENTS

The San Diego Water Board may direct the Copermittees to participate in an effort to develop alternative watershed monitoring with other regulated entities, other interested parties, and the San Diego Water Board to refine, coordinate, and implement regional monitoring and assessment programs to determine the status and trends of water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams.

2. MS4 Outfall Discharge Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the discharges from the MS4 outfalls in each Watershed Management Area during dry weather and wet weather. Following acceptance of the Water Quality Improvement Plans and schedule for implementation of monitoring for each Watershed Management Area, the Copermittees must conduct MS4 outfall discharge monitoring during implementation of the Water Quality Improvement Plan to assess the effectiveness of their jurisdictional runoff management programs toward effectively prohibiting non-storm water discharges and reducing pollutants in storm water discharges to and from their MS4s. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following MS4 outfall monitoring procedures:

a. TRANSITIONAL MS4 OUTFALL DISCHARGE MONITORING

Until the monitoring requirements of Provisions D.2.b-c are incorporated into a Water Quality Improvement Plan and schedule for implementation of monitoring that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following MS4 outfall discharge monitoring in the Watershed Management Area:

(1) MS4 Outfall Discharge Monitoring Station Inventory

Each Copermittee must identify all major MS4 outfalls that discharge directly to receiving waters within its jurisdiction and geo-locate those outfalls on a map of the MS4 pursuant to Provision E.2.b.(1). This information must be compiled into a MS4 outfall discharge monitoring station inventory, and must include the following information:

(a) Latitude and longitude of MS4 outfall point of discharge;

(b) Watershed Management Area;

(c) Hydrologic subarea;

(d) Outlet size;

(e) Accessibility (i.e. safety and without disturbance of critical habitat);

(f) Approximate drainage area; and

(g) Classification of whether the MS4 outfall is known to have persistent dry weather flows, transient dry weather flows, no dry weather flows, or unknown dry weather flows.

(2) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Until the monitoring requirements and the monitoring implementation schedule described in ~~of~~ Provision D.2.b are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, each Copermittee must perform dry weather MS4 outfall field screening monitoring to identify non-storm water and illicit discharges within its jurisdiction in accordance with Provision E.2.c, to determine which discharges are transient flows and which are persistent flows, and prioritize the dry weather MS4 discharges that will be investigated and eliminated in accordance with Provision E.2.d. Each Copermittee must conduct the following dry weather MS4 outfall discharge field screening monitoring within its jurisdiction:

(a) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Frequency

Each Copermittee must field screen the MS4 outfalls in its inventory developed pursuant to Provision D.2.a.(1) as follows:

(i) For Copermittees with less than 125 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 80 percent of the outfalls must be visually inspected two times per year during dry weather conditions. For Copermittees with jurisdiction in more than one WMA, this requirement is limited to 500 inspections annually per Provision D.2.a.(2)(a)(iv).

(ii) For Copermittees with 125 major MS4 outfalls or more, but less than or equal to 500, that discharge to receiving waters within a Watershed Management Area all the outfalls must be visually

inspected at least annually during dry weather conditions. For Copermittees with jurisdiction in more than one WMA, this requirement is limited to 500 inspections annually per Provision D.2.a.(2)(a)(iv).

(iii) For Copermittees with more than 500 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 500 outfalls must be visually inspected at least annually during dry weather conditions. Copermittees with more than 500 major MS4 outfalls within a Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

For Copermittees with jurisdiction in more than one WMA, this requirement is limited to 500 inspections annually, per Provision D.2.a.(2)(a)(iv).

(iv) For Copermittees with more than 500 major MS4 outfalls within its jurisdiction that are located in more than one Watershed Management Area, at least 500 major MS4 outfalls within its inventory must be visually inspected at least annually during dry weather conditions. Copermittees with more than 500 major MS4 outfalls in more than one Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(v) Inspections of major MS4 outfalls conducted in response to public reports and staff or contractor reports and notifications may count toward the required visual inspections of MS4 outfall discharge monitoring stations.

(b) Transitional Dry Weather MS4 Outfall Discharge Field Screening Visual Observations

(i) An antecedent dry period of at least 72 hours following any storm event producing measurable rainfall greater than 0.1 inch is required prior to conducting field screening visual observations during a field screening monitoring event.

(ii) During the field screening monitoring event, each Copermittee must record visual observations consistent with Table D-6 at each MS4 outfall discharge monitoring station inspected.

Table D-6. Field Screening Visual Observations for MS4 Outfall Discharge Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) - Flow source(s) suspected or identified from non-storm water source investigation - Flow source(s) eliminated during non-storm water source identification • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) - Known or suspected source(s) of pooled or ponded water • Station description (i.e. deposits or stains, vegetation condition, structural condition, observable biology) • Presence and assessment of trash in and around station • Evidence or signs of illicit connections or illegal dumping

(iii) Each Copermittee must implement the requirements of Provisions E.2.d.(2)(c)-(e) based on the field observations.

(iv) Each Copermittee must evaluate field observations together with existing information available from prior reports, inspections and monitoring results to determine whether any observed flowing, pooled, or ponded waters are likely to be transient or persistent flow.[19]

(c) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Records

[19] Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

Based upon the results of the transitional dry weather MS4 outfall discharge field screening monitoring conducted pursuant to Provisions D.2.a.(2)(a)-(b), each Copermittee must update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow.

(3) Transitional Wet Weather MS4 Outfall Discharge Monitoring

Until the monitoring requirements and the monitoring implementation schedule described in~~requirements of~~ Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(a) Transitional Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees must select at least five wet weather MS4 outfall discharge monitoring stations from the inventories developed pursuant to Provision D.2.a.(1) that are representative of storm water discharges from areas consisting primarily of residential, commercial, industrial, and typical mixed-use land uses present within the Watershed Management Area.

The County of San Diego shall select at least two (2) transitional wet weather MS4 outfall discharge monitoring stations for the portion of the Santa Margarita River Watershed Management Area within its jurisdiction until the Riverside Copermittees are enrolled under this Order. After the Riverside Copermittees are enrolled, the Watershed Management Area Copermittees shall select at least five (5) transitional wet weather MS4 outfall discharge monitoring stations consistent with the requirements above.

(b) Transitional Wet Weather MS4 Outfall Discharge Monitoring Frequency

Each wet weather MS4 outfall discharge monitoring station selected pursuant to Provision D.2.a.(3)(a) must be monitored twice during the wet season (October 1 – April 30) in the transitional period. ~~One~~ The wet weather monitoring events shall be selected to be representative of the range of hydrological conditions experienced in the region. At least 10% of samples must be conducted during the first wet weather event of the wet season, to include at least one such sample in each Watershed Management Area~~and one wet weather monitoring event at least a month after the first wet weather event of the wet season~~.

(c) Transitional Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(i) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(ii) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(iii) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(iv) Presence and assessment of trash in and around station.

(d) Transitional Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(e) Transitional Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, and indicator bacteria;

(iv) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

[a] Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

[b] Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

[c] If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours;

(v) Only one analysis of the composite of aliquots is required;

(vi) The samples must be analyzed for the following constituents:

[a] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

[b] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and

[c] Constituents listed in ~~in~~ Table D-7.

Table D-7. Analytical Monitoring Constituents for Wet Weather MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Nickel • Selenium • Thallium • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(f) Other Transitional Wet Weather MS4 Outfall Discharge Monitoring

The San Diego County Copermittees must continue the wet weather MS4 outfall monitoring program developed under Order No. R9-2007-0001, as approved by the San Diego Water Board, through its planned completion.

b. Dry Weather MS4 Outfall Discharge Monitoring

Each Copermittee must perform dry weather MS4 outfall monitoring to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. Each Copermittee must conduct the following dry weather MS4 outfall discharge monitoring within its jurisdiction:

(1) Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Each Copermittee must continue to perform the dry weather MS4 outfall discharge field screening monitoring in accordance with the requirements of Provision D.2.a.(2). The Copermittee may adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of persistent flow non-storm water discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of visual inspections performed is equivalent to the number of visual inspections required under Provision D.2.a.(2)(a).

(2) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring

Each Copermittee must perform non-storm water persistent flow MS4 outfall discharge monitoring to determine which persistent non-storm water discharges contain concentrations of pollutants below NALs, and which persistent non-storm water discharges impact receiving water quality during dry weather. Each Copermittee must conduct the following non-storm water persistent flow MS4 outfall discharge monitoring within its jurisdiction:

(a) Prioritization of Non-Storm Water Persistent Flow MS4 Outfalls

Based upon the dry weather MS4 outfall discharge field screening monitoring records developed pursuant to Provision D.2.a.(2)(c), each Copermittee must identify and prioritize the MS4 outfalls with persistent flows based on the highest priority water quality conditions identified in the Water Quality Improvement Plan and any additional criteria developed by the Copermittee, which may include historical data and data from sources other than what the Copermittee collects.

(b) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring Frequency

(i) Based on the prioritization of major MS4 outfalls developed under Provision D.2.b.(2)(a), each Copermittee must identify, at a minimum, the ~~10~~ 5 highest priority major MS4 outfalls with non-storm water persistent flows that the Copermittee will monitor within each Watershed Management Area within its jurisdiction. If a Copermittee has less than 5 major outfalls within a WMA, the Copermittee shall monitor all of its major outfalls with persistent flows within that WMA. The location of the highest priority non-storm water persistent flow MS4 outfall monitoring stations must be identified on the map required pursuant to Provision E.2.b.(1).

(ii) Each of the highest priority non-storm water persistent flow MS4 outfall monitoring stations identified pursuant to Provision D.2.b.(2)(b)(i) must be monitored under dry weather conditions at least semi-annually until one of the following occurs:

[a] The non-storm water discharges have been effectively eliminated (i.e. no flowing, pooled, or ponded water) for three consecutive dry weather monitoring events; or

[b] The source(s) of the persistent flows has been identified as a category of non-storm water discharges that does not require an NPDES permit and does not have to be addressed as an illicit discharge because it was not identified as a source of pollutants (i.e. constituents in non-storm water discharge do not exceed

NALs), and the persistent flow can be re-prioritized to a lower priority; or

[c] The constituents in the persistent flow non-storm water discharge do not exceed NALs, and the persistent flow can be re-prioritized to a lower priority; or

[d] The source(s) of the persistent flows has been identified as a non-storm water discharge authorized by a separate NPDES permit.

(iii) Where the criteria under Provision D.2.b.(2)(c)(ii) are not met, but the threat to water quality has been reduced by the Copermittee, the highest priority persistent flow MS4 outfall monitoring stations may be reprioritized accordingly for continued dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1).

(iv) Each Copermittee must document removal or re-prioritization of the highest priority persistent flow MS4 outfall monitoring stations identified under Provision D.2.b.(2)(b) in the Annual Report. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized major MS4 ~~major~~ outfall in the Watershed Management Area within its jurisdiction, unless there are no remaining qualifying major MS4 outfalls within the Copermittee's jurisdiction in the Watershed Management Area.

(c) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Observations

During each semi-annual monitoring event, each Copermittee must record field observations consistent with Table D-6 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(d) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Monitoring

During each semi-annual monitoring event, if conditions allow the collection of the data, each Copermittee must monitor and record the parameters in Table D-2 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(e) Non-Storm Water Persistent Flow MS4 Outfall Discharge Analytical Monitoring

During each semi-annual monitoring event in which measurable flow is present, each Copermittee must collect and analyze samples from each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) During development of the Water Quality Improvement Plan, for each WMA, consider the following sources to select constituents for ~~C~~collection of grab or composite samples to be analyzed at a qualified analytical laboratory~~for the following constituents~~:

[a] Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,
[b] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,
[c] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,
[d] Applicable NAL constituents, and
[e] Constituents listed in Table D-8~~, unless the~~

(iv) Copermittees may adjust the analytical list for a given WMA in successive monitoring events ~~Copermittee has~~ to add or eliminate constituents based on ~~historical~~ data that can demonstrate or provide justification ~~that~~ regarding the need or lack of need for analysis of ~~the~~ specific constituents ~~is not necessary~~.

Table D-8. Analytical Monitoring Constituents for Persistent Flow MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Total Hardness • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Cadmium • Copper • Lead • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(v) If the Copermittee identifies and eliminates the source of the persistent flow non-storm water discharge, analysis of the sample is not required.

c. WET WEATHER MS4 OUTFALL DISCHARGE MONITORING

The Copermittees must perform wet weather MS4 outfall monitoring to identify ~~sources of~~ pollutants in storm water discharges from the MS4s in the Watershed Management Area, and provide information to help guide source identification efforts. The Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(1) Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees may adjust the wet weather MS4 outfall discharge monitoring locations and frequencies in the Watershed Management Area, as needed, to identify ~~sources of~~ pollutants in storm water discharges from MS4s in the Watershed Management Area in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of stations is at least equivalent to the number of stations required under Provision D.2.a.(3)(a).

(2) Wet Weather MS4 Outfall Discharge Monitoring Frequency

The Copermittees must monitor the wet weather MS4 outfall discharge monitoring stations in the Watershed Management Area at an appropriate frequency to identify ~~sources of~~ pollutants in storm water discharges from the MS4s causing or contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan.

(3) Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(c) Station condition (i.e. deposits or stains, vegetation condition, structural

condition, observable biology); and

(d) Presence and assessment of trash in and around station.

(4) Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(5) Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

(iii) If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours.

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and

(iv) Applicable SAL constituents.

3. Special Studies

a. Within the term of this Order, the Copermittees must ~~develop and implement~~initiate the following special studies:

(1) At least two ~~three~~ special studies in each Watershed Management Area to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that cause or contribute to highest priority water quality conditions identified in the Water Quality Improvement Plan.

(2) At least one ~~two~~ special study~~ies~~ for the San Diego Region to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that are impacting receiving waters on a regional basis in the San Diego Region.

(3) One of the two ~~three~~ special studies in each Watershed Management Area may be replaced by a special study implemented pursuant to Provision D.3.a.(2).

b. The special studies must, at a minimum, be in conformance with the following criteria:

(1) The special studies must be related to the highest priority water quality conditions identified by the Copermittees in the Watershed Management Area and/or for the entire San Diego Region;

(2) The special studies developed pursuant to Provision D.3.a.(1) must:

(a) Be implemented within the applicable Watershed Management Area, and

(b) Require some form of participation by all the Copermittees within the Watershed Management Area;

(3) The special studies developed pursuant to Provision D.3.a.(2) must:

(a) Be implemented within the San Diego Region, and

(b) Require some form of participation by all Copermittees covered under the requirements of this Order.

c. Special studies developed to identify sources of pollutants and/or stressors should be pollutant and/or stressor specific and based on historical monitoring data and monitoring performed pursuant to Provisions D.1 and D.2. Development of source identification special studies should include the following:

(1) A compilation of known information on the specific pollutant and/or stressor, including data on potential sources and movement of the pollutant and/or stressor within the watershed. Data generated by the Copermittees and others, as well as information available from a literature research on the pollutant and/or stressor should be compiled and analyzed as appropriate.

(2) An identification of data gaps, based on the compiled information generated on the specific pollutant and/or stressor in Provision D.3.d.(1). Source identification special studies should be developed to fill identified data gaps.

(3) A monitoring plan that will collect and provide data the Copermittees can utilize to do the following:

(a) Quantify the relative loading or impact of a pollutant and/or stressor from a particular source or pollutant generating activity;

(b) Improve understanding of the fate of a pollutant and/or stressor in the environment;

(c) Develop an inventory of known and suspected sources of a pollutant and/or stressor in the Watershed Management Area; and/or

(d) Prioritize known and suspected sources of a pollutant and/or stressor based on relative magnitude in discharges, geographical distribution (i.e., regional or localized), frequency of occurrence in discharges, human health risk, and controllability.

d. Special studies initiated prior to the ~~acceptance of the Water Quality Improvement Plan~~term of this Order that meet the requirements of Provision D.3.b and are ~~completed~~ implemented during the term of this Order may be utilized to fulfill the special study requirements of Provision D.3.a.

e. The Copermittees must submit the monitoring plans for the special studies in the Water Quality Improvement Plans required pursuant to Provision F.1.

f. The Copermittees are encouraged to share the results of the special studies regionally among the Copermittees to provide information useful in improving and adapting the management of non-storm water and storm water runoff through the implementation of the Water Quality Improvement Plans.

4. Assessment Requirements

Each Copermittee must evaluate the data collected pursuant to Provisions D.1, D.2 and D.3, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E, to assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a. Assessments must be performed as described in the following provisions:

a. Receiving Waters Assessments

(1) The Copermittees must assess and report the conditions of the receiving waters in the Watershed Management Area as follows:

(a) Based on data collected pursuant to Provision D.1.a, the assessments under Provision D.4.a.(2) must be included in the first Annual Report required pursuant to Provision F.3.b.(1).

(b) Based on the data collected pursuant to Provisions D.1.a-e, the assessments required under Provision D.4.a.(2) must be included in the Report of Waste Discharge required pursuant to Provision F.5.b.

(2) The Copermittees must assess the status and trends of receiving water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under dry weather and wet weather conditions. For each of the three types of receiving waters in each Watershed Management Area the Copermittees must:

(a) Determine whether or not the conditions of the receiving waters are protective of the designated beneficial uses;

(b) Identify the most critical beneficial uses that must be protected or restored to ensure overall health of the receiving water;

(c) Determine whether or not those critical beneficial uses are being protected and where those beneficial used must be restored;

(d) Identify short-term and/or long-term improvements or degradation of those

critical beneficial uses;

(e) Identify data gaps in the monitoring data necessary to assess Provisions D.4.a.(2)(a)-(d).

b. MS4 OUTFALL DISCHARGES ASSESSMENTS

(1) Non-Storm Water Discharges Reduction Assessments

(a) Each Copermittee must assess and report the progress of its illicit discharge detection and elimination program, required to be implemented pursuant to Provision E.2, toward reducing and effectively prohibiting non-storm water and illicit discharges into the MS4 within its jurisdiction as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(2), the assessments under Provision D.4.b.(1)(b) must be included in the first Annual Report required pursuant to Provision F.3.b.(1).

(ii) Based on the data collected pursuant to Provisions D.2.b, the assessments required under Provision D.4.b.(1)(c) must be included when complete in the first Annual Report required pursuant to Provision F.3.b.(1), and annually thereafter.

(iii) Based on the data collected pursuant to Provisions D.2.b, the assessment required under Provision D.4.b.(1)(c) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.a.(2), each Copermittee must assess and report the following:

(i) Identify the known and suspected controllable sources (e.g. facilities, areas, land uses, pollutant generating activities) of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area;

(ii) Identify sources of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area that have been reduced or eliminated; and

(iii) Identify modifications to the field screening monitoring locations and frequencies for the MS4 outfalls in its inventory necessary to identify and eliminate sources of persistent flow non-storm water discharges pursuant to Provision D.2.b.(1).

(c) Based on the dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b, each Copermittee must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(1)(b);

(ii) Based on the data collected and applicable NALs in the Water Quality Improvement Plan, rank the MS4 outfalls in the Copermittee's jurisdiction according to potential threat to receiving water quality, and produce a prioritized list of major MS4 outfalls for follow-up action to update the Water Quality Improvement Plan, with the goal of eliminating persistent flow non-storm water discharges and/or pollutant loads in order of the ranked priority list through targeted programmatic actions and source investigations;

(iii) For the highest priority major MS4 outfalls with persistent flows that are in exceedance of NALs, identify the known and suspected sources within the Copermittee's jurisdiction in the Watershed Management Area that may cause or contribute to the NAL exceedances;

(iv) Each Copermittee must analyze the data collected pursuant to Provision D.2.b, and utilize a model or other method, to calculate or estimate the non-storm water volumes and pollutant loads collectively discharged from all the major MS4s outfalls in its jurisdiction identified as having persistent dry weather flows during the monitoring year. These calculations or estimates must be updated annually. ~~Each Copermittee must calculate or estimate:~~

[a] Each Copermittee must calculate or estimate:
Annual non-storm water volumes and pollutant loads collectively discharged from the Copermittee's major MS4 outfalls to receiving waters within the Copermittee's jurisdiction~~, with an estimate of the percent contribution from each known and suspected source for each MS4 outfall~~;

[b] Each Copermittee must ~~Annual non-storm water volumes and pollutant loads~~ identify and quantify, where feasible, sources of non-stormwater flows ~~from areas or facilities subject to~~ not subject to the Copermittee's legal authority that are discharged from the Copermittee's major MS4 outfalls to downstream receiving waters.

(v) Each Copermittee must review the data collected pursuant to Provision D.2.b and findings from the assessments required pursuant to Provision D.4.b.(1)(c)(i)-(iv) ~~on an annual basis to~~ once per Permit term to:

[a] Identify reductions and progress in achieving reductions in non-storm water and illicit discharges to the Copermittee's MS4 in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction, with an estimate, if possible, of the non-storm water volume and/or pollutant load reductions attributable to specific water quality strategies implemented by the Copermittee; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittee in the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction.

(vi) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(v).

(2) Storm Water Pollutant Discharges Reduction Assessments

(a) The Copermittees must assess and report the progress of the water quality improvement strategies, required to be implemented pursuant to Provisions B and E, toward reducing pollutants in storm water discharges from the MS4s within the Watershed Management Area as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(3), the assessments under Provision D.4.b.(2)(b) must be included in the first Annual Report required pursuant to Provision F.3.b.(1).

(ii) Based on the data collected pursuant to Provisions D.2.c, the assessments required under Provisions D.4.b.(2)(c)(i) and (ii) must be included when complete in the ~~first~~ Annual Report required pursuant to Provision F.3.b.(1), and annually thereafter.

(iii) Based on the data collected pursuant to Provisions D.2.c, the assessment required under Provisions D.4.b.(2)(c)-(d) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.a.(3) the Copermittees must assess and report the following:

(i) ~~The Copermittees must a~~Analyze the monitoring data collected pursuant to Provision D.2.a.(3), and utilize a watershed model or other method, to calculate or estimate storm water volumes and pollutant loads discharged from the MS4s in each Copermittee's

jurisdiction within the Watershed Management Area. The Copermittees must calculate or estimate the following for each monitoring year:

[a] The average storm water runoff coefficient for each land use type within the Watershed Management Area;

[b] The volume of storm water and pollutant loads discharged from each of the Copermittee's ~~major~~ monitored MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch;

~~[c] The pollutant loads discharged from each of the Copermittee's major MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch; and~~

~~[d] The percent contribution of storm water volumes and pollutant loads discharged from each land use type within the drainage basin to each of the Copermittee's major MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch.~~

[c] The total flow volume and pollutant loadings discharged from the Copermittee's jurisdiction within the Watershed Management Area over the course of the wet season, extrapolated from the data produced from the monitored outfalls.

(ii) Identify modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify ~~sources~~ pollutants in storm water discharges from the MS4s in the Watershed Management Area pursuant to Provision D.2.c.(1).

(c) Based on the wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.c the Copermittees must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(2)(b);

(ii) Based on the data collected and applicable SALs in the Water Quality Improvement Plan, analyze and compare the monitoring data to the analyses and assumptions used to develop the Water Quality Improvement Plans, including strategies developed per Provision B.3, and evaluate whether those analyses and assumptions should be updated as a component of the adaptive management efforts under Provision B.5,~~rank the MS4 outfalls in the Watershed Management Area according to potential threat to receiving water quality, and produce a prioritized list of major MS4 outfalls~~ for follow-up action to update the Water Quality Improvement Plan;

(iii) The Copermittees must review the data collected pursuant to Provision D.2.c and findings from the assessments required pursuant to Provisions D.4.b.(2)(c)(i)-(ii) ~~on an annual basis~~ once per Permit term to:

[a] Identify reductions and progress in achieving reductions in pollutant concentrations and/or pollutant loads from different land uses and/or drainage areas discharging from the Copermittees' MS4s in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters within the Watershed Management Area to the MEP, with an estimate, if possible, of the pollutant load reductions attributable to specific water quality strategies implemented by the Copermittees; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittees in the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters in the Watershed Management Area to the MEP.

(iv) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(iii).

(d) The Copermittees must evaluate all the data collected pursuant to Provision D.2.c, and incorporate new outfall monitoring data into time series plots for each long-term monitoring constituent for the Watershed Management Area, and perform statistical trends analysis on the cumulative long-term wet weather MS4 outfall discharge water quality data set.

c. Special Studies Assessments

The Copermittees must annually evaluate the results and findings from the special studies developed and implemented pursuant to Provision D.3, and assess their relevance to the Copermittees' efforts to characterize receiving water conditions, understand sources of pollutants and/or stressors, and control and reduce the discharges of pollutants from the MS4 outfalls to receiving waters in the Watershed Management Area. The Copermittees must report the results of the special studies assessments applicable to the Watershed Management Area, and identify any necessary modifications or updates to the Water Quality Improvement Plan based on the results in the Annual Reports required pursuant to Provision F.3.b.

d. Integrated Assessment of Water Quality Improvement Plan

As part of the iterative approach and adaptive management process required for the Water Quality Improvement Plan pursuant to Provision B.5, the Copermittees in each Watershed Management Area must integrate the data collected pursuant to Provisions D.1-D.3, the findings from the assessments required pursuant to Provisions D.4.a-c, and information collected during the implementation of the

jurisdictional runoff management programs required pursuant to Provision E to assess the effectiveness of, and identify necessary modifications to, the Water Quality Improvement Plan as follows:

(1) The Copermittees must re-evaluate the priority water quality conditions and numeric goals for the Watershed Management Area, as needed, during the term of this Order pursuant to Provision B.5.a. The re-evaluation and recommendations for modifications to the priority water quality conditions, and/or numeric goals and corresponding schedules may be provided in the Annual Reports required pursuant to Provision F.3.b, but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The priority water quality conditions and numeric goals for the Watershed Management Area must be re-evaluated as follows:

(a) Re-evaluate the receiving water conditions in the Watershed Management Area in accordance with Provision B.2.a;

(b) Re-evaluate the impacts on receiving waters in the Watershed Management Area from MS4 discharges in accordance with Provision B.2.b;

(c) Re-evaluate the identification of MS4 sources of pollutants and/or stressors in accordance with Provision B.2.d;

(d) Identify beneficial uses of the receiving waters that are protected or must be restored in accordance with Provision D.4.a;

(e) Evaluate the progress toward achieving the interim and final numeric goals for restoring impacted beneficial uses in the receiving waters.

(2) The Copermittees must re-evaluate the water quality improvement strategies for the Watershed Management Area during the term of this Order pursuant to Provision B.5.b. The re-evaluation and recommendations for modifications to the water quality improvement strategies and schedules must be provided in the ~~Annual Reports required pursuant to Provision F.3.b, and provided in the~~ Report of Waste Discharge pursuant to Provision F.5.b. The water quality improvement strategies for the Watershed Management Area must be re-evaluated as follows:

(a) Identify the non-storm water and storm water pollutant loads from the Copermittees' MS4 outfalls in the Watershed Management Area, calculated or estimated pursuant to Provisions D.4.b;

(b) Identify the non-storm water and storm water pollutant load reductions, or other improvements to receiving water or water quality conditions, that are necessary to attain the interim and final numeric goals for restoring impacted beneficial uses in the receiving waters;

(c) Identify the non-storm water and storm water pollutant load reductions, or other improvements to the quality of MS4 discharges, that are necessary for the Copermittees to demonstrate that non-storm water and storm water discharges from their MS4s are not causing or contributing to exceedances of receiving water limitations;

(d) Evaluate the progress of the water quality improvement strategies toward achieving the interim and final numeric goals for restoring impacted beneficial uses in the receiving waters.

(3) The Copermittees must re-evaluate and adapt the water quality monitoring and assessment program for the Watershed Management Area when new information becomes available to improve the monitoring and assessment program pursuant to Provision B.5.c. The re-evaluation and recommendations for modifications to the monitoring and assessment program may be provided in the Annual Reports required pursuant to Provision F.3.b, but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. Modifications to the water quality monitoring and assessment program must be consistent with the requirements of Provision D.1-D.3. The re-evaluation of the water quality monitoring and assessment program for the Watershed Management Area must consider the data gaps identified by the assessments required pursuant to Provisions D.4.a-b, and results of the special studies implemented pursuant to Provision D.4.c.

5. Monitoring Provisions

Each Copermittee must comply with all the monitoring, reporting, and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

E. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS

The purpose of this provision is for each Copermittee to implement a program to control the contribution of pollutants to and the discharges from the MS4 within its jurisdiction. The goal of the jurisdictional runoff management programs is to implement strategies that effectively prohibit non-storm water discharges to the MS4 and reduce the discharge of pollutants from the MS4~~in storm water~~ to the MEP. This goal will be accomplished through implementing the jurisdictional runoff management programs in accordance with the strategies identified in the Water Quality Improvement Plans. For the Santa Margarita River Watershed Management Area, the County of San Diego shall use the water quality priorities in the Santa Margarita River Watershed Urban Runoff Management Plan (developed pursuant to Order No. R9-2007-0001) to guide jurisdictional runoff management program implementation until notified by the San Diego Water Board that the Water Quality Improvement Plan developed in conjunction with the Riverside Copermittees has been approved.

Each Copermittee must update its jurisdictional runoff management program document, in accordance with Provision F.2.a, to incorporate all the requirements of Provision E. Until the Copermittee has updated its jurisdictional runoff management program document with the requirements of Provision E, the Copermittee must continue implementing its current jurisdictional runoff management program.

Modification of Jurisdictional Runoff Management Program Requirements

Modifications shall be considered and where selected, proposed according to the process in Provision B.5. Proposed modifications may increase, decrease, and/or replace minimum requirements identified in Provision E.

1. Legal Authority Establishment and Enforcement

a. Each Copermittee must establish, maintain, and enforce adequate legal authority within its jurisdiction to control pollutant discharges ~~into and~~ from its MS4 through statute, ordinance, permit, contract, order, or similar means. This legal authority must, at a minimum, authorize the Copermittee to:

(1) Effectively ~~P~~prohibit and eliminate all illicit discharges and illicit connections to its MS4;

(2) Control the contribution of pollutants in discharges of runoff associated with industrial and construction activity to its MS4 and control the quality of runoff from industrial and construction sites that do not~~, including industrial and construction sites which~~ have coverage under the statewide General Permit for Discharges of Storm Water Associated with Industrial Activities (Industrial General Permit) or General Permit for Discharges of Storm Water Associated with Construction Activities (Construction General Permit),~~ as well as to those sites which do not~~;

(3) Control the discharge of spills, dumping, or disposal of materials other than storm water into its MS4;

~~(4)~~ Coordinate, as possible, with other agencies to minimize the contribution of pollutant discharges from the Copermittee's portion of the MS4 to portions of the MS4 under another agency's jurisdiction and from other agency's portions of the MS4 to the portion of the MS4 under the Copermittee's jurisdiction~~Control through interagency agreements among Copermittees the contribution of pollutants from one portion of the MS4 to another portion of the MS4;~~

~~Control, by coordinating and cooperating with other owners of the MS4 such as Caltrans, the U.S. federal government, or sovereign Native American Tribes through interagency agreements, where possible, the contribution of pollutants from their portion of the MS4 to the portion of the MS4 within the Copermittee's jurisdiction~~;

~~(5)~~(4) Require compliance with conditions in its statutes, ordinances, permits, contracts, orders, or similar means to hold dischargers to its MS4 accountable for their contributions of pollutants and flows;

~~(6)~~(5) Require the use of BMPs to prevent or reduce the discharge of pollutants in ~~storm water~~ from its MS4 to the MEP;

~~(7)~~(6) Require documentation on the effectiveness of BMPs implemented to prevent or reduce the discharge of pollutants ~~in storm water~~ from its MS4 to the MEP;

~~(8)~~(7) Utilize enforcement mechanisms to require compliance with its statutes, ordinances, permits, contracts, orders, or similar means; and

~~(9)~~(8) Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with its statutes, ordinances, permits, contracts, orders, or similar means and with the requirements of this Order, including the effective prohibition of illicit discharges and connections to its MS4; the Copermittee must also have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from industrial facilities, including construction sites, discharging into its MS4.

b. With the first Annual Report required pursuant to Provision F.3.b, each Copermittee must submit a statement certified by its Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative that the Copermittee has taken the necessary steps to obtain and maintain full legal authority within its jurisdiction to implement and enforce each of the requirements contained in this Order.

2. Illicit Discharge Detection and Elimination

Each Copermittee must implement a program to actively detect and eliminate illicit discharges and improper disposal into the MS4, or otherwise require the discharger to apply for and obtain a separate NPDES permit. The illicit discharge detection and elimination program must be implemented in accordance with the strategies identified in the Water Quality Improvement Plan and include, at a minimum, the following requirements:

a. NON-STORM WATER DISCHARGES

To the extent allowable by law, ~~E~~each Copermittee must address all non-storm water discharges as illicit discharges, where the likelihood exists that they are a source of pollutants to waters of the U.S., unless a non-storm water discharge is either identified as a discharge authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to the following requirements:

(1) Discharges of non-storm water to the MS4 from uncontaminated pumped groundwater ~~the following categories~~ must be addressed as illicit discharges where there is evidence that suggests that they are the source of pollutants to waters of the U.S., unless the discharge has coverage under NPDES Permit No. CAG919001 (Order No. R9-2007-0034, or subsequent order) for discharges to San Diego Bay, or NPDES Permit No. CAG919002 (Order No. R9-2008-0002, or subsequent order) for discharges to surface waters other than San Diego Bay~~:~~.

~~(a) Uncontaminated pumped ground water;~~

~~(b) Discharges from foundation drains;~~[20]

~~(c) Water from crawl space pumps; and~~

~~(d) Water from footing drains.~~[19]

(2) Discharges of non-storm water from water line flushing and water main breaks to the MS4 must be addressed as illicit discharges unless the discharge has coverage under a valid NPDES Permit ~~No. CAG 679001 (Order No. R9-2010-0003~~, ~~(~~Order No. R9-2010-0003, or a subsequent order). This category includes water line flushing and water main break discharges from water purveyors under the Copermittee's jurisdiction that have been issued a water supply permit by the California Department of Public Health or

[20] ~~Provision E.2.a.(1) only applies to this category on non-storm water if the system is designed to be located at or below the highest historical groundwater table to actively or passively extract groundwater during any part of the year.~~

federal military installations. Discharges from recycled or reclaimed water lines to the MS4 must be addressed as illicit discharges, unless the discharges have coverage under a separate NPDES permit.

(3) Discharges of non-storm water to the MS4 from the following categories must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a source of pollutants to receiving waters:

(a) Diverted stream flows;

(b) Rising ground waters;

(c) Uncontaminated ground water infiltration to MS4s;

(d) Springs;

(e) Flows from riparian habitats and wetlands;

(f) Discharges from potable water sources;

(g) Discharges from foundation drains;[21] and

(h) Discharges from footing drains.; [20] and

(h)(i) Water from crawl space pumps.

(4) Discharges of non-storm water to the MS4 from the following categories must be controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means where the Copermittees or the San Diego Water Board identifies those discharges are a source of pollutants to waters of the U.S.- Discharges of non-storm water to the MS4 from the following categories not controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means must be addressed by the Copermittee as illicit discharges.

(a) Air conditioning condensation

The discharge of air conditioning condensation must should be directed to landscaped areas, or other pervious surfaces where feasible, or to the sanitary sewer.

(b) Individual residential vehicle washing

[21] Provision E.2.a.(3) only applies to this category of non-storm water discharge if the system is designed to be located above the highest historical groundwater table at all times of the year, and the system is only expected to discharge non-storm water under unusual circumstances.

~~(i)~~ The discharge of wash water must be encouraged through public outreach and education;

(i) to be directed to landscaped areas or other pervious surfaces where feasible; and

(ii) to m~~M~~inimize the use of water for vehicle washing, use as little washing detergent and other vehicle wash products as possible, wash vehicles at commercial wash facilities, and implement other practices or behaviors that will prevent the discharge of pollutants associated with individual residential vehicle washing from entering the MS4.

(c) Dechlorinated swimming pool discharges should be managed as to:

(i) Eliminate residual chlorine, algaecide, filter backwash, or other pollutants from swimming pools prior to discharging to the MS4; and

(ii) The discharge of saline swimming pool water must be directed to the sanitary sewer, landscaped areas, or other pervious surfaces that can accommodate the volume of water, unless the saline swimming pool water can be discharged via a pipe or concrete channel directly to a naturally saline water body (e.g. Pacific Ocean).

(5) Firefighting discharges to the MS4 must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a significant source of pollutants to receiving waters. Firefighting discharges to the MS4 not identified as a significant source of pollutants to receiving waters, must be addressed, at a minimum, as follows:

(a) Non-emergency firefighting discharges

(i) Building fire suppression system maintenance discharges (e.g., sprinkler line flushing) to the MS4 must be addressed as illicit discharges unless BMPs are implemented to prevent the discharge of pollutants to the MS4.

(ii) Non-emergency firefighting discharges (i.e., discharges from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems) must be addressed by a program, to be developed and implemented by the Copermittee, to reduce or eliminate pollutants in such discharges from entering the MS4.

(b) Emergency firefighting discharges

Each Copermittee should develop and encourage implementation of BMPs to reduce or eliminate pollutants in emergency firefighting discharges to the MS4s and receiving waters within its jurisdiction. During emergency situations, priority of efforts should be directed toward life, property, and the environment (in descending order). BMPs should not interfere with immediate emergency response operations or impact public health and safety.

(6) If the Copermittee or San Diego Water Board identifies any category of non-storm water discharges listed under Provisions E.2.a.(1)-(4) as a source of pollutants to receiving waters, the category must be ~~prohibit~~effectively prohibited through ordinance, order, or similar means and addressed as an illicit discharge.

(7) Each Copermittee must, where feasible, reduce or effectively eliminate non-storm water discharges listed under Provisions E.2.a.(1)-(4) into its MS4 ~~whether or not the non-storm water discharge has been identified as an illicit discharge~~, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit.

b. PREVENT AND DETECT ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to prevent and detect illicit discharges to the MS4:

(1) Each Copermittee must maintain an updated map of its entire MS4 and the corresponding drainage areas. The accuracy of the MS4 map must be confirmed during the field screening required pursuant to Provision E.2.c. The MS4 map must be included as part of the jurisdictional runoff management program document. Any geographic information system (GIS) layers or files used by the Copermittee to maintain the MS4 map must be made available to the San Diego Water Board upon request. The MS4 map must identify the following:

(a) All segments of the MS4 owned, operated, and maintained by the Copermittee;

(b) All known locations of inlets that discharge and/or collect runoff into the Copermittee's MS4;

(c) All known locations of connections with other MS4s not owned or operated by the Copermittee (e.g. Caltrans MS4s);

(d) All known locations of Major MS4 outfalls and private outfalls that discharge runoff collected from areas within the Copermittee's jurisdiction;

(e) All segments of receiving waters within the Copermittee's jurisdiction that

receive and convey runoff discharged from the Copermittee's MS4 outfalls;

(f) Locations of the MS4 outfalls, identified pursuant to Provision D.2.a.(1), within its jurisdiction; and

(g) Locations of the non-storm water persistent flow MS4 outfall discharge monitoring stations, identified pursuant to Provision D.2.b.(2)(b), within its jurisdiction.

(2) Each Copermittee must use Copermittee personnel and contractors to assist in identifying and reporting illicit discharges and connections during their daily employment activities.

(3) Each Copermittee must promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges to or from the MS4, including the following methods for public reporting:

(a) Operate a public hotline, which can be Copermittee-specific or shared by the Copermittees, and must be capable of receiving reports in both English and Spanish 24 hours per day and seven days per week; and

(b) Designate an e-mail address for receiving electronic reports from the public, which can be Copermittee-specific or shared by the Copermittees, and must be prominently displayed on the Copermittee's webpage and the Regional Clearinghouse required pursuant to Provision F.4.

(4) Each Copermittee must implement practices and procedures (including a notification mechanism) to prevent, respond to, contain, and clean up any spills that may discharge into the MS4 within its jurisdiction from any source. The Copermittee must coordinate, to the extent possible, with spill response teams to prevent entry of spills into the MS4, and prevent contamination of surface waters of the U.S.~~water, ground water, and soil.~~ The Copermittee must coordinate spill prevention, containment, and response activities throughout all appropriate Copermittee departments, programs, and agencies.

(5) Each Copermittee must implement practices and procedures to prevent and limit infiltration of seepage from sanitary sewers (including private laterals and failing septic systems) to the MS4.

(6) Each Copermittee ~~must~~ shall coordinate, when necessary, with upstream Copermittees and/or entities to prevent illicit discharges from upstream sources into the MS4 within its jurisdiction.

c. FIELD SCREENING

Each Copermittee must conduct field screening (i.e. visual observations, field testing, and/or analytical testing) of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4 in accordance with the dry weather MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

d. INVESTIGATE AND ELIMINATE ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to investigate and eliminate illicit discharges to the MS4:

(1) Each Copermittee must prioritize and determine when follow-up investigations will be performed in response to visual observations and/or water quality monitoring data collected during an investigation of a detected non-storm water or illicit discharge to or from the MS4. The criteria for prioritizing investigations must consider the following:

(a) Pollutants identified as causing or contributing to the highest water quality priorities identified in the Water Quality Improvement Plan;

(b) Pollutants identified as causing or contributing, or threatening to cause or contribute to impairments in water bodies on the 303(d) List and/or in environmentally sensitive areas (ESAs), located within its jurisdiction;

(c) Pollutants identified from sources or land uses known to exist within the area, drainage basin, or watershed that discharges to the portion of the MS4 within its jurisdiction included in the investigation;

(d) Pollutants identified as causing or contributing to an exceedance of a NAL in the Water Quality Improvement Plan where the source has not been identified as natural; and

(e) Pollutants identified as a threat to human health or the environment.

(2) Each Copermittee must implement procedures to investigate and inspect portions of its MS4 that, based on reports or notifications, field screening, or other appropriate information, indicate a reasonable potential of ~~receiving, containing, or~~ discharging pollutants due to illicit discharges, illicit connections, or other sources of non-storm water. The procedures must include the following:

(a) Each Copermittee must develop criteria to:

(i) Assess the validity of each report or notification received; and

(ii) Prioritize the response to each report or notification received.

(b) Each Copermittee must prioritize and respond to each valid report or notification (e.g., public reports, staff or contractor reports and notifications, etc.) of an incident in a timely manner.

(c) In accordance with the procedures defined in Provision E.2.d.(1), ~~E~~each Copermittee must investigate and seek to identify the source(s) of discharges of non-storm water where flows are observed in and from the MS4 during the field screening required pursuant to Provision D.2.b.(1) as follows:

(i) Obvious illicit discharges (i.e., unusual color or odor) must be immediately investigated to identify the source(s) of non-storm water discharges;

(ii) The investigation must include field investigations to identify sources or potential sources for the discharge, unless the source or potential source has already been identified during previous investigations; and

(iii) The investigation may include follow-up field investigations and/or reviewing Copermittee inventories and other land use data to identify potential sources of the discharge.

(d) Each Copermittee must maintain records and a database of the following information:

(i) Location of incident, including hydrologic subarea, portion of MS4 receiving the non-storm water or illicit discharge, and point of discharge or potential discharge from MS4 to receiving water;

(ii) Source of information initiating the investigation (e.g., public reports, staff or contractor reports and notifications, field screening, etc.);

(iii) Date the information used to initiate the investigation was received;

(iv) Date the investigation was initiated;

(v) Dates of follow-up investigations;

(vi) Identified or suspected source of the illicit discharge or connection, if determined;

(vii) Known or suspected related incidents, if any;

(viii) Result of the investigation; and

(ix) If a source cannot be identified and the investigation is not continued, document the response per the requirements of Provision E.2.d.(3) ~~a rationale for why a discharge does not pose a threat to water quality~~

~~and/or does not require additional investigation~~.

(e) Each Copermittee must ~~track~~ document and, if readily identifiable in accordance with Provision E.2.d.(1) procedures, seek to identify the source(s) of non-storm water discharges from the MS4 where there is evidence of non-storm water having been discharged into or from the MS4 (e.g., ~~pooled~~ flowing water), in accordance with MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.

(3) Each Copermittee must initiate the implementation of procedures, in a timely manner, to eliminate all detected and identified illicit discharges and connections within its jurisdiction. The procedures must include the following responses:

(a) Each Copermittee must enforce its legal authority, as required under Provision E.1, to eliminate illicit discharges and connections to the MS4.

(b) If the Copermittee identifies the source as a controllable source of non-storm water or illicit discharge or connection, the Copermittee must implement its Enforcement Response Plan pursuant to Provision E.6 and enforce its legal authority to effectively prohibit and eliminate illicit discharges and connections to its MS4.

(c) If the Copermittee identifies the source of the discharge as a category of non-storm water discharges in Provision E.2.a, and the discharge is in exceedance of NALs in the Water Quality Improvement Plan, then the Copermittee must determine if: (1) this is an isolated incident or set of circumstances that will be addressed through its Enforcement Response Plan pursuant to Provision E.6, or (2) the category of discharge must be addressed through the effective prohibition of that category of discharge as an illicit discharge pursuant to Provision E.2.a.(6).

(d) If the Copermittee suspects the source of the non-storm water discharge as natural in origin (i.e. non-anthropogenically influenced) and in conveyance into the MS4, then the Copermittee must document and provide the data and evidence necessary to demonstrate to the San Diego Water Board that it is natural in origin and does not require further investigation.

(e) If the Copermittee is unable to identify and document the source of a recurring non-storm water discharge to or from the MS4, then the Copermittee must address the discharge as an illicit discharge and update its jurisdictional runoff management program to address the common and suspected sources of the non-storm water discharge within its jurisdiction in accordance with the Copermittee's priorities.

(4) Each Copermittee must submit a summary of the non-storm water discharges

and illicit discharges and connections investigated and eliminated within its jurisdiction with each Annual Report required under Provision F.3.b of this Order.

e. STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the illicit discharge detection and elimination program to address non-storm water and illicit discharges and connections that the Copermittee has identified as potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, and/or increase/decrease frequency of inspections in specific areas); and

(2) The strategies and/or activities must be consistent with the requirements of Provisions E.2.a-d and the strategies identified in the Water Quality Improvement Plan.

3. Development Planning

Each Copermittee~~-~~, within their respective jurisdictions and to the extent that they may lawfully impose requirements, must ~~use their land use and planning authorities to~~ implement a development planning program in accordance with the strategies identified in the Water Quality Improvement Plan and includes, at a minimum, the following requirements:

a. BMP REQUIREMENTS FOR ALL DEVELOPMENT PROJECTS

Each Copermittee, as practical and feasible, must prescribe the following BMP requirements during the planning process (i.e. prior to project approval and issuance of local permits) for all development projects (regardless of project type or size), where local permits are issued, including unpaved roads and flood management projects, except emergency projects implemented for the protection of persons and property:

(1) General Requirements

(a) Onsite BMPs must be located so as to remove pollutants from runoff prior to its discharge to any receiving waters, and as close to the source as possible; and

(b) Structural BMPs must not be constructed within a water~~s~~ of the U.S. unless authorized by the San Diego Water Board Executive Officer~~or~~

~~waters of the state~~.

(2) Source Control BMP Requirements

The following source control BMPs must be implemented at all development projects where applicable and feasible:

(a) Prevention of illicit discharges into the MS4;

(b) Storm drain system stenciling or signage;

(c) Properly designed outdoor material storage areas;

(d) Properly designed outdoor work areas;

(e) Properly designed trash storage areas; and

(f) Any additional BMPs necessary to minimize pollutant generation at each project.

(3) Low Impact Development (LID) BMP Requirements

The following LID BMPs must be implemented at all development projects where applicable and feasible:

(a) Maintenance or restoration of natural storage reservoirs and drainage corridors (including topographic depressions, areas of permeable soils, natural swales, and ephemeral and intermittent streams);[22]

(b) Buffer zones for natural water bodies (where buffer zones are technically infeasible, require project applicant to include other buffers such as trees, access restrictions, etc.);

(c) Conservation of natural areas within the project footprint including existing trees, other vegetation, and soils;

(d) Construction of streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided public safety is not compromised;

(e) Minimization of the impervious footprint of the project;

(f) Minimization of soil compaction to landscaped areas;

[22] Development projects proposing to dredge or fill materials in waters of the U.S. must obtain a CWA Section 401 Water Quality Certification. Projects proposing to dredge or fill waters of the state must obtain waste discharge requirements.

(g) Disconnection of impervious surfaces through distributed pervious areas;

(h) Landscaped or other pervious areas designed and constructed to effectively receive and infiltrate, retain and/or treat runoff from impervious areas, prior to discharging to the MS4;

(i) Small collection strategies located at, or as close as possible to, the source (i.e. the point where storm water initially meets the ground) to minimize the transport of runoff and pollutants to the MS4 and receiving waters;

(j) Use of permeable materials for projects with low traffic areas and appropriate soil conditions;

(k) Landscaping with native or drought tolerant species; and

(l) Harvesting and using precipitation.

b. PRIORITY DEVELOPMENT PROJECTS

(1) Definition of Priority Development Project

Priority Development Projects include the following:

(a) All new development projects that fall under the Priority Development Project categories listed under Provision E.3.b.(2) (where a new development project feature, such as a parking lot, falls into a Priority Development Project category, the entire project footprint is subject to Priority Development Project requirements); and

(b) Those redevelopment projects that create, add, or replace at least 5,000 square feet of impervious surfaces on an already developed site, and the redevelopment project is a Priority Development Project category listed under Provision E.3.b.(2) (where redevelopment results in an increase of less than fifty percent of the impervious surfaces of a previously existing development and was not subject to previous Priority Project Development requirements, and the existing development was not subject to Priority Development Project requirements, the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) apply only to the addition or replacement, and not to the entire development; where redevelopment results in an increase of more than fifty percent of the impervious surfaces of a previously existing development, the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) apply to the entire development).

~~(b)~~(c) Projects where redevelopment results in an increase of more than fifty percent of impervious surfaces of a previously existing development,

and the existing development was subject to previous Priority Project Development Requirements, only the altered portion of development is subject to the new Priority Development Project requirements.

(2) Priority Development Project Categories

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This category includes commercial, industrial, residential, mixed-use, and public development projects on public or private land which fall under the planning and building authority of the Copermittee.

~~(b) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.~~

~~(c) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812), where the land area for development is 5,000 square feet or more.~~

~~(d) Hillside development projects. This category includes any development which creates 5,000 square feet or more of impervious surface which is located in an area with known erosive soil conditions, where the development will grade on any natural slope that is twenty-five percent or greater.~~

~~(e) Environmentally sensitive areas (ESAs). This category includes any development located within, directly adjacent to, or discharging directly to an ESA, which either creates 2,500 square feet of impervious surface on a proposed project site or increases the area of imperviousness of a proposed project site to 10 percent or more of its naturally occurring condition. "Directly adjacent to" means situated within 200 feet of the ESA. "Discharging directly to" means outflow from a drainage conveyance system that collects runoff from the subject development or redevelopment site and terminates at or in receiving waters within the ESA.~~

~~(f) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce that has 5,000 square feet or more of impervious surface.~~

~~(g) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface that is 5,000 square feet or more~~

~~used for the transportation of automobiles, trucks, motorcycles, and other vehicles.~~

~~(h) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.~~

(b) Development projects that create 5,000 square feet or more of impervious surfaces (collectively over the entire project site), and support one or more of the following uses (see Appendix C for definitions):

(i) Automotive repair shop

(ii) Restaurant

(iii) Parking lot

(iv) Street, road, highway, freeway and driveway

(v) Retail gasoline outlet (RGO)

~~(i)~~(c) Development projects that create 2,500 square feet or more of impervious surfaces (collectively over the entire project site) and where the project will directly discharge to an Environmentally Sensitive Area (see Appendix C for definitions).

~~(j)~~(d) Large development projects. This category includes any post-construction pollutant-generating new development projects that result in the disturbance of one acre or more of land.

(3) Priority Development Project Exemptions

Each Copermittee has the discretion to exempt the following projects from being defined as Priority Development Projects:

(a) New paved sidewalks, bicycle lanes, driveways, or trails that meet the following criteria:

(i) Designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas; OR

(ii) Designed and constructed to be hydraulically disconnected from paved streets or roads; OR

(iii) Designed and constructed with permeable pavements or surfaces in accordance with USEPA Green Streets guidance.[23]

[23] See "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).

(b) Any paved impervious surface that is 5,000 square feet or more used for the transportation of automobiles, trucks, motorcycles, and other vehicles that follows the USEPA guidance regarding Managing Wet Weather with Green Infrastructure: Green Streets, or equivalent standards, to the maximum extent practicable.

~~(b) Retrofitting of existing paved alleys, streets or roads that meet the following criteria:~~

~~(i) Must be two lanes or less; AND~~

~~(ii) Must be a retrofitting project implemented as part of an alternative compliance project option under Provision E.3.c.(3)(b)(v) to achieve the performance requirements of Provisions E.3.c.(1) and/or E.3.c.(2) for a Priority Development Project; AND~~

~~(iii) Designed and constructed in accordance with the USEPA Green Streets guidance.~~[24]

(c) New single family residences that meet the following criteria:

(i) Must not be constructed as part of a larger development or proposed subdivision; AND

(ii) Designed and constructed to meet requirements for certification ~~to be certified~~ under the U.S. Green Building Council (USGCB) Leadership in Energy and Environmental Design (LEED) for Homes green building certification program, receiving at least four (4) Surface Water Management credits under the Sustainable Sites category~~;~~, or other locally accepted certification of equivalent effectiveness;[25] OR

(iii) Designed and constructed with ~~structural~~ BMPs that will achieve ~~the~~ equivalent performance to the requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite, OR

~~(iii)~~(iv) Designed and constructed with structural BMPs that meet minimum performance standards, as outlined in the BMP Design Manual.

(d) Redevelopment of existing single family residences that meet the following criteria:

(i) Designed and constructed to meet requirements for certification ~~to be certified~~ under the USGCB LEED for Homes green building certification program, receiving at least four (4) Surface Water

[24] ~~Ibid.~~
[25] See LEED for Homes rating system at http://www.usgbc.org

Management credits under the Sustainable Sites category~~;~~, [26] or other locally accepted certification of equivalent effectiveness; OR

(ii) Designed and constructed with ~~structural~~ BMPs that will achieve ~~the~~ equivalent performance to the requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite; OR

(iii) Designed and constructed with structural BMPs that meet minimum performance standards, as outlined in the BMP Design Manual.

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c. Priority Development Project Structural BMP Performance Requirements

In addition to the BMP requirements listed for all development projects under Provision E.3.a, Priority Development Projects must also implement structural BMPs that conform to performance requirements below. Alternatively, watershed-specific performance requirements may be developed as part of a Water Quality Improvement Plan; these requirements would replace the general performance requirements below. Watershed-specific requirements must provide at least equivalent protection as the general performance requirement below.

(1) Storm Water Pollutant Control BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite structural BMPs to control pollutants in storm water that may be discharged from a project as follows:

(a) Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite the pollutants contained in the design capture volume. The design capture volume is equivalent to:

(i) The volume of storm water produced from a 24-hour 85th percentile storm event;[27] OR

(ii) The volume of storm water that would be retained onsite prior to the project~~if the site was fully undeveloped and naturally vegetated~~, as determined using continuous simulation modeling or other techniques based on site-specific soil conditions and ~~typical native~~ vegetative cover.

[26] See LEED for Homes rating system at http://www.usgbc.org

[27] This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals. The volume is a single event-based volume that occurs after an extended dry period.

(b) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) to comply with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1)(a).

(c) If a Priority Development project is allowed to utilize alternative compliance pursuant to Provisions E.3.c.(1)(b), flow-thru conventional treatment control BMPs must be implemented to treat the portion of the design capture volume that is not retained onsite. Additionally, project applicants must mitigate for the portion of the pollutant load in the design capture volume that is not retained onsite through one or more alternative compliance options under Provision E.3.c.(3). Conventional treatment control BMPs must be sized and designed to:

(i) Remove pollutants from storm water to the MEP;

(ii) Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;

(iii) Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Conventional treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of conventional treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

(2) Hydromodification Management BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite structural BMPs to manage hydromodification that may be caused by storm water runoff discharged from a project as follows:

(a) Post-project runoff flow rates and durations must not exceed pre-project~~development (naturally occurring)~~ runoff flow rates and durations by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat conditions downstream of Priority Development Projects).

(i) In evaluating the range of flows that results in increased potential for erosion of natural (non-hardened) channels, the lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks.

~~(ii) For artificially hardened channels, analysis to identify the lower boundary must use characteristics of a natural stream segment similar to that found in the watershed. The lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or erodes the toe of the channel banks.~~

~~(iii)~~(ii) The Copermittees may use monitoring results collected pursuant to Provision D.1.a.(2) to re-define the range of flows resulting in increased potential for erosion, or degraded instream habitat conditions, as warranted by the data.

(b) In accordance with the BMP Design Manual, projects shall preserve or provide compensation for significant losses of sediment supply anticipated as a result of development. ~~Post-project runoff flow rates and durations must compensate for the loss of sediment supply due to the development project, should loss of sediment supply occur as a result of the development project.~~

(c) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) to comply with the performance requirements of Provisions E.3.c.(2)(a)-(b).

(d) Exemptions

Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provisions E.3.c.(2)(a)-(b) where the project:

(i) Discharges storm water runoff into existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, tidally influenced waters, or the Pacific Ocean;

(ii) Discharges stormwater runoff into conveyance channels whose bed and bank are stabilized (e.g. concrete lined, an engineering interlocking paver, gabion system, etc.) all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, tidally influenced waters, or the Pacific Ocean;

~~(ii)~~(iii) Is a redevelopment Priority Development Project that meets the alternative compliance requirements of Provision E.3.c.(3)(b)(ii); or

~~(iii)~~(iv) Discharges storm water runoff into other areas identified by the San Diego Water Board as exempt, including those exemptions recognized in the 2010 San Diego Hydromodification Plan, approved by the San Diego Water Board Resolution No. R9-2010-0066, from the requirements of Provisions E.3.c.(2)(a)-(b).

(3) Alternative Compliance to Onsite Structural BMP Performance Requirements

Alternative compliance is an optional program for each jurisdiction to utilize if it is determined to provide an equivalent or greater benefit to the watershed than onsite compliance. Where alternative compliance is allowed, the determination of the responsible party to execute the onsite alternative compliance is at the jurisdiction's discretion and in accordance with policies set in place in the individual jurisdiction or in coordination with other jurisdictions, agencies, or Copermittees:

(a) Applicability

At the discretion of each Copermittee, Priority Development Projects may be allowed to utilize an alternative option to comply with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) under the following conditions:

(i) The Copermittee must determine that implementation of the alternative compliance option will have an equal or greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite;

(ii) The alternative compliance options must be designed by a registered professional engineer, geologist, architect, biologist, hydrologist, or landscape architect, or other appropriate certified professional;

(iii) The alternative compliance options must be implemented within the same ~~hydrologic unit~~ Watershed Management Area as the Priority Development Project, and preferably within the same hydrologic subarea;

~~(iv) Receiving waters must not be utilized to convey storm water runoff to the alternative compliance options;~~

~~(v) The pollutants in storm water runoff from the Priority Development Project must be treated to the MEP by the alternative compliance options prior to being discharged to receiving waters;~~

~~(vi)~~(iv) Unless otherwise allowed by Provision E.3.c.(3)(b), the alternative compliance options must have a net result of at least the same level of pollutant removal as would have been achieved if the Priority Development Project had fully complied with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1) onsite;

~~(vii)~~(v) Unless otherwise allowed by Provision E.3.c.(3)(b), the alternative compliance options must have a net result of at least the same level of protection from potential downstream and upstream erosion in the receiving water as would have been achieved if the Priority

Development Project had fully complied with the hydromodification management BMP performance requirements of Provision E.3.c.(2) onsite; and

~~(viii)~~(vi) The alternative compliance options utilized by the Priority Development Project to comply with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) must have reliable sources of funding for operation and maintenance.

(b) Alternative Compliance Project Options

The Copermittee may allow implementation of one or more of the following project options as part of an alternative approach to complying with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2):

(i) *Onsite LID Biofiltration Treatment Control BMPs*

The Copermittee may allow Priority Development Projects to utilize onsite LID biofiltration treatment control BMPs to comply with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1). Onsite LID biofiltration treatment control BMPs must be sized and designed to:

[a] Remove pollutants from storm water to the MEP; AND
[b] Have an appropriate surface loading rate to prevent erosion, scour and channeling within the BMP; AND
[c] Biofilter at least 1.5 times the design capture volume that is not reliably retained onsite; OR
[d] Biofilter up to the design capture volume that is not reliably retained onsite, AND 1) treat the remaining portion of the design capture volume not retained onsite with conventional treatment control BMPs in accordance with Provision E.3.c.(1)(c), and 2) if necessary, mitigate for the portion of the pollutant load in the design capture volume not retained onsite through one or more alternative compliance project, in-lieu fee and/or water quality credit system options below.

(ii) *LEED Certified Redevelopment Projects*

The Copermittee may ~~allow~~ exempt redevelopment Priority Development Projects ~~to comply with~~ from the hydromodification management BMP performance requirements of Provision E.3.c.(2) where the project is designed and constructed to be certified under the USGCB LEED for New Construction and Major Renovations green building certification program or other locally accepted certification of equivalent effectiveness. The Priority Development Project must receive at least one (1) Site Design credit and two (2)

Stormwater Design credits under the Sustainable Sites category.[28] In addition, the existing and future configuration of the receiving water must not be unnaturally altered or adversely impacted by storm water flow rates and durations discharged from the site.

(iii) *Watershed-Based Planned Development Projects*

The Copermittee may allow Priority Development Projects greater than 100 acres in total project size (or smaller than 100 acres in size yet part of a larger common plan of development that is over 100 acres) to comply with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) under~~. The Priority Development Project must comply with~~ the following conditions:

[a] The Priority Development Project was planned utilizing watershed and/or subwatershed based water quality, hydrologic, and fluvial geomorphologic planning principles that implement regional LID BMPs in accordance with the performance and location criteria of this Order and acceptable to the San Diego Water Board;

[b] Regional LID BMPs may be used provided that the BMPs capture and retain the volume of runoff produced from the design capture volume defined in Provision E.3.c.(1)(a)(i) and that such controls are located upstream of receiving waters;

[c] Regional LID BMPs must clearly exhibit that they will not result in a net impact from pollutant loadings over and above the impact caused by capture and retention of the design capture volume;

[d] Any portion of the design capture volume that is not retained by the regional LID BMPs must be treated using biofiltration BMPs; and

[e] Where regional LID BMPs are demonstrated to the Copermittee as technically infeasible to retain the entire design capture volume, any volume up to and including the design capture volume not retained by regional LID BMPs, nor treated by biofiltration BMPs, must be treated using conventional treatment control BMPs and the project applicant must implement additional alternative compliance project, in-lieu fee and/or water quality credit system options below.

(iv) *Offsite Regional BMPs*

[a] The Copermittee may allow Priority Development Projects to utilize offsite regional BMPs to comply with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1) if the offsite regional BMPs have the capacity to receive and retain at least 1.1 times the design capture volume that is not reliably retained onsite.

[28] See LEED for New Construction and Major Renovations rating system at http://www.usgbc.org

[b] The Copermittee may allow Priority Development Projects to utilize offsite regional BMPs to comply with the hydromodification management BMP performance requirements of Provision E.3.c.(2) if the offsite regional BMPs ~~have the capacity to manage the storm water flows rates and durations from the site such that the receiving waters are protected from the potential for increased erosion that would be caused if the unmanaged portion of the runoff was discharged from the site~~will have a greater overall receiving water benefit within the Watershed Management Area than implementation of the hydromodification controls onsite.

(v) *Offsite Retrofitting Projects*

The Copermittee may allow Priority Development Projects to utilize offsite retrofitting projects to comply with the storm water pollutant control and hydromodification management BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) if the retrofitting projects have been identified within the strategies included in the Water Quality Improvement Plan, or identified as potential retrofitting projects by the Copermittee pursuant to Provision E.5.

(vi) *Offsite Channel, Stream, or Habitat Rehabilitation Projects*

The Copermittee may allow Priority Development Projects to utilize offsite channel, stream, or habitat rehabilitation projects to comply with the hydromodification management BMP performance requirements of Provision E.3.c.(2) if the rehabilitation projects have been identified within the strategies included in the Water Quality Improvement Plan, or identified as potential channel rehabilitation projects by the Copermittee pursuant to Provision E.5. The channel, stream, or habitat rehabilitation project cannot be utilized for pollutant treatment ~~except~~ unless constructed with an artificial wetland.~~where artificial wetlands are constructed and located upstream of receiving waters~~.

(vii) *Offsite Regional Water Supply Augmentation Projects*

The Copermittee may allow Priority Development Projects to utilize offsite regional water supply augmentation projects (i.e. groundwater recharge, recycled water, storm water harvesting) to comply with the storm water pollutant control and hydromodification management BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) if the projects have been identified within the strategies included in the Water Quality Improvement Plan.

(viii) *Project Applicant Proposed Alternative Compliance Projects*

The Copermittee may allow one or more Priority Development Project applicant(s) to propose and implement alternative compliance

projects to comply with the storm water pollutant control and hydromodification management BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) if the alternative compliance projects are consistent with, and will address the highest water quality priorities of the Water Quality Improvement Plan, and comply with the requirements of Provision E.3.c.(3)(a).

(c) Alternative Compliance In-Lieu Fee Option

The Copermittee may develop and implement an alternative compliance in-lieu fee option, individually or with other Copermittees and/or entities, as a means for designing, developing, constructing, operating and/or maintaining offsite alternative compliance projects under Provision E.3.c.(3)(b). Priority Development Projects allowed to utilize the alternative compliance in-lieu fee option must comply with the following conditions:

(i) The in-lieu fee must be transferred to the Copermittee (for public projects) or an escrow account (for private projects) prior to the construction initiation date ~~construction~~ of the Priority Development Project ~~is initiated~~.

(ii) If the in-lieu fee is applied to the development, design, ~~and~~ construction, operation and maintenance of offsite alternative compliance projects, the following conditions must be met:

[a] The offsite alternative compliance projects must allow the Priority Development Project to comply with the onsite BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2);

[b] The offsite alternative compliance projects must be constructed as soon as possible, but no later than ~~4~~ 8 years after the certificate of occupancy is granted for the first Priority Development Project that contributed funds toward the construction of the offsite alternative compliance projects, unless a longer period of time is authorized by the San Diego Water Board Executive Officer;

~~[c] The in-lieu fee for the Priority Development Project must include mitigation of the pollutant loads and increased storm water flow rates and durations that are allowed to discharge from the site before the offsite alternative compliance projects are constructed; and~~

[d] The in-lieu fee must ~~also~~ include the cost to operate and maintain the offsite alternative compliance projects for the anticipated life of the constructed priority development project.

(iii) If the in-lieu fee ~~is applied~~ applies only to the operation and maintenance of offsite alternative compliance projects that have

already been constructed, the offsite alternative compliance projects must allow the Priority Development Project to comply with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2).

(d) Alternative Compliance Water Quality Credit System Option

The Copermittee may develop and implement an alternative compliance water quality credit system option, individually or with other Copermittees and/or entities, provided that such a credit system clearly exhibits that it will not allow discharges from Priority Development Projects to cause or contribute to a net impact over and above the impact caused by projects meeting the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2). Any credit system that a Copermittee chooses to implement must be submitted to the San Diego Water Board Executive Officer for review and acceptance as part of the Water Quality Improvement Plan.

~~(3)~~(4) Long-Term Structural BMP Maintenance

Each Copermittee must require the project applicant to submit proof of the mechanism under which ongoing long-term maintenance of all structural BMPs will be conducted.

~~(4)~~(5) Infiltration and Groundwater Protection

(a) Structural BMPs designed to primarily function as large, centralized infiltration devices (such as large infiltration trenches and infiltration basins) must not cause or contribute to an exceedance of an applicable groundwater quality objective. At a minimum, such infiltration BMPs must be in conformance with the design criteria listed below, unless the development project applicant demonstrates to the Copermittee that one or more of the specific design criteria listed below are not necessary to protect groundwater quality. The design criteria listed below do not apply to small infiltration systems dispersed throughout a development project.

(i) Runoff must undergo pretreatment such as sedimentation or filtration prior to infiltration;

(ii) Pollution prevention and source control BMPs must be implemented at a level appropriate to protect groundwater quality at sites where infiltration BMPs are to be used;

(iii) Infiltration BMPs must be adequately maintained to remove pollutants in storm water to the MEP;

(iv) The vertical distance from the base of any infiltration BMP to the seasonal high groundwater mark must be at least 10 feet. Where

groundwater basins do not support beneficial uses, this vertical distance criteria may be reduced, provided groundwater quality is maintained;

(v) The soil through which infiltration is to occur must have physical and chemical characteristics (e.g., appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses;

(vi) Infiltration BMPs must not be used for areas of industrial or light industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee, unless runoff does not exceed Basin Plan water quality standards or runoff is first treated or filtered to remove pollutants prior to infiltration; and

(vii) Infiltration BMPs must be located a minimum of 100 feet horizontally from any water supply wells.

(b) The Copermittee may develop, individually or with other Copermittees, alternative mandatory design criteria to that listed above for infiltration BMPs which are designed to primarily function as centralized infiltration devices. Before implementing the alternative design criteria in the development planning process the Copermittee(s) must:

(i) Notify the San Diego Water Board of the intent to implement the alternative design criteria submitted; and

(ii) Comply with any conditions set by the San Diego Water Board.

d. BMP DESIGN MANUAL UPDATE

Each Copermittee must update its BMP Design Manual[29] pursuant to Provision F.2.b. Until the Copermittee has updated its BMP Design Manual with the requirements of Provisions E.3.a-c, the Copermittee must continue implementing its current BMP Design Manual. Unless directed otherwise by the San Diego Water Board, the Copermittee must implement the BMP Design Manual within 180 days of completing the update. The update of the BMP Design Manual must include the following:

(1) Updated procedures to determine the nature and extent of storm water requirements applicable to a potential development or redevelopment projects. These procedures must inform project applicants of the storm water management requirements applicable to their project including, but not limited to, general requirements for all development projects, structural BMP design procedures and requirements, hydromodification management requirements, requirements specific to phased projects, and procedures specific to private

[29] The BMP Design Manual was formerly known as the Standard Storm Water Mitigation Plan under Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016.

developments and public improvement projects;

(2) Updated procedures to identify pollutants and conditions of concern for selecting the most appropriate structural BMPs that consider, at a minimum, the following:

(a) Receiving water quality (including pollutants for which receiving waters are listed as impaired under the CWA section 303(d) List);

(b) Pollutants, stressors, and/or receiving water conditions that cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(c) Land use type of the project and pollutants associated with that land use type; and

(d) Pollutants expected to be present onsite.

(3) Updated procedures for designing structural BMPs, including any updated performance requirements to be consistent with the requirements of Provision E.3.c for all structural BMPs listed in the BMP Design Manual;

(4) Long-term maintenance criteria for each structural BMP listed in the BMP Design Manual; and

(5) Alternative compliance criteria, in accordance with the requirements under Provision E.3.c.(3), if the Copermittee elects to allow Priority Development Projects within its jurisdiction to utilize alternative compliance.

e. PRIORITY DEVELOPMENT PROJECT BMP IMPLEMENTATION AND OVERSIGHT

Each Copermittee must implement a program that requires and confirms structural BMPs on all Priority Development Projects are designed, constructed, and maintained to remove pollutants in storm water to the MEP.

(1) Structural BMP Approval and Verification Process

(a) Each Copermittee must require and confirm that for all Priority Development Project applications that have not received prior lawful approval by the Copermittee by 18 months after the commencement of coverage under this Order, the requirements of Provision E.3 are implemented. For project applications that have received prior lawful approval by 18 months after the commencement of coverage under this Order, the Copermittee may allow previous land development requirements to apply.

(b) Each Copermittee must identify the roles and responsibilities of various municipal departments in implementing the structural BMP requirements,

including each stage of a project from application review and approval through BMP maintenance and inspections.

(c) Each Copermittee must require and confirm that appropriate easements and ownerships are properly recorded in public records~~ and the information is conveyed to all appropriate parties when there is a change in project or site ownership~~.

(d) Each Copermittee must require and confirm that prior to occupancy and/or intended use of any portion of the Priority Development Project, each structural BMP is inspected to verify that it has been constructed and is operating in compliance with all of its specifications, plans, permits, ordinances, and the requirements of this Order.

(2) Priority Development Project Inventory and Prioritization

(a) Each Copermittee must develop, maintain, and update~~ at least annually~~regularly, a watershed-based database to track and inventory all Priority Development Projects and associated structural BMPs within its jurisdiction. Inventories must be accurate and complete beginning from January 2002 for the San Diego County Copermittees, February 2003 for the Orange County Copermittees, and July 2005 for the Riverside County Copermittees, where data is available. The use of an automated database system, such as GIS, is highly recommended. The database must include, at a minimum, the following information:

(i) Priority Development Project location (address and hydrologic subarea);

(ii) Descriptions of structural BMP type(s);

(iii) Date(s) of construction;

(iv) Party responsible for structural BMP maintenance;

(v) Dates and findings of structural BMP maintenance verifications; and

(vi) Corrective actions and/or resolutions when applicable.

(b) Each Copermittee must prioritize the Priority Development Projects with structural BMPs within its jurisdiction. The designation of Priority Development Projects as high priority must consider the following:

(i) The highest water quality priorities identified in the Water Quality Improvement Plan;

(ii) Receiving water quality;

(iii) Number and sizes of structural BMPs;

(iv) Recommended maintenance frequency of structural BMPs;

(v) Likelihood of operation and maintenance issues of structural BMPs;

(vi) Land use and expected pollutants generated; and

(vii) Compliance record.

(3) Structural BMP Maintenance Verifications and Inspections

Each Copermittee is required to verify that structural BMPs on each Priority Development Project are adequately maintained, and continue to operate effectively to remove pollutants in storm water to the MEP through inspections, self-certifications, surveys, or other equally effective approaches.

(a) All (100 percent) of the structural BMPs at Priority Development Projects that are designated as high priority must be inspected directly by the Copermittee annually prior to each rainy season;

(b) For verifications performed through a means other than direct Copermittee inspection, adequate documentation must be required by the Copermittee to provide assurance that the required maintenance of structural BMPs at each Priority Development Project has been completed; and

(c) Appropriate follow-up measures (including re-inspections, enforcement, etc.) must be conducted to ensure that structural BMPs at each Priority Development Project continue to reduce pollutants in storm water to the MEP as originally designed.

f. DEVELOPMENT PROJECT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all development projects, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

g. STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the development planning program to address development and redevelopment projects that may become sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, increase frequency of verifications and/or inspections, alternative compliance options);

(2) Each Copermittee must identify areas within its jurisdiction where Priority

Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting and/or stream, channel, or habitat rehabilitation projects;

(3) Each Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify regional alternative compliance projects that Priority Development Projects may be allowed or should be encouraged to implement or participate in implementing; and

(4) The strategies and/or activities must be consistent with the requirements of Provisions E.3.a-c and E.3.e-f and the strategies identified in the Water Quality Improvement Plan.

4. Construction Management

Each Copermittee must implement a construction management program in accordance with the strategies identified in the Water Quality Improvement Plan and includes, at a minimum, the following requirements:

a. CONSTRUCTION PROGRAM MANAGEMENT

Each Copermittee must define in the Jurisdictional Runoff Management Plan the following:

(1) Define construction sites to be inventoried, such as sites that involve any ground disturbance or soil disturbing activities.

(2) Define a process for confirming adequate construction BMP implementation for non-inventoried sites. Non-inventoried sites involve minor construction activities that are not anticipated to create storm water pollution such as interior improvements, plumbing, electrical and mechanical work.

~~h.~~b. PROJECT APPROVAL PROCESS

Prior to issuance of any local permit(s) that allows the commencement of construction projects that involve ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff, each Copermittee must:

(1) Require a site-specific Pollution Control, construction BMP, and/or erosion and sediment control plan, to be submitted by the project applicant to the Copermittee;

(2) Confirm the Pollution Control, construction BMP, and/or erosion and sediment control plan, complies with the local grading ordinance, other applicable local

ordinances, and the requirements of this Order;

(3) Confirm the Pollution Control, construction BMP, and/or erosion and sediment control plan, includes seasonally appropriate and effective BMPs and management measures described in Provision E.4.c, as applicable to the project; and

(4) Verify that the project applicant has obtained coverage under ~~applicable permits, including, but not limited to~~ the Construction General Permit~~, Clean Water Act Section 401 Water Quality Certification and Section 404 Permit, and California Department of Fish and Game Streambed Alteration Agreement~~.

~~i.~~c. **CONSTRUCTION SITE INVENTORY AND TRACKING**

(1) Each Copermittee must maintain, and update at least monthly, a watershed-based inventory of all construction projects issued a local permit that allows ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff. The use of an automated database system, such as GIS, is highly recommended. The inventory must include:

(a) Relevant contact information for each site (e.g., name, address, phone, and email for the owner and contractor);

(b) The basic site information including location (address and hydrologic subarea), Waste Discharge Identification (WDID) number (if applicable), size of the site, and approximate area of disturbance;

(c) Whether or not the site is considered a high threat to water quality, as defined in Provision E.4.b.(2) below;

(d) The project start and ~~anticipated completion~~ completed dates;

(e) Current construction phase;

(f) The required inspection frequency, as defined in the Copermittee's jurisdictional runoff management program document;

(g) The date the Copermittee accepted and/or approved the site-specific pollution control, construction BMP, and/or erosion and sediment control plan; and

(h) Whether or not there are ongoing enforcement actions administered to the site.

(2) Each Copermittee must identify all construction sites within its jurisdiction that represent a high threat to downstream surface water quality. The designation of construction sites as high threat to water quality must consider the

following:

(a) Sites located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Sites located within the same hydrologic subarea and tributary to a water body segment listed as impaired for sediment on the CWA section 303(d) List;

(c) Sites located within, directly adjacent to, or discharging directly to a receiving water within an ESA; and

(d) Other sites determined by the Copermittees or the San Diego Water Board as a high threat to water quality.

~~j.~~d. CONSTRUCTION SITE BMP IMPLEMENTATION

Each Copermittee must implement, or require the implementation of effective BMPs to reduce discharges of pollutants in storm water from construction sites to the MEP, and prevent non-storm water discharges from construction sites into the MS4. These BMPs must be site specific, seasonally appropriate, and construction phase appropriate. BMPs must be implemented at each construction site year round. Dry season BMP implementation must plan for and address unseasonal rain events that may occur during the dry season (May 1 through September 30). Copermittees must implement, or require the implementation of, BMPs in the following categories:

(1) Project Planning;

(2) Good Site Management "Housekeeping", including waste management;

(3) Non-storm Water Management;

(4) Erosion Control;

(5) Sediment Control;

(6) Run-on and Run-off Control; and

(7) Active/Passive Sediment Treatment Systems, where applicable.

~~k.~~e. CONSTRUCTION SITE INSPECTIONS

Each Copermittee must conduct construction site inspections to require and confirm compliance with its local permits and applicable local ordinances, and the requirements of this Order. Priority for site inspections must consider threat to water quality pursuant to Provision E.4.b as well as the nature of the construction

activity, topography, and the characteristics of soils and receiving water quality.

(1) Inspection Frequency

(a) Each Copermittee must conduct inspections at all inventoried sites, including high threat to water quality sites, at an appropriate frequency for each phase of construction to ~~ensure~~ confirm the site reduces the discharge of pollutants in storm water from construction sites to the MEP, and prevents non-storm water discharges from entering the MS4.

(b) Each Copermittee must establish appropriate inspection frequencies for high threat to water quality sites, and all other sites, for each phase of construction. Inspection frequencies appropriate for addressing the highest water quality priorities identified in the Water Quality Improvement Plan, and for complying with the requirements of this Order must be identified in each Copermittee's jurisdictional runoff management program document.

(c) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e., re-inspection, enforcement) necessary to require and confirm site compliance with its local permits and applicable local ordinances, and the requirements of this Order.

(2) Inspection Content

Inspections of construction sites by the Copermittee must include, at a minimum:

(a) Verification of coverage under the Construction General Permit (Notice of Intent (NOI) and/or WDID number) during initial inspections, when applicable;

(b) Assessment of compliance with its local permits and applicable local ordinances related to pollution prevention, including the implementation and maintenance of applicable BMPs;

(c) Assessment of BMP adequacy and effectiveness;

(d) Visual observations of actual non-storm water discharges;

(e) Visual observations of actual or potential discharge of sediment and/or construction related materials from the site;

(f) Visual observations of actual or potential illicit connections; and

(g) If any violations are found and BMP corrections are needed, inspectors must take and document appropriate actions in accordance with the

Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried construction sites. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Site name, location (address and hydrologic subarea), and WDID number (if applicable);

(b) Inspection date;

(c) ~~Approximate amount of rainfall since last inspection~~Weather condition during inspection;

(d) Description of problems observed with BMPs and indication of need for BMP addition/repair/replacement and any scheduled re-inspection, and date of re-inspection;

(e) Descriptions of any other specific inspection comments which must, at a minimum, include rationales for longer compliance time;

(f) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(g) Resolution of problems noted and date problems fixed.

~~l.~~f. CONSTRUCTION SITE ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried construction sites, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

~~m.~~g. STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the construction management program to address construction sites that the Copermittee has identified as potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) Provide specific details about how the strategies and/or activities will be

implemented (e.g. designate additional BMPs, focus education, and/or increase/decrease frequency of inspections for specific types of sites and/or activities); and

(2) The strategies and/or activities must be consistent with the requirements of Provisions E.4.c-e and the strategies identified in the Water Quality Improvement Plan.

5. Existing Development Management

Each Copermittee must implement an existing development management program in accordance with the strategies identified in the Water Quality Improvement Plan and includes, at a minimum, the following requirements:

a. Existing Development Inventory and Tracking

Each Copermittee must maintain, and update at least annually, a watershed-based inventory of the existing development within its jurisdiction that ~~may~~ has the reasonable potential to discharge a pollutant load to and from the MS4. The use of an automated database system, such as GIS, is highly recommended. The inventory must, at a minimum, include:

(1) Name, location (hydrological subarea and address, if applicable) of the following types of existing development with its jurisdiction:

(a) Commercial facilities or areas;

(b) Industrial facilities;

(c) Municipal facilities, including:

(i) MS4 and related structures,[30]

(ii) Roads, streets, and highways,

(iii) Parking facilities,

(iv) Municipal airfields,

(v) Parks and recreation facilities,

(vi) Flood management and flood control devices and structures,

(vii) Operating or closed municipal landfills,

(viii) Publicly owned treatment works (including water and wastewater treatment plants) and sanitary sewer collection systems,

[30] The inventory may refer to the MS4 map required to be maintained pursuant to Provision E.2.b.(1).

(ix) Corporate yards, including maintenance and storage yards for materials, waste, equipment, and vehicles,

(x) Hazardous waste collection facilities,

(xi) Other treatment, storage or disposal facilities for municipal waste, and

(xii) Other municipal facilities that the Copermittee determines may contribute a significant pollutant load to the MS4; and

(d) Residential areas, which may be designated by one or more of the following:

(i) Residential management area,

(ii) Drainage basin or area,

(iii) Land use (e.g., single family, multi-family, rural),

(iv) Neighborhood,

(v) Common Interest Area,

(vi) Home Owner Association, and/or

~~(vii) Mobile home park, and/or~~

~~(viii)~~(vii) Other designations accepted by the San Diego Water Board Executive Officer.

(2) A description of the facility or area, including the following information:

(a) Classification as commercial, industrial, municipal, or residential;

(b) Status of facility or area as active or inactive;

(c) Identification if a business is a mobile business;

(d) SIC Code or NAICS Code, if applicable;

(e) Industrial General Permit NOI and/or WDID number, if applicable;

(f) ~~Identification if a residential area is or includes a~~ Common Interest Areas (CIAs) / Home Owner Associations (HOAs)~~, or mobile home park~~;

(g) Identification of pollutants generated and potentially generated by the facility or area;

(h) Whether the facility or area is adjacent to an ESA;

(i) Whether the facility or area is tributary to and within the same hydrologic subarea as a water body segment listed as impaired on the CWA section 303(d) List and generates pollutants for which the water body segment is impaired; and

(j) Whether the facility or area contributes or potentially contributes to the highest priority water quality conditions identified in the Water Quality Improvement Plan.

(3) An annually updated map showing the location of inventoried existing development, watershed boundaries, and water bodies.

b. EXISTING DEVELOPMENT BMP IMPLEMENTATION AND MAINTENANCE

Each Copermittee must designate a minimum set of BMPs required for all inventoried existing development with the reasonable potential to discharge pollutant loads to their MS4, including special event venues. The designated minimum BMPs must be specific to facility or area types and pollutant generating activities, as appropriate.

(1) Commercial, Industrial, and Municipal Facilities and Areas

(a) Pollution Prevention

Each Copermittee must ~~require~~ promote the use of pollution prevention methods by the commercial, industrial, and municipal facilities and areas in its inventoried existing development through public outreach.

(b) BMP Implementation

Each Copermittee must implement, or require the implementation of, designated BMPs at commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development.

(c) BMP Operation and Maintenance

(i) Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development.

(ii) Each Copermittee must implement a schedule of operation and maintenance activities for its MS4 and related structures (including but not limited to catch basins, storm drain inlets, detention basins, etc.), and verify proper operation of all its municipal structural treatment controls designed to reduce pollutants (including floatables) in storm water discharges to or from its MS4s and related drainage structures. Operation and maintenance activities may

include, but is not limited to, the following:

[a] Inspections of the MS4 and related structures;
[b] Cleaning of the MS4 and related structures; and
[c] Proper disposal of materials removed from cleaning of the MS4 and related structures.

(iii) Each Copermittee must implement a schedule of operation and maintenance for public streets, unpaved roads, paved roads, and paved highways and freeways within its jurisdiction to minimize pollutants that can be discharged in storm water.

(iv) Each Copermittee must implement controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers. Copermittees that operate both a municipal sanitary sewer system and a MS4 must implement controls and measures to prevent and eliminate seeping sewage from infiltrating the MS4. Copermittees that do not operate both a municipal sanitary sewer system and a MS4 must coordinate with sewering agencies to keep themselves informed of relevant and appropriate maintenance activities and sanitary sewage projects in their jurisdiction that may cause or contribute to seepage of sewage into the MS4.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must implement BMPs, or require the implementation of BMPs, to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development. Such BMPs must include, as appropriate, educational activities, permits, certifications and other measures for applicators and distributors.

(2) Residential Areas

(a) Pollution Prevention

Each Copermittee must promote and encourage the use of pollution prevention methods, where appropriate, by the residential areas in its inventoried existing development.

(b) BMP Implementation

Each Copermittee must promote and encourage the implementation of designated BMPs at residential areas in its inventoried existing development.

(c) BMP Operation and Maintenance

Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at residential areas in its inventoried existing development.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must promote and encourage the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from residential areas in its inventoried existing development.

c. EXISTING DEVELOPMENT INSPECTIONS

Each Copermittee must conduct inspections of inventoried existing development that have been identified by the Copermittee as having the reasonable potential to discharge pollutant loads from their MS4 to ensure compliance with applicable local ordinances and permits, and the requirements of this Order.

(1) Inspection Frequency

(a) Each Copermittee must establish appropriate inspection frequencies for inventoried existing development in accordance with the following requirements:

(i) At a minimum, inventoried existing development that has been identified by the Copermittee as having the reasonable potential to discharge pollutant loads to and from their MS4 must be inspected once during the permit term ~~every five years~~ utilizing one or more of the following methods:

[a] Drive-by inspections by Copermittee municipal and contract staff,
[b] Onsite inspections by Copermittee municipal and contract staff, and/or
[c] Inspections by volunteer monitoring or patrol programs trained by the Copermittee;

(ii) The frequency of inspections must be appropriate to confirm that BMPs are being implemented to reduce the discharge of pollutants in storm water from the MS4 to the MEP and effectively prohibit non-storm water discharges to the MS4;

(iii) The frequency of inspections must be based on the potential for a facility or area to discharge non-storm water and pollutants in storm water, and should reflect the priorities set forth in the Water Quality Improvement Plan;

(iv) Each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial facilities and

areas, industrial facilities, and municipal facilities in its inventoried existing development;[31] and

(v) Inventoried existing development must be inspected by the Copermittee, as needed, in response to valid public complaints and findings from the Copermittee's municipal and contract staff ~~or volunteer monitoring or patrol program~~ inspections.

(b) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e. education and outreach, re-inspection, enforcement) necessary to require and confirm compliance with its applicable local ordinances and permits and the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

(2) Inspection Content

(a) Inspections of existing development by the Copermittee or volunteer monitoring or patrol programs must include, at a minimum:

(i) Visual inspections for actual non-storm water discharges, if present;

(ii) Visual inspections for actual or potential discharge of pollutants, if present;

(iii) Visual inspections for actual or potential illicit connections, if present; and

(iv) Verification that the description of the facility or area in the inventory, required pursuant to Provision E.5.a.(2), has not changed.

(b) Onsite inspections of existing development by the Copermittee must include, at a minimum:

(i) Assessment of compliance with its applicable local ordinances and permits related to non-storm water and storm water discharges and runoff;

(ii) Assessment of the implementation of the designated BMPs;

(iii) Verification of coverage under the Industrial General Permit, when applicable; and

(iv) If any problems or violations are found, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

[31] If any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspection may count toward the total annual inspection requirement. This requirement excludes linear municipal facilities (i.e., MS4, streets, roads and highways).

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried existing development. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Name and location of facility or area (address and hydrologic subarea) consistent with the inventory name and location, pursuant to Provision E.5.a.(1);

(b) Inspection and re-inspection date(s);

(c) Inspection method(s) (i.e. drive-by, onsite);

(d) Observations and findings from the inspection(s);

(e) For onsite inspections of existing development by Copermittee municipal or contract staff, the records must also include, as applicable:

(i) Description of any problems or violations found during the inspection(s),

(ii) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6, and

(iii) The date problems or violations were resolved.

d. EXISTING DEVELOPMENT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried existing development identified by the Copermittee as having the reasonable potential to discharge pollutant loads from the MS4 within their jurisdiction, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

e. STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Each Copermittee must implement the water quality improvement strategies, where necessary, to address areas of existing development within its jurisdiction that are identified as sources of pollutants and/or stressors contributing to the highest priority water quality conditions in the Watershed Management Area. For the existing development management program, the following strategies must be implemented:

(1) Specific Existing Development Management Program Strategies

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented within its jurisdiction to address areas of existing development that the Copermittee has identified as sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(a) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, and/or increase/decrease frequency of inspections for specific types of facilities, areas and/or activities);

(b) The facilities and/or areas within the Copermittee's jurisdiction where the strategies and/or activities will be implemented; and

(c) The strategies and/or activities must be consistent with the requirements of Provisions E.5.b-d and the strategies identified in the Water Quality Improvement Plan.

(2) Retrofitting Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to retrofit areas of existing development within its jurisdiction to address identified sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify areas of existing development as candidates for retrofitting, focusing on areas where retrofitting will address pollutants and/or stressors that contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for retrofitting projects may be utilized to reduce pollutants that may be discharged in storm water from areas of existing development, and/or address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of retrofitting projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting projects; and

(e) Where retrofitting projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional retrofitting projects (i.e. projects that can receive and/or treat storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment) adjacent to and/or downstream of the areas of existing development.

(3) Stream, Channel and/or Habitat Rehabilitation in Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to rehabilitate streams, channels, and/or habitats in areas of existing development within its jurisdiction to address the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify streams, channels, and/or habitats in areas of existing development as candidates for rehabilitation, focusing on areas where stream, channel, and/or habitat rehabilitation projects will address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for stream, channel, and/or habitat rehabilitation projects may be utilized to address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters, rehabilitate channelized or hydromodified streams, restore wetland and riparian habitat, restore watershed functions, and/or restore beneficial uses of receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of stream, channel, and/or habitat rehabilitation projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance stream, channel, and/or habitat rehabilitation projects; and

(e) Where stream, channel, and/or habitat rehabilitation projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality

Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional stream, channel, and/or habitat rehabilitation projects (i.e. projects that can receive storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment).

(4) Upon Regional Board approval and in lieu of monitoring during any given year, the Copermittees may reallocate resources originally authorized for water quality monitoring for retrofit and/or rehabilitation project(s), if those projects occur at a location where monitoring is conducted, for a maximum of two nonconsecutive years during the permit term.

6. Enforcement Response Plans

Each Copermittee must develop and implement an Enforcement Response Plan as part of its jurisdictional runoff management program document. The Enforcement Response Plan must describe the applicable approaches and options to enforce its legal authority established pursuant to Provision E.1, as necessary, to achieve compliance with the requirements of this Order. The Enforcement Response Plan must include the following:

a. Enforcement Response Plan Components

The Enforcement Response Plan must include the following individual components:

(1) Illicit Discharge Detection and Elimination Enforcement Component;

(2) Development Planning Enforcement Component;

(3) Construction Management Enforcement Component; and

(4) Existing Development Enforcement Component.

b. Enforcement Response Approaches and Options

Each component of the Enforcement Response Plan must describe the enforcement response approaches that the Copermittee will implement to compel compliance with its statutes, ordinances, permits, contracts, orders, or similar means, and the requirements of this Order. The description must include the protocols for implementing progressively stricter enforcement responses. The enforcement response approaches must include appropriate sanctions to compel compliance, including, at a minimum, the following tools or their equivalent:

(1) Verbal and written notices of violation;

(2) Cleanup requirements;

(3) Fines;

(4) Bonding requirements;

(5) Administrative and criminal (if intentional or criminally negligent) penalties;

(6) Liens;

(7) Stop work orders; and

(8) Permit and occupancy denials.

c. CORRECTION OF VIOLATIONS

(1) Violations must be corrected in a timely manner with the goal of correcting the violations within 30 calendar days after the violations are discovered, or prior to the next predicted rain event, whichever is sooner.

(2) If more than 30 calendar days are required to achieve compliance, then a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

d. ESCALATED ENFORCEMENT

(1) The Enforcement Response Plan must include a definition of "escalated enforcement." Escalated enforcement must include any enforcement scenario where a violation or other non-compliance is determined to cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan. Escalated enforcement may be defined differently for development planning, construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas.

(2) Where the Copermittee determines escalated enforcement is not required, a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

(3) Escalated enforcement actions must continue to increase in severity, as necessary, to compel compliance as soon as possible.

e. REPORTING OF NON-COMPLIANT SITES

(1) Each Copermittee must notify the San Diego Water Board in writing within ~~2~~

~~working days~~ 5 calendar days of issuing escalated enforcement (as defined in the Copermittee's Enforcement Response Plan) to a construction site that poses a significant threat to water quality as a result of violations or other non-compliance with its permits and applicable local ordinances, and the requirements of this Order. Written notification may be provided electronically by email.

(2) Each Copermittee must notify the San Diego Water Board of non-filers under the Industrial General Permit and Construction General Permit by email to Nonfilers_R9@waterboards.ca.gov.

7. Public Education and Participation

Each Copermittee must implement, individually or with other Copermittees, a public education and participation program in accordance with the strategies identified in the Water Quality Improvement Plan to promote and encourage the development of programs, management practices, and behaviors that reduce the discharge of pollutants from the MS4 ~~in storm water~~ to the MEP, prevent controllable non-storm water discharges from entering the MS4, and protect water quality standards in receiving waters.

a. PUBLIC EDUCATION

The public education program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) Educational activities, public information activities, and other appropriate outreach activities intended to reduce pollutants ~~associated with the application of pesticides, herbicides and fertilizer and other pollutants of concern in storm water discharges~~ of concern ~~to and~~ from ~~its~~ the MS4 to the MEP. Activities shall be determined and prioritized by Copermittees by jurisdiction and/or watershed (Provision B) to address the highest threats to water quality (such as pesticides, herbicides and fertilizers, used oil, toxic waste, etc.; and to facilitate the proper management and disposal of used oil and toxic waste, etc.) as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed to address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

~~(2) Educational activities, public information activities, and other appropriate outreach activities to facilitate the proper management and disposal of used oil and toxic materials; and~~

~~(3)~~(2) Appropriate education and training measures for specific target audiences, such as construction site operators, residents, underserved target audiences and school-aged children, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed, based on high risk behaviors and pollutants of concern.

b. PUBLIC PARTICIPATION

The public participation program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) A process for members of the public to participate in updating the highest priority water quality conditions, numeric goals, and water quality improvement strategies in the Water Quality Improvement Plan.

(2) Opportunities for members of the public to participate in providing the Copermittee recommendations for improving the effectiveness of the water quality improvement strategies implemented within its jurisdiction.

(3) Opportunities for members of the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or restoration and protection of the quality of receiving waters.

c. STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented within its jurisdiction, as applicable, to educate the public and encourage public participation to address potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) The target audiences and/or areas within the Copermittee's jurisdiction where the strategies and/or activities will be implemented;

(2) Provide specific details about how the strategies and/or activities will be implemented (e.g. educational topics, materials and/or activities, public outreach and participation programs and/or opportunities);

(3) Each Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify and implement regional public education and participation activities, programs and opportunities;

(4) Each Copermittee must incorporate a mechanism for evaluating and

assessing educational and other public outreach activities, as needed, to identify progress and incorporate modifications necessary to increase the effectiveness of the public education and participation program.

8. Fiscal Analysis

a. Each Copermittee must secure the resources necessary to meet all the requirements of this Order.

b. Each Copermittee must conduct an annual fiscal analysis of its jurisdictional runoff management program in its entirety. The fiscal analysis must include the following:

(1) Identification of the various categories of expenditures necessary to implement the requirements of this Order, including a description of the specific capital, operation and maintenance, and other expenditure items to be accounted for in each category of expenditures;

(2) The staff resources needed and allocated to meet the requirements of this Order, including any development, implementation, and enforcement activities required;

(3) The estimated expenditures for Provisions E.8.b.(1) and E.8.b.(2) for the current fiscal year; and

(4) The source(s) of funds that are proposed to meet the necessary expenditures described in Provisions E.8.b.(1) and E.8.b.(2), including legal restrictions on the use of such funds, for the current fiscal year and next fiscal year.

c. Each Copermittee must submit a summary of the annual fiscal analysis with each Annual Report required pursuant to Provision F.3.b.

d. Each Copermittee must provide the documentation used to develop the summary of the annual fiscal analysis upon request by the San Diego Water Board.

F. REPORTING

The purpose of this provision is to determine and document compliance with the requirements set forth in this Order. The goal of reporting is to communicate to the San Diego Water Board and the people of the State of California the implementation status of each jurisdictional runoff management program and compliance with the requirements of this Order. This goal is to be accomplished through the submittal of specific deliverables to the San Diego Water Board by the Copermittees.

1. Water Quality Improvement Plans

The Copermittees for each Watershed Management Area must develop and submit the Water Quality Improvement Plan in accordance with the following requirements:

a. WATER QUALITY IMPROVEMENT PLAN DEVELOPMENT

Each Water Quality Improvement Plan must be developed in accordance with the following process:

(1) Priority Water Quality Conditions and Potential Strategies ~~Numeric Goals~~

(a) The Copermittees must implement a public participation process to solicit data and information to be utilized in the development and identification of the priority water quality conditions for the Watershed Management Area.

(b) The Copermittees are encouraged to involve the public and key stakeholders as early and often as possible during the development of the priority water quality conditions and ~~numeric goals~~ potential strategies to be included in the Water Quality Improvement Plan.

(c) Within 6 months after the commencement of coverage under this Order, the Copermittees must develop and submit the Water Quality Improvement Plan requirements of Provision B.2.a-d and a list of potential strategies that will be considered for the draft Water Quality Improvement Plan to the San Diego Water Board. Each Copermittee selecting the option to develop a Water Quality Improvement Plan to serve as an iterative, implementation-based compliance mechanism per Provision B.3.a.(3) must also indicate their intent to pursue the option in the submittal. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of 60 days.

(d) The Copermittees must consider ~~revise~~ revisions to the priority water quality conditions ~~and numeric goals~~ based on comments received and must respond to ~~and/or~~ recommendations or direction from the San Diego Water Board Executive Officer.

(2) Numeric Goals and Water Quality Improvement Strategies and Schedules

(a) The Copermittees are encouraged to involve the public and key stakeholders as early and often as possible during the development of the numeric goals and water quality improvement strategies and schedules to be included in the Water Quality Improvement Plan.

(b) Within ~~9~~ 16 months after the commencement of coverage under this Order, the Copermittees must develop and submit the Water Quality Improvement Plan requirements of Provisions B.2.e and B.3 to the San Diego Water Board. Each Copermittee selecting the option to develop a Water Quality Improvement Plan to serve as an iterative, implementation-based compliance mechanism per Provision B.3.a.(3) must also submit a draft Reasonable Assurance Analysis. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of 60 days.

(c) The Copermittees must consider revisions to~~revise~~ the numeric goals and water quality improvement strategies and schedules based on public comments received ~~and/or~~ and must respond to recommendations or direction from the San Diego Water Board Executive Officer.

b. WATER QUALITY IMPROVEMENT PLAN SUBMITTAL

(1) Within ~~18~~ 24 months after the commencement of coverage under this Order, the Copermittees for each Watershed Management Area must submit a complete Water Quality Improvement Plan in accordance with the requirements of Provision B to the San Diego Water Board. Each Copermittees selecting the option to develop a Water Quality Improvement Plan to serve as an iterative, implementation-based compliance mechanism per Provision B.3.a.(3) must also submit a final Reasonable Assurance Analysis. The Santa Margarita River Watershed Management Area must submit a complete Water Quality Improvement Plan in accordance with the requirements of Provision B to the San Diego Water Board 18 months after the Riverside Copermittees are covered under this Order. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of 30 days.

(2) Based on the comments received, the San Diego Water Board will determine whether to hold a public hearing or to limit public input to submittal of written comments. If no hearing is held the San Diego Water Board will notify the Copermittees within 6 months that the Water Quality Improvement Plan has been accepted as complete following its review and determination that the Water Quality Improvement Plan meets the requirements of this Order.

(3) The Copermittees must consider revisions to ~~revise~~ the Water Quality Improvement Plan based on public comments received ~~and/or~~ and must

respond to recommendations or direction from the San Diego Water Board Executive Officer.

(4) The Water Quality Improvement Plan must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance by the San Diego Water Board.

(5) Copermittees must commence with implementation of the Water Quality Improvement Plan no later than the fiscal year (July 1) following San Diego Water Board approval of the Water Quality Improvement Plan.

2. Updates

a. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATES

Each Copermittee must update its jurisdictional runoff management program document in accordance with the following requirements:

(1) Each Copermittee is encouraged to involve the public and key stakeholders as early and often as possible to solicit recommendations for updates to its jurisdictional runoff management program document.

(2) Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E no later than ~~18~~24 months after the commencement of coverage under this Order.

(3) Each Copermittee must submit updates to its jurisdictional runoff management program, with a rationale for the modifications, either in the Annual Report required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge required pursuant to Provision F.5.b.

(4) The Copermittee must revise the modifications as directed by the San Diego Water Board Executive Officer.

(5) Updated jurisdictional runoff management program documents must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of submitting the Annual Report.

b. BMP DESIGN MANUAL UPDATES

Each Copermittee must update its BMP Design Manual in accordance with the following requirements:

(1) Each Copermittee must update its BMP Design Manual to incorporate the requirements of Provisions E.3.a-d no later than ~~18~~24 months after the commencement of coverage under this Order.

(2) Subsequent updates must be consistent with the requirements of Provisions E.3.a-d and must be submitted as part of the Annual Reports required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge required pursuant to Provision F.5.b.

(3) Updated BMP Design Manuals must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of completing the update.

c. WATER QUALITY IMPROVEMENT PLAN UPDATES

The Water Quality Improvement Plans must be updated in accordance with the following process:

(1) The Copermittees must implement a public participation process to solicit data and information to be utilized in updating the Water Quality Improvement Plan.

(2) The Copermittees are encouraged to involve the public and key stakeholders as early and often as possible during the updates to the Water Quality Improvement Plan.

(3) The Copermittees for each Watershed Management Area must submit requested updates to the Water Quality Improvement Plan, with the public input received and the rationale for the requested updates, either in the Annual Reports required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The requested updates are considered accepted by the San Diego Water Board if no response is provided to the Copermittee after 3 months of submitting the request.

(4) The Copermittees must revise the requested updates as directed by the San Diego Water Board Executive Officer.

(5) Updated Water Quality Improvement Plans must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance of the requested updates by the San Diego Water Board.

3. Progress Reporting

a. PROGRESS REPORT PRESENTATIONS

The Copermittees for each Watershed Management Area must appear before the San Diego Water Board, as requested by the San Diego Water Board, to provide progress reports on the implementation of the Water Quality

Improvement Plan and jurisdictional runoff management programs.

b. ANNUAL REPORTS

(1) The Copermittees for each Watershed Management Area must submit an Annual Report for each reporting period no later than January 31 of the following year. The annual reporting period consists of two periods: 1) July 1 to June 30 of the following year for the jurisdictional runoff management programs, 2) October 1 to September 30 of the following year for the monitoring and assessment programs. The first Annual Report must be prepared for the reporting period beginning July 1 after commencement of coverage under this Order, and upon San Diego Water Board determination that the Water Quality Improvement Plan meets the requirements of this Order to June 30 in the following year for the jurisdictional runoff management programs. The first Annual Report must be prepared for the reporting period beginning 50 days after adoption of this Order and the January 31st following the first September 30th (conclusion of monitoring season) after the San Diego Water Board determines that the Water Quality Improvement Plan meets the requirements of this Order and September 30 in the following year for the monitoring and assessment programs. Annual Reports must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Each Annual Report must include the following:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, summarized and presented in tabular and graphical form;

(b) Progress of the special studies required pursuant to Provision D.3, and the results or findings when a special study, or each phase of a special study, is completed;

(c) The findings from the assessments required pursuant to Provision D.4;

(d) The progress of implementing the Water Quality Improvement Plan, including, but not limited to, the following:

(i) The progress toward achieving the interim and final numeric goals for the highest water quality priorities for the Watershed Management Area,

(ii) The water quality improvement strategies that were implemented and/or no longer implemented by each of the Copermittees during the reporting period and previous reporting periods, and are planned to be implemented during the next reporting period,

(iii) Proposed modifications to the water quality improvement strategies, with public input received and rationale for the proposed

modifications,

(iv) Previously proposed modifications or updates incorporated into the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document and implemented by the Copermittees in the Watershed Management Area, and

(v) Proposed modifications or updates to the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document;

(d) A completed Jurisdictional Runoff Management Program Annual Report Form (Attachment D or accepted revision) for each Copermittee in the Watershed Management Area, certified by a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative.

(2) Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (Attachment D or accepted revision) no later than October 31 of each year until the first Annual Report is required to be submitted. Each Copermittee must submit the information on the Jurisdictional Runoff Management Program Annual Report Form specific to the area within its jurisdiction in each Watershed Management Area.

(3) Each Copermittee must provide any data or documentation utilized in developing the Annual Report upon request by the San Diego Water Board. ~~Any~~ Copermittee monitoring data utilized in developing the Annual Report must be uploaded to the California Environmental Data Exchange Network (CEDEN).[32] Any Copermittee monitoring and assessment data utilized in developing the Annual Report must be provided on the Regional Clearinghouse required pursuant to Provision F.4.

~~c. Regional Monitoring and Assessment Report~~

~~(1) The Copermittees must submit a Regional Monitoring and Assessment Report no later than 180 days in advance of the expiration date of this Order. The Regional Monitoring and Assessment Report may be submitted as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The Copermittees must review the receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, and findings from the assessments required pursuant to Provision D.4, to assess the following:~~

~~(a) The beneficial uses of the receiving waters within the San Diego Region~~

[32] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

~~that are protected or must be restored;~~

~~(b) The progress toward restoring impacted beneficial uses in the receiving waters within the San Diego Region; and~~

~~(c) Pollutants or conditions of emerging concern that may impact beneficial uses in the receiving waters within the San Diego Region.~~

~~(2) The Regional Monitoring and Assessment Report must include recommendations for improving the implementation and assessment of the Water Quality Improvement Plans and jurisdictional runoff management programs.~~

~~(3) Each Copermittee must provide any data or documentation utilized in developing the Regional Monitoring and Assessment Report upon request by the San Diego Water Board. Any monitoring and assessment data utilized in developing the Regional Monitoring and Assessment Report must be provided on the Regional Clearinghouse required pursuant to Provision F.4.~~

4. Regional Clearinghouse

The Copermittees must develop, update, and maintain an internet-based Regional Clearinghouse that is made available to the public no later than 18 months after the effective date of this Order.[33]

a. The Copermittees, through the Regional Clearinghouse, must make the following documents and data available, organized by Watershed Management Area, which may be linked to other internet-based data portals and databases where the original documents are stored:

(1) Water Quality Improvement Plan for the Watershed Management Area, and all updated versions with date of update;

(2) Annual Reports for the Watershed Management Area;

(3) Jurisdictional Runoff Management Program document for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(4) BMP Design Manual for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

[33] The Copermittee may elect to develop and maintain the clearinghouse(s) provided by other Copermittees or agencies.

(5) Reports from special studies (e.g. source identification, BMP effectiveness assessment) conducted in the Watershed Management Area;

(6) Monitoring data collected pursuant to Provision D for each Watershed Management Area must be uploaded to CEDEN,[34] with links to the uploaded data; and

(7) Available GIS data, layers, and/or shapefiles used to develop the maps generated and maintained by the Copermittees for the Water Quality Improvement Plans, Annual Reports, and jurisdictional runoff management program documents.

b. The Copermittees, through the Regional Clearinghouse, must make the following information and documents available:

(1) Contact information (point of contact, phone number, email address, and mailing address) for each Copermittee;

(2) Public hotline number for reporting non-storm water and illicit discharges for each Copermittee;

[34] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

(3) Email address for reporting non-storm water and illicit discharges for each Copermittee;

(4) Link to each Copermittee's website, if available, where the public may find additional information about the Copermittee's storm water management program and for requesting records for the implementation of its program;

(5) Information about opportunities for the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or restoration and protection of the quality of receiving waters; and

(6) Reports from regional monitoring programs in which the Copermittees participate (e.g. Southern California Monitoring Coalition, Southern California Coastal Water Research Project Bight Monitoring);

(7) Regional Monitoring and Assessment Reports; and

(8) Any other information, data, and documents the Copermittees determine as appropriate for making available to the public.

5. Report of Waste Discharge

a. The Orange County Copermittees and the Riverside County Copermittees are required to submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders. The San Diego Water Board will review and consider the Reports of Waste Discharge to determine whether modification to this Order, pursuant to the requirements of Provision H, will be required prior the Orange County Copermittees and/or Riverside County Copermittees becoming covered under this Order. The current Orders for the Orange County Copermittees and Riverside County Copermittees are rescinded upon notification of coverage under this Order except for enforcement purposes.

b. The Copermittees subject to the requirements of this Order must submit to the San Diego Water Board a complete Report of Waste Discharge as an application for the re-issuance of this Order and NPDES permit. The Report of Waste Discharge must be submitted no later than 180 days in advance of the expiration date of this Order. The Report of Waste Discharge must contain the following minimum information:

(1) Names and addresses of the Copermittees;

(2) Names and titles of the primary contacts of the Copermittees;

(3) Proposed changes to the Copermittees' Water Quality Improvement Plans and the supporting justification;

(4) Proposed changes to the Copermittees' jurisdictional runoff management programs and the supporting justification;

(5) Any other information necessary for the re-issuance of this Order;

(6) Any information to be included as part of the Report of Waste Discharge pursuant to the requirements of this Order; and

(7) Any other information required by federal regulations for NPDES permit reissuance.

6. Application for Early Coverage

a. The Orange County Copermittees, collectively, or Riverside County Copermittees, collectively, may apply for early coverage under this Order by submitting a Report of Waste Discharge Form 200, with a written request for early coverage under this Order.

b. The San Diego Water Board will review the application for early coverage. A notification of coverage under this Order will be issued to the Copermittees in the respective county by the San Diego Water Board upon completion of the early coverage application requirements. The effective coverage date will be specified in the notification of coverage. The Copermittees in the respective county are authorized to have MS4 discharges pursuant to the requirements of this Order starting on the effective coverage date specified in the notification of coverage. The existing Order for the respective county is rescinded upon the effective coverage date specified in the notification of coverage except for enforcement purposes.

7. Reporting Provisions

Each Copermittee must comply with all the reporting and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

G. PRINCIPAL WATERSHED COPERMITTEE RESPONSIBILITIES

1. The Copermittees within each Watershed Management Area must designate a Principal Watershed Copermittee and notify the San Diego Water Board of the name of the Principal Watershed Copermittee. ~~An individual Copermittee should not be designated a Principal Watershed Copermittee for more than two Watershed Management Areas.~~ The notification may be submitted with the Water Quality Improvement Plan required pursuant to Provision F.1 of this Order.

2. All Copermittees have some level of commitment, not just the Principal Watershed Copermittee. The Principal Watershed Copermittee is responsible for, at a minimum, the following:

a. Serving as liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues, and when necessary and appropriate, representing the Copermittees in the Watershed Management Area before the San Diego Water Board.

b. Facilitating the development of the Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order

c. Coordinating the submittal of the deliverables required by Provisions F.1, F.2, F.3.a, and F.3.b of this Order.

d. Coordinating and developing, with the other Principal Watershed Copermittees, the requirements of Provisions F.3.c, F.4, and F.5.b of this Order.

H. MODIFICATION OF PROGRAMS

1. Modifications of the Order may be initiated by the San Diego Water Board or by the Copermittees. Requests by Copermittees must be made to the San Diego Water Board.

2. Minor modifications to the Order may be made by the San Diego Water Board where the proposed modification complies with all the effective prohibitions and limitations, and other requirements of this Order.

3. Proposed modifications to the Order outside of the Water Quality Improvement Plan process that are not minor require amendment of this Order in accordance with this Order's rules, policies, and procedures.

4. The San Diego Water Board may re-open and modify this Order at any time prior to its expiration, after opportunity for public comment and a public hearing, if the State Water Board determines that revisions are warranted to those provisions of the Order addressing compliance with water quality standards in the receiving water and/or those provisions of the Order establishing an iterative process for implementation of management practices to assure compliance with water quality standards in the receiving water.

~~4.~~5. The San Diego Water Board may re-open and modify this order at any time prior to its expiration, after opportunity for public comment and a public hearing, if the Basin Plan Amendments for any of the TMDLs in Attachment E are revised by the San Diego Regional Board. Should a TMDL Basin Plan Amendment be revised and adopted by the Regional Board, then the Regional Board will re-open this Order as soon as possible to update the TMDL requirements in Attachment E to reflect the revised Basin Plan Amendment.

I. STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

Each Copermittee must comply with all the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

ATTACHMENT A

DISCHARGE PROHIBITIONS AND SPECIAL PROTECTIONS

1. Basin Plan Waste Discharge Prohibitions

California Water Code Section 13243 provides that a Regional Water Board, in a water quality control plan, may specify certain conditions or areas where the discharge of waste or certain types of waste is not permitted. The following waste discharge prohibitions in the Water Quality Control Plan for the San Diego Basin (Basin Plan) are applicable to any person, as defined by Section 13050(c) of the California Water Code, who is a citizen, domiciliary, or political agency or entity of California whose activities in California could affect the quality of waters of the state within the boundaries of the San Diego Region.

1. The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in California Water Code Section 13050, is prohibited.

2. The discharge of waste to land, except as authorized by waste discharge requirements or the terms described in California Water Code Section 13264 is prohibited.

3. The discharge of pollutants or dredged or fill material to waters of the United States except as authorized by a National Pollutant Discharge Elimination System (NPDES) permit or a dredged or fill material permit (subject to the exemption described in California Water Code Section 13376) is prohibited.

4. Discharges of recycled water to lakes or reservoirs used for municipal water supply or to inland surface water tributaries thereto are prohibited, unless this San Diego Water Board issues a NPDES permit authorizing such a discharge; the proposed discharge has been approved by the State Department of Health Services (DHS) and the operating agency of the impacted reservoir; and the discharger has an approved fail-safe long-term disposal alternative.

5. The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the San Diego Water Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

6. The discharge of waste in a manner causing flow, ponding, or surfacing on lands not owned or under the control of the discharger is prohibited, unless the discharge is authorized by the San Diego Water Board.

7. The dumping, deposition, or discharge of waste directly into waters of the state, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the San Diego Water Board.

8. Any discharge to a storm water conveyance system that is not composed entirely of "*storm water*" is effectively prohibited unless authorized by the San Diego Water Board. [The federal regulations, 40 CFR 122.26(b)(13), define storm water as storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from fire fighting activities.] [§122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

9. The unauthorized discharge of treated or untreated sewage to waters of the state or to a storm water conveyance system is prohibited.

10. The discharge of industrial wastes to conventional septic tank/subsurface disposal systems, except as authorized by the terms described in California Water Code Section 13264, is prohibited.

11. The discharge of radioactive wastes amenable to alternative methods of disposal into the waters of the state is prohibited.

12. The discharge of any radiological, chemical, or biological warfare agent into waters of the state is prohibited.

13. The discharge of waste into a natural or excavated site below historic water levels is prohibited unless the discharge is authorized by the San Diego Water Board.

14. The discharge of sand, silt, clay, or other earthen materials from any activity, including land grading and construction, in quantities which cause deleterious bottom deposits, turbidity or discoloration in waters of the state or which unreasonably affect, or threaten to affect, beneficial uses of such waters is prohibited.

15. The discharge of treated or untreated sewage from vessels to Mission Bay, Oceanside Harbor, Dana Point Harbor, or other small boat harbors is prohibited.

16. The discharge of untreated sewage from vessels to San Diego Bay is prohibited.

17. The discharge of treated sewage from vessels to portions of San Diego Bay that are less than 30 feet deep at mean lower low water (MLLW) is prohibited.

18. The discharge of treated sewage from vessels, which do not have a properly functioning US Coast Guard certified Type I or Type II marine sanitation device, to portions of San Diego Bay that are greater than 30 feet deep at mean lower low water (MLLW) is prohibited.

2. Attachment B to State Water Board Resolution 2012-0012

Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges

I. PROVISIONS FOR POINT SOURCE DISCHARGES OF STORM WATER AND NONPOINT SOURCE WASTE DISCHARGES

The following terms, prohibitions, and special conditions (hereafter collectively referred to as special conditions) are established as limitations on point source storm water and nonpoint source discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in Areas of Special Biological Significance (ASBS), as required for State Water Quality Protection Areas pursuant to California Public Resources Code Sections 36700(f) and 36710(f). These Special Protections are adopted by the State Water Board as part of the California Ocean Plan (Ocean Plan) General Exception.

The special conditions are organized by category of discharge. The State Water Resources Control Board (State Water Board) and Regional Water Quality Control Boards (Regional Water Boards) will determine categories and the means of regulation for those categories [e.g., Point Source Storm Water National Pollutant Discharge Elimination System (NPDES) or Nonpoint Source].

A. PERMITTED POINT SOURCE DISCHARGES OF STORM WATER

1. General Provisions for Permitted Point Source Discharges of Storm Water

   a. Existing storm water discharges into an ASBS are allowed only under the following conditions:

      (1) The discharges are authorized by an NPDES permit issued by the State Water Board or Regional Water Board;

      (2) The discharges comply with all of the applicable terms, prohibitions, and special conditions contained in these Special Protections; and

      (3) The discharges:

         (i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

         (ii) Are designed to prevent soil erosion;

         (iii) Occur only during wet weather;

(iv) Are composed of only storm water runoff.

b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

c. The discharge of trash is prohibited.

d. Only discharges from existing storm water outfalls are allowed. Any proposed or new storm water runoff discharge shall be routed to existing storm water discharge outfalls and shall not result in any new contribution of waste to an ASBS (i.e., no additional pollutant loading). “Existing storm water outfalls” are those that were constructed or under construction prior to January 1, 2005. “New contribution of waste” is defined as any addition of waste beyond what would have occurred as of January 1, 2005. A change to an existing storm water outfall, in terms of re-location or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges are prohibited except as provided below:

(1) The term “non-storm water discharges” means any waste discharges from a municipal separate storm sewer system (MS4) or other NPDES permitted storm drain system to an ASBS that are not composed entirely of storm water.

(2) (i) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability or occur naturally:

(a) Discharges associated with emergency fire fighting operations.

(b) Foundation and footing drains.

(c) Water from crawl space or basement pumps.

(d) Hillside dewatering.

(e) Naturally occurring groundwater seepage via a storm drain.

(f) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(ii) An NPDES permitting authority may authorize non-storm water discharges to an MS4 with a direct discharge to an ASBS only to the extent the

NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

2. Compliance Plans for Inclusion in Storm Water Management Plans (SWMP) and Storm Water Pollution Prevention Plans (SWPPP).

The discharger shall specifically address the prohibition of non-storm water runoff and the requirement to maintain natural water quality for storm water discharges to an ASBS in an ASBS Compliance Plan to be included in its SWMP or a SWPPP, as appropriate to permit type. If a statewide permit includes a SWMP, then the discharger shall prepare a stand-alone compliance plan for ASBS discharges. The ASBS Compliance Plan is subject to approval by the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (for permits issued by Regional Water Boards).

a. The Compliance Plan shall include a map of surface drainage of storm water runoff, showing areas of sheet runoff, prioritize discharges, and describe any structural Best Management Practices (BMPs) already employed and/or BMPs to be employed in the future. Priority discharges are those that pose the greatest water quality threat and which are identified to require installation of structural BMPs. The map shall also show the storm water conveyances in relation to other features such as service areas, sewage conveyances and treatment facilities, landslides, areas prone to erosion, and waste and hazardous material storage areas, if applicable. The SWMP or SWPPP shall also include a procedure for updating the map and plan when changes are made to the storm water conveyance facilities.

b. The ASBS Compliance Plan shall describe the measures by which all non-authorized non-storm water runoff (e.g., dry weather flows) has been eliminated, how these measures will be maintained over time, and how these measures are monitored and documented.

c. For Municipal Separate Storm Sewer System (MS4s), the ASBS Compliance Plan shall require minimum inspection frequencies as follows:

(1) The minimum inspection frequency for construction sites shall be weekly during rainy season;

(2) The minimum inspection frequency for industrial facilities shall be monthly during the rainy season;

(3) The minimum inspection frequency for commercial facilities (e.g., restaurants) shall be twice during the rainy season; and

(4) Storm water outfall drains equal to or greater than 18 inches (457 mm) in diameter or width shall be inspected once prior to the beginning of the rainy season and once during the rainy season and maintained to remove trash and other anthropogenic debris.

d. The ASBS Compliance Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff, that are necessary to comply with these special conditions, will be achieved through BMPs. Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that such installation would pose a threat to health or safety. BMPs to control storm water runoff discharges (at the end-of-pipe) during a design storm shall be designed to achieve on average the following target levels:

(1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

(2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges. The baseline for the reduction is the effective date of the Exception. The baseline for these determinations is the effective date of the Exception, and the reductions must be achieved and documented within four (4) years of the effective date.

e. The ASBS Compliance Plan shall address erosion control and the prevention of anthropogenic sedimentation in ASBS. The natural habitat conditions in the ASBS shall not be altered as a result of anthropogenic sedimentation.

f. The ASBS Compliance Plan shall describe the non-structural BMPs currently employed and planned in the future (including those for construction activities), and include an implementation schedule. The ASBS Compliance Plan shall include non-structural BMPs that address public education and outreach. Education and outreach efforts must adequately inform the public that direct discharges of pollutants from private property not entering an MS4 are prohibited. The ASBS Compliance Plan shall also describe the structural BMPs, including any low impact development (LID) measures, currently employed and planned for higher threat discharges and include an implementation schedule. To control storm water runoff discharges (at the end-of-pipe) during a design storm, permittees must first consider using LID practices to infiltrate, use, or evapotranspirate storm water runoff on-site.

g. The BMPs and implementation schedule shall be designed to ensure that natural water quality conditions in the receiving water are achieved and maintained by

either reducing flows from impervious surfaces or reducing pollutant loading, or some combination thereof.

h. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents in storm water runoff that alter natural ocean water quality and the sources of these constituents.

(2) The report shall describe BMPs that are currently being implemented, BMPs that are identified in the SWMP or SWPPP for future implementation, and any additional BMPs that may be added to the SWMP or SWPPP to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the BMPs.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits), the discharger shall revise its ASBS Compliance Plan to incorporate any new or modified BMPs that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised SWMP or SWPPP, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural ocean water quality conditions due to the same constituent.

(5) Compliance with this section does not excuse violations of any term, prohibition, or condition contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within one year from the effective date of the Exception, the discharger shall submit a written ASBS Compliance Plan to the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that describes its strategy to comply with these special conditions, including the requirement to maintain natural water quality in the affected ASBS. The ASBS Compliance Plan shall include a time schedule to implement appropriate non-structural and structural controls (implementation

schedule) to comply with these special conditions for inclusion in the discharger's SWMP or SWPPP, as appropriate to permit type.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these special conditions shall be implemented.

d. Within four (4) years of the effective date of the Exception, any structural controls identified in the ASBS Compliance Plan that are necessary to comply with these special conditions shall be operational.

e. Within four (4) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water, pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data, and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

   If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

   The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

   (1) for municipalities, a demonstration of significant hardship to discharger ratepayers, by showing the relationship of storm water fees to annual

household income for residents within the discharger's jurisdictional area, and the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or

(2) for other governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process.

B. NONPOINT SOURCE DISCHARGES

[NOT INCLUDED]
[PROVISIONS FOR NONPOINT SOURCE DISCHARGES NOT APPLICABLE]

II. ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES

[NOT INCLUDED]
[ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES NOT APPLICABLE]

III. ADDITIONAL REQUIREMENTS – WATERFRONT AND MARINE OPERATIONS

[NOT INCLUDED]
[ADDITIONAL REQUIREMENTS FOR WATERFRONT AND MARINE OPERATIONS NOT APPLICABLE]

IV. MONITORING REQUIREMENTS

Monitoring is mandatory for all dischargers to assure compliance with the Ocean Plan. Monitoring requirements include both: (A) core discharge monitoring, and (B) ocean receiving water monitoring. The State and Regional Water Boards must approve sampling site locations and any adjustments to the monitoring programs. All ocean receiving water and reference area monitoring must be comparable with the Water Boards' Surface Water Ambient Monitoring Program (SWAMP).

Safety concerns: Sample locations and sampling periods must be determined considering safety issues. Sampling may be postponed upon notification to the State and Regional Water Boards if hazardous conditions prevail.

Analytical Chemistry Methods: All constituents must be analyzed using the lowest minimum detection limits comparable to the Ocean Plan water quality objectives. For metal analysis, all samples, including storm water effluent, reference samples, and ocean receiving water samples, must be analyzed by the approved analytical method with the lowest minimum detection limits (currently Inductively Coupled Plasma/Mass Spectrometry) described in the Ocean Plan.

A. CORE DISCHARGE MONITORING PROGRAM

1. General sampling requirements for timing and storm size:

   Runoff must be collected during a storm event that is greater than 0.1 inch and generates runoff, and at least 72 hours from the previously measurable storm event. Runoff samples shall be collected when post-storm receiving water is sampled, and analyzed for the same constituents as receiving water and reference site samples (see section IV B) as described below.

2. Runoff flow measurements

   a. For municipal/industrial storm water outfalls in existence as of December 31, 2007, 18 inches (457mm) or greater in diameter/width (including multiple outfall pipes in combination having a width of 18 inches, runoff flows must be measured or calculated, using a method acceptable to and approved by the State and Regional Water Boards.
   b. This will be reported annually for each precipitation season to the State and Regional Water Boards.

3. Runoff samples – storm events

   a. For outfalls equal to or greater than 18 inches (0.46m) in diameter or width:

      (1) samples of storm water runoff shall be analyzed during the same storm as receiving water samples for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination, ; and

      (2) samples of storm water runoff shall be analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS

      (3) If an applicant has no outfall greater than 36 inches, then storm water runoff from the applicant's largest outfall shall be further analyzed during the same storm as receiving water samples for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates).

   b. For outfalls equal to or greater than 36 inches (0.91m) in diameter or width:

      (1) samples of storm water runoff shall be analyzed during the same storm as receiving water samples for oil and grease, total suspended solids, and,

within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

(2) samples of storm water runoff shall be further analyzed during the same storm as receiving water samples for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates) and

(3) samples of storm water runoff shall be analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

c. For an applicant not participating in a regional monitoring program [see below in Section IV (B)] in addition to (a.) and (b.) above, a minimum of the two largest outfalls or 20 percent of the larger outfalls, whichever is greater, shall be sampled (flow weighted composite samples) at least three times annually during wet weather (storm event) and analyzed for all Ocean Plan Table A constituents, Table B constituents for marine aquatic life protection (except for toxicity, only chronic toxicity for three species shall be required), DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, and Ocean Plan indicator bacteria. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one (the largest) such discharge shall be sampled annually in each Region.

4. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may reduce or suspend core monitoring once the storm runoff is fully characterized. This determination may be made at any point after the discharge is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

B. OCEAN RECEIVING WATER AND REFERENCE AREA MONITORING PROGRAM

In addition to performing the Core Discharge Monitoring Program in Section II.A above, all applicants having authorized discharges must perform ocean receiving water monitoring. In order to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS, dischargers may choose either (1) an individual monitoring program, or (2) participation in a regional integrated monitoring program.

1. Individual Monitoring Program: The requirements listed below are for those dischargers who elect to perform an individual monitoring program to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within the affected ASBS. In addition to Core Discharge Monitoring, the following additional monitoring requirements shall be met:

a. Three times annually, during wet weather (storm events), the receiving water at the point of discharge from the outfalls described in section (IV)(A)(3)(c) above shall be sampled and analyzed for Ocean Plan Table A constituents, Table B constituents for marine aquatic life, DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, salinity, chronic toxicity (three species), and Ocean Plan indicator bacteria.

   The sample location for the ocean receiving water shall be in the surf zone at the point of discharges; this must be at the same location where storm water runoff is sampled. Receiving water shall be sampled at approximately the same time prior to (pre-storm) and during (or immediately after) the same storm (post storm). Reference water quality shall also be sampled and analyzed for the same constituents pre-storm and post-storm, during the same storms when receiving water is sampled. Reference stations will be determined by the State Water Board's Division of Water Quality and the applicable Regional Water Board(s).

b. Sediment sampling shall occur at least three times during every five (5) year period. The subtidal sediment (sand or finer, if present) at the discharge shall be sampled and analyzed for Ocean Plan Table B constituents for marine aquatic life, DDT, PCBs, PAHs, pyrethroids, and OP pesticides. For sediment toxicity testing, only an acute toxicity test using the amphipod Eohaustorius estuarius must be performed.

c. A quantitative survey of intertidal benthic marine life shall be performed at the discharge and at a reference site. The survey shall be performed at least once every five (5) year period. The survey design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The results of the survey shall be completed and submitted to the State Water Board and Regional Water Board at least six months prior to the end of the permit cycle.

d. Once during each five (5) year period, a bioaccumulation study shall be conducted to determine the concentrations of metals and synthetic organic pollutants at representative discharge sites and at representative reference sites. The study design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The bioaccumulation study may include California mussels (Mytilus californianus) and/or sand crabs (Emerita analoga or Blepharipoda occidentalis). Based on the study results, the Regional Water Board and the State Water Board's Division of Water Quality, may adjust the study design in subsequent permits, or add or modify additional test organisms (such as shore crabs or fish), or modify the study design appropriate for the area and best available sensitive measures of contaminant exposure.

e. Marine Debris: Representative quantitative observations for trash by type and source shall be performed along the coast of the ASBS within the influence of the

discharger's outfalls. The design, including locations and frequency, of the marine debris observations is subject to approval by the Regional Water Board and State Water Board's Division of Water Quality.

f. The monitoring requirements of the Individual Monitoring Program in this section are minimum requirements. After a minimum of one (1) year of continuous water quality monitoring of the discharges and ocean receiving waters, the Executive Director of the State Water Board (statewide permits) or Executive officer of the Regional Water Board (Regional Water Board permits) may require additional monitoring, or adjust, reduce or suspend receiving water and reference station monitoring. This determination may be made at any point after the discharge and receiving water is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

2. Regional Integrated Monitoring Program: Dischargers may elect to participate in a regional integrated monitoring program, in lieu of an individual monitoring program, to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS. This regional approach shall characterize natural water quality, pre- and post-storm, in ocean reference areas near the mouths of identified open space watersheds and the effects of the discharges on natural water quality (physical, chemical, and toxicity) in the ASBS receiving waters, and should include benthic marine aquatic life and bioaccumulation components. The design of the ASBS stratum of a regional integrated monitoring program may deviate from the otherwise prescribed individual monitoring approach (in Section IV.B.1) if approved by the State Water Board's Division of Water Quality and the Regional Water Boards.

   a. Ocean reference areas shall be located at the drainages of flowing watersheds with minimal development (in no instance more than 10% development), and shall not be located in CWA Section 303(d) listed waterbodies or have tributaries that are 303(d) listed. Reference areas shall be free of wastewater discharges and anthropogenic non-storm water runoff. A minimum of low threat storm runoff discharges (e.g. stream highway overpasses and campgrounds) may be allowed on a case-by-case basis. Reference areas shall be located in the same region as the ASBS receiving water monitoring occurs. The reference areas for each Region are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean reference water samples must be collected from each station, each from a separate storm. A minimum of one reference location shall be sampled for each ASBS receiving water site sampled per responsible party. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

   b. ASBS ocean receiving water must be sampled in the surf zone at the location where the runoff makes contact with ocean water (i.e. at "point zero"). Ocean

receiving water stations must be representative of worst-case discharge conditions (i.e. co-located at a large drain greater than 36 inches, or if drains greater than 36 inches are not present in the ASBS then the largest drain greater than18 inches.) Ocean receiving water stations are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean receiving water samples must be collected during each storm season from each station, each from a separate storm. A minimum of one receiving water location shall be sampled in each ASBS per responsible party in that ASBS. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

c. Reference and receiving water sampling shall commence during the first full storm season following the adoption of these special conditions, and post-storm samples shall be collected when annual storm water runoff is sampled. Sampling shall occur in a minimum of two storm seasons. For those ASBS dischargers that have already participated in the Southern California Bight 2008 ASBS regional monitoring effort, sampling may be limited to only one storm season.

d. Receiving water and reference samples shall be analyzed for the same constituents as storm water runoff samples. At a minimum, constituents to be sampled and analyzed in reference and discharge receiving waters must include oil and grease, total suspended solids, Ocean Plan Table B metals for protection of marine life, Ocean Plan PAHs, pyrethroids, OP pesticides, ammonia, nitrate, phosphates, and critical life stage chronic toxicity for three species. In addition, within the range of the southern sea otter, indicator bacteria or some other measure of fecal contamination shall be analyzed.

3. Waterfront and Marine Operations: In addition to the above requirements for ocean receiving water monitoring, additional monitoring must be performed for marinas and boat launch and pier facilities:

a. For all marina or mooring field operators, in mooring fields with 10 or more occupied moorings, the ocean receiving water must be sampled for Ocean Plan indicator bacteria, residual chlorine, copper, zinc, grease and oil, methylene blue active substances (MBAS), and ammonia nitrogen.

(1) For mooring field operators opting for an individual monitoring program (Section IV.B.1 above), this sampling must occur weekly (on the weekend) from May through October.

(2) For mooring field operators opting to participate in a regional integrated monitoring program (Section IV.B.2 above), this sampling must occur monthly from May through October on a high use weekend in each month. The Water

Boards may allow a reduction in the frequency of sampling, through the regional monitoring program, after the first year of monitoring.

b. For all mooring field operators, the subtidal sediment (sand or finer, if present) within mooring fields and below piers shall be sampled and analyzed for Ocean Plan Table B metals (for marine aquatic life beneficial use), acute toxicity, PAHs, and tributyltin. For sediment toxicity testing, only an acute toxicity test using the amphipod Eohaustorius estuarius must be performed. This sampling shall occur at least three times during a five (5) year period. For mooring field operators opting to participate in a regional integrated monitoring program, the Water Boards may allow a reduction in the frequency of sampling after the first sampling effort's results are assessed.

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ATTACHMENT B

STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

1. Standard Permit Provisions

Code of Federal Regulations Title 40 Section 122.41 (40 CFR 122.41) includes conditions, or provisions, that apply to all National Pollutant Discharge Elimination System (NPDES) permits. Additional provisions applicable to NPDES permits are in 40 CFR 122.42. All applicable provisions in 40 CFR 122.41 and 40 CFR 122.42 must be incorporated into this Order and NPDES permit. The applicable 40 CFR 122.41 and 40 CFR 122.42 provisions are as follows:

a. DUTY TO COMPLY [40 CFR 122.41(a)]

The Copermittee must comply with all of the provisions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

(1) The Copermittee must comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement. [40 CFR 122.41(a)(1)]

(2) The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to a civil penalty not to exceed $25,000 per day for each violation. The CWA provides that any person who *negligently* violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than 2 years, or both. Any person who *knowingly* violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both. Any person who knowingly violates Section 301, 302, 303, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, and who knows at that time that he thereby places another person in imminent danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of

not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.
[40 CFR 122.41(a)(2)]

(3) Any person may be assessed an administrative penalty by the San Diego Regional Water Quality Control Board (San Diego Water Board), State Water Resources Control Board (State Water Board), or United States Environmental Protection Agency (USEPA) for violating Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.
[40 CFR 122.41(a)(3)]

b. DUTY TO REAPPLY [40 CFR 122.41(b)]

If a Copermittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Copermittee must apply for and obtain a new permit.

c. NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE [40 CFR 122.41(c)]

It shall not be a defense for a Copermittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

d. DUTY TO MITIGATE [40 CFR 122.41(d)]

The Copermittee must take all reasonable steps to minimize or prevent any discharge or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

e. PROPER OPERATION AND MAINTENANCE [40 CFR 122.41(e)]

The Copermittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Copermittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by a Copermittee only when the operation is necessary to achieve compliance with the conditions of this permit.

f. PERMIT ACTIONS [40 CFR 122.41(f)]

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Copermittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

g. PROPERTY RIGHTS [40 CFR 122.41(g)]

This permit does not convey any property rights of any sort, or any exclusive privilege.

h. DUTY TO PROVIDE INFORMATION [40 CFR 122.41(h)]

The Copermittee must furnish to the San Diego Water Board, State Water Board, or USEPA within a reasonable time, any information which the San Diego Water Board, State Water Board, or USPEA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Copermittee must also furnish to the San Diego Water Board, State Water Board, or USPEA upon request, copies of records required to be kept by this permit.

i. INSPECTION AND ENTRY [40 CFR 122.41(i)]

The Copermittee must allow the San Diego Water Board, State Water Board, USEPA, and/or their authorized representative (including an authorized contractor acting as their representative), upon presentation of credentials and other documents as may be required by law, to:

(1) Enter upon the Copermittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit; [40 CFR 122.41(i)(1)]

(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit; [40 CFR 122.41(i)(2)]

(3) Inspect and photograph at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; [40 CFR 122.41(i)(3)] and

(4) Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location. [40 CFR 122.41(i)(4)]

j. MONITORING AND RECORDS [40 CFR 122.41(j)]

(1) Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity. [40 CFR 122.41(j)(1)]

(2) Except for records of monitoring information required by this permit related to the Copermittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five (5) years (or longer as required by 40 CFR Part 503), the

Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time. [40 CFR 122.41(j)(2)]

(3) Records for monitoring information must include: [40 CFR 122.41(j)(3)]

(a) The date, exact place, and time of sampling or measurements; [40 CFR 122.41(j)(3)(i)]
(b) The individual(s) who performed the sampling or measurements; [40 CFR 122.41(j)(3)(ii)]
(c) The date(s) analyses were performed; [40 CFR 122.41(j)(3)(iii)]
(d) The individual(s) who performed the analyses; [40 CFR 122.41(j)(3)(iv)]
(e) The analytical techniques or methods used; [40 CFR 122.41(j)(3)(v)] and
(f) The results of such analyses. [40 CFR 122.41(j)(3)(vi)]

(4) Monitoring must be conducted according to test procedures under 40 CFR Part 136 unless another method is required under 40 CFR Subchapters N or O. [40 CFR 122.41(j)(4)]

In the case of pollutants for which there are no approved methods under 40 CFR Part 136 or otherwise required under 40 CFR Subchapters N and O, monitoring must be conducted according to a test procedure specified in the permit for such pollutants. [40 CFR 122.44(i)(1)(iv)]

(5) The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. [40 CFR 122.41(j)(5)]

k. SIGNATORY REQUIREMENT [40 CFR 122.41(k)]

(1) All applications, reports, or information submitted to the San Diego Water Board, State Water Board, or USEPA must be signed and certified. (See 40 CFR 122.22) [40 CFR 122.41(k)(1)]

(a) *For a municipality, State, Federal, or other public agency.* [All applications must be signed] [b]y either a principal executive officer or ranking elected official. [40 CFR 122.22(a)(3)]

(b) All reports required by permits, and other information requested by the San Diego Water Board, State Water Board, or USEPA must be signed by a person described in paragraph (a) of this section, or by a duly authorized representative of that person. A person is a duly authorized representative only if: [40 CFR 122.22(b)]

(i) The authorization is made in writing by a person described in paragraph (a) of this section; [40 CFR 122.22(b)(1)]

(ii) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company, (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) [40 CFR 122.22(b)(2)] and,

(iii) The written authorization is submitted to the San Diego Water Board and State Water Board. [40 CFR 122.22(b)(3)]

(c) *Changes to authorization.* If an authorization under paragraph (b) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (b) of this section must be submitted to the San Diego Water Board prior to or together with any reports, information, or applications to be signed by an authorized representative. [40 CFR 122.22(c)]

(d) *Certification.* Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." [40 CFR 122.22(d)]

(2) The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both. [40 CFR 122.41(k)(2)]

I. REPORTING REQUIREMENTS [40 CFR 122.41(l)]

(1) *Planned changes.* The Copermittee must give notice to the San Diego Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when: [40 CFR 122.41(l)(1)]

(a) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); [40 CFR 122.41(l)(1)(i)] or

(b) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which

are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1).
[40 CFR 122.41(l)(1)(ii)]

(c) The alteration or addition results in a significant change in the Copermittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. [40 CFR 122.41(l)(1)(iii)]

(2) *Anticipated noncompliance*. The Copermittee must give advance notice to the San Diego Water Board or State Water Board of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.
[40 CFR 122.41(l)(2)]

(3) *Transfers*. This permit is not transferable to any person except after notice to the San Diego Water Board. The San Diego Water Board may require modification or revocation and reissuance of the permit to change the name of the Copermittee and incorporate such other requirements as may be necessary under the CWA.
[40 CFR 122.41(l)(3)]

(4) *Monitoring reports.* Monitoring results must be reported at the intervals specified elsewhere in this permit. [40 CFR 122.41(l)(4)]

(a) Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the San Diego Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices. [40 CFR 122.41(l)(4)(i)]

(b) If the Copermittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or another method required for an industry-specific waste stream under 40 CFR Subchapters N or O, the results of this monitoring must be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the San Diego Water Board or State Water Board.
[40 CFR 122.41(l)(4)(ii)]

(c) Calculations for all limitations which require averaging of measurements must utilize an arithmetic mean unless otherwise specified in the permit.
[40 CFR 122.41(l)(4)(iii)]

(5) *Compliance schedules*. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date. [40 CFR 122.41(l)(5)]

(6) *Twenty-four hour reporting.*

(a) The Copermittee must report any noncompliance that may endanger health or the environment. Any information must be provided orally within 24 hours from the time the Copermittee becomes aware of the circumstances. A written submission must also be provided within five (5) days of the time the Copermittee becomes aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6)(i)]

(b) The following must be included as information which must be reported within 24 hours under this paragraph: [40 CFR 122.41(l)(6)(ii)]

(i) Any unanticipated bypass that exceeds any effluent limitation in the permit (See 40 CFR 122.41(g)). [40 CFR 122.41(l)(6)(ii)(A)]
(ii) Any upset which exceeds any effluent limitation in the permit. [40 CFR 122.41(l)(6)(ii)(B)] and,
(iii) Violation of a maximum daily discharge limitation for any of the pollutants listed by the San Diego Water Board in the permit to be reported within 24 hours. (See 40 CFR 122.44(g)) [40 CFR 122.41(l)(6)(ii)(C)]

(c) The San Diego Water Board may waive the above-required written report on a case-by-case basis if the oral report has been received within 24 hours. [40 CFR 122.41(l)(6)(iii)]

(7) *Other noncompliance.* The Copermittee must report all instances of noncompliance not reported in accordance with the standard provisions required under 40 CFR 122.41(l)(4), (5), and (6), at the time monitoring reports are submitted. The reports must contain the information listed in the standard provisions required under 40 CFR 122.41(l)(6). [40 CFR 122.41(l)(7))]

(8) *Other information.* When the Copermittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the San Diego Water Board, State Water Board, or USEPA, the Copermittee must promptly submit such facts or information. [40 CFR 122.41(l)(8)]

~~**m. BYPASS** [40 CFR 122.41(m)]~~

~~(1) *Definitions.*~~

~~(a) "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. [40 CFR 122.41(m)(1)(i)] or~~

~~(b) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be~~

~~expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.~~
~~[40 CFR 122.41(m)(1)(ii)]~~

~~(2) *Bypass not exceeding limitations*. The Copermittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the standard provisions required under 40 CFR 122.41(m)(3) and (4).~~
~~[40 CFR 122.41(m)(2)]~~

~~(3) *Notice.*~~

~~(a) *Anticipated bypass*. If the Copermittee knows in advance of the need for a bypass, it must submit a notice, if possible at least ten days before the date of the bypass. [40 CFR 122.41(m)(3)(i)] or~~

~~(b) *Unanticipated bypass*. The Copermittee must submit notice of an unanticipated bypass in accordance with the standard provisions required under 40 CFR 122.41(l)(6) (24-hour notice).~~
~~[40 CFR 122.41(m)(3)(ii)]~~

~~(4) *Prohibition of Bypass.*~~

~~(a) Bypass is prohibited, and the San Diego Water Board may take enforcement action against a Copermittee for bypass, unless:~~
~~[40 CFR 122.41(m)(4)(i)]~~

~~(i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; [40 CFR 122.41(m)(4)(i)(A)]~~
~~(ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance;~~
~~[40 CFR 122.41(m)(4)(i)(B)] and,~~
~~(iii) The Copermittee submitted notice in accordance with the standard provisions required under 40 CFR 122.41(m)(3).~~
~~[40 CFR 122.41(m)(4)(i)(C)]~~

~~(b) The San Diego Water Board may approve an anticipated bypass, after considering its adverse effects, if the San Diego Water Board determines that it will meet the three conditions listed above.~~
~~[40 CFR 122.41(m)(4)(ii)]~~

~~n.~~**m. UPSET** [40 CFR 122.41(n)]

(1) *Definition.* "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Copermittee. An upset does not

include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. [40 CFR 122.41(n)(1)]

(2) *Effect of an upset*. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the standard provisions required under 40 CFR 122.41(n)(3) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. [40 CFR 122.41(n)(2)]

(3) *Conditions necessary for a demonstration of upset*. A Copermittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that: [40 CFR 122.41(n)(3)]

(a) An upset occurred and that the Copermittee can identify the cause(s) of the upset; [40 CFR 122.41(n)(3)(i)]
(b) The permitted facility was at the time being properly operated; [40 CFR 122.41(n)(3)(ii)] and
(c) The Copermittee submitted notice of the upset in accordance with the standard provisions required under 40 CFR 122.41(l)(6)(ii)(B) (24-hour notice). [40 CFR 122.41(n)(3)(iii)]
(d) The Copermittee complied with any remedial measures pursuant to the standard provisions required under 40 CFR 122.41(d). [40 CFR 122.41(n)(3)(iii)]

(4) *Burden of proof*. In any enforcement proceeding, the Copermittee seeking to establish the occurrence of an upset has the burden of proof. [40 CFR 122.41(n)(4)]

~~o.~~n. STANDARD PERMIT PROVISIONS FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS
[40 CFR 122.42(c)]

The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the San Diego Water Board or State Water Board under 40 CFR 122.26(a)(1)(v) must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report must include:

(1) The status of implementing the components of the storm water management program that are established as permit conditions; [40 CFR 122.42(c)(1)]

(2) Proposed changes to the storm water management programs that are established as permit conditions. Such proposed changes must be consistent with 40 CFR 122.26(d)(2)(iii); [40 CFR 122.42(c)(2)] and

(3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under 40 CFR 122.26(d)(2)(iv) and (v); [40 CFR 122.42(c)(3)]

(4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; [40 CFR 122.42(c)(4)]

(5) Annual expenditures and budget for year following each annual report; [40 CFR 122.42(c)(5)]

(6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; [40 CFR 122.42(c)(6)]

(7) Identification of water quality improvements or degradation. [40 CFR 122.42(c)(7)]

~~p.~~o. **STANDARD PERMIT PROVISIONS FOR STORM WATER DISCHARGES** [40 CFR 122.42(d)]

The initial permits for discharges composed entirely of storm water issued pursuant to 40 CFR 122.26(e)(7) must require compliance with the conditions of the permit as expeditiously as practicable, but in no event later than three years after the date of issuance of the permit.

2. General Provisions

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. The general provisions applicable to this Order and NPDES permit are as follows:

a. DISCHARGE OF WASTE IS A PRIVILEGE

No discharge of waste into the waters of the State, whether or not such discharge is made pursuant to waste discharge requirements, shall create a vested right to continue such discharge. All discharges of waste into waters of the State are privileges, not rights. [CWC Section 13263(g)]

b. DURATION OF ORDER AND NPDES PERMIT

(1) *Effective date*. This Order and NPDES permit becomes effective on the 50th day after its adoption provided the USEPA has no objection. If the USEPA objects to its issuance, this Order shall not become effective until such objection is withdrawn. This Order supersedes Order No. R9-2007-0001 upon the effective date of this Order, and supersedes Order Nos. R9-2009-0002 and R9-2010-0016 upon their expiration or earlier notice of coverage.

(2) *Expiration*. This Order and NPDES permit expires five years after its effective date. [40 CFR 122.46(a)]

(3) *Continuation of expired order*. After this Order and NPDES permit expires, the terms and conditions of this Order and NPDES permit are automatically continued pending issuance of a new permit if all requirements of the federal NPDES regulations on the continuation of expired permits (40 CFR 122.6) are complied with.

c. AVAILABILITY

A copy of this Order must be kept at a readily accessible location and must be available to on-site personnel at all times.

d. CONFIDENTIALITY OF INFORMATION

Except as provided for in 40 CFR 122.7, no information or documents submitted in accordance with or in application for this Order will be considered confidential, and all such information and documents shall be available for review by the public at the San Diego Water Board office.

Claims of confidentiality for the following information will be denied: [40 CFR 122.7(b)]

(1) The name and address of any permit applicant or Copermittee; [40 CFR 122.7(b)(1)] and

(2) Permit applications and attachments, permits, and effluent data. [40 CFR 122.7(b)(2)]

e. EFFLUENT LIMITATIONS

(1) *Interim effluent limitations*. The Copermittee must comply with any interim effluent limitations as established by addendum, enforcement action, or revised waste discharge requirements which have been, or may be, adopted by the San Diego Water Board.

(2) *Other effluent limitations and standards*. If any applicable toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant and that standard or prohibition is more stringent than any limitation on the pollutant in the permit, the San Diego Water Board shall institute proceedings under these regulations to modify or revoke and reissue the permit to conform to the toxic effluent standard or prohibition. [40 CFR 122.44(b)(1)].

f. DUTY TO MINIMIZE OR CORRECT ADVERSE IMPACTS

The Copermittee must take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this Order, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the noncompliance.

g. PERMIT ACTIONS

The filing of a request by the Copermittee for modification, revocation and reissuance, or termination of this Order, or a notification of planned change in or anticipated noncompliance with this Order does not stay any condition of this Order. (See 40 CFR

122.41(f)) In addition, the following provisions apply to this Order:

(1) Upon application by any affected person, or on its own motion, the San Diego Water Board may review and revise the requirements in this Order. All requirements must be reviewed periodically. [CWC Section 13263(e)]

(2) This Order may be terminated or modified for cause, including, but not limited to, all of the following: [CWC Section 13381]

(a) Violation of any condition contained in the requirements of this Order. [CWC Section 13381(a)]

(b) Obtaining the requirements in this Order by misrepresentation, or failure to disclose fully all relevant facts. [CWC Section 13381(b)]

(c) A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge. [CWC Section 13381(c)]

(3) When this Order is transferred to a new owner or operator, such requirements as may be necessary under the CWC may be incorporated into this Order.

h. NPDES PERMITTED NON-STORM WATER DISCHARGES

The San Diego Water Board has, in prior years, issued a limited number of individual NPDES permits for non-storm water discharges to MS4s. The San Diego Water Board or State Water Board may in the future, upon prior notice to the Copermittee(s), issue an NPDES permit for any non-storm water discharge (or class of non-storm water discharges) to an MS4. A Copermittee will not be held responsible for pollutants in its MS4 discharge originating from an NPDES-permitted non-storm water discharge.

i. MONITORING

In addition to the standard provisions required under 40 CFR 122.41(j) and (l)(4), the following general monitoring provisions apply to this Order:

(1) Where procedures are not otherwise specified in Order, sampling, analysis and quality assurance/quality control must be conducted in accordance with the Quality Assurance Management Plan (QAMP) for the State of California's Surface Water Ambient Monitoring Program (SWAMP), adopted by the State Water Resources Control Board (State Water Board).

~~(2) Pursuant to 40 CFR 122.41(j)(2) and CWC Section 13383(a), each Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five (5) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time.~~

~~(3)~~(2) All chemical, bacteriological, and toxicity analyses must be conducted at a

laboratory certified for such analyses by the California Department of Public Health or a laboratory approved by the San Diego Water Board.

~~(4)~~(3) For priority toxic pollutants that are identified in the California Toxics Rule (CTR) (65 Fed. Reg. 31682), the Copermittees must instruct their laboratories to establish calibration standards that are equivalent to or lower than the Minimum Levels (MLs) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP). If a Copermittee can demonstrate that a particular ML is not attainable, in accordance with procedures set forth in 40 CFR Part 136, the lowest quantifiable concentration of the lowest calibration standard analyzed by a specific analytical procedure (assuming that all the method specified sample weights, volumes, and processing steps have been followed) may be used instead of the ML listed in Appendix 4 of the SIP. The Copermittee must submit documentation from the laboratory to the San Diego Water Board for approval prior to raising the ML for any priority toxic pollutant.

j. ENFORCEMENT

(1) The San Diego Water Board is authorized to enforce the terms of this Order under several provisions of the CWC, including, but not limited to, CWC Sections 13385, 13386, and 13387.

(2) Nothing in this Order shall be construed to protect the Copermittee from its liabilities under federal, state, or local laws.

(3) The CWC provides for civil and criminal penalties comparable to, and in some cases greater than, those provided for under the CWA.

(4) Except as provided in the standard conditions required under 40 CFR 122.41(m) and (n), nothing in this Order shall be construed to relieve the Copermittee from civil or criminal penalties for noncompliance.

(5) Nothing in this Order shall be construed to preclude the institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties to which the Copermittee is or may be subject to under Section 311 of the CWA.

(6) Nothing in this Order shall be construed to preclude institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authoring preserved by Section 510 of the CWA.

k. SEVERABILITY

The provisions of this Order are severable, and if any provision of this Order, or the application of any provisions of this Order to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this Order shall not be affected thereby.

l. APPLICATIONS

Any application submitted by a Copermittee for reissuance or modification of this Order

must satisfy all applicable requirements specified in federal regulations as well as any additional requirements for submittal of a Report of Waste Discharge specified in the CWC and the California Code of Regulations.

m. IMPLEMENTATION

All plans, reports and subsequent amendments submitted in compliance with this Order must be implemented immediately (or as otherwise specified). All submittals by Copermittees must be adequate to implement the requirements of this Order.

n. REPORT SUBMITTALS

(1) All report submittals must include an executive summary, introduction, conclusion, recommendations, and signed certified statement.

(2) Each Copermittee must submit a signed certified statement covering its responsibilities for each applicable submittal.

(3) The Principal Watershed Copermittee(s) must submit a signed certified statement covering its responsibilities for each applicable submittal and the sections of the submittals for which it is responsible.

(4) Unless otherwise directed, the Copermittees must submit one hard copy and one electronic copy of each report required under this Order to the San Diego Water Board, and one electronic copy to the USEPA.

(5) The Copermittees must submit reports and provide notifications as required by this Order to the following:

EXECUTIVE OFFICER
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
9174 SKY PARK COURT, SUITE 100
SAN DIEGO CA 92123-4340
Telephone: (858) 467-2952 Fax: (858) 571-6972

EUGENE BROMLEY
US ENVIRONMENTAL PROTECTION AGENCY
REGION IX
PERMITS ISSUANCE SECTION (W-5-1)
75 HAWTHORNE STREET
SAN FRANCISCO CA 94105

ATTACHMENT C

ACRONYMS AND ABBREVIATIONS

AMAL	Average Monthly Action Level
ASBS	Area(s) of Special Biological Significance
BMP	Best Management Practice
Basin Plan	Water Quality Control Plan for the San Diego Basin
CEQA	California Environmental Quality Act
CCR	California Code of Regulations
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWC	California Water Code
CZARA	Coastal Zone Act Reauthorization Amendments of 1990
ESAs	Environmentally Sensitive Areas
GIS	Geographic Information System
IBI	Index of Biological Integrity
LID	Low Impact Development
MDAL	Maximum Daily Action Level
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
NAL	Non-Storm Water Action Level
NAICS	North American Industry Classification System
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
ROWD	Report of Waste Discharge (application for NPDES reissuance)
SAL	Storm Water Action Level
San Diego Water Board	California Regional Water Quality Control Board, San Diego Region
SIC	Standard Industrial Classification Code
State Water Board	State Water Resources Control Board
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
WDID	Waste Discharge Identification Number
WLA	Waste Load Allocation
WQBEL	Water Quality Based Effluent Limitation

DEFINITIONS

Active/Passive Sediment Treatment - Using mechanical, electrical or chemical means to flocculate or coagulate suspended sediment for removal from runoff from construction sites prior to discharge.

Anthropogenic Litter – Trash generated from human activities, not including sediment.

Automotive Repair Shop – a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539 or equivalent NAICS code.

Average Monthly Action Level – The highest allowable average of daily discharges over a calendar month.

Beneficial Uses - The uses of water necessary for the survival or wellbeing of man, plants, and wildlife. These uses of water serve to promote tangible and intangible economic, social, and environmental goals. "Beneficial Uses" of the waters of the State that may be protected include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. Existing beneficial uses are uses that were attained in the surface or ground water on or after November 28, 1975; and potential beneficial uses are uses that would probably develop in future years through the implementation of various control measures. "Beneficial Uses" are equivalent to "Designated Uses" under federal law. [California Water Code Section 13050(f)].

Best Management Practices (BMPs) - Defined in 40 CFR 122.2 as schedules of activities, effective prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. In the case of municipal discharge permits, BMPs may be used in the place of numeric effluent limits.

Bioassessment - The use of biological community information to evaluate the biological integrity of a water body and its watershed. With respect to aquatic ecosystems, bioassessment is the collection and analysis of samples of the benthic macroinvertebrate community together with physical/habitat quality measurements associated with the sampling site and the watershed to evaluate the biological condition (i.e. biotic integrity) of a water body.

Biofiltration - Practices that use vegetation and amended soils to detain and treat runoff from impervious areas. Treatment is through filtration, infiltration, adsorption, ion exchange, and biological uptake of pollutants.

Biological Integrity - Defined in Karr J.R. and D.R. Dudley. 1981. Ecological perspective on water quality goals. *Environmental Management* 5:55-68 as: "A balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitat of the region." Also referred to as ecosystem health.

BMP Design Manual – A plan developed to eliminate, reduce, or mitigate the impacts of runoff

from development projects, including Priority Development Projects.

Channel Rehabilitation and Improvement – Remedial measures or activities for the purpose of improving or restoring the environmental health of streams, channels or river systems. Techniques may vary from in-stream restoration techniques to off-line stormwater management practices installed in the system corridor or upland areas. Rehabilitation techniques may include, but are not limited to the following: riparian zone restoration, constructed wetlands, bank stabilization, channel modifications, and day lighting of drainage systems. Effectiveness may be measured in various manners, included: assessment of habitat, reduced stream bank erosion, and restoration of water and sediment transport balance.

Clean Water Act Section 303(d) Water Body - An impaired water body in which water quality does not meet applicable water quality standards and/or is not expected to meet water quality standards, even after the application of technology based pollution controls required by the CWA. The discharge of runoff to these water bodies by the Copermittees is significant because these discharges can cause or contribute to violations of applicable water quality standards.

Construction Site – Any project, including projects requiring coverage under the Construction General Permit, that involves soil disturbing activities greater than 10,000 square feet including, but not limited to, clearing, grading, disturbances to ground such as stockpiling, and excavation. This does not include interior construction activities such as interior remodeling, plumbing, electrical, or mechanical work.

Contamination - As defined in the Porter-Cologne Water Quality Control Act, contamination is "an impairment of the quality of waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste whether or not waters of the State are affected."

Copermittee – An incorporated city within the County of Orange, County of Riverside, or County of San Diego in the San Diego Region (Region 9), the County of Orange, the County of Riverside, the County of San Diego, the Orange County Flood Control District, the Riverside County Water Conservation and Flood Control District, the San Diego Regional Airport Authority, or the San Diego Unified Port District.

Copermittees – All of the individual Copermittees, collectively.

Critical Channel Flow (Qc) – The channel flow that produces the critical shear stress that initiates bed movement or that erodes the toe of channel banks. When measuring Qc, it should be based on the weakest boundary material – either bed or bank.

Daily Discharge – Defined as either: (1) the total mass of the constituent discharged over the calendar day or any 24 hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g. concentration.)

The Daily Discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day, or other 24 hour period other than a day), or by the arithmetic mean of analytical results from one or more grab samples taken over the course of a day.

Development Projects - Construction, rehabilitation, redevelopment, or reconstruction of any public or private ~~residential~~ projects involving land disturbance activities~~, industrial, commercial, or any other projects~~.

Direct Discharge to an Environmentally Sensitive Area – Flow that is conveyed overland a distance of 200 ft or less from the development to the ESA, or conveyed in a pipe any amount of distance as an isolated flow from the development to the ESA (i.e. not commingled with flows from adjacent lands).

Dry Season –May 1 to September 30.

Dry Weather – Weather is considered dry if the preceding 72 hours has been without measurable precipitation (>0.1 inch).

Enclosed Bays – Enclosed bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost bay works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays do not include inland surface waters or ocean waters.

Erosion – When land is diminished or worn away due to wind, water, or glacial ice. Often the eroded debris (silt or sediment) becomes a pollutant via storm water runoff. Erosion occurs naturally but can be intensified by land clearing activities such as farming, development, road building, and timber harvesting.

Environmentally Sensitive Areas (ESAs) - Areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; areas designated as preserves or their equivalent under the Natural Communities Conservation Program within the Cities and County of Orange; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.

Estuaries – Waters, including coastal lagoons, located at the mouth of streams that serve as areas of mixing fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and ocean water. Estuaries do not include inland surface waters or ocean waters.

Existing Development – Any area that has been developed and exists for municipal, commercial, industrial, or residential purposes, uses, or activities. May include areas that are not actively used for its originally developed purpose, but may be re-purposed or redeveloped for another use or activity.

Flow Duration – The long-term period of time that flows occur above a threshold that causes significant sediment transport and may cause excessive erosion damage to creeks and streams (not a single storm event duration). The simplest way to visualize this is to consider a histogram

of pre- and post-project flows using long-term records of hourly data. To maintain pre-development flow duration means that the total number of hours (counts) within each range of flows in a flow-duration histogram cannot increase between the pre- and post-development condition. Flow duration within the range of geomorphologically significant flows is important for managing erosion.

Grading - The cutting and/or filling of the land surface to a desired slope or elevation.

Hazardous Material – Any substance that poses a threat to human health or the environment due to its toxicity, corrosiveness, ignitability, explosive nature or chemical reactivity. These also include materials named by the USEPA in 40 CFR 116 to be reported if a designated quantity of the material is spilled into the waters of the U.S. or emitted into the environment.

Hazardous Waste - Hazardous waste is defined as "any waste which, under Section 600 of Title 22 of this code, is required to be managed according to Chapter 30 of Division 4.5 of Title 22 of this code" [CCR Title 22, Division 4.5, Chapter 11, Article 1].

Household Hazardous Waste – Paints, cleaning products, and other hazardous wastes generated during home improvement or maintenance activities.

Hydromodification – The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

Illicit Connection – Any connection to the MS4 that conveys an illicit discharge.

Illicit Discharge - Any discharge to the MS4 that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from fire fighting activities [40 CFR 122.26(b)(2)].

Inactive Areas – Areas of construction activity that are not active and those that have been active and are not scheduled to be re-disturbed for at least 14 days.

Infiltration – Water other than wastewater that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow [40 CFR 35.2005(20)].

Inland Surface Waters – Includes all surface waters of the U.S. ~~State~~ that do not include the ocean, enclosed bays, or estuaries.

Jurisdictional Runoff Management Program Document – A written description of the specific jurisdictional runoff management measures and programs that each Copermittee will implement to comply with this Order and ensure that storm water pollutant discharges in runoff are reduced to the MEP and do not cause or contribute to a violation of water quality standards.

Low Impact Development (LID) – A storm water management and land development strategy that emphasizes conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions.

Low Impact Development Best Management Practices (LID BMPs) – LID BMPs include schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States through storm water management and land development strategies that emphasize conservation ~~s~~and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions. LID BMPs include retention practices that do not allow runoff, such as infiltration, rain water harvesting and reuse, and evapotranspiration. LID BMPs also include flow-through practices such as biofiltration that may have some discharge of storm water following pollutant reduction.

Major Outfall – As defined in the Code of Federal Regulations, a major outfall is a MS4 outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (i.e. discharge from a single conveyance other than a circular pipe which is associated with a drainage area of more than 50 acres); or, for MS4s that receive storm water from lands zoned for industrial activity (based on comprehensive zoning plans or equivalent), a MS4 outfall that discharges from a single pipe with an inside diameter of 12 inches or more or from its equivalent (i.e. discharge from other than a circular pipe associated with a drainage area of 2 acres or more).

Maximum Daily Action Level (MDAL) –The highest allowable daily discharge of a pollutant, over a calendar day (or 24 hour period). For pollutants with action levels expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with action levels expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

Maximum Extent Practicable (MEP) – The technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) for ~~storm water~~ discharges of pollutants that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) in combination with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than BAT. A definition for MEP is not provided either in the statute or in the regulations. Instead the definition of MEP is dynamic and will be defined by the following process over time: municipalities propose their definition of MEP by way of their runoff management programs. Their total collective and individual activities conducted pursuant to the runoff management programs becomes their proposal for MEP as it applies both to their overall effort, as well as to specific activities (e.g., MEP for street sweeping, or MEP for MS4 maintenance). In the absence of a proposal acceptable to the San Diego Water Board, the San Diego Water Board defines MEP.

In a memo dated February 11, 1993, entitled "Definition of Maximum Extent Practicable," Elizabeth Jennings, Senior Staff Counsel, SWRCB addressed the achievement of the MEP standard as follows:

"*To achieve the MEP standard, municipalities must employ whatever Best Management*

Practices (BMPs) are technically feasible (i.e., are likely to be effective) and are not cost prohibitive. The major emphasis is on technical feasibility. Reducing pollutants to the MEP means choosing effective BMPs, and rejecting applicable BMPs only where other effective BMPs will serve the same purpose, or the BMPs would not be technically feasible, or the cost would be prohibitive. In selecting BMPs to achieve the MEP standard, the following factors may be useful to consider:

a. Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?
b. Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?
c. Public Acceptance: Does the BMP have public support?
d. Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?
e. Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc.?

The final determination regarding whether a municipality has reduced pollutants to the maximum extent practicable can only be made by the Regional or State Water Boards, and not by the municipal discharger. If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit derived, it would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs that would address a pollutant source, or to pick a BMP based solely on cost, which would be clearly less effective. In selecting BMPs the municipality must make a serious attempt to comply and practical solutions may not be lightly rejected. In any case, the burden would be on the municipal discharger to show compliance with its permit. After selecting a menu of BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented."

Monitoring Year – October 1 to September 30

Municipal Separate Storm Sewer System (MS4) – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designated or used for collecting or conveying storm water; (iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.22~~26~~. Copermittees need only comply with permit conditions relating to discharges from the municipal separate storm sewers for which they are operators." 40 CFR §122.21(a)(vi).

National Pollutant Discharge Elimination System (NPDES) - The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of

the CWA.

Non-Storm Water - All discharges to and from a MS4 that do not originate from precipitation events (i.e., all discharges from a MS4 other than storm water). Non-storm water includes illicit discharges and NPDES permitted discharges and the discharges described in Provision E(2)(a)(3)-(5).

Nuisance - As defined in the Porter-Cologne Water Quality Control Act, a nuisance is "anything which meets all of the following requirements: 1) Is injurious to health, or is indecent, or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. 2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. 3) Occurs during, or as a result of, the treatment or disposal of wastes."

Ocean Waters – the territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the State Board's California Ocean Plan.

Order – Unless otherwise specified, refers to this Order, Order No. R9-2013-0001 (NPDES No. CAS0109266)

Outfall - *Outfall* means a *point source* as defined by 40 CFR 122.2 at the point where a municipal separate storm sewer discharges to waters of the United States and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels or other conveyances which connect segments of the same stream or other waters of the United States and are used to convey waters of the United States. 40 C.F.R. 122.26(b)(9).

Parking Lot – a land area or facility for the tempraory parking or storage of motor vehicles used personally, for business, or for commerce.

Persistent Flow - Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

Person - A person is defined as an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof [40 CFR 122.2].

Point Source - Any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, landfill leachate collection systems, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

Pollutant - Any agent that may cause or contribute to the degradation of water quality such that a condition of pollution or contamination is created or aggravated.

Pollution - As defined in the Porter-Cologne Water Quality Control Act, pollution is "the alteration of the quality of the waters of the State by waste, to a degree that unreasonably affects the either of the following: 1) The waters for beneficial uses; or 2) Facilities that serve these beneficial uses." Pollution may include contamination.

Pollution Prevention - Pollution prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control BMPs, treatment control BMPs, or disposal.

~~**Pre-Development**~~ **Pre-Project Runoff Conditions** – Runoff conditions that exist~~ed~~ onsite immediately before ~~the existing development was constructed, or exists onsite before~~ planned development activities occur. Pre-project is not intended to be interpreted as that period before any human-induced land disturbance has occurred. 64 FR 68761.

Priority Development Projects - New development and redevelopment projects defined under Provision E.3.b of Order No. R9-2012-0011.

Properly Designed – Designed in accordance with the Copermittee's BMP Design Manual and/or any appropriate design requirements set forth by the Copermittee and based on widely accepted design criteria.

Public Education, Outreach and Participation – Programs to educate residents, businesses and visitors about the importance of water quality and water quality programs so that they will support local efforts and understand their role in protecting receiving waters. The Education and Outreach Program will increase knowledge and awareness, improve attitudes toward storm pollution prevention, and provide a foundation for changing behaviors that contribute to storm water pollution.

Rainy Season (aka Wet Season) –October 1 to April 30

Receiving Waters – Waters of the United States.

Receiving Water Limitations - Waste discharge requirements issued by the San Diego Water Board typically include both: (1) "Effluent Limitations" (or "Discharge Limitations") that specify the technology-based or water-quality-based effluent limitations; and (2) "Receiving Water Limitations" that specify the water quality objectives in the Basin Plan as well as any other limitations necessary to attain those objectives. In summary, the "Receiving Water Limitations" provision is the provision used to implement the requirements of CWA section 402(p)(3)(B).

Redevelopment - The creation, addition, and or replacement of impervious surface on an already developed site through construction or alteration of the existing footprint. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include trenching and resurfacing associated with utility work; resurfacing existing roadways; resurfacing, cutting and reconfiguring of surface parking lots; new sidewalk construction, pedestrian ramps, or bike lane on existing roads; and routine replacement of damaged pavement, such as pothole repair.

Reporting Period – The period of information that is reported in the Annual Report. The

reporting period consists of two components: 1) July 1 to June 30, consistent with the fiscal year, for the implementation of the jurisdictional runoff management programs, and 2) October 1 to September 30, consistent with the monitoring year for the monitoring and assessment programs. Together, these two time periods constitute the reporting year for the Annual Report due January 31 following the end of the monitoring year.

Restaurant – A facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812).

Retail gasoline outlet (RGO) – A business that sells automotive or truck fuel to the general public.

Retain –Keep or hold in a particular place, condition, or position without discharge to surface waters.

Retrofitting – – Storm water management practice put into place after development has occurred in watersheds where the practices previously did not exist or are ineffective. Retrofitting of developed areas is intended to improve water quality, protect downstream channels, reduce flooding, or meet other specific objectives. Retrofitting developed areas may include, but is not limited to replacing roofs with green roofs, disconnecting downspouts or impervious surfaces to drain to pervious surfaces, replacing impervious surfaces with pervious surfaces, installing rain barrels, installing rain gardens, and trash area enclosures.

Runoff - All flows in a storm water conveyance system that consists of the following components: (1) storm water (wet weather flows) and (2) non-storm water including dry weather flows.

San Diego Water Board – As used in this document the term "San Diego Water Board" is synonymous with the term "Regional Board" as defined in Water Code section 13050(b) and is intended to refer to the California Regional Water Quality Control Board for the San Diego Region as specified in Water Code Section 13200.

Sediment - Soil, sand, and minerals washed from land into water. Sediment resulting from anthropogenic sources (i.e. human induced land disturbance activities) is considered a pollutant. This Order regulates only the discharges of sediment from anthropogenic sources and does not regulate naturally occurring sources of sediment. Sediment can destroy fish-nesting areas, clog animal habitats, and cloud waters so that sunlight does not reach aquatic plants.

Source Control BMP – –—Land use or site planning practices, or structural or nonstructural measures that aim to prevent runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between pollutants and runoff.

Street, Road, Highway, Freeway and Driveway – Any paved impervious surface that is used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

Storm Water – – Per 40 CFR 122.26(b)(13), means storm water runoff, snowmelt runoff and surface runoff and drainage. Surface runoff and drainage pertains to runoff and drainage resulting from precipitation events.

Stream, Channel, or Habitat Rehabilitation – – Measures or activities for the purpose of improving or restoring the environmental health (i.e. physical, chemical and biological integrity) of streams, channels, or river systems. Rehabilitation techniques may include, but are not limited to, riparian zone restoration, constructed wetlands, bank stabilization, channel reconfiguration, and daylighting drainage systems.

Structural BMPs - A subset of BMPs which detains, retains, filters, removes, or prevents the release of pollutants to surface waters from development projects in perpetuity, after construction of a project is completed.

Total Maximum Daily Load (TMDL) - The maximum amount of a pollutant that can be discharged into a water body from all sources (point and non-point) and still maintain water quality standards. Under CWA section 303(d), TMDLs must be developed for all water bodies that do not meet water quality standards after application of technology-based controls.

Toxicity - Adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies). The water quality objectives for toxicity provided in the Basin Plan, state in part…"All waters shall be free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life….The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge".

Treatment Control BMP – Any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media absorption or any other physical, biological, or chemical process.

Unpaved Road – Any long, narrow stretch without pavement used for traveling by motor passenger vehicles between two or more points. Unpaved roads are generally constructed of dirt, gravel, aggregate or macadam and may be improved or unimproved.

Waste - As defined in CWC Section 13050(d), "waste includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal."

Article 2 of CCR Title 23, Chapter 15 (Chapter 15) contains a waste classification system that applies to solid and semi-solid waste, which cannot be discharged directly or indirectly to water of the state and which therefore must be discharged to land for treatment, storage, or disposal in accordance with Chapter 15. There are four classifications of waste (listed in order of highest to lowest threat to water quality): hazardous waste, designated waste, non-hazardous solid waste, and inert waste.

Water Quality Objective - Numerical or narrative limits on constituents or characteristics of water designated to protect designated beneficial uses of the water. [California Water Code Section 13050 (h)]. California's water quality objectives are established by the State and Regional Water Boards in the Water Quality Control Plans. Numeric or narrative limits for pollutants or characteristics of water designed to protect the beneficial uses of the water. In

other words, a water quality objective is the maximum concentration of a pollutant that can exist in a receiving water and still generally ensure that the beneficial uses of the receiving water remain protected (i.e., not impaired). Since water quality objectives are designed specifically to protect the beneficial uses, when the objectives are violated the beneficial uses are, by definition, no longer protected and become impaired. This is a fundamental concept under the Porter Cologne Act. Equally fundamental is Porter Cologne's definition of pollution. A condition of pollution exists when the water quality needed to support designated beneficial uses has become unreasonably affected or impaired; in other words, when the water quality objectives have been violated. These underlying definitions (regarding beneficial use protection) are the reason why all waste discharge requirements implementing the federal NPDES regulations require compliance with water quality objectives. (Water quality objectives are also called water quality criteria in the CWA.)

Water Quality Standards - Water quality standards, as defined in Clean Water Act section 303(c) consist of the beneficial uses (e.g., swimming, fishing, municipal drinking water supply, etc.,) of a water body and criteria (referred to as water quality objectives in the California Water Code) necessary to protect those uses. Under the Water Code, the water boards establish beneficial uses and water quality objectives in water quality control or basin plans. Together with an anti-degradation policy, these beneficial uses and water quality objectives serve as water quality standards under the Clean Water Act. In Clean Water Act parlance, state beneficial uses are called "designated uses" and state water quality objectives are called "criteria." Throughout this Order, the relevant term is used depending on the statutory scheme.

Waters of the State - Any water, surface or underground, including saline waters within the boundaries of the State [CWC section 13050 (e)]. The definition of the Waters of the State is broader than that for the Waters of the United States in that all water in the State is considered to be a Waters of the State ~~regardless of circumstances or condition~~.

Waters of the United States - As defined in the 40 CFR 122.2, the Waters of the U.S. are defined as: "(a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate "wetlands;" (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters otherwise defined as waters of the United States under this definition: (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial seas; and (g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA."

Watershed - That geographical area which drains to a specified point on a water course, usually a confluence of streams or rivers (also known as drainage area, catchment, or river basin).

Wet Season (aka Rainy Season) –October 1 to April 30

Wet Weather – Weather is considered wet if there is a storm event of 0.1 inches and greater and the following 72 hours, unless otherwise defined by another regulatory mechanism.

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ATTACHMENT D

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

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JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM
FY _____

I. COPERMITTEE INFORMATION			
Copermittee Name:			
Copermittee Primary Contact Name:			
Copermittee Primary Contact Information: Address: City:	County:	State:	Zip:
Telephone:	Fax:	Email:	

II. LEGAL AUTHORITY		
Has the Copermittee established adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 that complies with Order No. R9-2013-0001?	YES NO	☐ ☐
A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority?	YES NO	☐ ☐

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE		
Was an update of the jurisdictional runoff management program document required or recommended by the San Diego Water Board?	YES NO	☐ ☐
If YES to the question above, did the Copermittee update its jurisdictional runoff management program document and make it available on the Regional Clearinghouse?	YES NO	☐ ☐

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM		
Has the Copermittee implemented a program to actively detect and eliminate illicit discharges and connections to its MS4 that complies with Order No. R9-2013-0001?	YES NO	☐ ☐

Number of non-storm water discharges reported by the public	
Number of non-storm water discharges detected by Copermittee staff or contractors	
Number of non-storm water discharges investigated by the Copermittee	
Number of sources of non-storm water discharges identified	
Number of non-storm water discharges eliminated	
Number of sources of illicit discharges or connections identified	
Number of illicit discharges or connections eliminated	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

V. DEVELOPMENT PLANNING PROGRAM		
Has the Copermittee implemented a development planning program that complies with Order No. R9-2013-0001?	YES NO	☐ ☐
Was an update to the BMP Design Manual required or recommended by the San Diego Water Board?	YES NO	☐ ☐
If YES to the question above, did the Copermittee update its BMP Design Manual and make it available on the Regional Clearinghouse?	YES NO	☐ ☐

Number of proposed development projects in review	
Number of Priority Development Projects in review	
Number of Priority Development Projects approved	
Number of approved Priority Development Projects exempt from any BMP requirements	
Number of approved Priority Development Projects allowed alternative compliance	
Number of Priority Development Projects granted occupancy	

Number of completed Priority Development Projects in inventory	
Number of high priority Priority Development Project structural BMP inspections	
Number of Priority Development Project structural BMP violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM
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VI. CONSTRUCTION MANAGEMENT PROGRAM

Has the Copermittee implemented a construction management program that complies with Order No. R9-2013-0001?	YES	☐
	NO	☐

Number of construction sites in inventory	
Number of active construction sites in inventory	
Number of inactive construction sites in inventory	
Number of construction sites closed/completed during reporting period	
Number of construction site inspections	
Number of construction site violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

Has the Copermittee implemented an existing development management program that complies with Order No. R9-2013-0001?	YES	☐
	NO	☐

	Municipal	Commercial	Industrial	Residential
Number of facilities or areas in inventory				
Number of existing development inspections				
Number of follow-up inspections				
Number of violations				
Number of enforcement actions issued				
Number of escalated enforcement actions issued				

VIII. PUBLIC EDUCATION AND PARTICIPATION

Has the Copermittee implemented a public education program component that complies with Order No. R9-2013-0001?	YES	☐
	NO	☐
Has the Copermittee implemented a public participation program component that complies with Order No. R9-2013-0001?	YES	☐
	NO	☐

IX. FISCAL ANALYSIS

Has the Copermittee attached to this form a summary of its fiscal analysis that complies with Order No. R9-2013-0001?	YES	☐
	NO	☐

X. CERTIFICATION

I [☐ Principal Executive Officer ☐ Ranking Elected Official ☐ Duly Authorized Representative] certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature	Date
Print Name	Title
Telephone Number	Email

ATTACHMENT E

SPECIFIC PROVISIONS FOR TOTAL MAXIMUM DAILY LOADS APPLICABLE TO ORDER NO. R9-2013-0001

These provisions implement Total Maximum Daily Loads (TMDLs), adopted by the San Diego Water Board and approved by USEPA under Clean Water Act section 303(c), which are applicable to discharges regulated under this Order. The provisions and schedules for implementation of the TMDLs described below must be incorporated into the Water Quality Improvement Plans, required pursuant to Provision B of this Order, for the specified Watershed Management Areas.

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed
2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin
3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed
4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek
5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay
6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2002-0123

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	August 14, 2002
State Water Board Approval Date:	July 16, 2003
Office of Administrative Law Approval Date:	September 11, 2003
US EPA Approval Date:	November 3, 2003

(3) TMDL Effective Date: September 11, 2003

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS~~WATER QUALITY BASED EFFLUENT LIMITATIONS~~

Final TMDL compliance requirements ~~The WQBELs~~ for Chollas Creek consist of the following:

(1) Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the ~~violation~~ exceedance of the following receiving water limitations by the end of the compliance schedule under Specific Provision 1.a~~a~~:

Table 1.1
Receiving Water Limitations as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Diazinon	Acute	0.16~~08~~ µg/L	1 hour
	Chronic	0.10~~05~~ µg/L	4 days

(2) Final Water Quality Based Effluent Limitations

~~Discharges from the MS4s must not contain concentrations that exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 1.c:~~
In the case that receiving water limitations are exceeded after the end of the compliance schedules under Specific Provision 1.b.(4), effluent limitations will be used to determine whether MS4 discharges are causing or contributing to exceedances of receiving water quality limitations. To demonstrate MS4 discharges are not causing or contributing to an exceedance of receiving

water quality limitations, MS4 discharges must meet the concentration-based effluent limitations in Table 1.2.

Table 1.2
Effluent Limitations as Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation	Averaging Period
Diazinon	Acute	0.~~072~~ 144 µg/L	1 hour
	Chronic	0.~~045~~ 09 µg/L	4 days

1. Concentrations shall be determined on a flow-weighted basis across all outfalls within a jurisdiction, not outfall-by-outfall.

(3) Best Management Practices

The following BMPs for Chollas Creek must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area and implemented by the Responsible Copermittees:

(a) The Responsible Copermittees must implement BMPs to support the achievement of the WQBELs under Specific Provision 1.b for Chollas Creek.

(b) The Responsible Copermittees must implement the Diazinon Toxicity Control Plan and Diazinon Public Outreach/Education Program as described in the report titled, *Technical Report for Total Maximum Daily Load for Diazinon in Chollas Creek Watershed, San Diego County*, dated August 14, 2002, including subsequent modifications, in order to achieve the WQBELs under Specific Provision 1.b.

(c) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans as possible.

(d) For Copermittees utilizing the Water Quality Improvement Plan compliance option, the strategies and activities contained in the Water Quality Improvement Plan accepted by the San Diego Water Board and adaptively managed as outlined in Provision B.6, F.1, and F.2, will serve as BMP-based WQBELs under the following conditions, as outlined in Provision B.3.a:

(1) A Responsible Copermittee requests that the Water Quality Improvement Plan be approved as the basis for compliance with the discharge prohibitions (A.1), receiving water limitations (A.2), and/or effluent limitations (A.3) in the letter of submittal to the San Diego Water Board;

(2) Reasonable assurance is demonstrated that the strategies and activities in the Water Quality Improvement Plan are expected to attain the final receiving water limitations or final WQBELs under Specific Provision 1.b;

(3) The submitted schedule as outlined in Provision B.3 provides sufficient detail regarding the strategies and activities to be implemented to allow

the Regional Board to use the schedule for compliance determination in a clear, specific, measurable, and enforceable manner; AND

(4) The Water Quality Improvement Plan is approved by the Regional Board Executive Officer and is implemented per the approved schedule and adapted pursuant to Provisions B.6, F.1, and F.2.

~~c. COMPLIANCE SCHEDULE~~

(4) Final Compliance Dates

The Responsible Copermittees are required to achieve their respective WLAs by December 31, 2010. The Responsible Copermittees must be in compliance with the final receiving water limitations or final WQBELs under Specific Provision 1.b.

(5) Final Compliance Determination

Compliance with final compliance requirements of Specific Provision 1.b may be demonstrated by a Responsible Copermittee via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water; OR

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 1.b.(1) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the applicable effluent limitations under Specific Provision 1.b.(2) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittee can demonstrate that exceedances of the applicable final receiving water limitations under Specific Provision 1.b.(1) in the receiving water are due to loads from non-MS4 sources; OR

(e) The Responsible Copermittee has submitted and is fully implementing a Water Quality Improvement Plan that is developed and adaptively managed as outlined in Provisions B, F.1 and F.2, is accepted by the San Diego Water Board, and meets the conditions of Specific Provision 1.b.(3).d.

~~d.~~c. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal*

Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls for diazinon within the Chollas Creek watershed, and calculate or estimate the annual diazinon loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

~~e. COMPLIANCE DETERMINATION~~

~~Compliance with WQBELs of Specific Provision 1.b may be demonstrated via one of the following methods:~~

~~(1) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;~~

~~(2) There are no exceedances of the applicable receiving water limitations under Specific Provision 1.b.(1) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR~~

~~(3) There are no violations of the applicable effluent limitations under Specific Provision 1.b.(2) at the Responsible Copermittees' MS4 outfalls.~~

2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0019

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	September 22, 2005
Office of Administrative Law Approval Date:	December 2, 2005
US EPA Approval Date:	February 8, 2006

(3) TMDL Effective Date: December 2, 2005

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Shelter Island Yacht Basin

(6) Responsible Copermittee: City of San Diego~~t~~

b. FINAL TMDL COMPLIANCE REQUIREMENTS ~~WATER QUALITY BASED EFFLUENT LIMITATIONS~~

~~The WQBELs~~ Final TMDL compliance requirements for Shelter Island Yacht Basin consist of the following:

(1) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance ~~violation~~ of the following receiving water limitations by the end of the compliance schedule under Specific Provision 2.~~c~~b(4):

Table 2.1
Receiving Water Limitations as Concentrations in Shelter Island Yacht Basin

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Dissolved Copper	Acute	4.8 x WER µg/L	1 hour
	Chronic	3.1 x WER µg/L	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER.

(2) Final Water Quality Based Effluent Limitations

In the case that receiving water limitations are exceeded after the end of the compliance schedule under Specific Provision 2.b.(4), ~~Discharges from the MS4s must not contain pollutant loads that exceed the following~~ effluent limitations will be used to determine whether MS4 discharges are causing or contributing to exceedances of receiving water quality limitations~~by the end of the compliance schedule under Specific Provision 2.c:~~. To demonstrate MS4 discharges are not causing or contributing to exceedances of receiving water quality limitations, MS4 discharges must meet the load-based effluent limitations in Table 2.2.

Table 2.2
Effluent Limitations as Annual Loads in MS4 Discharges to Shelter Island Yacht Basin

Constituent	Effluent Limitation
Dissolved Copper	30 x WER kg/yr

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER.

(3) Final Best Management Practices

~~The Responsible Copermittee must implement BMPs to support the achievement of the WQBELs under Specific Provision 2.b for Shelter Island Yacht Basin~~

(a) The Responsible Copermittee must implement BMPs to support the achievement of the final receiving water limitations or final WQBELs under Specific Provision 2.b.

(b) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with other responsible parties as possible.

(c) For Copermittees utilizing the Water Quality Improvement Plan compliance option, the strategies and activities contained in the Water Quality Improvement Plan accepted by the San Diego Water Board and adaptively managed as outlined in Provision B.6, F.1, and F.2, will serve as BMP-based WQBELs under the following conditions, as outlined in Provision B.3.a:

(1) A Responsible Copermittee requests that the Water Quality Improvement Plan be approved as the basis for compliance in the letter of submittal to the San Diego Water Board;

(2) Reasonable assurance is demonstrated that the strategies and activities in the Water Quality Improvement Plan are expected to attain the final receiving water limitations or final WQBELs under Specific Provision 2.b;

(3) The submitted schedule as outlined in Provision B.3 provides sufficient

detail regarding the strategies and activities to be implemented to allow the Regional Board to use the schedule for compliance determination in a clear, specific, measurable, and enforceable manner; AND

(4) The Water Quality Improvement Plan is approved by the Regional Board Executive Officer and is implemented per the approved schedule and adapted pursuant to Provisions B.6, F.1, and F.2.

(4) Final Compliance Schedule

The Responsible Copermittee is required to achieve the MS4 WLA by December 2, 2005. The Responsible Copermittee must be in compliance with the final receiving water limitations or final WQBELs under Specific Provision 2.b.

(5) Final Compliance Determination

Compliance with final compliance requirements of Specific Provision 2.b.(1) may be demonstrated by a Responsible Copermittee via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 1.b.(1) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the applicable effluent limitations under Specific Provision 2.b.(2) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittee can demonstrate that exceedances of the applicable final receiving water limitations under Specific Provision 2.b.(1) in the receiving water are due to loads from non-MS4 sources; OR

(e) The Responsible Copermittee has submitted and is fully implementing a Water Quality Improvement Plan that is developed and adaptively managed as outlined in Provisions B, F.1 and F.2, is accepted by the San Diego Water Board, and meets the conditions of Specific Provision 2.b.(3).c.

c. Specific Monitoring and Assessment Requirements

The Responsible Copermittee must monitor the effluent of its MS4 outfalls for dissolved copper, and calculate or estimate the monthly and annual dissolved copper loads, in accordance with the requirements of Provisions D.2, D.4.b.(1),

and D.4.(b)(2)of this Order. The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

~~**d. COMPLIANCE DETERMINATION**~~

~~Compliance with WQBELs of Specific Provision 2.b may be demonstrated via one of the following methods:~~

~~(1) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water;~~

~~(2) There are no exceedances of the applicable receiving water limitations under Specific Provision 2.b.(1) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR~~

~~(3) There are no violations of the applicable effluent limitations under Specific Provision 2.b.(2) at the Responsible Copermittee's MS4 outfalls.~~

3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0036

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	November 16, 2005
Office of Administrative Law Approval Date:	February 1, 2006
US EPA Approval Date:	March 22, 2006

(3) TMDL Effective Date: February 1, 2006

(4) Watershed Management Area: Santa Margarita River

(5) Water Body: Rainbow Creek

(6) Responsible Copermittee: County of San Diego

b. FINAL TMDL COMPLIANCE REQUIREMENTS~~WATER QUALITY BASED EFFLUENT LIMITATIONS~~

~~The WQBELs~~ Final TMDL compliance requirements for Rainbow Creek consist of the following:

(1) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the ~~violation~~ exceedance of the following receiving water limitations by the end of the compliance schedule under Specific Provision 3.b(4)~~c.(1)~~:

Table 3.1
Receiving Water Limitations as Concentrations in Rainbow Creek

Constituent	Receiving Water Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(2) Final Water Quality Based Effluent Limitations

(a) In the case that receiving water limitations are exceeded after the end of the compliance schedules under Specific Provision 3.b.(4), ~~Discharges from the MS4s must not contain concentrations that exceed the following~~ effluent limitations will be used to determine whether MS4 discharges are causing or contributing to exceedances of receiving water quality limitations. ~~by the end of the compliance schedule under Specific Provision 3.c.(1):~~ To demonstrate MS4 discharges are not causing or contributing to exceedances of receiving water quality limitations, MS4 discharges must meet either the concentration-based effluent limitations in Table 3.2 or the load-based effluent limitations in Table 3.3.

Table 3.2
Effluent Limitations as Concentrations in MS4 Discharges to Rainbow Creek

Constituent	Effluent Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

1. Concentrations shall be determined on a flow-weighted basis across all outfalls within a jurisdiction, not outfall-by-outfall.

~~(b) Pollutant loads from given land uses discharging to and from the MS4s must not exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 3.c.(1):~~

Table 3.3
Effluent Limitations as Annual Loads in MS4 Discharges to Rainbow Creek

Land Use	Total N	Total P
Commercial nurseries	116 kg/yr	3 kg/yr
Park	3 kg/yr	0.1 kg/yr
Residential areas	149 kg/yr	12 kg/yr
Urban areas	27 kg/yr	6 kg/yr

~~Interim effluent limitations expressed as pollutant loads are given in the compliance schedule under Specific Provision 3.0.~~

(3) Final Best Management Practices

(a) The Responsible Copermittee must implement BMPs to support the achievement of the final receiving water limitations or final WQBELs under Specific Provision 3.b for Rainbow Creek.

(b) The Responsible Copermittee should coordinate any BMPs implemented to address this TMDL with Caltrans and other sources as possible.

(c) For Copermittees utilizing the Water Quality Improvement Plan compliance option, the strategies and activities contained in the Water Quality Improvement Plan accepted by the San Diego Water Board and adaptively managed as outlined in Provision B.6, F.1, and F.2, will serve

as BMP-based WQBELs under the following conditions, as outlined in Provision B.3.a:

(1) A Responsible Copermittee requests that the Water Quality Improvement Plan be approved as the basis for compliance in the letter of submittal to the San Diego Water Board;

(2) Reasonable assurance is demonstrated that the strategies and activities in the Water Quality Improvement Plan are expected to attain the final receiving water limitations or final WQBELs under Specific Provision 3.b;

(3) The submitted schedule as outlined in Provision B.3 provides sufficient detail regarding the strategies and activities to be implemented to allow the Regional Board to use the schedule for compliance determination in a clear, specific, measurable, and enforceable manner; AND

(4) The Water Quality Improvement Plan is approved by the Regional Board Executive Officer and is implemented per the approved schedule and adapted pursuant to Provisions B.6, F.1, and F.2.

~~c. Compliance Schedule~~

(5) Final Compliance Date

The Responsible Copermittee must be in compliance with the final receiving water limitations or final WQBELs under Specific Provision 3.b, by December 31, 2021.

(6) Final Compliance Determination

Compliance with final compliance requirements of Specific Provision 3.b.(1) may be demonstrated by a Responsible Copermittee via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 3.b.(1) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of either the applicable numeric or load based effluent limitations under Specific Provision 3.b.(2) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittee can demonstrate that exceedances of the applicable final receiving water limitations under Specific Provision 3.b.(1).a in the receiving water are due to loads from natural sources or non-MS4 sources; OR

(e) The Responsible Copermittee is using its legal authority to reduce nutrient discharges from the land uses identified under Specific Provision 3.b.(2).b to the maximum extent practicable; OR

(f) The Responsible Copermittee has submitted and is fully implementing a Water Quality Improvement Plan that is developed and adaptively managed as outlined in Provisions B, F.1 and F.2, is accepted by the San Diego Water Board, and meets the conditions of Specific Provision 3.b.(3).d.

c. Interim Compliance Requirements

~~(6) Interim Compliance Requirements~~

Interim TMDL compliance requirements consist of the following:

(1) Interim Water Quality Based Effluent Limitations

Discharges from the MS4s must not exceed the interim WQBELs presented in

Table 3.4 by the end of the interim compliance schedule as presented in Table 3.4.

Table 3.4
Interim Effluent Limitations as Annual Loads in MS4 Discharges from Specific Land Uses to Rainbow Creek

	Total N Interim Effluent Limitations (kg/yr)			Total P Interim Effluent Limitations (kg/yr)		
	Interim Compliance Date			Interim Compliance Date		
Land Use	**2009**	**2013**	**2017**	**2009**	**2013**	**2017**
Commercial nurseries	390	299	196	20	16	10
Park	5	3	3	0.15	0.10	0.10
Residential areas	507	390	260	99	74	47
Urban areas	40	27	27	9	6	6

(2) Interim Best Management Practices

(a) The Responsible Copermittee must implement BMPs to support the achievement interim effluent limitations under Specific Provision 3.c.(1).

(b) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with other responsible parties as possible.

(c) For Copermittees utilizing the Water Quality Improvement Plan compliance option, the strategies and activities contained in the Water Quality Improvement Plan accepted by the San Diego Water Board and adaptively managed as outlined in Provision B.6, F.1, and F.2, will serve as BMP-based WQBELs under the following conditions, as outlined in Provision B.3.a:

(1) A Responsible Copermittee requests that the Water Quality Improvement Plan be approved as the basis for compliance with the discharge prohibitions (A.1), receiving water limitations (A.2), and/or effluent limitations (A.3) in the letter of submittal to the San Diego Water Board;

(2) Reasonable assurance is demonstrated that the strategies and activities in the Water Quality Improvement Plan are expected to attain the interim load requirements under Specific Provision 3.c.(1);

(3) The submitted schedule as outlined in Provision B.3 provides sufficient detail regarding the strategies and activities to be implemented to allow the Regional Board to use the schedule for compliance determination in a clear, specific, measurable, and enforceable manner; AND

(4) The Water Quality Improvement Plan is approved by the Regional Board Executive Officer and is implemented per the approved schedule and adapted pursuant to Provisions B.6, F.1, and F.2.

(3) Interim Compliance Determination

Compliance with interim compliance requirements of Specific Provision 3.c may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the applicable final receiving limitations under Specific Provision 3.b.(1) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) The Responsible Copermittee demonstrates applicable interim WQBELs under Specific Provision 3.c.(1) have been achieved; OR

(d) The Responsible Copermittee can demonstrate that exceedances of the applicable final receiving water limitations under Specific Provision 3.b.(1) are due to loads from natural sources or non-MS4 sources; OR

(e) The Responsible Copermittee is using its legal authority to reduce nutrient discharges from the land uses identified under Specific Provision 3.b.(2).(b) to the maximum extent practicable; OR

(f) The Responsible Copermittee has submitted and is fully implementing a Water Quality Improvement Plan, that is developed and adaptively managed as outlined in Provisions B, F.1 and F.2, is accepted by the San Diego Water Board, and meets the conditions of Specific Provision 3.c.(2).c.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

The Responsible Copermittee must implement the Sampling and Analysis Plan for Rainbow Creek Nutrient Reduction TMDL Implementation Water Quality Monitoring, dated January 2010. The results of any monitoring conducted during the reporting period, and assessment of whether the interim and final WQBELs have been achieved must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

~~**e. COMPLIANCE DETERMINATION**~~

~~(1) Compliance with interim compliance requirements of Specific Provision 3.c.(2) may be demonstrated via one of the following methods:~~

~~(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water;~~

~~(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 3.b.(1) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls;~~

~~(c) There are no violations of the applicable effluent limitations under Specific Provision 3.b.(2)(a) at the Responsible Copermittee's MS4 outfalls;~~

~~(d) The pollutant loads from given land uses discharging to and from the MS4s do not exceed the applicable effluent limitations under Specific Provision 3.b.(2)(b); OR~~

~~(e) The Responsible Copermittee has submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim compliance requirements will be achieved by the interim compliance dates.~~

~~(2) Compliance with WQBELs of Specific Provision 3.b may be demonstrated via one of the following methods:~~

~~(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water;~~

~~(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 3.b.(1) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls;~~

~~(c) There are no violations of the applicable effluent limitations under Specific Provision 3.b.(2)(a) at the Responsible Copermittee's MS4 outfalls; OR~~

~~(d) The pollutant loads from given land uses discharging to and from the MS4s do not exceed the applicable effluent limitations under Specific Provision 3.b.(2)(b).~~

4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2007-0043

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2007
State Water Board Approval Date:	July 15, 2008
Office of Administrative Law Approval Date:	October 22, 2008
US EPA Approval Date:	December 18, 2008

(3) TMDL Effective Date: October 22, 2008

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS~~WATER QUALITY BASED EFFLUENT LIMITATIONS~~

~~The WQBELs~~ Final TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the ~~violation~~ exceedance of the following receiving water limitations by the end of the compliance schedule under Specific Provision 4.b.(4)~~c.(1)~~:

Table 4.1
Receiving Water Limitations as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$(0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$(0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$(0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$(0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:

* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER.

(2) Final Water Quality Based Effluent Limitations

In the case that receiving water limitations are exceeded after the end of the compliance schedules under Specific Provision 4.b.(4), ~~Discharges from the MS4s must not contain pollutant loads that exceed the following~~ effluent limitations will be used to determine whether MS4 discharges are causing or contributing to exceedances of receiving water quality limitations. ~~by the end of the compliance schedule under Specific Provision 4.c.(1):~~ To demonstrate MS4 discharges are not causing or contributing to exceedances of receiving water quality limitations, MS4 discharges must meet the concentration-based effluent limitations in Table 4.2.

Table 4.2
Effluent Limitations as Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER.

(3) Final Best Management Practices

(a) The Responsible Copermittees must implement BMPs to support the achievement of the final receiving water limitations or final WQBELs under Specific Provision 4.b.(1) for Chollas Creek.

(b) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans and the U.S. Navy as possible.

(c) For Copermittees utilizing the Water Quality Improvement Plan compliance option, the strategies and activities contained in the Water Quality Improvement Plan accepted by the San Diego Water Board and adaptively managed as outlined in Provision B.6, F.1, and F.2, will serve as BMP-based WQBELs under the following conditions, as outlined in Provision B.3.a:

(1) A Responsible Copermittee requests that the Water Quality Improvement Plan be approved as the basis for compliance with the

discharge prohibitions (A.1), receiving water limitations (A.2), and/or effluent limitations (A.3) in the letter of submittal to the San Diego Water Board;

(2) Reasonable assurance is demonstrated that the strategies and activities in the Water Quality Improvement Plan are expected to attain the final receiving water limitations or final WQBELs under Specific Provision 4.b;

(3) The submitted schedule as outlined in Provision B.3 provides sufficient detail regarding the strategies and activities to be implemented to allow the Regional Board to use the schedule for compliance determination in a clear, specific, measurable, and enforceable manner; AND

(4) The Water Quality Improvement Plan is approved by the Regional Board Executive Officer and is implemented per the approved schedule and adapted pursuant to Provisions B.6, F.1, and F.2.

~~c. COMPLIANCE SCHEDULE~~

(4) Final WLA Compliance Date

The Responsible Copermittees ~~are required to achieve the WLA, thus~~ must be in compliance with the final receiving water limitation or final WQBELs under Specific Provision 4.b, by October 22, 2028.

(5) Final Compliance Determination

Compliance with final compliance requirements of Specific Provision 4.b.(1) may be demonstrated by a Responsible Copermittee via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 4.b.(1) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the applicable effluent limitations under Specific Provision 4.b.(2) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittee can demonstrate that exceedances of the applicable final receiving water limitations under Specific Provision 4.b.(1) in the receiving water are due to loads from natural sources or non-MS4 sources; OR

(e) The Responsible Copermittee has submitted and is fully implementing an Enhanced Water Quality Improvement Plan that is developed and adaptively managed as outlined in Provisions B, F.1 and F.2, is accepted by the San Diego Water Board, and meets the conditions of Specific Provision 4.b.(3).c.

~~d.~~c. INTERIM COMPLIANCE REQUIREMENTS

Interim TMDL compliance requirements consist of the following:

(1) Interim Water Quality Based Effluent Limitations

Discharges from the MS4s must not exceed the interim WQBELs by the interim compliance schedule under Specific Provision 4.c.(3). ~~The Responsible Copermittee must comply with the following interim WQBELs by the interim compliance date:~~

Table 4.3
Interim Effluent Limitations as Concentrations in MS4 Discharges to Chollas Creek

Interim Compliance Date	Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
October 22, 2018	Dissolved Copper	Acute	1.2 x 90% x (0.96) x $e^{[0.9422 \times \ln(\text{hardness}) - 1.700]}$ x WER*	1 hour
		Chronic	1.2 x 90% x (0.96) x $e^{[0.8545 \times \ln(\text{hardness}) - 1.702]}$ x WER*	4 days
	Dissolved Lead	Acute	1.2 x 90% x [1.46203 – 0.145712 x ln(hardness)] x $e^{[1.273 \times \ln(\text{hardness}) - 1.460]}$ x WER*	1 hour
		Chronic	1.2 x 90% x [1.46203 – 0.145712 x ln(hardness)] x $e^{[1.273 \times \ln(\text{hardness}) - 4.705]}$ x WER*	4 days
	Dissolved Zinc	Acute	1.2 x 90% x (0.978) x $e^{[0.8473 \times \ln(\text{hardness}) + 0.884]}$ x WER*	1 hour
		Chronic	1.2 x 90% x (0.986) x $e^{[0.8473 \times \ln(\text{hardness}) + 0.884]}$ x WER*	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER.

(2) Interim Best Management Practices

(a) The Responsible Copermittee must implement BMPs to support the achievement interim effluent limitations under Specific Provision 4.c.(1).

(b) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with other responsible parties as possible.

(c) For Copermittees utilizing the Water Quality Improvement Plan compliance option, the strategies and activities contained in the Water Quality Improvement Plan accepted by the San Diego Water Board and adaptively managed as outlined in Provision B.6, F.1, and F.2, will serve as BMP-based WQBELs under the following conditions, as outlined in Provision B.3.a:

(1) A Responsible Copermittee requests that the Water Quality Improvement Plan be approved as the basis for compliance with the discharge prohibitions (A.1), receiving water limitations (A.2), and/or effluent limitations (A.3) in the letter of submittal to the San Diego Water Board;

(2) Reasonable assurance is demonstrated that the strategies and activities in the Water Quality Improvement Plan are expected to attain the interim WQBELs under Specific Provision 4.c.(1);

(3) The submitted schedule as outlined in Provision B.3 provides sufficient detail regarding the strategies and activities to be implemented to allow the Regional Board to use the schedule for compliance determination in a clear, specific, measurable, and enforceable manner; AND

(4) The Water Quality Improvement Plan is approved by the Regional Board Executive Officer and is implemented per the approved schedule and adapted pursuant to Provisions B.6, F.1, and F.2.

(3) Interim Compliance Date

The Responsible Copermittees must be in compliance with the interim WQBELs under Specific Provision 4.c, by October 22, 2018.

(4) Interim Compliance Determination

Compliance with interim compliance requirements of Specific Provision 4.c may be demonstrated via by a Responsible Copermittee one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the applicable final receiving limitations under Specific Provision 4.b.(1) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) The Responsible Copermittee demonstrates applicable interim WQBELs under Specific Provision 4.c.(1) have been achieved; OR

(d) The Responsible Copermittee can demonstrate that exceedances of the applicable final receiving water limitations under Specific Provision 4.b.(1) are due to loads from natural sources or non-MS4 sources; OR

(e) The Responsible Copermittee has submitted and is fully implementing a Water Quality Improvement Plan, that is developed and adaptively managed as outlined in Provisions B, F.1 and F.2, is accepted by the San Diego Water Board, and meets the conditions of Specific Provision 4.c.(2).c.

~~e.~~d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*, when it is amended to include monitoring requirements for the Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls discharging to Chollas Creek for dissolved copper, lead, and zinc, and calculate or estimate the monthly and annual dissolved copper, lead, and zinc loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2)of this Order. The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

~~f. COMPLIANCE DETERMINATION~~

~~(1) Compliance with interim compliance requirements of Specific Provision 4.c.(2) may be demonstrated via one of the following methods:~~

~~(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;~~

~~(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 4.b.(1) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls;~~

~~(c) There are no violations of the applicable effluent limitations under Specific Provision 4.b.(2) at the Responsible Copermittees' MS4 outfalls; OR~~

~~(d) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim compliance requirements will be achieved by the interim compliance dates.~~

~~(2) Compliance with WQBELs of Specific Provision 4.b may be demonstrated via one of the following methods:~~

~~(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;~~

~~(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 4.b.(1) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR~~

~~(c) There are no violations of the applicable effluent limitations under Specific Provision 4.b.(2) at the Responsible Copermittees' MS4 outfalls.~~

5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2008-0027

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 11, 2008
State Water Board Approval Date:	June 16, 2009
Office of Administrative Law Approval Date:	September 15, 2009
US EPA Approval Date:	October 26, 2009

(3) TMDL Effective Date: September 15, 2009

(4) Watershed Management Areas: See Table 5.0

(5) Water Bodies: See Table 5.0

(6) Responsible Copermittees: See Table 5.0

Table 5.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County	Dana Point Harbor	Baby Beach	-City of Dana Point -County of Orange
San Diego Bay	San Diego Bay	Shelter Island Shoreline Park	- San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS ~~WATER QUALITY BASED EFFLUENT LIMITATIONS~~

~~The WQBELs~~ Final TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Final Receiving Water Limitations

(a) Discharges from the MS4s must not cause or contribute to the ~~violation~~ exceedance of the following receiving water limitations by the end of the compliance schedules under Specific Provisions 5.c.(1)(a)~~(u)~~ and 5.c.(b):

Table 5.1
Receiving Water Limitations as Bacteria Densities in the Water Body

	Receiving Water Limitations	
Constituent	**Single Sample Maximum[1,2]**	**30-Day Geometric Mean[2]**
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.

~~(b) If the above receiving water limitations are not met in the receiving water, the Responsible Copermittees must demonstrate that the discharges from the MS4s are not causing or contributing to the exceedance of receiving water limitations.~~

(2) Final Water Quality Based Effluent Limitations

In the case that receiving water limitations are exceeded after the end of the compliance schedules under Specific Provision 5.b.4, ~~Discharges from the MS4s must not contain densities that exceed the following~~ effluent limitations will be used to determine whether MS4 discharges are causing or contributing to exceedances of receiving water quality limitations. ~~by the end of the compliance schedules under Specific Provisions 5.c.(1)(a) and 5.c.(2) to demonstrate the discharge is not causing or contributing to a violation of receiving water quality standards:~~ To demonstrate MS4 discharges are not causing or contributing to exceedances of receiving water quality limitations, MS4 discharges must meet either the concentration-based effluent limitations in Table 5.2a or the load-based effluent limitations in Table 5.2b.

Table 5.2
Effluent Limitations as Bacteria Densities in MS4 Discharges to the Water Body

Concentration-Based Effluent Limitations		
Constituent	**Single Sample Maximum[1,2]**	**30-Day Geometric Mean[2]**
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.
3. Concentrations shall be determined on a flow-weighted basis across all outfalls within a jurisdiction, not outfall-by-outfall

~~Interim effluent limitations expressed as pollutant loads are given in the compliance schedule under Specific Provision 5.c.~~

Table 5.2b
Effluent Limitations as Allowable Loading Rates for MS4 Discharges to the Water Body

		Load-based Effluent Limitations Expressed as Required % Load Reduction by MS4s					
		Dry Weather			Wet Weather		
Waterbody	Shoreline Segment/Area	Total Coliform	Fecal Coliform	*Entero-coccus*	Total Coliform	Fecal Coliform	*Entero-coccus*
Dana Point Harbor	Baby Beach	90.4% reduction	82.7% reduction	96.2% reduction	0% reduction	0% reduction	62.2% reduction
San Diego Bay	Shelter Island Shoreline Park	0% reduction	0% reduction	0% reduction	0% reduction	0% reduction	0% reduction

(3) Final Best Management Practices

(a) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 5.0 must incorporate the Bacteria Load Reduction Plan (BLRP) required to be developed pursuant to Resolution No. R9-2008-0027.

(b) The Responsible Copermittee must implement BMPs to support the achievement of the final receiving water limitations or final WQBELs under Specific Provision 5.0 for the segments or areas of the water bodies listed in Table 5.0

(c) For Copermittees utilizing the Water Quality Improvement Plan compliance option, the strategies and activities contained in the Water Quality Improvement Plan accepted by the San Diego Water Board and adaptively managed as outlined in Provision B.6, F.1, and F.2, will serve as BMP-based WQBELs under the following conditions, as outlined in Provision B.3.a:

(1) A Responsible Copermittee requests that the Water Quality Improvement Plan be approved as the basis for compliance with the discharge prohibitions (A.1), receiving water limitations (A.2), and/or effluent limitations (A.3) in the letter of submittal to the San Diego Water Board;

(2) Reasonable assurance is demonstrated that the strategies and activities in the Water Quality Improvement Plan are expected to attain the final receiving water limitations or final WQBELs under Specific Provision 5.b;

(3) The submitted schedule as outlined in Provision B.3 provides sufficient detail regarding the strategies and activities to be implemented to allow the Regional Board to use the schedule for compliance determination in a clear, specific, measurable, and enforceable manner; AND

(4) The Water Quality Improvement Plan is approved by the Regional Board Executive Officer and is implemented per the approved schedule and adapted pursuant to Provisions B.6, F.1, and F.2.

~~c. COMPLIANCE SCHEDULE~~

(4) Final Compliance Dates

(a) Baby Beach in Dana Point Harbor

~~(b) WLA Compliance Dates~~

The Responsible Copermittees for MS4 discharges to Baby Beach ~~are~~

~~required to achieve the WLA, thus~~ must be in compliance with the final receiving water limitations or final WQBELs under Specific Provision 5.b~~0,~~ according to the following compliance schedule:

Table 5.3
Compliance Schedule Dates to Achieve Baby Beach WLAs

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform	September 15, 2014	September 15, 2009
Fecal Coliform		September 15, 2009
Enterococcus		September 15, 2019

~~(c) Interim Compliance Requirements~~

~~The Responsible Copermittees for MS4 discharges to Baby Beach must comply with the following interim WQBELs by the interim compliance date:~~

~~**Table 5.4**~~
~~*Interim Effluent Limitations as Loads in MS4 Discharges to Baby Beach*~~

~~Constituent~~	~~Interim Compliance Date~~	~~Dry Weather Interim Effluent Limitation~~	~~Wet Weather Interim Effluent Limitation~~
~~Total Coliform~~	~~September 15, 2012~~	~~$4.93x10^9$ MPN/day~~	~~NA*~~
~~Fecal Coliform~~	~~September 15, 2012~~	~~$0.59x10^9$ MPN/day~~	~~NA*~~
~~*Enterococcus*~~	~~September 15, 2012~~	~~$0.42x10^9$ MPN/day~~	~~NA**~~
	~~September 15, 2016~~	~~NA*~~	~~$207x10^9$ MPN/30days~~

~~Notes:~~
~~* The WQBELs under Specific Provision 5.b must already be achieved by the given interim compliance date.~~
~~** There is no corresponding interim WQBEL for the given interim compliance date.~~

~~(d)~~(b) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park ~~is required to achieve the WLA, thus~~ must be in compliance with the final receiving water limitations or final WQBELs under Specific Provision 5.b~~0~~, by December 31, 2012.

(5) Final Compliance Determination

Compliance with final compliance requirements of Specific Provision 5.b may be demonstrated a Responsible Copermittee via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 5.b.(1) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the applicable effluent limitations under Specific Provision 5.b.(2) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittee can demonstrate that exceedances of the applicable final receiving water limitations under Specific Provision 5.b.(1)(a) in the receiving water are due to loads from natural sources or non-MS4 sources; OR

(e) The Responsible Copermittee has submitted and is fully implementing an Enhanced Water Quality Improvement Plan that is developed and adaptively managed as outlined in Provisions B, F.1 and F.2, is accepted by the San Diego Water Board, and meets the conditions of Specific Provision 5.b.(3).c.

c. Interim Compliance Requirements

Interim TMDL compliance requirements consist of the following:

(1) Interim Water Quality Based Effluent Limitations and Schedule

The Responsible Copermittees for MS4 discharges to Baby Beach must comply with the following interim WQBELs by the interim compliance date:

Table 5.4
Interim Effluent Limitations as Loads in MS4 Discharges to Baby Beach

Constituent	Interim Compliance Date	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	4.93×10^9 MPN/day	NA*
Fecal Coliform	September 15, 2012	0.59×10^9 MPN/day	NA*
Enterococcus	September 15, 2012	0.42×10^9 MPN/day	NA**
	September 15, 2016	NA*	207×10^9 MPN/30days

Notes:
* The WQBELs under Specific Provision 5.b must already be achieved by the given interim compliance date.
** There is no corresponding interim WQBEL for the given interim compliance date.

(2) Interim Best Management Practices

(a) The Water Quality Improvement Plans for the applicable Watershed Management Areas must incorporate the Bacteria Load Reduction Plan (BLRP) required to be developed pursuant to Resolution No. R9-2008-0027.

(b) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans and owners/operators of small MS4s as possible.

(c) For Copermittees utilizing the Water Quality Improvement Plan compliance option, the strategies and activities contained in the Water Quality Improvement Plan accepted by the San Diego Water Board and adaptively managed as outlined in Provision B.6, F.1, and F.2, will serve as BMP-based WQBELs under the following conditions, as outlined in Provision B.3.a:

(1) A Responsible Copermittee requests that the Water Quality Improvement Plan be approved as the basis for compliance with the discharge prohibitions (A.1), receiving water limitations (A.2), and/or effluent limitations (A.3) in the letter of submittal to the San Diego Water Board;

(2) Reasonable assurance is demonstrated that the strategies and activities in the Water Quality Improvement Plan are expected to attain the interim effluent limitations under Specific Provision 5.c.(1);

(3) The submitted schedule as outlined in Provision B.3 provides sufficient detail regarding the strategies and activities to be implemented to allow the Regional Board to use the schedule for compliance determination in a clear, specific, measurable, and enforceable manner; AND

(4) The Water Quality Improvement Plan is approved by the Regional Board Executive Officer and is implemented per the approved schedule and adapted pursuant to Provisions B.6, F.1, and F.2.

(3) Interim Compliance Determination

Compliance with interim compliance requirements of Specific Provision 5.c may be demonstrated by a Responsible Copermittee via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the applicable final receiving limitations under Specific Provision 5.b.(1) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) The Responsible Copermittee demonstrates applicable interim WQBELs under Specific Provision 5.c.(1) have been achieved; OR

(d) The Responsible Copermittee can demonstrate that exceedances of the applicable final receiving water limitations under Specific Provision 5.b.(1) are due to loads from natural sources or non-MS4 sources; OR

(e) The Responsible Copermittee has submitted and is fully implementing a Water Quality Improvement Plan, that is developed and adaptively managed as outlined in Provisions B, F.1 and F.2, is accepted by the San Diego Water Board, and meets the conditions of Specific Provision 5.c.(2).c.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) Monitoring Stations

Monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[35] If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(2) Monitoring Procedures

(a) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) The Responsible Copermittees must collect wet weather monitoring samples within the first 24 hours of the first storm event[36] of the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(c) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs have been achieved.

[35] Commonly referred to as AB 411 monitoring
[36] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(b) The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

~~e. COMPLIANCE DETERMINATION~~

~~(1) Compliance with interim compliance requirements of Specific Provision 5.c.(1)(b) may be demonstrated via one of the following methods:~~

~~(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;~~

~~(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 5.b.(1)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls;~~

~~(c) There are no violations of the applicable effluent limitations under Specific Provision 5.b.(2) at the Responsible Copermittees' MS4 outfalls;~~

~~(d) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the applicable effluent limitations under Specific Provision 5.c.(1)(b);~~

~~(e) The Responsible Copermittees can demonstrate that exceedances of the applicable receiving water limitations under Specific Provision 5.b.(1)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4 are not causing or contributing to the exceedances; OR~~

~~(f) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim compliance requirements will be achieved by the interim compliance dates.~~

~~(2) Compliance with WQBELs of Specific Provision 5.b may be demonstrated via one of the following methods:~~

~~(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;~~

~~(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 5.b.(1)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls;~~

~~(c) There are no violations of the applicable effluent limitations under Specific Provision 5.b.(2) at the Responsible Copermittees' MS4 outfalls;~~

~~(d) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the applicable effluent limitations under Specific Provision 5.c.(1)(b); OR~~

~~(e) The Responsible Copermittees can demonstrate that exceedances of the applicable receiving water limitations under Specific Provision 5.b.(1)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4 are not causing or contributing to the exceedances.~~

6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2010-0001

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 10, 2010
State Water Board Approval Date:	December 14, 2010
Office of Administrative Law Approval Date:	April 4, 2011
US EPA Approval Date:	June 22, 2011

(3) TMDL Effective Date: April 4, 2011

(4) Watershed Management Areas: See Table 6.0

(5) Water Bodies: See Table 6.0; Consistent with Basin Plan Amendment (Resolution No. R9-2010-0001, p. A-2); specific beach segments from some of the Pacific Ocean shorelines listed in Table 6.0 have been delisted from the 2008 (sic 2010) 303(d) list that was approved by the San Diego Board on December 16, 2009, and therefore are not subject to the requirements of Attachment E as long as monitoring data continues to support compliance with water quality standards.

(6) Responsible Copermittees: See Table 6.0

Table 6.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	-City of Laguna Beach -County of Orange -Orange County Flood Control District
		at Heisler Park - North	
	Pacific Ocean Shoreline	at Main Laguna Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Woods -County of Orange -Orange County Flood Control District
		Laguna Beach at Ocean Avenue	
		Laguna Beach at Cleo Street	
		Arch Cove at Bluebird Canyon Road	
		Laguna Beach at Dumond Drive	
	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Hills -City of Laguna Niguel -City of Laguna Woods -City of Lake Forest
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries:	

		- Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	-City of Mission Viejo -County of Orange -Orange County Flood Control District
	Aliso Creek Mouth	at mouth	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County (cont'd)	Pacific Ocean Shoreline	Aliso Beach at West Street	-City of Dana Point -City of Laguna Beach -City of Laguna Niguel -County of Orange -Orange County Flood Control District
		Aliso Beach at Table Rock Drive	
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)	
		at Salt Creek (large outlet)	
		Salt Creek Beach at Salt Creek service road	
		Salt Creek Beach at Strand Road	
	Pacific Ocean Shoreline	at San Juan Creek	-City of Dana Point -City of Laguna Hills -City of Laguna Niguel -City of Mission Viejo -City of Rancho Santa Margarita -City of San Juan Capistrano -County of Orange -Orange County Flood Control District
	San Juan Creek	lower 1 mile	
	San Juan Creek Mouth	at mouth	
	Pacific Ocean Shoreline	at Poche Beach	-City of Dana Point -City of San Clemente -County of Orange -Orange County Flood Control District
		Ole Hanson Beach Club Beach at Pico Drain	
		San Clemente City Beach at El Portal Street Stairs	
		San Clemente City Beach at Mariposa Street	
		San Clemente City Beach at Linda Lane	
		San Clemente City Beach at South Linda Lane	
		San Clemente City Beach at Lifeguard Headquarters	
		under San Clemente Municipal Pier	
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	

		San Clemente State Beach at Riviera Beach	
		Can Clemente State Beach at Cypress Shores	
San Luis Rey River	Pacific Ocean Shoreline	at San Luis Rey River mouth	-City of Oceanside -City of Vista -County of San Diego

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
Carlsbad	Pacific Ocean Shoreline	at Moonlight State Beach	-City of Carlsbad -City of Encinitas -City of Escondido -City of San Marcos -County of San Diego
San Dieguito River	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	-City of Del Mar -City of Escondido -City of Poway -City of San Diego -City of Solana Beach -County of San Diego
Penasquitos	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	-City of Del Mar -City of Poway -City of San Diego -County of San Diego
Mission Bay	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	-City of San Diego
		La Jolla Shores Beach at Caminito del Oro	
		La Jolla Shores Beach at Vallecitos	
		La Jolla Shores Beach at Avenida de la Playa	
		at Casa Beach, Children's Pool	
		South Casa Beach at Coast Boulevard	
		Whispering Sands Beach at Ravina Street	
		Windansea Beach at Vista de la Playa	
		Windansea Beach at Bonair Street	
		Windansea Beach at Playa del Norte	
		Windansea Beach at Palomar Avenue	
		at Tourmaline Surf Park	
		Pacific Beach at Grand Avenue	
	Tecolote Creek	Entire reach and tributaries	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I- Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
San Diego River	Forrester Creek	lower 1 mile	-City of El Cajon -City of Santee -County of San Diego
	San Diego River	lower 6 miles	-City of El Cajon -City of La Mesa -City of San Diego -City of Santee -County of San Diego
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	
San Diego Bay	Chollas Creek	lower 1.2 miles	-City of La Mesa -City of Lemon Grove -City of San Diego -County of San Diego - San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS ~~WATER QUALITY BASED EFFLUENT LIMITATIONS~~

~~The WQBELs~~ Final TMDL compliance requirements for segments or areas of the water bodies listed in Table 6.0 consist of the following:

(1) Receiving Water Limitations

(a) Discharges from the MS4s must not cause or contribute to the exceedance ~~violation~~ of the following receiving water limitations by the end of the compliance schedules under Specific Provision 6.c.(5)~~(1)~~:

Table 6.1
Receiving Water Limitations as Bacteria Densities and Allowable Exceedance Frequencies in the Water Body

	Receiving Water Limitations			
Constituent	Single Sample Maximum[1,2] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[3]	30-Day Geometric Mean[2] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform	10,000	22% / 0%	1,000	0%
Fecal Coliform	400	22% / 0%	200	0%
Enterococcus	104[4] / 61[5]	22% / 0%	35[4] / 33[5]	0%

Notes:
1. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
3. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. The 0% single sample maximum allowable exceedance frequency applies to dry weather days.
4. This *Enterococcus* receiving water limitation applies to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
5. This *Enterococcus* receiving water limitations applies to segments or areas of creeks or creek mouths listed in Table 6.0.

~~Interim receiving water limitations expressed as allowable exceedance frequencies are given in the compliance schedule under Specific Provision 6.c.~~

(b) If the above receiving water limitations are not met in the receiving water, the Responsible Copermittees must demonstrate that the discharges from the MS4s are not causing or contributing to the exceedance ~~violation~~ of receiving water limitations. The Copermittee must provide data that demonstrate the discharges from the MS4s are meeting the effluent limitations under Specific Provision 6.b.(2).

(2) Final Water Quality Based Effluent Limitations

In the case that receiving water limitations are exceeded after the end of the compliance schedules under Specific Provision 6.b.5, ~~Discharges from the MS4s must not contain densities that exceed the following~~ effluent limitations will be used to determine whether MS4 discharges are causing or contributing to exceedances of receiving water quality limitations. ~~by the end of the compliance schedules under Specific Provision 6.c.(1) to demonstrate the discharge is not causing or contributing to a violation of receiving water quality standards:~~ To demonstrate MS4 the discharges are not causing or contributing to a exceedance of receiving water quality limitations, MS4 discharges must meet either the concentration-based effluent limitations in Table 6.2a or the load-based effluent limitations in Table 6.2b.

~~**Table 6.2**~~
Table 6.2a
Effluent Limitations as Bacteria Densities and Allowable Exceedance Frequencies in MS4 Discharges to the Water Body

	Concentration-based Effluent Limitations[6]			
Constituent	**Single Sample Maximum[1,2] (MPN/100mL)**	**Single Sample Maximum Allowable Exceedance Frequency[3]**	**30-Day Geometric Mean[2] (MPN/100mL)**	**30-Day Geometric Mean Allowable Exceedance Frequency**
Total Coliform	10,000	22% / 0%	1,000	0%
Fecal Coliform	400	22% / 0%	200	0%
Enterococcus	104[4] / 61[5]	22% / 0%	35[4] / 33[5]	0%

Notes:
1. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.
3. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. The 0% single sample maximum allowable exceedance frequency applies to dry weather days
4. This *Enterococcus* effluent limitation and all total coliform limitations ~~applies~~ apply only to MS4 discharges to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
5. This *Enterococcus* effluent limitation applies only to MS4 discharges to segments or areas of creeks or creek mouths listed in Table 6.0.
6. Concentrations shall be determined on a flow-weighted basis across all outfalls within a jurisdiction, not outfall-by-outfall.

~~Interim effluent limitations expressed as allowable exceedance frequencies are given in the compliance schedule under Specific Provision 6.c.~~

Table 6.2b
Effluent Limitations as Allowable Loading Rates for MS4 Discharges to the Water Body

Watershed	Load-based Effluent Limitations Expressed as Required % Load Reduction by MS4s					
	Dry Weather			Wet Weather		
	Total Coliform	Fecal Coliform	*Entero-coccus*	Total Coliform	Fecal Coliform	*Entero-coccus*
San Joaquin Hills/ Laguna Hills HSAs (901.11 and 901.12)	91.78%	91.72%	98.28%	46.85%	52.07%	51.26
Aliso HSA (901.13)	95.47%	95.58%	99.13%	25.29%	26.62%	27.52%
Dana Point HSA (901.14)	95.04%	95.03%	98.98%	13.15%	14.86%	15.16%
Lower San Juan HSA (901.27)	72.96%	74.21%	94.94%	19.21%	12.82%	27.12%
San Clemente HA (901.30)	94.28%	94.23%	98.83%	23.85%	24.58%	25.26%
San Luis Rey HU (903.00)	38.13%	39.09%	87.38%	5.62%	3.12%	11.69%
San Marcos HA (904.50)	82.82%	82.55%	96.03%	18.47%	18.98%	20.19%
San Dieguito HU (905.00)	14.39%	20.72%	83.48%	4.29%	1.46%	7.72%
Miramar Reservoir HA (906.10)	96.50%	96.59%	99.42%	1.61%	1.99%	1.93%
Scripps HA (906.30)	96.44%	96.42%	99.25%	16.32%	21.14%	18.82%
Tecolote HA (906.5)	94.51%	94.59%	98.94%	16.51%	20.47%	18.15%
Mission San Diego/ Santee HSAs (907.11 and 907.12)	74.03%	69.44%	93.96%	38.14%	53.22%	42.74%
Chollas HSA (908.22)	92.06%	92.15%	98.46%	17.82%	24.84%	21.26%

(3) Best Management Practices

(a) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 6.0 must incorporate the Comprehensive Load Reduction Plans (CLRPs) required to be developed pursuant to Resolution No. R9-2010-0001. For segments or areas in Table 6.0 that have been delisted from the Clean Water Act Section 303(d) List of Water Quality Limited Segments, a CLRP is not required.

(b) The Responsible Copermittee must implement BMPs to support the achievement of the final receiving water limitations or final WQBELs under Specific Provision 6.b for the segments or areas of the water bodies listed in Table 6.0.

(c) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans and owners/operators of small MS4s as possible.

(d) For Copermittees utilizing the Water Quality Improvement Plan compliance option, the strategies and activities contained in the Water Quality Improvement Plan accepted by the San Diego Water Board and adaptively managed as outlined in Provision B.6, F.1, and F.2, will serve as BMP-based WQBELs under the following conditions, as outlined in Provision B.3.a:

(1) A Responsible Copermittee requests that the Water Quality Improvement Plan be approved as the basis for compliance with the discharge prohibitions (A.1), receiving water limitations (A.2), and/or effluent limitations (A.3) in the letter of submittal to the San Diego Water Board;

(2) Reasonable assurance is demonstrated that the strategies and activities in the Water Quality Improvement Plan are expected to attain the final receiving water limitations or final WQBELs under Specific Provision 6.b;

(3) The submitted schedule as outlined in Provision B.3 provides sufficient detail regarding the strategies and activities to be implemented to allow the Regional Board to use the schedule for compliance determination in a clear, specific, measurable, and enforceable manner; AND

(4) The Water Quality Improvement Plan is approved by the Regional Board Executive Officer and is implemented per the approved schedule and adapted pursuant to Provisions B.6, F.1, and F.2.

~~c. COMPLIANCE SCHEDULE~~

(1) ~~WLA~~ Compliance Dates

The Responsible Copermittees for MS4 discharges to a segment or area of the water bodies listed in Table 6.0 are required to achieve the WLA, thus must be in compliance with the WQBELs under Specific Provision 6.b, according to the following compliance schedule:

Table 6.3

Compliance Schedule Dates to Achieve Indicator Bacteria WLAs

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform*	April 4, 2021	April 4, 2031
Fecal Coliform		
Enterococcus		

* Total coliform receiving water limitations only apply to segments or areas of Pacific Ocean Shoreline listed in Table 6.0.

(5) Final Compliance Determination

Compliance with final compliance requirements of Specific Provision 6.b may be demonstrated by a Responsible Copermittee via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water;

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 6.b.(1) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls;

(c) There are no exceedances of the applicable effluent limitations under Specific Provision 6.b.(2) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittee can demonstrate that exceedances of the applicable final receiving water limitations under Specific Provision 6.b.(1)(a) in the receiving water are due to loads from natural sources or non-MS4 sources; OR

(e) The Responsible Copermittee has submitted and is fully implementing a Water Quality Improvement Plan that is developed and adaptively managed as outlined in Provisions B, F.1 and F.2, is accepted by the San Diego Water Board, and meets the conditions of Specific Provision 6.b.(3).d.

~~d.~~c. INTERIM COMPLIANCE REQUIREMENTS

Interim TMDL compliance requirements for segments or areas of the water bodies listed in Table 6.0 consist of the following:

~~The Responsible Copermittees must comply with the following interim WQBELs by the interim compliance dates:~~

(1) Interim Dry Weather Receiving Water Limitations

The Responsible Copermittee must calculate the “existing” exceedance frequencies of the 30-day geometric mean water quality objectives for each of the indicator bacteria by analyzing the available monitoring data

collected between January 1, 1996 and December 31, 2002. "Existing" exceedance frequencies may be calculated by segment or area of a water body, or by water body, and/or by Watershed Management Area listed in Table 6.0. Separate "existing" exceedance frequencies must be calculated for beaches and creeks/creek mouths.

The Responsible Copermittees must achieve a 50 percent reduction in the "existing" exceedance frequency of the 30-day geometric mean WQBELs for the segments or areas of the water bodies listed in Table 6.0 by the interim compliance dates for achieving the interim dry weather WQBELs given in Table 6.5. A 50 percent reduction in the "existing" exceedance frequency is equivalent to half of the "existing" exceedance frequency of the 30-day geometric mean WQBELs.

The "existing" exceedance frequencies and the interim dry weather allowable exceedance frequencies (i.e. interim dry weather WQBELs) calculated by the Responsible Copermittees must be included in the Water Quality Improvement Plans for the applicable Watershed Management Areas.

(2) Interim Wet Weather Receiving Water Limitations

The Responsible Copermittees must achieve the interim wet weather receiving water limitations in Table 6.4, expressed as interim allowable exceedance frequencies, by the interim compliance dates for achieving the interim wet weather WQBELs given in Table 6.5.

Table 6.4
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	38%	37%	39%
		at Heisler Park - North			
	Pacific Ocean Shoreline	at Main Laguna Beach			
		Laguna Beach at Ocean Avenue			
		Laguna Beach at Cleo Street			
		Arch Cove at Bluebird Canyon Road			
		Laguna Beach at Dumond Drive			
	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	41%	41%	42%
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	41%	41%	42%
	Aliso Creek Mouth	at mouth	41%	41%	42%
	Pacific Ocean Shoreline	Aliso Beach at West Street	36%	36%	36%
		Aliso Beach at Table Rock Drive			
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)			
		at Salt Creek (large outlet)			
		Salt Creek Beach at Salt Creek service road			
		Salt Creek Beach at Strand Road			

Table 6.4 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County (cont'd)	Pacific Ocean Shoreline	at San Juan Creek	44%	44%	48%
	San Juan Creek	lower 1 mile	44%	44%	47%
	San Juan Creek Mouth	at mouth	44%	44%	47%
	Pacific Ocean Shoreline	at Poche Beach	35%	35%	36%
		Ole Hanson Beach Club Beach at Pico Drain			
		San Clemente City Beach at El Portal Street Stairs			
		San Clemente City Beach at Mariposa Street			
		San Clemente City Beach at Linda Lane			
		San Clemente City Beach at South Linda Lane			
		San Clemente City Beach at Lifeguard Headquarters			
		under San Clemente Municipal Pier			
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)			
		San Clemente State Beach at Riviera Beach			
		Can Clemente State Beach at Cypress Shores			
San Luis Rey River	Pacific Ocean Shoreline	at San Luis Rey River mouth	45%	44%	47%
Carlsbad	Pacific Ocean Shoreline	at Moonlight State Beach	40%	40%	41%
San Dieguito River	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	33%	33%	36%

Table 6.4 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
Penasquitos	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	26%	26%	26%
Mission Bay	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	37%	37%	37%
		La Jolla Shores Beach at Caminito del Oro			
		La Jolla Shores Beach at Vallecitos			
		La Jolla Shores Beach at Avenida de la Playa			
		at Casa Beach, Children's Pool			
		South Casa Beach at Coast Boulevard			
		Whispering Sands Beach at Ravina Street			
		Windansea Beach at Vista de la Playa			
		Windansea Beach at Bonair Street			
		Windansea Beach at Playa del Norte			
		Windansea Beach at Palomar Avenue			
		at Tourmaline Surf Park			
		Pacific Beach at Grand Avenue			
	Tecolote Creek	Entire reach and tributaries	49%	49%	51%
San Diego River	Forrester Creek	lower 1 mile	46%	43%	49%
	San Diego River	lower 6 miles	46%	43%	49%
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	46%	43%	51%
San Diego Bay	Chollas Creek	lower 1.2 miles	41%	41%	43%

(3) Interim Water Quality Based Effluent Limitations

In the case that interim receiving water limitations are exceeded after the end of the interim compliance schedules under Specific Provision 6.c.5, interim effluent limitations, expressed as required MS4 load reductions, will be used to determine whether MS4 discharges are causing or contributing to exceedances of interim receiving water quality limitations. To demonstrate MS4 the discharges are not causing or contributing to a exceedance of receiving water quality limitations, MS4 discharges must meet the required MS4 load reductions in Table 6.5.

Table 6.5
Interim Effluent Limitations as Allowable Loading Rates for MS4 Discharges to the Water Body

	Interim Effluent Limitations Expressed as Required % Load Reduction by MS4s					
	Dry Weather			Wet Weather		
Watershed	Total Coliform	Fecal Coliform	*Entero-coccus*	Total Coliform	Fecal Coliform	*Entero-coccus*
San Joaquin Hills/ Laguna Hills HSAs (901.11 and 901.12)	45.89%	45.86%	49.14%	23.43%	26.04%	25.63%
Aliso HSA (901.13)	47.74%	47.79%	49.57%	12.65%	13.31%	13.76%
Dana Point HSA (901.14)	47.52%	47.52%	49.49%	6.58%	7.43%	7.58%
Lower San Juan HSA (901.27)	36.48%	37.11%	47.47%	9.61%	6.41%	13.56%
San Clemente HA (901.30)	47.14%	47.12%	49.42%	11.93%	12.29%	12.63%
San Luis Rey HU (903.00)	19.07%	19.55%	43.69%	2.81%	1.56%	5.85%
San Marcos HA (904.50)	41.41%	41.28%	48.02%	9.24%	9.49%	10.10%
San Dieguito HU (905.00)	7.20%	10.36%	41.74%	2.15%	0.73%	3.86%
Miramar Reservoir HA (906.10)	48.25%	48.30%	49.71%	0.81%	1.00%	0.97%
Scripps HA (906.30)	48.22%	48.21%	49.63%	8.16%	10.57%	9.41%
Tecolote HA (906.5)	47.26%	47.30%	49.47%	8.26%	10.24%	9.08%
Mission San Diego/ Santee HSAs (907.11 and 907.12)	37.02%	34.72%	46.98%	19.07%	26.61%	21.37%

Chollas HSA (908.22)	92.06%	92.15%	98.46%	17.82%	24.84%	21.26%

(4) Interim Best Management Practices

(a) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 6.0 must incorporate the Comprehensive Load Reduction Plans (CLRPs) required to be developed pursuant to Resolution No. R9-2010-0001. For segments or areas in Table 6.0 that have been delisted from the Clean Water Act Section 303(d) List of Water Quality Limited Segments, a CLRP is not required.

(b) The Responsible Copermittee must implement BMPs to support the achievement interim receiving water limitations under Specific Provision 6.c.(1) and 6.c.(2) for the segments or areas of the water bodies listed in Table 6.0.

(c) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans and owners/operators of small MS4s as possible.

(d) For Copermittees utilizing the Water Quality Improvement Plan compliance option, the strategies and activities contained in the Water Quality Improvement Plan accepted by the San Diego Water Board and adaptively managed as outlined in Provision B.6, F.1, and F.2, will serve as BMP-based WQBELs under the following conditions, as outlined in Provision B.3.a:

(1) A Responsible Copermittee requests that the Water Quality Improvement Plan be approved as the basis for compliance with the discharge prohibitions (A.1), receiving water limitations (A.2), and/or effluent limitations (A.3) in the letter of submittal to the San Diego Water Board;

(2) Reasonable assurance is demonstrated that the strategies and activities in the Water Quality Improvement Plan are expected to attain the interim receiving water limitations under Specific Provision 6.c.(1) and 6.c.(2) or interim load reduction requirements under Specific Provision 6.c.(3);

(3) The submitted schedule as outlined in Provision B.3 provides sufficient detail regarding the strategies and activities to be implemented to allow the Regional Board to use the schedule for compliance determination in a clear, specific, measurable, and enforceable manner; AND

(4) The Water Quality Improvement Plan is approved by the Regional Board Executive Officer and is implemented per the approved schedule and adapted pursuant to Provisions B.6, F.1, and F.2.

~~(3)~~(5) Interim Compliance Dates

The Responsible Copermittees must achieve the interim receiving water limitations under Specific Provisions 6.c.(2)(1) and 6.c.(~~2~~3)~~(b)~~ or the interim WQBELs under Specific Provisions 6.c.(3) by the interim compliance dates given in Table 6.~~5~~6 unless alternative interim compliance dates are provided in a Comprehensive Load Reduction Plan or Water Quality Improvement Plan accepted by the San Diego Regional Board Executive Officer.

Table 6.5
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs
South Orange County	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	April 4, 2016	April 4, 2021
		at Heisler Park - North		
	Pacific Ocean Shoreline	at Main Laguna Beach	April 4, 2016	April 4, 2021
		Laguna Beach at Ocean Avenue		
		Laguna Beach at Cleo Street		
		Arch Cove at Bluebird Canyon Road		
		Laguna Beach at Dumond Drive		
	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	April 4, 2016	April 4, 2021
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	April 4, 2018	April 4, 2021
	Aliso Creek Mouth	at mouth	April 4, 2018	April 4, 2021
	Pacific Ocean Shoreline	Aliso Beach at West Street	April 4, 2016	April 4, 2021
		Aliso Beach at Table Rock Drive		
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)		
		at Salt Creek (large outlet)		
		Salt Creek Beach at Salt Creek service road	April 4, 2017	April 4, 2021

		Salt Creek Beach at Strand Road	April 4, 2017	April 4, 2021

Table 6.5 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs
South Orange County (cont'd)	Pacific Ocean Shoreline	at San Juan Creek	April 4, 2016	April 4, 2021
	San Juan Creek	lower 1 mile	April 4, 2018	April 4, 2021
	San Juan Creek Mouth	at mouth	April 4, 2016	April 4, 2021
	Pacific Ocean Shoreline	at Poche Beach	April 4, 2016	April 4, 2021
		Ole Hanson Beach Club Beach at Pico Drain	April 4, 2016	April 4, 2021
		San Clemente City Beach at El Portal Street Stairs	April 4, 2017	April 4, 2021
		San Clemente City Beach at Mariposa Street		
		San Clemente City Beach at Linda Lane	April 4, 2016	April 4, 2021
		San Clemente City Beach at South Linda Lane	April 4, 2018	April 4, 2021
		San Clemente City Beach at Lifeguard Headquarters	April 4, 2017	April 4, 2021
		under San Clemente Municipal Pier		
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	April 4, 2018	April 4, 2021
		San Clemente State Beach at Riviera Beach	April 4, 2016	April 4, 2021
		Can Clemente State Beach at Cypress Shores	April 4, 2017	April 4, 2021
San Luis Rey River	Pacific Ocean Shoreline	at San Luis Rey River mouth	April 4, 2017	April 4, 2021
Carlsbad	Pacific Ocean Shoreline	at Moonlight State Beach	April 4, 2016	April 4, 2021
San Dieguito River	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	April 4, 2016	April 4, 2021

Table 6.5 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs
Penasquitos	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	April 4, 2016	April 4, 2021
Mission Bay	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	April 4, 2016	April 4, 2021
		La Jolla Shores Beach at Caminito del Oro		
		La Jolla Shores Beach at Vallecitos		
		La Jolla Shores Beach at Avenida de la Playa		
		at Casa Beach, Children's Pool		
		South Casa Beach at Coast Boulevard		
		Whispering Sands Beach at Ravina Street		
		Windansea Beach at Vista de la Playa		
		Windansea Beach at Bonair Street		
		Windansea Beach at Playa del Norte		
		Windansea Beach at Palomar Avenue		
		at Tourmaline Surf Park		
		Pacific Beach at Grand Avenue		
	Tecolote Creek	Entire reach and tributaries		
San Diego River	Forrester Creek	lower 1 mile	April 4, 2018	April 4, 2021
	San Diego River	lower 6 miles		
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach		
San Diego Bay	Chollas Creek	lower 1.2 miles	April 4, 2018	April 4, 2021

(6) Interim Compliance Determination

Compliance with interim compliance requirements of Specific Provision 6.c may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water;

(b) There are no exceedances of the applicable interim receiving water limitations under Specific Provision 6.c.(1) and 6.c.(2) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls;

(c) The Responsible Copermittee demonstrates applicable interim WQBELs

under Specific Provision 6.c.(3) have been achieved;

(d) The Responsible Copermittee can demonstrate that exceedances of the applicable interim receiving water limitations under Specific Provision 6.c.(1) and 6.c.(2) in the receiving water are due to loads from natural sources or non-MS4 sources; OR

(e) The Responsible Copermittee has submitted and is fully implementing a Water Quality Improvement Plan, that is developed and adaptively managed as outlined in Provisions B, F.1 and F.2, is accepted by the San Diego Water Board, and meets the conditions of Specific Provision 6.c.(4).d.

~~e.~~d. **SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS**

(1) Monitoring and Assessment Requirements for Beaches

(a) Monitoring Stations

For beaches addressed by the TMDL, monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[37] If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations at least once

[37] Commonly referred to as AB 411 monitoring

within the first 24 hours of the first storm event[38] of the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer in exceedance of the allowable exceedance frequencies in the receiving waters.

(iii) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs for the Pacific Ocean Shoreline segments or areas listed in Table 6.0 have been achieved.

(ii) The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

(2) Monitoring and Assessment Requirements for Creeks and Creek Mouths

(a) Monitoring Stations

For creeks addressed by the TMDL, monitoring locations should consist of, at a minimum, a location at or near the mouth of the creek (e.g. Mass Loading Station or Mass Emission Station) and one or more locations upstream of the mouth (e.g. Watershed Assessment Station). If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

[38] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations in accordance with the requirements of Provision D.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations within the first 24 hours of the first storm event[39] of the rainy season (i.e. October 1 through April 30).

(iii) Samples collected from receiving water monitoring stations must be analyzed for fecal coliform and *Enterococcus* indicator bacteria.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the receiving water monitoring data to assess whether the interim and final receiving water WQBELs for the creeks and creek mouths listed in Table 6.0 have been achieved.

(ii) The Responsible Copermittee must identify and incorporate additional MS4 outfall and receiving water monitoring stations and/or adjust monitoring frequencies to identify sources causing exceedances of the receiving water WQBELs.

(iii) The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

~~**f. COMPLIANCE DETERMINATION**~~

~~(1) Compliance with interim compliance requirements of Specific Provision 6.c.(2) may be demonstrated via one of the following methods:~~

~~(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;~~

~~(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 6.b.(1) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls;~~

~~(c) There are no violations of the applicable effluent limitations under Specific Provision 6.b.(2) at the Responsible Copermittees' MS4 outfalls;~~

[39] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)]. If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event shall be equal to the results from that one sample. If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all the wet weather days not sampled shall be equal to the highest bacteria density result reported from samples collected. The exceedance frequency shall be calculated by dividing the number of wet weather days that exceed the single sample maximum REC-1 WQOs by the total number of wet weather days during the rainy season.

~~(d) There are no exceedances of the applicable interim receiving water limitations under Specific Provision 6.c.(2) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls;~~

~~(e) The Responsible Copermittees can demonstrate that exceedances of the applicable interim or final receiving water limitations under Specific Provision 6.b.(1)(a) or 6.c.(2) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4 are not causing or contributing to the exceedances; OR~~

~~(f) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim compliance requirements will be achieved by the interim compliance dates.~~

~~(2) Compliance with WQBELs of Specific Provision 6.b may be demonstrated via one of the following methods:~~

~~(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;~~

~~(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 6.b.(1) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls;~~

~~(c) There are no violations of the applicable effluent limitations under Specific Provision 6.b.(2) at the Responsible Copermittees' MS4 outfalls; OR~~

~~(d) The Responsible Copermittees can demonstrate that exceedances of the applicable final receiving water limitations under Specific Provision 6.b.(1)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4 are not causing or contributing to the exceedances.~~

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SAN DIEGO COPERMITTEE COMMENTS ON TENTATIVE ORDER NO. R9-2013-0001				
Permit Section	Tentative Order Page	Section Title	Reason for Proposed Changes/Comments	Proposed Changes
General Comment	Multiple	Multiple	The term "prohibit" is broader than Clean Water Act requirements, and should be changed to "effectively prohibit." CWA Provision 402(p) (3) (B) (ii) reads as follows: (B) Municipal Discharge – Permits for discharges from municipal storm sewers – (ii) shall include a requirement to effectively prohibit non-stormwater discharges into the storm sewer; (Emphasis added) The provision does not provide any reference to exemptions. Rather the Provision may be read that a permit shall "effectively prohibit non-stormwater discharges" but may exempt certain discharges that are not significant sources of pollutants from the prohibition. The Provision does not require a full prohibition but rather an effective prohibition. The operative word is "effective". The more precise and correct finding/provision should note that non-stormwater discharges are effectively prohibited (per 402 (p) (3) (B) (ii)). However discharges that are not significant sources of pollutants are exempted from the prohibition. In a practical sense the use of word "effective" provides flexibility to assess the impacts of relatively benign discharges such as landscape irrigation, air condition condensate, individual car washing, and non-emergency fire fighting flows or non-anthropogenic sources before instituting a prohibition.	Revise "prohibit" to "effectively prohibit" throughout the Permit when referring to non-storm water discharges.

SAN DIEGO COPERMITTEE COMMENTS ON TENTATIVE ORDER NO. R9-2013-0001				
Permit Section	Tentative Order Page	Section Title	Reason for Proposed Changes/Comments	Proposed Changes
I. FINDINGS				
3 and throughout, as applicable	1	CWA NPDES Permit Conditions		Remove the following term in Finding 3 and throughout, as provided in the Strikeout: "~~storm water~~"
8	3	Point Source Discharges of Pollutants	Discharges may contain waste or pollutants, but it should not be presumed that they necessarily always contain waste or pollutants. In addition, it is inappropriate to consider all storm water and non-storm water discharges point source discharges.	Revise the text as follows: "Discharges from the MS4s may contain waste, as defined in the CWC, and pollutants that adversely affect the quality of the waters of the state. A discharge from an MS4 is a "discharge of pollutants from a point source" into waters of the U.S. as defined in the CWA. Storm water and non-storm water discharges from the MS4s may contain pollutants that cause or threaten to cause a violation of surface water quality standards, as outlined in the ~~Water Quality Control Plan for the San Diego Basin (~~Basin Plan~~)~~. ~~Storm water and non-storm water discharges from the MS4s are subject to the conditions and requirements established in the Basin Plan for point source discharges.~~ "
11	4	Runoff Discharges to Receiving Waters	Finding 11 is inconsistent with the definition of the MS4 in 40 C.F.R. 122.26, which does not include natural rivers and streams: "(8) *Municipal separate storm sewer* means a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management	Revise the text as follows: "11. Runoff Discharges to Receiving Waters. The MS4s discharge runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within the eleven hydrologic units comprising the San Diego Region. Historic and current development makes use of natural drainage patterns and features as conveyances for runoff. ~~Rivers, streams and creeks in developed areas used in this manner are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and receiving water.~~ Numerous receiving water bodies and water body segments have been designated as impaired by the San

SAN DIEGO COPERMITTEE COMMENTS ON TENTATIVE ORDER NO. R9-2013-0001				
Permit Section	Tentative Order Page	Section Title	Reason for Proposed Changes/Comments	Proposed Changes
			agency under Provision 208 of the CWA that discharges to waters of the United States; (ii) Designed or used for collecting or conveying storm water; (iii) Which is not a combined sewer; and (iv) Which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.2.	Diego Water Board pursuant to CWA Provision 303(d)."
15	5	Non-Storm Water and Storm Water Discharges	This is a legal argument that is contrary to the plain language of the statute, which specifically states that 'Permits for discharges from municipal storm sewers… shall require controls to reduce the discharge of pollutants to the maximum extent practicable…"402(p)(3)(B)(iii). The maximum extent practicable standard applies to storm water and non-storm water discharges.	Revise the text as follows: "~~Non-storm water discharges from the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard of CWA section 402(p)(3)(B)(iii), which is explicitly for Municipal… *Stormwater Discharges* (emphasis added)" from the MS4s.~~ Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s must be effectively prohibited. "Permits for discharges from municipal storm sewers shall require controls to reduce the discharge of pollutants to the maximum extent practicable…" 402(p)(3)(B)(iii)."
27	8	Integrated Report and Clean Water Act Section 303(d) List.		Revise the last paragraph as follows: "Implementation of the requirements of this Order will ~~may~~ allow the San Diego Water Board to include surface waters impaired by discharges from the Copermittees' MS4s in Category 4 in the Integrated Report for consideration during the next 303(d) List submittal by the State to USEPA."
29	9	Unfunded Mandates	Finding 29 states that the Order does not constitute an unfunded mandate under Article XIIIB, Section 6 of the California Constitution. This finding has no legal effect because the Regional Board does not have jurisdiction to determine what is a state mandate, and therefore should be deleted. The Commission on State Mandates, the agency with exclusive jurisdiction over state mandate claims, determined that multiple requirements in the 2007 San Diego MS4 Permit were unfunded state mandates. This case is currently on appeal before the Third Appellate	Delete Finding 29.

SAN DIEGO COPERMITTEE COMMENTS ON TENTATIVE ORDER NO. R9-2013-0001				
Permit Section	Tentative Order Page	Section Title	Reason for Proposed Changes/Comments	Proposed Changes
			District (Case No. C070357). Like the 2007 Permit, the Tentative Order exceeds the requirements of federal law, and the Copermittees reserve their right to challenge permit provisions exceeding federal law in the appropriate forum.	
II. PROVISIONS				
A. Prohibitions and Limitations				
A	13	Prohibitions and Limitations	The proposed Prohibitions and Limitation provisions may be construed as stand-alone provisions that could expose the Copermittees to state and federal enforcement actions, as well as to third party actions under the federal Clean Water Act's citizen suit provisions. Consistent with the recent 9th Circuit Court of Appeal decision (NRDC v. LA County), each provision of the permit could be read separately so if provision A.2.a states that "the MS4 must not cause or contribute to a violations of a water quality standard" then that is the stand-alone provision, and the accompanying language found in A.4 (Compliance with Discharge Prohibitions) regarding compliance may be considered irrelevant. As such, a clear linkage between the compliance provisions and the prohibitions, receiving water limitations, and effluent limitations must be established.	Insert the following sentence at the end of the introductory paragraph of Provision A: "The process for determination of compliance with the Discharge Prohibitions (A.1), Receiving Water Limitations (A.2), and Effluent Limitations (A.3) is defined in Provision A.4."
A.1.a (and throughout, as applicable)	13	Discharge Prohibitions	Provision A.1.a prohibits certain discharges into waters of the state. NPDES permits under the authority of the Clean Water Act regulate discharges into navigable (surface) waters. Expanding the scope of the Discharge Prohibitions to waters of the state would expand the scope of the Permit to protect groundwater. This exceeds federal requirements and would represent an unfunded mandate. Other MS4 permits in California, including the Los Angeles County MS4 permit, protect "waters of the United States."	Throughout the Permit, change "waters of the state" to "waters of the United States", where applicable (and throughout the Tentative Order). Revise the text as follows: "…in receiving waters of the US ~~state~~ are effectively prohibited…"

SAN DIEGO COPERMITTEE COMMENTS ON TENTATIVE ORDER NO. R9-2013-0001				
Permit Section	Tentative Order Page	Section Title	Reason for Proposed Changes/Comments	Proposed Changes
A.1.a A.1.c A.2.a	13 13 13	Prohibitions and Limitations	The Discharge Prohibitions do not establish a sufficient linkage with approved compliance schedules for TMDLs that have been incorporated into the Basin Plan. TMDLs adopted within the region include a schedule to provide MS4 Copermittees the time necessary to develop and implement a plan to achieve water quality standards in impaired waters. The compliance schedules for effective TMDLs have been incorporated into Attachment E, but these schedules are not included in Provision A.1 or A.2. By not referencing TMDL schedules, these provisions could result in violations of the permit even though the implementation compliance dates have not yet passed. Without modification, the Discharge Prohibitions *conflict* with TMDL compliance schedules. Language should be included to clarify that in instances where a TMDL is in place, or a TMDL is being developed, the Copermittees shall achieve compliance with these provisions as outlined in Attachment E (Specific Provisions for Total Maximum Daily Loads).	Revise A.1.a, A.1.c, and A.2.a by adding the following onto the end of each provision: "…, <u>unless such discharges are addressed by the Copermittee(s) through Provision A.1.d, A.3.b or A.4."</u>
A.3.a, footnote 5	15	Technology Based Effluent Limitations	See comment for Finding 15.	Revise text as follows: "This does not apply to MS4 discharges which receive subsequent treatment to reduce pollutants in ~~storm water~~ discharges to the MEP…"
A.4	15	Compliance with Discharge Prohibition and Receiving Water Limitations	The Copermittees envision Water Quality Improvement Plans as the foundation for a compliance approach for the Discharge Prohibitions, RWLs, and Effluent Limitations. However, the language in Provision A does not clearly link compliance with the iterative process set forth in the Water Quality Improvement Plans. The Water Quality Improvement Plans should provide an optional mechanism to "raise the bar" with regards to the detail and quantitative analyses used to identify pollutant sources, implement BMPs to address those sources, and increase the number or size of BMPs until water quality standards are attained. However, as Provision A.4 is written, the envisioned	Revise the text as follows: "Each Copermittee must achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order through timely implementation of <u>strategies,</u> control measures and other actions as specified in Provisions B and E of this Order, including any modifications. The Water Quality Improvement Plans required under Provision B must be designed and adapted to ultimately achieve compliance with Provisions A.1.a, A.1.c, and A.2.a, <u>and may be used for compliance determination as described in Provision B.3.a.(3).</u>

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			strategic compliance process falls short, and the Water Quality Improvement Plans do not have a meaningful linkage to Permit compliance. An unintended but significant consequence of this compliance uncertainty is that Copermittees will be faced with increased difficulty securing program funding because even substantial increases in funding would not eliminate the potential for non-compliance. The proposed approach for incorporating Water Quality Improvement Plan-based compliance option into the Permit is described in comments on Provision B.3.a.(3).	
A.4.a.(2)	15	Compliance with Discharge Prohibitions and Receiving Water Limitations	The Water Quality Improvement Plan should be responsive to new pollutants of concern if they are persistently exceeding standards and not be tied to a reactionary commitment based on a one time exceedance of a water quality objective.	Revise first sentence of Provision A.4.a.(2) as follows: "Upon a determination by either the Copermittees or the San Diego Water Board that discharges from the MS4 are causing or contributing to ~~a new~~ persistent indications of an exceedance…"
A.4.a.(2)	15	Compliance with Discharge Prohibitions and Receiving Water Limitations	See comment A.4.	Add new Provision A.4.a.(2)(c) as follows: "(c)For Copermittees who are implementing an Water Quality Improvement Plan pursuant to Provision B.2, the updated Water Quality Improvement Plan should provide reasonable assurance the updated strategies are expected to address the new exceedance(s)."
A.4.c	16	Compliance with Discharge Prohibitions and Receiving Water Limitations		Remove Provision A.4.c.
B. Water Quality Improvement Plans				
B	17	Water Quality Improvement Plans	The Copermittees request a revision to the Water Quality Improvement Plan goal statement. A concise goal statement that is more central to MS4 permitting is requested. This goal statement provides context to several	Revise the goal statement in the second sentence as follows: The goal of the Water Quality Improvement Plans is to

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			requested revisions to subsequent provisions.	~~protect, preserve, enhance,~~ 1) effectively prohibit non-storm water discharges into the MS4s, 2) reduce pollutants in discharges from the MS4s to the MEP, and ~~restore the~~ 3) support the attainment and reasonable protection, preservation, and enhancement of water quality and designated beneficial uses of waters of the state. This goal will be accomplished through an adaptive planning and management process that identifies the highest priority water quality conditions within a watershed and implements strategies through the jurisdictional runoff management programs to achieve improvements in the quality of discharges from the MS4s and receiving waters.
B	17	Water Quality Improvement Plans	The Copermittees request the Regional Board use Water Quality Improvement Plans to fully integrate watershed planning, BMP implementation, and Permit compliance determination and have proposed an approach for Water Quality Improvement Plans to form the basis for compliance as described in the comment below regarding the addition of a new subsection to B.3. Additional language is requested in the opening paragraph to Provision B to provide a linkage to the proposed revision to Provision B.3.	Add the following sentence at the end of the first paragraph in Provision B: Therefore, implementation of the Water Quality Improvement Plans also provides the basis for complying with Provisions A.1, A.2 and A.3, as described in Provision B.3.a.(3).
B.1	17	Watershed Management Areas	Allow Riverside County Copermittees to enroll and for a full watershed scale public process in the development of the Water Quality Improvement Plan for the Santa Margarita River Watershed.	Add an additional paragraph to B.1 that reads: "Development of the Water Quality Improvement Plan for the Santa Margarita River Watershed Management Area shall commence upon notification of coverage of the Riverside County Copermittees under this Order. Until this time, the County of San Diego shall use the water quality priorities in the Santa Margarita River Watershed Urban Runoff Management Plan, developed pursuant to Order No. R9-2007-0001, to guide implementation of Provisions D and E within its jurisdiction."
B.2.d.(1)(e) and B.2.d.(3)	21-22	Identification of MS4 Sources of	The Copermittees do not have jurisdiction to control MS4 discharges outside of their respective MS4s.	Delete Provisions B.2.d.(1)(e) and B.2.d(3).

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		Pollutants and/or Stressors		
B.2.e	23	Numeric Goals and Schedules	The requirement that "Final dates for achieving final numeric goals must not initially extend more than 10 years..." may be broadly misinterpreted as currently written with major implications. Based on conversations with Regional Board staff, it is understood that goals can take a number of forms and the "10 year" requirement is not intended as a requirement to attain all Basin Plan water quality standards within 10 years. However, to ensure this requirement is not misinterpreted by third parties, language should be added to make this clarification.	Add a footnote Provision B.2.e., as follows: "Achievement of final numeric goals within 10 years represents progress towards attainment of water quality standards, but is not a requirement to fully attain all applicable water quality standards or all priority receiving water conditions within 10 years." Revise text as follows: "… Numeric goals must be used to support Water Quality Improvement Plan implementation and measure progress towards addressing the highest priority water quality conditions identified under Provision B.2.c. Numeric goals are not enforceable compliance standards, effluent limitations, or receiving water limitations."…
B.3	24	Water Quality Improvement Strategies		Revise the text as follows: "…by ~~preventing or eliminating~~ effectively prohibiting non-storm water discharges to ~~and from~~ the MS4, reducing pollutants in ~~storm water~~ discharges from the MS4 to the MEP…"
B.3.a.	24	Water Quality Improvement Strategies and Schedules	The Copermittees request the Regional Board use Water Quality Improvement Plans to fully integrate watershed planning, BMP implementation, and Permit compliance determination. The Copermittees propose an optional compliance mechanism that Copermittees could chose to follow. To follow this optional path the Water Quality Improvement Plans would be required to demonstrate via a scientific analyses that the number and type of strategies and	To incorporate an option for Water Quality Improvement Plan-based compliance, add a new Provision "B.3.a.(3)" as follows: (3) Copermittees may elect to develop their Water Quality Improvement Plan to serve as an iterative, implementation-based compliance mechanism for the discharge prohibitions (A.1), receiving water limitations (A.2), and effluent limitations (A.3). To utilize the Water

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			activities to be implemented will attain discharge prohibitions, receiving water limitations, and effluent limitations. The analyses would be detailed in an optional *Reasonable Assurance Analysis*. The types of analyses that would be included a Reasonable Assurance Analysis – including efforts to quantify stormwater pollutant fate and transport and strategy/activity effectiveness – are beyond conventional stormwater planning efforts, and thus the Reasonable Assurance Analysis should be optional and not required. In order to qualify for the Water Quality Improvement Plan-based compliance mechanism, a Water Quality Improvement Plan would be [1] developed using rigorous, quantitative analyses to provide reasonable assurance that BMPs are expected to attain water quality standards and [2] sufficiently detailed in terms of the strategies and activities that will be implemented so that an quantitative analysis can be conducted. The proposed approach would allow the Regional Board to measure compliance in a clear, specific, measurable, and enforceable manner. In order to a Copermittee to qualify for the optional, Water Quality Improvement Plan-based compliance mechanism, the Copermittee would be required to [1] notify the Regional Board of its intent to pursue the optional compliance mechanism, [2] submit a *Reasonable Assurance Analysis*, , and [3] provide a sufficiently detailed implementation schedule.	Quality Improvement Plan-based compliance option, Copermittees shall conduct a Reasonable Assurance Analysis. The objective of the Reasonable Assurance Analysis shall be to demonstrate the strategies and activities of the Water Quality Improvement Plan will ultimately result in attainment of the discharge prohibitions (A.1), receiving water limitations (A.2), and effluent limitations (A.3). In order for a Copermittee to utilize the Water Quality Improvement Plan-based compliance option, the Regional Board Executive Officer must determine the following conditions are met: (1) The Copermittee requests that the Water Quality Improvement Plan be approved as the basis for compliance with the discharge prohibitions (A.1), receiving water limitations (A.2), and/or effluent limitations (A.3) in the letter of submittal to the San Diego Water Board as described in Provision F.1.(a); AND (2) The submitted Water Quality Improvement Plan includes a Reasonable Assurance Analysis that demonstrates that the strategies and activities in the Water Quality Improvement Plan will attain the applicable discharge prohibitions (A.1), receiving water limitations (A.2), and/or effluent limitations (A.3); AND (3) The submitted Water Quality Improvement Plan includes a schedule as outlined in Provision B.3.b that provides sufficient detail regarding the strategies and activities to be implemented to allow the Regional Board to use the schedule for compliance determination in a clear, specific, measurable, and enforceable

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				manner. If a Water Quality Improvement Plan-based compliance option is approved by the Regional Board Executive Officer, then in instances when the discharge prohibitions (A.1), receiving water limitations (A.2), and/or effluent limitations (A.3) are not met, the implementation of the strategies and activities contained in the Water Quality Improvement Plan will be used for determination of compliance with Provision A. That is, any determination of a Copermittee's compliance with Provision A shall be based on the following conditions: (1) The strategies and activities of the Water Quality Improvement Plan are implemented per the approved schedule outlined pursuant to Provision B.3.b and adapted pursuant to Provisions B.5, F.1, and F.2; AND (2) If exceedances persist notwithstanding implementations of the strategies and activities in the approved Water Quality Improvement Plan, then Responsible Copermittees revise the Water Quality Improvement Plan pursuant to Provision A.4.a, and implement the revised Water Quality Improvement Plan including additional or alternative activities per the schedule submitted with the revised Water Quality Improvement Plan. For cases when applicable discharge prohibitions (A.1), receiving water limitations (A.2), or effluent limitations (A.3) are not attained during the time period between a Copermittee's notification of intent to utilize a Water Quality Improvement Plan-based compliance option, pursuant to Provision F.1.(a), and Regional Board Executive Officer approval of the submitted Water Quality

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				Improvement Plan, determination of a Copermittee's compliance with Provision A shall be based on the following conditions: (1) All deadlines for development of a Water Quality Improvement Plan pursuant to Provision F.1.(a) and (b) are met; AND (2) The Water Quality Improvement Plan ultimately receives final approval.
B.5.a	25	Re-Evaluation of Priority Water Quality Conditions	The proposed revisions to Provision B.5 are intended to add a link with jurisdictional implementation efforts and to clarify receiving water conditions.	Revise first paragraph of B.5.a. as follows: "The priority receiving water quality conditions, and numeric goals and corresponding schedules, included…"
B.5.b.(2)	27	Adaptation of Strategies and Schedules		Revise the text as follows: "…reductions of non-storm water discharges to ~~and from~~ each Copermittee's MS4…"
B.5.b.(3)	27	Adaptation of Strategies and Schedules	See comment for Finding 15.	Revise the text as follows: "…reductions of pollutants in ~~storm water~~ discharges from each Copermittee's MS4…"
C. Action Levels				
C.1, footnote 7	28	Non-Storm Water Action Levels	Clarify that NALs are not enforceable compliance points.	Revise text as follows: "NALs are not considered ~~by the San Diego Water Board~~ to be enforceable limitations.
C.1.a C.1.b C.2.a C.2.b	28 30 31 32	Action Levels	The Draft Order in Provision B states that the goal of the Water Quality Improvement Plan is to identify the highest water quality priorities within a watershed and implement strategies to achieve improvements in the quality of discharge and receiving waters. Furthermore in Provision B.2.d the Copermittees are required to develop and use *interim and final numeric targets/goals* to measure progress towards the protection/enhancement of the receiving waters and beneficial uses. The choice of the target/goals of the watershed may be biological, chemical, or physical based	Revise the following Provisions, as indicated: C.1.a:"The following NALs must be incorporated, if the Copermittees do not establish numeric action levels within the Water Quality Improvement Plan based on watershed priorities: " C.1.b: "~~If not identified in Provision C.1.a~~, NALs must be identified, developed, and incorporated in the Water

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			and may include multiple criteria and/or indicators. The permit now provides a clear linkage between Provision B and Provision C and states that the Water Quality Improvement Plan should guide the customization of the NALs/SALs to meet the highest water quality priorities in a given watershed and that NALs/SALs will be used to assist Copermittees in reaching the goals specified in the Water Quality Improvement Plan. Although action levels will be used for several different purposes, the action levels defined in Provision C.1.a and C. 2.a are chemically based and may be in conflict with the selected watershed metrics. As an example, if the watershed metric is improved IBI scores for a water body, then NALs and SALs associated with water chemistry are unlikely to be the best metric to evaluate progress towards improving IBI scores or for assessing our implementation efforts. Thus, the chemically based NALs/SALs may direct resources away from the watershed priorities. Since Provision C indicates that there are three different purposes for the action levels, the permit should recognize that the action levels for each permit provision (B.4, D.4.a, and/or E.2) may be based on different constituents, metrics, and/or may be different values. A revision of the language in C.1.a and C.2.a stating that Tables C-1 to C-5 are only applicable if the Copermittees do not establish numeric action levels to support the Water Quality Improvement Plan would allow for the determination of appropriate numeric NALs and SALs per the intent of each permit provision.	Quality Improvement Plans…." C.2.a: "The following SALs for discharges of storm water from the MS4 must be incorporated, <u>if the Copermittees do not establish numeric action levels within the Water Quality Improvement Plan based on watershed priorities:</u> " C.2.b: "~~If not identified in Provision C.1.a~~, SALs must be identified, developed, and incorporated in the Water Quality Improvement Plans…."
C.1.a.(2) Table C-3	29	Non-Storm Water Action Levels	Refer to the California Toxics Rule (CTR) instead of including equations in the notes of Table C-3. The note to the table incorrectly sets the chronic CTR standard (Criterion Continuous Concentration; CCC) as both the	Revise the Table C-3 Notes as follows: * Action levels developed on a case-by-case basis (see below)

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			monthly average (AMAL) and daily maximum (MDAL) NALs. However, the acute CTR standard (Criterion Maximum Concentration; CMC) should be used instead of the chronic standard for the daily maximum. Another important reason to include the equations by reference is that the equations in the notes of Table C-3 also do not take into account that in some cases a site-specific water effects ratio may apply, which is considered in and allowed by the California Toxics Rule.	** Action levels developed on a case-by-case basis (see below), but calculated criteria are not to exceed Maximum Contaminant Levels (MCLs) under the California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Provision 64431 The Cadmium, Copper, Chromium (III), Lead, Nickel, Silver and Zinc NALs for MS4 discharges to freshwater receiving waters will be developed on a case-by-case basis because the freshwater criteria are based on site-specific water quality data (receiving water hardness). For these priority pollutants, refer to ~~the following~~ 40 CFR 131.38.b.2 for details.~~) will be required:~~ ~~Cadmium (Total Recoverable) = exp(0.7852[ln(hardness)] - 2.715)~~ ~~Chromium III (Total Recoverable) = exp(0.8190[ln(hardness)] + 0.6848)~~ ~~Copper (Total Recoverable) = exp(0.8545[ln(hardness)] - 1.702)~~ ~~Lead (Total Recoverable) = exp(1.273[ln(hardness)] - 4.705)~~ ~~Nickel (Total Recoverable) = exp(.8460[ln(hardness)] + 0.0584)~~ ~~Silver (Total Recoverable) = exp(1.72[ln(hardness)] - 6.52)~~ ~~Zinc (Total Recoverable) = exp(0.8473[ln(hardness)] + 0.884)~~
C.2, footnote 9	31	Storm Water Action Levels	Clarify that SALs are not enforceable compliance points.	Revise text as follows: "SALs are not considered ~~by the San Diego Water Board~~ to be enforceable limitations.
D. Monitoring and Assessment Requirements				
D.1	33	Receiving Water	About one year of lead time is needed to plan and secure	The Copermittees must develop and conduct a program to

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		Monitoring Requirements	the resources and contracting mechanisms to conduct monitoring programs. If the Order is adopted on March 1, 2013, then the Water Quality Improvement Plan would be submitted to the Regional Board by September 2014. The Water Quality Improvement Plan could be accepted by the Regional Board as early as 60 days after submittal (by November 2014) and as late as 6 months after submittal (by February 2015). Budgeting for the next fiscal year usually begins in October. Without an approved Water Quality Improvement Plan, it will be difficult to plan and secure the necessary funding. Therefore, to accommodate budgeting cycles, transitional monitoring should be required until the implementation monitoring schedule proposed in the Water Quality Improvement Plan is approved. Allowing this flexibility will allow time for the necessary resources to be secured by the WMA. Moreover, individual Water Quality Improvement Plans may likely be adopted at different times by the Regional Board and incorporating the implementation schedule of monitoring within the Water Quality Improvement Plan will increase the efficiency of the process.	monitor the condition of the receiving waters in each Watershed Management Area during dry weather and wet weather. Following acceptance of the Water Quality Improvement Plans and schedule for implementation of monitoring for each Watershed Management Area, the Copermittees must conduct long-term receiving water monitoring during implementation of the Water Quality Improvement Plan to assess the long term trends and determine if conditions in receiving waters are improving. This change is incorporated in *Proposed Changes* to Provision D below:
D.1.a	33	Transitional Receiving Water Monitoring	See comment D.1	Until the monitoring requirements and implementation schedule for monitoring of Provisions D.1.b-e are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following receiving water monitoring in the Watershed Management Area:
D.1.a.(1)	33	Transitional Receiving Water Monitoring	The Copermittees request removal of Coastal Storm Drain Monitoring Program from Transient Receiving Monitoring. The San Diego Copermittees' Report of Waste Discharge (2011) demonstrated a limited relationship (less than 2 %) between receiving water concentrations/exceedances and storm drain concentrations/exceedances in dry weather. Duplicative Effort - Many storm drain outfalls/receiving waters will be monitored as part of the Bacteria TMDL or the	Revise Provision D.1.a.(1) as follows: (1) Continue the receiving water monitoring programs required in Orders Nos. R9-2007-0001 (Attachment A, Provision II. A. 1-5), R9-2009-0002, and R9-2010-0016;

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			transient MS4 Outfall Program in D.2.a.(2).	
D.2	42	MS4 Outfall Discharge Monitoring Requirements	See comment D.1.	Revise Provision D.2. as follows: "The Copermittees must develop and conduct a program to monitor the discharges from the MS4 outfalls in each Watershed Management Area during dry weather and wet weather. Following acceptance of the Water Quality Improvement Plans and schedule for implementation of monitoring for each Watershed Management Area…"
D.2.a	42	Transitional MS4 Outfall Discharge Monitoring	See comment D.1.	Revise Provision D.2.a. as follows: "Until the monitoring requirements and schedule for implementation of monitoring of Provisions D.2.b-c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1
D.2.a.(2)	43	Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring	See comment D.1.	Revise Provision D.2.a.(2) as follows: "Until the monitoring requirements and the monitoring implementation schedule described in ~~of~~ Provision D.2.b are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1…"
D.2.a.(2)(a)	43-44	Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Frequency	To clarify that the maximum number of outfall inspections required annually per Copermittee is 500, per the limit on the number of major MS4 outfalls for field screening specified in CFR40CFR$122.26(d)(2)(iv)(D)(6) - "in large municipal separate storm sewer systems, no more than 500 cells need to have identified field screening points"	Revise Provision D.2.a.(2)(a) as follows: (a) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Frequency Each Copermittee must field screen the MS4 outfalls in its inventory developed pursuant to Provision D.2.a.(1) as follows: (i) For Copermittees with less than 125 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 80 percent of the outfalls must be visually inspected two times per year during dry weather conditions. For Copermittees with jurisdiction in more than one WMA, this requirement is limited to 500 inspections annually per Provision D.2.a.(2)(a)(iv).

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				(ii) For Copermittees with 125 major MS4 outfalls or more, but less than or equal to 500, that discharge to receiving waters within a Watershed Management Area all the outfalls must be visually inspected at least annually during dry weather conditions. For Copermittees with jurisdiction in more than one WMA, this requirement is limited to 500 inspections annually per Provision D.2.a.(2)(a)(iv). (iii) For Copermittees with more than 500 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 500 outfalls must be visually inspected at least annually during dry weather conditions. Copermittees with more than 500 major MS4 outfalls within a Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following: [a] Assessment of connectivity of the discharge to a flowing receiving water; [b] Reported exceedances of NALs in water quality monitoring data; [c] Surrounding land uses; [d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA Provision 303(d) List; and [e] Flow rate. For Copermittees with jurisdiction in more than one WMA, this requirement is limited to 500 inspections annually, per Provision D.2.a.(2)(a)(iv).
D.2.a.(3)	45	Transitional Wet Weather MS4 Outfall Discharge Monitoring	See D.1	Revise Provision D.2.a.(3) as follows: "Until the monitoring requirements and the monitoring implementation schedule described in ~~of~~ Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1…"
D.2.a.(3)(a)	46	Transitional Wet	Reduce the number of transitional wet weather MS4 outfall	Add an additional paragraph to D.2.a.(3)(a) that reads:

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		Weather MS4 Outfall Discharge Monitoring Stations	discharge monitoring stations for the Santa Margarita River Watershed Management Area to be proportional to the area of the watershed within the County of San Diego until such time the County of Riverside Copermittees are notified of coverage. After such time, the number of wet weather MS4 outfall discharge monitoring stations will be increased to five (5) as defined in D.2.(3).(a).	"The County of San Diego shall select at least two (2) transitional wet weather MS4 outfall discharge monitoring stations for the portion of the Santa Margarita River Watershed Management Area within its jurisdiction until the Riverside Copermittees are enrolled under this Order. After the Riverside Copermittees are enrolled, the Watershed Management Area Copermittees shall select at least five (5) transitional wet weather MS4 outfall discharge monitoring stations consistent with the requirements above."
D.2.a.(3)(b)	46	Transitional Wet Weather MS4 Outfall Discharge Monitoring Frequency	Reduce the frequency of sampling from annual to once during the 2-year transition period, because San Diego Copermittees have already satisfied the intent of this provision to provide baseline MS4 data. The 2007 Permit MS4 program will be completed in 2013 and characterizes baseline MS4 conditions through a statistically robust random sampling program (over 160 samples collected to date), in addition to targeted monitoring at selected sites. Collectively, the San Diego Copermittees also have performed storm event composite sampling for more than 150 wet weather MS4 discharge events to derive event mean concentrations and estimate the loading from single family residential, commercial and industrial land uses. The current First flush requirement skews the data set towards very early season conditions. Need samples representing a broader range of conditions to produce more representative data to better characterize seasonal/hydrological variation, and produce more accurate loading estimates. Logistically difficult to get equipment and personnel ready/available to monitor all sites in any one event. Propose minimum 10% of samples be First Flush, with at least one per WMA.	Revise Provision D.2.a.(3)(b) as follows: (b) Transitional Wet Weather MS4 Outfall Discharge Monitoring Frequency Each wet weather MS4 outfall discharge monitoring station selected pursuant to Provision D.2.a.(3)(a) must be monitored twice during the wet season (October 1 – April 30) in the transitional period. ~~One~~ The wet weather monitoring events shall be selected to be representative of the range of hydrological conditions experienced in the region. At least 10% of samples must be conducted during the first wet weather event of the wet season, to include at least one such sample in each Watershed Management Area~~, and one wet weather monitoring event at least a month after the first wet weather event of the wet season.~~

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D.2.b.(2)(b)(i)	49	Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring Frequency	The tentative order currently requires monitoring twice annually of at least 10 MS4 outfalls per WMA in which a jurisdiction is present; this adds up to 322 outfalls at one time across the region. The current requirement, as written, would significantly restrict available resources to follow-up on the top priorities - particularly in mid-size jurisdictions. The analytical requirements twice a year for mid-size cities would cost significantly more than the current dry weather program. Jurisdictions vary in size, population and thus number of major MS4 outfalls. Our recommendation is for an equitable approach: Assume 5 (unless a jurisdiction has less than 5) instead of 10 per jurisdiction within each WMA in which a jurisdiction is present. The total then equals 172 outfalls regionally instead of 322 (we proposed 69 on Sept 14th).	Revise Provision D.2.b.(2)(b)(i) as follows: "Based on the prioritization of major MS4 outfalls developed under Provision D.2.b.(2)(a), each Copermittee must identify, at a minimum, the ~~10~~ 5 highest priority major MS4 outfalls with non-storm water persistent flows that the Copermittee will monitor within each Watershed Management Area within its jurisdiction. If a Copermittee has less than 5 major outfalls within a WMA, the Copermittee shall monitor all of its major outfalls with persistent flows within that WMA."
D.2.b.(2)(e)(iii)	51	Non-Storm Water Persistent Flow MS4 Outfall Discharge Analytical Monitoring	Allow increased flexibility to developers of the Water Quality Improvement Plans to determine the appropriate analytes necessary to track and eliminate the prioritized persistent flows for specific Watershed Management Areas. Increase efficiency by increasing flexibility of analytical requirements in D.2.b & Table D-8 (p. 51): • Allow flexibility in Water Quality Improvement Plan to focus analytical testing and • After initial identification of issue, allow analytical testing reduced to key pollutants that exceed WQOs and aid in source abatement	Revise Provision D.2.b.(2)(e)(iii) as follows: (iii) During development of the Water Quality Improvement Plan, for each WMA, consider the following sources to select constituents for ~~C~~ collection of grab or composite samples to be analyzed ~~for the following constituents~~ at a qualified analytical laboratory: [a] Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan, [b] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA Provision 303(d) List, [c] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, [d] Applicable NAL constituents, and [e] Constituents listed in Table D-8~~, unless the~~ (iv) Copermittees may adjust the analytical list for a given WMA in successive monitoring events ~~has~~ to add or

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				eliminate constituents based on ~~historical~~ data that can demonstrate or provide justification ~~that~~ regarding the need or lack of need for analysis of ~~the~~ specific constituents ~~is not necessary~~. (~~i~~v) If the Copermittee identifies and eliminates the source of the persistent flow non-storm water discharge, analysis of the sample is not required.
D.2.c	52	Wet Weather MS4 Outfall Discharge Monitoring	Outfall monitoring is generally not an efficient or effective way of identifying sources of pollutants within urban watersheds. Source identification will be undertaken in the context of Special Studies (Provision D.3), as directed by the Water Quality Improvement Plan strategies to address specific issues in WMAs. The outfall monitoring data will be used to help design those strategies.	Revise Provision D.2.c. as follows: "c. Wet Weather MS4 Outfall Discharge Monitoring The Copermittees must perform wet weather MS4 outfall monitoring to identify ~~sources of~~ pollutants in storm water discharges from the MS4s in the Watershed Management Area, and provide information to help guide source identification efforts. The Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area: (1) Wet Weather MS4 Outfall Discharge Monitoring Stations The Copermittees may adjust the wet weather MS4 outfall discharge monitoring locations and frequencies in the Watershed Management Area, as needed, to identify ~~sources of~~ pollutants in storm water discharges from MS4s in the Watershed Management Area in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of stations is at least equivalent to the number of stations required under Provision D.2.a.(3)(a). (2) Wet Weather MS4 Outfall Discharge Monitoring Frequency The Copermittees must monitor the wet weather MS4 outfall discharge monitoring stations in the Watershed Management Area at an appropriate frequency to identify ~~sources of~~ pollutants in storm water discharges from the MS4s causing or contributing to the highest priority water quality conditions identified in the Water Quality

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				Improvement Plan."
D.3.a D.3.d	54 55	Special Studies	Special studies are typically multi-year efforts, requiring planning, funding approval/allocation, implementation, and analysis. Allow for special studies to be counted that are *initiated* during the current permit term as well as under the new permit term. Otherwise, unexpected delays (e.g., due to fire storms, etc.) could result in permit noncompliance. Flexibility is needed to maintain scientific rigor of studies and to accommodate variation in hydrological conditions, etc… Several Special Studies are currently ongoing. Planning and schedule for implementation of new Special Studies will be included within each Water Quality Improvement Plan, subject to RWQCB approval. In addition, the Copermittees request the number of Special Studies be reduced from 3 to 2 per WMA and from 2 to 1 for Regional Studies in consideration of the planning period required to develop the Monitoring and Assessment Plan required as part of the Water Quality Improvement Plan.	Revise Provision D.3.a.as follows: "a. Within the term of this Order, the Copermittees must ~~develop and implement~~ initiate the following special studies: (1) At least two ~~three~~ special studies in each Watershed Management Area to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that cause or contribute to highest priority water quality conditions identified in the Water Quality Improvement Plan. (2) At least one ~~two~~ special study~~ies~~ for the San Diego Region to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that are impacting receiving waters on a regional basis in the San Diego Region. (3) One of the two t~~hree~~ special studies in each Watershed Management Area may be replaced by a special study implemented pursuant to Provision D.3.a.(2)…" Revise Provision D.2.d. as follows: "d. Special studies initiated prior to the ~~acceptance of the Water Quality Improvement Plan~~ term of this Order that meet the requirements of Provision D.3.b and are ~~completed~~ implemented during the term of this Order may be utilized to fulfill the special study requirements of Provision D.3.a. "

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D.4	56-63	Assessment Requirements	Assuming that the overall purpose is to assess progress in reducing concentrations and loads of pollutants in runoff, the issue is that *annual* assessments of progress in load reductions won't provide useful information and will divert resources from program implementation, the high variability of water quality data and relatively small annual changes in loading and quality (≤10%) can't be overcome with reasonable numbers of samples. A longer assessment term is needed for meaningful analysis.	See proposed changes below.
D.4.b.(1)(a)(ii)	57	Non-Storm Water Discharges Reduction Assessments	Need to ensure timing for reporting will be compatible with completion of assessment.	Revise Provision D.4.b.(1)(a)(ii) as follows: "(ii) Based on the data collected pursuant to Provisions D.2.b, the assessments required under Provision D.4.b.(1)(c) must be included when complete in the ~~first~~ Annual Report required pursuant to Provision F.3.b.(1), and annually thereafter. "

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D.4.b.(1)(c)(iv)	58	Non-Storm Water Discharges Reduction Assessments	Proposed Dry Weather method for calculation of jurisdictional loads: extrapolate from monitored major MS4 outfalls with persistent flows to remainder of major MS4 outfalls with persistent flows collectively for each jurisdiction in each WMA.	Revise Provision D.4.b.(1)(c)(iv) as follows: "(iv) Each Copermittee must analyze the data collected pursuant to Provision D.2.b, and utilize a model or other method, to calculate or estimate the non-storm water volumes and pollutant loads collectively discharged from all the major MS4s outfalls in its jurisdiction identified as having persistent dry weather flows during the monitoring year. These calculations or estimates must be updated annually. [a] Each Copermittee must calculate or estimate: ~~[a]~~ Annual non-storm water volumes and pollutant loads collectively discharged from the Copermittee's major MS4 outfalls to receiving waters within the Copermittee's jurisdiction~~, with an estimate of the percent contribution from each known and suspected source for each MS4 outfall~~; [b] Each Copermittee must ~~Annual non-storm water volumes and pollutant loads~~ identify and quantify, where feasible, sources of non-stormwater flows ~~from areas or facilities subject to~~ not subject to the Copermittee's legal authority that are discharged from the Copermittee's major MS4 outfalls to downstream receiving waters."
D.4.b.(1)(c)(v)	58	Non-Storm Water Discharges Reduction Assessments	Loads will be calculated annually per previous comment, but strategic assessments should not be required more than once per permit term.	Revise Provision D.4.b.(1)(c)(v) as follows: "(v) Each Copermittee must review the data collected pursuant to Provision D.2.b and findings from the assessments required pursuant to Provision D.4.b.(1)(c)(i)-(iv) ~~on an annual basis~~ once per Permit term to:"
D.4.b.(2)(a)(ii)	59	Storm Water Pollutant Discharges Reduction Assessments	Need to ensure timing for reporting will be compatible with completion of assessment. Very important also to reference specifically the assessments that will occur annually (only D.4.b.(c)(i) and (ii)).	Revise Provision D.4.b.(2)(a)(ii) as follows: "(ii) Based on the data collected pursuant to Provision~~s~~ D.2.c., the assessments required under Provisions D.4.b.(2)(c)(i) and (ii) must be included when complete in the ~~first~~ Annual Report required pursuant to Provision F.3.b.(1), and annually thereafter."

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D.4.b.(2)(b)	59	Storm Water Pollutant Discharges Reduction Assessments	Proposed Wet Weather method for calculation of jurisdictional loads: extrapolate from monitored major MS4 outfalls to area-wide discharge from jurisdictional area within each WMA. Do not extrapolate wet weather data to individual (non-monitored) outfalls, as this is not technically supportable. The proposed method is a more effective means of establishing jurisdictional accountability. Per discussion with RWQCB staff, have consolidated calculation requirements in proposed language, given the added area-based jurisdictional computational approach.	Revise Provision D.4.b.(2)(b) as follows: "(b) Based on the transitional wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.a.(3) the Copermittees must assess and report the following: (i) ~~The Copermittees must a~~Analyze the monitoring data collected pursuant to Provision D.2.a.(3), and utilize a watershed model or other method, to calculate or estimate storm water volumes and pollutant loads discharged from the MS4s in each Copermittee's jurisdiction within the Watershed Management Area. The Copermittees must calculate or estimate the following for each monitoring year: [a] The average storm water runoff coefficient for each land use type within the Watershed Management Area; [b] The volume of storm water and pollutant loads discharged from each of the Copermittee's ~~major~~ monitored MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch; ~~[c] The pollutant loads discharged from each of the Copermittee's major MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch; and~~
				~~[d] The percent contribution of storm water volumes and pollutant loads discharged from each land use type within the drainage basin to each of the Copermittee's major MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch.~~

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				[c] The total flow volume and pollutant loadings discharged from the Copermittee's jurisdiction within the Watershed Management Area over the course of the wet season, extrapolated from the data produced from the monitored outfalls. (ii) Identify modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify ~~sources~~ pollutants in storm water discharges from the MS4s in the Watershed Management Area pursuant to Provision D.2.c.(1)."
D.4.b.(2)(c)	60	Storm Water Pollutant Discharges Reduction Assessments	(c)(ii): Clarify connection to improvement of strategies and Water Quality Improvement Plans in Provision B, and eliminate technically-infeasible ranking of outfalls based on extrapolated wet weather data. (c)(iii): Loads will be calculated annually per previous comment, but strategic assessments should not be required more than once per permit term.	Revise Provision D.4.b.(2)(c) as follows: (c) Based on the wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.c the Copermittees must assess and report the following: (i) The assessments required pursuant to Provision D.4.b.(2)(b); (ii) Based on the data collected and applicable SALs in the Water Quality Improvement Plan, analyze and compare the monitoring data to the analyses and assumptions used to develop the Water Quality Improvement Plans, including strategies developed per Provision B.3, and evaluate whether those analyses and assumptions should be updated as a component of the adaptive management efforts under Provision B.5, ~~rank the MS4 outfalls in the Watershed Management Area according to potential threat to receiving water quality, and produce a prioritized list of major MS4 outfalls~~ for follow-up action to update the Water Quality Improvement Plan; (iii) The Copermittees must review the data collected pursuant to Provision D.2.c and findings from the assessments required pursuant to Provisions D.4.b.(2)(c)(i)-(ii) ~~on an annual basis~~ once per Permit term to:

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D.4.d.(2)	62	Integrated Assessment of Water Quality Improvement Plan	The integrated assessment should be based on more than one year of data, and strategic assessments should not be required more than once per permit term. Information will be shared among monitoring personnel and stormwater program managers on an ongoing basis, and monitoring data will be used to assess program needs and data gaps annually per prior provisions (c.f., Provisions D.4.b.(c)(i) and (ii), with proposed revisions above). This information will then be used in adopting annual budgets and related resource planning.	Revise Provision D.4.d.(2) as follows: (2) The Copermittees must re-evaluate the water quality improvement strategies for the Watershed Management Area during the term of this Order pursuant to Provision B.5.b. The re-evaluation and recommendations for modifications to the water quality improvement strategies and schedules must be provided in the ~~Annual Reports required pursuant to Provision F.3.b, and provided in the~~ Report of Waste Discharge pursuant to Provision F.5.b. The water quality improvement strategies for the Watershed Management Area must be re-evaluated as follows:
E. Jurisdictional Runoff Management Programs				
E	64	Jurisdictional Runoff Management Programs	Minor grammatical correction in the first sentence.	Revise the first sentence of Provision E as follows: "The purpose of this provision is for each Copermittee to implement a program to control the contribution of pollutants to and the discharges from the MS4 within its jurisdiction.
E and throughout	64	Jurisdictional Runoff Management Programs	Language should reflect Clean Water Act, which requires Copermittees to effectively prohibit non-stormwater discharges into the MS4; and implement controls to reduce the discharge of pollutants from the MS4 to the maximum extent practicable. Language should be used and modified, as appropriate, throughout the Permit for consistency with federal regulations.	Revise the second sentence of Provision E as follows: "The goal of the jurisdictional runoff management programs is to implement strategies that effectively prohibit non-storm water discharges to the MS4 and reduce the discharge of pollutants from the MS4 ~~in storm water~~ to the MEP."
E	64	Jurisdictional Runoff Management Programs	Clarify that County of San Diego jurisdictional runoff management program implementation will based on the water quality priorities identified in the Santa Margarita River Watershed Urban Runoff Management Plan (required in Order No. R9-2007-0001) until a Water Quality Improvement Plan for the Santa Margarita River Watershed Management Area is approved.	Add to the first paragraph: "For the Santa Margarita River Watershed Management Area, the County of San Diego shall use the water quality priorities in the Santa Margarita River Watershed Urban Runoff Management Plan (developed pursuant to Order No. R9-2007-0001) to guide jurisdictional runoff management program implementation until notified by the San Diego Water Board that the Water Quality Improvement Plan developed in conjunction with the Riverside Copermittees has been approved."

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E	64	Jurisdictional Runoff Management Programs	As stated in the introduction to the Provision B (Water Quality Improvement Plans) "The purpose of this provision is to develop Water Quality Improvement Plans that guide the Copermittees' jurisdictional runoff management programs…" However, the provisions do not clearly allow for the appropriate modification of the JRMP requirements (increases, decreases, and/or replacement of activities) contained in the permit, with justification provided and subject to public input, to support adaptive management of programs.	Include language into the introductory provision that clearly indicates that the JRMP requirements contained in Provision E may be modified to allow for implementation of the JRMP consistent with the Water Quality Improvement Plan if appropriate justification is provided. In addition, add the following: Modification of Jurisdictional Runoff Management Program Requirements Modifications shall be considered and where selected, proposed according to the process in Provision B.5. Proposed modifications may increase, decrease, and/or replace minimum requirements identified in Provision E.
E.1.a.	64	Legal Authority Establishment and Enforcement		Revise text as follows: "… to control pollutant discharges ~~into and~~ from its MS4"
E.1.a.(2)	64	Legal Authority Establishment and Enforcement	Sites regulated under the Construction and Industrial General Permits are regulated elsewhere and through alternative means. Clarification is necessary for sites that are not regulated under the respective General Permits.	Revise Provision E.1.a.(2) as follows: "Control the contribution of pollutants in discharges of runoff associated with industrial and construction activity to its MS4 and control the quality of runoff from industrial and construction sites that do not~~, including industrial and construction sites which~~ have coverage under the statewide General Permit for Discharges of Storm Water Associated with Industrial Activities (Industrial General Permit) or General Permit for Discharges of Storm Water Associated with Construction Activities (Construction General Permit)~~, as well as to those sites which do not~~; "
E.1.a.(4) E.1.a.(5)	64 64	Legal Authority Establishment and Enforcement	The Copermittees do not have jurisdiction to control MS4 discharges outside of their respective MS4s and the Regional Board does not have the authority to require interagency agreements to grant such jurisdiction, particularly for those agencies not subject to the Order (Caltrans, Native American Tribes, Military installations,	Revise Provision E.1.a.(4) and E.1.a.(5) as follows: ~~"Control through interagency agreements among Copermittees the contribution of pollutants from one portion of the MS4 to another portion of the MS4;"~~ and ~~"Control, by coordinating and cooperating with other owners of the MS4 such as Caltrans, the U.S. federal~~

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			etc.).	~~government, or sovereign Native American Tribes, through interagency agreements, where possible, the contribution of pollutants from their portion of the MS4 to the portion of the MS4 within the Copermitee's jurisdiction;"~~ "Coordinate, as possible, with other agencies to minimize the contribution of pollutant discharges from the Copermittee's portion of the MS4 to portions of the MS4 under another agency's jurisdiction and from other agency's portions of the MS4 to the portion of the MS4 under the Copermittee's jurisdiction"
E.2.a	65	Non-Storm Water Discharges	The addition of "to the extent allowable by law", as referenced from the Phase II Regulations, limits Copermittees responsibility to those that they have the legal authority to implement. Copermittees cannot implement programs outside of what they have legal authority to do. In addition, some non-storm water discharges are authorized under the permit unless the Copermittee or San Diego Water Board determines they are a source of pollutants in receiving waters of the U.S., as consistent with 40 CFR 122.26(d)(2)(iv)(B)(1). Language should be provided to account for subsection E.2.a.(3).	Revise Provision E.2.a. as follows: "To the extent allowable by law, ~~E~~each Copermittee must address all non-storm water discharges as illicit discharges, where the likelihood exists that they are a source of pollutants to waters of the U.S."
E.2.a.(1)	66	Non-Storm Water Discharges	Uncontaminated pumped groundwater is the only category under this Provision that is required to be permitted under an NPDES Permit. It should be added to the initial paragraph and the remainder of the bullets should be added to E.2.a.(3), as consistent with 40 CFR 122.26(d)(2)(iv)(B)(1). No justification is provided in the fact sheet for inclusion of discharges from foundation drains, water from crawl space pumps, or from footing drains as requiring NPDES permits for the entire region. This exceeds CWA standards and there is no evidence that the Regional Board has considered the economic cost of enacting such measures under this permit. The reasoning provided in the fact sheet cites 40 CFR 122.26(d)(2)(iv)(B)(1), applicable to	Revise Provision E.2.a.(1) as follows: "Discharges of non-storm water to the MS4 from uncontaminated pumped groundwater ~~the following categories~~ must be addressed as illicit discharges where there is evidence that suggests that they are the source of pollutants to waters of the U.S., unless the discharge has coverage under NPDES Permit No. CAG919001 (Order No. R9-2007-0034, or subsequent order) for discharges to San Diego Bay, or NPDES Permit No. CAG919002 (Order No. R9-2008-0002, or subsequent order) for discharges to surface waters other than San Diego Bay: ~~(a) Uncontaminated pumped ground water;~~

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			"receiving waters of the US". Groundwater is not a receiving water of the US and, thus, the added footnote is inapplicable and inappropriate. While "the Director may include permit conditions that either require municipalities to prohibit or otherwise control any of these discharges where appropriate" (55 FR 48037), there is no justification provided to support these discharges as appropriate to require NPDES permits or that they have been "identified by the municipality [or the Regional Board] as sources of pollutants to waters of the United States". 40 CFR 122.26(d)(2)(iv)(B)(1). Water from foundation drains, crawl space pumps, and footing drains has not been identified as a source of pollutants to waters of the US and should be included under Provision E.2.a.(3). The footnote is inapplicable since groundwater is not a water of the US. In the future, based on data collected through the Monitoring Program and as part of the Water Quality Improvement Plan, Copermittees or the Regional Board may include any category of discharges determined to be a source of pollutants based on evidence that such discharge is causing or contributing pollutants to the receiving waters through the MS4. The "blanket" prohibition of the listed sources creates an unnecessary burden and potentially costly requirement that may yield little if any benefit. Footnotes 19 and 20 (E.2.a.3) provide a technical/engineering distinction between types of groundwater discharges that has no direct linkage to pollutants. Furthermore, it is unlikely that the location of the pipes and other features will be identifiable in the field or in any records; making it a burdensome investigative effort for discharges having no impact on water quality. Lastly, there are no reliable and readily available records (or a definition)	~~(b) Discharges from foundation drains[19];~~ ~~(c) Water from crawl space pumps; and~~ ~~(d) Water from footing drains[19].~~" And delete Footnotes 19 and 20.

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			for the "highest historical groundwater table".	
E.2.a.(2)	66	Non-Storm Water Discharges	Limit to within the Copermittee's jurisdiction per prior comments and reword the applicable permitting portion to allow flexibility for any subsequent NPDES permits that may be issued.	Revise Provision E.2.a.(2) as follows: "Discharges of non-storm water from water line flushing and water main breaks to the MS4 must be addressed as illicit discharges unless the discharge has coverage under a valid NPDES Permit, ~~No. CAG 679001 (~~Order No. R9-2010-0003, or a subsequent order~~)~~. This includes water line flushing and water main break discharges from water purveyors under the Copermittee's jurisdiction that have been issued a water supply permit by the California Department of Public Health or federal military installations."
E.2.a.(3)	66-67	Non-Storm Water Discharges	Non-storm water sources should be limited to anthropogenic sources of pollutants within the Copermittees jurisdiction to enable to Copermittees to address those sources in which they have control over. Also, see comment E.2.a.1.	Revise Provision E.2.a.(3) as follows: Limit the source of pollutants in receiving waters to anthropogenic sources identified as an illicit discharge within the Copermittees jurisdiction and add water from crawl space pumps. In addition, remove footnote 19.
E.2.a.(4)	67	Non-Storm Water Discharges	See comment E.2.a, as consistent with 40 CFR 122.26(d)(2)(iv)(B)(1).	Revise Provision E.2.a.(4) as follows: Add "or similar means where the Copermittee of the San Diego Water Board identifies those discharges as a source of pollutants to waters of the U.S."
E.2.a.(4)(a)	67	Non-Storm Water Discharges	Individual buildings may require substantial structural modifications to redirect air conditioning condensation to landscaped areas. Redirection should be encouraged instead of required. In addition, air conditioning condensate should be permitted to be directed to the sanitary sewer.	Revise Provision E.2.a.(4)(a) as follows: "The discharge of air conditioning condensation ~~must~~ should be directed to landscaped areas, other pervious surfaces where feasible, or to the sanitary sewer;"
E.2.a.(4)(b)	67	Non-Storm Water Discharges	Complete removal of residential car washing activities is unrealistic and resources would be better used to educate the public. Public outreach has proven to be also effective in minimizing water and detergent use and encouraging the use of commercial facilities.	Revise Provision E.2.a.(4)(b) as follows: "~~(i)~~ The discharge of wash water must be encouraged through public outreach and education (i) to be directed to landscaped areas or other pervious surfaces where feasible, and (ii) to m~~M~~inimize the use of water for vehicle washing, use as little washing detergent and other vehicle wash products as possible, wash vehicles at commercial wash facilities, and implement other practices or behaviors that will prevent the discharge of pollutants associated with

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				individual residential vehicle washing from entering the MS4; and"
E.2.a.(4)(c)	67	Non-Storm Water Discharges		Revise Provision E.2.a.(4)(c) as follows: "Dechlorinated swimming pool discharges should be managed as to:"
E.2.a.(5)(a)(i)	68	Non-Storm Water Discharges	Building fire suppression system maintenance discharges should not be considered an illicit discharge if BMPs are implemented to prevent discharge of pollutants to the MS4.	Revise Provision E.2.a.(5)(a)(i) as follows: Add "unless BMPs are implemented to prevent the discharge of pollutants to the MS4."
E.2.a.(7)	68	Non-Storm Water Discharges	Allowable discharges should not be treated the same as illicit discharges. This requirement will limit the Copermittee's ability to focus on priorities identified in Water Quality Improvement Plan and focus resources that could be used for reduction of illicit discharges on authorized discharges. This standard is more stringent than that applied by the State to Areas of Special Biological Significance.	Revise Provision E.2.a.(7) as follows: "Each Copermittee must, where feasible, reduce or effectively eliminate non-storm water discharges listed under Provisions E.2.a.(1)-(4) into its MS4 ~~whether or not the non-storm water discharge has been identified as an illicit discharge~~, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit."
E.2.b.(1)(d)	69	Prevent and Detect Illicit Discharges and Connections	MS4 and Private Outfalls should be clearly defined consistent with the Code of Federal Regulations.	Revise Provision E.2.b.(1)(d) as follows: "All known locations of Major MS4 outfalls and private outfalls that discharge runoff collected from areas within the Copermittee's jurisdiction,"
E.2.b.(4)	69-70	Prevent and Detect Illicit Discharges and Connections	Spill response should be limited to waters of the U.S. and is not applicable to soil contamination under an NPDES permit.	Revise Provision E.2.b.(4) as follows: "Each Copermittee must implement practices and procedures (including a notification mechanism) to prevent, respond to, contain, and clean up any spills that may discharge into the MS4 within their jurisdiction from any source. The Copermittee must coordinate with spill response teams to prevent to the extent possible entry of spills into the MS4, and prevent contamination of waters of the U.S. ~~surface water, ground water, and soil~~."
E.2.b.6	70	Prevent and Detect Illicit Discharges and Connections	Copermittees cannot control other agencies or MS4s outside their jurisdiction.	Revise Provision E.2.b.(6) as follows: "(6) Each Copermittee shall ~~must~~ coordinate, when necessary, with upstream Copermittees and/or entities to prevent illicit discharges from upstream sources into the MS4 within its jurisdiction."
E.2.d.(1)(d)	70	Investigate and Eliminate Illicit	Natural sources should be excluded to prevent diversion of resources for follow-ups on exceedances where the source	Revise Provision E.2.d.(1)(d) as follows: "Pollutants identified as causing or contributing to an

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		Discharges and Connections	has been determined as natural, versus focusing efforts on controllable sources.	exceedance of a NAL in the Water Quality Improvement Plan where the source has not been identified as natural; and"
E.2.d.(2)	71	Investigate and Eliminate Illicit Discharges and Connections	TCBMPs may be part of the MS4 and specifically designed to receive and contain pollutants. The language, as written, is inconsistent with the TCBMP requirements prescribed in Provision E.3.a of the proposed permit.	Revise Provision E.2.d.(2) as follows: "Each Copermittee must implement procedures to investigate and inspect portions of its MS4 that, based on reports or notifications, field screening and monitoring, or other appropriate information, indicate a reasonable potential of ~~receiving, containing, or~~ discharging pollutants to receiving waters within the Copermittees jurisdiction due to illicit discharges, illicit connections, or other sources of non-storm water."
E.2.d.(2)(c)	71		Clarify requirements for follow-up investigations on non-Storm Water flows; ensure consistency with Provision D and earlier Provision E requirements.	Revise Provision E.2.d.(2)(c) as follows: "(c) In accordance with the procedures defined in Provision E.2.d.(1), ~~E~~ each Copermittee must investigate and seek to identify the source(s) of discharges of non-storm water where flows are observed in and from the MS4 during the field screening required pursuant to Provision D.2.b.(1) as follows: (i) Obvious illicit discharges (i.e., unusual color or odor) must be immediately investigated to identify the source(s) of non-storm water discharges; "
E.2.d.(2)(d)(ix)	72	Investigate and Eliminate Illicit Discharges and Connections	The requirement to provide "a rationale for why a discharge does not pose a threat to water quality and/or does not require additional investigation" is not consistent with E.2.d.(3).	Revise Provision E.2.d.(2)(d)(ix) as follows: "(ix) If a source cannot be identified and the investigation is not continued, document the response per the requirements of Provision E.2.d.(3)~~a rationale for why a discharge does not pose a threat to water quality and/or does not require additional investigation."~~
E.2.d.(2)(e)	72	Investigate and Eliminate Illicit Discharges and Connections	Clarify requirements for follow-up investigations on non-Storm Water flows; ensure consistency with Provision D and earlier Provision E requirements. In addition, the example of "pooled" water is an unreasonable expectation based on over 10 years of dry weather monitoring data collected by the Copermittees that	Revise Provision E.2.d.(2)(e) as follows: " (e) Each Copermittee must ~~track~~ document and, if readily identifiable in accordance with Provision E.2.d.(1) procedures, seek to identify the source(s) of non-storm water discharges from the MS4 where there is evidence of non-storm water having been discharged into or from the MS4 (e.g., ~~pooled~~ flowing water), in accordance with MS4

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			clearly demonstrates the presence of pooled water in parts of the MS4 where no illegal or illicit discharges can be found after exhaustive investigations. Pooled water may result from past storm discharges due to minor imperfections or settling of the MS4 infrastructure. Flowing water should be set as the standard for investigating illicit or illegal discharges instead of pooled water.	outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b."
E.3	73	Development Planning	The Provisions of E.3 regulating storm water flow exceed the requirements of federal law. See Virginia Department of Transportation v. U.S. EPA, Civil Action No. 1:12-CV-775 (E.D. Va. Jan 3, 2013) (holding that EPA exceeded its authority under the Clean Water Act when it regulated storm water flow as a "surrogate" for pollutant discharges).	Acknowledge that affected provisions of E.3 regulating storm water flow exceed federal law.
E.3	73	Development Planning	No jurisdictional limitations are provided in this section. As a result, language in the subsections may be interpreted as expanding Copermittee requirements outside their MS4 jurisdiction. In addition how the Copermittees implement their program should be a decision left to the Copermittees. In rare instances a requirement listed within the permit may not be legal for the jurisdiction to impose upon an applicant.	Revise Provision E.3. as follows: "Each Copermittee, within their respective jurisdictions and to the extent that they may lawfully impose requirements, must ~~use their land use and planning authorities to~~ implement a development planning program…"
E.3.a	73	BMP Requirements for All Development Projects	Added language to clarify that not all the prescribed BMPs in Provision E.3.a. are applied to every project. These BMPs are applied as practical and feasible and as applicable based on the sites condition and nature of development.	Revise Provision E.3.a. as follows: "Each Copermittee, as practical and feasible, must prescribe the following BMP requirements during the planning process (i.e. prior to project approval and issuance of grading or building permits) for all development projects (regardless of project type or size), where local permits are issued, including unpaved roads and flood management projects, except emergency projects implemented for the protection of persons and property:"

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E.3.a.(1)(b)	74	BMP Requirements for All Development Projects	Include "unless authorized by the San Diego Water Board Executive Officer" because Hydromodification Mitigation may need to occur within receiving waters to address watershed water quality issues. This aligns with Regional Board staff suggestion that the 401 permit process should be streamlined to allow alternative compliance opportunities to mitigate and/or improve water quality conditions within a waterway. Delete "waters of the state". According to the definition of "Waters of the State," "all water in the State is considered to be Waters of the State". Thus the MS4 itself could be considered waters of the state and therefore structural BMPs cannot be constructed within the MS4. Therefore a stormdrain filter insert would be prevented, as would a bioretention device or basin holding state waters. The intent is to protect natural receiving waters, not to prevent the use of structural BMPs in the MS4. Removing "or waters of the state" will protect the natural receiving waters from construction and will protect the receiving waters from potential MS4 pollution.	Revise Provision E.3.a.(1)(b) as follows: "Structural BMPs must not be constructed within a waters of the U.S. unless authorized by the San Diego Water Board Executive Officer~~or waters of the state~~."
E.3.b.(1)(b) and E.3.b.(1)(c)	75	Definition of Priority Development Project	Since SUSMP requirements have been in effect since 2001, will start seeing some redevelopment projects that were subject to previous SUSMPS. Therefore, the 50% rule for redevelopment projects should apply only to projects that were not subject to any previous SUSMP requirements.	Revise Provision E.3.b.(1)(b) as follows: "Those redevelopment projects that create, add, or replace at least 5,000 square feet of impervious surfaces on an already developed site, and the redevelopment project is a Priority Development Project category listed under Provision E.3.b.(2)… where redevelopment results in an increase of more than fifty percent of the impervious surfaces of a previously existing development and was not subject to previous Priority Project Development requirements…". Add Provision E.3.b.(1)(c) as follows: (c) Projects where redevelopment results in an increase of more than fifty percent of impervious surfaces of a

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				previously existing development, and the existing development was subject to previous Priority Project Development Requirements, only the altered portion of development is subject to the new Priority Development Project requirements."
E.3.b.(2)	76	Priority Development Project Categories	Considerable staff resources are spent on understanding the complex set of rules in order to correctly apply them to each project. A simpler set of rules for the determination of whether or not a project is a Priority Development Project will greatly improve government efficiency and allow more focus on reviewing the project's compliance with performance requirements, thus resulting in greater overall Permit effectiveness. The proposed change is consistent with the current draft, while making the rules simpler. The definitions of each category are in Appendix C.	Delete items b through h and replace with the following: " (b) Development projects that create 5,000 square feet or more of impervious surfaces (collectively over the entire project site), and support one or more of the following uses (see Appendix C for definitions): i. Automotive repair shop ii. Restaurant iii. Parking lot iv. Street, road, highway, freeway and driveway v. Retail gasoline outlet (RGO) (c) Development projects that create 2,500 square feet or more of impervious surfaces (collectively over the entire project site) and where the project will directly discharge to an Environmentally Sensitive Area (see Appendix C for definitions)."
E.3.b.(2)(d)	76	Priority Development Project Categories	A separate Hillside Development category is unnecessary and redundant. Projects that grade on a natural slope that is twenty-five percent or greater require special consideration during the construction stage of the project, which is addressed elsewhere in the Permit. Local ordinances are very strict about adequate post-construction stabilization of hillside areas. Development projects that drain to a slope of sensitive habitat will be subject to the Environmentally Sensitive Area category. Removal of this category will facilitate the establishment of simpler rules as described above, while still keeping the same level of standards.	Delete this Provision.
E.3.b.(2)(e)	76	Priority Development Project Categories	The definition of a direct discharge has been established to mean that the project is releasing flows directly into the receiving water. If the project drains into an MS4 connection	If comment E.2.b.(2) is not incorporated, revise the last sentence of Provision E.3.b.(2)(e) as follows: "…means outflow from a drainage conveyance system

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			which serves existing developed areas before discharging to receiving water, this is not a direct discharge. Added language for clarification.	that collects runoff from the subject development or redevelopment site not commingled with flows from adjacent lands and terminates at or in receiving waters within the ESA.“
E.3.b.(2)(g)	76	Priority Development Project Categories	This requirement was present in the prior permit; however, the residential driveways clause was added under the proposed permit. Including residential driveways as a PDP will require unnecessary, burdensome PDP process without proportional water quality benefits. Driveways experience low daily traffic trips compared to highways and roads.	If comment E.2.b.(2) is not incorporated, revise Provision E.3.b.(2)(g) as follows: “Streets, roads, highways, and freeways, ~~and driveways~~. This category is defined as any paved impervious surface that is 5,000 square feet or more used for the transportation of automobiles, trucks, motorcycles, and other vehicles.”
E.3.b.(3)(a)	77	Priority Development Project Exemptions	The three methods listed as adequate for mitigating the minimal impacts that sidewalks, bicycle lanes and trails would have upon receiving waters should also be applied to driveways. Driveways typically have only very light vehicle usage and because they are linear it is possible to be very effective at removing pollutants and reducing runoff by techniques such as sloping the driveway toward a sufficiently sized landscape area and disconnecting from the MS4. The San Diego Model SUSMP currently has specific design parameters for controlling this type of design to ensure adequate effectiveness, and the BMP Design Manual Update that is require as part of this permit can further improve these design parameters using the latest information such as recent studies by Caltrans on the effectiveness of vegetated filter strips adjacent to major highways. The Manual’s detailed design guidance on effective practices will allow an “over the counter” design review, rather than subjecting the public to unnecessarily burdensome requirements to submit the extensive technical documents that accompany more significant projects.	Add “driveways” to the list of project types that can qualify for this exemption.
E.3.b.(3)(b)	77	Priority Development Project Exemptions	All municipal roadway projects should only be subject to the USEPA guidance regarding Managing Wet Weather with Green Infrastructure: Green Streets.	Replace the current language in Provision E.3.b.(3)(b) as follows: "Any paved impervious surface that is 5,000 square feet

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			The Ventura County NPDES MS4 Permit, the Santa Ana Region permits for Orange County, San Bernardino County, and Riverside County, and the Greater Los Angeles MS4 Permit provide that streets, roads, and highways follow USEPA guidance regarding Managing Wet Weather with Green Infrastructure: Green Streets to the maximum extent practicable. Roadways are different than other development projects as there are significant constraints to implementation of BMPs that need to be considered such as limited right-of-way, utilities, geotechnical and structural concerns, street trees, parking, and fire truck access among others. The USEPA guidance considers these constraints where the PDP requirements do not. Even in new roadways implementing hydromodification requirements can disturb a significant area of land which has its own environmental impacts including changing the natural hydrology which is antithetical to the LID approach.	or more used for the transportation of automobiles, trucks, motorcycles, and other vehicles that follows the USEPA guidance regarding Managing Wet Weather with Green Infrastructure: Green Streets, or equivalent standards, to the maximum extent practicable." ~~(b) Retrofitting of existing paved alleys, streets or roads that meet the following criteria:~~ ~~(i) Must be two lanes or less; AND~~ ~~(ii) Must be a retrofitting project implemented as part of an alternative compliance project option under Provision E.3.c.(3)(b)(v) to achieve the performance requirements of Provisions E.3.c.(1) and/or E.3.c.(2) for a Priority Development Project; AND~~ ~~(iii) Designed and constructed in accordance with the USEPA Green Streets guidance.~~[24]
E.3.b.(3)(c)(ii) E.3.b.(3)(c)(iii)	77 78	Priority Development Project Exemptions	Provide more flexibility for a jurisdiction to accept other comparable certification standards. In some cases a project may be already pursuing a certification from a different organization (such as Envision or SITES) and they should be allowed to get their credits that way rather than having to additionally comply with a second set of certification requirements. In addition, specifying "structural" BMPs is unnecessary. These types of projects could meet the performance requirements using non-structural BMPs.	Revise Provisions E.3.b.(3)(c)(ii) and E.3.b.(3)(c)(iii) and add a Provision (iv) as follows: "(ii) Designed and constructed ~~to be certified~~ to meet requirements for certification under the U.S. Green Building Council (USGCB) Leadership in Energy and Environmental Design (LEED) for Homes green building certification program, receiving at least four (4) Surface Water Management credits under the Sustainable Sites category, or other locally accepted certification of equivalent effectiveness; ~~OR~~ (iii) Designed and constructed with ~~structural~~ BMPs that will achieve ~~the~~ equivalent performance to the requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite, OR

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				(iv) Designed and constructed with structural BMPs that meet minimum performance standards, as outlined in the BMP Design Manual."
E.3.b.(3)(c)(iv)	78	Priority Development Project Exemptions	This exemption allows small individual residential projects to apply minimum BMPs that meet a minimum performance standards without going through the burdensome PDP review and approval process including; preparation of a full PDP study, and maintenance, verifications, and inspection of permanent treatment control BMPs. Under the current proposed language, single family residence as small as 5,000 sf may be subject to PDP requirements, and is lumped in with industrial and commercial development; The potential pollutants generated by small residential are not as significant as industrial or commercial and can be effectively reduced by effective source control and minimum permanent BMPs.	Add Provision E.3.b.(3)(c)(iv)as follows: "(iv) Designed and constructed with structural BMPs that meet minimum performance standards, as outlined in the BMP Design Manual."
E.3.b.(3)(d)(i) E.3.b.(3)(d)(ii)	78	Priority Development Project Exemptions	See comments for E.3.b.(3)(c)(ii) and E.3.b.(3)(c)(iii).	Revise Sections E.3.b.(3)(d)(i) and E.3.b.(3)(d)(ii) and add a Provision (iii) as follows: "(i) Designed and constructed ~~to be certified~~ to meet requirements for certification under the U.S. Green Building Council (USGCB) Leadership in Energy and Environmental Design (LEED) for Homes green building certification program, receiving at least four (4) Surface Water Management credits under the Sustainable Sites category, or other locally accepted certification of equivalent effectiveness; OR (ii) Designed and constructed with ~~structural~~ BMPs that will achieve ~~the~~ equivalent performance to the requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite~~.~~; OR (iii) Designed and constructed with structural BMPs that

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				meet minimum performance standards, as outlined in the BMP Design Manual."
E.3.c	78	Priority Development Projects Structural BMP Performance Requirements	Water Quality Improvement Plans allow Copermittees to define priorities on a watershed basis and to tailor programs and BMPs based on the specific needs of each watershed. The structural BMP performance requirements are an example of a prescriptive one-size-fits-all approach. The sizing criteria are the same for all projects regardless of pollutant removal efficiencies, soil retention capacities, or susceptibility to erosion. Encouraging watershed-specific performance requirements to be developed within the Water Quality Improvement Plans will allow for watershed specific flexibility while providing the same level of protection needed.	Revise Provision E.3.c as follows: "In addition to the BMP requirements listed for all development projects under Provision E.3.a, Priority Development Projects must also implement structural BMPs that conform to performance requirements below. Alternatively, watershed-specific performance requirements may be developed as part of a Water Quality Improvement Plan; these requirements would replace the general performance requirements below. Watershed-specific requirements must provide at least equivalent protection as the general performance requirement below."
E.3.c.(1)(a)(ii)	78	Storm Water Pollutant Control BMP Requirements	Language should be consistent with pre-project language used in Provision E.3.c.(2)(a).	Revise Provision E.3.c.(1)(a)(ii) as follows: "The volume of storm water that would be retained onsite prior to the project ~~if the site was fully undeveloped and naturally vegetated~~, as determined using continuous simulation modeling or other techniques based on site-specific soil conditions and ~~typical native~~ vegetative cover."
Footnote 26	78	Storm Water Pollutant Control BMP Requirements	Include language to clarify that the 85th design capture volume refers to first flush and it is a particular volume that corresponds to 85 percent of all the rain events for the area.	Revise Footnote 26 as follows: "Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals. The volume is a single event-based volume that occurs after an extended dry period."
E.3.c.(2)(a)	80	Hydromodification Management BMP Requirements	The Tentative Order proposed requirement to match predevelopment hydrographs (flow rates and duration) is the exception to the current hydromodification requirement found in other parts of the state. Specifically, the following permits/programs require hydromodification controls to match pre-project conditions: Region 2, Region 4, Region	Revise Provision E.3.c.(2)(a) as follows: "Post-project runoff flow rates and durations must not exceed pre-project ~~development (naturally occurring)~~ runoff flow rates and durations by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat conditions

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			5, Region 8, Caltrans and draft Phase 2 MS4. Region's 4 MS4 permit, Order No. R4-2012-0175 was recently adopted on November 8, 2012. Thus, there is very recent precedent to use pre-project conditions as a reference for hydromodification. Additionally, requiring matching the predevelopment hydrograph may impose mitigation beyond a project's impacts. Pre-project standard is the appropriate nexus to project impacts. In the case of new development, where open land is to be converted to impervious area, the hydromodification controls are required to match the pre-project condition, which equates to the pre-development, naturally occurring, condition. In these situations the pre-development conditions were based on Natural Resources Conservation Service soil maps and existing topography and vegetation. In cases where redevelopment projects increase impervious area as compared to the existing condition, hydromodification controls were required to mitigate for the impacts of the added impervious surfaces. The San Diego Copermittees have invested considerable time and resources to develop a technically sound and defensible hydromodification management plan (HMP). The San Diego Copermittees determined, during the development of the San Diego HMP, that the flow control design criteria should be based on flow duration matching to the pre-project condition and not the pre-development condition. This determination was made based upon the following. • Prior HMP implementation precedent in the State of California, specifically in Santa Clara and Contra Costa Counties, mandated flow duration matching to the pre-project condition. • Following consultation with leading geomorphologists in	downstream of Priority Development Projects)."

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			the State of California, the San Diego Copermittees determined that in areas of significant existing urbanization the receiving streams had shown an ability to attain a new channel equilibrium based upon the developed flow conditions. • Redevelopment practices often decrease the existing site's impervious area, especially with the 2007 Low Impact Development (LID) requirements. In such cases, the post-project site impervious area contributing to the receiving stream would be smaller and, based on the improvement relative to pre-project conditions, no hydromodification requirements would be required. • The Copermittees stated a desired goal of encouraging redevelopment projects for multiple planning, economical, and water quality purposes. From a hydromodification perspective, increasing redevelopment project implementation would invariably decrease the conversion of existing open space. The Copermittees were careful to avoid implementing hydromodification requirements on beneficial redevelopment projects if the redevelopment project decreased the site impervious area as compared to existing conditions. San Diego Copermittees have worked closely with Southern California Coastal Water Research Project (SCCWRP) during the development of the HMP. SCCWRP published technical report 667, Hydromodification Assessment and Management in California, dated April 2012. This report describes the "flow-duration control standards…require that the post-project discharge rates and durations may not deviate above the pre-project discharge rates and durations by more than a specific percent…and this approach is a dramatic improvement over earlier methods."	

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			Furthermore, the Copermittees are concerned that using "pre-development (naturally occurring)" reference condition as applied to sites that are, in fact, developed would expose the Copermittees to significant litigation risk and may be unenforceable. We are concerned this would subject the Copermittees to liability under the takings clauses of the U.S. and California Constitutions and the Mitigation Fee Act because of the questionable nexus between a project's impacts on hydromodification and the hydromodification management measures in the Draft Tentative Order. When imposing a condition on a development permit, a local government is required under the federal and state constitutions to establish that the condition bears a reasonable relationship to the impacts of the project. This rule applies even to legislatively enacted requirements and impact fees or exactions.[1]Moreover, fees imposed on a discretionary ad hoc basis are subject to heightened scrutiny under a two-part test. First, local governments must show that there is a substantial relationship between the burden created by the impact of development and any fee or exaction.[2] Second, a project's impacts must bear a "rough proportionality" to any development fee or exaction.[3] Under California law, the *Nollan/Dolan* heightened scrutiny test also applies to in-lieu fees.[4] The Legislature has memorialized these requirements in the Mitigation Fee Act which establishes procedures that local governments must follow to impose impact fees.[5] Irrespective of whether the hydromodification management	

[1] Building Indus. Ass'n v. City of Patterson, 171 Cal. App. 4th 886, 898 (2009).
[2] Nollan v. California Coastal Comm'n, 483 U.S. 825, 837 (1987).
[3] *Dolan v. City of Tigard*, 512 U.S. 374, 391 (1994).
[4] *Ehrlich v. City of Culver City*, 12 Cal. 4th 854, 876 (1996).
[5] Cal. Gov't Code §§ 66000-66025.

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			requirements are implemented by legislative act or on an ad hoc basis, the Copermittees' attempt to enforce them as proposed in the Tentative Order would likely result in claims alleging unconstitutional takings of private property and violations of the Mitigation Fee Act. This is because a developer could argue that limiting hydromodification impacts of already developed property to its "naturally occurring" state would not have a legally sufficient nexus to the impact of the development project.	
E.3.c.(2)(a)(ii)	80	Hydromodification Management BMP Requirements	A stable, naturally vegetated channel is a balance of sediment supply, channel geometry, longitudinal slope, channel material and size, and type, size and cover of channel vegetation. When a concrete channel is restored it is not just a process of removing the concrete. A naturally vegetated channel must be engineered in a configuration that will not be subject to hydromodification from the existing and any future discharges that may occur in the channel. This requires a larger channel cross Provision to convey flood control peak discharges, usually a wider channel and sometimes grade control structures. These existing concrete channels are typically in urbanized areas. Since the naturally vegetated channel must be engineered to convey all flows, additional hydromodification controls in the watersheds draining to these channels would provide no benefit at significant construction and perpetual maintenance costs.	Delete Provision E.3.c.(2)(a)(ii). ~~For artificially hardened channels, analysis to identify the lower boundary must use characteristics of a natural stream segment similar to that found in the watershed. The lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or erodes the toe of the channel banks.~~
E.3.c.(2)(b)	80	Hydromodification Management BMP Requirements	The current Tentative Order language as written is unclear and implies that each development project will be required to conduct studies and compensation for the loss of sediment supply specifically on site. However, the ability to compensate for the loss of sediment supply has not yet been fully researched, nor have practices yet been	Revise Provision E.3.c.(2)(b) as follows: "In accordance with the BMP Design Manual, projects shall preserve or provide compensation for significant losses of sediment supply anticipated as a result of development. ~~Post project runoff flow rates and durations~~

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			developed. Therefore the ability to require sediment compensation on a project by project basis is not yet validated or possible. SCCWRP technical report 667 cites that management approaches to compensate for the loss of sediment supply are necessary but "continues to prove challenging because, the effects of urban development on sediment supply in different geologic settings are not well understood and poorly represented in current models." The proposed change would allow the Copermittees to study and adapt to how sediment supply should appropriately be managed. Research may determine that sediment compensation would be addressed more appropriately on a regional or local level. The BMP Design Manual is a suitable mechanism to handle this evolving science over time, where the Copermittees can specify requirements and update the plan and practices as research advances.	~~must compensate for the loss of sediment supply due to the development project, should loss of sediment supply occur as a result of the development project."~~
E.3.c.(2)(d)(i) through (iii)	80	Hydromodification Management Exemptions	The permit should clearly reference the recently Board adopted Resolution No. R9-2010-0066, a Resolution for Approval of the Hydromodification Management Plan for the San Diego County. The SD Copermittees developed a technically sound HMP with a Technical Advisory Committee (TAC) and input from all stakeholders. This HMP has only been in effect for two years. In accordance with the adopted resolution, the SD Copermittees have embarked on a 5-year monitoring project to validate the HMP parameters and design criteria. The SD Copermittees are not aware of any current scientific data that would suggest the SD HMP is no longer effective or needs adjustment prior to the completion of their current monitoring project. It is appropriate to incorporate the approved resolution authorizing the SD HMP into the Permit and allow implementation and monitoring during this Permit cycle.	Revise Provision E.3.c.(2)(d) as follows: "(i) Discharges storm water runoff into existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, tidally influenced waters, or the Pacific Ocean; (ii) Discharges stormwater runoff into conveyance channels whose bed and bank are stabilized (e.g. concrete lined, an engineering interlocking paver, gabion system, etc.) all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, tidally influenced waters, or the Pacific Ocean; ~~(ii)~~ (iii) Is a redevelopment Priority Development Project that meets the alternative compliance requirements of Provision E.3.c.(3)(b)(ii); or

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				~~(iii)~~ (iv) Discharges storm water runoff into other areas identified by the San Diego Water Board as exempt, including those exemptions recognized in the 2010 San Diego Hydromodification Plan, approved by the San Diego Water Board Resolution No. R9-2010-0066, from the requirements of Provisions E.3.c.(2)(a)-(b). "
E.3.c.(3)	80	Alternative Compliance to Onsite Structural BMP Performance Requirements	The proposed language allows the alternative compliance program to be optional and gives Copermittees the discretion to exercise the program if it is determined to be beneficial and practical for the municipality. The permit as currently written could create an expectation that the Copermittees manage offsite mitigation for private developments. There are many factors to be considered when administering a mitigation program, including: overhead program management and administrative costs, availability of land, long term maintenance responsibilities and costs, variability and lack of accurate cost estimates for BMP construction and maintenance costs.	Revise Provision E.3.c.(3) as follows: "(3) Alternative Compliance to Onsite Structural BMP Performance Requirements Alternative compliance is an optional program for each jurisdiction to utilize if it is determined to provide an equivalent or greater benefit to the watershed than onsite compliance. Where alternative compliance is allowed, the determination of the responsible party to execute the onsite alternative compliance is at the jurisdiction's discretion and in accordance with policies set in place in the individual jurisdiction or in coordination with other jurisdictions, agencies, or Copermittees:"
E.3.c.(3)(a)(i)	81	Alternative Compliance to Onsite Structural BMP Performance Requirements-Applicability		Revise text as follows: "…implementation of the alternative compliance option will have an equal or greater overall water quality benefit…"
E.3.c.(3)(a)(ii)	81	Alternative Compliance to Onsite Structural BMP Performance Requirements-Applicability	Stream rehabilitation projects should be designed by a biologist and/or a hydrologist. Other certified professionals may have more specific knowledge to a particular stormwater design than an engineer or architect. Other applicable certifications could include LEED, QSD, CPESC, CPSWQ, Envision, SITES, or certifications that do not currently exist but may exist in the future.	Revise Provision E.3.c.(3)(a)(ii) as follows: The alternative compliance options must be designed by a registered professional engineer, geologist, architect, biologist, hydrologist, landscape architect, or other appropriate certified professional;
E.3.c.(3)(a)(iii)	81	Alternative Compliance to Onsite Structural	To be consistent with E.3.c.(3)(a)(i) which requires alternative compliance with greater water quality benefit for the Watershed Management Area.	Revise Provision E.3.c.(3)(a)(iii) as follows: The alternative compliance options must be implemented within the same ~~hydrologic unit~~ Watershed Management

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		BMP Performance Requirements-Applicability		Area as the Priority Development Project, and preferably within the same hydrologic subarea;
E.3.c.(3)(a)(iv)	81	Alternative Compliance to Onsite Structural BMP Performance Requirements-Applicability	This language suggests that the alternative compliance must be downstream of the PDP. However, this may not be necessary if HMP improvement is needed in the upper watershed instead of the lower watershed. SCCWRP Technical Report 667 concludes that "hydromodification management should be considered in the context of an overall watershed-scale strategy that targets maintenance and restoration of critical processes in the critical locations in the watershed." However, the current language in the tentative order limits the ability to utilize alternative compliance, including using a regional BMP constructed to mitigate for increases in flow. All PDPs must treat for water quality to the MEP to prevent polluted stormwater from entering MS4 and receiving waters. (vi) and (vii) sufficiently protect the watershed as a whole. Delete this language to remove this conflict.	Delete Provision E.3.c.(3)(a)(iv). ~~Receiving waters must not be utilized to convey storm water runoff to the alternative compliance options~~
E.3.c.(3)(a)(v)	81	Alternative Compliance to Onsite Structural BMP Performance Requirements - Applicability	Without deletion this would render Alternative Compliance through E.3.c(3)(b)(v) invalid as it would mean that all runoff from a PDP must be treated by Alternative Compliance that is physically in series with the PDP and not a separate site discharging to the same watershed as described in E.3.c(3)(a)(iii).	Delete Provision E.3.c.(3)(a)(v). ~~The pollutants in storm water runoff from the Priority Development Project must be treated to the MEP by the alternative compliance options prior to being discharged to receiving waters~~
E.3.c.(3)(b)(ii)	82	Alternative Compliance Project Options	This is an exemption listed in E.3.c.(2)(d)(ii). Other locally accepted certification programs should be made available. See same comment for sections E.3.b.(3)(c) & (d)	Revise Provision E.3.c.(3)(b)(ii) as follows: "The Copermittee may ~~allow~~ exempt redevelopment Priority Development Projects ~~to comply with~~ from the hydromodification management BMP performance requirements of Provision E.3.c.(2) where the project is designed and constructed to be certified under the USGCB LEED for New Construction and Major Renovations green building certification program, or other locally accepted certification of equivalent effectiveness."
E.3.c.(3)(b)(iii)	82	Alternative	Minor clarification.	Revise Provision E.3.c.(3)(b)(iii) as follows:

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		Compliance Project Options		"The Copermittee may allow Priority Development Projects greater than 100 acres in total project size (or smaller than 100 acres in size yet part of a larger common plan of development that is over 100 acres) to comply with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2)~~.~~ under ~~The Priority Development Project must comply with~~ the following conditions: "
E.3.c.(3)(b)(iv)[b]	83	Alternative Compliance Project Options	Without this change, this language would dictate that the alternative flow control be downstream of the PDP, when the downstream area may not benefit from any HMP control. By locating areas within the watershed that are in need of hydromodification mitigation, alternative compliance can be directed to areas that will have the greatest benefit for the watershed as a whole. This is in agreement with recommendations made in the SCCWRP technical report 667 which concludes that "hydromodification management should be considered in the context of an overall watershed-scale strategy that targets maintenance and restoration of critical processes in the critical locations in the watershed."	Revise Provision E.3.c.(3)(b)(iv)[b] as follows: "The Copermittee may allow Priority Development Projects to utilize offsite regional BMPs to comply with the hydromodification management BMP performance requirements of Provision E.3.c.(2) if the offsite regional BMPs ~~have the capacity to manage the storm water flows rates and durations from the site such that the receiving waters are protected from the potential for increased erosion that would be caused if the unmanaged portion of the runoff was discharged from the site~~ will have a greater overall receiving water benefit within the Watershed Management Area than implementation of the hydromodification controls onsite."
E.3.c.(3)(b)(vi)	84	Alternative Compliance Project Options	Minor clarification.	Revise Provision E.3.c.(3)(b)(vi) as follows: "The channel, stream, or habitat rehabilitation project cannot be utilized for pollutant treatment ~~except~~ unless constructed with an artificial wetland. ~~where artificial wetlands are constructed and located upstream of receiving waters."~~
E.3.c.(3)(c)	854	Alternative Compliance In-Lieu Fee Option	Add "or" to indicate that operation and maintenance may be a separate option as indicated in E.3.c.(3)(c)(iii).	Revise Provision E.3.c.(3)(c) as follows: "The Copermittee may develop and implement an alternative compliance in-lieu fee option, individually or with other Copermittees and/or entities, as a means for designing, developing, constructing, operating and/or maintaining offsite alternative compliance projects under Provision E.3.c.(3)(b). Priority Development Projects allowed to utilize the alternative compliance in-lieu fee

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				option must comply with the following conditions:"
E.3.c.(3)(c)(i)	84	Alternative Compliance In-Lieu Fee Option	Minor clarification.	Revise Provision E.3.c.(3)(c)(i) as follows: "The in-lieu fee must be transferred to the Copermittee (for public projects) or an escrow account (for private projects) prior to the construction initiation date ~~constructed~~ of the Priority Development Project ~~is initiated~~."
E.3.c.(3)(c)(ii)	84	Alternative Compliance In-Lieu Fee Option	Include "operation and maintenance" since it is included in E.3.c.(3)(c)(ii)[d].	Revise Provision E.3.c.(3)(c)(ii) as follows: "If the in-lieu fee is applied to the development, design, ~~and~~ construction, operation and maintenance of offsite alternative compliance projects, the following conditions must be met:"
E.3.c.(3)(c)(ii)[b]	85	Alternative Compliance In-Lieu Fee Option	Multiple PDPs joining into an alternative compliance regional BMP will require a longer timeline in order to generate enough funding to begin the planning, design, permitting, and construction of the regional BMP. In addition, multiple permits will likely be necessary from multiple government agencies (party agreements, jurisdictional agreements, Army Corp of Engineers, 401, 404, maintenance agreements, etc), thus slowing the timeline of completion of the alternative compliance project. If the alternative compliance project must be completed within the first 4 years of the first project to fund, then the complexity or size of the project will be limited and may serve as a deterrent to the use of the alternative compliance option.	Revise Provision E.3.c.(3)(c)(ii)[b] as follows: "The offsite alternative compliance projects must be constructed as soon as possible, but no later than 8 ~~4~~ years after the certificate of occupancy is granted for the first Priority Development Project that contributed funds toward the construction of the offsite alternative compliance projects, unless a longer period of time is authorized by the San Diego Water Board Executive Officer."
E.3.c.(3)(c)(ii)[c]	85	Alternative Compliance In-Lieu Fee Option	Delete redundant and ambiguous language	Delete Provision E.3.c.(3)(c)(ii)[c]. ~~The in-lieu fee for the Priority Development Project must include mitigation of the pollutant loads and increased storm water flow rates and durations that are allowed to discharge from the site before the offsite alternative compliance projects are constructed; and~~
E.3.c.(3)(c)(ii)[d]	85	Alternative Compliance In-Lieu Fee Option	A reasonable timeframe must be established to base the fee upon, however that time frame must be relevant to the type of project being constructed and its anticipated	Revise Provision E.3.c.(3)(c)(ii)[d] as follows: The in-lieu fee must ~~also~~ include the cost to operate and maintain the offsite alternative compliance projects for the

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			lifespan.	anticipated life of the constructed priority development project.
E.3.c.(3)(c)(iii)	85	Alternative Compliance In-Lieu Fee Option	Minor clarification.	Revise Provision E.3.c.(3)(c)(iii) as follows: If the in-lieu fee ~~is applied~~ applies only to the operation and maintenance of offsite alternative compliance projects that have already been constructed, the offsite alternative compliance projects must allow the Priority Development Project to comply with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2).
E.3.c.(5)(a)(vi)	86	Infiltration and Groundwater Protection	Treatment for infiltration BMPs should only be required if significant pollutant levels are present.	Revise Provision E.3.c.(5)(a)(vi) as follows: "Infiltration BMPs must not be used for areas of industrial or light industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee, unless runoff does not exceed Basin Plan water quality standards or runoff is first treated or filtered to remove pollutants prior to infiltration; and"
E.3.e(1)(c)	88	Structural BMP Approval and Verification Process	When easements and agreements are publicly recorded, information is conveyed during the sale of the property. Therefore this sentence is not necessary.	Revise Provision E.3.e.(1)(c) as follows: Each Copermittee must require and confirm that appropriate easements and ownerships are properly recorded in public records. ~~And the information is conveyed to all appropriate parties when there is a change in project or site ownership.~~
E.3.e.(2)(a)	89	Priority Development Project Inventory and Prioritization	Copermittees update databases on a regular basis to input new projects, track inventory, import/export data for daily activities, and pull data on an annual basis for reporting.	Revise Provision E.3.e.(2)(a) as follows: Each Copermittee must develop, maintain, and update ~~at least annually~~ regularly, a watershed-based database to track and inventory all Priority Development Projects and associated structural BMPs within its jurisdiction. Inventories must be accurate and complete beginning from January 2002 for the San Diego County Copermittees, February 2003 for the Orange County Copermittees, and July 2005 for the Riverside County Copermittees, where data is available.
E.3.e.(2)(a)(vi)	89	Priority Development Project Inventory	In some cases, corrective actions or resolutions are not needed if no violations were found. Therefore they would only be entered into the database "when applicable".	Revise Provision E.3.e.(2)(a)(vi) as follows: Corrective actions and/or resolutions when applicable.

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		and Prioritization		
E.4	90	Construction Management	The language has been updated so that the Copermittee can define which construction projects will be inventoried within its jurisdictional program. Not all jurisdictions apply permits the same way, therefore each needs the ability to address their processes in regards to construction projects. This will eliminate projects in the inventory that are issued local building or construction permits but have no ground disturbance, e.g. plumbing, electrical, mechanical, decks, patios, etc.	Add the following after the first paragraph of Provision E.4.: a. "Construction Program Management Each copermittee must define in the Jurisdictional Runoff Management Plan the following: (1) Define construction sites to be inventoried, such as sites that involve any ground disturbance or soil disturbing activities. (2) Define a process for confirming adequate construction BMP implementation for non-inventoried sites. Non-inventoried sites involve minor construction activities that are not anticipated to create storm water pollution such as interior improvements, plumbing, electrical and mechanical work. "
E.4.a.(4)	91	Project Approval Process	Language is redundant and unnecessary because applicable permits are included as an attachment of the project's SWPPP as required under the Construction General Permit.	Revise Provision E.4.a.(4) as follows: Delete language as shown: "Verify that the project applicant has obtained coverage under ~~applicable permits, including, but not limited to~~ the Construction General Permit. ~~, Clean Water Act Section 401 Water Quality Certification and Section 404 Permit, and California Department of Fish and Game Streambed Alteration Agreement.~~"
E.4.b.(1)(d)	91	Construction Site Inventory and Tracking	The anticipated completion date is often unknown and can fluctuate based on unpredictable and unforeseen circumstances. Keeping track of accurate dates in an inventory would be difficult and would not add significant value to the database. Construction Inspectors keep a close eye on the progress of projects and would not need to rely on inventory data to achieve effective stormwater management and oversight. Once a project is completed, the date can be entered into the database.	Revise Provision E.4.b.(1)(d) as follows: "The project start and ~~anticipated completion~~ completed dates;"
E.4.d.(1)(a)	93	Inspection	Minor clarification.	Revise Provision E.4.d.(1)(a) as follows:

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		Frequency		Each Copermittee must conduct inspections at all inventoried sites, including high threat to water quality sites, at an appropriate frequency for each phase of construction to ~~ensure~~ confirm the site reduces the discharge of pollutants in storm water from construction sites to the MEP, and prevents non-storm water discharges from entering the MS4.
E.4.d.(3)(c)	94	Inspection Tracking and Records	Considerable staff resources would be spent on calculating the amount of rainfall since last inspection and this information is not useful. This information would be really subjective if there is no nearby rain gauge. Instead, the current weather conditions observed during the inspection is more useful and easy data to capture.	Revise Provision E.4.d.(3)(c) as follows: ~~Approximate amount of rainfall since last inspection;~~ Weather condition during inspection;
E.5.a	95	Existing Development Inventory and Tracking	Adding the term "reasonable potential to discharge", consistent with the Clean Water Act, allows flexibility for the Copermittees to determine priorities. The term "may discharge" is too broad and will limit Copermittees ability to focus on jurisdictional and watershed priorities. The focus needs to be on significant pollutant load discharges so inspections and enforcement can actually succeed in receiving water pollutant load reductions versus spending an exhaustive amount of time and money inspecting sites that discharge no pollutant loads, but "may" discharge pollutant loads, even though unlikely to do so.	Revise Provision E.5.a. as follows: "Each Copermittee must maintain an annually updated watershed-based inventory of all the existing development that has the reasonable potential to ~~may~~ discharge a pollutant load to and from the MS4".
E.5.a.(1)(d)(vii) E.5.a.(2)(f)	96 96	Existing Development Inventory and Tracking	Mobile home parks are outside the jurisdiction of the Copermittees. They are regulated by the state.	Revise Provision E.5.a.(1)(d)(vii) as follows: ~~"Mobile home park"~~ Revise Provision E.5.a.(2)(f) as follows: "(f) ~~Identification if an area is a~~ Common Interest Areas (CIAs) / Home Owner Associations (HOAs)~~, or and mobile home parks~~; "
E.5.b	97	Existing Development BMP Implementation and Maintenance	See comment E.5.a.	Revise Provision E.5.b. as follows: "Each Copermittee must designate a minimum set of BMPs required for all inventoried existing development with the reasonable potential to discharge pollutant loads

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				to their MS4, including special event venues."
E.5.b.(1)(a)	97	Existing Development BMP Implementation and Maintenance	Required use of pollution prevention methods will be extremely difficult to enforce. Pollution prevention is proven to be more effective through public behavioral changes via public outreach and education.	Revise Provision E.5.b.(1)(a) as follows: "Each Copermittee must ~~require~~ promote the use of pollution prevention methods by the commercial, industrial, and municipal facilities and areas in its inventoried existing development through public outreach."
E.5.c	99	Existing Development Inspections	See comment E.5.a.	Revise Provision E.5.c. as follows: "Each Copermittee must conduct inspections of inventoried existing development that have been identified by the Copermittee as having the reasonable potential to discharge pollutant loads from their MS4 to ensure compliance with applicable local ordinances and permits, and the requirements of this Order."
E.5.c.(1)(a)(i)	99	Inspection Frequency	See comment E.5.a. The schedule for inspections should be limited to the permit term because the permit cannot require or enforce schedules beyond the term of the permit.	Revise Provision E.5.C.(1)(a)(i). as follows: "At a minimum, inventoried existing development that has been identified by the Copermittee as having the reasonable potential to discharge pollutant loads to and from their MS4 must be inspected once ~~every five years~~ during the permit term."
E.5.c.(1)(a)(v)	99	Inspection Frequency	Volunteer and patrol programs fall under the category of valid public complaints and should be clairified as such in the fact sheet. Volunteer and patrol programs may not have enforcement authority, requiring follow-up by the Copermittees. This Provision should be limited to Copermittees municipal and contract staff with some level of enforcement authority.	Revise Provision E.5.c.(1)(a)(v) as follows: "Inventoried existing development must be inspected by the Copermittee, as needed, in response to valid public complaints and findings from the Copermittee's municipal and contract staff ~~or volunteer monitoring or patrol program~~ inspections."
E.5.c.(2)(a)(i) through (iii)	100	Inspection Content	The addition of "if present" is necessary for clarification. Otherwise, it implies that an inspection must take place to observe an actual discharge which is an unpredictable event (would require inspector to be present for a long period of time waiting for such an event to take place).	Revise Provision E.5.c.(2)(a)(i) through (iii) as follows: "(i) Visual inspections of actual non-storm water discharges, if present; (ii)Visual inspections of actual or potential discharge of pollutants, if present; (iii)Visual inspections of actual or potential illicit connections, if present; and…"

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E.5.d	101	Existing Development Enforcement	Limiting language should be included for the Copermittee's jurisdiction. The existing development inventory and enforcement should be limited to development with the reasonable potential to discharge pollutants.	Revise Provision E.5.d.as follows: "Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried existing development identified by the Copermittee as having the reasonable potential to discharge pollutant loads from the MS4 within their jurisdiction, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6."
E.5.e	101	Strategies to Address the Highest Priority Water Quality Conditions	Resource re-allocation will assist in neutralizing costs for any channel rehabilitation/retrofit projects undertaken by the Copermittees and will have a more significant likelihood of improving water quality than monitoring.	Add: the following text to Provision E.5.e.: "(4) Upon Regional Board approval and in lieu of monitoring during any given year, the Copermittees may reallocate resources originally authorized for water quality monitoring for retrofit and/or rehabilitation project(s) if those projects occur at a location where monitoring is conducted, for a maximum of two nonconsecutive years during the Permit term."
E.6.b.(5)	104	Enforcement Response Approaches and Options	Criminal penalties should be limited to intentional or criminally negligent acts.	Revise Provision E.6.b.(5)(e) as follows: (5) Administrative and criminal (if intentional or criminally negligent) penalties; (a)
E.6.e.(1)	105	Reporting of Non-Compliant Sites	San Diego Water Board notice should be consistent with 40 CFR §122.41(l)(6) and the State of California Construction General Permit. The requirements should be 24 hour verbal notice and five day written notification	Revise Provision E.6.e.(1) as follows: "Each Copermittee must notify the San Diego Water Board in writing within ~~2 working days~~ 5 calendar days of issuing escalated enforcement…"
E.7	106	Public Education and Participation		"…discharge of pollutants from the MS4 ~~in storm water~~ to the MEP"
E.7.a.(1)	106	Public Education	There is specific emphasis on pesticides, herbicides and fertilizers. The rationale for the specificity of these topics is unclear. Given the emphasis on showing changes in water quality, education efforts should be focused on activities that address the pollutants of concern and behaviors that are tied to water quality issues. Therefore, each Copermittee, by jurisdiction and watershed, should identify, determine and prioritize the activities that address priorities consistent with Provision B.	Revise Provision E.7.e.(1) as follows: "Educational activities, public information activities, and other appropriate outreach activities intended to reduce pollutants ~~associated with the application of pesticides, herbicides and fertilizer in storm water discharges~~ of concern from the MS4 to the MEP. Activities shall be determined and prioritized by Copermittees by jurisdiction and/or watershed (Provision B) to address the highest threats to water quality (such as pesticides, herbicides and

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				fertilizers, used oil, toxic waste, etc. and to facilitate the proper management and disposal of used oil and toxic waste, etc.)…"
E.7.a.(2)	106	Public Education	There is specific emphasis on used oil and toxic material disposal. The rationale for the specificity in education topics is unclear. As stated above, Copermittees should be able to target education efforts on the pollutants and behaviors most commonly linked to the water quality issues within their respective jurisdictions and watersheds. Thus, this Provision is incorporated in the changes proposed above and would become part of E.7.a.1.	Move Provision E.7.a(2) into E.7.a(1).
F. Reporting				
F.1	109-110	Water Quality Improvement Plans	Based on the mock WQIP development process completed by stakeholders in recent months, the Copermittees have developed an alternative submittal schedule for the WQIPs. The alternative submittal schedule would provide additional information on potential BMP strategies with the first submittal (Priority Conditions and Potential Strategies), but allow for more time to develop numeric goals, detailed JRMP commitments, and Reasonable Assurance Analysis with the second submittal (Numerical Goals and Water Quality Improvement Strategies and Schedules) and approval from elected officials for final submittal (Water Quality Improvement Plan submittal). The revised timeline better reflects the schedule needed by Copermittees to develop robust WQIPs, but also provides additional information early in the process for stakeholder review. These requested changes are outlined in the comments below.	See the changed in the attached revised Permit to section F.1, as described in the comments below.
F.1.a.(1)	109	Priority Water Quality Conditions	The stakeholders' mock WQIP process has highlighted elements of the WQIP development process that could be	Revise Provision F.1.a.(1) as follows:

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			revised to better reflect the Copermittees' internal processes. For the early submittal, it is preferred to submit Priority Water Quality Conditions and Potential Strategies. Selection of specific strategies will be important, but an initial step is proposed at the 6-month mark to establish a level of understanding regarding the "menu" of options including terminology, BMP types, etc. The effort to develop numeric goals, however, will require more analyses, considering the array of pollutants and beneficial uses that will need to be considered. As such, it is requested that numeric goals be moved to the second WQIP submittal (as opposed to the first submittal). Finally, with the first submittal is when a Copermittee should express its intent to pursue an iterative, WQIP-based compliance mechanism using a Water Quality Improvement Plan with Reasonable Assurance Analysis, per our comments on Provision B.3.a.	(1) Priority Water Quality Conditions and Potential Strategies ~~Numeric Goals~~ (a) The Copermittees must implement a public participation process to solicit data and information to be utilized in the development and identification of the priority water quality conditions for the Watershed Management Area. (b) The Copermittees are encouraged to involve the public and key stakeholders as early and often as possible during the development of the priority water quality conditions and ~~numeric goals~~ potential strategies to be included in the Water Quality Improvement Plan. (c) Within 6 months after the commencement of coverage under this Order, the Copermittees must develop and submit the Water Quality Improvement Plan requirements of Provision B.2.a-d and a list of potential strategies that will be considered for the draft Water Quality Improvement Plan to the San Diego Water Board. Each Copermittee selecting the option to develop a Water Quality Improvement Plan to serve as an iterative, implementation-based compliance mechanism per Provision B.3.a.(3) must also indicate their intent to pursue the option in the submittal. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of 60 days. (d) The Copermittees must consider revisions to ~~revise~~ the priority water quality

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				conditions ~~and numeric goals~~ based on public comments received and must respond to ~~and/or~~ recommendations or direction from the San Diego Water Board Executive Officer.
F.1	109 and 110	Water Quality Improvement Plans	The public comment process for the WQIP submittals will be open to a wide array of stakeholders and the Regional Board staff. There is potential that some comments may conflict with one another, and may conflict with comments provided by the Regional Board EO. The language in the Permit suggests that each comment requires a revision. Each comment should be considered, but some comments may not result in a revision. The Copermittees agree, however, that all comments from the Regional Board Executive Officer must be responded to.	Revise Provisions F.1.a.(1).(d), F.1.a.(2).(c), and F.1.b.(3) as follows: "The Copermittees must consider revisions to ~~revise~~ the priority water quality conditions ~~and numeric goals~~ based on public comments received and must respond to ~~and/or~~ recommendations or direction from the San Diego Water Board Executive Officer."
F.1.a.(2)	109	Water Quality Improvement Strategies and Schedules	Modifications to the second WQIP submittals are proposed, based on the stakeholders' mock WQIP development process. The commitments to implement strategies/BMPs associated with JRMPs were highlighted as a major challenge of the second WQIP submittal. The 9-month timeline does not allow sufficient time to develop JRMP commitments, particularly if an optional Reasonable Assurance Analysis will be developed. A 16-month timeline is needed for Copermittees to engage elected officials/management on the draft WQIP numeric goals and resulting WQIP commitments (strategies, activities, etc.) to meet those goals. Furthermore, as mentioned above, it is requested that numeric goals be submitted with the second WQIP submittal (as opposed to the first submittal).	Revise Provision F.1.a.(2) as follows: (2) Numeric Goals and Water Quality Improvement Strategies and Schedules (a) The Copermittees are encouraged to involve the public and key stakeholders as early and often as possible during the development of the numeric goals and water quality improvement strategies and schedules to be included in the Water Quality Improvement Plan. (b) Within ~~9~~ 16 months after the commencement of coverage under this Order, the Copermittees must develop and submit the Water Quality Improvement Plan requirements of Provisions B.2.e and B.3 to the San Diego Water Board. Each Copermittee selecting the option to develop a Water Quality Improvement Plan to serve as an iterative, implementation-based compliance mechanism per Provision B.3.a.(3) must also submit a draft Reasonable Assurance Analysis. The San Diego Water Board will issue a public notice and solicit public

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				comments on the Water Quality Improvement Plan for a minimum of 60 days. (c) The Copermittees must consider revisions to ~~revise~~ the numeric goals and water quality improvement strategies and schedules based on public comments received ~~and/or~~ and must respond to recommendations or direction from the San Diego Water Board Executive Officer.
F.1.b.(1)	110	Water Quality Improvement Plan Submittal	Based on the comment above, and to allow Copermittees at least two months to respond to comments received during the 60-day comment period on the draft WQIP and provide four months for elected officials to approve the final WQIPs and incorporated commitments (strategies, activities, etc.), a total of 24 months are requested for final WQIP submittal. In this manner, the timeline from draft WQIP development to Regional Board submittal would proceed as follows: O 16 months: Draft WQIP O 18 months: comment period ends O 20 months: revise WQIPs O 24 months: Copermittee approval of WQIPs and submit to RB The 24-month timeline is considered reasonable, as it comprises the first two years of the Permit cycle, while the remaining three years can be focused on WQIP implementation. Also, Clarify that the Santa Margarita River Water Quality Improvement Plan is not due until 18 months after the Riverside County Copermittees are covered under this order.	Revise Provision F.1.b.(1) as follows: (1) Within ~~18~~ 24 months after the commencement of coverage under this Order, the Copermittees for each Watershed Management Area must submit a complete Water Quality Improvement Plan in accordance with the requirements of Provision B to the San Diego Water Board. Each Copermittee selecting the option to develop a Water Quality Improvement Plan to serve as an iterative, implementation-based compliance mechanism per Provision B.3.a.(3) must also submit a final Reasonable Assurance Analysis. The Santa Margarita River Watershed Management Area must submit a complete Water Quality Improvement Plan in accordance with the requirements of Provision B to the San Diego Water Board 18 months after the Riverside Copermittees are covered under this Order. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of 30 days.
F.1.b	109	Water Quality Improvement Plan	For WQIP implementation to be feasible, Copermittees must have at least one full fiscal year budgeting cycle within	Add Provision F.1.b.(5) as follows:

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		Submittal	which to seek additional funding to implement the WQIP from our governing bodies (i.e., City councils and County supervisors).	(5) Copermittees must commence with implementation of the Water Quality Improvement Plan no later than the fiscal year (July 1) following San Diego Water Board approval of the Water Quality Improvement Plan.
F.3.b.(1)	112	Annual Reports	The Annual Report for monitoring and assessment programs typically requires seven months to prepare. Lead time is needed to plan and secure the resources and contracting mechanisms to conduct monitoring programs. Therefore, If the Order is adopted on March 1, 2013, then the Water Quality Improvement Plan would be submitted to the SDRWQCB by September 2014. The Water Quality Improvement Plan could be accepted by SDRWQCB as early as 60 days after submittal (November 2014). This would then require the first Annual Monitoring and Assessment Report to be due on January 30, 2015. This report would only include one year of transitional monitoring instead of two. To rectify this, modify the reporting deadline such that it is the following January 31st of the conclusion of the monitoring season of September 30th.	Revise Provision F.3.b.1 as follows: "(1) The Copermittees for each Watershed Management Area must submit an Annual Report for each reporting period no later than January 31 of the following year. The annual reporting period consists of two periods: 1) July 1 to June 30 of the following year for the jurisdictional runoff management programs, 2) October 1 to September 30 of the following year for the monitoring and assessment programs. The first Annual Report must be prepared for the reporting period beginning July 1 after commencement of coverage under this Order, and upon San Diego Water Board determination that the Water Quality Improvement Plan meets the requirements of this Order to June 30 in the following year for the jurisdictional runoff management programs. ~~,~~The first Annual Report must be prepared for the reporting period beginning 50 days after adoption of this Order and the January 31st following the first September 30th (conclusion of monitoring season) after the San Diego Water Board determines that the Water Quality Improvement Plan meets the requirements of this Order ~~September 30 in the following year~~ for the monitoring and assessment programs. Annual Reports must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Each Annual Report must include the following:"
F.3.b.(3)	113	Annual Reports	Originators of data are legally responsible for their data and should enter the data into CEDEN. It is not always possible for Copermittees to verify the veracity or quality of third party data. The quality control data requirements of CEDEN do not easily allow third parties to successfully enter data	Revise Provision F.3.b.3.e as follows: "(3) Each Copermittee must provide any data or documentation utilized in developing the Annual Report upon request by the San Diego Water Board. ~~Any~~ Copermittee monitoring data utilized in developing the

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			without the associated detailed laboratory QA/QC data, detailed knowledge of the field protocols employed, and the ability to verify SWAMP comparability. There are also often difficulties associated with the practical aspects of data formatting to meet the requirements of the CEDEN data checker; these issues could be very difficult or impossible to resolve with third party data. The draft requirement would likely discourage Copermittees from seeking out third party data sets, as Copermittees would be in violation of the Permit if data could not readily be uploaded to CEDEN.	Annual Report must be uploaded to the California Environmental Data Exchange Network (CEDEN).[32] Any Copermittee monitoring and assessment data utilized in developing the Annual Report must be provided on the Regional Clearinghouse required pursuant to Provision F.4."
F.3.c	114	Regional Monitoring and Assessment Report	This report appears to be duplicative with the Integrated Assessment of Water Quality Improvement Plan (Provision D.4.d) that is also due with the Report of Waste Discharge. Please clarify the intent of these reports and if the same modify accordingly.	Delete Provision F.3.c. ~~a. REGIONAL MONITORING AND ASSESSMENT REPORT~~ ~~(1) The Copermittees must submit a Regional Monitoring and Assessment Report no later than 180 days in advance of the expiration date of this Order. The Regional Monitoring and Assessment Report may be submitted as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The Copermittees must review the receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, and findings from the assessments required pursuant to Provision D.4, to assess the following:~~ ~~(a) The beneficial uses of the receiving waters within the San Diego Region that are protected or must be restored;~~ ~~(b) The progress toward restoring impacted beneficial uses in the receiving waters within the San Diego Region; and~~ ~~(c) Pollutants or conditions of emerging concern that may impact beneficial uses in the receiving waters within the San Diego Region.~~ (2) ~~The Regional Monitoring and Assessment Report must include recommendations for improving the implementation and assessment of the Water Quality Improvement Plans and jurisdictional runoff~~

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				~~management programs.~~ (3) ~~Each Copermittee must provide any data or documentation utilized in developing the Regional Monitoring and Assessment Report upon request by the San Diego Water Board. Any monitoring and assessment data utilized in developing the Regional Monitoring and Assessment Report must be provided on the Regional Clearinghouse required pursuant to Provision F.4.~~
F.3.c.(3)	114	Regional Monitoring and Assessment Report	[*Applies if provision not stricken per prior comment:*] Originators of data are legally responsible for their data and should enter the data into CEDEN. It is not always possible for Copermittees to verify the veracity or quality of third party data. The quality control data requirements of CEDEN do not easily allow third parties to successfully enter data without the associated detailed laboratory QA/QC data, detailed knowledge of the field protocols employed, and the ability to verify SWAMP comparability. There are also often difficulties associated with the practical aspects of data formatting to meet the requirements of the CEDEN data checker; these issues could be very difficult or impossible to resolve with third party data. The draft requirement would likely discourage Copermittees from seeking out third party data sets, as Copermittees would be in violation of the Permit if data could not readily be uploaded to CEDEN.	If Provision F.3.c.(3) is not removed, revise Provision F.3.c.(3) as follows: "(3) Each Copermittee must provide any data or documentation utilized in developing the Regional Monitoring and Assessment Report upon request by the San Diego Water Board. Any monitoring and assessment data collected by Copermittees ~~utilized~~ in developing the Regional Monitoring and Assessment Report must be provided on the Regional Clearinghouse required pursuant to Provision F.4."
F.4	115	Regional Clearinghouse	The Copermittees require language clarification that the regional clearinghouse may be maintained by another agency.	Add the following footnote to the first paragraph of Provision F.4: "The Copermittee may elect to develop and maintain the clearinghouse(s) provided by other Copermittees or agencies."
F.5	116-117	Report of Waste Discharge	See comment F.4.	Add similar language from F.4 to a footnote.
G. Principal Watershed Copermittee Responsibilities				
G	118	Principal Watershed	Coordinating and developing, with the other Copermittees, the requirements of Provisions F.3.c, F.4, and F.5.b of this	Remove requirement that Principal Copermittee can only be Principal Copermittee for 2 watersheds and clarify that

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		Copermittee Responsibilities	Order.	all Copermittees have some level of commitment, not just the Principal Watershed Copermittee.
H. Modification of Programs				
H	119	Modification of Programs	Modifications of programs are allowed under the Water Quality Improvement Plan as part of the iterative process and adaptive management. Language should be added to that effect or there may be annual amendments to the Order.	Revise Provision H.3. as follows: "Proposed modifications <u>outside of the Water Quality Improvement Plan process</u> that are not minor require amendment of this Order in accordance with this Order's rules, policies, and procedures."
H	119	Modification of Programs	The reopener for the Project I Beaches and Creeks Bacteria TMDL is scheduled to fall within the term of this Permit (April 2016). This TMDL is a major component of TMDL requirements incorporated into this Permit, and should be acknowledged in Provision H. Other TMDLs may be reopened during this Permit as well. The Regional Board should express a good faith effort to revise this Order based on the revised TMDL requirements.	Add Provision H.5, as follows: <u>5. The San Diego Water Board may re-open and modify this order at any time prior to its expiration, after opportunity for public comment and a public hearing, if the Basin Plan Amendments for any of the TMDLs in Attachment E are revised by the San Diego Regional Board. Should a TMDL Basin Plan Amendment be revised and adopted by the Regional Board, then the Regional Board will re-open this Order as soon as possible to update the TMDL requirements in Attachment E to reflect the revised Basin Plan Amendment.</u>
I. Standard Permit Provisions and General Provisions				
			N/A	None.
Attachment A. Discharge Prohibitions				
			N/A	None.
Attachment B. Standard Permit Provisions and General Provisions				
Attachment B	B1-B5	Standard Permit Provisions and General Provisions	This attachment incorporates the standard NPDES permit provisions as identified in 40 CFR 122.41. Although correctly transposed from the regulations the provisions are obviously developed for a traditional point source permit (i.e. wastewater permit). As such there are a number of standard provision that pose challenges to the Copermittees to comply with. Clarification is requested on a number of the provisions.	See specific changes noted below.
Attachment B;	B-7	Bypass	This provision requires the Copermittees to notify the	Delete this provision.

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1.m			Regional Board whenever an anticipated or unanticipated bypass will occur. Given the nature of storm events and the fact that stormwater treatment BMPs include bypass provisions to protect the BMP integrity it would appear that the Copermittees would have to notify the Regional Board anytime a storm is predicted to ensure compliance with the provision. This provision was crafted for typical wastewater discharges and has little relevance to stormwater.	
Attachment B, 2.h	B-12	NPDES Permitted Non-Storm Water Discharges		Add the following text at the end of the Provision: "A Copermittee will not be held responsible for pollutants in its MS4 discharge originating from an NPDES-permitted non-storm water discharge.
Attachment B, 2.i.2	B-12	Monitoring	The timeline for retention of records is in conflict with similar retention provisions under Att B.1.j.(2)	Align requirements or delete either Provision.
Attachment C. Acronyms, Abbreviations and Definitions				
Attachment C	C-2	Definitions – Automotive Repair Shop	This is no change to the definition in E.3.b, but relocates the definition to Appendix C for consistency with the rest of the document. The square footage threshold is retained in Provision E.3.b because this is a regulatory specific rather than a definition.	Add the following definition: Automotive Repair Shop – a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539 or equivalent NAICS code.
Attachment C	C-2	Definitions – Best Management Practices	Include in the definition that BMPs may be used in place of numeric effluent limits.	Reinstate the previous definition as follows: "In the case of municipal discharge permits, BMPs may be used in the place of numeric effluent limits.
Attachment C	C-3	Definitions – Channel Rehabilitation and Improvement	The term channel rehabilitation and Improvement is used in the permit but is not adequately defined. Adding a definition with clarify which projects that would fit under this category.	Add the following definition: Channel Rehabilitation and Improvement – Remedial measures or activities for the purpose of improving or restoring the environmental health of streams, channels or river streams. Techniques may vary from in-stream restoration techniques to off-line stormwater management practices installed in the system corridor or upland areas. Rehabilitation techniques may include, but are not limited

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				to the following: riparian zone restoration, constructed wetlands, bank stabilization, channel modifications, and daylighting of drainage systems. Effectiveness may be measured in various manners, including: assessments of habitat, reduced streambank erosion, and restoration of water and sediment transport balance.
Attachment C	C-3	Definitions – Construction Site	Update the definition for Construction site to define the area to be disturbed and narrow definition to work outside of a facility.	Revise the definition of Construction Site as follows: "…soil disturbing activities greater than 10,000 square feet…excavation. This does not include interior construction activities such as interior remodeling, plumbing, electrical, or mechanical work."
Attachment C	C-3	Definitions - Copermittee	Add clarification that the San Diego Region is Region 9.	Add: "..Region (Region 9) …"
Attachment C	C-3	Definitions - Development Project	More concise and specifies development projects that have land disturbance, in line with Grading Ordinance definitions.	Edit the following definition as follows: Development Projects - Construction, rehabilitation, redevelopment, or reconstruction of any public or private ~~residential~~ projects involving land disturbance activities ~~industrial, commercial, or any other projects~~.
Attachment C	C-4	Definitions – Direct Discharge to an Environmentally Sensitive Area	The "Environmentally Sensitive Area" definition found elsewhere in Appendix C would remain unchanged. This new definition would support interpretation of the Priority Development Project category titled "Environmentally Sensitive Areas" (E.3.b(d)) and remove much current confusion that applicants and reviewers have in interpreting these rules. In discussions with Regional Board staff we have learned specifically what their concern is regarding a direct hydraulic connection between the development project and the specially protected areas. We feel that this language adequately addresses that concern while providing the most succinct language that can be interpreted reasonably well for a wide range of development scenarios.	Add the following definition: Direct Discharge to an Environmentally Sensitive Area – Flow that is conveyed overland a distance of 200 ft or less from the development to the ESA, or conveyed in a pipe any amount of distance as an isolated flow from the development to the ESA (i.e. not commingled with flows from adjacent lands).
Attachment C	C-4	Definitions – Household		Revise the text as follows: "… other hazardous wastes"

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		Hazardous Waste		
Attachment C	C-5	Definitions - Inland Surface Waters	Change the definition to include waters of the U.S. not State.	Replace the definition as follows: "Inland Surface Waters – Includes all surface waters of the U.S. that do not include the ocean, enclosed bays, or estuaries."
Attachment C	C-5	Definitions – Low Impact Development Best Management Practices	Minor grammatical correction.	Revise the definition as follows: "that emphasize conservation ~~s~~and the use of on-site natural features"
Attachment C	C-6	Definitions - Major Outfall	Minor grammatical correction	"…with a drainage area of more…"
Attachment C	C-6	Definitions – Maximum Extent Practicable (MEP)		Revise the text as follows: "The technology-based standard established by Congress in CWA Provision 402(p)(3)(B)(iii) for ~~storm water~~ discharges of pollutants that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) in combination with treatment methods serving as a backup (additional line of defense)."
Attachment C	C-7	Definitions – MS4	The addition of CWA language to the definition of MS4 limits Copermittees' responsibilities to within their jurisdiction and strengthens support that Copermittees are not responsible for discharges in MS4s that they do not operate.	Revise text as follows: "… Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.~~26~~22. Copermittees need only comply with permit conditions relating to discharges from the municipal separate storm sewers for which they are operators." 40 CFR §122.21(a)(vi).
Attachment C	C-7	Definitions – Non-Storm Water		Revise text as follows: All discharges to and from a MS4 that do not originate from precipitation events (i.e., all discharges from a MS4 other than storm water). Non-storm water includes illicit

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				discharges, ~~and~~ NPDES permitted discharges, and the discharges described in Provision E(2)(a)(3)-(5).
Attachment C	C-8	Definitions - Outfall	Add the definition of outfall and cite the Federal Regulations.	Add the following definition: Outfall - *Outfall* means a *point source* as defined by 40 CFR 122.2 at the point where a municipal separate storm sewer discharges to waters of the United States and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels or other conveyances which connect segments of the same stream or other waters of the United States and are used to convey waters of the United States. 40 C.F.R. 122.26(b)(9).
Attachment C	C-8	Definitions – Parking Lot	This is no change to the definition in E.3.b, but relocates the definition to Appendix C for consistency with the rest of the document. The square footage threshold is retained in Provision E.3.b because this is a regulatory specific rather than a definition.	Add the following definition: Parking Lot – a land area or facility for the tempraory parking or storage of motor vehicles used personally, for business, or for commerce.
Attachment C	C-8	Definitions – Pre-Development Runoff Conditions	The definition for Pre-Development Runoff Conditions should be the exact language EPA used in the Federal Register at 64 FR §68761. We acknowledge the removal of language referencing natural watershed hydrology before human induced alterations. Jurisdictions cannot require project applicants to match post-project hydrograph to the pre-development hydrograph because it may impose mitigation beyond the project's impacts. The pre-project standard provides the appropriate nexus to the project impacts, as is the standard followed by CEQA.	Revise the definition as follows: ~~Pre-Development~~ Pre-Project Runoff Conditions – "Runoff conditions that exist~~ed~~ onsite immediately before the ~~existing development was constructed, or exists onsite before~~ planned development activities occur. Pre-development is not intended to be interpreted as that period before any human-induced land disturbance has occurred. 64 FR 68761."
Attachment C	C-8	Definitions – Properly Designed	A definition of "Properly Designed," which mentioned in Source Control BMP Requirements is not mentioned in the definitions Provision of Attachment C. As currently written, the permit authorizes subjective broad authority and deference to the Regional Board in interpretation of the definitions, if not included. This term requires a definition.	Add the following definition: "Properly Designed – Designed in accordance with the Copermittee's BMP Design Manual and/or any appropriate design requirements set forth by the Copermittee and based on widely accepted design criteria."

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Attachment C	C-8	Definitions – Public Education, Outreach, and Participation	Neither Public Education and Outreach, nor Public Participation are mentioned in the definitions Provision of Attachment C. Please add definitions for these non-structural BMPs.	Add the following definition: "Public Education, Outreach and Participation – Programs to educate residents, businesses and visitors about the importance of water quality and water quality programs so that they will support local efforts and understand their role in protecting receiving waters. The Education and Outreach Program will increase knowledge and awareness, improve attitudes toward storm pollution prevention, and provide a foundation for changing behaviors that contribute to storm water pollution."
Attachment C	C-8 through C-9	Definitions - Redevelopment	The current San Diego permit R9-2007-0001 Definition for Redevelopment states "Redevelopment does not include trenching and resurfacing associated with utility work; resurfacing and reconfiguring surface parking lots and existing roadways." Resurfacing and reconfiguration of parking lots should still be included in this sentence as these actions are not increasing impervious surfaces and are necessary for ongoing maintenance (pothole repair, root intrusion, damage repair, etc).	Revise the following definition: Redevelopment – "The creation, addition, and/or replacement of impervious surface on an already developed site through construction or alteration of the existing footprint" …Redevelopment does not include trenching and resurfacing associated with utility work; resurfacing existing roadways; resurfacing, cutting and reconfiguring of surface parking lots; new sidewalk construction, pedestrian ramps, or bike lane on existing roads; and routine replacement of damaged pavement, such as pothole repair."
Attachment C	C-9	Definitions - Restaurant	This is no change to the definition in E.3.b, but relocates the definition to Appendix C for consistency with the rest of the document. The square footage threshold is retained in Provision E.3.b because this is a regulatory specific rather than a definition.	Add the following definition: Restaurant – a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812).
Attachment C	C-9	Definitions – Retail gasoline outlet	No prior definition existed, so one was created for consistency with the other priority development project categories. The square footage threshold is retained in Provision E.3.b because this is a regulatory specific rather than a definition.	Add the following definition: Retail gasoline outlet (RGO) – a business that sells automotive or truck fuel to the general public.
Attachment C	C-9	Definitions - Retrofitting	Minor edit to improve understanding of when retrofitting is appropriate.	Revise the following definition:

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				"Retrofitting – Storm water management practice put into place after development has occurred in watersheds where the practices previously did not exist or are ineffective…"
Attachment C	C-10	Definitions – Street, Road, Highway, Freeway, and Driveway	This is no change to the definition in E.3.b, but relocates the definition to Appendix C for consistency with the rest of the document. The square footage threshold is retained in Provision E.3.b because this is a regulatory specific rather than a definition.	Add the following definition: Street, Road, Highway, Freeway and Driveway – "Any paved impervious surface that is used for the transportation of automobiles, trucks, motorcycles, and other vehicles."
Attachment C	C-10	Definitions – Waters of the state	This language should be limited based on the intent of the definition (natural water sources) and should not be interpreted to include man-made structures that collect runoff for the sole purpose of flow volume/velocity and/or pollutant reduction, such as a wet pond. Circumstance and condition should be considered as part of determination whether a water body is a water of the state.	"Waters of the State - Any water, surface or underground, including saline waters within the boundaries of the State [CWC Provision 13050 (e)]. The definition of the Waters of the State is broader than that for the Waters of the United States in that all water in the State is considered to be a Waters of the State ~~regardless of circumstance or condition~~."
Attachment D. Jurisdictional Runoff Management Program Annual Report Form				
			N/A	None.
Attachment E. Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2013-0001				
Attachment E. (General)	E-1 through E-47	Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2013-0001	The organization of the TMDL provisions could be improved to help more clearly outline the interim and final requirements and schedules. The Copermittees recommend a reformat that would be easier to follow and has a clearer connection between receiving water limitations, effluent limitations, BMP requirements, and compliance determination.	As shown in the attached revised Permit, revise the organizational structure of the TMDL Specific Provisions, using the following outline: (a) Applicability (b) Final TMDL Compliance Requirements (c) Interim TMDL Compliance Requirements (d) Monitoring and Assessment
Attachment E. (General)	E-1 through E-47	Compliance Determination sub-sections for each TMDL	As discussed in comments under Provision B, the Copermittees have fully embraced using WQIPs as an integral component of our programs, and would like to extend the role of WQIPs into TMDL compliance determination.	Incorporate a WQIP-based compliance option (BMP-based WQBELs) into the Compliance Determination sections of Attachment E (consistent with the comment on the revisions to Provision B.3.a) , with the WQIPs serving as the compliance mechanism.

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			There is regulatory precedent for including WQIP-based compliance mechanisms ("BMP-based WQBELs") as a TMDL compliance option. State and federal law do not require the use of numeric effluent limitations for MS4 Copermittees, but rather encourage flexible implementation of best management practices through an iterative process. Specifically, the choice to include either management practices or numeric limitations in MS4 permits is within the regulatory agency's discretion, and on the question of whether MS4 permits must contain numeric effluent limitations, the court upheld EPA's use of iterative BMPs in place of numeric effluent limitations for storm water discharges. (See Defenders of Wildlife v. Browner, 191 F.3d 1159, 1166-1167 (9th Cir. 1999)[6] The findings of California's Stormwater Blue Ribbon Panel, which was convened specifically to examine the feasibility of incorporating numeric effluent limits in stormwater permits, ultimately concluded that numeric limits were generally infeasible across all three stormwater activities (municipal, industrial, and construction), with a few exceptions (*The Feasibility of Numeric Effluent Limits Applicable to Discharges of Stormwater Associated with Municipal, Industrial and Construction Activities, June 19, 2006*). Additionally, state law and policy does not require the use of numeric effluent limitations in MS4 permits. In 2009, the State Water Board affirmed this approach in a precedential order, stating: "[it] is our intent that federally mandated TMDLs be given substantive effect. Doing so can improve the efficacy of California's NPDES storm water permits. This is not to say that a wasteload allocation will result in	As shown in the attached revised Permit, the following sub-bullet would be incorporated into the interim and final Compliance Determination sections for each TMDL: "The Responsible Copermittee has submitted and is fully implementing a Water Quality Improvement Plan that is developed and adaptively managed as outlined in Provisions B, F.1 and F.2, is accepted by the San Diego Water Board, and meets the conditions of Specific Provision x.x.(x).x."

[6] See also California Regional Water Quality Control Board San Diego Region - Fact Sheet / Technical Report For Order No. R9-2010-0016 / NPDES NO. CAS0108766.

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			numeric effluent limitations for municipal storm water dischargers. Whether a future municipal storm water permit requirement appropriately implements a storm water wasteload allocation will need to be decided on the regional water quality control board's findings *supporting either the numeric or non-numeric* effluent limitations contained in the permit." (Order WQ 2009-0008, In the Matter of the Petition of County of Los Angeles and Los Angeles County Flood Control District, at p. 10 (emphasis added).) Furthermore, a memo issued in 2010 by EPA directors Hanlon and Keehner describes how permitting agencies have discretion to use BMP-based WQBELs for MS4 Permits: "The permitting authority's decision as to how to express the WQBELs(s), either as numeric effluent limitations or BMPs, including BMPs accompanied by numeric benchmarks, should be based on an analysis of the specific facts and circumstances surrounding the permit, and/or the underlying WLA, including the nature of the stormwater discharge, available data, modeling results or other relevant information." In a July 23, 2012 comment letter from EPA to the Los Angeles Regional Board on the recent LA County MS4 Permit regarding that Board's use of this approach,, EPA stated: "This is consistent with EPA guidance in its updated memorandum of November 10, 2010 concerning the incorporation of WLAs into stormwater permits, available at: http://www.epa.gov/npdes/pubs/establishingtmdlwla revision.pdf. This memorandum recommends the use of numeric effluent limits when feasible, and notes that BMP-	

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			based approaches are appropriate in cases where the administrative record for the permit quantitatively demonstrates the BMPs required by the permit will be sufficient to ensure compliance with the WLAs. This has also been a long-standing EPA policy dating back to EPA's previous 2002 guidance memorandum concerning the incorporation of WLAs into stormwater permits, available at: http://www.epa.gov/npdes/pubs/final-wwtmdl.pdf." The WQIPs could 1) demonstrate that BMP-based approaches are appropriate and 2) provide the necessary information so that the administrative record for the permit can demonstrate the BMPs required by the permit will be sufficient to ensure compliance with the WLAs.	
Attachment E. (General)	E-1 through E-47	Best Management Practice sub-sections for each TMDL	The "Best Management Practices" subsections for each TMDL should incorporate the WQIP-based compliance concept as proposed in the proposed revisions to Provision B.3, and describe the steps that Copermittees must take for WQIPs and BMP-based WQBELs to be approved by the Regional Board as a compliance mechanism. It is important to note that this approach would be subject to public review and Regional Board approval, and thus this approach has many "checkpoints" where the Regional Board is able to determine whether WQIP-based compliance (BMP-based WQBELs) is appropriate given the approach and level of rigor in the WQIP. Furthermore, the WQIPs would provide sufficient detail regarding the strategies and activities to be implemented, which would allow the Regional Board to use the schedule for compliance determination in a clear, specific, measurable, and enforceable manner.	As shown in the attached revised Permit, insert a new Best Management Practices sub-bullet in the interim and final TMDL Compliance Requirements sections for each TMDL as follows: (a) For Copermittees utilizing the WQIP-based compliance option, the strategies and activities contained in the WQIP accepted by the San Diego Water Board and adaptively managed as outlined in Provision B.6, F.1, and F.2, will serve as BMP-based WQBELs under the following conditions, as outlined in Provision B.3.a: (1) A Responsible Copermittee requests that the Water Quality Improvement Plan be approved as the basis for compliance with the discharge prohibitions (A.1), receiving water limitations (A.2), and/or effluent limitations (A.3) in the letter of submittal to the San Diego Water

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				Board; (2) Reasonable assurance is demonstrated that the strategies and activities in the Water Quality Improvement Plan are expected to attain the final receiving water limitations or final WQBELs under Specific Provision xx.y; (3) The submitted schedule as outlined in Provision B.3 provides sufficient detail regarding the strategies and activities to be implemented to allow the Regional Board to use the schedule for compliance determination in a clear, specific, measurable, and enforceable manner; AND (4) The WQIP is approved by the Regional Board Executive Officer and is implemented per the approved schedule and adapted pursuant to Provisions B.6, F.1, and F.2.
Attachment E. (General)	E-1 through E-47	Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2013-0001	The Receiving Water Limitations associated with TMDLs should not be referred to as Water Quality Based Effluent Limitations (WQBELs). The Copermittees are only responsible for their discharges to receiving waters not for concentrations in receiving waters. Receiving water quality can be affected by multiple sources, including agriculture and other sources that are permitted by this Board. A WQBEL is a restriction on the quantity or concentration of a pollutant that may be *discharged from a point source* into a receiving water that is necessary to achieve an applicable water quality standard in the receiving water (See 40 CFR § 122.2; NPDES Permit Writer's Manual, Appendix A. Categorizing the Receiving Water Limitations as WQBELs is inconsistent with federal regulations and standard permitting practices and could subject the Copermittees to	As shown in the attached revised Permit, for each TMDL, clearly separate receiving water limitations from Water Quality Based Effluent Limitations using separate sub-section headers.

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			Mandatory Minimum Penalties.	
Attachment E. (General)	E-1 through E-47	Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2013-0001	The Order needs to clearly describe the linkage between receiving water limitations and effluent limitations. The effluent limitations should be used to determine whether Copermittees are causing or contributing to exceedances of receiving water limitations. They are not a standalone provision. If receiving water limitations are met, then the effluent limitations are not applicable.	For each Water Quality Based Effluent Limitations sub-section, insert language to describe how WQBELs and RWLs are linked. As shown in the attached revised Permit, the corresponding WQBEL sub-section for each TMDL should open with language similar to the following: "In the case that receiving water limitations are exceeded after the end of the compliance schedules under Specific Provision E.X.x, effluent limitations will be used to determine whether MS4 discharges are causing or contributing to exceedances of receiving water quality limitations. To demonstrate MS4 discharges are not causing or contributing to an exceedance of receiving water quality limitations, MS4 discharges must meet the concentration-based effluent limitations in Table X.X." Similarly interim and final compliance schedules should reflect this as well. As shown in the attached revised Permit, the Interim and Final Compliance Schedule sub-sections for each TMDL should include language similar to the following: "The Responsible Copermittee must be in compliance with the final receiving water limitations or final WQBELs under Specific Provision E.X."
Attachment E. (General)	E-1 through E-47	Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2013-0001	Concentration-based effluent limitations should be applied on a watershed-basis, not outfall by outfall. The Copermittees should have flexibility to address the highest impact outfalls, and not be required to *address every single outfall* (e.g., there is little environmental benefit to construct	For each Water Quality Based Effluent Limitations table with concentration-based WQBELs, insert a footnote to allow Copermittees to manage stormwater quality on a watershed basis. As shown in the attached revised Permit, the footnote for

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			BMPs to control outfalls with relatively low *loadings* that do not affect receiving water conditions). If the approach is outfall-by-outfall (instead of watershed basis), then the costs of compliance will be MUCH higher as nearly every outfall will require an action/BMP regardless of whether or not the loading has an effect on the receiving water. The Copermittees can protect receiving waters by ensuring that discharge concentrations are below the effluent limitations on a *flow-weighted* basis. If one outfall is slightly higher than the WQBEL concentration, but another is below the WQBEL concentration then the MS4s have not impacted water quality as long as the flow-averaged concentration is below the effluent limitation.	each concentration-based WQBEL table would read as follows: "Concentrations shall be determined on a flow-weighted basis across all outfalls within a jurisdiction, not outfall-by-outfall."
Attachment E.1.b (Chollas Creek Diazinon TMDL)	E-3	Water Quality Based Effluent Limitations	The Chollas Creek Diazinon TMDL is based on an erroneous target. The TMDL set the numeric targets equal to the California Department of Fish and Game (CDFG) Water Quality Criteria for the protection of freshwater aquatic organisms from diazinon (Menconi and Cox 1994). The acute and chronic targets equal 0.08 ug/L and 0.05 ug/L, respectively. However, an error in a data point contained in the CDFG criteria was found. In a letter dated May 19, 2004, from Chris Ingersoll (US Geological Survey) to Lenwood Hall (University of Maryland), Mr. Ingersoll discusses an error in the 96-h LC50 of 0.2 ug/L for *Gammarus fasciatus* reported by Johnson and Finley (1980) and by Mayer and Ellersieck (1986). Mr. Ingersoll's letter notes that based on his review of the data sheets, the 96-h LC50 should have been reported as 2 ug/L and not 0.2 ug/L, which was used to calculate the criteria. In a letter dated July 30, 2004 from Brian Finlayson (CA Department of Fish and Game) to Joe Karkoski (Central Valley Regional Water Quality Control Board), Mr. Finlayson confirms that a transcription error occurred and suggests that these data	Replace the receiving water limitation with the recalculated Criterion Maximum Concentration (aka acute criterion) and the Criterion Continuous Concentration (aka chronic criterion) of 0.16 ug/L and 0.10 ug/L, respectively. Set the acute and chronic effluent limitations as 90% of the criteria (same approach as the TMDL) equal to 0.144 ug/L and 0.09 ug/L, respectively.

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			cannot be used in the calculation of the criteria. Mr. Finlayson suggests the recalculated Criterion Maximum Concentration (aka acute criterion) and the Criterion Continuous Concentration (aka chronic criterion) should be 0.16 ug/L and 0.10 ug/L, respectively. Additionally, USEPA published aquatic life water quality criteria for diazinon in December 2005 (EPA-822-R-05-006), which established acute and chronic criteria equal to 0.17 ug/L. Incorporation of the Chollas Creek Diazinon TMDL into the MS4 permit based on the CDFG criteria is inappropriate given the fact these criteria are known to be faulty. The receiving water limitations and effluent limitations should either 1) be removed until the TMDL can be corrected or 2) the recalculated CDFG or USEPA criteria should be utilized. The TMDL assumed, at the time, the CDFG criteria were correct and their use in setting targets and corresponding WLAs was appropriate. However, new information is available that demonstrates those criteria are faulty. Thus, replacement of the receiving water limitations and effluent limitations, would be consistent with the assumptions of the WLAs because the WLAs were intended to implement the narrative toxicity and pesticide objectives in the Basin Plan. As stated on page 16 of the TMDL Staff Report: "By setting the numeric targets equal to the CDFG Water Quality Criteria for diazinon, the Regional Board is quantitatively interpreting the narrative water quality objective of "no toxics in toxic amounts" to mean "no diazinon concentrations in Chollas Creek in excess of 0.08 µg/L for any 1 hour period or in excess of 0.05 µg/L for any 4-day period". The pesticide water quality objective is interpreted in the same way."	
Attachment E.2.b	E-5	Water Quality Based Effluent	The California Toxics Rule (CTR) establishes dissolved	Add the WER term to the receiving water limitations acute

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(Shelter Island Dissolved Copper TMDL)		Limitations	saltwater criteria that are expressed as a function of a Water-Effect Ratio (WER). The WER is set equal to 1.0 unless a site-specific study has been completed. The WER term was incorporated into the Chollas Creek Dissolved Metals TMDL.	and chronic criteria and the effluent limitations, tables 2.1 and 2.2, respectively. Add the following footnote to both tables: "The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER."
Attachment E.2 (Shelter Island Dissolved Copper TMDL)	E-6	Compliance Determination	The TMDL envisioned MS4s would implement management practices to reduce copper loadings to the Shelter Island Yacht Basin (SIYB). As stated on page 53 of the TMDL Staff Report: "The Regional Board will amend Order No. 2001-01, "Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm /Sewer Systems" to require that discharges of copper into SIYB waters not increase from existing loadings… The order could also be amended to require BMPs designed to reduce copper loading into SIYB, and/or monitoring for copper in the runoff management plan pertinent to SIYB."	Allow for BMP-based WQBELs, as envisioned when the TMDL was adopted. As shown in the attached revised Permit, a new Compliance Determination sub-bullet for each TMDL (for both final and interim WLAs) should be added as follows: "(e) The Responsible Copermittees have submitted and are fully implementing an Water Quality Improvement Plan that is developed and adaptively managed as outlined in Provisions B, F.1 and F.2, is accepted by the San Diego Water Board, and meets the conditions of Specific Provision x.x.(x).x."
Attachment E.3.b (Rainbow Creek Watershed Nutrient TMDL)	E-9 of redline	Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2012-0011	The Rainbow Creek TMDL for Total Nitrogen and Phosphorous does not include Wasteload Allocations for the County of San Diego Copermittees. The TMDL only contains Load Allocations. Load allocations should not be implemented through an NPDES permit. It is inappropriate to simply "re-name" the Load Allocations as Wasteload Allocations.	Strike the following TMDL from Attachment E in its entirety: Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed
Attachment E.3.b (Rainbow Creek Watershed Nutrient	E-10	Water Quality Based Effluent Limitations	Notwithstanding the previous comment, the TMDL clearly states which dischargers are subject to wasteload/load reductions that must be incorporated into their respective permits. For example the TMDL Technical Report states: "nutrient wasteload reductions will eventually be incorporated into Caltrans statewide NPDES storm water	If not striken entirely, add the following compliance determination method to Specific Provisions 3 "The Responsible Copermittee is using its legal authority to reduce nutrient discharges from the land uses identified under Specific Provision 3.b.(2).(b) to the maximum extent practicable."

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TMDL)			permit." Similar language cannot be found regarding incorporating nutrient wasteload and/or load reductions into the County of San Diego's NPDES permit. The only NPDES permit-related requirement imposed upon the County of San Diego is "to require increasingly stringent best management practices" for nutrient discharges to or from the MS4 within the watershed. Furthermore, the Technical Report states that "any Regional Board enforcement action taken will be against individual dischargers and not the County of San Diego."	
Attachment E.4.b (Chollas Creek Dissolved Metals TMDL)	E-12	Compliance Determination	The TMDL envisioned MS4s would implement actions to reduce metals loadings to Chollas Creek. As stated on page 4 of the BPA: "Actions to meet the WLAs in discharges to Chollas Creek will be required in WDRs that regulate MS4 discharges, industrial facility and construction activity stormwater discharges, and groundwater extraction discharges in the Chollas Creek watershed." Additionally, as stated on page 1 of the State Water Board's Resolution (No. 2008-00054) approving the BPA: "The amendment requires actions to be taken to implement management practices to ensure compliance with water quality criteria."	Allow for BMP-based WQBELs, as envisioned when the TMDL was adopted. As shown in the attached revised Permit, a new Compliance Determination sub-bullet for each TMDL (for both final and interim WLAs) should be added as follows: "(e) The Responsible Copermittees have submitted and are fully implementing an Water Quality Improvement Plan that is developed and adaptively managed as outlined in Provisions B, F.1 and F.2, is accepted by the San Diego Water Board, and meets the conditions of Specific Provision x.x.(x).x."
Attachment E.5.b (Baby Beach and Shelter Island Bacteria TMDL)	E-16	Final Water Quality Based Effluent Limitations	The WLAs from the Baby Beach and Shelter Island Bacteria TMDL include percent reductions that should be incorporated into the Order. These percent reductions would allow the Copermittees to plan and implement BMPs in a manner that best reflects the TMDL load reduction requirements. The load reduction requirements would also facilitate BMP-based compliance mechanisms and allow the WQIPs to be better integrated with TMDL requirements.	Incorporate load-based effluent limitations into the Specific Provisions for the Baby Beach and Shelter Island Bacteria TMDL. As shown in the attached revised Permit, a new Table 5.2b should be added to the Final WQBEL sub-section, including the % reductions required by the TMDL. These % reductions should be linked to the concentration-based effluent limitations with an "OR" statement.

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			For the Baby Beach and Shelter Island Bacteria TMDL, there were certain conditions that required ZERO reduction by MS4s. The effluent limitations should reflect these TMDL expectations.	
Attachment E.6.a.(5)	E-21	Applicability	Since adoption of the Project I Bacteria TMDL, the Copermittees have submitted data analysis to the Regional Board to demonstrate that 303(d) listings for San Marcos HA, San Dieguito River HA, and Los Penasquitos HA were incorrectly applied to REC beneficial uses. The Regional Board has concurred with the findings for each HA and stated that these HAs are "not subject to further action under Resolution No. R9-2010-0001." Similar responses are expected for the other HAs.	Add the following text to Section 6.a.(5): "See table 6.0; Consistent with Basin Plan Amendment (Resolution No. R9-2010-0001, p. A-2); specific beach segments from some of the Pacific Ocean shorelines listed in Table 6.0 have been delisted from the 2008 (sic 2010) 303(d) list that was approved by the San Diego Board on December 16, 2009, and therefore are not subject to the requirements of Attachment E as long as monitoring data continues to support compliance with water quality standards."
Attachment E.6.b (Project I Beaches and Creeks Bacteria TMDL)	E-24	Water Quality Based Effluent Limitations	The total coliform WQO only applies ocean waters, and should not be applied to creeks. The freshwater (creek) receiving water limitations in the TMDL do not include total coliform.	As shown in the attached revised Permit, apply the footnote 4 to total coliform receiving water limitations and WQBELs and specify the following: "Total coliform limitations apply only to segments of areas of Pacific Ocean Shoreline listed in Table 6.0."
Attachment E.6.b (Project I Beaches and Creeks Bacteria TMDL)	E-24 through E-25	Water Quality Based Effluent Limitations	The WLAs from the Project I Bacteria TMDL include allowable loadings and percent reductions that should be incorporated into the Order. These percent reductions would allow the Copermittees to plan and implement BMPs in a manner that best reflects the TMDL load reduction requirements. The load reduction requirements would also facilitate BMP-based compliance mechanisms and allow the WQIPs to be better integrated with TMDL requirements.	Incorporate load-based effluent limitations into the Specific Provisions for Project I Bacteria TMDL. As shown in the attached revised Permit, a new Table 6.2b should be added to the Final WQBEL sub-section, specifying the % reductions required by the TMDL. These % reductions should be linked to the concentration-based effluent limitations with an "OR" statement.
Attachment E.6.c	E-30	Compliance Schedule	Similarly, the interim effluent limitations should reflect the % reductions required by the TMDL. The TMDL requires a	Incorporate load-based, interim effluent limitations into the

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(Project I Beaches and Creeks Bacteria TMDL)			50% reduction, so the % reductions applied to the final effluent limitations should be divided by two and included as interim WQBELs.	Specific Provisions for Project I Bacteria TMDL. As shown in the attached revised Permit, a new Table 6.5 should be added to the Interim WQBEL sub-section, specifying the % reductions required by the TMDL. These % reductions, which are 50% of the reductions required for final WQBELs, should be linked to the interim concentration-based effluent limitations with an "OR" statement.
Attachment E.6.b (Project I Beaches and Creeks Bacteria TMDL)	E-30	Interim Compliance Dates	The CLRPs to be submitted by Copermitees propose interim compliance dates, as allowed by the Project I Bacteria TMDL, to meet the 50% reduction milestone for dry and wet weather. The CLRPs submitted by Copermittees may not all propose the same interim compliance dates and the Permit should acknowledge the flexibility allowed by the TMDL (see page 68 of Attachment A of the Basin Plan Amendment) to revise the interim compliance dates via the CLRPs. In fact, this scheduling flexibility was a primary "incentive" for Copermitees to develop CLRPs instead of BLRPs.	Revise the Order to reflect the flexibility allowed by the TMDL. As shown in the attached revised Permit, add language to the interim compliance dates section to allow interim compliance date flexibility, as follows: "…unless alternative interim compliance dates are provided in a Comprehensive Load Reduction Plan or Water Quality Improvement Plan accepted by the San Diego Regional Board Executive Officer."
Attachment E.6.b (Project I Beaches and Creeks Bacteria TMDL)	E-31 and 32 of redline	Final Receiving Water Limitations and Final WQBELs	The Basin Plan Amendment for the Project I Bacteria TMDL contains Receiving Water Limitations. These Receiving Water Limitations should be incorporated directly into the Permit. However, Attachment E contains Receiving Water Limitations that do not match those from the TMDL. The Regional Board should not revise or translate the RWLs from the TMDL, they should be incorporated directly. The RWLs incorporated into Attachment E have several discrepancies with the RWLs in the TMDL, including application of single sample targets to the dry weather RWLs and application of total coliform RWLs for inland waters.	Replace entirely the RWLs in the Permit with those from the TMDL, which separates RWLs into RWLs for beaches (Table 6.1) and RWLs for Creeks (Table 6.2). The TMDL RWLs should be *pasted directly* from the Basin Plan Amendment (Attachment A, page 52).

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Attachment E 6.d.1.b.ii and 6.d.2.b.ii, footnotes 36 and 3837 respectively (Project I Beaches and Creeks Bacteria TMDL)	E-33	Specific Monitoring and Assessment Requirements	To be consistent with Attachment A of Resolution No. R902010-0001,Section (7) (i) 2. Monitoring for TMDL Compliance and Compliance Assessment (p. A54), allow additional wet weather samples collected to be applied to the wet weather period as indicated in the following: "If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event shall be equal to the results from that one sample. If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all the wet weather days not sampled shall be equal to the highest bacteria density result reported from samples collected. The exceedance frequency shall be calculated by dividing the number of wet weather days that exceed the single sample maximum REC-1 WQOs by the total number of wet weather days during the rainy season."	Revise text as follows: Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)]. <u>If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event shall be equal to the results from that one sample. If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all the wet weather days not sampled shall be equal to the highest bacteria density result reported from samples collected. The exceedance frequency shall be calculated by dividing the number of wet weather days that exceed the single sample maximum REC-1 WQOs by the total number of wet weather days during the rainy season.</u>

San Elijo Lagoon CONSERVANCY
25 years of watershed moments

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January 08, 2013

Via e-mail to wchiu@waterboards.ca.gov
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

RE: Comments on Tentative Order Number: R9-2013-0001

Dear Mr. Chiu:

San Elijo Lagoon Conservancy respectfully submits the following comments on the draft San Diego Regional Municipal Separate Storm Sewer System permit.

Urban runoff is the San Diego region's most urgent pollution problem. Arguably, it is the most difficult to solve. In a region known for its beaches and strong tourism economy, polluted runoff makes our beaches and waterways unsafe for swimming, fishing and other recreation for at least 72 hours after a rain event. Even in dry weather, our "urban drool" from residents and businesses overwatering lawns becomes a major pollution source.

The good news is by working together as a community, we can solve this challenging public health problem. The Water Quality Improvement Plans proposed in the draft permit have the potential to become powerful tools to help us improve water quality within our watersheds. However, the Copermittees cannot be tasked with creating these plans alone. Specifically:

- The Permit should require formation of a stakeholder advisory group for each watershed that includes representatives of environmental groups with knowledge of the watershed.
- This stakeholder advisory group should work closely with the Copermittees and a regional board staff member while the Water Quality Improvement Plans are being developed to ensure these plans aggressively pursue water quality gains.
- The stakeholder advisory process should include accountability and measureable milestones to ensure the goals of the Permit are being met.

By taking advantage of the knowledge and resources of diverse stakeholders like municipalities, businesses and residents, our region can be on the cutting-edge of addressing urban runoff and creating healthier communities and watersheds. But this can only be achieved if these diverse voices are impacting the planning process in a meaningful way.

San Elijo Lagoon Conservancy recognizes the challenge urban runoff presents to our region, and we want to do our part to solve the problem. San Elijo Lagoon Conservancy is interested in participating in a Water Quality Improvement Plan development process for Escondido Creek watershed and the Carlsbad Hydraulic Unit.

San Elijo Lagoon Conservancy urges the Regional Board to enhance the stakeholder participation opportunities during Water Quality Improvement Plan development and then approve the permit.

Respectfully submitted,

Doug Gibson
Executive Director / Principal Scientist

From: Carol Crossman
To: Chiu, Wayne@Waterboards
Subject: draft water permit
Date: Wednesday, January 09, 2013 3:02:41 PM

Mr. Wayne Chiu, P.E.
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Re: Comment—Tentative Order No. R9-2013-001, Regional MS4 Permit, Place ID: 786088Wchiu

Dear Mr. Chiu:

I am writing in regards to the San Diego Regional Water Quality Control Board's Tentative Order R9-2012-0011 ("Permit") dated October 31, 2012. After reviewing the proposed Permit, I am concerned it will impose expensive, onerous, and untested regulations on local governments, businesses, and residents. These new regulations will impact the region's economy without improving its water quality.

Everyone understands the importance of clean, safe water to the region. It is important, however, that we use our limited resources wisely, and ensure that our efforts produce the desired outcome of improving water quality. I applaud the Board's inclusion of Water Quality Improvement Plans (WQIP) as a first step in developing a cost-effective approach to improving our water. Analysis remains a critical component of a successful strategy, and I am glad to see that the Board is committed to finding the best possible solution to water quality improvement.

I am concerned, however, that the costs associated with enforcing and implementing the permit will have a negative impact on my business and San Diego's economy. The four primary areas of concern include: 1) the strict liability for exceeding water quality objectives; 2) the additional and changing requirements for development projects, impacting items such as storm water retention and discharge; 3) the preemption of WQIPs by new and changing regulatory requirements prior to allowing the WQIPs to be developed and implemented; and 4) the lack of reliable funding sources to implement these regulatory changes.

It is necessary to hold individuals, businesses and governments accountable, but it is critical that the accountability measures can be reasonably achieved and are likely to have a significant and positive impact on San Diego's water. Because of these concerns, I respectfully request that the Permit focus on the timely development of effective and

enforceable WQIPs, and that each of the WQIPs be developed through a process that ensures public participation. I ask also that the designation of appropriate Best Management Practices in each watershed be determined through the WQIP process rather than the one size fits all strategy currently being proposed in the Permit. I ask further that until the Board adopts a WQIP for a watershed that the provisions of the existing Permit remain in place for that watershed. Finally, in order to avoid unnecessary litigation I request that the Board adopt the WQIPs as Orders implementing the proposed Permit.

I urge you to adopt final permit language that is evidence-based and both environmentally and economically sustainable. Thank you for your consideration.
Sincerely,

Carol T. Crossman
Independent Owner of rental units
Board Member of SDCAA
746 Horton Road Bonita CA 91902
619-479-2482

CITY OF POWAY

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JOHN MULLIN, Deputy Mayor
JIM CUNNINGHAM, Councilmember
DAVE GROSCH, Councilmember
STEVE VAUS, Councilmember

January 9, 2013

SAN DIEGO REGIONAL
WATER QUALITY
CONTROL BOARD
2013 JAN 10 AM 11 29

California Regional Water Quality Control Board, San Diego Region
Attn: Wayne Chiu, P.E.
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

RE: Comment -Tentative Order No. R9-2013-0001
Regional MS4 Permit, Place ID: 786088Wchiu

Dear Wayne,

The Priority Development "cutoff" levels don't appear to have a link to soil types, which greatly impact the amount of runoff. A site with Type A soil ("Site A") retains a large portion of rainwater naturally, and has a small amount of runoff. Adding 5,000 square feet (SF) of impervious surface to "Site A" massively increases the amount of runoff compared to the natural condition because the water that previously soaked into the ground now runs off. Compare this to a site of equal size and slope but with Type D soil ("Site D"). In its natural condition very little water is retained by soaking into the ground due to the tight soil matrix and rock. Adding 5,000 square feet of impervious surface to "Site D" only slightly increases runoff from the site, since the site was nearly impervious in its natural condition. The permit should reflect this basic hydrologic tenant, and have stepped cutoff, such as: 5,000 SF for A soils, 6,000 SF for B, 7,000 for C, and 9,000 SF for D. This would more accurately reflect the increase in runoff from sites with differing soils.

Suggested language:

II.E.b.(2)(a)
New development projects that create ~~10,000 square feet or~~ more ~~of~~ impervious surfaces (collectively over the entire project site) based on the following soil types:

Type A soil = 10,000 square feet or more
Type B soil = 12,000 square feet or more
Type C soil = 14,000 square feet or more
Type D soil = 16,000 square feet or more

This category includes commercial, industrial, residential, mixed-use, and public development projects on public or private land which fall under the planning and building authority of the Copermittee.

II.E.b.(2)(g)
Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface ~~that is 5,000 square feet or more~~ used for the transportation of automobiles, trucks, motorcycles, and other vehicles that meet the following criteria:

Type A soil = 5,000 square feet or more
Type B soil = 6,000 square feet or more
Type C soil = 7,000 square feet or more
Type D soil = 9,000 square feet or more

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K Rodda Time: 11:57 AM

Compliance

Develop language to clearly link WQIPs to Permit compliance.

TMDLs

Add options for BMP - and load-based compliance with WLAs. Insert language in *Modification of Programs* (Provision H) to reopen Permit to incorporate TMDL revisions and CLRP modifications.

Hydromodification Management Plan

Reaffirm Resolution R9-2010-0066; reference the Resolution in the permit.
Replace "pre-development naturally occurring" with "pre-project".

Should you have questions, you may contact me via email at sstrapac@poway.org or by phone at (858) 668-4653.

Sincerely,

DEVELOPMENT SERVICES DEPARTMENT

Steven E. Strapac, P.E., P.L.S.
Senior Civil Engineer

c: Steve Crosby, P.E., City Engineer
Roger Morrison, Management Analyst

M:\engserv\NPDES\2012 Permit\Request to Board.docx

County of San Diego

JACK MILLER
Director

DEPARTMENT OF ENVIRONMENTAL HEALTH
P.O. BOX 129261, SAN DIEGO, CA 92112-9261
Phone: (858) 505-6700 FAX (858) 505-6890
Phone: 1 (800) 253-9933
www.sdcdeh.org

ELIZABETH POZZEBON
Assistant Director

January 9, 2013

Mr. Wayne Chiu
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4353

NPDES PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION (REGIONAL MS4 PERMIT) (ORDER NO. R9-2013-0001)

Dear Mr. Chiu:

The County of San Diego, Department of Environmental Health (DEH) has reviewed the proposed draft Order No. R9-2013-001 (Regional MS4 Permit), and offers the following comments:

The existing San Diego MS4 Storm Water permit includes vector-related language which is intended to raise awareness of the potential unintended public health risk resulting from mosquito production in certain storm water management devices, the proposed draft permit does not. The removal of the vector-related language raises a significant concern, and we request that it be placed back into the proposed draft to protect public health. Please note that the San Diego Regional MS4 permit was the first in the United States to include vector-related language, and ultimately resulted in improved language adopted into storm water permits throughout the State.

The vector-related language included in the existing MS4 permit represents a compromise that allows water quality goals to be met while minimizing the risk to public health. It recognizes that mosquitoes cannot completely be eliminated given the current water quality requirements. It further serves a critical public health purpose of maintaining an awareness of the potential unintended public health threat created by mosquitoes, and emphasizes the importance of proper maintenance of storm water management and treatment structures to minimize the potential for mosquito production and ultimately the spread of mosquito-borne diseases including West Nile Virus (WNV).

WNV continues to be a threat to human health, and has proven to be unpredictable. 2012 was the second worst year for WNV in the United States and California since it was introduced 13 years ago. Approximately 5,400 human illnesses were confirmed nationwide, with 243 deaths as of December 12, 2012. In California there were 464 confirmed cases in 2012 with 18 deaths as of December 24, 2012.

It is critical that the State and the RWQCB continue to include vector-related language in storm water NPDES permits to protect public health. It would be counterproductive and counterintuitive to strive to improve the quality of water for the benefit of public and environmental health only to create environments highly conducive to mosquitoes that have the potential to severely impact human and animal health from mosquito-borne diseases.

The County of San Diego's DEH respectfully requests that the Board restore the vector-related language in the proposed draft MS4 Permit. The following is the existing permit language from Section D - Urban Runoff Management Systems, Subsection 2 - Development Planning:

> f. *If not properly designed or maintained, certain BMPs implemented or required by municipalities for urban runoff management may create a habitat for vectors (e.g. mosquitoes and rodents). However, proper BMP design and maintenance can prevent the creation of vector habitat. Nuisances and public health impacts resulting from vector breeding can be prevented with close collaboration and cooperative effort between municipalities and local vector control agencies and the State Department of Health Services during the development and implementation of urban runoff management programs.*

In addition, the County of San Diego's DEH requests that to facilitate inspection of new BMPs, the San Diego Regional Permit require that a list of new storm water management and treatment units be submitted by the Permittees to their respective vector control agencies. The County requests that the Permit include the following language recently added to the draft Fact Sheet for the Los Angeles MS4 permit:

> *Monitoring studies conducted by the California Department of Public Health (CDPH) have documented that mosquitoes opportunistically breed in structural storm water Best Management Practices (BMPs), particularly those that hold standing water for over 96 hours. Certain Low Impact Development (LID) site design measures that hold standing water such as rainwater capture systems may similarly produce mosquitoes. BMPs and LID design features should incorporate design, construction, and maintenance principles to promote drainage within 96 hours to minimize standing water available to mosquitoes. This Order requires regulated MS4 Permittees to coordinate with other agencies necessary to successfully implement the provisions of this Order. These agencies may include CDPH and local mosquito and vector control agencies on vector-related issues surrounding implementation of post-construction BMPs.*

Thank you for the opportunity to submit comments on the proposed draft language for the MS4 Permit. If you have questions regarding the above comments, please contact Rebecca Lafreniere, Chief, at (858) 694-3595 or by E-mail at Rebecca.Lafreniere@sdcounty.ca.gov.

Sincerely,

JACK MILLER, Director

cc: Richard Crompton, Director, County of San Diego, Department of Public Works
Rebecca Lafreniere, Chief, County of San Diego, Department of Environmental Health, Community Health Division

COUNTY OF RIVERSIDE
TRANSPORTATION AND LAND MANAGEMENT AGENCY
Transportation Department

Juan C. Perez, P.E., T.E.
Director of Transportation

January 9, 2013 *Submitted via email* to WChiu@waterboards.ca.gov

Wayne Chiu, PE
California Regional Water Quality Control Board – San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4353

Subject: Comment – Tentative Order No. R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu

Dear Mr. Chiu:

The Riverside County Transportation Department (Transportation Department) appreciates the opportunity to comment on Tentative Order No. R9-2013-0001, NPDES No. CAS0109266, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region (Tentative Order). The Transportation Department requests that the Tentative Order be revised to provide that public works transportation improvement projects are exempt from individual project-specific Standard Stormwater Mitigation Plans (SSMPs) when they are designed and constructed to the Maximum Extent Practicable (MEP) in conformance with the USEPA guidance "Managing Wet Weather with Green Infrastructure: Green Streets."[1]

Background

The Public Works departments of municipalities have an obligation to the traveling public to provide safe, efficient, and reliable street and road systems for travel. Municipalities are not profit driven, but, as public servants, strive to maintain and improve as many roads as possible within each fiscal year budget and within a reasonable (but uncertain) capital improvement program planning horizon. The Riverside County Transportation Department takes advantage of state and federal safety grants as often as we can; however such grants often come with funding limits, matching requirements, and time constraints for project completion.

Public Works transportation projects are different from conventional private development projects

[1] USEPA. 2008. http://water.epa.gov/infrastructure/greeninfrastructure/upload/gi_munichandbook_green_streets.pdf and http://water.epa.gov/infrastructure/greeninfrastructure/gi_policy.cfm#municipalhandbook

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P.O. Box 1090 · Riverside, CA 92502-1090 · FAX (951) 955-3198

due to the following:

- State and federal funding for Public Works transportation projects have strict timelines.
- Most Public Works transportation projects (1) are constrained by private property and utility easements on either side of the road right-of-way; (2) are linear in nature, and (3) have great difficulty meeting each and every requirement associated with a project-specific SSMP given right-of-way constraints.
- The number of roadway projects delivered to the public is based on annual transportation fund allocations.
- The purpose of the majority of Public Works transportation projects is to improve public safety. Safety projects include intersection improvements, minor shoulder widening, curve realignments, adjustments to vertical grades, and turn pockets.

On July 2, 2012 Riverside County submitted to the Executive Officer of the San Diego Regional Water Quality Control Board the Transportation Project Guidance that was developed in accordance with Order No. R9-2010-0016, NPDES No. CAS0108766, Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the County of Riverside, the Incorporated Cities of Riverside County, and the Riverside County Flood Control and Water Conservation District within the San Diego Region (2010 Riverside County MS4 Permit). The Transportation Project Guidance was prepared in accordance with Directive F.1.d.(2)(g) of the 2010 Riverside County MS4 Permit, which stated:

> *"...To the extent that the Copermittees develop revised standard roadway design and post-construction BMP guidance that comply with the provisions of Section F.1 of the Order, then public works projects that implement the revised standard roadway sections do not have to develop a project specific SSMP. The standard roadway design and post-construction BMP guidance must be submitted with the Copermittee's updated SSMP."*

The Transportation Project Guidance addresses improvements to streets, roads, highways, and freeways, and Class I Bikeway and sidewalk projects undertaken by the MS4 Copermittees and incorporates the principles contained in the USEPA guidance, "Managing Wet Weather with Green Infrastructure: Green Streets" and addresses Hydrologic Conditions of Concern criteria. The Transportation Project Guidance was also submitted to the Santa Ana Regional Water Quality Control Board and was approved by its Executive Officer on October 22, 2012. To date, the Riverside County NPDES MS4 Copermittees have received no comments or questions from staff of the San Diego Regional Water Quality Control Board relative to the Transportation Project Guidance submitted on July 2, 2012.

Transportation Department Project Example

Recently the Riverside County Transportation Department completed the construction of a roundabout on Rancho California Road in the Temecula area. The purpose of the project was to improve an existing intersection deficiency. Several thousand cars travel Rancho California Road each day for touring the many wineries in the Temecula area. Rancho California Road has multiple intersections with several in need of traffic control measures to slow the traffic through the area. The needed traffic control measures would improve safety and provide an opportunity for residents, tourists, and commercial vehicles to cross Rancho California Road or to merge into traffic on the road. A traffic signal light would have been the appropriate solution in a more urban setting. However, in this relatively rural environment, a roundabout was determined to be a more appropriate traffic control measure. This project was built at a cost of $1.6 million with $800,000 (half the total project cost) needed to purchase land and to construct a water quality basin to treat 100% of the runoff from the project site. We believe that a regional approach to water quality would have been much more appropriate, not only due to cost, but also because of the aesthetic sensitivity of the surrounding community. Although the water quality basin performs its function and meets the requirements of a project-specific Standard Stormwater Mitigation Plan (SSMP), it does not aesthetically complement the surrounding environment. This project area consists of rolling hills, a vast landscape of vineyards, beautiful wineries, and now, a nicely landscaped roundabout with an adjacent and unattractive water quality basin. In addition to the less than optimal (aesthetically) water quality basin, the cost of the project meant that other roundabouts planned for Rancho California Road had to be deferred.

Support for Transportation Department's Request

Providing the NPDES MS4 Copermittees the alternative of using the Transportation Project Guidance would provide the most efficient use of limited public resources by:

- Ensuring that *all new roadway projects* would incorporate hydromodification Best Management Practices (BMPs) as described in the Tentative Draft Regional MS4 Permit.
- Ensuring *all roadway improvement projects* would incorporate hydromodification BMPs to the Maximum Extent Practicable (MEP) through the use of templates included in the Transportation Project Guidance
- Allowing time sensitive projects to proceed without delay.
- Ensuring that projects do not get "shelved" due to costly project-specific SSMPs for individual projects.
- Reducing the need to condemn property for the purpose of acquiring enough right-of-way to meet the requirements of SSMPs for individual projects.

The Santa Ana River Region and the Santa Margarita River Region NPDES MS4 Permittees have

dedicated substantial time and resources to developing Transportation Project Guidance intended to provide a consistent structure and decision-making procedures during the planning and design of their transportation improvement projects. These NPDES MS4 Permittees are just beginning to implement the Transportation Project Guidance in which they invested to comply with their 2010 NPDES MS4 permits. The planning horizon for most transportation improvement projects is years. The NPDES MS4 Permittees should now be afforded the opportunity to implement the Transportation Project Guidance

The recently adopted 2012 NPDES MS4 Permit for the Coastal Watersheds of Los Angeles County requires street and road construction of 10,000 square feet or more of impervious surface area to (1) follow the USEPA guidance regarding "Managing Wet Weather with Green Infrastructure: Green Streets" to the maximum extent practicable and (2) to address hydromodification control measures. However, projects that are replacement, maintenance or repair of a Permittee's existing flood control facility, storm drain, or transportation network may be exempted from the hydromodification control measures. Further, the Coastal Los Angeles NPDES MS4 permit does not impose post-construction (permanent) BMPs on routine maintenance activities that are conducted to maintain original line and grade, hydraulic capacity, original purpose of facility or emergency redevelopment activity required to protect public health and safety, including impervious surface replacement or repaving, such as the reconstruction of parking lots and roadways which does not disturb additional area and maintains the original grade and alignment.

Request for Revision of Tentative Order

We urge you to reconsider the requirements imposed upon Public Works transportation projects as included in the Tentative Order No. R9-2013-0001. We request that you direct staff include the following exemption language into Provision E.3.(b)(3):

(b) Any impervious surface that is 5,000 square feet or more used for the transportation of automobiles, trucks, motorcycles, and other vehicles that is designed and constructed to the Maximum Extent Practicable in accordance with the USEPA guidance "Managing Wet Weather with Green Infrastructure: Green Streets"[2]. ~~Retrofitting of existing paved alleys, streets or roads that meet the following criteria:~~

~~(i) Must be two lanes or less; AND~~

~~(ii) Must be a retrofitting project implemented as part of an alternative compliance project option under Provision E.3.c.(3)(b)(v) to achieve the performance requirements of Provisions E.3.c.(1) and/or E.3.c.(2) for a Priority Development Project; AND~~

[2] USEPA. 2008. http://water.epa.gov/infrastructure/greeninfrastructure/upload/gi_munichandbook_green_streets.pdf and http://water.epa.gov/infrastructure/greeninfrastructure/gi_policy.cfm#municipalhandbook

~~(iii) Designed and constructed in accordance with the USEPA Green Streets guidance.~~

Conclusion

The Transportation Department appreciates the opportunity to comment on the Tentative Order and your consideration of our comments. The Transportation Department looks forward to participating in the further development of the next version of the Tentative Order in a collaborative process aimed at addressing the issues raised in this letter. If you have any questions regarding our comments, please contact Claudia Steiding at 951.955.1694.

Sincerely,

Patricia Romo

Patricia Romo, PE
Deputy Director
Riverside County Transportation Department

cc: Claudia Steiding
Jason Uhley

From: Matthew Boomhower
To: Chiu, Wayne@Waterboards
Subject: Comment - Tentative Order No.R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu.
Date: Wednesday, January 09, 2013 4:44:32 PM

Mr. Wayne Chiu, P.E.
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Re: Comment—Tentative Order No. R9-2013-001, Regional MS4 Permit, Place ID: 786088Wchiu

Dear Mr. Chiu:

I am writing in regards to the San Diego Regional Water Quality Control Board's Tentative Order R9-2012-0011 ("Permit") dated October 31, 2012. After reviewing the proposed Permit, I am concerned it will impose expensive, onerous, and untested regulations on local governments, businesses, and residents. These new regulations will impact the region's economy without improving its water quality.

Everyone understands the importance of clean, safe water to the region. It is important, however, that we use our limited resources wisely, and ensure that our efforts produce the desired outcome of improving water quality. I applaud the Board's inclusion of Water Quality Improvement Plans (WQIP) as a first step in developing a cost-effective approach to improving our water. Analysis remains a critical component of a successful strategy, and I am glad to see that the Board is committed to finding the best possible solution to water quality improvement.

I am concerned, however, that the costs associated with enforcing and implementing the permit will have a negative impact on my business and San Diego's economy. The four primary areas of concern include: 1) the strict liability for exceeding water quality objectives; 2) the additional and changing requirements for development projects, impacting items such as storm water retention and discharge; 3) the preemption of WQIPs by new and changing regulatory requirements prior to allowing the WQIPs to be developed and implemented; and 4) the lack of reliable funding sources to implement these regulatory changes.

It is necessary to hold individuals, businesses and governments accountable, but it is critical that the accountability measures can be reasonably achieved and are likely to have a significant and positive impact on San Diego's water. Because of these concerns, I respectfully request that the Permit focus on the timely development of effective and

enforceable WQIPs, and that each of the WQIPs be developed through a process that ensures public participation. I ask also that the designation of appropriate Best Management Practices in each watershed be determined through the WQIP process rather than the one size fits all strategy currently being proposed in the Permit. I ask further that until the Board adopts a WQIP for a watershed that the provisions of the existing Permit remain in place for that watershed. Finally, in order to avoid unnecessary litigation I request that the Board adopt the WQIPs as Orders implementing the proposed Permit.

I urge you to adopt final permit language that is evidence-based and both environmentally and economically sustainable. Thank you for your consideration.

Sincerely,

Matthew C. Boomhower, RA, CSI, CCCA
President
Southern Cross Property Consultants
858-395-8657
www.southerncrosspc.com

CITY OF DANA POINT

DEPARTMENT OF PUBLIC WORKS

January 10, 2013

Wayne Chiu, P.E.
California Regional Water Quality Control Board, San Diego region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340
(submitted electronically to wchiu@waterboards.ca.gov)

Subject: Comment - Tentative Order No. R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu.

Dear Mr. Chiu:

First, we would like to acknowledge the work that the Board staff has already accomplished through the focused work group efforts during the fall. Significant progress has been made on the Draft Permit from the input of co-permittees and NGO's alike since this process began in April 2012. Thank you.

That said, it was also apparent by the amount of testimony over two days at the following Board workshops that there remain significant concerns, many of which we believe can be easily be rectified to clarify and improve the Permit.

Following the Staff work sessions, we have spent a tremendous amount of additional time trying to explain our concerns at the Board workshops and work with our fellow permitees and co-permittees to develop comments and provide redline recommendations for the Permit language. Please review the comments and recommendations in writing that have been submitted on our behalf by the County of Orange, and which we support in great part.

Although it may first appear voluminous, the County of Orange redline recommendations should make for easy adjustment provided you concur with the justification and support that is presented. We have been working with these Permits now for many years and understand the importance of having carefully crafted language to allow for consistent implementation.

All of the issues that the Orange County letter raises reflect our concerns. However, we will add a few comments here on several selected issues to reinforce those comments from our own City's perspective.

For the hydromodification provision, please include the Engineered Channel Exemption (E3c2dii). While there may be a few locations upstream where reestablishment of a soft walled meandering stream may be technically & economically feasible, those locations are a small minority of the existing hard walled flood control channel system. As a suggestion to allow for that restoration possibility, you may want to reinstate the exemption, "Discharges storm water runoff into conveyance channels that are engineered for the capacity to convey the 10-year ultimate build out condition flow and are regularly maintained to ensure flow capacity all the

way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; except where the responsible flood control agency agrees with the likely feasibility of the proposed natural reestablishment and the long range goal is reflected in the approved WQIP." Although charging an in lieu fee to do other water quality improvements is a nice idea, it just won't stand up to legal challenge without a nexus. We feel it is important for the Permit to include justified requirements that are not subject to legal battles so as to not diminish the integrity of the program as a whole.

While we appreciate the intent of requiring roadwork to meet priority development standards, it must be restricted to new development (E.B.2g). In many cases, introducing water into the subgrade of street and gutter projects will be infeasible.

Our single biggest annual capital expenditure is street repair projects. The feasibility and cost to meet the draft imposed requirements could add 10% to 100% additional cost for these projects. This single requirement could exceed all the annual funding the City currently puts toward Water Quality Improvement. White it may be feasible to add these requirements to new development it is not appropriate for redevelopment and repair. Please allow EPA Green Street guidance to suffice as other NPDES permits do.

Please insert the TMDLs as originally written and intended. The municipalities and the SDRWQCB spent years developing the TMDL technical documents and approving them as part of the associated Basin Plan Amendment. As briefed by Nancy Palmer and carefully explained in the Orange County comments this is critical for both the Beaches and Creek TMDL, affecting the entire San Diego Region and Baby Beach TMDL. TMDLs by definition are based upon load, not concentration, and please include the necessary reopener provision(s).

The provisions requiring the development and implementation of a Water Quality Improvement Plan can be better aligned with the Jurisdictional Runoff Management Program requirements so that the programs are complimentary and prioritized instead of additive. We believe this is your intent, but the Draft Permit, as written, is unclear and open to conflicting interpretation at this time.

The City also underwent an audit of three key components of the current NPDES MS4 Permit in June of 2012, specifically covering the over-irrigation prohibition, the IC/ID Detection, and the NAL program elements. Although we have not received any feedback regarding the outcome of the audit beyond the debrief that occurred at the end of the audit (which appeared to be positive), we wanted to mention it to ensure that any potentially helpful information obtained was not overlooked in this process.

Again, I would like to emphasize there are many more critical issues contained in Orange County's response letter (attached via reference). We believe that while well intended, some of the draft provisions exceed the Federal Clean Water Act MS4 regulations. Given the potential for third party lawsuits, these are of great concern to our elected officials representing our constituency. As a beach city we are strongly committed to improving water quality. We can still accomplish that progressively with the modifications the County has recommended.

Again, thank you for your past efforts and for continuing consideration of our remaining concerns. The City would like to request the opportunity to meet with you, other Regional Board staff and the County of Orange to review in detail the changes requested in the County letter. Perhaps including the other Counties in the meeting to resolve language issues would be good as well.

Please direct any questions regarding this letter to myself at (949) 248-3582.

Yours sincerely,

Brad J. Fowler, P.E.
Director of Public Works

Attachment via reference: Comments/Redline submitted by the County of Orange

CC: -Douglas Chotkevys, City Manager
- Richard Montevideo, City Attorney
- Dana Point OWQ Subcommittee Members
- Lisa Zawaski, City of Dana Point
- Mary Ann Skorpanich, County of Orange

City of Mission Viejo

Public Works Department

Frank Ury
Mayor
Rhonda Reardon
Mayor Pro Tem
Trish Kelley
Council Member
Dave Leckness
Council Member
Cathy Schlicht
Council Member

January 10, 2013

Wayne Chiu, P.E.
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Subject: Comments on Tentative Order No. R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu.

Dear Mr. Chiu:

The City of Mission Viejo appreciates the opportunity to provide comments on Tentative Order No. R9-2013-0001, which is intended by the Regional Board to serve as the basis for stormwater regulation in the City upon the expiration of current Order R9-2009-0002. The City has been actively involved in the development of the comprehensive set of comments submitted by the County of Orange and supports those comments and attaches them by reference.

The City appreciates the revisions made by Regional Board staff since the prior Administrative Draft but believes that further changes are necessary, which are included in redline format in the County letter. A number of key issues have been extensively discussed in the focus meetings and Board workshops and, despite some changes, still remain a significant concern to the City. These include:

- The Receiving Water Limitations provisions in the Tentative Order could expose the City to Clean Water Act liabilities for discharges that cause or contribute to an exceedance of a water quality standard. A clear linkage between the compliance provisions and prohibitions, receiving water limitations, and effluent limitations must be established.

- The provisions dealing with land development, Low Impact Development (LID) and hydromodification control are significantly ratcheted up while existing permit programs are only just being implemented and/or pending approval. The City is particularly concerned with the elimination of all exemptions for the hydromodification control requirements, including for discharges to channels that have been engineered to prevent erosion. Exemptions for hydromodification management should include discharges to certain types of receiving waters and certain types of projects.

- The provisions implementing the Beaches and Creeks Total Maximum Daily Load (TMDL) bacteria requirements are inconsistent with the TMDL as it was developed and

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pose additional significant liabilities. Permit provisions must be consistent with the corresponding Basin Plan amendments.

- The provisions requiring the development and implementation of a Water Quality Improvement Plan need to be aligned with the Jurisdictional Runoff Management Program requirements so that the programs are complimentary and prioritized instead of additive.

Thank you for the opportunity to provide comments. The City would like to request the opportunity to meet with you, other Regional Board staff and the County of Orange to review in detail the changes requested in the County letter.

Please direct any questions regarding this letter to Joe Ames, Assistant City Engineer, at 949/470-8419.

Sincerely,

Dennis Wilberg
City Manager

C: Mark Chagnon, Director of Public Works
Rich Schlesinger, City Engineer
Joe Ames, Assistant City Engineer

CITY OF RANCHO SANTA MARGARITA

Mayor
L. Anthony Beall

Mayor Pro Tempore
Carol Gamble

Council Members
Steven Baric
Brad McGirr
Jesse Petrilla

City Manager
Jennifer M. Cervantez

January 10, 2013

Wayne Chiu, P.E.
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Subject: Comment – Tentative Order No. R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu.

Dear Mr. Chiu:

The City of Rancho Santa Margarita appreciates the opportunity to provide comments on Tentative Order No. R9-2013-0001, which is intended by the Regional Board to serve as the basis for stormwater regulation in the City upon the expiration of current Order R9-2009-0002. The City has been actively involved in the development of the comprehensive set of comments submitted by the County of Orange and supports those comments and attaches them by reference.

The City appreciates the revisions made by Regional Board staff since the prior Administrative Draft, but believes that further changes are necessary, which are included in redline format in the County letter. A number of key issues have been extensively discussed in the focus meetings and Board workshops and, despite some changes, still remain a significant concern to the City. These include, without limitation:

- The Receiving Water Limitations provisions in the Tentative Order could expose the City to Clean Water Act liabilities for discharges that cause or contribute to an exceedance of a water quality standard. A clear linkage between the compliance provisions and prohibitions, receiving water limitations, and effluent limitations must be established.

- The provisions dealing with land development, Low Impact Development (LID) and hydromodification control are significantly ratcheted up while existing permit programs are only just being implemented and/or pending approval. In addition, many of the land development requirements conflict with applicable federal and/or state constitutional provisions, laws and court decisions and may not be practically enforceable.

- The City is particularly concerned with the elimination of all exemptions for the hydromodification control requirements, including for discharges to channels that have been engineered to prevent erosion. Exemptions for hydromodification management should include discharges to certain types of receiving waters and certain types of projects.

- The provisions implementing the Beaches and Creeks Total Maximum Daily Load (TMDL) bacteria requirements are inconsistent with the TMDL as it was developed and pose additional significant liabilities. Permit provisions must be consistent with the corresponding Basin Plan amendments.

- The provisions requiring the development and implementation of a Water Quality Improvement Plan need to be aligned with the Jurisdictional Runoff Management Program requirements so that the programs are complimentary and prioritized instead of additive.

Thank you for the opportunity to provide comments. The City would like to request the opportunity to meet with you, other Regional Board staff and the County of Orange to review in detail the changes requested in the County letter.

Please direct any questions regarding this letter to myself or Rae Beimer, Environmental Associate, at 949-635-1800 x 6503.

Yours sincerely,

E. (Max) Maximous, P.E.
City Engineer

CC: City Council
Jennifer M. Cervantez, City Manager
Gregory E. Simonian, City Attorney
County of Orange, OC Public Works Department

EM/rb

CITY OF VISTA
CALIFORNIA

January 10, 2013

Wayne Chiu, P.E.
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Subject: **City of Vista Comments – Tentative Order No. R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu**

Dear Mr. Chiu:

The City of Vista appreciates the efforts that the Regional Water Board staff has undertaken to involve the stakeholders in the development of the new permit. The early release of the administrative draft, subsequent focused meetings, and revisions incorporated into the Tentative Order have resulted in a Tentative Order that is much improved and will allow stormwater programs in the region to make meaningful progress towards improving water quality.

The City of Vista participated in the development of the comments submitted by the County of San Diego on behalf of the 21 Copermittees in San Diego County. We support the comments and look forward to their inclusion in the Final Order. Additionally, a couple of comments are included in the attached table related to the Land Development Provisions for consideration.

We understand the need to balance the collaborative process in the development of the permit with the regulatory oversight incumbent on the Regional Water Quality Control Board. Thank you for the opportunities provided for the Copermittees to add their experience and insights to the process. Please contact Paul Hartman at (760) 726-1340 x1373 or at phartman@cityofvista.com with any questions related to our comments.

Sincerely,

Greg Mayer
City Engineer

P: 760-639-6111 | www.cityofvista.com | F: 760-639-6112
200 Civic Center Drive, Vista, California 92084-6275

Attachment 1 - City of Vista Comments on Tentative Order R9-2013-0001

Permit Section	Tentative Order Page	Section Title	Reason for Prosed Change/Comments	Proposed Changes
E.3.c.(1)(a)	78	Development Planning - Structural BMP Performance Requirements (Stormwater Pollutant Control BMP Requirements)	LID is intended to retain the first flush up to the 85th percentile runoff difference. In San Diego County, the 24 hour - 85th percentile precipitation event (P_{85}) usually generates runoff in natural conditions, as impervious soils (Type D) and poor or fair natural vegetation are predominant in the County. Runoff as a percentage of precipitation is dependent on the conditions of the natural terrain and the size of P85. The removal of this naturally occurring runoff as required in Section E.3.c.(1)(a)(i) may create an environmental problem in downstream wetlands, where critical habitat depends on this runoff for survival.	Modify E.3.c.(1)(a)(i) to read "The volume of storm water produced from a 24-hour 85th percentile storm event in post-development conditions less the volume of storm water produced by the same storm under natural conditions[26]" Modify footnote 26 to read "LID is intended to retain the first flush up to the 85th percentile runoff difference. The 85th percentile runoff in natural conditions will depend on the original natural vegetation and soil type."
E.3.c.(3)(b)(i)[c]	82	Alternative Compliance to Onsite Structural BMP Performance Requirements	The selection of 1.5 does not appear to be scientifically based. It is understood that a number greater than one is needed, but such a number could also be obtained from a concentration load – runoff analysis. The permit should have flexibility for projects where a more accurate scientific justification is provided.	Modify section E.3.c.(3)(b)(i)[c] to read "Biofilter at least 1.5 the design capture volume that is not reliably retained onsite, or biofilter a volume that demonstrates an equivalent load reduction that would occur if a retention LID volume is in place;"

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January 10, 2013

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via Fed Ex

Re: Tentative Order R9-2013-0001

Dear Catherine:

On behalf of our client the County of San Diego, I am writing concerning some provisions in Tentative Order R9-2013-0001 that are of particular concern to the County. I respectfully ask that you review our legal position on those provisions as outlined below, and please call me to discuss if you have any questions or need further information to assist your review.

The Bacteria TMDL Resolution

The Tentative Order would incorporate elements and requirements from the Bacteria TMDL Resolution (Resolution R9-2010-0001) into the new MS4 permit for San Diego Region copermittees, including the County of San Diego. We specifically urge the San Diego Regional Board to not incorporate the Bacteria TMDL provisions in this permit renewal cycle. It is our legal position that your Board has the authority to decline the demands of other interested parties that this action be taken.

Reasons Not to Incorporate the Bacteria TMDL Into the Permit

From a recent summary by Regional Board (RB) staff, County of San Diego copermittees spend approximately $119M per year on programs to improve water quality

in the San Diego region. Those programs have improved water quality in general and at beaches in the region. With ever-increasing knowledge gained through trial and error, and with the Watershed Quality Improvement Plan concept expected to permit existing resources to be focused in more efficient and effective ways, San Diego copermittees expect to continue the march toward improved water quality using the current level of resources. The copermittees are continually working on ways to improve water quality and have done so for over two decades. As evident in our annual expenditure and work with experts, we are committed to improving water quality.

By RB staff estimates and as confirmed by San Diego copermittees, the implementation of the Bacteria TMDL in the next permit cycle would add a magnitude of additional costs to copermittee budgets that is unsustainable using existing methods for raising general fund monies and given California's legal constraints on taxation or fees. As your Board has heard, the range of additional cost attributable to the Bacteria TMDL alone is $144M to $272M per year, meaning billions of taxpayer dollars over the compliance period.

As presentations in the adoption process have shown, given the unique challenges associated with bacteria as a constituent in stormwater, the cost-benefit analysis dictates that implementing the Bacteria TMDL at this time, as written, would be bad public policy. Studies and experience show that any magnitude of controls for bacteria, up to and including disinfectant efforts, will not consistently achieve the Resolution's numeric standards, even with the expenditure of billions of dollars. So, the sensible, logical next step is to take a hard look at the standards and assumptions of the Bacteria TMDL and devise plans to improve water quality using existing resources and as realistically achievable with today's scientific methods.

Legal Authority to Not Incorporate the Bacteria TMDL Into the Permit

As you know in 1987, Congress declared its intent to chart a different course for improving water quality flowing from MS4 systems by enacting Clean Water Act § 402 (33 U.S.C. § 1342). In establishing the "maximum extent practicable" (MEP) standard of CWA § 402(p)(3)(B), Congress recognized and enacted a different standard than the technology based requirements of CWA § 301. The MEP standard is the legal standard for stormwater compliance.

In *Defenders of Wildlife v. Browner,* 191 F.3d 1159 (1999) the Ninth Circuit held that the MEP standard of CWA § 402(p)(3)(B) *replaces* the requirements of CWA § 301(b)(1)(C) for MS4 dischargers. The *Browner* decision goes on to discuss the

discretion vested in permitting authorities to either require strict compliance, or less than strict compliance, with water quality standards.

Our office believes that the November 12, 2010 EPA memorandum concerning the incorporation and use of numeric WQBELs in permits is not dispositive of this issue. As acknowledged in its March 17, 2011 letter, EPA is still considering whether to retain, reissue, or withdraw the 2010 memorandum. And, in the same letter, EPA acknowledges that the 2010 memorandum, "does not impose legally binding requirements on EPA, States, or the regulated community, nor does it confer legal rights or impose legal obligations on any member of the public."

With regard to the unique challenges associated with bacteria control, the science shows that consistent achievement of the Bacteria TMDL numeric standards is not possible, even with any level of expenditure. Therefore, imposing the 2010 Bacteria TMDL provisions as permit conditions would exceed the "maximum extent practicable" standard. Accordingly, we believe your Board is vested with the discretion to elect not to incorporate the Bacteria TMDL provisions at this time.

Your Board would be justified to open a process to revisit and re-examine the Bacteria TMDL assumptions in the context of its basin planning process, instead of taking the irrevocable step of incorporating the TMDL into the permit and potentially wasting valuable taxpayer dollars that could better be spent on achievable water quality improvement goals.

Receiving Water Limitations (RWL) Language

As you know, the copermittees have expressed significant concerns about third-party liability risks resulting from the Ninth Circuit's interpretation of receiving water limitation language in the L.A. Region's stormwater permit. While we appreciate the State Water Resources Control Board's willingness to take comment and review those concerns, it may take several months for the State Board to act. The Tentative Order retains language similar to the problematic language reviewed in the *NRDC* case; this leaves the County and other copermittees immediately exposed to similar litigation from third parties for violations of water quality standards. We know that several various proposals to modify RWL language have been presented at state and local levels.

We suggest a simple solution consistent with Congress' intent in enacting CWA § 402 as discussed above: simply remove the RWL language in Provision A of the Tentative Order. Federal law does not require imposition of the receiving water limitations for MS4 systems. There is precedent for this action; a number of EPA issued

stormwater permits throughout the country do not include this language. Your Board has the discretion under CWA § 402 and *Browner* to remove the language. If EPA does not consider the RWL language to be essential to its own MS4 permitting, it seems logical that your Board is not required to include it in the new permit.

State Water Board policy supports the iterative process approach to water quality improvement, and acknowledges that water quality standards for many pollutants from MS4s cannot be met immediately. Therefore it is unrealistic and at odds with the iterative process to enact a standard that puts the third-party lawsuit gun to the head of public entities diligently spending significant time and public money pursuing water quality improvement. The permit would still include its enforceable prescriptive requirements and the WQIP features that all parties believe will focus resources in each watershed in the most productive fashion. Over the past two decades, the region has developed the knowledge and skill set to improve water quality, but understands that only through an iterative process can true progress be made.

Removal of the RWL language would eliminate the inevitable jousting over modified language proposals and the uncertainty created by its retention in light of the *NRDC* ruling. Copermittees would simply be obligated to focus on permit condition compliance, including the tasks identified in approved WQIPs, subject to RB enforcement if appropriate. Removal of the language would not create a "free pass"; to the contrary, it would encourage effective water quality monitoring and reporting that might otherwise be discouraged by the specter of third party lawsuits like those filed in the *NRDC* and other cases.

Land Development Standards/Hydromodification Issues

County Counsel concurs with the legal concerns sent to your attention in the December 19, 2012 letter from the Office of the City Attorney of the City of San Diego. The letter points out potential constitutional issues with hydromodification requirements imposed in the Tentative Order. We urge you to recommend modifying the referenced provisions to avoid the potential consequences for copermittees outlined in the letter.

The County also urges the Regional Board to amend the Tentative Order to incorporate the approved hydromodification management plan (HMP) for San Diego County into the permit, and remove provisions of the Tentative Order that are inconsistent with the HMP. As you know, the HMP was developed at significant cost to copermittees, and has only recently been implemented. Therefore, scrapping key components and changing the baseline standard for redevelopment to the questionable "pre-development" standard without further study of the effectiveness of the HMP as

implemented is legally inconsistent with the premise upon which the HMP was required to be developed in the first instance. Our client is submitting a more comprehensive technical comment on the HMP issue for your review.

Other legal concerns with various Tentative Order provisions will be woven into the comprehensive written comments to be submitted by the County and copermittees. Because of the potential impact of the above provisions of the Tentative Order for our client, we urge you to review and revise your recommendations to the Regional Board. Our mutual goal should be a permit that realistically and responsibly advances the march toward improved water quality in the region using available existing resources. As always, thank you for your consideration.

Very truly yours,

THOMAS E. MONTGOMERY, County Counsel

By James R. O'Day

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IN REPLY REFER TO:
5090
Ser N45JWW.ch/013
January 10, 2013

Wayne Chiu, P.E.
California Regional Water Quality Control Board,
San Diego Region
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San Diego California 92123-4340

Dear Mr. Chiu:

SUBJECT: COMMENT - TENTATIVE ORDER NO. R9-2013-0001, REGIONAL MS4 PERMIT, PLACE ID: 786088WCHIU

On behalf of Navy Region Southwest I respectfully submit these comments on the draft Regional MS4 Permit.

In a conscious policy decision, supported by the CWA, the MS4 permit mandates toxicity monitoring for receiving waters. This policy direction recognizes some very important and unique aspects of storm water discharges namely; they are intermittent, flow is unpredictable, and they are short duration representing a very temporary condition in the receiving water.

Receiving water toxicity testing is consistent with the San Diego Region Basin Plan which states that *"All waters shall be maintained free of toxic substances in concentrations that are toxic, or that produce detrimental physiological responses in human, plant, animal, or aquatic life"*. It is also consistent with the current draft of the State Water Board Policy for Toxicity Assessment and Control as well as the recently adopted Framework for Monitoring and Assessment in the San Diego Region. Together these documents insure that reliable and statistically and scientifically sound information is produced to show permit compliance, and guide decisions about, and the evaluation of, the progress of efforts to protect and restore the quality and beneficial uses of waters in the San Diego Region.

The Navy supports the use of toxicity testing of the receiving water as described in Provision D Monitoring and Assessment Program Requirements. Toxicity testing of the receiving water, as opposed to testing 100% storm water, is protective of water quality and beneficial uses and accurately measures toxicity impacts from storm water discharges.

Lastly, as articulated in the MS4 Fact sheet F-36:

> *"[t]he inclusion of receiving water limitations is also consistent with the Ninth Circuit Court of Appeals' ruling in Defenders of Wildlife v. Browner (191 F.3d 1159, 1166 (1999)) that the permitting authority has discretion regarding the nature and timing of requirements that it includes as MS4 permit conditions to attain water quality standards."*

We support the San Diego Regional Board's use of toxicity testing of the receiving water in all NPDES Stormwater Permits where toxicity limitations or monitoring requirements are determined necessary to insure water quality protection. This position is supported by the CWA, Porter Cologne Act, State Policy, US EPA-approved Regional Basin plans.

The Navy requests that you consider these comments in the upcoming permit adoption. The points of contact for this letter are Mr. Christopher Haynes at christopher.a.haynes@navy.mil or (619)532-2285 and Mr. Brian Gordon at brian.gordon@navy.mil or (619)532-2273.

Sincerely,

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RIVERSIDE COUNTY FLOOD CONTROL
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January 10, 2013

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San Diego, California 92123-4340

Dear Mr. Chiu:

Re: Tentative Order No. R9-2013-0001
Regional MS4 Permit
Place ID: 786088Wchiu

The Riverside County Flood Control and Water Conservation District (District) is submitting this comment letter on the above listed Tentative Draft Order on behalf of the Riverside County MS4 Copermittees within the San Diego Region (Riverside County Copermittees) which includes the District, the County of Riverside and the Cities of Murrieta, Temecula and Wildomar. Tentative Draft Order R9-2013-0001 (Draft Permit) was drafted by Board staff to cover Phase I municipal separate storm sewer system (MS4) Copermittees in San Diego County, southern Orange County, and the portion of southwestern Riverside County within the Santa Margarita Hydrologic Unit.

The Riverside County Copermittees have previously commented that the San Diego Water Board lacks authority to adopt a regional permit covering Orange and Riverside Counties, in addition to San Diego County; a comment which is discussed in further detail below and in the attached legal comments. Notwithstanding such objection, and subject to it, the Riverside County Copermittees are providing comments on the Draft Permit.

In the workshop on the Administrative Draft Order held on April 22, 2012 San Diego Water Board staff identified the following desired outcomes for the proposed permit:

- Improving the quality of water discharged from the MS4
- Restoring or enhancing Beneficial Uses and Receiving Water quality

It was further identified by Board staff that to be able to meet those goals, the proposed regional MS4 permit needed to be 1) Strategic, 2) Adaptive, and 3) Synergistic.

Notwithstanding the concerns of the Riverside County Copermittees with regard to the legal authority to issue a regional MS4 permit, the Copermittees agree that being able to adapt and direct resources toward specific water quality priorities in a given watershed, rather than all potential problems simultaneously, is more likely to result in actual and meaningful improvements in water quality. However, to be able to achieve those improvements the MS4 Permit must be crafted to provide the Copermittees with the ability to truly and fully

adaptively manage their programs to focus resources on those BMP strategies and monitoring efforts that are identified as being most effective, consistent with the MEP standard, at addressing watershed priorities.

Unfortunately, many provisions in the Draft Permit, including but not limited to the Receiving Water limitation provisions in Provision A and others discussed in this letter, still do not fully support the achievement of those outcomes. The Draft Permit does not provide the Copermittees with the flexibility to be fully strategic in managing their resources nor the ability to fully adapt their programs to focus on the highest priority water quality needs of the watershed. This comment letter and the other documents submitted herewith (a redline of the Draft Permit and Legal Comments) identify some suggestions which, if adopted by the San Diego Water Board, will help to address these limitations and facilitate the desired improvements.

This comment letter is organized as follows:

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As noted, the Riverside County Copermittees also are submitting a redline of the Draft Permit ("Redline") that proposes alternative language intended at achieving solutions to the various issues raised in this letter, and a Legal Comment document ("Legal Comments") that provides additional legal context for the various issues raised in this letter. The Riverside County Copermittees reserve their right, in the context of filing a Report of Waste Discharge ("ROWD") prior to the expiration of Order R9-2010-0016 (the 2010 MS4 Permit), to again address these issues and others relevant and appropriate to the SMR.

1 BACKGROUND

The Riverside County Copermittees were issued an extensive and prescriptive MS4 Permit in November 2010 which greatly expanded monitoring obligations, required special studies, a jurisdictional runoff management program, and Watershed Workplan requirements that were very different than the requirements set forth in the previous MS4 Permit issued to the Copermittees. Development and implementation of the 2010 MS4 Permit compliance requirements has been very expensive, especially in comparison to the relatively few demonstrated impairments of Beneficial Uses in the region and the Copermittees' resources. These requirements have left other important societal needs unfulfilled by the Riverside County Copermittees during a period of unprecedented and continuing economic distress. Further, the Riverside County Copermittees are still in the process of developing and implementing these 2010 MS4 Permit requirements, which is a serious concern given the very different compliance approach proposed in the Draft Permit. The Copermittees hope that the compliance efforts under the current MS4 Permit are taken into account when they submit their ROWD at the expiration of the 2010 MS4 Permit.

2 General Comments

2.1 Regional Permit

The Riverside County Copermittees respectfully submit that the San Diego Water Board is not authorized under the Clean Water Act or under its implementing regulations to issue a regional permit to Copermittees in San Diego County, South Orange County and the Santa Margarita Region (SMR) of Riverside County. As discussed more fully in the Legal Comments, the only circumstance under which the San Diego Water Board could issue such a permit would be if the Copermittees in these counties agreed to such a permit. Additionally, while the Draft Permit purports to affect the conduct of the Riverside County Copermittees upon expiration of the 2010 MS4 Permit in November 2015, the Riverside County Copermittees have not submitted a ROWD requesting coverage under a regional permit. Because no application has been made for the regional permit, which is a requirement set forth in the CWA regulations, the San Diego Water Board lacks jurisdiction to name the Riverside County Copermittees on the Draft Permit at this time.

Notwithstanding the above, the Riverside County Copermittees are submitting the comments in this letter based on:

- The San Diego Water Board staff's stated intent to enroll the Riverside County Copermittees in this permit upon expiration of the 2010 MS4 Permit.
- Statements made by San Diego Water Board staff that this comment period would serve as the primary opportunity for the Riverside County Copermittees to influence their next term MS4 Permit. The Riverside County Copermittees are entitled, as part of the ROWD process, to again raise relevant issues regarding permit provisions, but have undertaken in these comments to address major current concerns.

2.2 Outcome Focus

As mentioned above, the Copermittees agree that being able to adapt and direct resources toward addressing the specific water quality priorities in a given watershed, rather than all potential problems simultaneously, is more likely to result in actual/meaningful improvements in water quality. However, to be able to achieve those improvements, the MS4 Permit must fully integrate the following principles:

- **The Jurisdictional Program requirements must be fully flexible:** The Permit must be written in a way that allows the Copermittees to truly and adaptively manage their programs to fully focus their existing resources on those BMP strategies and monitoring efforts that are identified within the Water Quality Improvement Plan (WQIP) as being most effective, consistent with the Maximum Extent Practicable (MEP) standard, at addressing the watershed's priorities. We understand this to be the goal of the San Diego Water Board as well. While some elements of the Draft Permit embody this need, others do not and require dedication of resources to specific pre-defined efforts, regardless of the identified need for that effort in the watershed. The specific program areas that need more work to this end are:

    - The approach to addressing Non-stormwater discharges
    - Development Planning
    - Retrofitting
    - Channel Rehabilitation

These issues and proposed new language to address these issues are included throughout this letter and/or in the attached Redline.

- **Basin Plan updates need to be Prioritized by the San Diego Water Board:** For outcome-based permitting to be successful, the desired outcomes must be achievable by and appropriate to the Copermittee. To do that, the outcomes must take into account the background conditions in the watershed, and be appropriate for the attainment of Beneficial Uses in the specific waterbody, based on the specific conditions within and influencing that waterbody. The values in the Basin Plan should be comprehensively re-evaluated to ensure that water quality standards are scientifically justified to protect Beneficial Uses. Without updating the Basin Plan, the outcomes that the Copermittees target in the WQIPs would be arbitrary and not guaranteed to achieve the desired beneficial use improvements. Such an update should be pursued aggressively, led by and adequately funded by the San Diego Water Board, with participation by the MS4 Copermittees and other dischargers and stakeholders in the watershed.

- **Other Dischargers need to be Similarly Regulated by the San Diego Water Board:** The MS4 Copermittees are not the only dischargers of pollutants in the watershed. For example, the SMR of Riverside County includes State Lands (such as Caltrans), Tribal Lands, Agricultural Operators, Industrial Permit dischargers, Construction Permit dischargers, Phase II entities, Water Districts, and 'De Minimus' dischargers issued general permit coverage; all of which:

- Have separate regulatory programs (such as permits or waivers) implemented by the San Diego Water Board;
- May discharge pollutants, including non-stormwater, that can affect the quantity and quality of runoff, both directly within Receiving Waters, and in runoff discharges that may enter into and be discharged from the MS4; and
- Cannot be regulated by the Copermittees for the quantity and quality of their runoff because of their separate permits or waivers granted by the NPDES Program Administrator.

As such, while MS4 Copermittees can implement programs to reduce pollutants in discharges that are within their legal jurisdiction, no amount of effort by the MS4 Copermittees can be expected to fully attain water quality standards in the Receiving Waters. The only way to achieve that outcome will be for the NPDES Program Administrator (the San Diego Water Board in most cases) to directly regulate each of these entities to similar levels and standards as set forth by this Permit.

2.3 Responsibility for meeting goals of CWA

The CWA requires Copermittees subject to any MS4 permit, including the Draft Permit, only to address discharges from their MS4s. 33 U.S.C. § 1342(p)(3)(B). The Copermittees are not required to restore Beneficial Uses in any Receiving Water, or to address sources of pollution to those Receiving Waters that are not being discharged into or from those MS4s. However, in various provisions in the Draft Permit, there is a suggestion that the Copermittees are solely responsible for attaining water quality standards in their respective Receiving Waters. The San Diego Water Board must make clear in the Draft Permit that the responsibilities of the Copermittees are limited to their MS4s and the requirements of the CWA for municipal stormwater dischargers. Redline changes have been proposed in the above referenced portions of the Draft Permit to address this issue.

3 Specific Comments

The following comments represent specific high level concerns that the Riverside County Copermittees have identified at this time. Additional comments on the Draft Permit can be found in the Redline, as well as in the attached Legal Comments.

3.1 Findings

The Riverside County Copermittees have two separate sets of comments on the Findings. The first addresses the need for additional findings, with respect to aspects of California law and the physical setting of the SMR. The second set of comments focuses on existing Findings in the Draft Permit.

3.1.1 Needed Additional Findings

The Findings in the Draft Permit fail to fully address the context and conditions under which the proposed permit requirements are to be applied. A more complete explanation of this background is necessary to ensure that the Provisions ultimately included in the Draft Permit are credible, appropriate and legally required, and that the Permit Provisions (which must stem from the Findings) reflect the

context of the broader issues that affect MS4s within the region. The Riverside County Copermittees request that San Diego Water Board staff work with the MS4 Copermittees to expand the Findings, including the addition of findings to address the following:

California Water Law

California law requires that downstream entities must accept runoff from up-gradient properties. Owners and operators of MS4s are not exempt from this legal mandate, even if that runoff contains pollutants. Moreover, flood control districts, including the District, are mandated by the California Legislature (Legislature) to protect the lives and property of residents from floodwaters. The Riverside County Copermittees request that a finding, in the form set forth in the Redlines, be added to the Draft Permit.

Flooding

Many areas that would be under the jurisdiction of the Draft Permit are subject to periodic catastrophic flooding, which results from natural conditions, specifically the presence of mountains and hilly areas in close proximity to development, along with the effect of strong Pacific storms. This flooding would occur even in the absence of development. The Legislature recognized the importance of this issue in the early 20th Century, when it established flood control districts across the state, including in Riverside, Orange and San Diego Counties. Such flooding has, and if not controlled, could result in loss of life and widespread property damage. Further, the flooding can mobilize significant amounts of pollutants from industrial, commercial, residential and agricultural lands, damaging watercourses, habitat, and the Beneficial Uses therein. MS4 systems are designed and constructed to mitigate these impacts. The Riverside County Copermittees request that a finding in the form set forth in the Redline be added to the Draft Permit.

Flood Control District Acts

As noted above, the Legislature established Flood Control Districts in Orange, Riverside, and San Diego Counties through a series of Flood Control Acts. The Legislature determined that protection of life and property from the effects of flooding through the implementation of flood control improvements was a priority, and assigned those Districts with the sole responsibility to design, construct and maintain those improvements necessary to manage and contain floodwaters to prevent such negative impacts, as well as to conserve floodwaters for beneficial use. As noted above, these improvements represent fundamental water quality BMPs inasmuch as they reduce the widespread exposure of runoff to pollutants. The Flood Control Districts, while owners and operators of MS4s, have no authority or powers beyond those granted by the Legislature. The Legislature did not provide the Flood Control Districts, for example, the authority to regulate land uses within the municipal jurisdictions of Riverside County, nor to control the volume or quality of runoff discharged by those land uses. Findings describing the legislative priority for flood control and the limitations on the governing power of the Flood Control Districts should be added to set forth the appropriate role of the Flood Control Districts as MS4 Copermittees. The Riverside County Copermittees request that a finding, in the form set forth in the Redline, be added to the Draft Permit.

Limits on Extent of Permittee Legal Authority

The MS4 Copermittees lack the authority to regulate many significant sources of pollutants that may impact Receiving Waters. For example, the Copermittees cannot regulate pollutants discharged from federal and state lands, facilities, tribal lands, special districts, utilities, agricultural lands, or railroads. Moreover, the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) preclude local regulation of pesticides. The Riverside County Copermittees request that a finding in the form set forth in the Redline be added to the Draft Permit.

3.1.2 Comments on Existing Findings

Findings 3 and 15 (and elsewhere in Draft Permit)

In Findings 3 and 15 (and throughout the Draft Permit), it is stated that the CWA requires controls to reduce the discharge of pollutants "in stormwater" to the MEP. Finding 15, moreover, states that non-stormwater discharges from the MS4 are "not considered stormwater discharges and therefore are not subject to the MEP standard, stating that the MEP standard "is explicitly for 'Municipal . . . Stormwater Discharges" from the MS4s.

These conclusions are directly contrary to the plain language of the CWA, as set forth in the November 16, 1990 preamble accompanying the CWA stormwater regulations. Those authorities provide that the MEP standard applies to *all* pollutants discharged from the MS4, notwithstanding that some may be transported by non-stormwater. Additionally, the Redline reflects deletion of the limitation of the MEP standard to stormwater discharges in multiple locations, reflecting federal law. For a further discussion of this issue, please see the Legal Comments. The Riverside County Copermittees also request deletion of Finding 15.

Finding 11

This Finding states that "[r]ivers, streams and creeks in developed areas used [to convey runoff] . . . are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and Receiving Water." This statement is incorrect and must be deleted (as reflected in the Redline). For reasons more fully set forth in the Legal Comments, natural streams cannot be considered MS4; there is no MS4 "outfall" from a channelized river or stream to a natural stream; and, USEPA itself requires a distinction between MS4s and Receiving Waters.

Finding 12

This Finding states that as operators of MS4s, "Copermittees cannot passively receive and discharge pollutants from third parties." By providing free and open access to an MS4 that conveys discharges to Waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not prohibit or otherwise control. This statement is incorrect and must be deleted (as set forth in the Redline). As the discussion in the Legal Comments indicates, municipalities must maintain the MS4 to protect the lives and property of their citizens and to prevent nuisance. Flood Control Districts have a statutory obligation to operate and maintain such MS4, an obligation which is not affected by

either the CWA or the terms of the Draft Permit. While an MS4 operator has the obligation to effectively prohibit the entry of non-stormwater into the MS4, it does not have legal responsibility for such discharges, which are the responsibility of the discharger itself and subject to the jurisdiction of the San Diego Water Board, pursuant to Water Code section 13260 *et seq*.

Finding 28

This Finding recites that the San Diego Water Board finds that the requirements of the Draft Permit "are not more stringent than the minimum federal requirements." The Riverside County Copermittees disagree with this finding, as it is not supported by the evidence, *i.e.*, the many requirements in the Draft Permit which exceed the federal MEP standard. Moreover, any decision by the San Diego Water Board to adopt "other provisions" going beyond MEP is not a federal requirement, but rather a discretionary decision taken by a state agency under authorization in the CWA. *See Defenders of Wildlife v. Browner*, 191 F.3d 1159, 1164-65 (9th Cir. 1999). Please see discussion in the Legal Comments. The Finding also indicates that the San Diego Water Board has developed an economic analysis of the Draft Permit. As set forth in the Legal Comments, the Riverside County Copermittees challenge the adequacy of that analysis.

Finding 29

This finding purports to find that the Draft Permit does not constitute an unfunded state mandate. The Riverside County Copermittees disagree with the conclusions set forth in this finding. More importantly, the finding is without legal effect because exclusive jurisdiction as to whether a state mandate exists, and whether it is unfunded lies with the Commission on State Mandates. Government Code §§ 17751 and 17552; *Lucia Mar Unified School District v. Honig* (1988) 44 Cal.3d 830, 837; *Hayes v. Commission on State Mandates* (1992) 11 Cal.App.4th 1546, 1596-97. The finding of an agency that has no jurisdiction to make that finding is entitled to no weight and should be deleted, as shown in the Redline. For an additional discussion of these issues, please see the Legal Comments.

Finding 31

The Riverside County Copermittees believe that the Receiving Water Limitation ("RWL") language set forth in the Draft Permit renders compliance with the permit impossible, since exceedances of water quality standards occur routinely through no fault of the MS4 Permittees. Thus, unless the RWL is modified to provide the Copermittees with a means to be in compliance, those Copermittees risk the threat of arbitrary San Diego Water Board enforcement or the bringing of citizen suit lawsuits under the CWA, which could nullify compliance with all other terms set forth in the Draft Permit, as discussed more fully in the Legal Comments. The exposure to third party litigation from the proposed RWL language is one of the most significant threats to an otherwise collaborative approach to achieving long term water quality improvement. This threat was emphasized by the recent bringing of a citizen suit lawsuit against the City of Malibu, the County of Los Angeles and the Los Angeles County Flood Control District based on similar language in the 2001 Los Angeles County MS4 Permit. The Riverside County Copermittees have suggested modifications to Provision A in the Redline and as discussed below and in the Legal Comments that are intended to better support the Iterative Process for compliance authorized by the State Water Resources Control Board in Order No.

2001-15, through the WQIP process. The Copermittees also note that the State Board considered the problems with the RWL language at a recent workshop, which may eventually result in modifications which should, if applicable, be reflected in the Draft Permit. Other requested changes to the Findings are set forth in the Redline.

3.2 Provision A, Prohibitions and Limitations

As noted above, the requirements set forth in Provision A are of great concern to the Riverside County Copermittees. The Copermittees generally support an approach to compliance that utilizes WIQPs as the implementing mechanism for the 'Iterative Process' described in Provision A.4, and that by implementing that iterative process in accordance with A.4, that the Copermittee should be in compliance with Provisions A.1 and A.2. The Redline reflects edits of Provision A to clarify the linkage between the prohibitions and limitations in Provisions A.1. through A.3. and Provision A.4 – which is described as the method for complying with the prohibitions and limitations. It must be noted, however, that the Riverside County Copermittees do not agree with the approach suggested, that any WQIP-based compliance approach be necessarily accompanied by a Reasonable Assurance Analysis. Such analyses can be extremely complex, expensive and time-intensive to develop, and similar analyses are commonly developed within TMDL models; taking a number of years to develop and refine. Given that the Santa Margarita Watershed has no adopted TMDLs; thus, comprehensive pollutant transport and BMP models are not available for the suite of constituents that might be considered for prioritization within a WQIP for the Santa Margarita Watershed. In the context of a TMDL, such models would be developed by the combined resources of the San Diego Water Board and a range of stakeholders and dischargers. Undertaking such an exercise solely with the public resources of the 275,000 residents of the SMR is beyond the financial ability of the Copermittees and would shift the responsibility for development of TMDLs from the San Diego Water Board to the Copermittees. Comments on Provision A can be found below, in the Redline and in the Legal Comments.

3.2.1 Overview of Key Issues

As noted above, an overriding issue for the Riverside County Copermittees is having a permit that, while being appropriately proactive and aggressive at addressing the prioritized water quality conditions with the Receiving Waters, is one that all Copermittees can remain in compliance with while implementing those requirements. As presently drafted (and as made clear by statements in the Fact Sheet), Provision A imposes immediate potential liability on every Copermittee if monitoring in the Receiving Waters reflects exceedances of water quality standards that may have been caused or contributed to by MS4 discharges. San Diego Water Board staff has repeatedly indicated in workshop presentations that they expect that Copermittees will not be able to comply with the Receiving Water Limitations and Discharge Prohibitions for some time. Staff has separately indicated that they are interested in having the Copermittees undertake bold initiatives in trying to address urban runoff pollution, and that the Copermittees have actually been encouraged to "fail early and fail often" as this would reflect such progress in refining these initiatives. The iterative, flexible and priority-setting approach reflected in the WQIP is intended to allow the Copermittees to focus on the most important problems in their watershed. The entire approach is endangered, however, by RWL provisions which would allow either the San Diego Water Board or a citizen plaintiff to sue the Copermittees for any individual exceedance of the

RWLs. Under the current version of Provision A, the unmitigated risk of such actions leads not to bold initiatives but rather to attempts to minimize liability.

As set forth in the Legal Comments, this approach is not mandated by the CWA, State Board orders or the opinion of the Ninth Circuit Court of Appeals in *Natural Resources Defense Council v. County of Los Angeles*, 673 F.3d 880 (9th Cir. 2011), *reversed*, 568 U.S. __ (January 8, 2013). As importantly, the threat of immediate potential noncompliance actually interferes with the ability of the Copermittees, including the Riverside County Copermittees, to comply with the Draft Permit. Instead of being able to focus on pollutants of highest concern in the watershed, as called for in the WQIP, the Copermittees will be forced to try to address every pollutant monitored, since the exceedance of any water quality standard leads to immediate potential liability. Moreover, because citizen plaintiffs are entitled to injunctive relief under Section 505(a) of the CWA, a federal judge could order the Copermittees to undertake steps completely independent of the WQIP or other compliance provisions in the Draft Permit.

The Riverside County Copermittees do not object to compliance provisions that will provide a means to achieve real improvement in water quality. The Copermittees are willing to undertake these Provisions, because the success or failure is in their control. Compliance with the requirements of Provision A, however, is beyond the control of the Copermittees. Based on the statements made during the workshop process, the Riverside County Copermittees believe that the San Diego Water Board is serious about working with the Copermittees on a permit that provides flexibility and problem solving approaches. To ensure that this flexibility is not lost, the Draft Permit must tie in compliance with Provisions A.1 through A.3 to a process set forth in Provision A.4. This approach is shown in the Redline and is discussed further below.

3.2.2 Comments in support of specific changes

Provision A, Introduction

The introduction notes that pollutants "in stormwater discharges" from the MS4 must be controlled to the MEP. As discussed above, the CWA does not differentiate between stormwater and non-stormwater discharges from the MS4; both must be controlled to the MEP standard. The Riverside County Copermittees have requested revised language in the Redline. Additionally, the linkage between compliance with Discharge Prohibitions (Provision A.1), Receiving Water Limitations (Provision A.2) and Effluent Limitations (Provision A.3) should be noted as being defined by Provision A.4. This change is reflected in the Redline.

A.1.a

First, language must be added providing that compliance may be addressed through the process set forth in Provision A.4. This language is provided in the Redline. Second, the Provision prohibiting discharges which are "threatening to cause" a condition of pollution, etc., is unenforceable, because it prohibits an action that, with respect to MS4 operators, is beyond their control. Moreover, there is no authority for such provisions in the Porter-Cologne Act. The Riverside County Copermittees request

deletion of this phrase, as shown in the Redline. Additionally, as set forth in the Legal Comments, the Provision improperly expands the Discharge Prohibitions to Waters of the State.

A.1.b

40 CFR § 122.26(d)(2)(iv)(B)(1) clarifies that the requirement for an MS4 Copermittee to "effectively prohibit" the discharge of Non-stormwater/illegal discharges into its MS4s is to be accomplished through "a program, including inspections, to implement and enforce an ordinance, orders or similar means…". The language of this Provision should reflect federal law in this respect. The Redline reflects this change.

A.1.c

First, this Provision requires the Copermittees to comply with the Basin Plan prohibitions listed in Attachment A. This list is over-inclusive, as it contains requirements that are not applicable to some or all of the Copermittees' MS4 discharges, or to the Riverside County Copermittees in particular. The Riverside County Copermittees request that this Provision be amended to read as follows: "Discharges from MS4s are subject to all applicable waste Discharge Prohibitions in the Basin Plan." This change is noted in the Redline. Second, language must be added providing that compliance with this restriction can be obtained through the process set forth in Provision A.4. This language is provided in the Redline.

A.2.a

First, this Provision and Provisions A.1. and A.3 should be linked to the iterative process described in A.4. Please see the Redline.

Second, not all plans, policies, etc. set forth in Provision A.2.a.(1)-(4) may qualify as "water quality standards" or be applicable to all the MS4 Copermittees. These subsections should be deleted, and replaced with a reference to "Water Quality Standards," which is a defined term in the Draft Permit (This change is reflected in the Redline). Otherwise, the MS4 Permit would become over inclusive with respect to what is considered a water quality standard. Such standards must be established in accordance with federal and state law. If this process has not been followed for a particular requirement, it is not a "water quality standard."

A.3.a

As discussed above, this Provision erroneously states that pollutants "in stormwater discharges" from MS4s must be reduced to the MEP. Please see the Redline.

A.3.b

This Provision should also provide that compliance with a TMDL constitutes compliance with Provisions A.1 and A.2, for those pollutants/waterbodies subject to the TMDL.

A.4.a

The Riverside County Copermittees support an approach whereby compliance with Provisions A.1 through A.3 are achieved through a truly iterative approach, one which reflects the intent of the

precedential State Water Board Order Nos. 99-05 and 2001-015. As set forth in the Redline, the Riverside County Copermittees believe that they and the other Copermittees under the Draft Permit should be considered in compliance with Provisions A.1, A.2 and A.3, as applicable, through development of the WQIP, unless the San Diego Water Board denies approval of a WQIP or amendment thereof. This ensures that the Iterative Process which is the focus of the WQIP, is utilized to provide a means to be in compliance for the Copermittees.

A.4.c

This Provision should be deleted, as is reflected in the Redline. Again, this Provision defeats the purpose of an iterative approach to compliance with the Provisions A.1 through A.3, because it allows the San Diego Water Board to enforce any provision of the Draft Permit, including those provisions at any time. The San Diego Water Board obviously retains full ability to enforce the provisions of the Draft Permit, including with respect to the failure of the Copermittees to carry out required provisions. To short circuit the WQIP/JRMP process, however, is to defeat the entire intent of the Draft Permit.

3.3 Provision B, Water Quality Improvement Plans

3.3.1 Overview of Key Issues

- The goals and requirements of the WQIP need to be aligned with the requirements of the CWA that were established specifically for MS4 permits, and not impose the restoration of Receiving Waters entirely upon MS4 Copermittees.
- The WQIP should focus on addressing sources of pollutants within the jurisdiction of the respective Copermittees.
- The BMP strategies identified in the WQIP should fully inform the selection and design of programs identified in the JRMP. Some minor edits were proposed in Provision B, with additional edits as warranted in Provisions D and E.

3.3.2 Comments in support of specific changes

Introductory paragraph

The introductory language implies that the WQIP should be designed to unilaterally protect, preserve, enhance, and restore water quality and Beneficial Uses in waters of the state. As noted in Section 2.3 above, MS4 Copermittees are responsible only for discharges from their MS4s, not the unilateral protection of Beneficial Uses within their watersheds.

Redline edits were provided to:

- Tie the goals of the WQIP to the requirements of the CWA applicable to MS4 Permits.
- Replace 'waters of the state' with 'Receiving Waters' to be consistent with federal law.
- Clarify the linkage between Provision A and Provision B.

Additionally, Redline edits were provided to clarify that the strategies identified in the WQIP are intended to guide the specific actions that will be implemented by the Copermittees pursuant to Provision E.

B.1

The Riverside Copermittees support the redlines of the San Diego County Copermittees with regard to setting forth that the WQIP for the Santa Margarita Watershed Management Area (WMA) would commence upon enrollment of the Riverside County Copermittees into the Order.

B.2.e.

Two changes have been proposed, as shown in the Redline:

- The introductory paragraph includes language that clarifies that the Numeric Goals are not enforceable compliance standards, effluent limitations, or Receiving Water limitations. This clarification is consistent with San Diego Water Board staffs' verbally stated intent.
- Provision B.2.e.(1) as written requires that the final Numeric Goals be "capable of demonstrating the achievement of the restoration and/or protection of water quality standards in Receiving Waters". As discussed in Provision 2.3 above, meeting WQS in Receiving Waters is a goal of the overall NPDES regulatory programs under the CWA and not as a requirement to be accomplished alone by MS4 Copermittees. Redline edits have been provided to clarify that such goals are only required to be for MS4 discharges.

B.3.

In the Redline, edits were made to the introductory paragraph to ensure that the requirements are consistent with federal law. The CWA requires the 'effective prohibition' of non-stormwater discharges, not 'preventing' or 'eliminating' them.

Edits were also made to Provision B.3.a. to link the strategies more clearly to the Numeric Goals developed pursuant to Provision B.2.e, as well as to link them to the JRMP programs in Provision E.

B.5

In the Redline, edits were made to the introductory paragraph to clarify that the WQIP (and by extension the JRMP and Monitoring programs) are intended to meet the requirements of Provisions A.1, A.2, and A.3. The Tentative Order particularly excluded Provision A.1.b. (dealing with non-stormwater discharges). However, as discussed in the attached Legal Comments, the CWA requires that illegal discharges must be addressed via a program (as included in Provision E.2), and it is appropriate that the program be guided by the priorities and strategies included in the WQIP.

Other edits were made to clearly link Provision B.5 to the applicable requirements of Provision F.

3.4 Provision C, Action Levels

3.4.1 Overview of Key Issues

- The Action Levels (non-stormwater, and stormwater) applicable within each watershed should only be those that are associated with the priority water quality conditions in that watershed, or that are 303(d) listed for that watershed. For example, if Zinc is not a priority pollutant for a watershed, and is not 303(d) listed, there should not be a Zinc action level. This change is needed because Provision D requires analysis for all 'action level' parameters. Analysis for pollutants that are not a priority for a watershed is a waste of Copermittee resources.
- The Copermittees should be able to establish alternative action levels that are appropriate to the WMA within their WQIP. Such alternative action levels would be subject to Executive Officer approval as part of the WQIP approval process.
- Footnote 8 and 10 need to clarify that the NALs and SALs are not enforceable limitations.
- Various references to 'waters of the state' need to be changed to Receiving Waters for consistency with the Draft Order and the CWA.

Please see the Redline for further detailed comments and language changes.

3.5 Provision D, Monitoring and Assessment

The Riverside County Copermittees appreciate the changes in the monitoring program reflected in the Draft Permit, as compared to the Administrative Draft. However, elements of the revised requirements are still infeasible for the Riverside County Copermittees. The comments below identify modifications of areas of the monitoring requirement's which can significantly improve the Copermittees' ability to implement and comply with the requirements, while still maintaining appropriate jurisdictional accountability and assessment requirements to guide the implementation of the WQIPs and JRMP programs. The Redline provides further detailed comments and language changes.

3.5.1 Overview of Key Issues

- Dry Weather MS4 Outfall Monitoring
  - The level of effort dedicated to monitoring and addressing outfalls with non-stormwater discharges should be commensurate with the potential impact that discharge has on a Receiving Water. If a discharge, whether persistent or transient, has no or little potential for impacting a flowing Receiving Water, (e.g. due to infiltration, evaporation, or treatment of the flows), the outfall should be de-emphasized relative to other outfalls that have discharges that have connectivity to a flowing Receiving Water.
  - Outfall Dry Weather Field Screening – As currently drafted, the number of required visual inspections of outfalls during dry weather required per Provision D.2.a.(2)(a) and Provision D.2.b.(1) is both excessive and disproportionate. This will particularly impact smaller jurisdictions, which may be required to do more visual inspections of MS4 outfalls than would larger jurisdictions with more outfalls and more resources.
  - Similarly, as written, the Persistent Flow Outfall Monitoring requirements of Provision D.2.b.(2)(b) are excessive and also will disproportionately impact smaller jurisdictions.

Jurisdictions with several hundred outfalls will likely have significantly more resources to perform the required monitoring than smaller jurisdictions with fewer outfalls, yet both are required to implement the same level of persistent flow monitoring.

- Assessment Requirements
  - The assessment requirements require modeled extrapolation of monitored outfall data to non-monitored outfalls for the purposes of calculating loads from each outfall in each jurisdiction. Such extrapolations though modeling or other calculations will not accurately reflect actual jurisdictional loads, and have no benefit that directly analyzing the monitored data cannot more accurately provide.

3.5.2 Other Global Issues

- As currently drafted, MS4s operated by a flood control district within a city or county would be effectively double-counted for identification of outfalls in each jurisdiction and for performance of the load calculations from each jurisdiction. Additionally, Flood Control Districts have no land use or enforcement authorities outside of the MS4 and rely on the local Copermittee to address pollutant sources and discharges to their MS4. Redline edits have been included to clarify the relationship between districts and the municipal jurisdictions they serve for the purposes of outfall monitoring and the assessment requirements.
- Timelines for monitoring and assessments were clarified throughout and linked to specific reporting requirements of Provision F in the Redline.

3.5.3 Comments in support of specific changes

D.1.a.(3) and D.1.e.

The Redline clarifies that the Receiving Water monitoring described in these sections must be conducted as applicable to the WMA and the Copermittees' MS4 discharges, because some of the monitoring requirements only apply to MS4 discharges to certain waterbodies. Not all Copermittees within a WMA will have discharges to that waterbody.

D.1.b.

The Redline proposes language to allow for alternative long-term monitoring stations to be identified. Using the SMR as an example, the Copermittees might wish to utilize a location other than the existing stations due to the influence of groundwater during dry weather and/or the general lack of MS4 contributions in dry weather to those locations.

Table D-1 and D-6

The Redline proposes an addition to the list of field observations, an assessment for flow connectivity of any MS4 discharges to the sampled Receiving Water. It is important to know whether the sampled Receiving Water included a contribution of flows from MS4 discharges, or whether the data reflect conditions in the absence of an apparent MS4 discharge contribution.

D.2.a.(2)

The Redline clarifies that the identification of annual outfall monitoring requirements is based on municipal Copermittee boundaries, inclusive of Flood Control District MS4 outfalls within their jurisdiction.

The Redline clarifies that the field screening requirements apply to those outfalls in the Copermittee's inventory that are 'accessible'. If an outfall is inaccessible for safety reasons or due to habitat restrictions, it would not need to be field screened.

The Redline simplifies the 'tiers' in Provision D.2.a.(2)(a) by removing the lower tier (i), and expanding the second tier (ii) to cover all Copermittees with 500 or less outfalls. This resolves the disproportionality that occurs for Copermittees with a number of outfalls near the current 125 outfall threshold. For example, as currently drafted, a city with 150 outfalls would be required to do 150 visual inspections per year, but a smaller city with 120 outfalls would be required to do 192 visual inspections per year. The Redline also maintains the 80% requirement from the first tier to help smaller Copermittees manage their workload for meeting the field screening requirements while also conducting the additional source identifications that are required under the Draft Permit.

The Redline includes edits to Footnote 19 to clarify that persistent flow should effectively be a discharge that is hydraulically connected to a flowing Receiving Water. Any other discharges that are not affecting a flowing Receiving Water (such as pooled or ponded water) would be addressed as a Transient Discharge, with source IDs any time an obvious illegal discharge (i.e. color or odor) is identified.

D.2.a.(3)

The Redline incorporates edits proposed by the San Diego County Copermittees to require 10% of the samples in each WMA to be from a first storm event. As described in the comments of the San Diego County Copermittees, this will help avoid overly skewing of the data to 'first flush' data, while still incorporating such data into the data and analyses.

D.2.b.(1)

The Redline removes the requirement that the number of visual inspections performed be equivalent to the number of inspections required under Provision D.2.a.(2)(a).

As areas within a jurisdiction are confirmed not to have non-stormwater discharges, inspections of other outfalls would have to be perpetually (and unnecessarily) increased to maintain compliance with this requirement. For example, if a Copermittee had 150 outfalls, but after the transitional period it confirmed that 100 of those outfalls had no evidence of non-stormwater discharges to flowing Receiving Waters, it would have to visit the remaining 50 outfalls for up to three times a year to meet the requirement in this Provision. As the Copermittee got closer to eliminating non-stormwater flows at more outfalls, inspections at the remaining outfalls would quickly become excessive and unreasonable. Removing this requirement will better incentivize the elimination of non-stormwater

flows, as a Copermittee can look forward to reducing its workload in areas confirmed to not have non-stormwater flows.

D.2.b.(2)(b)

While the Riverside County Copermittees support the San Diego County Copermittees' proposal to reduce the number of required outfalls from 10 to 5 persistently flowing outfalls per WMA, the Riverside County Copermittees believe that applying the same minimum bar to all Copermittees is inappropriate and disproportionately affects smaller Copermittees that have commensurately less staff and resources.

The Riverside County Copermittees propose requiring monitoring of the top 10% of the prioritized persistent flow outfalls, with a lower and upper limit of 1 and 5 respectively, as shown in the redlines. With this change, the level of effort required of any individual Copermittee would scale consistent with the number of persistent flow outfalls within each Copermittees' jurisdiction.

Additionally, the Riverside County Copermittees request changing the requirement of Provision D.2.b.(2)(b)(ii) to require annual monitoring rather than semi-annual monitoring. With this change, a Copermittee could focus more of their annual budget on conduction Source ID efforts – which can result in eliminating problematic non-stormwater flows, rather than on a second monitoring event. Copermittees would still have the option to conduct a second monitoring event if they have more resources available and want to remove the outfall from their monitoring list sooner in accordance with Sub-Provisions [a] through [d].

D.2.b.(2)(e)

The Riverside County Copermittees support the San Diego County Copermittees' comments regarding allowing for a tailored list of constituents to be developed for each WMA. The Redline incorporates those edits.

D.3.

The Riverside County Copermittees support the changes recommended by the San Diego County Copermittees to this section, and these changes are reflected in the Redline.

D.4.a.(2)

This Provision as drafted would require the MS4 Copermittees to make comprehensive evaluations of Beneficial Uses that are beyond their expertise or the scope of an MS4 permit. Such evaluations and determinations would require advanced studies and cannot be answered with the monitoring data collected through this permit. This Provision should either be deleted or, alternatively the Riverside County Copermittees request that the assessments be focused on determining the status and progress toward addressing any Numeric Goals established for those Receiving Waters in the WQIP. Please see the Redline.

D.4.b.(1)

The Redline clarifies that outfall assessments are to be done for the area covered by each Municipal Copermittee (consistent with the proposed definition), and that the data to be used by each Municipal Copermittee would include the data collected from any Flood Control District Copermittee operated MS4s within its jurisdiction. This ensures that jurisdictional data is not double reported for Flood Control District MS4s within a city or county.

For Sub-Provision D.4.b.(1)(c)(iv) three key changes are requested in the Redline:

1) Annual volumes and pollutant loads should only be calculated from the monitored outfalls with persistent discharge to a flowing Receiving Water. This is directly applicable to the purpose of the Draft Permit and an important change, because volume and pollutant data extrapolated to non-monitored MS4 outfalls would be inaccurate and potentially misused if taken out of context. It is understood that San Diego Water Board staff want to ensure that jurisdictional accountability is maintained. However, since MS4 outfall monitoring will be conducted within each jurisdiction, inter-jurisdiction comparisons and accountability can be accomplished using the monitoring data directly without such extrapolations.
2) Added language to require a Copermittee to include in its jurisdictional load calculations any discharge that was demonstrated to have entered another Copermittees' MS4 before being discharged into the flowing Receiving Waters. This is important to ensure that each Copermittee maintains accountability for pollutants discharged to flowing Receiving Waters from within its jurisdiction.
3) The Redline proposes that the calculations of pollutant loads be only for the priority water quality constituents identified in the WQIP.

D.4.b.(2)(b)

Two key changes are recommended in the Redline:

1) Annual volumes and pollutant loads should only be calculated from the monitored outfalls for the monitored storm events. This is an important change because volume and pollutant data extrapolated to non-monitored events would be inaccurate and potentially misused if taken out of context. It is understood that San Diego Water Board staff want to ensure that jurisdictional accountability is maintained, so the Redline proposes that data from the monitored outfalls be extrapolated to identify loads for each jurisdiction during each monitored event. With this information, inter-jurisdiction comparisons and the desired 'accountability' can be accomplished using the monitoring data directly without such extrapolations to non-monitored events.
2) The Redline requests that calculations of pollutant loads be performed only for the priority water quality constituents identified in the WQIP.

D.4.b.(2)(c)

The Redline edits are consistent with those proposed by the San Diego County Copermittees, with minor modifications for clarity.

D.4.d.(2)(c)

It would be difficult to proactively determine the pollutant load reductions that *would* be necessary to demonstrate that discharges *are not* causing or contributing to exceedances of Receiving Water Limitations. Instead it would make more sense to calculate the necessary pollutant load reductions where the discharge has been demonstrated to be causing or contributing to such exceedances. In such circumstances, the necessary parameters would be known to calculate the needed load reduction. These changes are set forth in the Redline.

3.6 Provision E.1, Legal Authority

3.6.1 Overview of Key Issues

The Riverside County Copermittees note that Provision E.1, relating to the establishment of adequately legal authority, exceeds the requirements of federal CWA regulations in several respects. The federal regulations at 40 CFR 122.26(d)(2)(i)(A)-(F), provide explicit guidance for the Copermittees in developing the necessary legal authority to control MS4 discharges within its jurisdiction. However, several of the subsections of Provision E.1 go beyond these federal requirements, with respect to areas not within the responsibility of MS4 dischargers, such as negotiating with non-Copermittee entities. The Riverside County Copermittees have provided requested changes in the Redline, which are explained briefly below.

3.6.2 Comments in support of specific changes

E.1.a(1)

Changes in the Redline to accurately reflect the language of 40 CFR 122.26(d)(2)(i)(B).

E.1.a(2)

Changes in the Redline to accurately reflect the language of 40 CFR 122.26(d)(2)(i)(A). In addition, the Provision as written improperly requires the Copermittees to control the quality of runoff from sites covered by the state general permits for industrial activity and construction. These general permits are enforced by the State Board and the regional boards, and it is a state responsibility which cannot be handed off to the Municipal Copermittees.

E.1.a(3)

Changes in the Redline to accurately reflect the language of 40 CFR 122.26(d)(2)(i)(C).

E.1.a(5)

The Redline requests deletion of this Provision, which is not a requirement for municipal stormwater dischargers set forth in the CWA regulations. The Provision also improperly requests the Municipal Copermittees to attempt to negotiate with third parties the contribution of pollutants to the Copermittees' MS4. The Copermittees have no jurisdiction over such parties. The San Diego Water

Board has such jurisdiction, and should take responsibility for addressing non-MS4 sources of pollutants that may ultimately enter the MS4.

E.1.a(6)

Changes in the Redline to reflect accurately the language of 40 CFR 122.26(d)(2)(i)(E).

E.1.a(7)

The Redline requests deletion of this Provision, which is not a requirement for municipal stormwater dischargers set forth in the CWA regulations.

E.1.a(8)

The Redline requests deletion of this Provision, which is not a requirement for municipal stormwater dischargers set forth in the CWA regulations.

E.1.a(9)

The Redline requests deletion of this Provision, which is not a requirement for municipal stormwater dischargers set forth in the CWA regulations.

E.1.a(10)

The Redline requests both correction of the language in this Provision to comport with the federal regulations in 40 CFR 122.26(d)(2)(i)(F) and deletion of the second clause of this Provision, which is not found in 40 CFR 122.26(d)(2)(i)(F). Moreover, the requirement to inspect and monitor in the first clause of this Provision covers the issues set forth in the second clause. It is therefore unnecessary.

3.7 Provision E.2, IDDE

3.7.1 Overview of Key Issues

- The Draft Permit requires the Copermittees to address all non-stormwater discharges from the MS4 as illegal discharges, and then describes certain sources that need not be prohibited. This is effectively a 'guilty until proven innocent' provision, where a Copermittee will be required to expend potentially significant resources conducting source identification efforts any time non-stormwater is observed discharging from the MS4. In addition to the issues discussed in the Legal Comments, the Provision raises two practical and logistical problems:

    - This requirement is entirely independent of the determination that there are in fact any significant pollutants in such a discharge. A Copermittee could be spending substantial sums tracking (and then potentially enforcing upon) the source of a discharge that is not negatively impacting Receiving Waters. This not only is a waste of public resources, but would undermine the credibility of stormwater programs.
    - The San Diego Water Board and the State Water Board do not treat non-stormwater flows in the same manner across all of their regulatory mechanisms. For example, Order

No. R9-2008-0002 allows non-stormwater discharges to occur, POTWs are issued permits for their discharges and agricultural operators can discharge irrigation water. The Copermittees should not be forced to conduct an expensive source investigation, only to find that the discharge complies with a permit or a waiver granted by the Water Board. The Copermittee would have no ability to address such a discharge as an 'illegal discharge', and further would have no ability to recuperate their costs for the source identification.

The best way to address these issues, is to require the Copermittee to have and enforce an effective prohibition of illegal discharges of *pollutants* (through statutes, ordinances, permits, contracts, orders or similar means), and then allow the Copermittee full discretion to determine which non-stormwater discharges have the potential to negatively impact Receiving Waters, consistent with the WQIP priorities – and address those as illegal discharges.

- Several categories of non-stormwater discharge that were previously conditionally exempt consistent with the CWA, are required by the Draft Permit to be treated as illegal discharges, unless they have coverage under another order issued by the San Diego Water Board. In addition to the problems identified above for conducting enforcement in the absence of a pollutant discharge, the San Diego Water Board, not the Copermittees, is responsible for evaluating coverage, need for coverage, and compliance with other orders issued by the Water Board. The Copermittees have neither authority nor jurisdiction. Please see the Redline.
- Several categories of non-stormwater discharge that were previously conditionally exempt consistent with the CWA, are required by the draft permit to be 'controlled' or otherwise prohibited by the Copermittees. The Fact Sheet further describes that such controls are warranted because they could potentially contain pollutants. However, the CWA only requires controls where the discharges are determined to be a significant source of pollutants. Please see Legal Comments for a further discussion of this issue as well as the Redline.
- The Draft Permit eliminates the conditional exemptions for Landscape Irrigation, Irrigation Water, and Lawn Watering (collectively 'irrigation runoff'). The San Diego Water Board has provided no data demonstrating that these discharge categories have contributed a significant pollutant load to Receiving Waters within Riverside County. Information discussed in the Fact Ssheet focuses on data from other counties. The only data from Riverside County is public educational material referring to irrigation runoff; this material, however, was adapted from public education material from other counties. That public educational material was intended to help prevent such discharges from becoming a significant source of impact on the Receiving Waters, and did not constitute a determination that such discharges are in fact, actually a significant source that needs to be subject to a prohibition. See the discussion in the Legal Comments as well as the Redline.
- The Draft Permit, in Provision E.2.a.(7) requires efforts to minimize or eliminate all non-stormwater flows, including those that are natural, conditionally exempt, or otherwise permitted by the San Diego Water Board, regardless of whether or not such discharges are not contributing pollutants to the MS4. Such a requirement conflicts with the prior Provisions E.2.a.(1) through

(5), which state conditions where such discharges need not be prohibited. The requirement should therefore be removed, as set forth in the Redline.

3.7.2 Comments in support of specific changes

E.2.a.(1) and (3)

The Riverside County Copermittees request that this Provision be deleted (as shown in the Redline) and the categories of non-stormwater discharges be re-incorporated into Provision E.2.a.(3). The apparent premise of Provision E.2.a(1) as drafted is that since the San Diego Water Board requires those discharges to have coverage under a separate order, they are illegal if they lack such coverage. The MS4 Copermittees, however, are not responsible for enforcing discharge coverage under separate San Diego Water Board orders; that is the responsibility of the San Diego Water Board itself. Requiring the Copermittees to enforce such entities for their lack of coverage under a separate San Diego Order shifts that responsibility from the Board to Copermittees. This is not authorized by the CWA or the Porter-Cologne Water Quality Act. The Copermittees are, under the CWA, only required to address such discharges as illegal discharges if the discharge is found to be contributing a significant pollutant load to the MS4. By moving those categories to Provision E.2.a.(3), as shown in the Redline, the Copermittees will still be required to treat such discharges as illegal discharges if and when they are found to be contributing significant pollutants to the MS4. This proposed approach is consistent with other MS4 permits in the state, including prior San Diego Water Board orders, and is further consistent with the approach taken for the WQIP, which is intended to allow the Copermittees to focus resources on addressing the specific impacts that MS4 discharges are having on Receiving Water quality.

E.2.a.(2)

This Provision requires the Copermittees to treat water line breaks as illegal discharges, which in turn requires the Copermittee to conduct enforcement measures. Water main breaks are accidental occurrences, or may be the result of acts of nature. It is no more appropriate to treat accidents as illegal and subject to enforcement than it would be for a city to declare vehicular accidents as illegal, and conduct enforcement against those involved. This language needs to be removed as shown in the Redline. Additionally, as discussed in the Legal Comments, a recent case from the federal district court in Virginia suggests that the regulation of mere flow may exceed the authority of the CWA.

E.2.a.(4)

The Redline clarifies that if the 'statues, ordinances, permits, contracts, orders or similar means' are enacted/adopted by a Copermittee, the categories of non-stormwater discharges listed do not need to be treated as illegal discharges. Otherwise, the language could be read to imply that, for example, if it was infeasible for a particular resident to direct wash water to landscaped areas, that the Copermittee would be required to treat that residents' discharge as illegal and enforce upon them.

E.2.a.(5)

Contrary to the provisions of the CWA regulations, prior MS4 permits issued by the San Diego Water Board and other permits in the state, the Draft Permit requires implementation of BMPs, where

feasible, during emergency firefighting activities. During such emergencies, all focus of public resources must appropriately be dedicated to protecting life and property. Any diversions from that mission would only serve to diminish and potentially compromise that mission. The Redline proposes language consistent with that adopted by the San Diego Water Board in 2010 for the Riverside County MS4 Permit (Order R9-2010-0016).

E.2.a.(7)

Provisions E.2.a.(1) through E.2.a.(6) describe circumstances where non-stormwater discharges need not be prohibited. This Provision then requires the Copermittees to minimize such 'conditionally allowed' flows anyway. This requirement exceeds the scope of the CWA and its implementing regulations and makes no sense. The Redline requests deletion of these Provisions.

E.2.b.(1)(d)

This Provision requires the MS4 Copermittees to map all known private outfalls to Receiving Waters. Such a requirement is beyond the scope of an MS4 permit and should be removed, as shown in the Redline. The Draft Permit does not require a Copermittee to address private outfalls to Receiving Waters; this is the responsibility of the San Diego Water Board, which governs all waste dischargers under the authority of the CWA or the Porter-Cologne Act.

E.2.b.(4)

This Provision requires the Copermittees, in conjunction with a spill, to 'prevent contamination of surface water, groundwater, and soil.'This requirement is clearly beyond the scope of an MS4 permit issued under the CWA (which regulates only discharges of water containing pollutants *from* the MS4 to Receiving Waters) and must be removed, as shown in the Redline. The Draft Permit could more appropriately require the Copermittees to 'coordinate, to the extent possible, with spill response teams to prevent entry of spills into the MS4.'

E.2.d.(2)(e)

The Redline requests edits to clarify that the intent of this Provision is to document and attempt to quantify any obvious sources of non-stormwater illegal discharges in response to the outfall monitoring, and that it is not necessary to conduct a full source identification any time there is evidence of water near an outfall.

New Provisions E.2.d.(3)(e)-(f)

The Redline adds two new provisions to this section to address a gap in potential outcomes from a source identification effort. These Provisions address scenarios where a Copermittee identifies A) the illegal discharge is coming from another upstream Copermittees' MS4, or B) that the discharge has been authorized by the San Diego Water Board, either through an order or waiver of WDRs. In the first scenario, the responsibility to continue the source identification, and conduct enforcement, would be transferred to the upstream Copermittee. In the second scenario, the responsibility for follow-up would fall on the San Diego Water Board, after receiving relevant information from the Copermittee. This Provision also provides for reimbursement to the Copermittee for the cost of the source identification, since the San Diego Water Board required the Copermittee to conduct the investigation,

while not commensurately prohibiting all non-storm water discharges from all other sources regulated by the Water Boards.

3.8 Provision E.3, Development Planning

3.8.1 Overview of Key Issues

- Priority Development Projects - The Tentative Order identifies categories of projects that are to be defined as 'Priority Development Projects' (PDPs), which in turn will be required to comply with specific water quality and Hydromodification mitigation and quantitative requirements. The criteria for PDPs is quite broad and would include the majority of development projects, from small convenience stores and residences, to mega malls and specific plan developments. The Fact Sheet describes that while some smaller project types may not have significant pollutant loads, they may have a hydrologic impact upon Receiving Waters. However, it is important to recognize that pursuant to Provision E.3.a., All projects are required to implement a variety of LID principles such as disconnecting impervious surfaces, draining impervious surfaces to landscaped areas, and minimization of soil compaction in landscaped areas. Since such LID principles will be implemented wherever feasible consistent with the MEP standard, these smaller development projects are unlikely to create a pollutant or hydrologic impact. Additionally, the Fact Sheet advocates incentivizing LID design concepts and green infrastructure and building principles. Accordingly, the Redline requests changes to Provision E.3.b.(3) as described in Provision 3.8.2 below. The Legal Comments further note the potential impact of the Virginia case (*Virginia Dept. of Transp. v. U.S. Environmental Protection* Agency) holding that the CWA does not regulate stormwater as a pollutant.
- Design Capture Volume – There are two problems with how the Draft Permit defines the Design Capture Volume:
    - The Draft Permit changes the 'design capture volume' from previous permits by eliminating the term 'runoff'. Prior permits described that the design capture volume is the volume of stormwater runoff from the 24-hour 85th percentile storm event. This permit changes that to be the volume of stormwater produced from a 24-hour 85th percentile storm event. The elimination of the term 'runoff' means that BMPs would need to be sized potentially much larger than previously. For example, if the 85th percentile storm is 1" and a BMP is designed to treat 1 acre of residential land with a coefficient of runoff of 0.6, then under the current permits the BMP must be sized to hold 2,178 cubic feet of water. However, under the language of the Draft Permit, the BMP treating the same area would be required to hold 3,630 cubic feet of water, a 70% increase in BMP size. Accordingly, the Redline restores the term 'runoff'.
    - Additionally, the Draft Permit defines the Design Capture Volume alternatively as: *"the volume of storm water that would be retained onsite if the site was fully undeveloped and naturally vegetated, as determined using continuous simulation modeling techniques based on site-specific soil conditions and typical native vegetative cover."* In addition, to the problem identified above regarding the volume of storm water runoff, this language does not provide a temporal standard for determining which volume to

calculate from a continuous simulation model. Additionally, such models are not commonly used among general practitioners in the civil engineering community. The Redlines propose an alternative and simpler approach for this second definition: "The volume of stormwater runoff produced from a 24-hour 85th percentile storm event, that would be retained onsite in the pre-project condition." This definition is advantageous for several reasons: 1) it is simple for any civil engineer to understand, calculate, and comply with and is based on the same storm and hydrologic calculations as the first option, 2) it respects natural hydrology for the site, which may have had runoff in the pre-project condition, and as such, is more compatible with the intent of LID to mimic natural hydrology, and 3) as a result it is less likely to result in potential degradation of Beneficial Uses downstream, from reductions in flows beyond the pre-project condition.

- Pre-Project vs Pre-Development – Both the Storm Water Pollutant Control BMP requirements and the Hydromodification Management BMP requirements in the Draft Permit specify a 'pre-development' condition as the mitigation standard for all PDPs. In addition to the legal problems with such a standard as set forth in the Legal Comments, there are practical problems with the standard.
    - The presumption made in the discussions in the Fact Sheet are that all Receiving Waters can, and will, be restored to a fully natural condition - effectively to a natural floodplain. This presumption does not address reality, which is that development has occurred in those floodplains over many generations. The San Diego Water Board obviously lacks the authority to force homeowners and businesses to vacate such floodplains to effectuate restored natural conditions. Such an action would represent an unconstitutional taking. Moreover, the Legislature, in the Flood Control Acts covering all three counties proposed to be covered by the Draft Permit, has specifically authorized Flood Control Districts to construct flood control structures required to protect the lives and properties of the citizens.
    - Mitigation to a pre-development condition also may not be necessary to protect Receiving Waters from the effects of Hydromodification. If, for example a Receiving Water with existing development tributary to it, has not experienced increased erosion due to that existing development, there is no reason to require Hydromodification mitigation to anything more than the existing condition. In the counter-example, if under the existing condition the Receiving Water has experienced increased erosion due to that existing development, then, legal issues aside, there would be technical benefit to mitigating to that pre-development condition.

The Redline proposes alternative language that requires mitigation to a pre-development standard only where it is legal and technically justified based on the conditions of the Receiving Water.

- Alternative Compliance – The alternative compliance project options as set forth in the Draft Permit pose two key problems:

- Several statements are conflicting and thus confusing as to what the required standard is for the various alternative compliance projects. For example, throughout Provision E.3.c. it is stated that 'a PDP may be allowed to comply with Provision E.3.c.(1)(a) and/or Provision E.3.c.(2) if they …'. This language can be mis-read to imply that the project must comply both with Provisions E.3.c.(1)(a) and E.3.c.(2) *and* implement the alternative compliance project (thus negating the benefit of alternative compliance). The Redline clarifies this language.
- The Biofiltration option set forth in the Draft Permit arbitrarily, and without technical basis or justification, **doubles** the sizing standard for biofiltration BMPs from 0.75 times the design capture volume (as set forth in the 2010 MS4 Permit and the 2009 Orange County Permit) to 1.5 times the design capture volume. The existing 0.75 standard was set due to the fact that 1) the 85th percentile 24-hour storm occurs over a period of time, and 2) such BMPs have outflows and will regain some capacity during the storm event, and as such, do not need to instantaneously hold the entire 'Design Capture Volume' to have fully treated that volume. In fact, studies have shown that in addition to yielding excellent pollutant concentration reductions, LID Biofiltration BMPs are excellent at reducing the volume of runoff similar to retention BMPs. According to the ASCE International BMP database 60% or more of the long-term volume of runoff from a site can be retained within a Bioretention BMP (Bioretention BMPs are the primary 'biofiltration' BMP now allowed in Riverside County). In comparison, a Retention BMP sized to hold the runoff from the 85th percentile storm event (the Design Capture Volume) will end up retaining approximately 80% of the long-term volume of runoff. Thus, by simple proportions, a Bioretention BMP sized to 'hold' 100% of the Design Capture Volume may also be able to retain 80% of the long-term volume of runoff. $\left(\frac{0.75\times DCV}{60\%\ retained} = \frac{1.0\times DCV}{80\%\ retained}\right)$. This is being validated through Bioretention BMPs that have been constructed and are being monitored for such volume reductions at the Riverside County Flood Control District's headquarters in Riverside. Further, Biofiltration BMPs have the added benefit of providing better overall treatment of back to back storms. Where a Retention BMP would be full after the first storm, fully bypassing the second storm without treatment, a Biofiltration BMP will have restored some capacity after the first storm, providing for treatment of some or all of the second of the back to back storms. Thus, the attached redlines propose changing the sizing factor for Biofiltration BMPs to 1.0 times the Design Capture Volume. The Redline proposes changes consistent with these comments.

3.8.2 Comments in support of specific changes

Introduction

Provision E.3.g (Strategies to address the highest priority water quality conditions) was moved to the beginning to support and better integrate the development planning programs in the JRMP with the strategies developed in the WQIP.

E.3.a.(3)

The Redline changes the title of this section (and other appropriate references to this Provision) to refer to LID Principles, as identified in the CASQA LID Manual for Southern California (https://www.casqa.org/LIDDemo/LowImpactDevelopmentManual/tabid/242/Default.aspx)

E.3.b.(1)(c) (New Provision)

This Provision was added to clarify the requirements if a project that was already subjected to SSMP requirements redevelops a portion of the site.

E.3.b.(2)

The Redline edits shown for this Provision are primarily to simplify this Provision, by grouping various categories by their applicable square footage threshold and including some of the specifics in the definitions (Attachment C). Other changes (beyond reorganization) include:

- Removing the addition of 'driveways' from subsection (g) as described in Provision 3.8.1 of this letter.
- Adding a footnote for parking lots, to clarify that the trigger would not include parking lots that are not exposed to runoff, such as subterranean or covered parking lots. It is beneficial to not have parking lots exposed to runoff; excluding such parking lots from being defined as a PDP is a good way to encourage such practices.
- Hillside development projects were not included as it is not believed to be necessary anymore with the relatively low threshold (10,000 square feet) identified for other categories included in this and other recent MS4 permits.
- The definition for "Environmentally Sensitive Areas" from existing MS4 permits was restored to include the language referring to discharges that are not commingled with flows from adjacent or other upstream lands (note that the change is shown in the definitions per the re-organization suggested above).

E.3.b.(3)

- The PDP exemption for sidewalks, bicycle lanes, or trails, [E.3.b.(3)(a)] has been expanded to as shown in the Redline to include driveways and parking lots. If those projects implement criteria already described in that section, they are also unlikely to create an impact to Receiving Waters. Further, including those project types in that exemption will further incentivize developers to utilize those LID Principles.
- The exemption described in Provision E.3.b(3)(b), was modified as shown in the Redline, and as discussed in the comment letter submitted by the Riverside County Transportation Department. Please see that letter for a justification for the requested changes.
- As shown in the Redline, the exemptions for new and redeveloped single family residences [E.3.b.(3)(c) and (d)] were consolidated into a new provision [E.3.b.(3)(c)], covering all single family residential projects (both new and redeveloped). The key difference is that such projects would be considered exempt if they are both 1) not part of a larger common plan of development or planned subdivision, and 2) successfully incorporate each of the applicable source control and LID Principles identified in Provision E.2.a.(2)-(3) to the MEP.

- A new Provision-E.3.b.(3)(d), titled 'Watershed Protection Projects' was added in the Redline. The project types described therein are all projects that are undertaken to rehabilitate or prevent environmental, social, and economic damage within the watershed, including Receiving Waters. These projects, while they may in some cases require some level of impervious surfaces to be constructed, are 1) not designed for human use or activity that would generate pollutants, or are designed specifically to mitigate such pollutants; and 2) will implement each of the applicable source control and LID Principles identified in Provision E.2.a.(2)-(3) to the MEP.

E.3.c.(1)

In addition to the edits discussed in Provision 3.8.1 of this letter, the Redline removed subprovision E.3.c.(1)(c) , for two reasons:

- The requirements that must be met to when implementing an alternative compliance project are more fully described in Provision E.3.c.(3).
- The language, as drafted, appeared to require double-mitigation. It requires that: 1) conventional treatment is required to treat the entire volume not retained onsite, and 2) the pollutant load discharged must also be mitigated with an alternative compliance project. Such a scenario would be requiring double-mitigation. The Redline provides a clearer and more simple mitigation standard.

E.3.c.(2)

The Riverside County Copermittees have two concerns with this Provision:

- The first concern is the universal requirement to mitigate to the 'pre-development' standard, as discussed above in section 3.8.1 of this letter. The Copermittees in the Redline propose that this language be changed to the 'pre-project' condition. For new development projects, the 'pre-project' condition will be equivalent to the 'pre-development' condition. For redevelopment projects, the standard would be the conditions that exist onsite prior to the construction of the project. This is appropriate, because in many areas, particularly in areas of existing development that would be subject to 'redevelopment', Receiving Waters are engineered and maintained to 1) provide flood protection for the public, 2) ensure that floodwaters don't comingle with pollutants on adjacent private properties and 3) to ensure that the existing development draining to that system does not cause erosion. In cases where the Receiving Waters are not engineered and maintained, and erosion problems caused by existing development are observed, language has been added to the Redline to provide for additional standards to be developed in the WQIP, based on the WQIP priorities.
- Additionally, the Redline proposes an additional exemption from HMP requirements for projects that discharge into conveyance channels that are engineered and maintained for the build-out condition all the way from the project to a waterbody that is sufficiently resistant to Hydromodification. This language is consistent with the above discussions, and ensures the PDPs are not required to mitigate for non-existent impacts. Please see the specific language in the Redline. The engineered channel exemption can be found in other recent MS4 permits, including the recently adopted Los Angeles County MS4 Permit.

E.3.c.(3)(a) and (b)

These two Provisions were re-written in the Redline to be simpler and clearer on what BMPs, criteria, sizing standards are required for what type of project. This alternative language still meets the intent of the Draft Permit, while being easier to understand and comply with. Aside from simplifying the language, the following other changes were made in the Redline:

- The alternative compliance options must be determined to provide an equal or greater overall water quality benefit for the WMA.
- Additional options were provided for who can design the alternative compliance projects
- All alternative compliance projects are required to be consistent with the strategies in the WQIP. While the specific alternative compliance project would not be required to be identified in the WQIP, the goal of this language is to ensure that allowing the alternative compliance project would not in any way be detrimental to or contrary to the strategies in the WQIP.
- Requirements E.3.c.(3)(a)(iv) and (v) were removed entirely, as they conflict with E.3.c.(3)(a)(iii) which allowed the projects to be in the same WMA (preferably the same HSA)
- Changed the sizing factor for Biofiltration BMPs to 1.0 as discussed in section 3.8.1 of this letter, and deleted the option [d] which required triple mitigation by requiring Biofiltration + Conventional Treatment + Alternative Compliance projects.
- Added Conventional Treatment Control BMPs as an alternative compliance option, only where it has been shown to be technically infeasible to meet E.3.c.(1) and technically infeasible to implement LID Biofiltration Treatment Control BMPs.

E.3.c.(3)(c)

Redline edits in this section are primarily to simplify and consolidate the requirements. Sub-Provision [C] was removed, as it was duplicative of the mitigation standards for the alternative compliance project are specified in E.3.c.(3)(b) and E.3.c.(3)(c)(i)[a].

3.9 Provision E.4, Construction

3.9.1 Overview of Key Issues

This Riverside County Copermittees' comments and edits are set forth in the Redline.

- One key issue for the Copermittees is the edit shown in the Redline to Provision E.4.c, which clarifies that the Copermittees are responsible for *requiring* BMPs at private construction sites, and *implementing* BMPs at Copermittee construction sites.

3.9.2 Comments in support of specific changes

The Redline edits include comments supporting the requested edits.

3.10 Provision E.5., Existing Development

3.10.1 Overview of Key Issues

The Draft Permit includes requirements for advanced programs to identify opportunities and implement programs to facilitate the construction of Retrofit and Stream/Channel/Habitat Rehabilitation projects on private properties. Such requirements are clearly beyond the requirements of the CWA for a management plan to be implemented by an MS4 Copermittee. The Riverside County Copermittees request deletion of these requirements.

Alternatively, the Riverside County Copermittees have the following comments:

While these retrofitting and rehabilitation approaches can be helpful and/or needed in some circumstances, they are not required in all circumstances, nor are required to address all pollutants that may be identified in a WQIP as the highest priority water quality conditions. For example, some pollutants are best addressed with regulatory source controls at the state or federal level, such as the removal of copper from brake pads, and controls on pesticides, while other pollutants can be adequately addressed through inspections and enforcement. There are several problems with requiring Copermittee resources to be invested in such Retrofit and/or Rehabilitation strategies (collectively referred to as 'retrofit'):

- Land Ownership: The land that could potentially be identified for retrofit would likely not be owned by a Copermittee. The Copermittee therefore has no ability to force the property owner to retrofit their property. Although the Copermittee could potentially implement programs to "facilitate" implementation, such a program would still be limited by the rights of the individual property owner. Even if a Copermittee were to attempt to purchase a privately owned existing development for the purposes of retrofit (a step going far beyond any requirements in the CWA or the Porter-Cologne Act), such a process can take many years, and if the owner is unwilling to sell, the retrofit project could never be realized. In any scenario, the process to facilitate such "retrofits" is extremely costly and lengthy, with no guarantee of a benefit to water quality. Retrofits should only be undertaken where the Copermittee identifies it as a necessary step to addressing the MS4 contributions to Receiving Water problems to the MEP. Otherwise, it forces the Copermittee to utilize resources very ineffectively, which is contrary to the goals of the WQIP and may actually be detrimental to water quality.
- Permitting: Aside from the limitations discussed above, stream/channel/habitat restorations have the additional complexities of requiring other regulatory permits that are not the discretion of the San Diego Water Board nor the Copermittees to issue. Such projects can take many decades to implement, and thus, are not expected to be highly effective at addressing the goals of the WQIP, except in rare circumstances.

Redline edits have been provided to clarify that these strategies and programs should only be used when, and to the extent directed by the strategies developed in the WQIP.

3.10.2 Comments in support of specific changes

E.5.b.(1)(b) and (d)

BMP implementation requirements of Provision E.5.b.(1)(b) and (d) have been clarified in the Redline to require the Copermittee to implement BMPs on their existing development, and require implementation of BMPs on private existing development.

E.5.c.(1)(a)(iv)

The Riverside County Copermittees request deletion of this Provision. The Copermittees should be provided the flexibility to schedule inspections as they see fit, provided that the schedules they establish pursuant to E.5.c.(1)(a), and the minimum frequency in E.5.c.(1)(a)(i) are met. Requiring 20% every year will be difficult to track as businesses may be opened or closed throughout the year and throughout the permit term.

Additionally, the Riverside Copermittees understand that other Copermittees may be recommending that E.5.c.(1)(a)(i) be changed to 'once per permit term'. The Riverside Copermittees believe that the current language of 'once every five years' is more appropriate for two reasons: 1) not all Copermittees (i.e. OC and Riverside) will be enrolled into the permit at the beginning of the 'permit term', and 2) not all businesses will be in existence at the beginning of the permit term. Accordingly it is more appropriate to simply require the minimum to be once every five years, that way a program manager can simply look at the last time a facility was inspected, and use that date to schedule the next inspection.

3.11 Provision E.6, Enforcement Response Plans

3.11.1 Overview of Key Issues

The Riverside County Copermittees' edits and comments are shown in the Redline and discussed below.

3.11.2 Comments in support of specific changes

E.6.d.

The terminology in this Provision was changed in the Redline from 'escalated' enforcement to 'progressive' enforcement. The proposed language better reflects the nature of enforcement actions, which are not simply 'escalated' or 'not escalated', as implied by Provision E.6.d.(2), but are progressive as needed in response to the severity of the violation. Since every violation comes with a unique set of circumstances, it is not reasonable to presume that a single set of 'triggers' will universally result in the same level of enforcement.

3.12 Provision E.7, Public Education

3.12.1 Overview of Key Issues

The Riverside County Copermittees' edits and comments are shown in the Redline.

3.13 Provision, E.8 Fiscal Analysis

3.13.1 Overview of Key Issues

The requirement that the Copermittees "must secure all the resources necessary to comply with this Order" exceeds the requirements of the CWA and illegally intrudes on the home rule authority of municipalities to govern themselves. This must be deleted. Please also see Legal Comments.

With regard to other provisions, the Riverside County Copermittees' edits and comments are shown in the Redline.

3.14 Provision F

3.14.1 Overview of Key Issues

- F.1 – WQIP Submittal
  - Based on the schedule for the initial submittal of the Priority Water Quality Conditions and Numeric Goals, and the subsequent 60-day public review, only one month would be left for the Copermittees to finalize strategies based on those conditions and goals and the public input received. This is an insufficient amount of time. The Redline requests modifications to the schedule that would provide for the submittal of the final WQIP within 24 months (instead of 18), to provide additional time for the development of strategies.
- F.1 and F.2.
  - The schedules for submittals should be linked to the receipt of comments on prior submittals, or the approval of prior submittals, rather than the permit adoption date. If it is tied to the permit adoption date, the submittal dates could become out of sync with the comment periods or San Diego Water Board approvals if any unexpected delays occur (for example if the San Diego Water Board is delayed in approving a document, or posting a document online for public comment). The Redline requests appropriate modifications.
  - Implementation dates for the plans are unclear / undefined. The Redline clarifies this issue.
- F.3. Progress Reports
  - The reporting requirements across the transitional period were unclear. Redlines are provided to clarify and consolidate.
  - The Regional Monitoring and Assessment Report language was revised to be consistent with the requirements of the Integrated Assessment of the Water Quality Improvement Plan, rather than an additional, slightly different report, due at the same time.

3.15 Attachments B and C

Comments and edits to Attachments B and C are shown in the Redline.

Very truly yours,

for JASON E. UHLEY
Chief of Watershed Protection Division

CP:cw
P8/

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

TENTATIVE
ORDER NO. R9-2013-0001
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The San Diego County Copermittees in Table 1a are subject to waste discharge requirements set forth in this Order.

Table 1a. San Diego County Copermittees

Municipal Copermittees	
City of Carlsbad	City of Oceanside
City of Chula Vista	City of Poway
City of Coronado	City of San Diego
City of Del Mar	City of San Marcos
City of El Cajon	City of Santee
City of Encinitas	City of Solana Beach
City of Escondido	City of Vista
City of Imperial Beach	County of San Diego
City of La Mesa	San Diego County Regional Airport Authority
City of Lemon Grove	San Diego Unified Port District
City of National City	

After the San Diego Water Board receives and considers the Orange County Copermittees' Report of Waste Discharge and makes any necessary changes to the Order, the Orange County Copermittees in Table 1b will become subject to waste discharge requirements set forth in this Order after expiration of Order No. R9-2009-0002, NPDES No. CAS0108740 on or after December 16, 2014.

Table 1b. Orange County Copermittees

Municipal Copermittees	
City of Aliso Viejo	City of Rancho Santa Margarita
City of Dana Point	City of San Clemente
City of Laguna Beach	City of San Juan Capistrano
City of Laguna Hills	City of Laguna Woods
City of Laguna Niguel	County of Orange
City of Lake Forest	~~Orange County Flood Control District~~

City of Mission Viejo	
Special District Copermittee	
Orange County Flood Control District	

After the San Diego Water Board receives and considers the Riverside County Copermittees' Report of Waste Discharge and makes any necessary changes to this Order, the Riverside County Copermittees in Table 1c will become subject to waste discharge requirements set forth in this Order after expiration of Order No. R9-2010-0016, NPDES No. CAS0108766 on or after November 10, 2015.

Table 1c. Riverside County Copermittees

Municipal Copermittee	
City of Murrieta	County of Riverside
City of Temecula	~~Riverside County Flood Control and Water Conservation District~~
City of Wildomar	
Special District Copermittee	
Riverside County Flood Control and Water Conservation District	

The Orange County Copermittees and Riverside County Copermittees may become subject to the requirements of this Order at a date earlier than the expiration date of their current Orders subject to the conditions described in Provision F.6 of this Order if the Copermittees in the respective county receive a notification of coverage from the San Diego Water Board.

The term Copermittee in this Order refers to any San Diego County, Orange County, or Riverside County Copermittee covered under this Order, unless specified otherwise.

This Order provides permit coverage for the Copermittee discharges described in Table 2.

Table 2. Discharge Locations and Receiving Waters

Discharge Points	Locations throughout San Diego Region
Discharge Description	Municipal Separate Storm Sewer System (MS4) Discharges
Receiving Waters	Inland Surface Waters, Enclosed Bays and Estuaries, and Coastal Ocean Waters of the San Diego Region

Table 3. Administrative Information

This Order was adopted by the San Diego Water Board on:	**Month Day, 2013**
This Order will become effective on:	**Month Day, 2013**
This Order will expire on:	**Month Day, 2018**
The Copermittees must file a Report of Waste Discharge in accordance with Title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than 180 days in advance of the Order expiration date.	

I, David W. Gibson, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on Month Day, 2013.

TENTATIVE

David W. Gibson
Executive Officer

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ATTACHMENTS

Attachment A - Discharge Prohibitions and Special Protections A-1
Attachment B - Standard Permit Provisions and General Provisions B-1
Attachment C - Acronyms, Abbreviations and Definitions C-1
Attachment D - Jurisdictional Runoff Management Program Annual Report Form D-1
Attachment E - Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2013-0001 ..... E-1
Attachment F - Fact Sheet / Technical Report for Order No. R9-2013-0001 ..... F-1

I. FINDINGS

Comment [A1]: See discussions in section 3.1 of the comment letter

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), finds that:

JURISDICTION

1. **MS4 Ownership or Operation.** Each of the Copermittees owns or operates an MS4, through which it discharges storm water and non-storm water into waters of the U.S. within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the U.S.

Many geographical areas subject to this Order are subject to the threat of periodic catastrophic flooding resulting from natural conditions, specifically the presence of mountains and hilly areas in close proximity to urban development and the effect of period strong Pacific Ocean storms. Such flooding would occur in the absence of development. The Legislature recognized the importance of this issue when it established flood control districts across the state, including in Orange, Riverside and San Diego Counties. Such flooding has in the past, and if not controlled, could in the future result in loss of life and property damage. Such flooding can also mobilize significant Pollutants from industrial, commercial, residential and agricultural lands, damaging watercourses and the beneficial uses thereof, including habitat. MS4s are designed and constructed to mitigate such impacts.

2. Riverside County Flood Control and Water Conservation District.

Comment [A2]: See discussion in section 3.1.1 of the comment letter.

In 1945, the California Legislature enacted the Riverside County Flood Control and Water Conservation District Act, establishing the Riverside County Flood Control and Water Conservation District (District). The objects and purposes of the Act are to provide for the control and conservation of flood and storm waters and for the protection of watercourses, watersheds, public highways, life and property within the District from damage or destruction from flood waters. Among its other powers, the District also has the power to conserve, reclaim and save such waters for beneficial use. However the Act does not provide the District with the power to control the volume or quality of discharges that runs off of private property, which may end up in the District's flood control system. The District is governed by the District's Board of Supervisors as a separate legal entity from the County of Riverside.

Many of the flood management systems that the District operates are defined by the Clean Water Act as an MS4, and include many of the larger MS4s within the Santa Margarita watershed region of Riverside County (SMR). District does not however

own or operate streets, catch basins or storm drains smaller than 36 inches that collect runoff from the incorporated and unincorporated jurisdictions within the SMR, and commonly connect into the District's flood management system. Such systems are typically owned and operated by either the County of Riverside or the incorporated Cities within the SMR.

The waters and pollutants that may enter the regional receiving waters and/or the District's flood management systems come from various sources. These sources can include storm water and non-storm water from the Municipal Copermittees under this permit as well as from other NPDES and non-NPDES permittees, including industrial waste water dischargers, waste water treatment facilities, industrial and construction stormwater dischargers, water suppliers, tribal lands, other state and federal government entities, and Caltrans. Sources can also include discharges from Phase II entities such as school districts and discharges from entities that have been granted waste discharge requirements or waivers of waste discharge requirements, including agricultural operations.

The District does not own or operate any municipal sanitary sewer systems, public streets, roads, or highways. The District has no planning, zoning, development permitting or other land use authority, thus, it has no permitting or governing authority over industrial or commercial facilities, residents, new developments or re-development projects, and development construction sites located in any incorporated or unincorporated areas within its service area, including the SMR. The Copermittees that have such authority are responsible for implementing a storm water management program to address pollutants discharged from such industrial and commercial facilities, residential areas, new development and re-development projects, and development construction sites within their jurisdictional boundaries. Nonetheless, as an owner and operator of an MS4, the District is required to control pollutant discharges into and from its MS4, such as through interagency agreements among Copermittees and other owners of a MS4, the contribution of pollutants from one portion of the MS4 to another portion of the MS4 within their jurisdiction.

2. **Legal and Regulatory Authority.** This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]) adopted by the United States Environmental Protection Agency (USEPA), and chapter 5.5, division 7 of the California Water Code (CWC) (commencing with section 13370). This Order serves as an NPDES permit for discharges from MS4s to surface waters. This Order also serves as waste discharge requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

   The San Diego Water Board has the legal authority to issue a regional MS4 permit pursuant to its authority under CWA section 402(p)(3)(B) and 40 CFR 122.26(a)(1)(v). The USEPA also made it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide permits (55 Federal Register [FR] 47990, 48039-48042). The regional nature of this Order will ensure consistency of regulation within watersheds and is expected

to result in overall cost savings for the Copermittees and San Diego Water Board.

The federal regulations make it clear that the Copermittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators (40 CFR 122.26(a)(3)(vi)). This Order does not require the Copermittees to manage storm water outside of their jurisdictional boundaries, but rather to work collectively to improve storm water management within watersheds.

3. **CWA NPDES Permit Conditions.** Pursuant to CWA section 402(p)(3)(B), NPDES permits for storm water discharges from MS4s must include requirements to effectively prohibit non-storm water discharges into MS4s, and require controls to reduce the discharge of pollutants from the MS4s ~~in storm water~~ to the maximum extent practicable (MEP), and to require other provisions as the San Diego Water Board determines are appropriate to control such pollutants. This Order prescribes conditions to assure compliance with the CWA requirements for owners and operators of MS4s to effectively prohibit non-storm water discharges in to the MS4s, and require controls to reduce the discharge of pollutants ~~in storm water~~ from the MS4s to the MEP.

Comment [A3]: See discussion in section 3.1.2 of the comment letter.

4. **CWA and CWC Monitoring Requirements.** CWA section 308(a) and 40 CFR 122.41(h),(j)-(l) and 122.48 require that NPDES permits must specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s also specify additional monitoring and reporting requirements in 40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c). CWC section 13383 authorizes the San Diego Water Board to establish monitoring, inspection, entry, reporting and recordkeeping requirements. This Order establishes monitoring and reporting requirements to implement federal and State requirements.

5. **Total Maximum Daily Loads.** CWA section 303(d)(1)(A) requires that "[e]ach state shall identify those waters within its boundaries for which the effluent limitations…are not stringent enough to implement any water quality standard applicable to such waters." The CWA also requires states to establish a priority ranking of impaired water bodies known as Water Quality Limited Segments and to establish Total Maximum Daily Loads (TMDLs) for such waters. This priority list of impaired water bodies is called the Clean Water Act Section 303(d) List of Water Quality Limited Segments, commonly referred to as the 303(d) List. The CWA requires the 303(d) List to be updated every two years.

   TMDLs are numerical calculations of the maximum amount of a pollutant that a water body can assimilate and still meet water quality standards. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point sources (waste load allocations or WLAs) and non-point sources (load allocations or LAs), background contribution, plus a margin of safety. Discharges from MS4s are point source discharges. The federal regulations (40 CFR 122.44(d)(1)(vii)(B)) require that NPDES permits to incorporate water quality based effluent limitations (WQBELs) developed to protect a narrative water quality criterion, a numeric water

quality criterion, or both, consistent with the assumptions and requirements of any available WLA for the discharge. Requirements of this Order implement the TMDLs adopted by the San Diego Water Board and approved by USEPA.

6. **Non-Storm Water Discharges.** Pursuant to CWA section 402(p)(3)(B)(ii), this Order requires each Copermittee to effectively prohibit discharges of non-storm water into its MS4. Nevertheless, non-storm water discharges into and from the MS4s continue to be reported to the San Diego Water Board by the Copermittees and other persons. Monitoring conducted by the Copermittees, as well as the 303(d) List, have identified dry weather, non-storm water discharges from the MS4s as a source of pollutants causing or contributing to receiving water quality impairments in the San Diego Region. The federal regulations (40 CFR 122.26(d)(2)(iv)(B)(1)) require the Copermittees to have a program to prevent illicit discharges to the MS4. The federal regulations, however, allow for specific categories of non-storm water discharges or flows to be addressed as illicit discharges only where such discharges are identified as sources of pollutants to waters of the U.S.

7. **In-Stream Treatment Systems.** Pursuant to federal regulations (40 CFR 131.10(a)), in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S. Authorizing the construction of a runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to accepting waste assimilation as an appropriate use for that water body. Runoff treatment must occur prior to the discharge of runoff into receiving waters. Treatment control best management practices (BMPs) must not be constructed in waters of the U.S. Construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body.

DISCHARGE CHARACTERISTICS AND RUNOFF MANAGEMENT

8. **Point Source Discharges of Pollutants.** Discharges from the MS4s may contain waste, as defined in the CWC, and pollutants that adversely affect the quality of the waters of the state. A discharge from an MS4 is a "discharge of pollutants from a point source" into waters of the U.S. as defined in the CWA. Storm water and non-storm water discharges from the MS4s may contain pollutants that cause or threaten to cause a violation of surface water quality standards, as outlined in the Water Quality Control Plan for the San Diego Basin (Basin Plan). ~~Storm water and non-storm water discharges from the MS4s are subject to the conditions and requirements established in the Basin Plan for point source discharges.~~

9. **Potential Beneficial Use Impairment.** The discharge of pollutants and/or increased flows from MS4s may cause or threaten to cause the concentration of pollutants to exceed applicable receiving water quality objectives and impair or threaten to impair designated beneficial uses or which may result~~ing~~ in a condition of pollution, contamination, or nuisance. In addition, the reduction of flows below the

existing condition may impact negatively impact beneficial uses.

10. **Pollutants Generated by Land Development.** Land development has created and continues to create new sources of non-storm water discharges and pollutants in storm water discharges as human population density increases. This brings higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash. Pollutants from these sources are dumped or washed off the surface by non-storm water or storm water flows into and from the MS4s. When development converts natural vegetated pervious ground cover to impervious surfaces such as paved highways, streets, rooftops, and parking lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving a developed area without BMPs that can maintain pre-development conditions will contain greater pollutant loads and have significantly greater runoff volume, velocity, and peak flow rate than pre-development runoff from the same area.

11. **Runoff Discharges to Receiving Waters.** The MS4s discharge runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within the eleven hydrologic units comprising the San Diego Region. ~~Historic and current development makes use of natural drainage patterns and features as conveyances for runoff. Rivers, streams and creeks in developed areas used in this manner are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and receiving water.~~ Numerous receiving water bodies and water body segments have been designated as impaired by the San Diego Water Board pursuant to CWA section 303(d).

Comment [A4]: See discussion in section 3.1.2 of the comment letter.

Pollutants in Runoff. The most common pollutants in runoff discharged from the MS4s include total suspended solids, sediment, pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., cadmium, copper, lead, and zinc), petroleum products and polynuclear aromatic hydrocarbons, synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus), oxygen-demanding substances (e.g., decaying vegetation, animal waste), detergents, and trash. ~~As operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not effectively prohibit or otherwise control.~~ These discharges may cause or contribute to a condition of pollution or a violation of water quality standards. California law requires downstream landowners, including owners and operators of MS4, to accept upstream flows, even if that flow contains Pollutants. Failure to do can create conditions.

Comment [A5]: See discussion in section 3.1.2 of the comment letter.

Limitation on Powers of Copermittees. This Order regulates the discharge of non-stormwater into and Pollutants from non-agricultural Anthropogenic sources from the MS4s owned and/or operated by the Copermittees. The Copermittees lack legal

Comment [A6]: This finding is based on Findings I.B and I.C in Order R8-2010-33, applicable to portions of Riverside County within the Santa Ana region.

jurisdiction over discharges into their MS4 from agricultural activities, State and federal facilities, public schools and hospitals, utilities, railroads, special districts, Native American tribal lands, wastewater management agencies and other point and non-point source discharges otherwise permitted by the Water Board. The Water Board recognizes that the Copermittees should not be held responsible for discharges from such facilities or Pollutants in those discharges. Also, certain activities and sources that generate pollutants present in urban runoff may be beyond the ability of the Copermittees to prevent or eliminate. Examples of these activities and sources include, but are not limited to: emissions from internal combustion engines, brake pad wear and tear, atmospheric deposition, non-Anthropogenic sources of bacteria (including wildlife and feral cats and dogs), the regulation of pesticides and leaching of naturally occurring nutrients and minerals from local soils. This Order is not intended to address background or naturally occurring Pollutants or flows.

12.

13. **Human Health and Aquatic Life Impairment.** Pollutants in runoff discharged from the MS4s can threaten and adversely affect human health and aquatic organisms. Adverse responses of organisms to chemicals or physical agents in runoff range from physiological responses such as impaired reproduction or growth anomalies to mortality. Increased volume, velocity, rate, and duration of storm water runoff greatly accelerate the erosion of downstream natural channels. This alters stream channels and habitats and can adversely affect aquatic and terrestrial organisms.

14. **Water Quality Effects.** The Copermittees' water quality monitoring data submitted to date documents various persistent exceedances of Basin Plan water quality objectives for runoff-related pollutants at various watershed monitoring stations. Persistent toxicity has also been observed at several watershed monitoring stations. In addition, bioassessment data indicate that the majority of the monitored receiving waters have Poor to Very Poor Index of Biological Integrity (IBI) ratings. ~~These findings indicate that runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in the San Diego Region. Non-storm water discharges from the MS4s have been shown to contribute significant levels of pollutants and flow in arid, developed Southern California watersheds, and contribute significantly to exceedances of applicable receiving water quality objectives.~~

Comment [A7]: These statements are completely unsubstantiated.

15. ~~**Non-Storm Water and Storm Water Discharges.** Non-storm water discharges from the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard of CWA section 402(p)(3)(B)(iii), which is explicitly for "Municipal … *Stormwater Discharges* (emphasis added)" from the MS4s. Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s must be effectively prohibited.~~

Comment [A8]: See discussion in section 3.1.2 of the comment letter.

16. **Best Management Practices.** Waste and pollutants which are deposited and accumulate in MS4 drainage structures may~~will~~ be discharged from these structures

to waters of the U.S. unless they are removed. These discharges may cause or contribute to, or threaten to cause or contribute to, a condition of pollution in receiving waters. For this reason, pollutants in storm water discharges from the MS4s can be and must be effectively reduced in runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Pollution prevention is the reduction or elimination of pollutant generation at its source and is the best "first line of defense". Source control BMPs (both structural and non-structural) minimize the contact between pollutants and runoff, therefore keeping pollutants onsite and out of receiving waters. Treatment control BMPs remove pollutants that have been mobilized by storm water or non-storm water flows.

17. **BMP Implementation.** Runoff needs to be addressed during the three major phases of development (planning, construction, and use) in order to reduce the discharge of storm water pollutants to the MEP, effectively prohibit non-storm water discharges, and protect receiving waters. Development which is not guided by water quality planning policies and principles can result in increased pollutant load discharges, flow rates, and flow durations which can negatively affect receiving water beneficial uses. Construction sites without adequate BMP implementation result in sediment runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. Existing development can generate substantial pollutant loads which are discharged in runoff to receiving waters. Retrofitting areas of existing development with storm water pollutant control and hydromodification management BMPs may in many cases be ~~is~~ necessary to address storm water discharges from existing development that may cause or contribute to a condition of pollution or a violation of water quality standards.

Comment [A9]: It is not necessary in all cases.

18. **Long Term Planning and Implementation.** Federal regulations require municipal storm water permits to expire 5 years from adoption, after which the permit must be renewed and reissued. The San Diego Water Board recognizes that the degradation of water quality and impacts to beneficial uses of the waters in the San Diego Region occurred over several decades. The San Diego Water Board further recognizes that a decade or more may be necessary to realize demonstrable improvement to the quality of waters in the Region. This Order includes a long term planning and implementation approach that will require more than a single permit term to complete.

WATER QUALITY STANDARDS

19. **Basin Plan.** The San Diego Water Board adopted the Water Quality Control Plan for the San Diego Basin (Basin Plan) on September 8, 1994 that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for receiving waters addressed through the plan. The Basin Plan was subsequently approved by the State Water

Resources Control Board (State Water Board) on December 13, 1994. Subsequent revisions to the Basin Plan have also been adopted by the San Diego Water Board and approved by the State Water Board. Requirements of this Order implement the Basin Plan.

The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Process Supply (PROC), Industrial Service Supply (IND), Ground Water Recharge (GWR), Contact Water Recreation (REC1), Non-contact Water Recreation (REC2), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Freshwater Replenishment (FRSH), Hydropower Generation (POW), and Preservation of Biological Habitats of Special Significance (BIOL). The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region: Navigation (NAV), Commercial and Sport Fishing (COMM), Estuarine Habitat (EST), Marine Habitat (MAR), Aquaculture (AQUA), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN), and Shellfish Harvesting (SHELL).

20. **Ocean Plan.** The State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, and 2005. The State Water Board adopted the latest amendment on April 21, 2005 and it became effective on February 14, 2006. The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean. Requirements of this Order implement the Ocean Plan.

    The Ocean Plan identifies the following beneficial uses of ocean waters of the state to be protected: Industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture; preservation and enhancement of designated Areas of Special Biological Significance; rare and endangered species; marine habitat; fish spawning and shellfish harvesting

21. **Sediment Quality Control Plan**. On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes: 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

22. **National Toxics Rule and California Toxics Rule.** USEPA adopted the National Toxics Rule (NTR) on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the NTR applied in California. On May 18, 2000, USEPA adopted the California Toxics Rule (CTR). The CTR promulgated

new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants.

23. **Antidegradation Policy.** This Order is in conformance with the federal Antidegradation Policy described in 40 CFR 131.12, and State Water Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality Waters in California*. Federal regulations at 40 CFR 131.12 require that the State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. State Water Board Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies.

CONSIDERATIONS UNDER FEDERAL AND STATE LAW

24. **Coastal Zone Act Reauthorization Amendments.** Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states with approved coastal zone management programs to address non-point source pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point source pollution: agriculture, silviculture, urban, marinas, and hydromodification. This Order addresses the management measures required for the urban category, with the exception of septic systems. The runoff management programs developed pursuant to this Order fulfills the need for coastal cities to develop a runoff non-point source plan identified in the Non-Point Source Program Strategy and Implementation Plan. The San Diego Water Board addresses septic systems through the administration of other programs.

25. **Endangered Species Act.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 USC sections 1531 to 1544). This Order requires compliance with receiving water limits, and other requirements to protect the beneficial uses of waters of the State. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

26. **Report of Waste Discharge Process.** The waste discharge requirements set forth in this Order are based upon the Report of Waste Discharge submitted by the San Diego County Copermittees prior to the expiration of Order No. R9-2007-0001 (NPDES No. CAS0109266). The Orange County and Riverside County Copermittees are not immediately covered by the waste discharge requirements in this Order. The San Diego Water Board understands that each municipality is

unique although the Counties share watersheds and geographical boundaries. The Order will continue to use the Report of Waste Discharge process prior to initially making Orange County or Riverside County Copermittees subject to the requirements of this Order.

The federal regulations (40 CFR 122.21(d)(2)) and CWC section 13376 impose a duty on the Copermittees to reapply for continued coverage through submittal of a Report of Waste Discharge no later than 180 days prior to expiration of a currently effective permit. This requirement is set forth in the Orange County Copermittees' and Riverside County Copermittees' currently effective permits at Provisions K.2.b and K.2.c, respectively. The Orange County Permit, Order No. R9-2009-0002 (NPDES No. CAS0108740) expires on December 16, 2014 and the Riverside County MS4 Permit, Order No. R9-2010-0016 (NPDES No. CAS0108766) expires on November 10, 2015.

Unless the Orange County or Riverside County Copermittees apply for and receive early coverage under this Order, the Orange County Copermittees' and the Riverside County Copermittees' respective permits will be superseded by this Order upon expiration of their respective permits, subject to any necessary revisions to the requirements of this Order made after the San Diego Water Board considers their respective Reports of Waste Discharge through the public process provided in 40 CFR 124.

Comment [A10]: Please see Comment Letter and Legal Comments regarding regional permit authority,

27. **Integrated Report and Clean Water Act Section 303(d) List.** The San Diego Water Board and State Water Board submit an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. USEPA issued its *Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act* on July 29, 2005, which advocates the use of a five category approach for classifying the attainment status of water quality standards for water bodies in the Integrated Report. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 in the Integrated Report are placed on the 303(d) List.

Water bodies with available data and/or information that indicate at least one beneficial use is not being supported or is threatened, but a TMDL is not required, are included in Category 4 in the Integrated Report. Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

Implementation of the requirements of this Order may allow the San Diego Water Board to include surface waters impaired by discharges from the Copermittees'

MS4s in Category 4 in the Integrated Report for consideration during the next 303(d) List submittal by the State to USEPA.

28. Economic Considerations. The California Supreme Court has ruled that although CWC section 13263 requires the State and Regional Water Boards (collectively Water Boards) to consider factors set forth in CWC section 13241 when issuing an NPDES permit, the Water Board may not consider the factors to justify imposing pollutant restrictions that are less stringent than the applicable federal regulations require. (*City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 618, 626-627.) However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

Comment [A11]: See discussion in section 3.1.2 of the Comment Letter and also Legal Comments..

As noted in the following finding, the San Diego Water Board finds that the requirements in this permit are not more stringent than the minimum federal requirements. Therefore, a CWC section 13241 analysis is not required for permit requirements that implement the effective prohibition on the discharge of non-storm water into the MS4 or for controls to reduce the discharge of pollutants ~~in storm water~~ to the MEP, or other provisions that the San Diego Water Board has determined appropriate to control such pollutants, as those requirements are mandated by federal law. Notwithstanding the above, the San Diego Water Board has developed an economic analysis of the requirements in this Order. The economic analysis is provided in the Fact Sheet.

29. ~~Unfunded Mandates.~~ ~~This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following:~~

Comment [A12]: See discussion in section 3.1.2 of the comment letter and in the Legal Comments.

~~**a.** This Order implements federally mandated requirements under CWA section 402 (33 USC section 1342(p)(3)(B)).~~

~~**b.** The local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental and new dischargers who are issued NPDES permits for storm water and non-storm water discharges.~~

~~**c.** The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order.~~

~~**d.** The Copermittees have requested permit coverage in lieu of compliance with the complete effective prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)) and in lieu of numeric restrictions on their MS4 discharges (i.e. effluent limitations).~~

~~**e.** The local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under State law predates the enactment of Article XIIIB, Section (6) of the California Constitution.~~

~~f. The provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state develops a TMDL, federal law requires that permits must contain water quality based effluent limitations consistent with the assumptions and requirements of any applicable wasteload allocation (40 CFR 122.44(d)(1)(vii)(B)).~~

~~See the Fact Sheet for further discussion of unfunded mandates.~~

30. **California Environmental Quality Act.** The issuance of waste discharge requirements and an NPDES permit for the discharge of runoff from MS4s to waters of the U.S. is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 et seq.) in accordance with CWC section 13389.

STATE WATER BOARD DECISIONS

31. **Compliance with Prohibitions and Limitations.** The receiving water limitation language specified in this Order is consistent with language recommended by the USEPA and established in State Water Board Order WQ 99-05, *Own Motion Review of the Petition of Environmental Health Coalition to Review Waste Discharge Requirements Order No. 96-03, NPDES Permit No. CAS0108740*, adopted by the State Water Board on June 17, 1999. The receiving water limitation language in this Order requires storm water discharges from MS4s to not cause or contribute to a violation of water quality standards, which is to be achieved through an iterative approach requiring the implementation of improved and better-tailored BMPs over time. Implementation of the iterative approach to comply with receiving water limitations based on applicable water quality standards is necessary to ensure that Pollutant ~~storm water~~ discharges from the MS4 will not ultimately cause or contribute to violations of water quality standards and will not create conditions of pollution, contamination, or nuisance.

Comment [A13]: See discussion in section 3.1.2 of the comment letter.

Comment [A14]: Please see discussion in section 3.1.2 of the Comment Letter and Legal Comments.

32. **Special Conditions for Areas of Special Biological Significance.** On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving an exception to the Ocean Plan effective prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges. State Water Board Resolution No. 2012-0012 requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, effective prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject terms and conditions of State Water Board Resolution No. 2012-0012. The Special

Protections contained in Attachment B to Resolution No. 2012-0012, applicable to these discharges, are hereby incorporated into this Order as if fully set forth herein.

ADMINISTRATIVE FINDINGS

33. **Executive Officer Delegation of Authority.** The San Diego Water Board by prior resolution has delegated all matters that may legally be delegated to its Executive Officer to act on its behalf pursuant to CWC section 13223. Therefore, the Executive Officer is authorized to act on the San Diego Water Board's behalf on any matter within this Order unless such delegation is unlawful under CWC section 13223 or this Order explicitly states otherwise.

34. **Standard Provisions.** Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR 122.42, are provided in Attachment B to this Order.

35. **Fact Sheet.** The Fact Sheet for this Order contains background information, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of this Order. The Fact Sheet is hereby incorporated into this Order and constitutes part of the Findings of this Order.

36. **Public Notice.** In accordance with State and federal laws and regulations, the San Diego Water Board notified the Copermittees, and interested agencies and persons of its intent to prescribe waste discharge requirements for the control of discharges into and from the MS4s to waters of the U.S. and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet.

37. **Public Hearing.** The San Diego Water Board held a public hearing on Month Day, 2013 and heard and considered all comments pertaining to the terms and conditions of this Order. Details of the public hearing are provided in the Fact Sheet.

38. **Effective Date.** This Order serves as an NPDES permit pursuant to CWA section 401 or amendments thereto, and becomes effective fifty (50) days after the date of its adoption, provided that the Regional Administrator, USEPA, Region IX, does not object to this Order.

39. **Review by the State Water Board.** Any person aggrieved by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with CWC section 13320 and California Code of Regulations, title 23, sections 2050, et seq. The State Water Board must receive the petition by 5:00 p.m., 30 days after the San Diego Water Board action, except that if the thirtieth day following the action falls on a Saturday, Sunday or State holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the

Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

THEREFORE, IT IS HEREBY ORDERED that the Copermittees, in order to meet the provisions contained in division 7 of the CWC and regulations adopted thereunder, and the provisions of the CWA and regulations adopted thereunder, must each comply with the following:

II. PROVISIONS

A. PROHIBITIONS AND LIMITATIONS

Comment [A15]: See discussion in section 3.2 of the comment letter.

The purpose of this provision is to describe the conditions under which storm water and non-storm water discharges into and from MS4s are to be effectively prohibited or limited. The goal of the prohibitions and limitations is to protect the water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through the implementation of water quality improvement strategies and runoff management programs that effectively prohibit non-storm water discharges into the Copermittees' MS4s, and reduce pollutants in ~~storm water~~ discharges from the Copermittees' MS4s to the MEP. The process for determination of compliance with the Discharge Prohibitions (A.1), Receiving Water Limitations (A.2), and Effluent Limitations (A.3) is defined in Provisions A.3.b and A.4.

1. Discharge Prohibitions

a. Discharges from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters ~~of the state~~ are to be ~~prohibited.~~ effectively prohibited, unless the Regional Board determines such discharges are addressed by the Copermittee through A.3.b or A.4, including any modifications.~~prohibited.~~

Comment [A16]: See discussion in section 3.2.2 of the comment letter.

b. Non-storm water discharges into MS4s are to be effectively prohibited through a program consistent with the requirements of provision E.2. of this order, including inspections, to implement and enforce an ordinance, orders or similar means to prevent illicit discharges to the MS4, unless such discharges are either authorized by a separate NPDES permit, or the discharge is a category of non-storm water discharges or flows that must be addressed pursuant to Provisions E.2.a.(1)-(5) of this Order.

Comment [A17]: See discussion in section 3.2.2 of the comment letter.

c. Discharges from MS4s are subject to all applicable waste discharge prohibitions in the Basin Plan, included in Attachment A to this Order, unless the Regional Board determines such discharges are addressed by the Copermittee through A.3.b or A.4, including any modifications.

Comment [A18]: See discussion in section 3.2.2 of the comment letter.

d. Storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No.

2012-0012 applicable to these discharges, included in Attachment A to this Order. All other discharges from the Copermittees' MS4s to ASBS are ~~to be effectively~~ prohibited.

2. Receiving Water Limitations

Comment [A19]: See discussion in section 3.2.2 of the comment letter.

a. Discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters, including but not limited to all applicable provisions ~~contained in:~~below, unless the Regional Board determines such discharges are addressed by the Copermittee through A.3.b or A.4::~~contained in:~~

(1) The San Diego Water Board's Basin Plan, including beneficial uses, water quality objectives, and implementation plans;

(2) State Water Board plans for water quality control including the following:

(a) Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries (Thermal Plan), and

(b) The Ocean Plan, including beneficial uses, water quality objectives, and implementation plans;

(3) State Water Board policies for water and sediment quality control including the following:

(a) Water Quality Control Policy for the Enclosed Bays and Estuaries of California,

(b) Sediment Quality Control Plan which includes the following narrative objectives for bays and estuaries:

(i) Pollutants in sediments shall not be present in quantities that, alone or in combination, are toxic to benthic communities, and

(ii) Pollutants shall not be present in sediments at levels that will bioaccumulate in aquatic life to levels that are harmful to human health,

(c) The Statement of Policy with Respect to Maintaining High Quality of Waters in California;[1]

(4) Priority pollutant criteria promulgated by the USEPA through the following:

[1] State Water Board Resolution No. 68-16

(a) National Toxics Rule (NTR)[2] (promulgated on December 22, 1992 and amended on May 4, 1995), and

(b) California Toxics Rule (CTR).[3,4]

b. Discharges from MS4s composed of storm water runoff must not alter natural ocean water quality in an ASBS.

[2] 40 CFR 131.36
[3] 65 Federal Register 31682-31719 (May 18, 2000), adding Section 131.38 to 40 CFR
[4] If a water quality objective and a CTR criterion are in effect for the same priority pollutant, the more stringent of the two applies.

3. Effluent Limitations

a. TECHNOLOGY BASED EFFLUENT LIMITATIONS

Comment [A20]: See discussion in section 3.2.2 of the comment letter.

Pollutants in ~~storm water~~ discharges from MS4s must be reduced to the MEP.[5]

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

This Order establishes water quality based effluent limitations (WQBELs) consistent with the assumptions and requirements of all available TMDL waste load allocations (WLAs) assigned to discharges from the Copermittees' MS4s. Each Copermittee must comply with applicable WQBELs established for the TMDLs in Attachment E to this Order, pursuant to the applicable TMDL compliance schedules.

4. Compliance with Discharge Prohibitions and Receiving Water Limitations

Comment [A21]: See discussion in section 3.2.2 of the comment letter.

Each Copermittee must achieve compliance with Provisions A.1.a~~,~~ through A.1.c and A.2.a of this Order through timely implementation of control measures and other actions as specified in Provisions B and E of this Order, including any modifications. The Water Quality Improvement Plans required under Provision B must be designed and adapted to ultimately achieve compliance with Provisions A.1.a~~,~~ through A.1.c and A.2.a~~.~~, as described in Provision B.2.~~.~~

a. If exceedance(s) of water quality standards persist in receiving waters notwithstanding implementation of this Order, the Copermittees must comply with the following procedures:

(1) For exceedance(s) of a water quality standard in the process of being addressed by the Water Quality Improvement Plan, the Copermittee(s) must implement the Water Quality Improvement Plan as accepted by the San Diego Water Board, and update the Water Quality Improvement Plan, as necessary, pursuant to Provision F.2.c;

(2) Upon a determination by either the Copermittees or the San Diego Water Board that discharges from the MS4 are causing or contributing to a new exceedance of an applicable water quality standard not addressed by the Water Quality Improvement Plan, the Copermittees must submit the following updates to the Water Quality Improvement Plan pursuant to Provision F.2.c or as part of the Annual Report required under Provision F.3.b, unless the San

[5] This does not apply to MS4 discharges which receive subsequent treatment to reduce pollutants in storm water discharges to the MEP prior to entering receiving waters (e.g., low flow diversions to the sanitary sewer). Runoff treatment must occur prior to the discharge of runoff into receiving waters per Finding 7.

Diego Water Board directs an earlier submittal:

(a) The water quality improvement strategies being implemented that are effective and will continue to be implemented,

(b) Water quality improvement strategies (i.e. BMPs, retrofitting projects, stream and/or habitat rehabilitation or restoration projects, adjustments to jurisdictional runoff management programs, etc.) that will be implemented to reduce or eliminate any pollutants or conditions that are causing or contributing to the exceedance of water quality standards,

(c) Updates to the schedule for implementation of the existing and additional water quality improvement strategies, and

(d) Updates to the monitoring and assessment program to track progress toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a of this Order;

(3) The San Diego Water Board may require the incorporation of additional modifications to the Water Quality Improvement Plan required under Provision B. The applicable Copermittees must submit any modifications to the update to the Water Quality Improvement Plan within 90 days of notification that additional modifications are required by the San Diego Water Board, or as otherwise directed;

(4) Within 90 days of the San Diego Water Board determination that the update to the Water Quality Improvement Plan meets the requirements of this Order, the applicable Copermittees must revise the jurisdictional runoff management program documents to incorporate the updated water quality improvement strategies that have been and will be implemented, the implementation schedule, and any additional monitoring required; and

(5) Each Copermittee must implement the updated Water Quality Improvement Plan.

b. The procedure set forth above to achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order do not have to be repeated for continuing or recurring exceedances of the same water quality standard(s) following implementation of scheduled actions unless directed to do otherwise by the San Diego Water Board.

c. Nothing in Provisions A.4.a and A.4.b prevents the San Diego Water Board from enforcing any of provisions B through I of this Order while the applicable Copermittees prepare and implement the above update to the Water Quality Improvement Plan and jurisdictional runoff management programs.

B. WATER QUALITY IMPROVEMENT PLANS

Comment [A22]: See section 3.3 of the comment letter for discussions of the changes requested herein.

The purpose of this provision is to develop Water Quality Improvement Plans (WQIPs) that guide the Copermittees' jurisdictional runoff management programs towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plans is to ~~protect, preserve, enhance, and restorerestore the~~address the impacts of MS4 discharges so that such discharges do not impair water quality and designated beneficial uses of receiving waters~~. of the state.~~ Therefore, implementation of the WQIPs also provides the basis for complying with Provisions II.A.1, II.A.2, and II.A.3, as described in Provision II.A.4. This goal will be accomplished through an adaptive planning and management process that identifies the highest priority water quality conditions within a watershed and implements strategies through the jurisdictional runoff management programs to achieve improvements in the quality of discharges from the MS4s ~~and~~ to receiving waters. As such, the requirements outlined in Provision E may be modified for consistency with the WQIP priorities for the applicable Watershed Management Area, if appropriate justification is provided approved within the WQIP.

Comment [A23]: See discussion in section 3.3.2 of the comment letter.

1. Watershed Management Areas

Comment [A24]: See discussion in section 3.3.2 of the comment letter.

The Copermittees must develop a Water Quality Improvement Plan for each of the Watershed Management Areas in Table B-1. A total of ten Water Quality Improvement Plans must be developed for the San Diego Region.

Development of the Water Quality Improvement Plan for the Santa Margarita River Watershed Management Area shall commence upon notification of coverage of the Riverside County Copermittees under this Order. Until this time, the County of San Diego shall use the water quality priorities in the Santa Margarita River Watershed Urban Runoff Management Plan, developed pursuant to Order No. R9-2007-0001, to guide implementation of Provisions D and E within its jurisdiction

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
San Juan (901.00)	South Orange County	- Aliso Creek - San Juan Creek - San Mateo Creek - Pacific Ocean - Heisler Park ASBS	- City of Aliso Viejo[1] - City of Dana Point[1] - City of Laguna Beach[1] - City of Laguna Hills[1] - City of Laguna Niguel[1] - City of Laguna Woods[1] - City of Lake Forest[1] - City of Mission Viejo[1] - City of Rancho Santa Margarita[1] - City of San Clemente[1] - City of San Juan Capistrano[1] - County of Orange[1] - Orange County Flood Control District[1]

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
Santa Margarita (902.00)	Santa Margarita River	- Murrieta Creek - Temecula Creek - Santa Margarita River - Santa Margarita Lagoon - Pacific Ocean	- City of Murrieta[2] - City of Temecula[2] - City of Wildomar[2] - County of Riverside[2] - County of San Diego[3] - Riverside County Flood Control and Water Conservation District[2]
San Luis Rey (903.00)	San Luis Rey River	- San Luis Rey River - San Luis Rey Estuary - Pacific Ocean	- City of Oceanside - City of Vista - County of San Diego
Carlsbad (904.00)	Carlsbad	- Loma Alta Slough - Buena Vista Lagoon - Agua Hedionda Lagoon - Batiquitos Lagoon - San Elijo Lagoon - Pacific Ocean	- City of Carlsbad - City of Encinitas - City of Escondido - City of Oceanside - City of San Marcos - City of Solana Beach - City of Vista - County of San Diego
San Dieguito (905.00)	San Dieguito River	- San Dieguito River - San Dieguito Lagoon - Pacific Ocean	- City of Del Mar - City of Escondido - City of Poway - City of San Diego - City of Solana Beach - County of San Diego
Penasquitos (906.00)	Penasquitos	- Los Penasquitos Lagoon - Pacific Ocean	- City of Del Mar - City of Poway - City of San Diego - County of San Diego
	Mission Bay	- Mission Bay - Pacific Ocean - San Diego Marine Life Refuge ASBS	- City of San Diego
San Diego (907.00)	San Diego River	- San Diego River - Pacific Ocean	- City of El Cajon - City of La Mesa - City of San Diego - City of Santee - County of San Diego
Pueblo San Diego (908.00) Sweetwater (909.00) Otay (910.00)	San Diego Bay	- Sweetwater River - Otay River - San Diego Bay - Pacific Ocean	- City of Chula Vista - City of Coronado - City of Imperial Beach - City of La Mesa - City of Lemon Grove - City of National City - City of San Diego - County of San Diego - San Diego County Regional Airport Authority - San Diego Unified Port District
Tijuana (911.00)	Tijuana River	- Tijuana River - Tijuana Estuary - Pacific Ocean	- City of Imperial Beach - City of San Diego - County of San Diego

Notes:
1. The Orange County Copermittees will be covered under this Order after expiration of Order No. R9-2009-0002, or earlier if the Orange County Copermittees meet the conditions in Provision F.6.
2. The Riverside County Copermittees will be covered under this Order after expiration of Order No. R9-2010-0016, or earlier if the Riverside County Copermittees meet the conditions in Provision F.6.
3. The County of San Diego is required to implement the requirements of Provision B for its jurisdiction within the Santa

Margarita River Watershed Management Area until the Riverside County Copermittees have been notified of coverage under this Order.

2. Priority Water Quality Conditions

The Copermittees must identify the water quality priorities within each Watershed Management Area that will be addressed by the Water Quality Improvement Plan. Where appropriate, Watershed Management Areas may be separated into subwatersheds to focus water quality prioritization and jurisdictional runoff management program implementation efforts by receiving water.

a. Assessment of Receiving Water Conditions

The Copermittees must consider the following, at a minimum, to identify water quality priorities based on impacts of MS4 discharges on receiving water beneficial uses:

(1) Receiving waters listed as impaired on the CWA Section 303(d) List of Water Quality Limited Segments (303(d) List);

(2) TMDLs adopted and under development by the San Diego Water Board;

(3) Receiving waters recognized as sensitive or highly valued by the Copermittees, including estuaries designated under the National Estuary Program under CWA section 320, wetlands defined by the State or U.S. Fish and Wildlife Service's National Wetlands Inventory as wetlands, and receiving waters identified as ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (Attachment A);

(4) The receiving water limitations of Provision A.2;

(5) Known historical versus current physical, chemical, and biological water quality conditions;

(6) Available, relevant, and appropriately collected and analyzed physical, chemical, and biological receiving water monitoring data, including, but not limited to, data describing:

(a) Chemical constituents,

(b) Water quality parameters (i.e. pH, temperature, conductivity, etc.),

(c) Toxicity Identification Evaluations for both receiving water column and sediment,

(d) Trash impacts,

(e) Bioassessments, and

(f) Physical habitat;

(7) Available evidence of erosional impacts in receiving waters due to accelerated flows (i.e. hydromodification);

(8) Available evidence of adverse impacts to the chemical, physical, and biological integrity of receiving waters; and

(9) The potential improvements in the overall condition of the Watershed Management Area that can be achieved.

b. ASSESSMENT OF IMPACTS FROM MS4 DISCHARGES

The Copermittees must consider the following, at a minimum, to identify the potential impacts to receiving waters that may be caused or contributed to by discharges from the Copermittees' MS4s:

(1) The discharge prohibitions of Provision A.1 and effluent limitations of Provision A.3; and

(2) Available, relevant, and appropriately collected and analyzed storm water and non-storm water monitoring data from the Copermittees' MS4 outfalls;

(3) Locations of each Copermittee's MS4 outfalls that discharge to receiving waters;

(4) Locations of MS4 outfalls that are known to persistently discharge non-storm water to receiving waters likely causing or contributing to impacts on receiving water beneficial uses;

(5) Locations of MS4 outfalls that are known to discharge pollutants in storm water causing or contributing to impacts on receiving water beneficial uses; and

(6) The potential improvements in the quality of discharges from the MS4 that can be achieved.

c. IDENTIFICATION OF PRIORITY WATER QUALITY CONDITIONS

(1) The Copermittees must use the information gathered for Provisions B.2.a and B.2.b to develop a list of priority water quality conditions as pollutants, stressors and/or receiving water conditions that are the highest threat to receiving water quality or that most adversely affect the physical, chemical, and biological integrity of receiving waters. The list must include the following information for each priority water quality condition:

(a) The beneficial use(s) associated with the priority water quality condition;

(b) The geographic extent of the priority water quality condition within the Watershed Management Area, if known;

(c) The temporal extent of the priority water quality condition (e.g., dry weather and/or wet weather);

(d) The Copermittees with MS4s discharges that may cause or contribute to the priority water quality condition; and

(e) An assessment of the adequacy of and data gaps in the monitoring data to characterize the conditions causing or contributing to the priority water quality condition, including a consideration of spatial and temporal variation.

(2) The Copermittees must identify the highest priority water quality conditions to be addressed by the Water Quality Improvement Plan, and provide a rationale for selecting a subset of the water quality conditions identified pursuant to Provision B.2.c.(1) as the highest priorities.

d. IDENTIFICATION OF MS4 SOURCES OF POLLUTANTS AND/OR STRESSORS

The Copermittees must identify and prioritize known and suspected sources of storm water and non-storm water pollutants and/or other stressors within their jurisdiction, associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c. ~~The identification of known and suspected sources of pollutants and/or stressors that cause or contribute to the highest priority water quality conditions as identified for Provision B.2.c must~~ considering the following:

(1) Pollutant generating facilities, areas, and/or activities within the Watershed Management Area, including:

(a) Each Copermittee's inventory of construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas,

(b) Publicly owned parks and/or recreational areas,

(c) Open space areas,

(d) All currently operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste,,, and

(e) Areas not within the Copermittees' jurisdictions (e.g., Phase II MS4s, tribal lands, state lands, federal lands) that are known or suspected to be discharging to the Copermittees' MS4s;

(2) Locations of the Copermittees' MS4s, including the following:

(a) All major MS4 outfalls [per 40CFR 122.26 (b)(5)] that discharge to receiving waters, and

(b) Locations of major structural controls for storm water and non-storm water (e.g., retention basins, detention basins, major infiltration devices, etc.);

(3) Other known and suspected sources of non-storm water or pollutants in storm water discharges to receiving waters within the Watershed Management Area, including the following:

(a) Other MS4 outfalls (e.g., Phase II Municipal and Caltrans),

(b) Other NPDES permitted discharges,

(c) Any other discharges that may be considered point sources (e.g., private outfalls), and

(d) Any other discharges that may be considered non-point sources (e.g., agriculture, wildlife or other natural sources);

(4) Review of available data, including but not limited to:

(a) Findings from the Copermittees' illicit discharge detection and elimination programs,

(b) Findings from the Copermittees' MS4 outfall discharge monitoring,

(c) Findings from the Copermittees' receiving water monitoring,

(d) Findings from the Copermittees' MS4 outfall discharge and receiving water assessments, and

(e) Other available, relevant, and appropriately collected data, information, or studies related to pollutant sources and/or stressors that contribute to the highest priority water quality conditions as identified for Provision B.2.c.

(5) The adequacy of the available data to identify and prioritize sources and/or stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c.

e. NUMERIC GOALS AND SCHEDULES

Comment [A25]: See discussion in section 3.3.2 of the comment letter.

The Copermittees must develop and incorporate action levels, interim and final numeric goals[6] and schedules into the Water Quality Improvement Plan. Numeric goals must be used to support Water Quality Improvement Plan implementation and measure progress towards addressing the highest priority water quality conditions identified under Provision B.2.c. . Action Levels, Numeric goals are not enforceable compliance standards, effluent limitations, or receiving water limitations. When establishing numeric goals and corresponding schedules, the Copermittees must consider the following:

(1) Final numeric goals must be based on measureable criteria or indicators, to be achieved in ~~the receiving waters and/or~~ MS4 discharges for the highest priority water quality conditions which will ~~be capable of demonstrating the achievement of the restoration and/or protection~~ comply with the Receiving Water Limitations (A.2) of this Order; ~~water quality standards in receiving waters;~~

(2) Interim numeric goals must be based on measureable criteria or indicators capable of demonstrating incremental progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges; and

(3) Schedules must be adequate for measuring progress toward achieving the interim and final numeric goals required for Provisions B.2.e.(1) and B.2.e.(2). Schedules must incorporate the following:

(a) Interim dates for achieving the interim numeric goals,

(b) Compliance schedules for any applicable TMDLs in Attachment E to this Order,

(c) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A),

(d) Achievement of the final numeric goals in the receiving waters and/or MS4 discharges for the highest water quality priorities must be as soon as possible, and

[6] Interim and final numeric goals may take a variety of forms such as TMDL established WQBELs, action levels, pollutant concentration, load reductions, number of impaired water bodies delisted from the List of Water Quality Impaired Segments, Index of Biotic Integrity (IBI) scores, or other appropriate metrics. Interim and final numeric goals are not necessarily limited to one criterion or indicator, but may include multiple criteria and/or indicators. Except for TMDL established WQBELs, interim and final numeric goals and corresponding schedules may be revised through the adaptive management process under Provision B.5.

(e) Final dates for achieving the final numeric goals must not initially extend more than 10 years beyond the effective date of this Order, unless a longer period of time is authorized by the San Diego Water Board Executive Officer through an approved WQIP or the schedule includes an applicable TMDL in Attachment E to this Order[7].

Comment [A26]: Clarify that a longer period can be granted through the WQIP process.

[7] Achievement of final numeric goals within 10 years represents progress towards attainment of water quality standards, but is not a requirement to fully attain all applicable water quality standards or all priority receiving water conditions within 10 years.

3. Water Quality Improvement Strategies and Schedules

Comment [A27]: See discussion in section 3.3.2 of the comment letter.

The Copermittees must develop specific water quality improvement strategies to address the highest priority water quality conditions identified within a Watershed Management Area. The water quality improvement strategies must address the highest priority water quality conditions by ensuring the effective prohibition of~~preventing or eliminating~~ non-storm water discharges to and from the MS4, reducing pollutants in ~~storm water~~ discharges from the MS4 to the MEP, as applicable to the priority water quality conditions established per provision B.2. ~~and restoring and/or protecting the water quality standards of receiving waters~~.

a. Water Quality Improvement Strategies

The Copermittees must identify and prioritize water quality improvement strategies based on their likely effectiveness and efficiency, and design the JRMP programs to focus resources on those strategies to~~implement strategies to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, improve the physical, chemical, and biological receiving water conditions, and~~ achieve the interim and final numeric goals in accordance with the schedules required for Provision B.2.e.(3). The following water quality improvement strategies must be included and described in the Water Quality Improvement Plan:

(1) Specific strategies and/or activities that may be implemented by one or more Copermittees within their jurisdictions through the jurisdictional runoff management programs that will address the highest priority water quality conditions within the Watershed Management Area, in accordance with the following requirements:

(a) Strategies and/or activities must, at a minimum, be described for each jurisdictional runoff management program component where strategies to address the highest priority water quality conditions are required under Provision E;

(b) The Water Quality Improvement Plan must describe the circumstances or conditions when and where the strategies or/activities should be or will be implemented, but specific details about how each Copermittee will implement the strategies and/or activities within its jurisdiction are not required; and

(c) Descriptions of strategies and/or activities must include any monitoring, information collection, special studies, and/or data analysis that is necessary to assess the effectiveness of the strategy and/or activity toward addressing the highest priority water quality conditions.

(2) Additional strategies and/or activities that may be implemented within the Watershed Management Area on a jurisdictional, sub-watershed, or watershed scale by one or more Copermittees, not specifically required under

Provision E, which are designed to achieve the interim and final numeric goals identified in Provisions B.2.e.(1) and B.2.e.(2);

b. IMPLEMENTATION SCHEDULES

(1) The Copermittees must develop schedules for implementing the water quality improvement strategies identified under Provision B.3.a to achieve the interim and final numeric goals identified under Provision B.2.e.(1) and B.2.e.(2). Schedules must be developed for both the water quality improvement strategies implemented by each Copermittee within its jurisdiction and for strategies that the Copermittees choose to implement on a collaborative basis.

(2) The Copermittees must incorporate the implementation compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

4. Water Quality Improvement Monitoring and Assessment Program

a. The Copermittees in each Watershed Management Area must develop and incorporate an integrated monitoring and assessment program into the Water Quality Improvement Plan that assesses: 1) the progress toward achieving the numeric goals and schedules, 2) the progress toward addressing the highest priority water quality conditions for each Watershed Management Area, and 3) each Copermittee's overall efforts to implement the Water Quality Improvement Plan.

b. The monitoring and assessment program must incorporate the monitoring and assessment requirements of Provision D, which may allow the Copermittees to modify the program to be consistent with and focus on the highest priority water quality conditions for each Watershed Management Area.

c. For Watershed Management Areas with applicable TMDLs, the monitoring and assessment program must incorporate the specific monitoring and assessment requirements of Attachment E.

d. For Watershed Management Areas with any ASBS, the water quality monitoring and assessment program must incorporate the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

5. Iterative Approach and Adaptive Management Process

Comment [A28]: See discussion in section 3.3.2 of the comment letter.

The Copermittees in each Watershed Management Area must implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management

programs to become more effective toward achieving compliance with Provisions A.1, A.2, and A.3.~~A.1.a, A.1.c and A.2.a~~, and must include the following:

a. RE-EVALUATION OF PRIORITY WATER QUALITY CONDITIONS

The priority receiving water quality conditions, and numeric goals and corresponding schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.2.c and B.2.e, may be re-evaluated by the Copermittees as needed during the term of this Order as part of the Annual Report. Re-evaluation and recommendations for modifications to the priority water quality conditions, and numeric goals and corresponding schedules must be provided in the Regional Monitoring and Assessment Report pursuant to F.3.c~~Report of Waste Discharge~~, and must consider the following:

(1) Achieving the outcome of improved water quality in MS4 discharges and receiving waters through implementation of the water quality improvement strategies identified in the Water Quality Improvement Plan;

(2) Progress toward achieving interim and final numeric goals in receiving waters and/or MS4 discharges for the highest priority water quality conditions in the Watershed Management Area,

(3) Progress toward achieving outcomes according to established schedules;

(4) New information developed when the requirements of Provisions B.2.a-c have been re-evaluated;

(5) New policies or regulations that may affect identified numeric goals;

(6) Spatial and temporal accuracy of monitoring data collected to inform prioritization of water quality conditions and implementation strategies to address the highest priority water quality conditions;

(7) Availability of new information and data from sources other than the jurisdictional runoff management programs within the Watershed Management Area that informs the effectiveness of the actions implemented by the Copermittees;

(8) San Diego Water Board recommendations; and

(9) Recommendations for modifications solicited through a public participation process.

b. ADAPTATION OF STRATEGIES AND SCHEDULES

The water quality improvement strategies and schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.3, must be re-evaluated and adapted as new information becomes available to result in more effective and efficient measures to achieve the numeric goals established pursuant to

Provision B.2.e. Re-evaluation of and modifications to the water quality improvement strategies, if determined to be necessary, must be provided in the applicable Annual Report per F.3.b.(3)., and must consider the following:

(1) Modifications to the priority water quality conditions, and numeric goals and corresponding schedules based on Provision B.5.a;

(2) Measurable or demonstrable reductions of non-storm water discharges to and from each Copermittee's MS4;

(3) Measurable or demonstrable reductions of pollutants in ~~storm water~~ discharges from each Copermittee's MS4 to the MEP;

(4) New information developed when the requirements of Provisions B.2.b and B.2.d have been re-evaluated;

(5) Efficiency in implementing the Water Quality Improvement Plan;

(6) San Diego Water Board recommendations; and

(7) Recommendations for modifications solicited through a public participation process.

c. ADAPTATION OF MONITORING AND ASSESSMENT PROGRAM

The water quality improvement monitoring and assessment program, included in the Water Quality Improvement Plan pursuant to Provisions B.4, must be re-evaluated and adapted when new information becomes available. Re-evaluation and recommendations for modifications to the monitoring and assessment program, pursuant to the requirements of Provision D, may be provided in the Annual Report, but must be provided in the Report of Waste Discharge.

6. Water Quality Improvement Plan Submittal, Updates, and Implementation

a. The Copermittees must submit the Water Quality Improvement Plans in accordance with the requirements of Provision F.1.

b. The Copermittees must submit proposed updates to the Water Quality Improvement Plan for acceptance by the San Diego Water Board Executive Officer in accordance with the requirements of Provision F.2.c.

c. The Copermittees must commence with implementation of the Water Quality Improvement Plans ~~immediately after acceptance by the San Diego Water Board, in accordance with the schedules, or subsequently updated schedules, within the Water Quality Improvement Plan.~~in accordance with Provision F.1.b.(5).

C. ACTION LEVELS

Comment [A29]: See comment letter section 3.4 for a discussion of the redlines shown herein.

The purpose of this provision is for the Copermittees to incorporate numeric non-stormwater action levels (NALs) and stormwater action levels (SALs) in the Water Quality Improvement Plans (Provision B), and numeric non-stormwater action levels (NALs) in the Illicit Discharge Detection and Elimination (IDDE) program (Provision E.2.).

- For the purposes of the WQIPs, ~~T~~the goal of the action levels is to guide ~~Water Quality Improvement Plan~~ the implementation efforts and measure progress towards the protection of the identified high priority water quality conditions and associated designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through monitoring and assessing the quality of the MS4 discharges during the implementation of the Water Quality Improvement Plans.

- For the purposes of the IDDE program, the goal of the non-stormwater action levels is to assist in determining whether a persistent non-stormwater discharge into or from the MS4 contains pollutants at levels that have the potential to negatively affect the identified high priority water quality conditions.

Action levels will be developed and incorporated into the WQIP (Provision B) and the IDDE Program (Provision E). Depending upon the goals/objectives for the use of the action levels and the priority receiving water conditions, the constituents and values at which they are set may differ between watersheds. Copermittees may develop Watershed Management Area specific numeric action levels for non-stormwater and stormwater MS4 discharges using an approach approved by the Regional Board or use the default non-stormwater and stormwater action levels prescribed in C.1 and C.2 below.

The Copermittees will submit the action levels as a part of the WQIP and JRMP submittals. The action levels currently established will serve as the interim action levels until revised action levels are completed and approved. Exceedances of the action levels are not subject to enforcement or non-compliance actions under this Order.

1. Default Non-Storm Water Action Levels[8]

~~The Copermittees must develop and incorporate numeric non-storm water action levels (NALs) into the Water Quality Improvement Plan to: 1) support the development and prioritization of water quality improvement strategies for addressing non-storm water discharges to and from the MS4s, 2) assess the effectiveness of the water quality improvement strategies toward addressing MS4~~

Comment [A30]: As discussed in section 2.4 of the Riverside comment letter.

[8] NALs are not ~~considered by the San Diego Water Board to be~~ enforceable limitations under this Order.

~~non-storm water discharges, required pursuant to Provision D.4.b.(1), and 3) support the detection and elimination of non-storm water and illicit discharges to and from the MS4, required pursuant to Provision E.2.~~[9]

a. The following NALs must be incorporated as applicable to the WMA and the Copermittees' MS4 discharges,~~:~~ if the Copermittees do not establish numeric action levels within the WQIP based on watershed priorities:

(1) Non-Storm Water Discharges from MS4s to Ocean Surf Zone

Table C-1. Non-Storm Water Action Levels for Discharges from MS4s to Ocean Surf Zone

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Total Coliform	MPN/100 ml	1,000	-	10,000/1,000[1]	OP
Fecal Coliform	MPN/100 ml	200[2]	-	400	OP
Enterococci	MPN/100 ml	35	-	104[3]	OP

Abbreviations/Acronyms
AMAL – average monthly action level
OP – Ocean Plan water quality objective
MDAL – maximum daily action level
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Total coliform density NAL is 1,000 MPN/100 ml when the fecal/total coliform ratio exceeds 0.1.
2. Fecal coliform density NAL is 200 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas."

[9] ~~The Copermittees may utilize NALs or other benchmarks currently established by the Copermittees as interim NALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.~~

(2) Non-Storm Water Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Table C-2. Non-Storm Water Action Levels for Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Turbidity	NTU	75	-	225	OP
pH	Units	Within limit of 6.0 to 9.0 at all times			OP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	35	-	104[3]	BP
Priority Pollutants	ug/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
OP – Ocean Plan water quality objective
NTU – Nephelometric Turbidity Units
ug/L – micrograms per liter
MDAL – maximum daily action level
BP – Basin Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas" and is not applicable to waterbodies that are not designated with the water contact recreation (REC-1) beneficial use.

Table C-3. Non-Storm Water Action Levels for Priority Pollutants

Parameter	Units	Freshwater (CTR)		Saltwater (CTR)	
		MDAL	AMAL	MDAL	AMAL
Cadmium	ug/L	**	**	16	8
Copper	ug/L	*	*	5.8	2.9
Chromium III	ug/L	**	**	-	-
Chromium VI	ug/L	16	8.1	83	41
Lead	ug/L	*	*	14	2.9
Nickel	ug/L	**	**	14	6.8
Silver	ug/L	*	*	2.2	1.1
Zinc	ug/L	*	*	95	47

Abbreviations/Acronyms:
CTR – California Toxic Rule
AMAL – average monthly action level
ug/L – micrograms per liter
MDAL – maximum daily action level

Notes:
* Action levels developed on a case-by-case basis (see below)
** Action levels developed on a case-by-case basis (see below), but calculated criteria are not to exceed Maximum Contaminant Levels (MCLs) under the California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64431

The Cadmium, Copper, Chromium (III), Lead, Nickel, Silver and Zinc NALs for MS4 discharges to freshwater receiving waters will be developed on a case-by-case basis because the freshwater criteria are based on site-specific water quality data (receiving water hardness). For these priority pollutants, refer to ~~the following equations (~~40 CFR 131.38.b.2 for details~~) will be required~~:

~~Cadmium (Total Recoverable) = exp(0.7852[ln(hardness)] - 2.715)~~
~~Chromium III (Total Recoverable) = exp(0.8190[ln(hardness)] + 0.6848)~~
~~Copper (Total Recoverable) = exp(0.8545[ln(hardness)] - 1.702)~~
~~Lead (Total Recoverable) = exp(1.273[ln(hardness)] - 4.705)~~
~~Nickel (Total Recoverable) = exp(.8460[ln(hardness)] + 0.0584)~~
~~Silver (Total Recoverable) = exp(1.72[ln(hardness)] - 6.52)~~
~~Zinc (Total Recoverable) = exp(0.8473[ln(hardness)] + 0.884)~~

Comment [A31]: Consistent with SD Permittee recommendations.

(3) Non-Storm Water Discharges from MS4s to Inland Surface Waters

Table C-4. Non-Storm Water Action Levels for Discharges from MS4s to Inland Surface Waters

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Dissolved Oxygen	mg/L	Not less than 5.0 in WARM waters and not less than 6.0 in COLD waters			BP
Turbidity	NTU	-	20	See MDAL	BP
pH	Units	Within limit of 6.5 to 8.5 at all times			BP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	33	-	61[3]	BP
Total Nitrogen	mg/L	-	1.0	See MDAL	BP
Total Phosphorus	mg/L	-	0.1	See MDAL	BP
MBAS	mg/L	-	0.5	See MDAL	BP
Iron	mg/L	-	0.3	See MDAL	BP
Manganese	mg/L	-	0.05	See MDAL	BP
Priority Pollutants	ug/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
BP – Basin Plan water quality objective
COLD – cold freshwater habitat beneficial use
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
MDAL – maximum daily action level
WARM – warm freshwater habitat beneficial use
MBAS – Methylene Blue Active Substances
MPN/100 ml – most probable number per 100 milliliters
ug/L – micrograms per liter

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for freshwater "designated beach areas" and is not applicable to waterbodies that are not designated with the water contact recreation (REC-1) beneficial use.

b. NALs must be identified, developed and incorporated in the Water Quality Improvement Plan for any pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in Receiving waters ~~of the state~~ associated with the highest priority water quality conditions related to non-storm water discharges from the MS4s. NALs must be based on:

(1) Applicable water quality standards which may be dependent upon site-specific or receiving water-specific conditions or assumptions to be identified by the Copermittees; or

(2) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. ~~For the NALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary NALs specific to the Watershed Management Area at levels greater than the NALs required by Provisions C.1.a and C.1.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for addressing non-~~

~~storm water discharges to and from the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and from the MS4. The secondary NALs may be developed using an approach acceptable to the San Diego Water Board.~~

d. Dry weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.b may be utilized to develop or revise NALs based on watershed-specific data, subject to San Diego Water Board Executive Officer approval.

2. Default Storm Water Action Levels[10]

The Copermittees must develop and incorporate numeric storm water action levels (SALs) in the Water Quality Improvement Plans to: 1) support the development and prioritization of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s, and 2) assess the effectiveness of the water quality improvement strategies toward reducing pollutants in storm water discharges, required pursuant to Provision D.4.b.(2).[11]

a. The following SALs for discharges of storm water from the MS4 must be incorporated~~:~~ if the Copermittees do not establish stormwater action levels within the WQIP based on watershed priorities::~~:~~

Table C-5. Storm Water Action Levels for Discharges from MS4s to Receiving Waters

Parameter	Units	Action Level
Turbidity	NTU	126
Nitrate & Nitrite (Total)	mg/L	2.6
Phosphorus (Total P)	mg/L	1.46
Cadmium (Total Cd)*	µg/L	3.0
Copper (Total Cu)*	µg/L	127
Lead (Total Pb)*	µg/L	250
Zinc (Total Zn)*	µg/L	976

Abbreviations/Acronyms:
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
ug/L – micrograms per liter

Notes:
* The sampling must include a measure of receiving water hardness at each MS4 outfall. If a total metal concentration exceeds the corresponding metals SAL in Table C-5, that concentration must be compared to the California Toxics Rule criteria and the USEPA 1-hour maximum concentration for the detected level of receiving water hardness associated with that sample. If it is determined that the sample's total metal concentration for that specific metal exceeds that SAL, but does not exceed the applicable USEPA 1-hour maximum concentration criterion for the measured level of hardness, then the sample result will not be considered above the SAL for that measurement.

[10] SALs are not ~~considered by the San Diego Water Board to be~~ enforceable limitations under this Order.
[11] The Copermittees may utilize SALs or other benchmarks currently established by the Copermittees as interim SALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

b. SALs must be identified, developed and incorporated in the Water Quality Improvement Plan for pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in Receiving waters ~~of the state~~ associated with the highest water quality priorities related to storm water discharges from the MS4s. SALs must be based on:

(1) Federal and State water quality guidance and/or water quality standards; and

(2) Site-specific or receiving water-specific conditions; or

(3) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. ~~For the SALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary SALs specific to the Watershed Management Area at levels greater than the SALs required by Provisions C.2.a and C.2.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s. The secondary SALs may be developed based on the approaches recommended by the State Water Board's Storm Water Panel[12] or using an approach acceptable to the San Diego Water Board.~~

d. Wet weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.c may be used to develop or revise SALs based upon watershed-specific data, subject to San Diego Water Board Executive Officer approval.

~~[12] Storm Water Panel Recommendations to the California State Water Resources Control Board: The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities (June 2006)~~

D. MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS

Comment [A32]: See discussion in section 3.5 of the comment letter.

The purpose of this provision is for the Copermittees to monitor and assess the impact on the chemical, physical, and biological conditions of receiving waters caused by discharges from the Copermittees' MS4s under wet weather and dry weather conditions. The goal of the monitoring and assessment program is to inform the Copermittees about the nexus between the health of receiving waters and the water quality condition of the discharges from their MS4s to those receiving waters.~~.~~ This goal will be accomplished through monitoring and assessing the conditions of the receiving waters, discharges from the MS4s to those receiving waters, pollutant sources and/or stressors, and effectiveness of the water quality improvement strategies implemented as part of the Water Quality Improvement Plans.

1. Receiving Water Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the condition of the receiving waters in each Watershed Management Area during dry weather and wet weather. Following acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct long-term receiving water monitoring during implementation of the Water Quality Improvement Plan to assess the long term trends and determine if water quality conditions in receiving waters are improving. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following receiving water monitoring procedures:

a. TRANSITIONAL RECEIVING WATER MONITORING

Beginning October 1st or May 1st (whichever is sooner) following enrollment under this order and until~~Until~~ the monitoring requirements of Provisions D.1.b-e are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following receiving water monitoring in the Watershed Management Area:

(1) Continue the receiving water monitoring programs required in Order Nos. R9-2007-0001~~,~~ (Attachment A, Section II. A. 1-5),~~,~~ R9-2009-0002, and R9-2010-0016;

(2) Continue the monitoring in the Hydromodification Management Plans approved by the San Diego Water Board;

(3) Participate in the following regional receiving water monitoring programs, as applicable to the Watershed Management Area and each Copermittees' MS4 discharges:

Comment [A33]: See discussion in section 3.5.3 of the comment letter.

(a) Storm Water Monitoring Coalition Regional Monitoring,

(b) Southern California Bight Regional Monitoring, and

(c) Sediment Quality Monitoring;

(4) Implement the monitoring programs developed as part of any implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) for the TMDLs in Attachment E to this Order; and

(5) For Watershed Management Areas with ASBS, implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

b. LONG-TERM RECEIVING WATER MONITORING STATIONS

The Copermittees must select at least one long-term receiving water monitoring station from among the existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees to be representative of the receiving water quality in the Watershed Management Area. Additional or alternative long-term receiving water monitoring stations may~~must~~ be selected where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

Comment [A34]: See discussion in section 3.5.3 of the comment letter.

c. DRY WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three dry weather monitoring events at each of the long-term receiving water monitoring stations. At least one monitoring event must be conducted during the dry season (May 1 – September 30) and at least one monitoring event must be conducted during a dry weather period during the wet season (October 1 – April 30), after the first wet weather event of the season, with an antecedent dry period of at least 72 hours following a storm event producing measureable rainfall of greater than 0.1 inch.

(1) Dry Weather Receiving Water Field Observations

For each dry weather monitoring event, the Copermittees must record field observations consistent with Table D-1 at each long-term receiving water monitoring station.

Table D-1. Field Observations for Receiving Water Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) • Assessment of any observed connectivity of MS4 discharges to a flowing receiving water. • Station description (i.e. deposits or stains, vegetation condition, structural condition, and observable biology) • Presence and assessment of trash in and around station

Comment [A35]: See discussion in section 3.5.3 of the comment letter.

(2) Dry Weather Receiving Water Field Monitoring

For each dry weather monitoring event, if conditions allow the collection of the data, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

Table D-2. Field Monitoring Parameters for Receiving Water Monitoring Stations

Parameters
• pH • Temperature • Specific conductivity • Dissolved oxygen • Turbidity

(3) Dry Weather Receiving Water Analytical Monitoring

For each dry weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity,

dissolved oxygen, turbidity, hardness, and indicator bacteria Grab samples may also be collected for the analyses described in (f) where MS4 discharge runoff constitutes less than ten percent of the flow;

Comment [A36]: The receiving water stations in Riverside County either do not receive runoff from MS4 discharges or receive deminimus flows during dry weather conditions. The flow at these stations during dry weather consists virtually entirely of rising groundwater. Background receiving water quality conditions In such cases composite samples of receiving waters not affected by MS4 discharges is not warranted.

(d) For all other constituents where runoff constitutes more than ten percent of the flow, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable NAL constituents, and

(v) Constituents listed in Table D-3.

Table D-3. Analytical Monitoring Constituents for Receiving Water Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Pesticides	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1]	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Mercury • Nickel • Selenium • Thallium • Zinc	• Organophosphate Pesticides • Pyrethroid Pesticides	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

• Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia			

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(4) Dry Weather Receiving Water Toxicity Monitoring

For each dry weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for toxicity in accordance with Table D-4:

Table D-4. Dry Weather Toxicity Testing for Receiving Water Monitoring Stations

Freshwater Organism	Test Approach	USEPA Protocol[2]
Pimephales promelas	1 acute 1 chronic[1]	EPA-821-R-02-012
Hyalella Azteca	1 acute 1 chronic[1]	EPA-821-R-02-012
Psuedokirchneriella subcapitata	1 acute 1 chronic[1]	EPA-821-R-02-013

Notes:
1. Chronic toxicity testing is not required at receiving water monitoring stations located at mass loading stations if the channel flows are diverted year-round during dry weather conditions to the sanitary sewer for treatment.
2. USEPA protocols must be utilized for toxicity testing unless alternate toxicity testing protocols have been approved by the San Diego Water Board.

(5) Dry Weather Receiving Water Bioassessment Monitoring

Bioassessment monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must conduct bioassessment monitoring during at least one dry weather monitoring event at each long-term receiving water monitoring station as follows:

(a) The following bioassessment samples and measurements must be collected:

(i) Macroinvertebrate samples must be collected in accordance with the "Reachwide Benthos (Multihabitat) Procedure" in the most current Surface Water Ambient Monitoring Program (SWAMP) Bioassessment Standard Operating Procedures (SOP), and amendments, as applicable;[13]

(ii) The "Full" suite of physical habitat characterization measurements

[13] Ode, P.R.. 2007. Standard operating procedures for collecting macroinvertebrate samples and associated physical and chemical data for ambient bioassessments in California. California State Water Resources Control Board Surface Water Ambient Monitoring Program (SWAMP) Bioassessment SOP 001. http://www.swrcb.ca.gov/water_issues/programs/swamp/tools.shtml#monitoring

must be collected in accordance with the most current SWAMP Bioassessment SOP, and as summarized in the SWAMP Stream Habitat Characterization Form – Full Version;[14] and

(iii) Freshwater algae samples must be collected in accordance with the SWAMP Standard Operating Procedures for Collecting Algae Samples.[15] Analysis of samples must include algal taxonomic composition (diatoms and soft algae) and algal biomass.

(b) The bioassessment samples, measurements, and appropriate water chemistry data must be used to calculate the following:

(i) An Index of Biological Integrity (IBI) for macroinvertebrates for each monitoring station where bioassessment monitoring was conducted, based on the most current calculation method;[16] and

(ii) An IBI for algae for each monitoring station where bioassessment monitoring was conducted, when a calculation method is developed.[17]

(c) In lieu of the requirements of Provision D.1.c.(5)(a), the Copermittees may conduct the bioassessment monitoring in accordance with the "Triad" assessment approach[18] to calculate the IBIs required for Provision D.1.c.(5)(b). The Copermittees must conduct sampling, analysis, and reporting of specified in-stream biological and habitat data according to the protocols specified in the SCCWRP Technical Report No. 539, or subsequent protocols, if developed.

(6) Dry Weather Receiving Water Hydromodification Monitoring

In addition to the hydromodification monitoring conducted as part of the Copermittees' Hydromodification Management Plans, hydromodification monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must collect the

[14] Available at: http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/reports/fieldforms_fullversion052908.pdf
[15] Fetscher et al. 2009. Standard Operating Procedures for Collecting Stream Algae Samples and Associated Physical Habitat and Chemical Data for Ambient Bioassessments in California.
[16] The most current calculation method at the time the Order was adopted is outlined in "A Quantitative Tool for Assessing the Integrity of Southern California Coastal Streams" (Ode, et al. 2005. Environmental Management. Vol. 35, No. 1, pp. 1-13). If an updated or new calculation method is developed, either both (i.e. current and updated/new) methods must be used, or historical IBIs must be recalculated with the updated or new calculation method.
[17] When a calculation method is developed, IBIs must be calculated for all available and appropriate historical data.
[18] Stormwater Monitoring Coalition Model Monitoring Technical Committee, 2004. Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California. Technical Report #419. August 2004.

following hydromodification monitoring observations and measurements within an appropriate domain of analysis during at least one dry weather monitoring event for each long-term receiving water monitoring station:

(a) Channel conditions, including:

(i) Channel dimensions,

(ii) Hydrologic and geomorphic conditions, and

(iii) Presence and condition of vegetation and habitat;

(b) Location of discharge points;

(c) Habitat integrity;

(d) Photo documentation of existing erosion and habitat impacts, with location (i.e. latitude and longitude coordinates) where photos were taken;

(e) Measurement or estimate of dimensions of any existing channel bed or bank eroded areas, including length, width, and depth of any incisions; and

(f) Known or suspected cause(s) of existing downstream erosion or habitat impact, including flow, soil, slope, and vegetation conditions, as well as upstream land uses and contributing new and existing development.

d. WET WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three wet weather monitoring events at each long-term receiving water monitoring station. At least one wet weather monitoring event must be conducted during the first wet weather event of the wet season (October 1 – April 30), and at least one wet weather monitoring event during a wet weather event that occurs after February 1.

(1) Wet Weather Receiving Water Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each long-term receiving water monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event;

(b) The flow rates and volumes measured or estimated (data from nearby

USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(d) Presence and assessment of trash in and around station.

(2) Wet Weather Receiving Water Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

(3) Wet Weather Receiving Water Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) Constituents listed in Table D-3.

(4) Wet Weather Receiving Water Toxicity Monitoring

For each wet weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for toxicity in accordance with Table D-5:

Table D-5. Wet Weather Toxicity Testing for Receiving Water Monitoring Stations

Freshwater Organism	Test Approach	USEPA Protocol[1]
Pimephales promelas	1 acute	EPA-821-R-02-012
Hyalella Azteca	1 acute	EPA-821-R-02-012
Psuedokirchneriella subcapitata	1 acute	EPA-821-R-02-013

Notes:
1. USEPA protocols must be utilized for toxicity testing unless alternate toxicity testing protocols have been approved by the San Diego Water Board.

e. OTHER RECEIVING WATER MONITORING REQUIREMENTS

(1) Regional Monitoring

The Copermittees must participate in the following regional receiving waters monitoring programs, as applicable to the Watershed Management Area and the Copermittee's MS4 discharges:

(a) Storm Water Monitoring Coalition Regional Monitoring; and

(b) Southern California Bight Regional Monitoring.

(2) Sediment Quality Monitoring

The applicable Copermittees must perform sediment monitoring to assess compliance with sediment quality receiving water limits applicable to MS4

discharges to enclosed bays and estuaries. The monitoring may be performed either by individual or multiple affected Copermittees to assess compliance with receiving water limits, or through participation in a water body monitoring coalition. The Copermittees must identify sediment sampling stations that are spatially representative of the sediment within the water body segment or region of interest. Sediment quality monitoring must be conducted in conformance with the monitoring requirements set forth in the State Water Board Sediment Quality Control Plan.

(3) ASBS Monitoring

For Watershed Management Areas with ASBS, the applicable Copermittees must implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

f. ALTERNATIVE WATERSHED MONITORING REQUIREMENTS

The San Diego Water Board may direct the Copermittees to participate in an effort to develop alternative watershed monitoring with other regulated entities, other interested parties, and the San Diego Water Board to refine, coordinate, and implement regional monitoring and assessment programs to determine the status and trends of water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and/or 3) streams. As directed by the San Diego Water Board, such alternative watershed monitoring would be done in place and stead of the commensurate requirements set forth in Provision D.1.

2. MS4 Outfall Discharge Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the discharges from the major MS4 outfalls to receiving waters in each Watershed Management Area during dry weather and wet weather. Following acceptance of the Water Quality Improvement Plans and schedule for implementation of monitoring for each Watershed Management Area, the Copermittees must conduct MS4 outfall discharge monitoring during implementation of the Water Quality Improvement Plan to assess the effectiveness of their jurisdictional runoff management programs toward effectively prohibiting non-storm water discharges into the MS4 and reducing pollutants in ~~storm water~~ discharges ~~to and~~ from their MS4s to the MEP. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following MS4 outfall monitoring procedures:

Comment [A37]: Suggest same edits for SD and OC.

a. TRANSITIONAL MS4 OUTFALL DISCHARGE MONITORING

Beginning October 1st or May 1st (whichever is sooner) following enrollment under this order and until~~Until~~ the monitoring requirements of Provisions D.2.b-c

are incorporated into a Water Quality Improvement Plan and schedule for implementation of monitoring that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following monitoring of MS4 outfall discharges to flowing receiving waters ~~monitoring~~ in the Watershed Management Area:

(1) MS4 Outfall Discharge Monitoring Station Inventory

Each Municipal Copermittee must identify all major MS4 outfalls (including those operated by a Special District Copermittee) that discharge directly to receiving waters within its jurisdiction and geo-locate those outfalls on a map of the MS4 pursuant to Provision E.2.b.(1). This information must be compiled into a MS4 outfall discharge monitoring station inventory, and must include the following information:

(a) Latitude and longitude of MS4 outfall point of discharge;

(b) Watershed Management Area;

(c) Hydrologic subarea;

(d) Outlet size;

(e) Accessibility (i.e. safety and without disturbance of critical habitat);

(f) Approximate drainage area; and

(g) Classification of whether the MS4 outfall is known to have persistent dry weather flows, transient dry weather flows, no dry weather flows, or unknown dry weather flows.

(2) Transitional Dry Weather MS4 Outfall ~~Discharge~~ Field Screening ~~Monitoring~~

Until the monitoring requirements of Provision D.2.b are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, each Municipal Copermittee must perform the following dry weather MS4 outfall field screening monitoring to identify non-storm water and illicit discharges being discharged from MS4s within its jurisdiction in accordance with Provision E.2.c, to determine which discharges are transient ~~flows~~ and which are persistent discharges to flowing receiving waters~~flows~~, and prioritize the dry weather MS4 discharges that will be investigated and eliminated in accordance with Provision E.2.d. ~~Each Copermittee must conduct the following dry weather MS4 outfall discharge field screening monitoring within its jurisdiction:~~

Comment [A38]: Suggested change of title to better characterize the requirements of this section, compared to that of D.2.b.

Comments in this section are discussed in section 3.5.3 of the comment letter.

Comment [A39]: Duplicative of previous sentence

(a) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Frequency

Each Municipal Copermittee must field screen the accessible MS4 outfalls in its inventory developed pursuant to Provision D.2.a.(1) as follows:

(i) ~~For Copermittees with less than 125 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 80 percent of the outfalls must be visually inspected two times per year during dry weather conditions.~~

(ii) For Municipal Copermittees with ~~125 major MS4 outfalls or more, but~~ less than or equal to 500 MS4 outfalls~~,~~ that discharge to receiving waters within a Watershed Management Area, ~~all~~ at least 80 percent of the accessible outfalls must be visually inspected at least annually during dry weather conditions.

(iii) For Municipal Copermittees with more than 500 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 500 outfalls must be visually inspected at least annually during dry weather conditions. Copermittees with more than 500 major MS4 outfalls within a Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(iv) Municipal Copermittees with more than 500 major MS4 outfalls within its jurisdiction that are located in more than one Watershed Management Area, at least 500 major MS4 outfalls within its inventory must be visually inspected at least annually during dry weather conditions. Copermittees with more than 500 major MS4 outfalls in more than one Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;

[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(v) Inspections of major MS4 outfalls conducted in response to public reports and staff or contractor reports and notifications may count toward the required visual inspections of MS4 outfall discharge monitoring stations.

(b) Transitional Dry Weather MS4 Outfall Discharge Field Screening Visual Observations

(i) An antecedent dry period of at least 72 hours following any storm event producing measurable rainfall greater than 0.1 inch is required prior to conducting field screening visual observations during a field screening monitoring event.

(ii) During the field screening monitoring event, each Municipal Copermittee must record visual observations consistent with Table D-6 at each MS4 outfall discharge monitoring station inspected.

Table D-6. Field Screening Visual Observations for MS4 Outfall Discharge Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) - Flow source(s) suspected or identified from non-storm water source investigation - Flow source(s) eliminated during non-storm water source identification • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) - Known or suspected source(s) of pooled or ponded water • Assessment of any observed MS4 discharge ~~with~~ to a flowing receiving water. • Station description (i.e. deposits or stains, vegetation condition, structural condition, observable biology) • Presence and assessment of trash in and around station • Evidence or signs of illicit connections or illegal dumping

(iii) Each Municipal Copermittee must implement the requirements of Provisions E.2.d.(2)(c)-(e) based on the field observations.

(iv) Each Copermittee must evaluate field observations together with existing information available from prior reports, inspections and monitoring results to determine whether any observed flowing,

pooled, or ponded waters are likely to be transient or persistent flow.[19]

Comment [A40]: See footnote edits

(c) Transitional Dry Weather MS4 Outfall Discharge Field Screening ~~Monitoring~~ Records

Based upon the results of the transitional dry weather MS4 outfall discharge field screening monitoring conducted pursuant to Provisions D.2.a.(2)(a)-(b), each Municipal Copermittee must update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow.

(3) Transitional Wet Weather MS4 Outfall Discharge Monitoring

Comment [A41]: See discussion in section 3.5.3 of the comment letter.

Until the monitoring requirements of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(a) Transitional Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees must select at least five wet weather MS4 outfall discharge monitoring stations from the inventories developed pursuant to Provision D.2.a.(1) that are representative of storm water discharges from areas consisting primarily of residential, commercial, industrial, and typical mixed-use land uses present within the Watershed Management Area.

(b) Transitional Wet Weather MS4 Outfall Discharge Monitoring Frequency

Each wet weather MS4 outfall discharge monitoring station selected pursuant to Provision D.2.a.(3)(a) must be monitored twice during the wet season (October 1 – April 30)~~),~~) in the transitional period. The~~). One~~ wet weather monitoring ~~event~~events shall be selected to be representative of the range of hydrologic conditions experienced in the region. At least 10% of samples~~event~~ must be conducted during the first wet weather event of the wet season, ~~and~~to include~~and one wet weather monitoring event~~ at least one such sample in each Watershed Management Area~~, a month after the first wet weather event of the wet season.~~

[19] Persistent flow, for the purposes of provision II.D.2.b.(2) is defined as the presence of an MS4 discharge that is hydraulically connected to a flowing receiving~~, pooled, or ponded~~ water more than 72 hours after a measureable rainfall event of 0.1 inch or greater, during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

(c) Transitional Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded of the flow from~~at~~ each wet weather MS4 outfall discharge monitoring station:

(i) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(ii) The flow rates and volumes measured or estimated from the outfall (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(iii) ~~Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and~~

(iv) Presence ~~and assessment~~ of trash in and around station.

Comment [A42]: This isn't appropriate for a wet weather event.

Comment [A43]: This isn't appropriate for a wet weather event.

(d) Transitional Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(e) Transitional Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, and indicator bacteria;

(iv) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant

concentrations and runoff flows using one of the following techniques:

[a] Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or
[b] Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or
[c] If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours;

(v) Only one analysis of the composite of aliquots is required;

(vi) The samples must be analyzed for the following constituents:

[a] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,
[b] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and
[c] Constituents listed in in Table D-7.

Table D-7. Analytical Monitoring Constituents for Wet Weather MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Nickel • Selenium • Thallium • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(f) Other Transitional Wet Weather MS4 Outfall Discharge Monitoring

The San Diego County Copermittees must continue the wet weather MS4 outfall monitoring program developed under Order No. R9-2007-0001, as approved by the San Diego Water Board, through its planned completion.

b. DRY WEATHER MS4 OUTFALL DISCHARGE MONITORING

Each Municipal Copermittee must perform the following dry weather MS4 outfall monitoring within its jurisdiction to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. ~~Each Copermittee must conduct the following dry weather MS4 outfall discharge monitoring within its jurisdiction:~~

(1) Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Each Municipal Copermittee must continue to perform the dry weather MS4 outfall discharge field screening monitoring in accordance with the requirements of Provision D.2.a.(2). ~~The~~ however the Municipal Copermittee may adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of persistent ~~flow~~ non-storm water illegal discharges from the MS4 to flowing receiving waters in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan. ~~, provided the~~

Comment [A44]: Repetitive of previous sentence

Comment [A45]: See discussion in section 3.5.3 of the comment letter.

~~number of visual inspections performed is equivalent to the number of visual inspections required under Provision D.2.a.(2)(a).~~

Comment [A46]: See comments in comment letter

(2) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring

Each Municipal Copermittee must perform the following non-storm water monitoring of MS4 outfalls that persistently ~~flow MS4 outfall~~ discharge to flowing receiving waters ~~monitoring~~ to determine which persistent non-storm water discharges contain concentrations of pollutants below NALs, and which persistent non-storm water discharges impact receiving water quality during dry weather. ~~Each Copermittee must conduct the following non-storm water persistent flow MS4 outfall discharge monitoring within its jurisdiction:~~

Comment [A47]: Repetitive of previous sentence.

(a) Prioritization of Non-Storm Water Persistent Flow MS4 Outfalls

Based upon the dry weather MS4 outfall discharge field screening monitoring records developed pursuant to Provision D.2.a.(2)(c), each Municipal Copermittee must identify and prioritize the MS4 outfalls within its jurisdiction that have~~with~~ persistent discharges to flowing receiving waters ~~flows~~ based on the highest priority water quality conditions identified in the Water Quality Improvement Plan and any additional criteria developed by the Copermittee, which may include historical data and data from sources other than what the Copermittee collects.

(b) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring Frequency

Comment [A48]: See comment letter section 3.5.3

(i) Based on the prioritization of major MS4 outfalls developed under Provision D.2.b.(2)(a), each Municipal Copermittee must identify, at a minimum, the top 10 percent of the~~10~~ highest priority major MS4 outfalls with non-storm water persistent flows that the Copermittee will monitor within each Watershed Management Area within its jurisdiction, with a minimum of one persistent ~~flow~~discharge outfall, and a maximum of 5 required per WMA. The location of the selected highest priority non-storm water persistent ~~flow~~ discharge MS4 outfall monitoring stations must be identified on the map required pursuant to Provision E.2.b.(1).

(ii) Each of the highest priority non-storm water persistent flow MS4 outfall monitoring stations identified pursuant to Provision D.2.b.(2)(b)(i) must be monitored under dry weather conditions at least ~~semi~~ annually until one of the following occurs:

[a] The non-storm water discharges have been effectively eliminated (i.e. no flowing, pooled, or ponded water) for three consecutive dry weather monitoring events; or

[b] The source(s) of the persistent flows has been identified as a category of non-storm water discharges that does not require an NPDES permit and does not have to be addressed as an illicit discharge because it was not identified as a source of pollutants (i.e. constituents in non-storm water discharge do not exceed NALs), and the persistent flow can be re-prioritized to a lower priority; or

[c] The constituents in the persistent flow non-storm water discharge do not exceed NALs, and the persistent flow can be re-prioritized to a lower priority; or

[d] The source(s) of the persistent flows has been identified as a non-storm water discharge authorized by a separate NPDES permit.

(iii) Where the criteria under Provision D.2.b.(2)(c)(ii) are not met, but the threat to water quality has been reduced by the Copermittee, the highest priority persistent flow MS4 outfall monitoring stations may be reprioritized accordingly for continued dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1).

(iv) Each Municipal Copermittee must document removal or re-prioritization of the highest priority persistent flow MS4 outfall monitoring stations identified under Provision D.2.b.(2)(b) in the Annual Report. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized MS4 major outfall in the Watershed Management Area within its jurisdiction, unless there are no remaining qualifying major MS4 outfalls within the Copermittee's jurisdiction in the Watershed Management Area.

(c) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Observations

During each semi-annual monitoring event, each Municipal Copermittee must record field observations consistent with Table D-6 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(d) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Monitoring

During each ~~semi-annual~~ monitoring event, if conditions allow the collection of the data, each Municipal Copermittee must monitor and record the parameters in Table D-2 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(e) Non-Storm Water Persistent Flow MS4 Outfall Discharge Analytical Monitoring

Comment [A49]: See discussion in section 3.5.3 of the comment letter.

During each semi-annual monitoring event in which measurable flow from the MS4 outfall to a flowing receiving water is present, each Municipal Copermittee must collect and analyze samples from each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) During development of the WQIP, for each WMA, consider the following sources to select constituents for collection of~~Collect~~ grab or composite samples to be analyzed at a qualified analytical laboratory::~~for the following constituents:~~

[a] Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,
[b] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,
[c] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,
[d] Applicable NAL constituents, and
[e] Constituents listed in Table D-8, unless the Copermittee has historical data that can demonstrate or provide justification that the analysis of the constituent is not necessary.

(iv) Copermittees may adjust the analytical list for a given WMA in successive monitoring events to add or eliminate constituents based on data that can demonstrate or provide justification regarding need or lack of need for the analysis of specific constituents.

Table D-8. Analytical Monitoring Constituents for Persistent Flow MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Total Hardness • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen	• Cadmium • Copper • Lead • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

• Ammonia		

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

~~(iv)~~(v) If the Copermittee identifies and eliminates the source of the persistent flow non-storm water discharge, analysis of the sample is not required.

c. WET WEATHER MS4 OUTFALL DISCHARGE MONITORING

The Copermittees must perform wet weather MS4 outfall monitoring to identify sources areas of pollutants in ~~storm water~~ discharges from the MS4s in the Watershed Management Area. The Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(1) Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees may adjust the wet weather MS4 outfall discharge monitoring locations and frequencies in the Watershed Management Area, as needed, to identify sources of pollutants in storm water discharges from MS4s in the Watershed Management Area in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of stations is at least equivalent to the number of stations required under Provision D.2.a.(3)(a).

(2) Wet Weather MS4 Outfall Discharge Monitoring Frequency

The Copermittees must monitor the wet weather MS4 outfall discharge monitoring stations in the Watershed Management Area at an appropriate frequency to identify source areas of pollutants in ~~storm water~~ discharges from the MS4s causing or contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan.

(3) Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or

estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

~~(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and~~

~~(d) Presence and assessment of trash in and around station.~~

Comment [A50]: These are inappropriate for wet weather observations.

(4) Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(5) Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

(iii) If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours.

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and

(iv) Applicable SAL constituents.

3. Special Studies

Comment [A51]: See discussion in section 3.5.3 of the comment letter.

a. Within the term of this Order, the Copermittees must initiate~~develop and implement~~ the following special studies:

(1) At least two~~three~~ special studies in each Watershed Management Area to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that cause or contribute to highest priority water quality conditions identified in the Water Quality Improvement Plan.

(2) At least one~~two~~ special study~~studies~~ for the San Diego Region to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that are impacting receiving waters on a regional basis in the San Diego Region.

(3) One of the two~~three~~ special studies in each Watershed Management Area may be replaced by a special study implemented pursuant to Provision D.3.a.(2).

b. The special studies must, at a minimum, be in conformance with the following criteria:

(1) The special studies must be related to the highest priority water quality conditions identified by the Copermittees in the Watershed Management Area and/or for the entire San Diego Region;

(2) The special studies developed pursuant to Provision D.3.a.(1) must:

(a) Be implemented within the applicable Watershed Management Area, and

(b) Require some form of participation by all the Copermittees within the Watershed Management Area;

(3) The special studies developed pursuant to Provision D.3.a.(2) must:

(a) Be implemented within the San Diego Region, and

(b) Require some form of participation by all Copermittees covered under the requirements of this Order.

c. Special studies developed to identify sources of pollutants and/or stressors should be pollutant and/or stressor specific and based on historical monitoring data and monitoring performed pursuant to Provisions D.1 and D.2. Development of source identification special studies should include the following:

(1) A compilation of known information on the specific pollutant and/or stressor, including data on potential sources and movement of the pollutant and/or stressor within the watershed. Data generated by the Copermittees and others, as well as information available from a literature research on the pollutant and/or stressor should be compiled and analyzed as appropriate.

(2) An identification of data gaps, based on the compiled information generated on the specific pollutant and/or stressor in Provision D.3.d.(1). Source identification special studies should be developed to fill identified data gaps.

(3) A monitoring plan that will collect and provide data the Copermittees can utilize to do the following:

(a) Quantify the relative loading or impact of a pollutant and/or stressor from a particular source or pollutant generating activity;

(b) Improve understanding of the fate of a pollutant and/or stressor in the environment;

(c) Develop an inventory of known and suspected sources of a pollutant and/or stressor in the Watershed Management Area; and/or

(d) Prioritize known and suspected sources of a pollutant and/or stressor based on relative magnitude in discharges, geographical distribution (i.e.,

regional or localized), frequency of occurrence in discharges, human health risk, and controllability.

d. Special studies initiated prior to the term~~acceptance~~ of ~~the~~this Order~~the Water Quality Improvement Plan~~ that meet the requirements of Provision D.3.b and are implemented~~completed~~ during the term of this Order may be utilized to fulfill the special study requirements of Provision D.3.a.

e. The Copermittees must submit the monitoring plans for the special studies in the Water Quality Improvement Plans required pursuant to Provision F.1.

f. The Copermittees are encouraged to share the results of the special studies regionally among the Copermittees to provide information useful in improving and adapting the management of non-storm water and storm water runoff through the implementation of the Water Quality Improvement Plans.

4. Assessment Requirements

Each Copermittee must evaluate the data collected pursuant to Provisions D.1, D.2 and D.3, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E, to assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a. Assessments must be performed as described in the following provisions:

a. RECEIVING WATERS ASSESSMENTS

(1) The Copermittees must assess and report the conditions of the receiving waters in the Watershed Management Area as follows:

(a) Based on data collected pursuant to Provision D.1.a, the assessments under Provision D.4.a.(2) must be included in the transitional~~first~~ Annual Report required pursuant to Provision F.3.b.(2~~1~~).

Comment [A52]: See our edits to that section

(b) Based on the data collected pursuant to Provisions D.1.a-e, the assessments required under Provision D.4.a.(2) must be included in the Report of Waste Discharge required pursuant to Provision F.5.b.

(2) The Copermittees must assess the status and trends of receiving water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under dry weather and wet weather conditions, as those conditions are affected by discharges from the Copermittees' MS4, to determine the progress towards meeting interim or final goals of the Water Quality Implementation Plan for the Watershed Management Area~~.~~ For each of the three types of receiving waters that are present in each Watershed Management Area the applicable Copermittees must:

Comment [A53]: See discussion in section 3.5.3 of the comment letter.

(a) Determine whether or not the conditions of the receiving waters are meeting any applicable numeric goals established pursuant to provision B.2.e.~~protective of the designated beneficial uses~~;

~~(b) Identify the most critical beneficial uses that must be protected or restored to ensure overall health of the receiving water;~~

~~(c) Determine whether or not those critical beneficial uses are being protected and where those beneficial used must be restored;~~

~~(d)~~(b) Identify short-term and/or long-term improvements or degradation of Receiving Water conditions related to those numeric goals~~those critical beneficial uses~~;

~~(e)~~(c) Identify data gaps in the monitoring data necessary to assess Provisions D.4.a.(2)(a)-(d).

b. MS4 OUTFALL DISCHARGES ASSESSMENTS

(1) Non-Storm Water Discharges Reduction Assessments

Comment [A54]: See discussion in section 3.5.3 of the comment letter for key changes. Other changes are described in comments below.

(a) ~~Each Copermittee must assess and report the progress of its illicit discharge detection and elimination program, required to be implemented pursuant to Provision E.2, toward reducing and effectively prohibiting non-storm water and illicit discharges into the MS4 within its jurisdiction as follows:~~

~~(i) Based on data collected pursuant to Provisions D.2.a.(2), the assessments under Provision D.4.b.(1)(b) must be included when complete in the Annual Report required pursuant to Provision F.3.b.(1).~~

~~(ii) Based on the data collected pursuant to Provisions D.2.b, the assessments required under Provision D.4.b.(1)(c) must be included in the first Annual Report required pursuant to Provision F.3.b.(1), and annually thereafter.~~

~~(iii) Based on the data collected pursuant to Provisions D.2.b, the assessment required under Provision D.4.b.(1)(c) must be included in the Report of Waste Discharge required pursuant to F.5.b.~~

Comment [A55]: For clarity and simplicity, these timelines were integrated into the following sections.

(b) Based on the transitional dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.a.(2), each

Municipal Copermittee must assess and report the following, as applicable to discharges from the MS4 (including Special District Copermittee MS4s) to flowing receiving waters within their jurisdiction, in the Annual Report required pursuant to Provision F.3.b.(2):~~:~~

(i) Identify the known and suspected controllable sources (e.g. facilities, areas, land uses, pollutant generating activities) of transient and persistent flow discharges to flowing receiving waters~~flows~~ within the Copermittee's jurisdiction in the Watershed Management Area;

(ii) Identify sources of transient and persistent flow discharges to flowing receiving waters~~flows~~ within the Copermittee's jurisdiction in the Watershed Management Area that have been reduced or eliminated; and

(iii) Identify modifications to the field screening monitoring locations and frequencies for the MS4 outfalls in its inventory necessary to identify and eliminate sources of persistent flow non-storm water discharges to flowing receiving waters, pursuant to Provision D.2.b.(1).

(c) Based on the dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b, each Municipal Copermittee must assess and report the following, as applicable to discharges from the MS4 (including Special District Copermittee MS4s) within their jurisdiction, in each Annual Report required pursuant to F.3.b.(3) and in the Report of Waste Discharge required pursuant to Provision F.5.b.:~~:~~

(i) The assessments required pursuant to Provision D.4.b.(1)(a~~b~~);

(ii) Based on the data collected and applicable NALs in the Water Quality Improvement Plan, rank the MS4 outfalls in the Copermittee's jurisdiction according to potential threat to receiving water quality, and produce a prioritized list of major MS4 outfalls for follow-up action to update the Water Quality Improvement Plan, with the goal of eliminating persistent flow non-storm water discharges to flowing receiving waters and/or pollutant loads in order of the ranked priority list through targeted programmatic actions and source investigations;

(iii) For the highest priority major MS4 outfalls with persistent flow discharges to a flowing receiving water~~flows~~ that are in exceedance of NALs, identify the known and suspected sources within the Copermittee's jurisdiction in the Watershed Management Area that may cause or contribute to the NAL exceedances;

(iv) Each Copermittee must analyze the data collected pursuant to Provision D.2.b.(2), and: ~~utilize a model or other method, to calculate or estimate the non-storm water volumes and pollutant loads collectively discharged from all the major MS4s outfalls in its jurisdiction identified as having persistent dry weather flows during~~

Comment [A56]: Per edits to that section

Comment [A57]: Per edits to that section

Comment [A58]: Per edits above

Comment [A59]: Edits to this section (and sub-sections) is different than SD edits.

~~the monitoring year. These calculations or estimates must be updated annually. Each Copermittee must calculate or estimate:~~

[a] Calculate or estimate annual non-storm water volumes and pollutant loads (associated with the priority constituents identified in the WQIP) collectively discharged from the monitored persistently flowing ~~Copermittee's~~ major MS4 outfalls discharging to flowing receiving waters within the Copermittee's jurisdiction, or discharged into another Copermittee's MS4 as demonstrated through provision E.2.d.~~with an estimate of the percent contribution from each known and suspected source for each MS4 outfall~~;

[b] Identify ~~identify~~ and quantify, where feasible, known sources of non-stormwater flows not ~~[b] Annual non-storm water volumes and pollutant loads from areas or facilities~~ subject to the Copermittee's legal authority that are discharged from the Copermittee's major MS4 outfalls to downstream receiving waters.

Comment [A60]: This is to help ensure jurisdictional accountability for what is being discharged from their jurisdiction.

(v) Each Copermittee must review the data collected pursuant to Provision D.2.b and findings from the assessments required pursuant to Provision D.4.b.(1)(c)(i)-(iv) ~~once per Permit termon an annual basis, and then report~~ within the Regional Monitoring and Assessment Report per Provision F.3.c., the following ~~to~~:

[a] Identify reductions and progress in achieving reductions in non-storm water and illicit discharges to the Copermittee's MS4 in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction, with an estimate, if possible, of the non-storm water volume and/or pollutant load reductions attributable to specific water quality strategies implemented by the Copermittee; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittee in the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction.

(vi) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(v).

(2) Storm Water Pollutant Discharges Reduction Assessments

(a) ~~The Copermittees must assess and report the progress of the water quality improvement strategies, required to be implemented pursuant to~~

~~Provisions B and E, toward reducing pollutants in storm water discharges from the MS4s within the Watershed Management Area as follows:~~

~~(i) Based on data collected pursuant to Provisions D.2.a.(3), the assessments under Provision D.4.b.(2)(b) must be included in the first Annual Report required pursuant to Provision F.3.b.(1).~~

~~Based on the data collected pursuant to Provisions D.2.c, the assessments required under ProvisionProvision first Annual Report required pursuant to Provision F.3.b.(1), and annually thereafter.~~

~~Based on the data collected pursuant to Provisions D.2.c, the assessment required under Provisions D.4.b.(2)(c)-(d) must be included in the Report of Waste Discharge required pursuant to F.5.b.~~

(b) Based on the transitional wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.a.(3) the Copermittees must assess and report the following in the Transitional Period Monitoring Report required pursuant to Provision F.3.b.(2):

(i) The Copermittees must analyze the monitoring data collected pursuant to Provision D.2.a.(3), and utilize a watershed model or other method, to calculate or estimate: ~~storm water volumes and pollutant loads discharged from the MS4s in each Copermittee's jurisdiction within the Watershed Management Area. The Copermittees must calculate or estimate the following for each monitoring year:~~

[a] The average storm water runoff coefficient for each land use type within the Watershed Management Area;

[b] The volume of storm water and pollutant loads discharged from each of the Copermittee's monitored major MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each monitored storm event with measurable rainfall greater than 0.1 inch, for each of the priority water quality constituents identified in the WQIP;

[c] The total volume and pollutant loads potentially discharged from each Municipal Copermittee's jurisdiction within the watershed management area, for each monitored event, extrapolated from the data produced from the monitored outfalls.

~~The pollutant loads discharged from each of the Copermittee's major MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch; and~~

~~[d] The percent contribution of storm water volumes and pollutant loads discharged from each land use type within the drainage basin to each of the Copermittee's major MS4 outfalls in its~~

Comment [A61]: See discussion in section 3.5.3 of the comment letter.

Comment [A62]: Removed as this was confusing as it was duplicative of the subsections below.

Comment [A63]: There is no need to perform this analysis for other pollutants not identified as priorities in the WQIP.

~~jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch.~~

(ii) Identify modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify ~~sources~~ pollutants in storm water discharges from the MS4s in the Watershed Management Area pursuant to Provision D.2.c.(1).

(c) Based on the wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.c the Copermittees must assess and report (i) and (ii) below in the annual reports required per F.3.b.(3), and (i) through (iv) below in the Regional Monitoring and Assessment Report required per F.3.c. ~~the following~~:

(i) The assessments required pursuant to Provision D.4.b.(2)(a~~b~~);

(ii) Based on the data collected and applicable SALs in the Water Quality Improvement Plan, analyze and compare the monitoring data to the analyses and assumptions used to develop the Water Quality Improvement Plans, including strategies developed per Provision B.3, and evaluate whether ~~,rank the MS4 outfalls in the Watershed Management Area according to potential threat to receiving water quality, and produce a prioritized list of major MS4~~ there is a need to update the Water Quality Improvement Plan;

(iii) The Copermittees must review the data collected pursuant to Provision D.2.c and findings from the assessments required pursuant to Provisions D.4.b.(2)(c)(i)-(ii) ~~on an annual basis~~ to:

[a] Identify reductions and progress in achieving reductions in pollutant concentrations and/or pollutant loads from different land uses and/or drainage areas discharging from the Copermittees' MS4s in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing pollutants in ~~storm water~~ discharges from the MS4s to receiving waters within the Watershed Management Area to the MEP, with an estimate, if possible, of the pollutant load reductions attributable to specific water quality strategies implemented by the Copermittees; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittees in the Watershed Management Area toward reducing pollutants in ~~storm water~~ discharges from the MS4s to receiving waters in the Watershed Management Area to the MEP.

(iv) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(iii).

Comment [A64]: See discussion in section 3.5.3 of the comment letter.

Comment [A65]: Per edits to that section

Comment [A66]: Per edits above

(d) Within the Regional Monitoring and Assessment report required pursuant to F.3.c.~~The~~ Copermittees must evaluate all the data collected pursuant to Provision D.2.c, and incorporate new outfall monitoring data into time series plots for each long-term monitoring constituent for the Watershed Management Area, and perform statistical trends analysis on the cumulative long-term wet weather MS4 outfall discharge water quality data set.

c. SPECIAL STUDIES ASSESSMENTS

The Copermittees must in the applicable annual report required pursuant to F.3.b.,~~annually~~ evaluate the results and findings from the special studies developed and implemented pursuant to Provision D.3, and assess their relevance to the Copermittees' efforts to characterize receiving water conditions, understand sources of pollutants and/or stressors, and control and reduce the discharges of pollutants from the MS4 outfalls to receiving waters in the Watershed Management Area. The Copermittees must report the results of the special studies assessments applicable to the Watershed Management Area, and identify any necessary modifications or updates to the Water Quality Improvement Plan based on the results in the Annual Reports required pursuant to Provision F.3.b.

d. INTEGRATED ASSESSMENT OF WATER QUALITY IMPROVEMENT PLAN

As part of the iterative approach and adaptive management process required for the Water Quality Improvement Plan pursuant to Provision B.5, the Copermittees in each Watershed Management Area must integrate the data collected pursuant to Provisions D.1-D.3, the findings from the assessments required pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to assess the effectiveness of, and identify necessary modifications to, the Water Quality Improvement Plan as follows:

(1) The Copermittees must re-evaluate the priority water quality conditions and numeric goals for the Watershed Management Area, as needed, during the term of this Order pursuant to Provision B.5.a. The re-evaluation and recommendations for modifications to the priority water quality conditions, and/or numeric goals and corresponding schedules may be provided in the Annual Reports required pursuant to Provision F.3.b, but must at least be provided in the Regional Monitoring and Assessment Report ~~of Waste Discharge~~ pursuant to Provision F.3.c~~5.b~~. The priority water quality conditions and numeric goals for the Watershed Management Area must be re-evaluated as follows:

(a) Re-evaluate the receiving water conditions in the Watershed Management Area in accordance with Provision B.2.a;

(b) Re-evaluate the impacts on receiving waters in the Watershed Management Area from MS4 discharges in accordance with Provision B.2.b;

(c) Re-evaluate the identification of MS4 sources of pollutants and/or stressors in accordance with Provision B.2.d;

(d) Identify beneficial uses of the receiving waters that are protected or must be restored in accordance with Provision D.4.a;

(e) Evaluate the progress toward achieving the interim and final numeric goals for restoring impacted beneficial uses in the receiving waters.

(2) The Copermittees must re-evaluate the water quality improvement strategies for the Watershed Management Area during the term of this Order pursuant to Provision B.5.b. The re-evaluation and recommendations for modifications to the water quality improvement strategies and schedules may be provided in the Annual Reports required pursuant to Provision F.3.b, but must at least be provided in the Regional Monitoring and Assessment Report pursuant to Provision F.3.c~~must be provided in the Annual Reports required pursuant to Provision F.3.b, and provided in the Report of Waste Discharge pursuant to Provision F.5.b~~. The water quality improvement strategies for the Watershed Management Area must be re-evaluated as follows:

(a) Identify the non-storm water and storm water pollutant loads from the Copermittees' MS4 outfalls in the Watershed Management Area, calculated or estimated pursuant to Provisions D.4.b;

(b) Identify the non-storm water and storm water pollutant load reductions, or other improvements to receiving water or water quality conditions, that are necessary to attain the interim and final numeric goals identified in the WQIP~~for restoring impacted beneficial uses in the receiving waters~~;

(c) Identify any~~the~~ non-storm water and storm water pollutant load reductions, or other improvements to the quality of MS4 discharges, that are necessary for the Copermittees to ~~demonstrate that non-storm water and storm water~~ reduce discharges of pollutants from their MS4s that have been demonstrated to be~~are not~~ causing or contributing to exceedances of receiving water limitations;

(d) Evaluate the progress of the water quality improvement strategies toward achieving the interim and final numeric goals identified in the WQIP~~for restoring impacted beneficial uses in the receiving waters~~.

(3) The Copermittees must re-evaluate and adapt the water quality monitoring and assessment program for the Watershed Management Area when new information becomes available to improve the monitoring and assessment

Comment [A67]: See discussion in section 3.5.3 of the comment letter.

program pursuant to Provision B.5.c. The re-evaluation and recommendations for modifications to the monitoring and assessment program may be provided in the Annual Reports required pursuant to Provision F.3.b, but must at least be provided in the Regional Monitoring and Assessment Report ~~of Waste Discharge~~ pursuant to Provision F.3.c~~5.b~~. Modifications to the water quality monitoring and assessment program must be consistent with the requirements of Provision D.1-D.3. The re-evaluation of the water quality monitoring and assessment program for the Watershed Management Area must consider the data gaps identified by the assessments required pursuant to Provisions D.4.a-b, and results of the special studies implemented pursuant to Provision D.4.c.

5. Monitoring Provisions

Each Copermittee must comply with all the monitoring, reporting, and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

E. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS

The purpose of this provision is for each Copermittee to implement a program to control the contribution of pollutants to and the discharges from the MS4 within its jurisdiction. The goal of the jurisdictional runoff management programs is to implement strategies that effectively prohibit non-storm water discharges to the MS4 and reduce the discharge of pollutants in ~~storm water~~ to the MEP. This goal will be accomplished through implementing the jurisdictional runoff management programs in accordance with the strategies identified in the Water Quality Improvement Plans.

Each Copermittee must update its jurisdictional runoff management program document, in accordance with Provision F.2.a, to incorporate all the requirements of Provision E, consistent with their legal authority. Until the Copermittee has updated its jurisdictional runoff management program document with the applicable requirements of Provision E, the Copermittee must continue implementing its current jurisdictional runoff management program.

Modification of Jurisdictional Runoff Management Program Requirements

Modifications shall be considered and where selected, proposed according to the process in Provision B.5. Proposed modifications may increase, decrease, and/or replace minimum requirements identified in Provision E.

1. Legal Authority Establishment and Enforcement

Comment [A68]: See discussion in section 3.6 of the comment letter.

a. Each Copermittee must establish, maintain, and enforce adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 through statute, ordinance, permit, or series of contracts, ~~order, or similar means~~ which~~. This legal authority must~~, at a minimum, authorize the Copermittee to:

(1) Effectively prohibit through ordinance, order or other similar means~~Prohibit and eliminate all~~ illicit discharges ~~and illicit connections~~ to its MS4;

(2) Control, through ordinance, permit, contract, order or similar means the contribution of pollutants in discharges to the MS4 by storm water discharges ~~of runoff~~ associated with industrial and construction activity ~~to its MS4~~, and ~~control~~ the quality of storm water discharges ~~runoff~~ from sites of industrial and construction activity~~sites~~, whose discharges have not been separately authorized through ~~that do not, including industrial and construction sites which~~ ~~have coverage under~~ the statewide General Permit for Discharges of Storm Water Associated with Industrial Activities (Industrial General Permit) or General Permit for Discharges of Storm Water Associated with Construction Activities (Construction General Permit)~~, as well as to those sites which do not;~~

Comment [A69]: See discussion in section 3.6.2 of the comment letter.

(3) Control, through ordinance, order or similar means the discharge to the MS4 of spills, dumping, or disposal of materials other than storm water ~~into its~~

Comment [A70]: See discussion in section 3.6.2 of the comment letter.

~~MS4~~;

(4) Control through interagency agreements among Copermittees the contribution of pollutants from one portion of the MS4 to another portion of the MS4;

(5) ~~Control, by coordinating and cooperating with other owners of the MS4 such as Caltrans, the U.S. federal government, or sovereign Native American Tribes through interagency agreements, where possible, the contribution of from their portion of the MS4 to the portion of the MS4 within the Copermittee's jurisdiction;~~

(6) Require compliance with conditions in its ~~statutes,~~ ordinances, permits, contracts, or orders~~, or similar means to hold dischargers to its MS4 accountable for their contributions of pollutants and flows~~;

(7) ~~Require the use of BMPs to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;~~

(8) ~~Require documentation on the effectiveness of BMPs implemented to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;~~

(9) ~~Utilize enforcement mechanisms to require compliance with its statutes, ordinances, permits, contracts, orders, or similar means; and~~

(10) Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with permit conditions~~its statutes, ordinances, permits, contracts, orders, or similar means and with the requirements of this Order~~, including the prohibition of illicit discharges and connections to its MS4; ~~the Copermittee must also have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from industrial facilities, including construction sites, discharging into its MS4.~~

b. With the first Annual Report required pursuant to Provision F.3.b, each Copermittee must submit a statement certified by its Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative that the Copermittee has taken the necessary steps to obtain and maintain full legal authority within its jurisdiction to implement and enforce each of the requirements contained in this Order.

2. Illicit Discharge Detection and Elimination

Each Copermittee must implement a program to actively detect and eliminate illicit discharges and improper disposal into the MS4, or otherwise require the discharger

Comment [A71]: See discussion in section 3.6.2 of the comment letter.

Comment [A72]: See discussion in section 3.6.2 of the comment letter.

Comment [A73]: See discussion in section 3.6.2 of the comment letter.

Comment [A74]: See discussion in section 3.6.2 of the comment letter.

Comment [A75]: See discussion in section 3.7 of the comment letter.

to apply for and obtain a separate NPDES permit. The illicit discharge detection and elimination program must be implemented in accordance with the strategies identified in the Water Quality Improvement Plan and include, at a minimum, the following requirements:

STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the illicit discharge detection and elimination program to address ~~non-storm water and~~ illicit discharges and connections that the Copermittee has identified as potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate ~~additional~~ BMPs, focus education, and/or increase/decrease frequency of inspections in specific areas); and

(2) The strategies and/or activities ~~must~~ may be modified from ~~consistent with~~ the default requirements of Provisions E.2.b-~~ea-d~~ ~~and~~ to be consistent with the strategies identified in the Water Quality Improvement Plan;

(3) The requirements of the programs as outlined in the following sub-provisions may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality improvement Plan(s).

a. NON-STORM WATER DISCHARGES

To the extent allowable by law, each~~Each~~ Copermittee must address all non-storm water discharges ~~from~~into the MS4 as illicit discharges, where the likelihood exists that they are a source of pollutants to the Receiving Waters, unless ~~a non-storm water~~the discharge is either identified as a discharge authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that is consistent with~~must be addressed pursuant to~~ the following requirements:

(1) ~~Discharges of non-storm water to the MS4 from the following categories must be addressed as illicit dischargeunless the discharge has coverage under NPDES Permit No. CAG919001 (Order No. R9-2007-0034, or subsequent order) for discharges to San Diego Bay, or NPDES Permit No. CAG919002 (Order No. R9-2008-0002, or subsequent order) for discharges to surface waters other than San Diego Bay.~~

Comment [A76]: See discussion in section 3.7.2 of the comment letter.

~~(a) Uncontaminated pumped ground water;~~

~~(b) Discharges from foundation drains;~~[20]

~~(c) Water from crawl space pumps; and~~

~~(d) Water from footing drains.~~[19]

(2) Discharges of non-storm water from water line flushing and water main breaks to the MS4 must be addressed as illicit discharges unless the discharge has coverage under a valid NPDES Permit, ~~No. CAG 679001~~ (Order No. R9-2010-0003, or a subsequent order). This category includes potable water line flushing ~~and water main break~~ discharges from water purveyors issued a water supply permit by the California Department of Public Health or federal military installations. Discharges from recycled or reclaimed water lines to the MS4 must be addressed as illicit discharges, unless the discharges have coverage under a separate NPDES permit.

Comment [A77]: See discussion in section 3.7.2 of the comment letter.

(3) Discharges of non-storm water into the MS4 from the following categories must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the individual discharge as a source of pollutants to receiving waters:

Comment [A78]: See discussion in section 3.7.2 of the comment letter.

(a) Diverted stream flows;

(b) Rising ground waters;

(c) Uncontaminated ground water infiltration to MS4s;

(d) Uncontaminated pumped ground water;

(e) Springs;

(f) Water from crawl space pumps;

~~(c)~~(g) Flows from riparian habitats and wetlands;

(h) Landscape irrigation;

(i) Irrigation water;

(j) Lawn watering;

Comment [A79]: See Legal Comments discussion.

[20] ~~Provision E.2.a.(1) only applies to this category on non-storm water if the system is designed to be located at or below the highest historical groundwater table to actively or passively extract groundwater during any part of the year.~~

~~(d)~~(k) Discharges from potable water sources;

~~(e)~~(l) Discharges from foundation drains;[21] ~~and~~

(m)Discharges from footing drains. .[21]

(4) Discharges of non-storm water into the MS4 from the following categories must be controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means~~. Discharges of non-storm water to the MS4 from the following categories not controlled by the requirements given below through~~ If such statutes, ordinances, permits, contracts, orders, or similar means have not been enacted by the Copermittee, the applicable categories below must be addressed by the Copermittee as illicit discharges.

Comment [A80]: See discussion in section 3.7.2 of the comment letter.

(a) Air conditioning condensation

The discharge of air conditioning condensation should~~must~~ be directed to landscaped areas or other pervious surfaces where feasible.

(b) Individual residential vehicle washing

(i) The discharge of wash water ~~must~~ should be directed to landscaped areas or other pervious surfaces where feasible; and

(ii) Minimize the use of water for vehicle washing, use as little washing detergent and other vehicle wash products as possible, wash vehicles at commercial wash facilities, and implement other practices or behaviors that will prevent the discharge of pollutants associated with individual residential vehicle washing from entering the MS4.

(c) Dechlorinated swimming pool discharges

(i) Eliminate residual chlorine, algaecide, filter backwash, or other pollutants from swimming pools prior to discharging to the MS4; and

(ii) The discharge of saline swimming pool water must be directed to the sanitary sewer, landscaped areas, or other pervious surfaces that can accommodate the volume of water, unless the saline swimming pool water can be discharged via a pipe or concrete channel directly to a naturally saline water body (e.g. Pacific Ocean).

(5) Firefighting discharges to the MS4 must be addressed by the Copermittee as

Comment [A81]: See discussion in section 3.7.2 of the comment letter.

[21] ~~Provision E.2.a.(3) only applies to this category of non-storm water discharge if the system is designed to be located above the highest historical groundwater table at all times of the year, and the system is only expected to discharge non-storm water under unusual circumstances.~~

follows:illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a significant source of pollutants to receiving waters. Firefighting discharges to the MS4 not identified as a significant source of pollutants to receiving waters, must be addressed, at a minimum, as follows:

(a) Non-emergency firefighting discharges

(i) Building fire suppression system maintenance discharges (e.g., sprinkler line flushing) to the MS4 must be addressed as illicit discharges unless appropriate BMPs are implemented.

(ii) Non-emergency firefighting discharges (i.e., discharges from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems) must be addressed by a program, to be developed and implemented by the Copermittee in conjunction with the local Fire Authority/District, to reduce or eliminate pollutants in such discharges from entering the MS4.

(b) Emergency firefighting discharges (i.e., flows necessary for the protection of life or property) do not require BMPs and need not be prohibited.

Each Copermittee should develop and encourage implementation of BMPs to reduce or eliminate pollutants in emergency firefighting discharges to the MS4s and receiving waters within its jurisdiction. During emergency situations, priority of efforts should be directed toward life, property, and the environment (in descending order). BMPs should not interfere with immediate emergency response operations or impact public health and safety.

(6) If the Copermittee or San Diego Water Board identifies any category of non-storm water discharges listed under Provisions E.2.a.(1)-(4) as a source of pollutants to receiving waters, the category must be effectively prohibited through ordinance, order, or similar means and addressed as an illicit discharge.

(7) Each Copermittee must, where feasible, reduce or eliminate non-storm water discharges listed under Provisions E.2.a.(1)-(4) into its MS4 whether or not the non-storm water discharge has been identified as an illicit discharge, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit.

Comment [A82]: See discussion in section 3.7.2 of the comment letter.

b. Prevent And Detect Illicit Discharges And Connections

Each Copermittee must include the following measures within its program to prevent and detect illicit discharges to the MS4:

(1) Each Copermittee must maintain an updated map of its entire MS4 and the corresponding drainage areas. The accuracy of the MS4 map must be confirmed during the field screening required pursuant to Provision E.2.c. The MS4 map must be included as part of the jurisdictional runoff management program document. Any geographic information system (GIS) layers or files used by the Copermittee to maintain the MS4 map must be made available to the San Diego Water Board upon request. The MS4 map must identify the following:

(a) All segments of the MS4 owned, operated, and maintained by the Copermittee;

(b) All known locations of inlets that discharge and/or collect runoff into the Copermittee's MS4;

(c) All known locations of connections with other MS4s not owned or operated by the Copermittee (e.g. Caltrans MS4s);

(d) All known locations of major MS4 outfalls as defined by 40 CFR §122.26(b)(5-6) ~~and private outfalls,~~ that discharge runoff collected from areas within the Copermittee's jurisdiction;

Comment [A83]: See discussion in section 3.7.2 of the comment letter.

(e) All segments of receiving waters within the Copermittee's jurisdiction that receive and convey runoff discharged from the Copermittee's MS4 outfalls;

(f) Locations of the MS4 outfalls, identified pursuant to Provision D.2.a.(1), within its jurisdiction; and

(g) Locations of the non-storm water persistent flow MS4 outfall discharge monitoring stations, identified pursuant to Provision D.2.b.(2)(b), within its jurisdiction.

(2) Each Copermittee must use Copermittee personnel and contractors to assist in identifying and reporting illicit discharges and connections during their daily employment activities.

(3) Each Copermittee must promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges to or from the MS4, including the following methods for public reporting:

(a) Operate a public hotline, which can be Copermittee-specific or shared by the Copermittees, and must be capable of receiving reports in both English and Spanish 24 hours per day and seven days per week; and

(b) Designate an e-mail address for receiving electronic reports from the public, which can be Copermittee-specific or shared by the Copermittees, and must be prominently displayed on the Copermittee's webpage and the Regional Clearinghouse required pursuant to Provision F.4.

(4) Each Copermittee must implement practices and procedures (including a notification mechanism) to prevent, respond to, contain, and clean up any spills that may discharge into the MS4 within its jurisdiction from any source. Such practices and procedures may include the coordination with other parties, such as sanitary sewer operators. The Copermittee must coordinate, to the extent possible, with spill response teams to prevent entry of spills into the MS4~~, and prevent contamination of surface water, ground water, and soil.~~ The Copermittee must coordinate spill prevention, containment, and response activities throughout all appropriate internal~~Copermittee~~ departments, programs, and agencies.

Comment [A84]: See discussion in section 3.7.2 of the comment letter.

(5) Each Copermittee must implement practices and procedures to ~~prevent~~ control and limit infiltration of seepage from sanitary sewers owned by a Copermittee agency (including private laterals and failing septic systems) to the MS4.

(6) Each Copermittee shall~~must~~ coordinate, when necessary, with upstream Copermittees and/or entities to prevent illicit discharges from upstream sources into the MS4 within its jurisdiction.

c. Field Screening

Each Copermittee must conduct field screening (i.e. visual observations, field testing, and/or analytical testing) of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4 in accordance with the dry weather MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

d. Investigate and Eliminate Illicit Discharges And Connections

Each Copermittee must include the following measures within its program to investigate and eliminate illicit discharges to the MS4 to comply with provision A.1.b:

(1) Each Copermittee must prioritize and determine when follow-up investigations will be performed in response to visual observations and/or water quality monitoring data collected during an investigation of a detected non-storm water ~~or~~ illicit discharge into or from the MS4. The criteria for prioritizing investigations must consider the following:

(a) Pollutants identified as causing or contributing to the highest water quality

priorities identified in the Water Quality Improvement Plan;

(b) Pollutants identified as causing or contributing, or threatening to cause or contribute to impairments in water bodies on the 303(d) List and/or in environmentally sensitive areas (ESAs), located within its jurisdiction;

(c) Pollutants identified from sources or land uses known to exist within the area, drainage basin, or watershed that discharges to the portion of the MS4 within its jurisdiction included in the investigation;

(d) Pollutants identified as causing or contributing to an exceedance of a NAL in the Water Quality Improvement Plan, where the source has not been identified as natural or otherwise permitted; and

(e) Pollutants identified as an immediate and significant threat to human health or the environment.

(2) Each Copermittee must implement procedures to investigate and inspect portions of its MS4 that, based on reports or notifications, field screening, or other appropriate information, indicate a reasonable potential of receiving, containing, or discharging pollutants due to illicit discharges, or illicit connections~~, or other sources of non-storm water~~. The procedures must include the following:

(a) Each Copermittee must develop criteria to:

(i) Assess the validity of each report or notification received; and

(ii) Prioritize the response to each report or notification received.

(b) Each Copermittee must prioritize and respond to each valid report or notification (e.g., public reports, staff or contractor reports and notifications, etc.) of an incident in a timely manner.

(c) ~~Each~~In accordance with the procedures defined in Provision E.2.d.(1), each~~Each~~ Copermittee must investigate and seek to identify the source(s) of discharges of non-storm water illicit discharges or illicit connections ~~where flows are~~ observed into and from the MS4 during the field screening required pursuant to Provision D.2.b.(1) as follows:

(i) Obvious illicit discharges (i.e., unusual color or odor) must be immediately investigated to identify the source(s) of non-storm water illegal discharges;

(ii) The investigation must include field investigations to identify sources or potential sources for the discharge, unless the source or potential source has already been identified during previous investigations; and

(iii) The investigation may include follow-up field investigations and/or reviewing Copermittee inventories and other land use data to identify potential sources of the discharge.

(d) Each Copermittee must maintain records and a database of the following information:

(i) Location of incident, including hydrologic subarea, portion of MS4 receiving the non-storm water ~~or~~ illicit discharge, and point of discharge or potential discharge from MS4 to receiving water;

(ii) Source of information initiating the investigation (e.g., public reports, staff or contractor reports and notifications, field screening, etc.);

(iii) Date the information used to initiate the investigation was received;

(iv) Date the investigation was initiated;

(v) Dates of follow-up investigations;

(vi) Identified or suspected source of the illicit discharge or connection, if determined;

(vii) Known or suspected related incidents, if any;

(viii) Result of the investigation; and

(ix) If a source cannot be identified and the investigation is not continued, a rationale for why a discharge does not pose a threat to water quality and/or does not require additional investigation.

(e) Each Copermittee must ~~track~~ document, and where feasible quantify, any readily~~and seek to~~ identifiable~~y~~ the source(s) of non-storm water illegal discharges from the MS4 where there is evidence of non-storm water ~~having been discharged~~illegal discharges or connections into or from the MS4 (e.g., pooled water), in accordance with MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.

Comment [A85]: See discussion in section 3.7.2 of the comment letter.

(3) Each Copermittee must initiate the implementation of procedures, in a timely manner, to eliminate all detected and identified illicit discharges and connections within its jurisdiction. The procedures must include the following responses:

(a) Each Copermittee must enforce its legal authority, as required under Provision E.1, to eliminate illicit discharges and connections to the MS4.

(b) If the Copermittee identifies the source as a controllable source of non-storm water ~~or~~ illicit discharge or connection, the Copermittee must implement its Enforcement Response Plan pursuant to Provision E.6 and enforce its legal authority to effectively prohibit and with the goal of eliminating~~e~~ illicit discharges and connections to its MS4.

(c) If the Copermittee identifies the source of the discharge as a category of non-storm water discharges in Provision E.2.a, and the discharge is in exceedance of NALs in the Water Quality Improvement Plan, then the Copermittee must determine if: (1) this is an isolated incident or set of circumstances that will be addressed through its Enforcement Response Plan pursuant to Provision E.6, or (2) the category of discharge must be addressed through the effective prohibition of that category of discharge as an illicit discharge pursuant to Provision E.2.a.(6).

(d) If the Copermittee suspects the source of the non-storm water discharge as natural in origin (i.e. non-anthropogenically influenced) and in conveyance into the MS4, then the Copermittee must document and provide the data and evidence necessary to demonstrate to the San Diego Water Board that it is natural in origin and does not require further investigation.

(e) If the Copermittee identifies that the discharge is coming from another Copermittees' jurisdiction, the receiving Copermittee must document and provide the findings to the upstream Copermittee. The obligation to implement the requirements of provision E.2.d.(3) are thenceforth the responsibility of the upstream Copermittee.

(f) If the Copermittee identifies the source as a non-storm water discharge that has been separately authorized by the San Diego Water Board, or that is contributing pollutants to the MS4 and that may require coverage under a WDR from the San Diego Water Board, the Copermittee shall provide all relevant findings to the San Diego Water Board and may back charge the Regional Board for the entire cost of conducting the source investigation.

Comment [A86]: See discussion in section 3.7.2 of the comment letter.

~~(e)~~(g) If the Copermittee is unable to identify and document the source of a recurring non-storm water discharge to or from the MS4, then the Copermittee must ~~address the discharge as an illicit discharge and~~ update its jurisdictional runoff management program to address the common and suspected sources of the non-storm water discharge within its jurisdiction in accordance with the Copermittee's priorities.

(4) Each Copermittee must submit a summary of the non-storm water discharges and illicit discharges and connections investigated and eliminated within its jurisdiction with each Annual Report required under Provision F.3.b of this Order.

3. Development Planning

Comment [A87]: See discussion in section 3.8 of the comment letter.

Each Copermittee must, within their jurisdiction, use their land use and planning

authorities, to the extent that they may lawfully impose requirements, to implement a development planning program in accordance with the strategies identified in the Water Quality Improvement Plan and includes, at a minimum, the following requirements:

STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Comment [A88]: See discussion in section 3.8.2 of the comment letter.

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the development planning program to address development and redevelopment projects that may become sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional or alternative BMPs, focus education, increase frequency of verifications and/or inspections, alternative compliance options);

(2) Each Copermittee must identify areas within its jurisdiction where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting and/or stream, channel, or habitat rehabilitation projects;

(3) Each Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify regional alternative compliance projects that Priority Development Projects may be allowed or should be encouraged to implement or participate in implementing; and

(4) The requirements of the programs as outlined in the following sub-provisions may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality improvement Plan(s).~~The strategies and/or activities must be consistent with the requirements of Provisions E.3.a-c and E.3.e-f and the strategies identified in the Water Quality Improvement Plan.~~

a. BMP REQUIREMENTS FOR ALL DEVELOPMENT PROJECTS

Each Copermittee, as practical and feasible, must prescribe the following BMP requirements during the planning process (i.e. prior to project approval and issuance of local permits) for all development projects (regardless of project type or size), where local permits are issued, including unpaved roads and flood management projects, except emergency / public safety projects implemented for the protection of persons and property:

(1) General Requirements

(a) Onsite BMPs must be located so as to remove pollutants from runoff prior to its discharge to any receiving waters, and as close to the source as possible; and

(b) Structural BMPs must not be constructed within a waters of the U.S.. ~~or waters of the state.~~

(2) Source Control BMP Requirements

The following source control BMPs must be implemented at all development projects where applicable and feasible:

(a) Prevention of illicit discharges into the MS4;

(b) Storm drain system stenciling or signage;

(c) Properly designed outdoor material storage areas;

(d) Properly designed outdoor work areas;

(e) Properly designed trash storage areas; and

(f) Any additional BMPs determined necessary by the Copermittee to minimize pollutant generation at each project.

(3) Low Impact Development (LID) ~~BMP Requirements~~Principles

Comment [A89]: See discussion in section 3.8.2 of the comment letter.

The following LID ~~BMPs~~ Principles must be implemented at all development projects where applicable and feasible:

(a) Maintenance or restoration of natural storage reservoirs and drainage corridors (including topographic depressions, areas of permeable soils, natural swales, and ephemeral and intermittent streams);[22]

(b) Buffer zones for natural water bodies (where buffer zones are technically infeasible, require project applicant to include other buffers such as trees, access restrictions, etc.);

(c) Conservation of natural areas within the project footprint including existing trees, other vegetation, and soils;

[22] Development projects proposing to dredge or fill materials in waters of the U.S. must obtain a CWA Section 401 Water Quality Certification. Projects proposing to dredge or fill waters of the state must obtain waste discharge requirements.

(d) Construction of streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided public safety is not compromised;

(e) Minimization of the impervious footprint of the project;

(f) Minimization of soil compaction to landscaped areas;

(g) Disconnection of impervious surfaces through distributed pervious areas;

(h) Landscaped or other pervious areas designed and constructed to effectively receive and infiltrate, retain and/or treat runoff from impervious areas, prior to discharging to the MS4;

(i) Small collection strategies located at, or as close as possible to, the source (i.e. the point where storm water initially meets the ground) to minimize the transport of runoff and pollutants to the MS4 and receiving waters;

(j) Use of permeable materials for projects with low traffic areas and appropriate soil conditions;

(k) Landscaping with native or drought tolerant species; and

(l) Harvesting and using precipitation.

b. PRIORITY DEVELOPMENT PROJECTS

(1) Definition of Priority Development Project

Priority Development Projects include the following:

(a) All new development projects that fall under the Priority Development Project categories listed under Provision E.3.b.(2) (where a new development project feature, such as a parking lot, falls into a Priority Development Project category, the entire project footprint is subject to Priority Development Project requirements); and

(b) Those redevelopment projects that create, add, or replace at least 5,000 square feet of impervious surfaces on an already developed site, and the redevelopment project is a Priority Development Project category listed under Provision E.3.b.(2) (where redevelopment results in an increase of less than fifty percent of the impervious surfaces of a previously existing development, and the existing development was not subject to Priority Development Project requirements, the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) apply only to the addition or replacement, and not to the entire development; where redevelopment

results in an increase of more than fifty percent of the impervious surfaces of a previously existing development, the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) apply to the entire development).

(c) Projects where redevelopment results in an increase of more than fifty percent of impervious surfaces of a previously existing development, and the existing development *was* subject to previous Priority Project Development Requirements, only the altered portion of development is subject to the new Priority Development Project requirements.

Comment [A90]: See discussion in section 3.8.2 of the comment letter.

(2) Priority Development Project Categories

Comment [A91]: See discussion in section 3.8.2 of the comment letter.

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This category includes commercial, industrial, residential, mixed-use, and public development projects on public or private land which fall under the planning and building authority of the Copermittee.

(b) New development projects that create 5,000 square feet or more of impervious surfaces (collectively over the entire project site), and are designed for support one or more of the following uses (see Appendix for definitions):

(i) Automotive repair shop
(ii) Restaurant
(iii) Parking lot[23]
(iv) Street, road, highway, freeway
(v) Retail gasoline outlet (RGO)

Comment [A92]: See footnote

~~(b) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.~~

~~(c) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812), where the land area for development is 5,000 square feet or more.~~

~~(d) Hillside development projects. This category includes any development which creates 5,000 square feet or more of impervious surface which is~~

[23] Excluding parking lots that are not subject to runoff, such as but not limited to covered or subterranean parking lots

~~located in an area with known erosive soil conditions, where the development will grade on any natural slope that is twenty-five percent or greater.~~

~~(e)~~(c) New development projects that create 2,500 square feet or more of impervious surfaces (collectively over the entire project site), and are ~~Environmentally sensitive areas (ESAs). This category includes any development~~ located within, directly adjacent to, or discharging directly to an ESA, ~~which either creates 2,500 square feet of impervious surface on a proposed project site or increases the area of imperviousness of a proposed project site to 10 percent or more of its naturally occurring condition.~~ "Directly adjacent to" means situated within 200 feet of the ESA. "Discharging directly to" means outflow from a drainage conveyance system that collects runoff from the subject development or redevelopment site and terminates at or in receiving waters within the ESA and is not commingled with flows from adjacent or other upstream lands.

~~(f) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce that has 5,000 square feet or more of impervious surface.~~

~~(g) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface that is 5,000 square feet or more used for the transportation of automobiles, trucks, motorcycles, and other vehicles.~~

~~(h) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.~~

~~(i)~~(d) Large development projects. This category includes any post-construction pollutant-generating new development projects that result in the permanent disturbance of one acre or more of land.

(3) Priority Development Project Exemptions

Comment [A93]: See discussion in section 3.8.2 of the comment letter.

Each Copermittee has the discretion to exempt the following projects from being defined as Priority Development Projects:

(a) New paved sidewalks, driveways, parking lots, bicycle lanes, or trails that meet the following criteria:

(i) Designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas; OR

(ii) Designed and constructed to be hydraulically disconnected from paved streets or roads; OR

(iii) Designed and constructed with permeable pavements or surfaces in accordance with USEPA Green Streets guidance.[24]

(b) Any impervious surface that is 5,000 square feet or more used for the transportation of automobiles, trucks, motorcycles, and other vehicles that is designed and constructed to the Maximum Extent Practicable in accordance with the USEPA Green Streets Guidance "Managing Wet Weather with Green Infrastructure: Green Streets"[25]. ~~Retrofitting of existing paved alleys, streets or roads that meet the following criteria:~~

~~(i) Must be two lanes or less; AND~~

~~(ii) Must be a retrofitting project implemented as part of an alternative compliance project option under Provision E.3.c.(3)(b)(v) to achieve the performance requirements of Provisions E.3.c.(1) and/or E.3.c.(2) for a Priority Development Project; AND~~

~~(iii) Designed and constructed in accordance with the USEPA Green Streets guidance.[26]~~

(c) Single-family residential projects that meet the following criteria:

(i) Must not be constructed as part of a larger development or proposed subdivision;

(ii) Successfully incorporate and document that they have incorporated, each of the applicable Source Control and LID BMP strategies identified in provisions E.3.a.(2)-(3) to the MEP.

~~(c) New single family residences that meet the following criteria:~~

~~(i) Must not be constructed as part of a larger development or proposed subdivision; AND~~

~~(ii) Designed and constructed to be certified under the U.S. Green Building Council (USGCB) Leadership in Energy and Environmental Design (LEED) for Homes green building certification program, receiving at least four (4) Surface Water Management credits under the Sustainable Sites category[27] OR~~

~~Designed and constructed with structural BMPs that will achieve the~~

[24] USEPA. 2008. http://water.epa.gov/infrastructure/greeninfrastructure/upload/gi_munichandbook_green_streets.pdf and http://water.epa.gov/infrastructure/greeninfrastructure/gi_policy.cfm#municipalhandbook ~~See "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).~~

~~[26] Ibid.~~

~~[27] See LEED for Homes rating system at http://www.usgbc.org~~

~~performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite~~

~~(d) Redevelopment of existing single family residences that meet the following criteria:~~

~~(i) Designed and constructed to be certified under the USGCB LEED for Homes green building certification program, receiving at least four (4) Surface Water Management credits under the Sustainable Sites category;[28] OR~~

~~(ii) Designed and constructed with structural BMPs that will achieve the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite.~~

(d) Watershed Protection Projects that meet the following criteria:

(i) Projects undertaken to rehabilitate or prevent environmental, social, and economic damage to the watershed, including receiving waters, by providing one or more of the following:

- Water quality protection by the proper management of stormwater and floodplains
- Flood risk reduction to adjacent land uses, stored matter and stockpiled material
- Elimination of the comingling of stormwater and hazardous materials
- Erosion Mitigation
- Restoration of Rivers and Ecosystems
- Groundwater Recharge
- Creation of new open space and wetlands
- Programs for water conservation, stormwater capture and management
- Retrofit projects constructed to improve water quality or address hydromodification.

(ii) AND are not expected to be pollutant generating or are designed to reduce existing pollutant loads

(iii) AND incorporate and document that they have incorporated, each of the applicable Source Control and LID BMP strategies identified in provisions E.3.a.(2)-(3) to the MEP.

(e) Emergency public safety projects in any of the Priority Development Categories may be excluded if the delay caused due to the requirement for a SSMP compromises public safety, public health and/or environmental protection

~~[28] See LEED for Homes rating system at http://www.usgbc.org~~

c. Priority Development Project Structural BMP Performance Requirements

In addition to the BMP requirements listed for all development projects under Provision E.3.a, Priority Development Projects must also implement structural BMPs that conform to performance requirements below. If watershed-specific performance requirements are ~~may be~~ developed as part of a Water Quality Improvement Plan; these requirements would take precedence over the general performance requirements below. The watershed-specific requirement must provide at least equal protection as the general performance requirements below.

(1) Storm Water Pollutant Control BMP Requirements

Comment [A94]: See discussion in section 3.8.2 of the comment letter.

Each Copermittee must require each Priority Development Project to implement onsite structural BMPs to control pollutants in storm water that may be discharged from a project as follows:

(a) Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite the pollutants contained in the design capture volume. The design capture volume is equivalent to:

(i) The volume of storm water runoff produced from a 24-hour 85th percentile storm event;[29] OR

(ii) The volume of storm water runoff produced from a 24-hour 85th percentile storm event, that would be retained onsite ~~if~~ in the pre-project condition. ~~site was fully undeveloped and naturally vegetated, as determined using continuous simulation modeling techniques based on site-specific soil conditions and typical native vegetative cover.~~

(b) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of~~to~~ complying with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1)(a).

~~(c) If a Priority Development project is allowed to utilize alternative compliance pursuant to Provisions E.3.c.(1)(b), flow-thru conventional~~

[29] This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals. The volume is a single event-based volume that occurs after an extended dry period.

~~treatment control BMPs must be implemented to treat the portion of the design capture volume that is not retained onsite. Additionally, project applicants must mitigate for the portion of the pollutant load in the design capture volume that is not retained onsite through one or more alternative compliance options under Provision E.3.c.(3). Conventional treatment control BMPs must be sized and designed to:~~

~~(i) Remove pollutants from storm water to the MEP;~~

~~(ii) Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;~~

~~(iii) Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Conventional treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of conventional treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.~~

(2) Hydromodification Management BMP Requirements

Comment [A95]: See discussion in section 3.8.2 of the comment letter.

Each Copermittee must require each Priority Development Project disturbing greater than one acre to implement management measures~~onsite structural BMPs~~ to ensure ~~manage hydromodification~~ that ~~may be caused by~~ storm water runoff discharged from the~~a~~ project won't cause adverse Hydromodification impacts in the downstream receiving waters as follows:

The Copermittees in each Watershed Management Area may establish within the WQIP, watershed specific mitigation requirements that will apply to priority development projects, based on the susceptibility of the receiving waters to Hydromodification impacts caused by the project, and consistent with the priorities and strategies identified in the WQIP. Such requirements may be uniform across a Hydrologic Unit, or identified at an appropriate smaller scale to ensure that receiving waters are properly protected.

(a) Post-project runoff flow rates and durations must not exceed pre-project ~~development (naturally occurring)~~ runoff flow rates and durations by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat conditions downstream of Priority Development Projects~~)~~.

(i) In evaluating the range of flows that results in increased potential for

erosion of natural (non-hardened) channels, the lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks.

~~(ii) For artificially hardened channels, analysis to identify the lower boundary must use characteristics of a natural stream segment similar to that found in the watershed. The lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or erodes the toe of the channel banks.~~

~~(iii)~~(ii) The Copermittees may use monitoring results collected pursuant to Provision D.1.a.(2) to re-define the range of flows resulting in increased potential for erosion, or degraded instream habitat conditions, as warranted by the data.

(b) Priority Development Projects ~~Post-project runoff flow rates and durations~~ must implement appropriate measures to minimize the ~~compensate for~~ the loss of sediment supply delivered ~~due~~ to the Receiving Waters, consistent with WQIP priorities, ~~development project,~~ should loss of sediment supply be anticipated to occur as a result of the development project.

(c) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of~~to comply with~~ the performance requirements of Provisions E.3.c.(2)(a)-(b).

(d) Exemptions

Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provisions E.3.c.(2)(a)-(b) where the project:

(i) Discharges storm water runoff into existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;

(ii) Discharges of storm water into conveyance channels whose bed and bank are engineered and maintained for the 10-year ultimate development flow rate all the way from the point of discharge from the project to an water body that is sufficiently resistant to hydromodification (water storage reservoirs, lakes, enclosed embayments, pacific ocean, or other water bodies identified in the WQIP);

~~(ii)~~(iii) Is a redevelopment Priority Development Project that meets the alternative compliance requirements of Provision E.3.c.(3)(b)(ii); or

~~(iii)~~(iv) Discharges storm water runoff into other areas identified by the San Diego Water Board as exempt from the requirements of Provisions E.3.c.(2)(a)-(b), through an approved WQIP.

(3) Alternative Compliance to Onsite Structural BMP Performance Requirements

Comment [A96]: See discussion in section 3.8.2 of the comment letter.

(a) Applicability

At the discretion of each Copermittee, Priority Development Projects may be allowed to implement one or more of the alternative compliance project options described in E.3.c.(3)(b) below, in lieu of complying with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2), under the following conditions:

(i) The Copermittee must determine that implementation of the alternative compliance option will have an equal or greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite;

(ii) The alternative compliance options must be designed by a registered professional engineer, geologist, architect, biologist, hydrologist, landscape architect, or other appropriate certified professional;

(iii) The alternative compliance option must be consistent with the strategies developed within the WQIP, for the highest priority water quality conditions.

(iv) The alternative compliance options must be implemented within the same Watershed Management Area as the Priority Development Project, and preferably within the same hydrologic subarea;

(v) The alternative compliance options must have reliable sources of funding for operation and maintenance.

(b) Alternative Compliance Options

(i) *LID Biofiltration Treatment Control BMPs*

LID biofiltration treatment control BMPs may be used as an alternative compliance option if the BMPs are sized and designed to:

[a] Remove pollutants from storm water to the MEP; AND
[b] Have an appropriate surface loading rate to prevent erosion, scour and channeling; AND
[c] Biofilter at least 1.0 times the design capture volume that is not reliably retained onsite

(ii) *LEED Certified Redevelopment Projects*

Priority Development Projects that are designed and constructed to be certified under the USGCB LEED for New Construction and Major Renovations green building certification program, or other locally accepted certification of equivalent effectiveness, may be considered as an acceptable alternative compliance option if the project meets the following criteria:

[a] The project is designed to receive at least: One (1) Site Design credit, and Two (2) Stormwater Design credits under the Sustainable Sites category.[30], and

[b] The existing and future configuration of the receiving water must not be unnaturally altered or adversely impacted by the project.

(iii) *Watershed-Based Planned Development Projects*

Priority Development Projects greater than 100 acres in total project size (or smaller than 100 acres in size yet part of a larger common plan of development that is over 100 acres) may be considered as an acceptable alternative compliance option if the project meets the following conditions:

[a] The Priority Development Project was planned utilizing watershed and/or subwatershed based water quality, hydrologic, and fluvial geomorphologic planning principles that implement regional LID BMPs in accordance with the performance and location criteria of this Order and acceptable to the San Diego Water Board;

[b] Regional LID BMPs may be used provided that the BMPs capture and retain the volume of runoff produced from the design capture volume defined in Provision E.3.c.(1)(a)(i) and that such controls are located upstream of receiving waters;

[c] Regional LID BMPs must clearly exhibit that they will not result in a net impact from pollutant loadings over and above the impact caused by capture and retention of the design capture volume;

[d] Any portion of the design capture volume that is not retained by the regional LID BMPs must be treated using biofiltration BMPs; and

[e] Where regional LID BMPs are demonstrated to the Copermittee as technically infeasible to retain the entire design capture volume, any volume up to and including the design capture volume not retained by regional LID BMPs, nor treated by biofiltration BMPs, must be treated using conventional treatment control BMPs and the project applicant must implement additional alternative compliance project, in-lieu fee and/or water quality

[30] See LEED for New Construction and Major Renovations rating system at http://www.usgbc.org

credit system options below.

(iv) *Offsite Projects*

Offsite Projects, such as but not limited to Regional BMPs; Retrofitting Projects; Channel, Stream or Habitat Rehabilitation Projects; Water Supply Augmentation Projects; or other Offsite Projects proposed by a project proponent, may be considered as an acceptable alternative compliance option if the offsite project meets the following requirements:

- The project must provide a net result of at least the same level of pollutant removal, and/or protection from potential downstream and upstream erosion in the receiving water as would be required to meet the performance requirements of Provision E.3.c.(1) and E.3.c.(2), as applicable.
- The project must be consistent with the strategies identified in the WQIP.
- The project must be constructed and operational prior to occupancy being granted for the PDP.

(v) *Conventional Treatment Control BMPs*

Onsite Conventional Treatment Control BMPs may be used as an alternative compliance option, only if the following criteria have been met:

[a] It has been demonstrated to the satisfaction of the Copermittee that it is technically infeasible to comply with the onsite requirements of E.3.c.(1), AND

[b] It has been demonstrated to the satisfaction of the Copermittee that it is technically infeasible to implement onsite Biofiltration Treatment Control BMPs, AND

[c] The Conventional Treatment Control BMPs will remove pollutants from storm water to the MEP; AND

[d] The Conventional Treatment Control BMPs will filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two; AND

[e] The Conventional Treatment Control BMPs are ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Conventional treatment control BMPs with a low removal

efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of conventional treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

~~(a) Applicability~~

~~At the discretion of each Copermittee, Priority Development Projects may be allowed to utilize an alternative option to comply with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) under the following conditions:~~

~~(i) The Copermittee must determine that implementation of the alternative compliance option will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite;~~

~~(ii) The alternative compliance options must be designed by a registered professional engineer, geologist, architector landscape architect;~~

~~(iii) The alternative compliance options must be implemented within the same hydrologichydrologic unit as the Priority Development Project, and preferably within the same hydrologic subarea;~~

~~(iv) Receiving waters must not be utilized to convey storm water runoff to the alternative compliance options;~~

~~(v) The pollutants in storm water runoff from the Priority Development Project must be treated to the MEP by the alternative compliance options prior to being discharged to receiving waters;~~

~~(vi) Unless otherwise allowed by Provision E.3.c.(3)(b), the alternative compliance options must have a net result of at least the same level of pollutant removal as would have been achieved if the Priority Development Project had fully complied with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1) onsite;~~

~~(vii) Unless otherwise allowed by Provision E.3.c.(3)(b), the alternative compliance options must have a net result of at least the same level of protection from potential downstream and upstream erosion in the receiving water as would have been achieved if the Priority Development Project had fully complied with the hydromodification management BMP performance requirements of Provision E.3.c.(2) onsite; and~~

~~(viii) The alternative compliance options utilized by the Priority Development Project must have reliable sources of funding for operation and maintenance.~~

~~(b) Alternative Compliance Project Options~~

~~The Copermittee may allow implementation of one or more of the following project options as part of an alternative approach to complying with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2):~~

~~(i) *Onsite LID Biofiltration Treatment Control BMPs*~~

~~The Copermittee may allow Priority Development Projects to utilize onsite LID biofiltration treatment control BMPs to comply with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1). Onsite LID biofiltration treatment control BMPs must be sized and designed to:~~

~~[a] Remove pollutants from storm water to the MEP; AND~~
~~[b] Have an appropriate surface loading rate to prevent erosion, scour and channeling within the BMP; AND~~
~~[c] Biofilter at least 1.5 times the design capture volume that is not reliably retained onsite; OR~~
~~[d] Biofilter up to the design capture volume that is not reliably retained onsite, AND 1) treat the remaining portion of the design capture volume not retained onsite with conventional treatment control BMPs in accordance with Provision E.3.c.(1)(c), and 2) if necessary, mitigate for the portion of the pollutant load in the design capture volume not retained onsite through one or more alternative compliance project, in-lieu fee and/or water quality credit system options below.~~

~~(ii) *LEED Certified Redevelopment Projects*~~

~~The Copermittee may allow redevelopment Priority Development Projects to comply with designed and constructed to be certified under the USGCB LEED for New Construction and Major Renovations green building certification program. The Priority Development Project must receive at least one (1) Site Design credit and two (2) Stormwater Design credits under the Sustainable Sites category.[31] In addition, the existing and future configuration of the receiving water must not be unnaturally altered or adversely impacted by storm water flow rates and durations discharged from the site.~~

~~(iii) *Watershed-Based Planned Development Projects*~~

~~The Copermittee may allow Priority Development Projects greater than 100 acres in total project size (or smaller than 100 acres in size~~

~~[31] See LEED for New Construction and Major Renovations rating system at http://www.usgbc.org~~

~~yet part of a larger common plan of development that is over 100 acres) to comply with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2). The Priority Development Project must comply with the following conditions:~~

~~[a] The Priority Development Project was planned utilizing watershed and/or subwatershed based water quality, hydrologic, and fluvial geomorphologic planning principles that implement regional LID BMPs in accordance with the performance and location criteria of this Order and acceptable to the San Diego Water Board;~~

~~[b] Regional LID BMPs may be used provided that the BMPs capture and retain the volume of runoff produced from the design capture volume defined in Provision E.3.c.(1)(a)(i) and that such controls are located upstream of receiving waters;~~

~~[c] Regional LID BMPs must clearly exhibit that they will not result in a net impact from pollutant loadings over and above the impact caused by capture and retention of the design capture volume;~~

~~[d] Any portion of the design capture volume that is not retained by the regional LID BMPs must be treated using biofiltration BMPs; and~~

~~[e] Where regional LID BMPs are demonstrated to the Copermittee as technically infeasible to retain the entire design capture volume, any volume up to and including the design capture volume not retained by regional LID BMPs, nor treated by biofiltration BMPs, must be treated using conventional treatment control BMPs and the project applicant must implement additional alternative compliance project, in-lieu fee and/or water quality credit system options below.~~

~~(iv) *Offsite Regional BMPs*~~

~~[a] The Copermittee may allow Priority Development Projects to utilize offsite regional BMPs to comply with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1) if the offsite regional BMPs have the capacity to receive and retain at least 1.1 times the design capture volume that is not reliably retained onsite.~~

~~[b] The Copermittee may allow Priority Development Projects to utilize offsite regional BMPs to comply with the hydromodification management BMP performance requirements of Provision E.3.c.(2) if the offsite regional BMPs have the capacity to manage the storm water flows rates and durations from the site such that the receiving waters are protected from the potential for increased erosion that would be caused if the unmanaged portion of the runoff was discharged from the site.~~

~~(v) *Offsite Retrofitting Projects*~~

~~The Copermittee may allow Priority Development Projects to utilize offsite retrofitting projects to comply with the storm water pollutant control and hydromodification management BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) if the retrofitting projects have been identified within the strategies included in the Water Quality Improvement Plan, or identified as potential retrofitting projects by the Copermittee pursuant to Provision E.5.~~

~~(vi) *Offsite Channel, Stream, or Habitat Rehabilitation Projects*~~

~~The Copermittee may allow Priority Development Projects to utilize offsite channel, stream, or habitat rehabilitation projects to comply with the hydromodification management BMP performance requirements of Provision E.3.c.(2) if the rehabilitation projects have been identified within the strategies included in the Water Quality Improvement Plan, or identified as potential channel rehabilitation projects by the Copermittee pursuant to Provision E.5. The channel, stream, or habitat rehabilitation project cannot be utilized for pollutant treatmentexcept where artificial wetlands areand located upstream of receiving waters.~~

~~(vii) *Offsite Regional Water Supply Augmentation Projects*~~

~~The Copermittee may allow Priority Development Projects to utilize offsite regional water supply augmentation projects (i.e. groundwater recharge, recycled water, storm water harvesting) to comply with the storm water pollutant control and hydromodification management BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) if the projects have been identified within the strategies included in the Water Quality Improvement Plan.~~

~~(viii) *Project Applicant Proposed Alternative Compliance Projects*~~

~~The Copermittee may allow one or more Priority Development Project applicant(s) to propose and implement alternative compliance projects to comply with the storm water pollutant control and hydromodification management BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) if the alternative compliance projects are consistent with, and will address the highest water quality priorities of the Water Quality Improvement Plan, and comply with the requirements of Provision E.3.c.(3)(a).~~

(c) Alternative Compliance In-Lieu Fee Option

The Copermittee may develop and implement an alternative compliance in-lieu fee option, individually or with other Copermittees and/or entities, as a means for designing, developing, constructing, operating and/or maintaining offsite alternative compliance projects under Provision E.3.c.(3)(b). Priority Development Projects allowed to utilize the

alternative compliance in-lieu fee option must comply with the following conditions:

(i) The in-lieu fee must be collected and held in accordance with the Mitigation Fee Act and all other applicable development fee laws. ~~transferred to the Copermittee (for public projects) or an escrow account (for private projects) prior to the date construction of the Priority Development Project is initiated~~.

Comment [A97]: Please see Legal Comments.

(ii) If the in-lieu fee is applied to the development, design, ~~and~~ construction, operation and maintenance of offsite alternative compliance projects, the following conditions must be met:

[a] The offsite alternative compliance projects must meet ~~allow~~ the criteria identified within E.3.c.(3)(b)~~-~~, for each Priority Development Project relying on~~to comply with~~ the alternative compliance project;~~onsite BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2);~~

[b] The offsite alternative compliance projects must be constructed as soon as possible, but no later than 4 years after the certificate of occupancy is granted for the first Priority Development Project that contributed funds toward the construction of the offsite alternative compliance projects, unless a longer period of time is provided for in an approved WQIP~~authorized by the San Diego Water Board Executive Officer~~;

~~[c] The in-lieu fee for the Priority Development Project must include mitigation of the pollutant loads and increased storm water flow rates and durations that are allowed to discharge from the site before the offsite alternative compliance projects are constructed; and~~

[d] The in-lieu fee must also include the cost to operate and maintain the offsite alternative compliance projects for the anticipated life of the constructed priority development project.

(iii) If the in-lieu fee applies only~~is applied~~ to the operation and maintenance of offsite alternative compliance projects that have already been constructed, the offsite alternative compliance projects must meet~~allow~~ the requirements of E.3.c.(3)(a)(iv) and (v) as applicable, for each Priority Development Project relying on~~to comply with~~ the alternative compliance project..~~onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2).~~

(d) Alternative Compliance Water Quality Credit System Option

The Copermittee may develop and implement an alternative compliance water quality credit system option, individually or with other Copermittees

and/or entities, provided that such a credit system clearly exhibits that it will not allow discharges from Priority Development Projects to cause or contribute to a net impact over and above the impact caused by projects meeting the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2). Any credit system that a Copermittee chooses to implement must be submitted to the San Diego Water Board Executive Officer for review and acceptance as part of the Water Quality Improvement Plan.

(4) Long-Term Structural BMP Maintenance

Each Copermittee must require the project applicant to submit proof of the mechanism under which ongoing long-term maintenance of all structural BMPs will be conducted.

(5) Infiltration and Groundwater Protection

(a) Structural BMPs designed to primarily function as large, centralized infiltration devices (such as large infiltration trenches and infiltration basins) must not cause or contribute to an exceedance of an applicable groundwater quality objective. At a minimum, such infiltration BMPs must be in conformance with the design criteria listed below, unless the development project applicant demonstrates to the Copermittee that one or more of the specific design criteria listed below are not necessary to protect groundwater quality. The design criteria listed below do not apply to small infiltration systems dispersed throughout a development project.

(i) Runoff must undergo pretreatment such as sedimentation or filtration prior to infiltration;

(ii) Pollution prevention and source control BMPs must be implemented at a level appropriate to protect groundwater quality at sites where infiltration BMPs are to be used;

(iii) Infiltration BMPs must be adequately maintained to remove pollutants in storm water to the MEP;

(iv) The vertical distance from the base of any infiltration BMP to the seasonal high groundwater mark must be at least 10 feet. Where groundwater basins do not support beneficial uses, this vertical distance criteria may be reduced, provided groundwater quality is maintained;

(v) The soil through which infiltration is to occur must have physical and chemical characteristics (e.g., appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses;

(vi) Infiltration BMPs must not be used for areas of industrial or light

industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee, unless first treated or filtered to remove pollutants prior to infiltration; and

(vii) Infiltration BMPs must be located a minimum of 100 feet horizontally from any water supply wells.

(b) The Copermittee may develop, individually or with other Copermittees, alternative mandatory design criteria to that listed above for infiltration BMPs which are designed to primarily function as centralized infiltration devices. Before implementing the alternative design criteria in the development planning process the Copermitee(s) must:

(i) Notify the San Diego Water Board of the intent to implement the alternative design criteria submitted; and

(ii) Comply with any conditions set by the San Diego Water Board.

d. BMP DESIGN MANUAL UPDATE

Each Copermittee must update and implement its BMP Design Manual[32] pursuant to Provision F.2.b. ~~Until the Copermittee has updated its BMP Design Manual with the requirements of Provisions E.3.a-c, the Copermittee must continue implementing its current BMP Design Manual. Unless directed otherwise by the San Diego Water Board, the Copermittee must implement the BMP Design Manual within 180 days of completing the update.~~ The update of the BMP Design Manual must include the following:

Comment [A98]: This info was incorporated into F.2.b.

(1) Updated procedures to determine the nature and extent of storm water requirements applicable to a potential development or redevelopment projects. These procedures must inform project applicants of the storm water management requirements applicable to their project including, but not limited to, general requirements for all development projects, structural BMP design procedures and requirements, hydromodification management requirements, requirements specific to phased projects, and procedures specific to private developments and public improvement projects;

(2) Updated procedures to identify ~~pollutants and conditions of concern for selecting~~ the most appropriate structural BMPs that consider, at a minimum, the following:

(a) The requirements of E.3.c.(1) and (2)

~~(a)~~(b) Receiving water quality (including pollutants for which receiving waters are listed as impaired under the CWA section 303(d) List);

[32] The BMP Design Manual was formerly known as the Standard Storm Water Mitigation Plan under Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016.

~~(b)~~(c) Pollutants, stressors, and/or receiving water conditions that cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

~~(c)~~(d) Land use type of the project and pollutants associated with that land use type; and

~~(d)~~(e) Pollutants expected to be present onsite.

(3) Updated procedures for designing structural BMPs, including any updated performance requirements to be consistent with the requirements of Provision E.3.c for all structural BMPs listed in the BMP Design Manual;

(4) Long-term maintenance criteria for each structural BMP listed in the BMP Design Manual; and

(5) Alternative compliance criteria, in accordance with the requirements under Provision E.3.c.(3), if the Copermittee elects to allow Priority Development Projects within its jurisdiction to utilize alternative compliance.

e. PRIORITY DEVELOPMENT PROJECT BMP IMPLEMENTATION AND OVERSIGHT

Each Copermittee must implement a program that requires and confirms structural BMPs on all Priority Development Projects are designed, constructed, and maintained to remove pollutants in storm water to the MEP.

(1) Structural BMP Approval and Verification Process

(a) Each Copermittee must require and confirm that for all Priority Development Project applications that have not received prior lawful approval by the Copermittee by 18 months after the commencement of coverage under this Order, the requirements of Provision E.3 are implemented. For project applications that have received prior lawful approval by 18 months after the commencement of coverage under this Order, the Copermittee may allow previous land development requirements to apply.

(b) Each Copermittee must identify the roles and responsibilities of their various municipal departments in implementing the structural BMP requirements, including each stage of a project from application review and approval through BMP maintenance and inspections.

(c) Each Copermittee must require and confirm that appropriate easements and ownerships are properly recorded in public records and the information is conveyed to all appropriate parties when there is a change in project or site ownership.

(d) Each Copermittee must require and confirm that prior to occupancy and/or intended use of any portion of the Priority Development Project, each structural BMP is inspected to verify that it has been constructed and is operating in compliance with all of its specifications, plans, permits, ordinances, and the requirements of this Order.

(2) Priority Development Project Inventory and Prioritization

(a) Each Copermittee must develop, maintain, and update ~~at~~regularly~~at least annually~~, a watershed-based database to track and inventory all constructed Priority Development Projects and associated structural BMPs within its jurisdiction. Inventories must be accurate and complete beginning from January 2002 for the San Diego County Copermittees, February 2003 for the Orange County Copermittees, and July 2005 for the Riverside County Copermittees~~.~~, where data is available.~~.~~ The use of an automated database system, such as GIS, is highly recommended. The database must include, at a minimum, the following information:

(i) Priority Development Project location (address and hydrologic subarea);

(ii) Descriptions of structural BMP type(s);

(iii) Date(s) of construction;

(iv) Party responsible for structural BMP maintenance;

(v) Dates and findings of structural BMP maintenance verifications; and

(vi) Corrective actions and/or resolutions when applicable.

(b) Each Copermittee must prioritize the Priority Development Projects with structural BMPs within its jurisdiction. The designation of Priority Development Projects as high priority must consider the following:

(i) The highest water quality priorities identified in the Water Quality Improvement Plan;

(ii) Receiving water quality;

(iii) Number and sizes of structural BMPs;

(iv) Recommended maintenance frequency of structural BMPs;

(v) Likelihood of operation and maintenance issues of structural BMPs;

(vi) Land use and expected pollutants generated; and

(vii) Compliance record.

(3) Structural BMP Maintenance Verifications and Inspections

Each Copermittee is required to verify that structural BMPs on each Priority

Development Project are adequately maintained, and continue to operate effectively to remove pollutants in storm water to the MEP through inspections, self-certifications, surveys, or other equally effective approaches.

(a) All (100 percent) of the structural BMPs at Priority Development Projects that are designated as high priority must be inspected directly by the Copermittee annually prior to each rainy season;

(b) For verifications performed through a means other than direct Copermittee inspection, adequate documentation must be required by the Copermittee to provide assurance that the required maintenance of structural BMPs at each Priority Development Project has been completed; and

(c) Appropriate follow-up measures (including re-inspections, enforcement, etc.) must be conducted to ensure that structural BMPs at each Priority Development Project continue to reduce pollutants in storm water to the MEP as originally designed.

f. DEVELOPMENT PROJECT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all development projects, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

g. ~~STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS~~

Comment [A99]: This section was moved to the beginning of provision E.3.

~~Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the development planning program to address development and redevelopment projects that may become sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:~~

~~(5) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, increase frequency of verifications and/or inspections, alternative compliance options);~~

~~(6) Each Copermittee must identify areas within its jurisdiction where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting and/or stream, channel, or habitat rehabilitation projects;~~

~~(7) Each Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify regional alternative compliance projects that Priority Development Projects may be allowed or should be encouraged to implement or participate in implementing; and~~

~~(8) The strategies and/or activities must be consistent with the requirements of Provisions E.3.a-c and E.3.e-f and the strategies identified in the Water Quality Improvement Plan.~~

4. Construction Management

Each Copermittee must implement a construction management program in accordance with the strategies identified in the Water Quality Improvement Plan and includes, at a minimum, the following requirements:

STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Comment [A100]: This section was moved from provision E.4.f, Changes are shown in Redline

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the construction management program to address construction sites that the Copermittee has identified as potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, and/or increase/decrease frequency of inspections for specific types of sites and/or activities); and

(2) The strategies and/or activities must be consistent with the requirements of Provisions E.4.c-e and the strategies identified in the Water Quality Improvement Plan.

(3) The requirements of the programs as outlined in the following sub-provisions may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality improvement Plan(s).

a. PROJECT APPROVAL PROCESS

Prior to issuance of any local permit(s) that allows the commencement of construction projects that involve ground disturbance or soil disturbing activities that has the reasonable potential to discharge a pollutant load to and from the MS4, as defined in each Copermittees' JRMP~~can potentially generate pollutants in storm water runoff~~, each Copermittee must:

(1) Require a ~~site-specific~~ Pollution Control Plan~~pollution control~~, construction BMP, and/or erosion and sediment control plan, to be submitted by the project applicant to the Copermittee;

(2) Confirm the Pollution Control Plan~~pollution control~~, construction BMP, and/or erosion and sediment control plan, complies with the local grading ordinance, other applicable local ordinances, and the requirements of this Order;

(3) Confirm the Pollution Control Plan~~pollution control~~, construction BMP, and/or erosion and sediment control plan, includes seasonally appropriate and effective BMPs and management measures described in Provision E.4.c, as applicable to the project; and

(4) Verify that the project applicant has obtained coverage under ~~applicable permits, including, but not limited to~~ the Construction General Permit~~, Clean Water Act Section 401 Water Quality Certification and Section 404 Permit, and California Department of Fish and Game Streambed Alteration Agreement~~.

b. CONSTRUCTION SITE INVENTORY AND TRACKING

(1) Each Copermittee must maintain, and update ~~at least monthly~~regularly, a watershed-based inventory of all construction projects issued a local permit that allows ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff. The use of an automated database system, such as GIS, is highly recommended. The inventory must include:

(a) Relevant contact information for each site (e.g., name, address, phone, and email for the owner and contractor);

(b) The basic site information including location (address and hydrologic subarea), Waste Discharge Identification (WDID) number (if applicable), size of the site, and approximate area of disturbance;

(c) Whether or not the site is considered a high threat to water quality, as defined in Provision E.4.b.(2) below;

(d) The project start and ~~anticipated~~ completion dates;

~~(e) Current construction phase;~~

~~(f)~~(e) The required inspection frequency, as defined in the Copermittee's jurisdictional runoff management program document;

~~(g)~~(f) The date the Copermittee accepted and/or approved the ~~site-specific~~ pollution control plan, construction BMP, and/or erosion and sediment control plan; and

~~(h)~~(g) Whether or not there are ongoing enforcement actions administered to the site.

Comment [A101]: Some of the info can only be updated based on an inspection, which may or may not be monthly year round for all sites.

Comment [A102]: The anticipated completion date is often unknown and can fluctuate based on unpredictable and unforeseen circumstances. Keeping track of accurate dates in an inventory would be difficult and would not add significant value to the database. Construction Inspectors keep a close eye on the progress of projects and would not need to rely on inventory data to achieve effective stormwater management and oversight. Once a project is completed, the date can be entered into the database,.

(2) Each Copermittee must identify all construction sites within its jurisdiction that represent a high threat to downstream surface water quality. The designation of construction sites as high threat to water quality must consider the following:

(a) Sites located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Sites located within the same hydrologic subarea and tributary to a water body segment listed as impaired for sediment on the CWA section 303(d) List;

(c) Sites located within, directly adjacent to, or discharging directly to a receiving water within an ESA; and

(d) Other sites determined by the Copermittees or the San Diego Water Board as a high threat to water quality.

c. CONSTRUCTION SITE BMP IMPLEMENTATION

Comment [A103]: See discussion in section 3.9.1 of the comment letter.

Each Copermittee must implement, or require the implementation of effective BMPs (for Copermittee construction sites and private construction sites, respectively) to reduce discharges of pollutants in ~~storm water~~ runoff from construction sites to the MEP, and effectively prohibit~~prevent~~ non-storm water discharges from construction sites into the MS4. These BMPs must be site specific, seasonally appropriate, and construction phase appropriate. BMPs must be implemented at each construction site year round. Dry season BMP implementation must plan for and address unseasonal rain events that may occur during the dry season (May 1 through September 30). Copermittees must implement, or require the implementation of, BMPs in the following categories:

(1) Project Planning;

(2) Good Site Management “Housekeeping”, including waste management;

(3) Non-storm Water Management;

(4) Erosion Control;

(5) Sediment Control;

(6) Run-on and Run-off Control; and

(7) Active/Passive Sediment Treatment Systems, where applicable.

d. CONSTRUCTION SITE INSPECTIONS

Each Copermittee must conduct construction site inspections to require and confirm compliance with its local permits and applicable local ordinances, and the requirements of this Order. Priority for site inspections must consider threat to water quality pursuant to Provision E.4.b as well as the nature of the construction activity, topography, and the characteristics of soils and receiving water quality.

(1) Inspection Frequency

(a) Each Copermittee must conduct inspections at all inventoried sites, including high threat to water quality sites, at an appropriate frequency for each phase of construction to confirm~~ensure~~ the site reduces the discharge of pollutants in runoff~~storm water~~ from construction sites to the MEP, and effectively prevents non-storm water discharges from entering the MS4.

(b) Each Copermittee must establish appropriate inspection frequencies for high threat to water quality sites, and all other sites, for each phase of construction. Inspection frequencies appropriate for addressing the highest water quality priorities identified in the Water Quality Improvement Plan, and for complying with the requirements of this Order must be identified in each Copermittee's jurisdictional runoff management program document.

(c) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e., re-inspection, enforcement) necessary to require and confirm site compliance with its local permits and applicable local ordinances, and the requirements of this Order.

(2) Inspection Content

Inspections of construction sites by the Copermittee must include, at a minimum:

(a) Verification of coverage under the Construction General Permit (Notice of Intent (NOI) and/or WDID number) during initial inspections, when applicable;

(b) Assessment of compliance with its local permits and applicable local ordinances related to pollution prevention, including the implementation and maintenance of applicable BMPs;

(c) Assessment of BMP adequacy and effectiveness;

(d) Visual observations of actual non-storm water discharges;

(e) Visual observations of actual or potential discharge of sediment and/or construction related materials from the site;

(f) Visual observations of actual or potential illicit connections; and

(g) If any violations are found and BMP corrections are needed, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried construction sites. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Site name, location (address and hydrologic subarea), and WDID number (if applicable);

(b) Inspection date;

(c) Weather condition during~~Approximate amount of rainfall since last~~ inspection;

(d) Description of problems observed with BMPs and indication of need for BMP addition/repair/replacement and any scheduled re-inspection, and date of re-inspection;

(e) Descriptions of any other specific inspection comments which must, at a minimum, include rationales for longer compliance time;

(f) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(g) Resolution of problems noted and date problems fixed.

e. CONSTRUCTION SITE ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried construction sites, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

5. Existing Development Management

Comment [A104]: See discussion in section 3.10 of the comment letter.

Each Copermittee must implement an existing development management program in accordance with the strategies identified in the Water Quality Improvement Plan. and includes, at a minimum, the following requirements:

STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Comment [A105]: Moved from sub-provision e. Changes shown in redline

Each Copermittee must implement the water quality improvement strategies, where necessary, to address areas of existing development within its jurisdiction that are identified as sources of pollutants and/or stressors contributing to the highest priority water quality conditions in the Watershed Management Area. For the existing development management program, the following strategies must be implemented:

(1) Specific Existing Development Management Program Strategies

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented within its jurisdiction to address areas of existing development that the Copermittee has identified as sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(a) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, and/or increase/decrease frequency of inspections for specific types of facilities, areas and/or activities);

(b) The facilities and/or areas within the Copermittee's jurisdiction where the strategies and/or activities will be implemented; and

(2) The requirements of the programs as outlined in the following sub-provisions may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality improvement Plan(s).~~The strategies and/or activities must be consistent with the requirements of Provisions E.5.b-d and the strategies identified in the Water Quality Improvement Plan.~~

a. EXISTING DEVELOPMENT INVENTORY AND TRACKING

Each Copermittee must maintain, and update at least annually, a watershed-based inventory of the existing development within its jurisdiction that ~~may~~has the reasonable potential to~~may~~ discharge a high priority pollutant load to and from the MS4, as defined in the Copermittee's JRMP. The use of an automated database system, such as GIS, is highly recommended. The inventory must, at a minimum, evaluate and include the following if identified as a source of a high priority pollutant~~include~~:

(1) Name, location (hydrological subarea and address, if applicable) of the following types of existing development with its jurisdiction:

(a) Commercial facilities or areas;

(b) Industrial facilities;

(c) Copermittee owned Municipal facilities, including:

(i) MS4 and related structures,[33]

(ii) Roads, streets, and highways,

(iii) Parking facilities,

(iv) Municipal airfields,

(v) Parks and recreation facilities,

(vi) Flood management projects and flood control devices and structures,

(vii) Operating or closed municipal landfills,

(viii) Publicly owned treatment works (including water and wastewater treatment plants) and sanitary sewer collection systems,

(ix) Corporate yards, including maintenance and storage yards for materials, waste, equipment, and vehicles,

(x) Hazardous waste collection facilities,

(xi) Other treatment, storage or disposal facilities for municipal waste, and

(xii) Other Copermittee owned municipal facilities that the Copermittee determines may contribute a significant high priority pollutant load to the MS4; and

(d) Residential areas, which may be designated by one or more of the following:

(i) Residential management area,

(ii) Drainage basin or area,

(iii) Land use (e.g., single family, multi-family, rural),

(iv) Neighborhood,

[33] The inventory may refer to the MS4 map required to be maintained pursuant to Provision E.2.b.(1).

(v) Common Interest Area,

(vi) Home Owner Association,

(vii) Mobile home park, and/or

(viii) Other designations accepted by the San Diego Water Board Executive Officer.

(2) A description of the facility or area, including the following information:

(a) Classification as commercial, industrial, municipal, or residential;

(b) Status of facility or area as active or inactive;

(c) Identification if a business is a mobile business;

(d) SIC Code or NAICS Code, if applicable;

(e) Industrial General Permit NOI and/or WDID number, if applicable;

(f) Identification if a residential area is or includes a Common Interest Area / Home Owner Association, or mobile home park;

(g) Identification of pollutants generated and potentially generated by the facility or area;

(h) Whether the facility or area is adjacent to an ESA;

(i) Whether the facility or area is tributary to and within the same hydrologic subarea as a water body segment listed as impaired on the CWA section 303(d) List and generates pollutants for which the water body segment is impaired; and

(j) Whether the facility or area contributes or potentially contributes to the highest priority water quality conditions identified in the Water Quality Improvement Plan.

(3) An annually updated map showing the location of inventoried existing development, watershed boundaries, and water bodies.

b. EXISTING DEVELOPMENT BMP IMPLEMENTATION AND MAINTENANCE

Each Copermittee must designate a minimum set of BMPs required for all inventoried existing development, including special event venues. The designated minimum BMPs must be specific to facility or area types and pollutant generating activities, as appropriate.

(1) Commercial, Industrial, and Municipal Facilities and Areas

(a) Pollution Prevention

Each Copermittee must require the use of appropriate pollution prevention methods by the commercial, industrial, and municipal facilities and areas in its inventoried existing development, as determined necessary by the Copermittee to address the priorities and strategies addressed in the WQIP.

(b) BMP Implementation

Comment [A106]: See discussion in section 3.10.2 of the comment letter.

Each Copermittee must ~~implement, or~~ require the implementation of, designated BMPs at commercial facilities and areas, industrial facilities, and implement designated BMPs at municipal facilities in its inventoried existing development, as determined necessary by the Copermittee to address the priorities and strategies addressed in the WQIP.

(c) BMP Operation and Maintenance

(i) Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development.

(ii) Each Copermittee must implement a schedule of operation and maintenance activities for its MS4 and related structures (including but not limited to catch basins, storm drain inlets, detention basins, etc.), and verify proper operation of all its municipal structural treatment controls designed to reduce pollutants (including floatables) in storm water discharges to or from its MS4s and related drainage structures. Operation and maintenance activities may include, but is not limited to, the following:

[a] Inspections of the MS4 and related structures;
[b] Cleaning of the MS4 and related structures; and
[c] Proper disposal of materials removed from cleaning of the MS4 and related structures.

(iii) Each Copermittee must implement a schedule of operation and maintenance for public streets, unpaved roads, paved roads, and paved highways and freeways within its jurisdiction to minimize pollutants that can be discharged in storm water.

(iv) Each Copermittee must implement the following controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers:

[a]~~.~~ Copermittees that operate both a municipal sanitary sewer system and a MS4 must implement controls and measures to

prevent and eliminate seeping sewage from infiltrating the MS4.

[b]- Copermittees that do not operate both a municipal sanitary sewer system and a MS4 must coordinate with sewering agencies to keep themselves informed of relevant and appropriate maintenance activities and sanitary sewage projects in their jurisdiction that may cause or contribute to seepage of sewage into the MS4.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Comment [A107]: See discussion in section 3.10.2 of the comment letter.

Each Copermittee must~~ implement BMPs, or~~ require the implementation of BMPs, to reduce pollutants in runoff~~storm water~~ discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from commercial facilities and areas, industrial facilities;~~,~~ and implement such BMPs at municipal facilities in its inventoried existing development. Such BMPs must include, as appropriate, educational activities, permits, certifications and other measures for applicators and distributors.

(2) Residential Areas

(a) Pollution Prevention

Each Copermittee must promote and encourage the use of pollution prevention methods, where appropriate, by the residential areas in its inventoried existing development.

(b) BMP Implementation

Each Copermittee must promote and encourage the implementation of designated BMPs at residential areas in its inventoried existing development.

(c) BMP Operation and Maintenance

Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at residential areas in its inventoried existing development.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must promote and encourage the implementation of BMPs to reduce pollutants in runoff~~storm water~~ discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from residential areas in its inventoried existing development.

c. EXISTING DEVELOPMENT INSPECTIONS

Each Copermittee must conduct inspections of inventoried existing development that have been identified by the Copermittee as having the reasonable potential to discharge pollutant loads from their MS4, to ensure compliance with applicable local ordinances and permits, and the requirements of this Order.

(1) Inspection Frequency

(a) Each Copermittee must establish appropriate inspection frequencies for inventoried existing development in accordance with the following requirements:

(i) At a minimum, inventoried existing development must be inspected once every five years utilizing one or more of the following methods:

[a] Drive-by inspections by Copermittee municipal and contract staff,
[b] Onsite inspections by Copermittee municipal and contract staff, and/or
[c] Inspections by volunteer monitoring or patrol programs trained by the Copermittee;

(ii) The frequency of inspections must be appropriate to confirm that BMPs are being implemented to reduce the discharge of pollutants in runoff~~storm water~~ from the MS4 to the MEP and effectively prohibit non-storm water discharges to the MS4;

(iii) The frequency of inspections must be based on the potential for a facility or area to discharge non-storm water and pollutants in storm water, and should reflect the priorities set forth in the Water Quality Improvement Plan;

~~(iv) Each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development;[34] and~~

~~(v)~~(iv) Inventoried existing development must be inspected by the Copermittee, as needed, in response to valid public complaints and findings from the Copermittee's municipal and contract staff or volunteer monitoring or patrol program inspections.

(b) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e. education and outreach, re-inspection, enforcement) necessary to require and confirm compliance with its applicable local

Comment [A108]: Recommend keeping this instead of SD proposed 'during the permit term'. The 'during the permit term' language is problematic for businesses that are added to the inventory during the permit term. For example, if a business is added to the inventory one month before the expiration of the permit, it may not be reasonable to expect it to be immediately inspected. It is also problematic for Riverside (and OC?), who may be added to the permit less than two years before the end of the permit term.

Comment [A109]: See discussion in section 3.10.2 of the comment letter.

~~[34] If any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspection may count toward the total annual inspection requirement. This requirement excludes linear municipal facilities (i.e., MS4, streets, roads and highways).~~

ordinances and permits and the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

(2) Inspection Content

(a) Inspections of existing development by the Copermittee or volunteer monitoring or patrol programs must include, at a minimum:

(i) Visual inspections for actual non-storm water discharges, if present;

(ii) Visual inspections for actual or potential discharge of pollutants, if present;

(iii) Visual inspections for actual or potential illicit connections, if present; and

(iv) Verification that the description of the facility or area in the inventory, required pursuant to Provision E.5.a.(2), has not changed.

(b) Onsite inspections of existing development by the Copermittee must include, at a minimum:

(i) Assessment of compliance with its applicable local ordinances and permits related to non-storm water and storm water discharges and runoff;

(ii) Assessment of the implementation of the designated BMPs;

(iii) Verification of coverage under the Industrial General Permit, when applicable; and

(iv) If any problems or violations are found, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried existing development. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Name and location of facility or area (address and hydrologic subarea) consistent with the inventory name and location, pursuant to Provision E.5.a.(1);

(b) Inspection and re-inspection date(s);

(c) Inspection method(s) (i.e. drive-by, onsite);

(d) Observations and findings from the inspection(s);

(e) For onsite inspections of existing development by Copermittee municipal or contract staff, the records must also include, as applicable:

(i) Description of any problems or violations found during the inspection(s),

(ii) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6, and

(iii) The date problems or violations were resolved.

d. EXISTING DEVELOPMENT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried existing development, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

e. RETROFITTING AND REHABILITATION~~STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS~~

~~Each Copermittee must implement the water quality improvement strategies, where necessary, to address areas of existing development within its jurisdiction that are identified as sources of pollutants and/or stressors contributing to the highest priority water quality conditions in the Watershed Management Area. For the existing development management program, the following strategies must be implemented:~~

~~(3) Specific Existing Development Management Program Strategies~~

~~Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented within its jurisdiction to address areas of existing development that the Copermittee has identified as sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:~~

~~(a) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, and/or increase/decrease frequency of inspections for specific types of facilities, areas and/or activities);~~

~~(b) The facilities and/or areas within the Copermittee's jurisdiction where the strategies and/or activities will be implemented; and~~

~~(c)~~(a) ~~The strategies and/or activities must be consistent with the requirements of Provisions E.5.b-d and the strategies identified in the Water Quality Improvement Plan.~~

~~(4)~~(3) Retrofitting Areas of Existing Development

Where identified in the WQIP as a required strategy to address the highest priority water quality conditions, each~~Each~~ Copermittee must describe in its jurisdictional runoff management program document, a program to retrofit areas of existing development within its jurisdiction to address identified sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must, where necessary pursuant to the strategies identified in the WQIP, identify areas of existing development as candidates for retrofitting, focusing on areas where retrofitting will address pollutants and/or stressors that contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for retrofitting projects may be utilized to reduce pollutants that may be discharged in storm water from areas of existing development, and/or address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of retrofitting projects, where needed in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting projects; and

(e) Where retrofitting projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional retrofitting projects (i.e. projects that can receive and/or treat storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment) adjacent to and/or downstream of the areas of existing development.

~~(5)~~(4) Stream, Channel and/or Habitat Rehabilitation in Areas of Existing Development

Where identified in the WQIP as a required strategy to address the highest priority water quality conditions, each~~Each~~ Copermittee must describe in its jurisdictional runoff management program document, a program to rehabilitate streams, channels, and/or habitats in areas of existing development within its jurisdiction to address the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must, where necessary pursuant to the strategies identified in the WQIP, identify streams, channels, and/or habitats in areas of existing development as candidates for rehabilitation, focusing on areas where stream, channel, and/or habitat rehabilitation projects will address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for stream, channel, and/or habitat rehabilitation projects may be utilized to address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters, rehabilitate channelized or hydromodified streams, restore wetland and riparian habitat, restore watershed functions, and/or ~~restore~~ protect beneficial uses of receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of stream, channel, and/or habitat rehabilitation projects, where needed, in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance stream, channel, and/or habitat rehabilitation projects; and

(e) Where stream, channel, and/or habitat rehabilitation projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional stream, channel, and/or habitat rehabilitation projects (i.e. projects that can receive storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment).

(5) Upon Regional Board Executive Officer approval the Copermittees may reallocate resources in the WQIPs for retrofit and rehabilitation project(s).

6. Enforcement Response Plans

Each Copermittee must develop and implement an Enforcement Response Plan as part of its jurisdictional runoff management program document. The Enforcement Response Plan must describe the applicable approaches and options to enforce its legal authority established pursuant to Provision E.1, as necessary, to achieve compliance with the requirements of this Order. Copermittees may continue to utilize and implement established, equivalent guidelines and procedures for enforcement. If such equivalent guidelines and procedures have not been developed, ~~T~~the Enforcement Response Plan must include the following:

a. ENFORCEMENT RESPONSE PLAN COMPONENTS

The Enforcement Response Plan must include the following individual components:

(1) Illicit Discharge Detection and Elimination Enforcement Component;

(2) Development Planning Enforcement Component;

(3) Construction Management Enforcement Component; and

(4) Existing Development Enforcement Component.

b. ENFORCEMENT RESPONSE APPROACHES AND OPTIONS

Each component of the Enforcement Response Plan must describe the enforcement response approaches that the Copermittee will implement to compel compliance with its statutes, ordinances, permits, contracts, orders, or similar means, and the requirements of this Order. The description must include the protocols for implementing progressively stricter enforcement responses. The enforcement response approaches must include appropriate sanctions, as legally appropriate, to compel compliance, including, at a minimum, the following tools or their equivalent:

(1) Verbal and written notices of violation;

(2) Cleanup requirements;

(3) Fines;

(4) Bonding requirements;

(5) Administrative and criminal (if intentional or criminally negligent) penalties;

(6) Liens;

(7) Stop work orders; and

(8) Permit and occupancy denials.

c. CORRECTION OF VIOLATIONS

(1) Violations must be corrected in a timely manner with the goal of correcting the violations within 30 calendar days after the violations are discovered, or prior to the next predicted rain event, whichever is sooner.

(2) The status of the enforcement actions~~If more than 30 calendar days are required to achieve compliance, then a rationale~~ must be recorded and updated in the applicable electronic database or tabular system used to track violations.

Comment [A110]: This is just asking for paperwork violations if someone forgets to write a specific justification – even if all appropriate steps are being diligently pursued. Request alternatively to simply require that the status be updated as appropriate.

d. ~~ESCALATED~~ PROGRESSIVE ENFORCEMENT

Comment [A111]: See discussion in section 3.11.2 of the comment letter.

(1) The Enforcement Response Plan must include a definition of "~~escalated~~ progressive enforcement." ~~Escalated~~ Progressive enforcement must include a series of enforcement actions that match the severity of the violations and include distinct, progressive steps. ~~any enforcement scenario where a violation or other non-compliance is determined to cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan~~. ~~Escalated~~ Progressive enforcement may be defined differently for development planning, construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and/or residential areas.

(2) Where the Copermittee determines ~~escalated~~ the identified progressive enforcement steps ~~is~~are not required, a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

(3) ~~Escalated~~ Progressive enforcement actions must continue to increase in severity, as necessary, to compel compliance as soon as possible.

e. REPORTING OF NON-COMPLIANT SITES

(1) Each Copermittee must notify the San Diego Water Board in writing within ~~22~~5 calendar~~2 working~~ days of issuing escalated enforcement (as defined in the Copermittee's Enforcement Response Plan) to a construction site that poses a significant threat to water quality as a result of violations or other non-compliance with its permits and applicable local ordinances, and the requirements of this Order. Written notification may be provided electronically by email.

(2) Each Copermittee must notify the San Diego Water Board of non-filers under the Industrial General Permit and Construction General Permit by email to Nonfilers_R9@waterboards.ca.gov.

7. Public Education and Participation

Each Copermittee must implement, individually or with other Copermittees, a public education and participation program in accordance with the strategies identified in the Water Quality Improvement Plan to promote and encourage the development of programs, management practices, and behaviors that reduce the discharge of pollutants in runoff~~storm water~~ to the MEP, prevent controllable non-storm water discharges from entering the MS4, and protect water quality standards in receiving waters.

STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Comment [A112]: Recommended move from (c)

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented within its jurisdiction, as applicable, to educate the public and encourage public participation to address potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) The target audiences and/or areas within the Copermittee's jurisdiction where the strategies and/or activities will be implemented;

(2) Provide specific details about how the strategies and/or activities will be implemented (e.g. educational topics, materials and/or activities, public outreach and participation programs and/or opportunities);

(3) Each Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify and implement regional public education and participation activities, programs and opportunities;

(4) Each Copermittee must incorporate a mechanism for evaluating and assessing educational and other public outreach activities, as needed, to identify progress and incorporate modifications necessary to increase the effectiveness of the public education and participation program.

(5) The requirements of the programs as outlined in the following sub-provisions

may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality improvement Plan(s).

a. PUBLIC EDUCATION

The public education program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) Educational activities, public information activities, and other appropriate outreach activities intended to reduce pollutants associated with the ~~application of pesticides, herbicides and fertilizer and other pollutants of concern in storm water discharges to and from its MS4 to the MEP, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed to address the~~ highest priority water quality conditions identified in the Water Quality Improvement Plan;

(2) Educational activities, public information activities, and other appropriate outreach activities to facilitate the proper management and disposal of used oil and toxic materials; and

(3) Appropriate education and training measures for specific target audiences, such as construction site operators, residents, underserved target audiences and school-aged children, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed, based on high risk behaviors and pollutants of concern.

b. PUBLIC PARTICIPATION

The public participation program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) A process for members of the public to participate in updating the highest priority water quality conditions, numeric goals, and water quality improvement strategies in the Water Quality Improvement Plan.

(2) Opportunities for members of the public to participate in providing the Copermittee recommendations for improving the effectiveness of the water quality improvement strategies implemented within its jurisdiction.

(3) Opportunities for members of the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in ~~storm wate~~r discharges from

the MS4, and/or ~~restoration and~~ protection of the quality of receiving waters.

8. Fiscal Analysis

a. ~~Each Copermittee must secure the resources necessary to meet all the requirements of this Order~~.

b. Each Copermittee must conduct an annual fiscal analysis of its jurisdictional runoff management program in its entirety. The fiscal analysis must include the following:

(1) Identification of the various categories of expenditures necessary to implement the requirements of this Order, including a description of the specific capital, operation and maintenance, and other expenditure items to be accounted for in each category of expenditures;

(2) The staff resources needed and allocated to meet the requirements of this Order, including any development, implementation, and enforcement activities required;

(3) The estimated expenditures for Provisions E.8.b.(1) and E.8.b.(2) for the current fiscal year; and

(4) The source(s) of funds that are proposed to meet the necessary expenditures described in Provisions E.8.b.(1) and E.8.b.(2), including legal restrictions on the use of such funds, for the current fiscal year and next fiscal year.

c. Each Copermittee must submit a summary of the annual fiscal analysis with each Annual Report required pursuant to Provision F.3.b.

d. Each Copermittee must provide the documentation used to develop the summary of the annual fiscal analysis upon request by the San Diego Water Board.

Comment [A113]: Since the monitoring period is different than a fiscal year, we won't be able to consistently and accurately report monitoring costs incurred by the Copermittees. (which are a big part of overall budgets)

Comment [A114]: Please see Legal Comments.

F. REPORTING

Comment [A115]: See discussion in section 3.14 of the comment letter.

The purpose of this provision is to determine and document compliance with the requirements set forth in this Order. The goal of reporting is to communicate to the San Diego Water Board and the people of the State of California the implementation status of each jurisdictional runoff management program and compliance with the requirements of this Order. This goal is to be accomplished through the submittal of specific deliverables to the San Diego Water Board by the Copermittees.

1. Water Quality Improvement Plans

Comment [A116]: See discussion in section 3.14.1 of the comment letter.

The Copermittees for each Watershed Management Area must develop and submit the Water Quality Improvement Plan in accordance with the following requirements:

a. WATER QUALITY IMPROVEMENT PLAN DEVELOPMENT

Each Water Quality Improvement Plan must be developed in accordance with the following process:

(1) Priority Water Quality Conditions and Numeric Goals

(a) The Copermittees must implement a public participation process to solicit data and information to be utilized in the development and identification of the priority water quality conditions for the Watershed Management Area.

(b) The Copermittees are encouraged to involve the public and key stakeholders as early and often as possible during the development of the priority water quality conditions and numeric goals to be included in the Water Quality Improvement Plan.

(c) Within 6 months after the commencement of coverage under this Order, the Copermittees must develop and submit the Water Quality Improvement Plan requirements of Provision B.2 to the San Diego Water Board. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of 60 days.

(d) The Copermittees must revise the priority water quality conditions and numeric goals based on comments received and/or recommendations or direction from the San Diego Water Board Executive Officer.

(2) Water Quality Improvement Strategies and Schedules

(a) The Copermittees are encouraged to involve the public and key stakeholders as early and often as possible during the development of the water quality improvement strategies and schedules to be included in the Water Quality Improvement Plan.

(b) Within 9 months after receipt~~the commencement~~ of public comments and/or recommendations from the Executive Officer per (1)(c) above~~coverage under this Order~~, the Copermittees must develop and submit the Water Quality Improvement Plan requirements of Provision B.3 to the San Diego Water Board. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of 60 days.

(c) The Copermittees must revise the water quality improvement strategies and schedules based on comments received and/or recommendations or direction from the San Diego Water Board Executive Officer.

b. WATER QUALITY IMPROVEMENT PLAN SUBMITTAL

(1) Within 6~~18~~ months after receipt~~the commencement~~ of public comments and/or recommendations from the Executive Officer per (2)(c) above~~coverage under this Order~~, the Copermittees for each Watershed Management Area must submit a complete Water Quality Improvement Plan in accordance with the requirements of Provision B to the San Diego Water Board. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of 30 days.

(2) Based on the comments received, the San Diego Water Board will determine whether to hold a public hearing or to limit public input to submittal of written comments. If no hearing is held the San Diego Water Board will notify the Copermittees within 6 months that the Water Quality Improvement Plan has been accepted as complete following its review and determination that the Water Quality Improvement Plan meets the requirements of this Order.

(3) The Copermittees must revise the Water Quality Improvement Plan based on comments received and/or recommendations or direction from the San Diego Water Board Executive Officer.

(4) The Water Quality Improvement Plan must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance by the San Diego Water Board.

(5) Copermittees must commence with implementation of the BMP strategies identified in the Water Quality Improvement Plan no later than the fiscal year (July 1) following San Diego Water Board approval of the Water Quality Improvement Plan, and the monitoring strategies identified in the Water Quality Improvement Plan no later than October 1st (or May 1st, whichever is sooner) following the San Diego Water Board approval of the Water Quality Improvement Plan.

2. Updates

Comment [A117]: See discussion in section 3.14.1 of the comment letter.

a. Jurisdictional Runoff Management Program Document Updates

Each Copermittee must update its jurisdictional runoff management program document in accordance with the following requirements:

(1) Each Copermittee is encouraged to involve the public and key stakeholders as early and often as possible to solicit recommendations for updates to its jurisdictional runoff management program document.

(2) Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E and the strategies identified in the applicable WQIPs no later than 6~~18~~ months after approval~~the commencement~~ of the applicable Water Quality Improvement Plans (or updates thereto).~~coverage under this Order.~~

(3) The updated JRMP document must be implemented beginning July 1st following completion of the update, unless directed otherwise by the Executive Officer.

~~(3)~~(4) Each Copermittee must submit any subsequent updates to its jurisdictional runoff management program, with a rationale for the modifications, either in the Annual Report required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge required pursuant to Provision F.5.b.

~~(4)~~(5) The Copermittee must revise the modifications as directed by the San Diego Water Board Executive Officer.

~~(5)~~(6) Updated jurisdictional runoff management program documents must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of submitting the Annual Report.

b. BMP Design Manual Updates

Each Copermittee must update its BMP Design Manual in accordance with the following requirements:

(1) Each Copermittee must update its BMP Design Manual to incorporate the requirements of Provisions E.3.a-d, and E.3.g. no later than 6~~18~~ months after approval~~the commencement~~ of the applicable Water Quality Improvement Plans..

Comment [A118]: This is necessary for the WQIP strategies to inform the Development Planning process

(2) Unless directed otherwise by the San Diego Water Board, the Copermittee must implement the updated BMP Design Manual within 180 days of

Comment [A119]: An implementation date was missing from the Tentative Order

completing updates to the BMP Design Manual.

~~(1)~~(3) Until the Copermittee begins implementation of its updated BMP Design Manual, the Copermittee must continue implementing its current BMP Design Manual~~coverage under this Order~~.

Comment [A120]: This was moved to here

~~(2)~~(4) Subsequent updates must be consistent with the requirements of Provisions E.3.a-d and must be submitted as part of the Annual Reports required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge required pursuant to Provision F.5.b.

~~(3)~~(5) Updated BMP Design Manuals must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of completing the update.

c. WATER QUALITY IMPROVEMENT PLAN UPDATES

The Water Quality Improvement Plans must be updated in accordance with the following process:

(1) The Copermittees must implement a public participation process to solicit data and information to be utilized in updating the Water Quality Improvement Plan.

(2) The Copermittees are encouraged to involve the public and key stakeholders as early and often as possible during the updates to the Water Quality Improvement Plan.

(3) The Copermittees for each Watershed Management Area must submit requested updates to the Water Quality Improvement Plan, with the public input received and the rationale for the requested updates, either in the Annual Reports required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The requested updates are considered accepted by the San Diego Water Board if no response is provided to the Copermittee after 3 months of submitting the request.

(4) The Copermittees must revise the requested updates as directed by the San Diego Water Board Executive Officer.

(5) Updated Water Quality Improvement Plans must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance of the requested updates by the San Diego Water Board.

3. Progress Reporting

Comment [A121]: See discussion in section 3.14.1 of the comment letter.

a. PROGRESS REPORT PRESENTATIONS

The Copermittees for each Watershed Management Area must appear before the San Diego Water Board, as requested by the San Diego Water Board, to provide progress reports on the implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs.

b. ANNUAL REPORTS

Comment [A122]: See discussion in section 3.14.1 of the comment letter.

(1) Transitional Period JRMP Reports: Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (Attachment D or accepted revision) no later than October 31 of each year prior to the implementation of updated JRMP programs pursuant to F.2.a. Each Copermittee must submit the information on the Jurisdictional Runoff Management Program Annual Report Form specific to the area within its jurisdiction in each Watershed Management Area.

(2) Transitional Period Monitoring Report: The transitional period monitoring conducted pursuant to D.1.a and D.2.a. shall be reported in a single report that covers the entire reporting period from the initiation of the transitional period monitoring (as described in D.1.a and D.2.a.), through September 30th following approval of the Water Quality Improvement Plan. The Transitional Period Monitoring Report shall include the assessments required per D.4.a.(1)(a), D.4.b.(1)(a) and D.4.b.(2)(a); and be submitted by January 31st following completion of the above mentioned transitional period.

~~(1)~~(3) Post-Transitional Annual Reports – Following the initial transitional period after enrollment into this Order, the~~The~~ Copermittees for each Watershed Management Area must submit an combined Annual Report for each reporting period no later than January 31 of the following year. The annual reporting period consists of two periods: 1) July 1 to June 30 of the following year for the jurisdictional runoff management programs, 2) October 1 to September 30 of the following year for the monitoring and assessment programs~~. The first Annual Report must be prepared for the reporting period beginning July 1 after commencement of coverage under this Order, and upon San Diego Water Board determination that the Water Quality Improvement Plan meets the requirements of this Order to June 30 in the following year for the jurisdictional runoff management programs, and September 30 in the following year for the monitoring and assessment programs.~~ Annual Reports must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Each Annual Report must include the following:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, summarized and presented in tabular and graphical form;

(b) Progress of the special studies required pursuant to Provision D.3, and the results or findings when a special study, or each phase of a special study, is completed;

(c) The findings from the applicable assessments required pursuant to Provision D.4;

Comment [A123]: Not all are required annually.

(d) The progress of implementing the Water Quality Improvement Plan, including, but not limited to, the following:

(i) The progress toward achieving the interim and final numeric goals for the highest water quality priorities for the Watershed Management Area,

(ii) The water quality improvement strategies that were implemented and/or no longer implemented by each of the Copermittees during the reporting period and previous reporting periods, and are planned to be implemented during the next reporting period,

(iii) Proposed modifications to the water quality improvement strategies, with public input received and rationale for the proposed modifications,

(iv) Previously proposed modifications or updates incorporated into the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document and implemented by the Copermittees in the Watershed Management Area, and

(v) Proposed modifications or updates to the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document;

(e) A completed Jurisdictional Runoff Management Program Annual Report Form (Attachment D or accepted revision) for each Copermittee in the Watershed Management Area, certified by a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative.

~~(2) Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (Attachment D or accepted revision) no later than October 31 of each year until the first Annual Report is required to be submitted. Each Copermittee must submit the information on the Jurisdictional Runoff Management Program Annual Report Form specific to the area within its jurisdiction in each Watershed Management Area.~~

Comment [A124]: Adapted into new section (1)

~~(3)~~(4) Each Copermittee must provide any data or documentation utilized in

developing the Annual Report upon request by the San Diego Water Board. ~~AnyAny~~Copermittee~~Any~~ monitoring data utilized in developing the Annual Report must be uploaded to the California Environmental Data Exchange Network (CEDEN).[35] Any Copermittee monitoring and assessment data utilized in developing the Annual Report must be provided on the Regional Clearinghouse required pursuant to Provision F.4.

C. REGIONAL MONITORING AND ASSESSMENT REPORT

(1) The Copermittees must submit a Regional Monitoring and Assessment Report no later than 180 days in advance of the expiration date of this Order. The Regional Monitoring and Assessment Report may be submitted as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The Regional Monitoring and Assessment Report shall incorporate the Integrated Assessment of the Water Quality Improvement Plan per D.4.d.

~~(1) The Copermittees must review the receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, and findings from the assessments required pursuant to Provision D.4, to assess the following:~~

~~(2)~~

~~(3) The beneficial uses of the receiving waters within the San Diego Region that are protected or must be restored;~~

~~(4)~~

~~(5) The progress toward restoring impacted beneficial uses in the receiving waters within the San Diego Region; and~~

~~(6)~~

~~(7) Pollutants or conditions of emerging concern that may impact beneficial uses in the receiving waters within the San Diego Region.~~

~~(8)~~

~~(9) The Regional Monitoring and Assessment Report must include recommendations for improving the implementation and assessment of the Water Quality Improvement Plans and jurisdictional runoff management programs.~~

(2) Each Copermittee must provide any data or documentation utilized in developing the Regional Monitoring and Assessment Report upon request by the San Diego Water Board. Any monitoring and assessment data utilized in developing the Regional Monitoring and Assessment Report must be provided on the Regional Clearinghouse required pursuant to Provision F.4.

[35] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

4. Regional Clearinghouse

The Copermittees must develop, update, and maintain an internet-based Regional Clearinghouse that is made available to the public no later than 18 months after the effective date of this Order.[36]

a. The Copermittees, through the Regional Clearinghouse, must make the following documents and data available, organized by Watershed Management Area, which may be linked to other internet-based data portals and databases where the original documents are stored:

(1) Water Quality Improvement Plan for the Watershed Management Area, and all updated versions with date of update;

(2) Annual Reports for the Watershed Management Area;

(3) Jurisdictional Runoff Management Program document for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(4) BMP Design Manual for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(5) Reports from special studies (e.g. source identification, BMP effectiveness assessment) conducted in the Watershed Management Area;

(6) Monitoring data collected pursuant to Provision D for each Watershed Management Area must be uploaded to CEDEN,[37] with links to the uploaded data; and

(7) Available GIS data, layers, and/or shapefiles used to develop the maps generated and maintained by the Copermittees for the Water Quality Improvement Plans, Annual Reports, and jurisdictional runoff management program documents.

b. The Copermittees, through the Regional Clearinghouse, must make the following information and documents available:

(1) Contact information (point of contact, phone number, email address, and mailing address) for each Copermittee;

[36] The Copermittee may elect to develop and maintain the clearinghouse(s) provided by other Copermittees or agencies.

[37] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

(2) Public hotline number for reporting non-storm water and illicit discharges for each Copermittee;

(3) Email address for reporting non-storm water and illicit discharges for each Copermittee;

(4) Link to each Copermittee's website, if available, where the public may find additional information about the Copermittee's storm water management program and for requesting records for the implementation of its program;

(5) Information about opportunities for the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in ~~storm water~~ discharges from the MS4, and/or restoration and protection of the quality of receiving waters; and

(6) Reports from regional monitoring programs in which the Copermittees participate (e.g. Southern California Monitoring Coalition, Southern California Coastal Water Research Project Bight Monitoring);

(7) Regional Monitoring and Assessment Reports; and

(8) Any other information, data, and documents the Copermittees determine as appropriate for making available to the public.

5. Report of Waste Discharge

a. The Orange County Copermittees and the Riverside County Copermittees are required to submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders. The San Diego Water Board will review and consider the Reports of Waste Discharge to determine whether modification to this Order, pursuant to the requirements of Provision H, will be required prior the Orange County Copermittees and/or Riverside County Copermittees becoming covered under this Order. The current Orders for the Orange County Copermittees and Riverside County Copermittees are rescinded upon notification of coverage under this Order except for enforcement purposes.

b. The Copermittees subject to the requirements of this Order must submit to the San Diego Water Board a complete Report of Waste Discharge as an application for the re-issuance of this Order and NPDES permit. The Report of Waste Discharge must be submitted no later than 180 days in advance of the expiration date of this Order. The Report of Waste Discharge must contain the following minimum information:

(1) Names and addresses of the Copermittees;

(2) Names and titles of the primary contacts of the Copermittees;

(3) Proposed changes to the Copermittees' Water Quality Improvement Plans and the supporting justification;

(4) Proposed changes to the Copermittees' jurisdictional runoff management programs and the supporting justification;

(5) Any other information necessary for the re-issuance of this Order;

(6) Any information to be included as part of the Report of Waste Discharge pursuant to the requirements of this Order; and

(7) Any other information required by federal regulations for NPDES permit reissuance.

6. Application for Early Coverage

a. The Orange County Copermittees, collectively, or Riverside County Copermittees, collectively, may apply for early coverage under this Order by submitting a Report of Waste Discharge Form 200 with a written request for early coverage under this Order.

Comment [A125]: This form requests information that is not applicable to MS4s.

b. The San Diego Water Board will review the application for early coverage. A notification of coverage under this Order will be issued to the Copermittees in the respective county by the San Diego Water Board upon completion of the early coverage application requirements. The effective coverage date will be specified in the notification of coverage. The Copermittees in the respective county are authorized to have MS4 discharges pursuant to the requirements of this Order starting on the effective coverage date specified in the notification of coverage. The existing Order for the respective county is rescinded upon the effective coverage date specified in the notification of coverage except for enforcement purposes.

7. Reporting Provisions

Each Copermittee must comply with all the reporting and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

G. PRINCIPAL WATERSHED COPERMITTEE RESPONSIBILITIES

1. The Copermittees within each Watershed Management Area must designate a Principal Watershed Copermittee and notify the San Diego Water Board of the name of the Principal Watershed Copermittee. ~~An individual Copermittee should not be designated a Principal Watershed Copermittee for more than two Watershed Management Areas.~~ The notification may be submitted with the Water Quality Improvement Plan required pursuant to Provision F.1 of this Order.

2. The Principal Watershed Copermittee is responsible for, at a minimum, the following:

a. Serving as liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues, and when necessary and appropriate, representing the Copermittees in the Watershed Management Area before the San Diego Water Board.

b. Facilitating the development of the Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order

c. Coordinating the submittal of the deliverables required by Provisions F.1, F.2, F.3.a, and F.3.b of this Order.

d. Coordinating the development of~~and developing~~, with the other Principal Watershed Copermittees, the requirements of Provisions F.3.c, F.4, and F.5.b of this Order.

H. MODIFICATION OF PROGRAMS

1. Modifications of the Order may be initiated by the San Diego Water Board or by the Copermittees, including as part of the ROWD process applicable to the Orange County and Riverside County Copermittees. Requests by Copermittees must be made to the San Diego Water Board.

2. Minor modifications to the Order may be made by the San Diego Water Board Executive Officer, where the proposed modification complies with all the effective prohibitions and limitations, and other requirements of this Order.

3. Proposed modifications to the Order outside of the WQIP process that are not minor require amendment of this Order in accordance with this Order's rules, policies, and procedures.

4. The San Diego Water Board may re-open and modify this Order at any time prior to its expiration, after opportunity for public comment and a public hearing, if the State Water Board determines that revisions are warranted to those provisions of the Order addressing compliance with water quality standards in the receiving water and/or those provisions of the Order establishing an iterative process for implementation of management practices to assure compliance with water quality standards in the receiving water.

I. STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

Each Copermittee must comply with all the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

ATTACHMENT A

DISCHARGE PROHIBITIONS AND SPECIAL PROTECTIONS

1. Basin Plan Waste Discharge Prohibitions

California Water Code Section 13243 provides that a Regional Water Board, in a water quality control plan, may specify certain conditions or areas where the discharge of waste or certain types of waste is not permitted. The following waste discharge effective prohibitions in the Water Quality Control Plan for the San Diego Basin (Basin Plan) are applicable to any person, as defined by Section 13050(c) of the California Water Code, who is a citizen, domiciliary, or political agency or entity of California whose activities in California could affect the quality of waters of the state within the boundaries of the San Diego Region.

1. The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in California Water Code Section 13050, is prohibited.

2. The discharge of waste to land, except as authorized by waste discharge requirements or the terms described in California Water Code Section 13264 is prohibited.

3. The discharge of pollutants or dredged or fill material to waters of the United States except as authorized by a National Pollutant Discharge Elimination System (NPDES) permit or a dredged or fill material permit (subject to the exemption described in California Water Code Section 13376) is prohibited.

4. Discharges of recycled water to lakes or reservoirs used for municipal water supply or to inland surface water tributaries thereto are prohibited, unless this San Diego Water Board issues a NPDES permit authorizing such a discharge; the proposed discharge has been approved by the State Department of Health Services (DHS) and the operating agency of the impacted reservoir; and the discharger has an approved fail-safe long-term disposal alternative.

5. The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the San Diego Water Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

6. The discharge of waste in a manner causing flow, ponding, or surfacing on lands not owned or under the control of the discharger is prohibited, unless the discharge is authorized by the San Diego Water Board.

7. The dumping, deposition, or discharge of waste directly into waters of the state, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the San Diego Water Board.

8. Any discharge to a storm water conveyance system that is not composed entirely of "*storm water*" is effectively prohibited unless authorized by the San Diego Water Board. [The federal regulations, 40 CFR 122.26(b)(13), define storm water as storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from fire fighting activities.] [§122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

9. The unauthorized discharge of treated or untreated sewage to waters of the state or to a storm water conveyance system is prohibited.

10. The discharge of industrial wastes to conventional septic tank/subsurface disposal systems, except as authorized by the terms described in California Water Code Section 13264, is prohibited.

11. The discharge of radioactive wastes amenable to alternative methods of disposal into the waters of the state is prohibited.

12. The discharge of any radiological, chemical, or biological warfare agent into waters of the state is prohibited.

13. The discharge of waste into a natural or excavated site below historic water levels is prohibited unless the discharge is authorized by the San Diego Water Board.

14. The discharge of sand, silt, clay, or other earthen materials from any activity, including land grading and construction, in quantities which cause deleterious bottom deposits, turbidity or discoloration in waters of the state or which unreasonably affect, or threaten to affect, beneficial uses of such waters is prohibited.

15. The discharge of treated or untreated sewage from vessels to Mission Bay, Oceanside Harbor, Dana Point Harbor, or other small boat harbors is prohibited.

16. The discharge of untreated sewage from vessels to San Diego Bay is prohibited.

17. The discharge of treated sewage from vessels to portions of San Diego Bay that are less than 30 feet deep at mean lower low water (MLLW) is prohibited.

18. The discharge of treated sewage from vessels, which do not have a properly functioning US Coast Guard certified Type I or Type II marine sanitation device, to portions of San Diego Bay that are greater than 30 feet deep at mean lower low water (MLLW) is prohibited.

2. Attachment B to State Water Board Resolution 2012-0012

Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges

I. PROVISIONS FOR POINT SOURCE DISCHARGES OF STORM WATER AND NONPOINT SOURCE WASTE DISCHARGES

The following terms, effective prohibitions, and special conditions (hereafter collectively referred to as special conditions) are established as limitations on point source storm water and nonpoint source discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in Areas of Special Biological Significance (ASBS), as required for State Water Quality Protection Areas pursuant to California Public Resources Code Sections 36700(f) and 36710(f). These Special Protections are adopted by the State Water Board as part of the California Ocean Plan (Ocean Plan) General Exception.

The special conditions are organized by category of discharge. The State Water Resources Control Board (State Water Board) and Regional Water Quality Control Boards (Regional Water Boards) will determine categories and the means of regulation for those categories [e.g., Point Source Storm Water National Pollutant Discharge Elimination System (NPDES) or Nonpoint Source].

A. PERMITTED POINT SOURCE DISCHARGES OF STORM WATER

1. General Provisions for Permitted Point Source Discharges of Storm Water

   a. Existing storm water discharges into an ASBS are allowed only under the following conditions:

      (1) The discharges are authorized by an NPDES permit issued by the State Water Board or Regional Water Board;

      (2) The discharges comply with all of the applicable terms, effective prohibitions, and special conditions contained in these Special Protections; and

      (3) The discharges:

         (i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

         (ii) Are designed to prevent soil erosion;

         (iii) Occur only during wet weather;

         (iv) Are composed of only storm water runoff.

   b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

   c. The discharge of trash is effectively prohibited.

d. Only discharges from existing storm water outfalls are allowed. Any proposed or new storm water runoff discharge shall be routed to existing storm water discharge outfalls and shall not result in any new contribution of waste to an ASBS (i.e., no additional pollutant loading). “Existing storm water outfalls” are those that were constructed or under construction prior to January 1, 2005. “New contribution of waste” is defined as any addition of waste beyond what would have occurred as of January 1, 2005. A change to an existing storm water outfall, in terms of re-location or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges are effectively prohibited except as provided below:

(1) The term “non-storm water discharges” means any waste discharges from a municipal separate storm sewer system (MS4) or other NPDES permitted storm drain system to an ASBS that are not composed entirely of storm water.

(2) (i) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability or occur naturally:

(a) Discharges associated with emergency fire fighting operations.

(b) Foundation and footing drains.

(c) Water from crawl space or basement pumps.

(d) Hillside dewatering.

(e) Naturally occurring groundwater seepage via a storm drain.

(f) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(ii) An NPDES permitting authority may authorize non-storm water discharges to an MS4 with a direct discharge to an ASBS only to the extent the NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

2. Compliance Plans for Inclusion in Storm Water Management Plans (SWMP) and Storm Water Pollution Prevention Plans (SWPPP).

The discharger shall specifically address the effective prohibition of non-storm water runoff and the requirement to maintain natural water quality for storm water discharges to an ASBS in an ASBS Compliance Plan to be included in its SWMP or a SWPPP, as appropriate to permit type. If a statewide permit includes a SWMP, then the discharger shall prepare a stand-alone compliance plan for ASBS discharges. The ASBS Compliance Plan is subject to approval by the Executive Director of the State Water Board (statewide permits) or

Executive Officer of the Regional Water Board (for permits issued by Regional Water Boards).

a. The Compliance Plan shall include a map of surface drainage of storm water runoff, showing areas of sheet runoff, prioritize discharges, and describe any structural Best Management Practices (BMPs) already employed and/or BMPs to be employed in the future. Priority discharges are those that pose the greatest water quality threat and which are identified to require installation of structural BMPs. The map shall also show the storm water conveyances in relation to other features such as service areas, sewage conveyances and treatment facilities, landslides, areas prone to erosion, and waste and hazardous material storage areas, if applicable. The SWMP or SWPPP shall also include a procedure for updating the map and plan when changes are made to the storm water conveyance facilities.

b. The ASBS Compliance Plan shall describe the measures by which all non-authorized non-storm water runoff (e.g., dry weather flows) has been eliminated, how these measures will be maintained over time, and how these measures are monitored and documented.

c. For Municipal Separate Storm Sewer System (MS4s), the ASBS Compliance Plan shall require minimum inspection frequencies as follows:

   (1) The minimum inspection frequency for construction sites shall be weekly during rainy season;

   (2) The minimum inspection frequency for industrial facilities shall be monthly during the rainy season;

   (3) The minimum inspection frequency for commercial facilities (e.g., restaurants) shall be twice during the rainy season; and

   (4) Storm water outfall drains equal to or greater than 18 inches (457 mm) in diameter or width shall be inspected once prior to the beginning of the rainy season and once during the rainy season and maintained to remove trash and other anthropogenic debris.

d. The ASBS Compliance Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff, that are necessary to comply with these special conditions, will be achieved through BMPs. Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that such installation would pose a threat to health or safety. BMPs to control storm water runoff discharges (at the end-of-pipe) during a design storm shall be designed to achieve on average the following target levels:

   (1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

   (2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges. The baseline for the reduction is the effective date of the Exception. The

baseline for these determinations is the effective date of the Exception, and the reductions must be achieved and documented within four (4) years of the effective date.

e. The ASBS Compliance Plan shall address erosion control and the prevention of anthropogenic sedimentation in ASBS. The natural habitat conditions in the ASBS shall not be altered as a result of anthropogenic sedimentation.

f. The ASBS Compliance Plan shall describe the non-structural BMPs currently employed and planned in the future (including those for construction activities), and include an implementation schedule. The ASBS Compliance Plan shall include non-structural BMPs that address public education and outreach. Education and outreach efforts must adequately inform the public that direct discharges of pollutants from private property not entering an MS4 are effectively prohibited. The ASBS Compliance Plan shall also describe the structural BMPs, including any low impact development (LID) measures, currently employed and planned for higher threat discharges and include an implementation schedule. To control storm water runoff discharges (at the end-of-pipe) during a design storm, permittees must first consider using LID practices to infiltrate, use, or evapotranspirate storm water runoff on-site.

g. The BMPs and implementation schedule shall be designed to ensure that natural water quality conditions in the receiving water are achieved and maintained by either reducing flows from impervious surfaces or reducing pollutant loading, or some combination thereof.

h. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents in storm water runoff that alter natural ocean water quality and the sources of these constituents.

(2) The report shall describe BMPs that are currently being implemented, BMPs that are identified in the SWMP or SWPPP for future implementation, and any additional BMPs that may be added to the SWMP or SWPPP to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the BMPs.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits), the discharger shall revise its ASBS Compliance Plan to incorporate any new or modified BMPs that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised SWMP or SWPPP, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural ocean water quality conditions due to the same constituent.

(5) Compliance with this section does not excuse violations of any term, effective prohibition, or condition contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within one year from the effective date of the Exception, the discharger shall submit a written ASBS Compliance Plan to the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that describes its strategy to comply with these special conditions, including the requirement to maintain natural water quality in the affected ASBS. The ASBS Compliance Plan shall include a time schedule to implement appropriate non-structural and structural controls (implementation schedule) to comply with these special conditions for inclusion in the discharger's SWMP or SWPPP, as appropriate to permit type.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these special conditions shall be implemented.

d. Within four (4) years of the effective date of the Exception, any structural controls identified in the ASBS Compliance Plan that are necessary to comply with these special conditions shall be operational.

e. Within four (4) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water, pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data, and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

(1) for municipalities, a demonstration of significant hardship to discharger ratepayers, by showing the relationship of storm water fees to annual household income for residents within the discharger's jurisdictional area, and the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or
(2) for other governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process.

B. NONPOINT SOURCE DISCHARGES

[NOT INCLUDED]
[PROVISIONS FOR NONPOINT SOURCE DISCHARGES NOT APPLICABLE]

II. ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES

[NOT INCLUDED]
[ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES NOT APPLICABLE]

III. ADDITIONAL REQUIREMENTS – WATERFRONT AND MARINE OPERATIONS

[NOT INCLUDED]
[ADDITIONAL REQUIREMENTS FOR WATERFRONT AND MARINE OPERATIONS NOT APPLICABLE]

IV. MONITORING REQUIREMENTS

Monitoring is mandatory for all dischargers to assure compliance with the Ocean Plan. Monitoring requirements include both: (A) core discharge monitoring, and (B) ocean receiving water monitoring. The State and Regional Water Boards must approve sampling site locations and any adjustments to the monitoring programs. All ocean receiving water and reference area monitoring must be comparable with the Water Boards' Surface Water Ambient Monitoring Program (SWAMP).

Safety concerns: Sample locations and sampling periods must be determined considering safety issues. Sampling may be postponed upon notification to the State and Regional Water Boards if hazardous conditions prevail.

Analytical Chemistry Methods: All constituents must be analyzed using the lowest minimum detection limits comparable to the Ocean Plan water quality objectives. For metal analysis, all samples, including storm water effluent, reference samples, and ocean receiving water samples, must be analyzed by the approved analytical method with the lowest minimum detection limits (currently Inductively Coupled Plasma/Mass Spectrometry) described in the Ocean Plan.

A. CORE DISCHARGE MONITORING PROGRAM

1. General sampling requirements for timing and storm size:

   Runoff must be collected during a storm event that is greater than 0.1 inch and generates runoff, and at least 72 hours from the previously measurable storm event. Runoff samples shall be collected when post-storm receiving water is sampled, and analyzed for the same constituents as receiving water and reference site samples (see section IV B) as described below.

2. Runoff flow measurements

   a. For municipal/industrial storm water outfalls in existence as of December 31, 2007, 18 inches (457mm) or greater in diameter/width (including multiple outfall pipes in combination having a width of 18 inches, runoff flows must be measured or calculated, using a method acceptable to and approved by the State and Regional Water Boards.
   b. This will be reported annually for each precipitation season to the State and Regional Water Boards.

3. Runoff samples – storm events

   a. For outfalls equal to or greater than 18 inches (0.46m) in diameter or width:

      (1) samples of storm water runoff shall be analyzed during the same storm as receiving water samples for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination, ; and

      (2) samples of storm water runoff shall be analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS

      (3) If an applicant has no outfall greater than 36 inches, then storm water runoff from the applicant's largest outfall shall be further analyzed during the same storm as receiving water samples for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates).

   b. For outfalls equal to or greater than 36 inches (0.91m) in diameter or width:

      (1) samples of storm water runoff shall be analyzed during the same storm as receiving water samples for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

      (2) samples of storm water runoff shall be further analyzed during the same storm as receiving water samples for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides

(pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates) and

(3) samples of storm water runoff shall be analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

c. For an applicant not participating in a regional monitoring program [see below in Section IV (B)] in addition to (a.) and (b.) above, a minimum of the two largest outfalls or 20 percent of the larger outfalls, whichever is greater, shall be sampled (flow weighted composite samples) at least three times annually during wet weather (storm event) and analyzed for all Ocean Plan Table A constituents, Table B constituents for marine aquatic life protection (except for toxicity, only chronic toxicity for three species shall be required), DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, and Ocean Plan indicator bacteria. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one (the largest) such discharge shall be sampled annually in each Region.

4. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may reduce or suspend core monitoring once the storm runoff is fully characterized. This determination may be made at any point after the discharge is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

B. OCEAN RECEIVING WATER AND REFERENCE AREA MONITORING PROGRAM

In addition to performing the Core Discharge Monitoring Program in Section II.A above, all applicants having authorized discharges must perform ocean receiving water monitoring. In order to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS, dischargers may choose either (1) an individual monitoring program, or (2) participation in a regional integrated monitoring program.

1. Individual Monitoring Program: The requirements listed below are for those dischargers who elect to perform an individual monitoring program to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within the affected ASBS. In addition to Core Discharge Monitoring, the following additional monitoring requirements shall be met:

   a. Three times annually, during wet weather (storm events), the receiving water at the point of discharge from the outfalls described in section (IV)(A)(3)(c) above shall be sampled and analyzed for Ocean Plan Table A constituents, Table B constituents for marine aquatic life, DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, salinity, chronic toxicity (three species), and Ocean Plan indicator bacteria.

      The sample location for the ocean receiving water shall be in the surf zone at the point of discharges; this must be at the same location where storm water runoff is sampled. Receiving water shall be sampled at approximately the same time prior to (pre-storm) and during (or immediately after) the same storm (post storm). Reference water quality shall also be sampled and analyzed for the same constituents pre-storm and post-storm, during the same storms when receiving water is sampled. Reference stations will be

determined by the State Water Board's Division of Water Quality and the applicable Regional Water Board(s).

b. Sediment sampling shall occur at least three times during every five (5) year period. The subtidal sediment (sand or finer, if present) at the discharge shall be sampled and analyzed for Ocean Plan Table B constituents for marine aquatic life, DDT, PCBs, PAHs, pyrethroids, and OP pesticides. For sediment toxicity testing, only an acute toxicity test using the amphipod Eohaustorius estuarius must be performed.

c. A quantitative survey of intertidal benthic marine life shall be performed at the discharge and at a reference site. The survey shall be performed at least once every five (5) year period. The survey design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The results of the survey shall be completed and submitted to the State Water Board and Regional Water Board at least six months prior to the end of the permit cycle.

d. Once during each five (5) year period, a bioaccumulation study shall be conducted to determine the concentrations of metals and synthetic organic pollutants at representative discharge sites and at representative reference sites. The study design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The bioaccumulation study may include California mussels (Mytilus californianus) and/or sand crabs (Emerita analoga or Blepharipoda occidentalis). Based on the study results, the Regional Water Board and the State Water Board's Division of Water Quality, may adjust the study design in subsequent permits, or add or modify additional test organisms (such as shore crabs or fish), or modify the study design appropriate for the area and best available sensitive measures of contaminant exposure.

e. Marine Debris: Representative quantitative observations for trash by type and source shall be performed along the coast of the ASBS within the influence of the discharger's outfalls. The design, including locations and frequency, of the marine debris observations is subject to approval by the Regional Water Board and State Water Board's Division of Water Quality.

f. The monitoring requirements of the Individual Monitoring Program in this section are minimum requirements. After a minimum of one (1) year of continuous water quality monitoring of the discharges and ocean receiving waters, the Executive Director of the State Water Board (statewide permits) or Executive officer of the Regional Water Board (Regional Water Board permits) may require additional monitoring, or adjust, reduce or suspend receiving water and reference station monitoring. This determination may be made at any point after the discharge and receiving water is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

2. Regional Integrated Monitoring Program: Dischargers may elect to participate in a regional integrated monitoring program, in lieu of an individual monitoring program, to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS. This regional approach shall characterize natural water quality, pre- and post-storm, in ocean reference areas near the mouths of identified open space watersheds and the effects of the discharges on natural water quality (physical, chemical, and toxicity) in the ASBS receiving waters, and should include benthic marine aquatic life and bioaccumulation components. The design of the ASBS stratum of a regional integrated monitoring program may deviate from the otherwise prescribed individual

monitoring approach (in Section IV.B.1) if approved by the State Water Board's Division of Water Quality and the Regional Water Boards.

a. Ocean reference areas shall be located at the drainages of flowing watersheds with minimal development (in no instance more than 10% development), and shall not be located in CWA Section 303(d) listed waterbodies or have tributaries that are 303(d) listed. Reference areas shall be free of wastewater discharges and anthropogenic non-storm water runoff. A minimum of low threat storm runoff discharges (e.g. stream highway overpasses and campgrounds) may be allowed on a case-by-case basis. Reference areas shall be located in the same region as the ASBS receiving water monitoring occurs. The reference areas for each Region are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean reference water samples must be collected from each station, each from a separate storm. A minimum of one reference location shall be sampled for each ASBS receiving water site sampled per responsible party. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

b. ASBS ocean receiving water must be sampled in the surf zone at the location where the runoff makes contact with ocean water (i.e. at "point zero"). Ocean receiving water stations must be representative of worst-case discharge conditions (i.e. co-located at a large drain greater than 36 inches, or if drains greater than 36 inches are not present in the ASBS then the largest drain greater than18 inches.) Ocean receiving water stations are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean receiving water samples must be collected during each storm season from each station, each from a separate storm. A minimum of one receiving water location shall be sampled in each ASBS per responsible party in that ASBS. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

c. Reference and receiving water sampling shall commence during the first full storm season following the adoption of these special conditions, and post-storm samples shall be collected when annual storm water runoff is sampled. Sampling shall occur in a minimum of two storm seasons. For those ASBS dischargers that have already participated in the Southern California Bight 2008 ASBS regional monitoring effort, sampling may be limited to only one storm season.

d. Receiving water and reference samples shall be analyzed for the same constituents as storm water runoff samples. At a minimum, constituents to be sampled and analyzed in reference and discharge receiving waters must include oil and grease, total suspended solids, Ocean Plan Table B metals for protection of marine life, Ocean Plan PAHs, pyrethroids, OP pesticides, ammonia, nitrate, phosphates, and critical life stage chronic toxicity for three species. In addition, within the range of the southern sea otter, indicator bacteria or some other measure of fecal contamination shall be analyzed.

3. Waterfront and Marine Operations: In addition to the above requirements for ocean receiving water monitoring, additional monitoring must be performed for marinas and boat launch and pier facilities:

a. For all marina or mooring field operators, in mooring fields with 10 or more occupied moorings, the ocean receiving water must be sampled for Ocean Plan indicator bacteria, residual chlorine, copper, zinc, grease and oil, methylene blue active substances (MBAS), and ammonia nitrogen.

   (1) For mooring field operators opting for an individual monitoring program (Section IV.B.1 above), this sampling must occur weekly (on the weekend) from May through October.

   (2) For mooring field operators opting to participate in a regional integrated monitoring program (Section IV.B.2 above), this sampling must occur monthly from May through October on a high use weekend in each month. The Water Boards may allow a reduction in the frequency of sampling, through the regional monitoring program, after the first year of monitoring.

b. For all mooring field operators, the subtidal sediment (sand or finer, if present) within mooring fields and below piers shall be sampled and analyzed for Ocean Plan Table B metals (for marine aquatic life beneficial use), acute toxicity, PAHs, and tributyltin. For sediment toxicity testing, only an acute toxicity test using the amphipod Eohaustorius estuarius must be performed. This sampling shall occur at least three times during a five (5) year period. For mooring field operators opting to participate in a regional integrated monitoring program, the Water Boards may allow a reduction in the frequency of sampling after the first sampling effort's results are assessed.

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ATTACHMENT B

STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

1. Standard Permit Provisions

Code of Federal Regulations Title 40 Section 122.41 (40 CFR 122.41) includes conditions, or provisions, that apply to all National Pollutant Discharge Elimination System (NPDES) permits. Additional provisions applicable to NPDES permits are in 40 CFR 122.42. All applicable provisions in 40 CFR 122.41 and 40 CFR 122.42 must be incorporated into this Order and NPDES permit. The applicable 40 CFR 122.41 and 40 CFR 122.42 provisions are as follows:

a. DUTY TO COMPLY [40 CFR 122.41(a)]

The Copermittee must comply with all of the provisions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

(1) The Copermittee must comply with effluent standards or effective prohibitions established under Section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or effective prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement. [40 CFR 122.41(a)(1)]

(2) The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to a civil penalty not to exceed $25,000 per day for each violation. The CWA provides that any person who *negligently* violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than 2 years, or both. Any person who *knowingly* violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both. Any person who knowingly violates Section 301, 302, 303, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, and who knows at that time that he thereby places another person in imminent danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of

not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.
[40 CFR 122.41(a)(2)]

(3) Any person may be assessed an administrative penalty by the San Diego Regional Water Quality Control Board (San Diego Water Board), State Water Resources Control Board (State Water Board), or United States Environmental Protection Agency (USEPA) for violating Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.
[40 CFR 122.41(a)(3)]

b. DUTY TO REAPPLY [40 CFR 122.41(b)]

If a Copermittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Copermittee must apply for and obtain a new permit.

c. NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE [40 CFR 122.41(c)]

It shall not be a defense for a Copermittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

d. DUTY TO MITIGATE [40 CFR 122.41(d)]

The Copermittee must take all reasonable steps to minimize or prevent any discharge or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

e. PROPER OPERATION AND MAINTENANCE [40 CFR 122.41(e)]

The Copermittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Copermittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by a Copermittee only when the operation is necessary to achieve compliance with the conditions of this permit.

f. PERMIT ACTIONS [40 CFR 122.41(f)]

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Copermittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

g. PROPERTY RIGHTS [40 CFR 122.41(g)]

This permit does not convey any property rights of any sort, or any exclusive privilege.

h. DUTY TO PROVIDE INFORMATION [40 CFR 122.41(h)]

The Copermittee must furnish to the San Diego Water Board, State Water Board, or USEPA within a reasonable time, any information which the San Diego Water Board, State Water Board, or USPEA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Copermittee must also furnish to the San Diego Water Board, State Water Board, or USPEA upon request, copies of records required to be kept by this permit.

i. INSPECTION AND ENTRY [40 CFR 122.41(i)]

The Copermittee must allow the San Diego Water Board, State Water Board, USEPA, and/or their authorized representative (including an authorized contractor acting as their representative), upon presentation of credentials and other documents as may be required by law, to:

(1) Enter upon the Copermittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit; [40 CFR 122.41(i)(1)]

(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit; [40 CFR 122.41(i)(2)]

(3) Inspect and photograph at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; [40 CFR 122.41(i)(3)] and

(4) Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location. [40 CFR 122.41(i)(4)]

j. MONITORING AND RECORDS [40 CFR 122.41(j)]

(1) Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity. [40 CFR 122.41(j)(1)]

(2) Except for records of monitoring information required by this permit related to the Copermittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five (5) years (or longer as required by 40 CFR Part 503), the

Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time. [40 CFR 122.41(j)(2)]

(3) Records for monitoring information must include: [40 CFR 122.41(j)(3)]

(a) The date, exact place, and time of sampling or measurements; [40 CFR 122.41(j)(3)(i)]
(b) The individual(s) who performed the sampling or measurements; [40 CFR 122.41(j)(3)(ii)]
(c) The date(s) analyses were performed; [40 CFR 122.41(j)(3)(iii)]
(d) The individual(s) who performed the analyses; [40 CFR 122.41(j)(3)(iv)]
(e) The analytical techniques or methods used; [40 CFR 122.41(j)(3)(v)] and
(f) The results of such analyses. [40 CFR 122.41(j)(3)(vi)]

(4) Monitoring must be conducted according to test procedures under 40 CFR Part 136 unless another method is required under 40 CFR Subchapters N or O. [40 CFR 122.41(j)(4)]

In the case of pollutants for which there are no approved methods under 40 CFR Part 136 or otherwise required under 40 CFR Subchapters N and O, monitoring must be conducted according to a test procedure specified in the permit for such pollutants. [40 CFR 122.44(i)(1)(iv)]

(5) The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. [40 CFR 122.41(j)(5)]

k. SIGNATORY REQUIREMENT [40 CFR 122.41(k)]

(1) All applications, reports, or information submitted to the San Diego Water Board, State Water Board, or USEPA must be signed and certified. (See 40 CFR 122.22) [40 CFR 122.41(k)(1)]

(a) *For a municipality, State, Federal, or other public agency.* [All applications must be signed] [b]y either a principal executive officer or ranking elected official. [40 CFR 122.22(a)(3)]

(b) All reports required by permits, and other information requested by the San Diego Water Board, State Water Board, or USEPA must be signed by a person described in paragraph (a) of this section, or by a duly authorized representative of that person. A person is a duly authorized representative only if: [40 CFR 122.22(b)]

(i) The authorization is made in writing by a person described in paragraph (a) of this section; [40 CFR 122.22(b)(1)]

(ii) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company, (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) [40 CFR 122.22(b)(2)] and,

(iii) The written authorization is submitted to the San Diego Water Board and State Water Board. [40 CFR 122.22(b)(3)]

(c) *Changes to authorization.* If an authorization under paragraph (b) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (b) of this section must be submitted to the San Diego Water Board prior to or together with any reports, information, or applications to be signed by an authorized representative. [40 CFR 122.22(c)]

(d) *Certification.* Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." [40 CFR 122.22(d)]

(2) The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both. [40 CFR 122.41(k)(2)]

I. REPORTING REQUIREMENTS [40 CFR 122.41(l)]

(1) *Planned changes.* The Copermittee must give notice to the San Diego Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when: [40 CFR 122.41(l)(1)]

(a) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); [40 CFR 122.41(l)(1)(i)] or

(b) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which

are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1).
[40 CFR 122.41(l)(1)(ii)]

(c) The alteration or addition results in a significant change in the Copermittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. [40 CFR 122.41(l)(1)(iii)]

(2) *Anticipated noncompliance*. The Copermittee must give advance notice to the San Diego Water Board or State Water Board of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.
[40 CFR 122.41(l)(2)]

(3) *Transfers*. This permit is not transferable to any person except after notice to the San Diego Water Board. The San Diego Water Board may require modification or revocation and reissuance of the permit to change the name of the Copermittee and incorporate such other requirements as may be necessary under the CWA.
[40 CFR 122.41(l)(3)]

(4) *Monitoring reports.* Monitoring results must be reported at the intervals specified elsewhere in this permit. [40 CFR 122.41(l)(4)]

(a) Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the San Diego Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices. [40 CFR 122.41(l)(4)(i)]

(b) If the Copermittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or another method required for an industry-specific waste stream under 40 CFR Subchapters N or O, the results of this monitoring must be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the San Diego Water Board or State Water Board.
[40 CFR 122.41(l)(4)(ii)]

(c) Calculations for all limitations which require averaging of measurements must utilize an arithmetic mean unless otherwise specified in the permit.
[40 CFR 122.41(l)(4)(iii)]

(5) *Compliance schedules*. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date. [40 CFR 122.41(l)(5)]

(6) *Twenty-four hour reporting.*

(a) The Copermittee must report any noncompliance that may endanger health or the environment. Any information must be provided orally within 24 hours from the time the Copermittee becomes aware of the circumstances. A written submission must also be provided within five (5) days of the time the Copermittee becomes aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6)(i)]

(b) The following must be included as information which must be reported within 24 hours under this paragraph: [40 CFR 122.41(l)(6)(ii)]

(i) Any unanticipated bypass that exceeds any effluent limitation in the permit (See 40 CFR 122.41(g)). [40 CFR 122.41(l)(6)(ii)(A)]
(ii) Any upset which exceeds any effluent limitation in the permit. [40 CFR 122.41(l)(6)(ii)(B)] and,
(iii) Violation of a maximum daily discharge limitation for any of the pollutants listed by the San Diego Water Board in the permit to be reported within 24 hours. (See 40 CFR 122.44(g)) [40 CFR 122.41(l)(6)(ii)(C)]

(c) The San Diego Water Board may waive the above-required written report on a case-by-case basis if the oral report has been received within 24 hours. [40 CFR 122.41(l)(6)(iii)]

(7) *Other noncompliance.* The Copermittee must report all instances of noncompliance not reported in accordance with the standard provisions required under 40 CFR 122.41(l)(4), (5), and (6), at the time monitoring reports are submitted. The reports must contain the information listed in the standard provisions required under 40 CFR 122.41(l)(6). [40 CFR 122.41(l)(7))]

(8) *Other information.* When the Copermittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the San Diego Water Board, State Water Board, or USEPA, the Copermittee must promptly submit such facts or information. [40 CFR 122.41(l)(8)]

~~**m. BYPASS** [40 CFR 122.41(m)]~~

~~(1) *Definitions.*~~

~~(a) "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. [40 CFR 122.41(m)(1)(i)] or~~

~~(b) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be~~

Comment [A126]: While this is a standard condition for NPDES permits, it is manifestly inapplicable to MS4 permits. Since BMPs constructed to comply with the Order include bypass provisions to protect their entirety, the Copermittees would have to notify the Regional Board whenever a storm was predicted. This provision should be deleted.

~~expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.~~
~~[40 CFR 122.41(m)(1)(ii)]~~

~~(2) *Bypass not exceeding limitations*. The Copermittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the standard provisions required under 40 CFR 122.41(m)(3) and (4).~~
~~[40 CFR 122.41(m)(2)]~~

~~(3) *Notice.*~~

~~(a) *Anticipated bypass*. If the Copermittee knows in advance of the need for a bypass, it must submit a notice, if possible at least ten days before the date of the bypass. [40 CFR 122.41(m)(3)(i)] or~~

~~(b) *Unanticipated bypass*. The Copermittee must submit notice of an unanticipated bypass in accordance with the standard provisions required under 40 CFR 122.41(l)(6) (24-hour notice).~~
~~[40 CFR 122.41(m)(3)(ii)]~~

~~(4) *Prohibition of Bypass.*~~

~~(a) Bypass is prohibited, and the San Diego Water Board may take enforcement action against a Copermittee for bypass, unless:~~
~~[40 CFR 122.41(m)(4)(i)]~~

~~(i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; [40 CFR 122.41(m)(4)(i)(A)]~~
~~(ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance;~~
~~[40 CFR 122.41(m)(4)(i)(B)] and,~~
~~(iii) The Copermittee submitted notice in accordance with the standard provisions required under 40 CFR 122.41(m)(3).~~
~~[40 CFR 122.41(m)(4)(i)(C)]~~

~~(b) The San Diego Water Board may approve an anticipated bypass, after considering its adverse effects, if the San Diego Water Board determines that it will meet the three conditions listed above.~~
~~[40 CFR 122.41(m)(4)(ii)]~~

~~n.~~m. **UPSET** [40 CFR 122.41(n)]

(1) *Definition.* "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Copermittee. An upset does not

include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. [40 CFR 122.41(n)(1)]

(2) *Effect of an upset*. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the standard provisions required under 40 CFR 122.41(n)(3) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. [40 CFR 122.41(n)(2)]

(3) *Conditions necessary for a demonstration of upset*. A Copermittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that: [40 CFR 122.41(n)(3)]

(a) An upset occurred and that the Copermittee can identify the cause(s) of the upset; [40 CFR 122.41(n)(3)(i)]
(b) The permitted facility was at the time being properly operated; [40 CFR 122.41(n)(3)(ii)] and
(c) The Copermittee submitted notice of the upset in accordance with the standard provisions required under 40 CFR 122.41(l)(6)(ii)(B) (24-hour notice). [40 CFR 122.41(n)(3)(iii)]
(d) The Copermittee complied with any remedial measures pursuant to the standard provisions required under 40 CFR 122.41(d). [40 CFR 122.41(n)(3)(iii)]

(4) *Burden of proof*. In any enforcement proceeding, the Copermittee seeking to establish the occurrence of an upset has the burden of proof. [40 CFR 122.41(n)(4)]

~~o.~~n. STANDARD PERMIT PROVISIONS FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS
[40 CFR 122.42(c)]

The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the San Diego Water Board or State Water Board under 40 CFR 122.26(a)(1)(v) must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report must include:

(1) The status of implementing the components of the storm water management program that are established as permit conditions; [40 CFR 122.42(c)(1)]

(2) Proposed changes to the storm water management programs that are established as permit conditions. Such proposed changes must be consistent with 40 CFR 122.26(d)(2)(iii); [40 CFR 122.42(c)(2)] and

(3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under 40 CFR 122.26(d)(2)(iv) and (v); [40 CFR 122.42(c)(3)]

(4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; [40 CFR 122.42(c)(4)]

(5) Annual expenditures and budget for year following each annual report; [40 CFR 122.42(c)(5)]

(6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; [40 CFR 122.42(c)(6)]

(7) Identification of water quality improvements or degradation. [40 CFR 122.42(c)(7)]

~~p.~~o. **STANDARD PERMIT PROVISIONS FOR STORM WATER DISCHARGES** [40 CFR 122.42(d)]

The initial permits for discharges composed entirely of storm water issued pursuant to 40 CFR 122.26(e)(7) must require compliance with the conditions of the permit as expeditiously as practicable, but in no event later than three years after the date of issuance of the permit.

2. General Provisions

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. The general provisions applicable to this Order and NPDES permit are as follows:

a. DISCHARGE OF WASTE IS A PRIVILEGE

No discharge of waste into the waters of the State, whether or not such discharge is made pursuant to waste discharge requirements, shall create a vested right to continue such discharge. All discharges of waste into waters of the State are privileges, not rights. [CWC Section 13263(g)]

b. DURATION OF ORDER AND NPDES PERMIT

(1) *Effective date*. This Order and NPDES permit becomes effective on the 50th day after its adoption provided the USEPA has no objection. If the USEPA objects to its issuance, this Order shall not become effective until such objection is withdrawn. This Order supersedes Order No. R9-2007-0001 upon the effective date of this Order, and supersedes Order Nos. R9-2009-0002 and R9-2010-0016 upon their expiration or earlier notice of coverage.

(2) *Expiration*. This Order and NPDES permit expires five years after its effective date. [40 CFR 122.46(a)]

(3) *Continuation of expired order*. After this Order and NPDES permit expires, the terms and conditions of this Order and NPDES permit are automatically continued pending issuance of a new permit if all requirements of the federal NPDES regulations on the continuation of expired permits (40 CFR 122.6) are complied with.

c. AVAILABILITY

A copy of this Order must be kept at a readily accessible location and must be available to on-site personnel at all times.

d. CONFIDENTIALITY OF INFORMATION

Except as provided for in 40 CFR 122.7, no information or documents submitted in accordance with or in application for this Order will be considered confidential, and all such information and documents shall be available for review by the public at the San Diego Water Board office.

Claims of confidentiality for the following information will be denied:
[40 CFR 122.7(b)]

(1) The name and address of any permit applicant or Copermittee; [40 CFR 122.7(b)(1)] and

(2) Permit applications and attachments, permits, and effluent data. [40 CFR 122.7(b)(2)]

e. EFFLUENT LIMITATIONS

(1) *Interim effluent limitations*. The Copermittee must comply with any interim effluent limitations as established by addendum, enforcement action, or revised waste discharge requirements which have been, or may be, adopted by the San Diego Water Board.

(2) *Other effluent limitations and standards*. If any applicable toxic effluent standard or effective prohibition (including any schedule of compliance specified in such effluent standard or effective prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant and that standard or effective prohibition is more stringent than any limitation on the pollutant in the permit, the San Diego Water Board shall institute proceedings under these regulations to modify or revoke and reissue the permit to conform to the toxic effluent standard or effective prohibition. [40 CFR 122.44(b)(1~~)]}]}]}].}~~

f. DUTY TO MINIMIZE OR CORRECT ADVERSE IMPACTS

The Copermittee must take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this Order, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the noncompliance.

g. PERMIT ACTIONS

The filing of a request by the Copermittee for modification, revocation and reissuance, or termination of this Order, or a notification of planned change in or anticipated

noncompliance with this Order does not stay any condition of this Order. (See 40 CFR 122.41(f)) In addition, the following provisions apply to this Order:

(1) Upon application by any affected person, or on its own motion, the San Diego Water Board may review and revise the requirements in this Order. All requirements must be reviewed periodically. [CWC Section 13263(e)]

(2) This Order may be terminated or modified for cause, including, but not limited to, all of the following: [CWC Section 13381]

(a) Violation of any condition contained in the requirements of this Order. [CWC Section 13381(a)]

(b) Obtaining the requirements in this Order by misrepresentation, or failure to disclose fully all relevant facts. [CWC Section 13381(b)]

(c) A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge. [CWC Section 13381(c)]

(3) When this Order is transferred to a new owner or operator, such requirements as may be necessary under the CWC may be incorporated into this Order.

h. NPDES PERMITTED NON-STORM WATER DISCHARGES

The San Diego Water Board has, in prior years, issued a limited number of individual NPDES permits for non-storm water discharges to MS4s. The San Diego Water Board or State Water Board may in the future, upon prior notice to the Copermittee(s), issue an NPDES permit for any non-storm water discharge (or class of non-storm water discharges) to an MS4. A Copermittee will not be held responsible for pollutants in its MS4 discharge originating from an NPDES-permitted non-storm water discharge.

Comment [A127]: This comment reflects the appropriate responsibility between NPDES dischargers.

i. MONITORING

In addition to the standard provisions required under 40 CFR 122.41(j) and (l)(4), the following general monitoring provisions apply to this Order:

(1) Where procedures are not otherwise specified in Order, sampling, analysis and quality assurance/quality control must be conducted in accordance with the Quality Assurance Management Plan (QAMP) for the State of California's Surface Water Ambient Monitoring Program (SWAMP), adopted by the State Water Resources Control Board (State Water Board).

(2) Pursuant to 40 CFR 122.41(j)(2) and CWC Section 13383(a), each Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five (5) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time.

Comment [A128]: This provision and the provision in Attachment B 1.j(2) conflict. The Water Board should reconcile these provisions or delete one.

(3) All chemical, bacteriological, and toxicity analyses must be conducted at a laboratory certified for such analyses by the California Department of Public Health or a laboratory approved by the San Diego Water Board.

(4) For priority toxic pollutants that are identified in the California Toxics Rule (CTR) (65 Fed. Reg. 31682), the Copermittees must instruct their laboratories to establish calibration standards that are equivalent to or lower than the Minimum Levels (MLs) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP). If a Copermittee can demonstrate that a particular ML is not attainable, in accordance with procedures set forth in 40 CFR Part 136, the lowest quantifiable concentration of the lowest calibration standard analyzed by a specific analytical procedure (assuming that all the method specified sample weights, volumes, and processing steps have been followed) may be used instead of the ML listed in Appendix 4 of the SIP. The Copermittee must submit documentation from the laboratory to the San Diego Water Board for approval prior to raising the ML for any priority toxic pollutant.

j. ENFORCEMENT

(1) The San Diego Water Board is authorized to enforce the terms of this Order under several provisions of the CWC, including, but not limited to, CWC Sections 13385, 13386, and 13387.

(2) Nothing in this Order shall be construed to protect the Copermittee from its liabilities under federal, state, or local laws.

(3) The CWC provides for civil and criminal penalties comparable to, and in some cases greater than, those provided for under the CWA.

(4) Except as provided in the standard conditions required under 40 CFR 122.41(m) and (n), nothing in this Order shall be construed to relieve the Copermittee from civil or criminal penalties for noncompliance.

(5) Nothing in this Order shall be construed to preclude the institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties to which the Copermittee is or may be subject to under Section 311 of the CWA.

(6) Nothing in this Order shall be construed to preclude institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authoring preserved by Section 510 of the CWA.

k. SEVERABILITY

The provisions of this Order are severable, and if any provision of this Order, or the application of any provisions of this Order to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this Order shall not be affected thereby.

l. APPLICATIONS

Any application submitted by a Copermittee for reissuance or modification of this Order must satisfy all applicable requirements specified in federal regulations as well as any additional requirements for submittal of a Report of Waste Discharge specified in the CWC and the California Code of Regulations.

m. IMPLEMENTATION

All plans, reports and subsequent amendments submitted in compliance with this Order must be implemented immediately (or as otherwise specified). All submittals by Copermittees must be adequate to implement the requirements of this Order.

n. REPORT SUBMITTALS

(1) All report submittals must include an executive summary, introduction, conclusion, recommendations, and signed certified statement.

(2) Each Copermittee must submit a signed certified statement covering its responsibilities for each applicable submittal.

(3) The Principal Watershed Copermittee(s) must submit a signed certified statement covering its responsibilities for each applicable submittal and the sections of the submittals for which it is responsible.

(4) Unless otherwise directed, the Copermittees must submit one hard copy and one electronic copy of each report required under this Order to the San Diego Water Board, and one electronic copy to the USEPA.

(5) The Copermittees must submit reports and provide notifications as required by this Order to the following:

EXECUTIVE OFFICER
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
9174 SKY PARK COURT, SUITE 100
SAN DIEGO CA 92123-4340
Telephone: (858) 467-2952 Fax: (858) 571-6972

EUGENE BROMLEY
US ENVIRONMENTAL PROTECTION AGENCY
REGION IX
PERMITS ISSUANCE SECTION (W-5-1)
75 HAWTHORNE STREET
SAN FRANCISCO CA 94105

ATTACHMENT C

ACRONYMS AND ABBREVIATIONS

AMAL	Average Monthly Action Level
ASBS	Area(s) of Special Biological Significance
BMP	Best Management Practice
Basin Plan	Water Quality Control Plan for the San Diego Basin
CEQA	California Environmental Quality Act
CCR	California Code of Regulations
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWC	California Water Code
CZARA	Coastal Zone Act Reauthorization Amendments of 1990
ESAs	Environmentally Sensitive Areas
GIS	Geographic Information System
IBI	Index of Biological Integrity
LID	Low Impact Development
MDAL	Maximum Daily Action Level
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
NAL	Non-Storm Water Action Level
NAICS	North American Industry Classification System
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
ROWD	Report of Waste Discharge (application for NPDES reissuance)
SAL	Storm Water Action Level
San Diego Water Board	California Regional Water Quality Control Board, San Diego Region
SIC	Standard Industrial Classification Code
State Water Board	State Water Resources Control Board
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
WDID	Waste Discharge Identification Number
WLA	Waste Load Allocation
WQBEL	Water Quality Based Effluent Limitation

DEFINITIONS

Active/Passive Sediment Treatment - Using mechanical, electrical or chemical means to flocculate or coagulate suspended sediment for removal from runoff from construction sites prior to discharge.

Anthropogenic Litter – Trash generated from human activities, not including sediment.

Automotive Repair Shop – a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539 or equivalent NAICS code.

Average Monthly Action Level – The highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month, or the geometric mean for bacteria, as applicable.

Beneficial Uses - The uses of water necessary for the survival or wellbeing of man, plants, and wildlife. These uses of water serve to promote tangible and intangible economic, social, and environmental goals. "Beneficial Uses" ~~of the waters of the State~~ that may be protected include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. Existing beneficial uses are uses that were attained in the surface or ground water on or after November 28, 1975; and potential beneficial uses are uses that would probably develop in future years through the implementation of various control measures. "Beneficial Uses" are equivalent to "Designated Uses" under federal law. [California Water Code Section 13050(f)].

Best Management Practices (BMPs) - Defined in 40 CFR 122.2 as schedules of activities, effective prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. In the case of municipal discharge permits, BMPs may be used in the place of numeric effluent limits.

Bioassessment - The use of biological community information to evaluate the biological integrity of a water body and its watershed. With respect to aquatic ecosystems, bioassessment is the collection and analysis of samples of the benthic macroinvertebrate community together with physical/habitat quality measurements associated with the sampling site and the watershed to evaluate the biological condition (i.e. biotic integrity) of a water body.

Biofiltration - Practices that use vegetation and amended soils to detain and treat runoff from impervious areas. Treatment is through filtration, infiltration, adsorption, ion exchange, and biological uptake of pollutants.

Biological Integrity - Defined in Karr J.R. and D.R. Dudley. 1981. Ecological perspective on water quality goals. *Environmental Management* 5:55-68 as: "A balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitat of the region." Also referred to as ecosystem health.

BMP Design Manual – A plan developed to eliminate, reduce, or mitigate the impacts of runoff from development projects, including Priority Development Projects.

Channel Rehabilitation and Improvement – Remedial measures or activities for the purpose of improving or restoring the environmental health of streams, channels or river systems. Techniques may vary from in-stream restoration techniques to off-line stormwater management practices installed in the system corridor or upland areas. Rehabilitation techniques may include, but are not limited to the following: riparian zone restoration, constructed wetlands, bank stabilization, channel modifications, and day lighting of drainage systems.

Comment [A129]: This term should be defined in Attachment C given its use in the Order.

Clean Water Act Section 303(d) Water Body - An impaired water body in which water quality does not meet applicable water quality standards and/or is not expected to meet water quality standards, even after the application of technology based pollution controls required by the CWA. The discharge of runoff to these water bodies by the Copermittees is significant because these discharges can cause or contribute to violations of applicable water quality standards.

Construction Site – Any project, including projects requiring coverage under the Construction General Permit, that involves soil disturbing activities greater than 10,000 square feet including, but not limited to, clearing, grading, disturbances to ground such as stockpiling, and excavation. This does not include interior construction activities such as interior remodeling, plumbing, electrical, or mechanical work.

Contamination - As defined in the Porter-Cologne Water Quality Control Act, contamination is "an impairment of the quality of waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste whether or not waters of the State are affected."

Copermittee – An incorporated city within the County of Orange, County of Riverside, or County of San Diego in the San Diego Region~~,~~ (Region 9), ~~,~~ the County of Orange, the County of Riverside, the County of San Diego, the Orange County Flood Control District, the Riverside County Water Conservation and Flood Control District, the San Diego Regional Airport Authority, or the San Diego Unified Port District. See also "Municipal Copermittee" and "Special District Copermittee".

Comment [A130]: As set forth above, the Riverside County Copermittees make a distinction in these classes of Copermittees based on their respective legal authorities.

Copermittees – All of the individual Copermittees, collectively, unless the obligation in question is directed to one or a sub-group of Copermittees.

Comment [A131]: This clarifies that not all obligations in the Order directed to "Copermittees" are in fact applicable to all Copermittees.

Critical Channel Flow (Qc) – The channel flow that produces the critical shear stress that initiates bed movement or that erodes the toe of channel banks. When measuring Qc, it should be based on the weakest boundary material – either bed or bank.

Daily Discharge – Defined as either: (1) the total mass of the constituent discharged over the calendar day or any 24 hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g. concentration.)

The Daily Discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day, or other 24 hour period other than a day), or by the arithmetic mean of analytical results from one or more grab samples taken over the course of a

day.

Development Projects - Construction, rehabilitation, redevelopment, or reconstruction of any public or private residential project, industrial~~,~~ or commercial facility, or any other projects designed for post-construction human activity or occupation and involving land disturbance activities.

Comment [A132]: This definition clarifies the nature of Development Projects covered under the Order.

Direct Discharge to an Environmentally Sensitive Area – refers to outflow from a drainage conveyance system that collects runoff from the subject development or redevelopment site and terminates at or in receiving waters within the ESA, and is not commingled with flows from adjacent or other upstream lands.

Dry Season –May 1 to September 30.

Dry Weather – Weather is considered dry if the preceding 72 hours has been without measurable precipitation (>0.1 inch).

Enclosed Bays – Enclosed bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost bay works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays do not include inland surface waters or ocean waters.

Erosion – When land is diminished or worn away due to wind, water, or glacial ice. Often the eroded debris (silt or sediment) becomes a pollutant via storm water runoff. Erosion occurs naturally but can be intensified by land clearing activities such as farming, development, road building, and timber harvesting. This permit is concerned particularly with non-naturally occurring Erosion that eventually results in a Sediment discharge from MS4s into Receiving Waters.

Environmentally Sensitive Areas (ESAs) - Areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; areas designated as preserves or their equivalent under the Natural Communities Conservation Program within the Cities and County of Orange; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.

Estuaries – Waters, including coastal lagoons, located at the mouth of streams that serve as areas of mixing fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and ocean water. Estuaries do not include inland surface waters or ocean waters.

Existing Development – Any area that has been developed and exists for municipal, commercial, industrial, or residential purposes, uses, or activities. May include areas that are not actively used for its originally developed purpose, but may be re-purposed or redeveloped

for another use or activity.

Flow Duration – The long-term period of time that flows occur above a threshold that causes significant sediment transport and may cause excessive erosion damage to creeks and streams (not a single storm event duration). The simplest way to visualize this is to consider a histogram of pre- and post-project flows using long-term records of hourly data. To maintain pre-development flow duration means that the total number of hours (counts) within each range of flows in a flow-duration histogram cannot increase between the pre- and post-development condition. Flow duration within the range of geomorphologically significant flows is important for managing erosion.

Grading - The cutting and/or filling of the land surface to a desired slope or elevation.

Hazardous Material – Any substance that poses a threat to human health or the environment due to its toxicity, corrosiveness, ignitability, explosive nature or chemical reactivity. These also include materials named by the USEPA in 40 CFR 116 to be reported if a designated quantity of the material is spilled into the waters of the U.S. or emitted into the environment.

Hazardous Waste - Hazardous waste is defined as "any waste which, under Section 600 of Title 22 of this code, is required to be managed according to Chapter 30 of Division 4.5 of Title 22 of this code" [CCR Title 22, Division 4.5, Chapter 11, Article 1].

Household Hazardous Waste – Paints, cleaning products, and other hazardous wastes generated during home improvement or maintenance activities.

Hydromodification – The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

Illicit Connection – Any connection to the MS4 that conveys an illicit discharge.

Illicit Discharge - Any discharge to the MS4 that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from fire fighting activities [40 CFR 122.26(b)(2)]. Discharges from natural sources or from conditionally exempt sources described in this Order are not considered Illicit Discharges.

Inactive Areas – Areas of construction activity that are not active and those that have been active and are not scheduled to be re-disturbed for at least 14 days.

Infiltration – Water other than wastewater that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow [40 CFR 35.2005(20)].

Comment [A133]: Wrong definition. Should be defining infiltration (of stormwater into soil)

Inland Surface Waters – Includes all surface waters of the U.S.~~State~~ that do not include the ocean, enclosed bays, or estuaries.

Jurisdictional Runoff Management Program Document – A written description of the specific jurisdictional runoff management measures and programs that each Copermittee will implement to comply with this Order and ensure that illicit discharges are effectively prohibited, and storm water pollutant discharges in runoff are reduced to the MEP and do not cause or contribute to a violation of water quality standards.

Low Impact Development (LID) – A storm water management and land development strategy that emphasizes conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions.

Low Impact Development Best Management Practices (LID BMPs) – LID BMPs include schedules of activities, effective prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States through storm water management and land development strategies that emphasize conservation ~~s~~and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions. LID BMPs include retention practices that do not allow runoff, such as infiltration, rain water harvesting and reuse, and evapotranspiration. LID BMPs also include flow-through practices such as biofiltration that may have some discharge of storm water following pollutant reduction.

Major Outfall – As defined in the Code of Federal Regulations, a major outfall is a MS4 outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (i.e. discharge from a single conveyance other than a circular pipe which is associated with a drainage area of more than 50 acres); or, for MS4s that receive storm water from lands zoned for industrial activity (based on comprehensive zoning plans or equivalent), a MS4 outfall that discharges from a single pipe with an inside diameter of 12 inches or more or from its equivalent (i.e. discharge from other than a circular pipe associated with a drainage area of 2 acres or more).

Maximum Daily Action Level (MDAL) –The highest allowable daily discharge of a pollutant, over a calendar day (or 24 hour period). For pollutants with action levels expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with action levels expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

Maximum Extent Practicable (MEP) – The technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) ~~for storm water~~ that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) in combination with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than BAT. A definition for MEP is not provided either in the statute or in the regulations. Instead the definition of MEP is dynamic and will be defined by the following process over time: municipalities propose their definition of MEP by way of their runoff management programs. Their total collective and individual activities conducted pursuant to the runoff management programs becomes their proposal for MEP as it applies both to their overall effort, as well as to specific activities (e.g., MEP for street sweeping, or MEP for MS4 maintenance). In the absence of a proposal acceptable to the San Diego Water Board, the San Diego Water Board

defines MEP.

In a memo dated February 11, 1993, entitled "Definition of Maximum Extent Practicable," Elizabeth Jennings, Senior Staff Counsel, SWRCB addressed the achievement of the MEP standard as follows:

> "*To achieve the MEP standard, municipalities must employ whatever Best Management Practices (BMPs) are technically feasible (i.e., are likely to be effective) and are not cost prohibitive. The major emphasis is on technical feasibility. Reducing pollutants to the MEP means choosing effective BMPs, and rejecting applicable BMPs only where other effective BMPs will serve the same purpose, or the BMPs would not be technically feasible, or the cost would be prohibitive. In selecting BMPs to achieve the MEP standard, the following factors may be useful to consider:*
>
> *a. Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?*
> *b. Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?*
> *c. Public Acceptance: Does the BMP have public support?*
> *d. Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?*
> *e. Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc.?*
>
> *The final determination regarding whether a municipality has reduced pollutants to the maximum extent practicable can only be made by the Regional or State Water Boards, and not by the municipal discharger. If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit derived, it would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs that would address a pollutant source, or to pick a BMP based solely on cost, which would be clearly less effective. In selecting BMPs the municipality must make a serious attempt to comply and practical solutions may not be lightly rejected. In any case, the burden would be on the municipal discharger to show compliance with its permit. After selecting a menu of BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented."*

Monitoring Year – October 1 to September 30

Municipal Copermittee – Any Copermittee, exclusive of Special District Copermittees.

Comment [A134]: This definition clarifies distinction between municipal and special district copermittees.

Municipal Separate Storm Sewer System (MS4) – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designated or used for collecting or conveying storm water;

(iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.22~~6~~. Copermittees need only comply with permit conditions relating to "discharges from the municipal separate storm sewers for which they are operators." 40 CFR 122.26(a)(vi).

Comment [A135]: These changes correct a citation and clarifies the responsibility of the copermittees as to other MS4s.

National Pollutant Discharge Elimination System (NPDES) - The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the CWA.

Non-Storm Water - All discharges to and from a MS4 that do not originate from precipitation events (i.e., all discharges from a MS4 other than storm water). ~~Non storm water includes illicit discharges and NPDES permitted discharges.~~

Comment [A136]: This is overly limiting, There are other types of Non-storm discharges that do not fit these two categories (e.g. irrigated agriculture, natural flows, conditionally exempt flows, others). Rather than trying to identify all types of non-stormwater discharges, suggest just deleting this sentence.

Nuisance - As defined in the Porter-Cologne Water Quality Control Act, a nuisance is "anything which meets all of the following requirements: 1) Is injurious to health, or is indecent, or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. 2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. 3) Occurs during, or as a result of, the treatment or disposal of wastes."

Ocean Waters – the territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the State Board's California Ocean Plan.

Order – Unless otherwise specified, refers to this Order, Order No. R9-2013-0001 (NPDES No. CAS0109266)

Outfall – *Outfall* means a *point source* as defined by 40 CFR 122.2 at the point where a MS4 discharges to waters of the United States and does not include open conveyances connecting two MS4s, or pipes, tunnels or other conveyances which connect segments of the same stream or other waters of the United States and are used to convey waters of the United. 40 CFR 122.26(b)(9).

Comment [A137]: This federal regulatory definition clarifies the nature of an outfall.

Parking Lot – a land area or facility for the tempraory parking or storage of motor vehicles used personally, for business, or for commerce.

Comment [A138]: Definition placed in Attachment C for consistency.

Persistent Flow - Persistent flow is defined as the presence of an MS4 discharge that is hydraulically connected to a flowing~~, pooled, or ponded~~ receiving water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

Comment [A139]: Changes reflect the necessity of a connection to flowing receiving waters. Discharges that are pooled are not discharges to waters of the United States. Please see Comment Letter section 3.5.3.

Person - A person is defined as an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof [40 CFR 122.2].

Point Source - Any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, landfill leachate collection systems, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return

flows from irrigated agriculture or agricultural storm water runoff.

Pollutant - Any agent that may cause or contribute to the degradation of water quality such that a condition of pollution or contamination is created or aggravated.

Pollution - As defined in the Porter-Cologne Water Quality Control Act, pollution is "the alteration of the quality of the waters of the State by waste, to a degree that unreasonably affects the either of the following: 1) The waters for beneficial uses; or 2) Facilities that serve these beneficial uses." Pollution may include contamination.

Pollution Prevention - Pollution prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control BMPs, treatment control BMPs, or disposal.

Pre-Project~~Development~~ Runoff Conditions – Runoff conditions that exist~~existed~~ onsite immediately before the ~~existing development was constructed, or exists onsite before~~ planned development activities occur. Pre-development is not intended to be interpreted as that period before any human-induced land disturbance has occurred. 64 FR 68761.

Comment [A140]: This definition reflects the exact language used by U.S. EPA in the Federal Register. Moreover, it avoids the constitutional and statutory problems with requiring developers to mitigate for impacts not attributable to their project. It also is consistent with the CEQA standard for project impact mitigation.

Priority Development Projects - New development and redevelopment projects defined under Provision E.3.b of Order No. R9-2012-0011.

Properly Designed – Designed in accordance with the Copermittee's BMP Design Manual and/or any appropriate design requirements set forth by the Copermittee and based on widely accepted design criteria and in accordance with this Order.

Comment [A141]: This definition is required to address this standard, which is mentioned in the Order but not defined.

Rainy Season (aka Wet Season) –October 1 to April 30

Receiving Waters – Waters of the United States.

Receiving Water Limitations - Waste discharge requirements issued by the San Diego Water Board typically include both: (1) "Effluent Limitations" (or "Discharge Limitations") that specify the technology-based or water-quality-based effluent limitations; and (2) "Receiving Water Limitations" that specify the water quality objectives in the Basin Plan as well as any other limitations necessary to attain those objectives. In summary, the "Receiving Water Limitations" provision is the provision used to implement the requirements of CWA section 402(p)(3)(B).

Redevelopment - The creation, addition, and or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include trenching and resurfacing associated with utility work; parking lots; resurfacing existing roadways; cutting and reconfiguring of surface parking lots; new sidewalk construction, pedestrian ramps, or bike lane on existing roads; and routine replacement of damaged pavement, such as pothole repair and emergency restoration and public safety projects.

Comment [A142]: The changes requested in this definition appropriately exempts de minimis or emergency/public safety projects.

Reporting Period – The period of information that is reported in the Annual Report. The reporting period consists of two components: 1) July 1 to June 30, consistent with the fiscal

year, for the implementation of the jurisdictional runoff management programs, and 2) October 1 to September 30, consistent with the monitoring year for the monitoring and assessment programs. Together, these two time periods constitute the reporting year for the Annual Report due January 31 following the end of the monitoring year.

Restaurant – a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812).

Retail gasoline outlet (RGO) – a business that sells automotive or truck fuel to the general public with a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

Retain –Keep or hold in a particular place, condition, or position without discharge to ~~surface~~ Receiving W~~w~~aters.

Retrofitting – Storm water management practices put into place after development has occurred in watersheds where the practices previously did not exist~~.~~ or are ineffective.~~.~~ Retrofitting of developed areas is intended to improve water quality, protect downstream channels, reduce flooding, or meet other specific objectives. Retrofitting developed areas may include, but is not limited to replacing roofs with green roofs, disconnecting downspouts or impervious surfaces to drain to pervious surfaces, replacing impervious surfaces with pervious surfaces, installing rain barrels, installing rain gardens, and trash area enclosures.

Runoff - All flows in a storm water conveyance system that consists of the following components: (1) storm water (wet weather flows) and (2) non-storm water including dry weather flows.

San Diego Water Board – As used in this document the term "San Diego Water Board" is synonymous with the term "Regional Board" as defined in Water Code section 13050(b) and is intended to refer to the California Regional Water Quality Control Board for the San Diego Region as specified in Water Code Section 13200.

Sediment - Soil, sand, and minerals washed from land into water. Sediment resulting from anthropogenic sources (i.e. human induced land disturbance activities) that is discharged into Receiving Waters is considered a pollutant. This Order regulates only the discharges of sediment from anthropogenic sources into Receiving Waters and does not regulate naturally occurring sources of sediment. Sediment can destroy fish-nesting areas, clog animal habitats, and cloud waters so that sunlight does not reach aquatic plants.

Special District Copermittee – A separate legal entity that may own or operate MS4 systems, but has no land use authorities outside of their MS4. The Riverside County Flood Control and Water Conservation District [and Orange County Flood Control District?] is a [are] Special District Copermittee[s].

Source Control BMP – Land use or site planning practices, or structural or nonstructural measures that aim to prevent runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between pollutants and runoff.

Storm Water – Per 40 CFR 122.26(b)(13), means storm water runoff, snowmelt runoff and surface runoff and drainage. ~~Surface runoff and drainage pertains to runoff and drainage resulting from precipitation events.~~

Comment [A143]: Relocation of definition to Attachment C.

Comment [A144]: Definition added for clarity and consistency with prior redlines

Comment [A145]: Edit clarifies intent of definition.

Stream, Channel, or Habitat Rehabilitation – Measures or activities for the purpose of improving or restoring the environmental health (i.e. physical, chemical and biological integrity) of streams, channels, or river systems. Rehabilitation techniques may include, but are not limited to, riparian zone restoration, constructed wetlands, bank stabilization, channel reconfiguration, and daylighting drainage systems.

Street, Road, Highway, Freeway – Any paved impervious surface that is used for the transportation of automobiles, trucks, motorcycles, and other vehicles, with an ADT of at least 100 vehicles per day.

Comment [A146]: Definition relocated to Attachment C.

Comment [A147]: Consistent with RGO definition.

Structural BMPs - A subset of BMPs which detains, retains, filters, removes, or prevents the release of pollutants to surface waters from development projects in perpetuity, after construction of a project is completed.

Total Maximum Daily Load (TMDL) - The maximum amount of a pollutant that can be discharged into a water body from all sources (point and non-point) and still maintain water quality standards. Under CWA section 303(d), TMDLs must be developed for all water bodies that do not meet water quality standards after application of technology-based controls.

Toxicity - Adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies). The water quality objectives for toxicity provided in the Basin Plan, state in part…"All waters shall be free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life….The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge".

Treatment Control BMP – Any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media absorption or any other physical, biological, or chemical process.

Unpaved Road – Any long, narrow stretch without pavement used for traveling by motor passenger vehicles between two or more points. Unpaved roads are generally constructed of dirt, gravel, aggregate or macadam and may be improved or unimproved.

Waste - As defined in CWC Section 13050(d), "waste includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal."

Article 2 of CCR Title 23, Chapter 15 (Chapter 15) contains a waste classification system that applies to solid and semi-solid waste, which cannot be discharged directly or indirectly to water of the state and which therefore must be discharged to land for treatment, storage, or disposal in accordance with Chapter 15. There are four classifications of waste (listed in order of highest to lowest threat to water quality): hazardous waste, designated waste, non-hazardous solid waste, and inert waste.

Water Quality Objective - Numerical or narrative limits on constituents or characteristics of

water designated to protect designated beneficial uses of the water. [California Water Code Section 13050 (h)]. California's water quality objectives are established by the State and Regional Water Boards in the Water Quality Control Plans. Numeric or narrative limits for pollutants or characteristics of water designed to protect the beneficial uses of the water. In other words, a water quality objective is the maximum concentration of a pollutant that can exist in a receiving water and still generally ensure that the beneficial uses of the receiving water remain protected (i.e., not impaired). Since water quality objectives are designed specifically to protect the beneficial uses, when the objectives are violated the beneficial uses are, by definition, no longer protected and become impaired. This is a fundamental concept under the Porter Cologne Act. Equally fundamental is Porter Cologne's definition of pollution. A condition of pollution exists when the water quality needed to support designated beneficial uses has become unreasonably affected or impaired; in other words, when the water quality objectives have been violated. These underlying definitions (regarding beneficial use protection) are the reason why all waste discharge requirements implementing the federal NPDES regulations require compliance with water quality objectives. (Water quality objectives are also called water quality criteria in the CWA.)

Water Quality Standards - Water quality standards, as defined in Clean Water Act section 303(c) consist of the beneficial uses (e.g., swimming, fishing, municipal drinking water supply, etc.,) of a water body and criteria (referred to as water quality objectives in the California Water Code) necessary to protect those uses. Under the Water Code, the water boards establish beneficial uses and water quality objectives in water quality control or basin plans. Together with an anti-degradation policy, these beneficial uses and water quality objectives serve as water quality standards under the Clean Water Act. In Clean Water Act parlance, state beneficial uses are called "designated uses" and state water quality objectives are called "criteria." Throughout this Order, the relevant term is used depending on the statutory scheme.

Waters of the State - Any water, surface or underground, including saline waters within the boundaries of the State [CWC section 13050 (e)]. The definition of the Waters of the State is broader than that for the Waters of the United States in that all water in the State is considered to be a Waters of the State. ~~regardless of circumstances or condition.~~

Comment [A148]: The intent of the definition is to cover natural water sources, and not anthropogenic structures that collect runoff to reduce volume/velocity or pollutants.

Waters of the United States - As defined in the 40 CFR 122.2, the Waters of the U.S. are defined as: "(a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate "wetlands;" (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters otherwise defined as waters of the United States under this definition: (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial seas; and (g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA."

Watershed - That geographical area which drains to a specified point on a water course, usually a confluence of streams or rivers (also known as drainage area, catchment, or river basin).

Wet Season (aka Rainy Season) –October 1 to April 30

Wet Weather – Weather is considered wet if there is a storm event of 0.1 inches and greater and the following 72 hours, unless otherwise defined by the Copermittee for the purposes of monitoring consistent with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), or developed pursuant to another regulatory mechanism.

Comment [A149]: This is important as the monitoring requirements require you to sample the first 'Wet Weather' event. 0.1" of rainfall doesn't result in runoff in all watersheds. Copermittees should be able to define mobilization criteria to identify storms that are likely to produce runoff in that drainage area consistent with this EPA guidance.

LEGAL AND FACT SHEET COMMENTS ON TENTATIVE ORDER R9-2013-0001 MADE ON BEHALF OF THE RIVERSIDE COUNTY COPERMITTEES

This document provides comments on various legal issues raised by Tentative Order No. R9-2013-0001 (the "Draft Permit") and associated attachments, including Attachment F, the Fact Sheet/Technical Report ("Fact Sheet"), and are made on behalf of the Riverside County Flood Control & Water Conservation District ("District"), the County of Riverside and the Cities of Murrieta, Temecula and Wildomar (collectively, the "Riverside County Copermittees").

These legal comments are in addition to the other comments on the Draft Permit and attachments made by the Riverside County Copermittees (including the Comment Letter dated January 10, 2013 and signed by Jason E. Uhley, Chief of the District's Watershed Protection Division) and the redline attachment ("Redline"), as well as any comments or testimony which may be offered at the public hearing(s) on the Draft Permit. The Comment Letter and Redline also discuss legal issues. The Riverside County Copermittees appreciate this opportunity to comment and welcome any questions that Water Board staff may have.

These comments are submitted subject to the same reservations set forth in the Comment Letter regarding the Water Board's lack of authority, in the absence of agreement by the Riverside County Copermittees or the filing of a Report of Waste Discharge ("ROWD"), to issue a regional municipal separate storm sewer system ("MS4") permit to the Riverside County Copermittees. Submission of these comments does not waive this objection.

Request for Additional Public Comment

Before turning to comments on the Draft Permit, the Riverside County Copermittees wish to note that in view of the extensive comments made by them, as well as what we anticipate will be extensive comments by the South Orange County and San Diego County Copermittees, as well as from other stakeholders, it would greatly facilitate the permit adoption process if the Water Board were to release a revised Tentative Order for further review and comment prior to final adoption of the Permit. This will enable the Water Board staff to address the comments in a more orderly fashion and provide all parties with the opportunity to see how staff proposes to incorporate the comments in the Draft Permit.

Comments on Findings

Finding 2 and Fact Sheet Section VII.B: This finding recites that the Water Board "has the legal authority to issue a regional MS4 permit pursuant to its authority under Clean Water Act ("CWA") section 402(p)(3)(B) and 40 CFR 122.26(a)(i)(v)." Section VII.B of the Fact Sheet provides a more detailed rationale for this finding (at pages F-22-23).

The Riverside County Copermittees respectfully disagree with this finding and the analysis provided in the Fact Sheet. We do not believe that a regional MS4 permit is authorized under the CWA or the implementing regulations, absent agreement by the copermittees to be bound by such a MS4 permit (as is the case with the Bay Area MS4 permit covering discharges into the Bay).

The CWA itself does not explicitly authorize MS4 permits that, like the Draft Permit, cross county lines. CWA section 402(p)(3)(B) provides only that "[p]ermits for discharges from municipal storm sewers . . . may be issued on a system- or jurisdiction-wide basis." This language, contrary to the conclusion in Finding 2, indicates that a multi-county permit, covering several distinct non-interconnected municipal stormwater "systems" in multiple watersheds with multiple receiving waters, is not one issued on a "system-wide" basis and that an MS4 permit covering multiple jurisdictions in three different counties is not one issued on a "jurisdiction-wide basis." Because neither "system-wide" nor "jurisdiction-wide" are defined in the CWA, however, the CWA regulations must also be reviewed.

The regulatory provision cited in Finding 2, 40 CFR § 122.26(a)(1)(v), does not add clarity, since it merely repeats the "system-wide" and "jurisdiction-wide" language of the Act and the regulations define neither term. The regulations do, however, suggest that "system-wide" is not intended to cover multiple large MS4s in different jurisdictions. The regulations, at 40 CFR § 122.26(a)(1)(v) state that in making the determination to designate a system-wide or jurisdiction-wide basis" the permitting authority should consider the location of the "discharge" with respect to waters of the United States, the size of the discharge, the quantity and nature of the pollutants discharge and other relevant factors.

The Draft Permit covers multiple "discharges" into receiving waters located in three separate counties and the size, quality and nature of the discharges vary widely, due to varying hydrologic and climatic conditions in the three areas.

The Fact Sheet cites 40 CFR § 122.26(a)(3)(iv), which provides, in relevant part, that the Water Board "may issue one systemwide permit covering all, or a portion of all municipal separate storm systems in adjacent or interconnected large or medium municipal separate storm sewer systems." This provision does not, however, authorize issuance of a regional MS4 permit covering multiple counties and multiple watersheds that are not interconnected and which do not share a common receiving water. In fact, the only common fact uniting the various MS4s in the three counties under the Water Board's jurisdiction is that common jurisdiction.

First, even if the subject MS4 facilities otherwise met the criteria specified in the federal regulations (which, as noted below, they do not), the prospective permittees must apply for such a MS4 permit, as set forth in the first sentence of 40 CFR § 122.26(a)(3)(iv): "*One permit application may be submitted for all or a portion of all* municipal separate storm sewers within adjacent or interconnected large or medium municipal separate storm sewer systems." (emphasis supplied). No such application has been filed with respect to the Draft Permit. Only the San Diego County copermittees submitted a ROWD for MS4 facilities within that county.[1]

[1] Moreover, the fact that permittees have the ability to determine the geographic scope of the permit is reinforced by the language in 40 CFR § 122.26(a)(3)(iii)(B), which allows an individual municipality to submit "a distinct permit application which only covers discharges from the [MS4] for which the owner is responsible . . ." If a permittee can "opt out" of a multi-MS4 permit by submitting a individual permit application, a permitting authority such as a water board cannot impose a multi-MS4 permit on that permittee.

Second, this provision requires that the MS4s to be covered in the permit be "adjacent or interconnected." This is not true with respect to the MS4s proposed to be included within the Draft Permit. For example, the MS4 within the Santa Margarita Region of Riverside County is not "interconnected" with any other MS4s except those within that region. This is true also of the MS4s within South Orange County and San Diego County, which are not interconnected. Additionally, none of the MS4s in the three counties is "adjacent" to each other – each is separated by miles of non-urban area. In the SMR for example, the confluence of Temecula and Murrieta Creeks to form the Santa Margarita River is miles upstream of Rainbow Creek, the first discharge from San Diego County to the River. And, the confluence of Temecula and Murrieta Creeks is over 30 miles from the discharge of the Santa Margarita River to the Pacific Ocean.

The next inquiry is whether the three separate county MS4s could be considered, together, to form a single "large municipal separate storm sewer system." The federal MS4 regulations define this term as follows:

> *Large municipal separate storm sewer system* means all municipal separate storm sewers that are either:
>
> (i) Located in an incorporated place with a population of 250,000 or more . . . ."
>
> (ii) Located in the counties listed in Appendix H, except municipal separate storm sewers that are located in the incorporated places, townships or towns within such counties; or
>
> (iii) Owned or operated by a municipality other than those described [in paragraphs (i) and (ii)] . . . and that are designated by the Director as part of the large or medium municipal separate storm sewer system due to the interrelationship between the discharges of the designated storm sewer and the discharges from municipal separate storm sewers described [in paragraphs (i) and (ii)]. In making this determination the Director may consider the following factors:
>
> (A) Physical interconnections between the municipal separate storm sewers;
>
> (B) The location of discharges from the designated municipal separate storm sewer relative to discharges from municipal separate storm sewers described in [paragraph (i)];
>
> (C) The quantity and nature of pollutants discharged to waters of the United States;
>
> (D) The nature of the receiving waters; and
>
> (E) Other relevant factors, or
>
> (iv) The Director may, upon petition, designate as a large municipal separate storm sewer system, municipal separate storm sewers located within the boundaries of a region

> defined by a storm water management regional authority based on a jurisdictional, watershed, or other appropriate basis that includes one or more of the systems described [in paragraphs (i), (ii) or (iii)].

40 CFR § 122.26(b)(4).

None of paragraphs (i), (ii) or (iii) authorizes a regional MS4 permit such as that envisioned in the Draft Permit. The Draft Permit applies beyond a single incorporated place, County or municipality. Of these paragraphs, only paragraph (iv) could arguably be used to define the MS4s in the three Counties as a single MS4 and thus authorize a regional permit. The key limiting language is, however, "within the boundaries of a region **defined by a storm water management regional authority,** based on a jurisdictional, watershed, or other appropriate basis . . . ." A regional water board is not a stormwater management regional authority. This is clear from the MS4 regulations, which provide that a "**regional authority may be responsible for submitting a permit application"** under certain conditions. 40 CFR § 122.26(a)(3)(iii)(C). Clearly, a Water Board is not responsible for submitting MS4 permit applications.

U.S. EPA, in the Preamble to the final Phase I MS4 regulations (55 Fed Reg. 47990, November 16, 1990), further illuminated the meaning of the regulatory language. The Preamble indicates that commenters proposed eight different MS4 permitting options:

> Option 1 – systems owned or operated by incorporated places augmented by integrated discharges; Option 2 – systems owned or operated by incorporated places augmented with significant other municipal discharges; Option 3 – systems owned or operated by counties; Option 4 – systems owned and operated by States or State departments of transportation; Option 5 – systems within the boundaries of an incorporated place; Option 6 – systems within the boundaries of counties; Option 7 – systems in census designated urbanized areas; and Option 8 – systems defined by watershed boundaries.

55 Fed Reg. at 48039. None of these options encompasses the fact pattern presented by the Draft Permit, which covers multiple counties and multiple watersheds, are not interconnected, do not share common receiving waters and are located in separate census designated urbanized areas.

In explaining the derivation of 40 CFR 122.26(b)(4)(iv), U.S. EPA noted that it was "an outgrowth of comments on all options, especially Option 4 (State owned systems/State highways) and Option 8 (watersheds)." 55 Fed. Reg. at 48040. Thus, the Caltrans MS4 permit (which applies statewide) is authorized under paragraph (iv), since the "storm water management regional authority" defining the region to be covered is Caltrans itself. No such single authority exists for the three-county area proposed to be included in the Draft Permit, which also would encompass multiple watersheds.

Moreover, paragraph (iv) provides that the regional authority must "petition" the U.S. EPA Director to have a single MS4 designated within the boundaries of the region defined by the regional authority. Because California has been delegated NPDES permitting authority, a regional authority would presumably need to petition its Water Board to authorize such a regional permit. Since no such regional authority exists to establish the geographical basis for a

three-county MS4 permit, there is no such entity to "petition" the Water Board to establish a regional permit. This is clear from the Preamble to the Phase I regulations, which indicate that "regional storm water authorities" established by "some States or counties" may "petition the Director [or its state designee] to assume a regional role. 55 Fed. Reg. at 48042. It is clear from the Preamble that it is not the Water Board that has the authority to make such a petition, but rather the "storm water authorities" (i.e., municipalities, districts and Caltrans).

It should be noted that the Bay Area Regional MS4 Permit was a joint Bay Area Water Board and copermittee effort, coordinated by the Bay Area Stormwater Agencies Management Association ("BASMAA"). It is not the case that the Bay Area Water Board imposed this regional MS4 permit. The copermittees, coordinated by BASMAA, themselves determined to develop a regional MS4 permit. Further, all of the copermittees to the Bay Area Regional MS4 Permit discharge to a common receiving water, San Francisco Bay. Also, an Alaska MS4 permit cited in a letter from the Office of Chief Counsel to county counsel for Orange and Riverside Counties was issued to several municipalities and entities within a single "borough," which is equivalent in Alaska to a county.

Additionally, neither the Riverside County Copermittees nor those in South Orange County have filed ROWDs with the San Diego Water Board, which serve as the application for an NPDES MS4 permit in California. Water Code § 13260. The current Riverside County MS4 permit for the Santa Margarita Region provides that the ROWD is not required to be filed until May 2015, 180 days prior to the November 10, 2015 expiration date of that permit. Order R9-2010-0016, Part II.K.2.c.

> This ROWD must include:
>
> (1) Proposed changes to the Copermittees' runoff management programs; (2) Proposed changes to monitoring programs; (3) Justification for proposed changes; (4) Name and mailing addresses of the Copermittees; (5) Names and titles of primary contacts of the Copermittees; (6) Any other information necessary for the reissuance of this Order and (7) Any other information required by federal regulations for permit reapplications.

Id. It should be noted that several items of this ROWD are specifically intended to assist in the formulation of a new, SMR-specific MS4 permit, including proposed changes to the runoff management and monitoring programs, as well as justification for such changes, information necessary for "reissuance" of the SMR MS4 permit and information required by the federal regulations for MS4 permit reapplications.

As a simple jurisdictional matter, the Water Board cannot issue a regional MS4 permit to MS4 dischargers that have not applied for it. Moreover, as noted above, the SMR copermittees are entitled to apply for an MS4 permit applicable to their jurisdiction. Further, each individual copermittee has the right to apply for a MS4 permit covering only its discharges, as has the City of Long Beach in the Los Angeles Region.

Finding 3, Finding 15, in Fact Sheet Section VII.A and in Multiple Locations Throughout Draft Permit: In Finding 3, the Fact Sheet and in multiple locations throughout the Draft Permit (which are identified in the redline of the Draft Permit submitted with these comments by the Riverside County Copermittees ("Redline")), it is stated that the maximum extent practicable ("MEP") applies only to "storm water" discharges from the MS4. This is not correct.[2]

In fact, the Clean Water Act does not distinguish between non-stormwater and stormwater in terms of MS4 discharges which must be controlled to the MEP standard. *See* 33 U.S.C. § 1342(p)(3)(B)(iii)(the MS4 permit "shall require controls to reduce the discharge of pollutants to the maximum extent practicable . . . ." While the heading of 33 U.S.C. § 1342(p) refers to "Municipal and industrial stormwater discharges," this is not dispositive, as 33 U.S.C. § 1342(p)(3)(B)(ii), which requires the effective prohibition of "non-stormwater discharges" into the MS4. Thus, the language of this heading does not in fact support the argument that the MEP standard applies only to pollutants in stormwater discharges.

That both non-stormwater and stormwater must be controlled to the MEP standard was made clear by U.S. EPA itself in the preamble to the final Phase I stormwater regulations. In that preamble, U.S. EPA made it clear that "MEP control measures" would be implemented to address not only pollutants in "storm water" but also from "non-storm water discharges." As the preamble states:

> "Permittees are required to develop management programs for four types of pollutant sources which discharge to large and medium municipal storm sewer systems. Discharges from [such systems] are usually expected to be composed primarily of: (1) Runoff from commercial and residential areas; (2) storm water runoff from industrial areas; (3) runoff from construction sites; and (4) *non-storm water discharges*. Part 2 of the permit application has been designed to allow [permittees] the opportunity to propose *MEP control measures for each* of these components of the discharge."

55 Fed. Reg. at 48052 (emphasis supplied).

This language sets forth USEPA's understanding of the plain language of the CWA: "pollutants" must be controlled to the MEP from any MS4 "discharge," not merely pollutants in stormwater.

Finding 11: This finding, in relevant part, states that "[h]istoric and current development makes use of natural drainage patterns and features as conveyances for runoff. Rivers, streams and creeks in developed areas used in this manner are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and receiving water." This conclusion is legally incorrect.

First, under no circumstance can a natural stream constitute an MS4. The definition of "MS4" in the CWA regulations (a definition found in Attachment C of the Draft Permit) refers to a

[2] Finding 15 also states, erroneously, that the MEP standard "is explicitly for "Municipal . . . *Stormwater Discharges* (emphasis added)" from the MS4.

"conveyance or system of conveyances" "owned or operated" by a municipality. 40 CFR §122.26(b)(8). In California, natural rivers and streams are not "owned" nor "operated" by the municipality through which they flow. Moreover, a municipality obviously cannot "operate" a natural creek or stream. In further support of the point that a MS4 is an artificial, not natural, watercourse, the types of "conveyances" identified in the regulation ("roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains") all refer to anthropogenic structures, not natural streams. 40 CFR § 122.26(b)(8).

Second, a "receiving water" cannot also be an MS4, as is plain from the CWA regulations. An MS4 is itself defined as discharging to waters of the United States. 40 C.F.R. §122.26(b)(8). An MS4 cannot, in essence, discharge to itself. Moreover, an "outfall" from an MS4 (the point at which the discharge enters a receiving water) does not, pursuant to 40 C.F.R §122.26 (b)(9), include conveyances connecting "segments of the same stream or other waters of the United States and are used to convey waters of the United States."

Moreover, U.S. EPA, in the Preamble to the initial version of the MS4 regulations (53 Fed. Reg. 49416 (Dec. 7, 1988)) expressly determined that "streams, wetlands and other water bodies that are waters of the United States are not storm sewers for the purposes of this rule" and that "stream channelization, and stream bed stabilization, which occur in waters of the United States" were not subject to National Pollutant Discharge Elimination System ("NPDES") permits under Section 402 of the CWA. 53 Fed. Reg. at 49442.

Additionally, the United States Supreme Court recently reversed the Ninth Circuit Court of Appeals and ruled that flows from sections of the Los Angeles and San Gabriel Rivers that are comprised of concrete flood control channels are not a "discharge" under the CWA, confirming that such rivers, even if improved, are "receiving waters" along with any natural portions of those rivers. *Los Angeles County Flood Control Dist. v. Natural Resources Defense Council*, 568 U.S. __(January 8, 2013) (slip op.).

The above-cited statement in the finding is incorrect and should be stricken, as recommended in the Redline.

Finding 12: This finding states, in relevant part, that "[a]s operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not prohibit or otherwise control." This statement is legally incorrect, and ignores the salient point that the "discharger" of a pollutant is primarily responsible for controlling/permitting that discharge, under both the CWA and the Porter-Cologne Act. For example, under the Porter-Cologne Act, any persons discharging or proposing to discharge "waste" into waters of the state must file a report of waste discharge and obtain a waste discharge requirement. Water Code §§ 13260, 13263. The operator of the MS4 into which that water eventually flows is not "essentially accepting" responsibility for the discharge. The responsibility of the MS4 operator is established under the CWA, and that is to effectively prohibit non-stormwater discharges into [the MS4] and to control the discharge of pollutants from the MS4 to the MEP.

Moreover, the statement ignores the fact that in California, downstream property owners (including municipalities owning and operating MS4 facilities) must accept the flow of upstream waters. In fact, for a downstream municipality to block such flow would constitute an inverse condemnation or the creation of a nuisance under California law. *See Arreola v. County of Monterey* (2002) 99 Cal.App.4th 722 (obstruction of flood waters by improperly designed highway constituted inverse condemnation and nuisance).

Finding 28 and Fact Sheet Section VI: In the Finding, it is stated that the Water Board "finds that the requirements in this permit are not more stringent than the minimum federal requirements" and that therefore "a CWC section 13241 analysis is not required." The Finding further recites that notwithstanding this fact, "the San Diego Water Board has developed an economic analysis of the requirements in this Order."

For the reasons set forth in the comments of the Riverside County Copermittees, numerous provisions in the Draft Permit are in fact more stringent than the requirements of the CWA and its implementing regulations and therefore require an adequate Water Code § 13241 analysis. Unfortunately, this analysis is not provided in the Fact Sheet.

First, the economic analysis set forth in the Fact Sheet does not meet the requirements of Section 13241, as it does not analyze the six specific factors required to be analyzed under the section. Second, the analysis uses cost data from other sources, only a few of which were from the municipalities proposed to be included under the Draft Permit. These data are also a number of years old; the most recent study referenced in the Fact Sheet, the one done for the State Board by Cal State Sacramento, was dated January 2005 and included decade-old cost data from the City of Encinitas that dated from 2002-2003.

Third, the section of the Fact Sheet discussing the benefits of water quality notes that "there have been no studies for the San Diego Region to quantify the added value that surface waters with healthy water quality can provide." Thus, the Water Board has no evidence with which to compare the costs and benefits of the programs set forth in the Draft Permit. Moreover, the discussion makes the incorrect assumption that the alternative to the programs in the Draft Permit would be no controls on pollutants in urban runoff. As the Fact Sheet correctly notes, the Draft Permit is the fifth term MS4 permit for the copermittees. The previous four permits all contained increasingly complex and expensive control requirements, both structural and non-structural, designed to improve the quality of MS4 discharges. Thus, an appropriate cost analysis must compare the incremental costs of the programs set forth in the Draft Permit and the incremental benefits attributable to that permit. This has not been done in the Fact Sheet. Finally, the analysis does not recognize that the receiving waters provided economic benefits to residents of the San Diego Region long before issuance of the first MS4 permits in 1990. It is thus illogical to suggest that these pre-existing economic benefits would be lost if the Draft Permit is not adopted.

Finding 29 and Fact Sheet Section VII.F: The finding and the supporting argument in the Fact Sheet represents an attempt by Water Board staff to address whether the requirements of the Draft Permit represent an unfunded state mandate. That attempt, however, is beyond the scope of the Water Board's powers, since the *only* agency charged by the Legislature with determining

the presence of a state mandate, and whether that mandate is unfunded, is the Commission on State Mandates. Govt. Code § 17552; *Kinlaw v. State of California* (1991) 54 Cal.3d 326, 333. The Water Board has no jurisdiction to make a legal finding or discuss in the Fact Sheet that the Draft Permit, in whole or in part, does not constitute an unfunded state mandate.

Additionally fact sheets are required, under the CWA regulations, to provide the legal authority and reasons for each substantive permit provision (40 CFR § 124.8(a)(4); 40 CFR § 124.56(a)). *See also City of Rancho Cucamonga v. Regional Water Quality Control Board-Santa Ana Region* (2006), 135 Cal.App.4th 1377, 1382 (stating that fact sheets contains "the legal and factual grounds for the Water Board's recommendation to adopt the . . . permit"). Finding 29 and the discussion in Section VII.F of the Fact Sheet do not relate to any Draft Permit provision, nor provide legal authority or justification for the Draft Permit's adoption. As such, the finding and Fact Sheet discussion are surplussage and should be deleted.

The Riverside County Copermittees disagree with each of the arguments set forth in the Finding and Fact Sheet as to why the Draft Permit does not constitute an unfunded state mandate. Nevertheless, because the exclusive arena for such disagreements is the Commission on State Mandates, whose jurisdiction does not commence unless and until a test claim is filed before the Commission, the Copermittees need not and will not address those arguments.

Comments on Provisions in Draft Permit

Provision A and Fact Sheet Section VIII.A:

Lack of True Iterative Compliance Process

As set forth in the Redline and in the Comment Letter, the Riverside County Copermittees believe that to effectuate the iterative approach to compliance with water quality standards and other discharge prohibitions in the Draft Permit, the copermittees must be provided with the means to be in compliance. Based on monitoring, exceedances of water quality standards are occurring in the receiving waters subject to the Draft Permit, as set forth in Table G-14 to the latest 2011-2012 monitoring report submitted by the Riverside County Copermittees. Thus, if the copermittees are not provided an iterative means to be in compliance, which was contemplated by State Board's Order No. 2001-15, the copermittees will be issued an illegal MS4 permit, since it is a permit with which they cannot comply. This violates the intent of Congress in the CWA, which "is presumed not to have intended absurd (impossible) results." *Hughey v. JMS Development Corp.*, 78 F.3d 1523, 1529 (11th Cir. 1996); *accord, Mississippi River Revival v. City of Minneapolis*, 319 F.3d 1013, 1017-1018 (8th Cir. 2003).

With regard to the iterative process, Water Board staff has indicated numerous times during the workshop process that achievement of water quality standards is expected to take many years. The entire WQIP approach is aimed at the eventual attainment of such standards, as are the TMDLs issued to other copermittees, which have final compliance dates years into the future.

This approach is, however, put into jeopardy by the requirement, as expressed in the Fact Sheet at F-39, that the discharge prohibition and receiving water limitation provisions are

"independently applicable, meaning that compliance with one provision does not provide a 'safe harbor' where there is non-compliance with another provision (i.e., compliance with Provision A.4 does not shield a Copermittee who may have violated Provision A.1.a, A.1.c, or A.2.a from an enforcement action." While the Fact Sheet appropriately notes how this process should work through Provision A.4 (which "essentially requires the Copermittees to implement additional BMPs until MS4 discharges no longer cause or contribute to a violation of water quality standards") it also states that despite this iterative process, "the San Diego Water Board retains the discretion to take other appropriate enforcement and the iterative process does not shield dischargers from citizen suits under the CWA." Fact Sheet at F-40.

The consequences of this approach cannot be overemphasized. Despite the copermittees' good faith undertaking to follow the iterative process outlined in Provision A.4, a Water Board enforcement proceeding or a citizen suit can be brought for violations of water quality standards and, if the citizen plaintiff is successful, a federal judge is empowered to use his/her injunctive powers under Section 505(a) of the CWA to throw out the WQIP, JRMP or other compliance efforts of the copermittees and require other efforts. In such a case, the time and money spent by the copermittees in trying to comply with the Draft Permit, as well as the effort spent by the copermittees and Water Board staff in developing the Draft Permit's terms, are completely wasted.

Thus, the essential conundrum of Provision A, as presently drafted, is clearly exposed. Even though a copermittee may spend significant sums and undertake significant tasks under its WQIP or JRMP, be conducting expensive monitoring and special studies, and be in *full compliance* with all of the programmatic requirements of the Draft Permit, it would still face either a Water Board enforcement action or a citizen suit under Section 505 of the CWA. And, such a suit would allege exceedances of water quality standards (some of which are hardly capable of laboratory detection, much less control) that the Water Board acknowledges cannot be achieved for years.

Provision A is not, however, required by the CWA, as held by the Ninth Circuit in *Defenders of Wildlife v. Browner,* 191 F.3d 1159 (9th Cir. 1999). The holding in *Browner* is further reflected in State Board Order WQ 2001-15 (which the Fact Sheet acknowledges incorporates an "iterative process") which states:

> [O]ur [receiving water limitation] language, similar to the U.S. EPA's permit language discussed in the Browner case, **does not require strict compliance with water quality standards.** Our language requires that **storm water management plans be designed to achieve compliance with water quality standards**. **Compliance is to be achieved over time, through an iterative approach requiring improved BMPs**. As pointed out by the Browner court, there is nothing inconsistent between this approach and the determination that the Clean Water Act does not mandate strict compliance with water quality standards.

Order WQ 2001-15 at 7 (emphasis added). Thus, Provision A is inconsistent with the State Board's own precedential order, which requires the iterative approach effectuated by the suggested Redline changes.[3]

In further support, it may be noted that the U.S. EPA-drafted MS4 permit for the District of Columbia does not contain the type of language found in Provision A, but rather requires "an iterative and an adaptive management process for pollutant reduction and for achieving applicable water quality standard and/or total maximum daily load (TMDL) compliance." DC MS4 Permit Fact Sheet, page 5 (attached as Exhibit A).

Also, despite the assertion in the Fact Sheet that the copermittees are seeking a "safe harbor" from liability, this is incorrect. Every provision of an MS4 permit is subject to enforcement; given the complexity of the Draft Permit, the failure by a copermittee to comply with any provision could lead to such enforcement.

As noted above, MS4 discharges may not be achieving compliance with strict water quality standards, as recognized by the Issue Paper released by State Board staff in preparation for a November 20, 2012 workshop on receiving water limitation issues raised by *NRDC v. County of Los Angeles*. That Issue Paper stated that as "the storm water management programs of municipalities have matured, **an increasing body of monitoring data indicates that water quality standards are in fact not being met by many MS4s.**" (State Board Issue Paper, Page 2, emphasis supplied) (*see* Exhibit B.)

Perhaps most importantly, requiring strict and immediate compliance with discharge prohibition and receiving water limitations inhibits, not supports, the philosophy of the Draft Permit, which is to encourage the copermittees to focus on the most significant problems in their watersheds and to prioritize their resources to address those problems. Provision A, by contrast, discourages innovative approaches or prioritization, since all pollutants exceeding water quality standards create liability. Moreover, as discussed above, in the event of a citizen suit being brought such as that in the *NRDC* case, a federal judge could award injunctive relief to a successful plaintiff that could completely ignore or supplant the WQIP and other permit terms.

For additional discussion of receiving water limitations issues, please see Exhibit C, a letter submitted by the District to the State Board in connection with the recent workshop held by the State Board on receiving water limitations language. The Riverside County Copermittees hereby reference and incorporate this Exhibit into these comments.

The Riverside County Copermittees support a true iterative process that requires refinement and amendment of the WQIP and associated BMPs when receiving water limitation violations are recorded. That is the essence of the iterative process; the identification of problems and the development of BMPs to attempt to address those problems.

[3] While the Fact Sheet cites as authority *Natural Resources Defense Council v. County of Los Angeles*, discussed above, the Ninth Circuit was simply responding to language in the former Los Angeles County MS4 permit, and did not determine that such non-iterative language was required by the CWA.

The Redline proposes a means to achieve compliance using the WQIPs, which are intended to bring the copermittees into compliance with the discharge prohibition and receiving water limitation provisions of the Draft Permit over time. The Redline links compliance with Provisions A.1, A.2 and A.3 to A.4, which indicates that compliance is obtained through the preparation and updating of the WQIPs.

It must be noted, however, that the Riverside County Copermittees do not agree with the approach suggested by others, that any WQIP-based compliance approach be necessarily accompanied by a "Reasonable Assurance Analysis." Such an analysis could be extremely complex, expensive and time intensive to develop. Generally, such analyses are developed in the preparation of TMDLs and take a number of years to develop and refine. Given that the Santa Margarita Watershed has no adopted TMDLs, there are no comprehensive pollutant transport or BMP models available for the suite of constituents that might be considered for prioritization within a WQIP for that watershed. In the context of a TMDL, such models would be developed by the combined resources of the Water Board, stakeholders and dischargers. Requiring such an exercise to be undertaken solely with the public resources of the residents of the SMR is beyond the Copermittees' financial ability and would shift responsibility for development of TMDLs from the Water Board to the Copermittees.

Discussion in Fact Sheet

The Fact Sheet discussion also contains a number of legal and factual errors. First, the statement on page F-34 that non-stormwater discharges from the MS4 are subject to NPDES permitting requirements is unsupported by the plain language of the CWA, which (as noted above) applies the MEP standard to *all* discharges of pollutants from the MS4, not just those in stormwater. Also, such discharges are not subject to separate requirements under the NPDES program, as suggested on F-34, and non-storm water discharges are not the same, legally, as "illicit discharges." Please see discussion below.

Similarly, the Fact Sheet's conclusion that "Regional Water Boards are not limited by the iterative MEP approach to storm water regulation in crafting appropriate regulations for non-storm water discharges" is incorrect. The Fact Sheet correctly states that MEP has not been defined in the CWA or by U.S. EPA in the CWA regulations. However, the Fact Sheet incorrectly concludes that MEP is "ultimately defined" by the Water Boards or the State Board. What constitutes "MEP" is a question of federal law under the CWA, not a matter for definition by agencies which merely have been delegated the authority to enforce the CWA in California. The only source for such a finding is a memorandum from a State Board attorney, not case authority.

Moreover, Provisions B-E of the Draft Permit, far from establishing a "minimum framework" for the copermittees to achieve the MEP standard, sets forth in many cases requirements that far exceed the plain requirements of the CWA, the implementing regulations and in some cases even state law, or which require the copermittees to undertake steps that are not "practicable." These requirements are identified in the comments of the Riverside County Copermittees. In such respects, those requirements do not represent a "minimum framework" for MEP.

Other Issues

The Riverside County Copermittees also object to the provision in A.1.a and other portions of the Draft Permit that prohibit certain discharges into "waters of the state." The CWA regulates discharges into waters of the United States, which are surface waters. Expanding the prohibition to cover waters of the state expands the scope of the Draft Permit to protect groundwater, as a matter of state law. It should be noted that the recent Los Angeles County MS4 Permit appropriately applies this prohibition to waters of the United States.

Provision B.5: As noted in the Comment Letter, the CWA requires that illegal discharges into the MS4 be addressed by a program of steps taken to address such discharges. The Redline emphasizes that this program be guided by WQIP priorities, which is consistent with the overall intent of the Draft Program.

Provision E.2.a and E.2.a.(7): These provisions require the Copermittees to, as a part of their Illicit Discharge Detection and Elimination (IDDE) program, address all non-stormwater discharges as "illicit discharges," thus requiring the copermittees to "reduce or eliminate non-stormwater discharges" whether or not the discharges have been identified as "illicit."

The Fact Sheet asserts that "Provision E.2.a.(7) is consistent with the requirements of the CWA section 402(p)(3)(B)(ii) and 40CFR 122.26(d)(1)(v)(B). That assertion is not correct. Section 402(p)(3)(B)(ii) of the CWA states that MS4 permits "shall include a requirement to *effectively prohibit* non-stormwater discharges into the storm sewers" (emphasis supplied). The CWA regulations include two provisions designed to begin implementation of the "effective prohibition." The first provision requires MS4 permittees to perform a screening analysis, intended to provide sufficient information to develop priorities for a program to detect and remove illicit discharges. 40 CFR 122.26(d)(1)(iv)(D). The second requires MS4 permittees to develop a recommended site-specific management plan to detect and remove illicit discharges (or ensure they are covered by an NPDES permit) and to control improper disposal to MS4s. 40 CFR 122.26(d)(1)(iv)(D) and 122.26(d)(2)(B). The MS4 permittees are required to identify the non-stormwater discharge as an illicit discharge prior to having an obligation to effectively prohibit it. There is not otherwise a presumption to reduce or eliminate it.

40 CFR 122.26(d)(1)(v)(B), cited in the Fact Sheet, requires "[a] description of the existing program to identify illicit connections to the municipal storm sewer system. The description should include inspection procedures and methods for detecting and preventing illicit discharges, and describe areas where this program has been implemented."

The provision and rationale within the Fact Sheet blur the distinction between the copermittees' need to "effectively" prohibit non-stormwater discharges and to detect and eliminate illicit discharges.

- The requirement is "effectively prohibit" non-stormwater discharges, not "reduce or eliminate" non-stormwater discharges.
- Although copermittees are required to have a program to prevent illicit discharges to the MS4, non-stormwater discharges should only be addressed as illicit discharges where

such discharges are identified as sources of pollutants that may cause or contribute to an exceedance of a water quality objective.

- The IDDE program is established to detect and eliminate "illicit discharges", not non-stormwater discharges in general.

Please see the Redline for modifications to Provision E.2 addressing these issues.

Provision E.2.a.(3): In the Redline, the Riverside County Copermittees request that categories of irrigation runoff discharges (landscape irrigation, irrigation water and lawn watering) be considered as conditionally exempt discharges (not subject to treatment as illicit discharges).

The rationale for not including irrigation runoff discharges lacks a legal and factual basis. As noted in the Comment Letter, the only factual basis for this provision with respect to the Riverside County Copermittees is discussion in a public information informational brochure, which was itself based on a similar document from Orange County. Fact Sheet F-76. Despite assertions to the contrary in the Fact Sheet, this brochure does not represent a determination by the Riverside County Copermittees that irrigation runoff is a category of non-stormwater discharge that must be effectively prohibited. The other evidence in support of prohibiting the conditional exemption for irrigation runoff is entirely from different areas of the region, with different urban development patterns, lithology and hydrology. No specific determination has been made by the Copermittees (or the Water Board) that irrigation runoff in the Santa Margarita Region has actually been shown to be significant source of pollutants to receiving waters in the SMR.

EPA, in the preamble to the federal MS4 regulations, required that a *permittee* must make a finding that the "irrigation water" discharges must be a "source of pollutants to waters of the United States . . . ." 55 Fed. Reg. 48037. Moreover, such discharges must represent a "significant" source of pollutants to waters of the United States "under certain conditions." U.S. EPA, *Guidance Manual for the Preparation of Part 2 of the NPDES Permit Application for Discharges from Municipal Separate Storm Sewer Systems*, November 1992 ("EPA Part 2 Guidance Manual"), at p. 6-33. These conditions require a focus not on an entire category of discharges, but rather a discharger-by-discharger examination.

In the MS4 regulatory preamble, EPA stated that "[i]n general, municipalities will not be held responsible for prohibited some specific components of discharges or flows listed below through their [MS4], even though such components may be considered non-storm water discharges, unless such discharges *are specifically identified on a case-by-case basis as needing to be addressed."* 55 Fed. Reg. 47995 (emphasis supplied). In the Guidance Manual, EPA states:

> If an applicant knows . . . that landscape irrigation water from a ***particular site*** flows through and picks up pesticides **or** ***excess*** nutrients from fertilizer applications, there may be a reasonable potential for a storm water discharge to result in a water quality impact. In such an event, the applicant should contact the NPDES permitting authority to request that the authority order ***the discharger*** . . . to obtain a separate NPDES permit (or in this case, the discharge could be controlled through the storm water management program of the MS4).

EPA Part 2 Guidance Manual, p. 6-33 (emphasis added). Read in this context of this language, the Water Board has no power greater than a municipality in terms of its ability to identify non-stormwater discharges as "illicit" and thus required to be regulated, and must identify specific discharges, and not entire categories of discharges. *See* 55 Fed. Reg. 48037. This has not been done in the Fact Sheet.

Provision E.3(c): This provision requires the Copermittees to compel development projects that may not result in a hydromodification impact to the applicable receiving waters, to implement on-site or "alternative compliance" hydromodification mitigation measures and to use using "pre-development (naturally occurring)" runoff reference condition as applied to sites that are, in fact, developed.

The Riverside County Copermittees are concerned that implementing these requirements would subject the Copermittees to liability under the takings clauses of the U.S. and California Constitutions as well as under the Mitigation Fee Act because of the questionable nexus between such a project's lack of actual hydromodification impacts upon the receiving waters, and the hydromodification management measures required in the Draft Permit.

When imposing a condition on a development permit, a local government is required under the federal and state constitutions to establish that the condition bears a reasonable relationship to the impacts of the development project. This rule applies even to legislatively enacted requirements and impact fees or exactions.[4] Moreover, fees imposed on a discretionary ad hoc basis are subject to heightened scrutiny under a two-part test. First, local governments must show that there is a substantial relationship between the burden created by the impact of development and any fee or exaction.[5] Second, a development project's impacts must bear a "rough proportionality" to any development fee or exaction.[6] Under California law, the *Nollan/Dolan* heightened scrutiny test also applies to in-lieu fees.[7]

The Legislature has memorialized these requirements in the Mitigation Fee Act, which establishes procedures that local governments must follow to impose impact fees.[8] Irrespective of whether the hydromodification management requirements are implemented by legislative act or on an ad hoc basis, the copermittees' attempt to enforce them as proposed in the Draft Permit would likely result in claims by developers and property owners alleging unconstitutional takings of private property and violations of the Mitigation Fee Act. This is because a developer could argue that limiting hydromodification impacts of already developed property to its "naturally occurring" state, or requiring hydromodification mitigation measures for impacts not imposed by the project, would not have a legally sufficient nexus to the impact of the development project.

In addition, the Copermittees wish to bring the Water Board's attention to a recent case, *Virginia Dept. of Transportation v. United States Environmental Protection Agency,* Civ. Action No.

[4] *Building Indus. Ass'n v. City of Patterson* (2009)171 Cal. App. 4th 886, 898.
[5] *Nollan v. California Coastal Comm'n*, 483 U.S. 825, 837 (1987).
[6] *Dolan v. City of Tigard*, 512 U.S. 374, 391 (1994).
[7] *Ehrlich v. City of Culver City* (1996) 12 Cal. 4th 854, 876.
[8] Cal. Gov't Code §§ 66000-66025.

1:12-CV-775 (E.D. Va. January 3, 2013) (slip op.), which is attached for the Water Board's convenience as Exhibit D. In this case, a federal district judge found that the CWA did not authorize U.S. EPA to regulate stormwater itself as a pollutant. The impact of this case is not known at this time, as it will probably be appealed to the Fourth Circuit Court of Appeals. Still, any approach to hydromodification which focuses on flows *per se*, as opposed to pollutants, may not withstand legal scrutiny.

Provision E.3.c.(3)(c)(i): This provision requires the entire alternative compliance in-lieu fee to be transferred to the copermittee or an escrow account prior to construction of a Priority Development Project (PDP). This provision is problematic, as development fees (which would include the in-lieu fees) are collected at the time of building permit issuance. In large-scale projects, permits may be issued (and development fees collected) in phases. Further, for master-planned developments, fees are generally negotiated through a development agreement to be collected based on certain development milestones. Therefore, collecting and holding the entire in-lieu fee prior to construction interferes with the development practice and may violate the Mitigation Fee Act and local development ordinances. The Redline requests that in-lieu fees be collected in accordance with state and local law.

Provision E.5: In addition to other comments on this provision and others in the Draft Permit relating to retrofitting, any requirements in Draft Permit relating to the retrofitting of engineered channels and other structures employed for flood control purposes must be consistent with the judgment of the flood control districts, to which the Legislature has assigned sole authority for the protection of the lives and property of their citizens from flooding. (Please see Comment Letter and proposed new findings in Redline for further discussion). Due to the urbanization of the counties over the past 150 years, as well as the particular topography and weather conditions found in Southern California, there is a great risk of flooding and hence the need for flood control structures and channels. The flood control districts have both the expertise and the sole legal authority to determine whether retrofitting of flood control structures can be accomplished in light of their statutory obligations, and that expertise and authority must be recognized in the Draft Permit.

Provision E.8: As noted in the Redline, the first requirement under Fiscal Analysis, that each "Copermittee must secure the resources necessary to meet all the requirements of this Order" has been deleted. This requirement is not found in the CWA regulations, which require only the conduct of a fiscal analysis. Moreover, this requirement intrudes on the home rule power of cities and counties by requiring, in essence, that municipal budgets must reflect the priority of compliance with the Order over any competing obligation, including police, fire protection and public health. A key issue in complying with stormwater and MS4 obligations is the ability of municipalities to afford the increasing costs associated with those obligations. In California, of course, the ability to raise taxes to pay for such obligations has been severely curtailed through several voter-approved propositions.

The Riverside County Copermittees request that Provision E.8.a be deleted.

EXHIBIT A

NPDES Permit No. DC0000221

AUTHORIZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM MUNICIPAL SEPARATE STORM SEWER SYSTEM PERMIT

In compliance with the provisions of the Clean Water Act, 33 U.S.C. §§ 1251 *et seq.*

Government of the District of Columbia
The John A. Wilson Building
1350 Pennsylvania Avenue, N.W.
Washington, D.C. 20004

is authorized to discharge from all portions of the municipal separate storm sewer system owned and operated by the District of Columbia to receiving waters named:

Potomac River, Anacostia River, Rock Creek and stream segments tributary to each such water body

in accordance with the Stormwater Management Program(s) dated February 19, 2009, subsequent updates, and related reports, strategies, effluent limitations, monitoring requirements and other conditions set forth in Parts I through IX herein.

The effective issuance date of this permit is: October 7, 2011.

This permit and the authorization to discharge shall expire at midnight, on: October 7, 2016.

Signed this 30th day of September, 2011.

Jon M. Capacasa, Director
Water Protection Division
U.S. Environmental Protection Agency
Region III

1. DISCHARGES AUTHORIZED UNDER THIS PERMIT

1.1 Permit Area

This permit covers all areas within the jurisdictional boundary of the District of Columbia served by, or otherwise contributing to discharges from, the Municipal Separate Storm Sewer System (MS4) owned or operated by the District of Columbia. This permit also covers all areas served by or contributing to discharges from MS4s owned or operated by other entities within the jurisdictional boundaries of the District of Columbia unless those areas have separate NPDES MS4 permit coverage or are specifically excluded herein from authorization under the District's stormwater program. Hereinafter these areas collectively are referred to as "MS4 Permit Area".

1.2 Authorized Discharges

This permit authorizes all stormwater point source discharges to waters of the United States from the District of Columbia's MS4 that comply with the requirements of this permit. This permit also authorizes the discharge of stormwater commingled with flows contributed by process wastewater, non-process wastewater, or stormwater associated with industrial activity provided such discharges are authorized under separate NPDES permits.

This permit authorizes the following non-stormwater discharges to the MS4 when appropriate stormwater activities and controls required through this permit have been applied and which are: (1) discharges resulting from clear water flows, roof drainage, dechlorinated water line flushing, landscape irrigation, ornamental fountains, diverted stream flows, rising ground waters, uncontaminated ground water infiltration to separate storm sewers, uncontaminated pumped ground water, discharges from potable water sources, foundation drains, air conditioning condensation, irrigation waters, springs, footing drains, lawn watering, individual resident car washing, flows from riparian habitats and wetlands, dechlorinated swimming pool discharges, wash water, fire fighting activities, and similar types of activities; and (2) which are managed so that water quality is not further impaired and that the requirements of the federal Clean Water Act, 33 U.S.C. §§ 1251 *et seq.*, and EPA regulations are met.

1.3 Limitations to Coverage

1.3.1 Non-stormwater Discharges

The permittee, as defined herein, shall effectively prohibit non-stormwater discharges into the MS4, except to the extent such discharges are regulated with an NPDES permit.

1.3.2 Waivers and Exemptions

This permit does not authorize the discharge of any pollutant from the MS4 which arises from or is based on any existing waivers and exemptions that may otherwise apply and are not consistent with the Federal Clean Water Act and other pertinent guidance, policies, and regulations. This narrative prohibition on the applicability of such waivers and exemptions extends to any activity that would otherwise be authorized under District law, regulations or

ordinance but which impedes the reduction or control of pollutants through the use of stormwater control measures and/or prevents compliance with the narrative /numeric effluent limits of this permit. Any such discharge not otherwise authorized may constitute a violation of this permit.

1.4 Discharge Limitations

The permittee must manage, implement and enforce a stormwater management program (SWMP) in accordance with the Clean Water Act and corresponding stormwater NPDES regulations, 40 C.F.R. Part 122, to meet the following requirements:

1.4.1. Effectively prohibit pollutants in stormwater discharges or other unauthorized discharges into the MS4 as necessary to comply with existing District of Columbia Water Quality Standards (DCWQS);

1.4.2. Attain applicable wasteload allocations (WLAs) for each established or approved Total Maximum Daily Load (TMDL) for each receiving water body, consistent with 33 U.S.C. § 1342(p)(3)(B)(iii); 40 C.F.R. § 122.44(k)(2) and (3); and

1.4.3. Comply with all other provisions and requirements contained in this permit, and in plans and schedules developed in fulfillment of this permit.

Compliance with the performance standards and provisions contained in Parts 2 through 8 of this permit shall constitute adequate progress toward compliance with DCWQS and WLAs for this permit term.

2. LEGAL AUTHORITY, RESOURCES AND STORMWATER PROGRAM ADMINSTRATION

2.1 Legal Authority

2.1.1 The permittee shall use its existing legal authority to control discharges to and from the Municipal Separate Storm Sewer System in order to prevent or reduce the discharge of pollutants to achieve water quality objectives, including but not limited to applicable water quality standards. To the extent deficiencies can be addressed through regulation or other Executive Branch action, the permittee shall remedy such deficiencies within 120 days. Deficiencies that can only be addressed through legislative action shall be remedied within 2 years of the effective date of this permit, except where otherwise stipulated, in accordance with the District's legislative process. Any changes to or deficiencies in the legal authority shall be explained in each Annual Report.

2.1.2 No later than 18 months following the effective date of this permit, the District shall update and implement Chapter 5 of Title 21 of District of Columbia Municipal Regulations (Water Quality and Pollution) ("updated DC Stormwater Regulations"), to address the control of stormwater throughout the MS4 Permit Area. Such regulations shall be consistent with this

FACT SHEET

National Pollutant Discharge Elimination System (NPDES)
Municipal Separate Storm Sewer System (MS4)
Permit No. DC0000221 (Government of the District of Columbia)

NPDES PERMIT NUMBER: DC0000221 (Reissuance)

FACILITY NAME AND MAILING ADDRESS:

Government of the District of Columbia
The John A. Wilson Building
1350 Pennsylvania Avenue, N.W.
Washington, D.C. 20004

MS4 ADMINISTRATOR NAME AND MAILING ADDRESS:

Director, District Department of the Environment
1200 First Street, N.E., 6th Floor
Washington, D.C. 20002

FACILITY LOCATION:

District of Columbia's Municipal Separate Storm Sewer System (MS4)

RECEIVING WATERS:

Potomac River, Anacostia River, Rock Creek, and Stream Segments Tributary
To Each Such Water Body

INTRODUCTION:

Today's action finalizes reissuance of the District of Columbia Municipal Separate Storm Sewer System (MS4) Permit. In the Final Permit EPA has continued to integrate the adaptive management approach with enhanced control measures to address the complex issues associated with urban stormwater runoff within the corporate boundaries of the District of Columbia, where stormwater discharges via the Municipal Separate Storm Sewer System (MS4).

Since the United States Environmental Protection Agency, Region III (EPA) issued the District of Columbia (the District) its first MS4 Permit in 2000, the Agency has responded to a number of legal challenges involving both that Permit (as well as amendments thereto) and the second-round MS4 Permit issued in 2004. For the better part of ten years, the Agency has worked with various parties in the litigation, including the District and two non-governmental organizations, Defenders of Wildlife and Friends of the Earth, to address the concerns of the various parties. The Agency has engaged in both litigation and negotiation, including formal

mediation.[1] These activities ultimately led to an enhanced stormwater management strategy in the District, consisting of measurable outputs for addressing the issues raised during the litigation and mediation process.

FACILITY BACKGROUND AND DESCRIPTION:

The Government of the District of Columbia owns and operates its own MS4, which discharges stormwater from various outfall locations throughout the District into its waterways.[2]

On April 21, 2010 EPA public noticed the Draft Permit. The Draft Fact Sheet published with that Draft Permit contains more extensive permit background information, and the reader is referred to that document for the history of the District of Columbia MS4 permit.

The public comment period closed on June 4, 2010. EPA received comments from 21 individual commenters and an additional 53 form letters. The Draft Permit, Draft Fact Sheet, and comments received on those documents are all available at: http://www.epa.gov/reg3wapd/npdes/draft_permits.html. The Final Permit reflects many of the comments received. EPA is simultaneously releasing a responsiveness summary responding to these comments.

ACTION TO BE TAKEN:

EPA is today reissuing the District of Columbia NPDES MS4 Permit. The Final Permit replaces the 2004 Permit, which expired on August 18, 2009 and has been administratively extended since that time. The Final Permit incorporates concepts and approaches developed from studies and pilot projects that were planned and implemented by the District under the 2000 and 2004 MS4 permits and modifying Letters of Agreement, and implements Total Maximum Daily Loads (TMDLs) that have been finalized since the prior permit was issued, including the Chesapeake Bay TMDL. A number of applicable measurable performance standards have been incorporated into the Final Permit. These and other changes between the 2004 Permit and today's Final Permit are reflected in a Comparison Document that is part of today's Permit issuance.

WATER QUALITY IN DISTRICT RECEIVING WATERS:

The District's *2008 Integrated Report to the Environmental Protection Agency and U.S. Congress Pursuant to Sections 305(b) and 303(d) Clean Water Act*[3] documents the serious water

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1 A procedural history of Permit appeals can be viewed at the EPA Environmental Appeals Board web: http://yosemite.epa.gov/oa/EAB_Web_Docket.nsf/77355bee1a56a5aa8525711400542d23/b5e5b68e89edabe98525714f00731c6f!OpenDocument&Highlight=2,municipal.

2 Portions of the District are served by a combined sanitary and storm sewer system. The discharges from the combined sewer system are not subject to the MS4 permit, but are covered under NPDES Permit No. xxxx issued to the District of Columbia Water and Sewer Authority.

3 District Department of the Environment, *The District of Columbia Water Quality Assessment, 2008 Integrated Report to the Environmental Protection Agency and U.S. Congress Pursuant to Sections 305(b) and 303(d) Clean Water Act* (hereinafter "2008 Integrated Report").

quality impairments in the surface waters in and around the District. A number of the relevant designated uses are not being met, *e.g.*, aquatic life, fish consumption, and full body contact, and there are a number of specific pollutants of concern that have been identified (for additional discussion on relevant TMDLs *see* Section 4.10 of this Final Fact Sheet).

Commenters on the Draft Permit expressed some frustration over very slow progress or even lack of progress after a decade of implementation of the MS4 program and even longer for other water quality programs. EPA appreciates this concern. Although the District's receiving waters are affected by a range of discharge sources, discharges from the MS4 are a significant contributor of pollutants and cause of stream degradation. EPA also recognizes, however, that stormwater management efforts that achieve a reversal of the ongoing degradation of water quality caused by urban stormwater discharges entail a long term, multi-faceted approach.

Consistent with the federal stormwater regulations for characterizing discharges from the MS4 (40 C.F.R. §122.26(d)(2)(iii)), the first two permit terms for the District's MS4 program required end-of-pipe monitoring to determine the type and severity of pollutants discharging via the system. The monitoring program was not designed to evaluate receiving water quality *per se*, therefore detection of trends or patterns was not reasonably possible. Today's Final Permit includes requirements for a Revised Monitoring Program, and one of the objectives for the program is to use a suite of approaches and indicators to evaluate and track water quality over the long-term (*see* discussion of Section 5.1 in this Final Fact Sheet).
There have been identified improvements in some areas. For example the *2008 Integrated Report* noted improvements in the diversity of submerged aquatic vegetation in the Potomac River, as well as improvements in fish species richness in Rock Creek. Biota metrics are often the best indicators of the integrity of any aquatic system.

EPA also notes that there are a variety of indirect measures indicative of improvement. The federal stormwater regulations foresaw the difficulty, especially in the near-term, of detecting measurable improvement in receiving waters, and relied instead on indirect measures, such as estimates of pollutant load reductions (40 C.F.R. §122.26(d)(2)(v)). The District documents these types of indirect measures in its annual reports, *e.g.*, tons of solids collected from catch basin clean-outs, amount of household hazardous waste collected, number of trees planted, square footage of green roofs installed, and many other measures of success.[4]

EPA believes that documenting trends in water quality, whether improvements, no change, or even further degradation, is an important element of a municipal water quality program. Today's Final Permit recognizes this principle, both in the types of robust measures required as well as the transition to new monitoring paradigms. EPA encourages all interested parties to provide the District with input during the development of these program elements.

THIS FACT SHEET:

(http://ddoe.dc.gov/ddoe/frames.asp?doc=/ddoe/lib/ddoe/information2/water.reg.leg/DC_IR_2008_Revised_9-9-2008.pdf

4 District MS4 Annual Reports can be found at: http://ddoe.dc.gov/ddoe/cwp/view,a,1209,q,495855.asp

This Final Fact Sheet is organized to correspond with the chronological organization and numbering in today's Final Permit. Where descriptions or discussions may be relevant to more than one element of the Final Permit the reader will be referred to the relevant section(s).

To keep today's Final Fact Sheet of readable length, many of the elements included in the fact sheet published with the Draft Permit (Draft Fact Sheet) on April 21, 2010 have not been repeated, but are referenced. Readers are referred to the Draft Fact Sheet published with the Draft Permit for additional discussion on provisions that have been finalized as proposed.[5] The Final Fact Sheet does discuss significant changes since the 2004 Permit (even if discussed in the Draft Fact Sheet). The Final Fact Sheet also contains additional explanation of the Final Permit where commenters requested additional clarification. In addition, this Final Fact Sheet explains modifications to the Final Permit where provisions were changed in response to comments.

In many cases EPA made a number of very simple modifications to the Final Permit, *e.g.*, a word, phrase, or minor reorganization, simply for purposes of clarification. These modifications were not intended to change the substance of the permit provisions, only to clarify them. Most of those types of edits are not discussed in this Final Fact Sheet, but EPA has provided a Comparison Document of the Draft and Final Permits for readers who would like that level of detail.

Many commenters noted that the Draft Permit was not logically organized. EPA agrees. The major reorganization principles include:

1) There is a new Section 3, Stormwater Management Program (SWMP) Plan consolidating the various plans, strategies and other documents developed in fulfillment of permit requirements.
2) All implementation measures, *i.e.*, those stipulating management measures and implementation policies, are included in Section 4 of today's Final Permit. This includes "Source Identification" elements (Section 3 in the Draft Permit) and "Other Applicable Provisions" elements (Section 8 in the Draft Permit), which included TMDL requirements.
3) All monitoring requirements are consolidated in Section 5 of the Final Permit.
4) All reporting requirements are consolidated in Section 6 of the Final Permit.

EPA also refers readers to the Responsiveness Summary released today along with the Final Permit and Final Fact Sheet, for responses to comments and questions received on the Draft Permit. That document contains additional detailed explanations of the rationale for changes made to the Draft Permit in the Final Permit.

Finally, EPA made significant effort to avoid appending or incorporating by reference other documents containing permit requirements into the Final Permit. In the interest of clarity

5 The Permit and Fact Sheet proposed on April 21, 2010 can be viewed at: http://www.epa.gov/reg3wapd/npdes/draft_permits.html

and transparency EPA, to the extent possible, has included all requirements directly in the permit. Thus, EPA reviewed a variety of documents with relevant implementation measures, *e.g.*, TMDL Implementation Plans and the 2008 Modified Letter of Agreement to the 2004 permit[6], and translated elements of those plans and strategies into specific permit requirements that are now contained in the Final Permit. This Fact Sheet provides an explanation of the sources of provisions that are significant and are a direct result of one of those strategies.

1. DISCHARGES AUTHORIZED UNDER THIS PERMIT

(1.2 Authorized Discharges): The Final Permit authorizes certain non-stormwater discharges, including discharges from water line flushing. One commenter noted that many of these discharges, especially from potable water systems, contain concentrations of chlorine that may exceed water quality standards. EPA agrees, and has therefore clarified that dechlorinated water line flushing is authorized to be discharged under the Final Permit.

(1.4 Discharge Limitations): Comments on the language in Part 1.4 varied widely. Some commenters did not believe it was reasonable to require discharges to meet water quality standards. Other commenters believed this to be an unambiguous requirement of the Clean Water Act.

Today's Final Permit is premised upon EPA's longstanding view that the MS4 NPDES permit program is both an iterative and an adaptive management process for pollutant reduction and for achieving applicable water quality standard and/or total maximum daily load (TMDL) compliance. *See generally,* "National Pollutant Discharge Elimination System Permit Application Regulations for Stormwater Discharges," 55 F.R. 47990 (Nov. 16, 1990).

EPA is aware that many permittees, especially those in highly urbanized areas such as the District, likely will be unable to attain all applicable water quality standards within one or more MS4 permit cycles. Rather the attainment of applicable water quality standards as an incremental process is authorized under section 402(p)(3)(B)(iii) of the Clean Water Act, 33 U.S.C. § 1342(p)(3)(B)(iii), which requires an MS4 permit "to reduce the discharge of pollutants to the maximum extent practicable" (MEP) "and such other provisions" deemed appropriate to control pollutants in municipal stormwater discharges. To be clear, the goal of EPA's stormwater program is attainment of applicable water quality standards, but Congress expected that many municipal stormwater dischargers would need several permit cycles to achieve that goal.

Specifically, the Agency expects that attainment of applicable water quality standards in waters to which the District's MS4 discharges, requires staged implementation and increasingly more stringent requirements over several permitting cycles. During each cycle, EPA will continue to review deliverables from the District to ensure that its activities constitute sufficient progress toward standards attainment. With each permit reissuance EPA will continue to increase

6 District Department of the Environment, *Modification to the Letter of Agreement dated November 27, 2007 for the NPDES Municipal Separate Storm Sewer (MS4) Permit DC0000222* (2008) http://www.epa.gov/reg3wapd/npdes/pdf/DCMS4/Letter.PDF

stringency until such time as standards are met in all receiving waters. Therefore today's Final Permit is clear that attainment of applicable water quality standards and consistency with the assumptions and requirements of any applicable WLA are requirements of the Permit, but, given the iterative nature of this requirement under CWA Section 402(p)(3)(B)(iii), the Final Permit is also clear that "compliance with all performance standards and provisions contained in the Final Permit shall constitute adequate progress toward compliance with DCWQS and WLAs for this permit term" (Section 1.4).

EPA believes that permitting authorities have the obligation to write permits with clear and enforceable provisions and thus the determination of what is the "maximum extent practicable" under a permit is one that must be made by the permitting authority and translated into provisions that are understandable and measurable. In this Final Permit EPA has carefully evaluated the maturity of the District stormwater program and the water quality status of the receiving waters, including TMDL wasteload allocations. In determining whether certain measures, actions and performance standards are practicable, EPA has also looked at other programs and measures around the country for feasibility of implementation. Therefore today's Final Permit does not qualify any provision with MEP thus leaving this determination to the discretion of the District. Instead each provision has already been determined to be the maximum extent practicable for this permit term for this discharger.

EPA modified the language in the Final Permit to provide clarity on the expectations consistent with the preceding explanation. Specifically Section 1.4.2 of the Final Permit requires that discharges 'attain' applicable wasteload allocations rather than just 'be consistent' with them, since the latter term is somewhat ambiguous.

In addition, the general discharge limitation 'no increase in pollutant loadings from discharges from the MS4 may occur to receiving waters' was removed because of the difficulty in measuring, demonstrating and enforcing this provision. Instead, consistent with EPA's belief that the Final Permit must include all of the enforceable requirements that would achieve this principle, the following discharge limitation is substituted: "comply with all other provisions and requirements contained in this permit, and in plans and schedules developed in fulfillment of this permit."

In addition, EPA made the following modifications: "Compliance with <u>the</u> performance standards and provisions contained in <u>Parts 2 through 8 of</u> this permit shall constitute adequate progress towards compliance with DCWQS <u>and WLAs for this permit term</u>" (*underlined text added*) (Section 1.4 of the Final Permit). EPA eliminated circularity with the addition of "Parts 2 through 8", clarifying that this requirement does not circle back to include the statements in 1.4.1 and 1.4.2, but rather interprets them. Also, although WLAs are a mechanism for attainment of water quality standards, EPA added the specific language "and WLAs" to make this concept explicit rather than just implicit. In addition this revised language emphasizes that the specific measures contained in the Final Permit, while appropriate for this permit term, will not necessarily constitute full compliance in subsequent permit terms. It is the expectation that with each permit reissuance, additional or enhanced requirements will be included with the objective

of ensuring that MS4 discharges do not cause or contribute to an exceedance of applicable water quality standards, including attainment of relevant WLAs.

2. LEGAL AUTHORITY, RESOURCES, AND STORMWATER PROGRAM ADMINISTRATION

(2.1 Legal Authority): Several commenters pointed out that there were a number of requirements in the Draft Permit without clear compliance schedules or deadlines, or with deadlines that did not correspond well to others in the permit. In the Final Permit, EPA has made several revisions to address these comments. For example, EPA changed a requirement that deficiencies in legal authority must be remedied "as soon as possible" to a 120-day requirement for deficiencies that can be addressed through regulation, and two years for deficiencies that require legislative action (Section 2.1.1). Also, EPA increased the compliance schedule for updating the District's stormwater regulation from twelve months to eighteen months, *id.,* so that this action could be adequately coordinated with the development of the District's new offsite mitigation/payment-in-lieu program (for more discussion see Section 4.1.3 below).

(2.2 Fiscal Resources): One commenter suggested eliminating the reference to the District's Enterprise Fund since funding was likely to come from a number of different budgets within the District. EPA agrees with this comment and has removed this reference.

On the other hand, many commenters noted that the implementation costs of the District's stormwater program will be significant. EPA agrees. The federal stormwater regulations identify the importance of adequate financial resources [40 C.F.R. §122.26(d)(1)(vi) and (d)(2)(vi)]. In addition, after seeing notable differences in the caliber of stormwater programs across the country, EPA recognizes that dedicated funding is critical for implementation of effective MS4 programs.[7,8,9] In 2009 the District established, and in 2010 revised, an impervious-based surface area fee for service to provide core funding to the stormwater program[10] (understanding that stormwater-related financing may still come from other sources as they fulfill multiple purposes, *e.g.,* street and public right-of-way retrofits). In conjunction with the 2010 rule-making to revise the fee the District issued a Frequently Asked Questions document[11] that indicates the intent to restrict this fee to its original purpose, *i.e.*, dedicated funding to implement the stormwater program and comply with MS4 permit requirements. EPA believes this action is essential, and he expects that the District will maintain a dedicated source of funding for the stormwater program.

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7 National Research Council, *Urban Stormwater Management in the United States* (2009) National Academy of Sciences http://www.nap.edu/catalog.php?record_id=12465

8 National Association of Flood and Stormwater Agencies, Funded by EPA, *Guidance for Municipal Stormwater Funding* (2006) http://www.nafsma.org/Guidance%20Manual%20Version%202X.pdf

9 EPA, *Funding Stormwater Programs* (2008) http://www.epa.gov/npdes/pubs/region3_factsheet_funding.pdf

10 District of Columbia, Rule 21-566 Stormwater Fees, http://www.dcregs.dc.gov/Gateway/RuleHome.aspx?RuleID=474056

11 District of Columbia, FAQ Document *Changes to the District's Stormwater Fee* (2010) http://ddoe.dc.gov/ddoe/frames.asp?doc=/ddoe/lib/ddoe/information2/water.reg.leg/Stormwater_Fee_FAQ_10-5-10_-final.pdf

EXHIBIT B

CALIFORNIA Water Boards

EDMUND G. BROWN JR. GOVERNOR

MATTHEW RODRIQUEZ SECRETARY FOR ENVIRONMENTAL PROTECTION

State Water Resources Control Board

State Water Resources Control Board

Issue Paper
Municipal Storm Water Permit Receiving Water Limitations
Board Workshop
November 20, 2012

ISSUE:

The State Water Resources Control Board (State Water Board) has been asked, in public comments received on National Pollutant Discharge Elimination System (NPDES) permits for Municipal Separate Storm Sewer Systems (MS4s), to adopt permit provisions that create a partial or complete exemption from enforcement for violations of water quality standards while a discharger engages in an iterative process of improving controls (commonly referred to as a "safe harbor" provision). The State Water Board has scheduled a public workshop to consider the issue.

DISCUSSION:

Background:

The Clean Water Act generally requires NPDES permits to include technology-based effluent limitations and any more stringent limitations necessary to meet water quality standards. In the context of NPDES permits for MS4s, however, the Clean Water Act does not reference the requirement to meet water quality standards. MS4 discharges must meet a technology-based standard of reducing pollutants in the discharge to the Maximum Extent Practicable (MEP), but requirements to meet water quality standards are at the discretion of the permitting agency.[1] Further, under the Porter-Cologne Water Quality Control Act, waste discharge requirements must implement applicable water quality control plans, including water quality objectives; however, the Porter-Cologne Act also affords the State Water Board and regional water quality control boards (collectively, Water Boards) flexibility to consider other factors, such as economics, when establishing any NPDES permit requirements that are more stringent than required by the Clean Water Act.[2]

The State Water Board has exercised its discretion with regard to requiring compliance with water quality standards in MS4 permits by directing, in precedential orders, that MS4 permits contain provisions requiring discharges to be controlled so as not to cause or contribute to exceedances of water quality standards in receiving waters.[3] However, consistent with federal

[1] 33 U.S.C. § 1342(p); *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159.

[2] Wat. Code, §§ 13241, 13263; *City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613.

[3] SWRCB Order WQ 98-01 (*Environmental Health Coalition*), WQ 99-05 (*Environmental Health Coalition)*.

law, the State Water Board has found it appropriate to implement Best Management Practices (BMPs) in lieu of numeric water quality-based effluent limitations to meet water quality standards.[4] Additionally, in lieu of "strict compliance" with water quality standards, the State Water Board has prescribed an iterative process whereby an exceedance of a water quality standard triggers a process of BMP improvements: reporting of the violation, submission of a report describing proposed improvements to BMPs expected to better meet water quality standards, and implementation of these new BMPs.

While the Water Boards have generally directed dischargers to achieve compliance with water quality standards by improving control measures through the iterative process, the iterative process does not provide a "safe harbor" to MS4 permittees: that is, when a discharger is shown to be causing or contributing to an exceedance of water quality standards, that discharger is in violation of the relevant discharge prohibitions and receiving water limitations of the permit and potentially subject to enforcement by the Water Boards or through a citizen suit, even if the discharger is actively engaged in the iterative process. Despite the lack of a safe harbor provision, however, the Water Boards have, as a matter of practice, declined to initiate enforcement actions against MS4 permittees who have been actively engaged in the iterative process. The Water Boards' decisions to decline to include a safe harbor in MS4 permits have been upheld by courts of appeal.[5]

Need for and Purpose of Workshop:

The lack of a safe harbor in the iterative process was recently highlighted by the Ninth Circuit's decision in a citizen suit brought by the Natural Resources Defense Council (NRDC) against the County of Los Angeles and the Los Angeles County Flood Control District for violations of the receiving water limitations of their MS4 permit. The Ninth Circuit confirmed that, as the receiving water limitations of the Water Boards' MS4 permits are currently drafted, engagement in the iterative process does not excuse liability for violations of water quality standards.[6]

As the storm water management programs of municipalities have matured, an increasing body of monitoring data indicates that water quality standards are in fact not being met by many MS4s. MS4s accordingly assert that the receiving water limitations and iterative process provisions of the Water Boards' permits do not afford them with a viable path to compliance for these violations, which may take years of technical efforts to correct, especially for wet weather discharges. MS4s argue that they are increasingly vulnerable to citizen suits and/or Water Board enforcement. This concern has been raised by the California Stormwater Quality Association (CASQA) in comments on the proposed Phase II MS4 permit and by the California Department of Transportation (Caltrans) in comments on the Caltrans MS4 permit adopted

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[4] *See* SWRCB Orders WQ 91-03 (*Citizens for a Better Environment)*, WQ 98-01 (*Environmental Health Coalition*), WQ 2001-15 (*Building Industry Association of San Diego County*); *See also* 40 C.F.R. § 122.44(k); Interim Permitting Approach for Water Quality-Based Effluent Limitations In Storm Water Permits, USEPA, September 1995. In such orders and guidance, the State Water Board and Environmental Protection Agency acknowledge that the storm water program may evolve over time to incorporate stricter limitations, including improved BMPs to meet water quality standards or numeric water quality based effluent limitations.

[5] *Building Industry Assn. of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866; *City of Rancho Cucamonga v. Regional Water Quality Control Bd.* (2006) 135 Cal.App.4th 1377; see also *Natural Resources Defense Council v. County of Los Angeles* (9th Cir. 2011) 673 F.3d 880, 897, n.7.

[6] *Natural Resources Defense Council v. County of Los Angeles, supra*, 673 F.3d at p. 897. On July 13, 2012, the United States Supreme Court granted review of this case on other grounds.

September 19, 2012, as well as by numerous MS4s and interested persons in comments on both permits. The issue is additionally relevant to the Phase I MS4 permits issued by the regional water quality control boards.[7]

At the same time, the environmental community has commented that the iterative process has been underutilized and ineffective to date in bringing MS4 discharges into compliance with water quality standards. Environmental parties argue that direct enforcement of water quality standards is necessary to protect water quality, especially in such second- or third-generation permits where dischargers have already had a number of years to come into compliance.

Because of the broad applicability of any policy decisions regarding the receiving water limitations and iterative process provisions, the State Water Board is holding a public workshop to consider several alternatives in addressing the issue and to seek public input on these alternatives. Following the workshop, the State Water Board may propose revisions to the receiving water limitations in the Caltrans MS4 and Phase II MS4 permits, and as necessary, re-open those permits after public review and comment, to make the revisions.

ALTERNATIVES FOR CONSIDERATION:

The State Water Board may consider the alternatives below, individually or in combination, to address concerns with the receiving water limitations in the Caltrans or Phase II MS4 permits. While the listed alternatives attempt to capture the range of alternatives before the State Water Board, the Board welcomes comments proposing other options and will not be limiting its consideration to the alternatives as listed in this issue paper.

The receiving water limitations language prescribed by State Water Board Order WQ 99-05 is attached as Attachment 1 and forms the basis of Alternative 1. CASQA has submitted specific proposed language for the Receiving Water Limitations provision of the proposed Phase II MS4 permit (CASQA Proposal). The CASQA Proposal is attached as Attachment 2 and is referenced as appropriate in the discussion of the alternatives below.

Alternative 1: Keep the status quo of no safe harbor.

This alternative makes no changes to the existing State Water Board approach or to the current language of the adopted Caltrans MS4 permit or the proposed Phase II MS4 permit. As stated previously, the current MS4 permit provisions laying out the iterative process are based on language set forth in precedential State Water Board orders. (See Attachment 1.) Alternative 1 adheres to the prescribed language. Under this alternative, the Water Boards may choose to exercise their enforcement discretion to refrain from taking action against dischargers engaged in good faith implementation of the iterative process; however, they would not be constrained from enforcing the receiving water limitations when an MS4 causes or contributes to exceedances of water quality standards. As a limitation within an NPDES permit, dischargers who cause or contribute to an exceedance of water quality standards could be subject to citizen suits.

[7] Note that the issue is not relevant to any other NPDES permits, including permits for storm water discharges associated with industrial activity, because all other NPDES permits must include technology-based effluent limitations and any more stringent limitations necessary to meet water quality standards. (33 U.S.C. § 1311(b)(1)(C).)

Alternative 2: No safe harbor, but provide greater clarity and specificity for iterative process implementation and wet weather data analysis.

Greater clarity and specificity in the MS4 permits as to the iterative process requirements may result in increased efforts to improve controls and achieve compliance. Such clarity and specificity may include:

1. Clarification on how compliance with the relevant discharge prohibitions and receiving water limitations is determined, including type and frequency of monitoring;
2. Clarification that dischargers must begin the iterative process after documentation of violations without waiting to be directed to do so by the Water Boards;
3. Specification of the minimum efforts that will constitute meaningful compliance with the iterative process;
4. Specification of the scope of any corrective action, including whether it applies only at the location where exceedances are measured or throughout the relevant watershed;
5. Specification of additional wet weather data analysis to better define and assess the impact of municipal storm water discharges on receiving waters, as well as the efficacy of specific best management practices.

As the MS4 program continues to mature and more data becomes available, this alternative may be enhanced by the development of water quality-based effluent limitations for pollutants, as appropriate, as a means of determining compliance with receiving water limitations. In addition, the enhanced wet weather data could be used to identify surrogates that could be used as a measure of protecting beneficial uses. In time, the data could be used to develop actual wet weather water quality standards or wet weather implementation provisions for existing water quality standards that could be applied consistently on a statewide basis.

Given the nature of storm water discharges and of MS4s, questions such as where and how compliance with water quality standards should be measured and how narrowly or broadly corrective actions should be applied, pose complicated technical issues that require careful study and consideration. These challenges notwithstanding, water quality improvements are more likely to be achieved as the iterative process becomes automatic and dischargers follow clear guidelines for determining and addressing non-compliance with permit terms. Such improvements may dissuade the Water Boards and the public from bringing enforcement actions/citizen suits for all except the most egregious and repeated violations.

In addition to being a stand-alone alternative, Alternative 2 may be considered in combination with Alternatives 3 through 5. The CASQA Proposal incorporates some greater specificity in the iterative process requirements as a component of its proposed receiving water limitations.

Alternative 3: Safe harbor that applies only if a discharger is in compliance with the implementation provisions of an approved TMDL.

Under Alternative 3, the receiving water limitations would be amended to provide a safe harbor for permittees that are in compliance with the implementation provisions of a TMDL. In effect, as long as the permittee is in compliance with the TMDL (including any compliance schedule) the terms of the TMDL would replace the requirement to comply with water quality standards for the pollutants that are covered by the TMDL.

The CASQA Proposal contemplates a safe harbor for dischargers in compliance with a TMDL as a component of the receiving water limitations.

Alternative 4: Safe harbor that applies if a discharger is in compliance with the implementation provisions of an approved TMDL, as in Alternative 3, and, in addition, that applies when the discharger engages in good faith compliance with the iterative process for exceedances caused by wet weather discharges.

In addition to the safe harbor for TMDL implementation, Alternative 4 would provide a safe harbor when dischargers engage in the iterative process in good faith to address violations of permit terms caused by wet weather discharges. Thus, if a storm water discharge from an MS4 is causing or contributing to an exceedance of a water quality standard in the receiving water, the exceedance would not constitute a violation of the permit as long as the discharger was engaged in good faith efforts to address the exceedance through improved controls. Alternative 4 recognizes that wet weather discharges from MS4s frequently cause or contribute to violations of water quality standards and allows the MS4s time to address these violations by improving control measures.

However, the safe harbor would not extend to dry weather discharges. Non-storm water discharges are generally prohibited in MS4 permits and only a few categories of non-storm water discharges are exempted from the prohibition, with the condition that these exempted discharges also be prohibited if they are identified as sources of pollutants to receiving waters.

Alternative 5: Full safe harbor.

This alternative would provide a full safe harbor to dischargers complying with the implementation provisions of a TMDL or engaging in the iterative process to address exceedances caused by wet or dry weather discharges.

The CASQA Proposal attached provides for a full safe harbor.

Attachments Removed

EXHIBIT C

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RIVERSIDE COUNTY FLOOD CONTROL
AND WATER CONSERVATION DISTRICT

November 13, 2012

Honorable Members of the State Water Resources Control Board
Attn: Ms. Jeanine Townsend, Clerk to the Board
State Water Resources Control Board
1001 I Street, 24th Floor
Sacramento, CA 95814

Dear Honorable Board Members and Ms. Townsend:

Re: Comment Letter – Receiving Water Limitations Language Workshop

I am writing on behalf of the Riverside County Flood Control and Water Conservation District ("District") regarding the State Water Resources Control Board's consideration of Receiving Water Limitations ("RWL") language in MS4 permits. This review was triggered by a decision of the Ninth Circuit United States Court of Appeals in *Natural Resources Defense Council v. County of Los Angeles* (9th Cir. 2011) 673 F.3d 880, *cert granted,* __ U.S. __ (June 25, 2012) ("*NRDC*"). This letter is being submitted in advance of the State Board's November 20, 2012 workshop on reform of the RWL language to be incorporated into MS4 permits as a matter of statewide policy.

The District is the Principal Permittee for three Phase I MS4 permits applicable to municipalities across Riverside County: Order R8-2010-0033, issued by the Santa Ana Regional Water Board to municipalities within the Santa Ana River Region of Riverside County; Order R9-2010-016, issued by the San Diego Regional Water Board to municipalities within the Santa Margarita Region of Riverside County; and Order R7-2008-0001, issued by the Colorado River Regional Water Board to municipalities within the Whitewater River Region of Riverside County. Given our unique perspective as the manager of three Phase 1 MS4 permits, the District and its staff thus, have considerable experience and expertise in developing and administering MS4 permits, and a keen understanding of the issues that the above mentioned court case creates.

The District strongly supports reform of the RWL language to make clear the State Board's often-expressed intention that MS4 Permittees' compliance with RWL be effectuated through an iterative process. However, under the Ninth Circuit's interpretation, any MS4 discharge that causes or contributes to an exceedance of a Water Quality Standard subjects the MS4 Permittee to civil penalty liability, injunctive relief and the payment of attorneys' fees in an action brought by a citizen plaintiff, even where the Permittee is fully implementing the programmatic requirements of their MS4 Permit.

The District supports the California Stormwater Quality Association's ("CASQA") efforts to obtain RWL language that ensures that the iterative process favored by the State Board is honored. The District also supports the comments of the California State Association of Counties, and believes the proposed RWL language attached to those comments is a step in the right direction.

This letter contains additional District comments about the RWL language and the iterative process. We believe that they are best expressed in terms of correcting misperceptions regarding the current RWL language, as interpreted by the Ninth Circuit.

Misperception Number One: Strict compliance with Water Quality Standards is required of MS4 Permittees by the Clean Water Act.

The Clean Water Act provides that MS4 discharges must control pollutants in discharges from the MS4 to the "Maximum Extent Practicable" (33 U.S.C. § 1342(p)(3)(B)(iii)). Unlike the case with other NPDES Permittees, the Clean Water Act does not require that municipalities strictly comply with Water Quality Standards, as determined by the Ninth Circuit in *Browner v. Defenders of Wildlife*. The State Board's own precedential Order WQ 2001-15 recognizes this fact and states that the RWL language was intended to be consistent with the *Browner* case. In that Order, which interpreted RWL language similar to that in *NRDC*, the Board stated:

> *[O]ur language, similar to the U.S. EPA's permit language discussed in the Browner case, does not require strict compliance with water quality standards. Our language requires that storm water management plans be designed to achieve compliance with water quality standards. Compliance is to be achieved over time, through an iterative approach requiring improved BMPs. As pointed out by the Browner court, there is nothing inconsistent between this approach and the determination that the Clean Water Act does not mandate strict compliance with water quality standards. [Order WQ 2001-15 at 7 (emphasis added)].*

Unfortunately, the Ninth Circuit completely disregarded this language, and the Order, in holding that strict compliance was required of MS4 Permittees.

USEPA itself has issued MS4 permits (in non-delegated states) that do not contain RWL language requiring strict compliance with Water Quality Standards. Therefore, it is clear that such compliance is not required by the Clean Water Act nor is such compliance established by USEPA policy. The most prominent example of a recent MS4 permit promulgated by USEPA is that for the District of Columbia ("DC Permit") (relevant portions of which are attached as Exhibit A), which was adopted in 2011.

Part 1.4 of the DC Permit contains the requirements relating to Water Quality Standards and provides, in relevant part: "Compliance with the performance standards and provisions contained in Parts 2 through 8 of the permit shall constitute adequate progress towards compliance with DCWQS [water quality standards] and WLAs [established under TMDLs] for this permit term." The DC Permit Fact Sheet explains the rationale for that language as follows [DC Permit Fact Sheet, Pages 5-6, emphasis added, attached as Exhibit B]:

> *Comments on the language in Part 1.4 varied widely. Some commenters did not believe it was reasonable to require discharges to meet water quality standards. Other commenters believed this to be an unambiguous requirement of the Clean Water Act.*

Today's Final Permit is premised upon **EPA's longstanding view that the MS4 NPDES permit program is both an iterative and an adaptive management process for pollutant reduction and for achieving applicable water quality standard and/or total maximum daily load (TMDL) compliance.** *See generally, "National Pollutant Discharge Elimination System Permit Application Regulations for Stormwater Discharges," 55 F.R. 47990 (Nov. 16, 1990).*

EPA is aware that many Permittees, especially those in highly urbanized areas such as the District, likely will be unable to attain all applicable water quality standards within one or more MS4 permit cycles. *Rather the attainment of applicable water quality standards* **as an incremental process** *is authorized under section 402(p)(3)(B)(iii) of the Clean Water Act, 33 U.S.C. § 1342(p)(3)(B)(iii), which requires an MS4 permit "to reduce the discharge of pollutants to the maximum extent practicable" (MEP) "and such other provisions" deemed appropriate to control pollutants in municipal stormwater discharges.* **To be clear, the goal of EPA's stormwater program is attainment of applicable water quality standards, but Congress expected that many municipal stormwater dischargers would need several permit cycles to achieve that goal.**

Specifically, the Agency expects that attainment of applicable water quality standards in waters to which the District's MS4 discharges, requires staged implementation and increasingly more stringent requirements over several permitting cycles. During each cycle, EPA will continue to review deliverables from the District to ensure that its activities constitute sufficient progress toward standards attainment. With each permit reissuance EPA will continue to increase stringency until such time as standards are met in all receiving waters. **Therefore today's Final Permit is clear that attainment of applicable water quality standards and consistency with the assumptions and requirements of any applicable WLA are requirements of the Permit, but, given the iterative nature of this requirement under CWA Section 402(p)(3)(B)(iii), the Final Permit is also clear that "compliance with all performance standards and provisions contained in the Final Permit shall constitute adequate progress toward compliance with DCWQS and WLAs for this permit term" (Section 1.4).**

USEPA is now proposing clarifying changes to this language and to other sections of the DC Permit as the result of a settlement with various parties. However, those changes do not require strict compliance with Water Quality Standards, but rather compliance through the programs developed under the Permit.

The State Board is thus, free to adopt new RWL language that effectuates its previously expressed intent that MS4 permits not require strict compliance with Water Quality Standards with regard to contributions from discharges from MS4s.

Misperception Number Two: The MS4 Permittees are Seeking a "Safe Harbor" that would Insulate them from Responsibility Under the Clean Water Act.

While State Board staff's "Issue Paper" uses the term "safe harbor" in describing the iterative process, the District believes that this is fundamentally misleading. Even a cursory review of the terms of a typical MS4 permit in California reveals that it is full of compliance points. In the three MS4 Permits in which the District serves as Principal Permittee, literally every sentence is a separate point of compliance.

This fact is supported by the language of the Permits themselves. For example, in Order R8-2010-0033 Part XX.G provides: **"The Permittees must comply with all terms, requirements, and conditions of this Order. Any violation of this Order constitutes a violation of the CWA, its regulations and the California Water Code, and is grounds for enforcement action . . . ."** (emphasis added). Similar provisions are contained in the other two Riverside County MS4 Permits. Even without the strict Water Quality Standard language imposed under the Ninth Circuit's opinion, there is no "safe harbor" from liability under the Clean Water Act or, where applicable, the California Water Code, for any Permittee that fails to fully implement each the detailed and prescriptive requirements of its MS4 Permit.

There is a fundamental difference however, between fully complying with activities within the control and responsibility of the Permittees, such as monitoring, implementing BMPs and performing other programmatic requirements of the MS4 Permit; and being forced to guarantee that MS4 discharges will not cause or contribute to exceedances of Water Quality Standards in Receiving Waters, a guarantee that the Permittees' have no ability to make.

What the District and other MS4 Permittees seek is relief from what is essentially "guaranteed non-compliance" where a Permittee can be found in violation of their MS4 Permit even if the exceedance occurs at no fault of or failure by the Permittee, or put another way, even in circumstances where there is nothing a Permittee could have done to prevent that exceedance from occurring. In such a case, the Permittee can be held liable for potentially millions of dollars in legal costs, penalties and other expenses. We note that the City of Malibu, a city of only 13,000 residents, spent more than $2 million in defending against a citizen suit filed with respect to its MS4 Permit and more than $6 million to settle the case, including payment of $750,000 in attorney fees to plaintiffs. Given the tremendous financial challenges faced by every California municipality, including the District, the County of Riverside and the Permittee cities within the County, such a diversion of resources that otherwise would be directed at clean water programs or other vital municipal programs is a poor policy choice. And, as noted, it is not a policy choice that is required by the Clean Water Act, nor is it required by USEPA in their own Permits.

The District recognizes that regulatory enforcement actions and citizen suits are authorized by the Clean Water Act and that such suits may be an appropriate remedy where, for example, a Permittee has failed to comply with the programmatic requirements of its MS4 Permit. Where, however, the Permittees are complying with those requirements in good faith but, due to circumstances beyond

their control, their MS4 discharge causes or contributes to a Water Quality Standard exceedance in Receiving Waters, a citizen suit based on those exceedances potentially throws away the work done by the Permittees and the Water Boards under the MS4 Permit, as discussed below.

Misperception Number Three: MS4 can achieve compliance with strict Water Quality Standards.

MS4 Permittees cannot guarantee that discharges from their MS4s will in fact, not cause or contribute to an exceedance of Water Quality Standards in a Receiving Water. The monitoring conducted under our MS4 Permits reflects exceedances of various Water Quality Standards in Receiving Waters, and we understand that such results are typical for MS4 discharges around the state (please see Pages 2-3 of the CASQA comment letter dated November 2, 2012). The extreme variability of stormwater quality and quantity itself (which, in Southern California, arrives infrequently and from widely varying storm sizes) combined with a multitude of potential pollutant sources beyond a Permittee's ability to truly "control", make it impossible for a municipality to ensure that no discharges from its MS4 will ever cause or contribute to exceedances of Water Quality Standards in Receiving Waters. This was recognized by the Issue Paper released by State Board staff in preparation for the November 20th workshop, which found that as "the storm water management programs of municipalities have matured, **an increasing body of monitoring data indicates that water quality standards are in fact not being met by many MS4s**" (Issue Paper, Page 2 (emphasis supplied)).

Thus, even if municipal Permittees are to be held strictly liable for the ensuring that no discharges from their MS4s cause or contribute to an exceedance of Water Quality Standards, as the Ninth Circuit has interpreted the current RWL language, those Permittees have no ability to attain those standards. The reasons are several-fold and include the following:

1) Unlike an industrial NPDES Permittee, a municipal Permittee is not typically the source of the pollutants in the MS4 discharge (whether wet or dry). The municipality can regulate sources to some degree (through, for example, the operation of structural and non-structural BMPs and implementation of an Illegal Connection/Illicit Discharge program), but the municipality cannot guarantee that pollutants will not enter the MS4 and then be discharged into the Receiving Waters.

2) Municipalities cannot control natural sources of pollutants that are discharged through the MS4. Monitoring has indicated that many pollutants are likely from natural and not anthropogenic sources.

3) While Permittees conduct extensive public education programs as part of their MS4 programs, municipalities cannot "control" human behavior, or "prevent" an individual from taking an action that might cause pollution to enter the MS4. As an example, a resident may, despite all ordinances, regulations, potential penalties or enforcement, public outreach, available BMPs, etc., choose not to pick up after their pets, and

stormwater may, through no fault of the Permittee, pick up animal waste and deposit into the MS4.

4) MS4 Permittees cannot "prevent" flows from entering their MS4. To protect the health and property of their residents, MS4 operators must allow the legitimate flows of water into their drains. This is especially true for the District, which is charged directly by the Legislature [in Water Code App. §48-9] with the task of taking necessary steps to protect the people, properties and watersheds of Riverside County from the negative impacts of flooding. The District cannot, in effect, cause flooding by preventing flows from entering their storm drain, simply because such flows may contain pollutants that cause a violation of the Receiving Waters Limitation provisions of their MS4 Permits. In fact, California law requires downstream property owners (such as MS4 operators) to accept flows from upstream property owners.

5) Further, the authorities granted to flood control districts, such as this District, by the Legislature are narrow and do not include the authority to condition or regulate the quality or nature of stormwater runoff discharged from up gradient properties. This responsibility is appropriately assigned by the Legislature to the Regional Boards.

Similarly, MS4 Permittees cannot guarantee compliance with Water Quality Standards in dry weather. "Alternative 4" in the staff's Issue Paper suggests an alternative RWL approach that would not extend the iterative approach to dry weather discharges. The District submits that this alternative does not reflect the reality of urban runoff. Monitoring conducted under the Riverside County MS4 Permits reflects exceedances of Water Quality Standards during dry weather as well as wet weather. There is no justification for imposition of strict liability for exceedances during such conditions, for the following reasons:

1) During dry weather, other NPDES-permitted discharges continue to flow into the Receiving Waters. For example, much of the flow in the Santa Ana River during dry weather conditions is from non-MS4 sources, such as publicly owned treatment works. Additionally, numerous other separate NPDES-permitted discharges will occur, potentially at concentrations of pollutants that exceed Water Quality Standards. Evidence generated during the *NRDC* case involving the County of Los Angeles, for example, indicated that NPDES permits covering hundreds of these dischargers, including POTWs allowed the discharge of pollutants at concentrations *greater* than Water Quality Standards. Because of these discharges, which are legal and authorized by the Regional Boards, the MS4 Permittees have essentially no more control over compliance with Water Quality Standards in dry weather than they would have during wet weather conditions.

2) Accidental or even intentional illicit discharges by third parties into the MS4 obviously can occur during dry weather as well as wet weather. Such discharges would potentially have an even greater impact on sampling, since they are not diluted by large volumes of stormwater. For example, a vehicular accident recently caused hundreds of gallons of

asphalt tar to enter Sandia Creek, a Receiving Water in Riverside County. While this spill was not discharged through an MS4, if the vehicular accident had occurred in another portion of the watershed, the spill could feasibly have entered into and been discharged from an MS4. Similarly in many places throughout the State, sanitary sewer systems are owned and operated by special districts that have no relation to the MS4 Permittees that own or operate the MS4 systems. Nevertheless, an overflow of such sanitary sewer systems may cause an unavoidable discharge into, and from a Permittee-owned MS4. Such accidental or illicit discharges cannot be "prevented" or "controlled" by the Permittees except to the extent that they can be cleaned up or blocked if promptly reported. However, if the discharge has reached Receiving Waters and caused a measured exceedance of Water Quality Standards, under the Ninth Circuit's interpretation, liability for civil penalties, injunctive relief and attorneys fees will attach to the MS4 Permittee.

3) Enforcing strict Water Quality Standard limits in dry or wet weather is counter-productive to the watershed planning-based MS4 Permits currently being promulgated by many regional water boards. Enforcing such limits will divert Permittee attention and resources from watershed-based, monitoring-heavy compliance programs, as will be discussed in greater detail below.

In essence, under the Ninth Circuit's interpretation of the current RWL language, the District, and potentially every other MS4 Permittee in the state, is in violation of its Permit any time that an exceedance of a Water Quality Standard is recorded and attributed to a discharge from its MS4. This means that the Regional Water Boards have issued, and continue to adopt permits that include RWL language **which cannot be complied with**. The Clean Water Act, however, does not require Permittees to achieve the impossible. *See, e.g., Hughey v. JMS Development Corp.* (11th Cir. 1996) 78 F.3d 1523, 1530 ("In interpreting the liability provisions of the CWA, we realize that Congress is presumed not to have intended absurd (impossible) results.").

Misperception Number Four: The Current RWL Language is more Protective of Receiving Water Quality.

This statement is not only untrue but maintaining the current RWL language actually **impedes** efforts to protect Receiving Water Quality.

We understand that some stakeholders believe that there should be Numeric Effluent Limitations (NELs) contained in the MS4 Permits for purposes of accountability. In response, we note that many MS4 permits now contain numeric Stormwater and Non-stormwater Action Levels ("SALs" and "NALs") or other numeric targets or goals, the exceedance of which trigger specific compliance responses by the Permittees. It is these action levels (which were advocated by the Blue Ribbon Panel established by the State Board to investigate the appropriateness of NELs in MS4 permits) which provide such "numeric" accountability. This is in addition to the numerous other compliance documentation and reporting provisions required of MS4 Permittees that also provide measures of accountability.

More importantly, the current RWL language as interpreted by the Ninth Circuit actually impedes efforts by municipalities to protect water quality. First, by requiring immediate compliance, the language undermines efforts to bring Water Quality Standard-impaired waterbodies into compliance through the Total Maximum Daily Load ("TMDL") program. TMDLs are designed with the recognition that, due to the complexity of the issues causing the waterbody to be impaired in the first place, meeting these requirements cannot be achieved immediately. Therefore, TMDL compliance plans include timelines to achieve such compliance over periods of years and sometimes decades.

Second, most MS4 permits have begun incorporating sophisticated watershed management plans, which prioritize pollutants by waterbody and attempt, through aggressive monitoring and source identification efforts, to identify and address the sources of those prioritized pollutants. Municipalities subject to strict RWL language will have no ability to prioritize pollutants, since they must address any pollutant that exceeds a Water Quality Standard, irrespective of the relative impact that that discharge may have had upon the environment or beneficial uses. Moreover, these watershed management plan approaches employ cooperative monitoring and other watershed-based approaches. Permittees faced with potential liability for any exceedance of Water Quality Standards in Receiving Waters that may be caused or contributed to by discharges of their MS4s, will not likely volunteer to cooperate on any watershed-based approach, if cooperation could subject them to additional unnecessary liability.

Third, in a citizen suit brought under the Clean Water Act, a federal judge is free to impose any appropriate injunctive relief to enforce a permit (33 U.S.C. § 1365(a)). Thus, for example, a court could ignore the provisions of a MS4 permit in ordering municipal defendants to address Water Quality Standard exceedances in Receiving Water. This means that the thousands of people-hours invested in the Permit's development, implementation and oversight by municipalities, the Regional Water Boards and other stakeholders would be wasted. In essence, under the Ninth Circuit's reading of the RWL language, all other language in an MS4 permit appears to be superfluous, since the RWL language would control all compliance efforts. This result, of course, is not required by plain language of the Clean Water Act.

Fourth, if a municipality is in unavoidable and automatic non-compliance with the requirements of its MS4 Permit, it will be unable to justify budgeting for water quality management programs and BMPs otherwise required by the Permit as the municipality will simply receive no benefit from making compliance investments. To gain public support for stormwater programs, a municipality must demonstrate to its residents that such investments will constitute compliance with the Permit.

Discussion of Alternatives

The State Board staff's Issue Paper sets forth five alternatives for consideration. Alternative 1, no change in the current RWL language, is completely unacceptable to the District (and, we believe, to other municipalities across the state) because it fails to address the "guaranteed non-compliance" problem of the current language.

Alternative 2, which proposes to maintain the language that puts the MS4 Permittees in a situation of unavoidable and potentially "guaranteed" non-compliance, but would add greater specification as to how the iterative process might be carried out, is also unacceptable as the MS4 Permittees will still have no viable means to ensure their compliance with the RWL language. While the District does not object in principle to RWL language that spells out clearly, and in achievable terms, what is required of MS4 Permittees when exceedances are recorded, such a change alone does not address the fundamental issues identified in this letter.

Alternative 3, which proposes to provide an iterative process for compliance with the RWL only for pollutants being addressed by dischargers in compliance with an approved TMDL, is better than the first two alternatives, but is still entirely insufficient. By failing to provide a viable means for compliance with the RWL language for non-TMDL pollutants, this alternative language would force Permittees into unavoidable non-compliance, and require them to redirect their efforts and resources away from the TMDL activities, to those other pollutants, due to the strict liability attached to those exceedances. This would be a poor policy choice, as pollutants that are not subject to a TMDL may have significantly less, or even no impact on beneficial uses in the Receiving Waters, as noted in the CASQA comment letter.

Alternative 4, which excludes dry weather discharges from the iterative process to comply with the RWL, is unacceptable for the reasons previously set forth regarding an MS4 Permittees inability to truly "prevent" or "control" accidental or illegal dry weather discharges.

Alternative 5, which provides viable means for compliance with the RWL, for all types of MS4 discharges, is the only viable solution among the alternatives presented by State Board staff. In an era of limited budgets, the only and best way to make progress toward improving the quality our Receiving Waters, is to provide MS4 Permittees the ability to prioritize their efforts, as required in the Watershed Management Plan provisions contained in the most recent MS4 Permits, including the Los Angeles County Permit and the proposed Regional Permit for the San Diego Regional Water Board. As previously discussed, such prioritization cannot occur in the context of strict liability for the exceedance of Water Quality Standards in the Receiving Waters. For all of the reasons set forth in this letter, no other alternative makes policy sense or is congruent with the Maximum Extent Practicable standard in the Clean Water Act.

The District would add that Alternative 5 should additionally incorporate the concept of achieving RWL compliance through watershed management plans, and requests the Board to direct staff to work with stakeholders to ensure that any revised RWL language does not force intermittent or minor exceedances of Water Quality Standards to become de-facto higher priorities than those set by the watershed stakeholders.

In summary, the District supports CASQA, the California State Association of Counties and other municipal stakeholders in advocating for a fully iterative and viable approach to compliance with RWL language in both wet and dry weather conditions. Only when such an approach is in place and endorsed by the State Board will Permittees, including the District, feel confident that they can focus

fully on efforts to address pollutants in discharges into and from their MS4s, and not on preparing for costly and pointless litigation.

The District therefore, respectfully requests the State Board direct its staff to commence development of new language providing for an enforceable, iterative and viable process for MS4 Permittees to comply with the RWL language included in MS4 permits.

We wish to thank you and State Board staff for your consideration of these comments and any further comments, written or oral, that the District may make on these important issues.

Very truly yours,

Steve Thomas

For WARREN D. WILLIAMS
General Manager-Chief Engineer

CP:cw
P8/150189

EXHIBIT D

FILED
JAN - 3 2013
CLERK, U.S. DISTRICT COURT
ALEXANDRIA, VIRGINIA

IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF VIRGINIA
Alexandria Division

VIRGINIA DEPARTMENT OF TRANSPORTATION, ET AL, Plaintiffs, -v- UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, ET AL, Defendants.	Civil Action No. 1:12-CV-775

Memorandum Opinion

Before the Court is the Plaintiffs' motion for judgment on the pleadings under Federal Rule of Civil Procedure 12(c). The Defendants opposed the motion, and the Plaintiffs replied. The Court heard oral arguments on December 14, 2012 and now issues this memorandum opinion and accompanying order granting the Plaintiffs' motion.

Background

The Clean Water Act, 33 U.S.C. § 1251 et seq., establishes the basic structure for regulating discharge of pollutants into the waters of the United States, and provides certain mechanisms to improve and maintain the quality of surface waters.

One such mechanism is the requirement that states identify "designated uses" for each body of water within their borders, as well as "water quality criteria" sufficient to support those uses. 33 U.S.C. § 1313(c)(2)(A). The Environmental Protection Agency ("EPA") evaluates the uses and criteria developed by the states, and either approves them or else proposes and

promulgates its own set of standards. § 1313(c)(3).

Once the standards are in place, each state is required to maintain a list—also subject to approval or modification by EPA—of its waterbodies that are "impaired" because they do not meet their respective water quality criteria. 33 U.S.C. § 1313(d)(1)(A). For each waterbody on the impaired list, the state is required to establish a set of total maximum daily loads ("TMDLs") sufficient to bring the body back into compliance with its water quality criteria. § 1313(d)(1)(C). Each TMDL establishes the maximum amount of a pollutant that may be added to the waterbody daily from all sources (runoff, point sources, etc.). EPA is required to publish a list of pollutants suitable for maximum daily load measurement, § 1314(a)(2)(D), and it has determined that *all* pollutants are suitable for TMDLs, *see* Total Maximum Daily Loads Under Clean Water Act, 43 Fed. Reg. 60,662. Therefore, any pollutant that falls within the relatively broad definition of "pollutant" set forth in § 1362(6) may be regulated via TMDL. EPA can approve or modify as it sees fit TMDLs proposed by the states. § 1313(d)(2).

Here the state in question is Virginia, and the waterbody is a 25-mile long tributary of the Potomac River, located in Fairfax County, called Accotink Creek. The creek has been the subject of litigation in the past that is not relevant to this matter except the result: EPA was required to set TMDLs for Accotink Creek once Virginia failed to do so by a certain date. Specifically, the creek had been identified as having "benthic impairments," which is to say the community of organisms that live on or near the bottom of the creek were not as numerous or healthy as they should be. EPA was to set appropriate TMDLs to improve the health of the benthic community in Accotink Creek.

On April 18, 2011, EPA established a TMDL for Accotink Creek which limited the flow rate of stormwater into Accotink Creek to 681.8 ft^3/acre-day. The TMDL was designed to

regulate the amount of sediment in the Accotink, because EPA believed sediment was a primary cause of the benthic impairment. Both parties agree that sediment is a pollutant, and that stormwater is not. EPA refers to stormwater flow rate as a "surrogate" for sediment.

The Plaintiffs are now challenging the TMDL on multiple grounds, but presently before the Court is a single issue: Does the Clean Water Act authorize the EPA to regulate the level of a pollutant in Accotink Creek by establishing a TMDL for the flow of a nonpollutant into the creek?

Analysis

I. Standard of Review

Count I of the complaint, at issue here, is brought under the Administrative Procedures Act. *See* Comp. ¶ 169. The APA "confines judicial review of executive branch decisions to the administrative record of proceedings before the pertinent agency." *Shipbuilders Council of Am. V. U.S. Dept. of Homeland Sec.*, 770 F. Supp. 2d 793, 802 (E.D. Va. 2011). As such, the district court "sits as an appellate tribunal," and APA claims can be resolved equally well in the context of Rule 12 or Rule 56. *Univ. Med. Ctr. Of S. Nev. V. Shalala*, 173 F.3d 438, 441 n. 3 (D.C. Cir. 1999).

Because Count I presents a question of statutory interpretation, the Court reviews EPA's decision using the two-step analysis set forth in *Chevron, U.S.A., Inc. v. NRDC, Inc.*, 467 U.S. 837 (1984). For a given question of statutory interpretation, the first step under *Chevron* is to determine whether Congress addressed the "precise question at issue." 467 U.S. at 842. "If the intent of Congress is clear, that is the end of the matter . . . ." *Id.* If the Court cannot find that Congress has squarely addressed the question, the Court must move to Chevron's second step. In

the second step of statutory construction under *Chevron*, the Court must determine whether the agency's interpretation of the statute is "permissible." *Id.* at 843. The agency's construction is permissible if it is reasonable, but it need not be what the Court considers the *best* or *most reasonable* construction. *See id.* at 845. The Court is not to simply impose its own construction on the statute, but instead it gives deference to any reasonable statutory construction by the agency. *Id.* at 843.

II. Chevron Step One

Whether statutory ambiguity exists so that the issue cannot be settled at *Chevron's* first step is for the Court to decide, and the Court "owe[s] the agency no deference on the existence of ambiguity." *Am. Bar Ass'n v. FTC*, 430 F.3d 457, 468 (D.C. Cir. 2005). The Court begins the inquiry by "employing traditional tools of statutory construction." *Chevron*, 467 U.S. at 843 n.9. As always, the analysis begins with the text of the statute. *Nat'l Elec. Mfrs. Ass'n v. U.S. Dept't of Energy*, 654 F.3d 496, 504 (4th Cir. 2011).

The text of the statute that requires states to establish their own TMDLs, 33 U.S.C. § 1313(d)(1)(C), is:

> Each State shall establish for the waters identified in paragraph (1)(A) of this subsection, and in accordance with the priority ranking, **the total maximum daily load, for those pollutants which the Administrator identifies** under section 1314(a)(2) of this title as suitable for such calculation. Such load shall be established at a level necessary to implement the applicable water quality standards with seasonal variations and a margin of safety which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality. (emphasis added)

The next subsection, § 1313(d)(2), grants EPA the authority to set TMDLs when the state

has not done so adequately. "Pollutant" is a statutorily defined term. 33 U.S.C. § 1362(6).

The Court sees no ambiguity in the wording of this statute. EPA is charged with establishing TMDLs for the appropriate pollutants; that does not give them authority to regulate nonpollutants. The parties agree that sediment is a pollutant under 33 U.S.C. § 1362(6), and stormwater is not. Then how does EPA claim jurisdiction over setting TMDLs for stormwater?

EPA frames the stormwater TMDL as a surrogate. EPA's research apparently indicates that the "[sediment] load in Accotink Creek is a function of the amount of stormwater runoff generated within the watershed." Def. Opp. at 8. And EPA believes that framing the TMDL in terms of stormwater flow rate is superior to simply expressing it in terms of maximum sediment load.

The DC Circuit has considered and rejected a similar attempt by EPA to take liberties with the way Congress intended it to express its TMDLs. In *Friends of the Earth, Inc. v. Env. Protection Agency*, EPA had promulgated TMDLs for the Anacostia River that expressed the maximum load of certain pollutants in terms of annual and seasonal amounts. 446 F.3d 140, 143 (D.C. Cir. 2006). The court found that expressing a TMDL in terms of annual or seasonal maximums was not allowed, because the statute granted authority only for daily loads. *Id.* at 148. The court reached its conclusion even though EPA apparently made a strong argument that expressing TMDLs in terms of annual or seasonal loads was an effective and reasonable approach. *See id.* Presumably a daily load could have been derived by simply dividing the annual load by 365, yet the court still required expression in the terms dictated by Congress.

Here too, EPA hopes to express a TMDL in terms other than those contemplated by the statute, arguing that such an expression is the most effective method. But, as *Friends of the Earth* illustrates, EPA may not regulate something over which it has no statutorily granted power—

annual loads or nonpollutants—as a proxy for something over which it *is* granted power—daily loads or pollutants.

EPA's argument that its surrogate approach should be allowed because the statute does not specifically forbid it fails. EPA is not explicitly forbidden from establishing total maximum *annual* loads any more than they are explicitly barred from establishing TMDLs for nonpollutants. The question is whether the statute grants the agency the authority it is claiming, not whether the statute explicitly withholds that authority. And in this case, as in *Friends of the Earth*, the statute simply does not grant EPA the authority it claims.

The dicta in *Weyerhaeuser Co. v. Costle* is not as helpful to EPA's case as it would like. 590 F.2d 1011, 1022 n.6 (D.C. Cir. 1978). It is true that the court said in a footnote "[i]t is well recognized that EPA can use pollution parameters that are not harmful in themselves, but act as indicators of harm." *Id.* But in that case, the non-harmful pollution parameters the EPA sought to regulate were components of the effluent commonly discharged from paper mills, *id.* at 1022, making them effluents themselves. And power to regulate effluents is expressly granted to the EPA in the relevant statutory section. *See* 33 U.S.C. § 1314(b).

EPA would like to create the impression that Congress has given it loose rein to determine exactly what it could and could not regulate. On page 16 of its opposition to this motion, EPA points out that "Congress authorized EPA to determine which pollutants were suitable for TMDL calculation and measurement." (Internal quotes removed). While this may be true, EPA glosses over the fact that 33 U.S.C. § 1314(a)(2)(D) only gives EPA the power to regulate pollutants as that term is defined—by Congress—elsewhere in the statute. And, as discussed above, sediment is a pollutant for these purposes, but stormwater is not.

In a similar vein, EPA regulations which imply that the agency has discretion to set the

TMDL as it sees fit do not bear on the question now before the Court. EPA has promulgated a regulation allowing TMDLs to be "expressed in terms of either mass per time, toxicity, or other appropriate measure," 40 C.F.R. § 130.2(i), and another that allows TMDLs to be expressed as a "property of pollution," 50 Fed. Reg. 1774, 1776 (Jan. 11, 1985). But, EPA citing these regulations to demonstrate that the surrogate TMDL approach is permissible is mere bootstrapping. To the extent the regulations allow EPA to set TMDLs for nonpollutants, they exceed the statutory authority of EPA.

The plain language of the statute trumps all, but legislative history also supports Plaintiffs' argument. Congress's intent to limit EPA's discretion in this context is evidenced by the committee record cited by Plaintiffs, which has also been used by the Ninth Circuit, in which Senator Randolph, Chairman of the Senate committee that amended the act in 1972, explained, "We have written into law precise standards and definite guidelines on how the environment should be protected. We have done more than just provide broad directives [for] administrators to follow." Pl. Mot. 7, *citing Nw. Envtl. Def. Ctr. v. Brown*, 640 F.3d 1063, 1072 (9th Cir. 2011). Congress created a statutory scheme that included a precise definition of the word "pollutant," and then gave EPA authority to set TMDLs for those pollutants. Senator Randolph's comments strongly imply that Congress did not intend anything more or less than what is written in the statute.

The Court considers the language of 33 U.S.C. § 1313(d)(1)(C) to be unambiguous. Congress has spoken directly on the question at issue, and its answer is that EPA's authority does not extend to establishing TMDLs for nonpollutants as surrogates for pollutants. The legislative history of the CWA is consistent with this reading. Therefore, this Court finds EPA's interpretation of § 1313 and the related provisions to be impermissibly broad based on analysis

under the first step of *Chevron* analysis.

III. Chevron Step Two

Because the Court considers Congress's intent to be clear and unambiguously expressed by the language of the statute, it need not move to the second step of *Chevron* analysis. But the Court notes that there is substantial reason to believe EPA's motives go beyond "permissible gap-filling."

Page 9 of EPA's opposition says, "stormwater flow rates as a surrogate would more effectively address the process by which sediment impairs aquatic life in Accontink Creek." If the sediment levels in Accotink Creek have become dangerously high, what better way to address the problem than by limiting the amount of sediment permitted in the creek? If sediment level is truly "a function of" the amount of stormwater runoff, as EPA claims, then the TMDL could just as easily be expressed in terms of sediment load.

In fact, the Board of Supervisors of Fairfax County argued at the December 14th hearing (without objection from EPA) that EPA has approved 3,700 TMDLs for sediment nationwide, and in Virginia has addressed 111 benthic impairments with TMDLs. None of them regulated the flow rate of stormwater. By comparison, EPA has tried out its novel approach of regulating sediment via flow in only four instances nationwide, and all four attempts were challenged in court. One has settled, the other three are still pending.

The Court suspects that the decision to regulate stormwater flow as a surrogate for sediment load would not constitute a permissible construction of § 1313(d)(1)(C), even given the deference due at *Chevron's* second step. This is especially likely because EPA is attempting to increase the extent of its own authority via flow TMDLs, which courts must examine carefully.

See Brown & Williamson Tobacco Corp. v. Food & Drug Admin., 153 F.3d 155, 161-62 (4th Cir. 1998). EPA's attempt to set TMDLs for nonpollutants probably goes beyond "permissible gap-filling" and is instead an impermissible construction of the statute.

Conclusion

The language of § 1313(d)(1)(C) is clear. EPA is authorized to set TMDLs to regulate pollutants, and pollutants are carefully defined. Stormwater runoff is not a pollutant, so EPA is not authorized to regulate it via TMDL. Claiming that the stormwater maximum load is a surrogate for sediment, which is a pollutant and therefore regulable, does not bring stormwater within the ambit of EPA's TMDL authority. Whatever reason EPA has for thinking that a stormwater flow rate TMDL is a better way of limiting sediment load than a sediment load TMDL, EPA cannot be allowed to exceed its clearly limited statutory authority. For these reasons, the Plaintiffs' motion for Rule 12(c) judgment on the pleadings on Count I of their complaint is granted.

January 3, 2013
Alexandria, Virginia

/s/ LOG
Liam O'Grady
United States District Judge

FILED
JAN - 3 2013
CLERK, U.S. DISTRICT COURT
ALEXANDRIA, VIRGINIA

IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF VIRGINIA
Alexandria Division

VIRGINIA DEPARTMENT OF TRANSPORTATION, ET AL, Plaintiffs, -v- UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, ET AL, Defendants.	Civil Action No. 1:12-CV-775

Order

In accordance with the memorandum opinion that accompanies this order, it is now **ORDERED**:

1. Plaintiffs' motion (Dkt. No. 29) for judgment on the pleadings as to Count I of the complaint is **GRANTED**.
2. The clerk shall enter judgment in favor of the Plaintiffs.
3. The Accotink Creek TMDL is remanded to EPA for reconsideration consistent with this order.

January 3, 2013
Alexandria, Virginia

/s/
Liam O'Grady
United States District Judge

Board of Directors

Allied Waste Services
AT&T
Bank of America
Brown Marketing Strategies
City of Chula Vista
City of Coronado
City of Imperial Beach
City of National City
City of San Diego
Clevenger Geoconsulting
County of San Diego
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Falcon Strategies
Gensler Architects
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McMillin Companies
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Sharp Hospital
Solidus Property
Southwestern College
Triology PR Group
Union Bank
Vibra Bank

San Diego's Voice for Binational Business

South County Economic Development Council

SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD
2013 JAN 11 A 10:55

January 10, 2013

Mr. Wayne Chiu, P.E.
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Ct Ste 100
San Diego, CA 92123-4340

Dear Mr. Chiu,

On January 8, 2013, The South County Economic Development Council (SCEDC) Board of Directors agreed to send you a letter voicing our concerns with the changes proposed to the Regional Water Quality Board's Stormwater permit. While our members noted the intent of the ordinance is admirable, the anticipated implementing of the ordinance was viewed as onerous and expensive and a detriment to economic development in South San Diego County.

The draft language of the permit includes new requirements for development. These new requirements will increase costs substantially on an already over-burdened business community. These costs are due to the measures that must be taken to comply with the new regulations. Additionally, the new liability for exceeding the water quality objectives will discourage investment in our region at a time when we should encourage businesses to invest and create more jobs. Furthermore, it was noted that many of the previous exemptions to the Stormwater regulations had been deleted in this new ordinance. The additional measures needed to comply with these regulations will make a project infeasible.

SCEDC would like to offer our services if the San Diego Regional Water Quality Control Board would like to create an implementation task force to discuss best practices and realistic methods to achieve your goals. If I may be of further assistance or provide additional information please feel free to contact me at (619)424-5143.

Sincerely,

Cindy Gompper Graves
President & Chief Executive Officer

1111 Bay Blvd. Suite E • Chula Vista, CA 91911
(619) 424.5143 • Fax (619) 424.5738
www.SouthCountyEDC.com

SAN DIEGO
AMERICAN SOCIETY OF
LANDSCAPE ARCHITECTS
CHAPTER

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CC/ASLA REPRESENTATIVE
Jon Wreschinsky, ASLA

STUDENT AFFILIATE PRES.
John Thomas, Affiliate ASLA

EXECUTIVE DIRECTOR
Tracy Morgan Hollingworth, CAE

January 11, 2012

Re: SDASLA COMMENTS ON THE DRAFT REGIONAL MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) (Tentative Order No. R9-2013-0001)/(NPDS Case No. CAS0109266)

Dear Mr. Chiu:

The American Society of Landscape Architects (ASLA) continues to advocate across the country for economic recovery, sustainable design, quality of life issues and wise use of our natural resources including clean water. The San Diego Chapter of the American Society of Landscape Architects (SDASLA) is fully committed to these principals and respectfully submits the following comments, observations and recommendations to the draft San Diego Regional Municipal Separate Storm Sewer System at the request of the Regional Board.

The SDASLA fully supports the proposed approach to the permit that includes:

- Regional Permit / Holistic Approach
- Includes Strategic Planning
- Adaptive / Results Based Management
- Alternative Compliance / Mitigation
- Water Quality Improvement Plans (WQIP)

SDASLA understands that the proposed WQIPs in the draft permit will become powerful tools to help improve water quality within each of our ten watersheds and strongly recommends the following be added to the permit:

- Timely development of effective and enforceable WQIP(s).
- Each WQIP be developed through a process that ensures public participation such as the formation of a stakeholders advisory group.
- Stakeholder advisory groups for each watershed shall include representatives of environmental groups, business groups, community planning and /or sponsor groups, local universities and technical experts with knowledge of the watershed.
- This stakeholder advisory group should work closely with the Copermittees and a regional board staff member while the Water Quality Improvement Plans are being developed to ensure these plans aggressively pursue water quality gains.
- The stakeholder advisory process should include accountability and measureable milestones to ensure the goals of the Permit are being met.
- Appropriate BMP's should be determined for each watershed and should be reviewed by a project engineer and / or Landscape Architect to determine if they are infeasible.

- If project BMP's are determined to be infeasible than no other burden of proof should be required.
- To sections 3.b.(3)(c) Priority Development Exemptions (Page 77), and 3.c.(b) Alternative Compliance Project Options (Page 81), add the following option:
  - Designed and constructed to be certified under the Sustainable Sites Initiative (SITES™), a voluntary certification program through the American Society of Landscape Architects, the Lady Bird Johnson Wildflower Center at The University of Texas at Austin and the United States Botanic Garden, receiving at least credits 3.5 and 3.6. under the "Site Design - Water" category.

SDASLA supports the use of Low Impact Development (LID) BMP Requirements strategies when geologically appropriate and feasible. However, other options should be available to strengthen overall water quality such as in-lieu fees, mitigation and redevelopment of key sites to encourage smart growth and urban infill / redevelopment in the future. SDASLA encourages the required development of a priority site list by each Copermittee during the planning process for which in-lieu fees / mitigation may be applied. These sites could function as large water holding and infiltration sites and double as public open space / educational areas. However, SDASLA is concerned that not all BMPs will be effective or feasible throughout the basin. SDASLA recommends that the Copermittees be allowed to customize the application of specific BMPs on a watershed by watershed basis through the development of robust and enforceable Water Quality Improvement Plans rather than imposing a universal suite of BMPs on all watersheds regardless of their feasibility of applicability.

By taking advantage of the knowledge and resources of diverse stakeholders like municipalities, businesses and residents, environmental groups, technical experts and the academia, our region can benefit greatly from solutions that provide cleaner water more efficiently, quickly and cost effectively creating healthier communities. But this can only be achieved if these stakeholders are involved in a meaningful way during the Water Quality Improvement Plan development process.

SDASLA recognizes the challenge this permit and the proposed changes represents to our region, and would like to help by participating in the Water Quality Improvement Plan development process. SDASLA urges the Regional Board to enhance the stakeholder participation opportunities during Water Quality Improvement Plan development before approving the final permit.

Thank you for your consideration and we look forward to continuing our work with you and your staff on this draft permit.

Sincerely yours in Landscape Architecture,

Tim Jachlewski, Jr., ASLA
2013 President
San Diego Chapter/ASLA
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Andrew S. Reese, ASLA
SDASLA Storm Water Quality Committee Chair
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BUILDING INDUSTRY ASSOCIATION OF SAN DIEGO COUNTY
BUILDING INDUSTRY ASSOCIATION OF SOUTHERN CALIFORNIA
ASSOCIATED GENERAL CONTRACTORS, SAN DIEGO
SAN DIEGO REGIONAL CHAMBER OF COMMERCE
BUILDING OWNERS AND MANAGERS ASSOCIATION
SAN DIEGO ASSOCIATION OF REALTORS
ASSOCIATED BUILDERS AND CONTRACTORS
SAN DIEGO CHAPTER OF THE AMERICAN
SOCIETY OF LANDSCAPE ARCHITECTS
BUSINESS LEADERSHIP ALLIANCE
NAIOP

January 11, 2013

VIA E-MAIL AND HAND DELIVERY

Ms. Laurie Walsh
WRC Engineer
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Re: REVISED ADMINISTRATIVE DRAFT REGIONAL MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) Permit (Tentative Order No. R9-2013-0001)

Dear Ms. Walsh:

The following trade and professional associations, for the purposes of this communication known as, the regulated community, are responding as a Coalition. Spearheaded by the Building Industry Association of San Diego County (BIASD), Business Leadership Alliance (BLA), Associated General Contractors, San Diego (AGC), NAIOP (National Association of Industrial & Office Properties), Associated Builders & Contractors (ABC), the San Diego Regional Chamber of Commerce (SDRRC), the San Diego Association of Realtors® (SDAR), and the Building Owners & Managers Association (BOMA), the San Diego Chapter of the American Society of Landscape Architects and the members thereof, we appreciate the opportunity to provide comments on the Draft of the San Diego County Regional MS4 Permit (Draft Permit or Order). We submit these comments in addition to and in support of comments made by our affiliate the Building Industry Association of Southern California and its coalition partners. This Coalition employs over 210,000 San Diegans and generates in excess of $ 3 billion dollars of economic activity in the San Diego region.

At the request of the Regional Board, the Coalition submits the following observations, recommendation for revisions to the permit language and the rationale supporting those recommendations in the following areas:

1. Recent Legal Opinions and Legislation
2. Water Quality Improvement Plans,
3. Illicit Discharge Detection and Elimination Requirements,
4. Permanent BMP Performance and Sizing Requirements,
5. Sediment Supply Requirements.
6. Streambed Restoration
7. Vague and Conflicting Definitions
8. Hyrdomodification Management BMP Requirements
9. Alternative Compliance to Onsite Structural BMP Performance Requirements

Recent Legal Opinions and Legislation

On January 8, 2013, The United States Supreme Court rendered its opinion in *Los Angeles Flood Control District v. Natural Resources Defense Council, Inc., Et Al.* 568 U.S. ___ (2-13). In overturning the 9th Circuit, the Supreme Court held that "the flow of water from an improved portion of a navigable waterway into an unimproved portion of the very same waterway does not qualify as a discharge of pollutants under the CWA". The holding appears to be in direct conflict with Findings 1, 3, 6, 7, 8, 10, 11, 15, 28, and 32 of the Order as well as many of the permit provision. The Coalition requests that the San Diego Regional Water Quality Control Board (SDRWQCB) remand the Order to staff so that the Order may be revised in conformity with the Supreme Court's opinion.

On January 3, 2013 the United States District Court for the Eastern District of Virginia published its opinion in *Virginia Department of Transportation, Et Al., v United States Environmental Protection Agency* 213 U.S. Dist. LEXIS 981. While not precedential, the district court conducted a detailed analysis and well reasoned analysis of the use of surrogates for Total Daily Mass Loads ("TMDL")and concluded that [the State's] authority does not extend to establishing TMDLs for non-pollutants as surrogates for pollutants." In light of this well reasoned opinion, the Coalition requests that the SDRWQCB remand the Order to staff so that the TMDL provisions of the permit may be revised in conformity with the Court's opinion.

The Rainwater Capture Act of 2012 (AB 1750) took effect January 1, 2013. The act declares that use of rainwater collected from rooftops does not require a water right permit from the State Water Board. However, the law does not expand property owners' authority to collect and retain water from other impervious areas such as parking lots and driveways that would otherwise be available to other individuals holding appropriative water rights. In fact the law clearly states that it does not alter or impair any existing rights or change existing water rights law. Thus, requiring property

owners to retain water that would otherwise be subject to appropriation may in fact, be a violation of the Act. The Coalition requests that the SDRWQCB refrain from enforcing any onsite retention requirements for impervious surfaces other than roofs until it has sought and obtained declivity relief concerning the authority of property owners to do so.

Water Quality Improvement Plans

The Coalition supports the RWQCB staff's efforts to develop a Tentative Order, the goal of which is to achieve improved water quality throughout the region. The Coalition further supports the staff's proposal to develop and implement Water Quality Improvement Plans (WQIP) for each of the ten watersheds in the basin as recommended by the Little Hoover Commission.[1] We believe that WQIPs provide the opportunity to solve water quality problems through an iterative and accountable process while balancing the resources required to implement WQIPs with other public and environmental programs.

For this reason we have joined the Copermittees and various environmental groups in requesting that the Regional Board focus on improving water quality through the development and implementation of WQIPs. Accordingly, we ask that the Tentative Order focus on the timely development of effective and enforceable WQIPs, that each WQIP be developed through a process that insures public participation and that each WQIP be reviewed and approved by the Board through a public hearing process. We further ask that the designation of appropriate Best Management Practices in each watershed be determined through the WQIP process. To these ends we suggest the following revisions to WQIP language in the permit.

Regional Board Staff has suggested that Copermittees will be permitted to "fail early and often" in their attempts to achieve compliance with discharge prohibitions and receiving water limitations as part of their development and implementation of WQIPs. The Coalition appreciates the sentiment behind these statements, in that it will encourage an innovative and iterative process through which much will be learned. However, it creates a dilemma for the Copermittees and the property owners within their jurisdictions. Based on the 9th Circuit's opinion in *NRDC v. Los Angeles County* 636 F.3d 1235 (9th Cir. 2011), Provisions A.1. and A.2. create strict liability numeric effluent limits, which are enforceable both under the Clean Water Act and California Water Code.

The Clean Water Act provides for enforcement of a NPDES permit violation by State and Federal Agencies as well as private citizens. Violators may be subject to civil penalties up to $34,500 per day. Given the potential for citizen enforcement, jurisdiction cannot afford to fail. California Water Codes Section 13385 also requires the San Diego Regional Water Quality Control Board (SDRWQCB) to impose a mandatory minimum penalty of $3,000 for each

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[1] See Generally: Clearer Structure, Cleaner Water: Improving Performance and Outcomes, Little Hoover Commission, January 2009 a copy of which is attached hereto and incorporated by reference herein.

violation of a waste discharge requirement effluent limitation in excess of three violations within any six month period. As currently written, the Order appears to **require** that the SDRWQCB impose these penalties on Copermittees for each failure in excess of three exceedances within any six month period.

Obviously, elected officials are concerned about the budget implications of these legal liabilities. Moreover, private property owners are concerned as they realize that the cost of the penalties will ultimately be passed on to them in the form of higher taxes without any measurable benefit.

In order to address this problem, and to encourage Copermittees to find the necessary resources to develop and implement WQIPs, the Coalition proposes the following language.

Provision A.4. -- Compliance with Discharge Prohibitions and Receiving Water Limitations
Each Copermittee must achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order through timely implementation of control measures and other actions as specified in Provisions B and E of this Order, including any modifications. The Water Quality Improvement Plans required under Provision B must be designed and adapted to ultimately achieve compliance with Provisions A.1.a, A.1.c and A.2.a. Compliance with approved Water Quality Improvement Plans will be deemed to constitute compliance with the remaining Provisions of this Order.

The Coalition believes that the Copermittees and the public should have a free hand in the development of the WQIPs. These groups have the best understanding of the problems and needs of each watershed. Therefore, the Coalition recommends that the process of reducing and eliminating non-storm water discharges be left to the consideration of the Copermittees based on the specific information for each watershed. The Coalition notes that the SDRWQCB has discretion to reject or modify any WQIP that it believes does not adequately address water quality objectives. The Coalition therefore recommends the following changes to Provisions B.3. and B.3.a.

Provision B.3. -- Water Quality Improvement Strategies and Schedules
The Copermittees must develop specific water quality improvement strategies to address the highest priority water quality conditions identified within a Watershed Management Area. The water quality improvement strategies must address the highest priority water quality conditions by reducing non-storm water discharges to and from the MS4, reducing pollutants in storm water discharges from the MS4 to the MEP, and restoring and/or protecting the water quality standards of receiving waters.

Provision B.3.a. -- WATER QUALITY IMPROVEMENT STRATEGIES
The Copermittees must identify and prioritize water quality improvement strategies based on their likely effectiveness and efficiency, and implement strategies to effectively reduce non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, improve the physical, chemical, and biological receiving water conditions, and achieve the interim and final numeric goals in accordance with the schedules required for Provision B.2.e.(3). The following water quality improvement strategies must be included and described in the Water Quality Improvement Plan:

Once again, the Copermittees, in conjunction with the general public should have a free hand in developing the WQIPs. The inclusion of additional mandatory requirements both stifles creativity and prevents Copermittees and the public from tailoring the WQIPs to the specific needs of each watershed. The Coalition proposes that the WQIPs be reviewed and approved by the SDRWQCB after public notice and hearing. This process provides a failsafe and mitigates the need for additional mandatory requirements, which may not be applicable to a specific watershed. The Coalition, therefore recommends the following modifications to Provisions E.3., E.4. and E.5.

Provision E.3. Development Planning
Each Copermittee must utilize their land use and planning authorities to implement a development planning program in accordance with the strategies identified in the Water Quality Improvement Plan, which may include the following requirements:

Provision E.4. Construction Management
Each Copermittee must implement a construction management program in accordance with the strategies identified in the Water Quality Improvement Plan and which may include the following requirements:

Provision E.5. Existing Development Management
Each Copermittee must implement an existing development management program in accordance with the strategies identified in the Water Quality Improvement Plan, which may include the following requirements:

Given the discretionary nature of Alternative Compliance Water Quality Credit Systems, and the public interest therein, the Coalition believe that approval for these systems must remain vested with the SDRWQCB and not its Executive Officer. The Coalition suggest that Provision E.3.(d). be modified accordingly.

Provision E.3. (d) -- Alternative Compliance Water Quality Credit System Option
The Copermittee may develop and implement an alternative compliance water quality credit system option, individually or with other Copermittees and/or entities, provided that such a credit system clearly exhibits that it will not allow discharges from Priority Development Projects to cause or contribute to a net impact over and above the impact caused by projects meeting the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2). Any credit system that a Copermittee chooses to implement must be part of a Water Quality Improvement Plan approved by the SDRWQCB.

The Coalition believes that the timing and procedures for the development of the WQIPs are procedurally and technically infeasible. The simultaneous preparation of ten WQIPs assumes that there are sufficient experts available to take on these tasks simultaneously. The Coalition

disagrees. Attempting to prepare ten plans contemporaneously within the time lines proposed can only result in ten poorly developed plans. Moreover, at least two of the watersheds require input from Orange County and Riverside County Copermittees who will not be subject to the provisions of the permit for some time.

The Coalition believes that the better approach is to allow the Copermittees to prepare a suggested schedule for review and approval by the SDRWQCB as provided by the suggested revisions to Provision F.1.a.(1).(c). If these revisions are adopted Provisions F.1.a.(1)(c), F.1.a.(1)(d), F.1.a.(2).(b), F.1.a.(1).(d), F.1.a.(2).(b), F.1.a.(2).(c.) and portions of F.1.b. are no longer required.

Provision F.1.a.(1).(c)
Within 90 days after the commencement of coverage under this order, the Copermittees must develop and submit a Water Quality Improvement Plan schedule to the SDRWQCB for consideration and approval or amendment and approval. Said schedule will be based on the level of complexity and water quality of each watershed. Copermittees may propose either serial or concurrent preparation of the Water Quality Improvement Plans based on criteria to be established by the Copermittees. Copermittees must develop and submit the Water Quality Improvement Plan requirements of Provision B to the SDRWQCB. The SDRWQCB will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of 60 days. After a public hearing the San Diego Water Board may either adopt or amend and adopt the Water Quality Improvement Plans as enforceable time scheduled orders. In the alternative, the San Diego Water Board may remand the Draft Water Quality Improvement Plans to the Copermittees for further modification. The Copermittees must revise the priority water quality conditions and numeric goals based on comments received and/or recommendations or direction from the San Diego Water Board. Until a Water Quality Improvement Plan is adopted by the San Diego Water Board, the watershed shall be subject to Provisions A.1.a, A.1.c and A.2.a of this order.

Provision F.1.a.(1).(d)

Provision F.1.a.(2).(b)

Provision F.1.a.(2).(c)

Provision F.1.b. -- WATER QUALITY IMPROVEMENT PLAN SUBMITTAL

(4) The Water Quality Improvement Plan must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance by the San Diego Water Board.

Finally the Coalition suggests that the procedures for the approval of WQIP Updates mirror the approval process for initial adoption. Accordingly the Coalition suggests the following revisions to Provision F.2.c.

Provision F.2.c. WATER QUALITY IMPROVEMENT PLAN UPDATES
The Water Quality Improvement Plans must be updated in accordance with the following process:

(1) The Copermittees must implement a public participation process to solicit data and information to be utilized in updating the Water Quality Improvement Plan.

(2) The Copermittees are encouraged to involve the public and key stakeholders as early and often as possible during the updates to the Water Quality Improvement Plan.

(3) The Copermittees for each Watershed Management Area must submit requested updates to the Water Quality Improvement Plan, with the public input received and the rationale for the requested updates, either in the Annual Reports required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge required pursuant to Provision F.5.b. After a public hearing the SDRWQCB may either adopt or amend and adopt the Water Quality Improvement Plans Updates as an amendment to an enforceable time scheduled order. In the alternative, the SDRWQCB may remand the Draft Water Quality Improvement Plan Update to the Copermittees for further modification.

(4) The Copermittees must revise the requested updates as directed by the SDRWQCB .

(5) Updated Water Quality Improvement Plans must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance of the requested updates by the San Diego Water Board.

Illicit Discharge Detection and Elimination

The Coalition is concerned about the unanticipated consequences associated with the Permit's definition of "illicit discharges ""Persistent Flows" and the application of that definition to discharges of perched water through subsurface drains. The permit defines an "illicit discharge" as "Any discharge to the MS4 that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from firefighting activities [40 CFR 122.26(b)(2)]." The permit goes on to define a non-storm water discharge as "All discharges to and from a MS4 that do not originate from precipitation events (i.e., all discharges from a MS4 other than storm water). Non-storm water includes illicit discharges and NPDES permitted discharges." For the reasons described below, this interpretation is neither enforceable nor technically feasible.

The proposed permit requires development and redevelopment projects to retain the 85th percentile storm event on the project site and either use on site storage for reuse, infiltration or evapotranspiration of that water. [Citation] The available area where soil is conducive to infiltration within the County of San Diego is extremely limited. These available areas include soil adjacent to river or stream beds, coastal sandy deposits, and valleys (e.g. along San Luis Rey River, beaches, and Mission Valley) and are a small fraction of the County area. Therefore, the parameters in the permit cannot be met on most projects. About 90 percent of the area of San Diego County

belonging to Region 9 is likely deemed geotechnically infeasible for infiltration (soils Type C and D, see California Geological Survey - Preliminary Surface Geological Materials Map attached hereto).

Normally, these areas where infiltration can be performed are protected for environmental purposes (i.e. canyon drainages where the existing vegetation protects animal and waterway environments) However, in those areas where the native soils are permeable and development or redevelopment are permitted, building ordinances and design specifications require compacted fill at grade for higher density projects. The compacted fill has a reduced void structure and therefore does not facilitate water infiltration. Thus, this infiltration requirement as written pits the goal of minimizing urban sprawl though high density development with an attempt to infiltrate precipitation.

Because of the soil conditions in the geographic area regulated by this permit, much of the infiltrated water does not reach ground water aquifers but rather becomes perched water which tends to collect around subsurface utility lines, engineered fill soils, foundations and other structures. Unless the perched water can be allowed to escape, there is an almost certain probability of damage to critical infrastructure such as roads and utilities necessary to protect the health, safety and welfare of the community, as well as buildings, driveways, parking lots, etc. . There are necessary persistent flows of perched water, necessary for the safety of existing and future utilities, roads and structures, that the Copermittees should not be required to address unless the Copermittees or Board identify those discharges as a source of pollutants to the receiving waters.

The Permit offers the alternative of retention and reuse of water on site. As discussed at the Permit workshops, this alternative is both impractical and likely in violation of California law. First, because of the unique rain patterns in Southern California the scale of any retention structures would be enormous and costly well beyond any benefit to water quality particularly as applied to critical infrastructure projects such as roads and airports. Second, assuming that it is technically feasible to capture the runoff, doing so is likely to contravene other state laws and policies such as protection of wetland habitats[2], and previously granted water rights.[3]

The permit impermissibly assumes that any water flowing in a storm drain seventy two hours after an arbitrary 0.1 inch storm event during three consecutive monitoring and/or inspection events is

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[2] By capturing all events smaller or equal than the 85th percentile rain event, the runoff volumes are likely to be less than they were in the predevelopment condition, thereby drying up streams and valuable wetland habitat. The use of a universally accepted rainfall-runoff methodology such as the NRCS Method proves that events smaller than the 85th percentile rainfall event may generate a significant percentage of their volume as a runoff, depending on the soil type, antecedent conditions and vegetation type.

[3] If the amount of water being retained on site exceeds the amount of water retained in pre development condition, the additional water being retained will likely violate the prior appropriation rights and pueblo rights of others.

Persistent Flow, and therefore should be eliminated "through targeted programmatic actions and source investigations" (Section D Monitoring and Assessment Program Requirements(4)(b)(1)(c)(ii). First, the natural drainage from even an undeveloped site can take more than seventy two hours in many cases and could presumably be present during three consecutive monitoring and/or inspection events. As a matter of fact, a simple review of USGS precipitation and runoff records in a natural watershed in the area, such a San Mateo Creek, proves without a doubt that wet periods may take more than a month to fully drain natural runoff especially in wet years even for relatively small watersheds. Second, natural precipitation which is infiltrated on site is likely to emerge as perched water and enter the storm drain system day, weeks or months after was originally infiltrated. Third, hydromodification BMPs may take much more than 72 hours to drain, especially for those BMPs were a significant volume of detention occurs under amended soil and the drainage is constrained by a very small orifice. Thus, the Persistent Flow ~~seventy two hour~~ definition ~~after a 0.1 inch storm event~~ lacks any scientific basis and is, therefore, both arbitrary and capricious. Forth, many consecutive smaller events smaller than 0.1 inches may generate more runoff than an isolated 0.1 inch or larger rainfall event and the permit will consider as non-storm water the runoff from the many small storm water events but not from the later event, even if runoff from the multiple smaller events is higher[4]. Thus, the seventy two hour definition after a 0.1 inch storm event lacks any scientific bases and is, therefore, both arbitrary and capricious.

For the reasons stated above, the Coalition recommends that the Permit language be modified as follows:

ILLICIT DISCHARGE DETECTION AND ELIMINATION -- NON-STORM WATER DISCHARGES

Section 2.a.1

(1) Discharges of non-storm water to the MS4 from the following categories must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG919001 (Order No. R9-2007-0034, or subsequent order) for discharges to San Diego Bay, or NPDES Permit No. CAG919002 (Order No. R9-2008-0002, or subsequent order) for discharges to surface waters other than San Diego Bay:

(a) Uncontaminated pumped ground water; and

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[4] As an example, in San Diego Lindbergh, an isolated 0.13" event occurred on 10/29/1948, after 10 days without rain. The potential runoff for such event would be considered as stormwater discharge by the new permit. However, at the same place, there were 6 consecutives but separate events (using the CASQA criteria of a 6 hour threshold) all smaller than 0.1 inch: 0.08" on 2/2/1949; 0.05" on the morning of 2/3/1949; 0.04" on the late afternoon of 2/3/1949; 0.04" on 2/4/1949; 0.02" on the morning of 2/5/1949 and 0.07" on the night of 2/5/1949 for a total of 0.30 inches of rainfall in 96 hours (0:00 2/2/1949 to 0:00 2/6/1949). Any runoff observed during those 96 hours would be incorrectly considered as non-stormwater runoff by the new permit, as no event larger than 0.1" occurred since 06:00 of 1/25/1949. This example is also valid with a conservative threshold of 12 hours to separate the storms. Hundreds of examples like this can be found in Southern California rainfall records in different locations, and shows the capricious nature of the definition of non-stormwater runoff, unrelated to the natural occurrence of precipitation in our region.

Water from crawl space pumps. (2) Discharges of non-storm water from water line flushing and water main breaks to the MS4 must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG 679001 (Order No. R9-2010-0003, or subsequent order). This includes water line flushing and water main break discharges from water purveyors issued a water supply permit by the California Department of Public Health or federal military installations. Discharges from recycled or reclaimed water lines to the MS4 must be addressed as illicit discharges, unless the discharges have coverage under a separate NPDES permit.

(3) Discharges of non-storm water, including persistent flows, to the MS4 from the following categories must be addressed by the Copermittee as illicit discharges only if the Copermittee or the SDRWQCB identifies the discharge as a source of pollutants to receiving waters:

(a) Diverted stream flows;

(b) Rising ground waters;

(c) Uncontaminated ground water infiltration to MS4s;

(d) Springs;

(e) Flows from riparian habitats and wetlands;

(f) Discharges from potable water sources;

(g) Perched water discharges from foundation and footing drains

(h) Water from crawl space or basement pumps

(i) Perched water discharges from hillside/canyon drains

(6) If the Copermittee or SDRWQCB identifies any category of non-storm water discharges listed under Provisions E.2.a.(1)-(4) as a source of pollutants to receiving waters, the category must be prohibited through ordinance, order, or similar means and addressed as an illicit discharge.

~~(7) Each Copermittee must, where feasible, reduce or eliminate non-storm water discharges listed under Provisions E.2.a.(1)-(4) into its MS4 whether or not the non-storm water discharge has been identified as an illicit discharge, unless a non-storm water discharge authorized by a separate NPDES permit~~

Add to Appendix C – Definitions:

Groundwater – water that occurs beneath the water table in soil and geologic formation that are fully saturated as evaluated by a licensed geotechnical engineer/consultant or geologist.

Perched Water – water that occurs above the water table in soil and geologic formation as evaluated by a licensed geotechnical engineer/consultant or geologist.

Structural BMP Performance Requirements

The Coalition is concerned about the unintended consequences associated with the Permit's definition of LID implementation. We propose a more detailed and clear definition of the volume required for LID, as runoff should not be reduced below the expected runoff produced by the 24 hour – 85th percentile storm in natural conditions (nor the runoff produced by smaller storms in those cases where they indeed generate runoff). In natural conditions, runoff is not only a function of the precipitation event (the main variable) but also a function of the soil type, the natural vegetation type, and the Antecedent Moisture Condition (AMC) before the storm event (i.e., the degree of saturation of the soil at the beginning of the storm event). The current definition also lacks clarity in terms of the intent of the infiltration/retention LID: it is not clear if the volume retained is associated with the first storms of the season, or if it is associated with all storms smaller or equal to the 24 hour – 85th percentile storm event.

In San Diego County, the 24 hour - 85th percentile precipitation event (P_{85}) generates runoff in natural conditions, as impervious soils (Type D) are predominant in the County and poor or fair natural vegetation is common in many areas. The Coalition has prepared a figure that illustrates the percentage of runoff as a function of the Curve Number value (a well-known parameter for hydrologists and engineers to determine runoff via NRCS (SCS) method, which is a function of soil type, vegetation, and AMC), for different values of P_{85}. It is clear that runoff as a percentage of the precipitation can be as small as 0% or as large as 60% depending on the conditions of the natural terrain and the size of P_{85}.

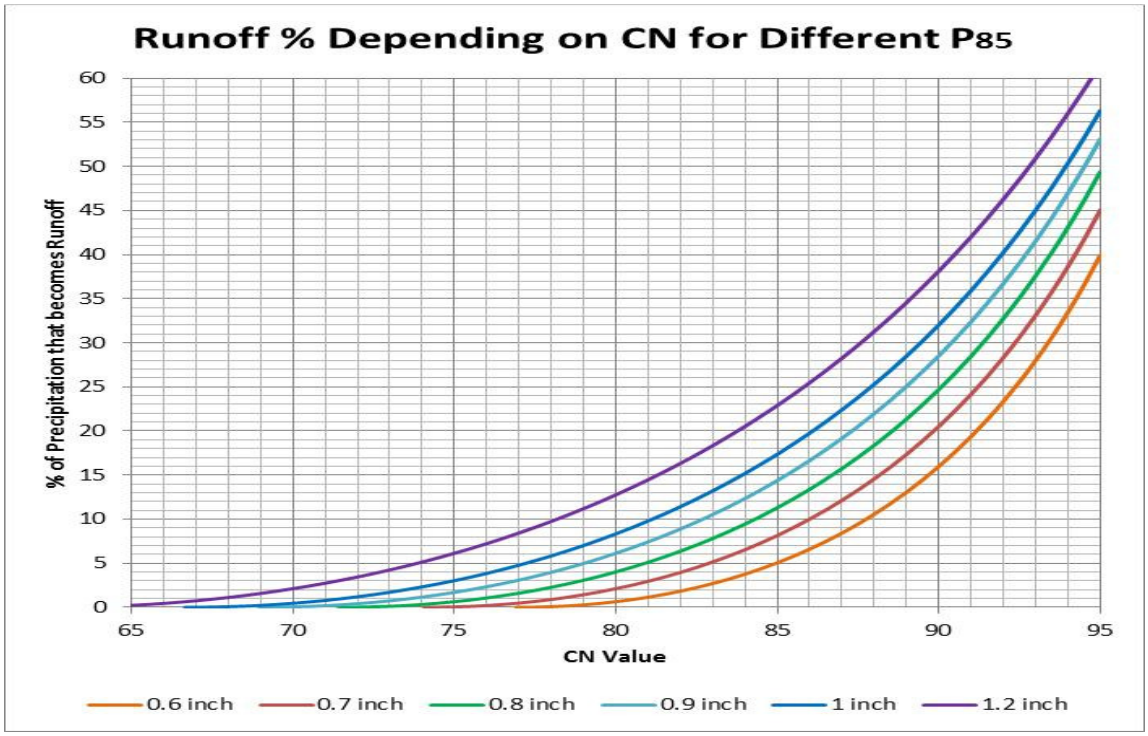

Removal of naturally occurring flows generated by storms similar to the 24 hour – 85th percentile storm for those natural environments where such flows do occur may have negative impacts to existing habitats, as excessive retention may alter the natural water balance. Additionally, excessive retention in soils that have a naturally limited capacity for infiltration increases the risks of failure of vital infrastructure due to lateral water migration.

Also, the intent of the permit to retain the seasonal first flush only (and not all runoff from all events smaller than or equal to the 24 hour – 85th percentile event) is not clear in the current language. It is clear in the technical literature (see for example CALTRANS CTSW-RT-05-73-02.6) that first flush treatment has a justification based on the fact that most of the time, in Southern California, treating the first storm of the season may remove built up contamination. Additionally, the first 20% - 40% of the storm volume may remove 50% - 70% of the total contaminant load (excluding sediments and trash). Finally, first flush treatment is justified by the theory of diminishing returns, because BMPs have a better efficiency removing higher loads, and the cost of treatment is more dependent on the volume of water than on the concentration of contaminants.

For the reasons stated above, the Coalition recommends that the Permit language be modified as follows:

Section E.3.c.(2)(b)

Each Priority Development Project must be required to implement LID BMPs that are sized and designed to retain the volume equivalent to the runoff volume produced from a 24-hour 85th percentile storm event after the development less the volume produced in natural conditions under the same storm. 26 ("design capture volume");

Footnote 26~~: This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals~~. Runoff volumes must be calculated using the NRCS Method applying average AMC-II conditions, natural NRCS soil types, and the corresponding natural vegetation that exist or existed prior to development; a different hydrologic method could be approved by the Copermittees. LID is not intended to retain the runoff of all events that generate a runoff volume equal to or smaller than the runoff produced by the 24 hour - 85th percentile storm event; rather to retain the first flush up to the 85th percentile runoff difference. The 85th percentile runoff in natural conditions could be 0 or larger depending on the original natural vegetation and soil type. The time needed to use the totality of volume retained must be compatible with current regulations and water usage in the area. Proper vector control will be required in the retention facility if usage and infiltration of the retained water is expected to exceed 96 hours.

Sediment Supply Requirements

The requirement to address sediment balance is briefly mentioned in the new permit in the form of compensation of the potential sediment supply loss due to the proposal of a priority project. The sediment balance within a watershed (or the establishment of new sediment equilibrium as a consequence of many years of development in multiple watersheds) is an extremely complex issue. The Coalition is therefore very concerned about the lack of direction regarding this issue, the myriad of factors affecting a highly variable phenomena and the possibility of wasting valuable resources preparing a useless Sediment Management Plan for Priority Projects. Such plans lack direction, proper design equations, and basic understanding of the sediment transport phenomena in Mediterranean climates.

Sediment yield and sediment transport are functions of the geology of the terrain, the topography of the watershed and the slope of the main channels, the grain size distribution of the sediments existing in the network of channels, the vegetation, the annual precipitation and its distribution, the state of the vegetation prior to the rainfall (burned, dry, stable), the geometry of the main creeks and channels, the Antecedent Moisture Condition of the soil, the equilibrium conditions of slopes and of the sediments already in the network of channels in terms of stability, the existence of reservoirs or dams and the frequency and duration of their discharges in extreme events, and many other factors.

Trying to accommodate such complex factors into a one-size-fits-all solution is a recipe for disaster. Also, trying to deal with the sediment problem in a typical pre-formatted Sediment Management Plan is not only impractical, but also ineffective and resource-consuming. Sediment transport analysis made in the Tijuana River with 73 years of daily runoff data has proven, for example, that more than 70% of the sediment transport occurs less than 0.15% of the time; sediment analysis in the Santa Clara watershed has generated very similar results, with the added complication of hyperpycnal flow transport (flows with density higher than the salt water due to high sediment content), generating significant geomorphological changes in the watershed. [Warrick and Milliman: "Hyperpycnal Sediment Discharge for Semi-arid southern California Rivers: Implications for Coastal Sediment Budgets" Geology, September 2003, v-31, p. 781-784].

In addition to the complexity of the problem, many proposed solutions (such as the use of the Lane Relationship) denote the lack of understanding of sediment transport theory, as the Lane Relationship is not a quantitative equation that can be used for design, but a qualitative relation that only can be used for the purposes of discussion about the main factors affecting sediment equilibrium. [Ponce: "The Lane Relation Revisited". http://lane.sdsu.edu].

An added difficulty is related to the compensation process. It is evident that, even if sediment supply loss can be proven for a given project, adding artificial sediments to a natural creek triggers so many permits and environmental and water quality constraints, that such an alternative is infeasible. Even if the sediment addition is allowed, it is not clear what amount, size distribution, and time-variable sediment injection is required to mimic a naturally variable sediment production and transport condition that is not clearly measured nor understood.

For the above stated reason, the Coalition recommends that the permit language be modified as follows:

Section E.3.C(2)(b)

First option:

Eliminate the language until a more comprehensive and reasonable approach is developed to deal with restoration/rehabilitation projects and measurement of loss of sediment supply:

(~~b) Post-project runoff flow rates and durations must compensate for the loss of sediment supply due to the development project, should loss of sediment supply occur as a result of the development project.~~

Second option:

Incorporate rehabilitation/restoration projects and/or protection of clearly identifiable sediment producing areas as the only feasible alternative to deal with sediment supply:

(b) Post-project runoff flow rates and durations must compensate for the loss of sediment supply due to the development project, should loss of sediment supply occur as a result of the development project. Redevelopment projects that increase pervious areas from pre-development conditions are not subject to such compensation. Compensation should be tied to restoration/rehabilitation projects for downstream creeks and/or funding for protection of identified sediment-supply areas in the watershed. WQIPs of each watershed must establish the mechanisms of restoration/rehabilitation and/or protection of sediment-supply areas.

Streambed Restoration

Currently the Tentative Order prohibits construction of any treatment control BMP within waters of the United States or waters of the state. This is appropriate for new development or redevelopment projects, which can and should be expected to treat storm water runoff prior to discharge to receiving waters. With respect to existing development, existing pollution, and efforts to improve water quality throughout the region via retrofit projects or channel, stream, and/or habitat rehabilitation, there may be situations when retrofit or rehabilitation of waters of the United States or waters of the state should incorporate structural treatment control BMPs to treat pollutants already in the water from existing development. The permit language should be modified to allow construction of pollutant removal devices within waters of the United States or waters of the state to address pollutants already existing or being conveyed in such waters. We recommend the following clarifications in the permit so that retrofit or rehabilitation projects will not be stymied by language applicable to new development or redevelopment projects:

Finding 7

7. In-Stream Treatment Systems. Pursuant to federal regulations (40 CFR 131.10(a)), in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S. Except where appropriate to treat existing pollution through retrofit or rehabilitation, authorizing the construction of a runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to accepting waste assimilation as an appropriate use for that water body. Treatment of storm water runoff from new development and redevelopment projects must occur prior to the discharge of runoff into receiving waters. Treatment control best management practices (BMPs) for new development or redevelopment projects must not be constructed in waters of the U.S. Construction, operation, and maintenance of a pollution control facility in a water body can

negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body.

Section E.3.a.(1)(b)

(b) Structural BMPs for new development or redevelopment projects must not be constructed within a waters of the U.S. or waters of the state.

Vague and Conflicting Definitions

Finally, the Coalition has significant concerns about what appears to be vague, ambiguous, and conflicting definitions of "flows" in the Order. The permit appears to identify at least six types of flows subject to regulation.

1. Wet weather flow: only mentioned three times, page A-5, page C-9 and page F-8
2. Dry weather flow: mentioned 4 times in page 43 (persistent dry weather flows, transient dry weather flows, no dry weather flows and unknown dry weather flows); in page 58 (persistent dry weather flow); in page A-5 and A-7 (e.g. dry weather flows); in page C-9 at the definition of runoff; in page F-63 three times (… as having persistent dry weather flows, transient dry weather flows, or no dry weather flows); in page F-64 (… of weather the MS4 produces persistent flow, transient flow, or no dry weather flow); twice in page F-75 (dry weather flow is the transport medium for bacteria… . Landscape irrigation is a major contributor to dry weather flow); and twice in page F-77 (are also likely sources of dry weather flow…. Examples of habitat changes from the dry weather flows);
3. No dry weather flow: page 45 and F-63
4. Transient flow : transient dry weather flow (page 43); transient non-storm water flows in page F-62; transient dry weather flow in page F-63; only as transient flows many times (pages 43, 45 three times, 57 twice, C-8, F-63, F-64 three times, and F-65).
5. Persistent flow: persistent dry weather flow (page 43, page 58); non-storm water persistent flow (page 49 in many titles, page 50 and 51); and many more times from page 49 to page 58; page 69; page F-62 to F-65. Persistent flow is many times mentioned as a non-storm water persistent flow, and sometimes as only persistent flow.
6. Combinations of all of the above.

The permit then provides the definitions or non-definitions for only three of these terms and then adds additional confusing definitions for terms that are not part of the order:

1. Persistent flow: "The presence of flowing, pooled, or pounded water more than 72 hours after a measurable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events".
2. Transient flow: "All other flowing, pooled, or pounded water" The definition does not seem to comport with the definitions of Persistent Flow and Wet Weather Flow. Further clarification is required.

3. Wet weather flow: mentioned in the definition of runoff but never fully defined.

4. Runoff: All flows in a storm water conveyance system that consists of the following components: (1) storm water (wet weather flows) and (2) non-storm water including dry weather flows. This definition includes the undefined term "non-storm water" and fails to address Persistent flows and Transient flows.

Moreover, these definitions seem to be applied inconsistently throughout the Order. By way of example:

1. Wet weather runoff: mentioned in F-11: "… and a distinction between storm water (wet weather) runoff and non-storm water (dry weather) runoff was emphasized."

2. Wet weather discharges: they are mentioned in F-37: "Non-storm water (dry weather) discharges from the MS4 are not considered storm water (wet weather) discharges and therefore are not subject to the MEP standard".

The Coalition respectfully requests that the SDRWQCB direct its staff to redraft the permit using consistent and intelligible terms and definitions.

Hydromodification Management BMP Requirements

The Coalition requests the following text be added to Provision E.3.c.(2)(d):

(d) Exemptions

Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provisions E.3.c.(2)(a)-(b) where the project:

(i) Discharges storm water runoff into existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;

(ii) Is a redevelopment Priority Development Project that meets the alternative compliance requirements of Provision E.3.c.(3)(b)(ii);

(iii) Discharges storm water runoff into other areas identified by the San Diego Water Board as exempt from the requirements of Provisions E.3.c.(2)(a)-(b); or

(iv) Discharges storm water runoff to areas that are defined as exempt from hydromodification management as determined by approved Water Quality Improvement Plans.

Alternative Compliance to Onsite Structural BMP Performance Requirements

In light of the issues and suggested changes discussed above, the Coalition believe that Provision E.3. needs to be revised as noted below. The intent of the revisions is to remove unnecessary

obstacles to alternative compliance options that would otherwise provide significantly more benefits to receiving water quality than onsite LID BMPs. For example, (3)(a)(iv) below would effectively prohibit storm water, treated onsite for pollutants, from being discharged into a reach of receiving water with low susceptibility, but with an alternative compliance option downstream.

(3) Alternative Compliance to Onsite Structural BMP Performance Requirements

(a) Applicability

At the discretion of each Copermittee, Priority Development Projects may be allowed to utilize an alternative option to comply with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) under the following conditions:

(i) The Copermittee must determine that implementation of the alternative compliance option will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite;

(ii) The alternative compliance options must be designed by a registered professional engineer, geologist, architect, or landscape architect;

(iii) The alternative compliance options must be implemented within the same hydrologic unit as the Priority Development Project, and preferably within the same hydrologic subarea;

(iv) The pollutants in storm water runoff from the Priority Development Project must be treated to the MEP prior to being discharged to receiving waters;

(v) Unless otherwise allowed by Provision E.3.c.(3)(b), the alternative compliance options must have a net result of at least the same level of pollutant removal as would have been achieved if the Priority Development Project had fully complied with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1) onsite;

(vi) Unless otherwise allowed by Provision E.3.c.(3)(b), the alternative compliance options must have a net result of at least the same level of protection from potential downstream erosion in the receiving water as would have been achieved if the Priority Development Project had fully complied with the hydromodification management BMP performance requirements of Provision E.3.c.(2) onsite; and

(vii) The alternative compliance options utilized by the Priority Development Project to comply with the performance requirements of

Provisions E.3.c.(1) and E.3.c.(2) must have reliable sources of funding for operation and maintenance.

(b) Alternative Compliance Project Options

The Copermittee may allow implementation of one or more of the following project options as part of an alternative approach to complying with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2):

(i) *Onsite LID Biofiltration Treatment Control BMPs*

The Copermittee may allow Priority Development Projects to utilize onsite LID biofiltration treatment control BMPs to comply with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1). Onsite LID biofiltration treatment control BMPs must be sized and designed to:

[a] Remove pollutants from storm water to the MEP; AND
[b] Have an appropriate surface loading rate to prevent erosion, scour and channeling within the BMP; AND
[c] Biofilter at least 1.5 times the design capture volume that is not reliably retained onsite, or biofilter an equivalent volume that demonstrates at least the same contaminant load reduction that would occur if a retention LID volume is in place; OR
[d] Biofilter up to the design capture volume that is not reliably retained onsite, AND 1) treat the remaining portion of the design capture volume not retained onsite with conventional treatment control BMPs in accordance with Provision E.3.c.(1)(c), and 2) if necessary, mitigate for the portion of the pollutant load in the design capture volume not retained onsite through one or more alternative compliance project, in-lieu fee and/or water quality credit system options below.

(ii) *LEED Certified Redevelopment Projects*

The Copermittee may allow redevelopment Priority Development Projects to comply with the hydromodification management BMP performance requirements of Provision E.3.c.(2) where the project is designed and constructed to be certified under the USGCB LEED for New Construction and Major Renovations green building certification program. The Priority Development Project must receive at least one (1) Site Design credit and two (2) Stormwater Design credits under the Sustainable Sites category.27

(iii) *Watershed-Based Planned Development Projects*

The Copermittee may allow Priority Development Projects greater than 100 acres in total project size (or smaller than 100 acres in size yet part of a larger common plan of development that is over 100 acres) to

comply with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2). The Priority Development Project must comply with the following conditions:

[a] The Priority Development Project was planned utilizing watershed and/or subwatershed based water quality, hydrologic, and fluvial geomorphologic planning principles that implement regional LID BMPs in accordance with the performance and location criteria of this Order and acceptable to the San Diego Water Board;
[b]

(iv) *Offsite Regional BMPs*

re volume that is not reliably retained onsite.
[a] The Copermittee may allow Priority Development Projects to utilize offsite regional BMPs to comply with the hydromodification management BMP performance requirements of Provision E.3.c.(2) if the offsite regional BMPs have the capacity to manage the storm water flows rates and durations from the site such that the receiving waters are protected from the potential for increased erosion that would be caused if the unmanaged portion of the runoff was discharged from the site.

(v) *Offsite Retrofitting Projects*

The Copermittee may allow Priority Development Projects to utilize offsite retrofitting projects to comply with the storm water pollutant control and hydromodification management BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) if the retrofitting projects have been identified within the strategies included in the Water Quality Improvement Plan, or identified as potential retrofitting projects by the Copermittee pursuant to Provision E.5.

(vi) *Offsite Channel, Stream, or Habitat Rehabilitation Projects*

The Copermittee may allow Priority Development Projects to utilize offsite channel, stream, or habitat rehabilitation projects to comply with the hydromodification management BMP performance requirements of Provision E.3.c.(2) if the rehabilitation projects have been identified within the strategies included in the Water Quality Improvement Plan, or identified as potential channel rehabilitation projects by the Copermittee pursuant to Provision E.5. The channel, stream, or habitat rehabilitation project cannot be utilized for pollutant treatment except where artificial wetlands are constructed and located upstream of receiving waters.

(vii) *Offsite Regional Water Supply Augmentation Projects*

The Copermittee may allow Priority Development Projects to utilize offsite regional water supply augmentation projects (i.e. groundwater recharge, recycled water, storm water harvesting) to comply with the storm water pollutant control and hydromodification management BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) if the projects have been identified within the strategies included in the Water Quality Improvement Plan.

(viii) *Project Applicant Proposed Alternative Compliance Projects*

The Copermittee may allow one or more Priority Development Project applicant(s) to propose and implement alternative compliance projects to comply with the storm water pollutant control and hydromodification management BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) if the alternative compliance projects are consistent with, and will address the highest water quality priorities of the Water Quality Improvement Plan, and comply with the requirements of Provision E.3.c.(3)(a).

(c) Alternative Compliance In-Lieu Fee Option

The Copermittee may develop and implement an alternative compliance in-lieu fee option, individually or with other Copermittees and/or entities, as a means for designing, developing, constructing, operating and maintaining offsite alternative compliance projects under Provision E.3.c.(3)(b). Priority Development Projects allowed to utilize the alternative compliance in-lieu fee option must comply with the following conditions:

(i) The in-lieu fee must be transferred to the Copermittee (for public projects) or an escrow account (for private projects) prior to prior to the issuance of the certificate of occupancy for the Priority Development Project is initiated.

(ii) If the in-lieu fee is applied to the development, design and construction of offsite alternative compliance projects, the following conditions must be met:

[a] The offsite alternative compliance projects must allow the Priority Development Project to comply with the onsite BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2);
[b] The offsite alternative compliance projects must be constructed by the Copermittee or its agent as soon as possible, but no later than 4 years after the certificate of occupancy is granted for the first Priority Development Project that contributed funds toward the construction of the offsite alternative compliance projects, unless a longer period of time is authorized by the San Diego Water Board

Executive Officer provided, however, that the project proponent's sole responsibility shall be the payment of the in-lieu fee;

[c]

[d] The in-lieu fee must also include the cost to operate and maintain the offsite alternative compliance projects.

(iii) If the in-lieu fee is applied to the operation and maintenance of offsite alternative compliance projects that have already been constructed, the offsite alternative compliance projects must allow the Priority Development Project to comply with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2).

(d) Alternative Compliance Water Quality Credit System Option

The Copermittee may develop and implement an alternative compliance water quality credit system option, individually or with other Copermittees and/or entities, provided that such a credit system clearly exhibits that it will not allow discharges from Priority Development Projects to cause or contribute to a net impact over and above the impact caused by projects meeting the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2). Any credit system that a Copermittee chooses to implement must be submitted to SDRWQCB for review and acceptance as part of the Water Quality Improvement Plan.

Thank you for consideration of the Coalition's comments on the Administrative Draft of the Permit. We look forward to working with the Regional Quality Control Board and its staff on improving the final draft with a goal toward achieving improved water quality in harmony with the Regional Board's Basin Plan.

Very truly yours,

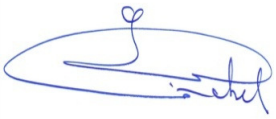

Borre Winckel
President & CEO of the BIASD
On behalf of the Coalition

GEOCON

Technical Infeasibility

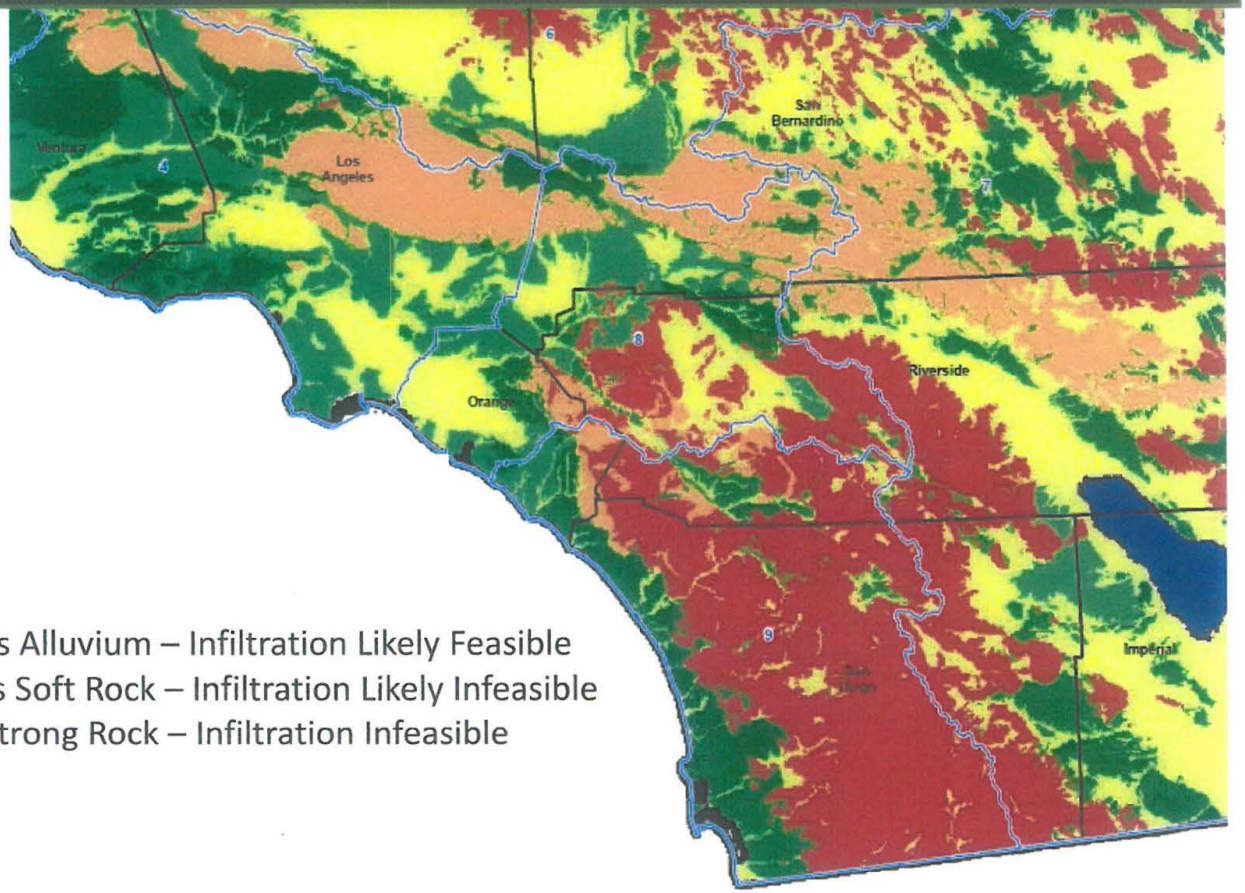

Yellow Indicates Alluvium – Infiltration Likely Feasible
Green Indicates Soft Rock – Infiltration Likely Infeasible
Red Indicates Strong Rock – Infiltration Infeasible

GEOCON

Technical Infeasibility

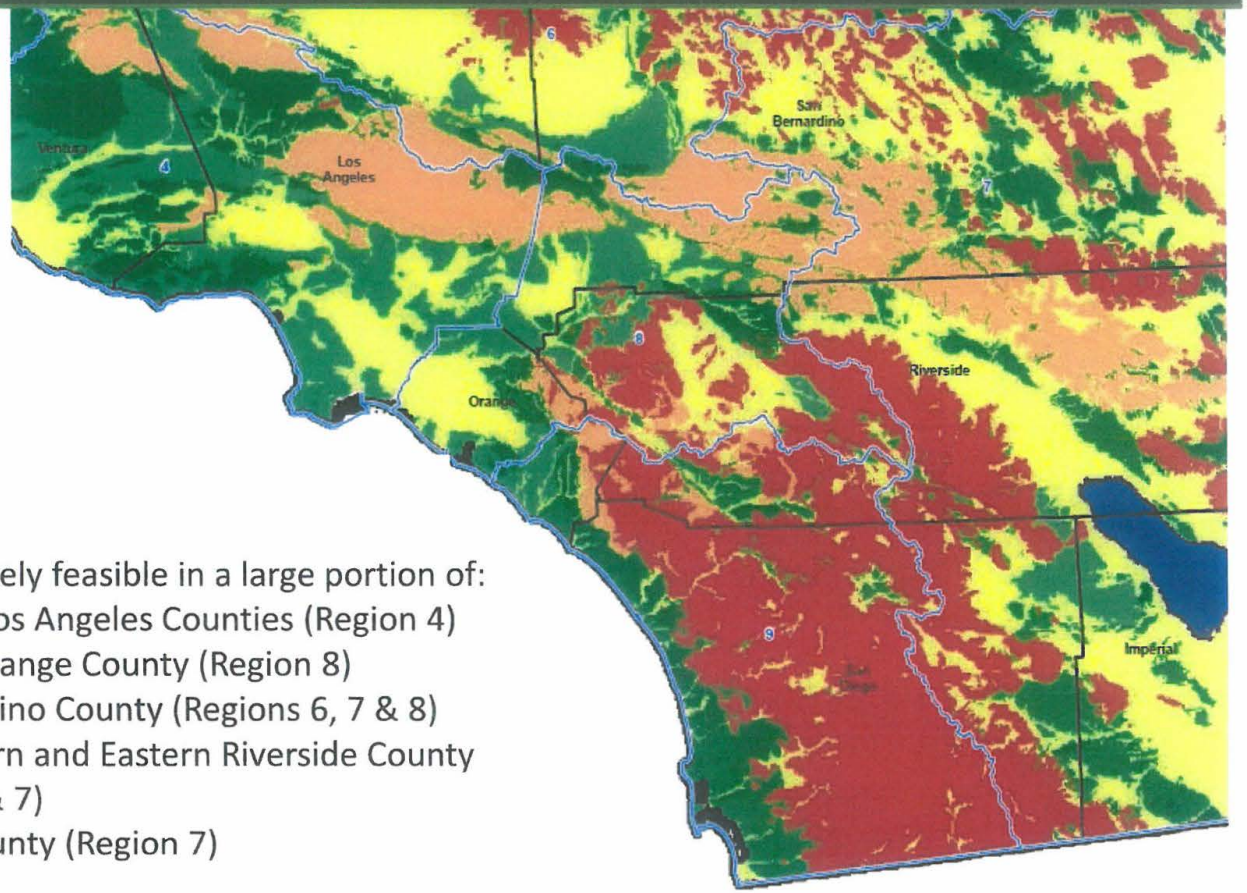

Infiltration is likely feasible in a large portion of:

- Ventura & Los Angeles Counties (Region 4)
- Northern Orange County (Region 8)
- San Bernardino County (Regions 6, 7 & 8)
- Northwestern and Eastern Riverside County (Regions 8 & 7)
- Imperial County (Region 7)

GEOCON

Technical Infeasibility

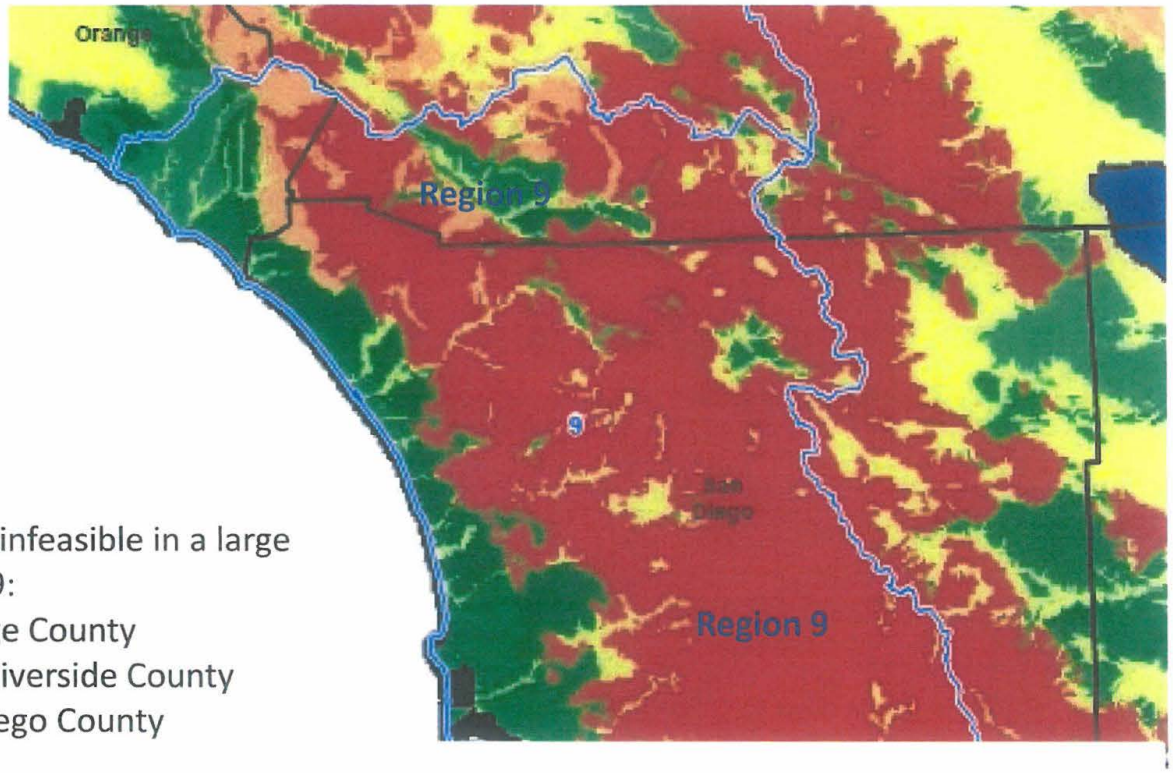

Infiltration is likely infeasible in a large portion of Region 9:

- Southern Orange County
- Southwestern Riverside County
- Western San Diego County

Clearer Structure, Cleaner Water:

Improving Performance and Outcomes at the State Water Boards

Little Hoover Commission

January 2009

State of California

LITTLE HOOVER COMMISSION

January 22, 2009

The Honorable Arnold Schwarzenegger
Governor of California

The Honorable Darrell Steinberg
President pro Tempore of the Senate
and members of the Senate

The Honorable Dave Cogdill
Senate Minority Leader

The Honorable Karen Bass
Speaker of the Assembly
and members of the Assembly

The Honorable Michael Villines
Assembly Minority Leader

Dear Governor and Members of the Legislature:

Clean water is a cornerstone of California's economic and environmental well-being.

As the state's lead water quality guardians, the State Water Resources Control Board and the nine Regional Water Quality Control Boards play a critical role in the state's health. Their job is to protect and improve the state's aquifers, rivers, lakes and shoreline.

For that job, however, the boards today must rely on regulatory tools that are not adequate to address modern threats to water quality, resulting in a system that has lost the confidence of the very people it needs to ensure clean water. The governor and Legislature must exercise their leadership to reform the current system into one that assures transparency, consistency and accountability, and demonstrates that it is improving water quality.

The boards face a daunting task. For decades, the boards' actions, supported by substantial federal investment – have led to a dramatic decrease in water pollution from wastewater treatment plants and other so-called "point sources," which discharge into water or the ground from a pipe. The current threats to the state's water quality, however, are far more difficult to solve, even as demand for clean water increases from a growing population and an economically important agricultural industry.

Stormwater pollution, caused when rains pummel the impervious surfaces that dominate cities and suburbs and sweep debris and contaminants into the state's waters, is one of the biggest water quality problems facing the state and country. Local governments, homebuilders and many industries face expensive fixes to limit and capture stormwater, and water boards are struggling with how to best regulate a diffuse pollution source. Other non-point sources, including agricultural runoff and decades-old legacy pollutants, also present challenges.

California relies on a system created nearly four decades ago, with a state board and nine separate regional boards that enjoy enormous autonomy. While regional decision-making remains essential to solutions that fit local conditions, the current structure places too little emphasis on accountability and outcomes. No one is holding regional boards truly

accountable for protecting and improving water quality. Regional boards, in turn, are overwhelmed by their tasks. The inability of the state board to implement statewide policies, practices and standards leads to inconsistencies and inefficiencies in how regional boards operate, creating the perception by water users, environmentalists, local governments and others that the boards' actions often are arbitrary and unfair.

The boards' continuing struggles with information technology, data and science lead to conflict over information, instead of policy. This complicates the ability for the public and policy-makers to get an accurate reading on the state of the state's water quality, and to determine which regulatory programs are effective in improving water quality.

California's current system for ensuring water quality does not rank the biggest threats to water quality and systematically match its finite resources to address the most serious of them using the tools of scientific and economic analysis. In this report, the Commission recommends the state board make better use of data to identify the biggest threats to water quality. The Commission recommends making greater use of science in determining the cause and remedies to water contamination as well as economic analysis to inform which options offer the greatest improvement within the available resources.

The Commission recommends reducing the size of the regional boards to seven members, all appointed by the governor, and making the regional chair a full-time position. The state board should be expanded to nine members, with five members, also appointed by the governor, representing a statewide perspective. The remaining four would be regional chairs serving staggered, two-year terms. Regional boards should focus on setting policy, not issuing permits.

While this review focuses on the water boards' duties to regulate water quality, the Commission is hopeful that it can become part of a broader conversation the state needs to engage in about its overall governance strategy for water. With a crashing Sacramento-San Joaquin River Delta, declining fish species, and continuing questions about how best to deliver water from north to south, California policy-makers must use 2009 to create an overall governance structure that can produce thoughtful responses that acknowledge the intertwined issues of water quality, water rights and water supply.

Facing increasing demand for water and the likelihood of diminishing supply, California undoubtedly will have to rely on cleaner local water supplies to meet future needs. The water boards will play a key role in this as they carry out their mission to protect and improve water quality. Reforming those boards is a first step, and one that is urgently needed.

Sincerely,

Daniel W. Hancock
Chairman

CLEARER STRUCTURE, CLEANER WATER:
IMPROVING PERFORMANCE AND OUTCOMES AT THE STATE WATER BOARDS

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Executive Summary

California is attempting to solve modern water pollution problems with an antiquated system.

Nearly four decades after the Legislature created the legal foundation to police water quality in the state, the governance structure surrounding the State Water Resources Control Board and the nine Regional Water Quality Control Boards is showing its age. The boards are overwhelmed and under-achieving, and have lost the confidence of a diverse array of water stakeholders.

The decentralized regulatory and permitting structure – with largely autonomous regional boards issuing permits, conducting enforcement and carrying out a wide array of other duties – has created a system that lacks consistency, accountability and transparency, and is unable to match resources to priorities. In fact, lack of prioritization is a fundamental weakness in state water quality regulation. The water boards' broad and ambitious mandate – to protect all waters at all times – set by state and federal law, makes it difficult to set priorities. This mandate, coupled with a state board that does not exercise enough authority over regional boards and the boards' failure to consistently consider the costs and benefits of various clean water solutions, leaves California's water quality system with dozens of priorities and, in effect, no clear, statewide priorities.

The state needs a smarter strategy to support the boards' critically important mission: protecting and improving the state's 7,800 square miles of surface water, as well as its ground water aquifers. Demand for water will grow in a state expecting a population boom. And as Governor Arnold Schwarzenegger's drought declaration in summer 2008 underscored, water is a scarce resource. The boards' work will have a profound impact on California's future: Clean water is essential to the environment, the economy and the state's well-being.

Despite the importance of water, there are ominous signs of water quality problems throughout the state. The ecological health of the Sacramento-San Joaquin River Delta, the country's largest estuary and the key cog to the state's daily efforts to deliver water from water-rich Northern California to parched Southern California, is deteriorating, partially due to water quality problems. Fish that rely

on the Bay Delta, from the Delta Smelt to the Chinook Salmon, are disappearing, due to a combination of factors, including water pollution. Beaches are closed due to water quality issues, and groundwater in parts of the Central Valley is tainted with contaminants.

As these problems indicate, the state and regional water boards face enormous challenges as they attempt to find and lessen the sources of pollution.

Urban stormwater is one of the biggest challenges the state faces. Stormwater pollution is essentially caused by modern city life, as rainwater sweeps metals, lawn fertilizer and other pollutants from city and suburban streets into nearby streams, lakes and the ocean. These sources of pollution are diffuse and difficult to control. For example, the San Francisco Bay regional board has been working for a decade to determine ways to reduce copper pollution in the Bay. The answer may lie in changing the composition of brake pads in cars, which leave copper residue on roads that is pushed into the Bay during storms.

No topic dominated the Commission's study like stormwater regulation. It is the area in which the boards' patchwork of permits has an effect on virtually everyone in California. More than 30,000 stormwater discharges are subject to permits (compared to about 2,200 permits for wastewater treatment) that regulate the behavior of large and small cities, construction sites and industry. A diverse group of water users – the military, small and large businesses, home builders, local governments and more – face enormous costs as they try and control and limit stormwater pollution. Regional boards issue many of the permits, and boards have differing philosophies and policies toward stormwater regulation in the absence of statewide policies and scientific consensus on causes and solutions. As a result, stormwater discharges are subject to significantly different levels of regulation depending upon the region. The costs of cleaning up stormwater are enormous, fueling the debate about who should pay. The costs of stormwater pollution, however, are far greater, as beach closures impact the state's economy and environmental damage threatens to impair wildlife.

Other problems are equally difficult. Agricultural runoff contaminates water throughout the Central Valley and other regions, and efforts are just getting underway to address it. Many regions are seeking to lower levels of salinity in water, which limits its use for drinking supplies or irrigation. So-called legacy pollutants, which settled into waterways years, decades or even a century ago, remain

harmful today. Mercury used to aid gold mining in the Sierra Nevada in the 1800s continues to pollute many northern California water bodies.

And while implementation of the federal Clean Water Act and the state's Porter-Cologne Water Quality Control Act, the two key laws governing water quality, have made profound improvements in wastewater treatment discharges, wastewater remains a critical statewide problem. Local governments, representing small, poor communities as well as larger, richer urban areas, are struggling to pay for upgrades needed to protect the state's waters and ensure they are safe to swim in, fish in or drink. An EPA report noted that California would need to spend more than $18 billion to properly upgrade and expand wastewater treatment.

In its study of California's water boards, the Commission focused on the boards' role in water quality regulation, by design excluding the state water board's administration of water rights. Quality and supply and the rights to that supply are profoundly intertwined and worthy of broader analysis and discussion. The Commission urges the state to use this report as a guide to improving water quality regulation, as well as a starting point for the important discussion on the much larger water issues facing the state, a discussion that must embrace water rights, water supply and restoration of the Sacramento-San Joaquin River Delta. Clean water is essential to the state's water future, but clean water is an unattainable goal without clear policies on the state's other pressing water issues.

Through public hearings, meetings of two Commission-created advisory committees, extensive interviews with stakeholders and a review of available research, the Commission identified the following critical problems with California's efforts to regulate and improve water quality:

- ***The relationship between the state and regional boards is not well-defined, leading to inconsistencies and inefficiencies among boards, an inability to set statewide priorities and a lack of focus on holding regional boards accountable for clean water outcomes.*** In statute, the state board has significant authority to steer regional board policies and provide statewide leadership. In practice, however, the state board does not provide enough oversight and regional boards have dramatically different approaches to similar problems, statewide priorities are unclear and there is not enough effort to understand which regional boards are the most effective at implementing clean water laws.

- ***The state and regional boards lack mechanisms to collect and analyze data properly, use scientific research and cost-effectiveness reviews to drive decision-making and provide useful information to the public, policy-makers and other researchers.*** Regional boards acknowledge they do not always have sufficient data to make decisions, determine whether programs are effective, or analyze whether the costs of regulation are worth the incremental benefits to our water supplies. The state has struggled to implement an information technology system and coordinate scientific research so that it is applied in regulatory processes. Basin plans, the key regulatory document dictating most regional board processes, are out of date in most regions.
- ***An antiquated regional board structure limits candidates for regional boards, hinders transparent decision-making and asks volunteer board members to do too much.*** Regional boards face complex decisions that require water expertise that some board members do not have. Compounding that difficulty are ex parte rules that limit board members' ability to communicate with stakeholders, who in turn feel they are not able to work with boards in a collaborative manner. Federal and state conflict-of-interest provisions dramatically limit the pool of potential qualified candidates.
- ***The appeals process is broken.*** Few stakeholders expressed confidence in the appeals process, arguing it was unclear why the state board decided to hear an appeal or not, and that the state board often appeared unwilling to overturn regional board decisions. In addition, because of their role as an appellate, the state board is reluctant to intervene in regional board matters that could benefit from a state board perspective before appeals are needed.
- ***The state – both water boards and other state agencies – is struggling to adapt appropriate strategies to address non-point source pollution.*** Non-point source pollution provides enormous challenges to the state and will require multi-agency responses, but the state has no structures in place to address water quality problems that stem from land use, centuries-old pollution and air pollution. Urban stormwater is a vexing problem with costly solutions, yet the state has not developed an adequate system for assessing and prioritizing this problem and other non-point source pollution problems.

Inherent to the water boards' inability to achieve better results is the governance structure. Regional decision-making is a cornerstone of California water quality regulation, and it remains a sound structure,

due to differing local conditions. But the boards have become too autonomous, and despite efforts by the state board to close the gulf between the boards, the structure creates in appearance and practice 10 different agencies instead of one. State board members, as co-equal gubernatorial appointees with regional board members, have been unable or unwilling to exercise authority over the regional boards. Examples abound of differing policies and processes at different regional boards that are incompatible with the goal of a coherent and cohesive state policy on water quality. Regional boards have had dramatically different policies on water recycling, a key statewide issue, for example. And boards have different methods of defining impaired water bodies, unduly complicating efforts to compare problems in different regions.

In part due to this autonomous structure, there is little focus on clean water outcomes or accountability. Regional boards admit they have difficulty in analyzing watersheds to determine whether their programs are protecting and improving water quality – the boards' focus on issuing permits and determining whether dischargers abide by permits leaves too few resources dedicated to analysis of whether anything is actually working. In addition, the state board has made little effort to understand why regional boards have dramatically different enforcement statistics, even accounting for size. While the state board does have the authority to set statewide policies, set budgets and hear appeals of regional decisions, a disconnect remains between the state board and the nine regional boards.

The boards also acknowledge they have difficulty prioritizing water quality problems. Seventy-four separate revenue streams, most of which must be spent on specific purposes, prevent the boards from shifting resources toward planning or enforcement, for example. During these dire economic times, it is unlikely that the boards will receive more state funding. But they should have more flexibility to match existing resources with priorities.

In addition to the difficulty in pointing resources toward the most pressing problems, the boards fail to use any type of cost-benefit analysis to help determine priorities. While full-scale cost-benefit analysis is costly and may not be warranted in many regulatory proceedings, the boards could do a better job of considering costs to find the quickest, cheapest solutions to improve and protect water quality. Simply ignoring the costs of compliance means that, too often, the price is not worth the prize when the boards set tough standards.

Underlying many of the conflicts facing the boards is a lack of data and scientific research as well as poor information technology systems. This has led to continual conflict among boards and stakeholders over information, before even beginning the discussion on proper policy.

Data collection remains a key problem. Water quality monitoring is sporadic throughout the state, leaving water boards to regulate on the basis of incomplete information. A 2004 report noted that as much as 75 percent of the state's rivers, streams, lakes and reservoirs were unmonitored. The boards struggle to organize what data they do have, however. One analysis of the water boards' program to protect and enhance wetlands was hampered because more than 40 percent of the files for the program could not be located.

The state board has struggled to implement a new IT system, making it difficult for the public, policy-makers and even board staff to conduct basic analysis. Incredibly, many board programs still rely on paper records, rather than computerized data. Environmental groups, such as the California Coastkeeper Alliance and Heal the Bay, are much better at using water board data to provide valuable information to the public than the boards can themselves.

And while the boards conduct and fund scientific research, the state has thus far done a poor job of coordinating or consolidating that research or working to infuse it into regulatory programs. Much more research is needed – the boards face a difficult challenge in regulating non-point sources such as stormwater, as there remains a lack of knowledge regarding the best, most cost-effective methods for reducing this kind of pollution – but the boards have failed to use science available to them in an efficient, effective manner.

The lack of data and science mean that the core regulatory document for each region – the basin plan – often is decades out of date. As basin plans guide virtually all regulations in each region, this undermines the legitimacy of the state's regulatory efforts. Basin plans list the uses of water bodies and the limits on contaminants in each of the water bodies to support those uses. Despite this, the state has not committed the resources to update them: Less than 3 percent of the boards' nearly 1,600 employees are dedicated to updating basin plans. The boards' funding structure, which relies mostly on fees to support specific permitting programs and almost no General Fund dollars, leaves little money available for this critical task. The state must give this task higher priority, commensurate with the role the plans play in ensuring and protecting water quality.

In addition to such basic information problems, the boards' appeals process undermines confidence in the board system. The state board is the appellate body, and acts when petitions are filed protesting a regional board action. The state board rarely overturns regional board decisions, however, and the state board does a poor job of explaining to stakeholders how it considers appeals and why appeals are denied. In addition, the appellate role prohibits the state board from taking a more active approach to regional board issues before conflicts lead to appeals and later, costly litigation. Stakeholders suggested there is a reluctance to launch an appeals process, for fear of reprisal.

Regional board members face an increasingly difficult job, particularly for a position that is essentially a volunteer post. Permits and other issues facing board members involve complex issues that are difficult for many board members who lack technical water backgrounds to understand.

Adding to the difficulty of the job are outdated ex parte rules that often prohibit board members from interacting with stakeholders outside of time-constrained public meetings. This works against the kind of communication between stakeholders and board members required for problem solving, and leaves water users and others in the water community with no avenue to discuss complex issues with board members.

A federal and state eligibility/conflict-of-interest rule, dubbed the 10 Percent Rule, eliminates many potential board members from consideration for an appointment, making it difficult for governors to fill 81 regional board positions. Five of the nine regional boards had one-third of their board positions unfilled during periods of the Commission's study. This high vacancy rate impairs boards' abilities to establish quorums and conduct important business.

Even the smoothest-running government agency, however, would struggle with the challenges facing the water boards. Modern water pollution problems are increasingly difficult and increasingly outside of the typical regulatory purview of the boards. Some studies, for example, suggest that mercury contamination in waters along the California coastline is caused by coal-burning power plants in China.

The state must understand that water pollution is a critical problem that will require creative, multi-agency responses. Aerial deposition, for example, creates water pollution, and will require a joint response from water and air regulators. Land-use planning has a profound impact on water quality, requiring more thought from the state and

local governments on how to slow and capture fast-moving stormwater that collects pollutants and deposits them in our waters.

All of these problems require important structural and procedural changes.

Toward a Reformed State Agency

A new, ideal system should include the following characteristics:

- ***A unified state water quality agency.*** Completely distinct regional boards may have been appropriate in past decades, but current common problems – urban stormwater, for example, or impairments caused by the same contaminants – call for a more centralized regulatory approach unified by a common vision and common processes. A unified state agency can better identify key problems and priorities in the state and align resources to address those problems. Efficiencies gained by a stronger bond between the state and regions will lead to clean water outcomes faster and cheaper.
- ***Local input.*** The need for local input on water quality objectives remains important, as water bodies are unique, with their own problems and solutions. Water quality objectives should continue to be set at the regional level, with vigorous debate and discussion among local stakeholders, while still subject to state oversight.
- ***A focus on accountability and outcomes.*** The public, and policy-makers, have a right to clearer information from the boards as to the state of the state's waters, and to which programs are effective – and which are not. Additionally, the boards must re-focus their mission, from ensuring that dischargers are abiding by their permits to this fundamental question: Are the state's programs protecting and improving water quality?
- ***Integrated science, accessible data.*** As water pollution problems increase in complexity, there is a need for a stronger scientific presence within board programs. The state board needs scientific advisors to help guide and coordinate research and utilize that research in regulation. In addition, the boards' dearth of water quality data must be rectified, and it can be: There are numerous federal, state and local agencies, as well as other groups, collecting information. The state must pull that information into an integrated system that allows the boards and others to access and use the information that already has been gathered.

To increase efficiency, improve cohesiveness between the state and regional boards and to better develop statewide priorities, the state board and regional boards must be reformed. The Commission proposes creating a 9-member state board, with five of the board members representing statewide perspectives. The remaining four members would be chairpersons of regional boards, serving staggered, two-year terms on a rotating basis. Regional board chairs, as well as the five state board members would be full-time, appointed by the governor and confirmed by the Senate.

Regional boards should be reduced in size from nine to seven members, with the six part-time members – aside from the chairperson – paid a per diem. The six part-time regional board members should represent various constituencies, including local government, industry, agriculture and nongovernmental organizations, as well as one spot reserved for a scientist or engineer with a background in water issues. Regional boards' missions should focus on broad policy issues, such as updating basin plans and setting regional priorities.

Regional executive officers, and the executive director of the state board, would have expanded authority to issue permits, allowing the boards to focus on quasi-legislative actions such as developing up-to-date basin plans. Permits would continue to be issued in public hearings conducted by executive officers or the executive director. Regional executive officers would report to the executive director of the state water board.

This new model would allow a stronger tie between the state and regional boards, create a "strong chair" model at the regional boards that would create new board leadership in the regions and at the state level and focus the state regional boards on policy, not permits. The state board would have better understanding of regional issues, and vice versa. The model retains the idea of regional decision-making, however, allowing regional input on setting water quality standards and beneficial uses. By reducing the regional board size, governors should have an easier time filling all board positions.

Other changes also are needed.

Ex parte rules must be reformed to allow more communication between decision-makers and stakeholders. The regulated community should have greater opportunity to talk with board members who have such significant power to influence their activities. The boards should adopt rules similar to those used by other state regulatory boards such as the Integrated Waste

Management Board, which allow communication between regulators and the regulated as long as it is disclosed at public meetings. These new rules should extend to executive officers if they are issuing permits.

A separate appeals board, comprised of water experts and appointed by the governor, should be created to hear appeals of state and regional decisions. This would restore confidence in the appeals process and allow the state board to become more active in regional board decisions before they are made.

To increase regional board accountability and provide better information to the public, the state should create easy-to-understand report cards for major water bodies throughout the state. Modeled after the report card issued by the environmental group Heal the Bay for state beaches, the report cards would provide the public with clear information about whether waters were safe to use, and whether board regulatory programs were effective. The state would need to conduct a thorough, inclusive process to determine the criteria for issuing grades, and report cards could be produced by either the state board or an outside entity, such as a water research institute like the Southern California Coastal Water Research Project or the University of California.

The boards must improve their use of science and data. The state should create a water science advisory board to help the state board determine needed areas of research, coordinate various research projects going on across the state and help the water boards incorporate research into regulatory programs. No new bureaucracy is needed – the board would consist of experts in water science who would provide advice to the state water board during regular meetings staffed by the state board.

Along with creating these new avenues to increase the use of science at the boards, the state is in desperate need of a water quality data library. The state should create an independent water data institute that would serve as a link to various federal, state and local agencies, as well as other groups, that gather water quality data. An independent institute would provide a clearinghouse where the public and policy-makers could find and compare water data. This would help the state leverage all of the water data that is gathered by various entities around the state but is currently not organized and analyzed.

Of critical importance to the water boards' effectiveness is updating basin plans in every region. The boards' reliance on out-of-date

basin plans, of which many are simply unresponsive to the current, non-point water pollution issues the boards face, hinders many of their programs. The boards should emulate the model created by the Santa Ana Regional Water Quality Control Board, which created a stakeholder task force that led to robust research, consensus-building and a largely re-written basin plan in 2004. Stakeholders – not the cash-strapped state – funded the basin plan update. Authorizing regional board executive officers to issue permits and take other quasi-judicial actions will free up the board members to focus on modernizing basin plans.

The water boards, and other state agencies, must focus on solving water quality problems in creative and collaborative ways. The water boards must increase the use of public education programs, and stakeholder task forces to confront current and complex issues, as well as improving their use of regional monitoring to determine the overall effectiveness of problems and spot new trends. The boards should find ways to examine watersheds and develop solutions that increase watershed health. Water quality regulators and air quality regulators must work together to address air pollution's effects on water, and discussion must occur among state leaders regarding land use decisions that impact water quality.

Finally, the water boards should incorporate cost-effectiveness tests into their analysis of programs to help them prioritize and find the most cost-effective solutions to water quality problems. The goal is not simply to eliminate costly fixes, but to help the regulated and regulators find ways to improve water quality in the most cost-efficient manner possible and meet statutory requirements to balance water quality needs with other factors, such as economics.

Throughout its review of the water boards, the Commission met many board members and staff who were professional, dedicated and tireless in their mission of protecting water quality. Many were aware of the criticisms of the boards' structures and processes and working diligently to improve the boards. Efforts are underway at the state board to improve the information technology system, for example, and to adopt more statewide policies that provide direction to regional boards. The problems the Commission found were not due to a lack of passion or professionalism by board personnel, but rather structural and systemic issues that can be and must be changed. This gives the Commission confidence that the water boards can improve their performance in the coming years.

Recommendation 1: To move toward a more consistent, transparent and accountable governance structure that allows for both statewide policy and regional flexibility, reform the State Water Resources Control Board and the Regional Water Quality Control Boards by strengthening ties between the boards, refocusing the boards on broad policy-making and restoring confidence in the appeals process. Specifically, the state should:

- Restructure the State Water Resources Control Board as a full-time, 9-member board charged with creating state policy, setting priorities and overseeing regional board activities. Members of the board should be appointed by the governor and confirmed by the state Senate. Five members of the state board would serve solely as state board members, including one person who would be chairperson of the state board, as named by the governor. These members should have the following backgrounds: One in engineering, one in water rights law, one in water quality, one in water-related science or resource economics, and another would represent the public. The position of regional chairperson would become full-time. Four regional chairpersons would serve on the state board for staggered, two-year terms, with membership rotating among all nine regional board chairpersons.
- Reconstitute the nine Regional Water Quality Control Boards as seven-member boards with six part-time members and a full-time chairperson, all appointed by the governor. The chairperson would be charged with monitoring statewide policies that are implemented at the regional level. Boards would continue to be stakeholder-boards, with six part-time members with the following backgrounds: experience in water supply, conservation or production; irrigated agriculture; industrial water use; local government; water science or engineering; and experience with a nongovernmental organization associated with recreation, fish or wildlife. Regional boards would focus on updating basin plans, adopting Total Maximum Daily Loads and other quasi-legislative functions.
- Empower the executive officers of each Regional Water Quality Control Board and the executive director of the State Water Resources Control Board to issue permits, allowing the boards to focus on updating basin plans, setting broad policy and focusing on upcoming water quality challenges. Executive officers would become Career Executive Assignment positions and report to the executive director of the State Water Resources Control Board. Regional boards would conduct an

annual evaluation of the executive officer that would be taken under advisement by the executive director.

- Exempt state and regional board members, regional board executive officers and the state board executive director from ex parte rules within the state Administrative Procedure Act that prohibit interaction with regulated entities. Instead, require board members and permit-issuing executives to disclose their contacts with regulated entities at public meetings, as is currently done by other boards such as the Integrated Waste Management Board.
- Create a new appeals board that would address appeals of quasi-adjudicative functions such as permits and enforcement actions. Removing the appeals process from state board jurisdiction would restore confidence in the process and allow the state board to take a more proactive approach in regional board issues. The members should have backgrounds in water issues and would be appointed by the governor to hear appeals. The board would follow Administrative Procedure Act policies in conducting hearings.

Recommendation 2: The state must improve and increase its use of data, scientific research and planning to better inform the public, respond to current and future water quality problems and focus more on accountability. Specifically, the state should:

- Create a Water Science Advisory Board for the State Water Resources Control Board. Members, appointed by the state board, should have backgrounds in environmental science and engineering. The board would help both the state and regional water boards and other state water agencies coordinate research, propose needed research, advise the boards on how to incorporate research into regulatory processes and increase the effectiveness of scientific peer review.
- Create an independent Water Data Institute that would act as a state library for water quality and supply data. The institute would pool information from various state agencies and other water monitoring groups to provide accessible information to the public, regulators and researchers.
- Develop report cards. Report cards for each major water body should allow the public easy access to information they can use and could act as a way to hold regional boards accountable for their effectiveness. The report cards should be developed and published by regional science institutes or an independent entity, such as the University of California.

- Launch a statewide effort to ensure that all regions have up-to-date basin plans. Regional boards should propose stakeholder-financed efforts similar to the one conducted by the Santa Ana Regional Water Quality Control Board.

Recommendation 3: The state must increase focus on clean water outcomes and emphasize collaboration, creativity and problem-solving to address current water quality problems. Specifically, the state should:

- Collaborate with other government agencies. Because land use, automobile emissions and other factors outside the traditional purview of the water boards are major contributors to non-point source pollution of water, the water boards must work with other government agencies on solutions. The state water and air boards should routinely meet to develop regulatory strategies to address air pollution's effects on water. The state should revive the Environmental Protection Council, which already exists in statute and consists of the heads of each of the boards and departments within Cal/EPA.
- Emphasize a watershed approach. To increase focus on outcomes and solving complex problems, the water boards should develop more processes aimed at watershed health.
- Use stakeholder task forces. As the Santa Ana Regional Water Quality Control Board has done, other regional boards should increase the use of stakeholder task forces to work through difficult regulatory issues.

Recommendation 4: The water boards must develop standardized economic analysis procedures to help set priorities and determine the most effective and efficient means to improve water quality.

- To fully implement Porter-Cologne's demand that water quality regulations be reasonable, given other economic and social factors, the boards must institute the use of economic analysis into decision-making. Cost-effectiveness analysis also would increase transparency of board decision-making and help the boards set priorities.

Background

As the state's lead water regulators, California's state and regional water boards are water cops with vast influence on the environment, economy and urban planning.

The boards' mission is as complex as the state is diverse, protecting water quality everywhere from the rain-soaked North Coast and the San Francisco Bay Delta to the Mojave Desert and the concrete streambeds of Los Angeles.

Collectively, their jurisdiction includes 10,000 lakes, 200,000 miles of rivers and 3,000 miles of coastline.[1] The boards police more than 100 contaminants, ranging from the mercury that has polluted water since the Gold Rush to the trash generated by modern city life. They issue more than 50,000 discharge permits to the biggest cities and the smallest wastewater treatment plants.[2]

Today, the state and the boards face enormous pressures on water, one of California's most valuable assets. Continued population growth strains publicly-owned systems designed to treat and dispense wastewater. Pollution caused by everything from automobile brake pads to lawn fertilizer surge from city streets into streams, rivers and the ocean when it rains. In rural California, pesticides and animal waste, produced by an agricultural industry that is a key driver of the economy, pose continuing threats to community drinking water. Throughout the state, the use of water for agriculture, wastewater treatment and other necessary functions increases salinity in water, complicating its re-use.

Adding to the boards' difficulties is this: Only a fraction of the state's waters are monitored and assessed. We truly cannot answer the most basic questions concerning the state of the state's waters: Is California water safe to drink, safe to swim in, safe to fish in or safe for aquatic life? For a majority of the state's waters, we do not know.

Amid these challenges, the need for clean water has never been greater. The state Department of Finance projects California will grow to 48 million people by 2030, with much of the growth occurring in water-poor Southern California.[3] While the state currently meets most of its agricultural, municipal and industrial water needs most

years, demand is growing. Water conservation practices have been effective – cities use about the same amount of water today as they did in the mid-1990s, despite adding 3.5 million more people.[4] Water use in urban areas, however, is expected to grow to 11.4 million acre-feet in 2020 from 8.8 million acre-feet in 2003, a 77 percent increase.[5] On top of this growing demand, experts believe global climate change will reduce the state's snow pack, which is a key source of water; increase sea levels; and, otherwise alter the state's hydrologic conditions.

Water quality is a key factor in the state's ongoing discussion on water supply. In short, water quality is water supply. Clean water is needed for drinking water, to help fish and to help farmers. Recycling both wastewater and urban stormwater are clearly needed to handle inevitable growing demand. Thus, as water quality is critical to the state's future, so too are the state and regional water boards.

The Commission took up the study of California's state and regional water boards to determine whether their structure and duties, and their relationship to each other, were adequate and appropriate for the challenges they face today. The boards and their staff members work hard and face complex problems. The issues regularly are contentious. The stakes are immense for Californians today and tomorrow.

From 'The Big Stench' to Porter-Cologne

The beginning of water quality regulation in its present form dates to the Dickey Water Pollution Act of 1949, which created nine regional boards and the State Water Pollution Control Board. At the time the new law was passed, California's post-war population was swelling, raw sewage was dumped directly into the ocean and Central Valley steams were inundated with industrial waste.[6] The Berkeley shoreline of San Francisco Bay was referred to as "The Big Stench" in the 1940s because of the pollution – human, industrial and other – draining through the city to the bay.[7] Prior to the Dickey Act, the official response to the outbreaks of water-borne disease and major degradation of state waters was a confusing and ineffective jumble of local and state governmental jurisdiction over water quality policy.

The Dickey Act marked the first major effort to implement state oversight of water quality. The nine-member state board and five-member regional boards created through the act were invested with the authority to impose requirements on discharges into water. It

also created a regional approach to water quality regulation that continues today. "Water pollution is largely a local or regional problem," members of the Assembly Committee on Water Pollution, who drafted the act, concluded.[8]

While the structure created by the Dickey Act remains, many of its philosophical and practical underpinnings since have been discarded. The Dickey Act, for example, considered waste disposal a beneficial use of water; that is not the case today. The Dickey Act also did not give the state the authority to require dischargers to clean up discharges that were in violation of requirements.[9]

In part because of these issues, California lawmakers and regulators called for an update of the Dickey Act in the late 1960s.

That overhaul was unveiled in 1969 as the Porter-Cologne Water Quality Control Act, ushering in the modern era of water quality regulation. Named for Assemblyman Carly V. Porter and Senator Gordon Cologne, the law was described as the toughest water quality act in the nation.[10]

Porter-Cologne outlined concepts that continue to be the cornerstone of state water quality policy today:

- ***Discharge is a privilege, not a right.*** Porter-Cologne's preamble states that "the quality of all the waters of the state shall be protected for use and enjoyment by the people of the state," and the act allowed the state to permit all discharges to surface water and ground water, and prohibit discharges entirely – a broad and powerful mandate.
- ***Reasonableness is required.*** Despite that broad authority, however, the law requires regulators to balance environmental protection with other factors. The "waters of the state shall be regulated to attain the highest water quality which is reasonable, considering all demands being made and to be made on those waters and the total values involved, beneficial and detrimental, economic and social, tangible and intangible," according to the statute.[11]
- ***Basin plans as the underlying regulation.*** Regional boards were required to develop water quality control plans, which would set the uses of each water body in the region, the water quality objectives needed to meet those uses and a program to ensure implementation of those objectives. These so-called "basin plans" remain the core regulatory document for each region today.

Levels of Wastewater Treatment

There are three levels of wastewater treatment. The Clean Water Act requires secondary treatment for most wastewater treatment plants in the United States:

- ***Primary.*** Mechanical methods, such as filters and scrapers, are used to remove pollutants. This process removes solid materials.
- ***Secondary.*** Biological methods, which reduce organic matter through bacterial metabolism, are used to remove pollutants.
- ***Tertiary.*** Mechanical, biological and chemical methods, which remove nutrients or other pollutants that resist other treatments.

California's enactment of Porter-Cologne was part of a burgeoning environmental movement in the state and around the country sparked in part by dramatic examples of water pollution, most notably a spectacular fire on the pollutant-soaked Cuyahoga River in Cleveland and a massive oil spill that marred the Santa Barbara coastline.

Following Porter-Cologne, the United States Congress enacted the Federal Water Pollution Control Act Amendments of 1972, now commonly referred to as the Clean Water Act. The act emulated many aspects of California's groundbreaking law.

State, Federal Acts Provide Broad Mandate

Both Porter-Cologne and the Clean Water Act are remarkable for their broad ambition. Porter-Cologne demands the "quality of all the waters of the state shall be protected." The Clean Water Act goes even further, stating that a national goal for the discharge of pollutants into the navigable waters to be eliminated by 1985, with an interim goal that "water quality which provides for the protection and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water be achieved by July 1, 1983."[12]

Critics of these lofty goals note two problems. By calling for the protection of all waters, Porter-Cologne makes it difficult for the state's water regulators to set priorities. In addition, few could argue that Congress or the California Legislature have ever funded the environmental agencies charged with carrying out these laws to the level needed to accomplish their enormous tasks.

UC Berkeley Professor of Law John Dwyer included the Clean Water Act as an example in his 1990 paper titled "The Pathology of Symbolic Legislation," in which he argued that Congress approves unrealistic environmental legislation to score political points, while leaving regulatory agencies, and, often the courts, to turn symbolic goals into reasonable standards and programs.[13]

The Clean Water Act, still the central federal law governing water quality, sought to protect the country's surface waters in two key ways. Water quality standards must be set for specific water bodies, and permits are issued requiring dischargers to use the best available technology to meet those standards. The permit program is called the National Pollutant Discharge Elimination System (NPDES). The

NPDES program required minimum standards based on the best available technology, and thus most municipal wastewater treatment plants upgraded to what is referred to as secondary treatment.

For the first decade of the Clean Water Act, regulators focused on implementing technology-based standards on point source discharges – contaminants that came out of the end of a pipe.

That focus began to shift in the mid 1980s and early 1990s, however, to the Clean Water Act's second approach to protect water quality, one that emphasized outcomes as measured by the condition of water bodies. This part of the act requires states to assess water quality, determine which water bodies are unhealthy and then take steps to improve those "impaired" water bodies. Each state is required to produce a list of impaired water bodies, referred to as the 303(d) list. Once a water body is listed as impaired, the state is required to prepare a total maximum daily load (TMDL), which determines the amount of pollutants that can be safely discharged into the water. This determination, essentially a pollution budget for each water body, then is used as a basis for assigning discharge limits to each discharger into the impaired water body.

Though both were original components of the Clean Water Act, the impaired water bodies list and the creation of total maximum daily loads largely were ignored by the United States Environmental Protection Agency (US EPA) and states until environmental groups, through successful litigation, forced regulators to comply. In California, lawsuits have led to consent decrees requiring water boards to develop TMDLs in three areas of the state in adherence with timelines developed in court.[14]

The strict new requirements served as a stick to improve water quality. Historically, the Clean Water Act also provided a carrot: federal money. The act's generous Federal Construction Grant Program initially covered 75 percent of project costs for wastewater treatment plants and upgrades and launched the largest nonmilitary public works program since the Interstate Highway System.[15] Since 1972, the federal government has contributed more than $76 billion to construct and improve plants around the country.[16] Federal funding amounted to $1.2 billion between 1972 and 1987 in the San Francisco Bay Area alone.[17]

The federal act gave water quality regulatory power to US EPA, but also allowed US EPA to delegate permitting and other duties to the states. California became the first state to assume Clean Water Act responsibilities soon after the act was approved by Congress.[18]

Despite this delegation, US EPA wields significant clout over states. In California, US EPA has final say over numerous programs, and the state and regional boards spend considerable time working with the EPA to ensure they are in compliance with federal regulations. As an example of US EPA's prominence in state and regional board matters, the San Diego Regional Water Quality Control Board declined to approve a stormwater permit for southern Orange County in February 2008 after an US EPA representative spoke out against the permit during a public hearing.[19] The permit is being revised to address the US EPA's concerns.

While Porter-Cologne was amended in 1972 to include language aimed at increasing consistency between state law and the Clean Water Act, there are differences. Among the differences:

- The Clean Water Act does not regulate discharges to ground water, for example, while Porter-Cologne does.
- The Clean Water Act exempts agriculture from regulation; Porter-Cologne does not.
- The Clean Water Act requires water quality standards to be set to the level that protects water, while Porter-Cologne allows regulators to consider other issues, such as economic considerations and past, present and probable beneficial uses of the water body.[20]

Regional Boards: The Frontline for Water Quality

Both of the state's major water quality regulation laws, the Dickey Act and Porter-Cologne, embraced the concept of nine powerful regional boards comprised of representatives of industry, local government and other stakeholders impacted by board decisions. Porter-Cologne expanded the regional board from five members to nine members, as it remains today. The nine members are appointed by the governor, confirmed by the state Senate and must reside or have a business in the region in which they serve.

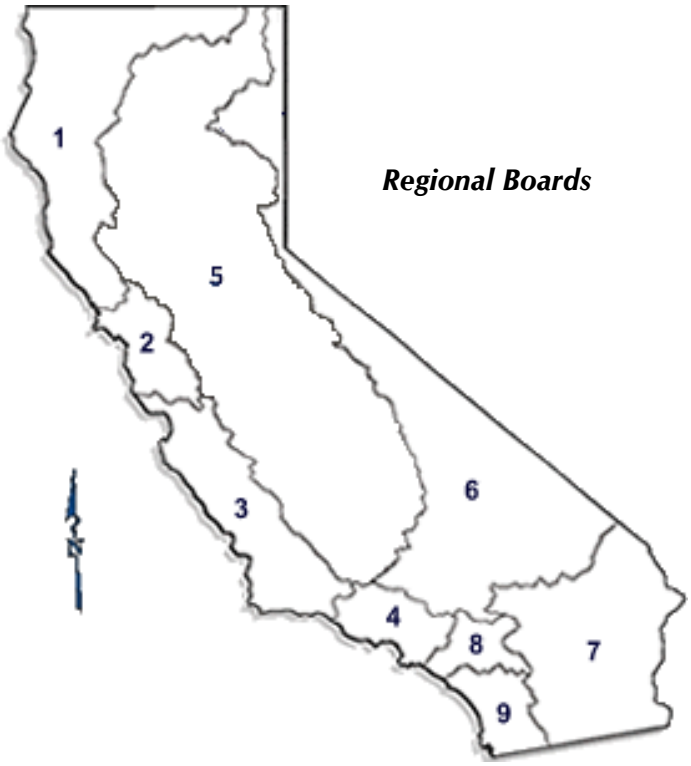

Source: Adapted from the State Water Resources Control Board. "Regional Boards." http://www.swrcb.ca.gov/regions.html. Accessed March 4, 2008.

The Importance of Basin Plans

Basin plans are the key regulatory document in any region. "The basic purpose of the state's basin planning effort is to determine the future direction of water quality control for protection of California's waters," according to the introduction in the North Coast Regional Water Quality Control Board's basin plan.

Basin plans, called water quality control plans in the Porter-Cologne Water Quality Control Act, fulfill requirements outlined in both federal and state law. Porter-Cologne requires regional boards to develop basin plans that outline the following:

Beneficial uses. There are 23 beneficial uses defined by the state water board, ranging from drinking water to agricultural supply to recreational uses such as swimming. In addition, some regional boards have adopted unique beneficial uses, such as a "cultural" designation signifying water used for cultural purposes such as Native American subsistence fishing in the North Coast region. Basin plans typically list hydrologic units in the basin and the beneficial uses attributed to each segment.

Water quality objectives. Porter-Cologne calls on regional boards to assign water quality objectives that "in the Regional Water Board's judgment, are necessary for the reasonable protection of the beneficial uses and for the prevention of nuisance." In developing water quality objectives, regional boards are required to analyze the following factors:

- Past, present and probable future beneficial uses of water.
- Environmental characteristics of the hydrographic unit under consideration, including the quality of water available thereto.
- Water quality considerations that could reasonably be achieved through the coordinated control of all factors which affect water quality in the area.
- Economic considerations.
- The need for developing housing within the region.
- The need to develop and use recycled water.

Within basin plans, water quality objectives can be numeric limits, in which the amount of a contaminant must be less than the regional board requires, or narrative limits, such as the Central Valley Regional Water Quality Board's description of limits on floating material in water, which states, "Water shall not contain floating material in amounts that cause nuisance or adversely affect beneficial uses." While some water quality objectives for specific contaminants are applicable across the basin, there are also site-specific objectives. Water quality objectives become the basis of permits issued by the board.

Implementation plan. Each basin plan includes a discussion of how the board will carry out the protection of water quality, including where discharges are prohibited, action plans for specific water bodies and other policies, such as total maximum daily loads.

Surveillance and monitoring. Basin plans also include descriptions of various monitoring programs within the region.

Basin plans are amended after public hearings, and amendments must be approved by the regional board, the state board, the Office of Administrative Law and US EPA. While the federal Clean Water Act requires states to update water quality standards every three years, regional boards typically only address a handful of issues in basin plans every three years due to staffing shortages. Thus, the last statewide initiative to conduct a major basin plan update was done in the mid-1990s.

Sources: North Coast Regional Water Quality Control Board. January 2007. "Water Quality Control Plan for the North Coast Region." Central Valley Regional Water Quality Control Board. October 2007. "The Water Quality Control Plan for the California Regional Water Quality Control Board Central Valley Region. The Sacramento River Basin and the San Joaquin River Basin." The Porter-Cologne Water Quality Control Act. Ken Harris, Assistant Director, Office of Information Management and Analysis. October 16, 2008. Personal communication with Commission.

The regional boards' main duties are to:

- ***Create and update basin plans.*** Basin plans are the key regulatory document for each region, listing uses for specific water bodies, standards needed to protect those uses and plans to implement those standards.
- ***Issue permits or waivers.*** Dischargers – be it companies, local governments or even individuals – must receive permission from the regional boards to discharge. Discharges to surface water are issued a permit through the federal NPDES. Discharges to the ground are issued a permit through the state Waste Discharge Requirement (WDR) process. In addition, the boards can issue a general permit for an entire industry, requiring each discharger within the category to file notice with the boards that they are complying with general permit rules. Finally, boards can issue a waiver to a category of dischargers, which typically requires dischargers to pay a fee and participate in water quality monitoring but does not include other requirements. Permits are typically reviewed, updated and renewed every five years.
- ***List, respond to impaired water bodies.*** Regional boards develop biannual lists of impaired water bodies as required by the federal Clean Water Act. To remedy a given impairment, the Clean Water Act requires states to develop total maximum daily loads for each water body, which limit the amount of contaminants allowed into a water body. Each discharger is given a limit through the TMDL, which also includes an implementation schedule.
- ***Monitor discharges and compliance with permits.*** Regional boards require dischargers to monitor their discharges and provide reports to the boards. Some regions also require dischargers to contribute to regional monitoring programs that assess overall water quality in a watershed. As part of their oversight role, regional boards also inspect wastewater treatment facilities and other dischargers.
- ***Enforce regulations.*** Regional boards take enforcement actions, including issuing fines, against dischargers who are violating terms of their permits. Money from fines is placed in the Clean Up and Abatement Account, a fund managed by the state board. Regional boards can request money from the fund for a project, though distribution is controlled by the state board. Regional boards also can enter into an agreement that

Water Board Statistics

Individual National Pollutant Discharge Elimination System permits cover 639 facilities in the state. Another 1,765 facilities are regulated through a general NPDES permit. About 6,800 facilities are regulated through a WDR permit. In 2006, California had 2,237 impaired water body-pollutant lists. (Water bodies are listed by segment; therefore, the same river or lake can be listed more than once for differing contaminants based on different portions of that water body.) Currently, the state is addressing 1,001 water body-pollutant lists through 134 TMDL plans, though it has considerable work ahead, with 1,780 TMDLs still to be developed.

Sources: State Water Resources Control Board. April 30, 2008. "Water Boards Baseline Enforcement Report, Fiscal Year 2006-07." Pages 18, 25. Also, State Water Resources Control Board and Water Education Foundation. April 21, 2008. "Water Education Workshop for Board Members." Section 3: TMDLs.

can reduce fines in exchange for the discharger performing a supplemental environmental project, or SEP, such as increased monitoring, habitat restoration or public awareness campaigns.

Regional boards typically hold monthly public meetings, in which they vote to adopt permits, take enforcement actions, implement TMDLs and conduct other business.

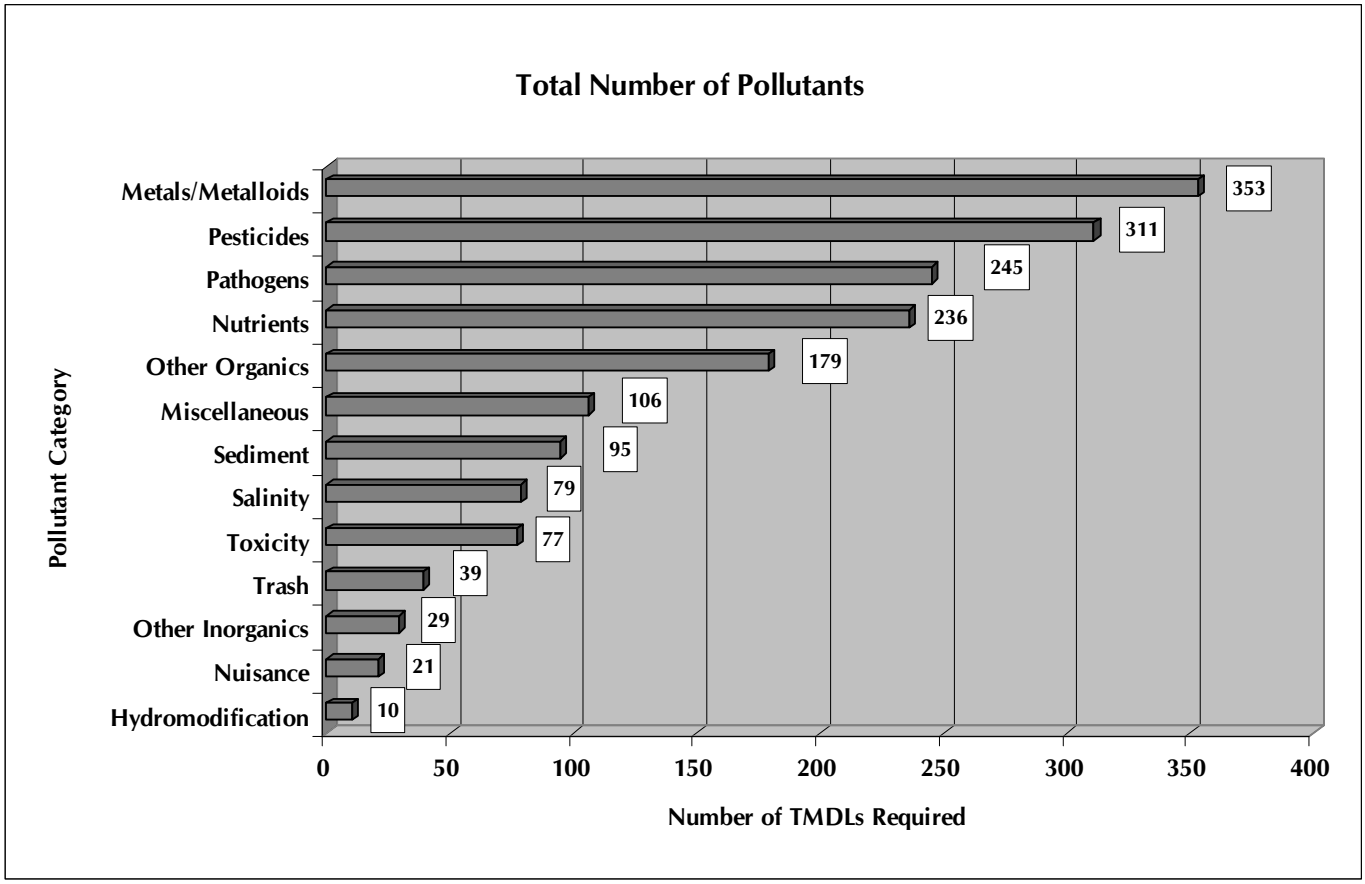

The chart shows the types of contaminants causing impairments to California waters that require the state to adopt total maximum daily loads or otherwise reduce the amount of the contaminant in water. Pesticides and metals are the leading causes of impairment in the state.

Source: State Water Resources Control Board. "California 2006 303(d) List. Total Number Pollutants Listed by Pollutant Category." http://www.waterboards.ca.gov/water_issues/programs/tmdl/docs/303dlists2006/epa/stats_2006_303dlist.xls. Accessed September 12, 2008.

State Board: Designed to Set Policy, Provide Oversight

In contrast to the regional boards, the State Water Resources Control Board is comprised of full-time board members. Each of the five members is appointed by the governor and confirmed by the Senate. All but one member must represent a specific expertise, including a civil engineer, a professional engineer, an attorney with water rights experience and someone with experience in water quality issues. The governor appoints the chair.

Porter-Cologne's framers intended decision-making largely to be conducted at the regional level, while the state board was to provide oversight and direction for the regional boards. In a presentation to regional board members in April 2008, Third Circuit Court of Appeal Associate Justice Ronald Robie, who years earlier helped draft Porter-Cologne, noted that the act enhanced the role of the state board and renamed the regional boards "California Regional Water Quality Control Boards" to emphasize that they were part of one state agency, not separate, local agencies.[21]

The state board's most important duties are:

- ***Setting state policy.*** Where it sees the need for statewide consistency on an issue, the state board can adopt a statewide policy to guide regional boards. The board currently has 16 statewide policies, on issues ranging from enforcement to implementing toxics standards.

State Water Policies

The State Water Resources Control Board can set statewide policies to help guide regional board policy. Statewide policies are intended to decrease inconsistency among the boards and address important statewide issues. The board has adopted 15 policies, and has amended some of those policies. Here those policies and the dates they were adopted or last amended by the board:

- Policy for Compliance Schedules in National Pollutant Discharge Elimination System Permits (April 15, 2008)
- Water Quality Control Policy for Addressing Impaired Waters: Regulatory Structure and Options (May 16, 2005)
- Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List (September 30, 2004)
- Policy for Implementation and Enforcement of the Nonpoint Source Pollution Control Program (May 20, 2004)
- Water Quality Enforcement Policy (February 19, 2002)
- Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (February 24, 2005)
- Water Quality Control Policy for Guidance on Development of Regional Toxic Hot Spot Cleanup Plans (September 2, 1998)
- Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under Water Code Section 13304 October 2, 1996)
- Water Quality Control Policy for the Enclosed Bays and Estuaries of California (November 16, 1995)
- Policy for Regulation of Discharges of Municipal Solid Waste (July 21, 2005)
- Pollutant Policy Document for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (July 21, 2005)
- Sources of Drinking Water Policy (February 1, 2006)
- Water Quality Control Policy on the Use and Disposal of Inland Waters Used for Powerplant Cooling (June 19, 1975)
- Policy Regarding Water Reclamation (January 6, 1977)
- Maintaining High Quality Water/Antidegradation Policy Implementation for NPDES Permitting (October 24, 1968)

Fees, not General Fund, Drive Boards' Budget

Beginning with the 2002-03 budget, the water boards have increasingly relied less on the general fund and more on fees from permit holders, federal funding and other special funds to sustain their activities. The General Fund contributed more than $101 million to the boards in the 2001-02 budget year, for example, but only accounts for $38.7 million in the 2008-09 budget year. In 2008-09, the General Fund comprises only about 5 percent of the boards' $733 million budget.

Board activities are funded by 74 separate revenue streams in the 2008-09 budget year, with most of the streams funding specific programs.

Thus, as the boards' duties have grown, along with the economy and population, the state has contributed less and less to their mission. The boards have the authority to raise fees every year, but that funding level is set by the Legislature and governor during the budget process.

- ***Reviewing regional board activity.*** The state board reviews and approves or denies some regional board actions, including basin plan amendments and TMDLs. The state board also has authority to set the regional boards' annual budgets.
- ***Issuing statewide permits.*** The state board also issues some statewide permits, such as stormwater permits for urban areas under 100,000 people, industrial uses, construction and the state Department of Transportation.
- ***Providing financial assistance.*** The state board oversees the distribution of federal and state dollars to help improve water quality. Funds administered by the board include the Clean Water State Revolving Fund Program, which provides about $400 million annually in loans to help improve wastewater treatment facilities and other improvements and the Clean Beach Initiative, which uses voter-approved bond borrowing to improve water quality along the state's coastline.
- ***Hearing appeals.*** The state board acts as an appellate for many regional boards quasi-adjudicatory decisions. Actions taken by regional boards, such as permitting and enforcement, can be petitioned to the state board. The state board determines whether to hear the petition and can then uphold the regional boards' action, remand the action back to the regional board with instructions on changes the state board desires, or take some other action, such as making changes to a permit or enforcement action on its own.
- ***Monitoring.*** The state board operates statewide monitoring programs, such as the Surface Water Ambient Monitoring Program (SWAMP), or Ground water Ambient Monitoring and Assessment (GAMA), with the goal of providing statewide water quality information and trends. The board also staffs the new California Water Quality Monitoring Council, which was created through legislation in 2006 and is charged with working to coordinate various monitoring efforts throughout the state to provide better water quality information to the public.
- ***Water rights.*** The state board has broad power to determine who can use surface water in the state. The board issues water rights permits, approves changes in water right permits,

and enforces permits. The Commission did not review the board's administration of water rights.

The State-Regional Relationship

The history and structure of the regional water quality control boards have important implications for implementing statewide water policies and establishing common standards. Just as all of the members of the state board are appointed by the governor, so too are all the members of each of the nine regional boards, making them semi-autonomous units. In addition, basin plans crafted in each region can set different limits on the same contaminants in different water bodies based on local conditions.

Despite language in Porter-Cologne stating that the state and regional boards "shall, at all times, coordinate their respective activities so as to achieve a unified and effective water quality control program in this state," California's approach to safeguarding and improving water quality relies on an inherently inconsistent system.[22]

In her testimony to the Commission, state board chairwoman Tam Doduc described the state boards' formal oversight of regional board activity as hearing petitions of regional board decisions, setting state policies, approving basin plan amendments and setting the budgets of regional boards.

Attorneys for both the state and regional boards are located together in Sacramento to ensure that legal advice provided to the boards is consistent.

There are other avenues to increase consistency among boards, which has been an issue championed by chairwoman Doduc during her tenure. Executive officers of the regional boards meet monthly with the state board executive director. All state and regional board members meet occasionally as the Water Quality Coordinating Committee. The committee met in San Diego in April 2008, for example, for a two-day seminar for regional board members on the water boards' history and current challenges, and again in October 2008 for a two-day seminar that included discussion of innovative practices at different regional boards.

Though statutory language requires consistent policies and procedures, critics of the current system say the relationship between the state and regional boards is ill-defined. Several reform efforts in the past five years have sought to alter the relationship between the

boards, arguing that a different structure would better focus the state's strategy and use its resources more efficiently. Those efforts, all of which failed, include:

- ***2003: Abolishing the boards.*** Governor Schwarzenegger's California Performance Review (CPR), launched soon after he took office in 2003, sought to abolish both the state and regional boards as part of a major overhaul of the California Environmental Protection Agency (Cal/EPA). The overhaul would have shifted many environmental regulation duties from the quasi-independent boards to state departments. The CPR called for a new division within Cal/EPA, called the Division of Water Quality that would have issued discharge permits, developed basin plans and performed most duties of the boards. Backers of the idea suggested that placing a state department in charge of water regulation would increase consistency and efficiency throughout the state. Opponents attacked the plan in part because it could limit the public's ability to shape policy.
- ***2005: Giving the state board more authority over regional staff.*** AB 1727 (Aghazarian) would have allowed the state board to appoint the executive officer of each regional board. As the top staff person in each region, executive officers have tremendous power to set staff priorities and shape policy. Currently, executive officers are exempt positions in state government and are hired and fired by the regional boards. The 2005 proposal, sponsored by the Schwarzenegger administration, sought to give executive officers more power to issue permits and, by giving hiring authority of executive officers to the state board, give more control over daily policy to the state board.
- ***2007: Revising the composition of the regional boards and giving the state board more authority to usurp regional boards.*** SB 1001 (Perata) sought to reduce the number of regional board members to seven from nine and broaden qualifications for board members to allow anyone with a "demonstrated interest and proven ability in the field of water quality" to be eligible for a regional board position.[23] A component of this legislation allowed the state board to assume the duties of a regional board if the state board determined the regional board was not complying with state and federal water quality laws.

Water Quality Regulation Has Improved State's Waters

Porter-Cologne and the Clean Water Act as well as the work of water regulators have significantly improved the quality of California's waters over the past three decades. Most discharges are regulated, leading to a sharp decline in point source contamination.

Billions of dollars of federal and state assistance has helped cities and communities build and improve wastewater treatment plants, dramatically reducing the amount of fecal matter in rivers and bays. Federal expenditures on municipal sewage treatment led to a jump in the number of Americans being served by wastewater treatment from 42 percent in 1970 to 74 percent in 1985.[24]

In California, one analysis showed that between 1971 and 2000, discharge volume and contaminant emissions into the Southern California coastal waters from large municipal-owned wastewater treatment plants fell 90 percent, despite substantial population growth.[25] A wastewater treatment facility built after the Clean Water Act's passage by the East Bay Municipal Utility District in the San Francisco Bay Area reduced the amount of metals in treatment discharge by 70 percent.[26]

The Bay Area's "Big Stench" is no more.

California has marked other clean water successes in recent years.

Efforts to control contaminant runoff from abandoned mines have reduced water pollution in the Central Valley. A cleanup effort in summer 2007 at Abbott and Turkey Run mines stabilized 20,000 pounds of mercury that would have run into Cache Creek, and the construction of a lime neutralization treatment plant at Iron Mountain Mine reduced the amount of metals running from the mine into the Sacramento River by 95 percent.[27]

A 2006 evaluation of projects funded by the Clean Beach Initiative, which has used voter-approved bond funds to improve water quality along the state's coastline, showed that five of eight projects designed to divert stormwater runoff into sanitary sewer systems reduced bacteria at beaches. While the evaluation also found that some of the projects were not successful, it noted that millions of gallons of contaminated runoff had been removed from state beaches and that lessons learned from the projects could improve water quality in the future.[28]

Stormwater Permits

The state and regional boards both issues stormwater permits in California. Most permits are broken into four categories:

- ***Municipal program.*** For medium (100,000 to 250,000 people) and large (more than 250,000) areas, regional boards issue a permit to municipal separate storm sewer systems (MS4). Most of these permits are issued to a group of co-permittees. For example, the Los Angeles Regional Water Quality Control Board issues one stormwater permit for all of Los Angeles County, with the permit including all of the cities within the county. There are 85 co-permittees for that permit. In all, there are 26 permits issued in the state for medium- and large-sized urban areas that regulate discharges from about 300 cities, counties and special districts. For small communities, the state board has adopted one general permit that covers about 190 cities, counties and special districts.
- ***Construction program.*** The state board adopted a general permit for construction in the state that disturbs one acre or more of land. There were about 20,000 such construction sites in the state in spring 2008. Generally, the permit requires construction sites to develop Storm Water Pollution Prevention Plans and reduce pollutants using available technologies.
- ***Industrial program.*** The state board adopted a general permit that covers runoff from about 9,500 industrial facilities. Like the construction permit, industry is required to develop Storm Water Pollution Prevention Plans and reduce pollutants using available technologies.
- ***Caltrans program.*** The state board issued a statewide permit for the California Department of Transportation (Caltrans), which designs, constructs and maintains the state highway system, including bridges and tunnels. The permit requires Caltrans to develop a Storm Water Management Plan.

Sources: State Water Resources Control Board and Water Education Foundation. April 21, 2008. "Water Education Workshop for Board Members." Section 5 "Regulating construction storm water discharges." Also, State Water Resources Control Board and Water Education Foundation. April 21, 2008. "Water Education Workshop for Board Members." Section 5 "Regulating industrial storm water discharges." Also, State Water Resources Control Board. "Storm Water Program – Caltrans Program." www.waterboards.ca.gov/water_issues/programs/stormwater/caltrans.shtml.

The San Diego Regional Water Quality Control Board led an effort in early 2000 to revitalize the San Diego Marina area by removing gasoline and diesel fuel from soil and ground water. The last of five Cleanup and Abatement Orders was lifted in 2005.[29]

Current Threats

Despite these successes, the state is clearly not meeting the lofty goals of the Clean Water Act and Porter-Cologne. Examples of water quality problems abound: Several recent studies show rapidly declining numbers of pelagic fish species in the Sacramento-San Joaquin River Delta, including the endangered Delta Smelt, in part due to water quality.[30] A 2006 study of 181 private wells in Tulare County showed that more than 40 percent had higher-than-allowed levels of nitrates.[31] In one day in 2005, volunteers collected 61,117 discarded bottle caps along California's coastline.[32]

Nearly four decades after California and the federal government sought to eliminate water pollution, the state's waters still face enormous threats.

Wastewater remains a problem. Improvements in wastewater treatment are the most important legacy of water quality regulation in the country and in California, yet wastewater continues to contaminate the state's waters. Some treatment plants have chronic problems, landing them on the EPA's quarterly "Watch List" of the most troubled discharge facilities in the state. Included on the EPA's April 2008 list were 10 publicly-owned plants that have been violating conditions of their permits continually for more than two years.[33]

"There are lots of really badly maintained, undercapitalized, undermanaged systems, even in affluent areas," Alexis Strauss, director of the water quality division for US EPA Region 9, told the Commission.[34]

Underscoring her point, the EPA in April 2008 ordered seven sanitary districts in Marin County – one of the wealthiest counties in the United States – to make changes to their systems due to repeated sewage spills caused by deteriorating sewer pipes. According to the order, the Mill Valley system recorded 110 sewage spills between December 2004 and February 2008.[35]

State of the State's Waters

How clean – or dirty – are the state's waters? A dearth of water quality monitoring and the state's failure to create an accessible site for available information depicting water quality in California makes answering this question difficult. Here are three separate reports depicting the state of the state's waters:

Clean Water Act Section 305b Report. The Clean Water Act's Section 305b requires each state to assess the condition of its waters and submit the results to US EPA every two years. Using information gathered through US EPA's Environmental Monitoring and Assessment Program, the 2006 report, the most recent, focuses on assessments of two types of water in the state: coastal bays and estuaries and wade-able, perennial streams. Results included:

- The report suggests most of the state's coastal waters are in "fair" or "good" condition, based on US EPA criteria. High phosphorous levels were found in much of San Francisco Bay, while Southern California ports reported sediment chemical contamination.
- Analysis focused on the number of benthic macroinvertebrates, such as crayfish, dragonflies and snails, living in streams versus the number that would be expected to live there based on models. Overall, the report suggests 67 to 78 percent of wade-able perennial streams in California are in "good" condition.

California Water Plan. In the 2005 update of the California Water Plan, water quality conditions were reviewed by focusing on four areas: surface water; ground water; drinking water; and, environmental water, defined as the water that serves as habitat for fish, birds and other animals. The plan outlines current issues within each area:

- ***Surface water.*** Thirteen percent of the total miles of the state's rivers and streams were listed as impaired by at least one contaminant. About 15 percent of the state's lake acreage is impaired.
- ***Ground water.*** Sixty-two percent of the state's wells met standards for contaminants. In each of the state's hydrologic regions, however, 24 to 49 percent of public water supply wells exceeded acceptable levels for one or more contaminants.
- ***Drinking water.*** Public water systems in the state collect water from about 15,000 ground water and 1,000 surface water sources. About one-quarter of these sources have at least one contaminant at higher-than-allowable levels.
- ***Environmental water.*** While providing no specific measurements describing the extent of water quality impairment on riparian and aquatic habitats, the Water Plan noted that habitats can be affected by "legacy" pollutants, such as mercury.

Heal the Bay report card. The Southern California environmental group Heal the Bay has graded water quality at beaches for 18 years. The group assigns letter grades to beaches, based on monitoring data collected by local governments and dischargers on fecal indicator bacteria, considered to be the best indicator of whether beach water is safe for swimming.

In its annual report card published in May 2008, 87 percent of 379 beach locations received an A or a B. Los Angeles County recorded the lowest grades in the state, with 71 percent As and Bs. Avalon Harbor Beach on Catalina Island, ranked last, received an F.

Sources: State Water Resources Control Board. October 2006. "Water Quality Assessment of the Condition of California Coastal Waters and Wadeable Streams." Also, California Department of Water Resources. February 14, 2006. "California Water Plan Update 2005: A Framework for Action." Volume 2, Chapter 13. Also, Heal the Bay. May 21, 2008. "18th Annual Beach Report Card."

According to a 2008 US EPA estimate, California would need to spend $18.2 billion to upgrade its wastewater treatment infrastructure to meet all water quality and public health needs.[36]

Despite these needs, federal funding for improvements is waning. The initial funding program enacted with the Clean Water Act now provides far less money than it once did. In the 1970s, federal dollars paid for 75 percent of projects. Congress stopped providing grants in 1987, launching in their place a revolving loan program, which provides low-interest loans for wastewater treatment plant upgrades. Federal contributions to the State Revolving Fund have shrunk to $48 million in 2008 from $144 million in 1996, while upgrade costs have increased.[37]

Non-point sources the biggest threat. A much bigger and broader threat comes in the form of so-called "non-point sources" of water pollution, such as urban stormwater runoff, agricultural runoff and legacy pollutants, all of which are diffuse and have no single pipe or source to control. Non-point source pollution is responsible for 76 percent of California water impairment.[38]

Non-point sources were largely ignored as a source of pollution in need of regulation during the first decades of the Clean Water Act and Porter-Cologne. But as point source pollution diminished and many water bodies remained impaired, attention turned to non-point sources. The Clean Water Act was amended in 1987 to include non-point sources in the NPDES permitting program.

Non-point sources are much more difficult to regulate for obvious reasons. The pollution is diffuse and difficult to trace to its sources. Its episodic nature makes non-point sources of water pollution even more difficult to monitor and assess.

Water quality experts note that non-point source regulation, unlike point source regulation, is still a relatively new process and that effective programs, funding sources and scientific understanding have not been fully developed.

Stormwater. Rain storms sweep debris and pollutants from roads, parking lots and other impervious surfaces that dominate city landscapes into waterways, creating pollution in creeks, rivers, lakes and the ocean.

In essence, modern life is the source of stormwater pollution. Urbanization has led to more paved, impervious land and more complex water pollution problems with unusual and hard-to-regulate

sources. Land use decisions that increase the amount of non-permeable surfaces in a city, for example, lead to more runoff. Studies conducted in the San Francisco Bay have found that copper from automobile brake pads, which falls from brakes onto streets and then is washed into storm drains during rain events, is a major source of pollution in the Bay.[39]

Many of the most complicated and contentious issues facing water boards and the entities they regulate involve urban stormwater. Stormwater permits affect an enormous percentage of the population: More than 30,000 stormwater discharges are subject to permits, covering every populous area of the state, compared to only 2,200 wastewater permits.[40]

Financially-strapped local governments complain that stormwater requirements eat up money that could be spent on police protection, social services and other local priorities. One study found that stormwater programs cost local governments between $18 and $46 per household annually.[41]

Despite these difficulties, it is clear that stormwater pollution must be dealt with. One recent study noted that metals from stormwater increased from 6 percent to 34 percent of the total metals pollution in water along the Southern California coastline between 1971 and 2000.[42]

Modern water regulators face this central dilemma: Urban development for decades has focused on collecting stormwater and conveying it quickly away from homes and other buildings to prevent flooding. The concrete channels throughout the Los Angeles County basin direct 500,000 acre-feet of stormwater into the ocean every year, for example.

Stormwater managers must develop strategies that in many ways run counter to those designed to prevent flooding. To protect the ocean and other water bodies from the lawn fertilizers, pet waste, pesticide, oil, grease and trash that is flushed from city streets by rain, a key solution is to retain stormwater so that the soil catches contaminates as the water percolates into the ground. Other strategies to address stormwater pollution include, cleaning streets, changing individual behaviors such as over-fertilizing lawns, or treating stormwater in a similar manner to treating wastewater. The state and regional water boards, through their permitting process, seek to require cities, industries, construction activities and the state's highway system to change practices to limit runoff and prevent contaminants from reaching streams, rivers and bays.

For much of the short history of stormwater regulation, rules have emphasized effort over outcomes. The Clean Water Act's 1987 amendment regarding stormwater requires cities and other regulated entities to reduce stormwater pollution to the "maximum extent possible," but Congress never defined that term. Typical stormwater permits have required cities to develop and submit plans explaining their efforts. The vagueness surrounding the regulation is in contrast to wastewater regulation, which typically provides treatment plants with numerical limits for certain contaminants.

Some water users noted the differences in the way Congress treated point sources and non-point sources: When the Clean Water Act was approved in 1972, Congress gave states specific direction to require numeric limits in permits, and the federal government provided significant funding through a grant program to improve wastewater treatment facilities. Through the 1987 amendment, the grant program became a loan program, and Congress did not require numeric limits in permits regulating cities.

"With point sources, Congress provided both a carrot and a stick," Mark Gold, president of Heal the Bay, said. "With non-point sources, there is neither a carrot nor a stick."[43]

Disagreements now abound over many stormwater programs. It is more difficult to monitor, and more difficult to determine whether specific programs are effective. A blue ribbon panel of experts convened by the State Water Resources Control Board noted in a 2006 report that both regulated entities and environmental groups complained that stormwater permitting "has become overly complex, and that it is extremely difficult, if not impossible to objectively determine if a facility, operation or municipality is in compliance with permit requirements."[44]

During the Commission's study process, the National Research Council published a lengthy and damning report on national stormwater policy, essentially declaring it a failure. "EPA's current approach to regulating stormwater is unlikely to produce an accurate or complete picture of the extent of the problem, nor is it likely to adequately control stormwater's contribution to water body impairment," the report strongly states.[45]

To improve effectiveness, California's water boards are attempting to place more numeric limits or measurable requirements into stormwater permits, which is creating conflict with many stakeholders. Regulated entities complained to the Commission that

the boards were using standards adapted for point sources in their efforts to better regulate stormwater.

This dilemma must be addressed by the state as it works toward improving water quality and water supplies in the future. Many argue that stormwater should not be treated as a problem, but as a resource. Captured and treated stormwater could be reused. The state's water future – in which recycled water must play a larger role – may in part depend on improving stormwater strategies.

Irrigated agriculture and dairies. In rural areas, runoff from agriculture and dairies plays a role in water pollution. Studies show that nitrates, often linked to farming practices, are affecting drinking water in parts of the Central Valley. A 2007 report issued by the Central Valley Regional Water Quality Control Board summarized more than two years of monitoring and found, among other things, toxicity to algal species throughout the valley that is generally associated with herbicides and metals, such as copper, and sediment toxicity throughout the valley likely due to certain types of pesticides.[46]

In part due to legislation enacted in 1999, regional water boards have begun to increase regulatory authority over irrigated agriculture, which is exempt from the Clean Water Act. The two regions with the most agricultural activity both have adopted conditional waivers of waste discharge requirements in the past five years that affect agricultural practices. Farmers are required to agree to the conditions of the waiver or face an individual waste discharge requirement.

The Central Valley Regional Water Quality Control Board oversees about 7 million acres of cropland, while the Central Coast Regional Water Quality Control Board regulates a much smaller area – about 600,000 acres.[47] The two boards take somewhat different approaches to regulating water quality in their districts, based in part on their sizes.

The Central Coast board requires farmers to participate in water quality education classes, participate in monitoring efforts and file regular reports with the board detailing activities geared toward improving water quality. The Central Valley board requires farmers to participate in – and fund – coalitions that perform monitoring. Based on that monitoring, the coalitions prepare management plans to address problem areas. Individual farmers are not required to submit reports as they are in the Central Coast region. The Central Valley board has found some difficulty in ensuring that all

agricultural operations required to join a coalition do so – they have issued more than 1,400 enforcement orders requiring non-participating landowners to do so.[48]

While the Central Coast's irrigated agriculture program includes operators that discharge into ground water, the Central Valley program only includes those who discharge to surface water.[49]

In May 2007, the Central Valley Regional Water Quality Board issued a Waste Discharge Requirement covering all dairies in the region in existence since October 2005 – about 1,600 operations. Most of the dairies that operate in California are located in the Central Valley region, and before the new requirements, most had not been regulated. This had led to problems – a study of 425 wells at 88 dairies found that 63 percent of dairies' water was contaminated by nitrates.[50] The new order requires dairies to prepare reports on how they handle animal waste and other potential contaminants and monitor ground water quality. Dairy operators must enroll in a class designed to teach them how to comply with the new regulations.

Dairy representatives estimate the new regulations will cost each dairy $30,000 to $36,000 each year and require them to change business practices.[51]

Environmental groups argue that the regulations are long overdue and do not go far enough to successfully address the contamination. They note, for example, that the regulations contain no numeric limits or enforcement provisions. Two groups, the Environmental Law Foundation and Asociacion de Gente Unida por el Agua, have sued the state board over the regulation. The lawsuit remains pending.[52]

Legacy Pollutants. Another threat to the state's waters is so-called legacy pollutants, or pollution that stems from historic practices. These pollutants stem from agriculture, manufacturing and mining activities that have been banned or are no longer practiced. Legacy pollutants' historical nature pose a significant challenge for regulators: It is often impossible to hold former dischargers accountable, and removal of contaminants can be difficult and costly.

Major legacy pollutants include:

- ***Mercury.*** Used in 19th century gold mining practices in the Sierra Nevada mountains, mercury is now a prevalent contaminant in the Central Valley and San Francisco Bay regions. A study released in September 2008 showed that while some contaminants in sport fish declined during a 30-year period, mercury levels in fish remained relatively constant.[53]
- ***Polychlorinated Biphenyl (PCBs).*** PCBs were used in numerous products until they were banned in 1979, after they were identified as causing cancer in humans and disrupting animal reproduction. Despite the ban, PCBs linger and remain at high levels in San Francisco Bay and some Southern California lakes.[54]
- ***Perchlorate.*** Perchlorate, used in rocket fuel in the last half of the 20th century, has contaminated water in Sacramento County and Southern California, mostly in areas formerly used by the United States Department of Defense and the National Aeronautics and Space Administration. The Central Valley, Santa Ana and Los Angeles Regional Water Quality Control Boards have worked with industry and the federal government to control and remove perchlorate.

The Challenge Going Forward

California ushered in state-governed water quality protection with the passage of the Dickey Act in 1949, which set a regional course for regulation. The sweeping ambition of the Porter-Cologne Act in 1969 raised expectations that the state could eliminate water pollution, and established the principles for how California would regulate point source discharges. It made clear that discharge was a privilege, not a right, that solutions had to strike a reasonable balance between environmental protection and other concerns, and established basin plans as the foundation of regional regulation.

At the federal level, the similarly ambitious Clean Water Act followed in 1972. In its first incarnation, it attacked point source pollution such as industrial discharges and wastewater treatment. The act has evolved to focus on non-point sources and developing solutions for impaired water bodies, most notably total maximum daily loads for identified contaminants. This new focus has not come with the same level of federal funding that was available in the 1970s and 1980s, however.

Water Board's Efforts to Improve Programs, Processes

To their credit, the state water board has made several recent efforts to improve its programs and respond to criticism. Examples of the boards' reform efforts include:

- ***Strategic Plan Update.*** Adopted in September 2008, the water boards' Strategic Plan Update 2008 – 2012 outlines priorities for the water boards, both in terms of clean-water outcomes and in improving processes. The plan calls for the boards to prioritize programs for important watersheds, such as the Klamath River basin, for example, and prioritize needed basin plan updates. The plan also addresses concerns involving transparency and consistency, and calls for the development of state and regional water board work plans that include ways to measure performance. The plan has numerous specific goals with dates these goals will be achieved that will allow the Legislature, governor and stakeholders to assess board effectiveness. The plan was adopted after a one-and-a-half-year span that allowed significant stakeholder and staff input.
- ***New Offices.*** During the past two years, the state water board has created new offices within the board to improve effectiveness. The Office of Information Management and Analysis is intended as a way to improve both the boards' information technology systems and its ability to provide the public with useful information. The office was created on July 1, 2008 and oversees IT systems such as California Integrated Water Quality System (CIWQS) and also will produce routine reports depicting water board activities and outcomes. The Office of Research, Planning and Performance was created in 2006 to help better coordinate scientific research, work on strategic planning and develop performance measurement targets to help improve accountability within the water board system. The Office of Public Participation was created in 2007 to help strengthen the boards' efforts to involve the public in decision-making processes.
- ***Expert Panels.*** The state board has used panels of experts to review failing programs and make recommendations for change. In two cases, the reviews have helped the board make improvements to critical programs – the CIWQS and the Surface Water Ambient Monitoring Program (SWAMP) – that needed extensive restructuring. Both reviews were facilitated by Stephen Weisberg of the Southern California Coastal Water Research Project. In both cases, initial reviews of the programs – made public by the state water board – provided a harsh assessment of the programs but offered clear direction to make changes. For example, the review of CIWQS found that bifurcated management of the system and a broad, overly complex scope set the system up for failure. In both cases, a second review conducted about a year later showed significant improvement.
- ***Water Quality Improvement Initiative.*** Unveiled in May 2008 by the Schwarzenegger administration, the Water Quality Improvement Initiative was a comprehensive legislative proposal to reform some aspects of the water boards. The initiative called for the creation of a water quality council comprised of the chairpersons of each regional board to help improve consistency, and for the state and regional boards to establish priorities and report regularly to the Legislature on whether those priorities had been met. In addition, the initiative would change the state's interpretation of the 10 percent rule to allow potential appointees to serve on a board as long as they do not have income from an entity permitted by that specific board. Other proposals include delegating permitting authority from the regional boards to the regional board executive officers to allow the regional boards to focus on broader policy issues. In all, the initiative contained more than a dozen proposals for change.

California's main regulatory tools to enforce its clean water laws are the State Water Resources Control Board and nine regional water quality control boards. The state board sets policy and oversees the regional boards. The regional boards, which largely act independently of each other, develop basin plans and issue permits, monitor the results and assess fines when necessary. To a great degree, their structure and their policies reflect the major water protection laws passed in 1949, 1969 and 1972 with their heavy emphasis on point source pollution.

These laws have significantly reduced much of pollution that plagued California in the 1960s and 1970s, especially water contamination from point sources. But with the state's continued economic and population growth over the decades, some problems, such as sewage discharges, still escape a complete solution, in some cases because of cost. Other problems have emerged that defy easy solutions, such as stormwater runoff and agricultural runoff, as well as legacy pollution from old mines or contaminants from now-banned industrial practices. They now represent the biggest challenges California and its water boards face in living up to its commitment to provide clean water to its people now and in the future.

An Outdated System

Enacted in 1969, the Porter-Cologne Water Quality Control Act placed California in the vanguard of environmental protection.

In recent years, however, the water quality regulatory system developed nearly four decades ago is showing signs of its age. The system has not adapted to address modern water quality issues. Pollution from sources such as urban stormwater and agricultural runoff is now the biggest threat to surface water and groundwater. Legacy pollutants, such as mercury from mining practices, as well as aerial deposition from automobiles and other sources, also contaminate water. The traditional system of issuing permits to dischargers and monitoring those dischargers is not well-equipped to handle complicated issues that involve land use, diffuse pollution sources and complex scientific inquiry.

Regional boards are overwhelmed. Basin plans, the key regulatory document for each region, are decades out of date. Priorities are not matched to the most important threats to water quality. Process trumps a focus on clean water outcomes. Volunteer regional board members face increasingly difficult decisions that require a sophisticated understanding of water science and have profound ramifications for both the environment and the economy. Transparency, a key tenet of democratic government, is missing in regional board processes, as stakeholders complain they have little ability to interact with board members and do not always understand the rationale behind decisions. Regional boards across the state have differing philosophies and processes, and the state board has not adequately exercised its authority to ensure that the boards operate as one state agency, rather than 10 separate entities. Though the system is set up to protect water for the people of California, it is virtually impossible for the public to find easy-to-understand information on water quality in the state.

The result is a troubled system that lacks credibility with stakeholders, ranging from environmentalists to regulated businesses and local governments to the Legislature. In a disturbing illustration of the mistrust between the water boards and the water community, several stakeholders declined to publicly testify to the Commission

about the boards because they were concerned there would be reprisals for publicly airing their complaints.

Worst of all, it is difficult to determine if the boards' regulatory programs are effectively cleaning and protecting California's waters. Many argue they are not.

"During the past 15 years, we have flat-lined in the effort to protect water quality," argues LaJuana Wilcher, a former administer with US EPA who advocates for a nation-wide overhaul of water quality regulatory practices.[55]

Cities of Arcadia, et al. vs. Los Angeles Water Board

Litigation involving 21 municipalities in Los Angeles County, the Building Industry Association (BIA) and the Los Angeles Regional Water Quality Board illustrates the difficulties boards are having regulating stormwater with out-of-date basin plans.

In 2004, as the Los Angeles board was conducting a triennial review of its basin plan, the cities and BIA asked the board to review its water quality standards in relation to stormwater regulation. Sections 13000 and 13241 of the Porter-Cologne Water Quality Control Act require the boards to enact standards that "attain the highest water quality which is reasonable," and the boards must consider several factors, such as probable beneficial uses of water, environmental characteristics of water, water quality conditions that could be reasonably achieved, and economic considerations, when it sets standards. The regulated entities argued that the basin plan's standards were developed before stormwater regulation was in place, and that due to stormwater's unique nature, new standards should be developed and applied in stormwater permits and during the TMDL process.

The board did not review the standards, arguing that the standards were adequate because the boards had considered the reasonableness factor and other factors when they were first developed. The state board approved the 2004 basin plan and declined to hear a petition for review from the regulated entities. In 2005, the group sued the board in state superior court, arguing that both stormwater permits and TMDLs were based on water quality standards set without consideration of stormwater issues. According to the lawsuit, the cities projected needing to spend several billion dollars complying with numeric limits on trash and trace metals as part of two TMDLs that were enacted based on existing water quality standards.

In July 2008, Judge Thierry Patrick Colaw sided with the plaintiffs, concluding that during the creation of the original basin plan and subsequent revisions, "there is no substantial evidence in the record to show that the boards have ever analyzed the 13241/13000 factors as they relate to stormwater." Colaw ordered the Los Angeles water board, and the State Water Resources Control Board, which has ultimate authority over the basin plans, to review water quality standards in the Los Angeles basin plan as they relate to stormwater.

The order created angst and confusion in the region, as the state board concluded that it could not authorize any new activity, including construction and industrial activities, until the matter was resolved. The judge later allowed the water quality standards to stand while the board conducted its review, and thus construction and industrial activity were allowed to resume.

But the lawsuit reveals what many stakeholders told the Commission: Stormwater regulation has been developed during the past 20 years based on standards that were largely created before nonpoint source water pollution was even considered. Other regional boards also have basin plans and water quality standards that were developed for point sources but are now being used in stormwater regulation.

Sources: Porter-Cologne Water Quality Control Act, sections 13000 and 13241. State Superior Court Judge Thierry Patrick Colaw. July 2, 2008. Judgment, Cities of Arcadia, et. Al. vs. State Water Resources Control Board and Los Angeles Regional Water Quality Control Board. Michael Lauffer, Chief Counsel, State Water Resources Control Board. July 16, 2008. Memo to Dorothy Rice, Executive Director, State Water Resources Control Board. State Superior Court Judge Thierry Patrick Colaw. August 28, 2008. Order, Cities of Arcadia, et. al. vs. State Water Resources Control Board and Los Angeles Regional Water Quality Control Board.

Through two public hearings, meetings of two Commission-created advisory committees, extensive interviews with stakeholders and a review of existing research, the Commission identified the following critical problems with California's efforts to improve and protect water quality:

- ***The relationship between the state and regional boards is not well-defined, leading to inconsistencies and inefficiencies among boards, an inability to set statewide priorities and a lack of focus on holding regional boards accountable for clean water outcomes.*** In statute, the state board has significant authority to steer regional board policies and provide statewide leadership. In practice, however, the state board does not provide enough oversight and regional boards have dramatically different approaches to similar problems, statewide priorities are unclear and there is not enough effort to understand which regional boards are the most effective at implementing clean water laws.
- ***The state and regional boards lack mechanisms to collect and analyze data properly, use scientific research and cost-effectiveness reviews to drive decision-making and provide useful information to the public, policy-makers and other researchers.*** Regional boards acknowledge they do not always have sufficient data to make decisions or determine whether programs are working. The state has struggled to implement an information technology system and coordinate scientific research so that it is applied in regulatory processes. Basin plans, the key regulatory document dictating most regional board processes, are out of date in most regions.
- ***An antiquated regional board structure and poor appeals process limits candidates for regional boards, hinders transparent decision-making, and asks volunteer board members to do too much.*** Regional boards face complex decisions that require water expertise that some board members do not have. Compounding that difficulty are ex parte rules that limit board members' ability to communicate with stakeholders, who in turn feel they are not able to work with boards in a collaborative manner. Federal and state conflict-of-interest provisions dramatically limit the pool of potential qualified candidates. And few stakeholders have confidence in the appeals process.
- ***The state – both water boards and other state agencies – is struggling to adapt appropriate strategies to address non-point source pollution.*** Non-point source pollution provides enormous challenges to the state and will require multi-

agency responses, but the state has no structures in place to address water quality problems that stem from land use, centuries-old pollution and air pollution. Urban stormwater is a vexing problem with costly solutions, yet the state has not developed an adequate system for assessing and prioritizing this problem and other non-point source pollution problems.

Inconsistencies and Inefficiencies

The framers of California's water quality regulatory system envisioned a decentralized governance structure that would lead to different objectives and standards in different regions. That is appropriate, as different regions have different hydrological conditions, and a contaminant may impact one water body differently than another.

But numerous stakeholders suggested that too often, regional board policies and processes vary dramatically, even on some of the most important statewide water issues. Examples include:

Water recycling. The Legislature in 1991 declared its support for increasing water recycling in the state by calling for the state to use 700,000 acre-feet of recycled water by 2000 and 1 million acre-feet by 2010. The 2000 goal was not met, and many believe the 2010 goal will not be met either.[56] Regional boards play a critical role in water recycling projects because reused water is often injected into ground water basins, giving boards authority to regulate that discharge. Boards have taken widely different approaches to recycled water projects; in fact, all boards do not offer the same type of permits for recycled water, with some issuing a NPDES permit and others regulating projects through water reclamation requirements.

"Inconsistent regulation of water recycling by state and local officials leads to confusion and uncertainty in how to design and manage water reuse systems and appears to have led to overly restrictive regulation and added costs, creating an obstacle to achieving the full potential for water reuse," a 2003 report on water recycling noted.[57]

The state board noted in 2007 that, "Regional Water Boards have established varying requirements for recycled water used for irrigation. Some have established limitations for salts in recycled water and others have not. Some water recycling irrigation projects have ground water monitoring requirements, but most do not."[58]

This can have profound effects: Los Angeles spent seven years working with the Los Angeles Regional Water Quality Control Board to obtain a permit to use recycled water for landscape irrigation

purposes such as watering golf courses.[59] This frustration led to legislation in 2007 to allow entities seeking water recycling permits to bypass regional boards and obtain a permit from the state water board instead.[60]

The state board is currently working on the creation of a statewide policy on water recycling.

Stormwater. Stormwater policy also varies widely from board to board. The Central Valley board issued a relatively brief stormwater management permit (62 pages) for the city of Stockton in December 2007 that required the city to determine its own best management practices to address stormwater cleanup. By comparison, the Los Angeles board issued a draft stormwater management permit to Ventura County in August 2007 that was nearly twice as long (115 pages) and far more specific about the tasks the county and cities within the county should perform and the numeric limits on specific pollutants in stormwater. The permit listed specific best management practices that could be used and detailed how often streets should be swept.[61]

"Instead of a statewide plan and comprehensive approach to stormwater, precedents are being set, conditions for permits are being imposed and numeric limits are being imposed in a fragmented, case-by-case manner," said Terese Ghio, past president of the Industrial Energy Association.[62]

The California Stormwater Quality Association, a group including local government stormwater managers and private consultants, has been advocating for several years that the state board develop a comprehensive stormwater policy for medium- and large-size cities that they argue would improve the effectiveness of stormwater regulation and better allow measurement of that effectiveness. So far, however, the state board has not taken that up.[63]

Thus, regional boards have radically different approaches to stormwater regulation, one of the most difficult and contentious water pollution issues facing the state.

Monitoring, reporting and other processes. How regional boards develop information and report water quality data also differs. A 2006 report reviewing the state's Surface Water Ambient Monitoring Program – which is intended to gather and report statewide information on water quality – outlined several notable inconsistencies among regions. The review found, for example, that the North Coast Regional Water Quality Control Board and the

Central Valley Regional Water Quality Control Board appeared to be compiling their lists of impaired water bodies differently, with the North Coast region declaring much larger swaths of water bodies impaired, while the Central Valley board listed much smaller segments. The result makes it difficult to compare impaired water bodies in the two regions. The report also noted that bioassessment tools – used to help determine the health of a water body – had been developed differently by different regional boards.[64]

A report published by the State Water Resources Control Board in 2006 depicting water quality across the state noted that regional board water quality "assessments cannot be successfully integrated into an accurate statewide report because regions use a variety of assessment approaches and do not always apply criteria consistently."[65]

A US EPA review of inspection and enforcement activities by regional boards noted that it was difficult to compare regions because inspection reports and permit compliance reviews were done differently in different regions. "The documentation was not standardized across the RWQCBs (Regional Water Quality Control Boards) or the various water programs," the EPA noted.[66]

While the state water board's newly-created Office of Information Management and Analysis is attempting to improve the board's use of data and coordinate data gathering and reporting, inconsistent approaches to monitoring and data gathering limit the ability of the public and policy-makers to determine the health of the state's waters and whether various state strategies to improve water quality are effective.

Mark Lubell, an assistant professor in the Department of Environmental Science and Policy at the University of California, Davis, said he had attempted to study whether one of the state's main thrusts on water policy – gathering local water interests together to develop long-term water resource plans, referred to as Integrated Regional Water Management Planning – was protecting water quality. He found that due to different data gathering and monitoring in different watersheds, it was impossible to compare different water bodies in a meaningful way. Thus, he was unable to determine whether a major statewide initiative – one that has consumed hundreds of millions of dollars – is effective.[67]

Inconsistencies among boards also lead to inefficiency and expense. The Riverside County Flood Control and Water Conservation District reported that it spent nearly $2 million during a five-year period

preparing three different sets of reports and permit applications because the three regional boards overseeing pieces of the district all required different paperwork.[68]

The state board can address regional inconsistency in multiple ways, including through rulings on appeals. The most effective avenue, however, would be through state board policies, which are intended as guidelines for all regional boards to follow. Currently, there are only 16 statewide policies.

State board officials complain that enacting policies is a long, staff-intensive process. Because some policies require scientific research, policies can take several years to develop. In addition, the state board is required to follow California Environmental Quality Act processes, which often take a year or longer.

Little Focus on Outcomes or Accountability

Are regional board permits, enforcement actions and other programs working to protect and improve California water quality? It is difficult to say.

Throughout the review process, the Commission found an alarming lack of information on the effectiveness of state water quality regulations. Regional boards submit a significant amount of data to the state board, from lists of impaired water bodies to work plans outlining upcoming plans, but there is not enough analysis done by the state board to determine program effectiveness. The state board does not provide enough leadership in directing regional board activity based on analysis of what is working, and what is not working.

Too much discussion within the boards – and among stakeholders – is focused on processes; not enough attention is paid to whether these processes lead to the desired clean-water outcomes.

Examples include:

- In a report summarizing current water quality monitoring practices and suggesting changes, an executive of the San Diego Regional Water Quality Control Board noted that monitoring and surveillance information and analysis was not integrated into board programs, with the result being "the Regional Board is unable to efficiently assure discharger compliance with regulatory requirements and effectively

measure the performance and success of its own regulatory activities."[69]

- In a 2008 report detailing enforcement activities of the boards, the state water board noted that the boards do not track the environmental benefits of enforcement actions, such as the amount of pollutants reduced in water or the acres of wetlands or beaches restored. "This information could be collected when the enforcement case is resolved," the report notes. But it currently is not.[70]

There are numerous reasons for the lack of focus on outcomes.

Reviews by US EPA of water board practices are influential in directing the boards' activities, due to US EPA's authority over Clean Water Act activities. Many of US EPA's reviews of California measure the boards' processes and outputs, not outcomes. For example, most of what US EPA measured in its 2007 "Enforcement and Compliance Assurance State Review Framework" report for California focused on processes, such as data inputs, penalties assessed and timely reporting, instead of environmental outcomes.[71]

In addition, board members, staff and stakeholders argue the boards simply do not have enough resources to ensure programs are working. Regional monitoring, which allows boards to take a broad look at the health of a watershed, is under-funded. Regional monitoring is done in addition to self-monitoring conducted by permitees to ensure they comply with conditions of their permits, and is usually funded through the General Fund, not user fees. An advisory group formed by the state water board produced a report in 2000 with recommendations for surface water monitoring that suggested it would cost between $59 and $115 million annually to conduct a comprehensive monitoring program.[72] In the eight years since, funding has never reached that level. In the 2007-08 fiscal year, the state and regional boards spent about $9.5 million, or about 16 percent of the minimum amount recommended – on ambient monitoring.[73]

In some instances, court cases also create pressure to focus more on processes than outcomes. A 1999 settlement between environmental groups and the US Environmental Protection Agency has forced the Los Angeles Regional Water Quality Control Board to develop 92 total maximum daily load plans in 13 years, and a 1997 settlement set up an 11-year schedule for the North Coast Regional Water Quality Control Board requiring two TMDLs per year.[74] Some stakeholders argue that the tight timeline has led regional boards to quickly adopt

TMDLs without adequately determining whether they will have a positive impact on water quality.[75]

Regardless of these pressures, stakeholders with numerous different perspectives complained to the Commission that a lack of focus on outcomes has led to a lack of accountability for regional boards. Local government officials and business interests subject to stormwater permits argue that some regional boards' zeal to regulate leads to too-stringent requirements, which should be reined in by the state board. Environmentalists argue that the state board does not do enough to ensure that regional boards are conducting timely enforcement actions to ensure that regulated entities are not fouling the state's waters in violation of their permits.

Regional boards differ considerably in their enforcement activities. A 2008 state board report on enforcement noted a wide range in the percent of violations that received enforcement among the regional boards, with one board pursuing only 30 percent of violations and another pursuing 97 percent. The report noted that the "variation in enforcement actions reflects differing emphasis on enforcement at the Regional Water Boards."[76] There was no further discussion or analysis as to why that was, or whether one region or another was performing more effectively.

In her testimony to the Commission, Linda Sheehan, executive director of the California Coastkeeper Alliance, referred to that report as an example of the state board's reluctance to hold regional boards accountable for their actions. Sheehan said the report did not delve further into reasons why regional boards' performance on enforcement varied. "Under its current authority and structure, the state board can and must – but generally fails to – call out under-performance at the Regional Board level," she said.[77]

Funding Constraints Limit Programs

While offering many different perspectives on various problems facing the water boards, stakeholders and board officials were virtually unanimous on one issue: They argue there is not enough money made available to accomplish the state's clean water goals.

An unmet needs analysis performed by the state water board in 2001 found that the state and regional boards would need 260 percent more funding than they were receiving to fully carry out current duties and future duties based on emerging issues. The Legislative Analyst's Office concluded that the assumptions made by the state board in determining unmet needs were reasonable. The report noted the following staffing deficiencies:

- ***NPDES wastewater program.*** While the state and regional boards need 233 staff, there are about 100.
- ***NPDES stormwater program.*** While the state and regional boards need 400 staff, there are about 100.
- ***Wetlands and 401 certification.*** While the state and regional boards need 134 staff, there are 16.
- ***Waste Disposal Requirement program.*** While the state and regional boards need 290 staff, there are 77.
- ***Land disposal program.*** While the state and regional boards need 164 staff, there are 70.

This lack of staff hinders the boards' abilities to perform duties. A Legislative Analyst's Office report found that more than one-fourth of major wastewater treatment facilities had permits that had expired because regional boards had not updated them. In addition, until the summer 2008, the water boards had yet to assess fines for 9,592 mandatory minimum penalty violations that occurred between 2000 and 2007. While a state board effort begun in summer 2008 is attempting to address the fine backlog, this lengthy period between violation and actual fine limits the deterrent effect that prompt enforcement actions might have.

The boards are funded largely through fees and other non-General Fund sources. In the water boards' budget for the 2008-09 fiscal year, for example, only $38.7 million of the boards' $733.1 million budget came from the General Fund.

While the boards have the authority to raise fees to meet program costs, they cannot raise fees above the amount set in the budget every year by the Legislature and governor. In other words, the governor and Legislature would have to agree to dramatically raise fees if they wanted to increase staffing to the levels called for in the water boards' report. Policy-makers have been unwilling to do so.

In its budget analysis in 2008, the Legislative Analyst's Office recommended a new fee for all water users to pay for water board programs, suggesting that a fee of less than $10 on every water utility hookup in the state would raise nearly $20 million for the boards.

Sources: State Water Resources Control Board. April 30, 2008. "Baseline Enforcement Report." Legislative Analyst's Office. February 20, 2002. "Analysis of the 2002-03 Budget Bill. Legislative Analyst's Office. February 20, 2008. "Analysis of the 2008-09 Budget Bill." Linda Sheehan, Executive Director, California Coastkeeper Alliance. April 24, 2008. Written testimony to the Commission.

Boards Unable to Prioritize

California has no current mechanism to appropriately prioritize water quality problems and steer resources toward the solutions to those problems.

Faced with a broad mandate to protect all of the state's waters, the water boards have been unable to focus on the most important water bodies or the most pressing contamination problems. Testimony to the Commission largely centered on urban stormwater issues, which has a dramatic impact on local government and business, as well as the environment. Should addressing stormwater be the boards' top priority? Many argue it should, but the state board has not indicated that it is, or should be, its top priority.

There are true impediments to prioritization. The boards' increasing reliance on fees limits their ability to match resources to needs, for example.

California's water boards have an annual budget of more than $700 million, with most money coming from fees and other non-General Fund sources.[78] Board activities are funded by 74 separate revenue streams, which are often fees assessed for specific programs.[79]

"Our actions are very much budget-driven," Karl Longley, chairman of the Central Valley Regional Water Quality Control Board, told the Commission. "The money is typically in an account and cannot be used outside of that account or for other purposes. If there was a mechanism for the executive officers and the boards to redirect resources given proper justification, it would allow us to be more diligent in addressing priorities."

Critical activities such as basin planning, enforcement and ambient monitoring, all funded through the state General Fund, received less money for staff than did other activities, even those that could be considered a lower priority.

Aside from administration, for example, staffing levels for the water boards' underground storage tanks program are the highest of any program overseen by the boards. The program regulates gas stations and other facilities that store potential contaminants underground, and is paid for entirely by fees from regulated businesses. At one time, leaking underground storage tanks were a major problem in the state. However, increased regulation has lessened the threat: The

Staff May Be Too Concentrated in Sacramento

About 45 percent of the state and regional water boards staff works for the state board in Sacramento. Some stakeholders suggested the boards could re-allocate some staff to improve regional board performance.

"... in many key areas, personnel are congregated at the state board, rather than on the ground in the regions, where the vast majority of actual permitting and enforcement is taking place,'' Linda Sheehan, executive director of the California Coastkeeper Alliance, told the Commission in her testimony.

According to water board budget year 2008-09 information provided to the Commission, for example, 42 percent of the water boards' enforcement staff and 45 percent of the boards' basin planning staff work for the state board.

During difficult financial times when the water boards should not expect new monies from the General Fund, the boards could look at deploying some staff in Sacramento to regional boards.

Sources: Linda Sheehan, Executive Director, California Coastkeeper Alliance. April 24, 2008. Written testimony to the Commission. Page 2. State Water Resources Control Board. November 24, 2008. "Budget Information for Little Hoover Commission, FY 08-09." Provided to the Commission.

number of active cases involving leaking underground storage tanks has fallen dramatically in the last 12 years, from 20,177 in 1995 to 11,899 in 2007.[80] Despite the change, the state and regional boards still have nearly 200 staff assigned to the program – far more than those working on stormwater permits, enforcement activities or even TMDLs.

The underground storage tanks program may warrant as much staffing as it receives. The boards do not conduct routine studies of their staffing and programs to determine whether staffing levels and priorities match.

Water users and environmentalists complain that the boards are not focused on addressing the state's biggest water quality issues or realistically solving problems.

In the foothills of the Sierra Nevada, for example, a small sanitation district with a treatment plant that serves 83 people faces a $574,000 fine for violations of its NPDES permit for minor discharges into a creek bed that is dry most of the year. The sanitation district may need to spend more than $4 million upgrading the facility, despite a letter from the state Department of Fish and Game that the fish the board's regulations are trying to protect do not live in the creek and a letter from the state Department of Public Health noting that the "current degree of treatment is adequate to protect public health."[81]

In Los Angeles, local governments complain that they face expensive wastewater treatment upgrades because the Los Angeles Regional Water Quality Control Board continues to require that effluent in Ballona Creek, which is a fenced-off, concrete-lined channel, be treated to allow for swimming and other forms of contact recreation.[82]

In the Central Valley, an effort to establish a total maximum daily load (TMDL) for methylmercury is focused on reducing mercury in the current discharges of wastewater and stormwater systems, despite studies showing that 75 to 80 percent of the mercury in the Sacramento-San Joaquin River Delta is not coming from those discharges. The mercury pollution is a result of mining practices dating to the 1800s. Regulated entities there argue they may be

forced to spend millions of dollars upgrading their systems even though the upgrades are not likely to result in a dramatic reduction of mercury in the water.[83]

Meanwhile, environmentalists note that non-dairy feedlots, such as those for cattle, which have the potential for causing major water quality damage, go unregulated in the Central Valley. And until an effort was initiated in summer 2008, the regional boards had levied more than 700 penalties during the previous eight years that had gone uncollected.[84] By not pursuing penalties in a timely manner, the deterrence affect that might come from enforcement efforts is lost.

Stakeholders told the Commission that the boards often are too narrowly focused on regulatory programs to work on larger solutions to the state's most pressing water quality problems, such as legacy pollutants, urban stormwater and agricultural runoff.

"There have not been enough forward-looking policies in the last decade," said Craig Wilson, an attorney representing the dairy industry and the former chief counsel of the State Water Resources Control Board. "The boards have been bogged down in minutia."[85]

One problem may be that the boards actually engage in too many prioritization processes. A 2008 report for the Ocean Science Trust intended to help the boards increase the use of science in decision-making noted that the "water boards prioritization processes are complex and numerous." The report listed six different activities or processes that the boards routinely conduct to set priorities.[86]

The state board made an effort to begin infusing prioritization into its system in 2008 with the adoption of a new strategic growth plan. The plan calls for prioritizing TMDL implementation in important watersheds such as the Klamath and Bay Delta, for example.

Struggling with Information Technology

One of the most profound problems facing California's water boards is its inability to develop information technology systems that can improve efficiency and provide better information to the boards, the public and policy-makers. Gathering data and using it to produce useful information is a key job of the water boards: There are at least 25 provisions in state statutes requiring the water boards to accumulate and produce information about water.[87]

Some of the best and easiest-to-use information about state water quality is produced not by the state, but by other interested groups. The California Coastkeeper Alliance has created on its Web site an interactive map showing the state's impaired water bodies using data culled from the state water board. The state does not have any similar maps on its Web site. Heal the Bay, a Southern California-based environmental group, produces weekly report cards on beaches across the state using monitoring information gathered by the water boards and local governments. The president of the group said that occasionally water board staff ask his group for data because it is better organized.[88]

Much of the monitoring data submitted to the regional water boards is still not electronic, and databases are not well organized. A 2006 report on a water board program designed to protect wetlands areas noted that when researchers sought to review 429 files regarding the program, they could only locate 257. More than 40 percent of the files could not be found.[89]

The state board's central information technology system, the California Integrated Water Quality System (CIWQS), has had a troubled history. CIWQS has been criticized by both the Legislative Analyst's Office and an independent review panel as unreliable, difficult to use and responsible for data-entry backlogs throughout the system.

"The State Water Board has a less functional system for water quality management than it had before CIWQS was implanted," the independent review panel concluded in a July 2007 report.[90]

The LAO noted that the state water board circumvented the Legislature in the initial stages of developing CIWQS. Turned down for funding by the Legislature in the 2002-03 budget year, the state board went ahead with the project anyway, seeking funds from US EPA.[91] Funding was less then originally intended, however, and the independent review panel found that a major problem with the system was that it was not funded appropriately to handle all of the functions the boards sought from the system. The panel also noted that the governance of the program was bifurcated between the EPA and two divisions within the state water board, leading to little accountability or proper oversight.[92]

In a follow-up report released in May 2008, the same panel found that significant progress had been made in improving the system but that there were still problems regarding the accuracy of data, the ability of the system to produce useful reports and the use of the

system by the public.[93] Faulty algorithms in the programming can create false violations, for example, and it is still difficult for the public to navigate the system and determine what kinds of water quality issues are relevant in their region. A report on enforcement actions produced by the state board in 2008 highlighted continuing problems with CIWQS: A chart depicting violations of stormwater permits showed five regions reporting more facilities with violations than the number of facilities inspected – an impossibility.

The noncompliance rate "for the stormwater program is likely misleading due to the quality of information in the CIWQS database," the report notes.[94]

Lack of Data

The water boards issue permits, set standards and adopt TMDLs every year that have serious consequences for both business and the environment, and water board officials acknowledge some of the those decisions are essentially made without sufficient information. Lack of monitoring data, the vastness of California's waters and a still-growing understanding of water science contribute to regulatory guesswork. The effect of regulation is often unknown.

"We base our decisions on such little data," Pamela Creeden, executive officer of the Central Valley Regional Water Control Board, acknowledged at a Commission advisory committee meeting.[95]

In Creeden's region, the controversial waiver for waste discharge requirements for irrigated agriculture adopted in 2006 notes that "although there is information that discharges of waste from irrigated lands have impaired waters of the state, information is not generally available concerning the specific locations of impairments, specific causes, specific types of waste, and specific management practices that could reduce impairments and improve and protect water quality."[96]

A joint effort by Cal/EPA and the state Resources Agency which sought to illuminate various environmental issues in California showed the difficulties facing the state. According to the 2004 "Environmental Protection Indicators for California" report, 80 percent of the state's shoreline, 72 percent of the bays, harbors and estuaries, and 75 percent of rivers, streams, lakes and reservoirs were unmonitored in 2002, making it impossible to determine whether those water bodies were safe for swimming.[97]

The lack of information is not altogether due to a simple lack of funding for more monitoring. It is also a failure by the state to better coordinate information. Numerous state and federal agencies – ranging from the United States Geological Survey to the state Department of Water Resources and Department of Fish and Game, as well as local monitoring groups – gather water data. But there has been a limited effort by the state to pull that data together to make it accessible to regulators, the public and others who would be interested.

This lack of coordination limits the state's ability to protect and improve water quality and determine what programs are working. For example, water monitoring done through billions of dollars doled out through voter-approved water bonds, such as Propositions 13, 40 and 50, have not been collected in a standardized format with the same type of quality assurance, leaving it difficult to compare monitoring and data.

The California Environmental Data Exchange Network (CEDEN) has been intended as a way to link various water databases together. According to the CEDEN Web site, "CEDEN is a growing statewide cooperative effort of various groups involved in the water and environmental resources of the state of California," and the purpose of the network is "to allow the exchange of water and environmental data between groups and to provide access to the public."[98]

CEDEN remains under development, however. The project was recently transferred from the Department of Water Resources to the state water board, with the state water board allocating $500,000 in fiscal year 2007-08 to the project.[99]

Lack of Science

Countless water users, environmentalists and water experts noted that the water boards do not engage in sufficient scientific research to support new regulation. In his testimony to the Commission, United States Navy Rear Admiral Len R. Hering, Sr. suggested the state's water boards lacked credibility because they did not have a rigorous science program.[100]

The water boards do conduct and fund a significant amount of scientific research. A survey compiled in 2008 by the state water board found 95 current research projects funded by the state and regional boards.[101] The boards also have a peer review program, requiring reviews of all science in regulatory programs, run in

partnership with the University of California. And some regional boards contribute to independent science-based groups that conduct relevant research: The San Francisco Bay Regional Water Quality Control Board is a contributor to the San Francisco Estuary Institute, a nonprofit organization that conducts research and monitoring in the San Francisco Bay. Three regional boards in Southern California and the state board are partners in the Southern California Coastal Water Research Project, a joint powers agency that conducts research and monitoring along the Southern California coastline.

The problem, however, is that the state board has had no mechanism to keep track of board-funded research, centralize information gathered in that research and analyze the research to ensure it informs board programs across the state. The result is an inefficient use of scientific resources, as well as a public perception that the water boards are not using science in their decision-making.

The board created a new Office of Research, Planning and Performance in 2006, which is still in its development stage. The survey of ongoing research was a first effort by the state board to get a better understanding of scientific studies throughout the regions.

Compounding the boards' inability to coordinate research and better infuse it into decision-making is the increasingly complex problems the boards face. Even a robust scientific program would be challenged to find cost effective solutions to such difficult issues as non-point source pollution or watershed-wide issues. Presentations at a 2008 meeting of the American Association for the Advancement of Science concluded, for example, that pesticides that run off the land and mix in rivers and streams combine to produce a greater toxic effect on salmon than the pesticides would have individually.[102] How do the boards design regulation to respond to that information?

Two reports in the last three years – one commissioned by the state water board and another by the Ocean Science Trust – have sought ways to improve the use of science within water quality regulations in California, and each report has acknowledged the complexity of the subject matter the water boards are attempting to tackle. The report commissioned by the Ocean Science Trust listed these subjects as in need of more scientific inquiry:

- Total maximum daily loads and water quality objectives:
    - ✓ Better understanding of watershed functioning and pollutant origin and dynamics.
    - ✓ Developing scientifically based pollutant standards and water quality indicators.

- ✓ Evaluating the effectiveness and cost-to-benefit ratio of TMDLs as a regulatory tool.

- Stormwater and non-point source impacts, origins and controls:
  - ✓ Understanding the origins, impacts, and the efficacy of management practices and measures related to stormwater, urban and agricultural nonpoint sources, and hydromodification.
- Emerging contaminants:
  - ✓ Understanding the sources and impacts of emerging contaminants.
  - ✓ Determining how best to control emerging and legacy pollutants.
- Climate change impacts on water quality:
  - ✓ Assessing the predicted water quality impacts of climate change using authoritative, non-politicized science.
  - ✓ Developing a strategic approach to predicted climate change impacts and their effects on the current regulatory framework.[103]

Water users complain that the boards too often implement regulations without a sound understanding of the science behind the problems or solutions.

"Stormwater science and technology lag behind regulatory implementation," Chris Crompton, manager of the Environmental Resources Section for Orange County Public Works Department, told the Commission.

Without adequate data and science, it is difficult for the water boards to determine the biggest threats to water quality and the best use of limited resources to address those threats.

Outdated Basin Plans Undermine Credibility

Throughout much of the state, basin plans – the key document outlining water quality standards for the region – are outdated. The chairman of the Central Valley Regional Board said the salinity standards in his region's basin plan have not been updated since the 1970s.[104] The executive officer of the Lahontan Regional Board said most sections of his region's basin plan are 14 years old.[105]

In addition to being outdated, there is evidence that aspects of the original basin plans were created in the 1970s without scientific study or even accurate data. "Many basin plan elements are found to lack a solid technical and scientific foundation," notes a review of the Los Angeles Regional Water Quality Control Board's basin plan conducted in 2003 by consultants hired by regulated entities.[106] A similar review of the Central Valley Regional Water Quality Control Board's basin plan noted that numerous water quality objectives placed into the basin plan were provided in a memo from the state board and were not based on local conditions.[107]

While basin plans are supposed to be updated every three years, regional boards have rarely had the resources to conduct a full review, complete with new scientific research.

Budget information provided by the state board shows that most regional boards have fewer than three staff members working on basin plan updates. Of 1,592.7 employees in the entire system in fiscal year 2007-08, just 41.2 – or 2.6 percent – were dedicated to basin planning.

"Currently, basin planning updates are being conducted as a routine, housekeeping type of function instead of a true analysis of current conditions," said Terese Ghio, past president of the Industrial Environmental Association and also a former member of the San Diego Regional Water Quality Control Board.[108]

The last major statewide basin plan update was in 1994. Many stakeholders note that the update occurred just as non-point source regulation began to truly be implemented, and current basin plans do not account for stormwater, despite its differences from a typical point discharge.

Numerous conflicts arise in each region due to this problem, leading to arguments over information and science before water users and

A Missed Opportunity

In 2002, Californians approved Proposition 50, a $3.44 billion general obligation bond designed to improve water quality in the state. In 2006, voters approved Proposition 84, a $5.388 billion general obligation bond designed to improve water quality, flood control and parks. Both propositions included extensive funding for integrated regional water management plans (IRWMP), which is intended to bring various groups together in a region to create a plan to improve water quality and supply. Funding goes both to the creation of the plans and to implement projects called for in the plans.

Proposition 50 earmarked $500 million for IRWMP, which has been spent. Proposition 84 earmarked $1 billion for IRWMP, most of which had not been spent when the Commission was conducting its study. IRWMP projects have been positive in many regions of the state, and regional water boards have participated in some of the projects.

However, at a time when virtually every regional board in the state is struggling to impose regulation based on badly out-of-date basin plans, the IRWMP funding appears to be a missed opportunity. Instead of creating new plans for each region, some of the funding could have gone to help regional boards work with stakeholders to revise and modernize basin plans. According to the propositions, however, the money is intended for local groups and local projects, not state government-sponsored functions.

While an up-to-date basin plan would not likely accomplish all of the things an IRWMP calls for – basin plans would be less likely to spell out how a region could increase water supply, for example – there is little question that one of the most important issues facing water quality in the state is outdated basin plans. An effort to redo basin plans can bring stakeholders together to help plot out the state's water future – the same goal that IRWMP has – without creating an entirely new bureaucracy.

The state could have used some of the $1.5 billion in bond money approved during the last four years for water planning to update basin plans.

Sources: Smart Voter. Proposition 84: Water Quality, Safety and Supply. Flood Control. Natural Resource Protection. Park Improvements. State of California. http://www.smartvoter.org/2006/11/07/ca/state/prop/84. Also, Smart Voter. Proposition 50 Water Quality, Supply and Safe Drinking Water Projects. Coastal Wetlands Purchase and Protection State of California. http://www.smartvoter.org/2002/11/05/ca/state/prop/50/. Also, State Water Resources Control Board and Department of Water Resources. June 2007. "Proposition 50 Chapter 8 Integrated Regional Water Management Grant Program Guidelines Proposal Solicitation Packages Second Round."

other constituencies even begin to debate appropriate policy. Regulated entities contend that most water quality standards and beneficial uses were developed prior to stormwater regulations, and because stormwater is significantly different than point source discharges, basin plans should be updated to include standards specific to non-point sources.

State and regional board officials acknowledge this problem.

"The Basin Plans, originally written in the 1970s and periodically updated, currently do not fully reflect the Water Board's fast-growing body of knowledge and evolving regulatory approaches to regional and statewide concerns such as stormwater, non-point sources (e.g. irrigated agriculture), and biological integrity," reads the state water board's current strategic plan.[109]

The plan calls for all basin plans to be updated, but not until 2015.

A major obstacle in updating basin plans is money. The water boards do not generate any fees that could be applied to basin planning, so it is one of the few programs funded solely through the General Fund. This is, in part, why major updating efforts have not occurred.

Appeals Process Flawed

Appeals were cited by State Water Resources Control Board chairwoman Tam Doduc as a key piece of the state board's authority to direct regional board activities. Any aggrieved person can appeal a regional board decision – such as a permit, or enforcement action – to the state board, which then has the power to overturn the regional board or send the issue back to the regional board with direction on changes that should be made.

The Commission found, however, that many stakeholders do not have confidence in the appeals process.

Regional board decisions rarely are overturned by the board. According to information provided to the Commission, the state board received 231 appeals of regional board actions between July 1, 2001, and June 30, 2008. The board upheld regional board actions on 193 of those appeals, modified regional board actions on 33 appeals, and is still making a determination on 5 appeals. The board reversed 14 percent of the regional board actions that were appealed to it in this seven-year period.[110]

In addition, the process of reviewing potential appeals appears troubling. As described by Gary Wolff, vice chairman of the State Water Resources Control Board, the state board's executive director and chief counsel vet appeals and then make a recommendation to the board members as to whether that appeal should be heard by the board or not. It is up to board members to seek out staff to have a broader discussion on the potential appeal, and if board members do not respond, the executive director issues a letter to the petitioner with a decision as to whether the appeal will go forward. Wolff acknowledged that in recent years, most of the decisions to consider appeals are based on whether a legal violation has occurred – not whether an action contradicts state policy or could clear up a controversial issue.

Of particular concern is the inadequate explanation given to would-be petitioners. For example, Laurel Firestone, an attorney representing the Visalia-based Community Water Center, told the Commission that she received a one-page letter informing her that the state board would not review a petition she filed concerning the Central Valley Regional Water Quality Control Board's 2007 waiver for waste discharge requirements for dairies. The waiver was a controversial issue, marking one of the first efforts to regulate dairies in the country. Firestone said she received no further explanation from the board as to why her petition was denied. It was only at the Commission's hearing that she learned that there was a five-page explanation, a public document, on why the board denied the petition, but it was written by the board's chief counsel.

Two environmental groups, including the one represented by Firestone, since have gone to court to block the waiver, arguing it does not go far enough in regulating dairies.

"It is pretty common to have an appeal dismissed without explanation," noted Linda Sheehan, executive director of the California Coastkeeper Alliance, at the Commission's April 2008 hearing.

While chairwoman Doduc touted the appeals process as a key check on regional board behavior, she acknowledged one flaw.

"The petition process is a reactive process," she noted. "I think the state water board does need to be more proactive in terms of reaching out to regional boards, the various stakeholders and identifying emerging issues and getting ahead of the curve."

The problem, however, is that because the state board handles appeals, it is not allowed to comment or intervene on an action taken by a regional board that could be appealed to the state board. The state's Administrative Procedure Act prohibits anyone who might have a role in an appellate process from expressing an opinion on a proceeding if an appeal is possible.[111] Thus, the board's role as judge prevents it from taking a proactive role in some regional board activities.

"Most 'coordination' (between the state and regional boards) is reactive and happens at the end of processes when something goes wrong and there are appeals or lawsuits," Chris Crompton, manager of environmental resources for Orange County, told the Commission in written testimony. "This 'back-end coordination' is inefficient and hence costly, and has real environmental impacts from delayed decisions/actions."[112]

Outdated Rules Limit Critical Communications

Another factor that undermines stakeholder confidence in the system is the boards' strict prohibition against ex parte communications. Both state and regional board members are subject to Chapter 4.5 of the state Administrative Procedure Act, which prohibits communication between board members and anyone subject to an adjudicative proceeding, such as the issuance of a discharge permit, enforcement action or water rights permit.[113]

Some water users and others involved in the process complain that ex parte rules limit regulated entities' ability to discuss important and complex issues with board members. Instead, local governments, businesses and other stakeholders are often limited to just a few minutes of testimony before the board during a formal hearing, despite the profound fiscal impact board decisions can have on these regulated entities.

Carole Besswick, chairwoman of the Santa Ana Regional Water Quality Control Board and a former member of the South Coast Air Quality Management District, told the Commission that one of the biggest differences between the water boards and air district boards was that air board members had much more freedom to talk to the people they regulated. As an air regulator, Beswick noted she frequently interacted with those she regulated, which helped her better understand the issues she and stakeholders faced.[114]

Others also have complained about the water boards' ex parte rules, even other state agencies. In a 2000 letter to the state water board, the state Department of Water Resources complained that the water boards' "strict reading of the ex parte communication rules is not in the public interest, because it reduces the ability of the public and parties to seek assistance from the board and staff on complicated water rights issues and to work toward resolving problems."[115]

Ex parte rules are different at other state boards and commissions. The Integrated Waste Management Board was created in 1989 and the law enacting the board included what is referred to as a "sunshine" rule. Section 40412 of the Public Resources Code allows for communication between board members and regulated entities as long the board member fully discloses the communication at a public meeting.[116] Other boards, such as the California Public Utilities Commission and the state Air Resources Board, have similar provisions. The "sunshine" rule allows regulators to interact with stakeholders so that they can become better informed, but at the same time ensures that all such communications are known to everyone interested in the proceeding.

"As for the fairness of the process, the regulated community is frustrated by the fact that members of the SWCRB and the nine RWQCBs say they are unapproachable under state law," complained Mick Pattinson, president and CEO of Barratt American Homes, a Southern California homebuilder. "While it is perfectly acceptable and appropriate to speak with elected city, state and federal officials, it is unfathomable that the same rights do not apply to unelected board members."[117]

10 Percent Rule Limits Appointees

Governors have long struggled to find interested, qualified people to serve on regional water boards. With nine positions on each board, and because the positions are virtually voluntary, with only a $100 per diem paid per meeting, appointments are a continuing problem.

As the Commission conducted its study, five of the nine regional boards each had three vacancies, leaving a third of these board spots unfilled. Some boards have gone with as few as five members for months at a time. This can lead to difficulties in achieving the quorum necessary for a board to take action, slowing down decision-making and impacting the environment and businesses waiting for permits or other actions.

Part of the difficulty in finding appointees stems from the so-called 10 Percent Rule, which is embedded in both federal and state law. The Clean Water Act prohibits anyone from serving on a board that issues permits if they have earned "a significant portion of his income directly or indirectly from permit holders or applicants for a permit."[118] Similar language was adopted into state statute. The EPA later interpreted significant to mean 10 percent or more of income.

The 10 Percent Rule goes beyond typical conflict-of-interest rules, which forbid people from participating in decisions that could affect their income, by prohibiting someone from even serving on a water board if they have a conflict. The rule has dramatically narrowed the pool of potential water board candidates who were interested or qualified to serve.

For example, Sari Sommerstram, a watershed consultant with a Ph.D. in resource planning and conservation, was appointed to serve on the North Coast Water Quality Control Board by Governor Arnold Schwarzenegger. Despite her background in water, she was not allowed to continue on the board due to the 10 Percent Rule. Her husband raised trees which were sold to timber companies for use in reforestation, and because those same companies were regulated by the water board, she had to leave the board soon after she joined it.[119]

Additionally, while each regional board has a slot for a county supervisor, it is virtually impossible to find a supervisor who qualifies for a board position because counties are subject to regulation under stormwater permits and because in most medium- and large-sized California counties, supervisors are full-time county employees.

For a governor, identifying 81 people interested in serving on a regional board who do not have a 10 Percent Rule conflict is a daunting task.

There is widespread consensus among stakeholders and others in California that the 10 Percent Rule should be changed. In her testimony to the Commission, however, Alexis Strauss of US EPA noted that it was extremely difficult to change US EPA regulations. Others noted that because California is one of only a few states with part-time political appointees making permit decisions – Colorado and Virginia are two other states with state water boards – there is little interest in Washington, D.C., to enact regulatory reform.

An Increasingly Complex Job

As water quality regulations evolve to handle increasingly complicated pollution programs, some suggest a part-time board has a more difficult time making appropriate decisions.

State Water Resources Control Board member Art Baggett told the Commission that many routine permits have grown from 10 to 12 pages when he joined the board in 1999 to more than 100 pages today, in part because the state has stepped up enforcement of permits and dischargers are now more concerned about every detail.[120] Permits can take up a significant amount of board time at monthly meetings. Due to permits' increased complexity, many stakeholders suggest that regional board members simply rubber stamp staff suggestions because they do not have the knowledge base to question the details.

A former board member told the Commission that the boards can be overwhelmed by volumes of paperwork that are difficult to understand without a background in water science.

Terese Ghio, who served on the San Diego Regional Water Quality Control Board, told the Commission that many regional board members were simply unqualified to render decisions on technical and science-based regulations. Ghio noted she had a background in wastewater treatment and was able to question staff on permit technical issues, but many other board members are not.

Even with technical expertise, Ghio noted the difficulty of the job. "In some cases, it was thousands of pages given to us one week before the meeting," she said.

As the complexity of permits and other regulations grows, it is unclear whether regional boards can act as a check on staff, or other stakeholders, to ensure they are making the right decision for the environment and the economy.

U.S. Navy's Stormwater Permit Illustrates Difficulties

The United States Navy receives an industrial stormwater permit from the San Diego Regional Water Quality Control Board for operations on three Naval bases along ports in the San Diego region. The 2002 permit has created conflict between the board and the Navy, and the Commission heard public testimony from the Navy and received written testimony from the executive officer of the San Diego board regarding the conflict. The Commission is not taking a side in this dispute, rather, the Commission points to the issues surrounding the Navy's stormwater permit as illustrative of several systemic problems: The boards are attempting to regulate non-point source pollution with standards that were developed before non-point source pollution was regulated, leading to a credibility problem among stakeholders who argue non-point standards should be different; the boards do not have the resources to conduct appropriate research to justify regulations or find cost-effective solutions to easing pollution problems; the boards are not as collaborative with stakeholders as they could be, which results in disputes that hinder progress toward protecting water quality; and, the relationship between the state and regional boards is unclear.

The Navy makes several contentions regarding their 2002 permit and the toxicity standard required in the permit:

- The standard is nearly impossible to meet without building a $300-million water treatment facility.
- The board is using a standard created in the 1974 Water Quality Control Policy for the Enclosed Bays and Estuaries of California, which states that it is not intended for land runoff.
- Based on letters between the Navy and the state water board, the state board and the regional board have differing interpretations of the 1974 Water Quality Control Policy for the Enclosed Bays and Estuaries of California which would lead to differing regulations, but the regional board has ignored the state board's opinion and the state board has done nothing to direct the regional board on the issue.
- A study conducted by the Navy shows that even when Navy stormwater is higher than the toxicity standard, the receiving water – the water to which the stormwater flows – still is not toxic. Thus, the Navy argues that the standard is stricter than necessary to protect San Diego Bay.
- The Navy study was completed in 2006 and offered two alternatives for the board to use when measuring toxicity, yet the board for two years did not responded to those suggestions. "We believe the board did not consider the study because it does not have the technical expertise to review it,'' Rear Admiral Len R. Hering Sr. said in his testimony to the Commission.

The board argues that the permit and its use of the toxicity standard are valid. It contends that:

- The board's basin plan states that "all waters shall be maintained free from toxic substances in concentrations that are toxic to or produce detrimental physiological responses in human, plant, animal, or aquatic life…" and that the board is properly interpreting that broad standard and standards within the Water Quality Control Policy for the Enclosed Bays and Estuaries of California, which actually calls for the eventual phasing out of all discharges into the state's bays.
- The Water Quality Control Policy for the Enclosed Bays and Estuaries of California sets the toxicity standard the Navy is required to abide by for all "industrial process waters," which the board interprets as the Navy's stormwater. The state board's interpretation that "industrial process waters" does not refer to stormwater could be considered by the state board if the Navy appealed its permit to the state board, which it has not done.
- The board allowed the Navy four years from the date of the 2002 permit to begin complying with the toxicity standard.
- There are Best Management Practices, such as detention basins, filtration and wetlands, that the Navy could create to meet the standard that would be cheaper than a treatment facility, but the board is prohibited by state law from dictating to the Navy or other regulated entities how they comply with their permits.
- The Navy's argument that the board should measure pollution in the receiving water, instead of measuring the Navy's stormwater, is simply a way for the Navy to make no improvements to its stormwater discharge, and all dischargers should be measuring and improving their discharge.
- The Navy was allowed to present the findings from its study to the board in a 2006 public hearing, and the board may use some of the information from the study in the re-issuance of the permit, which is scheduled for 2009.

As the Commission was finalizing this study, the San Diego board was preparing a draft of a proposed new stormwater permit for the Navy that was scheduled to be adopted in early 2009.

Sources: Rear Admiral Leendert "Len" Hering, Sr., United States Navy. April 24, 2008. Verbal and written testimony to the Commission. Also, John Robertus, Executive Officer, San Diego Regional Water Quality Control Board. September 26, 2008. Memo to the Commission.

State Has Difficulty Addressing Modern Water Problems

As focus in water quality regulation has shifted from point source pollution controls to non-point source pollution, the water boards have found it increasingly difficult to address and reduce water pollution. Many non-point source pollution problems require solutions outside of the water boards' typical regulatory programs, and more interaction with other state and local regulatory agencies.

Consider: Studies suggest that some mercury contamination in water along the California coastline is caused by coal-burning power plants in China.[121] Other water pollution problems stem from sources closer to home, but are still difficult for water boards to address. Studies conducted by the Southern California Coastal Water Research Project have found that local air pollution contributes to water pollution. One study showed that 50 to 100 percent of trace metals in stormwater runoff were deposited from the air.[122] Pollution from both vehicles and stationary sources, such as power plants, ends up in the water.

"The old models that EPA has put forward to deal with stormwater as if it were just a subset of wastewater are not models that carry us forward," Alexis Strauss, director of the Water Division for EPA's Region 9, told the Commission.

The water boards need help from other regulatory agencies, particularly the state air resources board and other air districts. In an attempt to begin addressing aerial deposition, the state Air Resources Board and the state Water Resources Control Board met in a joint public session in February 2006. The boards heard presentations on the impacts of airborne metals and mercury

How Proposition 218 Affects Stormwater

Approved by voters in 1996, Proposition 218 requires local governments to obtain the approval of two-thirds of voters, or a majority of property owners, to raise certain fees or taxes. The proposition excluded sewer, water or trash collection, however, allowing cities and counties to raise fees on utilities based on the vote of elected officials.

Efforts to consider stormwater services as a utility exempted from Proposition 218 were challenged, and in 2002, an appellate court decision in Howard Jarvis Taxpayers Association v. City of Salinas found that charges imposed by the city to pay for stormwater management were not utility fees and therefore were not exempt from Proposition 218 requirements.

Because of this, many local government officials complain that they are unable to pay for stormwater management services in the same way they pay for wastewater treatment, despite facing the same kind of regulation as wastewater treatment. Stormwater funds must come from the general funds of each municipality and compete with other services, such as police and fire protection. One regional water board official noted that wastewater treatment operations in his region had an overall budget of about five times that of stormwater agencies.

Efforts to amend Proposition 218 have been made in the Legislature but have been unsuccessful. SCA 12, by state Sen. Tom Torlakson, D-Antioch, in 2007 would have exempted new or increased stormwater and urban runoff management fees from Proposition 218's requirements, but it did not make it through the legislative process.

Sources: Legislative Analyst's Office. December 1996. "Understanding Proposition 218." Senate Local Government Committee. June 27, 2007. Tom Mumley, Assistant Executive Officer. July 31, 2008. Personal communication with Commission. Bill Analysis, SCA 12 by state Sen. Tom Torlakson, D-Antioch.

in water and pledged to work together to continue investigating the issue. But no formal relationship has been created.

One avenue receiving attention as a way to better address non-point source pollution is through a broader focus on watershed health. The idea is to seek creative and collaborative ways to reduce water pollution when typical regulatory practices are not working. Several efforts involving the water boards have been made to increase the focus on watershed-wide planning and projects.

The state board launched a Watershed Management Initiative in 1995, which required each regional board to develop management strategies for each of its watersheds and funded positions at each regional board to work on watershed issues. Today, each regional board continues to employ a full-time or part-time person who works on watershed issues, mainly as a liaison between the boards and local watershed coalitions. In addition, efforts by CalFed – the joint state-federal agency overseeing the Bay Delta – and a watershed council created by Cal/EPA and the state Resources Agency have sought to encourage watershed-level management and planning in recent years. The state Department of Conservation, which is within the Resources Agency, is currently using money from Proposition 50 and other state funds to continue work on adopting a statewide watershed program that would help develop local watershed management plans and projects.[123]

Despite these efforts, the state is still struggling with implementing true watershed management. The watershed council created by the state has disbanded, and many facets of its strategic plan, such as getting all state agencies to agree on a common set of watershed boundaries or coordinating regulatory programs at the watershed level, have not occurred. An interagency task force of deputy directors that met for an 18-month period in 2005 and 2006 has disbanded. Interest among state leaders in the topic has waxed and waned.

The EPA and San Francisco Bay Regional Water Quality Board attempted to create a watershed permit that would regulate all entities, including non-point sources, discharging into one watershed, for example. The effort was abandoned, however, because the regulators and stakeholders could not come up with solutions to fairly regulate very different sources all in one permit.

The state has promoted the idea of watershed planning as a way to improve water quality and water supply, by distributing money through bonds in the past several years for local planning efforts.

About $640 million was proposed in Proposition 50 for Integrated Regional Water Management Planning (IRWMP) projects, for example, and another $1 billion is earmarked in Proposition 84 for similar projects.

Participation in the IRWMP process by regional boards has been mixed, however. Some boards, such as the Santa Ana Regional Water Quality Control Board and the North Coast Regional Water Quality Control Board, have been active participants. Others have not.

Strengthening Ties, Solving Problems

In a February 7, 1969, letter to the chairman of the State Water Resources Control Board, Assemblyman Carley V. Porter lamented that the state's preeminent water quality law was 20 years old. "… we are indeed in different times and facing different situations than existed in 1949," Porter wrote. The letter urged a comprehensive review of the 1949 Dickey Act, and led to a major overhaul that became known as the Porter-Cologne Act that passed later that year.[124]

Four decades after the creation of Porter-Cologne, a similar letter could be written about it: We are in different times and face different situations than the Porter-Cologne framers imagined in 1969.

Through its study process, the Commission found two inseparable issues. First, water quality problems in the state, and efforts to address them, are becoming increasingly complicated. This was underscored by a report released in October 2008 by the National Research Council that essentially declared two decades of national stormwater regulatory policy a failure.[125] Second, as it grapples with these complex water quality problems, California acts through a decentralized governance structure that lacks accountability and transparency, and is unable to match resources to priorities. As a consequence, many in the water community – from environmental groups to regulated entities – have lost confidence in the system.

The two issues combined lead the Commission to conclude that major reform is needed. A 40-year-old regulatory structure is simply not equipped to handle current problems.

A new, ideal system should include the following characteristics:

- ***A unified state agency.*** Completely distinct regional boards may have been appropriate in past decades, but current common problems – urban stormwater, for example, or impairments in different water bodies caused by the same contaminants or sources – call for a more centralized regulatory approach with a common vision and common

processes. A unified state agency can better identify key problems in the state and align resources to address those problems. Efficiencies gained by a stronger bond between the state and regions will get to clean water outcomes faster and cheaper.

- ***Local input.*** A need for local input on water quality objectives remains, however, as water bodies are unique, with unique problems and solutions. Water quality objectives should continue to be set at the regional level, with vigorous debate and discussion among local stakeholders.
- ***A focus on accountability and outcomes.*** The public, and policy-makers, have a right to clearer information from the boards as to the state of the state's waters, and to which regulatory programs are effective – and which are not. Additionally, the boards must expand their scope beyond ensuring that dischargers are abiding by their permits toward this fundamental question: Are our programs protecting and improving water quality?
- ***Integrated science, accessible data.*** As water pollution problems increase in complexity, California needs to integrate more scientific analysis into board programs. The state board needs scientific advisors to help guide and coordinate research and use that research in regulation. In addition, the boards' dearth of water quality data must be rectified, and it can be: Numerous federal, state and local agencies, as well as other groups, already are collecting information. It is time for the state to make a serious effort to collect that information into an integrated system to allow the boards and others to use it to improve outcomes.

This system – one unified agency, with local input, an emphasis on accountability and outcomes and better use of science and data – will allow the boards and their communities to communicate better with stakeholders, and to better address problems. This should launch collaborative efforts in each region to focus on the most important tasks: updating basin plans, using science and economic analysis to drive decision-making, assessing program effectiveness and, when warranted, making swift changes.

Above all, California's water boards must set priorities. A mission to protect all waters everywhere to the same level – as stated in Porter-Cologne – simply is not possible, given the resources of the state, local governments and others. Water bodies must be prioritized, and so too must solutions. Economic analysis is needed to determine where the state can get the most clean up or pollution prevention for

each dollar spent. Collaboration centered around watersheds is needed to spark innovative solutions to water quality problems that are caused by and affect entire ecosystems.

Some water board officials noted they thought of themselves as water cops. This is an apt description – the boards' job is to police and protect the waters. But just as modern policing has evolved to include the concept of community policing – with police working within neighborhoods to help prevent crime – so to must the water boards work in a collaborative way with water users and others who benefit from clean water to find solutions to water quality programs. Non-regulatory approaches could be appropriate answers in some watersheds.

The key to board effectiveness in the future is up-to-date basin plans, built on current science and an understanding of non-point source pollution. Basin plans were created more than 30 years ago. Many water quality standards have not been updated since, and may not have been based on sound science or monitoring data when they were created. This creates a fundamental lack of credibility in the boards' decision-making. The state, with stakeholder support, must launch an effort to ensure these foundational regulatory documents reflect the current status of water use and needs, as well as water protection priorities.

The water boards have made recent efforts to improve. New offices designed to improve information management, strategic planning and public participation are positive steps, and the boards should be commended for recognizing weaknesses and seeking ways to address those issues. The Commission met countless board members and staff who were working diligently to better programs and board performance. But the state water board's boldest proposal, the 2008 Water Quality Improvement Initiative, only recommend changes within the current structural framework. The Commission believes a more profound change is required, one that will involve thoughtful and committed leadership and engagement by the governor and Legislature.

Change will be difficult. The Commission found that while virtually all stakeholders had a laundry list of complaints regarding the water boards, most did not endorse a major structural overhaul. Many water users and others in the water arena preferred processes and actions taken by specific regional boards that benefited them. The Commission's goal is different: Its recommendations seek to drive change that will protect and enhance water quality through a process that is more fair, transparent and effective.

The Commission recommends reconstituting the state board as a nine-member board, with five of the board members serving solely on the state board and four members serving both on the state board and as a full-time chairperson of a regional board. The regional chairpersons would rotate on and off the state board, and serve staggered, two-year terms. All regional board chairpersons would be full-time, and appointed by the governor. A state board that includes a mix of state and regional perspectives should produce a more unified agency and allow the state board a better understanding of regional issues and vice versa. Regional board buy-in to state board policies and priorities would be increased, while the state board would continue to have a majority of voting members considering issues from a statewide vantage point. Statewide priorities and policies would be more likely to be implemented under this structure.

Other States' Governance Structures

During its study, the Commission examined the governance structures surrounding water quality regulation in other states to determine if there was a better model than the structure in California. California is unique: No other state governs water quality with a gubernatorally-appointed state board and gubernatorally-appointed regional boards.

Some states – including Virginia and Colorado – have appointees administering water quality, but both of those states have one board overseeing the entire state. Most states have a bureaucracy that sets water quality standards, although some have a decentralized system, in which regional offices set standards and administer other programs, and many have a stakeholder board involved in some aspects of decision-making.

The Commission could find no evidence that one governance style or another led to cleaner water. Nonetheless, there may be lessons California can learn from other states' systems. California may learn from the following states that are comparable in terms of size and geography:

- ***New York.*** The Division of Water within the New York State Department of Environmental Conservation handles National Pollutant Discharge Elimination System (NPDES) program activities, water quality monitoring, standards, total maximum daily loads (TMDLs), non-point source programs, water resource permitting, permitting for discharges to ground water and dam safety. The Department of Environmental Conservation has a central office in Albany and nine regional offices throughout the state. The department maintains a Water Management Advisory Committee, which began in 1979 and is made up of environmental, business, municipal, academic and citizen representatives. The committee allows water policies and issues to be vetted and informed by stakeholders.
- ***Oregon.*** The Oregon Department of Environmental Quality administers the NPDES program. There is a central office in Portland and three regional offices. The regional offices issue permits, handle compliance issues and take informal enforcement actions or refer potential enforcement issues to the central office. The central office issues general permits, develops state regulations and policies and oversees regional offices. While the department sets water quality standards, a gubernatorally-appointed Environmental Quality Commission approves those standards and hears appeals regarding penalties assessed by the department and other issues.
- ***Florida.*** The Florida Department of Environmental Protection administers the NPDES program. Six regional offices issue most point source permits and ensure compliance with those permits, while the main headquarters issues all stormwater permits for the state. Florida also has five water management districts, which administer flood management programs and control water rights and flow issues. Each district is run by nine gubernatorial appointees, and each district has taxing authority to raise money to improve water quality and supply.

Sources: United States Environmental Protection Agency. March 10, 2005. "Permitting for Environmental Results: NPDES Profile: New York and Indian Country." Washington D.C. United States Environmental Protection Agency. September 27, 2005. "Permitting for Environmental Results: NPDES Profile: Oregon and Indian Country." Washington D.C. United States Environmental Protection Agency. March 10, 2005. "Permitting for Environmental Results: NPDES Profile: Florida and Indian Country." Washington D.C. Robert Moresi, senior hydrogeologist, Black and Veatch, Tampa, FL. September 19, 2008. Personal communication with Commission.

This new structure will eliminate barriers between the boards and improve communication and collaboration among regions. It is the surest way to provide both a unified state agency while maintaining regional input through a regional board. While the regional board chairpersons will become full-time positions, the other members of the regional board will remain part-time volunteers paid a per diem. The regional board chairpersons will represent the state board in their districts and be point persons for monitoring implementation of state policy at the regional level.

Other structural changes are needed. To improve confidence in the system and ensure accountability, the appeals process must be stripped from the state board and handled by a separate appeals board. This will ensure appropriate oversight of board activities, restore confidence in the appeals process and, in addition, allow the state board more leeway to interact with regional boards before they make key decisions.

To increase emphasis on science, the state should create a science advisory board to help the state and regional boards coordinate research and ensure that research is properly integrated into regulation. Regional boards also should be encouraged to become involved in an independent, collaborative scientific institute such as the Southern California Coastal Water Research Project, which brings regulators and the regulated together to jointly sponsor scientific research.

The state also must create an independent data institute to help gather, coordinate and present water data. Acting as a water data library, the institute would allow the boards and others to tap into the vast amount of water quality information that is gathered, but currently not synthesized.

The Commission realizes these are ambitious proposals, particularly in a period where both the state and local governments face daunting fiscal crises. But there are savings to be had through these strategies, which can create government efficiency, leverage resources of multiple agencies and stakeholders, and reduce the conflict that can consume both public and private resources without producing better outcomes.

Protecting and improving water quality is a challenging task, but one essential to the state's vitality and growth.

Strengthening Ties, Redefining Roles

The Commission considered abolishing the regional boards in favor of a bureaucracy controlled in Sacramento. This idea was proposed in Governor Schwarzenegger's California Performance Review and holds some appeal: One department could improve efficiencies and consistency.

But many board officials and other stakeholders made a compelling case for the concept of regional decision-making for water quality regulation.

"The water quality problems of the rainy North Coast are just fundamentally different than the water quality problems of the Central Valley or the Colorado River desert," Craig Wilson, an attorney for the dairy industry and former chief counsel of the state board, told the Commission. "I think having an agency that responds to those differences is important."[126]

Santa Ana Regional Water Quality Control Board chairwoman Carole Beswick was persuasive in her argument for a regional board approach, noting that an appointed board can work with businesses and other stakeholders in a way that a civil servant would likely not.[127]

The Commission concludes that regional decision-making remains a sound approach.

Yet the Commission encountered numerous problems with the current regional board structure. Boards appear to have dramatically different approaches on some important policy issues and processes. Despite Porter-Cologne's framework giving the state board oversight authority of regional boards, the state board does not routinely exercise that authority and there is little accountability in the system to ensure that regional boards are achieving desired results or following state policies.

"The state board is extremely reluctant to get involved in decisions made at the local level," US Navy Rear Admiral Len Hering, Sr. told the Commission.[128]

In addition, governors of both parties have struggled to find 81 appointees at any given time who are qualified and interested in serving on regional boards, and as the complexity of water quality regulation has increased, it is questionable whether voluntary boards

are capable of awarding proper permits, making other technically difficult decisions, and acting as a check on staff as they were intended to be.

The Schwarzenegger administration sought to address some of these issues through its proposed Water Quality Improvement Initiative. To address inconsistency problems, the initiative proposed the Water Quality Council, which would consist of the chairpersons of the nine regional boards and the chair of the state board. The council would hold public hearings and address issues of inconsistency by making suggestions to the state board. The council also would help the state board set statewide priorities.

The initiative also called for the reduction in size of regional boards from nine to seven members, and, in recognition of the regional boards' struggles to handle complex issues, proposed allowing executive officers to issue federal NPDES permits. Changes to the 10 Percent Rule that would only prohibit someone from serving on a regional board if they earned income from an entity permitted by that board – not all boards – would widen the pool of potential regional board appointees.

The initiative is a good start, but does not go far enough.

Instead of creating a new council, the state board should be reformed to include some regional board representation. Five members of the state board would be appointed by the governor to represent statewide interests, and have backgrounds similar to the current requirements, with one exception: instead of two spots for engineers, there should be one engineer position and another position for a scientist or resources economist with experience in water-related areas. Four other members of the state board would be serving simultaneously as the chairperson of a regional board. All of the members would be appointed by the governor, with the governor selecting the four regional board chairpersons to serve on the state board for two-year terms.

All nine regional board chairpersons should work full-time, allowing them to better coordinate and implement statewide policies, while also allowing them more time to work with executive officers and staff members in each region and to serve as a check on staff. All regional board chairpersons should have a background in water quality issues.

The Commission supports the administration's proposal to shrink regional boards to seven members. The boards should continue to be

stakeholder boards, with the part-time members earning a per diem, which should be raised to $500 per meeting, as the administration proposed, and allowed to grow with inflation. Raising the per diem would help make these positions more attractive to a wider group of people, not just those who can afford such a time-consuming, semi-volunteer position.

The state board would continue to set statewide policies and priorities. In addition, the state board would be more capable of working with regional boards in advance of controversial decisions made at the regional level.

The six part-time regional board members should represent the following backgrounds: experience in water supply, conservation or production, experience in irrigated agriculture, experience in industrial water use, experience in local government, experience as a water-related scientist or engineer, and experience with a nongovernmental organization associated with recreation, fish, wildlife or the environment.

In addition, executive officers at each regional board would be allowed to conduct most permitting activity. Permits would still be issued through a public hearing process with executive officers conducting hearings that allowed water users as well as the public to comment on permits. Executive officers would become career executive assignment positions reporting to the executive director of the state board. At the state level, the executive director would issue state permits through a similar public process.

Regional boards would be required to conduct an annual review of the executive officer's performance, which would be taken under advisement by the executive director. This would further strengthen the relationship between the state and regions.

This new structure has the following advantages:

- ***Stronger tie between the state and regions.*** Overlapping regional and state board membership allows for a clearer structural relationship between the state board and regional boards. The frequent interaction between some regional board chairpersons, as they met as the state board, and the state board members would allow regions to share more information, to better set and implement similar priorities and to strengthen the concept of the boards as one state agency. In addition, changing the executive officer position from a regional board employee to a career executive assistant hired

by the executive director of the state board would further improve the relationship between the regional boards and the state board.

- ***Strong chair bolsters leadership, clarifies state priorities.*** Implementing a "strong chair" system, in which the chairperson of the regional boards is full-time and the other members are not, allows the chairperson to develop more expertise in pertinent issues and become the true leader in the region on water quality. This concept is based on the successful model used by the state Air Resources Board.
- ***Retains regional decision-making.*** While the overlap between the boards would improve consistency and efficiency, regional boards would still adopt basin plans, adopt TMDLs and otherwise control water quality policy in their region.
- ***Focuses state and regional boards on planning and policy.*** By delegating permitting authority to regional executive officers and the executive director of the state board, state and regional boards would have more time to discuss and consider broader policies and update basin plans. This is the appropriate responsibility of the boards.
- ***Improves governor's ability to fill appointments.*** This proposal would reduce the number of state and regional water board appointees from an unworkable 86 to a more feasible 68. Governors should have an easier time finding 54 part-time regional board appointees, compared to the current 81.

Increasing Transparency and Accountability

Several aspects of the water boards' governance structure that hinder transparency and accountability require change.

Communication should be improved. Strict ex parte rules limit the ability to discuss issues with the regulated community. This leaves discussion to public hearings, in which speakers are often limited to a few minutes of testimony. These limits prevent communication between regulators and the regulated that could help boards better solve problems. The result is a lack of trust among stakeholders of the boards, and a lack of understanding as to why boards take the actions they do.

The Commission believes the water boards should adopt ex parte rules used by other boards, such as the Integrated Waste Management Board, that allow for communication between regulators and the regulated as long as they are disclosed in a public meeting.

If executive officers and the executive director are allowed to issue permits, they too should be allowed to communicate with all stakeholders as long as it is disclosed.

For greater understanding and better outcomes, communication should be encouraged.

Appeals process should be reformed. Many water users and others in the water community complained about the appeals process, arguing the state board rarely heard appeals and rarely was willing to overturn regional board decisions. The state board process of determining which appeals to consider is too staff-driven and often it is unclear to stakeholders why the board has not taken up an appeal. This adds to the mistrust stakeholders have for the boards.

Additionally, the state board's appellate role prohibits it from interacting with regional boards before they issue a controversial permit or make another decision that could be subject to appeal. The Administrative Procedure Act, which governs much of the boards' processes, require an absence of bias, prejudice or interest in a proceeding by a body that could hear the issue on appeal. Thus, the system is set up to create distance between the state and regional boards on decision-making, contributing to inconsistency and lack of communication and interaction between the state and regional boards.

Change is needed to restore confidence in the appeals process.

In an effort to improve the water boards' appeals process, the Commission examined how other state and federal environmental agencies that make quasi-judicial decisions, such as issuing permits, handle appeals.

Large local air quality management districts, such as the South Coast Air Quality Management District and the Bay Area Air Quality Management District, have hearing boards that handle appeals of district board decisions. The boards are appointed by the district board members and are paid a per diem for each meeting. The hearing board for the Bay Area Air Quality Management District, a five-member board consisting of an attorney, an engineer, a member of the medical profession and two members of the public, meet between three to five times each quarter to hear requests for a variance from district rules and appeals of abatement orders and permits.

US EPA also has an appeals board, which hears appeals of regulatory actions taken by US EPA under the Clean Water Act, the Clean Air Act, the Safe Drinking Water Act and five other environmental laws. US EPA's Environmental Appeals Board consists of four administrative law judges, who are appointed by the administrator of US EPA, who in turn is appointed by the President. A panel of three of the four board members hears each case. The board typically hears appeals based on the terms of federal permits or fines assessed by US EPA.

The Commission believes the water board appeals process should be separated from the board, to improve trust in the process and to give the state board room to become more involved in regional board issues before they get to the appeals stage.

A hearing board model is the best fit for the water boards. A board comprised of three administrative law judges, with backgrounds in water-related issues and appointed by the governor, should be created to hear appeals.

Anyone, whether regulated entities or members of the public, would be allowed to appeal a regional or state board decision to the appeals board, which would be required to review petitions for appeal and make decisions based on whether the action under the appeal was legally appropriate and consistent with state or regional policy. The board should follow guidelines set out in the state's Administrative Procedure Act for appeals processes, and should be required to issue a ruling on an appeal within 90 days of hearing. Petitioners who were unsatisfied with the results of an appeal could then go to court, as they do now.

Report cards would provide easy-to-understand information and add accountability. One of the most valuable and easily accessible reports published on water quality in the state is the Beach Report Card created by the environmental group Heal the Bay. Now in its 18th year, the report card gives a letter grade to more than 375 locations year-round, and has become so well respected that its grades have been used to obtain funding for water quality projects and cited during the water boards' process of listing impaired water bodies.

The grading process has gone through several iterations during the report cards' history, and the current formula requires weekly testing at each site for three indicator bacteria. The grading formula – a key to the credibility of the report cards – has been validated by the California Beach Water Quality Workgroup, an ad hoc committee that

includes regulators, regulated entities, local governments and environmental groups, and is geared toward whether a beach is safe for swimming.

These report cards are important in two ways: They provide easily understandable information to the public, and they hold water quality regulators and dischargers accountable for outcomes. Beaches with poor grades indicate regulators and the regulated are not achieving the clean water called for by law.

Statewide, the Commission found an alarming lack of easy-access information about water quality, and an equally alarming lack of focus on clean water outcomes by the water boards. While the state does maintain a list of impaired water bodies to fulfill Clean Water Act requirements, it is difficult for the public to use that list to discern whether water bodies are truly safe for swimming, fishing or other uses.

To address both of these issues, the Commission believes the state should create a report card system for water bodies across the state based on Heal the Bay's Beach Report Card. Publicly accessible, easy-to-understand letter grades for water bodies throughout the state would act as a scorecard for regional boards, by answering this simple question: Are programs working to protect and improve water quality?

The report cards could emulate the state Air Resources Board's Air Quality Index, which has become an important tool for the public in assessing whether air quality is safe or not. Water body report cards could eventually provide a similar tool.

This is a long-term project. More monitoring would be needed, and decisions would need to be made regarding grading formulas. While the Beach Report Card is geared toward whether ocean water is safe for swimming, other water bodies could be graded for fishing or other beneficial uses. This process could be organized by the state water board with assistance from an expert panel, such as the California Water Quality Monitoring Council, by a research institute such as the Southern California Coastal Water Research Project, or the University of California. The program could be tested on a pilot basis on significant water bodies with routine monitoring already in place, and then expanded.

Report cards eventually could be used by the state board to measure regional board effectiveness, and for policy-makers to determine where water quality improvement projects are most needed.

Integrating Science

The boards acknowledge the need for improving and integrating the use of science in their decision-making processes. In a 2005 report commissioned by the state board to improve the use of science and engineering within the boards, consultant William Vance spoke with numerous board staff and wrote, "In general, the Regional Boards acknowledge their limitations in scientific expertise … ." Recommendations in the report focus on "creating a means or mechanism that will enable the Regional Boards to obtain scientific advice and recommendations from technical experts not readily accessible today."[129]

Too often, this deficit leads to disputes about science and information, rather than a productive discussion on developing an appropriate policy.

Numerous recommendations for adding more science to water quality regulation have been made in the last few years. US Navy Rear Admiral Len Hering, Sr. told the Commission he thought the water boards should emulate the state Air Resources Board and develop its own research center to work on water quality problems and solutions. A report published in March 2008 by the California Ocean Science Trust listed 25 recommendations for improving links between academic scientists and the water boards, including building a directory of water quality experts with specific expertise to help regional boards find scientists to work with, designating a seat on the state board for a scientist, and reforming the contracting process to improve working relationships with outside scientists.[130]

The report by Vance listed four possible structural changes, all submitted by regional and state board staff:

- Set up "blue ribbon" science panels that would provide advice and guidance on complex scientific issues.
- Create a science advisory panel that would provide technical review, comment and suggestions on Regional Board field studies and interpretation of data.
- Create a pool of in-house experts that would be available to any of the Regional Boards on an as-needed basis (i.e., for expertise currently not available, such as economic analysis or risk assessment).
- Set up an expeditious mechanism for consulting or contracting with experts in other state, federal or local agencies on highly technical issues or projects.[131]

Comparing the Water Boards to the Air Resources Board

Several stakeholders told the Commission that the state's air regulators – the California Air Resources Board – were more effective, transparent and respected than the water boards, and the water boards should do more to emulate the Air Resources Board. In his testimony to the Commission, US Navy Rear Admiral Len R. Hering, Sr. suggested regulations proposed by the state's Air Resources Board and local air pollution control districts were more credible because of the air board's ability to conduct research showing that regulations were practical and effective.

"California's air program is known for a strict adherence to a science-based approach, including a state-operated research facility that leads the world in air pollution science and technology,'' he said. "Air regulators in this state uses science in all aspects, and include economic analysis as a key aspect of decision-making. Water quality regulations, on the other hand, do not have the same scientific basis."

The air and water boards are not easily comparable, but there are interesting differences in the two regulatory systems that could be instructive to efforts to improve the water boards.

The California Air Resources Board (CARB) and 35 local air districts regulate emissions in the state. The CARB is responsible for regulating emissions from mobile sources, such as vehicles, fuels and consumer products, while the local air districts regulate emissions from stationary sources in their districts, such as factories or oil refineries. The CARB consists of 11 members, each appointed by the governor, with the chairperson working full-time and the other members, who represent geographical areas in the state, specific professional backgrounds or the public, serving part-time. Local air districts have varying rules as to board membership, with most including local elected officials and only some members who are appointed by the governor.

Unlike the state water board, CARB rarely issues permits, and instead adopts quasi-legislative actions. Local air districts issue permits. There is less interaction between CARB and local air districts, as they are not a single, unified agency and CARB does not hear appeals of local air district decisions. CARB is charged with setting ambient air quality standards for air basins that local air districts must work to attain through their permitting and policies, however. Air regulators regulate fewer contaminants than do water regulators, and are charged with only addressing contaminants that affect human health. CARB has formally identified 22 toxic air contaminants requiring regulation, while the water boards deal with far more contaminants.

Resources also vary dramatically between the two regulatory sectors. The state Air Resources Board has about 1,200 employees – not including the state's 35 local air districts. The water boards – both the state boards and the nine regional boards – employ a total of about 1,600 people. Locally, the Central Valley Regional Water Quality Control Board has about 275 employees covering a region that includes more than 30 counties. In contrast, the San Joaquin Air District covers eight counties and has about 500 employees. One of CARB's key funding sources is the motor vehicle account, which includes a fee charged to every car owner in the state. The water boards lack a similar funding stream.

CARB has a far more extensive scientific research arm than do the water boards. State statutes require CARB to administer and coordinate all air pollution research funded by the state, conduct studies every three years on the feasibility of air quality models and other analytical tools used to determine air quality, and appoint a screening committee to provide the board with advice on needed research and review research projects. While the water boards also have statutes requiring the state water board to determine state needs for water quality research and administer research, the statutes are less specific. CARB also is required to prepare an assessment of the cost effectiveness of available and proposed controls on emissions and develop a list that ranks the possible controls from least cost-effective to most cost-effective. Water law requires the water boards to consider economics when developing water quality objectives, but the statute is not specific as to how that should be done. Thus, CARB typically conducts an extensive cost-benefit analysis of proposed regulations and has eight economists on staff, while the water boards rarely conduct a full cost-benefit analysis.

Sources: Len R. Hering Sr., Rear Admiral, United States Navy. April 28, 2008. Testimony to the Commission. Sacramento, CA. Robert Jenne, Office of Legal Affairs, California Air Resources Board. February 9, 2006. "Key Air Agencies in California." Presentation to joint meeting of California Air Resources Board and State Watrer Resources Control Board. Sacramento, CA. Pamela Creeden, executive officer, Central Valley Regional Water Quality Control Board. September 17, 2008. Personal communication with Commission. Health and Safety Code Division 26 Air Resources Part 2 Air Resources Board Chapter 4 Research, 39701, 39703, 39705. Health and Safety Code Division 26 Air Resources Part 2 Air Resources Board Chapter 3 General Powers and Duties, 39606, 39607, 39609. Water Code Division 7 Water Quality, 13161, 13162, 13241.

All of these ideas have merit.

The Commission believes the state can best improve its integration of science into the boards' regulatory programs by creating a science advisory board.

A science advisory board, appointed by the state water board, could help the state and regional boards determine where scientific research was needed, help the state board in acting as a clearinghouse for current scientific research, help the boards better incorporate research findings into regulatory proceedings and advise the state board on continuing education options for staff scientists. The board, a five-member board of scientists and engineers paid a per diem for attending monthly public meetings, would help institutionalize the role of science in water board processes while also remaining independent of the boards themselves. The board could act as a liaison with outside scientists and regularly develop short- and long-term plans for scientific study.

Regional Science Institutes a Key to Better Science at Boards

Regional science institutes such as the Southern California Coastal Water Resources Program (SCCWRP) and the San Francisco Estuary Institute (SFEI) are invaluable to their respective regions. Both bring regulators, scientists and stakeholders together to propose and conduct relevant research:

- SCCWRP is a joint powers agency with 14 member agencies, including US EPA, the state water board and the Los Angeles, Santa Ana and San Diego regional boards, as well as several local government agencies. Each agency contributes funding, and a commission comprised of representatives from each agency meets quarterly to oversee impartial research that can be used in regulatory processes. SCCWRP's achievements and ongoing activities include regional monitoring, including a report issued every five years on the health of the Southern California shoreline; important research into the effects of aerial deposition on coastal waters; and research that led to the state water board's adoption of sediment quality objectives in 2008.
- SFEI also is a joint powers authority involving regulators, regulated entities, scientists and other stakeholders, including environmental groups. A board of directors guides research, including regional monitoring of San Francisco Bay; a wetlands science program; and studies on invasive species in San Francisco Bay.

The Commission believes every regional board in the state should be affiliated with a body similar to SCCWRP or SFEI. The advantages are numerous: Collaborations among regulators and the regulated over science can build consensus around the underlying scientific issues of regulations and therefore lessen conflict and build relationships and trust among regulators, water users and other clean water constituencies. Also, a semi-independent agency can conduct and contract for research in a faster timeframe than state government. While it is important for the water boards to have competent scientists on staff, board personnel are often overworked and these outside agencies can do more thorough work that may be more credible with all sides.

Regions such as Lahontan and the Colorado River could combine to help create an institute that might include partners in the southern part of the Central Valley board's jurisdiction. In the Central Valley, the board could work with the new Delta governance structure to develop a science institute for work there. The North Coast could create its own organization, which is suggested by the Ocean Science Trust report, or join the San Francisco Estuary Institute.

Sources: Steve Weisberg, executive director, Southern California Coastal Water Research Project. July 14, 2008. Personal communication with Commission. Also, San Francisco Estuary Institute. "Region-wide Science for Ecosystem Management" brochure. Accessed at http://www.sfei.org/about. Also, T.C. Hoffman and Associates, LLC. March 2008. "Linking the Academic Community and Water Quality Regulators." Prepared for the California Ocean Science Trust.

Proposed Water Board Governance Structure

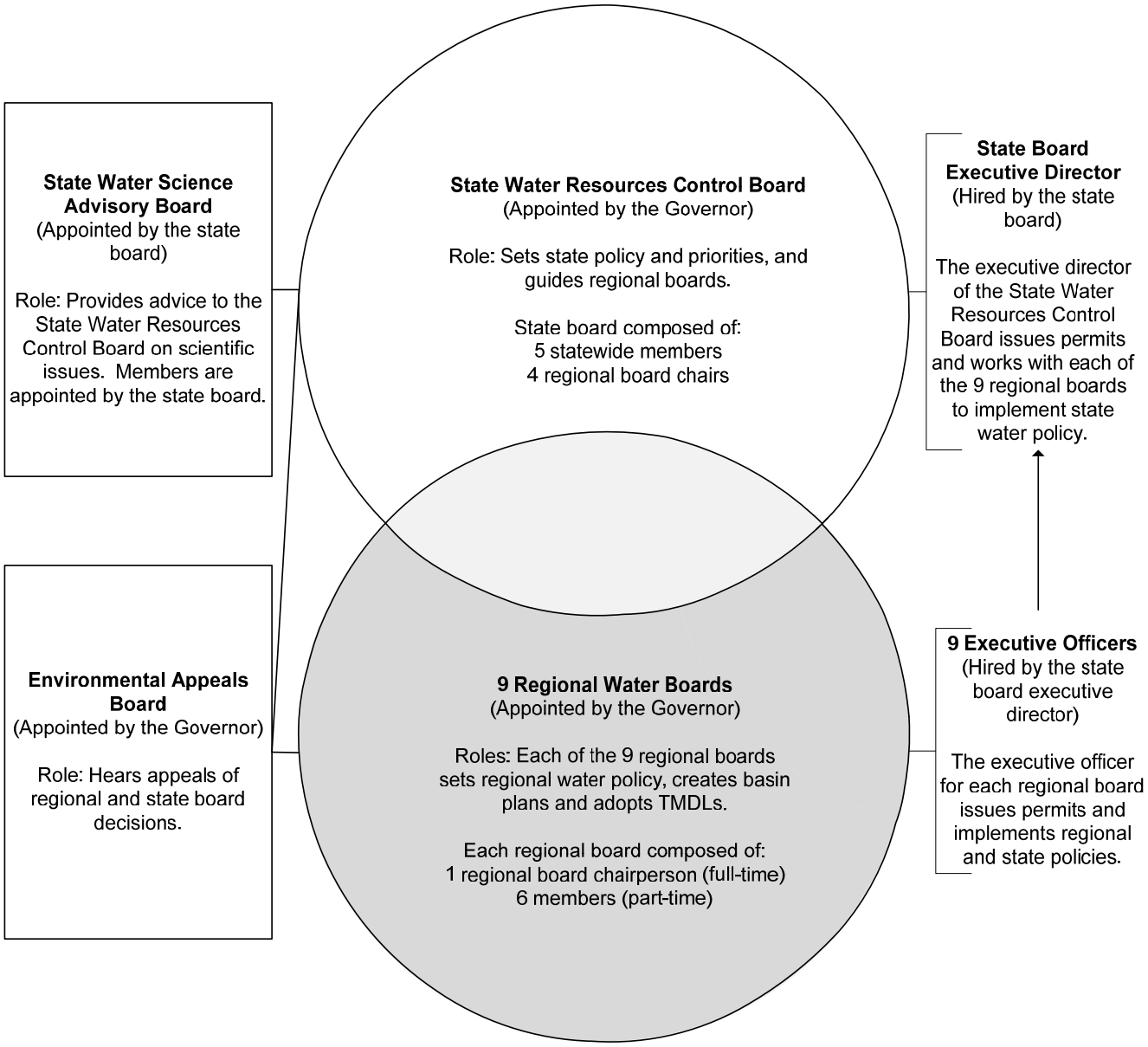

The board would not conduct research on its own, but act as a science oversight body for the boards. This is not a call for a new bureaucracy – the board could use staff from the state board.

As the Commission was preparing this report, Governor Arnold Schwarzenegger's Delta Vision Blue Ribbon Task Force was preparing a strategic plan for the Sacramento-San Joaquin River Delta and a proposal for a new Delta governance structure. As part of the process, there was discussion about the role of science in helping guide research in the Delta. Two separate proposals – one by Jeffrey Mount and Judy Meyer of the CalFED Independent Science Board and another by a science advisor for the task force – both called for an oversight board to conduct annual reviews of all science aspects of Delta water and ecosystem management.[132]

The rationale for a science oversight board in the Delta in both proposals applies equally to the need for a similar board as an arm of the state water board. The Commission urges the state to consider creating one scientific board that could oversee both the Delta and other state water issues.

Organizing, Leveraging Data

Hundreds of entities across the state – state agencies, local governments and private agencies – collect water quality data. Yet one of the biggest complaints among board officials, staff and stakeholders is the water boards' inability to cohesively gather, publish and analyze data to help inform the public, determine if regulatory efforts are effective and to drive decision-making.

The Legislature has sought to address this problem in several ways:

- AB 1404, approved in 2007, requires the state water board to provide a report by January 2009 on the feasibility of creating an integrated data system focusing on water supply and involving the water board's Division of Water Rights, the Department of Water Resources and the Department of Public Health.
- SB 1070, approved in 2006, created the California Water Quality Monitoring Council to help develop a "cost-effective, coordinated, integrated, and comprehensive statewide network for collecting and disseminating water quality information and ongoing assessments of the health of the state's waters and effectiveness of programs to protect and improve the quality of those waters."

- AB 1747 and SB 1049, approved in 2003, required any group receiving funding from Proposition 50 for water quality improvements to also monitor affected waters to determine a project's effectiveness. The legislation required that the monitoring data be compliant with the state's Surface Water Ambient Monitoring Program so that the data could be integrated and compared.

These efforts point toward the need for a statewide system that can coordinate water data from multiple sources and provide the public, policy-makers, regulators and others with useful information.

The state needs a water data library.

In its strategic plan, the state water board advocates for the creation of a statewide water data institute: "To improve transparency and accountability by ensuring that Water Board goals and actions are clear and accessible, by demonstrating and explaining results achieved with respect to the goals and resources available, by enhancing and improving accessibility of data and information, and by encouraging the creation of organizations or cooperative agreements that advance this goal, such as establishment of a statewide water data institute."[133]

This is an idea that should be pursued. The data institute could use new technology allowing for a federated system, linking data through a data exchange network. Each data provider would be responsible for maintaining its data, but the data could be accessed through a common portal. Some in the water community and board officials including Gary Wolff, vice chairman of the state water board, suggest the data institute should be managed by a non-state entity to encourage buy-in from the numerous data providers. An institute could be housed in an existing entity, such as the Southern California Coastal Water Research Project or the San Francisco Estuary Institute, or controlled by the California Water Quality Monitoring Council created by SB 1070.

This is a big task, as it would require hundreds of data gatherers to agree to standardized monitoring protocols and quality assurance, and allow their information to be used by others. It also would require a stable funding stream. But a coherent, easily-accessible library of data on water quality – and water use – would be a powerful tool for a state that faces profound water challenges in the future.

Updating Basin Plans

Nothing undermines the water boards' credibility and adds uncertainty to the regulatory process as much as outdated basin plans. While the boards do make minor changes to the basin plans every three years, and add TMDLS to them as they are adopted, the last major update, in the mid 1990s, preceded the increase in non-point source regulation. Many controversies and conflicts at the regional board level stem from regional boards' efforts to implement non-point source regulations using a basin plan that does not truly address the specificities of non-point source water pollution, which is different than point source water pollution. Regulated entities have a legitimate argument that regulation should be tailored for stormwater, irrigated agriculture and other non-point sources.

With the core regulatory document silent on some of the biggest water quality issues in the state, the regional boards are regulating in the dark.

The Commission heard compelling testimony from officials with the Santa Ana Regional Water Quality Board, regarding a multi-year, multi-stakeholder effort to revise that region's basin plan.

Concerns in 1995 that water quality objectives related to nitrate-nitrogen and salts would require dischargers to spend billions of dollars and might also discourage water recycling, the Santa Ana board created a task force to review the objectives to assure their technical and scientific validity. Twenty-two water supply and wastewater agencies participated, eventually contributing $3.5 million to a process that involved significant research. Regional board staff, including the executive officer, participated in nearly 100 meetings as the task force prepared a major overhaul of several aspects of the regional board's basin plan.[134]

According to written testimony supplied to the Commission by Santa Ana Regional Water Quality Control Board chairwoman Carole Beswick, keys to the task force's success included extensive discussions in the beginning of the process regarding the science needed, and the buy-in from all task force members that they would abide by regulations imposed by scientific findings. In other words, stakeholders agreed to go where the science took them.[135]

In 2004, the regional board approved significant changes to its basin plan based on the task force's work, including revised boundaries for ground water subbasins and new water quality objectives for nitrate-

nitrogen and salts in those ground water boundaries; new water quality objectives for other contaminants, such as chloride and sulfate; and new wasteload allocations for discharges of nitrogen and salts to the Santa Ana River. In all, 10 major aspects of the basin plan were updated.[136]

Gerard Thibeault, executive officer of the Santa Ana regional board, described the task force process to the Commission, and noted that when the basin plan updates were enacted, there was no dissenting testimony. Thibeault emphasized the importance of the task force's meetings, where regional board staff and stakeholders were able to hash out differences in lengthy conversations. During public hearings before the board, speakers often are limited to a few minutes.

"It is difficult to try and argue very complex technical issues in front of the board when all of the stakeholders have polarized positions," he said. "The task force allowed those arguments to be worked out."[137]

The Santa Ana region has unique characteristics that may have allowed it to gain unanimous support for basin plan changes that might be more difficult in other regions. It is the state's smallest region geographically. And a joint powers agency, the Santa Ana Watershed Project Authority, has effectively promoted collaboration among stakeholders in the region.

Nonetheless, other regions should emulate the Santa Ana region to update their basin plans. The state board should promote the idea and help facilitate regional board basin plan update task forces. Given the state's budget deficit, it seems unlikely that the state will be able to pay for the work needed to update basin plans. Thus, water users and others with a stake in clean water will need to contribute. While it is an upfront cost, stakeholders will benefit in the long run by avoiding lengthy disputes over permits and other conflicts that result from outdated basin plans.

Developing current basin plans is the most critical task facing the water boards.

Solving Problems

The state and regional water boards face an expanding set of threats to water quality at the same time that the state is grappling with water supply issues fueled by climate change, population growth and

a continuing dispute about the best ways to deliver water from north to south.

Throughout its study, the Commission found the boards too often focused on processes instead of results. The boards must reposition themselves from regulatory agencies to problem-solving agencies focused on clean water outcomes. This will require three important steps: working more collaboratively with stakeholders and other federal, state and local agencies; focusing on watershed health; and incorporating cost-effectiveness tests into their analysis to help determine the best ways to approach water quality problems.

A collaborative approach. While the boards do follow state law and have public participation processes for virtually all of their proceedings, many stakeholders complained that the boards do not work in a collaborative manner. This is despite examples of collaboration that have been productive:

- ***Brake Pad Partnership.*** Since the 1980s, studies showed high levels of copper in the southern portion of San Francisco Bay. Copper contamination continued in the Bay even as nearby wastewater treatment plants reduced copper discharges 10-fold. Continued monitoring and studies showed that area stormwater had unusually high levels of copper, and research was able to pinpoint a source for that copper: automobile brake pads. Every time cars brake, bits of copper in brake pads land on streets. That copper is washed away during storms. Faced with the near-impossible task of regulating automobile brake pads, which have design specifications mandated by the federal government, the San Francisco Bay Regional Water Quality Control Board and Bay Area stormwater managers decided to approach the brake pad industry to work on voluntary changes. A coalition of stormwater managers, environmental groups, board staff and some brake pad manufacturers was formed, with each contributing funding to further study the issue. The Brake Pad Partnership generated new research on copper in the Bay, including studies that allowed the Regional Board to relax limits on the amount of copper in the Bay while still upholding beneficial uses. The group is now preparing legislation that could impose new state restrictions on the use of copper in brake pads that will have some industry support.[138]
- ***Santa Ana Stormwater Quality Standards Task Force.*** Attempts to create water quality objectives for bacteria in water used for recreation created controversy in the Santa Ana region, so the

board agreed to create a stakeholder task force to look at the issue. Five entities are funding the task force, with no money coming from the regional board. A total of 54 agencies and organizations, including environmental groups, are participating. The task force began with three principles: new objectives and beneficial uses would be science-based, within current law, and all task force members agreed to support the new science-based objectives and standards even if it meant they would be more stringent. The task force has met monthly and took a creative approach to determining the beneficial uses of some water bodies: They set up video cameras at 12 locations to determine whether people were using them for recreation or not. Changes may allow some water bodies that are not used for recreation to have less stringent standards, in exchange for tougher standards where those water bodies meet receiving waters that are used for recreation. This will allow regulated entities to spend more time and money on waters with higher-priority uses. Basin plan amendments are expected to be completed in 2009.[139]

- ***Water Plan Update Steering Committee.*** In the past, the Department of Water Resources took sole responsibility for creating the Water Plan, which is the state's master plan for water. For its 2009 update of the Water Plan, however, DWR has created a Steering Committee of 19 state agencies, including the water boards, to better integrate water supply, water use efficiency, water quality, flood management planning and environmental stewardship into the plan. The Steering Committee is working together on nine Water Plan items, including recommendations on how to adapt to climate change and updating and expanding regional reports. DWR officials believe the committee will improve the Water Plan by including more attention to non-DWR issues, but also build inter-agency relationships to better address future water issues.[140]

Within the water boards, the boards must do a better job of working with stakeholders and the public to solve problems. The traditional method of issuing permits and requiring dischargers to monitor themselves is not as effective in dealing with non-point water pollution problems that have diffuse, hard-to-regulate origins. For example, because stormwater pollution is caused in part by individual actions, public education may play a key role in addressing the problem. In addition, stormwater permit processes that require stormwater agencies to develop best management practices to address stormwater pollution often do not include

enough interaction between the boards and agencies to determine program effectiveness during the five-year life of a typical permit.

In an address delivered to the California Stormwater Quality Association in 2006, consultant Armand Ruby proposed annual meetings between regulators and stormwater agencies in which the two parties could consider monitoring data, determine the contaminants they were most concerned about and develop strategies to address those concerns.[141] This does not often happen.

"More time and attention should be paid to getting the public and the regulated community and the regulators into a room to talk, rather then just having three minutes of testimony from each side at a hearing," noted Linda Sheehan, executive director of California Coastkeeper, at one of the Commission's public hearings.

In 2008, the state water board's effort to develop a statewide water recycling policy may have helped create a new model for policy development. With near unanimous dissent among stakeholders regarding a recycling policy proposal created by state water board staff, stakeholders agreed to work together and develop a policy that they would then propose to the board. After several months, the stakeholder group – which consisted of environmental groups, municipal wastewater treatment groups and the Association of California Water Agencies – created a 13-page proposal that all sides agreed on. The proposal suggested new goals for the use of recycled water in the state, called for state- and stakeholder-funded basin plan updates dealing with salt and nutrient issues, a streamlined permitting process to encourage recycled water projects, and the creation of an expert panel to advise the state on how to handle emerging contaminant issues that might affect wastewater and efforts to clean and recycle wastewater.

Boards should use this model to develop future policies.

Other sources of pollution will require more cooperation and collaboration among the water boards and other government agencies.

The state has taken a small step toward addressing air pollution that contaminates water. In February 2006, the state water board and the Air Resources Board met in a joint hearing to discuss aerial deposition and water pollution. The board heard presentations on research suggesting, among other things, that wood burning stoves contribute to Lake Tahoe pollution and emissions from cement kilns contribute mercury to the San Francisco Bay.[142]

While more studies are needed, existing research is clear: Air pollution does impact water.

While the initial meeting between the two state boards was positive, no subsequent meetings have been scheduled. The boards should meet again, and perhaps annually, to begin determining how best to address this difficult situation. Should the water boards begin regulating power plants, automobiles and other sources? Should the air boards expand their scope, from regulating 22 toxic air contaminants the directly impact human health, to other contaminants that impact water? How should regional boards and local air districts work together to address localized issues?

In its report on the boards' use of science, the California Ocean Trust noted several scientific questions regarding air pollution's effects on water quality that needed addressing:

- Developing studies and determining the impacts of atmospheric deposition pollutants on water quality and how to address this in TMDLs.
- Developing conceptual frameworks and models to determine how these systems interact and effect water quality.
- Determining pollutant loads in water from air- and land-based sources.[143]

These questions and issued need to be addressed, and state environmental officials should be working on solutions.

California needs a broad discussion of the impact of land development on water quality that is potentially beyond the scope of the water boards. As California's economy grows and changes, agricultural land is lost and urbanization increases, these issues will increase in importance.

Low Impact Development a Key Response to Stormwater

As the water boards have attempted to improve regulation surrounding urban stormwater, they have begun to focus more on low impact development (LID) as both a key to reducing stormwater discharges and as a potential source of recycled water. The state, as a whole, should continue discussing ways to encourage and improve LID.

The goal of LID is to maintain the hydrology of a development site even as development occurs. LID attempts to hold water on site through water storage and infiltration with the ground. Examples of LID include rooftop gardens on public buildings, rain barrels that catch rain water for reuse, permeable pavement and other methods that decrease the imperviousness of an area that often occurs when it is developed into an urban use.

LID marks a profound change in urban development. Past practices focused on moving water from rain storms quickly away from development to prevent flooding. In Los Angeles, for example, engineers designed concrete channels to convey large volumes of water from occasional but fierce rain storms.

The water boards and other state agencies have made efforts to promote – and require – LID:

- ***Central Coast LID Center.*** Using $2.25 million from the state board, the Central Coast Regional Water Quality Control Board helped develop the Central Coast LID Center, which opened in 2008. The non-profit, affiliated with an already-existing LID center in Maryland, opened in San Luis Obispo in 2008, and will develop technical expertise for the state on LID, provide education and outreach on the topic and serve as a library for research on the issues.
- ***LID Education Project.*** Developed by the water boards, the Coastal Commission and several other groups, including the California Stormwater Quality Association, the project is intended to hold workshops and promote LID throughout the state to local government officials, state officials, developers and others. The project, which was just launched 2008, is seeking to raise more than $2 million to pay for the workshops and other efforts.
- ***LID Regulations.*** Both the state water board and some regional boards have begun to require LID in permits. The San Francisco Bay Regional Water Quality Control Board, for example, is requiring in stormwater permits that new development maintain pre-development erosion levels, while the San Diego Regional Water Quality Control Board in its stormwater permits is requiring all new development and redevelopment projects to implement LID where feasible. Other boards are beginning to place numeric limits on development sites, limiting the amount of impervious surfaces in new development.

The construction industry and municipalities have objected to some of the boards' more aggressive efforts to require LID, arguing that it can increase design and construction costs. In addition, local governments may need to review decades-old ordinances: The city of Lompoc, for example, found that ordinances required impervious concrete in parking lots, which conflicted with Central Coast Regional Water Quality Control Board's requirements to dramatically decrease imperviousness.

Despite these conflicts, most stakeholders agree that LID is an essential tool to addressing stormwater pollution. In addition, LID may help local communities retain and eventually reuse water by recharging ground water basins. A 2005 report by the Los Angeles and San Gabriel Rivers Watershed Council noted that 500,000 acre-feet of stormwater runoff flow from the Los Angeles County basin to the ocean each year. The report noted that if the region could instead capture that water and reuse it, Southern California would be less dependent on water imports from Northern California.

Sources: Water Education Foundation. 2007. "Stormwater Management: Turning Runoff into a Resource." Eric Berntsen, State Water Resources Control Board. January 28, 2008. "Incorporation of LID into State Water Board Programs." Roger Briggs, Executive Officer, Central Coast Regional Water Quality Control Board, and Al Wanger, Deputy Director, California Coastal Commission. October 27, 2008. "Statewide Low Impact Development Education Project." Presented to the Water Quality Coordinating Committee. Central Coast Regional Water Quality Control Board. June 10, 2008. "Staff report, Proposed Re-Direction of Low Impact Development Project Funds to Support the Central Coast Low Impact Development Center."

There are already statutes in place that could be used to increase state government collaboration:

Environmental Policy Council. Section 71017 of the Public Resources Code creates the California Environmental Policy Council, which is comprised of the secretary of Cal/EPA and the heads of the other agencies within EPA, including the chairperson of the State Water Resources Control Board. The council was created to provide guidance for entities seeking a consolidated permit from multiple environmental regulators. It met in 1999 to help resolve issues relating to oxygenate methyl tertiary-butyl ether (MTBE), which was added to gasoline to mitigate air quality problems from gas but was later found to harm water quality.

The council could be used to help address cross-media pollution issues affecting water quality.

Environmental Goals and Policies Report. Enacted by Governor Ronald Reagan in 1970, the Environmental Goals and Policies Report is intended to outline the state's goals as they relate to land use, population growth and distribution, development and conservation of natural resources, including air and water quality. The report is supposed to be produced by the Governor's Office of Planning and Research, reviewed by the Legislature and approved by the governor every four years. It has only been issued twice in 38 years: once in 1978 and again in 2003. The 2003 report, however, was published the same month that Governor Gray Davis was recalled and failed to generate comment or reaction from the Legislature or Governor Arnold Schwarzenegger.

The 2003 report detailed expected population and economic trends, and how those trends could impact everything from air and water quality to agricultural land and open spaces to human health and energy resources. The report also included 58 broad and specific goals for improving sustainable development in the state, including promoting infill development in cities, preserving water quality through watershed protection efforts and encouraging development that supports public transportation possibilities.

Governors of both parties simply have ignored the statute calling for this report. And while some of the issues that could be raised in this report are addressed in other ways – Governor Arnold Schwarzenegger has convened the Climate Action Team, consisting of multiple state agencies, to work on achieving greenhouse gas reductions, for example – an updated version of this report could help the state frame water quality priorities for the future, particularly as

they concern urban stormwater and other non-point pollution sources.

Focusing on watershed health. The state board's new strategic plan emphasizes the boards' need to focus on watersheds as a critical way to improve water quality. "A watershed approach is hydrologically-focused, recognizes the degree to which ground water and surface water bodies are connected physically, recognizes the linkages between water quantity and water quality, and requires a comprehensive watershed protection approach," reads the preamble to the strategic plan.[144] A key action item in the plan requires the state board to identify priority watersheds and focus resources on impairments in those watersheds.[145]

National efforts underway to promote watershed-based planning and regulation can be used as examples. The National Research Council's report on stormwater, issued in October 2008, recommends that the EPA scrap its current stormwater permitting program in favor of regulating on a watershed basis. The report proposes moving from a site-by-site and stormwater permitting process to a permitting process that focuses on broad goals within a watershed and would include point source dischargers and non-point source dischargers.[146]

The National Research Council suggests integrating all discharge permitting under a municipal authority, which would be the lead permittee, and then identifying broad goals and objectives for the watershed and specific solutions for restoration and protection. The report notes that federal funding would be required to help implement such a major change, which includes folding the TMDL program be folded into the new permitting system as well.

Some states, notably Oregon, already have experimented with watershed permitting. Oregon's use of the watershed permitting concept led to a creative solution to addressing water impairment due to temperature, which affects the state's salmon. A discharger emitting heated water into the Tualatin River was allowed to plant trees that created shade and cooled water along the river. The alternative would have required building an expensive system to cool the discharges that would have contributed to climate change.[147]

Watershed-based Permitting

According to the National Research Council, components of watershed-based permitting would include:

- Centralizing responsibility and authority for implementation with a municipal lead permittee working in partnership with other municipalities in the watershed as co-permittees.
- Adopting a minimum goal in every watershed to avoid any further loss or degradation of designated beneficial uses within the watershed's component water bodies.
- Assessing water bodies that are not providing designated beneficial uses in order to set goals aimed at recovering these uses.
- Defining careful, complete, and clear specific objectives to be achieved through management and permitting.
- Comprehensive impact source analysis as a foundation for targeting solutions.
- Determining the most effective ways to isolate, to the extent possible, receiving water bodies from exposure to those impact sources.
- Developing and appropriately allocating funding sources to enable the lead permittee and partners to implement effectively.
- Developing a monitoring program composed of direct measures to assess compliance and progress toward achieving objectives and diagnosing reasons for the ability or failure to meet objectives, in support of active adaptive management.
- Developing a market system of trading credits as a tool available to municipal co-permittees to achieve watershed objectives, even if solutions cannot be uniformly applied.

Source: National Research Council. October 15, 2008. "Urban Stormwater Management in the United States. Page 391. Washington, D.C.

US EPA commissioned the stormwater study, and may attempt to implement a watershed approach in coming years. With this new federal focus in mind, the state and regional boards should emphasize watershed health by creating a new focus on how regulations affect watersheds. The Central Coast Regional Water Quality Control Board has begin this process by creating a new performance measurement structure focused on healthy watersheds.

Strategies the boards could implement include redeploying staff to place more emphasis on watershed health, increasing the use of regional monitoring to get a better sense of the overall state of watersheds, and working more closely with local watershed coalitions or convening watershed stakeholder groups. State law allows regional water boards to direct public agencies to conduct studies of issues affecting water quality, and in a presentation to state and regional board members in October 2008, Richard McMurtry of the Santa Clara County Creeks Coalition suggested using that authority to require all dischargers into a watershed to pool resources, study the watershed and develop priorities and strategies for addressing watershed-wide issues. This could be a step toward watershed permitting.

Legislation supported by the Building Industry Authority in 2008 authorized counties or cities to convene water quality committees to "develop and facilitate cooperation in achieving local water quality solutions" and develop watershed water quality management plans. The legislation would have required regional boards to consider the plans as amendments to their basin plans. The legislation, AB 938 by Assemblyman Charles Calderon, was approved by the Assembly but failed to pass in the Senate.

This is an arena where the board can and should exercise leadership on their own and convene watershed quality committees to provide input to the boards and, working with the EPA, begin considering pilot projects to implement watershed permitting.

Focusing on watershed health should help the boards focus more on solving water quality problems and on outcomes.

Central Coast Board Shifts Focus Toward Outcomes

Concerned that too much emphasis was placed on processes instead of outcomes, the Central Coast Regional Water Quality Control Board has developed a new performance measurement strategy to emphasize clean water outcomes and measure progress toward those outcomes. Through public meetings and internal staff meetings, the board created an overall vision statement for the agency and three specific, measurable goals. Four teams are working on achieving the goals, with staff from each program area involved in each team to ensure that changes happen system-wide. Staff is allowed to spend about 10 percent of their time on the project. Three of the teams are working on one of the specific goals, while the fourth team is charged with assessing the overall effectiveness of the new strategy.

The project has already led the board's agricultural program to begin comparing growers' monitoring reports, water quality data for nitrate and toxicity in streams, pesticide use information and inspection information to determine overall water quality. It is the first time the board has used Geographic Information System tools to link area land use and water quality data.

The board's vision is "Healthy Functioning Watersheds," and the three goals, along with some ways the board will measurement achievement of the goals, are:

- ***By 2025, 80 percent of our aquatic habitat is healthy and the remaining 20 percent exhibits positive trends in key parameters.*** The board seeks to ensure all agriculture lands have riparian buffers, ensure open space preservation in all important groundwater recharge areas and ensure that all new developments and redevelopment projects are designed to minimize runoff and maximize groundwater recharge. The board will likely develop a basin plan amendment to protect riparian and wetland habitat.
- ***By 2025, 80 percent of lands within any watershed will be managed to maintain healthy watershed functions, and the remaining 20 percent will exhibit positive trends in key parameters.*** The board will measure the percent of impervious surfaces in the region and seek ways to reduce those surfaces, and measure toxicity in runoff and seek to reduce toxicity. Long term, the board will study trends in water quality based on land development and incentivize groundwater recharge and water recycling projects.
- ***By 2025, 80 percent of our groundwater will be clean, and the remaining 20 percent will exhibit positive trends in key parameters.*** The board will measure groundwater nitrate concentrations and salt to determine effectiveness, work on basin plan amendments for groundwater recharge area protections and work with dischargers to groundwater on development of site-specific salt management plans.

Sources: Roger Briggs, executive officer, Central Coast Regional Water Quality Control Board. July 23, 2008. Personal communication with the Commission. And Central Coast Regional Water Quality Control Board. June 4, 2008. "Staff Report for Regular Meeting of June 4, 2008. Status Report on Regional Board Vision and Measureable Goals." San Luis Obispo, CA.

Considering Economics. Porter-Cologne requires the water boards to consider the economic consequences of regulations when they set water quality objectives, and states that "waters of the state shall be regulated to attain the highest water quality which is reasonable, considering all demands being made and to be made on those waters and the total values involved, beneficial and detrimental, economic and social, tangible and intangible."[148]

The statute, however, provides scant guidance on how the boards should specifically consider economic or other factors as they determine appropriate regulations. In addition, a state appeals court, in *City of Arcadia v. State Water Resources Control Board*, gave the boards significant leeway in determining how they consider the costs of a regulation.[149]

The state board has provided some guidance to regional boards as to how to consider the economics of water quality objectives through the board's administrative manual, but the Commission's questioning of regional board officials at its April 2008 hearing illustrated that the boards do not have a thorough or consistent process to determine the costs of new rules, nor do they attempt to determine the most cost-effective ways to solve water quality problems.

One former regional board member, Terese Ghio, told the Commission that she felt like the board gave very little thought to cost.

"Cost-benefit analysis was never really vetted," said Ghio, who was a member of the San Diego Regional Water Quality Control Board for four years. "It's talked about, the box is checked, but it's never really done."[150]

This approach contrasts to the federal government, where US EPA has a lengthy history of using cost-benefit analysis in decision-making. Both Presidents Reagan and Clinton issued executive orders requiring cost-benefit analysis in EPA regulations, indicating bi-partisan support for the concept.[151] The EPA's manual, "Guidelines for Preparing Economic Analyses," is a lengthy document detailing the agency's process for establishing the costs and benefits of regulations.

A formal cost-benefit analysis can be time-consuming and expensive. At the very least, the state and regional boards should use cost-effectiveness tests as they analyze their regulatory actions – such as water quality objectives and TMDLs. Ranking options by cost-effectiveness can help set priorities and find strategies that provide

the most benefit in terms of protecting and improving water quality. Porter-Cologne's requirement that regulations be reasonable suggests that the board should have a standardized procedure to analyze the potential costs of regulations, as well as some indication of the value of the potential benefits the regulations would produce.

In a 2006 paper entitled, "A Guide to Consideration of Economics Under the California Porter-Cologne Act," economists David Sunding and David Zilberman of University of California at Berkeley present their proposal for a economic evaluation process that can be used by the boards. Their proposal does not call for a full-scale cost-benefit analysis; instead it provides a method for the boards to gather information and provide a clear statement for the boards' rationale in setting regulations.

Adopting this process would improve transparency in the boards' decision-making process, allow the boards more information as they adopt regulations and instill more confidence among stakeholders in board decisions. Cost-effectiveness analysis could also help set priorities.

The Clean Water Act prohibits using excessive cost as a reason for not implementing a water quality standard or a TMDL, and the Commission is not advocating for the elimination of regulations simply because they are expensive. But adopting a formal process to analyze the costs of a regulation will provide the board with more information; boards are free to consider other issues in adopting regulations.

In its report, the Ocean Science Trust noted: "Cost-benefit analysis of present regulatory, management, and remediation measures

Proposed Economic Analysis for Water Boards

In a 2006 paper, University of California professors David Sunding and David Zilberman proposed that the state and regional water boards conduct, at minimum, a relatively quick economic analysis before imposing new regulations. The professors presented an eight-step process:

- A listing of the affected parties, including private industry and government agencies, together with a qualitative description of the impacts.
- Solicitation of data from the public regarding potential compliance and related costs for the proposed policy.
- The public's reported cost of compliance in relation to the revenue, cost, and profit margin of affected firms, and relative to the total budget of affected public entities.
- A statement of what the board staff thinks the costs are likely to be that specifically considers the data solicited from the public and the reasons for the board's estimate.
- A statement of potential factors that could affect the estimate, such as technological uncertainties, monitoring limitations, etc.
- A description of competitive conditions in the affected sectors, and an assessment of whether water quality regulations are likely to place California firms at a significant competitive disadvantage.
- A statement of the average time needed to obtain permits from the various boards, and a qualitative assessment of the impacts of delay.
- A statement of the goals to be achieved by the proposed regulation and an explicit consideration of these goals given the costs (i.e, at least a statement that "the board believes that $XX million represents a reasonable expenditure to achieve YY.") This description would include the types and numbers of beneficiaries, and an identification of other investments beyond those resulting from the regulation that are needed to produce the beneficial uses.

Source: David Sunding and David Zilberman, College of Natural Resources, UC Berkeley. April 6, 2006. "A Guide to the Consideration of Economics Under the California Porter-Cologne Act." Pages 53-54. Berkeley, CA.

could assist the water boards in choosing the most effective use of limited resources to improve water quality."[152]

Summary

With California facing inevitable population growth, the climate change threat and the collapse of the Sacramento-San Joaquin River Delta, the need for clean water has never been greater.

Created nearly 40 years ago, the current governance structure to ensure clean water is outdated and in need of reform. The governor, Legislature and water quality regulators must act now to restore consistency, transparency and accountability to the state and regional water boards. A more unified board system that can identify statewide priorities and implement them at the regional level is essential. This new system, with up-to-date basin plans, a commitment to the use of science and data, and willingness to seek creative solutions to solve modern water quality problems, can be a key player in the state's future.

A failure to act endangers both the environment and the economy.

Recommendation 1: To move toward a more consistent, transparent and accountable governance structure that allows for both statewide policy and regional flexibility, reform the State Water Resources Control Board and the Regional Water Quality Control Boards by strengthening ties between the boards, refocusing the boards on broad policy-making and restoring confidence in the appeals process. Specifically, the state should:

- Restructure the State Water Resources Control Board as a full-time, 9-member board charged with creating state policy, setting priorities and overseeing regional board activities. Members of the board should be appointed by the governor and confirmed by the state Senate. Five members of the state board would serve solely as state board members, including one person who would be chairperson of the state board, as named by the governor. These members should have the following backgrounds: One in engineering, one in water rights law, one in water quality, one in water-related science or resource economics, and another would represent the public. The position of regional chairperson would become full-time. Four regional chairpersons would serve on the state board for staggered, two-year terms, with membership rotating among all nine regional board chairpersons.

- Reconstitute the nine Regional Water Quality Control Boards as seven-member boards with six part-time members and a full-time chairperson, all appointed by the governor. The chairperson would be charged with monitoring statewide policies that are implemented at the regional level. Boards would continue to be stakeholder-boards, with six part-time members with the following backgrounds: experience in water supply, conservation or production; irrigated agriculture; industrial water use; local government; water science or engineering; and experience with a nongovernmental organization associated with recreation, fish or wildlife. Regional boards would focus on updating basin plans, adopting total maximum daily loads and other quasi-legislative functions.
- Empower the executive officers of each Regional Water Quality Control Board and the executive director of the State Water Resources Control Board to issue permits, allowing the boards to focus on updating basin plans, setting broad policy and focusing on upcoming water quality challenges. Executive officers would become Career Executive Assignment positions and report to the executive director of the State Water Resources Control Board. Regional boards would conduct an annual evaluation of the executive officer that would be taken under advisement by the executive director.
- Exempt state and regional board members, regional board executive officers and the state board executive director from ex parte rules within the state Administrative Procedure Act that prohibit interaction with regulated entities. Instead, require board members and permit-issuing executives to disclose their contacts with regulated entities at public meetings, as is currently done by other boards such as the Integrated Waste Management Board.
- Create a new appeals board that would address appeals of quasi-adjudicative functions such as permits and enforcement actions. Removing the appeals process from state board jurisdiction would restore confidence in the process and allow the state board to take a more proactive approach in regional board issues. The members should have backgrounds in water issues and would be appointed by the governor to hear appeals. The board would follow Administrative Procedure Act policies in conducting hearings.

Recommendation 2: The state must improve and increase its use of data, scientific research and planning to better inform the public, respond to current and future water quality problems and focus more on accountability. Specifically, the state should:

- Create a Water Science Advisory Board for the State Water Resources Control Board. Members, appointed by the state board, should have backgrounds in environmental science and engineering. The board would help both the state and regional water boards and other state water agencies coordinate research, propose needed research, advise the boards on how to incorporate research into regulatory processes and increase the effectiveness of scientific peer review.
- Create an independent Water Data Institute that would act as a state library for water quality and supply data. The institute would pool information from various state agencies and other water monitoring groups to provide accessible information to the public, regulators and researchers.
- Develop report cards. Report cards for each major water body should allow the public easy access to information they can use and could act as a way to hold regional boards accountable for their effectiveness. The report cards should be developed and published by regional science institutes or an independent entity, such as the University of California.
- Launch a statewide effort to ensure that all regions have up-to-date basin plans. Regional boards should propose stakeholder-financed efforts similar to the one conducted by the Santa Ana Regional Water Quality Control Board.

Recommendation 3: The state must increase focus on clean water outcomes and emphasize collaboration, creativity and problem-solving to address current water quality problems. Specifically, the state should:

- Collaborate with other government agencies. Because land use, automobile emissions and other factors outside the traditional purview of the water boards are major contributors to non-point source pollution of water, the water boards must work with other government agencies on solutions. The state water and air boards should routinely meet to develop regulatory strategies to address air pollution's effects on water. The state should revive the Environmental Protection Council, which already exists in statute and consists of the heads of each of the boards and departments within Cal/EPA.

- Emphasize a watershed approach. To increase focus on outcomes and solving complex problems, the water boards should develop more processes aimed at watershed health.
- Use stakeholder task forces. As the Santa Ana Regional Water Quality Control Board has done, other regional boards should increase the use of stakeholder task forces to work through difficult regulatory issues.

Recommendation 4: The water boards must develop standardized economic analysis procedures to help set priorities and determine the most effective and efficient means to improve water quality.

- To fully implement Porter-Cologne's demand that water quality regulations be reasonable, given other economic and social factors, the boards must institute the use of economic analysis into decision-making. Cost-effectiveness analysis also would increase transparency of board decision-making and help the boards set priorities.

Conclusion

California's state and regional water boards have a profound impact on the environment and the economy. The boards issue more than 50,000 discharge permits, regulating the state's biggest metropolises as well as its smallest wastewater treatment plants. Theirs is an enormous and challenging task: implementing ambitious and complicated federal and state laws, incorporating the still-evolving scientific understanding of pollution's causes and solutions and working with limited resources.

This job, however, is critical to the state's future. Demand for water grows with population growth. Water supply is threatened by climate change and the potential for earthquakes to destroy the state's levee system. Pressures are mounting on the state to improve the health of the Sacramento-San Joaquin River Delta, protect threatened fish species and restore waters around the state to ensure they are swimmable, fishable and drinkable.

Change is needed to help the boards meet their mission.

Regional decision-making – an idea first conceived for California water quality regulation nearly 60 years ago – remains a sound approach, as conditions in different water bodies merit different approaches and standards. But California needs a better way to set overarching state water quality policy, as well as a better way to implement policies that are important to the overall health of the state's water bodies.

This is nowhere more important than in the area of non-point source pollution. The current system is based on the outdated model of combating source pollution, where emitters could be easily identified and their actions modified though the permit process.

The Commission found a critical need for a more unified regulatory agency that has clear priorities and procedures that can be implemented throughout the state. While current statutes give the State Water Resources Control Board ample authority to direct the nine Regional Water Quality Control Boards, in practice the regional boards are too independent, with differing policies and processes on even some of the most important statewide issues.

The current structure has not produced a clear ranking of its water quality priorities, the first step in matching resources and action to the state's biggest water quality threats. The process for setting policy offers little transparency and little emphasis on accountability or outcomes.

Given the tools that exist, it is unacceptable that the public and policy-makers do not have easy-to-understand information to answer the most basic questions for water quality policy: What is the state of the state's waters, and which water board programs are effective at improving water quality and which are not?

Until the boards, starting with the state board, shift their focus from process to outcomes, the answers to these questions will remain elusive.

Other problems also limit the boards' effectiveness: Regional board members face too many technically difficult decisions, preventing them from focusing on broader policy issues. The boards have struggled to collect and use data, and there is no state-led clearinghouse of scientific research or analysis indicating the best ways to tackle modern water quality problems.

Structural solutions to these problems lie in strengthening the relationship between the state and regional boards, re-focusing gubernatorial appointees on big-picture problems and solutions, reforming the appeals process, creating more avenues for the boards to use science and economic analysis in rule-making, and developing a statewide water data institute to coordinate water quality data gathered throughout the state.

These changes should re-focus the boards on setting priorities with the goal of protecting and improving California's waters. Ultimately, the boards' effectiveness should be measureable by whether its actions improve water quality.

Environmental regulation will always cause conflict, as regulators push for tougher standards, more protections, and, inevitably, more costs. Conflict at the water boards is not inherently a problem. But the Commission found too much conflict about process and not enough confidence that the boards' structure, policies and processes would lead to reasonable, effective solutions. The boards must evolve to rebuild that confidence. Change will be required too to begin showing more clean water success stories.

As the Commission conducted its study in 2008 of the water boards' governance structure, a task force appointed by Governor Arnold Schwarzenegger simultaneously was reviewing governance, water supply

and environmental issues in the Sacramento-San Joaquin River Delta. The Commission's recommendations for a stronger, more proactive State Water Resources Control Board should not be in conflict with its earlier calls for a stronger governance structure for the state's management of the Delta. A strong state water board is essential to developing and implementing the policies that will help restore the Delta ecosystem and maintain water quality for not only the Delta, but the water transferred through it to the farms and cities of Central and Southern California.

The Commission's Study Process

The Commission initiated this study in early 2008 to review the governance structure regarding water quality regulation in the state and the relationship between the State Water Resources Control Board and the nine Regional Water Quality Control Boards. The Commission's goal was to assess the roles of the state and regional boards and the challenges facing the boards in their efforts to appropriately respond to the state's pressing water quality needs. As part of its study, the Commission investigated how to best balance the need for consistent statewide policy and the need for flexibility to handle regional issues. The Commission also explored the state's water quality goals and whether the state and regional boards have policies in place to reach those goals.

As part of the study, the Commission convened two public hearings. At the first public hearing, held in March 2008, the Commission heard from water quality regulators, including the chairwoman of the State Water Resources Control Board, two representatives of regional water quality control boards and the head of the United States Environmental Protection Agency's Region 9 water division. In addition, the Commission was briefed on the history of water quality regulation and the current roles of various state agencies in overseeing state water policy. At the second hearing, in April 2008, the Commission received input from representatives of regulated entities and environmental groups. Hearing witnesses are listed in Appendix A.

The Commission also convened two advisory group meetings during the course of this study. Both meetings included water quality regulators, representatives of regulated entities and environmental groups, legislative staff, and academics interested in water quality regulation. The first meeting, on May 21, 2008, focused on state water quality priorities and the advantages and disadvantages of the regional water quality control board system. The second meeting, on June 25, 2008, included discussion on the Water Quality Improvement Initiative and other possible changes to water quality governance in the state.

A subcommittee meeting, held on August 28, 2008, allowed the Commission to vet some ideas for reform through a group of water quality regulators and representatives of regulated entities and environmental groups.

A list of people who participated in the advisory group and subcommittee meetings is included in Appendix B.

Commission staff received valuable feedback from numerous stakeholders and other water quality experts, attended several State Water Resources Control Board meetings, one regional water quality control board meeting and the October 2008 meeting of the Water Quality Coordinating Council.

All written testimony submitted electronically for each of the hearings, and this report is available online at the Commission Web site, www.lhc.ca.gov.

Appendices & Notes

- ✓ ***Public Hearing Witnesses***
- ✓ ***Little Hoover Commission Public Meetings***
- ✓ ***Selected Acronyms***
- ✓ ***Notes***

Appendix A

Little Hoover Commission Public Hearing Witnesses

Witnesses Appearing at Little Hoover Commission Public Hearing on California's Water Boards, March 27, 2008

Carole Beswick, Chairwoman, Santa Ana Regional Water Quality Control Board

Lisa Beutler, Associate Director, Center for Collaborative Policy

Tam Doduc, Chairwoman, State Water Resources Control Board

Karl Longley, Chairman, Central Valley Regional Water Quality Control Board

Alexis Strauss, Director, Water Division, United States Environmental Protection Agency, Region 9

Witnesses Appearing at Little Hoover Commission Public Hearing on California's Water Boards, April 24, 2008

Chris Crompton, Manager, Environmental Resources Section, Orange County Public Works Department

Laurel Firestone, Co-Executive Director, Community Water Center

Terese Ghio, Vice President of Governmental Relations, Arena Pharmaceuticals

Rear Admiral Leendert "Len" R. Hering, Sr., Commander, Navy Region Southwest

Mick Pattinson, President, Barratt American Homes

Linda Sheehan, Executive Director, California Coastkeeper Alliance

Craig Wilson, Counsel, Community Alliance for Environmental Stewardship

Appendix B

Little Hoover Commission Public Meetings

California's Water Boards Advisory Committee Meeting – May 21, 2008

Desi Alvarez, Deputy City Manager, City of Downey

Arthur Baggett, Board Member, State Water Resources Control Board

Carole Beswick, Chairwoman, Santa Ana Regional Water Quality Control Board

Alf Brandt, Principal Consultant, Assembly Committee on Water, Parks and Wildlife

Kevin Buchan, Senior Coordinator, Bay Area Region and State Water Issues, Western States Petroleum Association

Tony Francois, Attorney/Lobbyist, KP Public Affairs

Craig Johns, Principal, California Resource Strategies, Inc.

Roberta Larson, Attorney, California Association of Sanitation Agencies

Phil Nails, Policy Consultant, Assembly Republican Caucus

John Robertus, Executive Officer, San Diego Regional Water Quality Control Board

Linda Sheehan, Executive Director, California Coastkeeper Alliance

Brian White, Vice President for Legislative Affairs, California Forestry Association

Craig Wilson, Counsel, Community Alliance for Environmental Stewardship

Gary Wolff, Vice Chairman, State Water Resources Control Board

California's Water Boards Advisory Committee Meeting – June 25, 2008

Nate Beason, Supervisor, Nevada County Board of Supervisors

David Beckman, Director, Coastal Water Quality Project, Natural Resources Defense Council

David Bolland, Senior Regulatory Advocate, Association of California Water Agencies

Alf Brandt, Principal Consultant, Assembly Committee on Water, Parks and Wildlife

Geoff Brosseau, Executive Director, California Stormwater Quality Association

Kevin Buchan, Senior Coordinator, Bay Area Region and State Water Issues, Western States Petroleum Association

Ken Farfsing, City Manager, City of Signal Hill

Randal Friedman, California Government Affairs, United States Navy Region Southwest

Mark Grey, Director of Environmental Affairs, Building Industry Association of Southern California

John Herrick, Counsel and Manager, South Delta Water Agency

Craig Johns, Principal, California Resource Strategies, Inc.

Roberta Larson, Attorney, California Association of Sanitation Agencies

Karl Longley, Chairman, Central Valley Regional Water Quality Control Board

Mark Newton, Director, Resources & Environmental Protection, Legislative Analyst's Office

Mick Pattinson, President, Barratt American

Dorothy Rice, Executive Director, State Water Resources Control Board

Brian White, Vice President for Legislative Affairs, California Forestry Association

Craig Wilson, Counsel, Community Alliance for Environmental Stewardship

California's Water Boards Subcommittee Meeting – August 28, 2008

Geoff Brosseau, Executive Director, California Stormwater Quality Association

Catherine Freeman, Senior Fiscal and Policy Analyst, Legislative Analyst's Office

Mark Grey, Director of Environmental Affairs, Building Industry Association of Southern California

Karl Longley, Chairman, Central Valley Regional Water Quality Control Board

Mark Lubell, Associate Professor, Department of Environmental Science and Policy, University of California, Davis

John Robertus, Executive Officer, San Diego Regional Water Quality Control Board

Linda Sheehan, Executive Director, California Coastkeeper Alliance

Gary Wolff, Vice Chairman, State Water Resources Control Board

Appendix C

Selected Acronyms

CARB: California Air Resources Board

Cal/EPA: California Environmental Protection Agency

Caltrans: California Department of Transportation

CEDEN: California Environmental Data Exchange Network

CIWQS: California Integrated Water Quality System

CPR: California Performance Review

CWA: Clean Water Act

DOIT: Department of Information Technology

DWR: Department of Water Resources

EPA: United States Environmental Protection Agency

GAMA: Groundwater Ambient Monitoring and Assessment

IRWMP: Integrated Regional Water Management Plans

LAO: Legislative Analyst's Office

LID: Low Impact Development

MMP: Maximum Minimum Penalty

MS4: Municipal Separate Storm Sewer Systems

MTBE: Methyl Tertiary-butyl Ether

NPDES: National Pollutant Elimination Discharge System

PCBs: Polychlorinated Biphenyl

RWQCBs: Regional Water Quality Control Boards

SCCWRP: Southern California Coastal Water Resources Program

SEP: Supplemental Environmental Project

SFEI: San Francisco Estuary Institute

SWAMP: Surface Water Ambient Monitoring Program

TMDL: Total Maximum Daily Load

WDR: Water Discharge Requirement

WQCC: Water Quality Coordinating Committee

Notes

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16. Claudia Copeland, Congressional Research Service. March 17, 2008. "Clean Water Act: A Summary of the Law." Page 5.
17. Fred Krieger, Michele Pla, Charles Weir, San Francisco Estuary Institute. See endnote 7. Page 10.
18. Ronald B. Robie, Associate Justice, California State Court of Appeal, Third Appellate District. April 21, 2008. Presentation to Water Education Workshop. Page 4.

19. Cindy Lin, US Environmental Protection Agency. January 25, 2008. Testimony to the San Diego Regional Water Quality Control Board, transcribed by the Orange County Watershed and Coastal Resources Division and provided to the Commission.

20. Michael Lauffer, Chief Counsel, State Water Resources Control Board. September 12, 2008. "Simplified Comparison of Key Differences Between the Federal Clean Water Act and California Water Code." Prepared for the Commission.

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22. Porter-Cologne Water Quality Control Act. See endnote 11. Section 130001.

23. SB 1001 (Perata). Bill text.

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VIA E-MAIL

January 11, 2013
Mr. Wayne Chiu, P.E.
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, Ca 92123-4340

Re: Comment Letter– Tentative Order No.R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu."

Dear: Mr. Chiu,

On behalf of Building Industry Association of Southern California, Inc. (BIASC), Construction Industry Coalition on Water Quality (CICWQ) and the members of both, we appreciate the opportunity to provide comments on the San Diego Regional Water Quality Control Board Tentative Order No. R9-2013-0001; NPDES No. CAS0109266, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems ("MS4s") Draining the Watersheds within the San Diego Region (the "Tentative Order"). In addition, we respectfully request that our comment letter submitted to the Regional Board on September 14, 2012 be made a part of our overall comments to the Tentative Order and admitted into the formal administrative record, because the constructive suggestions for permit improvement remain relevant at this point in the Tentative Order development.

BIASC is a nonprofit trade association representing nearly 1,000 member companies, which together have nearly 100,000 employees. For decades, BIASC's members have built the majority of the new homes in Ventura, Los Angeles, Orange, Riverside, and San Bernardino Counties in southern California. CICWQ is an education, research, and advocacy water quality coalition comprised of representatives from five industry trade associations (in addition to BIASC) which are involved in the development of public and private building, infrastructure and roads throughout California (Associated General Contractors, Engineering Contractors Association, Southern California Contractors Association, Engineering and General Contractors Association, and United Contractors). All of the above trade associations, their members and the union labor work force are affected by the post-construction runoff control requirements proposed in the Tentative Order, and this letter is meant to provide the San Diego Regional Board with constructive suggestions for improvement.

We appreciate the Regional Board's earlier release of a precursor to the Tentative Order as an Administrative Draft, and the extensive stakeholder involvement process that ensued over the summer and autumn of 2012. Unfortunately, the Tentative Order does not reflect critically important changes to the Tentative Order's Development Planning requirements which we and many other public and private stakeholders recommended, both during the focused stakeholder meetings and in comments submitted to the Regional Board. Moreover, Regional Board staff does not provide sufficient findings of fact to support the priority project water quality and hydromodification control design criteria and performance standards in the Tentative Order. The requirements proposed in the Tentative Order are vastly different from those contained in the 2010 South Orange and South Riverside County MS4 permits, and there is simply insufficient performance data to demonstrate the need for any change.

We are concerned that key water quality and hydromodification control provisions within the Development Planning section (Section C.3) are (i) unsupported by substantial evidence, (ii) very bad public policy, and (iii) not properly considered as legally required. Specifically, certain provisions: (i) lack sufficient auditing or performance data showing the need for or advisability of such requirements, (ii) lack technical or scientific basis, and (iii) depart without any justification from required and approved technical documents that have been issued by the San Diego Regional Board for priority development projects in San Diego, Orange, and Riverside Counties. In addition, the hydromodification control provisions illuminate the Regional Board's failure to consider the factors required by California Water Code section 13241 – especially subsection (b) thereof.

1. There are no findings of fact to support changes in the requirements to evaluate, design and install LID BMPs (Section E.3.c) when comparing the proposed requirements in the Tentative Order with that of the requirements in the 2010 adopted South Orange and South Riverside County MS4 permits.

The Orange and Riverside County permits have been in effect for a short period of time (<2 years); and there is no data (program audits or annual report data, for example) that we can find that would support any changes to priority development project water quality control design criteria (found in Section E.3.C of the Tentative Order). Moreover, in one particular instance concerning which we and others have repeatedly commented to Regional Board staff, there is no technical justification provided by staff for requiring biofiltration LID BMP to be sized at 1.5 times the remaining design capture volume not reliably retained on-site. Section E.3.c.(3)(b)(i)[c] requires that if biofiltration is used as an alternative compliance method the biofiltration BMP is required to be sized to 1.5 times the design capture volume, which is an increase from the existing South Orange County permit. The permit and the fact sheet provide no technical justification for the 1.5 factor and therefore this requirement should be deleted from the permit. BIASC and CICWQ comment letter submitted to the Regional Board on September

14, 2012 and attachments including suggested permit redline remains relevant in this matter. We have provided this here as Attachment1.

2. There are no findings of fact or supporting technical and scientific data indicating the need for changes in hydromodification control requirements for priority development projects.

As we have commented before, there needs to be (i) an in-stream hydromodification control performance standard using the erosion potential (EP) approach; and (ii) the permit must recognize that there are a number of different types of channel hardening that have been used for armoring in stream systems besides concrete. In Attachment 1, we again make suggestions for improving the consistency of hydromodification control standards with those identified and allowed in the South Orange County MS4 permit.

The Tentative Order provides an "on-site" option for addressing hydromodification through flow duration control. This is an important element of the hydromodification control standard. However the Tentative Order is incomplete in that it lacks an option to assess and demonstrate hydromodification control through in-stream metrics. In many cases, significant development within a watershed has already caused hydromodification impacts. Requiring project-by-project flow duration control for each new project may not address the existing issue as effectively as a regionally-coordinated approach that combines upland control with in-stream remedies. Including the EP standard—as BIASC and CICWQ urge--would enable the development of more comprehensive approaches that include both upland controls and stream modifications (i.e., restoration). This option is critical for more effectively and efficiently protecting the region's aquatic resources.

Additionally, the Tentative Order includes an unnecessarily narrow definition of hardened channels that includes only those channels lined with concrete. Other forms of artificial hardening may be comparably resistant to hydromodification impacts, such as channels that are lined with rip rap, armored with soil cement, or armored with other practices. While the co-permittees or the project proponent should be responsible for demonstrating that a specific channel material is sufficiently stable, the narrow definition currently provided by the Tentative Order does not allow the use of sound engineering judgment and does not allow for use of innovative materials.

The comment letter submitted by BIASC and CICWQ to the Regional Board on September 14, 2012 remains relevant here, as the Regional Board staff did not make any changes to the hydromodification control requirements except for minor exemption allowances for using USGB council's LEED for redevelopment program standards. Exemptions, generally, are welcome and appropriate. But, in practice, referencing a voluntary, national green building and

development certification program for use as part of a NPDES permit does not provide a viable pathway for most priority development projects that are located in already urbanized areas that are served by existing MS4 infrastructure. Exemptions identified in the adopted San Diego Hydromodification Management Plan are appropriate and should be cited and referenced in the Tentative Order, and any reference to USGB LEED standards deleted.

3. Preserve the 2010 adopted San Diego County Hydromodification Management Plan elements

The Regional Board staff has provided no technical justification for the new hydromodification provisions. The HMPs for San Diego and South Orange County are based on sound science and should be allowed time to understand if they are adequate for mitigating hydromodification impacts. The Regional Board adopted the San Diego Hydromodification Management Plan (HMP) in July 2010. Significant work, technical analysis and stakeholder input have gone into the development of the HMP and these requirements have been in effect for just 16 months. Rather than providing separate criteria, the permit should acknowledge implementation of the Regional Board approved HMP as a sufficient mechanism for meeting hydromodification requirements. Of particular note and concern is the removal of exemptions for certain priority development projects (projects in urban areas with greater than 70% existing impervious surface, for example) that discharge to an MS4 system that then discharges into a significantly hardened channel system. It is unquestionably bad public policy to require installation of controls (or payment of in-lieu fees to compensate for the inability to install controls) when there is no threat to the receiving water.

To this end--and for sake of brevity, we support and encourage the Regional Board to accept comments from Orange County Public Works which pertain to the hydromodification control requirements. Changes in permit language as indicated in the County's redline of the Tentative Order would sufficiently address our concerns about the tentative hydromodification control requirements, and we urge the Regional Board to accept these changes.

Regional Board staff has publically stated that the proposed hydromodification control requirements in the Tentative Order are consistent with the 2010 adopted HMP and that only minor adaptation is necessary. That assertion is simply not true and in fact adoption of the Tentative Order requirements will render the HMP obsolete and require a total overhaul. According to the County of San Diego and the co-permittees within the County (and private developer stakeholders), more than $1.5 million have been spent to date developing the plan and conducting required monitoring. By changing the performance standards, requiring hydromodification controls at all priority development projects, and removing standard exemptions that are found in all other 4th term MS4 permits in California, the Regional Board is sweeping away years of program development activities and turning program implementation on

its head. The Tentative Order should explicitly recognize the findings of hydromodification management plans (HMPs) that have been previously approved by this Regional Board. The South Orange County HMP and the San Diego County HMPs were both the products of rigorous technical analysis based on the state of the practice, which were reviewed in detail by Regional Board Staff. The findings of these efforts must not be jeopardized under the new terms of the Tentative Order. *S*pecifically, findings regarding exempt water bodies must be appreciated and upheld, and they should be explicitly recognized in the Tentative Order.

4. The Tentative Order's proposed hydromodification control measures betray the Regional Board's failure to take into account the considerations required by California Water Code section 13241

For years, BIASC and CICWQ have been urging the water boards when developing MS4 permit requirements to address and respect their longstanding legal obligation to take into account the six, specified, non-exclusive factors which are set forth in California Government Code section 13241. The water boards have persistently refused. Most recently (just months ago), the Los Angeles Regional Board dismissed its obligation to consider the Section 13241 factors by noting that it had, in fact, more or less considered two of them (economics and some technical considerations). If the Regional Board here were to adhere to such a position, it would act in violation of California law and without justification.

There is perhaps no greater example of a permit condition written pursuant to a failure to consider the Section 13241 factors than the hydromodification control measures in the Tentative Order – particularly those which impose heroic, expensive engineering standards on development that drains into hardened flood control channels. Section 13241, subsection (b), requires consideration of the "[e]nvironmental characteristics of the hydrological unit under consideration…." By imposing expensive hydromodification control measures even where a receiving flood control system is already firmly hardened, the Tentative Order ignores this Section 13241, subsection (b), factor (obviously so, and regrettably consistent with the Regional Board's general refusal to take into account all six Section 13241 considerations).

BIASC and CICWQ believe that the water boards' persistent refusal to take demonstrably and meaningfully into account the Section 13241 required considerations results from a mistaken view of the applicable law. Specifically, the water boards' seemingly hold to the belief that the "maximum extent practicable" standard in federal law absolves the state agencies of any obligation to apply Section 13241when issuing MS4 permits. If indeed the water boards' legal position is thus, then it reflects a mistaken view of the degree of "federalism" reflected in the Clean Water Act and its interplay with the California Water Code. Moreover, such a position would reflect a failure to apply basic "federal preemption principles," which apply any time a party claims that federal law displaces state law.

BIASC and CICWQ urge the Regional Board to reconsider and reverse its refusal to apply meaningfully all six Section 13241 considerations, and to correct the Tentative Order accordingly.

Concluding Remarks:

BIASC and CICWQ have been active participants and contributors to the creation of improved MS4 permits across southern California. We continue to believe that rational, *implementable*, and *effective* permit requirements are critical to achieving great progress concerning water quality and our environment. We hope that these comments are received in the manner in which they are intended – to create a workable permit that improves water quality to the maximum extent practicable. We remain committed to a positive dialog with the Regional Board and its staff – one that will result in an informed, balanced and effective permit.

If you have any questions or want to discuss the content of our comment letter, please feel free to contact me at (951) 781-7310, ext. 213, (909) 525-0623, cell phone, or mgrey@biasc.org.

Sincerely,

Mark Grey, Ph.D.
Director of Environmental Affairs and Technical Director
Building Industry Association of Southern California and
Construction Industry Coalition on Water Quality

Enclosures:
Attachment 1

cc. Andy Henderson, Esq., Building Industry Legal Defense Foundation

VIA E-MAIL

September 14, 2012
Ms. Laurie Walsh, Senior Engineer
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, Ca 92123-4340

Re: ADMINISTRATIVE DRAFT REGIONAL MUNICIPAL SEPARATE STORM SEWER SYSTEM (Tentative Order No. R9-2012-0011)

Dear: Ms. Walsh

On behalf of the Building Industry Association of Southern California, Inc. (BIA/SC) and the Construction Industry Coalition on Water Quality (CICWQ) and the members of both, we appreciate the opportunity to provide comments on the Administrative Draft of the San Diego County Regional MS4 Permit (Administrative Draft Permit). We submit these comments in addition to and in support of comments made by our affiliate in San Diego County, the Building Industry Association of San Diego and its coalition partners, and comments submitted by Rancho Mission Viejo.

BIA/SC is a nonprofit trade association representing nearly 1,000 member companies, which together have nearly 100,000 employees. BIA/SC's members have, for decades, built the majority of the homes in Ventura, Los Angeles, Orange, Riverside, and San Bernardino Counties in southern California. CICWQ is a water quality coalition comprised of representatives from five industry trade associations (in addition to BIA/SC) involved in the development of public and private building, infrastructure and roads throughout California (Associated General Contractors, Engineering Contractors Association, Southern California Contractors Association, Engineering and General Contractors Association, and United Contractors). All of the above trade associations and their members and the union labor work force are affected by the post-construction runoff control requirements proposed in the Draft Permit, and this letter and supporting attachments are intended to provide the San Diego Regional Board staff with constructive suggestions for improvement.

We appreciate the Regional Board's release of the Administrative Draft Permit in April 2012, and the extensive stakeholder involvement process that ensued over the summer of 2012. The comments provided here are intended to further meet the permit's underlying objective of protecting and improving water quality within the watersheds administered by the San Diego Regional Board. Our comments, supporting attachments, and suggested redline permit language

modifications reflect years of working not only on MS4 permits issued by the San Diego Board, but other MS4 permits administered by the Los Angeles, Santa Ana, and San Francisco Bay Regional Water Quality Control Boards.

We have four primary concerns with the Administrative Draft Permit content and the following discussion summarizes those concerns and provides the technical basis for those concerns including supporting attachments:

1. **Administrative Draft Permit Provision E. 3.c.(2)(c) establishes a zero discharge standard for biofiltration-type LID BMPs that are designed with an outlet/underdrain. This type of LID BMP cannot meet the on-site design capture volume standard as it is written. Such a zero discharge standard is scientifically and technically unsound and unsupported.**

Biofiltration is an established LID BMP for use in attempting to mimic pre-development hydrology. The US EPA, in multiple guidance documents produced since 2006, have recognized the use of biofiltration-type systems such as curb contained biofilters, bioswales, rain gardens, and using landscape areas for impervious area disconnection as essential LID BMP elements to include in land development projects, a few of which are cited below. The inclusion of biofiltration BMPs in US EPA's menu is a reflection of the practical limitations to retention of stormwater – retention practices are not universally feasible or desirable. When appropriately selected and designed, biofiltration BMPs achieve high levels of pollutant removal, which may exceed pollutant removal achieved in retention BMPs, particularly in cases where retention BMPs are inappropriately applied.

The retention requirement is contrary to EPA's definition of LID because it disfavors development strategies designed to appropriately "filter" runoff, such as bioretention cells or other vegetated LID BMPs. There are five principal EPA documents regarding LID; and four of them identify the appropriate roles of biotreatment-type BMP, such as detention (i.e., slow down, treat through vegetation, and then release across property lines), filtration, and surface release of stormwater.

In a compilation of case studies by EPA, most of 17 exemplary projects included biotreatment elements, such as bioretention, swales, and wetlands. *See* U.S. EPA 841-F-07-006. Each of two case studies described in another EPA document (s*ee* Attachment 1 at pp. 1-2, EPA 841-B-00-005) included the use of underdrains, and the example in one of the two specifically fed into the MS4 system at issue. Another EPA document updated in January 2009 refers to the many practices used to adhere to LID principles of promoting a watershed's hydrologic and ecological functions, such as bioretention facilities and rain gardens. *See* Attachment 2 at p. 2, EPA-560-F-07-231 (describing "an under-drain system to release treated stormwater off site," permitting planted areas to "safely allow filtration and evapotranspiration of stormwater");

http://www.epa.gov/owow/nps/lid/ (fact sheet describing under-drains used to release treated stormwater off site and permitting planted areas to safely allow filtration of stormwater). Thus, EPA's literature and guidance clearly recognize the important and even necessary role that biofiltration/biotreatment approaches play in real-world implementation of LID principles.

The National Research Council, in their 2008 Report to Congress titled "Urban Stormwater Management in the United States" cite the use of biofiltration and bioretention systems in improving water quality and in attempting to mimic predevelopment hydrology at many different site contexts and locations across the United States. The 2008 NRC report contains and cites numerous examples of using biofiltration type systems to reduce runoff volume and pollutant loads. The 2008 NRC Report clearly recognizes the role that biofiltration systems play in the LID BMP feasibility and selection process, and in achieving runoff management goals. The report states "In some situations ARCD (Aquatic Resources Conservation Design) practices will not be feasible, at least not entirely, and the SCMs [stormwater control measures] conventionally used now and in the recent past (e.g., retention/detention basins, biofiltration without soil enhancement, and sand filters) should be integrated into the overall system to realize the highest management potential." Note that the NRC report definition of ARCD includes both retention and biofiltration elements.

From a management perspective, a review of 4th Term Phase I MS4 permits within California (San Francisco Bay Area, Sacramento Area, North and South Orange County, Western and Southern Riverside County, and San Bernardino County) shows that the use of biofiltration to meet water quality volume and flow control performance standards is clearly allowed (See matrices submitted by BIA/SC_CICWQ at the August 22, 2012 Stakeholder Meeting and provided to the Regional Board by Mark Grey on August 24, 2012). These Regional Boards in California recognize that biofilter-type LID BMPs are an integral component of applying site design principles which seek to mimic pre-development hydrology. Furthermore, these permits implement a clear LID BMP feasibility and selection process, one that first requires examination of on-site retention systems (infiltration, harvest and use, and evapotranspiration), before moving to the evaluation and potential selection of bioinfiltration (some infiltration achieved) and biofiltration systems. This feasibility evaluation hierarchy, which is clearly explained in the South Orange County and South Riverside County MS4 permits adopted by the San Diego Regional Board in 2009 and 2010, respectively, must be preserved and included in the next version of the Administrative Draft Permit.

In summary, the zero discharge standard established by the Administrative Draft Permit significantly narrows the definition of LID, which is contrary to US EPA guidance, the 2008 NRC Report, and the standards established in recently-adopted Permits by the San Diego Regional Board and other Regional Boards. In essence, the proposed provisions would establish a standard that (i) will be impracticable in a relatively large proportion of sites, and (ii) has not

been demonstrated to be necessary to protect receiving water quality. We provide in Attachment 3 suggested permit language to address the continued use of biofiltration.

2. **A mitigation requirement is established when using flow-thru biofiltration-type LID BMPs to manage that portion of the SWQDv that is not retained on-site. This requirement is inconsistent with all other adopted Phase I MS4 permits in California and nationally. Biofiltration and bioretention BMPs are established LID practices; requiring accompanying mitigation of SWQDv that has already been biofiltered penalizes and dis-incentivizes use of these controls.**

Equally problematic, because it does not allow biofiltration type LID BMPs to meet the on-site storm water quality design volume (SWQDv) standard, is the current requirement in Administrative Draft Permit Provision E. 3.c.(2)(c) to "perform mitigation for the portion of the pollutant load that is not retained on-site." In other words, the draft provisions would require that, if a project proponent cannot retain 100 percent of the SWQDv on-site, and must therefore use biofiltration LID BMPs (with a treated discharge), then the use and installation of these systems will trigger an off-site mitigation or in-lieu fee program participation requirement. This provision in the Administrative Draft Permit is technically unjustified, disfavors the use of all types of recognized biofiltration LID BMPs, and could theoretically require a project proponent to not only pay for the installation and O&M of a biofiltration LID BMP, but also require mitigation or fee payment for that portion of runoff managed by it.

Biofiltration BMPs including natural treatment systems such as those that are part of the Irvine Ranch Water District's Natural Treatment System in Orange County (a regional example) can remove vast quantities of pollutant load, and provide other benefits such as habitat, flood control, and aesthetic, recreational and educational value. To relegate multi-benefit biofiltration or biotreatment BMPs applied at a site scale to a status inferior to on-site retention BMPs is not justified on a water quality basis, and is poor public policy, essentially depriving the region of an extremely important and effective approach to managing water quality.

While we agree that project proponents should be required to retain stormwater where technically and economically feasible, there are numerous conditions beyond a project's control that make retention infeasible, undesirable and/or ineffective. For example, in achieving a zero discharge standard, it is necessary to either maintain pre-project ET (which is generally impracticable) or increase the volume of stormwater that is infiltrated (which is the common result). Over-infiltrating rainwater can have adverse consequences such as altering the natural flow regime of the receiving waters such that riparian habitat changes, mobilizing pre-existing contamination in shallow groundwater, increasing inflow and infiltration to sanitary sewers, causing damage from rising groundwater, and other potential effects. By discouraging the use of biofiltration LID BMPs where there are more appropriate than retention, the Administrative

Draft Permit irresponsibly encourages the use of retention where it may have adverse consequences.

Retention BMPs are not necessarily more effective than biofiltration BMPs as the Administrative Draft Permit implies, especially considering the back-to-back-to-back nature of storm systems that arrive in southern California during winter months and deliver the majority of total rainfall volume. The Administrative Draft Permit establishes a SWQDv that must be retained, but does not specify the time over which this volume must be drawn down (i.e., drained) in order to have capacity for the volume from subsequent storms. The rate at which the SWQDv can be drained is a function of the infiltration rates of soils and the demand for harvested water. Where soils are not sufficiently permeable and/or where harvested water demands are moderate to low, the drawdown time of retention BMPs can be in the range of several days to several weeks.

In comparison, biofiltration BMPs are designed with engineered soils that can generally drain the SWQDv much more quickly, on the order of several hours. In cases where retention opportunities are limited, this results in a higher level of capture and treatment by biofiltration BMPs than retention BMPs, which can more than offset the lower "treatment efficiency" afforded by biofiltration compared to full retention. For example, based on rigorous technical analysis contained in the Orange County Technical Guidance Document (Figure III.2, Page III-11), a hypothetical biofiltration BMP draining in 12 hours would achieve approximately 25 percent greater treatment of average annual stormwater runoff volume than an equivalently sized retention BMP that drains in 72 hours and approximately 60 percent greater treatment than a retention BMP that drains in 10 days.

Because drawdown time is an important factor in (i) assessing BMP effectiveness and (ii) evaluating the site-specific determination of whether retention or biofiltration are preferable, we strongly recommend (in addition to allowing the use of biofiltration or biotreatment systems to meet the retention standard) including a secondary performance metric of managing 80 percent of annual runoff volume using continuous simulation modeling. This provides a means of accounting for the performance of strictly on-site retention BMPs versus the addition of biofiltration or biotreatment BMPs which can be designed to manage a greater volume of average annual runoff volume than retention BMPs of the same size. The total amount of water captured and treated and associated pollutant load reduction should be a primary deciding factor in whether retention or biofiltration BMPs are selected for a given project. As written, the Administrative Draft Permit strongly discourages an entire group of effective practices which have the potential to provide better protection of water quality, when compared to retention, in a wide range of cases. Attachment 3 provides suggestions for permit language which corrects these deficiencies.

3. Hydromodification control measures should allow use of the EP method to meet in stream standards; recognize multiple types of channel hardening when evaluating applications for hydromodification control exemptions

In Attachment 3, we also make suggestions for improving the consistency of hydromodification control standards with those identified and allowed in the South Orange County MS4 permit. Specifically, we recommend providing for an in-stream hydromodification control performance standard using the erosion potential (EP) approach and recognizing that there are a number of different types of channel hardening that have been used for armoring in stream systems besides concrete.

The Administrative Draft Permit provides an "on-site" option for addressing hydromodification through flow duration control. This is an important element of the hydromodification control standard. However the Administrative Draft Permit is incomplete without an option to assess and demonstrate hydromodification control through in-stream metrics. In many cases, significant development within a watershed has already caused hydromodification impacts. Requiring project-by-project flow duration control for each new project may not address the existing issue as effectively as a regionally-coordinated approach that combines upland control with in-stream remedies. Including the EP standard enables the development of more comprehensive approaches that include both upland controls and stream modifications (i.e., restoration). This option is critical for more effectively and efficiently protecting the region's aquatic resources.

Additionally, the Administrative Draft Permit includes an unnecessarily narrow definition of hardened channels that includes only those channels lined with concrete. Other forms of artificial hardening may be comparably resistant to hydromodification impacts, such as channels that are lined with rip rap, armored with soil cement, or armored with other practices. While the Permittees or the project proponent should be responsible for demonstrating that a specific channel material is sufficiently stable, the narrow definition currently provided by the Administrative Draft Permit does not allow the use of sound engineering judgment and does not allow for use of innovative materials.

Finally, the Administrative Draft Permit should explicitly recognize the findings of hydromodification management plans (HMPs) that have been previously approved by this Board. The South Orange County HMP and the San Diego County HMPs were both the products of rigorous technical analysis based on the state of the practice, which were reviewed in detail by Board Staff. The findings of these efforts must not be jeopardized under the new terms of the Administrative Draft Permit. Specifically, findings regarding exempt water bodies must be appreciated and upheld, and they should be explicitly recognized in the Administrative Draft Permit per our suggested redline.

4. **The Permit must preserve important provisions for watershed level design and implementation of LID BMPs.**

The proposed development project criteria and requirements in the Administrative Draft Permit do not include the language in the current South Orange County Permit that provides for Alternative Compliance for Watershed-Based Planning (See page 40-41 of the 2009 Permit). We ask that the Regional Board continue to recognize the protections to water quality and enhancements to water bodies which are achieved through watershed-based projects such as the Rancho Mission Viejo Ranch Plan, as it has in the current South County MS4 permit, and define Watershed Planning as an alternative and co-equal approach to the project-specific requirements. Attachment 3 to this submittal contains suggested redline language for addition to the Administrative Draft Permit.

Concluding Remarks:

BIA/SC and CICWQ have been active participants and contributors to the creation of improved MS4 permits across southern California. We continue to believe that rational, *implementable*, and *effective* permit requirements are critical to achieving great progress concerning water quality and our environment. We hope that these comments are received in the manner in which they are intended – to continue the discussion of how we can create a workable permit that improves water quality to the maximum extent practicable. We remain committed to a positive dialog with the Board and its staff – one that will result in an informed, balanced and effective permit.

If you have any questions or want to discuss the content of our comment letter, please feel free to contact me at (951) 781-7310, ext. 213, (909) 525-0623, cell phone, or mgrey@biasc.org.

Sincerely,

Mark Grey, Ph.D.
Director of Environmental Affairs and Technical Director
Building Industry Association of Southern California and
Construction Industry Coalition on Water Quality

United States
Environmental Protection Agency

Office of Water (4203)
Washington, DC 20460

EPA-841-B-00-005A
October 2000

Bioretention Applications

Inglewood Demonstration Project, Largo, Maryland
Florida Aquarium, Tampa, Florida

Key Concepts:

- Retrofits
- Structural Controls
- Source Controls

LOW-IMPACT DEVELOPMENT CENTER

Project Benefits:

- Retrofit Opportunity
- Pollutant Removal
- Volume Reduction
- Cost-Effectiveness

Introduction

Two case studies demonstrate the potential to use integrated management plans (IMPs) in the design of new parking facilities and as retrofits for existing parking facilities. The Inglewood study in Largo, Maryland, compared the pollutant removal efficiency of a bioretention cell in a laboratory setting to that of a comparable facility constructed in a parking lot. The Florida Aquarium study in Tampa, Florida, included monitoring of several storm events for volume and water quality control.

Inglewood Project Area

The project area is an existing 5-acre outdoor parking area located in a highly urbanized office park adjacent to Interstate 95. Runoff from adjacent areas does not flow across the lot. The slope of the parking area is approximately 3 percent. Parking stalls are aligned at 90-degree angles, and there are approximately 30 cars in each row of an aisle. At the end of each aisle are planting areas surrounded by curbs and gutters. Curb drainage inlets have been placed in some of the islands to intercept and collect runoff as sheet flow, which is piped to a downstream regional stormwater management facility.

Inglewood Project Description

The Inglewood project consisted of a laboratory segment and a field segment. The laboratory segment involved construction of a planter box filled with a typical bioretention facility soil mixture (50 percent construction sand, 20 to 30 percent topsoil, and 20 to 30 percent compost). This facility is approximately half the size in volume of the Inglewood facility. The box was planted with representative plants and mulched. A synthetic stormwater mixture was applied and the pollutant removal efficiency, temperature, and runoff volume rate were measured. The pollutant mix included metals (copper, lead, and zinc), phosphorus, organic nitrogen, and nitrate.

A landscaped island measuring approximately 38 feet by 12 feet was chosen as the retrofit area. The island contains a curb inlet that drains into the municipal storm drain system. Almost the entire drainage area is impervious. A 4-foot slot was cut into the curb immediately before the inlet. The landscaped island was then excavated to a depth of 4 feet. An underdrain was installed and tied into the bottom of the existing inlet to completely drain the planting soil to avoid oversaturation. The underdrain was covered with 8 inches of 1- to 2-inch gravel and backfilled with typical bioretention soil mix. The backfill extended to a depth of about 12 inches below the top of the curb, which allows for a ponding depth of approximately 6 inches of water in the island

Figure 1. Bioretention landscaping at the Inglewood demonstration project site.

Table 1. Summary of bioretention pollutant removal results for the Inglewood demonstration project.

Pollutant	Input mean ± standard deviation	Output mean ± standard deviation	Output range	Output percent removal mean ± standard deviation
Cu dissolved (μg/L)	120 ± 27	63 ± 6.5	55–75	48 ± 12
Cu total (μg/L)	120 ± 27	69 ± 9.4	55–85	43 ± 11
Pb dissolved (μg/L)	54 ± 9.4	11 ± 6	6.7–25	79 ± 26
Pb total (μg/L)	54 ± 9.4	16 ± 7	6.7–26	70 ± 23
Zn dissolved (mg/L)	1.1 ± 0.021	0.24 ± 0.44	0.11–0.56	78 ± 29
Zn total (mg/L)	1.1 ± 0.021	0.39 ± 0.44	0.12–1.4	64 ± 42
Ca (mg/L)	44 ± 6.4	32 ± 6.1	24–41	27 ± 14
Cl^- (mg/L)	5.1 ± 0.48	162 ± 80	74–228	3,000[a]
Na (mg/L)	3.1	359 ± 170	68–497	11,000[a]
P (mg/L)	0.83	0.11 ± 0.017	0.10–0.13	87 ± 2
TKN (mg/L as N)	6.9 ± 0.81	2.3 ± 0.64	1.7–3.0	67 ± 9
NO_3^- (mg/L as N)	1.3 ± 0.05	1.1 ± 0.15	0.94–1.2	15 ± 12

[a]Shows percent production.

before a backwater is created at the curb opening. Subsequently the area was planted and covered with 3 inches of shredded hardwood mulch. Figure 1 shows the bioretention area after vegetation was established.

The stormwater mixture was applied to a 50-square-foot area in the field facility at a rate of 1.6 inches per hour for 6 hours. The removal rates for several pollutants are shown in Table 1. In addition to pollutant removal, the runoff temperature was lowered approximately 12 °C as the runoff was processed and filtered through the soil mixture. Most of the pollutant removal process occurred in the mulch layer.

A similar field investigation was conducted on an 8-year-old facility, and the metals removal rate was much higher (Davis et al., 1998). This effect might be attributed to slower flow rates through the soil, which has higher clay content, as well as greater pollutant uptake by vegetation.

Inglewood Project Summary and Benefits

This study showed the feasibility of retrofitting an existing parking facility and demonstrated the consistency of laboratory and field pollutant removal performance. The retrofit cost approximately $4,500 to construct and treats approximately one-half acre of impervious surface. The bioretention retrofit was a more cost-effective way to filter pollutants than many proprietary devices designed to treat the same volume of runoff. These proprietary devices could cost $15,000 to $20,000, would be more expensive to maintain, and would not significantly decrease runoff volume or temperature. Also, bioretention areas offer the ancillary benefit of aesthetic enhancement. It is interesting to note that a drought occurred after the installation of the plants, and although many of the other plants in the parking lot died or experienced severe drought stress, the plants in the bioretention facility survived because of the retained water supply.

Florida Aquarium Project Area

The Florida Aquarium site is an 11.5-acre, asphalt and concrete parking area that serves approximately 700,000 visitors per year. Runoff was controlled using the following IMPs:

- End-of-island bioretention cells
- Bioretention swales located around the parking perimeter
- Permeable paving
- Bioretention strips between parking stalls
- A small pond to supplement storage and pollutant removal

Figure 2 is an illustration of the site that details the type and location of runoff controls.

Florida Aquarium Project Description

A total of 30 storm events were monitored for one year at the Florida Aquarium site during 1998-1999. The Southwest Florida Water Management

District measured rainfall and flow from eight of the subcatchments in the parking area and collected water quality samples on a flow-weighted basis. Comparisons between pavement areas controlled by IMPs and uncontrolled asphalt areas were made for peak runoff rate, runoff volume, runoff coefficients, and water quality. Sediment cores from swales also were collected and analyzed.

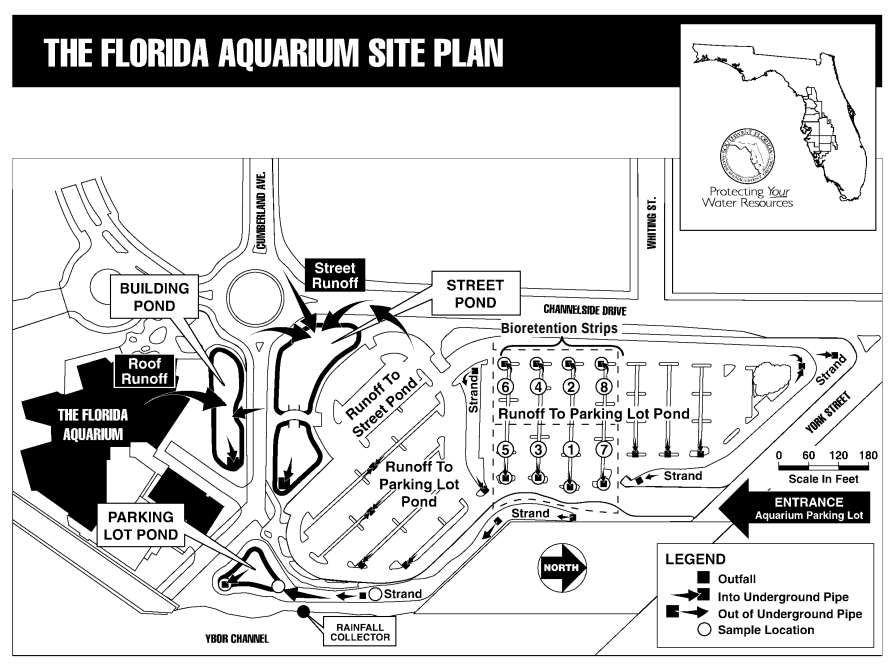

Figure 2. Layout of the Florida Aquarium site with IMPs. The eight basins outlined with dotted lines were evaluated in this part of the study.

Florida Aquarium Project Summary and Benefits

The parking areas controlled by IMPs showed a significant reduction in runoff volume and peak runoff rate. Table 2 shows pollutant load reductions for three pavement types; reduction is compared to pollutant loads in runoff from a basin without a swale. Much of the pollutant reduction is attributed to the reduced runoff in basins with swales. Because the swales are only the first element in the treatment train, even better removal efficiencies should be seen when data are analyzed for the entire system.

Table 2. Load efficiency of pollutants expressed as percent reduction for three types of pavement at the Florida Aquarium site.

Constituents	Percent pollutant reduction[a]		
	Asphalt w/swale	Cement w/swale	Porous w/swale
Ammonia	45	73	85
Nitrate	44	41	66
Total Nitrogen	9	16	42
Orthophosphorus	-180	-180	-74
Total Phosphorus	-94	-62	3
Suspended Solids	46	78	91
Copper	23	72	81
Iron	52	84	92
Lead	59	78	85
Manganese	40	68	92
Zinc	46	62	75

[a]The basins with swales were compared to a basin without a swale to determine the amount of reduction in pollutant loads possible using these small alterations. Notice that the efficiencies for phosphorus are negative, indicating an increase in phosphorus load in the basins with a swale.

References

Davis, A., M. Shokouhian, H. Sharma, and C. Minami, 1998. *Optimization of Bioretention Design for Water Quality and Hydrologic Characteristics*. Report 01-04-31032. Final report to Prince George's County, Maryland.

Rushton, B. 1999. *Low Impact Parking Lot Design Reduces Runoff and Pollutant Loads: Annual Report #1*. Southwest Florida Watershed Management District, Brooksville, Florida.

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Design Principles

for Stormwater Management on Compacted, Contaminated Soils in Dense Urban Areas

EPA's Brownfields Program is designed to empower states, communities, and other stakeholders in economic redevelopment to work together in a timely manner to prevent, assess, safely clean up, and sustainably reuse brownfields. A brownfield is a property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. EPA's Brownfields Program provides financial and technical assistance for brownfield revitalization, including grants for environmental assessment, cleanup, and job training.

What is Green Infrastructure?

Most development and redevelopment practices cover large areas of the ground with impervious surfaces such as roads, driveways, sidewalks, and new buildings themselves, which then prevent rainwater from soaking into the ground. These hard surfaces increase the speed and amount of stormwater that runs into nearby waterways, carrying pollutants and sediment each time it rains.

Green infrastructure seeks to reduce or divert stormwater from the sewer system and direct it to areas where it can be infiltrated, reused or evapotranspirated. Soil and vegetation are used instead of, or in conjunction with, traditional drains, gutters, pipes and centralized treatment areas. In many new and redevelopment projects, green infrastructure is implemented to manage and mitigate the polluted runoff created by precipitation that falls on rooftops, streets, sidewalks, parking lots and other impervious surfaces.

How can Green Infrastructure be Applied to Brownfield Sites?

Preparing brownfields for redevelopment often requires capping of contaminated soils, creating even larger impervious surfaces. The challenge for managing stormwater on brownfield sites is allowing this capping while mitigating the impervious surface conditions that can negatively impact local waterways.

Unlike many conventional developments, impervious footprints on brownfields cannot always be minimized through site designs that incorporate more porous surfaces to allow for infiltration. Direct infiltration on a brownfield site may introduce additional pollutant loads to groundwater and nearby surface waters. However, green infrastructure practices exist that can retain, treat and then release stormwater without it ever coming in contact with contaminated soils.

A bioswale in Wilmington, Delaware, designed to absorb and retain stormwater runoff.

The University of Michigan's School of Natural Resources and Environment developed design guidelines that use low impact development techniques on contaminated sites. Using a former industrial site in Flint, Michigan, called Chevy in the Hole, graduate students considered and refined methods to prevent residual contamination from moving with stormwater.

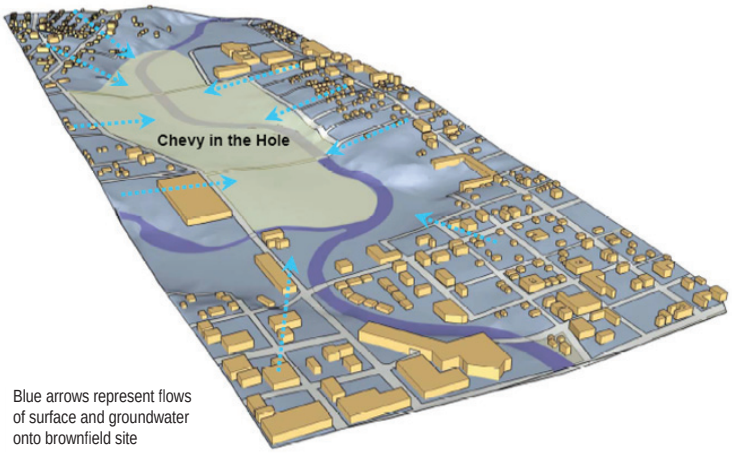

Blue arrows represent flows of surface and groundwater onto brownfield site

Design Considerations

A key component of using green infrastructure for brownfield sites is treatment and storage of stormwater, rather than complete infiltration. Most brownfields that have residual contamination need caps, so vegetated areas need to be located above caps and fitted with underdrain systems to remove overflow stormwater.

Development and redevelopment projects should start with keeping existing trees onsite, minimizing compaction of earth that inhibits water infiltration, and planting trees and other vegetation in areas where none exists. Retaining existing tree cover and vegetated areas helps infiltrate and evapotranspirate stormwater runoff while intercepting large amounts of rainfall that would otherwise enter waterways as runoff.

Buildings and other impervious surfaces can be strategically located to act as caps over areas with known contamination. Areas with fill caps can include soils and vegetation above the cap in the form of swales or rain gardens. If fitted with an under-drain system to release treated stormwater off site, these planted areas can safely allow filtration and evapotranspiration of stormwater. Additional features like impermeable liners or gravel filter blankets can be coupled with modified low impact development (LID) practices that safely filter stormwater without exposing the water to contaminated soils.

Green roofs are an ideal way to reduce the runoff from building roofs by encouraging evapotranspiration of rainwater. Another option for brownfield sites is the capture and reuse of stormwater for non-potable uses; this can include runoff storage in rain barrels for irrigation of green roofs or landscaped areas, or in cisterns that store rainwater for toilet flushing and other uses.

Site location within the watershed is very important. In particular, projects in groundwater recharge areas should avoid low impact development practices that promote infiltration, and use techniques that directly discharge treated stormwater instead. Furthermore, new and redeveloped sites near brownfields should use green infrastructure practices to prevent additional runoff from flowing onto potentially contaminated areas.

Overall, when developing a stormwater management plan on a brownfield, surrounding sites must be considered. *(Source: Flint Futures: Alternative Futures for Brownfield Redevelopment in Flint, Michigan.)*

The Matthew Henson Conservation Center in Washington, DC, utilizes a green roof.

General Principles for Using Green Infrastructure on Brownfield Sites

Guideline #1: Differentiate between groups of contaminants as a way to better minimize risks.

Guideline #2: Keep non-contaminated stormwater separate from contaminated soils and water to prevent leaching and spreading of contaminants.

Guideline #3: Prevent soil erosion using vegetation, such as existing trees, and structural practices like swales or sediment basins.

Guideline #4: Include measures that minimize runoff on all new development within and adjacent to a brownfield. These measures include green roofs, green walls, large trees, and rainwater cisterns.

Definitions

Bioswales are open channels with a dense cover of vegetation where runoff is directed or retained to evapotranspirate and filter.

Evapotranspiration is the return of water to the atmosphere either through evaporation or by plants.

Green Infrastructure and ***Low Impact Development (LID)*** both refer to systems and practices that use or mimic natural processes to infiltrate, evapotranspirate or reuse stormwater or runoff on the site where it is generated.

Green roofs can be used to effectively reduce or eliminate runoff from small and medium sized storms. A soil mixture is placed over a waterproof membrane and drainage system and then planted with water absorbent and drought tolerant plants. Most systems also have root barriers. These roofs soak up stormwater and release it back into the atmosphere through evaporation and plant respiration, while draining excess runoff.

Rain gardens serve the same purpose as stormwater planters and are appropriate where there is more area to plant vegetation. Sizing is dependent on the area of impervious surfaces draining to the rain garden, but they can be designed to only treat a portion of the runoff so they can be placed in most situations.

Stormwater harvest and reuse. Rainwater harvested in cisterns, rain barrels, or other devices may be used to reduce potable water used for landscape irrigation, fire suppression, toilet and urinal flushing, and custodial uses. Storage and reuse techniques range from small-scale systems (e.g., rain barrels) to underground cisterns that may hold large volumes of water.

Stormwater planters. Downspouts can be directed into stormwater planters. These planters are used to temporarily detain, filter and evapotranspirate stormwater using plant uptake.

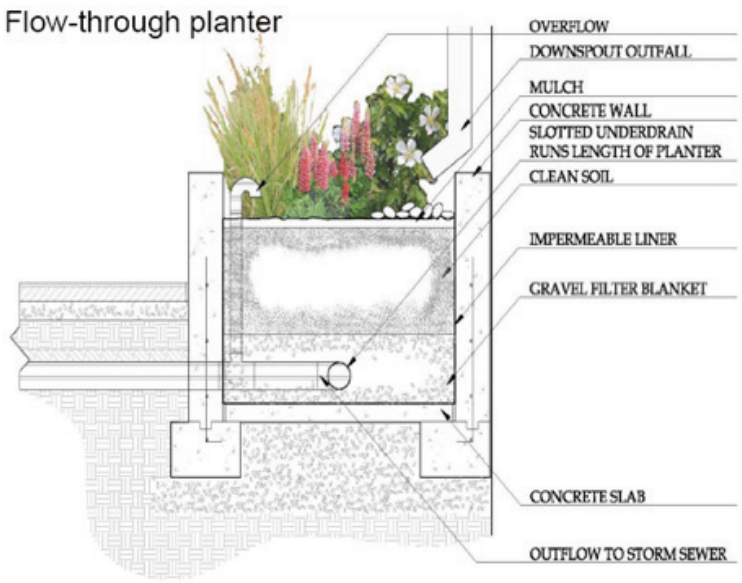

Additional Resources

The Emeryville, California *Stormwater Guidelines for Green, Dense Redevelopment* provides guidance on using vegetative stormwater treatment measures for this dense, brownfield-laden city: www.ci.emeryville.ca.us/planning/stormwater.html.

EPA's *Green Infrastructure Web site* (www.epa.gov/npdes/greeninfrastructure) provides definitions, case studies and performance data for various practices that might be applicable to brownfield sites.

The Low Impact Development Center is dedicated to research, development, and training for water resource and natural resource protection issues. The Center focuses specifically on furthering the advancement of Low Impact Development technology: www.lowimpactdevelopment.org.

Green Roofs for Healthy Cities collects and publishes technical information on green roof products and services: www.greenroofs.org.

The Center for Watershed Protection's Better Site Design Tools provide links to various better site design resources and publications: www.cwp.org/PublicationStore/bsd.htm.

American Rivers' *Catching the Rain: A Great Lakes Resource Guide for Natural Stormwater Management* describes a variety of low impact development strategies that can be implemented in a wide range of built environments. Available at: www.americanrivers.org/site/DocServer/CatchingTheRain.pdf?docID=163

NRDC's *Rooftops to Rivers: Green Strategies for Controlling Stormwater and Combined Sewer Overflows* is a policy guide for decision makers looking to implement green strategies in their own area, including nine case studies of cities that have successfully used green techniques to create a healthier urban environment. Available at: www.nrdc.org/water/pollution/rooftops/contents.asp

Portland's (Oregon) *Trees for Green Streets: An Illustrated Guide* is a guidebook that helps communities select street trees that reduce stormwater runoff from streets and improve water quality. Available at: www.metro-region.org/article.cfm?articleID=263

Seattle's *pilot Street Edge Alternatives Project (SEA Streets)* is designed to provide drainage that more closely mimics the natural landscape prior to development than traditional piped systems. Good information can be found at: www.seattle.gov/util/About_SPU/Drainage_&_Sewer_System/Natural_Drainage_Systems/Street_Edge_Alternatives/index.asp

EPA's *Protecting Water Resources with Higher-Density Development* report helps communities better understand the impacts of higher and lower density development on water resources. The findings indicate that low-density development may not always be the preferred strategy for protecting water resources. Available at: www.epa.gov/dced/water_density.htm.

Portland Metro's (Oregon) *Green Streets: Innovative Solutions for Stormwater and Stream Crossings* is a handbook that describes stormwater management strategies and includes detailed illustrations of "green" street designs that allow infiltration and limit stormwater runoff. Available at www.metro-region.org/article.cfm?articleID=262

EPA's *Protecting Water Resources with Smart Growth* is a report intended for audiences already familiar with smart growth concepts who seek specific ideas on how techniques for smarter growth can be used to protect water resources. The report describes 75 policies that communities can use to grow in the way that they want while protecting their water quality. Available at: www.epa.gov/dced/water_resource.htm

EPA's *Using Smart Growth Techniques as Stormwater Best Management Practices* reviews nine common smart growth techniques and examines how they can be used to prevent or manage stormwater runoff. Available at: www.epa.gov/dced/stormwater.htm

EPA's *Brownfields Program Website* (www.epa.gov/brownfields) provides information on and resources for assessing, cleaning up and redeveloping brownfields, including grant funding opportunities.

3. Development Planning

Each Copermittee must use their land use/planning authorities to implement a development planning program that includes, at a minimum, the following requirements.

a. PERMANENT BMP REQUIREMENTS FOR ALL DEVELOPMENT PROJECTS

Each Copermittee must prescribe the following BMP requirements during the planning process (i.e. prior to project approval and issuance of grading or building permits) for all pollutant-generating[14] development projects (regardless of project type or size), where local permits are issued~~, including unpaved roads and flood management projects:~~

(1) General Requirements

(a) All BMPs must be located so as to remove pollutants from runoff prior to its discharge to any receiving waters~~, and as close to the source as possible~~;

(b) Multiple development projects may use shared permanent BMPs as long as construction of any shared BMP is completed prior to the use or occupation of any development project from which the BMP will receive runoff; and

(c) Permanent BMPs must not be constructed within a waters of the U.S. or waters of the state except those that have obtained a CWA Section 401 Water Quality Certification or Waste Discharge Requirement as applicable.

(2) Source Control BMP Requirements

The following source control BMPs must be implemented at all development projects where applicable and feasible:

(a) Prevention of illicit discharges into the MS4;

(b) Storm drain system stenciling or signage;

(c) Properly designed outdoor material storage areas;

(d) Properly designed outdoor work areas;

(e) Properly designed trash storage areas; ~~and~~

~~(f) Any additional BMPs necessary to minimize pollutant generation at each project.~~

[14] Pollutant generating development projects are those projects that generate pollutants at levels greater than natural background levels.

(3) Low Impact Development (LID) BMP Requirements

The following LID BMPs must be implemented at all pollutant generating development projects where applicable and feasible:

(a) Maintenance or restoration of natural storage reservoirs and drainage corridors (including topographic depressions, areas of permeable soils, natural swales, and ephemeral and intermittent streams);[14][15]

(b) Buffer zones for natural water bodies (where buffer zones are technically infeasible, require project applicant to include other buffers such as trees, access restrictions, etc.);

(c) Conservation of natural areas within the project footprint including existing trees, other vegetation, and soils;

(d) Construction of streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided public safety is not compromised;

(e) Minimization of the impervious footprint of the project;

(f) Minimization of soil compaction to landscaped areas;

(g) Disconnection of impervious surfaces through distributed pervious areas;

(h) Landscaped or other pervious areas designed and constructed to effectively receive and infiltrate, retain and/or treat runoff from impervious areas, prior to discharge to the MS4;

(i) Small collection strategies located at, or as close as possible to, the source (i.e. the point where storm water initially meets the ground) to minimize the transport of runoff and pollutants to receiving waters;

(j) Use of permeable materials for projects with low traffic areas and appropriate soil conditions;

(k) Landscaping with native or drought tolerant species; and

(l) Harvesting and using precipitation.

~~14~~ 15 Development projects proposing to dredge or fill materials in waters of the U.S. must obtain a CWA Section 401 Water Quality Certification. Projects proposing to dredge or fill waters of the State must obtain Waste Discharge Requirements.

(4) Long-Term Permanent BMP Maintenance

Each Copermittee must require the project applicant to submit proof of the mechanism under which ongoing long-term maintenance of all permanent BMPs will be conducted.

(5) Infiltration and Groundwater Protection

(a) Infiltration and treatment control BMPs ~~designed to primarily function as large, centralized infiltration devices (such as large infiltration trenches and infiltration basins)~~ must not cause or contribute to an exceedance of an applicable groundwater quality objective. At a minimum, such infiltration and treatment control BMPs must be in conformance with the design criteria listed below, unless the development project applicant demonstrates to the Copermittee that one or more of the specific design criteria listed below are not necessary to protect groundwater quality. The ~~The design criteria listed below do not apply to small infiltration systems dispersed throughout a development project.~~ Permittees may establish different design criteria than those listed below for different BMP types based on the inherent degree of risk to groundwater quality (for example, dry wells versus bioretention).

(i) Runoff must undergo pretreatment such as sedimentation or filtration prior to infiltration;

(ii) Pollution prevention and source control BMPs must be implemented at a level appropriate to protect groundwater quality at sites where infiltration treatment control BMPs are to be used;

(iii) Infiltration treatment control BMPs must be adequately maintained to remove pollutants in storm water to the MEP;

(iv) The vertical distance from the base of any infiltration treatment control BMP to the seasonal high groundwater mark must be at least 10 feet. Where groundwater basins do not support beneficial uses, this vertical distance criteria may be reduced, provided groundwater quality is maintained;

(v) The soil through which infiltration is to occur must have physical and chemical characteristics (e.g., appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses, unless first treated or filtered to remove pollutants prior to infiltration;

(vi) Infiltration treatment control BMPs must not be used for areas of industrial or light industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee, unless first treated or filtered to remove pollutants prior to infiltration; and

(vii) Infiltration treatment control BMPs must be located a minimum of 100 feet horizontally from any water supply wells.

(b) The Copermittees may collectively or individually develop alternative mandatory design criteria to that listed above for infiltration and treatment control BMPs which are designed to primarily function as centralized infiltration devices. Before implementing the alternative design criteria in the development planning process the Copermitee(s) must:

(i) Notify the San Diego Water Board of the intent to implement the alternative design criteria submitted; and

(ii) Comply with any conditions set by the San Diego Water Board.

b. PRIORITY DEVELOPMENT PROJECTS

(1) Definition of Priority Development Project

Priority Development Projects include the following:

(a) All new development projects that fall under the Priority Development Project categories listed under Provision E.3.b.(2). Where a new development project feature, such as a parking lot, falls into a Priority Development Project category, the entire project footprint is subject to Priority Development Project requirements; and

(b) Those redevelopment projects that create, add, or replace at least 5,000 square feet of impervious surfaces on an already developed site, or the redevelopment project is a Priority Development Project

category listed under Provision E.3.b.(2). Where redevelopment results in an increase of less than fifty percent of the impervious surfaces of a previously existing development, and the existing development was not subject to Priority Development Project requirements, the performance and sizing requirements discussed in Provisions E.3.c.(2) and E.3.c.(3) apply only to the addition or replacement, and not to the entire development. Where redevelopment results in an increase of more than fifty percent of the impervious surfaces of a previously existing development, the performance and sizing requirements apply to the entire development.

(2) Priority Development Project Categories

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This category includes commercial, industrial, residential, mixed-use, and public development projects on public or private land which fall under the planning and building authority of the Copermittee.

(b) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

(c) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812), where the land area for development is 5,000 square feet or more.

(d) Hillside development projects. This category includes any development which creates 5,000 square feet or more of impervious surface which is located in an area with known erosive soil conditions, where the development will grade on any natural slope that is twenty-five percent or greater.

(e) Environmentally sensitive areas (ESAs). This category includes any development located within, directly adjacent to, or discharging directly to an ESA, which either creates 2,500 square feet of impervious surface on a proposed project site or increases the area of imperviousness of a proposed project site to 10 percent or more of its naturally occurring condition. “Directly adjacent to” means situated within 200 feet of the ESA. “Discharging directly to” means outflow from a drainage conveyance system that collects runoff

from the subject development or redevelopment site and terminates at or in receiving waters within the ESA.

(f) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce that has 5,000 square feet or more of impervious surface.

(g) Streets, roads, highways, freeways, and residential driveways. This category is defined as any paved impervious surface that is 5,000 square feet or more used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

(h) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

(i) Large development projects. This category includes any post-construction pollutant-generating new development projects that result in the disturbance of one acre or more of land.

(3) Priority Development Project Exemptions

Each Copermittee has the discretion to exempt the following projects from being defined as Priority Development Projects:

(a) Sidewalks constructed as part of new streets or roads and designed to direct storm water runoff to adjacent vegetated areas;

(b) Bicycle lanes that are constructed as part of new streets or roads but are not hydraulically connected to the new streets or roads and designed to direct storm water runoff to adjacent vegetated areas;

(c) Impervious trails constructed and designed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas;

(d) Sidewalks, bicycle lanes, or trails constructed with permeable surfaces.

C. PRIORITY DEVELOPMENT PROJECT PERMANENT BMP PERFORMANCE AND SIZING REQUIREMENTS

In addition to the BMP requirements listed for all pollutant generating development projects under Provision E.3.a, Priority Development Projects

must also implement permanent BMPs that conform to performance and sizing requirements.

(1) Source Control BMP Requirements

Each Copermittee must require each Priority Development Project to implement applicable source control BMPs listed under Provision E.3.a.(2).

(2) Retention and Treatment Control BMP Requirements

Each Copermittee must require each Priority Development Project to implement BMPs to retain and treat pollutants onsite in the following order:

(a) Each Priority Development Project must be required to implement LID BMPs as described in Provision E.3.a.(3);

(b) Each Priority Development Project must be required to implement LID BMPs that are sized and designed to retain the volume equivalent to runoff produced from a 24-hour 85th percentile storm ~~event[15]~~ event[16] ("design capture volume").~~;~~

(c) If onsite retention using LID BMPs is technically infeasible per Provision E.3.c.(4), flow-thru LID ~~and/or conventional~~ treatment control BMPs, such as bioretention with an underdrain, must be implemented to treat the portion of the design capture volume that is not retained onsite. Flow-thru LID treatment control BMPs that are sized for the portion of the design capture volume that is not retained onsite may be used if full onsite retention is technically infeasible. Flow-thru LID treatment control BMPs must be designed for an appropriate surface loading rate to prevent erosion, scour and channeling within the BMP. ~~Additionally, project applicants must perform mitigation for the portion of the pollutant load in the design capture volume that is not retained onsite, as described in Provision E.3.c.(4)(c).~~

(d) If it is shown to be technically infeasible per Provision E.3.c.(4) to retain and/or treat with flow-thru LID treatment control BMPs sized for the portion of the design capture volume that is not retained onsite, then the project must implement conventional treatment control BMPs in accordance with Provision E.3.c.(2)(d) below and must participate in the alternative compliance program in Provision E.3.c.(4)(c).

(~~d~~e) All onsite treatment control BMPs must:

(i) Be correctly sized and designed so as to remove pollutants from storm water to the MEP;

(ii) Be sized to comply with the following numeric sizing criteria:

[a] Volume-based treatment control BMPs must be designed to treat the remaining portion of the design capture volume that was not retained and/or treated with flow-thru LID treatment control BMPs sized for the portion of the design capture volume that is not retained onsite~~retained or onsite~~; or

[b] Flow-based treatment control BMPs must be designed to ~~mitigate (filter or~~ treat~~)~~ either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event; or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two, or 3) an alternative design rate that is demonstrated to result in the treatment of a volume of stormwater equivalent to that achieved under c.(2)(e)(ii)[a].

(iii) Be ranked with high or medium pollutant removal efficiency for the project's most significant pollutants of concern. Treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

[15] This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals.

(3) Hydromodification Management BMP Requirements

Each Copermittee must require each Priority Development Project to implement hydromodification management BMPs so that:

(a) ~~(a)~~ Post-project runoff flow rates and durations do not exceed pre-development (naturally occurring) runoff flow rates and durations by more than 10 percent (for the range of flows that result in increased potential for erosion or degraded channel conditions downstream of Priority Development Projects).

OR

The erosion potential ratio is maintained to within 10 percent of the target value from the project discharge point to a downstream receiving water that is exempt from the hydromodification management BMP requirements per Provision E.3.c.(3)(d). Erosion potential is the ratio of total long-term sediment transport capacity or channel work in the proposed condition versus the pre-development (naturally occurring) condition.

(i) In evaluating the range of flows that results in increased potential for erosion of natural (non-hardened) channels, the lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks.

~~(ii) For artificially hardened channels, analysis to identify the lower boundary must use characteristics of a natural stream segment similar to that found in the watershed. The lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or erodes the toe of the channel banks.~~

(ii~~i~~) The Copermittees may use monitoring results pursuant to Provision D.2.b.(6) to re-define the range of flows resulting in increased potential for erosion or degraded channel conditions, as warranted by the data.

(b) ~~(b)~~ Post-project conditions ~~runoff flow rates and durations~~ must ~~compensate~~ manage for the loss of bed sediment supply due to the development project, ~~should~~ if significant loss of sediment supply occurs as a result of the development project.

~~(a)~~(c) If hydromodification management BMPs are technically infeasible per Provision E.3.c.(4), project applicants must perform mitigation for the portion of the runoff volume that is not controlled and will cause or contribute to increased potential for erosion of receiving

waters downstream of the Priority Development Project, as described in Provision E.3.c.(4)(c).

~~(b)~~(d) Exemptions

Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP requirements where the project:

(i) Discharges storm water runoff into underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, ~~or~~ the Pacific Ocean, or exempt river reaches identified in Hydromodification Management Plans (HMPs) approved by the San Diego Water Board;

(ii) Discharges storm water runoff into conveyance channels whose bed and bank are ~~concrete lined~~artificially hardened all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, ~~or~~ the Pacific Ocean; ~~or~~or exempt river reaches identified in HMPs approved by the San Diego Water Board; or

(iii) Discharges storm water runoff into other areas identified by the San Diego Water Board as exempt from the requirements of Provisions E.3.c.(3)(a)-(c)~~.~~, ~~S~~such areas include those identified in HMPs approved by the San Diego Water Board.

(4) Alternative Compliance for Technical Infeasibility

At the discretion of each Copermittee, alternative compliance may be allowed for certain Priority Development Projects to comply with Provisions E.3.c.(2) and E.3.c.(3), subject to the following requirements:

(a) Applicability

Priority Development Projects may be allowed alternative compliance if:

(i) The Copermittee reviews and approves site-specific hydrologic and/or design analysis performed by a registered professional engineer, geologist, architect, or landscape architect;

(ii) The project applicant demonstrates, and the Copermittee determines and documents, that retention LID, flow-through LID treatment control BMPs, and/or hydromodification management BMPs per Provisions E.3.c.(2) and E.3.c.(3) were incorporated into the project

design to the maximum extent technically feasible given the project site conditions;

(iii) The project applicant is required to perform mitigation described in Provision E.3.c.(4)(c) with a net result of at least the same level of water quality protection as would have been achieved if the Priority Development Project had fully implemented the retention LID, flow-through LID treatment control BMPs, and hydromodification management BMP requirements under Provisions E.3.c.(2) and E.3.c.(3) onsite.

(b) Criteria For Technical Infeasibility

Each Copermittee must develop, or develop in collaboration with the other Copermittees, criteria to determine technical infeasibility for fully implementing the retention LID and hydromodification management BMP requirements under Provisions E.3.c.(2) and E.3.c.(3) and include these requirements in the Permanent BMP Sizing Criteria Design Manual pursuant to Provision E.3.d. Technical infeasibility may result from conditions including, but not limited to:

(i) Locations that cannot meet the infiltration and groundwater protection requirements in Provision E.3.a.(5) due to the presence of shallow bedrock, contaminated soils, near surface groundwater, underground facilities, or utilities;

(ii) Brownfield development sites or other locations where pollutant mobilization is a documented concern;

(iii) The design of the site precludes the use of soil amendments, plantings of vegetation, or other designs that can be used to infiltrate and evapotranspirate runoff;

(iv) Soils cannot be sufficiently amended to provide for the requisite infiltration rates;

(v) Locations with geotechnical hazards;

(vi) Insufficient onsite and/or offsite demand for storm water use;

(vii) Modifications to an existing building to manage storm water are not feasible due to structural or plumbing constraints; and

(viii) Smart growth and infill or redevelopment locations where the density and/or nature of the project would create significant

difficulty for compliance with Provisions E.3.c.(2) and E.3.c.(3) onsite.

(c) Mitigation

Priority Development Projects that meet the Copermittee's technical infeasibility criteria developed pursuant to Provision E.3.c.(4)(b) must be required to mitigate for the increased flow rates, increased flow durations, and/or increased pollutant loads expected to be discharged from the site. For the pollutant load in the volume of storm water not retained onsite with retention LID BMPs treated with flow-thru LID treatment control BMPs sized for the portion of the design capture volume that is not retained onsite, ~~, tre~~ or increased potential erosion of downstream receiving waters not fully controlled onsite with hydromodification management BMPs, the Copermittee must require the project applicant to either 1) implement an offsite mitigation project, and/or 2) provide sufficient funding for a public or private offsite mitigation project via a mitigation fund.

(i) *Mitigation Project Locations*

Offsite mitigation projects must be implemented within the same hydrologic unit as the Priority Development Project, and preferably within the same hydrologic subarea. Mitigation projects outside of the hydrologic subarea but within the same hydrologic unit may be approved provided that the project applicant demonstrates that mitigation projects within the same hydrologic subarea are infeasible and that the mitigation project will address similar potential impacts expected from the Priority Development Project.

(ii) *Mitigation Project Types*

Offsite mitigation projects must include, where applicable and feasible, retrofitting opportunities and stream and/or habitat rehabilitation or restoration opportunities identified in the Water Quality Improvement Plans, identified pursuant to Provision B.3.a. Other offsite mitigation projects may include green streets or infrastructure projects, or regional BMPs upstream of receiving waters. In-stream rehabilitation or restoration measures to protect or prevent adverse physical changes to creek bed and banks must not include the use of non-naturally occurring hardscape material such as concrete, riprap, or gabions. Project applicants seeking to utilize these alternative compliance provisions may propose other offsite mitigation projects, which the Copermittees may approve if they meet the requirements of Provision E.3.c.(4)(a).

(iii) *Mitigation Project Timing*

The Copermittee and/or project applicant must develop a schedule for the completion of offsite mitigation projects, including milestone dates to identify, fund, design, and construct the projects. Offsite mitigation projects must be completed upon the granting of occupancy for the first project that contributed funds toward the offsite mitigation project, unless a longer period is authorized by the San Diego Water Board.

(iv) *Mitigation Fund*

A Copermittee may choose to implement additional mitigation programs (e.g., pollutant credit system, mitigation fund) as a means for developing and implementing offsite mitigation projects, provided the projects conform to the requirements for project locations, types, and timing described above.

(5) Alternative Compliance for Watershed-Based Planning

Where a development project, greater than 100 acres in total project size or smaller than 100 acres in size yet part of a larger common plan of development that is over 100 acres, has been prepared using watershed and/or sub-watershed based water quality, hydrologic, and fluvial geomorphologic planning principles that implement regional LID BMPs in accordance with the sizing and location criteria of this Order and acceptable to the Regional Board, such standards shall govern review of projects with respect to Provision E.3. of this Order and shall be deemed to satisfy this Order's requirements for LID site design, buffer zone, infiltration and groundwater protection standards, source control, treatment control, and hydromodification control standards. Regional BMPs must clearly exhibit that they will not result in a net impact from pollutant loadings over and above the impact caused by capture and retention of the design storm. Regional BMPs may be used provided that the BMPs capture and retain the volume of runoff produced from the 24-hour 85th percentile storm event as defined in Provision E.3.c. and that such controls are located upstream of receiving waters. Any volume that is not retained by the LID BMPs, up to the design capture volume, must be treated using LID biofiltration sized for the design capture volume that has not been retained. Where regional LID implementation has been shown to be technically infeasible (per Provision E.3.c.(4)(b)) any volume up to and including the design capture volume, not retained by LID BMPs, nor treated by LID biofiltration, must be treated using conventional treatment control BMPs in accordance with Provision E.3.c.(2)(d) and participation in the mitigation program in Provision E.3.c.(4)(c).

BIOCOM

Mr. Gary Strawn
Vice Chairman
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

January 11, 2013

Re: Comment—Tentative Order No. R9-2013-001, Regional MS4 Permit,
Place ID: 786088Wchiu

Dear Vice Chair Strawn:

BIOCOM is responding the San Diego Regional Water Quality Control Board's Tentative Order R9-2012-0011 ("Permit") dated October 31, 2012. After reviewing the proposed Permit, BIOCOM is concerned it will impose expensive, onerous, and untested regulations on local governments, businesses, and residents.

BIOCOM is the largest regional life science advocacy organization representing more than 550 companies; including biotech, medical device, basic research institutions; universities; biofuels and service providers. We understand the importance of clean, safe water to the region and are interested in improving San Diego's water. It is important, however, that we use our limited resources wisely, and ensure that our efforts produce the desired outcome of improving water quality.

We commend the Board's inclusion of Water Quality Improvement Plans (WQIP) as a first step in developing a cost-effective approach to improving our water. Analysis remains a critical component of a successful strategy, and we are glad to see that the Board is committed to finding the best possible solution to water quality improvement.

However, we are concerned that the costs associated with enforcing and implementing the permit will have a negative impact on the local life science industry and San Diego's economy. The three primary areas of concern include: 1) the strict liability for exceeding water quality objectives; 2) the preemption of WQIPs by new and changing regulatory requirements prior to allowing the WQIPs to be developed and implemented; and 3) the lack of reliable funding sources to implement these regulatory changes.

It is necessary to hold individuals, businesses and governments accountable, but it is critical that accountability measures are practical with demonstrable, positive effects on water quality. Due to our concerns, we respectfully request that the Permit focus on the timely development of effective and enforceable WQIPs, and that each of the WQIPs be developed through a process that ensures public participation. We ask also that the designation of appropriate Best

Management Practices in each watershed be determined through the WQIP process rather than the one size fits all strategy currently being proposed in the Permit. We ask further that until the Board adopts a WQIP for a watershed that the provisions of the existing Permit remain in place for that watershed. Finally, in order to avoid unnecessary litigation we request that the Board adopt the WQIPs as Orders implementing the proposed Permit.

We strongly urge you to adopt final permit language that is evidence-based and both environmentally and economically sustainable. Thank you for your consideration. If you have any questions please me at fpicking@biocom.org or (858) 455-0300 x113.

Sincerely,

Faith Picking
Associate Director of Local Government Affairs
BIOCOM

January 11, 2013

Wayne Chiu, P.E.
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

via Electronic Mail
wchiu@waterboards.ca.gov

RE: Comment – Tentative Order No. R9-2013-0001, Regional MS4 Permit
Place ID: 786088Wchiu
Monitoring Requirements Should Be Strengthened

Please accept these comments on behalf of the Coastal Environmental Rights Foundation (CERF), Environmental Health Coalition (EHC), and San Diego Coastkeeper (SDCK). These San Diego organizations act through community involvement, regulatory participation, and legal action to ensure the protection restoration of San Diego Bay, Mission Bay, and the region's coastal waters.

CERF, EHC and SDCK support and hereby join in the comments submitted by the Keepers (San Diego, Orange County, and Inland Empire), and specifically reiterate the need for more stakeholder input in the development of Water Quality Improvement Plans, especially the monitoring component. CERF submits this comment letter to specifically focus on the water monitoring requirements within the Regional MS4 Permit.

As the Regional Water Quality Control Board (Regional Board) is likely aware, the United States Supreme Court recently issued a very narrow opinion in *L.A. County Flood Control Dist. v. NRDC, Inc*., 2013 U.S. LEXIS 597 (U.S. Jan. 8, 2013), reviewing a portion of the Ninth Circuit's decision in *NRDC, Inc. v. County of Los Angeles*, 673 F.3d 880 (9th Cir. Cal. 2011). The Supreme Court's ruling did not reach a portion of the Ninth Circuit's ruling related to the question of whether "exceedances detected at the instream monitoring stations are by themselves sufficient to establish the District's liability under the CWA for its upstream discharges." (*L.A. County Flood Control Dist,* 2013 U.S. LEXIS 597, 8-10).[1] (*NRDC, Inc*., 673 F.3d at 901). Therefore, it remains to be seen whether the Ninth Circuit's admonishment to citizen complainants that they must "spotlight how the flow of water from an ms4 'contribute[s]' to a water-quality exceedance detected at the Monitoring Stations" will stand.

In light of this potential new evidentiary hurdle, and more importantly the longstanding requirement that all NPDES permits contain monitoring provisions sufficient to assess compliance, CERF urges the Regional Board to require more robust, frequent, and widespread monitoring in the Regional MS4 Permit. (See Permit Attachment F, Fact Sheet, p. F-16). As reiterated by the Ninth Circuit, "Congress intended the Clean Water Act to function by self-monitoring and self-reporting violations to avoid the necessity of lengthy fact-finding,

[1] Environmental citizen plaintiffs still believe the water-quality exceedance itself is enough to establish Clean Water Act liability.

investigations, and negotiations at the time of enforcement." (*Id*. at 896, quoting S. Rep. No. 414, 92d Cong., 1st Sess. 64, reprinted in 1972 U.S.C.C.A.N. 3668, 3730).

Notwithstanding the aforementioned requirements, as amended from the previous, more expansive, administrative version of the permit, the current Regional MS4 Permit takes a more lax approach to monitoring. Pursuant to the proposed Regional MS4 Permit, the copermittees are not required to perform *any* transitional dry weather outfall monitoring, instead relying on field screening only. (D.2.a.(1)-(2)). In addition, the longterm monitoring plan for non-storm water persistent flow MS4 outfall discharge monitoring frequency is "at least semi-annually", while it was a monthly requirement in the previous draft. Most significantly, the currently proposed Regional MS4 moved away from the grid system, whereby the copermittees would monitor at least one station in each cell containing a segment of the copermittees' MS4. Now, copermittees will only have to monitor the ten highest priority non-storm water persistent flow outfalls. (D.2.b.(2)(b)).

This monitoring approach is insufficient for achieving the stated goal of informing copermittees about the "nexus between the health of receiving waters and the water quality condition of the discharges from their MS4." (Permit, p. 33). Equally important are the Regional Board's need to assess compliance and the public's ability to stay informed of the copermittees' compliance and progress:

> The monitoring and assessment information that will be reported to the San Diego Water Board is necessary to determine if the Copermittees are making progress toward achieving compliance with the discharge prohibitions, receiving water limitations, and effluent limitations under Provision A of the Order. (Permit Attachment F, Fact Sheet, p. F-16).
>
> Implementation of the monitoring and assessment requirements of Provision D will allow the Copermittees to demonstrate that the requirements of the CWA to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP are being achieved. (*Id*. at p. F-58).

The required semi-annual dry weather outfall monitoring does not adequately serve any of these functions. EPA *Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters* (*NPS Management Guidance*) provides some insight on the need for more frequent sampling:

> Coastal waters, estuaries, ground water, and lakes will typically have longer response times than streams and rivers. Thus, sampling frequency will usually be greater for streams and rivers than for other water resource types. Some parameters such as total suspended solids and fecal coliform bacteria can be highly variable in stream systems dominated by nonpoint sources, while nitrate levels may be less volatile in systems driven by baseflow from ground water. The highly variable parameters would generally require more frequent sampling, but parameter variability should be evaluated on a site-specific basis rather than by rule of thumb. (*NPS Management Guidance*, Chapter 8, section 5a.).

Thus, the proposed semi-annual monitoring frequency is unlikely to capture the variability of most inland receiving waters and many parameters.

The EPA further recognizes that *monthly* sampling is suitable to detect the annual pattern of changes with time. (*Id.*). Indeed, the original administrative version of the permit contained a monthly monitoring requirement. This more appropriate frequency was replaced with the current semi-annual monitoring provision apparently in response to comments by the San Diego copermittees.[2] The copermittees' reasoning, however, provides little justification for this change. The copermittees relied in part on their poor results in detecting and eliminating illicit discharges through the current permit's monitoring requirements. (San Diego Copermittee Supporting Documentation and Rationale for Alternative Provision II.D Monitoring and Assessment Requirements ("Supporting Rationale"), September 14, 2012, p. 26). The copermittees' inability to detect and eliminate non-storm water flows is more likely an enforcement issue rather than a monitoring problem. Indeed, if the copermittees need more data in order to trace the source of the non-storm water flow, *more* monitoring should be required, not less.

The copermittees also point to the effectiveness of their industrial and commercial inspections to justify less frequent monitoring. However, their own data shows that from 2009 to 2011, no ICIDs were detected, and therefore none were stopped. Rather than representing an effective ICID detection program, this data shows that inventoried commercial and industrial uses are not the source of ICIDs. In other words, this constitutes an exercise in the process of elimination, not detection.

Lastly, the copermittees argue the complaint process is the most effective means of detecting and eliminating ICIDs, and therefore should be relied upon more heavily. While CERF, EHC and SDCK applaud the copermittees for their success in complaint responses, and in ICID elimination as a result, the fact remains that dry weather flows continue, and copermittees have failed to adequately determine their source and effectively eliminate them. This is evident in the copermittees data. In response to dry weather monitoring, only 174 site visits were made, while the successful complaint procedure resulted in 939 visits – five times more visits. (*Id*. at p. 27). It appears copermittees are simply not *using* the dry weather monitoring data. Rather than reward the copermittees for their failure, the Regional Board should require more data in order to enable to copermittees to more effectively trace dry weather flows to their source.

[2] The copermittees argued: " The approach outlined in the Administrative Draft Tentative Order would generate a great deal of water quality data for dry weather flows and identify some IC/IDs. However, *since the purpose of the program is to eliminate dry weather flows and IC/ID flows entirely*, there is little value to collecting extensive dry weather water quality data for MS4 sites. Very little of the water quality data collected would support assessment of the stated program management objective to effectively prohibit non-storm water discharges to the MS4s." (San Diego Copermittee Comments on Tentative Order No. R9-2012-0011, September 14, 2012, p. 31, emphasis added).

Importantly, while the copermittees focus on the ICID detection and elimination aspect of dry weather monitoring, of equal importance is the compliance aspect. More frequent monitoring is integral to demonstrating active compliance with the prohibition against non-storm water flows in the MS4.

In addition to lax dry weather monitoring, the current permit requires minimal wet weather monitoring, as the copermittees are to monitor wet weather MS4 outfalls at "an **appropriate frequency** to identify sources of pollutants in storm water discharges from the MS4s causing or contributing to the highest priority water quality conditions...". (D.2.c.(2), emphasis added). As has been the case historically, when given the option copermittees will monitor as *infrequently* as possible.

Further, as provision B.4. of the Regional MS4 Permit requires, at a minimum, that Water Quality Improvement Plans (WQIPs) include the requirements of Provision D as part of the water quality improvement monitoring and assessment program for the WQIPs, it is very likely the copermittees will do no more monitoring than required in Provision D.[3] Thus, if the public, the Regional Board, and the copermittees are to truly assess compliance and the success of their iterative approach, the Regional MS4 Permit itself must require more monitoring.

We urge the Regional Board to reconsider its revised monitoring requirements in the draft Regional MS4 Permit in light of the stated goals of the monitoring program, and the potential compliance and enforcement issues that may result if adequate monitoring is not made part of the new permit.

Thank you in advance for your consideration of our comments. Should you have any questions, please feel free to contact us directly.

Sincerely,

Marco Gonzalez
Coastal Environmental Rights Foundation
marco@cerf.org

Livia Borak
Coastal Environmental Rights Foundation
livia@cerf.org

Nicole Capretz
Environmental Health Coalition
nicole@environmentalhealth.org

Jill Witkowski
San Diego Coastkeeper
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[3] Monitoring for TMDLs and ASBS is also required, but these provisions only apply to those copermittees where TMDLs have been adopted and ASBS are located. (See Attachment E).

CITY OF CHULA VISTA **Public Works Department**

January 11, 2013
File # 0780-85-KY181
Via: Email and Hand Delivery

Mr. Wayne Chiu, P.E.
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Subject: Comment – Tentative Order No. R9-2013-0001, Regional MS4 Permit
Place ID: 786088Wchiu

The City of Chula Vista appreciates the opportunity to provide comments on the Tentative Order No. R9-2013-0001 (NPDES General Permit No. CAS0109266). City staff has carefully reviewed the Tentative Order, and has specific comments that are presented in Attachment A to this letter. Additionally, the City of Chula Vista supports the comments and proposed revisions to the Tentative Order submitted by the County of San Diego on behalf of the San Diego Copermittees.

We trust that the San Diego Regional Board will give full consideration to our comments and recommendations in order to facilitate continued compliance, and to increase effectiveness of the MS4 Permit for the San Diego Region.

Should you have any questions or if you need further information, please call me at (619) 397-6111. Thank you.

K. Aminpour

KHOSRO AMINPOUR
SENIOR CIVIL ENGINEER

Attachment

C: Richard A. Hopkins, Director of Public Works
William S. Valle, Assistant Director of Public Works Engineering
Silvester Evetovich, Principal Civil Engineer

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ATTACHMENT A – City of Chula Vista Comments on Tentative Order No. R9-2013-0001

Comment No.	Page No.	Comment
1	73	II.E.3.a – Change "all development projects" to "all non-exempt development projects." An exempt-projects category should be created to include projects such as tenant improvements, traffic signals, utility work, road resurfacing, and projects similar to those exempted under the definition of Redevelopment (Attachment "C").
2	74	II.E.3.a.(1)(b) – By definition, all water in the state is considered to be a Waters of the State. Permanent BMPs require to be connected to drainage systems by conveyance systems that are also considered Waters of the State. Therefore, permanent BMPs inevitably are located within waters of the state. Please consider deleting "or waters of the state" similar to Order No. R9-2007-0001.
3	77	II.E.3.b.(3) – Add maintenance access roads to the list of potentially exempt categories, since this type of project results in insignificant pollutant discharge.
4	77	II.E.3.b.(3)(a) – Directing runoff from sidewalks to vegetated areas may result in localized flooding, standing water, degradation/damage to sidewalks, and excessive infiltration into electrical and other utility trenches. It is recommended to provide categorical exemption for sidewalks from SUSMP requirements, similar to Order No. R9-2007-0001.
5	78	II.E.3.c.(1)(a) – Examples of LID BMPs that retain runoff should be provided. Retention facilities typically include retention basins, rain barrels, or underground vaults. Can these facilities be considered LID BMPs? What should be done with the retained water in situations where soils are impermeable and there is a lack of demand for irrigation water during the rainy season?
6	78	II.E.3.c.(1)(a)(i) and (ii) – Please add "runoff" to read "The volume of storm water runoff…"
7	79	II.E.3.c.(1)(c) and throughout the Permit – Please provide a definition for "conventional treatment control BMPs".
8	79	II.E.3.c.(2) – Compliance with hydromodification control requirements on small projects is often infeasible and inefficient. It is recommended to adopt a lower threshold of one acre of impervious area (addition or replacement) for hydromodification control compliance, in line with the San Francisco Bay Area NPDES Municipal Permit.
9	80	II.E.3.c.(2)(a)(iii) – Monitoring data from Provision II.D.1.a.(2) will not provide necessary information to re-define the range of flows causing erosion.
10	80	II.E.3.c.(2)(b) – The Permit should provide guidelines to calculate sediment loss and the methods by which sediment loss can be compensated.

ATTACHMENT A – City of Chula Vista Comments on Tentative Order No. R9-2013-0001

Comment No.	Page No.	Comment
11	80	II.E.3.c.(2)(d) - The Copermittees spent about four years to develop the Final HMP, which includes exemptions based on sound technical justifications. The exemptions mainly deal with projects that discharge directly to depositional reaches of major rivers or large water bodies; small infill projects located within highly developed impervious drainage basins; or discharge to stabilized or hardened channels. Implementation of the Final HMP started in January of 2011 and many issues still remain to be resolved. Eliminating those exemptions at this time would create one size fits all regulations for all projects without regard to technical considerations. It is requested that the exemptions in the Final HMP remain in the Tentative Order until such time that further technical studies prove that they are no longer justified.
12	81	II.E.3.c.(3)(b) – Sizing criteria have not been provided for some alternative compliance options such as offsite retrofitting projects; offsite channel, stream, or habitat restoration; or offsite regional water supply augmentation. Sizing criteria is required to determine the size of alternative options that would provide the same level of water quality protection as would have been achieved by implementing provisions II.E.3.c.(1) and II.E.3.c.(2).
13	88	II.E.3.e.(2)(a) – Implementation of local SUSMPs in San Diego County started on 12/12/2002. Inventories of Priority Development Projects prior to that date are not available. Please revise the date.
14	91	II.E.4.a.(4) – This requirement is already included in other environmental regulations and its inclusion in this Permit is redundant.
15	95	II.E.5.a. – The permit should allow the Copermittees to use more than one data management system (inventory) to track the required information. For example, a GIS system can be used to identify and track the names and locations of existing facilities, while another system such as a business license database or a custom made industrial/commercial database can provide the SIC codes, WDID Nos., etc.
16	96	II.E.5.a.(2)(g) – Pollutants generated and potentially generated by existing facilities or areas can only be identified for typical land uses and not individual facilities or areas.
17	98	II.E.5.b.(1)(c)(iii) – Freeways are under the jurisdiction of Caltrans and that agency is responsible for their operation and maintenance. Please remove freeways from the list.

City of Del Mar

January 11, 2013

Mr. Wayne Chiu, P.E.
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego, California 92123-4340

SUBJECT: Comment – Tentative Order No. R9-2013-0001, Regional MS4 Permit
Place ID: 786088Wchiu

Dear Mr. Chiu:

The City of Del Mar would like to take the opportunity to provide written comments for Tentative Order R9-2013-0001. As stated in previous correspondence, the City appreciates the Order reissuance process to date. The process has allowed stakeholders to participate in shaping the Tentative Order by providing ideas and concepts that support an MS4 Permit that moves us towards our goal – improved water quality and receiving water conditions.

The City of Del Mar has participated in the process for development of the San Diego County Regional Copermittees' comments. Those comments, including an electronic version of recommended changes (e.g., redline/strikeouts), are to be submitted under separate cover by the County of San Diego on behalf of the San Diego County Regional Copermittees. The City of Del Mar supports the comprehensive comments and recommended edits to the Tentative Order.

In addition to supporting the comprehensive comments noted above, the City of Del Mar is providing two specific comments related to Attachment E (provisions for TMDLs) and applicability of hydromodication requirements.

Attachment E – Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2013-0001
The Bacteria TMDL[1] states that for watersheds where there are no longer any impairments listed on the 2008 303(d) List (for REC-1 water quality standards), the Phase I MS4s are not required to submit a load reduction plan and are not subject to any further action under the TMDL as long as monitoring continues to support compliance with REC-1 water quality standards. However, if the impairment returns for REC-1 water quality standards, the Responsible Parties will be required to submit a load reduction plan to the RWQCB.

The City of Del Mar and other Responsible Parties in the San Dieguito and Los Peñasquitos watersheds demonstrated to the RWQCB that the two watersheds are within this scenario where the Pacific Ocean Shoreline of the two watersheds are no longer listed as impaired for indicator bacteria under REC-1 water quality standards. The Responsible Copermittees received written confirmation that they are "not subject to further action under Resolution No. R9-2010-0001 as long as monitoring data continues

[1] Revised TMDL for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek) adopted by SDRWQCB Resolution No. R9-2010-0001

to support compliance with the REC-1 water quality standards." This scenario essentially places our two watersheds in a *dormant* TMDL condition, unless the Pacific Ocean shoreline of the one or both of the watersheds are relisted on future 303(d) lists for indicator bacteria[2].

Attachment E, Section 6[3] of the Tentative Order requires, amongst other provisions, the compliance with Water Quality Based Effluent Limitations (WQBELs). The WQBELs as described in the Tentative Order are expressed as Receiving Water Limitations, Effluent Limitations and as Best Management Practices requirements. As written, the Responsible Copermittees in the two watersheds are required to meet the listed WQBELs even while under the *dormant* TMDL condition.

There is a conflict between relisting of the Pacific Ocean shoreline and the more strict WQBEL limitations. Relisting of the Pacific Ocean shoreline would be done under the criteria established in the 2004 SWRCB Listing Policy[4] which allows for a certain number of water quality standard exceedances prior to listing. The WQBEL limitations allow **zero** water quality standard exceedances under dry weather conditions – a much higher bar with which to comply.

If the WQBELs are included in the final adopted Permit, at a minimum, the WQBEL compliance should only apply when the TMDL is in an *active* phase – i.e., the waterbody is impaired and listed on the 303(d) list as specified in the Bacteria TMDL (SDRWQCB Resolution R9-2010-0001). Otherwise, the Copermittees will be required to focus intense resources to address bacteria at the Pacific Ocean shorelines where water quality monitoring has demonstrated that it is not an issue. This ironic paradox would be contradictory to the watershed based adaptive management process where the objective is to focus limited resources on the highest water quality issues.

Comment – Based on the supporting information included in this letter and in SDRWQCB Resolution No. R9-2010-0001, correct the conflict between the Bacteria TMDL and Attachment E of the Tentative Order so that the WQBEL requirements are applicable when the TMDL is in an *active* phase, i.e., the waterbody is impaired and listed on the 303(d) list as specified in the Bacteria TMDL. Implied with correction of this conflict is that watersheds in a *dormant* TMDL condition, i.e., no longer listed as impaired for indicator bacteria under REC-1 water quality standards, are not subject to the WQBEL requirements of Attachment E of the Tentative Order.

Provision E.3.c.(2) Hydromodification Management BMP Requirements

The Tentative Order defines hydromodification as:

> The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

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[2] Page A66 of SDRWQCB Resolution No. R9-2010-0001

[3] Attachment E, Section 6 of the Tentative Order is the Specific Provisions for Total Maximum Daily Loads Applicable to Order R9-2013-0001 for the Revised TMDL for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

[4] State Water Resources Control Board – Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List, adopted September 2004

The Tentative Order requires that priority development projects, including redevelopment projects, are required to control post-project runoff flow rates and durations so as not to result in increased potential for erosion, or degraded instream habitat conditions downstream of the projects. There are several explicit exemptions for these requirements identified in the Tentative Order. However, these exemptions are not inclusive of many of the exemptions identified in the San Diego Regional Copermittees Final Hydromodification Management Plan[5] (HMP). The exemptions identified in the HMP include, but are not limited to, projects that discharges to an exempt river reach, or a tidally-influenced area and other areas where there was little or no increased potential for erosion, or degraded instream habitat conditions downstream of the projects.

Over 95% of the City of Del Mar's MS4 system drains directly to either the Pacific Ocean or to tidally influenced areas of the San Dieguito estuary and river. The areas that drain to the Pacific Ocean will remain exempt per the Tentative Order, however, those areas that drain to tidally influenced areas of the San Dieguito estuary and river will not be exempt even though they have no Hydromodification impacts. The City will be forced to require priority development projects to mitigate for impacts they will not have, e.g., mitigation with no nexus to impacts.

Comment – Based on the definition of hydromodification, correct the hydromodification management requirements in the Tentative Order to be applicable for project sites that have the potential to create hydromodification impacts downstream of the project sites. At a minimum, this can be achieved by reinstating appropriate exemptions in the Order requirements.

The City looks forward to continuing our dialog with Regional Water Quality Control Board staff during the next phases of the permit reissuance process. If you have any questions, please contact me at (619) 994-7074.

Sincerely,

Mikhail Ogawa, P.E.
Clean Water Manager

c: Kathleen A. Garcia, Planning and Community Development Director
File

[5] Approved on July 14, 2010 by San Diego RWQCB Resolution No. 2010-0066

City of
Encinitas

January 11, 2013

Wayne Chiu, P.E.
California Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego, California 92123-4340

SUBJECT: Comment – Tentative Order No.R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu

Dear Mr. Chiu,

Thank you for the opportunity to comment on *Tentative Order No. R9-2013-0001 Regional NPDES Permit and Waste Discharge Requirements for Discharges of Urban Runoff from Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Tentative Order).

The intent of this comment letter is to first offer that the City of Encinitas has participated in and is in support of the comprehensive comments and suggested permit language edits (e.g., red-line/strikeout) as submitted under separate cover by the San Diego County Copermittees on January 11, 2013.

In addition, consistent with the City's ongoing appeal to both Board Members and Staff related to *Attachment E – Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2013-0001, Section 6,* it is prudent and logical to distinguish the San Marcos HA as a 303(d) de-listed Pacific Ocean shoreline segment. This request has been captured in suggested language included in the San Diego County Copermittees submittal, premised upon the principles of the Tentative Order to focus resources on the highest water quality problems within a watershed, and supported by comprehensive technical analysis provided to RWQCB staff. As currently drafted without the necessary regulatory distinction, San Marcos HA Copermittees will be unreasonably constrained through an assessment of receiving water conditions (as prescribed in Provision B.2.a) to prioritize a water quality condition (indicator Bacteria) in a receiving water (Pacific Ocean) with unsupported beneficial use (REC-1) impairments.

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Reasoned as such, the City of Encinitas requests the following update to *Attachment E, Section 6.a(5):*

(5) Water Bodies: See Table 6.0; Consistent with Basin Plan Amendment (Resolution No. R9-2010-0001, p. A-2); specific beach segments from some of the Pacific Ocean shorelines listed in Table 6.0 have been delisted from the 2008 (sic 2010) 303(d) list that was approved by the San Diego Board on December 16, 2009, and therefore are not subject to the requirements of Attachment E as long as monitoring data continues to support compliance with water quality standards.

Thank you for your consideration of these comments and your evaluation of the significant matters presented above.

Sincerely,

Erik Steenblock,
Stormwater Program Manager, City of Encinitas

CITY OF LAGUNA HILLS

January 11, 2013

Wayne Chiu, P.E.
California Regional Water Quality Control Board, San Diego region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

SUBJECT: COMMENT – TENTATIVE ORDER NO. R9-2013-0001, REGIONAL MS4 PERMIT, PLACE ID: 786088WCHIU.

Dear Mr. Chiu:

The City of Laguna Hills appreciates the opportunity to provide comments on Tentative Order No. R9-2013-0001, which is intended by the Regional Board to serve as the basis for stormwater regulation in the City following the expiration of current Order R9-2009-0002. The City has been actively involved in the development of the comprehensive set of comments submitted by the County of Orange. The City of Laguna Hills supports those comments and incorporates them herein by reference.

The City appreciates the efforts put forth by the Regional Board staff to revise certain provisions of the prior Administrative Draft. However, there is a need to implement further significant changes in the Permit to make it feasible to implement. These changes are included in redline format in the County submitted comments. A number of key issues have been extensively discussed in the focus meetings and Board workshops and, despite some changes, still remain a significant concern to the City. These include:

- The Receiving Water Limitations provisions in the Tentative Order could expose the City to Clean Water Act liabilities for discharges that cause or contribute to an exceedance of a water quality standard. A clear linkage between the compliance provisions and prohibitions, receiving water limitations, and effluent limitations must be established.

- The provisions dealing with Land Development, Low Impact Development (LID) and Hydromodification control have been arbitrarily tightened even while existing

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permit programs are only just being implemented and/or are pending approval and have not been able to be evaluated for success. The City is particularly concerned with the elimination of all exemptions for the hydromodification control requirements, including for discharges to channels that have been engineered to prevent erosion. Exemptions for hydromodification management should include discharges to certain types of receiving waters and certain types of projects.

- The provisions implementing the Beaches and Creeks Total Maximum Daily Load (TMDL) bacteria requirements are inconsistent with the TMDL as it was developed and pose additional significant liabilities. Permit provisions must be consistent with the corresponding Basin Plan amendments.

- The provisions requiring the development and implementation of a Water Quality Improvement Plan need to be aligned with the Jurisdictional Runoff Management Program requirements so that the programs are complimentary and prioritized instead of additive.

Thank you, for the opportunity to provide comments. The City would like to request the opportunity to meet with you, other Regional Board staff and the County of Orange to review the changes requested in the County letter.

Sincerely,

Kenneth H. Rosenfield, P.E.
Director of Public Services

January 11, 2013

Dave Gibson, Executive Director
Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123

Wayne Chiu
Regional Water Quality Control Board
9174 Sky Park Court
San Diego CA 92123-4340

COMMENTS - TENTATIVE ORDER NO. R9-2013-0001, REGIONAL MS4 PERMIT, PLACE ID: 786088Wchiu

Dear Mr. Gibson:

The City of Laguna Niguel appreciates this opportunity to comment on the draft Regional MS4 Permit for the San Diego Region (Tentative Order No. R9-2013-0001 – NPDES No. CAS0109266). The City is generally very supportive of the proposed re-organization of the Permit and the consolidation of programs within the Water Quality Improvement Plan framework. Your staff is to be commended for their extensive re-writing and outreach efforts.

However, there are still significant unresolved issues, and the City continues to believe that the Draft Permit should be considered a work in progress. The County of Orange, as the Principal Permittee for South Orange County, is addressing key issues in a letter being forwarded separately, and is providing detailed redline text edits. The City of Laguna Niguel has reviewed the legal, technical and monitoring comments being submitted by the County of Orange as Lead Permittee. The City of Laguna Niguel concurs with, adopts and incorporates into this letter the comments, concerns, and recommended deletions and modifications to the Draft Permit that are being submitted by the County of Orange.

New Bacteria Data and Implications

As Laguna Niguel's urban runoff program manager, I have actively participated as South Orange County's representative to the San Diego Region's Beaches & Creeks Bacteria TMDL Stakeholder Advisory Group (SAG) since 2002. I would like to bring to your

attention the fact that **some critical new information, specifically related to the Bacteria TMDLs provisions, has become available in the last two weeks.** The new information strongly supports the understandings reached through 10 years of workshops, hearings, drafts and re-drafts of the Bacteria TMDL I for Beaches and Creeks, and for the Bacteria TMDL Implementation Provisions, both of which have been formally incorporated as Basin Plan Amendments. Your staff, the Permittees, the environmental groups, the Federal EPA, and the Regional Board put extensive work into to negotiating specific ideas and delicately-phrased language into the Basin Plan Amendment (BPA), to which all parties could commit. **The new information demonstrates the wisdom and prescience of the existing Basin Plan Amendment language**.

Our concern is that the TMDL Provisions in Attachment E of the Draft Regional Permit do not honor that hard-won consensus, and instead are contrary, in critical ways, to the Board-approved assumptions and requirements of the Basin Plan Amendments. In essence, **Attachment E sets several bars in wrong places**. If the language is not corrected, the net results are highly likely to be:

- It will be infeasible for us as Permittees to get or stay in compliance with the TMDLs.
- We will violate Numeric Effluent Limitations, which have been built into the Draft MS4 Permit as Water Quality Based Effluent Limitations.
- Under Porter-Cologne, local city governments will therefore be subject to potentially enormous Mandatory Minimum Penalties, and the Regional Board may not have discretionary authority to circumvent the situation.

Some parties have questioned whether these assertions, which have already been raised in several workshops, have been more melodramatic than technically accurate. Much of the quandary surrounds the question of whether it is or is not, in fact, reasonably feasible for Permittees to achieve the indicator bacteria concentration objectives as consistently as the Draft Permit requires (i.e., 100% of the time in dry weather, and at least 78% of the time in wet weather). Fortunately, within the last two weeks, new sets of bacteria data have become available that help answer this question, specifically for San Diego Region creeks. In short, the answer is: *no*.

Attached to this letter is a copy of the Year 1 Data Summary from the San Diego Regional Stream Reference Study. This study, which is still in progress, is being conducted, compiled and analyzed by the highly-respected non-partisan scientific organization, the Southern California Coastal Waters Research Project (SCCWRP), in cooperation with the Permittees, the Regional Board, and Federal EPA. The Study was undertaken as a direct procedural outcome of provisions incorporated into the Bacteria TMDL I and Implementation Provisions Basin Plan Amendments (BPAs), both of which stipulate that "*it is not the intent of these bacteria TMDLs to require treatment of natural sources of indicator bacteria";* the BPA-defined purpose of the Study was to find out whether, how often, and by how much *"natural sources cause exceedances of indicator bacteria water quality [concentration] objectives on their own, without contributions from anthropogenic sources."* **The preliminary Study data demonstrated that *natural***

bacteria exceedance frequencies in creeks were up to 71% in dry weather (versus the 0% required in the Draft Permit), and up to 100% in wet weather (versus the 22% allowed in the Draft Permit). *Natural* creek bacteria concentrations jump around a lot, ranging up to 15 times higher than the concentration objectives in both wet and dry weather. In other words, the indicator bacteria concentration objectives and "allowable" exceedance frequencies currently proposed in the Draft Permit are *unnatural* for San Diego Region creeks. Requiring Permittees to achieve them is asking us to do battle with Mother Nature herself. It would be a battle we would almost certainly lose.

Waste Loads vs. Concentrations

Understanding this reality provides insight into why determining impacts or compliance through concentration objectives, as proposed in the Draft Permit, is not feasible: such an approach only takes into account how many bacteria might happen to be caught in a random sampling vial, regardless of whether there is only a trickle of water or a flood. The Waste Load Allocations in the TMDLs Basin Plan Amendments, in contrast, describe the total number of *controllable anthropogenic* bacteria that are allowed to be discharged from an MS4 over the course of a specified time period (i.e. monthly for dry weather, and annually for wet weather). The Waste Load Allocations are determined as a function of total flow volume and bacteria concentrations that *on average overall* meet the concentration objectives.

Compliance Determination

For an MS4 manager trying to stay in compliance with the Permit, the difference between being judged on grab-sample concentrations and Waste Load Allocations is really insurmountable. Aside from the inherent jumpiness and high exceedance frequency of *natural* bacteria populations that the Permittees (pursuant to the Basin Plan Amendments) aren't supposed to have to control, the International Stormwater BMP Database, which compares the performance of various stormwater BMP types in achieving wet-weather effluent concentrations of indicator bacteria, identifies *no* BMPs that can achieve the effluent bacteria concentrations required for creeks under the draft Permit. The Database does, however, identify several stormwater BMPs that could feasibly achieve significantly more than the currently-required -22% as a bacteria *load* reduction in treated stormflows from individual sites. With respect to dry weather, several Permittee-implemented projects have demonstrated the ability to achieve 90% or greater reductions in anthropogenic dry weather bacteria *loads* through a combination of BMP treatments and flow reduction techniques; but none are consistently perfect in terms of bacteria concentrations. Achieving the implementation of Waste Load Allocations through appropriately-designed and appropriately-distributed systems of prevention, treatment and volume reduction BMPs targeting overall anthropogenic flow volumes and bacteria sources over time will be really the only feasible way for Cities to comply with the TMDLs – and is exactly what was envisioned in the approved Basin Plan Amendments. TMDL compliance determination needs to be based on load reductions achieved through BMP programs.

Water Quality Based Effluent Limits

The calculated TMDL Waste Load Allocations were incorporated directly into the TMDL Basin Plan Amendments. Federal law requires that Water Quality Based Effluent Limits set forth in an MS4 Permit, which make the TMDLs enforceable, have to be consistent with any available TMDL Waste Load Allocations. By leaving the Waste Load Allocations out of the Draft Permit and instead defining bacteria concentrations as Water Quality Based Effluent Limits, the Draft Permit contradicts Federal law, and establishes the concentrations as Numeric Effluent Limits under Porter-Cologne. **Exceedance of a Numeric Effluent Limit established in an MS4 Permit triggers Mandatory Minimum Penalties under Porter-Cologne.** Because natural bacterial exceedances and BMP performance limitations mean that the bacteria objective concentrations cannot feasibly be attained with adequate consistency, the **Permittees are being set up for failure and exposure to Mandatory Minimum Penalties, which the Regional Board would not have discretion to modulate.** Mandatory Minimum Penalties, which could easily run into hundreds of thousands of dollars daily, serve no good purpose for MS4s Permittees, the Board or the environment. Even the State Water Board's own Blue Ribbon Panel has concluded that incorporating Numeric Effluent Limits in MS4 Permits is *not feasible*. The WQBELs need to be *load-based*, and compliance needs to be based on implementing BMPs that achieve *load reductions.*

Provision for Re-Opener

When the Board approved the Bacteria TMDL Basin Plan Amendment in 2009, it committed specifically to a 5 year re-opener. The Board made that commitment because it recognized the TMDL had inherent flaws, principally because there were large gaps in the data used to inform the TMDL calculations. The plan was, that the Permittees would use the 5 years to do research to flesh out the local data, do some number-crunching, and bring back more locally appropriate Waste Load Allocations and exceedance frequency targets. With the re-opener, the updated allocations and frequencies would re-set the bar that Permittees would have to jump over – whether it was higher or lower. The Permittees are doing their part: we put funding together and started the research last winter to close the data gap, in conjunction with the Southern California Coastal Waters Research Project. Already, we have preliminary data demonstrating just how necessary that re-setting of the bar is likely to be. But the Permit, as currently drafted, doesn't keep the Board's part of the bargain, and doesn't recognize the course-correction that this Board had agreed was appropriate and necessary. An explicit commitment to the re-opener is needed.

Baseline for Improvement

Adding to the problem, the Draft Permit changes our starting line for measuring dry weather compliance. The Bacteria TMDL BPA specifically states that the "*available historical monitoring data from the years 1996-2002 shall be used to calculate the "existing" dry weather exceedance frequency of the 30-day geometric mean REC-1*

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WQOS for each watershed." The Draft Permit proposes changing the baseline to between 2002 and 2011. The Permittees have already spent millions of dollars between 2002 and 2011 on efforts to reduce anthropogenic bacteria waste loads. In some cases, Permittees are already close to achieving the final percent waste load reductions defined as numeric targets in the TMDLs, and some Permittees have attained 303(d) de-listings as a result of their efforts. Think about the math of it: if the final load reduction target was set at 75% in the approved TMDL BPA, and a Permittee had achieved a 70% bacteria load reduction prior to 2011, changing the starting date to 2011 would effectively change the overall load reduction needed from 75% to 92.5% - which would be a huge amount of unjustified additional work. Permittees have spent the last 2 years developing Bacteria Load Reduction Plans, based on the percent reductions that were agreed to in the TMDL Basin Plan Amendments. The Draft Permit needs to honor the agreed-upon starting date.

In summary: the City of Laguna Niguel requests correction of all the Attachment E TMDL provisions in the Draft Permit that are inconsistent with Federal law, contrary to the intent of the Basin Plan Amendments, and will result in non-discretionary Mandatory Minimum Penalties. The necessary corrections are all delineated in the redline/strike-out Permit text that the County of Orange is attaching to its comment letter on behalf of the Co-Permittees.

Thank you for the opportunity to provide comments. I would be happy to meet with you to discuss any of these issues. I can be reached at (949)362-4384 or npalmer@cityoflagunaniguel.org.

Sincerely,

Nancy R. Palmer
City Landscape Architect/Environmental Programs Manager

Attachment: San Diego Regional Stream Reference Study – Monitoring Progress Report #3 and Year 1 Data Summary (October 2011 through November 2012)

`SAN DIEGO REGIONAL STREAM REFERENCE STUDY
MONITORING PROGRESS REPORT #3 AND YEAR 1 DATA SUMMARY
OCTOBER 2011 THROUGH NOVEMBER, 2012

This Monitoring Progress Report is a summary of work completed from October 1, 2011 to November 31,2012. A data summary is provided and represents results based on calculation of Year 1 data. These will change as Year 2 data are included and are considered to be preliminary.

1 QAPP Approval and Amendment

The QAPP was submitted to the San Diego Regional Board in October 2011 and approved in December 2011.
A QAPP amendment was submitted and approved by the San Diego Regional Board in February 2012. The QAPP was amended to reflect the following changes:

- Laboratories and responsibilities (i.e. mobile lab)
- Updated sites including Prima Deschecha sediment basin and storm drain study
- Toxicity sampling approach
- Analyte list
- Sample volumes

2 Summary of Wet Weather Monitoring Activities:

Site installations were completed at all selected wet weather monitoring locations in late-January 2012 and as of February 2012, the project team was prepared for mobilization. To mobilize for a storm, AMEC reviews National Weather Service (NWS) San Diego, Los Angeles and other weather predictions and communicates with SCCWRP to assist in a go-no-go decision to mobilize. Additional site reconnaissance was conducted during the December and March timeframe to gain a better understanding of flow conditions at a particular site.

Six wet weather locations were finalized for stream monitoring (Table 1). Two of the original wet weather monitoring locations were rejected due to access issues: (1) San Clemente Canyon located within the Rose Canyon Watershed and (2) Cedar Creek located within the San Diego River Watershed. Two additional locations in the Prima Deschecha subwatershed will be monitored during wet weather only to isolate potential inputs to Cristianitos Creek.

Table 1 – Monitoring Locations. IM – Igneous/Metamorphic, SED – Sedimentary; Size: S – Small, M – Medium, and L – Large

Station Code	Stream Name	Watershed	Size	Geology	County
LCC	Long Canyon Creek	Tributary to Kitchen Creek	S	IM	San Diego
KC	Kitchen Creek	Kitchen Creek-Cottonwood Creek	M	IM	San Diego
SJC	San Juan Creek	Upper San Juan Creek	L	IM	Orange
BCC-1	Bell Canyon Creek-1	Middle San Juan Creek	S	SED	Orange
JC	Jardine Creek	San Onofre Creek	M	SED	Orange
CCCP	Cristianitos Creek	Lower San Mateo Creek	L	SED	Orange

2.1 Summary of Monitored Wet Weather Events

Since the inception of sampling, four storm events (February 13, 2012, March 17, 2012, March 25, 2012, April 26, 2012) have met the mobilization criteria and project field crew mobilized for each event. Cumulatively, since the program began in December 2010, project staff have monitored one wet weather event 1 at 3 sites (Cristianitos Creek+Prima Deschecha Golf Course+ Sediment Basin, San Juan Creek, and Long Canyon Creek).This section provides a summary of the monitored events, false-start events, and hydrographs for each monitored event.

Table 2 provides a summary of the wet weather event data including site, event date, total rainfall, flow, and total number of primary samples collected per site. The event hydrographs for Cristianitos Creek, Prima Deschecha, Golf Course, and Prima Deschecha, Sediment Basin and San Juan Creek are provided in Figures 1-5, respectively.

Table 2: Wet Weather Event Monitoring Summary

Date	Event Number	Site	Total Event Rainfall (inches)	Flow (cf)	Flow Start Time (MM/DD/YYYY hh:mm)	Flow End Time (MM/DD/YYYY hh:mm)(1)	Storm Size Category	Season	Total Primary Samples	Comment
2/13/2012	False Start	KC	0.56	N/A	N/A	N/A	Medium	Late	0	Forecast rain resulted in snow. Due to safety concerns, field crews stood-down. Rainfall data as measured at Cameron Fire Station. Accuracy of rainfall total may have been affected by snow melt.
2/13/2012	False Start	LCC	0.56	N/A	N/A	N/A	Medium	Late	0	Forecast rain resulted in snow. Due to safety concerns, field crews stood-down. Rainfall data as measured at Cameron Fire Station. Accuracy of rainfall total may have been affected by snow melt.
2/14/2012	Recon.	JC	N/A	N/A	N/A	N/A	N/A	Late	0	Post storm reconnaissance conducted.
2/14/2012	Recon.	CCCP	N/A	N/A	N/A	N/A	N/A	Late	0	Post storm reconnaissance conducted.
2/14/2012	Recon.	BCC-1	N/A	N/A	N/A	N/A	N/A	Late	0	Post storm reconnaissance conducted.
3/17/2012	Wet Event 1	CCCP	0.81	17,392,876	3/17/2012 13:38	3/18/2012 09:43	Medium	Late	9	Successfully completed.
3/17/2012	Wet Event 1	PDGC	0.81	57,079	3/17/2012 08:23	3/18/2012 10:31	Medium	Late	1	Successfully completed. AMEC needs to verify concurrent sampling approach with CCCP.
3/17/2012	Wet Event 1	PDSB	0.81	394,277	3/17/2012 07:32	3/18/2012 09:42	Medium	Late	1	Successfully completed. AMEC needs to verify concurrent sampling approach with CCCP.
3/17/2012	False Start	SJC	2.15	N/A	N/A	N/A	Large	Late	0	Equipment Malfunction – SCCWRP was not charged for this event.
3/17/2012	False Start and Recon.	JC	1.21	N/A	N/A	N/A	Large	Late	0	Creek was dry; therefore a sample could not be collected. Post storm reconnaissance conducted.
3/17/2012	False Start	BCC-1	1.63	N/A	N/A	N/A	Large	Late	0	Creek did not have sufficient flow within approximately 16 hours of mobilization. SCCWRP and AMEC agreed to stand-down. Additional verification from Starr Ranch and visual observation recon.
3/25/2012	Wet Event 1	SJC	1.05	892,288	3/25/2012 16:08	3/29/2012 08:49(2)	Large	Late	13	Successfully completed.
4/26/2012	False Start	KC	0.46	N/A	N/A	N/A	Medium	Late	0	Creek did not have sufficient increase in stage to initiate sampling.
4/26/2012	Wet Event 1	LCC	0.46	226,095	4/26/2012 00:20	4/29/2012 09:20	Medium	Late	11	Successfully completed.

Note:
Flow stop time based upon completion of sampling event when storm flow returned to approximately 25% above pre-storm base flow.
Storm Category: Trigger 0.1-0.2 inches of rainfall; Medium 0.2-1 inch of rainfall; Large >1 inch of rainfall.

Season: Early (before December) or Late (after December).
N/A = Flow data not generated for false start events.
Recon. = Reconnaissance.
Site IDs: BCC-1-Bell Canyon Creek, CCCP- Cristianitos Creek, JC Jardine Creek , KC-Kitchen Creek, LCC-Long Canyon Creek, PDGC -Prima Deschecha Golf Course, and PDSB -Prima Deschecha Sediment Basin

Figure 1: Cristianitos Creek (CCCP) – Wet Weather Event 1 Hydrograph (March 17 – 20, 2012)

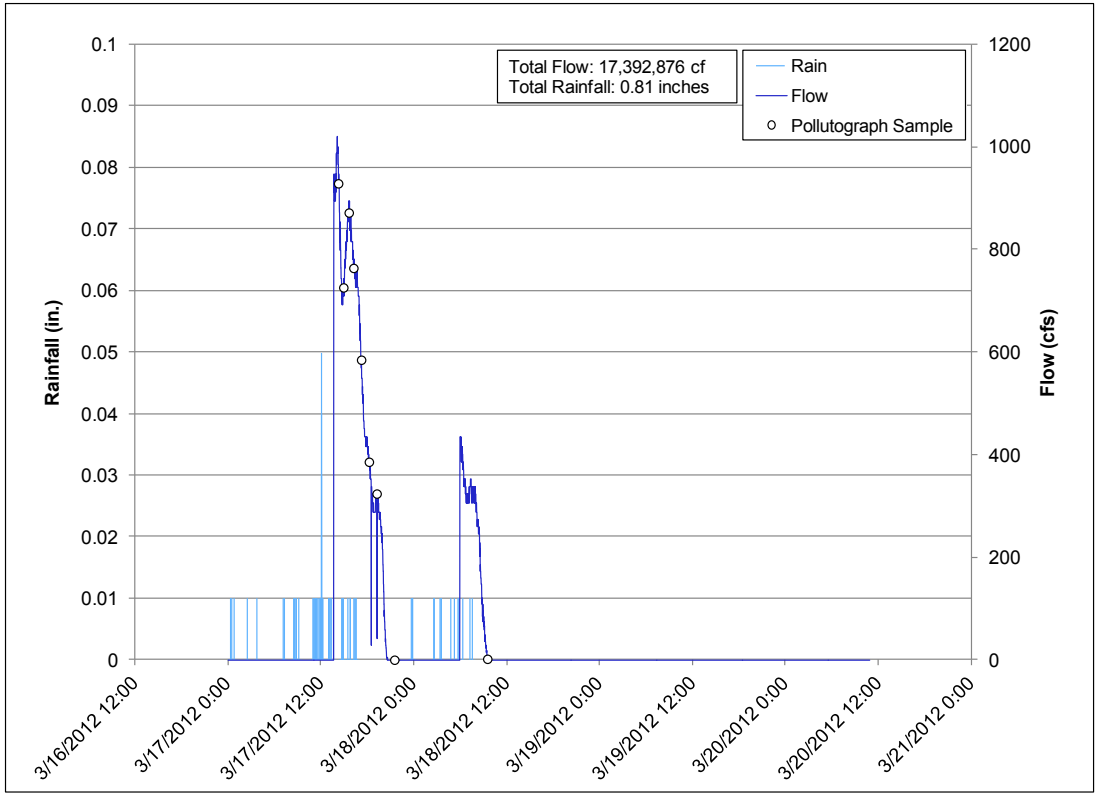

Figure 2: Prima Deschecha Golf Course Outlet (PDGC) – Wet Weather Event 1 (March 17, 2012)

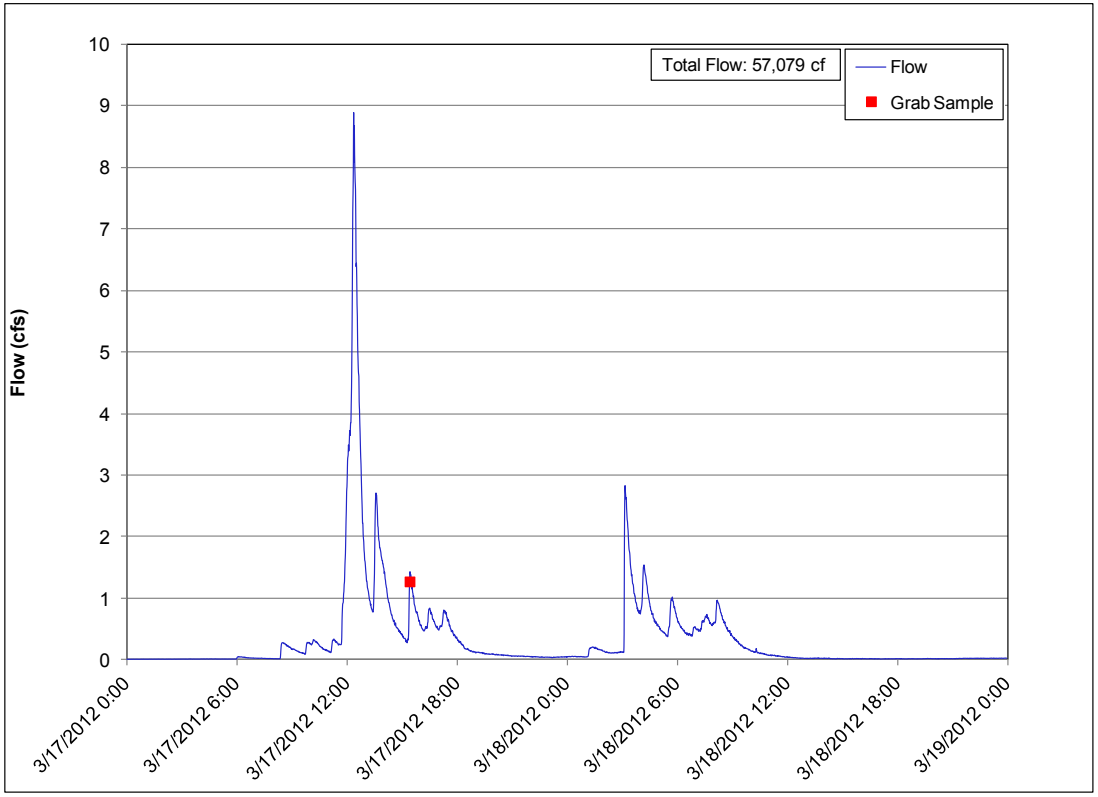

Figure 3: Prima Deschecha Sediment Basin (PDSB) – Wet Weather Event 1 Hydrograph (March 17, 2012)

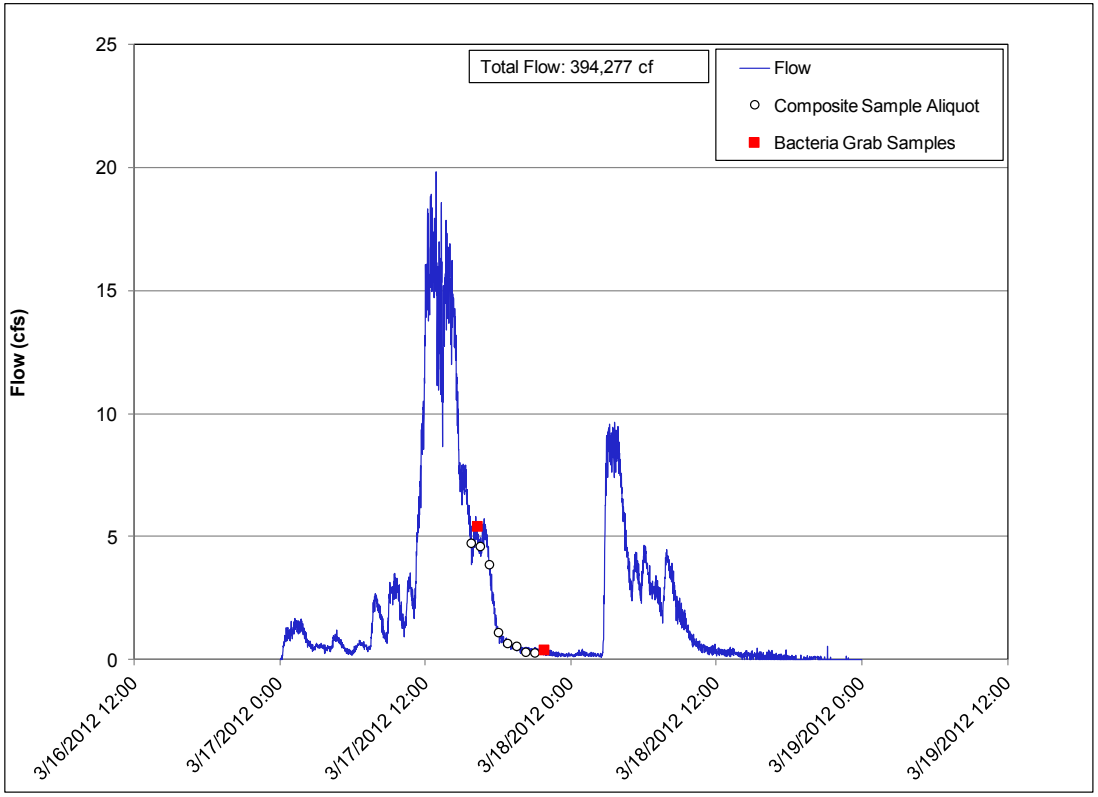

Figure 4: San Juan Creek (SJC) – Wet Weather Event 1 (March 25 – 28, 2012)

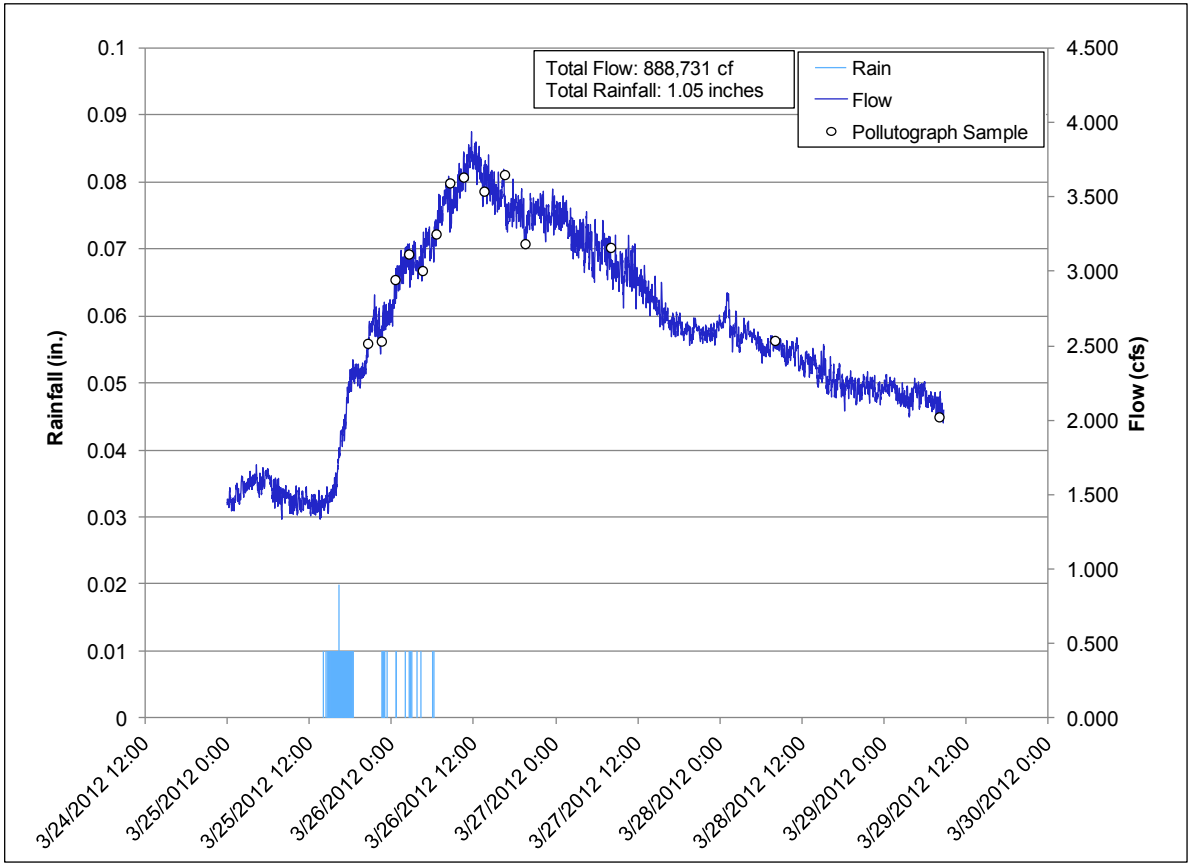

Figure 5: Long Canyon Creek (LCC) – Wet Weather Event 1 Hydrograph (April 26 – 29 2012)

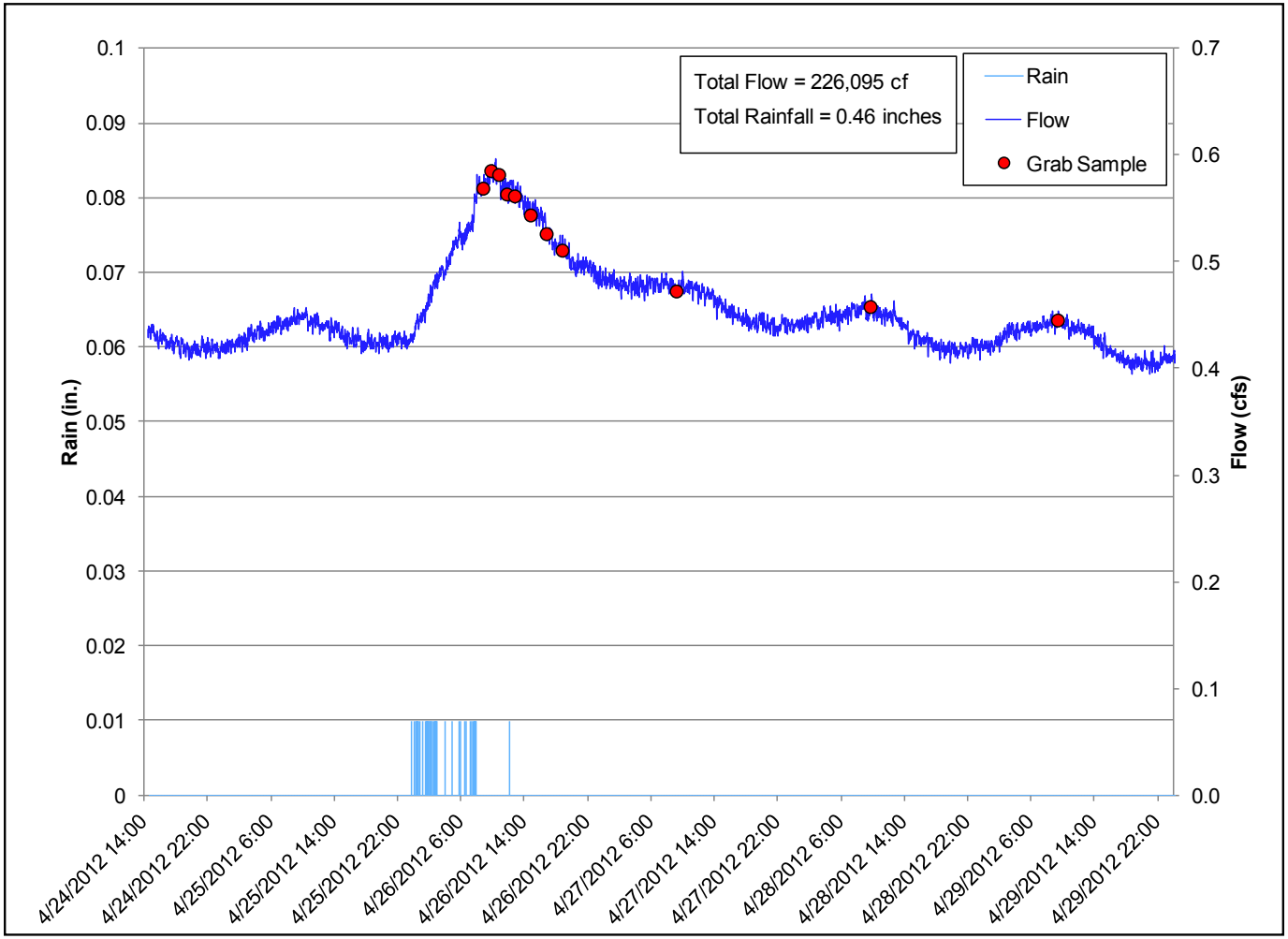

3 Summary of Dry Weather Monitoring Activities and Events

3.1 Sampling Sites

Recon of dry weather sites selected in Fall 2011 began in March 2012. Of these initial set of sites, 6 were dry and 3 were considered not to be reference because of evidence of human disturbance (Table 3). The sites that were dry will be observed beginning next fall and sampling reinitiated if flow returns.
Dry weather sampling was initiated the first week of April 2012 at seven reference streams located in both Orange and San Diego counties (Table 4). Further site reconnaissance was conducted during the April - May timeframe to target additional reference streams that met the San Diego Reference Stream monitoring program criteria. During this reconnaissance, two new streams located in San Diego, CA were added to the dry weather sampling regime (Agua Caliente Creek and Conejos Creek located in the El Capitan Reservoir) (Table 4). **No additional sedimentary sites were found within the study area.** Dry weather sampling commenced the third week of May at Conejos Creek and the fourth week of May at Agua Caliente Creek.

Reconnaissance on additional sedimentary and replacement dry weather sites have been conducted outside of the current study area. The decision on whether to add these sites to dry weather sampling was discussed with stakeholders in a meeting held September 26, 2012. During this meeting four streams were accepted to be added to the dry weather sampling regime: Fremont Canyon Creek and Santiago Creek in Orange County, Aliso Canyon Creek in Riverside and Dazur Creek in San Diego, CA. (Table 5).

3.2 Sampling Activities

For dry weather sampling, a site was eligible for sampling if it had not received measurable rainfall for at least 24 h and flow was no more than 20% above baseflow. Weekly sampling continued as long as there was measurable stream flow. For intermittent streams (i.e. Conejos Creek), sampling was suspended once the stream was too low to sample or ceased flowing (i.e. dry creek bed). Based on these criteria, the duration of sampling at the six reference sites and 3 non-reference sites has ranged from 4 to 19 weeks.

Currently, weekly dry-season bacteria and bi-weekly sampling for nutrients, trace metals and conventional constituents (i.e. total suspended solids (TSS)) has ceased at all sites; Table 6). Six to 18 weekly primary FIB samples were collected, 2 to 9 bi-weekly nutrient, trace metals, and conventional samples were collected, and 1 to 2 algal assessments have been measured at each natural stream with an overall total of 129, 58 and 9 primary samples collected respectively (Table 6). Mean stream flow during the sampling period for all sites combined was 0.013 ± .009 SD (Table 6).

Table 3: Original Dry Weather Reference Stream Monitoring Locations

Station Code	Stream Name	HUC_12_ Watershed	Latitude	Longitude	Area (Km2)	Size	Geology	Types	County
BCC-1[a]	Bell Canyon Creek-1	Middle San Juan Creek	33.6359	-117.5558	18.2	S	SED	Wet/dry	Orange
ATC[b]	Arroyo Trabuco	Arroyo Trabuco	33.6745	-117.5469	31.0	S	SED	Dry	
JC[a]	Jardin Creek	San Onofre Creek	33.39991	-117.4983	33.0	M	SED	Wet/dry	Orange
BCC-2[a]	Bell Canyon Creek-2	Middle San Juan Creek	33.56420	-117.5640	48.8	M	SED	Dry	Orange
BCC-3[a]	Bell Canyon Creek-3	Middle San Juan Creek	33.54489	-117.5613	52.2	M	SED	Dry	Orange
ASC[a]	Arroyo Seco Creek	Arroyo Seco Creek	33.45752	-116.9708	33.6	M	IM	Dry	Riverside
CCCP[a]	Cristianitos Creek	Lower San Mateo Creek	33.42739	-117.5698	80.0	L	SED	Wet/dry	Orange
SJC[b]	San Juan Creek	Upper San Juan Creek	33.58799	-117.5165	96.9	L	IM	Wet/dry	
LPC[b]	La Posta Creek	La Posta Creek	32.7002	-116.4801	115.3	L	IM	Dry	

(a) Six streams (BCC-1, JC, BCC-2, BCC-3, ASC & CCCP) were dry prior to the onset of dry season sampling in April 2012.
(b) Three locations (ATC, SJC and LPC) were considered not to be reference because of evidence of human disturbance (HWY 74 repaved) and/or grazing, however, sampling was initiated & continued at these sites to verify the validity of this assessment.

Table 4. April - July 2012 Dry Weather Monitoring Locations. IM – Igneous/Metamorphic, SED – Sedimentary; Size: S – Small, M – Medium, and L – Large

Site Code	Stream Name	Watershed	Size	Geology	County
USJ	Upper San Juan Creek	Upper San Juan Creek	S	IM	Orange
LCC	Long Canyon Creek	Tributary to Kitchen Creek	S	IM	San Diego
KC	Kitchen Creek	Kitchen Creek-Cottonwood Creek	M	IM	San Diego
PVC	Pine Valley Creek	Upper Pine Valley Creek	M	IM	San Diego
ACC	Agua Caliente Creek	Laguna Creek/ San Luis Rey River	M	IM	San Diego
LPC	La Posta Creek	La Posta Creek	L	IM	San Diego
CONC	Conejos Creek	San Diego River	L	IM	San Diego
SJC	San Juan Creek	Upper San Juan Creek	L	IM	Orange
ATC	Arroyo Trabuco Creek	Arroyo Trabuco	S	SED	Orange

Table 5. Additional Sedimentary and Replacement Dry Weather Monitoring Locations Accepted by Stakeholders in September 2012. IM – Igneous/Metamorphic, SED – Sedimentary; Size: S – Small, M – Medium, and L – Large

Site Code	Stream Name	Watershed	Size	Geology	County
SANT	Santiago Creek	Santiago Canyon Creek	S	SED	Orange
FCC	Fremont Canyon Creek	Fremont Canyon Creek	M	SED	Orange
ALIS	Aliso Canyon Creek	Aliso Canyon Creek	M	SED	Riverside
DULZ	Dulzura Creek	Otay River	L	IM	San Diego

Table 6. Dry season (2012) event monitoring summary including site, sampling start and end dates, total number of primary fecal indicator bacteria (FIB), trace metals, nutrients, conventionals (i.e. total suspended solids) and total number of algal assessments collected per site.

Site Code	Dry Weather Sampling Start Date	Dry Weather Sampling End Date	Total Sampling Weeks/yr	Total Bacteria Samples Collected (includes 30 d geomean)	Total Nutrient, Trace Metals and Conventional Samples Collected	Total No. Algal Assessments	Mean flow (m^3/sec)	Comment
LCC	4/2/2012	7/30/2012	18	19	9	2	0.0159	
LPC	4/2/2012	7/30/2012	18	19	9	0	0.0264	Evidence of grazing observed at site
KC	4/2/2012	6/25/2012	13	15	6	2	0.0369	
PVC	4/2/2012	7/2/2012	14	17	7	2	0.0242	
ACC	5/22/2012	6/12/2012	4	6	2	1	0.0013	
CONC	5/16/2012	6/14/2012	5	6	2	2	0.0006	
USJ	4/30/2012	7/3/2012	10	11	5	0	0.0024	
SJC	4/2/2012	7/31/2012	18	18	9	0	0.0032	Road repaved, sampling suspended
ATC	4/2/2012	7/31/2012	18	18	9	0	0.0066	Evidence anthropogenic disturbance
	Overall Total		**18**	**129**	**58**	**9**	0.0131 ± 0.0087	**Mean ± SD**

San Diego Reference Stream Study
Quarterly Monitoring Progress Report

4 Quality Assurance/Quality Control (QA/QC) of Year 1 Monitoring Data

The primary goal of the quality assurance/quality control (QA/QC) effort was to ensure that the sediment chemistry, nutrient and bacteria data generated by the three study participants were complete and met common data quality objectives (DQOs) for criteria pertaining to sensitivity, accuracy, and precision.

4.1 Reporting Limits

To achieve study goals, minimum target reporting limits (RLs) for each analyte were set forth in the San Diego Regional Reference Stream QAPP (Table 6-1). These RLs were set to achieve the Surface Waters Ambient Monitoring Program (SWAMP) target thresholds. Overall, participant-specific minimum RLs were lower than the target RLs, indicating that the analyses performed provided adequate sensitivity.

4.2 QA/QC Goals and Success

The sample storage conditions and maximum hold time requirements and success achieved are summarized in Table 7. Except for 25 grain size samples, all participating labs performed their analyses within the specified holding times.

The remaining criteria and corresponding DQOs, along with the degree of project success in attaining these goals, are summarized in Tables 8-9. Of the 125 samples delivered to the laboratories, over 97% of the samples were analyzed and data reported attaining our completeness DQO of 90%. Of the 85 laboratory analyses run for chemical contamination, approximately 99% had no detectable chemical measurements in blank samples. Of the remaining samples with detectable blanks values, no batch had a value more than three times the detection limit. Laboratories also attained success in accuracy DQOs for blank spiked samples (100.0% for trace metals and nutrients), matrix spiked samples (100% for trace metals and nutrients), and CRMs (96.0% for trace metals and 98.5% for nutrients). Finally, laboratories attained success in precision DQOs for laboratory duplicate samples (97.4% for trace metals, 98.0% for nutrients, and 100% for bacteria, TOC, TDS and TSS) and matrix spike duplicate samples (98.5% for trace metals and 97.6% for nutrients).

Overall, the majority of QA/QC criteria were met with greater than 90% success and completeness. For those few instances where specific criteria were not met, deviations did not impart additional uncertainty in the measurements and therefore did not warrant removal or exclusion of any data from the study database. All of these deviations, however, were noted in the study database for individual users to make their own decisions regarding data quality.

San Diego Reference Stream Study
Quarterly Monitoring Progress Report

Table 7: Achievement of sample storage conditions and maximum holding time criteria.

Parameter	Storage Condition	Maximum Holding Time	Actual Hold Times (days)	Percent Success
Alkalinity (Total Alkalinity as CaCO3)	< 6°C and store in the dark	14 days	3-14	100%
Chloride		28 days	3-25	100%
Hardness (Total Hardness as CaCO3)		6 months	3-25	100%
Sulfate		28 days	3-25	100%
TDS		7 days	3-30	94%
TSS		7 days	3-30	94%
Enterococcus	< to 6°C in the dark[(b)]	8 hours[(a)]	8	100%
E. coli			8	100%
Total Coliform			8	100%
Bacteroides			8	100%
M. smithii			8	100%
Bacteria community			8	100%
Nitrate + Nitrite (as N)	Cool to 4°C, store in the dark, filter and freeze at -20°C	48 hours; 28 days if frozen	10-26	100%
Ammonia (as N)		48 hours; 28 days frozen	10-26	100%
Total Dissolved Nitrogen	Cool to 4°Cand store in the dark, filter and freeze at -20°C	28 days if frozen	10-26	100%
Orthophosphate (dissolved; Soluble Reactive Phosphorus)	Cool to 4°C and store in the dark	48 hours	48 hours	100%
TDP		28 days	10-26	100%
Particulate Nitrogen & Carbon (PN, POC)	Keep at 4°C, dark, but must filter within 24 hours, freeze until dried	12 months after drying at 80°C for 24 hours	10-26	100%
Particulate Phosphorus (PP)	Keep at 4°C, dark, but must filter within 24 hrs, freeze until dried	12 months after drying at 80°C for 24 hours	10-26	100%
Dissolved Organic Carbon (DOC)	< to 6°C and store in the dark	28 days	10-26	100%
Trace Metals	< 6°C; Acidify to pH<2 with pre-tested nitric acid (HNO_3) w/in 48 h	6 months at room temperature following acidification	7-26	100%

San Diego Reference Stream Study
Quarterly Monitoring Progress Report

Table 8: Summary of performance-based QC criteria and project success in performing within those criteria for trace metals and nutrients.

	Trace Metals		Nutrients	
Quality Control Parameter	**DQO**	**Success**	**DQO**	**Success**
Completeness	100%	100.0%	100%	100%
Blanks				
Frequency	10% of total samples	100%	10% of total samples	100%
Accuracy	< RL	100%	< RL	100%
Precision	RPD<25%	100%	RPD<25%	100%
Spiked Blanks				
Frequency	10% of total samples	100%	10% of total samples	100%
Accuracy	Recovery within 75-125%	100%	Recovery within 80-120%	100%
Precision	RPD<25%	98.0%	RPD<25%	98.0%
CRM[1]				
Frequency	10% of total samples	100%	10% of total samples	100%
Accuracy	within lab specified limits	96.0%	within lab specified limits	98.5%
Matrix Spikes				
Frequency	10% of total samples	100%	10% of total samples	100%
Accuracy	Recovery within 75-125%	100%	Recovery within 80-120%	100%
Precision	Within ± 25% RPD[2]	98.5%	RPD<25%	96.7%
Sample Duplicates				
Frequency	10% of total samples	100%	10% of total samples	100%
Precision	Within ± 25% RPD	97.4%	Within ± 25% RPD	98.0%

[1]N/A=no DQO set, data are for evaluation purposes only as part of ongoing QA/AC efforts

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Table 9: Summary of performance-based QC criteria and project success in performing within those criteria for bacteria, total dissolved and total suspended solids (TDS/TSS).

	Bacteria		TDS/TSS	
Quality Control Parameter	**DQO**	**Success**	**DQO**	**Success**
Completeness	100%	100%	100%	100%
Blanks				
Frequency	10% of total samples	100%	10% of total samples	100%
Accuracy	Positive control within 80-120% recovery; Negative control = no growth on filter	100%	NA[1]	NA[1]
Precision	Lab Replicate RPD<25%	100%	Lab Replicate RPD<25%	100%
Spiked Blanks				
Frequency	NA[1]	NA[1]	NA[1]	NA[1]
Accuracy	NA[1]	NA[1]	NA[1]	NA[1]
Precision	NA[1]	NA[1]	NA[1]	NA[1]
CRM[1]				
Frequency	NA[1]	NA[1]	NA[1]	NA[1]
Accuracy	NA[1]	NA[1]	NA[1]	NA[1]
Matrix Spikes	-	-	-	-
Frequency	NA[1]	NA[1]	NA[1]	NA[1]
Accuracy	NA[1]	NA[1]	NA[1]	NA[1]
Precision	NA[1]	NA[1]	NA[1]	NA[1]
Sample Duplicates	-	-		
Frequency	10% of total samples	100%	10% of total samples	100%
Precision	Within ± 25% RPD	100%	Within ± 25% RPD	100%

[1]N/A=no DQO set, data are for evaluation purposes only as part of ongoing QA/AC efforts

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5 Preliminary Data Summary

A summary of exceedances are given for provided for bacterial indicators, trace metals, and nutrients for Year 1 sampling.

5.1 Wet Weather Data Summary

Table 10 provides a comparison of median constituent event mean concentration (EMCs) at open space sites during the 1983 Nationwide Urban Runoff Program (NURP, U.S. EPA 1983a), to the 1990 National Stormwater Quality Database (NSQD, Pitt et al. 2003) monitoring study, the San Diego Regional Reference Stream Study 2011-2012 wet season results and to the San Diego Regional Water Quality Control Board (SD RWQCB) Basin Plan. Comparison of bacteria, trace metals and nutrient concentrations in stormwater from reference streams from this study reveal overall median *E. coli*, total cadmium, copper, lead, nickel and zinc, nitrate + nitrite, total nitrogen and total phosphorus EMCs that are lower to current U.S. averages reported in the NSQD and SD RWQCB Basin Plan. The exception is that median constituent values from Cristianitos Creek are substantially higher than those observed in the rest of the U.S. Table 11 provides a comparison of exceedences of single sample maximum standards at reference stream sites for the three storms.

Figures 6-8 show the results of FIB pollutagraphs for each of the three storms captured during the 2011-2012 wet season.

5.2 Dry Weather Data Summary

5.2.1 Fecal Indicator Bacteria

Two analyses were used to characterize FIB levels from natural streams. First the 30-d geomeans, variances, and ranges of concentrations, were calculated to provide an estimate of expected baseline bacterial levels. Second, dry weather FIB concentrations were compared with the state of CA standards for single-sample and 30-d geomean maximum allowable densities (Table 12). Cumulative density frequency plots (CDFs) were produced to compare observed bacterial concentrations to the CA quantitative standards and to calculate accumulated relative exceedance percentages.

A total of 36.3% of the indicator bacteria dry season samples (for all three indicators) from the natural sites exceeded daily (single sample) water quality standards. Approximately 34.1% of enterococci exceeded the daily threshold of 104 MPN/100 ml (Figure 9). The average enterococci level of these exceedances was 141 MPN/100 ml, with a maximum of 1553 MPN/100 ml (La Posta Creek) and a minimum of 2 MPN/100 ml (Arroyo Trabuco Creek). For *E. coli*, 4.2% of the measurements exceeded the single sample standard of 235 MPN/100 ml with a maximum and a minimum of 727 MPN/100 ml

and 1 MPN/100 ml, respectively (La Posta Creek; both Kitchen and Long Canyon Creeks). For total coliforms, no sites exceeded the single sample standard of 10,000 MPN/100 ml.

A total of 71.0% of enterococci samples from the natural sites exceeded the 30-d geomean water quality standard of 33 MPN/100 ml. The average enterococci level of these exceedances was 107 MPN/100 ml, with a maximum of 843 MPN/100 ml and a minimum of 7.2 MPN/100 ml (Table 13; Appendix A1). For *E. coli*, approximately 3.3% exceeded the 30-d geomean threshold of 126 MPN/100 ml with a maximum and a minimum of 261 MPN/100 ml and 2 MPN/100 ml, respectively (Table 12; Appendix A2). For total coliforms, 61.3% exceeded the 30-d geomean of 1000 MPN/100 ml with a maximum and a minimum of 2419.6 MPN/100 ml and 345 MPN/100 ml, respectively (Table 13; Appendix A3).

Water temperature varied by about 5-10°C at each of the sites, increasing during the summer months reaching a mean of 17.3°C and a maximum of 19°C on warm sunny afternoons (Figure 10a). A negative correlation was observed between dissolved oxygen and stream temperature (Figure 10a and Appendix B, Table B1). Bacteria levels for all three indicators were substantially higher during the month of July than during all other months (Figures 10-13). For example, 30-d geomeans for enterococci at Long Canyon Creek were near the water quality standard in April 2012 with levels approximately 28.7 MPN/100 ml ± 3.2 SD, increased substantially during the summer, exceeding the criterion, peaking in July at 311.7 MPN/100 ml ± 3.1 SD as streams stopped flowing (Figure 10b). Similar enterococci exceedance patterns were observed for all streams with the exception of Upper San Juan Creek (Figure 8). Observed *E. coli* concentrations responded similarly to enteroccoci however none of the streams sampled showed exceedances for *E. coli* during the summer months (Figure 12). A similar exceedance pattern was observed for total coliforms (Figure 13).

5.2.2 Trace Metals Results

Metals occurred predominantly in the dissolved phase during the 2012 dry season, although the dissolved fraction varied by metal (Figure 14). Upper San Juan Creek had the highest mean dissolved copper concentration at 4.0 µg/L ± .06 followed by Arroyo Trabuco and Pine Valley at 0.38 ± .05 and 0.36 ± .01 µg/L respectively (Figure 14). Mean total and dissolved metals concentrations for each reference stream are provided in Appendix C. Reference stream metals concentrations varied considerably both spatially and temporally. Results indicate that for copper reference stream mean dissolved concentrations were substantially higher in April (0.3 ± .1 µg/L) than during the other three sampling events (Figure 15). Mean dissolved copper for all reference streams for the entire 2012 dry season was 0.3 ± .1 µg/L.

Comparison of reference stream samples to standards can be instructive in estimating the likelihood that inherent variability of reference concentrations may result in periodic exceedences. The concentrations of metals from filtered storm water and dry season samples were evaluated using the California State Water Quality Standards for Surface Waters (Federal Register, EPA Part III, 40 CFR Part 131). Toxicity of many metals is dependent upon the hardness of the water. Hardness of each water

sample was calculated from its calcium and magnesium concentrations and, using the calculated hardness, calculations for chronic toxicity of the sampled metals were then done. Equations for calculating hardness and chronic toxicity criteria are as follows (Federal Register, EPA Part III, 40 CFR Part 131):

- **Hardness**:
  using the values for calcium (mg/L) and magnesium (mg/L): Hardness = (2.497*Ca)+(4.1189*Mg).

- **Chronic toxicity criteria**:

  Copper $\leq (.960)(e^{(.8545(\ln(hardness))-1.702)})$ Freshwater
  $\leq (.830)(e^{(.8545(\ln(hardness))-1.702)})$ Saltwater

  Lead $\leq (.791)(e^{(1.237(\ln(hardness))-4.705)})$ Freshwater
  $\leq (.791)(e^{(1.237(\ln(hardness))-4.705)})$ Saltwater

  Zinc $\leq (.986)(e^{(0.8473(\ln(hardness))+0.884)})$ Freshwater
  $\leq (.946)(e^{(0.8473(\ln(hardness))+0.884)})$ Freshwater

Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. *Federal Register* Vol. 65, No. 97/ May 2000 Rules and Regulations.

Concentrations of dissolved copper, and zinc in reference streams were generally below the freshwater and saltwater chronic toxicity standards established under the California Toxics Rule (Figures 15 and 17). Of the 121 individual reference stream samples for each dissolved metal, four copper samples (2 dry weather; one in early April and one in early May; and 2 wet weather), and one dry weather zinc sample exceeded the CTR standards. Reference stream dissolved copper concentrations exceeded CTR standards in 4.1% and 11.2% of the wet and dry weather samples, respectively. In contrast, only 2.9% of dry weather reference stream samples exceeded CTR standards for zinc. No wet weather samples exceeded the CTR standards for zinc.

5.2.3 Total Solids Results

Increased levels of total dissolved solids (TDS) and/or suspended solids (TSS) can block out light and thus reduce photosynthetic activity and, depending on the amount of surface agitation (oxygenation), gradually decrease the amount of oxygen produced by the plants and lead to an increase in water temperature. Mean total dissolved solids exceeded the drinking water quality standard in June at both Arroyo Trabuco and La Posta creeks (548 and 564 mg/L, respectively; Figure 18). San Juan Creek had the highest TDS exceedance observed during the 2012 dry season (in July) with a concentration of 1066 mg/L. The source of this exceedance was probably due to soil erosion caused by the road construction

on Ortega HWY above the sampling site. None of the reference stream sites exceeded the TSS water quality threshold of 100 mg/L (Table 12).

5.2.4 Nutrient Results

For this discussion total nitrogen (TN) and total phosphorus (TP) were selected as the factors representing the water quality of the reference streams. Based upon ninety samples collected between April and July 2012, the mean total phosphorus (TP) concentration in all reference streams was 0.03 mg/L and the mean total nitrogen (TN) concentration was 0.16 mg/L (Table 14). Exceedance frequency of SD RWQCB basin plan standards of 1 mg TN L-1 and 0.1 mg TP L-1 was 0% and 11% respectively. The mean TN:TP (by weight) was 7.6:1 (Table 14).

Similar to metals, nutrients occurred predominantly in the dissolved and particulate phase during the 2012 dry season, although the dissolved and particulate fraction varied by nutrient (Figures 19 and 20; Tables D1-D3).

There was a slight positive relationship between the concentration of total nitrogen and the concentration of total phosphorus in the rivers (r^2 = 0.3) (Figure 21). Both TN and TP showed a negative relationship (r^2 = 0.6 and 0.2, respectively) when compared with proportion of underlying watershed geology (%) during the 2012 dry season (Figure 21).

Dissolved oxygen (DO) concentrations in reference streams averaged 7.9 mg/L. The mean value for Upper San Juan Creek was considerably less (5.3 mg/L) but higher than the minimal DO criteria of 5.0 mg/L established for class III (intermediate) waters.

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6 References

California Toxics Rule Environmental Protection Agency. 1997. Federal Register, EPA Part III, 40 CFR Part 130. California State Water Quality Standards for Surface Waters. Establishment of numeric criteria for priority toxic pollutants for the State of California: Proposed Rule. Federal Register 62:42159-42208.

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Pitt R., Maestre A., Morquecho R. "The National Stormwater Quality Database (NSQD, version 1.0)". Water Environment Federation Technical Expositoin and Conference, Los Angeles, CA. October, 2003.

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SD RWQCB basin plan standards. Water Quality Control Plan California Regional Water Quality Control Board, San Diego. For the San Diego Basin Region (9). 1994. San Diego, CA. http://www.waterboards.ca.gov/sandiego/programs/basinplan.html

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Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. *Federal Register* Vol. 65, No. 97/ May 2000 Rules and Regulations.

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Table 10. Comparison of median event mean concentrations (EMCs) for Open/ Non-Urban Land Uses. ND = not detected; NA = not analyzed. Note that Cristianitos Creek (CCCP) results are not adjusted for inputs from Prima Deschecha and Golf Course storm drain inputs.

	Reference Stream			Open/Non-Urban Land Use			SD RWQCB Basin Plan
	CCCP[1]	LCC[2]	SJC[3]	SDRS[4] Overall	NSQD[5]	NURP[6]	
Constituant	EMC			Median EMCs			
TSS (mg/L)	**619**	0.8	0.3	0.8	78	70	100
Bacteria (MPN/100 mL)							
E. coli	2,212	36	193	193	7,200	NA	235
Enterococi	8,577	124	314	314	NA	NA	104
Total coliforms	**24,176**	1163	1746	1746	NA	NA	10,000
Trace Metals (mg/L)							
Total Cadmium	**2.1**	ND	0.01	0.01	0.50	NA	0.05
Total Copper	**22**	0.5	0.8	0.8	5.3	NA	0.01
Total Lead	4.3	0.04	0.05	0.05	5.0	30	0.02
Total Nickel	25	0.2	0.4	0.4	ND	NA	0.10
Total Zinc	**169**	0.6	1.6	1.6	39	195	0.02
Nutrients (mg/L)							
Nitrate + Nitrite	0.57	0.06	0.00	0.06	0.60	0.54	10
Total Nitrogen	**1.1**	0.21	0.09	0.21	1.9	NA	1.0
Total Phosphorus	**0.18**	0.04	0.01	0.01	0.25	0.12	0.1

Reference Streams: [1]CCCP = Cristianitos Creek, [2]LCC = Long Canyon Creek, [3]SJC = San Juan Creek

Source: [4]SDRS = San Diego Reference Stream study;

[5]NSQD = The National Storm water Quality Database, Pitt et al. (2003)

[6]NURP = Nationwide Urban Runoff Program (US EPA 1983)

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Table 11. Comparison of exceedences of single sample maximum standards at reference stream sites for the three storms during the 2011-2012 wet season.

	% Exceedance		
Stream	**E. coli**	**Enterococci**	**Total Coliforms**
		(MPN/100 ml)	
Cristianitos Creek	89	100	100
Long Canyon Creek	33	89	0.0
San Juan Creek	7.1	71	0.0

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Table 12. State of California water quality standards for fecal indicator bacteria, trace metals and nutrients as established in Assembly Bill 411, the California Basin Plan and SD RWQCB Basin plan biostimulatory objectives for flowing waters.

Constituent	Reference Stream									CA Basin Plan/ Water Quality Threshold
	ACC[1]	ATC[1]	CONC[1]	KC[1]	LCC[1]	LPC[1]	PVC[1]	SJC[1]	USJ[1]	
	Mean Result									
Total Suspended Solids (mg/L)	0.7	2.5	2.2	1.5	4.5	1.2	1.2	10.6	9.7	**100**
Total Dissolved Solids (mg/L)	226	410	360	224	235	451	265	499	295	**500**
Bacteria										
E. coli	115	81	14	74	37	102	42	65	28	**235**
Enterococci	**283**	67	32	80	**169**	**298**	38	116	19	**104**
Total Coliforms	1,886	2,098	1,548	2,078	1,302	2,420	1,683	1,058	828	**10,000**
Total Metals (ug/L)										
Cadmium	nd[2]	0.03	nd[2]	nd[2]	nd[2]	0.02	nd[2]	0.06	0.03	**5.0**
Chromium	0.02	0.05	0.05	0.07	0.09	0.05	0.05	0.07	0.03	**50**
Copper	0.21	0.52	0.29	0.26	0.25	0.14	0.37	0.59	0.30	**5.83**
Iron	103	29.3	178	57.7	221	82.5	94.5	**596**	28.1	**300**
Lead	0.03	0.05	0.02	0.02	0.02	0.02	0.01	0.11	0.02	**15**
Manganese	14.3	2.3	**98.53**	5.25	44.7	32.6	9.52	**152**	0.74	**50**
Nickel	0.80	0.29	0.27	0.21	0.10	0.12	0.57	0.36	0.15	**100**
Selenium	0.10	1.1	0.15	0.07	0.04	0.19	0.18	0.20	0.42	**50**
Zinc	0.80	1.2	0.51	25.9	18.5	16.2	37.2	2.3	1.2	**16.91**
Dissolved Metals (ug/L)										
Copper	0.27	0.39	0.27	0.24	0.19	0.17	0.36	0.19	0.42	**5.6**
Zinc	0.46	0.53	0.29	**17.5**	15.9	**16.1**	**34.0**	0.64	0.86	**16.0**

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Table 12 continued.

Constituent	Reference Stream ACC[1]	ATC[1]	CONC[1]	KC[1]	LCC[1]	LPC[1]	PVC[1]	SJC[1]	USJ[1]	SD RWQB Basin Plan/ Water Quality Threshold
	Mean Result									
Nutrients (mg/L)										
Total Nitrogen	0.19	0.04	0.29	0.15	0.11	0.27	0.24	0.07	0.05	**1.0**
Nitrate (as NO3)	1.3E-03	1.1E-02	1.9E-03	2.3E-03	1.1	1.2E-01	1.5E-03	6.2E-03	3.2E-03	**45**
Nitrate + Nitrite (sum as Nitrogen)	1.6E-03	1.1E-02	2.0E-03	2.4E-03	1.1	1.2E-01	1.7E-03	6.5E-03	3.6E-03	**10**
Nitrite (as Nitrogen)	3.0E-04	1.0E-04	8.8E-05	1.5E-04	4.9E-04	8.6E-04	2.3E-04	2.8E-04	4.0E-04	**1.0**
Total Phosphorus	0.03	0.01	0.02	0.08	0.02	**0.10**	0.01	0.02	0.01	**0.1**

[1]Agua Caliente Creek; Arroyo Trabuco; Conejos Creek; Kitchen Creek; Long Canyon Creek; La Posta Creek; Pine Valley Creek; San Juan Creek; Upper San Juan

[2]nd = not detected

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Table 13. List of natural stream sampling sites, characteristics and their median monthly fecal indicator bacteria densities (MPN/100 ml). 30-d geomean exceedances are bolded.

Site Name	Watershed	County	Catchment size (km^2)	Mean flow (m^3/sec)	Geomean					
					E. coli		Enterococci		Total coliforms	
					(MPN/100 ml)	SD	(MPN/100 ml)	SD	(MPN/100 ml)	SD
Long Canyon Creek	Tributary to Kitchen Creek	San Diego	23.3	0.0159	8.8	81.0	**116.1**	35.3	**1,131.9**	325.9
Kitchen Creek[a]	Kitchen Creek-Cottonwood Creek		39.9	0.0369	13.0	22.1	**64.1**	36.1	**1,999.3**	273.9
Pine Valley Creek[a]	Upper Pine Valley Creek		43.1	0.0242	16.9	31.3	30.6	21.2	**1,486.9**	359.7
Agua Caliente Creek[a]	Laguna Creek/ San Luis Rey River		46.1	0.0013	15.6	108.3	**131.5**	219.0	**2,419.6**	0.0
La Posta Creek	La Posta Creek		115.3	0.0264	47.2	14.2	**133.0**	216.4	**1,685.9**	345.9
Conejos Creek[a]	San Diego River		116.0	0.0006	10.8	7.8	26.7	22.9	**1,993.1**	481.7
Upper San Juan Creek[a]	Upper San Juan Creek	Orange	19.3	0.0024	14.3	14.7	21.3	12.3	691.9	350.2
San Juan Creek	Upper San Juan Creek		96.9	0.0032	16.1	14.3	**59.9**	76.2	856.1	364.0
Arroyo Trabuco	Arroyo Trabuco		31.0	0.0066	30.5	92.7	**37.9**	92.1	**1,392.4**	342.6
[a]Intermittent stream		**Mean**	59.0	0.0130	19.3	42.9	**69.0**	81.3	**1,517.4**	316.0
		SD	39.2	0.0087	6.1	20.0	23.2	41.3	287.7	66.0
			Overall Geomean		18.0		**56.9**		**1,231.2**	
				SD	17.8		40.3		142.4	

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Table 14. Water quality results at reference streams during the 2012 dry season.

Reference Stream	DO	TN	TP	TN:TP
	Mean (mg/L)			
Agua Caliente	8.2	0.19	0.03	6.3
Arroyo Trabuco	8.7	0.05	0.01	5.0
Conejos	6.4	0.29	0.02	15
Kitchen Creek	9.7	0.15	0.08	1.9
Long Canyon	9.0	0.11	0.02	5.5
La Posta	7.7	0.27	0.10	2.7
Pine Valley	8.5	0.24	0.01	24
San Juan	7.8	0.07	0.02	3.5
Upper San Juan	5.3	0.05	0.01	5.0
Mean	**7.9**	**0.16**	**0.03**	**7.60**

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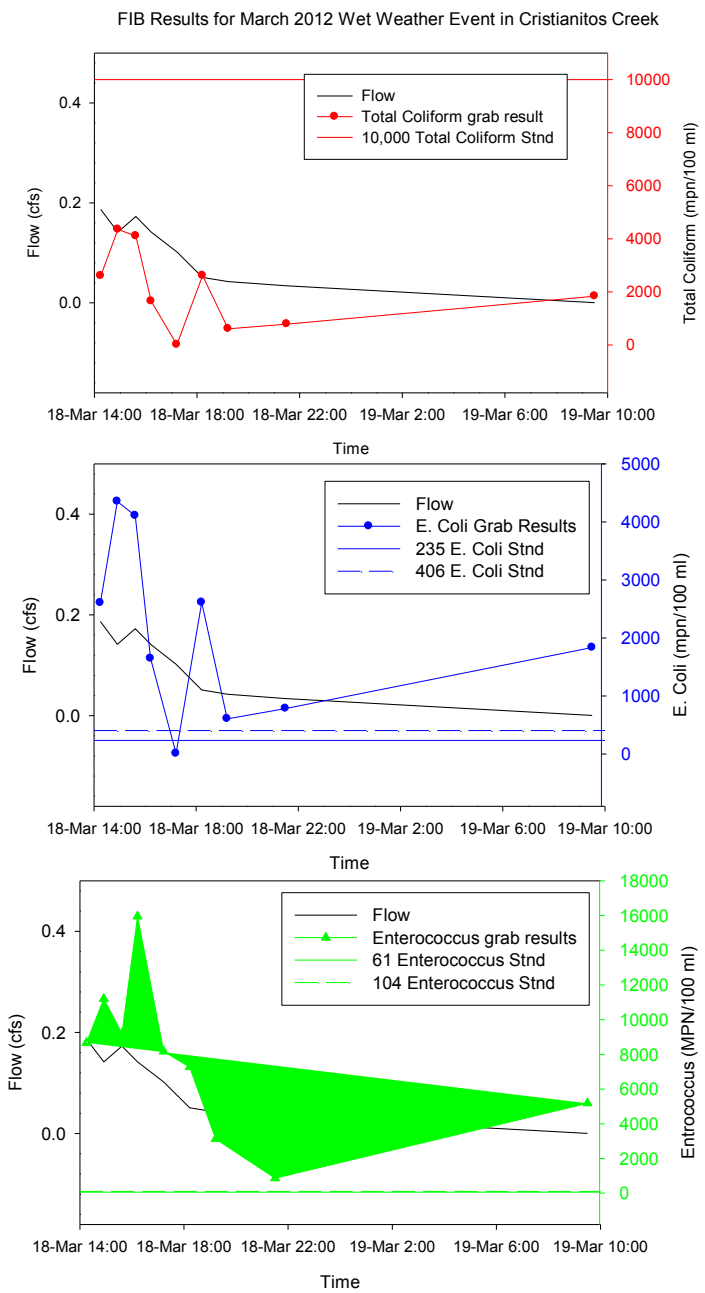

Figure 6. Pollutagraph of flow and FIB grab sample results relative to California standards for single grab samples for Cristianitos Creek March 18, 2012 wet weather event.

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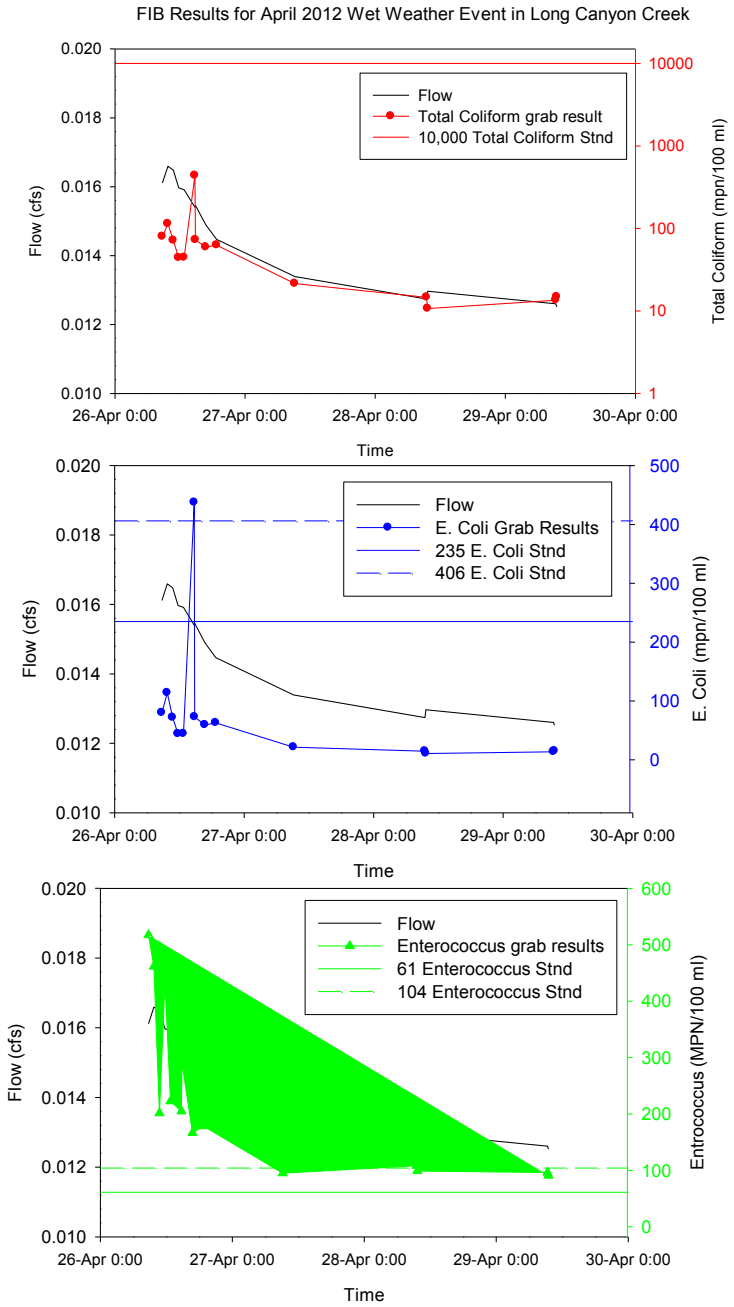

Figure 7. Pollutagraph of flow and FIB grab sample results relative to California standards for single grab samples for Long Canyon Creek April 26, 2012 wet weather event.

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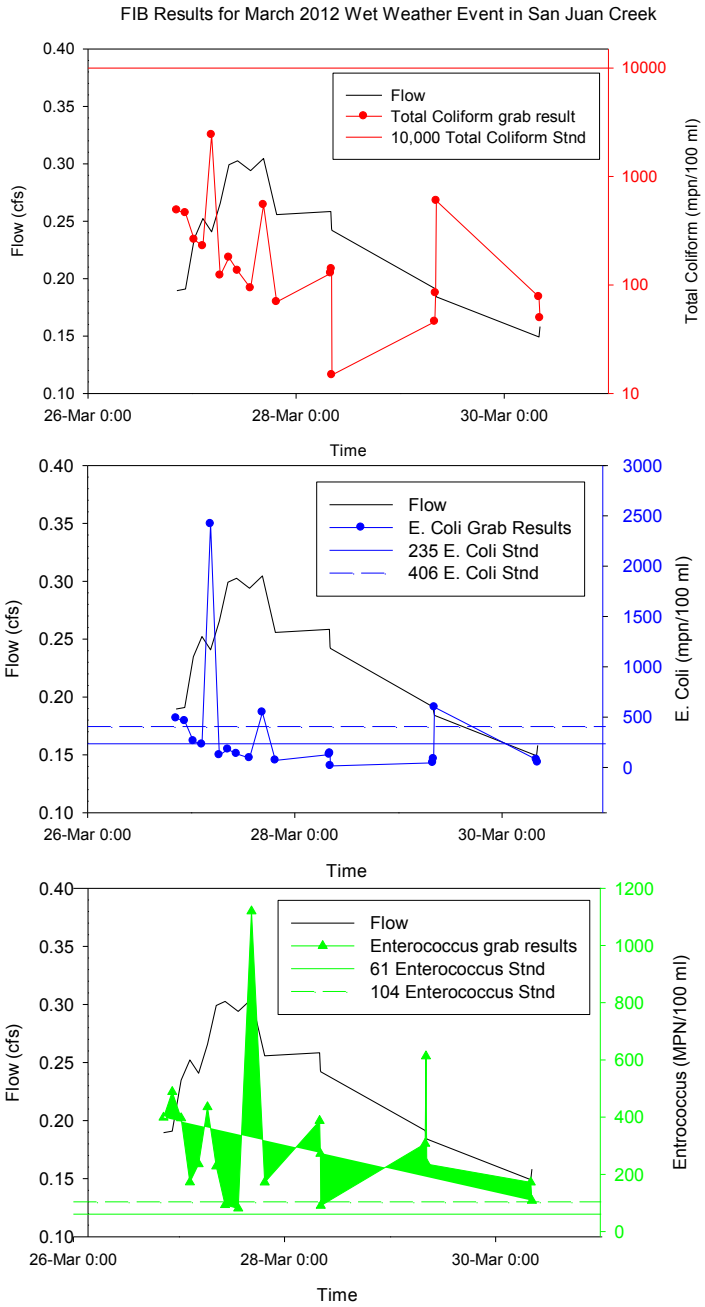

Figure 8. Pollutagraph of flow and FIB grab sample results relative to California standards for single grab samples for San Juan Creek March 20, 2012 wet weather event.

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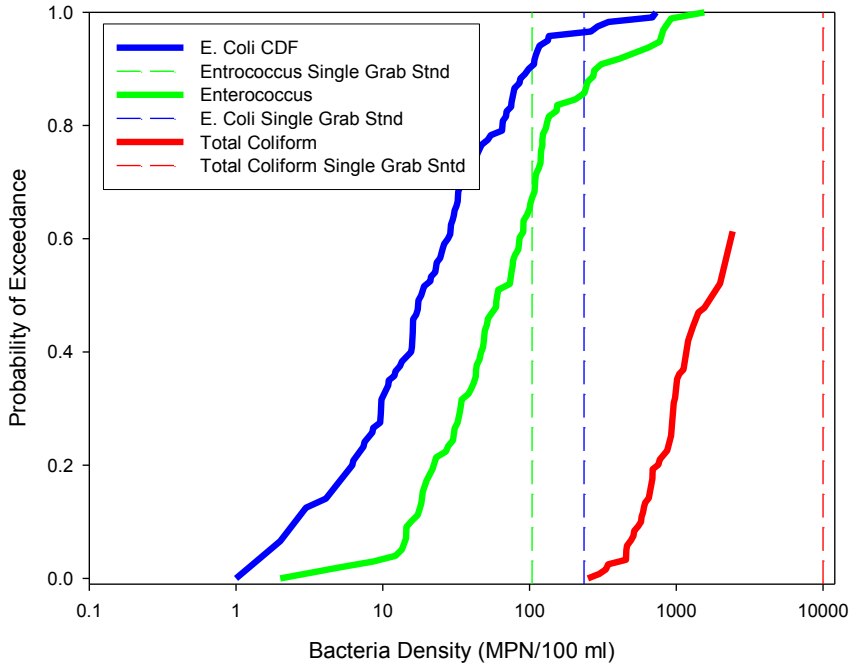

Figure 9. Cumulative density frequency plot (CDF) of dry weather FIB in natural streams relative to State of California marine water quality standards (dotted lines).

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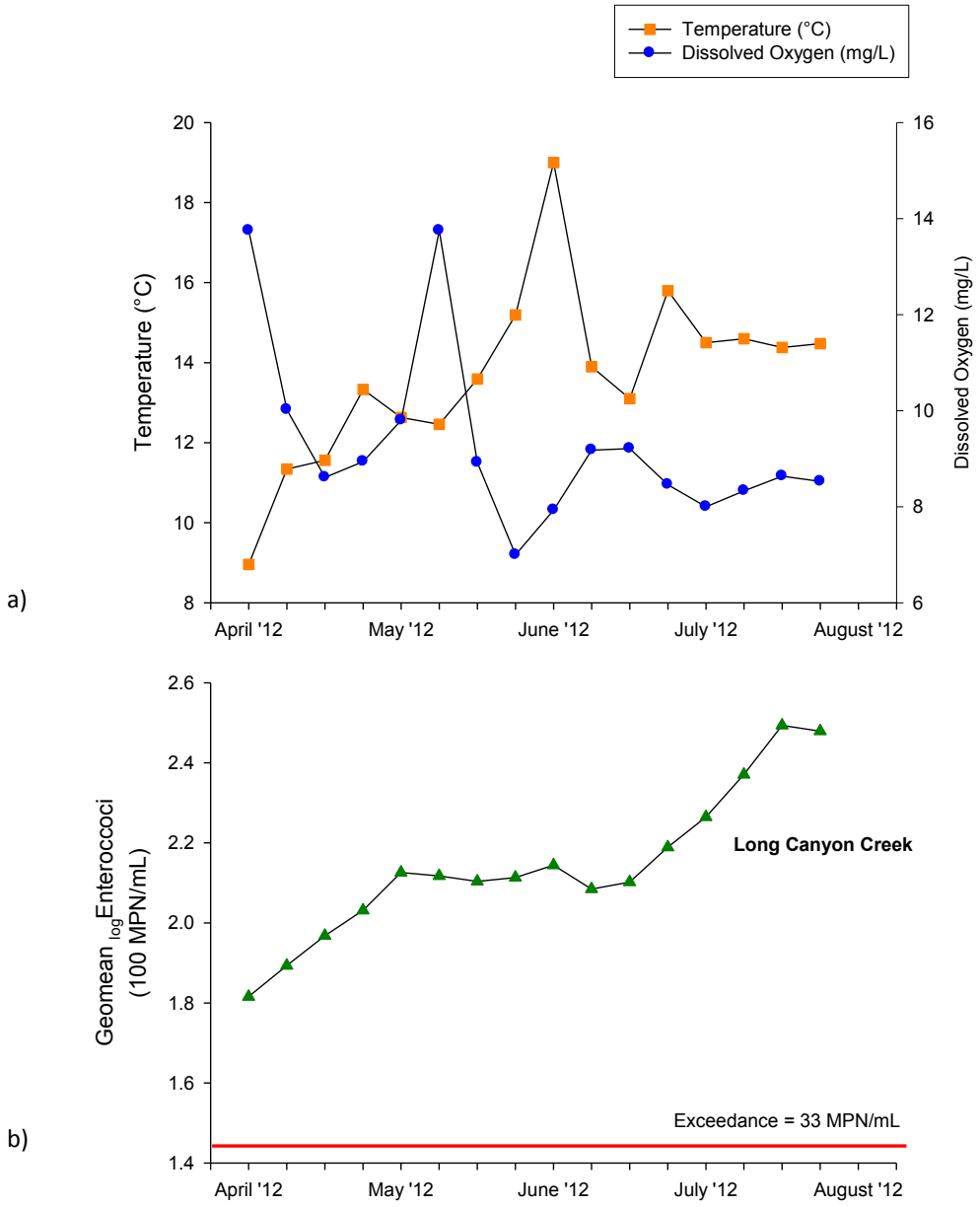

Figure 10. Monthly temperature (°C) and dissolved oxygen (mg/L) comparison (top pane, (a)) and geomean enterococci densities in natural streams in southern California (bottom panel, (b)) between April 2012 and July 2012. May-July were substantially higher than April. The solid line indicates the 30-d geomean for enterococci equal to 33 MPN/100 mL. All points above the line represent bacteria water quality exceedances.

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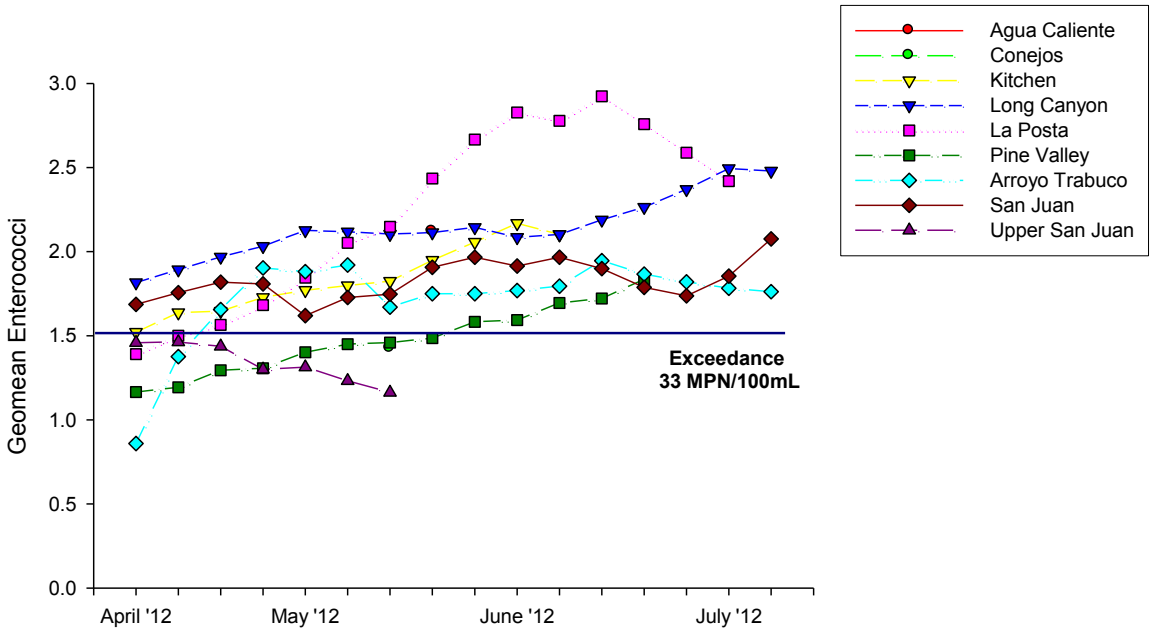

Figure 11. Geomean enterococci densities in natural streams in southern California between April 2012 and July 2012. The solid line indicates the 30-d geomean for enterococci equal to 33 MPN/100 mL. All points above the line represent bacteria water quality exceedances.

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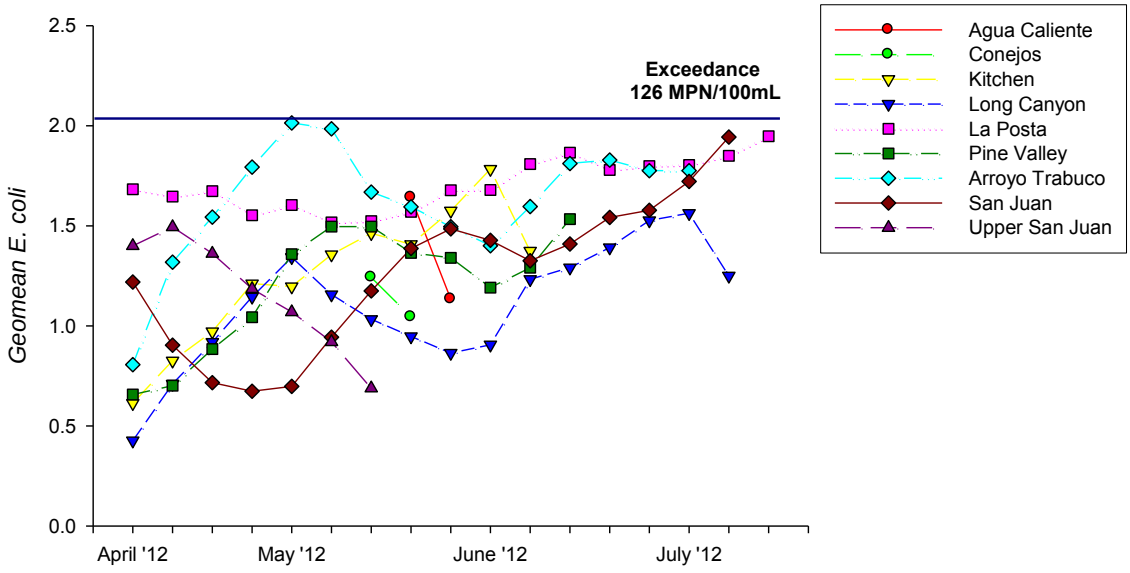

Figure 12. Geomean *E. coli* densities in natural streams in southern California between April 2012 and July 2012. None of the streams exceeded water quality standards. The solid line indicates the 30-d geomean for *E. coli* equal to 126 MPN/100 mL. All points above the line represent bacteria water quality exceedances.

San Diego Reference Stream Study
Quarterly Monitoring Progress Report

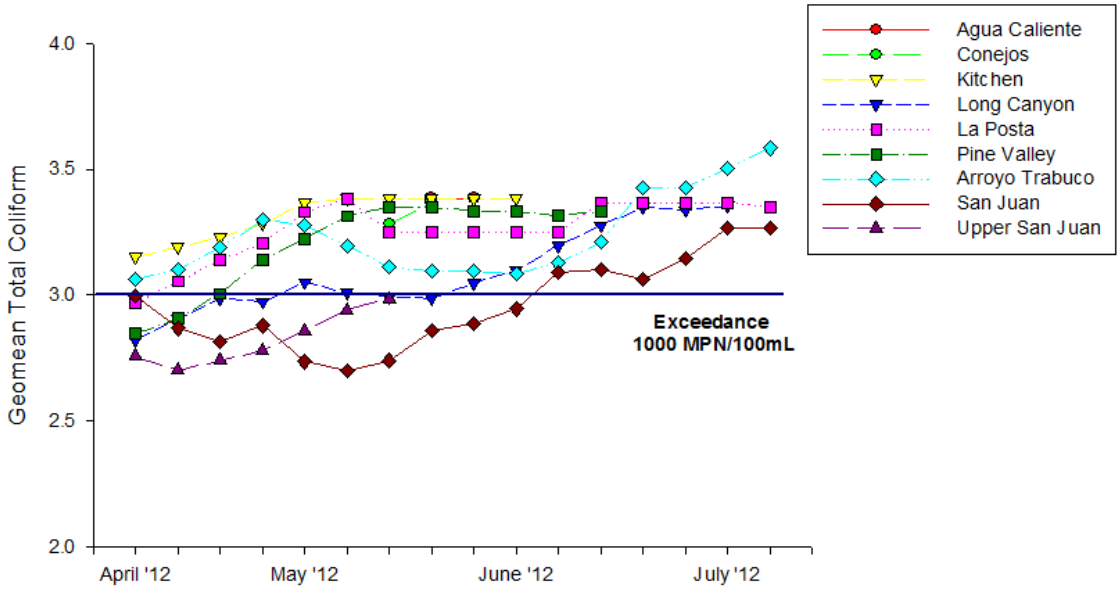

Figure 13. Geomean total coliform densities in natural streams in southern California between April 2012 and July 2012. The solid line indicates the 30-d geomean for total colifom equal to 1000 MPN/100 mL. All points above the line represent bacteria water quality exceedances.

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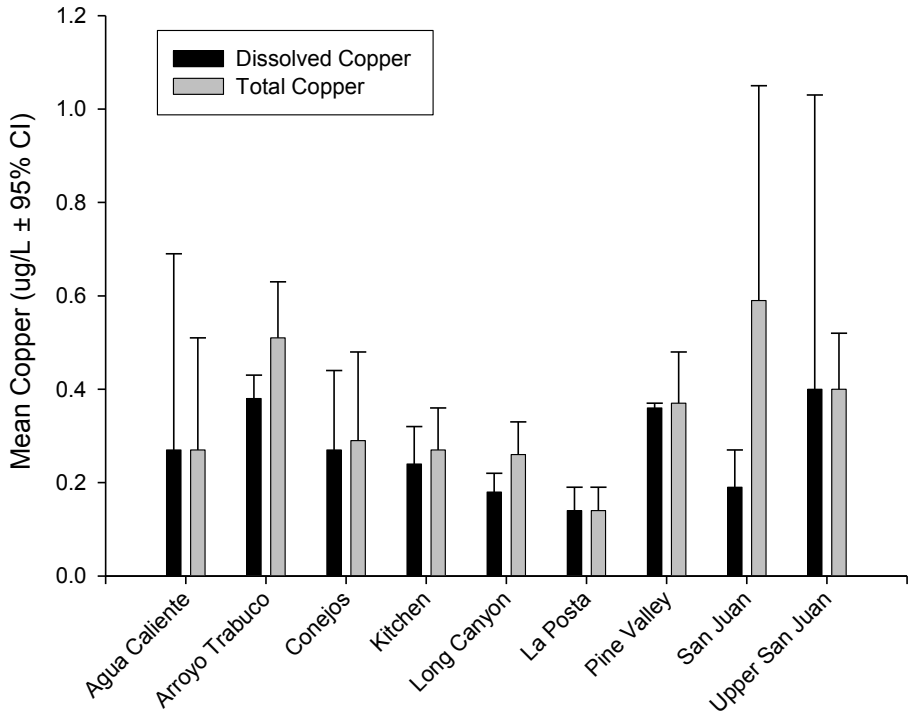

Figure 14. Comparison of dissolved and total copper concentrations in reference streams during the 2012 dry season, n = 68.

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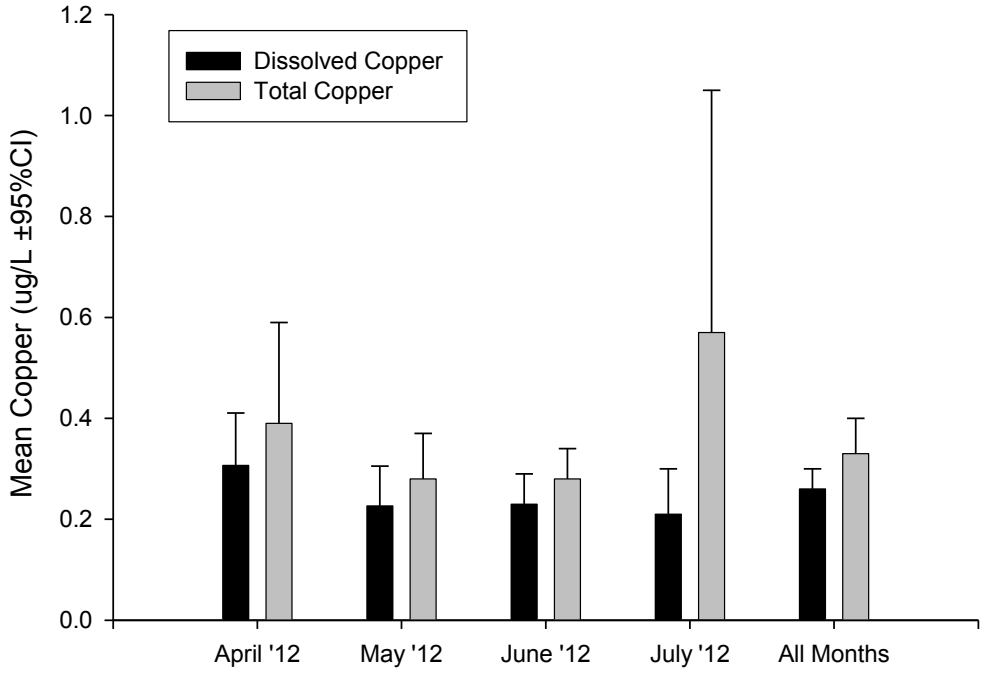

Figure 15. Inter-annual variability in copper concentrations in reference streams during the 2012 dry season. For the month of April n=12, May n=30, June n = 17, and July n=8.

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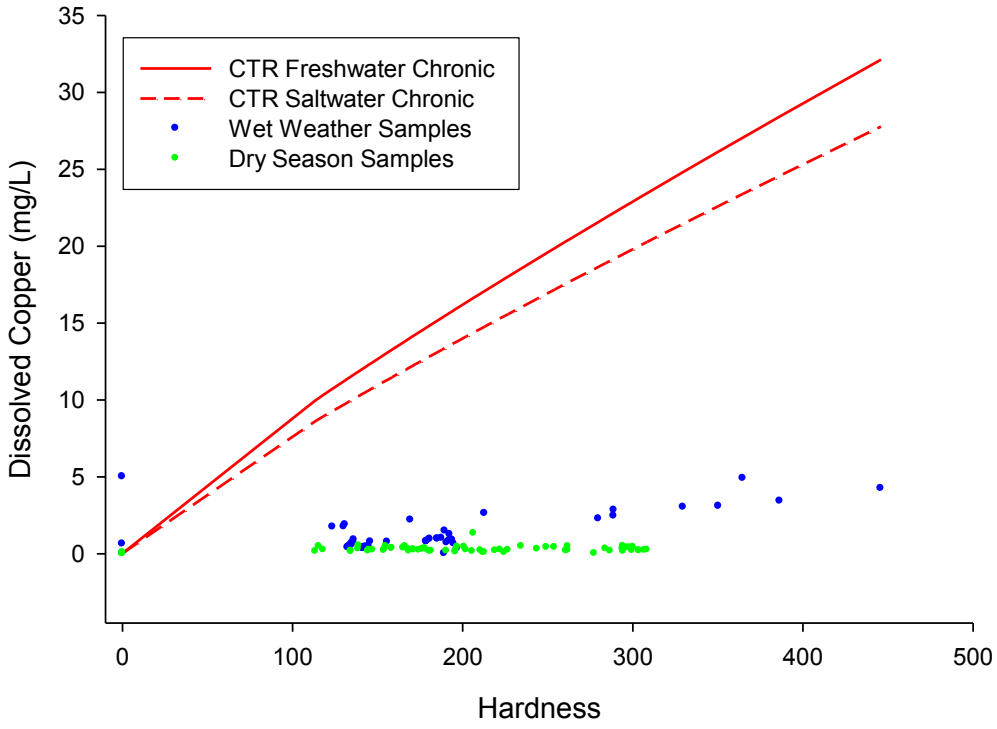

Figure 16. Comparison of reference stream dissolved copper concentrations to the California Toxics Rule (CTR). Concentrations relative to CTR standards for both wet weather and dry weather reference stream samples.

San Diego Reference Stream Study
Quarterly Monitoring Progress Report

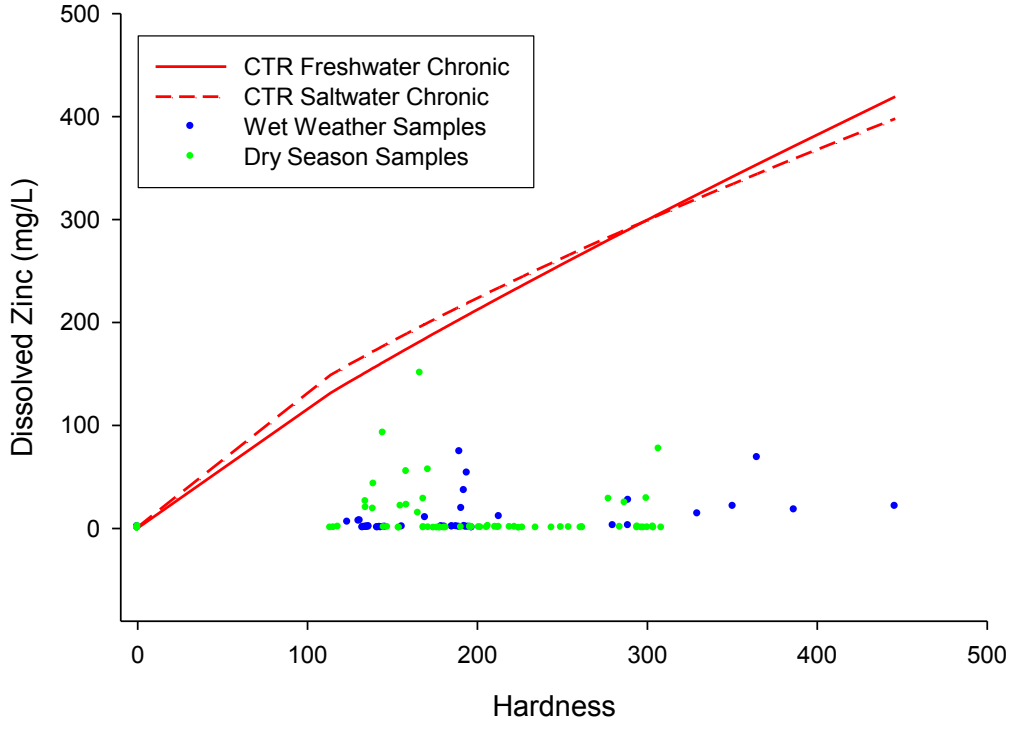

Figure 17. Comparison of reference stream dissolved zinc concentrations to the California Toxics Rule (CTR). Concentrations relative to CTR standards for both wet weather and dry weather reference stream samples.

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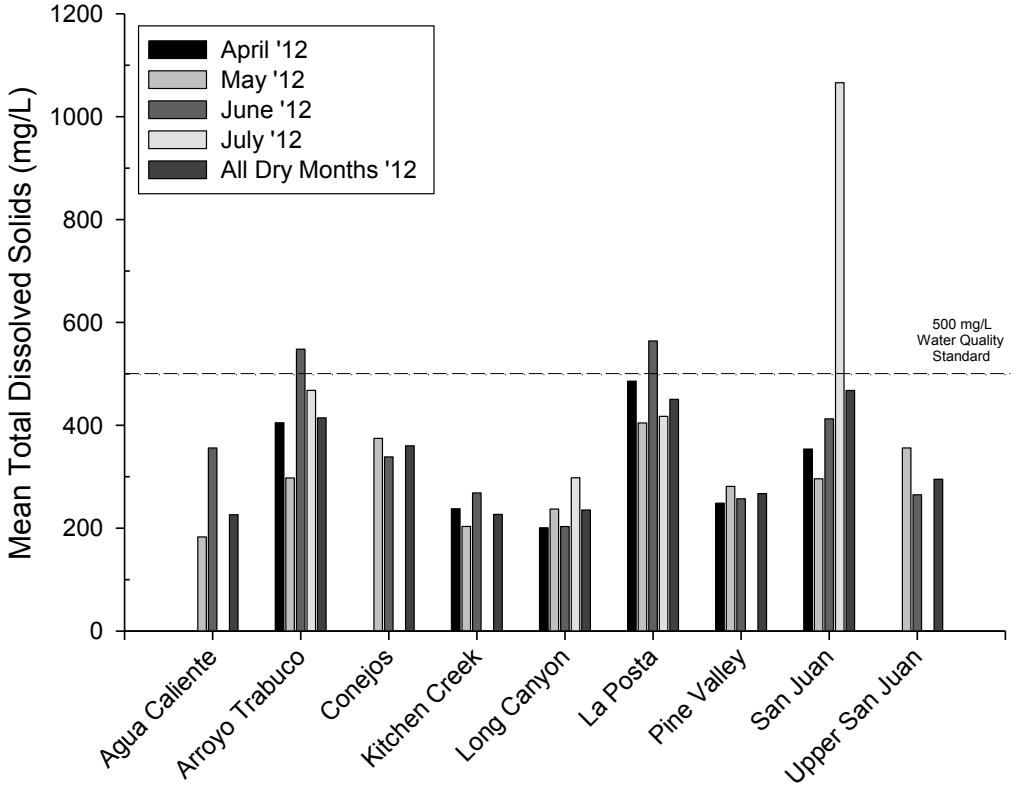

Figure 18. Comparison of mean concentrations of reference steam total dissolved solids for the four dry season sampling months and all months combined in 2012. Units are in mg/l. For the month of April n=12, May n=30, June n = 17, and July n=8.

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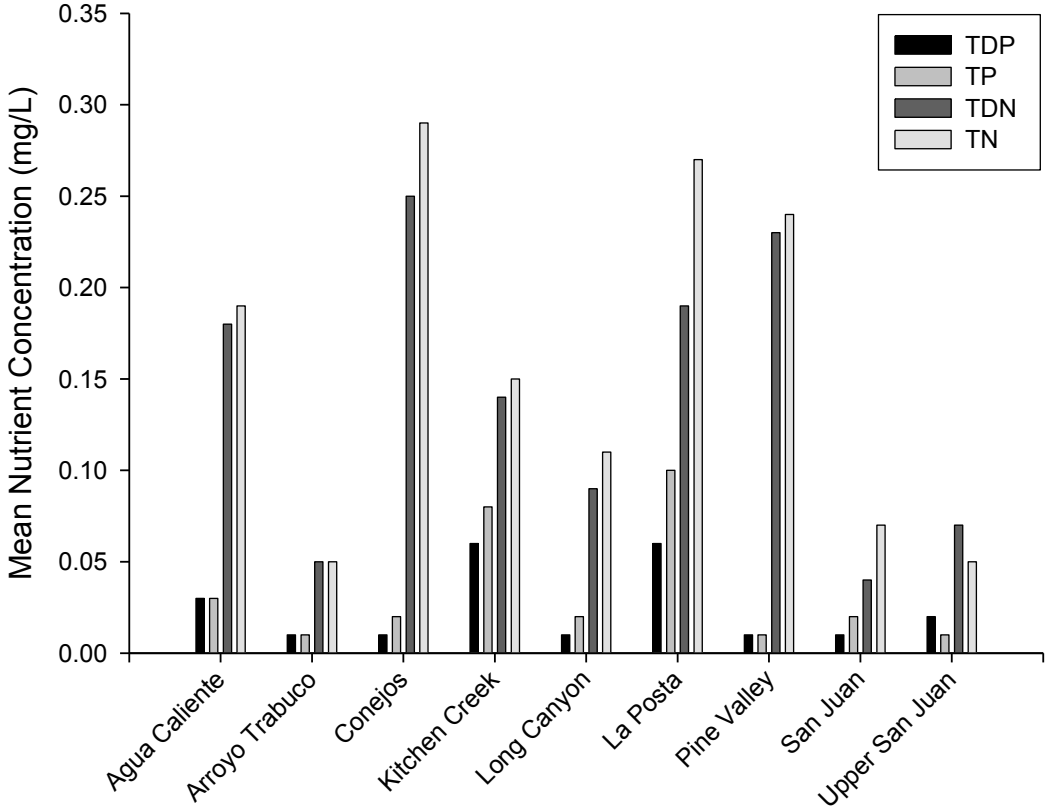

Figure 19. Comparison of reference stream nutrient concentrations (total dissolved phosphorus (TDP), total phosphorus (TP), total dissolved nitrogen (TDN), and total nitrogen (TN)) during the 2012 dry season. Units are mg/L.

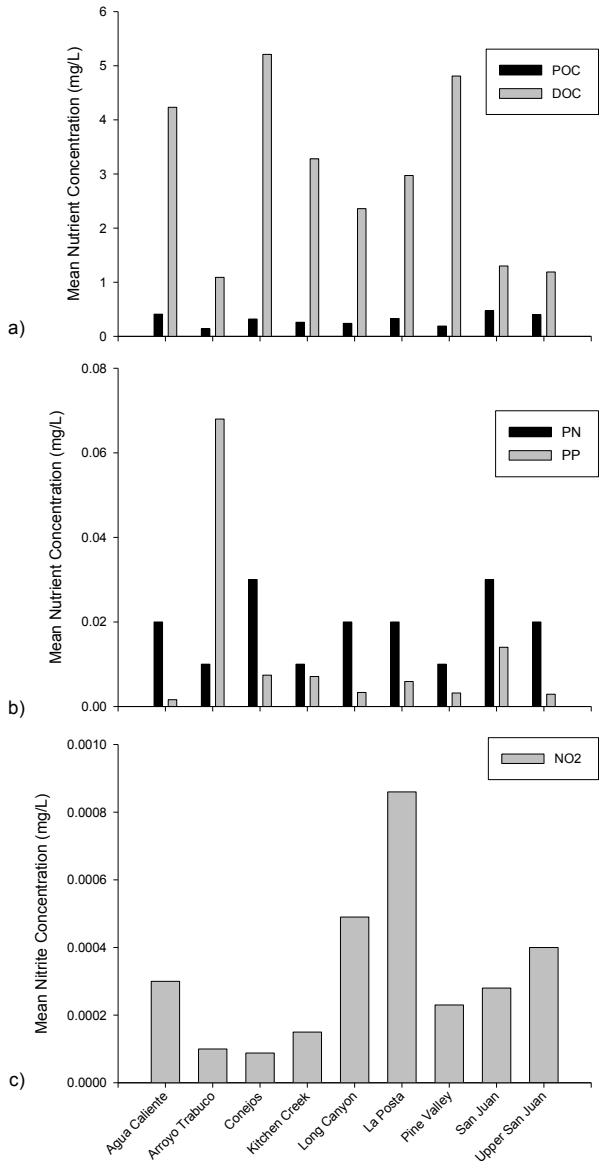

Figure 20. Comparison of reference stream nutrient concentrations a) particulate organic carbon (POC) and dissolved organic carbon (DOC); b) particulate nitrogen (PN) and particulate phosphorus (PP); and c) nitrite (NO_2) during the 2012 dry season. Units are mg/L.

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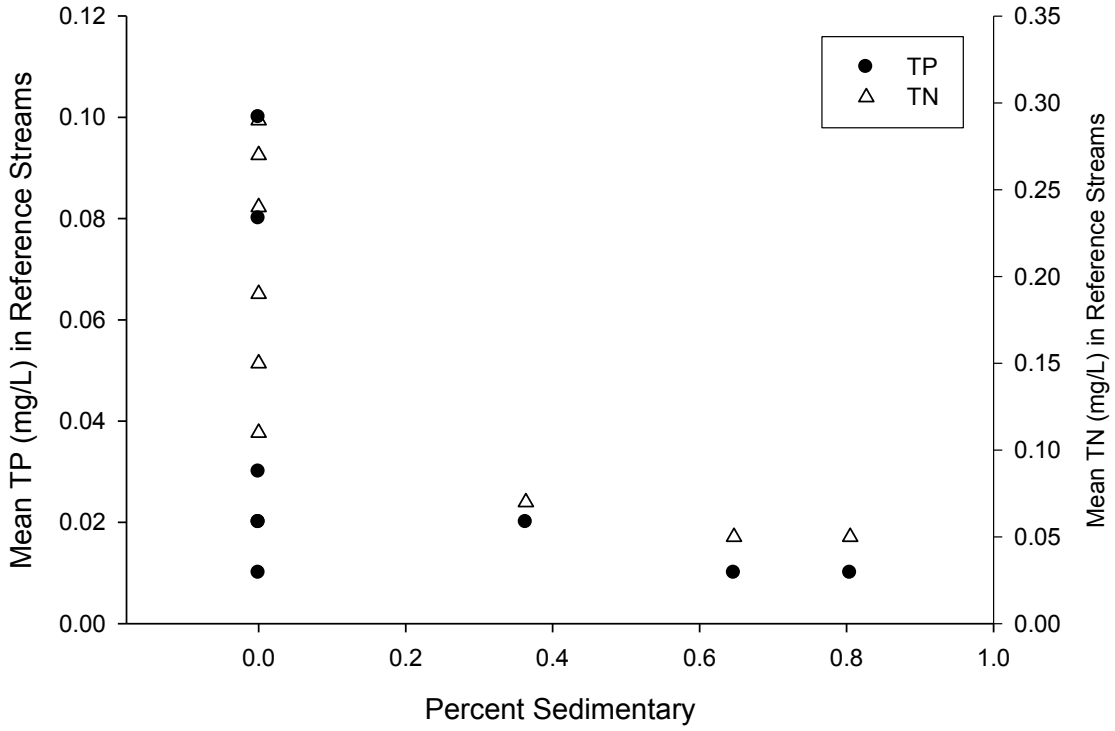

Figure 21. Relationship between total nitrogen (TN) and total phosphorus (TP) to proportion (%) sedimentary geology in reference streams during the 2012 dry season. Units are mg/L.

San Diego Reference Stream Study
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APPENDIX A - SUMMARY BACTERIA DATA FOR ALL REFERENCE STREAM SITE

San Diego Reference Stream Study
Quarterly Monitoring Progress Report

Table A1. Monthly Enterococci geomeans (MPN/100 ml) in natural streams during April 2012-July 2012 in southern California, USA. State of California water quality standards exceedances are bolded. [a] = intermittent stream. NA = not analyzed.

			Enteroccoci Geomean							
Site Name	Watershed	County	April (MPN/100 ml)	SD	May (MPN/100 ml)	SD	June (MPN/100 ml)	SD	July (MPN/100 ml)	SD
Long Canyon Creek[a]	Tributary to Kitchen Creek	San Diego	**72.3**	27.7	**127.0**	50.0	**133.7**	14.6	**291.1**	31.5
Kitchen Creek[a]	Kitchen Creek-Cottonwood Creek	San Diego	**38.1**	26.1	**66.8**	36.9	**132.7**	96.5	NA	NA
Pine Valley Creek[a]	Upper Pine Valley Creek	San Diego	15.0	2.5	28.8	13.9	**52.7**	16.2	**195.6**	-
Agua Caliente Creek[a]	Laguna Creek/ San Luis Rey River	San Diego	NA	NA	**150.8**	348.1	**100.0**	-	NA	NA
La Posta Creek	La Posta Creek	San Diego	27.8	22.1	**140.6**	323.1	**843.0**	436.9	**315.9**	680.3
Conejos Creek[a]	San Diego River	San Diego	NA	NA	**38.0**	57.2	21.1	15.9	NA	NA
Upper San Juan Creek[a]	Upper San Juan Creek	Orange	30.5	-	29.0	24.6	14.6	2.2	14.5	-
San Juan Creek	Upper San Juan Creek	Orange	**48.6**	222.5	**53.4**	12.4	**88.8**	88.3	**61.1**	73.9
Arroyo Trabuco	Arroyo Trabuco	Orange	7.2	15.8	**83.3**	282.2	**67.0**	38.9	**107.3**	197.7
San Diego Geomean ± SD			32.7	13.9	**74.2**	75.2	**121.5**	161.2	**277.8**	295.7
Orange Co. Geomean ± SD			19.6	112.1	**50.5**	95.1	**77.2**	37.3	**57.4**	83.3
Overall Geomean ± SD			27.8	35.8	**63.5**	58.6	**101.1**	107.1	**126.3**	153.4

Table A2. Monthly *E. coli* geomeans (MPN/100 ml) in natural streams during April 2012-July 2012 in southern California, USA. State of California water quality standards exceedances are bolded; [a] = intermittent stream. NA = not analyzed.

			E. coli Geomean							
			April		May		June		July	
Site Name	**Watershed**	**County**	**(MPN/100 ml)**	**SD**	**(MPN/100 ml)**	**SD**	**(MPN/100 ml)**	**SD**	**(MPN/100 ml)**	**SD**
Long Canyon Creek[a]	Tributary to Kitchen Creek	San Diego	3.9	39.8	12.3	2.3	6.8	5.3	47.9	440.4
Kitchen Creek[a]	Kitchen Creek-Cottonwood Creek		5.9	9.6	29.0	48.7	15.9	50.0	NA	NA
Pine Valley Creek[a]	Upper Pine Valley Creek		5.6	4.0	31.4	28.5	20.5	7.6	**261.3**	-
Agua Caliente Creek[a]	Laguna Creek/ San Luis Rey River		NA	NA	22.0	8.8	11.1	224.0	NA	NA
La Posta Creek	La Posta Creek		42.0	22.0	33.3	15.9	82.1	21.5	50.8	47.4
Conejos Creek[a]	San Diego River		NA	NA	10.4	1.5	11.2	24.3	NA	NA
Upper San Juan Creek[a]	Upper San Juan Creek	Orange	9.7	-	31.2	8.0	10.5	34.1	2.0	-
San Juan Creek	Upper San Juan Creek		16.5	24.6	8.8	6.7	30.0	32.2	19.8	68.8
Arroyo Trabuco	Arroyo Trabuco		6.4	12.7	96.5	260.8	33.4	20.9	70.9	268.1
San Diego Geomean ± SD			8.56	13.5	22.6	12.4	27.0	31.4	62.6	182.6
Orange Co. Geomean ± SD			10.2	15.7	29.8	91.8	18.8	16.7	20.8	107.4
Overall Geomean ± SD			9.6	10.3	25.1	35.3	23.8	20.6	39.6	114.0

Table A3. Monthly total coliforms geomeans (MPN/100 ml) in natural streams during April 2012-July 2012 in southern California, USA. State of California water quality standards exceedances are bolded; [a] = intermittent stream. NA = not analyzed.

			Total Coliforms Geomean							
			April		May		June		July	
Site Name	Watershed	County	(MPN/100 ml)	SD	(MPN/100 ml)	SD	(MPN/100 ml)	SD	(MPN/100 ml)	SD
Long Canyon Creek[a]	Tributary to Kitchen Creek	San Diego	732.3	316.1	981.8	168.5	**1,418.3**	551.2	**2,419.6**	0.0
Kitchen Creek[a]	Kitchen Creek-Cottonwood Creek		**1,550.1**	419.4	**2,419.6**	0.0	**2,419.6**	0.0	NA	NA
Pine Valley Creek[a]	Upper Pine Valley Creek		778.5	225.5	**2,236.0**	208.0	**2,086.7**	212.3	**2,419.6**	-
Agua Caliente Creek[a]	Laguna Creek/ San Luis Rey River		NA	NA	**2,419.6**	0.0	**2,419.6**	0.0	NA	NA
La Posta Creek	La Posta Creek		**1,094.2**	512.4	**1,776.5**	746.1	**2,419.6**	0.0	**2,265.6**	283.1
Conejos Creek[a]	San Diego River		NA	NA	**1,753.4**	979.2	**2,265.6**	283.1	NA	NA
Upper San Juan Creek[a]	Upper San Juan Creek	Orange	648.8	-	501.8	266.0	**1,098.2**	792.4	**1,524.6**	1,429.8
San Juan Creek	Upper San Juan Creek		991.4	711.3	500.9	131.7	**1,038.0**	807.1	**1,540.2**	1,410.4
Arroyo Trabuco	Arroyo Trabuco		**1,152.8**	326.5	**1,566.1**	767.8	**1,454.4**	721.9	579.4	-
San Diego Geomean ± SD			991.6	225.0	**1,864.6**	259.1	**1,486.5**	260.2	**2,352.3**	121.3
Orange Co. Geomean ± SD			**1,021.6**	354.3	732.9	400.0	876.4	418.0	**1,261.5**	771.1
Overall Geomean ± SD			**1,001.0**	187.5	**1,313.7**	270.7	**1,233.6**	265.5	**1,814.4**	401.7

CITY OF LAKE FOREST

January 11, 2013

Via US Mail and E-mail

Mayor
Scott Voigts

Mayor Pro Tem
Kathryn McCullough

Council Members
Peter Herzog
Adam Nick
Dwight Robinson

City Manager
Robert C. Dunek

Mr. David Gibson
Executive Officer
California Regional Water Quality Control Board,
San Diego Region
C/O Mr. Wayne Chiu, P.E.
9174 Sky Park Court, Suite 100
San Diego, CA 92123

Subject: **Comments - Tentative Order No. R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu.**

Dear Mr. Gibson:

The City of Lake Forest ("City") submits this letter to the California Regional Water Quality Control Board, San Diego Region ("SDRWQCB") to convey the City's formal written comments on Tentative Order No. R9-2013-0001/NPDES Permit No. CAS0109266 ("Draft Permit"). The Draft Permit is intended by the SDRWQCB to serve as the basis for stormwater regulation for the City upon the expiration of current Order R9-2009-0002. The City appreciates the efforts of the SDRWQCB staff in the development of the Draft Permit including the most recent revisions from the former Administrative Draft; however, significant concerns remain.

The City is aware that the County of Orange ("County") is submitting a comment letter documenting comprehensive technical and legal concerns identified during the review of the Draft Permit. The County's submittal also includes proposed revisions to the Draft Permit provided via "red line" format per SDRWQCB staff request. City staff have participated closely in the collaborative development of this comprehensive set of comments and the City has requested to be named as a concurring entity in the County's letter. The City would like to express its full support for the County's comments and proposed revisions. While detailed comments are provided within the County's submittal, the City would like to note and specifically highlight several key issues of concern as follows:

- The Receiving Water Limitations provisions in the Tentative Order could expose the City to Clean Water Act liabilities for discharges that cause or contribute to an exceedance of a water quality standard. A clear linkage between the compliance provisions and prohibitions, receiving water limitations, and effluent limitations must be established.

The provisions dealing with land development, Low Impact Development (LID) and hydromodification control are significantly ratcheted up while existing permit programs are only just being implemented and/or pending approval. The City is particularly concerned with the elimination of all exemptions for the hydromodification control requirements, including for discharges to channels that have been engineered to prevent erosion. Exemptions for hydromodification management should include discharges to certain types of receiving waters and certain types of projects. The City additionally questions the Regional Board's authority to impose *any* flow related limitations in an NPDES permit following the District Court's decision in Virgina Dept. of Transportation v. EPA, No. 1:12-CV-775, slip op. (E.D. Va. Jan. 3, 2013).

- The provisions implementing the Beaches and Creeks Total Maximum Daily Load (TMDL) bacteria requirements are inconsistent with the TMDL as it was developed and pose additional significant liabilities. Federal law does not require NPDES permits for municipal discharges to include TMDLs. (*Defenders of Wildlife v. Browner* 191 F.3d 1159 (9th Cir. 1999); 40 C.F.R. § 122.44(d).) Pursuant to state law, permit provisions must be consistent with the corresponding Basin Plan amendments (Cal Water Code § 13263), and may only be included after consideration of "the beneficial uses to be protected, the water quality objectives reasonably required for that purpose, other waste discharges, the need to prevent nuisance, and the provisions of Section 13241." (*Id.*)

- The provisions requiring the development and implementation of a Water Quality Improvement Plan need to be aligned with the Jurisdictional Runoff Management Program requirements so that the programs are complimentary and prioritized instead of additive.

Thank you for your attention to our comments. The City is committed to the goal of water quality improvement and wants to work with the SDRWQCB in developing the most prudent and cost effective permit possible. If you should have any questions, please contact Devin Slaven, Water Quality Administrator, at (949) 461-3436, or dslaven@lakeforestca.gov.

Sincerely,

CITY OF LAKE FOREST

FOR

Thomas Wheeler, P.E.
Director of Public Works/City Engineer

cc: Robert C. Dunek, City Manager
Devin E. Slaven, CPSWQ, QSD/QSP, Water Quality Administrator
Scott Smith, City Attorney, Best Best & Krieger, LLP
Mary Anne Skorpanich, County of Orange, OC Watersheds

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CALIFORNIA NATIONAL CITY 1887 INCORPORATED
SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD
2013 JAN 9 PM 2 34

January 11, 2013

Wayne Chiu, P.E.
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego California 92123-4340

Subject: Comment – Tentative Order No. R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu.

Dear Mr. Chiu:

The City of National City (City) appreciates the opportunity to comment on the proposed revision to the San Diego Regional Municipal Storm Water Permit, Tentative Order No. R9-2013-0001 (Tentative Order). The City generally supports the consensus comments prepared and submitted by the San Diego Copermittees. Two groups of comments are included in this letter: (1) Copermittee consensus comments for which the City wishes to provide additional, City-specific rationales in support of the proposed changes and (2) proposed changes that are different than the Copermittee consensus comments.

Additional City-specific rationales supporting selected Copermittee consensus comments are provided below to supplement the rationales provided in the overall Copermittee document.

- **Hydromodification management requirements for redevelopment projects, Tentative Order section E.3.c.(2)(a).** Requiring hydromodification management controls to match pre-development rather than pre-project conditions effectively has no impact on new development, for which pre-project and pre-development conditions are the same. However, requiring a redevelopment project to match runoff characteristics for the project area as it would have been before any development occurred on the property rather than based on the existing condition of the property dramatically increases requirements and cost for redevelopment projects. Redevelopment projects are important sources of jobs and economic development to cities like the City of National City. The proposed changes to the hydromodification requirements create a disincentive for redevelopment, which is particularly harmful to economically disadvantaged areas with contaminated sites due to past industrial activity that rely on redevelopment for economic improvement.
- **Non-storm water discharge requirements related to groundwater, Tentative Order section E.2.a.(1).** Tracking down locations of foundation and footing drains and crawl space pumps in the City, as well as records of prior approvals and plans and site-specific groundwater history, would be extremely time-consuming without a commensurate benefit in water quality. If any of

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these types of drains or pumps are identified as a persistent source of pollutants to the City's MS4, the City will perform the necessary follow-up investigation and research for the particular drain of concern as required by other provisions of the Tentative Order.

- **Assessment requirements, Tentative Order section D.4.** Revisions to these requirements as proposed by the Copermittees will still provide jurisdictional accountability while removing calculations and reporting requirements that would take up a proportionally large amount of program resources for a smaller jurisdiction like the City of National City and that would be unlikely to provide information useful for managing storm water programs. The proposed revisions would help minimize the extent to which reporting efforts would pull resources away from field implementation components of the City's program that reduce storm water pollution.

The City differs with Copermittee consensus comments with respect to the following sections of the Tentative Order:

- **Non-storm water discharge requirements for air conditioning condensate, Tentative Order section E.2.a.(4)(a).**
  - **Proposed revised language:** "The discharge of air conditioning condensation should be directed to landscaped areas or other pervious surfaces where feasible."
  - **Rationale and discussion:** The proposed language change would provide the City with more flexibility to target key sources of pollutants with program resources. If this recommendation is not acceptable, the City would prefer the existing Tentative Order language to the proposed consensus Copermittee language because the Tentative Order language more clearly recognizes that directing air conditioning condensate to landscaping or other pervious areas, while desirable, may not be feasible at all sites. The existing Tentative Order language also does not unnecessarily introduce the complexity of sanitary sewer diversions, as the Copermittee consensus language does. The City has required sanitary sewer diversions for air conditioning condensate discharges in site-specific circumstances, but these diversions are generally not suitable or desirable for widespread use.
- **Requirements for pretreatment for infiltration BMPs, Tentative Order section E.3.c.(5)(a)(vi).**
  - **Proposed revised language:** "Infiltration BMPs must not be used for high threat to water quality land uses and activities as designated by each Copermittee, unless sufficient permanent source control BMPs to prevent exposure of high threat activities are proposed or runoff from high threat land uses or activities is first treated or filtered to remove pollutants prior to infiltration; and"
  - **Rationale and discussion:** In some cases, developments with industrial or light industrial land use may not have significantly different pollutant generating activities than commercial properties. For example, current designs for most light industrial developments have virtually no exposed areas of industrial activities. It makes more sense to base requirements for additional measures to protect groundwater on the specific proposed activities at a development rather than general land use categories, which may or may not indicate a potential threat of groundwater contamination if

infiltration BMPs are used. Also, permanent source control BMPs that prevent exposure of high threat activities, such as structural canopies, may be more effective and require less maintenance for continued long-term effectiveness than filtration or other pretreatment approaches and should be allowed.

The City appreciates the Regional Board's consideration of our comments. Should you have any questions about any of the comments contained in this letter, please contact John Quenzer at (858) 586-6600 or Barby Tipton at (619) 336-4583.

Sincerely,

Stephen Manganiello
City Engineer

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MEMBERS OF THE CITY COUNCIL
SAM ALLEVATO
ROY L. BYRNES, M.D.
LARRY KRAMER
DEREK REEVE
JOHN TAYLOR

January 11, 2013

Wayne Chiu, P.E.
California Regional Water Quality Control Board, San Diego region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Subject: Comment – Tentative Order No. R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu.

Dear Mr. Chiu:

The City of San Juan Capistrano appreciates the opportunity to provide comments on Tentative Order No. R9-2013-0001, which is intended by the Regional Board to serve as the basis for stormwater regulation in the City upon the expiration of current Order R9-2009-0002. The City has been actively involved in the development of the comprehensive set of comments submitted by the County of Orange and supports those comments and attaches them by reference.

The City appreciates the revisions made by Regional Board staff since the prior Administrative Draft but believes that further changes are necessary, which are included in redline format in the County letter. A number of key issues have been extensively discussed in the focus meetings and Board workshops and, despite some changes, still remain a significant concern to the City. These include:

- The Receiving Water Limitations provisions in the Tentative Order could expose the City to Clean Water Act liabilities for discharges that cause or contribute to an exceedance of a water quality standard. A clear linkage between the compliance provisions and prohibitions, receiving water limitations, and effluent limitations must be established.

- The provisions dealing with land development, Low Impact Development (LID) and hydromodification control are significantly ratcheted up while existing permit programs are only just being implemented and/or pending approval. The City is particularly concerned with the elimination of all exemptions for the hydromodification control requirements, including for discharges to channels that have been engineered to prevent erosion. Exemptions for hydromodification management should include discharges to certain types of receiving waters and certain types of projects.

- The provisions implementing the Beaches and Creeks Total Maximum Daily Load (TMDL) bacteria requirements are inconsistent with the TMDL as it was developed and pose additional significant liabilities. Permit provisions must be consistent with the corresponding Basin Plan amendments.

- The provisions requiring the development and implementation of a Water Quality Improvement Plan need to be aligned with the Jurisdictional Runoff Management Program requirements so that the programs are complimentary and prioritized instead of additive.

Thank you for the opportunity to provide comments. The City would like to request the opportunity to meet with you, other Regional Board staff and the County of Orange to review in detail the changes requested in the County letter.

Please direct any questions regarding this letter to Ziad Mazboudi, Senior Civil Engineer, at zmazboudi@sanjuancapistrano.org or 949-234-4413

Yours sincerely,

Keith Van Der Maaten, PE
City of San Juan Capistrano
Utilities Director

CITY OF SANTEE

MAYOR
Randy Voepel

CITY COUNCIL
Jack E. Dale
Rob McNelis
John W. Minto
John Ryan

CITY MANAGER
Keith Till

January 11, 2013

Mr. Wayne Chiu, P.E
Regional Water Quality Control Board San Diego Region
9174 Sky Park Court, Suite 100
San Diego, Ca 92123

SUBJECT: DRAFT REGIONAL MUNICIPAL PERMIT

Dear Mr. Chiu,

I am writing to express the City of Santee's general support for the revised comments being submitted on behalf of the San Diego County Copermittees.

One issue that we would like to highlight is the inference from the inventory requirements (E.5.a.1(vii)) that mobile home parks can be regulated by the City. The Mobile Home Parks Act preempts the City's ability to regulate within a mobile home park, except for specifically enumerated areas where regulation is allowed. (Health & Safety section 18500: County of Santa Cruz v. Waterhouse (2005) 127 Cal.App.4th 1483, 1495.) The City is allowed to regulate, pursuant to its police powers, only the following:

(1) Zones where parks may be located,
(2) Park perimeter walls or enclosures on public street frontage,
(3) Signs,
(4) Access
(5) Vehicle parking,
(6) Certain uses for parks,
(7) Construction and use of equipment and facilities located outside of manufactured home or mobile home used to supply gas, water, or electricity thereto
(8) Permit to use a manufactured home or mobile home outside a park,
(9) Local building permit to construct an accessory structure for a manufactured home or mobile home when the manufactured home or mobile home is located outside a mobile home park
(10) Setback and separation requirements governing the installation of a manufactured home, mobile home, or mobile home accessory structure or building installed outside of a mobile home park.

As you can see from the above summary, the City is restricted in its ability to require best management practice (BMP) implementation , or even to conduct inspections in mobile home parks. We therefore recommend that these types of development not be inventoried for inspection and BMP retrofitting.

We appreciate the opportunity to constructively participate in the development of this permit and hope that the RWQCB will continue the discussion with us as we progress towards permit approval.

Pedro Orso Delgado, P.E.
Deputy City Manager/Director of Development Services

Date: January 11, 2013

TRANSMITTED VIA E-MAIL

To: Ms. Laurie Walsh
WRC Engineer
San Diego Regional Water Quality Control Board (SDRWQCB)
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

From: Roger E. Bütow Executive Director Clean Water Now

Re: Revised Administrative Draft San Diego Regional Municipal Separate Storm Sewer System (MS4) Permit: Tentative Order No. R9-2013-0001

Ms. Walsh

Clean Water Now (hereafter referred to as CWN) **was** prepared to submit extensive comments and provide proposed revisions in regards to the NPDES (MS4) Permit noted above by the determined deadline of today, January 11, 2013.

Instead, CWN supports the San Diego Building Industry of America (SDBIA) Coalition in their respectful request that the SDRWQCB remand the Tentative Order back to staff so that it may be revised in conformity and in resonance with the United States Supreme Court's 9-0 opinion handed down this past Tuesday, January 8, 2013. This Coalition generously shared their most recent draft dated January 10, 2013 and we also find ourselves in agreement with many of their other concerns and suggested revisions.

In light of numerous recent and related court decisions, we are going to place any further comments in abeyance pending more clarity. CWN feels that it would be precipitous, even futile to go any further in the ratification process for this particular regional permit. We definitely oppose placing it on the SDRWQCB agenda until such a time as the apparent disparities and discrepancies are reviewed then determined by legal counsel to be minor, major, real or false.

CWN has been in constant contact with the San Diego BIA personnel and with several other South Orange County MS4 Copermittees for the past 3 days regarding these decisions and their potential dissonance and some disarray for our regional regulatory oversight mechanisms.

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Many of the **Findings** and other sections of the Tentative Order now appear to be in potential contradiction or conflict, inconsistent and/or incongruent. The only thing that CWN is certain of is the auspice, the aura and appearance of general uncertainty. Even if only seen as an emotional disequilibrium, the onus and burden should be placed squarely upon the SDRWQCB staff to cure, to at minimum remedy this by remanding it pending greater specificity and subsequent clarification. We do not feel that remanding is a form of over-reaction or exaggeration.

The amount of confusion over the short, mid and long-term ramifications alone is daunting, but it is rampantly clear that a great portion of the Tentative Order may be subject to subsequent revisions by the SDRWQCB, even aspects of appropriative and riparian water rights entitlements that need other State agencies input. As presently written, it appears fragile, vulnerable, and will be exposed to extensive legal challenges if sustained as drafted.

The **Total Maximum Daily Load** (TMDL) provisions are another critically important element of the Tentative Order that we perceive to be problematic in light of the recent legal renderings.

SDRWQCB staff repeatedly embraced and implemented **"Adaptive Management"** (AM) at the stakeholder focused group meetings that took place in 2012. Staff encouraged stakeholders to follow their lead and guidance, to integrate this well-known, successful business and corporate methodology. Integral in the AM process are **"Conflict Resolution"** prescriptions.

It should be noted that this emerging conflict is in part self-inflicted by the SDRWQCB staff as it disallowed protracted yet potentially fruitful discussions about the present conundrum. A basic assertion by the facilitator noted the inherently egalitarian nature of AM, plus respect for ALL opinions and concerns yet dialogue on this subject was arguably suppressed and stifled.

To the best of our recollection during the entire focused group process and SDRWQCB rollout, at each venue, at least one significant stakeholder requested staff to clarify the State's legal position and projections, its legal counsel's perceptions regarding subsequent ramifications if the US Supreme Court over-ruled the NRDC and Santa Monica Baykeepers.

"Adaptive management (AM) is a structured, iterative process of robust decision making in the face of uncertainty, with an aim to reducing uncertainty over time via system monitoring. In this way, decision making simultaneously meets one or more resource management objectives and, either passively or actively, accrues information needed to improve future management."

In our humble opinion, this **"What if"** scenario should have been discussed to a greater length and depth per AM than allowed by staff and the facilitator who basically discouraged it. Staff appeared to lean towards irrelevance at some of these venues and at others towards confidence that ultimately the 9th Circuit Court of Appeals determination would be sustained.

Another example of the **"What if"** speculation and significant doubt is embedded in the SDBIA pleadings regarding down-slope (declivity) relief and the nexus with certain water rights disputes. CWN would go further and introduce another random and chaotic by-product of the MS4 proposal, the Law of Unintended Consequences:

Stormwater capture and who may claim accompanying increases in groundwater production rights associated with causing increased percolation is currently a major topic in the Chino Groundwater Basin (Region 8, SARWQCB). This topic includes the question of whether increased groundwater production rights should be accorded where the capture is compelled by regulatory requirements such as MS4 permits.

Personally, I have some arguable expertise in this **"one-size-fits-all"** shortcoming in the MS4 proposal. I have been a general contractor and builder of both commercial and custom residential homes for some 40+ years in South Orange County. Onsite detention/retention of stormwater could create and/or exacerbate the very conditions that caused both of the slides, the significant and monolithic slope failures that occurred in Bluebird Canyon here in Laguna.

We are a predominantly clay-expansive soil region, subject to flocculation and de-flocculation determined by events out of our control. Droughts cycles followed by El Niños followed by yet more drought cycles create subterranean pocket, voids that make us prone to such catastrophic failures. We now require greater compaction and subterranean stabilization (caissons, etc.) during construction, but that translates into more difficulties regarding full compliance with this MS4. Here in Laguna Beach, we cannot serve the two masters, and the MS4 demands uniformity and coherence among ALL of the copermittees jurisdictions where it cannot be reasonably accomplished. Practicality seems missing.

We strongly believe in the engineering project maxim expressed via an acronym metric: **SMART: "S**pecific**, M**easurable**, A**chievable **R**ealistic and **T**imely. Compliance in Laguna Beach is neither achievable nor realistic, and perhaps impossible to implement, putting us in chronic violation hence prone to fines by the SDRWQCB. And to impose, to initiate and assertively pursue the retrofitting elements of the Tentative Order's demands would make my city vulnerable to massive, mind-boggling private litigation. Ironically, it would also not **be** smart.

IF the US Supreme Court and other related decisions have no significance or bearing on this Tentative Order, need not result in remanding, then the SDRWQCB staff should mass broadcast, that is widely transmit that legally justifiable position to its stakeholder master list. Memorialize, that is codify it in some discernible and defensible manner. CWN had hoped that the AM process would streamline, would in essence triage and winnow to fast-track approval without rancor or post-ratification litigious challenges.

At the focused meetings we were only given non-binding verbal responses and assurances about the LA County case by staff without benefit or the immediate feedback via SDRWQCB legal counsel presence. The SDRWQCB should then publicize that legally tenable/defensible brief via mass media and post prominently their reasoning at the SDRWQCB website.

IF it is of **any** significance that might require revisiting or reopening, then reconvene the stakeholder focused group, appropriately confirm and acknowledge the US Supreme Court decision as a **"game-changer."** If it is, that should trigger a subsequent draft process with revisions and/or editing: Then, and only then, should staff proceed accordingly.

It is far better to delay, to get the Tentative Order aligned, to deal with potential irregularities leading to endless post-adoption legal challenges preemptively and hopefully summarily (immediately) than to let it move forward as is. In this case, **"One size fits none."**

We would also add our voice, our support, to the SDBIA proposal that such a regional permit ignores the impossibility of such a water quality management document to what I consistently pointed out at focused meetings as the equivalent to Einstein's Unified Field Theory research. He never succeeded in creating one equation or series of theoretical equations that explained everything in the Universe.

It would be better to create MS4s by apparent identifiably unique topographical/geo-morphological characteristics or watershed-by-watershed bases. It was intended to cut down on staff's invaluable entanglement time, yet we feel it will only increase demands and burdens on budgets, including the copermittees. The **"case-by-case basis"** concept **sounds** reasonable, but this could readily de-evolve into innumerable side-bar intrigues and endless negotiations.

This MS4 tries, attempts, to accomplish the noble goals of both the Clean Water Act and Porter-Cologne Water Quality Control Act in a singularity. CWN does not believe that is possible. Laguna Beach isn't an anomaly, we believe that other steep terrain copermittees will find themselves in similar conundrums and community disputes, some having gross sum $$$ litigious expenditure impacts unaddressed in the permit.

The very morass, the uncertainty that AM was supposed to attenuate, reduce or obviate has occurred. We, as stakeholders, bought into AM as our primary negotiation tool during meetings. In lieu of more time to professionally analyze the ramifications of the US Supreme Court decision, we feel that it is impossible at this time to properly assess what deserves serious consideration and possible mid-course corrections.

We have a rule on construction sites: **"Measure twice, cut once."** Many times, if the material is expensive and/or the potential adverse $$$ impacts of error considerable, we measure or gauge numerous times in proactive, pre-emptive anticipatory avoidance.

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(cont.)

The SDRWQCB can do the same. It was the intent of the MS4 focused meetings to at least minimize and un-complicate subsequent challenges, not to protract in a continuous, post-mortem loop. Instead, the US Supreme Court decision, in conjunction with other-related ongoing legal proceedings in California, seems poised to expand and create interminable contention.

One determination of the Order regarding **Priority Development Projects** (PDP) is that ALL hillside development in Laguna Beach will necessitate, will force the City into imposing such stringent categorization and compliance oversight on its construction industry and pass the increases on to parcel owners. Compliance would equate to fiscal suicide.

These multiple development or redevelopment designations will be impossible to implement on the broad-swath, grand scale suggested, and when added to non-hillside projects laughingly, absurdly unaffordable and unobtainable.

We have been repeatedly told that funding is not a legal issue for the SDRWQCB. But if Laguna and other copermittees cannot afford the implementation necessary to achieve compliance, then this Order will create a revolving door of staff meetings and violation hearings. Even bankrupt areas already fiscally impaired, depressed and distressed.

What happened to Economically Feasibility and Technological Possibility as reasonable, fair metrics? What good does it do to demand unachievable compliance standards?

Let's remand it, retract and revise if necessary, thus getting it done right the first time when finally placed on the SDRWQCB docket. As the present, highly prescriptive existing permits under the SDRWQCB jurisdictional domain don't expire or need renewal soon, are in place until a subsequent one is ratified, what's the hurry, the rush?

Otherwise, putting it in historical perspective regarding previous MS4 Permits, it'll be like the movie **"Groundhog Day,"** or as Yogi Berra exclaimed **"déjà vu all over again."** This happened back in 2002 when due to extensive legal appeals by the South Orange County copermittees, CWN was forced to spend precious internal funds to represent itself plus the Sierra Club and the Surfrider Foundation at the SWRCB hearing in Sacramento.

Litigation over this will only line the pockets of consultants and attorneys, including those aligned with eco-NGOs .This Order will expand that emerging compliance cottage industry tremendously, and should therefore be prophylactically remanded as soon as possible.

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(cont.)

CWN sincerely believes that this remanding and return could be accomplished in 90-120 days at most and does not constitute stalling nor is it unreasonable. We're certain that the dominant majority of the stakeholders would support this front-loaded revisitation and refinement to the Order as opposed to back-end dissolution, un-subsided disorder and jumbled chaos.

Respectfully submitted,

Roger E. Bütow
Executive Director
Email: roger@clean-water-now.org

CLEAN WATER NOW is an innovative, science-based organization committed to solution-oriented collaboration as a means of developing safe, sustainable water supplies and preserving healthy ecosystems.

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January 11, 2013

Wayne Chiu, P.E.

San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Subject: Comments on San Diego Region MS4 Permit - Tentative Order R9-2013-0001

Dear Mr. Chiu,

Thank you for the opportunity to comment on the Tentative Order R9-2013-0001, an updated NPDES permit for the San Diego region. It is encouraging to see the progress on this permit, in particular the incorporation of watershed planning and TMDL compliance sections. My comments here specifically pertain to verification of proprietary treatment controls. Attached to this letter is an additional table of specific change requests and comments.

This tentative order appropriately prioritizes runoff reduction strategies, specifically infiltration, rainwater harvesting and evapotranspiration. Contech supports this approach and the allowance of the use of biotreatment systems where runoff retention is infeasible. Where neither of these approaches is feasible, treatment controls may be used to intercept pollutants before they leave the site. Also, where retention BMPs are specified, treatment controls may be appropriate as pretreatment.

In past permit terms permittees have been required to review and rank the effectiveness of treatment controls relative to the requirement that pollutants of concern be managed by BMPs with medium or high effectiveness. This has been done at the broad BMP category level, most notably in Table 3 of the 2008 Model SUSMP. However, this broad characterization of classes of systems cannot begin to capture the myriad of specific proprietary device designs and sizing strategies. What is needed is a BMP specific verification program. The permittees should be directed to collaboratively initiate this review, or should be directed to only allow technologies that have been verified by an independent program that serves this purpose.

Until 2008, Caltrans published the Treatment BMP Technology Report which contained ratings for specific manufactured devices. The State of Washington Department of Ecology currently administers a verification program following the Technology Acceptance Protocol – Ecology (TAPE). There is a multistate collaborative that includes California called the Technology Acceptance Reciprocity Partnership (TARP) that has developed specific testing protocols and peer review processes for proprietary technologies. In California, the Sacramento Stormwater Quality Partnership has established a verification program. All of these programs are designed to ensure that the performance and operational feasibility of proprietary BMPs is known and reliable. At this point there is no equivalent program in the San Diego region that can give plan reviewers this assurance.

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Whether specified for pretreatment upstream of infiltration or standalone treatment as part of an alternative compliance approach, clear direction from the Board regarding the need for technology specific performance verification to ensure adequate performance. The comments above and attached reference several leading programs that I encourage you to consider for reciprocation of approvals.

Please contact me if you would like further discussion or clarification on any of the issues introduced here or in the attached comments.

Sincerely,

Vaikko Allen, CPSWQ, LEED-AP
Director – Regional Regulatory Management
Contech Engineered Solutions LLC
vallen@conteches.com

Suggested Changes
Tentative Order No. R9-2013-0001
Draft NPDES NO. CAS0109266
San Diego Region MS4 Permit Reissuance

Submitted by Vaikko Allen, CPSWQ, Director - Regional Regulatory Management
CONTECH Engineered Solutions, LLC
Phone:310-850-1736, e-mail: VAllen@conteches.com

Section	Page	Existing Text	Proposed Change or Comment	Justification
II.E.3.a.(1)(a)	73	"Onsite BMPs must be located so as to remove pollutants … prior to discharge … and as close to the source as possible…"	Remove "as close to the source as possible".	While it is typically advantageous to remove pollutants close to the source as possible, this should not be a requirement. Site developers and engineers should have the discretion to locate onsite BMPs wherever is most desirable as long as pollutants are removed prior to discharge from the site. For example routing all site runoff to fewer larger systems instead of installing more distributed smaller systems may allow provide economies of scale and decrease future inspection and maintenance burdens.
II.E.3.b.(3)(a)(i)	77	"..direct stormwater runoff to adjacent vegetated areas, or other non-erodible permeable areas"	The section should stipulate that the DCV must be retained by adjacent permeable areas.	If runoff is simply routed to pervious areas, but is not retained there, runoff will result. Since there are no design or performance requirements for these permeable areas, adequate treatment of runoff is not assured. Without assurance of adequate treatment or retention of runoff from the design storm, these areas should not be exempted.
II.E.3.c.(1)(a)(ii)	78	Definition of volume-based sizing requirements	This section should include an annual capture standard of 80%.	Projects pursuing runoff reduction via rainwater harvesting or with infiltration systems with drawdown times other than 48 hours may retain a significantly different amount of runoff on an annual basis than systems designed around the runoff volume from the 85th percentile storm. An annual capture compliance pathway should be added that is equivalent to the annual runoff capture percentage resulting from 85th percentile DCV based designs. In the Los Angeles and Santa Ana Regions, the equivalent average annual capture volume has been determined to be 80% based on continuous simulation modeling.
II.E.3.c.(1)(c)(iii)	79	Treatment Control Standards	Add the following language: Performance of proprietary treatment systems must be demonstrated in full scale-field laboratory or field performance monitoring following sampling protocols established by the Technology Acceptance Reciprocity Partnership, the Washington State Department of Ecology or similarly robust protocols.	Among permittees in the region, there is currently a very wide range of interpretations of requirement that BMPs must provide medium or high pollutant removal efficiency. In many cases, devices with are approved on the basis of unsubstantiated performance claims simply because they can be construed to fit within one of the broad BMP categories in Table 3 of the 2008 Model SUSMP. For proprietary BMPs, verification of specific technologies is needed to ensure that adequate treatment is provided. The permittees should either be directed to collaboratively evaluate and rate specific technologies, or should defer to one of the existing verification programs that serves this purpose.
II.E.3.c.(2)(b)	80	"…must compensate for the loss of sediment supply due to the development project, should loss of sediment supply occur as a result of the development project"	Clarity regarding the Board's expectations for maintaining the natural sediment balance in light of competing flow and pollutant mitigation demands is needed. In addition, practical examples of how to achieve this requirement are needed.	The importance of maintaining natural sediment supply is undisputed. However, at this point, no practical way has been identified that can accomplish this while concurrently controlling runoff volumes, rates, and priority pollutants. This requirement, while scientifically valid is technically unachievable. Clarity regarding the Board's expectation is needed.

Section	Page	Existing Text	Proposed Change or Comment	Justification
II.E.3.c.(2)(d)	80	Hydromodification Exemptions	Exemptions from the San Diego Hydromodification Management Plan should be included in this section.	The San Diego Hydromodification Management Plan was developed collaboratively with stakeholders representing the scientific, engineering, public interest and regulatory communities. It should serve as a guide for hydromodification management requirements in this order.
II.E.3.c.(3)(b)(i)	81	"Onsite LID Biofiltration Treatment Control BMPs"	A requirement should be added that proprietary biofiltration BMPs must achieve final approval by the New Jersey Department of Environmental Protection according to the Technology Acceptance Reciprocity Partnership (TARP) Tier II testing protocol, by the Washington State Department of Ecology according to the Technology Acceptance Protocol - Ecology (TAPE), or by the Sacramento Stormwater Quality Partnership following their Sacramento are field testing protocol prior to installation.	There are several high rate biotreatment systems commercially available that provide a significant land area savings and comparable pollutant removal performance to their larger conventional public domain systems. There are several performance verification programs designed specifically for these high rate systems. Final approval by the Washington State Department of Ecology, the New Jersey Department of Environmental Protection or the Sacramento Stormwater Quality Partnership provides assurance that systems are highly effective and are operationally robust. Adding this requirement for proprietary designs will ensure that unproven systems are not allowed.
II.E.3.c.(3)(b)(i)[c]	82	"Biofilter…the design capture volume.."	A flow-based design pathway should be added.	Many biofilters and other biotreatment systems are more properly sized to treat a specific design flow rate than a runoff volume. In previous guidance documents and permits, treatment of the runoff rate produced from the site during a sustained 0.2 inch per hour intensity has been considered to treat an equivalent runoff volume compared designing around a 0.75 inch storm depth. That design option should be retained in this section.
II.E.3.c.(5)(a)(i)	86	"Runoff must undergo pretreatment such as sedimentation or filtration prior to infiltration."	Pretreatment including filtration through at least 4 inches of media/soil or by a hydrodynamic separator approved for pretreatment by the Washington State Department of Ecology or the New Jersey Department of Environmental Protection. Catch basin inserts may be provided to control trash and other gross solids, but must not be allowed as pretreatment.	Clear pretreatment standards are required to ensure longevity of infiltration systems. As written, it is likely that catch basin inserts with a token amount of filtration media will be specified as pretreatment. There are many catch basin inserts and other devices commercially available with media depths in the range of 2" or less that at design rates have media contact times on the order of one second. Some of these devices are being marketed and accepted by permittees as media filters under the assumption that they will provide benefits similar to true media filters such as sand filters and cartridge based media filters. The result is a proliferation of systems that foul very rapidly and predominately operate in bypass mode unless very frequent maintenance is performed. In the absence of a vendor specific technology assessment by the permittees, there are several programs that can be relied on to identify those proprietary pretreatment systems with demonstrated performance and operational feasibility.
II.E.3.d.(3)	87	"Updated procedures for designing structural BMPs, including and updated performance requirements to be consistent with the requirements of Provision E.3.c…"	Specific guidance regarding evaluation of proprietary treatment systems is needed. Either the permittees need to conduct a technology specific performance and operational feasibility verification assessment or they can reference one of the existing programs that serve this purpose.	There has been a tremendous amount of work completed through the Technology Acceptance Reciprocity Partnership (TARP) and by the Washington Department of Ecology to evaluate the performance and operational feasibility of proprietary treatment systems. Due to the proliferation of designs and sizing strategies, there needs to be oversight of the specification of these treatment systems to ensure that claimed benefits are actually provided.

Section	Page	Existing Text	Proposed Change or Comment	Justification
II.E.3.e.(3)(a)	89	"All (100 percent) of the structural BMPs at Priority Development Projects that are designated as high priority…."	A definition of "high priority" should be given.	There is no definition or guidance provided to advise permittees regarding what constitutes "high priority". Specifying the types of BMPs, land uses etc. that are considered high priority or setting a % of total BMPs that must be identified as high priority would prevent permittees from characterizing none or very few of their BMPs as "high priority", thereby avoiding inspection requirements.

County of San Diego

RICHARD E. CROMPTON
DIRECTOR

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January 11, 2013

Wayne Chiu, P.E.
California Regional Water Quality Control Board, San Diego Region
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San Diego, CA 92123-4340

Dear Mr. Chiu:

COUNTY OF SAN DIEGO COMMENTS – TENTATIVE ORDER NO. R9-2013-0001, REGIONAL MS4 PERMIT, PLACE ID 786088WCHIU

Thank you for the opportunity to comment on Tentative Order No. R9-2013-0001, NPDES No. CAS0109266, *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Tentative Order). These comments are offered by the County of San Diego (County) in addition to those submitted separately on behalf of the 21 Copermittees of Order 2007-0001 (San Diego Copermittee Comment Letter). In this respect, the Copermittee comments should be considered to represent a general group consensus and those below to provide additional input necessary to reflect the unique perspective of the County as Regional Principal Permittee and a large jurisdiction covering portions of eight Watershed Management Areas. Additionally, these comments build on input provided in our September 14, 2012, comment letter on the Administrative Draft, many of which we do not believe to have been sufficiently addressed in the Tentative Order.

We greatly appreciate the public process employed to date toward the development of a new and improved permit for the San Diego Region, as well as the openness of staff and Regional Water Quality Control Board (Regional Board) members in listening to the issues and concerns put forth by the County and numerous other interested parties. However, the County is unable to support adoption of the Tentative Order as currently drafted. This letter addresses our remaining issues, the three principal of which are: 1) inclusion of requirements from a scientifically flawed Bacteria Total Maximum Daily Load (TMDL) with unattainable targets and unrealistic implementation costs, 2) inclusion of receiving water limitation (RWL) language that unnecessarily exposes the County to liability from third-party lawsuits, and 3) unwarranted expansion of requirements for development and redevelopment projects.

Please also note that on November 9, 2012, Ron Roberts, Chairman of the County of San Diego Board of Supervisors, sent letters to Governor Jerry Brown and other members of the San Diego delegation explaining the Board of Supervisors' concerns over the cost and reasonability of the permit's requirements, specifically the incorporation of the Bacteria Total Maximum Daily Load (TMDL) and the unwarranted expansion of requirements for development and redevelopment projects. A subsequent comment letter echoing these same concerns was submitted by elected officials from 19 of the 21 San Diego Copermittees to Regional Board Chairman Grant Destache on November 13, 2012. Both letters are included here as Attachment 1 and should be entered into the public record on this matter.

1. Bacteria TMDL for Beaches and Creeks

The Tentative Order incorporates elements and requirements from Resolution R9-2010-0001, *the Revised Total Maximum Daily Loads (TMDLs) for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region* (Bacteria TMDL). We specifically want to urge the Regional Board to <u>not</u> incorporate the Bacteria TMDL provisions in this permit renewal.

<u>Legal Authority to Not Incorporate the Bacteria TMDL into the Permit</u>

As documented in a letter to Catherine Hagen, Esq. (see Attachment 2), it is the legal position of our County Counsel's office that your Board has the authority to decline the demands of other interested parties to incorporate the Bacteria TMDL provisions in this permit renewal.

In 1987, Congress declared its intent to chart a different course for improving water quality flowing from MS4 systems by enacting Clean Water Act §402 (33 U.S.C.§1342). In establishing the "maximum extent practicable" (MEP) standard of CWA §402(p)(3)(B), Congress recognized and enacted a different standard than the technology-based requirements of CWA §301. The MEP standard is the legal standard for stormwater compliance.

In *Defenders of Wildlife v. Browner* 191 F.3d 1159, the Ninth Circuit held that the MEP standard of CWA §402(p)(3)(B) replaces the requirements of CWA §301(b)(1)(C) for MS4 dischargers. The Browner decision goes on to discuss the discretion vested in permitting authorities to either require strict compliance, or less than strict compliance, with water quality standards.

It is the County's belief that the November 12, 2010, United States Environmental Protection Agency (USEPA) memorandum concerning the incorporation and use of numeric water quality based effluent limitations (WQBELs) in permits is not dispositive of this issue. As acknowledged in its subsequent March 17, 2011, letter, USEPA is still considering whether to retain, reissue, or withdraw the 2010 memorandum. And, USEPA acknowledges that the 2010 memorandum "does not impose legally binding requirements on EPA, States, or the regulated community, nor does it confer legal rights or impose legal obligations on any member of the public."

<u>Scientific flaws and unattainable targets justify exclusion of the Bacteria TMDL.</u>

Serious scientific flaws and unattainable targets are the main reasons the County feels it is appropriate for the Regional Board to exclude the Bacteria TMDL from the permit at this time. The County hired Geosyntec Consultants, a nationally recognized firm with expertise in water

quality engineering and the co-principal investigator on the USEPA/American Society of Civil Engineers International Stormwater BMP Database, to assess the scientific merits of the Bacteria TMDL and to analyze whether the TMDL's numeric targets are achievable in practice. There are four main concerns in this regard, which are discussed in more detail in the memorandum from Geosyntec Consultants that is attached to this letter (see Attachment 3).

First, the science used to develop the Bacteria TMDL underestimates the amount of bacteria that come from natural sources such as birds, wildlife, and natural decomposition. In doing so, it overestimates the amount of bacteria required to be controlled by the County and other responsible parties named in the TMDL. Specifically, the TMDL inappropriately applies data from a "reference" (or minimally developed) watershed in Los Angeles County, which is not representative of San Diego County. It mistakenly applies data from a "reference" beach system to fresh water inland creeks, where natural concentrations of bacteria have been shown to be much higher. The TMDL does not incorporate a body of more recent water quality data which shows that the TMDL's numeric limits are overly conservative. For example, Geosyntec's analysis in Attachment 3 clearly shows that even the reference watershed itself in Los Angeles County has exceeded the Bacteria TMDL's targets in more than half of the years monitored. It is not appropriate to set a water quality target so stringent that a watershed with little to no development cannot consistently comply. The San Diego and Orange County MS4 Copermittees, partnering with Caltrans and with technical assistance from the Southern California Coastal Water Research Project (SCCWRP), are spending close to $2 million to fund a local "reference" watershed study that will provide data much more appropriate to the water bodies regulated by the Bacteria TMDL. TMDL development should not have proceeded until this data collection was conducted. Section 1 of Attachment 3 presents more detail on this subject.

Our second concern is that the Bacteria TMDL does not adequately reflect public health protection. Recreational water quality criteria published by USEPA acknowledge that indicator bacteria are not predictive of human health risk in stormwater-dominated waters, such as those regulated by this TMDL. Moreover, urban runoff epidemiology studies show a weak correlation between bacteria concentrations and human illness. USEPA Quantitative Microbial Risk Assessment (QMRA) studies also show that the numeric objectives used in this Bacteria TMDL are overly conservative for sites with minimal human bacteria sources. Related to our first concern, many studies show that natural sources, which are not appropriately accounted for in this TMDL, contribute significantly to bacteria levels but present lower human illness risk. Section 2 of Attachment 3 presents more detail on this subject.

Third, although a scientific peer review was conducted on the Bacteria TMDL prior to its adoption, that review was much too limited in scope to provide adequate defense of the TMDL basis and approach. Section 3 of Attachment 3 presents more detail on this subject.

Fourth, after thorough review of available non-structural and structural BMP performance data, Geosyntec, USEPA's own technical investigator of the International Stormwater BMP Database, finds that the Bacteria TMDL's numeric targets are not consistently or reliably attainable even with significant investment in new infrastructure. This is not surprising given that the Bacteria TMDL essentially requires the impacts of over 100 years of urbanization to be reversed to pristine, pre-development levels. BMP technology simply does not exist to comply with the

TMDL's aggressive targets. Statistically evaluated monitoring data from the International Stormwater BMP Database indicate that all non-disinfection structural BMPs are not capable of reducing effluent concentrations that would achieve bacterial water quality objectives with the consistency, frequency, and predictability required by the TMDL. Disinfection systems are widely considered not to be suitable or cost-effective for treating wet weather MS4 discharges, which are a primary focus of this TMDL. Section 4 of Attachment 3 presents more detail on this subject.

For all of the reasons discussed above and in Attachment 3, it is appropriate for the Regional Board to use its discretion to exclude the Bacteria TMDL from the permit at this time.

Practical Considerations

From a recent summary by Regional Board staff, County of San Diego Copermittees already spend approximately $119 million per year on programs to improve water quality in the San Diego region. Those programs have improved water quality in general and at beaches specifically throughout this region. For example, according to Heal the Bay's recent beach report cards, over 90% of San Diego County beaches receive A or A+ grades during dry weather conditions, when the vast majority of recreation occurs. With ever-increasing knowledge gained through trial and error, and with the Tentative Order's Watershed Quality Improvement Plan (WQIP) concept expected to encourage existing resources to be focused in more efficient and effective ways, the County expects to continue the march toward improved water quality using its current level of resources.

By Regional Board staff estimates (see Appendix R of the Bacteria TMDL Technical Report), and as confirmed by San Diego Copermittees through recent analysis using state-of-the-art BMP forecast modeling, implementation of the Bacteria TMDL in the next permit cycle would add a magnitude of additional costs to Copermittee budgets that is unsustainable using existing methods for raising general fund monies, given California's legal constraints on taxation or fees. As your Board has heard, the range of additional costs to the region that attributable to the Bacteria TMDL alone is expected to be $144 million to $272 million per year, meaning billions of additional taxpayer dollars over the compliance period. Funding does not exist to support this additional level of investment. If, in the future, a coalition of partners, including the Regional Board, environmental groups, regulated industry, Copermittees, and other stakeholders, decided it was in the best interest of the community to ask the public to support additional revenues for such an investment, only then could the County potentially support such significant expenditures. Without a reliable funding source, compliance with the Bacteria TMDL is simply not possible at this time.

As presentations in the adoption process have shown, given the unique challenges associated with bacteria as a constituent in stormwater, the cost-benefit analysis dictates that implementing the Bacteria TMDL at this time, as written, would be bad public policy. Studies and experience show that any magnitude of controls for bacteria, up to and including disinfectant efforts, will not consistently achieve the Resolution's numeric standards, even assuming the expenditure of billions of dollars. So, the sensible and logical next step is to take a hard look at the standards and assumptions of the Bacteria TMDL and devise plans to improve water quality using existing resources and as realistically achievable with today's scientific methods.

With regard to the unique circumstances concerning bacteria, because the science shows that consistent achievement of the Bacteria TMDL numeric standards is not possible, given any level of expenditure, imposing the Bacteria TMDL as currently written would exceed the "maximum extent practicable" standard. Accordingly, we believe your Board is vested with the discretion to elect not to incorporate the Bacteria TMDL provisions at this time, and it would be justified to open a process to revisit and re-examine the Bacteria TMDL assumptions in the context of its basin planning process, instead of taking the irrevocable step of incorporating the TMDL into the permit and potentially wasting valuable taxpayer dollars that could better be spent on achievable water quality improvement goals.

If, over these objections, your Board chooses to include the Bacteria TMDL into the permit, the San Diego Copermittees have proposed alternative language that, although still not acceptable to the County, would more appropriately incorporate the TMDL into the permit in a manner consistent with the intent of the TMDL Basin Plan Amendment.

2. Receiving Water Limitations (RWL) Language

Significant concerns have been expressed by the County and other Copermittees about third-party liability risks resulting from the Ninth Circuit's interpretation of receiving water limitation (RWL) language in the Los Angeles Region's stormwater permit. While we appreciate the State Water Resources Control Board's willingness to take comment and review those concerns, it may take several months for the State Board to act. The Tentative Order retains language similar to the problematic language reviewed in the *LA v. NRDC* case. This leaves the County and other Copermittees immediately exposed to similar litigation from third parties for violations of water quality standards. We know that several varied proposals to modify RWL language have been made at the state and local levels. The San Diego County Copermittees have proposed multiple alternatives, first in response to the April 2012 Administrative Draft Permit, which were rejected, and now to this Tentative Order.

The County suggests a simple solution consistent with Congress' intent in enacting CWA §402 as discussed above: simply remove the RWL language in Provision A of the Tentative Order. Federal law does not require imposition of the RWL language for MS4 systems. There is precedent for this action; a number of USEPA issued stormwater permits throughout the country do not include this language. Your Board has the discretion under CWA §402 and *Browner* to remove the language. If USEPA does not consider the RWL language to be essential to MS4 permitting, it seems logical that your Board is not required to include it in the new permit.

State Water Board policy supports the iterative process approach to water quality improvement, and acknowledges that water quality standards for many pollutants from MS4s cannot be met immediately. Therefore, it is unrealistic and at odds with the iterative process to enact a standard that puts public entities under threat of third-party lawsuits, even when they are diligently spending significant time and public money pursuing water quality improvement. The permit could still include its prescriptive requirements and the WQIP features that all parties believe will focus resources in each watershed in the most productive fashion, through the iterative process envisioned by Congress for MS4 systems.

Removal of the RWL language would eliminate the inevitable jousting over modified language proposals and the uncertainty created by its retention in light of the *LA v. NRDC* ruling. Copermittees would simply be obligated to focus on permit condition compliance, including the tasks identified in approved WQIPs, subject to Regional Board enforcement if appropriate. Removal of the language would not create a "free pass"; to the contrary, it would encourage effective water quality monitoring that might otherwise be discouraged by the specter of third-party lawsuits like those filed in the *LA v. NRDC* case.

3. New requirements for development and re-development projects.

On-site retention requirements for Priority Development Projects

The County does not support the Tentative Order's shift from current permit requirements by requiring Priority Development Projects to "retain" rather than "treat" pollutants. We specifically request that the language in Tentative Order section E.3.c.(1)(a) be changed as follows: *"Each Priority Development Project must be required to implement LID BMPs that are designed to ~~retain~~ treat (i.e. intercept, filter, store, infiltrate, evaporate, and evapotranspire) onsite the pollutants from storm water to the MEP."* All other applicable language in the Tentative Order should be made consistent with this change.

The shift to a "retention" standard will require large stormwater controls and corresponding cost increases, and lacks a scientific peer-reviewed study that considers all possible environmental impacts. Runoff is an important water source to creeks and rivers in our semi-arid climate. Retaining more than pre-project volumes of water could result in loss of downstream habitat and subsequent channel erosion. USEPA Municipal Permit Improvement Guide, Chapter 5, Page 54, recommends retaining pre-project volumes and SCCWRP's *Hydromodification Assessment and Management in CA* recommends a water balance approach to mimic natural hydrology.

The ability to retain water is constrained by many factors, such as: soil types, space, underground utilities and water table level. The permit should not include performance standards that are not possible onsite for most projects in the San Diego region. Projects need to be provided with a means to comply onsite even when soil conditions are poor.

The County hired Rick Engineering, a highly regarded company in the field of water quality engineering, to estimate the cost increase to development projects having to implement the new retention standard. As explained in detail in Attachment 4 (Rick Engineering Cost Comparison Study, December 2012), costs are expected to increase two- to 12-fold from the current Permit standard of "infiltrate, treat or detain". The San Diego Copermittees have invested considerable time and resources to develop a technically sound, effective, and defensible Standard Urban Stormwater Mitigation Plan (SUSMP), which was approved by the Regional Board in 2010. Low Impact Development (LID) and Treatment Control BMPs are efficient at pollutant load reduction. In many priority development projects, standard LID and treatment control BMPs are more than adequate for full pollutant load reduction. Existing requirements for development and redevelopment are already designed to improve water quality; therefore, forcing all priority development projects to retain the pre-developed 85th percentile storm volume is not scientifically justified, could be harmful to the watershed, and is forcing a "one size fits all" approach on all projects.

In addition, requiring the retention standard to be based on when the site was historically undeveloped and naturally vegetated may impose mitigation beyond a project's impacts. Applying the pre-development reference condition to sites that are, in fact, developed would expose the Copermittees to litigation risk and may be unenforceable. Whereas, the pre-project standard allows the appropriate nexus to the project's impacts and is enforceable by the local jurisdiction. Please see the letter from the City of San Diego, City Attorney, to Catherine Hagen, dated December 19, 2012, for additional justification for why a "Pre-development (naturally occurring)" standard is not supported.

Offsite Mitigation / Alternative Compliance Programs

The County has serious reservations about the creation of an alternative compliance program to allow private development to mitigate for project impacts off-site. There are significant administrative costs associated with developing mitigation methodology, establishing off-site locations suitable for mitigation, and establishing outside agreements with agencies to perform perpetual maintenance. Plus, there is the cost of constructing the piping from the project sites to the mitigation area (due to Tentative Order section E.3.c.(3)(a)(iv), which prohibits the use of receiving waters to convey stormwater runoff from a development site to the location of off-site mitigation). In addition, the taxpayer (not the developer) will ultimately be responsible for the perpetual maintenance of the piping and the offsite mitigation lands. And finally, the short time frame of four years for an alternative compliance in-lieu fee does not allow enough time to leverage enough resources from multiple projects to pay for the establishment of a regional solution prior to the first private project completion (occupancy). A State loan program will be necessary to provide a funding mechanism to initiate mitigation projects (similar to Clean Water State Revolving Fund used for Wetland mitigation).

The County recommends the following changes in order for an alternative compliance program to be effective:

- The alternative compliance program should be administered directly by the Regional Board. Applicants wishing to utilize off-site mitigation must have approval by the Regional Board for mitigation applicability, option, location and perpetual maintenance fee to be eligible for alternative compliance within a jurisdiction.

- Delete section E.3.c.(3)(a)(iv), which prohibits receiving waters from being utilized to convey storm water runoff to the alternative compliance options

- Change Section E.3.c.(3)(a)(iv) to allow for a ten-year alternative compliance in-lieu fee.

Mitigation for Loss of Sediment Supply

Tentative Order section E.3.c.(2)(b) as written is unclear and implies that each development project will be required to conduct studies and compensation for the loss of sediment supply specifically on site. However, the ability to compensate for the loss of sediment supply has not yet been fully researched, nor have practices been developed to accomplish this. Therefore, the ability to require sediment compensation on a project-by-project basis is not yet validated or

possible. The County recommends the language be removed from section E.3.c.(2)(b) and moved to Section E.3.d. as line item (6) so that it can be addressed regionally instead of at a project level: "Update sediment supply mitigation procedures, as research becomes available, to compensate for significant losses of sediment supply anticipated as a result of development." This proposed wording change would allow the Copermittees to study and adapt to how sediment supply should appropriately be managed.

Vector Breeding in Storm Water Management Devices

The existing permit includes vector-related language intended to raise awareness of the potential unintended public health risks resulting from mosquito production in certain storm water management devices. The Tentative Order does not include this language. The removal of the vector-related language raises a significant concern with the County's Department of Environmental Health, and the County requests that it be placed back into the proposed draft to protect public health. Please see the Department of Environmental Health's detailed comments on this issue in Attachment 5.

Other Concerns

In addition, the County fully supports the following San Diego County Copermittee recommendations related to requirements for new and re-development projects:

- Maintain the existing exemptions in the Regional Board-adopted San Diego Hydromodification Management Plan.
- Maintain the "pre-project" rather than "pre-development" standard for controlling runoff flow rates and durations.
- Instead of adjusting hydromodification management requirements now, reference the recently Board-adopted Resolution No. R9-2010-0066.

More detail and discussion on all of these recommendations is provided under separate cover in the San Diego County Copermittees' comment letter.

4. Attachment E, Total Maximum Daily Load for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed

The Rainbow Creek TMDL for Total Nitrogen and Phosphorous assigns a Load Allocation (LA) to the County. The Tentative Order inappropriately incorporates this Load Allocation as a Waste Load Allocation (WLA). We are aware of no legal basis for such a change, and therefore believe it was made in error. We request that the Regional Board strike the Rainbow Creek TMDL from Attachment E of the Tentative Order.

5. Santa Margarita Watershed WQIP and Transitional Monitoring Program

The County requests that the development of a WQIP and of a modified transitional monitoring program for the Santa Margarita River Watershed Management Area (WMA) be deferred until such time as the Riverside County Copermittees are covered under the reissued Order.

We are particularly concerned that the resource and time commitments required of dischargers, stakeholders, and Regional Board staff to develop a *provisional* WQIP for a limited portion of the Santa Margarita River WMA is not justified. San Diego County represents only 19% of the total land area and 12% of the population in this WMA. The extensive effort required to develop a WQIP for this limited area would be commensurate with that required to go through a full and inclusive WQIP process for the entire WMA – which would again be required once the Riverside County permittees obtain permit coverage. But this "first round" iteration would necessarily exclude many of the watershed stakeholders representing the Riverside County portion of the watershed, as well as other potential state and federal stakeholders. It simply does not make sense to invest in a "partial" WQIP process and to then repeat it on enrollment of the remaining watershed permittees – quite possibly only one or two years later. A full and inclusive process that involves all relevant watershed stakeholders should be the goal of WQIP development. Piecemeal plan development is antithetical to the WQIP vision.

We request that the County be allowed to use the current Watershed Urban Runoff Management Plan (WURMP), including the water quality priorities developed pursuant to Order No. R9-2007-0001, to guide implementation of Provisions D and E within its jurisdiction. We also request a reduction in the number of wet weather MS4 outfall discharge monitoring stations in the transitional monitoring program from five to two stations since: 1) the land uses within the unincorporated County represent only residential and agricultural use and not the full range of land uses listed in Provision D.2.a.(3).(a), and 2) this level of effort better reflects the County's portion of the WMA in terms of population and land area.

We understand that continued progress must be made during any transitional period, and can assure the Regional Board that the County is committed to maintaining its existing commitments in this WMA. We have already demonstrated, through the implementation of a 319(h) grant received in 2006, that we are committed to implementing actions within Rainbow Creek Watershed to reduce nutrient loadings. More recently, we have been awarded another 319(h) grant for Rainbow Creek to implement education and property evaluation programs targeted to agricultural and residential audiences, as well as extensive receiving water quality monitoring.

In addition to these implementation activities, the County, in partnership with Riverside County Flood Control and Conservation District, is committed to furthering our understanding of how nutrients are impacting the beneficial uses in the watershed. This effort is being funded through a Proposition 84 Integrated Regional Water Management (IRWM) grant to "test-drive" the State Water Board Nutrient Numeric Endpoint (NNE) process. This work will include the development of a Nutrients Process Plan to define the NNE process and to form as the foundation of an agreement between the various dischargers in the watershed and the Regional Board. The grant funds are also being used to collect background information, coordinate and facilitate stakeholder input and participation, complete data collection and modeling of the estuary, and to conduct water quality monitoring needed for the NNE process.

6. Non-Storm Water Discharges of Irrigation Runoff

Section B.2 of Order R9-2007-0001 requires that discharges from irrigation water, lawn watering, and landscape irrigation (collectively "over-irrigation discharges") be prohibited only where they have been identified as a <u>significant source</u> of pollutants to waters of the U.S. In

contrast, Section E.2.a of the Tentative Order categorically defines these as illicit discharges based on a conclusion that each represents a source of pollutants to waters of the U.S., thus requiring their outright prohibition.

In our comment letter on the Administrative Draft Permit, we noted the significance of this change and posed two critical questions that remained unanswered. First, we requested a rationale for the determination that these irrigation runoff discharges are sources of pollutants to receiving waters. And second, we asked that if such a rationale were provided, these discharges alternatively be added to Section E.2.a.(4), which would allow their control through statute, ordinance, permit, contract, order, or similar means rather than outright prohibition. The Fact Sheet/Technical Report provided as Attachment F of the Tentative Order partially answers the County's first question and does not address the second. Our remaining concerns are addressed below.

Question 1: Are irrigation water, lawn watering, and landscape irrigation discharges [significant] sources of pollutants to receiving waters?

Regarding the designation of over-irrigation discharges as sources of pollutants to receiving waters, the Fact Sheet (pp. F-74 through F-77) states:

"Non-storm water discharges resulting from over-irrigation have been found to be a source of several types of pollutants (e.g., nutrients, bacteria, pesticides, sediment) in receiving waters. The San Diego Water Board and the Copermittees have identified categories of non-storm water discharges associated with over-irrigation as a source of pollutants and conveyance of pollutants to the MS4 and waters of the United States in the following documents...". In support, six references are provided and briefly described.

1. SmartTimer/Edgescape Evaluation Program (SEEP) Grant Application;
2. 2006-2007 Orange County Watershed Action Plan Annual Reports;
3. Fiscal Year 2008 Carlsbad Watershed Urban Runoff Management Program Annual Report;
4. 2007-2008 San Diego Bay Watershed Urban Runoff Management Program Annual Report;
5. Orange and Riverside County Copermittee Public Education Materials; and
6. Los Penasquitos Lagoon Sedimentation/Siltation TMDL Technical Report (June 2012)

Each is accompanied by one or more qualitative statements about the nature of urban runoff and the potential or actual contribution of various types of over-irrigation practices to it. The following overall conclusion is provided: "These documents confirm that non-storm water discharges associated with over-irrigation are a source of pollutants and should be addressed as illicit discharges to the MS4."

Several aspects of this analysis are problematic. In moving from the language of the previous permit to that of the Tentative Order, the applicable litmus for evaluation of potential discharge prohibitions has been modified from significant sources of pollutants to sources of pollutants. While we understand that this change is consistent with 40 CFR 122.26(d)(2)(iv)(B)(1) ("flows shall be addressed where such discharges are identified by the municipality as sources of

pollutants to waters of the United States."), we would also emphasize that the implications of such a change go well beyond a paper exercise. Clearly, some potential exists for any over-irrigation discharge to reach receiving water. The pertinent question is really whether this potential is of a demonstrated level of significance that would justify the broad policy changes and resource commitments necessary to enforce their outright prohibition. From the little evidence cited in the Fact Sheet/Technical Report, we believe that such a case is not made.

None of the statements provided in support of staff's conclusion are supported by data, technical analysis, or any other form of substantiation. In particular, the use of outreach materials and a grant application (items 1 and 5) to justify the establishment of a categorical discharge prohibition covering portions of three counties is overreaching and inappropriate. Moreover, even if the remainder of the sources cited could be accepted as supporting staff's conclusions for the limited areas to which they apply (the Carlsbad, San Diego Bay, and Los Penasquitos Watersheds), they would not provide support for a more general conclusion that other watershed areas covered by the permit (San Juan, Santa Margarita, San Luis Rey, San Dieguito, San Diego, and Tijuana Watersheds) are similarly impacted.

It also bears emphasis that none of the discussion provided supports the conceptual leap that staff has taken from general statements concerning the presence of over-irrigation discharges to more specific conclusions that they are a source of pollutants to receiving waters <u>and</u> that they should be addressed as prohibited discharges. No evidence for either of these conclusions is presented.

Question 2: Why are over-irrigation discharges not included in Tentative Order Section E.2.a.(4) along with air conditioning condensation, individual residential vehicle washing, and dechlorinated swimming pool discharges?

In our comment letter on the Administrative Draft Permit, we noted that even if irrigation runoff discharges are determined to be sources of pollutants to receiving waters, a more appropriate compliance pathway for managing them is provided in Tentative Order Section E.2.a.(4), which would allow their control through statute, ordinance, permit, contract, order, or similar means rather than outright prohibition.

The Fact Sheet/Technical Report (p. F-76) states that "[p]rohibiting non-storm water discharges associated with over-irrigation, however, is not a new requirement for the Copermittees because it is also consistent with and required by the Water Conservation in Landscaping Act (AB 1881, Laird)." It is true that important conceptual similarities exist in the aims this Act and the Tentative Order. However, to equate the two sets of requirements is to miss critical distinctions between them, i.e., one establishes a variety of tools and approaches to conserve water and to discourage and prohibit runoff from leaving properties, and the other simply makes it illegal for over-irrigation runoff to enter MS4s. Since the former requirements are already in place through the adoption of local water conservation ordinances (County Ordinance No. 10032 was amended on 01/13/2010), it serves little function to create an additional layer of bureaucracy (and potential Copermittee liability) for the same discharges simply because they enter the MS4. It makes more sense to recognize these existing ordinances as substantially meeting the stated objective of Tentative Order Section E.2.a.(4) to instead allow these discharges to be controlled "through statute, ordinance, permit, contract, order, or similar means." In doing so,

Copermittees are afforded greater opportunity to appropriately utilize their local water conservation ordinances, but also to augment these approaches with tools other than strict enforcement. Given the significant variety in the nature and severity of over-irrigation discharges likely to be encountered over a permit cycle, it makes sense to allow Copermittees the discretion they need to effectively deal with them. Tentative Order Section E.2.a.(4) already provides this discretion for air conditioning condensation, individual residential vehicle washing, and dechlorinated swimming pool discharges. The County sees no fundamental difference in the potential risk posed by over-irrigation discharges, and again would emphasize that the Fact Sheet/Technical Report has provided no evidence that it exists.

The County requests that over-irrigation discharges be added to Section E.2.a.(3) of the final adopted Order. Alternatively, if sufficient rationale is provided for their designation as illicit discharges, we request that they instead be added to Section E.2.a.(4) since their control through statute, ordinance, permit, contract, order, or similar means would constitute a more appropriate management response than outright prohibition.

7. Staffing and cost increases for new and expanded requirements cannot be absorbed

The County is tentatively supportive of many of the key conceptual shifts likely to occur under a re-issued permit. In particular, we agree that an increased presence in residential areas can help us to better characterize source contributions from these areas and to craft more effective approaches to managing them. We also believe that developing and fine tuning our WQIP strategies will over time result in commercial and industrial inspection programs that are more focused and efficient in addressing key watershed problems.

However, the County is compelled to support a cost-neutral permitting approach that takes advantage of increased efficiencies and prioritization to put limited resources where they will be best utilized. To comply with the current permit, the County currently spends well over $30 million each year. This is equivalent to the entire budget of our Department of Parks and Recreation. Unfortunately, our analysis of the Tentative Order indicates that the cost to comply would increase significantly. The County cannot support a permit that increases costs for which no reliable source of funding exists.

On top of the Bacteria TMDL-related costs discussed above (see item 1), other new permit costs include the following:

- Development and implementation of a residential inspection program

The Department of Public Works estimates that the County will require a minimum of two to three additional staff to carry out these inspections and conduct all necessary follow-up activities (education, enforcement, etc.) over eight WMAs and 24 Community Planning Areas.

- Increases to agricultural inspections

The Department of Agriculture, Weights, and Measures estimates that seven additional staff may be needed to conduct inspections of a wider variety of agricultural operations. This is due primarily to possible increases in inspections and complaint referrals of additional agricultural

sites, where the County's inventory may increase approximately eightfold (from 483 to more than 4,000). These increases would be responsive to updated JRMP requirements and the development and implementation of WQIPs.

- Development and implementation of an alternative compliance program (see item 3 above):

There are significant administrative costs associated with developing off-site mitigation methodology, establishing off-site locations suitable for mitigation, and establishing outside agreements with agencies to perform perpetual maintenance. Plus, there is the cost of constructing the piping from the project sites to the mitigation area (due to Tentative Order section E.3.c.(3)(a)(iv)). In addition, the taxpayer (not the developer) will ultimately be responsible for the perpetual maintenance of the piping and the off-site mitigation lands.

- Development and implementation of a retrofit program for areas of existing development:

Per Section E.5.e.(2), the County would be required to develop "a program to retrofit areas of existing development within its jurisdiction to address identified sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area." While it is not possible at this time to anticipate the specific resource implications of this requirement, it is essential that they be acknowledged. Significant ongoing costs will be incurred in developing and managing the program itself, acquiring candidate properties, designing and constructing public projects, encouraging and/or compelling the construction of private facilities, and providing long-term maintenance of privately or publicly constructed facilities (e.g., permanent treatment control facilities installed in road rights-of-way). Such changes will require additional funding and resources that are not currently available.

Collectively, these increases are beyond the County's current ability to absorb. We believe that through additional dialogue we can identify commensurate reductions in other permit requirements or areas where greater prioritization and increased efficiencies can be achieved. We are anxious to continue dialogue so that an acceptable cost-neutral approach to implementing these new permit priorities can be found.

8. Determination of minimum inspection frequencies for industrial, commercial, and municipal facilities.

Tentative Order Section II.E.5.c.(1)(a)(iv) fails to differentiate compliance inspections from operation and maintenance inspections. In particular, inspections of linear municipal facilities and associated structures should not be included as part of a requirement to annually perform onsite inspections of an equivalent of at least 20 percent of a Copermittee's combined commercial, industrial, and municipal inventory.

Section II.E.5.a.(1) requires that Copermittee source inventories include commercial and industrial sources, and the following types of municipal facilities:

(i) MS4 and related structures

(ii) Roads, streets, and highways,
(iii) Parking facilities,
(iv) Municipal airfields,
(v) Parks and recreation facilities,
(vi) Flood management and flood control devices and structures,
- Operating or closed municipal landfills,

(vii) Publicly owned treatment works (including water and wastewater treatment plants) and sanitary sewer collection systems,
(viii) Corporate yards, including maintenance and storage yards for materials, waste, equipment, and vehicles,
(ix) Hazardous waste collection facilities,
(x) Other treatment, storage or disposal facilities for municipal waste, and
(xi) Other municipal facilities that the Copermittee determines may contribute a significant pollutant load to the MS4.

Section II.E.5.c.(1)(a)(iv) additionally requires that "[e]ach Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development". As such, it establishes a minimum inspection frequency that is based on each Copermittee's combined industrial, commercial, and municipal inventory totals.

Most of the facilities listed above are easily tabulated as discrete point sources (a building, a business location, etc.) and share a number of structural and operational commonalities (rooftop areas, parking lots, equipment operation, fueling, cleaning, etc.). As such, they are well-suited to the inspection requirements of Tentative Order Section II.E.5.c., which are primarily for compliance verification (assessment of BMP implementation, correction deficiencies or violations, etc.). Other facility types (streets, roads, highways, sanitary sewer collection systems, and MS4s) are fundamentally different because they consist of extensive networks of linear facilities and associated features (e.g., inlets and outlets). As such, it is impractical to inventory them as discrete point sources. Moreover, inspections of these facilities are conducted primarily for evaluating operation and maintenance needs, not for regulatory compliance. The following inventory totals are provided to illustrate how these differences in facility types apply to the County's current inventory.

Facilities subject to "compliance" inspections (2,286 total "facilities")

- Industrial sources (181 facilities)
- Stationary commercial sources (1,921 facilities)
- Solid waste facilities (22 facilities)
- Wastewater facilities (18 facilities)
- Road stations (21 facilities)
- Fleet maintenance facilities (27 facilities)
- Municipal airfields (4 facilities)
- Parks and recreational facilities (92 facilities)
- Office buildings and other municipal facilities (74 facilities)

Facilities subject to "maintenance" inspections (23,347 total "facilities")

- Streets, roads, and highways (1,929 linear miles)
- MS4 inlets and basins (18,974 facilities)
- MS4 linear channels (1,994 linear miles)
- Wastewater collection systems (450 linear miles)

As shown, calculating a combined total inventory across both lists by which either annual or 5-year inspection frequencies can be determined is problematic. Assuming for simplicity that each linear mile of road, MS4, or sewer collection system can be counted as a single facility, the "numbers" of these sources would outweigh all of the other discrete point sources in the first list by more than ten to one, artificially inflating the number of required annual facility inspections well beyond the apparent intent of the Tentative Order. While this would initially appear to drive inspection totals upward, it could have other unintended consequences. For example, a Copermittee could easily meet its overall targets by making comparatively minor increases to its inspections of streets, roads, highways, sewer collection systems, or MS4s. In essence, by focusing their efforts on linear municipal facilities, they could obviate the need for required inspections of other facility types. Such problems are easily remedied by separating the two sets of inspection requirements.

The County, therefore, requests that the following facility types be excluded from the requirements of Section II.E.5.c.(1)(a)(iv) to annually perform onsite inspections of an equivalent of at least 20 percent of the commercial facilities and areas, industrial facilities, and municipal facilities in each Copermittee's inventoried existing development:

- MS4 and related structures (inlets and outlets)
- Roads, streets, and highways, and
- Sanitary sewer collection systems.

This is consistent with Sections II.E.5.b.(1)(b) and (c), which make a clear distinction between general BMP implementation and those practices related to BMP operation and maintenance. We believe that the requirements of Section II.E.5.b.(1) are sufficient to ensure proper inspection frequencies for these other facilities.

9. Unfunded mandates

Permit Finding 29 (p. 9) states that the Tentative Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution, and cites six reasons for this conclusion. Section VII-F of the Fact Sheet/Technical Report (p. F-29) provides further explanation of staff's reasoning. The County disagrees that the general discussion provided in each of these sections is sufficient to summarily dismiss the possibility that specific provisions of the final Order might in fact constitute unfunded mandates. The County also disagrees that the Fact Sheet's attempt at legal analysis is correct, or controlling of the unfunded mandate issue that is currently being litigated, and as may be litigated with regard to new provisions and requirements of the Tentative Order.

10. Firefighting discharges

Since the County Fire Authority will be directly regulated by this permit, the County is very concerned that public funds and critical personnel may have to be spent or resourced to comply with requirements that are unnecessary, and that this will ultimately reduce the emergency personnel and funding available for essential public services. The County Fire Authority's detailed comments on permit requirements for firefighting-related discharges are included as Attachment 6.

Also attached for your consideration are several comment letters received from Community Planning and Sponsor Groups in the unincorporated area. These letters express support for the County's positions and recommendations and are included here as Attachment 7.

Again, thank you for the opportunity to participate in the development of a new permit for the San Diego Region. We look forward to continued discussion of the issues raised above. If you have questions, please contact Jon VanRhyn, Water Quality Program Manager, at (858) 495-5133, or Todd Snyder, Land Use & Environmental Planning Manager, at (858) 694-3482.

Sincerely,

RICHARD E. CROMPTON, Director
Department of Public Works

REC:cw

ATTACHMENTS:

1) Letter from Ron Roberts, Chairman, County of San Diego Board of Supervisors, to Governor Jerry Brown, dated November 9, 2012, and letter from 20 elected officials to Regional Board Chairman Grant Destache, dated November 13, 2012.
2) County Counsel letter to Catherine Hagen, Esq.
3) Geosyntec Consultants, Technical Assessment of the San Diego Beaches & Creeks Bacteria TMDL
4) Rick Engineering Cost Comparison Study, December 2012
5) County of San Diego Department of Environmental Health Comment Letter
6) County of San Diego Fire Authority Comment Letter
7) Community Planning and Sponsor Groups Comment Letters

RON ROBERTS
CHAIRMAN
SUPERVISOR, FOURTH DISTRICT
SAN DIEGO COUNTY BOARD OF SUPERVISORS

November 9, 2012

The Honorable Jerry Brown
Governor, State of California
State Capitol Building, Suite 1173
Sacramento, CA 95814

Dear Governor Brown:

On behalf of the County of San Diego (County), I would like to inform you of recent action taken by the Board of Supervisors (Board) regarding the renewal of the San Diego Municipal Stormwater Permit (Permit). The Board has voted unanimously to approve a strategy to ensure that reasonable compliance standards are incorporated into the renewed Permit now under consideration at the San Diego Regional Water Quality Control Board (RWQCB). The County is concerned that the proposed permit requirements included in the draft tentative order of the Permit would impose unreasonable costs and at the same time guarantee non-compliance with permit requirements. This is particularly true for the numeric standards that would have to be achieved to meet the objectives of the Bacteria Total Maximum Daily Load (TMDL).

The County of San Diego has been the principal permittee for the San Diego Municipal Stormwater Permit and is joined by 20 other regulated parties referred to as copermittees, including the 18 incorporated cities, the San Diego Unified Port District and the San Diego County Regional Airport Authority. This Permit is renewed every five years, and with each renewal the permittees have been required to meet more stringent and costly requirements. "Sustainable Environments" is one of the County's three Strategic Initiatives, and the County has long been a leader in promoting clean water at local beaches, bays and streams.

The County currently spends over $35 million annually to comply with existing stormwater requirements, and collectively the copermittees spend over $100 million per year. Additional compliance costs are difficult to quantify, but are also paid by the private sector. These costs would be compounded by new permit requirements, including the Bacteria TMDL, which seeks to return beaches and creeks to conditions that existed prior to urbanization within 18 years. Regional compliance costs for the Bacteria TMDL alone are estimated to be between $2.2 billion and $4.2 billion in the six watersheds that involve the County over the remaining 18 years of the 20-year compliance schedule. The County's portion of estimated compliance costs is between $286 million and $567 million. On average, this program would cost the County an additional $16 to $31 million dollars each year. These cost estimates are consistent with estimates provided in the RWQCB's own TMDL documentation, as well as estimates developed as part of TMDL load reduction plans in other regions. The state or federal government does not provide any funding to local agencies to comply with these requirements.

Despite the unrealistic price, the required limits may be unattainable and current science cannot reliably guarantee that this effort will result in permit compliance.

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The purpose of the Bacteria TMDL is to protect public health, as elevated bacteria levels at beaches have been shown to increase the risk of water-related illness in surfers and swimmers. However, the science used to develop the Bacteria TMDL underestimates the amount of bacteria that comes from natural sources such as birds, wildlife and natural decomposition. Since those sources of bacteria cannot be eliminated, compliance with the numeric limits in the proposed TMDL is unattainable. Additionally, bacteria are pervasive and can re-grow and multiply at a rapid rate, making them some of the most difficult pollutants to eliminate from the environment. Essentially, the Bacteria TMDL would require the impacts of over 100 years of urbanization to be reversed to pristine levels as soon as eight years from now in dry weather conditions and in less than 18 years for wet weather conditions. Above all, recent studies show that current technology is not capable of removing bacteria to levels that would meet standards, especially during rain events.

In addition to the Bacteria TMDL, the draft permit includes new unreasonable requirements for development projects that will increase costs significantly. The draft permit also includes performance standards that unnecessarily expose copermittees to third-party lawsuits.

While we necessarily focus on the specific requirements of the San Diego Municipal Stormwater Permit, we also remain concerned about developing policies at the national level where new stormwater permit requirements are expected next summer and United States Environmental Protection Agency (U.S. EPA) guidance on "waters of the U.S." could be released later this year. These represent significant additional regulatory requirements that could further impact the San Diego Municipal Stormwater Permit and increase its cost to residents and businesses in the San Diego region.

In the coming weeks the County will continue to express these concerns to the Regional Water Quality Control Board. The County urges your engagement on this issue at all levels, with the U.S. EPA, State Water Resources Control Board and RWQCB. Local government needs realistic objectives and schedules for the Bacteria TMDL, and more complete scientific analysis to ensure that resource commitments in water quality programs are justified based on the resulting benefits. Per the provisions of federal and state law, and the Maximum Extent Practicable standard established by the Clean Water Act, permit requirements should promote and ensure clean water while striking a reasonable balance in cost.

Concerns about the costs and compliance schedules for stormwater permits are shared by many jurisdictions in California and across the country. For this reason, the County is joining with other jurisdictions to bring attention to these concerns to regional water quality control boards, the U.S. EPA, and other appropriate state and federal offices. We appreciate your attention to the pending permit concerns in San Diego County, and we look forward to working with you in the months ahead to ensure that limited public funds are wisely dedicated to stormwater control. Please contact Geoff Patnoe, Director of the County of San Diego Office of Strategy and Intergovernmental Affairs, at (619) 531-5202 if you have any questions.

Sincerely,

RON ROBERTS
Chairman
San Diego County Board of Supervisors

RR:sia

County of San Diego
City of Carlsbad
City of Chula Vista
City of Coronado
City of Del Mar
City of El Cajon
City of Encinitas
City of Escondido
City of Imperial Beach
City of Lemon Grove
City of National City
City of Oceanside
City of Poway
City of San Diego
City of San Marcos
City of Santee
City of Solana Beach
City of Vista
S.D. Unified Port District

November 13, 2012

Mr. Grant Destache
Chairman
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Re: Regional Municipal Storm Water Permit

Dear Chairman Destache:

As representatives of the jurisdictions in San Diego County that are regulated by the Regional Water Quality Control Board (Regional Board), we share deep concerns over proposed regulations in the new Regional Municipal Storm Water Permit. While we strongly believe in the mission of achieving clean water, the proposed regulations are without sound scientific merit and, if implemented, will have catastrophic negative impacts on the fiscal health of local governments and private industry.

Collectively, we are committed to the goal of improving water quality through the storm water management programs that have been developed in conjunction with the Regional Board. Current compliance efforts to reduce storm water pollution are significant and cost regional agencies more than $100 million annually. As stewards of public tax dollars and governments that are faced with having to do more with less, we are concerned that with each permit renewal cycle, the stringency and cost of the unfunded mandates continue to go beyond any practical standards of attainment and what is required by the Clean Water Act.

The Draft Regional Municipal Storm Water Permit released by the Regional Board continues to include the far-reaching Bacteria Total Maximum Daily Load (TMDL), and other additional impractical and unattainable requirements for development projects. It is estimated that the proposed Bacteria TMDL standards alone would cost between $2.2 billion and $4.2 billion for those jurisdictions that share responsibility in six of the watersheds included in the permit. The cost to private industry is unknown but it is clear that any additional costs will be passed on to already struggling and financially burdened families.

Taxpayers will be gravely impacted if this unilateral regulatory practice is allowed to move forward. Governing bodies will be forced to shift public funds away from existing programs, increase taxes or assessments, or face regulatory fines resulting from non-compliance. The Bacteria TMDL, along with the many other proposed regulations, should not be incorporated into the next Regional Municipal Storm Water Permit until we are certain that they are founded on verifiable scientific data, achievable standards, and until sufficient resources are available.

On behalf of our respective constituencies, we are requesting that the Regional Water Quality Control Board direct staff to work collaboratively with all the co-permitees and various stakeholders to draft language that makes practical sense from an environmental and economic standpoint.

Sincerely,

Chairman Ron Roberts
County of San Diego

Vice Chairman Greg Cox
County of San Diego

Mayor Matt Hall
City of Carlsbad

Mayor Cheryl Cox
City of Chula Vista

Mayor Casey Tanaka
City of Coronado

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Mayor Joe Kellejian
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CHRISTOPHER DAWOOD
KRISTEN LAYCHUS

January 10, 2013

Catherine Hagan, Esq.
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, California 92123-4340

via Fed Ex

Re: Tentative Order R9-2013-0001

Dear Catherine:

On behalf of our client the County of San Diego, I am writing concerning some provisions in Tentative Order R9-2013-0001 that are of particular concern to the County. I respectfully ask that you review our legal position on those provisions as outlined below, and please call me to discuss if you have any questions or need further information to assist your review.

The Bacteria TMDL Resolution

The Tentative Order would incorporate elements and requirements from the Bacteria TMDL Resolution (Resolution R9-2010-0001) into the new MS4 permit for San Diego Region copermittees, including the County of San Diego. We specifically urge the San Diego Regional Board to not incorporate the Bacteria TMDL provisions in this permit renewal cycle. It is our legal position that your Board has the authority to decline the demands of other interested parties that this action be taken.

Reasons Not to Incorporate the Bacteria TMDL Into the Permit

From a recent summary by Regional Board (RB) staff, County of San Diego copermittees spend approximately $119M per year on programs to improve water quality

in the San Diego region. Those programs have improved water quality in general and at beaches in the region. With ever-increasing knowledge gained through trial and error, and with the Watershed Quality Improvement Plan concept expected to permit existing resources to be focused in more efficient and effective ways, San Diego copermittees expect to continue the march toward improved water quality using the current level of resources. The copermittees are continually working on ways to improve water quality and have done so for over two decades. As evident in our annual expenditure and work with experts, we are committed to improving water quality.

By RB staff estimates and as confirmed by San Diego copermittees, the implementation of the Bacteria TMDL in the next permit cycle would add a magnitude of additional costs to copermittee budgets that is unsustainable using existing methods for raising general fund monies and given California's legal constraints on taxation or fees. As your Board has heard, the range of additional cost attributable to the Bacteria TMDL alone is $144M to $272M per year, meaning billions of taxpayer dollars over the compliance period.

As presentations in the adoption process have shown, given the unique challenges associated with bacteria as a constituent in stormwater, the cost-benefit analysis dictates that implementing the Bacteria TMDL at this time, as written, would be bad public policy. Studies and experience show that any magnitude of controls for bacteria, up to and including disinfectant efforts, will not consistently achieve the Resolution's numeric standards, even with the expenditure of billions of dollars. So, the sensible, logical next step is to take a hard look at the standards and assumptions of the Bacteria TMDL and devise plans to improve water quality using existing resources and as realistically achievable with today's scientific methods.

Legal Authority to Not Incorporate the Bacteria TMDL Into the Permit

As you know in 1987, Congress declared its intent to chart a different course for improving water quality flowing from MS4 systems by enacting Clean Water Act § 402 (33 U.S.C. § 1342). In establishing the "maximum extent practicable" (MEP) standard of CWA § 402(p)(3)(B), Congress recognized and enacted a different standard than the technology based requirements of CWA § 301. The MEP standard is the legal standard for stormwater compliance.

In *Defenders of Wildlife v. Browner,* 191 F.3d 1159 (1999) the Ninth Circuit held that the MEP standard of CWA § 402(p)(3)(B) *replaces* the requirements of CWA § 301(b)(1)(C) for MS4 dischargers. The *Browner* decision goes on to discuss the

discretion vested in permitting authorities to either require strict compliance, or less than strict compliance, with water quality standards.

Our office believes that the November 12, 2010 EPA memorandum concerning the incorporation and use of numeric WQBELs in permits is not dispositive of this issue. As acknowledged in its March 17, 2011 letter, EPA is still considering whether to retain, reissue, or withdraw the 2010 memorandum. And, in the same letter, EPA acknowledges that the 2010 memorandum, "does not impose legally binding requirements on EPA, States, or the regulated community, nor does it confer legal rights or impose legal obligations on any member of the public."

With regard to the unique challenges associated with bacteria control, the science shows that consistent achievement of the Bacteria TMDL numeric standards is not possible, even with any level of expenditure. Therefore, imposing the 2010 Bacteria TMDL provisions as permit conditions would exceed the "maximum extent practicable" standard. Accordingly, we believe your Board is vested with the discretion to elect not to incorporate the Bacteria TMDL provisions at this time.

Your Board would be justified to open a process to revisit and re-examine the Bacteria TMDL assumptions in the context of its basin planning process, instead of taking the irrevocable step of incorporating the TMDL into the permit and potentially wasting valuable taxpayer dollars that could better be spent on achievable water quality improvement goals.

Receiving Water Limitations (RWL) Language

As you know, the copermittees have expressed significant concerns about third-party liability risks resulting from the Ninth Circuit's interpretation of receiving water limitation language in the L.A. Region's stormwater permit. While we appreciate the State Water Resources Control Board's willingness to take comment and review those concerns, it may take several months for the State Board to act. The Tentative Order retains language similar to the problematic language reviewed in the *NRDC* case; this leaves the County and other copermittees immediately exposed to similar litigation from third parties for violations of water quality standards. We know that several various proposals to modify RWL language have been presented at state and local levels.

We suggest a simple solution consistent with Congress' intent in enacting CWA § 402 as discussed above: simply remove the RWL language in Provision A of the Tentative Order. Federal law does not require imposition of the receiving water limitations for MS4 systems. There is precedent for this action; a number of EPA issued

stormwater permits throughout the country do not include this language. Your Board has the discretion under CWA § 402 and *Browner* to remove the language. If EPA does not consider the RWL language to be essential to its own MS4 permitting, it seems logical that your Board is not required to include it in the new permit.

State Water Board policy supports the iterative process approach to water quality improvement, and acknowledges that water quality standards for many pollutants from MS4s cannot be met immediately. Therefore it is unrealistic and at odds with the iterative process to enact a standard that puts the third-party lawsuit gun to the head of public entities diligently spending significant time and public money pursuing water quality improvement. The permit would still include its enforceable prescriptive requirements and the WQIP features that all parties believe will focus resources in each watershed in the most productive fashion. Over the past two decades, the region has developed the knowledge and skill set to improve water quality, but understands that only through an iterative process can true progress be made.

Removal of the RWL language would eliminate the inevitable jousting over modified language proposals and the uncertainty created by its retention in light of the *NRDC* ruling. Copermittees would simply be obligated to focus on permit condition compliance, including the tasks identified in approved WQIPs, subject to RB enforcement if appropriate. Removal of the language would not create a "free pass"; to the contrary, it would encourage effective water quality monitoring and reporting that might otherwise be discouraged by the specter of third party lawsuits like those filed in the *NRDC* and other cases.

Land Development Standards/Hydromodification Issues

County Counsel concurs with the legal concerns sent to your attention in the December 19, 2012 letter from the Office of the City Attorney of the City of San Diego. The letter points out potential constitutional issues with hydromodification requirements imposed in the Tentative Order. We urge you to recommend modifying the referenced provisions to avoid the potential consequences for copermittees outlined in the letter.

The County also urges the Regional Board to amend the Tentative Order to incorporate the approved hydromodification management plan (HMP) for San Diego County into the permit, and remove provisions of the Tentative Order that are inconsistent with the HMP. As you know, the HMP was developed at significant cost to copermittees, and has only recently been implemented. Therefore, scrapping key components and changing the baseline standard for redevelopment to the questionable "pre-development" standard without further study of the effectiveness of the HMP as

implemented is legally inconsistent with the premise upon which the HMP was required to be developed in the first instance. Our client is submitting a more comprehensive technical comment on the HMP issue for your review.

Other legal concerns with various Tentative Order provisions will be woven into the comprehensive written comments to be submitted by the County and copermittees. Because of the potential impact of the above provisions of the Tentative Order for our client, we urge you to review and revise your recommendations to the Regional Board. Our mutual goal should be a permit that realistically and responsibly advances the march toward improved water quality in the region using available existing resources. As always, thank you for your consideration.

Very truly yours,

THOMAS E. MONTGOMERY, County Counsel

By James R. O'Day

James R. O'Day, Senior Deputy

JRO/tlm
12-00802

Geosyntec consultants

Technical Assessment of the San Diego Beaches & Creeks Bacteria TMDL

County of San Diego, Department of Public Works
January 2013

Executive Summary

The purpose of this paper is to evaluate the Beaches and Creeks Bacteria Total Maximum Daily Load (San Diego Bacteria TMDL), which was adopted by the San Diego Regional Water Quality Control Board (Regional Board) on February 10, 2010, and is proposed for inclusion in Tentative Order R9-2013-0001, the draft San Diego Municipal Separate Storm Sewer System (MS4) Permit (Permit). This technical evaluation identified three fundamental weaknesses: 1) the TMDL reference approach is inappropriately applied to the TMDL compliance sites; 2) the TMDL does not adequately reflect a protection of public health; and 3) the TMDL targets are unattainable given technological and environmental constraints. In addition, while a technical peer review of the TMDL was conducted prior to TMDL adoption, that review is found here to be too limited in scope to provide adequate defense of the TMDL basis and approach.

Introduction

The County of San Diego is a co-permittee in the San Diego MS4 Permit (Tentative Order No. R9-2013-0001), which is currently in draft form but expected to be adopted in 2013. The Regional Board proposes to include requirements consistent with the San Diego Bacteria TMDL (Resolution R9-2010-0001) in the MS4 Permit, thereby making compliance with the TMDL's requirements an enforceable permit requirement.

BACKGROUND

The California Ocean Plan and the San Diego Region Basin Plan (for inland waters) establish beneficial use designations (such as water contact recreation, or REC-1) and associated water quality objectives (WQOs) for marine beaches, estuaries, bays and freshwater bodies. The stated goal of the San Diego Bacteria TMDL is to protect human health and allow for water contact recreation at the 20 beach and creek segments in San Diego and southern Orange Counties. The TMDL defines achievement of the REC-1 beneficial use through attainment of WQOs, which are expressed as concentrations of bacterial indicators – total coliform, fecal coliform, and Enterococcus. The REC-1 WQOs are expressed as both single sample maximum (SSM) and geometric mean (GM) values.

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Following adoption by the Regional Board, the TMDL became effective on April 4, 2011, upon approval by the State Water Board, Office of Administrative Law. The TMDL sets numeric compliance limits, or Wasteload Allocations (WLAs), for MS4 co-permittees based on a reference system approach. To account for natural sources of bacteria, this approach allows an identified percentage of samples to exceed the REC-1 WQOs based on observed exceedance frequencies at an undeveloped "reference" beach. The reference beach used in this TMDL is Leo Carrillo Beach in Los Angeles County. The TMDL's MS4 WLAs are expressed as allowable exceedance frequencies (AEFs) for any of the three SSM indicator bacteria WQOs, or 22% during wet weather (i.e., 22% of "wet weather" water samples are allowed to exceed any of the SSM WQOs) and 0% during dry weather, and 0% AEF of the GM during dry weather (i.e., no allowed exceedances). A "wet weather" day is defined in the TMDL as a day with rainfall of 0.2 inches or greater and the following 72 hours. All other days are treated as dry weather.

PURPOSE

The purpose of this white paper is to evaluate the TMDL based on a review of available data and relevant studies. This critical evaluation is structured into four fundamental questions: is the TMDL reference approach applied appropriately, does the TMDL reflect public health protection, are the TMDL MS4 WLAs attainable, and was the peer review sufficient?

1. Is the TMDL Reference Approach Applied Appropriately?

ALLOWABLE EXCEEDANCE FREQUENCIES ARE NOT APPROPRIATELY SET

To account for natural sources of bacteria, the San Diego Bacteria TMDL allows an identified percentage of samples to exceed REC-1 WQOs based on observed exceedance frequencies at an undeveloped "reference" beach. The "reference" beach used to set allowable exceedance frequencies (AEFs) for the San Diego Bacteria TMDL is Leo Carrillo Beach in Los Angeles County. MS4 WLAs are expressed as AEFs for three indicator bacteria (fecal coliform, total coliform, and Enterococcus) WQOs as follows:

- 22% AEF during wet weather[1] (i.e., 22% of "wet weather" water samples are allowed to exceed any of the SSM WQOs);

[1] A "wet weather" day is defined in the TMDL as a day with rainfall of 0.2 inches or greater and the following 72 hours. All other days are treated as dry weather.

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- 0% AEF of the SSM during dry weather;
- 0% AEF of the GM during dry weather.

The TMDL inappropriately applies the same AEFs to all compliance points, regardless of their beach type (e.g., open beach or lagoonal outlet), waterbody type (e.g., beach or stream), or watershed size. Enclosed lagoonal outlets have higher AEFs than open beaches due to limited flushing and stagnant water, nutrient and organic rich sediments and vegetation that harbor bacteria, and huge densities of birds and other wildlife, due to the high quality habitat. Freshwater streams are expected to have higher AEFs than marine beaches since beaches are sampled at "point zero", or in the mixing zone (where the discharge from the storm drain or stream initially mixes with the ocean water, resulting in dilution), and because streams carry higher suspended sediments, which harbor bacteria. For this reason, watershed size is expected to influence beach AEFs since large watersheds have greater discharge, and therefore less surfzone dilution. To demonstrate this influence, a 2006 Southern California Coastal Water Research Project (SCCWRP) monitoring study at Southern California reference beaches (Schiff et al, 2006) found that exceedance frequencies of bacteria WQOs in wet weather were greater in large (>100 km^2) watersheds than in medium (28-56 km^2) watersheds or small (3-12 km^2) watersheds. The Los Angeles Regional Board has acknowledged some of these factors in setting AEFs for various bacteria TMDLs. The Santa Clara Estuary, for example, has a wet weather SSM AEF of 30%, which is higher than that of other waterbodies due to its enclosed nature, which supports bacteria regrowth and natural sources. The Arroyo Sequit watershed, which drains to the Leo Carrillo reference beach, has a drainage area of approximately 31 km^2, placing it in the "medium watershed" category. For reference, the San Luis Rey River and San Diego River watersheds (two watersheds affected by the San Diego Bacteria TMDL) are 1,500 and 1,100 km^2, respectively, putting them in the "large watershed" category, and suggesting that TMDL compliance points at their outlets should have higher AEFs. AEFs could be more appropriately set to better reflect the watershed-specific characteristics of the regulated water bodies.

The San Diego Bacteria TMDL does not allow any exceedances during dry weather, which is inconsistent with both the reference watershed datasets and the Los Angeles bacteria TMDLs. The San Diego Bacteria TMDL requires a 0% SSM AEF during all dry weather conditions, while all Los Angeles TMDLs

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allow a higher dry weather SSM AEF, in some cases by separating summer-season dry weather from winter-season dry weather. In fact, based on review of recent monitoring data from the Leo Carrillo reference beach, Los Angeles beach bacteria TMDLs were modified in 2012 to increase the winter-season dry weather AEF from 3% to 10%. Furthermore, Geosyntec analysis of Leo Carrillo reference beach data from 2004 through 2011 shows an average SSM exceedance rate of 9% during summer-season dry weather, further challenging the basis for a 0% dry weather AEF in the San Diego TMDL. Table 1 compares dry weather single sample AEFs in the San Diego Bacteria TMDL with other Bacteria TMDLs adopted in the Los Angeles region.

Table 1. Bacteria TMDL Dry Weather Single Sample Allowable Exceedance Frequencies

Waterbody	Allowable Exceedance Frequency (%)	
	Winter Dry	Summer Dry
Los Angeles Region TMDLs		
Santa Monica Bay Beaches (reopened)	10%	0%
Malibu Creek (reopened)	1.6% (all dry weather)	
Los Angeles River	1.6% (all dry weather)	
Ballona Creek (reopened)	1.6% (all dry weather)	
Santa Clara River	1.6% (all dry weather)	
Santa Clara River Estuary	13.4%	4.7%
Malibu Lagoon (reopened)	10.4%	0%
Ballona Estuary (reopened)	10.4%	0%
San Diego Region TMDL		
San Diego 20 Beaches and Creeks (for comparison)	0% (all dry weather)	

The San Diego TMDL's use of AEFs as the compliance metric is also inconsistent with the Los Angeles reference approach (which uses allowable exceedance *days*) and, as a result, the wet weather WLAs are often unattainable at the reference beach itself. The Los Angeles TMDLs use the average wet weather reference beach exceedance frequency with the number of local wet days in the 90th percentile wet year to calculate the number of allowable exceedance days (AEDs)[2]. By doing this, the Los Angeles Regional Board has established a compliance metric that is only exceeded at the reference beach during 10% of years, and that accounts for the influence of year-to-year rainfall variability. In contrast, by using the average wet weather exceedance frequency as the compliance metric, the San Diego Bacteria TMDL

[2] The San Diego Bacteria TMDL also does this, but ultimately sets AEFs as the compliance metric, making its AED calculations unused and meaningless.

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establishes a metric that is exceeded at the reference beach during approximately half of the years (since they are taking the average value).

Reference-based compliance metrics could be set such that the reference beaches and creeks consistently meet the TMDL WLAs. Geosyntec analysis of Leo Carrillo monitoring data from 2004 through 2011 demonstrates that the average wet weather SSM exceedance frequency (28%), the average dry weather 30-day GM exceedance frequency (16%), and the average dry weather SSM exceedance frequency (10%) are higher than the AEFs defined in the TMDL (22%, 0%, and 0% respectively). Figure 1 shows the annual exceedance frequencies (or percent of samples that exceed the SSM WQOs) for the Leo Carrillo reference beach compared to the TMDL AEFs. During these eight years of monitoring, this reference beach would have exceeded the TMDL's single sample AEFs in 4 of 8 years during wet weather and 7 of 8 years during dry weather. The reference beach also would have exceeded the GM AEF in 5 of 8 years. These results demonstrate that the TMDL AEFs are exceeded during most years at the reference beach itself. Furthermore, in its 2008 report (Tiefenthaler et al), SCCWRP evaluated bacteria concentrations in reference streams during dry weather. The study results demonstrated that bacteria levels at the reference stream sites fluctuate seasonally, annually, and from site to site, often with measured exceedance frequencies above the AEFs. Therefore, currently available reference beach and stream datasets could be used to set more appropriate TMDL compliance metrics.

Figure 1. Leo Carillo Annual Bacteria Exceedance Frequency

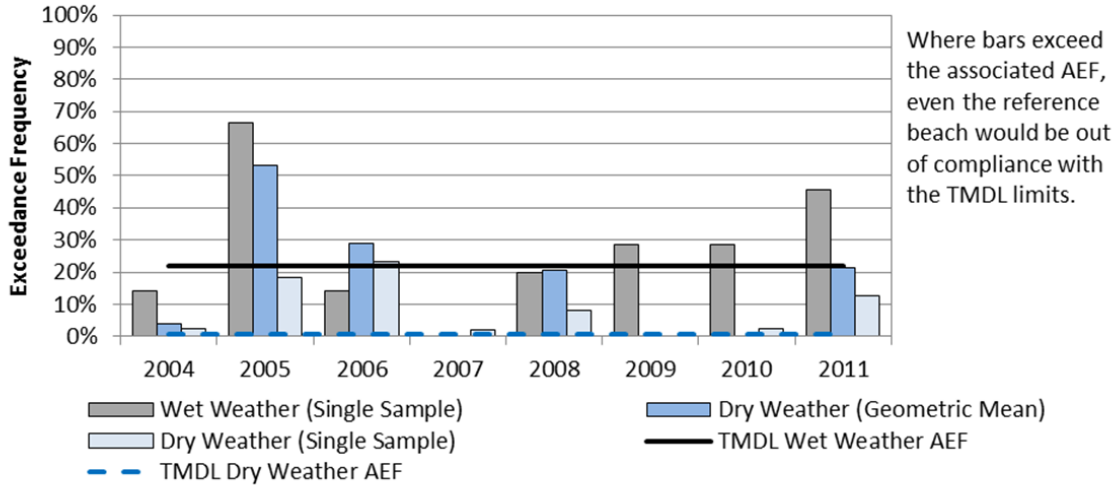

Notes:
1. 30-day Rolling GM - Geometric mean calculation performed every week, on the dry weather samples within the previous 30-days period, if 5 or more samples have been taken in the 30-day period.

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THE TMDL REFERENCE SITE IS NOT REPRESENTATIVE OF THE SAN DIEGO REGION

The Los Angeles region's reference beach, Leo Carrillo, which was used to set the San Diego TMDL AEFs, is not located in the San Diego region. Temperature, rainfall, and vegetation type and density may vary significantly by geographic region. These factors are known to influence bacterial concentrations in environmental samples. Therefore, the AEFs developed based on Leo Carrillo may be very different than the AEFs developed for a San Diego reference beach, and the same may be true of San Diego reference streams. This hypothesis is supported by an extensive SCCWRP study, completed between 2004 and 2006, where multiple reference beaches were monitored (Schiff et al, 2006). This study, which has been referenced in several Southern California bacteria TMDLs, shows higher wet and dry weather exceedance frequencies at the two San Diego reference beaches (San Onofre and San Mateo) than at Leo Carrillo (Table 2).

Table 2. Average exceedance frequencies for key reference beaches

Season		SD TMDL	Leo Carrillo	San Onofre[1]	San Mateo[1]
Wet Weather (Single sample)		22%	28%	30%	30%
Dry Weather (GM)		0%	16%	-	-
Dry Weather (Single sample)	Winter	0%	9%	7%	20%
	Summer			0%	9%

[1]Exceedance frequencies at these beaches are believed to be based on SSMs for dry weather; however the report did not describe the analysis method used.

WET DAY DEFINITION IS UNSUPPORTED

The TMDL inconsistently uses a wet weather definition of 0.2 inches of rainfall for compliance purposes, but adopted the Leo Carrillo reference beach AEFs that were determined using a 0.1 inch definition. Table 3 summarizes the AEFs defined in Tentative Order R9-2013-0001, based on the San Diego Bacteria TMDL, as well as the average exceedance frequencies calculated between 2004 and 2011 at the Leo Carrillo reference beach. These results are presented based on two methods: 1) assuming wet weather is defined as 0.1 inches (per the Los Angeles Regional Board and Leo Carrillo reference beach) and 2) assuming wet weather is defined as 0.2 inches (per the San Diego Regional Board). As shown, the AEFs observed using the 0.2 inches definition are higher (10-31%) than those observed using the 0.1 inches definition (9-28%). This suggests that the TMDL AEFs are biased lower, or resulting in more stringent AEFs, than they would be if the 0.2 inches definition was accurately applied.

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Table 3. Leo Carrillo average exceedance frequencies based on different wet weather definitions, 2004-2011

Season	SD TMDL AEFs	Average Observed Exceedance Frequency at Leo Carrillo Reference Beach	
		0.1 inch	0.2 inch
Wet Weather (Single sample)	22%	28%	31%
Dry Weather (GM)	0%	16%	18%
Dry Weather (Single sample)	0%	9%	10%

In addition, the San Diego Bacteria TMDL's wet day definition (0.2 inches) inappropriately skews the number of dry days high (and noting that dry days have no allowed exceedances) and wet days low (whereas wet days are allowed a number of exceedances).

To further evaluate the 0.2 vs. 0.1 inch definition, an analysis was performed correlating rainfall data from the San Diego County ALERT Flinn Springs gauge (32.8464N 116.8636W, San Diego County) and streamflow data from the USGS Los Coches Creek gauge (11022200, Lakeside, CA) from October 2007 to September 2012 (5 water years). Los Coches Creek is a small tributary of the San Diego River with a drainage area of 12.2 square miles. This pair of gauges was selected because the Flinn Springs rain gauge reasonably represents the Los Coches Creek drainage. Of the 12 storms that occurred during this period that produced rainfall depths between 0.1 inches and 0.2 inches, all 12 resulted in rainfall-induced excess runoff to the creek, as defined by a temporary increase in flow rate of at least 50% above pre-event base flow. The increased flows for these storms averaged 840% above baseflow with a range between 74% and 2500%. Therefore, 0.1 inches is a more appropriate threshold value for defining TMDL wet days in the San Diego region.

TMDL SHOULD REFLECT APPROPRIATE REC USE CATEGORIES

By assuming a "designated beach" usage frequency (the highest REC use category) for all beaches and creeks, the TMDL applies the most stringent REC-1 Enterococcus WQOs from the Basin Plan, or 61 and 104 MPN/100mL for freshwater and saltwater, respectively. However, Chapter 7 of the Basin Plan states that the "designated beach" category may be over-protective of water quality for the impaired freshwater creeks because of their infrequent recreational use, and that these waters may be better represented by the "moderately to lightly used areas" category, which has an Enterococci freshwater REC-1 SSM WQO of 108 MPN/100mL. The San Diego Regional Board has indicated in the TMDL that they may be open to amending the Basin Plan for these lower usage water bodies, and the MS4 co-permittees would likely support this action, which would more accurately reflect freshwater REC uses in the region. Furthermore, a lower REC use intensity or alternatively a REC use suspension could be considered to limit the applicability of REC-1 bacteria WQOs during wet weather when creek access is rare and often unsafe due to high flows. Such Basin Plan Amendments have been approved in the Los Angeles and Santa Ana regions.

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In addition, the TMDL applies reference beach AEFs to San Diego creeks and rivers; however, these AEFs were developed based on a 104 MPN/100mL Enterococcus WQO (along with other indicator bacteria WQOs), whereas the TMDL then applies this AEF to a freshwater WQO of 61 MPN/100mL. As a result, the conservatively low AEFs are compounded with the conservatively low WQO, again resulting in unnecessarily low TMDL WLAs. Based on the Leo Carrillo reference beach data that is used to develop the TMDL AEFs, using a 61 MPN/100mL WQO for Enterococcus (along with other indicator bacteria WQOs) the site's WQO exceedance frequency is 13% and 33% for dry and wet weather, respectively. Therefore, the San Diego Bacteria TMDL could use these percentages as the basis for their freshwater AEFs if the 61 MPN/100mL threshold is kept. Another potential solution would be to use USEPA's 2012 recommended REC criteria for both freshwater and saltwater, which is 35 CFU/100mL Enterococcus as a geomean and 130 CFU/100mL as a 90th percentile Statistical Threshold Value. Notably, USEPA REC 2012 criteria guidance also now allows site-specific criteria to be developed where appropriate based on study approaches such as Quantitative Microbial Risk Assessment.

SAN DIEGO REFERENCE WATERSHED STUDY

In its response to comments on the San Diego Bacteria TMDL (TMDL Appendix V), the Regional Board recognized that a San Diego reference watershed is needed, stating: *"For these bacteria TMDLs, the San Diego Water Board decided to use the 22 percent wet weather exceedance frequency as an initial allowable exceedance frequency, with the expectation that a region specific or multiple watershed specific allowable exceedance frequencies would be developed as additional data were collected in reference systems identified for the San Diego Region"* (San Diego Regional Board, 2010).

The San Diego and Orange County MS4 Co-permittees are currently partnering with Caltrans, with technical assistance from SCCWRP, to fund a local reference study that will provide data much more appropriate to the water bodies regulated by the San Diego Bacteria TMDL. For example, water body-specific AEFs could be determined for reference beaches, creeks, and enclosed lagoonal outlets, rather than applying AEFs derived for one reference beach to all three water body types. AEFs could also be determined for reference watersheds of varying sizes, rather than applying AEFs derived for a medium watershed to all other size watersheds. AEFs could also be derived using the same wet weather definition as will be used for compliance assessment purposes, resulting in greater scientific validity of the compliance metrics. Lastly, it is anticipated that local hydrologic, geologic, and environmental (freshwater vs. marine water and flora/fauna) factors may result in AEFs more appropriate for local water bodies than those derived for the Leo Carrillo reference beach. Therefore, local AEFs would be expected to improve upon the limitations mentioned above.

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2. Does the TMDL Reflect Public Health Protection?

USEPA REC CRITERIA ACKNOWLEDGE THAT INDICATOR BACTERIA ARE NOT PREDICTIVE OF HUMAN HEALTH RISK AT STORMWATER-DOMINATED WATERS

Indicator bacteria are not themselves pathogens, or illness-causing microorganisms. Rather, indicator bacteria are used as a proxy for gastrointestinal (GI) illness risk because of their presumed correlation with human fecal waste, which is presumed to carry pathogens and is therefore presumed to generate illness as a result of body contact recreation. However, this inference chain breaks down for recreational waters -- like the San Diego Bacteria TMDL waterbodies -- that are impacted by urban runoff rather than municipal wastewater effluent, since urban runoff carries many non-human (and much less pathogenic) sources of indicator bacteria, such as from pets, birds, other wildlife, plants, and soils or sediment. Recent epidemiology studies (i.e., studies that "measure" swimmer illness rates via post-activity surveys) and Quantitative Microbial Risk Assessments (QMRA) (i.e., studies that calculate swimmer illness rates based on measured pathogen concentrations in recreational waters and using known dose-response relationships) support this understanding. USEPA's 2012 REC criteria recommendation also acknowledges this limitation for urban runoff-impacted waters, and as a result they now formally allow epidemiology and/or QMRA studies to be used to develop site-specific criteria where the default REC criteria are inappropriate. The San Diego Bacteria TMDL and MS4 Permit could acknowledge this fundamental weakness by refining the WLAs as possible based on currently available information from USEPA and allowing site-specific criteria to be developed through stakeholder-led special studies.

Bacteria WQOs have historically been derived from epidemiological studies conducted in recreational waters impacted by municipal wastewater effluent. Experts on bacteria water quality in California have suggested that an unclear relationship exists between illness and bacteria from non-point sources, supporting the finding that the application of relationships based on epidemiological studies conducted in the 1970s for effluent-impacted water bodies may be inappropriate for recreational waters (Boehm et al. 2009). Other recent studies have also demonstrated that the traditional bacterial indicators, fecal coliform and total coliform in particular, show a weak correlation with illness in stormwater-dominated waters. For example, as part of the National Epidemiological and Environmental Assessment of Recreational water (NEEAR) program, the USEPA most recently conducted epidemiological studies at an urban runoff-impacted beach in South Carolina. No statistically significant relationship between Enterococcus and GI illness was observed at Surfside Beach (USEPA, 2010), which was hypothesized to be due to either the lack of human inputs or

> The USEPA 2012 REC Criteria include only Enterococcus and *E. coli* (latter for freshwater only). These were found to be better indicators of public health than total and fecal coliforms. The USEPA also recommends the use of the GM and STV, not SSMs.

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the low bacteria densities observed. A 2007 epidemiology study at Mission Bay (Colford et al) did not find any association between illness incidence and traditional fecal indicators (total coliform, fecal coliform, and Enterococcus). A four-year study conducted at 45 stormwater outfalls in Milwaukee found no correlation between E. coli or Enterococcus to the human Bacteroides genetic marker, even though all tested outfalls had Bacteroides detected in at least one sample (Sauer et al, 2011). The study further suggested that fecal indicators may be of little use for prioritizing efforts to protect human health in urban areas where numerous non-human sources of fecal pollution exist. A 2010 study (Fleischer et al) conducted at a recreational marine beach with no known point source inputs concluded that "there was no dose-response relationship between gastroenteritis and increasing exposure to Enterococci, even though many current water-monitoring standards use gastroenteritis as the major outcome illness." Other literature suggests that total coliform and fecal coliform concentrations do not correlate as well as Enterococcus with human illness rates in recreational waters (Cabelli 1983; Cabelli et al., 1982). Wade et al. (2003) conducted a scientific review of 27 studies evaluating the association between microbial indicators of recreational water quality and GI illness. The studies found that overall illness rates were better correlated with Enterococci in marine waters and with *E. coli* in freshwaters than with total coliform and fecal coliforms. Therefore, recreational waters that are not impacted by effluent require very careful application of bacteria WQOs (otherwise they create a compliance burden without providing any real human health benefit), and allowances for site-specific adjustments.

The recently finalized 2012 USEPA Recreational Water Quality Criteria Report states: *"Scientific advancements in microbiological, statistical, and epidemiological methods have demonstrated E. coli [for freshwater] and Enterococci [for marine sites] are better indicators of health than the previous indicators, total coliforms and fecal coliforms"* (USEPA 2012). This is consistent with USEPA's Ambient Water Quality Criteria for Bacteria (1986) which states: *"The freshwater studies confirmed the findings of the marine studies with respect to Enterococci and fecal coliforms in that densities of the former in bathing water showed strong correlation with swimming associated gastroenteritis rates and densities of the latter showed no correlation at all…. E. coli is the most fecal specific of the coliform indicators; and Enterococci, another fecal indicator, better emulates the virus than do the coliforms with respect to survival in marine waters"* (USEPA, 1986). Neither REC criteria (1986 or 2012) have been adopted by the California State Water Resources Control Board or the San Diego Regional Board. Given their weak link to public health, total coliform and fecal coliform WQOs could be removed from the San Diego Bacteria TMDL.

In the same 2012 document, USEPA further expresses that SSMs are overly conservative, statistically incorrect, and do not correlate with the same level of risk associated with the GM criteria. For this reason, they recommend replacing the 104 cfu/100mL SSM with the 130 cfu/100mL statistical threshold value (STV), or 90th percentile value (i.e., 10% of samples are allowed to exceed this). The STV corresponds to the same level of health protection as the GM, which was set based on observed illness rate correlations. Use of the STV would also increase consistency between states, which the USEPA has

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encouraged. In fact, even the San Diego Regional Board, in their Peer Review issue #9, acknowledge that, "the GM is more appropriate [for dry weather conditions] since this value likewise represents average conditions over 30 days." Inconsistent with Regional Board staff responses to peer reviewer comments, the SSM limit was included for all weather conditions in the adopted TMDL and draft permit.

URBAN RUNOFF BEACH EPIDEMIOLOGY STUDIES SHOW A WEAK CORRELATION BETWEEN BACTERIA CONCENTRATIONS AND HUMAN ILLNESS

Bacterial indicators, even *E. coli* and Enterococcus as recently recommended by USEPA, have been shown to have a weak (or nonexistent) correlation with human illness rates in stormwater-dominated waters, suggesting that WQOs based on these indicators may not accurately reflect public health as intended. Epidemiological results from the SCCWRP Pacific Coast Water Quality Study at Surfrider Beach in Malibu show increased illness rates for swimmers, although no relationship between illness and bacteria was observed (Arnold et al, draft, 2012). This is perhaps due to bather shedding of skin fungus and fecal pathogens (Elmir et al., 2007; Plano et al., 2011). Many epidemiological studies have similarly found no or very minor correlation between bacteria concentrations and illness rates associated with swimming in receiving waters impacted by non-point sources of bacteria. For example, a 2007 study conducted in Mission Bay in San Diego by Colford et al. found no associations between traditional bacteria concentrations (total coliforms, fecal coliforms, and Enterococcus) and illness. A number of other studies conducted in coastal water bodies in Southern California have also shown a lack of correlation between bacteria and human pathogens (Noble et al., 2006; Rajal et al., 2007; Boehm et al., 2003; Choi & Jiang 2005; Jiang & Chu, 2004a). Moore et al (2007) and Imamura et al (2011) found that Enterococcus in particular can originate in plants and kelp, thereby questioning the presumed human health linkage for urban runoff-impacted receiving waters. A recent epidemiology study in Dana Point, conducted at Doheny State Beach, which frequently exceeds bacteria WQOs, found that swimmer illness rates were not correlated to bacteria concentrations at any time except when a creek berm was open (Colford et al., 2012). Doheny State Beach is located at the outlet of the San Juan River, which is separated from the ocean by a sand berm for most of the dry season. The San Juan River is impacted by human sources, as evidenced by the consistent correlation of bacteria and human waste markers in the creek (McQuaig et al., 2012) and the fact that a municipal wastewater treatment plant discharges disinfected effluent into the creek less than a mile upstream of the outfall. On the ocean side of the berm, however, no consistent correlations were found between bacteria and human waste markers (McQuaig et al., 2012), suggesting that the dry weather bacteria exceedances at this beach may often be caused by sources other than those of human-origin when the berm is not overtopped. In all three recent Southern California beach epidemiology studies, the additional highly credible gastrointestinal illnesses (HCGIs) observed among swimmers (i.e., illnesses beyond those measured in the non-swimmer control group) were consistently below the USEPA's tolerable illness rate (up to 3.6%) that forms the basis for its REC criteria. This was even true for Doheny Beach with the creek berm open, which was the only beach and condition where an Enterococcus-illness association was observed (no illness

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associations for total or fecal coliform were observed at any of the beaches). Therefore, while indicator bacteria exceedances persist at these three Southern California beaches, measured swimmer illness rates are low and consistently meet USEPA's allowed levels. The San Diego Regional Board could therefore safely increase REC water quality objectives and still protect public health at creeks and beaches.

USEPA QMRA STUDIES SHOW RECREATIONAL OBJECTIVES ARE OVERLY CONSERVATIVE FOR SITES WITH MINIMAL HUMAN BACTERIA SOURCES

Recent USEPA Quantitative Microbial Risk Assessment (QMRA) studies (Soller et al 2010 and Schoen et al 2010) also indicate that REC objectives, specifically the Enterococcus GM, correspond to swimmer illness rates that are well below USEPA's tolerable levels at beaches with minimal human bacteria sources. Applying the 35 MPN/100mL limit at non-wastewater impacted beaches is a conservative (overly stringent) approach since recent peer-reviewed QMRA work by USEPA's contractor (Soller et al 2010) and USEPA (Schoen et al 2010) shows that the 35 MPN/100mL limit can be greatly increased at beaches where bacteria sources are primarily non-human, while still being protective of USEPA's gastrointestinal illness benchmark, as shown in Figure 2 from USEPA (Schoen et al 2010). Schoen states: *"The dominant source of fecal indicator at a recreational beach may not be the source of dominant risk."* This fact was recently acknowledged by USEPA REC criteria and QMRA experts at the November 28-29 State of the Science Workshop at SCCWRP, organized by SWRCB staff and the California Beach Water Quality Workgroup. So, while there are non-negligible risks from non-human fecal sources, for the same Enterococcus levels, these risks are much lower than those from human waste, which are the basis for default REC criteria. Therefore, if human sources are found to be very low or not detected, Enterococcus GM criteria can be safely increased[3].

[3] While used in the California Ocean Plan and San Diego Basin Plan, total and fecal coliform and SSM maximum objectives are no longer used in current USEPA REC criteria and are not associated with swimmer illnesses, therefore they are not mentioned here.

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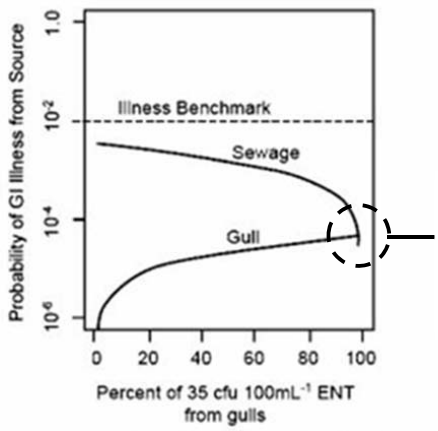

[Low illness rate sum, where Enterococcus is primarily from gull sources rather than human sewage.]

Figure 2. Comparison of median illness risk for adults when total ENT concentration (at 35 CFU /100mL) is attributed to a mixture of primary POTW effluent (sewage) and seagull feces (gulls) (Schoen et al 2010), of USEPA.

STUDIES SHOW THAT NATURAL SOURCES CONTRIBUTE SIGNIFICANTLY TO BACTERIA LEVELS, BUT PRESENT LOW HUMAN ILLNESS RISKS

Natural sources of bacteria, which present much lower human illness risks compared to human fecal sources, have shown to contribute to WQO exceedances at many Southern California sites. Table 4 summarizes several scientific studies that have identified and observed natural sources of bacteria, including plants, algae, soil, beach wrack, insects, and animal feces (especially birds). In fact, a very recent study conducted by SCCWRP and the San Diego MS4 co-permittees (Griffith and Ferguson, 2012) at Moonlight State Beach in Encinitas and Rock Pile Beach in La Jolla observed that at Moonlight Beach, *"the distribution of enterococci species and strains found in the creek and the storm drain system during the 22 week sampling period were phenotypically most similar to species and strains found among natural sources as compared to those present in sewage."* The *Bacteroides* marker was not found in any of the creek/stream or beach samples, suggesting that "human fecal contamination may not have been a significant source of Enterococci to either storm drain during the study period." In combination, these studies provide further evidence that natural sources are indeed significant contributors of indicator bacteria in Southern California recreational waters, while not likely contributing to an increased health risk.

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Table 4. Summary of findings on natural sources of bacteria

Finding	Reference(s)
Non-anthropogenic sources of bacteria confirmed, potentially contributing to exceedances.	Imamura et al 2011, Izbicki 2012b
Sand, sediment, and wrack can serve as reservoirs for bacteria.	Imamura et al 2011, Izbicki et al 2012b, Lee et al 2006, Ferguson et al 2005, Grant et al 2001, Griffith 2012, Litton et al 2010, Phillips et al 2011, Jiang et al 2004b, Sabino et al 2011, Weston Solutions 2010
Enterococci include non-fecal or "natural" strains that live and grow in water, soil, plants, and insects.	Griffith and Ferguson, 2012, Griffith 2012, Litton et al 2010, Weston Solutions 2010, Izbicki et al 2012b, Weisberg et al 2009
Lagoonal sediments have been shown to harbor nutrients, which when released may encourage regrowth of bacteria.	Sutula et al 2004, Weisberg et al 2009, Surbeck et al 2010

Bacterial regrowth can limit the ability of an MS4 to comply with the WQOs for a number of reasons. First, bacteria concentrations measured in impacted watersheds may be a result of actively growing, possibly environmental (rather than anthropogenic) communities within sediments or storm drain systems rather than a result of human fecal inputs. In addition, regrowth may lead to a decoupling of bacteria from pathogens, reducing the potential for bacteria concentrations to reflect risk of human illness (Litton et al 2010). The 2012 San Diego SCCWRP study also found that the naturally occurring bacteria species were apt to form biofilms on concrete surfaces, such as in storm drains, ultimately leading to sloughing and downstream release over time. These studies suggest that regrowth is a relatively uncontrollable source that, while potentially contributing to WQO exceedances, are unlikely to contribute increased risks to human health.

3. Was the Peer Review Sufficient?

In 2010 the San Diego Regional Board solicited two experts, Dr. Patricia Holden from University of California (UC) Santa Barbara, and Dr. Kara Nelson from UC Berkeley, to provide peer review of the wet and dry weather TMDL modeling approaches. Both are highly respected research scientists and academics. Dr. Holden is an expert on source tracking method development and testing, while Dr. Nelson is an expert on removal and inactivation of pathogens as well as vegetated treatment systems. While both researchers are highly respected in their fields, neither are expert practitioners on bacteria control technology selection or performance. Therefore, their approval of the TMDL should not reflect on the technical feasibility of meeting the TMDL limits.

The following are our specific comments on the expert peer review and San Diego Regional Board responses:

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a. *Other sources of bacteria*. In peer review topic #2 (use of wet weather model to simulate fate and transport of bacteria, and to calculate TMDL, to affected beaches and creeks), the reviewer raised the concern that "…the resuspension and erosion of sediments in water channels during storm events may be an important source of indicator bacteria that is not accounted for in the current model." Although the Board responds that, "the association of bacteria to sediments in the stream channels and processes of settling and resuspension are important considerations, and the LSPC model includes capabilities for the simulation of these processes if data becomes available to define modeling assumptions to facilitate model calibration", a peer-reviewed article co-authored by the expert reviewer was published on this exact topic in 2003 (Steets and Holden, 2003).

b. *Reference watershed.* In the peer review topic #3 (selection of Los Angeles watershed as a "reference" for background loading of bacteria in the San Diego Region during wet weather), it was noted by the reviewer that, "the Implementation Plan should require that one or more appropriate reference watersheds are identified and characterized for the San Diego region, and that these data are used to determine the TMDLs." This comment supports our opinion, expressed earlier in this paper, that a San Diego reference beach should be used to determine the final TMDL. The Board's response includes information that (1) measurements were based on the 2004-2005 winter season, (2) a single WQO was exceeded 27% of the time, on average across the four reference beaches evaluated, and (3) acknowledges that natural process do generate bacteria loads in both reference and urbanized systems. Although the reviewers were not provided an opportunity to respond to these items, we are concerned that (1) this response is based on only one wet season, while year to year variability has been illustrated at a reference beach per Figure 1, (2) if a 27% exceedance rate was observed across the four "local" reference beaches, why was 22% selected as the wet weather AEF?, and (3) natural source contribution processes occur year round, including during dry weather, therefore dry weather exceedances should be allowed.

c. *SSM objectives.* The use of SSM objectives (peer review topic #4) was questioned as follows, "…given that rainfall events subject the watersheds to more variability in flow and load, the use of a GM for wet weather seems more practical." The San Diego Regional Board responded, "The GM value does not evaluate peak loads at short time intervals because values are calculated over several weeks' time. Because the model used for wet weather analyzes high flow and loads, which are short-term events, the numeric target must likewise characterize risk from short-term events. Therefore the SSM WQOs were used." However, the comment was not regarding long term risk or short term risk, it was referring to the variability during individual storm events making it difficult for a single sample to accurately reflect the risk. The response did not adequately address the issue of variability in defending the use of SSM objectives. This

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reviewer comment is further supported by the 2012 USEPA REC criteria guidance, which does not recommend SSM for REC use protection.

d. *Assumptions concerning regrowth*. Peer review topic #10 (reasonableness of assumptions for dry weather modeling) prompted the reviewer to comment, "I agree that given the lack of data on the occurrence of bacterial regrowth in the Southern California region, however, it is not possible [to] include regrowth in the model for dry weather flows. However, regrowth has been demonstrated in tidally-influenced river sediments in Florida…Thus, regrowth should be recognized as a potential source of error, and should regrowth be documented in the region in the future, it may need to be incorporated into the modeling framework." The Griffith and Ferguson (2012) SCCWRP study has since demonstrated regrowth in the region. Also, although not directly identified by the reviewer, the model assumes that 100% of the existing load comes from MS4 discharges, while significant reference stream/beach data were available to demonstrate otherwise (e.g., SCCWRP Technical Report #542, "Fecal indicator bacteria (FIB) levels during dry weather from Southern California reference streams" [Tiefenthaler et al, 2008]). Therefore, we suggest the following: 1) Reopen the TMDL and remodel to include regrowth and other natural sources, 2) Use the model results to set MS4 compliance metrics (e.g., load based-metrics), and 3) Use the new model to evaluate whether AEFs are consistently achievable through MS4 load reductions, or whether instream regrowth, sediment resuspension, and other natural processes/inputs might prevent receiving water compliance with the WQOs even with substantial MS4 load reduction.

e. *Lagoons and estuaries.* The reviewer commented on peer review topic #11 (location of critical points for TMDL calculation) that, "where small estuaries or lagoons separate the creek mouth from the coastal ocean, they should be considered in this process." The San Diego Regional Board responded that, "the Board recognizes that small estuaries and lagoons provide habitat for wildlife, and therefore can be a significant source of bacteria. For this reason, systems with estuaries or lagoons were not analyzed in this project." While the San Diego Regional Board acknowledges that lagoons may have higher levels of bacteria than open beaches and streams, the Board does not set higher AEFs for such creeks and beaches. This is inconsistent and imposes unfairly strict AEFs on such waterbodies, and will likely result in more frequent an attainable non-compliance.

f. *Use of indicator bacteria for compliance and public health protection.* In response to the overarching question (b), "Is the scientific portion of the proposed rule based upon scientific knowledge, methods and practice", the reviewer questions the relationship between indicator bacteria and the threat to swimmers and fishers. It was specifically noted that, "At the time of this review, there is a reasonable amount of evidence in the peer-reviewed scientific literature that DNA-based markers of human waste can be used to more definitively understand the

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presence of human waste." We support this point that the indicators used in the TMDL do not protect public health, and that human waste marker data should be used as the basis for the TMDL.

g. *Insufficient data.* There were several instances where the reviewers could not fully comment on the question posed to them because the draft of the TMDL they were given contained insufficient data (peer review topics #2, #5, #6, #7, #8, and #12). This lack of data was mentioned by at least one of the reviewers in 5 of the 12 topics they were asked to comment on. While this information was often added to the TMDL in response, the reviewers did not have a chance to review the new information added to the TMDL, and therefore could not give their full opinion on the original question posed to them.

h. *Conservative assumptions.* There were also a number of instances where the reviewers pointed out sources of significant error and uncertainty in the models, data, or parameters used in developing the TMDL (peer review topics #2, #3, #7, #8, and #10). For example, the lack of regrowth in the model, the use of parameters from a few subwatersheds for use in the entire TMDL area, the assumptions about dry weather flows, and several other issues were identified as potential sources of significant uncertainty. To each of these, the San Diego Regional Board responded that while they recognize these issues as significant sources of uncertainty, the parameters and models they used were the best possible given the state of the science and the limited data available. They also pointed to efforts they are currently undertaking to collect more data to improve the models, and that, if these lead to significant changes to the TMDL, it could be addressed in a reopener. While we accept that there are many limitations imposed by limited data and the state of the science, the number and magnitude of these many sources of uncertainty underline the need for a more transparent and quantitative assessment of the level of conservatism that was applied within the TMDL analyses, since "conservative assumptions" are cited by the Regional Board as the "implicit margin of safety" used to address these sources of uncertainty. It is common in modeling studies to quantify uncertainty that derives from assumptions and limited data. Such scientific rigor is standard practice and should be followed by the Regional Board within this TMDL as well. One reviewer comment (peer review topic #12) stated, "It is really difficult to tell what are the 'conservative assumptions'." While the discussion of these assumptions was subsequently expanded after the peer review, the reviewers did not have access to them when giving their comments. Therefore, the TMDL's assumptions were recognized by the reviewers as being conservative as well as non-transparent, therefore their ability to review (including the lack of an opportunity to review the expanded discussion) was limited.

i. *San Diego Regional Board responses not reviewed.* While many positive changes were made to the TMDL as a result of the peer review, the experts were not offered the opportunity to

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approve the responses to their comments. Therefore, some of the responses by the Board may not have adequately addressed the reviewers' comments.

Lastly, a significant focus of this review was on the TMDL dry and wet weather modeling approaches, despite the fact that the TMDL model predictions (e.g., MS4 required load reductions to achieve the AEF during the critical year) were not used to set MS4 compliance metrics as stated in the draft Tentative Order. Rather, these compliance metrics were simply set to the reference beach average exceedance frequency for wet weather (22%) and the WQOs (SSM and GM) for dry weather. Therefore very little of the reviewers' attention was focused on aspects of the TMDL that are actually implemented for compliance determination purposes. For example, the reviewers were not asked to review the reference watershed data used to derive the AEF targets. Among other critical topics, reviewers were also not asked to comment on the appropriateness of using total coliform and fecal coliform rather than other indicators, nor were they consulted regarding the limits of technical achievability (nor are they experts on this subject). Therefore, we believe the peer review to have been limited in scope and lacking applicability to the important issues raised in this document.

4. Are TMDL MS4 WLAs Attainable?

BACTERIA WATER QUALITY STANDARDS ARE NOT CONSISTENTLY ATTAINABLE BY NON-STRUCTURAL SOURCE CONTROLS ALONE

Because of their low cost relative to structural treatment controls, the first emphasis of most Bacteria TMDL implementation strategies is to exhaustively explore and implement non-structural options to control bacteria at their source. Non-structural BMPs include outreach, inspection, and enforcement-based programs, such as those targeting homeowners to address over-irrigation and car washing as sources of dry weather runoff, pet owners to address pet waste, and food outlets to address sidewalk hose-down and proper trash and grease trap management. Non-structural BMPs also include illicit discharge detection and elimination programs, including efforts to identify sources of human waste into the MS4, such as recreational vehicle discharges and leaking sewer lines (where such flows may re-emerge into nearby stormdrains). Street sweeping and catch basin cleaning are also emphasized and intended to remove sources of sediment, trash and organic litter, all of which may contribute bacteria to the MS4.

Non-structural BMPs are essential components of the Comprehensive Load Reduction Plans (CLRPs) recently submitted to the Regional Board by the responsible parties named in the San Diego Bacteria TMDL. To the extent possible based on available data, the CLRPs quantified the effectiveness of non-structural BMPs. The CLRP analyses found these collective BMPs to achieve MS4 bacteria load reductions of 8 to 43% during dry weather and 5 to 29% during wet weather. Wide ranges were assumed due to the significant uncertainty associated with the effectiveness of such programs.

However, even with the most optimistic assumptions, a thoroughly exhaustive and comprehensive implementation of non-structural BMPs can simply not achieve compliance with the TMDL WLAs. This is partly because outreach, inspection, and enforcement can never achieve perfect control outcomes (i.e., some target groups will miss outreach, some behaviors won't change, and some waste generation activities will miss inspection). This is also partly because some urban bacteria loads are unable to be addressed by such programs (e.g., biofilms in stormdrains consistently grow and then mobilize whenever flows are present, such as during one of the many allowed dry weather flow sources like groundwater inflow and infiltration, and fire hydrant testing). Evaluations of the effectiveness of other source controls, such as sweeping and cleaning programs, have consistently indicated that they are not able to capture 100% of sediments and organic debris.

BACTERIA WATER QUALITY STANDARDS ARE NOT EVEN ATTAINABLE THROUGH USE OF STRUCTURAL BMPS

Because of limitations in the effectiveness and consistent performance of non-structural BMPs, more costly and time-intensive structural BMPs are described in the CLRPs in order to demonstrate additional, more effective and controllable bacteria reduction. Dry weather structural BMPs potentially include localized infiltration, diversions to sewer, and disinfection. During wet weather, however, many of these BMPs are often not feasible because flow rates are substantially greater and more variable, and considerable transient storage would be required. In general, more natural, passive, sustainable, and multi-benefit wet weather structural BMPs are preferred and recommended (as opposed to energy-intensive, mechanical systems).

Geosyntec is co-principal investigator on the EPA/ASCE International Stormwater BMP Database. The database is used to help evaluate and predict performance of structural BMPs in removing bacteria. Statistically evaluated monitoring data from the database, however, indicate that most non-disinfection[4] structural BMPs are not capable of achieving REC WQOs with the consistency, frequency, and predictability required by the TMDL and the CLRPs (Figure 3).

[4] Disinfection is not considered suitable or cost-effective for treating wet weather MS4 discharges.

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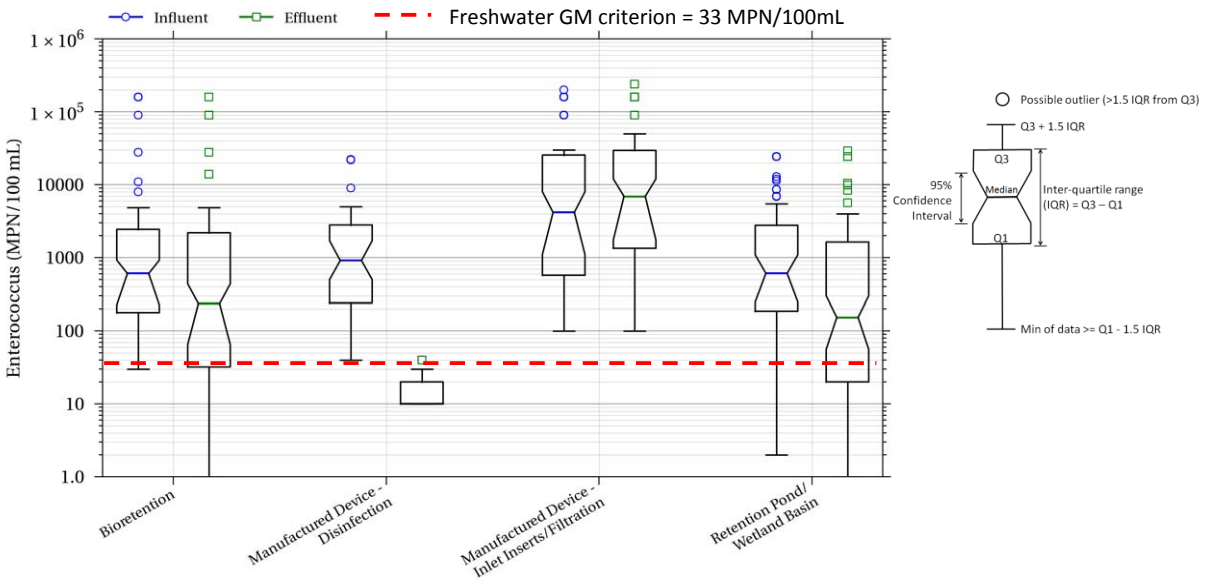

Figure 3. Structural BMP performance (Clary et al, 2012)

The CLRPs also describe other structural BMPs for wet weather controls such as subsurface flow wetlands (which have less performance data available but initial datasets suggest a relatively high level of effectiveness) and "zero discharge" types that rely on infiltration (e.g., infiltration trenches and basins) or capture and use (e.g., rainwater harvesting cisterns). These BMPs are effective for bacteria but are subject to local and site-specific constraints, which must be evaluated before implementation. For instance, infiltration BMPs are not appropriate for areas with relatively impervious soils, shallow groundwater, steep hillsides, landslide or liquefaction risk zones, subsurface contamination, or close proximity to certain structures. Similarly, capture and use BMPs are not cost effective for areas with little available water demand (such as minimal landscaping irrigation needs) or where water demand is temporally inconsistent with available supply (frequently the case in the arid southwest where rainfall occurs during one season while peak irrigation demands occur during a different period). Therefore many urban areas exist without feasible or cost-effective wet weather structural BMP options available.

EVEN COMBINING STRUCTURAL AND NON-STRUCTURAL BMPS, CONSISTENT AND RELIABLE ATTAINMENT OF BACTERIA STANDARDS IS NOT POSSIBLE

In order to reduce existing wet weather MS4 bacteria concentrations with the objective of meeting TMDL WLAs (with some regularity), no potential and reasonable non-structural and structural BMPs are excluded. This is the same strategy that is planned by many Los Angeles-area MS4 co-permittees in their TMDL Implementation Plans.

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That said, there remain numerous small watershed and beach examples where exhaustive non-structural and structural BMP efforts have been intensively applied, and significant costs expended, without the desired (or initially predicted) outcome of compliance. Extrapolating such costs on a per acre basis to the entire Sand Diego Bacteria TMDL area would result in tremendous cost estimates without evidence that TMDL compliance would be achieved, or that public health would benefit as a result.

- In Santa Barbara, extensive stormdrain investigations were conducted using conventional techniques (e.g., CCTV, visual flow observation, automated flow rate measurement, wastewater chemical indicators, bacteria sampling, dye testing, etc.) as well as more novel ones (e.g., canines scent trained for human waste, and human waste genetic markers) to seek inputs of human waste. As a result, RV discharges and leaking sewer lines were identified and immediately addressed (Sercu et al, 2011). Despite these efforts, however, channel and creek indicator bacteria levels are unchanged.

- At the Santa Monica Pier, BMPs included bird netting, trash covers, homeless enforcement, prevention of pier washing, repair of leaking sewers, major dry weather storm drain diversion (Santa Monica Urban Runoff Recycling Facility [SMURRF]) and potable offset use, and human source marker sampling to confirm that human fecal sources were indeed removed (Gold, 2012). However, despite these significant efforts which cost approximately $14M to treat runoff from 5,000 acres, beach bacteria concentrations improved but TMDL exceedances persist.

- At Inner Cabrillo Beach in the Port of Los Angeles, BMPs and studies included hydrodynamic modeling, circulation enhancement field investigations, bird deterrent testing, bird exclusion structures, dry weather storm drain diversions, sewer inspection and groundwater sampling, sewer repair, eelgrass sampling (eelgrass was found to be a natural source of indicator bacteria), human source marker sampling, and beach sand replacement (since beach sands were found to be a reservoir for indicator bacteria) and storm drain outfall exclusion. Again, despite over $30 million dollars spent at this one beach, TMDL WLA exceedances persist (Port of Los Angeles, 2006).

- In the Aliso Creek watershed in Orange County, dry weather storm drain discharges were treated with disinfection; despite complete bacteria removal at the treatment system outlet, bacteria concentrations in the concrete channel shortly downstream (with no other discharges entering the channel) rebounded as a result of uncontrollable regrowth) (Andersen, 2005).

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- At Ramirez Canyon in Malibu, where dry weather flows are disinfected at the beach by a system costing approximately $1 million dollars, surf zone water quality continues to exceed TMDL WLAs.

Perhaps most importantly, all the focused source control and treatment case studies described here focused on dry weather only; wet weather compliance costs would completely eclipse these dry weather compliance costs due to the orders of magnitude greater treatment flow rates.

OTHER ENVIRONMENTAL GOALS OFTEN CONFLICT WITH TMDL COMPLIANCE

There are also significant trade-offs between bacteria control measures and environmental concerns. For example, in-stream diversions often inhibit fish passage and impact downstream baseflow and habitat needs. In coastal environments, while shoreline wrack has been shown to contribute natural sources of bacteria, wrack itself is a valuable part of the beach ecosystem, and its removal is potentially problematic and often prohibited by resource agencies. Where bird feces is a significant bacteria source (like at many lagoons and beaches), resource agency requirements often restrict the use of bird deterrents because of needs to protect special status species such as the brown pelican. UV treatment of urban creeks also results in the sterilization of natural and beneficial aquatic microbes. Looking at the big picture, while massive treatment projects such as disinfection systems could be more effective at treating bacteria, such processes require significant long-term power consumption and do not necessarily align with the "sustainability" goals of regulators, municipalities, and the public (and in some cases, like the $12M Santa Monica Urban Runoff Facility, when the treatment system's water demand is not met by urban runoff, potable water must be supplied, resulting is a highly wasteful outcome). Lastly, some regional BMP footprints rely on recreational spaces for retention during wet weather and this land becomes unavailable for the intended public uses for a longer period than would have been the case otherwise. In summary, environmental constraints may be hindrances to projects that could reduce bacteria levels.

Conclusions

We appreciate the San Diego Regional Board's review of the above concerns and welcome any feedback. Our main concerns with the San Diego Bacteria TMDL are the lack of scientific justification and the infeasibility of achieving compliance. We strongly value the recreational uses of our water bodies; therefore, we are seeking revisions to the TMDL that would better reflect public health protection and the realities of technological and environmental constraints. To support these ends, the stakeholders have recently or are currently invested in the following significant efforts to improve the TMDL:

- The MS4 co-permittees have recently worked with SCCWRP to study the effects of Enterococci regrowth and natural bacteria sources at Moonlight State Beach in Encinitas and Rock Pile Beach in La Jolla (Griffith and Ferguson, 2012).
- The MS4 co-permittees are working with SCCWRP on an ongoing reference study evaluating both local reference watersheds and the impact of the wet day definition.
- The County and other San Diego MS4 co-permittees participated in the November 28-29 State of the Science Workshop to explore the current state of bacteria and science through the collaboration of experts, stakeholders, and regulators.
- The County is embarking upon significant bacteria source investigation work in the San Luis Rey, San Diego River, and San Dieguito River Watersheds.
- Other San Diego municipalities are considering QMRA test cases, including a proposal for funding through the Clean Beaches Initiative (CBI).

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COMPARISON OF COST OF ON-SITE RETENTION VS. TREATMENT AND RELEASE OF 85TH PERCENTILE STORM WATER RUNOFF

Job Number 16289-Z

November 29, 2012
Revised: January 8, 2013

RICK ENGINEERING COMPANY

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COMPARISON OF COST OF ON-SITE RETENTION VS. TREATMENT AND RELEASE OF 85TH PERCENTILE STORM WATER RUNOFF
January 8, 2013

This paper presents the results of an investigation of the potential cost of on-site retention of 85th percentile storm water runoff in San Diego County pursuant to the anticipated future municipal storm water permit (Tentative Order No. R9-2013-0001) versus the current cost of treatment and release of storm water runoff under the current municipal storm water permit (Order No. R9-2007-0001). This study was funded by the County of San Diego.

Background

California Regional Water Quality Control Board San Diego Region (SDRWQCB) Order No. R9-2007-0001, the municipal storm water permit in effect today for San Diego County and Co-Permittees, places requirements for new development and redevelopment to implement low impact development (LID) practices and/or treatment of storm water runoff. Priority development projects (PDPs) must implement LID practices such as infiltration or bioretention to treat storm water runoff to the maximum extent practicable (MEP). When LID practices are shown to be infeasible, storm water runoff may be treated using conventional treatment methods such as extended detention or filtration. The treated storm water runoff can be released from the project site. See Provisions D.1.d.(4) and D.1.d.(6) of Order No. R9-2007-0001 for LID and treatment control BMP requirements for PDPs.

A new municipal storm water permit, SDRWQCB Tentative Order No. R9-2013-0001, is anticipated to be adopted in spring 2013. The new municipal storm water permit would require each PDP to implement LID BMPs that are designed to retain (i.e., intercept, store, infiltrate, evaporate, evapotranspire, or harvest and use) a design capture volume of storm water runoff. See Provision E.3.c.(1)(a) and Appendix F, page F-87 of Tentative Order No. R9-2013-0001. When site conditions preclude the use of infiltration practices to remove the design capture volume, as is often the case in San Diego County due to geologic constraints, another potential way to dispose of the captured storm water runoff is to use it on-site ("harvest and use"). The purpose of this paper is to compare the cost of treating and releasing storm water runoff pursuant to current requirements of Order No. R9-2007-0001 (storm water management practice "today") to the potential cost of harvest and use of storm water runoff under the requirements of Tentative Order No. R9-2013-0001 (storm water management practice "future").

Selection of Projects and Practices for Analysis

For the purpose of this study, sample projects and storm water management practices had to be selected. There are many factors to be considered when evaluating the impact of the changing regulations. Any of the following factors could influence the results of the cost analysis: project size, project type (new development or redevelopment), proposed land use, site condition (e.g., soil type, geology, topography, proximity to existing infrastructure), amount of rainfall, or other factors. Therefore, multiple projects were evaluated. A range of typical projects was found from the "APWA BMP Sizing Calculator Training" workshop presented on March 8, 2011. In early 2011,

Rick Engineering Company developed five example projects for the purpose of training engineers to use the San Diego BMP Sizing Calculator in the "APWA BMP Sizing Calculator Training" workshop. All of the five example projects were based on actual PDPs. For the APWA workshop, "snapshots" of portions of the PDPs were taken for simplified analysis, amounts of impervious and pervious area were tabulated, and details of project site characteristics that affect runoff such as soil type, rainfall basin, and slope were created to represent a range of conditions throughout San Diego County. Using these previously developed example projects provided an un-biased range of realistic projects. Exhibits of the five example projects are attached (Attachment 1). Note the facility sizes and orifice sizes shown on the attached exhibits are from the BMP Sizing Calculator results for hydromodification management from the APWA workshop and are not a part of this study.

Tables 1 and 2 present the project data for the five example projects. In general it will be assumed that all of the project area will be captured in the storm water management practice, including landscaping area. However, example project 5 includes such a significant amount of landscaping area (approximately 30.55 acres or 51%) that this project will be evaluated both with and without capturing the landscaping area. Example project "5" will capture all of the project area including landscaping, and example project "5a" is the same project but capturing only the impervious area.

Table 1
Example Project Data

Project	Description	Total Area (Acres)	Rain Gauge	Slope	Hydrologic Soil Group
1	New Linear Roadway	0.77	Oceanside	Flat	C
2	Residential	1.15	Oceanside	Moderate	D
3	Small Commercial	0.53	Lake Wohlford	Flat	B
4	Redevelopment (Apartment Complex)	0.29	Lindbergh Field	Flat	D
5	Large Commercial	59.59	Lake Wohlford	Flat	D
5a	Large Commercial (Capturing the Impervious Area Only)	59.59	Lake Wohlford	Flat	D

Table 2
Example Project Proposed Impervious Area, Landscape Area, and Post-Project Effective Impervious Area

Project	Description	Total Area (ft^2)	Proposed Impervious Area (ft^2)	Proposed Landscape Area (ft^2)	Post-Project Effective Impervious Area* (ft^2)
1	New Linear Roadway	33,452	28,366	5,086	28,875
2	Residential	49,886	29,525	20,361	31,561
3	Small Commercial	23,020	19,787	3,233	20,110
4	Redevelopment (Apartment Complex)	12,613	11,163	1,450	11,308
5	Large Commercial	2,595,606	1,264,901	1,330,705	1,397,972
5a	Large Commercial (Capturing the Impervious Area Only)	2,595,606	1,264,901	1,330,705 (not captured)	1,264,901
*Post-project Effective Impervious Area = (Proposed Impervious Area x 1.0) + (Proposed Landscape Area x 0.1), pursuant to the County of San Diego SUSMP dated January 8, 2011.					

Post-project effective impervious area was calculated based on the method and runoff factors presented in the County of San Diego SUSMP dated January 8, 2011. The runoff factor for impervious area is 1.0. The runoff factor for landscape area is 0.1.

Stormwater Management Practice "Today"

There is a wide range of options available to satisfy the PDP LID and treatment control requirements of Order No. R9-2007-0001. In order to quantify the cost of requirements today, an appropriate LID or treatment control BMP must be selected. Bioretention was selected for this analysis because it would satisfy requirements for LID as well as provide a high level of treatment for most pollutants. Provided that land is available for a bioretention system (i.e., provided the bioretention system can fit into land already slated for project landscaping), it is also expected to be a relatively cost-effective practice, especially when long-term maintenance is considered.

Treatment-only bioretention facilities were sized for each example project using a sizing factor of 0.04 multiplied by the effective impervious area, pursuant to the County of San Diego SUSMP dated January 8, 2011. Table 3 presents the sizing of treatment-only bioretention facilities.

Table 3
Sizing of Bioretention Facilities

Project	Description	Post-Project Effective Impervious Area (ft^2)	Surface Area of Treatment-Only Bioretention Facility* (ft^2)
1	New Linear Roadway	28,875	1,155
2	Residential	31,561	1,262
3	Small Commercial	20,110	804
4	Redevelopment (Apartment Complex)	11,308	452
5	Large Commercial	1,397,972	55,919
5a	Large Commercial (Capturing the Impervious Area Only)	1,264,901	50,596
*Area of Treatment-Only Bioretention Facility = 0.04 x Post-Project Effective Impervious Area			

Stormwater Management Practice "Future"

It is anticipated that harvest and use of storm water will be the typical method for PDPs to satisfy the on-site retention requirement of Provision E.3.c.(1)(a) of Tentative Order No. R9-2013-0001. There are many ways to use harvested storm water. Some typical uses include irrigation, toilet flushing, and HVAC cooling. For the purpose of this study, it is assumed that the harvested storm water will be used for spray irrigation. All of the five example projects include landscaping on-site and will have a demand for irrigation water. However, this study does not establish a maximum holding time for the harvested storm water, size storage units to ensure collection of back to back storm events, or optimize the size of the storage unit based on irrigation demand. This study simply calculates the minimum design capture volume of storm water runoff pursuant to Provision E.3.c.(1)(a)(i) of Tentative Order No. R9-2013-0001. For the purpose of this study, the storm water harvesting system is assumed to include a pre-treatment unit to capture gross pollutants (for example inlet inserts or a hydrodynamic separator), an underground concrete vault for storage, a mechanical system for distribution that includes a pump, a treatment system consisting of fine filtration and ultraviolet disinfection, and a connection to a source of make-up water using a reduced pressure zone (RPZ) valve. Make-up water is the municipal water supply that will augment the harvested storm water supply to fulfill the total water demand (in this case, the total irrigation demand).

The minimum volume of the storm water runoff harvesting facility was calculated based on Provision E.3.c.(1)(a)(i) of Tentative Order No. R9-2013-0001, the volume of storm water produced from a 24-hour 85th percentile storm event. The 85th percentile rainfall was determined from the June 2003 *San Diego County Hydrology Manual*, Appendix E, 85th Percentile Precipitation Isopluvial Map. Table 4 presents the sizing of storm water harvesting facilities (minimum on-site retention volume).

Table 4
Sizing of Storm Water Harvesting Facilities

Project	Description	85th Percentile Rainfall (inches)	Post-Project Effective Impervious Area (ft^2)	Minimum On-Site Retention Volume* (ft^3)	Minimum On-Site Retention Volume (gallons)
1	New Linear Roadway	0.70	28,875	1,684	12,600
2	Residential	0.70	31,561	1,841	13,772
3	Small Commercial	0.85	20,110	1,424	10,656
4	Redevelopment (Apartment Complex)	0.60	11,308	565	4,229
5	Large Commercial	0.85	1,397,972	99,023	740,743
5a	Large Commercial (Capturing the Impervious Area Only)	0.85	1,264,901	89,597	670,233

*Minimum On-Site Retention Volume (ft^3) = (85th Percentile Rainfall / 12 inches per foot) x Post-Project Effective Impervious Area
**1 cubic foot is approximately 7.48 gallons

Costs

Rick Engineering Company estimated the cost of a typical treatment-only bioretention system in San Diego (based on a detail consistent with the County of San Diego SUSMP) at approximately $9.00 per square foot for media, liners, subdrains, lansdcaping, and installation. Based on the California Storm Water Quality Association New Development and Redevelopment Handbook Fact Sheet TC-32 Bioretention, construction costs for bioretention for commercial, industrial, or institutional sites can range from $10.00 to $40.00 per square foot, based on the need for control structures, curbing, storm drains, and underdrains. All of the example projects in this study would be considered to be "commercial-sized" projects. The low range cost for a commercial scale bioretention system was selected from TC-32. The following was used to estimate the cost for the treatment-only bioretention systems: $10.00 per square foot of bioretention area.

The cost of a rainwater harvesting system includes the cost of the pre-treatment unit (for example inlet inserts or a hydrodynamic separator), the storage vault, and the mechanical system for distribution. Pre-treatment costs were estimated to be $1,000.00 per inlet insert or roof drain insert (example projects 1 and 3 would each require 1 inlet insert and example project 4 would require 4 roof drain inserts), $15,000.00 for a small hydrodynamic separator for example project 2, or $40,000.00 for a large hydrodynamic separator for example project 5. The cost of the storage vault was estimated to be $8.50 per cubic foot for a modular concrete underground storage system. The

mechanical system includes a pump, a treatment system consisting of fine filtration and ultraviolet disinfection, and a connection to a source of make-up water. The total mechanical system cost was estimated to be $45,000.00 for the small projects (example projects 1 through 4, which will be storing and processing an average of 10,000 gallons of runoff), and $110,000 for the large project (example project 5, which will be processing approximately 700,000 gallons of runoff). The sum of the pre-treatment, storage, and mechanical system costs for each example project is presented in Table 5.

Table 5
Sum of Estimated Costs for Rainwater Harvesting Systems

Project	Description	Total Area (Acres)	Estimated Cost for Pre-Treatment	Estimated Cost for Runoff Storage	Estimated Cost for Mechanical System	Total Estimated Cost
1	New Linear Roadway	0.77	$1,000	$14,317	$45,000	$60,317
2	Residential	1.15	$15,000	$15,649	$45,000	$75,649
3	Small Commercial	0.53	$1,000	$12,108	$45,000	$58,108
4	Redevelopment (Apartment Complex)	0.29	$4,000	$4,806	$45,000	$53,806
5	Large Commercial	59.59	$40,000	$841,695	$110,000	$991,695
5a	Large Commercial (Capturing the Impervious Area Only)	(29.04 acres new impervious area)	$40,000	$761,576	$110,000	$911,576

Cost Comparison

Table 6 presents the estimated costs for on-site retention (harvest and use) of storm water runoff vs. treatment (treatment-only bioretention) and release of storm water runoff.

Table 6
Comparison of Costs for Harvest and Use of Storm Water Runoff vs. Treatment and Release of Storm Water Runoff

Project	Description	Total Area (Acres)	Estimated Cost for Treatment-Only Bioretention	Estimated Cost for Harvest and Use System	Ratio of Harvest and Use Cost to Treatment-Only Bioretention Cost
1	New Linear Roadway	0.77	$11,550	$60,317	5
2	Residential	1.15	$12,624	$75,649	6
3	Small Commercial	0.53	$8,044	$58,108	7
4	Redevelopment (Apartment Complex)	0.29	$4,523	$53,806	12
5	Large Commercial	59.59	$559,189	$991,695	2
5a	Large Commercial (Capturing the Impervious Area Only)	(29.04 acres new impervious area)	$505,960	$911,576	2

The results in Table 5 show that for example projects 1 through 4 ranging in size from 0.29 to 1.15 acres, the cost to harvest and use storm water runoff is approximately 5 to 12 times the cost of treatment-only bioretention and release of storm water runoff under the requirements of Order No. R9-2007-0001. For the larger project, example project 5, the cost of harvest and use is approximately twice the cost of treatment and release of runoff, regardless of whether the project design will capture runoff from all of the project area or from only the impervious area.

The following other factors may be significant to the cost or benefit of harvest and use of storm water runoff: the value of land not used for bioretention, the cost of electricity to operate the system, the value of the harvested water, system maintenance costs, possible enhancement to property value from "green" infrastructure, or other factors. These factors can only be quantified for systems that are in place and operating, and are not a part of this study.

Impact With Hydromodification Management

All of the five example projects were initially developed for the purpose of training engineers to use the San Diego BMP Sizing Calculator, which is a tool for sizing hydromodification management facilities pursuant to the "Final Hydromodification Management Plan" for County of San Diego dated March 2011. This study used the same previously developed example projects to evaluate treatment-only storm water management facilities, and the cost analysis in this study does not factor in the facility sizes potentially needed to meet hydromodification management criteria. In all cases, the size of the hydromodification management facility would be much larger than the size of the potential harvest and use facility. It can be expected that for PDPs subject to hydromodification management, the hydromodification management requirements will determine the design of storm water management facilities, and the impact of the future on-site retention requirements may be less significant.

Conclusion

Based on the costs estimated for this study, the cost of storm water management features for new development and redevelopment priority development projects to satisfy the requirements of the future municipal storm water permit, Tentative Order No. R9-2013-0001, may be two to twelve the cost of storm water management practices to satisfy the requirements of the current municipal storm water permit, Order No. R9-2007-0001. It is important to note that all new development and redevelopment projects are unique, and may or may not implement the specific storm water management features evaluated in this study, as there are many practices available to meet the current or future municipal permit requirements.

Attachment 1
Exhibits of Five Example Projects

New Linear Roadway
Residential
Small Commercial
Redevelopment (Apartment Complex)
Large Commercial

APWA BMP SIZING CALCULATOR TRAINING
EXAMPLE #1 ~ NEW LINEAR ROADWAY
EXHIBIT 1 (SHEET 1 OF 2)

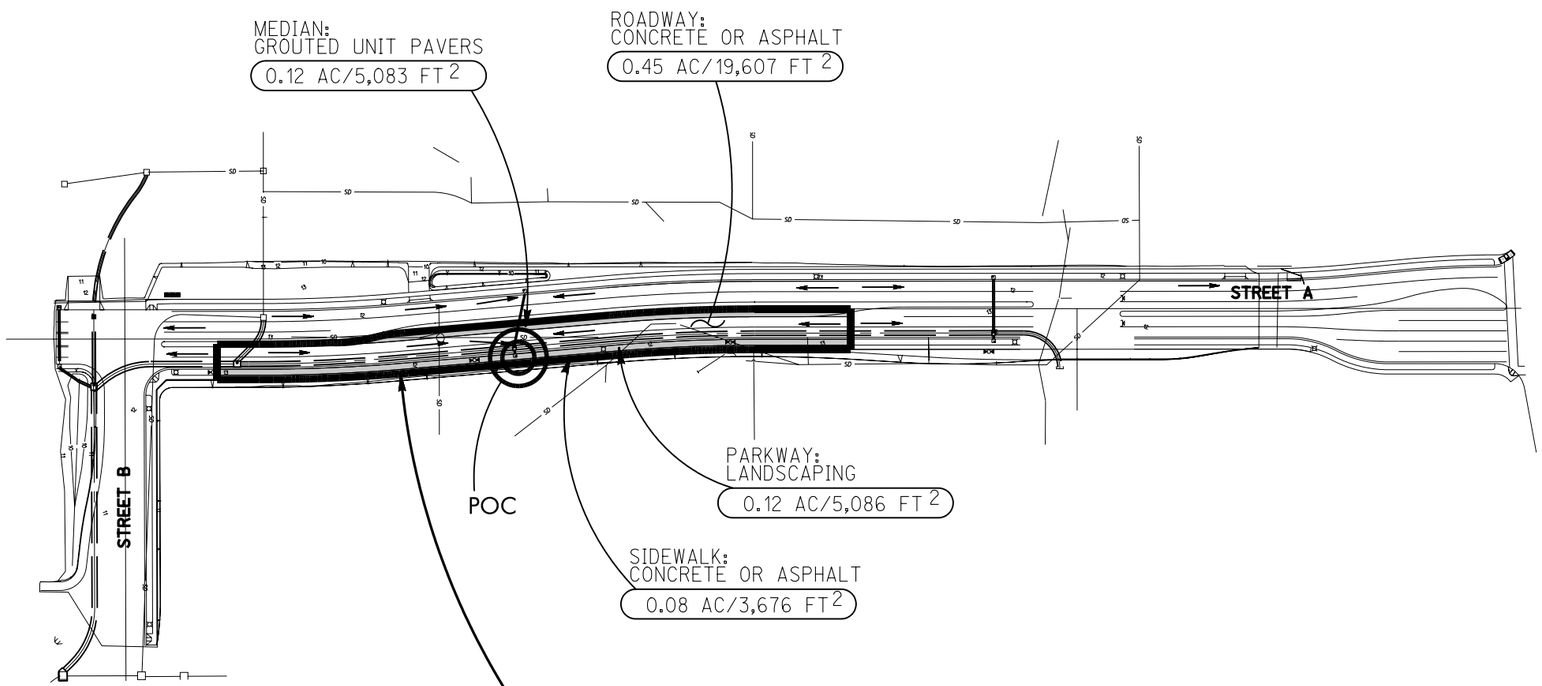

SEE SHEET 2 FOR LARGER SCALE OF EXAMPLE PROBLEM AREA.

150 75 0 150 300 450

GRAPHIC SCALE 1"= 150'

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APWA BMP SIZING CALCULATOR TRAINING
EXAMPLE #1 ~ NEW LINEAR ROADWAY
EXHIBIT 1 (SHEET 2 OF 2)

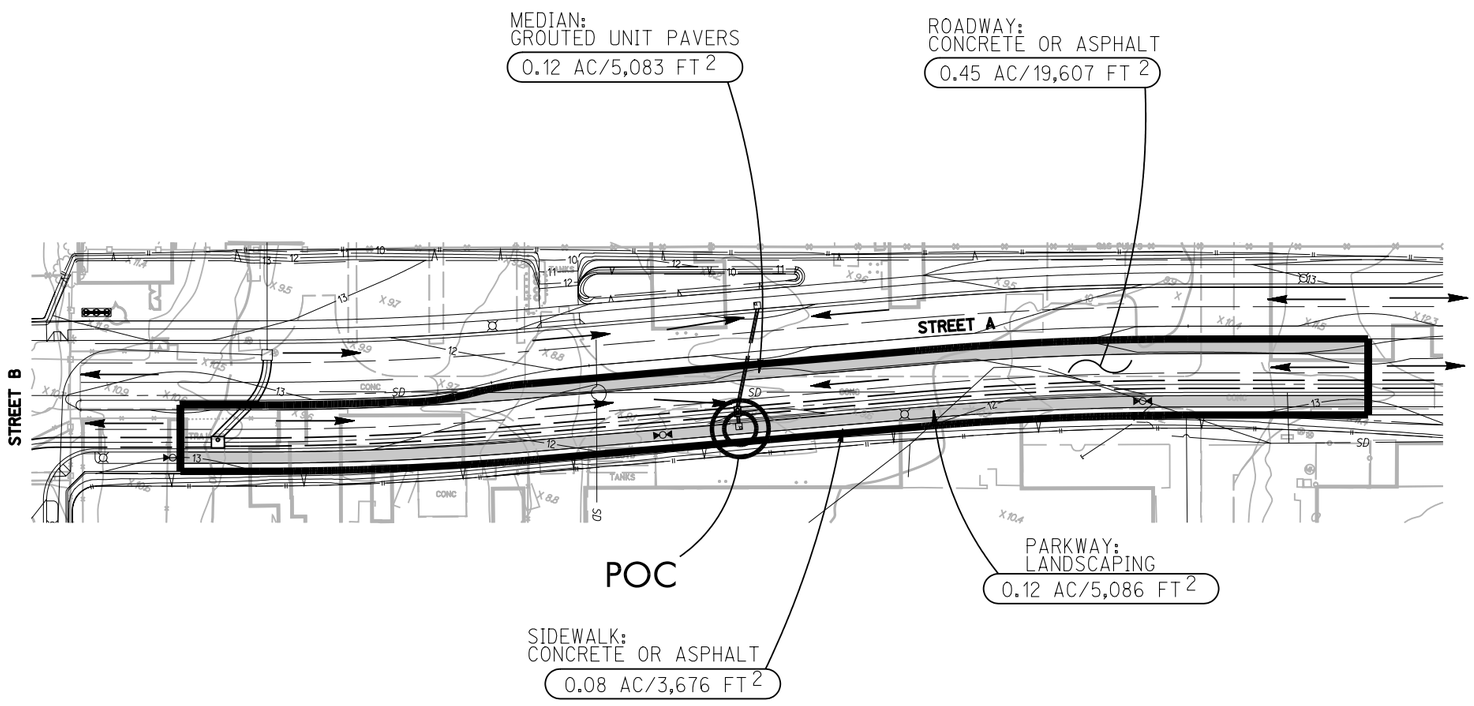

80 40 0 80 160 240

GRAPHIC SCALE 1"= 80'

EXAMPLE # 1 ~ NEW LINEAR ROADWAY

EXAMPLE INPUT DATA

- ☐ DESIGN GOAL: TREATMENT + FLOW CONTROL
- ☐ RAINFALL BASIN: OCEANSIDE
- ☐ POINT OF COMPLIANCE (POC): SUMP INLET ON STREET A
- ☐ DRAINAGE SOIL (HYDROLOGIC SOIL TYPE): TYPE C
- ☐ POST SURFACE: VARIES (SEE EXHIBIT)
- ☐ PRE-PROJECT COVER: PERVIOUS
- ☐ PRE-PROJECT SLOPE: 2%

EXAMPLE PROBLEM

SCENARIO 1:

DESIGN BIORETENTION BMP FOR PROPOSED PROJECT SURFACE AS SHOWN ON EXHIBIT.

ANSWER: AREA 3,748.8 FT^2
V_1 3,123.1 FT^3
V_2 2,249.3 FT^3
ORIFICE 0.5 IN

SCENARIO 2:

CHANGE BIORETENTION BMP TO FLOW-THROUGH PLANTER BMP.

ANSWER: AREA 5,479.1 FT^2
V_1 4,565.0 FT^3
V_2 3,287.4 FT^3
ORIFICE 0.5 IN

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APWA BMP SIZING CALCULATOR TRAINING
EXAMPLE #2 ~ RESIDENTIAL
EXHIBIT 1 (SHEET 1 OF 2)

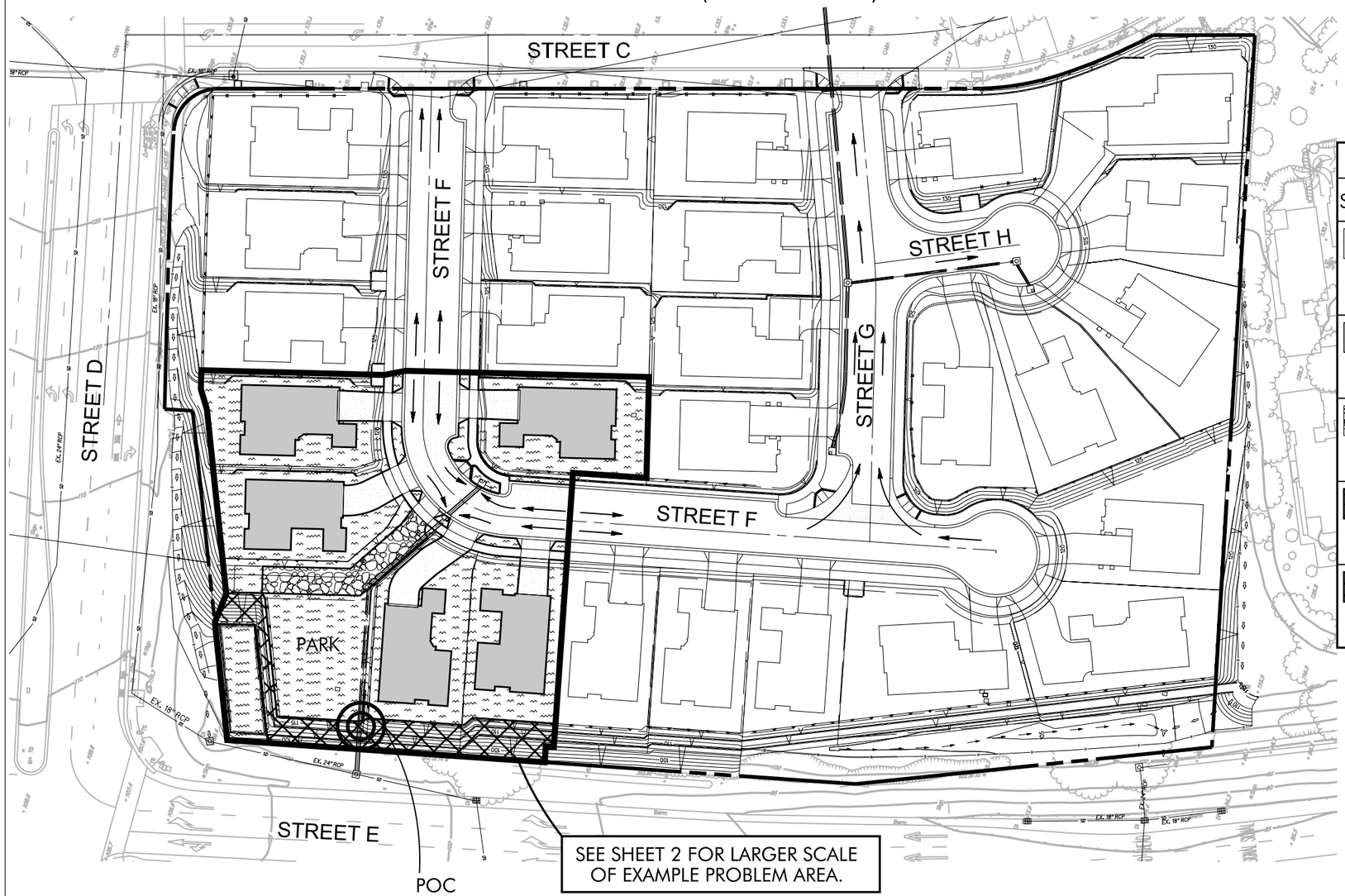

LEGEND		
SYMBOL	SURFACE	TOTAL AREA
	DRIVEWAYS, SIDEWALKS AND ROADWAY: CONCRETE OR ASPHALT	0.19 AC/8,194 FT^2
	ROOFS: ROOFS	0.45 AC/19,785 FT^2
	MAINTENANCE ACCESS: CRUSHED AGGREGATE	0.03 AC/1,546 FT^2
	LAWNS, PARK: LANDSCAPING	0.47 AC/20,361 FT^2
	SLOPES: LANDSCAPING (SELF-TREATING)	0.08 AC/3,699 FT^2

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60 30 0 60 120 180
GRAPHIC SCALE 1"= 60'

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APWA BMP SIZING CALCULATOR TRAINING
EXAMPLE #2 ~ RESIDENTIAL
EXHIBIT 1 (SHEET 2 OF 2)

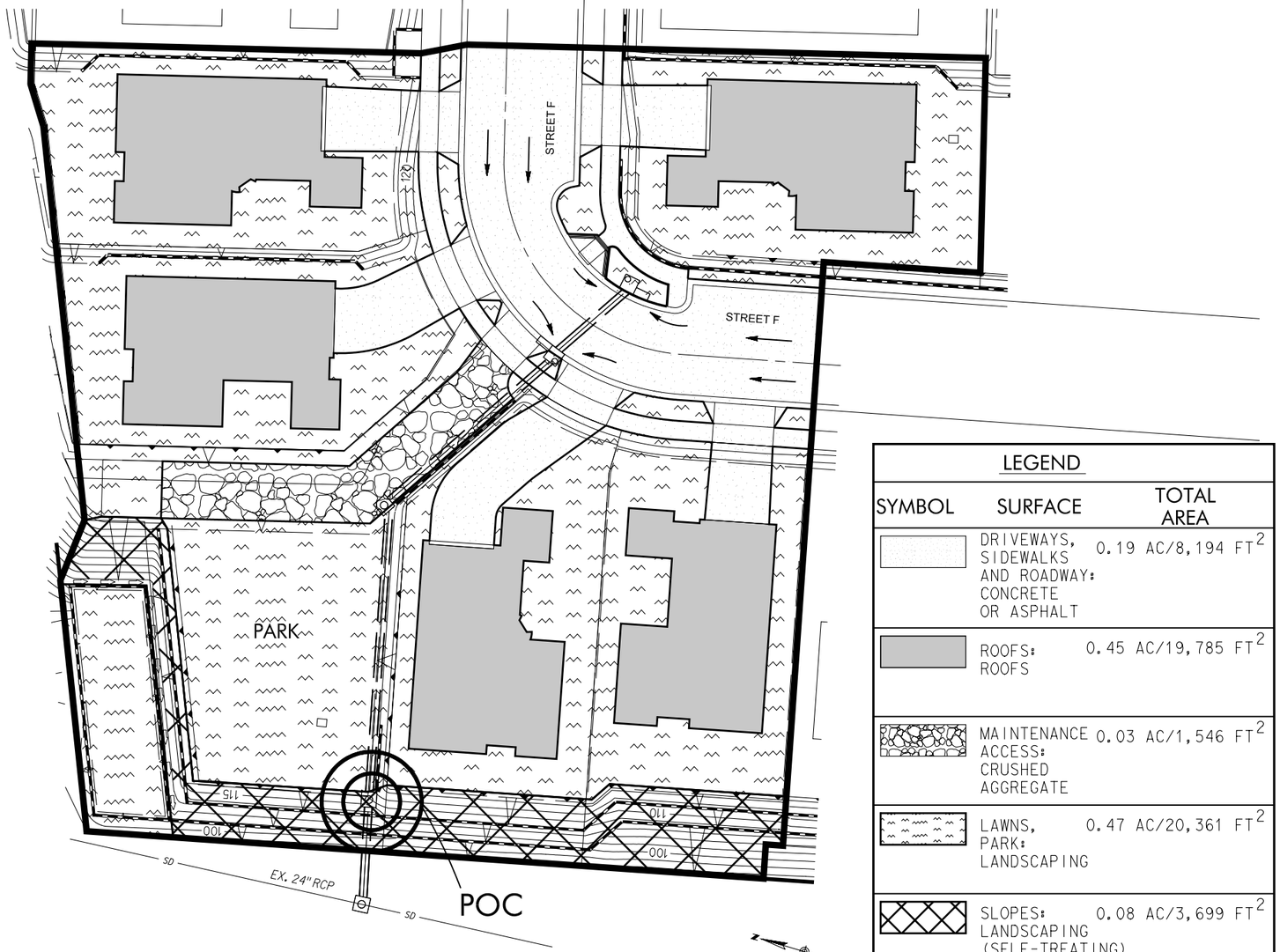

LEGEND

SYMBOL	SURFACE	TOTAL AREA
	DRIVEWAYS, SIDEWALKS AND ROADWAY: CONCRETE OR ASPHALT	0.19 AC/8,194 FT^2
	ROOFS: ROOFS	0.45 AC/19,785 FT^2
	MAINTENANCE ACCESS: CRUSHED AGGREGATE	0.03 AC/1,546 FT^2
	LAWNS, PARK: LANDSCAPING	0.47 AC/20,361 FT^2
	SLOPES: LANDSCAPING (SELF-TREATING)	0.08 AC/3,699 FT^2

EXAMPLE #2 ~ RESIDENTIAL

EXAMPLE INPUT DATA

- ☐ DESIGN GOAL: TREATMENT + FLOW CONTROL
- ☐ RAINFALL BASIN: OCEANSIDE
- ☐ POINT OF COMPLIANCE (POC): OUTLET TO STREET E
- ☐ DRAINAGE SOIL (HYDROLOGIC SOIL TYPE): TYPE D
- ☐ POST SURFACE: VARIES (SEE EXHIBIT)
- ☐ PRE-PROJECT COVER: PERVIOUS
- ☐ PRE-PROJECT SLOPE: 7%

EXAMPLE PROBLEM

SCENARIO 1:

DESIGN CISTERN PLUS BIORETENTION BMP FOR PROJECT SURFACES AS SHOWN ON EXHIBIT.

ANSWER: CISTERN VOLUME 6,011.4 FT^3

BIORETENTION AREA 601.1 FT^2

ORIFICE 0.6 IN

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30 15 0 30 60 90

GRAPHIC SCALE 1"= 30'

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APWA BMP SIZING CALCULATOR TRAINING
EXAMPLE #3 ~ SMALL COMMERCIAL
EXHIBIT 1 (SHEET 1 OF 2)

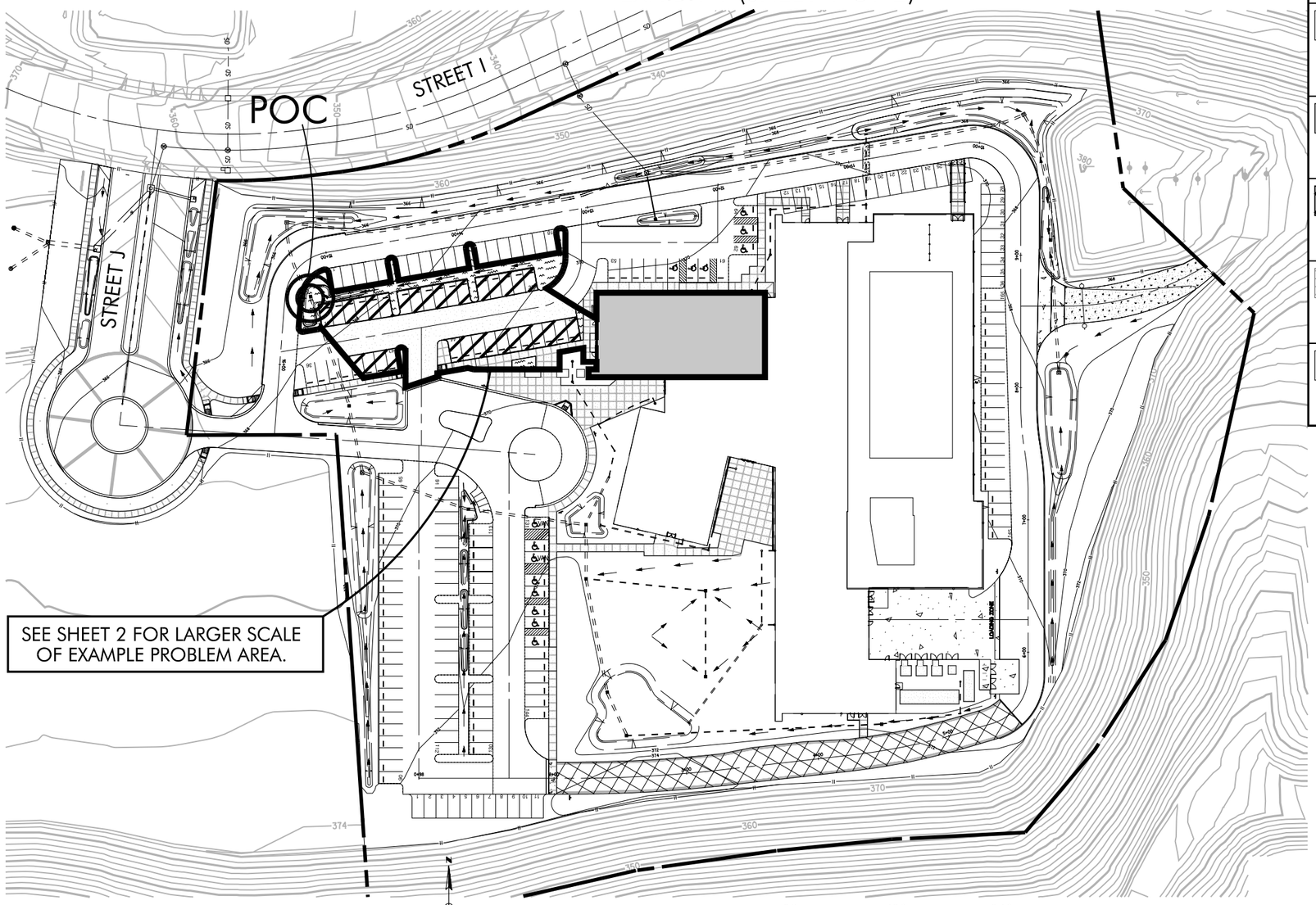

LEGEND		
SYMBOL	SURFACE	TOTAL AREA
	DRIVE LANE: CONCRETE OR ASPHALT	0.11 AC/5,030 FT^2
	ROOFS: ROOFS	0.19 AC/8,126 FT^2
	PARKING STALLS: CONCRETE OR ASPHALT	0.12 AC/5,112 FT^2
	SIDEWALK: CONCRETE OR ASPHALT	0.03 AC/1,519 FT^2
	LANDSCAPING: LANDSCAPING	0.07 AC/3,233 FT^2

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APWA BMP SIZING CALCULATOR TRAINING
EXAMPLE #3 ~ SMALL COMMERCIAL
EXHIBIT 1 (SHEET 2 OF 2)

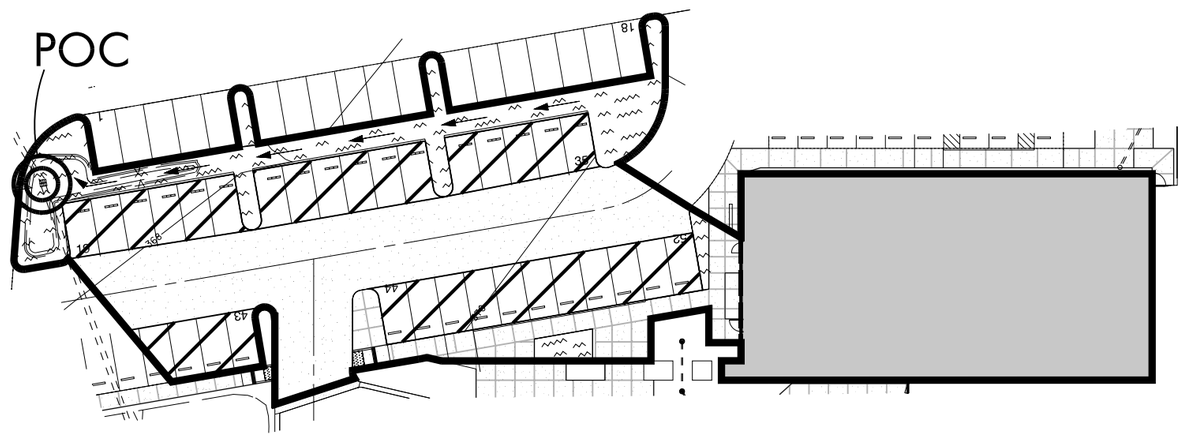

EXAMPLE # 3 ~ SMALL COMMERCIAL

EXAMPLE INPUT DATA

- DESIGN GOAL: TREATMENT + FLOW CONTROL
- RAINFALL BASIN: LAKE WOHLFORD
- POINT OF COMPLIANCE (POC): NORTHWEST CORNER OF PARKING ISLAND
- DRAINAGE SOIL (HYDROLOGIC SOIL TYPE): TYPE B
- POST SURFACE: VARIES (SEE EXHIBIT)
- PRE-PROJECT COVER: PERVIOUS
- PRE-PROJECT SLOPE: 1%

EXAMPLE PROBLEM

SCENARIO 1:

DESIGN DRY WELL BMP FOR PROPOSED PROJECT SURFACES AS SHOWN ON EXHIBIT.

ANSWER: AREA 1,542.8 FT^2
VOLUME 4,011.3 FT^3

SCENARIO 2:

CHANGE SURFACE OF PARKING STALLS FROM CONCRETE OR ASPHALT TO SOLID UNIT PAVERS ON GRANULAR AND RE-SIZE DRY WELL BMP.

ANSWER: AREA 1,218.7 FT^2
VOLUME 3,168.7 FT^3

LEGEND

SYMBOL	SURFACE	TOTAL AREA
	DRIVE LANE: CONCRETE OR ASPHALT	0.11 AC/5,030 FT^2
	ROOFS: ROOFS	0.19 AC/8,126 FT^2
	PARKING STALLS: CONCRETE OR ASPHALT	0.12 AC/5,112 FT^2
	SIDEWALK: CONCRETE OR ASPHALT	0.03 AC/1,519 FT^2
	LANDSCAPING: LANDSCAPING	0.07 AC/3,233 FT^2

N

40 20 0 40 80 120

GRAPHIC SCALE 1"= 40'

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APWA BMP SIZING CALCULATOR TRAINING
EXAMPLE #4 ~ REDEVELOPMENT
EXHIBIT 1 (SHEET 1 OF 2)

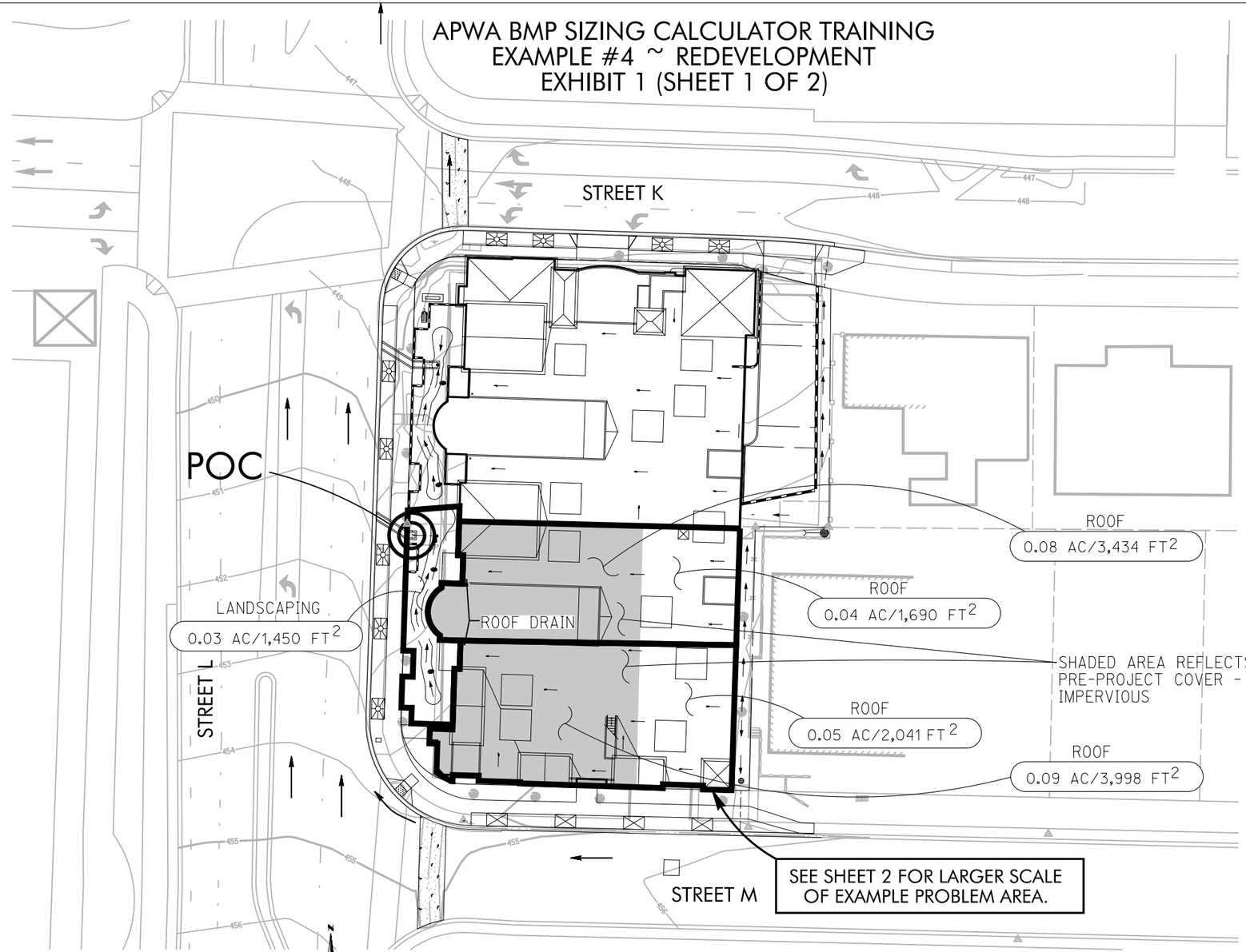

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GRAPHIC SCALE 1"= 40'

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APWA BMP SIZING CALCULATOR TRAINING
EXAMPLE #4 ~ REDEVELOPMENT
EXHIBIT 1 (SHEET 2 OF 2)

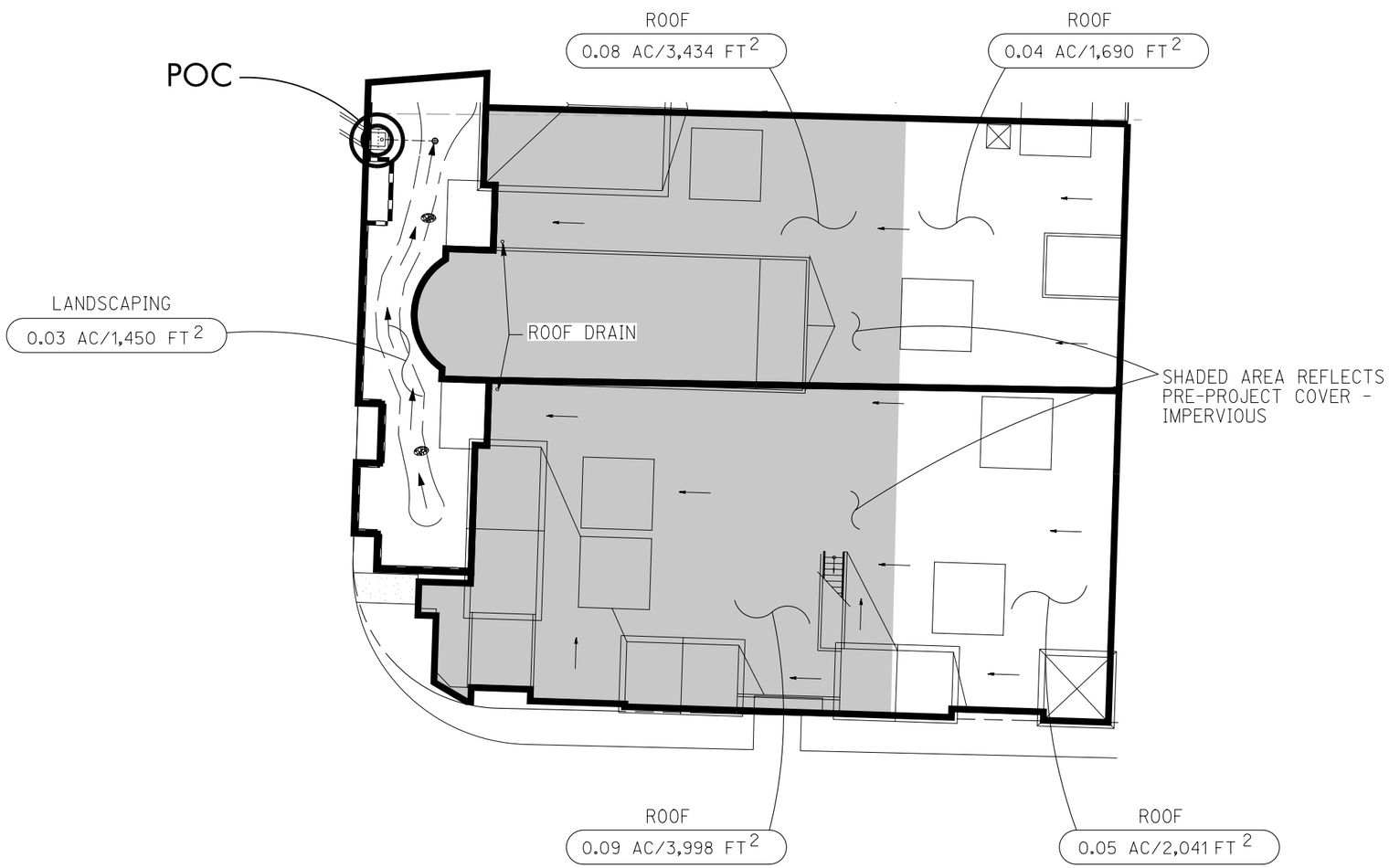

EXAMPLE # 4 ~ REDEVELOPMENT

EXAMPLE INPUT DATA

- ☐ DESIGN GOAL: TREATMENT + FLOW CONTROL
- ☐ RAINFALL BASIN: LINDBERGH FIELD
- ☐ POINT OF COMPLIANCE (POC): OUTLET TO STREET L
- ☐ DRAINAGE SOIL (HYDROLOGIC SOIL TYPE): TYPE D
- ☐ POST SURFACE: VARIES (SEE EXHIBIT)
- ☐ PRE-PROJECT COVER: PERVIOUS EXCEPT SHADED AREA - IMPERVIOUS (SEE EXHIBIT)
- ☐ PRE-PROJECT SLOPE: 1%

EXAMPLE PROBLEM

SCENARIO 1:

DESIGN BIORETENTION PLUS VAULT BMP FOR PROPOSED PROJECT SURFACES AS SHOWN ON EXHIBIT.

ANSWER: AREA 162.0 FT^2
V_1 1,053.3 FT^3
ORIFICE 0.4 IN

SCENARIO 2:

ASSUME THIS IS NEW DEVELOPMENT AND ALL PRE-PROJECT COVER IS PERVIOUS.

DESIGN BIORETENTION PLUS VAULT BMP FOR PROPOSED PROJECT SURFACES AS SHOWN ON EXHIBIT.

ANSWER: AREA 458.2 FT^2
V_1 2,978.7 FT^3
ORIFICE 0.1 IN

N

20 10 0 20 40 60

GRAPHIC SCALE 1"= 20'

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COUNTY OF SAN DIEGO
MDCCCLI

MARCH 8, 2011

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APWA BMP SIZING CALCULATOR TRAINING
EXAMPLE #5 ~ LARGE COMMERCIAL
EXHIBIT 1 (SHEET 1 OF 2)

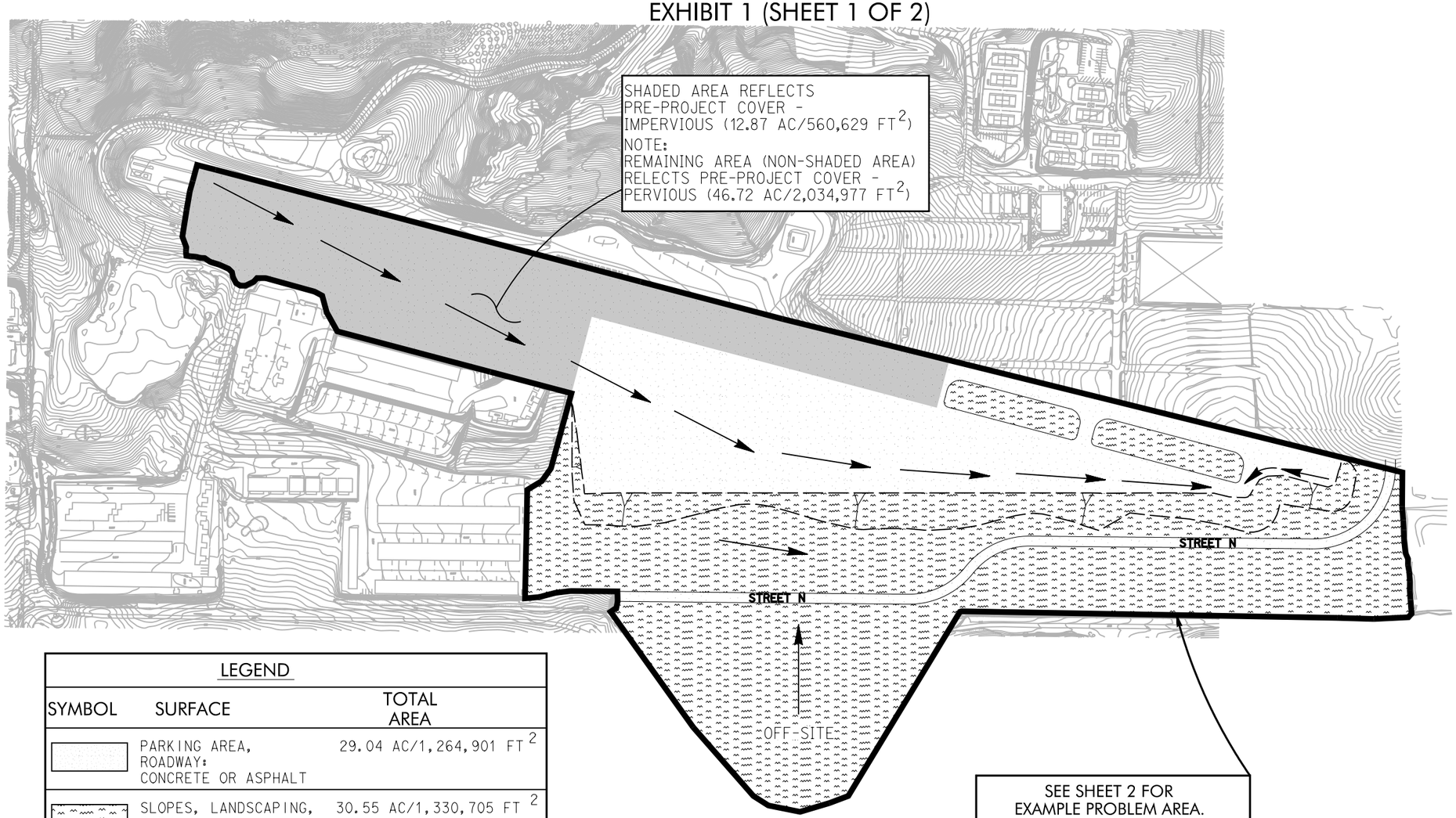

LEGEND		
SYMBOL	SURFACE	TOTAL AREA
	PARKING AREA, ROADWAY: CONCRETE OR ASPHALT	29.04 AC/1,264,901 FT 2
	SLOPES, LANDSCAPING, PARK: LANDSCAPING	30.55 AC/1,330,705 FT 2

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(FAX)619.291.4165

300 150 0 300 600 900

GRAPHIC SCALE 1"= 300'

MARCH 8, 2011

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04-MAR-2011 19:32

APWA BMP SIZING CALCULATOR TRAINING
EXAMPLE #5 ~ LARGE COMMERCIAL
EXHIBIT 1 (SHEET 2 OF 2)

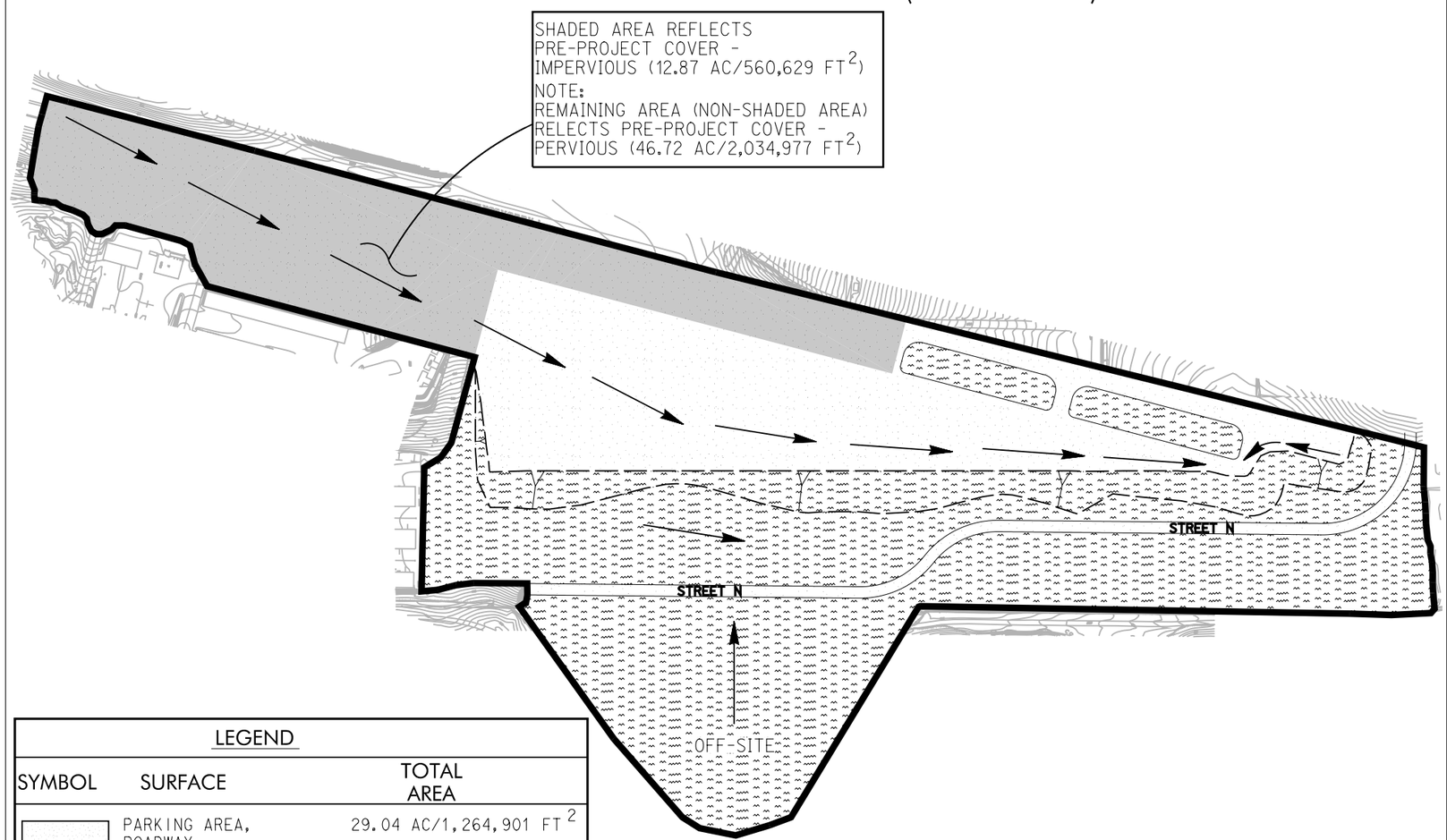

LEGEND

SYMBOL	SURFACE	TOTAL AREA
	PARKING AREA, ROADWAY: CONCRETE OR ASPHALT	29.04 AC/1,264,901 FT^2
	SLOPES, LANDSCAPING, PARK: LANDSCAPING	30.55 AC/1,330,705 FT^2

EXAMPLE # 5 ~ LARGE COMMERCIAL

EXAMPLE INPUT DATA

- DESIGN GOAL: TREATMENT + FLOW CONTROL
- RAINFALL BASIN: LAKE WOHLFORD
- POINT OF COMPLIANCE (POC): SOUTHWEST CORNER OF SITE
- DRAINAGE SOIL (HYDRLOGIC SOIL TYPE): TYPE D
- POST-PROJECT COVER: VARIES (SEE EXHIBIT)
- PRE-PROJECT COVER: PERVIOUS EXCEPT SHADED AREA - IMPERVIOUS (SEE EXHIBIT)
- PRE-PROJECT SLOPE: 3%

EXAMPLE PROBLEM

SCENARIO 1:

DESIGN POND BMP FOR PROPOSED PROJECT SURFACES AS SHOWN ON EXHIBIT.

POND DIMESNIONS (INPUT DATA):

SIDE SLOPE 1 (H:1)	3.00	
SIDE SLOPE 2 (H:1)	3.00	
DEPTH	5.0	FT
LOWER ORIFICE INVERT	0.00	FT
UPPER ORIFICE INVERT	3.0	FT
WEIR INVERT	5.0	FT
WEIR LENGTH	0.0	FT

ANSWER:

LOWER MAX. ORIFICE SIZE	5.0	IN
UPPER MAX. ORIFICE SIZE	28.0	IN
TOP AREA	75,596	FT^2
BOTTOM AREA	60,000	FT^2
VOLUME	338,992.3	FT^3
DRAWDOWN TIME	74.0	HRS
PERCENT DRAINED (96 HRS)	100	%

RICK ENGINEERING COMPANY
5620 FRIARS ROAD
SAN DIEGO, CA 92110
619.291.0707
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300 150 0 300 600 900
GRAPHIC SCALE 1"= 300'

MARCH 8, 2011

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04-MAR-2011 19:37

County of San Diego

JACK MILLER
Director

DEPARTMENT OF ENVIRONMENTAL HEALTH
P.O. BOX 129261, SAN DIEGO, CA 92112-9261
Phone: (858) 505-6700 FAX (858) 505-6890
Phone: 1 (800) 253-9933
www.sdcdeh.org

ELIZABETH POZZEBON
Assistant Director

January 9, 2013

Mr. Wayne Chiu
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4353

NPDES PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION (REGIONAL MS4 PERMIT) (ORDER NO. R9-2013-0001)

Dear Mr. Chiu:

The County of San Diego, Department of Environmental Health (DEH) has reviewed the proposed draft Order No. R9-2013-001 (Regional MS4 Permit), and offers the following comments:

The existing San Diego MS4 Storm Water permit includes vector-related language which is intended to raise awareness of the potential unintended public health risk resulting from mosquito production in certain storm water management devices, the proposed draft permit does not. The removal of the vector-related language raises a significant concern, and we request that it be placed back into the proposed draft to protect public health. Please note that the San Diego Regional MS4 permit was the first in the United States to include vector-related language, and ultimately resulted in improved language adopted into storm water permits throughout the State.

The vector-related language included in the existing MS4 permit represents a compromise that allows water quality goals to be met while minimizing the risk to public health. It recognizes that mosquitoes cannot completely be eliminated given the current water quality requirements. It further serves a critical public health purpose of maintaining an awareness of the potential unintended public health threat created by mosquitoes, and emphasizes the importance of proper maintenance of storm water management and treatment structures to minimize the potential for mosquito production and ultimately the spread of mosquito-borne diseases including West Nile Virus (WNV).

WNV continues to be a threat to human health, and has proven to be unpredictable. 2012 was the second worst year for WNV in the United States and California since it was introduced 13 years ago. Approximately 5,400 human illnesses were confirmed nationwide, with 243 deaths as of December 12, 2012. In California there were 464 confirmed cases in 2012 with 18 deaths as of December 24, 2012.

It is critical that the State and the RWQCB continue to include vector-related language in storm water NPDES permits to protect public health. It would be counterproductive and counterintuitive to strive to improve the quality of water for the benefit of public and environmental health only to create environments highly conducive to mosquitoes that have the potential to severely impact human and animal health from mosquito-borne diseases.

The County of San Diego's DEH respectfully requests that the Board restore the vector-related language in the proposed draft MS4 Permit. The following is the existing permit language from Section D - Urban Runoff Management Systems, Subsection 2 - Development Planning:

> f. *If not properly designed or maintained, certain BMPs implemented or required by municipalities for urban runoff management may create a habitat for vectors (e.g. mosquitoes and rodents). However, proper BMP design and maintenance can prevent the creation of vector habitat. Nuisances and public health impacts resulting from vector breeding can be prevented with close collaboration and cooperative effort between municipalities and local vector control agencies and the State Department of Health Services during the development and implementation of urban runoff management programs.*

In addition, the County of San Diego's DEH requests that to facilitate inspection of new BMPs, the San Diego Regional Permit require that a list of new storm water management and treatment units be submitted by the Permittees to their respective vector control agencies. The County requests that the Permit include the following language recently added to the draft Fact Sheet for the Los Angeles MS4 permit:

> *Monitoring studies conducted by the California Department of Public Health (CDPH) have documented that mosquitoes opportunistically breed in structural storm water Best Management Practices (BMPs), particularly those that hold standing water for over 96 hours. Certain Low Impact Development (LID) site design measures that hold standing water such as rainwater capture systems may similarly produce mosquitoes. BMPs and LID design features should incorporate design, construction, and maintenance principles to promote drainage within 96 hours to minimize standing water available to mosquitoes. This Order requires regulated MS4 Permittees to coordinate with other agencies necessary to successfully implement the provisions of this Order. These agencies may include CDPH and local mosquito and vector control agencies on vector-related issues surrounding implementation of post-construction BMPs.*

Thank you for the opportunity to submit comments on the proposed draft language for the MS4 Permit. If you have questions regarding the above comments, please contact Rebecca Lafreniere, Chief, at (858) 694-3595 or by E-mail at Rebecca.Lafreniere@sdcounty.ca.gov.

Sincerely,

JACK MILLER, Director

cc: Richard Crompton, Director, County of San Diego, Department of Public Works
Rebecca Lafreniere, Chief, County of San Diego, Department of Environmental Health, Community Health Division

County of San Diego

HERMAN REDDICK
PROGRAM MANAGER
(858) 974-5813
FAX (858) 974-5928

PUBLIC SAFETY GROUP
SAN DIEGO COUNTY FIRE AUTHORITY
5510 Overland Ave, Suite 250, San Diego, CA 92123

KEN MILLER & RALPH STEINHOFF
FIRE SERVICES COORDINATOR
(858) 974-5920
FAX (858) 974-5928

January 4, 2013

Mr. Wayne Chiu, P.E.
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego California 92123-4340

Dear Mr. Chiu,

SUBJECT: Amendment of Draft Permit Language for Fire Fighting Activities – Tentative Order No.R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu

As a local authority affected by the most recent MS4 Draft Permit we feel compelled to provide written comments to ensure that water quality regulations are practical, cost-effective, and scientifically justified. Since the County Fire Authority will be directly regulated by the Regional MS4 Permit, we are concerned that public funds and critical personnel may have to be spent or resourced to comply with requirements that are unnecessary, and that this will ultimately reduce the emergency personnel and funding available for essential public services.

It is vital that the resources required to keep our communities safe from the threat of fire be solely purposed for that task. For this reason the 15 rural fire agencies within San Diego County have joined the County Fire Authority's call to action to protect water quality while controlling the mounting and unsubstantiated costs of increased regulation on local governments, business, and industry. As written, the Tentative Order will result in a significant and unprecedented level of regulation and cost without clear scientific basis or environmental benefit. The Fire Authority along with the 15 rural agencies believe that the language incorporated in a re-issued permit should not deviate from the current permit unless the RWQCB can provide clear evidence that emergency fire fighting activities and fire sprinkler line flushing significantly impact stormwater runoff, and that the increased costs associated with proposed changes are justified and feasible. Accordingly, we ask that the Regional Board honor the language in the existing permit and make no changes at this time.

In order to provide the best service possible the Fire Authority and its 15 participating agencies must be focused on emergency activities and not with implementing BMPs or removing debris caused by the emergency after the fact. This should be the sole responsibility of the entities owning or operating the sites or facilities for which the fire agencies are responding. The Fire Authority also believes that existing requirements are sufficient to ensure that the flushing of fire sprinkler systems has minimal impact to storm water quality and should not be prohibited. These activities exist for the safety of the public and the environment and should be continued in their current fashion pursuant to existing permit requirements.

We are hopeful that the final permit language will result in programs that make sense from a public safety, environmental and economic standpoint. Please contact Greg Schreiner, Fire Marshal, if you have questions or would like to discuss our concerns. His number is 858-495-5425, email is greg.schreiner@sdcounty.ca.gov

Sincerely,

Herman Reddick,
Program Manager

CC:
Acting Chairman Gary Strawn, San Diego Regional Water Quality Control Board (SD RWQCB)
Board Member Eric Anderson, SD RWQCB
Board Member Henry Abarbanel, SD RWQCB
Board Member Tomas Morales, SD RWQCB
Board Member Sharon Kalemkiarian, SD RWQCB
Executive Officer David Gibson, SD RWQCB

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JAMUL DULZURA
COMMUNITY PLANNING GROUP
P.O. Box 613
Jamul, California 91935

December 14, 2012

Mr. Rich Crompton, Director
County of San Diego Department of Public Works
5510 Overland Ave, Ste 410
San Diego, CA 92123

SUBJECT: Comment – Tentative Order No.R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu

Dear Mr. Crompton,

The Jamul Dulzura Community Planning Group feels compelled to provide written comments on the draft San Diego Regional MS4 Permit to ensure that water quality regulations are practical, cost-effective, and scientifically based. While we are not directly regulated by the Regional MS4 Permit, we are concerned that public funds may have to be spent to comply with requirements that are not proven or effective, and that this will ultimately reduce the funding available for community projects and essential public services.

It is vital that the resources required to implement regulations are balanced with other public and environmental programs. For this reason we have joined the County's call to action to protect water quality while controlling the mounting and unsubstantiated costs of increased regulation on local governments, business and industry. As written, the Tentative Order will result in a significant and unprecedented level of regulation and cost without clear scientific basis or environmental benefit. The three main areas of concern in the draft permit are: 1) a far-reaching Bacteria Total Maximum Daily Load (TMDL), 2) additional requirements for development projects, and 3) performance standards that unnecessarily expose municipalities to third-party lawsuits. These requirements needlessly increase costs for regulated parties and may further constrain development in the region.

The cost to comply with the Bacteria TMDL is estimated between $2.6 billion and $4.9 billion for the named watersheds in the region over the 20 year TMDL compliance timeline, of which only 18 years remain. The numeric targets in this TMDL may never be attainable even if the County and other municipalities were to spend billions in public resources. This puts us in an untenable situation with the public, who will ultimately fund this effort. Technology simply does not exist to return urbanized watersheds back to pristine, "reference" conditions. The TMDL compliance targets must be attainable. The Bacteria TMDL requirement should not be incorporated into the MS4 Permit until there are more practical goals to work toward. We cannot ask the public to fund a program that will not succeed.

The cost of doing business in California has already pushed many businesses and developers out of the state. The draft permit will impose significant hardships on development. Permit requirements would require almost all development projects in the County to comply with hydromodification requirements, regardless of whether the projects themselves contribute to the problem. It also requires that new and re-development projects return site hydrology to pre-development conditions as opposed to pre-project conditions. Returning urban infill projects to conditions that existed under "natural", pre-urban conditions would be a substantial constraint to re-development. Over the last several years, local governments in San Diego have worked together with Regional Board staff and a host of technical experts to develop a Hydromodification Management Plan with reasonable and scientifically based standards. The

Regional Board recently approved that Plan. This draft permit ignores all of the good work invested in that Plan, which was developed at a significant cost to the public. In its place, it would impose new, one-size-fits-all requirements that impose a standard that is unrealistic and without scientific justification. The result of all these changes is that the structures built to mitigate development impacts will need to be bigger and will cost significantly more than the current approved program. Implementing these requirements would be an economic burden to our region and, are targeted at an unobtainable endpoint.

Accordingly, we would like for the Regional Board to honor existing plans, including the Hydromodification Management Plan. SANDAG has worked for many years through a comprehensive public process to develop the Regional Transportation Plan and Regional Comprehensive Plan that provides the framework for local General Plans. These plans recognize regional smart growth opportunity areas, including infill development. These are sound principals. Urban infill reduces aerial deposition which then reduces pollutant loading in urban runoff. Re-development is considered an environmentally preferable method of development. The MS4 permit should encourage re-development, retrofit landscapes, and green streets, through greater flexibility and reduced requirements rather than penalizing it with additional cost and constraints. To this end, any new regulations must be integrated into approved plans and must not be a burdensome, additional layer.

Finally, the draft permit includes performance standards that should be amended so that regulated municipalities are not unnecessarily exposed to third-party litigation. This Permit's receiving water limitations language is contrary to the intent of the federal Clean Water Act, which is to assure municipal agencies will be regulated to a reasonable standard. The State and Regional Water Boards have the discretion and a responsibility to ensure that water quality regulations are applied in a context that results in economic and environmental sustainability. It is imperative to reduce the threat of litigation when a municipality is engaged in a good faith effort to comply. The current receiving water provisions do not serve the environment, the public or the permittees. Public funds should be used to implement comprehensive programs that are proactive and adaptive to promote clean water goals.

Local government must have the flexibility to make policy decisions for the good of our residents. The 21 Copermittees in our region (the County, 18 cities, Port District, and Airport Authority) already spend close to $120 million a year to comply with current permit requirements. Heal the Bay's own report cards show that water quality at local beaches is improving. We would like to see the Regional Board adopt a permit that will be cost neutral and that local municipalities will have the flexibility to apply funding to priority areas.

We are hopeful that the final permit language will result in programs that make sense from both an environmental and economic standpoint. Please contact me if you have questions or would like to discuss our concerns.

Sincerely,

Michael Casinelli

Michael Casinelli, Chair
Jamul Dulzura Community Planning Group

CC:
Vice Chairman Gary Strawn, San Diego Regional Water Quality Control Board (SD RWQCB)
Board Member Eric Anderson, SD RWQCB
Board Member Henry Abarbanel, SD RWQCB
Board Member Tomas Morales, SD RWQCB
Executive Officer David Gibson, SD RWQCB
Mr. Wayne Chiu, SD RWQCB

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Pala Pauma Valley Community Sponsor Group
P O Box 1273, Pauma Valley, CA 92061
760.481.4201

By: USPS

Monday, December 10, 2012

Mr. Rich Crompton, Director
County of San Diego Department of Public Works
5510 Overland Ave, Ste 410
San Diego, CA 92123

Dear Mr. Crompton,

Re: Comment – Tentative Order No.R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu

At its December 4, 2012 meeting the Pala Pauma Community Sponsor Group ("PPCSG") voted unanimously to support the action of San Diego County to protect water quality while controlling the mounting and unsubstantiated costs of increased regulation on local governments, business and industry. In particular, PPCSG supports the view that regulation based upon unproven science used in pursuit of parametric objectives that are apparently unattainable is poor governance and detrimamential to the interests of our community.

PPCSG believes that it is incumbent upon regulatory agencies to ensure that their enacted regulations are practical, cost-effective, and scientifically based. We are concerned that, otherwise, public funds may have to be spent to comply with requirements that are not proven nor effective, and that this will ultimately reduce the funding available for community projects and essential public services and increase the costs absorbed by trade and industry thereby inhibiting badly needed economic growth.

It appears that, as written, the Tentative Order will result in a significant and unprecedented level of regulation and cost without clear scientific basis or environmental benefit. The three main areas of concern in the draft permit are: i.) a far-reaching Bacteria Total Maximum Daily Load ("BTMDL"), ii.) additional requirements for development projects, and iii.) performance standards that unnecessarily expose municipalities to third-party lawsuits

PPCSG understands that the cost to comply with the Bacteria TMDL is estimated to be between $2.6 billion and $4.9 billion for the named watersheds in the region over the 20 year TMDL compliance timeline, of which only 18 years remain. The numeric targets in this TMDL may never be attainable even if government agencies were to spend billions in public resources, thereby increasing the costs of business and trade. PPCSG understand that available technology does not exist to return urbanized watersheds back to pristine, "reference" conditions.

Additionally, the Tentative Order requires that new and re-development projects return site hydrology to pre-development conditions as opposed to pre-project conditions. Returning urban infill projects to conditions that existed under "natural", pre-urban conditions would be a substantial constraint to re-development to the disadvantage of general Plans that seek to use infill development as a way of reducing urban sprawl. Further, the Tentative Order ignores all of the good work invested in the Hydromodification Management Plan developed at a significant cost to the public over the past years between the County and Regional Board staff and apparently seeks to impose a new, one-size-fits-all requirements standard that is unrealistic and without scientific justification. The result of all these changes is that the structures built to mitigate development impacts will need to be bigger and will cost significantly more than under the currently approved program.

PPCSG understands that receiving water limitations language is contrary to the intent of the Federal Clean Water Act, which is to assure municipal agencies will be regulated to a reasonable standard resulting in State and Regional Water Boards having the responsibility to ensure that water quality regulations are applied in a context that results in economic and environmental sustainability. PPCSG further understands that the 21 Co-permittees in our region (the County, 18 cities, Port District, and Airport Authority) already spend close to $120 million a year to comply with current regulations. PPCSG would like to see the Regional Board adopt Permit standards that will be cost neutral in a way that local municipalities will have the flexibility to apply funding to priority areas.

PPCSG is hopeful that the final permit language will result in programs that are rational from both environmental and economic standpoints -regulation within reason- and not impose upon our community the crippling disadvantages of regulation without reason.

Yours sincerely,

Charles Mathews, Chair,
Pala Pauma Valley Community Sponsor Group.

Copy: PPCSG members
Gary Strawn, Vice Chairman
Eric Anderson, SD RWQCB
Henry Abarbanel, SD RWQCB
Tomas Morales, SD RWQCB
David Gibson, SD RWQCB
Wayne Chiu, SD RWQCB
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego California 92123-4340
Stephanie Gaines, DPW Watershed Protection Program (by email)

Julian Community
Planning Group
P.O. Box 249, Julian, CA 92036

January 4, 2013

Ms. Stephanie Gaines, Land Use/Environmental Planner
DPW/Watershed Protection Program (M.S. 0326)
5510 Overland Avenue, Suite 410
San Diego CA 921123

Dear Stephanie;

First I want to thank you for meeting with our Planning Group to discuss the reissuance process regarding the region NPDES Permit (MS4 Storm Water) with particular focus on the Total Maximum Daily Load plan (TMDL) and the effects that may have on our community.

After reviewing the documents provided to us, discussing the issue with you, and considerable discussion by our Group, the following statement has been prepared to express the position of the Julian Community Planning Group:

1) As written, the tentative order MS4 will result in a significant, unprecedented and likely unattainable level of regulation and unsustainable cost. The tentative order includes:

A. Far reaching water quality improvements.

B. Performance standards that cannot conceivably be attained.

C. Transferring the state's responsibility of cost to the local agencies, including testing, liability, and enforcement.

D. Ignoring of existing plans developed by other agencies.

E. Requiring the co-permittee to comply with unknown conditions.

The far reaching water quality improvements likely never can be attained, especially in urban developed areas. Will the Regional Water Quality Control Board remove legal conforming residences to obtain pre-development conditions; or require all existing developments to retrofit in order to attain the requested standards?
There are also jurisdictions over which the co-permittee has no authority and therefore can not require compliance. Those include Caltrans, State lands and parks, Federal lands and parks, and Indian Reservations.

2) The San Diego Regional Water Quality Control Board is attempting to pass all cost and responsibility to the co-permittee. Why would any agency accept these liabilities and costs? The County of San Diego has estimated the cost to comply with the Bacteria TMDL alone to be between 2.6 and 4.9 million dollars.

3) The County of San Diego, Cities and SanDag have worked extensively to develop Transportation plans, regional comprehensive plans and general plans that address the concerns shown in the tentative order MS4. The San Diego Regional Water Quality Control Board has ignored this effort in the new proposed regulation.

4) The proposed MS4 permit requires the co-permittees to accept new regulation without knowledge of what they are or their impacts.

5) The requirement of returning all watersheds back to pristine reference level is just not practical nor feasible.

6) The County of San Diego should not require the portion of the County in the Colorado River Basin to comply with San Diego County Water Quality Control Board requirements. The issues and conditions in the Colorado River Basin are not similar to those in the western coastal portion of the County.

Thank you for including our comments in your presentation to the San Diego Region Water Quality Control Board.

Sincerely

Jack D. Shelver, Chair
Julian Community Planning Group

RAMONA COMMUNITY PLANNING GROUP
15873 HWY 67, RAMONA, CALIFORNIA 92065
Phone: (760)445-8545

Jim Piva
Chair

Chris Anderson
Vice-Chair

Kristi Mansolf
Secretary

Chad Anderson

Torry Brean

Matt Deskovick

Scotty Ensign

Bob Hailey

Carl Hickman

Eb Hogervorst

Dennis Sprong

Paul Stykel

Angus Tobiason

Richard Tomlinson

Kevin Wallace

December 14, 2012

Mr. Rich Crompton, Director
County of San Diego Department of Public Works
5510 Overland Ave, Ste 410
San Diego, CA 92123

Dear Mr. Crompton,

SUBJECT: Comment – Tentative Order No.R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu

As the Ramona Community Planning Group, a land use advisory group to the County of San Diego for land use issues in Ramona, we feel compelled to provide written comments on the draft San Diego Regional MS4 Permit to ensure that water quality regulations are practical, cost-effective, and scientifically based. While we are not directly regulated by the Regional MS4 Permit, we are concerned that public funds may have to be spent to comply with requirements that are not proven or effective, and that this will ultimately reduce the funding available for community projects and essential public services.

It is vital that the resources required to implement regulations are balanced with other public and environmental programs. For this reason we have joined the County's call to action to protect water quality while controlling the mounting and unsubstantiated costs of increased regulation on local governments, business and industry. As written, the Tentative Order will result in a significant and unprecedented level of regulation and cost without clear scientific basis or environmental benefit. The three main areas of concern in the draft permit are: 1) a far-reaching Bacteria Total Maximum Daily Load (TMDL), 2) additional requirements for development projects, and 3) performance standards that unnecessarily expose municipalities to third-party lawsuits. These requirements needlessly increase costs for regulated parties and may further constrain development in the region.

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Tentative Order No.R9-2013-0001 **December 14, 2012**

Finally, the draft permit includes performance standards that should be amended so that regulated municipalities are not unnecessarily exposed to third-party litigation. This Permit's receiving water limitations language is contrary to the intent of the federal Clean Water Act, which is to assure municipal agencies will be regulated to a reasonable standard. The State and Regional Water Boards have the discretion and a responsibility to ensure that water quality regulations are applied in a context that results in economic and environmental sustainability. It is imperative to reduce the threat of litigation when a municipality is engaged in a good faith effort to comply. The current receiving water provisions do not serve the environment, the public or the permittees. Public funds should be used to implement comprehensive programs that are proactive and adaptive to promote clean water goals.

Local government must have the flexibility to make policy decisions for the good of our residents. The 21 Copermittees in our region (the County, 18 cities, Port District, and Airport Authority) already spend close to $120 million a year to comply with current permit requirements. Heal the Bay's own report cards show that water quality at local beaches is improving. We would like to see the Regional Board adopt a permit that will be cost neutral and that local municipalities will have the flexibility to apply funding to priority areas.

We are hopeful that the final permit language will result in programs that make sense from both an environmental and economic standpoint. Please contact Jim Piva if you have questions or would like to discuss our concerns.

Sincerely,

Jim Piva

JIM PIVA, Chair
Ramona Community Planning Group

CC:
Vice Chairman Gary Strawn, San Diego Regional Water Quality Control Board (SD RWQCB)
Board Member Eric Anderson, SD RWQCB
Board Member Henry Abarbanel, SD RWQCB
Board Member Tomas Morales, SD RWQCB
Executive Officer David Gibson, SD RWQCB
Mr. Wayne Chiu, SD RWQCB

EOMPOA

East Otay Mesa Property Owners Association

January 10, 2013

Mr. Wayne Chiu, P.E.
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego California 92123-4340

SUBJECT: Comment – Tentative Order No.R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu

Dear Mr. Chui:

Everyone, from every edge of the political and economic spectrum, supports improved water quality and environmentally healthy watersheds. The East Otay Mesa Property Owners Association ("EOMPOA") represents the major landowners within the County portion of Otay Mesa, who collectively control more than 2,000 acres at the last large scale industrial development site in the County, also support the California Regional Water Quality Control Board's ("Board") goal of clean water for all users in the region.

However, after listening to public testimony at recent board workshops, and being briefed by co-permittees on the proposed Tentative Order No. R9-2013-0001, Regional MS4 Permit ("Tentative Order"), we are writing to express our significant reservations on the Tentative Order. In brief, our concerns fall into these broad categories:

1. Existing Tentative Order No. R9-2007-0001-- Over the last several years, local governments in San Diego have worked together with your staff and a host of technical experts to develop a Hydromodification Management Plan with reasonable and scientifically based standards. Your Board recently approved that Plan in July 2010. This draft permit ignores all of the good work invested in that Plan, which was developed at a significant cost to the public. The existing Plan has only been in effect for 2 years, with 3 years remaining prior to its expiration. Given the short timeframe that the existing Plan has been in practice, we do not yet have adequate data to determine if the measures within the existing Plan are sufficient. Pursuing a new tentative order at this time has not been scientifically validated and is premature.

2. Legal Issues--The attempt by Board staff to mandate a proposed in lieu fee for watershed and hydrologic unit improvements to projects that have no impacts and therefore, no nexus to the watershed or unit improvements is a direct violation of CEQA, according to multiple city attorneys who spoke to the issue at the December 12, 2012 public hearing. On such a key issue as a CEQA violation, why didn't Board counsel catch this error in advance in the draft permit?

1050 Rosecrans Street, Ste. B
San Diego, CA 92106

619.222.8155 • 619.222.8154

EOMPOA

East Otay Mesa Property Owners Association

3. Clarity on Pre-Development vs. Pre-Project Conditions--We are at a loss to find a definition of the term pre-development conditions in the Tentative Order. For such a significant determination and impact, the lack of clarity on this matter is concerning. In the most current public workshop on December 12, 2012, when a Board member pressed staff on this issue, the staff member was unable to clearly define what the term meant, how far back was a reasonable gauge of pre-development conditions and finally, when pressed about the source of a soils database found on the internet that would be used as a key determinant of compliance, staff was unable to describe the accuracy or source documents for the website's database.

4. Hydromodification--We disagree with the proposed deletion of the current exemption in the hydromodification permit approved by the Board in July of 2010 for projects that discharge stormwater into lined or engineered channels. Speaker after speaker in the public comment period of the December 12th workshop representing co-permittees and other stakeholders, gave numerous examples of the conflict they had with Board staff on this issue. Further, the potential waste of public and private dollars and man-hours spent on already approved permits under the current hydromod scheme would be shocking. And this leads to our next point.

5. Fiscal Impact--Why is there no credible economic analysis on the potential cost to the co-permittees and the public for the implementation of the Tentative Order? For a regulator, or staff, to propose such broad and sweeping changes to public policy, without any consequence to the cost of their grand ideal, is irresponsible.

6. Coordination with neighboring regional boards and publication of previous similar experiences--According to public testimony at the December 12th workshop, the neighboring regional water boards in North Orange County and the Inland Empire have already dealt with several of the issues contemplated in the San Diego Board's Tentative Order. Specific examples include pre-development vs. pre-project conditions. Why hasn't the experience of the neighboring boards on these critical issues been shared with the public so our decision could benefit from their experience?

SANDAG estimates that the industrial development of the East Otay Mesa sub-region can produce up to 42,000 well-paying jobs for unemployed San Diegans by 2020. When the total cost of environmental compliance from local, state and federal agencies is placed upon the backs of landowners in East Otay and other parts of our region with other habitat and environmental mandates, the financial return on economic development will simply not pencil out. Proposed projects will not develop, jobs will not be created, economies will not grow and the dream of an emerging economy will die hard. The cost of doing business in California has already pushed many businesses and developers out of the state and disincentive developers further would be a catastrophic loss to California.

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EOMPOA

East Otay Mesa Property Owners Association

If implemented as written, this Tentative Order, and the actions of the Board, will further degrade San Diego's economy. We will have an economy based on sand and suntan oil, with a lower income workforce to match, instead of a healthy and diverse economic base with well-paying jobs for all San Diegans.

We urge the Board to delay implementation of the Proposed Order and revisit the untimely, unfunded mandate, poorly drafted terminology, the lack of key definitions, the apparent CEQA violations and unjust burden on industry and the economy. The Tentative Order is not ready for implementation and should not be considered until data from the existing 2010 Plan is fully understood. It would be a public travesty and irresponsible act by the Board to enact the Tentative Order in its current form at this premature stage.

Sincerely,

Judd Halenza, Vice President
EOMPOA

cc: Assemblymember Ben Hueso
Supervisor Greg Cox
Richard Crompton, County of San Diego
Stephanie Gaines, County of San Diego

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January 11, 2013

Via e-mail to wchiu@waterboards.ca.gov
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

RE: Comments from Environmental Groups on Tentative Order Number: R9-2013-0001

Dear Mr. Chiu:

San Diego Coastkeeper, Orange County Coastkeeper, Inland Empire Waterkeeper, Environmental Health Coalition, Surfrider Foundation—San Diego County Chapter, Surfrider Foundation—South Orange County Chapter, Laguna Bluebelt Coalition, South Laguna Civic Association, and Preserve Wild Santee (the "Environmental Groups") respectfully submit the following comments on the draft San Diego Regional Municipal Separate Storm Sewer System permit, Tentative Order No. R9-2013-0001 ("Draft Permit").

BACKGROUND

Urban runoff is the San Diego region's most urgent pollution problem. Arguably, it is the most difficult to solve. In a region known for its beaches and strong tourism economy, polluted runoff keeps people out of the water and off the beaches for at least 72 hours after a rain event. Even in dry weather, our urban drool from residents and businesses overwatering lawns becomes a major pollution source.

The San Diego region Copermittees cannot solve this problem alone. It will take municipalities partnering with businesses, environmental groups, planning groups, fishing clubs, and even the local Parent-Teacher Association for us to tackle these pollution issues and restore our waters to a healthy state where they support all designated beneficial uses. Because we can only solve our urban runoff problem with help and buy-in from municipalities, businesses and residents working together, this Permit must foster a watershed-based planning process that involves the whole community in achieving a healthier watershed.

COMMENTS

I. THE PERMIT MUST IMPROVE THE WATER QUALITY IMPROVEMENT PLAN DEVELOPMENT PROCESS.

The Draft Permit takes a unique approach to permitting by focusing on Water Quality Improvement Plans. Other than setting some baseline requirements related to development and monitoring, the Draft Permit basically requires the Copermittees to write their own watershed-based permits by directing them to create Water Quality Improvement Plans.

This approach has the potential to lead to significant improvements in water quality while allowing Copermittees to focus on spending stormwater funds efficiently and effectively. However, without certain safeguards, this approach could stall water quality improvements, or in a worst case scenario, lead to backsliding in water quality. To ensure the Water Quality Improvement Plans become effective *de facto* permits, the Regional Board must make the following changes to the Draft Permit.

A. The Permit must require robust stakeholder participation throughout the entire Water Quality Improvement Planning process.

Robust stakeholder involvement is key to successful Water Quality Improvement Planning. First, meaningful stakeholder involvement throughout the planning process can ensure stakeholder buy-in to the process and help develop a well-vetted plan. Environmental groups and other stakeholders have key information, data, knowledge, and resources that can assist Copermittees in developing a robust Water Quality Improvement Plan.

Second, while Copermittees may have good intentions about achieving water quality improvements, they are also faced with significant other pressures and dwindling budgets. The Regional Board is essentially placing the Copermittees in an untenable conflict that promotes marginal, and less expensive, water quality improvements rather than designing and implementing a comprehensive plan that rises to the challenges presented by this complex issue. While the current stormwater professionals working for the Copermittees would likely love to see their programs be granted robust budgets, they will undoubtedly receive pressure from city council members, mayors, city managers, and supervisors to reduce costs of the stormwater programs to the minimum amount necessary to meet permit requirements. To best support these stormwater professionals, stakeholders and Regional Board staff members must be involved throughout the planning process to provide a backstop and an opposing pressure to those political and economic pressures the stormwater staff will face.

1. Early, consistent input from knowledgeable stakeholders is key to developing well-informed and successful Water Quality Improvement Plans.

Meaningful stakeholder involvement throughout the planning process can ensure stakeholder buy-in to the process and help develop a well-vetted plan. Environmental stakeholders like lagoon foundations or river park foundations have specific knowledge of watershed challenges and will likely be key partners in seeing true watershed improvements. Engaging these groups as partners

throughout the process, instead of merely at checkpoints, will ensure their input is considered and incorporated during the planning process, leading to a better end product. Stakeholder groups often have access to different and additional resources than Copermittees to address watershed-based problems, so active partnership between Copermittees and these groups could lead to more funding for watershed activities. Additionally, active participation by key stakeholders will also help streamline the final approval process.

2. **The Draft Permit language allows watershed groups to develop Water Quality Improvement Plans with minimal public participation.**

The Draft Permit only requires minimal stakeholder participation. The Draft Permit requires Copermittees to develop a public participation plan, and "encourages" public participation, but only provides minimal public participation requirements. Specifically, the Draft Permit requires that Copermittees: *(1)* solicit public input as to priority water quality conditions;[1] *(2)* submit priority water quality conditions to the Regional Board to solicit comments for 60 days;[2] *(3)* submit water quality improvement strategies and schedules to the Regional Board to solicit comments for 60 days;[3] and *(4)* submit the entire Water Quality Improvement Plan to the Regional Board for a 30 day public comment period.[4]

The problem with this approach is that, by the time the separate sections of the Water Quality Improvement Plan are subject to public review, much of the "work" of selecting issues, goals and strategies is complete. This means that incorporating feedback or suggestions becomes a more difficult prospect. As this permitting process demonstrated, the final approval process becomes streamlined when stakeholders are involved early and often throughout the permit development process.

Further, the Draft Permit's language "encouraging"[5] public participation is meaningless; Copermittees are free to disregard the suggestion and only allow minimal stakeholder input.

3. **The Draft Permit fails to detail the extent of Regional Board staff participation in developing the Water Quality Improvement Plans.**

Just as involving key stakeholders early and often as Water Quality Improvement Plans are developed will avoid the potential for having to start from scratch on the plans, Regional Board staff participation throughout the Water Quality Improvement Plan process is imperative. The Permit should reflect when and how the Regional Board staff intends to be involved in Water Quality Improvement Plan development. At a minimum, the Regional Board staff should receive monthly updates from watershed groups and should provide formal review of water quality priorities, pollutant sources identified, numeric targets and schedules, strategies and schedules, and monitoring

[1] *See* Tentative Order No. R9-2013-0001 § II.F.1.a.(1)(a) at 109.
[2] *See* Tentative Order No. R9-2013-0001 § II.F.1.a.(1)(c) at 109.
[3] *See* Tentative Order No. R9-2013-0001 § II.F.1.a.(2)(c) at 110.
[4] *See* Tentative Order No. R9-2013-0001 § II.F.1.b.(1) at 110.
[5] *See* Tentative Order No. R9-2013-0001 § II.F.1.a.(1)(b), (2)(a) at 109.

and assessment plans as they are developed. Ideally, the Regional Board should be part of the Water Quality Improvement Plan development team through the Stakeholder Advisory Group.

4. **The Permit should require that Copermittees develop Water Quality Improvement Plans in conjunction with regional board staff and a Stakeholder Advisory Group.**

To address the current shortfalls in the Water Quality Improvement Planning process related to stakeholder and regional board staff input, the Permit should be changed to require a Water Quality Improvement Plan development team, which includes a Stakeholder Advisory Group. The development team should consist of one or more representatives from each Copermittee in the watershed, a regional board staff member, and the Stakeholder Advisory Group, consisting of at least one representative of an environmental group familiar with the watershed, and at least one non-Copermittee representative with engineering, hydrology, geology or other specialized knowledge to assist in selecting effective strategies for the watershed. The regional board could select the non-Copermittee members of the development team based on an application process.

Adding an independent environmental representative and scientist to the development team provides legitimacy to the Water Quality Improvement Plan development process. At the same time, it provides important stakeholder input while keeping the process streamlined to avoid delays that would be caused by requiring multiple lengthy public comment periods (which is another way to add legitimacy and oversight).

5. **The Permit must require Copermittees within each Watershed Management Area to create a schedule for developing Water Quality Improvement Plans that reflects points for stakeholder input.**

The Draft Permit requires Copermittees to establish a public participation plan for its Water Quality Improvement Plan development process.[6] However, the Permit could better encourage robust public participation if it required Copermittees to create a schedule for Water Quality Improvement Plan development and public input.

This process of establishing a schedule ahead of time becomes critical for volunteer-based groups or planning groups that meet infrequently. Some planning groups or watershed-based groups only meet once a month. Without prior notice of public input points, key stakeholders may miss the opportunity to submit public comments based on their meeting frequency.

B. Formal review periods for the Water Quality Improvement Plans should occur after identifying priorities, then after strategies, then after goals and assessment methods.

The Water Quality Improvement Plan development process would work better if the development teams identified strategies to improve water quality, and received formal feedback on those strategies, before the goals are finalized. Furthermore, because most Copermittees span more than

[6] *See* Tentative Order No. R9-2013-0001 § II.F.1.a. at 109.

one watershed, Copermittees will likely need an internal review period to examine all jurisdictional activities to determine how many activities are feasible to perform within each watershed. Therefore, the Permit should take these delays into consideration as the Water Quality Improvement Plan development process is adjusted.

C. The Water Quality Improvement Plans should be developed consecutively, starting with the "worst" watershed, instead of concurrently.

To facilitate effective and efficient Water Quality Improvement Planning, and to ensure robust stakeholder participation and Regional Board staff review of the plans, the Permit should stagger the preparation of Water Quality Improvement Plans. For groups such as San Diego Coastkeeper, which will be reviewing all ten Water Quality Improvement Plans for San Diego County, the prospect of reviewing all ten plans during a 30-day comment period is untenable. San Diego Coastkeeper cannot effectively comment on ten Water Quality Improvement Plans in such a short period of time, particularly if Coastkeeper is not actively involved in the plan development process. Without an adequate time to review and opportunity to comment on the plans, the process invites groups either to oppose the plans in order to gain more time, or else the plans go unreviewed and the watershed is deprived of the benefit of public comments from groups like Coastkeeper.

Not only would consecutive Water Quality Improvement Plan development ensure better public participation, but it would ensure that later plans were completed faster as each subsequent plan can learn from, and be streamlined because of, the plan developed before. At the very least, the Regional Board should ensure that the comment periods for each phase of each Water Quality Improvement Plan are not concurrent in order to ensure robust public participation.

D. The Water Quality Improvement Plans Must Detail Specific Activities Each Copermittee will Undertake to Achieve the Water Quality Improvement Plan Goals.

The Draft Permit requires the Copermittees within a watershed to identify activities that "may"[7] be undertaken by one or more Copermittees during the permit cycle to meet watershed goals. While watershed-based goals and activities may be ideal for the watershed itself, this approach ignores the reality of how activities are actually accomplished and paid for—at the jurisdictional level.

In an ideal world, each Copermittee within a watershed would expend its fair share of effort and resources to reach the watershed goals. But with limited funding and many Copermittees facing costs to comply with Bacteria TMDL requirements, it becomes a real possibility that the burdens of achieving water quality improvement within a watershed will fall to only one or two Copermittees. Or even worse, there is the possibility that all Copermittees within a watershed may focus on their "other" watersheds, leaving a particular watershed "orphaned."

To prevent this situation, and to ensure that each Copermittee's' contribution to achieving water quality improvements in a watershed is clearly laid out, the Water Quality Improvement Plan must include a detailed list of activities and the jurisdictions that will perform them. This list must then

[7] *See* Tentative Order No. R9-2013-0001 § II.B.3.a.1 at 24.

be approved by the Regional Board, after a public hearing, to become enforceable requirements of the Permit.

An alternative option would be for the Permit to require approval, after public review and comment, of each Copermittee's jurisdictional plan. Either approach gives both the jurisdictions and stakeholders the enforceable commitments each Copermittee will undertake to achieve "compliance" with the Permit. While this approach is not the "safe harbor" that come Copermittees seek, it does provide needed clarity on what Copermittees must do to be in compliance with the Permit.

E. The Permit Should Require Interim and Final Numeric Targets and Schedules Based on Applicable Water Quality Standards.

The Draft Permit states that Copermittees must develop and incorporate interim and final numeric targets into their Water Quality Improvement Plans.[8] The permit should direct Copermittees that final targets must be compliance with applicable water quality standards. Interim targets should reflect incremental, yet demonstrable, progress towards improving water quality. Interim targets will allow the Copermittees, the Regional Board, and the public to fully assess Copermittees' progress towards compliance with final targets.

F. Each Copermittee Should Be Held Accountable For Achieving Watershed Numeric Targets.

During the focused meeting process, some Copermittees indicated that they intended to focus jurisdictional program efforts on one watershed and effectively ignore water quality priorities in other watersheds that are also within its jurisdiction. While this approach may be consistent with jurisdictions focusing resources where they can have the most impact, it also presents the potential that watershed priorities will be "orphaned" or that one jurisdiction will carry the primary or sole burden of implementing water quality improvement strategies within the watershed.

In order to help identify this problem, the Water Quality Improvement Plan schedules for implementing water quality improvement strategies must indicate which jurisdiction(s) is responsible for each strategy and cross-reference the section and page in the jurisdictional plan where each Copermittee commits to implementing the strategy.[9]

To avoid this potential problem and ensure that each jurisdiction remains actively involved in ensuring that each watershed within its jurisdiction achieves its interim and numeric targets, the Permit should reflect that each jurisdiction will be held accountable for achieving the watershed numeric targets.[10] Further, the Permit should specify that the Regional Board will reject any Water Quality Improvement Plan including orphaned priorities.[11]

[8] *See* Tentative Order No. R9-2013-0001 § II.B.2.b at 20.
[9] *See* Tentative Order No. R9-2013-0001 § II.B.3.b(1) at 25.
[10] *See* Tentative Order No. R9-2013-0001 § II.B.2.e at 23.
[11] *See* Tentative Order No. R9-2013-0001 § II.F.1 at 109.

These proposed changes are consistent with the Draft Permit's special study requirements. The Draft Permit requires Copermittees to implement at least three special studies within each Watershed Management Area, and the special studies require some form of participation by all Copermittees within the Watershed Management Area.[12] This requirement demonstrates the Regional Board's commitment to avoiding "orphaned" water quality priorities or having the primary responsibility for watershed strategy implementation fall to only Copermittee.

G. The Water Quality Improvement Plans Must Solicit and Include Alternative Compliance Options that Copermittees May Allow Priority Development Projects to Utilize According to provision E.3.c.(3).

The Draft Permit contains development provisions that Copermittees must incorporate into their jurisdictional plans. While some complain that these baseline requirements are "one size fits all," the Draft Permit properly provides "off-ramps" and alternative compliance methods where compliance is infeasible, or in some cases when greater water quality benefits can be achieved. Alternative compliance methods include off-site mitigation and in-lieu fee mitigation schemes, within the Copermittee's discretion.

1. The Water Quality Improvement Plans must solicit and include alternative compliance options that Copermittees may allow priority development projects to utilize according to provision E.3.c.(3).

The Draft Permit fails to detail how and when off-site mitigation projects are identified or how in-lieu fee programs might work. Because retrofit or stream rehabilitation or enhancement projects can carry a hefty price tag, there is a great risk that these projects may not be completed unless developers and Copermittees from throughout the watershed contribute funding. In order to make these projects a reality, they should be identified during the Water Quality Improvement Plan development process and be available as a "menu" of approved mitigation options for developers and Copermittees to choose from.

2. The Draft Permit must revise the alternative in-lieu compliance process to ensure that projects are completed.

The Draft Permit allows Copermittees to develop an alternative compliance in-lieu fee option either individually or with other Copermittees. While the Draft Permit specifies that the "alternative compliance projects must be constructed… no later than 4 years after the certificate of occupancy is granted for the first Priority Development Project that contributed funds toward construction of the offsite alternative compliance project…,"[13] the Draft Permit fails to detail exactly who is responsible for ensuring that the alternative compliance project is completed. The Draft Permit should specify that the Copermittee that approves that alternative compliance project is ultimately responsible for completing the project within four years and failure to complete to project in four years is a permit violation. This will incentivize the Copermittees to require proper bonding and assurances from developers to guarantee that the alternative compliance project is completed.

[12] *See* Tentative Order No. R9-2013-0001 § II.D.3.a. at 54.
[13] *See* Tentative Order No. R9-2013-0001 § II.E.3.c(3)(ii)[b] at 85.

H. The Permit Must Add a Step Where the Public and Regional Board Review All Watershed Activities and Water Quality Improvement Plans to Avoid "Orphaned" Watersheds.

Because the Water Quality Improvement Plans allow jurisdictions to prioritize how and where they choose to spend their stormwater funding, there is a real danger of a watershed being "orphaned" by jurisdictions that all chose to spend their efforts in adjacent watersheds. To avoid orphaned watersheds, the Permit must add a step where all watershed plans and jurisdictional activities can be reviewed together—before Water Quality Improvement Plans and jurisdictional plans are finalized. This will allow regional board staff and the stakeholders to do a county-wide review of all watersheds to ensure that no watershed is abandoned.

One way to easily display this information visually is to require Copermittees to create a matrix by watershed of all jurisdictional activities. This way, the regional board and stakeholders can evaluate and prevent orphaned watersheds.

I. The Water Quality Improvement Plans Must Be Approved at a Public Hearing.

California law requires the Regional Board hold a public hearing before adopting any water quality control plan.[14] Water Quality Improvement Plans qualify as "water quality control plans" and therefore are subject to public hearing requirements.[15] The criteria to be considered a "water quality control plan" subject to a public hearing are that the plan: *(1)* is created for a specific area or region; *(2)* protects the beneficial uses of waters; *(3)* sets limits to protect beneficial uses; *(4)* includes an implementation program designed to meet water quality objectives.[16] The Water Quality Improvement Plans meet all the criteria of a water quality control plan.[17] Therefore, the permit must require, not merely allow, public hearings for Water Quality Improvement Plans.[18]

J. The Annual Reporting Must Reflect Activities That Each Copermittee Undertakes to Achieve Water Quality Improvements in Each Watershed.

In addition to establishing in the Water Quality Improvement Plans exactly what activities each jurisdiction plans to undertake in order to see improvements in the watershed, the annual reporting process must reflect whether or not those activities were completed and whether or not they were successful. This analysis is critical to the adaptive management process. If water quality within a watershed fails to improve to target levels, Copermittees, the Regional Board, and stakeholders must know whether that was because the strategies were poorly selected or not implemented.

The Annual Report form contained in Appendix D fails to require enough information from the Copermittees to determine whether or not they successfully completed all committed activities in

[14] *See* Cal. Water Code § 13244.
[15] *See* Cal. Water Code § 13050(j).
[16] *See id.*
[17] *See* Tentative Order No. R9-2013-0001 §§ II. B.1., B.2(a) & (d), B.3 at 17-25.
[18] *See* Tentative Order No. R9-2013-0001 § II. F.1. at 109.

each watershed. Indeed, thorough reporting is beneficial for Copermittees to justify their budgets and programs to their city council, mayor, manager, or supervisors. The environmental community and the Copermittees stand hand-in hand asking for a more robust reporting requirement.

K. The Adaptive Management Process Should Include a Formal Public Participation Process.

The Draft Permit recognizes that public participation is an important element in the adaptive management process.[19] However, the Draft Permit fails to detail how and when the Copermittees are to solicit recommendations for modifications to the Water Quality Improvement Plans or Jurisdictional Runoff Management Plans as part of a public participation process.

For Water Quality Improvement Plans, the permit should include a process during which the Copermittees in each Watershed Management Area prepare a progress report, akin to a Report of Waste Discharge, that details the water quality improvement strategies completed or in progress, along with water quality data (from the Copermittees and third parties) and an assessment of progress towards interim and final numeric targets. Before revising the Water Quality Improvement Plan, the Copermittees must solicit comments from the Regional Board and public. The revised Water Quality Improvement Plan should be subject to public comment and a public hearing.

The Draft Permit requires Copermittees to create a means for the "public to participate in updating the highest priority water quality conditions, numeric goals, and water quality improvement strategies in the Water Quality Improvement Plan."[20] Part of the adaptive management process for Jurisdictional Runoff Management Programs requires Copermittees to take into account recommendations they receive.[21] To involve the public in the adaptive management process for jurisdictional runoff management programs, the Permit should explicitly require each Copermittee to solicit public comment on its initial findings and proposed changes before changes to the jurisdictional runoff management program is finalized.

II. THE DRAFT PERMIT PROPERLY REQUIRES WATER QUALITY BASED COMPLIANCE WITH BACTERIA TOTAL MAXIMUM DAILY LOADS BUT SHOULD REQUIRE PERIODIC MONITORING AND SET INTERIM GOALS.

A. The Permit Should Include Mass Limits In Order to Comply with the Bacteria Total Maximum Daily Loads.

The Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay (adopted June 11, 2008) and the Total Maximum Daily Loads for Indicator Bacteria, Project I—Twenty Beaches and Creeks in the San Diego Region (adopted February 10, 2010) include both effluent limitations and wasteload allocations. However,

[19] *See* Tentative Order No. R9-2013-0001 § II.B.5.b.(7) at 27.
[20] *See* Tentative Order No. R9-2013-0001 § II.E.7.b.(1) at 106.
[21] *See* Tentative Order No. R9-2013-0001 § II.B.5.b.(6)-(7) at 27.

the Draft Permit excludes the wasteload allocations. These wasteload allocations are a requirement of a valid Total Maximum Daily Load (TMDL),[22] and therefore should be included in the Permit.

However, the Regional Board should not allow Copermittees to demonstrate compliance with the TMDL solely based on mass loading numbers.[23] As the TMDL reflects, the mass loading numbers are conservative and based on a worst-case-scenario year of rain.[24] This means that loading will likely vary year to year as rainfall varies.[25]

The Copermittees are asking the Regional Board to incorporate "BMP-based compliance" as an alternative to having to meet the numeric water quality based effluent limits currently in the Permit. But the TMDL document recognizes that "Meeting the concentration based TMDLs in the receiving waters will be used to determine compliance with the TMDLs."[26] Further, since "dry weather TMDLs are assigned entirely to the Municipal MS4s as W[aste] L[oad] A[llocation]s," meeting the numeric water quality based objective is an appropriate measure of Copermittee compliance with the Bacteria TMDL.[27]

B. The Permit should require interim goals and monitoring for the Bacteria TMDL.

In order to assess whether or not the Copermittees are progressing toward Bacteria TMDL goals, the Permit must incorporate interim goals and monitoring for the Bacteria TMDL. Regardless of the interim goals stated in the TMDL itself, the Permit must require periodic monitoring and evaluation of progress toward achieving TMDL goals. It is particularly important that the Permit include interim goals for wet-weather bacteria exceedances, since the wet-weather compliance date is well past the Permit term. At the very least, this assessment must take place by the end of the Permit term.

C. The Permit should not allow Copermittees to comply with TMDLs by performing a "reasonable assurance" analysis that a suite of BMPs will reduce bacteria loads.

Some Copermittees are requesting that the Regional Board allow them to demonstrate compliance with the Bacteria TMDL requirements by developing a suite of BMPs that should, according to the Copermittees' modeling, reduce bacteria loads to comply with the Bacteria TMDL. However, under the law, all permit terms must be consistent with the assumptions and requirements of Waste Load Allocations established in TMDLs.[28] The Twenty Beaches TMDL does not contemplate a

[22] *See* 40 C.F.R. 130.2(i).
[23] "The mass-load based TMDLs were calculated under critical conditions consisting of flows generated during a critical wet year and estimation of existing and allowable loads at a critical location." Twenty Beaches TMDL, Resolution No. R9-2010-0001, Attachment A. February 10, 2010.
[24] "The flow from the critical wet year is a "worst case" annual wet weather flow and loading scenario. Actual annual wet weather flow and loading will vary from year to year." Twenty Beaches TMDL, Resolution No. R9-2010-0001, Attachment A. February 10, 2010.
[25] "The mass-load based TMDLs calculated at the critical location are dependent on the flow, which can vary from year to year, but the numeric targets will not vary." Twenty Beaches TMDL, Resolution No. R9-2010-0001, Attachment A. February 10, 2010.
[26] Twenty Beaches TMDL, Resolution No. R9-2010-0001, Attachment A at A19, February 10, 2010.
[27] Twenty Beaches TMDL, Resolution No. R9-2010-0001, Attachment A at A53, February 10, 2010.
[28] *See* 40 C.F.R. § 122.44(d)(1)(vii)(B).

"reasonable assurance" analysis, but rather specifies that "Meeting the concentration based TMDLs in the receiving waters will be used to determine compliance with the TMDLs."[29] To comply with the law, the Permit must require that each Copermittee must demonstrate compliance with all interim and final goals set forth in the TMDL. Any compliance option that excuses any Copermittee from compliance with interim or final goals violates that law.

Further, the Regional Board should not look to the Los Angeles Regional Board for ideas on changes to this permit. The Los Angeles region stormwater permit's safe harbor provisions violate federal anti-backsliding requirements; violate state and federal antidegradation requirements and violate requirements for incorporation of TMDLs into permits. The Los Angeles Waterkeeper is legally challenging the Los Angeles region stormwater permit because of the safe harbor provisions in the permit. The Environmental Groups urge the San Diego Regional Board to avoid the pitfalls of the Los Angeles stormwater permit and to maintain the current approach to receiving water limitations and TMDLs incorporated in the Draft Permit.

III. MONITORING AND ASSESSMENT REQUIREMENTS MUST ENSURE THAT COPERMITTEES IDENTIFY PROGRESS TOWARDS WATERSHED GOALS AND TRACK THE HEALTH OF THE WATERSHEDS.

The Draft Permit sets out a comprehensive system of monitoring and assessment procedures that will ensure Copermittees are able to detect and eliminate illicit discharges and connections. The Regional Board must recognize the importance of extensive monitoring in making continued progress towards clean waters in the San Diego Region. If the Permit does not include enough monitoring, the watersheds in Region 9 will be in danger of increased pollutant discharges that Copermittees will not be able to detect.

A. The Permit Should Specify that Copermittees Must Accept Quality-Controlled Data Received from Third Parties.

The Draft Permit and the Regional Board staff have indicated that Copermittees should use third party water quality monitoring data to assist in assessing our watersheds and the Copermittees' progress towards achieving water quality standards.[30] However, some Copermittees are reluctant to use data collected by third parties. One Copermittee articulated its distaste for third party-collected data by saying that third party data is not as rigorous as data collected by the Copermittees and therefore trying to compare third party data to Copermittee data is "like comparing apples and oranges."

The Permit should specify that Copermittees must use third party data that meets particular criteria. These criteria should require third parties to maintain and make available for review the following information: *(1)* a quality assurance project plan; *(2)* a list of methods used; and *(3)* standard operating procedures. In the alternative, the Permit should specify that data is "appropriate" if it has been collected using the latest Standard Methods of Water and Waste Water Analysis.

[29] Twenty Beaches TMDL, Resolution No. R9-2010-0001, Attachment A at A19, February 10, 2010.
[30] *See* Tentative Order No. R9-2013-0001 § II.B.2 at 20.

Additionally, the Draft Permit's "Assessment Requirements" should specify that Copermittees must evaluate not just "the data collected pursuant to Provisions D.1, D.2, and D.3" to identify causes of exceedances, but must also solicit and evaluate third party data that meets that permit criteria to identify causes of water quality problems.

B. The Permit Should Allow Third Party Participations in Special Studies.

The Draft Permit requires Copermittees to implement at least three special studies within each Watershed Management Area and at least two regional special studies for the San Diego Region.[31] These studies are important to ensure that the Copermittees work together to identify sources of high priority pollutants and assess the efficiency of various best management practices within a watershed to achieve watershed goals. The Draft Permit's approach properly requires each Copermittee within a watershed to participate in each of the watershed's special studies. However, the Permit should also specifically allow Copermittees to partner with environmental groups or other third parties to complete regional special studies.

For example, Copermittees within the Peñasquitos watershed group might partner with San Diego Coastkeeper to complete a pilot project combining GPS-based water quality data and volunteer patrols to track pollution up a watershed to identify a pollution problem's source. Or perhaps Copermittees within the Carlsbad watershed might work with the Building Industry Alliance and the Escondido Creek Watershed Conservancy to create a pilot Escondido Creek restoration project and assess the feasibility of using such restoration as a regional mitigation project for development within the Carlsbad watershed.

By encouraging the Copermittees to partner with third parties to complete special studies, the Permit could foster watershed-based collaboration and leverage efficiencies and additional resources that third parties bring to the table.

CONCLUSION

In conclusion, the Environmental Groups appreciate the effort the Regional Board and its staff have put towards developing an MS4 permit for the San Diego Region which effectively and efficiently addresses the environmental concerns of the watershed in a transparent and comprehensive approach. We look forward to a constructive relationship with the Regional Board and hope our comments will assist in the development of a thoughtful and progressive permit.

Respectfully submitted,

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San Diego Coastkeeper

Colin Kelly
Orange County Coastkeeper

Garry Brown
Inland Empire Waterkeeper

Nicole Capretz
Environmental Health Coalition

[31] *See* Tentative Order R9-2013-0001 §§ II.D.3.a.(1)-(2) at 54.

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Surfrider Foundation,
San Diego Chapter

Doug Reese
Surfrider Foundation,
South Orange County Chapter

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Preserve Wild Santee

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CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

TENTATIVE
ORDER NO. R9-2013-0001
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The San Diego County Copermittees in Table 1a are subject to waste discharge requirements set forth in this Order.

Table 1a. San Diego County Copermittees

City of Carlsbad	City of Oceanside
City of Chula Vista	City of Poway
City of Coronado	City of San Diego
City of Del Mar	City of San Marcos
City of El Cajon	City of Santee
City of Encinitas	City of Solana Beach
City of Escondido	City of Vista
City of Imperial Beach	County of San Diego
City of La Mesa	San Diego County Regional Airport Authority
City of Lemon Grove	San Diego Unified Port District
City of National City	

After the San Diego Water Board receives and considers the Orange County Copermittees' Report of Waste Discharge and makes any necessary changes to the Order, the Orange County Copermittees in Table 1b will become subject to waste discharge requirements set forth in this Order after expiration of Order No. R9-2009-0002, NPDES No. CAS0108740 on or after December 16, 2014.

Table 1b. Orange County Copermittees

City of Aliso Viejo	City of Rancho Santa Margarita
City of Dana Point	City of San Clemente
City of Laguna Beach	City of San Juan Capistrano
City of Laguna Hills	City of Laguna Woods
City of Laguna Niguel	County of Orange
City of Lake Forest	Orange County Flood Control District
City of Mission Viejo	

After the San Diego Water Board receives and considers the Riverside County Copermittees' Report of Waste Discharge and makes any necessary changes to this Order, the Riverside County Copermittees in Table 1c will become subject to waste discharge requirements set forth in this Order after expiration of Order No. R9-2010-0016, NPDES No. CAS0108766 on or after November 10, 2015.

Table 1c. Riverside County Copermittees

City of Murrieta	County of Riverside
City of Temecula	Riverside County Flood Control and Water Conservation District
City of Wildomar	

The Orange County Copermittees and Riverside County Copermittees may become subject to the requirements of this Order at a date earlier than the expiration date of their current Orders subject to the conditions described in Provision F.6 of this Order if the Copermittees in the respective county receive a notification of coverage from the San Diego Water Board.

The term Copermittee in this Order refers to any San Diego County, Orange County, or Riverside County Copermittee covered under this Order, unless specified otherwise.

This Order provides permit coverage for the Copermittee discharges described in Table 2.

Table 2. Discharge Locations and Receiving Waters

Discharge Points	Locations throughout San Diego Region
Discharge Description	Municipal Separate Storm Sewer System (MS4) Discharges
Receiving Waters	Inland Surface Waters, Enclosed Bays and Estuaries, and Coastal Ocean Waters of the San Diego Region

Table 3. Administrative Information

This Order was adopted by the San Diego Water Board on:	**Month Day, 2013**
This Order will become effective on:	**Month Day, 2013**
This Order will expire on:	**Month Day, 2018**
The Copermittees must file a Report of Waste Discharge in accordance with Title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than 180 days in advance of the Order expiration date.	

I, David W. Gibson, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on Month Day, 2013.

TENTATIVE

David W. Gibson
Executive Officer

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I. FINDINGS

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), finds that:

JURISDICTION

1. **MS4 Ownership or Operation.** Each of the Copermittees owns or operates an MS4, through which it discharges storm water and non-storm water into waters of the U.S. within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the U.S.

2. **Legal and Regulatory Authority.** This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]) adopted by the United States Environmental Protection Agency (USEPA), and chapter 5.5, division 7 of the California Water Code (CWC) (commencing with section 13370). This Order serves as an NPDES permit for discharges from MS4s to surface waters. This Order also serves as waste discharge requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

   The San Diego Water Board has the legal authority to issue a regional MS4 permit pursuant to its authority under CWA section 402(p)(3)(B) and 40 CFR 122.26(a)(1)(v). The USEPA also made it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide permits (55 Federal Register [FR] 47990, 48039-48042). The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees and San Diego Water Board.

   The federal regulations make it clear that the Copermittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators (40 CFR 122.26(a)(3)(vi)). This Order does not require the Copermittees to manage storm water outside of their jurisdictional boundaries, but rather to work collectively to improve storm water management within watersheds.

3. **CWA NPDES Permit Conditions.** Pursuant to CWA section 402(p)(3)(B), NPDES permits for storm water discharges from MS4s must include requirements to effectively prohibit non-storm water discharges into MS4s, and require controls to reduce the discharge of pollutants in storm water to the maximum extent practicable (MEP), and to require other provisions as the San Diego Water Board determines are appropriate to control such pollutants. This Order prescribes conditions to assure

compliance with the CWA requirements for owners and operators of MS4s to effectively prohibit non-storm water discharges in to the MS4s, and require controls to reduce the discharge of pollutants in storm water from the MS4s to the MEP.

4. **CWA and CWC Monitoring Requirements.** CWA section 308(a) and 40 CFR 122.41(h),(j)-(l) and 122.48 require that NPDES permits must specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s also specify additional monitoring and reporting requirements in 40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c). CWC section 13383 authorizes the San Diego Water Board to establish monitoring, inspection, entry, reporting and recordkeeping requirements. This Order establishes monitoring and reporting requirements to implement federal and State requirements.

5. **Total Maximum Daily Loads.** CWA section 303(d)(1)(A) requires that "[e]ach state shall identify those waters within its boundaries for which the effluent limitations…are not stringent enough to implement any water quality standard applicable to such waters." The CWA also requires states to establish a priority ranking of impaired water bodies known as Water Quality Limited Segments and to establish Total Maximum Daily Loads (TMDLs) for such waters. This priority list of impaired water bodies is called the Clean Water Act Section 303(d) List of Water Quality Limited Segments, commonly referred to as the 303(d) List. The CWA requires the 303(d) List to be updated every two years.

   TMDLs are numerical calculations of the maximum amount of a pollutant that a water body can assimilate and still meet water quality standards. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point sources (waste load allocations or WLAs) and non-point sources (load allocations or LAs), background contribution, plus a margin of safety. Discharges from MS4s are point source discharges. The federal regulations (40 CFR 122.44(d)(1)(vii)(B)) require that NPDES permits to incorporate water quality based effluent limitations (WQBELs) developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, consistent with the assumptions and requirements of any available WLA for the discharge. Requirements of this Order implement the TMDLs adopted by the San Diego Water Board and approved by USEPA.

6. **Non-Storm Water Discharges.** Pursuant to CWA section 402(p)(3)(B)(ii), this Order requires each Copermittee to effectively prohibit discharges of non-storm water into its MS4. Nevertheless, non-storm water discharges into and from the MS4s continue to be reported to the San Diego Water Board by the Copermittees and other persons. Monitoring conducted by the Copermittees, as well as the 303(d) List, have identified dry weather, non-storm water discharges from the MS4s as a source of pollutants causing or contributing to receiving water quality impairments in the San Diego Region. The federal regulations (40 CFR 122.26(d)(2)(iv)(B)(1)) require the Copermittees to have a program to prevent illicit discharges to the MS4. The federal regulations, however, allow for specific categories of non-storm water discharges or flows to be addressed as illicit discharges only where such discharges

are identified as sources of pollutants to waters of the U.S.

7. **In-Stream Treatment Systems.** Pursuant to federal regulations (40 CFR 131.10(a)), in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S. Authorizing the construction of a runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to accepting waste assimilation as an appropriate use for that water body. Runoff treatment must occur prior to the discharge of runoff into receiving waters. Treatment control best management practices (BMPs) must not be constructed in waters of the U.S. Construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body.

DISCHARGE CHARACTERISTICS AND RUNOFF MANAGEMENT

8. **Point Source Discharges of Pollutants.** Discharges from the MS4s contain waste, as defined in the CWC, and pollutants that adversely affect the quality of the waters of the state. A discharge from an MS4 is a “discharge of pollutants from a point source” into waters of the U.S. as defined in the CWA. Storm water and non-storm water discharges from the MS4s contain pollutants that cause or threaten to cause a violation of surface water quality standards, as outlined in the Water Quality Control Plan for the San Diego Basin (Basin Plan). Storm water and non-storm water discharges from the MS4s are subject to the conditions and requirements established in the Basin Plan for point source discharges.

9. **Potential Beneficial Use Impairment.** The discharge of pollutants and/or increased flows from MS4s may cause or threaten to cause the concentration of pollutants to exceed applicable receiving water quality objectives and impair or threaten to impair designated beneficial uses resulting in a condition of pollution, contamination, or nuisance.

10. **Pollutants Generated by Land Development.** Land development has created and continues to create new sources of non-storm water discharges and pollutants in storm water discharges as human population density increases. This brings higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash. Pollutants from these sources are dumped or washed off the surface by non-storm water or storm water flows into and from the MS4s. When development converts natural vegetated pervious ground cover to impervious surfaces such as paved highways, streets, rooftops, and parking lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving a developed area without BMPs that can maintain pre-development conditions will contain greater pollutant loads and have significantly greater runoff volume, velocity, and peak flow rate than pre-development runoff from the same area.

11. **Runoff Discharges to Receiving Waters.** The MS4s discharge runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within the eleven hydrologic units comprising the San Diego Region. Historic and current development makes use of natural drainage patterns and features as conveyances for runoff. Rivers, streams and creeks in developed areas used in this manner are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and receiving water. Numerous receiving water bodies and water body segments have been designated as impaired by the San Diego Water Board pursuant to CWA section 303(d).

12. **Pollutants in Runoff.** The most common pollutants in runoff discharged from the MS4s include total suspended solids, sediment, pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., cadmium, copper, lead, and zinc), petroleum products and polynuclear aromatic hydrocarbons, synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus), oxygen-demanding substances (e.g., decaying vegetation, animal waste), detergents, and trash. As operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not prohibit or otherwise control. These discharges may cause or contribute to a condition of pollution or a violation of water quality standards.

13. **Human Health and Aquatic Life Impairment.** Pollutants in runoff discharged from the MS4s can threaten and adversely affect human health and aquatic organisms. Adverse responses of organisms to chemicals or physical agents in runoff range from physiological responses such as impaired reproduction or growth anomalies to mortality. Increased volume, velocity, rate, and duration of storm water runoff greatly accelerate the erosion of downstream natural channels. This alters stream channels and habitats and can adversely affect aquatic and terrestrial organisms.

14. **Water Quality Effects.** The Copermittees' water quality monitoring data submitted to date documents persistent exceedances of Basin Plan water quality objectives for runoff-related pollutants at various watershed monitoring stations. Persistent toxicity has also been observed at several watershed monitoring stations. In addition, bioassessment data indicate that the majority of the monitored receiving waters have Poor to Very Poor Index of Biological Integrity (IBI) ratings. These findings indicate that runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in the San Diego Region. Non-storm water discharges from the MS4s have been shown to contribute significant levels of pollutants and flow in arid, developed Southern California watersheds, and contribute significantly to exceedances of applicable receiving water quality objectives.

15. **Non-Storm Water and Storm Water Discharges.** Non-storm water discharges from the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard of CWA section 402(p)(3)(B)(iii), which is explicitly for "Municipal … *Stormwater Discharges* (emphasis added)" from the MS4s. Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s must be effectively prohibited.

16. **Best Management Practices.** Waste and pollutants which are deposited and accumulate in MS4 drainage structures will be discharged from these structures to waters of the U.S. unless they are removed. These discharges may cause or contribute to, or threaten to cause or contribute to, a condition of pollution in receiving waters. For this reason, pollutants in storm water discharges from the MS4s can be and must be effectively reduced in runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Pollution prevention is the reduction or elimination of pollutant generation at its source and is the best "first line of defense". Source control BMPs (both structural and non-structural) minimize the contact between pollutants and runoff, therefore keeping pollutants onsite and out of receiving waters. Treatment control BMPs remove pollutants that have been mobilized by storm water or non-storm water flows.

17. **BMP Implementation.** Runoff needs to be addressed during the three major phases of development (planning, construction, and use) in order to reduce the discharge of storm water pollutants to the MEP, effectively prohibit non-storm water discharges, and protect receiving waters. Development which is not guided by water quality planning policies and principles can result in increased pollutant load discharges, flow rates, and flow durations which can negatively affect receiving water beneficial uses. Construction sites without adequate BMP implementation result in sediment runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. Existing development can generate substantial pollutant loads which are discharged in runoff to receiving waters. Retrofitting areas of existing development with storm water pollutant control and hydromodification management BMPs is necessary to address storm water discharges from existing development that may cause or contribute to a condition of pollution or a violation of water quality standards.

18. **Long Term Planning and Implementation.** Federal regulations require municipal storm water permits to expire 5 years from adoption, after which the permit must be renewed and reissued. The San Diego Water Board recognizes that the degradation of water quality and impacts to beneficial uses of the waters in the San Diego Region occurred over several decades. The San Diego Water Board further recognizes that a decade or more may be necessary to realize demonstrable improvement to the quality of waters in the Region. This Order includes a long term planning and implementation approach that will require more than a single permit term to complete.

WATER QUALITY STANDARDS

19. **Basin Plan.** The San Diego Water Board adopted the Water Quality Control Plan for the San Diego Basin (Basin Plan) on September 8, 1994 that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for receiving waters addressed through the plan. The Basin Plan was subsequently approved by the State Water Resources Control Board (State Water Board) on December 13, 1994. Subsequent revisions to the Basin Plan have also been adopted by the San Diego Water Board and approved by the State Water Board. Requirements of this Order implement the Basin Plan.

    The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Process Supply (PROC), Industrial Service Supply (IND), Ground Water Recharge (GWR), Contact Water Recreation (REC1), Non-contact Water Recreation (REC2), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Freshwater Replenishment (FRSH), Hydropower Generation (POW), and Preservation of Biological Habitats of Special Significance (BIOL). The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region: Navigation (NAV), Commercial and Sport Fishing (COMM), Estuarine Habitat (EST), Marine Habitat (MAR), Aquaculture (AQUA), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN), and Shellfish Harvesting (SHELL).

20. **Ocean Plan.** The State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, and 2005. The State Water Board adopted the latest amendment on April 21, 2005 and it became effective on February 14, 2006. The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean. Requirements of this Order implement the Ocean Plan.

    The Ocean Plan identifies the following beneficial uses of ocean waters of the state to be protected: Industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture; preservation and enhancement of designated Areas of Special Biological Significance; rare and endangered species; marine habitat; fish spawning and shellfish harvesting

21. **Sediment Quality Control Plan**. On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes: 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health,

and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

22. **National Toxics Rule and California Toxics Rule.** USEPA adopted the National Toxics Rule (NTR) on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the NTR applied in California. On May 18, 2000, USEPA adopted the California Toxics Rule (CTR). The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants.

23. **Antidegradation Policy.** This Order is in conformance with the federal Antidegradation Policy described in 40 CFR 131.12, and State Water Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality Waters in California*. Federal regulations at 40 CFR 131.12 require that the State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. State Water Board Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies.

CONSIDERATIONS UNDER FEDERAL AND STATE LAW

24. **Coastal Zone Act Reauthorization Amendments.** Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states with approved coastal zone management programs to address non-point source pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point source pollution: agriculture, silviculture, urban, marinas, and hydromodification. This Order addresses the management measures required for the urban category, with the exception of septic systems. The runoff management programs developed pursuant to this Order fulfills the need for coastal cities to develop a runoff non-point source plan identified in the Non-Point Source Program Strategy and Implementation Plan. The San Diego Water Board addresses septic systems through the administration of other programs.

25. **Endangered Species Act.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 USC sections 1531 to 1544). This Order requires compliance with receiving water limits, and other requirements to protect the beneficial uses of waters of the State. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

26. **Report of Waste Discharge Process.** The waste discharge requirements set forth in this Order are based upon the Report of Waste Discharge submitted by the San Diego County Copermittees prior to the expiration of Order No. R9-2007-0001 (NPDES No. CAS0109266). The Orange County and Riverside County Copermittees are not immediately covered by the waste discharge requirements in this Order. The San Diego Water Board understands that each municipality is unique although the Counties share watersheds and geographical boundaries. The Order will continue to use the Report of Waste Discharge process prior to initially making Orange County or Riverside County Copermittees subject to the requirements of this Order.

    The federal regulations (40 CFR 122.21(d)(2)) and CWC section 13376 impose a duty on the Copermittees to reapply for continued coverage through submittal of a Report of Waste Discharge no later than 180 days prior to expiration of a currently effective permit. This requirement is set forth in the Orange County Copermittees' and Riverside County Copermittees' currently effective permits at Provisions K.2.b and K.2.c, respectively. The Orange County Permit, Order No. R9-2009-0002 (NPDES No. CAS0108740) expires on December 16, 2014 and the Riverside County MS4 Permit, Order No. R9-2010-0016 (NPDES No. CAS0108766) expires on November 10, 2015.

    Unless the Orange County or Riverside County Copermittees apply for and receive early coverage under this Order, the Orange County Copermittees' and the Riverside County Copermittees' respective permits will be superseded by this Order upon expiration of their respective permits, subject to any necessary revisions to the requirements of this Order made after the San Diego Water Board considers their respective Reports of Waste Discharge through the public process provided in 40 CFR 124.

27. **Integrated Report and Clean Water Act Section 303(d) List.** The San Diego Water Board and State Water Board submit an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. USEPA issued its *Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act* on July 29, 2005, which advocates the use of a five category approach for classifying the attainment status of water quality standards for water bodies in the Integrated Report. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 in the Integrated Report are placed on the 303(d) List.

    Water bodies with available data and/or information that indicate at least one beneficial use is not being supported or is threatened, but a TMDL is not required, are included in Category 4 in the Integrated Report. Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal

authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

Implementation of the requirements of this Order may allow the San Diego Water Board to include surface waters impaired by discharges from the Copermittees' MS4s in Category 4 in the Integrated Report for consideration during the next 303(d) List submittal by the State to USEPA.

28. **Economic Considerations.** The California Supreme Court has ruled that although CWC section 13263 requires the State and Regional Water Boards (collectively Water Boards) to consider factors set forth in CWC section 13241 when issuing an NPDES permit, the Water Board may not consider the factors to justify imposing pollutant restrictions that are less stringent than the applicable federal regulations require. (*City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 618, 626-627.) However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

    As noted in the following finding, the San Diego Water Board finds that the requirements in this permit are not more stringent than the minimum federal requirements. Therefore, a CWC section 13241 analysis is not required for permit requirements that implement the effective prohibition on the discharge of non-storm water into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determined appropriate to control such pollutants, as those requirements are mandated by federal law. Notwithstanding the above, the San Diego Water Board has developed an economic analysis of the requirements in this Order. The economic analysis is provided in the Fact Sheet.

29. **Unfunded Mandates.** This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following:

    a. This Order implements federally mandated requirements under CWA section 402 (33 USC section 1342(p)(3)(B)).

    b. The local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental and new dischargers who are issued NPDES permits for storm water and non-storm water discharges.

    c. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order.

    d. The Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)) and in lieu of numeric restrictions on

their MS4 discharges (i.e. effluent limitations).

e. The local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under State law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

f. The provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state develops a TMDL, federal law requires that permits must contain water quality based effluent limitations consistent with the assumptions and requirements of any applicable wasteload allocation (40 CFR 122.44(d)(1)(vii)(B)).

See the Fact Sheet for further discussion of unfunded mandates.

30. California Environmental Quality Act. The issuance of waste discharge requirements and an NPDES permit for the discharge of runoff from MS4s to waters of the U.S. is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 et seq.) in accordance with CWC section 13389.

STATE WATER BOARD DECISIONS

31. Compliance with Prohibitions and Limitations. The receiving water limitation language specified in this Order is consistent with language recommended by the USEPA and established in State Water Board Order WQ 99-05, *Own Motion Review of the Petition of Environmental Health Coalition to Review Waste Discharge Requirements Order No. 96-03, NPDES Permit No. CAS0108740*, adopted by the State Water Board on June 17, 1999. The receiving water limitation language in this Order requires storm water discharges from MS4s to not cause or contribute to a violation of water quality standards, which is to be achieved through an iterative approach requiring the implementation of improved and better-tailored BMPs over time. Implementation of the iterative approach to comply with receiving water limitations based on applicable water quality standards is necessary to ensure that storm water discharges from the MS4 will not ultimately cause or contribute to violations of water quality standards and will not create conditions of pollution, contamination, or nuisance.

32. Special Conditions for Areas of Special Biological Significance. On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving an exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges. State Water Board Resolution No. 2012-0012 requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions

were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject terms and conditions of State Water Board Resolution No. 2012-0012. The Special Protections contained in Attachment B to Resolution No. 2012-0012, applicable to these discharges, are hereby incorporated into this Order as if fully set forth herein.

ADMINISTRATIVE FINDINGS

33. **Executive Officer Delegation of Authority.** The San Diego Water Board by prior resolution has delegated all matters that may legally be delegated to its Executive Officer to act on its behalf pursuant to CWC section 13223. Therefore, the Executive Officer is authorized to act on the San Diego Water Board's behalf on any matter within this Order unless such delegation is unlawful under CWC section 13223 or this Order explicitly states otherwise.

34. **Standard Provisions.** Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR 122.42, are provided in Attachment B to this Order.

35. **Fact Sheet.** The Fact Sheet for this Order contains background information, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of this Order. The Fact Sheet is hereby incorporated into this Order and constitutes part of the Findings of this Order.

36. **Public Notice.** In accordance with State and federal laws and regulations, the San Diego Water Board notified the Copermittees, and interested agencies and persons of its intent to prescribe waste discharge requirements for the control of discharges into and from the MS4s to waters of the U.S. and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet.

37. **Public Hearing.** The San Diego Water Board held a public hearing on Month Day, 2013 and heard and considered all comments pertaining to the terms and conditions of this Order. Details of the public hearing are provided in the Fact Sheet.

38. **Effective Date.** This Order serves as an NPDES permit pursuant to CWA section 401 or amendments thereto, and becomes effective fifty (50) days after the date of its adoption, provided that the Regional Administrator, USEPA, Region IX, does not object to this Order.

39. **Review by the State Water Board.** Any person aggrieved by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with CWC section 13320 and California Code of Regulations, title 23,

sections 2050, et seq. The State Water Board must receive the petition by 5:00 p.m., 30 days after the San Diego Water Board action, except that if the thirtieth day following the action falls on a Saturday, Sunday or State holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

THEREFORE, IT IS HEREBY ORDERED that the Copermittees, in order to meet the provisions contained in division 7 of the CWC and regulations adopted thereunder, and the provisions of the CWA and regulations adopted thereunder, must each comply with the following:

II. PROVISIONS

A. PROHIBITIONS AND LIMITATIONS

The purpose of this provision is to describe the conditions under which storm water and non-storm water discharges into and from MS4s are prohibited or limited. The goal of the prohibitions and limitations is to protect the water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through the implementation of water quality improvement strategies and runoff management programs that effectively prohibit non-storm water discharges into the Copermittees' MS4s, and reduce pollutants in storm water discharges from the Copermittees' MS4s to the MEP.

1. Discharge Prohibitions

a. Discharges from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the state are prohibited.

b. Non-storm water discharges into MS4s are to be effectively prohibited, unless such discharges are either authorized by a separate NPDES permit, or the discharge is a category of non-storm water discharges or flows that must be addressed pursuant to Provisions E.2.a.(1)-(5) of this Order.

c. Discharges from MS4s are subject to all waste discharge prohibitions in the Basin Plan, included in Attachment A to this Order.

d. Storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 applicable to these discharges, included in Attachment A to this Order. All other discharges from the Copermittees' MS4s to ASBS are prohibited.

2. Receiving Water Limitations

a. Discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters, including but not limited to all applicable provisions contained in:

(1) The San Diego Water Board's Basin Plan, including beneficial uses, water quality objectives, and implementation plans;

(2) State Water Board plans for water quality control including the following:

(a) Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries (Thermal Plan), and

(b) The Ocean Plan, including beneficial uses, water quality objectives, and implementation plans;

(3) State Water Board policies for water and sediment quality control including the following:

(a) Water Quality Control Policy for the Enclosed Bays and Estuaries of California,

(b) Sediment Quality Control Plan which includes the following narrative objectives for bays and estuaries:

(i) Pollutants in sediments shall not be present in quantities that, alone or in combination, are toxic to benthic communities, and

(ii) Pollutants shall not be present in sediments at levels that will bioaccumulate in aquatic life to levels that are harmful to human health,

(c) The Statement of Policy with Respect to Maintaining High Quality of Waters in California;[1]

(4) Priority pollutant criteria promulgated by the USEPA through the following:

(a) National Toxics Rule (NTR)[2] (promulgated on December 22, 1992 and amended on May 4, 1995), and

(b) California Toxics Rule (CTR).[3,4]

b. Discharges from MS4s composed of storm water runoff must not alter natural ocean water quality in an ASBS.

[1] State Water Board Resolution No. 68-16
[2] 40 CFR 131.36
[3] 65 Federal Register 31682-31719 (May 18, 2000), adding Section 131.38 to 40 CFR
[4] If a water quality objective and a CTR criterion are in effect for the same priority pollutant, the more stringent of the two applies.

3. Effluent Limitations

a. TECHNOLOGY BASED EFFLUENT LIMITATIONS

Pollutants in storm water discharges from MS4s must be reduced to the MEP.[5]

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

This Order establishes water quality based effluent limitations (WQBELs) consistent with the assumptions and requirements of all available TMDL waste load allocations (WLAs) assigned to discharges from the Copermittees' MS4s. Each Copermittee must comply with applicable WQBELs established for the TMDLs in Attachment E to this Order, pursuant to the applicable TMDL compliance schedules.

4. Compliance with Discharge Prohibitions and Receiving Water Limitations

Each Copermittee must achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order through timely implementation of control measures and other actions as specified in Provisions B and E of this Order, including any modifications. The Water Quality Improvement Plans required under Provision B must be designed and adapted to ultimately achieve compliance with Provisions A.1.a, A.1.c and A.2.a.

a. If exceedance(s) of water quality standards persist in receiving waters notwithstanding implementation of this Order, the Copermittees must comply with the following procedures:

(1) For exceedance(s) of a water quality standard in the process of being addressed by the Water Quality Improvement Plan, the Copermittee(s) must implement the Water Quality Improvement Plan as accepted by the San Diego Water Board, and update the Water Quality Improvement Plan, as necessary, pursuant to Provision F.2.c;

(2) Upon a determination by either the Copermittees or the San Diego Water Board that discharges from the MS4 are causing or contributing to a new exceedance of an applicable water quality standard not addressed by the Water Quality Improvement Plan, the Copermittees must submit the following updates to the Water Quality Improvement Plan pursuant to Provision F.2.c or as part of the Annual Report required under Provision F.3.b, unless the San Diego Water Board directs an earlier submittal:

[5] This does not apply to MS4 discharges which receive subsequent treatment to reduce pollutants in storm water discharges to the MEP prior to entering receiving waters (e.g., low flow diversions to the sanitary sewer). Runoff treatment must occur prior to the discharge of runoff into receiving waters per Finding 7.

(a) The water quality improvement strategies being implemented that are effective and will continue to be implemented,

(b) Water quality improvement strategies (i.e. BMPs, retrofitting projects, stream and/or habitat rehabilitation or restoration projects, adjustments to jurisdictional runoff management programs, etc.) that will be implemented to reduce or eliminate any pollutants or conditions that are causing or contributing to the exceedance of water quality standards,

(c) Updates to the schedule for implementation of the existing and additional water quality improvement strategies, and

(d) Updates to the monitoring and assessment program to track progress toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a of this Order;

(3) The San Diego Water Board may require the incorporation of additional modifications to the Water Quality Improvement Plan required under Provision B. The applicable Copermittees must submit any modifications to the update to the Water Quality Improvement Plan within 90 days of notification that additional modifications are required by the San Diego Water Board, or as otherwise directed;

(4) Within 90 days of the San Diego Water Board determination that the update to the Water Quality Improvement Plan meets the requirements of this Order, the applicable Copermittees must revise the jurisdictional runoff management program documents to incorporate the updated water quality improvement strategies that have been and will be implemented, the implementation schedule, and any additional monitoring required; and

(5) Each Copermittee must implement the updated Water Quality Improvement Plan.

b. The procedure set forth above to achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order do not have to be repeated for continuing or recurring exceedances of the same water quality standard(s) following implementation of scheduled actions unless directed to do otherwise by the San Diego Water Board.

c. Nothing in Provisions A.4.a and A.4.b prevents the San Diego Water Board from enforcing any provision of this Order while the applicable Copermittees prepare and implement the above update to the Water Quality Improvement Plan and jurisdictional runoff management programs.

B. WATER QUALITY IMPROVEMENT PLANS

The purpose of this provision is to develop Water Quality Improvement Plans that guide the Copermittees' jurisdictional runoff management programs towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plans is to protect, preserve, enhance, and restore the water quality and designated beneficial uses of waters of the state. This goal will be accomplished through an adaptive planning and management process that identifies the highest priority water quality conditions within a watershed and implements strategies through the jurisdictional runoff management programs to achieve improvements in the quality of discharges from the MS4s and receiving waters.

1. Watershed Management Areas

The Copermittees, in conjunction with a Stakeholder Advisory Group, must develop a Water Quality Improvement Plan for each of the Watershed Management Areas in Table B-1. The Stakeholder Advisory Group will consist of at least one representative of an environmental group with knowledge of the watershed, one independent engineer, hydrologist, geologist, soil specialist or other scientist, and a regional board staff member. The Stakeholder Advisory Group members will be selected by regional board staff after an application process. A total of ten Water Quality Improvement Plans must be developed for the San Diego Region.

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
San Juan (901.00)	South Orange County	- Aliso Creek - San Juan Creek - San Mateo Creek - Pacific Ocean - Heisler Park ASBS	- City of Aliso Viejo[1] - City of Dana Point[1] - City of Laguna Beach[1] - City of Laguna Hills[1] - City of Laguna Niguel[1] - City of Laguna Woods[1] - City of Lake Forest[1] - City of Mission Viejo[1] - City of Rancho Santa Margarita[1] - City of San Clemente[1] - City of San Juan Capistrano[1] - County of Orange[1] - Orange County Flood Control District[1]
Santa Margarita (902.00)	Santa Margarita River	- Murrieta Creek - Temecula Creek - Santa Margarita River - Santa Margarita Lagoon - Pacific Ocean	- City of Murrieta[2] - City of Temecula[2] - City of Wildomar[2] - County of Riverside[2] - County of San Diego[3] - Riverside County Flood Control and Water Conservation District[2]
San Luis Rey (903.00)	San Luis Rey River	- San Luis Rey River - San Luis Rey Estuary - Pacific Ocean	- City of Oceanside - City of Vista - County of San Diego

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
Carlsbad (904.00)	Carlsbad	- Loma Alta Slough - Buena Vista Lagoon - Agua Hedionda Lagoon - Batiquitos Lagoon - San Elijo Lagoon - Pacific Ocean	- City of Carlsbad - City of Encinitas - City of Escondido - City of Oceanside - City of San Marcos - City of Solana Beach - City of Vista - County of San Diego
San Dieguito (905.00)	San Dieguito River	- San Dieguito River - San Dieguito Lagoon - Pacific Ocean	- City of Del Mar - City of Escondido - City of Poway - City of San Diego - City of Solana Beach - County of San Diego
Penasquitos (906.00)	Penasquitos	- Los Penasquitos Lagoon - Pacific Ocean	- City of Del Mar - City of Poway - City of San Diego - County of San Diego
	Mission Bay	- Mission Bay - Pacific Ocean - San Diego Marine Life Refuge ASBS	- City of San Diego
San Diego (907.00)	San Diego River	- San Diego River - Pacific Ocean	- City of El Cajon - City of La Mesa - City of San Diego - City of Santee - County of San Diego
Pueblo San Diego (908.00) Sweetwater (909.00) Otay (910.00)	San Diego Bay	- Sweetwater River - Otay River - San Diego Bay - Pacific Ocean	- City of Chula Vista - City of Coronado - City of Imperial Beach - City of La Mesa - City of Lemon Grove - City of National City - City of San Diego - County of San Diego - San Diego County Regional Airport Authority - San Diego Unified Port District
Tijuana (911.00)	Tijuana River	- Tijuana River - Tijuana Estuary - Pacific Ocean	- City of Imperial Beach - City of San Diego - County of San Diego

Notes:
1. The Orange County Copermittees will be covered under this Order after expiration of Order No. R9-2009-0002, or earlier if the Orange County Copermittees meet the conditions in Provision F.6.
2. The Riverside County Copermittees will be covered under this Order after expiration of Order No. R9-2010-0016, or earlier if the Riverside County Copermittees meet the conditions in Provision F.6.
3. The County of San Diego is required to implement the requirements of Provision B for its jurisdiction within the Santa Margarita River Watershed Management Area until the Riverside County Copermittees have been notified of coverage under this Order.

2. Priority Water Quality Conditions

The Copermittees must identify the water quality priorities within each Watershed Management Area that will be addressed by the Water Quality Improvement Plan. Where appropriate, Watershed Management Areas may be separated into subwatersheds to focus water quality prioritization and jurisdictional runoff management program implementation efforts by receiving water.

a. Assessment of Receiving Water Conditions

The Copermittees must consider the following, at a minimum, to identify water quality priorities based on impacts of MS4 discharges on receiving water beneficial uses:

(1) Receiving waters listed as impaired on the CWA Section 303(d) List of Water Quality Limited Segments (303(d) List);

(2) TMDLs adopted and under development by the San Diego Water Board;

(3) Receiving waters recognized as sensitive or highly valued by the Copermittees, including estuaries designated under the National Estuary Program under CWA section 320, wetlands defined by the State or U.S. Fish and Wildlife Service's National Wetlands Inventory as wetlands, and receiving waters identified as ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (Attachment A);

(4) The receiving water limitations of Provision A.2;

(5) Known historical versus current physical, chemical, and biological water quality conditions;

(6) Available, relevant, and ~~appropriately~~ collected and analyzed using the latest Standard Methods of Water and Waste Water Analysis physical, chemical, and biological receiving water monitoring data, including, but not limited to, data describing:

(a) Chemical constituents,

(b) Water quality parameters (i.e. pH, temperature, conductivity, etc.),

(c) Toxicity Identification Evaluations for both receiving water column and sediment,

(d) Trash impacts,

(e) Bioassessments, and

(f) Physical habitat;

(7) Available evidence of erosional impacts in receiving waters due to accelerated flows (i.e. hydromodification);

(8) Available evidence of adverse impacts to the chemical, physical, and biological integrity of receiving waters; and

(9) The potential improvements in the overall condition of the Watershed Management Area that can be achieved.

b. ASSESSMENT OF IMPACTS FROM MS4 DISCHARGES

The Copermittees must consider the following, at a minimum, to identify the potential impacts to receiving waters that may be caused or contributed to by discharges from the Copermittees' MS4s:

(1) The discharge prohibitions of Provision A.1 and effluent limitations of Provision A.3; and

(2) Available, relevant, and appropriately collected and analyzed storm water and non-storm water monitoring data from the Copermittees' MS4 outfalls;

(3) Locations of each Copermittee's MS4 outfalls that discharge to receiving waters;

(4) Locations of MS4 outfalls that are known to persistently discharge non-storm water to receiving waters likely causing or contributing to impacts on receiving water beneficial uses;

(5) Locations of MS4 outfalls that are known to discharge pollutants in storm water causing or contributing to impacts on receiving water beneficial uses; and

(6) The potential improvements in the quality of discharges from the MS4 that can be achieved.

c. IDENTIFICATION OF PRIORITY WATER QUALITY CONDITIONS

(1) The Copermittees must use the information gathered for Provisions B.2.a and B.2.b to develop a list of priority water quality conditions as pollutants, stressors and/or receiving water conditions that are the highest threat to receiving water quality or that most adversely affect the physical, chemical, and biological integrity of receiving waters. The list must include the following information for each priority water quality condition:

(a) The beneficial use(s) associated with the priority water quality condition;

(b) The geographic extent of the priority water quality condition within the Watershed Management Area, if known;

(c) The temporal extent of the priority water quality condition (e.g., dry weather and/or wet weather);

(d) The Copermittees with MS4s discharges that may cause or contribute to the priority water quality condition; and

(e) An assessment of the adequacy of and data gaps in the monitoring data to characterize the conditions causing or contributing to the priority water quality condition, including a consideration of spatial and temporal variation.

(2) The Copermittees must identify the highest priority water quality conditions to be addressed by the Water Quality Improvement Plan, and provide a rationale for selecting a subset of the water quality conditions identified pursuant to Provision B.2.c.(1) as the highest priorities.

d. IDENTIFICATION OF MS4 SOURCES OF POLLUTANTS AND/OR STRESSORS

The Copermittees must identify and prioritize known and suspected sources of storm water and non-storm water pollutants and/or other stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c. The identification of known and suspected sources of pollutants and/or stressors that cause or contribute to the highest priority water quality conditions as identified for Provision B.2.c must consider the following:

(1) Pollutant generating facilities, areas, and/or activities within the Watershed Management Area, including:

(a) Each Copermittee's inventory of construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas,

(b) Publicly owned parks and/or recreational areas,

(c) Open space areas,

(d) All currently operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste, and

(e) Areas not within the Copermittees' jurisdictions (e.g., Phase II MS4s, tribal lands, state lands, federal lands) that are known or suspected to be

discharging to the Copermittees' MS4s;

(2) Locations of the Copermittees' MS4s, including the following:

(a) All MS4 outfalls that discharge to receiving waters, and

(b) Locations of major structural controls for storm water and non-storm water (e.g., retention basins, detention basins, major infiltration devices, etc.);

(3) Other known and suspected sources of non-storm water or pollutants in storm water discharges to receiving waters within the Watershed Management Area, including the following:

(a) Other MS4 outfalls (e.g., Phase II Municipal and Caltrans),

(b) Other NPDES permitted discharges,

(c) Any other discharges that may be considered point sources (e.g., private outfalls), and

(d) Any other discharges that may be considered non-point sources (e.g., agriculture, wildlife or other natural sources);

(4) Review of available data, including but not limited to:

(a) Findings from the Copermittees' illicit discharge detection and elimination programs,

(b) Findings from the Copermittees' MS4 outfall discharge monitoring,

(c) Findings from the Copermittees' receiving water monitoring,

(d) Findings from the Copermittees' MS4 outfall discharge and receiving water assessments, and

(e) Other available, relevant, and appropriately collected data, information, or studies related to pollutant sources and/or stressors that contribute to the highest priority water quality conditions as identified for Provision B.2.c.

(5) The adequacy of the available data to identify and prioritize sources and/or stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c.

e. NUMERIC GOALS AND SCHEDULES

The Copermittees must develop and incorporate interim and final numeric goals[6] and schedules into the Water Quality Improvement Plan. Numeric goals must be used to support Water Quality Improvement Plan implementation and measure progress towards addressing the highest priority water quality conditions identified under Provision B.2.c. Each Copermittee within a watershed will be held jointly and severally responsible for ensuring that the numeric goals and schedules are achieved. When establishing numeric goals and corresponding schedules, the Copermittees must consider the following:

(1) Final numeric goals must be based on measureable criteria or indicators, to be achieved in the receiving waters and/or MS4 discharges for the highest priority water quality conditions which will be capable of demonstrating the achievement of the restoration and/or protection of water quality standards in receiving waters;

(2) Interim numeric goals must be based on measureable criteria or indicators capable of demonstrating incremental progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges; and

(3) Schedules must be adequate for measuring progress toward achieving the interim and final numeric goals required for Provisions B.2.e.(1) and B.2.e.(2). Schedules must incorporate the following:

(a) Interim dates for achieving the interim numeric goals,

(b) Compliance schedules for any applicable TMDLs in Attachment E to this Order,

(c) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A),

(d) Achievement of the final numeric goals in the receiving waters and/or MS4 discharges for the highest water quality priorities must be as soon as possible, and

(e) Final dates for achieving the final numeric goals must not initially extend more than 10 years beyond the effective date of this Order, unless a

[6] Interim and final numeric goals may take a variety of forms such as TMDL established WQBELs, action levels, pollutant concentration, load reductions, number of impaired water bodies delisted from the List of Water Quality Impaired Segments, Index of Biotic Integrity (IBI) scores, or other appropriate metrics. Interim and final numeric goals are not necessarily limited to one criterion or indicator, but may include multiple criteria and/or indicators. Except for TMDL established WQBELs, interim and final numeric goals and corresponding schedules may be revised through the adaptive management process under Provision B.5.

longer period of time is authorized by the San Diego Water Board Executive Officer or the schedule includes an applicable TMDL in Attachment E to this Order.

3. Water Quality Improvement Strategies and Schedules

The Copermittees must develop specific water quality improvement strategies to address the highest priority water quality conditions identified within a Watershed Management Area. The water quality improvement strategies must address the highest priority water quality conditions by preventing or eliminating non-storm water discharges to and from the MS4, reducing pollutants in storm water discharges from the MS4 to the MEP, and restoring and/or protecting the water quality standards of receiving waters.

a. WATER QUALITY IMPROVEMENT STRATEGIES

The Copermittees must identify and prioritize water quality improvement strategies based on their likely effectiveness and efficiency, and implement strategies to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, improve the physical, chemical, and biological receiving water conditions, and achieve the interim and final numeric goals in accordance with the schedules required for Provision B.2.e.(3). The following water quality improvement strategies must be included and described in the Water Quality Improvement Plan:

(1) Specific strategies and/or activities that ~~may~~ will be implemented by one or more Copermittees within their jurisdictions through the jurisdictional runoff management programs that will address the highest priority water quality conditions within the Watershed Management Area, in accordance with the following requirements:

(a) Strategies and/or activities must, at a minimum, be described for each jurisdictional runoff management program component where strategies to address the highest priority water quality conditions are required under Provision E;

(b) The Water Quality Improvement Plan must describe which Copermittees will implement which strategies ~~the circumstances or conditions when and where the strategies or/activities should be or will be implemented, but specific details about how each Copermittee will implement the strategies and/or activities within its jurisdiction are not required~~; and

(c) Descriptions of strategies and/or activities must include any monitoring, information collection, special studies, and/or data analysis that is necessary to assess the effectiveness of the strategy and/or activity toward addressing the highest priority water quality conditions.

~~(c)~~

(2) Additional strategies and/or activities that may be implemented within the Watershed Management Area on a jurisdictional, sub-watershed, or watershed scale by one or more Copermittees, not specifically required under Provision E, which are designed to achieve the interim and final numeric goals identified in Provisions B.2.e.(1) and B.2.e.(2);

b. IMPLEMENTATION SCHEDULES

(1) The Copermittees must develop schedules for implementing the water quality improvement strategies identified under Provision B.3.a to achieve the interim and final numeric goals identified under Provision B.2.e.(1) and B.2.e.(2). Schedules must be developed for both the water quality improvement strategies implemented by each Copermittee within its jurisdiction and for strategies that the Copermittees choose to implement on a collaborative basis.

(2) The Copermittees must incorporate the implementation compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

4. Water Quality Improvement Monitoring and Assessment Program

a. The Copermittees in each Watershed Management Area must develop and incorporate an integrated monitoring and assessment program into the Water Quality Improvement Plan that assesses: 1) the progress toward achieving the numeric goals and schedules, 2) the progress toward addressing the highest priority water quality conditions for each Watershed Management Area, and 3) each Copermittee's overall efforts to implement the Water Quality Improvement Plan.

b. The monitoring and assessment program must incorporate the monitoring and assessment requirements of Provision D, which may allow the Copermittees to modify the program to be consistent with and focus on the highest priority water quality conditions for each Watershed Management Area.

c. For Watershed Management Areas with applicable TMDLs, the monitoring and assessment program must incorporate the specific monitoring and assessment requirements of Attachment E.

d. For Watershed Management Areas with any ASBS, the water quality monitoring and assessment program must incorporate the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

5. Iterative Approach and Adaptive Management Process

The Copermittees in each Watershed Management Area must implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a, and must include the following:

a. RE-EVALUATION OF PRIORITY WATER QUALITY CONDITIONS

The priority water quality conditions, and numeric goals and corresponding schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.2.c and B.2.e, may be re-evaluated by the Copermittees as needed during the term of this Order as part of the Annual Report. Re-evaluation and recommendations for modifications to the priority water quality conditions, and numeric goals and corresponding schedules must be provided in the Report of Waste Discharge, and must consider the following:

(1) Achieving the outcome of improved water quality in MS4 discharges and receiving waters through implementation of the water quality improvement strategies identified in the Water Quality Improvement Plan;

(2) Progress toward achieving interim and final numeric goals in receiving waters and/or MS4 discharges for the highest priority water quality conditions in the Watershed Management Area,

(3) Progress toward achieving outcomes according to established schedules;

(4) New information developed when the requirements of Provisions B.2.a-c have been re-evaluated;

(5) New policies or regulations that may affect identified numeric goals;

(6) Spatial and temporal accuracy of monitoring data collected to inform prioritization of water quality conditions and implementation strategies to address the highest priority water quality conditions;

(7) Availability of new information and data from sources other than the jurisdictional runoff management programs within the Watershed Management Area that informs the effectiveness of the actions implemented by the Copermittees;

(8) San Diego Water Board recommendations; and

(9) Recommendations for modifications solicited through a public participation process.

b. ADAPTATION OF STRATEGIES AND SCHEDULES

The water quality improvement strategies and schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.3, must be re-evaluated and

adapted as new information becomes available to result in more effective and efficient measures to achieve the numeric goals established pursuant to Provision B.2.e. Re-evaluation of and modifications to the water quality improvement strategies must be provided in the Annual Report, and must consider the following:

(1) Modifications to the priority water quality conditions, and numeric goals and corresponding schedules based on Provision B.5.a;

(2) Measurable or demonstrable reductions of non-storm water discharges to and from each Copermittee's MS4;

(3) Measurable or demonstrable reductions of pollutants in storm water discharges from each Copermittee's MS4 to the MEP;

(4) New information developed when the requirements of Provisions B.2.b and B.2.d have been re-evaluated;

(5) Efficiency in implementing the Water Quality Improvement Plan;

(6) San Diego Water Board recommendations; and

(7) Recommendations for modifications solicited through a public participation process.

c. ADAPTATION OF MONITORING AND ASSESSMENT PROGRAM

The water quality improvement monitoring and assessment program, included in the Water Quality Improvement Plan pursuant to Provisions B.4, must be re-evaluated and adapted when new information becomes available. Re-evaluation and recommendations for modifications to the monitoring and assessment program, pursuant to the requirements of Provision D, may be provided in the Annual Report, but must be provided in the Report of Waste Discharge.

6. Water Quality Improvement Plan Submittal, Updates, and Implementation

a. The Copermittees must submit the Water Quality Improvement Plans in accordance with the requirements of Provision F.1.

b. The Copermittees must submit proposed updates to the Water Quality Improvement Plan for acceptance by the San Diego Water Board Executive Officer in accordance with the requirements of Provision F.2.c.

c. The Copermittees must commence with implementation of the Water Quality Improvement Plans immediately after acceptance by the San Diego Water Board, in accordance with the schedules, or subsequently updated schedules, within the Water Quality Improvement Plan.

C. ACTION LEVELS

The purpose of this provision is for the Copermittees to incorporate numeric action levels in the Water Quality Improvement Plans. The goal of the action levels is to guide Water Quality Improvement Plan implementation efforts and measure progress towards the protection of water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through monitoring and assessing the quality of the MS4 discharges during the implementation of the Water Quality Improvement Plans.

1. Non-Storm Water Action Levels[7]

The Copermittees must develop and incorporate numeric non-storm water action levels (NALs) into the Water Quality Improvement Plan to: 1) support the development and prioritization of water quality improvement strategies for addressing non-storm water discharges to and from the MS4s, 2) assess the effectiveness of the water quality improvement strategies toward addressing MS4 non-storm water discharges, required pursuant to Provision D.4.b.(1), and 3) support the detection and elimination of non-storm water and illicit discharges to and from the MS4, required pursuant to Provision E.2.[8]

a. The following NALs must be incorporated:

(1) Non-Storm Water Discharges from MS4s to Ocean Surf Zone

Table C-1. Non-Storm Water Action Levels for Discharges from MS4s to Ocean Surf Zone

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Total Coliform	MPN/100 ml	1,000	-	10,000/1,000[1]	OP
Fecal Coliform	MPN/100 ml	200[2]	-	400	OP
Enterococci	MPN/100 ml	35	-	104[3]	OP

Abbreviations/Acronyms
AMAL – average monthly action level
MDAL – maximum daily action level
OP – Ocean Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Total coliform density NAL is 1,000 MPN/100 ml when the fecal/total coliform ratio exceeds 0.1.
2. Fecal coliform density NAL is 200 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas."

[7] NALs are not considered by the San Diego Water Board to be enforceable limitations.
[8] The Copermittees may utilize NALs or other benchmarks currently established by the Copermittees as interim NALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

(2) Non-Storm Water Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Table C-2. Non-Storm Water Action Levels for Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Turbidity	NTU	75	-	225	OP
pH	Units	Within limit of 6.0 to 9.0 at all times			OP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	35	-	104[3]	BP
Priority Pollutants	ug/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
OP – Ocean Plan water quality objective
NTU – Nephelometric Turbidity Units
ug/L – micrograms per liter
MDAL – maximum daily action level
BP – Basin Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas" and is not applicable to waterbodies that are not designated with the water contact recreation (REC-1) beneficial use.

Table C-3. Non-Storm Water Action Levels for Priority Pollutants

Parameter	Units	Freshwater (CTR)		Saltwater (CTR)	
		MDAL	AMAL	MDAL	AMAL
Cadmium	ug/L	**	**	16	8
Copper	ug/L	*	*	5.8	2.9
Chromium III	ug/L	**	**	-	-
Chromium VI	ug/L	16	8.1	83	41
Lead	ug/L	*	*	14	2.9
Nickel	ug/L	**	**	14	6.8
Silver	ug/L	*	*	2.2	1.1
Zinc	ug/L	*	*	95	47

Abbreviations/Acronyms:
CTR – California Toxic Rule
AMAL – average monthly action level
ug/L – micrograms per liter
MDAL – maximum daily action level

Notes:
* Action levels developed on a case-by-case basis (see below)
** Action levels developed on a case-by-case basis (see below), but calculated criteria are not to exceed Maximum Contaminant Levels (MCLs) under the California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64431

The Cadmium, Copper, Chromium (III), Lead, Nickel, Silver and Zinc NALs for MS4 discharges to freshwater receiving waters will be developed on a case-by-case basis because the freshwater criteria are based on site-specific water quality data (receiving water hardness). For these priority pollutants, the following equations (40 CFR 131.38.b.2) will be required:

Cadmium (Total Recoverable) = exp(0.7852[ln(hardness)] - 2.715)
Chromium III (Total Recoverable) = exp(0.8190[ln(hardness)] + 0.6848)
Copper (Total Recoverable) = exp(0.8545[ln(hardness)] - 1.702)
Lead (Total Recoverable) = exp(1.273[ln(hardness)] - 4.705)
Nickel (Total Recoverable) = exp(.8460[ln(hardness)] + 0.0584)
Silver (Total Recoverable) = exp(1.72[ln(hardness)] - 6.52)
Zinc (Total Recoverable) = exp(0.8473[ln(hardness)] + 0.884)

(3) Non-Storm Water Discharges from MS4s to Inland Surface Waters

Table C-4. Non-Storm Water Action Levels for Discharges from MS4s to Inland Surface Waters

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Dissolved Oxygen	mg/L	Not less than 5.0 in WARM waters and not less than 6.0 in COLD waters			BP
Turbidity	NTU	-	20	See MDAL	BP
pH	Units	Within limit of 6.5 to 8.5 at all times			BP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	33	-	61[3]	BP
Total Nitrogen	mg/L	-	1.0	See MDAL	BP
Total Phosphorus	mg/L	-	0.1	See MDAL	BP
MBAS	mg/L	-	0.5	See MDAL	BP
Iron	mg/L	-	0.3	See MDAL	BP
Manganese	mg/L	-	0.05	See MDAL	BP
Priority Pollutants	ug/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
BP – Basin Plan water quality objective
COLD – cold freshwater habitat beneficial use
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
MDAL – maximum daily action level
WARM – warm freshwater habitat beneficial use
MBAS – Methylene Blue Active Substances
MPN/100 ml – most probable number per 100 milliliters
ug/L – micrograms per liter

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for freshwater "designated beach areas" and is not applicable to waterbodies that are not designated with the water contact recreation (REC-1) beneficial use.

b. If not identified in Provision C.1.a, NALs must be identified, developed and incorporated in the Water Quality Improvement Plan for any pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in waters of the state associated with the highest priority water quality conditions related to non-storm water discharges from the MS4s. NALs must be based on:

(1) Applicable water quality standards which may be dependent upon site-specific or receiving water-specific conditions or assumptions to be identified by the Copermittees; or

(2) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the NALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary NALs specific to the Watershed Management Area at levels greater than the NALs required by Provisions C.1.a and C.1.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for addressing non-storm water discharges to and from the MS4s, as well as the detection and

elimination of non-storm water and illicit discharges to and from the MS4. The secondary NALs may be developed using an approach acceptable to the San Diego Water Board.

d. Dry weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.b may be utilized to develop or revise NALs based on watershed-specific data, subject to San Diego Water Board Executive Officer approval.

2. Storm Water Action Levels[9]

The Copermittees must develop and incorporate numeric storm water action levels (SALs) in the Water Quality Improvement Plans to: 1) support the development and prioritization of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s, and 2) assess the effectiveness of the water quality improvement strategies toward reducing pollutants in storm water discharges, required pursuant to Provision D.4.b.(2).[10]

a. The following SALs for discharges of storm water from the MS4 must be incorporated:

Table C-5. Storm Water Action Levels for Discharges from MS4s to Receiving Waters

Parameter	Units	Action Level
Turbidity	NTU	126
Nitrate & Nitrite (Total)	mg/L	2.6
Phosphorus (Total P)	mg/L	1.46
Cadmium (Total Cd)*	µg/L	3.0
Copper (Total Cu)*	µg/L	127
Lead (Total Pb)*	µg/L	250
Zinc (Total Zn)*	µg/L	976

Abbreviations/Acronyms:
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
ug/L – micrograms per liter

Notes:
* The sampling must include a measure of receiving water hardness at each MS4 outfall. If a total metal concentration exceeds the corresponding metals SAL in Table C-5, that concentration must be compared to the California Toxics Rule criteria and the USEPA 1-hour maximum concentration for the detected level of receiving water hardness associated with that sample. If it is determined that the sample's total metal concentration for that specific metal exceeds that SAL, but does not exceed the applicable USEPA 1-hour maximum concentration criterion for the measured level of hardness, then the sample result will not be considered above the SAL for that measurement.

[9] SALs are not considered by the San Diego Water Board to be enforceable limitations.
[10] The Copermittees may utilize SALs or other benchmarks currently established by the Copermittees as interim SALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

b. If not identified in Provision C.2.a, SALs must be identified, developed and incorporated in the Water Quality Improvement Plan for pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in waters of the state associated with the highest water quality priorities related to storm water discharges from the MS4s. SALs must be based on:

(1) Federal and State water quality guidance and/or water quality standards; and

(2) Site-specific or receiving water-specific conditions; or

(3) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the SALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary SALs specific to the Watershed Management Area at levels greater than the SALs required by Provisions C.2.a and C.2.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s. The secondary SALs may be developed based on the approaches recommended by the State Water Board's Storm Water Panel[11] or using an approach acceptable to the San Diego Water Board.

d. Wet weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.c may be used to develop or revise SALs based upon watershed-specific data, subject to San Diego Water Board Executive Officer approval.

[11] Storm Water Panel Recommendations to the California State Water Resources Control Board: The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities (June 2006)

D. MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS

The purpose of this provision is for the Copermittees to monitor and assess the impact on the chemical, physical, and biological conditions of receiving waters caused by discharges from the Copermittees' MS4s under wet weather and dry weather conditions. The goal of the monitoring and assessment program is to inform the Copermittees about the nexus between the health of receiving waters and the water quality condition of the discharges from their MS4s. This goal will be accomplished through monitoring and assessing the conditions of the receiving waters, discharges from the MS4s, pollutant sources and/or stressors, and effectiveness of the water quality improvement strategies implemented as part of the Water Quality Improvement Plans.

1. Receiving Water Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the condition of the receiving waters in each Watershed Management Area during dry weather and wet weather. Following acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct long-term receiving water monitoring during implementation of the Water Quality Improvement Plan to assess the long term trends and determine if conditions in receiving waters are improving. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following receiving water monitoring procedures:

a. TRANSITIONAL RECEIVING WATER MONITORING

Until the monitoring requirements of Provisions D.1.b-e are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following receiving water monitoring in the Watershed Management Area:

(1) Continue the receiving water monitoring programs required in Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016;

(2) Continue the monitoring in the Hydromodification Management Plans approved by the San Diego Water Board;

(3) Participate in the following regional receiving water monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring,

(b) Southern California Bight Regional Monitoring, and

(c) Sediment Quality Monitoring;

(4) Implement the monitoring programs developed as part of any implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) for the TMDLs in Attachment E to this Order; and

(5) For Watershed Management Areas with ASBS, implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

b. LONG-TERM RECEIVING WATER MONITORING STATIONS

The Copermittees must select at least one long-term receiving water monitoring station from among the existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees to be representative of the receiving water quality in the Watershed Management Area. Additional long-term receiving water monitoring stations must be selected where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

c. DRY WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three dry weather monitoring events at each of the long-term receiving water monitoring stations. At least one monitoring event must be conducted during the dry season (May 1 – September 30) and at least one monitoring event must be conducted during a dry weather period during the wet season (October 1 – April 30), after the first wet weather event of the season, with an antecedent dry period of at least 72 hours following a storm event producing measureable rainfall of greater than 0.1 inch.

(1) Dry Weather Receiving Water Field Observations

For each dry weather monitoring event, the Copermittees must record field observations consistent with Table D-1 at each long-term receiving water monitoring station.

Table D-1. Field Observations for Receiving Water Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) • Station description (i.e. deposits or stains, vegetation condition, structural condition, and observable biology) • Presence and assessment of trash in and around station

(2) Dry Weather Receiving Water Field Monitoring

For each dry weather monitoring event, if conditions allow the collection of the data, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

Table D-2. Field Monitoring Parameters for Receiving Water Monitoring Stations

Parameters
• pH • Temperature • Specific conductivity • Dissolved oxygen • Turbidity

(3) Dry Weather Receiving Water Analytical Monitoring

For each dry weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable NAL constituents, and

(v) Constituents listed in Table D-3.

Table D-3. Analytical Monitoring Constituents for Receiving Water Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Pesticides	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Mercury • Nickel • Selenium • Thallium • Zinc	• Organophosphate Pesticides • Pyrethroid Pesticides	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(4) Dry Weather Receiving Water Toxicity Monitoring

For each dry weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for toxicity in accordance with Table D-4:

Table D-4. Dry Weather Toxicity Testing for Receiving Water Monitoring Stations

Freshwater Organism	Test Approach	USEPA Protocol[2]
Pimephales promelas	1 acute 1 chronic[1]	EPA-821-R-02-012
Hyalella Azteca	1 acute 1 chronic[1]	EPA-821-R-02-012
Psuedokirchneriella subcapitata	1 acute 1 chronic[1]	EPA-821-R-02-013

Notes:
1. Chronic toxicity testing is not required at receiving water monitoring stations located at mass loading stations if the channel flows are diverted year-round during dry weather conditions to the sanitary sewer for treatment.
2. USEPA protocols must be utilized for toxicity testing unless alternate toxicity testing protocols have been approved by the San Diego Water Board.

(5) Dry Weather Receiving Water Bioassessment Monitoring

Bioassessment monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must conduct bioassessment monitoring during at least one dry weather monitoring event at each long-term receiving water monitoring station as follows:

(a) The following bioassessment samples and measurements must be collected:

(i) Macroinvertebrate samples must be collected in accordance with the "Reachwide Benthos (Multihabitat) Procedure" in the most current Surface Water Ambient Monitoring Program (SWAMP) Bioassessment Standard Operating Procedures (SOP), and amendments, as applicable;[12]

(ii) The "Full" suite of physical habitat characterization measurements must be collected in accordance with the most current SWAMP Bioassessment SOP, and as summarized in the SWAMP Stream Habitat Characterization Form – Full Version;[13] and

(iii) Freshwater algae samples must be collected in accordance with the SWAMP Standard Operating Procedures for Collecting Algae

[12] Ode, P.R.. 2007. Standard operating procedures for collecting macroinvertebrate samples and associated physical and chemical data for ambient bioassessments in California. California State Water Resources Control Board Surface Water Ambient Monitoring Program (SWAMP) Bioassessment SOP 001. http://www.swrcb.ca.gov/water_issues/programs/swamp/tools.shtml#monitoring
[13] Available at: http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/reports/fieldforms_fullversion052908.pdf

Samples.[14] Analysis of samples must include algal taxonomic composition (diatoms and soft algae) and algal biomass.

(b) The bioassessment samples, measurements, and appropriate water chemistry data must be used to calculate the following:

(i) An Index of Biological Integrity (IBI) for macroinvertebrates for each monitoring station where bioassessment monitoring was conducted, based on the most current calculation method;[15] and

(ii) An IBI for algae for each monitoring station where bioassessment monitoring was conducted, when a calculation method is developed.[16]

(c) In lieu of the requirements of Provision D.1.c.(5)(a), the Copermittees may conduct the bioassessment monitoring in accordance with the "Triad" assessment approach[17] to calculate the IBIs required for Provision D.1.c.(5)(b). The Copermittees must conduct sampling, analysis, and reporting of specified in-stream biological and habitat data according to the protocols specified in the SCCWRP Technical Report No. 539, or subsequent protocols, if developed.

(6) Dry Weather Receiving Water Hydromodification Monitoring

In addition to the hydromodification monitoring conducted as part of the Copermittees' Hydromodification Management Plans, hydromodification monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must collect the following hydromodification monitoring observations and measurements within an appropriate domain of analysis during at least one dry weather monitoring event for each long-term receiving water monitoring station:

(a) Channel conditions, including:

(i) Channel dimensions,

[14] Fetscher et al. 2009. Standard Operating Procedures for Collecting Stream Algae Samples and Associated Physical Habitat and Chemical Data for Ambient Bioassessments in California.
[15] The most current calculation method at the time the Order was adopted is outlined in "A Quantitative Tool for Assessing the Integrity of Southern California Coastal Streams" (Ode, et al. 2005. Environmental Management. Vol. 35, No. 1, pp. 1-13). If an updated or new calculation method is developed, either both (i.e. current and updated/new) methods must be used, or historical IBIs must be recalculated with the updated or new calculation method.
[16] When a calculation method is developed, IBIs must be calculated for all available and appropriate historical data.
[17] Stormwater Monitoring Coalition Model Monitoring Technical Committee, 2004. Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California. Technical Report #419. August 2004.

(ii) Hydrologic and geomorphic conditions, and

(iii) Presence and condition of vegetation and habitat;

(b) Location of discharge points;

(c) Habitat integrity;

(d) Photo documentation of existing erosion and habitat impacts, with location (i.e. latitude and longitude coordinates) where photos were taken;

(e) Measurement or estimate of dimensions of any existing channel bed or bank eroded areas, including length, width, and depth of any incisions; and

(f) Known or suspected cause(s) of existing downstream erosion or habitat impact, including flow, soil, slope, and vegetation conditions, as well as upstream land uses and contributing new and existing development.

d. WET WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three wet weather monitoring events at each long-term receiving water monitoring station. At least one wet weather monitoring event must be conducted during the first wet weather event of the wet season (October 1 – April 30), and at least one wet weather monitoring event during a wet weather event that occurs after February 1.

(1) Wet Weather Receiving Water Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each long-term receiving water monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event;

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(d) Presence and assessment of trash in and around station.

(2) Wet Weather Receiving Water Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

(3) Wet Weather Receiving Water Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) Constituents listed in Table D-3.

(4) Wet Weather Receiving Water Toxicity Monitoring

For each wet weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for toxicity in accordance with Table D-5:

Table D-5. Wet Weather Toxicity Testing for Receiving Water Monitoring Stations

Freshwater Organism	Test Approach	USEPA Protocol[1]
Pimephales promelas	1 acute	EPA-821-R-02-012
Hyalella Azteca	1 acute	EPA-821-R-02-012
Psuedokirchneriella subcapitata	1 acute	EPA-821-R-02-013

Notes:
1. USEPA protocols must be utilized for toxicity testing unless alternate toxicity testing protocols have been approved by the San Diego Water Board.

e. Other Receiving Water Monitoring Requirements

(1) Regional Monitoring

The Copermittees must participate in the following regional receiving waters monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring; and

(b) Southern California Bight Regional Monitoring.

(2) Sediment Quality Monitoring

The Copermittees must perform sediment monitoring to assess compliance with sediment quality receiving water limits applicable to MS4 discharges to enclosed bays and estuaries. The monitoring may be performed either by individual or multiple Copermittees to assess compliance with receiving water limits, or through participation in a water body monitoring coalition. The Copermittees must identify sediment sampling stations that are spatially representative of the sediment within the water body segment or region of interest. Sediment quality monitoring must be conducted in conformance with the monitoring requirements set forth in the State Water Board Sediment Quality Control Plan.

(3) ASBS Monitoring

For Watershed Management Areas with ASBS, the Copermittees must implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

f. ALTERNATIVE WATERSHED MONITORING REQUIREMENTS

The San Diego Water Board may direct the Copermittees to participate in an effort to develop alternative watershed monitoring with other regulated entities, other interested parties, and the San Diego Water Board to refine, coordinate, and implement regional monitoring and assessment programs to determine the status and trends of water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams.

2. MS4 Outfall Discharge Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the discharges from the MS4 outfalls in each Watershed Management Area during dry weather and wet weather. Following acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct MS4 outfall discharge monitoring during implementation of the Water Quality Improvement Plan to assess the effectiveness of their jurisdictional runoff management programs toward effectively prohibiting non-storm water discharges and reducing pollutants in storm water discharges to and from their MS4s. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following MS4 outfall monitoring procedures:

a. TRANSITIONAL MS4 OUTFALL DISCHARGE MONITORING

Until the monitoring requirements of Provisions D.2.b-c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following MS4 outfall discharge monitoring in the Watershed Management Area:

(1) MS4 Outfall Discharge Monitoring Station Inventory

Each Copermittee must identify all major MS4 outfalls that discharge directly to receiving waters within its jurisdiction and geo-locate those outfalls on a map of the MS4 pursuant to Provision E.2.b.(1). This information must be compiled into a MS4 outfall discharge monitoring station inventory, and must include the following information:

(a) Latitude and longitude of MS4 outfall point of discharge;

(b) Watershed Management Area;

(c) Hydrologic subarea;

(d) Outlet size;

(e) Accessibility (i.e. safety and without disturbance of critical habitat);

(f) Approximate drainage area; and

(g) Classification of whether the MS4 outfall is known to have persistent dry weather flows, transient dry weather flows, no dry weather flows, or unknown dry weather flows.

(2) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Until the monitoring requirements of Provision D.2.b are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, each Copermittee must perform dry weather MS4 outfall field screening monitoring to identify non-storm water and illicit discharges within its jurisdiction in accordance with Provision E.2.c, to determine which discharges are transient flows and which are persistent flows, and prioritize the dry weather MS4 discharges that will be investigated and eliminated in accordance with Provision E.2.d. Each Copermittee must conduct the following dry weather MS4 outfall discharge field screening monitoring within its jurisdiction:

(a) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Frequency

Each Copermittee must field screen the MS4 outfalls in its inventory developed pursuant to Provision D.2.a.(1) as follows:

(i) For Copermittees with less than 125 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 80 percent of the outfalls must be visually inspected two times per year during dry weather conditions.

(ii) For Copermittees with 125 major MS4 outfalls or more, but less than or equal to 500, that discharge to receiving waters within a Watershed Management Area all the outfalls must be visually inspected at least annually during dry weather conditions.

(iii) For Copermittees with more than 500 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 500 outfalls must be visually inspected at least annually

during dry weather conditions. Copermittees with more than 500 major MS4 outfalls within a Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(iv) For Copermittees with more than 500 major MS4 outfalls within its jurisdiction that are located in more than one Watershed Management Area, at least 500 major MS4 outfalls within its inventory must be visually inspected at least annually during dry weather conditions. Copermittees with more than 500 major MS4 outfalls in more than one Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(v) Inspections of major MS4 outfalls conducted in response to public reports and staff or contractor reports and notifications may count toward the required visual inspections of MS4 outfall discharge monitoring stations.

(b) Transitional Dry Weather MS4 Outfall Discharge Field Screening Visual Observations

(i) An antecedent dry period of at least 72 hours following any storm event producing measurable rainfall greater than 0.1 inch is required prior to conducting field screening visual observations during a field screening monitoring event.

(ii) During the field screening monitoring event, each Copermittee must record visual observations consistent with Table D-6 at each MS4 outfall discharge monitoring station inspected.

Table D-6. Field Screening Visual Observations for MS4 Outfall Discharge Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) - Flow source(s) suspected or identified from non-storm water source investigation - Flow source(s) eliminated during non-storm water source identification • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) - Known or suspected source(s) of pooled or ponded water • Station description (i.e. deposits or stains, vegetation condition, structural condition, observable biology) • Presence and assessment of trash in and around station • Evidence or signs of illicit connections or illegal dumping

(iii) Each Copermittee must implement the requirements of Provisions E.2.d.(2)(c)-(e) based on the field observations.

(iv) Each Copermittee must evaluate field observations together with existing information available from prior reports, inspections and monitoring results to determine whether any observed flowing, pooled, or ponded waters are likely to be transient or persistent flow.[18]

(c) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Records

Based upon the results of the transitional dry weather MS4 outfall discharge field screening monitoring conducted pursuant to Provisions D.2.a.(2)(a)-(b), each Copermittee must update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow.

(3) Transitional Wet Weather MS4 Outfall Discharge Monitoring

Until the monitoring requirements of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following

[18] Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(a) Transitional Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees must select at least five wet weather MS4 outfall discharge monitoring stations from the inventories developed pursuant to Provision D.2.a.(1) that are representative of storm water discharges from areas consisting primarily of residential, commercial, industrial, and typical mixed-use land uses present within the Watershed Management Area.

(b) Transitional Wet Weather MS4 Outfall Discharge Monitoring Frequency

Each wet weather MS4 outfall discharge monitoring station selected pursuant to Provision D.2.a.(3)(a) must be monitored twice during the wet season (October 1 – April 30). One wet weather monitoring event must be conducted during the first wet weather event of the wet season, and one wet weather monitoring event at least a month after the first wet weather event of the wet season.

(c) Transitional Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(i) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(ii) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(iii) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(iv) Presence and assessment of trash in and around station.

(d) Transitional Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(e) Transitional Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, and indicator bacteria;

(iv) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

[a] Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or
[b] Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or
[c] If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours;

(v) Only one analysis of the composite of aliquots is required;

(vi) The samples must be analyzed for the following constituents:

[a] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,
[b] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and
[c] Constituents listed in in Table D-7.

Table D-7. Analytical Monitoring Constituents for Wet Weather MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Nickel • Selenium • Thallium • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(f) Other Transitional Wet Weather MS4 Outfall Discharge Monitoring

The San Diego County Copermittees must continue the wet weather MS4 outfall monitoring program developed under Order No. R9-2007-0001, as approved by the San Diego Water Board, through its planned completion.

b. DRY WEATHER MS4 OUTFALL DISCHARGE MONITORING

Each Copermittee must perform dry weather MS4 outfall monitoring to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. Each Copermittee must conduct the following dry weather MS4 outfall discharge monitoring within its jurisdiction:

(1) Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Each Copermittee must continue to perform the dry weather MS4 outfall discharge field screening monitoring in accordance with the requirements of Provision D.2.a.(2). The Copermittee may adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of persistent flow non-storm water discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of visual inspections performed is equivalent to the number of visual inspections required under Provision D.2.a.(2)(a).

(2) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring

Each Copermittee must perform non-storm water persistent flow MS4 outfall discharge monitoring to determine which persistent non-storm water discharges contain concentrations of pollutants below NALs, and which persistent non-storm water discharges impact receiving water quality during dry weather. Each Copermittee must conduct the following non-storm water persistent flow MS4 outfall discharge monitoring within its jurisdiction:

(a) Prioritization of Non-Storm Water Persistent Flow MS4 Outfalls

Based upon the dry weather MS4 outfall discharge field screening monitoring records developed pursuant to Provision D.2.a.(2)(c), each Copermittee must identify and prioritize the MS4 outfalls with persistent flows based on the highest priority water quality conditions identified in the Water Quality Improvement Plan and any additional criteria developed by the Copermittee, which may include historical data and data from sources other than what the Copermittee collects.

(b) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring Frequency

(i) Based on the prioritization of major MS4 outfalls developed under Provision D.2.b.(2)(a), each Copermittee must identify, at a minimum, the 10 highest priority major MS4 outfalls with non-storm water persistent flows that the Copermittee will monitor within each Watershed Management Area within its jurisdiction. The location of the highest priority non-storm water persistent flow MS4 outfall monitoring stations must be identified on the map required pursuant to Provision E.2.b.(1).

(ii) Each of the highest priority non-storm water persistent flow MS4 outfall monitoring stations identified pursuant to Provision D.2.b.(2)(b)(i) must be monitored under dry weather conditions at least semi-annually until one of the following occurs:

[a] The non-storm water discharges have been effectively eliminated (i.e. no flowing, pooled, or ponded water) for three consecutive dry weather monitoring events; or

[b] The source(s) of the persistent flows has been identified as a category of non-storm water discharges that does not require an NPDES permit and does not have to be addressed as an illicit discharge because it was not identified as a source of pollutants (i.e. constituents in non-storm water discharge do not exceed NALs), and the persistent flow can be re-prioritized to a lower priority; or

[c] The constituents in the persistent flow non-storm water discharge do not exceed NALs, and the persistent flow can be re-prioritized to a lower priority; or

[d] The source(s) of the persistent flows has been identified as a non-storm water discharge authorized by a separate NPDES permit.

(iii) Where the criteria under Provision D.2.b.(2)(c)(ii) are not met, but the threat to water quality has been reduced by the Copermittee, the highest priority persistent flow MS4 outfall monitoring stations may be reprioritized accordingly for continued dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1).

(iv) Each Copermittee must document removal or re-prioritization of the highest priority persistent flow MS4 outfall monitoring stations identified under Provision D.2.b.(2)(b) in the Annual Report. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized MS4 major outfall in the Watershed Management Area within its jurisdiction, unless there are no remaining qualifying major MS4 outfalls within the Copermittee's jurisdiction in the Watershed Management Area.

(c) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Observations

During each semi-annual monitoring event, each Copermittee must record field observations consistent with Table D-6 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(d) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Monitoring

During each semi-annual monitoring event, if conditions allow the collection of the data, each Copermittee must monitor and record the parameters in Table D-2 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(e) Non-Storm Water Persistent Flow MS4 Outfall Discharge Analytical Monitoring

During each semi-annual monitoring event in which measurable flow is present, each Copermittee must collect and analyze samples from each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Collect grab or composite samples to be analyzed for the following constituents:

[a] Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,
[b] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,
[c] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,
[d] Applicable NAL constituents, and
[e] Constituents listed in Table D-8, unless the Copermittee has historical data that can demonstrate or provide justification that the analysis of the constituent is not necessary.

Table D-8. Analytical Monitoring Constituents for Persistent Flow MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Total Hardness • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Cadmium • Copper • Lead • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(iv) If the Copermittee identifies and eliminates the source of the persistent flow non-storm water discharge, analysis of the sample is not required.

c. WET WEATHER MS4 OUTFALL DISCHARGE MONITORING

The Copermittees must perform wet weather MS4 outfall monitoring to identify sources of pollutants in storm water discharges from the MS4s in the Watershed Management Area. The Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(1) Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees may adjust the wet weather MS4 outfall discharge monitoring locations and frequencies in the Watershed Management Area, as needed, to identify sources of pollutants in storm water discharges from MS4s in the Watershed Management Area in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of stations is at least equivalent to the number of stations required under Provision D.2.a.(3)(a).

(2) Wet Weather MS4 Outfall Discharge Monitoring Frequency

The Copermittees must monitor the wet weather MS4 outfall discharge monitoring stations in the Watershed Management Area at an appropriate frequency to identify sources of pollutants in storm water discharges from the MS4s causing or contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan.

(3) Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(d) Presence and assessment of trash in and around station.

(4) Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(5) Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

(iii) If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours.

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and

(iv) Applicable SAL constituents.

3. Special Studies

a. Within the term of this Order, the Copermittees must develop and implement the following special studies:

(1) At least three special studies in each Watershed Management Area to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that cause or contribute to highest priority water quality conditions identified in the Water Quality Improvement Plan.

(2) At least two special studies for the San Diego Region to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that are impacting receiving waters on a regional basis in the San Diego Region.

(3) One of the three special studies in each Watershed Management Area may be replaced by a special study implemented pursuant to Provision D.3.a.(2).

b. The special studies must, at a minimum, be in conformance with the following criteria:

(1) The special studies must be related to the highest priority water quality conditions identified by the Copermittees in the Watershed Management Area and/or for the entire San Diego Region;

(2) The special studies developed pursuant to Provision D.3.a.(1) must:

(a) Be implemented within the applicable Watershed Management Area, and

(b) Require some form of participation by all the Copermittees within the Watershed Management Area;

(3) The special studies developed pursuant to Provision D.3.a.(2) must:

(a) Be implemented within the San Diego Region, and

(b) Require some form of participation by all Copermittees covered under the requirements of this Order.

c. Special studies developed to identify sources of pollutants and/or stressors should be pollutant and/or stressor specific and based on historical monitoring data and monitoring performed pursuant to Provisions D.1 and D.2. Development of source identification special studies should include the following:

(1) A compilation of known information on the specific pollutant and/or stressor, including data on potential sources and movement of the pollutant and/or stressor within the watershed. Data generated by the Copermittees and others, as well as information available from a literature research on the pollutant and/or stressor should be compiled and analyzed as appropriate.

(2) An identification of data gaps, based on the compiled information generated on the specific pollutant and/or stressor in Provision D.3.d.(1). Source identification special studies should be developed to fill identified data gaps.

(3) A monitoring plan that will collect and provide data the Copermittees can utilize to do the following:

(a) Quantify the relative loading or impact of a pollutant and/or stressor from a particular source or pollutant generating activity;

(b) Improve understanding of the fate of a pollutant and/or stressor in the environment;

(c) Develop an inventory of known and suspected sources of a pollutant and/or stressor in the Watershed Management Area; and/or

(d) Prioritize known and suspected sources of a pollutant and/or stressor based on relative magnitude in discharges, geographical distribution (i.e., regional or localized), frequency of occurrence in discharges, human health risk, and controllability.

d. Special studies initiated prior to the acceptance of the Water Quality Improvement Plan that meet the requirements of Provision D.3.b and are completed during the term of this Order may be utilized to fulfill the special study requirements of Provision D.3.a.

e. The Copermittees must submit the monitoring plans for the special studies in the Water Quality Improvement Plans required pursuant to Provision F.1.

f. The Copermittees are encouraged to share the results of the special studies regionally among the Copermittees to provide information useful in improving and adapting the management of non-storm water and storm water runoff through the implementation of the Water Quality Improvement Plans.

4. Assessment Requirements

Each Copermittee must evaluate the data collected pursuant to Provisions D.1, D.2 and D.3, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E, to assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a. Assessments must be performed as described in the following provisions:

a. Receiving Waters Assessments

(1) The Copermittees must assess and report the conditions of the receiving waters in the Watershed Management Area as follows:

(a) Based on data collected pursuant to Provision D.1.a, the assessments under Provision D.4.a.(2) must be included in the first Annual Report required pursuant to Provision F.3.b.(1).

(b) Based on the data collected pursuant to Provisions D.1.a-e, the assessments required under Provision D.4.a.(2) must be included in the Report of Waste Discharge required pursuant to Provision F.5.b.

(2) The Copermittees must assess the status and trends of receiving water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under dry weather and wet weather conditions. For each of the three types of receiving waters in each Watershed Management Area the Copermittees must:

(a) Determine whether or not the conditions of the receiving waters are protective of the designated beneficial uses;

(b) Identify the most critical beneficial uses that must be protected or restored to ensure overall health of the receiving water;

(c) Determine whether or not those critical beneficial uses are being protected and where those beneficial used must be restored;

(d) Identify short-term and/or long-term improvements or degradation of those critical beneficial uses;

(e) Identify data gaps in the monitoring data necessary to assess Provisions D.4.a.(2)(a)-(d).

b. MS4 OUTFALL DISCHARGES ASSESSMENTS

(1) Non-Storm Water Discharges Reduction Assessments

(a) Each Copermittee must assess and report the progress of its illicit discharge detection and elimination program, required to be implemented pursuant to Provision E.2, toward reducing and effectively prohibiting non-storm water and illicit discharges into the MS4 within its jurisdiction as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(2), the assessments under Provision D.4.b.(1)(b) must be included in the first Annual Report required pursuant to Provision F.3.b.(1).

(ii) Based on the data collected pursuant to Provisions D.2.b, the assessments required under Provision D.4.b.(1)(c) must be included in the first Annual Report required pursuant to Provision F.3.b.(1), and annually thereafter.

(iii) Based on the data collected pursuant to Provisions D.2.b, the assessment required under Provision D.4.b.(1)(c) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.a.(2), each Copermittee must assess and report the following:

(i) Identify the known and suspected controllable sources (e.g. facilities, areas, land uses, pollutant generating activities) of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area;

(ii) Identify sources of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area that have been reduced or eliminated; and

(iii) Identify modifications to the field screening monitoring locations and frequencies for the MS4 outfalls in its inventory necessary to identify and eliminate sources of persistent flow non-storm water discharges pursuant to Provision D.2.b.(1).

(c) Based on the dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b, each Copermittee must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(1)(b);

(ii) Based on the data collected and applicable NALs in the Water Quality Improvement Plan, rank the MS4 outfalls in the Copermittee's

jurisdiction according to potential threat to receiving water quality, and produce a prioritized list of major MS4 outfalls for follow-up action to update the Water Quality Improvement Plan, with the goal of eliminating persistent flow non-storm water discharges and/or pollutant loads in order of the ranked priority list through targeted programmatic actions and source investigations;

(iii) For the highest priority major MS4 outfalls with persistent flows that are in exceedance of NALs, identify the known and suspected sources within the Copermittee's jurisdiction in the Watershed Management Area that may cause or contribute to the NAL exceedances;

(iv) Each Copermittee must analyze the data collected pursuant to Provision D.2.b, and utilize a model or other method, to calculate or estimate the non-storm water volumes and pollutant loads discharged from all the major MS4s outfalls in its jurisdiction identified as having persistent dry weather flows during the monitoring year. These calculations or estimates must be updated annually. Each Copermittee must calculate or estimate:

[a] Annual non-storm water volumes and pollutant loads discharged from the Copermittee's major MS4 outfalls to receiving waters within the Copermittee's jurisdiction, with an estimate of the percent contribution from each known and suspected source for each MS4 outfall;

[b] Annual non-storm water volumes and pollutant loads from areas or facilities subject to the Copermittee's legal authority that are discharged from the Copermittee's major MS4 outfalls to downstream receiving waters.

(v) Each Copermittee must review the data collected pursuant to Provision D.2.b and findings from the assessments required pursuant to Provision D.4.b.(1)(c)(i)-(iv) on an annual basis to:

[a] Identify reductions and progress in achieving reductions in non-storm water and illicit discharges to the Copermittee's MS4 in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction, with an estimate, if possible, of the non-storm water volume and/or pollutant load reductions attributable to specific water quality strategies implemented by the Copermittee; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittee in the Watershed Management Area toward reducing

or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction.

(vi) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(v).

(2) Storm Water Pollutant Discharges Reduction Assessments

(a) The Copermittees must assess and report the progress of the water quality improvement strategies, required to be implemented pursuant to Provisions B and E, toward reducing pollutants in storm water discharges from the MS4s within the Watershed Management Area as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(3), the assessments under Provision D.4.b.(2)(b) must be included in the first Annual Report required pursuant to Provision F.3.b.(1).

(ii) Based on the data collected pursuant to Provisions D.2.c, the assessments required under Provision D.4.b.(2)(c) must be included in the first Annual Report required pursuant to Provision F.3.b.(1), and annually thereafter.

(iii) Based on the data collected pursuant to Provisions D.2.c, the assessment required under Provisions D.4.b.(2)(c)-(d) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.a.(3) the Copermittees must assess and report the following:

(i) The Copermittees must analyze the monitoring data collected pursuant to Provision D.2.a.(3), and utilize a watershed model or other method, to calculate or estimate storm water volumes and pollutant loads discharged from the MS4s in each Copermittee's jurisdiction within the Watershed Management Area. The Copermittees must calculate or estimate the following for each monitoring year:

[a] The average storm water runoff coefficient for each land use type within the Watershed Management Area;
[b] The volume of storm water discharged from each of the Copermittee's major MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch;
[c] The pollutant loads discharged from each of the Copermittee's major MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch; and

[d] The percent contribution of storm water volumes and pollutant loads discharged from each land use type within the drainage basin to each of the Copermittee's major MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch.

(ii) Identify modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify sources pollutants in storm water discharges from the MS4s in the Watershed Management Area pursuant to Provision D.2.c.(1).

(c) Based on the wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.c the Copermittees must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(2)(b);

(ii) Based on the data collected and applicable SALs in the Water Quality Improvement Plan, rank the MS4 outfalls in the Watershed Management Area according to potential threat to receiving water quality, and produce a prioritized list of major MS4 outfalls for follow-up action to update the Water Quality Improvement Plan;

(iii) The Copermittees must review the data collected pursuant to Provision D.2.c and findings from the assessments required pursuant to Provisions D.4.b.(2)(c)(i)-(ii) on an annual basis to:

[a] Identify reductions and progress in achieving reductions in pollutant concentrations and/or pollutant loads from different land uses and/or drainage areas discharging from the Copermittees' MS4s in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters within the Watershed Management Area to the MEP, with an estimate, if possible, of the pollutant load reductions attributable to specific water quality strategies implemented by the Copermittees; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittees in the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters in the Watershed Management Area to the MEP.

(iv) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(iii).

(d) The Copermittees must evaluate all the data collected pursuant to Provision D.2.c, and incorporate new outfall monitoring data into time series plots for each long-term monitoring constituent for the Watershed Management Area, and perform statistical trends analysis on the cumulative long-term wet weather MS4 outfall discharge water quality data set.

c. SPECIAL STUDIES ASSESSMENTS

The Copermittees must annually evaluate the results and findings from the special studies developed and implemented pursuant to Provision D.3, and assess their relevance to the Copermittees' efforts to characterize receiving water conditions, understand sources of pollutants and/or stressors, and control and reduce the discharges of pollutants from the MS4 outfalls to receiving waters in the Watershed Management Area. The Copermittees must report the results of the special studies assessments applicable to the Watershed Management Area, and identify any necessary modifications or updates to the Water Quality Improvement Plan based on the results in the Annual Reports required pursuant to Provision F.3.b.

d. INTEGRATED ASSESSMENT OF WATER QUALITY IMPROVEMENT PLAN

As part of the iterative approach and adaptive management process required for the Water Quality Improvement Plan pursuant to Provision B.5, the Copermittees in each Watershed Management Area must integrate the data collected pursuant to Provisions D.1-D.3, the findings from the assessments required pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to assess the effectiveness of, and identify necessary modifications to, the Water Quality Improvement Plan as follows:

(1) The Copermittees must re-evaluate the priority water quality conditions and numeric goals for the Watershed Management Area, as needed, during the term of this Order pursuant to Provision B.5.a. The re-evaluation and recommendations for modifications to the priority water quality conditions, and/or numeric goals and corresponding schedules may be provided in the Annual Reports required pursuant to Provision F.3.b, but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The priority water quality conditions and numeric goals for the Watershed Management Area must be re-evaluated as follows:

(a) Re-evaluate the receiving water conditions in the Watershed Management Area in accordance with Provision B.2.a;

(b) Re-evaluate the impacts on receiving waters in the Watershed Management Area from MS4 discharges in accordance with Provision B.2.b;

(c) Re-evaluate the identification of MS4 sources of pollutants and/or stressors in accordance with Provision B.2.d;

(d) Identify beneficial uses of the receiving waters that are protected or must be restored in accordance with Provision D.4.a;

(e) Evaluate the progress toward achieving the interim and final numeric goals for restoring impacted beneficial uses in the receiving waters.

(2) The Copermittees must re-evaluate the water quality improvement strategies for the Watershed Management Area during the term of this Order pursuant to Provision B.5.b. The re-evaluation and recommendations for modifications to the water quality improvement strategies and schedules must be provided in the Annual Reports required pursuant to Provision F.3.b, and provided in the Report of Waste Discharge pursuant to Provision F.5.b. The water quality improvement strategies for the Watershed Management Area must be re-evaluated as follows:

(a) Identify the non-storm water and storm water pollutant loads from the Copermittees' MS4 outfalls in the Watershed Management Area, calculated or estimated pursuant to Provisions D.4.b;

(b) Identify the non-storm water and storm water pollutant load reductions, or other improvements to receiving water or water quality conditions, that are necessary to attain the interim and final numeric goals for restoring impacted beneficial uses in the receiving waters;

(c) Identify the non-storm water and storm water pollutant load reductions, or other improvements to the quality of MS4 discharges, that are necessary for the Copermittees to demonstrate that non-storm water and storm water discharges from their MS4s are not causing or contributing to exceedances of receiving water limitations;

(d) Evaluate the progress of the water quality improvement strategies toward achieving the interim and final numeric goals for restoring impacted beneficial uses in the receiving waters.

(3) The Copermittees must re-evaluate and adapt the water quality monitoring and assessment program for the Watershed Management Area when new information becomes available to improve the monitoring and assessment program pursuant to Provision B.5.c. The re-evaluation and recommendations for modifications to the monitoring and assessment program may be provided in the Annual Reports required pursuant to Provision F.3.b, but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. Modifications to the water quality monitoring and assessment program must be consistent with the

requirements of Provision D.1-D.3. The re-evaluation of the water quality monitoring and assessment program for the Watershed Management Area must consider the data gaps identified by the assessments required pursuant to Provisions D.4.a-b, and results of the special studies implemented pursuant to Provision D.4.c.

5. Monitoring Provisions

Each Copermittee must comply with all the monitoring, reporting, and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

E. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS

The purpose of this provision is for each Copermittee to implement a program to control the contribution of pollutants to and the discharges from the MS4 with its jurisdiction. The goal of the jurisdictional runoff management programs is to implement strategies that effectively prohibit non-storm water discharges to the MS4 and reduce the discharge of pollutants in storm water to the MEP. This goal will be accomplished through implementing the jurisdictional runoff management programs in accordance with the strategies identified in the Water Quality Improvement Plans.

Each Copermittee must update its jurisdictional runoff management program document, in accordance with Provision F.2.a, to incorporate all the requirements of Provision E. Until the Copermittee has updated its jurisdictional runoff management program document with the requirements of Provision E, the Copermittee must continue implementing its current jurisdictional runoff management program.

1. Legal Authority Establishment and Enforcement

a. Each Copermittee must establish, maintain, and enforce adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 through statute, ordinance, permit, contract, order, or similar means. This legal authority must, at a minimum, authorize the Copermittee to:

(1) Prohibit and eliminate all illicit discharges and illicit connections to its MS4;

(2) Control the contribution of pollutants in discharges of runoff associated with industrial and construction activity to its MS4 and control the quality of runoff from industrial and construction sites, including industrial and construction sites which have coverage under the statewide General Permit for Discharges of Storm Water Associated with Industrial Activities (Industrial General Permit) or General Permit for Discharges of Storm Water Associated with Construction Activities (Construction General Permit), as well as to those sites which do not;

(3) Control the discharge of spills, dumping, or disposal of materials other than storm water into its MS4;

(4) Control through interagency agreements among Copermittees the contribution of pollutants from one portion of the MS4 to another portion of the MS4;

(5) Control, by coordinating and cooperating with other owners of the MS4 such as Caltrans, the U.S. federal government, or sovereign Native American Tribes through interagency agreements, where possible, the contribution of pollutants from their portion of the MS4 to the portion of the MS4 within the Copermittee's jurisdiction;

(6) Require compliance with conditions in its statutes, ordinances, permits, contracts, orders, or similar means to hold dischargers to its MS4 accountable for their contributions of pollutants and flows;

(7) Require the use of BMPs to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(8) Require documentation on the effectiveness of BMPs implemented to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(9) Utilize enforcement mechanisms to require compliance with its statutes, ordinances, permits, contracts, orders, or similar means; and

(10) Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with its statutes, ordinances, permits, contracts, orders, or similar means and with the requirements of this Order, including the prohibition of illicit discharges and connections to its MS4; the Copermittee must also have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from industrial facilities, including construction sites, discharging into its MS4.

b. With the first Annual Report required pursuant to Provision F.3.b, each Copermittee must submit a statement certified by its Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative that the Copermittee has taken the necessary steps to obtain and maintain full legal authority within its jurisdiction to implement and enforce each of the requirements contained in this Order.

2. Illicit Discharge Detection and Elimination

Each Copermittee must implement a program to actively detect and eliminate illicit discharges and improper disposal into the MS4, or otherwise require the discharger to apply for and obtain a separate NPDES permit. The illicit discharge detection and elimination program must be implemented in accordance with the strategies identified in the Water Quality Improvement Plan and include, at a minimum, the following requirements:

a. NON-STORM WATER DISCHARGES

Each Copermittee must address all non-storm water discharges as illicit discharges, unless a non-storm water discharge is either identified as a discharge authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to the following requirements:

(1) Discharges of non-storm water to the MS4 from the following categories must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG919001 (Order No. R9-2007-0034, or subsequent order) for discharges to San Diego Bay, or NPDES Permit No. CAG919002 (Order No. R9-2008-0002, or subsequent order) for discharges to surface waters other than San Diego Bay:

(a) Uncontaminated pumped ground water;

(b) Discharges from foundation drains;[19]

(c) Water from crawl space pumps; and

(d) Water from footing drains.[19]

(2) Discharges of non-storm water from water line flushing and water main breaks to the MS4 must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG 679001 (Order No. R9-2010-0003, or subsequent order). This category includes water line flushing and water main break discharges from water purveyors issued a water supply permit by the California Department of Public Health or federal military installations. Discharges from recycled or reclaimed water lines to the MS4 must be addressed as illicit discharges, unless the discharges have coverage under a separate NPDES permit.

(3) Discharges of non-storm water to the MS4 from the following categories must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a source of pollutants to receiving waters:

(a) Diverted stream flows;

(b) Rising ground waters;

(c) Uncontaminated ground water infiltration to MS4s;

(d) Springs;

(e) Flows from riparian habitats and wetlands;

(f) Discharges from potable water sources;

[19] Provision E.2.a.(1) only applies to this category on non-storm water if the system is designed to be located at or below the highest historical groundwater table to actively or passively extract groundwater during any part of the year.

(g) Discharges from foundation drains;[20] and

(h) Discharges from footing drains.[20]

(4) Discharges of non-storm water to the MS4 from the following categories must be controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means. Discharges of non-storm water to the MS4 from the following categories not controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means must be addressed by the Copermittee as illicit discharges.

(a) Air conditioning condensation

The discharge of air conditioning condensation must be directed to landscaped areas or other pervious surfaces where feasible.

(b) Individual residential vehicle washing

(i) The discharge of wash water must be directed to landscaped areas or other pervious surfaces where feasible; and

(ii) Minimize the use of water for vehicle washing, use as little washing detergent and other vehicle wash products as possible, wash vehicles at commercial wash facilities, and implement other practices or behaviors that will prevent the discharge of pollutants associated with individual residential vehicle washing from entering the MS4.

(c) Dechlorinated swimming pool discharges

(i) Eliminate residual chlorine, algaecide, filter backwash, or other pollutants from swimming pools prior to discharging to the MS4; and

(ii) The discharge of saline swimming pool water must be directed to the sanitary sewer, landscaped areas, or other pervious surfaces that can accommodate the volume of water, unless the saline swimming pool water can be discharged via a pipe or concrete channel directly to a naturally saline water body (e.g. Pacific Ocean).

(5) Firefighting discharges to the MS4 must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a significant source of pollutants to receiving waters. Firefighting discharges to the MS4 not identified as a significant source of pollutants to receiving waters, must be addressed, at a minimum, as follows:

[20] Provision E.2.a.(3) only applies to this category of non-storm water discharge if the system is designed to be located above the highest historical groundwater table at all times of the year, and the system is only expected to discharge non-storm water under unusual circumstances.

(a) Non-emergency firefighting discharges

(i) Building fire suppression system maintenance discharges (e.g. sprinkler line flushing) to the MS4 must be addressed as illicit discharges.

(ii) Non-emergency firefighting discharges (i.e., discharges from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems) must be addressed by a program, to be developed and implemented by the Copermittee, to reduce or eliminate pollutants in such discharges from entering the MS4.

(b) Emergency firefighting discharges

Each Copermittee should develop and encourage implementation of BMPs to reduce or eliminate pollutants in emergency firefighting discharges to the MS4s and receiving waters within its jurisdiction. During emergency situations, priority of efforts should be directed toward life, property, and the environment (in descending order). BMPs should not interfere with immediate emergency response operations or impact public health and safety.

(6) If the Copermittee or San Diego Water Board identifies any category of non-storm water discharges listed under Provisions E.2.a.(1)-(4) as a source of pollutants to receiving waters, the category must be prohibited through ordinance, order, or similar means and addressed as an illicit discharge.

(7) Each Copermittee must, where feasible, reduce or eliminate non-storm water discharges listed under Provisions E.2.a.(1)-(4) into its MS4 whether or not the non-storm water discharge has been identified as an illicit discharge, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit.

b. PREVENT AND DETECT ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to prevent and detect illicit discharges to the MS4:

(1) Each Copermittee must maintain an updated map of its entire MS4 and the corresponding drainage areas. The accuracy of the MS4 map must be confirmed during the field screening required pursuant to Provision E.2.c. The MS4 map must be included as part of the jurisdictional runoff management program document. Any geographic information system (GIS) layers or files used by the Copermittee to maintain the MS4 map must be made available to the San Diego Water Board upon request. The MS4 map must identify the following:

(a) All segments of the MS4 owned, operated, and maintained by the Copermittee;

(b) All known locations of inlets that discharge and/or collect runoff into the Copermittee's MS4;

(c) All known locations of connections with other MS4s not owned or operated by the Copermittee (e.g. Caltrans MS4s);

(d) All known locations of MS4 outfalls and private outfalls that discharge runoff collected from areas within the Copermittee's jurisdiction;

(e) All segments of receiving waters within the Copermittee's jurisdiction that receive and convey runoff discharged from the Copermittee's MS4 outfalls;

(f) Locations of the MS4 outfalls, identified pursuant to Provision D.2.a.(1), within its jurisdiction; and

(g) Locations of the non-storm water persistent flow MS4 outfall discharge monitoring stations, identified pursuant to Provision D.2.b.(2)(b), within its jurisdiction.

(2) Each Copermittee must use Copermittee personnel and contractors to assist in identifying and reporting illicit discharges and connections during their daily employment activities.

(3) Each Copermittee must promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges to or from the MS4, including the following methods for public reporting:

(a) Operate a public hotline, which can be Copermittee-specific or shared by the Copermittees, and must be capable of receiving reports in both English and Spanish 24 hours per day and seven days per week; and

(b) Designate an e-mail address for receiving electronic reports from the public, which can be Copermittee-specific or shared by the Copermittees, and must be prominently displayed on the Copermittee's webpage and the Regional Clearinghouse required pursuant to Provision F.4.

(4) Each Copermittee must implement practices and procedures (including a notification mechanism) to prevent, respond to, contain, and clean up any spills that may discharge into the MS4 within its jurisdiction from any source. The Copermittee must coordinate, to the extent possible, with spill response teams to prevent entry of spills into the MS4, and prevent contamination of surface water, ground water, and soil. The Copermittee must coordinate spill

prevention, containment, and response activities throughout all appropriate Copermittee departments, programs, and agencies.

(5) Each Copermittee must implement practices and procedures to prevent and limit infiltration of seepage from sanitary sewers (including private laterals and failing septic systems) to the MS4.

(6) Each Copermittee must coordinate, when necessary, with upstream Copermittees and/or entities to prevent illicit discharges from upstream sources into the MS4 within its jurisdiction.

c. FIELD SCREENING

Each Copermittee must conduct field screening (i.e. visual observations, field testing, and/or analytical testing) of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4 in accordance with the dry weather MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

d. INVESTIGATE AND ELIMINATE ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to investigate and eliminate illicit discharges to the MS4:

(1) Each Copermittee must prioritize and determine when follow-up investigations will be performed in response to visual observations and/or water quality monitoring data collected during an investigation of a detected non-storm water or illicit discharge to or from the MS4. The criteria for prioritizing investigations must consider the following:

(a) Pollutants identified as causing or contributing to the highest water quality priorities identified in the Water Quality Improvement Plan;

(b) Pollutants identified as causing or contributing, or threatening to cause or contribute to impairments in water bodies on the 303(d) List and/or in environmentally sensitive areas (ESAs), located within its jurisdiction;

(c) Pollutants identified from sources or land uses known to exist within the area, drainage basin, or watershed that discharges to the portion of the MS4 within its jurisdiction included in the investigation;

(d) Pollutants identified as causing or contributing to an exceedance of a NAL in the Water Quality Improvement Plan; and

(e) Pollutants identified as a threat to human health or the environment.

(2) Each Copermittee must implement procedures to investigate and inspect portions of its MS4 that, based on reports or notifications, field screening, or other appropriate information, indicate a reasonable potential of receiving, containing, or discharging pollutants due to illicit discharges, illicit connections, or other sources of non-storm water. The procedures must include the following:

(a) Each Copermittee must develop criteria to:

(i) Assess the validity of each report or notification received; and

(ii) Prioritize the response to each report or notification received.

(b) Each Copermittee must prioritize and respond to each valid report or notification (e.g., public reports, staff or contractor reports and notifications, etc.) of an incident in a timely manner.

(c) Each Copermittee must investigate and seek to identify the source(s) of discharges of non-storm water where flows are observed in and from the MS4 during the field screening required pursuant to Provision D.2.b.(1) as follows:

(i) Obvious illicit discharges must be immediately investigated to identify the source(s) of non-storm water discharges;

(ii) The investigation must include field investigations to identify sources or potential sources for the discharge, unless the source or potential source has already been identified during previous investigations; and

(iii) The investigation may include follow-up field investigations and/or reviewing Copermittee inventories and other land use data to identify potential sources of the discharge.

(d) Each Copermittee must maintain records and a database of the following information:

(i) Location of incident, including hydrologic subarea, portion of MS4 receiving the non-storm water or illicit discharge, and point of discharge or potential discharge from MS4 to receiving water;

(ii) Source of information initiating the investigation (e.g., public reports, staff or contractor reports and notifications, field screening, etc.);

(iii) Date the information used to initiate the investigation was received;

(iv) Date the investigation was initiated;

(v) Dates of follow-up investigations;

(vi) Identified or suspected source of the illicit discharge or connection, if

determined;

(vii) Known or suspected related incidents, if any;

(viii) Result of the investigation; and

(ix) If a source cannot be identified and the investigation is not continued, a rationale for why a discharge does not pose a threat to water quality and/or does not require additional investigation.

(e) Each Copermittee must track and seek to identify the source(s) of non-storm water discharges from the MS4 where there is evidence of non-storm water having been discharged into or from the MS4 (e.g., pooled water), in accordance with MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.

(3) Each Copermittee must initiate the implementation of procedures, in a timely manner, to eliminate all detected and identified illicit discharges and connections within its jurisdiction. The procedures must include the following responses:

(a) Each Copermittee must enforce its legal authority, as required under Provision E.1, to eliminate illicit discharges and connections to the MS4.

(b) If the Copermittee identifies the source as a controllable source of non-storm water or illicit discharge or connection, the Copermittee must implement its Enforcement Response Plan pursuant to Provision E.6 and enforce its legal authority to prohibit and eliminate illicit discharges and connections to its MS4.

(c) If the Copermittee identifies the source of the discharge as a category of non-storm water discharges in Provision E.2.a, and the discharge is in exceedance of NALs in the Water Quality Improvement Plan, then the Copermittee must determine if: (1) this is an isolated incident or set of circumstances that will be addressed through its Enforcement Response Plan pursuant to Provision E.6, or (2) the category of discharge must be addressed through the prohibition of that category of discharge as an illicit discharge pursuant to Provision E.2.a.(6).

(d) If the Copermittee suspects the source of the non-storm water discharge as natural in origin (i.e. non-anthropogenically influenced) and in conveyance into the MS4, then the Copermittee must document and provide the data and evidence necessary to demonstrate to the San Diego Water Board that it is natural in origin and does not require further investigation.

(e) If the Copermittee is unable to identify and document the source of a recurring non-storm water discharge to or from the MS4, then the Copermittee must address the discharge as an illicit discharge and update

its jurisdictional runoff management program to address the common and suspected sources of the non-storm water discharge within its jurisdiction in accordance with the Copermittee's priorities.

(4) Each Copermittee must submit a summary of the non-storm water discharges and illicit discharges and connections investigated and eliminated within its jurisdiction with each Annual Report required under Provision F.3.b of this Order.

e. STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the illicit discharge detection and elimination program to address non-storm water and illicit discharges and connections that the Copermittee has identified as potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, and/or increase/decrease frequency of inspections in specific areas); and

(2) The strategies and/or activities must be consistent with the requirements of Provisions E.2.a-d and the strategies identified in the Water Quality Improvement Plan.

3. Development Planning

Each Copermittee must use their land use and planning authorities to implement a development planning program in accordance with the strategies identified in the Water Quality Improvement Plan and includes, at a minimum, the following requirements:

a. BMP REQUIREMENTS FOR ALL DEVELOPMENT PROJECTS

Each Copermittee must prescribe the following BMP requirements during the planning process (i.e. prior to project approval and issuance of local permits) for all development projects (regardless of project type or size), where local permits are issued, including unpaved roads and flood management projects:

(1) <u>General Requirements</u>

(a) Onsite BMPs must be located so as to remove pollutants from runoff prior to its discharge to any receiving waters, and as close to the source as possible; and

(b) Structural BMPs must not be constructed within a waters of the U.S. or waters of the state.

(2) Source Control BMP Requirements

The following source control BMPs must be implemented at all development projects where applicable and feasible:

(a) Prevention of illicit discharges into the MS4;

(b) Storm drain system stenciling or signage;

(c) Properly designed outdoor material storage areas;

(d) Properly designed outdoor work areas;

(e) Properly designed trash storage areas; and

(f) Any additional BMPs necessary to minimize pollutant generation at each project.

(3) Low Impact Development (LID) BMP Requirements

The following LID BMPs must be implemented at all development projects where applicable and feasible:

(a) Maintenance or restoration of natural storage reservoirs and drainage corridors (including topographic depressions, areas of permeable soils, natural swales, and ephemeral and intermittent streams);[21]

(b) Buffer zones for natural water bodies (where buffer zones are technically infeasible, require project applicant to include other buffers such as trees, access restrictions, etc.);

(c) Conservation of natural areas within the project footprint including existing trees, other vegetation, and soils;

(d) Construction of streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided public safety is not compromised;

(e) Minimization of the impervious footprint of the project;

(f) Minimization of soil compaction to landscaped areas;

[21] Development projects proposing to dredge or fill materials in waters of the U.S. must obtain a CWA Section 401 Water Quality Certification. Projects proposing to dredge or fill waters of the state must obtain waste discharge requirements.

(g) Disconnection of impervious surfaces through distributed pervious areas;

(h) Landscaped or other pervious areas designed and constructed to effectively receive and infiltrate, retain and/or treat runoff from impervious areas, prior to discharging to the MS4;

(i) Small collection strategies located at, or as close as possible to, the source (i.e. the point where storm water initially meets the ground) to minimize the transport of runoff and pollutants to the MS4 and receiving waters;

(j) Use of permeable materials for projects with low traffic areas and appropriate soil conditions;

(k) Landscaping with native or drought tolerant species; and

(l) Harvesting and using precipitation.

b. PRIORITY DEVELOPMENT PROJECTS

(1) Definition of Priority Development Project

Priority Development Projects include the following:

(a) All new development projects that fall under the Priority Development Project categories listed under Provision E.3.b.(2) (where a new development project feature, such as a parking lot, falls into a Priority Development Project category, the entire project footprint is subject to Priority Development Project requirements); and

(b) Those redevelopment projects that create, add, or replace at least 5,000 square feet of impervious surfaces on an already developed site, and the redevelopment project is a Priority Development Project category listed under Provision E.3.b.(2) (where redevelopment results in an increase of less than fifty percent of the impervious surfaces of a previously existing development, and the existing development was not subject to Priority Development Project requirements, the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) apply only to the addition or replacement, and not to the entire development; where redevelopment results in an increase of more than fifty percent of the impervious surfaces of a previously existing development, the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) apply to the entire development).

(2) Priority Development Project Categories

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This category includes commercial, industrial, residential, mixed-use, and public development projects on public or private land which fall under the planning and building authority of the Copermittee.

(b) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

(c) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812), where the land area for development is 5,000 square feet or more.

(d) Hillside development projects. This category includes any development which creates 5,000 square feet or more of impervious surface which is located in an area with known erosive soil conditions, where the development will grade on any natural slope that is twenty-five percent or greater.

(e) Environmentally sensitive areas (ESAs). This category includes any development located within, directly adjacent to, or discharging directly to an ESA, which either creates 2,500 square feet of impervious surface on a proposed project site or increases the area of imperviousness of a proposed project site to 10 percent or more of its naturally occurring condition. “Directly adjacent to” means situated within 200 feet of the ESA. “Discharging directly to” means outflow from a drainage conveyance system that collects runoff from the subject development or redevelopment site and terminates at or in receiving waters within the ESA.

(f) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce that has 5,000 square feet or more of impervious surface.

(g) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface that is 5,000 square feet or more used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

(h) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

(i) Large development projects. This category includes any post-construction pollutant-generating new development projects that result in the disturbance of one acre or more of land.

(3) Priority Development Project Exemptions

Each Copermittee has the discretion to exempt the following projects from being defined as Priority Development Projects:

(a) New paved sidewalks, bicycle lanes, or trails that meet the following criteria:

(i) Designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas; OR

(ii) Designed and constructed to be hydraulically disconnected from paved streets or roads; OR

(iii) Designed and constructed with permeable pavements or surfaces in accordance with USEPA Green Streets guidance.[22]

(b) Retrofitting of existing paved alleys, streets or roads that meet the following criteria:

(i) Must be two lanes or less; AND

(ii) Must be a retrofitting project implemented as part of an alternative compliance project option under Provision E.3.c.(3)(b)(v) to achieve the performance requirements of Provisions E.3.c.(1) and/or E.3.c.(2) for a Priority Development Project; AND

(iii) Designed and constructed in accordance with the USEPA Green Streets guidance.[23]

(c) New single family residences that meet the following criteria:

(i) Must not be constructed as part of a larger development or proposed subdivision; AND

(ii) Designed and constructed to be certified under the U.S. Green Building Council (USGCB) Leadership in Energy and Environmental Design (LEED) for Homes green building certification program, receiving at least four (4) Surface Water Management credits under the Sustainable Sites category;[24] OR

[22] See "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).
[23] Ibid.
[24] See LEED for Homes rating system at http://www.usgbc.org

(iii) Designed and constructed with structural BMPs that will achieve the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite.

(d) Redevelopment of existing single family residences that meet the following criteria:

(i) Designed and constructed to be certified under the USGCB LEED for Homes green building certification program, receiving at least four (4) Surface Water Management credits under the Sustainable Sites category; [25] OR

(ii) Designed and constructed with structural BMPs that will achieve the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite.

c. PRIORITY DEVELOPMENT PROJECT STRUCTURAL BMP PERFORMANCE REQUIREMENTS

In addition to the BMP requirements listed for all development projects under Provision E.3.a, Priority Development Projects must also implement structural BMPs that conform to performance requirements below.

(1) Storm Water Pollutant Control BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite structural BMPs to control pollutants in storm water that may be discharged from a project as follows:

(a) Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite the pollutants contained in the design capture volume. The design capture volume is equivalent to:

(i) The volume of storm water produced from a 24-hour 85th percentile storm event;[26] OR

(ii) The volume of storm water that would be retained onsite if the site was fully undeveloped and naturally vegetated, as determined using continuous simulation modeling techniques based on site-specific soil conditions and typical native vegetative cover.

[25] See LEED for Homes rating system at http://www.usgbc.org

[26] This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals.

(b) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) to comply with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1)(a).

(c) If a Priority Development project is allowed to utilize alternative compliance pursuant to Provisions E.3.c.(1)(b), flow-thru conventional treatment control BMPs must be implemented to treat the portion of the design capture volume that is not retained onsite. Additionally, project applicants must mitigate for the portion of the pollutant load in the design capture volume that is not retained onsite through one or more alternative compliance options under Provision E.3.c.(3). Conventional treatment control BMPs must be sized and designed to:

(i) Remove pollutants from storm water to the MEP;

(ii) Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;

(iii) Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Conventional treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of conventional treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

(2) <u>Hydromodification Management BMP Requirements</u>

Each Copermittee must require each Priority Development Project to implement onsite structural BMPs to manage hydromodification that may be caused by storm water runoff discharged from a project as follows:

(a) Post-project runoff flow rates and durations must not exceed pre-development (naturally occurring) runoff flow rates and durations by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat conditions downstream of Priority Development Projects).

(i) In evaluating the range of flows that results in increased potential for erosion of natural (non-hardened) channels, the lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks.

(ii) For artificially hardened channels, analysis to identify the lower boundary must use characteristics of a natural stream segment similar to that found in the watershed. The lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or erodes the toe of the channel banks.

(iii) The Copermittees may use monitoring results collected pursuant to Provision D.1.a.(2) to re-define the range of flows resulting in increased potential for erosion, or degraded instream habitat conditions, as warranted by the data.

(b) Post-project runoff flow rates and durations must compensate for the loss of sediment supply due to the development project, should loss of sediment supply occur as a result of the development project.

(c) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) to comply with the performance requirements of Provisions E.3.c.(2)(a)-(b).

(d) Exemptions

Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provisions E.3.c.(2)(a)-(b) where the project:

(i) Discharges storm water runoff into existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;

(ii) Is a redevelopment Priority Development Project that meets the alternative compliance requirements of Provision E.3.c.(3)(b)(ii); or

(iii) Discharges storm water runoff into other areas identified by the San Diego Water Board as exempt from the requirements of Provisions E.3.c.(2)(a)-(b).

(3) <u>Alternative Compliance to Onsite Structural BMP Performance Requirements</u>

(a) Applicability

At the discretion of each Copermittee, Priority Development Projects may be allowed to utilize an alternative option to comply with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) under the following conditions:

(i) The Copermittee must determine that implementation of the alternative compliance option will have a greater overall water quality

benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite;

(ii) The alternative compliance options must be designed by a registered professional engineer, geologist, architect, or landscape architect;

(iii) The alternative compliance options must be implemented within the same hydrologic unit as the Priority Development Project, and preferably within the same hydrologic subarea;

(iv) Receiving waters must not be utilized to convey storm water runoff to the alternative compliance options;

(v) The pollutants in storm water runoff from the Priority Development Project must be treated to the MEP by the alternative compliance options prior to being discharged to receiving waters;

(vi) Unless otherwise allowed by Provision E.3.c.(3)(b), the alternative compliance options must have a net result of at least the same level of pollutant removal as would have been achieved if the Priority Development Project had fully complied with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1) onsite;

(vii) Unless otherwise allowed by Provision E.3.c.(3)(b), the alternative compliance options must have a net result of at least the same level of protection from potential downstream and upstream erosion in the receiving water as would have been achieved if the Priority Development Project had fully complied with the hydromodification management BMP performance requirements of Provision E.3.c.(2) onsite; and

(viii) The alternative compliance options utilized by the Priority Development Project to comply with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) must have reliable sources of funding for operation and maintenance.

(b) Alternative Compliance Project Options

The Copermittee may allow implementation of one or more of the following project options as part of an alternative approach to complying with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2):

(i) *Onsite LID Biofiltration Treatment Control BMPs*

The Copermittee may allow Priority Development Projects to utilize onsite LID biofiltration treatment control BMPs to comply with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1). Onsite LID biofiltration treatment control BMPs must be sized and designed to:

[a] Remove pollutants from storm water to the MEP; AND
[b] Have an appropriate surface loading rate to prevent erosion, scour and channeling within the BMP; AND
[c] Biofilter at least 1.5 times the design capture volume that is not reliably retained onsite; OR
[d] Biofilter up to the design capture volume that is not reliably retained onsite, AND 1) treat the remaining portion of the design capture volume not retained onsite with conventional treatment control BMPs in accordance with Provision E.3.c.(1)(c), and 2) if necessary, mitigate for the portion of the pollutant load in the design capture volume not retained onsite through one or more alternative compliance project, in-lieu fee and/or water quality credit system options below.

(ii) *LEED Certified Redevelopment Projects*

The Copermittee may allow redevelopment Priority Development Projects to comply with the hydromodification management BMP performance requirements of Provision E.3.c.(2) where the project is designed and constructed to be certified under the USGCB LEED for New Construction and Major Renovations green building certification program. The Priority Development Project must receive at least one (1) Site Design credit and two (2) Stormwater Design credits under the Sustainable Sites category.[27] In addition, the existing and future configuration of the receiving water must not be unnaturally altered or adversely impacted by storm water flow rates and durations discharged from the site.

(iii) *Watershed-Based Planned Development Projects*

The Copermittee may allow Priority Development Projects greater than 100 acres in total project size (or smaller than 100 acres in size yet part of a larger common plan of development that is over 100 acres) to comply with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2). The Priority Development Project must comply with the following conditions:

[a] The Priority Development Project was planned utilizing watershed and/or subwatershed based water quality, hydrologic, and fluvial geomorphologic planning principles that implement regional LID BMPs in accordance with the performance and location criteria of this Order and acceptable to the San Diego Water Board;
[b] Regional LID BMPs may be used provided that the BMPs capture and retain the volume of runoff produced from the design capture volume defined in Provision E.3.c.(1)(a)(i) and that such controls are located upstream of receiving waters;

[27] See LEED for New Construction and Major Renovations rating system at http://www.usgbc.org

[c] Regional LID BMPs must clearly exhibit that they will not result in a net impact from pollutant loadings over and above the impact caused by capture and retention of the design capture volume;

[d] Any portion of the design capture volume that is not retained by the regional LID BMPs must be treated using biofiltration BMPs; and

[e] Where regional LID BMPs are demonstrated to the Copermittee as technically infeasible to retain the entire design capture volume, any volume up to and including the design capture volume not retained by regional LID BMPs, nor treated by biofiltration BMPs, must be treated using conventional treatment control BMPs and the project applicant must implement additional alternative compliance project, in-lieu fee and/or water quality credit system options below.

(iv) *Offsite Regional BMPs*

[a] The Copermittee may allow Priority Development Projects to utilize offsite regional BMPs to comply with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1) if the offsite regional BMPs have the capacity to receive and retain at least 1.1 times the design capture volume that is not reliably retained onsite.

[b] The Copermittee may allow Priority Development Projects to utilize offsite regional BMPs to comply with the hydromodification management BMP performance requirements of Provision E.3.c.(2) if the offsite regional BMPs have the capacity to manage the storm water flows rates and durations from the site such that the receiving waters are protected from the potential for increased erosion that would be caused if the unmanaged portion of the runoff was discharged from the site.

(v) *Offsite Retrofitting Projects*

The Copermittee may allow Priority Development Projects to utilize offsite retrofitting projects to comply with the storm water pollutant control and hydromodification management BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) if the retrofitting projects have been identified within the strategies included in the Water Quality Improvement Plan, or identified as potential retrofitting projects by the Copermittee pursuant to Provision E.5.

(vi) *Offsite Channel, Stream, or Habitat Rehabilitation Projects*

The Copermittee may allow Priority Development Projects to utilize offsite channel, stream, or habitat rehabilitation projects to comply with the hydromodification management BMP performance requirements of Provision E.3.c.(2) if the rehabilitation projects have been identified within the strategies included in the Water Quality

Improvement Plan, or identified as potential channel rehabilitation projects by the Copermittee pursuant to Provision E.5. The channel, stream, or habitat rehabilitation project cannot be utilized for pollutant treatment except where artificial wetlands are constructed and located upstream of receiving waters.

(vii) *Offsite Regional Water Supply Augmentation Projects*

The Copermittee may allow Priority Development Projects to utilize offsite regional water supply augmentation projects (i.e. groundwater recharge, recycled water, storm water harvesting) to comply with the storm water pollutant control and hydromodification management BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) if the projects have been identified within the strategies included in the Water Quality Improvement Plan.

(viii) *Project Applicant Proposed Alternative Compliance Projects*

The Copermittee may allow one or more Priority Development Project applicant(s) to propose and implement alternative compliance projects to comply with the storm water pollutant control and hydromodification management BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) if the alternative compliance projects are consistent with, and will address the highest water quality priorities of the Water Quality Improvement Plan, and comply with the requirements of Provision E.3.c.(3)(a).

(c) Alternative Compliance In-Lieu Fee Option

The Copermittee may develop and implement an alternative compliance in-lieu fee option, individually or with other Copermittees and/or entities, as a means for designing, developing, constructing, operating and maintaining offsite alternative compliance projects under Provision E.3.c.(3)(b). Priority Development Projects allowed to utilize the alternative compliance in-lieu fee option must comply with the following conditions:

(i) The in-lieu fee must be transferred to the Copermittee (for public projects) or an escrow account (for private projects) prior to the date construction of the Priority Development Project is initiated.

(ii) If the in-lieu fee is applied to the development, design and construction of offsite alternative compliance projects, the following conditions must be met:

[a] The offsite alternative compliance projects must allow the Priority Development Project to comply with the onsite BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2);

[b] The offsite alternative compliance projects must be constructed as soon as possible, but no later than 4 years after the certificate of occupancy is granted for the first Priority Development Project that contributed funds toward the construction of the offsite alternative compliance projects, unless a longer period of time is authorized by the San Diego Water Board Executive Officer;

[c] The in-lieu fee for the Priority Development Project must include mitigation of the pollutant loads and increased storm water flow rates and durations that are allowed to discharge from the site before the offsite alternative compliance projects are constructed; and

[d] The in-lieu fee must also include the cost to operate and maintain the offsite alternative compliance projects.

(iii) If the in-lieu fee is applied to the operation and maintenance of offsite alternative compliance projects that have already been constructed, the offsite alternative compliance projects must allow the Priority Development Project to comply with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2).

(d) Alternative Compliance Water Quality Credit System Option

The Copermittee may develop and implement an alternative compliance water quality credit system option, individually or with other Copermittees and/or entities, provided that such a credit system clearly exhibits that it will not allow discharges from Priority Development Projects to cause or contribute to a net impact over and above the impact caused by projects meeting the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2). Any credit system that a Copermittee chooses to implement must be submitted to the San Diego Water Board Executive Officer for review and acceptance as part of the Water Quality Improvement Plan.

(4) Long-Term Structural BMP Maintenance

Each Copermittee must require the project applicant to submit proof of the mechanism under which ongoing long-term maintenance of all structural BMPs will be conducted.

(5) Infiltration and Groundwater Protection

(a) Structural BMPs designed to primarily function as large, centralized infiltration devices (such as large infiltration trenches and infiltration basins) must not cause or contribute to an exceedance of an applicable groundwater quality objective. At a minimum, such infiltration BMPs must be in conformance with the design criteria listed below, unless the development project applicant demonstrates to the Copermittee that one

or more of the specific design criteria listed below are not necessary to protect groundwater quality. The design criteria listed below do not apply to small infiltration systems dispersed throughout a development project.

(i) Runoff must undergo pretreatment such as sedimentation or filtration prior to infiltration;

(ii) Pollution prevention and source control BMPs must be implemented at a level appropriate to protect groundwater quality at sites where infiltration BMPs are to be used;

(iii) Infiltration BMPs must be adequately maintained to remove pollutants in storm water to the MEP;

(iv) The vertical distance from the base of any infiltration BMP to the seasonal high groundwater mark must be at least 10 feet. Where groundwater basins do not support beneficial uses, this vertical distance criteria may be reduced, provided groundwater quality is maintained;

(v) The soil through which infiltration is to occur must have physical and chemical characteristics (e.g., appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses;

(vi) Infiltration BMPs must not be used for areas of industrial or light industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee, unless first treated or filtered to remove pollutants prior to infiltration; and

(vii) Infiltration BMPs must be located a minimum of 100 feet horizontally from any water supply wells.

(b) The Copermittee may develop, individually or with other Copermittees, alternative mandatory design criteria to that listed above for infiltration BMPs which are designed to primarily function as centralized infiltration devices. Before implementing the alternative design criteria in the development planning process the Copermitee(s) must:

(i) Notify the San Diego Water Board of the intent to implement the alternative design criteria submitted; and

(ii) Comply with any conditions set by the San Diego Water Board.

d. BMP DESIGN MANUAL UPDATE

Each Copermittee must update its BMP Design Manual[28] pursuant to Provision F.2.b. Until the Copermittee has updated its BMP Design Manual with the

[28] The BMP Design Manual was formerly known as the Standard Storm Water Mitigation Plan under Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016.

requirements of Provisions E.3.a-c, the Copermittee must continue implementing its current BMP Design Manual. Unless directed otherwise by the San Diego Water Board, the Copermittee must implement the BMP Design Manual within 180 days of completing the update. The update of the BMP Design Manual must include the following:

(1) Updated procedures to determine the nature and extent of storm water requirements applicable to a potential development or redevelopment projects. These procedures must inform project applicants of the storm water management requirements applicable to their project including, but not limited to, general requirements for all development projects, structural BMP design procedures and requirements, hydromodification management requirements, requirements specific to phased projects, and procedures specific to private developments and public improvement projects;

(2) Updated procedures to identify pollutants and conditions of concern for selecting the most appropriate structural BMPs that consider, at a minimum, the following:

(a) Receiving water quality (including pollutants for which receiving waters are listed as impaired under the CWA section 303(d) List);

(b) Pollutants, stressors, and/or receiving water conditions that cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(c) Land use type of the project and pollutants associated with that land use type; and

(d) Pollutants expected to be present onsite.

(3) Updated procedures for designing structural BMPs, including any updated performance requirements to be consistent with the requirements of Provision E.3.c for all structural BMPs listed in the BMP Design Manual;

(4) Long-term maintenance criteria for each structural BMP listed in the BMP Design Manual; and

(5) Alternative compliance criteria, in accordance with the requirements under Provision E.3.c.(3), if the Copermittee elects to allow Priority Development Projects within its jurisdiction to utilize alternative compliance.

e. PRIORITY DEVELOPMENT PROJECT BMP IMPLEMENTATION AND OVERSIGHT

Each Copermittee must implement a program that requires and confirms structural BMPs on all Priority Development Projects are designed, constructed, and maintained to remove pollutants in storm water to the MEP.

(1) Structural BMP Approval and Verification Process

(a) Each Copermittee must require and confirm that for all Priority Development Project applications that have not received prior lawful approval by the Copermittee by 18 months after the commencement of coverage under this Order, the requirements of Provision E.3 are implemented. For project applications that have received prior lawful approval by 18 months after the commencement of coverage under this Order, the Copermittee may allow previous land development requirements to apply.

(b) Each Copermittee must identify the roles and responsibilities of various municipal departments in implementing the structural BMP requirements, including each stage of a project from application review and approval through BMP maintenance and inspections.

(c) Each Copermittee must require and confirm that appropriate easements and ownerships are properly recorded in public records and the information is conveyed to all appropriate parties when there is a change in project or site ownership.

(d) Each Copermittee must require and confirm that prior to occupancy and/or intended use of any portion of the Priority Development Project, each structural BMP is inspected to verify that it has been constructed and is operating in compliance with all of its specifications, plans, permits, ordinances, and the requirements of this Order.

(2) Priority Development Project Inventory and Prioritization

(a) Each Copermittee must develop, maintain, and update at least annually, a watershed-based database to track and inventory all Priority Development Projects and associated structural BMPs within its jurisdiction. Inventories must be accurate and complete beginning from January 2002 for the San Diego County Copermittees, February 2003 for the Orange County Copermittees, and July 2005 for the Riverside County Copermittees. The use of an automated database system, such as GIS, is highly recommended. The database must include, at a minimum, the following information:

(i) Priority Development Project location (address and hydrologic subarea);

(ii) Descriptions of structural BMP type(s);

(iii) Date(s) of construction;

(iv) Party responsible for structural BMP maintenance;

(v) Dates and findings of structural BMP maintenance verifications; and

(vi) Corrective actions and/or resolutions.

(b) Each Copermittee must prioritize the Priority Development Projects with structural BMPs within its jurisdiction. The designation of Priority Development Projects as high priority must consider the following:

(i) The highest water quality priorities identified in the Water Quality Improvement Plan;

(ii) Receiving water quality;

(iii) Number and sizes of structural BMPs;

(iv) Recommended maintenance frequency of structural BMPs;

(v) Likelihood of operation and maintenance issues of structural BMPs;

(vi) Land use and expected pollutants generated; and

(vii) Compliance record.

(3) Structural BMP Maintenance Verifications and Inspections

Each Copermittee is required to verify that structural BMPs on each Priority Development Project are adequately maintained, and continue to operate effectively to remove pollutants in storm water to the MEP through inspections, self-certifications, surveys, or other equally effective approaches.

(a) All (100 percent) of the structural BMPs at Priority Development Projects that are designated as high priority must be inspected directly by the Copermittee annually prior to each rainy season;

(b) For verifications performed through a means other than direct Copermittee inspection, adequate documentation must be required by the Copermittee to provide assurance that the required maintenance of structural BMPs at each Priority Development Project has been completed; and

(c) Appropriate follow-up measures (including re-inspections, enforcement, etc.) must be conducted to ensure that structural BMPs at each Priority Development Project continue to reduce pollutants in storm water to the MEP as originally designed.

f. DEVELOPMENT PROJECT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all development projects, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

g. STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the development planning program to address development and redevelopment projects that may become sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, increase frequency of verifications and/or inspections, alternative compliance options);

(2) Each Copermittee must identify areas within its jurisdiction where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting and/or stream, channel, or habitat rehabilitation projects;

(3) Each Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify regional alternative compliance projects that Priority Development Projects may be allowed or should be encouraged to implement or participate in implementing; and

(4) The strategies and/or activities must be consistent with the requirements of Provisions E.3.a-c and E.3.e-f and the strategies identified in the Water Quality Improvement Plan.

4. Construction Management

Each Copermittee must implement a construction management program in accordance with the strategies identified in the Water Quality Improvement Plan and includes, at a minimum, the following requirements:

a. PROJECT APPROVAL PROCESS

Prior to issuance of any local permit(s) that allows the commencement of construction projects that involve ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff, each Copermittee must:

(1) Require a site-specific pollution control, construction BMP, and/or erosion and sediment control plan, to be submitted by the project applicant to the Copermittee;

(2) Confirm the pollution control, construction BMP, and/or erosion and sediment control plan, complies with the local grading ordinance, other applicable local ordinances, and the requirements of this Order;

(3) Confirm the pollution control, construction BMP, and/or erosion and sediment control plan, includes seasonally appropriate and effective BMPs and management measures described in Provision E.4.c, as applicable to the project; and

(4) Verify that the project applicant has obtained coverage under applicable permits, including, but not limited to the Construction General Permit, Clean Water Act Section 401 Water Quality Certification and Section 404 Permit, and California Department of Fish and Game Streambed Alteration Agreement.

b. CONSTRUCTION SITE INVENTORY AND TRACKING

(1) Each Copermittee must maintain, and update at least monthly, a watershed-based inventory of all construction projects issued a local permit that allows ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff. The use of an automated database system, such as GIS, is highly recommended. The inventory must include:

(a) Relevant contact information for each site (e.g., name, address, phone, and email for the owner and contractor);

(b) The basic site information including location (address and hydrologic subarea), Waste Discharge Identification (WDID) number (if applicable), size of the site, and approximate area of disturbance;

(c) Whether or not the site is considered a high threat to water quality, as defined in Provision E.4.b.(2) below;

(d) The project start and anticipated completion dates;

(e) Current construction phase;

(f) The required inspection frequency, as defined in the Copermittee's jurisdictional runoff management program document;

(g) The date the Copermittee accepted and/or approved the site-specific pollution control, construction BMP, and/or erosion and sediment control plan; and

(h) Whether or not there are ongoing enforcement actions administered to the site.

(2) Each Copermittee must identify all construction sites within its jurisdiction that represent a high threat to downstream surface water quality. The designation of construction sites as high threat to water quality must consider the following:

(a) Sites located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Sites located within the same hydrologic subarea and tributary to a water body segment listed as impaired for sediment on the CWA section 303(d) List;

(c) Sites located within, directly adjacent to, or discharging directly to a receiving water within an ESA; and

(d) Other sites determined by the Copermittees or the San Diego Water Board as a high threat to water quality.

c. CONSTRUCTION SITE BMP IMPLEMENTATION

Each Copermittee must implement, or require the implementation of effective BMPs to reduce discharges of pollutants in storm water from construction sites to the MEP, and prevent non-storm water discharges from construction sites into the MS4. These BMPs must be site specific, seasonally appropriate, and construction phase appropriate. BMPs must be implemented at each construction site year round. Dry season BMP implementation must plan for and address unseasonal rain events that may occur during the dry season (May 1 through September 30). Copermittees must implement, or require the implementation of, BMPs in the following categories:

(1) Project Planning;

(2) Good Site Management "Housekeeping", including waste management;

(3) Non-storm Water Management;

(4) Erosion Control;

(5) Sediment Control;

(6) Run-on and Run-off Control; and

(7) Active/Passive Sediment Treatment Systems, where applicable.

d. CONSTRUCTION SITE INSPECTIONS

Each Copermittee must conduct construction site inspections to require and confirm compliance with its local permits and applicable local ordinances, and the requirements of this Order. Priority for site inspections must consider threat to water quality pursuant to Provision E.4.b as well as the nature of the construction activity, topography, and the characteristics of soils and receiving water quality.

(1) Inspection Frequency

(a) Each Copermittee must conduct inspections at all inventoried sites, including high threat to water quality sites, at an appropriate frequency for each phase of construction to ensure the site reduces the discharge of pollutants in storm water from construction sites to the MEP, and prevents non-storm water discharges from entering the MS4.

(b) Each Copermittee must establish appropriate inspection frequencies for high threat to water quality sites, and all other sites, for each phase of construction. Inspection frequencies appropriate for addressing the highest water quality priorities identified in the Water Quality Improvement Plan, and for complying with the requirements of this Order must be identified in each Copermittee's jurisdictional runoff management program document.

(c) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e., re-inspection, enforcement) necessary to require and confirm site compliance with its local permits and applicable local ordinances, and the requirements of this Order.

(2) Inspection Content

Inspections of construction sites by the Copermittee must include, at a minimum:

(a) Verification of coverage under the Construction General Permit (Notice of Intent (NOI) and/or WDID number) during initial inspections, when applicable;

(b) Assessment of compliance with its local permits and applicable local ordinances related to pollution prevention, including the implementation and maintenance of applicable BMPs;

(c) Assessment of BMP adequacy and effectiveness;

(d) Visual observations of actual non-storm water discharges;

(e) Visual observations of actual or potential discharge of sediment and/or construction related materials from the site;

(f) Visual observations of actual or potential illicit connections; and

(g) If any violations are found and BMP corrections are needed, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried construction sites. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Site name, location (address and hydrologic subarea), and WDID number (if applicable);

(b) Inspection date;

(c) Approximate amount of rainfall since last inspection;

(d) Description of problems observed with BMPs and indication of need for BMP addition/repair/replacement and any scheduled re-inspection, and date of re-inspection;

(e) Descriptions of any other specific inspection comments which must, at a minimum, include rationales for longer compliance time;

(f) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(g) Resolution of problems noted and date problems fixed.

e. CONSTRUCTION SITE ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried construction sites, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

f. STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the construction management program to address construction sites that the Copermittee has identified as potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, and/or increase/decrease frequency of inspections for specific types of sites and/or activities); and

(2) The strategies and/or activities must be consistent with the requirements of Provisions E.4.c-e and the strategies identified in the Water Quality Improvement Plan.

5. Existing Development Management

Each Copermittee must implement an existing development management program in accordance with the strategies identified in the Water Quality Improvement Plan and includes, at a minimum, the following requirements:

a. Existing Development Inventory and Tracking

Each Copermittee must maintain, and update at least annually, a watershed-based inventory of the existing development within its jurisdiction that may discharge a pollutant load to and from the MS4. The use of an automated database system, such as GIS, is highly recommended. The inventory must, at a minimum, include:

(1) Name, location (hydrological subarea and address, if applicable) of the following types of existing development with its jurisdiction:

(a) Commercial facilities or areas;

(b) Industrial facilities;

(c) Municipal facilities, including:

(i) MS4 and related structures,[29]

(ii) Roads, streets, and highways,

(iii) Parking facilities,

(iv) Municipal airfields,

(v) Parks and recreation facilities,

(vi) Flood management and flood control devices and structures,

(vii) Operating or closed municipal landfills,

(viii) Publicly owned treatment works (including water and wastewater treatment plants) and sanitary sewer collection systems,

(ix) Corporate yards, including maintenance and storage yards for materials, waste, equipment, and vehicles,

(x) Hazardous waste collection facilities,

[29] The inventory may refer to the MS4 map required to be maintained pursuant to Provision E.2.b.(1).

(xi) Other treatment, storage or disposal facilities for municipal waste, and

(xii) Other municipal facilities that the Copermittee determines may contribute a significant pollutant load to the MS4; and

(d) Residential areas, which may be designated by one or more of the following:

(i) Residential management area,

(ii) Drainage basin or area,

(iii) Land use (e.g., single family, multi-family, rural),

(iv) Neighborhood,

(v) Common Interest Area,

(vi) Home Owner Association,

(vii) Mobile home park, and/or

(viii) Other designations accepted by the San Diego Water Board Executive Officer.

(2) A description of the facility or area, including the following information:

(a) Classification as commercial, industrial, municipal, or residential;

(b) Status of facility or area as active or inactive;

(c) Identification if a business is a mobile business;

(d) SIC Code or NAICS Code, if applicable;

(e) Industrial General Permit NOI and/or WDID number, if applicable;

(f) Identification if a residential area is or includes a Common Interest Area / Home Owner Association, or mobile home park;

(g) Identification of pollutants generated and potentially generated by the facility or area;

(h) Whether the facility or area is adjacent to an ESA;

(i) Whether the facility or area is tributary to and within the same hydrologic subarea as a water body segment listed as impaired on the CWA section 303(d) List and generates pollutants for which the water body segment is impaired; and

(j) Whether the facility or area contributes or potentially contributes to the highest priority water quality conditions identified in the Water Quality Improvement Plan.

(3) An annually updated map showing the location of inventoried existing development, watershed boundaries, and water bodies.

b. EXISTING DEVELOPMENT BMP IMPLEMENTATION AND MAINTENANCE

Each Copermittee must designate a minimum set of BMPs required for all inventoried existing development, including special event venues. The designated minimum BMPs must be specific to facility or area types and pollutant generating activities, as appropriate.

(1) Commercial, Industrial, and Municipal Facilities and Areas

(a) Pollution Prevention

Each Copermittee must require the use of pollution prevention methods by the commercial, industrial, and municipal facilities and areas in its inventoried existing development.

(b) BMP Implementation

Each Copermittee must implement, or require the implementation of, designated BMPs at commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development.

(c) BMP Operation and Maintenance

(i) Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development.

(ii) Each Copermittee must implement a schedule of operation and maintenance activities for its MS4 and related structures (including but not limited to catch basins, storm drain inlets, detention basins, etc.), and verify proper operation of all its municipal structural treatment controls designed to reduce pollutants (including floatables) in storm water discharges to or from its MS4s and related drainage structures. Operation and maintenance activities may include, but is not limited to, the following:

[a] Inspections of the MS4 and related structures;
[b] Cleaning of the MS4 and related structures; and
[c] Proper disposal of materials removed from cleaning of the MS4 and related structures.

(iii) Each Copermittee must implement a schedule of operation and maintenance for public streets, unpaved roads, paved roads, and paved highways and freeways within its jurisdiction to minimize pollutants that can be discharged in storm water.

(iv) Each Copermittee must implement controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers. Copermittees that operate both a municipal sanitary sewer system and a MS4 must implement controls and measures to prevent and eliminate seeping sewage from infiltrating the MS4. Copermittees that do not operate both a municipal sanitary sewer system and a MS4 must coordinate with sewering agencies to keep themselves informed of relevant and appropriate maintenance activities and sanitary sewage projects in their jurisdiction that may cause or contribute to seepage of sewage into the MS4.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must implement BMPs, or require the implementation of BMPs, to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development. Such BMPs must include, as appropriate, educational activities, permits, certifications and other measures for applicators and distributors.

(2) <u>Residential Areas</u>

(a) Pollution Prevention

Each Copermittee must promote and encourage the use of pollution prevention methods, where appropriate, by the residential areas in its inventoried existing development.

(b) BMP Implementation

Each Copermittee must promote and encourage the implementation of designated BMPs at residential areas in its inventoried existing development.

(c) BMP Operation and Maintenance

Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at residential areas in its inventoried existing development.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must promote and encourage the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from residential areas in its inventoried existing development.

c. EXISTING DEVELOPMENT INSPECTIONS

Each Copermittee must conduct inspections of inventoried existing development to ensure compliance with applicable local ordinances and permits, and the requirements of this Order.

(1) Inspection Frequency

(a) Each Copermittee must establish appropriate inspection frequencies for inventoried existing development in accordance with the following requirements:

(i) At a minimum, inventoried existing development must be inspected once every five years utilizing one or more of the following methods:

[a] Drive-by inspections by Copermittee municipal and contract staff,
[b] Onsite inspections by Copermittee municipal and contract staff, and/or
[c] Inspections by volunteer monitoring or patrol programs trained by the Copermittee;

(ii) The frequency of inspections must be appropriate to confirm that BMPs are being implemented to reduce the discharge of pollutants in storm water from the MS4 to the MEP and effectively prohibit non-storm water discharges to the MS4;

(iii) The frequency of inspections must be based on the potential for a facility or area to discharge non-storm water and pollutants in storm water, and should reflect the priorities set forth in the Water Quality Improvement Plan;

(iv) Each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development;[30] and

(v) Inventoried existing development must be inspected by the Copermittee, as needed, in response to valid public complaints and

[30] If any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspection may count toward the total annual inspection requirement. This requirement excludes linear municipal facilities (i.e., MS4, streets, roads and highways).

findings from the Copermittee's municipal and contract staff or volunteer monitoring or patrol program inspections.

(b) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e. education and outreach, re-inspection, enforcement) necessary to require and confirm compliance with its applicable local ordinances and permits and the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

(2) Inspection Content

(a) Inspections of existing development by the Copermittee or volunteer monitoring or patrol programs must include, at a minimum:

(i) Visual inspections for actual non-storm water discharges;

(ii) Visual inspections for actual or potential discharge of pollutants;

(iii) Visual inspections for actual or potential illicit connections; and

(iv) Verification that the description of the facility or area in the inventory, required pursuant to Provision E.5.a.(2), has not changed.

(b) Onsite inspections of existing development by the Copermittee must include, at a minimum:

(i) Assessment of compliance with its applicable local ordinances and permits related to non-storm water and storm water discharges and runoff;

(ii) Assessment of the implementation of the designated BMPs;

(iii) Verification of coverage under the Industrial General Permit, when applicable; and

(iv) If any problems or violations are found, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried existing development. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Name and location of facility or area (address and hydrologic subarea) consistent with the inventory name and location, pursuant to Provision E.5.a.(1);

(b) Inspection and re-inspection date(s);

(c) Inspection method(s) (i.e. drive-by, onsite);

(d) Observations and findings from the inspection(s);

(e) For onsite inspections of existing development by Copermittee municipal or contract staff, the records must also include, as applicable:

(i) Description of any problems or violations found during the inspection(s),

(ii) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6, and

(iii) The date problems or violations were resolved.

d. EXISTING DEVELOPMENT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried existing development, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

e. STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Each Copermittee must implement the water quality improvement strategies, where necessary, to address areas of existing development within its jurisdiction that are identified as sources of pollutants and/or stressors contributing to the highest priority water quality conditions in the Watershed Management Area. For the existing development management program, the following strategies must be implemented:

(1) Specific Existing Development Management Program Strategies

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented within its jurisdiction to address areas of existing development that the Copermittee has identified as sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(a) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, and/or increase/decrease frequency of inspections for specific types of facilities, areas and/or activities);

(b) The facilities and/or areas within the Copermittee's jurisdiction where the strategies and/or activities will be implemented; and

(c) The strategies and/or activities must be consistent with the requirements of Provisions E.5.b-d and the strategies identified in the Water Quality Improvement Plan.

(2) Retrofitting Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to retrofit areas of existing development within its jurisdiction to address identified sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify areas of existing development as candidates for retrofitting, focusing on areas where retrofitting will address pollutants and/or stressors that contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for retrofitting projects may be utilized to reduce pollutants that may be discharged in storm water from areas of existing development, and/or address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of retrofitting projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting projects; and

(e) Where retrofitting projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional retrofitting projects (i.e. projects that can receive and/or treat storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment) adjacent to and/or downstream of the areas of existing development.

(3) Stream, Channel and/or Habitat Rehabilitation in Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to rehabilitate streams, channels, and/or habitats in areas of existing development within its jurisdiction to address the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify streams, channels, and/or habitats in areas of existing development as candidates for rehabilitation, focusing on areas where stream, channel, and/or habitat rehabilitation projects will address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for stream, channel, and/or habitat rehabilitation projects may be utilized to address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters, rehabilitate channelized or hydromodified streams, restore wetland and riparian habitat, restore watershed functions, and/or restore beneficial uses of receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of stream, channel, and/or habitat rehabilitation projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance stream, channel, and/or habitat rehabilitation projects; and

(e) Where stream, channel, and/or habitat rehabilitation projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional stream, channel, and/or habitat rehabilitation projects (i.e. projects that can receive storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment).

6. Enforcement Response Plans

Each Copermittee must develop and implement an Enforcement Response Plan as part of its jurisdictional runoff management program document. The Enforcement Response Plan must describe the applicable approaches and options to enforce its legal authority established pursuant to Provision E.1, as necessary, to achieve compliance with the requirements of this Order. The Enforcement Response Plan must include the following:

a. Enforcement Response Plan Components

The Enforcement Response Plan must include the following individual components:

(1) Illicit Discharge Detection and Elimination Enforcement Component;

(2) Development Planning Enforcement Component;

(3) Construction Management Enforcement Component; and

(4) Existing Development Enforcement Component.

b. Enforcement Response Approaches and Options

Each component of the Enforcement Response Plan must describe the enforcement response approaches that the Copermittee will implement to compel compliance with its statutes, ordinances, permits, contracts, orders, or similar means, and the requirements of this Order. The description must include the protocols for implementing progressively stricter enforcement responses. The enforcement response approaches must include appropriate sanctions to compel compliance, including, at a minimum, the following tools or their equivalent:

(1) Verbal and written notices of violation;

(2) Cleanup requirements;

(3) Fines;

(4) Bonding requirements;

(5) Administrative and criminal penalties;

(6) Liens;

(7) Stop work orders; and

(8) Permit and occupancy denials.

c. CORRECTION OF VIOLATIONS

(1) Violations must be corrected in a timely manner with the goal of correcting the violations within 30 calendar days after the violations are discovered, or prior to the next predicted rain event, whichever is sooner.

(2) If more than 30 calendar days are required to achieve compliance, then a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

d. ESCALATED ENFORCEMENT

(1) The Enforcement Response Plan must include a definition of "escalated enforcement." Escalated enforcement must include any enforcement scenario where a violation or other non-compliance is determined to cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan. Escalated enforcement may be defined differently for development planning, construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas.

(2) Where the Copermittee determines escalated enforcement is not required, a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

(3) Escalated enforcement actions must continue to increase in severity, as necessary, to compel compliance as soon as possible.

e. REPORTING OF NON-COMPLIANT SITES

(1) Each Copermittee must notify the San Diego Water Board in writing within 2 working days of issuing escalated enforcement (as defined in the Copermittee's Enforcement Response Plan) to a construction site that poses a significant threat to water quality as a result of violations or other non-compliance with its permits and applicable local ordinances, and the requirements of this Order. Written notification may be provided electronically by email.

(2) Each Copermittee must notify the San Diego Water Board of non-filers under the Industrial General Permit and Construction General Permit by email to Nonfilers_R9@waterboards.ca.gov.

7. Public Education and Participation

Each Copermittee must implement, individually or with other Copermittees, a public education and participation program in accordance with the strategies identified in the Water Quality Improvement Plan to promote and encourage the development of programs, management practices, and behaviors that reduce the discharge of pollutants in storm water to the MEP, prevent controllable non-storm water discharges from entering the MS4, and protect water quality standards in receiving waters.

a. PUBLIC EDUCATION

The public education program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) Educational activities, public information activities, and other appropriate outreach activities intended to reduce pollutants associated with the application of pesticides, herbicides and fertilizer and other pollutants of concern in storm water discharges to and from its MS4 to the MEP, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed to address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(2) Educational activities, public information activities, and other appropriate outreach activities to facilitate the proper management and disposal of used oil and toxic materials; and

(3) Appropriate education and training measures for specific target audiences, such as construction site operators, residents, underserved target audiences and school-aged children, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed, based on high risk behaviors and pollutants of concern.

b. PUBLIC PARTICIPATION

The public participation program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) A process for members of the public to participate in updating the highest priority water quality conditions, numeric goals, and water quality improvement strategies in the Water Quality Improvement Plan.

(2) Opportunities for members of the public to participate in providing the Copermittee recommendations for improving the effectiveness of the water quality improvement strategies implemented within its jurisdiction.

(3) Opportunities for members of the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or restoration and protection of the quality of receiving waters.

c. STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented within its jurisdiction, as applicable, to educate the public and encourage public participation to address potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) The target audiences and/or areas within the Copermittee's jurisdiction where the strategies and/or activities will be implemented;

(2) Provide specific details about how the strategies and/or activities will be implemented (e.g. educational topics, materials and/or activities, public outreach and participation programs and/or opportunities);

(3) Each Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify and implement regional public education and participation activities, programs and opportunities;

(4) Each Copermittee must incorporate a mechanism for evaluating and assessing educational and other public outreach activities, as needed, to identify progress and incorporate modifications necessary to increase the effectiveness of the public education and participation program.

8. Fiscal Analysis

a. Each Copermittee must secure the resources necessary to meet all the requirements of this Order.

b. Each Copermittee must conduct an annual fiscal analysis of its jurisdictional runoff management program in its entirety. The fiscal analysis must include the following:

(1) Identification of the various categories of expenditures necessary to implement the requirements of this Order, including a description of the specific capital, operation and maintenance, and other expenditure items to be accounted for in each category of expenditures;

(2) The staff resources needed and allocated to meet the requirements of this Order, including any development, implementation, and enforcement activities required;

(3) The estimated expenditures for Provisions E.8.b.(1) and E.8.b.(2) for the current fiscal year; and

(4) The source(s) of funds that are proposed to meet the necessary expenditures described in Provisions E.8.b.(1) and E.8.b.(2), including legal restrictions on the use of such funds, for the current fiscal year and next fiscal year.

c. Each Copermittee must submit a summary of the annual fiscal analysis with each Annual Report required pursuant to Provision F.3.b.

d. Each Copermittee must provide the documentation used to develop the summary of the annual fiscal analysis upon request by the San Diego Water Board.

F. REPORTING

The purpose of this provision is to determine and document compliance with the requirements set forth in this Order. The goal of reporting is to communicate to the San Diego Water Board and the people of the State of California the implementation status of each jurisdictional runoff management program and compliance with the requirements of this Order. This goal is to be accomplished through the submittal of specific deliverables to the San Diego Water Board by the Copermittees.

1. Water Quality Improvement Plans

The Copermittees for each Watershed Management Area must develop and submit the Water Quality Improvement Plan in accordance with the following requirements:

a. WATER QUALITY IMPROVEMENT PLAN DEVELOPMENT

Each Water Quality Improvement Plan must be developed in accordance with the following process:

(1) The Copermittees must develop a schedule detailing public participation opportunities during the Water Quality Improvement Plan development. The schedule must indicate dates for public participation required under Provisions F.1.a.(2)(a), (b) and F.1.a.(3)(a). The schedule must be made available on the Regional Clearinghouse within 30 days of Permit adoption.

~~(1)~~(2) Priority Water Quality Conditions and Numeric Goals

(a) The Copermittees must implement a public participation process to solicit data and information to be utilized in the development and identification of the priority water quality conditions for the Watershed Management Area.

(b) The Copermittees ~~are encouraged to~~must involve the public and key stakeholders as early and often as possible during the development of the priority water quality conditions and numeric goals to be included in the Water Quality Improvement Plan.

(c) Within 6 months after the commencement of coverage under this Order, the Copermittees must develop and submit the Water Quality Improvement Plan requirements of Provision B.2 to the San Diego Water Board. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of 60 days.

(d) The Copermittees must revise the priority water quality conditions and numeric goals based on comments received and/or recommendations or direction from the San Diego Water Board Executive Officer.

~~(2)~~(3) Water Quality Improvement Strategies and Schedules

(a) The Copermittees ~~are encouraged to~~must involve the public and key stakeholders as early and often as possible during the development of the water quality improvement strategies and schedules to be included in the Water Quality Improvement Plan.

(b) Within 9 months after the commencement of coverage under this Order, the Copermittees must develop and submit the Water Quality Improvement Plan requirements of Provision B.3 to the San Diego Water Board. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of 60 days.

(c) The Copermittees must revise the water quality improvement strategies and schedules based on comments received and/or recommendations or direction from the San Diego Water Board Executive Officer.

b. WATER QUALITY IMPROVEMENT PLAN SUBMITTAL

(1) Within 18 months after the commencement of coverage under this Order, the Copermittees for each Watershed Management Area must submit a complete Water Quality Improvement Plan in accordance with the requirements of Provision B to the San Diego Water Board. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of ~~30~~60 days.

(2) T~~Based on the comments received, t~~he San Diego Water Board will ~~determine whether to~~ hold a public hearing on the Water Quality Improvement Plan. ~~or to limit public input to submittal of written comments. If no hearing is held the San Diego Water Board will notify the Copermittees within 6 months that the Water Quality Improvement Plan has been accepted as complete following its review and determination that the Water Quality Improvement Plan meets the requirements of this Order.~~

(3) The Copermittees must revise the Water Quality Improvement Plan based on comments received and/or recommendations or direction from the San Diego Water Board Executive Officer.

(4) The Water Quality Improvement Plan must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance by the San Diego Water Board.

2. Updates

a. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATES

Each Copermittee must update its jurisdictional runoff management program

document in accordance with the following requirements:

(1) Each Copermittee is encouraged to involve the public and key stakeholders as early and often as possible to solicit recommendations for updates to its jurisdictional runoff management program document.

(2) Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E no later than 18 months after the commencement of coverage under this Order.

(3) Each Copermittee must submit updates to its jurisdictional runoff management program, with a rationale for the modifications, either in the Annual Report required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge required pursuant to Provision F.5.b.

(4) The Copermittee must revise the modifications as directed by the San Diego Water Board Executive Officer.

(5) Updated jurisdictional runoff management program documents must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of submitting the Annual Report.

b. BMP DESIGN MANUAL UPDATES

Each Copermittee must update its BMP Design Manual in accordance with the following requirements:

(1) Each Copermittee must update its BMP Design Manual to incorporate the requirements of Provisions E.3.a-d no later than 18 months after the commencement of coverage under this Order.

(2) Subsequent updates must be consistent with the requirements of Provisions E.3.a-d and must be submitted as part of the Annual Reports required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge required pursuant to Provision F.5.b.

(3) Updated BMP Design Manuals must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of completing the update.

c. WATER QUALITY IMPROVEMENT PLAN UPDATES

The Water Quality Improvement Plans must be updated in accordance with the following process:

(1) The Copermittees must implement a public participation process to solicit

data and information to be utilized in updating the Water Quality Improvement Plan.

(2) The Copermittees are encouraged to involve the public and key stakeholders as early and often as possible during the updates to the Water Quality Improvement Plan.

(3) The Copermittees for each Watershed Management Area must submit requested updates to the Water Quality Improvement Plan, with the public input received and the rationale for the requested updates, either in the Annual Reports required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The requested updates are considered accepted by the San Diego Water Board if no response is provided to the Copermittee after 3 months of submitting the request.

(4) The Copermittees must revise the requested updates as directed by the San Diego Water Board Executive Officer.

(5) Updated Water Quality Improvement Plans must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance of the requested updates by the San Diego Water Board.

3. Progress Reporting

a. Progress Report Presentations

The Copermittees for each Watershed Management Area must appear before the San Diego Water Board, as requested by the San Diego Water Board, to provide progress reports on the implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs.

b. Annual Reports

(1) The Copermittees for each Watershed Management Area must submit an Annual Report for each reporting period no later than January 31 of the following year. The annual reporting period consists of two periods: 1) July 1 to June 30 of the following year for the jurisdictional runoff management programs, 2) October 1 to September 30 of the following year for the monitoring and assessment programs. The first Annual Report must be prepared for the reporting period beginning July 1 after commencement of coverage under this Order, and upon San Diego Water Board determination that the Water Quality Improvement Plan meets the requirements of this Order to June 30 in the following year for the jurisdictional runoff management programs, and September 30 in the following year for the monitoring and assessment programs. Annual Reports must be made available on the

Regional Clearinghouse required pursuant to Provision F.4. Each Annual Report must include the following:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, summarized and presented in tabular and graphical form;

(b) Progress of the special studies required pursuant to Provision D.3, and the results or findings when a special study, or each phase of a special study, is completed;

(c) The findings from the assessments required pursuant to Provision D.4;

(d) The progress of implementing the Water Quality Improvement Plan, including, but not limited to, the following:

(i) The progress toward achieving the interim and final numeric goals for the highest water quality priorities for the Watershed Management Area,

(ii) The water quality improvement strategies that were implemented and/or no longer implemented by each of the Copermittees during the reporting period and previous reporting periods, and are planned to be implemented during the next reporting period,

(iii) Proposed modifications to the water quality improvement strategies, with public input received and rationale for the proposed modifications,

(iv) Previously proposed modifications or updates incorporated into the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document and implemented by the Copermittees in the Watershed Management Area, and

(v) Proposed modifications or updates to the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document;

(e) A completed Jurisdictional Runoff Management Program Annual Report Form (Attachment D or accepted revision) for each Copermittee in the Watershed Management Area, certified by a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative.

(2) Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (Attachment D or accepted revision) no later than October 31 of each year until the first Annual Report is required to be submitted. Each Copermittee must submit the information on

the Jurisdictional Runoff Management Program Annual Report Form specific to the area within its jurisdiction in each Watershed Management Area.

(3) Each Copermittee must provide any data or documentation utilized in developing the Annual Report upon request by the San Diego Water Board. Any monitoring data utilized in developing the Annual Report must be uploaded to the California Environmental Data Exchange Network (CEDEN).[31] Any monitoring and assessment data utilized in developing the Annual Report must be provided on the Regional Clearinghouse required pursuant to Provision F.4.

c. REGIONAL MONITORING AND ASSESSMENT REPORT

(1) The Copermittees must submit a Regional Monitoring and Assessment Report no later than 180 days in advance of the expiration date of this Order. The Regional Monitoring and Assessment Report may be submitted as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The Copermittees must review the receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, and findings from the assessments required pursuant to Provision D.4, to assess the following:

(a) The beneficial uses of the receiving waters within the San Diego Region that are protected or must be restored;

(b) The progress toward restoring impacted beneficial uses in the receiving waters within the San Diego Region; and

(c) Pollutants or conditions of emerging concern that may impact beneficial uses in the receiving waters within the San Diego Region.

(2) The Regional Monitoring and Assessment Report must include recommendations for improving the implementation and assessment of the Water Quality Improvement Plans and jurisdictional runoff management programs.

(3) Each Copermittee must provide any data or documentation utilized in developing the Regional Monitoring and Assessment Report upon request by the San Diego Water Board. Any monitoring and assessment data utilized in developing the Regional Monitoring and Assessment Report must be provided on the Regional Clearinghouse required pursuant to Provision F.4.

[31] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

4. Regional Clearinghouse

The Copermittees must develop, update, and maintain an internet-based Regional Clearinghouse that is made available to the public no later than 18 months after the effective date of this Order.

a. The Copermittees, through the Regional Clearinghouse, must make the following documents and data available, organized by Watershed Management Area, which may be linked to other internet-based data portals and databases where the original documents are stored:

(1) Water Quality Improvement Plan for the Watershed Management Area, and all updated versions with date of update;

(2) Annual Reports for the Watershed Management Area;

(3) Jurisdictional Runoff Management Program document for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(4) BMP Design Manual for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(5) Reports from special studies (e.g. source identification, BMP effectiveness assessment) conducted in the Watershed Management Area;

(6) Monitoring data collected pursuant to Provision D for each Watershed Management Area must be uploaded to CEDEN,[32] with links to the uploaded data; and

(7) Available GIS data, layers, and/or shapefiles used to develop the maps generated and maintained by the Copermittees for the Water Quality Improvement Plans, Annual Reports, and jurisdictional runoff management program documents.

b. The Copermittees, through the Regional Clearinghouse, must make the following information and documents available:

(1) Contact information (point of contact, phone number, email address, and mailing address) for each Copermittee;

(2) Public hotline number for reporting non-storm water and illicit discharges for each Copermittee;

[32] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

(3) Email address for reporting non-storm water and illicit discharges for each Copermittee;

(4) Link to each Copermittee's website, if available, where the public may find additional information about the Copermittee's storm water management program and for requesting records for the implementation of its program;

(5) Information about opportunities for the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or restoration and protection of the quality of receiving waters; and

(6) Reports from regional monitoring programs in which the Copermittees participate (e.g. Southern California Monitoring Coalition, Southern California Coastal Water Research Project Bight Monitoring);

(7) Regional Monitoring and Assessment Reports; and

(8) Any other information, data, and documents the Copermittees determine as appropriate for making available to the public.

5. Report of Waste Discharge

a. The Orange County Copermittees and the Riverside County Copermittees are required to submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders. The San Diego Water Board will review and consider the Reports of Waste Discharge to determine whether modification to this Order, pursuant to the requirements of Provision H, will be required prior the Orange County Copermittees and/or Riverside County Copermittees becoming covered under this Order. The current Orders for the Orange County Copermittees and Riverside County Copermittees are rescinded upon notification of coverage under this Order except for enforcement purposes.

b. The Copermittees subject to the requirements of this Order must submit to the San Diego Water Board a complete Report of Waste Discharge as an application for the re-issuance of this Order and NPDES permit. The Report of Waste Discharge must be submitted no later than 180 days in advance of the expiration date of this Order. The Report of Waste Discharge must contain the following minimum information:

(1) Names and addresses of the Copermittees;

(2) Names and titles of the primary contacts of the Copermittees;

(3) Proposed changes to the Copermittees' Water Quality Improvement Plans and the supporting justification;

(4) Proposed changes to the Copermittees' jurisdictional runoff management programs and the supporting justification;

(5) Any other information necessary for the re-issuance of this Order;

(6) Any information to be included as part of the Report of Waste Discharge pursuant to the requirements of this Order; and

(7) Any other information required by federal regulations for NPDES permit reissuance.

6. Application for Early Coverage

a. The Orange County Copermittees, collectively, or Riverside County Copermittees, collectively, may apply for early coverage under this Order by submitting a Report of Waste Discharge Form 200, with a written request for early coverage under this Order.

b. The San Diego Water Board will review the application for early coverage. A notification of coverage under this Order will be issued to the Copermittees in the respective county by the San Diego Water Board upon completion of the early coverage application requirements. The effective coverage date will be specified in the notification of coverage. The Copermittees in the respective county are authorized to have MS4 discharges pursuant to the requirements of this Order starting on the effective coverage date specified in the notification of coverage. The existing Order for the respective county is rescinded upon the effective coverage date specified in the notification of coverage except for enforcement purposes.

7. Reporting Provisions

Each Copermittee must comply with all the reporting and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

G. PRINCIPAL WATERSHED COPERMITTEE RESPONSIBILITIES

1. The Copermittees within each Watershed Management Area must designate a Principal Watershed Copermittee and notify the San Diego Water Board of the name of the Principal Watershed Copermittee. An individual Copermittee should not be designated a Principal Watershed Copermittee for more than two Watershed Management Areas. The notification may be submitted with the Water Quality Improvement Plan required pursuant to Provision F.1 of this Order.

2. The Principal Watershed Copermittee is responsible for, at a minimum, the following:

a. Serving as liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues, and when necessary and appropriate, representing the Copermittees in the Watershed Management Area before the San Diego Water Board.

b. Facilitating the development of the Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order

c. Coordinating the submittal of the deliverables required by Provisions F.1, F.2, F.3.a, and F.3.b of this Order.

d. Coordinating and developing, with the other Principal Watershed Copermittees, the requirements of Provisions F.3.c, F.4, and F.5.b of this Order.

H. MODIFICATION OF PROGRAMS

1. Modifications of the Order may be initiated by the San Diego Water Board or by the Copermittees. Requests by Copermittees must be made to the San Diego Water Board.

2. Minor modifications to the Order may be made by the San Diego Water Board where the proposed modification complies with all the prohibitions and limitations, and other requirements of this Order.

3. Proposed modifications to the Order that are not minor require amendment of this Order in accordance with this Order's rules, policies, and procedures.

4. The San Diego Water Board may re-open and modify this Order at any time prior to its expiration, after opportunity for public comment and a public hearing, if the State Water Board determines that revisions are warranted to those provisions of the Order addressing compliance with water quality standards in the receiving water and/or those provisions of the Order establishing an iterative process for implementation of management practices to assure compliance with water quality standards in the receiving water.

I. STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

Each Copermittee must comply with all the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

ATTACHMENT A

DISCHARGE PROHIBITIONS AND SPECIAL PROTECTIONS

1. Basin Plan Waste Discharge Prohibitions

California Water Code Section 13243 provides that a Regional Water Board, in a water quality control plan, may specify certain conditions or areas where the discharge of waste or certain types of waste is not permitted. The following waste discharge prohibitions in the Water Quality Control Plan for the San Diego Basin (Basin Plan) are applicable to any person, as defined by Section 13050(c) of the California Water Code, who is a citizen, domiciliary, or political agency or entity of California whose activities in California could affect the quality of waters of the state within the boundaries of the San Diego Region.

1. The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in California Water Code Section 13050, is prohibited.

2. The discharge of waste to land, except as authorized by waste discharge requirements or the terms described in California Water Code Section 13264 is prohibited.

3. The discharge of pollutants or dredged or fill material to waters of the United States except as authorized by a National Pollutant Discharge Elimination System (NPDES) permit or a dredged or fill material permit (subject to the exemption described in California Water Code Section 13376) is prohibited.

4. Discharges of recycled water to lakes or reservoirs used for municipal water supply or to inland surface water tributaries thereto are prohibited, unless this San Diego Water Board issues a NPDES permit authorizing such a discharge; the proposed discharge has been approved by the State Department of Health Services (DHS) and the operating agency of the impacted reservoir; and the discharger has an approved fail-safe long-term disposal alternative.

5. The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the San Diego Water Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

6. The discharge of waste in a manner causing flow, ponding, or surfacing on lands not owned or under the control of the discharger is prohibited, unless the discharge is authorized by the San Diego Water Board.

7. The dumping, deposition, or discharge of waste directly into waters of the state, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the San Diego Water Board.

8. Any discharge to a storm water conveyance system that is not composed entirely of "*storm water*" is prohibited unless authorized by the San Diego Water Board. [The federal regulations, 40 CFR 122.26(b)(13), define storm water as storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from fire fighting activities.] [§122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

9. The unauthorized discharge of treated or untreated sewage to waters of the state or to a storm water conveyance system is prohibited.

10. The discharge of industrial wastes to conventional septic tank/subsurface disposal systems, except as authorized by the terms described in California Water Code Section 13264, is prohibited.

11. The discharge of radioactive wastes amenable to alternative methods of disposal into the waters of the state is prohibited.

12. The discharge of any radiological, chemical, or biological warfare agent into waters of the state is prohibited.

13. The discharge of waste into a natural or excavated site below historic water levels is prohibited unless the discharge is authorized by the San Diego Water Board.

14. The discharge of sand, silt, clay, or other earthen materials from any activity, including land grading and construction, in quantities which cause deleterious bottom deposits, turbidity or discoloration in waters of the state or which unreasonably affect, or threaten to affect, beneficial uses of such waters is prohibited.

15. The discharge of treated or untreated sewage from vessels to Mission Bay, Oceanside Harbor, Dana Point Harbor, or other small boat harbors is prohibited.

16. The discharge of untreated sewage from vessels to San Diego Bay is prohibited.

17. The discharge of treated sewage from vessels to portions of San Diego Bay that are less than 30 feet deep at mean lower low water (MLLW) is prohibited.

18. The discharge of treated sewage from vessels, which do not have a properly functioning US Coast Guard certified Type I or Type II marine sanitation device, to portions of San Diego Bay that are greater than 30 feet deep at mean lower low water (MLLW) is prohibited.

2. Attachment B to State Water Board Resolution 2012-0012

Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges

I. PROVISIONS FOR POINT SOURCE DISCHARGES OF STORM WATER AND NONPOINT SOURCE WASTE DISCHARGES

The following terms, prohibitions, and special conditions (hereafter collectively referred to as special conditions) are established as limitations on point source storm water and nonpoint source discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in Areas of Special Biological Significance (ASBS), as required for State Water Quality Protection Areas pursuant to California Public Resources Code Sections 36700(f) and 36710(f). These Special Protections are adopted by the State Water Board as part of the California Ocean Plan (Ocean Plan) General Exception.

The special conditions are organized by category of discharge. The State Water Resources Control Board (State Water Board) and Regional Water Quality Control Boards (Regional Water Boards) will determine categories and the means of regulation for those categories [e.g., Point Source Storm Water National Pollutant Discharge Elimination System (NPDES) or Nonpoint Source].

A. PERMITTED POINT SOURCE DISCHARGES OF STORM WATER

1. General Provisions for Permitted Point Source Discharges of Storm Water

   a. Existing storm water discharges into an ASBS are allowed only under the following conditions:

      (1) The discharges are authorized by an NPDES permit issued by the State Water Board or Regional Water Board;

      (2) The discharges comply with all of the applicable terms, prohibitions, and special conditions contained in these Special Protections; and

      (3) The discharges:

         (i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

         (ii) Are designed to prevent soil erosion;

         (iii) Occur only during wet weather;

         (iv) Are composed of only storm water runoff.

   b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

   c. The discharge of trash is prohibited.

d. Only discharges from existing storm water outfalls are allowed. Any proposed or new storm water runoff discharge shall be routed to existing storm water discharge outfalls and shall not result in any new contribution of waste to an ASBS (i.e., no additional pollutant loading). “Existing storm water outfalls” are those that were constructed or under construction prior to January 1, 2005. “New contribution of waste” is defined as any addition of waste beyond what would have occurred as of January 1, 2005. A change to an existing storm water outfall, in terms of re-location or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges are prohibited except as provided below:

(1) The term “non-storm water discharges” means any waste discharges from a municipal separate storm sewer system (MS4) or other NPDES permitted storm drain system to an ASBS that are not composed entirely of storm water.

(2) (i) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability or occur naturally:

(a) Discharges associated with emergency fire fighting operations.

(b) Foundation and footing drains.

(c) Water from crawl space or basement pumps.

(d) Hillside dewatering.

(e) Naturally occurring groundwater seepage via a storm drain.

(f) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(ii) An NPDES permitting authority may authorize non-storm water discharges to an MS4 with a direct discharge to an ASBS only to the extent the NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

2. Compliance Plans for Inclusion in Storm Water Management Plans (SWMP) and Storm Water Pollution Prevention Plans (SWPPP).

The discharger shall specifically address the prohibition of non-storm water runoff and the requirement to maintain natural water quality for storm water discharges to an ASBS in an ASBS Compliance Plan to be included in its SWMP or a SWPPP, as appropriate to permit type. If a statewide permit includes a SWMP, then the discharger shall prepare a stand-alone compliance plan for ASBS discharges. The ASBS Compliance Plan is subject to approval by the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (for permits issued by Regional Water Boards).

a. The Compliance Plan shall include a map of surface drainage of storm water runoff, showing areas of sheet runoff, prioritize discharges, and describe any structural Best Management Practices (BMPs) already employed and/or BMPs to be employed in the future. Priority discharges are those that pose the greatest water quality threat and which are identified to require installation of structural BMPs. The map shall also show the storm water conveyances in relation to other features such as service areas, sewage conveyances and treatment facilities, landslides, areas prone to erosion, and waste and hazardous material storage areas, if applicable. The SWMP or SWPPP shall also include a procedure for updating the map and plan when changes are made to the storm water conveyance facilities.

b. The ASBS Compliance Plan shall describe the measures by which all non-authorized non-storm water runoff (e.g., dry weather flows) has been eliminated, how these measures will be maintained over time, and how these measures are monitored and documented.

c. For Municipal Separate Storm Sewer System (MS4s), the ASBS Compliance Plan shall require minimum inspection frequencies as follows:

   (1) The minimum inspection frequency for construction sites shall be weekly during rainy season;

   (2) The minimum inspection frequency for industrial facilities shall be monthly during the rainy season;

   (3) The minimum inspection frequency for commercial facilities (e.g., restaurants) shall be twice during the rainy season; and

   (4) Storm water outfall drains equal to or greater than 18 inches (457 mm) in diameter or width shall be inspected once prior to the beginning of the rainy season and once during the rainy season and maintained to remove trash and other anthropogenic debris.

d. The ASBS Compliance Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff, that are necessary to comply with these special conditions, will be achieved through BMPs. Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that such installation would pose a threat to health or safety. BMPs to control storm water runoff discharges (at the end-of-pipe) during a design storm shall be designed to achieve on average the following target levels:

   (1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

   (2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges. The baseline for the reduction is the effective date of the Exception. The baseline for these determinations is the effective date of the Exception, and the

reductions must be achieved and documented within four (4) years of the effective date.

e. The ASBS Compliance Plan shall address erosion control and the prevention of anthropogenic sedimentation in ASBS. The natural habitat conditions in the ASBS shall not be altered as a result of anthropogenic sedimentation.

f. The ASBS Compliance Plan shall describe the non-structural BMPs currently employed and planned in the future (including those for construction activities), and include an implementation schedule. The ASBS Compliance Plan shall include non-structural BMPs that address public education and outreach. Education and outreach efforts must adequately inform the public that direct discharges of pollutants from private property not entering an MS4 are prohibited. The ASBS Compliance Plan shall also describe the structural BMPs, including any low impact development (LID) measures, currently employed and planned for higher threat discharges and include an implementation schedule. To control storm water runoff discharges (at the end-of-pipe) during a design storm, permittees must first consider using LID practices to infiltrate, use, or evapotranspirate storm water runoff on-site.

g. The BMPs and implementation schedule shall be designed to ensure that natural water quality conditions in the receiving water are achieved and maintained by either reducing flows from impervious surfaces or reducing pollutant loading, or some combination thereof.

h. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents in storm water runoff that alter natural ocean water quality and the sources of these constituents.

(2) The report shall describe BMPs that are currently being implemented, BMPs that are identified in the SWMP or SWPPP for future implementation, and any additional BMPs that may be added to the SWMP or SWPPP to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the BMPs.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits), the discharger shall revise its ASBS Compliance Plan to incorporate any new or modified BMPs that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised SWMP or SWPPP, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural ocean water quality conditions due to the same constituent.

(5) Compliance with this section does not excuse violations of any term, prohibition, or condition contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within one year from the effective date of the Exception, the discharger shall submit a written ASBS Compliance Plan to the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that describes its strategy to comply with these special conditions, including the requirement to maintain natural water quality in the affected ASBS. The ASBS Compliance Plan shall include a time schedule to implement appropriate non-structural and structural controls (implementation schedule) to comply with these special conditions for inclusion in the discharger's SWMP or SWPPP, as appropriate to permit type.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these special conditions shall be implemented.

d. Within four (4) years of the effective date of the Exception, any structural controls identified in the ASBS Compliance Plan that are necessary to comply with these special conditions shall be operational.

e. Within four (4) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water, pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data, and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

   If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

   The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

(1) for municipalities, a demonstration of significant hardship to discharger ratepayers, by showing the relationship of storm water fees to annual household income for residents within the discharger's jurisdictional area, and the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or
(2) for other governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process.

B. NONPOINT SOURCE DISCHARGES

[NOT INCLUDED]
[PROVISIONS FOR NONPOINT SOURCE DISCHARGES NOT APPLICABLE]

II. ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES

[NOT INCLUDED]
[ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES NOT APPLICABLE]

III. ADDITIONAL REQUIREMENTS – WATERFRONT AND MARINE OPERATIONS

[NOT INCLUDED]
[ADDITIONAL REQUIREMENTS FOR WATERFRONT AND MARINE OPERATIONS NOT APPLICABLE]

IV. MONITORING REQUIREMENTS

Monitoring is mandatory for all dischargers to assure compliance with the Ocean Plan. Monitoring requirements include both: (A) core discharge monitoring, and (B) ocean receiving water monitoring. The State and Regional Water Boards must approve sampling site locations and any adjustments to the monitoring programs. All ocean receiving water and reference area monitoring must be comparable with the Water Boards' Surface Water Ambient Monitoring Program (SWAMP).

Safety concerns: Sample locations and sampling periods must be determined considering safety issues. Sampling may be postponed upon notification to the State and Regional Water Boards if hazardous conditions prevail.

Analytical Chemistry Methods: All constituents must be analyzed using the lowest minimum detection limits comparable to the Ocean Plan water quality objectives. For metal analysis, all samples, including storm water effluent, reference samples, and ocean receiving water samples, must be analyzed by the approved analytical method with the lowest minimum detection limits (currently Inductively Coupled Plasma/Mass Spectrometry) described in the Ocean Plan.

A. CORE DISCHARGE MONITORING PROGRAM

1. General sampling requirements for timing and storm size:

   Runoff must be collected during a storm event that is greater than 0.1 inch and generates runoff, and at least 72 hours from the previously measurable storm event. Runoff samples shall be collected when post-storm receiving water is sampled, and analyzed for the same constituents as receiving water and reference site samples (see section IV B) as described below.

2. Runoff flow measurements

   a. For municipal/industrial storm water outfalls in existence as of December 31, 2007, 18 inches (457mm) or greater in diameter/width (including multiple outfall pipes in combination having a width of 18 inches, runoff flows must be measured or calculated, using a method acceptable to and approved by the State and Regional Water Boards.
   b. This will be reported annually for each precipitation season to the State and Regional Water Boards.

3. Runoff samples – storm events

   a. For outfalls equal to or greater than 18 inches (0.46m) in diameter or width:

      (1) samples of storm water runoff shall be analyzed during the same storm as receiving water samples for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination, ; and

      (2) samples of storm water runoff shall be analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS

      (3) If an applicant has no outfall greater than 36 inches, then storm water runoff from the applicant's largest outfall shall be further analyzed during the same storm as receiving water samples for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates).

   b. For outfalls equal to or greater than 36 inches (0.91m) in diameter or width:

      (1) samples of storm water runoff shall be analyzed during the same storm as receiving water samples for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

      (2) samples of storm water runoff shall be further analyzed during the same storm as receiving water samples for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates) and

(3) samples of storm water runoff shall be analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

c. For an applicant not participating in a regional monitoring program [see below in Section IV (B)] in addition to (a.) and (b.) above, a minimum of the two largest outfalls or 20 percent of the larger outfalls, whichever is greater, shall be sampled (flow weighted composite samples) at least three times annually during wet weather (storm event) and analyzed for all Ocean Plan Table A constituents, Table B constituents for marine aquatic life protection (except for toxicity, only chronic toxicity for three species shall be required), DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, and Ocean Plan indicator bacteria. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one (the largest) such discharge shall be sampled annually in each Region.

4. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may reduce or suspend core monitoring once the storm runoff is fully characterized. This determination may be made at any point after the discharge is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

B. OCEAN RECEIVING WATER AND REFERENCE AREA MONITORING PROGRAM

In addition to performing the Core Discharge Monitoring Program in Section II.A above, all applicants having authorized discharges must perform ocean receiving water monitoring. In order to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS, dischargers may choose either (1) an individual monitoring program, or (2) participation in a regional integrated monitoring program.

1. Individual Monitoring Program: The requirements listed below are for those dischargers who elect to perform an individual monitoring program to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within the affected ASBS. In addition to Core Discharge Monitoring, the following additional monitoring requirements shall be met:

   a. Three times annually, during wet weather (storm events), the receiving water at the point of discharge from the outfalls described in section (IV)(A)(3)(c) above shall be sampled and analyzed for Ocean Plan Table A constituents, Table B constituents for marine aquatic life, DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, salinity, chronic toxicity (three species), and Ocean Plan indicator bacteria.

      The sample location for the ocean receiving water shall be in the surf zone at the point of discharges; this must be at the same location where storm water runoff is sampled. Receiving water shall be sampled at approximately the same time prior to (pre-storm) and during (or immediately after) the same storm (post storm). Reference water quality shall also be sampled and analyzed for the same constituents pre-storm and post-storm, during the same storms when receiving water is sampled. Reference stations will be determined by the State Water Board's Division of Water Quality and the applicable Regional Water Board(s).

b. Sediment sampling shall occur at least three times during every five (5) year period. The subtidal sediment (sand or finer, if present) at the discharge shall be sampled and analyzed for Ocean Plan Table B constituents for marine aquatic life, DDT, PCBs, PAHs, pyrethroids, and OP pesticides. For sediment toxicity testing, only an acute toxicity test using the amphipod Eohaustorius estuarius must be performed.

c. A quantitative survey of intertidal benthic marine life shall be performed at the discharge and at a reference site. The survey shall be performed at least once every five (5) year period. The survey design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The results of the survey shall be completed and submitted to the State Water Board and Regional Water Board at least six months prior to the end of the permit cycle.

d. Once during each five (5) year period, a bioaccumulation study shall be conducted to determine the concentrations of metals and synthetic organic pollutants at representative discharge sites and at representative reference sites. The study design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The bioaccumulation study may include California mussels (Mytilus californianus) and/or sand crabs (Emerita analoga or Blepharipoda occidentalis). Based on the study results, the Regional Water Board and the State Water Board's Division of Water Quality, may adjust the study design in subsequent permits, or add or modify additional test organisms (such as shore crabs or fish), or modify the study design appropriate for the area and best available sensitive measures of contaminant exposure.

e. Marine Debris: Representative quantitative observations for trash by type and source shall be performed along the coast of the ASBS within the influence of the discharger's outfalls. The design, including locations and frequency, of the marine debris observations is subject to approval by the Regional Water Board and State Water Board's Division of Water Quality.

f. The monitoring requirements of the Individual Monitoring Program in this section are minimum requirements. After a minimum of one (1) year of continuous water quality monitoring of the discharges and ocean receiving waters, the Executive Director of the State Water Board (statewide permits) or Executive officer of the Regional Water Board (Regional Water Board permits) may require additional monitoring, or adjust, reduce or suspend receiving water and reference station monitoring. This determination may be made at any point after the discharge and receiving water is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

2. Regional Integrated Monitoring Program: Dischargers may elect to participate in a regional integrated monitoring program, in lieu of an individual monitoring program, to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS. This regional approach shall characterize natural water quality, pre- and post-storm, in ocean reference areas near the mouths of identified open space watersheds and the effects of the discharges on natural water quality (physical, chemical, and toxicity) in the ASBS receiving waters, and should include benthic marine aquatic life and bioaccumulation components. The design of the ASBS stratum of a regional integrated monitoring program may deviate from the otherwise prescribed individual monitoring approach (in Section IV.B.1) if approved by the State Water Board's Division of Water Quality and the Regional Water Boards.

a. Ocean reference areas shall be located at the drainages of flowing watersheds with minimal development (in no instance more than 10% development), and shall not be located in CWA Section 303(d) listed waterbodies or have tributaries that are 303(d) listed. Reference areas shall be free of wastewater discharges and anthropogenic non-storm water runoff. A minimum of low threat storm runoff discharges (e.g. stream highway overpasses and campgrounds) may be allowed on a case-by-case basis. Reference areas shall be located in the same region as the ASBS receiving water monitoring occurs. The reference areas for each Region are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean reference water samples must be collected from each station, each from a separate storm. A minimum of one reference location shall be sampled for each ASBS receiving water site sampled per responsible party. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

b. ASBS ocean receiving water must be sampled in the surf zone at the location where the runoff makes contact with ocean water (i.e. at "point zero"). Ocean receiving water stations must be representative of worst-case discharge conditions (i.e. co-located at a large drain greater than 36 inches, or if drains greater than 36 inches are not present in the ASBS then the largest drain greater than18 inches.) Ocean receiving water stations are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean receiving water samples must be collected during each storm season from each station, each from a separate storm. A minimum of one receiving water location shall be sampled in each ASBS per responsible party in that ASBS. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

c. Reference and receiving water sampling shall commence during the first full storm season following the adoption of these special conditions, and post-storm samples shall be collected when annual storm water runoff is sampled. Sampling shall occur in a minimum of two storm seasons. For those ASBS dischargers that have already participated in the Southern California Bight 2008 ASBS regional monitoring effort, sampling may be limited to only one storm season.

d. Receiving water and reference samples shall be analyzed for the same constituents as storm water runoff samples. At a minimum, constituents to be sampled and analyzed in reference and discharge receiving waters must include oil and grease, total suspended solids, Ocean Plan Table B metals for protection of marine life, Ocean Plan PAHs, pyrethroids, OP pesticides, ammonia, nitrate, phosphates, and critical life stage chronic toxicity for three species. In addition, within the range of the southern sea otter, indicator bacteria or some other measure of fecal contamination shall be analyzed.

3. Waterfront and Marine Operations: In addition to the above requirements for ocean receiving water monitoring, additional monitoring must be performed for marinas and boat launch and pier facilities:

a. For all marina or mooring field operators, in mooring fields with 10 or more occupied moorings, the ocean receiving water must be sampled for Ocean Plan indicator bacteria,

residual chlorine, copper, zinc, grease and oil, methylene blue active substances (MBAS), and ammonia nitrogen.

(1) For mooring field operators opting for an individual monitoring program (Section IV.B.1 above), this sampling must occur weekly (on the weekend) from May through October.

(2) For mooring field operators opting to participate in a regional integrated monitoring program (Section IV.B.2 above), this sampling must occur monthly from May through October on a high use weekend in each month. The Water Boards may allow a reduction in the frequency of sampling, through the regional monitoring program, after the first year of monitoring.

b. For all mooring field operators, the subtidal sediment (sand or finer, if present) within mooring fields and below piers shall be sampled and analyzed for Ocean Plan Table B metals (for marine aquatic life beneficial use), acute toxicity, PAHs, and tributyltin. For sediment toxicity testing, only an acute toxicity test using the amphipod Eohaustorius estuarius must be performed. This sampling shall occur at least three times during a five (5) year period. For mooring field operators opting to participate in a regional integrated monitoring program, the Water Boards may allow a reduction in the frequency of sampling after the first sampling effort's results are assessed.

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ATTACHMENT B

STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

1. Standard Permit Provisions

Code of Federal Regulations Title 40 Section 122.41 (40 CFR 122.41) includes conditions, or provisions, that apply to all National Pollutant Discharge Elimination System (NPDES) permits. Additional provisions applicable to NPDES permits are in 40 CFR 122.42. All applicable provisions in 40 CFR 122.41 and 40 CFR 122.42 must be incorporated into this Order and NPDES permit. The applicable 40 CFR 122.41 and 40 CFR 122.42 provisions are as follows:

a. DUTY TO COMPLY [40 CFR 122.41(a)]

The Copermittee must comply with all of the provisions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

(1) The Copermittee must comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement. [40 CFR 122.41(a)(1)]

(2) The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to a civil penalty not to exceed $25,000 per day for each violation. The CWA provides that any person who *negligently* violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than 2 years, or both. Any person who *knowingly* violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both. Any person who knowingly violates Section 301, 302, 303, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, and who knows at that time that he thereby places another person in imminent danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of

not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.
[40 CFR 122.41(a)(2)]

(3) Any person may be assessed an administrative penalty by the San Diego Regional Water Quality Control Board (San Diego Water Board), State Water Resources Control Board (State Water Board), or United States Environmental Protection Agency (USEPA) for violating Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.
[40 CFR 122.41(a)(3)]

b. DUTY TO REAPPLY [40 CFR 122.41(b)]

If a Copermittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Copermittee must apply for and obtain a new permit.

c. NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE [40 CFR 122.41(c)]

It shall not be a defense for a Copermittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

d. DUTY TO MITIGATE [40 CFR 122.41(d)]

The Copermittee must take all reasonable steps to minimize or prevent any discharge or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

e. PROPER OPERATION AND MAINTENANCE [40 CFR 122.41(e)]

The Copermittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Copermittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by a Copermittee only when the operation is necessary to achieve compliance with the conditions of this permit.

f. PERMIT ACTIONS [40 CFR 122.41(f)]

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Copermittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

g. PROPERTY RIGHTS [40 CFR 122.41(g)]

This permit does not convey any property rights of any sort, or any exclusive privilege.

h. DUTY TO PROVIDE INFORMATION [40 CFR 122.41(h)]

The Copermittee must furnish to the San Diego Water Board, State Water Board, or USEPA within a reasonable time, any information which the San Diego Water Board, State Water Board, or USPEA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Copermittee must also furnish to the San Diego Water Board, State Water Board, or USPEA upon request, copies of records required to be kept by this permit.

i. INSPECTION AND ENTRY [40 CFR 122.41(i)]

The Copermittee must allow the San Diego Water Board, State Water Board, USEPA, and/or their authorized representative (including an authorized contractor acting as their representative), upon presentation of credentials and other documents as may be required by law, to:

(1) Enter upon the Copermittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit; [40 CFR 122.41(i)(1)]

(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit; [40 CFR 122.41(i)(2)]

(3) Inspect and photograph at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; [40 CFR 122.41(i)(3)] and

(4) Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location. [40 CFR 122.41(i)(4)]

j. MONITORING AND RECORDS [40 CFR 122.41(j)]

(1) Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity. [40 CFR 122.41(j)(1)]

(2) Except for records of monitoring information required by this permit related to the Copermittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five (5) years (or longer as required by 40 CFR Part 503), the

Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time. [40 CFR 122.41(j)(2)]

(3) Records for monitoring information must include: [40 CFR 122.41(j)(3)]

(a) The date, exact place, and time of sampling or measurements; [40 CFR 122.41(j)(3)(i)]
(b) The individual(s) who performed the sampling or measurements; [40 CFR 122.41(j)(3)(ii)]
(c) The date(s) analyses were performed; [40 CFR 122.41(j)(3)(iii)]
(d) The individual(s) who performed the analyses; [40 CFR 122.41(j)(3)(iv)]
(e) The analytical techniques or methods used; [40 CFR 122.41(j)(3)(v)] and
(f) The results of such analyses. [40 CFR 122.41(j)(3)(vi)]

(4) Monitoring must be conducted according to test procedures under 40 CFR Part 136 unless another method is required under 40 CFR Subchapters N or O. [40 CFR 122.41(j)(4)]

In the case of pollutants for which there are no approved methods under 40 CFR Part 136 or otherwise required under 40 CFR Subchapters N and O, monitoring must be conducted according to a test procedure specified in the permit for such pollutants. [40 CFR 122.44(i)(1)(iv)]

(5) The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. [40 CFR 122.41(j)(5)]

k. SIGNATORY REQUIREMENT [40 CFR 122.41(k)]

(1) All applications, reports, or information submitted to the San Diego Water Board, State Water Board, or USEPA must be signed and certified. (See 40 CFR 122.22) [40 CFR 122.41(k)(1)]

(a) *For a municipality, State, Federal, or other public agency.* [All applications must be signed] [b]y either a principal executive officer or ranking elected official. [40 CFR 122.22(a)(3)]

(b) All reports required by permits, and other information requested by the San Diego Water Board, State Water Board, or USEPA must be signed by a person described in paragraph (a) of this section, or by a duly authorized representative of that person. A person is a duly authorized representative only if: [40 CFR 122.22(b)]

(i) The authorization is made in writing by a person described in paragraph (a) of this section; [40 CFR 122.22(b)(1)]

(ii) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company, (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) [40 CFR 122.22(b)(2)] and,

(iii) The written authorization is submitted to the San Diego Water Board and State Water Board. [40 CFR 122.22(b)(3)]

(c) *Changes to authorization.* If an authorization under paragraph (b) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (b) of this section must be submitted to the San Diego Water Board prior to or together with any reports, information, or applications to be signed by an authorized representative. [40 CFR 122.22(c)]

(d) *Certification.* Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." [40 CFR 122.22(d)]

(2) The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both. [40 CFR 122.41(k)(2)]

I. REPORTING REQUIREMENTS [40 CFR 122.41(l)]

(1) *Planned changes.* The Copermittee must give notice to the San Diego Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when: [40 CFR 122.41(l)(1)]

(a) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); [40 CFR 122.41(l)(1)(i)] or

(b) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which

are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1).
[40 CFR 122.41(l)(1)(ii)]

(c) The alteration or addition results in a significant change in the Copermittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. [40 CFR 122.41(l)(1)(iii)]

(2) *Anticipated noncompliance*. The Copermittee must give advance notice to the San Diego Water Board or State Water Board of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.
[40 CFR 122.41(l)(2)]

(3) *Transfers*. This permit is not transferable to any person except after notice to the San Diego Water Board. The San Diego Water Board may require modification or revocation and reissuance of the permit to change the name of the Copermittee and incorporate such other requirements as may be necessary under the CWA.
[40 CFR 122.41(l)(3)]

(4) *Monitoring reports.* Monitoring results must be reported at the intervals specified elsewhere in this permit. [40 CFR 122.41(l)(4)]

(a) Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the San Diego Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices. [40 CFR 122.41(l)(4)(i)]

(b) If the Copermittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or another method required for an industry-specific waste stream under 40 CFR Subchapters N or O, the results of this monitoring must be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the San Diego Water Board or State Water Board.
[40 CFR 122.41(l)(4)(ii)]

(c) Calculations for all limitations which require averaging of measurements must utilize an arithmetic mean unless otherwise specified in the permit.
[40 CFR 122.41(l)(4)(iii)]

(5) *Compliance schedules*. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date. [40 CFR 122.41(l)(5)]

(6) *Twenty-four hour reporting.*

(a) The Copermittee must report any noncompliance that may endanger health or the environment. Any information must be provided orally within 24 hours from the time the Copermittee becomes aware of the circumstances. A written submission must also be provided within five (5) days of the time the Copermittee becomes aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6)(i)]

(b) The following must be included as information which must be reported within 24 hours under this paragraph: [40 CFR 122.41(l)(6)(ii)]

(i) Any unanticipated bypass that exceeds any effluent limitation in the permit (See 40 CFR 122.41(g)). [40 CFR 122.41(l)(6)(ii)(A)]
(ii) Any upset which exceeds any effluent limitation in the permit. [40 CFR 122.41(l)(6)(ii)(B)] and,
(iii) Violation of a maximum daily discharge limitation for any of the pollutants listed by the San Diego Water Board in the permit to be reported within 24 hours. (See 40 CFR 122.44(g)) [40 CFR 122.41(l)(6)(ii)(C)]

(c) The San Diego Water Board may waive the above-required written report on a case-by-case basis if the oral report has been received within 24 hours. [40 CFR 122.41(l)(6)(iii)]

(7) *Other noncompliance.* The Copermittee must report all instances of noncompliance not reported in accordance with the standard provisions required under 40 CFR 122.41(l)(4), (5), and (6), at the time monitoring reports are submitted. The reports must contain the information listed in the standard provisions required under 40 CFR 122.41(l)(6). [40 CFR 122.41(l)(7))]

(8) *Other information.* When the Copermittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the San Diego Water Board, State Water Board, or USEPA, the Copermittee must promptly submit such facts or information. [40 CFR 122.41(l)(8)]

m. BYPASS [40 CFR 122.41(m)]

(1) *Definitions.*

(a) "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. [40 CFR 122.41(m)(1)(i)] or

(b) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be

expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
[40 CFR 122.41(m)(1)(ii)]

(2) *Bypass not exceeding limitations*. The Copermittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the standard provisions required under 40 CFR 122.41(m)(3) and (4).
[40 CFR 122.41(m)(2)]

(3) *Notice.*

(a) *Anticipated bypass*. If the Copermittee knows in advance of the need for a bypass, it must submit a notice, if possible at least ten days before the date of the bypass. [40 CFR 122.41(m)(3)(i)] or

(b) *Unanticipated bypass*. The Copermittee must submit notice of an unanticipated bypass in accordance with the standard provisions required under 40 CFR 122.41(l)(6) (24-hour notice).
[40 CFR 122.41(m)(3)(ii)]

(4) *Prohibition of Bypass.*

(a) Bypass is prohibited, and the San Diego Water Board may take enforcement action against a Copermittee for bypass, unless:
[40 CFR 122.41(m)(4)(i)]

(i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; [40 CFR 122.41(m)(4)(i)(A)]
(ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance;
[40 CFR 122.41(m)(4)(i)(B)] and,
(iii) The Copermittee submitted notice in accordance with the standard provisions required under 40 CFR 122.41(m)(3).
[40 CFR 122.41(m)(4)(i)(C)]

(b) The San Diego Water Board may approve an anticipated bypass, after considering its adverse effects, if the San Diego Water Board determines that it will meet the three conditions listed above.
[40 CFR 122.41(m)(4)(ii)]

n. UPSET [40 CFR 122.41(n)]

(1) *Definition.* "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Copermittee. An upset does not

include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. [40 CFR 122.41(n)(1)]

(2) *Effect of an upset*. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the standard provisions required under 40 CFR 122.41(n)(3) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. [40 CFR 122.41(n)(2)]

(3) *Conditions necessary for a demonstration of upset*. A Copermittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that: [40 CFR 122.41(n)(3)]

(a) An upset occurred and that the Copermittee can identify the cause(s) of the upset; [40 CFR 122.41(n)(3)(i)]
(b) The permitted facility was at the time being properly operated; [40 CFR 122.41(n)(3)(ii)] and
(c) The Copermittee submitted notice of the upset in accordance with the standard provisions required under 40 CFR 122.41(l)(6)(ii)(B) (24-hour notice). [40 CFR 122.41(n)(3)(iii)]
(d) The Copermittee complied with any remedial measures pursuant to the standard provisions required under 40 CFR 122.41(d). [40 CFR 122.41(n)(3)(iii)]

(4) *Burden of proof*. In any enforcement proceeding, the Copermittee seeking to establish the occurrence of an upset has the burden of proof. [40 CFR 122.41(n)(4)]

o. STANDARD PERMIT PROVISIONS FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS [40 CFR 122.42(c)]

The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the San Diego Water Board or State Water Board under 40 CFR 122.26(a)(1)(v) must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report must include:

(1) The status of implementing the components of the storm water management program that are established as permit conditions; [40 CFR 122.42(c)(1)]

(2) Proposed changes to the storm water management programs that are established as permit conditions. Such proposed changes must be consistent with 40 CFR 122.26(d)(2)(iii); [40 CFR 122.42(c)(2)] and

(3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under 40 CFR 122.26(d)(2)(iv) and (v); [40 CFR 122.42(c)(3)]

(4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; [40 CFR 122.42(c)(4)]

(5) Annual expenditures and budget for year following each annual report; [40 CFR 122.42(c)(5)]

(6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; [40 CFR 122.42(c)(6)]

(7) Identification of water quality improvements or degradation. [40 CFR 122.42(c)(7)]

p. STANDARD PERMIT PROVISIONS FOR STORM WATER DISCHARGES [40 CFR 122.42(d)]

The initial permits for discharges composed entirely of storm water issued pursuant to 40 CFR 122.26(e)(7) must require compliance with the conditions of the permit as expeditiously as practicable, but in no event later than three years after the date of issuance of the permit.

2. General Provisions

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. The general provisions applicable to this Order and NPDES permit are as follows:

a. DISCHARGE OF WASTE IS A PRIVILEGE

No discharge of waste into the waters of the State, whether or not such discharge is made pursuant to waste discharge requirements, shall create a vested right to continue such discharge. All discharges of waste into waters of the State are privileges, not rights. [CWC Section 13263(g)]

b. DURATION OF ORDER AND NPDES PERMIT

(1) *Effective date*. This Order and NPDES permit becomes effective on the 50th day after its adoption provided the USEPA has no objection. If the USEPA objects to its issuance, this Order shall not become effective until such objection is withdrawn. This Order supersedes Order No. R9-2007-0001 upon the effective date of this Order, and supersedes Order Nos. R9-2009-0002 and R9-2010-0016 upon their expiration or earlier notice of coverage.

(2) *Expiration*. This Order and NPDES permit expires five years after its effective date. [40 CFR 122.46(a)]

(3) *Continuation of expired order*. After this Order and NPDES permit expires, the terms and conditions of this Order and NPDES permit are automatically continued pending issuance of a new permit if all requirements of the federal NPDES regulations on the continuation of expired permits (40 CFR 122.6) are complied with.

c. AVAILABILITY

A copy of this Order must be kept at a readily accessible location and must be available to on-site personnel at all times.

d. CONFIDENTIALITY OF INFORMATION

Except as provided for in 40 CFR 122.7, no information or documents submitted in accordance with or in application for this Order will be considered confidential, and all such information and documents shall be available for review by the public at the San Diego Water Board office.

Claims of confidentiality for the following information will be denied: [40 CFR 122.7(b)]

(1) The name and address of any permit applicant or Copermittee; [40 CFR 122.7(b)(1)] and

(2) Permit applications and attachments, permits, and effluent data. [40 CFR 122.7(b)(2)]

e. EFFLUENT LIMITATIONS

(1) *Interim effluent limitations*. The Copermittee must comply with any interim effluent limitations as established by addendum, enforcement action, or revised waste discharge requirements which have been, or may be, adopted by the San Diego Water Board.

(2) *Other effluent limitations and standards*. If any applicable toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant and that standard or prohibition is more stringent than any limitation on the pollutant in the permit, the San Diego Water Board shall institute proceedings under these regulations to modify or revoke and reissue the permit to conform to the toxic effluent standard or prohibition. [40 CFR 122.44(b)(1)]

f. DUTY TO MINIMIZE OR CORRECT ADVERSE IMPACTS

The Copermittee must take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this Order, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the noncompliance.

g. PERMIT ACTIONS

The filing of a request by the Copermittee for modification, revocation and reissuance, or termination of this Order, or a notification of planned change in or anticipated noncompliance with this Order does not stay any condition of this Order. (See 40 CFR 122.41(f)) In addition, the following provisions apply to this Order:

(1) Upon application by any affected person, or on its own motion, the San Diego Water Board may review and revise the requirements in this Order. All requirements must be reviewed periodically. [CWC Section 13263(e)]

(2) This Order may be terminated or modified for cause, including, but not limited to, all of the following: [CWC Section 13381]

(a) Violation of any condition contained in the requirements of this Order. [CWC Section 13381(a)]

(b) Obtaining the requirements in this Order by misrepresentation, or failure to disclose fully all relevant facts. [CWC Section 13381(b)]

(c) A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge. [CWC Section 13381(c)]

(3) When this Order is transferred to a new owner or operator, such requirements as may be necessary under the CWC may be incorporated into this Order.

h. NPDES PERMITTED NON-STORM WATER DISCHARGES

The San Diego Water Board has, in prior years, issued a limited number of individual NPDES permits for non-storm water discharges to MS4s. The San Diego Water Board or State Water Board may in the future, upon prior notice to the Copermittee(s), issue an NPDES permit for any non-storm water discharge (or class of non-storm water discharges) to an MS4.

i. MONITORING

In addition to the standard provisions required under 40 CFR 122.41(j) and (l)(4), the following general monitoring provisions apply to this Order:

(1) Where procedures are not otherwise specified in Order, sampling, analysis and quality assurance/quality control must be conducted in accordance with the Quality Assurance Management Plan (QAMP) for the State of California's Surface Water Ambient Monitoring Program (SWAMP), adopted by the State Water Resources Control Board (State Water Board).

(2) Pursuant to 40 CFR 122.41(j)(2) and CWC Section 13383(a), each Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five (5) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time.

(3) All chemical, bacteriological, and toxicity analyses must be conducted at a laboratory certified for such analyses by the California Department of Public Health or a laboratory approved by the San Diego Water Board.

(4) For priority toxic pollutants that are identified in the California Toxics Rule (CTR) (65 Fed. Reg. 31682), the Copermittees must instruct their laboratories to establish calibration standards that are equivalent to or lower than the Minimum Levels (MLs) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP). If a Copermittee can demonstrate that a particular ML is not attainable, in accordance with procedures set forth in 40 CFR Part 136, the lowest quantifiable concentration of the lowest calibration standard analyzed by a specific analytical procedure (assuming that all the method specified sample weights, volumes, and processing steps have been followed) may be used instead of the ML listed in Appendix 4 of the SIP. The Copermittee must submit documentation from the laboratory to the San Diego Water Board for approval prior to raising the ML for any priority toxic pollutant.

j. ENFORCEMENT

(1) The San Diego Water Board is authorized to enforce the terms of this Order under several provisions of the CWC, including, but not limited to, CWC Sections 13385, 13386, and 13387.

(2) Nothing in this Order shall be construed to protect the Copermittee from its liabilities under federal, state, or local laws.

(3) The CWC provides for civil and criminal penalties comparable to, and in some cases greater than, those provided for under the CWA.

(4) Except as provided in the standard conditions required under 40 CFR 122.41(m) and (n), nothing in this Order shall be construed to relieve the Copermittee from civil or criminal penalties for noncompliance.

(5) Nothing in this Order shall be construed to preclude the institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties to which the Copermittee is or may be subject to under Section 311 of the CWA.

(6) Nothing in this Order shall be construed to preclude institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authoring preserved by Section 510 of the CWA.

k. SEVERABILITY

The provisions of this Order are severable, and if any provision of this Order, or the application of any provisions of this Order to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this Order shall not be affected thereby.

l. APPLICATIONS

Any application submitted by a Copermittee for reissuance or modification of this Order must satisfy all applicable requirements specified in federal regulations as well as any additional requirements for submittal of a Report of Waste Discharge specified in the CWC and the California Code of Regulations.

m. IMPLEMENTATION

All plans, reports and subsequent amendments submitted in compliance with this Order must be implemented immediately (or as otherwise specified). All submittals by Copermittees must be adequate to implement the requirements of this Order.

n. REPORT SUBMITTALS

(1) All report submittals must include an executive summary, introduction, conclusion, recommendations, and signed certified statement.

(2) Each Copermittee must submit a signed certified statement covering its responsibilities for each applicable submittal.

(3) The Principal Watershed Copermittee(s) must submit a signed certified statement covering its responsibilities for each applicable submittal and the sections of the submittals for which it is responsible.

(4) Unless otherwise directed, the Copermittees must submit one hard copy and one electronic copy of each report required under this Order to the San Diego Water Board, and one electronic copy to the USEPA.

(5) The Copermittees must submit reports and provide notifications as required by this Order to the following:

EXECUTIVE OFFICER
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
9174 SKY PARK COURT, SUITE 100
SAN DIEGO CA 92123-4340
Telephone: (858) 467-2952 Fax: (858) 571-6972

EUGENE BROMLEY
US ENVIRONMENTAL PROTECTION AGENCY
REGION IX
PERMITS ISSUANCE SECTION (W-5-1)
75 HAWTHORNE STREET
SAN FRANCISCO CA 94105

ATTACHMENT C

ACRONYMS AND ABBREVIATIONS

AMAL	Average Monthly Action Level
ASBS	Area(s) of Special Biological Significance
BMP	Best Management Practice
Basin Plan	Water Quality Control Plan for the San Diego Basin
CEQA	California Environmental Quality Act
CCR	California Code of Regulations
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWC	California Water Code
CZARA	Coastal Zone Act Reauthorization Amendments of 1990
ESAs	Environmentally Sensitive Areas
GIS	Geographic Information System
IBI	Index of Biological Integrity
LID	Low Impact Development
MDAL	Maximum Daily Action Level
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
NAL	Non-Storm Water Action Level
NAICS	North American Industry Classification System
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
ROWD	Report of Waste Discharge (application for NPDES reissuance)
SAL	Storm Water Action Level
San Diego Water Board	California Regional Water Quality Control Board, San Diego Region
SIC	Standard Industrial Classification Code
State Water Board	State Water Resources Control Board
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
WDID	Waste Discharge Identification Number
WLA	Waste Load Allocation
WQBEL	Water Quality Based Effluent Limitation

DEFINITIONS

Active/Passive Sediment Treatment - Using mechanical, electrical or chemical means to flocculate or coagulate suspended sediment for removal from runoff from construction sites prior to discharge.

Anthropogenic Litter – Trash generated from human activities, not including sediment.

Average Monthly Action Level – The highest allowable average of daily discharges over a calendar month.

Beneficial Uses - The uses of water necessary for the survival or wellbeing of man, plants, and wildlife. These uses of water serve to promote tangible and intangible economic, social, and environmental goals. "Beneficial Uses" of the waters of the State that may be protected include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. Existing beneficial uses are uses that were attained in the surface or ground water on or after November 28, 1975; and potential beneficial uses are uses that would probably develop in future years through the implementation of various control measures. "Beneficial Uses" are equivalent to "Designated Uses" under federal law. [California Water Code Section 13050(f)].

Best Management Practices (BMPs) - Defined in 40 CFR 122.2 as schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Bioassessment - The use of biological community information to evaluate the biological integrity of a water body and its watershed. With respect to aquatic ecosystems, bioassessment is the collection and analysis of samples of the benthic macroinvertebrate community together with physical/habitat quality measurements associated with the sampling site and the watershed to evaluate the biological condition (i.e. biotic integrity) of a water body.

Biofiltration - Practices that use vegetation and amended soils to detain and treat runoff from impervious areas. Treatment is through filtration, infiltration, adsorption, ion exchange, and biological uptake of pollutants.

Biological Integrity - Defined in Karr J.R. and D.R. Dudley. 1981. Ecological perspective on water quality goals. *Environmental Management* 5:55-68 as: "A balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitat of the region." Also referred to as ecosystem health.

BMP Design Manual – A plan developed to eliminate, reduce, or mitigate the impacts of runoff from development projects, including Priority Development Projects.

Clean Water Act Section 303(d) Water Body - An impaired water body in which water quality does not meet applicable water quality standards and/or is not expected to meet water quality standards, even after the application of technology based pollution controls required by the

CWA. The discharge of runoff to these water bodies by the Copermittees is significant because these discharges can cause or contribute to violations of applicable water quality standards.

Construction Site – Any project, including projects requiring coverage under the Construction General Permit, that involves soil disturbing activities including, but not limited to, clearing, grading, disturbances to ground such as stockpiling, and excavation.

Contamination - As defined in the Porter-Cologne Water Quality Control Act, contamination is "an impairment of the quality of waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste whether or not waters of the State are affected."

Copermittee – An incorporated city within the County of Orange, County of Riverside, or County of San Diego in the San Diego Region, the County of Orange, the County of Riverside, the County of San Diego, the Orange County Flood Control District, the Riverside County Water Conservation and Flood Control District, the San Diego Regional Airport Authority, or the San Diego Unified Port District.

Copermittees – All of the individual Copermittees, collectively.

Critical Channel Flow (Qc) – The channel flow that produces the critical shear stress that initiates bed movement or that erodes the toe of channel banks. When measuring Qc, it should be based on the weakest boundary material – either bed or bank.

Daily Discharge – Defined as either: (1) the total mass of the constituent discharged over the calendar day or any 24 hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g. concentration.)

The Daily Discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day, or other 24 hour period other than a day), or by the arithmetic mean of analytical results from one or more grab samples taken over the course of a day.

Development Projects - Construction, rehabilitation, redevelopment, or reconstruction of any public or private residential project, industrial, commercial, or any other projects.

Dry Season –May 1 to September 30.

Dry Weather – Weather is considered dry if the preceding 72 hours has been without measurable precipitation (>0.1 inch).

Enclosed Bays – Enclosed bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost bay works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays do not include inland surface waters or ocean waters.

Erosion – When land is diminished or worn away due to wind, water, or glacial ice. Often the eroded debris (silt or sediment) becomes a pollutant via storm water runoff. Erosion occurs naturally but can be intensified by land clearing activities such as farming, development, road building, and timber harvesting.

Environmentally Sensitive Areas (ESAs) - Areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; areas designated as preserves or their equivalent under the Natural Communities Conservation Program within the Cities and County of Orange; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.

Estuaries – Waters, including coastal lagoons, located at the mouth of streams that serve as areas of mixing fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and ocean water. Estuaries do not include inland surface waters or ocean waters.

Existing Development – Any area that has been developed and exists for municipal, commercial, industrial, or residential purposes, uses, or activities. May include areas that are not actively used for its originally developed purpose, but may be re-purposed or redeveloped for another use or activity.

Flow Duration – The long-term period of time that flows occur above a threshold that causes significant sediment transport and may cause excessive erosion damage to creeks and streams (not a single storm event duration). The simplest way to visualize this is to consider a histogram of pre- and post-project flows using long-term records of hourly data. To maintain pre-development flow duration means that the total number of hours (counts) within each range of flows in a flow-duration histogram cannot increase between the pre- and post-development condition. Flow duration within the range of geomorphologically significant flows is important for managing erosion.

Grading - The cutting and/or filling of the land surface to a desired slope or elevation.

Hazardous Material – Any substance that poses a threat to human health or the environment due to its toxicity, corrosiveness, ignitability, explosive nature or chemical reactivity. These also include materials named by the USEPA in 40 CFR 116 to be reported if a designated quantity of the material is spilled into the waters of the U.S. or emitted into the environment.

Hazardous Waste - Hazardous waste is defined as “any waste which, under Section 600 of Title 22 of this code, is required to be managed according to Chapter 30 of Division 4.5 of Title 22 of this code” [CCR Title 22, Division 4.5, Chapter 11, Article 1].

Household Hazardous Waste – Paints, cleaning products, and other wastes generated during home improvement or maintenance activities.

Hydromodification – The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

Illicit Connection – Any connection to the MS4 that conveys an illicit discharge.

Illicit Discharge - Any discharge to the MS4 that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from fire fighting activities [40 CFR 122.26(b)(2)].

Inactive Areas – Areas of construction activity that are not active and those that have been active and are not scheduled to be re-disturbed for at least 14 days.

Infiltration – Water other than wastewater that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow [40 CFR 35.2005(20)].

Inland Surface Waters – Includes all surface waters of the State that do not include the ocean, enclosed bays, or estuaries.

Jurisdictional Runoff Management Program Document – A written description of the specific jurisdictional runoff management measures and programs that each Copermittee will implement to comply with this Order and ensure that storm water pollutant discharges in runoff are reduced to the MEP and do not cause or contribute to a violation of water quality standards.

Low Impact Development (LID) – A storm water management and land development strategy that emphasizes conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions.

Low Impact Development Best Management Practices (LID BMPs) – LID BMPs include schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States through storm water management and land development strategies that emphasize conservation sand the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions. LID BMPs include retention practices that do not allow runoff, such as infiltration, rain water harvesting and reuse, and evapotranspiration. LID BMPs also include flow-through practices such as biofiltration that may have some discharge of storm water following pollutant reduction.

Major Outfall – As defined in the Code of Federal Regulations, a major outfall is a MS4 outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (i.e. discharge from a single conveyance other than a circular pipe which is associated with a drainage are of more than 50 acres); or, for MS4s that receive storm water from lands zoned for industrial activity (based on comprehensive zoning plans or equivalent), a MS4 outfall that discharges from a single pipe with an inside diameter of 12 inches or more or from its equivalent

(i.e. discharge from other than a circular pipe associated with a drainage area of 2 acres or more).

Maximum Daily Action Level (MDAL) –The highest allowable daily discharge of a pollutant, over a calendar day (or 24 hour period). For pollutants with action levels expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with action levels expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

Maximum Extent Practicable (MEP) – The technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) for storm water that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) <u>in combination</u> with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than BAT. A definition for MEP is not provided either in the statute or in the regulations. Instead the definition of MEP is dynamic and will be defined by the following process over time: municipalities propose their definition of MEP by way of their runoff management programs. Their total collective and individual activities conducted pursuant to the runoff management programs becomes their proposal for MEP as it applies both to their overall effort, as well as to specific activities (e.g., MEP for street sweeping, or MEP for MS4 maintenance). In the absence of a proposal acceptable to the San Diego Water Board, the San Diego Water Board defines MEP.

In a memo dated February 11, 1993, entitled "Definition of Maximum Extent Practicable," Elizabeth Jennings, Senior Staff Counsel, SWRCB addressed the achievement of the MEP standard as follows:

> "*To achieve the MEP standard, municipalities must employ whatever Best Management Practices (BMPs) are technically feasible (i.e., are likely to be effective) and are not cost prohibitive. The major emphasis is on technical feasibility. Reducing pollutants to the MEP means choosing effective BMPs, and rejecting applicable BMPs only where other effective BMPs will serve the same purpose, or the BMPs would not be technically feasible, or the cost would be prohibitive. In selecting BMPs to achieve the MEP standard, the following factors may be useful to consider:*
>
> *a. Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?*
> *b. Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?*
> *c. Public Acceptance: Does the BMP have public support?*
> *d. Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?*
> *e. Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc.?*
>
> *The final determination regarding whether a municipality has reduced pollutants to the maximum extent practicable can only be made by the Regional or State Water Boards, and not by the municipal discharger. If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would*

exceed any benefit derived, it would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs that would address a pollutant source, or to pick a BMP based solely on cost, which would be clearly less effective. In selecting BMPs the municipality must make a serious attempt to comply and practical solutions may not be lightly rejected. In any case, the burden would be on the municipal discharger to show compliance with its permit. After selecting a menu of BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented."

Monitoring Year – October 1 to September 30

Municipal Separate Storm Sewer System (MS4) – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designated or used for collecting or conveying storm water; (iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.26.

National Pollutant Discharge Elimination System (NPDES) - The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the CWA.

Non-Storm Water - All discharges to and from a MS4 that do not originate from precipitation events (i.e., all discharges from a MS4 other than storm water). Non-storm water includes illicit discharges and NPDES permitted discharges.

Nuisance - As defined in the Porter-Cologne Water Quality Control Act, a nuisance is "anything which meets all of the following requirements: 1) Is injurious to health, or is indecent, or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. 2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. 3) Occurs during, or as a result of, the treatment or disposal of wastes."

Ocean Waters – the territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the State Board's California Ocean Plan.

Order – Unless otherwise specified, refers to this Order, Order No. R9-2013-0001 (NPDES No. CAS0109266)

Persistent Flow - Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

Person - A person is defined as an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof [40 CFR 122.2].

Point Source - Any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, landfill leachate collection systems, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

Pollutant - Any agent that may cause or contribute to the degradation of water quality such that a condition of pollution or contamination is created or aggravated.

Pollution - As defined in the Porter-Cologne Water Quality Control Act, pollution is "the alteration of the quality of the waters of the State by waste, to a degree that unreasonably affects the either of the following: 1) The waters for beneficial uses; or 2) Facilities that serve these beneficial uses." Pollution may include contamination.

Pollution Prevention - Pollution prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control BMPs, treatment control BMPs, or disposal.

Pre-Development Runoff Conditions – Runoff conditions that existed onsite before the existing development was constructed, or exists onsite before planned development activities occur.

Priority Development Projects - New development and redevelopment projects defined under Provision E.3.b of Order No. R9-2012-0011.

Rainy Season (aka Wet Season) –October 1 to April 30

Receiving Waters – Waters of the United States.

Receiving Water Limitations - Waste discharge requirements issued by the San Diego Water Board typically include both: (1) "Effluent Limitations" (or "Discharge Limitations") that specify the technology-based or water-quality-based effluent limitations; and (2) "Receiving Water Limitations" that specify the water quality objectives in the Basin Plan as well as any other limitations necessary to attain those objectives. In summary, the "Receiving Water Limitations" provision is the provision used to implement the requirements of CWA section 402(p)(3)(B).

Redevelopment - The creation, addition, and or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include trenching and resurfacing associated with utility work; resurfacing existing roadways; new sidewalk construction, pedestrian ramps, or bike lane on existing roads; and routine replacement of damaged pavement, such as pothole repair.

Reporting Period – The period of information that is reported in the Annual Report. The reporting period consists of two components: 1) July 1 to June 30, consistent with the fiscal year, for the implementation of the jurisdictional runoff management programs, and 2) October 1 to September 30, consistent with the monitoring year for the monitoring and assessment programs. Together, these two time periods constitute the reporting year for the Annual Report due January 31 following the end of the monitoring year.

Retain –Keep or hold in a particular place, condition, or position without discharge to surface waters.

Retrofitting – Storm water management practice put into place after development has occurred in watersheds where the practices previously did not exist. Retrofitting of developed areas is intended to improve water quality, protect downstream channels, reduce flooding, or meet other specific objectives. Retrofitting developed areas may include, but is not limited to replacing roofs with green roofs, disconnecting downspouts or impervious surfaces to drain to pervious surfaces, replacing impervious surfaces with pervious surfaces, installing rain barrels, installing rain gardens, and trash area enclosures.

Runoff - All flows in a storm water conveyance system that consists of the following components: (1) storm water (wet weather flows) and (2) non-storm water including dry weather flows.

San Diego Water Board – As used in this document the term "San Diego Water Board" is synonymous with the term "Regional Board" as defined in Water Code section 13050(b) and is intended to refer to the California Regional Water Quality Control Board for the San Diego Region as specified in Water Code Section 13200.

Sediment - Soil, sand, and minerals washed from land into water. Sediment resulting from anthropogenic sources (i.e. human induced land disturbance activities) is considered a pollutant. This Order regulates only the discharges of sediment from anthropogenic sources and does not regulate naturally occurring sources of sediment. Sediment can destroy fish-nesting areas, clog animal habitats, and cloud waters so that sunlight does not reach aquatic plants.

Source Control BMP – Land use or site planning practices, or structural or nonstructural measures that aim to prevent runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between pollutants and runoff.

Storm Water – Per 40 CFR 122.26(b)(13), means storm water runoff, snowmelt runoff and surface runoff and drainage. Surface runoff and drainage pertains to runoff and drainage resulting from precipitation events.

Stream, Channel, or Habitat Rehabilitation – Measures or activities for the purpose of improving or restoring the environmental health (i.e. physical, chemical and biological integrity) of streams, channels, or river systems. Rehabilitation techniques may include, but are not limited to, riparian zone restoration, constructed wetlands, bank stabilization, channel reconfiguration, and daylighting drainage systems.

Structural BMPs - A subset of BMPs which detains, retains, filters, removes, or prevents the release of pollutants to surface waters from development projects in perpetuity, after construction of a project is completed.

Total Maximum Daily Load (TMDL) - The maximum amount of a pollutant that can be discharged into a water body from all sources (point and non-point) and still maintain water quality standards. Under CWA section 303(d), TMDLs must be developed for all water bodies that do not meet water quality standards after application of technology-based controls.

Toxicity - Adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies). The water quality objectives for toxicity provided in the Basin Plan, state in part…"All waters shall be free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life….The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge".

Treatment Control BMP – Any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media absorption or any other physical, biological, or chemical process.

Unpaved Road – Any long, narrow stretch without pavement used for traveling by motor passenger vehicles between two or more points. Unpaved roads are generally constructed of dirt, gravel, aggregate or macadam and may be improved or unimproved.

Waste - As defined in CWC Section 13050(d), "waste includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal."

Article 2 of CCR Title 23, Chapter 15 (Chapter 15) contains a waste classification system that applies to solid and semi-solid waste, which cannot be discharged directly or indirectly to water of the state and which therefore must be discharged to land for treatment, storage, or disposal in accordance with Chapter 15. There are four classifications of waste (listed in order of highest to lowest threat to water quality): hazardous waste, designated waste, non-hazardous solid waste, and inert waste.

Water Quality Objective - Numerical or narrative limits on constituents or characteristics of water designated to protect designated beneficial uses of the water. [California Water Code Section 13050 (h)]. California's water quality objectives are established by the State and Regional Water Boards in the Water Quality Control Plans. Numeric or narrative limits for pollutants or characteristics of water designed to protect the beneficial uses of the water. In other words, a water quality objective is the maximum concentration of a pollutant that can exist in a receiving water and still generally ensure that the beneficial uses of the receiving water remain protected (i.e., not impaired). Since water quality objectives are designed specifically to protect the beneficial uses, when the objectives are violated the beneficial uses are, by definition, no longer protected and become impaired. This is a fundamental concept under the Porter Cologne Act. Equally fundamental is Porter Cologne's definition of pollution. A condition of pollution exists when the water quality needed to support designated beneficial uses has become unreasonably affected or impaired; in other words, when the water quality objectives

have been violated. These underlying definitions (regarding beneficial use protection) are the reason why all waste discharge requirements implementing the federal NPDES regulations require compliance with water quality objectives. (Water quality objectives are also called water quality criteria in the CWA.)

Water Quality Standards - Water quality standards, as defined in Clean Water Act section 303(c) consist of the beneficial uses (e.g., swimming, fishing, municipal drinking water supply, etc.,) of a water body and criteria (referred to as water quality objectives in the California Water Code) necessary to protect those uses. Under the Water Code, the water boards establish beneficial uses and water quality objectives in water quality control or basin plans. Together with an anti-degradation policy, these beneficial uses and water quality objectives serve as water quality standards under the Clean Water Act. In Clean Water Act parlance, state beneficial uses are called "designated uses" and state water quality objectives are called "criteria." Throughout this Order, the relevant term is used depending on the statutory scheme.

Waters of the State - Any water, surface or underground, including saline waters within the boundaries of the State [CWC section 13050 (e)]. The definition of the Waters of the State is broader than that for the Waters of the United States in that all water in the State is considered to be a Waters of the State regardless of circumstances or condition.

Waters of the United States - As defined in the 40 CFR 122.2, the Waters of the U.S. are defined as: "(a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate "wetlands;" (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters otherwise defined as waters of the United States under this definition: (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial seas; and (g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA."

Watershed - That geographical area which drains to a specified point on a water course, usually a confluence of streams or rivers (also known as drainage area, catchment, or river basin).

Wet Season (aka Rainy Season) –October 1 to April 30

Wet Weather – Weather is considered wet if there is a storm event of 0.1 inches and greater and the following 72 hours, unless otherwise defined by another regulatory mechanism.

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ATTACHMENT D

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

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JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM
FY _____

I. COPERMITTEE INFORMATION			
Copermittee Name:			
Copermittee Primary Contact Name:			
Copermittee Primary Contact Information: Address: City:	County:	State:	Zip:
Telephone:	Fax:	Email:	

II. LEGAL AUTHORITY		
Has the Copermittee established adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 that complies with Order No. R9-2013-0001?	**YES** **NO**	☐ ☐
A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority?	**YES** **NO**	☐ ☐

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE		
Was an update of the jurisdictional runoff management program document required or recommended by the San Diego Water Board?	**YES** **NO**	☐ ☐
If YES to the question above, did the Copermittee update its jurisdictional runoff management program document and make it available on the Regional Clearinghouse?	**YES** **NO**	☐ ☐

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM		
Has the Copermittee implemented a program to actively detect and eliminate illicit discharges and connections to its MS4 that complies with Order No. R9-2013-0001?	**YES** **NO**	☐ ☐

Number of non-storm water discharges reported by the public	
Number of non-storm water discharges detected by Copermittee staff or contractors	
Number of non-storm water discharges investigated by the Copermittee	
Number of sources of non-storm water discharges identified	
Number of non-storm water discharges eliminated	
Number of sources of illicit discharges or connections identified	
Number of illicit discharges or connections eliminated	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

V. DEVELOPMENT PLANNING PROGRAM		
Has the Copermittee implemented a development planning program that complies with Order No. R9-2013-0001?	**YES** **NO**	☐ ☐
Was an update to the BMP Design Manual required or recommended by the San Diego Water Board?	**YES** **NO**	☐ ☐
If YES to the question above, did the Copermittee update its BMP Design Manual and make it available on the Regional Clearinghouse?	**YES** **NO**	☐ ☐

Number of proposed development projects in review	
Number of Priority Development Projects in review	
Number of Priority Development Projects approved	
Number of approved Priority Development Projects exempt from any BMP requirements	
Number of approved Priority Development Projects allowed alternative compliance	
Number of Priority Development Projects granted occupancy	

Number of completed Priority Development Projects in inventory	
Number of high priority Priority Development Project structural BMP inspections	
Number of Priority Development Project structural BMP violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM
FY _____

VI. CONSTRUCTION MANAGEMENT PROGRAM

Has the Copermittee implemented a construction management program that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

Number of construction sites in inventory	
Number of active construction sites in inventory	
Number of inactive construction sites in inventory	
Number of construction sites closed/completed during reporting period	
Number of construction site inspections	
Number of construction site violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

Has the Copermittee implemented an existing development management program that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

	Municipal	Commercial	Industrial	Residential
Number of facilities or areas in inventory				
Number of existing development inspections				
Number of follow-up inspections				
Number of violations				
Number of enforcement actions issued				
Number of escalated enforcement actions issued				

VIII. PUBLIC EDUCATION AND PARTICIPATION

Has the Copermittee implemented a public education program component that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐
Has the Copermittee implemented a public participation program component that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

IX. FISCAL ANALYSIS

Has the Copermittee attached to this form a summary of its fiscal analysis that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

X. CERTIFICATION

I [☐ Principal Executive Officer ☐ Ranking Elected Official ☐ Duly Authorized Representative] certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature	Date
Print Name	Title
Telephone Number	Email

ATTACHMENT E

SPECIFIC PROVISIONS FOR TOTAL MAXIMUM DAILY LOADS APPLICABLE TO ORDER NO. R9-2013-0001

These provisions implement Total Maximum Daily Loads (TMDLs), adopted by the San Diego Water Board and approved by USEPA under Clean Water Act section 303(c), which are applicable to discharges regulated under this Order. The provisions and schedules for implementation of the TMDLs described below must be incorporated into the Water Quality Improvement Plans, required pursuant to Provision B of this Order, for the specified Watershed Management Areas.

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed
2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin
3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed
4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek
5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay
6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2002-0123

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	August 14, 2002
State Water Board Approval Date:	July 16, 2003
Office of Administrative Law Approval Date:	September 11, 2003
US EPA Approval Date:	November 3, 2003

(3) TMDL Effective Date: September 11, 2003

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for Chollas Creek consist of the following:

(1) Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedule under Specific Provision 1.c:

Table 1.1
Receiving Water Limitations as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Diazinon	Acute	0.08 µg/L	1 hour
	Chronic	0.05 µg/L	4 days

(2) Effluent Limitations

Discharges from the MS4s must not contain concentrations that exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 1.c:

Table 1.2
Effluent Limitations as Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation	Averaging Period
Diazinon	Acute	0.072 µg/L	1 hour
	Chronic	0.045 µg/L	4 days

(3) Best Management Practices

The following BMPs for Chollas Creek must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area and implemented by the Responsible Copermittees:

(a) The Responsible Copermittees must implement BMPs to support the achievement of the WQBELs under Specific Provision 1.b for Chollas Creek.

(b) The Responsible Copermittees must implement the Diazinon Toxicity Control Plan and Diazinon Public Outreach/Education Program as described in the report titled, *Technical Report for Total Maximum Daily Load for Diazinon in Chollas Creek Watershed, San Diego County*, dated August 14, 2002, including subsequent modifications, in order to achieve the WQBELs under Specific Provision 1.b.

(c) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans as possible.

c. COMPLIANCE SCHEDULE

The Responsible Copermittees are required to achieve their respective WLAs by December 31, 2010. The Responsible Copermittees must be in compliance with the WQBELs under Specific Provision 1.b.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls for diazinon within the Chollas Creek watershed, and calculate or estimate the annual diazinon loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

e. COMPLIANCE DETERMINATION

Compliance with WQBELs of Specific Provision 1.b may be demonstrated via one of the following methods:

(1) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;

(2) There are no exceedances of the applicable receiving water limitations under Specific Provision 1.b.(1) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(3) There are no violations of the applicable effluent limitations under Specific Provision 1.b.(2) at the Responsible Copermittees' MS4 outfalls.

2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0019

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	September 22, 2005
Office of Administrative Law Approval Date:	December 2, 2005
US EPA Approval Date:	February 8, 2006

(3) TMDL Effective Date: December 2, 2005

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Shelter Island Yacht Basin

(6) Responsible Copermittee: City of San Diegot

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for Shelter Island Yacht Basin consist of the following:

(1) Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedule under Specific Provision 2.c:

Table 2.1
Receiving Water Limitations as Concentrations in Shelter Island Yacht Basin

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Dissolved Copper	Acute	4.8 µg/L	1 hour
	Chronic	3.1 µg/L	4 days

(2) Effluent Limitations

Discharges from the MS4s must not contain pollutant loads that exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 2.c:

Table 2.2
Effluent Limitations as Annual Loads in MS4 Discharges to Shelter Island Yacht Basin

Constituent	Effluent Limitation
Dissolved Copper	30 kg/yr

(3) Best Management Practices

The Responsible Copermittee must implement BMPs to support the achievement of the WQBELs under Specific Provision 2.b for Shelter Island Yacht Basin

c. Compliance Schedule

The Responsible Copermittee is required to achieve the MS4 WLA by December 2, 2005. The Responsible Copermittee must be in compliance with the WQBELs under Specific Provision 2.b.

d. Specific Monitoring and Assessment Requirements

The Responsible Copermittee must monitor the effluent of its MS4 outfalls for dissolved copper, and calculate or estimate the monthly and annual dissolved copper loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.(b)(2)of this Order. The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

e. Compliance Determination

Compliance with WQBELs of Specific Provision 2.b may be demonstrated via one of the following methods:

(1) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water;

(2) There are no exceedances of the applicable receiving water limitations under Specific Provision 2.b.(1) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(3) There are no violations of the applicable effluent limitations under Specific Provision 2.b.(2) at the Responsible Copermittee's MS4 outfalls.

3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0036

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	November 16, 2005
Office of Administrative Law Approval Date:	February 1, 2006
US EPA Approval Date:	March 22, 2006

(3) TMDL Effective Date: February 1, 2006

(4) Watershed Management Area: Santa Margarita River

(5) Water Body: Rainbow Creek

(6) Responsible Copermittee: County of San Diego

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for Rainbow Creek consist of the following

(1) Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedule under Specific Provision 3.c.(1):

Table 3.1
Receiving Water Limitations as Concentrations in Rainbow Creek

Constituent	Receiving Water Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(2) Effluent Limitations

(a) Discharges from the MS4s must not contain concentrations that exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 3.c.(1):

Table 3.2
Effluent Limitations as Concentrations in MS4 Discharges to Rainbow Creek

Constituent	Effluent Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(b) Pollutant loads from given land uses discharging to and from the MS4s must not exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 3.c.(1):

Table 3.3
Effluent Limitations as Annual Loads in MS4 Discharges to Rainbow Creek

Land Use	Total N	Total P
Commercial nurseries	116 kg/yr	3 kg/yr
Park	3 kg/yr	0.1 kg/yr
Residential areas	149 kg/yr	12 kg/yr
Urban areas	27 kg/yr	6 kg/yr

Interim effluent limitations expressed as pollutant loads are given in the compliance schedule under Specific Provision 3.0.

(3) Best Management Practices

(a) The Responsible Copermittee must implement BMPs to support the achievement of the WQBELs under Specific Provision 3.b for Rainbow Creek.

(b) The Responsible Copermittee should coordinate any BMPs implemented to address this TMDL with Caltrans and other sources as possible.

c. COMPLIANCE SCHEDULE

(1) Compliance Date

The Responsible Copermittee must be in compliance with the WQBELs under Specific Provision 3.b, by December 31, 2021.

(2) Interim Compliance Requirements

Table 3.4
Interim Effluent Limitations as Annual Loads in MS4 Discharges from Specific Land Uses to Rainbow Creek

	Total N Interim Effluent Limitations (kg/yr)			Total P Interim Effluent Limitations (kg/yr)		
	Interim Compliance Date			Interim Compliance Date		
Land Use	**2009**	**2013**	**2017**	**2009**	**2013**	**2017**
Commercial nurseries	390	299	196	20	16	10
Park	5	3	3	0.15	0.10	0.10
Residential areas	507	390	260	99	74	47
Urban areas	40	27	27	9	6	6

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

The Responsible Copermittee must implement the Sampling and Analysis Plan for Rainbow Creek Nutrient Reduction TMDL Implementation Water Quality Monitoring, dated January 2010. The results of any monitoring conducted during the reporting period, and assessment of whether the interim and final WQBELs have been achieved must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

e. COMPLIANCE DETERMINATION

(1) Compliance with interim compliance requirements of Specific Provision 3.c.(2) may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water;

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 3.b.(1) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls;

(c) There are no violations of the applicable effluent limitations under Specific Provision 3.b.(2)(a) at the Responsible Copermittee's MS4 outfalls;

(d) The pollutant loads from given land uses discharging to and from the MS4s do not exceed the applicable effluent limitations under Specific Provision 3.b.(2)(b); OR

(e) The Responsible Copermittee has submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim compliance requirements will be achieved by the interim compliance dates.

(2) Compliance with WQBELs of Specific Provision 3.b may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water;

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 3.b.(1) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls;

(c) There are no violations of the applicable effluent limitations under Specific Provision 3.b.(2)(a) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant loads from given land uses discharging to and from the MS4s do not exceed the applicable effluent limitations under Specific Provision 3.b.(2)(b).

4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2007-0043

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2007
State Water Board Approval Date:	July 15, 2008
Office of Administrative Law Approval Date:	October 22, 2008
US EPA Approval Date:	December 18, 2008

(3) TMDL Effective Date: October 22, 2008

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for Chollas Creek consist of the following:

(1) Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedule under Specific Provision 4.c.(1):

Table 4.1
Receiving Water Limitations as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$(0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$(0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$(0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$(0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER.

(2) Effluent Limitations

Discharges from the MS4s must not contain pollutant loads that exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 4.c.(1):

Table 4.2
Effluent Limitations as Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER.

(3) Best Management Practices

(a) The Responsible Copermittees must implement BMPs to support the achievement of the WQBELs under Specific Provision 4.b for Chollas Creek.

(b) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans and the U.S. Navy as possible.

c. COMPLIANCE SCHEDULE

(1) WLA Compliance Date

The Responsible Copermittees are required to achieve the WLA, thus must be in compliance with the WQBELs under Specific Provision 4.b, by October 22, 2028.

(2) Interim Compliance Requirements

The Responsible Copermittee must comply with the following interim WQBELs by the interim compliance date:

Table 4.3
Interim Effluent Limitations as Concentrations in MS4 Discharges to Chollas Creek

Interim Compliance Date	Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
October 22, 2018	Dissolved Copper	Acute	1.2 x 90% x (0.96) x $e^{[0.9422 \times \ln(\text{hardness}) - 1.700]}$ x WER*	1 hour
		Chronic	1.2 x 90% x (0.96) x $e^{[0.8545 \times \ln(\text{hardness}) - 1.702]}$ x WER*	4 days
	Dissolved Lead	Acute	1.2 x 90% x [1.46203 – 0.145712 x ln(hardness)] x $e^{[1.273 \times \ln(\text{hardness}) - 1.460]}$ x WER*	1 hour
		Chronic	1.2 x 90% x [1.46203 – 0.145712 x ln(hardness)] x $e^{[1.273 \times \ln(\text{hardness}) - 4.705]}$ x WER*	4 days
	Dissolved Zinc	Acute	1.2 x 90% x (0.978) x $e^{[0.8473 \times \ln(\text{hardness}) + 0.884]}$ x WER*	1 hour
		Chronic	1.2 x 90% x (0.986) x $e^{[0.8473 \times \ln(\text{hardness}) + 0.884]}$ x WER*	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER.

d. Specific Monitoring and Assessment Requirements

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*, when it is amended to include monitoring requirements for the Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls discharging to Chollas Creek for dissolved copper, lead, and zinc, and calculate or estimate the monthly and annual dissolved copper, lead, and zinc loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2)of this Order. The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

e. COMPLIANCE DETERMINATION

(1) Compliance with interim compliance requirements of Specific Provision 4.c.(2) may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 4.b.(1) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls;

(c) There are no violations of the applicable effluent limitations under Specific Provision 4.b.(2) at the Responsible Copermittees' MS4 outfalls; OR

(d) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim compliance requirements will be achieved by the interim compliance dates.

(2) Compliance with WQBELs of Specific Provision 4.b may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 4.b.(1) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(c) There are no violations of the applicable effluent limitations under Specific Provision 4.b.(2) at the Responsible Copermittees' MS4 outfalls.

5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2008-0027

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 11, 2008
State Water Board Approval Date:	June 16, 2009
Office of Administrative Law Approval Date:	September 15, 2009
US EPA Approval Date:	October 26, 2009

(3) TMDL Effective Date: September 15, 2009

(4) Watershed Management Areas: See Table 5.0

(5) Water Bodies: See Table 5.0

(6) Responsible Copermittees: See Table 5.0

Table 5.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County	Dana Point Harbor	Baby Beach	-City of Dana Point -County of Orange
San Diego Bay	San Diego Bay	Shelter Island Shoreline Park	- San Diego Unified Port District

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Receiving Water Limitations

(a) Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedules under Specific Provisions 5.c.(1)(a) and 5.c.(2):

Table 5.1
Receiving Water Limitations as Bacteria Densities in the Water Body

	Receiving Water Limitations	
Constituent	Single Sample Maximum[1,2]	30-Day Geometric Mean[2]
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.

(b) If the above receiving water limitations are not met in the receiving water, the Responsible Copermittees must demonstrate that the discharges from the MS4s are not causing or contributing to the exceedance of receiving water limitations.

(2) Effluent Limitations

Discharges from the MS4s must not contain densities that exceed the following effluent limitations by the end of the compliance schedules under Specific Provisions 5.c.(1)(a) and 5.c.(2) to demonstrate the discharge is not causing or contributing to a violation of receiving water quality standards:

Table 5.2
Effluent Limitations as Bacteria Densities in MS4 Discharges to the Water Body

	Effluent Limitations	
Constituent	Single Sample Maximum[1,2]	30-Day Geometric Mean[2]
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.

Interim effluent limitations expressed as pollutant loads are given in the compliance schedule under Specific Provision 5.c.

(3) Best Management Practices

(a) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 5.0 must incorporate the Bacteria Load Reduction Plan (BLRP) required to be developed pursuant to Resolution No. R9-2008-0027.

(b) The Responsible Copermittee must implement BMPs to support the achievement of the WQBELs under Specific Provision 5.0 for the segments or areas of the water bodies listed in Table 5.0

c. COMPLIANCE SCHEDULE

(1) Baby Beach in Dana Point Harbor

(a) WLA Compliance Dates

The Responsible Copermittees for MS4 discharges to Baby Beach are required to achieve the WLA, thus must be in compliance with the WQBELs under Specific Provision 5.0, according to the following compliance schedule:

Table 5.3
Compliance Schedule Dates to Achieve Baby Beach WLAs

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform	September 15, 2014	September 15, 2009
Fecal Coliform		September 15, 2009
Enterococcus		September 15, 2019

(b) Interim Compliance Requirements

The Responsible Copermittees for MS4 discharges to Baby Beach must comply with the following interim WQBELs by the interim compliance date:

Table 5.4
Interim Effluent Limitations as Loads in MS4 Discharges to Baby Beach

Constituent	Interim Compliance Date	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	4.93×10^9 MPN/day	NA*
Fecal Coliform	September 15, 2012	0.59×10^9 MPN/day	NA*
Enterococcus	September 15, 2012	0.42×10^9 MPN/day	NA**
	September 15, 2016	NA*	207×10^9 MPN/30days

Notes:
* The WQBELs under Specific Provision 5.b must already be achieved by the given interim compliance date.
** There is no corresponding interim WQBEL for the given interim compliance date.

(2) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park is required to achieve the WLA, thus must be in compliance with the WQBELs under Specific Provision 5.0, by December 31, 2012.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) Monitoring Stations

Monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[33] If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(2) Monitoring Procedures

(a) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) The Responsible Copermittees must collect wet weather monitoring samples within the first 24 hours of the first storm event[34] of the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(c) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs have been achieved.

[33] Commonly referred to as AB 411 monitoring

[34] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(b) The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

e. COMPLIANCE DETERMINATION

(1) Compliance with interim compliance requirements of Specific Provision 5.c.(1)(b) may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 5.b.(1)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls;

(c) There are no violations of the applicable effluent limitations under Specific Provision 5.b.(2) at the Responsible Copermittees' MS4 outfalls;

(d) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the applicable effluent limitations under Specific Provision 5.c.(1)(b);

(e) The Responsible Copermittees can demonstrate that exceedances of the applicable receiving water limitations under Specific Provision 5.b.(1)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4 are not causing or contributing to the exceedances; OR

(f) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim compliance requirements will be achieved by the interim compliance dates.

(2) Compliance with WQBELs of Specific Provision 5.b may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 5.b.(1)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls;

(c) There are no violations of the applicable effluent limitations under Specific Provision 5.b.(2) at the Responsible Copermittees' MS4 outfalls;

(d) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the applicable effluent limitations under Specific Provision 5.c.(1)(b); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the applicable receiving water limitations under Specific Provision 5.b.(1)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4 are not causing or contributing to the exceedances.

6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2010-0001

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 10, 2010
State Water Board Approval Date:	December 14, 2010
Office of Administrative Law Approval Date:	April 4, 2011
US EPA Approval Date:	June 22, 2011

(3) TMDL Effective Date: April 4, 2011

(4) Watershed Management Areas: See Table 6.0

(5) Water Bodies: See Table 6.0

(6) Responsible Copermittees: See Table 6.0

Table 6.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	-City of Laguna Beach -County of Orange -Orange County Flood Control District
		at Heisler Park - North	
	Pacific Ocean Shoreline	at Main Laguna Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Woods -County of Orange -Orange County Flood Control District
		Laguna Beach at Ocean Avenue	
		Laguna Beach at Cleo Street	
		Arch Cove at Bluebird Canyon Road	
		Laguna Beach at Dumond Drive	
	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Hills -City of Laguna Niguel -City of Laguna Woods -City of Lake Forest -City of Mission Viejo -County of Orange -Orange County Flood Control District
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	
	Aliso Creek Mouth	at mouth	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County (cont'd)	Pacific Ocean Shoreline	Aliso Beach at West Street	-City of Dana Point -City of Laguna Beach -City of Laguna Niguel -County of Orange -Orange County Flood Control District
		Aliso Beach at Table Rock Drive	
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)	
		at Salt Creek (large outlet)	
		Salt Creek Beach at Salt Creek service road	
		Salt Creek Beach at Strand Road	
	Pacific Ocean Shoreline	at San Juan Creek	-City of Dana Point -City of Laguna Hills -City of Laguna Niguel -City of Mission Viejo -City of Rancho Santa Margarita -City of San Juan Capistrano -County of Orange -Orange County Flood Control District
	San Juan Creek	lower 1 mile	
	San Juan Creek Mouth	at mouth	
	Pacific Ocean Shoreline	at Poche Beach	-City of Dana Point -City of San Clemente -County of Orange -Orange County Flood Control District
		Ole Hanson Beach Club Beach at Pico Drain	
		San Clemente City Beach at El Portal Street Stairs	
		San Clemente City Beach at Mariposa Street	
		San Clemente City Beach at Linda Lane	
		San Clemente City Beach at South Linda Lane	
		San Clemente City Beach at Lifeguard Headquarters	
		under San Clemente Municipal Pier	
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	
		San Clemente State Beach at Riviera Beach	
		Can Clemente State Beach at Cypress Shores	
San Luis Rey River	Pacific Ocean Shoreline	at San Luis Rey River mouth	-City of Oceanside -City of Vista -County of San Diego

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
Carlsbad	Pacific Ocean Shoreline	at Moonlight State Beach	-City of Carlsbad -City of Encinitas -City of Escondido -City of San Marcos -County of San Diego
San Dieguito River	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	-City of Del Mar -City of Escondido -City of Poway -City of San Diego -City of Solana Beach -County of San Diego
Penasquitos	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	-City of Del Mar -City of Poway -City of San Diego -County of San Diego
Mission Bay	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	-City of San Diego
		La Jolla Shores Beach at Caminito del Oro	
		La Jolla Shores Beach at Vallecitos	
		La Jolla Shores Beach at Avenida de la Playa	
		at Casa Beach, Children's Pool	
		South Casa Beach at Coast Boulevard	
		Whispering Sands Beach at Ravina Street	
		Windansea Beach at Vista de la Playa	
		Windansea Beach at Bonair Street	
		Windansea Beach at Playa del Norte	
		Windansea Beach at Palomar Avenue	
		at Tourmaline Surf Park	
		Pacific Beach at Grand Avenue	
	Tecolote Creek	Entire reach and tributaries	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I- Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
San Diego River	Forrester Creek	lower 1 mile	-City of El Cajon -City of Santee -County of San Diego
	San Diego River	lower 6 miles	-City of El Cajon -City of La Mesa -City of San Diego -City of Santee -County of San Diego
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	
San Diego Bay	Chollas Creek	lower 1.2 miles	-City of La Mesa -City of Lemon Grove -City of San Diego -County of San Diego - San Diego Unified Port District

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for segments or areas of the water bodies listed in Table 6.0 consist of the following:

(1) Receiving Water Limitations

(a) Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedules under Specific Provision 6.c.(1):

Table 6.1
Receiving Water Limitations as Bacteria Densities and Allowable Exceedance Frequencies in the Water Body

Constituent	Receiving Water Limitations			
	Single Sample Maximum[1,2] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[3]	30-Day Geometric Mean[2] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform	10,000	22% / 0%	1,000	0%
Fecal Coliform	400	22% / 0%	200	0%
Enterococcus	104[4] / 61[5]	22% / 0%	35[4] / 33[5]	0%

Notes:
1. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
3. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. The 0% single sample maximum allowable exceedance frequency applies to dry weather days.
4. This *Enterococcus* receiving water limitation applies to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
5. This *Enterococcus* receiving water limitations applies to segments or areas of creeks or creek mouths listed in Table 6.0.

Interim receiving water limitations expressed as allowable exceedance frequencies are given in the compliance schedule under Specific Provision 6.c.

(b) If the above receiving water limitations are not met in the receiving water, the Responsible Copermittees must demonstrate that the discharges from the MS4s are not causing or contributing to the violation of receiving water limitations. The Copermittee must provide data that demonstrate the discharges from the MS4s are meeting the effluent limitations under Specific Provision 6.b.(2).

(2) Effluent Limitations

Discharges from the MS4s must not contain densities that exceed the following effluent limitations by the end of the compliance schedules under Specific Provision 6.c.(1) to demonstrate the discharge is not causing or contributing to a violation of receiving water quality standards:

Table 6.2
Effluent Limitations as Bacteria Densities and Allowable Exceedance Frequencies in MS4 Discharges to the Water Body

	Effluent Limitations			
Constituent	Single Sample Maximum[1,2] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[3]	30-Day Geometric Mean[2] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform	10,000	22% / 0%	1,000	0%
Fecal Coliform	400	22% / 0%	200	0%
Enterococcus	104[4] / 61[5]	22% / 0%	35[4] / 33[5]	0%

Notes:
1. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.
3. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. The 0% single sample maximum allowable exceedance frequency applies to dry weather days
4. This *Enterococcus* effluent limitation applies to MS4 discharges to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
5. This *Enterococcus* effluent limitation applies to MS4 discharges to segments or areas of creeks or creek mouths listed in Table 6.0.

Interim effluent limitations expressed as allowable exceedance frequencies are given in the compliance schedule under Specific Provision 6.c.

(3) Best Management Practices

(a) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 6.0 must incorporate the Comprehensive Load Reduction Plans (CLRPs) required to be developed pursuant to Resolution No. R9-2010-0001. For segments or areas in Table 6.0 that have been delisted from the Clean Water Act Section 303(d) List of Water Quality Limited Segments, a CLRP is not required.

(b) The Responsible Copermittee must implement BMPs to support the achievement of the WQBELs under Specific Provision 6.b for the segments or areas of the water bodies listed in Table 6.0.

(c) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans and owners/operators of small MS4s as possible.

c. COMPLIANCE SCHEDULE

(1) WLA Compliance Dates

The Responsible Copermittees for MS4 discharges to a segment or area of the water bodies listed in Table 6.0 are required to achieve the WLA, thus must be in compliance with the WQBELs under Specific Provision 6.b, according to the following compliance schedule:

Table 6.3
Compliance Schedule Dates to Achieve Indicator Bacteria WLAs

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform*	April 4, 2021	April 4, 2031
Fecal Coliform		
Enterococcus		

* Total coliform receiving water limitations only apply to segments or areas of Pacific Ocean Shoreline listed in Table 6.0.

(2) Interim Compliance Requirements

The Responsible Copermittees must comply with the following interim WQBELs by the interim compliance dates:

(a) Interim Dry Weather Receiving Water Limitations

The Responsible Copermittee must calculate the "existing" exceedance frequencies of the 30-day geometric mean water quality objectives for each of the indicator bacteria by analyzing the available monitoring data collected between January 1, 1996 and December 31, 2002. "Existing" exceedance frequencies may be calculated by segment or area of a water body, or by water body, and/or by Watershed Management Area listed in Table 6.0. Separate "existing" exceedance frequencies must be calculated for beaches and creeks/creek mouths.

The Responsible Copermittees must achieve a 50 percent reduction in the "existing" exceedance frequency of the 30-day geometric mean WQBELs for the segments or areas of the water bodies listed in Table 6.0 by the interim compliance dates for achieving the interim dry weather WQBELs given in Table 6.5. A 50 percent reduction in the "existing" exceedance frequency is equivalent to half of the "existing" exceedance frequency of the 30-day geometric mean WQBELs.

The "existing" exceedance frequencies and the interim dry weather allowable exceedance frequencies (i.e. interim dry weather WQBELs) calculated by the Responsible Copermittees must be included in the Water Quality Improvement Plans for the applicable Watershed Management Areas.

(b) Interim Wet Weather Receiving Water Limitations

The Responsible Copermittees must achieve the interim wet weather receiving water limitations in Table 6.4, expressed as interim allowable exceedance frequencies, by the interim compliance dates for achieving the interim wet weather WQBELs given in Table 6.5.

Table 6.4
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	38%	37%	39%
		at Heisler Park - North			
	Pacific Ocean Shoreline	at Main Laguna Beach			
		Laguna Beach at Ocean Avenue			
		Laguna Beach at Cleo Street			
		Arch Cove at Bluebird Canyon Road			
		Laguna Beach at Dumond Drive			
	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	41%	41%	42%
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	41%	41%	42%
	Aliso Creek Mouth	at mouth	41%	41%	42%
	Pacific Ocean Shoreline	Aliso Beach at West Street	36%	36%	36%
		Aliso Beach at Table Rock Drive			
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)			
		at Salt Creek (large outlet)			
		Salt Creek Beach at Salt Creek service road			
		Salt Creek Beach at Strand Road			

Table 6.4 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County (cont'd)	Pacific Ocean Shoreline	at San Juan Creek	44%	44%	48%
	San Juan Creek	lower 1 mile	44%	44%	47%
	San Juan Creek Mouth	at mouth	44%	44%	47%
	Pacific Ocean Shoreline	at Poche Beach	35%	35%	36%
		Ole Hanson Beach Club Beach at Pico Drain			
		San Clemente City Beach at El Portal Street Stairs			
		San Clemente City Beach at Mariposa Street			
		San Clemente City Beach at Linda Lane			
		San Clemente City Beach at South Linda Lane			
		San Clemente City Beach at Lifeguard Headquarters			
		under San Clemente Municipal Pier			
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)			
		San Clemente State Beach at Riviera Beach			
		Can Clemente State Beach at Cypress Shores			
San Luis Rey River	Pacific Ocean Shoreline	at San Luis Rey River mouth	45%	44%	47%
Carlsbad	Pacific Ocean Shoreline	at Moonlight State Beach	40%	40%	41%
San Dieguito River	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	33%	33%	36%

Table 6.4 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
Penasquitos	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	26%	26%	26%
Mission Bay	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	37%	37%	37%
		La Jolla Shores Beach at Caminito del Oro			
		La Jolla Shores Beach at Vallecitos			
		La Jolla Shores Beach at Avenida de la Playa			
		at Casa Beach, Children's Pool			
		South Casa Beach at Coast Boulevard			
		Whispering Sands Beach at Ravina Street			
		Windansea Beach at Vista de la Playa			
		Windansea Beach at Bonair Street			
		Windansea Beach at Playa del Norte			
		Windansea Beach at Palomar Avenue			
		at Tourmaline Surf Park			
		Pacific Beach at Grand Avenue			
	Tecolote Creek	Entire reach and tributaries	49%	49%	51%
San Diego River	Forrester Creek	lower 1 mile	46%	43%	49%
	San Diego River	lower 6 miles	46%	43%	49%
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	46%	43%	51%
San Diego Bay	Chollas Creek	lower 1.2 miles	41%	41%	43%

(c) Interim Compliance Dates

The Responsible Copermittees must achieve the interim receiving water limitations under Specific Provisions 6.c.(2)(a) and 6.c.(2)(b) by the interim compliance dates given in Table 6.5.

Table 6.5
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs
South Orange County	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	April 4, 2016	April 4, 2021
		at Heisler Park - North		
	Pacific Ocean Shoreline	at Main Laguna Beach	April 4, 2016	April 4, 2021
		Laguna Beach at Ocean Avenue		
		Laguna Beach at Cleo Street		
		Arch Cove at Bluebird Canyon Road		
		Laguna Beach at Dumond Drive		
	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	April 4, 2016	April 4, 2021
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	April 4, 2018	April 4, 2021
	Aliso Creek Mouth	at mouth	April 4, 2018	April 4, 2021
	Pacific Ocean Shoreline	Aliso Beach at West Street	April 4, 2016	April 4, 2021
		Aliso Beach at Table Rock Drive		
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)		
		at Salt Creek (large outlet)		
		Salt Creek Beach at Salt Creek service road	April 4, 2017	April 4, 2021
		Salt Creek Beach at Strand Road	April 4, 2017	April 4, 2021

Table 6.5 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area	Water Body	Segment or Area	Interim Compliance Dates	
			Interim Dry Weather WQBELs	Interim Wet Weather WQBELs
South Orange County (cont'd)	Pacific Ocean Shoreline	at San Juan Creek	April 4, 2016	April 4, 2021
	San Juan Creek	lower 1 mile	April 4, 2018	April 4, 2021
	San Juan Creek Mouth	at mouth	April 4, 2016	April 4, 2021
	Pacific Ocean Shoreline	at Poche Beach	April 4, 2016	April 4, 2021
		Ole Hanson Beach Club Beach at Pico Drain	April 4, 2016	April 4, 2021
		San Clemente City Beach at El Portal Street Stairs	April 4, 2017	April 4, 2021
		San Clemente City Beach at Mariposa Street		
		San Clemente City Beach at Linda Lane	April 4, 2016	April 4, 2021
		San Clemente City Beach at South Linda Lane	April 4, 2018	April 4, 2021
		San Clemente City Beach at Lifeguard Headquarters	April 4, 2017	April 4, 2021
		under San Clemente Municipal Pier		
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	April 4, 2018	April 4, 2021
		San Clemente State Beach at Riviera Beach	April 4, 2016	April 4, 2021
		Can Clemente State Beach at Cypress Shores	April 4, 2017	April 4, 2021
San Luis Rey River	Pacific Ocean Shoreline	at San Luis Rey River mouth	April 4, 2017	April 4, 2021
Carlsbad	Pacific Ocean Shoreline	at Moonlight State Beach	April 4, 2016	April 4, 2021
San Dieguito River	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	April 4, 2016	April 4, 2021

Table 6.5 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs
Penasquitos	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	April 4, 2016	April 4, 2021
Mission Bay	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	April 4, 2016	April 4, 2021
		La Jolla Shores Beach at Caminito del Oro		
		La Jolla Shores Beach at Vallecitos		
		La Jolla Shores Beach at Avenida de la Playa		
		at Casa Beach, Children's Pool		
		South Casa Beach at Coast Boulevard		
		Whispering Sands Beach at Ravina Street		
		Windansea Beach at Vista de la Playa		
		Windansea Beach at Bonair Street		
		Windansea Beach at Playa del Norte		
		Windansea Beach at Palomar Avenue		
		at Tourmaline Surf Park		
		Pacific Beach at Grand Avenue		
	Tecolote Creek	Entire reach and tributaries		
San Diego River	Forrester Creek	lower 1 mile	April 4, 2018	April 4, 2021
	San Diego River	lower 6 miles		
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach		
San Diego Bay	Chollas Creek	lower 1.2 miles	April 4, 2018	April 4, 2021

d. Specific Monitoring and Assessment Requirements

(1) Monitoring and Assessment Requirements for Beaches

(a) Monitoring Stations

For beaches addressed by the TMDL, monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[35] If exceedances

[35] Commonly referred to as AB 411 monitoring

of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations at least once within the first 24 hours of the first storm event[36] of the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer in exceedance of the allowable exceedance frequencies in the receiving waters.

(iii) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs for the Pacific Ocean Shoreline segments or areas listed in Table 6.0 have been achieved.

(ii) The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

[36] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(2) Monitoring and Assessment Requirements for Creeks and Creek Mouths

(a) Monitoring Stations

For creeks addressed by the TMDL, monitoring locations should consist of, at a minimum, a location at or near the mouth of the creek (e.g. Mass Loading Station or Mass Emission Station) and one or more locations upstream of the mouth (e.g. Watershed Assessment Station). If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations in accordance with the requirements of Provision D.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations within the first 24 hours of the first storm event[37] of the rainy season (i.e. October 1 through April 30).

(iii) Samples collected from receiving water monitoring stations must be analyzed for fecal coliform and *Enterococcus* indicator bacteria.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the receiving water monitoring data to assess whether the interim and final receiving water WQBELs for the creeks and creek mouths listed in Table 6.0 have been achieved.

(ii) The Responsible Copermittee must identify and incorporate additional MS4 outfall and receiving water monitoring stations and/or adjust monitoring frequencies to identify sources causing exceedances of the receiving water WQBELs.

(iii) The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

[37] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

e. COMPLIANCE DETERMINATION

(1) Compliance with interim compliance requirements of Specific Provision 6.c.(2) may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 6.b.(1) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls;

(c) There are no violations of the applicable effluent limitations under Specific Provision 6.b.(2) at the Responsible Copermittees' MS4 outfalls;

(d) There are no exceedances of the applicable interim receiving water limitations under Specific Provision 6.c.(2) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls;

(e) The Responsible Copermittees can demonstrate that exceedances of the applicable interim or final receiving water limitations under Specific Provision 6.b.(1)(a) or 6.c.(2) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4 are not causing or contributing to the exceedances; OR

(f) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim compliance requirements will be achieved by the interim compliance dates.

(2) Compliance with WQBELs of Specific Provision 6.b may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 6.b.(1) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls;

(c) There are no violations of the applicable effluent limitations under Specific Provision 6.b.(2) at the Responsible Copermittees' MS4 outfalls; OR

(d) The Responsible Copermittees can demonstrate that exceedances of the applicable final receiving water limitations under Specific Provision 6.b.(1)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4 are not causing or contributing to the exceedances.

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January 11th, 2013

Via e-mail to
wchiu@waterboards.ca.gov
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

The Escondido Creek Conservancy

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Environmental Engineer
Richard Murphy
Operations Manager

Of counsel

Everett Delano of Delano Law Offices

RE: Comments on Tentative Order Number: R9-2013-0001

Dear Mr. Chiu:

The Escondido Creek Conservancy (TECC) respectfully submits the following comments on the draft San Diego Regional Municipal Separate Storm Sewer System Permit, Tentative Order No. R9-2013-0001.

Urban runoff is not only one of the San Diego area's most urgent pollution problem, it is also one of the most challenging. In a region known for its beaches and strong tourism economy, polluted runoff makes our beaches and waterways unsafe for surfing, swimming, fishing, and other recreation for at least 72 hours after a rain event. Even in dry weather, runoff due to residential, municipal, and industrial irrigation for urban and suburban landscape can be a major pollution source.

Despite this challenge, we are confident that this public health problem can be successfully mitigated by working collaboratively as a community. The Water Quality Improvement Plans proposed in the draft permit have the potential to become powerful tools to help us improve water quality within our watersheds. However, the Copermittees cannot be tasked with creating these plans alone.

Specifically:

•The Permit should require formation of a stakeholder advisory group for each watershed, and these groups should include representatives of environmental and other public interest organizations with knowledge of the respective watersheds.

•The stakeholder advisory groups should work closely with the Copermittees and a Regional Board staff member during the development phase of Water Quality Improvement Plans to ensure these Plans target significant water quality goals that are both significant and quantifiable.

•The stakeholder advisory process should include accountability and measureable milestones to ensure the goals of the Permit are being met, as defined in the Water Quality Improvement Plans.

By taking advantage of the knowledge and resources of diverse stakeholders like municipalities, businesses, and residents, the San Diego area can be a pioneer in controlling urban runoff, creating healthier communities and watersheds, and improving our local beaches. Not only will the steps listed above help to accomplish these goals, but also bolster the local economy by firmly establishing San Diego as the country's finest coastal destination. However, all of these benefits can only be achieved if the diverse voices of the watershed stakeholders are influencing the planning process in a meaningful way.

TECC recognizes the challenge urban runoff presents to our region and is committed being a part of the solution. Consequently, TECC is interested in participating in a Water Quality Improvement Plan development process for the Carlsbad Hydrologic Unit watershed.

In summary, TECC urges the Regional Board to enhance the stakeholder participation opportunities as Water Quality Improvement Plans are developed and subsequently approve the permit.

Respectfully submitted,

Kevin Barnard

Kevin Barnard
President
The Escondido Creek Conservancy

January 11, 2013

Via e-mail to wchiu@waterboards.ca.gov
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

RE: Comments on Tentative Order Number: R9-2013-0001

Dear Mr. Chiu:

Friends of Rose Canyon, Friends of Rose Creek, and the Rose Creek Watershed Alliance respectfully submit the following comments on the draft San Diego Regional Municipal Separate Storm Sewer System permit.

We have been working together to implement some aspects of the Rose Creek Watershed Opportunities Assessment, a plan whose goal is to enhance and preserve the Rose Creek Watershed (www.rosecreekwatershed.org). Urban runoff is the San Diego region's most urgent pollution problem and was identified in the Assessment for action. Arguably, it is the most difficult to solve. In a region known for its beaches and strong tourism economy, polluted runoff makes our beaches and waterways unsafe for swimming, fishing and other recreation for at least 72 hours after a rain event. Even in dry weather, our "urban drool" from residents and businesses overwatering lawns becomes a major pollution source.

The good news is that by working together as a community, we can solve this challenging public health problem. The Water Quality Improvement Plans proposed in the draft permit have the potential to become powerful tools to help us improve water quality within our watersheds. However, the Copermittees cannot be tasked with creating these plans alone. Specifically:

- The Permit should require formation of a stakeholder advisory group for each watershed that includes representatives of environmental and community groups with knowledge of the watershed.
- These stakeholder advisory groups should work closely with the Copermittees and a regional board staff member while the Water Quality Improvement Plans are being developed to ensure that these plans aggressively pursue water quality gains.
- The stakeholder advisory process should include accountability and measureable milestones to ensure the goals of the Permit are being met.

By taking advantage of the knowledge and resources of diverse stakeholders like municipalities, businesses and residents, our region can be on the cutting-edge of addressing urban runoff and creating healthier communities and watersheds.

Friends of Rose Canyon, Friends of Rose Creek, and the Rose Creek Watershed Alliance recognize the challenge urban runoff presents to our region. We look forward to participating in a Water Quality Improvement Plan development process for the Rose Creek watershed in the city of San Diego.

We urge the Regional Board to enhance the stakeholder participation opportunities during Water Quality Improvement Plan development.

Respectfully submitted,

Deborah Knight
Executive Director, Friends of Rose Canyon
www.rosecanyon.org

Karin Zirk
Friends of Rose Creek
www.saverosecreek.org

Ann Van Leer
Rose Creek Watershed Alliance
www.rosecreekwatershed.org

From: Tom Gable
To: Chiu, Wayne@Waterboards
Subject: Public Participation in Water Quality Control Regulation Development, Measurement, Accountability
Date: Friday, January 11, 2013 4:49:54 PM
Attachments: ~~29A587CE-9A03-469F-[redacted]03B42[redacted]23930[61].png~~

Mr. Gary Strawn

Vice Chairman

San Diego Regional Water Quality Control Board

9174 Sky Park Court, Suite 100

San Diego, CA 92123-4340

Re: Comment—Tentative Order No. R9-2013-001, Regional MS4 Permit,

Place ID: 786088Wchiu

Dear Vice Chair Strawn:

As a native San Diegan and businessman, I am concerned that implementing the permit outlined in Board's Tentative Order R9-2012-0011 ("Permit") dated October 31, 2012, we be detrimental to the clients of our public relations firm in the life science, biotech, clean tech and technology industries.

We all want clean, safe water to the region. But in participating in several committee meetings and reviewing documents related to the permit, indicators are the costs will be debilitating to many, particularly in those industries which have significant water usage requirements.

To echo concerns raised by others, the three primary areas of concern include: 1) the strict liability for exceeding water quality objectives; 2) the preemption of WQIPs by new and changing regulatory requirements prior to allowing the WQIPs to be developed and implemented; and 3) the lack of reliable funding sources to implement these regulatory changes.

It is necessary to hold individuals, businesses and governments accountable. But what are the accountability measures that would be practical and have a demonstrable, positive effects on water quality?

Because of these concerns, I respectfully request that the Permit focus on the timely development of effective and enforceable WQIPs, and that each of the WQIPs be developed through a process that ensures public participation. I ask also that the designation of appropriate Best Management Practices in each watershed be determined through the WQIP process rather than the one size fits all strategy currently being proposed in the Permit. I ask further that until the Board adopts a WQIP for a watershed that the provisions of the existing Permit remain in place for that watershed. Finally, in order to avoid unnecessary litigation I request that the Board adopt the WQIPs as Orders implementing the proposed Permit.

I urge you to adopt final permit language that is evidence-based and both environmentally and economically sustainable.

Thank you for your consideration.

Sincerely,

Tom Gable

CEO

_____

gablepr

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From: Ed Muna
To: Chiu, Wayne@Waterboards
Subject: Comment—Tentative Order No. R9-2013-001, Regional MS4 Permit
Date: Friday, January 11, 2013 5:16:28 PM

Mr. Gary Strawn

Vice Chairman

San Diego Regional Water Quality Control Board

9174 Sky Park Court, Suite 100

San Diego, CA 92123-4340

Re: Comment—Tentative Order No. R9-2013-001, Regional MS4 Permit,

Place ID: 786088Wchiu

Dear Vice Chair Strawn:

I am responding to the San Diego Regional Water Quality Control Board's Tentative Order R9-2012-0011 ("Permit") dated October 31, 2012. After reviewing the proposed Permit, I am concerned it will impose expensive, onerous, and untested regulations on local governments, businesses, and residents.

Everyone understands the importance of clean, safe water to the region. As a member of the business community, I too am interested in improving San Diego's water. It is important, however, that we use our limited resources wisely, and ensure that our efforts produce the desired outcome of improving water quality.

I applaud the Board's inclusion of Water Quality Improvement Plans (WQIP) as a first step in developing a cost-effective approach to improving our water. Analysis remains a critical component of a successful strategy, and I am glad to see that the Board is committed to finding the best possible solution to water quality improvement.

I am concerned, however, that the costs associated with enforcing and implementing the permit will have a negative impact on my business and San Diego's economy. The three primary areas of concern include: 1) the strict liability for exceeding water quality objectives; 2) the preemption of WQIPs by new and changing regulatory requirements prior to allowing the WQIPs to be developed and implemented; and 3) the lack of reliable funding sources to implement these regulatory changes.

It is necessary to hold individuals, businesses and governments accountable, but it is critical that accountability measures are practical with demonstrable, positive effects on water quality. Because of these concerns, I respectfully request that the Permit focus on the timely development of effective and enforceable WQIPs, and that each of the WQIPs be developed

through a process that ensures public participation. I ask also that the designation of appropriate Best Management Practices in each watershed be determined through the WQIP process rather than the one size fits all strategy currently being proposed in the Permit. I ask further that until the Board adopts a WQIP for a watershed that the provisions of the existing Permit remain in place for that watershed. Finally, in order to avoid unnecessary litigation I request that the Board adopt the WQIPs as Orders implementing the proposed Permit.

I urge you to adopt final permit language that is evidence-based and both environmentally and economically sustainable. Thank you for your consideration. Please contact XXXXX if you have any questions.

Sincerely,

Ed Muna

Senior Vice President
Hughes Marino, Inc.
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INDUSTRIAL
ENVIRONMENTAL
ASSOCIATION

January 11, 2013

Mr. Wayne Chiu
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego, California, 92123-4340

Sent Via Email to: wchiu@waterboards.ca.gov

Re: Comment – Tentative Order No. R9-2013-0001, NPDES No. CAS0109266
Regional MS4 Permit

Dear Mr. Chiu:

Please find attached comments prepared and submitted by the Industrial Environmental Association (IEA) regarding the San Diego Region MS4 Permit Reissuance.

The Industrial Environmental Association (IEA) was formed in 1983 to promote responsible, cost-effective environmental laws and regulations, facilitate environmental compliance among member companies and provide related education activities for the community at large. IEA actively insists on strong environmental compliance efforts among member companies as a matter of written policy. Further, IEA urges reliance on scientific, analytical data to evaluate the regulations necessary to protect the public and the environment.

After many hours of review and consideration, we appreciate the opportunity to submit these suggestions which we believe will help meet the goals of the Regional Board in a manner that avoids excessive cost and regulatory burden for our members.

We appreciate the opportunity to work with the Board and Staff throughout what has been a very open process, and we look forward to the opportunity to discuss these issues more comprehensively in the weeks ahead. .

Sincerely,

Jack Monger
Executive Director

1330 Orange Avenue, Suite 100 • Coronado, CA 92118 • 619-522-9000 • IEA-sd.com

Industrial Environmental Association (IEA) Comments

Tentative
Order No. R9-2013-0001
NPDES No. CAS0109266

National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region

1. **Overall Methodology**- In general, IEA supports a Regional MS4 Permit promoting an adaptive planning and management process that allows implementation of appropriate strategies, control measures, and best management practices (BMPs) to protect and preserve water quality and suitable beneficial uses of waters of the state.

2. **Water Quality Improvement Plan Approach-** IEA recognizes the general intent of the Water Quality Improvement Plans (Provision B) is for Copermittees to develop focused watershed-based plans to identify water quality conditions and issues, develop priorities, establish strategies and schedules, and implement adaptive processes to carry out prioritized actions to improve water quality. IEA welcomes the opportunity to participate in the Water Quality Improvement Plan development process and collaborate with Copermittees to develop targeted and cost-efficient strategies and assessment metrics aimed at water quality improvement.

3. **Monitoring and Assessment**- IEA recognizes a key goal of an effective Monitoring and Assessment framework (Provision D) is the collection of precise and useful data to inform stakeholders about water quality conditions in discharges and receiving waters. It is presumed that this data will allow for focused implementation actions and water quality improvement strategies. IEA supports a monitoring framework that provides cost-effective informed data to guide future actions. Accordingly, IEA supports coordination of Regional Water Quality Control Board (RWQCB) staff and Copermittee stakeholders in identifying an iterative, strategic, cost-effective, question-driven monitoring approach. The approach should incorporate short-, medium-, and long-term goals and outline procedures to collect comparable data across watersheds/jurisdictions that allows for future statistical assessments. Short-term goals can include discharge and receiving water characterization to understand current conditions and track progress. Medium-term goals can include planning for Clean Water Act Section 303(d) listings/delistings and best available science-based TMDL development in accordance with the Clean Water Act. Long-term goals can include collecting data appropriate for development of site-specific water quality objectives and potential revisions to Basin Plan objectives.

4. **Non-Storm Water Discharges**- There is still confusion in the Regional MS4 Permit regarding which non-storm water discharges are effectively prohibited and must be eliminated and those that are authorized. The Regional MS4 Permit both states that it authorizes and prohibits non-storm water discharges but it is not always clear which are authorized and which are prohibited. In multiple locations (e.g. Finding 15), the Regional MS4 Permit states that non-stormwater discharges into the MS4s must be

"effectively prohibited" or eliminated. This language conflicts with other provisions (Provision II.A.1.b., for example), which state, consistent with EPA's regulations, that non-stormwater discharges authorized by a NPDES permit are authorized to be discharged to the MS4 system. One change that would help to clarify this issue would be to revise Finding 15 as follows:

> **Non-Storm Water and Storm Water Discharges.** Non-storm water discharges from the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard of CWA section 402(p)(3)(B)(iii), which is explicitly for "Municipal … *Stormwater Discharges* (emphasis added)" from the MS4s. Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s must be effectively prohibited. *However, consistent with EPA's regulations, the draft Permit authorizes discharges of non-storm water to MS4s that are either authorized by a separate NPDES permit, or the discharge is a category of non-storm water discharges or flows that must be addressed pursuant to Provisions E.2.a.(1)-(5) of this Order.*

IEA recognizes the Regional MS4 Permit intent to reduce transport of pollutants through elimination of non-storm water discharges (Provision E. 2). However, this intent can also be achieved through implementation of appropriate BMPs if, and when, the listed sources of non-storm water are found to be sources of pollutants to the receiving water. This is the approach used in previous MS4 permits and is consistent with EPA storm water regulations.

A good example of this is non-emergency firefighting flows from fire suppression equipment maintenance activities that can and have been treated with BMPs. IEA recognizes that the RWQCB has identified fire suppression equipment maintenance discharges "contain waste"1 and thus need to be prohibited by the Copermittees as illicit discharges through ordinance, order, or similar means. IEA recommends the Regional MS4 Permit be modified to allow the Water Quality Improvement Plan process to incorporate the use of BMPs for fire suppression equipment maintenance activity discharges.

IEA recommends the following amendment of Provision E.2.a.6:

> If the Copermittee or San Diego Water Board identifies any category of non-storm water discharges listed under Provisions E.2.a.(1)-(4) as a source of pollutants to receiving waters, the category must be prohibited through ordinance, order, or similar means and addressed as an illicit discharge. *Alternately, the Copermittee can designate different and/ or additional BMPs to be implemented as opposed to prohibiting the category of non-stormwater.*

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[1] Order R9-2010-0016 Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the County of Riverside, the Incorporated Cities of Riverside County, and the Riverside County Flood Control and Water Conservation District within the San Diego Region. NPDES No. CAS0108766. November 10, 2010.

Further, the Regional MS4 Permit currently specifies that air conditioner condensation [Provision E.2.a.(4).(a)] is a non-storm water discharge that must be directed to landscaped areas or other pervious surfaces *where feasible* (emphasis added). IEA members have previously independently evaluated this potential action and have identified potentially significant costs for compliance. A case study in the Los Penasquitos watershed estimated that due to current system configuration, re-routing the condensation line at one building facility would require ~$12,000 investment. For these reasons, it is suggested that these requirements be limited to new development and the actual footprint of any re-development, unless otherwise required by the Water Quality Improvement Plans.

5. **Development Planning**- IEA supports the implementation of cost-effective methods to reduce the discharge of pollutants in storm water to the maximum extent practicable (MEP) and effectively prohibit non-storm water discharges to provide the reasonable protection, preservation, enhancement, and restoration of water quality and designated beneficial uses of waters of the state. IEA supports the business and development community in requesting the Development Planning (Provision E.3) criteria for priority development project structural BMP requirements and alternative compliance be carefully examined. Given the poor soil infiltration rates in much of San Diego County, many development projects will likely demonstrate technical infeasibility in implementing cost-effective Low Impact Development (LID) and hydromodification controls. The process currently identified in the Regional MS4 Permit does not provide sufficient detail for consistency among Copermittees in evaluating technical infeasibility conditions and implementation of feasible mitigation alternatives. IEA supports development of a stakeholder-lead Technical Advisory Committee to assist in the revision of Provision E.3 to meet multiple objectives for both improved water quality and consideration of site-specific conditions and economic constraints.

6. **Existing Development Management-Inspections-** In general, IEA recognizes the importance of Copermittee inspection activities at inventoried existing development to ensure compliance with applicable local ordinances and permits and the Regional MS4 Permit. However, Provision E.5.c currently contains language that provides for "volunteer monitoring or patrol programs" to conduct visual and verification inspections for Copermittees. IEA strongly opposes authorization of volunteer monitoring and/or patrol programs for third party inspections of industrial or commercial facilities through the Regional MS4 Permit. This type of action has potentially serious safety, procedural, and liability issues for the volunteer program responsible party, Copermittees and inspected facility owner. IEA recognizes there may be some amount of water quality, collaboration, and cost-efficiency value in engaging properly-trained and insured volunteer programs for certain types of visual observation activities on public right-of-way property. However, Provision E.5.c.(1). (a) (i) is not the appropriate permit provision to reference this type of collaboration in the Regional MS4 Permit.

   IEA recommends Provision E. 5.c..(1).(a) (i) be revised to delete provision [c] that states: "Inspections by volunteer monitoring or patrol programs trained by the Copermittee". As an alternative, IEA recommends the "volunteer monitoring or patrol programs trained by the Copermittee" language be added to Provision E. 5.c.(1). (a) (i) [a] such that the whole section would as indicated below. Further IEA

recommends a footnote be added to the word "program" to clearly identify that volunteer program staff shall conduct visual observations in the public right-of-way only as indicated below.

..(1) Inspection Frequency

(a) Each Copermittee must establish appropriate inspection frequencies for inventoried existing development in accordance with the following requirements:

(i) At a minimum, inventoried existing development must be inspected once every five years utilizing one or more of the following methods:

[a] Drive-by inspections by Copermittee municipal or contract staff, or volunteer monitoring or patrol program[1] staff trained by the Copermittee, and

[b] Onsite inspections by Copermittee municipal and contract staff;

[1] *Volunteer monitoring or patrol program staff shall be limited to only inspection activities performed in the public right-of-way, when conducted at the direction of a copermittee.*

In order to further clarify this issue, IEA recommends Provision E.5.c.(2). (a) be revised to delete the words "by the Copermittee or volunteer monitoring or patrol programs". Provision E. 5.c.(2).(a) would then read:

..(2) Inspection Content

(a) Inspections of existing development must include, at a minimum:

Finally, IEA recommends the Regional MS4 Permit language and/or Attachment F - Fact Sheet/Technical Report include language that requires participating volunteer monitoring or patrol programs to demonstrate appropriate training, equipment calibration records, and proof of professional liability insurance to Copermittee or other responsible party(s) prior to engagement in visual or other monitoring activities under the Regional MS4 Permit. This requirement will work to both protect the interests of Copermittee and other interested organizations as well as provide reasonable assurance that data collected by volunteer monitoring or patrol programs is consistent and of high quality.

January 11, 2013

San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Subject: Tentative Draft Order Number: R9-2013-0001

The Laguna Bluebelt Coalition is dedicated to marine life protection through cooperative efforts in education, enforcement, water quality improvements, habitat restoration and networking among diverse stakeholders, agencies and elected officials. We support efforts by many local and regional environmental groups and organizations to address urban runoff pollution in the Aliso Watershed as a model for other impaired creek and coastal receiving waters. The following comments on the draft San Diego Regional Municipal Separate Storm Sewer System permit are intended to educate and motivate sustainable solutions to creek and ocean pollution..

Urban runoff is the San Diego region's most urgent pollution problem. Laguna Beach and the regional economy depend upon a healthy ecology. In a region known for its beaches and strong tourism economy, polluted runoff makes our beaches and waterways unsafe for swimming, fishing and other recreation for at least 72 hours after a rain event. Even in dry weather, contaminated urban runoff from known from residential and commercial overwatering becomes a major regional pollution source.

Today modern techniques, tactics and technologies can re-purpose polluted water as a "new water" resource. By working together as a community, we can solve this challenging public health problem affecting our economy and healthy ecology. The Water Quality Improvement Plans proposed in the draft permit have the potential to become powerful tools to help us improve water quality within our watersheds. However, the Copermittees cannot be tasked with creating these plans alone.

Specifically:

- The Permit should require formation of a stakeholder advisory group for each watershed that includes representatives of environmental groups with knowledge of the watershed.
- This stakeholder advisory group should work closely with the Copermittees and a regional board staff member while the Water Quality Improvement Plans are being developed to ensure these plans aggressively pursue water quality gains.
- The stakeholder advisory process should include accountability and measureable milestones to ensure the goals of the Permit are being met.

By taking advantage of the knowledge and resources of diverse stakeholders like municipalities, businesses and residents, our region can be on the cutting-edge of addressing urban runoff and creating healthier communities and watersheds. But this can only be achieved if these diverse voices are impacting the planning process in a meaningful way.

The Laguna Bluebelt Coalition recognizes the challenges and opportunities urban runoff presents to our region, and we want to do our part to implement innovative, sustainable solutions to water pollution. The Laguna Bluebelt Coalition is committed to participating in a Water Quality Improvement Plan development process for the Aliso Watershed.

Among recommended actions to mitigate present impacts to Laguna Beach's creek, estuary, beach and coastal receiving waters are the following:

1. Map all creek and coastal receiving waters indicating water quality impacts. (SCCWRP, Scripps, NOAA,etc.) A Bioregional Watershed Map will identify degraded land elements, offending storm drain outlets and candidate areas for re-forestation and estuarine/coastal restoration.

2. On an annual basis, issue citations against the primary six known storm drain point sources in each watershed. This measure will incrementally compel clean-up and abatement throughout a given watershed bioregion without the burden of costs to abate all points of contamination at once. Failed Best Management Practices (BMPs) urban runoff facilities, required as a Condition of Approval for inland residential developments, can be retrofitted with dry weather diversions to local Publically Owned Treatment Works (POTWs) or, alternatively, re-engineered with deep groundwater injection wells.

3. Fines must be allocated to re-vegetate impaired watersheds and kelp forests to restore the native functions of semi-arid creeks and protected coastal receiving waters. A re-forested Aliso Canyon with a canopy similar to San Mateo Creek will qualify for California Cap and Trade funding to offset costs. Restoration of natural habitats is demonstrated to be the best, most cost effective measure for improving watershed water quality.

4. Restoration of high value coastal wetlands and estuaries will guarantee protection of natural beach sand berms and provide measurable improvement to coastal receiving waters. Funds from the California Coastal Conservancy and other wetland recovery resources can offset costs.

5. Watershed restoration will offer multiple community benefits by reducing destructive stormwater flows, eliminating pollutants and increasing eco-tourist revenues to surrounding cities. Large street cisterns incorporating designs proposed by GeoSynTech for the re-development of the Aliso Golf Course can serve as a model for extensive rainwater harvest/reuse systems. Restoration of some or all of the 1500 foot Aliso Creek Ox Bow in Laguna Niguel can restore hydric soils to reduce stormwater impacts.

6. Increased use of recycled water for wildland fire suppression along the entire Highway 73 Toll Road bisecting the Laguna Greenbelt will maintain a healthy, fire safe wilderness area. Orange County Measure M and State Proposition funds are available to offset costs. Increased use of recycled water reduces ocean discharges to the Laguna State Marine Conservation Area.

7. A citywide network of recycled water for all of Laguna Beach will reduce imported water demand significantly and increase water security, disaster preparedness and fire suppression resources. Revenues from routine use for irrigation mandated Fuel Modification Zones will provide new revenue streams. Laguna Beach is the only Orange County city without a comprehensive recycled water program and remains a "once use" community of valuable imported water.

The Laguna Bluebelt Coalition appreciates the Staff and Regional Board's commitment to supporting key community stakeholder participation opportunities during Water Quality Improvement Plan development and then approves the permit.

Thank you for your dedication to regional water quality improvements for our creeks, canyon and coastal waters.

Jonathan Claypool
Facilitator

jonathan@lagunabluebelt.org

LATITUDE 33
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Mr. Gary Strawn
Vice Chairman
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Re: Comment—Tentative Order No. R9-2013-001, Regional MS4 Permit, Place ID: 786088Wchiu

Dear Vice Chair Strawn:

I am responding to the San Diego Regional Water Quality Control Board's Tentative Order R9-2012-0011 ("Permit") dated October 31, 2012. After reviewing the proposed Permit, I am concerned it will impose expensive, onerous, and untested regulations on local governments, businesses, and residents.

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I applaud the Board's inclusion of Water Quality Improvement Plans (WQIP) as a first step in developing a cost-effective approach to improving our water. Analysis remains a critical component of a successful strategy, and I am glad to see that the Board is committed to finding the best possible solution to water quality improvement.

I am concerned, however, that the costs associated with enforcing and implementing the permit will have a negative impact on my business and San Diego's economy. The three primary areas of concern include: 1) the strict liability for exceeding water quality objectives; 2) the preemption of WQIPs by new and changing regulatory requirements prior to allowing the WQIPs to be developed and implemented; and 3) the lack of reliable funding sources to implement these regulatory changes.

It is necessary to hold individuals, businesses and governments accountable, but it is critical that accountability measures are practical with demonstrable, positive effects on water quality. Because of these concerns, I respectfully request that the Permit focus on the timely development of effective and enforceable WQIPs, and that each of the WQIPs be developed through a process that ensures public participation. I ask also that the designation of appropriate Best Management

Practices in each watershed be determined through the WQIP process rather than the one size fits all strategy currently being proposed in the Permit. I ask further that until the Board adopts a WQIP for a watershed that the provisions of the existing Permit remain in place for that watershed. Finally, in order to avoid unnecessary litigation I request that the Board adopt the WQIPs as Orders implementing the proposed Permit.

I urge you to adopt final permit language that is evidence-based and both environmentally and economically sustainable. Thank you for your consideration. Please contact Ted Shaw at ted.shaw@latitude33.com if you have any questions.

Sincerely,

Theodore RL Shaw

Principal, Latitude 33 Planning & Engineering

January 11, 2013

Attention: Wayne Chiu, P.E.
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

RE: Comments on Tentative Order No. R9-2013-0001 (San Diego Region MS4 Permit Reissuance)

Dear Mr. Chiu,

On behalf of the Los Peñasquitos Lagoon Foundation (LPLF), I would like to submit the following comments on Tentative Order No. R9-2013-0001 San Diego Region MS4 Permit Reissuance (Please see attached Exhibit A). Thank you for this opportunity and I look forward to working with Water Board staff and Co-Permittees on improving and protecting the beneficial uses afforded by Los Peñasquitos Lagoon, a State Preserve that is also listed as an impaired water body in the Clean Water Act Section 303(d).

Please contact me if you have any questions. (760) 271-0574.

Sincerely,

Mike Hastings

Mike Hastings
Executive Director, Los Peñasquitos Lagoon Foundation

Exhibit A.
Comments for Tentative Order No. R9-2013-0001
San Diego Region MS4 Permit Reissuance
Los Peñasquitos Lagoon Foundation
1/11/13

GENERAL COMMENTS

- Require public participation in Water Quality Improvement Plans (WQIP) development process to improve the Plan and avoid unnecessary "surprises" later on.
- WQIP development, implementation and assessment processes and efforts should be transparent to all stakeholders to facilitate their involvement.
- Provide summarized details on what a jurisdiction is doing in a particular watershed for understanding of RWQCB and public.
- WQIPs should be coordinated with other planning documents developed to improve, enhance and protect beneficial uses of receiving water bodies, including those prepared by third parties (e.g. NGOs).

SPECIFIC COMMENTS

Comment #1.

Page 2, #6. Non-Storm Water Discharges
Page 4, #12. Pollutants in Runoff
Page #15. Non-Storm Water and Storm Water Discharges
Page 65, #2 Illicit Discharges Detection and Elimination

Comment: Provide mechanisms to allow Co-permittees to address dry-weather flows/illicit discharges into receiving waters regardless of whether or not constituents of concern are present within these flows. These mechanisms should be broad enough to allow co-permittees to require landowners to modify their actions (e.g. landscape irrigation) that are identified directly or indirectly as contributing to dry weather discharges into the MS4. Priority given to dry weather discharges into the MS4 that discharge directly into 303(d) listed water bodies.

Context: Dry weather discharges can create serious impacts to the beneficial uses of receiving water bodies that support salt marsh habitats, especially when these discharges are perennial in nature. These flows are directly related to habitat conversion through their ability to alter salinity levels in soils that displace native salt marsh species, often permanently. Numerous studies, including those pertaining to Los Peñasquitos Lagoon, document the impacts of dry weather flows. The current methods available to co-permittees reduce their ability to effectively control all of these discharges.

Example: Ground-water charging from irrigation practices on top of sandstone bluffs. Water filters down, through the sandstone and seeps out at the bottom and into MS4. Although lines of evidence point to the irrigation practices that contribute

to and/or cause the mounding and subsequent seepage(s) that generated dry weather discharges into the MS4, co-permittees cannot address the source under the current regulatory format.

Figure 1. Perrenial seepage from over-irrigation on mesa top. Flow enter the MS4 and discharge into Los Peñasquitos Lagoon, a 303(d) listed waterbody.

Comment #2.

Page 3. #8. Point Source Discharge of Pollutants.

Comment: Needs to include discharges from the MS4 that generate and/or contribute to pollutant discharges below the outfall (e.g. sediment scoured below MS4 outlets). Or, keep the language under #11 that recognizes natural drainages and conveyances (e.g. creeks) within developed areas as part of the MS4 and receiving waters.

Context: Multiple lines of evidence support this claim (e.g. Los Peñasquitos Lagoon Sediment TMDL).

Comment #3.

Page 4. #13.

Comment. Human Health and Aquatic Impairment. Dry weather flows themselves, especially those that are perennial in nature, can contribute to impacts to receiving water bodies that historically received ephemeral flows (e.g. coastal salt marshes). One such impact is habitat conversion that can contribute to impaired beneficial uses within the receiving water body (e.g. Los Peñasquitos Lagoon) and substantial

threats to nearby communities. One example is related to the presence of West Nile Virus (WNV) at Los Peñasquitos Lagoon (LPL), as documented by the County of San Diego's Department of Environmental Health. WNV is transmitted by the freshwater mosquito *Culex tarsalis* that was not present in LPL prior to the recent establishment of riparian and brackish marsh habitats caused by perennial flows of dry weather discharges into the Lagoon's main tributaries and along Lagoon boundaries.

Another impact related to dry weather flows of freshwater include aquatic impairment within tidally influenced lagoons (e.g. salinity/temperature stratification within lagoon tidal channels that can be harmful to aquatic species).

Comment #4.

Page 66, #2(3) Illicit Discharges Detection and Elimination

Comment: Revise language under (3) to replace "…identifies the discharge a source of pollutants to receiving waters" with "…identifies the discharge a source of pollutants and/or contributor to the impairment (e.g. habitat conversion) of the receiving waterbody." Please see Comment #1 for more information and supporting justification for this requested change in language.

Comment #5.

Page 13 & 14, #2 Receiving Water Limitations

Comment: Insert the following (underlined) language under 2a. "Discharge from MS4 must not cause or contribute to the violation of water quality standards and/or impairment to receiving waters, ……."

Comment #6.

Page 19, #2 Priority Water Quality Conditions

Comment: include the following language under the first paragraph - "The Copermittees must work with the appropriate land managers and related management groups directly associated with the receiving water body to identify the water quality priorities within each Watershed Management Area."

This needs to occur since the land managers and associated groups will have a better idea (and supporting data) about what should be priorities for water quality improvements in receiving water bodies. Priority should be given to the land managers and management entities (e.g. NGOs) directly associated with the receiving water body (e.g. lagoon foundations/conservancies). Relevant monitoring

programs and management documents (e.g. enhancement plans) for receiving waterbodies should be considered and included in efforts to identify priority water quality conditions.

Comment #7.

Page 24, #3 Water Quality Improvement Strategies

Comment: include the following language under the first paragraph - "The Copermittees must work with the appropriate land managers and related management groups directly associated with the receiving water body to identify and prioritize strategies to address the highest priority water quality conditions identified within a Watershed Management Area."

This needs to occur since the land managers and associated groups will have a better idea (and supporting data) about what should be priorities for water quality improvements in receiving water bodies. Priority should be given to the land managers and management entities (e.g. NGOs) directly associated with the receiving water body (e.g. lagoon foundations/conservancies). Relevant monitoring programs management documents (e.g. enhancement plans) for receiving waterbodies should be considered and included in efforts to identify, develop and implement Water Quality Improvement Strategies.

Comment #8.

Page 25, #4 Water Quality Improvement Monitoring and Assessment Program

Comment: include the following sentence under the paragraph for 4a.- "The Copermittees in each Watershed Management Area must work with the appropriate land managers and related management groups directly associated with the receiving water body to plan, implement and review Water Quality Improvement Monitoring and Assessment Program.

Justification: The use of better data sets collected by land managers and related NGOs over longer periods of time that better describe water quality conditions. Also improves data collection by determining the appropriate monitoring locations by avoiding areas or conditions that can confound monitoring efforts (e.g. salinity stratification in lagoon channels).

Exhibit A.
Comments for Tentative Order No. R9-2013-0001
San Diego Region MS4 Permit Reissuance
Los Peñasquitos Lagoon Foundation
1/11/13

Comment #9.

Page 25, #5 Iterative Approach and Adaptive Management Process

Comment: include the following language in the first sentence - "The Copermittees in each Watershed Management Area must work with the appropriate land managers and related management groups directly associated with the receiving water body to implement the iterative approach ……."

Comment #10.

Page 28, C. Action Levels

Comment: Include action levels for insecticides (e.g. pyrethroids), since they are known to contribute impairment to receiving water bodies and quite possibly directly related to low Index of Biological Integrity (IBI) for macroinvertebrates in most, if not all, receiving water bodies.

Comment #11.

Page 33, D. Monitoring and Assessment Program Requirements

Comment: "The Copermittees in each Watershed Management Area must work with the appropriate land managers and related management groups directly associated with the receiving water body to plan, implement and review Water Quality Improvement Monitoring and Assessment Program.

Justification: The use of better data sets collected by land managers and related NGOs over longer periods of time that better describe water quality conditions. Also improves data collection by determining the appropriate monitoring locations by avoiding areas or conditions that can confound monitoring efforts (e.g. salinity stratification in lagoon channels).

Comment #12.

Page 39, D 1(c). Dry Weather Receiving Water Monitoring

Comment 1: Include continuous flow monitoring at the base of tributaries to 303(d) listed water bodies to better document the transport of pollutants and total volume of dry weather inputs that impair the beneficial uses of receiving water bodies (i.e. salt marshes) by converting lagoon tributaries from seasonal to perennial and facilitating habitat conversion through reductions in soil salinities.

Comment 2: Include monitoring of groundwater seepages into 303(d) listed water bodies to better document the transport dry weather inputs that impair the beneficial uses of receiving water bodies (i.e. salt marshes) by converting native habitats through reductions in soil salinities.

Comment #13.

Page 39, D 1(d). Wet Weather Receiving Water Monitoring

Comment: Include continuous flow monitoring at the base of tributaries to 303(d) listed water bodies to better document the transport of pollutants, peak discharge and total volume of storm runoff.

Comment #14.

Page 56, #4 Assessment Requirements

Comment: under 4a(2), include language such that the Copermittees must work with local land managers and related management entities (e.g. NGOs) for receiving water bodies to assess the status and trends of receiving water quality conditions. This is essential for the effective management of receiving water bodies and surrounding environs.

From: Jeff Marston
To: Chiu, Wayne@Waterboards
Subject: SDRWQCB Storm Water Permit Administrative Draft
Date: Friday, January 11, 2013 3:39:51 PM

January 11, 2013

Mr. Gary Strawn

Vice Chairman

San Diego Regional Water Quality Control Board

9174 Sky Park Court, Suite 100

San Diego, CA 92123-4340

Re: Comment—Tentative Order No. R9-2013-001, Regional MS4 Permit,

Place ID: 786088Wchiu

Dear Vice Chair Strawn:

I am responding to the San Diego Regional Water Quality Control Board's Tentative Order R9-2012-0011 ("Permit") dated October 31, 2012. After reviewing the proposed Permit and consulting with numerous colleagues, I am concerned it will impose expensive, onerous, and untested regulations on local governments, businesses, and residents alike.

As a business owner, I understand the importance of clean and safe water to the region. It is important, however, that we use our limited resources wisely, and ensure that our efforts produce the desired outcome of improving water quality.

I applaud the Board's inclusion of Water Quality Improvement Plans (WQIP) as a first step in developing a cost-effective approach to improving our water. Analysis remains a critical component of a successful strategy, and I am glad to see that the Board is committed to finding the best possible solution to water quality improvement.

I am concerned, however, that the costs associated with enforcing and implementing the permit will have a negative impact on my business and San Diego's economy. I have three primary areas of concern: 1) the strict liability for exceeding water quality objectives; 2) the preemption of WQIPs by new and changing regulatory requirements prior to allowing the WQIPs to be developed and implemented; and 3) the lack of reliable funding sources to

implement these regulatory changes.

While it is necessary to hold individuals, businesses and governments accountable, it is critical that accountability measures are practical, with demonstrable, positive effects on water quality. Because of these concerns, I respectfully request that the Permit focus on the following: timely development of effective and enforceable WQIPs and that each of the WQIPs be developed through a process that ensures public participation. I ask also that the designation of appropriate Best Management Practices in each watershed be determined through the WQIP process rather than the one size fits all strategy currently being proposed in the Permit. Also, that until the Board adopts a WQIP for a watershed that the provisions of the existing Permit remain in place for that watershed. Finally, in order to avoid unnecessary litigation I request that the Board adopt the WQIPs as Orders implementing the proposed Permit.

I urge you to adopt final permit language that is evidence-based and both environmentally and economically sustainable. Thank you for your time and consideration.

Sincerely,

Jeff Marston

President

Marston+Marston, Inc.

From:	Clark,Joyce Truhan
To:	Chiu, Wayne@Waterboards
Cc:	Bell,Janet J
Subject:	"Comment - Tentative Order No. R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu"
Date:	Friday, January 11, 2013 3:00:04 PM
Importance:	High

January 11, 2013

Sent Via E-Mail

Attention: Mr. Wayne Chiu, P.E.
wchiu@waterboards.ca.gov

California Regional Water Quality Control Board
San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4353

Subject: Metropolitan Water District of Southern California – "Comment – Tentative Order No. R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu"

Dear Mr. Chiu:

The Metropolitan Water District of Southern California (MWD) appreciates the opportunity to comment on subject Tentative Order No. R9-2013-0001, Regional MS4 Permit (MS4 Tentative Order). MWD is a consortium of 26 cities and water districts that provides drinking water to nearly 19 million people in parts of Los Angeles, Orange, San Diego, Riverside, San Bernardino, and Ventura counties. MWD delivers an average of 1.7 billion gallons of water per day to a 5,200 square mile service area. Our facilities include the Colorado River Aqueduct, pumping plants, treatment plants, reservoirs, tunnels, pipelines and hydroelectric plants. MWD is enrolled under the current 2010 San Diego Regional Water Quality Control Board's (SDRWQCB) General Permit, Order No.R9-2010-0003 (Existing General Permit), which captures dewatering, hydrostatic testing, and related potable water discharges for our Skinner Water Treatment Plant and water supply pipelines under the jurisdiction of the SDRWQCB.

To ensure continuous safety and protection of water supplies, MWD, our member agencies, and other water supply purveyors must perform various routine operations and maintenance activities that result in planned drinking water system releases of potable water, raw water, or low volume releases. These activities include, but are not limited to, routine dewatering/flushing of distribution systems for maintenance, cleaning and lining of pipe sections, pipeline disinfection, reservoir repairs and reservoir cover cleaning, and hydrostatic testing. Additionally, MWD and other water purveyors may also have unplanned releases that include pipeline breaks, leaks, overflows, and emergency flushing activities.

Comments

In the MS4 Tentative Order, MWD has noted that non-storm water discharges from water purveyors are categorized as "illicit" discharges. We understand the rationale for the MS4 Tentative Order using the term "illicit discharges" to define any discharges to an MS4 that are not composed entirely of storm water, and are not covered under a separate NPDES permit. However, we feel that use of another category would be more appropriate to describe these potable water discharges. Such a category could be similar to those included in the recently adopted Los Angeles Regional Water Quality Control Board's MS4 Permit (e.g. "conditionally exempt essential non-storm water discharges," or "authorized non-storm water discharges separately regulated by an individual or general NPDES permit").

Additionally, the MS4 Tentative Order references Order No. R9-2010-0003, which covers all discharges from water purveyors and community water systems. MWD has reviewed the MS4 Tentative Order against the Existing General Permit, and the abbreviated language in the MS4 Tentative Order is not consistent with the language used to describe these covered discharge in the Existing General Order. The MS4 Tentative Order needs to be consistent with the authorized discharges from water purveyors and community water systems that are captured in the Existing General Permit. As such, MWD staff recommends that SDRWQCB revise the language in the MS4 Tentative Order that applies to water purveyors and community water systems as follows:

Section E – Jurisdictional Runoff Management Programs, 2. Illicit Discharge Detection and Elimination, a. Non-Storm Water Discharges

Item (2) – Current Language: "Discharges of non-storm water from water line flushing and water main breaks to the MS4 must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG 679001 (Order No.R9-2010-0003, or subsequent order). This category includes water line flushing and water main break discharges from water purveyors issued a water supply permit by the California Department of Public Health or federal military installations. Discharges from recycled or reclaimed water lines to the MS4 must be addressed as illicit discharges under a separate NPDES permit."

Item(2) – **Suggested Revision:** **"Discharges of non-storm water from water purveyors and community water systems are authorized discharges, and are not considered illicit discharges, if the discharger is enrolled and regulated under an individual or general NPDES permit, such as NPDES Permit No. CAG 679001 (Order No. R9-2010-0003, or subsequent order). This category includes those discharge activities described in Order No. R9-2010-0003, which includes but is not limited to the following: discharges resulting from repair, maintenance, and disinfection of pipelines, tanks, vessels, and reservoirs dedicated to drinking water purveyance and storage, and hydrostatic test water discharges resulting from testing of pipelines, tanks, and vessels that are dedicated to drinking water purveyance and storage."**

Please contact Janet Bell at (213) 217-5516 or via email at jbell@mwdh2o.com, if you have any questions.

Thank you,

Joyce T. Clark
Program Manager
Metropolitan Water District of Southern California
(213) 217-5593
jtruhan@mwdh2o.com

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January 11, 2013

Mr. Wayne Chiu, P.E.
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego California 92123-4340

SUBJECT: Comment – Tentative Order No.R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu

Dear Mr. Chui:

We are in receipt of the proposed Tentative Order No. R9-2013-0001, Regional MS4 Permit ("Tentative Order"). This letter is in response to your request for comments on the Tentative Order to be submitted by January 11, 2013.

National Enterprises, Inc. ("NEI") manages approximately 2,200 acres within the City and County portions of Otay Mesa. We and other Otay Mesa stakeholders support improved water quality and environmentally healthy watersheds and the California Regional Water Quality Control Board's ("Board") goal of clean water for all users in the region.

However, after listening to public testimony at recent board workshops, and being briefed by co-permittees on the proposed Tentative Order, we are writing to express our significant reservations on the Tentative Order. In brief, our concerns fall into these broad categories:

1. Existing Tentative Order No. R9-2007-0001-- Over the last several years, local governments in San Diego have worked together with your staff and a host of technical experts to develop a Hydromodification Management Plan with reasonable and scientifically based standards. Your Board recently approved that Plan in July 2010. This draft permit ignores all of the good work invested in that Plan, which was developed at a significant cost to the public. The existing Plan has only been in effect for 2 years, with 3 years remaining prior to its expiration. Given the short timeframe that the existing Plan has been in practice, we do not yet have adequate data to determine if the measures within the existing Plan are sufficient. Pursuing a new tentative order at this time has not been scientifically validated and is premature.

2. Legal Issues--The attempt by Board staff to mandate a proposed in lieu fee for watershed and hydrologic unit improvements to projects that have no impacts and therefore no nexus to watershed or unit improvements, appears to contradict CEQA.

3. Clarity on Pre-Development vs. Pre-Project Conditions--We are at a loss to find a definition of the term pre-development conditions in the Tentative Order. For such a significant determination and impact, the lack of clarity on this matter is concerning. In the most current public workshop on December 12, 2012, when a Board member pressed staff on this issue, the staff member was unable to clearly define what the term meant, the time element standard to be utilized to gauge pre-development conditions and when pressed about the source of a soils database found on the internet that would be used as a key determinant of compliance, staff was unable to describe the accuracy or source documents for the website's database.

4. Hydromodification--We disagree with the proposed deletion of the current exemption in the hydromodification permit approved by the Board in July of 2010 for projects that discharge stormwater into lined or engineered channels. Speaker after speaker in the public comment period of the December 12th workshop representing co-permittees and other stakeholders, gave numerous examples of the conflict they had with Board staff on this issue. Further, the potential waste of public and private dollars and man-hours spent on already approved permits under the current hydromod scheme would be excessive. And this leads to our next point.

5. Fiscal Impact--Why is there no credible economic analysis on the potential cost to the co-permittees and the public for the implementation of the Tentative Order? For a regulator, or staff, to propose such broad and sweeping changes to public policy, without any consequence to the cost does not make sense, particularly in today's economic environment.

6. Coordination with neighboring regional boards and publication of previous similar experiences--According to public testimony at the December 12th workshop, the neighboring regional water boards in North Orange County and the Inland Empire have already dealt with several of the issues contemplated in the San Diego Board's Tentative Order. Specific examples include pre-development vs. pre-project conditions. Why hasn't the experience of the neighboring boards on these critical issues been shared with the public so our decision could benefit from their experience?

SANDAG estimates that the industrial development of the East Otay Mesa sub-region can produce up to 42,000 well-paying jobs for San Diegans by 2020. When the total cost of environmental compliance from local, state and federal agencies is placed upon the backs of landowners in East Otay and other parts of our region with other habitat

and environmental mandates, the incentive for economic investment is severely impeded. Proposed projects will not develop, jobs will not be created, economies will not grow and the dream of an emerging economy will die hard. The cost of doing business in California has already pushed many businesses and developers out of the state. Further disincentives, such as this Tentative Order, would be but another catastrophic loss for California. If implemented as written, this Tentative Order, and the actions of the Board, will further degrade San Diego's economy.

Therefore, we urge the Board to delay implementation of the Proposed Order and revisit the parts of the Tentative Order detailed in our aforementioned comments. The Tentative Order is not ready for implementation and should not be considered until data from the existing 2010 Plan is fully understood.

Sincerely,

David Wick
President
National Enterprises, Inc.
(858) 623-9000, ext. 700
dwick@natent.com

cc: Assemblymember Ben Hueso
Mayor Bob Filner
Supervisor Greg Cox
Councilmember David Alvarez
Richard Crompton, County of San Diego
Stephanie Gaines, County of San Diego

January 11, 2013

Via electronic mail

Mr. David Gibson
Executive Officer and Members of the Board
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123
Email: wchiu@waterboards.ca.gov

Re: Comments on Tentative Order R9-2013-0001, San Diego Region MS4 Permit

Dear Mr. Gibson:

On behalf of the Natural Resources Defense Council ("NRDC"), we are writing with regard to the Draft National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds Within the San Diego Region, Draft permit R9-2013-0001, NPDES Permit No. CAS0109266 ("Draft Permit"). We appreciate the opportunity to submit these comments to the San Diego Regional Water Quality Control Board ("Regional Board") on the Draft Permit.[1]

I. Stormwater Runoff is a Leading Source of Water Pollution in the San Diego Region

The U.S. Environmental Protection Agency ("U.S. EPA") considers urban runoff to be "one of the most significant reasons that water quality standards are not being met nationwide."[2] As the U.S. EPA has stated:

> Most stormwater runoff is the result of the man-made hydrologic modifications that normally accompany development. The addition of impervious surfaces, soil compaction, and tree and vegetation removal

[1] NRDC previously submitted comments on the Draft Permit to the Regional Board on September 14, 2012. We incorporate those comments and documents submitted in support by reference here.
[2] U.S. General Accounting Office (June 2001) *Water Quality: Urban Runoff Programs*, Report No. GAO-01-679.

> result in alterations to the movement of water through the environment. As interception, evapotranspiration, and infiltration are reduced and precipitation is converted to overland flow, these modifications affect not only the characteristics of the developed site but also the watershed in which the development is located. Stormwater has been identified as one of the leading sources of pollution for all waterbody types in the United States. Furthermore, the impacts of stormwater pollution are not static; they usually increase with more development and urbanization.[3]

A recent study of the effects of urban development on stream ecosystems by the U.S. Geological Survey showed that urban development impacts stream chemistry, hydrology, habitat, and species composition, and that communities of invertebrate species "Begin to Degrade at the Earliest Stages of Urban Development."[4]

In the San Diego Region, the Regional Board has found that:

- "Land development has created and continues to create new sources of non-storm water discharges and pollutants in storm water discharges as human population density increases. This brings higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash. Pollutants from these sources are dumped or washed off the surface by non-storm water or storm water flows into and from the MS4s." (Draft Permit, at Finding 10);

- "[C]ommon pollutants in runoff discharged from the MS4s include total suspended solids, sediment, pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., cadmium, copper, lead, and zinc), petroleum products and polynuclear aromatic hydrocarbons, synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus), oxygen-demanding substances (e.g., decaying vegetation, animal waste), detergents, and trash." (Draft Permit, at Finding 12); and,

- "The Copermittees' water quality monitoring data . . . documents persistent exceedances of Basin Plan water quality objectives for runoff-related pollutants at various watershed monitoring stations. Persistent toxicity has also been observed at several watershed monitoring stations. In addition, bioassessment data indicate that the majority of the monitored receiving waters have Poor to Very Poor Index

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[3] U.S. Environmental Protection Agency (December 2007) *Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices*, at v.
[4] U.S. Geological Survey (2012) *Effects of Urban Development on Stream Ecosystems in Nine Metropolitan Study Areas Across the United States*, at 4; see generally, 1-5. Available at: http://pubs.usgs.gov/circ/1373/.

> of Biotic Integrity (IBI) ratings. These findings indicate that runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in the San Diego Region." (Draft Permit, at Finding 14.)

The Draft Permit establishes requirements critical to addressing this pollution.

II. Pollutants in Stormwater Must be Reduced to the Maximum Extent Practicable

Consistent with the federal Clean Water Act, a fundamental goal of all municipal stormwater permits is to ensure that discharges from storm sewers do not cause or contribute to a violation of water quality standards. (33 U.S.C. § 1341.) In addition, for MS4s covered under the National Pollutant Discharge Elimination System program, permits for discharges from municipal storm sewers:

> shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants.

(33 U.S.C. § 1342(p)(3)(B)(iii).) The maximum extent practicable ("MEP") standard serves as a floor to performance for regulated parties. This standard does not grant unbridled leeway to Permittees in developing controls to reduce the discharge of pollution. "[W]hat the discharger will do to reduce discharges to the 'maximum extent practicable' . . . crosses the threshold from being an item of procedural correspondence to being a substantive requirement of a regulatory regime." (*Environmental Defense Center, Inc. v. U.S. E.P.A* (9th Cir. 2003) 344 F.3d 832, 853.) The MEP standard "imposes a clear duty on the agency to fulfill the statutory command to the extent that it is feasible or possible." (*Defenders of Wildlife v. Babbitt,* 130 F. Supp. 2d 121, 131 (D.D.C. 2001); *Friends of Boundary Waters Wilderness v. Thomas,* 53 F.3d 881, 885 (8th Cir. 1995) ("feasible" means "physically possible").

As one state hearing board held:

> [MEP] means to the fullest degree technologically feasible for the protection of water quality, except where costs are wholly disproportionate to the potential benefits…. This standard requires more of Permittees than mere compliance with water quality standards or numeric effluent limitations designed to meet such standards…. The term "maximum extent practicable" in the stormwater context implies that the mitigation measures in a stormwater permit must be more than simply adopting standard practices. This definition applies particularly in areas where standard practices are already failing to protect water quality….

(*North Carolina Wildlife Fed. Central Piedmont Group of the NC Sierra Club v. N.C. Division of Water Quality* (N.C.O.A.H. October 13, 2006) 2006 WL 3890348, Conclusions of Law 21-22 (internal citations omitted).) The North Carolina board further found that the permits in question violated the MEP standard both because commenters highlighted measures that would reduce pollution more effectively than the permits' requirements and because other controls, such as infiltration measures, "would [also] reduce discharges more than the measures contained in the permits." (*Id.* at Conclusions of Law 19.)

Nor is MEP a static requirement—the standard anticipates and in fact requires new and additional controls to be included with each successive permit. As U.S. EPA has explained, NPDES permits, including the MEP standard, will "evolve and mature over time" and must be flexible "to reflect changing conditions." (55 Fed. Reg. 47990, 48052.) "EPA envisions application of the MEP standard as an iterative process. MEP should continually adapt to current conditions and BMP effectiveness and should strive to attain water quality standards. Successive iterations of the mix of BMPs and measurable goals will be driven by the objective of assuring maintenance of water quality standards." (64 Fed. Reg. 68722, 68754.) In other words, successive iterations of permits for a given jurisdiction will necessarily evolve, and contain new and more stringent requirements for controlling the discharge of pollutants in runoff.

Although requiring compliance with MEP may be sufficient to achieve water quality standards and other common permit terms, the Clean Water Act independently requires that MS4 permits achieve water quality standard compliance.[5] EPA has stated "all permits for MS4s must include any requirements necessary to achieve compliance with [water quality standards]."[6] Notwithstanding this requirement, permits also require "such other provisions as the Administrator or the State determines appropriate for the control of such pollutants." This language in section 1342(p) has been held by California courts to grant "the EPA (and/or a state approved to issue the NPDES permit) . . . the discretion to impose 'appropriate' water pollution controls in addition to those that come within the definition of 'maximum extent practicable.'" (*Building Industry Ass'n of San*

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[5] See, 33 U.S.C. § 1311(a); 1313; 1341(a); 1342(p); 40 C.F.R. § 122.44(d)(1) (permits must contain, as applicable, any requirements necessary to "[a]chieve water quality standards established under section 303 of the CWA, including State narrative criteria for water quality"); Memorandum from E. Donald Elliott, Assistant Administrator and General Counsel, U.S. Environmental Protection Agency, to Nancy J. Marvel, Regional Counsel Region IX, re: Compliance with Water Quality Standards in NPDES Permits Issued to Municipal Separate Storm Sewer Systems, Jan. 9, 1991 ("EPA Elliott Memo"). But see, *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159, 1166 (holding that permitting authority is not required to impose strict water quality-based effluent limitations, but has the authority to do so).

[6] EPA Elliott Memo, at 1; *In re: Government of the District of Columbia Municipal Separate Storm Sewer System* (EPA 2002) 10 E.A.D. 323, 2002 WL 257698.

Diego County v. State Water Resources Control Bd. (2004) 124 Cal.App.4th 866, 883 (citing *Defenders of Wildlife v. Browner* (1999) 191 F.3d 1159, at 1165–1167).)

As a result, while the MEP standard represents a statutory floor, rather than limit, for permit requirements, the Regional Board and EPA maintain the authority to impose additional restrictions over and above MEP as they determine appropriate. Both California and federal authority maintain that MS4 permits must include provisions to ensure that discharges do not cause or contribute to exceedances of water quality standards.

III. Permit Provisions

A. The Draft Permit's Receiving Water Limitations Appropriately Prohibit Discharges that Cause or Contribute to the Violation of Water Quality Standards.

Consistent with the 2007 San Diego County MS4 Permit, 2009 South Orange County MS4 Permit, and 2010 Riverside County MS4 Permit,[7] as well as federal authority and State Water Board WQ Order No. 99-05,[8] the Draft Permit requires that "Discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters." (Draft Permit, at II.A.2.a.)[9] Multiple California and federal courts have upheld such provisions, including in prior iterations of the San Diego MS4 Permit.[10]

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[7] See, San Diego Regional Water Quality Control Board (January 24, 2007) San Diego County MS4 Permit, Order No. R9-2007-0001, at A.3 ("2007 San Diego Permit"); San Diego Regional Water Quality Control Board (December 16, 2009) South Orange County MS4 Permit, Order No. R9-2009-0002, at A.3; San Diego Regional Water Quality Control Board (November 10, 2010) Riverside County MS4 Permit, Order No. R9-2010-0016, at A.3.

[8] Under Order No. 99-05, the State Board directed the Regional Boards to include receiving water limitations language devised by EPA, without incorporation of a safe harbor provision, into all future MS4 permits.

[9] See, 2007 San Diego Permit, at § A.3; see also, South Orange County MS4 Permit, Order No. R9-2009-0002, at § A.3.

[10] *See, e.g., Building Industry Ass'n of San Diego County*, 124 Cal.App.4th at 883; *In re L.A. County Mun. Storm Water Permit Litigation.*, No. BS 080548 at 4-7 (L.A. Super. Ct. Mar. 24, 2005) ("*L.A. County Mun. Stormwater*"); *County of Los Angeles v. Cal. State Water Res. Control Bd.* (2006) 143 Cal.App.4th 985, 989; *Natural Resources Defense Council v. County of Los Angeles* (2011) 673 F.3d 880, 897. The court in *In re L.A. County Mun. Stormwater* noted that, "the Regional Board acted within its authority when it included Parts 2.1 and 2.2 in the Permit without a 'safe harbor,' whether or not compliance therewith requires efforts that exceed the 'MEP' standard." (*In re L.A. County Mun. Stormwater*, at 7.) But regardless of this authority, the Court found that "the terms of the Permit taken, as a whole [including the Permit's receiving water limitations], constitute the Regional Board's definition of MEP." (*Id.* at 7-8.)

As such, the prohibition against discharges that cause or contribute to violations of water quality standards is appropriately incorporated into the Draft Permit's receiving water limitations here.

Moreover, any weakening of the receiving water limitations language would constitute a violation of the Clean Water Act's anti-backsliding provisions, which require that "a permit may not be renewed, reissued, or modified to contain effluent limitations which are less stringent than the comparable effluent limitations in the previous permit," except in circumstances not presented by the Draft Permit. (33 U.S.C. § 1342(o)(1).) Similarly, federal regulations require that "when a permit is renewed or reissued, interim effluent limitations, standards or conditions must be at least as stringent as the final effluent limitations, standards, or conditions in the previous permit. . . ." (40 C.F.R. § 122.44(l)(1).) Because the prohibition against exceedances of water quality standards was required by the prior San Diego, South Orange County, and Riverside permits, this provision cannot be less stringent in the Draft Permit. A weakening of the receiving water limitations would further violate state and federal antidegradation requirements, which mandate that existing water quality in navigable waters be maintained unless degradation is justified by specific findings.[11] As a result, the adopted permit must require compliance with water quality standards, without restriction.

B. The Draft Permit's Development Planning Requirements Must Require On-Site Retention of at least the 85th Percentile Storm

We strongly support that the Draft Permit establishes requirements for new development and redevelopment projects to retain stormwater runoff on-site. A principal reason to adopt such an approach is the superior pollutant load reduction capacity of LID practices that retain runoff on-site, for a variety of climatic scenarios, including for the San Diego region.[12] However, we are concerned that, as currently drafted, the Draft Permit's Development Planning requirements in many circumstances will allow projects to retain less runoff than has been demonstrated to be practicable. This in turn will result in increased discharge of pollutants to receiving waters over what could practicably be reduced, in violation of Clean Water Act's MEP standard. In particular, the Draft Permit's provision allowing for required runoff retention to be calculated as the "volume

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[11] See, 40 C.F.R. § 131.12; State Board Resolution 68-16; *Associacion de Gente Unida for El Agua v. Central Valley Regional Board* (2012) (210 Cal.App.4th 1255) [149 Cal.Rptr.3d 132, 142; 144] (citing "St. Water Res. Control Bd., Guidance Memorandum (Feb. 16, 1995)).

[12] Dr. Richard Horner and Jocelyn Gretz (December 2011) Investigation of the Feasibility and Benefits of Low-Impact Site Design Practices Applied to Meet Various Potential Stormwater Runoff Regulatory Standards ("Horner and Gretz Runoff Study"); see also, Horner, Richard. Report for Ventura County; Horner, Richard. Initial Investigation for San Francisco Bay Area; Horner, Richard. Supplementary Investigation for San Francisco Bay Area; Horner, Richard. Report for San Diego Region.

of storm water that would be retained on-site if the site was fully undeveloped and naturally vegetated" should be deleted. (See Draft Permit, at E.3.c(1)(a)(ii).)

The Draft Permit requires, under one provision, that the runoff from the 85th percentile, 24-hour rain event must be retained on-site. (Draft Permit, at E.3.c(1)(a)(i).) This requirement, resulting in retention of stormwater runoff with no off-site discharge in the vast majority of storms, is consistent with on-site retention requirements of other permits throughout California, as in permits and ordinances found in all corners of the United States. Similar or more stringent requirements are included in the following permits:

Ventura County: MS4 permit requires on-site retention of ninety-five percent of rainfall from the 85th percentile storm; off-site mitigation allowed if on-site retention is technically infeasible;[13]

South Orange County: MS4 permit requires on-site retention of the 85th percentile storm, off-site mitigation allowed if on-site retention is technically infeasible;[14]

However, the 85th percentile standard is actually less stringent than required by permits in many other parts of the county. For example, permits in the following locations require retention that generally exceeds the 85th percentile storm volume in San Diego:

Washington D.C.: MS4 permit requires retention of the first 1.2 inches of stormwater (which represents the 90th percentile storm) for all new development and redevelopment over 5,000 square feet.[15]

West Virginia: Statewide Phase II MS4 permit requires on-site retention of "the first one inch of rainfall from a 24-hour storm" event unless infeasible;[16] and,

Philadelphia, PA: Infiltrate the first one inch of rainfall from all impervious surfaces; if on-site infiltration is infeasible, the same performance must be achieved off-site.[17]

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[13] Los Angeles Regional Water Quality Control Board (July 8, 2010) Ventura County Municipal Separate Stormwater National Pollutant Discharge Elimination System (NPDES) Permit; Order No. R4-2009-0057; NPDES Permit No. CAS004002.
[14] San Diego Regional Water Quality Control Board (December 16, 2009) South Orange County MS4 Permit, Order No. R9-2009-0002, NPDES Permit No. CAS0108740.
[15] U. S. EPA (2011) Fact Sheet, National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Permit No. DC0000221 (Government of the District of Columbia).
[16] State of West Virginia Department of Environmental Protection, Division of Water and Waste Management, General National Pollution Discharge Elimination System Water Pollution Control Permit, NPDES Permit No. WV0116025 at 13-14 (June 22, 2009).
[17] City of Philadelphia (Jan. 29, 2008) Stormwater Management Guidance Manual 2.0, at 1.1, available at.

Further, research conducted by Dr. Richard Horner, a member of the National Academy of Sciences Panel on Reducing Stormwater Discharge Contributions to Water Pollution demonstrates that, for five different types of land use development or redevelopment projects in Southern California, the full 85th percentile, or even the full 95th percentile, 24-hour precipitation event could be retained on-site using *only* infiltration practices on sites overlying soils classified as Group C (typically containing 20 to 40 percent clay) under the Natural Resources Conservation Service (NRCS) major soil orders classification scheme.[18] Critically, even for sites overlying Group D soils (typically 40 percent or more clay with substantially restricted water transmissivity) and assuming *no* infiltration was feasible, greater than 50 percent of the 85th percentile storm (or between 37 and 62 percent of annual runoff) could be retained at each development type using only rooftop runoff dispersion or rooftop harvest and reuse techniques.[19] Additional retention under these scenarios could be achieved through use of evaporation practices, green roofs, or, in cases where some infiltration is feasible, use of infiltration BMPs.

The Permit also allows for required stormwater runoff retention to be calculated as the "volume of storm water that would be retained onsite if the site was fully undeveloped and naturally vegetated" based on site specific soil conditions and natural vegetative cover. (Draft Permit, at E.3.c(1)(a)(ii).) This approach requires only that a development retain the change in runoff between pre-development (or undeveloped) conditions and post-development, or the "delta volume." Yet, as described below, the delta volume approach alone does not achieve control of pollutants to the MEP, and represents a significant departure from both state and national precedents. For this reason, it has been rejected in other California Permits as insufficient to meet statutory requirements.[20]

While the delta volume approach may be appropriate in assessing effects of hydromodification, because preservation of hydrologic profile from pre-development to post-development[21] will not cause modification in the hydrology of the receiving water,

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[18] Horner and Gretz Runoff Study, at Table 16 p. 35; Natural Resources Conservation Service, Distribution Maps of Dominant Soil Orders (http://soils.usda.gov/technical/classification/orders/, last accessed December 16, 2011).

[19] Horner and Gretz Runoff Study, at Table 16 p. 35; 27-34. We note as well that even in areas characterized regionally as underlain by D soils, site specific investigation may establish substantial potential for infiltration of runoff.

[20] See, e.g., Santa Ana Regional Water Quality Control Board, OC MS4 Tentative Order No. R8-2008-0030 (R8-2009-0030) Comments/Responses, at comment 103.

[21] We distinguish delta volume's application to water quality considerations from the otherwise appropriate application of comparisons of pre-development to post development hydrology as a means of establishing hydromodification controls. Irrespective of this approach, however, we note that the Draft Permit should require projects to implement hydromodification controls to meet "predevelopment (naturally occurring)" runoff flow rate (see Draft Permit, at E.3.c.(2)(a)), rather than "pre-project" conditions, or the conditions of a previously developed site immediately prior to

this approach is inappropriate for management of water quality. Under the delta volume approach, the unretained volume of runoff resulting from development (i.e., any amount of runoff greater than would have been retained under undeveloped conditions), will carry pollutants to receiving waters that would not have been present in runoff from undeveloped land.

This is particularly a concern in the San Diego region, which contains significant land area underlain by clay rich soils that may reduce infiltrative capacity.[22] For example, for development sites underlain by C soils, Dr. Horner's research demonstrates that the delta volume approach may actually require the site to retain more runoff than would be retained under the 85th percentile storm standard.[23] However, for development sites underlain by D soils, which may include large portions of the San Diego region, the delta volume approach will result in requiring development to substantially *less* runoff than would be required, or feasibly retained, under the 85th percentile storm standard. Under case studies for the 85th percentile storm standard, development sites would be required to retain between 37 and 62 percent of average annual runoff, with even greater retention possible given use of soil amendments or other practices to augment recharge. For the same sites, the delta volume approach would only require retention of between 27 and 44 percent of annual runoff.[24] Because the delta volume standard allows runoff that could be feasibly retained on-site to be discharged and carry pollutants to receiving waters, the standard violates the Clean Water Act's MEP requirement. The Draft Permit should either delete reference to this standard from section E.3.c(1)(a)(ii), or require that a project site retain the runoff from the 85th percentile, 24-hour storm event, or the delta volume approach, *whichever is greater*.

1. <u>The Draft Permit Must Require a Determination that it is Technically Infeasible to Retain the Design Storm On-Site Before Biofiltration or Off-site Mitigation/Retrofitting is Authorized.</u>

While we support the inclusion of strong retention standards for stormwater runoff, and the Draft Permit's requirement to incorporate on-site treatment in addition to performance of off-site mitigation in the event of technical infeasibility for on-site retention, we are concerned by statements of Regional Board staff that they "would like to make a shift away from determining what is infeasible onsite to determining what is

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construction. This issue is of concern for both natural, non-hardened channels, and for concrete lined or hardened channels, where allowing use of a "pre-project" standard for hydromodification may serve to prevent stream rehabilitation.

[22] See, e.g., Horner and Gretz Runoff Study, at 15-16.

[23] *Id*., at Table 16 p 35. In the San Marcos case studies, the delta volume approach would require retention of 72 to 80 percent of average annual runoff, while retention of the 85th percentile storm event would result in retention of 62 percent of average annual runoff.

[24] *Id*.

feasible onsite"[25] and Draft Permit provisions allowing for use of biofiltration and off-site mitigation even where on-site retention is feasible. Because retention of the 85th Percentile Storm event has been established as MEP in California Permits,[26] the project proponent must meet this standard or demonstrate that it cannot be met.

The jurisdictions identified in sections above have recognized the paramount importance of mandating on-site retention of a certain quantity of stormwater since, in contrast to retention practices, which ensure that 100 percent of the pollutant load in the retained volume of runoff does not reach receiving waters, biofiltration practices (or tree-box filters and other similar practices) that treat and then discharge runoff through an underdrain result in the release of pollutants to receiving waters. Indeed, in order to achieve equivalent pollutant load reduction benefits to the use of on-site retention, biofiltration practices would have to be 100 percent effective at filtering pollutants from the same volume of runoff, which they are invariably not. As a result, while biofiltration practices (or conventional flow-through practices) may be appropriate for on-site treatment when coupled with an off-site mitigation requirement in cases of technical infeasibility (discussed further below), they are not a proper substitute for low impact development ("LID") practices that retain water on-site.

This conclusion is borne out by data presented in the Draft Ventura County Technical Guidance Manual, which estimates pollutant removal efficiency for total suspended solids to be 54-89 percent, and for total zinc to be 48-96 percent.[27] Biofiltration has additionally been shown to be a particularly ineffective method of pollutant removal for addressing nitrogen or phosphorous, two common contaminants found in stormwater.[28] The Draft Ventura Technical Guidance, for example, indicates that biofiltration achieves

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[25] Regional MS4 Permit RWQCB Workshop Notes, September 5, 2012, at 4.

[26] See, e.g., Ventura County MS4 Permit, Order No. R4-2009-0057; San Francisco Bay Area MS4 Permit, Order No. R2-2009-0074; North Orange County MS4 Permit, Order No. R8-2009-0030; South Orange County MS4 Permit, Order No. R9-2009-0002.

[27] Ventura County Low Impact Development Technical Guidance Manual, July 13, 2011, at D-7.

[28] Lawn irrigation has been identified as a "hot spot" for nutrient contamination in urban watersheds—lawns "contribute greater concentrations of Total N, Total P and dissolved phosphorus than other urban source areas . . . source research suggests that nutrient concentrations in lawn runoff can be as much as four times greater than other urban sources such as streets, rooftops or driveways." Center for Watershed Protection (March 2003) *Impacts of Impervious Cover on Aquatic Systems* at 69; see also H.S. Garn (2002) *Effects of lawn fertilizer on nutrient concentration in runoff from lakeshore lawns, Lauderdale Lakes, Wisconsin*. U.S. Geological Survey Water- Resources Investigations Report 02-4130 (In an investigation of runoff from lawns in Wisconsin, runoff from fertilized lawns contained elevated concentrations of phosphorous and dissolved phosphorous).

pollutant removal efficiency for total nitrogen at between only 21-54 percent,[29] as compared with 100 percent for runoff retained on-site. As a result, even where a multiplier is applied requiring 1.5 times as much runoff be treated using biofiltration as would otherwise be retained, biofiltration may achieve substantially less pollution reduction as would retention.

Likewise, the Draft Permit's provisions allowing for a project to perform off-site mitigation through off-site regional BMPs or retrofits may violate the Clean Water Act's MEP requirement because it does not provide any actual mechanism to ensure that an alternative "off-site" location will provide "greater overall water quality benefit" to on-site retention. (Draft Permit, at E.3.c(3)(b).) NRDC supports use of regional projects that may provide multiple benefits, including increased local water supply, where runoff is *conveyed* from a project site to a regional facility that will retain that runoff, albeit at a different location, with no discharge to receiving waters, as this process typically does not implicate significant water quality concerns. Where the same, specific quantum of runoff from the project is ultimately retained, 100 percent of the pollution contained in that particular volume of water will be prevented from reaching receiving waters.

In contrast, where a project, performs off-site mitigation or retrofit at some other location within the same watershed or sub-watershed that is not hydrologically connected to the original project site, it raises substantial concerns as to whether the alternate location will provide equal water quality benefits to the receiving surface water. Among the issues presented by this form of off-site mitigation are whether the off-site mitigation will be performed at a similar land use type; whether the mitigation project will achieve equivalent pollutant load reduction; and if so, what pollutants it will be monitored for. In practice it may prove exceedingly difficult to assess the equivalency of benefits to surface water quality from retention at one site to the next. Further, while we note that the Regional Board has included a multiplier for retention 1.1 times the design volume not retained on-site in cases of off-site mitigation, (Draft Permit, at E.3.c(3)(b)(iv)) the Board has not provided any analysis or evidence to demonstrate that this volume will be sufficient to offset the release of pollution from on-site sources. As a result, off-site mitigation should be allowed only where on-site retention or regional projects where runoff is conveyed directly to the retention site are infeasible.

Finally, while we support development under the USGCB LEED program, the Board has not provided any analysis to demonstrate that meeting the criteria set forth in section E.3.c(3)(b)(ii) will result in a reduction of pollution equivalent to the Permit's otherwise

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[29] Ventura County Low Impact Development Technical Guidance Manual, July 13, 2011, at D-7. See also, BASMAA (December 1, 2010) *Draft Model Bioretention Soil Media Specifications-MRP Provision C.3.c.iii*, at Annotated Bibliography section 3.0 (noting nutrient removal from synthetic stormwater runoff demonstrated only 55 to 65 percent of total Kjeldahl nitrogen removal and that only 20 percent of nitrate is removed from the runoff).

applicable retention standard, or to the MEP. This section should therefore be revised accordingly or deleted.

2. LID Is Cost-Effective and Provides Significant Economic Benefits

LID "provides ecosystem services and associated economic benefits that conventional stormwater controls do not."[30] Because traditional stormwater management approaches involve the construction of complex systems of infrastructure, they can entail substantial costs. Since LID emphasizes storage and use, infiltration, and use of a site's existing drainage conditions, "[c]ost savings are typically seen in reduced infrastructure because the total volume of runoff to be managed is minimized."[31] A 2007 U.S. EPA study found that "in the vast majority of cases . . . implementing well-chosen LID practices saves money for developers, property owners, and communities while protecting and restoring water quality."[32] With only "a few exceptions," the EPA study found that "[t]otal capital cost savings ranged from 15 to 80 percent when LID methods were used" instead of conventional stormwater management techniques.[33] The savings identified in documented studies are noteworthy considering they do not reflect the additional economically beneficial attributes LID provides, including reduced costs of municipal infrastructure, reduced costs of municipal stormwater management, and increased value of real estate.[34]

Nor is the EPA study alone in reaching this conclusion. A survey released by the American Society of Landscape Architects in 2011 found that green infrastructure reduced or did not influence project costs 75 percent of the time.[35] A joint project by the University of New Hampshire Stormwater Center and Virginia Commonwealth University found that use of LID provided stormwater management cost savings of 6 percent for residential development and 26 percent for commercial developments as compared with conventional stormwater management.[36] And while the economics of

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[30] ECONorthwest, The Economics of Low-Impact Development: A Literature Review, at iii. (2007) ("ECONorthwest") (Exh. 61).
[31] U.S. EPA Cost Study, at 2; U.S. Department of Housing and Urban Development, The Practice of Low Impact Development, at 33 (2003) (Exh. 62).
[32] U.S. EPA Cost Study, at iii.
[33] *Id.* at iv.
[34] See ECONorthwest, at 5; *Id*. at 15 (disconnecting downspouts to allow for natural infiltration in the Beecher Water District near Flint, Michigan cost the district about $15,000, but decreased the mean volume of sewer flows by 26 percent, and saved the district more than $8,000 per month in stormwater fees); U.S. EPA Cost Study, at 7.
[35] American Society of Landscape Architects (2011) Advocacy: Stormwater Case Studies.
[36] Roseen, R., T. Janeski, J. Houle, M. Simpson, and J. Gunderson (2011) *Forging the Link: Linking the Economic Benefits of Low Impact Development and Community*

integrating LID into redevelopment projects vary slightly from new development, there is little evidence it typically raises project costs. An analysis of three communities by ECONorthwest found that while complying with stormwater standards, including strict runoff volume reduction requirements, is a cost consideration, it is rarely, if ever, a driving factor in decisions to undertake redevelopment projects.[37]

Further, LID can provide substantial benefits for the San Diego region in terms of increased local supply of water and reduced energy usage, in addition to the stormwater runoff and pollution benefits it can provide.[38]

C. The Requirements for Water Quality Improvement Plans Lack Sufficient Detail, Represent an Illicit Self Regulatory Scheme, and Violate Clean Water Act Prohibitions Against the Discharge of Non-stormwater

1. The Draft Permit Must Provide for Adequate Public and Agency Review of Any Substantive Permit Requirements Designed by the Permittees

While we support watershed based efforts to address stormwater pollution in the San Diego region, the Draft Permit's requirements for Water Quality Improvement Plans are in many parts vague, essentially directing Permittees to develop their own priorities and requirements, which are subject only to minimal, inadequate public review or Regional Board oversight. In this way, the provisions represent a "plan to develop a plan," rather than any form of plan in itself. In *Environmental Defense Center, Inc. v. U.S. E.P.A* ((9th Cir. 2003) 344 F.3d 832, 854-56), the court explained: "[S]tormwater management programs that are designed by regulated parties must, in every instance, be subject to meaningful review by an appropriate regulating entity. . . . Congress identified public participation rights as a critical means of advancing the goals of the Clean Water Act in

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Decisions. University of New Hampshire Stormwater Center, the Virginia Commonwealth University, and Antioch University New England. Available at: http://www.unh.edu/unhsc/resource-manual-and-fact-sheets; see generally, NRDC (2011) Rooftops to Rivers II: Green Strategies for Controlling Stormwater and Combined Sewer Overflows, at 19-30.

[37] ECONorthwest (2011) "Managing Stormwater in Redevelopment and Greenfield Development Projects Using Green Infrastructure: Economic Factors that Influence Developers Decisions,"prepared by S. Reich et al, at 2.

[38] See, NRDC and University of California at Santa Barbara (2009) A Clear Blue Future: How Greening California Cities Can Address Water Resources and Climate Challenges in the 21st Century; See also, NRDC (2011) Capturing Rainwater from Rooftops: An Efficient Water Resource Management Strategy that Increases Supply and Reduces Pollution; NRDC and University of California at Los Angeles (2012) Looking Up: How Green Roofs and Cool Roofs Can Reduce Energy Use, Address Climate Change, and Protect Water Resources in Southern California.

its primary statement of the Act's approach and philosophy." Provisions or substantive permit terms such as these which get at the core of permit requirements, and are designed or developed by the Permittees must be subject to proper opportunity for public comment to the Regional Board, and should be properly reviewed by the Regional Board at public hearing prior to approval and implementation.

2. The Permit's use of Numeric Action Limits Violates Clean Water Act Prohibitions Against the Discharge of Non-Stormwater

While we support the Regional Board's attempt to provide increased focus on dry weather, non-storm water discharges, we are concerned that the provisions for use of "numeric action limits" ("NALs") as drafted in the Water Quality Improvement Plans (Draft Permit, at II.C.1), do not fully support the Clean Water Act's absolute prohibition against the discharge of non-storm water to the MS4 system. The federal Clean Water Act mandates that MS4 permits "include a requirement to effectively prohibit non-stormwater discharges into the storm sewers." (33 U.S.C. § 1342(p)(3)(B)(ii); see 40 C.F.R. § 122.26(d)(2)(iv)(B)(1).) The Permit incorporates this requirement under section II.A.1.b. To support the development and prioritization of water quality improvement strategies for addressing non-storm water discharges to and from the MS4s and identify sources of non-stormwater pollution or potential violations of Permit provisions, the Draft Permit establishes (or requires Permittees to establish) quantifiable discharge goals for specific pollutants in the form of NALs.

We presume that the NAL provisions are intended to support the goal of compliance with the Clean Water Act's prohibition. However, the Draft Permit, which states that "NALs are not considered by the San Diego Water Board to be enforceable limitations," could be confusingly taken to suggest that the Permit allows for non-storm water discharges to occur or to contribute pollutants to the MS4 system so long as the pollution occurs at levels below the NALs.[39] This would violate both the Clean Water Act's absolute prohibition against non-storm water discharges to the MS4 under 33 U.S.C. § 1342(p)(3)(B)(ii), and the Act's implementing regulations, which require that "where such discharges are identified by the municipality as sources of pollutants to waters of the United States," in any amount, they must be addressed by the Permittee. (40 C.F.R. § 122.26(d)(2)(iv)(B)(1).)[40] The Draft Permit must require action by the Permittees to address non-stormwater discharges for pollution observed at levels both above *and* below

[39] We note a similar concern with respect to "SALs" for stormwater discharges, as this provision could be interpreted as authorizing the discharge of pollutants below the SAL, but which may contribute to an exceedance of water quality standards. (Draft Permit, at II.C.2.)

[40] Critically in this regard, any amount of pollution from an exempt source is prohibited, regardless of whether it occurs at levels below the NALs. As a result, action should be required of the Copermittees even for pollution occurring at levels below the NALs

the specified NALs in order to meet obligations fixed by the Clean Water Act, as the Act requires action to prohibit all discharges, regardless of the discharge's pollutant load.

IV. Conclusion

We appreciate this opportunity to comment on the Draft Permit. Please feel free to contact us with any questions or concerns you may have.

Sincerely,

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January 11, 2013

Mr. David Gibson, Executive Officer, and Members of the Board
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123

Dear Mr. Gibson and Board Members:

I am writing with respect to a provision with which I disagree among the Storm Water Pollutant Control BMP Requirements of Tentative Order No. R9-2013-0001, NPDES No. CAS0109266 ("the Tentative Order"). I base my comments on my extensive experience in the stormwater management field, summarized in the attachment to this letter. My full *curriculum vitae* are available on request.

I refer specifically to Tentative Order section E.3.c(1)(a)(ii), which gives as one of two options for a standard of runoff retention (i.e., interception, storage, infiltration, and/or evapotranspiration):

> The volume of storm water that would be retained onsite if the site was fully undeveloped and naturally vegetated, as determined using continuous simulation modeling techniques based on site-specific soil conditions and typical native vegetative cover.

The implication of this passage is that the retention requirement is equal to the difference between the post- and pre-development stormwater runoff volumes. In this letter I refer to this requirement as the "differential volume standard".

I disagree with the Tentative Order's allowing application of the differential volume standard, in any case and without restriction, as an alternative to a retention requirement based on the full volume of storm water produced by the 85th percentile, 24-hour storm event [i.e., provision E.3.c(1)(a)(i)]. Broadly exercising the differential volume option instead of the alternative would result in considerably greater volumes of urban stormwater discharge over the San Diego region as a whole, with concomitant, substantial increases in the mass loading to receiving waters of a range of pollutants.[1] It also departs from standard and well-accepted practice around the nation. This letter provides supporting documentation for my opinion.

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[1] For purposes of my analysis and comments I assume that the difference implied by the provision is between the post- and pre-development average annual runoff volumes. If, on the other hand, the intent is to apply it up to a certain rainfall event cap (e.g., the 85th percentile, 24-hour storm), I object even more strenuously to allowance of this option. I do so because that capped standard would result in the release of even more stormwater pollutant mass, as shown later in this letter.

Basis of Full-Volume Standard

Using the differential volume between pre- and post-development conditions breaks the long-standing precedent, in California and elsewhere, of using the full volume of stormwater discharged from the developed site in a designated event as the basis for stormwater best management practices ("BMPs") that store runoff for longer than a few minutes.[1] The widespread adoption (see examples below) of the full water quality volume instead of the differential volume occurred for good reasons. The total runoff volume from the 85th percentile, 24-hour event—the prevailing design standard in southern California—was determined through objective analysis to represent the point above which substantially diminishing returns in water quality improvement would accompany considerable BMP size enlargement and, therefore, cost (Guo and Urbonas 1996).[2] The analysis identified the full volume generated by the 85th percentile, 24-hour event— not some lesser quantity like the differential volume—as the appropriate threshold at which the decrease in benefits accelerates.

The use of a differential hydrologic measure that compares pre- and post-development states is common in the management of storm runoff quantity (i.e., hydromodification). The pre- vs. post-development measure is appropriate in that situation because successfully matching pre- and post-development hydrologic characteristics causes no modification in the hydrologic status of the receiving water and, hence, no negative physical effects.

When managing water quality, in contrast, any untreated volume (in the differential volume scenario, this would be the amount that originally flowed from the undeveloped land) would deliver to the receiving water the many pollutants characteristic of urban runoff. There, these pollutants would create negative physical, chemical, and biological effects. On the other hand, if the appropriate water quality volume is used (i.e., no less than the full volume of the 85th percentile, 24-hour event), the retentive stormwater management BMPs would deliver no pollutants to the receiving water in any rainfall up to and including the design event. Undeveloped land generates runoff discharged to surface waters as a function of factors such as its soils, hydrogeology, topography, and vegetative cover. Sites having conditions such as soils of relatively fine texture, high groundwater table, steep slopes, and/or scanty vegetation can produce substantial surface runoff flows in the undeveloped state compared to locations not having such characteristics.

Comparative Quantitative Assessment of Alternative Standards for the San Diego Area

A fairly common condition in the San Diego area is soil relatively restrictive to infiltration of water (Hydrologic Soil Group D soils). Lands with these soils, even in the undeveloped

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[1] There is a different basis for BMPs through which water flows rapidly (e.g., biofiltration swales), as given by Tentative Order provision E.3.c(1)(c)(ii).
[2] Guo, J.C.Y. and B. Urbonas. 1996. Maximized Detention Volume Determined by Runoff Capture Ratio. *Journal of Water Resources Planning and Management*, January/February.

condition, produce substantially more runoff than other soils, the least restrictive of which yield very little runoff at all when undeveloped. However, that D soil runoff is uncontaminated with the numerous pollutants characteristic of urban runoff. Developing on these soils and allowing retention only of the differential runoff volume still releases the relatively high pre-development quantity of runoff, now contaminated with the urban pollutants.

I performed an analysis and prepared a report on the relative benefits of five potential runoff retention standards, including: Standard 1—the 85th percentile, 24-hour event standard; Standard 4—a differential standard based on the average annual runoff volume; and Standard 5—a differential standard capped at the 85th percentile, 24-hour event (standard numerical designation are from the original report, Horner and Gretz 2011).[1] I applied "low impact development" (LID) runoff retention strategies to attempt to meet each standard for a range of land uses from single-family residential, to "big-box" commercial, to high-density infill redevelopment. I divided the strategies into Basic ARCD and Full ARCD (ARCD is aquatic resources conservation design, essentially a synonym for LID). When infiltration alone (Basic ARCD) could not accomplish full retention according to the standard, roof runoff management strategies were selected as appropriate for the land use case (Full ARCD). For the retail commercial development, roof runoff management would be accomplished by harvesting, temporarily storing, and applying water to use in the building. In residential cases roof runoff would be dispersed on the landscape for evapotranspiration and some infiltration. I performed the analysis for four locations around the nation, including the San Diego area (a specific location based on San Marcos). I used the two most common soil types around San Marcos, Hydrologic Soil Groups C (somewhat restrictive to infiltration) and D.

My calculations showed that it is possible to retain <u>all</u> of the average annual runoff volume on the C soil using only Basic ARCD.[2] No urban stormwater pollutants would enter receiving waters in an average year in that situation. Any retention standard that might be set by a permit could be met with that soil condition, and also in any less restrictive Hydrologic Soil Group (e.g, A and B soils) present. With D soils I estimated that Full ARCD would retain 37-66 percent of the average annual runoff volume, depending on the land use and its land cover characteristics. The pollutant mass (the multiplication product of pollutant concentration and runoff volume) prevented from entering receiving waters would be somewhat greater as a percentage of the total produced in an average year, because the BMPs would reduce concentrations as well as volume.

I also analyzed the water quality benefits that would be realized if each standard was <u>just</u> met; i.e., the BMPs do not necessarily accomplish all that they could but just enough to meet the respective standard. With the San Diego area D soil I determined that the 85th percentile, 24-

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[1] Horner, R.R. and J. Gretz. 2011. Investigation of the Feasibility and Benefits of Low-Impact Site Design Practices Applied to Meet Various Potential Stormwater Runoff Regulatory Standards. Report to U.S. Environmental Protection Agency by Natural Resources Defense Council.

[2] As a result, a more stringent standard, such as retention of runoff from the 90th or 95th percentile, 24-hour storm event or, alternatively, 90 or 95 percent of the average annual runoff volume would be appropriately applied in the permit. Retention Standards 2 and 3 assessed by Horner and Gretz (2011) were based , respectively, on the 95th percentile, 24-hour event and 90 percent of the average annual volume

hour event standard (Standard 1) would not actually be met with Full ARCD strategies for most land use cases. However, in attempting to meet that standard those strategies would retain 37-62 percent of the average annual runoff volume, again depending on the land use. The capped differential volume standard (Standard 5) would be met with Full ARCD for all land use cases, but the average annual volume retention would be only 16-28 percent. The differential standard based on the average annual runoff volume (Standard 4) would be achieved with all but one land use, retaining 27-44 percent of the average annual volume, still less than with Standard 1. This analysis demonstrates the clear superiority of Standard 1, especially over the capped differential volume standard, on the relatively restrictive soils. Priority projects should be required to comply with this standard on-site to the extent possible and to compensate for any shortfall by creating or contributing to off-site retention opportunities in the same watershed.

As I noted above, all standards can be achieved for any land use considered on the C soils. If those standards are just met, Standard 1 would result in retention of 62 percent of the average annual runoff volume in all land use cases. Standard 4 would actually out-perform Standard 1with these soils, retaining an estimated 72-80 percent. However, Standard 5 would again yield lesser benefits, retaining only 44-49 percent. Accordingly, here should be no consideration of a capped differential volume standard in my opinion; and there should be no consideration of a differential volume standard on D soils or where this standard under-performs the standard based on retention of the 85th percentile, 24-hour storm event.

My Recommendations

For optimum water quality benefits, I recommend and encourage that the Tentative Order be revised to require the larger of the two retention volumes determined according to both provisions E.3.c(1)(a)(i) and E.3.c(1)(a)(ii). The latter standard should be clarified to constitute the difference between the post- and pre-development average annual runoff volumes, with the pre-development state taken as the typical land cover existing before European settlement of an area. Furthermore, I urge that the permit require compensation for any shortfall in meeting the retention requirement by creating or contributing to off-site retention opportunities in the same watershed.

Example Standards from Elsewhere in the United States

As pointed out above, adopting a volumetric basis for stormwater treatment design and then subjecting that full volume to onsite retention or treatment has been the rule in the United States. Jurisdictions take differing approaches to defining that volume; but, once it is set, they utilize the entire quantity as the basis for BMP design. Common approaches include the storm percentile method: a storm event of selected frequency and duration is chosen, which correlates to a certain depth of precipitation spread over a watershed area. In addition to southern California, Georgia provides an example of this approach (http://www.georgiastormwater.com/vol2/1-3.pdf at 1.3-1):

> Treat the runoff from 85% of the storms that occur in an average year. For Georgia, this equates to providing water quality treatment for the runoff resulting from a rainfall depth

> of 1.2 inches.

The state of Washington employs a second approach, originally developed according to a storm percentile analysis (http://www.ecy.wa.gov/pubs/0510029.pdf at 2-28):

> Water Quality Design Storm Volume: The volume of runoff predicted from a 24-hour storm with a 6-month return frequency (a.k.a., 6-month, 24-hour storm). Wetpool facilities are sized based upon the volume of runoff predicted through use of the Natural Resource Conservation Service curve number equations … for the 6-month, 24-hour storm. Alternatively, the 91st percentile, 24-hour runoff volume indicated by an approved continuous runoff model may be used.

Numerous jurisdictions, such as Maine, use the precipitation depth approach (http://www.maine.gov/dep/blwq/docstand/stormwater/stormwaterbmps/vol3/chapter2.pdf at 2-12):

> Stormwater management facilities must be designed to treat the first 1 inch of runoff ...

Similarly, Maryland's standard is (http://www.mde.state.md.us/assets/document/chapter2.pdf at 2.1):

> P= rainfall depth in inches and is equal to 1.0" in the Eastern Rainfall Zone and 0.9" in the Western Rainfall Zone ...

Pennsylvania specifies (http://www.depweb.state.pa.us/watershedmgmt/cwp/view.asp?a=1437&q=529063&watershedmgmtNav=| at 3.3.4):

- Stormwater facilities shall be sized to capture at least the first two inches (2") of runoff from all contributing impervious surfaces.

- At least the first one inch (1.0") of runoff from new impervious surfaces shall be permanently removed from the runoff flow – i.e., it shall not be released into the surface Waters of this Commonwealth. Removal options include reuse, evaporation, transpiration, and infiltration.

North Carolina's approach is (http://h2o.enr.state.nc.us/su/documents/BMPManual_WholeDocument_CoverRevisedDec2007.pdf at 2-2):

> Non-coastal counties: Control and treat the first 1.0" of rain. (Note: a more complex basis applies to coastal counties.)

In none of these cases does the stormwater treatment design basis involve a differential volume computation, and certainly not one capped at a certain event. I encourage the San Diego Regional Board to take notice.

I would be glad to discuss my comments and invite you to contact me if you wish to do so.

Sincerely,

Richard R. Horner

Attachment: Richard R. Horner, Ph.D., Background and Experience

RICHARD R. HORNER, PH.D.

BACKGROUND AND EXPERIENCE

I have 36 years of experience in the urban stormwater management field and 11 additional years of engineering practice. During this period I have performed research, taught, and offered consulting services on all aspects of the subject, including investigating the sources of pollutants and other causes of aquatic ecological damage, impacts on organisms in waters receiving urban stormwater drainage, and the full range of methods of avoiding or reducing these impacts.

I received a Ph.D. in Civil and Environmental Engineering from the University of Washington in 1978, following two Mechanical Engineering degrees from the University of Pennsylvania. Although my degrees are all in engineering, I have had substantial course work and practical experience in aquatic biology and chemistry. For 12 years beginning in 1981, I was a full-time research professor in the University of Washington's Department of Civil and Environmental Engineering. From 1993 until 2011, I served half time in that position and had adjunct appointments in two additional departments (Landscape Architecture and the College of the Environment's Center for Urban Horticulture). I spent the remainder of my time in private consulting through a sole proprietorship. My appointment became emeritus in late 2011, but I continue university research and teaching at a reduced level while maintaining my consulting practice.

I have conducted numerous research investigations and consulting projects involving all aspects of stormwater management. Serving as a principal or co-principal investigator on more than 40 research studies, my work has produced three books, approximately 30 papers in the peer-reviewed literature, and over 20 reviewed papers in conference proceedings. I have also authored or co-authored more than 80 scientific or technical reports. In addition to graduate and undergraduate teaching, I have taught many continuing education short courses to professionals in practice. My consulting clients include federal, state, and local government agencies; citizens' environmental groups; and private firms that work for these entities, primarily on the West Coast of the United States and Canada but in some instances elsewhere in the nation.

Over an 18-year period I spent a major share of my time as the principal investigator on two extended research projects concerning the ecological responses of freshwater resources to urban conditions and the urbanization process. I led an interdisciplinary team for 11 years in studying the effects of human activities on freshwater wetlands of the Puget Sound lowlands. This work led to a comprehensive set of management guidelines to reduce negative effects and a published book detailing the study and its results. The second effort, extending 10 years, involved an analogous investigation of human effects on Puget Sound's salmon spawning and rearing streams. These two research programs had broad sponsorship, including the U.S. Environmental Protection Agency, the Washington Department of Ecology, and a number of local governments.

I have helped to develop stormwater management programs in Washington State, California, and British Columbia and studied such programs around the nation. I was one of four principal participants in a U.S. Environmental Protection Agency-sponsored assessment of 32 state,

regional, and local programs spread among 14 states in arid, semi-arid, and humid areas of the West and Southwest, as well as the Midwest, Northeast, and Southeast. This evaluation led to the 1997 publication of "Institutional Aspects of Urban Runoff Management: A Guide for Program Development and Implementation" (subtitled "A Comprehensive Review of the Institutional Framework of Successful Urban Runoff Management Programs").

My background includes 19 years of work in California, where I have been a federal court-appointed overseer of stormwater program development and implementation at the city and county level and for two Caltrans districts. I was directly involved in the process of developing the 13 volumes of Los Angeles County's Stormwater Program Implementation Manual, working under the terms of a settlement agreement in federal court as the plaintiffs' technical representative. My role was to provide quality-control review of multiple drafts of each volume and contribute to bringing the program and all of its elements to an adequate level. I have also evaluated the stormwater programs in San Diego, Orange, Riverside, San Bernardino, Ventura, Santa Barbara, San Luis Obispo, and Monterey Counties, as well as a regional program for the San Francisco Bay Area. My clients in these cases include Natural Resources Defense Council, Santa Monica Baykeeper, Orange County Coastkeeper, Ventura Coastkeeper, Santa Barbara Channelkeeper, Russian Riverkeeper, and San Diego Coastkeeper. At the recommendation of the latter organization, I have been a consultant on stormwater issues to the City of San Diego, the San Diego Unified Port District, and the San Diego County Regional Airport Authority.

For the last six years I have been a member of Salmon-Safe's assessment team. Salmon-Safe is an organization based in Portland, Oregon that certifies academic and professional campuses and other developed lands for maintaining practices supportive of salmon protection and recovery. We have assessed numerous parcels in Oregon and Washington and extended certification to those whose practices met our criteria or conditions imposed to achieve certification.

I was a member of the National Academy of Sciences-National Research Council (NAS-NRC) committee on Reducing Stormwater Discharge Contributions to Water Pollution. NAS-NRC committees bring together experts to address broad national issues and give unbiased advice to the federal government. The present panel was the first ever to be appointed on the subject of stormwater. Its broad goals were to understand better the links between stormwater discharges and impacts on water resources, to assess the state of the science of stormwater management, and to apply the findings to make policy recommendations to the U.S. Environmental Protection Agency relative to municipal, industrial, and construction stormwater permitting. The committee issued its final report in October 2008.

INVESTIGATION OF THE FEASIBILITY AND BENEFITS OF LOW-IMPACT SITE DESIGN PRACTICES APPLIED TO MEET VARIOUS POTENTIAL STORMWATER RUNOFF REGULATORY STANDARDS

By

Richard R. Horner[1] and Jocelyn Gretz[2]

Report to

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Washington, DC 20460

From

Natural Resources Defense Council
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December, 2011

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EXECUTIVE SUMMARY

STUDY DESIGN

A study was performed to investigate the degree to which stormwater management practices, commonly referred to as "low-impact development" methods or "green infrastructure," can retain urban runoff and meet five possible regulatory standards that could be applied nationally. Retention is defined as preventing the conversion of precipitation to runoff discharging from a development site on the surface, from where it can enter a receiving water. Retaining runoff from impervious and pollutant generating pervious surfaces prevents the introduction of urban runoff pollutants to receiving waters as well as reduces runoff volume to prevent stream channel and habitat damage, flooding, and loss of groundwater recharge. ARCD methods were assessed for their ability to: (1-2) meet standards pertaining to retention of the runoff generated by the 85th and 95th percentile, 24-hour precipitation events; (3) retain 90 percent of the post-development runoff; and (4-5) retain the difference between the post- and pre-development runoff, both with and without a cap at the 85th percentile, 24-hour event. The study assessed five urban land use types (three residential, one retail commercial, and one infill redevelopment), each placed in four climate regions in the continental United States on two regionally common soil types.

Infiltrating bioretention was applied as an initial strategy in the analysis of each case. When the initial strategy could not fully retain post-development runoff, additional methods were applied, involving roof runoff harvesting in the most impervious development cases and roof water dispersion in those with substantial pervious area. Benefits were assessed with respect to reduction of the annual average surface runoff volume from the quantity estimated without any stormwater management practices, the associated maintenance of pre-development groundwater recharge, and water quality improvement achieved through preventing discharge to receiving waters of pollutants generated with developed land uses.

RETENTION AND POLLUTANT REDUCTION CAPABILITIES

The initial strategy of infiltrating bioretention could retain all post-development runoff and pre-existing groundwater recharge, as well as attenuate all pollutant transport, in the three residential land use development types on hydrologic soil group (HSG) B soils, in all cases, in all regions, taking a fraction of the available pervious area to do so. For the more highly impervious commercial retail and redevelopment cases, bioretention would retain about 45 percent of the runoff and pollutants generated and save about 40 percent of the pre-development recharge. Adding roof runoff management measures in these cases would approximately double retention and pollutant reduction for the retail commercial land use and raise it to 100 percent for the redevelopment. Results were generally similar with HSG C soils, although more of the pervious portion of sites was required to equal the retention seen on B soils.

For development on the D soils in all climate regions, use of roof runoff management techniques was estimated to increase runoff retention and pollutant reduction from zero to between about one-third to two-thirds of the post-development runoff generated, depending on the land use case. These strategies would offer little groundwater recharge benefit with this soil condition, but would still have the potential to significantly reduce runoff volume and pollutant loading.

ABILITY TO MEET STANDARDS

The projected ability to meet the five standards identified above was found to vary mostly in relation to soil type (B or C versus D) and the relative imperviousness of development. The ability to meet the five standards varied much less across climate regions. With B and C soils,

the methods considered were projected to meet all five standards in all but 12 of 125 evaluations. With D soils, however, only three standards could be met at all and those only occasionally. However, even on D soils, all cases for Standard 1 (retention of the 85th percentile, 24-hour precipitation event) were able to retain greater than 50 percent of the required runoff volume. Moreover, opportunities to use ARCD practices or site design principles not modeled in this analysis have the potential to further increase runoff retention volume.

Standard 3 (retain 90 percent of the average annual post-development runoff volume) would be the most environmentally protective standard. Meeting or coming as close as possible to meeting, but not exceeding, this standard was estimated to lead to 66-90 percent of total runoff retention and pollutant loading reduction on B and C soils and 37-66 percent runoff retention on D soils. Standard 2 (retain the runoff produced by the 95th percentile, 24-hour precipitation event) would yield equivalent protection on D soils and only slightly less protection with B and C soils. The outcome with this standard would also be more consistent region to region than with the alternative standard 1, based on the 85th instead of the 95th percentile precipitation event. Sites located on B or C soils were able retain the runoff produced by the 85th percentile storm in 24 of 25 cases modeled (in 18 of the 25 cases by using infiltrating bioretention alone), and were able to retain the runoff produced by the 95th percentile storm in 22 of 25 cases modeled.

Standards 4 and 5, based on the differential between pre- and post-development runoff volume, are inconsistent in retaining runoff and reducing pollutants, in that they are relatively protective where pre-development runoff is estimated to be low relative to post-development flow, but result in progressively lower retention and pollutant loading reduction as pre- and post-development volumes converge, such as in several cases on D soils. Standard 5 is especially weak in this regard. The potentially low level of retention and pollutant loading reduction renders these standards based on the change in pre- versus post-development runoff volume poor candidates for national application, at least as formulated in these terms.

In summary, standards 2 and 3 are clearly superior to the other three options from both a volume and pollutant load reduction standpoint. Standard 3 is entirely consistent from place to place in degree of environmental protection, and standard 2 does not deviate much. Analysis of the five development cases on two soil groups in each of four regions demonstrated the two standards are virtually identical in the runoff retention and pollutant loading reduction they would bring about. Of the remaining standards, standard 1 (retantion of the runoff produced by the 85th percentile storm event) remains more consistent across regions and more protective of water quality for development on D soils than either standard 4 or 5, and is preferable to those standards in this regard.

INTRODUCTION

GENERAL STUDY DESCRIPTION

Study Design

This purpose of this study was to investigate the degree to which low-impact development (LID) [1] practices can meet or exceed the requirements of various potential stormwater management facility design standards and to determine the environmental benefits that can be realized by applying these techniques. The investigation was performed by estimating the stormwater retention possible with full application of low-impact options under a range of conditions broadly representative of different regions within the United States and then determining the implications of the findings for achieving various standards and for providing benefits. Retention is defined as preventing the conversion of precipitation to surface runoff from urbanized land uses through infiltration, evapotranspiration, and/or harvesting for some water supply purpose. Retaining runoff from impervious and pollutant generating pervious surfaces prevents the introduction of urban runoff pollutants to receiving waters as well as reduces runoff volume to prevent stream channel and habitat damage, flooding, and loss of groundwater recharge. Benefits were assessed with respect to reduction of the potential developed land surface runoff volume, the associated maintenance of pre-development groundwater recharge, and water quality improvement achieved through preventing discharge to receiving waters of pollutants generated with developed land uses.

The potential regulatory standards investigated were capture and retention of, at minimum:

- Standard 1—The runoff produced by the 85th percentile, 24-hour precipitation event,[2] a standard commonly used in California;
- Standard 2—The runoff produced by the 95th percentile, 24-hour precipitation event, the standard adopted under Section 438 of the Energy Independence and Security Act;
- Standard 3—90 percent of the average annual post-development runoff volume;
- Standard 4—The difference between the post- and pre-development[3] average annual runoff volumes; and
- Standard 5—The difference between the post- and pre-development runoff volumes for all events up to and including the 85th percentile, 24-hour precipitation event.

Conditions broadly representative of the nation were selected by, first, considering the climate regions defined in USEPA's (1983) Nationwide Urban Runoff Project (NURP) report. For full analysis, climate regions 1 (Northeast-Upper Midwest), 3 (Southeast), 5 (South Central), and 6 (Southwest) were chosen as providing a wide range of climatological conditions and geographic distribution. Once the four regions were picked, a metropolitan area and a specific city in each were chosen to serve as typical models of development circumstances in the general area, as

[1] The National Research Council (NRC, 2009) renamed LID, also known as green infrastructure, as aquatic resources conservation design (ARCD), the term used henceforth in this report.

[2] The 85th percentile, 24-hour event represents the precipitation quantity in a 24-hour period not exceeded in 85 percent of all events in an extended record.

[3] In this study the pre-development state is taken as the typical land cover existing before European settlement of an area.

detailed in the Case Studies discussion below. In addition, region 7 (Pacific Northwest) was identified as an additional location to be discussed. This region is the site of a considerable amount of ARCD application in an area somewhat different climatologically than other selected regions, in having persistent winter rainfall totaling annually, in the major urban areas, intermediately among the other regions. Results of research on ARCD conducted in this region are discussed at several points in this report.

Soils and topography were the next considerations in developing broadly representative conditions. U.S. Department of Agriculture websites were the source of general soil characterizations for the study regions and specific soil survey data in and around the representative metropolitan areas. Soils generally represented some range in textural classes and associated hydraulic conductivities. For each region, a soil type predominating among those representing hydraulic conductivities relatively high and low for the region were selected to serve as a basis for the analyses. The effect of slope was also investigated but ultimately found not to affect results substantially.

Five types of urban development were selected to represent breadth in land use: (1) multi-family residential, (2) small-scale single-family residential, (3) large-scale single-family residential, (4) large-scale commercial, and (5) infill redevelopment. Building permit data from each region were consulted to determine typical distributions of site features for each (e.g., land cover by buildings, parking areas, roadways, walkways, driveways, landscaping).

Case studies thus comprised four climate regions, each with two soil conditions and five land use types, for a total of 40 permutations. For each, the ability of the site to accommodate soil- and vegetation-based ARCD practices was investigated. Runoff quantities were estimated and compared to the five potential regulatory standards. Annual mass loading discharges were estimated for four pollutants: total suspended solids (TSS), total recoverable copper (TCu) and zinc (TZn), and total phosphorus (TP). In any case where soil- and vegetation-based ARCD infiltration techniques appeared not to be able to attenuate all runoff, specific roof runoff management strategies were investigated as possible measures to achieve additional retention. Runoff quantities and pollutant discharges were recalculated based on use of these additional practices in place.

This report covers the methods employed in the investigation, data sources, and references for both. It then presents the results, discusses their consequences, draws conclusions, and makes recommendations relative to the feasibility of utilizing low-impact development practices to meet the respective potential regulatory standards.

AQUATIC RESOURCES CONSERVATION DESIGN PRACTICES

General Description

As the stormwater management field developed, it passed through several stages. First, it was thought that the key to success was to match post-development with pre-development peak flow rates, while also reducing a few common pollutants (usually, TSS) by a set percentage. Finding that these efforts generally required large ponds, but that they did not forestall impacts, stormwater managers next deduced that runoff volumes and high discharge durations would also have to decrease. Almost simultaneously, although not necessarily in concert, the idea of low-impact development arose to offer a way to achieve actual avoidance, or at least minimization, of discharge quantity and pollutant increases reaching far above pre-development levels. These methods reduce storm runoff and its contaminants by decreasing their generation

at sources, infiltrating into the soil or evaporating or transpiring[4] storm flows before they can enter surface receiving waters, and treating flow remaining on the surface through contact with vegetation and soil, or a combination of these strategies.

The National Research Council ("NRC") (2009) renamed LID as Aquatic Resources Conservation Design (ARCD) for several reasons. First, this term signifies that the principles and many of the methods apply not only to building on previously undeveloped sites, but also to redeveloping and retrofitting existing development. Second, incorporating aquatic resources conservation in the title is a direct reminder of the central reason for improving stormwater regulation and management. ARCD encompasses the complete range of practices to counteract all negative urban runoff impacts; i.e., the full suite of practices that emphasize and accomplish retention as defined above. These practices aim at decreasing surface runoff peak flow rates, volumes, and elevated flow durations, as well as avoiding or at least minimizing the introduction of pollutants to any surface runoff produced. Reducing the concentration of pollutants, together with runoff volume decrease, cuts the cumulative mass loadings (mass per unit time) of pollutants entering receiving waters over time.

The menu of ARCD practices begins with conserving, as much as possible, existing trees, other vegetation, and soils, as well as natural drainage features (e.g., depressions, dispersed sheet flows, swales). Clustering development to affect less land is a fundamental practice advancing this goal. Conserving natural features would further entail performing construction in such a way that vegetation and soils are not needlessly disturbed and soils are not compacted by heavy equipment. Using less of polluting materials, isolating contaminating materials and activities from contact with rainfall or runoff, and reducing the introduction of irrigation and other non-stormwater flows into storm drain systems are essential. Many ARCD practices fall into the category of minimizing impervious areas through decreasing building footprints and restricting the widths of streets and other pavements to the minimums necessary. Another important category of ARCD practices involves directing runoff from roofs and pavements onto pervious areas as sheet flow, where all or much of the runoff can infiltrate or evaporate in many situations.

Water can be harvested from impervious surfaces, especially roofs, and put to use for irrigation, non-potable indoor water supply. Harvesting is a standard technique for Leadership in Energy and Environmental Design (LEED) buildings (U.S. Green Building Council, 2008). Many successful systems of this type are in operation, with examples such as the Natural Resources Defense Council offices (Santa Monica, CA), the King County Administration Building (Seattle, WA), and two buildings on the Portland State University campus (Portland, OR). Harvesting is feasible at the small scale using rain barrels and at larger scales using larger collection cisterns and piping systems. These small-scale applications have been used throughout the world for centuries and are rapidly spreading in the United States today (See, e.g., Texas Water Development Board, 2005; Georgia Department of Community Affairs, 2009).

If these practices are used but runoff is still produced, ARCD offers an array of techniques to retain it on-site through infiltration and evapotranspiration (ET). The bioretention cell (rain garden) is the workhorse practice in this category, but swales conveying flow slowly, filter strips set up for sheet flows, and other modes are also important. Relatively low traffic areas can be constructed with permeable surfaces such as porous asphalt, open-graded Portland cement concrete, coarse granular materials, concrete or plastic unit pavers, or plastic grid systems to allow for infiltration.

[4] Transpiration refers to vaporization of water from plant tissue, while evaporation applies to vaporization from a liquid (e.g., pool) or solid (e.g., leaf) surface. The terms are often combined to form the compound evapotranspiration (ET).

ARCD practices should be selected and applied as close to sources as possible to stem runoff and pollutant production near the point of potential generation. However, these practices must also work well together and, in many cases, must be supplemented with strategies operating farther downstream. For example, the City of Seattle, in its "natural drainage system" retrofit initiative, built serial bioretention cells flanking relatively flat streets. "Cascades" of vegetated stepped pools created by weirs were installed along more sloping streets. In some cases the cells drain to downstream cascades. The upstream components are highly effective in attenuating most or even all runoff. Flowing at higher velocities on sloped surfaces, the cascades do not perform at such a high level, although under favorable conditions they can still infiltrate or evapotranspire the majority of the incoming runoff (Chapman 2006, Chapman and Horner 2010). Even if not as impressive statistically, cascades can actually decrease storm discharge to streams more than the cells do, because of their generally greater size. Also, the cascades extract pollutants from remnant runoff through mechanisms mediated by vegetation and soils. The success of Seattle's natural drainage systems demonstrates that well designed ARCD practices can mimic natural landscapes hydrologically, and thereby avoid raising discharge quantities.

A watershed-based program emphasizing ARCD practices would convey significant benefits beyond greatly improved stormwater management. ARCD techniques overall would advance water conservation, and infiltrative practices would increase recharge of groundwater resources. ARCD practices can be made attractive and thereby improve neighborhood aesthetics and property values. Retention of more natural vegetation can both save wildlife habitat and provide recreational opportunities. Municipalities could use the program in their general urban improvement initiatives, giving incentives to property owners to contribute to goals in that area while also protecting water resources.

A Catalogue of ARCD Practices

ARCD practices are numerous and expanding as existing configurations are applied in new ways. Table 1 presents a catalogue adapted from USEPA (2007) and NRC (2009). This catalogue contains practices that are not equally applicable in all settings; e.g., nevertheless, each category offers practices applicable in a broad variety of circumstances.

The best strategy for choosing among and implementing these practices is a decentralized, integrated one; i.e., selecting practices that fit together as a system, starting at or near sources and working through the landscape until management objectives are met. This strategy makes maximum possible use of practices in the first three categories, which prevent stormwater quantity and quality problems, and then selects among the remaining classifications in relation to the localized and overall site conditions. Source control and preservation of existing vegetation and soils obviously avoid post-development runoff quantity and pollutant increases from any portion of the site that can be so treated. Among all strategies, these best maintain natural infiltration and ET patterns and yield of materials flowing from the site. This preventive strategy is supplemented by strategies to create as little impervious cover as possible. The remaining practices then contend with the excess runoff and pollutants over pre-development levels generated by the development.

For the practices that infiltrate water, a site's soil characteristics and depth to groundwater can and should be determined through infiltration rate testing and excavation to determine the infiltration capability. Because of the often substantial variability of conditions around a site, these determinations should be made at multiple points. If the natural infiltration rate is low, generally < 0.5 inch/hour (< 1.25 cm/h, Geosyntec 2008), in many situations the soil can be amended, usually with organic compost, to apply an infiltrative practice.

In addition to soil characteristics, the position of the groundwater table is a crucial determinant of whether or not stormwater infiltration should be promoted by applying ground-based ARCD

practices. A seasonal high water table too close to the surface results in rapid saturation of a thin soil column and retarded infiltration. Ponding water longer than 72 hours can permit mosquito growth, damage vegetation, and promote clogging of the facility by microorganism growths and polysaccharide organic materials that form in the reduced-oxygen environment accompanying excessive ponding time (Mitchell and Nevo 1964, Ronner and Wong 1996). Also, storm runoff flow through a short soil column or very rapidly through a coarse-textured soil can convey contaminants to groundwater.

Evidence gathering from available performance data is that evapotranspiration (ET) can be a substantial factor in water retention (discussed below) but may be difficult to quantify at a given site without more research. A conservative approach is to design on the basis of infiltration rate, calculated to include consideration of soil amendments, if any. Together with careful investigation of soils and hydrogeologic conditions, this means of proceeding is very likely to produce facilities that retain at least as much runoff as predicted, and almost certainly more as a result of unquantified ET.

Table 1. A Catalogue of Aquatic Resources Conservation Design Practices (USEPA [2007] and NRC [2009])

Category	Definition	Examples
Source control	Minimizing pollutants or isolating them from contact with rainfall or runoff	• Substituting less for more polluting products • Segregating, covering, containing, and/or enclosing pollutant-generating materials, wastes, and activities • Avoiding or minimizing fertilizer and pesticide applications • Removing animal wastes deposited outdoors • Conserving water to reduce non-stormwater discharges
Conservation site design	Minimizing the generation of runoff by preserving open space and reducing the amount of land disturbance and impervious surface	• Clustering development • Preserving wetlands, riparian areas, forested tracts, and porous soils • Reducing pavement widths (streets, sidewalks, driveways, parking lot aisles) • Reducing building footprints
Conservation construction	Retaining vegetation and avoiding removing topsoil or compacting soil	• Minimizing site clearing • Minimizing site grading • Prohibiting heavy vehicles from driving anywhere unnecessary
Runoff harvesting	Capturing rainwater, generally from roofs, for a beneficial use	• Using storage and distribution systems (rain barrels or cisterns) for irrigation and/or indoor supply for public and private buildings
Natural runoff conveyance practices	Maintaining natural drainage patterns (e.g., depressions, natural swales) as much as possible, and designing drainage paths to increase the time before runoff leaves the site	• Emphasizing sheet instead of concentrated flow • Eliminating curb-and-gutter systems in favor of natural drainage systems • Roughening land surfaces • Creating long flow paths over landscaped areas • When flow must be concentrated, using vegetated channels with flow controls (e.g., check dams)
Practices for temporary runoff storage followed by infiltration and/or evapotranspiration[a]	Use of soil pore space and vegetative tissue to increase the opportunity for runoff to percolate to groundwater or vaporize to the atmosphere	• Bioretention cells (rain garden) • Vegetated swales (channel flow) • Vegetated filter strips (sheet flow) • Planter boxes • Tree pits • Infiltration basins • Infiltration trenches • Roof downspout surface or subsurface dispersal • Permeable pavement • Vegetated (green) roofs
ARCD landscaping[b]	Soil amendment and/or plant selection to increase storage, infiltration, and evapotranspiration	• Organic compost soil amendments • Native, drought-tolerant plantings • Reforestation • Turf conversion to meadow, shrubs, and/or trees

[a] Some of these practices are also conventional stormwater BMPs but are ARCD practices when ARCD landscaping methods are employed as necessary to maximize storage, infiltration, and evapotranspiration. The first five examples can be constructed with an impermeable liner and an underdrain connection to a storm sewer, if full retention is technically infeasible (see further discussion later). Vegetated roofs store and evapotranspire water but offer no infiltration opportunity, unless their discharge is directed to a secondary, ground-based facility.

[b] Selection of landscaping methods depends on the ARCD practice to which it applies and the stormwater management objectives, but amending soils unless they are highly infiltrative and planting several vegetation canopy layers (e.g., herbaceous growth, shrubs, and trees) are generally conducive to increasing storage, infiltration, and evapotranspiration.

Application of ARCD Practices in This Study

The investigation performed for this study first assessed the capacity of each case study site to infiltrate the full average annual post-development storm runoff volume and thereby reduce pollutant releases to zero. The report terms this initial evaluation as the "Basic ARCD Analysis". The means of infiltration was not distinguished at this level of analysis. For example, it was not specified if runoff would be distributed in sheet flow across a pervious area or channeled into a rain garden. As detailed later in the Methods of Analysis section, this analysis was limited to the estimated infiltration capacity of the case study soil type, possibly compost-amended, and the available pervious area.

Critically, there was no attempt to estimate the loss of surface runoff through ET in the Basic ARCD analysis (ET is considered, to address rooftop runoff only, as part of our "Full ARCD analysis," discussed below). In general, the estimated mean annual evapotranspiration in the Southeast is about 70 percent of the precipitation, or roughly 35 inches per year. For large areas of the Southwest, evapotranspiration is virtually equal to 100 percent of the precipitation, which is only about 10 inches per year. The ratio of estimated mean annual evapotranspiration to precipitation is least in the mountains of the Pacific Northwest and New England where evapotranspiration is about 40 percent of the precipitation (Hanson, 1991). By leaving out these substantial losses, generally 40 percent of precipitation or more, the retention estimates in this study can be considered quite conservative.

Additionally, there was no consideration of many ARCD practices in the Table 1 catalogue that could be applied in site-specific design. For example, there were no refinements of the prevailing building standards to reduce street widths or cluster buildings and reduce their footprints. Further, green roofs were not considered in this study, although they are already making a contribution to runoff reduction around the nation and reflect a significant additional opportunity to retain runoff on-site. The U.S. EPA has stated that "a 3.5-4 in. (8 -10 cm) deep green roof can retain 50% or more of the annual precipitation." (U.S. EPA, 2009a). For water quality, we did not assume any source control implementation. Thus, actual site design could take advantage of substantial additional capabilities not considered in this study.

In cases where the practices incorporated in the initial level of analysis (infiltration through bioretention) did not, according to the estimates, fully attenuate post-development pollutant discharges, specific attention was directed at ways of extracting additional water from surface discharge by managing roof runoff. This assessment is called the "Full ARCD Analysis" in the report. The options broadly divide into harvesting water for a purpose such as irrigation and/or non-potable indoor supply, or making special provisions to infiltrate or evapotranspire roof runoff even if soil conditions are limiting. Harvesting applies best to relatively large developments having sufficient demand for the collected water. While single-family residences can harvest water into rain barrels or cisterns for lawn and garden watering, these containers may be small in volume relative to runoff production; and though opportunity exists, no credit was taken for them in this study. However, even in poorly infiltrating soils, options exist to disperse house roof runoff as sheet flow for storage in vegetation and soil until evapotranspiration and some infiltration occurs.

CASE STUDIES

CLIMATE REGIONS

Basis of Selection

The Nationwide Urban Runoff Project divided the nation into nine regions based on differences in volume, intensity, and duration of precipitation and interval between precipitation events (USEPA 1983). For broad representation of the U.S. generally this study chose regions 1 (Northeast-Upper Midwest), 3 (Southeast), 5 (South Central), and 6 (Southwest) for analysis. Table 2 provides the annual precipitation statistics from the NURP compilation.

Table 2. Precipitation Statistics (Means) for Four NURP Regions Selected for Study (USEPA 1983)

Region	Volume (inch)	Intensity (inch/hour)	Duration (hours)	Interval (hours)
1—Northeast-Upper Midwest	0.26	0.051	5.8	73
3—Southeast	0.49	0.102	5.2	89
5—South Central	0.33	0.080	4.0	108
6—Southwest	0.17	0.045	3.6	277

The selected regions represent a volume differential of about a factor of three, intensity variation of approximately two times, and inter-storm interval varying by almost four times. The NURP report shows coefficients of variation (mean/standard deviation) of greater than 1.0 for all of these means, indicating an overall high degree of dispersion.

Figure 1 visually depicts variation in mean annual precipitation across the continental United States. It shows that the selected regions are overall representative of the broadly prevailing range across the nation, particularly its major urban and still urbanizing areas.

Region 7 (Pacific Northwest) was also identified for discussion of research results on ARCD, although not full analysis. It has less intense (mean 0.024 inch/hour) but much more extended (mean 20.0 hours) precipitation compared to any other region in the nation. Mean storm volume ranks with region 3 (mean 0.48 inch); but fewer storms, especially in the summer, yield overall less total annual precipitation in lowland areas holding all urban development in region 7. It was of interest because of the already occurring use of ARCD techniques in a relatively rainy part of the country.

Representative Metropolitan Areas and Cities

Once the regions were identified, a metropolitan area within each area was chosen as a basis for assigning specific precipitation and development characteristics. The areas considered were USEPA-designated Urban Areas: “An urbanized area is a land area comprising one or more places – central place(s) – and the adjacent densely settled surrounding area – urban fringe – that together have a residential population of at least 50,000 and an overall population density of at least 1,000 people per square mile” (USEPA 2007). Stormwater regulations would have the most impact in areas that are being quickly developed, redeveloped, or both. Five of the twenty fastest growing counties in the nation from 2000 to 2009 were near Atlanta, GA and five were in the state of Texas (U.S. Census Bureau 2010). These statistics factored into the decision to focus on records from these regions.

Each selected metropolitan area is generally representative of its region in precipitation and development characteristics. Each is also undergoing relatively active new development and redevelopment, offering candidate locations where a prospective stormwater standard would frequently be applied. These metropolitan areas are: region 1—Boston, MA, region 3—Atlanta, GA, region 5—Austin, TX, and region 6—San Diego, CA

Figure 1. Precipitation of the Conterminous States of the United States, National Atlas of the United States, 2011.

Finally, a city with a high rate of development (and often redevelopment) was picked in each metropolitan area for investigation of building patterns and standards. The intent was to match regional patterns of climate, soils (see discussion on physiographic data, below), and land use and land cover realistically. After substantial investigation, the conclusion was that building standards, how land is used, and the relative allocation of impervious and pervious lands do not vary in any systematic way across the nation and cannot be regionally distinguished. Therefore, the variables of interest came down to precipitation and soils.

Alpharetta, about 30 miles north of Atlanta, represents that metropolitan area. In 1981 it was a small town of approximately 3,000 residents but grew to 51,243 by 2007. During the workday, the city swells to more than 120,000 residents, workers, and visitors. Alpharetta is home to large corporations such as AT&T (3500 employees), Verizon Wireless (3000 employees), and ADP, Inc./National Account Services (2100 employees). Infill redevelopment projects are anticipated in the downtown area (City of Alpharetta, 2011).

Round Rock is a typical developing city located 15 miles to the north of Austin, TX. In 1970 there were only 2,700 residents in this town, while today the population exceeds 100,000. Round Rock is the eighth-fastest growing city in the nation and the location of several large corporate campuses.

The Town of Framingham, 20 miles west of Boston, represents the northeastern climate zone. At nearly 67,000 inhabitants, Framingham is the largest entity designated as a “town” in the Commonwealth of Massachusetts. It is home to three large corporations and overall 2200 businesses providing 45,000 jobs. Differing greatly from the representative communities in

other regions, Framingham was incorporated in 1700 and developed early in the nation's history. Today's activity includes redevelopment of brownfields and downtown revitalization, although some agricultural land still remains within the town limits (Town of Framingham, 2011).

San Marcos, representing the San Diego area and located about 35 miles north of the city, grew from a population of 17,479 in 1980 to 82,743 by 2008. Major institutions in the city include California State University San Marcos and Palomar Community College. At this stage the city is only approximately 72 percent built out, and thus new development continues (City of San Marcos, 2011).

Precipitation Data

Average monthly precipitation data were obtained from the NOAA Hourly Precipitation Data Rainfall Event Statistics[5] for one station with a long-term record in each region: Southeast—Atlanta/Hartsfield International Airport (Station #90451), South Central—Austin/Robert Mueller Municipal Airport (410428), Northeast—Boston/Logan International Airport (190770), and Southwest—San Diego/San Diego International Airport (Lindbergh Field) (47740). Atlanta receives the most precipitation, averaging about 49 inches per year, followed by Boston (47 inches/year), Austin (33 inches/year), and San Diego (10 inches/year). Figure 2 depicts precipitation variations over more than 50 years.

Values for either the 85th and 95th percentile, 24-hour storms were available in a number of state-specific resources, including the Georgia Stormwater Standards Supplement (Center for Watershed Protection 2009) and the Integrated Stormwater Management Program (North Central Texas Council of Governments 2010), as well as national publications such as an USEPA's technical guidance documents (USEPA 2009). However, few references had values for both 85th and 95th percentile storms. Therefore, these values were calculated following the methodology outlined in the USEPA's Technical Guidance on Implementing the Stormwater Runoff Requirements (USEPA 2009, page 30). Daily precipitation and temperature data from the National Climatic Data Center's TD Summary of the Day data set were collected and analyzed for the four stations lover a time period of 60 years, January 1, 1950 to January, 31 2010.

[5] National Climatic Data Center, Hourly Precipitation Data Rainfall Event Statistics (http://cdo.ncdc.noaa.gov/cgi-bin/HPD/HPDStats.pl, last accessed December 15, 2011).

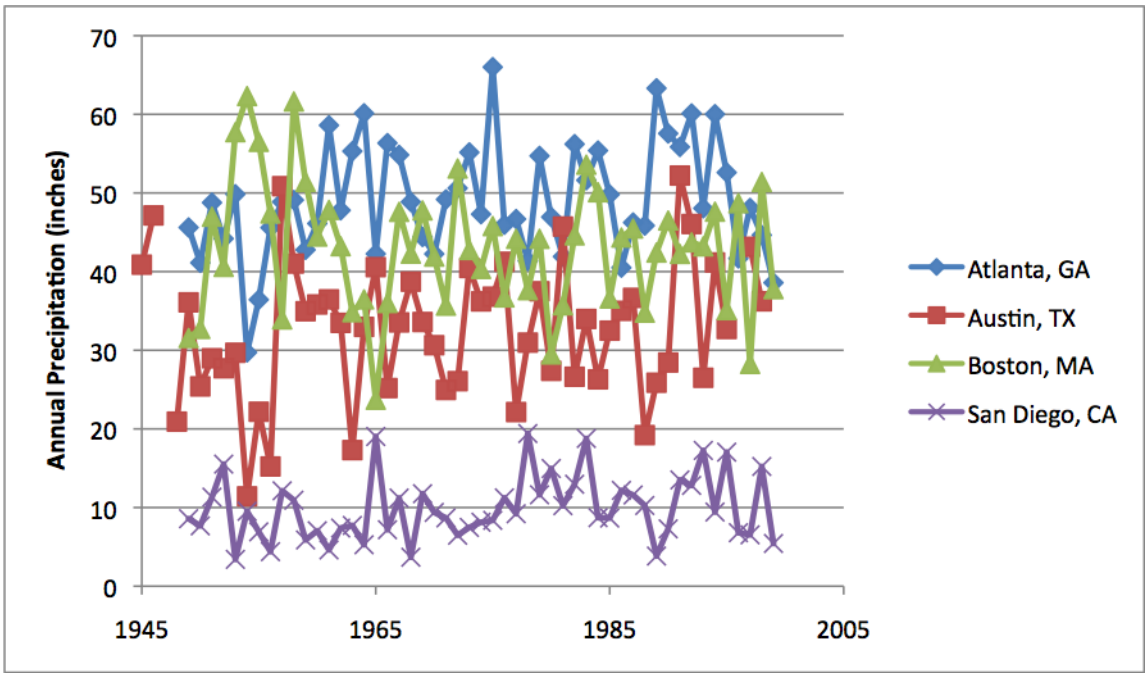

Figure 2. Average Annual Precipitation for Four Climate Regions over the Latter Part of the Twentieth Century (from NOAA Hourly Precipitation Data Rainfall Event Statistics, http://cdo.ncdc.noaa.gov/cgi-bin/HPD/HPDStats.pl)

For snowfall days, snow water equivalent (SWE) was calculated according to the guidelines provided by a National Climate Data Center's (NCDC) document, Estimating the Water Equivalent of Snow, utilizing the reported mean temperature for the day (National Climatic Data Center, accessed December 16, 2011). The NCDC tables calculate that the SWE is at most, about 10 percent of the total snowfall depth. In the methodology for determining the 85th and 95th percentile events, all days with < 0.1 inch precipitation are removed, lowering the impact of snow on the results. Snowfall had no effect in the Southwest region, a very minor effect in the Southeast and South Central, and still a relatively small effect in the Northeast, as follows: San Diego—0 snow days; Atlanta—74 of 4600 total days having ≥ 0.1 inch (1.6 percent), with a contribution ranging 0.01-0.79 inch precipitation; Austin—32 of 2418 days (1.3 percent), contributing 0.01-0.50 inch; and Boston—993 of 4783 days (20.8 percent), contributing 0.01-2.24 inch. Since snow does add to runoff that must be managed in a location like the Northeast, these snow water equivalents were left in the records. Table 3 summarizes precipitation data used in the analyses for the four regions.

Table 3. Precipitation Summary for Study Regions

Region	Average Annual Precipitation (inches)	85th Percentile, 24-Hour Event		95th Percentile, 24-Hour Event	
		Depth (inch)[a]	Fraction Covered[b]	Depth (inch)[a]	Fraction Covered[b]
Southeast	49.02	1.13	0.63	1.79	0.87
South Central	32.67	1.19	0.58	1.99	0.82
Northeast	47.03	1.07	0.81	1.72	0.89
Southwest	9.68	0.76	0.62	1.26	0.83

[a] Calculated from National Climatic Data Center's TD Summary of the Day, for all precipitation days >0.1 inch for period January 1, 1950 – December 31, 2009
[b] Fraction of total annual precipitation covered by event standard

Physiographic Data

General Methods

This section of the report covers the soils, groundwater, and topographic data underlying the analyses. Soil characteristics are largely a product of climate, geology and topography. The characteristics of most interest for this study were those controlling infiltration of surface water and percolation to an aquifer. Although there is variation within each climate region, the major soil orders can be used to identify regional characteristics. The Natural Resources Conservation Service (NRCS) website[6] describing the major soil orders and their locations was the initial source of these data. Maps generated by Miller and White (1998) gave information from the State Soil Geographic Database (STATSGO), including characteristics such as soil texture and hydrologic soil group. These resources were employed to gain a broad view of the soils in each of the four regions.

To extend the scope of the study, soils were investigated in the Upper Midwest, in addition to the Southeast, South Central, Northeast, and Southwest climate regions. Upper Midwest and Northeast soils share general similarities. Both regions also have temperate, seasonal, humid climates. While average annual precipitation is overall somewhat greater in the Northeast compared to the Upper Midwest, the two regions were deemed similar enough physiographically and climatologically to be considered together. This report henceforth groups them as the Northeast – Upper Midwest climate region.

To validate the regional patterns emerging from the general sources, custom "soil resource" reports for four cities were generated using the NRCS Web Soil Survey[7] tool. These reports collected characteristics related to infiltration rates and runoff including soil texture, hydrologic soil group, drainage classification, representative slope, and depth to water table. Using this tool requires selecting an "area of interest". This examination utilized a size of at least 8,000 acres (10,000 acres is the maximum allowed) to insure a representative sample of soil and related conditions.

Hydrologic soil group assignment is a means of generally categorizing soils according to their tendency to admit and transmit water. The hydrologic soil group (HSG) is determined with respect to the water-transmitting soil layer with the lowest saturated hydraulic conductivity and depth to any layer that is more or less water impermeable (such as a fragipan or duripan) or depth to a water table. Box 1 summarizes the characteristics of the four HSGs (NRCS 2007).

The position of the groundwater table is a crucial determinant of whether or not stormwater infiltration should be promoted by applying ground-based ARCD practices. A seasonal high water table too close to the surface results in rapid saturation of a thin soil column and retarded infiltration. Ponding water longer than 72 hours can permit mosquito growth, damage vegetation, and promote clogging of the facility by microorganism growths and polysaccharide organic materials that form in the reduced-oxygen environment accompanying excessive ponding time (Mitchell and Nevo 1964, Ronner and Wong 1996). Also, storm runoff flow through a short soil column or very rapidly through a coarse-textured soil can potentially convey contaminants to groundwater. To avoid entertaining stormwater management strategies threatening development of these problems, data on depth to groundwater was obtained from the U.S. Geological Survey's (USGS) Groundwater-Level Annual Statistics (USGS 2011).

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[6] Natural Resources Conservation Service, Distribution Maps of Dominant Soil Orders (http://soils.usda.gov/technical/classification/orders/, last accessed December 16, 2011).

[7] Natural Resources Conservation Service, 2011, Web Soil Survey (http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm).

Topographic slope influences runoff production by setting incident precipitation in motion downslope, thus producing a horizontal component of velocity vector partially counteracting the tendency to penetrate the soil vertically. This study investigated that importance of that effect by considering two slopes typical of urban development sites. As discussed during the presentation of results, below, this factor did not have a large effect on the analysis.

Box 1. Summary of Hydrologic Soil Groups (NRCS 2007)

Group A—Soils in this group have low runoff potential when thoroughly wet. Water is transmitted freely through the soil. Group A soils typically have less than 10 percent clay and more than 90 percent sand or gravel and have gravel or sand textures. Some soils having loamy sand, sandy loam, loam or silt loam textures may be placed in this group if they are well aggregated, of low bulk density, or contain greater than 35 percent rock fragments. The saturated hydraulic conductivity of all soil layers exceeds 5.67 inches per hour. The depth to any water-impermeable layer is greater than 20 inches. The depth to the water table is greater than 24 inches. Soils deeper than 40 inches to a water-impermeable layer are in group A if the saturated hydraulic conductivity of all soil layers within 40 inches of the surface exceeds 1.42 inch per hour.[a]

Group B—Soils in this group have moderately low runoff potential when thoroughly wet. Water transmission through the soil is unimpeded. Group B soils typically have between 10 percent and 20 percent clay and 50 percent to 90 percent sand and have loamy sand or sandy loam textures. Some soils having loam, silt loam, silt, or sandy clay loam textures may be placed in this group if they are well aggregated, of low bulk density, or contain greater than 35 percent rock fragments. The saturated hydraulic conductivity in the least transmissive layer between the surface and 20 inches ranges from 10.0 1.42 to 5.67 inches per hour. The depth to any water-impermeable layer is greater than 20 inches. The depth to the water table is greater than 24 inches. Soils deeper than 40 inches to a water- impermeable layer or water table are in group B if the saturated hydraulic conductivity of all soil layers within 40 inches of the surface exceeds 0.57 inch per hour but is less than 1.42 inch per hour.

Group C—Soils in this group have moderately high runoff potential when thoroughly wet. Water transmission through the soil is somewhat restricted. Group C soils typically have between 20 percent and 40 percent clay and less than 50 percent sand and have loam, silt loam, sandy clay loam, clay loam, and silty clay loam textures. Some soils having clay, silty clay, or sandy clay textures may be placed in this group if they are well aggregated, of low bulk density, or contain greater than 35 percent rock fragments. The saturated hydraulic conductivity in the least transmissive layer between the surface and 20 inches is between 0.14 and 1.42 inch per hour. The depth to any water-impermeable layer is greater than 20 inches. The depth to the water table is greater than 24 inches. Soils deeper than 40 inches to a restriction or water table are in group C if the saturated hydraulic conductivity of all soil layers within 40 inches of the surface exceeds 0.06 inch per hour but is less than 0.57 inch per hour.

Group D—Soils in this group have high runoff potential when thoroughly wet. Water movement through the soil is restricted or very restricted. Group D soils typically have greater than 40 percent clay, less than 50 percent sand, and have clayey textures. In some areas, they also have high shrink-swell potential. All soils with a depth to a water-impermeable layer less than 20 inches and all soils with a water table within 24 inches of the surface are in this group, although some may have a dual classification if they can be adequately drained. For soils with a water-impermeable layer at a depth between 20 and 40 inches, the saturated hydraulic conductivity in the least transmissive soil layer is less than or equal to 0.14 inch per hour. For soils deeper than 40 inches to a restriction or water table, the saturated hydraulic conductivity of all soil layers within 40 inches of the surface is less than or equal to 0.06 inch per hour.

[a] While Group A soils are present across large areas of the country, our analysis considers only Group B, C, and D soils to provide a conservative assessment of infiltration potential in urban areas, and to account for potential issues such as soil compaction that may occur for lawn and other landscaping in urban and suburban development.

Southeast Climate Region

The major soil order found throughout the southeastern United States is Utisols, sub-order Udults. The humid climate with frequent rainfall gives the soils an udic moisture regime; soils are rarely dry for more than 45 consecutive days. Utisols are highly weathered and are deficient in calcium and other bases. Georgia is known for its red soils, which are the unhydrated iron oxides left in the weathered material. Pre-European contact, these soils supported mixed conifer and deciduous woodlands. Due to its relatively flat topography and warmer temperatures, Florida has primarily Spodosols, Alphisols and Histosols (Soil Survey Staff, NRCS 2011).

This region has a variety of soil textures, ranging from sand and sandy loam throughout Mississippi, Alabama, and Georgia; silty loam soils near the Appalachian Mountains; and some areas with significant organic materials in Florida. The major soil hydrologic groups of the region are varied as well, with C and D soils dominating the Georgia coastline and most of Florida. Group A and B soils are more prevalent in the interior parts of the region, in central Georgia and Alabama (Miller and White 1998).

A NRCS web soil survey was conducted for an area of interest (AOI) centered in Alpharetta, GA. The selected AOI did not have complete soil survey coverage, and findings were compared with another AOI of 8990.5 acres north of the city in Fulton County. In both AOIs, the leading HSG is B (86 percent of AOI), followed by group C (11 percent of AOI). Approximately 97 percent of the AOI has a sandy loam soil texture. The leading drainage classification was well drained (86 percent of AOI), followed by somewhat poorly drained (10 percent of AOI). The selected AOI was moderately steep, with approximately 70 percent of the AOI having slopes between 8 and 12 percent.

Fulton County, Georgia has four wells in the USGS record, three with depth-to-groundwater data. Two wells have only one recorded depth: site 08CC08 had a depth of 2.447 ft in 1986, and site 10DD01 had a depth of 16.131 ft in 1968. Site 10DD02 has been monitored annually from 1977-2010 and has an annual well-depth average in this time period of 6.292 ft.

South Central Climate Region

The major soil order in Texas is Mollisols, sub-order ustolls. These soils span the sub-humid and semiarid climate zones, and are common on the western Great Plains and throughout the Rocky Mountain States. These soils originally supported grasslands and (in mountainous regions) forests, and now are ranched or farmed. Houston black soils are also characteristic of the region and are important in agriculture and urban areas, occurring throughout central Texas. Dry soils in the Order Aridisols, sub-orders Argids and Calcids, are found in west Texas and large portions of New Mexico as well. These soils were formerly sparsely vegetated areas, now used for rangeland or wildlife habitat (Soil Survey Staff, NRCS 2011).

Soil characteristic maps generated by Miller & White (1998) indicate that the majority of soil types in the South Central climate region are diverse: sandy loam and clay dominate eastern Texas, clay soils are prevalent in central parts of the state and loam soils are in western Texas and New Mexico. Most soils tend to be in the C and D hydrologic groups, however B soils are found in bands in New Mexico (Miller & White, 1998).

A web soil survey was conducted for an area of interest of 8267.5 acres centered in Round Rock, TX. The leading HSG is D (68 percent of AOI), followed by group C (22 percent of AOI) and group B (10 percent). Primary soil textures are clay (33 percent), silty clay (27 percent), extremely stony clay (17 percent), and silty clay loam (10 percent). The leading drainage classification is well drained (79 percent of AOI) followed by moderately well drained (21

percent). The selected AOI is relatively flat; approximately 70 percent of the AOI has slopes under 2 percent, and 20 percent has slopes of 3-4 percent.

Travis County, Texas had three wells that were measured in 2003 and recorded by USGS (site YD-58-50-216) and 2004 (sites YD-58-50-216 and YD-58-25-907). Groundwater is very deep in each location, averaging 220 ft below the ground surface.

Northeast – Upper Midwest Climate Region

This climate region has significant variation in dominant soil orders. The Spodsols order, sub-order Orthods, dominates the northern portions (northern Minnesota, Wisconsin, Michigan, Vermont, and Maine) and is generally considered infertile without soil amendments. Inceptisols, sub-order Udepts, are also prevalent in the region, especially in New England states, through the Appalachian Mountains and northeastern Minnesota. Alfisols, sub-order Udalfs, too are prevalent in the region, extending from Minnesota east to New York. These two soils both have an udic moisture regime, and are rarely dry for more than 45 consecutive days due to the year-round precipitation in the area (Soil Survey Staff, NRCS 2011). The state soil of Massachusetts is the Paxton fine sandy loam and also extends into New Hampshire, New York and Vermont. These deep soils were formed in acid subglacial till and are derived from schist, gneiss and granite (NRCS undated).

Based on maps generated by Miller and White (1998), sandy loam and silt loam soils tend to dominate the region, with small areas of clay and silty clay soils. Hydrologic soil group B is most prevalent in the Midwestern states (Minnesota, Wisconsin, Illinois), and Group C is most common in the rest of the region, spanning from Indiana to Maine. The region primarily supported forest ecosystems before development.

A web soil survey was conducted for an area of interest centered in Framingham, MA with an AOI of 8645.6 acres. The region has relatively equal amounts of each HSG: 20 percent of the AOI in Group A, 19 percent in group B, 20 percent in Group C, and 24 percent in Group D. Soil textures represented are fine sandy loam (49 percent), muck (10 percent), loamy sand (9 percent), and moderately decomposed plant material (8 percent). The leading drainage classification is well drained (32 percent of AOI) followed by very poorly drained (16 percent), somewhat excessively drained (12 percent), and moderately well drained (11 percent). Fourteen percent of the AOI has slopes of 1 percent or less, with 18 percent at 2-5 percent, 23 percent at 6-8 percent, and another 23 percent at 8-12 percent slopes.

There are three wells in the USGS record for Middlesex County, MA including 5 years of record for an Acton well averaging 17.75 ft, 6 years for the Wakefield well with an average depth of 6.59 ft, and 11 years at the Wilmington well with an average of 8.09 ft.

Southwest Climate Region

There are multiple soil orders in California due to its variation in climate, topography and geologic history. Entisols occur in the southern parts of the state; sub-order Psamments is a frequently found sandy soil that makes productive rangeland. Order Mollisols, sub-order Xerolls, are freely drained and dry soils found in the Mediterranean climate along the coast of California. Pre-settlement ecosystems supported by these soils include oak savanna, grasslands, and chaparral. Current soils may be used as cropland or rangeland (Soil Survey Staff, NRCS 2011).

A web soil survey was conducted for an 8267.5-acre area of interest centered in San Marcos, CA. The leading HSG is D (58 percent of AOI), followed by group C (26 percent) and group B (14 percent). Soil texture include sandy loam (19 percent), coarse sandy loam (17 percent), silt loam (15 percent), very fine sandy loam (14 percent), loamy fine sand (12 percent), loam (7

percent), and clay (5 percent). The leading drainage classification is well drained (51 percent of AOI), followed by moderately well drained (34 percent). Approximately 10 percent of the AOI has slopes ≤ 5 percent, and 66 percent has slopes of 5-10 percent.

There are no groundwater records for San Diego County available on the USGS website. Data were collected from the California Department of Water Resource Water Data Library[8]. Ten wells west of San Marcos near Escondido were sampled in 1987. The depth to groundwater ranged from 2.0 to 28.1 ft for an average of 11.6 ft.

Summary of Physiographic Characteristics

Due to the large area of land encompassed in each climate region, it is difficult to select one location that is truly "representative" of the entire region. By selecting four cities that are spaced throughout the country with different climate and soil characteristics, however, this study can demonstrate the different potential for ARCD strategies in regions around the nation. Table 4 summarizes the major soils, groundwater, and topographic characteristics for these regions. Figure 3 shows the distributions of hydrologic soil groups in areas of interest investigated in the four metropolitan areas.

Table 4. Summary of Physiographic Data

Characteristic	Southeast	South Central	Northeast – Upper Midwest	Southwest
Main soil types	Sandy loam	Clay, clay loam	Sandy loam, silt loam	Sandy loam, loam
Hydrologic soil group near study site	B (GA, AL, SC)	D (TX)	C (Northeastern states)	D
Other hydrologic soil group in climate region	D (FL)	C (NM)	B (MN, WI, IL, MI)	C
Predominant pre-development land cover	Woods	Semi-arid herbaceous	Woods	Narrow-leaved chaparral
Predominant slopes	70% @ 8-12%	90% < 4%	65% < 12%	76% < 10%

LAND USE CASES

Five cases were selected to represent a range of urban development types considered to be representative of the nation. These cases involved: a multi-family residential complex (MFR), a relatively small-scale (23 homes) single-family residential development (Sm-SFR), a relatively large (1000 homes) single-family residential development (Lg-SFR), a sizeable commercial retail installation (COMM), and an urban redevelopment (REDEV).

Building permit records from the City of San Marcos in San Diego County, California provided data on total site areas for the first three cases, including numbers of buildings, building footprint areas (including porch and garage for Sm-SFR), and numbers of parking spaces associated with the development projects. Information was not as complete for cities in other regions, but what data was available indicated no substantial difference in these site features. Therefore, the San Marcos data were used for all regional case studies. This uniformity had the advantage of placing comparisons completely on the basis of the major variables of interest, climatological and soils characteristics.

[8] http://www.water.ca.gov/waterdatalibrary (last accessed December 16, 2011).

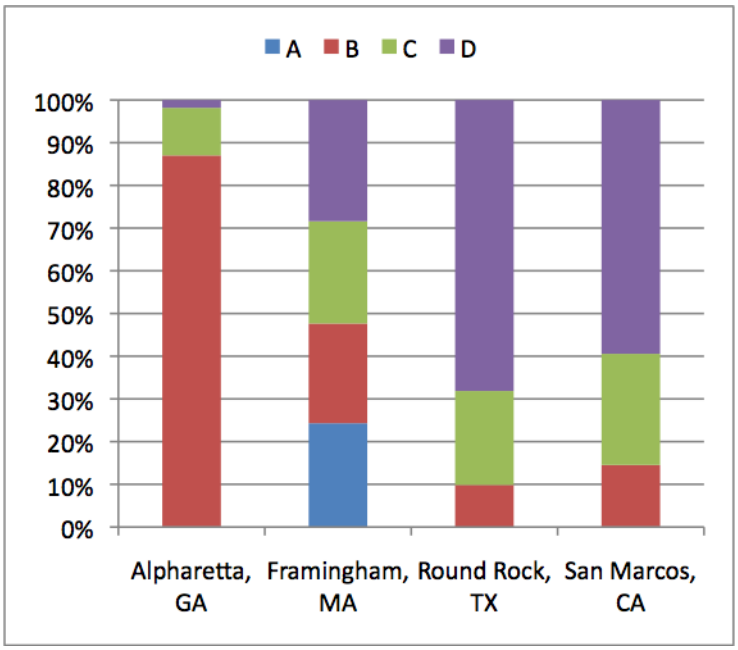

Figure 3. Distribution of Hydrologic Soil Groups in Four Study Cities

The REDEV case was taken from an actual project in Berkeley, California involving conversion of an existing structure, built originally as a corner grocery store, to apartments and addition of a new building to create a nine-unit, mixed-use, urban infill project. Space remained for a large side yard.

Larger developments were not represented in the sampling of building permits from the San Marcos database. To take larger development projects into account in the subsequent analysis, the two larger scale cases were hypothesized. The Lg-SFR scenario scaled up all land use estimates from the Sm-SFR case in the ratio of 1000:23. The hypothetical COMM scenario consisted of a building with a 2-acre footprint and 500 parking spaces. As with the smaller-scale cases, these hypothetical developments were assumed to have roadways, walkways, and landscaping, as described below.

While the building permit records made no reference to features such as roadways, walkways, and landscaping normally associated with development projects, these features were taken into account in the case studies using assumptions described herein. Parking spaces were estimated to be 176 square ft in area, which corresponds to 8 ft width by 22 ft length dimensions. Code requirements vary by jurisdiction, with the tendency now to drop below the traditional 200 square ft average. About 180 square ft is common, but various standards for full- and compact-car spaces, and for the mix of the two, can raise or lower the average (Gibbons, 2009). The 176 square ft size is considered to be a reasonable value for conventional practice.

Roadways and walkways assume a wide variety of patterns. Exclusive of the two SFR cases, simple, square parking lots with roadways around the four sides and square buildings with walkways also around the four sides were assumed. Roadways and walkways were taken to be 20 ft and 6 ft wide, respectively.

Each single-family residences (SFR) was assumed to have a lot area of 5749 square ft,, and a driveway 20 ft wide and 30 ft long. Assuming a square lot, each would have a sidewalk 76 feet by 4 feet wide, and a walkway that is 40 feet by 4 feet. .

Exclusive of the COMM case, the total area for all of these impervious features was subtracted from the total site area to estimate the pervious area, which was assumed to have conventional landscaping cover (grass, small herbaceous decorative plants, bushes, and a few trees). For the COMM scenario, an additional 10 percent was added to the building, parking lot, access road, and walkway area to represent the landscaping, on the belief that a typical retail commercial establishment would be mostly impervious.

Table 5 summarizes the characteristics of the five land use cases. The table also provides the recorded or estimated areas in each land use and cover type.

Table 5. Summary of Cases with Land Use and Land Cover Areas

	MFR[a]	Sm-SFR[a]	Lg-SFR[a]	COMM[a]	REDEV[a]
No. buildings	11	23	1000	1	2
Total area (ft^2)	476,982	132,227	5,749,000	226,529	5,451
Roof area (ft^2)	184,338	34,949	1,519,522	87,120	3,435
No. parking spaces[b]	438	-	-	500	2
Parking area (ft^2)[b]	77,088	-	-	88,000	316
Access road area (ft^2)	22,212	-	-	23,732	-
Walkway area (ft^2)	33,960	10,656	463,289	7,084	350
Driveway area (ft^2)	-	13,800	600,000	-	650
Landscape area (ft^2)	159,384	72,822	3,166,190	20,594	700

[a] MFR—multi-family residential; Sm-SFR—small-scale single-family residential; Lg-SFR—large-scale single-family residential; COMM—retail commercial; REDEV—redevelopment
[b] Uncovered

METHODS OF ANALYSIS

AVERAGE EVENT AND ANNUAL STORMWATER RUNOFF VOLUMES

Calculation Methods

Surface runoff volumes produced were estimated for both pre- and post-development conditions for each case study. The pre-development state was considered to be the predominant land cover for each region prior to European settlement.

For impervious areas, average event and annual runoff volumes were computed as the product of event or average annual precipitation, contributing drainage area, and a runoff coefficient (ratio of runoff produced to precipitation received) according to the familiar Rational Method equation. The runoff coefficient was determined from the equation C = (0.009) I + 0.05, where I is the impervious percentage. This equation was derived by Schueler (1987) from Nationwide Urban Runoff Program data (USEPA 1983). With I = 100 percent for fully impervious surfaces, C is 0.95.

The basis for pervious area runoff coefficients, for both the pre-development state and landscaped areas in developments, was the NRCS's Urban Hydrology for Small Watersheds (NRCS 1986, as revised from the original 1975 edition). This model estimates storm event runoff (R, inch) as a function of precipitation (P, inch) and a variable representing land cover and soil, termed the curve number (CN, dimensionless). CN enters the calculation via a variable S, which is the potential maximum soil moisture retention after runoff begins. The equations for English units of measurement are:

$$R = \frac{(P - 0.2S)^2}{P + 0.8S} \qquad S = \frac{1000}{CN} - 10$$

The runoff equation is valid for P > 0.2S, which represents the initial abstraction, the amount of water retained before runoff begins by vegetative interception and infiltration (NRCS 1986). According to this model, larger events are forecast to produce a greater amount of runoff in relation to amount of precipitation, because they more fully saturate the soil. Therefore, use of the model to estimate annual runoff requires selecting some event or group of events to compute an average runoff coefficient representing the year.

Average pre- and post-development pervious area average runoff coefficients were derived by computing runoff from a series of precipitation events ranging from 0.1 inch up to the 95th percentile, 24-hour event for the respective metropolitan areas, dividing by the associated precipitation, and averaging for all event amounts > 0.2S. Average annual runoff volumes for pervious areas were estimated based on these runoff coefficients and average annual precipitation quantities recorded at the respective gauging locations.

Curve Number Selection

Pre-development curve numbers were determined from existing studies and NRCS (1986) CN tables based on pre-European settlement land cover. Before development, woods predominated in Georgia and Massachusetts. Pre-development Texas had principally arid and semi-arid range with herbaceous cover. Chaparral was the predominant land cover in the San Diego area, however, this land cover type is not listed in the NRCS tables. For that region the selection came from a study by Easterbrook (undated) on curve numbers and associated soil hydrologic groups in an investigation of mainly chaparral lands before and after wildfires in the San Diego area.

Conversion to landscaping typical of development modifies soil and water infiltration characteristics by removing topsoil and even subsoil, compacting the remaining soil, and changing the vegetative cover. For pervious landscaping after development, CN was based on 1/8-acre urban development for all building types.

To demonstrate a range of results, runoff estimates were made for two soils in each region falling in B and C, B and D, or C and D HSGs. The more infiltrative soil was assumed to be in "good" condition and the less permeable one in "poor" condition, differentiations made in the NRCS tables. Table 6 summarizes the curve numbers used in the analyses. The paragraphs following the table detail how the selections were made for each region.

Table 6. Summary of Curve Numbers for Study Regions

	Southeast		South Central		Northeast – Upper Midwest		Southwest	
Hydrologic soil group-condition	B-good	D-poor	C-good	D-poor	B-good	C-poor	C-good	D-poor
Pre-development	55	83	74	93	55	77	77	90
Post-development	85	92	90	93	85	90	91	93

The Georgia Stormwater Manual Supplement recommends that watershed managers select curve numbers proposed by the NRCS based on hydrologic soil groups A through D and hydrologic condition of the site (Center for Watershed Protection 2009). As aforementioned, the pre-European land cover of the southeastern United States was forested. A study by Dyke (2001) in Forsyth and Hall Counties northeast of Atlanta confirmed that, immediately prior to development, approximately 50 percent of urban lands were forested, with 22 percent in agricultural use.

Because the region includes B soils in the interior of Alabama and Georgia, and poorly draining D soils in Florida and along the coasts, it was decided, for the purpose of demonstrating a range of results, to base NRCS Curve number values on B soils in good condition and D soils in poor condition. The corresponding pre- and post-development curve numbers are 55 and 83 and 85 and 92, respectively.

Prior to human development, approximately 80 percent of Texas, mostly in the central part, was covered in short and tall grassland communities; the western 10 percent of the state was desert grassland; and the eastern 10 percent was forested (University of Texas 2000). McLendon (2002) conducted a study on the observed and predicted curve numbers in 107 watersheds in Texas. For rural watersheds the CNs ranged from 48 to 88. The range in Austin was 49-89 and in Dallas 60-90. The Texas Department of Transportation's (2001) Hydraulic Design Manual Section 7 lists values for pre-development curve numbers for arid and semi- arid rangelands. Based on these sources, the respective pre- and post-development CN choices were 74 (C—good soil) and 93 (D—poor soil) and 90 (C—good soil) and 93 (D—poor soil).

Before European development, most of the Northeast – Upper Midwest region was covered in mixed hardwood and coniferous forests. A recent USGS report confirms that most urban development in the region from 1973 to 2000 has converted forestland (47 percent of all changes), followed by farmland (11 percent) (Auch undated). For this study's pre-development curve number, the woods cover type, soil group B in good condition and C soil in poor condition gave corresponding curve numbers of 55 and 77, respectively. Post-development curve numbers for these soil types at 1/8-acre development size were 85 and 90 for the good B and poor C soils, respectively. These post-development curve numbers are similar to a recent study in the Aberjona River watershed, an urban catchment northwest of Boston, where the authors used an overall CN of 89 to represent the more impervious parts of the watershed (Perez-Pedini et al. 2005).

With the lack of NRCS data for chaparral, CN selection for the San Diego area was based on an analysis performed in the area of the 2003 Cedar Fire in San Diego County by Easterbrook (undated). For pre-development C soils in good condition and D soils in poor condition, the choices were 77 and 90, respectively. Post-development curve numbers were selected from Easterbrook's estimation of CN after a high-burn fire; for good C soils CN = 91, and for poor D soils CN = 93.

Effect of Slope on Curve Number

NRCS documents developing the curve number concept and associated methods did not cover the effect of land slope. Independent researchers have given some attention to the question though. Sharpley and Williams (1990) introduced the empirical equation that has been most often used to adjust CN relative to slope:

$$CN_s = 0.333(CN_w - CN)(1 - 2e^{-13.86s}) + CN$$

where CN is the curve number reported in NRCS tables for an average soil moisture condition and assumed slope ≤ 5 percent, CN_s = slope-adjusted CN, CN_w = CN in an initially wet soil condition, and s = slope (ft/ft). Ward and Trimble provided factors to adjust tabulated CN values to obtain CN_w. Carrying through the analysis in this manner demonstrated that results deviated between two assessed slopes (5 and 10 percent) by only around 2-6 percent. This small difference was considered minimal in the context of the approximations and assumptions inherent in the modeling process. While the results presentation gives some additional data on slope effects, full coverage is given only for 5 percent, the topographic basis of the NRCS model and by far the subject of its greatest application.

ESTIMATING INFILTRATION CAPACITY OF THE CASE STUDY SITES

Infiltration Rates

Infiltrating sufficient runoff to maintain pre-development hydrologic characteristics and prevent pollutant transport is the most effective way to protect surface receiving waters. Successfully applying infiltration requires soils and hydrogeological conditions that will pass water sufficiently rapidly to avoid overly-lengthy ponding, while not allowing percolating water to reach groundwater before the soil column captures pollutants.

The study assumed that infiltration would occur in surface facilities and not in below-ground trenches. The use of trenches is certainly possible. However, the intent of this investigation was to determine the ability of pervious areas to manage the site runoff, and their exclusion is consistent with the conservative approach to modeling taken in this analysis. This inquiry was accomplished by evaluating the ability of the predominant soil types identified for each region to provide an infiltration rate of at least 0.5 inch/hour, the rate often regarded in the stormwater management field as the minimum for the use of infiltration practices (e.g., Geosyntec Consultants 2008). The assessment considered soils that either would provide this rate, at a minimum, in their original condition or could be organically amended to augment soil water storage and increase infiltration, while also safeguarding groundwater. Therefore, prevailing groundwater depths were assessed in relation to runoff percolation times generally regarded as safe.

Infiltration rates were based on saturated hydraulic conductivities (obtained from Leij et al. 1996) typical of the basic soil types incorporated in the U.S. Department of Agriculture (USDA, 1987) soil textural triangle. Sand, loamy sand, sandy loam have conductivities well above 0.5 inch/hour. As Table 4 indicates, three of the four regions have a sandy loam as the dominant soil type. For such a soil in the B HSG in these regions, the infiltration rate was taken as 1.74

inch/hour (Leij et al. 1996). Other textures represented that would generally fall in the C group are mostly loam and silt loam. These soil types either have conductivities in excess of 0.5 inch/hour or, in the first author's experience, can be and have been successfully organically amended to produce such a rate and infiltrate accumulated water within 72 hours, and usually less time. The D soils in some study regions, silty clay and clay, were regarded as not amendable to reach 0.5 inch/hour conductivity to host conventional or ARCD-type facilities designed specifically for infiltration. Still, locations with these soils could distribute sheet flow over pervious areas for evapotranspiration and some infiltration at slow rates and could utilize roof downspout surface or subsurface dispersal.

Groundwater Protection Assessment

Avoidance of groundwater contamination was assessed by assuming a hydraulic conductivity generally regarded as the maximum rate for the use of infiltration practices, 2.4 inches/hour (e.g., Geosyntec Consultants 2008), and a minimum spacing to seasonal high groundwater from the bed of an infiltration facility of 4 ft. These conditions would provide a travel time of 20 hours, during which contaminant capture would occur through soil contact. This 20-hour travel time was regarded as a minimum for any soil type. For example, infiltrating on loamy sand with a hydraulic conductivity of 5.7 inches/hour would require minimum spacing from the infiltration surface to groundwater of 10 ft. This consideration did not actually become an issue for analyses in any region in this study, because all predominant soil types have infiltration rates under 2.4 inches/hour and groundwater spacings that exceed 4 ft.

Site Infiltration Capacities

Runoff volumes were estimated for the 85th and 95th percentile, 24-hour events as described previously. Bioretention cell surface area to accommodate these volumes was calculated based on a method in the City of Santa Barbara's Storm Water BMP Guidance Manual (Geosyntec Consultants 2008) (adapted from the Georgia Stormwater Manual (Atlanta Regional Commission, 2001)):

$$A = \frac{(V_{design})(l)}{(t)(k_{design})(d + l)}$$

where:

V_{design} = design volume of runoff to be infiltrated (ft3);

k_{design} = design infiltration rate (in/hr), taken as 0.5 times the typical rate for the soil type naturally or amended as a safety factor;

d = ponding depth (ft), assumed as 0.25 ft for a shallow landscape feature on the recommendation of the Georgia manual;

l = depth of planting media (ft), assumed as 4 ft on the recommendation of the Georgia manual;

t = required drawdown time (hr), taken as 48 hours.

The design variable selections are conservative in applying a safety factor to hydraulic conductivity, using minimum depths for economy and limiting site disruption, and applying a drain time lower than the maximum of 72 hours.

In considering the long-term capacity of a facility designed to infiltrate, the potential for groundwater mounding below or aside the unit is a concern. To avoid this problem a basic analysis was made using a groundwater rise equation from Zomorodi (2005):

$$\text{Rise} = 0.86\,\frac{(K_v)(W)}{(K_h - K_v)}$$

where:

Rise = mounding occurring in a year of use (ft);

K_v = vertical saturated hydraulic conductivity (ft/year);

W = bioretention cell width (ft); and

K_h = horizontal saturated hydraulic conductivity (ft/year).

This equation was solved for K_v for computation of the allowable annual infiltration rate, assuming a rise limited to 1 ft. It was assumed that the bioretention surface area would be broken up to have no more than one basin for each 5 acres of total site area, another measure safeguarding against groundwater mounding. Also assumed was a square cell (i.e., W was computed as the square root of the surface area calculated according to the equation for A above). Horizontal hydraulic conductivites for loams such as represented among the B and C soils in the study regions tend to run in the range of 10 to 1000 meters/year (0.1 to 9 ft/day. A conservative value of 3 ft/day was used in the analysis.

The yearly rate of infiltration from a bioretention cell can be expressed in terms of volume of runoff per unit infiltrating surface area, acre-ft/acre-year, which is equivalent to K_v expressed as ft/year. The K_v value avoiding groundwater monitoring was therefore used to assess maximum annual infiltration capacity by multiplying by the total available pervious surface area. However, the K_v value was capped at a rate found in a study of infiltration capacity and benefits for Los Angeles' San Fernando Valley by Chralowicz et al. (2001). The Los Angeles study posited providing 0.1-0.5 acre for infiltration basins to serve each 5 acres of contributing drainage area. At 2-3 ft deep, it was estimated that such basins could infiltrate 0.90-1.87 acre-ft/year of runoff in San Fernando Valley conditions. Three types of soils predominate in the study area: sandy loams (35 percent of the area), a clay loam (23 percent), and a silty clay loam (29 percent). The balance of 13 percent includes small amounts at both ends of the textural spectrum, a clay and loamy sands. Infiltration rates are in the approximate range of 0.5-2.0 inches/hour, within the span generally regarded as ideal for successful infiltration without threatening groundwater. Computing the ratios of the rate and basin size data of Chralowicz et al. (2001), K_v maximized at approximately 20 acre-ft of runoff/acre infiltration surface-year under the most limiting conditions of soils and basin dimensions. This value was applied in this study if calculated rates were higher, another conservative feature to obtain the most realistic projections of infiltration potential.

In some cases analyzed, the maximum annual infiltration capacity was estimated at greater than post-development runoff volume production. In these instances complete retention would be possible with excess capacity left, and only a fraction of the available pervious area would have to be devoted to bioretention. That fraction was expressed as the ratio of annual runoff production to infiltration capacity.

STORMWATER RUNOFF VOLUME AND POLLUTANT DISCHARGES

Urban Land Use Pollutant Yields

Annual pollutant mass loadings prior to application of any stormwater management practices were estimated as the product of annual runoff volumes produced by the various land use and cover types and pollutant concentrations typical of those areas. General land use types (e.g., single-family residential, commercial) have typically been the basis for measuring and reporting stormwater pollutant data. However, an investigation of ARCD practices of the type of interest in this study demands data on specific land coverages. The literature offers few data on this basis. Those available and used herein were assembled by a consultant to the City of Seattle for a project in which the author participated. They appear in Attachment A (Herrera Environmental Consultants, Inc. undated). Table 7 summarizes the representative values used in the analysis.

Table 7. Pollutant Concentrations in Runoff from Developed Land Uses (after Herrera Environmental Consultants, Inc. undated)

Land Use	Total Suspended Solids (mg/L)	Total Copper (µg/L)	Total Zinc (µg/L)	Total Phosphorus (µg/L)
Residential roof	25	13	159	110
Commercial roof	18	14	281	140
Access road/driveway	120	22	118	660
Parking	75	36	97	140
Walkway	25	13	59	110
Landscaping	213	13	59	2040

Pollutant concentrations expected to occur typically in the mixed runoff from the several land use and cover types making up a development were estimated by mass balance; i.e., the concentrations from the different areas of the sites were combined in proportion to their contribution to the total runoff.

Estimating Retention

The principal interest of this study was to estimate how much of the post-development runoff volume for the various land use cases could be retained by ARCD measures and prevented from discharging from the site on the surface. The analyses initially evaluated the runoff volume that could potentially be infiltrated by using a portion or all of the available pervious area for bioretention facilities. In some instances judicious use of the pervious area could infiltrate the full volume. In other cases use of the pervious area for as much infiltration as possible plus special management of roof runoff would fully attenuate post-development runoff.

Complete retention would, of course, exceed any ordinary regulatory standard intended to govern discharge quantity and quality. To the extent that full retention could not be expected, the study was interested in assessing the degree to which bioretention and roof runoff management could meet the specific potential standards outlined earlier. Performance was estimated in terms of volume retained versus released, the extent to which pre-development groundwater recharge would be preserved, and the pollutant loading reduction accompanying volume retention in comparison to the quantities that would enter receiving waters with no stormwater management actions. These measures expressed in equation form are:

$$\text{Runoff retention (\%)} = \frac{(\text{Volume with no practices} - \text{Volume with ARCD practices})}{\text{Volume with no practices}} \text{x}100$$

(expresses amount of the theoretical maximum post-development runoff prevented from discharging by ARCD)

$$\text{Recharge retention (\%)} = [1 - \frac{(\text{Predevelopment recharge} - \text{Postdevelopment recharge with ARCD})}{\text{Predevelopment recharge}}]\text{x}100$$

Pre-development recharge = Rainfall volume – Predevelopment runoff volume

Post-development recharge = The smaller of rainfall volume or post-development infiltration volume

$$\text{Loading reduction (\%)} = \frac{(\text{Loading with no practices} - \text{Loading with ARCD practices})}{\text{Loading with no practices}} \text{x}100$$

It should be noted that runoff retention and recharge retention express different quantities and are not equal numerically.

When infiltration alone (Basic ARCD) could not accomplish full retention, roof runoff management strategies were selected as appropriate for the land use case (Full ARCD). For the retail commercial development (COMM), roof runoff management was assumed to be accomplished by harvesting, temporarily storing, and applying water to use in the building. To this end, the assumption was made that the commercial development would be able to manage and would have capacity to store and make use of the entire roof runoff volume. While this particular assumption is, on its own, speculative, the commercial development would, as discussed in the section on Application of ARCD Practices, earlier, see a reduction in runoff as a result of evapotranspiration, and would have the option to employ ARCD site design principles to reduce impervious surface area, to install a green roof to retain runoff, or to implement any of a number of other ARCD practices designed to reduce runoff volume and pollutant loading. As a result, the overall analysis of the commercial site remains conservative in its assessment of the potential to retain runoff onsite.

In the three multi-family and single-family residential cases it was assumed that the roof water would be dispersed on or within the pervious area according to accepted and standardized practices. For example, the Washington Department of Ecology's (2005) Stormwater Management Manual for Western Washington provides design criteria for two methods: splash blocks followed by vegetated dispersion areas and gravel-filled trenches. These devices can be used wherever space is sufficient regardless of infiltration rates, as they operate by evapotranspiration and slow infiltration. Even clay can infiltrate at an approximate rate of 0.2 inch/hour or higher (Leij et al. 1996; Pitt, Chen, and Clark 2002). Care was taken to assure that pervious area already allocated to infiltration would not also be counted upon for dispersion. While dispersion was assumed for simplification of the study analyses, in reality a site designer would have the option of using rain barrels, cisterns, and/or green roofs instead of or along with ground dispersion to manage roof water. Analyses for the final case, the redevelopment scenario (REDEV), assumed dispersion and/or small-scale harvesting of roof runoff above whatever level of infiltration could be accomplished given the soil condition.

Additional Analyses When Full Retention Cannot Be Expected

Retaining runoff from impervious and pollutant generating pervious surfaces is the best stormwater management policy, because it prevents the introduction of urban runoff pollutants

to receiving waters as well as serves quantity discharge control requirements. Maintaining pre-development peak flow rates, volumes, and elevated flow durations prevents stream channel and habitat damage, flooding, and loss of groundwater recharge. When conditions were expected to render full retention technically infeasible for the study cases, estimates were made of the volume and pollutant loadings that would be discharged assuming the remaining surface runoff is released to a receiving water with and without treatment. Treatment was assumed to be provided by bioretention discharging either directly on the surface or via an underdrain. While not as environmentally beneficial as retention, such treatment is superior to conventional stormwater management practices like ponds and sand filters. It captures pollutants through a number of mechanisms as contaminants are held for a time in the facility and contact vegetation and soil, such as sedimentation, filtration by plants, and adsorption and ion exchange in soil.

The effectiveness of bioretention in removing pollutants from surface runoff was estimated according to measurements by Chapman and Horner (2010). This study was performed on a linear bioretention device located on a slope and made up of a number of cells separated by weirs (termed a “cascade”). While an estimated 74 percent of all entering runoff infiltrated or evapotranspired before discharging, the flows reaching the end in the larger storms would have less residence time in the facility than in a unit on flat ground percolating water through soil before surface discharge via an underdrain. Therefore, pollutant concentrations exiting such a unit could be less yet. On the other hand, some bioretention facilities bypass the relatively rare higher flows, affording no treatment, while the cascade was designed to convey all runoff, even beyond its water quality design storm flow, and provide some treatment. On balance between the advantage and disadvantage of the facility providing the data, the discharge concentrations are considered to be representative of bioretention.

Chapman and Horner (2010) computed volume-weighted average discharge pollutant concentrations by multiplying concentrations times flow volumes for each monitored storm, summing, and dividing by total volume. The resulting values for the contaminants considered in this study are: total suspended solids (TSS)—30 mg/L, total copper—6.3 µg/L, total zinc—47 µg/L, and total phosphorus—133 µg/L. In a few instances these concentrations are higher than those in Table 7, an expression of the observation sometimes made in stormwater management that treatment cannot reduce concentrations in relatively “clean” flows below certain minimum values. In these situations the concentrations in Table 8 were also used in computing discharge loadings; i.e., no concentration reduction was applied in estimating discharge loadings, although flow volume would still be decreased to the extent infiltration could occur.

RESULTS OF THE ANALYSIS

ASSESSMENT OF MAXIMUM ARCD CAPABILITIES

Runoff Retention and Groundwater Recharge

Basic ARCD

One goal of this exercise was to determine if ARCD practices could eliminate post-development runoff production, and the pollutants it transports, and maintain pre-development groundwater recharge. The first assessment, termed the Basic ARCD analysis in this report, was to estimate if each site's pervious area is sufficient for full infiltration if given to this purpose to the extent necessary without compromising other uses. Accordingly, shallow, unobtrusive bioretention cells (i.e., rain gardens) are envisioned, dispersed through sites at no more than one for each 5 acres. It bears reemphasis that no credit was taken for water loss through evapotranspiration in this assessment, although a substantial, but not necessarily easily quantifiable, amount would undoubtedly occur. Estimates of runoff retention are therefore conservative.

Table 8 presents comparisons, for the Southeast climate region, between estimated annual runoff volumes generated before development and then post-development with and without Basic ARCD stormwater management. The table also gives annual groundwater recharge estimates for these same conditions.

Table 8. Runoff and Groundwater Recharge Volumes with Basic ARCD: Southeast Climate Region[a]

Period	Volume (acre-ft) or Percentage Measure	MFR	Sm-SFR	Lg-SFR	COMM	REDEV
B soil						
Pre-dev.	Runoff	0.046	0.013	0.56	0.022	0.001
	Recharge	44.7	12.4	539	21.2	0.51
Post-dev.	Runoff without stormwater practices	29.5	6.85	298	18.7	0.45
	Runoff retained with Basic ARCD	29.5	6.85	298	8.30	0.21
	Runoff released with Basic ARCD	0	0	0	10.4	0.25
	Runoff retention (%)	100%	100%	100%	44%	45%
	Recharge without stormwater practices	15.3	5.55	241	2.53	0.06
	Recharge with Basic ARCD	44.7	12.4	539	8.30	0.21
	Recharge retention (%)	100%	100	100%	39%	40%
	Pervious area needed (%)[b]	36%	22%	22%	100%	100%
D soil						
Pre-dev.	Runoff	13.5	3.76	163	6.43	0.16
	Recharge	31.2	8.64	376	14.8	0.36
Post-dev.	Runoff without stormwater practices	Full ARCD needed to maximize retention on D soil				
	Runoff retained with Basic ARCD					
	Runoff released with Basic ARCD					
	Runoff retention (%)					
	Recharge without stormwater practices	11.6	4.17	181	2.12	0.05
	Recharge with Basic ARCD	Full ARCD needed to maximize retention on D soil				
	Recharge retention (%)	37%	48%	48%	14%	14%
	Pervious area needed (%)[b]	Full ARCD needed to maximize retention on D soil				

[a] Pre-dev.—pre-development; post-dev.—post-development; ARCD—aquatic resources conservation design; MFR—multi-family residential; Sm-SFR—small-scale single-family residential; Lg-SFR—large-scale single-family residential; COMM—retail commercial; REDEV—infill redevelopment; Basic ARCD—infiltrating bioretention; runoff—quantity of water discharged from the site on the surface; recharge--quantity of water infiltrating the soil

[b] Proportion of the total pervious area on the site required for bioretention to achieve given results

In all cases the majority of the infiltration that would recharge groundwater in the undeveloped state would be lost to surface runoff after development. These losses would approach 90 percent in the most impervious developments. The greatly increased surface flow would raise peak flow rates and volumes in receiving water courses, increase flooding risk, and transport pollutants.

Basic ARCD could retain all post-development runoff and pre-existing groundwater recharge in the three residential cases on the B soils, using from less than one-fourth to just over one-third of the available pervious area for bioretention cells. Taking all available pervious area for the more highly impervious COMM and REDEV cases on B soil, bioretention would retain about 45 percent of the runoff generated and save about 40 percent of the pre-development recharge. To illustrate the relatively small role that slope increase from 5 to 10 percent plays in runoff retention, full retention would still be expected in the three residential cases and for the remaining two cases (COMM and REDEV) would decrease from 44-45 percent only slightly to 40-41 percent (not shown in table).

On the D soil, infiltrating bioretention may not be technically feasible and was not relied upon for retention estimates. Without the use of additional measures in the Full ARCD category, only incidental post-development runoff would be retained; and most pre-development recharge would be lost.

Tables 9-11 are companions to Table 8 for the South Central, Northeast – Upper Midwest, and Southwest climate regions, respectively. Results for the Northeast - Upper Midwest B soil are very close to those for the Southeast B soil, as would be expected given the similar precipitation quantities and soil characteristics. In the three regions having C soils, Basic ARCD can retain all runoff for the MFR, Sm-SFR, and Lg-SFR residential cases. With these soils, except in the Southwest, achieving full retention requires more of the available pervious area than with B soils, up to 69 percent, but is still fully attainable.

The effect of lower rainfall is evident in the South Central and, especially, the Southwest regions. In the latter location, not only the residential cases but also the COMM and REDEV scenarios can achieve full runoff retention with Basic ARCD on the C soil. The residential cases need much smaller percentages of the available pervious area for bioretention than for the same cases on C and even B soils elsewhere. Applying Basic ARCD to the South Central, C soil, REDEV case results in higher runoff retention than for the B soil cases in higher rainfall regions.

The study cases demonstrated two interesting points about groundwater recharge. First, with effective infiltrating bioretention it is possible for post-development annual recharge to exceed the pre-development quantity. This phenomenon is most evident in comparing the two amounts for cases with 100 percent runoff retention on C soils, which in the natural state produce much less recharge in relation to runoff than B soils. The B soils have a recharge-to-runoff ratio of about 500, whereas that ratio is only 4-6 for the C soils studied. One reason for higher post- compared to pre-development recharge is that bioretention is set up to hold water, increasing the time for infiltration to occur, instead of letting it run off. Another is that soils, especially in the C HSG, are often improved by organic amendments to yield both more water storage capacity and higher infiltration rates than the pre-existing soils.

A related point is that the percentage of pre-development recharge retained after development can be higher with C than B soils. This situation can best be seen in cases without full runoff retention, COMM and sometimes REDEV. In terms of recharge, installing bioretention conveys a greater advantage to the C than the B soils, which already have more pore space for water storage and higher infiltration and recharge rates.

Table 9. Runoff and Groundwater Recharge Volumes with Basic ARCD: South Central Climate Region[a]

Period	Volume (acre-ft) or Percentage Measure	MFR	Sm-SFR	Lg-SFR	COMM	REDEV
C soil						
Pre-dev.	Runoff	4.10	1.14	49.4	1.95	0.05
	Recharge	25.7	7.13	310	12.2	0.29
Post-dev.	Runoff without stormwater practices	21.2	5.15	224	12.7	0.31
	Runoff retained with Basic ARCD	21.2	5.15	224	4.33	0.21
	Runoff released with Basic ARCD	0	0	0	8.32	0.10
	Runoff retention (%)	100	100	100	34	67
	Recharge without stormwater practices	8.62	3.11	135	1.51	0.03
	Recharge with Basic ARCD	29.8	8.3	359	4.33	0.21
	Recharge retention (%)	100	100	100	38	70
	Pervious area needed (%)[b]	51	23	30	100	100
D soil						
Pre-dev.	Runoff	18.5	5.14	223	8.80	0.21
	Recharge	11.3	3.13	136	5.36	0.13
Post-dev.	Runoff without stormwater practices	Full ARCD needed to maximize retention on D soil				
	Runoff retained with Basic ARCD					
	Runoff released with Basic ARCD					
	Runoff retention (%)					
	Recharge without stormwater practices	7.23	7.59	112	1.35	0.03
	Recharge with Basic ARCD	Full ARCD needed to maximize retention on D soil				
	Recharge retention (%)	64	83	83	25	24
	Pervious area needed (%)[b]	Full ARCD needed to maximize retention on D soil				

Table 10. Runoff and Groundwater Recharge Volumes with Basic ARCD: Northeast – Upper Midwest Climate Region[a]

Period	Volume (acre-ft) or Percentage Measure	MFR	Sm-SFR	Lg-SFR	COMM	REDEV
B soil						
Pre-dev.	Runoff	0.04	0.01	0.54	0.02	0.001
	Recharge	42.9	11.9	517	20.4	0.49
Post-dev.	Runoff without stormwater practices	28.3	6.68	286	18.0	0.44
	Runoff retained with Basic ARCD	28.3	6.68	286	8.53	0.21
	Runoff released with Basic ARCD	0	0	0	9.43	0.23
	Runoff retention (%)	100	100	100	48	47
	Recharge without stormwater practices	14.6	5.32	231	2.42	0.06
	Recharge with Basic ARCD	42.9	11.9	517	8.53	0.21
	Recharge retention (%)	100	100	100	42	42
	Pervious area needed (%)[b]	34	21	21	100	100
C soil						
Pre-dev.	Runoff	7.87	2.18	94.8	3.74	0.09
	Recharge	35.1	9.72	422	16.6	0.40
Post-dev.	Runoff without stormwater practices	30.5	7.42	323	18.2	0.44
	Runoff retained with Basic ARCD	30.5	7.42	323	4.57	0.21
	Runoff released with Basic ARCD	0	0	0	13.6	0.24
	Runoff retention (%)	100	100	100	25	47
	Recharge without stormwater practices	12.4	4.48	195	2.17	0.05
	Recharge with Basic ARCD	42.9	11.9	517	4.57	0.21
	Recharge retention (%)	100	100	100	27	51
	Pervious area needed (%)[b]	69	31	40	100	100

Table 11. Runoff and Groundwater Recharge Volumes with Basic ARCD: Southwest Climate Region[a]

Period	Volume (acre-ft) or Percentage Measure	MFR	Sm-SFR	Lg-SFR	COMM	REDEV
C soil						
Pre-dev.	Runoff	1.62	0.45	19.5	0.77	0.02
	Recharge	7.22	2.00	87.0	3.43	0.08
Post-dev.	Runoff without stormwater practices	6.41	1.57	68.5	3.77	0.09
	Runoff retained with Basic ARCD	6.41	1.57	68.5	3.77	0.09
	Runoff released with Basic ARCD	0	0	0	0	0
	Runoff retention (%)	100	100	100	100	100
	Recharge without stormwater practices	2.43	0.88	38.1	0.43	0.01
	Recharge with Basic ARCD	8.84	2.45	107	4.20	0.10
	Recharge retention (%)	100	100	100	100	100
	Pervious area needed (%)[b]	12	5	7	69	44
D soil						
Pre-dev.	Runoff	4.47	1.24	53.8	2.12	0.05
	Recharge	4.37	1.21	52.7	2.08	0.05
Post-dev.	Runoff without stormwater practices	Full ARCD needed to maximize retention on D soil				
	Runoff retained with Basic ARCD					
	Runoff released with Basic ARCD					
	Runoff retention (%)					
	Recharge without stormwater practices	2.14	0.77	33.3	0.40	0.01
	Recharge with Basic ARCD	Full ARCD needed to maximize retention on D soil				
	Recharge retention (%)	49	63	63	19	18
	Pervious area needed (%)[b]	Full ARCD needed to maximize retention on D soil				

Full ARCD

Infiltration is one of a wide variety of ARCD-based source reduction techniques. Where site conditions such as soil quality or available area limit a site's infiltration capacity, other ARCD measures can enhance a site's runoff retention capability. Such practices can also be used where infiltration capacity is adequate, but the developer desires greater flexibility for land use on-site. Among those techniques, this study considered special management of roof water in those cases where bioretention could not infiltrate all post-development runoff.

Specifically, water harvesting for supply of irrigation and/or non-potable indoor uses was investigated for the retail commercial development. In residential cases with insufficient capacity for infiltrative bioretention but remaining space not already devoted to infiltration, efficiently directing roof runoff into the soil through downspout dispersion systems was the method of choice. Such cases invariably occurred with HSG D soils. The Full-ARCD scenario applied to the redevelopment case was roof water dispersion, harvesting, or a combination of the two practices. Generally speaking, infiltration consumed all available pervious area in the REDEV cases on B and C soils, making roof runoff harvesting the mechanism to retain more water. With no bioretention facility on D soil, the pervious area would be available for dispersion. Of course, harvesting could be applied instead of or along with dispersion. Again, it was assumed that that the commercial and, as needed, redevelopment sites had capacity to harvest and make use of the full volume of roof runoff generated, however, the analysis remains conservative in terms of the potential for onsite retention as it does not consider the use of ARCD site design principles to reduce impervious surfaces, green roofs, and evaporation/evapotranspration from surfaces other than rooftops.

Table 12 gives Southeast climate region results with the addition of Full ARCD techniques: roof runoff management, consisting of harvesting for reuse in the COMM case, dispersion on or within pervious land for the three residential cases, and a combination of these measures for REDEV. On the B soil runoff retention would approximately double for the retail commercial

land use and reach 100 percent for the redevelopment. Groundwater recharge would not be expected to increase over the Basic ARCD case, though; because harvesting still keeps water out of the soil system.

For development on the D soil, use of roof runoff management techniques was estimated to increase runoff retention from zero to about one-third to two-thirds of the post-development runoff generated, depending on the land use case. Groundwater recharge would not materially benefit, however; because harvest does not contribute to it. Also, no recharge credit was taken for dispersion, since infiltration is restricted and loss by ET would tend to occur before infiltration. Some small amount of recharge would still be likely though. To illustrate further the small role of topography, in this D soil, Full ARCD scenario runoff retention is forecast to decrease by only 1-2 percent at a 10 percent slope compared to a 5 percent slope (not shown in table).

Table 12. Runoff and Groundwater Recharge Volumes with Full ARCD: Southeast Climate Region[a]

Period	Volume (acre-ft) or Percentage Measure	MFR	Sm-SFR	Lg-SFR	COMM	REDEV
B soil						
Pre-dev.	Runoff	0.046	0.013	0.56	0.022	0.001
	Recharge	44.7	12.4	539	21.2	0.51
Post-dev.	Runoff without stormwater practices	Complete retention possible with Basic ARCD			18.7	0.45
	Runoff retained with Full ARCD				16.1	0.45
	Runoff released with Full ARCD				2.66	0
	Runoff retention (%)				86%	100%
	Recharge without stormwater practices				2.53	0.06
	Recharge with Full ARCD				8.30	0.21
	Recharge retention (%)				39%	40%
	Pervious area needed (%)[b]				100%	100%
D soil						
Pre-dev.	Runoff	13.5	3.76	163	6.43	0.16
	Recharge	31.2	8.64	376	14.8	0.36
Post-dev.	Runoff without stormwater practices	33.1	8.23	358	19.1	0.46
	Runoff retained with Full ARCD	16.4	3.11	135	7.76	0.31
	Runoff released with Full ARCD	16.7	5.12	222	11.4	0.16
	Runoff retention (%)	50%	38%	38%	41%	66%
	Recharge without stormwater practices	11.6	4.17	181	2.12	0.05
	Recharge with Full ARCD	11.6	4.17	181	2.12	0.05
	Recharge retention (%)	37.2%	48.3%	48.3%	14.3%	13.6%
	Pervious area needed (%)[b]	100%	100%	100%	100%	100%

[a] Pre-dev.—pre-development; post-dev.—post-development; ARCD—aquatic resources conservation design; MFR—multi-family residential; Sm-SFR—small-scale single-family residential; Lg-SFR—large-scale single-family residential; COMM—retail commercial; REDEV—infill redevelopment; Full ARCD—infiltrating bioretention, roof runoff harvesting, and/or roof runoff dispersion; runoff—quantity of water discharged from the site on the surface; recharge--quantity of water infiltrating the soil
[b] Proportion of the total pervious area on the site required for bioretention to achieve given results

Tables 13-15 give data analogous to Table 12 for the South Central, Northeast – Upper Midwest, and Southwest climate regions, respectively. Results are similar to those reported for the Southeast region. Full ARCD can approximately double runoff retention from the Basic ARCD level for the COMM case and extend runoff retention to 100 percent for the redevelopment on both B and C soils. Once again, application of Full ARCD to the D soil cases increases runoff retention from zero to one-third to two-thirds of the volume produced, depending on land use case.

Table 13. Runoff and Groundwater Recharge Volumes with Full ARCD: South Central Climate Region[a]

Period	Volume (acre-ft) or Percentage Measure	MFR	Sm-SFR	Lg-SFR	COMM	REDEV
C soil						
Pre-dev.	Runoff	4.10	1.14	49.4	1.95	0.05
	Recharge	25.7	7.13	310	12.2	0.29
Post-dev.	Runoff without stormwater practices	Complete retention possible with Basic ARCD			12.7	0.31
	Runoff retained with Full ARCD				9.51	0.31
	Runoff released with Full ARCD				3.15	0
	Runoff retention (%)				75	100
	Recharge without stormwater practices				1.51	0.03
	Recharge with Full ARCD				4.33	0.21
	Recharge retention (%)				35	72
	Pervious area needed (%)[b]				100	100
D soil						
Pre-dev.	Runoff	18.5	5.14	223	8.80	0.21
	Recharge	11.3	3.13	136	5.36	0.13
Post-dev.	Runoff without stormwater practices	22.6	5.68	247	12.8	0.31
	Runoff retained with Full ARCD	11.0	2.08	90.3	5.17	0.20
	Runoff released with Full ARCD	11.6	3.60	157	7.63	0.11
	Runoff retention (%)	49	37	37	40	66
	Recharge without stormwater practices	7.23	2.59	112	1.35	0.03
	Recharge with Full ARCD	7.23	2.59	112	1.35	0.03
	Recharge retention (%)	64	83	83	25	24
	Pervious area needed (%)[b]	100	100	100	100	100

Table 14. Runoff and Groundwater Recharge Volumes with Full ARCD: Northeast – Upper Midwest Climate Region[a]

Period	Volume (acre-ft) or Percentage Measure	MFR	Sm-SFR	Lg-SFR	COMM	REDEV
B soil						
Pre-dev.	Runoff	0.04	0.01	0.54	0.02	0.001
	Recharge	42.9	11.9	51.7	20.4	0.49
Post-dev.	Runoff without stormwater practices	Complete retention possible with Basic ARCD			18.0	0.44
	Runoff retained with Full ARCD				16.0	0.44
	Runoff released with Full ARCD				2.00	0
	Runoff retention (%)				89	100
	Recharge without stormwater practices				2.42	0.06
	Recharge with Full ARCD				8.53	0.21
	Recharge retention (%)				42	43
	Pervious area needed (%)[b]				100	100
C soil						
Pre-dev.	Runoff	7.87	2.18	94.8	3.74	0.09
	Recharge	35.1	9.72	422	16.6	0.40
Post-dev.	Runoff without stormwater practices	Complete retention possible with Basic ARCD			18.2	0.44
	Runoff retained with Full ARCD				12.0	0.44
	Runoff released with Full ARCD				6.19	0
	Runoff retention (%)				66	100
	Recharge without stormwater practices				2.17	0.05
	Recharge with Full ARCD				4.57	0.21
	Recharge retention (%)				28	43
	Pervious area needed (%)[b]				100	100

Table 15. Runoff and Groundwater Recharge Volumes with Full ARCD: Southwest Climate Region[a]

Period	Volume (acre-ft) or Percentage Measure	MFR	Sm-SFR	Lg-SFR	COMM	REDEV
C soil						
Pre-dev.	Runoff	1.62	0.45	19.5	0.77	0.02
	Recharge	7.22	2.00	87.0	3.43	0.08
Post-dev.	Runoff without stormwater practices	Complete retention possible with Basic ARCD				
	Runoff retained with Full ARCD					
	Runoff released with Full ARCD					
	Runoff retention (%)					
	Recharge without *stormwater* practices					
	Recharge with Full ARCD					
	Recharge retention (%)					
	Pervious area needed (%)[b]					
D soil						
Pre-dev.	Runoff	4.47	1.24	53.8	2.12	0.05
	Recharge	4.37	1.21	52.7	2.08	0.05
Post-dev.	Runoff without stormwater practices	6.70	1.68	73.2	3.80	0.09
	Runoff retained with Full ARCD	3.25	0.62	26.8	1.53	0.06
	Runoff released with Full ARCD	3.45	1.07	46.5	2.26	0.03
	Runoff retention (%)	49	37	37	40	66
	Recharge without stormwater practices	2.14	0.77	33.3	0.40	0.01
	Recharge with Full ARCD	2.14	0.77	33.3	0.40	0.01
	Recharge retention (%)	49	63	63	19	18
	Pervious area needed (%)[b]	100	100	100	100	100

Pollutant Loading Reductions

The examination of maximum ARCD capabilities considered the reductions of annual mass loadings of four water pollutants that would accompany runoff retention. Since retention means no surface discharge, these loading reductions are, at a minimum, equal to the percentages of runoff retention. In those cases with less than full runoff retention, there is good reason to expect pollutant loading reductions higher than the percentage of runoff retained. The early runoff ("first flush"), occurring when the soils are least saturated, is more likely to be retained than later runoff. It is frequently observed that the first flush has higher pollutant concentrations than later runoff, particularly in the wash off after relatively extended dry periods.

For the B and D soil and the residential cases on C soils, the reductions were very consistent among regions:

- B and C soils, Basic ARCD, residential cases—100%;
- B soil, Basic ARCD, COMM and REDEV cases—44-45%;
- B soil, Full ARCD, COMM and REDEV cases—86-100%;
- D soil, Full ARCD, SFR and COMM cases—38-41%;
- D soil, Full ARCD, MFR case—50%; and
- D soil, Full ARCD, REDEV case—66%.

For the most highly impervious cases, COMM and REDEV, on C soils reduction was variable and dependent on precipitation. With Basic ARCD the range was from 25 to 100 percent, going from relatively high to low precipitation. Full ARCD is expected to raise the lowest reductions to 100 percent for REDEV and at least 66 percent for COMM.

Therefore, taking the greatest advantage of what ARCD offers could prevent the addition to receiving waters of all or almost all pollutant mass that would otherwise discharge from a range

of urban developments on B and C soils. With D soils, Full ARCD can accomplish loading reductions approaching or somewhat exceeding 50 percent.

ABILITY TO MEET POTENTIAL STANDARDS

General Summary

This section evaluates the ability of the Basic and Full ARCD strategies to meet each of the five potential stormwater management standards enumerated in the beginning of the report. It also examines the extent of pollutant loading reduction if the standards are just met; i.e., if runoff is retained at the minimum needed to meet the standard. It has already been demonstrated that retention of all post-development runoff and full pollutant attenuation is possible in some circumstances. Table 16 summarizes the results for all regions and cases and both ARCD strategies.

Ability to Meet Standards

The projected ability to meet the standards overall varies mostly in relation to soil type (B or C versus D) and the relative imperviousness of development, and much less across climate regions. The one exception to this generality is that implementing Basic ARCD practices on the Southwest region C soil would meet all five standards. This uniformity does not occur elsewhere on either B or C soils, and is apparently primarily a function of the relatively low precipitation in the region.

Setting aside the Southwest region, success in complying with standards is mostly comparable among the various B and C soils, with a small number of instances where a development type meets a standard on B but not on C soil. Basic ARCD methods invariably can meet all standards on B and C soils for the residential development cases (MFR and Sm- and Lg-SFR). Full ARCD practices are forecast to meet all standards for the redevelopment case on B soils but only standards 1 and 5 consistently on C soils. The combination of infiltration and roof runoff management applied to the retail commercial development allows meeting these same two standards on B soils but only the latter on both of the C soils occurring outside the Southwest region. The only standards that cannot be met on B and C soils by the ARCD methods considered are standards 2-4 for the COMM case. Therefore, of the 125 standards assessments, ARCD practices are projected to meet 113 (90.4 percent) with B and C soils.

The ability to meet these standards is much reduced on D soils. Standard 1 can be met occasionally with Full ARCD used in the redevelopment. All cases with Full ARCD comply with standard 4 on this soil where pre-development runoff is estimated to be relatively high, reflecting a low overall requirement for retention volume. Standard 5 can be met with Full ARCD with the exception of one COMM case. Standards 2 and 3 were never estimated to be met in any D soil case. All in all, with this soil 26 of the 75 scenarios (34.7 percent) are expected to meet a standard.

Table 16. Ability to Meet Potential Regulatory Standards with Basic/Full ARCD Practices

Region-Case[a]	Standards Met—Basic ARCD[b]	Standards Met—Full ARCD[b]	Runoff Retention and Pollutant Loading Reduction (%)[b, c]				
			Std. 1	Std. 2	Std. 3	Std. 4	Std. 5
SE(B)-MFR	1, 2, 3, 4, 5		63	87	90	>99	63
Sm-SFR	1, 2, 3, 4, 5		63	87	90	>99	63
Lg-SFR	1, 2, 3, 4, 5		63	87	90	>99	63
COMM		1, 5	63	86	86	86	63
REDEV		1, 2, 3, 4, 5	63	87	90	>99	63
SE(D)-MFR		5	50	50	50	50	37
Sm-SFR		5	38	38	38	38	34
Lg-SFR		5	38	38	38	38	34
COMM			41	41	41	41	41
REDEV		1, 5	63	66	66	66	42
SC(C)-MFR	1, 2, 3, 4, 5		58	82	90	81	47
Sm-SFR	1, 2, 3, 4, 5		58	82	90	78	45
Lg-SFR	1, 2, 3, 4, 5		58	82	90	78	45
COMM		1, 5	58	75	75	75	49
REDEV		1, 2, 3, 4, 5	58	82	90	84	49
SC(D)-MFR		4, 5	49	49	49	18	10
Sm-SFR		4, 5	37	37	37	10	6
Lg-SFR		4, 5	37	37	37	10	6
COMM		4, 5	40	40	40	31	18
REDEV		1, 4, 5	58	66	66	32	18
NM(B)-MFR	1, 2, 3, 4, 5		81	89	90	>99	81
Sm-SFR	1, 2, 3, 4, 5		81	89	90	>99	81
Lg-SFR	1, 2, 3, 4, 5		81	89	90	>99	81
COMM		1, 2, 5	81	89	89	89	81
REDEV		1, 2, 3, 4, 5	81	89	90	>99	81
NM(C)-MFR	1, 2, 3, 4, 5		81	89	90	74	60
Sm-SFR	1, 2, 3, 4, 5		81	89	90	71	57
Lg-SFR	1, 2, 3, 4, 5		81	89	90	71	57
COMM		5	66	66	66	66	64
REDEV		1, 2, 3, 4, 5	81	89	90	80	64
SW(C)-MFR	1, 2, 3, 4, 5		62	83	90	75	46
Sm-SFR	1, 2, 3, 4, 5		62	83	90	72	44
Lg-SFR	1, 2, 3, 4, 5		62	83	90	72	44
COMM	1, 2, 3, 4, 5		62	83	90	80	49
REDEV	1, 2, 3, 4, 5		62	83	90	80	49
SW(D)-MFR		4, 5	49	49	49	33	21
Sm-SFR		4, 5	37	37	37	27	16
Lg-SFR		4, 5	37	37	37	27	16
COMM		5	40	40	40	40	27
REDEV		1, 4, 5	62	66	66	44	28

[a] Region (hydrologic soil group)—land use; regions: SE—Southeast, SC—South-central, NM—Northeast-Upper Midwest, SW—Southwest; land uses: MFR—multi-family residential, Sm-SFR—small single-family residential, Lg-SFR--large single-family residential, COMM—retail commercial, REDEV--redevelopment

[b] Standard (Std.) 1—Retain the runoff produced by the 85th percentile, 24-hour precipitation event
Standard 2—Retain the runoff produced by the 95th percentile, 24-hour precipitation event
Standard 3—Retain 90 percent of the average annual post-development runoff volume
Standard 4—Retain the difference between the post- and pre-development average annual runoff volumes
Standard 5—Retain the difference between the post- and pre-development runoff volumes for all events up to and including the 85th percentile, 24-hour precipitation event

[c] Reduction estimated to result from meeting the standard, to the extent it can be met (fully met if so indicated in preceding columns), without treatment of remaining discharge. Where a standard can be met using Basic or Full ARCD application it is indicated in black, where a standard cannot be met using Basic or Full ARCD it is highlighted red.

Figure 4a. Ability to Meet Potential Regulatory Standards with Basic/Full ARCD Practices for Southeast Climate Region

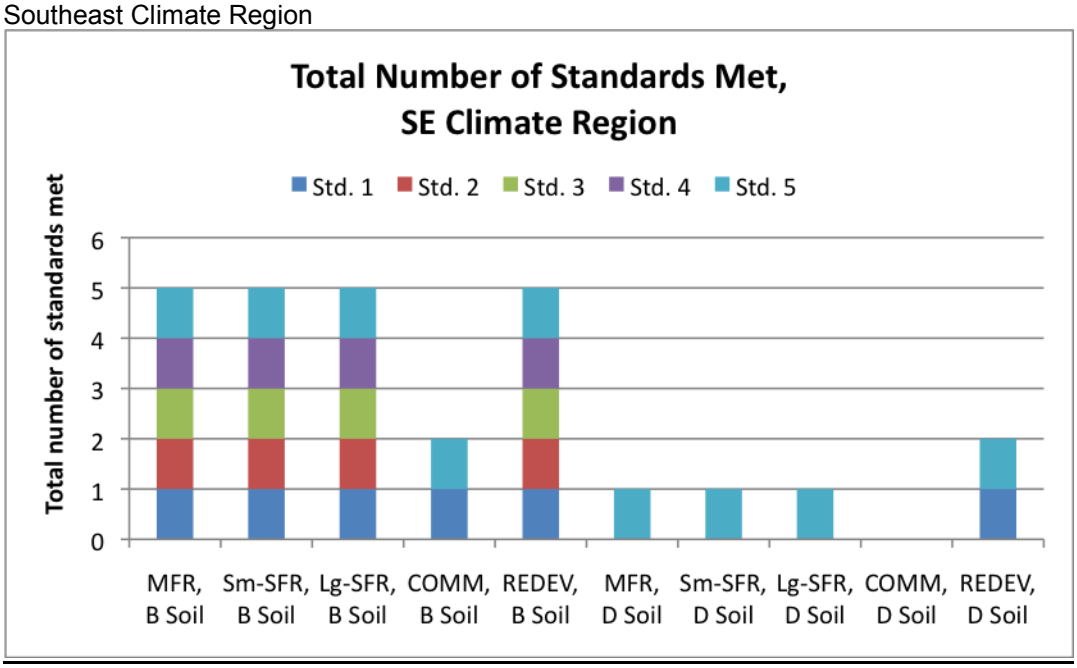

MFR—multi-family residential, Sm-SFR—small single-family residential, Lg-SFR--large single-family residential, COMM—retail commercial, REDEV—redevelopment. Standard (Std.) 1—Retain the runoff produced by the 85th percentile, 24-hour precipitation event; Standard 2—the 95th percentile, 24-hour precipitation event; Standard 3—90 percent of the average annual post-development runoff volume; Standard 4—the difference between the post- and pre-development average annual runoff volumes; and, Standard 5—the difference between the post- and pre-development runoff volumes for all events up to and including the 85th percentile, 24-hour precipitation event

Figure 4b. Ability to Meet Potential Regulatory Standards with Basic/Full ARCD Practices for South Central Climate Region

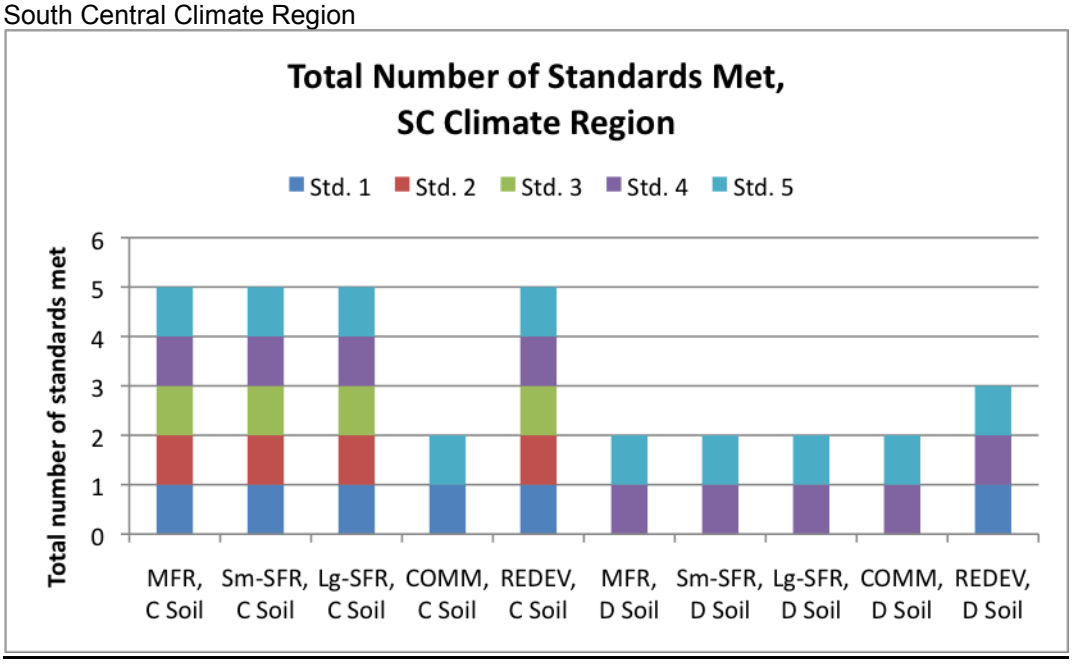

Figure 4c. Ability to Meet Potential Regulatory Standards with Basic/Full ARCD Practices for Northeast-Midwest Climate Region

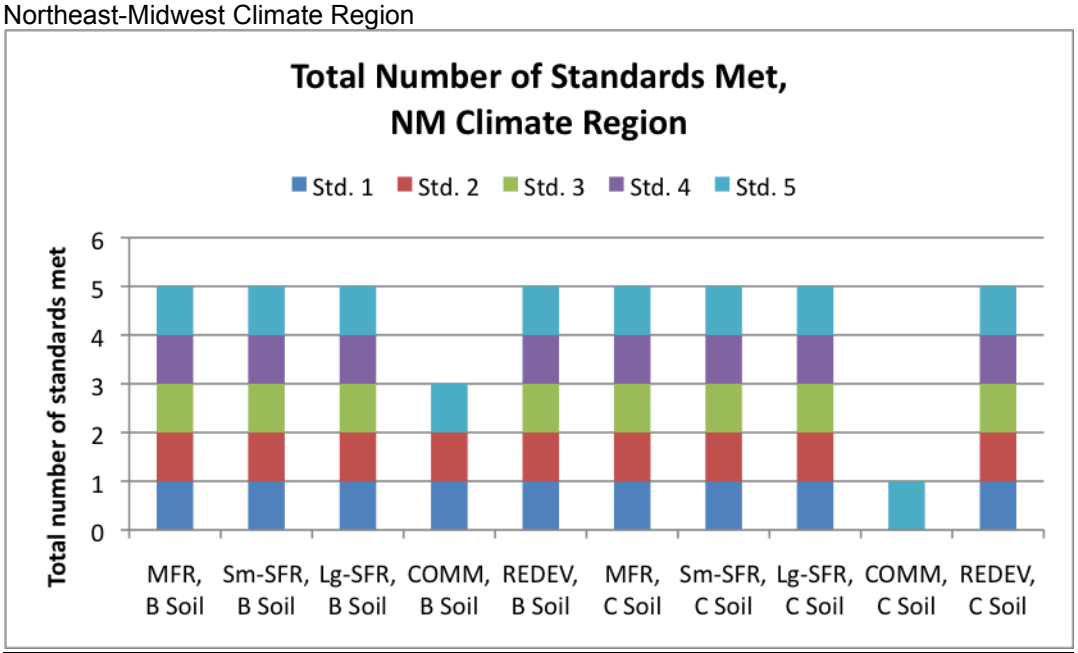

Figure 4d. Ability to Meet Potential Regulatory Standards with Basic/Full ARCD Practices for Southwest Climate Region

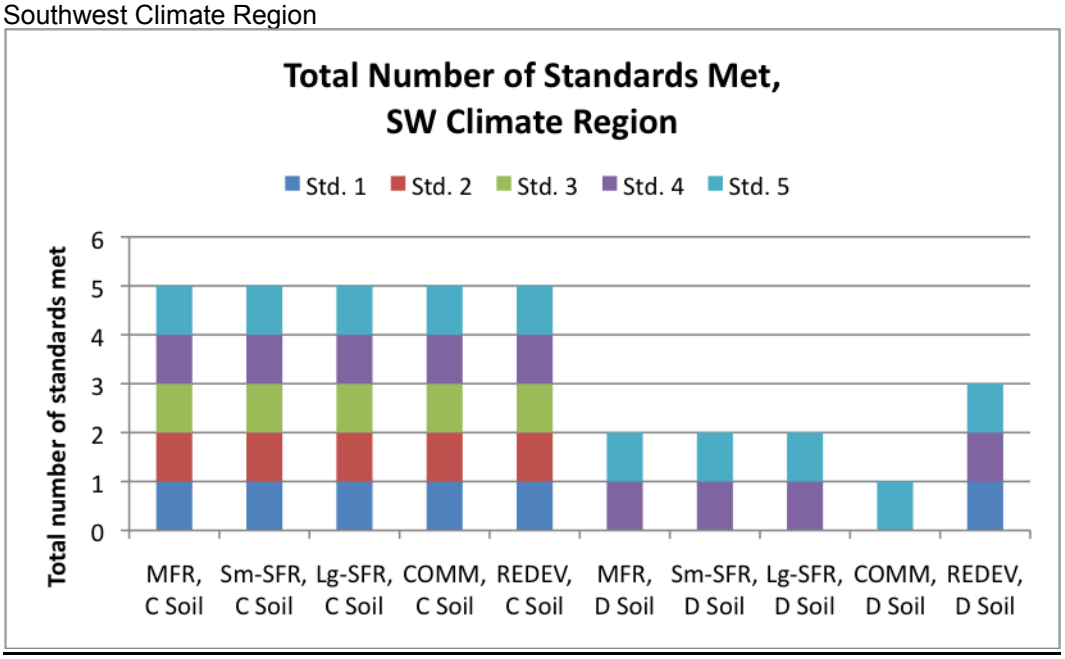

Figure 5a. Percentage of Runoff Retained Relative to Standards 1 (85th Percentile, 24-hour precipitation event) and 2 (95th Percentile event) for Southeast Climate Region

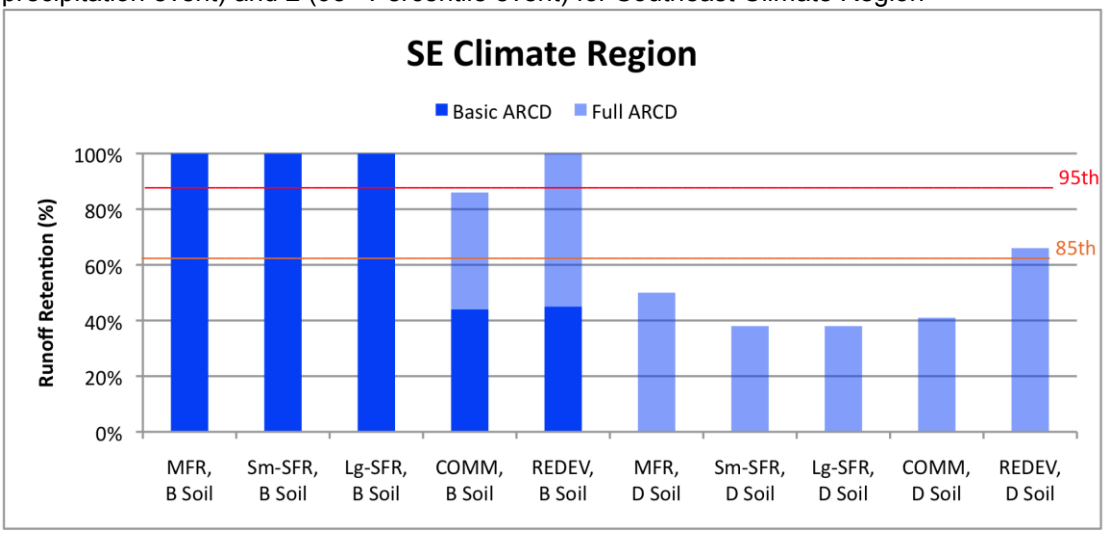

MFR—multi-family residential, Sm-SFR—small single-family residential, Lg-SFR--large single-family residential, COMM—retail commercial, REDEV—redevelopment. Standard (Std.) 1—Retain the runoff produced by the 85th percentile, 24-hour precipitation event; Standard 2—the 95th percentile, 24-hour precipitation event; Standard 3—90 percent of the average annual post-development runoff volume; Standard 4—the difference between the post- and pre-development average annual runoff volumes; and, Standard 5—the difference between the post- and pre-development runoff volumes for all events up to and including the 85th percentile, 24-hour precipitation event

Figures 5a-d show the percentage of runoff that can be retained for each development type, in each region, using either Basic or Full ARCD practices, in comparison with Standard 1 (retention of the 85th percentile, 24-hour precipitation event) and Standard 2 (retention of the 95th percentile, 24 hour event). Even where Standards 1 and 2 cannot be met in full, ARCD practices can still result in substantial compliance, and retention of significant runoff volume.

Figure 5b. Percentage of Runoff Retained Relative to Standards 1 (85th Percentile, 24-hour precipitation event) and 2 (95th Percentile event) for South Central Climate Region

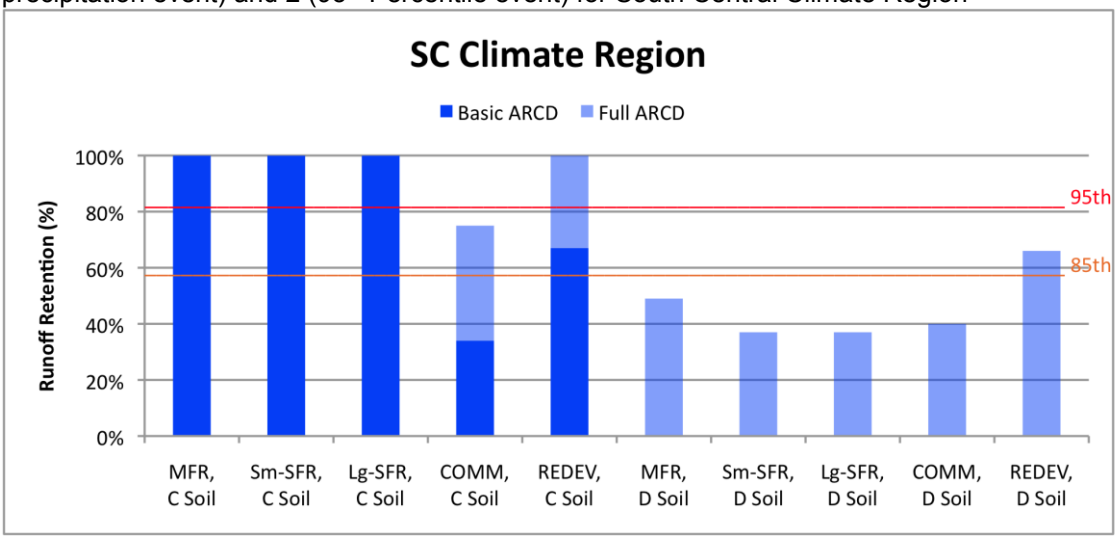

Figure 5c. Percentage of Runoff Retained Relative to Standards 1 (85th Percentile, 24-hour precipitation event) and 2 (95th Percentile event) for Northeast-Midwest Region

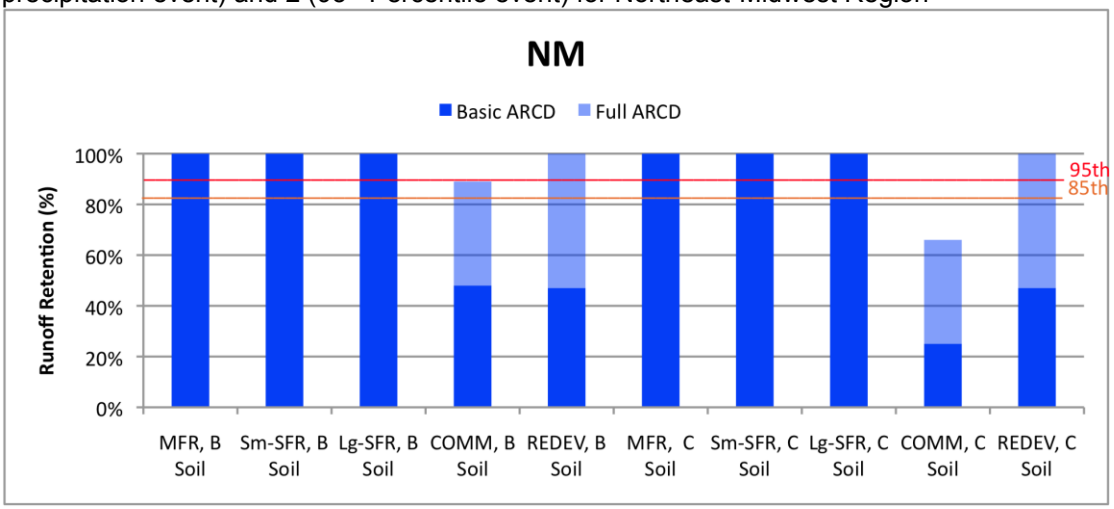

Figure 5d. Percentage of Runoff Retained Relative to Standards 1 (85th Percentile, 24-hour precipitation event) and 2 (95th Percentile event) for Southwest Region

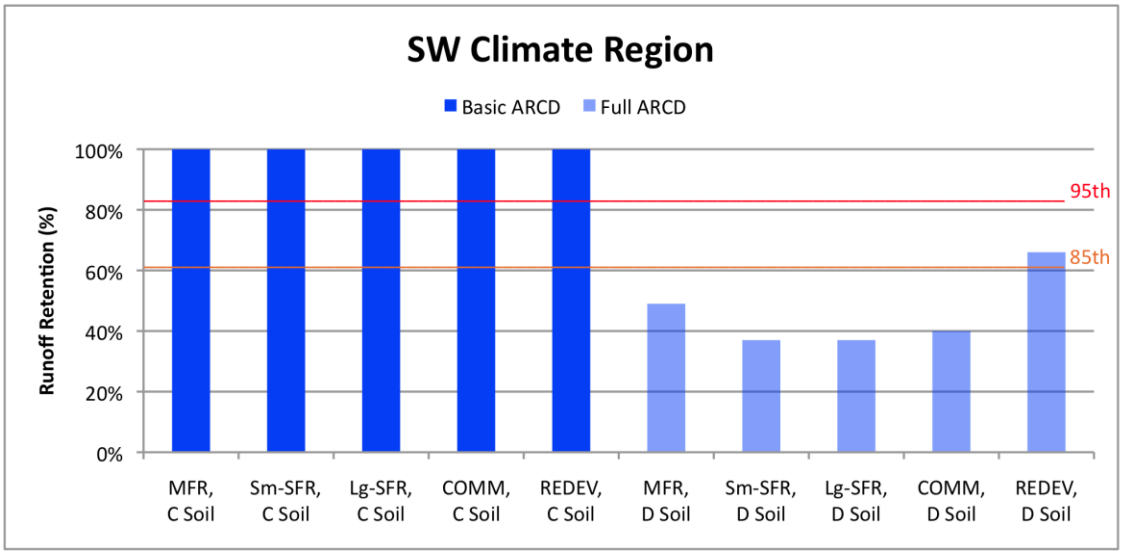

Effectiveness of Standards in Environmental Protection

Standard 3 (retain 90 percent of the average annual post-development runoff volume) would be the most protective standard. Meeting or coming as close as possible to meeting, but not exceeding, this standard is estimated to lead to 66-90 percent runoff retention and pollutant loading reduction on B and C soils and 37-66 percent on D soil. Standard 2 (retain the runoff produced by the 95th percentile, 24-hour precipitation event) would yield only slightly less protection with B and C soils and, with D soil, retention and loading reduction equivalent to standard 3.

Standards 4 and 5, based on the differential between pre- and post-development runoff volume, are highly inconsistent in retaining runoff and reducing pollutants, in that they are relatively protective where pre-development runoff is estimated to be very low relative to post-development flow, but result in progressively lower retention and pollutant loading reduction as pre- and post-development volumes converge, such as in several cases on D soils. Standard 5 is especially weak in this regard. The potentially low level of retention and pollutant loading reduction renders these standards based on the change in pre- versus post-development runoff volume poor candidates for national application, at least as formulated in these terms.

Fully meeting standard 1 (retain the runoff produced by the 85th percentile, 24-hour precipitation event) would yield runoff retention and pollutant mass reduction ranging from 58 to 81 percent, depending on climate region. This level of inconsistency decreases the utility of this standard for widespread use. Standard 2, based on the 95th percentile event, is much better in this respect, with variability in runoff retention and loading reduction across the nation in the much narrower 82-89 percent range. However, standard 1 remains more consistent across regions, and more protective of water quality for development on D soils than either standard 4 or 5, and is preferable to those standards in this regard.

In summary, standards 2 and 3 are clearly superior to the other three options. Standard 3 is entirely consistent from place to place in degree of environmental protection, and standard 2 does not deviate much. Analysis of the five development cases on two soil groups in each of four regions demonstrated the two standards are virtually identical in the runoff retention and pollutant loading reduction they would bring about.

Management or Runoff in Excess of Standards Requirements

All of the analysis reported above assumed that any remaining runoff after the application of ARCD and meeting, or coming as close as possible to meeting a standard, would discharge with no treatment. In fact, additional treatment could further decrease pollutant loadings. Treatment without further runoff retention could be accomplished by many conventional or ARCD methods designed to lower contaminant concentrations. The most effective of the alternatives is probably bioretention discharging non-retained runoff either on the surface or through an underdrain, assumed in the analysis conducted for this study according to the methods cited above. Treatment of all remaining runoff with underdrained bioretention cells where space remains but all infiltration capacity is used can raise the pollutant removals given in Table 16 to the levels in Table 17. These estimates apply to the four pollutants considered, TSS and total copper, zinc, and phosphorus. Space would most likely be available in the three MFR and SFR cases but not the COMM and REDEV scenarios.

While there is substantial variability in these results, they demonstrate that discharging effluent of relatively consistent, high quality can be accomplished with a comprehensive ARCD strategy. This strategy would embrace, first, retaining as much urban runoff as possible and then utilizing treatment based on soil and vegetative media to capture contaminants from the remainder.

Table 17. Estimated Pollutant Loading Reduction Benefits of Bioretention Treatment of Runoff Remaining After ARCD Implemented to Meet or Approach Standards

Range of Table 16 Values (%)	Approximate Pollutant Removal Increase (%)	Total Estimated Pollutant Removal Range (%)
35-45	30-45	65-90
45-55	25-35	70-90
55-65	20-30	75-95
65-75	15->20	80->95
75-85	10->15	85->95
>85	5->10	90->95

SUMMARY AND CONCLUSIONS

STUDY DESIGN

This study was performed to investigate the degree to which low-impact development ARCD practices can meet or exceed the requirements of various potential stormwater management facility design standards and the resulting environmental benefits. The investigation was performed by estimating the stormwater retention possible with full application of ARCD practices to five land use cases in four representative climatic regions in the United States on two prominent soil types in each region. Retention is defined as preventing the conversion of precipitation to surface runoff. Retaining runoff from impervious and pollutant generating pervious surfaces prevents the introduction of urban runoff pollutants to receiving waters as well as reduces runoff volume to prevent stream channel and habitat damage, flooding, and loss of groundwater recharge. Infiltrating bioretention was first applied in the analysis of each case, a strategy termed Basic ARCD. When Basic ARCD could not fully retain post-development runoff, a Full ARCD strategy was added, involving roof runoff harvesting in the most impervious development cases and roof water dispersion in those with substantial pervious area. Benefits were assessed with respect to reduction of the annual average surface runoff volume from the quantity estimated without any stormwater management practices, and associated maintenance of pre-development groundwater recharge and water quality improvement through preventing discharge to receiving waters of pollutants generated with developed land uses.

A number of conservative assumptions were built into the analysis to ensure that the capabilities and benefits of ARCD would not be over-estimated. In summary, these assumptions are:

- No retention credit for evapotranspiration in the Basic ARCD strategy, although generally a substantial amount would occur, and consideration of evapotranspiration only for roof runoff in the Full ARCD strategy;
- Letting aside many available ARCD practices and site design principles that could be employed to reduce the runoff quantity, and the pollutants it transports, by reducing impervious surface area or directing the runoff to bioretention, harvesting, and dispersion facilities;
- The assumption of no infiltration on hydrologic soil group D soils, although some infiltration occurs at finite rates even on clay;
- Application of a safety factor to estimated infiltration rates;
- Minimum bioretention cell depths, so that these facilities would not be disruptive to site design and could be put to other uses;
- Requiring a 48-hour drawdown time for bioretention, instead of the 72-hour maximum;
- An analysis to guard against groundwater mounding under bioretention cells, with conservative assumptions for horizontal and vertical hydraulic conductivity rates; and
- An analysis demonstrating that doubling topographic slope changes results by only a few percent.

CAPABILITIES OF FULL ARCD APPLICATION

Comparison of estimated runoff production in the pre- and post-development states demonstrated that the majority of the infiltration that would recharge groundwater in the undeveloped state would be lost to surface runoff after development with no stormwater management practices. These losses would approach 90 percent in the most impervious developments. These observations apply in in all climate regions and with the full range of soil conditions.

Basic ARCD could retain all post-development runoff and pre-existing groundwater recharge, as well as attenuate all pollutant transport, in the three residential cases on B soils in the two climate regions where these soils were analyzed. Bioretention cells to accomplish this retention would use from less than one-fourth to just over one-third of the available pervious area for infiltration. Taking all available pervious area for the more highly impervious COMM and REDEV cases, bioretention would retain about 45 percent of the runoff and pollutants generated and save about 40 percent of the pre-development recharge. Adding Full ARCD measures in these cases would approximately double retention and pollutant reduction for the retail commercial land use and raise it to 100 percent for the redevelopment. Groundwater recharge would not increase, however, because the additional retention is accomplished by harvesting or dispersion.

In the three regions having C soils, Basic ARCD can again retain all runoff and reduce urban runoff pollutant mass loading to zero for the MFR and Sm-SFR and Lg-SFR residential cases, although generally requiring more of the available pervious area to do so than in B soil cases. The effect of lower rainfall is evident in the South Central and, especially, the Southwest regions. In the latter location, not only the residential cases but also the COMM and REDEV scenarios can achieve full runoff and groundwater recharge retention and pollutant loading attenuation with Basic ARCD on C soil. Full ARCD can approximately double runoff retention and pollutant removal from the Basic ARCD level for the COMM case and extend these measures to 100 percent for the redevelopment.

For development on the D soils in all climate regions, use of roof runoff management techniques was estimated to increase runoff retention and pollutant reduction from zero to between about one-third to two-thirds of the post-development runoff generated, depending on the land use case. These strategies would offer little groundwater recharge benefit with this soil condition, but would still have the potential to significantly reduce runoff volume and pollutant loading.

Therefore, taking the greatest advantage of what ARCD offers is expected to retain the great majority of post-development runoff and pre-development groundwater recharge. This strategy would also prevent the addition to receiving waters of all or almost all pollutant mass that would otherwise discharge from a range of urban developments on B and C soils. With D soils, Full ARCD can accomplish runoff retention and loading reductions approaching or somewhat exceeding 50 percent, and opportunities to use ARCD practices or site design principles not modeled in this analysis can further increase runoff retention volume.

ABILITY TO MEET STANDARDS

ARCD methods were assessed for their ability to meet five potential regulatory standards, the first two pertaining to retention of the 85th and 95th percentile, 24-hour precipitation events, the third to retain 90 percent of the post-development runoff, and the last two to retain the difference between the post- and pre-development runoff, the final standard capped at the 85th percentile, 24-hour event. The projected ability to meet the five standards varies mostly in relation to soil type (B or C versus D) and the relative imperviousness of development, and much less across climate regions, except for the relatively arid Southwest.

The only standards that cannot be fully met on B and C soils by the ARCD methods considered are standards 2-4 for the COMM case. Of the 125 standards assessments, ARCD practices are projected to meet 113 (90.4 percent) with B and C soils. The ability to meet these standards is much reduced on D soils. Only standards 1 (85th percentile, 24-hour precipitation event, and 4 and 5 (related to the difference between the post- and pre-development runoff) can be met occasionally and under limited conditions using Full ARCD methods. However, even on D soils, all cases for Standard 1 were able to retain greater than 50 percent of the required runoff volume.

Standard 3 (retain 90 percent of the average annual post-development runoff volume) would be the most environmentally protective standard. Meeting or coming as close as possible to meeting, but not exceeding, this standard was estimated to lead to 66-90 percent runoff retention and pollutant loading reduction on B and C soils and 37-66 percent on D soil. Standard 2 (retain the runoff produced by the 95th percentile, 24-hour precipitation event) would yield equivalent protection on D soils and only slightly less protection with B and C soils.

Standards 4 and 5, based on the differential between pre- and post-development runoff volume, are very inconsistent in retaining runoff and reducing pollutants. They are highly protective where pre-development runoff is estimated to be very low relative to post-development flow, and then to result in progressively lower retention and loading reduction as pre- and post-development volumes converge. Standard 5 is especially weak in this regard. This inconsistency makes these standards poor candidates for national application, at least as formulated in these terms.

Fully meeting standard 1 (retain the runoff produced by the 85th percentile, 24-hour precipitation event) would yield runoff retention and pollutant mass reduction ranging from 58 to 81 percent, depending on climate region. This level of inconsistency decreases the utility of this standard to some degree. Standard 2, based on the 95th percentile event, is much better in this respect, with variability in runoff retention and loading reduction across the nation in the much narrower 82-89 percent range. However, standard 1 remains more consistent across regions, and more protective of water quality for development on D soils than either standard 4 or 5, and is preferable to those standards in this regard.

In summary, standards 2 and 3 are clearly superior to the other three options. Standard 3 is entirely consistent from place to place in degree of environmental protection, and standard 2 does not deviate much. Analysis of the five development cases on two soil groups in each of four regions demonstrated the two standards are virtually identical in the runoff retention and pollutant loading reduction they would bring about.

All five standards are based on some stipulated runoff retention. Pollutant mass loading reduction is at least equal to the amount of retention that occurs. It is possible to decrease loadings further by treating excess runoff. Analysis showed that subjecting that runoff to bioretention treatment before discharge could reduce loadings of TSS and total copper, zinc, and phosphorus by at least two-thirds and as much as over 95 percent. This conclusion applies to all climate regions and soil types for land use cases where space is available for the additional bioretention cells. The three residential cases are in this group but not the COMM or REDEV cases, where all pervious land would have already been used for retentive or roof water dispersion practices.

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ATTACHMENT A

POLLUTANT CONCENTRATIONS FOR URBAN SOURCE AREAS (HERRERA ENVIRONMENTAL CONSULTANTS, INC. UNDATED)

Source Area	Study	Location	Sample Size (n)	TSS (mg/L)	TCu (µg/L)	TPb (µg/L)	TZn (µg/L)	TP (mg/L)	Notes
Roofs									
Residential	Steuer, et al. 1997	MI	12	36	7	25	201	0.06	2
Residential	Bannerman, et al. 1993	WI	~48	27	15	21	149	0.15	3
Residential	Waschbusch, et al. 2000	WI	25	15	n.a.	n.a.	n.a.	0.07	3
Residential	FAR 2003	NY		*19*	*20*	*21*	*312*	*0.11*	4
Residential	Gromaire, et al. 2001	France		*29*	*37*	*493*	*3422*	*n.a.*	5
Representative Residential Roof Values				**25**	**13**	**22**	**159**	**0.11**	
Commercial	Steuer, et al. 1997	MI	12	24	20	48	215	0.09	2
Commercial	Bannerman, et al. 1993	WI	~16	15	9	9	330	0.20	3
Commercial	Waschbusch, et al. 2000	WI	25	18	n.a.	n.a.	n.a.	0.13	3
Representative Commercial Roof Values				**18**	**14**	**26**	**281**	**0.14**	
Parking Areas									
Res. Driveways	Steuer, et al. 1997	MI	12	157	34	52	148	0.35	2
Res. Driveways	Bannerman, et al. 1993	WI	~32	173	17	17	107	1.16	3
Res. Driveways	Waschbusch, et al. 2000	WI	25	34	n.a.	n.a.	n.a.	0.18	3
Driveway	FAR 2003	NY		*173*	*17*		*107*	*0.56*	4
Representative Residential Driveway Values				**120**	**22**	**27**	**118**	**0.66**	
Comm./ Inst. Park. Areas	Pitt, et al. 1995	AL	16	110	116	46	110	n.a.	1
Comm. Park. Areas	Steuer, et al. 1997	MI	12	110	22	40	178	0.2	2
Com. Park. Lot	Bannerman, et al. 1993	WI	5	58	15	22	178	0.19	3
Parking Lot	Waschbusch, et al. 2000	WI	25	51	n.a.	n.a.	n.a.	0.1	3
Parking Lot	Tiefenthaler, et al. 2001	CA	5	36	28	45	293	n.a.	6
Loading Docks	Pitt, et al. 1995	AL	3	40	22	55	55	n.a.	1
Highway Rest Areas	CalTrans 2003	CA	53	*63*	*16*	*8*	*142*	*0.47*	7

Park and Ride Facilities	CalTrans 2003	CA	179	*69*	*17*	*10*	*154*	*0.33*	7
Comm./ Res. Parking	FAR 2003	NY		*27*	*51*	*28*	*139*	*0.15*	4
Representative Parking Area/Lot Values				**75**	**36**	**26**	**97**	**0.14**	
Landscaping/Lawns									
Landscaped Areas	Pitt, et al. 1995	AL	6	33	81	24	230	n.a.	1
Landscaping	FAR 2003	NY		*37*	*94*	*29*	*263*	n.a.	4
Representative Landscaping Values				**33**	**81**	**24**	**230**	**n.a.**	
Lawns - Residential	Steuer, et al. 1997	MI	12	262	n.a.	n.a.	n.a.	2.33	2
Lawns - Residential	Bannerman, et al. 1993	WI	~30	397	13	n.a.	59	2.67	3
Lawns	Waschbusch, et al. 2000	WI	25	59	n.a.	n.a.	n.a.	0.79	3
Lawns	Waschbusch, et al. 2000	WI	25	122	n.a.	n.a.	n.a.	1.61	3
Lawns - Fertilized	USGS 2002	WI	58	n.a.	n.a.	n.a.	n.a.	2.57	3
Lawns - Non-P Fertilized	USGS 2002	WI	38	n.a.	n.a.	n.a.	n.a.	1.89	3
Lawns - Unfertilized	USGS 2002	WI	19	n.a.	n.a.	n.a.	n.a.	1.73	3
Lawns	FAR 2003	NY	3	*602*	*17*	*17*	*50*	*2.1*	4
Representative Lawn Values				**213**	**13**	**n.a.**	**59**	**2.04**	

Notes:
Representative values are weighted means of collected data. Italicized values were omitted from these calculations.
1 - Grab samples from residential, commercial/institutional, and industrial rooftops. Values represent mean of DETECTED concentrations
2 - Flow-weighted composite samples, geometric mean concentrations
3 - Geometric mean concentrations
4 - Citation appears to be erroneous - original source of data is unknown. Not used to calculate representative value
5 - Median concentrations. Not used to calculate representative values due to site location and variation from other values.
6 - Mean concentrations from simulated rainfall study
7 - Mean concentrations. Not used to calculate representative values due to transportation nature of land use.

Summary of Comments and Responses on the Orange County Municipal Storm Water Permit						
11/10/08 Draft (Comments 1-173) ; 03/24/09 Draft (Comments 174-244) ; 04/10/09 Draft (Comments 245-260) ; Public Hearing (Comments 261-278) ; 05/01/09 Draft (Comments 279 – 315)						
Comment No.	**Commenting Parties**	**Section No.**	**Permit Requirement**	**Comment**	**Submitted Recommendations**	**Response**
1	Lake Forest	General	N/A	The Draft Permit does not have a Table of Contents	Add a Table of Contents to allow easier navigation to various sections	Comment noted. Due to time constraints, the recommendation could not be implemented.
2	Irvine, County of Orange, Anaheim, Lake Forest,	Finding A5.c	The Permittees have the authority to levy service charges, fees or assessments to pay for compliance with this order.	Assessments to pay for compliance with this order must meet voter approval	Remove Section A.5c	Permit language has been revised to reflect the need for voter approval for some assessments.
3	County of Orange-Attachment B	General	Reference to Permittees	Reference to the Permittees is inconsistent throughout the permit.	Use the recommended language.	Permit language has been revised.
4	County of Orange-Attachment B	Finding A.3, Fact Sheet page 13	MEP definition	The definition of maximum extent practicable stated in the permit and the fact sheet are different and are not consistent with the case law.	Use recommended language.	Permit language has been revised.
5	Irvine	Finding C.8 and Section XVIII.B.3	This order is intended to regulate the discharge of pollutants…from anthropogenic…sourc es…not… background or naturally occurring pollutants	While this finding indicates an appropriate focus of the permit, Section XVIII, which addresses selenium in rising groundwater is not consistent with Finding C.8. Selenium should be addressed under the TMDL and NSMP programs.	Revise Section XVIII to make it consistent with Finding C.8.	Permit language has been revised to describe the co-operative process that is being used to address the selenium and nutrient impacted groundwater in the San Diego Creek Watershed.
6	Irvine	Finding C.10	Regional Board recognition that the permittees may lack jurisdiction over certain discharges	While this finding appropriately identifies the legal limitations of the co-permittees, Section XVIII requires co-permittees to address selenium in rising groundwater and copper in receiving waters when it's beyond their ability to eliminate those pollutants.	Revise Section XVIII to make it consistent with Finding C.10	Permit language has been revised to describe the co-operative process that is being used to address the selenium and nutrient impacted groundwater in the San Diego Creek Watershed. The sources of copper include controllable sources such as industrial sites.
7	Irvine	Finding 16.b, Finding K.56, Section	The 2007 DAMP includes all activities the permittees propose to undertake during the next permit	This finding references the Draft 2007 Drainage Area Management Plan, which has not been reviewed by the co-permittees.	Ensure that the co-permittees have had an opportunity to review and approve the entire 2007 DAMP prior to permit adoption.	The 2007 Draft Drainage Area Management Plan (DAMP) was submitted with the ROWD on July 21, 2006 by the principal permittee.

Summary of Comments and Responses on the Orange County Municipal Storm Water Permit						
11/10/08 Draft (Comments 1-173) ; 03/24/09 Draft (Comments 174-244) ; 04/10/09 Draft (Comments 245-260) ; Public Hearing (Comments 261-278) ; 05/01/09 Draft (Comments 279 – 315)						
Comment No.	**Commenting Parties**	**Section No.**	**Permit Requirement**	**Comment**	**Submitted Recommendations**	**Response**
		II.B.2 and Section XIX.3	term.			
8	Irvine	Finding F.18	The County's storm water conveyance systems include an estimated 400 miles of storm drains	The 2002 MS4 permit stated that there were an estimated 400 miles of storm drains in the County and that number should have increased.	Revise estimate.	Finding has been updated to current conditions.
9	Irvine	Finding G.21	This order prohibits the construction of treatment BMPs within waters of the U.S.	This language is overly broad and appears to prohibit trash booms and Natural Treatment System facilities that are installed in retrofitted channels and basins.	Eliminate or narrow the prohibition against natural and structural treatment BMPs.	As stated in the current language of the draft permit, if discharge treatment sufficiently protects the beneficial uses of the receiving water, additional polishing within waters of the U.S. may be considered. Street sweeping, catch basin inserts/filters and catch basin cleanouts result in discharges that, for the most part, protect the beneficial uses of those receiving waters. The use of trash booms primarily protects the downstream beaches. Finding 21 indicates that treatment systems within waters of the U.S. could be considered on a case-by-case basis.
10	Irvine	Finding H.30	It is anticipated that many of the inspections required under this order can be carried out by inspectors currently conducting other types of inspections for the permittees.	It should not be assumed that additional duties added to current inspections do not lead to any additional workload or City resources.	Remove that language.	The permit language does not assume that no additional workload will result from these duties being carried out by inspectors currently conducting other types of inspections, but rather identifies possible workload savings using this strategy, rather than always sending out an additional inspector to address only storm water issues.

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11	Irvine	Finding I.38 and O.74	Theses findings discuss the use of debris booms within apparent waters of the U.S.	This statement would appear to violate the restriction identified in Finding G.21, prohibiting the implementation of treatment BMPs in waters of the U.S.	Please clarify.	See response to comment 9.
12	Irvine	Finding J.43	TMDLs have been established by the Regional Board for… the San Diego Creek / Newport Bay watershed.	It is the City's understanding that the San Diego Creek/Newport Bay watershed is referred to as the Newport Bay watershed.	Please clarify.	Permit language has been revised.
13	Irvine	Finding K.55	The permittees have adopted grading and erosion control ordinances, guidelines and BMPs for municipal, commercial, and industrial activities.	The co-permittees have not adopted BMPs but instead the DAMP and LIPs contain guidelines for the implementation of minimum BMPs	*Revise to read: The permittees have adopted grading and erosion control ordinances and guidelines for the implementation of minimum best management practices (BMPs) for municipal, commercial, and industrial activities.*	Permit language has been revised.
14	Irvine	Finding L and throughout	NEW DEVELOPMENT/ SIGNIFICANT REDEVELOPMENT – WQMP/LIP/LID	Throughout the draft order there should be a distinction between the model WQMP and the project WQMP.	Please differentiate between the project and model WQMPs	Permit language has been revised.
15	Irvine	Finding L.61	Finding identifies that the Southern California Coastal Water Research Project (SCCWRP) is developing a Low Impact Development Manual for Southern California.	It is our understanding that SCCWRP is not developing this manual.	Please clarify.	Permit language has been revised.
16	Irvine	Finding L.62	Finding identifies that USEPA has determined that by limiting the effective impervious area (EIA) of a site, downstream	USEPA has not determined that prescriptively limiting EIA to 5% or less is the best way to minimize receiving water impacts in all watersheds and for all physical conditions. With	Revise this finding to recognize other white papers and information submitted to the Regional Board and revise the New Development and Significant Redevelopment provisions to use a volume	Permit language has been revised.

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			impacts could be minimized. A limited study conducted by Dr. Richard Horner concluded that a 3% EIA standard for development in Ventura County is feasible.	regards to Dr. Horner's study, additional white papers produced in meetings regarding this Orange County permit indicate that a 3% EIA standard may be inappropriate for incorporation into this permit.	treatment performance standard for LID implementation, more specific exemption criteria for when LID may be undesirable, and establish timelines for the development of watershed plans and LID/hydromodification control standards.	
17	Irvine	Finding L.66	Finding states that if certain BMPs are not properly designed and maintained, they could become sources of groundwater pollution, nuisance, etc.	While the City supports the more stringent requirements for use of LID BMPs, if LID infiltration BMPs are used in inappropriate conditions, they may be sources of pollution or nuisance.	Revise findings to indicate technical and environmental constraints on LID infiltration BMPs.	Permit language has been revised.
18	Irvine	Finding L.67	Finding states that if the BMPs in Finding L.65 are not properly designed and maintained, they could become sources of nuisance and/or habitat for vectors.	If LID infiltration BMPs are not properly designed or maintained, they may become sources of nuisance and/or habitat for vectors.	Revise findings to indicate that LID infiltration BMPs may become sources of nuisance and/or habitat for vectors if not properly designed or maintained.	Permit language has been revised.
19	Irvine	Finding M.68	Finding discusses de minimus discharges and states that municipal de minimus discharges generally do not require separate coverage under the Regional Board's de minimus permit.	This finding can be interpreted to mean that all de minimus discharges are prohibited in the San Diego Creek/Newport Beach watershed.	The language should be clarified. Further, the City supports the County comment that all de minimus discharges should be allowed unless a finding is made that those discharges are a significant source of pollutants.	Permit language has been revised to clearly state that a separate de minimus permit is required for non-storm water discharges to the MS4 in the San Diego Creek/Newport Beach watershed.
20	Irvine	Finding M.69	Finding points out the high nitrate and/or selenium levels in the soils and/or groundwater in the San Diego Creek/Newport	LID infiltration BMPs can also potentially mobilize nitrogen and selenium.	The findings should recognize that fact.	While the comment is valid, it was not the intent of Regional Board staff to identify <u>all scenarios</u> that could lead to mobilization of nitrogen and selenium in Finding 69.

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			Bay watershed and that dewatering activities could mobilize these pollutants.			
21	Irvine	Finding N.71	The principal permittee in collaboration with the co-permittees is to develop guidelines for the competencies and training schedules for municipal storm water positions.	While training is necessary, the City wants the flexibility to design and conduct training as well as the methodology for assessing the competency of staff.	Revise this finding and add an option to enable individual co-permittees to provide in-house training using curriculum developed by the principal permittee in collaboration with the co-permittees.	Permit language has been revised.
22	Irvine	Finding O.76	The finding discusses the importance of cooperation by public agency organizations within Orange County that have an impact on storm water quality.	More needs to be done to secure the participation of some of the larger public agencies within the Newport Bay Watershed, such as UCI.	Encourage state institutions and other major dischargers in the watershed, such as UCI, to join the NSMP and other applicable watershed efforts.	Regional Board staff will continue to work with the stakeholders whose activities and/or discharge contributes to the selenium/nutrient impacts in the watershed.
23	Irvine	Finding R.83	The finding discusses the elimination of illegal discharges and illicit connections to the MS4.	The terms 'illegal' and 'illicit' should not be used interchangeably	Determine correct/consistent terminology and use throughout the permit.	Permit language has been revised.
24	County of Orange, Riverside County Flood Control	General comment	General comment	The proposed permit increases administrative burden.	Adjust the current reporting requirements rather than increasing the reporting requirements.	Draft permit amended to streamline reporting requirements.
25	Riverside County Flood Control	General comment	General Comment	The basis for the Riverside County MS4 Permit should be the 2002 Riverside County MS4 Permit, not the Draft OC MS4 permit	The basis for the Riverside County MS4 Permit should be the 2002 Riverside County MS4 Permit	Comment noted
26	San Bernardino Stormwater Program	I.B.12	Requires permittee to develop adequate guidelines for competency	This requires developing an entire training program to be placed upon the shoulders of the Principal Permittee	These competencies are in a large part already well-established by CASQA and other organizations. It would be appropriate for the	Although guidance documents have been created by various organizations, it is the

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			requirements for stormwater managers, inspectors etc.		Principal Permittee to coordinate only the training effort	responsibility of the Principal Permittee to collaborate with co-permittees to develop a competency program specific to the requirements within this permit.
27	Irvine	Section I.B.12	Develop guidelines for defining competencies of municipal managers and inspectors	The competency of staff and the outcome of any evaluation of competency are confidential	The permittee cannot commit to providing any competency evaluations or reporting on confidential documents that are part of an employees' performance.	The permit language has been revised, with the understanding that deficiencies in a permittee's program that are the result of either management or staff's lack of understanding of the program will result in enforcement actions.
28	Orange County-Attachment B, Riverside County Flood Control	III.3.	Discharge limitation/prohibition	Make the prohibitions consistent with the federal regulations.	Retain language from Order No. R8-2002-0010.	Language revised to be consistent with the federal regulations, 122.26(d)(2)(iv)(B)(1).
29	Orange County-Attachment B, Riverside County Flood Control	III.3.	Public education to reduce non-storm water discharges	Remove the requirements for public education and outreach to reduce non-storm water discharges.	Retain language from Order No. R8-2002-0010.	Reducing non-storm water discharges could possibly reduce the pollutant load to the MS4s.
30	Orange County-Attachment B, Riverside County Flood Control	III.3.	Categories of non-storm water	Irrigation water from agricultural sources.	Runoff from agricultural sources should be addressed through other programs.	Permit language has been revised.
31	Irvine	Section III.3.i	The discharges identified below need not be prohibited by the permittees if they have been determined	The wording reverses the presumption found in Federal regulations that these de minimus discharges are not significant sources unless a	No submitted recommendation was submitted for this comment.	Permit language has been revised.

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			not to be substantial contributors of pollutants to the MS4 and receiving waters.	finding is made to the contrary.		
32	Irvine	Section III.3.i.l	Discharges of potable water (i.e., fire hydrant flushing) would have to be addressed as a de minimus discharge.	Discharges from fire hydrant flushing would require capture, analysis and volumetrically and velocity controlled discharges.	Change III.3.i.l to existing de minimus permit requirements by cross-referencing that permit.	The proposed permit conditions for the discharge of fire hydrant flushing waters remain the same as the de minimus permit with regard to residual chlorine concentrations. The proposed language regarding volumetrically and velocity controlled to prevent resuspension of sediments has been revised to read "…prevent hydrologic conditions of concern in receiving waters."
33	Irvine	Section III.3.i.l and XXI.5	With regards to emergency fire fighting flows, where possible, when not interfering with health and safety issues, BMPs should be implemented.	BMPs should only be required during controlled fire exercises and/or training. BMPs should not be required, even as 'where possible' for emergency situations.	Delete sentence referring to implementation of BMPs during emergency fire fighting operations, as well as the requirement in XXI.5.	While the sensitivity of implementing BMPs during actual fire fighting activities is understood, it is not unreasonable to expect BMPs to be implemented where feasible to meet the Maximum Extent Practicable threshold for permittee action.
34	County of Orange-Attachment A, Riverside County Flood Control	III.3.i.c	Irrigation runoff from agricultural sources	Runoff from agricultural sources is exempt from NPDES requirements.	Agricultural sources should not be included in this category.	Permit language has been revised.
35	Irvine	Section III.3.i.c	Irrigation water from agricultural sources.	Agricultural sources are non-point source, are not subject to NPDES permits, and are not currently the subject of Waste	The category 'irrigation water from agricultural sources' should be amended to read 'irrigation water' and the category 'irrigation water	Permit language has been revised.

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				Discharge Requirements or a Conditional Waiver of WDRs. Federal regulations do not specify agricultural irrigation runoff as a de minimus discharge to MS4 systems.	from agricultural sources' should be addressed through other Regional Board regulatory mechanisms.	
36	SDGE	III.3	Prohibition of non-storm water discharges unless the following conditions are met:	As the permit is currently worded, there could be some misunderstanding that non-storm water discharges covered under a separate permit may be considered prohibited	Revise sentence to read: The permittees shall prohibit the following categories of non-stormwater discharges unless such discharges are authorized by a separate NPDES and/or the stated conditions below are met.	Permit language has been revised.
37	Cypress	III.3 (ii)a	Discharge Limitations/Prohibition: Discharges from potable water sources, including water line flushing, superchlorinated water line flushing, fire hydrant system flushing , and pipeline hydrostatic test water: Planned discharges shall be dechlorinated to a concentration of 0.1 ppm or less, pH adjusted if necessary , and volumetrically and velocity controlled to prevent resuspension of sediments.	The Orange County Stormwater program has developed BMP Fact Sheets FP-6 – Water and Sewer Utility Operation and Maintenance, FP-7 Fire Department Activities and IC-23 Fire Sprinkler Testing/Maintenance. In the absence of any Finding that existing control efforts are inadequate,	Specific requirements for the discharges identified in Section 3.ii.a should reference these Fact Sheets	Although the information contained within the Orange County Storm water program's Fact Sheets may be consistent with the requirements illustrated within this Section of the Draft Order and have been developed in order to comply with previous iterations of the Order, the Order itself sets the requirements for compliance. Fact Sheets have been prepared as a guidance tool to be used by co-permittees.
38	State Water Resources Control Board	III.3(ii)c	Dechlorinated swimming pool discharges: reduce volume and velocity to	Is the intent to prevent resuspension of sediments in the receiving water, the MS4 or the BMP?	Clarify information concerning comment and revise paragraph heading to read "Swimming Pool Discharge"	The proposed language regarding volumetrically and velocity controlled to prevent resuspension of sediments

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			prevent resuspension of sediments			has been revised to read "…prevent hydrologic conditions of concern in receiving waters." The paragraph heading as been revised.
39	Cypress	III.3(ii)c	Dechlorinated swimming pool discharges: reduce volume and velocity to prevent resuspension of sediments	Placing numeric limits for pool discharges affirms that the City is already doing by distributing the County's "Tips for Pool Maintenance" brochure.	The City wants to be certain the intent is not to make the City test each discharge or have the City require residents to obtain permits for such.	The criteria listed in this section should be used to establish municipal codes and enforcement procedures. In most cases, we do not anticipate the need for residual chlorine testing or permitting.
40	County of Orange	Section IV of the M&RP	Program Effectiveness Assessment	Use existing and newly generated data for program assessment in accordance with the CASQA Guidance.	Make program assessment requirements consistent with the recommendations in the ROWD.	The permit provides the permittees the option of using the CASQA Guidance or other technically sound methodology.
41	Orange County-Attachment B	Section VI	Reporting of State's General Permit violations.	Permittees do not enforce the State's General Permit.	Revise language as suggested.	Enforcement requirements have not changed from the 2002 permit; this approach avoids duplicative efforts and fosters cooperation among various regulatory/local agencies.
42	Irvine	Section VI.1,VI.3, VII.1	Such legal authority must address all illegal connections and illicit discharges into the MS4s, including those from all industrial and construction sites.	The legal authority documents (ordinances, etc.) give authority to the permittee to develop a program to control illicit discharges and illegal connections, but does not set forth the specific components of the program. Legal authority should not be confused with procedures and methods to accomplish compliance.	Revise the language of this requirement to indicate the role of the DAMP and LIPs in setting forth the program to address illegal connections and illicit discharges.	Permit language has been revised.

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43	Lake Forest	VI.2	The permittees shall progressively and decisively take enforcement actions against any violators of their Water Quality Ordinance	This language (progressively and decisively) creates ambiguity about what is actually required.	None offered	The language in question reflects the progressive enforcement actions as referenced in the permittee adopted Orange County Enforcement Consistency Guide.
44	Anaheim, Villa Park, Cypress	VI.2	The permittees' ordinance must include adequate legal authority to enter, inspect, gather evidence (pictures, videos, samples, documents, etc.) from industrial, construction and commercial establishments	Concern about search and seizure laws and the necessity to obtain a Court Order are being looked into, should the current iteration of the proposed permit language remain as is. Villa Park states: Proposed language may be viewed as a violation of 4th amendment	Therefore, in order to ensure inspections may be conducted as intended through legal authority via municipal codes, the permit language should be retooled to avoid unnecessary efforts	Permit language has been revised.
45	Irvine	Section VI.2	The permittee's ordinance must include adequate legal authority to enter, inspect and gather evidence from industrial, construction and commercial establishments.	The City agrees with the County comments that this provision could impose entry requirements on the co-permittees that violate the 4th Amendment rights of property owners	"The permittees shall carry out inspections, surveillance, and monitoring necessary to determine compliance with their ordinances and permits. The permittees' ordinance must include adequate legal authority, to the extent permitted by California and Federal Law and subject to the limitations on municipal action under the constitutions of California and the United States, to enter, inspect and gather evidence (pictures, videos, samples, documents, etc.) from industrial, construction and commercial establishments…"	Permit language has been revised.
46	Lake Forest	VI.3	"these penalties shall be issued in a decisive manner	The term *decisive* creates ambiguity about what is actually required	None offered	The term decisive was used to infer a directly definitive, results-oriented enforcement process.
47	Villa Park, Cypress, Laguna Hill	VI.6	Permittees are to provide quarterly notifications w/	Quarterly reporting of enforcement activity is an administratively burdensome	Maintain current enforcement activity reporting requirements	Reporting requirements have not changed with respect to the information to be

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			inspection results to RB, for all inspections conducted at sites covered under the Statewide General Industrial and Construction Permits.	requirement for medium and small cities with little to no staff resources.		submitted. However, the frequency has been changed. Historically, many permittees have submitted inspection information on a monthly basis or immediately following the inspection event.
48	Fullerton, Costa Mesa, Brea, Irvine	Various	Additional reporting requirements throughout various Sections	The draft Order requires additional reporting to the Regional Board staff. The City believes that adjusting the existing reporting processes rather than creating additional reporting requirements is the most effective approach to increasing transparency and accountability	None	Information collected during the (third term permit) MS4 audits, concluded that additional reporting requirements were warranted. In order to ensure compliance with data collection requirements within the permit, various reporting requirements have either been sustained or introduced accordingly
49	Orange County-Attachment B	Section VII.5	Trash Characterization	Each Permittee should not be required to characterize trash.	Principal Permittee should be responsible for this.	While trash sources may not significantly vary among municipalities, the relative quantities of trash type will vary between municipalities and even within municipalities. The purpose of this study is to focus municipal resources (education and enforcement) on the most prevalent trash sources within the municipality in an effort to avoid a possible, future trash TMDL.
50	Orange	VII.5	Permittees to review their trash control ordinance. To determine the need for	Is the intent of the Permit to have each permittee carry out this requirement? It makes no sense to have each permittee conduct a	Revise the paragraph to require the principal permittee instead of the co-permittees to conduct the county-wide study over the 5 year	Permit language has been revised. See response to Comment #49

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			any revisions/ determine sources and proper BMPs to control urban runoff. Include findings in the Annual Report	county-wide study, since trash sources do not vary significantly among municipalities	permit term to characterize trash sources	
51	Orange, Cypress, Riverside County Flood Control	VIII.2	Construction site inventory to include all sites, within each co-permittee's jurisdiction for which building or grading permits have been issued where activities at the site include …..	The first part of the paragraph requires the inventory list is limited to sites with issued building or grading permits that raise concerns regarding water quality, but later contradicts itself by stating "all sites". This would include plumbing, encroachment or other indoor permits.	Change language to make it not contradictory. Exclude the GIS requirement from construction projects within the public right of way as well.	Permit language has been revised. .
52	Irvine	VIII.2	Construction site inventory to be maintained and updated quarterly	This requirement will be burdensome and unnecessary as it will just be created to satisfy a draft tentative order. Since construction project timelines are not short enough to result in meaningful additions to the inventory within the period of three months.	Updates should only be required on a biannual basis (in September, preparatory for the rainy season and rainy season inspections).	Maintaining and updating the site inventory quarterly is to ensure that records remain current concerning the regular and constant oversight of construction activities within each permittee's jurisdiction.
53	Irvine	Section VIII.4	Each permittee shall conduct construction inspections for compliance with its ordinances (grading, Water Quality Management Plans, etc.), local permits (construction, grading, etc.), the Model Construction Program…	Water Quality Ordinances do not include a reference to project WQMPs, which are post-construction documents.	Remove parenthetical entries. "Each permittee shall conduct construction inspections for compliance with its ordinances, local permits, the Model Construction Program…"	Permit language has been revised.

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54	Riverside County Flood Control		Construction site inspection requirement to include review of the Erosion & Sediment Control Plan	In addition to requiring a significant increase in the level of training and expertise of construction site inspectors, this requirement will significantly increase the amount of time needed for each construction site inspection	Exclude requirement from the draft Riverside County MS4 permit	The current (2002) OC MS4 permit already requires, inspection staff to have sufficient expertise in construction inspection processes as they relate to water quality and storm water related issues.
55	Lake Forest	VIII.6	"[e]ach permittee shall respond to complaints received by a third party in a *timely* manner to ensure that the construction sites are not a source of pollutants in the MS4s and the receiving waters	The term "timely" creates ambiguity about what is actually required	None offered	Response to complaints must be handled in order of severity, with respect to the sites' potential to act as a pollutant source to the MS4. Therefore, the term "timely manner" was listed with the understanding that municipal staff receiving the complaint would be properly trained and equipped to determine how potentially grievous the pollutant threat could be and address it accordingly. The setting of an arbitrary time limit (e.g., within 1 business day) could put permittees in violation of the permit by not addressing very low priority complaints in that time limit.
56	County of Orange – Attachment A	Sections VIII, IX and X	Inspection requirements	The inspection requirements are well beyond federal law.	Make requirements in the permit consistent with the federal laws and regulations.	The inspection requirements are consistent with the federal laws and regulations. See 40CFR112.26(d)(2)(F) and the MEP provisions in Clean Water Act at Section 402(p)(3)(B)(iii).
57	County of Orange – Attachment A	Sections VIII, IX and X	Inspection requirements	Requirements beyond the federal requirements tantamount to unfunded mandate.	Unfunded mandates should not be part of this permit.	The permit requirements are consistent with the federal laws and regulations and,

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						therefore, are not unfunded mandates.
58	County of Orange – Attachment A	Sections VIII, IX and X	Inspection requirements	The inspection requirements violate the fourth amendment.	Make changes to the inspection requirements consistent with the state and federal laws and regulations.	Permit language amended.
59	San Bernardino Stormwater Program	VIII,IX,X	Inspection requirements	Requirement within these sections have new specific actions, such as electronic database, to check if sites have filed NOI, photos that need to be taken and included in the database, requirements for on-site enforcement actions.	We suggest that the permittees be allowed to prioritize and take enforcement actions based on their own criteria.	While the permittees have the ability to prioritize enforcement activities based on their own criteria to a certain extent, the Regional Board still has the obligation to set a minimum standard in the permit to ensure a level of consistency amongst the permittees.
60	Orange	IX.2	Facilities Covered under the General Industrial Permit are automatically considered as High Priority and therefore are required to be inspected.	History has shown that once a facility has been inspected at least once, there is an increased awareness of water quality impacts and facilities will implement BMPs to minimize storm water and non storm water discharges.	Allow redesignation of mandatory high priority facilities based on the suite of factors in the DAMP used to rank a facility.	The criteria by which facilities are identified for coverage under the General Industrial Permit are based on either their industry's potential to pollute and/or the actual exposure of materials, wastes, or processes to storm water. This criteria alone is sufficient for a mandatory 'high' priority.
61	Irvine	Section IX.3	Industrial inspections shall include a review of material and waste handling and storage practices, written documentation of pollutant control BMP implementation and	The written documentation, in the form of storm water pollution prevention plan, is only required for facilities with industrial storm water permits. The burden of SWPPP review for compliance with the State's General Industrial permit should remain	Please clarify the intent of the industrial facility document inspections consistent with the City's comments.	Permit language has been revised to clarify that the '… written documentation of pollutant control BMP implementation and maintenance procedures …', refers to one of the four items required to be in a permittee-

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			maintenance procedures and digital photographic documentation for any water quality violations, as well as, evidence of past or present unauthorized, non-storm water discharges and enforcement actions issued at the time of inspection.	with the Regional Board staff. The City's inspections should continue to assure no ICs/IDs and compliance of facilities with City water quality ordinances and requirements		prepared inspection report. Those four items include: a written review of material/waste storage procedures; the written documentation of BMP implementation; photographic documentation of evidence of discharges; and, a listing of enforcement actions resulting from the inspection.
62	Westminster	IX.6 & X.5	Electronic inspection database submittal requirement in each annual report for Industrial and Commercial inspection programs	Clarify if permittees should submit only inspection inventory or the entire inspection database for these categories.	None. Request for clarification only	Permit language has been revised to allow the submittal of all inspection documentation/information in hardcopy form if a municipality's database uses a proprietary program (not Access or Excel compatible)
63	County of Orange	Section X	Commercial inspections	The permit extends the regulatory reach of local jurisdictions without technical justification.	Unjustified inspections should not be required.	Quantifiable inspection requirements are included to ensure an equitable level of effort across all permittees.
64	Irvine	Section X.1	Each permittee shall continue to maintain and quarterly update an inventory of the types of commercial businesses listed below.	Section X.1 requires 11 new, additional categories to be added to the commercial facilities inventory. It does not make sense to increase the commercial facility inspection burden so significantly in the time of budget constraint. Further, there's no indication in the ROWD that commercial facilities are currently such significant sources of pollutants to warrant this increase in inspections.	The new categories should be deleted until such a time that these types of facilities have been determined to contribute a significant pollutant load to the MS4.	The Fact Sheet and the findings have been revised. The revised permit language requires the Principal Permittee to prioritize these new categories based on potential threat to water quality.

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Comment No.	**Commenting Parties**	**Section No.**	**Permit Requirement**	**Comment**	**Submitted Recommendations**	**Response**
65	Orange County-Attachment B	Section X.1	Municipal inspections of commercial facilities.	There are 11 new categories included in the draft permit with out any technical justification.	These resource intensive inspection requirements should be deleted.	The Fact Sheet and the findings have been revised. The revised permit language requires the Principal Permittee to prioritize these new categories based on potential threat to water quality.
66	Orange County-Attachment B	Section X.1	Commercial inspection frequencies	Some of the facilities listed under the commercial inspection program should be under the industrial program.	Move industrial type of facilities under the industrial program.	Permit language has been revised.
67	Orange County-Attachment B	Section X.2	Commercial inspection frequencies	The permit arbitrarily assigns priorities for inspections.	The Permittees should be allowed to develop a prioritization system.	Audits conducted by Regional Board staff indicated that some Permittees were ranking all their commercial facilities as “low” even though similar facilities were ranked as “high” by other Permittees.
68	Orange County-Attachment B	Section X.8	Mobile businesses	No technical basis. Difficulty in regulating mobile businesses.	Principal Permittee to develop a pilot program.	A uniform prioritization criteria and inspection requirements are acceptable alternatives. Permit language has been changed.
69	Villa Park, Yorba Linda, Tustin	X.1	Permittees to maintain and update commercial facility inventories quarterly, in a computer-based database system with all third term permit inventory criteria, as well as information on ownership, size, location, GIS w/ Lat/Longitude	Quarterly updating of the commercial facilities database and the implementation of GIS tracking of commercial fixed facilities is a burdensome requirement that for medium to small cities with little to no staff resources is not viable	Maintain current commercial facility tracking requirements	Third term permit recommended annual updating of commercial inventories with GIS tracking capabilities. During the 3rd term permit, MS4 Audits conducted by Regional Board staff indicated the need for more regimented oversight regarding commercial inventory management. Therefore this recommendation transitioned into a requirement within the fourth term permit.

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70	Laguna Hills	X.1	Permittees to maintain and quarterly update an inventory of commercial facilities within its jurisdiction.	This section should be modified to allow the permittees to update the commercial inventory annually and submit it with the annual NPDES report	The requirements within this section should not be changed from the current 3rd term permit.	The purpose of maintaining an updated inventory list is to ensure that adequate oversight controls are in place. During the 3rd term permit, MS4 Audits conducted by Regional Board staff indicated the need for more regimented oversight regarding commercial inventory management.
71	Irvine	Section X.2 and X.3	Commercial facility inspection criteria	The mandate that 10%, 40% and 50% of commercial facilities be ranked high, medium and low is not based on technical data or on demonstrated risk posed by commercial facilities.	The DAMP and LIP provisions should instead be reviewed and revised to assure that the criteria result in adequate oversight. Secondly, high ranked sites should be inspected once per permit cycle rather than once a year and medium and low site inspections be dropped.	During the third permit term, the permittees were given the opportunity to design a commercial facility ranking system based on a number of criteria including type/size of activity, potential for pollutant discharge and history of pollutant discharges. Despite this opportunity, in the most recent annual report, some permittees are reporting few or no high priority commercial sites out of hundreds to thousands of sites that met one or more of the 11 categories listed in the third term permit. The 10/40/50 breakdown should be used to ensure that the 10% of commercial facilities with the highest potential for pollutant discharge be ranked 'high' and be inspected annually, similarly for the medium and low priority rankings.

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72	OC Public Works, Huntington Beach, Costa Mesa, Orange, Brea, Westminster, Villa Park, Lake Forest, Cypress, Laguna Hills, Yorba Linda, Tustin	X.2	10% of all commercial sites (excluding restaurants) shall be ranked "high" , 40% ranked medium and the remaining 50% ranked low	This new requirement will increase the annual inspection requirements to a point where resources are incapable of complying with the requirements. The inventory should be determined solely on a risk-based instead of a mandatory curve-based criterion.	Each permittee conduct inspections of its commercial facilities as indicated below. To establish priorities for inspection, the perrmittees shall continue to prioritize commercial facilities/businesses within their jurisdiction as a high, medium or low threat to water quality based on such factors as the type, magnitude and location of the commercial activity, potential for discharges, proximity and sensitivity of receiving waters, material used and wastes generated at he site. Within 6 mos. Of the adoption of this order, the Permittees shall review their existing prioritization system, criteria and results based on the inspections and determine if any modifications are necessary. The modifications shall be completed within 6 months of the determination and reported on in the annual report.	During the 3rd term permit, MS4 Audits conducted by Regional Board staff indicated the need for more regimented oversight regarding commercial inventory management and inspections within this section. The percentages indicated within this section were developed following extensive review of inspection information within PEAs submitted by co-permittees during the 3rd term permit.
73	Irvine, Westminster	Section X.3 and X.5	Commercial facility inspection documentation	The commercial inspection section that requires photographic documentation for all aspects of the inspection is too onerous.	Photographic evidence should only be required in the case of water quality ordinance violations and only in manner consistent with local, state and federal ordinance, regulations and laws.	Photographic evidence of all aspects of commercial inspections will assist permittees in supporting the appropriate enforcement action and will provide evidence during Regional Board audits that site conditions during inspections by municipal staff, are receiving the appropriate enforcement actions, if any.

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74	County of Orange	Section X.8	Mobile businesses	A new regulatory oversight is prescribed for mobile businesses.	The permittees have already developed BMPs for these businesses; additional requirements are not warranted.	Complaints received in the Regional Board office and Board staff's field observations indicate that these discharges have not been fully eliminated and additional measures are needed to control discharges from mobile businesses.
75	Villa Park, Cypress, Laguna Hills	X.8	Mobile businesses shall implement appropriate control measures within 3 months of being notified by permittees	It's unrealistic to expect that over any period of time it would be possible for the principal permittee to notify all mobile businesses operating within the County, of minimum source controls and pollution prevention measures that they must develop and implement.	…modify the requirement to read that "…the principal permittee shall utilize all reasonable resources to notify mobile businesses…"	Permit language has been revised.
76	ProntoWash	X.8	Mobile businesses shall implement appropriate control measures within 3 months of being notified by permittees	Require mobile operators to be inspected and trained in water quality control measures during the business licensing process.	During the licensing process, the mobile operations should be inspected and the operators should be trained on water quality protection procedures.	Many municipalities currently do not issue business licenses. Listed within Section X.8, are requirements for the permittee to distribute educational materials to businesses as well as a training program requirement.
77	Lake Forest	X.8	Mobile businesses shall implement appropriate control measures within 3 months of being notified by permittees	The regular, effective practice of unannounced inspections is difficult to impossible to implement. Identifying mobile businesses is difficult because they are often not permitted or licensed. Mobile businesses are transient in nature, advertise a mobile phone number as the only means of contact and may have geographic scope of several cities or the entire region.	Remove the mobile business requirements from the draft permit and instead, require the permittees to develop their own program for implementation during the next permit cycle.	Permit language has been revised.

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78	County of Orange, Villa Park, San Bernardino Stormwater Program	Section XI	Each permittee shall develop and implement a residential program to reduce the discharge of pollutants from residential facilities to the MS4 to MEP…	No technical justification for the residential program. Remove the Residential Program from the Order completely	Recognize the fact that the current public education programs are working. Remove the Residential Program from the Order completely.	Despite implementation of public education programs, residential areas continue to be a significant source of pesticides, herbicides, nutrients and nuisance flows. Additional actions are necessary to further address these problems.
79	Irvine	Section XI.2	Identification of residential areas and activities that are potential pollution sources and requiring residents to implement pollution prevention BMPs.	Many aspects of this proposed requirement are already covered by Public Education activities. Further it may require passage of new ordinances forcing residents to implement specific minimum BMPs and those types of ordinances are unpopular.	Retain the residential program as part of the Public Education section and revise the key provision in the draft permit to : "The permittees shall ~~require~~ *encourage* residents to implement pollution prevention measures via the public education and outreach Program …".	Despite implementation of public education programs, residential areas continue to be significant sources of pesticides, herbicides, nutrients and nuisance flows. Additional programs are needed to address these problems. Some changes made to the provisions.
80	Orange County-Attachment B,	Section XI.2	Residential program	The requirement for a residential program is duplicative of existing public education and outreach activities.	Avoid duplicative requirements.	Permit language has been amended.
81	Anaheim, Fullerton, Costa Mesa, Brea, Cypress, Laguna Hills, Yorba Linda, Tustin	XI.2	The permittees shall require residents to implement pollution prevention measures	Requiring residents to implement best management practices is problematic	Change the wording to state: "The permittees shall *encourage* residents to implement pollution prevention measures*."*	Permit language has been revised.
82	Cypress	XI.3	The permittees, collectively or individually, shall facilitate the proper collection and management of used oil, toxic and hazardous materials, and other household wastes.	The city is concerned with the funding for conducting collection events.	The current County of Orange Household Hazardous Waste Collection Program has been working well since its implementation and agencies continue to do a good job making residents aware of this service. Change language from "shall" to "…***should*** *facilitate the proper collection and management*."	Requirements within this section have not changed essentially from requirements within Section I.4 of the 3rd term permit.

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83	Irvine	Section XI.4	Control measure requirements for common interest areas and areas managed by Home Owner Associations.	A limited pilot HOA program has been initiated by the City to educate certain property managers on the economic and water quality benefits of improved irrigation and landscaping practices. But the draft tentative order as currently written mandates that co-permittees must develop and implement new BMPs for common interest areas, including, we presume, structural treatment control BMPs as well as source control BMPs.	Revise the first sentence of this section as follows: "The permittees shall develop ~~and implement~~ a public education and outreach component to encourage owners …".	The tentative order requires the permittees to develop and implement a public education and outreach component to encourage HOAs to implement BMPs. Nothing in that section requires permittees to build or maintain BMPs on private property.
84	Cypress, Irvine	Section XII.A.2	Inclusion of LID requirements in WQMPs.	The 6-month time frame for this requirement is too aggressive and does not allow time to collect info on watershed characteristics, stakeholder participation and the time required for adoption of the revisions by local governments.	A more reasonable time frame should be established.	Much of the groundwork for this requirement has been completed through a series of meetings between permittees, environmental NGOs and development representatives. It should be noted that this deadline refers to the default plan. Watershed specific plans can be delivered after that date. Some changes have been made to the new development section of the permit.
85	Irvine	Section XII.A.4	The first annual report following adoption of this permit must include a review of the inclusion of LID principals in the General Plan and other city documents.	This requirement is out of sync with the actual requirements for updating the DAMP, LIPs and model WQMPs.	Revise the requirements so that a single, integrated update of these documents is implemented.	Permit language has been revised.

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86	Irvine	Section XII.B.2	The list of priority development projects requiring a WQMP	Items f and g of this section would require treatment control BMPs for single-family homes, if they were large enough. This would be too much of a burden on homeowners and on City staff required to review and inspect these BMPs.	Do not require WQMPs or treatment control BMPs for single-family homes.	This permit requirement will only affect projects on hillsides with a natural slope of 25 percent or more and projects that are within 200 feet of an Area of Biological Significance (ASBS). As such these projects need the extra level of protection afforded by the development of a WQMP and implementation of appropriate control measures.
87	Irvine	XII.B.2.c	Priority Development Projects would include commercial/industrial developments greater than 10,000 square feet.	The threshold has been lowered in this permit from 100,000 square feet to 10,000 square feet.	The fact sheet should explain the basis for lowering the threshold criterion.	Fact sheet has been revised to provide basis.
88	Irvine	XII.B.2.i	Priority Development Projects would include streets, roads, highways and freeways of 5,000 square feet or more.	Road projects as small as 5,000 do not and cannot properly involve changes to the drainage facilities. Further it is not feasible to implement a 5%EIA or LID BMPs for the 85th percentile design treatment volume.	Reconsider this requirement.	The permit will be revised including the incorporation of the concepts presented in "Managing Wet Weather with Green Infrastructure: Green Streets" (U.S. EPA, 2008)
89	Irvine	XII.B.5.a	Use of structural infiltration treatment BMPs shall not cause or contribute to groundwater water quality objective exceedances.	In the Newport Bay Watershed, there are areas where the use of any infiltration BMPs will result in mobilization of nitrogen and/or selenium.	Explicitly preclude the use of LID BMPs and exempt projects from LID implementation and hydromodification control performance standards in areas with shallow groundwater, polluted groundwater, inappropriate geotechnical conditions or rising groundwater.	The current Draft Permit language already contains sufficient warnings regarding the use of infiltration BMPs, including LID-type BMPs, without having to specifically add this language.
90	NAIOP	Section XII.C	Treatment and Low Impact Development (LID) BMPs.	It appears that the permit is biased against the use of a watershed-based or regional type solutions.	Allow as much flexibility as possible in order to achieve the permit's goals across the jurisdiction regulated by the permit.	Comment noted. The permit provides sufficient flexibility for regional and sub-regional type solutions.

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91	Irvine	XII.C.1	Requirements that LID site design principals be implemented to reduce runoff to the maximum extent practicable.	The list of site design BMPs provided is a confusing mix of goals, tasks and work products that don't provide a clear basis for compliance.	Separate the provisions to distinguish between recommended site design BMPs and other goals for the new development and redevelopment program.	Permit language has been revised.
92	Irvine	XII.C.2	Requirements for source control BMP implementation.	It is not clear why the major discussion of LID also includes prescribed source control BMPs.	Section XII.C.2 should be deleted from the current section and proposed as a separate section.	While the primary focus of Section C is on LID BMP implementation, source control BMPs, particularly when they're implemented through proper site design, play a play a role in LID.
93	Irvine	XII.C.4	Conditions for the substitution of treatment control BMPs for LID measures.	One of the conditions is for EIA to be 5% or less. How does one achieve an EIA of 5% or less without implementing LID?	Delete this section.	Permit language has been revised.
94	Irvine	XII.D	Hydromodification	It is not clear how the 5% or less hydrologic impact standard would be measured and does the standard allow for dense infill and transit oriented development as required by SB 375?	Revise and clarify section.	Permit language has been revised.
95	Irvine	XII.E.2	Structural treatment control BMP requirement met by regional treatment systems.	No mention of obtaining Executive Officer determination on regional treatment systems.	Please revise to clarify the need for Executive Officer approval of common project BMPs.	Permit language has been revised.
96	Irvine	XII.G.3	Prior to occupancy, permittees shall verify through visual observation that the BMPs are operational.	It will be impossible to ascertain the operation of BMPs prior to occupancy unless it rains between construction and occupancy	Revise to verification that BMPs are built according to approved plans prior to occupancy.	Permit language has been revised.
97	Irvine	XII.H	Change of ownership and recordation	The City already has a non-recorded mechanism that tracks the transfer of long-term maintenance and operation responsibilities from a developer to an appropriate operator upon completion of	Delete reference of recording any documents and explicitly allow other methods of tracking ownership and responsibility.	Permit language has been revised.

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				development. The recordation requirement should be left to the discretion of the permittees.		
98	ConTech	Section XII	5% Effective Impervious Area (EIA)	Reliance on a 5% EIA standard is inappropriate. The water quality benefits of applying a 5% EIA standard on a site-by-site basis are unknown.	Support the approach outlined in the January 2009[1] white paper. Use delta volume (post minus pre-development) from the water quality design storm event.	Permit language has been revised based on the water quality design storm event.
99	ConTech	Section XII	Treatment and Low Impact Development (LID) BMPs.	Treatment and LID BMPs inspection and maintenance requirements are not well defined.	All water quality and/or water quantity control BMPs should have maintenance and inspection requirements.	Permit language has been revised.
100	ConTech	Section XII	Post-construction	There is no standard for selection of post-construction BMPs	Provide standards for selection of post-construction BMPs.	There are a number of handbooks (e.g., CASQA[2] BMP handbooks) available for this purpose.
101	ConTech	General	Potential pollutants of concern	Match potential pollutants with control BMPs.	The permit should require that pollutants be controlled by matching with appropriate BMPs.	There are a number of handbooks (e.g., CASQA[3] BMP handbooks) available for this purpose.
102	NRDC/OCC[4]	Section XII	Need for LID metrics	To ensure compliance with the Clean Water Act, quantifiable measures must be included.	Support the use of an EIA limitation in the permit; a 3% EIA limitation is recommended.	Comment noted. The 5% EIA metric in the permit has been replaced with a volume capture metric.
103	NRDC/OCCCI CWQ	Section XII	EIA definition	Change the EIA definition to include full onsite retention of a design storm event. EIA is not clearly defined.	The design storm should not be the delta volume from a 2-year storm event; it should be the full volume. Include a design storm volume.	The draft permit has been amended to incorporate appropriate design storm criteria.
104	NRDC/OCC	Section XII	EIA definition	The tern “percolate” is not defined.	Revise the permit such that BMPs are required to have the capacity to “infiltrate, harvest for reuse, or evapotranspire”.	Permit language has been changed.

[1] January 2009 white paper=
[2] CASQA=California Stormwater Quality Association
[3] CASQA=California Stormwater Quality Association
[4] OCC=Orange County Coastkeeper

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105	NRDC/OCC	Section XII	Waiver Provisions	Existing waiver provisions are very broad. The permit's waiver provisions should include a floor for all projects to meet.	The permit should include a provision to implement all feasible LID BMPs and must include a provision for offsite mitigation of storm water not retained onsite. The permit should define technical infeasibility. Rewrite the waiver provisions to include establishment of an "urban runoff fund". Include time limitations for the expenditure of funds.	Permit language has been revised to provide clarification.
106	NRDC/OCC	Section XII	Waiver provisions	The permit must impose limits on water quality credit system to ensure equivalent benefits within the watershed.	Having a cap of something like 50% or less of the volumetric requirement should be considered.	Waiver provisions have been revised.
107	NRDC/OCC	Section XII	Prioritize LID BMPs	A hierarchy of BMPs should be included.	Include a preferred approach of BMPs.	Permit language has been revised.
108	NRDC/OCC	Section XII	Treatment Control BMPs	LID should not be a substitute for treatment control BMPs.	Any project exercising this option should be required to provide 1:1.5 mitigation offsite.	Permit language has been revised to provide clarification.
109	NRDC/OCC	Section XII	Hydrologic conditions of concern	No waiver should be provided for discharges to engineered hardened conveyance channels.	Do not allow this waiver provision.	The waiver provision has been revised.
110	NRDC/OCC	Section XII	Priority projects	Support the inclusion of projects with a threshold of 5,000 sq ft impervious area.	Add clarifying language to Section XII.B.2.(a)	Permit language has been revised.
111	NRDC/OCC	Section XII	Groundwater Protection	The 10' separation requirement may be overly restrictive.	A 5' separation requirement may be appropriate.	The 10' separation is a conservative approach; there is an option for a case-by-case consideration of other options.
112	NRDC/OCC	Section XII	LID Metrics	A critique[5] of the January 2009 white paper (see footnote 1).	The critique provides some arguments in support of a 3-5% EIA metric and provides an analysis of some of the other findings of the January 2009 white paper (see footnote 1).	The January 2009 white paper and its critique have been considered in the revision of some of the LID provisions in the permit.

[5] Critique of Certain Elements of "Low Impact Development Metrics in Stormwater Permitting" by Dr. Richard Horner.

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113	CICWQ[6]	Section XII	LID/Regional BMPs LID BMPs should be preferred	Support LID; regional BMPs and off-site solutions should be considered.	Both provisions are in the current draft.	Comments noted.
114	CICWQ	Section XII	LID design storm	A 2-year, 24-hour design storm is not appropriate.	Consider a design storm as specified in the DAMP.	Permit language has been revised.
115	CICWQ	Section XII	LID	LID BMPs should be the preferred approach.	LID BMPs should be required of all projects.	Permit language revised.
116	CICWQ	Section XII	HCOC	HCOC should be considered on a watershed specific basis.	A technically sound hydromodification plan should be permitted.	Permit language has been revised.
117	CICWQ	Section XII	Watershed Master Plan	Support such a plan.	Include a provision in the permit to require development of a watershed master plan or plans.	Permit language has been revised and a new section has been added.
118	NAIOP	Section XII	Watershed Master Plan	The entire issue surrounding hydromodificaton, infiltration and addressing water quality is very complex. The draft permit seems to want to approach it with a focus on a project by project basis.	Watershed Master Plans can be developed such that water resource goals can be integrated to address water quality, hydromodification, water supply and habitat issues.	Comment noted. Some changes have been made to the new/re-development section of the permit.
119	CICWQ	Section XII	Capture volume	Permit should not require make up of capture volume off site or require a fee.	Delete all requirements for off site mitigation.	The preferred option is 100% LID implementation on site. Off site mitigation is one option where full on site implementation of LID BMPS are not feasible.
120	CICWQ	Section XII	LID feasibility	Permittee should decide whether LID is feasible.	Permittees should have the option to require conventional or LID BMPs on a site-specific basis.	LID BMPs are cost effective and provides water quality and quantity benefits. As such, LID should be the preferred option. Permit does provide other options.
121	CICWQ	Section XII	LID guidance	Additional time is needed to develop LID guidance	Provide 12 months to develop LID guidance and revise WQMP.	Much of the required information is already in the WQMP and six months should be enough to consolidate readily available information.

[6] CICWQ=Construction Industry Coalition on Water Quality

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122	CICWQ	Section XII	WQMP Contents	Revise the requirements specified in the draft permit for revising the WQMP.	Delete Section XII.B.3(a) of the permit.	While some revisions to the permit have been incorporated, Section XII.b.3(a) is still applicable.
123	CICWQ	Section XII	Design volume	Capture volume should be SUSMP volume.	Delete references to 5% EIA and include a capture volume design based on the SUSMP design criteria.	The design volume has been changed to SUSMP criteria.
124	CICWQ	Section XII	HCOC	Hydromodification control strategies should be those recommended in the GeoSyntec white papers[7].	Use control strategies as defined in Attachment 4 (see footnote 7).	Some changes have been made to the permit based on this white paper and other discussions at the stakeholder meetings.
125	CICWQ, NAIPO	Section XII	Areas of agreement	1) EIA or other metrics may be used for LID. 2) Capture volume design may be based on WQMP criteria. 3) LID BMPs should be prioritized. 4) Offsite mitigation needed if on site treatment is not provided		Comments noted and agreed upon items are reflected in the revised draft.
126	County of Orange	Section XII.G	Field verification of BMPs	The requirement to inspect treatment control BMPs is burdensome.	Allow self certification and/or third party verification.	An option is added for self-certification and/or third party verification.
127	County of Orange	Section XII	LID/HCOC	The Model Water Quality Management Plan addresses LID and HCOC; additional mandates and metrics need careful consideration.	Areas of agreement: A performance standard other than the 5% EIA. Water quality design volume at 85th percentile. Prioritize LID BMPs.	LID and HCOC sections have been amended to reflect areas of agreement and to provide clarity.
128	County of Orange-Attachment A	Section XII	Land use authority/LID	The permit intrudes upon local land use authority.	Requirements, such as the 5% EIA requirement, are in contravention to the separation of powers.	As an agency of the State of California, the Regional Water Board has full legal authority

[7] Orange County MS4 Permit Stakeholder Sub-Group Examining LID BMP and Hydormodification Control Sizing Alternatives, prepared by Geosyntec for the January 27, 2009 Sub-Group meeting.

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						to implement LID requirement in this permit, including the 5% EIA requirement. Furthermore, the 5% EIA requirement was one of the options provided as a quantifiable measure for determining compliance with the LID/HCOC provisions of the permit. Other options were also provided in the permit. Providing several tools for compliance determination does not intrude into local land use authority. (The 5% EIA requirement has been amended.)
129	County of Orange-Attachment A	Section XII	Land use authority/LID	Prescribing a method of compliance is a violation of Section 13360 of the Water Code.	Do not specify a method of compliance.	As indicated above, the 5% EIA was one of the tools for compliance determination. Further, the Regional Board is well within its legal authority to determine what is included in the MEP standard.
130	Orange County-Attachment B	Section XII	New Development/re-development	Revisions to proposed land development provisions are needed.	Revise “grandfathering” provision.	Permit language has been revised.
131	Orange County-Attachment B	Section XII.A.2	WQMP guidance	Revisions should be in the LIP.	Modify permit language.	Permit language has been revised.
132	Orange County Attachment B	Section XIIA.6	CEQA review	Annual review of CEQA process is unnecessary.	Modify permit language.	Permit language has been revised.
133	Orange County Attachment B	Section XII.B.2	Commercial/industrial development	The threshold has been changed w/o technical justification.	Provide justification for changing it from 100,000 to 10,000 square feet.	Fact Sheet has been revised.
134	Orange County Attachment B	Section XII.B.2.(c)	Streets, roads and highways	The LID provision is difficult to implement.	Make it consistent with the U.S. EPA requirements.	Permit language has been revised.

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135	Orange County Attachment B	Section XII.B.2.(j)	Retail gasoline outlets	The DAMP includes BMPs for these types of facilities.	Avoid duplicative efforts.	The BMPs in the DAMP, along with LID and other requirements, should be considered for these types of facilities.
136	Orange County Attachment B	Section XII.B.3.	WQMP goals	Goals are written as specific requirements.	Revise permit language.	Permit language has been revised.
137	Orange County Attachment B	Section XII.B.5	Structural infiltration BMPs	No technical basis for the 10 feet separation for infiltration systems, light industrial category and for high vehicular traffic.	Consider the proposed regulations developed by State Board for onsite wastewater treatment systems.	Permit language provides for other options on a case-by-case basis.
138	Orange County Attachment B	Section XII.B.7	WQMP for non-priority projects	Certain non-priority projects may not require a WQMP.	A WQMP should not be required of all projects.	The permit language provides other options.
139	Orange County Attachment B	Section XII.C.1	LID design principals	The design BMPs is a confusing mix of goals, tasks and work products.	Revise the list.	Permit language has been revised.
140	Orange County Attachment B	Section XII.C.2	LID site design	Source control BMPs should not a part of this discussion.	Should delete this section.	Permit language has been revised.
141	Orange County Attachment B	Section XII.C.3	LID/EIA	5% EIA is not appropriate.	Use other LID metric.	Permit language has been revised.
142	Orange County Attachment B	Section XII.C.4	Substitution of LID/treatment controls	This provision, as written, does not appear to be correct.	Provide clarification.	Permit language has been revised.
143	Orange County Attachment B	Section XII. D.1	HCOC	An assessment of a project's impact on the hydrologic regime should not be required for all projects.	For some projects, there may not be a hydrologic condition of concern.	Permit language has been revised.
144	Orange County Attachment B	Section XII.D.2	HCOC	5% EIA should not be the metric for hydrologic conditions of concern.	Express the metric in terms of runoff volume.	The metric for hydrologic condition of concern has been changed.
145	Orange County Attachment B	Section XII.D	HCOC	An additional provision should be added to this section to include HCOC mapping as an option.	Add an interim provision till development of an appropriate LID metric.	Permit language has been revised.

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146	Irvine	XIII.J.1	The LID and hydrologic conditions of concern provisions are not applicable to projects that have an approved WQMP as of the date of adoption of this order.	Under the DAMP and LIPs, project WQMPs are prepared at a conceptual level to be used as planning documents and at a project level, to implement the concept project WQMP planning document. It is unclear whether the conceptual level WQMPs will be grandfathered in as were the land use approvals in the 2002 permit.	Revise to specify land use approvals that will determine development projects that are grandfathered and those that are not.	Permit language has been revised to further identify the level of approval/stage of planning where the requirements of this permit do not apply.
147	Irvine	XIII.3	Public education requirements include making 10 million impressions per year.	There must be a clear definition for an impression. Currently an impression can consist of anything from driving past a pollution prevention banner to and extended face-to-face interaction with a member of the public.	Consider a more effective way of evaluating the effectiveness of a public education program rather than relying on impressions. If impressions must be used, develop a standardized method of determining what qualifies as an impression.	While it is agreed that a more precise method of measuring the impacts of each and every public education interaction would be advantageous, trying to evaluate the effectiveness of City bus placards (depends on the route of the bus), City bill mailing inserts (determining percentage of inserts dumped without seeing, glanced at or actually read), etc., may be more tedious.
148	County of Orange-Attachment B	Section XIII.4	Public Education and Outreach	Requirements for annual business-related workshops may not be very useful.	Suggest modifying the language to include chamber of commerce or other outreach efforts.	Permit language has been revised.
149	County of Orange-Attachment B	Section XIV	Municipal facilities	Annual inspection requirement should be only for open channel systems.	Change annual inspection requirements to open channels only.	Permit language has been revised.
150	Irvine	XIV.7	Report on the effectiveness of debris boom	Do debris booms violate the restriction on treatment BMPs being employed in waters of the U.S.?	Clarify the Regional Board's position.	No violation exists (see Comment 9).
151	Irvine	XIV.10	Permittees shall examine opportunities to retrofit existing	A 2005 retrofit study performed by RBF Consultants has not been adopted or approved by the	The 2005 RBF Retrofit Study should not be mandated as the basis for co-permittee retrofit	The permit requires that a retrofit study be performed and a report on the study be

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			storm water conveyance systems and parks with water quality protection measures and report within 12 months of permit adoption	principal permittee, is still in draft form and co-permittees have not had the opportunity to review the draft.	programs until the co-permittees have had an opportunity to review, comment, and approve the final draft, as required in the current MS4 permit for any program developed by the principal permittee.	submitted within a year of permit adoption. If the 2005 study is still current/valid, that study could be submitted after review, and if not then a new study would have to be initiated.
152	County of Orange-Attachment B	Section XVI	Training program	Revise annual training requirement to be consistent with the County program (2 year frequency).Permittees should be given an option to have their own training programs.	Change training frequency requirements.	Permit language has been revised.
153	Irvine	XVI.2	Water quality training program curriculum	Permittees should be able to tailor their training programs. Non-management staff should not be responsible for knowing the whole storm water program, just their discrete tasks.	Revise order to allow greater flexibility in tailoring course curriculum to be appropriate to an employee's area of responsibility.	Permit language has been revised.
154	Irvine	XVI.3	Training modules should include an outline of the curriculum, a training procedure at the end and Certificate of Completion.	Mandatory training and practical application workshops should provide an alternative to a Certificate of Completion, which raises employment and labor issues.	Delete reference to testing requirements, certifications and Certificates of Completion.	Permit language has been revised.
155	Irvine	XVI.4, XVI.5 and XVI.6	At least on an annual basis, the principal permittee shall provide training to staff on Fixed Facility Model Maintenance procedures, Field Program Model Training, etc.	While this section explicitly states that the principal permittee shall provide training, where city management is competent in the storm water program, they should be allowed to provide that training in-house. Cities with a demonstrated or perceived deficiency may benefit from training provided by the principal permittee.	Revise the tentative order to allow individual cities to provide in-house training rather than participate in training administered by the principal permittee or by their consultants.	Permit language has been revised with the understanding that deficiencies in a permittee's program that are the result of either management or staff's lack of understanding about the program could result in enforcement actions.
156	Irvine	XVI.7	The principal permittee shall notify Regional Board staff at least 30	This notification requirement should not be applied to the initial training given to new	Revise the tentative order to allow documentation of training summary information in the annual report	By notifying Regional Board staff, by email, prior to conducting training, it gives

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			days prior to conducting training sessions.	employees, but only to the annual training given to all appropriate staff. Further, providing a summary training in the annual report be used in lieu of contacting Regional Board staff.	rather than notifying Regional Board staff of it's occurrence, but at minimum clarify that new employee training sessions do not require Regional Board notification.	Regional Board staff the opportunity to sit in on the training to ensure that the quality of the training meets the requirements of the permit. The Regional Board is also interested in the initial training for new storm water program employees
157	Irvine	XVI.8	Permittee shall adequately train staff within 60 days of being assigned duties related to the storm water permit.	It would be impractical for the principal permittee or their consultant to provide training within 60 days of every new co-permittee hire. If co-permittees are responsible for this training then it makes sense for co-permittees to be responsible for training existing staff.	Add an option to enable individual co-permittees to provide in-house training for new hires using curriculum developed by the principal permittee in collaboration with the co-permittees.	Permit language has been revised.
158	Irvine	XIV	None	Sections are misnumbered	No recommendation submitted.	Section numbers corrected.
159	U.S. EPA	XVIII.B.2	TMDL applicability	Although 2007 TMDL listed in this section have been adopted by the Regional Board, they have not been submitted to the State Board for approval. Until the State Board, OAL and the EPA have approved these TMDLs, they are not applicable.	Continue to implement the currently approved 2002 TMDLs until the 2007 TMDLs have been approved by the State Board, OAL and EPA	Permit language has been revised to include both 2002 and 2007 TMDLs.
160	U.S. EPA	XVIII Tables 1A/B		These tables do not accurately reflect the WLA's for urban runoff in EPA's 2002 TMDLs. Additionally, the table should clarify that the WLAs are intended to be enforceable effluent limits.	Compliance with WLAs could be required in accordance with the time frame envisioned by the Board's implementation plan, since this would be consistent with the intent of the EPA TMDLs.	Tables have been revised
161	County of Orange-Attachment A	Sections III.3.i and XVIII.B.3	Selenium in rising groundwater	The source of selenium in the rising groundwater should be considered as a non-point source	Since selenium is from a non-point source, it should not be regulated under the NPDES permit.	The release of selenium has been caused, in part, due to anthropogenic

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				and should not be subject to the NPDES permit.		hydromodification of the watershed. 40 CFR 122.26 requires the prevention of illicit discharges, which includes selenium contained in rising groundwater, into the MS4 system.
162	County of Orange-Attachment B, U.S. EPA	Section XVIII.B.3	Selenium and nutrient TMDL	Make the collaborative language more explicit.	Use suggested changes.	Permit language has been revised to describe the co-operative process that is being used to address the selenium and nutrient impacted groundwater in the San Diego Creek Watershed.
163	County of Orange-Attachment B, U.S. EPA	Section XVIII.E	Numeric effluent limits	The reference to numeric effluent limit is not accurate.	Recognize these as wasteload/load allocations.	Permit language has been revised.
164	County of Orange-Attachment A	Section XVIII.B.4	San Gabriel River metals TMDL	The permit inappropriately implements TMDLs developed by the U.S.EPA.	The requirements in the permit are for Coyote Creek; the upper reach of Coyote Creek is not listed as an impaired waterbody and therefore this requirement is inappropriate.	While the San Gabriel River metals TMDL lists the portion of Coyote Creek that lies within the Los Angeles Region, the upstream portion of Coyote Creek that lies within Orange County is one of the sources of pollutants responsible for the exceedances in the lower Coyote Creek, San Gabriel River and San Gabriel Estuary. The San Gabriel River metals TMDL contains a specific Waste Load Allocation of the MS4 discharge to the upper Coyote Creek. Moreover, the Coyote Creek TMDL was

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						promulgated by USEPA, and pursuant to 40 CFR 122.44, the Regional Board is required to incorporate this TMDL into the NPDES permit. The Regional Board does not have the authority to revisit and revise a USEPA promulgated TMDL.
165	County of Orange-Attachment A	Section XVIII.B.4	San Gabriel River metals TMDL	Since the Santa Ana Regional Board's Basin Plan does not include an implementation plan for Coyote Creek TMDL, this requirement is not consistent with the Clean Water Act and the TMDL requirements. For San Gabriel River.	This TMDL's requirements are outside the scope of authority given to the Regional Board by the Clean Water Act's NPDES program.	These TMDLs where promulgated by US EPA and notification and the opportunity to comment was given to the entities that discharge to these impacted waters. There is no state or federal law requirement that the Regional Board adopt the USEPA promulgated TMDL into the basin plan (and develop an associated implementation plan), prior to incorporating the TMDL into the NPDES permit pursuant to 40 CFR 122.26.
166	U.S. EPA	XVIII.C Tables 5a & 5b	Tables illustrating future Fecal Coliform TMDL's	These tables contain errors in that the first two rows of each table both include "TMDL for Fecal Coliform". It appears that one of these rows should present the WLA for urban runoff.	Make necessary changes in tables as deemed appropriate. Additionally, clarification language should be added to reflect that urban runoff WLA's are intended to be permit effluent limits	Tables corrected and clarification added.
167	U.S. EPA	XVIII.D.1	Diazinon and chlorpyriphos TMDLs for San Diego Creek and Newport Bay	The permit does not explicitly state that diazinon and chlorpyriphos WLAs are intended to be permit effluent limits and that the permittees shall comply with the wasteload allocations in	Add language in this section that states "The permittees shall comply with the following wasteload allocations in tables 6a and 6b." Additionally, the Fact Sheet should discuss the current compliance	Permit language has been revised.

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				tables 6a and 6b.	status of the permittees with the WLAs; given the phase-out of these pesticides within urban areas.	
168	U.S. EPA	XVIII.D.4	Sediment load allocations for Newport Bay and San Diego Creek	The permit should include firm dates for the submittal of monitoring data presenting the 10-year running averages.	The permit should include firm dates for the submittal of monitoring data presenting the 10-year running averages.	Permit language has been changed.
169	U.S. EPA	XVIII.E.2	Compliance with TMDLs	Language should be clarified for consistency with the rest of section XVIII.	Recommend revising language to read: "Based on the TMDLs, numeric effluent limits have been specified to ensure consistency with the wasteload allocations."	Permit language has been revised.
170	Irvine	XIX.B.4	"The Management Committee shall meet at least six times a year to discuss issues related to permit…"	Has the Permittee Committee's name been changed to the Management Committee?	Please clarify.	Permit language has been revised.
171	County of Orange-Attachment C	Monitoring and Reporting	Bioassessment	Integrate this requirement with the regional bioassessment programs.	Integrate monitoring programs.	Permit language has been revised.
172	County of Orange	Monitoring and Reporting	Land use correlation	This information has already been collected.	Eliminate the land use correlation element.	Permit language has been revised.
173	County of Orange	Monitoring and Reporting	Bacteriological monitoring	Intense bacteriological monitoring has been conducted for the last four years.	Reduce bacteriological monitoring requirements.	Permit language has been revised.

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174	NRDC	ROWD MRP IV.2.b	Permit renewal application	The permit renewal application is incomplete as it did not include an assessment of controls.	ROWD should have included an assessment of control measures and their effectiveness in removing pollutants.	The ROWD was posted for public comments. No comments were received and we accepted it as complete after providing 30 days of public notice and review period. We believe that the requirement in the Monitoring and Reporting Section of the draft order for program effectiveness analysis is an appropriate requirement to address this issue.
175	Orange	Fact Sheet	Section IX	Fact sheet still refers to 5% EIA	Delete this reference.	Fact sheet language has been amended.
176	BIA	General	Maximum extent practicable (MEP)	Some stakeholders misrepresent the meaning of MEP.	MEP is “hortatory” (i.e., merely encouraging or exhorting) and permit requirements should be based on the real meaning of MEP.	This comment appears to take issue with characterizations of the term MEP made by other stakeholders. Thus, the comment is noted, but no substantive response is given as the Regional Board cannot speak for other stakeholders.
177	Cypress			Please give further consideration to previously submitted recommendations.		Comment noted.
178	Contech Stormwater Solutions	Finding 66 and 67	Requires proper design of BMPs	Vortex systems, filters, and catch basin inlets have no connection to groundwater and cannot therefore cause groundwater pollution.	Remove these BMPs from this finding.	The finding also references these BMPs becoming a nuisance and/or cause surface water pollution. Improper maintenance of the aforementioned BMPs can result in these problems.
179	County of Orange	Various	Reporting requirements	The County believes that the refining of existing reporting	Revise reporting requirements.	The permit has been revised giving the permittees the

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				mechanisms is the most effective approach to increasing transparency and accountability		opportunity to propose alternative reporting methodologies contingent on the approval of the Executive Officer.
180	County of Orange, Irvine, Lake Forest	Various	Deliverables and submittal dates	Compliance submittals within 6 months or with the first annual report may not provide enough time to budget and complete work.	With the exception of the hydrologic conditions of concern mapping, revise compliance dates to at least one year after permit approval.	For the majority of these deadlines, the compliance dates have been revised.
181	NRDC	III	Non-storm water discharges	Prohibit non-storm water discharges.	Include a prohibition on non-storm water discharges.	The permit provisions are consistent with the Clean Water Act and the federal regulations (40 CFR 122.26(d)(2)(iv)(B). The federal regulations state that certain types of de minimus discharges need not be prohibited from the MS4s unless they are identified by the permittees as a significant source of pollutants.. Section III.1 of the draft order prohibits all other types of non-storm water discharges.
182	Golden State Water Company	III.3	De minimus discharge requirements	Does section III.3.ii refers to discharges from all entities or just municipal permittees?	Clarify requirement.	Permit language has been amended to clarify that this section only applies to discharges from municipal permittee owned/operated facilities and activities.
183	Laguna Hills	VI.6	Construction and industrial inspections	The new requirement that cities notify the Regional Board regarding violations at sites that are State General Permittees is unwarranted	Remove this requirement.	This requirement was in previous permit (Order R8-2002-0010 – Section VI.5). Further, coordinated enforcement actions will enhance water quality and meets the MEP threshold for this MS4 permit.

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184	County of Orange	IX.10 and X.11	Coordination of inspections with Regional Board staff	The current limited resources available to both the Regional Board and permittees to conduct inspections makes coordination of these activities a priority. It is recommended that a formal framework for inspection responsibilities be established.	Revise permit accordingly.	Permit language has been added identifying this goal.
185	Laguna Hills	X.1	Quarterly update of commercial facility inventory	The City already updates it's commercial inventory on a continuous basis.	Allow permittees to constantly track facilities.	The permit has been revised to give the permittees an opportunity to devise an alternate updating methodology that's approved by the Executive Officer.
186	Huntington Beach	X.2	Prioritizing commercial sites.	Requirement will increase number of inspections 10-fold.	Allow self-inspections of commercial sites 4 of 5 years and have cities inspect once per permit term.	While analysis of the permittee's commercial site database revealed numerous commercial businesses not listed in X.1.a-s, which could probably be dropped from their inspection database without threat to water quality, the permit has been revised to lower the Medium priority percentage to 20%. In the April 10, 2009 draft, Section XII.2 provides an option for the permittees to develop a scheme for prioritization and inspection of commercial sites.
187	Laguna Hills	X.2	Prioritizing commercial sites	The assignment of arbitrary percentages for high, medium and low priority sites means if a City has already assigned 100% commercial sites a High priority, it will have to downgrade at least 40% to meet the requirement.	Permittees should be given the flexibility as to designating its facilities without being restricted by the Regional Board.	During the 3rd term permit, MS4 Audits conducted by Regional Board staff indicated the need for more regimented oversight regarding commercial inventory management and inspections

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						within this section. If the example cited by the commenter arises, certainly, having 100% High priority ranked sites would be going beyond the minimum standards set by the permit and would not be viewed as a violation. Section XII.2 provides an option to develop a scheme for prioritization and inspection of commercial sites.
188	Irvine	X.2 and 3	Inspections of commercial sites	The new 10/40/50 High/Medium/ Low commercial breakdown will require that the City perform an additional 985 inspections per year resulting in an additional annual cost of $279,700.	Make use of the 10% High priority, but only require inspections of High priority sites.	While communication with the permittee has revealed some problems with their estimates, revisions to the permit have lowered the Medium priority percentage to 20%. In addition, Section XII.2 provides an option to develop a scheme for prioritization and inspection of commercial sites.
189	County of Orange	X.2 and 3	Commercial facility inspections	The permit should provide an opportunity to develop a risk-based scheme as an alternative to current permit language.	Revise permit accordingly.	Section X.2 now provides the permittees an opportunity to develop a prioritization scheme for inspections. The commercial inspection program was introduced in the 2002 permit cycle. The permit requirements prescribed a minimum of the program's structure. As a result of permittee's implementation of the program, further prescription of a minimum program was warranted.

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						Through implementation of the program proposed in the current draft permit, a more efficient program should evolve for the next permit cycle.
190	Huntington Beach, Irvine	X.3 and X.5	Photographic documentation of commercial sites	Permit requires photos of waste & material handling BMPs which is beyond the requirement for industrial sites.	Require photos only to document violations.	Photographic documentation of waste and material handling practices will ensure that sufficiently substandard storage is appropriately documented as a violation by the permittees and will allow Regional Board staff to more accurately evaluate permittee inspection/enforcement activities during audits.
191	Orange	X.3	Commercial inspections	The proposed 10/40/50 (high/medium/low) priority breakdown will require an additional 900 inspections per permit cycle for the City.	Either maintain current flexibility or introduce the 10% mandatory 'High' priority and inspect remaining 90% as needed.	While the 900 additional inspections/permit cycle works out to 4 additional inspections a week, the priority breakdown has been adjusted to a minimum 10/20/70.
192	BIA	Section XII	CEQA	Integrate MS4 permit requirements into the CEQA documents.	Use CEQA to integrate LID principles into the project at an early stage.	We agree; there are a number of requirements in the draft permit requiring such integration (e.g., see Section XII.A.4 and 6)
193	NRDC	XII	New Development	This section should be revised to require meeting MEP standard.	Include clarifications to ensure that Permittees meet MEP standard.	Clarifications added.
194	NRDC	XII	Documents submitted for review and approval	The public should have an opportunity to review and comment on the documents submitted for approval.	Revise permit language.	Permit language revised (See Footnote 55).
195	Irvine	XII.A.7	Project approval process requirement	None	Clarify that the update of the project approval process is the same as for the DAMP finalization.	Permit language has been revised.

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196	Lake Forest	XII.B and C	Implementation of LID	Implementation of LID and hydromodification requirements will not always be feasible, in particular there is concern about implementing the USEPA's 'Green Streets' guidance document.	None	The permit addresses situations where requirements may not be feasible and provides suitable alternatives in these situations (See Section XII.E).
197	NRDC	XII.B.2	List of priority projects	Revise the list to make it clear.	Revise the list to make it clear.	List revised.
198	Orange	XII.B.2.b	New Development	By revising permit language to include subdivisions with less than 10 units, if there's a combined 10,000 sq. ft. of imperviousness, the permit may now require single family homes to be priority development projects.	Retain the language exempting subdivisions of less than 10 units.	If the threshold of 10,000 sq. ft. of impervious surface is exceeded there is the potential for a similar level of pollutant load and alteration of the hydrologic regime, whether that area is divided between 10 residential units or less than 10.
199	Orange	XII.B.2.c and j	Priority Development Project classification	It is unclear whether the 10,000 square feet refers to land area or building area.	Clarify	Permit language has been amended to indicate that 10,000 sq. ft. refers to impervious area.
200	Orange County Business Council	XII.B.2.h	WQMPs for streets	The requirement for adherence to US EPA's 'Green Infrastructure" for public streets will increase costs and may not be possible.	Remove this requirement.	The incorporation of the US. EPA guidance document was at the suggestion of some of the stakeholders. Further, XII.B.2.h only requires the incorporation of the US EPA guidance document to the Maximum Extent Practicable.
201	NRDC	XII.B.5	Infiltration systems	The specified separation needed for infiltration systems to groundwater of 10' should be revised.	Make the separation 5'.	Permit language revised.
202	Irvine	XII.B.5(a)	Structural infiltration BMPs	Structural infiltration BMPs should meet minimum requirements that they not increase seepage or exfiltration of contaminated groundwater	Clarify language.	Permit language states that infiltration systems shall not cause or contribute to groundwater water quality exceedances (Section XII.B.5.a).

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Comment No.	**Commenting Parties**	**Section No.**	**Permit Requirement**	**Comment**	**Submitted Recommendations**	**Response**
203	Orange County Water District	XII.b.5.f	LID – Infiltration requirements	Footnote 50 restricts infiltration in sites known to have soil 'and' groundwater contamination. The word 'and' should be replaced with the word 'or.'	Revise permit language.	The footnote (54 in 3rd draft) has been revised.
204	Orange County Water District	XII.B.5.f	LID – Infiltration requirements	There are some land uses that should be restricted from infiltration whether or not there is current contamination (e.g., gas stations).	Include restrictions on infiltration for sites that have a high threat to water quality	The tentative order includes restrictions on infiltration systems in high vehicular traffic areas. We believe that this restriction along with the underground storage tank regulations should provide the needed groundwater protection from infiltration systems.
205	Contech Stormwater Solutions	XII.B.5.f	Structural infiltration BMPs	In high traffic areas, infiltration BMPs should have a minimum 75 gallon spill retention capability for diesel/hydraulic fluid spills.	Add requirement.	Rather than risking groundwater contamination by spills greater than the design volume of a proposed BMP, it is more prudent to prohibit infiltration BMPs in the situations presented in XII.B.5.f.
206	Orange County Water District	XII.C	LID – Infiltration requirements	OCWD would encourage the creation of a comprehensive map of Orange County identifying areas suitable for infiltration.	Require data to be collected and a map to be prepared.	The permittees are encouraged to prepare a Watershed Master Plan (see Section XII.D.5) to address LID infiltration and hydrologic conditions of concern in a comprehensive manner. Also Section XII.E.1 of the order requires the permittees to develop feasibility criteria for implementing LID BMPs.
207	Orange County Water District	XII.C	LID – Infiltration requirements	From a management and monitoring standpoint, grouping or clustering infiltration systems on a regional basis would make sense.	Consider the grouping of infiltration systems.	Sections XII.D.5 and XII.E of the order provides an opportunity for the permittees to develop LID infiltration systems on a regional or sub-regional basis.

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Comment No.	**Commenting Parties**	**Section No.**	**Permit Requirement**	**Comment**	**Submitted Recommendations**	**Response**
208	Orange County Water District	XII.C	LID – Infiltration requirements	Data needs to be collected in Orange County to assess the potential impacts to groundwater quality due to dry wells, infiltration galleries and poorly maintained infiltrations systems.	Revise permit language.	A requirement for developing a monitoring program for the infiltration systems has been added to the tentative order (see Section XII.B.5.g).
209	Orange County Water District	XII.C	LID – Infiltration requirements	An anti-degradation analysis in terms of groundwater quality should be provided in the Order.	Revise permit language.	We do not believe that any further anti-degradation analysis is needed as the infiltration systems are required to be designed to mimic pre-development hydrologic conditions with proper controls for pollutant sources.
210	Orange	XII.C	LID requirements	Redevelopment and in-fill projects may not be able to meet the LID requirements.	Exempt redevelopment and in-fill projects from LID requirements where sites drain to hardened or engineered channels.	While permit language in the 3rd draft, acknowledges that sites for which all receiving waters are hardened do not need to meet hydrology modification requirements, LID implementation also addresses pollutant transport by reducing the runoff responsible for the transport. So were possible, LID BMPs should be implemented.
211	Irvine	XII.C	LID requirements	It should be made clear that "LID requirements do not apply to development of conceptual or project WQMPs approved prior to 12 months after permit adoption…"	Clarify language.	XII.J clearly states that the only fully grandfathered projects are those that already have an approved WQMP. For all projects for which conceptual or project WQMPs are approved after the adoption of the permit and prior 90 days after approval of the revised model WQMP must implement the provisions in Section XII of the permit to the maximum extent practicable.

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Comment No.	**Commenting Parties**	**Section No.**	**Permit Requirement**	**Comment**	**Submitted Recommendations**	**Response**
212	Irvine	XII.C	Hydrologic conditions of concern requirements	It should be made clear that "hydromodification control requirements do not apply to development of conceptual or project WQMPs approved prior to 12 months after permit adoption…"	Clarify language.	XII.J clearly states that the only fully grandfathered projects are those that already have an approved WQMP. For all projects for which conceptual or project WQMPs are approved after the adoption of the permit and prior 90 days after approval of the revised model WQMP must implement the provisions in Section XII of the permit to the maximum extent practicable.
213	Orange County Business Council	XII.C	LID requirements	The permit should make clear that capture and infiltration is not required where infeasible or impractical.	Clarify permit.	The permit already makes this clear. See Section XII.E.1.
214	CICWQ	Section XII.C.	Conventional treatment control BMPs	Conventional treatment control BMPs should be considered only as a last resort.	Require structural treatment controls only if LID BMPs are infeasible.	We agree.
215	CICWQ	Section XII.C	LID BMPs	NGOs references to more restrictive volume controls for MS4 permits are not relevant.	Most references are from guidance documents and are not included in the adopted MS4 permits.	We agree that most references are not from adopted MS4 permits. Nevertheless, some of these are useful guidance documents for implementing LID.
216	BIA	Section XII.C	LID BMPs	The Board should include filtration as an acceptable LID BMP.	Include "filtration" as an LID BMP.	We have no objection to considering filtration as a second-tier LID BMP. This should be done on a case-by-case basis.
217	BIA	Section XII.C	LID BMPs	100% on-site retention should not be mandated. Reject any "universal retention doctrine".	Allow for "natural flow doctrine".	The draft permit does not require 100% on-site retention.
218	NRDC	XII.C	LID	LID provisions should be clearly articulated with performance standards.	Revise daft permit language.	Permit language has been revised.

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Comment No.	**Commenting Parties**	**Section No.**	**Permit Requirement**	**Comment**	**Submitted Recommendations**	**Response**
219	NRDC	XII.C	LID	LID BMPs must meet the MEP standard.	Provide clarification.	Permit language revised.
220	County of Orange	XII.C.1 and 2	LID requirements	Clarifying text change recommendations were provided for these sections.	Revise permit accordingly.	Permit language has been revised to include some of the recommended changes.
221	Contech Stormwater Solutions	XII.C.2.b	LID BMPs	Permit should not limit permeable paving alternatives.	Allow alternatives to permeable concrete or porous asphalt.	Permit language has been amended.
222	Contech Stormwater Solutions	XII.C.2.b	LI D BMPs	The phrase "minimize pipes, culverts and engineered systems…" should be replaced.	Replace statement with a more general "minimize changes to the time of concentration on site."	Recommended language has been incorporated into the permit.
223	Orange	XII.C.3	Infiltration BMPs	Dry wells are listed as an allowable BMP, but may result in groundwater contamination	Require consultation with local water district prior to approval of dry wells.	Permit language has been revised.
224	Contech Stormwater Solutions	XII.C.4	LID BMP design requirements	While the goal of LID BMPs might be capturing the 85th percentile event, it shouldn't be a design requirement	Delete this section.	The permit already provides options for sites where conditions rule out treating the 85th percentile event through LID BMPs.
225	Contech Stormwater Solutions	XII.C.5	Treatment BMP requirements	This section does not specify any level of treatment that is required by BMPs.	Specify the treatment control BMPs must be designed to have medium or high effectiveness based on full-scale, in-field testing.	The current Model WQMP has a similar requirement and it will be carried over in the Model WQMP approved for this permit.
226	CICWQ	Section XII.C. 5 & 7	LID BMPs	The current language in provisions 5 and 7 restricts the application of all available LID BMPs. These provisions include a universal mandate to infiltrate.	Include a second tier option for biofiltration, bioretention, filter strips, etc.	We believe that the most effective LID BMPs are those that infiltrate or harvest and re-use storm water onsite. The bio-treatment types of BMPs should be considered on a case-by-case basis.
227	Contech Stormwater Solutions	XII.C.7.a-b	LID BMPs	It is overly prescriptive to dictate where BMPs should be implemented.	Delete these sections.	The intent of this permit language is to encourage mimicking natural conditions where localized detention areas address the majority of storm events.

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Comment No.	**Commenting Parties**	**Section No.**	**Permit Requirement**	**Comment**	**Submitted Recommendations**	**Response**
228	Orange County Business Council	XII.D	Hydrologic modifications	The permit should recognize that most, if not all, in-fill projects are incapable of mimicking the pre-development hydrologic regime.	Clarify permit	The permit already acknowledges that not all sites will be able to meet this requirement on-site and provides suitable alternative compliance mechanisms.
229	Orange, County of Orange	XII.D.2.b	Hydrologic Conditions of Concern (HCOC)	Second draft of the permit has added that HCOC may exist for downstream hardened channels if those channels are Waters of the U.S. In the City's experience, all conveyance channels have been considered Waters of the U.S. by the Army Corps of Engineers.	Delete the added statement.	Permit language has been revised.
230	Irvine	XII.D.2(b)	Hydrologic conditions of concern exemptions	The permit language that currently exempts hardened channels from requiring hydrologic controls should be expanded to include stabilized channels	Clarify language.	If channels are engineered and regularly maintained to ensure design flow capacity, they do not have a hydrologic condition of concern per the third draft permit language.
231	CICWQ	Section XII.D.2.(b)	HCOC	The addition of the last sentence eliminates any waivers for HCOC.	Delete the last sentence.	The last sentence has been deleted.
232	NRDC	XII.E	Alternatives and in-lieu programs	The alternatives should be better integrated.	Revise permit language.	We did not see the need for any additional changes.
233	County of Orange	XII.E.1	Alternative and In-lieu programs	Clarifying text change recommendations were provided for this section.	Revise permit accordingly.	It's the judgment of Regional Board staff that the language currently in the draft permit more accurately portrays staff's intent.
234	Irvine	XII.H	Structural treatment BMP tracking	This section requires permittees to establish a mechanism to track structural BMPs and ensure that proper easements are recorded and conveyed to new owners.	There are already procedures in place at the County Recorder's office and through permittee's WQMP approval processes that address these requirements.	If the permittees can ensure that the requirements set forth in XII.H are being addressed then XII.H is satisfied.

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Comment No.	**Commenting Parties**	**Section No.**	**Permit Requirement**	**Comment**	**Submitted Recommendations**	**Response**
235	Laguna Hills	XII.H.1	Ensure that structural treatment control information is tracked with ownership change.	Recorded information is already transferred to new owner and City should not be held responsible for keeping track of this.	Delete requirement.	If the permittees can ensure that the requirements set forth in XII.H are being addressed then XII.H is satisfied.
236	Lake Forest	XII.I.3	Structural treatment BMP database	It appears that the requirement is that all BMPs installed to date would have to be included.	Limit database to only newly constructed BMPs.	Permit language has been revised.
237	Irvine	XII.I.5	Structural treatment BMP inspections	Current permit language limits inspection of these BMPs to the dry season. Further, because the number of these BMPs will increase every year we request that the number inspected be dropped from 50% to 25%.	Revise permit	The need to ensure that the BMPs are functional during the wet season requires inspection prior to the wet season. However, the inspection quantities have been reduced to 25% per year with 100% coverage during every 4 year cycle.
238	Lake Forest	XII.I.5	Structural treatment BMP inspections	The number of these BMPs will be increasing every year, becoming burdensome.	The permit should allow self inspections or use a representative sampling	Permit language has been revised.
239	Laguna Hills	XIII.4	Commercial business training	Business owners will not attend training during the work day.	Rely on education during site visits.	Because site visits for some facilities may not occur until the end of the permit cycle, site visit education can only be one part of an overall business education system.
240	Orange	XVI.3 and 4	Permittee employee training	The requirement for testing and Certificates of Completion infringes on the City's right to set employee class specifications.	Allow attendance sheets or other proof that training has been completed in place of Certificates of Completion and allow other procedures to substitute for testing to verify an employee's understanding of the curriculum.	Section XVI.3 has been amended to include other methods of course completion.
241	NRDC	XVIII	TMDL	Specify that the wasteload allocations (WLA) are enforceable permit limits.	Make WLAs enforceable permit limits.	Permit language revised.

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Comment No.	**Commenting Parties**	**Section No.**	**Permit Requirement**	**Comment**	**Submitted Recommendations**	**Response**
242	NRDC	XVIII	TMDL	Prohibit new sources and new dischargers from discharging into 303(d) listed waters.	Include a prohibition on new sources and new dischargers into impaired waters.	First, while new development or redevelopment in an urban area may change the characteristics of the discharge entering the MS4 and hence the receiving water, each new development or redeveloped area does not constitute a new source or discharge. Further, the intent of the current MS4 permit is to address pollutant loads through an iterative BMP process. Moreover, the case primarily relied on in this comment, *Friends of Pinto Creek v. USEPA*, 504 F.3d 1007, did not involve an MS4 permit. Rather, it involved an individual NPDES permit for an individual discharger discharging directly into a water of the United States. Here, NRDC asks that the Regional Board expand the holding of that case to prohibit discharges into an MS4 system. These are two very different contexts, as the regulatory scheme/NPDES permitting requirements for an MS4 system are distinct from that of an individual discharger discharging directly into federal waters. Thus, to the extent that *Friends of Pinto Creek* is factually, distinguishable from the current situation, the holding is not applicable to this permit.

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Comment No.	**Commenting Parties**	**Section No.**	**Permit Requirement**	**Comment**	**Submitted Recommendations**	**Response**
243	County of Orange, Lake Forest	XVIII.B.10	Coyote Creek TMDL	TMDLs adopted by another Regional Board should not be applied outside their jurisdiction. Regulated entities should have the opportunity to participate and dispute the adoption of a TMDL.	The Coyote Creek TMDLs should not be included in this permit.	This TMDL was promulgated by USEPA. While the San Gabriel River metals TMDL lists the portion of Coyote Creek that lies within the Los Angeles Region, the upstream portion of Coyote Creek that lies within Orange County is one of the sources of pollutants responsible for the exceedances in the lower Coyote Creek, San Gabriel River and San Gabriel Estuary. Further, the San Gabriel River metals TMDL contains a specific Waste Load Allocation of the MS4 discharge to the upper Coyote Creek. We also note that the permittees that discharge to the listed waters were notified during the TMDL stakeholder process and commented on the TMDL at that time. See also response to comment numbers 164 and 165.
244	Lake Forest	Distribution list	None	Saddleback Valley School District was not included.	Include the school district.	The school district has been added to the list of other entities with the potential to discharge pollutants to the Orange County storm water system.

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Comment No.	**Commenting Parties**	**Section No.**	**Permit Requirement**	**Comment**	**Submitted Recommendations**	**Response**
	COMMENTS RECEIVED ON THE APRIL 10, 2009 DRAFT					
245	NRDC	XII	The permittees shall incorporate LID site design principles to reduce runoff to MEP.	The language in this Section of the tentative order requires a feasibility analysis before any LID BMP is required, as opposed to providing an "out" in situations of true infeasibility. This would mean that you would have to prove feasibility in each situation which is very problematic for many reasons and cuts against the common agreement by all that LID is generally feasible at some scale.	Modify Permit language.	During the public hearing on April 24, 2009, staff proposed a change to address this issue. This change is reflected in the 4th draft of the permit. Further changes may be made to Sections XII.C.1 & 2 based on comments on the 4th draft and any revisions will be addressed at the May 22, 2009 Regional Board meeting..
246	NRDC	XII	LID design criteria	The permit language does not require retaining the water on site from the design capture storm unless Infeasible. Rather, it says to capture and if you cannot you can use LID and conventional treatment BMPs. This doesn't seem to provide any requirement to retain the design storm when it can be done.	Change language to include a clear measurable performance standard that requires landscape-based treatment, on-site retention, and/or storage for re-use. These should be written in order to incorporate clear, enforceable LID requirements. Qualifier language such as: 'to the extent feasible' and 'as practicable' should not be used.	During the public hearing on April 24, 2009, staff proposed a change to address this issue. This change is reflected in the 4th draft of the permit. Further changes may be made to Sections XII.C.1 & 2 based on comments on the 4th draft and any revisions will be addressed at the May 22, 2009 Regional Board meeting.
247	EPA	XII.C.1	LID BMPs	The Tentative Order states that projects that "meet the feasibility criteria" shall implement the permit's specific LID provisions. The feasibility criteria are prepared as a separate deliverable by the permittees (under section XII.E), and require EO approval. With this language, LID requirements will not apply until the permittees prepare an approvable feasibility criteria.	Modify Permit language.	This issue is under review and any revisions will be addressed at the May 22, 2009 Regional Board meeting.

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Comment No.	**Commenting Parties**	**Section No.**	**Permit Requirement**	**Comment**	**Submitted Recommendations**	**Response**
248	EPA	XII.C.2	LID criteria	As it is currently written, the tentative Ooder opens the door to allow the use of conventional treatment controls in-lieu of LID BMPs.	LID BMPs should be considered for each priority development project.	This issue is under review and any revisions will be addressed at the May 22, 2009 Regional Board meeting.
249	Orange County Water District	XII.B.5(d)	The vertical distance from the bottom of the infiltration system to the seasonal high groundwater must be at least 5 feet.	The Water District was concerned about the uncertainty factor in determining historic high groundwater and recommended a minimum 10 feet separation.	It would be prudent to specify a 10 feet vertical separation in the permit.	Permit language was modified in the 4th draft permit.
250	County of Orange	Finding J.52		Reference to 40 CFR citation is wrong.	Modify Permit language.	Permit language was modified in the 4th draft permit.
251	County of Orange	XVIII		Technical TMDLs (TMDLs with no implementation plans) should not be included in the permit	Delete technical TMDLs from the permit.	40 CFR 122.44(d)(1)(vii)(B) requires that this MS4 permit be consistent with the applicable waste load allocations in TMDLs and does not exempt those without implementation plans.
252	Riverside County Flood Control	Various	`	Commenter references numerous findings and permit requirements and requests that either they not be included in the Riverside County permit or be included with changes.	None	Comment noted.
253	Latham & Watkins, CICWQ,	XII.C.2 and 7	LID Implementation	Approved LID BMPs should include bio-treatment.	Modify Permit language.	Bio-filtration has been added to XII.C.2 in the 4th draft permit and may need to be added elsewhere within the permit to achieve consistency.
254	County of Orange, OC Coastkeeper, CICWQ	XII	Watershed Master Planning	Commenters support the inclusion of Watershed Master Planning and want it to be mandatory.	CICWQ supports the use of Watershed Master Plans. The County of Orange and OC Coastkeeper jointly submitted language making Watershed Master Plans mandatory.	The permit language proposed by the commenters was incorporated in Section XII.D.5
255	Prontowash	X.8	Mobile Commercial Source Program	Permit should require mobile car detailer to contain all discharge.	Revise permit language	The permit currently prohibits mobile car wash discharge as a non-storm water discharge and requires municipalities to prohibit this discharge.

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Comment No.	**Commenting Parties**	**Section No.**	**Permit Requirement**	**Comment**	**Submitted Recommendations**	**Response**
256	CICWQ	XII.C.2	LID	Provide clarification for the word "capture"; does it include bio-treatment.	Make the definition of LID consistent with the USEPA definition to include bio-treatment.	The 4th draft of the permit addresses this issue.
257	CICWQ	XII.C.3	Design "strategy"	Request replacing the word "strategy" with the word "preference"	Modify permit language.	This issue is under review and any revisions will be addressed at the May 22, 2009 Regional Board meeting.
258	Geosyntec, County of Orange	General	Assessment of Pollutant Reductions	Response to NRDC comments	Response to NRDC comments	Comments noted.
259	Geosyntec, County of Orange	General, LID	LID Metrics	A response to Dr. Horner's critical comments on "LID Metrics in Storm Water Permitting".	Response to critical comments.	Comments noted.
260	Latham& Watkins	General, New Discharges	"New "discharges to impaired waters	A response to NRDC's comments regarding the applicability of Friends of Pinto Creek v. U.S. EPA.	Latham & Watkins analysis concludes that this case is not applicable to the Orange County MS4 permit.	Comments noted.
	ORAL COMMENTS RECEIVED AT THE APRIL 24, 2009 PUBLIC HEARING (Extracted From Audio Records, May Be Supplemented Based On Transcripts, When Available.) (Comments Reflected In Written Correspondence Not Duplicated.)					
261	City of Lake Forest	Various		Keep in mind financial considerations and maximize the flexibility of permit requirements.		Comment noted.
262	County of Riverside	Various		The County wants the opportunity to base their new permit on their old permit.		Comment noted.
263	County of Orange	XII.C.1	LID Implementation	Recommends phasing in the LID requirements over an 18-month period instead of immediately, as reflected in the U.S. EPA proposed language.	Revise implementation date to 18 months.	This issue is under review and any revisions will be addressed at the May 22, 2009 Regional Board meeting.
264	County of Orange	XII.C.2	LID Implementation	If LID is required prior to the establishment of the feasibility criteria, as proposed in the U.S. EPA language, how do the permittees determine if LID is in fact infeasible at a site?		This issue is under review and any revisions will be addressed at the May 22, 2009 Regional Board meeting.

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Comment No.	**Commenting Parties**	**Section No.**	**Permit Requirement**	**Comment**	**Submitted Recommendations**	**Response**
265	County of Orange	XVIII.B.9	Coyote Creek TMDLs	The Los Angeles Regional Board should identify the load for dischargers in the Santa Ana Region. The Santa Ana Region should then determine impairment, list the impaired waters and develop TMDLs for those impaired waters. Only Santa Ana Board adopted TMDLs should be in the Santa Ana permit.	Modify Permit language.	The San Gabriel River TMDLs (including Coyote Creek) and the waste load allocations associated with those TMDLs were promulgated by the U.S. EPA and therefore this Permit must be consistent with those TMDLs as provided in 40 CFR section 122.26. Please see responses to comments number 164 and 165.
266	CICWQ	XII.C.1	LID Implementation	Put back the portion of XII.C.1, deleted in the proposed U.S. EPA language.	Modify Permit language.	This issue is under review and any revisions will be addressed at the May 22, 2009 Regional Board meeting.
267	CICWQ, City of Irvine, County of Orange	XII.C.2	LID Implementation	Strike the language added in the U.S. EPA changes in XII.C.2.	Modify Permit language.	This issue is under review and any revisions will be addressed at the May 22, 2009 Regional Board meeting.
268	CICWQ, Michael Recupero	XII.C	LID Implementation	Clarify that bio-filtration is consistent with U.S. EPA definition of LID	Modify Permit language.	Bio-filtration has been added to XII.C.2 in the 4th draft permit and may need to be added elsewhere within the permit to achieve consistency.
269	CICWQ	XII.C.3	LID Implementation	Replace the word 'strategy' with the word 'preference'.	Modify Permit language.	The word "strategy" may be replaced with the word "goal" as discussed at the April 24, 2009 public hearing.
270	GeoSyntec	XII.C	LID Implementation	Keeping the design storm volume on site will not always work, in many cases evapotranspiration is the key transport mechanism and replacing that with infiltration may have unintended consequences.	None	Comment noted.
271	OC Coastkeeper	XII.C	LID Implementation	This permit should have a three-pronged approach with Watershed Master Plans and an internet based information	None	Comment noted.

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Comment No.	**Commenting Parties**	**Section No.**	**Permit Requirement**	**Comment**	**Submitted Recommendations**	**Response**
				system with hydrologic data for builders and planners.		
272	City of Irvine	XII.C	LID Implementation	It should be made clear that if the design storm volume is addressed through bio-treatment and there is subsequent discharge to the MS4, no further treatment or offset is required.	Modify Permit language.	This issue is under review and any revisions will be addressed at the May 22, 2009 Regional Board meeting.
273	City of Orange	XII.J.1	Pre-Approved Projects	The permit language may not include all projects that have already received approval by the municipalities.	Ensure that permit language includes all projects approved by municipalities.	The current permit language recognizes this and requires implementation of LID BMPs consistent with the MEP standard.
274	Lennar Homes	XII.C.7	Regional Treatment	Regional treatment should be allowed without a waiver requirement and without additional treatment or offset.	Modify Permit language.	The draft permit includes provisions for regional treatment. The Watershed Master Plan, Section XII.D.5, should be used as another tool to incorporate regional treatment systems.
275	Michael Recupero	XII.C.1	Feasibility criteria	Does the language proposed by U.S. EPA strike the feasibility analysis?	None	While the feasibility analysis is not eliminated, the timing of LID implementation and the approval of a model WQMP (including feasibility criteria) are under review and any revisions will be addressed at the May 22, 2009 Regional Board meeting.
276	Michael Recupero	XII.C	Feasibility criteria	What will be the threshold for infeasibility and who decides it and does every project not implementing LID for the full 85th percentile 24-hour storm require a Regional Board granted waiver?	None	These issues are under review and any revisions will be addressed at the May 22, 2009 Regional Board meeting.
277	Michael Recupero	XII.B.5(d)	The vertical distance from the bottom of the infiltration system to	Supports a 10' vertical separation.	Modify Permit language.	The 4th draft permit specifies a 10-foot vertical separation.

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Comment No.	**Commenting Parties**	**Section No.**	**Permit Requirement**	**Comment**	**Submitted Recommendations**	**Response**
			the seasonal high groundwater must be at least 5 feet.			
278	San Bernardino County Flood Control District, Storm Water Program	General	Various	Commenter requests that the Orange County Permit should not be used as a template for the San Bernardino County Permit. .	None	Comments noted.
	COMMENTS RECEIVED ON THE MAY 1, 2009 DRAFT					
279	U.S. EPA	XII.C.2	LID	Language should be added to clarify that compliance with XII.C.& or XII.E meets the permit's LID requirements.	Insert "Compliance with the permit's LID requirements may also be achieved by implementation of the alternatives specified in section XII.C.7 or by implementation of an approved waiver under section XII.E" at the end of XII.C.2.	With other changes made to subsections XII.C.1 and 2, insertion of the submitted language would not have clarified the intent of this permit requirement. It is thought that the other changes made to this section have sufficiently clarified these requirements.
280	U.S. EPA	XII.C.2	LID	The meaning of the term 'bio-filter' is unclear and the use may not be necessary.	Criteria for the design and operation of these systems should be specified in the permit or should be part of the feasibility criteria required pursuant to Section XII.E.	The term 'bio-filter' has been replaced by 'bio-treatment' and the requirement that design, operation, and maintenance criteria be developed as part of the model WQMP has been added.
281	U.S. EPA	XII.C.7	LID	The term 'treat' is used repeatedly in Section XII.C.7, which sets up an inconsistency with other permit requirements.	Either 'treat' should be deleted or with Board approval, changed to 'bio-treat'.	The references to 'treat' in Section XII.C.7 have been changed to 'bio-treat' or 'bio-treatment'.
282	U.S. EPA	XII.E	Waiver Approval	With regards to project-specific waivers generated by Section XII.E, commenter believes that the number of waivers will be small. While supporting the 4th	None made.	While waiver approval per Section XII.E remains the same, if the feasibility criteria required by that section is not approved within 12 months of

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				draft permit language, the commenter would be open to revisions that do not require EO approval for waivers.		permit adoption, the resulting case-by-case feasibility determination by the municipalities on proposed projects will not require EO approval, but will be submitted for Regional Board staff review 30 days prior to municipal approval.
283	Paul Singarella, Latham & Watkins	Findings	None	A Finding should be added stating that the Regional Board does not expect on-site retention of 100% of the design capture volume to be feasible in all cases and that implementation of bio-treatment will still satisfy legal requirements and provide a significant advance on the previous Order.	Insert provided Finding.	The existing Findings clearly indicate that LID itself, much less LID with 100% on-site retention may not be feasible at all sites.
284	Larry McKenny, RBF Consulting	XII.C	LID	Commenter supports the CICWQ comments and notes that the MEP standard does not dictate full retention of a design storm volume on site.	None	Comment noted.
285	County of Orange	None	None	The County notes involvement in the development of their comments by the Cities of Anaheim, Buena Park, Cypress, Fountain Valley, Irvine, La Palma, Laguna Hills, Lake Forest, Newport Beach, Orange, Placentia, Tustin, Villa Park and Westminster , as well as their concurrence with the submitted comments.	None	Comment noted.
286	County of Orange	XII.C.1	LID	While the change in Section XII.C.1 made at the Public Hearing and further in the fourth	Language was submitted by the commenter for Section XII.C.1.	Many of the changes in language, proposed by the commenter were incorporated

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				draft were made to address the possibility that approval of the feasibility criteria may drag on, it has the possible effect of excessive administrative burden and project delays.		in the permit and are reflected in the Errata Sheet.
287	County of Orange	XII.C.2	LID	The consequence of changes to Section XII.C.2 in the fourth draft result in the need for a waiver and EO approval for any project not addressing 100% of the design storm volume through on-site LID BMPs.	Language was submitted by the commenter for Section XII.C.2.	Many of the changes in language, proposed by the commenter were incorporated in the permit and are reflected in the Errata Sheet.
288	County of Orange	XII.C.2	LID	The term 'bio-filter' was used instead of 'bio-treat'. Further, the language in footnote 56 identifies that bio-treatment can only be used if infiltration, harvest/reuse and evapotranspiration are infeasible.	Language was submitted by the commenter for Section XII.C.2 and footnote 56/57.	The term 'bio-filtration' has been used throughout Section XII.C. While much of the permit language suggested by the commenter has been used, the permit continues to require that the use of 'on-site' retention LID BMPs be implemented (where feasible) prior to the use of 'treat and release' lid BMPs.
289	NRDC/ Coastkeeper	General Comment and Section XII.C	LID	The language in the draft permit is not based on any consensus agreement among the stakeholders. There are key disagreements on certain issues.	NRDC and Coastkeeper believe that law requires a standard that retains on site the design storm whenever possible.	The draft permit language includes on site retention as the highest priority LID BMP.
290	NRDC/ Coastkeeper	Section XII.C	LID	Infiltration and reuse implements MEP requirements and is a wise policy.	Require infiltration and reuse.	Infiltration and reuse are the highest priority LID BMPs included in the draft permit.
291	NRDC/ Coastkeeper	Section XII.C.2	LID	Clarify permit language.	Use suggested permit language.	Draft permit language now includes the requested change.
292	NRDC/ Coastkeeper	Sections XII.C. 1 & 2	LID	Disagree with the inclusion of bio-filtration to meet the basic LID standard.	Remove references to bio-filtration	Permit language has been modified; it still includes bio-treatment as the lowest priority LID BMP.

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293	NRDC/ Coastkeeper	Footnotes 56 and 57	LID	Include a design standard for bi-filtration systems.	Use suggested language to modify the footnotes.	The footnotes have been revised and the permittees are now required to include specific design criteria in the WQMP for bio-treatment systems.
294	NRDC/ Coastkeeper	Section XII.C	LID	Other sections of the permit have references to “treatment”. It should be replaced with bio-treatment.	Replace references to treatment with bio-treatment.	Permit language changed.
295	City of Cypress	XII.C	LID	Consideration should be given to leaving the language in Section XII.C as existed in the third draft.	Revise permit language to reflect that proposed in the third draft.	The changes proposed in the Errata sheet for the May 22, 2009 Regional Board meeting represent an effort to allow maximum flexibility in the implementation of post-construction BMPs while maintaining a set of minimum requirements designed to insure compliance.
296	City of Irvine			Support comments made by County of Orange and CICWQ	Refer to County of Orange and CICWQ	Comment noted.
297	CONTECH	XII.C.3	LID criteria	The word “bio-filter “ should be replaced with “filter” The addition of the term bio-filter appears to be excluding non-vegetative media filters, which in some cases, may prove more effective.	Replace the term Bio-filter with filter.	Wording has been changed in this case by using the term “bio-treat” or “bio-treatment”
298	City of Orange	XI.C.1	LID implementation schedule	By deleting the phrase “that meet the feasibility criteria established pursuant to Section XII.E1” within this Section, this could be interpreted as making the Permittees begin immediate implementation of LID following permit adoption.	Maintain the existing language in Section XII.C.1 in order to maintain clarity	Permit language has been revised to address this issue within this Section
299	City of Orange	XII.C.2		The proposed language change to this paragraph can be interpreted to read that projects that cannot fully infiltrate,	Delete second sentence in Section XII.C.2 “Projects that do not comply with this requirement shall meet requirements established in	Permit language has been revised.

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				harvest, reuse or evapotranspire or capture will need to meet in-lieu programs and still require treatment by conventional BMPs.	Section XII.E for alternative and in-lieu compliance. Alternatively, adopt the County of Orange recommended language.	
300	City of Orange	(general) LID Systems		Concern has been raised about allowing only BMPs that capture the 85th percentile storm. This requirement will not allow the use of systems such as grass swales or vegetated strips. Use of these systems, under the new criteria will not be allowed, as they will be deemed only as "infiltration systems"	Comment only	Comment noted
301	CICWQ	Section XII.C	LID	Provided a marked up copy of Section XII.C	Make changes as per the marked up copy.	See revised permit language.
302	San Bernardino County Storm Water Program	Section XII	LID	Section XII lacks clarity.	Provide clarifying language or a flow chart.	Permit language amended to clarify some of the requirements.
303	San Bernardino County Storm Water Program	Section XII.B.4	Design capture volume	Does the design capture volume include all the options under Section XII.B.4?	Provide clarification.	The design capture volume only provides two of these options, "runoff produced from a 24-hour, 85th percentile storm event", as indicated in XII.B.4.A.1 and 2.
304	San Bernardino County Storm Water Program	Section XII.B.5.f	Infiltration	Is a feasibility analysis required for infiltration systems in industrial areas?	Provide clarification.	A feasibility analysis is not required for infiltration systems for the type of facilities listed under Section XII.B. 5.f.
305	San Bernardino County Storm Water Program	Section XII.C.2 And XII.E	Feasibility Criteria	Section XII.E requires the principal permittee to develop a "technically-based" feasibility criteria.	The MEP standard should be applicable here.	The co-permittees are governed by the MEP standard.
306	San Bernardino County Storm Water Program	Sections XII.C.1 & 2	Full retention	There is an overemphasis on full retention BMPs.	Consider other equally effective LID BMPs. A broader concept of LID BMPs should be included.	The permit language includes a hierarchy of LID BMPs mostly based on their effectiveness in protecting water quality and quantity.

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Comment No.	**Commenting Parties**	**Section No.**	**Permit Requirement**	**Comment**	**Submitted Recommendations**	**Response**
307	Riverside County Water Flood Control and Water Conservation District	Section XII.C.2	On site retention	Avoid infiltration centric definition of LID.	Provide flexibility to implement proactive, effective, and economical LID BMPs.	Please note that the permit does provide other options, including bio-treatment.
308	Riverside County Water Flood Control and Water Conservation District	Section XII.C.2	On site infiltration	The permit does not allow properly designed filtration systems.	Include filtration as an option for implementing LID BMPs.	Bio-filtration is generally considered as an LID BMP and is included in the draft permit.
309	Riverside County Water Flood Control and Water Conservation District	Section XII.C.2	LID	The permit focuses on micro-scale LID	Allow broader implementation of LID BMPs.	Section XII.C.7 provides for sub-regional and regional LID implementation techniques.
310	Riverside County Water Flood Control and Water Conservation District	Section XII.C	LID	The goal should be to mimic pre-development hydrology.	Revise Section XII.C.	Section XII.C.3 notes that the design goal is to replicate pre-development hydrologic regime.
311	Riverside County Water Flood Control and Water Conservation District	Section XII.C	LID	Allow filtration and detention.	Revise Footnotes 56 and 57.	Minor changes have been made to Footnotes 56 & 57.
312	Riverside County Water Flood Control and Water Conservation District	Section XII.C	LID	The District's qualifications for submitting comments on LID	The District developed criteria for the use of LID BMPs.	Comments noted.

OC MS4 Tentative Order No. R8-2008-0030 (R8-2009-0030)
Comments/Responses

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313	Riverside County Water Flood Control and Water Conservation District	Section XII.C	LID	USEPA's guide includes filtration as an LID BMP.	Allow properly engineered filtration systems as an LID BMP.	Even though filtration per se is not included, bio-filtration is recognized as an LID BMP.
314	Riverside County Water Flood Control and Water Conservation District	Section XII.C	LID BMPs	On site vs. regional	Regional systems have many advantages, including ease of public maintenance, municipal inspections and nuisance reduction.	The permit language has provisions for regional and sub-regional systems (see Section XII.C. 7).

To	From
Co.	Co.
Dept.	Phone #
Fax #	Fax #

JAN - 9 1991

OFFICE OF GENERAL COUNSEL

MEMORANDUM

SUBJECT: Compliance with Water Quality Standards in NPDES Permits Issued To Municipal Separate Storm Sewer Systems

FROM: E. Donald Elliott
Assistant Administrator and
General Counsel (LE-130)

TO: Nancy J. Marvel
Regional Counsel
Region IX

In your memorandum of August 9, 1990, you have asked for our views on the following two issues:

ISSUES

1) Must NPDES permits for municipal separate storm sewer systems ("MS4s") issued under Section 402(p)(3)(B) of the Clean Water Act (CWA) include requirements necessary to achieve water quality standards (WQS), as generally required by Section 301(b)(1)(C) for all NPDES permits?

2) If permits issued to MS4s must comply with WQS, by what date must the permit ensure compliance?

SHORT ANSWERS

1) The better reading of Sections 402(p)(3)(B) and 301(b)(1)(C) is that all permits for MS4s must include any requirements necessary to achieve compliance with WQS.

2) Sections 402(p)(4)(A) and (p)(4)(B) give "large" and "medium" MS4s three years to comply with permit conditions from the date of permit issuance. This three year compliance date also applies to WQS-based permit requirements.

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DISCUSSION

1. Statutory Background

Section 402(a)(1) requires that all NPDES permits comply with the applicable provisions of section 301. This includes compliance with appropriate technology-based standards and effluent limits (sections 301(b)(1)(B), 301(b)(2)). Permits must include "any more stringent limitation" necessary to meet WQS. Section 301(b)(1)(C). In addition, Section 401 requires that any applicant for a federal permit (including NPDES permits issued by EPA) must provide the permitting agency a certification from the State in which the discharge originates that the discharge will comply with the State's WQS.

As part of the 1987 amendments to the Clean Water Act, Congress added Section 402(p) to the Act, related to storm water discharges. Congress exempted some storm water discharges from the requirement to obtain an NPDES permit until after October 1, 1992. Section 402(p)(1). For certain specific categories of storm water discharges, this permit "moratorium" is not in effect, including discharges "associated with industrial activity," discharges from large and medium municipal separate storm sewer systems (i.e., systems serving a population over 250,000 or systems serving a population between 100,000 and 250,000, respectively). Section 402(p)(2).

For industrial and municipal storm water discharges, EPA was instructed to promulgate new regulations specifying permit application requirements. Congress mandated EPA to issue permits no later than February 4, 1991 (for industrial and large municipal discharges) or February 4, 1993 (for medium municipal discharges). Section 402(p)(4). These permits shall provide for compliance "as expeditiously as practicable, but in no event later than 3 years after the date of issuance of such permit." Id.

Section 402(p) also specified the levels of control to be incorporated into storm water permits. Permits for discharges associated with industrial activity are to require compliance with all applicable provisions of Sections 301 and 402 of the CWA, i.e., all technology-based and water quality-based requirements. Section 402(p)(3)(A). By contrast, permits for discharges from municipal separate storm sewers "shall require controls to reduce the discharge of pollutants to the maximum extent practicable" ("MEP"). Section 402(p)(3)(B)(iii).

2. Analysis

A. WQ-based Requirements in Municipal Storm Water Permits

The relationship of Section 402(p)(3)(B)(iii) to Section 301(b)(1)(C) is not clear, either on the face of the statute or in legislative history. Section 402(p)(3) is clearly intended to draw a distinction between the requirements on industrial and municipal storm water discharges. Section 402(p)(3)(A) states that industrial discharges shall comply with the applicable provisions of section 301, i.e., BAT/BCT technology-based requirements as well as any more stringent WQ-based requirements pursuant to 301(b)(1)(C). In the next sub-paragraph, Congress requires municipalities to control storm water to the MEP standard; no mention is made of section 301. The juxtaposition of (p)(3)(A) and (p)(3)(B) gives rise to the argument that Congress may have intended to waive all section 301 requirements for municipal discharges in favor of the MEP standard. On the other hand, one could read (p)(3)(B)(iii) as modifying only technology-based requirements for municipal storm water (i.e., MEP substitutes for BAT/BCT); any WQ-based requirements would still be necessary in a municipal permit, even if those requirements are more stringent than "practicable." The legislative history of Section 402(p) provides no guidance as to how Congress intended the MEP standard to operate.

Where Congressional intent behind a statutory provision is ambiguous in light of the language or legislative history, the Agency charged with administering that statute may adopt any reasonable interpretation consistent with the goals and purposes of the statute. Chevron, U.S.A. v. NRDC, 467 U.S. 837 (1984). Therefore, EPA has a large degree of discretion to choose how it will interpret the applicability of WQS to municipal storm water discharges. The only interpretation by EPA to date, contained in its proposed rulemaking, has been that WQS would continue to apply to permits for municipal storm water discharges. See, e.g., 53 Fed. Reg. 49,457 (Dec. 7, 1988) (priorities for controls in municipal storm water management programs will be developed to ensure achievement of water quality standards and the CWA).[1] There has been no intervening interpretation expressed by EPA on this issue. It is the opinion of the Office of General Counsel that the interpretation adopted by the Agency in the proposal is a reasonable one, for the following reasons.

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[1] EPA's intent to apply WQS to municipal storm water discharges can also be inferred by the fact that the 1988 proposal did not propose to alter 40 CFR 122.44(d), which provides that all NPDES permits must contain water quality-based requirements more stringent than technology-based requirements, where necessary to achieve WQS.

First, to support the opposite reading (i.e., that WQ-based requirements do not apply to municipal storm water permits), one would have to assert that Congress implicitly waived section 301(b)(1)(C) requirements for municipal storm water. One would further have to assume that Congress impliedly exempted municipal storm water permits from the Section 401 certification requirements. Implied repeals of statutory provisions are generally disfavored. Morton v. Mancari, 417 U.S. 535, 549 (1974). A court generally will find a statute impliedly repealed only if the later enacted provision is in "irreconcilable conflict" with the earlier provision. Kremer v. Chemical Construction Corp., 456 U.S. 461, 468 (1982) (citations omitted). In this case, the statutory provisions are not in irreconcilable conflict; rather, as discussed above, one may read Section 301(b)(1)(C) as requiring "any more stringent limitation" necessary to meet a WQS in every NPDES permit, including permits for discharges from municipal separate storm sewers which are subject to the MEP standard. Such a reading would harmonize the two provisions and give effect to the policy behind Sections 301(b)(1)(C) and 401, i.e., to ensure that WQS are met, regardless of practical considerations (such as the availability of treatment technology or the "practicability" of MS4 permit requirements).

To read Section 402(p)(3)(B) as overriding 301(b)(1)(C) requirements would also cause a conflict between Section 402(p) and the general focus of the provisions in the 1987 Amendments, many of which reflect a Congressional desire to improve compliance with the WQ-based requirements of the Act. The amendments to/additions of sections 303(c)(2)(B), 304(l), 319, 320, 402(o) all reflect Congressional concern with the improvement of water quality through the NPDES and other CWA programs. It would be particularly difficult to argue that the storm water provisions, a major part of the 1987 Amendments, were intended to create an exemption from the general rule regarding WQ-based requirements without an explicit acknowledgment of that result. We think the approach taken in the proposed rule is preferable.

B. Compliance Date for WQ-Based Limits in Municipal Storm Water Permits

In contrast to the issue of whether WQ-based requirements apply at all to MS4s, Congress had indeed spoken to the compliance date issue. Section 402(p)(4) requires compliance with all permit conditions no later than three years from the date of issuance. In light of the express language, we believe the Agency may reasonably interpret the three-year compliance provisions in Section 402(p)(4) to apply to all permit

conditions, including those imposed under 301(b)(1)(C).[2]

There are arguments which support the reasonableness of this interpretation. First, EPA has issued few, if any storm water permits to MS4s to date. Many of these systems will face NPDES permit conditions for the first time, and I understand immediate compliance for these systems is likely to be unrealistic. The compliance date in Section 402(p)(4) apparently reflects a Congressional realization of that reality. Second, EPA has already construed another very similar provision of the 1987 Amendments in the same manner. Section 304(l) establishes an identical three-year compliance date for achieving water quality standards in Individual Control Strategies issued under that section. EPA has interpreted that provision, while not repealing Section 301(b)(1)(C), to allow for three-year compliance with new effluent limits established to meet WQS on 304(l)-identified streams. 54 Fed. Reg. 23,889 (Jun. 2, 1989). Given that 304(l) deals directly with WQ-based standards and permit requirements, a consistent interpretation with respect to 402(p)(3) and (p)(4) (which, as we have seen, is silent on the role of WQ-based requirements for MS4s) is certainly reasonable.[3]

If you have any questions regarding this memorandum, please contact Randy Hill of my staff, FTS 382-7700.

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[2]. There may be some municipal separate storm sewer systems which are unable to meet even the three-year compliance date in their permits. The Agency retains the discretion to issue an administrative order fixing a schedule for compliance if compliance is not achieved in that three-year period.

[3] The decision of the Administrator in the Star-Kist permit appeal does not affect this analysis. Indeed, the decision itself supports the reading that compliance schedules under Section 304(l) (and, by extension, schedules under Section 402(p)(4)) are unaffected by the holding in that decision. Cf. Order on Petition for Reconsideration, In the Matter of Star-Kist Caribe, Inc., NPDES Appeal No. 88-5, (Apr. 17, 1990), at 6 n.5 (because decision does not prevent all post-1977 compliance schedules, arguments regarding 304(l) are not pertinent); (order stayed Sept. 4 1990).

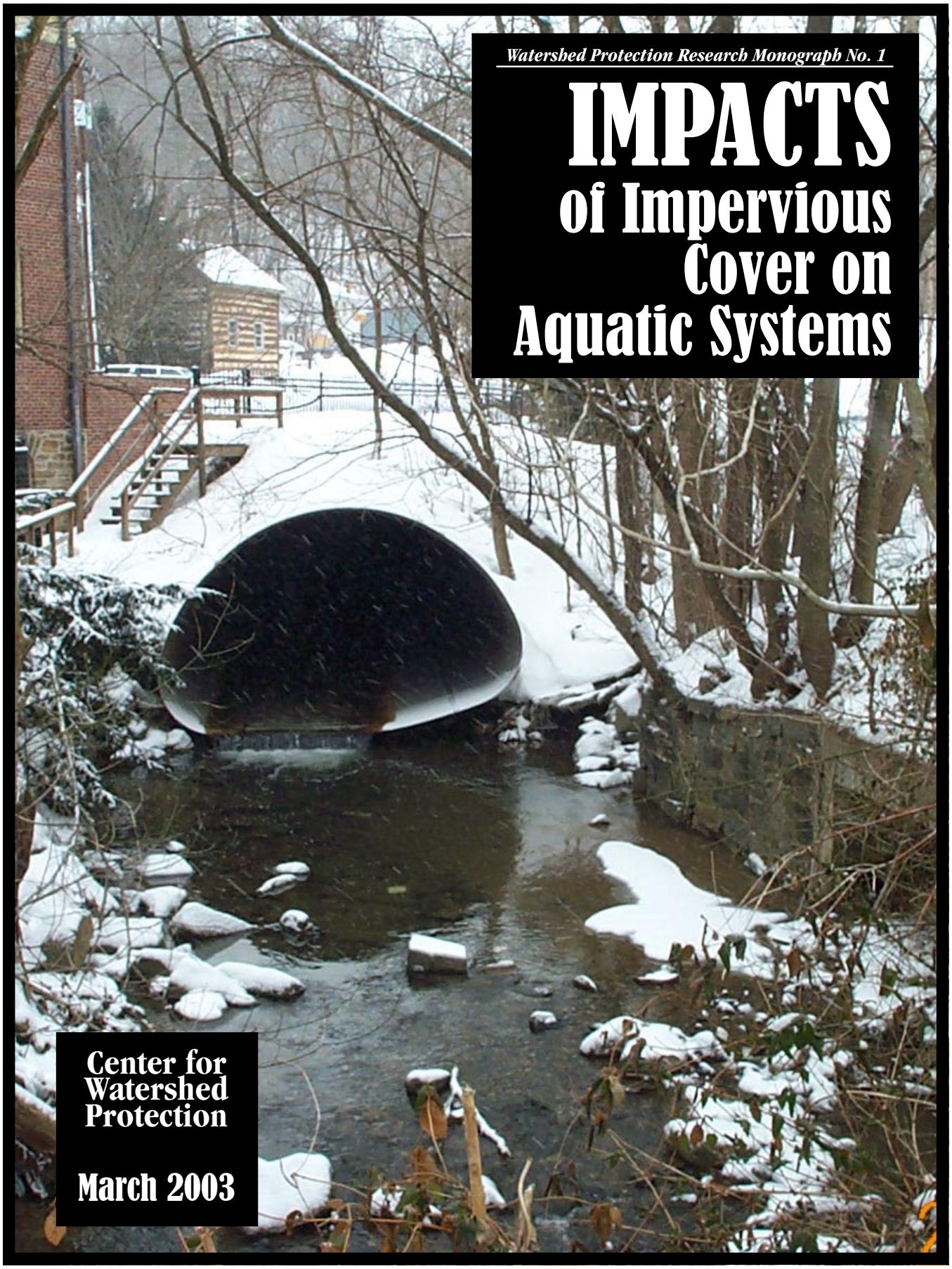

Watershed Protection Research Monograph No. 1

IMPACTS of Impervious Cover on Aquatic Systems

Center for Watershed Protection

March 2003

Cover photograph Ellicott City, Maryland 2003.
Courtesy Anne Kitchell, Center for Watershed Protection.

Watershed Protection Research Monograph No. 1

Impacts of Impervious Cover on Aquatic Systems

March 2003

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Foreword

We are extremely pleased to launch the first edition of a new series called *Watershed Protection Research Monographs*. Each monograph will synthesize emerging research within a major topical area in the practice of watershed protection. The series of periodic monographs will replace our journal *Watershed Protection Techniques,* which lapsed in 2002. We hope this new format will provide watershed managers with the science and perspectives they need to better protect and restore their local watersheds.

This monograph was written to respond to many inquiries from watershed managers and policy makers seeking to understand the scientific basis behind the relationship between impervious cover and the health of aquatic ecosystems. It reviews more than 225 research studies that have explored the impact of impervious cover and other indicators of urbanization on aquatic systems. This report comprehensively reviews the available scientific data on how urbanization influences hydrologic, physical, water quality, and biological indicators of aquatic health, as of late 2002.

Our intention was to organize the available scientific data in a manner that was accessible to watershed leaders, policy-makers and agency staff. In addition, the research itself, which spans dozens of different academic departments and disciplines, was conducted in many different eco-regions, climatic zones, and stream types. In order to communicate across such a wide audience, we have resorted to some simplifications, avoided some important particulars, refrained from some jargon, and tried, wherever possible, to use consistent terminology. Thus, the interpretations and conclusions contained in this document are ours alone, and our readers are encouraged to consult the original sources when in doubt.

We would also like to note that the Center for Watershed Protection and the University of Alabama are currently developing a major national database on stormwater quality. The database will contain nearly 4,000 station-storm events collected by municipalities as part of the U.S. EPA's National Pollutant Discharge Elimination System (NPDES) Phase I Stormwater Permit Program. We anticipate releasing a data report in late 2003 that will provide a much needed update of stormwater event mean concentrations (EMCs).

As of this writing, many research efforts are underway that will further test and refine these relationships (most notably, the U.S. Geological Survey gradients initiative, but also many other local, state and academic efforts). We hope that this report provides a useful summary of the existing science, suggests some directions for new research, and stimulates greater discussion of this important topic in watershed management. We also feel it is time for a major conference or symposium, where this diverse community can join together to discuss methods, findings and the important policy implications of their research.

Foreword

Acknowledgments

Putting this first research monograph together took a lot of energy, editing and analysis, and many Center staff devoted their time and energy over the last two years to get it done. The project team consisted of Karen Cappiella, Deb Caraco, Samantha Corbin, Heather Holland, Anne Kitchell, Stephanie Linebaugh, Paul Sturm, and Chris Swann. Special thanks are extended to Tiffany Wright, who worked tirelessly to assemble, edit and otherwise polish the final draft.

I am also grateful to Michael Paul of Tetratech, Inc., who graciously provided us with an extensive literature review from his PhD days at the University of Georgia that contained many obscure and hard to find citations. Portions of this monograph were developed as part of a literature review conducted as part of a work assignment for the U.S. EPA Office of Wastewater Management in 2001, which proved indispensable in our efforts. Lastly, I would like to thank the hundreds of scientists who have contributed their time and data to explore and test the relationships between urbanization and aquatic health.

Tom Schueler
Center for Watershed Protection

Acknowledgments

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Acronyms and Abbreviations

B-IBI	Benthic Index of Biotic Integrity
BOD	Biological Oxygen Demand
BSD	Better Site Design
C-IBI	Combined Index of Biotic Integrity
cfs	cubic feet per second
COD	Chemical Oxygen Demand
CSO	Combined Sewer Overflow
Cu	Copper
DOC	Dissolved Organic Carbon
du/ac	dwelling units per acre
EMC	Event Mean Concentration
EPT	Ephemeroptera, Plecoptera and Trichoptera
FC	Forest Cover
GIS	Geographic Information Systems
IBI	Index of Biotic Integrity
IC	Impervious Cover
ICM	Impervious Cover Model
lbs/ac	pounds per acre
LWD	Large Woody Debris
mg/kg	milligrams per kilogram
mg/l	milligrams per liter (equal to ppm)
MPN	Most Probable Number
MTBE	Methyl Tertiary-Butyl Ether
N	Number of Studies
N/R	data not reported
NO_2	Nitrite
NO_3	Nitrate
NO_x	Nitrogen Oxides
NPDES	National Pollutant Discharge Elimination System
NTU	Nephelometric Turbidity Unit
NURP	National Urban Runoff Program
PAH	Polycylic Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyl
ppb	Parts per billion (equal to ug/l)
ppm	Parts per million (equal to mg/l)
RBP	Rapid Bioassessment Protocol
SLAMM	Source Loading Assessment/ Management Model
SPMD	Semi-Permeable Membrane Device
SSO	Sanitary Sewer Overflow
STP	Stormwater Treatment Practice
TC	Turf Cover
TDS	Total Dissolved Solids
TKN	Total Kjeldhal Nitrogen
TMDL	Total Maximum Daily Load
Total N	Total Nitrogen
Total P	Total Phosphorous
TOC	Total Organic Carbon
TSS	Total Suspended Solids
ug/l	micrograms per liter (equal to ppb)
VMT	Vehicle Miles Traveled
VOC	Volatile Organic Compound
WLF	Water Level Fluctuation
WTP	Wastewater Treatment Plant

Acronyms and Abbreviations

Chapter 1: Introduction

This research monograph comprehensively reviews the available scientific data on the impacts of urbanization on small streams and receiving waters. These impacts are generally classified according to one of four broad categories: changes in hydrologic, physical, water quality or biological indicators. More than 225 research studies have documented the adverse impact of urbanization on one or more of these key indicators. In general, most research has focused on smaller watersheds, with drainage areas ranging from a few hundred acres up to ten square miles.

Streams vs. Downstream Receiving Waters

Urban watershed research has traditionally pursued two core themes. One theme has evaluated the direct impact of urbanization on small streams, whereas the second theme has explored the more indirect impact of urbanization on downstream receiving waters, such as rivers, lakes, reservoirs, estuaries and coastal areas. This report is organized to profile recent research progress in both thematic areas and to discuss the implications each poses for urban watershed managers.

When evaluating the direct impact of urbanization on streams, researchers have emphasized hydrologic, physical and biological indicators to define urban stream quality. In recent years, impervious cover (IC) has emerged as a key paradigm to explain and sometimes predict how severely these stream quality indicators change in response to different levels of watershed development. The Center for Watershed Protection has integrated these research findings into a general watershed planning model, known as the impervious cover model (ICM). The ICM predicts that most stream quality indicators decline when watershed IC exceeds 10%, with severe degradation expected beyond 25% IC. In the first part of this review, we critically analyze the scientific basis for the ICM and explore some of its more interesting technical implications.

While many researchers have monitored the quality of stormwater runoff from small watersheds, few have directly linked these pollutants to specific water quality problems within streams (e.g., toxicity, biofouling, eutrophication). Instead, the prevailing view is that stormwater pollutants are a downstream export. That is, they primarily influence downstream receiving water quality. Therefore, researchers have focused on how to estimate stormwater pollutant loads and then determine the water quality response of the rivers, lakes and estuaries that receive them. To be sure, there is an increasing recognition that runoff volume can influence physical and biological indicators within some receiving waters, but only a handful of studies have explored this area. In the second part of this review, we review the impacts of urbanization on downstream receiving waters, primarily from the standpoint of stormwater quality. We also evaluate whether the ICM can be extended to predict water quality in rivers, lakes and estuaries.

This chapter is organized as follows:

1.1 A Review of Recent Urban Stream Research and the ICM
1.2 Impacts of Urbanization on Downstream Receiving Waters
1.3 Implications of the ICM for Watershed Managers

1.1 A Review of Recent Urban Stream Research and the ICM

In 1994, the Center published "The Importance of Imperviousness," which outlined the scientific evidence for the relationship between IC and stream quality. At that time, about two dozen research studies documented a reasonably strong relationship between watershed IC and various indicators of stream quality. The research findings were subsequently integrated into the ICM (Schueler, 1994a and CWP, 1998). A brief summary of the basic assumptions of the ICM can be found in Figure 1. The ICM has had a major influence in watershed planning, stream classification and land use regulation in many communities. The ICM is a deceptively simple model that raises extremely complex and profound policy implications for watershed managers.

The ICM has been widely applied in many urban watershed settings for the purposes of small watershed planning, stream classification, and supporting restrictive development regulations and watershed zoning. As such, the ICM has stimulated intense debate among the planning, engineering and scientific communities. This debate is likely to soon spill over into the realm of politics and the courtroom, given its potential implications for local land use and environmental regulation. It is no wonder that the specter of scientific uncertainty is frequently invoked in the ICM debate, given the land use policy issues at stake. In this light, it is helpful to review the current strength of the evidence for and against the ICM.

The ICM is based on the following assumptions and caveats:

- Applies only to 1st, 2nd and 3rd order streams.
- Requires accurate estimates of percent IC, which is defined as the total amount of impervious cover over a subwatershed area.
- Predicts potential rather than actual stream quality. It can and should be expected that some streams will depart from the predictions of the model. For example, monitoring indicators may reveal poor water quality in a stream classified as "sensitive" or a surprisingly high biological diversity

Figure 1: Impervious Cover Model

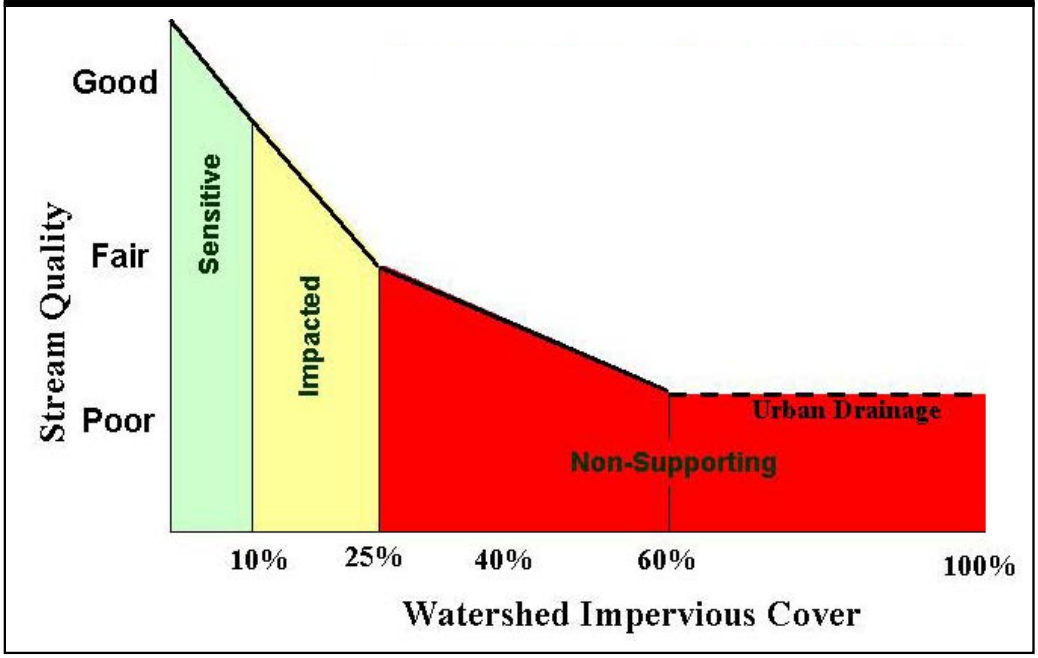

score in a "non-supporting" one. Consequently, while IC can be used to initially diagnose stream quality, supplemental field monitoring is recommended to actually confirm it.

- Does not predict the precise score of an individual stream quality indicator but rather predicts the average behavior of a group of indicators over a range of IC. Extreme care should be exercised if the ICM is used to predict the fate of individual species (e.g., trout, salmon, mussels).

- "Thresholds" defined as 10 and 25% IC are not sharp "breakpoints," but instead reflect the expected transition of a composite of individual indicators in that range of IC. Thus, it is virtually impossible to distinguish real differences in stream quality indicators within a few percentage points of watershed IC (e.g., 9.9 vs. 10.1%).

- Should only be applied within the ecoregions where it has been tested, including the mid-Atlantic, Northeast, Southeast, Upper Midwest, and Pacific Northwest.

- Has not yet been validated for non-stream conditions (e.g., lakes, reservoirs, aquifers and estuaries).

- Does not currently predict the impact of watershed treatment.

In this section, we review available stream research to answer four questions about the ICM:

1. Does recent stream research still support the basic ICM?
2. What, if any, modifications need to be made to the ICM?
3. To what extent can watershed practices shift the predictions of the ICM?
4. What additional research is needed to test the ICM?

1.1.1 Strength of the Evidence for the ICM

Many researchers have investigated the IC/stream quality relationship in recent years. The Center recently undertook a comprehensive analysis of the literature to assess the scientific basis for the ICM. As of the end of 2002, we discovered more than 225 research studies that measured 26 different urban stream indicators within many regions of North America. We classified the research studies into three basic groups.

The first and most important group consists of studies that directly test the IC/stream quality indicator relationship by monitoring a large population of small watersheds. The second and largest group encompasses secondary studies that indirectly support the ICM by showing significant differences in stream quality indicators between urban and non-urban watersheds. The third and last group of studies includes widely accepted engineering models that explicitly use IC to directly predict stream quality indicators. Examples include engineering models that predict peak discharge or stormwater pollutant loads as a direct function of IC. In most cases, these relationships were derived from prior empirical research.

Table 1 provides a condensed summary of recent urban stream research, which shows the impressive growth in our understanding of urban streams and the watershed factors that influence them. A negative relationship between watershed development and nearly all of the 26 stream quality indicators has been established over many regions and scientific disciplines. About 50 primary studies have tested the IC/stream quality indicator relationship, with the largest number looking at biological indicators of stream health, such as the diversity of aquatic insects or fish. Another 150 or so secondary studies provide evidence that stream quality indicators are significantly different between urban and non-urban watersheds, which lends at least indirect support for the ICM and suggests that additional research to directly test the IC/stream quality indicator

Table 1: The Strength of Evidence: A Review of the Current Research on Urban Stream Indicators

Stream Quality Indicator	#	IC	UN	EM	RV	Notes
Increased Runoff Volume	2	Y	Y	Y	N	extensive national data
Increased Peak Discharge	7	Y	Y	Y	Y	type of drainage system key
Increased Frequency of Bankfull Flow	2	?	Y	N	N	hard to measure
Diminished Baseflow	8	?	Y	N	Y	inconclusive data
Stream Channel Enlargement	8	Y	Y	N	Y	stream type important
Increased Channel Modification	4	Y	Y	N	?	stream enclosure
Loss of Riparian Continuity	4	Y	Y	N	?	can be affected by buffer
Reduced Large Woody Debris	4	Y	Y	N	?	Pacific NW studies
Decline in Stream Habitat Quality	11	Y	Y	N	?	
Changes in Pool Riffle/Structure	4	Y	Y	N	?	
Reduced Channel Sinuosity	1	?	Y	N	?	straighter channels
Decline in Streambed Quality	2	Y	Y	N	?	embeddedness
Increased Stream Temperature	5	Y	Y	N	?	buffers and ponds also a factor
Increased Road Crossings	3	?	Y	N	?	create fish barriers
Increased Nutrient Load	30+	?	Y	Y	N	higher stormwater EMCs
Increased Sediment Load	30+	?	Y	N	Y	higher EMCs in arid regions
Increased Metals & Hydrocarbons	20+	?	Y	Y	N	related to traffic/VMT
Increased Pesticide Levels	7	?	Y	N	Y	may be related to turf cover
Increased Chloride Levels	5	?	Y	N	Y	related to road density
Violations of Bacteria Standards	9	Y	Y	N	Y	indirect association
Decline in Aquatic Insect Diversity	33	Y	Y	N	N	IBI and EPT
Decline in Fish Diversity	19	Y	Y	N	N	regional IBI differences
Loss of Coldwater Fish Species	6	Y	Y	N	N	trout and salmon
Reduced Fish Spawning	3	Y	Y	N	?	
Decline in Wetland Plant Diversity	2	N	Y	N	?	water level fluctuation
Decline in Amphibian Community	5	Y	Y	N	?	few studies

#: *total number of all studies that evaluated the indicator for urban watersheds*
IC: *does balance of studies indicate a progressive change in the indicator as IC increases? Answers: Yes, No or No data (?)*
UN: *If the answer to IC is no, does the balance of the studies show a change in the indicator from non-urban to urban watersheds? Yes or No*
EM *Is the IC/stream quality indicator relationship implicitly assumed within the framework of widely accepted engineering models? Yes, No or No models yet exist (?)*
RV: *If the relationship has been tested in more than one eco-region, does it generally show major differences between ecoregions? Answers: Yes, No, or insufficient data (?)*

relationship is warranted. In some cases, the IC/stream quality indicator relationship is considered so strongly established by historical research that it has been directly incorporated into accepted engineering models. This has been particularly true for hydrological and water quality indicators.

1.1.2 Reinterpretation of the ICM

Although the balance of recent stream research generally supports the ICM, it also offers several important insights for interpreting and applying the ICM, which are discussed next.

Statistical Variability

Scatter is a common characteristic of most IC/stream quality indicator relationships. In most cases, the overall trend for the indicator is down, but considerable variation exists along the trend line. Often, linear regression equations between IC and individual stream quality indicators produce relatively modest correlation coefficients (reported r^2 of 0.3 to 0.7 are often considered quite strong).

Figure 2 shows typical examples of the IC/stream quality indicator relationship that illustrate the pattern of statistical variability. Variation is always encountered when dealing with urban stream data (particularly so for biological indicators), but several patterns exist that have important implications for watershed managers.

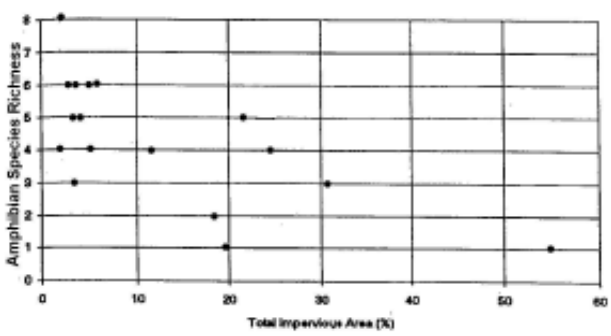

a. Fish IBI vs. IC in Fairfax, VA (Fairfax County, 2001)

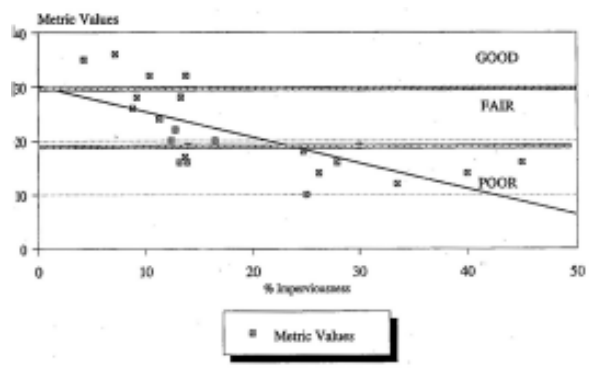

b. CPSS vs. IC in Montgomery County, MD (MNCPPC, 2000)

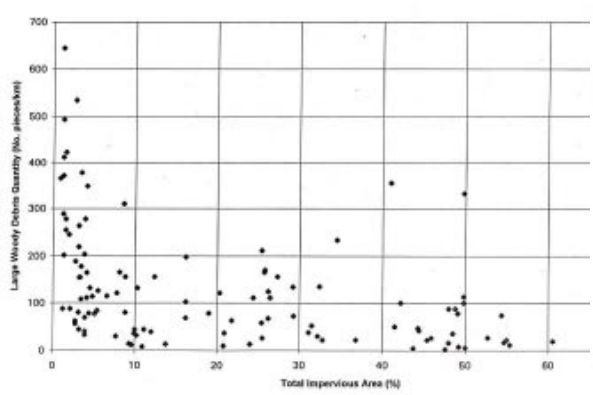

c. Large Woody Debris vs. IC (Booth *et al.*, 1997)

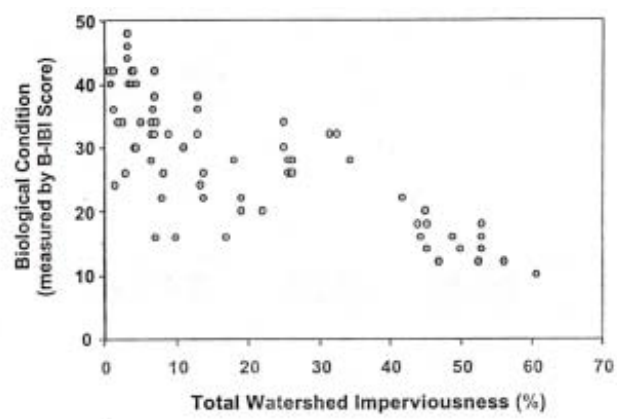

d. Biological Condition vs. Total Watershed IC (Booth, 2000)

Figure 2: Typical Scatter Found in IC/Stream Quality Indicator Research

The first pattern to note is that the greatest scatter in stream quality indicator scores is frequently seen in the range of one to 10% IC. These streams, which are classified as "sensitive" according to the ICM, often exhibit low, moderate or high stream quality indicator scores, as shown in Figure 2. The key interpretation is that sensitive streams have the potential to attain high stream quality indicator scores, but may not always realize this potential.

Quite simply, the influence of IC in the one to 10% range is relatively weak compared to other potential watershed factors, such as percent forest cover, riparian continuity, historical land use, soils, agriculture, acid mine drainage or a host of other stressors. Consequently, watershed managers should never rely on IC alone to classify and manage streams in watersheds with less than 10% IC. Rather, they should evaluate a range of supplemental watershed variables to measure or predict actual stream quality within these lightly developed watersheds.

The second important pattern is that variability in stream quality indicator data is usually dampened when IC exceeds 10%, which presumably reflects the stronger influence of stormwater runoff on stream quality indicators. In particular, the chance that a stream quality indicator will attain a high quality score is sharply diminished at higher IC levels. This trend becomes pronounced within the 10 to 25% IC range and almost inevitable when watershed IC exceeds 25%. Once again, this pattern suggests that IC is a more robust and reliable indicator of overall stream quality beyond the 10% IC threshold.

Other Watershed Variables and the ICM

Several other watershed variables can potentially be included in the ICM. They include forest cover, riparian forest continuity and turf cover.

Forest cover (FC) is clearly the main rival to IC as a useful predictor of stream quality in urban watersheds, at least for humid regions of North America. In some regions, FC is simply the reciprocal of IC. For example, Horner and May (1999) have demonstrated a strong interrelationship between IC and FC for subwatersheds in the Puget Sound region (Figure 3). In other regions, however, "pre-

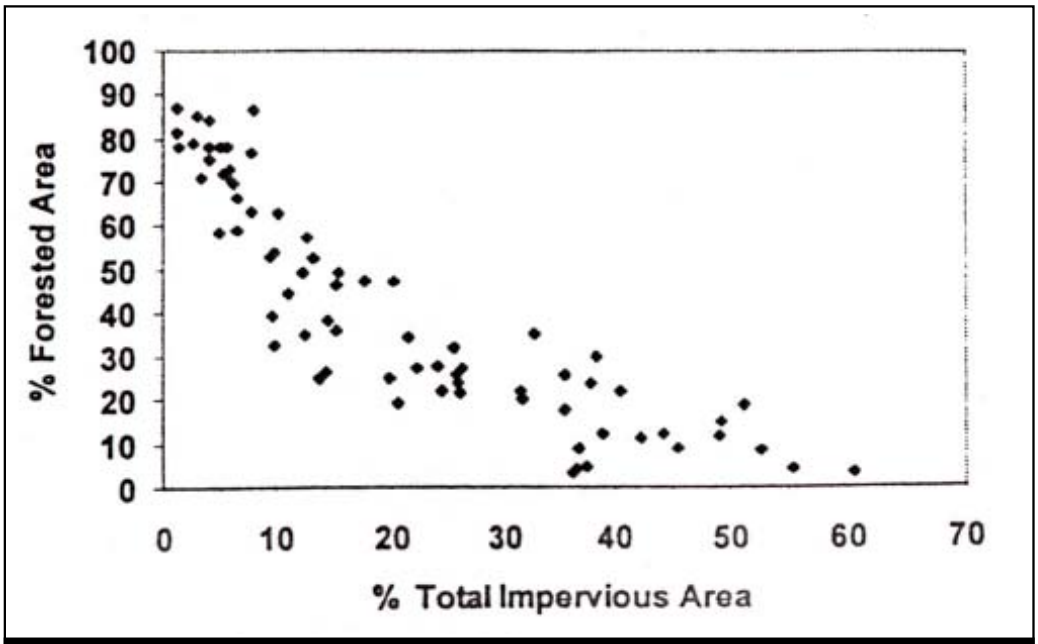

Figure 3: Relationship of IC and FC in Puget Sound Subwatersheds (Horner and May, 1999)

development" land use represents a complex mosaic of crop land, pasture and forest. Therefore, an inverse relationship between FC and IC may not be universal for subwatersheds that have witnessed many cycles of deforestation and cultivation.

It should come as little surprise that the progressive loss of FC has been linked to declining stream quality indicators, given that forested watersheds are often routinely used to define natural reference conditions for streams (Booth, 2000 and Horner *et al.*, 2001). Mature forest is considered to be the main benchmark for defining pre-development hydrology within a subwatershed, as well. Consequently, FC is perhaps the most powerful indicator to predict the quality of streams within the "sensitive" category (zero to 10% IC).

To use an extreme example, one would expect that stream quality indicators would respond quite differently in a subwatershed that had 90% FC compared to one that had 90% crop cover. Indeed, Booth (1991) suggests that stream quality can only be maintained when IC is limited to less than 10% <u>and</u> at least 65% FC is retained within a subwatershed. The key management implication then is that stream health is best managed by simultaneously minimizing the creation of IC and maximizing the preservation of native FC.

FC has also been shown to be useful in predicting the quality of terrestrial variables in a subwatershed. For example, the Mid-Atlantic Integrated Assessment (USEPA, 2000) has documented that watershed FC can reliably predict the diversity of bird, reptile and amphibian communities in the mid-Atlantic region. Moreover, the emerging discipline of landscape ecology provides watershed managers with a strong scientific foundation for deciding where FC should be conserved in a watershed. Conservation plans that protect and connect large forest fragments have been shown to be effective in conserving terrestrial species.

Riparian forest continuity has also shown considerable promise in predicting at least some indicators of stream quality for urban watersheds. Researchers have yet to come up with a standard definition of riparian continuity, but it is usually defined as the proportion of the perennial stream network in a subwatershed that has a fixed width of mature streamside forest. A series of studies indicates that aquatic insect and fish diversity are associated with high levels of riparian continuity (Horner *et al.,* 2001; May *et al.*, 1997; MNCPPC, 2000; Roth *et al.,* 1998). On the other hand, not much evidence has been presented to support the notion that riparian continuity has a strong influence on hydrology or water quality indicators.

One watershed variable that received little attention is the fraction of watershed area maintained in turf cover (TC). Grass often comprises the largest fraction of land area within low-density residential development and could play a significant role in streams that fall within the "impacted" category (10 to 25% IC). Although lawns are pervious, they have sharply different properties than the forests and farmlands they replace (i.e., irrigation, compacted soils, greater runoff, and much higher input of fertilizers and pesticides, etc.). It is interesting to speculate whether the combined area of IC and TC might provide better predictions about stream health than IC area alone, particularly within impacted subwatersheds.

Several other watershed variables might have at least supplemental value in predicting stream quality. They include the presence of extensive wetlands and/or beaverdam complexes in a subwatershed; the dominant form of drainage present in the watershed (tile drains, ditches, swales, curb and gutters, storm drain pipes); the average age of development; and the proximity of sewer lines to the stream. As far as we could discover, none of these variables has been systematically tested in a controlled population of small watersheds. We have observed that these factors could be important in our field investigations and often measure them to provide greater insight into subwatershed behavior.

Lastly, several watershed variables that are closely related to IC have been proposed to predict stream quality. These include popula-

tion, percent urban land, housing density, road density and other indices of watershed development. As might be expected, they generally track the same trend as IC, but each has some significant technical limitations and/or difficulties in actual planning applications (Brown, 2000).

Individual vs. Multiple Indicators

The ICM does not predict the precise score of individual stream quality indicators, but rather predicts the average behavior of a group of indicators over a range of IC. Extreme care should be exercised if the ICM is used to predict the fate of individual indicators and/or species. This is particularly true for sensitive aquatic species, such as trout, salmon, and freshwater mussels. When researchers have examined the relationship between IC and individual species, they have often discovered lower thresholds for harm. For example, Boward *et al.* (1999) found that brook trout were not found in subwatersheds that had more than 4% IC in Maryland, whereas Horner and May (1999) asserted an 8% threshold for sustaining salmon in Puget Sound streams.

The key point is that if watershed managers want to maintain an individual species, they should be very cautious about adopting the 10% IC threshold. The essential habitat requirements for many sensitive or endangered species are probably determined by the *most sensitive* stream quality indicators, rather than the *average behavior* of all stream quality indicators.

Direct Causality vs. Association

A strong relationship between IC and declining stream quality indicators does not always mean that the IC is directly responsible for the decline. In some cases, however, causality can be demonstrated. For example, increased stormwater runoff volumes are directly caused by the percentage of IC in a subwatershed, although other factors such as conveyance, slope and soils may play a role.

In other cases, the link is much more indirect. For these indicators, IC is merely an index of the cumulative amount of watershed development, and more IC simply means that a greater number of known or unknown pollutant sources or stressors are present. In yet other cases, a causal link appears likely but has not yet been scientifically demonstrated. A good example is the more than 50 studies that have explored how fish or aquatic insect diversity changes in response to IC. While the majority of these studies consistently shows a very strong negative association between IC and biodiversity, they do not really establish which stressor or combination of stressors contributes most to the decline. The widely accepted theory is that IC changes stream hydrology, which degrades stream habitat, and in turn leads to reduced stream biodiversity.

Regional Differences

Currently, the ICM has been largely confirmed within the following regions of North America: the mid-Atlantic, the Northeast, the Southeast, the upper Midwest and the Pacific Northwest. Limited testing in Northern California, the lower Midwest and Central Texas generally agrees with the ICM. The ICM has not been tested in Florida, the Rocky Mountain West, and the Southwest. For a number of reasons, it is not certain if the ICM accurately predicts biological indicators in arid and semiarid climates (Maxted, 1999).

Measuring Impervious Cover

Most researchers have relied on total impervious cover as the basic unit to measure IC at the subwatershed level. The case has repeatedly been made that effective impervious cover is probably a superior metric (e.g., only counting IC that is hydraulically connected to the drainage system). Notwithstanding, most researchers have continued to measure total IC because it is generally quicker and does not require extensive (and often subjective) engineering judgement as to whether it is connected or not. Researchers have used a wide variety of techniques to estimate subwatershed IC, including satellite imagery, analysis of aerial photographs, and derivation from GIS land use layers. Table 2 presents some standard land use/IC relationships that were developed for suburban regions of the Chesapeake Bay.

Table 2: Land Use/IC Relationships for Suburban Areas of the Chesapeake Bay
(Cappiella and Brown, 2001)

Land Use Category	Sample Number (N)	Mean IC (SE)	Land Use Category	Sample Number (N)	Mean IC (SE)
Agriculture	8	**1.9** – 0.3	Institutional	30	**34.4** – 3.45
Open Urban Land	11	**8.6** – 1.64	Light	20	**53.4** – 2.8
2 Acre Lot Residential	12	**10.6** – 0.65	Commercia	23	**72.2** – 2.0
1 Acre Lot Residential	23	**14.3** – 0.53	Churches	8	**39.9** – 7.8 1
1/2 Acre Lot Residential	20	**21.2** – 0.78	Schools	13	**30.3** – 4.8
1/4 Acre Lot Residential	23	**27.8** – 0.60	Municipals	9	**35.4** – 6.3
1/8 Acre Lot Residential	10	**32.6** – 1.6	Golf	4	**5.0** – 1.7
Townhome Residential	20	**40.9** – 1.39	Cemeteries	3	**8.3** – 3.5
Multifamily Residential	18	**44.4** – 2.0	Parks	4	**12.5** – 0.7

Three points are worth noting. First, it is fair to say that most researchers have spent more quality control effort on their stream quality indicator measurements than on their subwatershed IC estimates. At the current time, no standard protocol exists to estimate subwatershed IC, although Cappiella and Brown (2001) presented a useful method. At best, the different methods used to measure IC make it difficult to compare results from different studies, and at worst, it can introduce an error term of perhaps +/- 10% from the true value within an individual subwatershed. Second, it is important to keep in mind that IC is not constant over time; indeed, major changes in subwatershed IC have been observed within as few as two years. Consequently, it is sound practice to obtain subwatershed IC estimates from the most recent possible mapping data, to ensure that it coincides with stream quality indicator measurements. Lastly, it is important to keep in mind that most suburban and even rural zoning categories exceed 10% IC (see Table 2). Therefore, from a management standpoint, planners should try to project future IC, in order to determine the future stream classification for individual subwatersheds.

1.1.3 Influence of Watershed Treatment Practices on the ICM

The most hotly debated question about the ICM is whether widespread application of watershed practices such as stream buffers or stormwater management can mitigate the impact of IC, thereby allowing greater development density for a given watershed. At this point in time, there are fewer than 10 studies that directly bear on this critical question. Before these are reviewed, it is instructive to look at the difficult technical and scientific issues involved in detecting the effect of watershed treatment, given its enormous implications for land use control and watershed management.

The first tough issue is how to detect the effect of watershed treatment, given the inherent scatter seen in the IC/stream quality indicator relationship. Figure 4 illustrates the "double scatter" problem, based on three different urban stream research studies in Delaware, Maryland and Washington. A quick inspection of the three plots shows how intrinsically hard it is to distinguish the watershed treatment effect. As can be seen, stream quality indicators in subwatersheds with treatment tend to

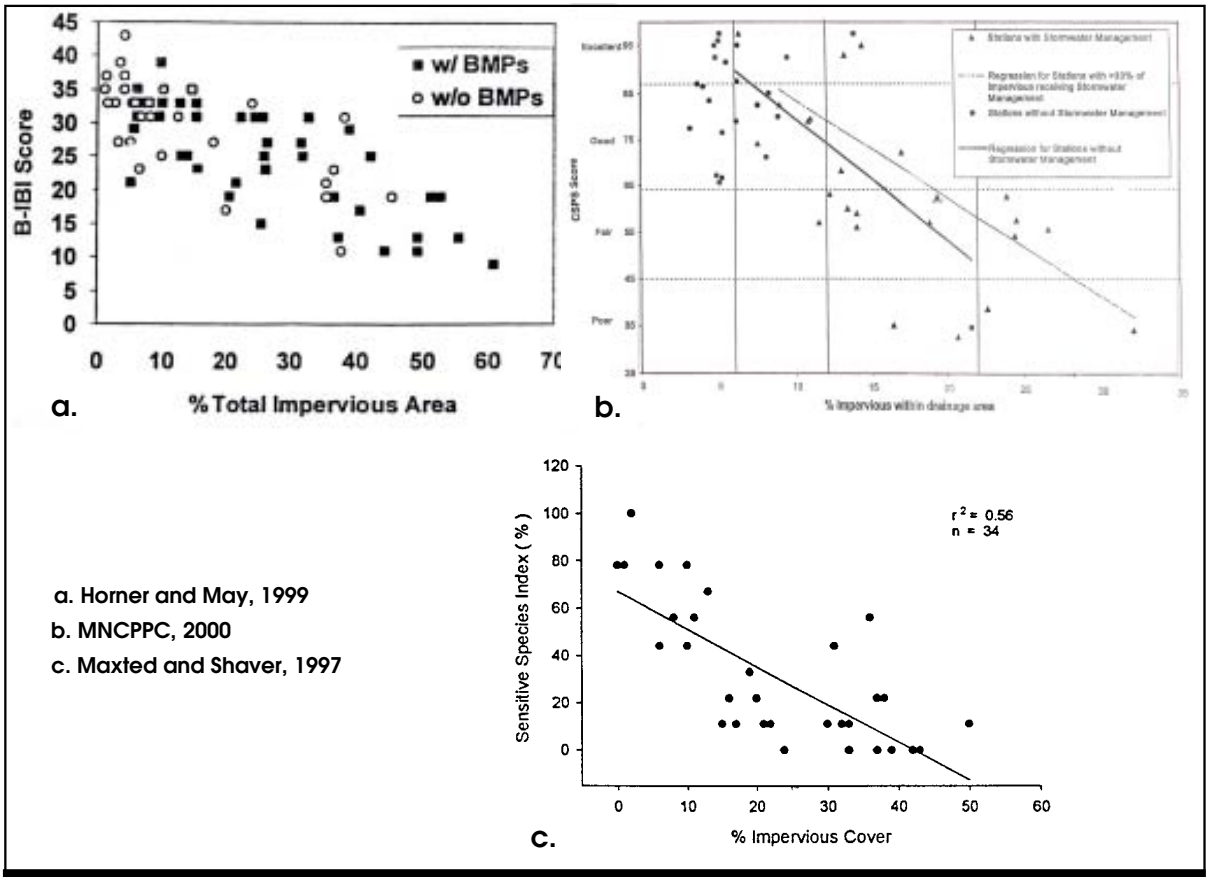

Figure 4: The Double Scatter Problem: Difficulties in Detecting the Effect of Watershed Treatment

overplot those in subwatersheds that lack treatment. While subtle statistical differences may be detected, they are not visibly evident. This suggests that the impact of watershed treatment would need to be extremely dramatic to be detected, given the inherent statistical variability seen in small watersheds (particularly so within the five to 25% IC range where scatter is considerable).

In an ideal world, a watershed study design would look at a controlled population of small urban watersheds that were developed with and without watershed practices to detect the impact of "treatment." In the real world, however, it is impossible to strictly control subwatershed variables. Quite simply, no two subwatersheds are ever alike. Each differs slightly with respect to drainage area, IC, forest cover, riparian continuity, historical land use, and percent watershed treatment. Researchers must also confront other real world issues when designing their watershed treatment experiments.

For example, researchers must carefully choose which indicator or group of indicators will be used to define stream health. IC has a negative influence on 26 stream quality indicators, yet nearly all of the watershed treatment research so far has focused on just a few biological indicators (e.g., aquatic insect or fish diversity) to define stream health. It is conceivable that watershed treatment might have no effect on biological indicators, yet have a positive influence on hydrology, habitat or water quality indicators. At this point, few of these indicators have been systematically

tested in the field. It is extremely doubtful that any watershed practice can simultaneously improve or mitigate all 26 stream quality indicators, so researchers must carefully interpret the outcomes of their watershed treatment experiments.

The second issue involves how to quantify watershed treatment. In reality, watershed treatment collectively refers to dozens of practices that are installed at individual development sites in the many years or even decades it takes to fully "build out" a subwatershed. Several researchers have discovered that watershed practices are seldom installed consistently across an entire subwatershed. In some cases, less than a third of the IC in a subwatershed was actually treated by any practice, because development occurred prior to regulations; recent projects were exempted, waived or grandfathered; or practices were inadequately constructed or maintained (Horner and May, 1999 and MNCPPC, 2000).

Even when good coverage is achieved in a watershed, such as the 65 to 90% reported in studies of stormwater ponds (Jones *et al*., 1996; Maxted, 1999; Maxted and Shaver, 1997), it is still quite difficult to quantify the actual quality of treatment. Often, each subwatershed contains its own unique mix of stormwater practices installed over several decades, designed under diverse design criteria, and utilizing widely different stormwater technologies. Given these inconsistencies, researchers will need to develop standard protocols to define the extent and quality of watershed treatment.

Effect of Stormwater Ponds

With this in mind, the effect of stormwater ponds and stream buffers can be discussed. The effect of larger stormwater ponds in mitigating the impacts of IC in small watersheds has received the most scrutiny to date. This is not surprising, since larger ponds often control a large fraction of their contributing subwatershed area (e.g. 100 to 1,000 acres) and are located on the stream itself, therefore lending themselves to easier monitoring. Three studies have evaluated the impact of large stormwater ponds on downstream aquatic insect communities (Jones *et al.*, 1996; Maxted and Shaver, 1997; Stribling *et al.*, 2001). Each of these studies was conducted in small headwater subwatersheds in the mid-Atlantic Region, and none was able to detect major differences in aquatic insect diversity in streams with or without stormwater ponds.

Four additional studies statistically evaluated the stormwater treatment effect in larger populations of small watersheds with varying degrees of IC (Horner and May, 1999; Horner *et al.,* 2001; Maxted, 1999; MNCPPC, 2000). These studies generally sampled larger watersheds that had many stormwater practices but not necessarily complete watershed coverage. In general, these studies detected a small but positive effect of stormwater treatment relative to aquatic insect diversity. This positive effect was typically seen only in the range of five to 20% IC and was generally undetected beyond about 30% IC. Although each author was hesitant about interpreting his results, all generally agreed that perhaps as much as 5% IC could be added to a subwatershed while maintaining aquatic insect diversity, given effective stormwater treatment. Forest retention and stream buffers were found to be very important, as well. Horner *et al.* (2001) reported a somewhat stronger IC threshold for various species of salmon in Puget Sound streams.

Some might conclude from these initial findings that stormwater ponds have little or no value in maintaining biological diversity in small streams. However, such a conclusion may be premature for several reasons. First, the generation of stormwater ponds that was tested was not explicitly designed to protect stream habitat or to prevent downstream channel erosion, which would presumably promote aquatic diversity. Several states have recently changed their stormwater criteria to require extended detention for the express purpose of preventing downstream channel erosion, and these new criteria may exert a stronger influence on aquatic diversity. Instead, their basic design objective was to maximize pollutant removal, which they did reasonably well.

The second point to stress is that streams with larger stormwater ponds should be considered "regulated streams" (Ward and Stanford, 1979), which have a significantly altered aquatic insect community downstream of the ponds. For example, Galli (1988) has reported that on-stream wet stormwater ponds shift the trophic structure of the aquatic insect community. The insect community above the pond was dominated by shredders, while the insect community below the pond was dominated by scrapers, filterers and collectors. Of particular note, several pollution-sensitive species were eliminated below the pond. Galli reported that changes in stream temperatures, carbon supply and substrate fouling were responsible for the downstream shift in the aquatic insect community. Thus, while it is clear that large stormwater ponds can be expected to have a negative effect on aquatic insect diversity, they could still exert positive influence on other stream quality indicators.

Effect of Stream Buffers

A handful of studies have evaluated biological indicator scores for urban streams that have extensive forest buffers, compared to streams where they were mostly or completely absent (Horner and May, 1999; Horner *et al.,* 2001; May *et al.*, 1997; MNCPPC, 2000; Roth *et al.,* 1998; Steedman, 1988). Biological indicators included various indices of aquatic insect, fish and salmon diversity. Each study sampled a large population of small subwatersheds over a range of IC and derived a quantitative measure to express the continuity, width and forest cover of the riparian buffer network within each subwatershed. Riparian forests were hypothesized to have a positive influence on stream biodiversity, given the direct ways they contribute to stream habitat (e.g., shading, woody debris, leaf litter, bank stability, and organic carbon supply).

All five studies detected a small to moderate positive effect when forested stream buffers were present (frequently defined as at least two-thirds of the stream network with at least 100 feet of stream side forest). The greatest effect was reported by Horner and May (1999) and Horner *et al.* (2001) for salmon streams in the Puget Sound ecoregion. If excellent riparian habitats were preserved, they generally reported that fish diversity could be maintained up to 15% IC, and good aquatic insect diversity could be maintained with as much as 30% IC. Steedman (1988) reported a somewhat smaller effect for Ontario streams. MNCPPC (2000), May *et al.* (1997), and Roth *et al.* (1998) could not find a statistically significant relationship between riparian quality and urban stream quality indicators but did report that most outliers (defined as higher IC subwatersheds with unusually high biological indicator scores) were generally associated with extensive stream side forest.

1.1.4 Recommendations for Further ICM Research

At this point, we recommend three research directions to improve the utility of the ICM for watershed managers. The **first direction** is to expand basic research on the relationship between IC and stream quality indicators that have received little scrutiny. In particular, more work is needed to define the relationship between IC and hydrological and physical indicators such as the following:

- Physical loss or alteration of the stream network
- Stream habitat measures
- Riparian continuity
- Baseflow conditions during dry weather

In addition, more watershed research is needed in ecoregions and physiographic areas where the ICM has not yet been widely tested. Key areas include Florida, arid and semiarid climates, karst areas and mountainous regions. The basic multiple subwatershed monitoring protocol set forth by Schueler (1994a) can be used to investigate IC/stream quality relationships, although it would be wise to measure a wider suite of subwatershed variables beyond IC (e.g., forest cover, turf cover, and riparian continuity).

The **second** research direction is to more clearly define the impact of watershed treatment on stream quality indicators. Based on

the insurmountable problems encountered in controlling variation at the subwatershed level, it may be necessary to abandon the multiple watershed or paired watershed sampling approaches that have been used to date. Instead, longitudinal monitoring studies within individual subwatersheds may be a more powerful tool to detect the effect of watershed treatment. These studies could track changes in stream quality indicators in individual subwatersheds over the entire development cycle: pre-development land use, clearing, construction, build out, and post construction. In most cases, longitudinal studies would take five to 10 years to complete, but they would allow watershed managers to measure and control the inherent variability at the subwatershed level and provide a "before and after" test of watershed treatment. Of course, a large population of test subwatersheds would be needed to satisfactorily answer the watershed treatment question.

The **third** research direction is to monitor more non-supporting streams, in order to provide a stronger technical foundation for crafting more realistic urban stream standards and to see how they respond to various watershed restoration treatments. As a general rule, most researchers have been more interested in the behavior of sensitive and impacted streams. The non-supporting stream category spans a wide range of IC, yet we do not really understand how stream quality indicators behave over the entire 25 to 100% IC range.

For example, it would be helpful to establish the IC level at the upper end of the range where streams are essentially transformed into an artificial conveyance system (i.e., become pipes or artificial channels). It would also be interesting to sample more streams near the lower end of the non-supporting category (25 to 35% IC) to detect whether stream quality indicators respond to past watershed treatment or current watershed restoration efforts. For practical reasons, the multiple subwatershed sampling approach is still recommended to characterize indicators in non-supporting streams. However, researchers will need to screen a large number of non-supporting subwatersheds in order to identify a few subwatersheds that are adequate for subsequent sampling (i.e., to control for area, IC, development age, percent watershed treatment, type of conveyance systems, etc.).

1.2 Impacts of Urbanization on Downstream Receiving Waters

In this section, we review the impacts of urbanization on downstream receiving waters, primarily from the standpoint of impacts caused by poor stormwater quality. We begin by looking at the relationship between IC and stormwater pollutant loadings. Next, we discuss the sensitivity of selected downstream receiving waters to stormwater pollutant loads. Lastly, we examine the effect of watershed treatment in reducing stormwater pollutant loads.

1.2.1 Relationship Between Impervious Cover and Stormwater Quality

Urban stormwater runoff contains a wide range of pollutants that can degrade downstream water quality (Table 3). Several generalizations can be supported by the majority of research conducted to date. First, the unit area pollutant load delivered by stormwater runoff to receiving waters increases in direct proportion to watershed IC. This is not altogether surprising, since pollutant load is the product of the average pollutant concentration and stormwater runoff volume. Given that runoff volume increases in direct proportion to IC, pollutant loads must automatically increase when IC increases, as long the average pollutant concentration stays the same (or increases). This relationship is a central assumption in most simple and complex pollutant loading models (Bicknell *et al.*, 1993; Donigian and Huber, 1991; Haith *et al.*, 1992; Novotny and Chester, 1981; NVPDC, 1987; Pitt and Voorhees, 1989).

The second generalization is that stormwater pollutant concentrations are generally similar

Table 3: Summary of Urban Stormwater Pollutant Loads on Quality of Receiving Waters

Pollutants in Urban Stormwater	WQ Impacts To:					Higher Unit Load?	Load a function of IC?	Other Factors Important in Loading
	R	L	E	A	W			
Suspended Sediment	Y	Y	Y	N	Y	Y (ag)	Y	channel erosion
Total Nitrogen	N	N	Y	Y	N	Y (ag)	Y	septic systems
Total Phosphorus	Y	Y	N	N	Y	Y (ag)	Y	tree canopy
Metals	Y	Y	Y	?	N	Y	Y	vehicles
Hydrocarbons	Y	Y	Y	Y	Y	Y	?	related to VMTs and hotspots
Bacteria/Pathogens	Y	Y	Y	N	Y	Y	Y	many sources
Organic Carbon	N	?	?	?	Y	Y	Y	
MTBE	N	N	N	Y	Y	Y	?	roadway, VMTs
Pesticides	?	?	?	?	Y	Y	?	turf/landscaping
Chloride	?	Y	N	Y	Y	Y	?	road density
Trash/Debris	Y	Y	Y	N	?	Y	Y	curb and gutters

Major Water Quality Impacts Reported for:
R = River, L = Lake, E = Estuary, A = Aquifer, W = Surface Water Supply
Higher Unit Area Load? Yes (compared to all land uses) (ag): with exception of cropland
Load a function of IC? Yes, increases proportionally with IC

at the catchment level, regardless of the mix of IC types monitored (e.g., residential, commercial, industrial or highway runoff). Several hundred studies have examined stormwater pollutant concentrations from small urban catchments and have generally found that the variation within a catchment is as great as the variation between catchments. Runoff concentrations tend to be log-normally distributed, and therefore the long term "average" concentration is best expressed by a median value. It should be kept in mind that researchers have discovered sharp differences in pollutant concentrations for smaller, individual components of IC (e.g., rooftops, parking lots, streets, driveways and the like). Since most urban catchments are composed of many kinds of IC, this mosaic quality tempers the variability in long term pollutant concentrations at the catchment or subwatershed scale.

The third generalization is that median concentrations of pollutants in urban runoff are usually higher than in stormwater runoff from most other non-urban land uses. Consequently, the unit area nonpoint pollutant load generated by urban land normally exceeds that of nearly all watershed land uses that it replaces (forest, pasture, cropland, open space — see Table 3). One important exception is cropland, which often produces high unit area sediment and nutrient loads in many regions of the country. In these watersheds, conversion of intensively managed crops to low density residential development may actually result in a slightly decreased sediment or nutrient load. On the other hand, more intensive land development (30% IC or more) will tend to equal or exceed cropland loadings.

The last generalization is that the effect of IC on stormwater pollutant loadings tends to be weakest for subwatersheds in the one to 10% IC range. Numerous studies have suggested that other watershed and regional factors may have a stronger influence, such as the underlying geology, the amount of carbonate rock in the watershed, physiographic region, local soil types, and most important, the relative fraction of forest and crop cover in the subwatershed (Herlihy *et al*., 1998 and Liu *et al.,* 2000). The limited influence of IC on pollutant loads is generally consistent with the finding for hydrologic, habitat and biological indicators over this narrow range of IC. Once again, watershed managers are advised to track other watershed indicators in the sensitive stream category, such as forest or crop cover.

1.2.2 Water Quality Response to Stormwater Pollution

As noted in the previous section, most ICM research has been done on streams, which are directly influenced by increased stormwater. Many managers have wondered whether the ICM also applies to downstream receiving waters, such as lakes, water supply reservoirs and small estuaries. In general, the exact water quality response of downstream receiving waters to increased nonpoint source pollutant loads depends on many factors, including the specific pollutant, the existing loading generated by the converted land use, and the geometry and hydraulics of the receiving water. Table 3 indicates the sensitivity of rivers, lakes, estuaries, aquifers and water supply reservoirs to various stormwater pollutants.

Lakes and the ICM

The water column and sediments of urban lakes are impacted by many stormwater pollutants, including sediment, nutrients, bacteria, metals, hydrocarbons, chlorides, and trash/debris. Of these pollutants, limnologists have always regarded phosphorus as the primary lake management concern, given that more than 80% of urban lakes experience symptoms of eutrophication (CWP, 2001a).

In general, phosphorus export steadily increases as IC is added to a lake watershed, although the precise amount of IC that triggers eutrophication problems is unique to each urban lake. With a little effort, it is possible to calculate the specific IC threshold for an individual lake, given its internal geometry, the size of its contributing watershed, current in-lake phosphorus concentration, degree of watershed treatment, and the desired water quality goals for the lake (CWP, 2001a). As a general rule, most lakes are extremely sensitive

to increases in phosphorus loads caused by watershed IC. Exceptions include lakes that are unusually deep and/or have very small drainage area/lake area ratios. In most lakes, however, even a small amount of watershed development will result in an upward shift in trophic status (CWP, 2001a).

Reservoirs and the ICM

While surface water supply reservoirs respond to stormwater pollutant loads in the same general manner as lakes, they are subject to stricter standards because of their uses for drinking water. In particular, water supply reservoirs are particularly sensitive to increased turbidity, pathogens, total organic carbon, chlorides, metals, pesticides and hydrocarbon loads, in addition to phosphorus (Kitchell, 2001). While some pollutants can be removed or reduced through expanded filtering and treatment at drinking water intakes, the most reliable approach is to protect the source waters through watershed protection and treatment.

Consequently, we often recommend that the ICM be used as a "threat index" for most drinking water supplies. Quite simply, if current or future development is expected to exceed 10% IC in the contributing watershed, we recommend that a very aggressive watershed protection strategy be implemented (Kitchell, 2001). In addition, we contend that drinking water quality cannot be sustained once watershed IC exceeds 25% and have yet to find an actual watershed where a drinking water utility has been maintained under these conditions.

Small Tidal Estuaries and Coves and the ICM

The aquatic resources of small tidal estuaries, creeks, and coves are often highly impacted by watershed development and associated activities, such as boating/marinas, wastewater discharge, septic systems, alterations in freshwater flow and wetland degradation and loss. Given the unique impacts of eutrophication on the marine system and stringent water quality standards for shellfish harvesting, the stormwater pollutants of greatest concern in the estuarine water column are nitrogen and fecal coliform bacteria. Metals and hydrocarbons in stormwater runoff can also contaminate bottom sediments, which can prove toxic to local biota (Fortner *et al*., 1996; Fulton *et al.*, 1996; Kucklick *et al.*, 1997; Lerberg *et al.*, 2000; Sanger *et al.,* 1999; Vernberg *et al.*, 1992).

While numerous studies have demonstrated that physical, hydrologic, water quality and biological indicators differ in urban and non-urban coastal watersheds, only a handful of studies have used watershed IC as an indicator of estuarine health. These studies show significant correlations with IC, although degradation thresholds may not necessarily adhere to the ICM due to tidal dilution and dispersion. Given the limited research, it is not fully clear if the ICM can be applied to coastal systems without modification.

Atmospheric deposition is considered a primary source of nitrogen loading to estuarine watersheds. Consequently, nitrogen loads in urban stormwater are often directly linked to IC. Total nitrogen loads have also been linked to groundwater input, especially from subsurface discharges from septic systems, which are common in low density coastal development (Swann, 2001; Valiela *et al.*, 1997; Vernberg *et al.*, 1996a). Nitrogen is generally considered to be the limiting nutrient in estuarine systems, and increased loading has been shown to increase algal and phytoplankton biomass and cause shifts in the phytoplankton community and food web structure that may increase the potential for phytoplankton blooms and fish kills (Bowen and Valiela, 2001; Evgenidou *et al.*, 1997; Livingston, 1996).

Increased nitrogen loads have been linked to declining seagrass communities, finfish populations, zooplankton reproduction, invertebrate species richness, and shellfish populations (Bowen and Valiela, 2001; Rutkowski *et al*., 1999; Short and Wyllie-Echeverria, 1996; Valiela and Costa, 1988). Multiple studies have shown significant increases in nitrogen loading as watershed land use becomes more urban (Valiela *et al.,* 1997; Vernberg *et al.* 1996a; Wahl *et al.,* 1997). While a few studies

link nitrogen loads with building and population density, no study was found that used IC as an indicator of estuarine nitrogen loading.

The second key water quality concern in small estuaries is high fecal coliform levels in stormwater runoff, which can lead to the closure of shellfish beds and swimming beaches. Waterfowl and other wildlife have also been shown to contribute to fecal coliform loading (Wieskel *et al.*, 1996). Recent research has shown that fecal coliform standards are routinely violated during storm events at very low levels of IC in coastal watersheds (Mallin *et al.,* 2001; Vernberg *et al.*, 1996b; Schueler, 1999). Maiolo and Tschetter (1981) found a significant correlation between human population and closed shellfish acreage in North Carolina, and Duda and Cromartie (1982) found greater fecal coliform densities when septic tank density and IC increased, with an approximate threshold at 10% watershed IC.

Recently, Mallin *et al.* (2000) studied five small North Carolina estuaries of different land uses and showed that fecal coliform levels were significantly correlated with watershed population, developed land and IC. Percent IC was the most statistically significant indicator and could explain 95% of the variability in fecal coliform concentrations. They also found that shellfish bed closures were possible in watersheds with less than 10% IC, common in watersheds above 10% IC, and almost certain in watersheds above 20% IC. While higher fecal coliform levels were observed in developed watersheds, salinity, flushing and proximity to pollution sources often resulted in higher concentrations at upstream locations and at high tides (Mallin *et al.*, 1999). While these studies support the ICM, more research is needed to prove the reliability of the ICM in predicting shellfish bed closures based on IC.

Several studies have also investigated the impacts of urbanization on estuarine fish, macrobenthos and shellfish communities. Increased PAH accumulation in oysters, negative effects of growth in juvenile sheepshead minnows, reduced molting efficiency in copepods, and reduced numbers of grass shrimp have all been reported for urban estuaries as compared to forested estuaries (Fulton *et al.,* 1996). Holland *et al. (*1997) reported that the greatest abundance of penaid shrimp and mummichogs was observed in tidal creeks with forested watersheds compared to those with urban cover. Porter *et al.* (1997) found lower grass shrimp abundance in small tidal creeks adjacent to commercial and urban development, as compared to non-urban watersheds.

Lerberg *et al.* (2000) studied small tidal creeks and found that highly urban watersheds (50% IC) had the lowest benthic diversity and abundance as compared to suburban and forested creeks, and benthic communities were numerically dominated by tolerant oligochaetes and polychaetes. Suburban watersheds (15 to 35% IC) also showed signs of degradation and had some pollution tolerant macrobenthos, though not as markedly as urban creeks. Percent abundance of pollution-indicative species showed a marked decline at 30% IC, and the abundance of pollution-sensitive species also significantly correlated with IC (Lerberg *et al*., 2000). Holland *et al*. (1997) reported that the variety and food availability for juvenile fish species was impacted at 15 to 20% IC.

Lastly, a limited amount of research has focused on the direct impact of stormwater runoff on salinity and hypoxia in small tidal creeks. Blood and Smith (1996) compared urban and forested watersheds and found higher salinities in urban watersheds due to the increased number of impoundments. Fluctuations in salinity have been shown to affect shellfish and other aquatic populations (see Vernberg, 1996b). When urban and forested watersheds were compared, Lerberg *et al.* (2000) reported that higher salinity fluctuations occurred most often in developed watersheds; significant correlations with salinity range and IC were also determined. Lerberg *et al.* (2000) also found that the most severe and frequent hypoxia occurred in impacted salt marsh creeks and that dissolved oxygen dynamics in tidal creeks were comparable to dead-end canals common in residential marina-style

coastal developments. Suburban watersheds (15 to 35% IC) exhibited signs of degradation and had some pollution-tolerant macrobenthic species, though not to the extent of urban watersheds (50% IC).

In summary, recent research suggests that indicators of coastal watershed health are linked to IC. However, more research is needed to clarify the relationship between IC and estuarine indicators in small tidal estuaries and high salinity creeks.

1.2.3 Effect of Watershed Treatment on Stormwater Quality

Over the past two decades, many communities have invested in watershed protection practices, such as stormwater treatment practices (STPs), stream buffers, and better site design, in order to reduce pollutant loads to receiving waters. In this section, we review the effect of watershed treatment on the quality of stormwater runoff.

Effect of Stormwater Treatment Practices
We cannot directly answer the question as to whether or not stormwater treatment practices can significantly reduce water quality impacts at the watershed level, simply because no controlled monitoring studies have yet been conducted at this scale. Instead, we must rely on more indirect research that has tracked the change in mass or concentration of pollutants as they travel through individual stormwater treatment practices. Thankfully, we have an abundance of these performance studies, with nearly 140 monitoring studies evaluating a diverse range of STPs, including ponds, wetlands, filters, and swales (Winer, 2000).

These studies have generally shown that stormwater practices have at least a moderate ability to remove many pollutants in urban stormwater. Table 4 provides average removal efficiency rates for a range of practices and stormwater pollutants, and Table 5 profiles the mean storm outflow concentrations for various practices. As can be seen, some groups of practices perform better than others in removing certain stormwater pollutants. Consequently, managers need to carefully choose which practices to apply to solve the primary water quality problems within their watersheds.

It is also important to keep in mind that site-based removal rates cannot be extrapolated to the watershed level without significant adjustment. Individual site practices are never implemented perfectly or consistently across a watershed. At least three discount factors need to be considered: bypassed load, treatability and loss of performance over time. For a review on how these discounts are derived, consult Schueler and Caraco (2001). Even under the most optimistic watershed implementation scenarios, overall pollutant reduc-

Table 4: The Effectiveness of Stormwater Treatment Practices in Removing Pollutants - Percent Removal Rate (Winer, 2000)

Practice	N	TSS	TP	OP	TN	NOx	Cu	Zn	Oil/ Grease[1]	Bacteria
Dry Ponds	9	47	19	N/R	25	3.5	26	26	3	44
Wet Ponds	43	80	51	65	33	43	57	66	78	70
Wetlands	36	76	49	48	30	67	40	44	85	78
Filtering Practices[2]	18	86	59	57	38	-14	49	88	84	37
Water Quality Swales	9	81	34	1.0	84	31	51	71	62	-25
Ditches[3]	9	31	-16	N/R	-9.0	24	14	0	N/R	0
Infiltration	6	95	80	85	51	82	N/R	N/R	N/R	N/R

1: Represents data for Oil and Grease and PAH
2: Excludes vertical sand filters
3: Refers to open channel practices not designed for water quality
N/R = Not Reported

Table 5: Median Effluent Concentrations from Stormwater Treatment Practices (mg/l) (Winer, 2000)

Practice	N	TSS	TP	OP	TN	NOx	Cu[1]	Zn[1]
Dry Ponds[2]	3	28	0.18	N/R	0.86	N/R	9.0	98
Wet Ponds	25	17	0.11	0.03	1.3	0.26	5.0	30
Wetlands	19	22	0.20	0.07	1.7	0.36	7.0	31
Filtering Practices[3]	8	11	0.10	0.07	1.1	0.55	9.7	21
Water Quality Swales	7	14	0.19	0.09	1.1	0.35	10	53
Ditches[4]	3	29	0.31	N/R	2.4	0.72	18	32

1. Units for Zn and Cu are micrograms per liter (Fg/l)
2. Data available for Dry Extended Detention Ponds only
3. Excludes vertical sand filters
4. Refers to open channel practices not designed for water quality
N/R = Not Reported

tions by STPs may need to be discounted by at least 30% to account for partial watershed treatment.

Even with discounting, however, it is evident that STPs can achieve enough pollutant reduction to mimic rural background loads for many pollutants, as long as the watershed IC does not exceed 30 to 35%. This capability is illustrated in Figure 5, which shows phosphorus load as a function of IC, with and without stormwater treatment.

Effect of Stream Buffers/Riparian Areas
Forested stream buffers are thought to have very limited capability to remove stormwater pollutants, although virtually no systematic monitoring data exists to test this hypothesis. The major reason cited for their limited removal capacity is that stormwater generated from upland IC has usually concentrated before it reaches the forest buffer and therefore crosses the buffer in a channel, ditch or storm drain pipe. Consequently, the opportunity to filter runoff is lost in many forest buffers in urban watersheds.

Effect of Better Site Design
Better site design (BSD) is a term for nonstructural practices that minimize IC, conserve natural areas and distribute stormwater treatment across individual development sites. BSD is also known by many other names, including conservation development, low-impact development, green infrastructure, and sustainable urban drainage systems. While

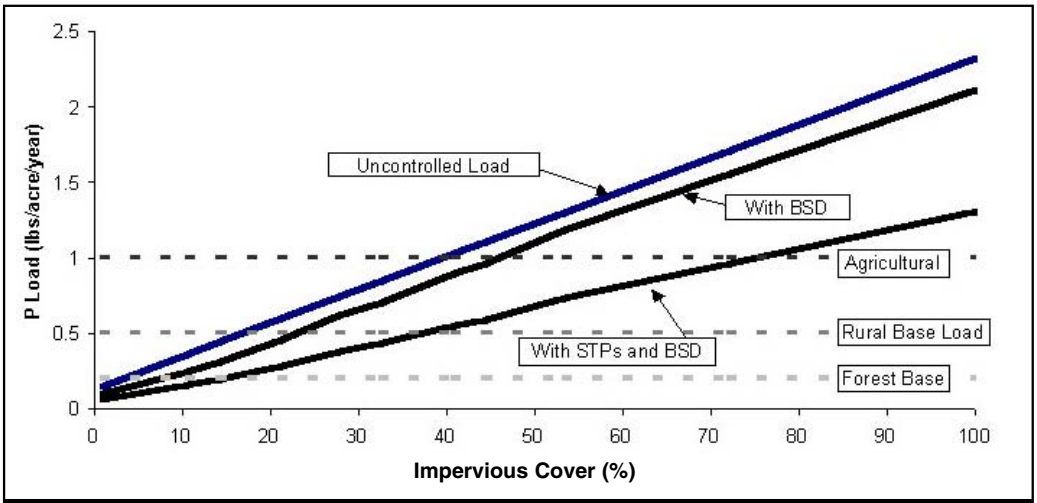

Figure 5: Estimated Phosphorus Load as a Function of Impervious Cover, Discounted Stormwater Treatment and Better Site Design (Schueler and Caraco, 2001)

some maintain that BSD is an alternative to traditional STPs, most consider it to be an important complement to reduce pollutant loads.

While BSD has become popular in recent years, only one controlled research study has evaluated its potential performance, and this is not yet complete (i.e. Jordan Cove, CT).

Indirect estimates of the potential value of BSD to reduce pollutant discharges have been inferred from modeling and redesign analyses (Zielinski, 2000). A typical example is provided in Figure 5, which shows the presumed impact of BSD in reducing phosphorus loadings. As is apparent, BSD appears to be a very effective strategy in the one to 25% IC range, but its benefits diminish beyond that point.

1.3 Implications of the ICM for Watershed Managers

One of the major policy implications of the ICM is that in the absence of watershed treatment, it predicts negative stream impacts at an extremely low intensity of watershed development. To put this in perspective, consider that a watershed zoned for two-acre lot residential development will generally exceed 10% IC, and therefore shift from a sensitive to an impacted stream classification (Cappiella and Brown, 2001). Thus, if a community wants to protect an important water resource or a highly regarded species (such as trout, salmon or an endangered freshwater mussel), the ICM suggests that there is a maximum limit to growth that is not only quite low, but is usually well below the current zoning for many suburban or even rural watersheds. Consequently, the ICM suggests the unpleasant prospect that massive down-zoning, with all of the associated political and legal carnage involving property rights and economic development, may be required to maintain stream quality.

It is not surprising, then, that the ICM debate has quickly shifted to the issue of whether or not watershed treatment practices can provide adequate mitigation for IC. How much relief can be expected from stream buffers, stormwater ponds, and other watershed practices, which might allow greater development density within a given watershed? Only a limited amount of research has addressed this question, and the early results are not reassuring (reviewed in section 1.1.3). At this early stage, researchers are still having trouble detecting the impact of watershed treatment, much less defining it. As noted earlier, both watershed research techniques and practice implementation need to be greatly improved if we ever expect to get a scientifically defensible answer to this crucial question. Until then, managers should be extremely cautious in setting high expectations for how much watershed treatment can mitigate IC.

1.3.1 Management of Non-Supporting Streams

Most researchers acknowledge that streams with more than 25% IC in their watersheds cannot support their designated uses or attain water quality standards and are severely degraded from a physical and biological standpoint. As a consequence, many of these streams are listed for non-attainment under the Clean Water Act and are subject to Total Maximum Daily Load (TMDL) regulations. Communities that have streams within this regulatory class must prepare implementation plans that demonstrate that water quality standards can ultimately be met.

While some communities have started to restore or rehabilitate these streams in recent years, their efforts have yielded only modest improvements in water quality and biological indicators. In particular, no community has yet demonstrated that they can achieve water quality standards in an urban watershed that exceeds 25% IC. Many communities are deeply concerned that non-supporting streams may never achieve water quality standards, despite massive investments in watershed restoration. The ICM suggests that water quality standards may need to be sharply revised for streams with more than 25% IC, if they are ever to come into attainment. While states have authority to create more achievable standards for non-supporting streams within the regulatory framework of the Clean Water Act (Swietlik, 2001), no state has yet exercised this authority. At this time, we are not aware of any water quality standards that are based on the ICM or similar urban stream classification techniques.

Two political perceptions largely explain why states are so reticent about revising water quality standards. The first is a concern that they will run afoul of anti-degradation provisions within the Clean Water Act or be accused of “backsliding” by the environmental community. The second concern relates to the demographics of watershed organizations across the country. According to recent surveys, slightly more than half of all watershed organizations

represent moderately to highly developed watersheds (CWP, 2001a). These urban watershed organizations often have a keen interest in keeping the existing regulatory structure intact, since it is perceived to be the only lever to motivate municipalities to implement restoration efforts in non-supporting streams.

However, revised water quality standards are urgently needed to support smart growth efforts. A key premise of smart growth is that it is more desirable to locate new development within a non-supporting subwatershed rather than a sensitive or impacted one (i.e., concentrating density and IC within an existing subwatershed helps prevent sprawl from encroaching on a less developed one). Yet while smart growth is desirable on a regional basis, it will usually contribute to already serious problems in non-supporting watersheds, which makes it even more difficult to meet water quality standards.

This creates a tough choice for regulators: if they adopt stringent development criteria for non-supporting watersheds, their added costs can quickly become a powerful barrier to desired redevelopment. If, on the other hand, they relax or waive environmental criteria, they contribute to the further degradation of the watershed. To address this problem, the Center has developed a "smart watersheds" program to ensure that any localized degradation caused by development within a non-supporting subwatershed is more than compensated for by improvements in stream quality achieved through municipal restoration efforts (CWP, in press). Specifically, the smart watersheds program includes 17 public sector programs to treat stormwater runoff, restore urban stream corridors and reduce pollution discharges in highly urban watersheds. It is hoped that communities that adopt and implement smart watershed programs will be given greater flexibility to meet state and federal water quality regulations and standards within non-supporting watersheds.

1.3.2 Use of the ICM for Urban Stream Classification

The ICM has proven to be a useful tool for classifying and managing the large inventory of streams that most communities possess. It is not unusual for a typical county to have several thousand miles of headwater streams within its political boundaries, and the ICM provides a unified framework to identify and manage these subwatersheds. In our watershed practice, we use the ICM to make an initial diagnosis rather than a final determination for stream classification. Where possible, we conduct rapid stream and subwatershed assessments as a final check for an individual stream classification, particularly if it borders between the sensitive and impacted category. As noted earlier, the statistical variation in the IC/stream quality indicator makes it difficult to distinguish between a stream with 9% versus 11% IC. Some of the key criteria we use to make a final stream classification are provided in Table 6.

1.3.3 Role of the ICM in Small Watershed Planning

The ICM has also proven to be an extremely important tool for watershed planning, since it can rapidly project how streams will change in response to future land use. We routinely estimate existing and future IC in our watershed planning practice and find that it is an excellent indicator of change for subwatersheds in the zero to 30% IC range. In particular, the ICM often forces watershed planners to directly confront land use planning and land conservation issues early in the planning process.

On the other hand, we often find that the ICM has limited planning value when subwatersheds exceed 30% IC for two practical reasons. First, the ICM does not differentiate stream conditions within this very large span of IC (i.e., there is no difference in the stream quality prediction for a subwatershed that has 39.6% IC versus one that has 58.4% IC). Second, the key management question for non-supporting watersheds is whether or not

they are potentially restorable. More detailed analysis and field investigations are needed to determine, in each subwatershed, the answer to this question. While a knowledge of IC is often used in these feasibility assessments, it is but one of many factors that needs to be considered.

Lastly, we have come to recognize several practical factors when applying the ICM for small watershed planning. These include thoughtful delineation of subwatershed boundaries, the proper accounting of a direct drainage area in larger watersheds, and the critical need for the most recent IC data. More guidance on these factors can be found in Zielinski (2001).

Impervious cover is not a perfect indicator of existing stream quality. A number of stream and subwatershed criteria should be evaluated in the field before a final classification decision is made, particularly when the stream is on the borderline between two classifications. We routinely look at the stream and subwatershed criteria to decide whether a borderline stream should be classified as sensitive or impacted. Table 6 reviews these additional criteria.

Table 6: Additional Considerations for Urban Stream Classification

Stream Criteria
Reported presence of rare, threatened or endangered species in the aquatic community (e.g., freshwater mussels, fish, crayfish or amphibians) Confirmed spawning of cold-water fish species (e.g., trout) Fair/good, good, or good to excellent macro invertebrate scores More than 65% of EPT species present in macro-invertebrate surveys No barriers impede movement of fish between the subwatershed and downstream receiving waters Stream channels show little evidence of ditching, enclosure, tile drainage or channelization Water quality monitoring indicates no standards violations during dry weather Stream and flood plain remain connected and regularly interact Stream drains to a downstream surface water supply Stream channels are generally stable, as determined by the Rosgen level analysis Stream habitat scores are rated at least fair to good
Subwatershed Criteria
Contains terrestrial species that are documented as rare, threatened and endangered Wetlands, flood plains and/or beaver complexes make up more than 10% of subwatershed area Inventoried conservation areas comprise more than 10% of subwatershed area More than 50% of the riparian forest corridor has forest cover and is either publicly owned or regulated Large contiguous forest tracts remain in the subwatershed (more than 40% in forest cover) Significant fraction of subwatershed is in public ownership and management Subwatershed connected to the watershed through a wide corridor Farming, ranching and livestock operations in the subwatershed utilize best management practices Prior development in the subwatershed has utilized stormwater treatment practices

1.4 Summary

The remainder of this report presents greater detail on the individual research studies that bear on the ICM. Chapter 2 profiles research on hydrologic indicators in urban streams, while Chapter 3 summarizes the status of current research on the impact of urbanization on physical habitat indicators. Chapter 4 presents a comprehensive review of the impact of urbanization on ten major stormwater pollutants. Finally, Chapter 5 reviews the growing body of research on the link between IC and biological indicators within urban streams and wetlands.

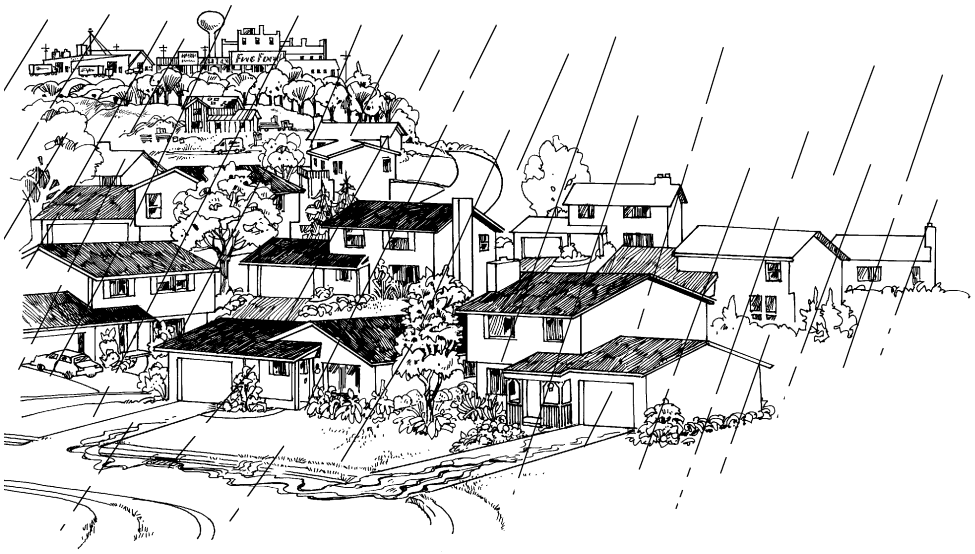

Chapter 2: Hydrologic Impacts of Impervious Cover

The natural hydrology of streams is fundamentally changed by increased watershed development. This chapter reviews the impacts of watershed development on selected indicators of stream hydrology.

This chapter is organized as follows:

2.1 Introduction
2.2 Increased Runoff Volume
2.3 Increased Peak Discharge Rates
2.4 Increased Bankfull Flow
2.5 Decreased Baseflow
2.6 Conclusions

2.1 Introduction

Fundamental changes in urban stream hydrology occur as a result of three changes in the urban landscape that accompany land development. First, large areas of the watershed are paved, rendering them impervious. Second, soils are compacted during construction, which significantly reduces their infiltration capabilities. Lastly, urban stormwater drainage systems are installed that increase the efficiency with which runoff is delivered to the stream (i.e., curbs and gutters, and storm drain pipes). Consequently, a greater fraction of annual rainfall is converted to surface runoff, runoff occurs more quickly, and peak flows become larger. Additionally, dry weather flow in streams may actually decrease because less groundwater recharge is available. Figure 6 illustrates the change in hydrology due to increased urban runoff as compared to pre-development conditions.

Research has demonstrated that the effect of watershed urbanization on peak discharge is more marked for smaller storm events. In particular, the bankfull, or channel forming flow, is increased in magnitude, frequency and duration. Increased bankfull flows have strong ramifications for sediment transport and channel enlargement. All of these changes in the natural water balance have impacts on the physical structure of streams, and ultimately affect water quality and biological diversity.

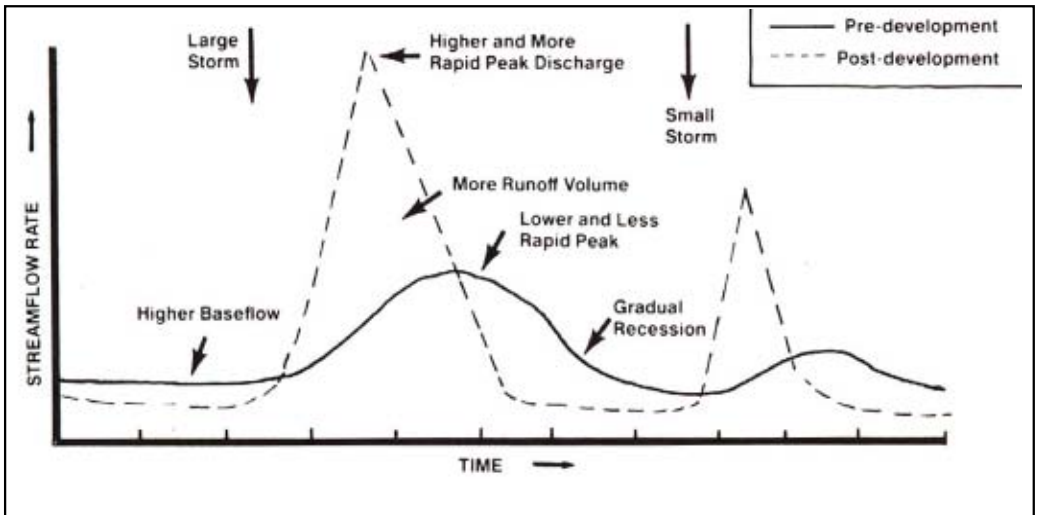

Figure 6: Altered Hydrograph in Response to Urbanization (Schueler, 1987)

The relationship between watershed IC and stream hydrology is widely accepted, and has been incorporated into many hydrologic engineering models over the past three decades. Several articles provide a good summary of these (Bicknell *et al.*, 1993; Hirsch *et al.*, 1990; HEC, 1977; Huber and Dickinson, 1988; McCuen and Moglen, 1988; Overton and Meadows, 1976; Pitt and Voorhees, 1989; Schueler, 1987; USDA, 1992; 1986).

The primary impacts of watershed development on stream hydrology are as follows:

- Increased runoff volume
- Increased peak discharge rates
- Increased magnitude, frequency, and duration of bankfull flows
- Diminished baseflow

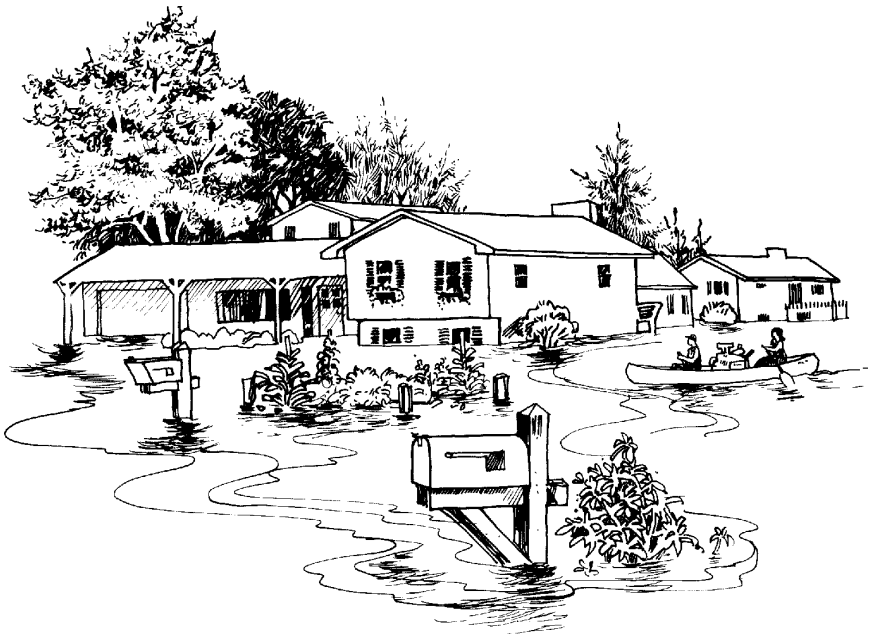

2.2 Increased Runoff Volume

Impervious cover and other urban land use alterations, such as soil compaction and storm drain construction, alter infiltration rates and increase runoff velocities and the efficiency with which water is delivered to streams. This decrease in infiltration and basin lag time can significantly increase runoff volumes. Table 7 reviews research on the impact of IC on runoff volume in urban streams. Schueler (1987) demonstrated that runoff values are directly related to subwatershed IC (Figure 7). Runoff data was derived from 44 small catchment areas across the country for EPA's Nationwide Urban Runoff Program.

Table 8 illustrates the difference in runoff volume between a meadow and a parking lot, as compiled from engineering models. The parking lot produces more than 15 times more runoff than a meadow for the same storm event.

Urban soils are also profoundly modified during the construction process. The compaction of urban soils and the removal of topsoil can decrease the infiltration capacity, causing increases in runoff volumes (Schueler, 2000). Bulk density is often used to measure soil compaction, and Table 9 illustrates how bulk density increases in many urban land uses.

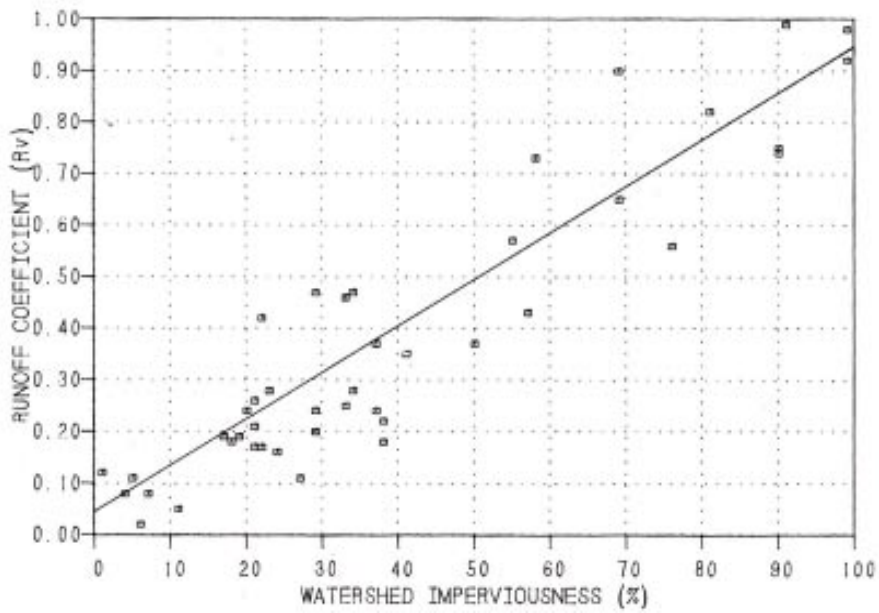

Note: 44 small urban catchments monitored during the national NURP study

Figure 7: Runoff Coefficient vs. IC (Schueler, 1987)

Table 7: Research Review of Increased Runoff Volume and Peak Discharge in Urban Streams		
Reference	**Key Finding**	**Location**
Increased Runoff Volume		
Schueler, 1987	Runoff coefficients were found to be strongly correlated with IC at 44 sites nationwide.	U.S.
Neller, 1988	Urban watershed produced more than seven times as much runoff as a similar rural watershed. Average time to produce runoff was reduced by 63% in urban watersheds compared to rural watersheds.	Australia
Increased Peak Discharge		
Hollis, 1975	Review of data from several studies showed that floods with a return period of a year or longer are not affected by a 5% watershed IC; small floods may be increased 10 times by urbanization; flood with a return period of 100 years may be doubled in size by a 30% watershed IC.	N/A
Leopold, 1968	Data from seven nationwide studies showed that 20% IC can cause the mean annual flood to double.	U.S.
Neller, 1988	Average peak discharge from urban watersheds was 3.5 times higher than peak runoff from rural watersheds.	Australia
Doll *et al.*, 2000	Peak discharge was greater for 18 urban streams versus 11 rural Piedmont streams.	NC
Sauer *et al.*, 1983	Estimates of flood discharge for various recurrence intervals showed that less than 50% watershed IC can result in a doubling of the 2-year, 10-year, and 100-year floods.	U.S.
Leopold, 1994	Watershed development over a 29-year period caused the peak discharge of the 10-year storm to more than double.	MD
Kibler *et al.*, 1981	Rainfall/runoff model for two watersheds showed that an increase in IC caused a significant increase in mean annual flood.	PA
Konrad and Booth, 2002	Evaluated streamflow data at 11 streams and found that the fraction of annual mean discharges was exceeded and maximum annual instantaneous discharges were related to watershed development and road density for moderately and highly developed watersheds.	WA

Table 8: Hydrologic Differences Between a Parking Lot and a Meadow (Schueler, 1994a)

Hydrologic or Water Quality Parameter	Parking Lot	Meadow
Runoff Coefficient	0.95	0.06
Time of Concentration (minutes)	4.8	14.4
Peak Discharge, two-year, 24-hour storm (cfs)	4.3	0.4
Peak Discharge Rate, 100-year storm (cfs)	12.6	3.1
Runoff Volume from one-inch storm (cu. ft)	3,450	218
Runoff Velocity @ two-year storm (ft/sec)	8	1.8

Key Assumptions:
2-yr, 24-hr storm = 3.1 in; 100-yr storm = 8.9 in.
Parking Lot: 100% imperviousness; 3% slope; 200ft flow length; hydraulic radius =.03; concrete channel; suburban Washington C values
Meadow: 1% impervious; 3% slope; 200 ft flow length; good vegetative condition; B soils; earthen channel
Source: Schueler, 1994a

Table 9: Comparison of Bulk Density for Undisturbed Soils and Common Urban Conditions (Schueler, 2000)

Undisturbed Soil Type or Urban Condition	Surface Bulk Density (grams/cubic centimeter)	Urban Condition	Surface Bulk Density (grams/cubic centimeter)
Peat	0.2 to 0.3	Urban Lawns	1.5 to 1.9
Compost	1.0	Crushed Rock Parking Lot	1.5 to 1.9
Sandy Soils	1.1 to 1.3	Urban Fill Soils	1.8 to 2.0
Silty Sands	1.4	Athletic Fields	1.8 to 2.0
Silt	1.3 to 1.4	Rights-of-Way and Building Pads (85%)	1.5 to 1.8
Silt Loams	1.2 to 1.5	Rights-of-Way and Building Pads (95%)	1.6 to 2.1
Organic Silts/Clays	1.0 to 1.2	Concrete Pavement	2.2
Glacial Till	1.6 to 2.0	Rock	2.65

2.3 Increased Peak Discharge Rate

Watershed development has a strong influence on the magnitude and frequency of flooding in urban streams. Peak discharge rates are often used to define flooding risk. Doll *et al.* (2000) compared 18 urban streams with 11 rural streams in the North Carolina Piedmont and found that unit area peak discharge was always greater in urban streams (Figure 8). Data from Seneca Creek, Maryland also suggest a similar increase in peak discharge. The watershed experienced significant growth during the 1950s and 1960s. Comparison of pre- and post-development gage records suggests that the peak 10-year flow event more than doubled over that time (Leopold, 1994).

Hollis (1975) reviewed numerous studies on the effects of urbanization on floods of different recurrence intervals and found that the effect of urbanization diminishes when flood recurrence gets longer (i.e., 50 and 100 years). Figure 9 shows the effect on flood magnitude in urban watersheds with 30% IC, and shows the one-year peak discharge rate increasing by a factor of 10, compared to an undeveloped watershed. In contrast, floods with a 100-year recurrence interval only double in size under the same watershed conditions.

Sauer *et al.* (1983) evaluated the magnitude of flooding in urban watersheds throughout the United States. An equation was developed for estimating discharge for floods of two-year, 10-year, and 100-year recurrence intervals. The equations used IC to account for increased runoff volume and a basin development factor to account for sewers, curbs and gutters, channel improvements and drainage development. Sauer noted that IC is not the dominant factor in determining peak discharge rates for extreme floods because these storm events saturate the soils of undeveloped watersheds and produce high peak discharge rates. Sauer found that watersheds with 50% IC can increase peak discharge for the two-year flood by a factor of four, the 10-year flood by a factor of three, and the 100-year flood by a factor of 2.5, depending on the basin development factor (Figure 10).

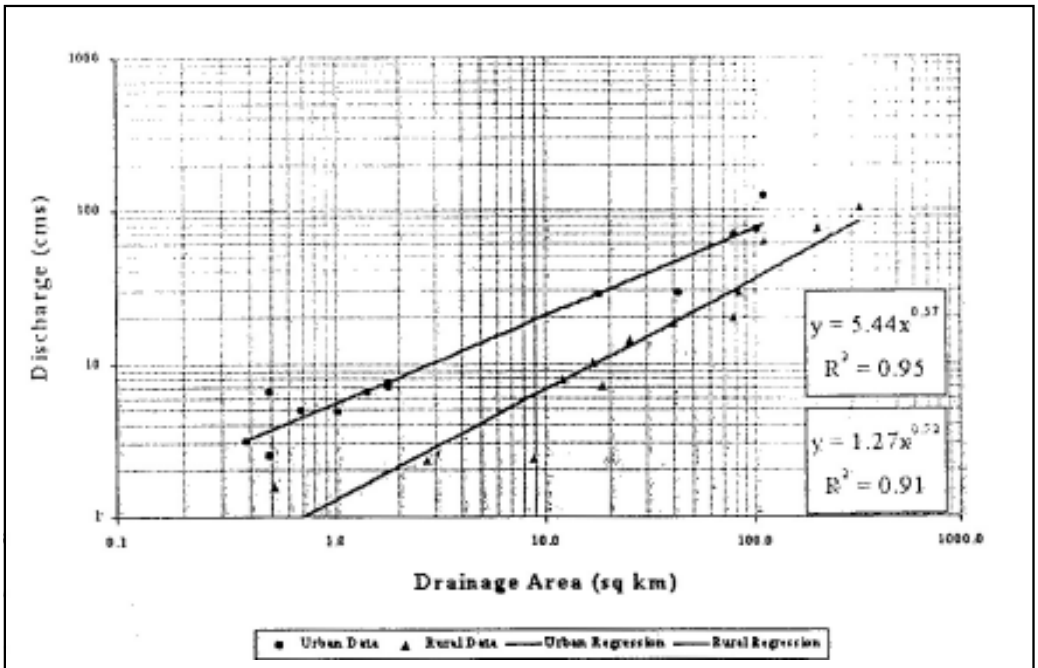

Figure 8: Peak Discharge for Urban and Rural Streams in North Carolina (Doll *et al.*, 2000)

2.4 Increased Bankfull Flow

Urbanization also increases the frequency and duration of peak discharge associated with smaller flood events (i.e., one- to two-year return storms). In terms of stream channel morphology, these more frequent bankfull flows are actually much more important than large flood events in forming the channel. In fact, Hollis (1975) demonstrated that urbanization increased the frequency and magnitude of bankfull flow events to a greater degree than the larger flood events.

An example of the increase in bankfull flow in arid regions is presented by the U.S. Geological Survey (1996), which compared the peak discharge rate from two-year storm events before and after watersheds urbanized in Parris Valley, California. Over an approximately 20-year period, watershed IC increased by 13.5%, which caused the two-year peak flow to more than double. Table 10 reviews other research studies on the relationship between watershed IC and bankfull flows in urban streams.

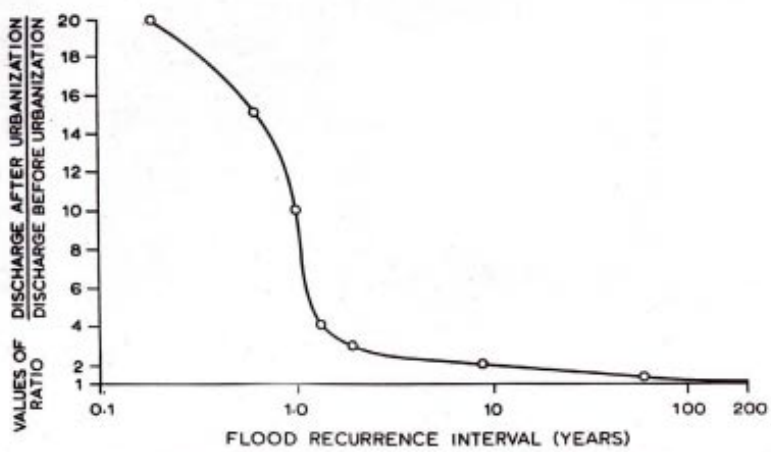

Figure 9: Effect on Flood Magnitudes of 30% Basin IC (Hollis, 1975)

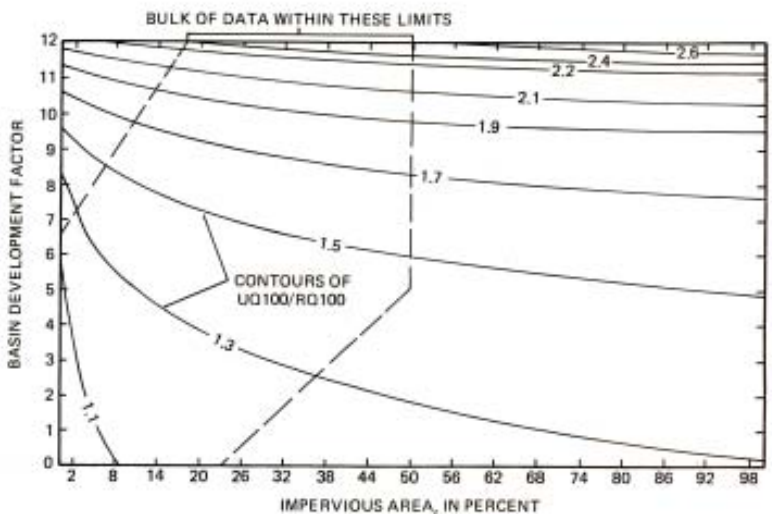

Figure 10: Relationship of Urban/Rural 100-Year Peak Flow Ratio to Basin Development Factor and IC (Sauer *et al.*, 1983)

Table 10: Research Review of Increased Bankfull Discharge in Urban Streams

Reference	Key Finding	Location
Booth and Reinelt, 1993	Using a simulation model and hydrologic data from four watersheds, it was estimated that more than 10% watershed IC may cause discharge from the two-year storm under current conditions to equal or exceed discharge from the 10-year storm under forested conditions.	WA
Fongers and Fulcher, 2001	Bankfull flow of 1200 cfs was exceeded more frequently over time with urbanization, and exceedence was three times as frequent from 1930s to 1990s.	MI
USGS, 1996	Over a 20-year period, IC increased 13.5%, and the two-year peak flow more than doubled in a semi-arid watershed.	CA
Henshaw and Booth, 2000	Two of three watersheds in the Puget Sound lowlands showed increasing flashiness over 50 years with urbanization.	WA
Leopold, 1968	Using hydrologic data from a nine-year period for North Branch Brandywine Creek, it was estimated that for a 50% IC watershed, bankfull frequency would be increased fourfold.	PA
Leopold, 1994	Bankfull frequency increased two to seven times after urbanization in Watts Branch.	MD
MacRae, 1996	For a site downstream of a stormwater pond in Markham, Ontario hours of exceedence of bankfull flows increased by 4.2 times after the watershed urbanized (34% IC)	Ontario

Leopold (1968) evaluated data from seven nationwide studies and extrapolated this data to illustrate the increase in bankfull flows due to urbanization. Figure 11 summarizes the relationship between bankfull flows over a range of watershed IC. For example, watersheds that have 20% IC increase the number of flows equal to or greater than bankfull flow by a factor of two. Leopold (1994) also observed a dramatic increase in the frequency of the bankfull event in Watts Branch, an urban subwatershed in Rockville, Maryland. This watershed experienced significant urban development during the 1950s and 1960s. Leopold compared gage records and found that the bankfull storm event frequency increased from two to seven times per year from 1958 to 1987.

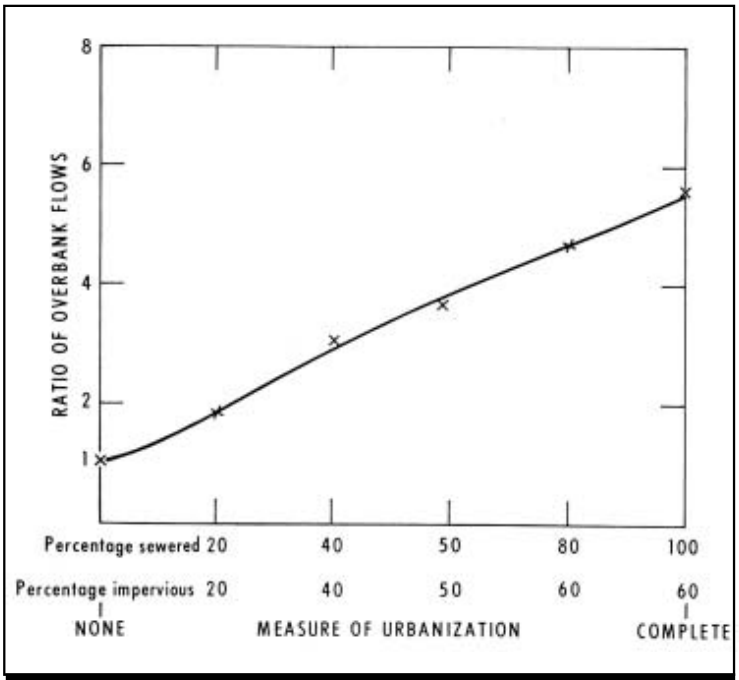

Figure 11: Increase in Bankfull Flows Due to Urbanization (Leopold, 1968)

More recent data on bankfull flow frequency was reported for the Rouge River near Detroit, Michigan by Fongers and Fulcher (2001). They noted that channel-forming flow (1200 cfs) was exceeded more frequently as urbanization increased in the watershed and had become three times more frequent between 1930 and 1990 (Figure 12).

McCuen and Moglen (1988) have documented the increase in duration of bankfull flows in response to urbanization using hydrology models. MacRae (1996), monitored a stream in Markham, Ontario downstream of a stormwater pond and found that the hours of

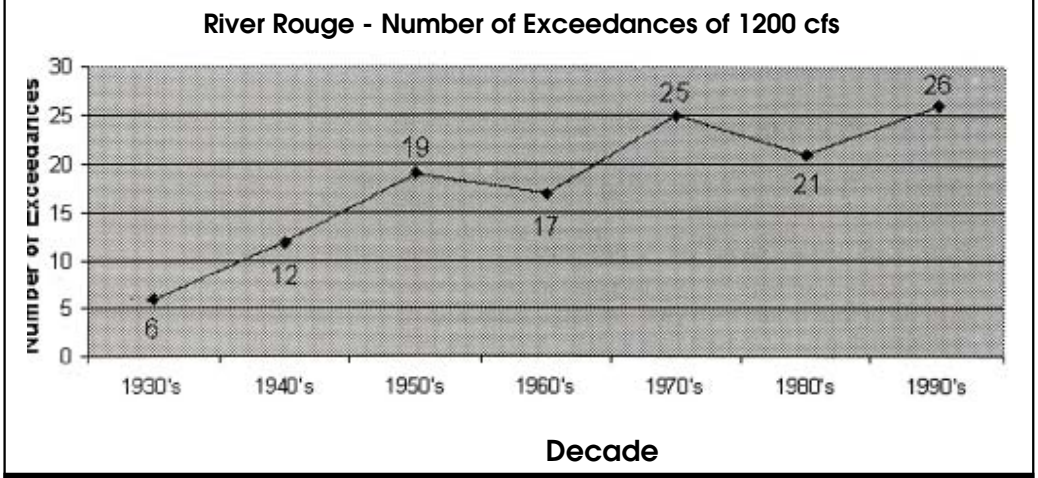

Figure 12: Increase in Number of Exceedences of Bankfull Flow Over Time With Urbanization in the Rouge River, MT (Fongers and Fulcher, 2001)

exceedence of bankfull flows increased by a factor of 4.2 once watershed IC exceeded 30%. Modeling for seven streams also downstream of stormwater ponds in Surrey, British Columbia also indicated an increase in bankfull flooding in response to watershed development (MacRae, 1996).

Watershed IC also increases the "flashiness" of stream hydrographs. Flashiness is defined here as the percent of daily flows each year that exceeds the mean annual flow. Henshaw and Booth (2000) evaluated seven urbanized watersheds in the Puget Sound lowland streams and tracked changes in flashiness over 50 years (Figure 13). The most urbanized watersheds experienced flashy discharges. Henshaw and Booth concluded that increased runoff in urban watersheds leads to higher but shorter-duration peak discharges.

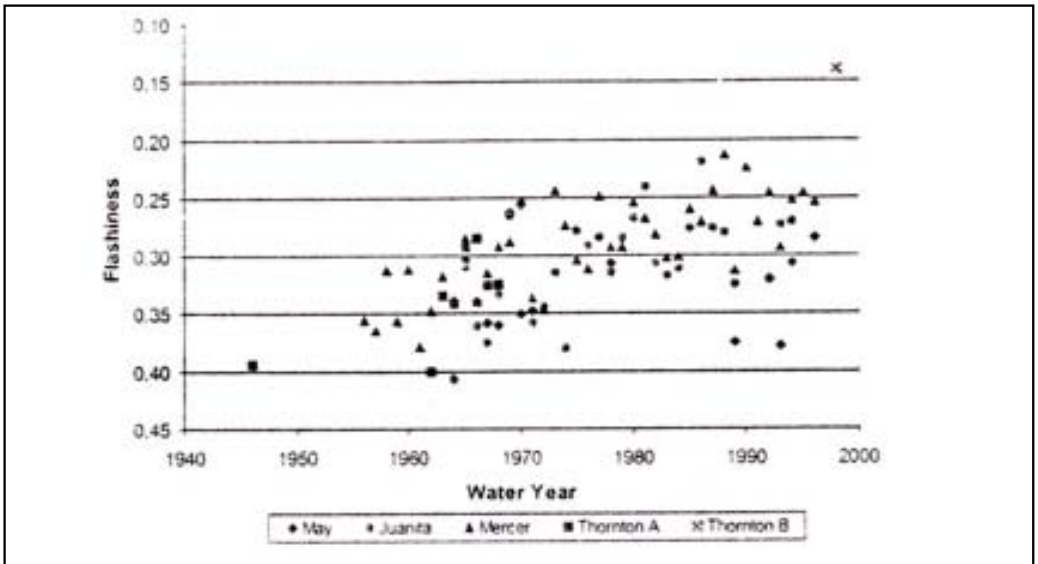

Figure 13: Percent of Gage Reading Above Mean Annual Flow for Puget Sound Lowland Streams (Henshaw and Booth, 2000)

2.5 Decreased Baseflow

As IC increases in a watershed, less groundwater infiltration is expected, which can potentially decrease stream flow during dry periods, (i.e. baseflow). Several East Coast studies provide support for a decrease in baseflow as a result of watershed development. Table 11 reviews eight research studies on baseflow in urban streams.

Klein (1979) measured baseflow in 27 small watersheds in the Maryland Piedmont and reported an inverse relationship between IC and baseflow (Figure 14). Spinello and Simmons (1992) demonstrated that baseflow in two urban Long Island streams declined seasonally as a result of urbanization (Figure 15). Saravanapavan (2002) also found that percentage of baseflow decreased in direct proportion to percent IC for 13 subwatersheds of the Shawsheen River watershed in Massachusetts (Figure 16).

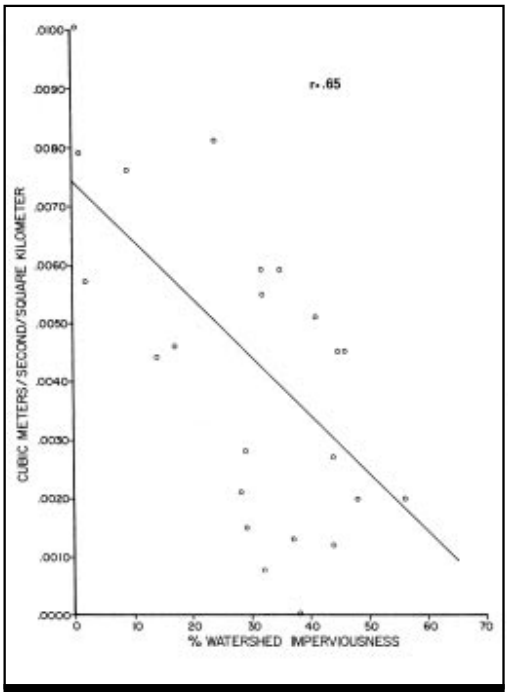

Figure 14: Relationship Between Baseflow and Watershed IC in the Streams on Maryland Piedmont (Klein, 1979)

Table 11: Research Review of Decreased Baseflow in Urban Streams

Reference	Key Finding	Location
Finkenbine *et al.*, 2000	Summer base flow was uniformly low in 11 streams when IC reached 40% or greater.	Vancouver
Klein, 1979	Baseflow decreased as IC increased in Piedmont streams.	MD
Saravanapavan, 2002	Percentage of baseflow decreased linearly as IC increased for 13 subwatersheds of Shawsheen River watershed.	MA
Simmons and Reynolds, 1982	Dry weather flow dropped 20 to 85% after development in several urban watersheds on Long Island.	NY
Spinello and Simmons, 1992	Baseflow in two Long Island streams went dry as a result of urbanization.	NY
Konrad and Booth, 2002	No discernable trend over many decades in the annual seven day low flow discharge for 11 Washington streams.	WA
Wang *et al.*, 2001	Stream baseflow was negatively correlated with watershed IC in 47 small streams, with an apparent breakpoint at 8 to 12% IC.	WI
Evett *et al.*, 1994	No clear relationship between dry weather flow and urban and rural streams in 21 larger watersheds.	NC

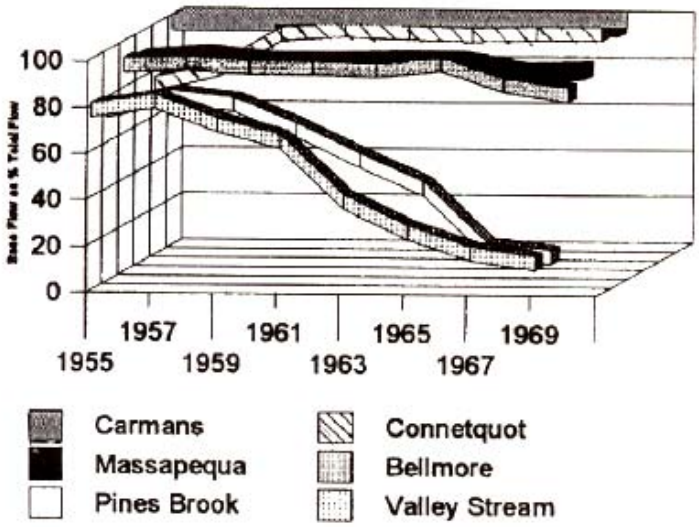

Notes:

Carmans and Connetquot: Rural/suburban, watersheds are unsewered

Bellmore and Massapequa: Moderately urbanized, not sewered until 1989

Valley Stream and Pine Brook: Urbanized and densely populated watersheds, sewer systems completed in 1960s

1953-1964: Period of sanitary sewer construction in eastern Nassau County

1962-1966: Drought years

Figure 15: Baseflow Response to Urbanization in Long Island Streams (Spinello and Simmons, 1992)

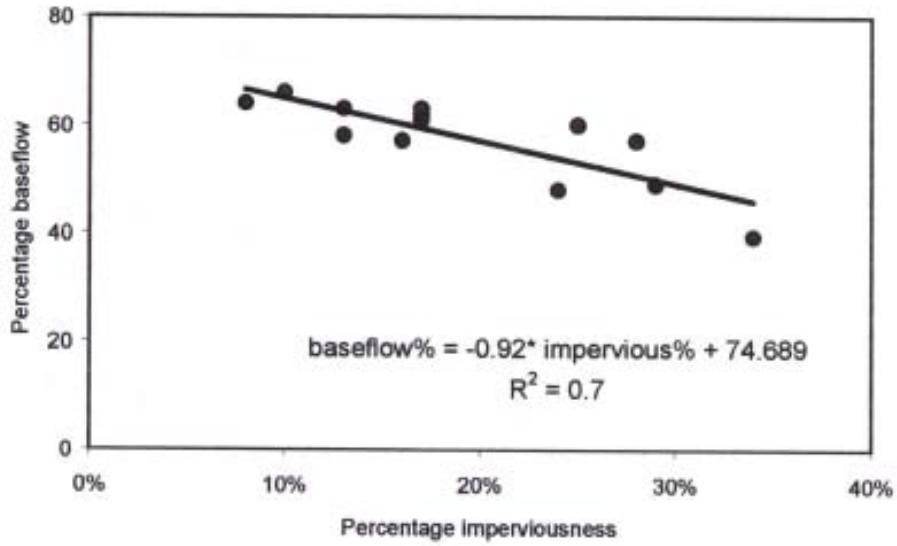

Figure 16: Relationship Between Percentage Baseflow and Percent IC in Massachusetts Streams (Saravanapan, 2002)

Finkebine *et al.* (2000) monitored summer baseflow in 11 streams near Vancouver, British Columbia and found that stream base flow was uniformly low due to decreased groundwater recharge in watersheds with more than 40% IC (Figure 17). Baseflow velocity also consistently decreased when IC increased (Figure 18). The study cautioned that other factors can affect stream baseflow, such as watershed geology and age of development.

Other studies, however, have not been able to establish a relationship between IC and declining baseflow. For example, a study in North Carolina could not conclusively determine that urbanization reduced baseflow in larger urban and suburban watersheds in that area (Evett *et al.*, 1994). In some cases, stream baseflow is supported by deeper aquifers or originate in areas outside the surface watershed boundary. In others, baseflow is augmented by leaking sewers, water pipes and irrigation return flows.

This appears to be particularly true in arid and semi-arid areas, where baseflow can actually increase in response to greater IC (Hollis, 1975). For instance, Crippen and Waananen (1969) found that Sharon Creek near San Francisco changed from an ephemeral stream into a perennial stream after urban development. Increased infiltration from lawn watering and return flow from sewage treatment plants are two common sources of augmented baseflows in these regions (Caraco, 2000a).

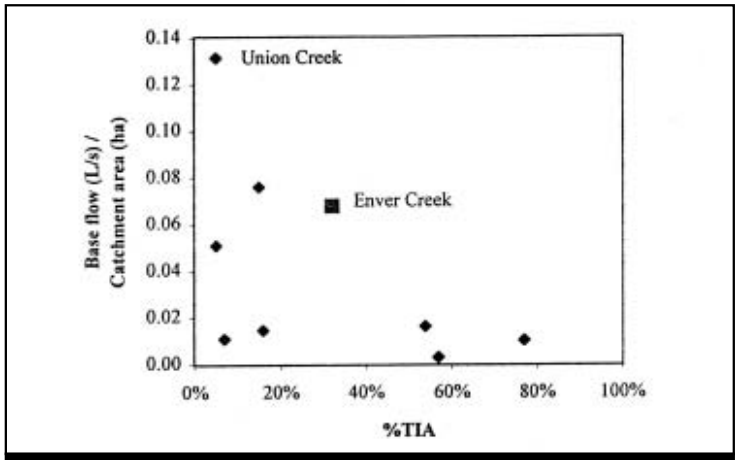

Figure 17: Effect of IC on Summer Baseflow in Vancouver Streams (Finkerbine *et al.*, 2000)

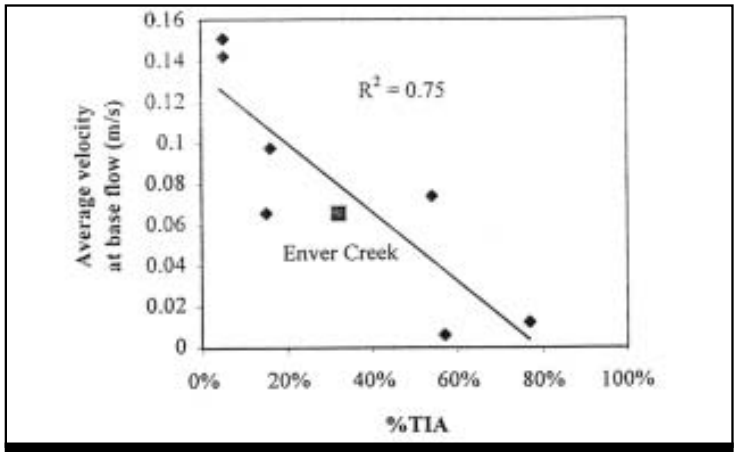

Figure 18: Effect of Watershed IC on Summer Stream Velocity in Vancouver Streams (Finkerbine *et al.*, 2000)

2.6 Conclusions

The changes in hydrology indicators caused by watershed urbanization include increased runoff volume; increased peak discharge; increased magnitude, frequency and duration of bankfull flows; flashier/less predictable flows; and decreased baseflow. Many studies support the direct relationship between IC and these indicators. However, at low levels of watershed IC, site-specific factors such as slope, soils, types of conveyance systems, age of development, and watershed dimensions often play a stronger role in determining a watershed's hydrologic response.

Overall, the following conclusions can be drawn from the relationship between watershed IC and hydrology indicators:

- Strong evidence exists for the direct relationship between watershed IC and increased stormwater runoff volume and peak discharge. These relationships are considered so strong that they have been incorporated into widely accepted engineering models.
- The relationship between IC and bankfull flow frequency has not been extensively documented, although abundant data exists for differences between urban and non-urban watersheds.
- The relationship between IC and declining stream flow is more ambiguous and appears to vary regionally in response to climate and geologic factors, as well as water and sewer infrastructure.

The changes in hydrology indicators caused by watershed urbanization directly influence physical and habitat characteristics of streams. The next chapter reviews how urban streams physically respond to the major changes to their hydrology.

Chapter 3: Physical Impacts of Impervious Cover

A growing body of scientific literature documents the physical changes that occur in streams undergoing watershed urbanization. This chapter discusses the impact of watershed development on various measures of physical habitat in urban stream channels and is organized as follows:

3.1 Difficulty in Measuring Habitat
3.2 Changes in Channel Geometry
3.3 Effect on Composite Indexes of Stream Habitat
3.4 Effect on Individual Elements of Stream Habitat
3.5 Increased Stream Warming
3.6 Alteration of Stream Channel Network
3.7 Conclusion

This chapter reviews the available evidence on stream habitat. We begin by looking at geomorphological research that has examined how the geometry of streams changes in response to altered urban hydrology. The typical response is an enlargement of the cross-sectional area of the stream channel through a process of channel incision, widening, or a combination of both. This process triggers an increase in bank and/or bed erosion that increases sediment transport from the stream, possibly for several decades or more.

Next, we examine the handful of studies that have evaluated the relationship between watershed development and composite indicators of stream habitat (such as the habitat Rapid Bioassessment Protocol, or RBP). In the fourth section, we examine the dozen studies that have evaluated how individual habitat elements respond to watershed development. These studies show a consistent picture. Generally, streams with low levels of IC have stable banks, contain considerable large woody debris (LWD) and possess complex habitat structure. As watershed IC increases, however, urban streambanks become increasingly unstable, streams lose LWD, and they develop a more simple and uniform habitat structure. This is typified by reduced pool depths, loss of pool and riffle sequences, reduced channel roughness and less channel sinuosity.

Water temperature is often regarded as a key habitat element, and the fifth section describes the stream warming effect observed in urban streams in six studies. The last section looks at the effect of watershed development on the stream channel network as a whole, in regard to headwater stream loss and the creation of fish barriers.

3.1 Difficulty in Measuring Habitat

The physical transformation of urban streams is perhaps the most conspicuous impact of watershed development. These dramatic physical changes are easily documented in sequences of stream photos with progressively greater watershed IC (see Figure 19). Indeed, the network of headwater stream channels generally disappears when watershed IC exceeds 60% (CWP).

3.1.1 The Habitat Problem

It is interesting to note that while the physical impacts of urbanization on streams are widely accepted, they have rarely been documented by the research community. As a consequence, no predictive models exist to quantify how physical indicators of stream habitat will decline in response to watershed IC, despite the fact that most would agree that some kind of decline is expected (see Table 12).

Figure 19: Urban Stream Channels with Progressively Greater IC

The main reason for this gap is that "habitat" is extremely hard to define, and even more difficult to measure in the field. Most indices of physical habitat involve a visual and qualitative assessment of 10 or more individual habitat elements that are perceived by fishery and stream biologists to contribute to quality stream habitat. Since these indices include many different habitat elements, each of which is given equal weight, they have not been very useful in discriminating watershed effects (Wang *et al.*, 2001).

Researchers have had greater success in relating individual habitat elements to watershed conditions, such as large woody debris (LWD), embeddedness, or bank stability. Even so, direct testing has been limited, partly because individual habitat elements are hard to measure and are notoriously variable in both space and time. Consider bank stability for a moment. It would be quite surprising to see a highly urban stream that did not have unstable banks. Yet, the hard question is exactly how would bank instability be quantitatively measured? Where would it be measured — at a point, a cross-section, along a reach, on the left bank or the right?

Geomorphologists stress that no two stream reaches are exactly alike, due to differences in gradient, bed material, sediment transport, hydrology, watershed history and many other factors. Consequently, it is difficult to make controlled comparisons among different streams. Indeed, geomorphic theory stresses that individual stream reaches respond in a highly dynamic way to changes in watershed hydrology and sediment transport, and can take several decades to fully adjust to a new equilibrium.

Table 12: Physical Impacts of Urbanization on Streams

Specific Impacts
Sediment transport modified Channel enlargement Channel incision Stream embeddedness Loss of large woody debris Changes in pool/riffle structure Loss of riparian cover Reduced channel sinuosity Warmer in-stream temperatures Loss of cold water species and diversity Channel hardening Fish blockages Loss of 1st and 2nd order streams through storm drain enclosure

Returning to our example of defining bank stability, how might our measure of bank instability change over time as its watershed gradually urbanizes, is built out, and possibly reaches a new equilibrium over several decades? It is not very surprising that the effect of watershed development on stream habitat is widely observed, yet rarely measured.

3.2 Changes in Stream Geometry

As noted in the last chapter, urbanization causes an increase in the frequency and duration of bankfull and sub-bankfull flow events in streams. These flow events perform more "effective work" on the stream channel, as defined by Leopold (1994). The net effect is that an urban stream channel is exposed to more shear stress above the critical threshold needed to move bank and bed sediments (Figure 20). This usually triggers a cycle of active bank erosion and greater sediment transport in urban streams. As a consequence, the stream channel adjusts by expanding its cross-sectional area, in order to effectively accommodate greater flows and sediment supply. The stream channel can expand by incision, widening, or both. Incision refers to stream down-cutting through the streambed, whereas widening refers to lateral erosion of the stream bank and its flood plain (Allen and Narramore, 1985; Booth, 1990; Morisawa and LaFlure, 1979).

3.2.1 Channel Enlargement

A handful of research studies have specifically examined the relationship between watershed development and stream channel enlargement (Table 13). These studies indicate that stream cross-sectional areas can enlarge by as much as two to eight times in response to urbanization, although the process is complex and may take several decades to complete (Pizzuto *et al.*, 2000; Caraco, 2000b; Hammer, 1972). An example of channel enlargement is provided in Figure 21, which shows how a stream cross-section in Watts Branch near Rockville, Maryland has expanded in response to nearly five decades of urbanization (i.e., watershed IC increased from two to 27%).

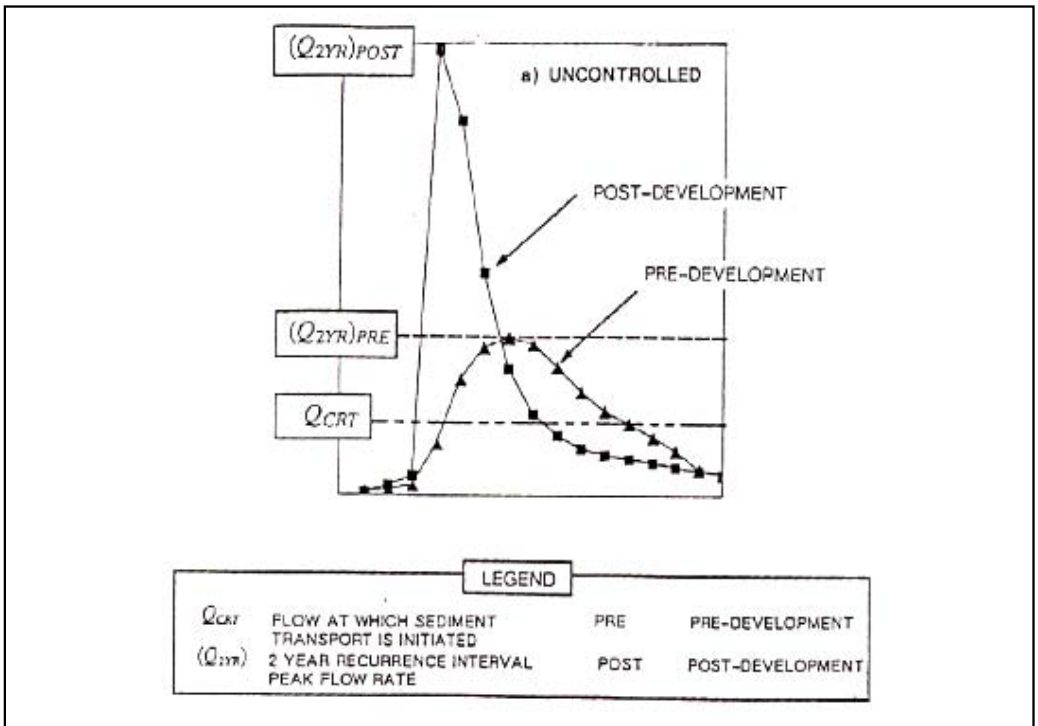

Figure 20: Increased Shear Stress from a Hydrograph (MacRae and Rowney, 1992)

Table 13: Research Review of Channel Enlargement and Sediment Transport in Urban Streams		
Reference	**Key Finding**	**Location**
% IC used as Indicator		
Caraco, 2000b	Reported enlargement in ratios of 1.5 to 2.2 for 10 stream reaches in Watts Branch and computed ultimate enlargement ratios of 2.0	MD
MacCrae and De Andrea, 1999	Introduced the concept of ultimate channel enlargement based on watershed IC and channel characteristics.	Ontario, TX
Morse, 2001	Demonstrated increased erosion rates with increases in IC (channels were generally of the same geomorphic type).	ME
Urbanization Used as Indicator		
Allen and Narramore, 1985	Enlargement ratios in two urban streams ranged from 1.7 to 2.4.	TX
Bledsoe, 2001	Reported that channel response to urbanization depends on other factors in addition to watershed IC including geology, vegetation, sediment and flow regimes.	N/A
Booth and Henshaw, 2001	Evaluated channel cross section erosion rates and determined that these rates vary based on additional factors including the underlying geology, age of development and gradient.	WA
Hammer, 1972	Enlargement ratios ranged from 0.7 to 3.8 in urban watersheds.	PA
Neller, 1989	Enlargement ratios in small urban catchments ranged from two to 7.19, the higher enlargement ratios were primarily from incision occurring in small channels.	Australia
Pizzuto *et al.*, 2000	Evaluated channel characteristics of paired urban and rural streams and demonstrated median bankfull cross sectional increase of 180%. Median values for channel sinuosity were 8% lower in urban streams; Mannings N values were found to be 10% lower in urban streams.	PA
Hession *et al.*, *in press*	Bankfull widths for urban streams were significantly wider than non-urban streams in 26 paired streams. Forested reaches were consistently wider than non-forested reaches in urban streams.	MD, DE, PA
Dartiguenave *et al.*, 1997	Bank erosion accounted for up to 75% of the sediment transport in urban watersheds.	TX
Trimble, 1997	Demonstrated channel enlargement over time in an urbanizing San Diego Creek; Bank erosion accounted for over 66% of the sediment transport.	CA

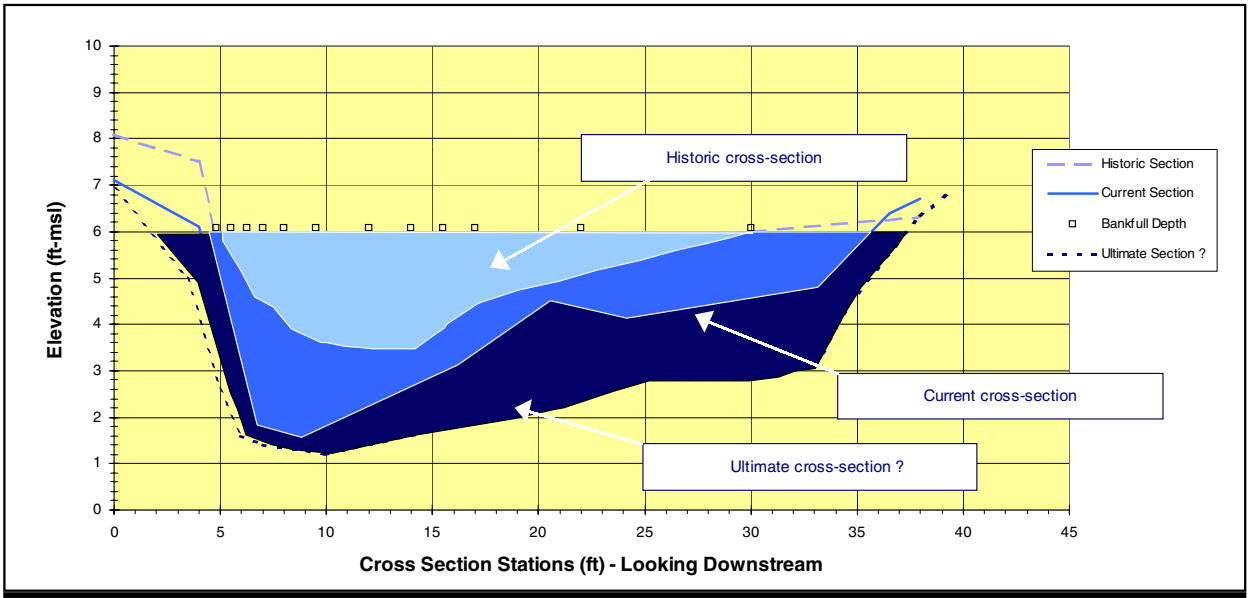

Figure 21: Stream Channel Enlargement in Watts Branch, MD 1950-2000 (Caraco, 2000b)

Some geomorphologists suggest that urban stream channels will reach an "ultimate enlargement" relative to pre-developed channels (MacRae and DeAndrea, 1999) and that this can be predicted based on watershed IC, age of development, and the resistance of the channel bed and banks. A relationship between ultimate stream channel enlargement and watershed IC has been developed for alluvial streams in Texas, Vermont and Maryland (Figure 22). Other geomorphologists such as Bledsoe (2001) and Booth and Henshaw (2001) contend that channel response to urbanization is more complex, and also depends on geology, grade control, stream gradient and other factors.

Channel incision is often limited by grade control caused by bedrock, cobbles, armored substrates, bridges, culverts and pipelines. These features can impede the downward erosion of the stream channel and thereby limit the incision process. Stream incision can become severe in streams that have softer substrates such as sand, gravel and clay (Booth, 1990). For example, Allen and Narramore (1985) showed that channel enlargement in chalk channels was 12 to 67% greater than in shale channels near Dallas, Texas. They attributed the differences to the softer substrate, greater velocities and higher shear stress in the chalk channels.

Neller (1989) and Booth and Henshaw (2001) also report that incised urban stream channels possess cross-sectional areas that are larger than would be predicted based on watershed area or discharge alone. This is due to the fact that larger floods are often contained within the stream channel rather than the floodplain. Thus, incised channels often result in greater erosion and geomorphic change. In general, stream conditions that can foster incision include erodible substrates, moderate to high stream gradients, and an absence of grade control features.

Channel widening occurs more frequently when streams have grade control and the stream has cut into its bank, thereby expanding its cross-sectional area. Urban stream channels often have artificial grade controls caused by frequent culverts and road crossings. These grade controls often cause localized sediment deposition that can reduce the capacity of culverts and bridge crossings to pass flood waters.

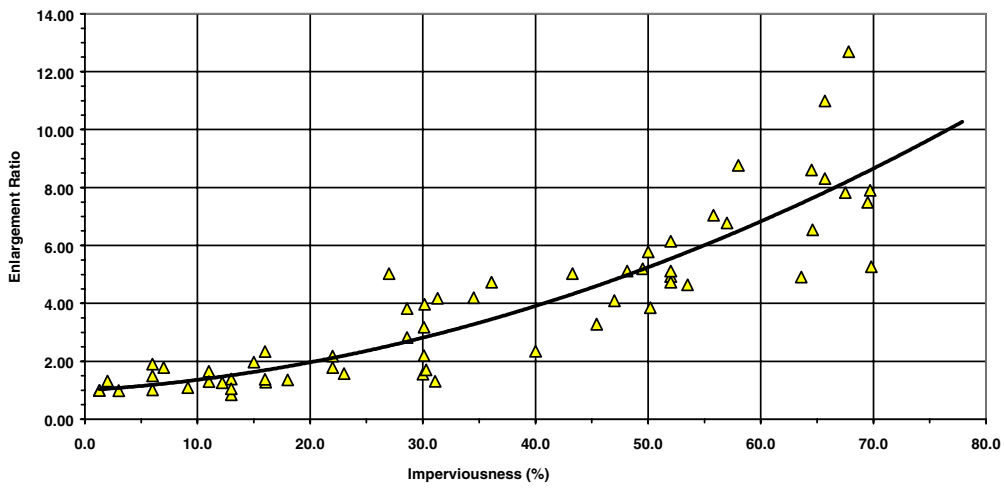

Figure 22: Ultimate Channel Enlargement in MD, UT and TX Alluvial Streams (MacRae and DeAndrea, 1999 and CWP, 2001b)

The loss of flood plain and riparian vegetation has been strongly associated with watershed urbanization (May *et al.*, 1997). A few studies have shown that the loss of riparian trees can result in increased erosion and channel migration rates (Beeson and Doyle, 1995 and Allmendinger *et al.*, 1999). For example, Beeson and Doyle (1995) found that meander bends with vegetation were five times less likely to experience significant erosion from a major flood than non-vegetated meander bends.Hession *et al.* (in press) observed that forested reaches consistently had greater bankfull widths than non-forested reaches in a series of urban streams in Pennsylvania, Maryland and Delaware.

3.2.2 Effect of Channel Enlargement on Sediment Yield

Regardless of whether a stream incises, widens, or does both, it will greatly increase sediment transport from the watershed due to erosion. Urban stream research conducted in California and Texas suggests that 60 to 75% of the sediment yield of urban watersheds can be derived from channel erosion (Trimble, 1997 and Dartingunave *et al.*, 1997) This can be compared to estimates for rural streams where channel erosion accounts for only five to 20% of the annual sediment yield (Collins *et al.*, 1997 and Walling and Woodward, 1995).

Some geomorphologists speculate that urban stream channels will ultimately adjust to their post-development flow regime and sediment supply. Finkenbine *et al.* (2000) observed these conditions in Vancouver streams, where study streams eventually stabilized two decades after the watersheds were fully developed. In older urban streams, reduced sediment transport can be expected when urbanization has been completed. At this point, headwater stream channels are replaced by storm drains and pipes, which can transport less sediment. The lack of available sediment may cause downstream channel erosion, due to the diminished sediment supply found in the stream.

3.3 Effect on Composite Measures of Stream Habitat

Composite measures of stream habitat refer to assessments such as EPA's Habitat Rapid Bioassessment Protocol (RBP) that combine multiple habitat elements into a single score or index (Barbour *et al*., 1999). For example, the RBP requires visual assessment of 10 stream habitat elements, including embeddedness, epifaunal substrate quality, velocity/depth regime, sediment deposition, channel flow status, riffle frequency, bank stabilization, streambank vegetation and riparian vegetation width. Each habitat element is qualitatively scored on a 20 point scale, and each element is weighted equally to derive a composite score for the stream reach.

To date, several studies have found a relationship between declining composite habitat indicator scores and increasing watershed IC in different eco-regions of the United States. A typical pattern in the composite habitat scores is provided for headwater streams in Maine (Morse, 2001; Figure 23). This general finding has been reported in the mid-Atlantic, Northeast and the Northwest (Black and Veatch, 1994; Booth and Jackson, 1997; Hicks and Larson, 1997; Maxted and Shaver, 1997; Morse, 2001; Stranko and Rodney, 2001).

However, other researchers have found a much weaker relationship between composite habitat scores and watershed IC. Wang and his colleagues (2001) found that composite habitat scores were not correlated with watershed IC in Wisconsin streams, although it was correlated with individual habitat elements, such as streambank erosion. They noted that many agricultural and rural streams had fair to poor composite habitat scores, due to poor riparian management and sediment deposition. The same basic conclusion was also reported for streams of the Maryland Piedmont (MNCPPC, 2000).

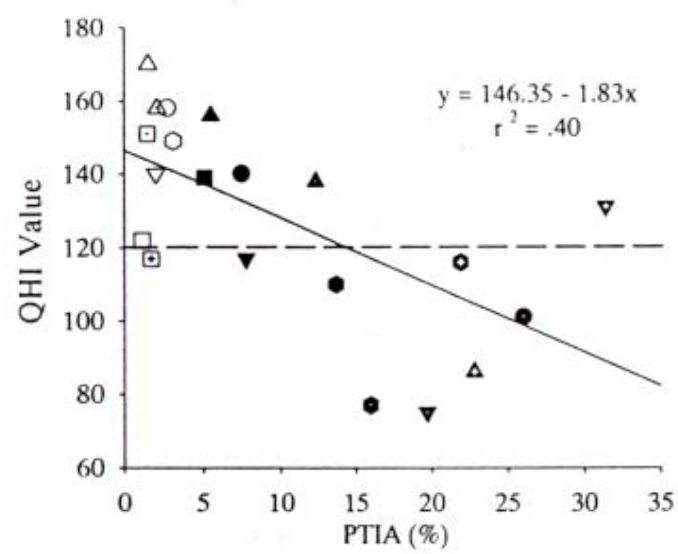

Figure 23: Relationship Between Habitat Quality and IC in Maine Streams (Morse, 2001)

3.4 Effect on Individual Elements of Stream Habitat

Roughly a dozen studies have examined the effect of watershed development on the degradation of individual stream habitat features such as bank stability, embeddedness, riffle/pool quality, and loss of LWD (Table 14). Much of this data has been acquired from the Pacific Northwest, where the importance of such habitat for migrating salmon has been a persistent management concern.

3.4.1 Bank Erosion and Bank Stability

It is somewhat surprising that we could only find one study that related bank stability or bank erosion to watershed IC. Conducted by Booth (1991) in the streams of the Puget Sound lowlands, the study reported that stream banks were consistently rated as stable in watersheds with less than 10% IC, but became progressively more unstable above this threshold. Dozens of stream assessments have found high rates of bank erosion in urban streams, but none, to our knowledge, has systematically related the prevalence or severity of bank erosion to watershed IC. As noted earlier, this may reflect the lack of a universally recognized method to measure comparative bank erosion in the field.

3.4.2 Embeddedness

Embeddedness is a term that describes the extent to which the rock surfaces found on the stream bottom are filled in with sand, silts and clay. In a healthy stream, the interstitial pores between cobbles, rock and gravel generally lack fine sediments, and are an active habitat zone and detrital processing area. The increased sediment transport in urban streams can rapidly fill up these pores in a process known as embedding. Normally, embeddedness is visually measured in riffle zones of streams. Riffles tend to be an important habitat for aquatic insects and fish (such as darters and sculpins). Clean stream substrates are also critical to trout and salmon egg incubation and embryo development. May *et al.* (1997) demonstrated that the percent of fine sediment particles in riffles generally increased with watershed IC (Figure 24). However, Finkenbine *et al.* (2000) reported that embeddedness eventually decreased slightly after watershed land use and sediment transport had stabilized for 20 years.

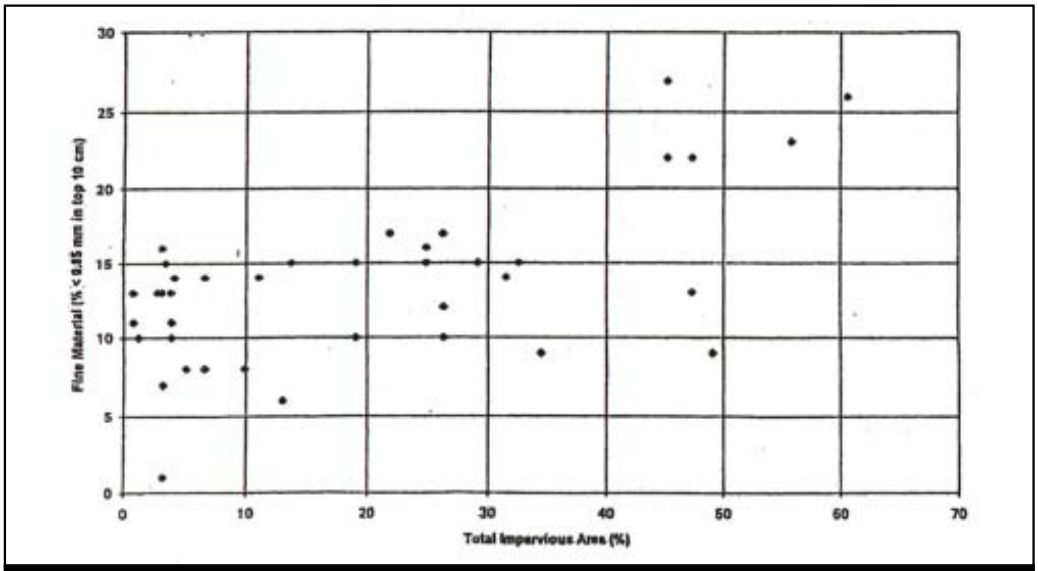

Figure 24: Fine Material Sediment Deposition as a Function of IC in Pacific Northwest Streams (Horner *et al.*, 1997)

Table 14: Research Review of Changes in Urban Stream Habitat		
Reference	**Key Finding**	**Location**
% IC Used as Indicator		
Black & Veatch, 1994	Habitat scores were ranked as poor in five subwatersheds that had greater than 30% IC.	MD
Booth and Jackson, 1997	Increase in degraded habitat conditions with increases in watershed IC.	WA
Hicks and Larson, 1997	Reported a reduction in composite stream habitat indices with increasing watershed IC.	MA
May *et al.*, 1997	Composite stream habitat declined most rapidly during the initial phase of the watershed urbanization, when percent IC exceeded the 5-10% range.	WA
Stranko and Rodney, 2001	Composite index of stream habitat declined with increasing watershed IC in coastal plain streams.	MD
Wang *et al.*, 2001	Composite stream habitat scores were not correlated with watershed IC in 47 small watersheds, although channel erosion was. Non-urban watersheds were highly agricultural and often lacked riparian forest buffers.	WI
MNCPPC, 2000	Reported that stream habitat scores were not correlated with IC in suburban watersheds.	MD
Morse, 2001	Composite habitat values tended to decline with increases in watershed IC.	ME
Booth, 1991	Channel stability and fish habitat quality declined rapidly after 10% watershed IC.	WA
Booth *et al.*, 1997	Decreased LWD with increased IC.	PNW
Finkenbine *et al.*, 2000	LWD was scarce in streams with greater than 20% IC in Vancouver.	B.C.
Horner & May, 1999	When IC levels were >5%, average LWD densities fell below 300 pieces/kilometer.	PNW
Horner *et al.*, 1997	Interstitial spaces in streambed sediments begin to fill with increasing watershed IC.	PNW
Urbanization Used as Indicator		
Dunne and Leopold, 1978	Natural channels replaced by storm drains and pipes; increased erosion rates observed downstream.	MD
May *et al.*, 1997	Forested riparian corridor width declines with increased watershed IC.	PNW
MWCOG, 1992	Fish blockages caused by bridges and culverts noted in urban watersheds.	D.C.
Pizzuto *et al.*, 2000	Urban streams had reduced pool depth, roughness, and sinuosity, compared to rural streams; Pools were 31% shallower in urban streams compared to non-urban ones.	PA
Richey, 1982	Altered pool/riffle sequence observed in urban streams.	WA
Scott *et al.*, 1986	Loss of habitat diversity noted in urban watersheds.	PNW
Spence *et al.*, 1996	Large woody debris is important for habitat diversity and anadromous fish.	PNW

3.4.3 Large Woody Debris (LWD)

LWD is a habitat element that describes the approximate volume of large woody material (< four inches in diameter) found in contact with the stream. The presence and stability of LWD is an important habitat parameter in streams. LWD can form dams and pools, trap sediment and detritus, stabilize stream channels, dissipate flow energy, and promote habitat complexity (Booth *et al.,* 1997). LWD creates a variety of pool features (plunge, lateral, scour and backwater); short riffles; undercut banks; side channels; and a range of water depths (Spence *et al.*, 1996). Urban streams tend to have a low supply of LWD, as increased stormwater flows transport LWD and clears riparian areas. Horner *et al.* (1997) presents evidence from Pacific Northwest streams that LWD decreases in response to increasing watershed IC (Figure 25).

3.4.4 Changes in Other Individual Stream Parameters

One of the notable changes in urban stream habitat is a decrease in pool depth and a general simplification of habitat features such as pools, riffles and runs. For example, Richey (1982) and Scott *et al.* (1986) reported an increase in the prevalence of glides and a corresponding altered riffle/pool sequence due to urbanization. Pizzuto *et al.* (2000) reported a median 31% decrease in pool depth in urban streams when compared to forested streams. Pizzuto *et al.* also reported a modest decrease in channel sinuosity and channel roughness in the same urban streams in Pennsylvania.

Several individual stream habitat parameters appear to have received no attention in urban stream research to date. These parameters include riparian shading, wetted perimeter, various measures of velocity/depth regimes, riffle frequency, and sediment deposition in pools. More systematic monitoring of these individual stream habitat parameters may be warranted.

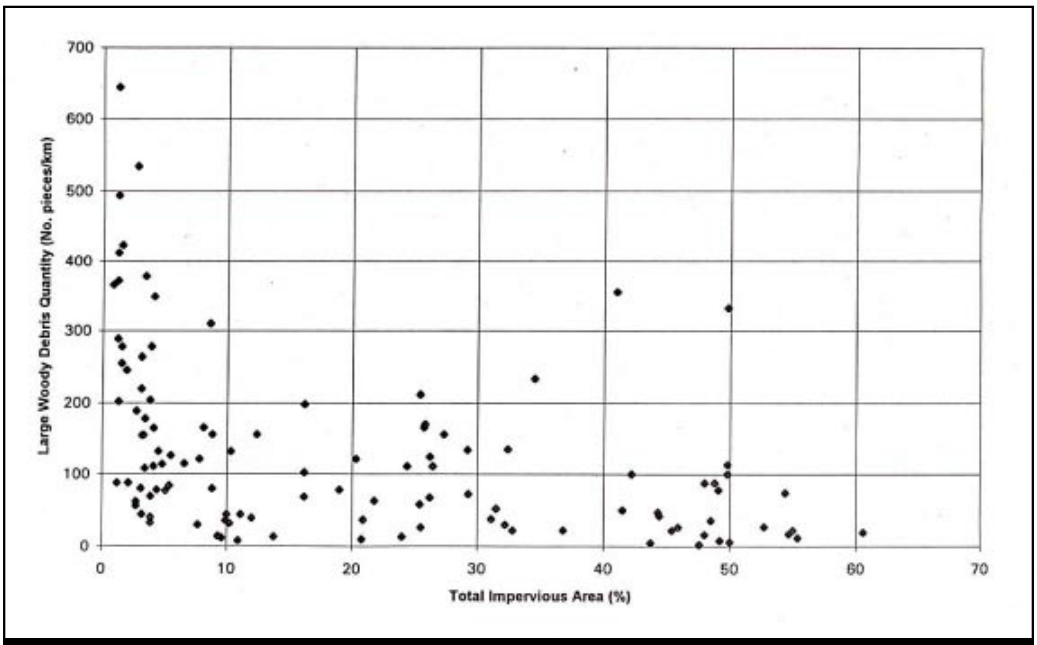

Figure 25: LWD as a Function of IC in Puget Sound Streams (Horner *et al.*, 1997)

3.5 Increased Stream Warming

IC directly influences our local weather in urban areas. This effect is obvious to anyone walking across a parking lot on a hot summer day, when temperatures often reach a scorching 110 to 120 degrees F. Parking lots and other hard surfaces tend to absorb solar energy and release it slowly. Furthermore, they lack the normal cooling properties of trees and vegetation, which act as natural air conditioners. Finally, urban areas release excess heat as a result of the combustion of fossil fuels for heating, cooling and transportation. As a result, highly urban areas tend to be much warmer than their rural counterparts and are known as urban heat islands. Researchers have found that summer temperatures tend to be six to eight degrees F warmer in the summer and two to four degrees F warmer during the winter months.

Water temperature in headwater streams is strongly influenced by local air temperatures. Summer temperatures in urban streams have been shown to increase by as much as five to 12 degrees F in response to watershed development (Table 15). Increased water temperatures can preclude temperature-sensitive species from being able to survive in urban streams. Figure 26 shows the stream warming phenomenon in small headwater streams in the Maryland Piedmont.

Galli (1990) reported that stream temperatures throughout the summer increased in urban watersheds. He monitored five headwater streams in the Maryland Piedmont with different levels of IC. Each urban stream had mean temperatures that were consistently warmer than a forested reference stream, and stream warming appeared to be a direct function of watershed IC. Other factors, such as lack of riparian cover and the presence of ponds, were also demonstrated to amplify stream warming, but the primary contributing factor appeared to be watershed IC.

Johnson (1995) studied how stormwater influenced an urban trout stream in Minnesota and reported up to a 10 degree F increase in stream water temperatures after summer storm events. Paul *et al.* (2001) evaluated stream temperatures for 30 subwatersheds to the Etowah River in Georgia, which ranged from five to 61% urban land. They found a correlation between summer daily mean water temperatures and the percentage of urban land in a subwatershed.

Table 15: Research Review of Thermal Impacts in Urban Streams

Reference	Key Finding	Location
%IC Used as Indicator		
Galli, 1990	Increase in stream temperatures of five to 12 degrees Fahrenheit in urban watersheds; stream warming linked to IC.	MD
Urbanization Used as Indicator		
Johnson, 1995	Up to 10 degrees Fahrenheit increases in stream temperatures after summer storm events in an urban area	MN
LeBlanc *et al.*, 1997	Calibrated a model predicting stream temperature increase as a result of urbanization	Ontario
MCDEP, 2000	Monitoring effect of urbanization and stormwater ponds on stream temperatures revealed stream warming associated with urbanization and stormwater ponds	MD
Paul *et al.*, 2001	Daily mean stream temperatures in summer increased with urban land use	GA

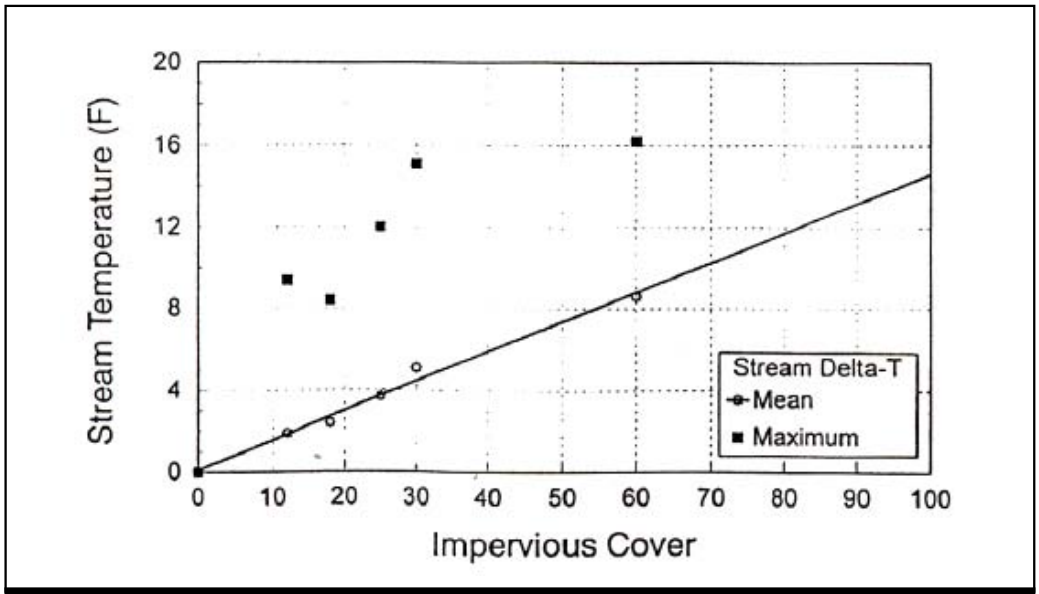

Figure 26: Stream Temperature Increase in Response to IC in Maryland Piedmont Streams (Galli, 1990)

Discharges from stormwater ponds can also contribute to stream warming in urban watersheds. Three studies highlight the temperature increase that can result from stormwater ponds. A study in Ontario found that baseflow temperatures below wet stormwater ponds increased by nine to 18 degrees F in the summer (SWAMP, 2000a, b). Oberts (1997) also measured change in the baseflow temperature as it flowed through a wetland/wet pond system in Minnesota. He concluded that the temperature had increased by an average of nine degrees F during the summer months. Galli (1988) also observed a mean increase of two to 10 degrees F in four stormwater ponds located in Maryland.

3.6 Alteration of Stream Channel Networks

Urban stream channels are often severely altered by man. Channels are lined with rip rap or concrete, natural channels are straightened, and first order and ephemeral streams are enclosed in storm drain pipes. From an engineering standpoint, these modifications rapidly convey flood waters downstream and locally stabilize stream banks. Cumulatively, however, these modifications can have a dramatic effect on the length and habitat quality of headwater stream networks.

3.6.1 Channel Modification

Over time, watershed development can alter or eliminate a significant percentage of the perennial stream network. In general, the loss of stream network becomes quite extensive when watershed IC exceeds 50%. This loss is striking when pre- and post-development stream networks are compared (Figure 27). The first panel illustrates the loss of stream network over time in a highly urban Northern Virginia watershed; the second panel shows how the drainage network of Rock Creek has changed in response to watershed development.

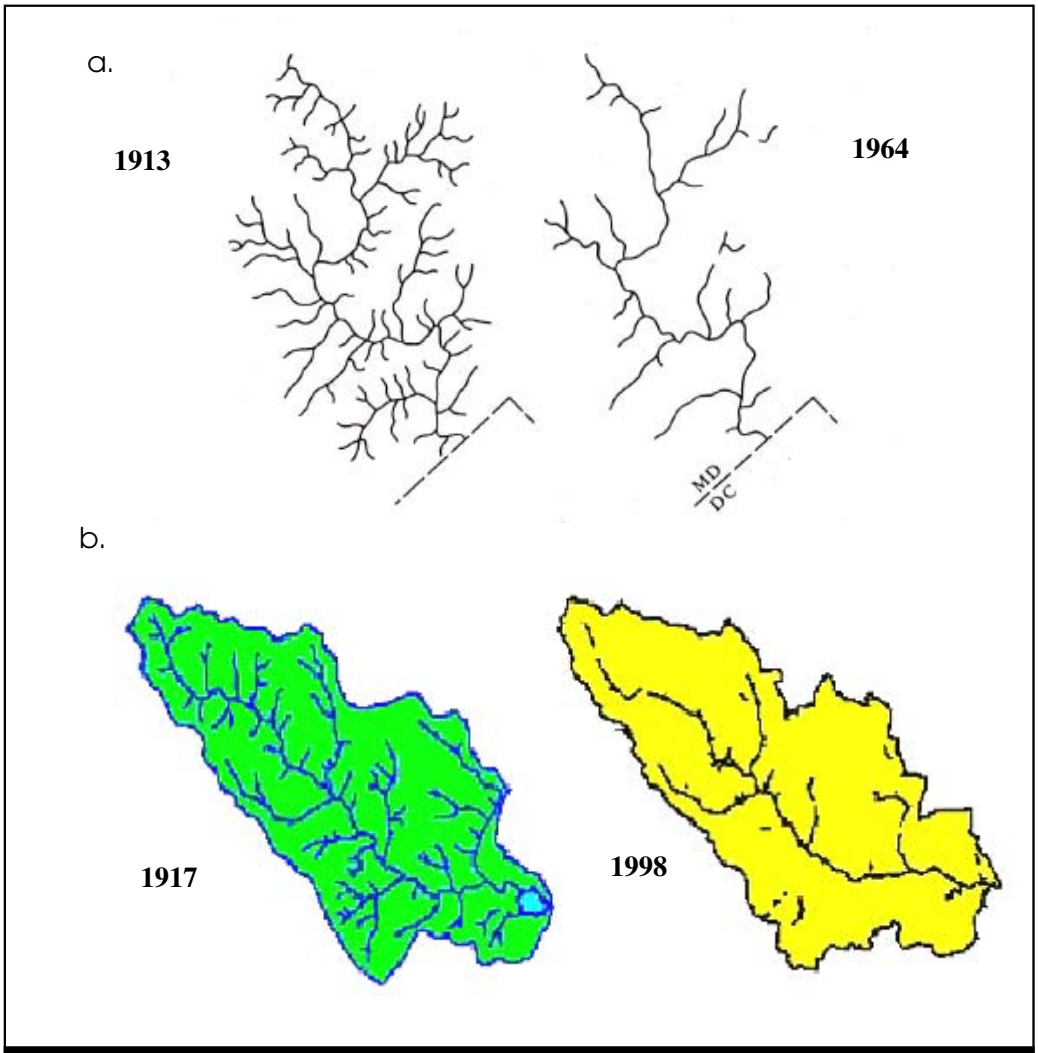

Figure 27: a. Drainage Network of Rock Creek, D.C. (Dunne and Leopold, 1978) and b. Drainage Network of Four Mile Run, VA Before and After Urbanization (NVRC, 2001)

In a national study of 269 gaged urban watersheds, Sauer *et al.* (1983) observed that channelization and channel hardening were important watershed variables that control peak discharge rates. The channel modifications increase the efficiency with which runoff is transported through the stream channel, increasing critical shear stress velocities and causing downstream channel erosion.

3.6.2 Barriers to Fish Migration

Infrastructure such as bridges, dams, pipelines and culverts can create partial or total barriers to fish migration and impair the ability of fish to move freely in a watershed. Blockages can have localized effects on small streams where non-migratory fish species can be prevented from re-colonizing upstream areas after acutely toxic events. The upstream movement of anadromous fish species such as shad, herring, salmon and steelhead can also be blocked by these barriers. Figure 28 depicts the prevalence of fish barriers in the Anacostia Watershed (MWCOG, 1992).

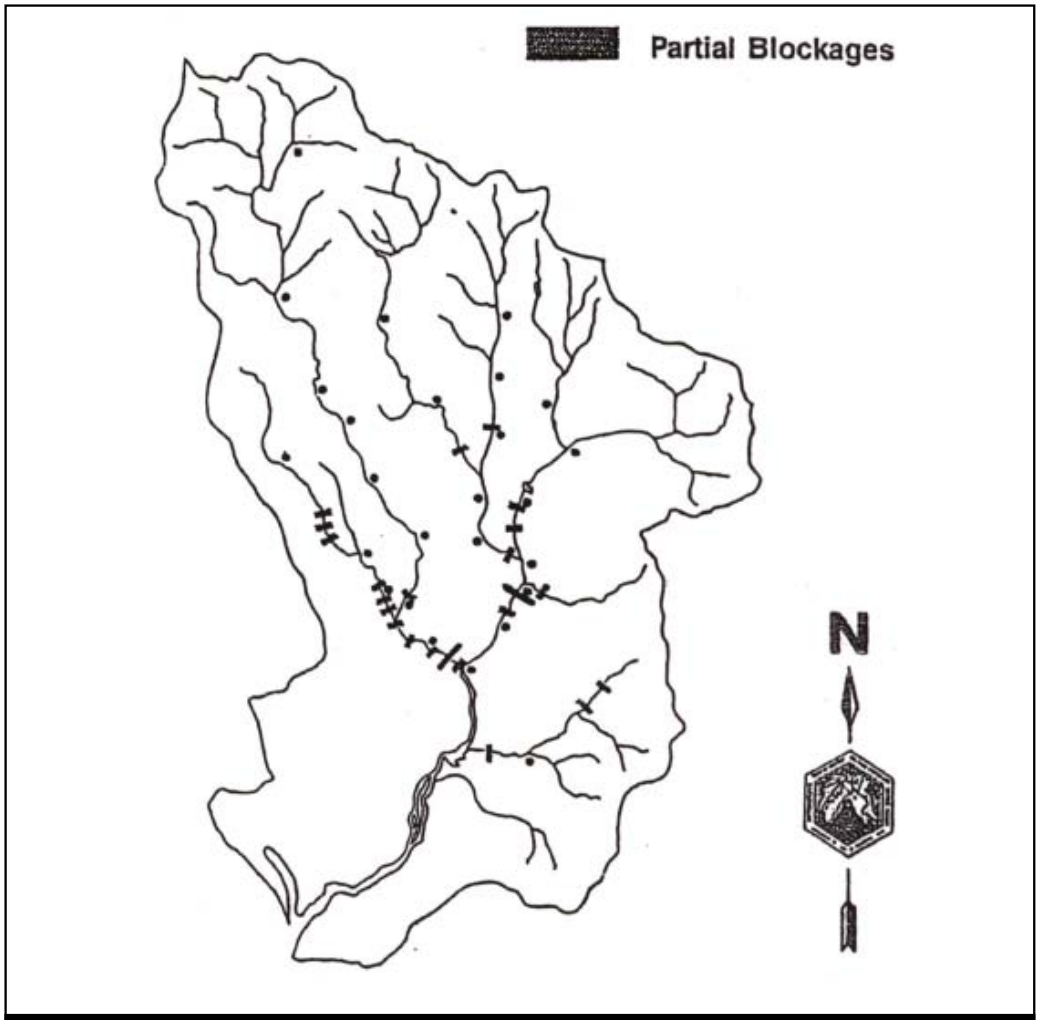

Figure 28: Fish Migration Barriers in the Anacostia Watershed of D.C. and MD (MWCOG, 1992)

3.7 Conclusion

Watershed development and the associated increase in IC have been found to significantly degrade the physical habitat of urban streams. In alluvial streams, the effects of channel enlargement and sediment transport can be severe at relatively low levels of IC (10 to 20%). However, the exact response of any stream is also contingent upon a combination of other physical factors such as geology, vegetation, gradient, the age of development, sediment supply, the use and design of stormwater treatment practices, and the extent of riparian buffers (Bledsoe, 2001).

Despite the uncertainty introduced by these factors, the limited geomorphic research to date suggests that physical habitat quality is almost always degraded by higher levels of watershed IC. Even in bedrock-controlled channels, where sediment transport and channel enlargement may not be as dramatic, researchers have noted changes in stream habitat features, such as embeddedness, loss of LWD, and stream warming.

Overall, the following conclusions can be made about the influence of watershed development on the physical habitat of urban streams:

- The major changes in physical habitat in urban streams are caused by the increased frequency and duration of bankfull and sub-bankfull discharges, and the attendant changes in sediment supply and transport. As a consequence, many urban streams experience significant channel enlargement. Generally, channel enlargement is most evident in alluvial streams.

- Typical habitat changes observed in urban streams include increased embeddedness, reduced supply of LWD, and simplification of stream habitat features such as pools, riffles and runs, as well as reduced channel sinuosity.

- Stream warming is often directly linked to watershed development, although more systematic subwatershed sampling is needed to precisely predict the extent of warming.

- Channel straightening, hardening and enclosure and the creation of fish barriers are all associated with watershed development. More systematic research is needed to establish whether these variables can be predicted based on watershed IC.

- In general, stream habitat diminishes at about 10% watershed IC, and becomes severely degraded beyond 25% watershed IC.

While our understanding of the relationship between stream habitat features and watershed development has improved in recent years, the topic deserves greater research in three areas. First, more systematic monitoring of composite habitat variables needs to be conducted across the full range of watershed IC. In particular, research is needed to define the approximate degree of watershed IC where urban streams are transformed into urban drainage systems.

Second, additional research is needed to explore the relationship between watershed IC and individual and measurable stream habitat parameters, such as bank erosion, channel sinuosity, pool depth and wetted perimeter. Lastly, more research is needed to determine if watershed treatment such as stormwater practices and stream buffers can mitigate the impacts of watershed IC on stream habitat. Together, these three research efforts could provide a technical foundation to develop a more predictive model of how watershed development influences stream habitat.

Chapter 4: Water Quality Impacts of Impervious Cover

This chapter presents information on pollutant concentrations found in urban stormwater runoff based on a national and regional data assessment for nine categories of pollutants. Included is a description of the Simple Method, which can be used to estimate pollutant loads based on the amount of IC found in a catchment or subwatershed. This chapter also addresses specific water quality impacts of stormwater pollutants and explores research on the sources and source areas of stormwater pollutants.

This chapter is organized as follows:

4.1 Introduction
4.2 Summary of National and Regional Stormwater Pollutant Concentration Data
4.3 Relationship Between Pollutant Loads and IC: The Simple Method
4.4 Sediment
4.5 Nutrients
4.6 Trace Metals
4.7 Hydrocarbons (PAH and Oil and Grease)
4.8 Bacteria and Pathogens
4.9 Organic Carbon
4.10 MTBE
4.11 Pesticides
4.12 Deicers
4.13 Conclusion

4.1 Introduction

Streams are usually the first aquatic system to receive stormwater runoff, and their water quality can be compromised by the pollutants it contains. Stormwater runoff typically contains dozens of pollutants that are detectable at some concentration, however small. Simply put, any pollutant deposited or derived from an activity on land will likely end up in stormwater runoff, although certain pollutants are consistently more likely to cause water quality problems in receiving waters. Pollutants that are frequently found in stormwater runoff can be grouped into nine broad categories: sediment, nutrients, metals, hydrocarbons, bacteria and pathogens, organic carbon, MTBE, pesticides, and deicers.

The impact that stormwater pollutants exert on water quality depends on many factors, including concentration, annual pollutant load, and category of pollutant. Based on nationally reported concentration data, there is considerable variation in stormwater pollutant concentrations. This variation has been at least partially attributed to regional differences, including rainfall and snowmelt. The volume and regularity of rainfall, the length of snow accumulation, and the rate of snowmelt can all influence stormwater pollutant concentrations.

The annual pollutant load can have long-term effects on stream water quality, and is particularly important information for stormwater managers to have when dealing with non-point source pollution control. The Simple Method is a model developed to estimate the pollutant load for chemical pollutants, assuming that the annual pollutant load is a function of IC. It is an effective method for determining annual sediment, nutrient, and trace metal loads. It cannot always be applied to other stormwater pollutants, since they are not always correlated with IC.

The direct water quality impact of stormwater pollutants also depends on the type of pollutant, as different pollutants impact streams differently. For example, sediments affect stream habitat and aquatic biodiversity; nutrients cause eutrophication; metals, hydrocarbons, deicers, and MTBE can be toxic to aquatic life; and organic carbon can lower dissolved oxygen levels.

The impact stormwater pollutants have on

water quality can also directly influence human uses and activities. Perhaps the pollutants of greatest concern are those with associated public health impacts, such as bacteria and pathogens. These pollutants can affect the availability of clean drinking water and limit consumptive recreational activities, such as swimming or fishing. In extreme situations, these pollutants can even limit contact recreational activities such as boating and wading.

It should be noted that although there is much research available on the effects of urbanization on water quality, the majority has not been focused on the impact on streams, but on the response of lakes, reservoirs, rivers and estuaries. It is also important to note that not all pollutants are equally represented in monitoring conducted to date. While we possess excellent monitoring data for sediment, nutrients and trace metals, we have relatively little monitoring data for pesticides, hydrocarbons, organic carbon, deicers, and MTBE.

4.2 Summary of National and Regional Stormwater Pollutant Concentration Data

4.2.1 National Data

National mean concentrations of typical stormwater pollutants are presented in Table 16. National stormwater data are compiled from the Nationwide Urban Runoff Program (NURP), with additional data obtained from the U.S.Geological Survey (USGS), as well as initial stormwater monitoring conducted for EPA's National Pollutant Discharge Elimination System (NPDES) Phase I stormwater program.

In most cases, stormwater pollutant data is reported as an event mean concentration (EMC), which represents the average concentration of the pollutant during an entire stormwater runoff event.

When evaluating stormwater EMC data, it is important to keep in mind that regional EMCs can differ sharply from the reported national pollutant EMCs. Differences in EMCs between regions are often attributed to the variation in the amount and frequency of rainfall and snowmelt.

4.2.2 Regional Differences Due to Rainfall

The frequency of rainfall is important, since it influences the accumulation of pollutants on IC that are subsequently available for wash-off during storm events. The USGS developed a national stormwater database encompassing 1,123 storms in 20 metropolitan areas and used it as the primary data source to define regional differences in stormwater EMCs. Driver (1988) performed regression analysis to determine which factors had the greatest influence on stormwater EMCs and determined that annual rainfall depth was the best overall predictor. Driver grouped together stormwater EMCs based on the depth of average annual rainfall, and Table 17 depicts the regional rainfall groupings and general trends for each

region. Table 18 illustrates the distribution of stormwater EMCs for a range of rainfall regions from 13 local studies, based on other monitoring studies. In general, stormwater EMCs for nutrients, suspended sediment and metals tend to be higher in arid and semi-arid

Table 16: National EMCs for Stormwater Pollutants

Pollutant	Source	EMCs		Number of Events
		Mean	Median	
Sediments (mg/l)				
TSS	(1)	78.4	54.5	3047
Nutrients (mg/l)				
Total P	(1)	0.32	0.26	3094
Soluble P	(1)	0.13	0.10	1091
Total N	(1)	2.39	2.00	2016
TKN	(1)	1.73	1.47	2693
Nitrite & Nitrate	(1)	0.66	0.53	2016
Metals (Fg/l)				
Copper	(1)	13.4	11.1	1657
Lead	(1)	67.5	50.7	2713
Zinc	(1)	162	129	2234
Cadmium	(1)	0.7	N/R	150
Chromium	(4)	4	7	164
Hydrocarbons (mg/l)				
PAH	(5)	3.5	N/R	N/R
Oil and Grease	(6)	3	N/R	N/R
Bacteria and Pathogens (colonies/ 100ml)				
Fecal Coliform	(7)	15,038	N/R	34
Fecal Streptococci	(7)	35,351	N/R	17
Organic Carbon (mg/l)				
TOC	(11)	17	15.2	19 studies
BOD	(1)	14.1	11.5	1035
COD	(1)	52.8	44.7	2639
MTBE	(8)	N/R	1.6	592
Pesticides (Fg/l)				
Diazinon	(10)	N/R	0.025	326
	(2)	N/R	0.55	76
Chlorpyrifos	(10)	N/R	N/R	327
Atrazine	(10)	N/R	0.023	327
Prometon	(10)	N/R	0.031	327
Simazine	(10)	N/R	0.039	327
Chloride (mg/l)				
Chloride	(9)	N/R	397	282

Sources: (1) Smullen and Cave, 1998; (2) Brush et al., 1995; (3) Baird et al., 1996; (4) Bannerman et al., 1996; (5) Rabanal and Grizzard, 1995; (6) Crunkilton et al., 1996; (7) Schueler, 1999; (8) Delzer, 1996; (9) Environment Canada, 2001; (10) USEPA, 1998; (11) CWP, 2001a N/R - Not Reported

Table 17: Regional Groupings by Annual Rainfall Amount (Driver, 1988)

Region	Annual Rainfall	States Monitored	Concentration Data
Region I: Low Rainfall	<20 inches	AK, CA, CO, NM, UT	Highest mean and median values for Total N, Total P, TSS and COD
Region II: Moderate Rainfall	20 40 inches	HA, IL, MI, MN, MI, NY, TX, OR, OH, WA, WI	Higher mean and median values than Region III for TSS, dissolved phosphorus and cadmium
Region III: High Rainfall	>40 inches	FL, MD, MA, NC, NH, NY, TX, TN, AR	Lower values for many parameters likely due to the frequency of storms and the lack of build up in pollutants

regions and tend to decrease slightly when annual rainfall increases (Table 19).

It is also hypothesized that a greater amount of sediment is eroded from pervious surfaces in arid or semi-arid regions than in humid regions due to the sparsity of protective vegetative cover. Table 19 shows that the highest concentrations of total suspended solids were recorded in regions with least rainfall. In addition, the chronic toxicity standards for several metals are most frequently exceeded during low rainfall regions (Table 20).

4.2.3 Cold Region Snowmelt Data

In colder regions, snowmelt can have a significant impact on pollutant concentrations. Snow accumulation in winter coincides with pollutant build-up; therefore, greater concentrations of pollutants are measured during snowmelt events. Sources of snowpack pollution in urban areas include wet and dry atmospheric deposition, traffic emissions, urban litter, deteriorated infrastructure, and deicing chemicals and abrasives (WERF, 1999).

Oberts *et al.* (1989) measured snowmelt pollutants in Minnesota streams and found that as much as 50% of annual sediment, nutrient, hydrocarbon and metal loads could be attributed to snowmelt runoff during late winter and early spring. This trend probably applies to any region where snow cover persists through much of the winter. Pollutants accumulate in the snowpack and then contribute high concentrations during snowmelt runoff. Oberts (1994) described four types of snowmelt runoff events and the resulting pollutant characteristics (Table 21).

A typical hydrograph for winter and early spring snow melts in a northern cold climate is portrayed in Figure 29. The importance of snowpack melt on peak runoff during March 1989 can clearly be seen for an urban watershed located in St. Paul, Minnesota.

Major source areas for snowmelt pollutants include snow dumps and roadside snowpacks. Pollutant concentrations in snow dumps can be as much as five times greater than typical stormwater pollutant concentrations (Environment Canada, 2001). Snow dumps and packs accumulate pollutants over the winter months and can release them during a few rain or snow melt events in the early spring. High levels of chloride, lead, phosphorus, biochemical oxygen demand, and total suspended solids have been reported in snow pack runoff (La Barre *et al*, 1973; Oliver *et al.*, 1974; Pierstorff and Bishop, 1980; Scott and Wylie, 1980; Van Loon, 1972).

Atmospheric deposition can add pollutants to snow piles and snowpacks. Deposited pollutants include trace metals, nutrients and particles that are primarily generated by fossil fuel combustion and industrial emissions (Boom and Marsalek, 1988; Horkeby and Malmqvist, 1977; Malmqvist, 1978; Novotny and Chester, 1981; Schrimpff and Herrman, 1979).

Table 18: Stormwater Pollutant Event Mean Concentration for Different U.S. Regions (Units: mg/l, except for metals which are in *F*g/l)

		Region I - Low Rainfall				Region II - Moderate Rainfall			Region III - High Rainfall				Snow
	National	Phoenix, AZ	San Diego, CA	Boise, ID	Denver, CO	Dallas, TX	Marquette, MI	Austin, TX	MD	Louisville, KY	GA	FL	MN
Reference	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(11)	(12)
Annual Rainfall (in.)	N/A	7.1"	10"	11"	15"	28"	32"	32"	41"	43"	51"	52"	N/R
Number of Events	3000	40	36	15	35	32	12	N/R	107	21	81	N/R	49
Pollutant													
TSS	78.4	227	330	116	242	663	159	190	67	98	258	43	112
Total N	2.39	3.26	4.55	4.13	4.06	2.70	1.87	2.35	N/R	2.37	2.52	1.74	4.30
Total P	0.32	0.41	0.7	0.75	0.65	0.78	0.29	0.32	0.33	0.32	0.33	0.38	0.70
Soluble P	0.13	0.17	0.4	0.47	N/R	N/R	0.04	0.24	N/R	0.21	0.14	0.23	0.18
Copper	14	47	25	34	60	40	22	16	18	15	32	1.4	N/R
Lead	68	72	44	46	250	330	49	38	12.5	60	28	8.5	100
Zinc	162	204	180	342	350	540	111	190	143	190	148	55	N/R
BOD	14.1	109	21	89	N/R	112	15.4	14	14.4	88	14	11	N/R
COD	52.8	239	105	261	227	106	66	98	N/R	38	73	64	112

Sources: Adapted from Caraco, 2000a: (1) Smullen and Cave, 1998; (2) Lopes et al.; 1995; (3) Schiff, 1996; (4) Kjelstrom, 1995 (computed); (5) DRCOG, 1983, (6) Brush et al., *1995; (7) Steuer* et al., *1997; (8) Barrett* et al., *1995; (9) Barr, 1997; (10) Evaldi* et al., *1992; (11) Thomas and McClelland, 1995; (12) Oberts, 1994 N/R = Not Reported; N/A = Not Applicable*

Table 19: Mean and Median Nutrient and Sediment Stormwater Concentrations for Residential Land Use Based on Rainfall Regions (Driver, 1988)

Region	Total N (median)	Total P (median)	TSS (mean)
Region I: Low Rainfall	4	0.45	320
Region II: Moderate Rainfall	2.3	0.31	250
Region III: High Rainfall	2.15	0.31	120

Table 20: EPA 1986 Water Quality Standards and Percentage of Metal Concentrations Exceeding Water Quality Standards by Rainfall Region (Driver, 1988)

	Cadmium	Copper	Lead	Zinc
EPA Standards	10 *F*g/l	12 *F*g/l	32 *F*g/l	47 *F*g/l
Percent Exceedance of EPA Standards				
Region I: Low Rainfall	1.5%	89%	97%	97%
Region II: Moderate Rainfall	0	78%	89%	85%
Region III: High Rainfall	0	75%	91%	84%

Table 21: Runoff and Pollutant Characteristics of Snowmelt Stages (Oberts, 1994)

Snowmelt Stage	Duration /Frequency	Runoff Volume	Pollutant Characteristics
Pavement	Short, but many times in winter	Low	Acidic, high concentrations of soluble pollutants; Chloride, nitrate, lead; total load is minimal
Roadside	Moderate	Moderate	Moderate concentrations of both soluble and particulate pollutants
Pervious Area	Gradual, often most at end of season	High	Dilute concentrations of soluble pollutants; moderate to high concentrations of particulate pollutants depending on flow
Rain-on-Snow	Short	Extreme	High concentrations of particulate pollutants; moderate to high concentrations of soluble pollutants; high total load

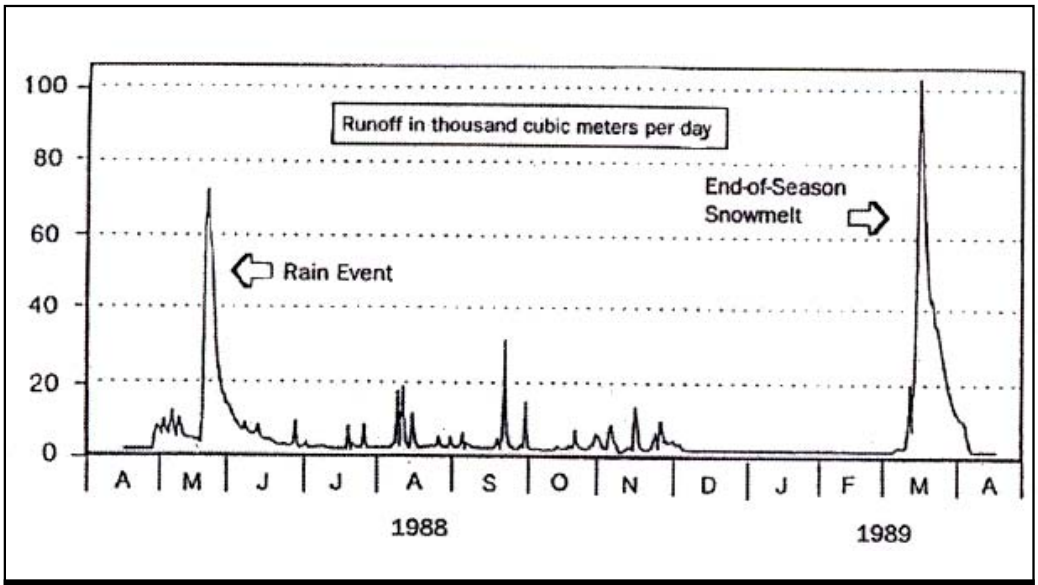

Figure 29: Snowmelt Runoff Hydrograph for Minneapolis Stream (Oberts, 1994)

4.3 Relationship Between Pollutant Loads and IC: The Simple Method

Urban stormwater runoff contains a wide range of pollutants that can degrade downstream water quality. The majority of stormwater monitoring research conducted to date supports several generalizations. First, the unit area pollutant load delivered to receiving waters by stormwater runoff increases in direct proportion to watershed IC. This is not altogether surprising, since pollutant load is the product of the average pollutant concentration and stormwater runoff volume. Given that runoff volume increases in direct proportion to IC, pollutant loads must automatically increase when IC increases, as long the average pollutant concentration stays the same (or increases). This relationship is a central assumption in most simple and complex pollutant loading models (Bicknell *et al.*, 1993; Donigian and Huber, 1991; Haith *et al.*, 1992; Novotny and Chester, 1981; NVPDC, 1987; Pitt and Voorhees, 1989).

Recognizing the relationship between IC and pollutant loads, Schueler (1987) developed the "Simple Method" to quickly and easily estimate stormwater pollutant loads for small urban watersheds (see Figure 30). Estimates of pollutant loads are important to watershed managers as they grapple with costly decisions on non-point source control. The Simple Method is empirical in nature and utilizes the extensive regional and national database (Driscoll, 1983; MWCOG, 1983; USEPA, 1983). Figure 30 provides the basic equations to estimate pollutant loads using the Simple

Figure 30: The Simple Method - Basic Equations

The Simple Method estimates pollutant loads as the product of annual runoff volume and pollutant EMC, as:

$$(1)\ L = 0.226 * R * C * A$$

Where: L = Annual load (lbs), and:
R = Annual runoff (inches)
C = Pollutant concentration in stormwater, EMC (mg/l)
A = Area (acres)
0.226 = Unit conversion factor

For bacteria, the equation is slightly different, to account for the differences in units. The modified equation for bacteria is:

$$(2)\ L = 1.03 * 10^{-3} * R * C * A$$

Where: L = Annual load (Billion Colonies), and:
R = Annual runoff (inches)
C = Bacteria concentration (#/100 ml)
A = Area (acres)
$1.03 * 10^{-3}$ = Unit conversion factor

Annual Runoff

The Simple Method calculates the depth of annual runoff as a product of annual runoff volume and a runoff coefficient (Rv). Runoff volume is calculated as:

$$(3)\ R = P * P_j * Rv$$

Where: R = Annual runoff (inches), and:
P = Annual rainfall (inches)
P_j = Fraction of annual rainfall events that produce runoff (usually 0.9)
Rv = Runoff coefficient

In the Simple Method, the runoff coefficient is calculated based on IC in the subwatershed. The following equation represents the best fit line for the data set (N=47, R^2=0.71).

$$(4)\ Rv=0.05+0.9Ia$$

Where: Rv = runoff coefficient, and:
Ia = Impervious fraction

Method. It assumes that loads of stormwater pollutants are a direct function of watershed IC, as IC is the key independent variable in the equation.

The technique requires a modest amount of information, including the subwatershed drainage area, IC, stormwater runoff pollutant EMCs, and annual precipitation. With the Simple Method, the investigator can either divide up land use into specific areas (i.e. residential, commercial, industrial, and roadway) and calculate annual pollutant loads for each land use, or utilize a generic urban land use. Stormwater pollutant EMC data can be derived from the many summary tables of local, regional, or national monitoring efforts provided in this chapter (e.g., Tables 16, 18, 22, 28, 30, 35, 36, 40, and 44). The model also requires different IC values for separate land uses within a subwatershed. Representative IC data from Cappiella and Brown (2001) were provided in Table 2 (Chapter 1).

Additionally, the Simple Method should not be used to estimate annual pollutant loads of deicers, hydrocarbons and MTBE, because they have not been found to be correlated with IC. These pollutants have been linked to other indicators. Chlorides, hydrocarbons and MTBE are often associated with road density and vehicle miles traveled (VMT). Pesticides are associated with turf area, and traffic patterns and "hotspots" have been noted as potential indicators for hydrocarbons and MTBE.

Limitations of the Simple Method

The Simple Method should provide reasonable estimates of changes in pollutant export resulting from urban development. However, several caveats should be kept in mind when applying this method.

The Simple Method is most appropriate for assessing and comparing the relative stormflow pollutant load changes from different land uses and stormwater treatment scenarios. The Simple Method provides estimates of storm pollutant export that are probably close to the "true" but unknown value for a development site, catchment, or subwatershed. However, it is very important not to overemphasize the precision of the load estimate obtained. For example, it would be inappropriate to use the Simple Method to evaluate relatively similar development scenarios (e.g., 34.3% versus 36.9% IC). The Simple Method provides a general planning estimate of likely storm pollutant export from areas at the scale of a development site, catchment or subwatershed. More sophisticated modeling is needed to analyze larger and more complex watersheds.

In addition, the Simple Method only estimates pollutant loads generated during storm events. It does not consider pollutants associated with baseflow during dry weather. Typically, baseflow is negligible or non-existent at the scale of a single development site and can be safely neglected. However, catchments and subwatersheds do generate significant baseflow volume. Pollutant loads in baseflow are generally low and can seldom be distinguished from natural background levels (NVPDC, 1979).

Consequently, baseflow pollutant loads normally constitute only a small fraction of the total pollutant load delivered from an urban area. Nevertheless, it is important to remember that the load estimates refer only to storm event derived loads and should not be confused with the total pollutant load from an area. This is particularly important when the development density of an area is low. For example, in a low density residential subwatershed (IC < 5%), as much as 75% of the annual runoff volume could occur as baseflow. In such a case, annual baseflow load may be equivalent to the annual stormflow load.

4.4 Sediment

Sediment is an important and ubiquitous pollutant in urban stormwater runoff. Sediment can be measured in three distinct ways: Total Suspended Solids (TSS), Total Dissolved Solids (TDS) and turbidity. TSS is a measure of the total mass suspended sediment particles in water. The measurement of TSS in urban stormwater helps to estimate sediment load transported to local and downstream receiving waters. Table 22 summarizes stormwater EMCs for total suspended solids, as reported by Barrett *et al.* (1995), Smullen and Cave (1998), and USEPA (1983). TDS is a measure of the dissolved solids and minerals present in stormwater runoff and is used as a primary indication of the purity of drinking water. Since few stormwater monitoring efforts have focused on TDS, they are not reported in this document. Turbidity is a measure of how suspended solids present in water reduce the ability of light to penetrate the water column. Turbidity can exert impacts on aquatic biota, such as the ability of submerged aquatic vegetation to receive light and the ability of fish and aquatic insects to use their gills (Table 23).

4.4.1 Concentrations

TSS concentrations in stormwater across the country are well documented. Table 18 reviews mean TSS EMCs from 13 communities across the country and reveals a wide range of recorded concentrations. The lowest concentration of 43 mg/l was reported in Florida, while TSS reached 663 mg/l in Dallas, Texas. Variation in sediment concentrations has been attributed to regional rainfall differences (Driver, 1988); construction site runoff (Leopold, 1968); and bank erosion (Dartiguenave *et al.*, 1997). National values are provided in Table 22.

Turbidity levels are not as frequently reported in national and regional monitoring summaries. Barrett and Malina (1998) monitored turbidity at two sites in Austin, Texas and reported a mean turbidity of 53 NTU over 34 storm events (Table 22).

4.4.2 Impacts of Sediment on Streams

The impacts of sediment on aquatic biota are well documented and can be divided into impacts caused by suspended sediment and those caused by deposited sediments (Tables 23 and 24).

In general, high levels of TSS and/or turbidity can affect stream habitat and cause sedimentation in downstream receiving waters. Deposited sediment can cover benthic organisms such as aquatic insects and freshwater mussels. Other problems associated with high sediments loads include stream warming by reflecting radiant energy due to increased turbidity (Kundell and Rasmussen, 1995), decreased flow capacity (Leopold, 1973), and increasing overbank flows (Barrett and Malina, 1998). Sediments also transport other pollutants which bind to sediment particles. Significant levels of pollutants can be transported by sediment during stormwater runoff events,

Table 22: EMCs for Total Suspended Solids and Turbidity

Pollutant	EMCs		Number of Events	Source
	Mean	Median		
TSS (mg/l)	78.4	54.5	3047	Smullen and Cave, 1998
	174	113	2000	USEPA, 1983
Turbidity (NTU)	53	N/R	423	Barrett and Malina, 1998

N/R = Not Reported

Table 23: Summary of Impacts of Suspended Sediment on the Aquatic Environment (Schueler and Holland, 2000)
Abrades and damages fish gills, increasing risk of infection and disease
Scouring of periphyton from stream (plants attached to rocks)
Loss of sensitive or threatened fish species when turbidity exceeds 25 NTU
Shifts in fish community toward more sediment-tolerant species
Decline in sunfish, bass, chub and catfish when month turbidity exceeds 100 NTU
Reduces sight distance for trout, with reduction in feeding efficiency
Reduces light penetration causing reduction in plankton and aquatic plant growth
Adversely impacts aquatic insects, which are the base of the food chain
Slightly increases the stream temperature in the summer
Suspended sediments can be a major carrier of nutrients and metals
Reduces anglers chances of catching fish

Table 24: Summary of Impacts of Deposited Sediments on the Aquatic Environment (Schueler and Holland, 2000)
1. Physical smothering of benthic aquatic insect community
2. Reduced survival rates for fish eggs
3. Destruction of fish spawning areas and eggs
4. Embeddedness of stream bottom reduced fish and macroinvertebrate habitat value
5. Loss of trout habitat when fine sediments are deposited in spawning or riffle-runs
6. Sensitive or threatened darters and dace may be eliminated from fish community
7. Increase in sediment oxygen demand can deplete dissolved oxygen in streams
8. Significant contributing factor in the alarming decline of freshwater mussels
9. Reduced channel capacity, exacerbating downstream bank erosion and flooding
10. Reduced flood transport capacity under bridges and through culverts
11. Deposits diminish scenic and recreational values of waterways

including trace metals, hydrocarbons and nutrients (Crunkilton *et al.,* 1996; Dartiguenave *et al*., 1997; Gavin and Moore, 1982; Novotny and Chester, 1989; Schueler 1994b).

4.4.3 Sources and Source Areas of Sediment

Sediment sources in urban watersheds include stream bank erosion; erosion from exposed soils, such as from construction sites; and washoff from impervious areas (Table 25).

As noted in this chapter, streambank erosion is generally considered to be the primary source of sediment to urban streams. Recent studies by Dartiguenave *et al.* (1997) and Trimble (1997) determined that streambank erosion contributes the majority of the annual sediment budget of urban streams. Trimble (1997) directly measured stream cross sections, sediment aggradation and suspended sediment loads and determined that two-thirds of the annual sediment budget of a San Diego, California watershed was supplied by streambank erosion. Dartiguenave *et al.* (1997) developed a GIS based model in Austin, Texas to determine the effects of stream bank erosion on the annual sediment budget. They compared modeled sediment loads from the watershed with the actual sediment loads measured at USGS gaging stations and concluded that more than 75% of the sediment load came from streambank erosion. Dartiguenave *et al.* (1997) reported that sediment load per unit area increases with increasing IC (Figure 31).

Sediment loads are also produced by washoff of sediment particles from impervious areas and their subsequent transport in stormwater runoff sediment. Source areas include parking lots, streets, rooftops, driveways and lawns. Streets and parking lots build up dirt and grime from the wearing of the street surface, exhaust particulates, "blown on" soil and organic matter, and atmospheric deposition. Lawn runoff primarily contains soil and organic matter. Urban source areas that produce the highest TSS concentrations include streets, parking lots and lawns (Table 26).

Parking lots and streets are not only responsible for high concentrations of sediment but also high runoff volumes. The SLAMM source loading model (Pitt and Voorhees, 1989) looks at runoff volume and concentrations of pollutants from different urban land uses and predicts stream loading. When used in the Wisconsin and Michigan subwatersheds, it demonstrated that parking lots and streets were responsible for over 70% of the TSS delivered to the stream. (Steuer *et al*., 1997; Waschbusch *et al.*, 2000).

Table 25: Sources and Loading of Suspended Solids Sediment in Urban Areas

Sources	Loading	Source
Bank Erosion	75% of stream sediment budget	Dartinguenave *et al.*, 1997
	66% of stream sediment budget	Trimble, 1997
Overland Flow- Lawns	397 mg/l (geometric mean)	Bannerman *et al.*, 1993
	262 mg/l	Steuer *et al.*, 1997
	11.5% (estimated; 2 sites)	Waschbusch *et al.*, 2000
Construction Sites	200 to 1200 mg/l	Table 27
Washoff from Impervious Surfaces	78 mg/l (mean)	Table 16

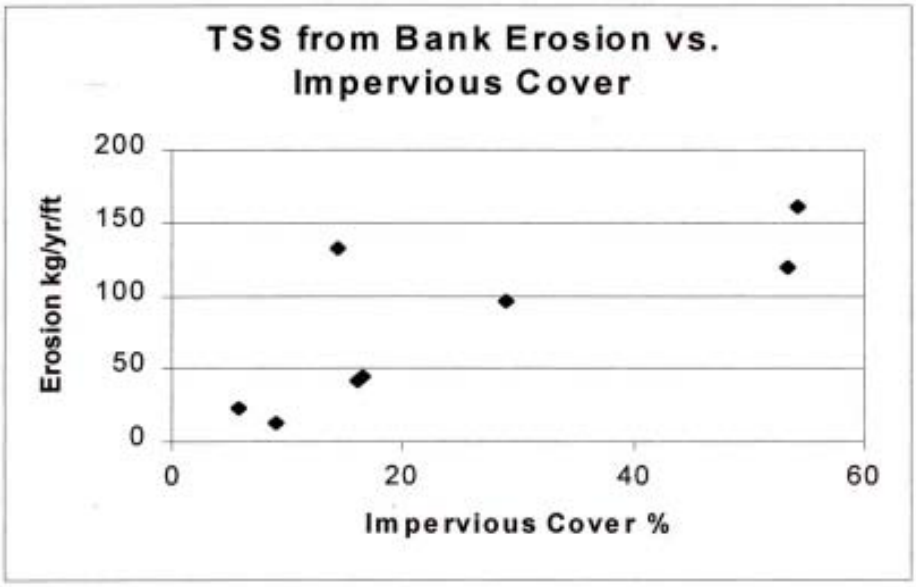

Figure 31: TSS from Bank Erosion vs. IC in Texas Streams (Daringuenave *et al.*, 1997)

The third major source of sediment loads is erosion from construction sites. Several studies have reported extremely high TSS concentrations in construction site runoff, and these findings are summarized in Table 27. TSS concentrations from uncontrolled construction sites can be more than 150 times greater than those from undeveloped land (Leopold, 1968) and can be reduced if erosion and sediment control practices are applied to construction sites.

Table 26: Source Area Geometric Mean Concentrations for Suspended Solids in Urban Areas

Source Area	Suspended Solids (mg/l)		
Source	(1)	(2)	(3)
Commercial Parking Lot	110	58	51
High Traffic Street	226	232	65
Medium Traffic Street	305	326	51
Low Traffic Street	175	662	68
Commercial Rooftop	24	15	18
Residential Rooftop	36	27	15
Residential Driveway	157	173	N/R
Residential Lawn	262	397	59

Sources: (1) Steuer et al., 1997; (2) Bannerman et al., 1993; (3) Waschbusch et al., 2000; N/R = Not Reported

Table 27: Mean TSS Inflow and Outflow at Uncontrolled, Controlled and Simulated Construction Sites

Source	Mean Inflow TSS Concentration (mg/l)	Mean Outflow TSS Concentration (mg/l)	Location
Uncontrolled Sites			
Horner *et al.*, 1990	7,363	281	PNW
Schueler and Lugbill,1990	3,646	501	MD
York and Herb, 1978	4,200	N/R	MD
Islam *et al.*, 1988	2,950	N/R	OH
Controlled Sites			
Schueler and Lugbill, 1990	466	212	MD
Simulated Sediment Concentrations			
Jarrett, 1996	9,700	800	PA
Sturm and Kirby, 1991	1,500-4,500	200-1,000	GA
Barfield and Clar, 1985	1,000-5,000	200-1,200	MD
Dartiguenave *et al.*, 1997	N/R	600	TX

N/R = Not Reported

4.5 Nutrients

Nitrogen and phosphorus are essential nutrients for aquatic systems. However, when they appear in excess concentrations, they can exert a negative impact on receiving waters. Nutrient concentrations are reported in several ways. Nitrogen is often reported as nitrate (NO_3) and nitrite (NO_2), which are inorganic forms of nitrogen; total nitrogen (Total N), which is the sum of nitrate, nitrite, organic nitrogen and ammonia; and total Kjeldhal nitrogen (TKN), which is organic nitrogen plus ammonia.

Phosphates are frequently reported as soluble phosphorus, which is the dissolved and reactive form of phosphorus that is available for uptake by plants and animals. Total phosphorus (Total P) is also measured, which includes both organic and inorganic forms of phosphorus. Organic phosphorus is derived from living plants and animals, while inorganic phosphate is comprised of phosphate ions that are often bound to sediments.

4.5.1 Concentrations

Many studies have indicated that nutrient concentrations are linked to land use type, with urban and agricultural watersheds producing the highest nutrient loads (Chessman *et al.* 1992; Paul *et al.*, 2001; USGS, 2001b and Wernick *et al.*,1998). Typical nitrogen and phosphorus EMC data in urban stormwater runoff are summarized in Table 28.

Some indication of the typical concentrations of nitrate and phosphorus in stormwater runoff are evident in Figures 32 and 33. These graphs profile average EMCs in stormwater runoff recorded at 37 residential catchments across the U.S. The average nitrate EMC is remarkably consistent among residential neighborhoods, with most clustered around the mean of 0.6 mg/l and a range of 0.25 to 1.4 mg/l. The concentration of phosphorus during storms is also very consistent with a mean of 0.30 mg/l and a rather tight range of 0.1 to 0.66 mg/l (Schueler, 1995).

The amount of annual rainfall can also influence the magnitude of nutrient concentrations in stormwater runoff. For example, both Caraco (2000a) and Driver (1988) reported that the highest nutrient EMCs were found in stormwater from arid or semi-arid regions.

Table 28: EMCs of Phosphorus and Nitrogen Urban Stormwater Pollutants

Pollutant	EMCs (mg/l)		Number of Events	Source
	Mean	Median		
Total P	0.315	0.259	3094	Smullen and Cave, 1998
	0.337	0.266	1902	USEPA, 1983
Soluble P	0.129	0.103	1091	Smullen and Cave, 1998
	0.1	0.078	767	USEPA, 1983
Total N	2.39	2.00	2016	Smullen and Cave, 1998
	2.51	2.08	1234	USEPA, 1983
TKN	1.73	1.47	2693	Smullen and Cave, 1998
	1.67	1.41	1601	USEPA, 1983
Nitrite & Nitrate	0.658	0.533	2016	Smullen and Cave, 1998
	0.837	0.666	1234	USEPA, 1983

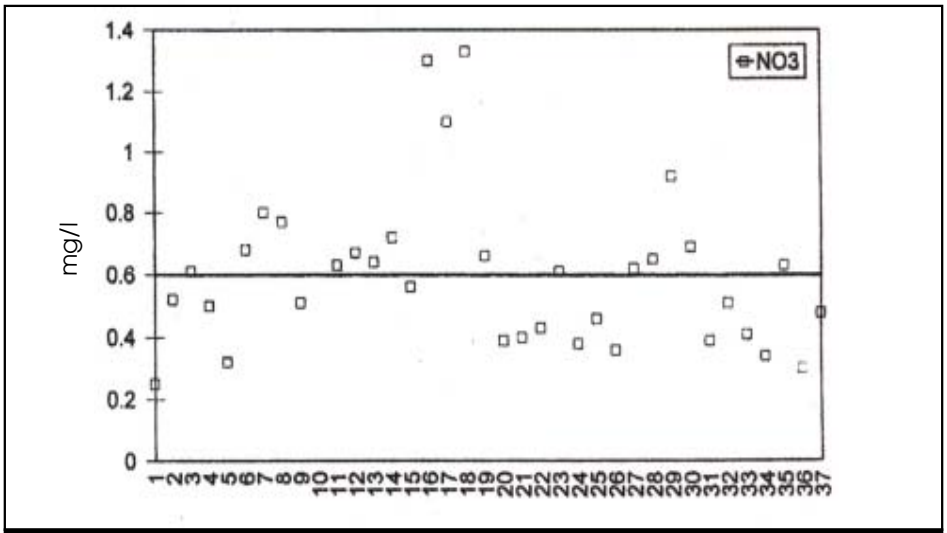

Figure 32: Nitrate-Nitrogen Concentration in Stormwater Runoff at 37 Sites Nationally (Schueler, 1999)

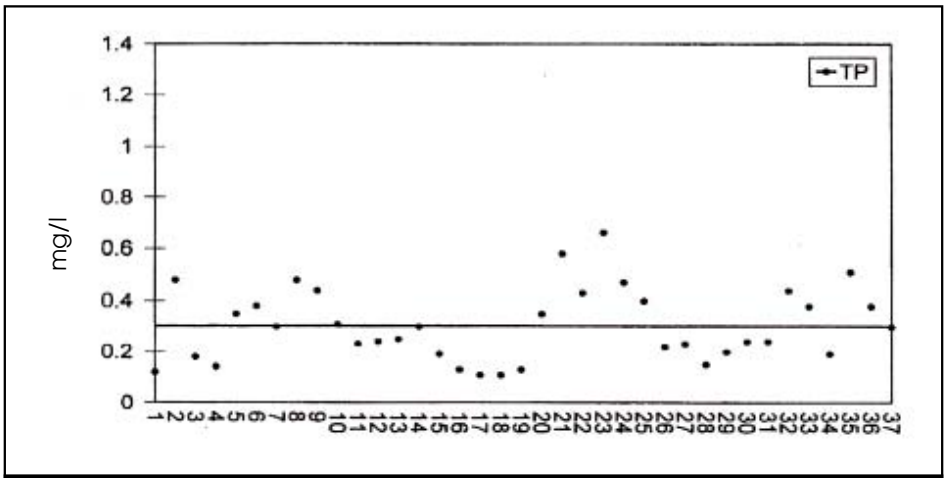

Figure 33: Total Phosphorus Concentration in Stormwater at 37 Sites Nationally (Schueler, 1999)

4.5.2 Impacts of Nutrients on Streams

Much research on the impact of nutrient loads has been focused on lakes, reservoirs and estuaries, which can experience eutrophication. Nitrogen and phosphorus can contribute to algae growth and eutrophic conditions, depending on which nutrient limits growth (USEPA, 1998). Dissolved oxygen is also affected by eutrophication. When algae or aquatic plants that are stimulated by excess nutrients die off, they are broken down by bacteria, which depletes the oxygen in the water. Relatively few studies have specifically explored the impact of nutrient enrichment on urban streams. Chessman *et al*. (1992) studied the limiting nutrients for periphyton growth in a variety of streams and noted that the severity of eutrophication was related to low flow conditions. Higher flow rates in streams may cycle nutrients faster than in slow flow rates, thus diminishing the extent of stream eutrophication.

4.5.3 Sources and Source Areas of Nutrients

Phosphorus is normally transported in surface water attached to sediment particles or in soluble forms. Nitrogen is normally transported by surface water runoff in urban watersheds. Sources for nitrogen and phosphorus in urban stormwater include fertilizer, pet waste, organic matter (such as leaves and detritus), and stream bank erosion. Another significant source of nutrients is atmospheric deposition. Fossil fuel combustion by automobiles, power plants and industry can supply nutrients in both wet fall and dry fall. The Metropolitan Washington Council of Governments (MWCOG, 1983) estimated total annual atmospheric deposition rates of 17 lbs/ac for nitrogen and 0.7 lbs/ac for phosphorus in the Washington, D.C. metro area.

Research from the upper Midwest suggests "hot spot" sources can exist for both nitrogen and phosphorus in urban watersheds. Lawns, in particular, contribute greater concentrations of Total N, Total P and dissolved phosphorus than other urban source areas. Indeed, source research suggests that nutrient concentrations in lawn runoff can be as much as four times greater than other urban sources such as streets, rooftops or driveways (Bannerman *et al.*, 1993; Steuer *et al.*, 1997 and Waschbusch *et al.*, 2000) (Table 29). This finding is significant, since lawns can comprise more than 50% of the total area in suburban watersheds. Lawn care, however, has seldom been directly linked to elevated nutrient concentrations during storms. A very recent lakeshore study noted that phosphorus concentrations were higher in fertilized lawns compared to unfertilized lawns, but no significant difference was noted for nitrogen (Garn, 2002).

Wash-off of deposited nutrients from IC is thought to be a major source of nitrogen and phosphorus during storms (MWCOG, 1983). While the concentration of nitrogen and phosphorus from parking lots and streets is lower than lawns, the volume of runoff is significantly higher. In two studies using the SLAMM source loading model (Pitt and Voorhees, 1989), parking lots and streets were responsible for over 30% of the nitrogen and were second behind lawns in their contributions to the phosphorus load (Steuer *et al.*, 1997; Waschbusch *et al.*, 2000).

Table 29: Source Area Monitoring Data for Total Nitrogen and Total Phosphorous in Urban Areas

Source Area	Total N (mg/l)	Total P (mg/l)		
Source	(1)	(1)	(2)	(3)
Commercial Parking Lot	1.94	0.20	N/R	0.10
High Traffic Street	2.95	0.31	0.47	0.18
Med. Traffic Street	1.62	0.23	1.07	0.22
Low Traffic Street	1.17	0.14	1.31	0.40
Commercial Rooftop	2.09	0.09	0.20	0.13
Residential Rooftop	1.46	0.06	0.15	0.07
Residential Driveway	2.10	0.35	1.16	N/R
Residential Lawn	9.70	2.33	2.67	0.79
Basin Outlet	1.87	0.29	0.66	N/R

(1) Steuer et al., 1997; (2) Bannerman et al., 1993; (3) Waschbusch et al., 2000; N/R= Not Reported

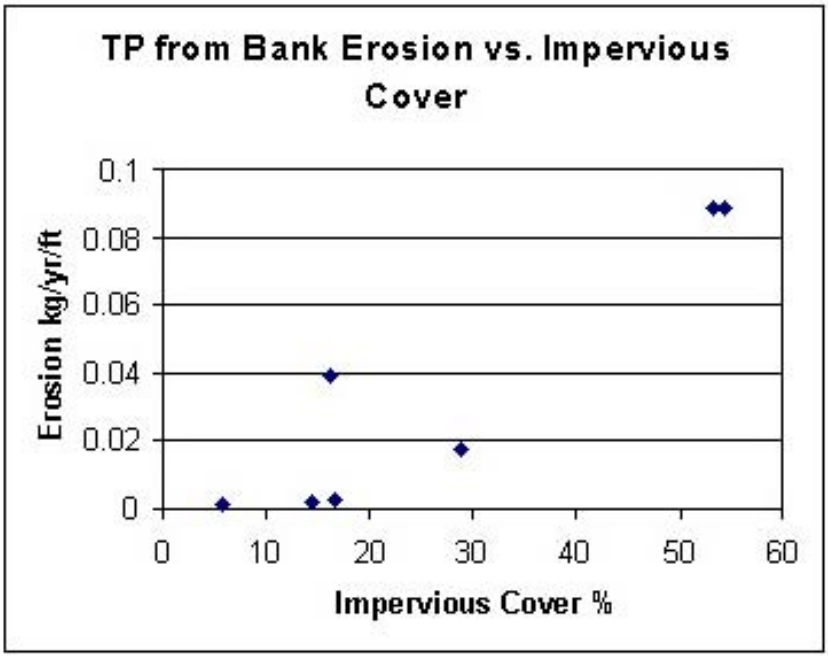

Figure 34: Total Phosphorus from Bank Erosion as a Function of IC in Texas Streams (Dartiguenave *et al.*, 1997)

Streambank erosion also appears to be a major source of nitrogen and phosphorus in urban streams. Both nitrogen and phosphorus are often attached to eroded bank sediment, as indicated in a recent study by Dartiguenave *et al.* (1997) in Austin, Texas. They showed that channel erosion contributed nearly 50% of the Total P load shown for subwatersheds with IC levels between 10 and 60 % (Figure 34). These findings suggest that prevention or reduction of downstream channel erosion may be an important nutrient reduction strategy for urban watersheds.

Snowmelt runoff generally has higher nutrient EMCs, compared to stormwater runoff. Oberts (1994) found that TKN and nitrate EMCs were much higher in snowmelt at all sites. The same pattern has also been observed for phosphorus EMCs during snowmelt and stormwater runoff. Zapf-Gilje *et al*. (1986) found that the first 20% of snowmelt events contained 65% of the phosphorus and 90% of the nitrogen load. Ayers *et al.* (1985) reported that a higher percentage of the annual nitrate, TKN and phosphorus load was derived from snowmelt runoff compared to stormwater runoff in an urban Minnesota watershed, which presumably reflects the accumulation of nutrients in the snowpack during the winter.

4.6 Trace Metals

Many trace metals can be found at potentially harmful concentrations in urban stormwater. Certain metals, such as zinc, copper, lead, cadmium and chromium, are consistently present at concentrations that may be of concern. These metals primarily result from the use of motor vehicles, weathering of metals and paints, burning of fossil fuels and atmospheric deposition.

Metals are routinely reported as the total recoverable form or the dissolved form. The dissolved form refers to the amount of metal dissolved in the water, which excludes metals attached to suspended particles that cannot pass through a 0.45 micron filter. Total recoverable refers to the concentration of an unfiltered sample that is treated with hot dilute mineral acid. In general, the toxicity of metals is related more to the dissolved form than the recoverable form.

4.6.1 Concentrations

Stormwater EMCs for zinc, copper, lead, cadmium and chromium vary regionally and are reviewed in Table 30. Regional differences in trace metal concentrations and water quality standard exceedence appears to be related to climate. In general, drier regions often have a

Table 30: EMCs and Detection Frequency for Metals in Urban Stormwater

Metal	Detection Frequency(1)	EMCs (Fg/l)		Number of Events	Source
		Mean	Median		
Zinc	94%	162	129	2234	Smullen and Cave, 1998
		176	140	1281	USEPA, 1983
Copper	91%	13.5	11.1	1657	Smullen and Cave, 1998
		66.6	54.8	849	USEPA, 1983
Lead	94%	67.5	50.7	2713	Smullen and Cave, 1998
		175(2)	131 (2)	1579	USEPA, 1983
Cadmium	48%	0.7	N/R	150	USEPA, 1983
		0.5	N/R	100	USEPA, 1993
		N/R	0.75 **R** 0.96 **C** 2.1 **I**	30	Baird *et al.*, 1996
		3 **I** 1**U**	N/R	9	Doerfer and Urbonas, 1993
Chromium	58%	4	N/R	32	Baird *et al.*, 1996
		N/R	2.1 **R** 10 **C** 7 **I**	30	Baird *et al.*, 1996
		N/R	7	164	Bannerman *et al.*, 1993

N/R = Not Reported; R- Residential, C- Commercial, I- Industrial; (1) as reprinted in USEPA, 1983; (2) Lead levels have declined over time with the introduction of unleaded gasoline

Table 31: Average Total Recoverable and Dissolved Metals for 13 Stormwater Flows and Nine Baseflow Samples from Lincoln Creek in 1994 (Crunkilton *et al.*, 1996)

	Total Recoverable		Dissolved	
Metal (Fg/l)	Storm Flow	Baseflow	Storm Flow	Baseflow
Lead	35	3	1.7	1.2
Zinc	133	22	13	8
Copper	23	7	5	4
Cadmium	0.6	0.1	0.1	0.1

higher risk of exceeding trace metal concentration standards.

Crunkilton *et al.* (1996) measured recoverable and dissolved metals concentrations in Lincoln Creek, Wisconsin and found higher EMCs during storm events compared to baseflow periods (Table 31). They also found that total recoverable metal concentrations were almost always higher than the dissolved concentration (which is the more available form).

4.6.2 Impacts of Trace Metals on Streams

Although a great deal is known about the concentration of metals in urban stormwater, much less is known about their possible toxicity on aquatic biota. The primary concern related to the presence of trace metals in streams is their potential toxicity to aquatic organisms. High concentrations can lead to bioaccumulation of metals in plants and animals, possible chronic or acute toxicity, and contamination of sediments, which can affect bottom dwelling organisms (Masterson and Bannerman, 1994). Generally, trace metal concentrations found in urban stormwater are not high enough to cause acute toxicity (Field and Pitt, 1990). The cumulative accumulation of trace metal concentrations in bottom sediments and animal tissues are of greater concern. Some evidence exists for trace metal accumulation in bottom sediments of receiving waters and for bioaccumulation in aquatic species (Bay and Brown, 2000 and Livingston, 1996).

Relatively few studies have examined the chronic toxicity issue. Crunkilton *et al.* (1996) found that concentrations of lead, zinc and copper exceeded EPA's Chronic Toxicity Criteria more than 75% of the time in stormflow in stormwater samples for Lincoln Creek in Wisconsin. When exposed to storm and base flows in Lincoln Creek, *Ceriodaphnia dubia*, a common invertebrate test species, demonstrated significant mortality in extended flow-through tests. Around 30% mortality was recorded after seven days of exposure and 70% mortality was recorded after 14 days.

Crunkilton *et al.* (1996) also found that significant mortality in bullhead minnows occurred in only 14% of the tests by the end of 14 days, but mortality increased to 100% during exposures of 17 to 61 days (see Table 32). In a related study in the same watershed, Masterson and Bannerman (1994) determined that crayfish in Lincoln Creek had elevated levels of lead, cadmium, chromium and copper when compared to crayfish from a reference stream. The Lincoln Creek research provides limited evidence that prolonged exposure to trace metals in urban streams may result in significant toxicity.

Most toxicity research conducted on urban stormwater has tested for acute toxicity over a short period of time (two to seven days). Shorter term whole effluent toxicity protocols are generally limited to seven days (Crunkilton *et al.*, 1996). Research by Ellis (1986) reported delayed toxicity in urban streams. Field and Pitt (1990) demonstrated that pollutants deposited to the stream during storm events

may take upwards of 10 to 14 days to exert influence. The research suggests that longer term in-situ and flow-through monitoring are needed to definitively answer the question whether metal levels in stormwater can be chronically toxic.

An additional concern is that trace metals co-occur with other pollutants found in urban stormwater, and it is not clear whether they interact to increase or decrease potential toxicity. Hall and Anderson (1988) investigated the toxicity and chemical composition of urban stormwater runoff in British Columbia and found that the interaction of pollutants changed the toxicity of some metals. In laboratory analysis with *Daphnia pulex*, an aquatic invertebrate, they found that the toxicity of iron was low and that its presence reduced the toxicity of other metals. On the other hand, the presence of lead increased the toxicity of copper and zinc.

Interaction with sediment also influences the impact of metals. Often, over half of the trace metals are attached to sediment (MWCOG, 1983). This effectively removes the metals from the water column and reduces the availability for biological uptake and subsequent bioaccumulation (Gavin and Moore, 1982 and OWML, 1983). However, metals accumulated in bottom sediment can then be resuspended during storms (Heaney and Huber, 1978). It is important to note that the toxic effect of metals can be altered when found in conjunction with other substances. For instance, the presence of chlorides can increase the toxicity of some metals. Both metals and chlorides are common pollutants in snowpacks (see section 4.2 for more snow melt information).

4.6.3 Sources and Source Areas of Trace Metals

Research conducted in the Santa Clara Valley of California suggests that cars can be the dominant loading source for many metals of concern, such as cadmium, chromium, copper, lead, mercury and zinc (EOA, Inc., 2001). Other sources are also important and include atmospheric deposition, rooftops and runoff from industrial and residential sites.

The sources and source areas for zinc, copper, lead, chromium and cadmium are listed in Table 33. Source areas for trace metals in the urban environment include streets, parking lots, snowpacks and rooftops. Copper is often found in higher concentrations on urban streets, because some vehicles have brake pads that contain copper. For example, the Santa Clara study estimated that 50% of the total copper load was due to brake pad wear (Woodward-Clyde, 1992). Sources of lead include atmospheric deposition and diesel fuel emissions, which frequently occur along rooftops

Table 32: Percentage of In-situ Flow-through Toxicity Tests Using Daphnia *magna* and Pimephales *promelas* with Significant Toxic Effects from Lincoln Creek (Crunkilton *et al.*, 1996)

Species	Effect	Percent of Tests with Significant (p<0.05) Toxic Effects as Compared to Controls According to Exposure				
		48 hours	96 hours	7 days	14 days	17-61 days
D. *magna*	Mortality	0	N/R	36%	93%	N/R
	Reduced Reproduction	0	N/R	36%	93%	N/R
P. *promelas*	Mortality	N/R	0	0	14%	100%
	Reduced Biomass	N/R	N/R	60%	75%	N/R

N/R = Not Reported

and streets. Zinc in urban environments is a result of the wear of automobile tires (estimated 60% in the Santa Clara study), paints, and weathering of galvanized gutters and downspouts. Source area concentrations of trace metals are presented in Table 34. In general, trace metal concentrations vary considerably, but the relative rank among source areas remains relatively constant. For example, a source loading model developed for an urban watershed in Michigan estimated that parking lots, driveways and residential streets were the primary source areas for zinc, copper and cadmium loads (Steuer *et al.*, 1997).

Table 33: Metal Sources and Source Area "Hotspots" in Urban Areas

Metal	Sources	Source Area Hotspots
Zinc	tires, fuel combustion, galvanized pipes, roofs and gutters, road salts **estimate of 60% from tires*	parking lots, commercial and industrial rooftops, and streets
Copper	auto brake linings, pipes and fittings, algacides, and electroplating **estimate of 50% from brake pad wear*	parking lots, commercial roofs and streets
Lead	diesel fuel, paints and stains	parking lots, rooftops, and streets
Cadmium	component of motor oil and corrodes from alloys and plated surfaces	parking lots, rooftops, and streets
Chromium	found in exterior paints and corrodes from alloys and plated surfaces	most frequently found in industrial and commercial runoff

Sources: Bannerman et al., 1993; Barr, 1997; Steuer et al., 1997; Good, 1993; Woodward - Clyde, 1992

Table 34: Metal Source Area Concentrations in the Urban Landscape (Fg/l)

Source Area	Dissolved Zinc	Total Zinc	Dissolved Copper		Total Copper	Dissolved Lead		Total Lead		
Source	(1)	(2)	(1)	(2)	(2)	(1)	(3)	(1)	(3)	(2)
Commercial Parking Lot	64	178	10.7	9	15	N/R	N/R	40	N/R	22
High Traffic Street	73	508	11.2	18	46	2.1	1.7	37	25	50
Medium Traffic Street	44	339	7.3	24	56	1.5	1.9	29	46	55
Low Traffic Street	24	220	7.5	9	24	1.5	.5	21	10	33
Commercial Rooftop	263	330	17.8	6	9	20	N/R	48	N/R	9
Residential Rooftop	188	149	6.6	10	15	4.4	N/R	25	N/R	21
Residential Driveway	27	107	11.8	9	17	2.3	N/R	52	N/R	17
Residential Lawn	N/R	59	N/R	13	13	N/R	N/R	N/R	N/R	N/R
Basin Outlet	23	203	7.0	5	16	2.4	N/R	49	N/R	32

Sources: (1) Steuer et al., 1997; (2) Bannerman et al., 1993; (3) Waschbusch, 2000; N/R = Not Reported

4.7 Hydrocarbons: PAH, Oil and Grease

Hydrocarbons are petroleum-based substances and are found frequently in urban stormwater. The term "hydrocarbons" is used to refer to measurements of oil and grease and polycyclic-aromatic hydrocarbons (PAH). Certain components of hydrocarbons, such as pyrene and benzo[b]fluoranthene, are carcinogens and may be toxic to biota (Menzie-Cura , 1995). Hydrocarbons normally travel attached to sediment or organic carbon. Like many pollutants, hydrocarbons accumulate in bottom sediments of receiving waters, such as urban lakes and estuaries. Relatively few studies have directly researched the impact of hydrocarbons on streams.

4.7.1 Concentrations

Table 35 summarizes reported EMCs of PAH and oil and grease derived from storm event monitoring at three different areas of the U.S. The limited research on oil and grease concentrations in urban runoff indicated that the highest concentrations were consistently found in commercial areas, while the lowest were found in residential areas.

4.7.2 Impacts of Hydrocarbons on Streams

The primary concern of PAH and oil and grease on streams is their potential bioaccumulation and toxicity in aquatic organisms. Bioaccumulation in crayfish, clams and fish has been reported by Masterson and Bannerman (1994); Moring and Rose (1997); and Velinsky and Cummins (1994).

Table 35: Hydrocarbon EMCs in Urban Areas

Hydrocarbon Indicator	EMC Mean	Number of Events	Source	Location
PAH (Fg/l)	3.2*	12	Menzie-Cura, 1995	MA
	7.1	19	Menzie-Cura, 1995	MA
	13.4	N/R	Crunkilton *et al.*, 1996	WI
Oil and Grease (mg/l)	1.7 **R** 9 **C** 3 **I**	30	Baird *et al.*, 1996	TX
	3	N/R	USEPA, 1983	U.S.
	5.4*	8	Menzie-Cura, 1995	MA
	3.5	10	Menzie-Cura, 1995	MA
	3.89 **R** 13.13 **C** 7.10 **I**	N/R	Silverman *et al.*, 1988	CA
	2.35 **R** 5.63 **C** 4.86 **I**	107	Barr, 1997	MD

*N/R = Not Reported; R = Residential, C = Commercial, I = Industrial; * = geometric mean, ** = median*

Moring and Rose (1997) also showed that not all PAH compounds accumulate equally in urban streams. They detected 24 different PAH compounds in semi-permeable membrane devices (SPMDs), but only three PAH compounds were detected in freshwater clam tissue. In addition, PAH levels in the SPMDs were significantly higher than those reported in the clams.

While acute PAH toxicity has been reported at extremely high concentrations (Ireland *et al.*, 1996), delayed toxicity has also been found (Ellis, 1986). Crayfish from Lincoln Creek had a PAH concentration of 360 Fg/kg, much higher than the concentration thought to be carcinogenic (Masterson and Bannerman, 1994). By comparison, crayfish in a non-urban stream had undetectable PAH levels. Toxic effects from PAH compounds may be limited since many are attached to sediment and may be less available, with further reduction occurring through photodegradation (Ireland *et al.,* 1996).

The metabolic effect of PAH compounds on aquatic life is unclear. Crunkilton *et al.* (1996) found potential metabolic costs to organisms, but Masterson and Bannerman (1994) and MacCoy and Black (1998) did not. The long-term effect of PAH compounds in sediments of receiving waters remains a question for further study.

4.7.3 Sources and Source Areas of Hydrocarbons

In most residential stormwater runoff, hydrocarbon concentrations are generally less than 5mg/l, but the concentrations can increase to five to 10 mg/l within some commercial, industrial and highway areas (See Table 35). Specific "hotspots" for hydrocarbons include gas stations, commuter parking lots, convenience stores, residential parking areas and streets (Schueler and Shepp, 1993). These authors evaluated hydrocarbon concentrations within oil and grease separators in the Washington Metropolitan area and determined that gas stations had significantly higher concentrations of hydrocarbons and trace metals, as compared to other urban source areas. Source area research in an urban catchment in Michigan showed that commercial parking lots contributed 64% of the total hydrocarbon load (Steuer *et al.*, 1997). In addition, highways were found to be a significant contributor of hydrocarbons by Lopes and Dionne (1998).

4.8 Bacteria and Pathogens

Bacteria are single celled organisms that are too small to see with the naked eye. Of particular interest are coliform bacteria, typically found within the digestive system of warm-blooded animals. The coliform family of bacteria includes fecal coliform, fecal streptococci and Escherichia coli, which are consistently found in urban stormwater runoff. Their presence confirms the existence of sewage or animal wastes in the water and indicates that other harmful bacteria, viruses or protozoans may be present, as well. Coliform bacteria are indicators of potential public health risks and not actual causes of disease.

A pathogen is a microbe that is actually known to cause disease under the right conditions. Two of the most common waterborne pathogens in the U.S. are the protozoans *Cryptosporidium parvum* and *Giardia lambia*. *Cryptosporidium* is a waterborne intestinal parasite that infects cattle and domestic animals and can be transmitted to humans, causing life-threatening problems in people with impaired immune systems (Xiao *et al.*, 2001). *Giardia* can cause intestinal problems in humans and animals when ingested (Bagley *et al.,* 1998). To infect new hosts, protozoans create hard casings known as oocysts (*Cryptosporidium*) or cysts (*Giardia*) that are shed in feces and travel through surface waters in search of a new host.

4.8.1 Concentrations

Concentrations of fecal coliform bacteria in urban stormwater typically exceed the 200 MPN/100 ml threshold set for human contact recreation (USGS, 2001b). Bacteria concentrations also tend to be highly variable from storm to storm. For example, a national summary of fecal coliform bacteria in stormwater runoff is shown in Figure 35 and Table 36. The variability in fecal coliform ranges from 10 to 500,000 MPN/100ml with a mean of 15,038 MPN/100ml (Schueler, 1999). Another national database of more than 1,600 stormwater events computed a mean concentration of 20,000

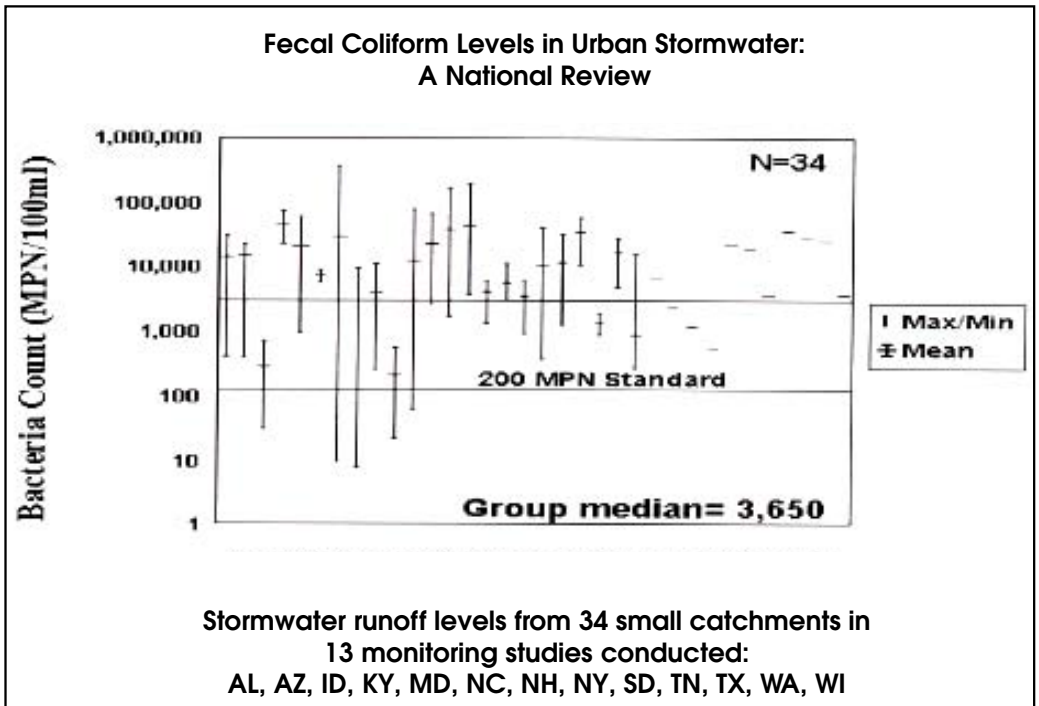

Figure 35: Fecal Coliform Levels in Urban Stormwater (Schueler, 1999)

Table 36: Bacteria EMCs in Urban Areas

Bacteria Type	EMCs (MPN/100ml) Mean	Number of Events	Source	Location
Fecal Coliform	15,038	34	Schueler, 1999	U.S.
	20,000	1600	Pitt, 1998	U.S.
	7,653	27	Thomas and McClelland, 1995	GA
	20,000 **R*** 6900 **C** 9700 **I**	30*	Baird *et al.*, 1996	TX
	77,970	21 watersheds	Chang *et al.*, 1990	TX
	4,500	189	Varner, 1995	WA
	23,500	3	Young and Thackston, 1999	TN
Fecal Strep	35,351	17	Schueler, 1999	U.S.
	28,864 **R**	27	Thomas and McClelland, 1995	GA
	56,000 **R** * 18,000 **C** 6,100 **I**	30*	Baird *et al.*, 1996	TX

*N/R = Not Reported, R = Residential Area, C = Commercial Area, I = Industrial Area, * = Median*

MPN/100ml for fecal coliform (Pitt, 1998). Fecal streptococci concentrations for 17 urban sites across the country had a mean of 35,351 MPN/100ml (Schueler, 1999).

Young and Thackston (1999) showed that bacteria concentrations at four sites in metro Nashville were directly related to watershed IC. Increasing IC reflects the cumulative increase in potential bacteria sources in the urban landscape, such as failing septic systems, sewage overflows, dogs, and inappropriate discharges. Other studies show that concentrations of bacteria are typically higher in urban areas than rural areas (USGS, 1999a), but they are not always directly related to IC. For example, Hydroqual (1996) found that concentrations of fecal coliform in seven subwatersheds of the Kensico watershed in New York were generally higher for more developed basins, but fecal coliform concentrations did not directly increase with IC in the developed basins (Figure 36).

There is some evidence that higher concentrations of coliform are found in arid or semi-arid watersheds. Monitoring data from semi-arid regions in Austin, San Antonio, and Corpus Christi, Texas averaged 61,000, 37,500 and 40,500 MPN/100ml, respectively (Baird *et al.*,1996 and Chang *et al.* 1990). Schiff (1996), in a report of Southern California NPDES monitoring, found that median concentrations of fecal coliform in San Diego were 50,000 MPN/100ml and averaged 130,000 MPN/100ml in Los Angeles. In all of these arid and semi-arid regions, concentrations were significantly higher than the national average of 15,000 to 20,000 MPN/100ml.

Concentrations of *Cryptosporidium* and *Giardia* in urban stormwater are shown in Table 37. States *et al.* (1997) found high concentrations of *Cryptosporidium* and *Giardia* in storm samples from a combined sewer in Pittsburgh (geometric mean 2,013 oocysts/100ml and 28,881 cysts/100ml). There is evidence that urban stormwater runoff may have higher concentrations of *Cryptosporidium* and *Giardia* than other surface waters, as reported in Table 38 (Stern, 1996). Both pathogens were detected in about 50% of urban stormwater samples, suggesting some concern for drinking water supplies.

4.8.2 Impacts of Bacteria and Pathogens on Streams

Fecal coliform bacteria indicate the potential for harmful bacteria, viruses, or protozoans and are used by health authorities to determine public health risks. These standards were established to protect human health based on exposures to water during recreation and drinking. Bacteria standards for various water uses are presented in Table 39 and are all easily exceeded by typical urban stormwater concentrations. In fact, over 80,000 miles of streams and rivers are currently in non-attain-

Table 37: *Cryptosporidium* and *Giardia* EMCs

Pathogens	Units	EMCs		Number of Events	Source
		Mean	Median		
Cryptosporidium	oocysts	37.2	3.9	78	Stern, 1996
	oocysts/100ml	2013	N/R	N/R	States *et al.*, 1997
Giardia	cysts	41.0	6.4	78	Stern, 1996
	cysts/100ml	28,881	N/R	N/R	States *et al.*, 1997

N/R= Not reported

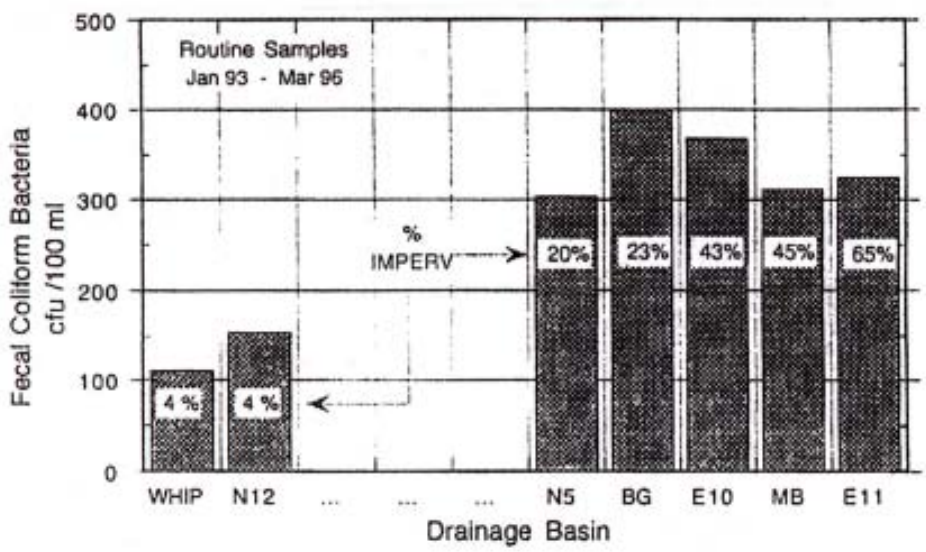

Figure 36: Relationship Between IC and Fecal Coliform Concentrations in New York Streams (Hydroqual, 1996)

Table 38: Percent Detection of *Giardia* cysts and *Cryptosporidium* oocysts in Subwatersheds and Wastewater Treatment Plant Effluent in the New York City Water Supply Watersheds (Stern, 1996)

Source Water Sampled	Number of Sources/ Number of Samples	Percent Detection			
		Total *Giardia*	Confirmed *Giardia*	Total *Cryptosporidium*	Confirmed *Cryptosporidium*
Wastewater Effluent	8/147	41.5%	12.9%	15.7%	5.4%
Urban Subwatershed	5/78	41.0%	6.4%	37.2%	3.9%
Agricultural Subwatershed	5/56	30.4%	3.6%	32.1%	3.6%
Undisturbed Subwatershed	5/73	26.0%	0.0%	9.6%	1.4%

Table 39: Typical Coliform Standards for Different Water Uses (USEPA, 1998)

Water Use	Microbial Indicator	Typical Water Standard
Water Contact Recreation	Fecal Coliform	<200 MPN per 100ml
Drinking Water Supply	Fecal Coliform	<20 MPN per 100ml
Shellfish Harvesting	Fecal Coliform	<14 MPN/ 100ml
Treated Drinking Water	Total Coliform	No more than 1% coliform positive samples per month
Freshwater Swimming	E.Coli	<126 MPN per 100ml

Important Note: Individual state standards may employ different sampling methods, indicators, averaging periods, averaging methods, instantaneous maximums and seasonal limits. MPN = most probable number. Higher or lower limits may be prescribed for different water use classes.

ment status because of high fecal coliform levels (USEPA, 1998).

4.8.3 Sources and Source Areas of Bacteria and Pathogens

Sources of coliform bacteria include waste from humans and wildlife, including livestock and pets. Essentially, any warm-blooded species that is present in significant numbers in a watershed is a potential culprit. Source identification studies, using methods such as DNA fingerprinting, have put the blame on species such as rats in urban areas, ducks and geese in stormwater ponds, livestock from hobby farms, dogs and even raccoons (Blankenship, 1996; Lim and Olivieri, 1982; Pitt, 1998; Samadpour and Checkowitz, 1998).

Transport of bacteria takes place through direct surface runoff, direct inputs to receiving waters, or indirect secondary sources. Source areas in the urban environment for direct runoff include lawns and turf, driveways, parking lots and streets. For example, dogs have high concentrations of fecal coliform in their feces and have a tendency to defecate in close proximity to IC (Schueler, 1999). Weiskel *et al.* (1996) found that direct inputs of fecal coliform from waterfowl can be very

important; these inputs accounted for as much as 67% of the annual coliform load to Buttermilk Bay, Massachusetts.

Indirect sources of bacteria include leaking septic systems, illicit discharges, sanitary sewer overflows (SSOs), and combined sewer overflows (CSOs). These sources have the potential to deliver high coliform concentrations to urban streams. In fact, extremely high bacteria concentrations are usually associated with wastewater discharges. CSOs and SSOs occur when the flow into the sewer exceeds the capacity of the sewer lines to drain them. CSOs result from stormwater flow in the lines, and SSOs are a result of infiltration problems or blockages in the lines.

Illicit connections from businesses and homes to the storm drainage system can discharge sewage or washwater into receiving waters. Illicit discharges can often be identified by baseflow sampling of storm sewer systems. Leaking septic systems are estimated to comprise between 10 and 40% of the systems, and individual inspections are the best way to determine failing systems (Schueler, 1999).

There is also evidence that coliform bacteria can survive and reproduce in stream sediments and storm sewers (Schueler, 1999). During a storm event, they often become resuspended and add to the in-stream bacteria load. Source area studies reported that end of pipe concentrations were an order of magnitude higher than any source area on the land surface; therefore, it is likely that the storm sewer system itself acts as a source of fecal coliform (Bannerman *et al.*, 1993 and Steuer *et al.*, 1997). Resuspension of fecal coliform from fine stream sediments during storm events has been reported in New Mexico (NMSWQB, 1999). The sediments in-stream and in the storm sewer system may be significant contributors to the fecal coliform load.

Sources of *Cryptosporidium* and *Giardia* include human sewage and animal feces. *Cryptosporidium* is commonly found in cattle, dogs and geese. Graczyk *et al.* (1998) found that migrating Canada geese were a vector for *Cryptosporidium* and *Giardia*, which has implications for water quality in urban ponds that support large populations of geese.

4.9 Organic Carbon

Total organic carbon (TOC) is often used as an indicator of the amount of organic matter in a water sample. Typically, the more organic matter present in water, the more oxygen consumed, since oxygen is used by bacteria in the decomposition process. Adequate levels of dissolved oxygen in streams and receiving waters are important because they are critical to maintain aquatic life. Organic carbon is routinely found in urban stormwater, and high concentrations can result in an increase in Biochemical Oxygen Demand (BOD) and Chemical Oxygen Demand (COD). BOD and COD are measures of the oxygen demand caused by the decay of organic matter.

4.9.1 Concentrations

Urban stormwater has a significant ability to exert a high oxygen demand on a stream or receiving water, even two to three weeks after an individual storm event (Field and Pitt, 1990). Average concentrations of TOC, BOD and COD in urban stormwater are presented in Table 40. Mean concentrations of TOC, BOD and COD during storm events in nationwide studies were 17 mg/l, 14.1 mg/l and 52.8 mg/l, respectively (Kitchell, 2001 and Smullen and Cave,1998).

4.9.2 Impacts of Organic Carbon on Streams

TOC is primarily a concern for aquatic life because of its link to oxygen demand in streams, rivers, lakes and estuaries. The initial effect of increased concentrations of TOC, BOD or COD in stormwater runoff may be a depression in oxygen levels, which may persist for many days after a storm, as deposited organic matter gradually decomposes (Field and Pitt, 1990).

TOC is also a concern for drinking water quality. Organic carbon reacts with chlorine during the drinking water disinfection process and forms trihalomethanes and other disinfection by-products, which can be a serious drinking water quality problem (Water, 1999). TOC concentrations greater than 2 mg/l in treated water and 4 mg/l in source water can result in unacceptably high levels of disinfection byproducts and must be treated to reduce TOC or remove the disinfection byproducts (USEPA, 1998). TOC can also be a carrier for other pollutants, such as trace metals, hydrocarbons and nutrients.

4.9.3 Sources and Source Areas of Total Organic Carbon

The primary sources of TOC in urban areas appear to be decaying leaves and other organic matter, sediment and combustion by-products. Source areas include curbs, storm drains, streets and stream channels. Dartiguenave *et al.* (1997) determined that about half of the annual TOC load in urban watersheds of Austin, TX was derived from the eroding streambanks.

Table 40: EMCs for Organic Carbon in Urban Areas

Organic Carbon Source	EMCs (mg/l)		Number of Events	Source
	Mean	Median		
Total Organic Carbon (TOC)	32.0	N/R	423	Barrett and Malina, 1998
	17	15.2	19 studies	Kitchell, 2001
Biological Oxygen Demand (BOD)	14.1	11.5	1035	Smullen and Cave, 1998
	10.4	8.4	474	USEPA, 1983
Chemical Oxygen Demand (COD)	52.8	44.7	2639	Smullen and Cave, 1998
	66.1	55	1538	USEPA, 1983

N/R = Not Reported

4.10 MTBE

Methyl tertiary butyl-ether (MTBE) is a volatile organic compound (VOC) that is added to gasoline to increase oxygen levels, which helps gas burn cleaner (called an oxygenate). MTBE has been used as a performance fuel additive since the 1970s. In 1990, the use of oxygenates was mandated by federal law and concentrations of MTBE in gasoline increased. Today, MTBE is primarily used in large metropolitan areas that experience air pollution problems. Since 1990, MTBE has been detected at increasing levels in both surface water and groundwater and is one of the most frequently detected VOCs in urban watersheds (USGS, 2001a). EPA has declared MTBE to be a potential human carcinogen at high doses. In March 2000, a decision was made by EPA to follow California's lead to significantly reduce or eliminate the use of MTBE in gasoline.

4.10.1 Concentrations

MTBE is highly soluble in water and therefore not easily removed once it enters surface or ground water. Delzer (1999) detected the presence of MTBE in 27% of the shallow wells monitored in eight urban areas across the country (Figure 37). Detection frequency was significantly higher in New England and Denver, as shown in Table 41. In a second study conducted in 16 metropolitan areas, Delzer (1999) found that 83% of MTBE detections occurred between October and March, the time when MTBE is primarily used as a fuel additive. The median MTBE concentration was 1.5 ppb, well below EPA's draft advisory level of 20 ppb (Delzer, 1996).

4.10.2 Impacts of MTBE on Streams

The primary concerns regarding MTBE are that it is a known carcinogen to small mammals, a suspected human carcinogen at higher

Table 41: MTBE Detection Frequency

Location	Detection Frequency	Source	Year
211 shallow wells in eight urban areas	27%	Delzer	1999
Surface water samples in 16 metro areas	7%	Delzer	1996

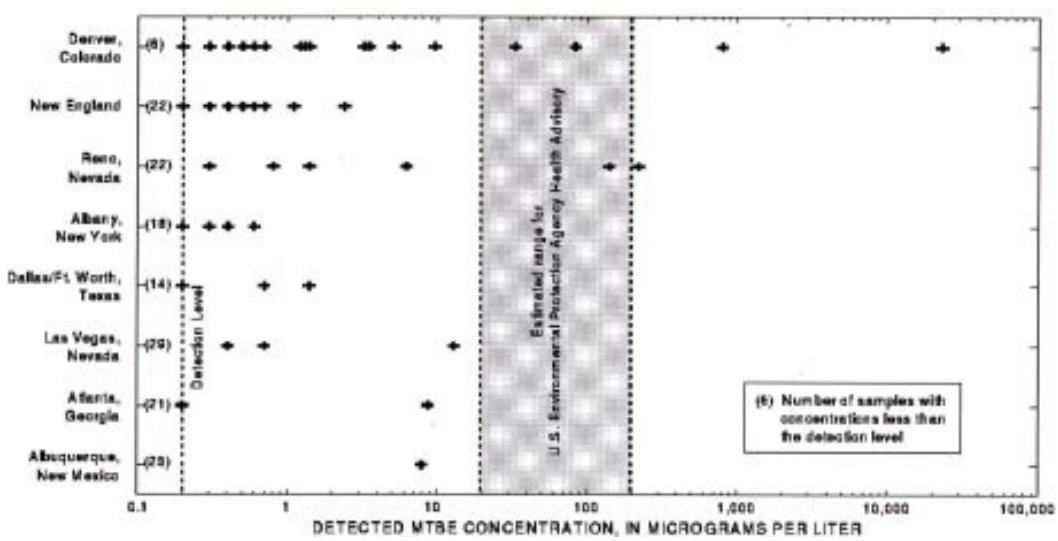

Figure 37: MTBE Concentrations in Surface Water from Eight Cities (Delzer, 1996)

doses and may possibly be toxic to aquatic life in small streams (Delzer, 1996). MTBE can also cause taste and odor problems in drinking water at fairly low concentrations. EPA issued a Drinking Water Advisory in 1997 that indicated that MTBE concentrations less than 20 ppb should not cause taste and odor problems for drinking water. However, the Association of California Water Agencies reports that some consumers can detect MTBE at levels as low as 2.5 ppb (ACWA, 2000). Because MTBE is frequently found in groundwater wells, it is thought to be a potential threat to drinking water (Delzer, 1999). For example, Santa Monica, California reportedly lost half of its groundwater drinking water supply due to MTBE contamination (Bay and Brown, 2000). MTBE has also been detected in human blood, especially in people frequently exposed to gasoline, such as gas station attendants (Squillace *et al.*, 1995).

4.10.3 Sources and Source Areas of MTBE

Since MTBE is a gasoline additive, its potential sources include any area that produces, transports, stores, or dispenses gasoline, particularly areas that are vulnerable to leaks and spills. Leaking underground storage tanks are usually associated with the highest MTBE concentrations in groundwater wells (Delzer, 1999). Vehicle emissions are also an important source of MTBE. Elevated levels are frequently observed along road corridors and drainage ditches. Once emitted, MTBE can travel in stormwater runoff or groundwater. Main source areas include heavily used multilane highways. Gas stations may also be a hotspot source area for MTBE contamination.

Another potential source of MTBE is watercraft, since two cycle engines can discharge as much as 20 to 30% of their fuel through the exhaust (Boughton and Lico, 1998). MTBE concentrations are clearly associated with increased use of gas engines, and there is concern that MTBE is an increasing component of atmospheric deposition (Boughton and Lico, 1998 and UC Davis, 1998).

4.11 Pesticides

Pesticides are used in the urban environment to control weeds, insects and other organisms that are considered pests. EPA estimates that nearly 70 million pounds of active pesticide ingredients are applied to urban lawns each year as herbicides or insecticides. Herbicides are used on urban lawns to target annual and perennial broadleaf weeds, while insecticides are used to control insects. Many types of pesticides are available for use in urban areas. Immerman and Drummond (1985) report that 338 different active ingredients are applied to lawns and gardens nationally. Each pesticide varies in mobility, persistence and potential aquatic impact. At high levels, many pesticides have been found to have adverse effects on ecological and human health. Several recent research studies by the USGS have shown that insecticides are detected with the greatest frequency in urban streams, and that pesticide detection frequency increases in proportion to the percentage of urban land in a watershed (Ferrari *et al.*, 1997; USGS, 1998, 1999a-b, 2001b). A national assessment by the USGS

Table 42: Median Concentrations and Detection Frequency of Herbicides and Insecticides in Urban Streams

Pollutant	Detection Frequency	Median Concentration (Fg/l)	Number of Samples	Source
Insecticides				
Diazinon	75%	0.025	326	USGS, 1998b
	92%	0.55	76	Brush *et al.*, 1995
	17%	0.002	1795	Ferrari *et al.*, 1997
Chlorpyrifos	41%	Non Detect	327	USGS, 1998b
	14%	0.004	1218	Brush *et al.*, 1995
Carbaryl	46%	Non Detect	327	USGS, 1998b
	22%	0.003	1128	Ferrari *et al.*, 1997
Herbicides				
Atrazine	86%	0.023	327	USGS, 1998b
	72%	0.099	2076	Ferrari *et al.*, 1997
Prometon	84%	0.031	327	USGS, 1998b
	56%	0.029	1531	Ferrari *et al.*, 1997
Simazine	88%	0.039	327	USGS, 1998b
	17%	0.046	1995	Ferrari *et al.*, 1997
2,4 -D	67%	1.1	11	Dindorf, 1992
	17%	0.035	786	Ferrari *et al.*, 1997
Dicamba	22%	1.8	4	Dindorf, 1992
MCPP	56%	1.8	10	Dindorf, 1992
MCPA	28%	1.0	5	Dindorf, 1992

(2001a) also indicates that insecticides are usually detected at higher concentrations in urban streams than in agricultural streams.

4.11.1 Concentrations

Median concentrations and detection frequency for common pesticides are shown in Table 42. Herbicides that are frequently detected in urban streams include atrazine; simazine; prometon; 2,4-D; dicamba; MCPP; and MCPA. Insecticides are also frequently encountered in urban streams, including diazinon, chlorpyrifos, malathion, and carbaryl. A USGS (1996) study monitored 16 sites in Gills Creek in Columbia, South Carolina over four days. This study reported that pesticide detection frequency increased as percent urban land increased.

Wotzka *et al.* (1994) monitored herbicide levels in an urban stream in Minneapolis, Minnesota during more than 40 storms. They found herbicides, such as 2,4-D; dicamba; MCPP; and MCPA in 85% of storm runoff events sampled. Total herbicide EMCs ranged from less than one to 70 µg/l. Ferrari *et al.* (1997) analyzed 463 streams in the mid-Atlantic region for the presence of 127 pesticide compounds. At least one pesticide was detected at more than 90% of the streams sampled.

Diazinon is one of the most commonly detected insecticides in urban stormwater runoff and dry weather flow. Diazinon was detected in 75% of National Water Quality Assessment (NAWQA) samples, 92% of stormflow samples from Texas, and 100% of urban stormflow samples in King County, Washington (Brush *et al.*, 1995 and USGS, 1999b). Diazinon is most frequently measured at concentrations greater than freshwater aquatic life criteria in urban stormwater (USGS, 1999a). USGS reports that diazinon concentrations were generally higher during urban stormflow (Ferrari *et al.,* 1997).

4.11.2 Impacts of Pesticides on Streams

Many pesticides are known or suspected carcinogens and can be toxic to humans and aquatic species. However, many of the known health effects require exposure to higher concentrations than typically found in the environment, while the health effects of chronic exposure to low levels are generally unknown (Ferrari *et al.*, 1997).

Studies that document the toxicity of insecticides and herbicides in urban stormwater have been focused largely on diazinon. Diazinon is responsible for the majority of acute toxicity in stormwater in Alameda County, California and King County, Washington (S.R. Hansen & Associates, 1995). Concentrations of diazinon in King County stormwater frequently exceed the freshwater aquatic life criteria (Figure 38). Similarly, research on Sacramento, California streams revealed acute toxicity for diazinon in 100% of stormwater samples using *Ceriodaphnia* as the test organism (Connor, 1995). Diazinon has a half-life of 42 days and is very soluble in water, which may explain its detection frequency and persistence in urban stormwater. Diazinon is also reported to attach fairly readily to organic carbon; consequently, it is likely re-suspended during storm events.

Insecticide concentrations exceeding acute and chronic toxicity thresholds for test organisms such as *Ceriodaphnia* have frequently been found in urban stormwater in New York, Texas, California, and Washington (Scanlin and Feng, 1997; Brush *et al.*, 1995; USGS, 1999b). The possibility exists that pesticides could have impacts on larger bodies of water, but there is a paucity of data on the subject at this time.

4.11.3 Sources and Source Areas of Pesticides

Sources for pesticides in urban areas include applications by homeowners, landscaping contractors and road maintenance crews. Source areas for pesticides in urban areas include lawns in residential areas; managed turf, such as golf courses, parks, and ball fields; and rights-of-way in nonresidential areas. Storage areas, which are subject to spills and leaks, can also be a source area. A study in San Francisco was able to trace high diazinon concentrations in some streams back to just a few households which had applied the pesticide at high levels (Scanlin and Feng, 1997). Two herbicides, simazine and atrazine, were detected in over 60% of samples in King County, WA stormwater but were not identified as being sold in retail stores. It is likely these herbicides are applied to nonresidential areas such as rights-of-way, parks and recreational areas (USGS, 1999b). Because pesticides are typically applied to turf, IC is not a direct indicator for pesticide concentrations, although they can drift onto paved surfaces and end up in stormwater runoff.

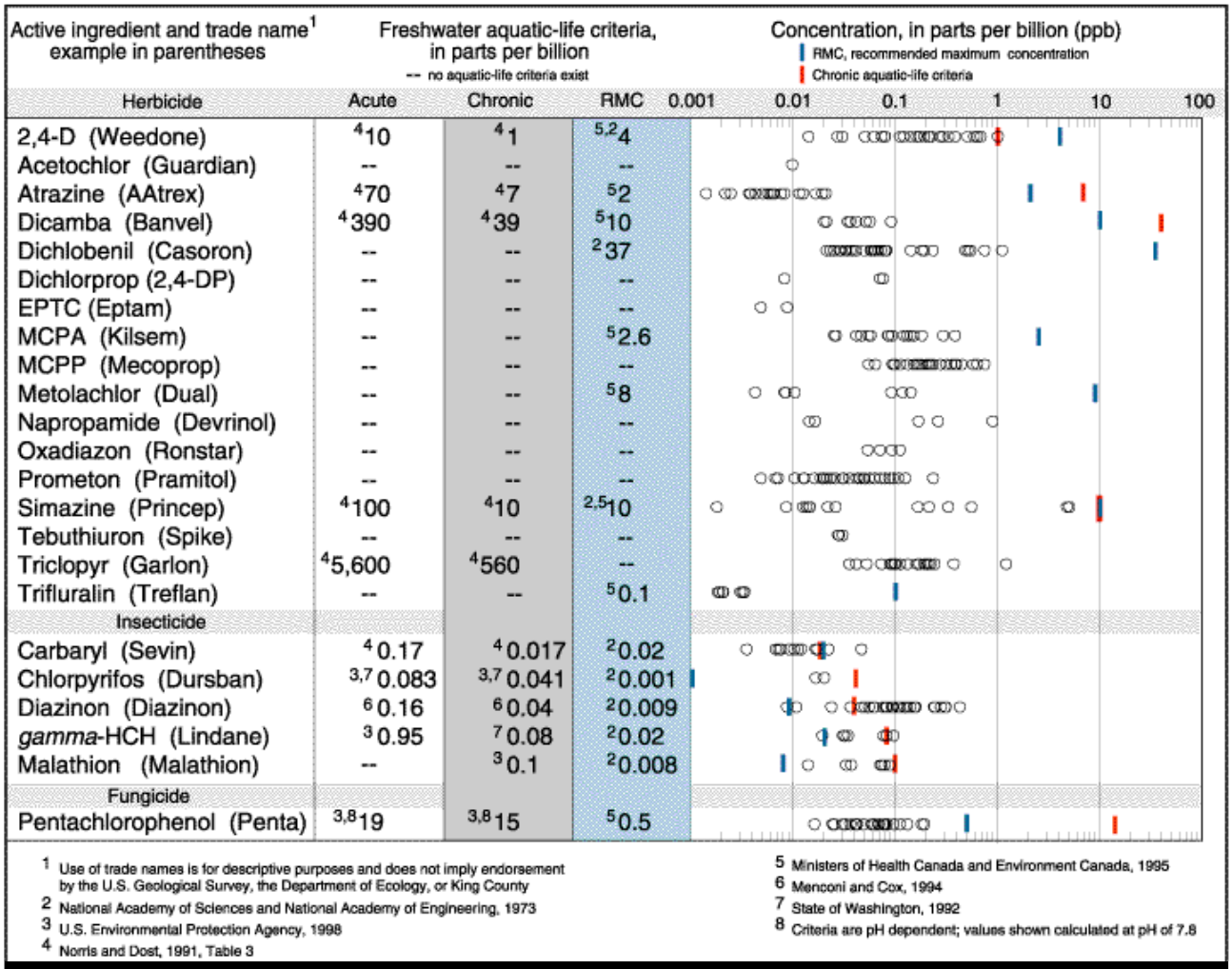

Figure 38: Concentrations of Pesticides in Stormwater in King County, WA (S.R. Hansen & Associates, 1995 and USGS, 1999b)

4.12 Deicers

Deicers are substances used to melt snow and ice to keep roads and walking areas safe. The most commonly used deicer is sodium chloride, although it may also be blended with calcium chloride or magnesium chloride. Other less frequently used deicers include urea and glycol, which are primarily used at airports to deice planes. Table 43 summarizes the composition, use and water quality effects of common deicers.

Chlorides are frequently found in snowmelt and stormwater runoff in most regions that experience snow and ice in the winter months (Oberts, 1994 and Sherman, 1998). Figure 39 shows that the application of deicer salts has increased since 1940 from 200,000 tons to 10 to 20 million tons per year in recent years (Salt Institute, 2001). Several U.S. and Canadian studies indicate severe inputs of road salts on water quality and aquatic life (Environment Canada, 2001 and Novotny *et al.*, 1999).

Table 43: Use and Water Quality Effect of Snowmelt Deicers (Ohrel, 1995; Sills and Blakeslee, 1992)

Deicer	Description	Use	Water Quality Effect
Chlorides	Chloride based deicer usually combined with Na, Ca or Mg	Road Deicer and Residential Use	Cl complexes can release heavy metals, affect soil permeability, impacts to drinking water, potential toxic effects to small streams
Urea	Nitrogen-based fertilizer product	Used as alternative to glycol	Increased nitrogen in water and potential toxicity to organisms
Ethylene Glycol	Petroleum based organic compounds, similar to antifreeze	Used at airports for deicing planes	Toxicity effects, high BOD and COD, hazardous air pollutant

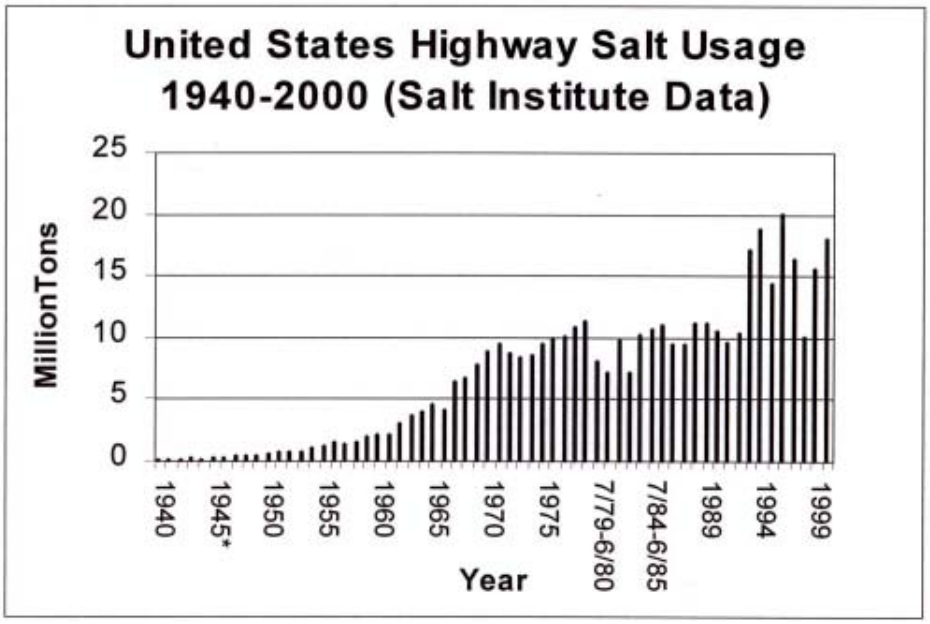

Figure 39: U.S. Highway Salt Usage Data (Salt Institute, 2001)

4.12.1 Concentrations

Chloride concentrations in snowmelt runoff depend on the amount applied and the dilution in the receiving waters. Data for snowmelt and stormwater runoff from several studies are presented in Table 44. For example, chloride concentrations in Lincoln Creek in Wisconsin were 1,612 mg/l in winter snowmelt runoff, as compared to 40 mg/l in non-winter runoff (Novotny *et al.*, 1999 and Masterson and Bannerman, 1994). Chloride concentrations in the range of 2,000 to 5,000 mg/l have been reported for Canadian streams (Environment Canada, 2001). Novotny *et al.* (1999) monitored chloride concentrations in snowmelt near Syracuse, New York and found that residential watersheds had higher chloride concentrations than rural watersheds.

Concentrations of glycol in stormwater runoff are also highly variable and depend on the amount of deicer used, the presence of a recovery system, and the nature of the precipitation event. Corsi *et al*. (2001) monitored streams receiving stormwater runoff from a Wisconsin airport. They found concentrations of propylene glycol as high as 39,000 mg/l at airport outfall sites during deicing operations and concentrations of up to 960 mg/l during low-flow sampling at an airport outfall site.

4.12.2 Impacts of Deicers on Streams

Chloride levels can harm aquatic and terrestrial life and contaminate groundwater and drinking water supplies (Ohrel, 1995). Generally, chloride becomes toxic to many organisms when it reaches concentrations of 500 to1,000 mg/l (Environment Canada, 2001). These concentrations are common in small streams in snow regions, at least for short periods of time. Many plant species are relatively intolerant to high salt levels in wetland swales and roadside corridors. Fish are also negatively affected by high chloride concentrations, with sensitivity as low as 600 mg/l for some species (Scott and Wylie, 1980).

Table 45 compares the maximum chloride concentrations for various water uses in eight states (USEPA, 1988). Snowmelt chloride concentrations typically exceed these levels.

Table 44: EMCs for Chloride in Snowmelt and Stormwater Runoff in Urban Areas

Form of Runoff	EMCs (mg/l)	Number of Events	Sources	Location
	Mean			
Snowmelt	116*	49	Oberts, 1994	MN
	2119	N/R	Sherman, 1998	Ontario
	1267 **R** 474 **U**	N/R	Novotny *et al.*, 1999	NY
	1612	N/R	Masterson and Bannerman, 1994	WI
	397	282	Environment Canada, 2001	Ontario, Canada
Non-winter Storm Event	42	61	Brush *et al.*, 1995	TX
	45	N/R	Sherman, 1998	Ontario
	40.5	N/R	Masterson and Bannerman, 1994	WI

*N/R = Not Reported, R = residential, U = urban, * = Median*

Chloride is a concern in surface drinking water systems because it can interfere with some of the treatment processes and can cause taste problems at concentrations as low as 250 mg/l. Chloride is also extremely difficult to remove once it enters the water.

Glycol-based deicers have been shown to be highly toxic at relatively low concentrations in streams receiving airport runoff. These deicers contain many proprietary agents, which may increase their toxicity and also make it very difficult to set standards for their use (Hartwell *et al.*, 1995). Corsi *et al.* (2001) observed acute toxicity of *Ceriodaphnia dubia*, *Pimephelas promelax*, *Hyalela azteca*, and *Chironimus tentans* in Wisconsin streams that experienced propylene glycol concentrations of 5,000 mg/l or more. Chronic toxicity was observed for *Ceriodaphnia dubia* and *Pimephelas promelax* at propylene glycol concentrations of 1,500 mg/l in the same study. In addition, glycol exerts an extremely high BOD on receiving waters, which can quickly reduce or eliminate dissolved oxygen. Glycol can also be toxic to small animals that are attracted by its sweet taste (Novotny *et al.*, 1999).

As with many urban pollutants, the effects of chloride can be diluted in larger waterbodies. In general, small streams are more likely to experience chloride effects, compared to rivers, which have a greater dilution ability.

4.12.3 Sources and Source Areas of Deicers

The main sources for deicers in urban watersheds include highway maintenance crews, airport deicing operations, and homeowner applications. Direct road application is the largest source of chloride, by far. Source areas include roads, parking lots, sidewalks, storm drains, airport runways, and snow collection areas. Because deicers are applied to paved surfaces, the primary means of transport to streams is through stormwater and meltwater runoff. Therefore, concentrations of deicer compounds are typically associated with factors such as road density or traffic patterns.

Table 45: Summary of State Standards for Salinity of Receiving Waters (USEPA, 1988)

State	Limiting Concentration (mg/l)	Beneficial Use
CO	250*	Drinking water
IL	500	General water supply
	250	Drinking water
IN	500	Drinking water
MA	250	Class A waters
MN	250	Drinking water
	500	Class A fishing and recreation
OH	250	Drinking water
SD	250	Drinking water
	100	Fish propagation
VA	250	Drinking water

** Monthly average*

4.13 Conclusion

IC collects and accumulates pollutants deposited from the atmosphere, leaked from vehicles, or derived from other sources. The pollutants build up over time but are washed off quickly during storms and are often efficiently delivered to downstream waters. This can create water quality problems for downstream rivers, lakes and estuaries.

As a result of local and national monitoring efforts, we now have a much better understanding of the nature and impacts of stormwater pollution. The typical sample of urban stormwater is characterized by high levels of many common pollutants such as sediment, nutrients, metals, organic carbon, hydrocarbons, pesticides, and fecal coliform bacteria. Other pollutants that have more recently become a concern in urban areas include MTBE, deicers, and the pathogens *Cryptosporidium* and *Giardia*. Concentrations of most stormwater pollutants can be characterized, over the long run, by event mean storm concentrations. Monitoring techniques have also allowed researchers to identify source areas for pollutants in the urban environment, including stormwater hotspots, which generate higher pollutant loads than normal development.

In general, most monitoring data shows that mean pollutant storm concentrations are higher in urban watersheds than in non-urban ones. For many urban pollutants, EMCs can be used to predict stormwater pollutant loads for urban watersheds, using IC as the key predictive variable. While a direct relationship between IC and pollutant concentrations does not usually exist, IC directly influences the volume of stormwater and hence, the total load. A few exceptions are worth noting. MTBE, deicers, and PAH appear to be related more to traffic or road density than IC. Additionally, MTBE and PAH concentrations may be greater at hotspot source areas, which are not always widely or uniformly distributed across a watershed. Pesticides, bacteria and pathogens are often associated with turf areas rather than IC. Bacteria and pathogen sources also include direct inputs from wildlife and inappropriate sewage discharges that are not uniformly distributed across a watershed and are not directly related to IC.

Further research into the relationship between stormwater pollutant loads and other watershed indicators may be helpful. For example, it would be interesting to see if turf cover is a good indicator of stream quality for impacted streams. Other important watershed indicators worth studying are the influence of watershed treatment practices, such as stormwater practices and stream buffers.

The direct effects of stormwater pollutants on aquatic systems appears to be a function of the size of the receiving water and the initial health of the aquatic community. For example, a small urban stream receiving high stormwater pollutant concentrations would be more likely to experience impacts than a large river, which is diluted by other land uses. Likewise, organisms in sensitive streams should be more susceptible to stormwater pollutants than pollution-tolerant organisms found in non-supporting streams.

Overall, the following conclusions can be made:

- Sediment, nutrient and trace metal loads in stormwater runoff can be predicted as a function of IC, although concentrations are not tightly correlated with watershed IC.
- Violations of bacteria standards are indirectly associated with watershed IC.
- It is not clear whether loads of hydrocarbons, pesticides or chlorides can be predicted on the basis of IC at the small watershed level.
- More research needs to be conducted to evaluate the usefulness of other watershed indicators to predict stormwater pollutant loads. For example, traffic, road density or hotspots may be useful in predicting MTBE, deicer and hydrocarbon loads. Also, watershed turf cover may be useful in predicting pesticide and bacterial loads.

- Most research on pollutants in stormwater runoff has been conducted at the small watershed level. Additional research is needed to evaluate the impact of watershed treatment, such as stormwater and buffer practices to determine the degree to which these may change stormwater concentrations or loads.
- Regional differences are evident for many stormwater pollutants, and these appear to be caused by either differences in rainfall frequency or snowmelt.

Chapter 5: Biological Impacts of Impervious Cover

This chapter reviews research on the impact of urbanization on the aquatic community, focusing on aquatic insects, fish, amphibians, freshwater mussels, and freshwater wetlands. Specifically, the relationship between the health of the aquatic community and the amount of watershed IC is analyzed within the context of the Impervious Cover Model (ICM).

The chapter is organized as follows:

5.1 Introduction
5.2 Indicators and General Trends
5.3 Effects on Aquatic Insect[1] Diversity
5.4 Effects on Fish Diversity
5.5 Effects on Amphibian Diversity
5.6 Effects on Wetland Diversity
5.7 Effects on Freshwater Mussel Diversity
5.8 Conclusion

5.1 Introduction

A number of studies, crossing different ecoregions and utilizing various techniques, have examined the link between watershed urbanization and its impact on stream and wetland biodiversity. These studies reveal that a relatively small amount of urbanization has a negative effect on aquatic diversity, and that as watersheds become highly urban, aquatic diversity becomes extremely degraded. As documented in prior chapters, hydrologic, physical, and water quality changes caused by watershed urbanization all stress the aquatic community and collectively diminish the quality and quantity of available habitat. As a result, these stressors generally cause a decline in biological diversity, a change in trophic structure, and a shift towards more pollution-tolerant organisms.

Many different habitat conditions are critical for supporting diverse aquatic ecosystems. For example, streambed substrates are vulnerable to deposition of fine sediments, which affects spawning, egg incubation and fry-rearing. Many aquatic insect species shelter in the large pore spaces among cobbles and boulders, particularly within riffles. When fine sediment fills these pore spaces, it reduces the quality and quantity of available habitat. The aquatic insect community is typically the base of the food chain in streams, helps break down organic matter and serves as a food source for juvenile fish.

Large woody debris (LWD) plays a critical role in the habitat of many aquatic insects and fish. For example, Bisson *et al.* (1988) contend that no other structural component is more important to salmon habitat than LWD, especially in the case of juvenile coho salmon. Loss of LWD due to the removal of stream side vegetation can significantly hinder the survival of more sensitive aquatic species. Since LWD creates different habitat types, its quality and quantity have been linked to salmonid rearing habitat and the ability of multiple fish species to coexist in streams.

The number of stream crossings (e.g., roads, sewers and pipelines) has been reported to increase directly in proportion to IC (May *et al*., 1997). Such crossings can become partial or total barriers to upstream fish migration, particularly if the stream bed downcuts below the fixed elevation of a culvert or pipeline. Fish barriers can prevent migration and recolonization of aquatic life in many urban streams.

Urbanization can also increase pollutant levels and stream temperatures. In particular, trace metals and pesticides often bind to sediment particles and may enter the food chain, particularly by aquatic insects that collect and filter particles. While in-stream data is rare, some data are available for ponds. A study of trace

[1] *Throughout this chapter, the term "aquatic insects" is used rather than the more cumbersome but technically correct "benthic macroinvertebrates."*

metal bioaccumulation of three fish species found in central Florida stormwater ponds discovered that trace metal levels were significantly higher in urban ponds than in non-urban control ponds, often by a factor of five to 10 (Campbell, 1995; see also Karouna-Renier, 1995). Although typical stormwater pollutants are rarely acutely toxic to fish, the cumulative effects of sublethal pollutant exposure may influence the stream community (Chapter 4).

Table 46 summarizes some of the numerous changes to streams caused by urbanization that have the potential to alter aquatic biodiversity. For a comprehensive review of the impacts of urbanization on stream habitat and biodiversity, the reader should consult Wood and Armitage (1997) and Hart and Finelli (1999).

Table 46: Review of Stressors to Urban Streams and Effects on Aquatic Life

Stream Change	Effects on Organisms
Increased flow volumes/ Channel forming storms	Alterations in habitat complexity Changes in availability of food organisms, related to timing of emergence and recovery after disturbance Reduced prey diversity Scour-related mortality Long-term depletion of LWD Accelerated streambank erosion
Decreased base flows	Crowding and increased competition for foraging sites Increased vulnerability to predation Increased fine sediment deposition
Increase in sediment transport	Reduced survival of eggs and alevins, loss of habitat due to deposition Siltation of pool areas, reduced macroinvertebrate reproduction
Loss of pools and riffles	Shift in the balance of species due to habitat change Loss of deep water cover and feeding areas
Changes in substrate composition	Reduced survival of eggs Loss of inter-gravel fry refugial spaces Reduced aquatic insect production
Loss of LWD	Loss of cover from predators and high flows Reduced sediment and organic matter storage Reduced pool formation and organic substrate for aquatic insects
Increase in temperature	Changes in migration patterns Increased metabolic activity, increased disease and parasite susceptibility Increased mortality of sensitive fish
Creation of fish blockages	Loss of spawning habitat for adults Inability to reach overwintering sites Loss of summer rearing habitat, Increased vulnerability to predation
Loss of vegetative rooting systems	Decreased channel stability Loss of undercut banks Reduced streambank integrity
Channel straightening or hardening	Increased stream scour Loss of habitat complexity
Reduction in water quality	Reduced survival of eggs and alevins Acute and chronic toxicity to juveniles and adult fish Increased physiological stress
Increase in turbidity	Reduced survival of eggs Reduced plant productivity Physiological stress on aquatic organisms
Algae blooms	Oxygen depletion due to algal blooms, increased eutrophication rate of standing waters

5.2 Indicators and General Trends

Stream indicators are used to gauge aquatic health in particular watersheds. The two main categories of stream indicators are **biotic** and **development** indices. **Biotic** indices use stream diversity as the benchmark for aquatic health and use measures, such as species abundance, taxa richness, EPT Index, native species, presence of pollution-tolerant species, dominance, functional feeding group comparisons, or proportion with disease or anomalies. **Development** indices evaluate the relationship between the degree of watershed urbanization and scores for the biotic indices. Common development indices include watershed IC, housing density, population density, and percent urban land use.

5.2.1 Biological Indicators

Biotic indices are frequently used to measure the health of the aquatic insect or fish community in urban streams. Because many aquatic insects have limited migration patterns or a sessile mode of life, they are particularly well-suited to assess stream impacts over time. Aquatic insects integrate the effects of short-term environmental variations, as most species have a complex but short life cycle of a year or less. Sensitive life stages respond quickly to environmental stressors, but the overall community responds more slowly. Aquatic insect communities are comprised of a broad range of species, trophic levels and pollution tolerances, thus providing strong information for interpreting cumulative effects. Unlike fish, aquatic insects are abundant in most small, first and second order streams. Individuals are relatively easy to identify to family level, and many "intolerant" taxa can be identified to lower taxonomic levels with ease.

Fish are good stream indicators over longer time periods and broad habitat conditions because they are relatively long-lived and mobile. Fish communities generally include a range of species that represents a variety of trophic levels (omnivores, herbivores, insectivores, planktivores, and piscivores). Fish tend to integrate the effects of lower trophic levels; thus, their community structure reflects the prevailing food sources and habitat conditions. Fish are relatively easy to collect and identify to the species level. Most specimens can be sorted and identified in the field by experienced fisheries scientists and subsequently released unharmed.

A review of the literature indicates that a wide variety of metrics are used to measure the aquatic insect and fish community. Community indices, such as the Index of Biotic Integrity (IBI) for fish and the Benthic Index of Biotic Integrity (B-IBI) for the aquatic insect community are a weighted combination of various metrics that typically characterize the community from "excellent" to "poor." Common metrics of aquatic community are often based on a composite of measures, such as species richness, abundance, tolerance, trophic status, and native status. Combined indices (C-IBI) measure both fish and aquatic insect metrics and a variety of physical habitat conditions to classify streams. Table 47 lists several common metrics used in stream assessments. It should be clearly noted that community and combined indices rely on different measurements and cannot be directly compared. For a comprehensive review of aquatic community indicators, see Barbour *et al.*(1999).

5.2.2 Watershed Development Indices

Watershed IC, housing density, population density, and percent urban land have all been used as indices of the degree of watershed development. In addition, reverse indicators such as percent forest cover and riparian continuity have also been used. The majority of studies so far have used IC to explore the relationship between urbanization and aquatic diversity. Percent urban land has been the second most frequently used indicator to describe the impact of watershed development. Table 48 compares the four watershed development indices and the thresholds where significant impacts to aquatic life are typically observed.

Table 47: Examples of Biodiversity Metrics Used to Assess Aquatic Communities

Measurement	Applied to:	Definition of Measurement
Abundance	Fish, Aquatic Insects	Total number of individuals in a sample; sometimes modified to exclude tolerant species.
Taxa Richness	Fish, Aquatic Insects	Total number of unique taxa identified in a sample. Typically, an increase in taxa diversity indicates better water and habitat quality.
EPT Index	Aquatic Insects	Taxa belonging to the following three groups: *Ephemeroptera* (mayflies), *Plecoptera* (stoneflies), *Trichoptera* (caddisflies). Typically, species in these orders are considered to be pollution-intolerant taxa and are generally the first to disappear with stream quality degradation.
Native Status	Fish	Native vs. non-native taxa in the community.
Specific Habitat	Fish	Riffle benthic insectivorous individuals. Total number of benthic insectivores. Often these types of individuals, such as darters, sculpins, and dace are found in high velocity riffles and runs and are sensitive to physical habitat degradation.
		Minnow species Total number of minnow species present. Often used as an indicator of pool habitat quality. Includes all species present in the family Cyprinidae, such as daces, minnows, shiners, stonerollers, and chubs.
Tolerant Species	Fish, Aquatic Insects	The total number of species sensitive to and the number tolerant of degraded conditions. Typically, intolerant species decline with decreasing water quality and stream habitat. A common high pollution-tolerant species that is frequently used is Chironomids.
Dominance	Fish, Aquatic Insects	The proportion of individuals at each station from the single most abundant taxa at that particular station. Typically, a community dominated by a single taxa may be indicative of stream degradation.
Functional Feeding Group Comparisons	Fish	Omnivores/ Generalists: The proportion of individuals characterized as omnivores or generalists to the total number of individuals. Typically, there is a shift away from specialized feeding towards more opportunistic feeders under degraded conditions as food sources become unreliable.
		Insectivores: The proportion of individuals characterized as insectivores to the total number of individuals. Typically, the abundance of insectivores decreases relative to increasing stream degradation.
	Aquatic Insects	Others: The proportion of individuals characterized as shredders, scrapers, or filter feeders to the total number of individuals. Typically, changes in the proportion of functional feeders characterized as shredders can be reflective of contaminated leaf matter. In addition, an overabundance of scrapers over filterers can be indicative of increased benthic algae.
Disease/ Anomalies	Fish	Proportion of individuals with signs of disease or abnormalities. This is ascertained through gross external examination for abnormalities during the field identification process. Typically, this metric assumes that incidence of disease and deformities increases with increasing stream degradation.

** This table is not meant to provide a comprehensive listing of metrics used for diversity indices; it is intended to provide examples of types of measures used in biological stream assessments (see Barbour* et al.*, 1999).*

5.2.3 General Trends

Most research suggests that a decline in both species abundance and diversity begins at or around 10% watershed IC (Schueler, 1994a). However, considerable variations in aquatic diversity are frequently observed from five to 20% IC, due to historical alterations, the effectiveness of watershed management, prevailing riparian conditions, co-occurrence of stressors, and natural biological variation (see Chapter 1).

Figures 40 through 42 display the negative relationship commonly seen between biotic indices and various measures of watershed development. For example, stream research in the Maryland Piedmont indicated that IC was the best predictor of stream condition, based on a combined fish and aquatic insect IBI (MNCPPC, 2000). In general, streams with less than 6% watershed IC were in "excellent" condition, whereas streams in "good" condition had less than 12% IC, and streams in "fair" condition had less than 20%. Figure 40 shows the general boundaries and typical variation seen in MNCPPC stream research.

Figure 41 illustrates that B-IBI scores and Coho Salmon/Cutthroat Trout Ratio are a function of IC for 31 streams in Puget Sound, Washington. The interesting finding was that "good" to "excellent" B-IBI scores (greater than 25) were reported in watersheds that had less than 10% IC, with eight notable outliers. These outliers had greater IC (25 to 35%) but similar B-IBI scores. These outliers are unique in that they had a large upstream wetland and/or a large, intact riparian corridor upstream (i.e. >70% of stream corridor had buffer width >100 feet).

Figure 42 depicts the same negative relationship between watershed urbanization and fish-IBI scores but uses population density as the primary metric of development (Dreher, 1997). The six-county study area included the Chicago metro area and outlying rural watersheds. Significant declines in fish-IBI scores were noted when population density exceeded 1.5 persons per acre.

The actual level of watershed development at which an individual aquatic species begins to decline depends on several variables, but may be lower than that indicated by the ICM. Some researchers have detected impacts for individual aquatic species at watershed IC levels as low as 5%. Other research has suggested that the presence of certain stressors, such as sewage treatment plant discharges (Yoder and Miltner, 2000) or construction sites (Reice, 2000) may alter the ICM and lower the level of IC at which biodiversity impacts become evident.

Table 48: Alternate Land Use Indicators and Significant Impact Levels (Brown, 2000; Konrad and Booth, 2002)

Land Use Indicator	Level at which Significant Impact Observed	Typical Value for Low Density Residential Use	Comments
% IC	10-20%	10%	Most accurate; highest level of effort and cost
Housing Density	>1 unit/acre	1 unit/acre	Low accuracy in areas of substantial commercial or industrial development; less accurate at small scales
Population Density	1.5 to 8+ people/acre	2.5 people/acre	Low accuracy in areas of substantial commercial or industrial development; less accurate at small scales
% Urban Land Use	33% (variable)	10-100%	Does not measure intensity of development; moderately accurate at larger watershed scales
Road Density	5 miles/square mile	2 miles/square mile	Appears to be a potentially useful indicator

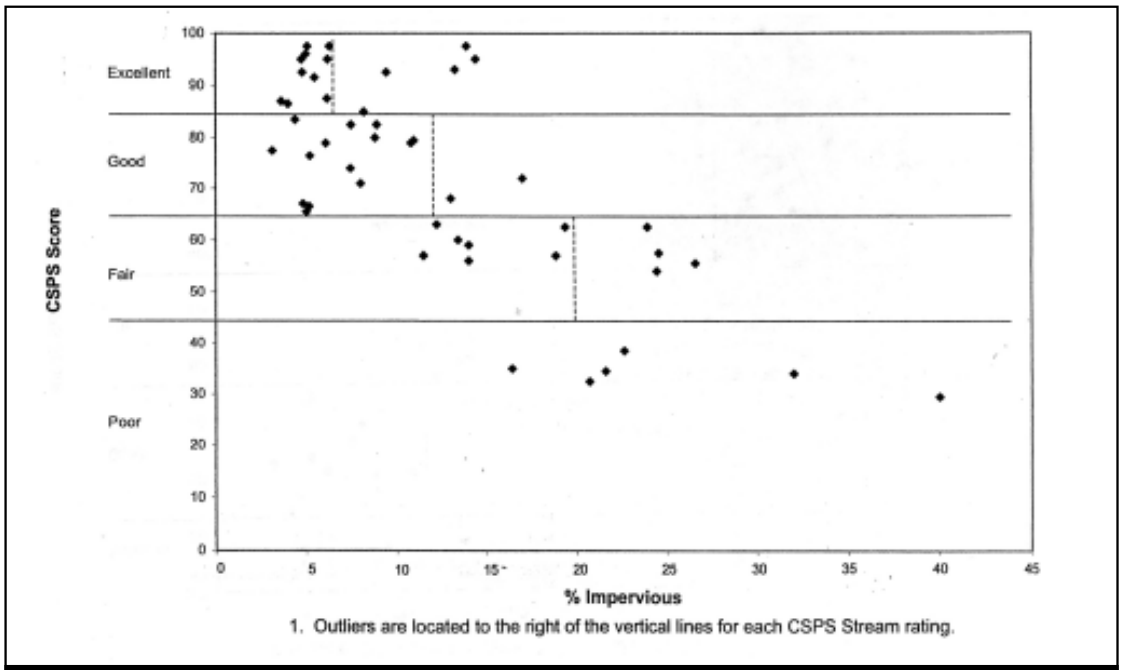

Figure 40: Combined Fish and Benthic IBI vs. IC in Maryland Piedmont Streams (MNCPPC, 2000)

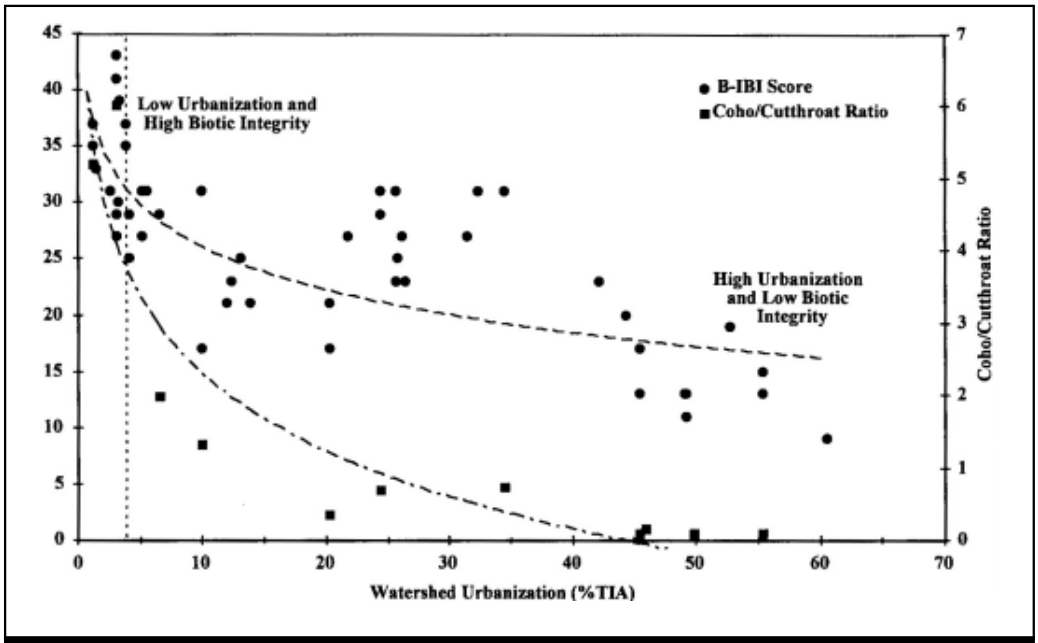

Figure 41: Relationship Between B-IBI, Coho/Cutthroat Ratios, and Watershed IC in Puget Sound Streams (Horner *et al.*, 1997)

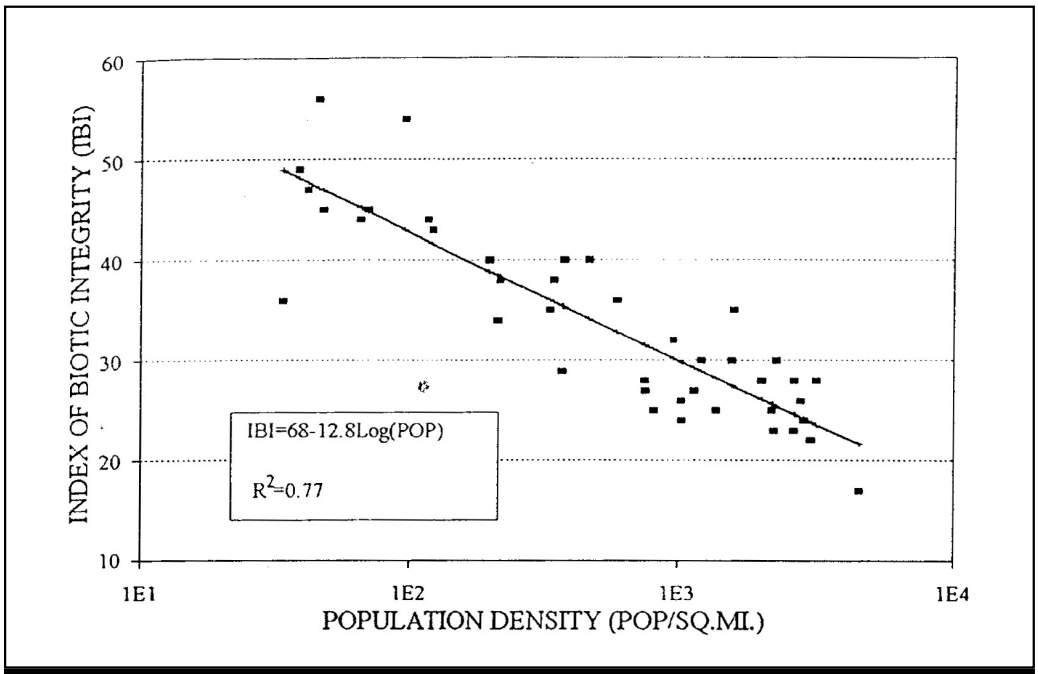

Figure 42: Index for Biological Integrity as a Function of Population Density in Illinois (Dreher, 1997)

5.3 Effects on Aquatic Insect Diversity

The diversity, richness and abundance of the aquatic insect community is frequently used to indicate urban stream quality. Aquatic insects are a useful indicator because they form the base of the stream food chain in most regions of the country. For this reason, declines or changes in aquatic insect diversity are often an early signal of biological impact due to watershed development. The aquatic insect community typically responds to increasing development by losing species diversity and richness and shifting to more pollution-tolerant species. More than 30 studies illustrate how IC and urbanization affect the aquatic insect community. These are summarized in Tables 49 and 50.

5.3.1 Findings Based on IC Indicators

Klein (1979) was one of the first researchers to note that aquatic insect diversity drops sharply in streams where watershed IC exceeded 10 to 15%. While "good" to "fair" diversity was noted in all headwater streams with less than 10% IC, nearly all streams with 12% or more watershed IC recorded "poor" diversity. Other studies have confirmed this general relationship between IC and the decline of aquatic insect species diversity. Their relationships have been an integral part in the development of the ICM. The sharp drop in aquatic insect diversity at or around 12 to 15% IC was also observed in streams in the coastal plain and Piedmont of Delaware (Maxted and Shaver, 1997).

Impacts at development thresholds lower than 10% IC have also been observed by Booth (2000), Davis (2001), Horner *et al.* (1997) and Morse (2001). There seems to be a general recognition that the high levels of variability observed below 10% IC indicate that other factors, such as riparian condition, effluent discharges, and pollution legacy may be better indicators of aquatic insect diversity (Horner and May, 1999; Kennen, 1999; Steedman, 1988; Yoder *et al.*, 1999).

The exact point at which aquatic insect diversity shifts from fair to poor is not known with absolute precision, but it is clear that few, if any, urban streams can support diverse aquatic insect communities with more than 25% IC. Indeed, several researchers failed to find aquatic insect communities with good or excellent diversity in any highly urban stream (Table 52). Indeed, MNCPPC (2000) reported that all streams with more than 20% watershed IC were rated as "poor."

Several good examples of the relationship between IC and B-IBI scores are shown in Figures 43 through 45. Figure 43 depicts the general trend line in aquatic insect diversity as IC increased at 138 stream sites in Northern Virginia (Fairfax County, 2001). The survey study concluded that stream degradation occurred at low levels of IC, and that older developments lacking more efficient site design and stormwater controls tended to have particularly degraded streams. Figures 44 and 45 show similar trends in the relationship between IC and aquatic insect B-IBI scores in Maryland and Washington streams. In particular, note the variability in B-IBI scores observed below 10% IC in both research studies.

Often, shift in the aquatic insect community from pollution-sensitive species to pollution-tolerant species occurs at relatively low IC levels (<10%). This shift is often tracked using the EPT metric, which evaluates sensitive species found in the urban stream community in the orders of *Ephemeroptera* (mayflies), *Plecoptera* (stoneflies), and *Trichoptera* (caddisflies). EPT species frequently disappear in urban streams and are replaced by more pollution-tolerant organisms, such as chironomids, tubificid worms, amphipods and snails.

In undisturbed streams, aquatic insects employ specialized feeding strategies, such as shredding leaf litter, filtering or collecting organic matter that flows by, or preying on other insects. These feeding guilds are greatly reduced in urban streams and are replaced by grazers, collectors and deposit feeders. Maxted and Shaver (1997) found that 90% of sensitive

Table 49: Recent Research Examining the Relationship Between IC and Aquatic Insect Diversity in Streams

Index	Key Finding (s)	Source	Location
Community Index	Three years stream sampling across the state at 1000 sites found that when IC was >15%, stream health was never rated good based on a C-IBI.	Boward *et al.*, 1999	MD
Community Index	Insect community and habitat scores were all ranked as poor in five subwatersheds that were greater than 30% IC.	Black and Veatch, 1994	MD
Community Index	Puget sound study finds that some degradation of aquatic invertebrate diversity can occur at any level of human disturbance (at least as measured by IC). 65% of watershed forest cover usually indicates a healthy aquatic insect community.	Booth, 2000	WA
Community Index	In a Puget Sound study, the steepest decline of B-IBI was observed after 6% IC. There was a steady decline, with approximately 50% reduction in B-IBI at 45% IC.	Horner *et al.*, 1997	WA
Community Index	B-IBI decreases with increasing urbanization in study involving 209 sites, with a sharp decline at 10% IC. Riparian condition helps mitigate effects.	Steedman, 1988	Ontario
Community Index	Wetlands, forest cover and riparian integrity act to mitigate the impact of IC on aquatic insect communities.	Horner *et al.*, 2001	WA, MD, TX
Community Index	B-IBI declines for aquatic insect with increasing IC at more than 200 streams.	Fairfax Co., 2001	VA
Community Index	Two-year stream study of eight Piedmont watersheds reported B-IBI scores declined sharply at an IC threshold of 15-30%.	Meyer and Couch,2000	GA
Community Index	Montgomery County study; subwatersheds with <12% IC generally had streams in good to excellent condition based on a combined fish and aquatic insect IBI. Watersheds with >20% IC had streams in poor condition.	MNCPPC, 2000	MD
Community Index	Study of 1st, 2nd, and 3rd order streams in the Patapsco River Basin showed negative relationship between B-IBI and IC.	Dail *et al.*, 1998	MD
Community Index	While no specific threshold was observed, impacts were seen at even low levels of IC. B-IBI values declined with increasing IC, with high scores observed only in reaches with <5% IC or intact riparian zones or upstream wetlands.	Horner and May, 1999	WA
Community Index	The C-IBI also decreased by 50% at 10-15% IC. These trends were particularly strong at low-density urban sites (0-30% IC).	Maxted and Shaver, 1997	DE
Diversity	In both coastal plain and Piedmont streams, a sharp decline in aquatic insect diversity was found around 10-15% IC.	Shaver *et al.*, 1995	DE
Diversity	In a comparison of Anacostia subwatersheds, there was significant decline in the diversity of aquatic insects at 10% IC.	MWCOG, 1992	DC
Diversity	In several dozen Piedmont headwater streams, aquatic diversity declined significantly beyond 10-12% IC.	Klein, 1979	MD
EPT Value	In a 10 stream study with watershed IC ranging from three to 30%, a significant decline in EPT values was reported as IC increased (r2 = 0.76).	Davis, 2001	MO
Sensitive Species	In a study of 38 wadeable, non-tidal streams in the urban Piedmont, 90% of sensitive organisms were eliminated from the benthic community after watershed IC reaches 10-15%.	Maxted and Shaver, 1997	DE
Species Abundance EPT values	For streams draining 20 catchments across the state, an abrupt decline in species abundance and EPT taxa was observed at approximately 6% IC.	Morse, 2001	ME

Table 50: Recent Research Examining the Relationship of Other Indices of Watershed Development on Aquatic Insect Diversity in Streams			
Biotic	**Key Finding (s)**	**Source**	**Location**
Percent Urban Land use			
Community Index	Study of 700 streams in 5 major drainage basins found that the amount of urban land and total flow of municipal effluent were the most significant factors in predicting severe impairment of the aquatic insect community. Amount of forested land in drainage area was inversely related to impairment severity.	Kennen, 1999	NJ
Community Index	All 40 urban sites sampled had fair to very poor B-IBI scores, compared to undeveloped reference sites.	Yoder, 1991	OH
Community Index	A negative correlation between B-IBI and urban land use was noted. Community characteristics show similar patterns between agricultural and forested areas the most severe degradation being in urban and suburban areas.	Meyer and Couch, 2000	GA
EPT Value, Diversity, Community Index	A comparison of three stream types found urban streams had lowest diversity and richness. Urban streams had substantially lower EPT scores (22% vs 5% as number of all taxa, 65% vs 10% as percent abundance) and IBI scores in the poor range.	Crawford and Lenat, 1989	NC
Sensitive Species	Urbanization associated with decline in sensitive taxa, such as mayflies, caddisflies and amphipods while showing increases in oligochaetes.	Pitt and Bozeman, 1982	CA
Sensitive Species	Dramatic changes in aquatic insect community were observed in most urbanizing stream sections. Changes include an abundance of pollution-tolerant aquatic insect species in urban streams.	Kemp and Spotila, 1997	PA
Diversity	As watershed development levels increased, the aquatic insect diversity declined.	Richards *et al.*, 1993	MN
Diversity	Significant negative relationship between number of aquatic insect species and degree of urbanization in 21 Atlanta streams.	Benke *et al.*, 1981	GA
Diversity	Drop in insect taxa from 13 to 4 was noted in urban streams.	Garie and McIntosh, 1986	NJ
Diversity	Aquatic insect taxa were found to be more abundant in non-urban reaches than in urban reaches of the watershed.	Pitt and Bozeman, 1982	CA
Diversity	A study of five urban streams found that as watershed land use shifted from rural to urban, aquatic insect diversity decreased.	Masterson and Bannerman, 1994	WI
Other Land Use Indicators			
Community Index	Most degraded streams were found in developed areas, particularly older developments lacking newer and more efficient stormwater controls.	Fairfax Co., 2001	VA
Diversity	Urban streams had sharply lower aquatic insect diversity with human population above four persons/acre in northern VA.	Jones and Clark, 1987	VA
EPT Value	Monitoring of four construction sites in three varying regulatory settings found that EPT richness was related to enforcement of erosion and sediment controls. The pattern demonstrated that EPT richness was negatively affected as one moved from upstream to at the site, except for one site.	Reice, 2000	NC
Sensitive Species	In a Seattle study, aquatic insect community shifted to chironomid, oligochaetes and amphipod species that are pollution-tolerant and have simple feeding guild.	Pedersen and Perkins,1986	WA

species (based on EPT richness, % EPT abundance, and Hilsenhoff Biotic Index) were eliminated from the aquatic insect community when IC exceeded 10 to 15% in contributing watersheds of Delaware streams (Figure 46). In a recent study of 30 Maine watersheds, Morse (2001) found that reference streams with less than 5% watershed IC had significantly more EPT taxa than more urban streams. He also observed no significant differences in EPT Index values among streams with six to 27% watershed IC (Figure 47).

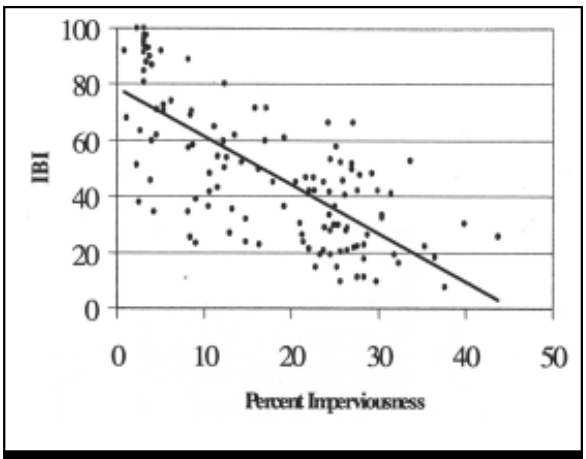

Figure 43: Trend Line Indicating Decline in Benthic IBI as IC Increases in Northern VA Streams (Fairfax County, 2001)

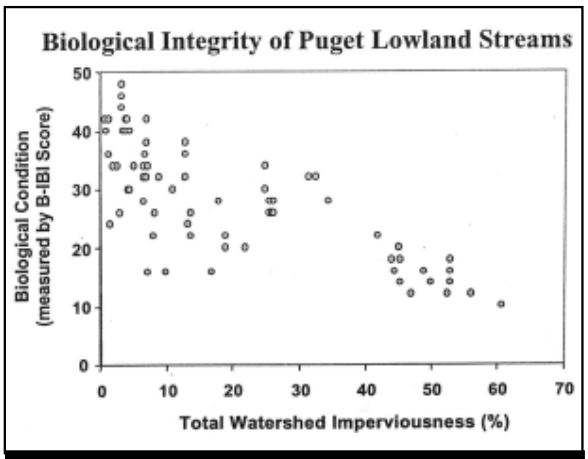

Figure 44: Relationship Between IC and B-IBI Scores in Aquatic Insects in Streams of the Puget Sound Lowlands (Booth, 2000)

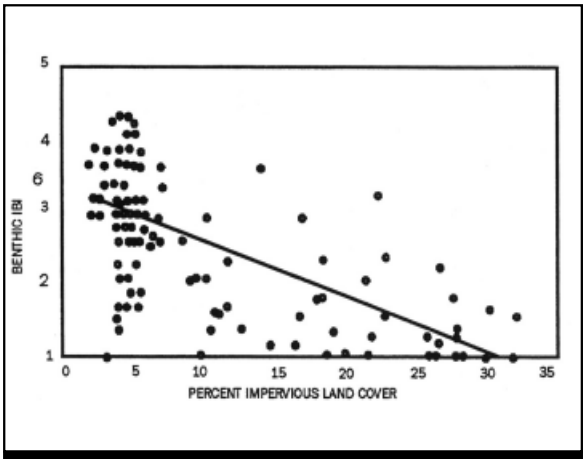

Figure 45: IC and B-IBI at Stream Sites in the Patapsco River Basin, MD (Dail *et al.*, 1998)

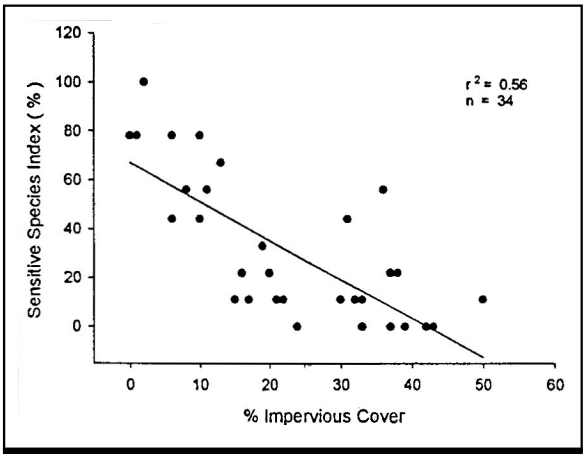

Figure 46: IC vs. Aquatic Insect Sensitivity - EPT Scores in Delaware Streams (Maxted and Shaver, 1997)

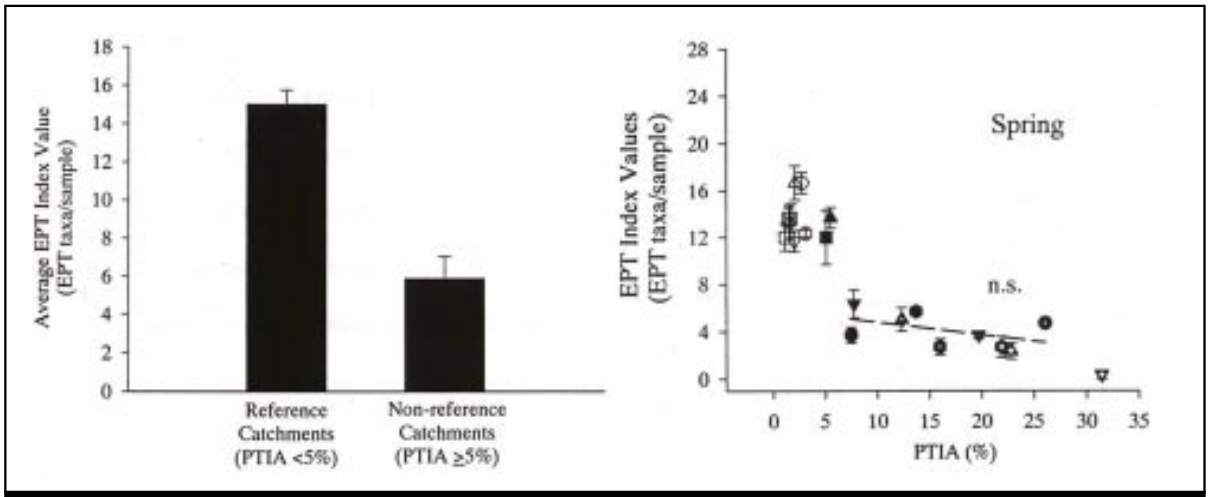

Figure 47: Average and Spring EPT Index Values vs.% IC in 20 Small Watersheds in Maine (Morse, 2001)

5.3.2 Findings Based on Other Development Indicators

Development indices, such as percent urban land use, population density, and forest and riparian cover have also been correlated with changes in aquatic insect communities in urban streams. Declines in benthic IBI scores have frequently been observed in proportion to the percent urban land use in small watersheds (Garie and McIntosh, 1986; Kemp and Spotila, 1997; Kennen, 1999; Masterson and Bannerman, 1994; Richards *et al.*, 1993; USEPA, 1982).

A study in Washington state compared a heavily urbanized stream to a stream with limited watershed development and found that the diversity of the aquatic insect community declined from 13 taxa in reference streams to five taxa in more urbanized streams (Pedersen and Perkins, 1986). The aquatic insect taxa that were lost were poorly suited to handle the variable erosional and depositional conditions found in urban streams. Similarly, a comparison of three North Carolina streams with different watershed land uses concluded the urban watershed had the least taxa and lowest EPT scores and greatest proportion of pollution-tolerant species (Crawford and Lenat, 1989).

Jones and Clark (1987) monitored 22 streams in Northern Virginia and concluded that aquatic insect diversity diminished markedly once watershed population density exceeded four or more people per acre. The population density roughly translates to ½ - 1 acre lot residential use, or about 10 to 20 % IC. Kennen (1999) evaluated 700 New Jersey streams and concluded that the percentage of watershed forest was positively correlated with aquatic insect density. Meyer and Couch (2000) reported a similar cover relationship between aquatic insect diversity and watershed and riparian forest cover for streams in the Atlanta, GA region. A study in the Puget Sound region found that aquatic insect diversity declined in streams once forest cover fell below 65% (Booth, 2000).

5.4 Effects on Fish Diversity

Fish communities are also excellent environmental indicators of stream health. In general, an increase in watershed IC produces the same kind of impact on fish diversity as it does for aquatic insects. The reduction in fish diversity is typified by a reduction in total species, loss of sensitive species, a shift toward more pollution-tolerant species, and decreased survival of eggs and larvae. More than 30 studies have examined the relationship between watershed development and fish diversity; they are summarized in Tables 51 and 52. About half of the research studies used IC as the major index of watershed development, while the remainder used other indices, such as percent urban land use, population density, housing density, and forest cover.

5.4.1 Findings Based on IC Indicators

Recent stream research shows a consistent, negative relationship between watershed development and various measures of fish diversity, such as diversity metrics, species loss and structural changes.

Typically, a notable decline in fish diversity occurs around 10 to 15% watershed IC (Boward *et al.*, 1999; Galli, 1994; Klein, 1979; Limburg and Schmidt, 1990; MNCPPC, 2000; MWCOG, 1992; Steward, 1983). A somewhat higher threshold was observed by Meyer and Couch (2000) for Atlanta streams with 15 to 30% IC; lower thresholds have also been observed (Horner *et al.*, 1997 and May *et al.*, 1997). A typical relationship between watershed IC and fish diversity is portrayed in Figure 48, which shows data from streams in the Patapsco River Basin in Maryland (Dail *et al.*, 1998). Once again, note the variability in fish-IBI scores observed below 10% IC.

Wang *et al.* (1997) evaluated 47 Wisconsin streams and found an apparent threshold around 10% IC. Fish-IBI scores were "good" to "excellent" below this threshold, but were consistently rated as "fair" to "poor." Additionally, Wang documented that the total number of fish species drops sharply when IC increases (Figure 49). Often, researchers also reported that increases in IC were strongly correlated with several fish metrics, such as increases in non-native and pollution-tolerant species in streams in Santa Clara, California (EOA, Inc., 2001).

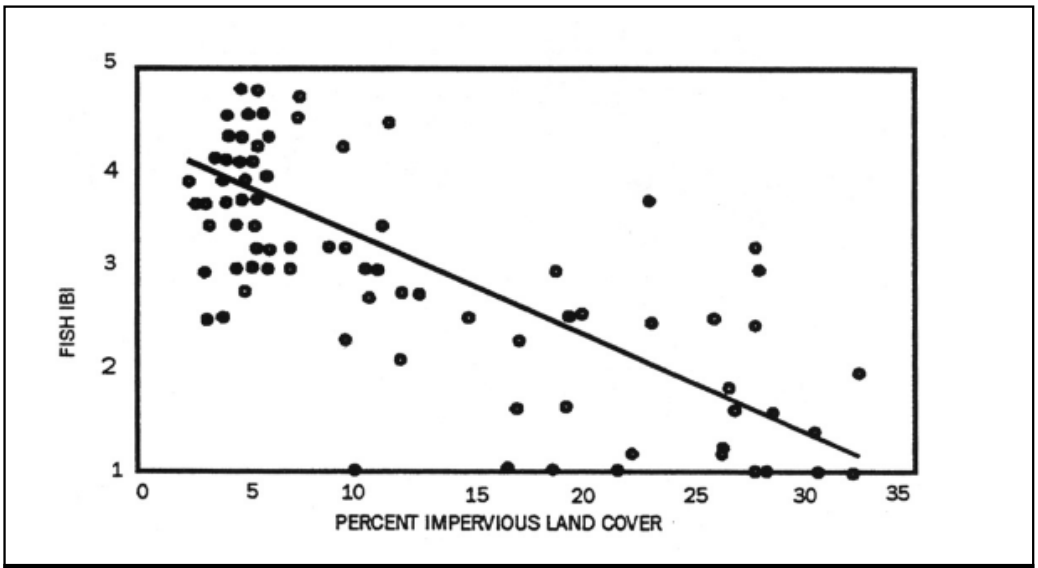

Figure 48: Fish-IBI vs. Watershed IC for Streams in the Patapsco River Basin, MD (Dail *et al.*, 1998)

Table 51: Recent Research Examining the Relationship Between Watershed IC and the Fish Community

Biotic	Key Finding (s)	Source	Location
Abundance	Brown trout abundance and recruitment declined sharply at 10-15% IC.	Galli, 1994	MD
Salmonids	Seattle study showed marked reduction in coho salmon populations noted at 10-15% IC at nine streams.	Steward, 1983	WA
Anadromous Fish Eggs	Resident and anadromous fish eggs and larvae declined in 16 subwatersheds draining to the Hudson River with >10% IC area.	Limburg and Schmidt, 1990	NY
Community Index	1st, 2nd, and 3rd order streams in the Patapsco River Basin showed negative relationship between IBI and IC.	Dail *et al.*, 1998	MD
Community Index	Fish IBI and habitat scores were all ranked as poor in five subwatersheds that were greater than 30% IC.	Black and Veatch, 1994	MD
Community Index	In the Potomac subregion, subwatersheds with < 12% IC generally had streams in good to excellent condition based on a combined fish and aquatic insect IBI. Watersheds with >20% IC had streams in poor condition.	MNCPPC, 2000	MD
Community Index	In a two-year study of Piedmont streams draining eight watersheds representing various land uses in Chattahochee River Basin, fish community quality dropped sharply at an IC threshold of 15-30%.	Meyer and Couch, 2000	GA
Diversity	Of 23 headwater stream stations, all draining <10% IC areas, rated as good to fair; all with >12% were rated as poor. Fish diversity declined sharply with increasing IC between 10-12%.	Schueler and Galli, 1992	MD
Diversity, Sensitive Species	Comparison of 4 similar subwatersheds in Piedmont streams, there was significant decline in the diversity of fish at 10% IC. Sensitive species (trout and sculpin) were lost at 10-12%.	MWCOG, 1992	MD
Diversity, Community Index	In a comparison of watershed land use and fish community data for 47 streams between the 1970s and 1990s, a strong negative correlation was found between number species and IBI scores with effective connected IC. A threshold of 10% IC was observed with community quality highly variable below 10% but consistently low above 10% IC.	Wang *et al.*, 1997	WI
Diversity	In several dozen Piedmont headwater streams fish diversity declined significantly in areas beyond 10-12% IC.	Klein, 1979	MD
Diversity , Abundance, Non-native Species	IC strongly associated with several fisheries species and individual-level metrics, including number of pollution-tolerant species, diseased individuals, native and non-native species and total species present	EOA, Inc., 2001	CA
Juvenile Salmon Ratios	In Puget Sound study, the steepest decline of biological functioning was observed after six percent IC. There was a steady decline, with approximately 50% reduction in initial biotic integrity at 45% IC area.	Horner *et al.*, 1997	WA
Juvenile Salmon Ratio	Physical and biological stream indicators declined most rapidly during the initial phase of the urbanization process as total IC area exceeded the five to 10% range.	May *et al.*, 1997	WA
Salmonoid	Negative effects of urbanization (IC) with the defacto loss of non-structural BMPs (wetland forest cover and riparian integrity) on salmon ratios	Horner *et al.*, 2001	WA, MD, TX
Salmonoid, Sensitive Species	While no specific threshold was observed (impacts seen at even low levels of IC), Coho/cutthroat salmon ratios >2:1 were found when IC was < 5%. Ratios fell below one at IC levels below 20 %.	Horner and May, 1999	WA
Sensitive species, Salmonid	Three years stream sampling across the state (approximately 1000 sites), MBSS found that when IC was >15%, stream health was never rated good based on CBI, and pollution sensitive brook trout were never found in streams with >2% IC.	Boward *et al.*, 1999	MD
Sensitive Species, Salmonids	Seattle study observed shift from less tolerant coho salmon to more tolerant cutthroat trout population between 10 and 15% IC at nine sites.	Luchetti and Feurstenburg 1993	WA

Sensitive fish are defined as species that strongly depend on clean and stable bottom substrates for feeding and/or spawning. Sensitive fish often show a precipitous decline in urban streams. The loss of sensitive fish species and a shift in community structure towards more pollution-tolerant species is confirmed by multiple studies. Figure 50 shows the results of a comparison of four similar subwatersheds in the Maryland Piedmont that were sampled for the number of fish species present (MWCOG, 1992). As the level of watershed IC increased, the number of fish species collected dropped. Two sensitive species, including sculpin, were lost when IC increased from 10 to 12%, and four more species were lost when IC reached 25%. Significantly, only two species remained in the fish community at 55% watershed IC.

Salmonid fish species (trout and salmon) and anadromous fish species appear to be particularly impacted by watershed IC. In a study in the Pacific Northwest, sensitive coho salmon were seldom found in watersheds above 10 or 15% IC (Luchetti and Feurstenburg, 1993 and Steward, 1983). Key stressors in urban streams, such as higher peak flows, lower dry weather flows, and reduction in habitat complexity (e.g. fewer pools, LWD, and hiding places) are believed to change salmon species composition, favoring cutthroat trout populations over the natural coho populations (WDFW, 1997).

A series of studies from the Puget Sound reported changes in the coho/cutthroat ratios of juvenile salmon as watershed IC increased (Figure 51). Horner *et al.* (1999) found Coho/Cutthroat ratios greater than 2:1 in watersheds with less than 5 % IC. Ratios fell below 1:1 when IC exceeded 20%. Similar results were reported by May *et al.* (1997). In the mid-Atlantic region, native trout have stringent temperature and habitat requirements and are seldom present in watersheds where IC exceeds 15% (Schueler, 1994a). Declines in trout spawning success are evident above 10% IC. In a study of over 1,000 Maryland streams, Boward *et al.* (1999) found that sensitive brook trout were never found in streams that had more than 4% IC in their contributing watersheds.

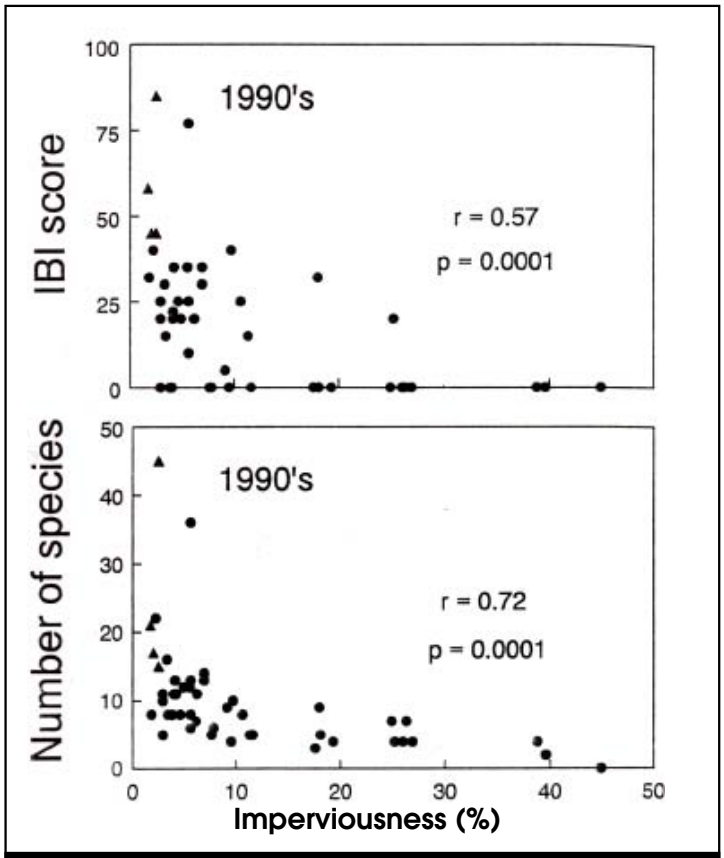

Figure 49: Fish-IBI and Number of Species vs. % IC in Wisconsin Streams (Wang *et al.*, 1997)

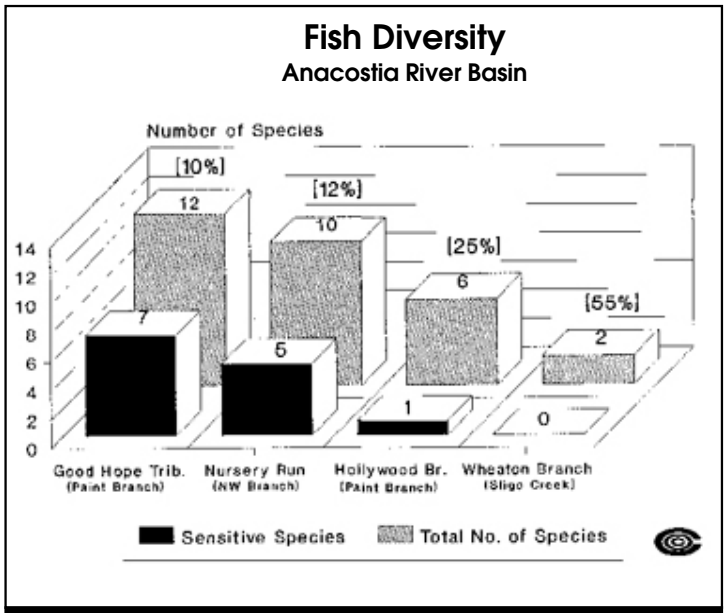

Figure 50: IC and Effects on Fish Species Diversity in Four Maryland Subwatersheds (MWCOG, 1992)

Table 52: Recent Research Examining Urbanization and Freshwater Fish Community Indicators

Biotic	Key Finding (s)	Source	Location
	Urbanization		
Community Index	All 40 urban sites sampled had fair to very poor IBI scores, compared to undeveloped reference sites.	Yoder, 1991	OH
Community Index	Negative correlations between biotic community and riparian conditions and forested areas were found. Similar levels of fish degradation were found between suburban and agricultural; urban areas were the most severe.	Meyer and Couch, 2000	GA
Community Index	Residential urban land use caused significant decrease in fish-IBI scores at 33%. In more urbanized Cuyahoga, a significant drop in IBI scores occurred around 8% urban land use in the watershed. When watersheds smaller than 100mi^2 were analyzed separately, the level of urban land associated with a significant drop in IBI scores occurred at around 15%. Above one du/ac, most sites failed to attain biocriteria regardless of degree of urbanization.	Yoder *et al.*, 1999	OH
Community Index, Abundance	As watershed development increased to about 10%, fish communities simplified to more habitat and trophic generalists and fish abundance and species richness declined. IBI scores for the urbanized stream fell from the good to fair category.	Weaver, 1991	VA
Diversity	A study of five urban streams found that as land use shifted from rural to urban, fish diversity decreased.	Masterson and Bannerman, 1994	WI
Diversity, Community Index	A comparison of three stream types found urban streams had lowest diversity and richness. Urban streams had IBI scores in the poor range.	Crawford and Lenat, 1989	NC
Salmon Spawning, Flooding Frequency	In comparing three streams over a 25-year period (two urbanizing and one remaining forested), increases in flooding frequencies and decreased trends in salmon spawning were observed in the two urbanizing streams, while no changes in flooding or spawning were seen in the forested system.	Moscript and Montgomery, 1997	WA
Sensitive Species	Observed dramatic changes in fish communities in most urbanizing stream sections, such as absence of brown trout and abundance of pollution-tolerant species in urban reaches.	Kemp and Spotila, 1997	PA
Sensitive Species, Diversity	Decline in sensitive species diversity and composition and changes in trophic structure from specialized feeders to generalists was seen in an urbanizing watershed from 1958 to 1990. Low intensity development was found to affect warm water stream fish communities similarly as more intense development.	Weaver and Garman, 1994	VA
Warm Water Habitat Biocriteria	25-30% urban land use defined as the upper threshold where attainment of warm water habitat biocriterion is effectively lost. Non-attainment also may occur at lower thresholds given the co-occurrence of stressors, such as pollution legacy, WTPs and CSOs.	Yoder and Miltner, 2000	OH
Community Index, Habitat	The amount of urban land use upstream of sample sites had a strong negative relationship with biotic integrity, and there appeared to be a threshold between 10 and 20% urban land use where IBI scores declined dramatically. Watersheds above 20% urban land invariably had scores less than 30 (poor to very poor). Habitat scores were not tightly correlated with degraded fish community attributes.	Wang *et al.*, 1997	WI
Community Index	A study in the Patapsco Basin found significant correlation of fish IBI scores with percent urbanized land over all scales (catchment, riparian area, and local area).	Roth *et al.*, 1998	MD

Table 52 (continued): Recent Research Examining Urbanization and Freshwater Fish Community Indicators

Biotic	Key Finding (s)	Source	Location
Urbanization			
Sensitive Species	Evaluated effects of runoff in both urban and non-urban streams; found that native species dominated the non-urban portion of the watershed but accounted for only seven percent of species found in the urban portions of the watershed.	Pitt, 1982	CA
Other Land Use Indicators			
Community Index, Habitat	Atlanta study found that as watershed population density increased, there was a negative impact on urban fish and habitat. Urban stream IBI scores were inversely related to watershed population density, and once density exceeded four persons/acre, urban streams were consistently rated as very poor.	Couch *et al.*, 1997	GA
Community Index	In an Atlanta stream study, modified IBI scores declined once watershed population density exceeds four persons/acre in 21 urban watersheds	DeVivo *et al.*, 1997	GA
Community Index	In a six-county study (including Chicago, its suburbs and outlying rural/agricultural areas), streams showed a strong correlation between population density and fish community assessments such that as population density increased, community assessment scores went from the better - good range to fair - poor. Significant impacts seen at 1.5 people/acre.	Dreher, 1997	IL
Community Index	Similarly, negative correlations between biotic community and riparian conditions and forested areas were also found. Similar levels of fish degradation were found between suburban and agricultural; urban areas were the most severe.	Meyer and Couch, 2000	GA
Community Index	Amount of forested land in basin directly related to IBI scores for fish community condition.	Roth *et al.*, 1996	MD
Salmonid, Sensitive Species	Species community changes from natural coho salmon to cutthroat trout population with increases in peak flow, lower low flow, and reductions in stream complexity.	WDFW, 1997	WA

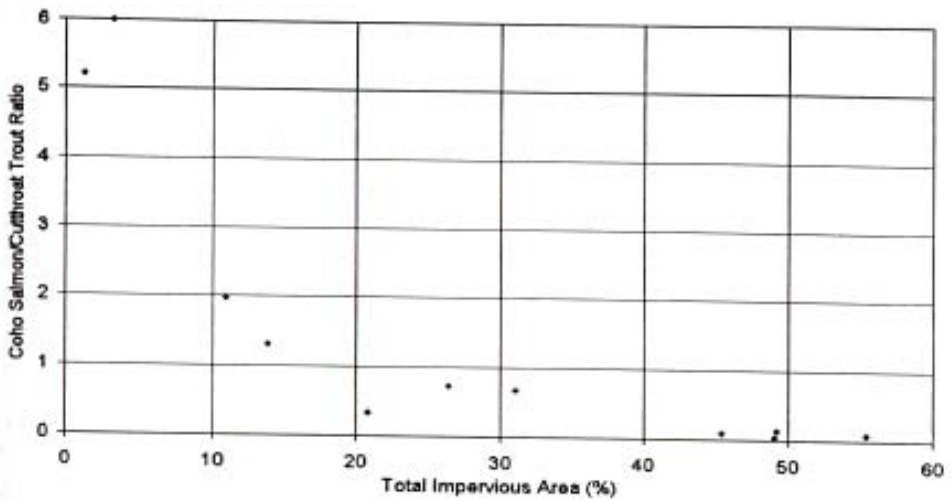

Figure 51: Coho Salmon/Cutthroat Trout Ratio for Puget Sound Streams (Horner *et al.*, 1997)

Many fish species have poor spawning success in urban streams and poor survival of fish eggs and fry. Fish barriers, low intragravel dissolved oxygen, sediment deposition and scour are all factors that can diminish the ability of fish species to successfully reproduce. For example, Limburg and Schmidt (1990) discovered that the density of anadromous fish eggs and larvae declined sharply in subwatersheds with more than 10% IC.

5.4.2 Findings Based on Other Development Indicators

Urban land use has frequently been used as a development indicator to evaluate the impact on fish diversity. Streams in urban watersheds typically had lower fish species diversity and richness than streams located in less developed watersheds. Declines in fish diversity as a function of urban land cover have been documented in numerous studies (Crawford and Lenat, 1989; Masterson and Bannerman, 1994; Roth *et al., 1998;* Yoder, 1991, and Yoder *et al.*, 1999). USEPA (1982) found that native fish species dominated the fish community of non-urban streams, but accounted for only 7% of the fish community found in urban streams. Kemp and Spotila (1997) evaluated streams in Pennsylvania and noted the loss of sensitive species (e.g. brown trout) and the increase of pollution-tolerant species, such as sunfish and creek chub (Figure 52).

Wang *et al.* (1997) cited percentage of urban land in Wisconsin watersheds as a strong negative factor influencing fish-IBI scores in streams and observed strong declines in IBI scores with 10 to 20% urban land use. Weaver and Garman (1994) compared the historical changes in the warm-water fish community of a Virginia stream that had undergone significant urbanization and found that many of the sensitive species present in 1958 were either absent or had dropped sharply in abundance when the watershed was sampled in 1990. Overall abundance had dropped from 2,056 fish collected in 1958 to 417 in 1990. In addition, the 1990 study showed that 67% of the catch was bluegill and common shiner, two species that are habitat and trophic "generalists." This shift in community to more habitat and trophic generalists was observed at 10% urban land use (Weaver, 1991).

Yoder *et al.* (1999) evaluated a series of streams in Ohio and reported a strong decrease in warm-water fish community scores around 33% residential urban land use. In the more urbanized Cuyahoga streams, sharp drops in

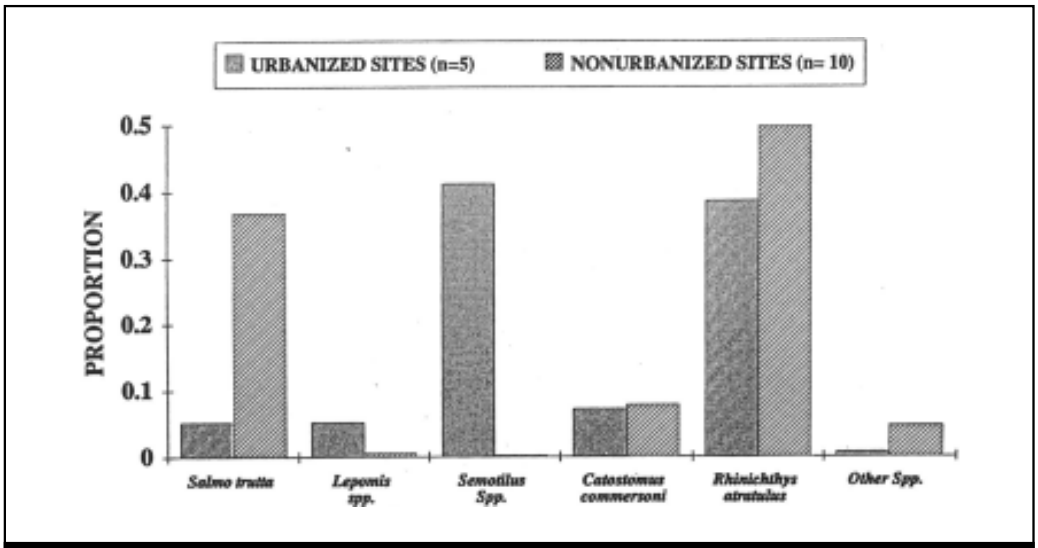

Figure 52: Mean Proportion of Fish Taxa in Urban and Non-Urban Streams, Valley Forge Watershed, PA (Kemp and Spotila, 1997)

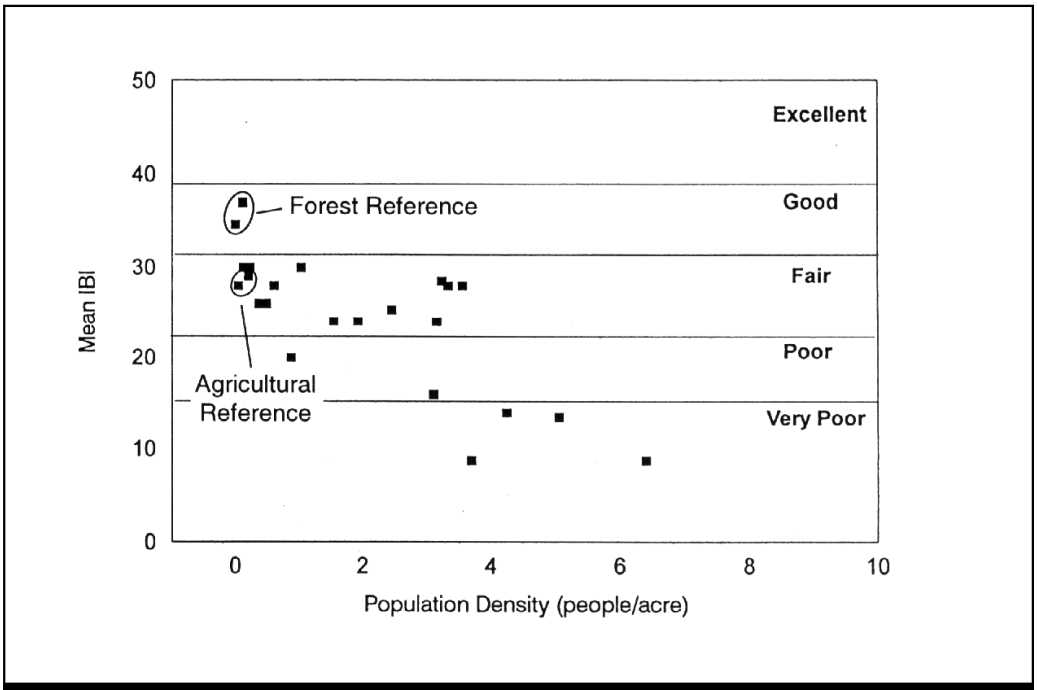

Figure 53: Relationship Between Watershed Population Density and Stream IBI Scores in Georgia Streams (DeVivo *et al.*, 1997)

fish-IBI scores occurred around 8% urban land use, primarily due to certain stressors which functioned to lower the non-attainment threshold. When watersheds smaller than 100mi^2 were analyzed separately, the percentage of urban land use associated with a sharp drop in fish-IBI scores was around 15%. In a later study, Yoder and Miltner (2000) described an upper threshold for quality warm-water fish habitat at 25 to 30% urban land use.

Watershed population and housing density have also been used as indicators of the health of the fish community. In a study of 21 urban watersheds in Atlanta, DeVivo *et al.* (1997) observed a shift in mean fish-IBI scores from "good to fair" to "very poor" when watershed population density exceeded four people/acre (Figure 53). A study of Midwest streams in metropolitan Illinois also found a negative relationship between increase in population density and fish communities, with significant impacts detected at population densities of 1.5 people or greater per acre (Dreher, 1997). In the Columbus and Cuyahoga watersheds in Ohio, Yoder *et al.* (1999) concluded that most streams failed to attain fish biocriteria above one dwelling unit/acre.

5.5 Effects on Amphibian Diversity

Amphibians spend portions of their life cycle in aquatic systems and are frequently found within riparian, wetland or littoral areas. Relatively little research has been conducted to directly quantify the effects of watershed development on amphibian diversity. Intuitively, it would appear that the same stressors that affect fish and aquatic insects would also affect amphibian species, along with riparian wetland alteration. We located four research studies on the impacts of watershed urbanization on amphibian populations; only one was related to streams (Boward *et al.,* 1999), while others were related to wetlands (Table 53).

A primary factor influencing amphibian diversity appears to be water level fluctuations (WLF) in urban wetlands that occur as a result of increased stormwater discharges. Chin (1996) hypothesized that increased WLF and other hydrologic factors affected the abundance of egg clutches and available amphibian breeding habitat, thereby ultimately influencing amphibian richness. Increased WLF can limit reproductive success by eliminating mating habitat and the emergent vegetation to which amphibians attach their eggs.

Taylor (1993) examined the effect of watershed development on 19 freshwater wetlands in King County, WA and concluded that the additional stormwater contributed to greater annual WLF. When annual WLF exceeded about eight inches, the richness of both the wetland plant and amphibian communities dropped sharply. Large increases in WLF were consistently observed in freshwater wetlands when IC in upstream watersheds exceeded 10 to 15%. Further research on streams and wetlands in the Pacific northwest by Horner *et al.* (1997) demonstrated the correlation between watershed IC and diversity of amphibian species. Figure 54 illustrates the relationship between amphibian species abundance and watershed IC, as documented in the study.

Table 53: Recent Research on the Relationship Between Percent Watershed Urbanization and the Amphibian Community

Indicator	Key Finding(s)	Reference Year	Location
% IC			
Reptile and Amphibian Abundance	In a three-year stream sampling across the state (approximately 1000 sites), MBSS found only hardy pollution-tolerant reptiles and amphibians in stream corridors with >25% IC drainage area.	Boward *et al.*, 1999	MD
Amphibian Density	Mean annual water fluctuation inversely correlated to amphibian density in urban wetlands. Declines noted beyond 10% IC.	Taylor, 1993	WA
Other Studies			
Species Richness	In 30 wetlands, species richness of reptiles and amphibians was significantly related to density of paved roads on lands within a two kilometer radius.	Findlay and Houlahan, 1997	Ontario
Species Richness	Decline in amphibian species richness as wetland WLF increased. While more of a continuous decline rather than a threshold, WLF = 22 centimeters may represent a tolerance boundary for amphibian community.	Horner *et al.*, 1997	WA
Amphibian Density	Mean annual water fluctuation inversely correlated to amphibian density in urban wetlands.	Taylor, 1993	WA

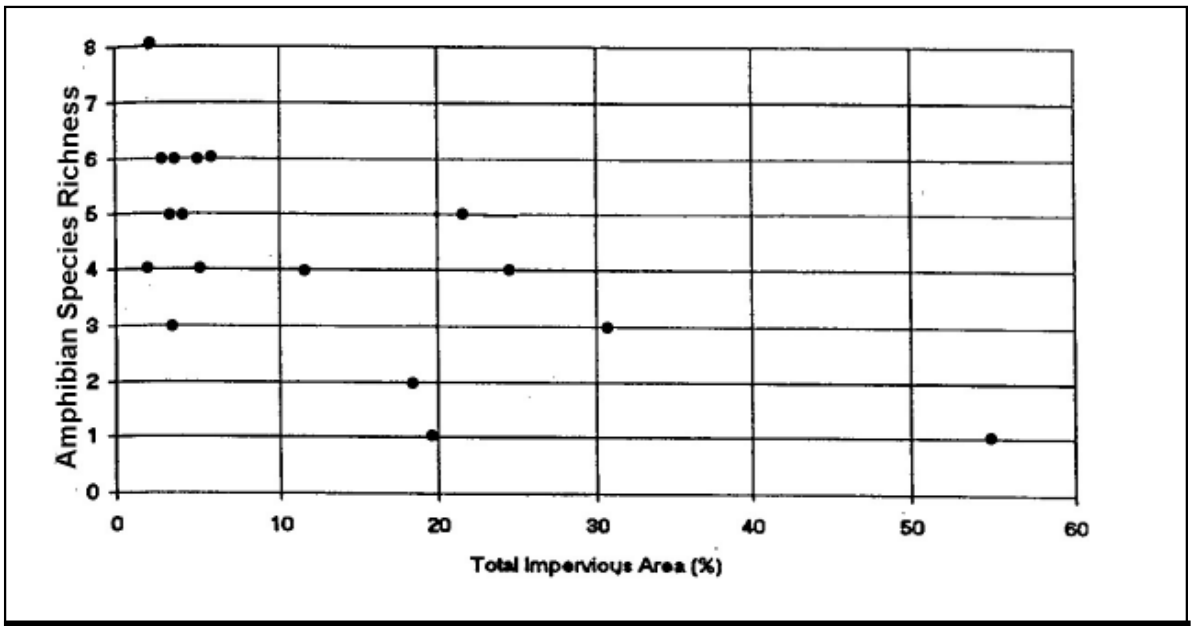

Figure 54: Amphibian Species Richness as a Function of Watershed IC in Puget Sound Lowland Wetlands (Horner *et al.*, 1997)

5.6 Effects on Wetland Diversity

We found a limited number of studies that evaluated the impact of watershed urbanization on wetland plant diversity (Table 54). Two studies used IC as an index of watershed development and observed reduced wetland plant diversity around or below 10% IC (Hicks and Larson, 1997 and Taylor, 1993). WLF and road density were also used as indicators (Findlay and Houlahan, 1997; Horner *et al.*, 1997; Taylor, 1993).

Horner *et al.* (1997) reported a decline in plant species richness in emergent and scrub-shrub wetland zones of the Puget Sound region as WLF increased. They cautioned that species numbers showed a continuous decline rather than a threshold value; however, it was indicated that WLF as small as 10 inches can represent a tolerance boundary for wetland plant communities. Horner further stated that in 90% of the cases where WLF exceeded 10 inches, watershed IC exceeded 21%.

Table 54: Recent Research Examining the Relationship Between Watershed Development and Urban Wetlands

Watershed Indicator Biotic	Key Finding(s)	Reference	Location
% IC			
Insect Community	Significant declines in various indicators of wetland aquatic macro-invertebrate community health were observed as IC increased to 8-9%.	Hicks and Larson, 1997	CT
WLF, Water Quality	There is a significant increase in WLF, conductivity, fecal coliform bacteria, and total phosphorus in urban wetland as IC exceeds 3.5%.	Taylor *et al.*, 1995	WA
Plant Density	Declines in urban wetland plant density noted in areas beyond 10% IC.	Taylor, 1993	WA
Other Watershed Indicators			
Plant Density	Mean annual water fluctuation inversely correlated to plant density in urban wetlands.	Taylor, 1993	WA
Plant Species Richness	Decline in plant species richness in emergent and scrub-shrub wetland zones as WLF increased. While more of a continuous decline, rather than a threshold, WLF=22 centimeters may represent a tolerance boundary for the community	Horner *et al.*, 1997	WA
Plant Species Richness	In 30 wetlands, species richness was significantly related to density of paved roads within a two kilometer radius of the wetland. Model predicted that a road density of 2kilometers per hectare in paved road within 1000 meters of wetland will lead to a 13% decrease in wetland plant species richness.	Findlay and Houlahan,1997	Ontario

5.7 Effects on Freshwater Mussel Diversity

Freshwater mussels are excellent indicators of stream quality since they are filter-feeders and essentially immobile. The percentage of imperiled mussel species in freshwater ecoregions is high (Williams *et al.*, 1993). Of the 297 native mussel species in the United States, 72% are considered endangered, threatened, or of special concern, including 21 mussel species that are presumed to be extinct. Seventy mussel species (24%) are considered to have stable populations, although many of these have declined in abundance and distribution. Modification of aquatic habitats and sedimentation are the primary reasons cited for the decline of freshwater mussels (Williams *et al.,* 1993).

Freshwater mussels are very susceptible to smothering by sediment deposition. Consequently, increases in watershed development and sediment loading are suspected to be a factor leading to reduced mussel diversity. At sublethal levels, silt interferes with feeding and metabolism of mussels in general (Aldridge *et al.*, 1987). Major sources of mortality and loss of diversity in mussels include impoundment of rivers and streams, and eutrophication (Bauer, 1988). Changes in fish diversity and abundance due to dams and impoundments can also influence the availability of mussel hosts (Williams *et al.*, 1992).

Freshwater mussels are particularly sensitive to heavy metals and pesticides (Keller and Zam, 1991). Although the effects of metals and pesticides vary from one species to another, sub-lethal levels of PCBs, DDT, Malathion, Rotenone and other compounds are generally known to inhibit respiratory efficiency and accumulate in tissues (Watters, 1996). Mussels are more sensitive to pesticides than many other animals tested and often act as “first-alerts” to toxicity long before they are seen in other organisms.

We were unable to find any empirical studies relating impacts of IC on the freshwater mussel communities of streams.

5.8 Conclusion

The scientific record is quite strong with respect to the impact of watershed urbanization on the integrity and diversity of aquatic communities. We reviewed 35 studies that indicated that increased watershed development led to declines in aquatic insect diversity and about 30 studies showing a similar impact on fish diversity. The scientific literature generally shows that aquatic insect and freshwater fish diversity declines at fairly low levels of IC (10 to 15%), urban land use (33%), population density (1.5 to eight people/acre) and housing density (>1 du/ac). Many studies also suggest that sensitive elements of the aquatic community are affected at even lower levels of IC. Other impacts include loss of sensitive species and reduced abundance and spawning success. Research supports the ICM, although additional research is needed to establish the upper threshold at which watershed development aquatic biodiversity can be restored.

One area where more research is needed involves determining how regional and climatic variations affect aquatic diversity in the ICM. Generally, it appears that the 10% IC threshold applies to streams in the East Coast and Midwest, with Pacific Northwest streams showing impacts at a slightly higher level. For streams in the arid and semi-arid Southwest, it is unclear what, if any, IC threshold exists given the naturally stressful conditions for these intermittent and ephemeral streams (Maxted, 1999). Southwestern streams are characterized by seasonal bursts of short but intense rainfall and tend to have aquatic communities that are trophically simple and relatively low in species richness (Poff and Ward, 1989).

Overall, the following conclusions can be drawn:

- IC is the most commonly used index to assess the impacts of watershed urbanization on aquatic insect and fish diversity. Percent urban land use is also a common index.

- The ICM may not be sensitive enough to predict biological diversity in watersheds with low IC. For example, below 10% watershed IC, other watershed variables such as riparian continuity, natural forest cover, cropland, ditching and acid rain may be better for predicting stream health.

- More research needs to be done to determine the maximum level of watershed development at which stream diversity can be restored or maintained. Additionally, the capacity of stormwater treatment practices and stream buffers to mitigate high levels of watershed IC warrants more systematic research.

- More research is needed to test the ICM on amphibian and freshwater mussel diversity.

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Glossary

1st order stream: The smallest perennial stream. A stream that carries water throughout the year and does not have permanently flowing tributaries.

2nd order stream: Stream formed by the confluence of two 1st order streams.

3rd order stream: Stream formed by the confluence of two 2nd order streams.

Acute toxicity: Designates exposure to a dangerous substance or chemical with sufficient dosage to precipitate a severe reaction, such as death.

Alluvial: Pertaining to processes or materials associated with transportation or deposition by running water.

Anadromous: Organisms that spawn in freshwater streams but live most of their lives in the ocean.

Annual Pollutant Load: The total mass of a pollutant delivered to a receiving water body in a year.

Bankfull: The condition where streamflow just fills a stream channel up to the top of the bank and at a point where the water begins to overflow onto a floodplain.

Baseflow: Stream discharge derived from ground water that supports flow in dry weather.

Bedload: Material that moves along the stream bottom surface, as opposed to suspended particles.

Benthic Community: Community of organisms living in or on bottom substrates in aquatic habitats, such as streams.

Biological Indicators: A living organism that denotes the presence of a specific environmental condition.

Biological Oxygen Demand (BOD): An indirect measure of the concentration of biologically degradable material present in organic wastes. It usually reflects the amount of oxygen consumed in five days by bacterial processes breaking down organic waste.

Carcinogen: A cancer-causing substance or agent.

Catchment: The smallest watershed management unit. Defined as the area of a development site to its first intersection with a stream, usually as a pipe or open channel outfall.

Chemical Oxygen Demand (COD): A chemical measure of the amount of organic substances in water or wastewater. Non-biodegradable and slowly degrading compounds that are not detected by BOD are included.

Chronic Toxicity: Showing effects only over a long period of time.

Combined Sewer Overflow (CSO): Excess flow (combined wastewater and stormwater runoff) discharged to a receiving water body from a combined sewer network when the capacity of the sewer network and/or treatment plant is exceeded, typically during storm events.

Combined Indices (C-IBI or CSPS): Combined indices that use both fish and aquatic insect metrics and a variety of specific habitat scores to classify streams.

Cryptosporidium parvum: A parasite often found in the intestines of livestock which contaminates water when animal feces interacts with a water source.

Deicer: A compound, such as ethylene glycol, used to melt or prevent the formation of ice.

Dissolved Metals: The amount of trace metals dissolved in water.

Dissolved Phosphorus: The amount of phosphorus dissolved in water.

Diversity: A numerical expression of the evenness and distribution of organisms.

Ecoregion: A continuous geographic area over which the climate is uniform to permit the development of similar ecosystems on sites with similar geophysical properties.

Embeddedness: Packing of pebbles or cobbles with fine-grained silts and clays.

EPT Index: A count of the number of families of each of the three generally pollution-sensitive orders: Ephemeroptera (mayflies), Plecoptera (stoneflies), and Trichoptera (caddisflies).

Escherichia coli (E. coli): A bacteria that inhabits the intestinal tract of humans and other warm-blooded animals. Although it poses no threat to human health, its presence in drinking water does indicate the presence of other, more dangerous bacteria.

Eutrophication: The process of over-enrichment of water bodies by nutrients, often typified by the presence of algal blooms.

Fecal coliform: Applied to E. coli and similar bacteria that are found in the intestinal tract of humans and animals. Coliform bacteria are commonly used as indicators of the presence of pathogenic organisms. Their presence in water indicates fecal pollution and potential contamination by pathogens.

Fecal streptococci: Bacteria found in the intestine of warm-blooded animals. Their presence in water is considered to verify fecal pollution.

Fish Blockages: Infrastructures associated with urbanization, such as bridges, dams, and culverts, that affect the ability of fish to move freely upstream and downstream in watersheds. Can prevent re-colonization of resident fish and block the migration of anadromous fish.

Flashiness: Percent of flows exceeding the mean flow for the year. A flashy hydrograph would have larger, shorter-duration hydrograph peaks.

Geomorphic: The general characteristic of a land surface and the changes that take place in the evolution of land forms.

Giardia lamblia: A flagellate protozoan that causes severe gastrointestinal illness when it contaminates drinking water.

Herbicide: Chemicals developed to control or eradicate plants.

Hotspot: Area where land use or activities generate highly contaminated runoff, with concentrations of pollutants in excess of those typically found in stormwater.

Hydrograph: A graph showing variation in stage (depth) or discharge of a stream of water over a period of time.

Illicit discharge: Any discharge to a municipal separate storm sewer system that is not composed entirely of storm water, except for discharges allowed under an NPDES permit.

Impervious Cover: Any surface in the urban landscape that cannot effectively absorb or infiltrate rainfall.

Impervious Cover Model (ICM): A general watershed planning model that uses percent watershed impervious cover to predict various stream quality indicators. It predicts expected stream quality declines when watershed IC exceeds 10% and severe degradation beyond 25% IC.

Incision: Stream down-cuts and the channel expands in the vertical direction.

Index of Biological Integrity (IBI): Tool for assessing the effects of runoff on the quality of the aquatic ecosystem by comparing the condition of multiple groups of organisms or taxa against the levels expected in a healthy stream.

Infiltration: The downward movement of water from the surface to the subsoil. The infiltration capacity is expressed in terms of inches per hour.

Insecticide: Chemicals developed to control or eradicate insects.

Large Woody Debris (LWD): Fundamental to stream habitat structure. Can form dams and pools; trap sediment and detritus; provide stabilization to stream channels; dissipate flow energy and promote habitat complexity.

Mannings N: A commonly used roughness coefficient; actor in velocity and discharge formulas representing the effect of channel roughness on energy losses in flowing water.

Methyl Tertiary-Butyl Ether: An oxygenate and gasoline additive used to improve the efficiency of combustion engines in order to enhance air quality and meet air pollution standards. MTBE has been found to mix and move more easily in water than many other fuel components, thereby making it harder to control, particularly once it has entered surface or ground waters.

Microbe: Short for microorganism. Small organisms that can be seen only with the aid of a microscope. Most frequently used to refer to bacteria. Microbes are important in the degradation and decomposition of organic materials.

Nitrate: A chemical compound having the formula NO_3. Excess nitrate in surface waters can lead to excessive growth of aquatic plants.

Organic Matter: Plant and animal residues, or substances made by living organisms. All are based upon carbon compounds.

Organic Nitrogen: Nitrogen that is bound to carbon-containing compounds. This form of nitrogen must be subjected to mineralization or decomposition before it can be used by the plant community.

Overbank Flow: Water flow over the top of the bankfull channel and onto the floodplain.

Oxygenate: To treat, combine, or infuse with oxygen.

Peak Discharge: The maximum instantaneous rate of flow during a storm, usually in reference to a specific design storm event.

Pesticides: Any chemical agent used to control specific organisms, for example, insecticides, herbicides, fungicides and rodenticides.

Piedmont: Any plain, zone or feature located at the foot of a mountain. In the United States, the Piedmont (region) is a plateau extending from New Jersey to Alabama and lying east of the Appalachian Mountains.

Pool: A stream feature where there is a region of deeper, slow-moving water with fine bottom materials. Pools are the slowest and least turbulent of the riffle/run/pool category.

Protozoan: Any of a group of single-celled organisms.

Rapid Bioassessment Protocols (RBP): An integrated assessment, comparing habitat, water quality and biological measures with empirically defined reference conditions.

Receiving Waters: Rivers, lakes, oceans, or other bodies of water that receive water from another source.

Riffle: Shallow rocky banks in streams where water flows over and around rocks disturbing the water surface; often associated with whitewater. Riffles often support diverse biological communities due to their habitat niches and increased oxygen levels created by the water disturbance. Riffles are the most swift and turbulent in the riffle/run/pool category.

Roughness: A measurement of the resistance that streambed materials, vegetation, and other physical components contribute to the flow of water in the stream channel and flood-plain. It is commonly measured as the Manning's roughness coefficient (Manning's N).

Run: Stream feature characterized by water flow that is moderately swift flow, yet not particularly turbulent. Runs are considered intermediate in the riffle/run/pool category.

Runoff Coefficient: A value derived from a site impervious cover value that is applied to a given rainfall volume to yield a corresponding runoff volume.

Salmonid: Belonging to the family Salmonidae, which includes trout and salmon.

Sanitary Sewer Overflow (SSO): Excess flow of wastewater (sewage) discharged to a receiving water body when the capacity of the sewer network and/or treatment plant is exceeded, typically during storm events.

Semi-arid: Characterized by a small amount of annual precipitation, generally between 10 and 20 inches.

Simple Method: Technique used to estimate pollutant loads based on the amount of IC found in a catchment or subwatershed.

Sinuosity: A measure of channel curvature, usually quantified as the ratio of the length of the channel to the length of a straight line along the valley axis. It is, in essence, a ratio of the stream's actual running length to its down-gradient length.

Soluble Phosphorus: The amount of phosphorus available for uptake by plants and animals.

Stormwater: The water produced as a result of a storm.

Subwatershed: A smaller geographic section of a larger watershed unit with a drainage area of between two to 15 square miles and whose boundaries include all the land area draining to a point where two 2nd order streams combine to form a 3rd order stream.

Total Dissolved Solids (TDS): A measure of the amount of material dissolved in water (mostly inorganic salts).

Total Kjeldhal Nitrogen (TKN): The total concentration of nitrogen in a sample present as ammonia or bound in organic compounds.

Total Recoverable Metals: The amount of a metal that is in solution after a representative suspended sediment sample has been digested by a method (usually using a dilute acid solution) that results in dissolution of only readily soluble substances).

Total Maximum Daily Load (TMDL): The maximum quantity of a particular water pollutant that can be discharged into a body of water without violating a water quality standard.

Total Nitrogen (Total N): A measure of the total amount of nitrate, nitrite and ammonia concentrations in a body of water.

Total Organic Carbon (TOC): A measure of the amount of organic material suspended or dissolved in water.

Total Phosphorous (Total P): A measure of the concentration of phosphorus contained in a body of water.

Total Suspended Solids (TSS): The total amount of particulate matter suspended in the water column.

Trophic Level: The position of an organism in a food chain or food pyramid.

Turbidity: A measure of the reduced transparency of water due to suspended material which carries water quality and aesthetic implications. Applied to waters containing suspended matter that interferes with the passage of light through the water or in which visual depth is restricted.

Volatile Organic Compounds (VOC): Chemical compounds which are easily transported into air and water. Most are industrial chemicals and solvents. Due to their low water solubility they are commonly found in soil and water.

Glossary

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United States General Accounting Office

GAO

Report to Congressional Requesters

June 2001

WATER QUALITY

Better Data and Evaluation of Urban Runoff Programs Needed to Assess Effectiveness

GAO-01-679

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Abbreviations

BMP	best management practices
CSO	combined sewer overflow
DOT	Department of Transportation
DPW	Department of Public Works
EPA	Environmental Protection Agency
FHWA	Federal Highway Administration
MCTT	Multi-Chambered Treatment Tank
MDE	Maryland Department of Environment
MS4	Municipal Separate Storm Sewer System
NPDES	National Pollutant Discharge Elimination System
PAH	polycyclic aromatic hydrocarbons
PCB	polychlorinated biphenyls
TEA-21	Transportation Equity Act for the 21st Century
TMDL	total maximum daily load
USGS	U.S. Geological Survey
WDNR	Wisconsin Department of Natural Resources
WPDES	Wisconsin Pollutant Discharge Elimination System

United States General Accounting Office
Washington, D.C. 20548

June 29, 2001

The Honorable Olympia Snowe
United States Senate

The Honorable Sherrod Brown
The Honorable Martin Meehan
The Honorable James Oberstar
The Honorable Jack Quinn
House of Representatives

Nonpoint source pollution—that is, pollution from contaminants picked up and carried into surface water by water running over land—is known to be one of the leading causes of water quality problems in the United States. Water that runs over developed areas, including paved surfaces such as roads and parking lots, before reaching a water body is known as urban runoff and is an increasingly important category of water pollution. As urban areas have expanded over the past several decades, the amount of urban runoff has also increased. Although the overall quality of the nation's waters has improved since the passage of the Clean Water Act in 1972, a significant number of water bodies still suffer from poor water quality. Because the act brought discharges from "point sources," such as industrial plants and municipal treatment plants, under control, the continuing pollution of these waters suggests that other sources, including urban runoff, are contributing to water quality problems. As a result, the Environmental Protection Agency (EPA) now classifies urban runoff as a significant cause of impairment to water quality. The Water Quality Act of 1987, which amended the Clean Water Act, required EPA, among other things, to regulate as a point source urban runoff that reaches municipal sewer systems. EPA's National Pollutant Discharge Elimination System Program for storm water requires that certain local governments take measures to control storm water runoff.

Concerned about the degradation of water quality in urban areas, you asked us to report on (1) the amount of runoff from urban areas, particularly from roads, highways, and other impervious surfaces,[1] and its effects on water quality and (2) the programs that federal regulations require local governments to develop to address urban runoff, and the costs and effectiveness of those programs. To address these issues, we reviewed federal and other studies and interviewed experts on the relationship between the amount of paved and other impervious surfaces and the amount of runoff, and on the types of materials typically contained in urban runoff. We also reviewed studies and interviewed experts on the sources of these materials and any actual or potential effects on water quality from urban runoff. We visited five urban areas and organizations that are affiliated with their watersheds[2] to obtain site-specific information about urban runoff problems, programs these areas have implemented in response to federal requirements, and the costs and effectiveness of these programs. Finally, we reviewed studies and estimates of the costs and investment requirements associated with implementing storm water management programs. Because this report focuses on local governments' actions, we did not review the portions of the National Pollutant Discharge Elimination System Storm Water Program that address industrial facilities and construction sites.

We performed our review from August 2000 through May 2001 in accordance with generally accepted government auditing standards.

Results in Brief

The volume of urban storm water runoff increased throughout the United States in the last half of the 20th century because of the growth in impervious surfaces that resulted from the development of urban and suburban areas. According to the U.S. Department of Agriculture, between 1945 and 1997, land devoted to urban areas in the United States has increased by about 327 percent; according to EPA, paved road mileage has increased by 278 percent. Because paved surfaces are almost impervious, they allow little storm water to infiltrate the ground; therefore, the storm water runs off into creeks, rivers, and lakes. As storm water runs across these impervious surfaces and land, it picks up pollutants from these surfaces and carries them to receiving bodies of water—either directly or

[1]An impervious surface keeps water from soaking into soils.

[2]A watershed is an area of land in which all surface water drains to a common point.

through conveyances such as gutters, storm sewers, and culverts. EPA's 1998 *National Water Quality Inventory Report to Congress* showed that certain rivers, streams, lakes, and estuaries are impaired in terms of their ability to support such uses as aquatic life, swimming, and fish consumption, and concluded that urban runoff was a major source of this impairment. Studies have shown that urban runoff and the pollutants it carries can cause increases in sedimentation, water temperature, and pathogen levels and decreases in dissolved oxygen levels in bodies of water. These changes can lead to the degradation of habitat in these water bodies and a decline in diversity of aquatic life and can endanger public health. For example, metals, a pollutant typically found in urban runoff, can be toxic to aquatic organisms. Pathogens, such as bacteria from animal waste, another pollutant commonly found in urban runoff, can pose public health problems when present in waters used for recreational purposes. The magnitude and nature of these effects vary by region, depending on the type and concentration of pollutants in storm water, rainfall characteristics, land use, and other factors.

Local governments are required to address urban runoff through EPA's National Pollutant Discharge Elimination System Storm Water Program. Under permits that EPA and states issue through this program, over 1,000 local governments must meet EPA's requirements to implement storm water management programs to reduce contaminants in storm water to the "maximum extent practicable." EPA recommends that these cities use "best management practices" to reduce contaminants in storm water runoff. The most typical practices included controlling runoff through a combination of structural means, such as detention ponds, and nonstructural means, such as increasing the frequency of street sweeping and educating the public about how to prevent pollutants from reaching storm sewers. Cities also used specialized practices to address specific local runoff problems. For example, Baltimore, Maryland, has focused on reducing the level of nutrients, such as fertilizers, in its runoff because of its proximity to the Chesapeake Bay, which suffers from high nutrient levels.

Neither the overall costs of implementing the storm water program nor the program's effectiveness has been determined. EPA estimated in a 1996 report to congress that the potential need for spending on storm water runoff and overflows of sewage resulting from runoff was over $50 billion over 20 years, but the agency also believes this estimate will increase when it issues its next report in 2002. EPA's regulations require that permitted cities annually report the costs of implementing their storm water

programs, along with the results of their monitoring of storm water runoff and water quality. However, in part because EPA has not established guidelines for reporting costs, these data have not been calculated or reported consistently and, therefore, are not currently useful in characterizing the program's overall cost. EPA, state, and city officials generally believe that managing storm water runoff will reduce the volume of runoff and concentrations of pollutants in the runoff, as well as improve water quality, but no systematic effort to evaluate the program's results has been started. EPA and the states have generally been unsuccessful in developing measurable program goals and in demonstrating program effectiveness through the review of water quality data reported by local governments.

We believe it is time for EPA to begin evaluating this program, which is directed at one of the nation's most significant water quality problems. Therefore, this report includes a recommendation to EPA to work with states to develop program goals, establish standards for reporting on program costs and effectiveness, and review reported water quality data to determine whether the current storm water management programs are having the intended effect of improving the quality of the nation's waters and how much the programs cost. We provided a draft of this report to EPA and the Department of Transportation (DOT). EPA generally agreed with the report and plans to take action to implement several parts of the recommendation; the agency did not comment on the other parts of the recommendation. DOT generally agreed with the report. (See the Agency Comments and Our Evaluation section of this report.)

Background

Nonpoint source pollution can result when water, such as precipitation, runs over land surfaces and into bodies of water. Significant nonpoint sources of pollution can include paved urban areas, agricultural practices, forestry, and mining. However, in urban and suburban areas, this runoff generally enters a sewer system that can be regulated as a point source of water pollution. For example, precipitation from rain or snowmelt may run into a municipal separate storm sewer system (MS4 or storm sewer) that eventually discharges into a body of water. The precipitation may also run into a combined sewer system, which carries a combination of storm water runoff, industrial waste, and raw sewage in a single pipe to a sewage treatment facility for discharge after treatment. Lastly, the precipitation may run off of land or paved surfaces directly into nearby receiving waters.

EPA's Office of Wastewater Management, which is within the Office of Water, implements the National Pollutant Discharge Elimination System (NPDES) Program. The program was created in 1972 with the passage of the Clean Water Act. Created to control water pollution from point sources—those sources, such as a factory or wastewater treatment plant, that contribute pollutants directly into a body of water from a pipe or other conveyance—the NPDES Program did not specifically address storm water discharges. In 1987, the Congress amended the Clean Water Act with the Water Quality Act, which directed EPA to also control storm water discharges that enter MS4s—essentially requiring EPA to treat such storm water as a point source.[3] MS4s are defined as those sewers that collect and convey storm water; are owned or operated by the federal, state, or local government; and are not part of a publicly owned treatment (sewage) facility.

To regulate urban storm water runoff, EPA published regulations in 1990 that established the NPDES Storm Water Program and described permit application requirements. According to EPA, the program's objective, in part, is to preserve, protect, and improve water quality by, among other things, controlling the volume of runoff from paved surfaces and by reducing the level of runoff pollutants to the maximum extent practicable using best management practices (BMP).[4] The 1987 act also authorized EPA to implement a program that provides federal funds and technical assistance to states to develop their own nonpoint source pollution management programs. States can use the federal funds they receive for nonpoint source programs to address nonpoint sources of pollution as well as urban runoff.

Currently, EPA manages NPDES Storm Water programs in six states (Alaska, Arizona, Idaho, Massachusetts, New Hampshire, and New Mexico) and has delegated authority to the remaining 44 states to manage these programs. The storm water program is being implemented in two phases. Local governments meeting the following criteria must comply with EPA's storm water program regulations. First, Phase I of the program requires that municipalities with a population of 100,000 or more obtain a permit for their MS4 system; second, the program requires that entities obtain a

[3]Section 402(p) of the Clean Water Act.

[4]According to EPA, a best management practice is a device, practice, or method for removing, reducing, retarding, or preventing targeted storm water runoff constituents, pollutants, and contaminants from reaching receiving waters.

permit if they discharge storm water from sites with industrial activities, including construction activities that disturb 5 acres or more of land. In addition, NPDES permitting authorities may also bring other municipalities and industrial entities into the program if they deem it necessary. Municipalities that meet these conditions must submit a permit application to EPA or the governing regulatory state agency. In 1990, the regulations specifically identified 220 municipalities throughout the United States that were required to apply for a Phase I permit. According to EPA, as of April 2001, about 256 Phase 1 MS4 permits had been issued and about 17 more still needed to be issued. Because some permits cover more than one municipality, these permits cover about 1,000 medium and large municipalities nationwide.

The final rule for Phase II of the program was issued in December 1999. Phase II extends Phase I efforts by requiring that a storm water discharge permit be obtained by (1) operators of all MS4s not already covered by Phase I of the program in urbanized areas[5] and (2) construction sites that disturb areas equal to or greater than 1 acre and less than 5 acres of land. As with Phase I of the program, permitting authorities may require additional small MS4s and construction sites to obtain a permit if they are a significant contributor of pollutants. Currently, EPA anticipates that about 5,000 municipalities may be subject to permitting requirements under Phase II of the storm water program. These municipalities are required to obtain permits no later than March 10, 2003.

[5]The Bureau of the Census generally defines an urbanized area as a land area comprising one or more places—central place(s)—and the adjacent densely settled surrounding area—urban fringe—that together have a residential population of at least 50,000 and an overall population density of at least 1,000 per square mile.

EPA also regulates combined sewer overflows (CSO) that can be caused by urban storm water runoff. Combined sewer systems, in which storm water enters pipes already carrying sewage, may overflow when rain or snowmelt entering the system exceeds the system's flow capacity. In the CSO that results, the mixture of untreated sewage and runoff bypasses the water treatment facility and is diverted directly into receiving waters. (See fig. 1 for an illustration of combined and separate sewer systems.) These combined systems generally serve the older parts of approximately 900 cities in the United States. Pipes carrying sewage and storm water separately generally serve newer parts of cities. EPA's 1994 CSO policy requires communities with combined sewer systems to take immediate and long-term actions to address CSO problems. The policy contains provisions for developing appropriate, site-specific NPDES permit requirements for all combined sewer systems that overflow because of wet-weather events. The Wet Weather Water Quality Act of 2000 requires that any permit, order, or decree issued for a CSO conform to the 1994 policy. Under this act, EPA is also required to submit a report to the Congress by September 2001 on the status of the program.[6]

[6]Sanitary sewer overflows, which are illegal under the Clean Water Act, can also result from rainfall. A sanitary sewer overflow may occur when rainwater or snowmelt leaks into sanitary sewage pipes, thereby exceeding the pipes' capacity and causing them to overflow. This discharge of raw sewage from municipal sanitary sewer systems can release untreated sewage into places such as streams, basements, and streets. EPA proposed regulations to require municipalities to reduce the number of overflows. However, these regulations have been withdrawn for further review.

Figure 1: Urban Runoff Flows in Different Types of Sewer Systems

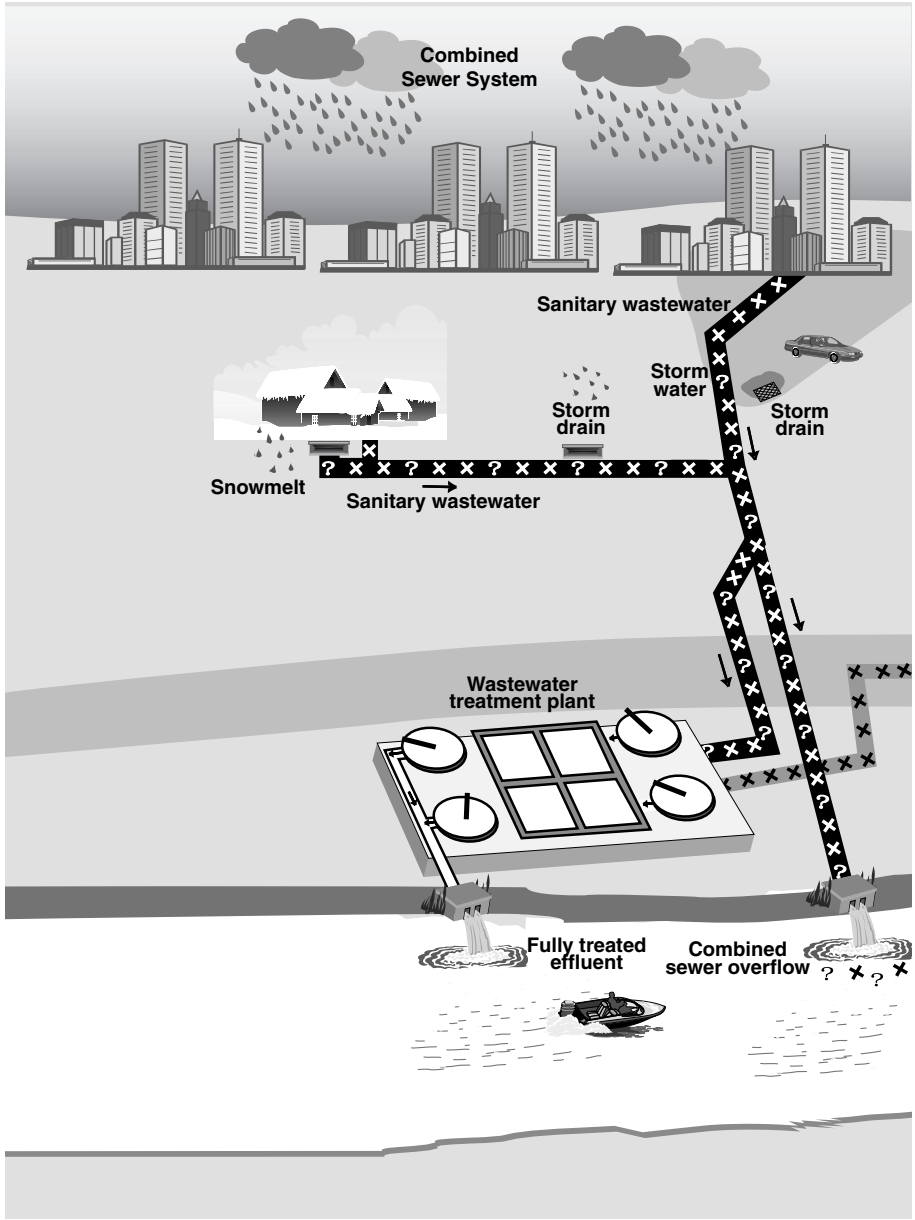

× Sanitary sewage/wastewater
? Storm water runoff with potential contaminants

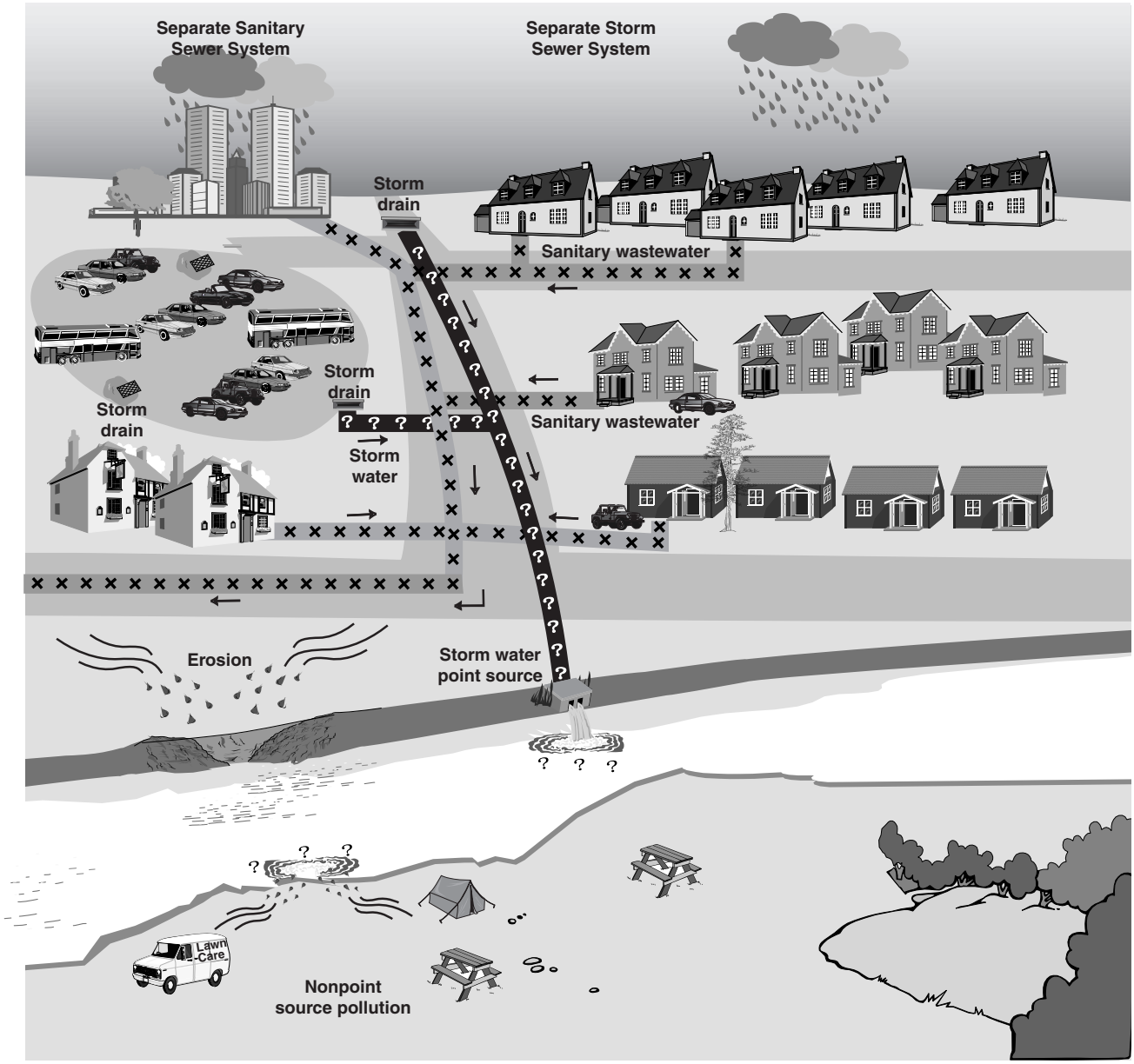

Source: GAO illustration based on EPA data.

The Total Maximum Daily Load (TMDL) Program, established under the Clean Water Act, is intended to address water bodies that do not meet water quality standards because of pollutant loadings from point and nonpoint sources. Currently, it is unclear how and when this program will affect EPA's and states' issuance of storm water permits. A TMDL is a calculation of the maximum amount of a pollutant that a body of water can receive and still meet the water quality standard set by the state. Under EPA's regulations, the state is to allocate this "pollutant load" among the point and nonpoint pollutant sources that flow into the water body and then take steps to ensure that no source exceeds its assigned load. In 1996, EPA issued a policy that outlined an interim approach to including water quality standards in storm water permits. The policy promoted the use of BMPs in the first 5-year term permits, followed by a tailoring of BMPs in the second round of permits as necessary to comply with water quality standards. Until recently, few TMDLs had been established, and citizen organizations sued EPA for its lack of action. EPA issued a new set of regulations for the TMDL Program in 2000, but the Congress prevented EPA from spending money to implement the rule in 2000 and 2001. It is possible that establishing a TMDL for a body of water could result in the application of a numeric effluent limit to outfalls[7] that release storm water into that body of water. Some city officials we spoke with generally felt that numeric effluent limits would significantly increase the cost of managing storm water.

Volume of Urban Runoff Increases With the Expansion of Urban Development and Can Affect Water Quality

Since World War II, urban runoff has increased throughout the United States. This increase is directly related to growth in the amount of impervious surfaces due to urban and suburban development and the construction of roads, highways, and other impervious surfaces. Coinciding with this growth in impervious surfaces has been a reduction in wetlands and in the amount of storm water that infiltrates the ground to recharge aquifers. Moreover, the loss of vegetation due to development and related runoff can cause major erosion. Ultimately, much of this runoff is channeled into gutters, storm drains, and paved channels, and vegetation and sediment removed with the runoff may end up in receiving waters. EPA has identified urban storm water runoff as one of the leading sources of pollution to the nation's rivers, streams, lakes, and estuaries. Runoff from impervious surfaces picks up potentially harmful pollutants and

[7]An outfall is an outlet, such as a pipe, that allows storm water to flow into a river, lake, or other body of water.

carries them into receiving waters. Studies have shown that urban runoff and the pollutants it carries can negatively affect water quality, aquatic life, and public health.

Paved Surfaces Have Increased With Urban and Suburban Expansion and Growth in Automobile Use

According to the U.S. Department of Agriculture, between 1945 and 1997, urban land area increased by almost 327 percent, from 15 million acres to about 64 million acres in the contiguous 48 states. From 1992 through 1997, the annual rate of development averaged about 1 million acres per year. The land developed between 1945 and 1997 came primarily from forestland and pasture and range.[8] For example, according to the Bureau of the Census, between 1960 and 1990, the amount of land used for urban purposes in Baltimore, Maryland, and Washington, D.C., grew by about 170 percent and 177 percent, respectively. As a result, urbanization, with its accompanying expansion of impervious surfaces like sidewalks, roofs, parking lots, and roads, has significantly increased the nation's total developed land and paved surface area.[9] Figure 2 demonstrates the growth in the urbanized areas of Baltimore and Washington, D.C., over the last half of the 20th century.

[8] *Agricultural Resources and Environmental Indicators, 2000,* U.S. Department of Agriculture, Economic Research Service, Resource Economics Division.

[9] *Our Built and Natural Environments, A Technical Review of the Interaction Between Land Use, Transportation and Environmental Quality,* U.S. Environmental Protection Agency (EPA 231-R-00-005, Nov. 2000).

Figure 2: Increase in Urbanized Land in Selected Cities, 1960-90

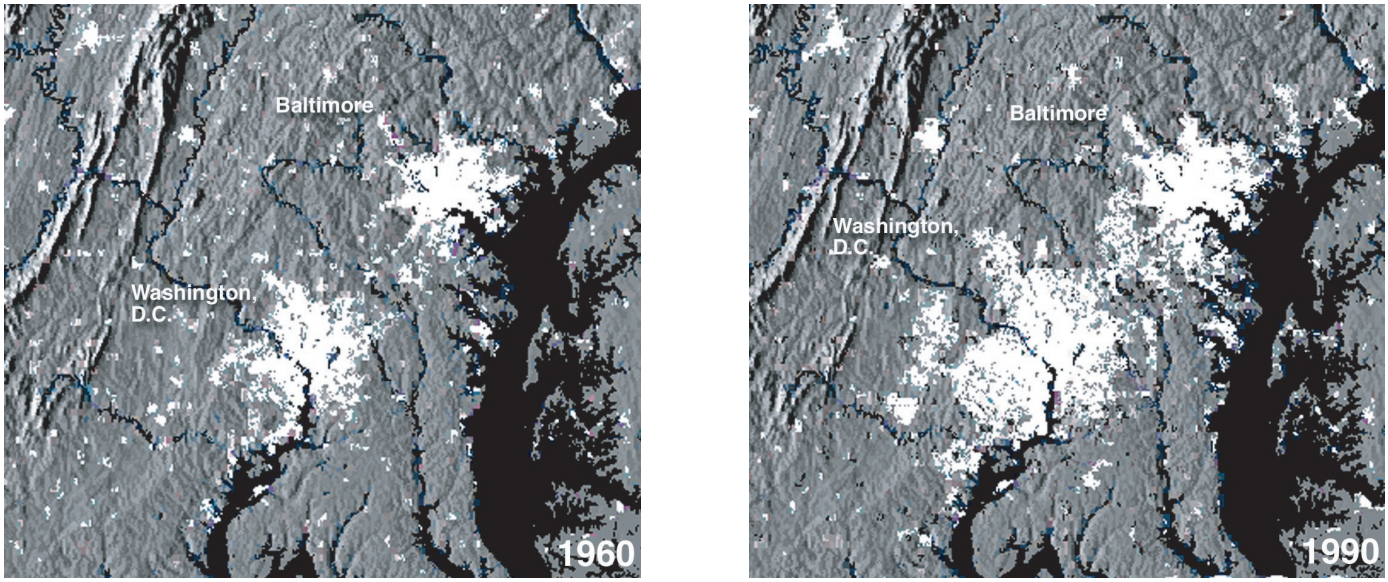

Source: U.S. Geological Survey.

The increase in paved surfaces has been spurred not only by urban and suburban development, but also by a steady increase in the use of automobiles, the primary mode of daily transportation for most Americans. Roads also play an important role in the economy of the United States, since trucks carry about 75 percent of the value of all goods shipped. According to EPA, paved road mileage in the United States increased by 278 percent from 1945 to 1997. In 1945, 19 percent of the public roads in the country were paved; by 1997, that percentage had increased to 61. (See fig. 3.) According to a 1999 study, motor-vehicle infrastructure, such as roads and parking lots, accounts for close to half of the land area in U.S. urban cities.[10]

[10] *Stormwater Strategies, Community Responses to Runoff Pollution,* Natural Resources Defense Council (May 1999).

Figure 3: Percentage of Paved Public Road Miles, 1945-97

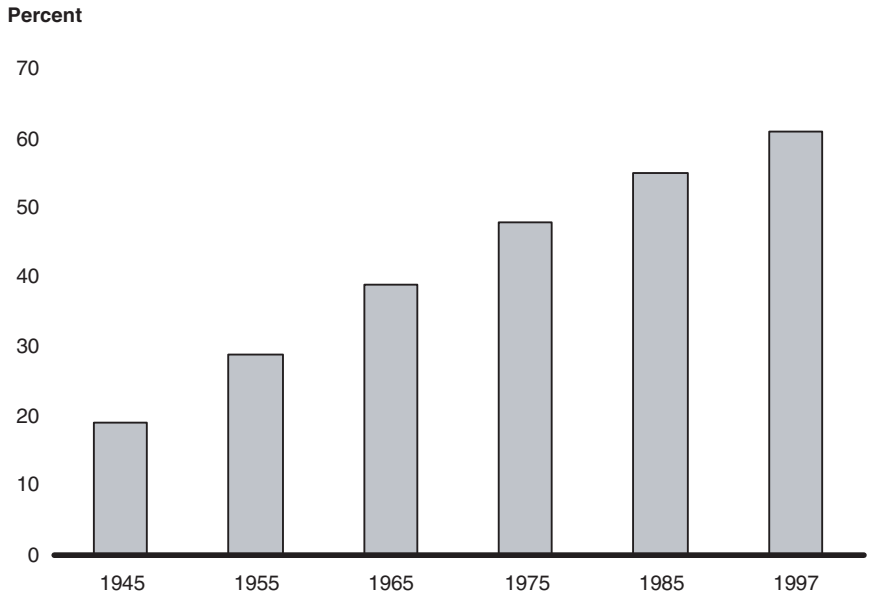

Source: EPA.

Increase in Impervious Surfaces Leads to Increased Runoff

The increase in impervious surfaces over the past several decades has led to an increase in storm water runoff. In part, this has occurred because highways and other developments have reduced the amount of wetlands and other undeveloped land. Wetlands mitigate the effects of storm water runoff by acting as a natural form of flood control, facilitating sediment replenishment, and improving water quality by removing excess nutrients and other chemical contaminants before the contaminants can affect receiving waters. According to a 2000 EPA report,[11] of the 12 states that listed wetland losses, six reported that they had significant losses due to highway construction, and 10 reported that they had significant losses due to residential growth and development. However, the effect of road building on wetland loss has been reduced in recent years. According to a Federal Highway Administration (FHWA) official, since 1996, wetlands have been replaced and restored under the Federal-Aid Highway Program

[11]See footnote 9.

at an average rate of 2.7 acres for every acre lost to highway building. Other undeveloped land with vegetation also performs some of the roles that wetlands play in managing runoff, although to a lesser extent.

Furthermore, as impervious surfaces increase, less storm water is able to infiltrate through the soil to groundwater. Impervious areas allow only a very small amount of initial infiltration compared with unpaved areas whose infiltration capacity varies, depending on the soil type. Figure 4 demonstrates EPA's estimates of the impact of impervious surfaces on the percentages of storm water that runs off, infiltrates the ground, and is lost through evapotranspiration.[12] When natural ground cover is present over an entire site, normally 10 percent of precipitation runs off the land into nearby creeks, rivers, and lakes. In contrast, when a site is 75- to 100-percent impervious, 55 percent of the precipitation runs off into these receiving waters. However, according to an FHWA official, the runoff rates can be reduced if developers take mitigating actions to develop and implement BMPs to control flooding or runoff.

[12]Evapotranspiration represents water loss from evaporation and the absorption and eventual release into the atmosphere of water that plants and trees have collected. The extent to which evapotranspiration occurs is dependent primarily on the solar energy available to vaporize the water. As a result, the effect of evapotranspiration varies greatly across the country.

Figure 4: Impact of Impervious Surfaces on the Amount of Storm Water That Runs Off, Infiltrates, and Evapotranspires

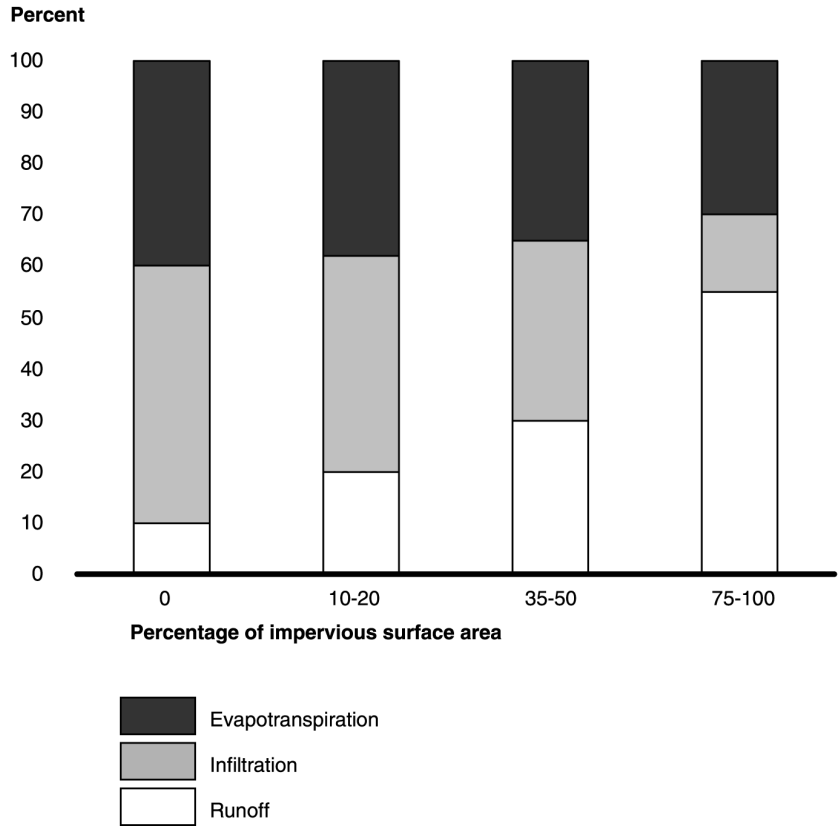

Source: EPA.

The decrease in storm water infiltration that accompanies urbanization also reduces the amount of water that is available to recharge groundwater supplies. For this reason, reduced infiltration may lead to problems with the water table in certain urban areas. For example, a Massachusetts Department of Environmental Protection official noted that a low recharge rate affects water quality because it can result in a loss of wetlands and adversely affect aquatic habitat as water-table levels fall during dry weather.[13] In addition, officials from the Charles River Watershed Association in Massachusetts are concerned that the lack of infiltration might cause some communities to run short of drinking water in the next 20 years.

Urban Runoff Has the Potential to Impair Water Quality and Disrupt Biological Integrity

Urban runoff can adversely affect the quality of the nation's waters, and urban storm water runoff has been identified as one of the leading sources of pollution to rivers, streams, lakes, and estuaries.[14] Section 305(b) of the Clean Water Act requires states and other jurisdictions to report on the quality of their waters to EPA every 2 years. The 1998 *National Water Quality Inventory Report to Congress* showed that 35 percent of assessed river and stream miles, 45 percent of assessed lake acres, and 44 percent of assessed estuarine square miles were impaired in terms of their ability to support uses such as aquatic life, swimming, and fish consumption.[15] The report identified urban storm water runoff as one of the leading sources of impairment to the assessed waters.

[13]Dry weather is defined as a period when rainfall measuring at least 0.10 of an inch has not occurred for 72 hours.

[14]Other leading sources of pollution include agricultural runoff, municipal point sources, hydrologic modifications, and atmospheric deposition.

[15]Information contained in the 1998 report reflects only those waters assessed by states and other jurisdictions and cannot be used to characterize nationwide water quality. Furthermore, water quality standards among states are not identical, and the monitoring design used to collect data differed among states.

Studies have shown that as the percentage of impervious cover increases within a watershed, biodiversity also declines. Research conducted by the Center for Watershed Protection found that, generally speaking, when a watershed has 10 percent or less impervious cover, the associated stream can be categorized as sensitive.[16] Sensitive streams are characterized as having high fish diversity and good water quality. Once the percentage of impervious cover exceeds 25 to 30 percent of the watershed, however, streams tend to become nonsupporting. Nonsupporting streams are highly unstable, have poor diversity of fish and aquatic life, and have poor water quality. For example, one study evaluated the relationship between the extent of impervious cover in watersheds to the number and diversity of fish populations in 47 small streams in southeastern Wisconsin between the 1970s and 1990s.[17] The results revealed that the number of fish species per site was highly variable for drainage areas that had less than 10-percent imperviousness. In contrast, sites that had greater than 10-percent imperviousness had consistently low numbers of fish species.

Other studies have associated urban runoff with basic changes in the receiving body of water. Runoff can carry sediment into surface water, and this sediment can carry contaminants, harm aquatic plants, and smother organisms. Runoff can also be warmed by the impervious surfaces it flows across. When sufficient amounts of warmed runoff enter a water body, the water temperature can rise. Less oxygen is then available for aquatic organisms because water holds less oxygen as it becomes warmer. These combined factors lead to the degradation of aquatic habitat. According to EPA, the common effects of these types of pollution on aquatic life include a decline in biodiversity and an increase in invasive species.

An increase in the volume of storm water runoff also increases the likelihood of erosion, which allows for transport of eroded sediment downstream into receiving waters. For example, during a site visit, we observed extensive erosion along the Gingerville Creek Subbasin in Anne Arundel County, Maryland, that was caused by urban runoff channeled into the creek. Figure 5 depicts the eroded banks and channel of this creek.

[16]"The Importance of Imperviousness," *Watershed Protection Techniques*, v.1:3, Fall, 1994. The article reviews 18 studies on the relationship between urbanization and stream quality.

[17]L. Wang and others, "Watershed Urbanization and Changes in Fish Communities in Southeastern Wisconsin Streams," *Journal of the American Water Resources Association,* Oct. 2000, Vol. 36, No. 5.

Figure 5: Damage Caused by Storm Water Runoff From Urbanized Areas in the Gingerville Creek Subbasin

Source: Anne Arundel County, Maryland, Department of Public Works.

Contaminants in Urban Runoff Can Affect Aquatic Life and Human Health

There have been several efforts to characterize the chemicals and other constituents in urban runoff. The Nationwide Urban Runoff Program, conducted by EPA between 1978 and 1983, examined the characteristics of urban runoff. Another federal effort to characterize urban runoff is an ongoing joint project of the U.S. Geological Survey (USGS) and the FHWA to evaluate guidelines for highway runoff. As table 1 indicates, these studies and others have shown that the principal contaminants found in

urban runoff include nutrients, solids, pathogens, metals, hydrocarbons, organics, salt, and trash. Water flowing over various surfaces, such as streets, parking lots, construction sites, industrial facilities, rooftops, and lawns, carries these pollutants to receiving waters. The contaminants have the potential to impair water quality, degrade aquatic ecosystems, and pose health risks to swimmers.

Table 1: Storm Water Pollutants in Urban Runoff, Including Sources and Potential Impacts

Contaminant	Source	Potential impact
Nutrients		
Nitrogen, phosphorous	Animal waste, fertilizers, failing septic systems, atmospheric deposition,[a] CSOs	Nutrient enrichment can cause an excessive growth of algae. Nuisance levels of algae are associated with dissolved oxygen deficiencies leading to fish kills, loss of submerged aquatic vegetation that serves as a habitat for aquatic organisms, and loss of natural biodiversity.
Solids		
Sediment	Construction sites, other disturbed and/or nonvegetated lands, eroding banks, road sanding	Sediment can cause infection and disease among fish, scour submerged aquatic vegetation, prevent sunlight from reaching aquatic plants, and bury bottom-dwelling aquatic organisms.
Pathogens		
Bacteria, viruses	Animal waste, failing septic systems, illicit connections and discharges to storm sewer system, CSOs	Pathogens entering waters used for recreational purposes can pose human health risks.
Metals		
Lead, cadmium, copper, zinc, mercury, chromium, aluminum, and others	Industrial processes, normal wear of automobile brake linings and tires, automobile emissions, automobile fluid leaks, metal roofs	Metals can cause acute or chronic toxicity for aquatic organisms.
Hydrocarbons		
Oil and grease, polycyclic aromatic hydrocarbons	Industrial processes, automobile wear, automobile emissions, automobile fluid leaks, waste oil	Hydrocarbons have the potential to be acutely toxic for aquatic organisms and several are suspected carcinogens.
Organics		
Pesticides, polychlorinated biphenyls (PCB), synthetic chemicals	Pesticides (herbicides, insecticides, fungicides, rodenticides, etc.), industrial processes	Low concentrations of some organics have the potential to bioaccumulate in the food chain.

(Continued From Previous Page)

Contaminant	Source	Potential impact
Salt		
Sodium Chlorides	Road salting and uncovered salt storage	Salt can damage roadside vegetation, transport high levels of chlorides to receiving waters, and degrade aquatic ecosystems. Chloride can be harmful to some species of fish.
Trash		
	Street refuse and improperly discarded waste material	Trash impairs water quality by inhibiting the growth of aquatic vegetation and conveys nutrients, toxic substances, and other pollutants to aquatic ecosystems.

[a]Atmospheric deposition occurs when pollutants in the air fall on land or water.

Sources: Massachusetts Department of Environmental Protection Stormwater Policy; EPA reports and guidance, including *Preliminary Data Summary of Urban Storm Water Best Management Practices, Combined Sewer Overflow Control Policy, Innovative Urban Wet-Weather Flow Management Systems*, and the 1998 *National Water Quality Inventory Report to Congress*; the California Regional Water Quality Control Board; the Natural Resources Defense Council's *Stormwater Strategies: Community Responses to Runoff Pollution*; "Accretion of Pollutants in Roadway Snow Exposed to Urban Traffic and Winter Storm Maintenance Activities - Part I," Draft;[18] and USGS' National Water Quality Assessment Program.

[18]J.J. Sansalone and D.W. Glenn, "Accretion of Pollutants in Roadway Snow Exposed to Urban Traffic and Winter Storm Maintenance Activities –Part I," DRAFT.

In our visits to cities with Phase I permits and their watersheds, we identified specific instances in which these contaminants had affected water quality. The Chesapeake Bay, for example, has been polluted with the nutrients nitrogen and phosphorus and with excess sediment caused, in part, by urban runoff. The excess nutrients cause algae blooms that block sunlight from reaching bay grasses—which are a source of food, shelter, and nursery grounds for many aquatic species. In an effort to control nutrient pollution in the Chesapeake Bay, the Executive Council of the Chesapeake Bay Program[19] established a goal to reduce the nitrogen and phosphorus entering the Chesapeake Bay by 40 percent, including through control of runoff from urban areas. In addition, an assessment of the status of chemical contaminant effects on living resources in the bay's tidal rivers found "hot spots" of contaminated sediment. As a result, the Baltimore Harbor and the Patapsco River in Maryland; the Anacostia River in Washington, D.C.; and the Elizabeth River in Virginia were designated as "regions of concern." Urban storm water runoff is a significant source of contaminants in the three regions. The Chesapeake Executive Council has committed to reduce by 30 percent the chemicals of concern in the regions of concern by 2010 through pollution prevention measures and other voluntary means.[20]

Pathogens such as bacteria and viruses, which are often present in urban runoff, can pose public health problems. For example, the Santa Monica Bay Restoration Project conducted a study to identify adverse health effects of untreated urban runoff by surveying over 13,000 swimmers at three bay beaches. [21] The study established a positive association between an increased risk of illness and swimming near flowing storm-drain outlets. Table 2 explains health outcome measures at various distances from storm drains. For example, the study found a 1-in-14 chance of fever for swimmers in front of the drain versus a 1-in-22 chance at 400 or more yards away.

[19]The Chesapeake Executive Council includes the governors of Maryland, Pennsylvania, and Virginia; the Administrator of the U.S. Environmental Protection Agency; the mayor of the District of Columbia; and the chair of the Chesapeake Bay Commission.

[20]Chesapeake Bay Program Office, *Toxics 2000 Strategy: A Chesapeake Bay Watershed Strategy for Chemical Contaminant Reduction, Prevention, and Assessment,* Dec. 2000.

[21]R.W. Haile and others, "The Health Effects of Swimming in Ocean Water Contaminated by Storm Drain Runoff," *Epidemiology,* July 1999, Vol. 10, No. 4.

Table 2: Comparative Health Outcomes for Swimming in Front of Drains Versus 400 or More Yards Away

Health outcomes	0 yards	400 or more yards
Fever	1:14	1:22
Chills	1:26	1:42
Ear discharge	1:68	1:143
Coughing with phlegm	1:20	1:33
Significant respiratory disease (fever and nasal congestion, fever and sore throat, and cough with phlegm)	1:12	1:22

Note: This table includes the statistically significant health outcomes.

Source: GAO analysis of data from "The Health Effects of Swimming in Ocean Water Contaminated by Storm Drain Runoff," *Epidemiology*, July 1999, Vol. 10, No. 4.

Metals and polycyclic aromatic hydrocarbons (PAH) in urban runoff can present a threat to aquatic life. Studies have found the following:

- Storm water runoff from an urban area proved to be toxic to sea urchin fertilization in the Santa Monica Bay, and dissolved zinc and copper were determined to be contributors to this toxicity. [22]
- Brown bullheads (a bottom-dwelling catfish) in the Anacostia River developed tumors that were believed to be caused by PAHs associated in part with urban runoff.[23]
- High PAH and heavy metal concentrations were found in crayfish tissue samples from several urban streams in Milwaukee. The study associated these contaminants with storm water runoff.[24]

[22]Southern California Coastal Water Research Project, *Study of the Impact of Stormwater Discharge on Santa Monica Bay–Executive Summary,* Nov. 1, 1999.

[23]Chesapeake Bay Program Office.

[24]J.P. Masterson and R.T. Bannerman, "Impacts of Stormwater Runoff on Urban Streams in Milwaukee County, Wisconsin," *National Symposium on Water Quality, American Water Resources Association,* Nov. 1994.

In addition, USGS tracked trends in the concentrations of PAHs found in sediment in 10 lakes and reservoirs in six metropolitan areas over the last several decades. This study found that PAH concentrations in developed watersheds are increasing and that these increases may be linked to the amount of urban development and vehicle traffic in urban and suburban areas.[25] For example, from 1982 to 1996, PAH concentrations in the sediment core in Town Lake (Austin, Texas) and total miles driven in greater Austin both increased by about 2.5 times. Figure 6 illustrates this correlation.

Figure 6: Comparison of Town Lake PAHs and Traffic Trends

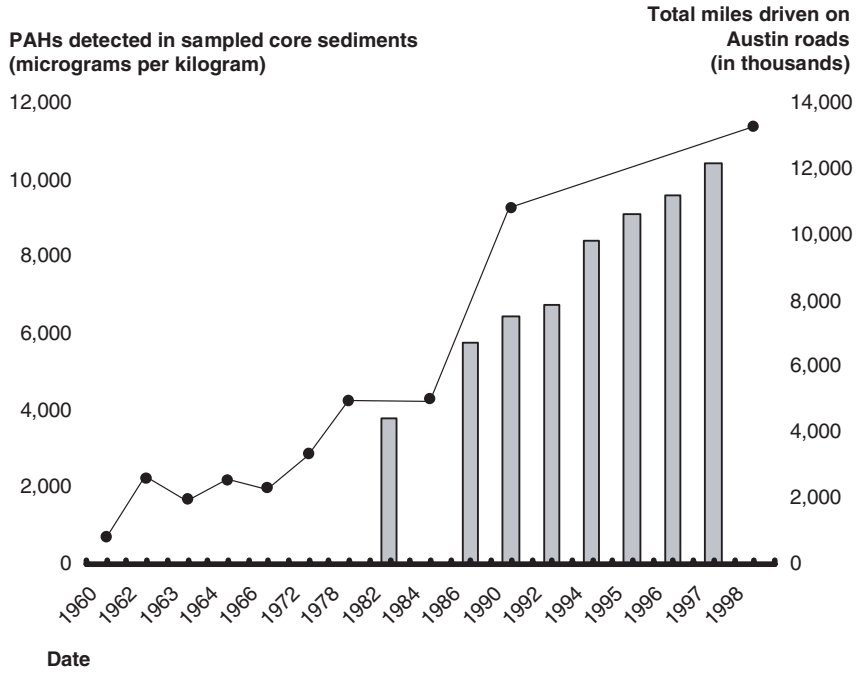

Note: According to USGS, irregularities in the date pattern are due to intervals at which sediment samples were collected.

Source: USGS National Water Quality Assessment Reconstructed Trends Program.

[25]P. Van Metre, B. Mahler, and E. Furlong, "Urban Sprawl Leaves Its PAH Signature," *Environmental Science and Technology,* Vol. 34, No. 19, 2000.

Although the studies we reviewed show that certain contaminants are likely to be present in urban runoff, factors such as land development practices, climate conditions, atmospheric deposition, and traffic characteristics all can affect the characteristics of runoff from a particular area. Therefore, given the diffuse nature of many storm water discharges and the variability of other contributing factors, characterizing the concentrations of pollutants contained in storm water runoff has been challenging. Recent USGS reports also suggest that improvements are needed in the methods used to analyze sediment and metals in runoff.[26]

Local Governments Take Actions to Manage Urban Storm Water Runoff, but Information Is Limited on the Cost and Effectiveness of These Actions

To comply with federal and state storm water management for Phase I permitting requirements, permitted municipalities must create and implement storm water management programs. The three primary activities used in these programs include efforts to characterize storm water runoff; BMPs aimed at reducing pollutants in storm water runoff to the maximum extent practicable; and reporting program activities, monitoring results, and costs of implementing the program. Some BMPs are structural—meaning that they are designed to trap and detain runoff until constituents settle or are filtered out. Other BMPs are nonstructural—meaning that they are designed to prevent contaminants from entering storm water through actions like street sweeping and inspections. Many permitted municipalities use specialized BMPs tailored to address particular runoff problems in their locations. Over 1,000 cities are undertaking these efforts under the NPDES Storm Water Program, but information on the overall costs of managing urban runoff and the effectiveness of the actions taken is limited. EPA's attempts to forecast costs have not encompassed the entire program or are out of date. In addition, the permitted municipal agencies we visited estimated their annual storm water management costs and reported them to state agencies or EPA, but the approaches they used to calculate these estimates varied considerably, making it difficult to draw any conclusions. Although EPA and state agencies believe that the program will be effective in improving water quality, EPA has not made a systematic effort to evaluate the program. Without such an effort, EPA cannot tell what effect the program is having on water quality nationally.

[26]The USGS reports indicate that certain methods used to analyze sediment and metals samples can be unreliable. For example, sample collection and processing methods can have an effect on measured concentrations of metals.

Municipalities Comply With Federal and State Requirements Through Monitoring, Best Management Practices, and Reporting

The NPDES Storm Water Program requires municipalities operating under a Phase I MS4 permit to characterize and monitor storm water runoff, implement BMPs to reduce pollutants to the maximum extent practicable, and report costs and monitoring results to the permitting authorities. Because of these requirements, local governments have generally shifted the focus of their storm water management from water quantity control or flood management to water quality concerns.

Besides following the basic federal requirements, municipalities must follow any additional regulations developed by states that have been delegated the authority to manage the NPDES Storm Water Program. For example, Wisconsin's Department of Natural Resources broadened the requirements for determining which municipalities must get permits. The state requires local governments with storm sewer systems in priority watersheds (based on the significance of storm water runoff as a pollutant source) that serve a populace of 50,000 or more[27] to obtain a permit with requirements similar to those for a Phase I permit. Wisconsin's Department of Natural Resources also requires municipalities that are located in one of the state's five Great Lakes Areas of Concern[28] to obtain a state permit. Furthermore, in line with specific criteria in Wisconsin's Administrative Code, the state requires other municipalities to obtain a permit if the municipality is found to significantly contribute storm water pollutants to waters of the state. These various requirements increased the number of municipalities that must get permits from the two under federal requirements to over 70 under the states' requirements.

The local governments we reviewed were undertaking three primary activities when applying for permits and implementing their storm water management programs. Specifically, these activities were (1) characterizing storm water runoff; (2) developing BMPs to reduce discharges of pollutants to the maximum extent practicable; and (3) reporting program activities, monitoring results, and reporting program costs.

First, to characterize runoff, applicants are to provide quantitative data that describe the volume and quality of discharges from municipal storm

[27]For example, we visited West Allis, Wisconsin, which has a permit even though its population is under 100,000.

[28]Areas of concern have persistent water quality problems, which impair beneficial uses.

sewers. For example, cities must map all storm sewer outfalls—an undertaking that one group representing cities described as significant. After the permit application is approved, additional monitoring is required throughout the life of the permit to facilitate the design of effective storm water management programs and to document the nature of the storm water. The local governments we visited were all monitoring for a variety of purposes, including characterizing runoff from different types of land use in order to target their BMPs, testing the effectiveness of a particular BMP, or establishing a baseline for their storm water quality evaluations.

Second, the storm water management programs that local governments develop focus on implementing BMPs. While active treatment, such as sending storm water through a treatment facility, is a possible BMP, the cities we visited were generally not using active treatment. EPA's February 2000 report[29] on the Phase I program described the program as based on the "use of low-cost, common-sense solutions." The five cities we visited were generally using similar types of structural and nonstructural BMPs, as follows:

- Structural BMPs are designed to separate contaminants from storm water. For example, detention ponds temporarily hold storm water runoff to allow solids and other constituents in the runoff to settle before the water is released at a predetermined rate into receiving waters. In addition, catch-basin inserts, placed in a storm drain, catch trash and other debris, and particle separators, placed beneath the surface of an impervious area such as a parking lot, separate oils from runoff and allow sediment and debris to settle. Structural devices such as these require regular maintenance to function properly and remain effective.
- Nonstructural BMPs are primarily designed to minimize the contaminants that enter storm water. These nonstructural BMPs include
  - "good housekeeping" practices by the local government, such as oil collection and recycling, spill response, household and hazardous waste collection, pesticide controls, flood control management, and street sweeping;

[29] *Report to Congress on the Phase I Storm Water Regulations*, U.S. Environmental Protection Agency, February 2000. This report includes information on the program for local governments, industries, and construction sites.

- public education programs, such as storm-drain stenciling, to remind the public that trash, motor oil, and other pollutants thrown into storm drains end up in nearby receiving waters;[30]
- new ordinances to control pollution sources, such as prohibiting the disposal of lawn clippings in storm drains and requiring pet owners to clean up after their pets;[31]
- requirements that developers comply with storm water regulations and incorporate erosion and sediment controls at all new development sites;
- requirements that runoff from properties owned or activities sponsored by the municipality be properly controlled; and
- efforts to identify and eliminate illicit connections and illegal discharges to the storm sewer systems, such as those from pipes carrying sewage.

We found that the NPDES Program's requirements allowed local governments to tailor their storm water management efforts to prioritize local concerns, such as a particular type of contaminant, a particular climatic condition, or a particular body of water. Some cities also developed specialized BMPs to address these concerns. The following information highlights specific storm water-related concerns in the five cities we visited and the specialized BMPs these municipalities have developed to address these particular concerns. (See apps. I to V for additional information on these cities' storm water management programs.)

[30]Other public education programs we observed included in-school education programs, partnerships with grassroots organizations concerned with water quality issues, and the identification of commercial businesses and industries to educate owners on methods to control storm water runoff.

[31]According to Worcester, Massachusetts' April 2000 *City of Worcester DPW Stormwater Management Program Annual Report*, the city has proposed ordinances that prohibit the disposal of lawn clippings and other yard waste in catch basins and that require pet owners to clean up after their pets. As of April 2001, neither ordinance had been implemented.

- In **Baltimore, Maryland**, excessive levels of nutrients, particularly phosphorus and nitrogen, are among the city's major water quality concerns because of the city's participation in the Chesapeake Bay Program. Baltimore City agreed to assist the state in reaching the Chesapeake Bay Program's goal to reduce nutrients discharged to the bay by 40 percent by the year 2000. According to a Chesapeake Bay Program Office representative,[32] as of March 2001, the program has not met this goal but expects to reach it within the next several years.
- In **Boston, Massachusetts**, the Boston Water and Sewer Commission, which holds the permit for Boston's storm sewer system, is concerned about runoff from roadways, especially runoff containing salt and sand used in the winter months and dissolved metals (copper and zinc) from automobiles. In September 2000, the commission began a 3-year program to develop and implement a citywide catch-basin inspection, cleaning, and preventive maintenance program. The program will also include the development of a database and map that can be linked to the commission's Geographic Information System.
- **Los Angeles County, California**, is responding to a TMDL for trash in the Los Angeles River Watershed that will require the county, over a 10-year period, to eliminate trash in runoff. The county is testing a variety of devices that remove trash from runoff and specialized catch-basin devices that are designed to prevent trash from ever reaching the storm sewers.
- **Milwaukee, Wisconsin**, changed its monitoring and public education activities in its recent permit to test the effectiveness of a BMP targeting public education efforts to a specific community. The new permit also requires a monitoring program aimed at the community, its associated watershed, and city employees who work in the area.
- **Worcester, Massachusetts**, had a significant problem with illicit connections to its storm sewers and with flow in these sewers during dry weather. Worcester's Department of Public Works (DPW) screened 71 of its storm water outfalls and determined that 32 of them had drainage areas that carried both sanitary sewage and storm drainage in separate conduits through common manholes. DPW has retrofitted over 65 percent of the manholes to prevent sewage from mixing with storm water.

[32]The Chesapeake Bay Program Office, U.S. EPA Region III, was founded in 1983 with the formation of the Chesapeake Bay Program. The program is a voluntary regional partnership that leads and directs restoration of the Chesapeake Bay. Members of the Chesapeake Bay Program include Maryland, Pennsylvania, Virginia, the District of Columbia, the Chesapeake Bay Commission (a tristate legislative body), EPA, and participating citizen advisory groups.

Third, local governments participating in the Phase I program are required to report annually to EPA or the state regulatory agency on their storm water programs. These reports are to include a status report on the program; a summary of data, including monitoring results collected during the reporting year; information on annual expenditures on the program and a budget for the coming year; and a description of any water quality improvements or degradation.

Information on the Costs of Addressing Storm Water Runoff Is Limited

Good information about the cost of implementing federal storm water requirements is limited. EPA conducted a survey to estimate the nation's future water infrastructure needs over a 20-year period—from 1996 to 2016. In its 1996 report,[33] EPA estimated that states would require over $50 billion to meet their current (as of 1996) water infrastructure needs. The estimate consists of storm water management needs (at $7.4 billion) and CSO needs (at $44.7 billion).[34] EPA noted, however, that estimated storm water management needs are likely too low and could increase following an analysis of data collected to prepare the agency's 2000 clean water needs survey—to be released in 2002. According to EPA, many cities have implemented the Phase I program since EPA reported to the Congress in 1996, and municipalities should now be better able to provide documented cost data. As a result, EPA will need to rely less on modeled storm water needs than it did in the 1996 needs survey. EPA did not project the costs and benefits of the program when it was initiated; therefore, no initial cost estimates are available. When EPA promulgated the Phase I program regulations in 1990, the agency decided that the storm water program did not meet the requirements for preparing a benefit/cost analysis.

[33] *1996 Clean Water Needs Survey Report to Congress*, U.S. Environmental Protection Agency (Sept. 1997). EPA's estimate represents the estimated capital costs for water quality projects eligible for state revolving fund support.

[34] EPA also estimates that $81.9 billion of its 20-year water infrastructure needs cost can be attributed to sanitary sewer overflows. These overflows may occur when rainwater or snowmelt leaks into sanitary sewage pipes, exceeding the pipes' capacity and causing them to overflow. This overflow can release untreated sewage from municipal sanitary sewer systems into streams, basements, and streets.

The costs to local governments of complying with the Phase I program have generally been portrayed as high. However, because of inconsistencies in cost accounting and reporting practices, we could not determine the cost of the program to several of the cities we visited. Although municipalities are required to provide information on the expenditures that they anticipate will be needed to implement their storm water management programs for each fiscal year covered by the permit, EPA has not issued any cost reporting guidelines. Consequently, while the reported fiscal year 1999 total cost to manage and treat storm water runoff across the five municipalities in our review ranged from less than $1 million (Milwaukee) to $135 million (Los Angeles County),[35] these numbers are not comparable because the municipalities did not have consistent cost accounting and reporting practices and did not fully express storm water management costs.[36] For example, some cities reported only the costs of activities that were funded by the city department that held the permit. Significant activities funded by other city departments were not reported, even if they were important components of the storm water program. Officials in the Milwaukee Department of Infrastructure Services and the Boston Water and Sewer Commission told us that other city departments perform and fund activities such as street sweeping and flood control. The costs of these activities are not reported as storm water program costs because the activities serve other purposes besides preventing storm water pollution.

In addition, according to some city officials, these activities were in place before the permit was issued and, therefore, cannot be characterized solely as storm water costs. The cost of street sweeping can be significant—for fiscal year 1999, Baltimore City and Worcester, which did include street-sweeping costs in their storm water program's cost estimate, stated that their street-sweeping expenses totaled about $9.5 million and $1.2 million, respectively. Similarly, Milwaukee did not report the cost of a significant project related to storm water runoff because it was mostly funded by the state of Wisconsin.

[35]Los Angeles County's cost was projected by the municipal permit holder and represents the cost of the 85 cities covered by the permit.

[36]We were unable to obtain comprehensive information on the total cost to the Boston Water and Sewer Commission of managing storm water, so their fiscal year 1999 costs could not be included in this range.

An EPA official told us that the agency had not yet made a national effort to analyze the information that Phase I permittees submitted on the costs of their storm water programs. This official cited the inconsistent formats of the annual reports as a reason that the information was not readily available at the national level and also indicated that adequate staff are not available to analyze the data. In addition, other EPA officials informed us that the Office of Wastewater Management must divide its resources among a number of issues that will challenge the agency's water program over the next decade.

Several officials in the cities we visited said that their annual costs are likely to increase. A number of factors could affect the costs. For example, a Baltimore City official explained that the anticipated, future program costs depend on several factors, including (1) requirements in watershed-management plans currently being developed, (2) pollution-reduction goals the city will be required to achieve, (3) requirements of the state regulatory agency in future permits, and (4) requirements the city may have to meet if TMDLs or numeric effluent limits are incorporated into NPDES storm water permits. Other city officials also expressed concern about the extent to which TMDLs could affect their future costs. These city officials are concerned that when and if TMDLs are established, their future storm water permits may require that storm water runoff meet specific water quality standards. For example, Los Angeles County's trash TMDL could potentially drive the county's storm water management costs upward, and the county expects additional TMDLs to be imposed. On the other hand, Worcester officials estimated that their future storm water costs would be about the same as they were at the time of our review—about $4.5 million per year.

In a separate analysis, EPA estimated in 1999 that it will cost Phase II municipalities about $848 million to $981 million per year (in 1998 dollars) to manage storm water runoff. Because Phase II permits have not been issued as of May 2001, we did not gather any cost information on them from these cities.

Funding for Managing Storm Water Runoff Is Available From Local and Federal Sources

The five cities we visited had not generally obtained federal funds for their storm water management efforts. They used local sources, including general revenues, bonds, revenue from specifically created storm water utilities, state grants, and inspection and permit fees.

While several sections of the Clean Water Act provide funding that can be used for municipal storm water control, relatively few federal funds have been directed to these types of projects. The most significant source of funds is the state revolving loan funds administered by states.[37] These revolving loan funds provide loans for eligible storm water control projects. In some cases, nonpoint source projects may also qualify for funding when storm water permits are not required or issued. However, municipal storm water management is generally a low priority in these programs. Specifically, in the year 2000, revolving fund loans were made in the "storm sewers" category in the amount of $38.76 million for 44 different projects. These funds represented less than 1 percent of the amounts loaned from these revolving funds that year. Activities eligible for revolving fund loans include constructing BMPs to control runoff, but support for ongoing operations and maintenance is not eligible. Revolving fund loans can also be used for eligible CSO control projects. In 2000, Clean Water State Revolving Fund Program loans were made in the "CSO Correction" category of a national EPA database in the amount of $411.3 million for 69 different projects and could have been used for CSO or sanitary sewer overflow projects. This amount represented about 9 percent of the funds loaned in 2000.

According to EPA, the agency also issues grants to universities and other research institutions to help implement the storm water program. Some of these grants provide training and guidance to Phase I permittees on watershed protection and the proper selection of BMPs.

Other sources of funding may be available to local governments beginning in 2002. In December 2000, the Congress authorized programs for fiscal years 2002 through 2004 to provide grants to local governments for (1) pilot projects for managing municipal CSOs, sanitary sewer overflows, and storm water discharges on a watershed basis and for testing BMPs and (2) controlling pollutants from MS4s to demonstrate and determine cost-effective, innovative technologies for reducing pollutants from storm water discharge. EPA's proposed budget does not request funds for these programs. In addition, the Congress authorized programs for fiscal years 2002 and 2003 to provide grants to local governments for planning, designing, and constructing treatment works to intercept, transport,

[37]Under the Clean Water State Revolving Fund Program, the federal government provides grants to capitalize states' funds. States provide loans to local governments for wastewater projects.

control, or treat municipal CSOs and sanitary sewer overflows. EPA's proposed budget requested $450 million for this program.

EPA, States, and Local Governments Believe the NPDES Storm Water Program Is Effective, but It Has Not Been Evaluated

EPA, state, and municipal officials generally believe that the NPDES Storm Water Program will improve water quality. These officials believe that the program will result in more bodies of water that meet water quality standards, improved aesthetic conditions, reduced risk from bacterial contamination, and improvements attributable to the discovery and management of pollutants in storm water that otherwise would have gone unnoticed. EPA attempted to put a dollar value on these benefits in its benefit/cost analysis prepared for the Phase II storm water regulations, estimating that such benefits could range from $672 million to $1.1 billion per year (in 1998 dollars).[38]

However, little information is currently available on the benefits of the storm water program or its general effectiveness. There is no doubt that it will take time for the results of the Phase I program to be demonstrated. As EPA notes in its February 2000 report to the Congress, pollution control efforts under water quality management programs produce long-term changes, and the agency expects water quality improvements attributable to the Phase I program to become evident in the future, as the program matures. In this report, EPA concluded that the program has improved storm water management at the local level, improved water quality, and decreased pollutant loads in storm water. However, EPA relied on a survey of only nine Phase I cities in making these conclusions and, therefore, also reported that the agency could not provide national estimates on water quality protection and improvements generated by Phase I of the program. To evaluate the entire program, EPA would have to establish goals for the program that are based on its mission; obtain information about the program's results; compare the results with the goals; and make changes to the program, if warranted, to get closer to achieving the agency's goals.

EPA and the states also have not taken advantage of information that is available to evaluate the program. Each city we visited was regularly monitoring its storm water to establish baseline information on pollutant levels and was reporting this information to EPA or the regulatory state agency each year. Although cities with Phase I permits are required to report on their storm water monitoring results and changes in water

[38]Using another method, EPA estimated the benefits at $1.6 billion per year.

quality, overall, EPA and the states have not successfully developed measurable goals for the program or demonstrated its effectiveness through the review of municipal reports. An EPA official said that some states had requested funding to analyze program data because they did not have the resources to do so, and that EPA had provided the funding in a few cases. EPA also has not established any guidelines for how these data should be reported. Therefore, the reports may be as variable as the cost information we obtained in our five site visits.

EPA has not yet taken any of these data-analysis steps because, according to EPA officials, other program challenges within the Office of Wastewater Management compete with storm water management efforts for priority. For example, EPA officials stressed that available resources within the office must address other significant wet-weather pollution problems, such as CSOs and sanitary sewer overflows, and nonpoint source pollution problems, such as agricultural practices, forestry, and mining. One agency official noted that the highest priority is addressing needs that the agency and local governments have identified for improving wastewater infrastructure, such as sewage treatment facilities. The program also has relatively few staff assigned—about five in the headquarters office and about 10 in the regional offices—for the municipal, industrial, and construction portions of the program. In a program plan recently prepared for the storm water program, EPA estimated that nine to 10 staff would be needed in EPA headquarters to evaluate the program and implement other program requirements.

EPA officials described two efforts that may be the first steps in developing better information about the program. First, EPA intends to issue a grant to the University of Alabama in June 2001 to evaluate monitoring data submitted by a sample of municipalities with Phase I permits. This effort will (1) determine the different types of monitoring being conducted by Phase I municipalities, (2) assess water quality in and around permitted municipalities and determine any correlation between program implementation and impacts on water quality, and (3) recommend approaches for improving the effectiveness of municipal storm water monitoring programs. EPA expects the results of this study in 2003. Second, an EPA official stated that the agency would like to establish a system for analyzing program findings, incorporating necessary changes that are based on these findings, and evaluating the program's effectiveness. The agency plans to implement a pilot project in 2001 in the agency's Atlanta Region IV office for analyzing data reported in annual

reports and developing key indicators for the program. If this project is successful and resources are available, the project could be expanded.

Conclusions

EPA regards urban runoff as a significant threat to water quality across the nation and considers it to be one of the most significant reasons that water quality standards are not being met nationwide. Prompted by the Congress, EPA has responded with a variety of programs, including the NPDES Storm Water Program, which requires more than 1,000 local governments to implement storm water management programs. Those municipalities that are currently involved in Phase I of the program have been attempting to reduce pollutants in storm water runoff for several years. It is time to begin evaluating these efforts. However, EPA has not established measurable goals for this program. In addition, the agency has not attempted to evaluate the effectiveness of this program in reducing storm water pollution or to determine its cost. The agency attributes this problem to inconsistent data reporting from permitted municipalities, insufficient staff resources, and other competing priorities within the Office of Wastewater Management. Although Phase I municipalities report monitoring and cost data to EPA or state regulatory agencies annually, these agencies have not reviewed this information to determine whether it can be of use in determining the program's overall effectiveness or cost. Our analysis shows that the reported cost information will be difficult to analyze unless EPA and its state partners set guidelines designed to elicit more standardized reporting. Better data on costs and program effectiveness are needed—especially in light of the Phase II program that will involve thousands more municipalities in 2003. EPA's planned research grant to the University of Alabama and its pilot project in the agency's Region IV to analyze data from annual reports and develop baseline indicators is a step in the right direction and could point the way for a more comprehensive approach.

Recommendation

To determine the extent to which activities undertaken through the NPDES Storm Water Program are reducing pollutants in urban runoff and improving water quality, and the costs of this program to local governments, we recommend that the Administrator, EPA, direct the Assistant Administrator for the Office of Water to

- establish measurable goals for the program;

- establish guidelines for obtaining consistent and reliable data from local governments with Phase I permits, including data on the effects of the program and the costs to these governments;
- review the data submitted by these permittees to determine whether program goals are being met and to identify the costs of the program; and
- assess whether the agency has allocated sufficient resources to oversee and monitor the program.

Agency Comments and Our Evaluation

We provided a draft of this report to EPA and DOT for their review and comment. EPA generally agreed with the report and with the recommendation, although it did not explicitly comment on all parts of it. (EPA's comments appear in app. VI.) In response to our recommendation that EPA set measurable goals for the storm water program, EPA stated that under the second phase of the program, local governments will establish their own goals. Although this is an important activity, EPA will have difficulty evaluating the program's effectiveness at a national level without setting goals that reflect the program's mission of improving water quality. The agency (1) agreed that it should establish guidelines for obtaining consistent and reliable data from local governments about their programs and (2) plans to award grants to two universities for reviews of monitoring data reported by local governments. EPA did not comment on whether local governments should report on the costs of their programs. EPA also agreed that it and its state partners should review data reported by local governments to determine whether the program's goals are being met. In April 2001, EPA officials told us that the agency planned to undertake a project in the Region IV (Atlanta) office to evaluate the methods local governments are using to control storm water. EPA's letter indicates that the agency now plans to implement this project in three regional offices and 10 states. EPA did not comment on the part of our recommendation that the agency review the level of resources devoted to overseeing and monitoring the program. EPA also provided technical comments that we incorporated where appropriate.

DOT generally agreed with the draft report and provided technical comments that we incorporated where appropriate. In particular, DOT suggested that we revise several references in the draft report to paved surface area and its relationship to increases in urban runoff, to emphasize that impervious surfaces, of which paved surfaces are a significant subset, cause increases in runoff. We revised the language in these places.

As agreed with your offices, unless you publicly announce its contents earlier, we plan no further distribution of this report until 7 days after the date of this report. At that time, we will send copies of this report to the Administrator, Environmental Protection Agency, and the Secretary of Transportation. We will make copies available to others on request. If you or your staff have any questions about this report, please call me at (202) 512-2834. Key contributors to this report are listed in appendix VII.

Peter F. Guerrero
Director, Physical Infrastructure Issues

Appendix I

The Storm Water Program in Baltimore City, Maryland

Baltimore City's municipal separate storm sewer system (MS4) is regulated by the Maryland Department of Environment (MDE) and, according to a city official, services the entire city. The city is currently implementing its second, 5-year National Pollutant Discharge Elimination System (NPDES) permit, issued on February 8, 1999. Before obtaining the first NPDES storm water permit in 1993, Baltimore City addressed the adverse affects of storm water runoff by implementing Maryland's Storm Water Management Program and Erosion and Sediment Control Program. According to the 2000 census, Baltimore City's population is about 651,000.

Urban Runoff Problems in Baltimore City

Baltimore City's urban runoff discharges to four major areas—Gwynns Falls, Jones Falls, Herring Run, and the Patapsco River—and then ultimately to the Chesapeake Bay. In 1990, the Environmental Protection Agency's (EPA) 319(a) report[1] implicated urban runoff as the main source of pollution in these waters. Moreover, Baltimore City was one of the areas studied in EPA's Nationwide Urban Runoff Program in the 1980s. This study reported that urban runoff contributed over 60 percent of the total nitrogen, phosphorus, and organic carbon; over 70 percent of the chemical oxygen demand; and over 80 percent of the total suspended solids, lead, and zinc in local water bodies.

An MDE official told us that nutrients, zinc, and suspended solids are among the constituents most commonly found in urban runoff, but the quantitative contribution to water quality impairment in the state's waters was not known. Also, in 1996, the Chesapeake Executive Council designated the Baltimore Harbor as one of three toxic regions of concern in the Chesapeake Bay. The harbor suffers from sediment contaminated by banned substances (such as the termiticide chlordane) and contaminants currently being released (such as metals and organics). Furthermore, according to the Chesapeake Bay Program Office, data collected from Phase I permittees indicate that storm water runoff can be a significant source of metals and organics in the harbor.

A Baltimore City official told us that some portions of Maryland's waters are impaired because of unacceptable levels of nutrients, metals,

[1]Section 319(a) of the Clean Water Act requires, among other things, that states identify and report to EPA the navigable waters that cannot reasonably be expected to maintain water quality standards (e.g., established water body uses) without additional action to control nonpoint source pollution.

suspended sediments, and chlordane. Moreover, this official noted that the state does not consider data that municipalities collect under their NPDES storm water permits during the 303(d) listing process. Therefore, he believes that streams in Maryland are much more impaired than indicated by the listing process.

Baltimore City's Use of Best Management Practices

Like other NPDES storm water permit holders, Baltimore City uses a variety of best management practices (BMP) to reduce the amount of pollutants in runoff to the maximum extent practicable. These BMPs include detention ponds, shallow marshes (which use the biological and naturally occurring chemical processes in water and plants to remove pollutants), sand filter devices, public education programs, and the identification of illicit discharges to the MS4 system. Furthermore, Baltimore City participates in Maryland's effort to reduce nutrient levels in the Chesapeake Bay. Refer to the section of this report describing local government efforts to manage storm water for details concerning this nutrient-reduction goal. One other BMP includes the following:

- Baltimore City has incorporated the *2000 Maryland Storm Water Design Manual's* management policies, principles, methods, and practices into its current NPDES storm water discharge permit. The purpose of the design manual is to (1) protect the waters of the state from the adverse effects of urban storm water runoff; (2) provide design guidance on the most effective structural and nonstructural BMPs for development sites; and (3) improve the quality of BMPs that are constructed in the state, with particular attention to their performance, longevity, safety, ease of maintenance, community acceptance, and environmental benefit.

Costs Associated With Managing Storm Water

We were not able to obtain comprehensive information on the total cost to Baltimore City of managing storm water. Therefore, we do not present that information here.

Funding Sources

Baltimore City funds its storm water management control efforts with city water and sewer user fees and with state funds.

The Storm Water Program in Boston, Massachusetts

The Boston Water and Sewer Commission received a NPDES storm water permit in October 1999. The commission is a separate entity from the city of Boston and, therefore, does not manage some storm water controls that are common in Phase I permits, such as street sweeping, winter deicing, and many of the urban runoff controls required for new developments. Boston has combined sewer systems as well as separate sanitary sewers and storm drains. The commission maintains 206 storm water outfalls and serves approximately 33 percent of the city through its separate MS4 system. In addition to the resident population of about 589,000, this system also almost daily serves 340,000 commuting workers; 70,000 shoppers, tourists, and business people; and 75,000 commuting students. The commission's sanitary and combined flows are transported to the Massachusetts Water Resources Authority at Deer Island. The commission is also the permittee for EPA's Combined Sewer Overflow Program.

Urban Runoff Problems in Boston

The commission considers the identification and elimination of illegal sanitary sewer connections as the most effective means of improving water quality and protecting public health. It is also concerned with the washoff of animal wastes from residential and open land, which is another major contributor to the impairment of water quality because it can cause an increase in coliform levels in the storm water discharges to the receiving waters.

The commission has contracted for various studies to determine the impact of storm water runoff. The following two studies identified sources of bacterial contamination and characterized the quality of storm water discharged from different types of land uses. The studies included metering storm water flows, collecting and analyzing the storm water and receiving water quality samples, and identifying and remediating illegal sewer connections. Observations from the studies include the following:

- A 1996 study determined that pet waste, rather than sanitary sewage, was a key contributor of bacteria to the storm drain system that had possibly led to beach closings in the area.
- A 1998 study identified several illegal connections to the storm drain system. Furthermore, the study showed that deicing and sanding efforts resulted in levels of sodium, chloride, total dissolved solids, and cyanide that exceeded EPA's acute (high dose) toxicity levels.

Boston's Use of Best Management Practices

To meet the NPDES permit's requirements, the commission, like other permittees, continued BMPs, such as identifying illegal connections, and implemented new BMPs aimed at preventing the discharge of pollutants to storm drains and receiving waters. Refer to the section of this report describing local government efforts to manage storm water for details describing the commission's citywide catch-basin inspection cleaning and preventative maintenance program. Other efforts include the following:

- The commission has placed particle separators, which remove oil, grease, and sediments from storm water flows, throughout the city. The commission requires particle separators to be installed by developers on all newly constructed storm drains that serve outdoor parking areas. Fuel-dispensing areas not covered by a canopy or other type of roof enclosure must also have a particle separator.
- The commission requires developers to consider on-site retention of storm water for all new projects, wherever feasible. On-site retention aids in controlling the rate, volume, and quality of storm water discharged to the commission's storm drainage system.

Costs Associated With Managing Storm Water

We were not able to obtain comprehensive information on the total cost to the commission of managing storm water because the commission does not separate the cost of its storm water program from the cost of its sewer operations. Therefore, we do not present that information here.

Funding Sources

The commission funds its storm water management control efforts primarily with city water and sewer user fees and bond proceeds.

Appendix III

The Storm Water Program in Los Angeles County, California

Under the NPDES Storm Water Program, the Los Angeles Regional Water Quality Control Board issues 5-year permits to Los Angeles County for its municipal storm water program. The Los Angeles County permit, issued in July 1996, is the county's second storm water permit. This permit includes Los Angeles County as the principal permittee and 85 cities as permittees. According to the 2000 census, Los Angeles County's population is about 9.5 million.

Urban Runoff Problems in Los Angeles County

The effects of urban runoff on the ocean are of particular concern in southern California. Contaminated sediments, impaired natural resources, and potential human illness could threaten the county's tourism economy, estimated to be about $2 billion a year.

The following three studies have shown that urban runoff can pose health risks to swimmers near storm drains and contribute toxic metals to receiving water sediments:

- The Santa Monica Bay Restoration Project conducted a study to assess the possible adverse health effects of swimming in waters contaminated by urban runoff.[1] This study revealed that there is an increased risk of illness associated with swimming near flowing storm drain outlets and an increased risk of illness associated with swimming in areas with high concentrations of bacteria indicators. Furthermore, illnesses were reported more frequently on days when the samples were positive for enteric viruses. Refer to the section of this report describing the effects of runoff on aquatic life and human health for more details.
- The Southern California Coastal Water Research Project coordinated a study that assessed microbiological water quality and found that the majority of shoreline waters exceeded water quality standards during wet-weather conditions. Furthermore, the ocean waters near storm water outlets demonstrated the worst water quality regardless of the weather.[2]
- The Southern California Coastal Water Research Project also compared the runoff from an urban area and a nonurban area in the Santa Monica

[1]R.W. Haile and others, "The Health Effects of Swimming in Ocean Water Contaminated by Storm Drain Runoff," *Epidemiology,* July 1999, Vol. 10, No. 4.

[2]Southern California Coastal Water Research Project, *Southern California Bight 1998 Regional Monitoring Program, Volume 3: Storm Event Shoreline Microbiology,* 2000.

Bay Watershed.[3] The results of the study indicated that storm water plumes extended up to several miles offshore and persisted for a few days. Furthermore, the runoff from the urban area proved to be toxic to sea urchin fertilization, and dissolved zinc and copper were determined to be contributors to the toxicity. The study also found that in urban areas, sediments offshore generally had higher concentrations of contaminants such as lead and zinc.

Los Angeles County's Use of Best Management Practices

As in the other sites we visited, the county is managing its runoff through the use of conventional BMPs. These BMPs include the elimination of illicit connections and discharges to the storm sewer system, construction control measures, routine inspections, staff training, pollution prevention plans for public vehicle maintenance and material storage facilities, sweeping and cleaning public parking facilities, street sweeping, catch-basin cleaning, and public education.

The Los Angeles Regional Water Quality Control Board recently adopted a Total Maximum Daily Load (TMDL) Program to reduce trash loads to the Los Angeles River. As a result, the county is exploring a number of trash reduction BMPs, which are discussed in the section of this report describing local government efforts to manage storm water.

Costs Associated With Managing Storm Water

Table 3 indicates that the county and the other permittees have allocated significant funding for storm water management activities over the years. For example, for fiscal year 1999,[4] projected funding for storm water management activities for the county and the other permittees amounted to over $134 million.[5] The largest projections for both went toward public agency activities. For example, during fiscal year 1999, the principal permittee and the permittees together projected almost 67 percent of storm water management funds to public agency activities. The activities in this

[3]Southern California Coastal Water Research Project, *Study of the Impact of Stormwater Discharge on Santa Monica Bay –Executive Summary,* Nov. 1, 1999.

[4]The county's fiscal year begins July 1 and ends June 30.

[5]According to an official with the Los Angeles Regional Water Quality Control Board, this figure may also include activities that are outside the scope of the permit.

program include staff training, inspections of construction projects, street sweeping, and catch-basin cleaning.

Table 3: Summary of Fiscal Resources Projected for Los Angeles County and Its Co-permittees, Fiscal Years 1997-99

(Dollars in thousands)[a]

	Fiscal year 1997		Fiscal year 1998		Fiscal year 1999	
Activity	**County**	**Others[b]**	**County**	**Others[b]**	**County**	**Others**
Program Management	$2,225	$6,195	$1,856	$4,874	$1,466	$6,187
Illicit Connection, Illicit Discharge Program	1,620	3,515	1,017	3,075	764	2,901
Development planning and construction	784	6,208	1,300	3,769	1,452	5,743
Public agency activities	38,544	40,915	40,256	31,992	43,316	46,657
Public information and participation	2,840	5,538	4,360	3,856	4,629	6,177
Monitoring	2,018	619	1,768	729	1,598	737
Other	187	13,991	490	8,656	1,318	11,834
Total	**$48,218**	**$76,981**	**$51,048**	**$56,950**	**$54,543**	**$80,237**

[a]Totals may not add up because of rounding.

[b]Does not include 17 permittees for fiscal year 1998 and 13 permittees for fiscal year 1997 for the following reasons: The permittee operated on a different budget cycle, the final document was not available at the time of the annual report, or the information submitted by the permittee was not complete.

Source: GAO's analysis of cost data provided by the Los Angeles County Department of Public Works.

As shown in table 3, the county maintains primary responsibility for monitoring activities, having projected over $2 million for storm water monitoring activities in fiscal year 1997, almost $2 million in fiscal year 1998, and over $1.5 million in fiscal year 1999. Conversely, the permittees' projected funding levels for monitoring activities amounted to only $619,000 in fiscal year 1997, $729,000 in fiscal year 1998, and $737,000 in fiscal year 1999. According to an official with the Los Angeles Regional Water Quality Control Board, the County has consistently maintained primary responsibility for monitoring activities required under the permit.

Funding Sources

The primary source of funds for the county's storm water program is flood control assessments collected throughout the district. Although the county has not applied for any state revolving funds, it has applied for and received approval for federal funds through the Transportation Equity Act for the 21st Century (TEA-21) for a pilot study of an engineering device that would remove trash from storm water. Additionally, the county has received partial funding through Proposition A of the Safe Neighborhood Parks of 1992 and 1996[6] for two Vortex Separation Systems—a Continuous Deflective Separation unit and a Stormceptor unit. Additionally, the county received grant money from the Metropolitan Transit Authority, which partially funded catch-basin screens, a Continuous Deflective Separation unit, and 120 catch-basin inserts.[7]

[6]The Los Angeles County Regional Park and Open Spaces District (a district within the Parks Department) received this funding from Proposition A and, in turn, made grants to the Los Angeles County Department of Public Works for the BMP devices.

[7]The Metropolitan Transit Authority receives TEA-21 funds from the California Department of Transportation.

The Storm Water Program in Milwaukee, Wisconsin

The Wisconsin Department of Natural Resources (WDNR) has the authority to regulate the discharge of storm water from municipalities, construction sites, and industries under Natural Resources Code 216. This rule identifies Wisconsin municipalities that are required to obtain a storm water discharge permit under the Wisconsin Pollutant Discharge Elimination System (WPDES). Milwaukee completed its application process in 1994, and WDNR issued a WPDES permit to the city in October 1994. This was the first municipal storm water permit issued to a municipality in EPA's Region 5 covering the midwest. In July 2000, WDNR reissued Milwaukee's storm water permit. According to the 2000 census, Milwaukee's population is about 597,000.

Urban Runoff Problems in Milwaukee

Milwaukee has a combined sewer system as well as a separate sanitary sewer system. The Milwaukee Metropolitan Sewerage District implemented a rehabilitation program that cost over $2 billion to reduce the number of combined sewer overflow (CSO) events each year. The rehabilitation program involved the construction of deep tunnels to store untreated wastewater and rainwater for later treatment at a wastewater treatment plant. Since 1996, the deep tunnels have significantly reduced the number of overflow events from an average of 50 to 60 per year before the construction to an average of two per year afterwards.

Urban runoff has been identified as a leading source of pollution to the Milwaukee River basin's streams, lakes, and wetlands and the Milwaukee River estuary. To address pollution from urban runoff, WDNR issues storm water permits to municipalities with MS4s serving areas with populations of 100,000 or more, municipalities in Great Lakes "areas of concern" where water quality has been identified as a serious problem, municipalities with populations of 50,000 or more that are located in priority watershed planning areas, and designated municipalities that contribute to the violation of a water-quality standard or are significant contributors of pollutants to state waters.

Milwaukee's Use of Best Management Practices

In addition to BMPs such as the elimination of illicit connections and discharges to the storm sewer system, the reduction of pollutants in storm water runoff from construction sites, public education, catch-basin cleaning, street sweeping, and the use of detention basins, Milwaukee has explored the use of innovative BMPs. Refer to the section of this report describing local government efforts to manage storm water for more

details about an educational campaign directed at a specific watershed. Additional BMPs include the following:

- An innovative storm water control device was installed in a parking lot at a heavily used municipal public works yard that was found to discharge significant amounts of storm water pollutants. Termed the Multi-Chambered Treatment Tank (MCTT), this device is suitable for areas with limited space, cleans up polluted runoff close to its source, removes pollutants that are not susceptible to other treatment methods, and is hidden from view. The MCTT consists of a catch basin, a settling chamber, and a filter. Although the results of the monitoring studies have revealed that the device has a positive effect on water quality, officials with the Department of Public Works explained that it is cost-prohibitive and suitable only for sites with limited space.
- The permittee has also been working with WDNR, the Department of Transportation, the U.S. Geological Survey, and a neighborhood association in a joint effort to develop a storm water monitoring assessment program consisting of two innovative storm water treatment devices. One device removes grit, contaminated sediments, heavy metals, and oily floating pollutants from surface runoff. The other device removes a broad range of pollutants from runoff, such as bacteria, heavy metals, nutrients, petroleum hydrocarbons, and suspended solids. The devices are to be installed along a new reach of the Milwaukee Riverwalk through the third ward of Milwaukee.

Costs Associated With Managing Storm Water

Reliable data on the total cost to manage storm water in Milwaukee were not available and cannot be presented here because certain activities are not reported as program costs in the city's annual report. These activities include street sweeping; leaf collection; catch-basin and inlet cleaning; maintenance of public boulevards, parks, and public green spaces; and the recycling of waste oil and antifreeze. Therefore, the program costs reflected in the annual report do not take into account many of the nonstructural BMPs employed by the city nor do the totals include activities funded through grants. The storm water management activities that were included in the city's 2000 budget request were estimated to cost $460,000.

Funding Sources

Milwaukee's storm water program is primarily funded through the city's sewer maintenance fund. Unlike the general revenue account, which is

based on property taxes, the sewer maintenance fund is based on water consumption. The city has also received supplemental funding from the Wisconsin Nonpoint Source Water Pollution Abatement Program in the form of WDNR grants. The city has received over $1 million since 1991 for a wide variety of storm water management activities.

The Storm Water Program in Worcester, Massachusetts

Worcester's Department of Public Works (DPW) received a NPDES permit on November 1, 1998. The Sewer Operations Division, within the DPW, is directly responsible for operating and maintaining the city's separate storm sewer system, along with the sanitary and combined sewer system. Since 1993, the Sewer Operations Division has had a full-time storm water coordinator, reflecting Worcester's increased emphasis on meeting NPDES program requirements. Worcester has a population of about 173,000. Its water system covers an extensive area, including 371 miles of sanitary sewers, 340 miles of storm sewers, 56 miles of combined sewers, 27,000 manholes, over 14,000 catch basins, and 263 outfalls. Worcester's separate storm drain systems consist of 93 main drainage areas covering approximately 6,680 acres.

Urban Runoff Problems in Worcester

The constituents that are typically found in urban runoff in Worcester are the same as those normally found in urban runoff in older cities. Because virtually all of the paved surfaces in the Worcester area are devoted to the city's transportation infrastructure, the constituents generated include automobile-related petroleum products, such as total petroleum hydrocarbons, oil and grease, along with total suspended solids. Also, coliform, silt, and sediment have been identified in the city's runoff.

Worcester's Use of Best Management Practices

Like other permittees, the DPW has implemented BMPs under the major areas of education outreach, pollution prevention and source controls, storm-drainage system maintenance, regulatory efforts, and storm-drainage system infrastructure. Additionally, to reduce storm water pollution, the DPW has retrofitted a number of twin manholes in the city as discussed below. BMPs that are specific to Worcester include the following:

- The DPW implemented a demonstration project to determine the effectiveness of an oil and grit separator installed on a street drain. The drain is a major surface sewer main that services approximately 226 acres of heavily urbanized area with a typical mix of residential, commercial, and industrial use. The drain discharges into Lake Quinsigamond, which is a large lake used for recreational purposes such as swimming and boating. In its April 2000 annual plan submitted to EPA, the DPW noted that because of drought conditions, it currently did not have sufficient sampling data to determine the effectiveness of the project.

- The DPW has embarked on a comprehensive program to minimize the possibility that sewage and storm water will be mixed in its twin invert manholes. Since the program began, the DPW has installed hold-down devices on over 1,680 of the approximately 2,580 twin invert manholes in the city. The DPW expects to continue the program until all of the manholes have been retrofitted.
- The DPW is also working closely with the Massachusetts Department of Environmental Protection in its ongoing tracking efforts to ensure that industries in Worcester are doing their part to reduce storm water pollution.
- To improve its storm-drainage infrastructure, the city has established a voluntary plan to reduce the number of unpaved private roads. The dirt from these roads, especially after rain storms, causes sediment to build up in the drainage system. The DPW has developed a plan to pave the streets at a lower grade than would be necessary to meet the legal requirements for a public street. Under this plan, residents would not have to pay the additional betterment taxes that are now required to cover the costs of sediment removal and less sediment would be transported in runoff.

Costs Associated With Managing Storm Water

Since 1993, the DPW has allocated significant funding from the water and sewer utility fees it collects for controlling the effects of runoff, especially through catch-basin cleaning, street sweeping, and correcting illegal connections. For example, its fiscal year 1993 budget for storm water programs included about $1.6 million for specific programs and another $1 million for capital improvement programs, such as inflow/infiltration and flood control. The DPW also spent $500,000 to develop and submit its permit application. Furthermore, as shown in table 4, Worcester made extensive capital expenditures during fiscal years 1994 through 1999 on pertinent storm water projects to improve the quality of storm water runoff emanating from the city's storm water sewer system.

Table 4: City of Worcester's Capital Expenditures for Storm Water Management

(Dollars in thousands)

	Fiscal year					
Activity	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**
Sewer construction	$0	$500	$500	$300	$300	$300
Infiltration control	0	400	400	100	100	100
Pump station rehabilitation	200	200	200	200	200	200
Sewer rehabilitation	300	750	300	750	750	1,500
Landfill closeout	150	1,200	200	500	0	0
Belmont Drainage project	0	100	600	100	0	0
Beaver Brook Culvert project	0	500	100	100	300	100
Surface drain control	40	150	200	200	200	200
Geographic Information System	0	0	0	125	125	125
Other	0	70	10	0	0	0
Total	**$690**	**$3,870**	**$2,510**	**$2,375**	**$1,975**	**$2,525**

Note: The Belmont Drainage project involved enlarging the drain to eliminate surcharging and siltation and moving the outfall to eliminate stagnation. The Beaver Brook Culvert project involved repairing the culvert and conducting a study that included a detailed hydraulic analysis of the drainage basin.

Source: Worcester Department of Public Works.

Furthermore, during fiscal year 1999, the DPW spent approximately another $2.1 million to operate and maintain storm water activities. Key expenditures included about $1.2 million for street sweeping, about $617,000 for catch-basin maintenance, $52,000 for root control, and another $48,000 for street paving. Also included was $40,000 per year for sampling five outfalls around the city three times per year as required by the permit. According to a DPW official, in previous fiscal years, the DPW funded the same or similar operation and maintenance activities to help control storm water runoff. As a result, the costs since 1994 were similar to those for 1999, except for annual adjustments for inflation. Therefore, the annual operation and maintenance expenditures ranged from about $1.7 million for 1994 to about $2.1 million for 1999.

According to a DPW official, the department expects to spend from $3 million to $4.5 million annually over the next several years on storm water-

related activities. The amount of the cost increase will depend on whether EPA asks the city to increase its spending.

Funding Sources

The DPW funds its storm water management controls effort from the water and sewer user fees it assesses to homes and businesses.

Appendix VI

Comments From the Environmental Protection Agency

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

JUN 14 2001

OFFICE OF WATER

Mr. Peter F. Guerrero
Director, Physical Infrastructure Issues
United States General Accounting Office
Washington, DC 20548

Dear Mr. Guerrero:

Thank you for the opportunity to review your draft report entitled "Better Data and Evaluation of Urban Runoff Needed to Assess Effectiveness." We appreciate the difficulty that assimilating and interpreting such information on an extremely complex subject must have presented. Your report provides a fair and balanced depiction of the Agency's efforts, with the assistance of our State and local partners, to implement a national urban storm water runoff control program.

As the report correctly acknowledges, the Environmental Protection Agency (EPA) believes that urban runoff is a significant threat to water quality and is actively working to control the discharge of pollutants in storm water runoff. EPA's urban storm water control program has been a very successful undertaking to date and we are taking steps to address several of the recommendations identified in the report.

One of the challenges of controlling urban storm water runoff is to be able to address a wide array of complex environmental issues, even within the boundaries of one municipality. EPA's urban storm water program is developed with the understanding that a "one size fits all" approach will not work. For example, existing municipal separate storm sewer system (MS4) permits are tailored to suit the needs of each individual municipality. In fact, the municipalities select the majority of the measures that will be implemented to control storm water runoff. Similarly, EPA's Phase II regulatory framework for small MS4s requires the municipality to identify appropriate BMPs to control runoff and establish measurable goals against which program effectiveness will be measured. These BMPs and measurable goals then become the enforceable permit conditions for that municipality. EPA expects that approximately 5,000 small MS4s will each have a unique set of measurable goals that will define expectations of a successful storm water control program.

While EPA has developed a sound regulatory basis for urban storm water control, competing initiatives have limited our ability to invest sufficient resources to fully evaluate the effectiveness of the program and the associated implementation costs. We believe that the flexibility afforded MS4 permittees provides some assurance that permit requirements do not become onerous or unjustified. Additionally, with the MS4 permits reissued every five years,

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EPA expects that dialogue between MS4s and permitting authorities will better focus on those activities found to be most beneficial.

Over the next year, we will address challenges relating to evaluating the effectiveness of municipal storm water programs. Consistent with the first recommendation, EPA will evaluate storm water monitoring data that has been collected since program inception. Two grantees (UCLA and the University of Alabama) will review monitoring data that has been submitted as part of routine discharge monitoring reports and annual reports. EPA expects these efforts will evaluate the correlation between storm water discharges and trends in water quality impairment. Another anticipated finding from these grants is a compilation of the range of monitoring activities required of municipalities in storm water permits and the identification of the monitoring that appears to be most effective in demonstrating program results.

To meet another challenge, we are evaluating MS4 permit requirements and annual reports to identify the types of storm water control activities in place and the environmental and programmatic results of these activities. Initially, this effort will evaluate MS4s in at least three EPA Regions and 10 states to gather information on the range of methods employed by permitted MS4s to control storm water discharges. Through this effort, EPA expects to determine whether program goals are being met and establish meaningful indicators of program performance. Should this effort prove useful, EPA will expand the evaluation to a national effort that will evaluate MS4 permits and annual reports in all affected EPA Regions and states. In either case, results of this effort will be disseminated nationally to ensure that findings are incorporated into other MS4 programs, as appropriate.

Enclosed are additional comments on terminology and regulatory citations provided in the report. Again, we appreciate the opportunity to review and comment on the draft report. If you have any questions about these comments or would like to discuss urban storm water runoff issues, please contact me or call Jeff Lape, Acting Director of the Water Permits Division, at (202) 564-9545.

Sincerely,

Michael B. Cook
Director
Office of Wastewater Management

Enclosure

Enclosure

Below are several additional comments for your consideration that address terminology and regulatory citations provided in the report:

- The term "nonpoint source" throughout the report, when referring to storm water runoff, is somewhat misleading in that the federal definition of "point source" includes many of the types of storm water discharges discussed in the draft report as "nonpoint source pollution." We recommend clarifying that EPA's NPDES storm water permits regulate point source discharges that include storm water runoff from small, medium, and large municipal separate storm sewer systems. In fact, to avoid confusion between point sources and nonpoint sources in an NPDES context, we recommend that you consider using the term "wet weather discharges" when referring to storm water runoff.

- The third sentence in the first full paragraph on page 3 states that "EPA requires cities to use 'best management practices' to reduce contamination in storm water runoff." We recommend that you change the word "requires" to "recommends." While best management practices are common for reducing storm water contamination, EPA regulations allow MS4s to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques, and system, design, and engineering methods, and such other provisions which are appropriate.

- The last sentence in the second full paragraph on page 3 states that "managing storm water runoff will reduce runoff and improve water quality." We recommend changing this sentence to indicate that "managing storm water runoff will reduce the volume and concentration of pollutants in runoff and improve water quality.

- The last sentence of the same paragraph indicates that "Neither EPA nor states have developed measurable program goals or reviewed municipal reports on the results of storm water programs to determined whether the reports provide information that could demonstrate the program's effectiveness." A similar statement is made in the first full paragraph on page 31. We recommend that these two sentences be revised to indicate that "EPA and states have generally been unsuccessful in developing measurable program goals and in demonstrating program effectiveness through the review of municipal reports." EPA and some states have attempted to determine program effectiveness through the review of municipal reports but, to date, these efforts have been unsuccessful in making this determination.

Appendix VII

GAO Contacts and Staff Acknowledgments

GAO Contacts

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Staff Acknowledgments

In addition to those named above, Jennifer Clayborne, Richard LaMore, Sally Coburn, Elizabeth McNally, Charles Bausell, and Timothy Guinane made key contributions to this report.

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Effects of Lawn Fertilizer on Nutrient Concentration in Runoff from Lakeshore Lawns, Lauderdale Lakes, Wisconsin

Introduction

Transport of nutrients (primarily forms of nitrogen and phosphorus) to lakes and resulting accelerated eutrophication are serious concerns for planners and managers of lakes in urban and developing suburban areas of the country. Runoff from urban land surfaces such as streets, lawns, and rooftops has been noted to contain high concentrations of nutrients; lawns and streets were the largest sources of phosphorus in residential areas (Waschbusch, Selbig and Bannerman, 1999). The cumulative contribution from many lawns to the amount of nutrients in lakes is not well understood and potentially could be a large part of the total nutrient contribution.

Why study runoff from lawns?

The shorelines of many lakes are already highly developed, and the potential water-quality effects of this development are increasing. Many lawn-care professionals and homeowners hold a common belief that runoff from lawn surfaces is minimal and that phosphorus movement from lawns is not a problem (Barth, 1995). The homeowners' goal to maintain lush green lawns may conflict with the lake manager's goal to minimize nutrient inputs. In cooperation with the Lauderdale Lakes Lake Management District and the Wisconsin Department of Natural Resources, the U.S. Geological Survey (USGS) conducted a study during 1999–2000 to determine the magnitude of nutrient runoff from nearshore residential lawns surrounding a lake and to determine whether fertilizer application and the type of fertilizer (regular or nonphosphorus types) affect the amount of nutrients in runoff from lawns. Such information is important for developing stormwater best-management practices and for developing or improving shoreland zoning ordinances and other local regulations to protect or improve the water quality of lakes (Wisconsin Department of Natural Resources, Wisconsin Shoreland Management Program, http://www.dnr.state.wi.us/org/water/wm/dsfm/shore/title.htm, accessed February 8, 2002).

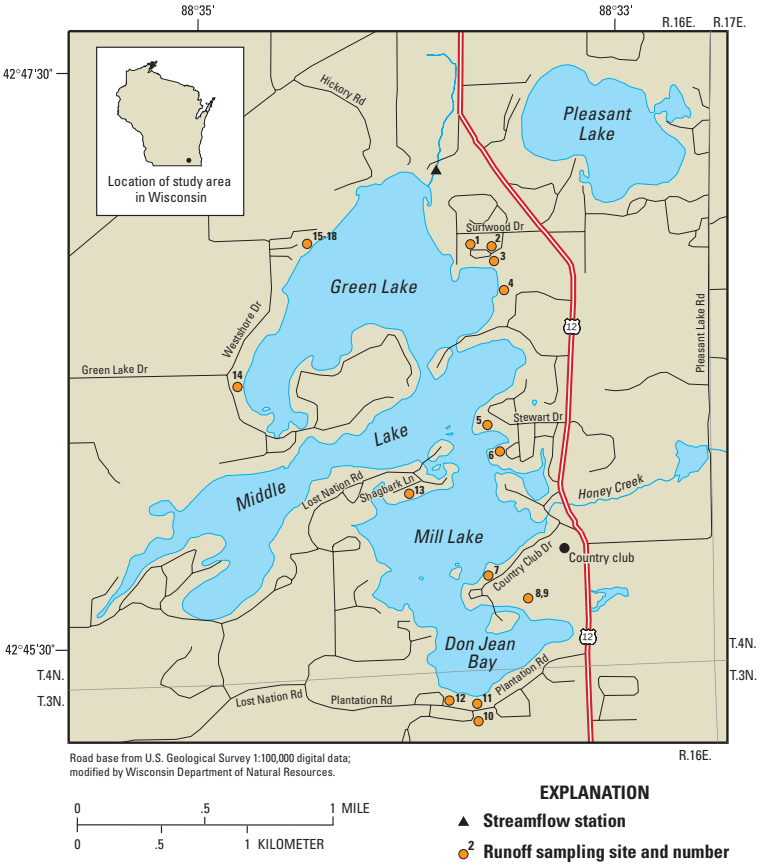

Figure 1. Site locations surrounding Lauderdale Lakes, Wis.

The study area was located at Lauderdale Lakes in Walworth County, a chain of lakes in the more populated southeastern part of Wisconsin (fig. 1). The 15-mile shoreline of the lakes is about 70 percent developed, primarily as single-family housing, and is the focus for additional residential development. Most of the lakefront homes have sloping lawns that are maintained to the water's edge (fig. 2). Information about the specific sources and amounts of phosphorus entering the lakes was needed to develop a plan for reducing the input of phosphorus. The lakes are phosphorus limited, meaning that phosphorus is the nutrient limiting plant growth and affecting lake productivity. A previous study (Garn and others, 1996) found that surface-water inflow from the small nearshore contributing drainage area accounted for only 4 percent of the water inflow to the lake but represented 51 percent of the total annual phosphorus input from all sources. The Lake Management District is in the process of installing

Figure 2. Lakeshore development and lawns at Lauderdale Lakes, Wis.

Figure 3. Tube-type lawn sampler (site 2).

and implementing various measures to reduce the phosphorus input to the lakes, among which is a "lake-friendly" fertilizer program that encourages residents to apply nonphosphorus turf fertilizer. The Lake Management District has been supplying residents with phosphorus-free fertilizer for purchase for about 3 years, and data were needed to evaluate the effectiveness of the program.

Equipment and Methods

In 1999 and spring 2000, lawn samplers designed to collect surface runoff were installed using methods described in Waschbusch, Selbig, and Bannerman (1999, p. 7). The samplers collect runoff through two 5-foot pieces of 1/2-inch-diameter PVC tubing placed flush with the surface of the ground, on a sloping lawn, with an angle of about 150 degrees between the two tubes (fig. 3). Runoff entered the tubing through a 1/8-inch slot cut at intervals along the length of the tube; each tube was then wrapped with fiberglass screen to prevent insects and large debris from entering. The tube was held in place on the lawn surface with wire staples. At the end of each tube, a connecting piece of 1/2-inch silicone tubing directed the collected runoff into a covered 1-quart glass jar placed in the ground in a 4-inch-diameter protective PVC sleeve with a cover.

During the summer of 2000, the original sampler design was modified to increase sample volumes at sites that did not generate sufficient runoff samples and to minimize contamination problems caused by insects and earthworms entering the samples despite the fiberglass screen. One variation to increase runoff-collection efficiency was to enlarge the slots cut in the pipes to 1/4-inch. Another technique used at sites with the least runoff production was to replace the tubing with two lengths of 4-foot-long plastic lawn edging that directed runoff toward the collecting jar (fig. 4); this solution was more effective at increasing captured runoff and minimizing contamination than increasing the slot size.

Clean sample bottles were placed in the lawn samplers before each expected storm or at about 2-week intervals when sites were inspected if there was no rain. Samplers were cleaned and rinsed with deionized water during each visit to remove any accumulated dirt or debris. Notes were kept on volume of runoff in the collection bottle; color and noticeable sediment, debris, or insects in the bottle; and site condition. Sample bottles were collected as soon as possible after each storm (usually within 1 to 5 days) and brought to Madison, where the contents were filtered with a 0.45-micrometer filter, preserved with sulfuric acid, and then delivered to the Wisconsin State Laboratory of Hygiene for nutrient analyses. Samples were analyzed according to standard laboratory methods (Wisconsin State Laboratory of Hygiene, written commun., 2001) for concentrations of total phosphorus (TP), total dissolved phosphorus, total Kjeldahl nitrogen (TKN), dissolved ammonia nitrogen, and dissolved nitrate plus nitrite nitrogen. When insufficient sample volume was collected from a storm to analyze for all nutrients, analyses were done first for total phosphorus.

Figure 4. Edging-type lawn sampler (site 5).

Description of Sampling Sites

The Lauderdale Lakes are a chain of three interconnected lakes with a surface area of 807 acres. The lakes are ground-water drainage lakes in which more than 90 percent of the water inflows are from ground water and direct precipitation. Some surface water enters the lakes by way of a few ephemeral drainageways or as overland flow from the nearshore area. Lake and drainage-basin characteristics are described in detail by Garn and others (1996). Lakeshore developments include about 1,010 single-family homes, of which about 30 percent are year-round residences. Other developments include a golf course, a boat marina, and two recreational camps.

In the lakeshore area within 300 feet of the shoreline, soils consist primarily of the Casco-Rodman Complex (60 percent of the area), Rodman-Casco Complex (12 percent of the area), and Casco-Fox Silt Loam (6 percent of the area). The Casco-Rodman Complex is found on 20–30 percent slopes; surface textures range from loam to silt loam, and subsoils are clay loam to sandy loam. The Rodman-Casco Complex is found on slopes of 30 to 45 percent formed in loamy deposits over sand and gravel. The Casco-Fox soils are found on slopes of 6 to 12 percent and have a silt loam texture (Haszel, 1971). Soil disturbance can be severe during building construction in suburban areas, commonly resulting in subsoil compaction by heavy equipment followed by layering with topsoil. Such disturbance has the potential for greatly increasing runoff and nutrient losses.

Samplers were installed at 18 locations along the lakeshore (fig.1), representing different types of lawn-fertilizer use, undeveloped areas, and one area of mixed land use (part agricultural, ditched paved roads, and lawns). Sites were grouped into three categories: regular-fertilizer sites, nonphosphorus-fertilizer sites, and unfertilized sites. Samplers were installed at 12 sites and operated during the growing season in 1999. In 2000, six additional sites were installed, including two samplers in a swale. Samplers were installed at seven lawn sites where traditional fertilizer was applied, three sites where nonphosphorus fertilizer was applied, and six control sites where no fertilizer was applied (three steep, wooded sites; two lawns; and an undeveloped grass field). Much of the area is wooded, and many of the lawns have an overhead canopy of hardwood trees. Two samplers were installed in a swale area on the south side of Mill Lake (Don Jean Bay) that collected mixed runoff from an agricultural field, lawns, and streets. The drainage area of the upgradient sampler was 8 acres and of the downgradient sampler was 38 acres, of which about 25 percent was cropland.

Property owners were asked to participate in the runoff study. It was assumed that most lawn fertilizer users followed usual manufacturer recommendations of four applications per season made in about April–May, June–July, August–September, and October at 3 to 3.5 pounds per 1,000 square feet. Homeowners applying regular fertilizer fertilized their lawns two or more times per year. Each participant's property was inspected to ensure that lawn slope was at least 20 feet long, grade was at

Table 1. Physical characteristics of sampling sites at Lauderdale Lakes, Wis. [P, phosphorus; ppm, parts per million; %, percent, turf-quality values are defined in text; ft^2, square feet; --, no data]

Site ID	Station number	Site type	Soil type/texture[a]	Soil P concentration[b] (ppm)	Slope (%)	Vegetative cover density (%)	Turf quality	Runoff area (ft^2)	Number of samples	Percentage of storm events
Regular fertilizer application sites										
2	424652088333901	Wooded lawn	Hebron loam, gravelly	68	21	65	6	150	10	67
3	424650088333501	Lawn	Hebron loam	32	9	90	8.5	180	8	80
5	424616088334201	Wooded lawn	Casco-Rodman loam-silt loam	66	20	100	9	114	8	33
8	424541088334602	Golf course lawn	Casco-Rodman loam-silt loam	35	20	100	9.5	250	15	63
9	424541088334601	Golf course lawn	Casco-Rodman loam-silt loam	78	24	100	9.5	186	9	54
10	424514088334001	Swale	Casco-Fox silt loam	--	5	--	--	8 acres	9	69
11	424518088334301	Swale	Casco-Fox silt loam	--	4	--	--	38 acres	10	77
12	424519088334101	Lawn	Casco-Fox silt loam	28	16	100	10	104	1	8
15	424654088343103	Lawn	Fox silt loam	11	11	60	6	152	5	24
Nonphosphorus-fertilizer application sites										
6	424611088334001	Wooded lawn	Casco-Rodman loam-silt loam	20	14	80	7.5	250	18	67
13	424603088340201	Wooded lawn	Casco-Rodman loam-silt loam	21	34	60	5	140	15	54
14	424623088345101	Wooded lawn	Casco-Rodman loam-silt loam	70	14	85	8	225	8	30
Unfertilized sites										
1	424652088334401	Grass field	Fox sandy loam	65	9	100	7	128	2	13
4	424643088333601	Wooded lawn	Casco-Rodman loam-silt loam	38	12	85	8	188	6	47
7	424543088334001	Wooded lawn	Casco-Rodman loam-silt loam	14	22	70	6	209	12	46
16	424654088343101	Wooded	Rodman-Casco loam/sand,gravel	28	41	95	1	200	9	33
17	424654088343102	Wooded	Rodman-Casco loam/sand,gravel	24	33	95	1	300	13	48
18	424654088343104	Wooded	Rodman-Casco sandy, gravelly	16	30	65	2	140	7	28

[a]From Haszel, 1971.

[b]50–75 ppm P optimum recommendation for turfgrass.
Analysis by Soil and Plant Laboratory, University of Wisconsin, Madison.

least 5 percent, and sample catchment area was not affected by runoff from rain gutters, driveways, or other lawns or sources. A soil sample collected at the time of sampler installation was analyzed for soil texture, pH, and phosphorus content by the University of Wisconsin Soil and Plant Analysis Laboratory. A visual vegetative soil-cover density, in percent, and a turf-quality rating were assigned to each lawn during visits. Turf quality was based on a 1 to 10 scale: for example, a score of 10 represented 100 percent best-quality green grass cover, 5 represented 50 percent grass cover with bare spots, weeds, and dead grass providing additional cover, and 1 indicated no turfgrass cover, with dead grass, weeds, and other vegetation providing primary soil cover. The more heavily fertilized sites (5, 8, 9, 12) had the best turf-quality ratings. Various physical characteristics of the sampling sites are summarized in table 1.

Nutrient Concentration in Runoff

Rainfall and Runoff

Long-term precipitation records from the National Weather Service stations at Whitewater (about 9 miles northwest of Lauderdale Lakes) and Lake Geneva (about 13 miles southeast) were used to estimate rainfall at Lauderdale Lakes (National Oceanic and Atmospheric Administration, 1999–2000). Data from a recording rain gage at a USGS streamflow-gaging station at Jackson Creek near Elkhorn (9 miles south) was used after the rain gage was installed on May 25, 1999. Rainfall was above the 1961-90 average for April, May, and June 1999 and near or below average the remainder of the season. In 2000, rainfall amounts for May, June, and September were substantially above average (fig. 5). Ten runoff events occurred from 12 storms in the 1999 sampling season and 13 runoff events occurred from 15 storms in 2000; generally, the storms in 2000 were larger than those in 1999. A storm event was defined as more than 0.3 inches of rain, and a runoff event as one that resulted in at least two runoff samples with sufficient volume for analysis (about 100 ml). A summary of the storm dates and precipitation amounts is given in table 2.

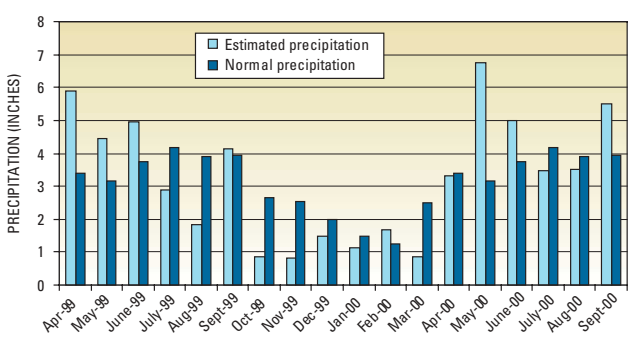

Figure 5. Estimated monthly precipitation at Lauderdale Lakes, Wis., during 1999–2000 compared to normal monthly precipitation.

Although measurement of quantity of runoff was not part of this study, a qualitative evaluation of runoff may be obtained by comparing the

Table 2. Storm information and number of sites with runoff samples at Lauderdale Lakes, Wis., 1999–2000 [est, estimated]

Storm number	Storm start date	Total precip amount (inches)	Number of sites with runoff samples
99S1	4/9/1999	0.86 [a]	4
99S2	4/22/1999	3.73 [a]	9
99S3	5/12/1999	0.63 [a]	3
99S4	5/16/1999	0.80 [a] est	4
99S5	5/17/1999	0.66 [a] est	3
99S6	6/1/1999	0.70	8
99S7	6/10/1999	3.35	6
99S8	7/17/1999	1.11	4
99S9	8/13/1999	0.37	5
99S10	9/27/1999	3.66	11
00S1	2/21/2000	2.0 [b]	11
00S2	4/19/2000	2.59	2
00S3	5/9/2000	1.36	9
00S4	5/18/2000	1.95	5
00S5	5/27/2000	3.85	14
00S6	6/11/2000	1.95	9
00S7	7/2/2000	1.40	12
00S8	7/10/2000	1.33	5
00S9	7/31/2000	1.62	3
00S10	8/5/2000	1.17	16
00S11	8/17/2000	0.70	5
00S12	9/11/2000	1.94	17
00S13	9/22/2000	1.89	9

[a] Measured at Whitewater.
[b] From 6 inches snowmelt and light rain.

Figure 6. Site 12 at Lauderdale Lakes, Wis.—an example of high-quality turfgrass.

number of sites where runoff was sampled for each storm (table 2) and the number of storms sampled at each site (table 1). The magnitude of runoff is dependent on a combination of factors including rainfall amount and intensity, soil-surface storage and detention, and infiltration rate. Infiltration is affected by soil type, vegetative cover, slope, and other factors (Haan, Barfield, and Hayes, 1994, p. 52–54). In general, sites with dense vegetative cover and coarse soils with high infiltration rates produced less runoff. Specifically, site 12 of the fertilized sites (fig. 6), which had the best-quality turf and fertilizer applications of 4 times per year, produced the least runoff (only 8 percent of all storms). Other sites (5, 8, 9) with high turf quality and density produced more frequent runoff samples, possibly because of steeper slopes or other factors. At six of the lawn sites, more than 50 percent of the storm events produced runoff.

The phenomenon of soil-water repellency, or hydrophobicity, was observed at many of the lawn sites, especially after dry periods. Water repellency of soils reduces affinity to water so that the soil resists wetting, thus reducing infiltration capacity, decreasing plant growth, and increasing surface runoff. The phenomenon has been widely accepted as a problem for many soils in seasonally dry climates. Soils with grass cover in temperate climates have recently been found to develop resistance to wetting—a common problem known as "localized dry spot" on golf courses (Doerr, Shakesby and Walsh, 2000; Kostka, 2000). Therefore, water repellency could be an additional factor influencing runoff from residential lawn soils (L.F. DeBano, University of Arizona, oral commun., 2001). At Lauderdale Lakes, there was also some indication that lawn shading by trees and less frequent use of fertilizer (sites 6, 7, and 13) resulted in less dense and patchy turf cover, increasing runoff. In ongoing turf studies at the University of Wisconsin (W.R. Kussow, Department of Soil Science, written commun., 2000), researchers found that not fertilizing turfgrass caused thinning of the turf, increased the amount of runoff, and increased nitrogen and phosphorus loss. Generally, the percentage of storms resulting in surface runoff from many of the lawns was higher than expected. Runoff from lawns may occur more frequently than previously thought because of the complex interaction of many factors.

Nutrient Concentrations in Runoff and Effects of Fertilizer Use

Summary statistics of nutrient concentrations measured in runoff from different site categories are given in table 3 and compared in figure 7. Detailed data for each of the sites were published annually in the U.S. Geological Survey Water-Data Reports (Holmstrom and others, 2000; Garn and others, 2001). There was a wide range in concentration of most nutrients among storms during the study period. Given this variability, geometric means or medians are more meaningful for comparison because they are better estimates of central tendency than arithmetic means. The nonparametric Kruskal-Wallis test was used to test for overall differences in concentration distributions, and the Wilcoxon rank sum test was used to test

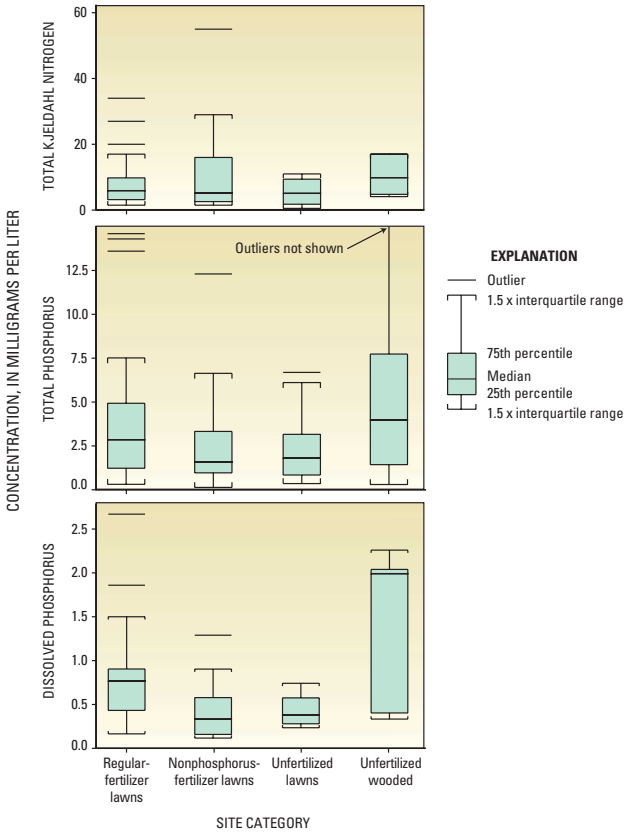

Figure 7. Nutrient concentrations in runoff from different categories of sampling sites at Lauderdale Lakes, Wis.

for differences in medians between pairs of lawn categories (P.W. Rasmussen, Wisconsin Department of Natural Resources, written commun., 2001). A confidence level of 10 percent ($p = 0.10$) was chosen to evaluate the results of the statistical tests. The difference in medians for samples from two different lawn categories was considered statistically significant if p values were less than 0.10.

A quality-control study was done to determine nutrient-concentration effects of grass clippings, earthworms, and insects that managed to get into water samples. All of these contamination sources had a large effect by increasing nitrogen and phosphorus concentrations. Samples that were affected by these contamination sources, identified from field notes, were excluded from data analysis, but the exclusions did not significantly change the overall results.

No significant differences in concentration among lawn categories were found for any of the nitrogen species. Fertilizer use did not affect total nitrogen concentrations in runoff. In addition, nitrite plus nitrate concentrations in runoff were generally low.

Dissolved phosphorus concentrations were significantly different ($p = 0.02$) among the lawn categories. Moreover, the median concentration of dissolved phosphorus from regular-fertilizer sites (0.77 milligram per liter (mg/L)) was significantly greater than that from nonphosphorus-fertilizer sites (0.33 mg/L) and unfertilized lawn sites (0.38 mg/L). Total phosphorus in runoff from regular-fertilizer sites compared to nonphosphorus-fertilizer and to unfertilized-lawn sites had p-values of 0.11 and 0.14, respectively. Thus, median total phosphorus concentrations were not significantly different at $p < 0.1$. Dissolved phosphorus was a fraction of total phosphorus, and its concentrations ranged from 22 to 45 percent of total phosphorus for all lawn categories.

Figure 8. Dense understory vegetation on wooded slope of sites 16 and 17 at Lauderdale Lakes, Wis.

The median dissolved phosphorus concentration in lawn runoff from regular-fertilizer sites was twice that for unfertilized and nonphosphorus-fertilizer sites. Runoff from lawn sites with nonphosphorus-fertilizer applications had a median dissolved phosphorus and total phosphorus concentration that was similar to unfertilized sites. Dissolved phosphorus in runoff is important because it is readily available for plant growth. Although not significant at $p < 0.1$, lawn sites with regular fertilizer applications had a median total phosphorus concentration in runoff that was 1.6 times that for unfertilized sites and 1.8 times that for nonphosphorus-fertilizer sites.

In comparison with other studies, phosphorus concentrations in lawn runoff at Lauderdale Lakes were slightly higher than concentrations found in runoff from urban lawns in Madison, Wis. (Waschbusch, Selbig and Bannerman, 1999), but were similar to those in lawn runoff from suburban lawns in Minneapolis/St. Paul, Minn. (Barten and Jahnke, 1997). Surprisingly, nutrient concentrations in runoff from the unfertilized, steep, wooded hillsides (sites 16, 17, and 18) were higher than those from the lawn sites and thus were separated from the unfertilized lawn sites in the data comparisons. These wooded sites (fig. 8) may be different from other wooded sites because of their steep slopes, thick surface organic and litter layer, and dense understory vegetation (crown vetch) planted for erosion control. Waschbusch, Selbig, and Bannerman (1999) found a direct relation between phosphorus concentration and percentage of overhead tree canopy that could affect source-area concentrations. In the Lauderdale Lakes study, however, all lawn categories contained sites with overhead tree canopy, and the lawn sites treated with regular fertilizer had the fewest trees; therefore, differences between regular-fertilizer sites and the other lawn sites could be even greater if there was an effect from tree cover.

Total phosphorus concentration in lawn runoff had a significant ($p = 0.08$) relation to soil-phosphorus concentration (table 1); total dissolved phosphorus had no significant relation. The low category of soil-phosphorus concentration (0 to 24 parts per million (ppm)) had a significantly lower median concentration of total phosphorus in lawn runoff (about half) than the medians from medium (25-65 ppm) or high (66 ppm or more) soil-phosphorus concentration lawns. There was no significant difference between runoff concentrations from medium and high soil-phosphorus concentration lawns. Barten and Jahnke (1997) also found a significant difference in concentration of phosphorus in runoff from different categories of lawn soil fertility. In their study, total and soluble reactive phosphorus concentrations in runoff from high soil-phosphorus concentration lawns were twice as large as the concentrations in runoff from low soil-phosphorus concentration lawns.

Median nutrient concentrations from the Don Jean Bay swale area with mixed land use were more similar to those from the unfertilized wooded sites and fertilized lawn sites than to those from other lawn sites (table 3). The range in concentrations for ammonia nitrogen and total Kjeldahl nitrogen in runoff from the swale, however, was greater than those for the other sites.

Although it was not within the scope of this study to measure runoff volumes from each of the sites and quantify the mass of nutrients transported offsite, the concentration data will be useful for future computations of unit-area loads (that is, mass of a particular nutrient species per unit contributing area). Concentrations of nutrients from lawns observed in this

Table 3. Statistical summary of nutrient concentrations in runoff from different site categories, Lauderdale Lakes, Wis. [n, number of samples; TKN, total Kjeldahl nitrogen; NO_2, nitrite nitrogen; NO_3, nitrate nitrogen; TP, total phosphorus; Diss P, dissolved phosphorus; all concentrations in milligrams per liter]

	Ammonia N	TKN	$NO_2 + NO_3$	TP	Diss P
Regular-fertilizer lawn sites					
Geometric mean	1.11	5.9	0.09	2.57	0.7
Median	1.07	5.9	0.12	2.85	0.77
Mean	2.18	8.6	0.17	4.02	0.93
Max	14.5	34	0.56	23.2	3.32
Min	0.05	1.5	0.01	0.31	0.17
n	23	23	23	58	23
Nonphosphorus-fertilizer lawn sites					
	Ammonia N	TKN	$NO_2 + NO_3$	TP	Diss P
Geometric mean	1	6.5	0.14	1.89	0.34
Median	0.93	5.2	0.14	1.58	0.33
Mean	3.95	12.2	0.57	3.3	0.45
Max	36.2	55	5.22	23.5	1.29
Min	0.04	1.5	0.14	0.14	0.12
n	14	14	14	38	15
Unfertilized lawn sites					
	Ammonia N	TKN	$NO_2 + NO_3$	TP	Diss P
Geometric mean	0.76	4.08	0.12	1.73	0.4
Median	0.63	5.1	0.14	1.81	0.38
Mean	1.12	5.85	0.17	2.33	0.43
Max	2.98	11	0.4	6.69	0.74
Min	0.22	0.53	0.01	0.36	0.23
n	9	9	9	19	8
Unfertilized wooded sites					
	Ammonia N	TKN	$NO_2 + NO_3$	TP	Diss P
Geometric mean	2.95	12.7	0.16	3.52	1.04
Median	4.38	9.8	0.24	3.98	1.99
Mean	5.33	29.3	0.9	6.78	1.4
Max	11.6	130	2.24	30.6	2.26
Min	0.41	4.1	0.01	0.3	0.33
n	5	6	5	28	5
Don Jean Bay swale sites					
	Ammonia N	TKN	$NO_2 + NO_3$	TP	Diss P
Geometric mean	3.48	14.5	0.06	2.46	0.49
Median	3.96	19	0.04	2.66	0.41
Mean	11.91	31.3	0.15	3.55	0.91
Max	88.1	160	0.6	9.07	3.33
Min	0.56	2	0.01	0.37	0.18
n	11	11	10	19	9

study are much greater (by 3 to 5 times) than the estimated concentrations used to calculate total phosphorus load from surface runoff to Lauderdale Lakes in a previous study by Garn and others (1996, p. 16). All of the nutrient load from lawn runoff may not actually reach or be deposited in the lake because of varying flowpaths, soil permeability, breaks in slope, vegetative buffers, and other obstructions; however, in many cases, lawns extend and slope continuously to the water's edge to provide a direct source of loading.

The annual phosphorus load from the nearshore area of Lauderdale Lakes may be greater than the 430 pounds previously estimated. Using a revised median concentration of 2.3 mg/L for surface runoff from an estimated 220 acres of developed shoreline (67 percent of shoreline) within 200 feet from the edge of water, annual total phosphorus load from residential lawns could be as much as 370 pounds (assuming all of the phosphorus reaches the lake). If a delivery of 50 percent of the load is assumed, and the total surface-water load is recomputed using the surface runoff values from the previous study, the total annual surface-water load from the nearshore drainage area would be 620 pounds, which represents 60 precent of the total annual phosphorus input from all sources. Studies at Lauderdale Lakes and several other ongoing studies by the USGS in Wisconsin will provide additional information on the effects of lawns and shoreline development on nutrient loads to lakes.

Limitations of Results

- Many runoff samples (about 30 percent) overflowed the collecting bottle and may not be truly representative of the mean concentration from each storm. According to T.D. Stuntebeck (U.S. Geological Survey, unpub. data, 2002), overflow samples for suspended solids and total phosphorus had higher concentrations than those from samples that did not overflow the container, but the opposite was true for dissolved phosphorus. Barten and Jahnke (1997) also found that overflow samples had lower concentrations for some constituents. Overflow occurred, however, for all categories of sites, and differences noted could potentially be even greater.
- The number of samples for some categories was relatively small for rigorous statistical analysis, and the small numbers could lead to inconsistencies among comparisons for different pairs of categories.
- Nutrient-concentration data are for onsite runoff and should be used with caution when making offsite interpretations. Not all of the nutrient load from lawn runoff may actually enter the lake.
- Some changes in nutrient species composition affecting dissolved constituents may have occurred in those samples that were not collected within 2 days after a storm.

Conclusions

- A high percentage of storms resulted in surface runoff from many of the lawns. Runoff from lawns may occur relatively frequently, more than 50 percent of the storms for many lawns.
- Fertilizer use did not affect nitrogen concentrations in runoff. Nitrite plus nitrate concentrations in runoff were generally low.
- Total phosphorus concentration in lawn runoff was directly related to the phosphorus concentration of lawn soils.
- Dissolved phosphorus concentrations were significantly different among the lawn categories; the median from regular-fertilizer sites was twice that from unfertilized or nonphosphorus-fertilizer sites.
- Runoff from lawn sites with nonphosphorus fertilizer applications had a median total phosphorus concentration that was similar to that of unfertilized sites, an indication that nonphosphorus fertilizer use may be an effective, low-cost practice for reducing phosphorus in runoff.

Acknowledgments

Thanks are extended to Scott Mason of the Lauderdale Lakes Lake Management District for his assistance in this study; to the lakeshore homeowners that allowed us to install sampling equipment in their lawns; and to the Wisconsin Department of Natural Resources, Lake Protection Grant Program.

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Information

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From: Mark Olson
To: Chiu, Wayne@Waterboards
Subject: Comment Tentative Order No.R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu
Date: Friday, January 11, 2013 12:57:56 PM
Importance: High

Dear Mr. Chiu:

As a member of the San Diego Regional Chamber of Commerce, I am responding to the San Diego Regional Water Quality Control Board's Tentative Order R9-2012-0011 ("Permit") dated October 31, 2012. After reviewing and speaking with people involved with the proposed Permit, I am concerned it will impose expensive, onerous, and untested regulations on local governments, businesses and residents. These new regulations will impact the region's economy without improving its water quality.

Everyone understands the importance of clean, safe water to the region. As a member of the business community, I too am interested in improving San Diego's water. It is important, however, that we use our limited resources wisely and ensure that our efforts produce the desired outcome of improving water quality.

I applaud the Board's inclusion of Water Quality Improvement Plans (WQIP) as a first step in developing a cost-effective approach to improving our water. Analysis remains a critical component of a successful strategy, and I am glad to see that the Board is committed to finding the best possible solution to water quality improvement.

I am concerned, however, that the costs associated with enforcing and implementing the permit will have a negative impact on my business and San Diego's economy. The four primary areas of concern include: 1) the strict liability for exceeding water quality objectives; 2) the additional and changing requirements for development projects, impacting items such as storm water retention and discharge; 3) the preemption of WQIPs by new and changing regulatory requirements prior to allowing the WQIPs to be developed and implemented; and 4) the lack of reliable funding sources to implement these regulatory changes.

It is necessary to hold individuals, businesses and governments accountable, but it is critical that the accountability measures can be reasonably achieved and are likely to have a significant and positive impact on San Diego's water. Because of these concerns, I respectfully request that the Permit focus on the timely development of effective and enforceable WQIPs, and that each of the WQIPs be developed through a process that ensures public participation. I ask also that the designation of appropriate Best Management Practices in each watershed be determined through the WQIP process rather than the one size fits all strategy currently being proposed in the Permit. I ask further that until the Board adopts a WQIP for a watershed that the provisions of the existing Permit remain in place for that watershed. Finally, in order to avoid unnecessary litigation I request that the Board adopt the WQIPs as Orders implementing the proposed Permit.

I urge you to adopt final permit language that is evidence-based and both environmentally and economically sustainable. Thank you for your consideration. Please contact me at (858) 354-1441, if you have any questions.

Sincerely,

Mark Olson

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January 11, 2013

By E-Mail and Delivery

Wayne Chiu, P.E.
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9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Subject: Comment – Tentative Order No. R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu.

Dear Mr. Chiu:

The County of Orange, as Principal Permittee of the Orange County Stormwater Program (Program), appreciates the opportunity to provide comments on *Tentative Order No. R9-2013-0001, NPDES No. CAS0109266, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region (Tentative Order)* issued on October 31, 2012. The south Orange County Permittees (Permittees) were involved in the development of these comments and the Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano have directed that they be recognized as concurring entities on this letter. We have also coordinated our review with permittees in Riverside and San Diego Counties, who have identified many of the same issues with the Tentative Order. We support their comments except where noted otherwise in the attachments to this letter.

The Permittees have been actively engaged in discussions of the prior Administrative Draft of Tentative Order No. R9-2012-0011 (and subsequently on Tentative Order R9-2013-0001). Since April 9, 2012 the Permittees have participated with Board staff in two Orange County-specific meetings, an initial public workshop (April 25), four "focused meetings" (June 27, July 11, July 25 and August 22), a hydromodification workshop (August 30), and a final public workshop (September 5). We also conveyed in writing our concerns regarding the scheduling and appropriateness of this effort (see prior correspondence dated May 10, 2012, May 17, 2012 and July 3, 2012) and submitted extensive comments on the Administrative Draft on September 14, 2012 (all of which are incorporated by reference).

We recognize the significant efforts of Regional Board staff to engage the Permittees and key stakeholders in the development of a regional permit in a collaborative manner. We also recognize that Tentative Order No. R9-2013-0001 reflects a number of changes directly in

response to Permittee comments. The Tentative Order, however, still contains many issues of significant concern and does not, in our view, achieve at this time what Board staff laid out as its intended purpose and approach during the workshop process. Our extensive comments on the Tentative Order are organized and submitted as follows:

- A summary of our overarching concerns with the Tentative Order are included below in this letter
- Attachment A presents detailed comments on the entire permit
- Attachment B presents a redline/strikeout version of recommended changes to the Tentative Order.

The County is aware that Regional Board staff has held a number of meetings and discussions with San Diego Permittees since the release of the Tentative Order R9-2013-0001 on changes they are proposing. The Orange County Permittees would similarly request the opportunity to meet with you and other Regional Board staff to review in detail the changes requested in this comment submittal.

Overarching Issues of Concern with the Tentative Order

I. Failure to Consider Orange County Permittee Programs and Accomplishments

The Orange County Stormwater Program has been regulated under municipal NPDES stormwater permits since the first permit was issued in 1990. Subsequent permits were issued in 1996, 2002, and 2009. Since the inception of the Program the County of Orange and the other 12 Permittees have developed a comprehensive Drainage Area Management Plan (DAMP) that serves as the principal policy and guidance document for the entire Program, Local Implementation Plans (LIPs) that are developed by each Permittee to identify how the program is implemented on a city/jurisdiction basis, and through a series of watershed workplans for each watershed in the San Diego Region. These workplans detail the Permittee efforts to prevent and control pollutants on a watershed level.

The Orange County Stormwater Program is one of the few programs to date to have actively defined a series of performance metrics (headline measures) and use an assessment framework to define the relationships between compliance actions and, ultimately, positive changes in water quality. This assessment process is important because, in the end, the goal of the Program is to reduce urban pollutants and assist in attaining water quality standards.

Looking at the achievements that the Program has had since 1990, several major themes emerge:

- The Orange County Stormwater Program is proactive and a leader within the State
- The Permittees are engaged in the Program and provide valuable input into the process
- The Program uses several separate, but highly inter-related water quality planning processes to address urban sources of pollutants

- The Program recognizes the benefits of watershed-based planning and regional controls and has an increased emphasis to support this as foundational to the success of the Stormwater Program
- The Permittees adaptively manage the Program - the iterative process is actively employed and necessary modifications are proposed, reviewed and incorporated into the Program. Collaborative research is a key tool to understand and characterize sources of pollutants
- The existing framework and implementation of the Program meets or exceeds the permit requirements
- The Program receives significant funding and resources to ensure that it is successful
- Improvements in water quality have been realized including delistings from the 303(d) list

Specific successes include:

- With the 2010 303(d) List, Dana Point Harbor was delisted for indicator bacteria and several shoreline segments were delisted for *Enterococcus*, Fecal Coliform and/or Total Coliform
- In 2012, water quality in Orange County was excellent with 89% A grades and 94% B or better grades as reported by Heal the Bay in their annual beach water quality report card. Wet weather grades were fair (69% A or B grades) but bested the five-year average by 15%. Furthermore, for almost ten months (June 21, 2011 to April 6, 2012) Orange County did not have any beach closures, which is unprecedented. This is the longest stretch of time the county has gone without a single beach closure.
- The Permittees' public education program has changed public awareness as shown by surveys and is clearly promoting behaviors in our residents that are protective of water quality. In 2006 this effort – Project Pollution Prevention – was formally recognized for its excellence on a statewide basis by CASQA. In 2012, the American Public Works Association recognized our Project Pollution Prevention Public Education website as a "model practice." Results from the 2012 Public Awareness Survey of Orange County Residents indicate increased overall knowledge of stormwater issues and willingness to participate in stormwater pollution preventative behaviors in some key areas.
- With respect to land development, in 2012 the OC Engineering Council awarded the County with an Engineering Project Achievement Award for the Technical Guidance Document, which is the companion document to the Model Water Quality Improvement Plan.

There is concern that these achievements and the significant local engagement in the Program are not considered and approaches developed by the Permittees are sometimes overridden by the Tentative Order without support. For example, provisions dealing with land development, Low Impact Development (LID) and hydromodification control are significantly ratcheted up while award-winning permit programs are only just being implemented and/or pending approval and the programmatic successes as demonstrated with the annual effectiveness assessments are not recognized.

II. Lack of Authority to Include the Orange County Permittees in a Regional Permit

The Regional Board lacks the authority to include Orange County Permittees in a Regional Permit because there is no system-wide, jurisdiction-wide, watershed or other basis to do so. Orange County's MS4 does not interconnect with Riverside and San Diego Counties. There is no shared jurisdiction or other regional stormwater management authority that is applying for one permit. Orange County does not drain into a shared watershed, and the County is not adjacent to either county due to large federal lands that isolate Orange County from Riverside and San Diego. In addition, the quantity and nature of pollutants are different between the three counties. Therefore, the Regional Board cannot under federal and state regulations impose a Regional Permit without the Permittees expressly consenting to the Board's jurisdiction, as was done in the San Francisco Bay Area Regional Permit.

When preparing for the next iteration of each permit, the Permittees spend a significant amount of time and energy developing a Report of Waste Discharge (ROWD). The ROWD discusses the Permittee's compliance activities and includes a description of accomplishments, an assessment of program effectiveness using the California Stormwater Quality Program Effectiveness Assessment (CASQA) guidance in conjunction with the iterative process, the necessary programmatic changes that are evident as a result of the assessment, and, finally, a proposed new management program in the form of a draft updated DAMP. In the case of the current Tentative Order, new requirements are being proposed and will be adopted for south Orange County in the absence of a ROWD, since the Permittees are still covered by an existing permit and have not been required to submit one. As noted in previous correspondence, inclusion of south Orange County in a regional permit and in the absence of a ROWD is inappropriate.

III. Consistency in MS4 Permitting

In 2009, your staff committed in the last permit renewal to look at consistency with the State's other MS4 permits, notably those being promulgated by the Santa Ana Regional Board. This commitment represented recognition of the Little Hoover Commission's conclusions on the lack of consistency in MS4 permits as a critical area of concern and USEPA's interest in seeing greater permitting consistency. Nonetheless, while Regional Board staff has stated that the Tentative Order is meant to be a modest incremental update of the current south Orange County permit, it nevertheless escalates the regulatory requirements in many key areas, creates greater variance with the north Orange County permit, and appears to represent a singular rather than statewide vision of the future of MS4 permitting. The Fact Sheet (Attachment F) points to two similarities between the current Santa Ana Regional Board MS4 permit and the Tentative Order, but fails to identify the numerous other areas of inconsistency.

To the extent that the Tentative Order may ease the regulatory burden for your staff, there will be a commensurate increase in the burden for the County other Permittees that are dealing with multiple Regional Board jurisdictions if permitting in California continues to be defined by divergent rather than convergent approaches. We have therefore proposed many changes to the Tentative Order supportive of a more cogent alignment of our countywide Program. This consistency is important to the credibility of our respective efforts to manage urban runoff and is vital to sustaining the obvious cost effectiveness of a coordinated countywide program in

Orange County with promising synergies in other regions at a time of widespread economic distress for many communities.

It should also be noted that the Tentative Order provides no consideration at all for the five Permittees whose jurisdictional area is regulated under separate permits from the Santa Ana and San Diego Regional Boards. Fundamentally different requirements between our two permits, particularly within the same city, damage the credibility of the regulatory framework and confound the ability of local government to cost effectively address key environmental mandates.

IV. Prohibitions and Limitations

The Prohibitions and Limitations language in MS4 permits statewide was recently the subject of a State Water Resources Control Board workshop on November 20, 2012. The County provided testimony at this workshop expressing concern that the new iteration of permit language could expose the Permittees to State and federal enforcement actions, as well as to third party actions under the federal Clean Water Act's citizen suit provisions. This was the case with the recent Ninth Circuit Court of Appeals decision in the case of *Los Angeles County Flood Control District v. Natural Resources Defense Council*, No. 11-460, slip op. (Jan. 8, 2013). The proposed Prohibitions and Limitations provisions in the Tentative Order, as written, could be construed as standalone provisions that could expose the Permittees to Clean Water Act liabilities for discharges that cause or contribute to an exceedance of a water quality standard. Receiving water limitations must provide a compliance mechanism for exceedances of effluent limitations, water quality standards or TMDLs if the Permittees are diligently following an iterative process and implementing BMPs to the MEP standard

The Tentative Order should then reaffirm the iterative process in that compliance is to be achieved over time using improved BMPs. The iterative process is a fundamental aspect of MS4 programs, as envisioned by State Water Board Order 99-05 and later reconfirmed in Order WQ 2001 15 (BIA Order), and is the mechanism by which MS4 Permittees should demonstrate compliance. The County supports this approach and believes that the Regional Board has discretion on the receiving water limitations language beyond what is required to be included per Water Board Order 99-05.

The Permittees envision Water Quality Improvement Plans (WQIPs) as the foundation for an iterative BMP-based compliance approach for the discharge prohibitions and limitations and have provided detailed comments and recommended redline permit language in Attachment A.

V. New Requirements for Land Development

The evolution of MS4 permitting has largely been defined by a focus on land development. In 2009, MS4 programs on a statewide basis started to transition requirements for land development from "treat and release" runoff management to onsite retention with a new emphasis on LID, and hydromodification. Currently, while there is recognition of an emerging paradigm that the future management of urban landscapes should be based upon the principal

of seeking to restore of natural hydrologic processes, there is absolutely no clear consensus on how and where this approach should be effected.

The comments and proposed redline permit language in Attachments A and B are intended to shift the land development program toward an approach based upon nationally accepted LID principles, recognize the uncertainties and need for greater flexibility in hydromodification requirements, and offer a mitigative approach to urban land development that will produce meaningful environmental outcomes. Our revisions would recognize biofiltration as an equal LID BMP; ensure that the significantly more challenging requirements related to hydromodification are not imposed for discharges to channels that are engineered, concrete lined, significantly hardened, and/or are regularly maintained as part of a regional flood control program; and incorporate USEPA green street guidance to provide greater flexibility for land-constrained street, road, and highway projects consistent with other adopted MS4 permits in the State.

Additionally, the County has continued concern that the provisions dealing with land development, LID and hydromodification controls are significantly ratcheted up in the Tentative Order while existing Fourth Term Permit programs are only just being implemented and/or pending approval. The fact sheet and findings provide no foundation for the changes being proposed.

VI. TMDL Incorporation

The Regional Board has adopted two Basin Plan Amendments to establish Total Maximum Daily Loads (TMDLs) where the Permittees are assigned wasteload allocations: (1) Indicator Bacteria in Baby Beach in Dana Point Harbor and (2) Indicator Bacteria, Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek).

There are several fundamental and substantive discrepancies between the adopted TMDL Basin Plan Amendments and the provisions of the Tentative Order. These inconsistencies negate the Basin Plan Amendment process that occurred to establish the TMDLs and clearly contradict the Board's intent for how the TMDLs would be incorporated into the MS4 Permit. The Tentative Order should be revised to ensure that the TMDLs are properly incorporated as mass-based WLAs and not as concentration-based limits and that BMP-based compliance is established for the TMDL provisions. The Tentative Order should also provide an explicit re-opener provision to ensure that any revision to the TMDL is included in the adopted Order.

VII. Complimentary Watershed and Jurisdictional Planning

The WQIP approach represents a significant advance in the development and implementation of stormwater programs. The WQIP framework allows for the identification and development of a program built around the highest priority water quality conditions within a specific watershed. The WQIP also allows for the integration of all program elements and focuses the efforts on the highest priorities for each watershed through the customization of actions and strategies. If positioned correctly, the WQIP can be a significant advance in making the

Tentative Order and corresponding compliance programs truly strategic, adaptive, and synergistic.

The County believes the Tentative Order provisions, especially Provision E, JRMP, deviate from the strategic and adaptive approach to the anachronistic "one-size fits all" approach. For example, the Existing Development provisions dictate that specific BMPs that must be implemented, regardless of the high priority water quality concerns within a watershed. These provisions become "additive" instead of "prioritized" and are not supportive of the overarching WQIP. The Tentative Order should be modified so that the WQIPs and related Jurisdictional Runoff Management Plans can be streamlined and focus on the highest priorities within each watershed.

Thank you for your attention to our comments. Please contact the undersigned directly if you have any questions. For technical questions, please contact Chris Crompton at (714) 955-0630 or Richard Boon at (714) 955-0670.

Very truly yours,

Mary Anne Skorpanich, Manager
OC Watersheds

Ryan M. F. Baron
Senior Deputy County Counsel
Office of County Counsel

Attachments: A – Detailed Comments
B – Redline Version of the Tentative Order

Cc: (Electronic copies only)
David Gibson, San Diego Regional Board
Tony Felix, San Diego Regional Board
South Orange County Permittees
Orange County Technical Advisory Committee
Tony Olmos, Orange County Public Works
Todd Snyder, County of San Diego
Jason Uhley, Riverside County Flood Control and Water Conservation District
Andrew Kleis, City of San Diego

ATTACHMENT A

ORANGE COUNTY DETAILED COMMENTS ON CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD SAN DIEGO REGION TENTATIVE ORDER No. R9-2013-0001 NPDES NO. CAS0109266

This document, Attachment A, contains the detailed legal and technical comments of the County of Orange and the Orange County Flood Control District (collectively, the "**County**") on Tentative Order No. R9-2013-0001 dated October 31, 2012 ("**Tentative Order**"). These comments are divided into three sections (*General*, *Findings*, and *Permit Provisions*) and address issues relating to specific parts of the Tentative Order. At times, the issues and concerns raised will pertain to more than one section of the Tentative Order. In addition to the recommended language changes identified below, Attachment B (the recommended changes to the Tentative Order) also includes some minor edits in order to provide additional clarification where necessary.

The County of Orange, as the Principal Permittee, and the cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Lake Forest, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano collectively refer to themselves as "San Diego Region Permittees" or "Permittees." The Tentative Order refers to the County and incorporated cities of South Orange County as the "Copermittees." As such, the comments below use the term "Copermittees" to be consistent with the terminology of the Tentative Order.

GENERAL

1. Permitting Consistency Is Critical Since Several Copermittees Are Regulated Under Multiple Regional Boards

Although the County of Orange is very supportive of the overall approach that the San Diego Regional Water Quality Control Board (Regional Board) is proposing with the development of the Water Quality Improvement Plans (WQIPs) to guide the Copermittees' jurisdictional runoff management programs (JRMPs) towards the high priority water quality conditions within a watershed to achieve improvements, it is critical that consistency be maintained between Regional Boards, where feasible.

The Orange County stormwater program operates a unified countywide program of 36 Permittees, with five (5) Copermittees split between two (2) Regional Boards. Consequently, a number of our comments are aimed at creating greater uniformity and implementability between the two permits that we operate under. Fundamentally different requirements between our two permits, particularly within the same city, damage the credibility of the regulatory framework and confound the ability of local government to cost effectively address key environmental mandates. To this end, the County of Orange (County) has provided some recommended language changes within this document and Attachment B in order to try to preserve that consistency.

2. Many of the New or Modified Requirements within the Tentative Order Do Not Have Adequate Findings of Fact and/or Technical Justification

In many instances the Findings and/or Fact Sheet provide little or no justification of the need for the new requirement. Although Finding 35 states that the Fact Sheet "contains background information, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of this Order", many of the new or modified requirements within the Tentative Order do not have adequate findings of fact and/or technical justification. In addition, they do not identify the "program deficiency" that warrants the modification. The comments provided herein identify many of the areas where new or modified provisions of the Tentative Order lack factual or technical support in the Findings and/or Fact Sheet. Examples of this include, but are not limited to, the following:

- Basis for including Orange County in the regional municipal stormwater permit;
- Basis for the 10 year timeline to achieve the final numeric goals identified within the Water Quality Improvement Plans (WQIPs);
- Basis for requiring uncontaminated pumped ground water, foundation drains, water from crawl space pumps, and footing drains to obtain coverage under the San Diego Region groundwater extraction permits;
- Basis for including single family residential projects as a category requiring coverage as a Priority Development Project;
- Basis for including U.S. Green Building Council (USGCB) Leadership in Energy and Environmental Design (LEED) as exemption criteria for single family residential projects and for alternative compliance for hydromodification management;
- Basis for requiring conventional BMPs onsite in addition to alternative compliance;
- Basis for hydromodification requirements not considering existing Hydromodification Management Plans and being a one size fits all approach;
- Basis for biofiltration BMPs required to be sized at 1.5 times the design capture volume;
- Basis for biofiltration BMPs not being an effective LID and treatment measure per the requirement to size them at 1.5 times the design capture volume and also require conventional BMPs when they are used.
- Basis for offsite regional BMPs required to be sized at 1.1 times the design capture volume;
- Basis for verification of coverage under all related permits for construction sites;
- Basis for evaluation and retrofit/rehabilitation of stream channel systems;
- Basis for including residential driveways as a category requiring coverage as a Priority Development Project;
- Basis for not incorporating the Total Maximum Daily Load (TMDL) waste load allocations (WLAs) into the Tentative Order; and
- Basis for establishing Water Quality Based Effluent Limits (WQBELs) expressed as numeric effluent limitations, in lieu of WQBELs expressed as BMPs, for the TMDL provisions.

3. The Numbering in the Tentative Order Should Explicitly Identify the Major Sections to Help Guide the Reader

The County is recommending that the Regional Board explicitly identify the numbering system within the Tentative Order subsections in order to assist and orient the reader. For example, within the Provisions (Section II of the Tentative Order):

- The sub-sections within Provision A should be listed as:
  - *A.1 Discharge Prohibitions* instead of *1. Discharge Prohibitions*
  - *A.2 Receiving Water Limitations* instead of *2. Receiving Water Limitations*

- The sub-sections within Provision B should be listed as:
  - *B.1 Watershed Management Areas* instead of *1. Watershed Management Areas*
  - *B.2 Priority Water Quality Conditions* instead of *2. Priority Water Quality Conditions*

Given the styles and formatting currently used within the Tentative Order, these edits were not made within Attachment B.

FINDINGS

4. Finding 2 (Page 1 of 120) – A Regional Permit Cannot Be Issued to Orange County Because There Is No System-wide, Jurisdiction-wide, Watershed or Other Basis to Do So

The Tentative Order is intended to cover Copermittees in three large metropolitan counties – Orange, Riverside and San Diego. In May 2012, Orange and Riverside Counties ("**Counties**") sent letters to Staff Counsel for the Regional Board requesting the legal authority to issue a regional permit to the three counties.[1] The Counties contended that, in accordance with federal regulations, there was no system-wide, jurisdiction-wide or watershed basis to issue a regional permit. The Counties also asserted that the lack of a Report of Waste Discharge (ROWD) process for either county prior to the initial adoption of the Tentative Order prevented the issuance of a regional permit on the grounds that there was a conflict with both federal and state law. On September 7, 2012, Staff Counsel responded to the Counties stating that there was a jurisdiction-wide and watershed basis to impose a regional permit on the Counties, and cited legal authority and examples in the Bay Area and an Alaskan borough where regional permits had been issued.[2]

For the following reasons, the County continues to believe that the Regional Board lacks authority to issue a regional permit to Orange County:

1. Orange County's MS4 system does not interconnect with Riverside and San Diego Counties,
2. There is no jurisdictional basis to issue a regional permit to Orange County,

[1] Letter from Ryan M. F. Baron, Office of County Counsel, County of Orange, to Catherine Hagan, Office of Chief Counsel, State Water Resources Control Board, San Diego Region (May 10, 2012); Letter from David H. K. Huff, Office of County Counsel, County of Riverside, to Catherine Hagan, Office of Chief Counsel, State Water Resources Control Board, San Diego Region (May 21, 2012).

[2] Letter from Jessica Jahr, California Regional Water Quality Control Board, San Diego Region, to Ryan M. F. Baron, Office of County Counsel, County of Orange, and David H. K. Huff, Office of County Counsel, County of Riverside (Sept. 7, 2012).

3. Orange County's MS4 does not drain into a shared watershed, and
4. Orange County's MS4 is not adjacent to Riverside or San Diego's MS4, and the quantity and nature of pollutants differ between the three counties.

Therefore, the Regional Board cannot under federal and state regulations impose a Regional Permit without the Permittees expressly consenting to the Board's jurisdiction.

A. There Is No System-wide, Jurisdiction-Wide, Watershed or Other Basis by Which to Legally Impose a Regional Permit on Orange County

Finding 2 in the Tentative Order states that the legal and regulatory authority for implementing a regional MS4 permit stems from Section 402(p)(3)(B) and 40 CFR 122.26(a)(1)(v). The Tentative Order also cites EPA's Final Rule regarding stormwater discharge permit application procedures that there is flexibility to establish system-wide or region-wide permits.[3] During Focused Meeting Workshops conducted on June 27, 2012 and July 11, 2012, Regional Board staff stated that the reason for a regional permit was to consolidate all three permits into one to lessen the amount of permit writing time for three separate permits and reduce internal costs for writing and issuing permits. The justification at Finding 2 is largely the same although it adds that the "regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall costs savings for the Copermittees and San Diego Water Board."[4]

First, although Orange County geographical boundaries abut San Diego and Riverside Counties, Orange County's MS4 does not interconnect with the counties regulated under the regional permit (see map in **Appendix A-1**). There is substantial undeveloped area between the developed jurisdictions of Orange County and Riverside Counties. The Santa Ana Mountains and the Cleveland National Forest separate Orange and Riverside Counties encompassing tens of thousands of acres of total land separating the two counties. Camp Pendleton military base separates Orange and San Diego Counties totaling over 122,000 acres with no adjacent cities or interconnected MS4s. Clean Water Act (CWA) regulations expressly state that a permit can be issued on a system-wide basis covering all discharges from MS4s within a large or medium municipal storm sewer system. One of the primary considerations in defining a "large or medium municipal separate storm sewer system" is one that has physical interconnections with other municipal separate storm sewers.[5] In this case, there are no physical interconnections.

Secondly, there is no jurisdiction-wide basis to issue a regional permit. 40 CFR 122.26(a)(3)(ii) states that one system-wide permit can cover all discharges from MS4s within a large or medium municipal storm sewer system located within the same jurisdiction. Orange, Riverside and San Diego Counties are separate counties with distinct political and geographical boundaries that do not drain into a common watershed and do not share physical interconnections. The three counties are not within the same political jurisdiction. While Region 9 can be considered one jurisdiction for Regional Water Board purposes, federal regulations state that there has to be one stormwater management regional authority in which to issue a permit, and the Regional Board is not such an authority.[6] Regardless, such a permit can only be issued to a multi-jurisdictional entity upon a permit application and upon there being an

[3] 55 Fed. Reg. 47990, 48039-48042.
[4] Part I.2.
[5] 40 CFR 122.26(b)(4) (defining large systems); 40 CFR 122.26(b)(7) (defining medium systems)
[6] 40 CFR § 122.26(a)(3)(iii)(C).

interconnected MS4 or adjacent MS4. There is no tri-county stormwater management authority, there is no system-wide interconnection and Orange County is not adjacent to San Diego and Riverside Counties due to the large federal lands that separate the County.

Third, Orange County does not drain into a shared watershed with Riverside and San Diego Counties. The Orange County Copermittees drain into various watersheds that drain into the Pacific Ocean. The Riverside County Copermittees drain into the Santa Margarita watershed. San Diego County drains into various watersheds. Orange County's MS4 does not drain into or share one common watershed with either county, and therefore cannot be regulated on this basis.

There is no other basis by which to regulate Orange County in the same permit with Riverside and San Diego Counties. Although it is true that Orange County political boundaries abut the two counties, there are hundreds of thousands of acres of federal land that separate Orange County, and thus, the County's MS4 does not interconnect with and is not adjacent to its neighbors like Orange County is with Los Angeles County. Based on differing permit requirements for the three counties, such as TMDLs, and data filed in annual reports and past ROWDs, the quantity and nature of pollutants are different between the three counties, and do not serve as a basis or determination by which to lump all three counties into a one-size fits all permit (e.g., hydromodification). In addition, federal regulations look to interconnection and similarities between jurisdictions as the basis by which to issue one permit.[7] Federal regulations do not authorize and the EPA Final Rule does not contemplate regional permit issuance based on overall reduced cost savings, and overall cost savings have not been demonstrated in the Tentative Order.[8] And although it may be convenient to ensure consistency of regulation, EPA Final Rule contemplates such consistency within a watershed and not throughout a geographical area the size of the three counties. In fact, the EPA Final Rule does indeed use the term "regional" throughout its analysis in the Response to Comments. A careful examination of the term "regional," however, shows that EPA was analyzing whether individual permits should be issued to individual cities, a county and its incorporated cities, a set of Copermittees with interconnected sewer systems and other infrastructure, one state entity or a regional stormwater management authority. The largest area by which one permit could be issued under the Final Rule was essentially to a state entity or one county and its incorporated cities. There is no factual or technical basis in the Tentative Order that meets this criteria or establishes other bases to regulate Orange County under one unified permit. There is also no statistical basis by which to issue a regional permit as Orange County is comprised of over three million people and is the sixth largest county by population in the U.S. In fact, the U.S. Bureau of Census designates Orange County in a different Metropolitan Statistical Area than San Diego County, and is designated in a Combined Statistical Area with Los Angeles, Ventura and San Bernardino Counties.

Lastly, the letter from Staff Counsel cites examples in the Bay Area and in Alaska where regional permits have been issued. In the Bay Area, various cities and counties under that permit interconnect in some fashion and drain into the San Francisco Bay. The Bay Area is also represented by a joint powers organization or regional watershed management program comprised of 8 municipal stormwater programs that voluntarily agreed to end their existing permits early and enroll in a regional permit. In the case of the Alaska example, a "regional" permit was issued to the Fairbanks North Star Borough, City of Fairbanks, City of the North

[7] 33 USC 1342(p)(3)(B)(i); 40 CFR 122.26(a)(1)(v).
[8] 55 Fed. Reg. 47990-01.

Pole, the Alaska Department of Transportation and the University of Alaska Fairbanks. Further examination of that permit and the stormwater program maps demonstrate, though, that the region regulated is a borough, the Alaskan equivalent of a county. All of the regulated Copermittees are physically interconnected through its storm drain system and roadways, and most drain into one watershed. In short, neither the Bay Area nor the Fairbanks Borough permits provide sufficient examples of a regional permit comparable to the one being issued to Orange County.

B. There Is No Technical Basis to Regulate Orange County Due to the Lack of a Report of Waste Discharge Application.

The ROWD is a federally required application that is the technical basis to draft a new permit for a permittee. The information contained in the ROWD is used to determine prospective provisions of the new permit, including but not limited to monitoring, program strengths and other tools that are assessed in the new permit. In other words, the ROWD is the technical basis or substantial evidence for determining what will be required in the new permit. In the case of the Tentative Order, permit conditions that will apply to Orange County upon the expiration of its current permit in December 2014 or upon early enrollment are not based on any ROWD filed by the County. Thus, there is no technical basis or substantial evidence to regulate Orange County under a regional permit, and therefore, the regional permit terms and conditions are arbitrary and capricious. The initial draft of the Tentative Order did not contain a ROWD requirement for Orange County. The Order was subsequently revised to include a ROWD requirement to determine whether modification to the Order upon enrollment by Orange County is necessary, but the Tentative Order will still be adopted by the Regional Board with terms and conditions that apply to Orange County that are not based on any federally required application or report. Orange County's current Fourth Term permit has been in existence for only two years with programs that have just started, or like hydromodification, have not yet started or are in interim phases. Therefore, the current programs do not provide any meaningful benchmark by which to draft new regional permit terms that apply to the County. And, in addition, the ROWD requirement that is now in the Tentative Order is essentially an after the fact application.

In short, the Tentative Order is drafted and will be initially adopted by the Regional Board with provisions that will generally regulate Orange County Copermittees, along with specific numeric and other requirements that will only apply to Orange County that are not based on an application process or other documented technical basis. There is no substantial evidence or CWA basis by which to impose certain regulations on the County. Thus, the lack of a ROWD requirement prior to initial adoption of a regional permit is in conflict with the CWA, Porter Cologne and the California Administrative Procedure Act.

The County recommends the following language changes:

I. Findings
2. Legal and Regulatory Authority
This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]) adopted by the United States Environmental Protection Agency (USEPA), and chapter 5.5, division 7 of the California Water Code (CWC) (commencing with section 13370). This Order serves as an NPDES permit for discharges from MS4s to surface waters. This Order also serves as waste discharge requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

~~The San Diego Water Board has the legal authority to issue a regional MS4 permit pursuant to its authority under CWA section 402(p)(3)(B) and 40 CFR 122.26(a)(1)(v). The USEPA also made it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide permits (55 Federal Register [FR] 47990, 48039-48042). The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees and San Diego Water Board.~~

The federal regulations make it clear that the Copermittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators (40 CFR 122.26(a)(3)(vi)). This Order does not require the Copermittees to manage storm water outside of their jurisdictional boundaries, but rather to work collectively to improve storm water management within watersheds.

I. Findings
26. Report of Waste Discharge Process
…..The San Diego Water Board understands that each municipality is unique ~~although the Counties share watersheds and geographical boundaries~~. The Order will continue to use the Report of Waste Discharge process prior to initially making Orange County or Riverside County Copermittees subject to the requirements of this Order.

5. Finding 8 (Page 3 of 120) – It Should Not Be Presumed That Discharges From MS4s Always Contain Waste or Pollutants

Discharges may contain waste or pollutants, but it should not be presumed that they necessarily always contain waste or pollutants.

Under current law, the State Board's issuance of the Small MS4 Permit is a quasi-judicial decision.[9] As a quasi-judicial decision, the State Board's action must be supported by legally adequate findings, and those findings must be supported by evidence in the record.[10]

Pursuant to the Supreme Court's decision in *Topanga Association for a Scenic Community v. County of Los Angeles* (1974) 11 Cal.3d 506, findings are intended to "facilitate orderly analysis and ***minimize the likelihood that the agency will randomly leap from evidence to conclusions***."[11] Here, there is no cited evidence that stormwater itself is a pollutant or that in every instance it contains pollutants or waste as those terms are defined by the CWA and Porter Cologne respectively. Absent evidence demonstrating that this is the case, in all cases, the Regional Board cannot make this finding.

Moreover, as a matter of law, the Regional Board lacks the authority to regulate pure stormwater as a pollutant. The CWA and its implementing regulations define the term "pollutant" to mean:

> dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials

[9] *City of Rancho Cucamonga v. Regional Water Quality Control Board* (2006) 135 Cal.App.4th 1377, 1385.
[10] T*opanga Association for a Scenic Community v. County of Los Angeles* (1974) 11 Cal.3d 506.
[11] *Id*., at 514 [emphasis added].

> (except those regulated under the Atomic Energy Act of 1954, as amended (42 U.S.C. 2011 et seq.)), heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water[12].

Federal regulations further define the term "stormwater" to mean: "storm water runoff, snow melt runoff, and surface runoff and drainage."[13] Notably, the definition of the term "Pollutant" does not include "Stormwater." Moreover, the text of the CWA requires the discharges of *pollutants* to be reduced to the Maximum Extent Practicable (MEP).[14] There is no prohibition on or comparable authority to regulate the discharge of pure *stormwater.*

This rationale was recently adopted by the Eastern District of Virginia, when it held that the EPA has no authority under the Clean Water Act to regulate non-pollutants.[15] Specifically, the Court stated:

> Pollutant is statutorily defined. (33 U.S.C. § 1362(6).) The Court sees no ambiguity in the wording of this statute. EPA is charged with establishing TMDLs for the appropriate pollutants; that does not give them the authority to regulate nonpollutants. The parties agree that sediment is a pollutant under 33 U.S.C. § 1362(6), and stormwater is not. Then how does EPA claim jurisdiction over setting TMDLs for stormwater.[16]

Likewise, Porter Cologne defines the term "Waste" to mean:

> sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal.[17]

While the definition is certainly different and potentially broader than the definition of *Pollutant* under the CWA, the definition of waste does not include stormwater or any other discharge that is not created by human activity. As a matter of law, the Regional Board is therefore without authority to regulate all discharges of stormwater as pollutants or waste.

[12] 33 U.S.C. § 1362(6); 40 C.F.R. § 122.2.
[13] 40 C.F.R. § 122.26(b)(13).
[14] 33 U.S.C. § 1342(p).
[15] Virginia Dept. of Transportation v. EPA, No. 1:12-CV-775, slip op. (E.D. Va. Jan. 3, 2013).
[16] Id., at 5.

[17] Cal Water Code § 13050(d).

The County recommends the following language changes:

I. Findings

8. Point Source Discharges of Pollutants
Discharges from the MS4s may contain waste, as defined in the CWC, and pollutants that adversely affect the quality of the waters of the state. A discharge from an MS4 is a "discharge of pollutants from a point source" into waters of the U.S. as defined in the CWA. Storm water and non-storm water discharges from the MS4s may contain pollutants that cause or threaten to cause a violation of surface water quality standards, as outlined in the Basin Plan…..

16. Best Management Practices. Waste and pollutants which are deposited and accumulate in MS4 drainage structures may ~~will~~ be discharged from these structures to waters of the U.S. unless they are removed…..

17. BMP Implementation. …..Retrofitting areas of existing development with storm water pollutant control and hydromodification management BMPs ~~is~~ may, in many cases be necessary to address storm water discharges from existing development that may cause or contribute to a condition of pollution or a violation of water quality standards.

6. Finding 11 (Page 4 of 120) – Natural Waters Cannot Legally Be Classified as Part of the MS4, and Cannot Be Classified as Both a MS4 and Receiving Water

The Tentative Order states that development often makes use of natural drainage patterns and features as conveyances for runoff. Finding 11 goes on to state that rivers, streams and creeks in developed areas are part of the Copermittees' MS4 whether the river, stream or creek is natural, anthropogenic or partially modified. It further states that these natural water bodies are both an MS4 and a receiving water.

Finding 11 is expressly contradicted by federal regulations and a recent opinion by the U.S. Supreme Court. Natural creeks cannot legally be classified as part of the MS4, and the MS4 and a water of the U.S. cannot be comingled. The flow of water from an improved portion of a navigable waterway into an unimproved portion of the same waterway does not qualify as a "discharge of a pollutant" under the CWA.[18]

In addition, the definition of a *municipal separate storm sewer* means "a conveyance or system of conveyances including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains:

i. Owned or operated by a state, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to state law) ... including special districts under state law such as a sewer district sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the Clean Water Act that discharges into waters of the United States;

[18] *L.A. County Flood Control District v. NRDC*, slip op. (Jan. 8, 2013); *South. Fla. Water Management Dist. V. Miccosukee Tribe*, 541 U.S. 95, 109-112 (holding that the transfer of a polluted water between two parts of the same waterbody does not cause a discharge of pollutants under the CWA).

ii. Designed or used for collecting or conveying stormwater;

iii. Which is not a combined sewer; and

iv. Which is not part of a publicly owned treatment works (POTW) as defined at 40 CFR 122.2."[19]

This definition only includes man-made channels and systems and does not encompass natural water bodies simply because an outfall discharges to a receiving water. Any water quality improvement to a natural river, stream or creek does not mean it is a MS4, but an improved water of the U.S. Moreover, U.S. EPA itself, in the Preamble to its proposed MS4 regulations[20] expressly determined that "streams, wetlands and other water bodies that are waters of the United States are not storm sewers for the purposes of this rule" and that "stream channelization, and stream bed stabilization, which occur in waters of the United States" were not subject to NPDES permits under Section 402 of the CWA[21].

Lastly, municipalities do not own, control or operate natural rivers, streams and creeks. Such water bodies are often administrated by the State of California in the public trust for the right of the people to use such waters for certain purposes or are privately owned.[22] The Legislature, acting within the confines of the common law public trust doctrine, is the ultimate administrator of the trust and may often be the final arbiter of permissible uses of trust lands. Moreover, a municipality obviously cannot "operate" a natural creek or stream.

The County recommends the following language changes:

I. Findings
11. Runoff Discharges to Receiving Waters
….Historic and current development makes use of natural drainage patterns and features as conveyances for runoff. ~~Rivers, streams and creeks in developed areas used in this manner are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and receiving water.~~ Numerous receiving water bodies and water body segments have been designated as impaired by the San Diego Water Board pursuant to CWA section 303(d).

7. Finding 12 (Page 4 of 120) – Copermittees Do Not Accept Free and Open Access to MS4s, and Are Not Responsible for All Discharges not Prohibited

The Tentative Order states that MS4s willingly provide free and open access and convey discharges to waters of the U.S., and that MS4 operators then accept all responsibility for such discharges not prohibited or otherwise controlled. This is simply not the case and is legally unsupportable. An MS4 is designed to accept stormwater for flood control purposes and prevent damage to life and property. Although it is true that the Copermittees have an obligation to effectively prohibit non-stormwater discharges, namely illicit connections and unlawful dumping, it is also true that the discharger into the MS4 is ultimately responsible for a condition of pollution or violation of a water quality standard. And, in accordance with California

[19] 40 CFR 122.26(b)(8).
[20] 53 Fed. Reg. 49416 (Dec. 7, 1988)
[21] 53 Fed. Reg. at 49442.
[22] *Marks v. Whitney* (1971) 6 Cal. 3d 251, 259, 260.

state law, MS4s downstream of upstream flows must accept those flows and cannot attempt to block or divert such flows.[23] Finding 12 attempts to shift all legal responsibility to the MS4s, which is unsupported by federal and State law.

The County recommends the following language changes:

I. Findings
12. Pollutants in Runoff
…. As operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. ~~*By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not prohibit or otherwise control.*~~ *These discharges may cause or contribute to a condition of pollution or a violation of water quality standards.*

8. Finding 15 (Page 5 of 120) – The Tentative Order Must Recognize that the Discharge of All Pollutants From the MS4 is Subject to the MEP Standard

Section 402(p)(3)(B)(ii) requires the Copermittees to effectively prohibit non-stormwater discharges into the MS4, namely pollutants generated from illicit connections and unlawful dumping.

The Tentative Order at Finding 15, however, states that non-stormwater discharges are not subject to the MEP standard. This finding is not supported by federal law. While federal law regulates "non-stormwater discharges" into the MS4, Section 402(p)(3)(B)(iii) expressly states that the "discharge of pollutants" shall be reduced to MEP. In drafting this section of the CWA, Congress expressly intended all discharges from MS4s to be subject to MEP as it used the term "pollutant" and did not differentiate between stormwater and nonstormwater, as the Tentative Order attempts to do. Therefore, the duty of the Copermittees to reduce the discharge of pollutants from the MS4 to MEP applies to both stormwater and nonstormwater pollutants.

Furthermore, the focus of the CWA and federal regulations is on a management program that includes a comprehensive planning process to reduce the discharge of pollutants to MEP.[24] One of the elements of the management program is the illicit discharge prevention program.[25] The control and limitation of illicit discharges into the MS4 is intended to achieve the overall MEP standard for discharges from the MS4. This is confirmed by the preamble to EPA regulations that discuss the required elements of the management program. According to EPA:

> [Copermittees are required] to develop management programs for four types of pollutant sources which discharge to large and medium municipal storm sewer systems. Discharges from large and medium municipal storm sewer systems are usually expected to be composed primarily of: (1) Runoff from commercial and residential areas; (2) storm water runoff from industrial areas; (3) runoff from construction sites; and **(4) non-storm water discharges**. Part 2 of the permit application has been designed to allow [Copermittees] the opportunity to propose **MEP control measures for each of these components of the discharge**. 55 Fed Reg at 48052 (emphasis added). *See also* 55 Fed Reg at 48045 (stating "Part 2 of the proposed permit application [which includes the illicit discharge prevention requirement] is designed to . . . provide municipalities with

[23] *Keyes v. Romley* (1966) 64 Cal.2d 396; *Locklin v. City of Lafayette*, (1994) 7 Cal. 4th 327.
[24] 40 CFR 122.26(d)(2)(iv).
[25] 40 CFR 122.26(d)(2)(iv)(B)(1).

> the opportunity of proposing a comprehensive program of structural and non-structural control measures that will **control the discharge of pollutants, to the maximum extent practicable, from municipal storm sewers**.") (Emphasis added).

EPA's position is consistent with existing State Water Resources Control Board policy which states that discharges into the MS4 are to be controlled through an iterative, BMP based approach that is *less* stringent than the MEP standard.[26] The State Board held:

> An NPDES permit is properly issued for "discharge of a pollutant" to waters of the United States. (Clean Water Act § 402(a).) The Clean Water Act defines "discharge of a pollutant" as an "addition" of a pollutant to waters of the United States from a point source. (Clean Water Act section 502(12).) Section 402(p)(3)(B) authorizes the issuance of permits for discharges "from municipal storm sewers."
>
> We find that the permit language is overly broad because it applies the MEP standard not only to discharges "from" MS4s, but also to discharges "into" MS4s. . . [T]he specific language in this prohibition too broadly restricts all discharges "into" an MS4, and does not allow flexibility to use regional solutions, where they could be applied in a manner that fully protects receiving waters. It is important to emphasize that dischargers into MS4s continue to be required to implement a full range of BMPs, including source control. In particular, dischargers subject to industrial and construction permits must comply with all conditions in those permits prior to discharging storm water into MS4s.[27]

The State Board's decision in the Building Industry Association (BIA) matter makes clear that the CWA does not include a blanket prohibition on discharges of non-stormwater into the MS4. To the extent the Tentative Order would hold the dischargers liable in the event that any discharge into the MS4 occurs, the Tentative Order exceeds the requirements of the CWA and violates existing State Board policy.

It is also technically infeasible in some cases to differentiate between non-stormwater or stormwater pollutants discharged from the MS4. Thus, just as the discharge of non-stormwater into the MS4 is subject to the effective prohibition standard, the discharge of pollutants in non-stormwater from the MS4 is subject to the MEP standard. There are several instances where the specific provisions in the Tentative Order need to be modified in order to reflect this approach.

The County recommends the following language changes:

I. Findings
3. CWA NPDES Permit Conditions
….This Order prescribes conditions to assure compliance with the CWA requirements for owners and operators of MS4s to effectively prohibit non-storm water discharges ~~in to~~ <u>into</u> the MS4s, and require controls to reduce the discharge of pollutants in storm water from the MS4s to the MEP.

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[26] Specifically in State Board in Order No. WQ-2001-15, *In the Matter of the Petitions of Building Industry Assoc. of San Diego County and Western States Petroleum Assoc*. (2001).
[27] Id., at 9-10.

I. Findings
15. Non-Storm Water and Storm Water Discharges
The discharge of pollutants from the MS4 is subject to the MEP standard notwithstanding whether the pollutants are transported by stormwater or non-stormwater. ~~Non-storm water discharges from the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard of CWA section 402(p)(3)(B)(iii), which is explicitly for "Municipal … Stormwater Discharges (emphasis added)" from the MS4s.~~ Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s,namely identified illicit discharges and pollutants from unlawful dumping, must be effectively prohibited.

II. Provisions
A. Prohibitions and Limitations
The purpose of this provision is to describe the conditions under which storm water from and non-storm water discharges into ~~and from~~ the MS4s are effectively prohibited or limited.

E. Jurisdictional Runoff Management Programs [Intro]
The purpose of this provision is for each Copermittee to implement a program to control non-stormwater ~~the~~ discharges ~~contribution of pollutants~~ into and ~~the~~ stormwater discharges from the MS4 within its jurisdiction and to focus and prioritize those implementation actions based on the highest water quality priorities identified within the associated Water Quality Improvement Plan……

E. Jurisdictional Runoff Management Programs
1. Legal Authority Establishment and Enforcement
a.(1) Effectively prohibit and eliminate all illicit discharges and illicit connections into its MS4;
a.(2) Control the contribution of pollutants in discharges of runoff associated with industrial and construction activity into its MS4 and control the quality of runoff from industrial and construction sites

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E. Jurisdictional Runoff Management Programs
2. Illicit Discharge Detection and Elimination
a. Non-stormwater Discharges
(3) Discharges of non-storm water into the MS4 from the following categories must be controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means, where there is evidence that those discharges are a source of pollutants to waters of the state. Discharges of non-storm water into the MS4 from the following categories not controlled by the…..

E. Jurisdictional Runoff Management Programs
2. Illicit Discharge Detection and Elimination
b. Prevent and Detect Illicit Discharges and Connections
(3) Each Copermittee must promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges into or from the MS4, including the following methods for public reporting

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E. Jurisdictional Runoff Management Programs
2. Illicit Discharge Detection and Elimination
e. Investigate and Eliminate Illicit Discharges and Connections
(1) Each Copermittee must prioritize and determine when follow-up investigations will be performed in response to visual observations and/or water quality monitoring data collected during an investigation of a detected non-storm water or illicit discharge into or from the MS4

E. Jurisdictional Runoff Management Programs
2. Illicit Discharge Detection and Elimination
e. Investigate and Eliminate Illicit Discharges and Connections
(2)(c) Each Copermittee must investigate and seek to identify the source(s) of ~~discharges of non-stormwater where flows are~~ illicit discharges or illicit connections observed into and from the MS4 during the…

E. Jurisdictional Runoff Management Programs
2. Illicit Discharge Detection and Elimination
e. Investigate and Eliminate Illicit Discharges and Connections
(3)(e) If the Copermittee is unable to identify and document the source of a recurring ~~non-stormwater discharge~~ illicit discharges or connections into or from the MS4, then the….

E. Jurisdictional Runoff Management Programs
5. Existing Development Management
c. Existing Development Inspections
(1)(ii) The frequency of inspections must be appropriate to confirm that BMPs are being implemented to reduce the discharge of pollutants in storm water from the MS4 to the MEP and effectively prohibit non-storm water discharges into the MS4;

9. Finding 28 (Page 9 of 120) – The Requirements in the Tentative Order Are More Stringent Than Federal Law, Requiring An Economic Analysis. In Addition, the Current Economic Analysis Is Insufficient

Finding 28 states that pollutant restrictions are not more stringent than federal law, yet an economic analysis is still conducted pursuant to CWC 13241. Despite the finding that the Tentative Order does not exceed federal law requirements, there are a number of requirements that are more stringent.

However, when you evaluate the economic analysis presented in the Fact Sheet[1] the Regional Water Board staff did not, in fact, fully consider the 13241 factors when they make the finding that the "requirements in this Order are reasonably necessary to protect beneficial uses." There has not been a full consideration of the section 13241 factors, which would include an analysis of the economic impacts that would result from compliance with the existing stormwater permit compared to the costs of complying with the proposed stormwater permit (thereby the costs of complying with the new requirements). Instead, the Order's analysis begins by stating, and without any quantification, that it would more expensive to not fully implement programs. Section 13241 is not satisfied by this inverse analysis.

Additionally, the Tentative Order states that Copermittees have a significant amount of flexibility to choose how to implement BMPs and that "least expensive measures" can be chosen.[28] This

[28] F-17.

statement, however, conflicts with the Order's definition of MEP at C-6 which expressly acknowledges Chief Counsel's 1993 MEP memo that only the Regional and State Boards determine whether BMPs meet MEP, and that selection of the least expensive BMPs will likely not result in meeting the MEP standard.

The Fact Sheet also fails to cite any recent cost benefit numbers but relies on inapplicable cost data such as a 1999 EPA study on household costs.

The analysis of costs contained in the Fact Sheet is deficient in two additional ways. First, the approach to compliance costs is fundamentally deficient because it tells the public nothing at all about the relationship between the cost of any particular control and the pollution control benefits to be achieved by implementing that control. Under this "generalized" approach, extremely costly requirements that bear little or even no relationship (or even a negative relationship) to the pollution control benefits to be achieved could be "justified" as long as the "overall" program costs are within what the Regional Board deems to be an acceptable range. This is not a proper way to determine whether a control reduces the discharge of pollutants from the MS4 to the MEP. A more individualized assessment of cost is required. Otherwise, dischargers may be required to implement very costly controls that have no relationship to pollution control benefits, a result inconsistent with MEP.

This analytical flaw in the Fact Sheet is compounded by the approach taken to assess the benefits of the Tentative Order. Here again, the assessment approach misses the mark because it tells the public nothing about the pollution control benefits to be achieved by implementation of the controls in the Tentative Order. All the Fact Sheet says, in essence, is that people like clean water and in theory may be willing to pay for it, that urban storm water may contribute to beach closures and that such beach closures have an economic impact. This analysis sheds no light on the relationship between a BMP's costs and the pollution control benefits to be achieved by implementing that BMP.

Second, the Fact Sheet contains faulty assumptions and relies upon outdated or inapplicable data. The California State University, Sacramento (CSUS) Cost Survey assessed program costs for Phase I cities. Nothing in the Fact Sheet links any of the actual conditions of the Phase I permits of the Phase I cities studied by CSUS with any of the requirements of the Tentative Order. Therefore, the study tells the public nothing about the costs to implement the Tentative Order. The data included in the Fact Sheet is also from seven years to more than a decade old. In short, the Fact Sheet uses old data from Phase I programs that have no linkage to any conditions of the Tentative Order. The full costs of implementing the entire program required by the Tentative Order in 2013 dollars must be assessed.

Lastly, stormwater agencies cannot readily establish or raise fees to help pay for the BMPs necessary to comply with either the California Toxics Rule (CTR) criteria or proposed Site Specific Objectives (SSOs) due to the requirements of Proposition 218, Proposition 26 and the Mitigation Fee Act. For instance, Proposition 218 requires that property-related fees be put to a vote, so cities cannot assess fees without the consent of a majority (two-thirds) of the property owners. Therefore, the costs associated with the implementation and maintenance of the BMPs are more likely to be covered through the stormwater agency General Funds.

The County recommends the following language changes:

I. Findings

28. Economic Considerations
As noted in the following finding, the San Diego Water Board finds that the requirements in this permit are ~~not~~ more stringent than the minimum federal requirements. Therefore, a CWC section 13241 analysis is ~~not~~ required for permit requirements that implement the effective prohibition on the discharge of non-storm water into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determined appropriate to control such pollutants, as those requirements are mandated by federal law. ~~Not withstanding the above, the San Diego Water Board has developed an economic analysis of the requirements in this Order.~~ The economic analysis is provided in the Fact Sheet.

10. Finding 29 (Page 9 of 120) – The Regional Board has no Legal Ability to Determine Whether a Particular Mandate is Unfunded

The Tentative Order finds that none of the requirements therein constitute an unfunded local mandate. This finding, however, should be stricken as the Regional Board has no legal ability to determine whether a particular mandate is unfunded. The Commission on State Mandates is the only State agency that has the jurisdiction and ability to make that determination.

The Fact Sheet's discussion of unfunded state mandates is not consistent with applicable legal authority or the Tentative Order, as discussed below.

Article XIII B, Section 6(a) of the California Constitution ("Section 6") provides that whenever "any state agency mandates a new program or higher level of service on any local government, the state shall provide a subvention of funds to reimburse that local government for the costs of the program or increased level of service . . . ." Section 6 applies to storm water permits issued by the State Board and the Regional Boards.[29] Thus, Section 6 applies to the Tentative Order.

Section 6 was added to the California Constitution by voter approval in 1979, as part of a larger effort that had as its goal both limiting state and local spending and restricting the ability of local entities to raise revenue. Section 6 must be viewed as a "safety valve" designed to protect local governments from being placed in the untenable position of being required by the state, on the one hand, to implement certain state mandated programs while also, on the other hand, being prohibited from raising the money needed to pay for those state mandated programs.[30] Recognizing that such a situation was neither a fair nor a wise approach to governing, the voters enacted Section 6 to prevent state government from shifting financial responsibility for carrying out governmental functions to local agencies without the state paying for them.

[29] *County of Los Angeles v. Commission on State Mandates* (2007) 150 Cal.App.4th 898, 920.
[30] *Department of Finance v. Commission on State Mandates* (2003) 30 Cal.4th 727, 735; *County of San Diego v. State of California* (1997) 15 Cal.4th 68, 81.

To implement Section 6, the Legislature created the Commission on State Mandates ("Commission"). The Commission has sole and exclusive jurisdiction to determine whether a state law or order of a state agency is an unfunded state mandate.[31] In accordance with Section 6, Government Code section 17500 et seq., and case law, the Commission on State Mandates has determined that an unfunded state mandate exists when: (a) the state imposes a new program or higher level of service that is; (b) mandated by state law, not federal law; and (c) when the local government lacks adequate fee authority to pay for the new program or higher level of service.

Whether and how individual storm water permit conditions constitute unfunded state mandates is currently the subject of pending litigation. In 2009 and 2010, the Commission on State Mandates determined that parts of the Los Angeles Phase I Permit and major components of the San Diego Phase I Permit constituted unfunded state mandates. The State challenged these two decisions in court, and, in the San Diego matter, the court confirmed that only the Commission on State Mandates could make the ultimate determination of whether a permit condition constituted an unfunded state mandate. Specifically, the court in the San Diego case held that the "Commission has exclusive authority to determine whether the Regional Board has imposed a state mandate." The court in the San Diego case further concluded that the Commission on State Mandates should reconsider its decision to assess whether each of the individual permit conditions were required to achieve the MEP standard. Specifically, the court held that "the Commission must determine whether any of the permit conditions exceed the 'maximum extent practicable' standard." (Emphasis added.) Therefore, contrary to the discussion in the Fact Sheet, each permit condition (control) must be assessed to determine whether it is consistent with MEP.

The San Diego Copermittees have appealed the trial court's decision that the Commission on State Mandates revisit its decision. Regardless of the outcome of that appeal, however, the Commission on State Mandates is the entity that must determine whether a condition in the Tentative Order constitutes an unfunded state mandate.

I. Findings
~~*29. Unfunded Mandates*~~
~~*This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following:*~~

a. ~~*This Order implements federally mandated requirements under CWA section 402 (33 USC section 1342(p)(3)(B)).*~~

b. ~~*The local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental and new dischargers who are issued NPDES permits for storm water and non-storm water discharges.*~~

c. ~~*The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order.*~~

d. ~~*The Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section*~~

[31] Government Code §§ 17551 and 17552; *Kinlaw v. State of California* (1991) 54 Cal.3d 326, 331-334.

~~*301(a) (33 USC section 1311(a)) and in lieu of numeric restrictions on their MS4 discharges (i.e. effluent limitations).*~~

e. ~~*The local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under State law predates the enactment of Article XIIIB, Section (6) of the California Constitution.*~~

f. ~~*The provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state develops a TMDL, federal law requires that permits must contain water quality based effluent limitations consistent with the assumptions and requirements of any applicable wasteload allocation (40 CFR 122.44(d)(1)(vii)(B)).*~~

~~*See the Fact Sheet for further discussion of unfunded mandates.*~~

PERMIT PROVISIONS

General

11. The Tentative Order Includes Language That Provides An Overly Broad Interpretation Of The Stormwater Regulations By Requiring MS4s To "Enhance" and/or "Restore" Beneficial Uses Or Habitat

The Tentative Order recognizes that the overarching objective of the CWA is "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters" and that, in order to carry out this objective, the CWA utilizes a number permitting programs and regulatory tools to regulate the discharge of pollutants and other materials to Waters of the United States (Waters of the U.S.).

However, CWA Section 402(p), that section which governs that permitting for municipal and industrial stormwater discharges, is only one regulatory tool within the CWA. Moreover, it requires the MS4s to focus on the quality and impact of their non-stormwater and stormwater discharges, not on the active enhancement and/or restoration of beneficial uses or habitat.

While the Fact Sheet recognizes that the development and implementation of a WQIP will identify the highest priority water quality conditions and that "addressing these threats and/or adverse impacts should restore the physical, chemical, and biological integrity of receiving waters, and result in the restoration and protection of the beneficial uses of the receiving waters in the Watershed Management Area",[32] the Tentative Order should not explicitly require the enhancement or restoration of beneficial uses as the CWA only requires that the Copermittees protect beneficial uses and prevent nuisance.[33]

[32] Fact Sheet, Page F-45
[33] 40 CFR 131.12()(1); CWC 13263(a) and 13050.

This is important from a prioritization and resource allocation perspective because while the Copermittees must control the discharge of pollutants in order to, ultimately, protect the beneficial uses of the receiving waters, they are not required to actively "enhance" or "restore" the beneficial uses and habitat of the receiving waters. It must be recognized that the actions and resources necessary to "protect" the beneficial uses may, in fact, be different than those that would be required to "enhance" or "restore" the beneficial uses of a particular receiving water.

The County recommends the following language changes:

B. Water Quality Improvement Plans
The purpose of this provision is to develop Water Quality Improvement Plans that guide the Copermittees' jurisdictional runoff management programs towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plans is to address the impacts of MS4 discharges so that such discharges do not impair ~~protect, preserve, enhance, and restore the~~ water quality and designated beneficial uses of waters of the state…….

B. Water Quality Improvement Plans
2. Priority Water Quality Conditions
e. Numeric Goals and Schedules
(1) Final numeric goals must be based on measureable criteria or indicators, to be achieved in the receiving waters and/or MS4 discharges for the highest priority water quality conditions which will be capable of demonstrating the ~~achievement of the restoration and/or~~ protection of water quality standards in receiving waters;

B. Water Quality Improvement Plans
3. Water Quality Improvement Strategies and Schedules
The Copermittees must develop specific water quality improvement strategies to address the highest priority water quality conditions identified within a Watershed Management Area. The water quality improvement strategies must address the highest priority water quality conditions by preventing or eliminating non-storm water discharges to and from the MS4, reducing pollutants in storm water discharges from the MS4 to the MEP, and ~~restoring and/or~~ protecting the water quality standards of receiving waters.

D. Monitoring and Assessment Program Requirements
4. Assessment Requirements
a. Receiving Waters Assessment
(2)(b) Identify the most critical beneficial uses that must be protected ~~or restored~~ to ensure overall health of the receiving water;
(2)(c) Determine whether or not those critical beneficial uses are being protected ~~and where those beneficial used must be restored~~;

D. Monitoring and Assessment Program Requirements
4. Assessment Requirements
d. Integrated Assessment of Water Quality Improvement Plan
(1)(d) Identify beneficial uses of the receiving waters that are protected ~~or must be restored~~ in accordance with Provision D.4.a;

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(1)(e) Evaluate the progress toward achieving the interim and final numeric goals for ~~restoring impacted~~ protecting beneficial uses in the receiving waters.
(2)(b) Identify the non-storm water and storm water pollutant load reductions, or other improvements to receiving water or water quality conditions, that are necessary to attain the interim and final numeric goals for ~~restoring impacted~~ protecting beneficial uses in the receiving waters;
(2)(d) Evaluate the progress of the water quality improvement strategies toward achieving the interim and final numeric goals for ~~restoring impacted~~ protecting beneficial uses in the receiving waters.

E. Jurisdictional Runoff Management Program
5. Existing Development Management
e. Strategies to Address the Highest Priority Water Quality Conditions
(3)(b) Candidates for stream, channel, and/or habitat rehabilitation projects may be utilized to address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters, rehabilitate channelized or hydromodified streams, restore wetland and riparian habitat, restore watershed functions, and/or ~~restore~~ protect beneficial uses of receiving waters;

E. Jurisdictional Runoff Management Program
7. Public Education and Participation
b. Public Participation
(3) Opportunities for members of the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or ~~restoration and~~ protection of the quality of receiving waters.

F. Reporting
3. Progress Reporting
c. Regional Monitoring and Assessment Report
(1)(a) The beneficial uses of the receiving waters within the San Diego Region that are protected ~~or must be restored~~;
(1)(b) The progress toward protecting the ~~restoring~~ impacted beneficial uses in the receiving waters within the San Diego Region; and

12. The Tentative Order Includes Language That Provides An Overly Broad Use Of The Term "Prohibit"

Although some changes were made in the Tentative Order language, the Tentative Order should be reviewed for the correct use of the terminology "effectively prohibit" since it appears that there are a couple of cases where this language was not modified.

The term "prohibit" is broader than the CWA requirements, and should be changed to "effectively prohibit." CWA section 402(p) (3) (B) (ii) reads as follows:

> (B) Municipal Discharge – Permits for discharges from municipal storm sewers –
> (ii) shall include a requirement to effectively prohibit non-stormwater discharges into the storm sewer; (Emphasis added)

The Tentative Order shall "effectively prohibit non-stormwater discharges" but may exempt certain discharges that are not significant sources of pollutants from the prohibition. The section does not require a full prohibition but rather an effective prohibition. The operative word is "effective", which recognizes the constraints of owning and operating a stormwater drainage system, which includes hundreds of miles of open channel. The finding/provision should note that non-stormwater discharges are effectively prohibited.[34]

In addition, discharges that are not significant sources of pollutants are exempted from the prohibition. In a practical sense, the use of word "effective" also provides flexibility to assess the impacts of relatively benign discharges such as air condition condensate, individual car washing, and non-emergency fire-fighting flows or non-anthropogenic sources before instituting a prohibition.

The County recommends the following language changes:

Finding 12. Pollutants in Runoff
....By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not effectively prohibit or otherwise control…..

A. Prohibitions and Limitations
The purpose of this provision is to describe the conditions under which storm water from and non-storm water discharges into ~~and from~~ the MS4s are effectively prohibited or limited. The goal of the prohibitions and limitations……

D. Monitoring and Assessment Program Requirements
4. Assessment Requirements
b. MS4 Outfall Discharges Assessments
(1)(a) Each Copermittee must assess and report the progress of its illicit discharge detection and elimination program, required to be implemented pursuant to Provision E.2, toward ~~reducing and~~ effectively prohibiting non-storm water and illicit discharges into the MS4 within its jurisdiction as follows:

E. Jurisdictional Runoff Management Programs
1. Legal authority Establishment and Enforcement
(1) Effectively ~~P~~prohibit and eliminate all illicit discharges and illicit connections into its MS4

COVER PAGE – PERMIT ENROLLMENT

13. Cover Page (Page 1 of 120) – The Tentative Order Should Recognize That The Enrollment Of The Orange County and/or Riverside County Copermittees Must Necessitate Changes To The Order Based On The Report Of Waste Discharge Submittals

The Tentative Order does not account for Orange County's current Fourth Term permit as there is no process for a ROWD prior to initial adoption of the permit by the Regional Board, and thus

[34] Per 402(p)(3)(B)(ii)

there is no technical basis by which to adopt many of the permit terms that apply to Orange County. Instead, the Tentative Order states that the Orange County Copermittees will submit a ROWD and will become subject to the waste discharge requirements set forth within the Tentative Order:

1) After the expiration of their current Permits (Order No. R9-2009-0002 and Order No. R9-2010-0016, respectively); or
2) At a date earlier than the expiration of their current Permits subject to the conditions described in Provision F.6 of the Tentative Order.

Although the cover page of the Tentative Order states "After the San Diego Water Board receives and considers the Orange County Copermittees' Report of Waste Discharge and makes any necessary changes to the Order….", Provision F.6 and Provision H, do not similarly recognize that changes to the Order must be made prior to the enrollment of the Orange County and/or Riverside County Copermittees.

In addition, the Findings and Fact Sheet would need to consider the thorough program analysis that the Copermittees conduct as a part of their preparation of the ROWD and the deficiencies and program modifications that Copermittees themselves identify as necessary for the program.

The County recommends the following language changes:

F. Reporting
6. Application for Early Coverage
a. The Orange County Copermittees, collectively, or Riverside County Copermittees, collectively, may apply for early coverage under this Order by submitting a Report of Waste Discharge Form 200, with a written request for early coverage under this Order <u>and identification of the necessary changes to this Order, if any, that the Copermittees are recommending based on the ROWD submittal</u>.

b. The San Diego Water Board will review the application for early coverage <u>and will make any necessary changes to this Order</u>. A notification of coverage under this Order will be issued to the Copermittees in the respective county by the San Diego Water Board upon completion of the early coverage application requirements <u>and consideration of any necessary changes to this Order</u>. The effective coverage…..

<u>c. The timelines specified within this Order will be initiated based on the effective coverage date (as specified within the notification of coverage)</u>.

H. Modification of Programs
<u>5. The San Diego Water Board will review any applications received for early coverage under this Order (Provision F.6) as well as any general applications received for coverage under this Order and will consider any necessary changes to this Order based on the newly-obtained information and/or reports received as a part of the application process. Within the applications for coverage under this Order, the Copermittees shall identify the changes that are proposed to this Order.</u>

PROVISION A – PROHIBITIONS AND LIMITATIONS

14. Provision A (Entire Provision; Begins Page 13 of 120) – A Clear Linkage Between The Compliance Provisions And Prohibitions, Receiving Water Limitations, And Effluent Limitations Must Be Established

The proposed Prohibitions and Limitations provisions may be construed as standalone provisions that could expose the Copermittees to state and federal enforcement actions, as well as to third party actions under the federal Clean Water Act's citizen suit provisions. Consistent with the recent 9th Circuit Court of Appeal decision, each provision of the permit could be read separately, so if Provision A.2.a states that "the MS4 must not cause or contribute to the violation of a water quality standard" then that is the stand-alone provision, and the accompanying language found in A.4 (Compliance with Discharge Prohibitions) regarding compliance may be considered irrelevant. As such, a clear linkage between the compliance provisions and the prohibitions, receiving water limitations, and effluent limitations must be established. This was the subject of a State Water Resources Control Board workshop on November 20, 2012; however the State Board did not make any determinations or provide further direction after a day of testimony.

In addition, compliance with Provisions A.1, A.2 and A.3 should be linked to Provision A.4, Provision B, and Attachment E so that it is clear that the compliance mechanism for A.4 is the WQIP (Provision B) and/or the TMDL (Attachment E), as applicable.

The County recommends the following language changes:

A. Prohibitions and Limitations (Introduction)
[at the end of the introductory paragraph insert this sentence]
The process for determining compliance with the Discharge Prohibitions (A.1), Receiving Water Limitations (A.2), and Effluent Limitations (A.3, including effluent limitations derived from the TMDL requirements – Attachment E) is defined in Provision A.4.

1. Discharge Prohibitions
a. Except as provided for in Provisions A.1.e or A.4, ~~D~~discharges from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the state are prohibited.

2. Receiving Water Limitations
a. Discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters, including but not limited to all applicable provisions contained in the list below to the extent that they remain in effect and are operative, unless such discharges are being addressed by the Copermittee(s) through the processes set forth in this Order (Provision A.4 and Attachment E). Where a TMDL has been developed and its terms have been incorporated into this Order (in a manner that is consistent with the waste load allocations set forth in the TMDL), a Permittee shall also be considered in compliance with such TMDL-related requirements provided in this Order, if it is timely and in good faith implementing the MEP-compliant control measures otherwise established by this Order.

15. Provision A (Entire Provision; Begins Page 13 of 120) – The Discharge Prohibitions Must Establish A Linkage With The Approved Compliance Schedules For TMDLs That Have Been Incorporated Into The Basin Plan

The Discharge Prohibitions do not establish a sufficient linkage with approved compliance schedules for TMDLs that have been incorporated into the Basin Plan. TMDLs adopted within the region include a schedule to provide MS4 Copermittees the time necessary to develop and implement a plan to achieve water quality standards in impaired waters. The compliance schedules for adopted TMDLs have been incorporated into Attachment E and language is recommended in the Receiving Water Limitations provisions (A.2.c.) and the Effluent Limitations provisions (A.3.b.) pointing to the TMDL compliance schedules.

The Receiving Water Limitations language in the Tentative Order conflicts with TMDL compliance schedules. Language should be included to clarify that in instances where a TMDL is in effect, the Copermittees shall achieve compliance with these provisions as outlined in Attachment E (Specific provisions for TMDLs). Without this change, the Receiving Water Limitations language puts Copermittees in immediate and ongoing non-compliance with the permit, as opposed to incorporating TMDL implementation schedules.

In addition, the footnote to A.2.a.(4)(b) requires Copermittees to not cause or contribute to the more stringent of a water quality objective or a CTR criterion. Instances may exist where it has been determined that one or the other is more appropriate given site specific conditions or analysis (i.e., a TMDL has been established).

The County recommends the following language changes:

1. Discharge Prohibitions
e. For discharges associated with water body pollutant combinations addressed in a TMDL in Attachment E of this Order, the affected Copermittees shall achieve compliance as outlined in Attachment E.

2. Receiving Water Limitations
a. Discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters, including but not limited to all applicable provisions contained in the list below to the extent that they remain in effect and are operative, unless such discharges are being addressed by the Copermittee(s) through the processes set forth in this Order (Provision A.4 and Attachment E). Where a TMDL has been developed and its terms have been incorporated into this Order (in a manner that is consistent with the waste load allocations set forth in the TMDL), a Permittee shall also be considered in compliance with such TMDL-related requirements provided in this Order, if it is timely and in good faith implementing the MEP-compliant control measures otherwise established by this Order.

2. Receiving Water Limitations
c. For receiving water limitations associated with water body pollutant combination addressed in a TMDL in Attachment E of this Order, the affected Copermittees shall achieve compliance as outlined in Attachment E.

Footnote #4 to Provision A.2.a.(4)(b)

[1] If a water quality objective and a CTR criterion are in effect for the same priority pollutant, the more stringent of the two applies, unless a previous regulatory action (i.e., TMDL) has specified otherwise.

16. Provision A (Entire Provision; Begins Page 13 of 120) – The Receiving Water Limitations Language Is Discretionary And Should Be Revised To Provide A Clear Compliance Mechanism

The Copermittees envision WQIPs as the foundation for a BMP-based compliance approach for the Discharge Prohibitions and Receiving Water Limitations language. However, the language in the Provision A.4 describes the WQIPs as a document trail rather than a compliance mechanism. In essence, the language suggests that Copermittees shall expend significant resources to develop and implement WQIPs, but taking the actions in the WQIPs has no effect on the Regional Board's compliance determination.

The Receiving Water Limitations language should be revised to expressly state that if exceedances of a water quality objective, water quality standard or any effluent limitation persist, or a discharge prohibition stated as an effluent limitation is not complied with, notwithstanding implementation of control measures, BMPs or compliance with the other water quality control program requirements of the Order, the Copermittee shall take actions to further reduce its discharges of such pollutants over time by complying with the iterative process, and that diligent implementation of the iterative process (i.e., WQIP) constitutes compliance to MEP.

The iterative process is a fundamental aspect of MS4 programs, as envisioned by State Water Board Order 99-05 and later reconfirmed in Order WQ 2001-15 (BIA Order), and is the mechanism by which MS4 Copermittees should demonstrate compliance. The WQIPs now provide a mechanism to provide the detail and quantitative analyses used to identify pollutant sources and implement BMPs to address those sources.

Language in Provision A.4 should be consistent with the California Stormwater Quality Association (CASQA) proposed receiving water limitation language (see **Attachment B**).

(See the recommended language changes in Provision A.4 of the Attachment B, Tentative Order redline)

PROVISION B – WATER QUALITY IMPROVEMENT PLANS

17. Provision B (Entire Provision; Begins Page 17 of 120) – The Water Quality Improvement Plans Should Be The Foundation For A BMP-Based Compliance Approach [35]

The County strongly supports the Watershed approach as described in the Tentative Order and Fact Sheet, with modifications as discussed below and in Provision E. A watershed-based approach is ideal for the implementation of stormwater programs in the San Diego Region as it allows for the integration of all program elements, focuses efforts on the highest priorities for each watershed through the customization of actions and strategies, and allows for streamlined reporting. This approach also supports the implementation of TMDLs, which are developed and implemented at the watershed scale.

Although the language for the WQIP recognizes the need for the consideration of provisions A.1, A.2, and A.3 as a part of the assessments and identification of water quality priorities, consistent with the intent described in the Fact Sheet, the language within the Tentative Order should explicitly identify that compliance with those provisions is achieved through the development and implementation of the WQIPs and or TMDLs (Attachment E).

In particular, the Fact Sheet states[36]:

> **Provision B includes requirements for the Copermittees to develop and implement Water Quality Improvement Plans to ultimately comply with the prohibitions and limitations under Provision A**. The Water Quality Improvement Plans will provide the Copermittees a comprehensive program that can achieve the requirements of the CWA.

[35] Orange County notes that in the recently adopted LA MS4 permit a Reasonable Assurance Analysis (RAA) is required in order for a Copermittee to receive approval of a Watershed Management Program (essentially the same concept as the WQIP) and then utilize the Watershed Management Program as a method of compliance with Receiving Water Limitation provision requirements. Orange County believes that the WQIP process described in the Tentative Order, subject to the County's comments herein, is robust and does not necessitate the addition of a RAA. The WQIPs will provide enforceable, objective, and measurable requirements for the Copermittees, without having to implement an RAA.

To the extent that future proceedings on the Tentative Order contemplate a RAA requirement, Orange County strongly disagrees with such an approach. RAA would impose unnecessary and costly modeling requirements on the Copermittees. Orange County is not covered by TMDLs to the extent that Los Angeles and other counties are, where such models have already been developed and where such modeling efforts have previously been conducted for many pollutant-waterbody combinations. RAA is essentially a "TMDL-lite" process that would shift regulatory obligations from the Regional Board to the Copermittees. Although the Copermittees may choose to work with the Regional Board, as deemed appropriate and necessary in the future, to develop TMDLs collaboratively, the Copermittees object to the obligation to fully assume the Regional Board's regulatory responsibilities. Federal law is clear as to how a TMDL should be established, and RAA would "backdoor" the TMDL process into the WQIP approach without the Regional Board going through the necessary steps to formulate a TMDL. This would be a violation of federal law. There is also no federal or state authority by which a RAA could be required by the Regional Board. Even assuming such authority, a RAA is unnecessary and goes beyond MEP.

[36] Fact Sheet, Page F-42

> Implementation of the Water Quality Improvement Plans will also improve the quality of the receiving waters in the San Diego Region…..
>
> The Water Quality Improvement Plan also incorporates a program to monitor and assess the progress of the Copermittees' jurisdictional runoff management programs toward improving the quality of discharges from the MS4s, as well as tracking improvements to the quality of receiving waters. **A process to adapt and improve the effectiveness of the Water Quality Improvement Plans has also been incorporated into the requirements of Provision B to be consistent with the "iterative approach" required to achieve compliance with discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a, pursuant to the requirements of Provision A.4.**
>
> [Emphasis added]

In other words, the Water Quality Improvement Plan framework, as outlined within the Tentative Order, is established as the compliance mechanism for Provision A.4. In fact, this would complement the existing language in Provision A.4, which states (as modified below):

> Each Copermittee must achieve compliance with Provisions A.1, A.2, and A.3 of this Order through timely implementation of control measures and other actions as specified in Provisions B and E of this Order, including any modifications. The Water Quality Improvement Plans required under Provision B must be designed and adapted to ultimately achieve compliance with Provisions A.1, A2, and A.3.

In addition, the WQIP should identify the high priority water quality issues and conditions and provide direction for the development and implementation of the JRMPs. The goals for the WQIPs should be clearly identified and directly linked to the JURMPs (and the corresponding flexibility provided within the development of the JURMPs) (See also Provision E).

Lastly, although Regional Water Board staff have indicated that the WQIPs, once developed and approved, will functionally replace the CLRPs and BLRPs, the Tentative Order does not formally recognize this. The County recommends that a footnote be added to clarify that this is the case.

The County recommends the following language changes:

B. Water Quality Improvement Plans[1]
The purpose of this provision is to develop Water Quality Improvement Plans that guide the Copermittees' jurisdictional runoff management programs towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plans is to address the impacts of MS4 discharges so that such discharges do not impair ~~protect, preserve, enhance, and restore~~ the water quality and designated beneficial uses of waters of the state. Therefore, implementation of the WQIPs also provides the basis for complying with Provisions II.A.1, II.A.2, and II.A.3, as described in Provision II.A.4. This goal will be accomplished through an adaptive planning and management process that identifies the highest priority water quality conditions within a watershed and implements strategies through the jurisdictional runoff management programs to achieve improvements in the quality of discharges from the MS4s and receiving waters. As such, the requirements outlined in Provision

E may be modified for consistency with the WQIP priorities for the applicable Watershed Management Area, if appropriate justification is provided.

[1] – Once developed and approved, the Water Quality Improvement Plan and corresponding Jurisdictional Runoff Management Plan will functionally replace the Load Reduction Plans.

18. Provision B (Entire Provision; Begins Page 17 of 120) – The WQIP Numeric Goals Are Used To Support The WQIP Implementation And Measure Progress, They Are Not Enforceable Compliance Standards

Similar to the footnotes in Provisions C.1.a and C.2.a, Provision B.2.e should explicitly state that the action levels, interim goals and final goals are not enforceable limitations.

The County recommends the following language changes:

B. Water Quality Improvement Plans
2. Priority Water Quality Conditions
e. Numeric Goals
The Copermittees must develop and incorporate action levels, interim and final numeric goals and schedules into the Water Quality Improvement Plan. Numeric goals must be used to support Water Quality Improvement Plan implementation and measure progress towards addressing the highest priority water quality conditions identified under B.2.c. Actions levels and numeric goals, themselves, are not enforceable compliance standards, effluent limitations, or receiving water limitations. When establishing numeric goals…..

19. Provision B.2 (Page 19 of 120) – The Schedule For The Achievement Of The Final WQIP Numeric Goals Should Be Based On The Results Of The Assessment Conducted As A Part Of The Development Of The WQIP Priority Water Quality Conditions

Provision B.2.e.(3)(e) states that the "final dates for achieving the final numeric goals must not initially extend more than 10 years beyond the effective date of this Order, unless a longer period of time is authorized by the San Diego Water Board Executive Officer or the schedule includes an applicable TMDL…."

In addition, the Fact Sheet notes that this provision is consistent with 40 CFR 122.47(a)(1), which states:

> (1) Time for compliance. Any schedules of compliance under this section shall require compliance as soon as possible, but not later than the applicable statutory deadline under the CWA.

The Fact Sheet provision citing 122.47 is inapplicable, however, and this provision should be deleted, as there are no federal or state statutory deadlines for achieving WQIP final numeric goals. Provision B.2.e(3)(e) expressly states that the Copermittees must develop and incorporate schedules for numeric goals into the WQIP, and compliance schedules for such goals are determined by the Copermittees with certain approvals by the Regional Board or the Executive Officer.

Furthermore, the requirement that the final dates for achieving the final numeric targets must not extend more than 10 years unless authorized by the Executive Officer is one of the most disconcerting requirements in the Tentative Order for several reasons:

- There is no factual or technical basis or other evidence for why a 10 year time period is the timeframe for all of the listed numeric goal, and therefore 10 year is arbitrary;
- Although the assessments that will be conducted pursuant to Provision E.2 will be thorough, they will not take the place of the type(s) of assessments that should be conducted when developing a TMDL and establishing waste load allocations and the timeframes necessary for achieving the allocations;
- Many TMDLs that are developed have longer timeframes than 10 years. There are many implementation schedules that extend out 15 or 20 years depending upon the constituent, sources, and potential compliance options available to the responsible parties.

Instead of a 'one size fits all' timeline of 10 years, the final date for achieving the final goals should be determined by the Copermittees during the development of the WQIP, which undergoes a thorough public review process. It should also be recognized that this date may need to be modified based on additional data and information that is received during the implementation of the WQIP.

Based on conversations with Regional Board staff, it is understood that goals can take a number of forms and the "10 year" requirement is not intended as a requirement to attain all Basin Plan water quality standards within 10 years. However, to ensure this requirement does not cause confusion and is not mis-interpreted by third parties, language should be added to clarify this.

The County recommends the following language changes:

B. Water Quality Improvement Plans
2. Priority Water Quality Conditions
e. Numeric Goals
~~(3)(e) Final dates for achieving the final numeric goals must not initially extend more than 10 years beyond the effective date of this Order, unless a longer period of time is authorized by the San Diego Water Board Executive Officer or the schedule includes an applicable TMDL in Attachment E to this Order.~~

(4) The schedules for achieving the interim and final goals will be evaluated with each annual report [F.3.b.(1)(d)] and/or as a part of the ROWD development [B.5.a] to determine if they should be modified.

PROVISION C – ACTION LEVELS

20. Provision C (Entire Provision; Begins Page 28 of 120) – The Tentative Order Should Clarify The Use Of The Action Levels Within The WQIP And IDDE Program and the Copermittees Should Develop The NALs/SALs Based On The Priorities Of The WQIP and/or the IDDE Program

Although the modifications in this provision have improved from the Administrative Draft, there are a number of outstanding issues related to the proposed language that need to be addressed in order for the Action Levels to be effective and assist with the overall management and assessment of the Stormwater Program. These issues include:

- The differentiation for the Non-stormwater Action Levels (NALs) between the WQIP and Illicit Discharge Detection and Elimination (IDDE) program element; and
- The Copermittees should be allowed to develop or use previously established NALs/Stormwater Action Levels (SALs) instead of the values identified within this provision.

These outstanding issues are discussed in additional detail below.

A. The Tentative Order Needs to Differentiate and Provide a Clear Linkage Between Provisions B and C and Provisions E.2 and C.

Provision C.1 indicates that the NALs will be incorporated into the WQIPs and used to:

a) Support the development and prioritization of water quality improvement strategies for addressing non-stormwater discharges to and from the MS4s;

b) Assess the effectiveness of the water quality improvement strategies toward addressing MS4 non-storm water discharges; and

c) Support the detection and elimination of non-stormwater and illicit discharges to and from the MS4.

Similarly, Provision C.2 indicates that the SALs will be incorporated into the WQIPs and used to:

a) Support the development and prioritization of water quality improvement strategies for reducing pollutants in stormwater discharges from the MS4s;

b) Assess the effectiveness of the water quality improvement strategies toward reducing pollutants in stormwater discharges….

Although the NALs and SALs have these stated objectives, the Tentative Order must provide a clearer linkage and differentiate between

- Provision B (WQIPs) and Provision C (Action Levels) and
- Provision E.2 (Illicit Discharge Detection and Elimination Program [IDDE]) and Provision C.

Examples of what clarification is necessary include the following:

- Provision B does not include any mention of the NALs or SALs even though they are supposed to be incorporated into the WQIPs.
- It should be recognized that the WQIP should guide the customization of the NALs/SALs to meet the highest water quality priorities in a given watershed and that NALs/SALs will be used to assist Copermittees in reaching the goals specified in the WQIP.
- The NALs and SALs developed and incorporated into the WQIP should address the high priority water quality conditions identified. (see comment below)

B. The Copermittees Need to Have the Flexibility to Develop or Use Previously Established Action Levels

Although the Tentative Order states that the Copermittees are to develop and incorporate numeric non-stormwater and numeric stormwater action levels into the Water Quality Improvement Plans (C.1 and C.2, respectively), the Tentative Order then contradicts this approach and mandates that the Copermittees include all of the numeric actions levels as

identified in tables C-1, C-2, C-3, C-4 and C-5.

The mandated action levels are problematic for the following reasons:

1) The NALs for the WQIPs will likely include different constituents and/or values than those values that would be used for the IDDE program.
2) The NALs and SALs will likely include different constituents and/or values between WQIPs depending upon the identified high priority water quality conditions.
3) The NALs set for the IDDE program should not be based on water quality objectives at the 'end of pipe'. Instead, these values should be based on upset values.
4) In Provision B.2.d the Copermittees are required to develop and use interim and final numeric targets/goals to measure progress towards the protection/enhancement of the receiving waters and beneficial uses. The choice of the target/goals of the watershed may be biological, chemical, or physical based and may include multiple criteria and/or indicators. If the mandated values have to be used as action levels within the WQIP, they may not correspond to the highest priority water quality conditions or the metrics that are being used to measure progress. Thus, the chemically based NALs/SALs may direct resources away from the watershed priorities.

As a part of the IDDE program, the County had developed and implemented an innovative Dry Weather Reconnaissance Program, based upon statistically derived benchmarks to identify illegal discharges and illicit connections during the typically dry summer months of May through September using a suite of water quality analyses conducted in the field at designated random and targeted drains. The 2010-11 reporting period marked the ninth season of dry weather monitoring in the San Diego Region. Monitoring in the San Diego Region under the Dry Weather Reconnaissance Program was replaced in August 2011 with the NALs Monitoring Program (pursuant to Order No. R9-2009-0002).

After the implementation of the NAL-based program for a year, some clear differences between the previously established Dry Weather Reconnaissance Program and the NAL-based program have been evident (see the table below).

- Of the 236 site visits conducted in the Dry Weather Reconnaissance Program, there were 77 exceedances that required follow up actions;
- For the Dry Weather Reconnaissance Program, this represented 32% of the discharges samples being prioritized for follow up actions and/or investigations;
- Of the 68 site visits conducted in the NAL program, there were 167 exceedances that required follow up actions (almost 2 x the number of site visits); and
- For the NAL program, there was limited ability to prioritize discharges for follow up since some of the constituents exceeded the NALs 33-91% of the time.

Comparison of NAL Program and Previous Dry Weather Reconnaissance Program

	NAL Exceedances 2011 - 12		DW Reconn Pgm Action Level* Exceedances May-Sep 2010	
Constituent	**Number**	**%**	**Number**	**%**
pH	1	1.5	12	5.1
MBAS	1	1.5	2	0.8
Turbidity	5	11	3	1.3
Dissolved Oxygen	1	1.5	2	0.8
Fecal Coliform	19	42	0	0
Enterococcus	41	91	1	0.4
Total P / Ortho PO4	37	82	6	2.5
Total N / Nitrate	41	91	22	9.3
Nickel	6	13	18	7.6
Cadmium	15	33	11	4.7
Total # of Site Visits	**68**		**236**	

The conclusions from the implementation of the Orange County NAL-based program to date are:

- The NAL program replaced an previously existing and effective program;
- The NAL program has required increased resources and has resulted in everything being a priority;
- There have been many exceedances that have been due to non-IDDE factors such as local geology (especially for nickel and cadmium);
- It has been very difficult to determine the endpoints, the sources, of the various non-stormwater discharges since the discharges are so co-mingled; and
- There is a strong need for a regionally-based prioritization so that there is not a mis-direction of limited resources

The Regional Water Board would be well served to review the results of the Orange County NAL-based program to date and consider the revisions as proposed in order to assist with the prioritization of resources and water quality issues. The Tentative Order should establish the purpose(s) of the action levels and then allow the Copermittees to develop the numeric action levels. The mandated NALs and SALs should only be considered “default” values if the Copermittees do not develop their own NALs/SALs or use previously established values. Previously developed action levels should serve as interim action levels until the WQIPs are completed.

The County recommends the following language changes:

B. Water Quality Improvement Plans
2. Priority Water Quality Conditions
e. Numeric Goals and Schedules
The Copermittees must develop and incorporate action levels, interim and final numeric goals[37] and schedules into the Water Quality Improvement Plan. Numeric goals must be used to support Water Quality Improvement Plan implementation and measure progress towards addressing the highest priority water quality conditions identified under Provision B.2.c. Action levels and numeric goals, themselves, are not enforceable compliance standards, effluent limitations, or receiving water limitations. When establishing numeric goals and corresponding schedules, the Copermittees must consider the following:

C. Action Levels
The purpose of this provision is for the Copermittees to incorporate numeric non-stormwater action levels (NALs) and stormwater action levels (SALs) in the Water Quality Improvement Plans (WQIP) and numeric non-stormwater action levels (NALs) in the Illicit Discharge Detection and Elimination (IDDE) Program.

- *For the purposes of the WQIPs, ~~Water Quality Improvement Plan~~ the goal of the action levels is to guide the implementation efforts and measure progress towards the protection of the high priority water quality conditions and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through monitoring and assessing the quality of the MS4 discharges during the implementation of the Water Quality Improvement Plans.*

- *For the purposes of the IDDE program, the goal of the action levels is to assist in the effective prohibition of non-stormwater discharges into the MS4.*

Action levels will be developed and incorporated into the WQIP (Provision B) and the IDDE Program (Provision E). Depending upon the goals/objectives for the use of the action levels and the priority receiving water conditions, the constituents and values at which they are set may differ between watersheds. Copermittees may develop Watershed Management Area specific numeric action levels for non-stormwater and stormwater MS4 discharges using an approach approved by the Regional Board or use the default non-stormwater and stormwater action levels prescribed in C.1 and C.2 below.

The Copermittees will submit the action levels as a part of the WQIP and JURMP submittals. The action levels currently established will serve as the interim action levels until revised action levels are completed and approved. Exceedances of the action levels are not subject to enforcement or non-compliance actions under this Order.

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[37] Interim and final numeric goals may take a variety of forms such as TMDL established WQBELs, action levels, pollutant concentration, load reductions, number of impaired water bodies delisted from the List of Water Quality Impaired Segments, Index of Biotic Integrity (IBI) scores, or other appropriate metrics. Interim and final numeric goals are not necessarily limited to one criterion or indicator, but may include multiple criteria and/or indicators. Except for TMDL established WQBELs, interim and final numeric goals and corresponding schedules may be revised through the adaptive management process under Provision B.5.

1. *Default Non-Storm Water Action Levels*[38]

~~*The Copermittees must develop and incorporate numeric non-storm water action levels (NALs) into the Water Quality Improvement Plan to: 1) support the development and prioritization of water quality improvement strategies for addressing non-storm water discharges to and from the MS4s, 2) assess the effectiveness of the water quality improvement strategies toward addressing MS4 non-storm water discharges, required pursuant to Provision D.4.b.(1), and 3) support the detection and elimination of non-storm water and illicit discharges to and from the MS4, required pursuant to Provision E.2.*~~[39]*The following non-stormwater action levels (NALs) must be incorporated in the WQIPs and IDDE program if the Copermittees have not developed their own NALs for the identified high priority constituents using an approach approved by the Regional Board EO.*

~~C.1.c For the NALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary NALs specific to the Watershed Management Area at levels greater than the NALs required by Provisions C.1.a and C.1.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for addressing non-storm water discharges to and from the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and from the MS4. The secondary NALs may be developed using an approach acceptable to the San Diego Water Board.~~

2. *Default Storm Water Action Levels*[40]

The Copermittees must develop and incorporate numeric storm water action levels (SALs) in the Water Quality Improvement Plans to: 1) support the development and prioritization of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s, and 2) assess the effectiveness of the water quality improvement strategies toward reducing pollutants in storm water discharges, required pursuant to Provision D.4.b.(2)[41]*.*

The following stormwater action levels (SALs) must be incorporated in the WQIPs if the Copermittees have not developed their own SALs for the identified high priority constituents using an approach approved by the Regional Board EO.

~~*C.2.c For the SALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary SALs specific to the Watershed Management Area at levels greater than the SALs required by Provisions C.2.a and C.2.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s. The secondary SALs may be developed based on the approaches recommended by the State Water Board's Storm Water Panel*[42] *or using an approach acceptable to the San Diego Water Board.*~~

[38] NALs are not considered by the San Diego Water Board to be enforceable limitations.

[40] SALs are not considered by the Regional Water Board to be enforceable limitations.

[41] The Copermittees may utilize SALs or other benchmarks currently established by the Copermittees as interim SALs until the WQIPs are accepted by the San Diego Water Board Executive Officer.

PROVISION D – MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS

21. Provision D (Entire Provision; Begins Page 33 of 120) – The Prescribed Receiving Water Program Does Not Incorporate A Question Driven Approach Nor Does The Tentative Order Recognize That The Phase I Municipal NPDES Copermittees Are Not The Sole Dischargers To Receiving Water

Provision D.1.f provides for alternative watershed monitoring requirements that may be fulfilled in addition to or in lieu of the receiving water monitoring program detailed in Provision D.1.b to D.1.d

The Tentative Order contains a modified approach to receiving waters monitoring that has not been implemented in previous Tentative Orders. While this approach provides a welcomed opportunity for the Copermittees to shift their resources towards assessing MS4 contributions, the conceptual basis of the receiving waters programs needs additional consideration. The prescribed receiving water program does not appear to be a question driven approach nor does the Tentative Order recognize that the Phase I municipal NPDES Copermittees are not the sole dischargers to receiving waters and that the contributions from many other regulated and unregulated entities contribute to the overall receiving water conditions.

The Tentative Order should establish an integrated and collaborative receiving water program that is consistent with watershed management area priorities in lieu of individual and uncoordinated efforts. The Regional Board should:

1. Establish a water-body oriented monitoring and assessment workgroup for each Watershed Management Area as outlined in the staff report titled "A Framework for Monitoring and Assessment in the San Diego Region" that establishes a question-driven monitoring program;
2. Establish language that provides an opportunity for all regulated discharges to create pooled resources so that monitoring efforts are singularly focused on receiving waters during both dry and wet weather conditions; and
3. Establish language that provides for an alternate compliance option for the Monitoring and Reporting program in lieu of the prescribed receiving waters monitoring program as previously adopted in R9-2009-0002 that lead to the development of the Orange County Regional Shoreline Monitoring Program.

The County recommends the following changes

D. Monitoring and Assessment Program Requirements
1. Receiving Water Monitoring Requirements
f. Alternate Watershed Monitoring Requirements

The San Diego Water Board may direct the Copermittees to participate in an effort to develop alternative watershed monitoring with other regulated entities, other interested parties, and the San Diego Water Board to refine, coordinate, and implement regional monitoring and assessment programs to determine the status and trends of water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams.

<u>In lieu of the Receiving Water Monitoring Program requirements specified in 1.a to 1.d, the Copermittees may participate in the development and implementation of monitoring for the</u>

collaborative receiving waters monitoring program. It is expected that a regional monitoring will allow for a more effective and efficient receiving waters monitoring program. The regional monitoring plan must be submitted to the Executive Officer for review and approval. Documentation of participation and monitoring shall be included in the annual report.

22. Provision D (Entire Provision; Begins Page 33 of 120) – The Prescribed MS4 Outfall Discharge Monitoring Needs Additional Refinement In Order To Support The Development Of Effective Water Quality Improvement Plans

A. Transitional Wet Weather MS4 Outfall Discharge Monitoring Program

In order to fulfill the jurisdictional and land use requirements for the monitoring and assessment provisions of the Tentative Order, the coordination of the wet weather MS4 program should be scheduled to start at a later date. The rescheduling of the commencement of wet weather MS4 monitoring will provide adequate time to complete the required geo-location and land use analysis of the major MS4 drainage areas.

The County recommends the following changes

2. MS4 Outfall Discharge Monitoring
a. Transitional MS4 Outfall Discharge Monitoring
(3) Transitional Wet Weather MS4 Outfall Discharge Monitoring
(b) Transitional Wet Weather MS4 Outfall Discharge Monitoring Frequency

Each wet weather MS4 outfall discharge monitoring station selected pursuant to Provision D.2.a.(3)(a) must be monitored twice during the wet season (October 1 – April 30). One wet weather monitoring event must be conducted during the first wet weather event of the wet season, and one wet weather monitoring event at least a month after the first wet weather event of the wet season.

Transitional wet weather MS4 outfall discharge monitoring may begin in year 2 of the transitional period once the MS4 outfall discharge monitoring stations have been inventoried and evaluated pursuant to Provision D.2.a.(1)

B. Transitional MS4 Outfall Discharge Analytical Monitoring

The Copermittees need the flexibility to retain consistent monitoring methods between permit cycles in order to maintain the long term trend baselines.

The County recommends the following changes

2. MS4 Outfall Discharge Monitoring
a. Transitional MS4 Outfall Discharge Monitoring
(3) Transitional Wet Weather MS4 Outfall Discharge Monitoring
(e) Transitional Wet Weather MS4 Outfall Discharge Analytical Monitoring

(iv) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

[a] Time-weighted composites collected over the length of the storm event or the first 24 hour period, whichever is shorter, composed of ~~24~~ discrete ~~hourly~~ samples, which may be collected through the use of automated equipment, or
[b] Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or
[c] If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours;

Additionally in Provision D:

2. MS4 Outfall Discharge Monitoring
c. Wet Weather MS4 Outfall Discharge Monitoring
(5) Wet Weather MS4 Outfall Discharge Analytical Monitoring
(d) composite sample requirements

(i) *Time-weighted composites collected over the length of the storm event or the first 24 hour period, whichever is shorter, composed of discrete samples, which may be collected through the use of automated equipment ~~Time weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment~~, or,*
(ii) Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or
(iii) If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours.

***23.* Provision D (Entire Provision; Begins Page 33 of 120) – The Copermittees Need To Have The Flexibility To Develop Or Use Analytical Monitoring Requirements In The Water Quality Improvement Plans Based On Assessments Of Current Sources That May Contribute To The Section 303(d) Water Body Impairments**

The Regional Board should recognize the inherent difficulties associated with monitoring 303(d) constituents such as the legacy pesticides or the monitoring of aquatic toxicity. Many existing developments were never subjected to the application of legacy pesticides such as DDT and, as such, these constituents are highly unlikely to be found in modern communities. The Regional Board should also recognize that laboratory toxicity tests provide a cumulative perspective of pollutant effects that may or may not be sampled as part of a monitoring program.

The Copermittees should be relieved of analytical monitoring requirements if supporting information can be provided to document the current pollutant concentrations or may provide historic information to support the absence of usage of these constituents in the MS4 drainage area. Additionally, the Copermittees should be allowed to develop an alternate approach for monitoring that allows the Copermittees to evaluate and identify the cause of toxicity currently affecting receiving waters and to iteratively adapt the monitoring program to address these chemical stressors in their MS4 outfall discharges through the WQIPs.

The County recommends the following changes

2. MS4 Outfall Discharge Monitoring
a. Transitional MS4 Outfall Discharge Monitoring
(3) Transitional Wet Weather MS4 Outfall Discharge Monitoring
(e) Transitional Wet Weather MS4 Outfall Discharge Analytical Monitoring
(iv) *The samples must be analyzed for the following constituents:*

[a] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List with the exception of toxicity[1]
[b] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and
[c] Constituents listed in in Table D-7.
[e] The Copermittee may be relieved of analytical monitoring requirements [a] to [c] if supporting information can be provided or has historical data that can demonstrate or provide justification that the analysis of the constituent is not necessary.

Footnote to [a]
[1]Copermittees may provide an alternate approach to evaluate and identify the cause of toxicity currently affecting receiving waters and to iteratively adapt the monitoring program to address these chemical stressors in their MS4 outfall discharges in the monitoring plan which is subject to Regional Board approval.

Additionally in Provision D

2. MS4 Outfall Discharge Monitoring
b. Dry Weather MS4 Outfall Discharge Monitoring
(2) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring
(e) Non-Storm Water Persistent Flow MS4 Outfall Discharge Analytical Monitoring
(iii) Collect grab or composite samples to be analyzed for the following constituents:

[a] Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,
[b] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List with the exception of toxicity[1],
[c] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,
[d] Applicable NAL constituents, and
[e] Constituents listed in Table D-8, unless the Copermittee has historical data that can demonstrate or provide justification that the analysis of the constituent is not necessary.
[f] The Copermittee may be relieved of analytical monitoring requirements if supporting information can be provided or has historical data that can demonstrate or provide justification that the analysis of the constituent is not necessary.

Footnote to [b]

[1]Copermittees may provide an alternate approach to evaluate and identify the cause of toxicity currently affecting receiving waters and to iteratively adapt the monitoring program to address these chemical stressors in their MS4 outfall discharges in the monitoring plan which is subject to Regional Board approval.

Additionally in Provision D

2. MS4 Outfall Discharge Monitoring
c. Wet Weather MS4 Outfall Discharge Monitoring
(5) Wet Weather MS4 Outfall Discharge Analytical Monitoring

(f) *Analysis for the following constituents is required:*

(i) *Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,*

(ii) *Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List, with the exception of toxicity[1],*

(iii) *Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and*

(iv) *Applicable SAL constituents.*

(v) *The Copermittee may be relieved of analytical monitoring requirements if supporting information can be provided or has historical data that can demonstrate or provide justification that the analysis of the constituent is not necessary.*

Footnote to [ii]
[1]Copermittees may provide an alternate approach to evaluate and identify the cause of toxicity currently affecting receiving waters and to iteratively adapt the monitoring program to address these chemical stressors in their MS4 outfall discharges in the monitoring plan which is subject to Regional Board approval

Additionally in Provision D

Footnotes Table D-3.
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. E. Coli may be substituted for Total ~~Fecal~~ Coliform at inland receiving water monitoring stations.

Footnotes Table D-7.
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. E. Coli may be substituted for Total ~~Fecal~~ Coliform for discharges to inland surface waters.

Footnotes Table D-8.
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. E. Coli may be substituted for Total ~~Fecal~~ Coliform for discharges to inland surface waters

PROVISION E – JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS

24. Provision E (Entire Provision; Begins Page 64 of 120) – The JRMP Provisions Must Be Modified So As Not To Negate The Very Intent And Purpose Of The Watershed Approach And The Focus On The Highest Priorities Within Each Watershed Management Area

The Tentative Order states that the purpose of the WQIPs is to guide the Copermittees' jurisdictional runoff management programs towards achieving improved water quality by identifying the highest priority water quality conditions within a watershed and implementing strategies through the jurisdictional runoff management programs (Provision B).

Provision E goes on to state that the jurisdictional runoff management programs will be implemented in accordance with the strategies identified in the WQIPs. In addition, the Fact Sheet states:

> "Where the Water Quality Improvement Plan is the '*comprehensive planning process'* on a Watershed Management Area scale, requiring '*intergovernmental coordination'*, the jurisdictional runoff management program document is the '*comprehensive planning process'* on a jurisdictional scale that should be coordinated with the other Copermittees in the Watershed Management Area to achieve the goals of the Water Quality Improvement Plan."[43]

The Fact Sheet also supports this when it states:

> "Based on the economic considerations below, the San Diego Water Board has provided the Copermittees a significant amount of flexibility to choose how to implement the requirements of the Order. This Order also allows the Copermittees to customize their plans, programs, and monitoring requirements. In the end, it is up to the Copermittees to determine the effective BMPs and measures necessary to comply with this Order. The Copermittees can choose to implement the least expensive measures that are effective in meeting the requirements of this Order."[44]

Although the Fact Sheet states that "Implementation of the components of each Copermittee's jurisdictional runoff management program must be consistent with the water quality improvement strategies identified within the Water Quality Improvement Plan,"[45] the Tentative Order then requires the Copermittees to incorporate <u>all</u> of the requirements identified within Provision E regardless of the high priority water quality conditions that have been identified within the WQIP. If the Copermittees are required to implement <u>all</u> of the requirements in Provision E instead of prioritizing and implementing those requirements that directly address the highest priority water quality conditions and support the watershed strategies, then the program becomes additive instead of prioritized and focused. The net result is that the approach in Provision E negates the prioritized and strategic approach outlined in Provision B.

The Tentative Order should provide a clear linkage between Provision B and Provision E and state that the WQIP should guide the customization of the JRMP to meet the highest water quality priorities and strategies in a given watershed.

[43] Fact Sheet, Page F-71
[44] Fact Sheet, Page F-17
[45] Fact Sheet, Page F-71

(See also the corresponding comments under Provision E.2, E.3. E.4, E.5, and E.7)
The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs [Intro]
The purpose of this provision is for each Copermittee to implement a program to control non-stormwater ~~the~~ discharges ~~contribution of pollutants~~ into and ~~the~~ stormwater discharges from the MS4 within its jurisdiction and to focus and prioritize those implementation actions based on the highest water quality priorities identified within the associated Water Quality Improvement Plan. The goal of the jurisdictional runoff management programs is to implement strategies and actions that effectively prohibit non-storm water discharges into the MS4 and reduce the discharge of pollutants in storm water to the MEP. This goal will be accomplished through implementing the jurisdictional runoff management programs in accordance with the water quality priorities and strategies identified in the Water Quality Improvement Plans.

Each Copermittee must update its jurisdictional runoff management program document, in accordance with Provision F.2.a, to incorporate ~~all~~ the requirements of Provision E consistent with the highest water quality priorities as identified in the corresponding Water Quality Improvement Plan. Until the Copermittee has updated its jurisdictional runoff management program document with the requirements of Provision E, the Copermittee must continue implementing its current jurisdictional runoff management program.

Similarly, the County recommends the following language changes be incorporated into each of the program elements within Provision E as identified below:
The requirements of the jurisdictional runoff management programs as outlined below may be modified and prioritized as appropriate for consistency with the highest water quality priorities as identified in the corresponding Water Quality improvement Plan.

LEGAL AUTHORITY

25. Provision E.1 (Page 64 of 120) – The Copermittees Are Only Responsible For Administering and Enforcing the Codes and Ordinances Applicable To Their Jurisdictions

Provision E.1.a(2) requires the Copermittees to establish the legal authority to control the contribution of pollutants in discharges of runoff associated with industrial and construction activity within their jurisdictions. Since the Copermittees can only administer and enforce their local codes and ordinances, it is unnecessary and confusing to include the language regarding the Statewide Industrial and Construction General Permits. The sites subject to the Statewide Permits (which are administered and enforced by the State and Regional Boards) are already inspected by state staff and are included within the Copermittee inventories, inspection, and enforcement programs.

In addition, language that acknowledges that the local codes and ordinances will include the legal authorities identified within the Tentative Order to the extent permitted by the Constitution should be included.

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
1. Legal Authority Establishment and Enforcement

a.(2) – Control the contribution of pollutants in discharges of runoff associated with industrial and construction activity into its MS4 and control the quality of runoff from industrial and construction sites[1] ~~including industrial and construction sites which have coverage under the statewide General Permit for Discharges of Storm Water Associated with Industrial Activities (Industrial General Permit) or General Permit for Discharges of Storm Water Associated with Construction Activities (Construction General Permit), as well as to those sites which do not~~

[1] - The Copermittees will only be responsible for administering and enforcing the codes and ordinances applicable to their jurisdictions (i.e.; a municipality is not responsible for administering and/or enforcing a permit issued by the State of California).

E. Jurisdictional Runoff Management Programs
1. Legal Authority Establishment and Enforcement
a.(10) Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with its statutes, ordinances, permits, contracts, orders, or similar means and with the requirements of this Order, including the effective prohibition of illicit discharges and connections to its MS4. The Copermittee's ordinance must include adequate legal authority, to the extent permitted by California and Federal Law and subject to the limitations on municipal action under the constitutions of California and the United States. The Copermittee must also have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from industrial facilities, including construction sites, discharging into its MS4.

26. Provision E (Entire Provision; Begins Page 64 of 120) – The Requirement For Third Party BMP Effectiveness Documentation Is Duplicative

The Tentative Order includes a provision that requires the Copermittees to demonstrate that they have the legal authority to require documentation on the effectiveness of BMPs. The County has concerns about this provision for the following reasons:

As it is currently written, this provision broadly applies to any aspect of the stormwater program where BMPs have been implemented – the result is that this provision sets up a process for the establishment of multiple third party monitoring programs and expenditure of a significant amount of funds to monitor the effectiveness of BMPs. If the desire is to document the effectiveness of certain types of BMPs, it would be much more effective and scientifically sound to establish special studies by entities qualified to conduct such sampling instead of requiring potentially hundreds of third parties to conduct a monitoring program for every BMP that is implemented.

This provision is redundant with other requirements in the Tentative Order in that it ignores the fact that the New Development/Significant Redevelopment section of the Drainage Area Management Plan (DAMP) (Section 7.0) establishes a process for the selection, design, and long-term maintenance of permanent BMPs for new development and significant redevelopment projects and requires developers to select BMPs that have been demonstrated as effective for their project category. By going through a thorough process, the Copermittees have determined what BMPs would be effective for a particular project – thus eliminating the need to establish a monitoring program for every BMP implemented.

This provision ignores the fact that the Copermittees have already established legal authority for their development standards so that project proponents have to incorporate and implement the required BMPs.

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
1. Legal Authority Establishment and Enforcement
~~a.(8) Require documentation on the effectiveness of BMPs implemented to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;~~

ILLICIT DISCHARGE DETECTION AND ELIMINATION

27. Provision E.2 (Page 65 of 120) – The Illicit Discharge Detection And Elimination Program Provisions Must Be Modified So As Not To Negate The Very Intent And Purpose Of The Watershed Approach And The Focus On The Highest Priorities Within Each Watershed Management Area

(See the corresponding comments under Provision E – Jurisdictional Runoff Management Programs)

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
2. Illicit Discharge Detection and Elimination [Intro]
….The illicit discharge detection and elimination program must be implemented in accordance with the strategies identified in the Water Quality Improvement Plan ~~and include, at a minimum, the following requirements.~~ The requirements of the jurisdictional runoff management programs as outlined below may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality improvement Plan(s).

Move Provision 2e, "Strategies to Address the Highest Priority Water Quality Conditions" to just after the Introduction to the section. This should become the new Provision 2.a.

E. Jurisdictional Runoff Management Programs
2. Illicit Discharge Detection and Elimination
a. Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the illicit discharge detection and elimination program to address ~~non-stormwater and~~ illicit discharges and connections that the Copermittee has identified as potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) *Provide specific details about how the strategies and/or activities will be implemented (e.g. designate ~~additional~~ BMPs, focus education, and/or increase/decrease frequency of inspections in specific areas); and*

(2) *The strategies and/or activities must be consistent with the requirements of Provisions E.2.a-d and the strategies identified in the Water Quality Improvement Plan.*

28. Provision E.2 (Page 65 of 120) – The Copermittees Should Be Allowed The Flexibility To Prioritize Their IDDE Program To Focus On Those Non-Stormwater Discharges That Are Likely To Be A Source Of Pollutants

Provision E.2.a identifies several categories of discharges that are to be considered "non-stormwater discharges." The categories that are considered to be non-stormwater discharges (do not need to be addressed as an illicit discharge) generally include the following:

- E.2.a.(1) - Those discharges which have coverage under a separate NPDES Permit;
- E.2.a.(2) - Those discharges which have coverage under a separate NPDES Permit
- E.2.a.(3) - Those discharges which are recognized within the federal regulations as acceptable unless they are identified as a source of pollutants to the receiving waters;
- E.2.a.(4) - Those discharges that are addressed by a set of requirements/BMPs; and
- E.2.a.(5) - Firefighting related discharges that are addressed by a set of requirements/BMPs.

In comparison, the Code of Federal Regulations [40CFR122.26(d)(2)(iv)(B)(1)] states that, as a part of an illicit discharge program, that the Copermittees shall incorporate a series of items including the following:

> A description of a program, including inspections, to implement and enforce an ordinance, orders or similar means to prevent illicit discharges to the municipal separate storm sewer system; this program description shall address all types of illicit discharges, <u>however the following category of non-storm water discharges or flows shall be addressed where such discharges are identified by the municipality as sources of pollutants to waters of the United States</u>: [Emphasis added and items re-ordered based on Tentative Order (TO) structure]
>
> - landscape irrigation, [not included in TO]
> - irrigation water, [not included in TO]
> - lawn watering, [not included in TO]
> - street wash water [not included in TO]
> - *uncontaminated pumped ground water, [E.2.a.(1)]*
> - *foundation drains, [E.2.a.(3)]; [E.2.a.(1)]*
> - *water from crawl space pumps, [E.2.a.(1)]*
> - *footing drains, [E.2.a.(3)]; [E.2.a.(1)]*
> - water line flushing, [E.2.a.(2)]
> - diverted stream flows, [E.2.a.(3)]
> - rising ground waters, [E.2.a.(3)]
> - springs, [E.2.a.(3)]
> - uncontaminated ground water infiltration (as defined at 40 CFR 35.2005(20)) to separate storm sewers, [E.2.a.(3)]
> - flows from riparian habitats and wetlands, [E.2.a.(3)]
> - discharges from potable water sources, [E.2.a.(3)]
> - air conditioning condensation, [E.2.a.(4)]
> - individual residential car washing, [E.2.a.(4)]
> - dechlorinated swimming pool discharges, and [E.2.a.(4)]
>
> (program descriptions shall address discharges or flows from fire fighting [E.2.a.(5)] only where such discharges or flows are identified as significant sources of pollutants to waters of the United States);

Although the discharges listed within the Federal Regulations are generally considered to be "conditionally exempt" from the illicit discharge program (unless they are found to be sources of pollutants), the Regional Water Board has determined that the following categories of non-stormwater discharges

- uncontaminated pumped ground water, [E.2.a.(1)]
- foundation drains, [E.2.a.(3)]; [E.2.a.(1)]
- water from crawl space pumps, [E.2.a.(1)]
- footing drains, [E.2.a.(3)]; [E.2.a.(1)]

will be considered to be illicit discharges unless the discharge has coverage under the following two NPDES Permits:

1) NPDES Permit No. CAG919001 (Order No. R9-2007-0034)
General Waste Discharge Requirements for Discharges from Temporary Groundwater Extraction and Similar Waste Discharges to San Diego Bay, Tributaries Thereto Under Tidal Influence, and Storm Drains or Other Conveyance Systems and Tributary Thereto

- Groundwater Extraction defined as (I.A): Existing and proposed discharges of groundwater extraction waste to San Diego Bay from construction groundwater extraction, foundation groundwater extraction, and groundwater extraction related to groundwater remediation cleanup projects (collectively groundwater extraction):

  1. Result from similar operations (all involve extraction and discharge of groundwater);

  2. Are the same type of wastes (<u>all are groundwater containing or potentially containing petroleum hydrocarbons, solvents, or other pollutants</u>);

  3. Require similar effluent limitations for the protection of the beneficial uses of San Diego Bay;

  4. Require similar monitoring; <u>and</u>

  5. Are more appropriately regulated under a WDR rather than individual permits.

- Eligibility Criteria (I.C): This WDR is intended to cover <u>temporary discharges</u> of groundwater extraction wastes to San Diego Bay, and its tributaries under tidal influence, from groundwater extraction <u>due to construction and other groundwater extraction activities</u>.

2) NPDES Permit No. CAG919002 (Order No. R9-2008-002)
General Waste Discharge Requirements for Discharges from Groundwater Extraction and Similar Discharges to Surface Waters Within the San Diego Region Except for San Diego Bay

- Groundwater Extraction defined as (I.A): Existing and proposed discharges of groundwater extraction waste to surface waters within the San Diego Region from construction groundwater extraction, foundation groundwater extraction, and groundwater extraction related to groundwater remediation cleanup projects (collectively groundwater extraction):

  1. Result from similar operations (all involve extraction and discharge of groundwater);

  2. Are the same type of wastes (<u>all are groundwater containing or potentially containing petroleum hydrocarbons, solvents, or other pollutants</u>);

3. Require similar effluent limitations for the protection of the beneficial uses of San Diego Bay;

4. Require similar monitoring; and

5. Are more appropriately regulated under a general permit rather than individual permits.

- Eligibility Criteria (I.C): This WDR is intended to cover all discharges of groundwater extraction wastes to surface waters within the San Diego Region Except San Diego Bay from groundwater extraction due to construction and other groundwater extraction activities, regardless of volume.

However, the County would submit that it is unnecessary to move these discharges (uncontaminated pumped groundwater, foundation drains, water from crawl space pumps, and footing drains) from the E.2.a.(3) category to the E.2.a.(1) category and require them to obtain coverage under one of these two permits for the following reasons:

- There is no technical basis or demonstrated water quality concern that justifies the need for these discharges to obtain coverage under these permits;
- The two permits are clearly defined for groundwater extraction activities where there is groundwater containing or potentially containing petroleum hydrocarbons, solvents, or other pollutants (in fact, one of the categories of discharges required to obtain coverage is 'uncontaminated pumped groundwater');
- One of the permits is clearly defined for temporary discharges, not permanent discharges; and
- The categories of discharges are non-stormwater discharges that are generally not expected to be a source of pollutants to receiving waters.

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
2. Illicit Discharge Detection and Elimination
a. Each Copermittee must address ~~all~~ non-storm water discharges as illicit discharges, where the likelihood exists that they are a source of pollutants to the waters of the state, unless the ~~a non-storm water~~ discharge is either identified as a discharge authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to the following requirements:

Delete Provision 2.a.(1)

Add the following categories from Provision 2.a.(1) to the list of allowable non-stormwater discharges listed in Provision 2.a.(3):

- *Uncontaminated pumped ground water*
- *Discharges from foundation drains*
- *Water from crawl space pumps*
- *Water from footing drains*

E. Jurisdictional Runoff Management Programs
2. Illicit Discharge Detection and Elimination
a.(4) Discharges of non-storm water into the MS4 from the following categories must be controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means, where there is evidence that those discharges are a source of pollutants to waters of the state. Discharges of non-storm water into the MS4 from the following categories not controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means must be addressed by the Copermittee as illicit discharges.

29. Provision E.2.a (Page 65 of 120) – The Fire Fighting BMP Provisions Should Reflect The Language Included In The Current Orange County Permit

Provision E.2.a includes a requirement for the Copermittees to establish BMPs for both emergency and non-emergency firefighting activities. While the Copermittees already have established guidelines for non-emergency firefighting activities, it is unclear why the approach and language in the Tentative Order regarding the emergency firefighting activities has been modified from Order R9-2009-0002. In fact, the language in the Tentative Order is actually inconsistent with the Phase I Final Rule (55 FR 48037), which stated

"In the case of fire fighting it is not the intention of these rules to prohibit in any circumstances the protection of life and public and private property through the use of water or other fire retardants that flow into separate storm sewers." [Emphasis added]

Thus, as stated above, there should not be a circumstance in which the Copermittees or San Diego Water Board would identify emergency firefighting discharges as illicit discharges or a significant source of pollutants to receiving waters. The language previously adopted by the San Diego Regional Board in Order R9-2009-0002 regarding emergency firefighting discharges is recommended.

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
2. Illicit Discharge Detection and Elimination
a. Non-Storm Water Discharges
(5) Firefighting discharges to the MS4 must continue to be addressed by the Copermittees ~~as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a significant source of pollutants to receiving waters. Firefighting discharges to the MS4 not identified as a significant source of pollutants to receiving waters, must be addressed, at a minimum,~~ as follows:

(a) Non-emergency firefighting discharges

(i) *Building fire suppression system maintenance discharges (e.g. sprinkler line flushing) to the MS4 must be addressed as illicit discharges.*

(ii) *Non-emergency firefighting discharges (i.e., discharges from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems) must be addressed by a program, to be developed and implemented by the Copermittee, in conjunction with the local Fire Authority/District, to reduce or eliminate pollutants in such discharges from entering the MS4.*

(b) Emergency firefighting discharges (i.e., flows necessary for the protection of life or property) do not require BMPs and need not be prohibited.

~~*Each Copermittee should develop and encourage implementation of BMPs to reduce or eliminate pollutants in emergency firefighting discharges to the MS4s and receiving waters within its jurisdiction. During emergency situations, priority of efforts should be directed toward life, property, and the environment (in descending order). BMPs should not interfere with immediate emergency response operations or impact public health and safety.*~~

30. Provision E (Entire Provision; Begins Page 64 of 120) – The Tentative Order Should Not Require the Reduction Or Elimination Of All Non-Stormwater Discharges As A Part Of The IDDE Program

Provision E.2.a and E.2.a.(7) require the Copermittees to, as a part of their IDDE program, to address all non-stormwater discharges as illicit discharges, and thus Copermittees must "reduce or eliminate non-stormwater discharges" whether or not the discharges have been identified as illicit discharges.

The rationale within the Fact Sheet states that "Provision E.2.a.(7) is consistent with the requirements of the CWA section 402(p)(3)(B)(ii) and 40CFR 122.26(d)(1)(v)(B)." That, in fact, is not the case. Clean Water Act Section 402(p)(3)(B)(ii) states that the MS4 stormwater permits "shall include a requirement to effectively prohibit non-stormwater discharges into the storm sewers" (emphasis added). Federal regulations include two provisions designed to begin implementation of the "effective prohibition."[46] The first provision requires Copermittees to perform a screening analysis, intended to provide sufficient information to develop priorities for a program to detect and remove illicit discharges[47]. The second provision requires Copermittees to develop a recommended site-specific management plan to detect and remove illicit discharges (or ensure they are covered by an NPDES permit) and to control improper disposal to MS4s.[48] Therefore, Provision E.2.a and E.2.a(7) misapply federal regulations in that Copermittees are required to identify the non-stormwater discharge as an illicit discharge prior to having an obligation to effectively prohibit it. There is not a presumption to reduce or eliminate it otherwise.

> The Code of Federal Regulations 122.26(d)(1)(v)(B) states "A description of the existing program to identify illicit connections to the municipal storm sewer system. The description should include inspection procedures and methods for detecting and preventing illicit discharges, and describe areas where this program has been implemented."

The provision and rationale within the Fact Sheet blur the lines between the need of the Copermittees to "effectively" prohibit non-stormwater discharges and detect and eliminate illicit discharges.

- The requirement is "effectively prohibit" non-stormwater discharges, not "reduce or eliminate" non-stormwater discharges (this is already addressed in Provision A).
- Although the Copermittees are required to have a program to prevent illicit discharges to the MS4, non-stormwater discharges should only be addressed as illicit discharges

[46] 55 Fed. Reg. 47989, 48037 (Nov. 16, 1990).
[47] 40 CFR 122.26(d)(1)(iv)(D).
[48] 40 CFR 122.26(d)(1)(iv)(D) and 122.26(d)(2)(B).

where such discharges are identified as sources of pollutants that may cause or contribute to an exceedance of a water quality objective.

- The IDDE program is established to detect and eliminate "illicit discharges", not non-stormwater discharges in general.

In order to clarify the requirements the following modifications to Provision E.2, which expressly address the Illicit Discharge Detection and Elimination Program are requested.

The County recommends the following language changes:

A. Prohibitions and Limitations
1. Discharge Prohibitions
b. Non-storm water discharges into MS4s are to be effectively prohibited, unless such discharges are either authorized by a separate NPDES permit, or the discharge is a category of non-storm water discharges ~~or flows~~ that must be addressed pursuant to Provisions E.2.a.(1)-(5) of this Order.

E. Jurisdictional Runoff Management Programs
2. Illicit Discharge Detection and Elimination
b. Non-Stormwater Discharges
Each Copermittee must address ~~all~~ non-storm water discharges as illicit discharges, where the likelihood exists that they are a source of pollutants to the waters of the state, unless the ~~a non-stormwater~~ discharge is either identified as a discharge authorized by a separate NPDES permit, or identified as a category of non-storm water discharges ~~or flows~~ that must be addressed pursuant to the following requirements:

E. Jurisdictional Runoff Management Programs
2. Illicit Discharge Detection and Elimination
a. Non-Storm Water Discharges
~~(7) Each Copermittee must, where feasible, reduce or eliminate non-storm water discharges listed under Provisions E.2.a.(1)-(4) into its MS4 whether or not the non-storm water discharge has been identified as an illicit discharge, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit.~~

E. Jurisdictional Runoff Management Programs
2. Illicit Discharge Detection and Elimination
c. Field Screening
Each Copermittee must conduct field screening (i.e. visual observations, field testing, and/or analytical testing) of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect ~~non-stormwater and~~ illicit discharges and connections to the MS4 in accordance with the dry weather MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

E. Jurisdictional Runoff Management Programs
2. Illicit Discharge Detection and Elimination
d. Investigate and Eliminate Illicit Discharges and Connections
[Various – see the suggested changes in the redline of the Tentative Order]

DEVELOPMENT PLANNING

The Tentative Order's land development requirements are some of the most onerous requirements in the Tentative Order, and in many cases lack the necessary technical and legal foundation for adoption. Many of the land development requirements, particularly hydromodification controls, pose federal constitutional issues as well as conflict with the CWA, the State Administrative Procedure Act, California Environmental Quality Act (CEQA), the Mitigation Fee Act and federal court decisions such as the recent U.S. District Court case, *Virginia Dept. of Transportation v. EPA*[49] (holding that EPA has no authority to regulate non-pollutants).

The following discussion examines the overarching legal concerns with the land development requirements, and is followed by specific technical analyses for individual requirements.

A. Land Development Requirements Expose the Copermittees to Significant Litigation Risk And Will Be Largely Unenforceable

Many of the land development requirements, such as hydromodification, pose constitutional issues either exposing municipalities to litigation and/or will result in municipalities being unable and unwilling to implement such requirements. Specifically, but not limited to, Orange County is most concerned with the provisions: 1) requiring Copermittees to compel development projects that have no impact on hydromodification to implement on-site or alternative compliance hydromodification mitigation measures, 2) using pre-development (naturally occurring) runoff reference condition as applied to sites that are, in fact, developed, and 3) stream, channel, and habitat restoration.

Orange County is concerned that implementing these types of requirements would subject the Copermittees to liability under the takings clauses of the U.S. and California Constitutions and the Mitigation Fee Act because of the questionable nexus between a project's impacts on hydromodification and the hydromodification management measures in the Tentative Order. When imposing a condition on a development permit, a local government is required under federal and state constitutions to establish that the condition bears a reasonable relationship to the impacts of the project. This rule applies evenly to legislatively enacted requirements and impact fees or exactions.[50] Moreover, fees imposed on a discretionary ad-hoc basis are subject to heightened scrutiny under a two-part test. First, local governments must show that there is a substantial relationship between the burden created by the impact of development and any fee or exaction[51]. Second, a project's impacts must bear a rough proportionality to any development fee or exaction.[52] Under California law, the *Nollan/Dolan* heightened scrutiny test also applies to in-lieu fees.[53]

The Legislature has memorialized these requirements in the Mitigation Fee Act, which establishes procedures that local governments must follow to impose impact fees.[54] Irrespective of whether the hydromodification management requirements are implemented by

[49] Virginia Dept. of Transportation v. EPA, No. 1:12-CV-775, slip op. (E.D. Va. Jan. 3, 2013).
[50] *Building Ass'n Industry v. City of Patterson*, 171 Cal. App. 4th 886, 898 (2009).
[51] *Nollan v. Calif. Coastal Comm'n*, 483 U.S. 825, 837 (1987).
[52] *Dolan v. City of Tigard*, 512 U.S. 374, 391 (1994).
[53] *Ehrlich v. City of Culver City*, 12 Cal. 4th 854, 876 (1996).
[54] Gov't Code secs. 66000-66025.

legislative act or on an ad-hoc basis, the Copermittees attempt to enforce them as proposed in the Tentative Order will likely result in claims alleging unconstitutional takings of private property and violations of the Mitigation Fee Act. This is because a developer could argue that limiting hydromodification impacts of already developed property to its naturally occurring state, or requiring hydromodification mitigation measures for impacts not imposed by the project, would not have a legally sufficient nexus to the impact of the development project.

Additionally, CEQA does not allow a local government discretionary approval to require over-mitigation of a project. The CEQA Guidelines provide that "a lead agency for a project has the authority to require feasible changes in any or all activities involved in the project in order to substantially lessen or avoid significant effects on the environment, consistent with applicable constitutional requirements such as the 'nexus' and 'rough proportionality' standards established by case law."[55] Thus, Copermittees would most assuredly be exposed to CEQA challenges, which are the most prevalent lawsuits against projects.

In all likelihood, municipalities will not risk constitutional challenges and the high litigation costs of such challenges, but will instead exempt projects from certain requirements or limit their applicability based on documented technical and legal reasons. Such actions then would only be addressed through a Regional Board audit years after a project has been approved and developed. Therefore, predevelopment runoff reference conditions and stream, channel and habitat restoration requirements should be eliminated in their entirety.

B. Stream, Channel and Habitat Restoration Cannot Be Required Due to Conflicts with Federal and State Laws

The Tentative Order requires stream, channel and habitat restoration and/or retrofitting depending on certain land development projects. The prior analysis above discussed the litigation risk to which municipalities will be exposed. The following discussion focuses on the direct conflicts with federal and state laws that also prohibit such requirements.

The objective of the CWA is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters.[56] In carrying out this objective, Section 402(p) requires municipalities to reduce the discharge of pollutants from the MS4 to the MEP standard. The Tentative Order, however, goes well beyond the Congressional intent of the CWA to only address pollutants by requiring both Copermittees and the property owners to restore and/or retrofit streams, channels and habitat, with no technical evidence as to how this will reduce the discharge of pollutants to MEP or under what legal authority these requirements can be imposed.

Not only do such requirements go beyond MEP, but go beyond the scope of the CWA's focus on pollutant reduction. First, there is no evidence in the Order for how restoration requirements reduce pollutants from leaving the MS4. Second, in a recent decision in the Eastern District of Virginia, a federal court has held that the EPA has no authority under the Clean Water Act to regulate non-pollutants.[57] Restoration as described in the Tentative Order does not regulate pollutants directly, but requires costly over-mitigation by project proponents to do more than address pollutants by restoring streams, channels and habitat to a subjective, predevelopment

[55] Cal. Code Regs. Tit. 14, sec. 15041 (citing *Nollan/Dolan*).
[56] CWA 101(a).
[57] *Virginia Dept. of Transportation v. EPA*, No. 1:12-CV-775, slip op. (E.D. Va. Jan. 3, 2013).

standard. Essentially, the Tentative Order uses restoration as a surrogate for pollutants, and tries to unlawfully regulate the flow of water and not pollutants themselves.

Under state law, the Orange County Flood Control District has been delegated authority by the Legislature to construct lengthy networks of channels and infrastructure for flood control purposes. Under this authority, the Flood Control District has exclusive authority to control the flow of water in these channels. Although the State and Regional Boards may have some ability to impose conditions that impact volumetric flows (which is now called into question by the 4th District court case), this authority does not extend to NPDES permits.[58] Returning channels to natural conditions impinges on municipal flood control authority as removing concrete and performing other restoration efforts would alter the flow of water in those channels.

Engineered channels serve the public health and safety through flood control protection. A significant portion of Orange County lies in a flood plain whereby property owners are required to carry flood insurance. Concrete channels are used to better control the flow of water and minimize flooding and reduce insurance premiums. State courts have long recognized that residents living near flood control improvements have a right to rely on the current standards of a particular channel to protect against flooding.[59] Restoring a stream or channel to a natural state would not ensure against flooding as engineering is used to ensure that stormwater is controlled to certain patterns. Many developments are built up to flood control channels, and thus, restoration would expose residents to threats of flood, potential property damage and loss of life and expose municipalities to claims of inverse condemnation and other torts based on relied upon flood control protections by the public. Restoration in some cases would also require use of eminent domain authority, which the State cannot require municipalities to exercise.

31. Provision E.3 (Page 73 of 120) – The Development Planning Provisions Must Be Modified So As Not To Negate The Very Intent And Purpose Of The Watershed Approach And The Focus On The Highest Priorities Within Each Watershed Management Area

(See the corresponding comments under Provision E – Jurisdictional Runoff Management Programs)

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
3. Development Planning [Intro]
Each Copermittee must use their land use and planning authorities to implement a development planning program in accordance with the strategies identified in the Water Quality Improvement Plan ~~and include, at a minimum, the following requirements.~~ The requirements of the jurisdictional runoff management programs as outlined below may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality improvement Plan(s).

[58] *S.D. Warren Co. v. Me. Bd. of Envtl. Prot.*, 547 U.S. 370 (2006); *PUD No.1 v. Washington Dep't of Ecology*, 511 U.S. 700 (1994).
[59] *Arreola v. County of Monterey*, 99 Cal.App.4th 722 (2002).

Move Provision 3g, "Strategies to Address the Highest Priority Water Quality Conditions" to just after the Introduction to the section and before Provision 3.a.

(1) *Provide specific details about how the strategies and/or activities will be implemented (e.g. designate ~~additional~~ BMPs, focus education, increase frequency of verifications and/or inspections, alternative compliance options);*

32. Provision E.3 (Page 73 of 120) – Clarifying Language For Applying The PDP Requirements For A New Development Project Feature Is Confusing And Should Be Removed

In E.3.b.(1)(a) the Regional Board staff attempts to provide clarifying language which we believe actually makes for more confusion. The purpose of this provision is to state that Priority Development Projects are defined in E.3.b(2). In E.3.b(2) further clarification is provided regarding what is parts of a project are subject to the new development standards. The language provided in E.3.b(1)(a) starting with "where a new …. Requirement" does not add clarification and instead may be construed to be in conflict with E.3.b(2).

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
3. Development Planning
b. Priority Development Projects
(1) Definition of Priority Development Project
(a) All new development projects that fall under the Priority Development Project categories listed under Provision E.3.b.(2)~~. Where a new development project feature, such as a parking lot, falls into a Priority Development Project category, the entire project footprint is subject to Priority Development Project requirements~~; and

33. Provision E.3 (Page 73 of 120) – Portions Of Redevelopment Projects That Already Have Water Quality Treatment BMPs Should Not Be Subject To The New PDP Requirements

Some redevelopment projects already have portions of the project that were subject to previous permit PDP requirements. These portions of redevelopment that were subject to prior PDP requirements should not be subject to the new PDP requirements as these projects already have water quality treatment. Such an approach is consistent with the Los Angeles and Ventura MS4 permits.

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
3. Development Planning
b. Priority Development Projects
(1) Definition of Priority Development Project
(b) Those redevelopment projects that create, add, or replace at least 5,000 square feet of impervious surfaces on an already developed site, or the redevelopment project is a Priority Development Project category listed under Provision E.3.b.(2). Where redevelopment results in an increase of less than fifty percent of the impervious surfaces of a previously existing development, and the existing development was not subject to Priority Development Project

requirements, the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) apply only to the addition or replacement, and not to the entire development.
Where redevelopment results in an increase of more than fifty percent of the impervious surfaces of a previously existing development, and was not subject to previous Priority Project Development requirements, the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) apply to the entire development.

34. Provision E.3.b.2 (Page 76 of 120) – Residential Driveways Should Not Be Subject To The PDP Requirements

Section E.3.b.2.g triggers PDP requirements for development and redevelopment of streets, roads, highways, freeways, and residential driveways over 5,000 square feet. This requirement was present in the prior permit; however, the residential driveways requirement was added under the Tentative Order and will require additional Copermittee effort for treatment control and structural Low Impact Development (LID) BMP inventory, inspections, and maintenance verification and may have potential enforcement issues. The Regional Board has not provided sound technical basis for this provision as there is no evidence provided in the fact sheet that the cumulative impact of residential driveways would be significant and that residential driveways are a significant source of pollutants. Additionally vehicles should be defined as internal combustion vehicles since internal combustion vehicles are the source of pollutants this section is developed for.

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
3. Development Planning
b. Priority Development Projects
(2) Priority Development Project Categories
(g) Streets, roads, highways, and freeways~~, and residential driveways~~. This category is defined as any paved impervious surface that is 5,000 square feet or more used for the transportation of automobiles, trucks, motorcycles, and other internal combustion vehicles.

35. Provision E.3 (Page 73 of 120) – All Municipal Roadway Projects Should Only Be Subject To The USEPA Guidance Regarding Managing Wet Weather With Green Infrastructure: Green Streets

The Ventura County NPDES MS4 Permit, the Santa Ana Region permits for Orange County, San Bernardino County, and Riverside County, and the Greater Los Angeles MS4 Permit provide that streets, roads, and highways follow US EPA guidance regarding *Managing Wet Weather with Green Infrastructure: Green Streets to the maximum extent practicable*. This document is recognized nationwide as the standard for incorporation of LID techniques into roadway projects, which is why it was it is specified in the permits identified above. In April of 2007 the US EPA, National Association of Clean Water Agencies; Natural Resources Defense Council; the Low Impact Development Center; and the Association of State and Interstate Water Pollution Control Administrators signed the Green Infrastructure Statement of Intent. This statement of intent recognized the benefits of green infrastructure and laid the ground work for the development of the USEPA Green Infrastructure Action Strategy. One of the areas of study was the municipal roadways and the result of the study is the US EPA Green Streets Municipal Handbook. The Handbook provides guidance on green street design, different types of LID BMPs that are appropriate for municipal roadways, and implementation hurdles. The Handbook

was specifically developed for incorporating LID techniques into roadway projects as roadways are very different from traditional land development projects.
Roadways are different than other development projects as there are significant constraints to implementation of BMPs that need to be considered such as limited right-of-way, utilities, geotechnical and structural concerns, street trees, parking, and fire truck access among others. The US EPA guidance considers these constraints where the PDP requirements do not. Even in new roadways implementing hydromodification requirements can disturb a significant area of land which has its own environmental impacts including changing the natural hydrology which is antithetical to the LID approach.

In addition, retrofitting of existing alleys is infeasible. In accordance with the Streets & Highways Code, State Controller Gas Tax Expenditure Guidelines and several California Attorney General opinions, alleys are not considered "city streets" or "county highways," and are not certified to the State Controller for gas tax purposes as they do not serve as thoroughfares for the general public. Therefore, section 2150 of the Streets & Highways Code and other State laws prohibit municipalities from expending Road Funds on alleyway rehabilitation, and retrofitting of an alleyway would be an unlawful expenditure. In the case of private development where there is a clear nexus to alleyway improvement, a landowner adjacent to an alley could only be conditioned to retrofit that portion of alleyway in front of the property and could not be conditioned to retrofit an entire alleyway.

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
3. Development Planning
b. Priority Development Projects
(3) Priority Development Project Exemptions
(b) Any impervious surface that is 5,000 square feet or more used for the transportation of automobiles, trucks, motorcycles, and other vehicles that follows the USEPA guidance regarding Managing Wet Weather with Green Infrastructure: Green Streets[1] to the MEP.

[1]:http://water.epa.gov/infrastructure/greeninfrastructure/index.cfm

~~*Retrofitting of existing paved alleys, streets or roads that meet the following criteria:*~~
~~*(i) Must be two lanes or less; AND*~~
~~*(ii) Must be a retrofitting project implemented as part of an alternative compliance project option under Provision E.3.c.(3)(b)(v) to achieve the performance requirements of Provisions E.3.c.(1) and/or E.3.c.(2) for a Priority Development Project; AND*~~
~~*(iii) Designed and constructed in accordance with the USEPA Green Streets guidance.23*~~

36. Provision E.3 (Page 73 of 120) – Exemptions From The Development Planning Requirements Should Be Provided For Certain Types Of Projects

An exemption for PDPs should be provided for driveways and parking lots constructed with permeable surfaces. This exemption is provided to sidewalks, bicycle lanes and trails and should also be provided to driveways and parking lots. The fact sheet identifies that "The exemptions have been provided as an incentive for the Copermittees to encourage and promote the implementation of LID design concepts and green infrastructure and building principles." Permeable surfaces qualify as an LID design concept, which should be recognized in the Tentative Order provisions for driveways and parking lots. The use of permeable surfaces

should be encouraged, which will be accomplished by providing an exemption for driveways and parking lots constructed with permeable surfaces.
The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
3. Development Planning
b. Priority Development Projects
(3) Priority Development Project Exemptions
(a) ~~New paved~~ Sidewalks, bicycle lanes, driveways, parking lots, or trails that meet the following criteria:
(i) Designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas; OR
(ii) Designed and constructed to be hydraulically disconnected from paved streets or roads; OR
(iii) Designed and constructed with permeable pavements or surfaces in accordance with USEPA Green Streets guidance.22

An exemption should also be provided to single family residential projects as single family residential projects should not be subject to PDP requirements as the PDP requirements would put an undue burden on single family residences where it has not been shown that they are significant source of pollutants. There is no technical justification or proof that single family residences are a significant source of pollutants identified in the fact sheet and thus should be provided an exemption. Furthermore the inclusion of the U.S. Green Building Council (USGCB) Leadership in Energy and Environmental Design (LEED) for Homes green building certification program in the Tentative Order is not appropriate as this program encompasses other environmental considerations besides surface water management which are outside the scope of a stormwater permit and outside the authority of the Regional Board. Since the Regional Board has not met the burden of proof that single family residential projects are a significant source of pollutants the exemption should be provided to all single family residential projects and not just in meeting the LEED certification which is inappropriate for the Regional Board to specify.

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
3. Development Planning
b. Priority Development Projects
(3) Priority Development Project Exemptions
(c) Single-family residential projects that are not part of a larger development or proposed subdivision.

~~New single family residences that meet the following criteria:~~
~~(i) Must not be constructed as part of a larger development or proposed subdivision; AND~~
~~(ii) Designed and constructed to be certified under the U.S. Green Building Council (USGCB) Leadership in Energy and Environmental Design (LEED) for Homes green building certification program, receiving at least four (4) Surface Water Management credits under the Sustainable Sites category;24 OR~~
~~(iii) Designed and constructed with structural BMPs that will achieve the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite.~~
~~(d) Redevelopment of existing single family residences that meet the following criteria:~~

~~*(i) Designed and constructed to be certified under the USGCB LEED for Homes green building certification program, receiving at least four (4) Surface Water Management credits under the Sustainable Sites category; 25 OR*~~
~~*(ii) Designed and constructed with structural BMPs that will achieve the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite.*~~

An exemption should be added for the protection of persons and property, particularly as it applies to BMPs not being implemented in waters of the U.S. or state. This language is consistent with Cal. Water Code §13269(c)(1-2). Flood control projects are intended for the protection of public safety and property and are mandated by the Orange County Flood Control Act of 1927. Requiring flood control projects to implement BMPs which are intended for traditional types of development projects is inappropriate and in most cases infeasible. Furthermore requiring flood control projects to implement BMPs may cause flood control projects to be infeasible which in many cases will increase the risk of flooding. If flooding does occur in these areas it would increase the risk of pollutants discharging into receiving waters from the flooded areas. Stream restoration projects are also projects that should not be subject to the PDP requirements as they are projects intended to restore beneficial uses of receiving waters.

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
3. Development Planning
b. Priority Development Projects
(3) Priority Development Project Exemptions
(d)Flood control and stream restoration projects.

An exemption for emergency public safety projects where a delay due to a Standard Stormwater Mitigation Plan (SSMP) would compromise public safety, public health and/or the environment is needed in the permit. Copermittees need an exemption where if public health or safety or environmental protection is threatened the project can proceed without a SSMP. Emergency projects are provided exempt status in many other MS4 permits including the recently adopted LA MS4 permit.

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
3. Development Planning
b. Priority Development Projects
(3) Priority Development Project Exemptions
(e) *Emergency public safety projects in any of the Priority Development Categories may be excluded if the delay caused due to the requirement for a SSMP compromises public safety, public health and/or environmental protection*

37. Provision E.3.c (Page 78 of 120) – Flexibility Should Be Provided To The Structural BMP Performance Standards If Watershed-Specific Performance Standards Are Developed In The Water Quality Improvement Plans

Based on the watershed approach it is conceivable that the Water Quality Improvement Plans may identify that an alternate performance standard than the provisions in E.3.c. may be appropriate for certain watersheds. To fully realize the watershed approach the Copermittees should be given the opportunity to develop alternative BMP performance standards consistent with the goals and objectives developed in the Water Quality Improvement Plans.

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
3. Development Planning
c. Priority Development Project Structural BMP Performance Requirements

In addition to the BMP requirements listed for all development projects under Provision E.3.a, Priority Development Projects must also implement structural BMPs that conform to performance requirements below. <u>If watershed-specific performance requirements are developed as part of a Water Quality Improvement Plan; these requirements would take precedence over the general performance requirements below. The watershed-specific requirement must provide at least equal protection as the general performance requirements below.</u>

38. Provision E.3 (Page 73 of 120) – Terminology Is Inconsistent Especially With The Use Of Low Impact Development BMPs And Should Be Modified

In Provision E.3.c. the Tentative Order specifies the requirements for structural BMPs. Furthermore in Provision E.3.c.(1) the concepts of onsite structural BMPs and LID BMPs are introduced. The County recommends that the Tentative Order be modified to provide more consistency in terminology. The County views LID as a strategy of BMPs that is used to mimic predevelopment water balance. (see Provision E.3.a(3)). Furthermore there is no single definition for LID BMPs that has gained widespread recognition. Although Attachment C includes a definition for LID BMPs, this definition is not widely accepted. LID is rather a concept (the attachment C definition does adequately capture this concept) made up of various non-structural and structural BMPs. While the onsite BMP requirements should be defined (e.g. retention of the 85% storm) the Tentative Order could be greatly simplified by avoiding multiple terms and uses. The County has provided suggested edits throughout the Development Planning provision to provide better consistency.

39. Provision E.3.c (Page 78 of 120) – The Retention Performance Standard Needs Clarification

Clarification is needed regarding both Section E.3.c.(1)(a)(i) and (ii). In Section E.3.c.(1)(a)(i) the section states "The volume of storm water produced…" where it should state "The volume of storm water <u>runoff</u> produced". The Fact Sheet identifies that this design standard is consistent with the Fourth Term Permits for Orange County and Riverside County however in both of these permits the standard is identified "the volume of runoff produced from a from a 24-hour 85th percentile storm event". The word "runoff" needs to be added to the Tentative Order. In Section E.3.c.(1)(a)(ii) the newly added language that provides an alternative method for calculating the design capture volume does not specify a storm threshold or range of storms for the alternative

method for calculating the design capture volume. Clarification is needed to identify the threshold to be used and the County believes that the average annual volume of stormwater runoff is appropriate. Additionally flexibility should be provided as far as the technique to calculate this volume so that other methods besides continuous simulation should be accepted.

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
3. Development Planning
c. Priority Development Project Structural BMP Performance Requirements
(1) Storm Water Pollutant Control BMP Requirements
(a) Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite the pollutants contained in the design capture volume. The design capture volume is equivalent to:
(i) The volume of storm water runoff produced from a 24-hour 85th percentile storm event; OR
(ii) The average annual volume of storm water runoff that would be retained onsite if the site was fully undeveloped and naturally vegetated, as determined using continuous simulation modeling or other techniques based on site-specific soil conditions and typical native vegetative cover.

40. Provision E.3.c (Page 78 of 120) – If Projects Use Alternative Compliance Conventional BMPs Should Not Be Also Required Onsite

Section E.3.c.(1)(c) requires that if projects use alternative compliance that conventional BMPs must also be implemented onsite. Although the Fact Sheet identifies that the intent of this provision is to reduce the pollutants onsite to the MEP there is not adequate technical justification for effectively requiring additional mitigation. This provision requires additional mitigation for projects and in effect requires double mitigation which goes well beyond the MEP standard that is referenced in the Fact Sheet. Providing mitigation offsite for the PDP requirements offsite in itself is adequate to meet the MEP standard.

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
3. Development Planning
c. Priority Development Project Structural BMP Performance Requirements
(1) On-site Storm Water Pollutant Control Structural BMP Requirements
(c) If a Priority Development project is allowed to utilize alternative compliance pursuant to Provisions E.3.c.(1)(b), ~~flow-thru conventional treatment control BMPs must be implemented to treat the portion of the design capture volume that is not retained onsite. Additionally,~~ project applicants must mitigate for the portion of the pollutant load in the design capture volume that is not retained onsite through one or more alternative compliance options under Provision E.3.c.(3). If alternative compliance involves the use of ~~C~~conventional treatment control BMPs, those BMPs must be sized and designed to:

41. Provision E (Entire Provision; Begins Page 64 of 120) – The Hydromodification Management Requirements Should Be Based On A Watershed Management Approach, Be Consistent With The WQIPs, And Consider The Current Copermittee HMPs

Hydromodification management should be based on the conditions of receiving waters and on the impacts and potential impacts from development projects. The basis to make hydromodification management decisions needs to be an understanding of the watershed and receiving waters within a watershed. This understanding of a watershed is achieved through watershed analysis and analysis of the susceptibility of the receiving waters to hydromodification impacts. This approach of watershed analysis is identified in the Southern California Coastal Water Research Project (SCCWRP) Technical Report 667 – Hydromodification Assessment and Management in California **(Appendix A-2).** The SCCWRP report identifies that watershed analysis is the first step and most critical step in the development of watershed hydromodification management. The SCCWRP report, the authors of the SCCWRP report at the Hydromodification Management Meeting in August of 2012, and even State Water Resource Control Board (SWRCB) staff at the recent California Stormwater Quality Association (CASQA) General Meeting in San Francisco on January 10, 2012 identified that hydromodification management is not a one size fits all approach and needs to consider watershed analysis. The Tentative Order hydromodification requirements are however a one size fits all approach as the requirements do not allow consideration of watershed analysis or receiving water information.

The County believes the best way to implement the vision of the SCCWRP Report for development of effective hydromodification management is to develop clear hydromodification management objectives that are watershed specific and developed through a stakeholder process, which is consistent with the approach in the SCCWRP report. The intent of the WQIPs is to improve water quality in the WMAs based on the highest priorities for water quality in the watershed, however unless more is known about the watersheds and their receiving waters including their susceptibility to hydromodification then the appropriate standards and performance criteria cannot be identified to reach the goal of improving water quality. The WQIPs can build on the current Hydromodification Management Plans (HMPs) that have been developed and can use additional watershed and receiving water information to develop appropriate watershed specific hydromodification standards and where they should apply in a specific watershed. Instead of hydromodification requirements that do not consider specific watershed analysis and conditions of receiving waters and that were developed unilaterally by Regional Board staff the County suggests that watershed specific requirements be developed as part of the WQIPs as part of a watershed stakeholder process.

Matching pre-development (naturally occurring) flow rates and duration is identified as the performance standard for hydromodification management. Although it is not stated anywhere in the Tentative Order, it is assumed that the purpose of such a standard is to address the overall objective of the CWA (§101) - to restore the chemical, physical, and biological integrity of the Nation's waters in the Tentative Order's jurisdiction. However, the CWA does not imply or state that its objective is to restore waters to pre-Columbian (pre-development) conditions. Rather the objective must be taken in context of § 402(p) and reflect the stormwater compliance standard to reduce pollutants to the maximum extent practicable. When read in total the hydromodification standard should reflect the developed urban environment. To do otherwise would negate the engineering efforts done to date to protect life and property from floods and create an impractical solution for municipalities. Furthermore the current hydromodification standard as provided for in numerous municipal permits in California is to match post development with "pre-project" conditions. It is unclear to us how the San Diego Regional Board staff has redefined the MEP standard for hydromodification.

Hydromodification effects may also be caused from other sources that are not in the Copermittees' jurisdiction. Initial implementation of the pre-development (naturally occurring) hydromodification performance standard has identified that BMPs to comply with the standard are of significant size even for smaller projects. Implementing the hydromodification requirements can disturb a significant area of land which has its own environmental impacts including changing the natural hydrology which is antithetical to the LID concept. This can also cause a decrease in open space which may be of issue with the Orange County General Plan which requires certain thresholds of open space for developments. For the smaller redevelopment projects and infill projects it may just not be feasible, either physically or due to cost, to build these projects which will represent a lost opportunity to improve water quality through the implementation of the LID requirements.

Furthermore identifying "naturally occurring" conditions for redevelopment sites is difficult and entirely subjective, as in most cases there are no historical records of the natural condition of the site, and begs a technical question as to how far back does one go historically in determining the proper predevelopment timeframe. In cases where natural conditions of a site are not known the best approach is to use an undeveloped natural site in proximity to the re-development site as a reference site. The vegetative cover, soil type, and slope will most affect the hydrology of a site and so approximating these conditions for a re-development site using a natural reference site where these parameters can be measured is a way to approximate the natural conditions of a redevelopment site, however, locating a natural reference site in proximity to a redevelopment site is difficult, as the entire sub-watershed or watershed may be developed. Additionally the conditions of the natural reference site maybe totally different than the "naturally occurring" conditions of the re-development site as vegetative cover, soil type, and slope may have been very different and without historical records there is no way of knowing the actual ""naturally occurring" conditions of a re-development site. The subjectivity of the pre-development approach not only puts municipalities in a position to violate the U.S. and California Constitutions on unlawful takings, but it also conflicts with the Mitigation Fee Act, CEQA and the State Administrative Procedure Act in that the Tentative Order does not contain an adequate record justifying the reasonableness of this standard.

The County is therefore suggesting an approach to hydromodification management that is not a one size fits all approach, is consistent with the watershed approach and the intent of the WQIPs, considers the current Copermittee HMPs, and provides an opportunity to develop watershed specific requirements as part of a watershed stakeholder process that have the best chance of improving water quality.

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
3. Development Planning
c. Priority Development Project Structural BMP Performance Requirements

(2) <u>On-site</u> Hydromodification Management <u>Structural</u> BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite structural BMPs to manage hydromodification <u>to ensure</u> that ~~may be caused~~ ~~by~~ storm water runoff discharged from a project <u>does not cause adverse hydromodification impacts in the downstream receiving waters.</u> ~~as follows:~~

The Copermittees in each Watershed Management Area may establish, as part of the WQIP, watershed specific requirements that will apply to priority development projects based on the susceptibility of the receiving waters to hydromodification impacts and historic receiving water changes from development. If watershed specific requirements are developed they will supersede requirements in the HMP. The watershed specific requirements must include the following:

(a) Post-project runoff flow rates and durations must not exceed ~~pre-development (naturally occurring)~~ the performance standard for runoff flow rates and durations to be determined as part of the development of the WQIPs for each Watershed Management Area by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat conditions downstream of Priority Development Projects).

(i) In evaluating the range of flows that results in increased potential for erosion of natural (non-hardened) channels, the lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks.

~~(ii) For artificially hardened channels, analysis to identify the lower boundary must use characteristics of a natural stream segment similar to that found in the watershed. The lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or erodes the toe of the channel banks.~~

~~(iii)~~(ii) The Copermittees may use monitoring results collected pursuant to Provision D.1.a.(2) to re-define the range of flows resulting in increased potential for erosion, or degraded instream habitat conditions, as warranted by the data.

(b) Post-project runoff flow rates and durations must compensate for the loss of sediment supply due to the development project, should loss of sediment supply occur as a result of the development project.

(c) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) to comply with the performance requirements of Provisions E.3.c.(2)(a)-(b).

(d) Exemptions

Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provisions E.3.c.(2)(a)-(b) where the project:

(i) Discharges storm water runoff into existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;

(ii) Discharges storm water runoff into conveyance channels that are engineered for the capacity to convey the 10-year ultimate build out condition flow and are regularly maintained to ensure flow capacity all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean.

(iii) Discharges to large rivers where large rivers are defined as reaches for which the contributing drainage area exceeds 100 square miles and with a 100-year design flow in excess of 20,000 cfs.

(iv) Discharges from infill redevelopment projects that meet criteria to be established in updates to the Copermittees' HMPs.

(v) Flood control and stream restoration projects.

~~(ii)~~(vi) Is a redevelopment Priority Development Project that meets the alternative compliance requirements of Provision E.3.c.(3)(b)(ii); or

~~(iii)~~(vii) Discharges storm water runoff into other areas identified by the San Diego Water Board as exempt from the requirements of Provisions E.3.c.(2)(a)-(b).

If the Copermittees in a Watershed Management Area select not to develop watershed specific requirements, development projects will be subject to the current Copermittee HMPs inclusive of the exemptions identified in Section E.3.c.(d)(2) that will integrated into updated Copermittee HMPs.

42. Provision E.3.c (Page 78 of 120) – Exemptions For Hydromodification Management Should Include Discharges To Certain Types Of Receiving Waters And Certain Types Of Projects

PDPs that discharge to conveyance channels that are engineered for the capacity to convey the 10-year ultimate build out condition flow and are regularly maintained to ensure flow capacity should be exempt from the hydromodification management requirements. This exemption is similar to the hardened conveyance system exemption, provided in the San Diego HMP and identified in Section D.1.g.(3) of the current San Diego MS4 Permit. Hydromodification requirements are not appropriate for discharges to channels that are designed to accept increased flows from upstream development, as the potential for erosion is non-existent. Studies[60] have shown that hydromodification is caused by the smaller storms up to the 10 year event. Based on these studies those engineered channels designed to convey the 10-year ultimate build out condition will therefore not experience hydromodification impacts. These channels were installed for the purpose of flood control and protection of public safety and property as historically flooding occurred where there is now development. The Permittees in Orange, Riverside and San Diego Counties hosted a workshop on hydromodification management on August 30, 2012. A panel of experts was convened to answer key questions regarding hydromodification to provide the Regional Board Permit team, Copermittee storm water program managers, non-governmental environmental organizations, and the development/business community with a greater understanding of the practice of hydromodification management in the urban watershed. One of the panel expert,s Chris Bowles, PhD, PE, whose qualifications include:

> Chris Bowles, PhD, PE is a registered civil engineer (CA P.E. C76898) specializing in hydraulics, hydrology, geomorphology, water resources, water quality and environmental

[60] *See* Leopold, L.B., M.G. Wolman, J.P. Miller. 1964. Fluvial Processes in Geomorphology. San Francisco, W.H. Freeman and Company. 522 pp. *and* MacRae, C.R. 1993. An Alternate Design Approach for the Control of Instream Erosion Potential in Urbanizing Watersheds. Sixth International Conference on Urban Storm Drainage, Niagara Falls, Ontario.

> restoration. He has over seventeen years of project management experience on a wide variety of large multi-disciplinary, multi-stakeholder projects such as floodplain restoration, sediment studies, watershed hydrology, water quality, river and wetland restoration in California, Nevada, Washington, Oregon, and Florida, and oversees, including projects in the UK and Central America. Thirteen of these years have been spent in practice in the US. His technical expertise spans the range of hydraulic and hydrologic modeling (HEC software and a wide variety of 1D, 2D and 3D hydraulic models), geomorphology, GIS and field data collection (topographic and bathymetric surveying, water quality monitoring, flow gauging and sediment transport measurements). Prior to specializing in environmental hydrology, Dr. Bowles worked initially as a land surveyor and latterly as a site construction supervisor. Dr. Bowles has a doctorate in computational fluid dynamics in the application of fluvial hydraulics and has constructed numerous 1-, 2-, and 3-dimensional hydrodynamic models over his 17 years of experience in environmental engineering.

stated that having to build a storage facility on site to retain stormwater when the site drains into a resilient channel is a "huge waste of money." Dr. Bowles stated that different approaches are needed for different situations (a copy of the video is available at the following link and is incorporated by reference: http://granicus.sandiego.gov/MediaPlayer.php?publish_id=1427 Dr. Bowles statement is at 4:06:24).[61]

Flood control channels cannot be removed as they serve the important and mandated service of flood control. It is also cost prohibitive to think that development can be removed from the floodplain so that these flood control channels could be removed and returned to a natural state. Since removal of these channels is infeasible restoration of these channels to a natural state is also infeasible. In many cases the historic path of the channel went right through where existing development is now and therefore there is no hope of restoration of the channel to its natural state. Since there is no potential for restoration to a natural state and because these channels are designed to be flood control channels they should be allowed to convey the storm events they are designed for. Since there is no potential for removal of these channels there is no environmental benefit to requiring onsite mitigation of hydromodification when these channels are designed and engineered to accept these flows. Although this comment here applies to the hydromodification requirement the County would like to point out that LID concepts will be implemented consistent with the Tentative Order requirements and will have a mitigating effect on hydromodification impacts. Thus between the fact that implementing hydromodification controls on discharges to engineered channel will have no effect on the channel and that LID concepts will be implemented to address the smaller storms there is justification for creating an exemption for discharges to engineered channels.

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
3. Development Planning
c. Priority Development Project Structural BMP Performance Requirements
(2) Hydromodification Management BMP Requirements
(d) Exemptions

[61] Video Presentation of August 30, 2012 Hydromodification Management Workshop: http://granicus.sandiego.gov/MediaPlayer.php?publish_id=1427

(ii) *Discharges storm water runoff into conveyance channels that are engineered for the capacity to convey the 10-year ultimate build out condition flow and are regularly maintained to ensure flow capacity all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;"*

Based on this proposed exemption the County recommends deleting section E.3.c.(2)(a)(ii):

E. Jurisdictional Runoff Management Programs
3. Development Planning
c. Priority Development Project Structural BMP Performance Requirements
(2) Hydromodification Management BMP Requirements
(a)
~~*(ii) For artificially hardened channels, analysis to identify the lower boundary must use characteristics of a natural stream segment similar to that found in the watershed. The lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or erodes the toe of the channel banks.*~~

The San Diego and South Orange County HMPs identified that cumulative watershed impacts are minimal in stream reaches of large depositional rivers. Analysis in the San Diego HMP demonstrated that the effects of cumulative watershed impacts are minimal in those reaches which the drainage area exceeds 100 square miles and with a 100-year design flow in excess of 20,000 cubic feet per second (cfs). An exemption for those reaches that meet these criteria should be included in the exemption provisions of the Tentative Order.

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
3. Development Planning
c. Priority Development Project Structural BMP Performance Requirements
(2) Hydromodification Management BMP Requirements
(d) Exemptions
(iii) *Discharges to large rivers where large rivers are defined as reaches for which the contributing drainage area exceeds 100 square miles and with a 100-year design flow in excess of 20,000 cfs.*

Infill redevelopment projects offer an opportunity for improvement in water quality. Due to the usual tight constraints and limited footprint of infill development projects implementing onsite hydromodification controls is often infeasible. In many cases projects will not be able to meet the hydromodification criteria and so will choose "greenfield" developments where meeting hydromodification criteria are more feasible. To encourage infill development over "urban sprawl" and "greenfield" development, a hydromodification exemption should be provided for infill development projects. This will also provide the benefit of improving water quality as the water quality/LID requirements will still be required to be met. Over time, infill redevelopment projects will address the significant issue of improving water quality from existing development. Without this exemption redevelopment for infill projects will likely not occur as implementing onsite hydromodification will just be too expensive for these types of projects and so the benefits meeting the water quality/LID requirements will not be realized at these sites. Criteria for what projects qualify for the infill development exemption shall be developed by each of the Copermittees as part of updates to their HMPs.

An exemption for infill redevelopment projects comports with a current EPA study that demonstrates the significant environmental benefits that can be attained from infill. *Residential Construction Trends in America's Metropolitan Regions: 2012 Edition*.[62] The lack of an exemption and rigid infill requirements would then be contrary to EPA's support for such projects.

Additionally, the lack of an infill exemption conflicts with State housing element law,[63] guidelines set forth by the California Department of Housing and Community Development and achievement with Regional Housing Needs Assessment (RHNA) numbers issued by the Southern California Area of Governments (SCAG), which require municipalities to quantify and meet their low income housing needs. Infill development is the only means by which affordable housing projects are built. Affordable units cannot be offered at market rates and are heavily subsidized. The lack of an exemption will make it increasingly difficult to construct affordable units due to increased costs, and will likely inhibit municipalities from meeting their RHNA obligations for low income housing. This will have the further effect of making local zoning actions inconsistent with municipal general plans, which may subject municipalities to lawsuits preventing the issuance of building permits.[64]

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
3. Development Planning
c. Priority Development Project Structural BMP Performance Requirements
(2) Hydromodification Management BMP Requirements
(d) Exemptions
(iv) *Discharges from infill redevelopment projects that meet criteria to be established in updates to the Copermittees' HMPs.*

Flood control projects are intended for the protection of public safety and property and are mandated by the Orange County Flood Control Act of 1927. Requiring flood control projects to implement hydromodification controls intended for traditional types of development projects is inappropriate and in most cases infeasible. Furthermore requiring flood control projects to implement hydromodification controls may cause flood control projects to be infeasible which may increase the risk of flooding. If flooding does occur in these areas it would increase the risk of hydromodification impacts to receiving waters from the flooded areas. In-stream restoration projects are designed to restore beneficial use of streams and channels. These projects also serve as a potential option for restoring impacts from hydromodification. It is counterproductive to require mitigation of a stream restoration project.

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
3. Development Planning
c. Priority Development Project Structural BMP Performance Requirements

[62] EPA Study Available at: http://www.epa.gov/smartgrowth/construction_trends.htm
[63] Gov't Code §§ 65580 et seq.
[64] *Urban Habitat Program v. City of Pleasonton*, No. RG06—293831, Alameda Sup. Ct. (March 12, 2010) (unpublished trial court decision ordering city to cease issuing building permits due to non-compliance with housing element law); *see generally Garat v. City of Riverside*, 2 Cal. App. 4th 259, 286 (1991); *Citizens of Goleta Valley v Board of Supervisors*, 52 Cal. 3d 553, 570 (1990).

(2) Hydromodification Management BMP Requirements
(d) Exemptions
(v) *Flood control and stream restoration projects.*

43. Provision E.3.c (Page 78 of 120) – Biofiltration BMPs Should Be Sized For The Design Capture Volume And If Used For Alternative Compliance Conventional BMPs Should Not Also Be Required

Section E.3.c.(3)(b)(i)[c] requires that if biofiltration is used as an alternative compliance method the biofiltration BMP is required to be sized to 1.5 times the design capture volume, which is an increase from the existing Orange County permit. The Fact Sheet provides no technical justification for the 1.5 factor.

Studies based on work conducted within Orange County by Geosyntec Consultants provide contrary information to the unsupported subjective inclusion of a 1.5 factor. The following documents are submitted for the record [**Appendix A-3 & Appendix A-4**].

Storage and Reuse Systems for Stormwater Management – Preliminary Cost and Performance Estimates for Residential Use in Irvine, CA, Eric Strecker (2009 presentation to Santa Ana Regional Board). Assessed the costs and modeled the performance of harvest and use retention BMPs and compared average annual total suspended solids (TSS) load removed and annual TSS concentrations with BMPs. In both scenarios presented, biofiltration provided superior TSS results to harvest and use.

The Water Report Issue #65: Stormwater Retention on Site, An Analysis of Feasibility and Desirability,[65] The paper identified significant limitations with all retention BMPs and states that "There needs to be a more technical vetting of "retain on site" and stormwater harvest and use before these approaches are made mandatory." The authors also caution that a "one size fits all" approach requiring retention may not be desirable and "in many cases would lead to undesirable results."

Based on the above information, the requirement to oversize biofiltration BMPs should be deleted from the Tentative Order. Biofiltration should be considered equivalent to other retention BMPs and should remain a full part of the LID toolbox without penalization.

Section E.3.c.(3)(b)(i)[d] requires that PDPs that use biofiltration as an alternative compliance option must also implement conventional BMPs. This provision requires additional mitigation for projects and in effect requires double mitigation when it is not needed. Biofiltration BMPs are more effective than conventional BMPs and requiring both does not make any technical sense and this goes well beyond the MEP standard. Furthermore the Fact Sheet provides no technical justification for requiring conventional treatment in addition to biofiltration and this is not the standard in the current Orange County and Riverside permits nor any other permits in California.

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
3. Development Planning

[65] Strecker and Poresky (2009) (reproduced with permission of The Water Report).

c. Priority Development Project Structural BMP Performance Requirements
(3) Alternative Compliance to Onsite Structural BMP Performance Requirements
(b) Alternative Compliance Project Options
(i) Onsite LID Biofiltration Treatment Control BMPs
~~[c] Biofilter at least 1.5 times the design capture volume that is not reliably retained onsite; OR~~
[~~d~~c]Biofilter up to the design capture volume that is not reliably retained onsite, ~~AND 1) treat the remaining portion of the design capture volume not retained onsite with conventional treatment control BMPs in accordance with Provision E.3.c.(1)(c),~~ and ~~2)~~ if necessary, mitigate for the portion of the pollutant load in the design capture volume not retained onsite through one or more alternative compliance project, in-lieu fee and/or water quality credit system options below.

44. Provision E.3.c (Page 78 of 120) – USGBC LEED Certification Is Not An Appropriate Standard In A Stormwater Permit

Provision E.3.c.(3)(b)(ii) allows redevelopment projects to comply with the hydromodification management requirements by achieving LEED Certification. As previously noted inclusion of the USGCB LEED for Homes green building certification program in the Tentative Order is not appropriate as this program encompasses other environmental considerations besides surface water management which are outside the scope of a stormwater permit and outside the authority of the Regional Board.

The County recommends that provision E.3.c.(3)(B)(ii) be deleted from the Tentative Order.

E. Jurisdictional Runoff Management Programs
3. Development Planning
c. Priority Development Project Structural BMP Performance Requirements
(3) Alternative Compliance to Onsite Structural BMP Performance Requirements
(b) Alternative Compliance Project Options
~~(ii) LEED Certified Redevelopment Projects~~
~~The Copermittee may allow redevelopment Priority Development Projects to comply with the hydromodification management BMP performance requirements of Provision E.3.c.(2) where the project is designed and constructed to be certified under the USGCB LEED for New Construction and Major Renovations green building certification program. The Priority Development Project must receive at least one (1) Site Design credit and two (2) Stormwater Design credits under the Sustainable Sites category. In addition, the existing and future configuration of the receiving water must not be unnaturally altered or adversely impacted by storm water flow rates and durations discharged from the site.~~

45. Provision E.3.c (Page 78 of 120) – Offsite Regional BMPs Should Be Sized For The Design Capture Volume

Provision E.3.c.(3)(b)(iv)[a] requires that if an offsite regional BMP is used as an alternative compliance method the offsite regional BMP is required to be sized to 1.1 times the design capture volume, which is an increase from the existing Orange County permit. The Fact Sheet provides no technical justification for the 1.1 factor and so the 1.1 factor should be removed and offsite regional BMPs should only be sized for the design capture volume.

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
3. Development Planning
c. Priority Development Project Structural BMP Performance Requirements
(3) Alternative Compliance to Onsite Structural BMP Performance Requirements
(b) Alternative Compliance Project Options
(iv)Offsite Regional BMPs
[a] The Copermittee may allow Priority Development Projects to utilize offsite regional BMPs to comply with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1) if the offsite regional BMPs have the capacity to receive and retain ~~at least 1.1 times~~ the design capture volume that is not reliably retained onsite.

46. Provision E.3.c (Page 78 of 120) – Alternative Compliance In-Lieu Fee Option Is Inconsistent With State Law

Provision E.3.c.(3)(c)(i) requires the in-lieu fee to be transferred to the Copermittee or an escrow account prior to PDP construction. Development fees however, are collected at the time of building permit issuance, and permits can be issued throughout phases of the development whereby the entire in-lieu fee is not necessarily collected upfront when construction first begins. Furthermore, for large master planned developments, fees are negotiated through a development agreement to be collected based on certain development milestones. Therefore collecting and holding fees prior to construction is not common development practice and there should be flexibility in collecting fees given the timing and phasing of development and the market.

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
3. Development Planning
c. Priority Development Project Structural BMP Performance Requirements
(3) Alternative Compliance to Onsite Structural BMP Performance Requirements
(c) Alternative Compliance In-Lieu Fee Option
(i) The in-lieu fee <u>should</u> ~~must~~ be <u>collected and held in accordance with the Mitigation Fee Act and all other applicable development fee laws</u>. ~~transferred to the Copermittee (for public projects) or an escrow account (for private projects) prior to the date construction of the Priority Development Project is initiated.~~

Provision E.3.c.(3)(c)(ii)[d] requires the in-lieu fee to include the cost to operate and maintain the alternative compliance projects. Development fees however are generally limited to capital costs (design and construction) that go to the useful life of the project of 5 years or more. There are sometimes limitations in State Law on the use of development fees for operations and

maintenance. Operations and maintenance can probably be negotiated with a developer, but a requirement to include operations and maintenance as part of the fee has potential legal issues. *The County recommends the following language be deleted:*

E. Jurisdictional Runoff Management Programs
3. Development Planning
c. Priority Development Project Structural BMP Performance Requirements
(3) Alternative Compliance to Onsite Structural BMP Performance Requirements
(c) Alternative Compliance In-Lieu Fee Option
~~(ii)[d] The in-lieu fee must also include the cost to operate and maintain the offsite alternative compliance projects.~~

47. Provision E.3.c (Page 78 of 120) – The Copermittees Should be Allowed the Flexibility Provided Under EPA Policy to Develop a Trading and Water Quality Credit System

The Copermittees appreciate the flexibility of the Tentative Order to implement a water quality credit system as an alternative compliance schedule. Trading systems create cost-effective, market-based mechanisms for pollutant reduction, and have been successful in other water quality and air quality contexts. The Copermittees do note that any water quality trading system should be implemented in accordance with EPA's 2003 Final Water Quality Trading Policy, which allows for flexibility in generating and trading credits and offsets. The Tentative Order appears to limit a trading system to no net impacts caused by projects meeting the onsite structural BMP performance requirements of Provisions E.3.c(1) and E.3.c(2).

The Copermittees request that this language be stricken and that Copermittees be allowed the flexibility provided under the EPA 2003 Policy. Trading systems differ from program to program and are highly robust and complex credit mechanisms. Therefore, no net impact limitations should be addressed on a case-by-case basis subject to Executive Office approval, and should not immediately be limited by permit language, as certain projects may offer other significant environmental benefits.

The County recommends the following language be deleted:

E. Jurisdictional Runoff Management Programs
3. Development Planning
c. Priority Development Project Structural BMP Performance Requirements
(3) Alternative Compliance to Onsite Structural BMP Performance Requirements
(d) Alternative Compliance Water Quality Credit System Option
The Copermittee may develop and implement an alternative compliance water quality credit system option, individually or with other Copermittees and/or entities. ~~provided that such a credit system clearly exhibits that it will not allow discharges from Priority Development Projects to cause or contribute to a net impact over and above the impact caused by projects meeting the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2)~~. Any credit system that a Copermittee chooses to implement must be submitted to the San Diego Water Board Executive Officer for review and acceptance as part of the Water Quality Improvement Plan.

CONSTRUCTION MANAGEMENT

48. Provision E.4 (Page 90 of 120) – The Construction Management Program Provisions Must Be Modified So As Not To Negate The Very Intent And Purpose Of The Watershed Approach And The Focus On The Highest Priorities Within Each Watershed Management Area

(See the corresponding comments under Provision E – Jurisdictional Runoff Management Programs)

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
4. Construction Management [Intro]
Each Copermittee must implement a construction management program in accordance with the strategies identified in the Water Quality Improvement Plan ~~and include, at a minimum, the following requirements.~~ The requirements of the jurisdictional runoff management programs as outlined below may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality improvement Plan(s).
Move Provision 4f, "Strategies to Address the Highest Priority Water Quality Conditions" to just after the Introduction to the section and before Provision 4.a.

E. Jurisdictional Runoff Management Programs
4. Construction Management
(1) *Provide specific details about how the strategies and/or activities will be implemented (e.g. designate ~~additional~~ BMPs, focus education, and/or increase/decrease frequency of inspections for specific types of sites and/or activities); and*

49. Provision E.4 (Page 90 of 120) – Verification Of Permit Coverage By The Copermittees Should Be For The CGP Only

Per Section 4.a.(4) Copermittees are required to verify that the project applicant has obtained coverage under applicable permits. The fact sheet identifies that "The requirements under Provision E.4. are consistent with the 4th Term Permits for San Diego, Orange, and Riverside Counties", however the requirement of the current Orange County permit is to verify coverage under the Construction General Permit only and so there is not consistency with the 4th Term permits. It is only appropriate to require the Copermittees to verify coverage under the CGP as tracking down the other applicable permits does not assist in ensuring construction management is being implemented correctly. Furthermore, the USACE requires all other permits to be in place prior to issuing the 404 permit. It is not possible to have the 404 permit prior to issuing a grading or building permit.

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
4. Construction Management
a. Project Approval Process

(4) *"Verify that the project applicant has obtained coverage under ~~applicable permits, including, but not limited to~~ the Construction General Permit.~~, Clean Water Act Section 401 Water Qaulity Certification and Section 404 Permit, and California Department of Fish and Game Streambed Alteration Agreement.~~*

50. Provision E.4 (Page 90 of 120) – Maintaining An Inventory Of Construction Sites Should Be Done On A Quarterly Basis

The current language requires monthly update of construction sites. Quarterly update of the inventory is more appropriate to track construction sites as this is a significant burden on the Copermittees. Some information for the construction site inventory will be based on inspections and as inspections for some sites will not be completed monthly it is more appropriate to maintain the inventory on a quarterly basis. These sites are tracked through SMARTS already and, therefore, more frequent tracking is not necessary.

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
4. Construction Management
b. Construction Site Inventory and Tracking
(1) Each Copermittee must maintain and update at least quarterly ~~monthly~~, a watershed-based inventory of all construction projects issued a local permit that allows ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff. The use of an automated database system, such as GIS, is highly recommended. The inventory must include:

51. Provision E.4 (Page 90 of 120) – Identifying The Weather Conditions During An Inspection Is More Appropriate Than Quantifying The Amount Of Rainfall Since The Last Inspection

The current language requires the inspector to quantify the approximate amount of rainfall since the previous inspection. Quantifying the amount of rainfall since the last inspection provides no benefit in the documentation of an inspection. Documentation of the weather conditions at the time of the inspection however does provide some context as to the state of BMPs during the inspections.

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
4. Construction Management
e. Construction Site Inspections
(c) ~~Approximate amount of rainfall since last~~ Weather condition during inspection;

EXISTING DEVELOPMENT

52. Provision E.5 (Page 95 of 120) –The Existing Development Program Provisions Must Be Modified So As Not To Negate The Very Intent And Purpose Of The Watershed Approach And The Focus On The Highest Priorities Within Each Watershed Management Area

(See the corresponding comments under Provision E – Jurisdictional Runoff Management Programs)

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
5. Existing Development Management [Intro]
Each Copermittee must implement an existing development management program in accordance with the strategies identified in the Water Quality Improvement Plan ~~and include, at a minimum, the following requirements.~~ The requirements of the jurisdictional runoff management programs as outlined below may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality improvement Plan(s).

Move Provision 5e, "Strategies to Address the Highest Priority Water Quality Conditions" to just after the Introduction to the section and before Provision 5.a.

(a) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate ~~additional~~ BMPs, focus education, and/or increase/decrease frequency of inspections for specific types of facilities, areas and/or activities);

E. Jurisdictional Runoff Management Programs
5. Existing Development Management
a. Existing Development Inventory and Tracking
Each Copermittee must maintain, and update at least annually, a watershed-based inventory of the existing development within its jurisdiction that may discharge a high priority pollutant load to and from the MS4…….The inventory must, at a minimum, evaluate and include the following if identified as a source of a high priority pollutant ~~include~~:

(1)(c)(vi) Flood management projects and flood control devices and structures;
(1)(c)(xii) Other municipal facilities that the Copermittee determines may contribute a significant high priority pollutant load to the MS4; and
(2)(g) Identification of the high priority pollutants ~~generated and~~ potentially generated by the facility or area;
~~(2)(j) Whether the facility or area contributes or potentially contributes to the highest priority water quality conditions identified in the Water Quality Improvement Plan.~~

E. Jurisdictional Runoff Management Programs
5. Existing Development Management
b. Existing Development BMP Implementation and Maintenance
Each Copermittee must designate a ~~minimum~~ set of BMPs required for all inventoried existing development, including special event venues. The designated ~~minimum~~ BMPs must be specific

to the identified high priority facility or area types and high priority pollutant generating activities, as appropriate.

53. Provision E.5 (Page 95 of 120) – The Tentative Order Should Recognize That Some Channel Rehabilitation Projects May Occur Downstream Of A Copermittee's Jurisdiction

Some minor changes to the Tentative Order language are needed to recognize that channel rehabilitation projects for a Copermittee may occur just downstream of the Copermittee's jurisdiction.

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
5. Existing Development Management
e. Strategies to Address the Highest Priority Water Quality Conditions
(3) Stream, Channel and/or Habitat Rehabilitation in Areas of Existing Development
Each Copermittee must describe in its jurisdictional runoff management program document, a program to rehabilitate streams, channels, and/or habitats in areas of existing development within its jurisdiction or just downstream of its jurisdiction to address the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

54. Provision E.5 (Page 95 of 120) – Remove The Requirement To Evaluate Retrofit Of Stream Channels From The Tentative Order

Requiring Municipalities to take full responsibility for evaluation of stream channels for restoration goes beyond the intent and scope of Section 402 (p) of the Clean Water Act. The fact sheet identifies that "areas of existing development are responsible for poor water quality, degraded habitats, and hydromodified channels", however existing development may not be the only cause and it is not the responsibility of the Copermittees to restore receiving waters but rather reduce the discharge of pollutants in stormwater and non-stormwater to the Maximum Extent Practicable. Restoration and rehabilitation of stream channels is not the responsibility of the Copermittees. Additionally in many instances the channels are flood control facilities which are designed to protect public safety and developments from flooding. In many instances stream restoration or rehabilitation may not be feasible.

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
5. Existing Development Management
e. Strategies to Address the Highest Priority Water Quality Conditions
(3) Stream, Channel and/or Habitat Rehabilitation in Areas of Existing Development
~~*(a) Each Copermittee must identify streams, channels, and/or habitats in areas of existing development as candidates for rehabilitation, focusing on areas where stream, channel, and/or habitat rehabilitation projects will address the highest priority water quality conditions identified in the Water Quality Improvement Plan;*~~

ENFORCEMENT RESPONSE PLANS

55. Provision E.6 (Page 104 of 120) – The Copermittees Should Be Allowed To Utilize Existing Guidelines And Procedures For Enforcement

Provision E.6 requires each Copermittee to develop and implement an Enforcement Response Plan as a part of its jurisdictional runoff management plan. The Fact Sheet notes that the Enforcement Response Plans will serve as a reference to determine if consistent enforcement actions are being implemented in order to achieve timely and effective compliance. Although the County understands the need for this document, the Tentative Order should be modified to allow the Copermittees to continue to utilize and implement established, equivalent guidelines and procedures for enforcement.

As a part of the development and implementation of a robust Illegal Discharge/Illicit Connection (ID/IC) Program, the Orange County Copermittees have developed an *Investigative Guidance Document* and *Enforcement Consistency Guide*. The response procedures generally include record keeping, notifications and response requests, response activities, investigations, clean-up activities, reporting, education, and enforcement/progressive enforcement. As provided for in the *Enforcement Consistency Guide*, when selecting enforcement options, the County's Authorized Inspectors ensure that violations of a similar nature receive a consistent enforcement remedy. More severe enforcement options may be utilized depending on variables such as history of non-compliance or failure to take good faith actions to eliminate continuing violations or to meet a previously imposed compliance schedule.

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
6. Enforcement Response Plans [Intro]
Each Copermittee must develop and implement an Enforcement Response Plan as part of its jurisdictional runoff management program document. The Enforcement Response Plan must describe the applicable approaches and options to enforce its legal authority established pursuant to Provision E.1, as necessary, to achieve compliance with the requirements of this Order. Copermittees may continue to utilize and implement established, equivalent guidelines and procedures for enforcement. The Enforcement Response Plan must include the following:

56. Provision E.6 (Page 104 of 120) – The Term And Definition For "Escalated Enforcement" Should Be Redefined

Although Provision E.6.d requires each Copermittee to include "Escalated Enforcement" in the required Enforcement Response Plan, the definition of what is intended by "Escalated Enforcement" is different within the Tentative Order than the Fact Sheet and may not be enforceable.

The Tentative Order defines "Escalated Enforcement" as "any enforcement scenario where a violation or other non-compliance is determined to cause or contribute to the highest water quality conditions identified in the Water Quality Improvement Plan". This definition seems to indicate that a Copermittee may enforce differently in a particular situation if it involves a high priority pollutant of concern. Not only does the County take exception to the notion that they would enforce differently solely based on the constituent involved, the legality of such an enforcement action is questionable. In fact, when selecting enforcement options, the Co-

Copermittees must ensure that violations of a similar nature are subjected to similar-types of enforcement remedies in order to avoid any claim of selective enforcement of the Ordinance.

However, the Fact Sheet seems to indicate that "Escalated Enforcement" would instead require the Copermittees to "take progressively stricter response to enforce its legal authority and achieve compliance….". The County supports this approach, especially since this is consistent with other ID/IC programs in California and the established guidance that has been developed and implemented by the Copermittees. In fact, the established guidance recognizes that a more severe enforcement option may be selected when a violator has either a history of noncompliance or has failed to take good faith actions to eliminate continuing violations or to meet a previously imposed compliance schedule.

The Tentative Order should be modified as indicated below so that it reflects a standard progressive response approach.

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
6. Enforcement Response Plans
d. ~~Escalated~~ Progressive Enforcement
(1)The Enforcement Response Plan must include a definition of "~~escalated~~ progressive enforcement". ~~Escalated~~ Progressive enforcement must include a series of enforcement actions that match the severity of the violations and include distinct, progressive steps. ~~any enforcement scenario where a violation or other non-compliance is determined to cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan~~. ~~Escalated~~ Progressive enforcement may be defined differently for development planning, construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and/or residential areas.
(2)Where the Copermittee determines progressive ~~escalated~~ enforcement is not required, a rationale must be recorded in the applicable electronic database or tabular system used to track violations.
(3)Progressive ~~Escalated~~ enforcement actions must continue to increase in severity, as necessary, to compel compliance as soon as possible.

Add a definition for "Progressive Enforcement" in Attachment C

PUBLIC EDUCATION

57. Provision E.7 (Page 106 of 120) – The Public Education Program Provisions Must Be Modified So As Not To Negate The Very Intent And Purpose Of The Watershed Approach And The Focus On The Highest Priorities Within Each Watershed Management Area

(See the corresponding comments under Provision E – Jurisdictional Runoff Management Programs)

The County recommends the following language changes:

E. Jurisdictional Runoff Management Programs
7. Public Education and Participation [Intro]

Each Copermittee must implement, individually or with other Copermittees, a public education and participation program in accordance with the strategies identified in the Water Quality Improvement Plan to promote and encourage the development…. ~~*and include, at a minimum, the following requirements.*~~ *The requirements of the jurisdictional runoff management programs as outlined below may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality improvement Plan(s).*

Move Provision 7c, "Strategies to Address the Highest Priority Water Quality Conditions" to just after the Introduction to the section and before Provision 7.a.

B. Public Education
The public education program component implemented within the Copermittee's jurisdiction ~~*must*~~ *may include*~~*, at a minimum,*~~ *the following:*
(1) Educational activities, public information activities, and other appropriate outreach activities intended to reduce pollutants associated with the ~~*application of pesticides, herbicides and fertilizer, and other pollutants of concern in storm water discharges to and from its MS4 to the MEP, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed to address the*~~ *highest priority water quality conditions identified in the Water Quality Improvement Plan;*

PROVISION F – REPORTING

58. Provision F (Entire Provision; Begins Page 109 of 120) – The Process For The Development And Updates Of The Various Plans Needs To Be Aligned And Allow For The Time Necessary To Complete The Work

Provision F includes the requirements for the documents and reports that the Copermittees must prepare and provide to the Regional Water Board. This provision incorporates significantly expanded requirements for public participation and involvement in the development and implementation of the WQIPs and JRMPs.

However, the timeframe outlined in this section links each step of the development of the WQIP and JRMP to the commencement of coverage under the Order instead of to the development step that precedes it. The three steps outlined for the development of the WQIP need to be sequential so that the Copermittees have adequate time to complete each step and build the program based on previous comments received. In addition, the timeframe needs to explicitly incorporate adequate time for the Copermittees to review and respond to the comments received on the current action before moving on to the next step of development. For example, it is unclear how the Copermittees would establish their water quality improvement strategies (step 2 of development) at the same time as the establishment of the priority water quality conditions and numeric goals (step 1 of development), however the timelines are concurrent in the Tentative Order.

It should also be noted that this approach appears to establish a heavy workload for the public, Copermittees, and Regional Board. We would submit that a more streamlined approach for the development of the WQIPs should be considered which would provide the Copermittees with the necessary time to develop the final WQIP without extending the overall timeframe. For example, instead of requiring a formal public notice and solicitation of comments by the Regional Board for all three (3) steps of each WQIP, perhaps the Copermittees can work with the local stakeholders to solicit comments for the first two steps of the development of the WQIP

and only require formal public noticing for the final approval of the WQIP. Although this is one approach to streamline the development of the WQIP and recommended by the County, an alternative approach would be to modify the timelines as indicated below.

In addition, it should be noted that the preparation of a regional WQIP may trigger local requirements under CEQA. This should be recognized in setting the timeline as noted within the table below.

A comparison of the current and recommended approach is provided in the table below.

Steps and Timelines	Existing Approach in Tentative Order	Total Time from Effective Date of Order	Recommended Approach (w/ edits provided in Tentative Order)	Total Time from Effective Date of Order
Establish Priority Water Quality Conditions and Numeric Goals	Within 6 months of commencement of coverage	6 months	Within 6 months of commencement of coverage	6 months
Request Public Comments	60 days from posting	8 months	30 days from posting	7 months
Revise Priority Water Quality Conditions and Numeric Goals	Not specified	? months	30 days from receiving comments	8 months
Establish Water Quality Improvement Strategies and Schedules	Within 9 months of commencement of coverage	9 months	Within 3 months of finalizing Priority Water Quality Conditions and Numeric Goals	11 months
Request Public Comments	60 days from posting	11 months	30 days with stakeholders	12 months
Revise Water Quality Improvement Strategies and Schedules	Not specified	? months	30 days from receiving comments	13 months
Develop WQIP	Within 18 months of commencement of coverage	18 months	Within 18 months of commencement of coverage	**18 months (this allows 5 months for the development of the document)**
Request Public Comments	30 days from posting	19 months	30 days from posting	19 months

If no hearing, Regional Board notify Copermittees that the WQIP is accepted	Within 6 months of the public request for comments	25 months	Within 6 months of the public request for comments	25 months
Finalize WQIP	Not specified	? months	60 days from receiving comments (this assumes that it is concurrent with the Regional Board notification above)	? months
Review for CEQA Requirements	*It should be noted that the preparation of a regional WQIP may trigger local requirements under CEQA. This should be recognized in setting the timeline. This would likely take 30-60 days.*			
Posting on Regional Clearinghouse	Within 30 days of acceptance by Regional Board	26 months	Within 30 days of acceptance by Regional Board	26 months

The County recommends the following language changes

F. Reporting
1. Water Quality Improvement Plans
a. Water Quality Improvement Plan Development
(1)(c) Within 6 months after the commencement of coverage under this Order, the Copermittees must develop and submit the Water Quality Improvement Plan requirements of Provision B.2 to the San Diego Water Board. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of ~~6~~30 days.
(1)(d) Within 30 days of receiving the public comments, the Copermittees must revise the priority water quality conditions and numeric goals based on comments received and/or recommendations or direction from the San Diego Water Board Executive Officer.

F. Reporting
1. Water Quality Improvement Plans
a. Water Quality Improvement Plan Development
(2)(b) Within 3 months after the development of the priority water quality conditions and numeric goals, ~~9 months after the commencement of coverage under this Order,~~ the Copermittees must develop and submit the Water Quality Improvement Plan requirements of Provision B.3 to the San Diego Water Board. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of ~~6~~30 days.
(2)(c) Within 30 days of receiving the public comments, the Copermittees must revise the water quality improvement strategies and schedules based on comments received and/or recommendations or direction from the San Diego Water Board Executive Officer.

F. Reporting
1. Water Quality Improvement Plans
b. Water Quality Improvement Plan Submittal

(2) Based on the comments received, the San Diego Water Board will determine whether to hold a public hearing or to limit public input to submittal of written comments. If no hearing is held the San Diego Water Board will notify the Copermittees within 6 months that the Water Quality Improvement Plan has been accepted as complete following its review and determination that the Water Quality Improvement Plan meets the requirements of this Order.
(3) Within 60 days of receiving comments, the Copermittees must revise the Water Quality Improvement Plan based on comments received and/or recommendations or direction from the San Diego Water Board Executive Officer.

(4)The Water Quality Improvement Plan must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of the finalization of the Water Quality Improvement Plan and acceptance by the San Diego Water Board.

F. Reporting
2. Updates
a. Jurisdictional Runoff Management Program Document Updates
(2)Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E no later than 6 ~~18~~ months after the completion of the corresponding Water Quality Improvement Plan and acceptance of the Water Quality Improvement Plan by the San Diego Water Board ~~commencement of coverage under this Order~~.
(3) Each Copermittee must submit updates to its jurisdictional runoff management program, with a rationale for the modifications, either in the Annual Report required pursuant to Provision F.3.b, and/or as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The requested updates are considered accepted by the San Diego Water Board if no response is provided to the Copermittee after 3 months of submitting the request.
(5) Updated jurisdictional runoff management program documents must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of ~~submitting the annual report~~ completing the updates.

F. Reporting
2. Updates
d. BMP Design Manual Updates
(2)Subsequent updates must be consistent with the requirements of Provisions E.3.a-d and must be submitted as part of the Annual Reports required pursuant to Provision F.3.b, and/or as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The requested updates are considered accepted by the San Diego Water Board if no response is provided to the Copermittee after 3 months of submitting the request.

59. Provision F.3 (Page 112 of 120) – The JRMP Annual Report Form Is Not Linked To The Watershed Priorities And Does Not Result In Meaningful Reporting

The Tentative Order states that the purpose of the reporting is to determine and document compliance with the Order and to communicate the implementation status of each jurisdictional runoff management program. This goal is met, in part, through the submittal of the Annual Reports (F.3.b), which includes a requirement for each Copermittee to submit a Jurisdictional Runoff Management Program (JRMP) Annual Report Form (Attachment D). The requirement for the Copermittees to submit Attachment D is problematic for the following reasons:

1. The Form is a significant departure from the current jurisdictional reporting and effectiveness assessment required pursuant to Order R9-2009-002 and will only focus on the *implementation* of the permit provisions instead of the *impact, effectiveness* and potential *modifications* necessary for the program.

2. The jurisdictional reporting should complement the WQIP reporting and be focused on the implementation, impact, and effectiveness assessment of the jurisdictional actions and activities that are being implemented to support the goals, objectives, and high priority water quality issues of the WQIP.

3. The ability of the Copermittees to be able to, on a jurisdictional basis, determine if there are modifications and/or improvements needed to maximize the JRMP and, ultimately, the WQIP effectiveness will be severely limited.

4. The reporting required pursuant to the Form is not linked to the priorities within the WQIP and, is therefore, additive and will require the Copermittees to develop the related data collection and reporting infrastructure without a commensurate benefit for the management of the programs.

5. The Form seems to restrict the reporting capabilities of the Copermittees and requires the compilation of cumbersome and uninformative numbers such as “number of existing developments in residential inventory” and “number of priority development projects in review”.

6. Although the Fact Sheet identifies Attachment D as an “example”, this is not clearly stated within the provisions. If the Copermittees can develop their own JRMP reporting form that would be aligned with the WQIP priorities and strategies, then this should be clarified within the Tentative Order.

As a result, it is unclear how this new reporting requirement will improve upon existing reporting processes and/or provide information that would inform management decisions at the jurisdictional or watershed scale. Allowing the Copermittees to develop their own jurisdictional reporting to support the overarching WQIP will still be consistent with the reporting requirements identified in 40CFR 122.42(c). The County is recommending that the jurisdictional reporting be aligned with the WQIP reporting and either delete Attachment D or make it optional.

The County recommends the following language changes:

F. Reporting
3. Progress Reporting
b. Annual Reports [add the following provision]
(1)(e) For each Water Quality Improvement Plan, the progress of implementing the corresponding Jurisdictional Urban Runoff Management Programs. Each Copermittee should report on the items listed below. The individual JRMP annual reports may be included as attachments to the corresponding WQIP annual report. The JRMP annual report should include, but not be limited to, the following:

(i) The water quality improvement strategies that were implemented and/or no longer implemented by each of the Copermittees during the reporting period and previous reporting periods, and are planned to be implemented during the next reporting period,

(ii) Proposed modifications to the water quality improvement strategies, with public input received and rationale for the proposed modifications,

(iii) Previously proposed modifications or updates incorporated into each Copermittee’s jurisdictional runoff management program document and implemented by the Copermittees in the Watershed Management Area, and

(iv) Proposed modifications or updates to each Copermittee’s jurisdictional runoff management program document;

(f) ~~A completed Jurisdictional Runoff Management Program Annual Report Form (Attachment D or accepted revision) for each Copermittee in the Watershed Management Area, certified by a~~

~~Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative.~~

F. Reporting
3. Progress Reporting
b. Annual Reports
(2) ~~Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (Attachment D or accepted revision) no later than October 31 of each year until the first Annual Report is required to be submitted~~. Until the Copermittees have updated their jurisdictional runoff management programs consistent with Provision F.2.a, the Copermittees must continue to utilize the current jurisdictional runoff management program annual reporting format. Each Copermittee must submit the information on the Jurisdictional Runoff Management Program Annual Report Form specific to the area within its jurisdiction in each Watershed Management Area.

F. Reporting
3. Progress Reporting
c. Regional Monitoring and Assessment Report

[This provision should be moved to section F.5.c since it is a part of the ROWD assessment]

Delete Attachment D or make it an "example" of what the Copermittees can prepare for each Watershed Management Area.

60. Provision F.3 (Page 112 of 120) – The Annual Reporting Section Should Be Modified To Distinguish Between The Reporting That Is Conducted During The Transitional Period And The Reporting That Is Conducted Afterward

The language in Provision F.3.b should be clarified to provide additional direction to the Copermittees regarding the transitional period annual reporting and the post-transitional annual reporting requirements.

The County recommends the following language changes:

F. Reporting
3. Progress Reporting
b. Annual Reports
(1) Transitional Period JRMP Reports: Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report no later than October 31 of each year prior to the implementation of updated JRMP programs pursuant to F.2.a. Each Copermittee must submit the information on the Jurisdictional Runoff Management Program specific to the area within its jurisdiction in each Watershed Management Area.

(2) Transitional Period Monitoring Report: The transitional period monitoring conducted pursuant to D.1.a and D.2.a. shall be reported in a single report that covers the entire reporting period from the initiation of the transitional period monitoring (as described in D.1.a and D.2.a.), through September 30th following approval of the Water Quality Improvement Plan. The Transitional Period Monitoring Report shall include the assessments required per D.4.a.(1)(a), D.4.b.(1)(a) and D.4.b.(2)(a); and be submitted by January 31st following completion of the above mentioned transitional period.

(3) Post-Transitional Annual Reports – Following the initial transitional period after enrollment into this Order, the Copermittees for each Watershed Management Area must submit a combined Annual Report for each reporting period no later than January 31 of the following year. The annual reporting period consists of two periods: 1) July 1 to June 30 of the following year for the jurisdictional runoff management programs, 2) October 1 to September 30 of the following year for the monitoring and assessment programs. ~~The first Annual Report must be prepared for the reporting period beginning July 1 after commencement of coverage under this Order, and upon San Diego Water Board determination that the Water Quality Improvement Plan meets the requirements of this Order to June 30 in the following year for the jurisdictional runoff management programs, and September 30 in the following year for the monitoring and assessment programs.~~ Annual Reports must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Each Annual Report must include the following:

61. Provision F.4 (Page 115 of 120) –The Copermittees Should Be Able To Define The Geographic Coverage Of And Utilize Established Web-Based Mechanisms As Their Regional Clearinghouse

The Tentative Order requires the Copermittees to develop, update, and maintain an internet-based Regional Clearinghouse, however it does not define what geographic area is covered by a Regional Clearinghouse or if the Copermittees can utilize their existing web-based systems and/or linkages that have been developed over the last four permit terms. The Copermittees should be able to define what geographic area is covered by the Regional Clearinghouse, which could include, but not be limited to, watershed management areas, County jurisdictions and/or the San Diego Regional Water Quality Control Board jurisdiction. In addition, the Copermittees should be able to utilize existing, established mechanisms and linkages, in whole or in part, as their Regional Clearinghouse so that they do not, necessarily, need to expend resources in developing new infrastructure.

The County recommends the following language changes:

F. Reporting
4. Regional Clearinghouse
The Copermittees must develop, update, and maintain an internet-based Regional Clearinghouse that is made available to the public no later than 18 months after the effective date of this Order. The Copermittees may elect to develop and maintain the clearinghouse(s) provided by other Copermittees or agencies.

Add a definition for "Regional Clearinghouse" in Attachment C

ATTACHMENT C
Acronyms, Abbreviations, and Definitions

62. Attachment C (Entire Attachment; Begins Page C-1) – Attachment C Should Clarify The Meaning Or Intent Of Specific Terms Used Within The Order

In addition to the acronyms and abbreviations, Attachment C also includes definitions that may provide an explanation or description of the meaning or intent of specific terms or phrases that are used within the Order. The County recommends the addition and/or modification of the following definitions in order to assist in describing the meaning or intent of these terms and to avoid unnecessary confusion.

The County recommends the following language changes:

This term did not have a definition.

Channel Rehabilitation and Improvement *– Remedial measures or activities for the purpose of improving the environmental health of streams, channels, or river systems. Techniques may vary from in-stream restoration techniques to off-line stormwater management practices installed in the system corridor or upland areas. Rehabilitation techniques may include, but are not limited to the following: riparian zone restoration, constructed wetlands, bank stabilization, channel modifications, and daylighting of drainage systems. Effectiveness may be measured in various manners, including: assessments of habitat, reduced streambank erosion, and/or restoration of water and sediment transport balance.*

This definition should remain consistent with the Federal regulations.

Copermittee *– A permittee to a NPDES permit that is only responsible for permit conditions relating to the discharge for which it is operator [40 CFR 122.26(b)(1)]. For the purposes of this Order, a Copermittee may include the following jurisdictions: a~~A~~n incorporated city within the County of Orange, County of Riverside, or County of San Diego in the San Diego Region, the County of Orange, the County of Riverside, the County of San Diego, the Orange County Flood Control District, the Riverside County Water Conservation and Flood Control District, the San Diego Regional Airport Authority, or the San Diego Unified Port District.*

This definition should provide additional clarification.

Illicit Connection *– Any man-made conveyance or drainage system through which the discharge of any pollutant to the stormwater drainage system occurs or may occur. ~~Any connection to the MS4 that conveys an illicit discharge.~~*

This definition should remain consistent with the Federal regulations.

Illicit Discharge *- Any discharge to a ~~the~~ municipal separate storm sewer ~~MS4~~ that is not composed entirely of storm water except discharges pursuant to a NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer) and discharges resulting from fire fighting activities [40 CFR 122.26(b)(2)].*

This definition should provide additional clarification for the purposes of low impact development.

Infiltration *– Water other than wastewater that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow [40 CFR 35.2005(20)]. In the context of low impact development, infiltration may also be defined as the percolation of water into the ground. Infiltration is often expressed as a rate (inches per hour), which is determined through an infiltration test.*

This term did not have a definition.

Progressive Enforcement *– A series of enforcement actions that increase in severity commensurate with the violation. Such enforcement actions may include verbal and written notices of violation, fines, stop work orders, administrative penalties, criminal penalties, etc.*

This definition should provide additional clarification.

Redevelopment *- The creation, addition, and or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include trenching and resurfacing associated with utility work; parking lots, resurfacing existing roadways; cutting and reconfiguring of surface parking lots; new sidewalk construction, pedestrian ramps, or bike lane on existing roads; and routine replacement of damaged pavement, such as pothole repair.*

This term did not have a definition.

Regional Clearinghouse *– A central location for the collection, classification, and distribution of information including, but not limited to, plans, reports, manuals, data, contact information, and/or links to such documents and information. The clearinghouse(s) may be organized by the following regions: Watershed Management Areas, County jurisdictions, and/or the San Diego Regional Water Quality Control Board jurisdiction.*

This definition should remain consistent with the Federal regulations.

Storm Water *– Per 40 CFR 122.26(b)(13), means storm water runoff, snowmelt runoff and surface runoff and drainage. ~~Surface runoff and drainage pertains to runoff and drainage resulting from precipitation events.~~*

This definition should remain consistent with the State regulations

Waters of the State *- Any ~~water,~~ surface water or groundwater ~~underground~~, including saline waters, within the boundaries of the s~~S~~tate [CWC section 13050 (e)]. The definition of the Waters of the State is broader than that for the Waters of the United States in that all water in the State is considered to be a Waters of the State ~~regardless of circumstances or condition~~.*

This term should clarify that a wet weather period should be preceded by a minimum dry weather period, unless defined differently in another regulatory mechanism.

Wet Weather – *Weather is considered wet if there is a storm event of 0.1 inches and greater ~~and the following~~ preceded by 72 hours of dry weather, unless otherwise defined by another regulatory mechanism, such as a TMDL.*

ATTACHMENT D
Jurisdictional Runoff Management Program Annual Report Form

63. Attachment D (Entire Attachment; Begins Page D-1) – The JRMP Annual Report Form Is Not Linked To The Watershed Priorities And Does Not Result In Meaningful Reporting

(See Comments on Provision F.3.b)

ATTACHMENT E
Specific Provisions for Total Maximum Daily Loads

64. Attachment E (Entire Attachment; Begins Page E-1) – Permit Provisions Must Be Consistent With The Corresponding Basin Plan Amendments (BPAs)

The Regional Board has adopted two Basin Plan Amendments (BPAs) to establish Total Maximum Daily Loads (TMDLs) where the Copermittees are identified as Responsible Parties and assigned wasteload allocations (WLAs): (1) Indicator Bacteria in Baby Beach in Dana Point Harbor[66] and (2) Indicator Bacteria, Project I - Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)[67] (Beaches and Creeks Bacteria TMDL).

However, there are several fundamental and substantive discrepancies between the adopted TMDL BPAs and the provisions of the Tentative Order. These inconsistencies negate the Basin Planning process that occurred to establish the TMDLs and clearly contradict the Board's intent for how the TMDLs would be incorporated into the MS4 Permit. As the TMDLs have been incorporated into the Basin Plan, the TMDLs constitute the "program of implementation needed for achieving water quality objectives"[68] and the provisions in the MS4 Permit must therefore be consistent with the Basin Plan.

For example:

- Both the Baby Beach and Beaches and Creeks TMDLs clearly establish mass-based wasteload allocations. These wasteload allocations are entirely absent from the Tentative Order (see additional comments below for further discussion). Instead, the Tentative Order establishes water quality based effluent limits (WQBELs) based upon an effluent concentration (set equal to the numeric targets).
- For the Beaches and Creeks TMDL, the Tentative Order is not consistent with the compliance schedule approach provided for the comprehensive load reduction plans (CLRPs) established in the BPA. The CLRPs that will be submitted by Copermittees will propose interim compliance dates, as allowed by the BPA, to meet the 50% reduction milestone for dry and wet weather. The CLRPs submitted by Copermittees may not all propose the same interim compliance dates and the Tentative Order should

[66] Resolution R9-2008-0027
[67] Resolution R9-2010-0001
[68] Water Code section 13050(j)

acknowledge the flexibility allowed by the TMDL[69]. In fact, this scheduling flexibility was a primary "incentive" for Copermittees to develop CLRPs instead of Bacteria Load Reduction Plans (BLRPs).

- For the Baby Beach TMDL, the BPA includes two paths for the implementation of the TMDL – one where the beach has been delisted from the 303(d) list and one where the beach remains impaired[70]. Where a beach has been delisted, the BPA requires that Responsible Copermittees monitor and continue implementation of existing implementation actions "to ensure REC-1 water quality objectives are maintained" (i.e., the beach is not placed back on the 303(d) list). Only if the beach is placed back on the 303(d), the NPDES permit is to be revised to include "requirements consistent with these TMDLs." As Baby Beach is not on the most recent 303(d) list for REC-1 bacteria objectives, the requirements for Responsible Copermittees must be limited to monitoring and implementation of existing implementation actions. The Tentative Order does not recognize the approach for delisted beaches or recognize that Baby Beach is delisted.
- For the Beaches and Creeks TMDL, the BPA clearly establishes that no additional actions are required for beaches that are delisted[71]. This language is not included in the Tentative Order.
- Monitoring requirements in the Tentative Order must be consistent with the requirements of the BPAs. Both the Baby Beach TMDL and the Beaches and Creeks TMDL provide certain flexibility in monitoring, via the BLRPs and CLRPs, respectively, and this flexibility is not captured in the Tentative Order.
- Both the Baby Beach TMDL and the Beaches and Creeks TMDL clearly acknowledges that exceedances in the receiving water may not be from the MS4 and contains specific compliance language to address such a situation. This language is not provided in the Tentative Order.

These examples are not exhaustive of the inconsistencies between the BPAs and the Tentative Order (additional inconsistencies are identified and modified language is proposed in **Attachment B**).

During the workshops on the Tentative Order, Regional Board members raised the question of feasibility of attaining the TMDLs. The Basin Plan Amendments included many considerations and requirements that cumulatively result in a more feasible program of implementation. If many of the requirements of the BPAs are modified or not included in the MS4 permit, such as the mass-based WLAs, flexible monitoring programs, no further action for delisted beaches, and reconsideration of the TMDLs through reopeners, the Tentative Order establishes requirements that are not only inconsistent with the BPAs, but that make attainment of the TMDLs infeasible.

*The County recommends that the Regional Board modify the requirements in Attachment E to establish provisions that are consistent with the adopted Basin Plan Amendments. Specific modifications to address these inconsistencies are provided in **Attachment B**. Certain key inconsistencies are noted in the subsequent comments below. Additional inconsistencies are also captured in the modifications detailed in **Attachment B**.*

[69] Page 68 of Attachment A of the Basin Plan Amendment
[70] See BPA pg. A-12
[71] See the Basin Plan Amendment, pgs. A2, A12, A66

65. Attachment E (Entire Attachment; Begins Page E-1) – The Tentative Order's Numeric WQBELs Violate the Requirements of Law Because They are Infeasible

The Tentative Order's numeric WQBELs are not feasible. The 2010 EPA Memorandum on TMDLs[72] recommends "where feasible, the NPDES permitting authority exercise its discretion to include numeric effluent limitations as necessary to meet water quality standards."[73] This position is based on 40 CFR §122.44(k), which authorizes the use of BMPs "when numeric limitations are infeasible." In 1991, the State Board concluded that "numeric effluent limitations are infeasible as a means of reducing pollutants in municipal storm water discharges, at least at this time."[74]

Although this determination was made over twenty years ago, the State Board's position on this issue has not changed since then, as evidenced by its adoption of the Caltrans MS4 permit in September of 2012. Citing the fact sheet for the Caltrans MS4 permit, the State Board affirmed that "it is not feasible at this time to set enforceable numeric effluent criteria for municipal BMPs and in particular urban discharges."[75]

The Caltrans MS4 permit's fact sheet also supports the use of BMP-based WQBELs as a means of meeting TMDLs and other quality standards. The Caltrans MS4 permit is also subject to TMDLs adopted by the Regional Board and USEPA. If this aspect of the Tentative Order is not corrected, Orange County MS4 Copermittees will be compelled to comply strictly with numeric WQBELs and receiving water limitations while Caltrans need only implement WQBEL BMPs to achieve compliance with the same TMDLs. This inconsistency lacks any justification.

66. Attachment E (Entire Attachment; Begins Page E-1) – The Tentative Order's WQBELs Were Improperly Formulated

The Tentative Order fails to provide adequate justification for incorporating numeric water quality based effluent limitations in the Tentative Order for each of the incorporated TMDLs to which they apply. A WQBEL is an enforceable translation in an MS4 permit for attaining compliance with a TMDL WLA, which serves to protect beneficial uses of a receiving water[76]. The Tentative Order fails to establish that an adequate requisite Reasonable Potential Analysis ("RPA") has been conducted.

The Tentative Order fails to establish if discharges from any individual permittee's MS4 have the reasonable potential to cause or contribute to an excursion above any "State water quality standard including State narrative criteria for water quality." Page 2 of the 2010 EPA Memo states:

[72] U.S. Environmental Protection Agency, Memorandum, *Revisions to the November 22, 2002 Memorandum "Establishing Total Maximum Daily Load (TMDL) Waste d Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs,"* (Nov. 12, 2010) (*2010 EPA Memo*).
[73] EPA Memo, p. 2 (emphasis added).
[74] State Water Resources Control Board Water Quality Order 91-03, page 49.
[75] Fact Sheet for NPDES Permit and Waste Discharges Requirements for State of California Department of Transportation, NPDES Permit No. CAS000003, Order No. 2012-0011-DWQ, September 7, 2012, page 9.
[76] 40 C.F.R. § 130.2.

> "Where the NPDES authority determines that MS4 discharges *have the reasonable potential to cause or contribute to a water quality excursion*, EPA recommends that, where feasible, the NPDES permitting authority exercise its discretion to include numeric effluent limitations as necessary to meet water quality standards."

There are two generally accepted approaches to conducting an RPA. According to USEPA guidance, "A permit writer can conduct a reasonable potential analysis using effluent and receiving water data and modeling techniques, as described above, or using a non-quantitative approach."[77]

Neither the administrative record nor the Tentative Order's fact sheet contains any evidence of that an RPA has been performed in accordance with the two foregoing approaches. Regarding the first approach, such an analysis would in any case have been impossible to perform given that no outfall (effluent) monitoring has been required for any prior Orange County MS4 permit. No modeling appears to have been conducted either.

Beyond this, federal regulations not only require that an RPA be performed to determine if an excursion above a water quality standard occurred, but also that the storm water discharge must be measured against an "allowable" ambient concentration[78].

A WQBEL is a means of attaining a TMDL WLA, a translation of a WLA into prescribed actions or limits which has in the past been typically expressed as a BMP. Before a WQBEL can be developed, however, a need for it must be established. As the Writers' Manual points out:

> The permit writer should always provide justification for the decision to require WQBELs in the permit fact sheet or statement of basis and must do so where required by federal and state regulations. *A thorough rationale is particularly important when the decision to include WQBELs is not based on an analysis of effluent data for the pollutant of concern*. NPDES Permit Writers' Manual, September 2010, page 6-23 (emphasis added).

No such rationale is provided in the Fact Sheet, which in the absence of effluent data derived from outfall monitoring, would have been absolutely necessary to justify the need for a numeric WQBEL.

Finally, the 2010 EPA Memo is clear that reliance on numerics should be coupled with the "disaggregation" of different storm water sources within permits. The Tentative Order fails to adequately disaggregate storm water sources within applicable TMDLs regarding numeric WQBELs and for receiving water limitations, further making the imposition of numeric standards inappropriate.

67. Attachment E (Entire Attachment; Begins Page E-1) – WQBELs Are Incorrect For Both Baby Beach Bacteria TMDL And Beaches And Creeks TMDLs As They Are Inconsistent With The WLAs

Federal regulations require that NPDES permits contain effluent limits consistent with the assumptions and requirements of all available WLAs[79]. As currently established in the

[77] NPDES Permit Writers' Manual, September 2010, page 6-23.
[78] 40 C.F.R. §122.44(d)(iii).
[79] 40 CFR 122.44(d)(1)(vii)(B)

Tentative Order, the WQBELs are not consistent with the WLAs and are therefore not consistent with federal regulations.

The Tentative Order establishes WQBELs based upon the numeric targets (set equal to water quality objectives), not the mass-based WLAs established by the TMDL. To justify this approach, the Fact Sheet states (emphasis added):

> *"Because **numeric targets** for TMDLs typically include a component that will be protective of water quality standards, a TMDL will likely include one or more numeric receiving water limitations and/or effluent limitations as part of the assumptions or requirements of the TMDL. **Any numeric receiving water limitations and/or effluent limitations developed as part of the assumptions or requirements of a TMDL must be incorporated and included as part of a WQBELs for the MS4s.**" Pg. F-38.*

However, federal regulations require that the WLAs, not the numeric targets, are incorporated into the Tentative Order. Further, federal regulations do not require that any receiving water limitation or effluent limitation developed as part of the TMDL must be incorporated. Rather, federal regulations require that the WQBELs are consistent with the assumptions and requirements of the WLAs.

40 CFR 122.44(d)(1)(vii)(B) states (emphasis added).

> *When developing water quality based effluent limits under this paragraph the permitting authority shall ensure that: (B) Effluent limits developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, **are consistent with the assumptions and requirements of any available wasteload allocation** for the discharge prepared by the State and approved by EPA pursuant to 40 CFR 130.7.*

While in most cases the numeric targets are a component of the allocations, there are numerous additional assumptions and requirements of the WLAs that are also a component of the WLAs. Wasteload allocations take into account various considerations, including the multiple sources of a pollutant, flow rates, critical conditions, and margin of safety. By only incorporating the numeric target component of the WLAs, the Tentative Order fails to include all of the other assumptions and requirements of the WLAs, which is required by federal regulations. Only incorporating the numeric targets negates the entire TMDL analysis and Basin Planning process. Otherwise, TMDLs would be as simple as assigning numeric effluent limitations to MS4 discharges equal to the numeric objectives in the Basin Plan, which is essentially what this Tentative Order is proposing to do, and which is explicitly contrary to the TMDLs that have been established in the Basin Plan.

In fact, simply defining the WQBELs as the numeric targets of the TMDL is contrary to the purpose of the Basin Plan itself, which not only requires the establishment of water quality objectives, but also the program of implementation needed to achieve the water quality objectives[80]. A TMDL, once incorporated into the Basin Plan, is exactly that – a program of implementation needed for achieving water quality objectives.

Per the Beaches and Creeks Bacteria TMDL BPA:

[80] See Water Code section 13050(j) and as stated in the Beaches and Creeks Bacteria TMDL (Resolution, Pg.2): "A "Water Quality Control Plan" or "Basin Plan" consists of a designation or establishment for the waters within a specified area of all of the following: (1) Beneficial uses to be protected, (2) Water quality objectives and (3) A program of implementation needed for achieving water quality objectives."

> *"TMDLs must be established at levels necessary to attain and maintain the applicable narrative and numerical water quality standards with seasonal variations and a margin of safety which takes into account any lack of knowledge between effluent limitations and water quality." – Resolution, Pg. 2*

Per the Baby Beach Bacteria TMDL BPA:

> *"The loading capacities are defined as the maximum amount of fecal coliform, total coliform and Enterococcus that the waterbody can receive and still attain water quality objectives necessary for the protection of designated beneficial uses. Each TMDL must accommodate all known sources of a pollutant, whether from natural background, nonpoint sources, or point sources, and must include a margin of safety (MOS) to preclude pollutant loading from exceeding the actual assimilative capacities of the waterbodies. The TMDL calculations also account for seasonal variations and critical conditions and were developed in a manner consistent with guidelines published by USEPA." – Resolution, Pg. 4*

In both the Baby Beach Bacteria TMDL and the Beaches and Creeks Bacteria TMDL, the WLAs clearly take into consideration factors other than the numeric targets, such as flow rates as the WLAs are expressed as mass-based limits. If it was the Regional Board's intent to establish a concentration-based TMDL, then the WLAs would be expressed as a concentration. However, by establishing mass-based WLAs, the TMDL purposefully and explicitly establishes WLAs that incorporate many other factors than just the concentrations of the numeric targets. Therefore, establishing WQBELs that fail to incorporate the mass-based WLAs fails to be consistent with all of the assumptions and requirements of the WLAs as well as failing to be consistent with the intent of the Basin Plan itself.

<u>Baby Beach Bacteria TMDL</u>

In addition to the universal issues identified above, there are additional concerns with the WQBELs specific to the Baby Beach Bacteria TMDL.

Of particular concern are the WQBELs established for wet weather for total coliform (TC) and fecal coliform (FC). The BPA establishes WLAs for those indicators based upon existing conditions as the loading capacity was determined to be greater than the current discharges and clearly states that no further reductions are necessary. The BPA states (pg. A-23)*:*

> *"According to Tables 7-26 and 7-27, no wet weather wasteload reductions are required for total and fecal coliform indicator bacteria. This means that according to the wet weather models for Baby Beach, REC-1 water quality objectives for total and fecal coliform indicator bacteria are not expected to be exceeded due to discharges from the MS4s. The only wet weather wasteload reductions required for MS4s discharging into the receiving waters along the shoreline at Baby Beach is for Enterococcus indicator bacteria.".*

These existing conditions WLAs were based upon a *load assessment, not a concentration assessment* (e.g., the numeric targets). The final compliance date for these WLAs was set equal to the effective date of the TMDL, given that the WLAs were set to existing conditions and no further reductions were required. Therefore, not only are the WLAs in the Tentative Order not incorporated properly as mass-based WQBELs, but the Copermittees are not provided any time to attain these new and inappropriately established concentration-based WQBELs as the effective date, and therefore final compliance date, was 2009.

Beaches and Creeks Bacteria TMDL

In addition to the universal issues identified above, there are additional concerns with the WQBELs specific to the Beaches and Creeks Bacteria TMDL.

Attachment E specifies WQBELs for dry weather flows as both receiving water and effluent limitations, in terms of zero allowable exceedances of the single sample maximum and the 30-day geometric mean. However, the dry weather component of the TMDL only considered the 30-day geometric mean and did not consider the single sample maximum within its calculation. Incorporating single sample effluent limitations into the Tentative Order goes beyond the TMDL requirements.

In addition, if the TMDL had included single sample limits, there would have been a corresponding allowable exceedance frequency, just as for wet weather. The 22% allowable exceedance rate for wet weather was based on a reference beach within the Los Angeles Region, and although not used in the technical approach for the San Diego Beaches and Creeks TMDL, the reference beach also exhibits exceedances during dry weather, which is incorporated into beach TMDLs in the Los Angeles region.

The County recommends that the Tentative Order is modified to be consistent with the assumptions and requirements of the WLAs by incorporating the WLAs into the Permit. See ***Attachment B*** *for the specific requested modifications.*

68. Attachment E (Entire Attachment; Begins Page E-1) – WQBELs Should Only Be Defined as Effluent Limitations

There is a significant legal distinction between the Receiving Water Limitations established in Provision A (Discharge Prohibitions) and the Receiving Water Limitations established as part of the WQBELs in Attachment E (TMDL provisions). As currently (inappropriately) defined, WQBELs include receiving water limitations based on the numeric targets (set equal to WQOs) and not based upon the WLAs.

Ensuring that MS4 discharges do not cause or contribute to exceedance of WQOs is already and more appropriately addressed via Provision A.2. When an exceedance occurs under Provision A (Discharge Prohibitions), there is the potential for enforcement action and the Regional Board has discretion with enforcement (e.g., issuing a Notice of Violation). However, where an exceedance occurs for a WQBEL, the Copermittees may be subject to Mandatory Minimum Penalties (MMPs) where the Regional Board does not have discretion.

As established in comments above, the WQBELs have been inappropriately defined to be based upon concentrations, not the mass-based WLAs. And ensuring that discharges do not cause or contribute to exceedances of WQOs is already addressed via Provision A.2. Therefore, the inclusion of concentration-based receiving water limitations in the definition of the WQBELs is inconsistent with the assumptions and requirements of the WLAs and unnecessarily exposes Copermittees to MMPs without any requisite change to the protection of water quality. Throughout the Beaches and Creeks Bacteria TMDL, the BPA consistently refers to attaining the numeric targets (e.g., the water quality objectives) via receiving water limitations. Therefore, establishing the mass-based WLAs as the WQBELs and the numeric targets as receiving water limitations, is consistent with federal regulations for the incorporation of WLAs and the BPA for establishing the receiving water limitations.

The WQBELs should be defined only as the mass-based effluent limitations, consistent with the WLAs in the BPAs. While the Copermittees prefer that the receiving water limitations are simply addressed with a cross-reference back to Provision A.2, if the Regional Board prefers to keep the receiving water limitations as part of the TMDL provisions, they must be distinct from and excluded from the definition of the WQBELs.

The County recommends that the Tentative Order is modified to be consistent with the assumptions and requirements of the WLAs by incorporating the WLAs into the Tentative Order and defining the WQBELs as equal to the WLAs. Receiving water limitations should be excluded from the definition of WQBELs as they are not part of the WLAs. See ***Attachment B*** *for the specific requested modifications.*

69. Attachment E (Entire Attachment; Begins Page E-1) – Compliance Determination For Final WQBELs Should Be Based On The Implementation Of BMPs And Not Numeric Effluent Limitations

For interim water quality-based effluent limitations and receiving water limitations, A BMP-based path to compliance is provided via the implementation of an approved Water Quality Improvement Plan[81]. The Copermittees greatly appreciate and support this approach as it acknowledges the inherent challenges unique to stormwater management and provides appropriate flexibility to implement the necessary BMPs. However, the same approach is not applied to the final WQBELs.

A. Regional Board has Discretion to Establish BMP-Based Compliance

State and federal law do not require the use of numeric effluent limitations for MS4 Copermittees, but rather encourage flexible implementation of best management practices through an iterative process. Specifically, the choice to include either management practices or numeric limitations in MS4 permits is within the regulatory agency's discretion.

Over the last decade, EPA has issued a succession of policy memoranda and guidance documents regarding the incorporation of TMDLs into stormwater permits, including:

1) *Guidance for Developing TMDLs in California* (EPA Region 9). January 7, 2000
2) *Establishing Total Maximum Daily Load (TMDL) WLAs for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs* (Wayland and Hanlon). November 22, 2002
3) *TMDLs to Stormwater Permit Handbook* (Draft) (EPA). November 2008
4) *Revision to the November 22, 2002 Memorandum "Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs"* (Hanlon and Keehner). November 12, 2010
5) Untitled Letter (Kevin Weiss). March 17, 2011

In each of these EPA documents, EPA allows for discretion on the part of the permitting authority in the use of numeric effluent limitations for stormwater or BMP-based effluent limitations. This flexibility is a key aspect of both Wayland and Hanlon (2002), and Hanlon and Keehner (2010).

[81] Attachment E.5.e.(1)(f)); Attachment E.6.e.(1)(f)

Further, it is important to note that the EPA documents did not identify any differences in how interim and final WQBELs may be addressed by effluent limitations. In particular, the guidance did not limit BMP-based effluent limitation approaches to interim WQBELs.

EPA guidance does emphasize that NPDES provisions implementing TMDLs be enforceable, objective, and measurable. The Hanlon and Keehner memorandum notes that while numeric effluent limitations provide this type of accountability, effluent limitations expressed as BMPs can include objective and measurable elements. Such measurable elements might include as noted on page 3 of Hanlon and Keehner (2010), *"schedule for BMP installation or level of BMP performance"* or *"numeric benchmarks for BMPs and associated monitoring protocols or specific protocols for estimating BMP effectiveness."*

The Tentative Order provides for enforceable, objective, and measurable provisions via the Water Quality Improvement Programs (WQIPs). Establishing an additional compliance path for the final WQBELs would therefore be consistent with the approach already provided in the Tentative Order for interim WQBELs as well as guidance issued by EPA over the last decade in numerous policy memoranda and guidance documents.

B. Compliance Mechanism Matters

The Regional Board has the opportunity to exercise discretion in drafting and approving the compliance language in the Order; however, if the Regional Board continues to opt for numeric effluent limitations for final WQBELs, the Regional Board will no longer have discretion for enforcement decisions during implementation of the Order as Copermittees may be subject to Mandatory Minimum Penalties (MMPs). Such a limit on discretion matters both to Copermittees and the Regional Board.

Take for example a watershed where a group of Copermittees implement a suite of BMPs designed to achieve the final WQBELs. The Copermittees work closely with Regional Board staff and non-governmental organizations in developing and implementing the plan. Implementation of the BMPs achieves a 90% reduction in bacteria loads and results in the delisting of the waterbody from the State's 303(d) list, yet the reductions do not attain the WQBELs. Another Permittee does little to nothing to address the TMDL and achieves no reductions in bacteria loads, the waterbody continues to be listed as impaired on the State's 303(d) list, and the WQBELs are not attained.

If numeric effluent limitations continue as the compliance mechanism for final WQBELs, both Copermittees (the group that achieved the 90% reduction and the Copermittee that did little to nothing) would equally be out of compliance with the Order and equally subject to MMPs. If a BMP-based compliance option is provided for final WQBELs, the Regional Board would have the ability to exercise discretion. The Regional Board could continue to work with the group or Copermittees that are successfully implementing actions and evaluate appropriate additional actions. For the Copermittee that did little to nothing, the Regional Board would still be able to take appropriate enforcement action.

BMP-Based Compliance is not a request to decrease accountability or the efforts of the Copermittees or the commitment to water quality, it is a request for the Regional Board to utilize its discretion to establish Permit provisions that will support and reward actions taken by Copermittees that are achieving the intended purposes of the TMDLs.

C. Consistent with Regional Board Approach to Enforcement

A BMP-based compliance mechanism for final WQBELs is consistent with the Regional Board's stated approach to enforcement (as noted in the BPA establishing the Indicator Bacteria TMDL for Baby Beach):

> *"Regional Board typically implements enforcement through an escalating series of actions to:*
>
> > *(1) assist cooperative dischargers in achieving compliance; (2) compel compliance for repeat violations and recalcitrant violators; and (3) provide a disincentive for noncompliance." Baby Beach Bacteria TMDL BPA, pg. A-20*

The Regional Board can structure the final WQBEL compliance options to achieve this escalating approach to enforcement. A BMP-based compliance option can be provided via the implementation of the WQIPs where discrete milestones and actions are identified. For Copermittees that do not implement the WQIPs, this compliance mechanism would no longer be an option and Copermittees would be compelled to comply via the other mechanisms (essentially, no discharge or numeric effluent limitations). Such an approach achieves all three of the escalating compliance approaches identified by the Regional Board in the Baby Beach Bacteria TMDL, while numeric effluent limitations remove the Regional Board's discretion and will require that the Board treat cooperative dischargers and recalcitrant violators equally.

D. Consistent with Basin Plan Amendments

Establishing a BMP-based compliance path is also consistent with the Basin Plan Amendments for both TMDLs.

Beaches and Creeks TMDL (pg. A-41):

> *"The San Diego Water Board will revise and re-issue the WDRs and NPDES requirements for Phase I MS4s to incorporate the following:*
>
> *WQBELs consistent with the requirements and assumptions of the Municipal MS4 WLAs. WQBELs may be expressed as numeric effluent limitations, when feasible, and/or as a BMP program of expanded or better-tailored BMPs."*

Baby Beach Bacteria TMDL (emphasis added):

> *BPA, pg. A-14: WQBELs consistent with the requirements and assumptions of the bacteria WLAs described in Tables [Insert table numbers] and a schedule of compliance applicable to the MS4 discharges into the impaired shoreline segments described in Tables [Insert table numbers].* ***At a minimum, WQBELs shall include a BMP program to attain the WLAs.***
>
> *BPA, pg. A-15: If the WQBELs consist of BMP programs, then the reporting requirements shall consist of annual progress reports on BMP planning, implementation, and effectiveness in attaining the WQOs in impaired shoreline segments, and annual water quality monitoring reports.*
>
> *BPA, pg. A-19: The BLRPs are the municipal dischargers' opportunity to propose methods for assessing compliance with WQBELs that implement TMDLs.*

Additionally, the compliance schedule[82] anticipates revisions to the TMDL after the final compliance date, potentially through the Natural Sources Exclusion Approach (NSEA). It is inconsistent with the assumptions and requirements of the BPA to require strict compliance via numeric effluent limitations at Year 10 when the TMDL explicitly anticipates revisions occurring after that final date. The intent from the BPA is to have 10 years of implementation, evaluate progress, and assess if additional regulatory options (such as the NSEA) are necessary and/or

[82] BPA, pg. A-24

warranted. This approach can only be accomplished if BMP-based compliance is provided as an option for the final WQBELs.

E. BMP-Based Compliance is Not a "Safe Harbor"

The concept of "safe harbor" implies that Copermittees are not being held accountable, the requirements are not enforceable, and Copermittees will not be obligated to implement actions to address the TMDLs. However, BMP-based compliance can be structured to provide strict accountability and enforceability and require concrete and specific actions to be implemented. In fact, EPA guidance does emphasize that NPDES provisions implementing TMDLs be enforceable, objective, and measurable. The Hanlon and Keehner memorandum notes that effluent limitations expressed as BMPs can include objective and measurable elements. Such measurable elements might include as noted on page 3 of Hanlon and Keehner (2010), *"schedule for BMP installation or level of BMP performance"* or *"numeric benchmarks for BMPs and associated monitoring protocols or specific protocols for estimating BMP effectiveness."*

Additionally, the concept of "safe harbor" was raised during the hearing for the recently adopted Los Angeles Region MS4 Permit. The Regional Board as well as Executive Officer of the Regional Board directly addressed the question if BMP-based compliance, via the implementation of a Watershed Management Program (equivalent to the WQIPs), constituted a "safe harbor." Both the Board and Executive Officer clearly stated that BMP-based compliance was not a "safe harbor" for the Copermittees and the Watershed Management Programs provided objective and measureable elements whereby Copermittees would be required to implement actions and would have clear accountability.

F. Numeric Effluent Limitations are Not Feasible

Finally, in Hanlon and Keehner (2010) (EPA's policy memorandum regarding incorporation of TMDLs into stormwater Permits), states "EPA recommends that, where feasible, the NPDES permitting authority **exercise its discretion** to include numeric effluent limitations as necessary to meet water quality standards." (emphasis added). This statement highlights the basic principle that the Regional Board has discretion in how the WLAs are incorporated into the MS4 Permit. Further, the concept of feasibility relates to *achieving* the numeric effluent limitations, not to *calculating* a numeric effluent limitation. As all TMDLs have numeric WLAs, it would be "feasible" for most all TMDLs, from the very first TMDL ever established, to utilize numeric effluent limitations if simply calculating a WQBEL was the intended definition. As Wayland and Hanlon (2002) (EPA's policy memorandum regarding incorporation of TMDLs into stormwater Permits) noted EPA "expects that most WQBELs for NPDES-regulated municipal and small construction storm water discharges will be in the form of BMPs, and that numeric limits will be used only in rare instances." Therefore, in EPA's policy memoranda, the concept of feasibility is not related to the ability to simply calculate the WQBELs. The concept of "feasibility" really relates to whether or not *achieving* a numeric effluent limitations are feasible for the stormwater permit.

The State Water Resources Control Board convened a Blue Ribbon Panel in 2006 to investigate this very question – are numeric effluent limitations feasible for stormwater permits? This panel of national experts ultimately concluded that numeric limits were generally infeasible across all three stormwater activities (municipal, industrial, and construction), with a few exceptions.[83]

[83] *The Feasibility of Numeric Effluent Limits Applicable to Discharges of Stormwater Associated with Municipal, Industrial and Construction Activities, June 19, 2006*.

Therefore, without providing the BMP-based compliance option for Copermittees, the Tentative Order directly contradicts the State Water Resources Control Board's finding regarding the feasibility of achieving numeric effluent limitations for municipal stormwater discharges.

The County recommends that the Regional Board exercise its discretion and establish a BMP-based compliance path for final WQBELs by adding the following provisions as Attachment E.5.e(2)(f) and as Attachment E.6.e.(2)(e):

> *"The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the final compliance requirements will be achieved by the final compliance dates. A Responsible Copermittee that does not implement its WQIP in accordance with the milestones and compliance schedules shall demonstrate compliance with the final WQBELs pursuant to Attachment E.5.e(2)(a - e)/Attachment E.6.e(2)(a-d)."*

70. Attachment E (Entire Attachment; Begins Page E-1) – An Explicit Re-Opener Provision Is Necessary

In both the Baby Beach TMDL and the Beaches and Creeks TMDL, the BPAs have included an implementation schedule that defines a point at which the TMDL will be reconsidered to incorporate new information and potentially modify targets, allocations and/or implementation requirements. The intent of the approach is clear in both BPAs:

- **Beaches and Creeks TMDL:** There is an entire section of the Basin Plan Amendment that details modifications to the TMDL through a future Basin Plan Amendment. The BPA specifically notes (BPA pg. A49):

  "As the implementation of these TMDLs progress, the San Diego Water Board recognizes that revisions to the Basin Plan may be necessary in the future."

- **Baby Beach TMDL:** The intent to reassess this TMDL is built directly into several sections of the implementation plan as well as the compliance schedule (emphasis added):

  - *"The San Diego Water Board recognizes that there are potential problems associated with using indicator bacteria WQOs to indicate the presence of human pathogens in receiving waters free of sewage discharges. The indicator bacteria WQOs were developed, in part, based on epidemiological studies in waters with sewage inputs. The risk of contracting a water-born illness from contact with urban runoff devoid of sewage, or human-source bacteria is not known. Some pathogens, such as giardia and cryptosporidium can be contracted from animal hosts. Likewise, domestic animals can pass on human pathogens through their feces.* ***These and other uncertainties need to be addressed through special studies and, as a result, revisions to the TMDLs may be appropriate****." – BPA, pg. A-22*
  - *"Ultimately, the San Diego Water Board supports the idea of measuring pathogens (the agents causing impairment of beneficial uses) or an acceptable alternative indicator, rather than indicator bacteria (surrogates for pathogens). However, as stated previously, indicator bacteria have been used to measure water quality historically because measurement of pathogens is both difficult and costly. The San Diego Water Board is supportive of any efforts by the scientific community to perform epidemiological studies and/or investigate the feasibility of measuring pathogens directly.* ***The San Diego Water Board further supports***

subsequent modification of WQOs as a result of such studies. Ultimately, TMDLs will be recalculated if WQOs are modified due to results from future studies*."- BPA, pg. A-23*

- Excerpt from Baby Beach Bacteria TMDL Compliance Schedule. Revisions to the TMDL are anticipated to occur in Year 10+ (after the final compliance date).

Table 1. Excerpt from Baby Beach Bacteria TMDL Compliance Schedule (BPA, pg. A-24). Revisions to the TMDL are anticipated to occur in Year 10+ (after the final compliance date).

Year (after OAL approval)	Required Wasteload Reduction	TMDL Compliance Action
10	100 percent *Enterococcus* reduction	• Water Quality Monitoring • Implement BMPs • Submit request for removal from 303(d) List • (if not requested and removed earlier)
10+	Same as above	• Water Quality Monitoring • Implement BMPs • **Submit request for TMDL revisions based on Natural Sources Exclusion Approach if supported by data (if not requested and recalculated earlier)** • Submit request for removal from 303(d) List (if not requested and removed earlier)

While the County is not advocating for technical revisions to the TMDL as part of the Tentative Order issuance (such revisions would appropriately occur through the Basin Plan Amendment process with any subsequent revisions incorporated into the Permit), there is a well documented level of uncertainty in the BPAs with the existing TMDLs where revisions to the targets, allocations, and implementation plans and schedules may be warranted. Such uncertainty should be incorporated into the provisions via an explicit re-opener in Provision H (Modifications of Programs) of the Tentative Order.

The explicit re-opener provision for the Tentative Order would serve two purposes:

- Provide a trigger to reconsider the compliance mechanism (BMP-based compliance in lieu of numeric effluent limits) prior to any compliance dates; and
- Ensure that the WQBELs are reconsidered, consistent with the intent of the TMDLs to revisit and revise as necessary the targets, allocations, and implementation actions prior to final compliance being required. This aspect is especially critical as the Beaches and Creeks re-opener would occur during this permit term (request must be made by Permittees by 2016) and the Baby Beach TMDL has final WQBELs compliance dates within the permit term (2014 and 2019).

While the County recognizes that the Regional Board has the authority to re-open the Permit at any time, the explicit re-opener captures the Regional Board's intent to revisit and revise as necessary the TMDL provisions, consistent with the assumption and requirements of the BPAs. Based upon the first year data summary for the on-going San Diego Regional Stream

Reference Study[84], such revisions may likely be warranted. The first year data show that during dry weather, the reference systems demonstrated a 34.1% exceedance rate of the single sample maximum and a 71% exceedance rate of the 30 day geometric mean for enterococci. The TMDL currently allows for a 0% exceedance rate during dry weather. During storm events, the reference systems had a 71% - 100% exceedance rate of the single sample maximum for enterococci. The TMDL currently only allows for a 22% exceedance rate during storm events. Providing the explicit reopener in the Permit will ensure that such compelling information, such as the results of the Reference Study, are considered prior to subjecting Copermittees to enforcement actions, such as Mandatory Minimum Penalties.

The explicit re-opener is consistent with the Regional Board's stated approach to enforcement, an escalating enforcement approach that contemplates "cooperative dischargers" as well as "recalcitrant violators." Lastly, such an approach was built into the recently adopted Los Angeles MS4 Permit[85].

The County recommends that an explicit Permit re-opener is provided, to capture the Regional Board's intent to revisit and revise as necessary the TMDL provisions prior to final compliance dates. The following additional language is requested as Provision H.6 and H.7:

> *H.6. Modifications of the Order shall be initiated to incorporate provisions as a result of future amendments to the Basin Plan, such as a new or revised water quality objectives or the adoption or reconsideration of a TMDL, including the program of implementation. As soon as practicable, but no later than 6 months of the effective date of a revised TMDL where the revisions warrant a change to the provisions of this Order, the Regional Water Board shall modify this Order consistent with the assumptions and requirements of the revised WLA(s), including the program of implementation.*
>
> *H.7. Modification to the Order shall be considered 18 months prior to the compliance date for final WQBELs where the compliance mechanism is based upon numeric effluent limitations. The intent of the reconsideration is to include provisions or modifications to WQBELs in Attachment E of this Order prior to the final compliance deadlines, if practicable, that would allow an action-based, BMP compliance demonstration approach with regard to final WQBELs.*

71. Attachment E (Entire Attachment; Begins Page E-1) – Compliance Mechanism Is Necessary Prior To Approval Of The Water Quality Improvement Plans

The Tentative Order currently provides for BMP-based compliance with interim WQBELs via the implementation of the WQIPs (Attachment E.5.e.(1)(f)); Attachment E.6.e.(1)(f)). However, as the BMP-based compliance mechanism is contingent upon implementation of an approved WQIP, the Copermittees are not provided with a BMP-based compliance mechanism during the development of the WQIPs. Without any modifications to the Tentative Order, the Copermittees would be subject to numeric effluent limitations for during WQIP development, then provided BMP-based compliance for interim WQBELs during WQIP implementation. Prior to the approval of the WQIPs, Copermittees should be provided a similar BMP-based compliance

[84]Southern California Coastal Water Research Project (SCCWRP). San Diego Regional Stream Reference Study, Monitoring Progress Report #3 and Year 1 Data Summary, October 2011 through November 2012. January 3, 2013.
[85] R4-2012-0175

mechanism while resources are devoted to plan development and the continuation with the implementation of the existing programs.

Recognizing that the shift to a watershed approach is an important and necessary shift in the management of stormwater, in the recently adopted Los Angeles MS4 Permit[86], such compliance was provided during the plan development phase.

The County recommends that the TO provide BMP-based compliance as a compliance option during the development of the WQIPs, the Copermittees request that the following provisions are added

- *Interim WQBELs Compliance (Attachment E.5.e(1) and Attachment E.6.e(1)):*

  Upon the effective date of this Order, a Copermittee's full compliance with all of the following requirements shall constitute a Copermittee's compliance with provisions pertaining to interim WQBELs with compliance deadlines occurring prior to approval of a WQIP.

  (1) Meets all interim and final deadlines for development of a WQIP,

  (3 Targets implementation of watershed control measures in its existing storm water management program, including watershed control measures to eliminate non-storm water discharges of pollutants through the MS4 to receiving waters, to address known contributions of pollutants from MS4 discharges that cause or contribute to the impairment(s) addressed by the TMDL(s), and

  (4) Receives final approval of its WQIP from the Regional Board.

- *If the Regional Board makes modifications to provide for a BMP-based compliance path for final WQBELs, the same revisions are requested to be added to Attachment E.5.e(2) and Attachment E.6.e(2).*

[86] R4-2012-0175

ATTACHMENT A

**ORANGE COUNTY LEGAL &TECHNICAL COMMENTS ON
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
TENTATIVE ORDER No. R9-2013-0001
NPDES NO. CAS0109266**

Appendix A-1

Regional Map

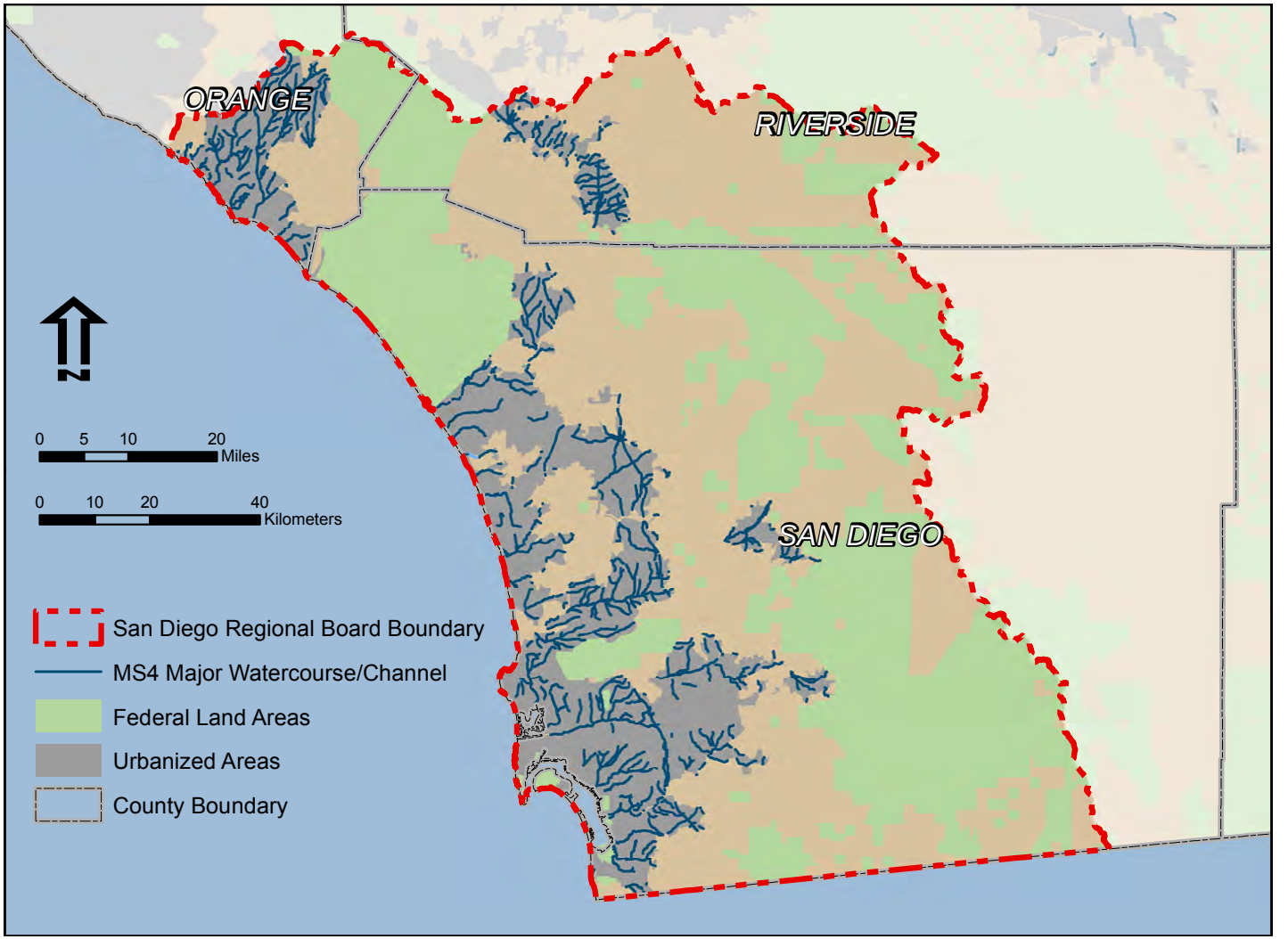
ORANGE
RIVERSIDE
SAN DIEGO
N
0 5 10 20
Miles
0 10 20 40
Kilometers
San Diego Regional Board Boundary
MS4 Major Watercourse/Channel
Federal Land Areas
Urbanized Areas
County Boundary

ATTACHMENT A

**ORANGE COUNTY LEGAL &TECHNICAL COMMENTS ON
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
TENTATIVE ORDER No. R9-2013-0001
NPDES NO. CAS0109266**

Appendix A-2

SCCWRP Report

April 10 and 11, 2013 010322
Item No. 8
Supporting Document No. 5

HYDROMODIFICATION ASSESSMENT AND MANAGEMENT IN CALIFORNIA

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SCCWRP Established 1969

UCLA Institute of the Environment and Sustainability
UCLA La Kretz Center for California Conservation Science

BREN SCHOOL OF ENVIRONMENTAL SCIENCE & MANAGEMENT
UNIVERSITY OF CALIFORNIA SANTA BARBARA

Colorado State University

cbec eco engineering

THE UNIVERSITY OF CALIFORNIA 1868

CALIFORNIA Water Boards
STATE WATER RESOURCES CONTROL BOARD
REGIONAL WATER QUALITY CONTROL BOARDS

Southern California Coastal Water Research Project

Technical Report 667 - April 2012

Hydromodification Assessment and Management in California

Commissioned and Sponsored by California State Water Resources Control Board Stormwater Program

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April 2012

Technical Report 667

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EXECUTIVE SUMMARY

Most jurisdictions in California are now required to address the effects of *hydromodification* through either a municipal stormwater permit or the statewide construction general permit. Hydromodification is generally defined as changes in channel form associated with alterations in flow and sediment due to past or proposed future land-use alteration. Hydromodification management has emerged as a prominent issue because degradation of the physical structure of a channel is often indicative of and associated with broader impacts to many beneficial uses, including water supply, water quality, habitat, and public safety. Conversely, reducing hydromodification and its effects has the potential to protect and restore those same beneficial uses. Although hydromodification has the potential to affect all water body types, this document focuses on assessing and managing effects to streams because they are the most prevalent, widely studied, and arguably most responsive type of receiving water.

Hydromodification by definition results from alteration of watershed processes; therefore, correcting the root causes of hydromodification ought to be most effective if based on integrated watershed-scale solutions. To date, such a watershed approach has not been adopted in California; most hydromodification management plans simply consist of site-based runoff control with narrow, local objectives and little coordination between projects within a watershed. Furthermore, each municipality is required to develop its own approach to meeting hydromodification management requirements rather than drawing from standard or recommended approaches that facilitate regional or watershed-scale integration. Long-term reversal of hydromodification effects, however, will require movement away from reliance on such site-based approaches to more integrated watershed-based strategies.

This document has two goals, and hence two audiences. The first goal is to describe the elements of effective hydromodification assessment, management and monitoring. The audience for this goal is primarily the State and Regional Water Boards, since meeting this goal will require integration of watershed and site-scale activities that are likely beyond the responsibility or control of any individual municipality. Success will require fundamental changes in the regulatory and management approach to hydromodification that will likely advance only iteratively and potentially require one or more NPDES permit cycles to fully implement. The second goal of this document is to provide near-term technical assistance for implementing current and pending hydromodification management requirements. This goal can be achieved by municipalities within the construct of existing programs and therefore the primary audience for this aspect of the document is local jurisdictions. Achieving this goal will facilitate greater consistency and effectiveness between hydromodification management strategies, giving them a stronger basis in current scientific understanding.

Watershed analysis should be the foundation of all hydromodification management plans (Figure ES-1). This analysis should begin with a documentation of watershed characteristics and processes, and past, current, and expected future land uses. The analysis should lead to identification of existing opportunities and constraints that can be used to help prioritize areas of greater concern, areas of restoration potential, infrastructure constraints, and pathways for potential cumulative effects. The combination of watershed and site-based analyses should be used to establish clear objectives to guide management actions. These objectives should articulate desired and reasonable physical and biological

conditions for various reaches or portions of the watershed and should prioritize areas for protection, restoration, or management. Strategies to achieve these objectives should be customized based on consideration of current and expected future channel and watershed conditions. A one-size-fits-all approach should be avoided. Even where site-based control measures, such as flow-control basins, are judged appropriate, their location and design standards should be determined in the context of the watershed analysis.

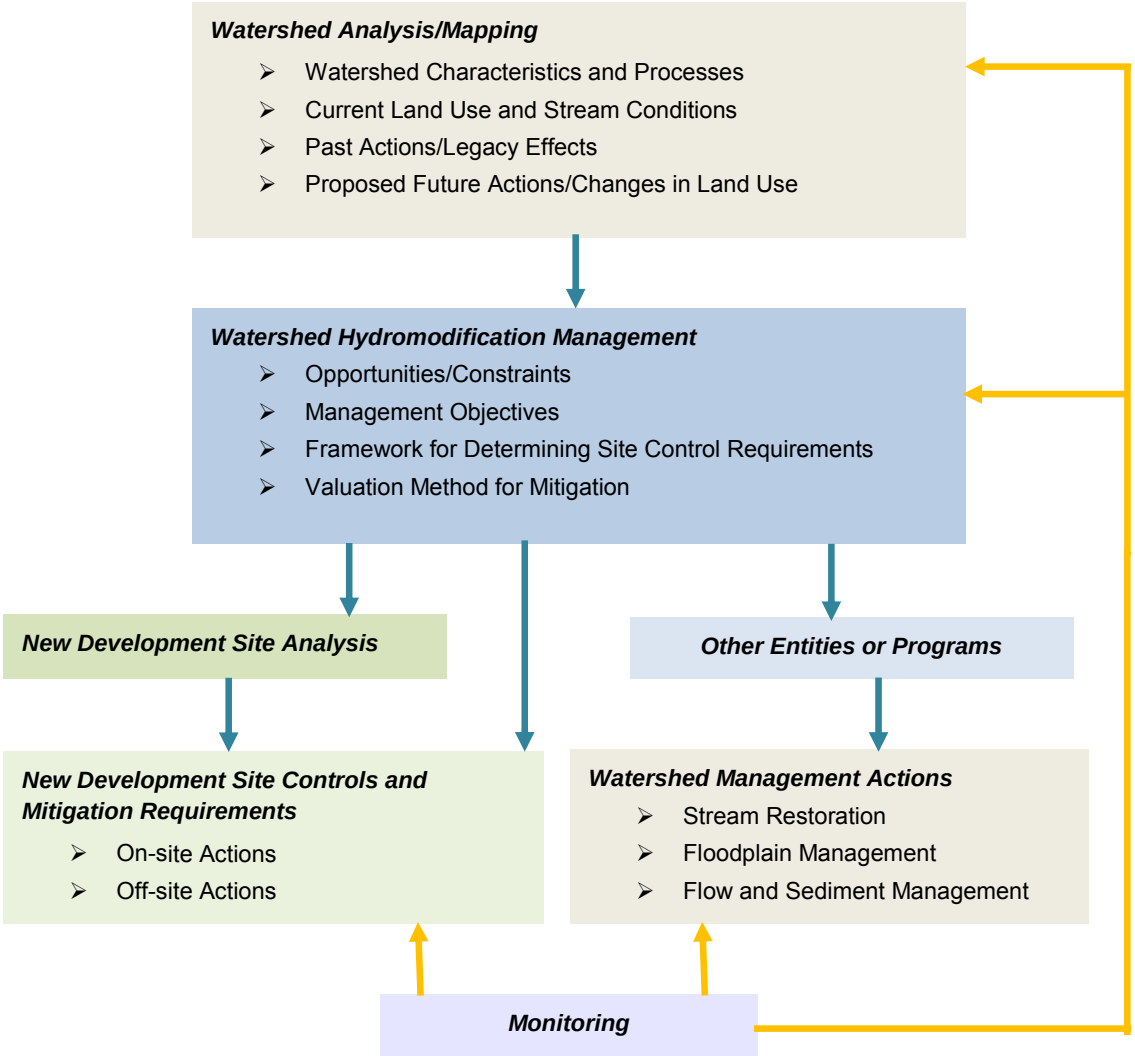

Figure ES-1. Framework for Integrated Hydromodification Management.

An effective management program will likely include combinations of on-site measures (e.g., low-impact development techniques, flow-control basins), in-stream measures (e.g., stream habitat restoration), floodplain and riparian zone actions, and off-site measures. Off-site measures may include compensatory mitigation measures at upstream locations that are designed to help restore and manage flow and sediment yield in the watershed.

Project-specific analysis and design requirements should vary depending on location, discharge point, and size. The range of efforts may include:

- Application of scalable, standardized designs for flow control based on site-specific soil type and drainage design. The assumptions used to develop these scalable designs should be conservative, to account for loss of sediment and uncertainties in the analysis and our understanding of stream impacts.
- Use of an erosion potential metric, based on long-term flow duration analysis and in-stream hydraulic calculations. Guidelines should specify stream reaches where in-stream controls would and would not be allowed to augment on-site flow control.
- Implementation of more detailed hydraulic modeling for projects of significant size or that discharge to reaches of special concern to understand the interaction of sediment supply and flow changes.
- Analysis of the water-balance for projects discharging into streams with sensitive habitat. This may include establishment of requirements for matching metrics such as number of days with flow based on the needs of species present.

Achieving these goals will require that hydromodification management strategies operate across programs beyond those typically regulated by NPDES/MS4 requirements. Successful strategies will need to be developed, coordinated, and implemented through land-use planning, habitat management and restoration, and regulatory programs. Regulatory coordination should include programs administered by the Water Boards, such as non-point source runoff control, Section 401 Water Quality Certifications and Waste Discharge Requirement programs, and traditional stormwater management programs. It should also include other agency programs, such as the Department of Fish and Game Streambed Alteration Program and the Corps of Engineers Section 404 Wetland Regulatory Program. Thus, all levels of the regulatory framework—federal, state, and local—will need to participate in developing and implementing such a program. The integrated watershed-based approach will likely take one or more permit cycles (i.e., at least ten years) to fully implement.

Short- and long-term recommendations for management are summarized in Table ES-1 below.

Table ES-1. Recommendations for implementing watershed-based hydromodification management.

Time Frame	Programmatic: State and Regional Water Boards	Local: City and County Jurisdictions
Short-term (<10 years)	• Establish consistent standards for HMPs • Promote use of watershed approaches in HMPs to move away from reliance on project-based management actions • Develop a valuation method to determine appropriate off-site mitigation • Transition to a broader set of monitoring endpoints including flow, geomorphology, and biology	• Implement watershed analysis of opportunities and constraints related to hydromodification • Implement a broader set of tools to improve on-site management actions • Develop institutional capacity to oversee and review modeling and assessment tools • Develop capacity for information/data management and dissemination
Long-term (1+ decades)	• Develop watershed-based regulatory programs and policies for hydromodification management • Integrate hydromodification management needs into other regulatory programs (e.g. TMDL, 401/WDR)	• Develop institution capacity to implement watershed-based hydromodification programs • Incorporate hydromodification and other water quality management into the land use planning process

To successfully accomplish these various recommendations for implementation, both agencies and private-sector practitioners will need to make use of a range of analytical tools. Such tools generally fall into three categories: descriptive tools, mechanistic models, and empirical/statistical models. Models may be used deterministically and/or in a probabilistic manner. These different types of tools can be selected or combined, depending on the specific objective, such as characterizing stream condition, predicting response, establishing criteria / requirements, or evaluating the effectiveness of management actions. Selection of tools should also consider the type of output, intensity of resource requirements (i.e., data, time, cost), and the extent to which uncertainty is explicitly addressed. It is important to note that deterministic modeling without accompanying probabilistic analysis may mask the uncertainties inherent in predicting hydromodification effects. Short-term and long-term recommendations for the application and improvement of tools to support the management framework are shown in Table ES-2.

Although there is sufficient scientific and engineering understanding of hydromodification causes and effects to begin implementing more effective management approaches now, improvements should be informed and adapted based on subsequent monitoring data. To be useful, monitoring programs should be designed to answer questions and test hypotheses that are implicit in the choice of management actions, such that practices that prove effective can be emphasized in the future (and those that prove ineffective can be abandoned). The focus of monitoring efforts, however, needs to be tailored to the time frame of the questions being addressed and the implementing agency (Table ES-3), reflecting the dual goals and audiences of this document.

Table ES-2. Recommendations for the application and improvement of tools in support of the proposed management framework.

Time Frame	Programmatic: State and Regional Water Boards	Local: City and County Jurisdictions
Short-term (<10 years)	• Develop quality control and standardization for continuous simulation modeling • Perform additional testing and demonstration of probabilistic modeling for geomorphic response • Pursue development of biologically- and physically-based compliance endpoints	• Work cooperatively with adjacent jurisdictions to implement hydromodification risk mapping at the watershed scale • Implement continuous simulation modeling for project impact analysis
Long-term (1+ decades)	• Improve tools for sediment analysis and develop tools for sediment mitigation design • Develop tools for biological response prediction • Improve tools for geomorphic response prediction	• Expand use of probabilistic and statistical modeling for geomorphic response • Apply biological tools for predicting and evaluating waterbody condition

Table ES–3. Recommendations for hydromodification monitoring.

Time Frame	Programmatic: State and Regional Water Boards	Local: City and County Jurisdictions
Short-term (<10 years)	• Define the watershed context for local monitoring (at coarse scale) • Evaluate whether permit requirements are making positive improvements	• Evaluate whether specific projects/ regulations are meeting objectives • Identify the highest priority action(s) to take
Long-term (1+ decades)	• Define watershed context and setting benchmarks for local-scale monitoring (i.e., greater precision, if/as needed) • Demonstrate how permit requirements can improve receiving-water "health," state-wide (and change those requirements, as needed)	• Evaluate and demonstrate whether actions (on-site, instream, and watershed scale) are improving receiving-water conditions • Assess program cost-effectiveness • Identify any critical areas for resource protection

Identifying and, ultimately, achieving the desired conditions in receiving waters requires multiple lines of evidence to characterize condition in an integrative fashion. At their most comprehensive, the chosen metrics should include measures of flow, geomorphic condition, chemistry, and biotic integrity. Biological criteria are key to integrative assessment: in general, biological criteria are more closely related to the designated uses of waterbodies than are physical or chemical measurements. This understanding is reflected in the State's proposed bio-objectives policy, which includes explicit links to hydromodification management.

In summary, transitioning from the current site-based to a more effective watershed-based approach to hydromodification management that addresses both legacy and future impacts will require cooperation between the State and Regional Water Boards and local jurisdictions. Both technical and regulatory/program approaches will need to be updated or revised altogether over the next several permit cycles to realize this long-term goal. Substantial resources will be necessary to realize these goals; therefore, opportunities for joint funding and leveraging of resource should be vigorously pursued from the onset. This cooperative approach should replace the current fragmented efforts among regions and jurisdictions.

1. Overview and Intended Uses of the Document

1.1 Overall Objectives and Intended Audience

Regulation and management of hydromodification is in its infancy in California. As with any new endeavor, initial attempts to meet this need is unproven, inconsistent, and relatively narrow in focus. To improve on existing efforts, the State Water Resources Control Board (SWRCB) has engaged a team of experts to provide technical support to both regulators and permittees for development of Hydromodification Management Plans (HMPs) and their associated permit requirements. This resulting document has two goals and hence two audiences.

The first goal of this document is to provide broad perspectives on what would constitute effective hydromodification assessment, management and monitoring, based on our current best scientific understanding of the topic. The audience for this goal is primarily the State and Regional Water Boards, since meeting this goal will require integration of watershed and site-scale activities that are likely beyond the control or responsibility of any individual municipality. Success will require fundamental changes in the regulatory and management approach to hydromodification that will likely be possible only iteratively and potentially requiring one or more NPDES permit cycles to fully implement. The State and Regional Water Boards will need to provide leadership in implementing these changes, but they will also need to work cooperatively with permittees so that planning, management and monitoring programs can be adapted to operate in a more integrated manner over the broader spatial scales and longer time frames that are necessary to achieve genuine success. Furthermore, hydromodification management plans will need to address preexisting conditions from previous (i.e., legacy) land uses. Clearly, addressing such past effects will require approaches beyond regulation of new development.

This document provides broad perspectives on what would constitute effective hydromodification assessment, management and monitoring, based on our current best scientific understanding of the topic. The document also provides near-term technical assistance for implementing current and pending hydromodification management requirements.

The second goal of this document is to provide near-term technical assistance for implementing current and pending hydromodification management requirements. This goal can be achieved by municipalities within the construct of existing programs, and therefore the primary audience for this aspect of the document is MS4 permittees. Achieving this goal will facilitate greater consistency and effectiveness between HMPs, giving them a stronger basis in current scientific understanding, and will also serve as initial steps toward realizing the broader goal stated above.

1.2 Rationale and Justification

The process of urbanization has the potential to affect stream courses by altering watershed hydrology and geomorphic processes. Development and redevelopment can increase impervious surfaces on formerly undeveloped landscapes and reduce the capacity of remaining pervious surfaces to capture and infiltrate rainfall. The most immediate result is that as a watershed develops, a larger percentage of

rainfall becomes surface runoff during any given storm. In addition, runoff reaches the stream channel much more efficiently, so that the peak discharge rates for floods are higher for an equivalent rainfall than they were prior to development. This process has been termed hydromodification. In some instances, direct channel alteration such as construction of dams and channel armoring has also been termed "hydromodification." Such direct alterations are not the focus of this document. Rather, this document focuses on the geomorphic and biological changes associated with changes in land use in the contributing watershed, which in turn alter patterns and rates of runoff and sediment yield. These changes can result in adverse impacts to channel form, stream habitat, surface water quality, and water supply that can alter habitat and threaten infrastructure, homes, and businesses.

The State and Regional Water Boards have recognized the need to manage and control the effects of hydromodification in order to protect beneficial uses in streams and other receiving water bodies. This recognition has led to the inclusion of requirements for development of "hydromodification management plans" (HMPs) in many Phase 1 and some Phase 2 Municipal Stormwater (MS4) permits. Most HMPs require the permitted municipalities to develop programs and policies to assess the potential effects of hydromodification associated with new development and redevelopment, to require the inclusion of management measures to control the impacts of hydromodification, and to develop monitoring programs to assess the effectiveness of HMP implementation at controlling and/or mitigating the impacts of hydromodification.

Development of HMPs is challenging for several reasons. First, there are few accepted approaches for assessing the impacts of hydromodification. Traditional modeling tools are generally untested and may be difficult to apply or inappropriate for use in some California watersheds and streams. Responses of streams to hydromodification are difficult to assess, given inherent climatic variability and the highly stochastic nature of rainfall and the resulting response of streams to runoff events. There are few local examples or case studies from which to draw experiences or conclusions.

As a result of these challenges, individual HMPs to date have utilized a variety of approaches with little coordination or consistency between them. Little information is available on the relative efficacy of any of these approaches. Furthermore, where approaches and tools developed for HMPs in one region of the State (or even from a different region of the country altogether) have been used in subsequent HMPs elsewhere, there has been little or no consideration of the effect of regional climatological or physiographical differences on the transferability of analytical techniques and tools.

1.3 Need for an Expanded Approach

Current site-based hydromodification management approaches are limited in their ability to address the underlying processes that are responsible for most deleterious impacts of hydromodification. Hydromodification effects, by definition, are watershed-dependent processes that are influenced by water and sediment discharge, movement, and storage patterns that may be occurring up- or downstream of a specific project site. Ideally, then, the first step of any hydromodification management plan (HMP) should be a watershed analysis; management of processes at the site or project scale should be done only in the context of such a watershed analysis. Understanding larger-scale processes

facilitates prioritization of activities in areas of greatest need and allows for management measures to be located where they have the largest potential benefit, even if that is not on or adjacent to the project site where the current impact is occurring. It also allows for expansion of site based management beyond simple flow control and/or channel stabilization toward strategies that consider flow, sediment, and biological conditions as an integrated set of desired endpoints.

Because watershed boundaries are often not the same as geopolitical boundaries of cities or counties, incorporation of watershed analysis will require leadership from the State and Regional Water Boards. Changes to the current regulatory structure may be necessary to accommodate inter-jurisdictional cooperation and regional information sharing. Similarly, program implementation by both large and small municipalities must include mechanisms that allow site-specific decisions to be informed by watershed-scale analysis.

This document is intended to help address some of these challenges and needs by providing technical recommendations, both to state and regional program developers and to local implementing agencies, for assessment, modeling, development of management strategies, and monitoring. This document can support current HMP development and, at the same time, serve as a first step toward achieving the longer term goals of more integrated, watershed-based hydromodification management.

Current site-based approaches are limited in their ability to address the underlying processes that are responsible for hydromodification impacts.

Effective management of hydromodification will require coordinated approaches across programs at the watershed scale that address all aspects of runoff, sediment generation and storage, instream habitat, and floodplain management.

Adopting this broader approach means that managing the effects of hydromodification cannot be the purview of the stormwater (MS4) program alone. Effective management of hydromodification will require coordinated approaches across programs at the watershed scale that address all aspects of runoff, sediment generation and storage, instream habitat, and floodplain management. Various SWRCB programs have the opportunity and ability to contribute to the goals of comprehensive hydromodification management, including the non-point source control program, water quality certifications, waste discharge requirements, basin planning, SWAMP, and the emerging State Wetland Policy and Freshwater Bio-objectives program. Each of these programs can take advantage of the tools and approaches outlined in this paper to contribute to coordinated management of hydromodification in order to protect beneficial uses and meet basin plan objectives. Furthermore, successful control and mitigation of hydromodification effects will support other programs by improving water quality, enhancing groundwater recharge, and protecting habitat. Therefore, hydromodification management can be a unifying element of many programs and support integrated regional watershed planning.

It is important to note that hydromodification has the potential to affect all water body types; therefore, HMPs should address potential effects to all streams and receiving waters. Because streams are most directly affected by hydromodification, they have been the focus of current regulatory requirements and, therefore, most HMPs. Consequently, this document emphasizes tools and approaches applicable

to fluvial systems, which are broadly defined to include wadeable streams, large rivers, headwater streams, intermittent and ephemeral drainages, and alluvial fans (although new specific tools may be necessary for assessment and management of alluvial fans). We recognize, however, that hydromodification can also affect nearshore and coastal environments, including bays, harbors, and estuaries, by altering estuary channel structure, water quality, sand delivery, siltation, and salinity. These effects have been less extensively studied or documented and have received substantially less attention in current hydromodification requirements. Future efforts should more directly address hydromodification effects to all receiving waters, but the information is not presently available to provide equally comprehensive guidance here.

1.4 Scope and Organization

This document is not intended to be prescriptive or to serve as a "cookbook" for development of hydromodification management strategies. Rather, it is a resource to evaluate the utility of existing tools and approaches, and it proposes a framework for integrating multiple approaches for more comprehensive assessment and management. This framework should be used to aid in the development of HMPs that are appropriate for specific regions and settings and take advantage of the best available science. It can also be used to improve consistency in assessment and monitoring approaches so that information collected across regions and programs can be compiled and leveraged to provide more comprehensive assessments of the effectiveness of management actions. Ultimately, such consistency should improve the effectiveness of all programs.

The authors, a team of technical experts, developed the content for this document in consultation with agency staff and regulated entities. The document begins with a brief general discussion of the effects of hydromodification and stream response mechanisms, providing the best available science to support subsequent recommendations. The main body of the document focuses on presenting a proposed new management paradigm where site-based management is nested within an overall watershed assessment that accounts for past, current, and proposed future land use. The body of the document also includes a discussion of existing tools and how they can be used more effectively and appropriately to evaluate potential impacts and guide decisions on selection and design of management practices. The third major section of the document focuses on monitoring that includes evaluation of hydrologic, geomorphic, and biologic conditions with an overriding goal of adaptive management. The document concludes with several technical appendices that offer specific guidance on the appropriate application of tools and models within the existing HMP approaches, and a bibliography of resources.

2. HYDROMODIFICATION SCIENCE

2.1 Introduction

Land-use changes can alter a wide variety of watershed processes, including site water balance, surface and near-surface runoff, groundwater recharge, and sediment delivery and transport. Although alteration to these watershed processes (referred to collectively as hydromodification) can affect many elements of a landscape, the focus of this document is on impacts to stream systems. Furthermore, while this paper will often refer to urbanization, it is recognized that other types of land-use changes (grazing, agricultural, forestry, etc.) can have similar impacts. This section reviews relevant hydrologic processes and summarizes the impact of urbanization on hydrologic, biologic, and geomorphic systems, and it describes our current understanding of the physical mechanisms underlying these impacts. This provides a foundation for establishing assessment tools and predictive models, as well as for developing management and monitoring programs.

Although not addressed by this report, urbanization also has a range of effects on water quality (*Heaney and Huber* 1984, *Brabec et al.* 2002) by increasing pollutant loads (*Owe et al.* 1982), increasing nutrient loads (*Wanielista and Yousef* 1993, *Hubertz and Cahoon* 1999), and diluting dissolved minerals through increased runoff and decreased infiltration and soil contact (*Loucaides et al.* 2007). As a result of both its physical and chemical effects, urbanization also affects the integrity of biota (*Heaney and Huber* 1984) including fishes (*Klein* 1979, *Weaver and Garman* 1994, *Wang et al.* 2000) and invertebrates (*Sonneman et al.* 2001, *Wang and Kanehl* 2003). These impacts are acknowledged and evaluated in the discussion of monitoring Section 4, but the details of their interactions and effects are not otherwise addressed here.

Land-use changes can alter a wide variety of watershed processes, including site water balance, surface and near-surface runoff, groundwater recharge, and sediment delivery and transport. Alteration to these watershed processes are referred to collectively as hydromodification.

2.2 Hydrology Overview

To understand the effects of urbanization, the basic processes of the hydrologic system must be highlighted. A watershed's drainage system consists of all the features of the landscape that water flows over or through (*Booth* 1991). These features include vegetation, soil, underlying bedrock, and stream channels. Urban elements such as roofs, gutters, storm sewers, culverts, pipes, impervious surfaces such as parking lots and roads, and cleared and compacted surfaces fundamentally change the rate and character of hydrologic processes. Generally, the hydrologic changes associated with development and urbanization increases the speed and efficiency with which water enters and moves through the drainage system. In undeveloped watersheds, only a portion of the precipitation that falls ever enters the stream channel. Instead, precipitation may be: 1) evaporated off the ground surface or intercepted by vegetation and evaporated; 2) transpired from the soil; or 3) infiltrated deeply into regional aquifers. For the portion of precipitation that ultimately enters the stream, the rate and processes of delivery vary between watersheds, with important implications for how urbanization will affect runoff.

Flow can be classified as stormflow (or "quickflow") if it enters the stream channel within a day or two of rainfall (*Dunne and Leopold* 1978). Quickflow occurs through 1) infiltration excess (also called "Horton") overland flow, wherever rainfall intensity exceeds the infiltration capacity of the soil and water flows over the ground surface; 2) saturation excess overland flow, where overland flow occurs following filling of all pore space in surface soils; 3) shallow subsurface flow, where water flows relatively quickly through permeable shallow soils (but still more slowly than either Horton or saturation overland flow); and 4) precipitation directly into stream channels. Conversely, water that infiltrates more deeply is classified as delayed flow, because it travels slowly as deep groundwater and emerges into a stream slowly over time.

As a storm progresses, runoff patterns and rates can change, even within the same catchment. For example, surficial soils may become saturated during the course of a storm (or a storm season) as the water table rises, and this can induce a shift in runoff from shallow (or even deep) subsurface flow to the quickflow process of saturation excess overland flow (*Booth* 1991). Even under scenarios in which rainfall intensity exceeds infiltration capacity, Horton overland flow will not be connected to stream channels until surface depressions are filled.

2.3 Impacts of Urbanization

The archetypal model of development involves clearing vegetation; grading, removing, and compacting soils; building roads and stormwater sewers; constructing buildings; and re-landscaping. The specific ways in which these activities alter runoff processes are discussed below. Development may also directly alter stream, such as through channel straightening, levee construction, and flood control reservoirs; however, discussion of the impacts of these alterations is beyond the scope of this document.

2.3.1 Decreased Interception

When rainfall occurs in a watershed, some of the precipitation will be intercepted by vegetation and leaf litter and prevented from entering the stream channel network (Figure 2-1). The percentage of precipitation that can be intercepted varies according to cover type and the character of rainfall (rainfall intensity, storm duration, storm frequency, evaporation conditions) (*Dunne and Leopold* 1978). The effectiveness of interception decreases as a storm progresses because once the surface area of a tree is completely wetted, water will drip off leaves and run down the vegetation as stem flow. Typically, 10-35% of precipitation is intercepted by trees and 5-20% by crops, though these amounts vary widely (*Dunne and Leopold* 1978, *Xiao and McPherson* 2002, *Reid and Lewis* 2009, *Miralles et al.* 2010). In urban environments where vegetative cover is greatly reduced, landscape-scale interception may be lower by an order of magnitude (*Xiao and McPherson* 2002). Precipitation that is not intercepted enters the drainage system. Thus, the mere reduction in interception in urban areas may produce the hydrologic equivalent of a storm that is 10-30% larger.

Figure 2-1. Vegetation reduces runoff by intercepting a portion of the total rainfall and preventing water from entering the drainage system. (Illustration by Jennifer Natali).

The influence of urbanization on climate is complex and varied. For example, urbanization has been shown to increase temperature (*Kalnay and Cai* 2003), increase or decrease wind speeds (*Oke* 1978, *Balling and Brazel* 1987, *Grimmond* 2007), increase pan-evaporation rates (*Balling and Brazel* 1987), and increase shading of the ground surface (*Kalnay and Cai* 2003). In most studies of urban hydrology, the dynamics of evapotranspiration (ET) are typically, explicitly or implicitly, ignored (*Grimmond and Oke* 1999). This exclusion exists because of the widespread assumption that urban ET is negligible compared to rural areas with higher proportions of vegetation-covered soils (*Chandler* 1976, *Oke* 1979). In cases such as urban deforestation in the temperate Eastern United States, it is appropriate to assume a net loss of ET due to urbanization (*Bosch and Hewlett* 1982, *Sun et al.* 2005, *Roy et al.* 2009). However, spatial variability and the site-specific dynamics of climate, vegetation, and land-use should be considered carefully in arid and semi-arid regions where vegetation is limited prior to development. In drier climates (including much of southern California), primary productivity (and ET) may be substantially increased through the irrigation of urban landscaping (*Buyantuyev and Wu* 2008).

2.3.2 Decreased Infiltration

Infiltration in urban areas is decreased due to several factors: impermeable surfaces such as roads, parking lots, and roofs prevent infiltration by blocking water from reaching soils; heavy-equipment construction operations cause soil compaction and degrade soil structures; construction projects may remove surface soils and expose subsurface soils with poorer infiltration capacity; vegetation-clearing and bare-earth construction increase erosion and loss of topsoil (*Pitt et al.* 2008). The effect of impervious surfaces is intuitive, visible, and dramatic (*Booth and Jackson* 1997), but not all impervious areas affect runoff processes equally. For example, if an impervious surface is built over clayey soils with poor infiltration, the overall runoff rates will be less affected than if built over sandy soils with high natural infiltration rates. While the loss of pervious area has received substantial attention within scientific and policy communities, until recent years considerably less attention has been paid to the effects of compaction and the reductions in infiltration capacity of soils (*Pitt et al.* 2008). Commonly, an area of green is assumed to be permeable, but playing fields and even ornamental lawns may have very

low infiltration capacities (*Pitt et al.* 2008). A study of urban runoff in Washington found that impervious areas generated only 20% more runoff than what appeared to be green, pervious areas of lawns (*Wigmosta et al.* 1994). Factors such as excavation and lawn-establishment methods appear to be more significant for infiltration than any other factor including grain size of the original sediments (*Hamilton and Waddington* 1999). Tillage may increase infiltration slightly, while compost or peat soil amendments can increase infiltration by 29 to 50 percent (*Kolsti et al.* 1995).

2.3.3 Increased Connectivity and Efficiency of the Drainage System

Rainfall in urban areas moves quickly as overland flow into storm sewers and the stream channel network (Figure 2-2). The delivery of precipitation into urban stream channels is extremely efficient, transforming essentially all precipitation into stormflow and creating nearly instantaneous runoff. Under natural conditions, in contrast, most runoff to streams is via groundwater paths that typically flow at least one or two orders of magnitude slower than surface water. Thus converting subsurface flow into surface stormflow has dramatic consequences. Furthermore, artificial surfaces such as roofs, pavement, and storm sewers are 1) straight, which shortens the travel distance required for delivery into the channel network; and 2) smooth, which decreases friction and allows flow to travel more quickly than in natural channels (*Hollis* 1975). Storm sewer systems increase the density of "channels," which further shortens runoff travel distances (Figure 2-3). In particular, upland regions that may not have had any surface channels prior to urbanization are frequently fitted with storm sewers, which dramatically increase delivery efficiency into the channel network (*Roy et al.* 2009). In sum, urbanization transforms watershed processes and flow paths that were once slow, circuitous, and disconnected into engineered and non-engineered systems that are highly efficient, direct, and connected.

In contrast to the slow measured runoff to natural streams by surface and subsurface pathways, the delivery of precipitation into urban stream channels is extremely efficient, transforming essentially all precipitation into stormflow and creating nearly instantaneous runoff.

2.3.4 Decreased Infiltration into Stream Beds

Concreting of bed and banks, channel narrowing, and channel straightening limit infiltration from a stream into the ground. Concrete channel margins create infiltration barriers, while channel narrowing and straightening limit the surface area accessible for infiltration and also create a less complex channel. Channel complexity such as pools, riffles, steps, and debris dams create hydraulics that slow flow velocities and also divert water into the subsurface (*Lautz et al.* 2005). In arid and semi-arid watersheds where streams may flow only occasionally, infiltration through bed, banks, and floodplain areas may significantly lower peak flows and may sustain aquifers vital to regional water supplies and natural habitats (*Kresan* 1988, *Dahan et al.* 2008). Increasing recognition is being paid in the scientific literature to the infiltration services provided by natural channels and floodplains (*Macheleidt et al.* 2006, *Schubert* 2006).

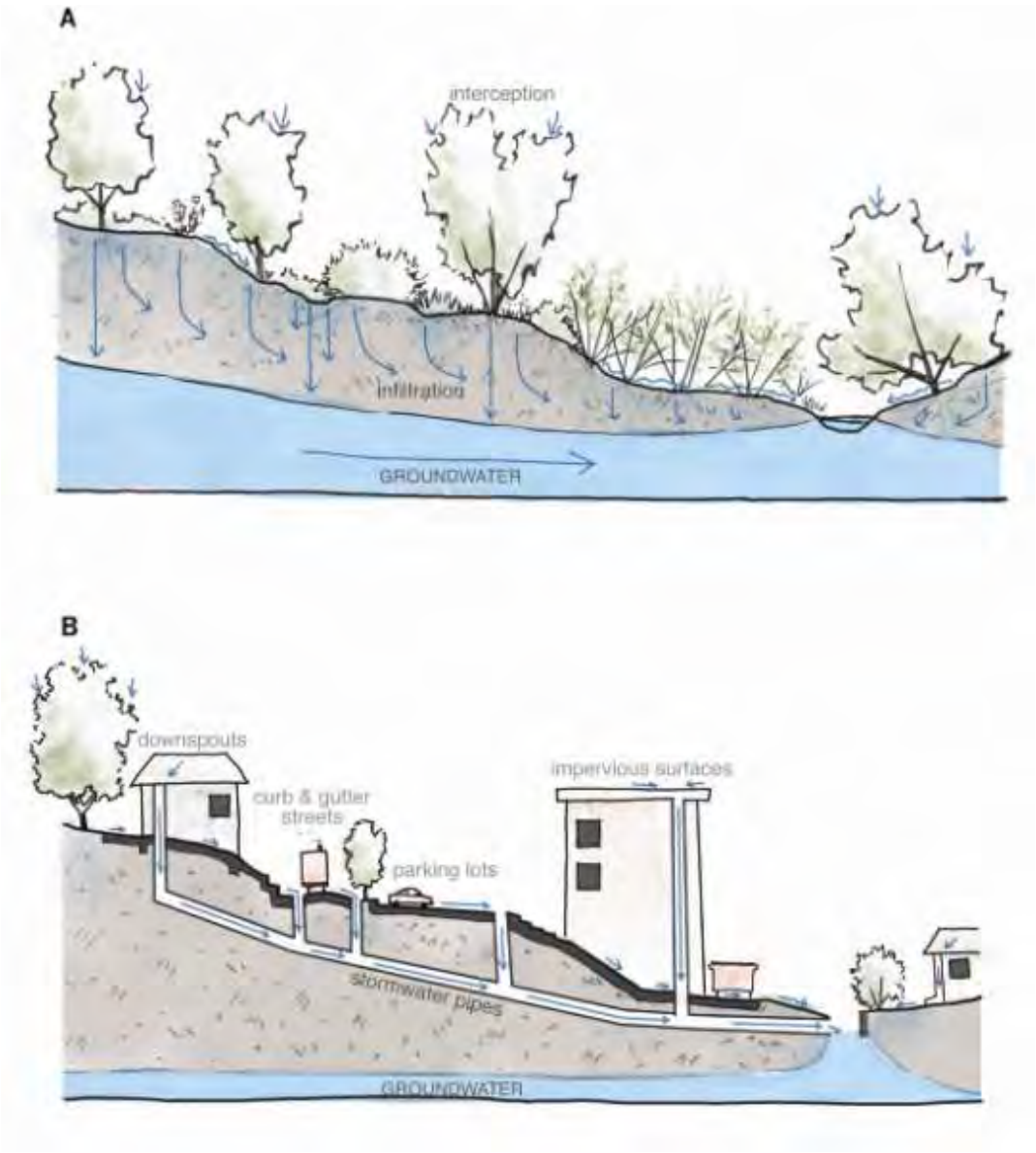

Figure 2-2. Stormwater flowpaths are shortened and quickened through paving, building, soil compaction, and sewer infrastructure. The rapid concentration of streamflow increases storm peaks. Rapid runoff and reduced infiltration prevent groundwater recharge. (Illustration by Jennifer Natali).

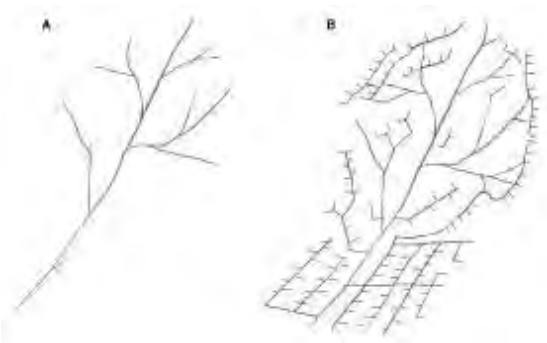

Figure 2-3. Increased surface runoff causes an extension of the channel network. This occurs through increased channel erosion or through constructed networks (to manage increased surface flow). The expanded channel network delivers runoff to downstream reaches much more efficiently. (Illustration by Jennifer Natali).

2.4 Changes in Instream Flow

The instream flow changes resulting from urbanization depend upon site-specific watershed and development characteristics, but typically they include modification of the timing, frequency, magnitude, and duration of both stormflows and baseflow. Urbanization has been shown to increase the magnitude of stormflows, increase the frequency of flood events, decrease the lag time to peak flow, and quicken the flow recession (Figure 2-4; *Hollis* 1975, *Konrad and Booth* 2005, *Walsh et al.* 2005). Because the effects of urbanization manifest differently for different components of the hydrograph, the hydrologic alterations of moderate storms, large storms, and baseflow are discussed individually below.

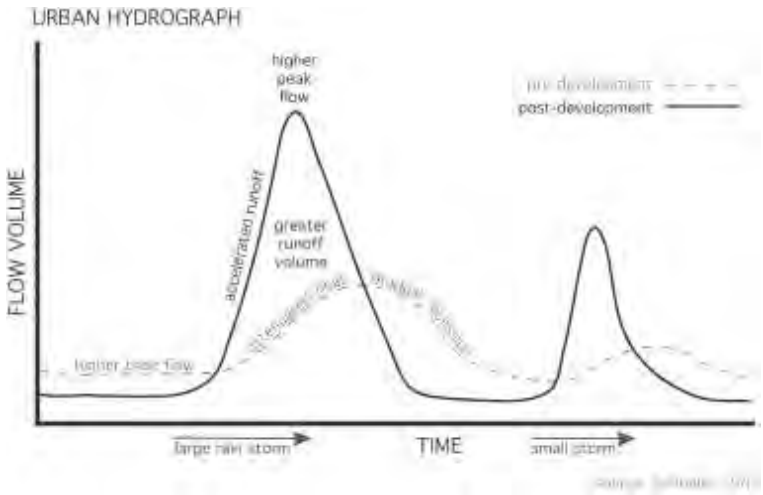

Figure 2-4. Increased runoff efficiency causes higher magnitude peak flows, shorter duration runoff events, decreased baseflow, and dramatic increases in small storms that may have generated little or no runoff under pre-development conditions. (Illustration by Jennifer Natali).

2.4.1 Moderate Stormflow

Urbanization of a watershed can drastically increase the frequency and magnitude of small and moderate flow events (Hawley and Bledsoe 2011). The magnitude of flow amplification increases generally in proportion to the amount of impervious area (*Leopold* 1968, *Hollis* 1975). For example, flows with a return period of one year or longer were shown to be unaffected by paving 5% of the watershed, yet the magnitude of a one-year flow could be more than ten times higher when 20% of a watershed is paved (*Hollis* 1975). In undeveloped watersheds, small storms may not generate any overland flow or streamflow increase at all, because interception, infiltration, soil absorption, and evapotranspiration contain all the precipitation.

Urbanization of a watershed can drastically increase the frequency, duration, and magnitude of small and moderate flow events by factors of 10 or more.

The change to a flashier regime with larger magnitude streamflow generated from small and moderate storms has two primary consequences. First, the stream power and sediment-transport capacity of the stream increase significantly, potentially creating channel erosion and/or stressing instream biota. Second, the season of stormflow is likely to be extended. In undeveloped watersheds, early or late-season storms typically do not generate significant runoff because soils are dry, can effectively absorb most precipitation, and therefore do not generate overland flow or streamflow. Antecedent moisture conditions are less important in urban watersheds where overland flow is generated regardless, and streamflow is generated by even a small storm in a dry watershed. Through magnifying small and moderate storms, urbanization may increase the duration of sediment-transporting and habitat-disturbing flows by factors of 10 or more (*Booth* 1991, *Booth and Jackson* 1997).

2.4.2 Large, Infrequent Storms

In large storms with return intervals of 10 or more years, the influence of urbanization is less pronounced though still present. Whereas a 1-year stormflow may be increased by ten times by paving 20% of the watershed, historical data from humid-region watersheds suggest that the peak magnitude of a 100-year flood would not even be doubled (*Hollis* 1975). The diminishing influence of urbanization on floods of higher recurrence intervals is understood by recognizing that the hydrologic processes of large storms resemble the processes of urban runoff. Essentially, a 100-yr flood is an event that is long in duration, severe in intensity, and likely occurs when soils are already wet. Even in an undeveloped watershed, a storm of this magnitude can typically generate (saturation) overland flow and transport water efficiently into the channel network in a manner more generally comparable to an urban setting.

2.4.3 Baseflow

Urbanization does not affect instream baseflows consistently. Many studies have documented baseflow reductions and/or lowered groundwater levels that have been attributed to decreased infiltration (*Simmons and Reynolds* 1982, *Ferguson and Suckling* 1990) and groundwater extraction (*Postel* 2000). In extreme cases, baseflow in urban watersheds can disappear completely during drought years, dry

seasons, or even between storm events during the wet season. The effect of reducing infiltration may be counteracted in urban and suburban landscapes, however, through irrigation of lawns, parks, golf courses, and other water inputs such as septic systems, leaky pipes, and sewage treatment outflow which typically import water from outside the watershed and contribute to both streamflow and groundwater recharge (*Konrad and Booth* 2005, *Walsh et al.* 2005, *Roy et al.* 2009). Indeed, imported water volumes in very dense cities may be an order of magnitude greater than precipitation. Lerner (2002) judged that leakage in water importation and delivery infrastructure typically ranges from 20-50%, and in general this leakage will increase groundwater recharge in urban areas. Similarly, other studies have found municipal irrigation capable of raising groundwater levels and causing surface flooding (*Rushton and Al-Othman* 1994) and changing ephemeral streams into perennial streams (*Rubin and Hecht* 2006, *Roy et al.* 2009). In summary, the magnitude and direction baseflow and groundwater recharge alteration depends on climate, land use, water use, and the infrastructure system of the watershed. There are no simple "rules."

2.5 Changes in Sediment Yield

The role of watershed sediment yield in the behavior of watersheds was first characterized systematically by Wolman (1967) in a three-part conceptual framework of how rivers respond to urban development, in which 1) pre-development quasi-equilibrium conditions are followed by 2) a period of active construction involving grading, vegetation removal, and bare earth exposed to erosion; and 3) the establishment of an urban landscape consisting of pavement, houses, gutters and sewers etc. The construction period is marked by an increase in sediment (typically 2-10 times pre-development rates) produced from bare surfaces and the disturbances associated with construction (*Chin* 2006). The sediment produced during construction is often deposited within stream channels, initiating aggradation and/or channel widening. Following the construction period, sediment production decreases (Figure 2-5) and runoff increases, resulting in increased transport capacity and the potential for severe channel erosion that can result in channel enlargement of commonly 2-3 (and as much as 15) times the original channel cross-section (*Chin* 2006). Changes in post-construction sediment production rates are not well studied, though case studies have found sediment yields in post-construction watersheds to be somewhat higher than rural, undeveloped basins.

The combination of increased runoff and decreased sediment production can result in channel enlargement of commonly 2-3 (and as much as 15) times the original channel cross-section.

Post-construction sediment loads are typically derived from channel enlargement as a result of increased peak flows and the legacy of construction-phase disturbance (*Trimble* 1997, *Nelson and Booth* 2002). The rate of decline in post-construction sediment yields is therefore predominantly controlled by the degree of channel instability caused by the construction phase and the effect of increased peak flows. If the channel margins are armored, densely vegetated, or otherwise erosion resistant, sediment yields may decline quickly following urbanization. If channel instability ensues, elevated sediment yields may persist for decades or more.

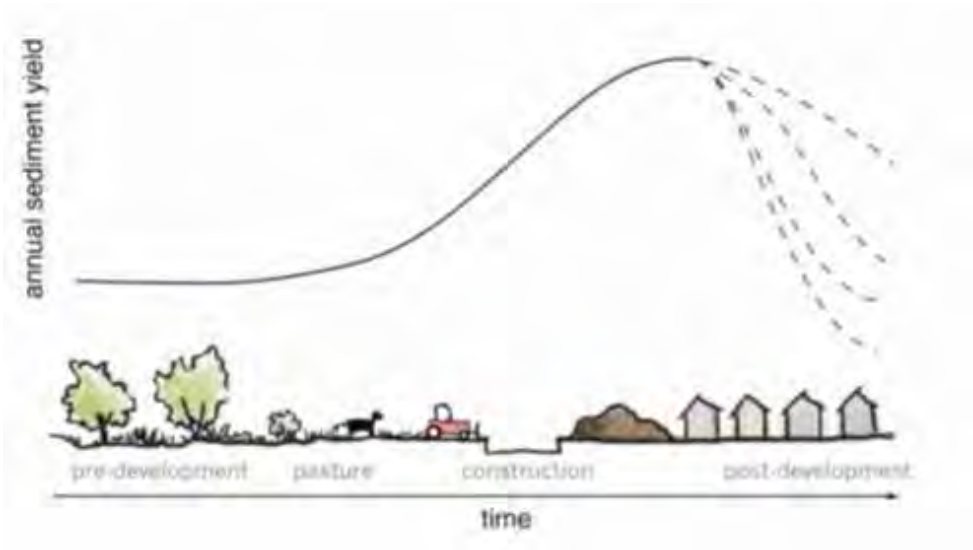

Figure 2-5. Increased sediment yields occur during the land-clearing and construction phases of development. Post-construction sediment yields decrease, though the rate of decrease varies considerably depending on the degree of channel instability caused by the construction phase and by increased runoff. (Illustration by Jennifer Natali).

2.6 Impacts on Channel Form and Stability

Channel form and stability reflect both hydrologic and geomorphic processes. Changes to runoff characteristics and sediment supply can affect all aspects of stream morphology, including planform, cross-sectional geometry, longitudinal profile, bed topography (e.g., pools, riffles), and bed sediment size and mobility. While many factors influence the type and degree of impacts (discussed below), a suite of commonly observed morphological changes due to hydromodification include channel enlargement (incision and widening), decreased bank stability, increased local sediment yield from eroding reaches, overall simplification of stream habitat features such as pools and riffles, changes in bed substrate conditions, loss of connectivity between channel and floodplain (*Segura and Booth* 2010), and changes in sediment delivery to coastal waters (*Jacobson et al.* 2001). Impacts may also propagate upstream as headcuts resulting from reductions in base level due to excess erosion. Likewise, tributaries entering downstream of a developed area may also experience the upstream propagation of headcuts due to base level reductions of the mainstem.

In addition to Jacobson *et al.* (2001), two well-researched literature reviews of morphological impacts (as well impacts to riparian habitat and biota) can be found in: "Impacts of Impervious Cover on Aquatic Systems" by The Center for Watershed Protection (2003) and "Physical Effects of Wet Weather Flows on Aquatic Habitats: Present Knowledge and Research Needs" published by Water Environment Research Foundation (*Roesner and Bledsoe* 2003). Note that these two studies differ significantly in how they

synthesize and interpret the reviewed literature, and the CWP publication acknowledges that it does not necessarily apply to streams in the arid west.

2.6.1 Physical Principles Underlying Channel Impacts

A convenient conceptual framework for the physical impacts of hydromodification on stream morphology is "Lane's Balance" (*Lane* 1955; Figure 2-6). This framework encapsulates a fundamental (albeit qualitative) relationship between the hydrologic and geomorphic processes that balance water flow and sediment in a channel. It expresses the condition of sediment transport capacity, as controlled by water discharge and slope, in broad balance with the supplied load and size of bed sediment for a channel in equilibrium. An increase in streamflow or a decrease in sediment supply (for example) will typically initiate a corresponding decrease in slope and/or increase in grain size in order to reestablish equilibrium. That decrease in slope is expressed by channel incision or degradation. In contrast, an increase in sediment supply or decrease in streamflow will typically result in aggradation and a corresponding increase in slope.

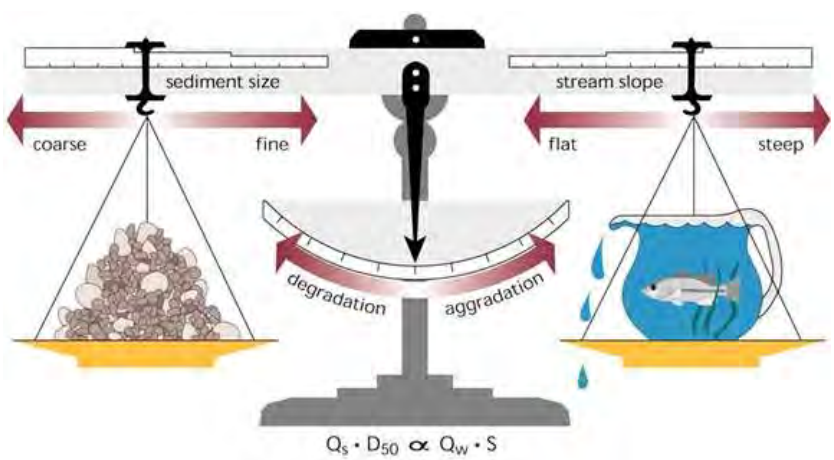

Figure 2-6. Lane's Balance, showing the interrelationship between sediment discharge (Q_s), median bed sediment size (D_{50}), water discharge (Q_w), and channel slope (S).

Slope and grain size are not the only modes of adjustment, as stream channels have many more degrees of freedom in responding to changes in streamflow and sediment supply. For example, Schumm (1969) extended Lane's Balance to include width, depth, sinuosity, and meander wavelength. More quantitatively (and more complexly), adjustments to channel form resulting from hydromodification are controlled by interactions among flow-generated shear stresses (described by hydraulic equations for open channel flow, as a function of channel geometry, roughness, and longitudinal slope), inflowing sediment load, and the shear strength of the bed and bank sediments (a function of their size distribution and cohesiveness).

2.6.2 Natural Variability in Stream Systems

Understanding natural variability in streams is critical to predicting and assessing anthropogenic impacts. A stream may be considered "stable" or "at equilibrium" when its overall planform, cross-section and profile are maintained with no net degradation or aggradation within a range of variance, over extended timeframes (*Mackin* 1948, *Schumm* 1977, *Leopold and Bull* 1979, *Biedenharn et al.* 1997). Such systems can often withstand short-term disturbances without significant change. Even without discrete disturbances, natural streams may be in a state of dynamic equilibrium (*Schumm* 1977), where the channel exhibits stability over the long term even while actively migrating laterally such that erosion of outer banks is accompanied by sediment deposition and bar building on inner banks. Streams may also be fluctuating between aggradation/ degradation/ stability, all within a limited range of conditions. A large-scale event, like a flood or landslide, can cause dramatic changes in channel form, but the channel will often re-established its pre-event planform, geometry and slope over time.

In contrast, a persistent alteration like hydromodification can cause the rate of change to increase. As a result, the channel may begin an evolutionary (or catastrophic) change in morphology, leading to enlargement and instability. A geomorphic threshold is the condition at which there is an abrupt and significant channel adjustment or failure because the channel has evolved to a critical situation. It is the condition at which the proverbial straw breaks the camel's back. Channels that are near a geomorphic threshold can exhibit significant adjustments in response to a relatively small degree of hydromodification. For example, a channel with banks that are near the height and angle for geotechnical failure may widen abruptly due to slight incision.

2.6.3 The Role of Sediment Transport and Flow Frequency in Channel Morphology

Extensive research has been devoted to establishing specific relationships between flow frequency and characteristics of channel morphology. The concept of "effective discharge" was introduced by Wolman and Miller (1960), using a magnitude-frequency analysis to assess the effectiveness of flow events to transport sediment. They concluded that, for the rivers in their analysis, relatively frequent events (occurring on average about 1 times/year) are most effective over the long term in transporting sediment. This concept has formed the basis for a large body of literature (and occasional controversy) over the subsequent five decades relating to the relationships between these flow frequencies and principal channel dimensions (e.g., bankfull stage, width-to-depth ratio), and the application of these relationships to stream design and restoration, as well as prediction and control of hydromodification impacts. Much of the controversy has related to the use of a single event ("dominant discharge" or "bankfull flow") as the basis for such applications, with the implicit assumption that control for that single discharge will result in commensurate channel changes regardless of the distribution of flow frequencies and flow durations over a wider range of discharges.

More recently, the concept of a *range* of moderately frequent, "geomorphically significant" flows that transport the majority of the sediment over the long term (King County 1990, *Bledsoe* 2002, *Roesner and Bledsoe* 2003) was proposed to replace the focus on a single event. The geomorphically significant flow range is considered to be the most influential in determining channel form, as this collective group

of flows typically does the most "work" on the channel boundary over engineering time scales. Controlling changes to the frequency of flows within this range is therefore critical to reducing impacts to stream morphology, and is the scientific basis for the "flow-duration" control criteria discussed in the following sections. A flow-duration criterion aims to match the pre-development volumes, durations, and frequencies of this critical range of sediment transporting flows over a period of many decades. Even this concept, however, relies on the implicit assumption that infrequent large events, no matter how dramatic their effects, typically occur "too infrequently" to reset channel morphology and habitat over the timescales of concern in meeting regulatory requirements. These events are typically managed through traditional flood control practices as opposed to hydromodification management.

A flow-duration management approach aims to match the pre-development volumes, durations, and frequencies of this critical range of sediment transporting flows over a period of many decades.

2.6.4 Applicability to California Streams

The traditional concepts of dynamic equilibrium in streams and geomorphically significant flows, discussed above, derive largely from studies on perennial streams in humid areas. An important question is: to what extent do these concepts apply to managing hydromodification impacts to streams within arid and semi-arid areas (such as large portions of California, and particularly the southern and eastern regions)? In such climate regions, precipitation is highly variable, with low annual totals and episodic, large events. Many streams are ephemeral or intermittent and located in a setting of extremely high sediment production associated with erosive geology resulting from high rates of tectonic uplift, sparse vegetative cover and frequent fires (*Graf* 1988, *Stillwater Sciences* 2007). These streams are often characterized by multi-thread sand-bed channels that are inherently unstable and readily respond to changes in flow conditions. In the ephemeral streams described by Bull (1997), for example, the natural behavior is one of alternating periods and locations of aggradation and degradation, varying both temporally and spatially. In such "episodic" streams, the vast majority of sediment may be moved by extreme, highly infrequent events. The importance of understanding the role of episodic events has been emphasized for semi-arid and arid fluvial systems (e.g., *Wolman and Gerson* 1978, *Brunsden and Thornes* 1979, *Yu and Wolman* 1987). The latter authors reviewed concepts of frequency and magnitude in geomorphology research and noted that episodic behavior hinges on frequency of episodic events relative to the time required to return to an "equilibrium" channel form. Episodic behavior is more prevalent where the average long-term disturbance is low but the year-to-year variability is high, a characteristic of arid and semi-arid climates.

Although the morphology of arid and semi-arid streams may be more strongly influenced by extreme events under natural conditions, hydromodification has nevertheless been shown to cause rapid and significant physical changes in such California streams (*Trimble* 1997, *Coleman et al.* 2005, *Hawley and Bledsoe* 2011). Such dramatic responses to the effects of urbanization on relatively frequent flows, often over periods of a decade or less, have profound implications for aquatic life and physical habitat. Despite the flashy streamflow regimes, high sediment supplies, and steep gradients of many streams in the region, the responses of California streams are controlled by the same physical processes as those in

other regions that have been studied more extensively. As such, the key controls of stream response can be identified and managed to mitigate the chronic effects of hydromodification between infrequent extreme events. However, it is always advisable to ensure that the application of tools and approaches for prediction and assessment should be based on reference data and empirical models (where applicable) drawn from stream types that are similar in both hydrologic and geomorphic characteristics.

2.6.5 Factors Determining Extent of Impacts

The extent and nature of impacts to stream morphology and habitat from a given change in runoff and sediment supply vary widely, depending on the channel geometry, longitudinal slope, channel material type(s) and size(s), and the type and density of channel vegetation (*Center for Watershed Protection* 2003, *Roesner and Bledsoe* 2003). For example, increased flows within a deep, narrow channel may result in significantly higher shear stresses at the bed; this same increase in a wide, shallow channel may become predominantly overbank flow, with less effect on bed shear stress. Where all other factors are equal, fewer impacts would be expected where flows have access to broad overbank areas (i.e., floodplains) during relatively common floods (*Segura and Booth* 2010), channel materials are more resistant, and stabilizing riparian vegetation is present. Conversely, where erosion and bank instability result in the loss of vegetation reinforcement, a positive feedback response may cause erosion to be accelerated. Furthermore, the relative erosive resistance of bed and bank materials will influence the extent of lateral versus vertical channel adjustments (*Simon and Rinaldi* 2006, *Simon et al.* 2007). For example, if bank resistance is lower than bed resistance, then the channel will tend to widen rather than deepen.

The extent of impacts will also depend on the stream's physiographic context and spatial and temporal patterns of urban development within the watershed (Konrad and Booth 2005). Large-scale studies of hydrologic responses to urbanization (Chin 2006, Poff et al. 2006) also highlighted the regional variation in these responses and reinforced the need to understand local watershed and channel characteristics when managing hydromodification impacts. The presence of road crossings and other infrastructure can provide local grade control and create sediment bottlenecks which often translate to exacerbated erosion in the immediately downstream areas.

The extent and nature of impacts to stream morphology and habitat from a given change in runoff and sediment supply vary widely, depending on the channel geometry, longitudinal slope, channel material type(s) and size(s), and the type and density of channel vegetation, and the spatial and temporal patterns of urban development

An additional consideration relates to the pre-development balance between sediment and streamflow, which is dependent on precipitation patterns, the location of a stream reach within the watershed, the associated sediment behavior of that reach (i.e., production, transport or deposition zone), and local rates of sediment production.

While many of these factors may be quantified for a given time and location, stream systems are enormously complex both spatially and temporally. The existence of physical thresholds and feedback systems can cause an incremental change to result in a disproportionately large response (*Schumm* 1977, 1991). Furthermore, there may be significant temporal lags between the point in time at which

land use is altered and when channel impacts are observed (*Trimble* 1995, 1997). In recognition of these effects and the associated uncertainty, predictive models and management tools may present results in terms of probabilities or within the context of a risk-based approach, as discussed further in this document. Such effects also have substantial implications for the design of assessment and monitoring programs.

There may be significant temporal lags between the point in time at which land use is altered and when channel impacts are observed.

2.6.6 Impacts on Other Types of Receiving Waters

Although outside the scope of this document, hydromodification impacts to other water body types are recognizable and should be the subject of additional research and future consideration.

Wetlands, Estuaries, and Coastal Ecosystems. Urbanization can alter water quality, quantity and sediment delivery to wetlands and sensitive coastal ecosystems. Urbanization has led to loss or degradation of wetlands and estuaries as a result of 1) draining and conversion to agriculture (*Dahl*, 1997); 2) upstream alterations to flow and sediment regimes that can change the magnitude, frequency, timing, duration, and rate of change of estuarine salinity, turbidity, freshwater flooding, freshwater baseflow, and groundwater recharge dynamics (*Azous and Horner* 2001); and 3) contaminated runoff from urban areas (*Paul and Meyer* 2001, *J Brown et al.* 2010). Urbanization may also lead to coastal erosion in circumstances where reservoir sediment trapping or post-development decreases in sediment yield reduce the sediment supply to the coast (*Pasternack et al.* 2001, *Syvitski et al.* 2005).

Alluvial Fans. Alluvial fans are dynamic landforms that are under increased development pressure in recent decades, particularly in the expanding cities of the American West. Upstream urbanization, and the resultant flashier flow regime, shortens the time available for infiltration and groundwater recharge in alluvial fans. Furthermore, development on fans themselves results in channel straightening and/or construction of concrete flood conveyance channels that also reduce or eliminate infiltration. The reduction in infiltration amplifies the flood risk further downstream. Additionally, alluvial fans may be more vulnerable than other landscapes to channel instability resulting from hydromodification, because they lack intrinsic geologic controls on channel gradient, and commonly have little vegetation or bank cohesion to provide stability in the purely alluvial deposits (*Chin* 2006).

2.6.7 Influence of Scale

The ability to detect impacts from land-use changes depends upon the spatial and temporal scale at which they are measured. Issues of hydrograph timing and the relative size of the storm system with respect to the watershed area may confound relationships at larger spatial scales. Furthermore, a number of fluvial geomorphic features that are commonly used as metrics of geomorphic condition are scale-dependent. For example, width-depth ratio, tendency toward braiding, and channel depth relative to stable bank height all commonly increase downstream. Other factors, such as the influence of vegetation, depend on protrusion relative to width and rooting depth relative to bank height. The

temporal scale over which channel changes occur will be influenced by precipitation variability, in addition to the many physical factors already discussed.

These scale considerations, as well as previous discussion of factors influencing stream response, are important when determining the choice of both management tools and monitoring approaches. It is generally much easier to predict the direction of response than the magnitude. Accurate, detailed predictions of response are difficult to make, and they are generally only possible when applied to specific locations, using extensive data input, to answer very specific questions; even then they are subject to uncertainty. Policies or assessment methods aimed to address a range of streams and geographic conditions are better suited to probabilistic approaches that explicitly acknowledge uncertainty, as described further in subsequent sections.

2.7 Impacts on Fluvial Riparian Vegetation

Stream channel form and stability is closely linked with the ecology of instream and floodplain habitats (Figure 2-7). Spatial and temporal distributions of plant communities are tied to moisture availability and seasonality. The ability of vegetation to stabilize soils, trap sediments, and reduce flow velocities (*Sandercock et al.* 2007) can create positive feedback that promotes further vegetation establishment and enhancement of these stabilizing features. This can result in a strong influence on channel geometric features, specifically channel narrowing (*Anderson et al.* 2004). The change in frequency of overbank flows resulting from channel incision will also affect riparian processes, including nutrient transfer and seed dispersal. For example, it is believed that *Tamarix* dominance over native species along Western US rivers would be less extensive if not for anthropogenic alteration of streamflow regimes (most recently supported by Merritt and Poff (2010)).

Impacts to stream biota may occur through the alteration of habitat structure and habitat dynamics caused by hydrologic and geomorphic changes, as well as directly from hydrologic alteration.

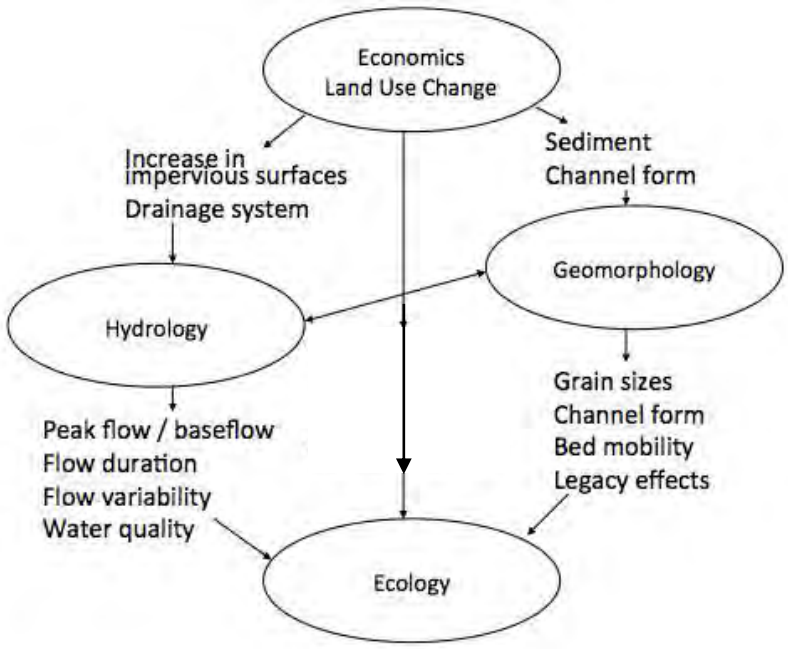

Figure 2-7. Land use changes, hydrology, geomorphology and ecology are closely and complexly interrelated. (Adapted from Palmer *et al.* 2004).

Vegetation changes not only are a result of morphological impacts but also can result directly from changes in streamflow. These findings continue to be supported by recent studies; for example, increases or decreases in baseflow or changes to the seasonal availability of water can determine the extent and type of riparian vegetation capable of thriving in that environment (*White and Greer* 2006). Vegetation changes can have cascading effects on indigenous fauna that require native plants for food or nesting (*Riley et al.* 2005). Channel incision can also result in phreatic draining of adjacent wetland and floodplain habitats and result in loss of key riparian species (*Scott et al.* 2000).

2.8 Impacts on In-Stream Biota

As shown in Figure 2-7, impacts to stream biota may occur through the alteration of habitat structure and habitat dynamics caused by hydrologic and geomorphic changes, as well as directly from hydrologic alteration. (The term biota is used here to refer to a range of non-plant species including algae, macroinvertebrates, amphibians, fishes, etc.) Because of these relationships, the condition of in-stream biota is considered to reflect the effects of all other impacts and has been recommended as an integrative measure of stream health (discussed further in Section 5).

Studies continue to build on Poff *et al.* (1997), who highlighted the importance of the “natural flow regime” and its variability as critical to ecosystem function and native biodiversity. Streamflow pattern or “regime” interacts with the geomorphic context to control the physical and biological response of streams to hydromodification. The basic characteristics of streamflow regimes are typically described in five ways: magnitude, frequency, duration, timing, and rate of change. There is a large body of science

linking one or more of these five elements of flow regimes to geomorphic processes, physical habitat, and ecological structure and function. A few examples of linkages with physical habitat are provided in Table 2-1; these linkages describe the mechanisms by which flow changes can impact stream ecology through morphological alterations.

Table 2-1. Examples of Relationships between Flow Regime Attributes and Physical Habitat Characteristics (adapted from Roesner and Bledsoe 2002).

Flow Attribute	Example Relationships with Physical Habitat
Magnitude	• Determines extent to which erosion/removal thresholds for substrate, banks, vegetation, and structural habitat features are exceeded • Determines whether floodplain inundation/exchange occurs • Habitat refugia may become ineffective during extreme events
Frequency	• Flashiness can affect potential for recovery of quasi-equilibrium channel forms between events, bank stability, and streambank/riparian vegetation assemblages • Frequency of substrate disturbance can act as a major determinant of fish reproductive success and benthic macroinvertebrate abundance and composition
Duration	• Determines the impact of a threshold exceeding event, e.g., scour depths • Urbanization frequently increases the duration of geomorphically effective flows which also affect bank vegetation establishment and maintenance • Extended durations of high suspended sediment concentrations can act as chronic and acute stressors on fish communities
Timing	• The temporal sequence of flow events affects channel form and stability as geomorphic systems may be “primed” for abrupt changes. • Stream biota may use flow timing as a life-cycle cue • Predictability of flow can affect utilization of habitat refugia
Rate of Change	• Affects bank drainage regimes (bank stability) and sedimentation processes, e.g., re-suspended fine sediment concentrations during storm hydrographs, embeddedness, armoring • Rapid drawdown can result in stranding of instream biota • Rise and fall rates control riparian water table dynamics and seedling recruitment

The mechanisms of such impacts are also well detailed by Center for Watershed Protection (2003); for example, increased flows are related to a reduction in habitat diversity and simplification of habitat features such as pools; this in turn reduces the availability of deep-water cover and feeding areas.

Many studies support the conclusion that stream biota are also directly impacted by altered flow regimes, independent of channel instability and erosion. Konrad and Booth (2005) identified four hydrologic changes resulting from urban development that are potentially significant to stream ecosystems: increased frequency of high flows, redistribution of water from baseflow to stormflows,

increased daily variation in streamflow, and reduction in low flow. They caution that ecological benefits of improving physical habitat and water quality may be tempered by persistent effects of altered streamflow and sediment discharge, and that hydrologic effects of urban development must be addressed for restoration of urban streams. Walsh *et al.* (2007) concluded that low-impact watershed drainage design was more important than riparian revegetation with respect to indicators of macroinvertebrate health. Bioengineered bank stabilization can also have positive effects on habitat and macroinvertebrates, but it cannot completely mitigate impacts of urbanization with respect to stream biotic integrity (*Sudduth and Meyer* 2006). Walters and Post (2011) and Brooks *et al.* (2011) found impacts to benthic macroinvertebrates due to upstream water abstractions, including reductions in total biomass of insects and reductions in abundance respectively.

2.9 Conclusions

Alterations in streamflow and sediment transport as a result of land use change can have severe impacts on streams. Common responses include changes in water balance, surface and near-surface runoff timing and magnitude, groundwater recharge, sediment delivery and transport, channel enlargement, widespread incision, and habitat degradation. The extent and consequences of these impacts depend on stream type, watershed context, and local controls on channel adjustment; as such, stream responses to hydromodification are complex and difficult to predict with any precision. Due to the direct impacts of streamflow modification on vegetation and biota, channel morphology cannot be the sole measure of hydromodification impacts. Thus, mitigation efforts that are narrowly focused on channel stability may be insufficient for sustaining key ecological attributes. Likewise, reach-scale stabilization of streams will not necessarily result in the return of comparable habitat quality and complexity (Henshaw and Booth 2000, Roesner and Bledsoe 2003). Hydromodification management should be considered in the context of an overall watershed-scale strategy that targets maintenance and restoration of critical processes in critical locations in the watershed. Furthermore, it is imperative that monitoring and adaptive management be focused on achieving desired objectives for aquatic life and overall stream “health” in addition to simply measures of geomorphic response.

3. Framework for Hydromodification Management

3.1 Introduction and Overview

The current approach to managing hydromodification impacts on a project-by-project basis is not sufficient to protect beneficial uses of streams. This section outlines a comprehensive, alternative framework that begins with watershed analysis and uses the results to guide the site-based management decisions that are the current focus of most hydromodification management strategies. It also recommends the implementation of a compensatory mitigation program in support of hydromodification management objectives identified in the watershed analysis. Figure 3-1 summarizes this approach and illustrates how current site-based management relates to the larger framework.

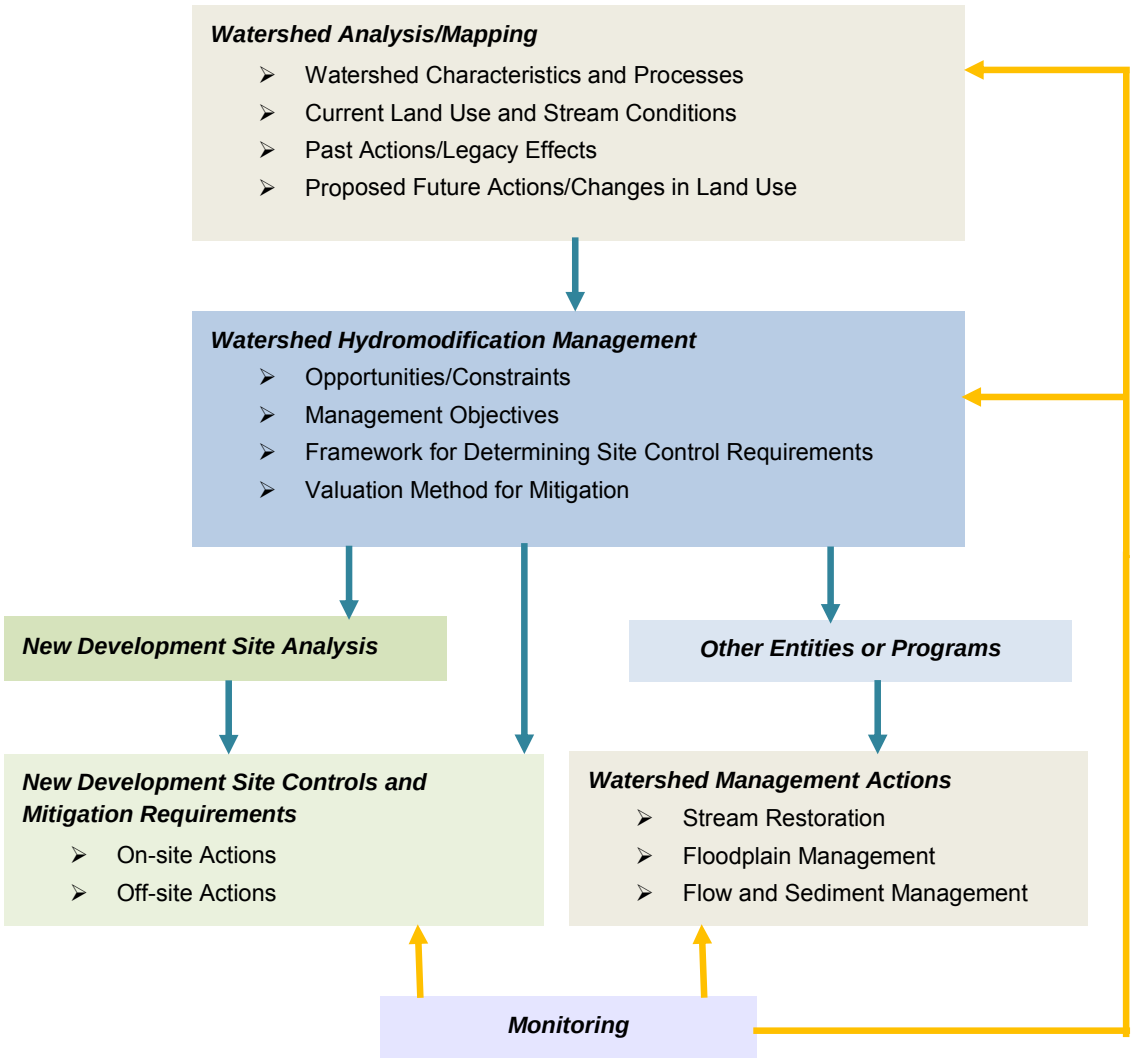

Figure 3-1. Framework for Integrated Hydromodification Management.

This section discusses the details of the integrated framework proposed in Figure 3-1. Key features of this comprehensive approach to hydromodification management are:

- Hydromodification management needs to occur primarily at the watershed scale. The foundation of any hydromodification management approach should be an analysis of existing and proposed future land use and stream conditions that identifies the relative risks, opportunities, and constraints of various portions of the watershed. Site-based control measures should be determined in the context of this analysis.
- Clear objectives should be established to guide management actions. These objectives should articulate desired and reasonable physical and biological conditions for various reaches or portions of the watershed. Management strategies should be customized based on consideration of current and expected future channel and watershed conditions. A one-size-fits-all approach should be avoided.
- An effective management program will likely include combinations of on-site measures (e.g., low-impact development techniques), in-stream measures (e.g., stream habitat restoration), and off-site measures. Off-site measures may include compensatory mitigation measures at upstream locations that are designed to help restore and manage flow and sediment yield in the watershed.
- Management measures should be informed and adapted based on monitoring data. Similarly, monitoring programs should be designed to answer questions and test hypotheses that are implicit in the choice of management measures, such that measures that prove effective can be emphasized in the future (and those that prove ineffective can be abandoned).
- Hydromodification potentially affects all downstream receiving waters; therefore, there generally should be no areas exempted from hydromodification management plans. However, the variety of types and conditions of receiving waters should result in a range of requirements. This also means that objectives, and the management strategies employed to reach them, will need to acknowledge pre-existing impacts associated with historical land uses.

A watershed-based approach to hydromodification management will allow integration of objectives with related programs such as water quality management, groundwater management, and habitat management and restoration through mechanisms such as Integrated Regional Water Resources Management Plans.

Implementation of this approach will likely require changes in the current administration of hydromodification management plans statewide, both in the development and promulgation of regulations by the State and Regional Water Boards and in the administration and execution of those regulations by local jurisdictions (Table 3-1). In the short term, municipalities will need to broaden the approaches to on-site management measures and expand monitoring and adaptive management programs based on the tools described in this document. In the long term, regulatory agencies will need to develop watershed-based programs that allow for implementation of management measures in the locations and manner that will have the greatest impact on controlling hydromodification effects. A

watershed-based approach will also allow the integration of hydromodification management objectives with related programs such as water quality management, groundwater management, and habitat management and restoration through mechanisms such as Integrated Regional Water Resources Management Plans.

Table 3-1. Recommendations for implementation of watershed-based hydromodification management, organized by the scale of implementation and the time frame in which useful results should be anticipated.

Time Frame	Programmatic: State and Regional Water Boards	Local: City and County Jurisdictions
Short-term (<10 years)	• Define the watershed context for local monitoring (at coarse scale) • Evaluate whether permit requirements are making positive improvements	• Evaluate whether specific projects/ regulations are meeting objectives • Identify the highest priority action(s) to take
Long-term (1+ decades)	• Define watershed context and setting benchmarks for local-scale monitoring (i.e., greater precision, if/as needed) • Demonstrate how permit requirements can improve receiving-water "health," state-wide (and change those requirements, as needed)	• Evaluate and demonstrate whether actions (on-site, instream, and watershed scale) are improving receiving-water conditions • Assess program cost-effectiveness • Identify any critical areas for resource protection

3.2 Background on Existing Strategies and Why They are Insufficient

Current hydromodification approaches and strategies, such as flow and sediment-control basins, have been long-recognized as insufficient to fully address hydromodification impacts (e.g., Booth and Jackson 1997, Maxted and Horner 1999). Present understanding of the causes and effects of urbanization suggest that such approaches must be expanded to include integrated flow and sediment management at the watershed scale, along with stream corridor/floodplain restoration (NRC 2009).

Flow management has its origins in flood-control basins intended to reduce peak discharge through stormwater detention (Dunne and Leopold 1978). A key shortcoming of these approaches for hydromodification management is that they do not address (and may exacerbate) cumulative erosive forces on the receiving channel because they trap sediment and release sediment-starved water to downstream areas. Simple detention can increase the frequency and duration with which channels are exposed to erosive effects (McCuen and Moglen 1988, Bledsoe *et al.* 2007), resulting in an increase in the downstream impacts of hydromodification.

Since the late 1980's in parts of the US, hydromodification management plans began to explore "flow-duration" control standards as a way to address this shortcoming. These standards require that the post-project discharge rates *and durations* may not deviate above the pre-project discharge rates and

durations by more than a specific (and typically quite small) percent, across a broad range of discharges at and above the presumed threshold of instream erosion and sediment transport, as averaged over a multi-year period of measured (or simulated) record. This approach is a dramatic improvement over earlier methods, although it does not adequately address the issues of sediment deficit associated with urbanization (Chin 2006). In addition, current flow-duration standards do not fully account for the effects of flow alteration on in-stream habitat and biological functions (e.g., they do not address the seasonality of peak flows, rates of hydrograph rise and recession, low-flow magnitude and duration) and therefore may not be protective of all beneficial uses of downstream waterbodies.

Current strategies are also insufficient with respect to how municipal stormwater permits apply hydromodification standards. Currently, development triggers are established to determine if a project is subject to the standards. These triggers are generally specified by either project land use type in conjunction with size, or by project size alone (e.g., 20 units or more of single family residential housing, or 10,000 square feet or more of new impervious area). The exemption of many small projects from hydromodification controls can result in cumulative impacts to downstream waterbodies (see Booth and Jackson, 1997, for an example from western Washington of the cumulative effects of a small-project exemption); a move to include LID requirements that apply to all projects, regardless of size, is a positive development to begin to address this issue. There is usually also an exemption for projects discharging to hardened channels or waterbodies; however these exemptions may not be supportive of future stream restoration possibilities, and do not address the impacts of hydromodification on lentic and coastal waterbodies (as yet not fully understood). A further limitation of the current permit structure is that there is no consideration of project characteristics such as position within the watershed, sensitivity of the receiving stream reach, or level of coarse sediment production on the proposed project site. Finally, current programs rely solely on regulating new development and re-development to prevent hydromodification impacts without addressing pre-existing conditions which may limit the effectiveness of future management actions.

Shortcoming of current hydromodification standards that may limit their effectiveness include the exemption of many small projects, which can result in cumulative impacts to downstream waterbodies, and the reliance solely on regulating new development and re-development without addressing pre-existing conditions which may limit the effectiveness of future management actions.

When flow-control measures of whatever regulatory standard have failed to protect streams from erosion, hydromodification "management" typically consists of bank or channel armoring, drop structures, and other hard engineering approaches. Although these methods may reduce local hydromodification impacts, it is typically at the expense of other in-stream or riparian functions or beneficial uses. For example, channel armoring can reduce habitat and water conservation functions and services by direct habitat removal, increased bed scour, and decreased connectivity between the channel and its floodplain. In addition to loss of biological and physical stream function, many armoring solutions degrade or fail over time because they address only the localized channel instability rather than the overarching processes that led to the instability (Kondolf and Piegay 2004). For example, drop structures constructed to stabilize a specific channel reach will tend to shift downstream the

consequences of an insufficient sediment load—the reach immediately upstream of the drop structure is "protected," but that immediately downstream is degraded even more severely. In extreme cases, the structure itself can be undermined by downstream erosion and headcutting that is exacerbated by the sudden shift in velocity and associated eddy effects (i.e., hydraulic jump) that often occurs downstream of grade stabilization (Chin 2006). Bank armoring can also fail due to being undermined by erosion at the toe of slope, which can lead to scour (Figure 3-2). In both cases, structural failures often lead to a sequence of incremental increases in the size and extent of the structural solution in an attempt to continually repair increasing channel degradation. In extreme cases, catastrophic failure of bank or grade stabilization can lead to sudden and dramatic changes in channel form, which can be associated with devastating loss of habitat, infrastructure, and property.

Figure 3-2. Undermining of grade control and erosion of banks downstream of structures intended to stabilize a particular stream reach. Left photo is looking upstream at drop structure; right photo is looking downstream from the drop structure.

3.3 Development of Comprehensive Hydromodification Management Approaches

The goal of hydromodification management should be to protect and restore overall receiving water conditions, by maintaining or reestablishing the watershed processes that support those conditions, in the face of urbanization. Achieving these goals will require that hydromodification management strategies operate across programs beyond those typically regulated by NPDES/MS4 requirements. Successful strategies will need to be developed, coordinated, and implemented through land-use planning, non-point source runoff control, and Section 401 Water Quality Certifications and Waste Discharge Requirement programs in addition to traditional stormwater management programs. Thus, all levels of the regulatory framework—federal, state, and local—will need to participate in developing such a program, with program development occurring mainly through regulatory and resource protection agencies and program implementation occurring mainly through local jurisdictions.

As shown in Figure 3-1, watershed-scale hydromodification management should include all of the following key elements:

- Watershed-wide assessment of the condition of key watershed processes, to understand the natural functioning of the watershed and what has been (or is at risk of being) altered by urbanization.
- Watershed-wide assessment of hydromodification risk, to categorize areas based on the likelihood of hydromodification impacts and to identify opportunities for restoration or protection of key reaches or sub-basins.

The goal of hydromodification management should be to protect and restore overall receiving water conditions, by maintaining or reestablishing the watershed processes that support those conditions, in the face of urbanization.

- Appropriate management objectives for various stream reaches and/or portions of the watershed.
- Process for selecting management actions and mitigation measures for project sites and stream reaches.
- Monitoring program that is consistent with the goals of the HMP so that information generated can be used to improve the HMP over time.

3.4 Watershed Mapping and Analysis – Identification of Opportunities and Constraints

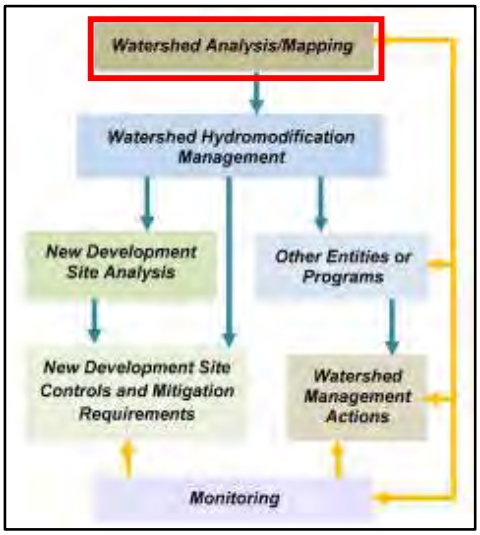

Watershed analysis should be the foundation of all hydromodification management plans. Analysis should identify the nature and distribution of key watershed processes, existing opportunities and constraints in order to help prioritize areas of greater vs. lesser concern, areas.

"Watershed analysis" has several steps, of which the first is mapping. Mapping may occur at the watershed or regional (i.e., multiple watersheds) scale. Mapping should include data layers to facilitate the following analyses. Most of these data layers are freely available as online. Further information on analysis tools is provided in the next section. These maps should be designed for iterative updates over time as new information becomes available:

- Dominant watershed processes – analysis of topography (10-m digital elevation model), hydrology, climate patterns, soil type (NRCS soil classifications) and surficial geology can be used to identify the location and type of dominant watershed processes, such as sediment source areas and areas where infiltration is important or where overland flow likely dominates. This can provide a template for the eventual design of management measures that correspond most

closely to the pre-development conditions, which support processes that promote long-term channel health. The Central Coast Hydromodification Control Program (the "Joint Effort"; see Booth *et al.* 2011) provides an example of this type of analysis.

- Existing stream conditions – At a minimum the National Hydrography Database (NHD) can provide maps of streams and lakes in the watershed. Additional information on stream condition should be included to the extent that it is available. This could include major bed material composition, channel planform, grade control locations and condition, and approximate channel evolution stage. These maps can also be used to conduct general stream power evaluations.
- Current (Past) and anticipated future land use - Current land use and land cover plus proposed changes due to general or specific plans. Historical information on past land use practices or stream conditions should be included if it is readily available. Classified land cover (NLCD 2006) is available from the Multi-Resolution Land Characteristics Consortium (MRLC).
- Potential coarse and fine sediment yield areas – methods such as the Geomorphic Land Use (GLU) approach (Booth *et al.* 2010) can be used that to estimate potential sediment yield areas based on geology, slope and land cover.
- Existing flood control infrastructure and channel structures – maps should include major channels, constrictions, grade control, etc. that affect water and sediment movement through the watershed. Any available information on water quality, flood control or hydromodification management basins should also be included.
- Habitat – both upland and in-stream and riparian habitat should be mapped to help determine areas of focus for both resource protection and restoration. This may be based on readily available maps such as the National Wetlands Inventory and National Land Cover Database, aerial photo interpretation, or detailed local mapping.
- Areas of Particular Management Concern – these may include sensitive biological resources, critical infrastructure, 303(d) listed waterbodies, priority restoration areas or other locations or portions of the watershed that have particular management needs.
- Economic and social opportunities and constraints – comprehensive watershed management includes consideration of opportunities for improving community amenities associated with streams, economic redevelopment zones, etc. Details on this are beyond the scope of this paper, but emphasize the need to include planning agencies in the development of hydromodification management plans.

Substantial resources will be necessary to implement a watershed analysis approach; therefore, opportunities for joint funding and leveraging of resources should be vigorously pursued.

Watershed analysis will be challenging especially for smaller municipalities with limited resources or where their jurisdiction only encompasses a portion of the watershed. Substantial resources will be necessary to implement this approach; therefore, opportunities for joint funding and leveraging of resource should be vigorously pursued. A cooperative approach should replace the current fragmented efforts among regions and jurisdictions. Furthermore, the State and Regional Water Boards should support completion of these maps and common technical tools as the foundation for future hydromodification management actions.

3.5 Defining Management Objectives

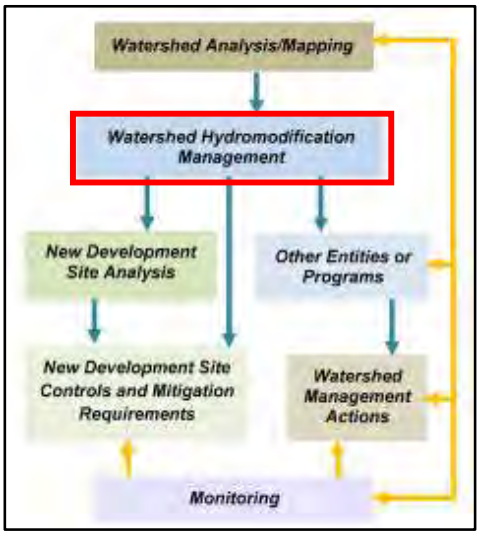

Results of the watershed analysis should be used to determine the most appropriate management actions for specific portions of the watershed. Management strategies should be tailored to meet the objectives, desired future conditions, and constraints of the specific channel reach being addressed.

Decisions should be based on considerations of areas suitable for specific ecosystem services, opportunities, and constraints as described above. Management objectives may be aimed at reducing effects of proposed future land use or mitigating for the effects of past land use, and they may apply to stream reaches or upland areas. Potential management objectives for specific stream reaches may include: protect, restore, or manage as a new channel form.

The specific manifestation of each of these strategies will differ by location, based on constraints of the stream, watershed plan objectives, etc. Decisions about appropriate objectives will need to consider current and future opportunities and constraints in upland, floodplain, and in-stream portions of the watershed. General definitions are provided below as a starting point for case-specific refinement.

Management strategies should be tailored to meet the objectives, desired future conditions, and constraints of the specific channel reach being addressed. Objectives for specific stream reaches may include:

- **Protect**
- **Restore**
- **Manage as a new channel form**

3.5.1 Protect

This approach consists of protecting the functions and services of relatively unimpacted streams in their current form through conservation and anti-degradation programs. This strategy should not be used if streams are degraded, or nearing thresholds of planform adjustment or changes in vegetation community. This strategy may apply following natural disturbances such as floods depending on the condition of the stream reach and the ability for natural rehabilitation to occur (due to how intact

watershed processes are). The goal of this strategy is not to create an artificial preserve (such as a created stream running through an urban park) but rather a naturally function river system. Fully channelized systems are not considered in this framework. Examples of specific actions include:

- Preserving intact channel systems through easements, restrictions, covenants, etc. This should be considered in the watershed context to ensure adequate connectivity with upstream and downstream reaches of similar condition, and to ensure that the watershed processes responsible for creating and maintaining instream conditions will persist.
- Providing appropriate space for channel processes to occur (e.g., floodplain connectivity).
- Establishing transitional riparian and upland buffer zones that are protected from encroachment by infrastructure or development.

3.5.2 Restore

There are many definitions of "restoration". For the purposes of this document, restoration is considered re-establishing the natural processes and characteristics of a stream. The process involves converting an unstable, altered, or degraded stream corridor, including adjacent riparian zone (buffers), uplands, and flood-prone areas, to a natural condition. In most cases, restoration plans should be based on a consideration of watershed processes and their ability to support a desired stream type. The watershed analysis discussed above should be used to determine how and where watershed process should be protected or restored in order to best support stream and stream-corridor restoration. This process should be based on a reference condition/reach for the valley type and includes restoring the appropriate geomorphic dimension (cross-section), pattern (sinuosity), and profile (channel slopes), as well as reestablishing the biological and chemical integrity, including physical processes such as transport of the water and sediment produced by the stream's watershed in order to achieve dynamic equilibrium. Design of restoration structural elements must be based on existing and anticipated upstream land uses, and reflect the modified hydrology resulting from these uses. Restoration should apply to streams that are already on a degradation trajectory where there is a reasonable expectation that a more stable equilibrium condition that reflects previously existing conditions can be recreated and maintained via some intervention. Creating a stream system that differs from "natural conditions" is not considered restoration. All elements of the "protection" strategy should also be included once the restoration actions are complete. Examples of specific actions include:

- Floodplain and in-stream measures that restore natural channel form consistent with current and/or anticipated hydrology and sediment yield. Examples include recontouring, biotechnical slope stabilization, soft-grade control features (e.g., woody debris).
- Revegetation of stream banks and beds, including removal of invasive species.
- Preserving intact channel systems through easements, restrictions, covenants, etc. This should be considered in the watershed context to ensure adequate connectivity with upstream and downstream reaches of similar pristine condition.

- Providing appropriate space for channel processes to occur (e.g. channel migration at allowable levels, floodplain connectivity, and development of self-sustaining riparian vegetation).
- Establishing transitional riparian and upland buffer zones that are protected from encroachment by infrastructure or development.

3.5.3 Manage as New Channel Form

Once a stream channel devolves far enough down the channel evolution sequence, it is extremely difficult to recover and restore without substantial investment of resources. If critical thresholds in key structural elements, such as planform or bank height, are surpassed, streams should be allowed to continue progressing toward a new stable equilibrium condition that is consistent with the current setting and watershed forcing functions, if such progress does not pose a danger to property and infrastructure. Substantial alteration of flow or sediment discharge, slope or floodplain width may make it improbable that a stream can be restored to its previous condition. In such circumstances, it may be preferable to determine appropriate channel form given expected future conditions and "recreate" a new channel to match the appropriate equilibrium state under future conditions. For example, a multi-thread braided system may not be the appropriate planform based on new runoff and sediment pattern; instead, a single-thread channel or step-pool structure may be a more appropriate target. Examples of specific actions include:

- In-channel recontouring or reconstruction of channel form.
- Floodplain recontouring or reconstruction that improves connectivity with the channel.
- In extreme circumstances based on channel condition, position in the watershed, etc. this may involve hardening portions of the channel and focusing "mitigation" measures at off-site measures at a different part of the watershed. Off-site mitigation can be informed by "hydromodification risk mapping".
- Re-establishing longitudinal connectivity for sediment transport and ecological linkages.
- Preserving intact channel systems through easements, restrictions, covenants, etc. This should be considered in the watershed context to ensure adequate connectivity with upstream and downstream reaches of similar pristine condition.
- Providing appropriate space for channel processes to occur (e.g. floodplain connectivity).
- Establishing transitional riparian and upland buffer zones that are protected from encroachment by infrastructure or development.

Several authors have previously noted that in urban systems, natural channel state often can no longer be sustained under changed hydrological conditions. Thus, different management goals are probably appropriate for watersheds at varying stages of development (Booth, 2005) and at varying degrees of adjustment (Chin and Gregory 2005). In this context, identifying which channels are suitable for

protection, restoration, or alternative channel form can be used to guide restoration and management efforts (Booth *et al.* 2004).

Upland objectives should be established to support management objectives for stream reaches. These objectives will have direct implications and will influence site-specific control requirements (discussed below). Potential management objectives for upland areas may include:

- *Conserve open space for infiltration*: Infiltration reduces the magnitude and duration of runoff to the stream channel and allows flow to re-enter the stream through diffuse overland flow, shallow subsurface flow, or groundwater recharge. This in turn reduces the work (energy) on the channel bed and banks and helps promote stability.
- *Conserve open space for stream buffers*: Buffers allow many of the same infiltration processes discussed above to occur. In addition, they provide space for channel migration and overbank flow, both of which function to reduce energy and allow the channel to better withstand potentially erosive forces associated with high flow events.
- *Conserve open space for coarse sediment production*: Course sediment functions to naturally armor the stream bed and reduce the erosive forces associated with high flows. Absence of coarse sediment often results in erosion of in-channel substrate during high flows. In addition, coarse sediment contributes to formation of in-channel habitats necessary to support native flora and fauna.
- *Encourage development on poorly-infiltrating soils*: The difference between pre and post development runoff patterns is less when development occurs on soils that have low infiltration rates and functioned somewhat like paved surfaces. Focusing development on these areas reduces changes in hydrology associated with transition to developed land uses.
- *Encourage urban infill*: Urban infill reduces the effect on watershed processes by concentrating development on previously impacted areas. This reduces disruption of hydrology and sediment process compared to developing on open space or other natural areas.

3.6 Selecting Appropriate Management Objectives

The combination of expected force acting on the stream channel (in terms of higher flow and less sediment) and estimated resistance (in the form of channel and floodplain condition) can be used to inform selection of an appropriate management objective for a specific stream reach, as shown in Figure 3-3. This figure represents a conceptual approach to selecting appropriate management objectives, in which modifications to runoff and sediment are compared against stream reach conditions. By weighing these factors within the context of watershed opportunities, constraints and resources, management objectives and specific actions can be determined. More complete decision support systems or guidance will need to be developed for individual

Selection of appropriate management objectives should consider changes to runoff and sediment, and existing stream reach conditions, within the context of watershed opportunities, constraints and resources.

hydromodification management plans that account for other considerations such as upstream and downstream conditions, cost, infrastructure constraints, availability of floodplain area for restoration, presence of downstream sensitive resources, etc. All decisions should be made in the context of the watershed position of a project site relative to existing opportunities and constraints as discussed above.

A number of tools are available to be used in conjunction with watershed mapping to inform this prioritization process. For example, GLU mapping (Booth *et al.* 2010) and hydromodification risk mapping can be used to assign high, medium or low ratings to watershed resistance (i.e., susceptibility to change). Similarly, field based tools such as the hydromodification screening tool (Bledsoe *et al.* 2010) or European tools such as Fluvial Audit or River Habitat Survey can be used to assign a rating of high, medium or low at the reach scale. In addition to geomorphic assessments, habitat assessments such as the California Rapid Assessment Method (CRAM; Collins *et al.* 2008) or biological evaluations via an index of biotic integrity (IBI; e.g., Ode *et al.* 2005) should be used as measures of biological condition to provide a more complete stream assessment. The next section provides an overview of hydromodification assessment and prediction tools, as well as further details on specific tools to support the selection of management objectives.

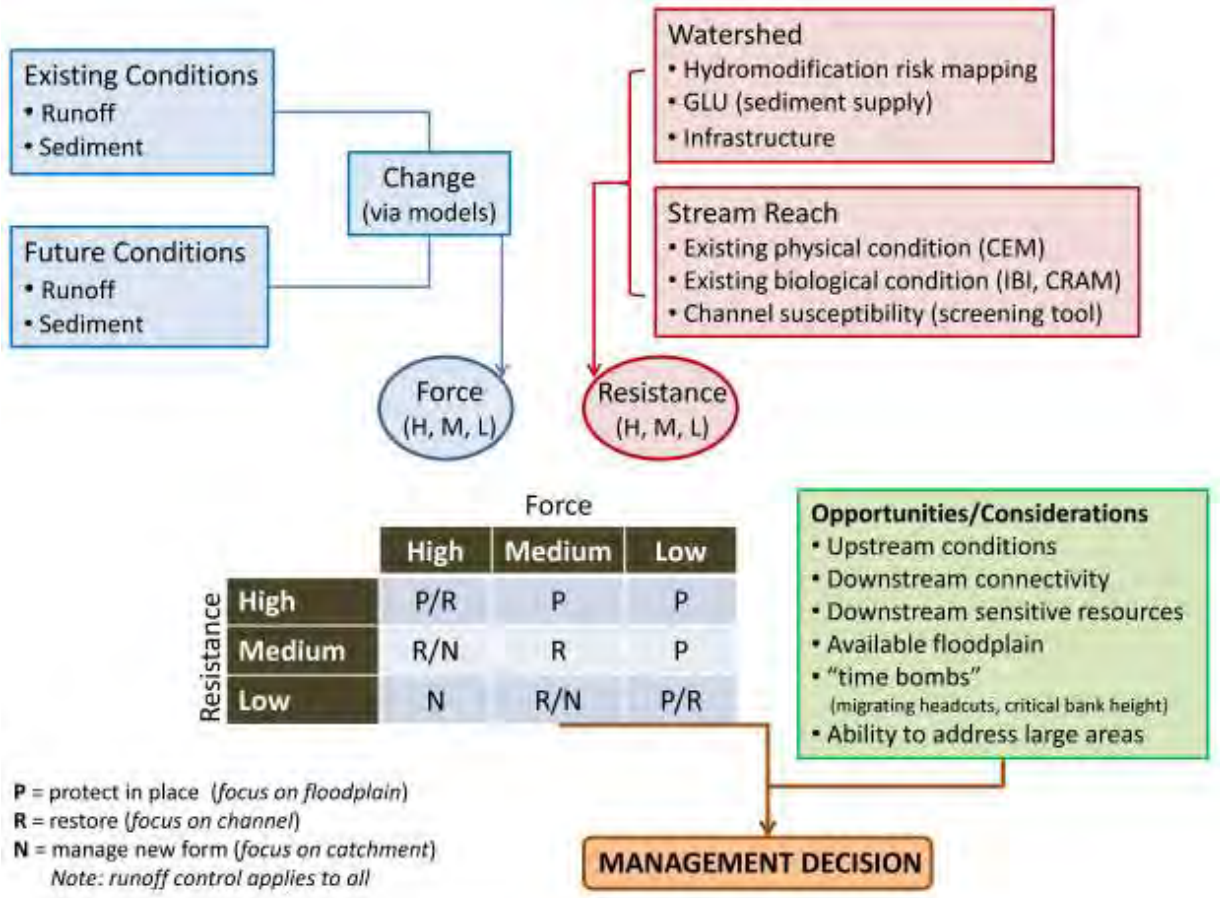

Figure 3-3: Example of a hydromodification management decision-making process.

3.7 Framework for Determining Site-Specific Control Requirements

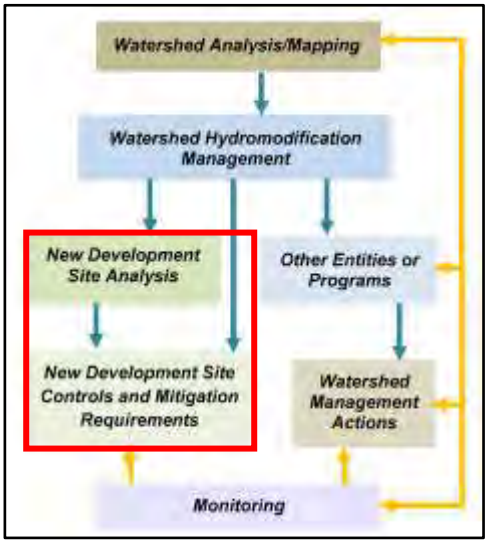

Once the watershed analysis is complete and opportunities, constraints and management objectives have been identified for both upland areas and stream reaches, a framework should be developed for site-specific project analyses and control requirements. The level of detail required for the analysis of proposed projects should be based on a combination of factors including project size, location within the watershed, and point of discharge to receiving waterbody.

The HMP should specify how these factors will be evaluated within the context of the identified management objectives to determine analysis requirements. The HMP should also ideally contain scalable BMP designs (based on conservative assumptions and consistent with prevailing watershed conditions) that can be applied by small projects where appropriate to avoid overly burdensome requirements for site-specific analysis. The framework should include the following components:

- A set of standard on-site management measures/BMPs that should apply to all projects; no projects should be exempted from these measures as they will have broader water quality benefits beyond helping to control the effects of hydromodification. These management actions consist of reducing the effects of urbanization on catchment runoff and sediment yield. On-site management measures should attempt to reduce excess runoff, maintain coarse sediment yield (if possible) and provide for appropriate discharge to receiving streams to support in-stream biological resources. In some cases, common features or facilities may be able to accommodate these objectives. In other cases, separate features or facilities will be necessary to deal with distinct objectives. On-site measures should ***generally be applied in all cases*** as allowed by site-specific geotechnical constraints, with specific management practices informed by the watershed processes most important at particular locations in the watershed, as well as by the nature of downstream receiving waters:
    - Low impact development (LID) practices.
    - Disconnecting impervious cover through infiltration, interception, and diversion.
    - Coarse sediment bypass through avoidance of sediment yield areas or measures that allow coarse sediment to be discharged to the receiving stream.
    - Flow-duration control basins to reduce runoff below a threshold value.

- Specification of the level of analysis detail and design requirements for the project, depending on project location, discharge point, and project size. Levels of analysis and design requirements may include:
    - Application of scalable, standardized designs for flow control based on site-specific soil type and drainage design. The assumptions used to develop these scalable designs should be conservative, to account for loss of sediment and uncertainties in the analysis and our understanding of stream impacts.
    - Use of an erosion potential metric, based on long-term flow duration analysis and in-stream hydraulic calculations. Guidelines should specify stream reaches where in-stream controls would and would not be allowed to augment on-site flow control.
    - Implementation of more detailed hydraulic modeling for projects of significant size or that discharge to reaches of special concern to understand the interaction of sediment supply and flow changes.
    - Analysis of the water-balance for projects discharging into streams with sensitive habitat. This may include establishment of requirements for matching metrics such as number of days with flow based on the needs of species present.
- Guidelines for prioritization of on-site or regional flow and sediment control facilities. Watershed analysis will help identify opportunities for regional flow or sediment control facilities, which may help to mitigate for existing hydromodification impacts.

Appendix A provides detailed guidance on the appropriate application of tools to meet site control requirements.

3.8 Off-site Compensatory Mitigation Measures

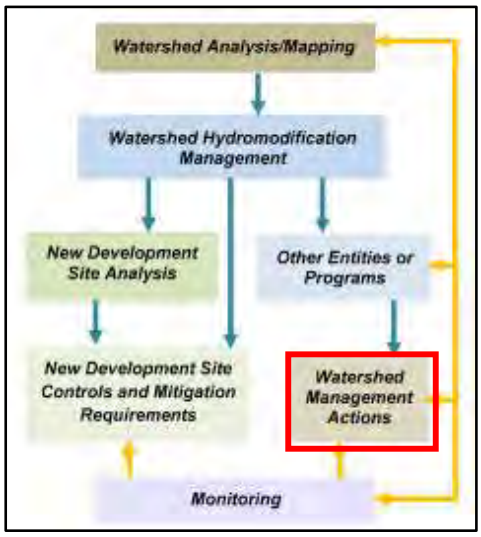

In some cases, on-site control of water and sediment will not be sufficient to offset the effects of hydromodification on receiving waters. In these cases, off-site compensatory mitigation measures will be necessary (similar to the concepts used in the Section 401/404 permitting programs). Off-site measures could be implemented by project proponents or through the use of regional mitigation banks or in-lieu fee programs.

Off-site mitigation may be necessary for several reasons:

- Off-site measures may be more effective at addressing effects or at achieving desired management goals. This may be particularly true for sites near the bottom of a watershed where upstream measures may be preferred

- Off-site measures may be necessary to supply compensation for residual project impacts where on-site measures are limited by site constraints or solutions are beyond the scope of what can be accomplished on an individual site.
- Off-site measures may be necessary where accomplishing specified management objectives is not practical using on-site measures alone. Off-site measures may be desired to remedy legacy effects of prior land use or to achieve desired beneficial uses.

Performance monitoring and adaptive management must be a part of compensatory mitigation given its inherent uncertainty.

The location and type of mitigation should be determined in the context of the watershed analysis and should account for the size and nature of the impact, location in the watershed, pre-existing conditions in the watershed, and uncertainty associated with the success of the proposed mitigation actions. In some cases these measures may be near the project site (e.g., restoring a stream reach downstream of the project site), but in other cases the off-site mitigation may be in the form of in-lieu fee or "mitigation bank" type contributions to a project located in a different portion of the watershed (e.g. upstream grade control, protection of sediment source areas). Such off-site mitigation relatively far from the site will only be possible if conducted in the context of an overall watershed plan, as discussed above. Off-site measures may include:

In cases where on-site control of water and sediment will not be sufficient to offset the effects of hydromodification on receiving waters, off-site compensatory mitigation measures will be necessary. Implementation of this approach will require that the State Water Board develop a valuation method to help determine appropriate off-site mitigation requirements in light of the anticipated impacts of hydromodification on receiving streams.

- Stream corridor restoration
- Purchase, restoration and protection of floodplain/floodway habitat
- Purchase and/or protection of critical sediment source or transport areas
- Regional basins or other retention facilities
- Upstream or downstream natural/bio-engineered grade control
- Retrofit or repair of currently undersized structures (e.g. culverts, bridge crossings)
- Removal or hydrologically disconnecting impervious surfaces

A valuation method will be necessary for assigning appropriate mitigation requirements in light of the anticipated impacts of hydromodification on receiving streams. The valuation method should be developed by the State Water Board.

To support the management approaches discussed above, HMPs should provide general guidance for application of models and other tools based on the questions being asked and the desired outcomes of

the HMP. Models can also be used to help communicate levels of uncertainty in particular management actions and to guide restoration / in-channel management actions. Modeling and other tools are discussed in detail in Section 4 and Appendices A and B.

Finally, management endpoints should articulate the desired physical and biological conditions for various reaches or portions of the watershed. To the extent possible, these desired conditions should be expressed in numeric, quantifiable terms to avoid ambiguity. Additionally, since regulatory strategies will invariably rely on quantifiable measures to determine whether stormwater management actions achieve these desired conditions, identifying appropriate numeric objectives will support determinations of regulatory compliance. As desired physical and biological watershed conditions are expressed in quantifiable terms to the extent possible, a similar need would apply to site control requirements. Control measures should be linked to, a) a desired condition (or goal), b) the parameter(s) that best define that condition, and c) quantifiable measures that serve to evaluate performance of the control measure. Direct measures (e.g., volume of runoff to be retained) as well as indirect or surrogate measures (IBI scores) are appropriate if they are quantifiable.

Management endpoints should articulate the desired physical and biological conditions for various reaches or portions of the watershed. To the extent possible, these desired conditions should be expressed in numeric, quantifiable terms to avoid ambiguity.

4. Overview of Assessment and Prediction Tools

4.1 Introduction

The previous section discussed a number of potential actions for managing hydromodification impacts. These ranged from high-level watershed-scale characterization to the site-specific design of a proposed development. This section provides an overview of the current and emerging assessment and prediction tools available to inform these management actions. An organizing framework helps explain the appropriate application of these tools, as well as their strengths and weaknesses. Specific tools that support the selection of management objectives are also discussed. Examples of "suites" of tools that are commonly used together to predict stream responses and formulate management prescriptions for channels of varying susceptibility are presented in Appendix B. Appendix A provides detailed guidance on the appropriate application of tools to meet site control requirements.

Municipalities are the primary audience for this section, as they select and incorporate these tools into their HMPs. However, the State and Regional Water Boards should be aware of the overall capabilities, appropriate uses, and gaps in our current toolbox. The development of new and improved tools should ideally be coordinated at the State level for optimum cost effectiveness and widest applicability. The table below identifies the key actions necessary at both the programmatic and local level to address the considerations discussed above, within the context of the goals of the framework described in Section 3.

Table 4-1. Recommendations for the application and improvement of tools in support of the proposed management framework.

Time Frame	Programmatic: State and Regional Water Boards	Local: City and County Jurisdictions
Short-term (<10 years)	• Develop quality control and standardization for continuous simulation modeling • Perform additional testing and demonstration of probabilistic modeling for geomorphic response • Pursue development of biologically- and physically-based compliance endpoints	• Work cooperatively with adjacent jurisdictions to implement hydromodification risk mapping at the watershed scale • Implement continuous simulation modeling for project impact analysis
Long-term (1+ decades)	• Improve tools for sediment analysis and develop tools for sediment mitigation design • Develop tools for biological response prediction • Improve tools for geomorphic response prediction	• Expand use of probabilistic and statistical modeling for geomorphic response • Apply biological tools for predicting and evaluating waterbody condition

4.2 Background

In the context of hydromodification, tools and models are typically used to help answer one or more of the following questions involving an assessment of natural and human influences at various spatial and temporal scales:

- How does the stream work in its watershed context?
- Where is the stream going? For example, have past human actions induced channel changes? What are the effects on sediment transport and channel form? What is the magnitude of current and potential channel incision following land use conversion?
- How will the stream likely respond to alterations in runoff and sediment supply?
- How can we manage hydromodification and simultaneously improve the state of the stream?

Previous sections have underscored the variability and complexity of relationships among land use, the hydrologic cycle, and the physical and ecological conditions of stream systems. It follows that the process of assessing stream condition and predicting future conditions is highly challenging and subject to uncertainty. Therefore it is important to understand the inherent strengths and limitations of the available tools, especially with respect to prediction uncertainty and how it is expressed for various tools. Considerable judgment is needed to choose the appropriate model for the question at hand. In addition to prediction uncertainty, considerations in choosing the right model for a particular application include appropriate spatial and temporal detail, cost of calibration and testing, meaningful outputs, and simplicity in application and understanding (NRC 2001; Reckhow 1999a,b).

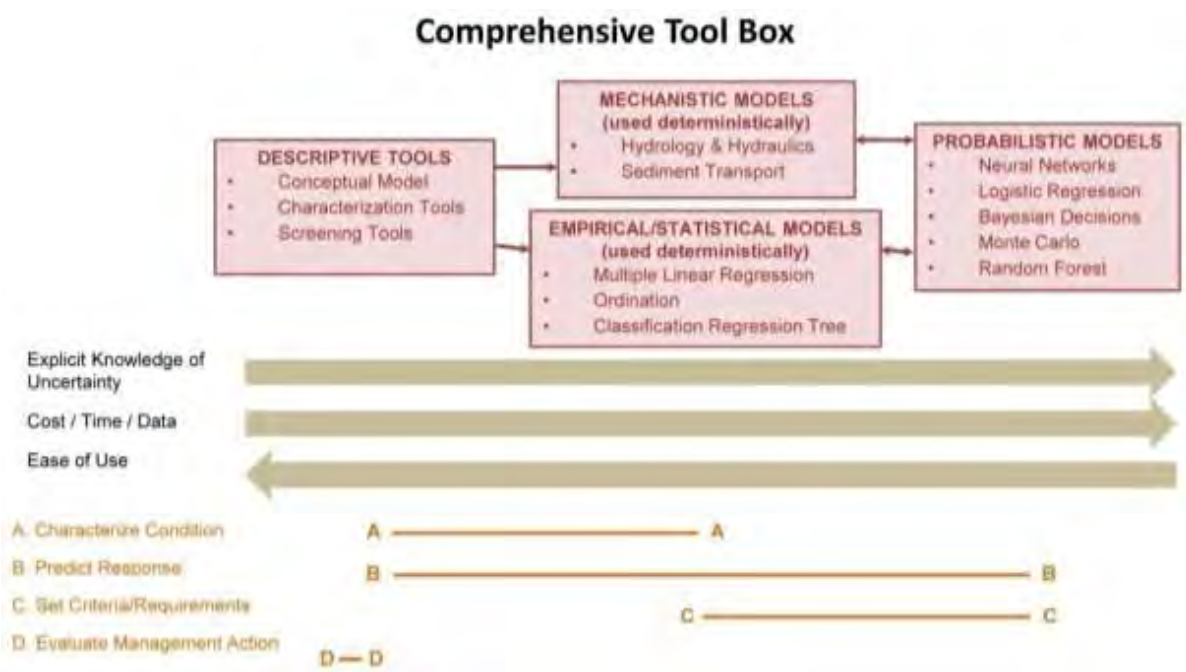

Figure 4-1. Organizing Framework for understanding hydromodification assessment and management tools.

4.3 Organizing Framework

Figure 4-1 presents an organizing framework by which to understand the available tools that may be applied in support of hydromodification management and policy development. Tools fall into three major categories: descriptive tools, mechanistic and empirical/statistical models that are used deterministically, and probabilistic models/predictive assessments with explicitly quantified uncertainty. The organizing framework relates these categories to the types of question the tools are designed to answer, specifically: characterization of stream condition, prediction of response, establishment of criteria/requirements, or evaluation of management actions. The framework also characterizes the tools according to the following features: intensity of resource requirements (i.e., data, time, cost), and the extent to which uncertainty is explicitly addressed. Subsequent sections of this section discuss each of the three major categories in turn, highlighting examples of specific tools within each category.

Given the uncertainty associated with predicting hydromodification impacts, probabilistic models should be incorporated into analysis and design, particularly where resource values or potential consequences of impacts are high.

Tools required to support the management framework presented in Section 3 include watershed characterization and analysis tools and project analysis and design tools. The level of resolution that is required will depend on the point in the planning process. At early stages, descriptive tools will be sufficient, but more precise tools will be required toward the design phase. Currently, most projects rely solely on deterministic models. However, given the uncertainty associated with predicting hydromodification impacts, probabilistic models should be incorporated into analysis and design, particularly where resource values or potential consequences of impacts are high.

4.3.1 Descriptive Tools

Descriptive tools include conceptual models, screening tools, and characterization tools. These tools are used to answer the question: *What is the existing condition of a stream or watershed?* Although descriptive tools are not explicitly predictive, they can be used to assess levels of susceptibility to future stressors by correlation with relationships seen elsewhere. The application of some type of descriptive tool, such as a characterization tool, is almost always necessary before applying a deterministic model. In particular, descriptive tools can aid in understanding the key processes and boundary conditions that may need to be represented in more detailed models.

Conceptual Models. A conceptual model, in the context of river systems, is a written description or a simplified visual representation of the system being examined, such as the relationship between physical or ecological entities, or processes, and the stressors to which they may be exposed. Conceptual models have been used to describe processes in a wide range of physical and ecological fields of study, including stream-channel geomorphology (Bledsoe *et al.* 2008). For example, Channel Evolution Models (CEMs) are conceptual models which describe a series of morphological configurations of a channel, either as a longitudinal progression from the upper to the lower watershed, or as a series at a fixed location over time subsequent to a disturbance. The incised channel CEM developed by

Schumm *et al.* (1984) is one of the most widely known conceptual models within fluvial geomorphology. This CEM documents a sequence of five stages of adjustment and ultimate return to quasi-equilibrium that has been observed and validated in many regions and stream types (ASCE 1998, Simon and Rinaldi 2000). The Schumm *et al.* (1984) CEM has been modified for streams characteristic of southern California, including transitions from single-thread to multi-thread and braided evolutionary endpoints (Hawley et al., in press).

Conceptual models also include planform classifications of braided, meandering and straight, and other general geomorphic classifications, which categorize streams by metrics such as slope, sinuosity, width-to-depth ratio, and bed material size. The qualitative response model described by Lane's diagram (1955), and discussed earlier in this report, is also a conceptual model.

Characterization Tools. Examples of characterization tools include baseline geomorphic assessments, river habitat surveys, and fluvial audits. A fluvial audit uses contemporary field survey, historical map and documentary information and scientific literature resources to gain a comprehensive understanding of the river system and its watershed. Fluvial audits, along with watershed baseline surveys are a standardized basis for monitoring change in fluvial systems. These types of comprehensive assessments are comprised of numerous, more detailed field methodologies, such as morphologic surveys, discharge measurements, and estimates of boundary material critical shear strength through measurements of resistance (for cohesive sediments) or size. Baseline assessments may also draw on empirical relationships such as sediment supply estimation models.

Screening Tools. Screening tools can be used to predict the relative severity of morphologic and physical-habitat changes that may occur due to hydromodification, as a critical first step toward tailoring appropriate management strategies and mitigation measures to different geomorphic settings. However, assessing site-specific stream susceptibility to hydromodification is challenging for several reasons, including the existence of geomorphic thresholds and non-linear responses, spatial and temporal variability in channel boundary materials, time lags, historical legacies, and the large number of interrelated variables that can simultaneously respond to hydromodification (Schumm 1991, Trimble 1995, Richards and Lane 1997).

Screening tools can be used to predict the relative severity of morphologic and physical-habitat changes due to hydromodification, as a critical first step toward tailoring appropriate management strategies and mitigation measures to different geomorphic settings.

Despite the foregoing difficulties, the need for practical tools in stream management have prompted many efforts to develop qualitative or semi-quantitative methods for understanding the potential response trajectories of channels based on their current state. For example, predictors of channel planform can be used to identify pattern thresholds and the potential for planform shifts (e.g., van den Berg 1995, Bledsoe and Watson 2001, Kleinhans and van den Berg 2010).

In addition, regional CEMs (discussed above) can partially address the needs of the hydromodification management community by providing a valuable framework for interpreting past and present response trajectories, identifying the relative severity of potential response sequences, applying appropriate

models in estimating future channel changes, and developing strategies for mitigating the impacts of processes likely to dominate channel response in the future (Simon 1995).

More recent screening-level tools for assessing channel instability and response potential, especially in the context of managing bridge crossings and other infrastructure, have borrowed elements of the CEM approach and combined various descriptors of channel boundary conditions and resisting vs. erosive forces. For example, Simon and Downs (1995) and Johnson *et al.* (1999) developed rapid assessment techniques for alluvial channels based on diverse combinations of metrics describing bed material, CEM stage, existing bank erosion, vegetative resistance, and other controls on channel response. Although based on a strong conceptual foundation of the underlying mechanisms controlling channel form, these specific examples are either overly qualitative with respect to the key processes, or developed with goals and intended applications (e.g., evaluating potential impacts to existing infrastructure such as bridges or culverts) that differ from what is needed by current hydromodification management programs.

SCCWRP has recently proposed a general framework for developing screening-level tools that help assess channel susceptibility to hydromodification, and a new region-specific tool for rapid, field-based assessments in urbanizing watersheds of southern California (Booth *et al.* 2010, Bledsoe *et al.* 2010). The criteria used to assign susceptibility ratings are designed to be repeatable, transparent, and transferable to a wide variety of geomorphic contexts and stream types. The assessment tool is structured as a decision tree with a transparent, process-based flow of logic that yields four categorical susceptibility ratings through a combination of relatively simple but quantitative input parameters derived from both field and GIS data. The screening rating informs the level of data collection, modeling, and ultimate mitigation efforts that can be expected for a particular stream-segment type and geomorphic setting. The screening tool incorporates various measures of stream bed and bank erodibility, probabilistic thresholds of channel instability and bank failure based on regional field data, integration of rapid field assessments with desktop analyses, and separate ratings for channel susceptibility in vertical and lateral dimensions.

An example of a specific analysis component that predicts changes in post-development sediment delivery, and that can be applied within this screening tool framework, is a GIS-based catchment analyses of “Geomorphic Landscape Units” (GLUs). A GLU analysis integrates readily available data on geology, hillslope, and land cover to generate categories of relative sediment production under a watershed’s current configuration of land use. Those areas subject to future development are identified, and corresponding sediment-production levels are determined by substituting developed land cover for the original categories and reassessing the relative sediment production. The resultant maps can be used to aid in planning decisions by indicating areas where changes in land use will likely have the largest (or smallest) effect on sediment yield to receiving channels.

Effective screening tools for assessing the susceptibility of streams to hydromodification necessarily rely on both field and office-based elements to examine local characteristics within their broader watershed context. Proactive mapping of flow energy measures (e.g., specific stream power) throughout drainage networks has the potential to complement field-based assessments in identifying hotspots for channel

instability and sediment discontinuities as streamflows change with land use. Such analyses may partially guide subsequent field reconnaissance; however, this approach also has limitations in that some geomorphic settings are inherently difficult to map using widely available digital elevation data. In particular, maps of stream power in narrow entrenched valleys and low gradient valleys (ca. <1%) with sinuous channels should be carefully field-truthed and used with a level of caution commensurate with the accuracy of the input data.

Moreover, spatial variability in channel boundary materials and form cannot be accurately mapped at present using remotely sensed data. Thus, boundary materials and channel width are typically assumed in watershed-scale mapping efforts, thereby introducing potential inaccuracies. Coupling desktop analysis with a field-based assessment when using such an approach can help resolve variation in site-specific features such as the erodibility of bed and bank materials, channel width, entrenchment, grade control features, and proximity to geomorphic thresholds.

4.3.2 Mechanistic and Empirical/Statistical Models with Deterministic Outputs

Mechanistic/deterministic models are simplified mathematical representations of a system based on physical laws and relationships (*link to next*). Empirical/statistical models use observed input and output data to develop relationships among independent and dependent variables. Statistical analyses determine the extent to which variation in output can be explained by input variables. Both types of models are typically used to generate a single output or answer for a given set of inputs. These tools can be used to help answer such questions as: *What are the expected responses in the stream and watershed given some future conditions? What criteria should be set to prevent future hydromodification impacts?* However, hydromodification modeling embodies substantial uncertainties in terms of both the forcing processes and the stream response. Deterministic representations of processes and responses can therefore mask uncertainties and be misleadingly precise, unless prediction uncertainty is explicitly characterized as described later in this section.

Although valuable, deterministic representations (such as those derived from continuous simulation modeling) of processes and responses can mask uncertainties and be misleadingly precise unless prediction uncertainty is explicitly characterized.

Hydrologic Models are used to simulate watershed hydrologic processes, including runoff and infiltration, using precipitation and other climate variables as inputs. Some models, such as the commonly-used HEC-HMS, can be run for either single-event simulations or in a continuous-simulation mode which tracks soil moisture over months or years. Other hydrologic models that are commonly used for event-based and continuous simulation modeling include HSPF and SWMM. It is widely accepted that continuous simulation modeling, rather than event-based modeling, is required to assess long term changes in geomorphically-significant flow events (Booth and Jackson 1997; Roesner *et al.* 2001).

Several HSPF-based continuous simulation models have been developed specifically for use in hydromodification planning. These include the Western Washington Hydrology Model (WWHM) and

the Bay Area Hydrology Model (BAHM). Hydromodification Management Plans (HMPs) in Contra Costa County, San Diego County and Sacramento County have developed sizing calculators for BMPs based on modeling done using HSPF models. To illustrate the point about uncertainly in mechanistic models, HSPF contains approximately 80 parameters, only about 8 of which are commonly adjusted as part of the calibration process.

Hydraulic Models are used to simulate water-surface profiles, shear stresses, stream power values and other hydraulic characteristics generated by stream flow, using a geometric representation of channel segments. The industry standard hydraulic model is the HEC River Analysis System (HEC-RAS).

Coupled Hydrologic and Hydraulic Models represent a valuable tool in hydromodification management. Because the streamflow regime interacts with its geomorphic context to control physical habitat dynamics and biotic organization, it is often necessary to translate discharge characteristics into hydraulic variables that provide a more accurate physical description of the controls on channel erosion potential, habitat disturbance, and biological response. For example, a sustained discharge of 100 cfs could potentially result in significant incision in a small sand bed channel but have no appreciable effect on the form of a larger channel with a cobble bed. By converting a discharge value into a hydraulic variable (common choices are shear stress, or stream power per unit area of channel relative to bed sediment size), a "common currency" for managing erosion and associated effects can be established and applied across many streams in a region. Such a common currency can improve predictive accuracy across a range of stream types. As opposed to focusing on the shear stress or stream power characteristics of a single discharge, it is usually necessary to integrate the effects of hydromodification on such hydraulic variables over long simulated periods of time (on the order of decades) to fully assess the potential for stream channel changes. By using channel morphology to estimate hydraulic variables across a range of discharges, models like HEC-RAS provides a means of translating hydrologic outputs from continuous simulations in HEC-HMS, SWMM, or HSPF into distributions of shear stress and stream power across the full spectrum of flows.

Sediment Transport Models such as HEC-6T, the sediment transport module in HEC-RAS, CONCEPTS, MIKE 11 and FLUVIAL12, use sediment transport and supply relationships to simulate potential changes in channel morphology (mobile boundary) resulting from imbalances in sediment continuity. This means that hydraulic characteristics are calculated as channel form and cross-section evolve through erosion and deposition over time. Such models have high mechanistic detail but are often difficult to apply effectively. Although it is not a mobile boundary model, the SIAM (Sediment Impact Analysis Method) module in HEC-RAS represents an intermediate complexity model designed to predict sediment imbalances at the stream network scale and to describe likely zones of aggradation and degradation.

Statistical Models use descriptive tools and empirical data to develop relationships that quantify the risk of specific stream behaviors. For example, Hawley (2009) developed a statistical model to explain variance in channel enlargement based on measures of erosive energy and channel features such grade control and median bed sediment size. Such models often include independent variables based on input from the mechanistic models described above; however, a key difference is that statistical models do not explicitly represent actual physical processes in their mathematical structure. Instead, these models

simply express the observed correlations between dependent and independent variables. Like mechanistic models, the output from these models is commonly treated as precise results in management decisions, despite the fact that predictions from most statistical models could be readily (and more accurately) expressed in terms of confidence intervals with a range of uncertainty.

Probabilistic/Risk-based Models integrate many of the tools discussed above, using modeled changes in hydrology as input to hydraulic models, which in turn provide input to various types of statistical models to predict response. However, the predictions are not represented as deterministic outputs, instead, the range of (un)certainty in the likelihood of the predicted response is explicitly quantified. Although not commonly used for hydromodification management at this time, there are well established models based on these principals currently in use in other scientific disciplines. An example of a probabilistic approach that has been used for hydromodification management is a logistic regression analysis that was used to produce a threshold "erosion potential metric" that can be used to quantify the risk of a degraded channel state. More details on this approach are provided in Appendix B.

Risk-based modeling in urbanizing streams provides a more scientifically defensible alternative to standardization of stormwater controls across stream types, and can inform management decisions about acceptable levels of risk.

Risk-based modeling in urbanizing streams provides a more scientifically defensible alternative to standardization of stormwater controls across stream types. A probabilistic representation of possible outcomes also improves understanding of the uncertainty that is inherent in model predictions, and can inform management decisions about acceptable levels of risk.

Predictive Tools for Habitat Quality and Stream Biota. The tools discussed above focus on physical stream impacts; however, as discussed in the preceding chapter, it is recognized that maintenance of stream "stability" does not necessarily conserve habitat quality and biological potential. In general, the knowledge base for biota/habitat associations is not generally adequate to allow for prediction of how whole communities will change in response to environmental alterations associated with urbanization. Making such predictions deterministically requires a thorough knowledge of species-specific environmental responses, as well as an adequate (accurate) characterization of habitat structure and habitat dynamics (both of which are modified by urbanization). However, recent studies have demonstrated that the effects of hydrologic alterations induced by urbanization on selected stream biota can be quantitatively described without a full mechanistic understanding, using stressor-response type relationships and empirical correlations from field-measured conditions (Konrad and Booth 2005, Konrad *et al.* 2008, DeGasperi *et al.* 2009).

In moving beyond a narrow focus on linkages between flow alteration and channel instability, scientific understanding of hydrologic controls on stream ecosystems has recently led to new approaches for assessing the ecological implications of hydromodification. The essential steps in developing quantitative "flow-ecology relationships" have been recently described in the Ecological Limits of Hydrologic Alteration (ELOHA) process (Poff *et al.* 2010), a synthesis of a number of existing hydrologic techniques and environmental flow methods. ELOHA provides a regional framework for elucidating the

key hydrologic influences on biota of interest, and translating that understanding into relationships between hydromodification and biological endpoints that can be used in management decision making. This requires a foundation of hydrologic data provided by modeling and/or monitoring, and sufficient biological data across regional gradients of hydromodification. Although hydrologic–ecological response relationships may be confounded to some extent by factors such as chemical and thermal stressors, there are numerous case studies from the US and abroad in which stakeholders and decision-makers reached consensus in defining regional flow standards for conservation of stream biota and ecological restoration (Poff *et al.* 2010; http://conserveonline.org/workspaces/eloha).

4.3.3 Strengths, Limitations and Uncertainties

The Organizing Framework shown in Figure 4-1 shows the applicability of the three major categories of tools in support of various management actions. This section addresses a range of issues relating to strengths, limitations and uncertainty of the tools discussed above. Detailed analysis of individual models is beyond the scope of this document, but EPA/600/R-05/149 (2005) contains an extensive comparison of functions and features across a wide range of hydrologic and hydraulic models.

Explicit consideration, quantification, and gradual reduction of model uncertainty will be necessary to advance hydromodification management.

The uncertainty inherent to hydromodification modeling underscores the need for carefully designed monitoring and adaptive management programs.

General Considerations. The well-known statistician George Box famously said that "all models are wrong, some are useful." The usefulness of a model for a particular application depends on many factors including prediction accuracy, spatial and temporal detail, cost of calibration and testing, meaningful outputs, and simplicity in application and understanding. There is no cookbook for selecting models with an optimal balance of these characteristics. Models of stream response to land-use change will always be imperfect representations of reality with associated uncertainty in their predictions. In addition to the prediction errors of standard hydrologic models, common limitations and sources of uncertainties include insufficient spatial and/or temporal resolution, and poorly known parameters and boundary conditions. Ultimately, the focus of scientific study in support of decision making should be on the decisions (or objectives) associated with the resource and not on the model or basic science. Each model has limitations in terms of its utility in addressing decisions and objectives of primary concern to stakeholders. Prediction error, not perception of mechanistic correctness, should be the most important criterion reflecting the usefulness of a model (NRC 2001; Reckhow 1999a,b). The predictive models discussed above may be thought of as predictive scientific assessments; that is, a flexible, changeable mix of small mechanistic models, statistical analyses, and expert scientific judgment.

Region-Specific Considerations. Because all models are vulnerable to improper specification and omission of significant processes, caution must be exercised in transferring existing models to new

regional conditions. For example, mobile boundary hydraulic models are mechanistically detailed but not generally well-suited to many southern California streams given the prevalence of near-supercritical flow, braiding and split flow (Dust 2009). In addition, bed armoring and channel widening resulting from both fluvial erosion and mass wasting processes are key influences on channel response in semi-arid environments. These processes are not well-represented and constrained in current mobile boundary models. Accordingly, the appropriateness of existing models for addressing a particular hydromodification management question should be empirically tested and supported with regionally appropriate data from diverse stream settings.

Managing Uncertainty. To date, hydromodification management has generally relied on oversimplified models or deterministic outputs from numerical models that consume considerable resources but yield highly uncertain predictions that can be difficult to apply in management decisions. Numerical models are nevertheless an important part of the hydromodification toolbox, especially in characterizing rainfall-response over decades of land-use change. It is challenging to rigorously quantify the prediction accuracy of these mechanistic numerical models; however, their utility of can be enhanced by addressing prediction uncertainties in number of ways (Cui *et al.* 2011). Candidate models can be subjected to sensitivity analysis to understand their relative efficacy for assessment and prediction of hydromodification effects. Moreover, it should also be demonstrated that selected models can reasonably reproduce background conditions before they are applied in predicting the future. Modeling results that are used in relative comparisons of outcomes are generally much more reliable than predictions of absolute magnitudes of response.

Hydromodification modeling embodies substantial uncertainties in terms of both the forcing processes and stream response. Deterministic representations of processes and responses can mask uncertainties and can be misleading unless prediction uncertainty is explicitly quantified. Errors may be transferred and compounded through coupled hydrologic, geomorphic, and biologic models. Accordingly, explicit consideration, quantification, and gradual reduction of model uncertainty will be necessary to advance hydromodification management. This points to two basic needs. First, there is a need to develop more robust probabilistic modeling approaches that can be systematically updated and refined as knowledge increases over time. Such approaches must be amenable to categorical inputs and outputs, as well as combining data from a mix of sources including mechanistic hydrology models, statistical models based on field surveys of stream characteristics, and expert judgment. Second, the uncertainty inherent to hydromodification modeling underscores the need for carefully designed monitoring and adaptive management programs, as discussed in Section 5.

A risked-based framework can provide a more rational and transparent basis for prediction and decision-making by explicitly recognizing uncertainty in both the reasoning about stream response and the quality of information used to drive the models. Prediction uncertainty can be quantified for any of the types of models described above; however, some types are more amenable to uncertainty analysis than others. For example, performing a Monte Carlo analysis of a coupled hydrologic-hydraulic model is a very demanding task. A simple sensitivity analysis of high, medium, and low values of plausible model parameters is much more tractable and still provides an improved understanding of the potential range of system responses. Such information can be subsequently integrated with other model outputs and

expert judgment into a probabilistic framework. For example, Bayesian probability network approaches can accommodate a mix of inputs from mechanistic and statistical models, and expert judgment to quantify the probability of categorical states of stream response. Such networks also provide an explicit quantification of uncertainty, and lend themselves to continual updating and refinement as information and knowledge increase over time. As such, they have many attractive features for hydromodification management, and are increasingly used in environmental modeling in support of water quality (Reckhow 1999a,b) and stream restoration decision-making (Stewart-Koster *et al.* 2010).

Sediment Supply. As described above, a reduction in sediment supply to a stream may result in instability and impacts, even if pre- and post-land use change flows are perfectly matched. Thus, there is a need to develop management approaches to protect stream channels when sediment supply is reduced, and to refine and simplify tools to support these approaches. This continues to prove challenging because, the effects of urban development on sediment supply in different geologic settings are not well understood and poorly represented in current models. As a starting point, models used to analyze development proposals that reduce sediment supply could be applied with more protective assumptions with respect to parameters and boundary conditions (inflowing sediment loads). Effects of altered sediment supply on stream response could be addressed in a probabilistic framework by adjusting conditional probabilities of stream states to reflect the influence of reductions in important sediment sources due to land use change.

5. MONITORING

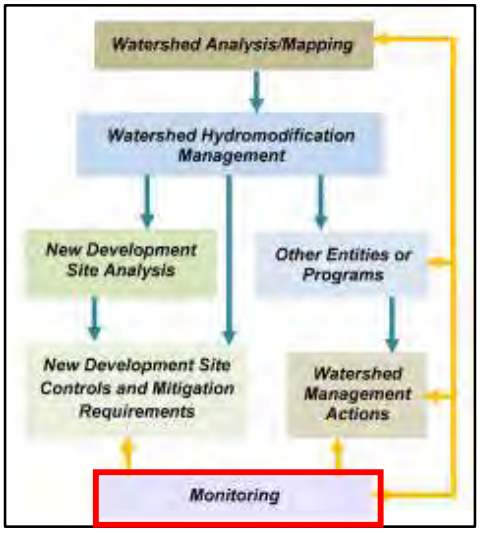

"Monitoring" can cover a tremendous range of activities in the context of stormwater management in general, and of hydromodification in particular. For example, the NPDES Phase 2 general permit for California (SWRCB, 2003 (*www.swrcb.ca.gov/**water**_issues/.../storm**water**/.../final_ms4_**permit**.p...)*, National Pollutant Discharge Elimination System (NPDES) General Permit No. CAS000004, p. 11) notes that the objectives of a monitoring program may include:

- Assessing compliance with the General Permit.
- Measuring and improving the effectiveness of stormwater management plans.
- Assessing the chemical, physical, and biological impacts on receiving waters resulting from urban runoff.
- Characterizing storm water discharges.
- Identifying sources of pollutants.
- Assessing the overall health and evaluating long-term trends in receiving water quality.

These objectives span multiple goals, ranging from verifying of compliance, evaluating effectiveness, characterizing existing conditions, and tracking changes over time. Each would likely require different monitoring methods, duration of measurement, and uses of the resulting data (Table 5-1). This variability emphasizes what we consider the key starting point of any monitoring program: to answer the questions, "What is the purpose of monitoring? How will the data be used?" Even secondary considerations can exert great influence over every aspect of the design of a monitoring program: "How quickly do you need to have an answer?" And, perhaps most influential of all, "What are the resources available to provide that answer?"

Table 5-1. The recommended purpose(s) of monitoring associated with hydromodification control plans, organized by the scale of implementation and the time frame in which useful results should be anticipated.

Time Frame	Programmatic: State and Regional Water Boards	Local: City and County Jurisdictions
Short-term (<10 years)	• Define the watershed context for local monitoring (at coarse scale) • Evaluate whether permit requirements are making positive improvements	• Evaluate whether specific projects/ regulations are meeting objectives • Identify the highest priority action(s) to take
Long-term (1+ decades)	• Define watershed context and setting benchmarks for local-scale monitoring (i.e., greater precision, if/as needed) • Demonstrate how permit requirements can improve receiving-water "health," state-wide (and change those requirements, as needed)	• Evaluate and demonstrate whether actions (on-site, instream, and watershed scale) are improving receiving-water conditions • Assess program cost-effectiveness • Identify any critical areas for resource protection

5.1 The Purpose of Monitoring

In the context of hydromodification assessment and management, we propose three interrelated purposes for monitoring that will guide the discussion and recommendations in this section:

- **Characterizing the conditions** of receiving waters downstream of urban development (including any trends in those conditions over time).
- **Evaluating the effectiveness** of hydromodification controls at protecting or improving the conditions of downstream receiving waters (and modify them, as needed).
- **Setting priorities** on the wide variety of hydromodification control practices, as promulgated by the State and Regional Boards and as implemented by local jurisdictions.

These needs give rise to several interrelated types of monitoring, all common to many watershed and stormwater monitoring programs. They are typically executed at different spatial and temporal scales, and if well-designed and executed they can collectively help guide management actions. We define them here, using terms and definitions that are common to the monitoring literature:

- **Performance monitoring,** by which is normally meant the evaluation of a particular stormwater facility relative to its intended (or designed) performance, but independent of whether that intended design is actually beneficial for downstream receiving waters.
- **Effectiveness monitoring,** by which we mean the assessment of how well specific management actions or suites of actions reduce or eliminate the direct impacts of stormwater on receiving waters. This type of monitoring can answer a question common to stormwater management: does a particular facility actually achieve its intended goal (e.g., flow releases from a stormwater facility protect the stream channel downstream from erosion)? More broadly, monitoring can evaluate the "effectiveness" of a suite of measures or an overall program designed to produce

beneficial outcomes (or avoid negative ones) in downstream receiving waters. In this context, the precise boundaries division between effectiveness monitoring and other types are blurry and unnecessarily artificial.

- **Trends monitoring,** by which we mean an integrative assessment of whether our "endpoint" indicators (physical, chemical, or biological) are showing any consistent, statistically significant change over time. Such monitoring rarely "proves" the direct impacts of a specific stressor on a receiving water, but it is critical to setting and evaluating progress towards integrative assessment endpoints at a regional scale. If well-designed, trend monitoring commonly provides useful information at smaller spatial scales as well, particularly in evaluating response to recent management actions or recovery from a prior disturbance.
- **Characterization monitoring**, by which is commonly meant the identification and (or) the quantification of various parameters in stormwater or a receiving-water body. Characterizing the condition of an outflow discharge or a water body at a particular time and place is always an outcome of the other kinds of monitoring; when it is called out as a goal in-and-of itself, however, it is can be useful to prioritize actions—but only if there is a preexisting standard for what constitutes a "good" or "acceptable" condition (also termed "status monitoring"), and a program to implement (or at least to set the priority for implementing) actions to improve the condition of waterbodies found to be "not good" or "unacceptable."

Without a context for evaluation, characterization monitoring is prone to generate large quantities of rarely used data. We strongly encourage that the purpose of any "characterization" monitoring be clearly articulated in hypothesis testing, priority setting, or systematic trend evaluation. As noted by NRC (2009, p. 508) with respect to this type of monitoring, "…monitoring under all three (NPDES municipal, industrial, and construction) stormwater permits is according to minimum requirements not founded in any particular objective or question. It therefore produces data that cannot be applied to any question that may be of importance to guide management programs, and it is entirely unrelated to the effects being produced in the receiving waters." We seek to proactively avoid this problem.

Monitoring should occur at two scales:

- **Regional or state-wide scale- this will require a time frame of one to several decades**
- **Local scale – this is required to evaluate the performance and effectiveness of specific management measures.**

In this sub-section, we focus our discussion on two interrelated scales at which these various types of monitoring should be applied as outlined in Table 5-1 at the beginning of this section. The first, which here and elsewhere in this document is termed "programmatic," has a regional or state-wide spatial scale; many of its key actions will require a time frame of one to several decades. Monitoring data from this scale should inform the broadly construed "health" of receiving waters to assess whether the range of hydromodification strategies being implemented is maintaining desired conditions across the (state-wide) range of physiography, climate, land-use change, and regulatory approaches of the regional boards. They should be used to identify particularly promising (or particularly ineffective) combinations of control strategies and landscape conditions. Finally, they should provide regionally tailored benchmarks for what constitutes "healthy

watersheds" and "healthy receiving waters" so regulators and permittees alike know what still needs to be done, where it should be done, and how urgently it needs to happen.

The second scale of monitoring data we term "local." It comprises the generation of monitoring data to evaluate the performance and effectiveness of specific management measures (be they structural or nonstructural) at reducing the negative consequences of hydromodification on downstream receiving waters. Useful information at this scale will normally be generated in the time frame of an NPDES permit cycle (i.e., ~5 years) and should provide direct guidance on whether the evaluated management strategies are working, need refinement, or should be abandoned altogether. They should also provide guidance on the degree to which management efforts should be prioritized where regulatory flexibility exists, given the conditions (and, perhaps, the potential responsiveness) of downstream receiving waters. Over longer time frames, monitoring at this scale can also provide public demonstration of the value of regulatory and programmatic efforts, and it can also help identify the most cost-effective mix of publically funded projects and regulatory protection to achieve (or maintain) receiving-water health.

5.2 Programmatic Monitoring at the Regional Scale

5.2.1 Defining Watershed Context

Although not "monitoring" in the strictest sense of this word, establishing a watershed context for the measurement and evaluation of receiving waters is a hallmark of virtually all recommended monitoring strategies (e.g., Beechie *et al.* 2010, Brierley *et al*. 2010). Monitoring programs should be consistent with the watershed perspective that forms the basis for the management framework discussed in Section 3. In California (as in most other states), this can only be executed at a supra-jurisdictional scale, because most watersheds cross one or more city and/or county boundaries. This presents the long-term challenge that many jurisdictions do not have authority over parts of the landscape that can affect the quality of rivers and streams that pass through their boundaries; more immediately, however, it makes an inclusive watershed assessment almost impossible to execute at a local level.

5.2.2 Determining the Effectiveness of Permit Requirements

A second, more challenging contextual need at the regional scale is the definition of thresholds or endpoints against which to compare the results of monitoring or modeling. Both of these "assessment tools" can guide the application of hydromodification control strategies, evaluate their real or likely success, and predict the consequences of hydromodification on downstream receiving waters. However, they provide little insight into the question, "how good is good enough?" Answering this question requires a definition of "assessment endpoints" (borrowing the term from NRC 1994), which in turn requires objective, quantifiable criteria for evaluating progress or outright success.

Most existing HMPs require the permitted municipalities to develop programs and policies to assess the potential effects of hydromodification associated with new development and redevelopment, to include management measures to control the effects of hydromodification, and to implement a monitoring program that assesses the effectiveness of HMP implementation at controlling and/or mitigating the

effects of hydromodification. Yet the appropriate objectives of such management measures, or a basis to evaluate success or failure of the HMP through monitoring data, are rarely provided in consort. Setting these endpoints is beyond the capacity of any but the largest municipalities—and even for those, neither the field of watershed science nor the arena of public policy is so clear that an unequivocally "correct" answer is likely to emerge without much additional work. Any such finding would also lack state-wide applicability; California is far too physically and ecologically diverse for an assessment endpoint developed in one part of the state to transfer everywhere without careful consideration.

For these reasons, we consider this aspect of monitoring at the regional scale to be a long-term, state-wide effort. This reflects the challenge of conducting meaningful characterization (or "status") monitoring: it requires a benchmark against which the measured condition can be compared, and to which an absolute rating ("good," bad," etc.) can be assigned.

In contrast, "trends" monitoring requires no such benchmark, only equivalent measurements undertaken at multiple times coupled with an understanding of what direction of change is desirable. For this reason, evaluating whether permit requirements are making positive improvements is a reasonable (and probably critical) short-term effort, one that can be conducted locally (see below). It should also be integrated and compiled at a regional level, however, the better to inform the continued development of hydromodification requirements.

5.3 Monitoring at the Local Scale

The needs of a monitoring program for local jurisdictions should complement those being satisfied at a regional scale. Showing net improvement is critical to maintaining support for regulatory actions and capital expenditures, but any monitoring program must reflect the typical constraints of showing rapid results while acknowledging constraints on staff resources and expertise (Scholz and Booth 2001). No less urgent is the need to identify what to do "next"—not necessarily establishing a multi-year capital improvement plan, but at least identifying key problems with one or two associated actions that would likely result in significant improvements in receiving-water conditions. Watershed characterization, as discussed above and applied to a specific jurisdiction, can provide useful guidance for such identification; even without it, local knowledge is commonly sufficient in-and-of itself. Targeted monitoring can normally confirm (or refute) such inferences in short order, which is why we place this monitoring application in the "short-term" category.

However, a monitoring program can also provide longer term guidance to local jurisdictions. When supported by the regional context of receiving-water conditions, local monitoring data can demonstrate trends over time that can lend support to (or indicate necessary changes to) hydromodification control plans. In combination with economic data, they can show long-term cost-effectiveness. Finally, site-specific monitoring data, when analyzed in the context of an appropriate scale of watershed characterization, can guide the stratification of less developed and undeveloped watershed areas into those where more assertive protection (or restoration) will be most worthwhile. None of these outcomes depend solely on collecting monitoring data, which is why none of them are presumed to be credible "short-term" applications of monitoring data. However, they have found expression in other

parts of the country having long-term monitoring efforts, and they should provide similar benefits to California as well.

5.4 Developing a Monitoring Plan

"Monitoring" the effects of a management action, whether it is a new regulation, a change in operational procedures, or a constructed project, is commonly included by design or required by regulation. The collection of monitoring data may be seen as a worthwhile activity in its own right, but this discussion uses a more restrictive, implementation-based definition: any "monitoring" needs to demonstrate a direct connection to management actions, such that the results of monitoring are translated into on-the-ground management actions (or changes in management actions). This focus on the *use* of monitoring data requires clear linkages between a management action, the uncertainties associated with that action, the ways in which the effects of that action are expressed (and can be measured) in the world, and the management changes that should be implemented if monitoring results provide unanticipated (or equivocal) resolution to those uncertainties. This is the basis for establishing an "adaptive management" approach to hydromodification monitoring, discussed in more detail in Appendix C. Here, we discuss the design of a monitoring program and outline the variety of measurements that can be made, under the assumption that the intended use(s) of the monitoring data have already been established.

"Stormwater management would benefit most substantially from a well-balanced monitoring program that encompasses chemical, biological, and physical parameters from outfalls to receiving waters" (NRC 2009, p. 257). In pursuit of a comprehensive monitoring program we might also add regular documentation of weather and climate conditions and land-cover changes. As a practical matter, however, monitoring at a site scale is almost never coordinated with other equivalent efforts at other locations, nor placed in a broader spatial context being developed as part of a regional effort. For monitoring data to have greatest value, however, such coordination and context-setting is needed.

Stormwater management would benefit most substantially from a well-balanced monitoring program that encompasses chemical, biological, and physical parameters… (NRC, 2009)

5.4.1 Design of a Monitoring Plan

As noted at the beginning of this section, the overarching question that must be asked and answered at the beginning of any monitoring design effort is "What is its purpose?" The considerations enumerated below cannot be addressed without an explicit answer to this question, because the outcome of those considerations will depend on how the data are to be used. For certain common application of monitoring data we suggest guidance that will be widely appropriate, but there are no recommendations in this section (or any other monitoring guidance document) that apply universally.

Multiple authors have condensed their guidance for designing a monitoring plan into a short list of steps that should precede the first instance of field data collection (e.g., Shaver *et al.* 2007). Although all

differ in details and intended audience, they share significant commonalities that can be distilled as follows:

- Articulate the purpose of the monitoring (the "management question").
- Identify key constraints, in particular the geographic range and scale over which the monitoring can occur, financial/staff resources available, and the time frame in which results must be generated.
- Evaluate existing information, model outputs, and/or regulatory requirements to identify promising metrics and specific sites appropriate to the management question.
- Identify the specifics of the monitoring plan: what parameter(s), where, for how often and for how long. This may include multiple iterations, wherein the guidance of Step 3 must align with the constraints of Step 2.

Most such guidance is written with site-specific, "local" monitoring in mind—the existing literature provides less direction for monitoring that is herein recommended to occur at a regional scale over the next one or more decades. However, the basic principles are the same at all scales: a coherent, explicit purpose needs to be articulated, resource constraints need to be acknowledged, and a credible strategy needs to be developed with its specifics fleshed out. Below we discuss some of the primary considerations in this last step, because they are common across a wide range of monitoring purposes, programmatic constraints, and indicator types.

5.4.2 Constraints (Step 2 of the Monitoring Plan)

Ideally, a monitoring program should be designed to detect trends, assess effectiveness and allow for source identification.

Scale. Ideally, a monitoring program should encompass multiple, nested scales of monitoring that are determined by the question(s) being addressed. For hydromodification applications, the broadest scale of monitoring is that of the integrated effect of stormwater impacts and stormwater management on receiving waters. *Trends monitoring* (and characterization monitoring, if regionally appropriate ranges of quality have been determined) addresses these questions, and it also allows stormwater and resource managers to measure the broad benefits obtained from management investments. Site-specific conditions normally cannot be traced back to specific generators of pollution (NRC 2009), and so monitoring at the broadest scales (i.e., many tens of square miles and larger) should not attempt to do so. Instead, identifying overall conditions and trends requires a broad spatial scale over long time frames (i.e., multiple years), the essence of trends monitoring. This level of effort is recommended as a regional responsibility, because the area(s) of interest will normally far exceed the geographic limits of any single jurisdiction.

If trends monitoring (or long-standing prior knowledge) indicates that there are impacts on beneficial uses, a second (and more site-specific) scale is invoked, that of *effectiveness monitoring:* which of our many stormwater-management actions are achieving the greatest reduction in downstream impacts

(and which are not)? On the whole, such stormwater control measures, both structural and nonstructural, vary by land use—the measures suitable for a residential neighborhood will likely be impractical or ineffective (or both) in an industrial setting. We therefore anticipate that most effectiveness monitoring will be stratified by land use and conducted by individual jurisdictions (see, for example, such an approach in the Nationwide Stormwater Quality Database, which contains water-quality data from more than 8600 events and 100 municipalities throughout the country).

The finest scale of monitoring is that of *source identification*, a form of characterization monitoring: what specific locations and which parts of the landscape generate stormwater of sufficiently deleterious quantity and (or) quality to cause impacts to beneficial uses, be they direct or indirect effects? This question is widely posed in stormwater management programs, and a number of existing monitoring programs seek to provide answers. The science of stormwater already suggests where the greatest attention is probably warranted (NRC 2009), namely a particular focus on areas of well-connected (or "effective") impervious area, high vehicular traffic, and exposure to toxic chemicals. We therefore suggest these categories should define areas of highest priority for this type of targeted investigation, allowing even a resource-constrained jurisdiction to conduct a useful, well-focused monitoring effort with good efficiencies.

Siting. Site selection is most commonly guided by the location of the management action being evaluated while dictated by more mundane considerations of property ownership and access logistics. In general, sites need to meet a few following basic criteria.

- Appropriate scale: the upstream area should be dominated by, or at least significantly affected by, the management action of interest.
- Responsiveness: at the chosen location, the parameters being measured should be amenable to change in response to the management action (e.g., monitoring for geomorphic change in a concrete channel is ill-advised).
- Representativeness: the results at the chosen location should be credibly extrapolated to "similar" sites, and those sites in aggregate should constitute a widespread (or otherwise important) subset of the landscape as a whole.
- Access: the site should be easily reached by the appropriate personnel and equipment, and with a cost of doing so consistent with the frequency of measurements being made. Any equipment left unattended needs to be secure (or well-hidden).

There are institutional considerations in site selection as well. Multiple programs implement monitoring or impose monitoring requirements, and coordination can provide mutual benefits and efficiencies to all. In particular, monitoring driven by management actions at a particular location (i.e., a local scale) will always benefit from information from one or more regional-scale reference sites that can characterize natural or background variability. Local studies will rarely have resources to execute such an effort themselves, again emphasizing the importance of a nested (and coordinated) hierarchy of monitoring programs.

Time and Variability. Evaluating the effectiveness of management actions requires a preliminary judgment of the time frame over which effects can be recognized. For water-quality parameters, storm-specific grab samples or continuous flow-weighted sampling has been most common; for changes in geomorphic form or in the population attributes of benthic macroinvertebrates, one-time annual sampling that presumes to integrate the effects of the past year are typical. Flow metrics are normally extracted from "continuous" (i.e., 5-, 15-, or 60-minute) measurements of discharge. However, every measurement has some degree of variability, a consequence of "natural" variability, measurement errors, and induced change (i.e., the effects of the management action we are trying to perceive). Separating these components is a matter of statistical analysis (see next section) based on repeated measurements, either in time or in space (or both).

We note that many practices common to past monitoring efforts, particularly the use of individual grab samples to characterize stormwater quality, have yielded results with little to no subsequent value: "…to use stormwater data for decision making in a scientifically defensible fashion, grab sampling should be abandoned as a credible stormwater sampling approach for virtually all applications" (NRC 2009, p. 330).

The duration of a monitoring program is commonly determined by the desire for "timely" answers, although normally the ability to generate statistically significant results is a function of the system being evaluated and the indicators being measured. This often creates a conflict between the intended "mission" of the monitoring program and its ability to produce defensible results, a conflict that can only be avoided by a design that identifies meaningful variables to measure, conducts sufficiently frequent measurements to dampen random variability, and must persist~~s~~ for long enough to allow a management "signal" to emerge from the data. This is the essence of the iteration noted above in Step 4 of monitoring-plan design above.

The monitoring program design must persist long enough to a allow management "signal" to emerge from the data. Consequently, long-term records (i.e., one to several decades) will be needed to detect all but the most dramatic of trends in biological indicators.

In one of relatively few quantitative studies of variability in biological indicators, Mazor *et al.* (2009) found that year-to-year variability for the same site sampled in the same season showed a variability (i.e., ±1σ) was typically about 10 points for a benthic IBI. With average scores for their 5 sites ranging from 28–51 (on a 100-point scale), this reflects a coefficient of variation of about 25%. Individual metrics were even more variable. This emphasizes that long-term records (i.e., one to several decades) will be needed to detect all but the most dramatic of trends in biological indicators.

The duration of monitoring also needs to capture the events that are most important to the anticipated responses of the measured system. For evaluating the effects of hydromodification, frequent storms (i.e., those that are normally expected to occur one to several times per year) are commonly judged important and their effects would normally be captured by a monitoring effort of even just one or a few years' duration. Particularly in more semi-arid regions of the state, however, significant channel-altering events may occur only after many decades of relative quiescence and stability, and noticeable (or documentable) response of streams to hydromodification may only occur under certain circumstances or following specific combination of events. Therefore, the lack of channel response on an annual basis

may not necessarily indicate that management actions are effective. Thus a long-term, ongoing monitoring effort is necessary to capture the responses to infrequent, stochastic events, but determining the likely duration of such a program requires some knowledge (or assumptions) of the critical drivers of those responses. It therefore requires a well-posed set of management questions underlying the monitoring effort as well.

For management questions concerning the effectiveness of hydromodification controls, monitoring will almost always benefit from long-term flow monitoring at multiple sites, especially those in the mid to upper watershed (and key tributaries, depending on the scale of the effort). Local rainfall measurements are nearly as essential, since flow data without rainfall data resolved at a similar spatial and temporal scale are useless at best, misleading at worst. Baseline (pre-project) monitoring normally is also invaluable. However, each of these elements will normally require some combination of a multi-scale, long-term, coordinated monitoring program with an investment of at least several years' duration in anticipation of (and follow-up after) a specific management action at a specific location. Despite the value for evaluating the effects of hydromodification (and hydromodification control efforts), such monitoring almost never occurs to this degree. To the extent this remains a practical constraint on implementation, the range of management questions needs to be commensurately narrowed as well.

Statistical Considerations. The statistical design of a monitoring program is beyond the scope of this section, because the range of possible requirements and approaches is tremendously broad. Several general principals are worth articulating, however, because they apply almost universally (and are commonly ignored):

- Although trends can be "suggested" by monitoring data, only statistically rigorous results can be offered as "proof." Thus, ignoring this dimension of monitoring program design severely limits future applicability of the results.
- Most natural parameters display high variability when measured outside a laboratory, and thus the magnitude of change caused by a management action also needs to be great before it can be recognized. There is a trade-off between the relative magnitude of change and the number of samples required to recognize it (i.e., large relative changes require fewer samples), but many monitoring efforts pay little attention to this basic fact. Where sampling can only occur during specified storm conditions or once during the same season each year, the duration of a monitoring campaign sufficient to detect even large changes in naturally variable parameters is likely to be a decade or longer. For many management applications, this is tantamount to generating no useful information at all (but is significantly more costly).
- The level of effort needed can be estimated *a priori* to help guide final monitoring design, but only if the degree of variability and the magnitude of change to be perceived are known or estimated ahead of time. One such example is given below, where the diagonal lines are labeled with the number of independent samples needed to achieve a typical level of statistical power for various combinations of permissible error from the "true" value (x axis), and the intrinsic variability in values across the population being measured (y axis) in Figure 5-1 below.

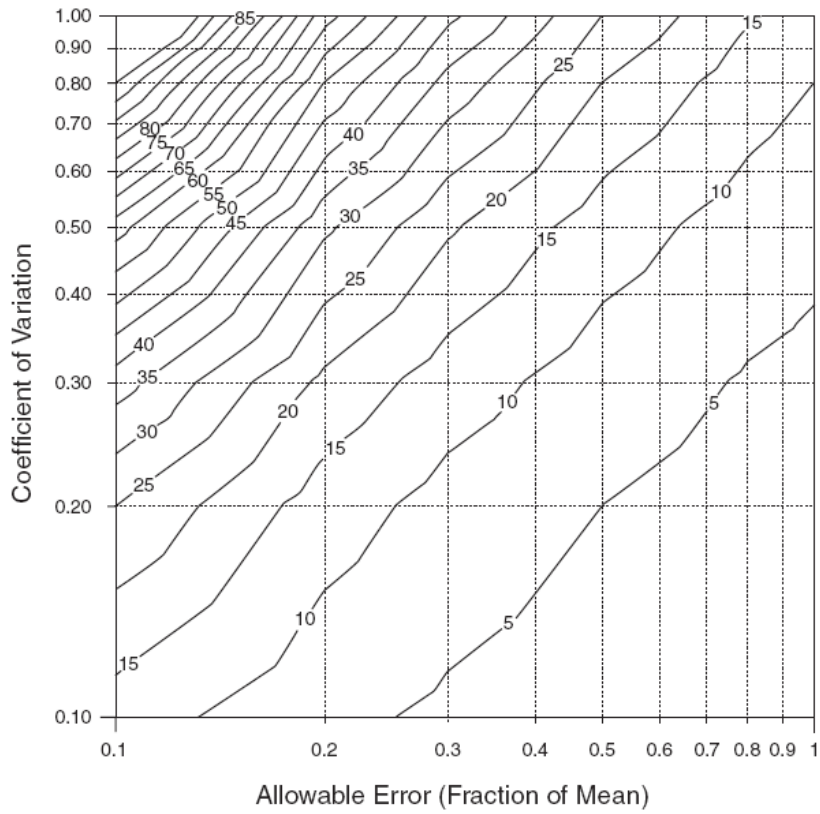

Figure 5-1. Sample requirements for confidence of 95% (α = 0.05) and power of 80% (β = 0.20). Figure from Pitt and Parmer 1995.

5.4.3 What to Monitor (Step 3 of the Monitoring Plan)

The choice of "what to monitor" follows from the choice of assessment endpoints, which in turn depends on the choice of management goals: for example, if "stable stream channels" is the intended outcome of an HMP, then measurement of the physical form of a channel over time would be appropriate. If diagnosing the cause of observed changes is also desired, then some evaluation of potential causal agents (e.g., hydrology, sediment input, or direct disturbance) would also be needed. Because management goals are now commonly (and appropriately) cast more broadly, however, they can embrace less clearly defined endpoints such as "watershed health" or "biological integrity." Many such endpoints fail the test of quantifiable objectivity.

However, these goals invoke a broad scope of concern, embracing not only physical stream conditions but also a range of chemical, hydrologic, and biological attributes. They encompass a broader catalog of receiving waters that may need to be evaluated. Finally, they emphasize the importance of looking more broadly to identify the cause of observed changes—both spatially, to conditions throughout a watershed that may have influence downstream; and temporally, to recognize ongoing adjustments to past disturbance (i.e., legacy effects) and to future environmental changes (e.g., climate change) that commonly lie well beyond the ability of local watershed managers to address. The imprecision of these

goals should not obscure the importance of broadening the scope of stormwater and hydromodification assessments to include not only the traditionally emphasized characterization of selected water-quality constituents and channel stability, but also more integrative measures.

These considerations suggest two broad categories of assessments, which largely but not entirely align with the two scales of implementation (i.e., "programmatic" and "local") defined in Table 4–1:

- Integrative: defining an overall level of "health" of the watershed, as expressed in the condition(s) of its receiving waters. Current scientific consensus suggests that biological indicators are best suited to this scale of evaluation (Karr and Chu 1999), insofar as they integrate the consequences of multiple stressors on aquatic systems and because many management goals (and regulatory requirements) are cast in biological terms. To be meaningful, however, any such indicators need to be suitably chosen and stratified for their particular geo-hydro-climatological region (e.g., "ecoregions"; Omernick and Bailey 1997).
- Targeted: demonstrating the achievement of an established regulatory standard or a designated threshold (typically, a measured or modeled pre-development condition) by a particular parameter, commonly one or more chemical constituents or a specific hydrologic metric of flow. This can be evaluated at the outfall of a single stormwater facility, at the discharge point for a site, or in the receiving water itself. Many of these thresholds are important in their own right—to protect human health, to preserve riparian property from erosion, to avoid flooding of previously non-inundated lands. However, they should be recognized as providing only one-dimensional views of a much broader system. Thus, targeted monitoring can supplement but should not replace more integrative measures.

Integrative assessment endpoints require multiple lines of evidence to characterize receiving-water conditions. At their most comprehensive, they should include measures of flow, geomorphic condition, chemistry, and biotic integrity (Griffith *et al.* 2005, Johnson and Hering 2009). However, biological criteria are generally key to integrative assessment: "In general, biological criteria are more closely related to the designated uses of waterbodies than are physical or chemical measurements" (NRC 2001, p. 8). In most applications, such assessments are compared to one or more reference sites where conditions have been independently judged as "excellent," or where human disturbance is minimal and so best-quality conditions are assumed.

Integrative assessment endpoints require multiple lines of evidence to characterize receiving-water conditions. At their most comprehensive, they should include measures of flow, geomorphic condition, chemistry, and biotic integrity.

The task of identifying and quantifying reference conditions in California streams is presently being carried out by the Reference Condition Management Program (RCMP) of the State Water Board's Surface Water Ambient Monitoring Program (SWAMP; see 2009 Recommendations). About 600 sites have been recognized by this program as "reference" based on having minimal human disturbance, and they have been geographically stratified into the 12 Level III ecoregions mapped for the state of California (by USEPA 2000). The metrics chosen to characterize their biologic conditions should provide an appropriate list for the evaluation of impaired (or potentially impaired) streams.

An equivalent set of reference sites and conditions for other receiving-water types does not presently exist. California also presently lacks a systematic basis for defining relative categories of "poor," "fair," "good," or "excellent" based on numeric values of biological indicators, such as exists in parts of the Pacific Northwest. Several regions, however, now have multimetric biological indicators with defined reference conditions (see below).

Elsewhere, however, there is as yet no context for setting assessment endpoints for biological indicators in California receiving waters. Such an effort is in progress, at least for streams, and its eventual completion to support the management application of more local monitoring results is a key recommendation of this report. Biological assessment endpoints will need to be established region by region on an as-needed basis; in the interim, locally collected data can be very useful for trend monitoring of receiving water but not for defining existing levels of "health."

5.4.3.1 An Example from Washington State

The Puget Sound region of western Washington State provides an instructive example for identifying indicators and establishing desired assessment endpoints. Multiple agencies over the last two decades have sought to measure the overall ecological health of the region and to define targets for recovery. Following the most recent three-year process, the lead agency for the current effort released its set of 20 "dashboard indicators" designed both to express scientific understanding of conditions needed for ecological health and to communicate that understanding in a public-accessible manner (http://www.psp.wa.gov/pm_dashboard.php; accessed September 5, 2011). They cover physical, chemical, and biological indicators: all expressed in terms of relative improvement or quantified conditions to be reached by the year 2020.

This level of target-setting is possible only after extensive study and public discussion; it falls far beyond the scope of the present document. It is instructive for the state of California, however, in several regards as it looks to the future:

- The physiographic scope of the indicators and their target values is well-constrained to a particular geographic region with broadly similar geologic, hydrologic, and climatological attributes. Multiple parallel efforts would almost certainly be needed for a more diverse region (such as the entire state).
- Each indicator has a strong scientific basis for inclusion and at least some scientific basis for specific targets. Their communication value with the public was also an explicit criterion for inclusion.
- The most numerous indicators are biological, and they address multiple levels of the trophic chain from top predators to plants (a planktonic metric, however, was rejected as requiring too much additional scientific study and offering little communication value to the general public).
- Although emphasizing biology, the indicators are broadly distributed amongst biological, chemical, and physical metrics; most are broadly integrative in nature (e.g., reference to "bug populations" (the Puget Sound B-IBI) and a "freshwater quality index").

- The set of physical indicators is most parsimonious for instream conditions, and excluding marine nearshore and estuary conditions is restricted to a single hydrologic metric (chosen for its presumed influence on fish). This stands in stark contrast to most existing hydromodification monitoring plans, which emphasize measures of channel geomorphology and a wider range of hydrologic metrics. Such indicators may provide useful performance measures, but they should not be mistaken for more integrative measures of ecosystem or watershed "health."
- Although each indicator has a specified, numeric goal to be reached by 2020, there are no articulated changes to the current management plan if any of those goals are not reached (or if interim measures suggest that they will not be reached). This is a recognized shortcoming of the present plan but there is no mechanism yet in place to address it. As such, it does not currently meet the test for "adaptive management" (see Appendix C).

In California, such a list of integrative assessment indicators (let alone quantified endpoints for those indicators) cannot presently be defined, except in a few specific localities where data collection and analysis have been ongoing for many years. Thus, we recognize the value of such targets but must guide the present development of monitoring in recognition of their near-complete absence. Rectifying this shortcoming is the central recommendation for long-term program development; in the interim, short-term monitoring at both the regional and local levels need to acknowledge the absence of an integrative context in which to interpret their results.

In California, a list of integrative assessment indicators (let alone quantified endpoints for those indicators) cannot presently be defined, except in a few specific localities. Rectifying this shortcoming is the central recommendation for long-term program development.

Regulatory standards are established on the assumption that "clean water" will result in "healthy streams," but the elements of a watershed are far too complexly interrelated to permit such a simplistic perspective. Although the inverse ("polluted water results in unhealthy streams") is almost always true, the challenge for inferring causality from typical monitoring data is that *many* such stressors can all yield the same, degraded outcome. For this reason, targeted monitoring can provide useful diagnostic information and demonstrate regulatory compliance, but it cannot provide sufficient information to address integrative assessment endpoints.

5.4.3.2 Indicators from Existing Programs

We now turn to some of the most common indicators used in monitoring programs today, recognizing that their suitability in any given application depends on the questions being asked, the characteristics of the natural system being measured, and the practical constraints imposed on the monitoring program.

Hydrologic Indicators. Historically, the effects of urbanization on flow were characterized exclusively in terms of peak flow increases (e.g., Leopold 1968, Hollis 1975). Study since those early works has emphasized the degree to which other attributes of a stream hydrograph are changed by watershed imperviousness, and the importance of assessing the *duration* of moderate flows that are capable of transporting channel sediments and the frequency with which those geomorphically active flows occur

(Section 2). Thus, monitoring relevant to a particular hydromodification management application will likely include a variety of flow metrics (e.g., Konrad and Booth 2005, Degasperi *et al*. 2009).

In moving beyond a narrow focus on linkages between watershed urbanization, flow alteration, and in-stream effects, scientific understanding of hydrologic controls on stream ecosystems has recently led to new approaches for assessing the ecological implications of hydromodification. For example, the ecological limits of hydrologic alteration (ELOHA) framework is a synthesis of a number of existing hydrologic techniques and environmental flow methods that allows water-resource managers and stakeholders to develop socially acceptable goals and standards for streamflow management (Poff *et al.* 2010). The central focus of the ELOHA framework is the development empirically testable relationships between hydrologic alteration and ecological responses for different types of streams. This requires a foundation of hydrologic data provided by gaging and/or monitoring, and sufficient biological data across regional gradients of hydromodification. Although hydrologic–ecological response relationships may be confounded to some extent by factors such as chemical and thermal stressors, there are numerous case studies from the US and abroad in which stakeholders and decision-makers have reached consensus in defining regional flow standards for conservation and ecological restoration of streams and rivers (Poff *et al.* 2010).

Hydrologic monitoring provides essential information needed for establishing flow–geomorphology–ecology relationships, validating conceptual models, and assessing effectiveness of management actions in developing watersheds. Implementing regional flow standards should proceed in an adaptive management context, where collection of monitoring data or targeted field sampling data allows for testing of flow alteration–geomorphic–ecological response relationships. This allows for a fine-tuning of flow management targets based on improved understanding of the actual mechanisms; however, such monitoring can be expensive and it may take many years to adequately characterize the full spectrum of streamflows. Thus, hydrologic monitoring programs should be carefully planned and executed so that they are cost-effective and address the key uncertainties In this paper we primarily focus on indicators that do not require additional, extensive data collection.

Hydrologic indicators provide essential information needed for establishing flow–geomorphology–ecology relationships, validating conceptual models, and assessing effectiveness of management actions in developing watersheds.

Geomorphic indicators have been long-recognized as simple, easy-to-measure, and relatively responsive indicators of changes to the flow regime or sediment supply of a river or stream.

Biological indicators provide an integrative view of river condition, or river health.

Hydrologic monitoring is feasible in the context of a short-term program only if the purpose is to evaluate the engineering performance of a particular facility. For most applications, however, at least two (and commonly many more) years are necessary to measure a range of variable conditions sufficient to capture significant geomorphic and/or biological effects. Measurement of precipitation, generally a less cost-intensive effort than flow monitoring, must occur in consort for the data to be useful. In an effort to minimize the cost of continuous long-term flow modeling, a hydrologic model may be calibrated on one or two years of actual data and then used *in lieu* of further data to predict flow conditions. Whether the level of imprecision so introduced is appropriate will depend on the

management questions being asked, but in general such an approach is normally judged more appropriate for comparative results (e.g., did a specified flow magnitude increase in frequency or duration?) than for absolute results (what is the magnitude of the 2-year discharge?).

Geomorphic Indicators. Geomorphic indicators have been long-recognized as simple, easy-to-measure, and relatively responsive indicators of changes to the flow regime or sediment supply of a river or stream (e.g., Leopold 1968). They require little specialized equipment, many commonly can be measured "in the dry" (or close to it), they typically change little from week-to-week (and so are often measured only once per year), and the morphologic features of interest provide the physical template on which a wide range of biological conditions are expressed.

Scholtz and Booth (2000) recognized five geomorphological "channel features" commonly measured as part of monitoring programs:

- Channel geometry (cross sections, longitudinal profile).
- Channel erosion and bank stability.
- Large woody debris.
- Channel-bed sediment.
- In-stream physical habitat (pools, riffles, etc.).

To this list, others have also added:

- Floodplain connectivity.
- Channel planform (meandering, braiding, rates of channel shifting).

Each metric has well-defined methods for field (or, in some cases, airphoto) measurements that need not be repeated here. However, despite broad agreement on *how* to measure each parameter, there is substantially less agreement on the meaning of particular measurements, or indeed under what circumstances (if any) such measurements should be made at all. Most contentious are the various protocols for assessing instream physical habitat (#5 above)—seemingly the most "relevant" for a host of biological applications and for evaluating restoration success. However, a variety of studies have documented a high level of uncertainty imposed by observer bias:

> "Habitat-unit classification was not designed to quantify or monitor aquatic habitat. At the level necessary for use as a stream habitat monitoring tool, the method is not precise, suffers from poor repeatability, cannot be precisely described or accurately transferred among investigators, can be insensitive to important human land-use activities, is affected by stream characteristics that vary naturally and frequently, and is not based on direct, quantitative measurements of the physical characteristics of interest. Relying on habitat-unit classification as a basis for time-trend monitoring is time-consuming, expensive, and ill-advised." (Poole *et al*. 1997, p. 894)

Other geomorphic metrics, in contrast, can provide a robust, albeit coarse, characterization of the channel boundaries. Some changes, particularly if consistently expressed by multiple adjacent cross-

sections, can provide clear documentation of systematic channel changes over time that can be credibly associated with upstream changes (e.g., increased discharge from urbanization leading to channel enlargement). Other changes, however, may have a more indirect or uncertain association with upstream conditions (e.g., grain-size changes) because of the potential for rapid, ill-described changes over time without a corresponding human "cause." This emphasizes the importance of having a well-crafted purpose for the monitoring program into which the utility of any chosen parameter can be clearly described.

Biological Indicators. Biological indicators have been long-applied in society's evaluation of stream conditions, but historically that application has been rather informal. Observation of major fish kills, for example, is the application of a "biological indicator," but it provides little diagnostic or discriminatory information except in those streams where conditions are so poor that even casual awareness is inescapable. As a more refined assessment tool, however, their application to freshwater streams is only a few decades old. As such, the science is still under construction and some basic principles are still debated.

The rationale behind using biological indicators, however, is relatively undisputed. Karr (1999) has provided a useful summary of that rationale, of which the key elements are:

- Biological monitoring and biological endpoints provide the most integrative view of river condition, or river health.
- Biological monitoring is essential to identify *biological* responses (emphasis added) to human actions.
- Communicating results of biological monitoring to citizens and political leaders is critical if biological monitoring is to influence environmental policies.

Some of the earliest references to biological monitoring are associated with the development of RIVPACS, the River Invertebrate Prediction and Classification System, developed by the Centre for Ecology and Hydrology in the United Kingdom and now applied in a number of countries worldwide to predict instream biological conditions from a suite of watershed and channel variables. Since that beginning, other approaches have been advanced and practiced (e.g., the US Environmental Protection Agency's *Rapid Bioassessment Protocols*) that provide alternative, but likely near-equivalent results (e.g., Herbst and Silldorf 2004).

In this section we compare several biological indicators recently applied in various regions of California. This not intended as a comprehensive comparison of all available approaches potentially applicable to California; rather, it simply provides a few examples that illustrate the differences, and the similarities, of the various approaches. As the comparisons demonstrate, there is no "right" approach—but all share commonalities that are likely to be valuable elements of any biological monitoring program. We focus exclusively on benthic macroinvertebrates (BMI), because these have seen the longest and most widespread application (both in California and worldwide) given their species diversity and their relative geographic immobility. However, a variety of other biological metrics (particularly fish and periphyton) have relevance to biological monitoring and strong advocates in the scientific community. Their

omission here is not a judgment on their value, merely a reflection of the broader applicability and richer scientific development of BMI-based indicators.

Multimetric indices are presently completed for four areas of the state (Eastern Sierra, North Coast, Central Valley, and Southern Coast). They are not standardized or calibrated state-wide (nor should they necessarily be), and they do not provide statewide coverage. In addition, the City of Santa Barbara (Ecology Consultants 2010) has sponsored development of its own BMI index (geographically embedded within the Southern Coast region), with both commonalities and differences between it and the others.

Eastern Sierra Nevada. Herbst and Silldorf (2009) developed an IBI based on streams from the upper Owens River north to the Truckee River. Their purpose was both to provide a region-specific IBI for future use and to evaluate the results of such an approach with others that also make use of BMIs to assess stream conditions. They evaluated the performance of 12-, 10-, and 8-metric indices, recommending the 10-metric index as providing the best overall performance included in the 12-metric index were these 10 and also predator richness and EPT% abundance:

- % tolerant percent richness (% of taxa with TV= 7,8,9,10).
- Richness (total number of taxa).
- Chironomidae Percent Richness (% of taxa that are midges).
- Ephemeroptera (E) Richness (number of mayfly taxa).
- Plecoptera (P) Richness (number of stonefly taxa).
- Trichoptera (T) Richness (number of caddisfly taxa).
- Dominance 3 (proportion of 3 most common taxa)
- Biotic Index (modified Hilsenhoff, composite tolerance).
- Acari richness (number of water mite taxa).
- Percent shredders (% of total number that are shredders).

A statistical analysis suggests that as many as 10 distinct classes can be discriminated using this IBI, although their recommended application uses only five categories of quality.

North Coast. Rehn *et al.* (2005) developed an IBI based on coastal-draining streams from Marin County north to the Oregon border. They evaluated 77 individual metrics, testing them for responsiveness to human disturbance and redundancy, and ultimately settled on eight:

- EPT richness.
- Coleoptera richness.
- Diptera Richness.
- Percent intolerant individuals.

- Percent non-gastropod scraper individuals.
- Percent predator individuals.
- Percent shredder taxa.
- Percent non-insect taxa.

Their statistical analysis indicated that five categories of quality could be discriminated; response was driven most strongly by watershed land cover (natural vs. unnatural) and percent of substrate that was sand-sized or finer. They also suggested a set of thresholds for rejecting potential "reference" sites (Rehn *et al.* 2005; Table 5-2), which was also used in the Southern Coast study (Ode *et al.* 2005; see below):

Table 5-2. Thresholds for rejecting potential "reference" sites.

Stressor	Threshold
Percentage of unnatural land use at the local scale	> 5%
Percentage of urban land use at the local scale	> 3%
Percentage of total agriculture at the local scale	> 5%
Road density at the local scale	> 1.5 km/km^2
Population density (2000 census) at the local scale	> 25 ind./ km^2
Percentage of unnatural land use at the watershed scale	> 5%
Percentage of urban land use at the watershed scale	> 3%
Percentage of total agriculture at the watershed scale	> 5 %
Road density at the watershed scale	> 2.0 km/km^2
Population density (2000 census) at the watershed scale	> 50 ind./ km^2

Central Valley. Rehn *et al.* (2008) also developed an IBI for Central Valley streams, evaluating 80 candidate metrics to yield a final list of five:

- Collector richness.
- Predator richness.
- Percent EPT taxa.
- Percent clinger taxa.
- Shannon diversity (a composite measure of taxonomic richness and evenness of abundance).

They found that reach-scale physical habitat variables were more critical in their data set than water chemistry or land use. They also presented their findings with greater caution than with other regions of the state, noting the difficulty of identifying truly "unimpaired" reference conditions and the geographic concentration of much of their source data.

Southern Coast. Ode *et al.* (2005) developed a BMI index of biological integrity based on 61 potential metrics from reference sites drawn from relatively undisturbed coastal-draining watersheds from Monterey Bay south to the Mexican border. They included seven final metrics:

- Percent tolerant taxa.
- Percent collector-gatherer + collector-filterer individuals.
- Predator richness.
- Percent intolerant individuals.
- EPT richness.
- Percent noninsect taxa.
- Coleoptera richness.

They note that the last two on the list are not common in other multimetric B-IBIs but were statistically appropriate for their data set. They judge that this "SoCal B-IBI" can discriminate 5 categories of condition, using 5 categories evenly divided along a 100-point scale. Particularly strong correlations amongst all seven metrics were displayed in comparison to road density and percent "watershed unnatural."

A portion of the Southern Coast region has also been the subject of independent IBI development over the past decade (Ecology Consultants 2010, 2011). The region of study spans the Santa Barbara coastal streams from the Ventura County line west about 45 miles to Gaviota Creek. Their work led to the development of an IBI using the following 7 metrics:

- # of insect families
- # of EPT families
- % EPT minus Baetidae
- % PT
- Tolerance value average
- % sensitive BMIs
- % predators + shredders

In the course of this work, tolerance values were adjusted for certain taxa based on local observations of presence/absence relative to the level of watershed disturbance. With these changes, they found strong statistical basis for discriminating five categories of biological quality. They also found that considering both watershed-level land use patterns and localized physical habitat conditions were necessary to achieve the best prediction of biological integrity.

Summary. A compilation of the various metrics (Table 5-3) demonstrates only broad commonalities between the various regional IBI's presently available for specific parts of California, suggesting that additional work needs to be done before comprehensive recommendations for biological monitoring can be made. At present, perhaps half(?) of the state's area is covered by existing multimetric indices as noted above, and for these areas they provide the best (indeed, the only) guidance for meaningful collection and interpretation of biological data. Elsewhere, however, only a few general points can be made:

- Biological monitoring in un-assessed regions of the state cannot be used to identify absolute conditions of biological health (i.e., "status" monitoring). However, they will likely be useful for "trends" monitoring, where only the change relative to a prior state is being sought.
- Despite the variability in metric choices amongst the various regions (Table 5-2), some broad commonalities are apparent. In particular, several types of metrics are likely to provide useful indicators of change in a known direction (i.e., an increase or decrease in the metric can be confidently assigned to a change in quality in a known direction):
    - One or more measures of tolerance or intolerance
    - One or more measures of predator prevalence
    - One or more measures of EPT taxa or taxa richness

This list does not purport to describe a true multimetric B-IBI, nor to provide a basis to evaluate instream biological health on an absolute scale (i.e., from "poor" to "excellent"). In the absence of any region-specific guidance, however, changes in one or more of these metrics are each likely to provide some initial, useful indication of temporal trends in biological health until such time as the types of studies referenced above can be conducted.

Table 5-3. Compilation of metrics used in the five regional B-IBI's described in the text.

METRIC	Eastern Sierra	North coast	Central Valley	Southern coast	Santa Barbara
Percent intolerant individuals		X		X	X
% tolerant (% of taxa with TV= 7,8,9,10)	X			X	
Tolerance value average					X
# of insect families					X
Percent non-insect taxa		X		X	
Percent shredders (% of total number that are shredders)	X	X			
Percent predator individuals		X			
% predators + shredders					X
Predator richness			X	X	
Collector richness			X		
Percent non-gastropod scraper individuals		X			
Percent clinger taxa			X		
Percent collector-gatherer + collector-filterer individuals				X	
EPT richness		X		X	X
Percent EPT taxa			X		
% EPT minus Baetidae					X
% PT					X
Ephemeroptera (E) Richness (number of mayfly taxa)	X				
Plecoptera (P) Richness (number of stonefly taxa)	X				
Trichoptera (T) Richness (number of caddisfly taxa)	X				
Coleoptera richness		X		X	
Diptera Richness		X			
Chironomidae Percent Richness (% of taxa that are midges)	X				
Richness (total number of taxa)	X				
Dominance 3 (proportion of 3 most common taxa)	X				
Biotic Index (modified Hilsenhoff, composite tolerance)	X				
Acari richness (number of water mite taxa)	X				
Shannon diversity index			X		

5.5 Recommendations

Based on this review of monitoring theory, current applications, and current needs, the following steps are recommended to advance a state-wide program of monitoring to support the management of hydromodification control plans.

5.5.1 Programmatic Monitoring

Over the next several years, the following actions should be implemented at the state and/or regional level:

- Executing broad-scale, GIS-based watershed characterization;
- Identifying a set of representative indicator watersheds, and a basic suite of regular measurements that are suitable for establishing trends in physical, chemical, and biological indicators;
- Identifying (and multi-metric monitoring within) a relatively small set of watersheds that have implemented recent hydromodification control plans to initiate the long-term evaluation of downstream trends.

Over the course of the next several NPDES permit cycles (i.e., one or more decades), the following actions should also be undertaken as a regional responsibility:

- Setting regionally appropriate endpoints for biological health of receiving waters;
- Identifying particularly promising (or particularly ineffective) combinations of control strategies across a range of different landscape conditions;
- Providing supplemental data collection at reference sites to support trends monitoring by local jurisdictions;
- Compiling local results to guide development and refinement of regionally appropriate hydromodification control strategies.

5.5.2 Local Monitoring

Over the next several years, the following actions should be implemented by local jurisdictions at a local scale:

- Implementing a program of source identification at one or more high-risk locations (e.g., high vehicular traffic, high imperviousness, toxic chemical storage/transport);
- Demonstrating the hydrologic performance of one or more representative hydromodification control facilities;
- Monitoring trends at one or more representative receiving waters, ideally at a regionally identified site (see the second bullet under “Programmatic monitoring,” above);

- Conducting a synoptic evaluation of waterbodies, stratified by watershed type (see the first bullet under "Programmatic monitoring," above), to identify highest priority systems for protection or rehabilitation, if not already known.

Over the course of the next several NPDES permit cycles, the following long-term actions should also be undertaken as a local responsibility:

- Monitoring representative conditions to evaluate whether management actions are improving overall receiving-water health;
- Evaluating cost-effectiveness of implemented hydromodification control measures;
- Identifying critical areas for resource protection by virtue of existing high-quality conditions.

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APPENDIX A: GUIDANCE FOR APPROPRIATE APPLICATION OF HYDROLOGIC AND HYDRAULIC ANALYSES

Information contained in this document is intended solely for guidance purposes only. It is not intended to be an instruction manual and use of any of the guidance provided herein is at the risk of the user. No other person or entity shall be entitled to rely on the services, opinions, recommendations, plans or specifications provided in the document.

1. INTRODUCTION AND PURPOSE

The purpose of this Appendix is to provide technical guidance on hydrologic and hydraulic analyses, including the use of Continuous Simulation (Hydrologic) Modeling (CSM), in support of hydromodification assessment and mitigation. CSM is the industry standard developed since the early 2000s for use in the assessment and mitigation of hydromodification. The fundamental difference between CSM and peak flow hydrologic modeling, is that CSM considers the full range of flow events over a long period of record, typically 30 years or more, to develop flow duration curves, whereas peak flow hydrologic modeling generally considers synthetically (usually calibrated to measured data) produced event-based hydrographs (2-, 10-, 50-, 100- and 200-year return frequency events). CSM allows flow duration curves and other derived hydraulic metrics to be compared between existing and proposed conditions in order to assess hydromodification impact potential and to develop mitigation strategies. The guidance provided in this appendix is the product of the experience gained in the application of hydromodification management strategies to multiple urban development projects. This appendix is not intended to be an instruction manual but to provide guidance to engineers, planners and regulatory staff on specific modeling elements involved with HMPs.

MODELING METOHDOLOGY REVIEW

Modeling Approaches

A common approach to mitigating hydromodification impacts from development projects is to construct best management practices (BMPs) which capture, infiltrate and retain runoff, where possible. In such cases, the water is detained and released over a period of time at rates which more closely mimic pre-project hydrology. Methods commonly used to size hydromodification BMPs include hydrograph matching (matching pre and post-project flow regimes), volume control and flow duration control. Hydrograph matching is most traditionally used to design flood detention facilities for a specific storm recurrence interval, such as the 100-year storm, whereby the outflow hydrograph for a project area matches the pre-project hydrograph for a design storm. Volume control matches pre- and post-project runoff volume for a project site; however, the frequency and duration of the flows are not controlled. This can result in higher erosive forces during storms. Flow duration control matches both the duration and magnitude of a range of storm events for pre- and post-project runoff. The complete hydrologic record is taken into account, and runoff magnitudes and volumes are matched as closely as possible.

It is generally accepted that flow duration control matching is the most appropriate method to be used in the design of hydromodification BMPs. The flow duration control approach has been used in at least half a dozen HMPs in California, all of which used a CSM to match flow durations. However, differences exist in how the continuous simulation modeling is used between programs.

OVERVIEW OF APPENDIX

This appendix covers the following specific topics, addressed in the order in which they would arise as part of a hydromodification analysis for a major development project:

Section 2 addresses calculation of a flow control range, including identification of an acceptable low flow value, based upon critical flow for incipient motion of the channel material. .

Section 3 addresses the development of evaluation criteria to assess the effectiveness of a proposed mitigation design, including a discussion of flow duration matching and the erosion potential metric.

Section 4 addresses CSM, including precipitation data requirements, hydrologic time steps, model calibration and validation, and other modeling considerations and tips.

2. METHOD FOR SELECTION OF A FLOW CONTROL RANGE

INTRODUCTION TO FLOW CONTROL

Most hydromodification plans (HMPs) in California have adopted a flow control approach, which establishes a range of flow magnitudes discharging from the proposed site that must be controlled. The magnitude of the flow range is commonly expressed in terms of a percentage of the return period flow to which it is equivalent; for example: from 10% of the Q2 to 100% of the Q10. Flow magnitudes within the prescribed range must not occur more frequently under the proposed condition than they do in the existing (or pre-project) condition. Another way of expressing this is that the long term (decadal) cumulative duration of these flows must not be longer in the post-project condition compared to the pre-project condition. Generally, a small exceedance tolerance is allowed. For example, the following is a typical criterion that has been used in HMPs:

> For flow rates ranging from 10% of the pre-project 2-year recurrence interval event (XQ2) to the pre-project 10-year runoff event (Q10), the post-project discharge rates and durations shall not deviate above the pre-project rates and durations by more than 10% over and more than 10% of the length of the flow duration curve. The specific lower flow threshold should be influenced by results from the channel susceptibility assessment.

The rationale behind setting an upper limit is the understanding that when less frequent, high intensity/volume precipitation events occur, the watershed reaches a saturation level and responds in a similar manner for undeveloped and developed conditions. Furthermore, while these less frequent, high magnitude events do induce significant geomorphic change, they occur so infrequently that over a long time period, they comprise only a small portion of the work done on a channel. For example GeoSyntec (2007) used a hydro-geomorphic model to assess cumulative sediment transport on Laguna Creek (near Sacramento) and determined that 95% of the total erosion and sediment transport in the creek is accomplished by flow rates less than Q_{10}.

The purpose of determining a low flow range is one of practical design consideration when meeting a requirement for flow duration matching. The requirement to match flow durations between a pre- and post-project condition requires that runoff be detained and infiltrated within a BMP (e.g. open basin or underground vault). If flow matching is required to be achieved for all flows down to zero, the BMP

volume will be significantly larger (and therefore more costly) than if there were some low flow below which runoff could be discharged at durations longer than in the pre-project condition. A key assumption underlying the concept of a low-flow discharge is that the increase in discharge durations below this rate will not increase channel erosion because the flows are too small to initiate movement of channel materials to any significant extent. Another critical assumption in the flow duration matching approach is that a single discharge value is valid across the range of grain sizes and geometries in the streams to which that low flow value applies.

For a specific set of hydraulic conditions (e.g., cross sectional shape, channel slope, bed and bank roughness), the flow rate can be calculated where the critical shear strength value is reached. Thus with an estimate of the critical shear strength of the materials composing a channel's bed or banks, and the hydraulic conditions occurring at the same location, the critical flow rate can be determined at which transport (or erosion) begins. This critical flow rate (Q_c) can then be compared to the magnitude of a flood peak which occurs every two years (Q_2) to establish the estimate of percent Q_2 to be used as the lower flow threshold.

Thus in order to calculate the lower flow threshold as expressed by a percentage of Q_2, three values must be determined for each analysis location (described in further detail below):

- The critical shear strength (τ_c) of bed and bank materials;
- The critical flow rate (Q_c) at which this critical shear strength is reached and exceeded;
- The magnitude of a flood peak which occurs every two years (Q_2).

In contrast, when using an erosion potential (Ep) metric (rather than flow duration matching) for BMP sizing, the Ep analysis incorporates channel geometry to estimate shear stresses generated at various flow rates, and then compares these to estimated critical shear stresses (i.e., shear stress required to initiate transport) for the grain size distribution within the stream. However, for either flow duration matching or for erosion potential analysis, the first step is to determine the critical shear stress for incipient motion of channel materials.

DETERMINATION OF CRITICAL SHEAR STRESS

The composition and condition of the bed and banks of a stream channel are the best indicators of how a channel will react (i.e., its susceptibility) to hydrologic changes resulting from development projects (i.e., hydromodification). Channels composed of materials more resistant to erosion are less susceptible to excessive erosion due to hydromodification than channels composed of less resistant materials. Channel material type can vary widely between, as well as within, watersheds. Figure 2-1 **Error! Reference source not found.**a. and b. illustrate stream incision through (a) relatively loosely consolidated, non-cohesive sand and gravels, and (b) relatively cohesive silty-clays. The resistance of bed and bank materials is quantified by their critical shear strengths, (τ_c) that is, the value where entrainment or transport begins.

Typical stream erosion in a southern California stream (granular, non-cohesive
(Photo courtesy of Eric Stein, SCCWRP)

Typical stream erosion in a northern California stream (generally cohesive silty clays)
(Photo cbec, inc.)

Notes:	cbec	*Guidance on the Use of Continuous Simulation Hydrologic Modeling* **Examples of Stream Erosion in Southern and Northern California**		
		Project: 11-1001	Created By: CBB	**Figure 2-1**

Figure 2-1. a. Example of a loosely consolidated, non-cohesive sand and gravel stream bed. b. Example of a relatively cohesive silty-clay stream bed.

Several methods are available for the estimation of critical shear stress, including laboratory studies (e.g., flume studies) and field measurements, with different methods utilized for cohesive materials and non-cohesive materials.

Estimating Critical Shear Stress for Non-Cohesive Materials

The most common method for determining the critical shear stress of a non-cohesive material is through the application of the Shields relationship. This relationship is applicable to the calculation of critical shear stress for a uniform size mixture of sediment with a known particle size and specific gravity. Since it was originally proposed by Shields in 1936, the relationship has been tested and further investigated by several other researchers, resulting in a variety of modifications, primarily through variation of the Shields parameter. The original value of the Shields parameter proposed by Shields was 0.06, however, values from 0.03-0.06 have been suggested, with 0.045 acknowledged as a good approximation. Recent research has demonstrated that a value of 0.03 may be more appropriate for estimating incipient motion in streams with gravel beds (Neill 1968, Parker et al. 2008, Wilcock et al. 2009), where D50 estimates are based upon data collected via pebble count. The decision of what value of Shields parameter is used can have a large influence on the resulting τ_c estimate. For example, if a value of 0.06 is used, it results in twice as large of an estimate of τ_c than if a value of 0.03 is used.

While the Shields relationship was developed for a mixture of uniform sized sediment, it can be applied to a mixture of sediment with varying sizes as long as the distribution is uni-modal and does not have a high standard deviation of grain sizes (Wilcock 1993). In contrast, for sediment mixtures which are bimodal (e.g., if there is a large amount of sand in addition to gravel), a different approach (e.g., Wilcock and Crowe 2003) is recommended. For a more in depth discussion of sediment transport and incipient motion, the reader is referred to Wilcock et al. (2009).

In order to apply the Shields relationship to determine τ_c, the median grain size (d50) present on the channel surface must be determined. River channels are often armored; meaning that coarser material is present on the surface than is present underneath the armor layer. However to access and transport the finer material beneath, the surface layer must first be mobilized. The median grain size is determined by analysis of a particle size distribution.

A particle size distribution can take the form of: 1) a cumulative *frequency* distribution which is determined by way of a pebble count or photographic analysis, or 2) a cumulative *weight* distribution. For a cumulative frequency distribution a subset of particles present on the surface are measured, and the frequency of particles within different size class bins is used. **Error! Reference source not found.** shows a sample particle size distribution graph developed from a pebble count. For a cumulative weight distribution, a bulk sample of the surface material is collected, and then sorted using a set of sieves with different screen sizes. The amount of material retained by each sieve is weighed and then used to plot the cumulative weight distribution. Both approaches have advantages and disadvantages.

A pebble count is a relatively straightforward field technique that is easily applied in streams which are wadable. **Error! Reference source not found.** shows photographs of pebble counts being conducted in the field. They can be performed relatively quickly, which means more samples can be collected to better characterize the conditions present in a reach. However, there are a variety of ways a pebble count can be conducted, and there is tremendous opportunity to introduce bias to the measurement. Furthermore, while studies often cite Wolman (1954) as the method employed in data collection, strict adherence to this protocol is not always achieved. Rather than the method suggested by Wolman (1954), a refined, more regimented approach has been suggested by Bundte and Abt (2001a), and is recommended. In addition, it should be noted that pebble counts generally do a poor job of characterizing sand and smaller sized material. In addition to pebble counts, software can be used to process a digital image of an area of the bed. The software samples a subset of particles present in the image, and using assumptions regarding the amount of given particle that is visible, is able to provide a cumulative frequency distribution.

Collecting a bulk sample for sieve analysis is another method frequently employed to determine values for typical characteristic indices of a particle size distribution. In this method a sample is collected from the channel surface, and then the sample is segregated into various size classes with sieves. One advantage of this approach is that it utilizes all the data available from the sampled area (as opposed to a pebble count which uses a subset of the entire population, e.g., ~100 particles as opposed to thousands), however the sampled area is typically smaller than the area sampled within one pebble count. One disadvantage is the size of sample that is necessary. Because the resulting particle size distribution is based upon weight, the largest particles present can have a very large influence on the resulting particle size distribution. Research has suggested that the weight of the entire sample must exceed 100x the weight of the largest particle present to escape this possible bias. This means large (volume and weight) samples are often required. Some sieving can occur on site through the use of shaker sieves, but typically some portion of the sample is also taken back to the lab for further analysis. Thus, bulk samples typically require more effort and equipment to establish a particle size distribution, however they provide a much more accurate estimate, especially when a large fraction of the sample is sand sized (2mm) and smaller.

For a more in depth discussion of sampling methods to determine particle size distributions in wadable streams, the reader is referred to Bunte and Abt (2001).

Estimating Critical Shear Stress for Cohesive Materials

The methods described above are not appropriate for cohesive materials, which due to chemical cohesion between particles exhibit larger τ_c values than would be estimated by consideration of particle size/weight in isolation (i.e., cohesive properties not considered). One method that allows for the determination of τ_c *in situ* is the application of a jet test (ASTM 2007). The jet-testing apparatus and analytical methods were developed by researchers at the USDA Agricultural Research Station (Hanson and Cook 1999; Hanson et al. 2002; Hanson and Cook 2004; ASTM 2007). The method uses a submerged impinging jet of water directed perpendicularly at the material surface, in order to erode the material. As erosion occurs, a scour hole is created. The depth of this hole is measured periodically as time

progresses through the test. As the scour hole increases in depth, the strength of the jet is reduced because it is travelling longer distance through water from the jet orifice to the soil surface. Eventually, the energy of the jet is dissipated enough that it no longer has energy in excess of the material's shear strength and erosion stops. **Error! Reference source not found.** shows a photograph of a jet testing rig deployed in a stream bank.

In addition to jet testing, *in situ* testing of shear strength can be obtained through the application of a field vane shear test (ASTM 2008). This method provides τ_c values based upon the assumption that the bed or bank will fail via large blocks (composed of thousands of particles), as opposed to erosion occurring particle by particle. As such, the values measured by a shear vane are often several orders of magnitude larger than those obtained via testing with the jet-device.

Estimating Critical Shear Stress Through the Use of Literature Values

An alternative to the measurement/calculation of τ_c, is the use of values found in the literature. Indeed, several HMPs have several HMPs have been developed through assumption of material resistance properties found in the literature based upon literature based upon a textural description of the material. An often-cited reference is Fischenich (2001), which provides a (2001), which provides a summary (compiled from the relevant literature) for critical shear strength values for various values for various materials. An extract from this reference is provided in

Figure 2-5.

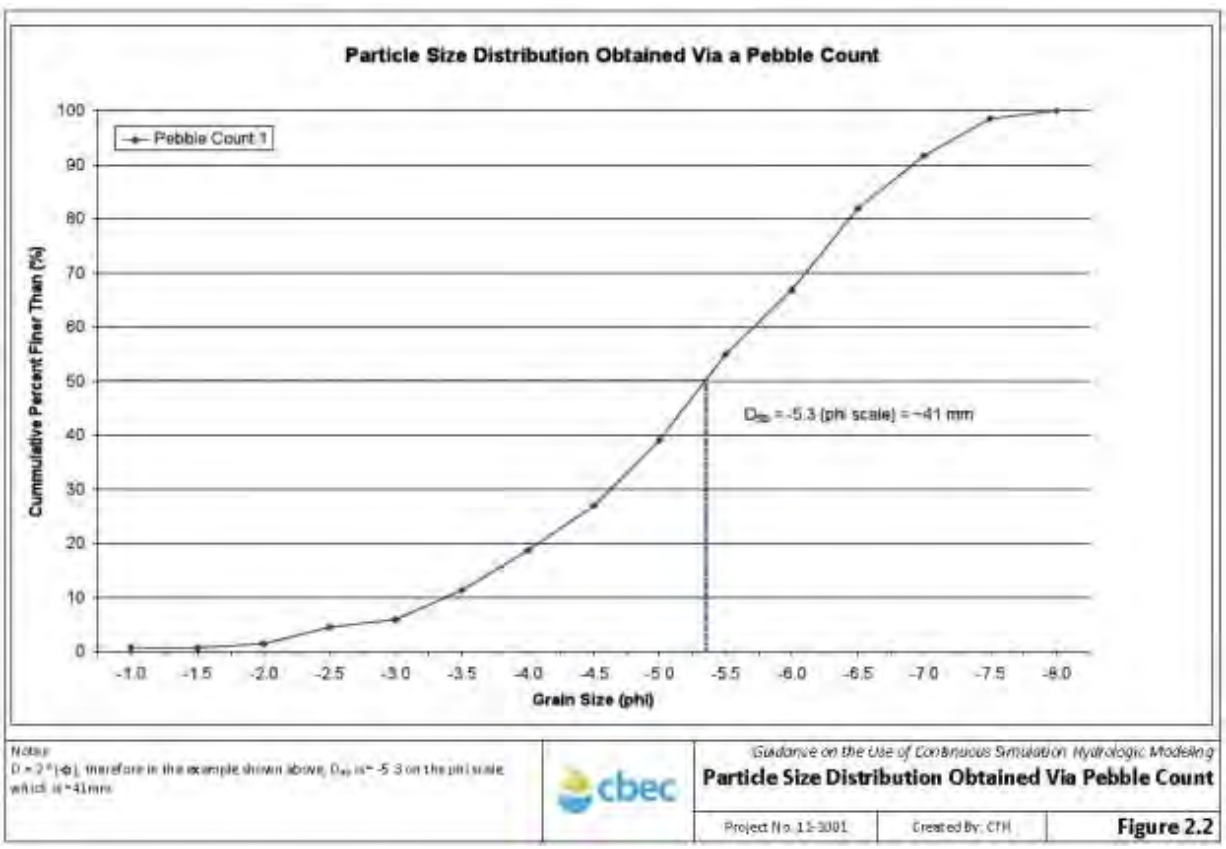

Figure 2-2. Particle Size Distribution Graph Developed from a Pebble Count

Notes:	cbec	*Guidance on the Use of Continuous Simulation Hydrologic Modeling* **Pebble Counts Being Conducted in the Field**		
		Project: 11-1001	Created By: CBB	**Figure 2-3**

Figure 2-3. Pebble Counts Being Conducted in the Field

Typical installation of jet testing equipment in stream bank

Hole created in cohesive bank material by jet impinging on surface

Notes:	cbec	*Guidance on the Use of Continuous Simulation Hydrologic Modeling* **Jet Testing Equipment Deployed in a Stream Bank**		
		Project: 11-1001	Created By: CBB	**Figure 2-4**

Figure 2-4. Jest Testing Equipment Deployed in a Stream

Table 2. Permissible Shear and Velocity for Selected Lining Materials[1]

Boundary Category	Boundary Type	Permissible Shear Stress (lb/sq ft)	Permissible Velocity (ft/sec)	Citation(s)
Soils	Fine colloidal sand	0.02 - 0.03	1.5	A
	Sandy loam (noncolloidal)	0.03 - 0.04	1.75	A
	Alluvial silt (noncolloidal)	0.045 - 0.05	2	A
	Silty loam (noncolloidal)	0.045 - 0.05	1.75 – 2.25	A
	Firm loam	0.075	2.5	A
	Fine gravels	0.075	2.5	A
	Stiff clay	0.26	3 – 4.5	A, F
	Alluvial silt (colloidal)	0.26	3.75	A
	Graded loam to cobbles	0.38	3.75	A
	Graded silts to cobbles	0.43	4	A
	Shales and hardpan	0.67	6	A
Gravel/Cobble	1-in.	0.33	2.5 – 5	A
	2-in.	0.67	3 – 6	A
	6-in.	2.0	4 – 7.5	A
	12-in.	4.0	5.5 – 12	A
Vegetation	Class A turf	3.7	6 - 8	E, N
	Class B turf	2.1	4 - 7	E, N
	Class C turf	1.0	3.5	E, N
	Long native grasses	1.2 – 1.7	4 - 6	G, H, L, N
	Short native and bunch grass	0.7 - 0.95	3 – 4	G, H, L, N
	Reed plantings	0.1-0.6	N/A	E, N
	Hardwood tree plantings	0.41-2.5	N/A	E, N
Temporary Degradable RECPs	Jute net	0.45	1 – 2.5	E, H, M
	Straw with net	1.5 – 1.65	1 – 3	E, H, M
	Coconut fiber with net	2.25	3 – 4	E, M
	Fiberglass roving	2.00	2.5 - 7	E, H, M
Non-Degradable RECPs	Unvegetated	3.00	5 – 7	E, G, M
	Partially established	4.0-6.0	7.5 – 15	E, G, M
	Fully vegetated	8.00	9 – 21	F, L, M
Riprap	6 – in. d_{50}	2.5	5 – 10	H
	9 – in. d_{50}	3.8	7 – 11	H
	12 – in. d_{50}	5.1	10 – 13	H
	18 – in. d_{50}	7.6	12 – 16	H
	24 – in. d_{50}	10.1	14 – 18	E
Soil Bioengineering	Wattles	0.2 – 1.0	3	C, I, J, N
	Reed fascine	0.6-1.25	5	E
	Coir roll	3 - 5	8	E, M, N
	Vegetated coir mat	4 - 8	9.5	E, M, N
	Live brush mattress (initial)	0.4 – 4.1	4	B, E, I
	Live brush mattress (grown)	3.00-8.2	12	B, C, E, I, N
	Brush layering (initial/grown)	0.4 – 6.25	12	E, I, N
	Live fascine	1.25-3.10	6 – 8	C, E, I, J
	Live willow stakes	2.10-3.10	3 – 10	E, N, O
Hard Surfacing	Gabions	10	14 – 19	D
	Concrete	12.5	>18	H

[1] Ranges of values generally reflect multiple sources of data or different testing conditions.

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Notes:

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Guidance on the Use of Continuous Simulation Hydrologic Modeling

Permissible Shear Strength and Velocity for Selected Lining Materials

Project No:11-1001 | Created By: CBB | **Figure 2-5**

Figure 2-5. Permissible Shear and Velocity for Selected Lining Materials

DETERMINATION OF CRITICAL FLOW (Q_c)

For a specific set of hydraulic conditions at a location (i.e., cross sectional shape, channel slope, bed and bank roughness), the flow rate at which critical shear values are reached can be calculated. These calculations can be made with a programed spreadsheet analysis, or with a hydraulic model (e.g., HEC-RAS, Brunner 2010). Because of their ease of use and the ease at which multiple flow rates can be assessed (in order to determine when τ_c is reached), hydraulic models are typically employed for this part of the analysis. Average boundary shear stress is calculated with the following equation:

$$\tau = \rho g R s$$

where p represents the density of water, g represents the gravitational constant, R represents the hydraulic radius (defined as the wetted area dived by the wetted perimeter), and s represents the slope. For wide channels the value of the hydraulic radius is approximately equal to the average depth of the cross section. The hydraulic model calculates the value for R for a given discharge based on the channel dimensions.

Typically one-dimensional approximations are used for this analysis, which means that the value of Q_c determined is that where the cross sectional average of τ_c is reached, not the highest value which is occurring at the deepest point of the cross section. This is typically considered reasonable because the grain size is determined for the bed of the cross section, not just the shallow or deep area.

Analyses can be conducted at a station, or in other words just looking at one cross section in isolation using normal depth calculations, or within a larger hydraulic model constructed for the entire reach (i.e., multiple distributed cross sections upstream and downstream of the location of interest). The advantage of looking at the cross section of interest within the context of the entire reach is that conditions downstream (e.g. a constriction which causes a backwater condition) may affect the flow depth (or hydraulic radius), yielding different results than would be obtained if the cross-section was analyzed in isolation.

It is important that the determination of τ_c (via pebble count or other means) and the hydraulic calculations to determine Q_c, occur at the same location. Typically the analysis is undertaken at a riffle because these are the high points of a long profile and are what are controlling incision in the system. Bed material characterization in a pool is much more difficult (because of the depth of water), in addition the resulting calculated shear values are typically much higher, because of the added depth.

If HEC-RAS is used (which is typical), the way the bank markers are set can have a dramatic influence on the calculated shear results. The bank markers are used to delineate differences in roughness across the channel and flood plain (typically higher values are used on the lateral margins to include the influence of vegetation roughness in the resulting depth calculations). The shear values calculated by HEC-RAS are segregated by these bank markers, and thus may include values for each of the floodplains as well as the channel. If bank markers are set too wide, and the shear stress calculation may include a portion of the floodplain too, and subsequently the conditions in the actual channel will be greatly underestimated. Remember that the model is essentially using the average depth for the entire cross section (as limited by the bank markers), so including floodplain with shallow depths greatly influences the average depth and thus the resulting calculated shear value.

DETERMINATION OF Q_2

The determination of a value of Q_2 is the third and final piece of the equation used to determine what percent of Q_2 the lower threshold should be. As with the other two pieces, several options are available, and again the decision on what method is used can have a profound influence upon the final results. Q_2 can be determined through the results of a calibrated and validated hydrologic model (e.g., HEC-HMS, HSPF, SWMM, etc.) which uses precipitation, sub basin area, soil conditions, etc. to calculate a runoff hydrograh. This type of model can be used in one of two ways, to simulate a single precipitation event or to simulate a long term (e.g., 50 year) precipitation record. The first approach produces a single runoff hydrograph resulting from a "design" storm, from which the peak magnitude can be determined. As such the results are largely controlled by the precipitation hyetograph, so a good understanding of how that was developed is important. This method has been used considerably less than the approach detailed below. The advantage of this method is that, if any existing model has already been developed (e.g., SacCalc; DFCE 2001), it will be cheaper and easier for an agency to review. However, it can yield different values for Q_2, due to differing assumptions employed in the modeling.

The second method uses a long-term precipitation record for simulation which results in a flow record containing a large number of runoff events of varying magnitudes (i.e., which are subsequently analyzed to determine the magnitude of the 2 year recurrence interval event). This method is more typical for HMP assessments, but again methodical decisions can have a large influence on the results. The rigor of the model calibration and validation has a strong influence. If the model is not representing through simulation what is actually occurring, then the simulation results are questionable.

Assuming the model has been calibrated and satisfactorily validated or verified, the manner in which the simulated runoff record is analyzed is important. The first basic distinction is whether an annual maximum series (AMS) or a partial duration series (PDS) is used. In an AMS analysis, just the single largest flood peak of any given year is used in the analysis, and the second and third largest events of the year are ignored. This is the method typically utilized when analyzing the flood frequency of large, less frequently occurring flood events. In the second approach, PDS, multiple flood events are considered in any given year. This is important when the second or third largest flood events in one year are greater than the annual maximum of another year. Because more large events are included, the resulting estimate of the given return period event (e.g., Q_2) is larger. For example, Langbein (1960) showed that a 1.45 year event determined with PDS is the same magnitude as a 2 year event with an AMS, and a 2 year event determined with PDS is a 2.54 year event with an AMS. Thus the value of Q_2 determined by PDS is larger than the value of Q_2 determined by AMS. While significant differences are apparent for smaller magnitude, more frequently occurring events (e.g., Q_2), for return periods greater than 10 years, there is almost no difference between the results obtained from the AMS and PDS.

When compiling a PDS for a recurrence interval analysis, the manner in which events are identified as independent can also have an effect upon the results. One typical method is to include all flood peaks above a certain base magnitude. This base value is often selected as equal to the lowest annual maximum flood of record, however can also be chosen such that the PDS only contains as many peaks as

there are years of record. Some analysts have established a base value (e.g., 0.002 cfs/acre), and then added a duration below this base value as well (i.e., flow must be below 0.002 cfs/acre for at least 24 hours for events to be considered independent). One additional method is to identify individual events by extracting the highest peak (not just the maximum value) within a moving time window (e.g., 3 days), and therefore determine independence through time, rather than the discharge rate receding to a non-storm condition. With all of these options available, and no prescribed standard, the use of a PDS can have different Q_2 results even if an identical flow time series is used.

SUMMARY

The determination of the lower flow threshold, defined as a percentage of Q_2, is heavily influenced by three primary inputs: τ_c, Q_c, and Q_2. The determination of each of these values is sensitive to a variety of factors determined by the particular methodology. To demonstrate the sensitivity of the lower flow threshold to methodological decisions, a few examples are provided below.

- If 0.06 is used rather than 0.03 for Shields parameter in Shields relationship, τ_c increases, subsequently Q_c increases and ultimately the lower limit increases
- If bank markers are set too wide (including the floodplain and not just the channel) in the hydraulic analysis, a larger value for Q_c is calculated (because of a reduction of the hydraulic radius due to the inclusion of extensive shallow floodplain areas), resulting in an increase of the lower limit.
- If an annual maximum series is used in place of a partial duration series, the calculated Q_2 will be less than that obtained by a PDS analysis, and the ratio of Q_c to Q_2 will be higher if the AMS is used.

3. DEVELOPMENT OF EVALUATION CRITERIA

FLOW DURATION CONTROL AND PEAK FLOW CURVE MATCHING

Flow Duration Control (FDC) and Peak Flow Curve (PFC) matching criteria in their current form for many counties in CA are similar in form to the curve matching criteria from WA (WADOE, 2001). The curve matching criteria typically include a goodness of fit or variance due to the difficulty in achieving a precise match across the range of flows. The criteria are typically applied at the subwatershed scale based on continuous simulation flow results for pre- and post-project conditions to size individual BMP or LID features. In this instance, flow matching at the subwatershed scale assumes that there are no routing or timing effects in the treated runoff when it rejoins the receiving waterbody; however, this may not be true in all cases. For example, if treated runoff is delayed and rejoins the upstream runoff such that there is an increase in flow rates and durations or an increase in the peak flows in the receiving waterbody, then there is the potential to impair the receiving waterbody. To address this potential concern, the FDC and PFC criteria could be applied to the routed flows in the receiving waterbody as a

check.

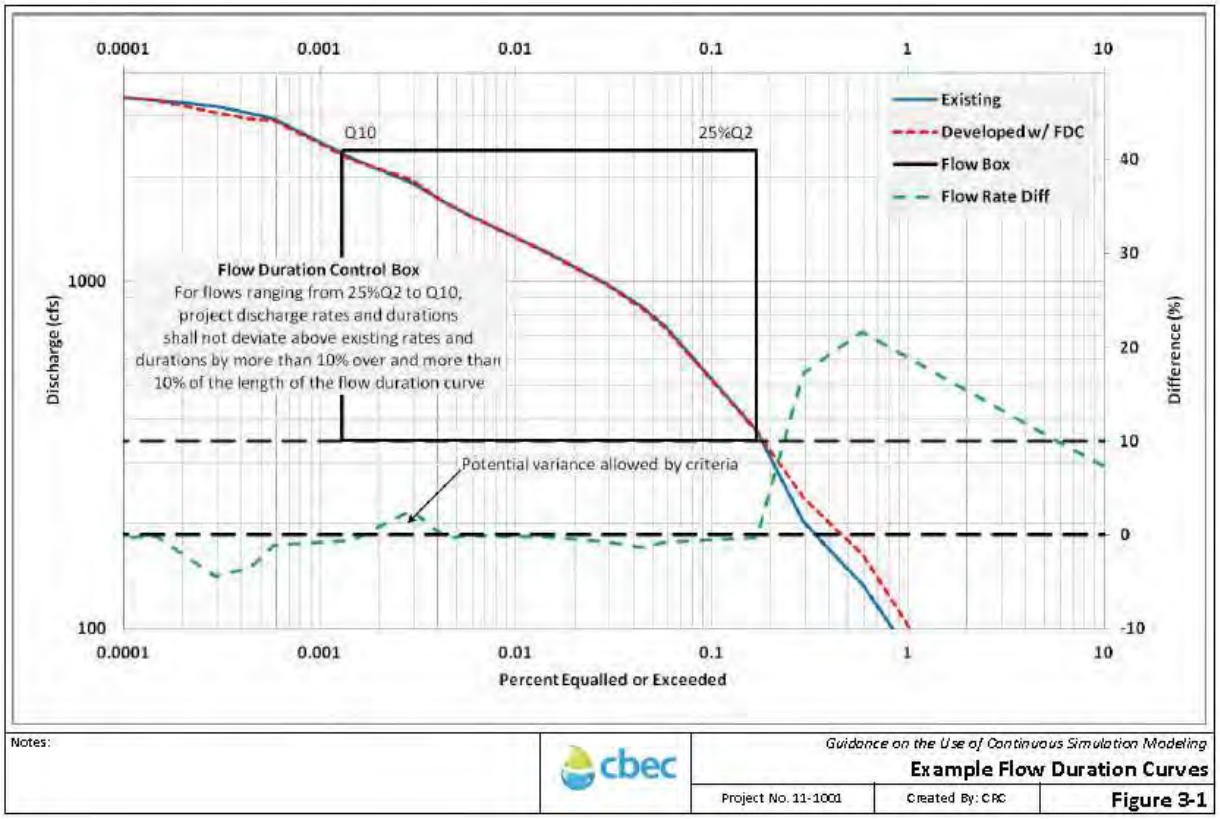

Figure 3-1 shows an example of FDC matching on the routed flows within a receiving waterbody with an example of the variance allowed by the criteria. However, it is cautioned that the FDC variance (e.g., "…by more than 10 percent over and more than 10 percent of the length…") may need to be reduced to something less than 10 percent (perhaps based on a ratio of watershed areas) to account for cumulative effects if there remain the potential for continued development in the watershed.

EROSION POTENTIAL

Erosion Potential (EP) is an index to indicate the impact of increased flows on stream stability and is based on bed mobility and an integration of work (as a function of velocity and excess shear stress in the channel only) over time, expressed as a ratio of post-project work divided by pre-project work in the receiving waterbody. Total work is based on integrating effective stream power as:

$$W = \sum_{i=1}^{n} (\tau_i - \tau_c)^e \cdot V_i \cdot \Delta t_i$$

where W is the total work done (ft-lbf/ft^2), τ is the average channel shear stress, τ_c is the critical shear stress to initiate erosion, e is an exponent varying from 1 to 2.5 to account for the exponential rise in stream power with flow, V is the velocity (ft/sec), and Δt is the numerical time step (sec). The EP index is then calculated as the ratio of W_{dev} / W_{ex} where W_{ex} and W_{dev} is the total work for existing and developed conditions, respectively. EP can be calculated at any location in the waterbody based on

continuous simulation time series of flow, velocity, and excess shear stress in the channel as derived from hydraulic model outputs.

EP criteria are not widely integrated into HMPs. Notably Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP) included EP criteria in their HMP, but in so much as it was used to inform their overall management objective (i.e., post-project runoff shall not exceed estimated pre-project rates and/or durations) and the development of their FDC / PFC criteria. In the SCVURPPP (2005) final HMP, an EP ratio <= 1.0 was recommended as the instream target value to be maintained for stream segments downstream of the point of discharge for HMP management. From a risk management perspective, the chance of a stream becoming unstable at an EP of 1.0 is 9%, meaning that 1 in 11 streams could become unstable even with controls (SCVURPPP, 2005). As such, instream EP must be evaluated considering the effects of the cumulative changes that have or may take place in the watershed.

Even though EP criteria are not widely promoted in county HMPs, that does not preclude analyses based on EP from being used, especially when instream measures permit more robust geomorphic analyses (e.g., SCVURPPP final HMP; SSQP draft HMP). While EP analyses are more time and data intensive, there is the potential outcome to discharge runoff at higher rates and durations than FDC / PFC criteria would allow, thus resulting in possibly smaller onsite measures. The time and data intensiveness of EP analyses stem from the need to evaluate the hydraulic and geomorphic conditions of the receiving waterbody to be protected at multiple locations based on continuous simulation hydraulic model outputs and geomorphic data. Potential hydraulic model considerations when performing EP calculations are addressed below.

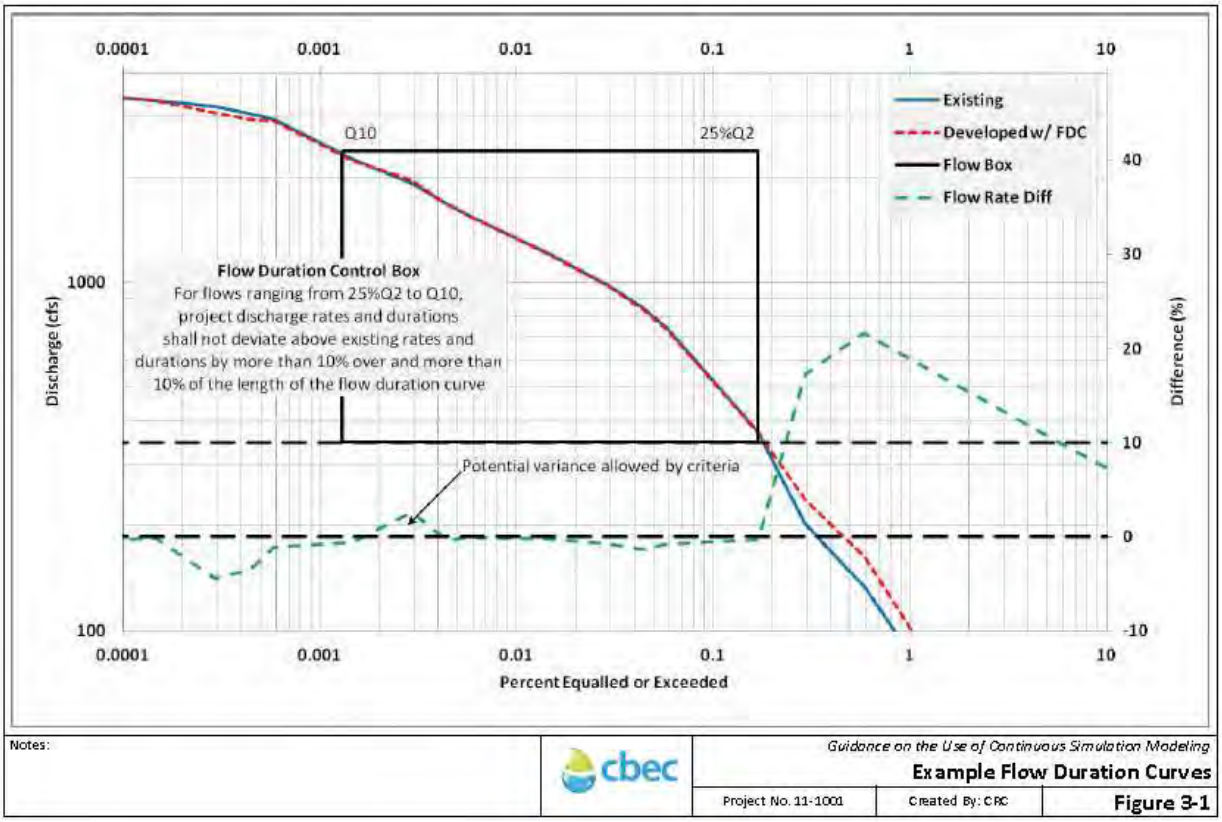

Figure 3-1. Example Flow Duration Curves

4. DATA REQUIREMENTS FOR CSM AND HYDRAULIC ANALYSIS

Hydrologic models capable of performing long-term continuous simulation to support HMPs include, but are not limited to, HSPF, HEC-HMS soil moisture accounting (SMA) method, and other hydrology models, such as the Bay Area Hydrology Model (BAHM). The first two are public domain software models and the third is a proprietary software model customized for specific counties that uses HSPF as its computational engine. A fourth modeling tool based on continuous simulation results, and also using HSPF as its computational engine, are the suite of BMP sizing calculators specifically designed for HMP management for select counties. These have been developed for Contra Costa and San Diego County and Sacramento County (in draft form). All four suites of models use site conditions (i.e., topography, soils, vegetation, and land use) and long-term precipitation data to calculate the various components of the hydrologic cycle (i.e., infiltration, surface runoff, soil moisture, evapotranspiration, percolation, interflow, and groundwater). Specific details about each model and model comparisons (e.g., TetraTech, 2011) are not discussed here, but can be reviewed in available literature.

Following model selection, hydrologic models are created for existing and project conditions based on various considerations, some of which are discussed in subsequent sections. For project conditions, county specific HMP measures need to be specified to manage project runoff to meet the evaluation criteria identified above. The BMP sizing calculators and BAHM-type hydrology models do have optimization routines to size BMP and LID measures. Automatic sizing allows for efficient and quick sizing of such features based on county specific, model specific (e.g., the sizing calculator for San Diego and Contra Costa County is based on pre-defined sizing factors such that site specific continuous simulations do not need to be performed, and is limited to drainage management units of less than 100 acres), and user-defined (e.g., the BAHM-type hydrology models require site specific continuous simulation with a wide selection of measure configurations) assumptions and limitations. As standalone models, HSPF and HEC-HMS offer flexibility as it relates to model configuration, model inputs, and user-defined parameters. However, these models do not have optimization routines to size various BMP and LID measures, thus requiring manual iteration to achieve a satisfactory solution.

PRECIPITATION DATA

Long-term precipitation data in the range of 30 to 50 years is typically needed to generate a sufficiently long flow record from which FDC and PFC analyses and/or subsequent hydraulic analyses can be performed. The precipitation data observation interval should ideally be no coarser than hourly, and if available, can be sub-hourly (e.g., 15 minutes) to coincide with a finer continuous simulation time step.

The precipitation data should ideally be located near the project site, and if needed, scaled to the project site based on a ratio of mean annual precipitation as derived from county specific mapping or regional sources (e.g., PRISM [http://www.prism.oregonstate.edu/]) and reviewed to ensure that it captures key IDF characteristics from county specific mapping or regional sources (e.g., NOAA Atlas 14 [http://www.nws.noaa.gov/oh/hdsc/index.html]). A variety of precipitation data sources exist, and include, but are not limited to:

- ALERT system for individual counties (e.g., Sacramento [http://www.sacflood.org/])
- Western Region Climate Center (WRCC [http://www.wrcc.dri.edu/])
- NOAA National Climatic Data Center (NCDC [http://www.ncdc.noaa.gov/])
- California Irrigation Management Information System (CIMIS [http://wwwcimis.water.ca.gov/])

HYDROLOGIC SIMULATION TIME STEP

The continuous simulation time step and output reporting interval for the four models identified above has traditionally has traditionally been hourly. However, an hourly time step is often significantly larger than the time of concentration for concentration for developed subwatersheds relative to existing subwatersheds, especially those commonly configured commonly configured developed subwatersheds that are limited to less than 100 acres. The sizing calculator and BAHM-type calculator and BAHM-type models are hardwired at hourly, but the public domain software still affords the user to go to a the user to go to a finer time step. As such, a sub-hourly time step and output reporting interval is preferred in order to preferred in order to adequately resolve and sample flow from developed subwatershed elements where time of where time of concentrations are typically less than one hour. As shown by

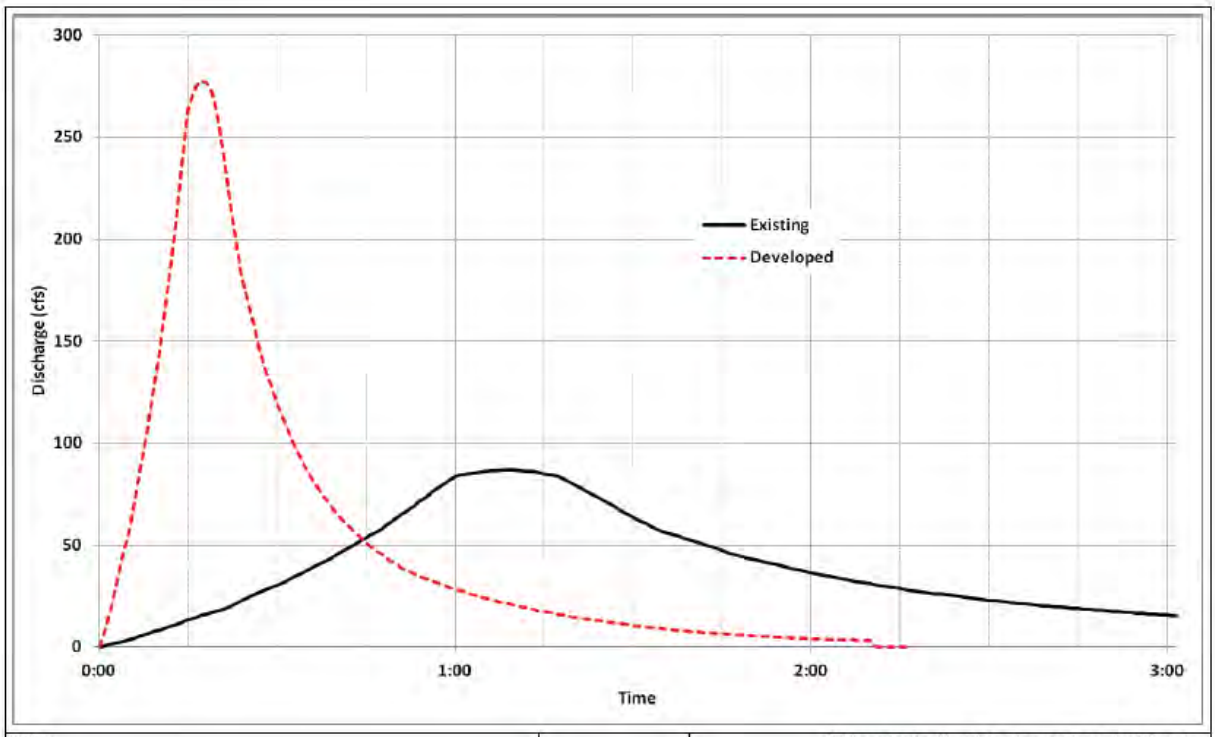

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Guidance on the Use of Continuous Simulation Modeling

Example Unit Hydrographs

Project No. 11-1001 | Created By: CRC | **Figure 4-1**

Figure 4-1 for a typical developed subwatershed, the unit hydrograph for developed conditions is flashier, peaks quicker (well within one hour), and the recession limb becomes small quickly. While a sub-hourly time step and output reporting interval may not be desirable due to the volume of model output that will be generated, it is possible to bias the results in favor of the developed condition due to under sampling of the flashier and larger developed flows under an hourly time step.

HYDROLOGIC MODEL CALIBRATION AND VALIDATION

In developing continuous simulation models, the model parameters describing soil characteristics, land use descriptions, and evapotranspiration should be derived from published data (e.g., soil survey, local studies, county standards, etc.). These parameters should be calibrated and validated, where applicable, by comparing modeled flows to measured or observed flows with the receiving waterbody for specific overlapping periods when there is adequate precipitation, evapotranspiration, and flow data. In the absence of site-specific data for calibration and validation, calibrated model parameters from neighboring watersheds within the region could be used so long as proper justification is provided that said parameters are appropriate. However, it is not recommended that local studies rely upon calibrated parameters from other regions where soil characteristics and land use descriptions are markedly different. Rather, when calibration cannot be performed, general review and comparison of continuous simulation model outputs (e.g., hydrograph shape, AMS, etc.) to standardized event-based approaches could be performed to demonstrate that continuous simulation results are generally consistent with local standards and methodologies.

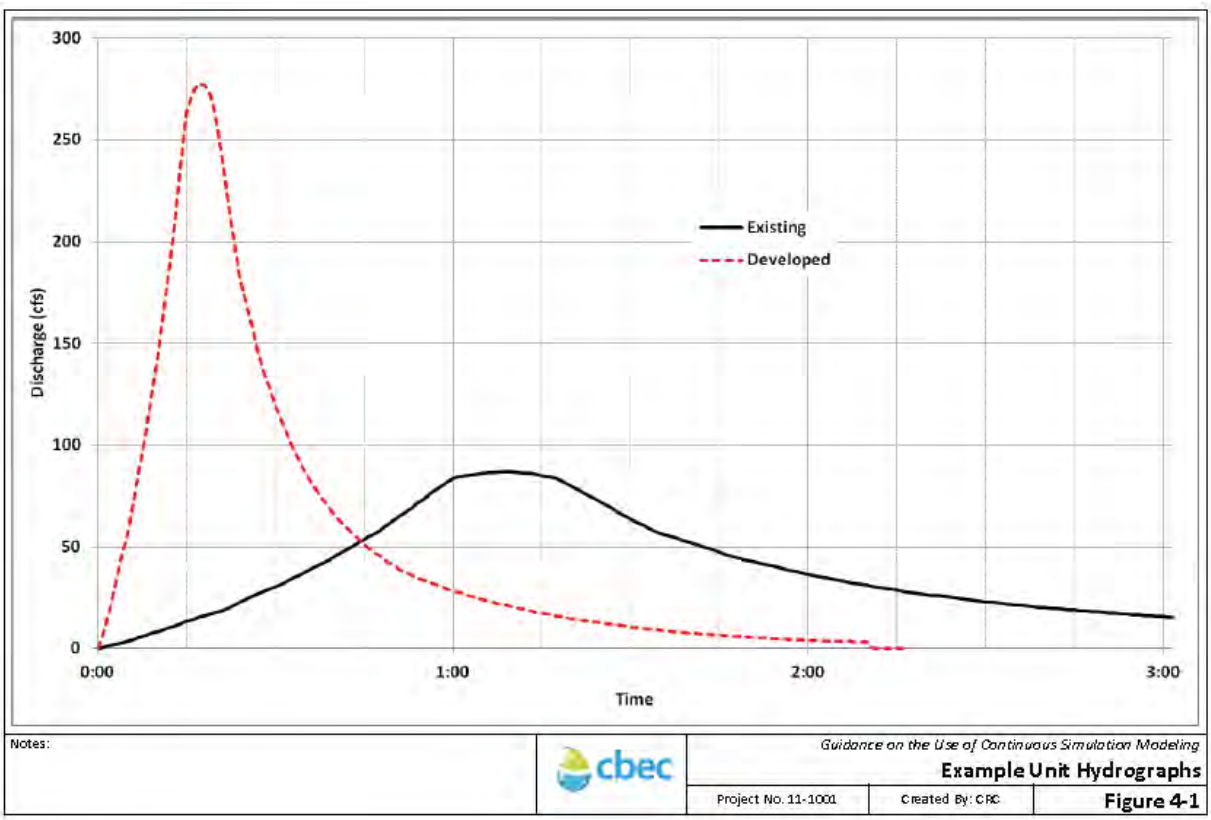

Figure 4-1. Unit Hydrograph Method

For example, continuous simulation modeling in Sacramento County for some developments has relied up conversion of SacCalc (HEC-1 pre- and post-processor) event-based models to the SMA method within HEC-HMS. This conversion often involves retaining the surface infiltration rate determined by SacCalc based on accepted land use descriptions, but parameterizing the subsurface based on soil survey information and local studies, using local potential evapotranspiration data, and reviewing model hydrographs for reasonableness.

HYDRAULIC MODEL CONSIDERATIONS

Sometimes hydraulic models are needed since the basic flow routing within the hydrologic models is not adequate to characterize the potential changes to the hydraulic and geomorphic character of the receiving waterbody, especially when instream measures are suggested or EP is used as the evaluation criteria. Potential considerations and issues encountered when developing and using hydraulic models for continuous simulation include:

1. Low flow instabilities can introduce anomalies into model output (which is commonly encountered in HEC-RAS), so careful hydraulic model selection is important for accuracy and efficiency
2. The sensitivity of the hydraulic model outputs (i.e., velocity and shear stress) to accurate hydraulic description of the receiving waterbody (i.e., cross section geometry (i.e., is it based on LiDAR influenced by vegetation or ground survey), proper definition of channel transitions, proper definition of channel bank markers, appropriate Manning's n-values, etc.)
3. Selection of appropriate compliance points that are representative of the reach and capture flow changes (e.g., downstream of points of discharge and not in backwater areas).

All of these issues have the potential to introduce error and subjectivity into long-term hydraulic analyses and care should be taken to systematically address each source of error.

GENERAL TIPS

A series of general tips are provided as follows. These can be used to increase efficiency and accuracy when performing CSM.

- To shorten the simulation time, the precipitation record can be truncated to only the rainy season (e.g., October through May) by removing the dry summer months from the simulation, especially in ephemeral systems where applicable.
- Hourly precipitation data does not prohibit the continuous simulation model from being run at a sub-hourly time step.
- Subwatershed delineation between existing conditions and developed conditions can often result in relatively large existing subwatersheds compared to relatively small developed subwatersheds. It is commonly known that smaller subwatersheds have flashier flows, so making existing and developed conditions subwatershed sizing consistent is recommended to provide a more meaningful comparison.

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APPENDIX B: APPLICATION OF SUITES OF MODELING AND ASSESSMENT TOOLS

Introduction. This appendix provides a discussion of four example "suites of tools" that can be used to perform predictive scientific assessments and address specific questions related to hydromodification assessment and management. The suites are changeable mixes of mechanistic models, statistical analyses, and expert scientific judgment that incorporate a number of the tools discussed in Chapter 4, combined in various ways. For example, some suites apply a series of cascading models, in which the output from one is used as input to the next; other suites apply a number of models in parallel to develop an assessment based on the weight of evidence. The suites of tools discussed below are used to perform a baseline stability assessment, a channel forming discharge analysis, an erosion potential analysis, and a sediment transport analysis. Most of these standard tools (with the exception of the erosion potential suite) have been widely employed in a variety of stream management activities for decades, and are considered essential components of the broader fluvial geomorphology toolbox. This is far from a comprehensive list of tools, as there are many other important tools (focused on both geomorphic and biologic endpoints) relevant to hydromodification management (Kondolf et al. 2003; Poff et al. 2010); however, the purpose of this appendix is to briefly illustrate how several standard tools can be integrated to answer key questions about stream responses and to provide a stronger technical basis for hydromodification management.

Application of these tools provides basic geomorphic data and knowledge that are typically needed to manage a stream for some desired future state in a watershed with changing land uses. This critical information comes at a cost—the tools require substantially more time and effort to apply than has been the norm in hydromodification management because they involve examining streams within their watershed context with a deeper level of geomorphic analysis. Stormwater management programs typically have made the "practical" assumptions that stream reaches can be managed in isolation from the larger systems of which they are a part, and that effective management prescriptions can be formulated with little or no substantive geomorphic analysis. ***These assumptions are in direct conflict with current understanding in fluvial geomorphology and stream ecology, which indicates that protection of stream integrity is often predicated upon careful assessments of geologic and historical context, performing detailed hydraulic and sedimentation analyses where appropriate, and developing basic understanding of streamflow-ecology linkages***. If hydromodification management policies are to have a reasonable chance of actually achieving their aims, then it will most likely be necessary to reject these simplifying assumptions and instead rely on approaches rooted in current scientific understanding of stream systems.

The suites of tools described below go beyond screening level assessments that are designed, in part, to identify which streams lend themselves to relatively straightforward management prescriptions versus which streams do not. For streams that do not lend themselves to generic management prescriptions, the level of analysis performed with these tools should increase with the level of risk and geomorphic / biologic susceptibility of the streams. This does not mean that every stream will require in-depth analysis by local permitting agencies. It is not possible to carry out sufficient geomorphic analyses with the tools illustrated below on a permit-by-permit basis, and local governments may lack the resources and/or technical capacity to effectively apply these tools. Instead, ***the vital information provided by these tools***

will need to be obtained through proactive regional studies that involve baseline assessments followed by progressively more in-depth analyses as necessary to provide local governments with a sound basis for effective project-by-project decision-making within a broader watershed management framework.

1. **Baseline Stability Assessment**. This suite of tools is designed to answer the following key questions:
   - What is the trajectory of the stream's form over time?
   - How has the channel form responded to changes in water and sediment supply over the years?
   - Is the channel close to a geomorphic threshold that could result in rapid, significant change in response to only minor flow alteration?
   - How can past channel responses provide insight into potential responses to future watershed change, and so aid in prediction of future hydromodification-induced changes?
   - What level of subsequent geomorphic analysis is appropriate given the complexity of the situation and the susceptibility of the streams of interest?

   The goals of a baseline stability assessment are to:
   - Document the historical trends of the system;
   - Establish the present stability status of the system and identify the dominant processes and features within the system;
   - Provide the foundation for projecting future trends with and without proposed project features;
   - Provide critical data for calibration and proper interpretation of models; and
   - Provide a rational basis for identification and design of effective alternatives to meet project goals.

   The key tools that comprise this suite include:
   - GIS mapping of topography, soils, geology, land use/land cover across the contributing watershed (e.g., Thorne 2002)
   - Analysis of hydro-climatic data, e.g. streamflow gauge records, changes in stage-discharge relationships over time (e.g., Thorne 2002)
   - Analysis of aerial photos and historical data (e.g., Thorne 2002)
   - Field reconnaissance (e.g., Thorne 1998)
   - Qualitative response (e.g., Lane 1955b, Schumm 1969, Henderson 1966 relations)
   - Classification systems - (e.g., Thorne 1997; Schumm et al. 1982; and channel evolution model developed for S CA by Hawley et al. in press)
   - Relationships between sediment transport and hydraulic variables
   - Regional hydraulic geometry (e.g., Hawley 2008; Haines in prep)
   - Regional planform and stability predictors (e.g., Hawley et al. in press, Bledsoe et al. in press, Dust and Wohl 2010)

- Bank stability analysis (e.g., BSTEM http://www.ars.usda.gov/Research/docs.htm?docid=5044, Hawley (2009), Bledsoe et al. in press, Osman and Thorne 1988; Thorne et al. 1998)
- Sediment budgets (Booth et al. 2010; Reid and Dunne 1996)
- Fluvial audit (Thorne 2002 – a comprehensive framework for performing baseline assessments)

A baseline assessment is completed by integrating information from all the available data sources and analytical tools. Analysis with each of the individual tools may yield a verdict of aggradation, degradation, or dynamic equilibrium with respect to the channel bed, and stable or unstable with respect to the banks. The individual assessments can produce contradictory results. In this case, one should assign a level of confidence to the various components based on the reliability and availability of the data, and the analyst's own experience level. As is often the case in the management of fluvial systems, there is no "cookbook" answer, and we must always incorporate sound judgment.

A process-based channel evolution model (CEM) is a particularly useful element of the baseline assessment process. A CEM aids in identifying the dominant processes and trends of channel change and provides a framework for subsequent, more detailed modeling (ASCE 2008). In some locations, CEMs have already been developed and calibrated with regional data. For example, the CSU / SCCWRP Screening Tool (Bledsoe et al. 2010) grew out of a regional CEM (Hawley et al. in press) and integrates several baseline assessment tools including regionally-calibrated braiding, incision, and bank stability thresholds, and sediment supply analysis with "Geomorphic Landscape Units" (Booth et al. 2010). In locations where a CEM has not been sufficiently defined, the baseline assessment suite of tools can provide the data and understanding needed to develop a regionally calibrated CEM.

The following are example outputs from a baseline stability assessment, including channel stability and bank stability diagrams associated with key geomorphic thresholds of management concern in the channel evolution sequence (i.e. braiding, incision, and bank failure):

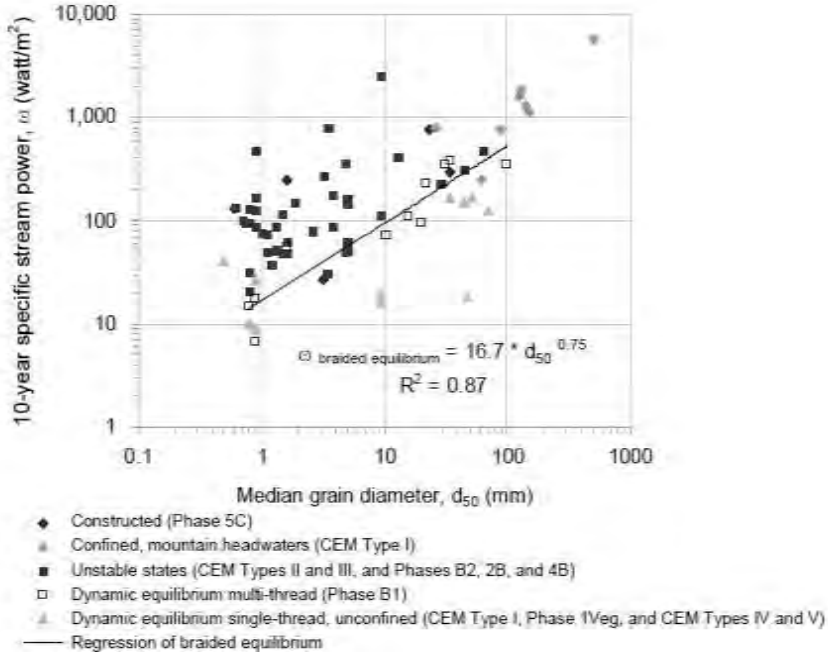

Figure B-1. Stability thresholds for channel types of southern CA, as identified through the development of a regional CEM (Hawley et al., in press).

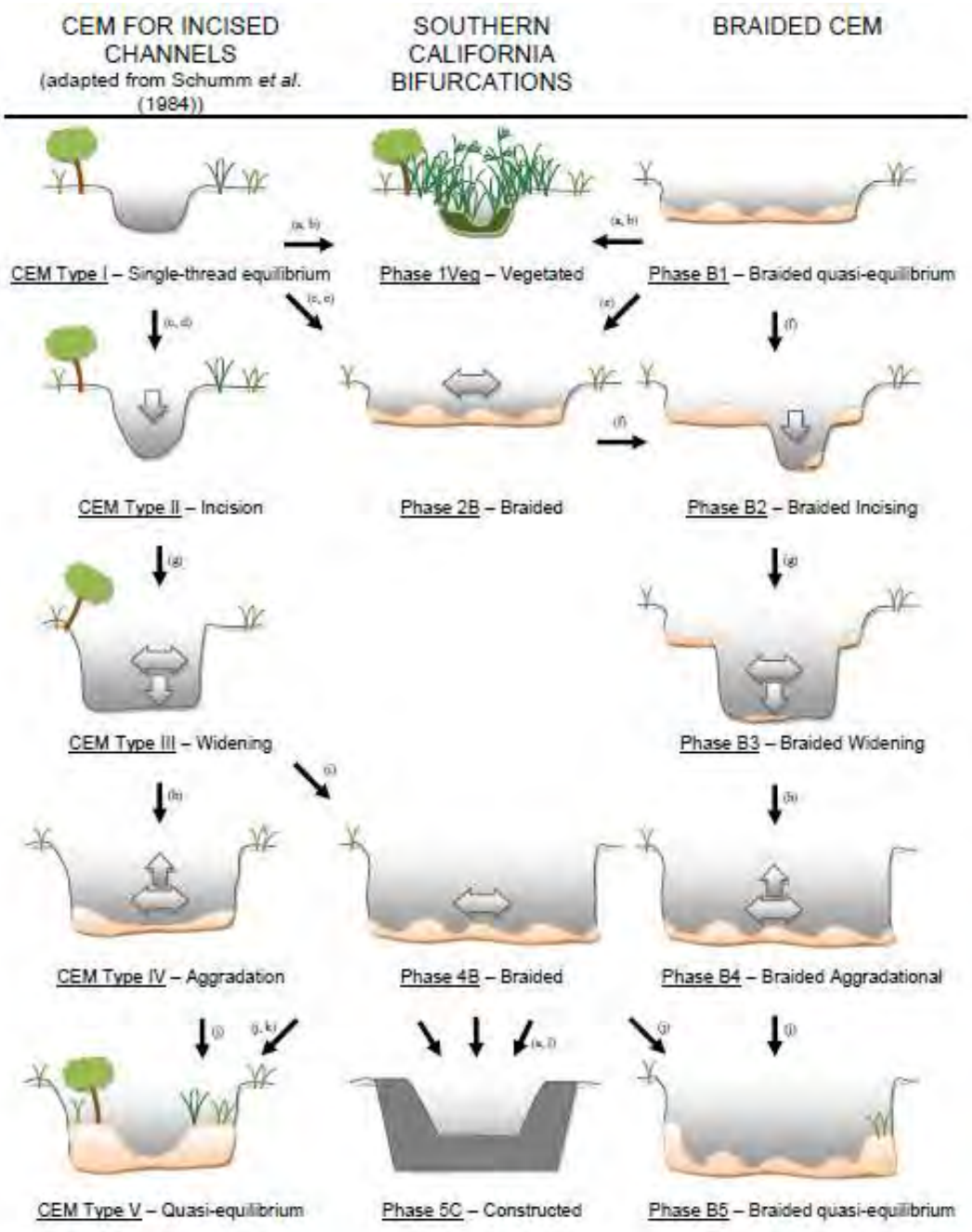

Figure B-2. Channel evolution model of response to hydromodification in southern California (Hawley et al. in press). Red and blue ovals highlight geomorphic thresholds that may be quantified using the baseline assessment suite of tools. By developing a general physical understanding of channel evolution sequences commonly observed in urbanizing watersheds of southern CA, two braiding thresholds and a bank stability threshold of management concern were identified. Channels may shift from single thread to braided planforms if widening is the dominant mode of initial adjustment. Alternatively, single thread channels may become braided after an initial period of incision that triggers geotechnical instability and failure of the banks. Quantitative predictors of these thresholds of braiding, incision, and bank failure can be developed in the baseline assessment process to evaluate the proximity of streams to these critical stages of channel evolution and instability.

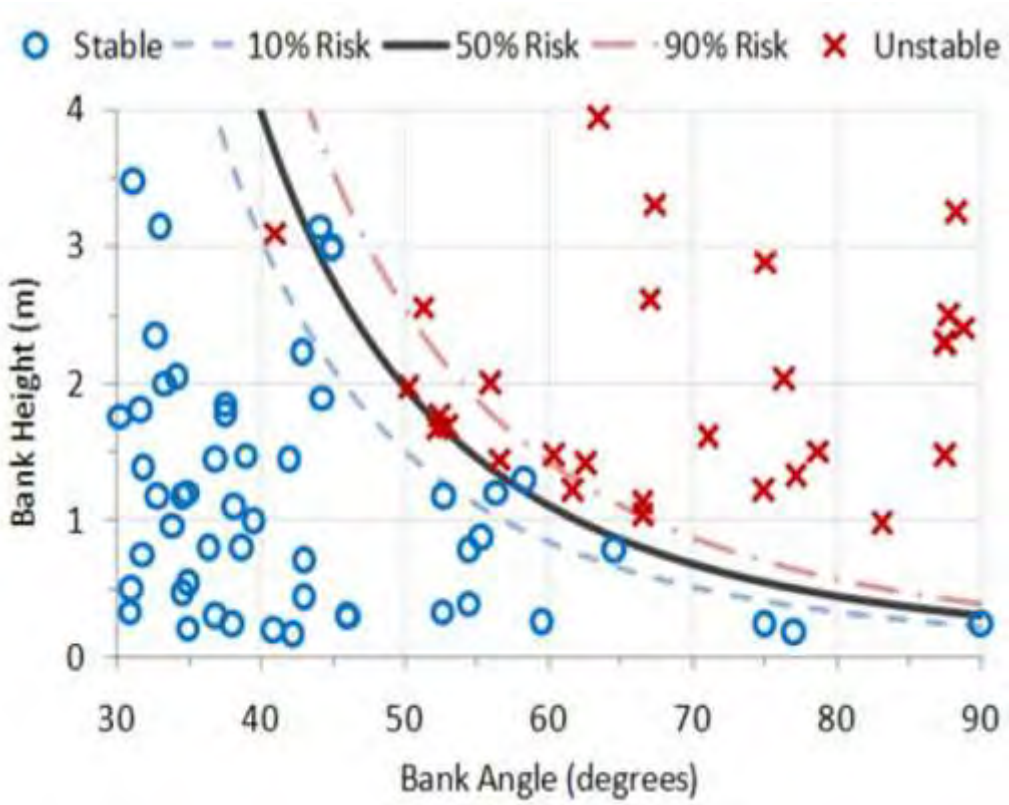

Figure B-3. Bank stability threshold for mass wasting identified through analysis of field data from southern California streams with stable and unstable banks (Bledsoe et al., in press).

2. **Channel-forming discharge suite of tools.** This suite of tools is designed to answer the following key questions:
   - What ranges of discharges are most influential in controlling channel form and processes over decadal time scales?
   - What channel-forming discharge should be used in sediment transport analyses to identify sediment transport capacity, equilibrium slope and geometry, etc.?

   The tools that comprise this suite include the following:
   - Effective discharge computations (e.g., Soar and Thorne 2001; Biedenharn et al. 2000; GeoTools – Bledsoe et al. 2007). An effective discharge analysis directly quantifies the range of discharges that transport the largest portion of the annual sediment yield over a period of many years.
   - Field identification of high water elevations, depositional surfaces, and "bankfull" features
   - Flood frequency analysis
   - Un-gauged site analysis (e.g. USGS StreamStats) http://water.usgs.gov/osw/streamstats/california.html; Hawley and Bledsoe (2011), regional flow duration curve extrapolation – Biedenharn et al. 2000)

This suite incorporates a number of parallel analyses that can be used to establish likely upper and lower bounds to the range of influential discharges, and that can be assessed through a weight-of-evidence evaluation. The following is an example output from the channel forming discharge suite of tools:

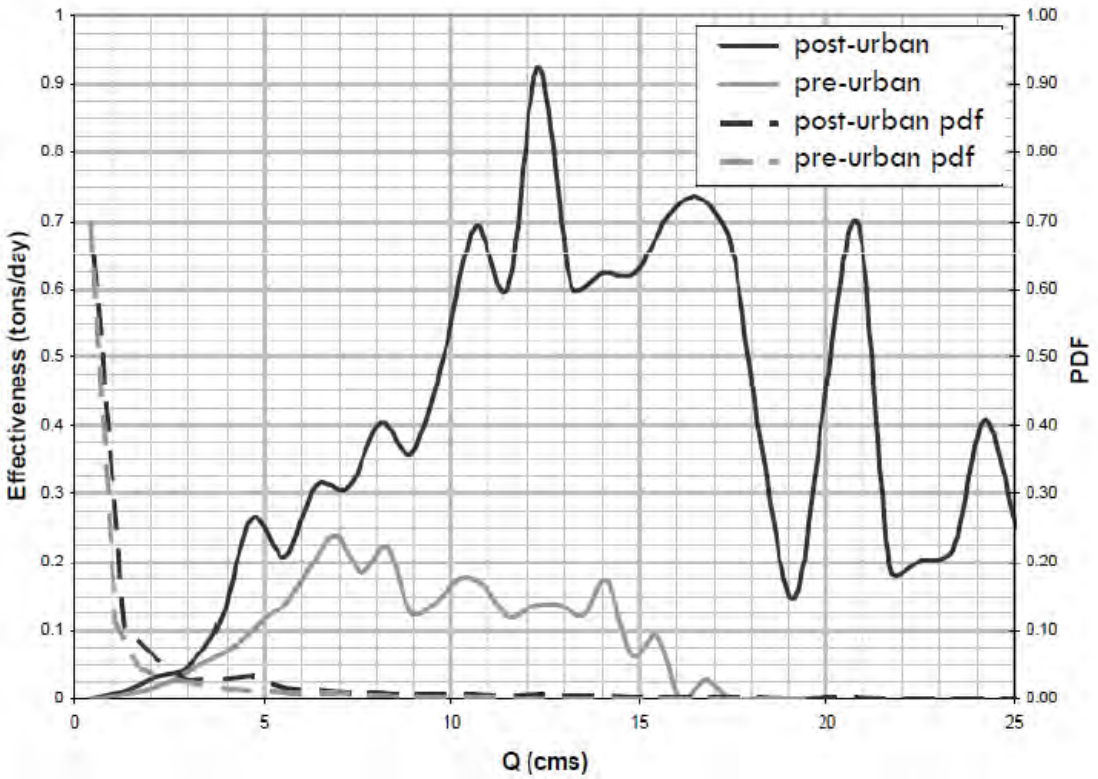

Figure B-4. Flow effectiveness curves for continuous series of pre-urban and post-urban discharges (Biedenharn et al. 2000; Bledsoe et al. 2007). Cumulative sediment yield is approximated by the area under the respective curves. If the stream bed is the most erodible channel boundary, the ratio of areas under these curves would be the erosion potential metric described below in the next suite of tools.

3. **Erosion potential suite of tools.** This suite of tools is designed to answer the following key questions:
   - How do proposed land-use changes or channel alteration affect the capacity of a channel to transport the *most erodible material in its boundary* over a period of many years (erosion potential – Ep)?
   - Do proposed mitigation approaches match the pre- vs. post- development erosion potential over the full spectrum of erosive flows?
   - Do past changes in erosion potential correspond to different states of channel stability and degradation in this region?
   - Does a proposed change in streamflow make it more likely that a channel will enter an alternative / degraded state?

The underlying premise of the erosion potential approach advances the concept of flow duration control (discussed in Chapters 2 and 3) by addressing in-stream processes related to sediment transport. An erosion potential calculation combines flow parameters with stream geometry to assess long term (decadal) changes in the sediment transport capacity. The cumulative distribution of shear stress, specific stream power and sediment transport capacity across the entire range of relevant flows can be calculated and expressed using an erosion potential metric, Ep (e.g., Bledsoe, 2002). This erosion potential metric is a simple ratio of post- vs. pre-development sediment transport capacity over a period of many years. The calculated capacity to transport sediment can be based on the channel bed material or the bank material, depending on which one is more erodible.

This Ep suite of tools has been applied in two primary ways:

a) At a project-level analysis, it has been applied to answer the first two questions above. A municipal stormwater permit may require a project design to achieve an erosion potential (Ep) value of 1.0. This means that a project must be designed so that the long-term erosion potential of the site's stormwater discharge is equal to the erosion potential of the pre-development condition. Section 3.1 below explains the process by which this analysis is conducted.
b) At a regional level, this suite of tools can be applied to answer the third and fourth questions above and to provide further guidance to project-level assessments. For example, practical engineering considerations generally require that a tolerance be permitted around a target design value. It is unlikely that a project design can match an Ep target of 1.0 across all conditions and through all stream reaches, due to variations in a multitude of contributing factors. The selection of an acceptable tolerance or variance from 1.0 is a management decision that should be informed by regional data presented in a risk-based format. Section 3.2 below explains how such a study has been conducted, using the Santa Clara Valley example from northern California.

3.1. *Project-Level Analysis.* As applied to the analysis of project impacts and mitigation design, the steps and associated tools that comprise this suite include the following (Figure B-5):

- Perform continuous simulation of hydrology (e.g. SWMM, HEC-HMS, HSPF) for the project site, for both pre-project condition and post-project condition with the proposed mitigation design.
- Convert discharges and field surveys to hydraulic parameters (shear stress and specific stream power) – e.g., for uniform flow analysis use Manning's equation, GeoTools; for varied flow analysis use HEC-RAS
- Convert hydraulic parameters into sediment transport capacity – e.g., at-a-station hydraulic geometry, HEC-RAS, GeoTools, sediment transport relationships (bedload and total load)
- Integrate Ep over time – e.g., GeoTools

- Compare Ep values for pre-development and post development to determine if the proposed mitigation design is adequate. Adjust stormwater controls as necessary to meet target Ep.

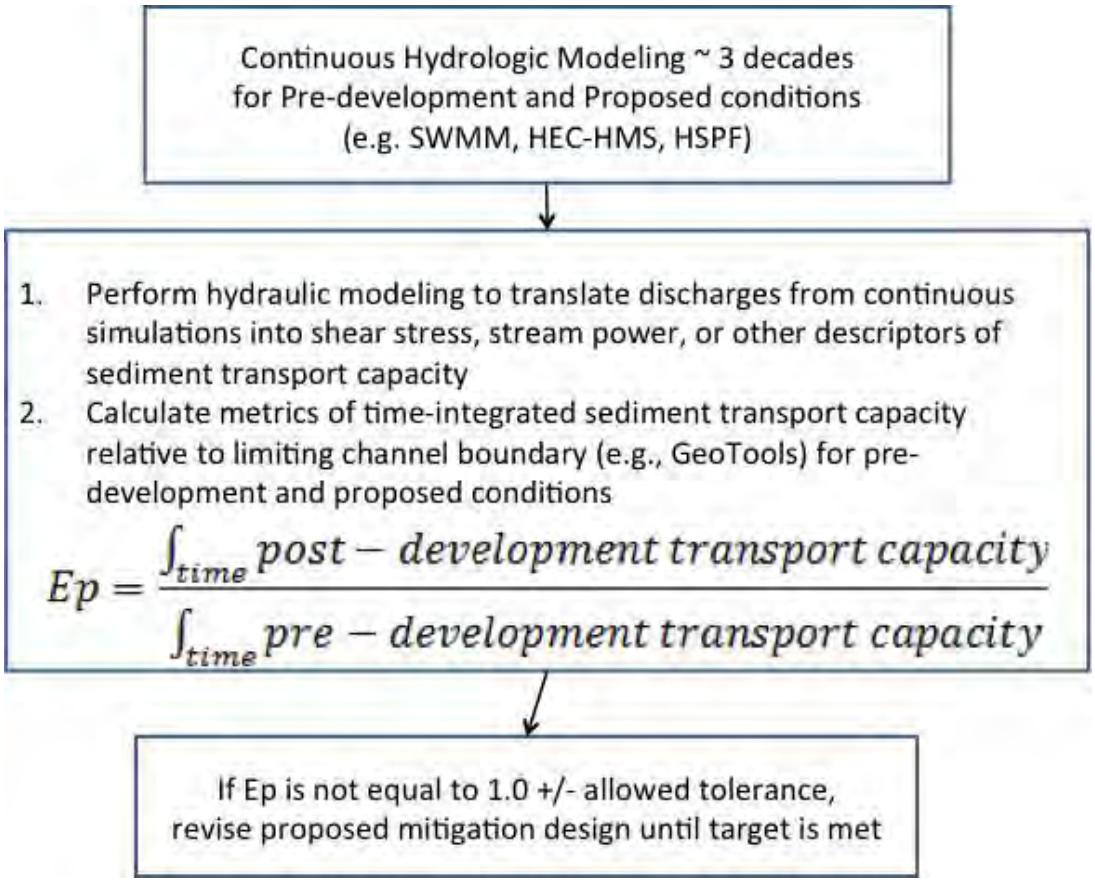

Figure B-5: Steps involved in a project-level Erosion Potential analysis

3.2. *Risk-Based Regional Analysis*. Risk-based modeling estimates the probability of stream geomorphic states. Decision-makers can then choose acceptable risk levels based on an explicit estimate of prediction error. The foundation of risk-based modeling in the context of hydromodification management is the integration of hydrologic and geomorphic data derived from the output of continuous hydrologic simulation models to generate metrics describing expected departures in the most important stream processes. These physical metrics are provided as inputs to probabilistic models that estimate the risk of streams shifting to some undesirable state. Because the decision endpoint is often categorical (e.g., stable, good habitat) the statistical tools of choice

are often logistic regression, classification and regression trees (CART), and/or Bayesian probability networks.

The steps below are used to develop a risk-based framework (Fig. B-6) for assessing how hydromodification may impact streams within a region, and for understanding the relationships between deviation from an Ep of 1.0 and the likelihood of channel instability. Illustrating figures are taken from a risk-based approach was used in the development of the Santa Clara Valley Urban Runoff Program Hydromodification Management Plan (www.SCVURPPP.org). This study demonstrated that a time-integrated index of erosion potential based on continuous hydrologic simulation and an assessment of stream power relative to the erodibility of channel boundary materials could be used to distinguish between channels of a particular regional type that are stable vs. degraded by hydromodification in urban watersheds.

- Perform project-level analysis as described in section 3.1 above for existing developments throughout the study watersheds.
- Perform stream surveys throughout the study watersheds to characterize condition (i.e., stable, unstable)
- Create statistical relationships between Ep and different channel states – e.g., logistic regression in R, SAS, Statistica, Minitab, etc. Note that standard regression techniques are applied when the dependent variable and the explanatory variables are quantitative and continuous. To analyze a binary qualitative variable (e.g., 0 or 1, stable or unstable, healthy or degraded) as a function of a number of explanatory variables, alternative techniques must be used. The regression problem may be revised so that, rather than predicting a binary variable, the regression model predicts a continuous probability of the binary variable that stays within 0–1 bounds. One of the most common regression models that accomplishes this is the logit or logistic regression model (Menard, 1995; Christensen, 1997).

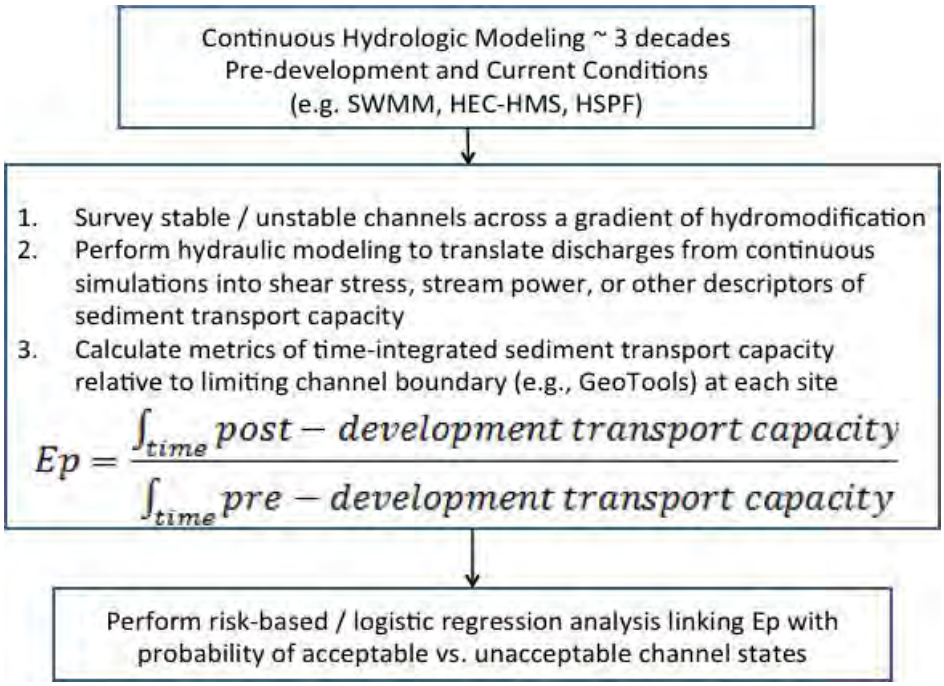

Figure B-6: Steps involved in a Risk-Based Erosion Potential analysis

The variables included in risk-based models of stream response are not limited to erosion potential. Additional multi-scale controls could be included. For example, simple categories of physical habitat condition and ecological integrity could be predicted by augmenting erosion potential metrics with descriptors of the condition of channel banks and riparian zones, geologic influences, floodplain connectedness, hydrologic metrics describing flashiness, proximity to known thresholds of planform change, and BMP types. Furthermore, although most of the emphasis to date has been on predicting geomorphic endpoints, the risk-based approach can be extended to the prediction of biological states in urban streams if the necessary data are available.

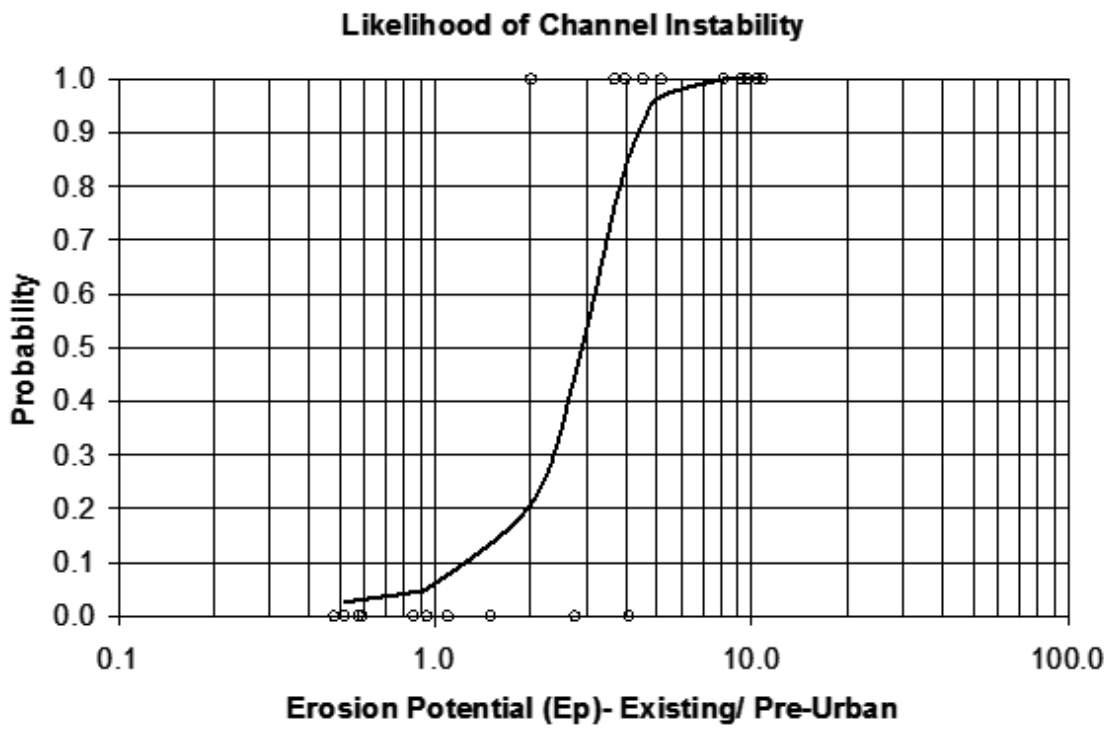

Figure B-7: Example of a logistic regression analysis of stable vs. unstable channels (Bledsoe and Watson, 2001; Bledsoe et al., 2007). The vertical axis represents the probability of stream instability which increases rapidly for channels with sediment transport capacity increased by urban hydromodification (Ep > 1).

3.3. *Strengths and Limitations.* The Erosion Potential approach combines a sound physical basis with probabilistic outputs and requires a substantial modeling effort. Such an effort is necessary to adequately characterize the effects of hydromodification on the stability of streams that are not armored with very coarse material such as large cobbles and boulders. Although policies based on this approach should reduce impacts to channel morphology, they may still fail to protect stream functions and biota. Key simplifying assumptions and prediction uncertainty in the inputs (hydrologic modeling, assumptions of static channel geometry in developing long term series of shear stresses or stream powers, assumptions of stationarity in sediment supply, etc.) have not been rigorously addressed. Its effectiveness also depends on careful stratification of streams in a region such that fundamentally different stream types are not lumped together (e.g. labile sand channels vs. armored threshold channels with grade control) in developing general relationships for instability risk. Endpoints to date have been rather coarse, e.g. stable vs. unstable; as such, they do not provide sufficient resolution for envisioning future stream states. However, the Erosion Potential approach provides

promise as an important tool for hydromodification management; it is recommended that it be refined to address sediment supply changes and to provide more finely resolved endpoints for improved predictive capabilities.

4. **Sediment transport analysis suite of tools.** This suite of tools is designed to answer the following questions:
   - Do I need to incorporate sediment transport analysis in predicting channel response to hydromodification, i.e. what is the sensitivity of channel slope and geometry to inflowing sediment load?
   - At what discharges are different fractions of bed material mobilized in a particular stream segment?
   - What is inflowing sediment load to a stream segment, i.e. what is the water discharge Q(t) and sediment supply rate Qs(t) and grain size D(t) delivered to the upstream end of the channel segment of interest?
   - How will the available flow move the supplied sediment through the segment of interest?
   - What is the new equilibrium slope given some change in streamflow, and how much incision would be necessary to achieve this new slope?
   - What is the sediment transport capacity of the segment of interest *relative to* the inflowing sediment load from *upstream* supply reaches?
   - What is the sediment transport capacity of the segment of interest *relative to* the capacity of *downstream* reaches?
   - At the network scale, where are zones of low vs. high energy, aggradation vs. degradation potential, and coarse sediment constriction located?

   The primary tools that comprise this suite include the following:
   - Tools for estimating watershed sediment supply (Reid and Dunne 1996), including the RUSLE (Renard et al. 1997; http://www.ars.usda.gov/Research/docs.htm?docid=5971) and WEPP (Laflin et al. 1991; http://www.ars.usda.gov/Research/docs.htm?docid=10621) models.
   - Effective discharge analysis (see above)
   - Incipient motion analysis (tractive force, e.g. ASCE 2008; Brown and Caldwell 2011; Buffington and Montgomery 1998; Lane 1955a)
   - Sediment continuity analysis at single dominant discharge with an appropriate sediment transport relation – e.g., HEC-RAS, Bedload Assessment for Gravel-bed Streams (BAGS -Pitlick et al. 2009; GeoTools)
   - Equilibrium slope / geometry analysis e.g., HEC-RAS – Copeland et al. 2001, iSURF-NCED 2011)
   - Sensitivity to inflowing sediment load analysis e.g., Copeland's method in HEC-RAS, iSURF-NCED 2011)
   - Sediment continuity analysis over the entire flow frequency distribution e.g., Capacity-Supply Ratio of Soar and Thorne (2001), BAGS, GeoTools

- Network scale sediment balance – Sediment Impact Analysis Methods (SIAM) module in HEC-RAS

Movable bed / mobile boundary models also provide a mechanistic tool for estimating the trend and magnitude of changes in channel geometry due to hydromodification. However, a recent study evaluated the potential applicability of various movable bed and/or boundary models to streams in southern CA (Dust 2009), including HEC-RAS, CONCEPTS (Langendoen, 2000), and FLUVIAL 12 (Chang, 2006). The results of tests performed on urban streams in southern CA indicate that these models are difficult to apply and have high prediction uncertainty due to flows near critical, split flow conditions, and lack of fidelity to complex widening, bank failure, and armoring processes.

The following figures depict example outputs from an application of the sediment-transport suite of tools:

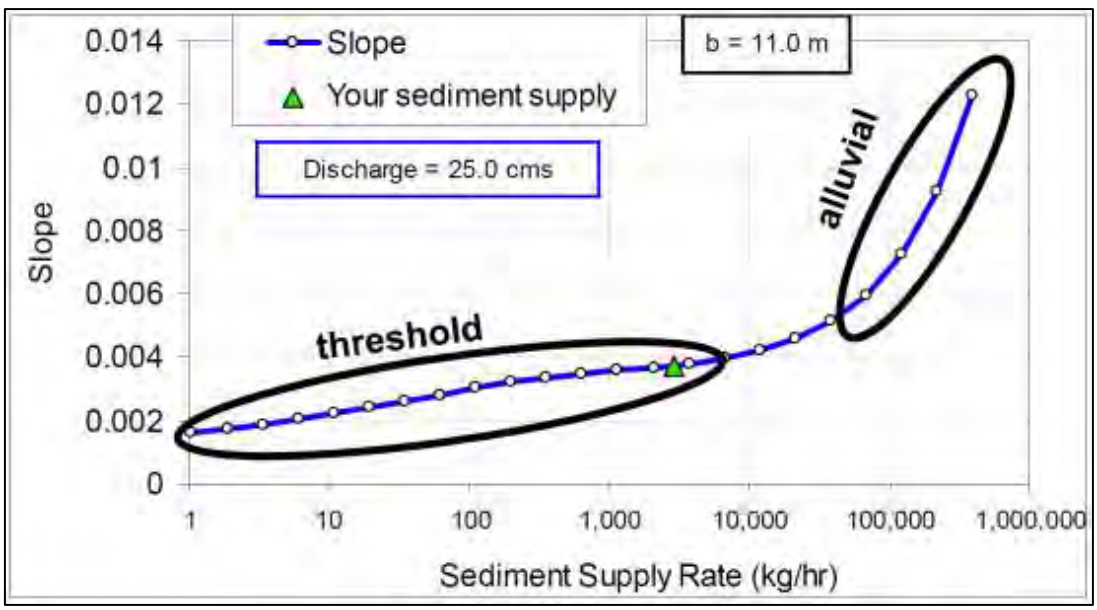

Figure B-8. Sensitivity analysis of equilibrium channel slope to inflowing sediment load (from iSURF, NCED 2011). Slopes of alluvial channels with high sediment supply are much more sensitive than threshold channels with relatively low sediment supply. Channels with beds composed of sand and fine gravels are generally much more geomorphically sensitive to hydromodification than threshold channels in which coarse bed sediments are primarily transported at relatively high flows.

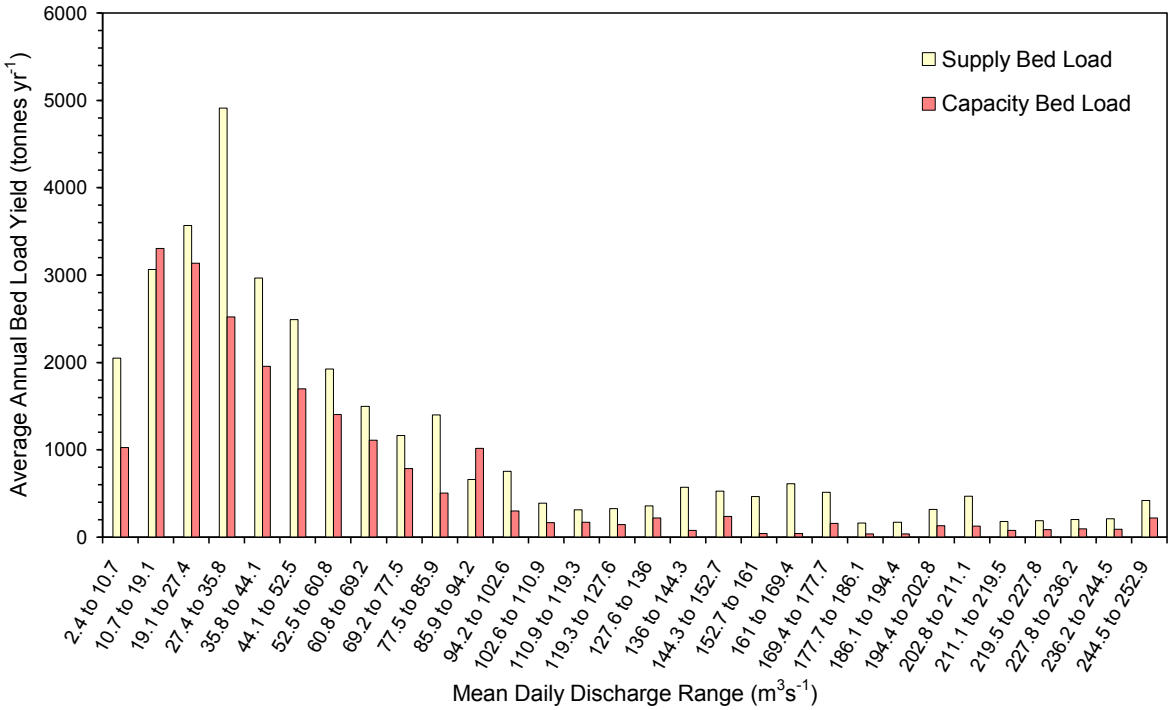

Figure B-9. Analysis of sediment transport capacity vs. inflowing sediment load over the full spectrum of stream discharges (capacity-supply ratio; Soar and Thorne 2001). In this case, the time-integrated capacity to transport bedload is 64% of the supplied bedload and significant aggradation is expected.

5. **Relationship to Management Framework**. These suites of tools could be applied to establish project-specific requirements for hydromodification assessment and mitigation, as recommended in the Management Framework presented in Chapter 3. In the example shown in the diagram below, results of the Baseline Assessment are used as a screening tool to assign high, moderate or low risk levels for stream reaches, in conjunction with the proposed land-use changes. Thus, the Baseline Assessment suite of tools is crucial in determining whether a detailed survey-level assessment and additional suites of tools are necessary for an adequate analysis. The need to apply additional suites of tools in formulating a management approach is commensurate with the level of risk and susceptibility of the stream. More complex and rigorous analysis with multiple suites of tools is necessary in predictive assessments for relatively susceptible stream types such as alluvial channels with sand beds.

   Although a stream may have relatively low susceptibility for overall geomorphic change, it may nevertheless have ecological attributes that are highly susceptible to hydromodification. Thus, suites of tools focused on both geomorphic and biological endpoints must be used to fully assess stream susceptibility to hydromodification. More work will be required to develop tools for prediction of biological response to flow alterations throughout California, as noted in Chapter 3 (see Poff et al., 2010 and http://conserveonline.org/workspaces/eloha).

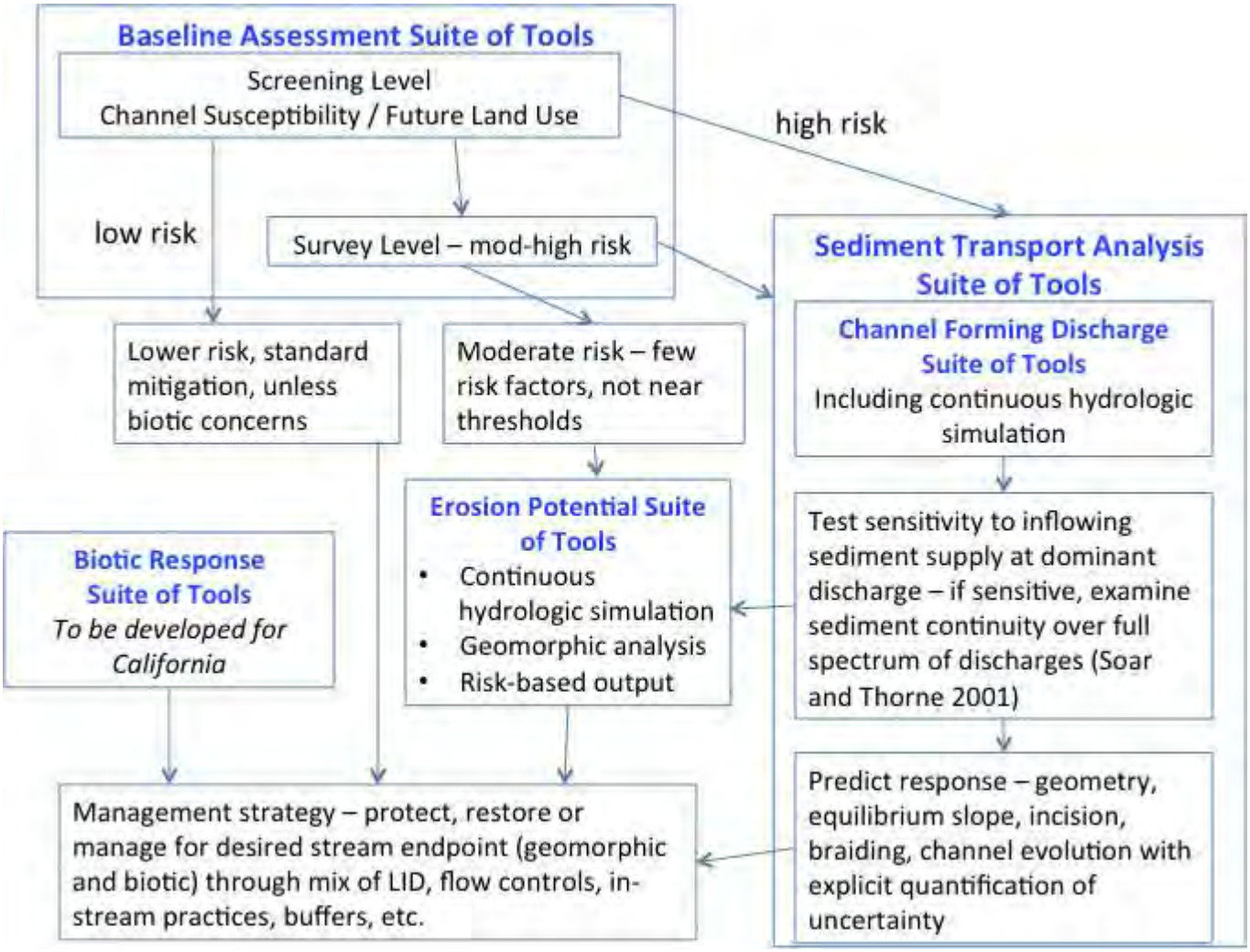

Figure B-10. Conceptual diagram showing relationships among the four suites of existing tools and biotic response tools to be developed in the future. Additional analyses will be required for engineering design.

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APPENDIX C: ADAPTIVE MANAGEMENT

WHAT IS ADAPTIVE MANAGEMENT

Adaptive management is a formalized approach for overcoming the inescapable difficulty in predicting ecological outcomes resulting from natural-resource management actions. It accomplishes this by treating all "management actions" (whether intentional or not) as experimental components within the larger structure of a monitoring program (Holling 1978, Walters 1986, Lee 1999, Ralph and Poole 2003). In other words, specific management actions that may affect ecological processes and functions are systematically evaluated, via "monitoring," to provide the data to affirm or refute the expected outcomes. To the extent that the monitoring results indicate a need to revise the scientific understanding or the management actions built on that understanding, establishing the mechanism to change management actions is a precursor, not an afterthought, of the monitoring program.

Adaptive Management was first articulated over 30 years ago (Holling, 1978) and more recently embraced through various conservation efforts worldwide. Fundamental to this approach is the integration of management and monitoring, recognizing that any management action in the context of a complex ecological system is ultimately experimental, requiring feedback to make progress.

The process of adaptive implementation is iterative and continuous; new knowledge is actively incorporated into revised experiments, a practice best described as "learning while doing" (Lee 1999). The key difference between this approach and other commonly implemented environmental management strategies is the application of scientific principles, such as hypotheses-testing,[is used] to explicitly define the relationships between policy decisions, management actions, and their measured ecological outcomes. Furthermore, this approach provides a means to understand and document these cause-and-effect relationships; it can also point to alternative actions that may produce more desirable outcomes. Uncertainty is embraced and serves as a focal point for defining ever-more specific evaluations.

Scientifically credible and relevant information can only be generated when the management "experiments" are designed with clear hypotheses about the effects of proposed actions or prescriptions. These hypotheses must be testable at multiple scales using available technology and methods (Conquest and Ralph 1998; Currens *et al*. 2000). Hypotheses that cannot be tested, are trivial (e.g., "water flows downhill"), are not credible ("water flows uphill"), or only account for site-specific conditions are not useful in considerations of the singular or cumulative effects of management actions.

In order to retain clear linkages between key questions, hypotheses, and monitoring protocols, the experimental approach must be designed before determining which goals and endpoints are appropriate (Ralph and Poole 2003) since appropriate goals should be *outcomes* of the

effort, not a precondition; and the approach must explicitly tie stated hypotheses to the key ecological questions.

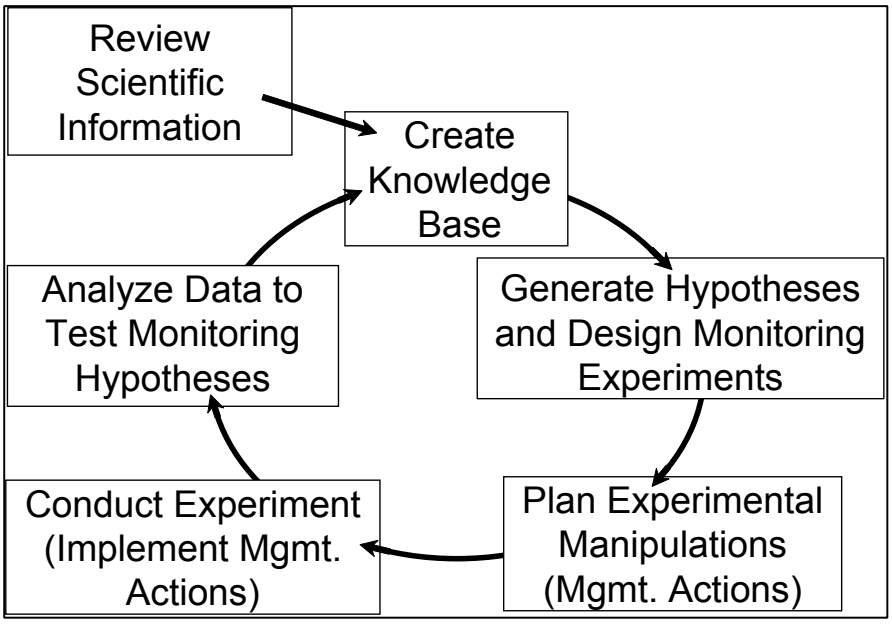

Figure A-1. Framework for an adaptive management program. The key feature of this cycle is the foundation of scientific principles and hypothesis generation; design of the management actions and the monitoring to evaluate their effects are integrated and designed to test assumptions, improve understanding, and reduce uncertainty (modified from Ralph and Poole 2003, Figure 3).

Wagner (2006) asserts that [stormwater] regulatory programs in the past often failed because they were designed in ways that ignored technological and scientific limitations. "Science-based" does not simply mean the monitoring of status and trends followed by responding to imposed benchmarks and goals, but rather that scientific principles must be the foundation of regulatory program design, and that these programs must rely on scientific methods to demonstrate results. Wagner suggests that regulations can still be designed despite incomplete or developing knowledge, but that gaps and limitations must be acknowledged and used to inform ongoing investigations. His argument clearly echoes those of scientists who insist that monitoring experiments and testable hypotheses must frame management decisions and land-use objectives.

WHAT IS *NOT* ADAPTIVE MANAGEMENT, AND WHY IS IT SO PROBLEMATIC?

Unlike the experimental approach embodied by adaptive management, an alternative process traditionally dominates in natural resource management: (1) a problem is identified, but a cause is simultaneously presumed (e.g., "increased sediment inputs into a stream are negatively impacting salmonid survival"); (2) a solution or set of solutions is proposed (e.g., timber harvest is restricted and riparian buffer width is increased), but the prescription is not translated into a testable hypothesis associated with the problem or question; and (3) if the problem is not solved within an arbitrarily reasonable period of time (e.g., a few years) then a different solution is proposed (e.g., "augmented upland and riparian restoration must be implemented"). Although simplified, this outline displays its divergence from adaptive management and from the basic principles of the scientific process—the resulting process is perpetually reactive.

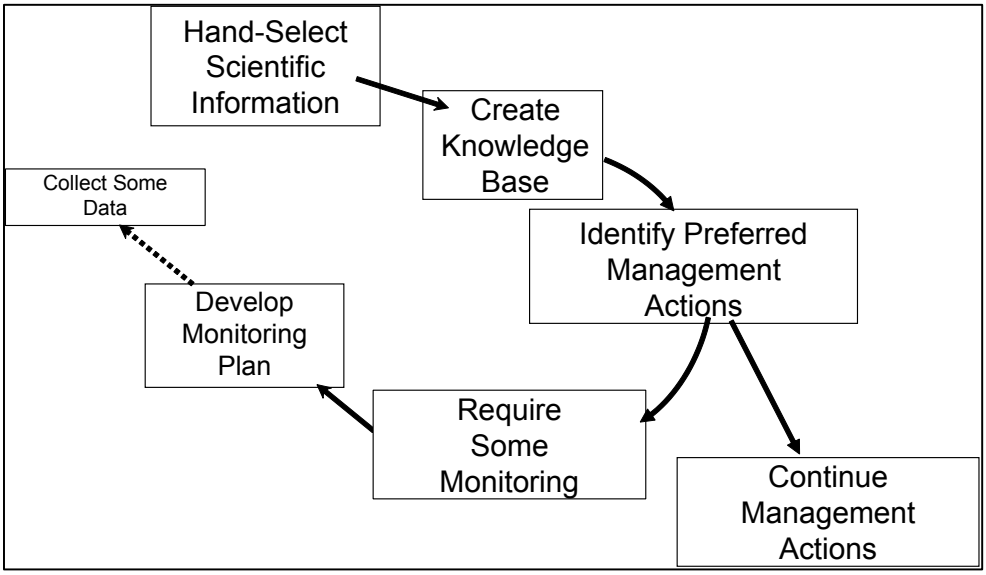

Figure A-2. Common framework for monitoring outside of an adaptive management structure. Management actions are chosen with a presumptive effect on ecological systems, and monitoring is conducted without any feedback to future actions. Even where monitoring is intended to "inform" future management actions, the absence of an explicit experimental design normally limits the utility of any monitoring data to provide meaningful insights.

In its best form, this paradigm has been termed passive adaptive management:

> Restoration planners' current management approach has been described as a "passive" adaptive management approach: science is used to

> develop best-guess predictive models, make policies according to these models, and revise them as data become available. The National Academies advise that every effort be made to take a more "active" adaptive management approach by developing alternative hypotheses for the expected consequences of a particular project and then design the project so the hypotheses can be experimentally tested" (from the summary to *Adaptive Monitoring and Assessment for the Comprehensive Everglades Restoration Plan*, 2003, National Academies Press, 122 pp.).

Ralph and Poole (2003) have aptly named this approach "socio-political adaptive management" (i.e., SPAM).

BARRIERS TO IMPLEMENTING "ACTIVE" ADAPTIVE MANAGEMENT

Although the virtues of active adaptive management are readily articulated, the framework is surprisingly rare in practice. Some of these barriers are practical or logistical, and they include such issues as:

- Longevity and long-term institutionalization of monitoring;
- Effective data management systems that allow managers to readily access data;
- Ability to differentiate effects from natural variability and events, such as flood and fire;
- Cost and technical limitations of necessary data collection.

The most severe impediments, however, are not scientific but social: "We suggest that watershed-scale adaptive management must be recognized as a radical departure from established ways of managing natural resources if it is to achieve its promise... Adaptive management encourages scrutiny of prevailing social and organizational norms and this is unlikely to occur without a change in the culture of natural resource management and research" (Allan et al. 2008).

While science can provide defensible and replicable insights regarding the ecological outcomes of management prescriptions, it cannot offer absolute certainty. Policy can be and should be informed by science but is ultimately based on a variety of considerations that are not always amenable to the spatial, temporal, and technological limitations of the scientific process (Van Cleave et al. 2004). This is an uncomfortable truth for agency managers and elected officials to acknowledge, and it commonly results in funding decisions and public pronouncements using the "language" of science but not its substance.

Although efforts to build large, collaborative programs are commonly characterized by increasing stakeholder involvement and outreach, greater participation does not necessarily

mean that true adaptive management is occurring, or that scientific principals are being applied to either the choice of management actions or their evaluation. These efforts, however, do reflect a movement to extend natural resource management decision-making processes beyond just technical experts in order to reflect evolving social values (Pahl-Wostl *et al*. 2007). If they are successful, this approach can open a path to achieving the best of both realms, namely scientific rigor with a broad base of community support.

ATTRIBUTES OF USEFUL HYPOTHESES FOR AN ADAPTIVE MANAGEMENT PROGRAM

A key element of any adaptive management approach is the set of hypotheses that guide both the management actions and their associated monitoring. Because these management actions are recognized as "experimental" (because in a complex system most outcome(s) cannot be predicted with absolute certainty), their selection must be guided by assumptions about what *might happen,* or what is *expected* to happen. This defines the first attribute of a useful hypothesis: it is **credible**, typically because it is based on prior knowledge or scientific understanding of the system. Indeed, some hypotheses may already be so well evaluated and understood (e.g., "Stormwater runoff from freeways carries measurably elevated concentrations of toxic pollutants") that there is little point in framing them in this structure at all—as new monitoring programs to address such hypotheses are highly unlikely to result in new information or knowledge and might be perceived as an unwise expenditure of scarce monitoring resources.

The second attribute of a useful hypothesis stems from the scientific reality that any experiment, whether conducted in the laboratory or across the landscape, provides value only insofar as its outcomes are measured and the effects are distinguishable from the influence of other, unrelated factors. Thus, the hypothesis that guides the experiment should not only be credible but also **testable**. Otherwise, why bother making measurements at all?

Lastly, these actions and measurements and analyses do not occur in a vacuum. Thus, the final guiding principle for any hypothesis in an adaptive management approach is that it be **actionable**, or that different outcomes, as revealed by monitoring, can (and will) result in different management responses. If no difference occurs, then clearly there is no reason to have made the effort in the first place.

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ATTACHMENT A

**ORANGE COUNTY LEGAL &TECHNICAL COMMENTS ON
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
TENTATIVE ORDER No. R9-2013-0001
NPDES NO. CAS0109266**

Appendix A-3

2009 Presentation to Santa Ana Regional Board

Storage and Reuse Systems for Stormwater Mangement

Preliminary Cost and Performance Estimates for Residential Land Use in Irvine, CA

Eric Strecker, P.E.
Geosyntec consultants

Summary of Study

- Compared hypothetical scenarios for rainwater harvesting and reuse systems (cisterns)
  - single lot scenario
  - 100 ac neighborhood scenario
- Compared resulting costs and for both scenarios
- Performed modeling (long term simulation) analysis for neighborhood scenario
- Evaluated water quality loading differences between rainwater harvesting and reuse systems and typical bioretention installation for single family residential
- Performed preliminary review of applicable codes

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Rainwater harvesting and Reuse Systems

Impervious Area

- Roof tops
- Driveways
- Streets

Stormwater Conveyance and Pretreatment

- Pipes
- Filters

Storage

- Cistern
- Storage Basin
- Underground Vault

Treatment

- UV treatment
- Filtration

Pumping and Piping

- Pipes back to house (purple)

Indoor Use and Irrigation

- Toilet flushing
- Yard and Garden irrigation

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Single Lot Scenario

- Two reuse demands were examined: 1) indoor use only (toilet flushing), and 2) indoor and outdoor use (toilets and irrigation)

- Lot Characteristics:
  - 0.1 acres
  - 69% impervious area
    - Roof area - 2400 ft^2
    - Other (patio) - 600 ft^2
  - 3.5 people/house
  - Toilet use/capita = 18.5

- Method assumptions:
  - Rational Method
    - Impervious Runoff Coeff. (0.9)
    - Precipitation Depth – 0.8 in (85th percentile for large parts of Orange County)
    - Toilet use / house = 65 gal/day
    - Irrigation /house = 77 gal/day (Avg. from Irvine Water District data)

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Single Lot Scenario Results

Water Collected From:	Roof	Roof + Other Impervious area
Demand Scenario	**Average Drawdown Time (days)**	
Toilets only	17	21
Both Toilets & Outdoor uses	7.6	9.5

Note: Outdoor demand assumes that irrigation demand is immediate; more sophisticated modeling would allow more accurate characterize of irrigation demand, but for purposes of this analyses, it was assumed to be immediate. This likely significantly overstates the demand for irrigation.

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Neighborhood Scenario

- Two reuse demands were examined: 1) indoor use only (toilet flushing), and 2) indoor and outdoor use (toilets and irrigation)
- Neighborhood Properties:
  - 100 acres – 60 % impervious
  - 0.1 acre lots at 4.5 du/ac = 450 houses
  - 3.5 people/house
  - Toilet use/capita = 18.5
  - Basin used to store runoff
- Method assumptions:
  - Rational Method
    - Impervious Runoff Coeff. (0.9)
    - Precipitation Depth – 0.8 in (85th percentile for large parts of Orange County)
    - Toilet use / house = 65 gal/day
    - Irrigation /house = 77 gal/day (Avg. from Irvine Water District data)

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Neighborhood Scenario Results

Demand Scenario	Average Drawdown Time (days)
Toilets only	45
Both Toilets & Outdoor uses	10

Note: Outdoor demand assumes that irrigation demand is immediate; more sophisticated modeling would allow more accurate characterize of irrigation demand, but for purposes of this analyses, it was assumed to be immediate. This likely significantly overstates the demand for irrigation.

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General Cost List

Item	Description	Cost	Reference/Source
TANKS			
Galvanized steel	200 gal	$225	Fairfax County, 2005
Polyethylene	165 gal	$160	Fairfax County, 2005
Fiberglass	350 gal	$660	Fairfax County, 2005
Plastic	800 gal	$400	Plastic-mart.com
Plastic	1100 gal	$550	Plastic-mart.com
Plastic	1350	$600	Plastic-mart.com
Plastic cone	1500 gal w/metal stand	$1500	Plastic-mart.com
Plastic	2500 gal	$900	Plastic-mart.com
Plastic	5000 gal	$3000	Plastic-mart.com
Plastic	10000 gal	$6000	Plastic-mart.com
[1] Dry Det. Basin(1997)	$C = 12.4V^{0.760}$: for 1 ac-ft	$41,600	stormwatercenter.net
[2] Below Ground Vault	$C = 38.1 (V / 0.02832)^{0.6816}$	$55,300	fhwa.dot.gov
Concrete	1,000,000 gal above g. (O&P)	$548,000	RSMeans
Steel	1,000,000 gal above g. (O&P)	$467,000	RSMeans
TREATMENT			
UV (house-scale)	Whole system - 12 gpm	$700-$900	rainwatercollection.com
UV bulb	Life: 10,000 hrs or 14 months	$80-$110	rainwatercollection.com
UV (neighborhood-scale)	Whole system - 200 gpm	$10,000	Bigbrandwater.com
Downspout filter	Placed in Gutter	$20 - $500	many online
1st Flush Diverter	Vertical pipe w/ ball float	$50-$100	raintankdepot.com
PUMP	1 hp (all in one package)	$575 - varies	rainwatercollection.com
PIPING (Purple)			
to Tank (lot)	PVC: 2”-6” (O&P)	$2-$12 / LF	RSMeans
to House (lot)	PVC: 2”-6” (O&P)	$2-$12 / LF	RSMeans
to Tank (neighbor.)	Concrete: 6” – 18” (O&P)	$15-$30 /LF	RSMeans
to House (neighbor.)	HDPE- 4” – 10” (O&P)	$11-$27 / LF	RSMeans
to Irrigation	PVC: 2”-6” (O&P)	$2-$12 / LF	RSMeans
Backflow prev. valve	Each	$100-$200	web
STENCILS	Non-potable water	----	
INSTALLATION	Percentage of material cost	40 % – 50%	

[1] This dry detention cost equation - Brown and Schueler, 1997: C is the construction, design and permitting cost and V is the volume (cu-ft) need to control the 10-year design storm. In this case, the 0.8” storm runoff volume was used in place of the 10-yr design storm volume.
[2] This below ground storage vault equation - Weigand et al., 1986:C is the construction cost estimate (1995 dollars), and V is the runoff volume (cubic meters)

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Single Lot Costs

Item	Description	Cost
TANKS		
Plastic	1100 gal and 1350 gal	$550
TREATMENT		
UV	Whole system - 12 gpm	$800
UV bulb	Life: 10,000 hrs or 14 months	$80-$110
Downspout filter	Placed in Gutter	$250
1st FLUSH DIVERTER	Vertical pipe w/ ball float	$100
PUMP	1 hp (all in one package)	$575
PIPING (Purple)		
to Tank (lot)	PVC: 2”-6” (O&P) 20ft	$8 / LF
to House (lot)	PVC: 2”-6” (O&P) 50ft	$8/ LF
to Irrigation	PVC: 2”-6” (O&P) 50ft	$8 / LF
Backflow prev. valve	each	$200
STENCILS	Non-potable water	----
INSTALLATION	40% of material cost	$1400
TOTAL		**$4,900**

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Neighborhood Costs

Item	Description	Cost	Units Assumed
TANKS			
Dry Det. Basin(1997)	$C = 12.4V^{0.760}$	$119,000	174,000ft^3
Below Ground Vault	$C = 38.1 (V / 0.02832)^{0.6816}$	$142,000	174,000ft^3
TREATMENT			
UV - neighborhood	Whole system - 200 gpm	$10000	
Catch basin filters	1 every 2 acres	$2000	50 catch basins
PUMP		$50,000	
PIPING (Purple)			
to Tank (neighbor.)	Concrete: 6" – 18" (O&P)	$15-$30 /LF	$23 - 14000 ft
to House (neighbor.)	HDPE- 4" – 10" (O&P)	$11-$27 / LF	$19 - 14000 ft
to Irrigation	PVC: 2"-6" (O&P)	$2-$12 / LF	$8 - 60 ft /house
Backflow prev. valve	each	$100-$200	$200 per house
STENCILS	Non-potable water	----	
INSTALLATION	40% of material cost	$470,000	
TOTAL		**$1,650,000**	

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SWMM Modeling Analysis

- Long term (40 yr) analysis of the neighborhood scenario was performed using SWMM. Two scenarios analyzed:
  - 0.8 inch design storm
  - 1.6 inch design storm
- Modeling assumptions:
  1. Toilet flushing – same as scenarios and applied as constant rate
  2. Irrigation – monthly values (from the IRWD) applied as constant rates by month (i.e. demand occurs continuously during and after storm event)
  3. Overflow from tanks considered to be untreated bypass
  4. Same total area and impervious areas in both studies

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SWMM Modeling Results

	Units	Scenario			
		A	**B**	**C**	**D**
		Toilet Flushing Only, 0.8" design storm	Toilet Flushing + Irrigation, 0.8" design storm	Toilet Flushing Only, 1.6" design storm	Toilet Flushing + Irrigation, 1.6" design storm
Average Annual Drawdown Time	**days**	**47**	**8.5**	**94**	**17**
Average Stormwater % Capture and Reuse	**%**	**32%**	**55%**	**41%**	**68%**
Avg Annual Volume of Stormwater Reused	MG | CCF	5.2 | 6,950	8.8 | 11,800	6.5 | 8,700	10.9 | 14,620
Avg % of Total Residential Demand Satisfied	**%**	**6.2%**	**11%**	**7.8%**	**13%**

Note: Outdoor demand assumes that irrigation demand is immediate; more sophisticated modeling would allow more accurate characterize of irrigation demand, but for purposes of this analyses, it was assumed to be immediate. This likely significantly overstates the demand for irrigation.

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Pollutant Loading Example

Assumptions

- Median Runoff EMC for TSS for HSFD: **70 mg/L**
- Median Effluent Concentration for TSS for Media Filters from International BMP Database: **15 mg/L**
- % Captured by cistern per SWMM (Scenario B – 0.8" design storm with toilet and irrigation re-use): **55%**
- % Captured by Bioretention with Underdrains per DAMP requirement: **80%** (requires approx 0.4" design storm)
- Bypass from both BMPs assumed to be untreated

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Pollutant Loading Example

Results – Average Annual TSS Load Removed

Cisterns and Re-Use: **55%**

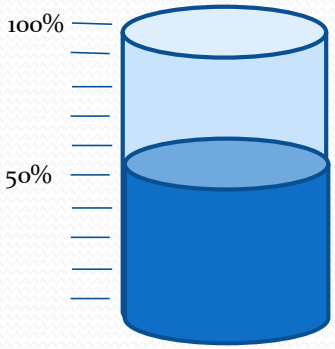

Bioretention with Underdrains: **63%**

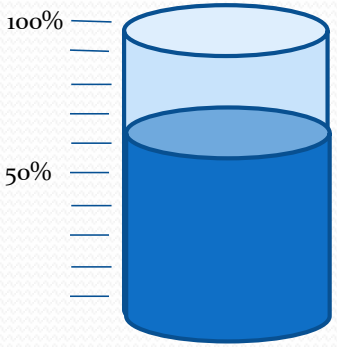

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Pollutant Loading Example

Results – Average Annual TSS Concentration with BMPs

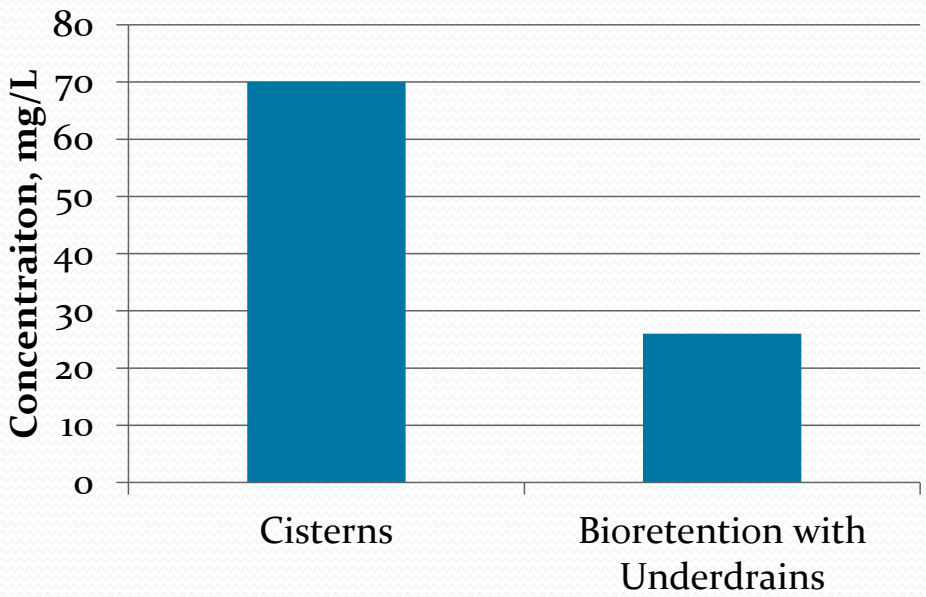

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Rainwater Harvesting - Code and Regulations

Applicable Codes

- Title 24—Building Standards Code (plumbing code)
  - Mechanical design and installation procedures
- Title 22—Social Security (recycled water quality standards)
  - Current technologies can meet this requirement (filtration, UV, and others)
- Title 17—Public Health (public water system cross-connection and backflow prevention)

Preliminary Conclusions

Since state codes do not currently recognize rainwater harvesting and reuse, discretion in approval will likely reside at the county and/or City levels through local codes and ordinances.

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ATTACHMENT A

**ORANGE COUNTY LEGAL &TECHNICAL COMMENTS ON
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SAN DIEGO REGION
TENTATIVE ORDER No. R9-2013-0001
NPDES NO. CAS0109266**

Appendix A-4

The Water Report Issue #65:
Stormwater Retention on Site, An Analysis Of Feasibility and Desirability, Strecker and Poresky (2009)

The Water Report™
Water Rights, Water Quality & Water Solutions in the West

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Groundwater Decline

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STORMWATER RETENTION ON SITE

AN ANALYSIS OF FEASIBILITY AND DESIRABILITY

by Eric W. Strecker, PE, and Aaron Poresky, EIT, Geosyntec Consultants (Portland, OR)

INTRODUCTION

Both nationally and in various localities, there is increasing regulatory pressure to maximize or require the retention of stormwater on site with compliance often linked to matching post-development runoff with predevelopment hydrology.

For example, in California the recently adopted Ventura Municipal Separate Storm Sewer System (MS4) NPDES permit requires retention on site — via infiltration, evapotranspiration and/or harvest and "re-use" — of precipitation from storms ranging up in size to the permit-defined "design storm" (Standard Urban Stormwater Mitigation Plan (SUSMP) depth of 3/4 of a inch — "design storms" are events defined in regulation and reflected in stormwater system design). There is an exception allowed where it is not feasible to retain the entire volume: the project may then retain "only" 70 percent of the SUSMP storm on site and mitigate the remaining volume off site. Another example is the North Orange County permit, which requires that infiltration, evapotranspiration, and/or harvest and re-use be employed to manage the water quality design storm, unless infeasible.

Nationally, the recent Energy Independence and Security Act (EISA) Section 438 requires that any Federal project with over 5,000 square feet of impervious area "maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow." Guidance for compliance with this provision allows either retention of the 90th percentile, 24-hour storm event or a model-based evaluation of discharge rates and volumes, matching predevelopment with post-development runoff hydrology. In effect , both of these conditions mandate substantial on site retention.

These permits/regulations have "narrowed" the traditional definition of Low Impact Development (LID) down to only a few elements — i.e., infiltration, evapotranspiration and/or harvest and use. This narrowing precludes management options present in the broader LID definition, such as detention and bio-filtration in vegetation-based facilities that provide incidental infiltration and evapotranspiration, but have a surface discharge point (e.g. bioretention with underdrains).

Nationally, the US Environmental Protection Agency (EPA) has also limited the definition of LID in some of their various guidance documents. For example, *Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices*, December 2007 (EPA 841-F-07-006) includes the definition: "LID comprises a set of approaches and practices that are designed to reduce runoff of water and pollutants from the site at which they are generated. By means of **infiltration, evapotranspiration, and reuse of rainwater**, LID techniques manage water and water pollutants at the source and thereby prevent or reduce the impact of development on rivers, streams, lakes, coastal waters, and ground water." (Emphasis added) It should be noted that other EPA documents include

Stormwater On Site

LID Definitions

Harvested Water

Natural Balance

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definitions with the broader definition of filtration and surface release (see **Table 1**). It also should be noted that even in the guidance that includes the narrowed definition, in most cases the examples and guidance details include filtration and surface release of runoff.

Table 1. Summary of Filtration and Surface Release Inclusion in LID Definitions and associated guidance

Document/Reference	Filtration and Surface Release	
	In Definition	In Guidance/Examples
Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices, December 2007 (EPA 841-F-07-006)	No	Yes
Low Impact Development (LID) Literature Review, October 2000 (EPA-841-B-00-005	Yes	Yes
Low-Impact Development: An Integrated Environmental Design Approach (Prepared by the Prince George's County Maryland Department of Environmental Resources Programs and Planning Division, with assistance from EPA), June 1999	Yes	Yes
Polluted Runoff (Nonpoint Source Pollution) Low Impact Development (LID), Last updated on Thursday, January 15th, 2009 Additional information from linked factsheet: *Design Principles for Stormwater Management on Compacted, Contaminated Soils in Dense Urban Areas*, April 2008 (EPA-560-F-07-231)	Not Clear	Yes
Low Impact Development (LID) and Other Green Design Strategies, Last updated on October 09, 2008	No	Not Clear

To date, the retention of stormwater on site has been primarily been accomplished via infiltration and, to a much more limited extent, evapotranspiration. Only in a few cases has harvest and use (the authors believe that stormwater that is captured and used is not "re-used") been employed on a site scale (typically as a part of a Leadership in Energy and Environmental Design (LEED) rating process). Uses for harvested water typically include non-potable uses such as irrigation and toilet flushing and in some cases process water for industrial uses.

The feasibility and desirability of retaining stormwater on site up to some design storm level has not been vetted technically on a national or regional scale. For example, in the EPA *Reducing Stormwater Costs* Guidance referenced above there is virtually no assessment via monitoring or modeling information of the potential results of the case studies presented. It is primarily a compendium of antidotal information. There has been almost no consideration of the natural water balance (i.e., predevelopment conditions) in technical guidance or whether infiltrating more volume than occurs under natural conditions (as would tend to result from matching runoff hydrology without matching evapotranspiration) could, in many cases, cause problems. This paper attempts to present some of the considerations for retaining on site to determine whether it is feasible and/or desirable. It focuses on Southern California examples, but the factors discussed are applicable to much of the West and beyond.

It should be noted that "retaining stormwater on site" in its contemporary usage typically only refers to not having surface discharges result from specific "design storm" events. This usage ignores the fact that infiltrated or evapotranspirated stormwater is not actually "retained" on site — it either enters a deeper aquifer, flows as shallow interflow which may emerge elsewhere or, in the case of evapotranspiration, escapes to rain another day.

The authors believe that, while one should try to maximize the retention of stormwater on site, such retention should not be mandated, as site specific circumstances often indictate wiser alternatives.

PERFORMANCE OF STORMWATER BEST MANAGEMENT PRACTICES (BMPs)

General Considerations

In order to assess the performance of stormwater treatment Best Management Practices (BMPs), it is important to understand the range of factors which may impact BMP performance. BMP performance is effected by: runoff patterns; pollutant types and forms; the storage volume and/or treatment rate; the ability to recover storage capacity (for BMPs that rely on storage); the treatment processes for released flows (to surface waters or groundwaters); and operations and maintenance issues that affect the ability of the BMP to continue operations (Strecker, et. al., 2006). For storage-based BMPs, methods for recovering storage capacity include: surface discharge; evapotranspiration; deeper infiltration; and putting the stored water to use. For systems which include cisterns (harvest and use), one of the most critical factors is the ability to quickly recover storage capacity before the next storm event arrives. Typically, if storage capacity cannot be recovered within two-to-four days, then the amount of runoff bypassing storage becomes significant due to the cistern being partially to nearly full.

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Stormwater On Site

Storage Capacity Recovery

Weather and Resulting Runoff Patterns

In Southern California and the West Coast in general, precipitation patterns in most urban areas are affected by the presence or absence of a high pressure ridge that in essence blocks-out low pressure storm systems. Typically, once the high pressure ridge is absent a series of storms arrives, delivering "back-to-back" storms until a high pressure ridge re-establishes. Storms arrive about every two to three days during this period. If the storage capacity is not quickly recovered, these back-to-back storms can result in storage-based BMPs that are full or partially full when the next storm arrives, which then causes significant bypass or overflow to occur. In Southern California, most precipitation arrives from December to March. **Figure 1** shows the monthly normal rainfall in Irvine California (and monthly **e**vapo**t**ranspiration (ET)). Monthly normals tend to mask the patterns that occur within specific months in the period of record. **Figure 2** shows a typical precipitation pattern for the same gage, which includes the effect of 'back-to-back" storm events on a weekly timescale in an actual year. These weather patterns indicate that the recovery of storage on a sub-weekly time scale is critical to ensure that sequential storms do not result in excessive bypass or overflow of BMPs. Study of typical storm patterns indicates that storage capacity should be regenerated within two-to-three days to maximize the stormwater management performance when harvesting stormwater.

Precipitation v. "ET"

Figure 1. Monthly Precipitation vs. Monthly Evapotranspiration for Irvine, California.

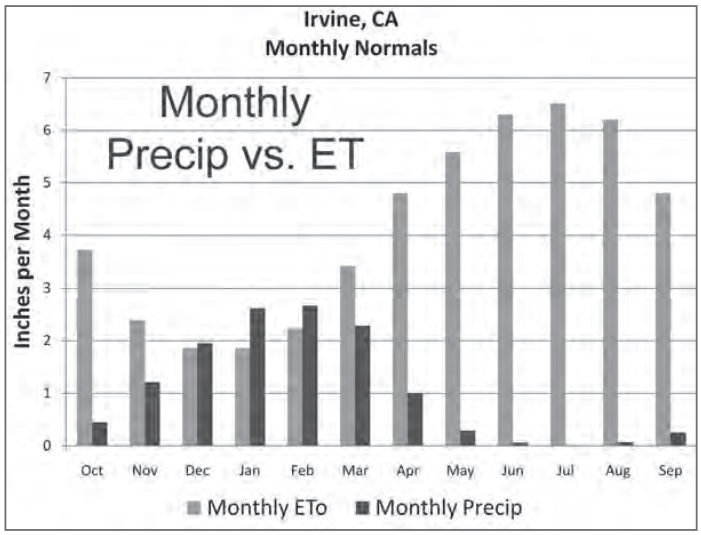

Precipitation Pattern

Figure 2. Typical Precipitation Pattern Showing Back-to-Back Storms at Irvine California for a Near Average Water Year.

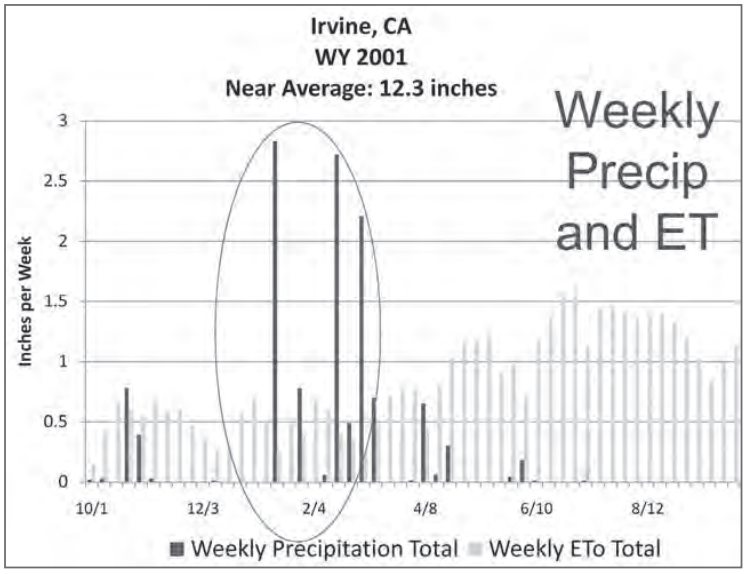

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Stormwater On Site

Infiltration Issues

Infiltration is the primary method that is employed to retain stormwater on site. This is because, when it can be accomplished, infiltration is the method most likely to be successful. However, the authors believe that three key questions/issues need to be addressed when considering infiltration strategies if unintended, problematic consequences are to be avoided.

Key infiltration considerations include:

- Can you do it?
- Should you do it and, if so, to what extent?
- If you do employ infiltration, what factors need to be addressed to insure a desirable outcome?

Infiltration: Can You Do It?

Soil Factors

Underlying soils greatly affect the ability to infiltrate. In much of Southern California (and the West) urban areas are situated atop soils that are difficult for infiltration. Some practitioners have suggested soil amendments as a strategy for increasing infiltration. However, amending soils typically only addresses surface soils, so if underlying soils are still difficult for infiltration, soil amendments may only be increasing the storage available (vs. significantly increasing underlying infiltration rates). **Figure 3** presents a map that shows underling soils for the North Orange County, California permit area. It is expected that, in general, infiltration will only be successful in areas with A and B soil types. Of course, in mapping broader soils groups, there may be pockets where infiltration is more feasible. However, the converse is also true. In this Orange County example, a little over 58% of the permit area has C and D soil types that would be unlikely to promote infiltration at an acceptable rate. Infiltration facilities that ignore low underlying infiltration rates in their design would tend to be full for much of the wet season, resulting in substantial bypass/overflow, thereby greatly reducing retention on site. Infiltration facilities designed with lower infiltration rates in mind would have shallower allowable ponding depths and thus require a greater amount of site area, possibly promoting sprawl. To ascertain feasibility, maps like this should be developed prior to requiring infiltration or on site stormwater retention.

Infiltration Rates & Design

Infiltration: Should You Do It?

The next question is "should you (or how much should you) infiltrate?" In many areas there are unnatural (e.g., solvent) or natural (e.g., selenium) plumes or soil contamination that infiltration could negatively impact by either moving or spreading the contaminants. Infiltration in industrial areas is often not desirable due to general concerns about groundwater contamination resulting from potentially elevated

Figure 3. Soil types for North Orange County MS4 NPDES Permit Area

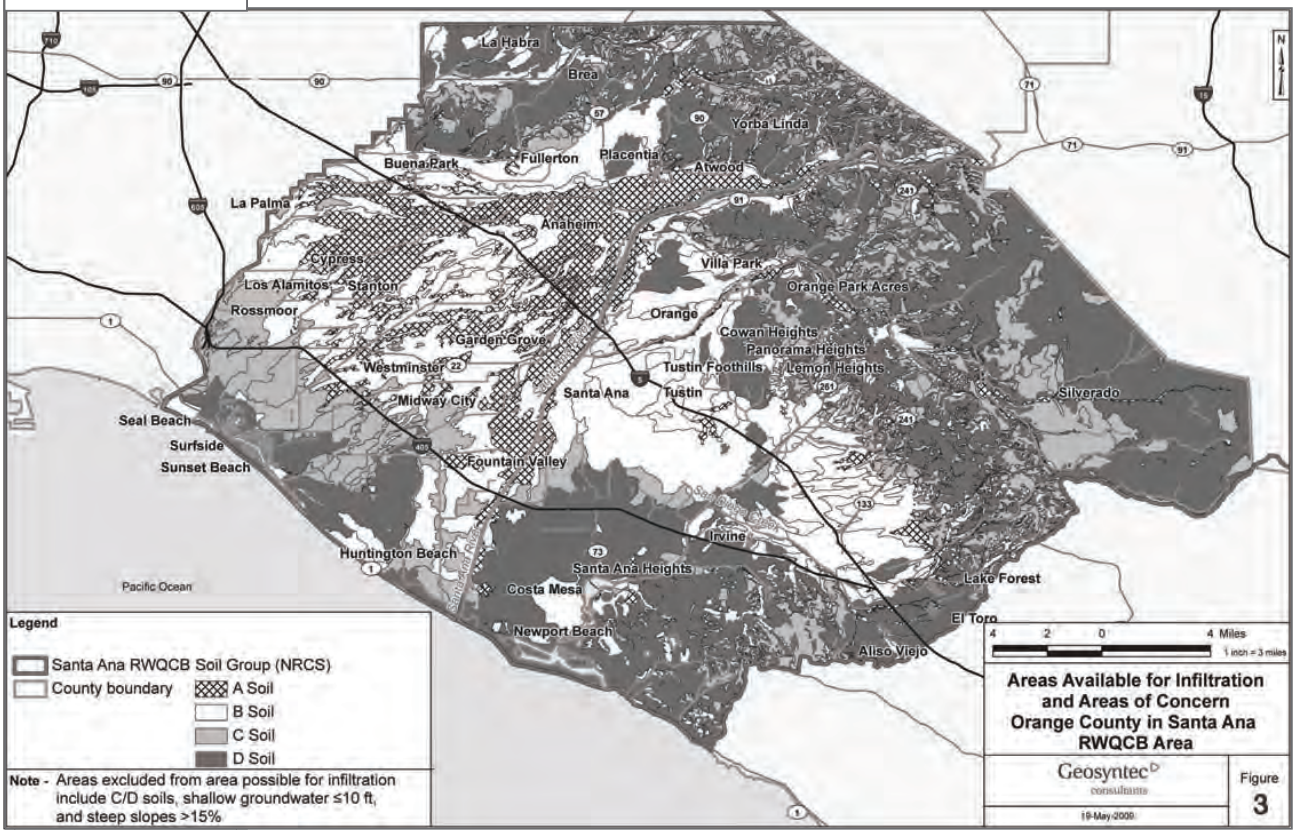

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Stormwater On Site

Water Balance Consequences

pollutant concentrations in industrial stormwater runoff. Geotechnical issues associated with steep slopes or expansive soils may also be an issue for infiltration. Depth to groundwater typically limits infiltration to areas with 10 or more feet of separation from the bottom of infiltration facilities to groundwater. Finally, in some locations upgradient of an ephemeral stream, increased infiltration may cause undesirable habitat type changes downstream of the site due to increased periods of base flows that result in vegetation changes (e.g. conversion of dry wash to a thickly vegetated system). There has been a lack of consideration of the overall water balance consequences that a "retention on site" requirement may have in terms of habitat.

As an example, **Figure 4** presents a map of the North Orange County permit area that shows the areas remaining with good potential for infiltration after consideration of some of the issues covered above. The area remaining within the permit area for consideration of infiltration is less than 23 percent of the permit area, even without considering habitat issues or regulated facilities (small contamination areas shown as dots). There are large urbanized areas where infiltration would not be either feasible or desirable.

Groundwater Quality

Infiltration: Do It Carefully

Finally, infiltration should be done carefully to ensure that groundwater quality is protected and widespread stormwater management facility failure does not occur. Proper treatment of infiltrating water should occur before this water reaches groundwater either via treatment with BMPs or ensuring that soils are adequate to provide treatment while passing infiltrating water. Infiltration facilities have often failed due to poor maintenance and operation of the facilities. One needs to think through how to design infiltration facilities to minimize maintenance issues, including whether widely-distributed infiltration facilities can be maintained as adequately as one centralized facility. Water districts that utilize groundwater should obviously be involved in decisions about where and how to infiltrate stormwater so that groundwater supplies are protected.

Maintenance Issues

Infiltration: Summary

Infiltration must be done carefully to ensure that it can be successful on a long-term basis as well as be protective of water supplies. The best opportunities for successful infiltration are in areas where groundwater is actively managed for water supply. Such areas are unlikely to face as many water balance hindrances or other issues. For example, areas along the Santa Ana River are actively managed for recharge and withdrawals by the Orange County Water District. These localities provide the best opportunity for successful infiltration.

Figure 4. Areas available for infiltration for the North Orange County Permit Area

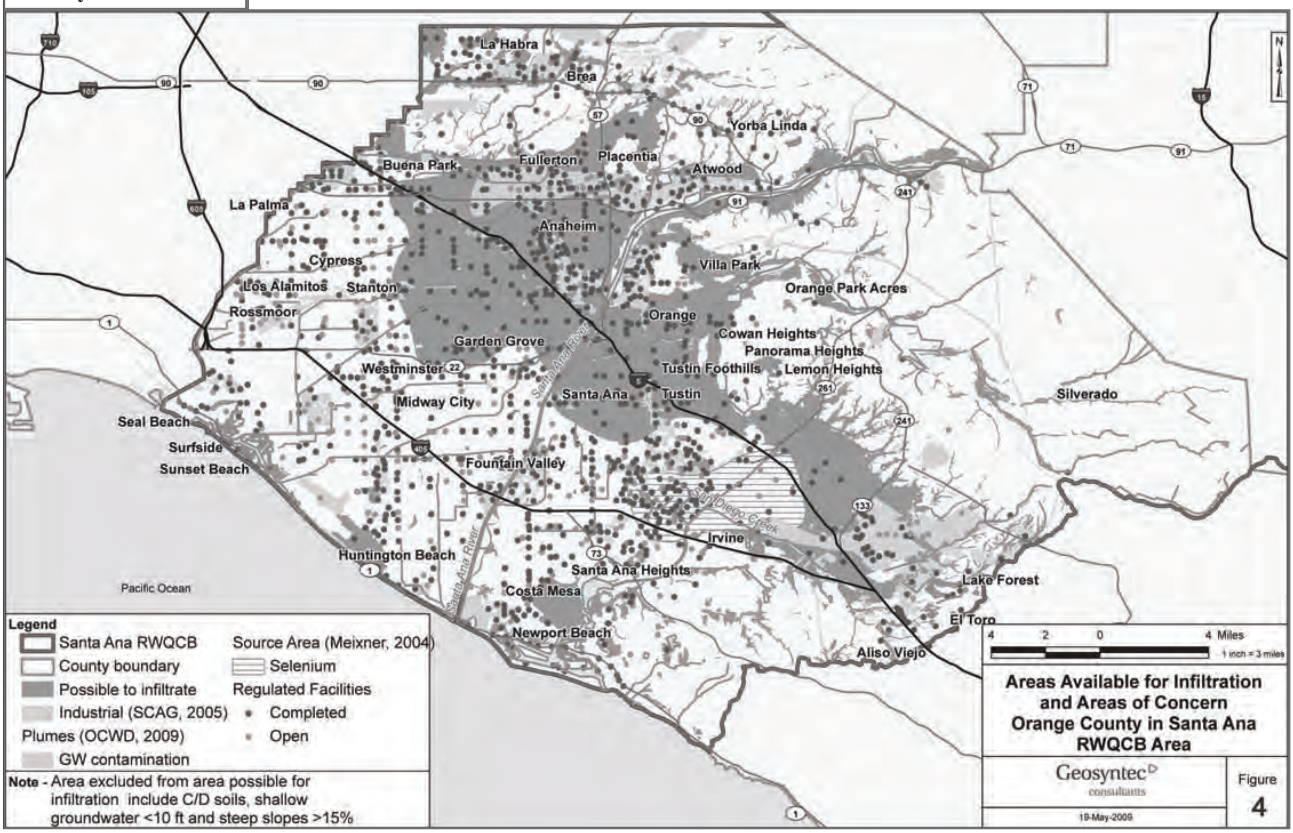

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Stormwater On Site

Development Factors

Precipitation v. ET

In Soil Storage Recovery

Water Balance

EVAPOTRANSPIRATION (ET)

After an area undergoes development there will be less available area for **e**vapo**t**ranspiration (ET)to occur. This holds true even when vegetated roofs, pervious pavements, and other "green" development practices are employed and is especially true for high density projects. Some analysts have compared monthly or seasonal ET to precipitation levels to assess the potential for ET losses as a significant retain-runoff on site measure. This is particularly inappropriate on the West Coast in light of the region's tendency for back-to-back storm events.

Refer again to **Figures 1 and 2** appearing above. **Figure 1** shows monthly normal comparisons of precipitation versus ET, while **Figure 2** shows precipitation and ET as weekly totals for an example year. While the former suggests that ET matches or exceeds precipitation on a monthly normal bases, it does not account for back-to-back storms or the fact that months with higher than normal rainfall would be the same months that correspond to lower than normal ET. **Figure 2** clearly demonstrates that ET cannot keep up with precipitation on a weekly basis in critical periods of the typical back-to-back storms of an average year. During these critical periods, the storage provided in soils would not have recovered in time for subsequent rainfall. While ET of stormwater should be maximized, it almost certainly will not be able to match pre-development levels and is likely a minor component of retaining stormwater on site (without storage and use for irrigation).

ET is a very important consideration when assessing the ability to mimic predevelopment runoff volume. **Figure 5** presents typical arid southwest water balances for: undisturbed areas; areas developed with infiltration facilities (Example Developed with LID – no underdrains); and for areas developed using LID with underdrains. Predevelopment ET can range upwards of 80 to 97 percent of the precipitation on an average annual basis. It is very unlikely that predevelopment ET will be matched by post-development ET due to reduction in vegetated open soils areas. So, the choice for development, particularly high density development, is to either have more runoff than predevelopment or more infiltration, or a combination of the two. This fact and its ramifications have not been considered during the development of on site retention requirements that are focused on surface hydrology versus overall hydrology (including sub-surface).

Figure 5. Typical Water Balance from Precipitation in Arid Southwest Climate

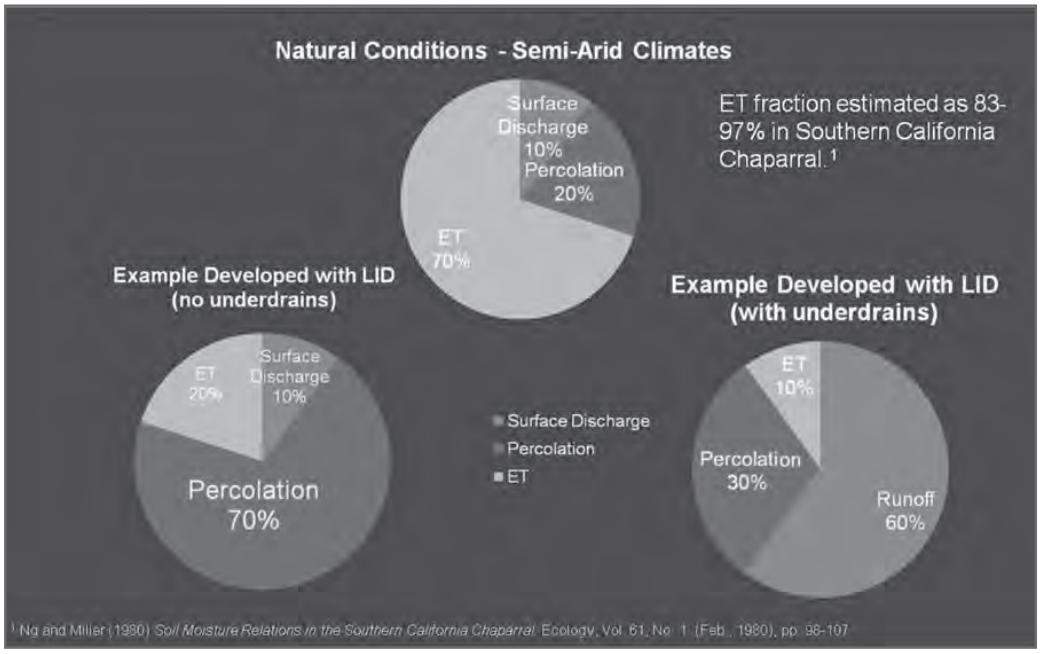

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Stormwater On Site

Harvest Demand

CAPTURE & USE ("RE-USE")

In most all cases where infiltration is not feasible or possible, the only option remaining to meet the retain on site requirements is to capture (harvest) and use the stormwater. In North Orange County, for example, this would be the option in about 77 percent of the permit area or more.

The key factor for success of capture and use of stormwater as a means to retaining water on site is the rate at which storage can be made available for subsequent events. This means having a demand for the captured water that is high enough, especially during the rainy season. The two most obvious uses for captured stormwater are for irrigation and toilet flushing. There are significant code issues with capture and use for internal non-potable demand in many jurisdictions. In addition, there are water rights issues associated with capture of stormwater in some areas (e.g., Colorado and Utah). These limitations are not the focus of this article. Other potential uses include process water for commercial or industrial purposes. A scenario for a residential development was conducted to illustrate the potential for capture and use of stormwater. This scenario is discussed next.

Capture and Use: Residential Scenario

Model Assumptions

Your authors modeled and evaluated a100-acre residential catchment with 60 percent overall impervious area using a continuous simulation model (SWMM) as an example of a capture-and-use scenario. It was assumed that infiltration losses would be minimal (due to shallow groundwater depth, poor soils for infiltration and/or other issues). A tank (above ground storage) of 1.3 million gallons (equivalent to the runoff from the catchment resulting from a 0.8 inch storm event — the water quality design storm) was evaluated with toilet flushing and irrigation uses combined. Toilet flushing assumed 65 gallons per day per dwelling unit at 4.5 units per acre. For simplicity, irrigation demands were assumed to equal the monthly average ET levels for the 30 acres of landscaped areas. It was also assumed that irrigation was always on, even during rainfall (note that irrigation demands during and after rainfall are significantly over-estimated in this analysis). A 21-year hourly long-term simulation model was run to ascertain the potential effectiveness of such a system for retaining runoff on-site. We also evaluated potential pollutant removal results as compared to biofiltration with an underdrain (surface water release).

Capture & Use Levels

Overall the system resulted in an estimated capture and use of stormwater of about 48% of the total runoff volume (52% bypassing with no treatment — though one could treat the bypass as well). The capture and use levels varied annually from less than 30 percent to 100 percent for the 21 water years evaluated (**Figure 6**).

Figure 6. Predicted Annual Runoff and Overflow for Example Cistern System

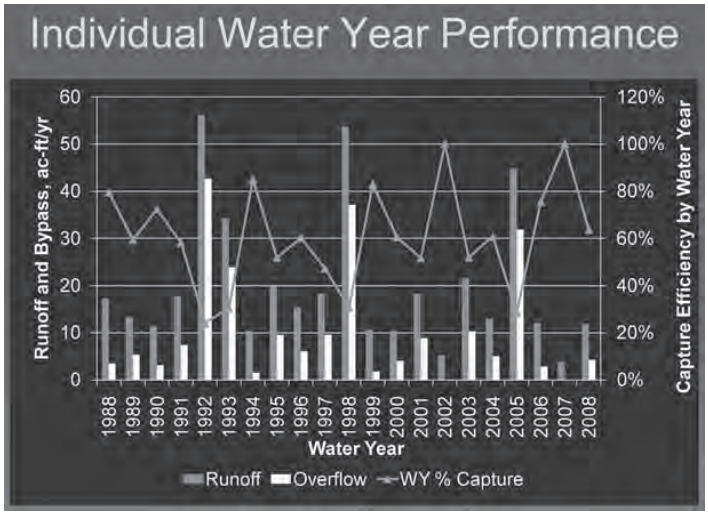

Biofiltration Comparison

Using data from International BMP Database (see: www.bmpdatabase.org), a comparison of total loadings performance to a biofiltration system with underdrains was made. This comparison showed that the biofiltration system reduced **t**otal **s**uspended **s**olids (TSS) loads by about 63% compared to 48% for the cistern scenario for the 21-year simulation. So, in this case the assumption that retain on site is the most effective at reducing pollutant loadings is not valid, unless one also required treatment of the bypassed flows (in essence an additional BMP treatment requirement). Finally, the average annual potable water saved was on the order of about 10 percent of the average annual demand.

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Stormwater On Site

Another scenario was run doubling the size of the cistern tank to 2.6 million gallons (equivalent to a 1.6 inch design storm). Under this scenario, the capture and use level went up to about 57 percent (so doubling the tank size resulted in another nine percent of the runoff being captured and used). Again, this emphasizes the point that being able to drain the cistern relatively rapidly is the key to success for capture and use.

Capture and Use: Limiting Factors

Evaluation Factors

As illustrated in these examples, one should evaluate carefully potential scenarios to help ensure that choices made regarding retention on site requirements actually result in the desired results. Evaluation should consider land use and density assumptions as well as assessment of local precipitation and runoff patterns, irrigation needs, and ability to use water for toilet flushing or other non-potable uses.

Rapid Storage Recovery

For capture and use to work, the storage must be quickly recovered. Irrigation typically is not an effective use for recovering storage quickly as irrigation needs during wet periods are minimal and in some cases (i.e., colder climates) there is no irrigation demand for long periods. In addition, much of the arid southwest is encouraging "xeri-scaping" (drought tolerant plants), which is likely much more effective at reducing potable demand than capture and use for irrigation. Xeriscape plant pallets typically do not like to be saturated for long periods, as would occur via over-irrigation if irrigation use was maximized. Further, use of a water-loving plant palate to maximize the use of captured runoff during normal and wet years could exert an additional demand for potable water during dry years.

Toilet Use Ratio

For toilet flushing to be effective, there needs to be a high enough ratio of Toilet Users To Impervious Area (TUTIA). Perhaps in high-rise condominiums, office buildings, institutional buildings, etc. this ratio would be high enough to drain the tank sufficiently fast and in these cases capture and use should be considered.

However, there would be a "competition" for reclaimed water in much of the arid west. Reclaimed water systems tend to be limited in their ability to distribute water in the wetter and colder periods of the year due to low irrigation demands. In addition, in some locations use of reclaimed water for toilet flushing is required in high density projects. One has to question if the capture and use of stormwater that may result in reclaimed water being discharged is an effective strategy. Under this scenario, the captured stormwater would not be reducing potable water demand.

Infrastructure Needs

Finally, there is significant infrastructure (**Figure 7**) that would be required to employ cistern and use on a site basis, including piping, storage, treatment, pumping, and separate piping (purple pipes). Questions about sustainability for these systems need to be explored and assessed.

Figure 7. Typical Components of a Stormwater Harvest and Use system.

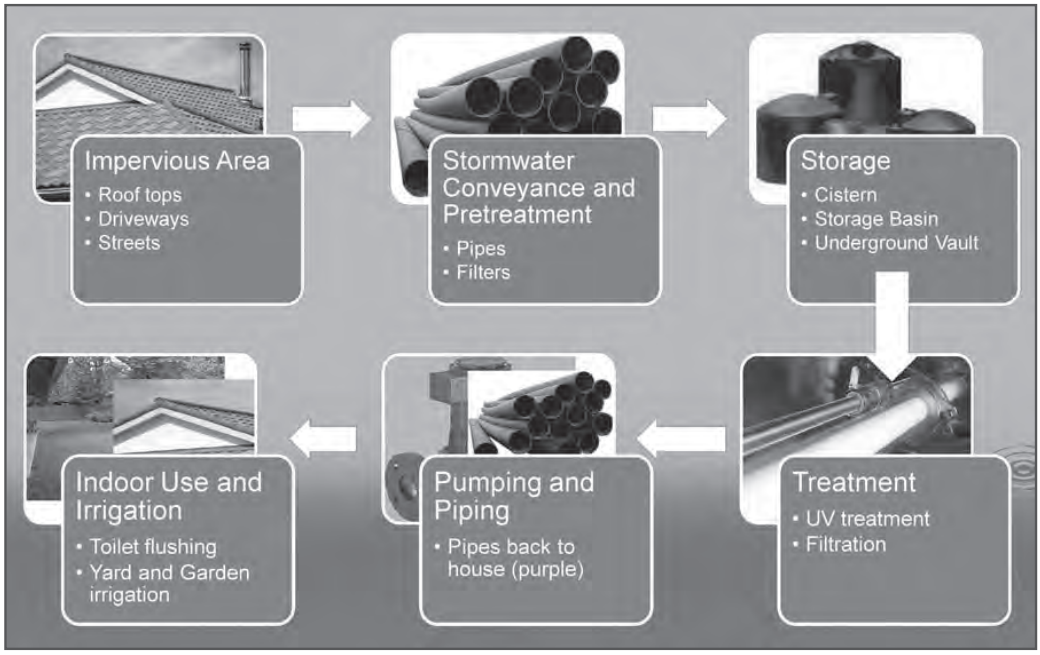

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Stormwater On Site

Key Considerations

Unique Factors

CONCLUSIONS

In Summary:

- Infiltration is often not broadly feasible, effective and/or desirable. While it should be maximized where appropriate, studies are needed to identify suitable areas and also identify areas where infiltration may be feasible but not appropriate.
- Precipitation/runoff patterns in California and much of the West limit the ability of evapotranspiration-based BMPs to achieve retention on site requirements. Evapotranspiration of stormwater should be maximized, but will not be a significant component of retaining stormwater on site in densely developed areas.
- Precipitation/runoff patterns coupled with landscaping and reclaimed water considerations limit the applications where capture and use of runoff can be effective. Generally, only scenarios with high indoor demand and no competing requirements to use reclaimed water can be expected to provide a complete and reliable stormwater solution. Capture and use should be maximized in these cases, but in other cases it should be carefully considered against other options such as biofiltration and discharge to determine which option is most effective in meeting stormwater management goals.
- The overall water balance should be considered when making choices on proper levels of infiltration versus surface runoff.
- There needs to be more technical vetting of "retain on site" and stormwater harvest and use before these approaches are made mandatory.

Each watershed and site has unique soils, topography, groundwater, water quality, land uses, receiving water sensitivities, wastewater strategies, etc. which should be considered when evaluating retention on site as a requirement or strategy. The authors believe that management approaches that are "one size fit all" are not appropriate and in many cases would likely lead to undesirable results.

Proper Stormwater Management Includes:

- Source controls
- Infiltration where feasible and appropriate
- Maximizing ET losses
- Harvest and use where it makes sense
- Capture and treat with effective (i.e. vegetated) BMPs where it makes sense

We believe that significant progress could be made by improving BMP selection and design guidance for all BMPs to better target unit processes (i.e. physical, biological, chemical treatment processes) to the pollutants and parameters of concern for each watershed.

For Additional Information:

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Eric Strecker, P.E. is a Principal and Water Resources Practice Leader with Geosyntec Consultants in Portland, Oregon. He has over 25 years of stormwater management experience, including national level applied research efforts for EPA, FHWA, WERF, and NCHRP as well as state and local stormwater management, design and research projects throughout the United States. He is a Principal Investigator for the International BMP Database.

Aaron Poresky, E.I.T. has more than four years of experience in water resources and urban stormwater management. At Geosyntec, he has been involved in a variety of projects including structural BMP design and evaluation, water quality planning and impact analysis, hydromodification planning and impact analysis, stormwater policy support, and modeling methodology development. Key project areas have included stormwater retrofit planning and design for a variety of municipal and private clients, modeling methodology development and implementation, new development stormwater planning, and regulatory analysis. Mr. Poresky has been an invited speaker on the topics of modeling, BMP design, and stormwater policy.

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CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

TENTATIVE
ORDER NO. R9-2013-0001
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The San Diego County Copermittees in Table 1a are subject to waste discharge requirements set forth in this Order.

Table 1a. San Diego County Copermittees

City of Carlsbad	City of Oceanside
City of Chula Vista	City of Poway
City of Coronado	City of San Diego
City of Del Mar	City of San Marcos
City of El Cajon	City of Santee
City of Encinitas	City of Solana Beach
City of Escondido	City of Vista
City of Imperial Beach	County of San Diego
City of La Mesa	San Diego County Regional Airport Authority
City of Lemon Grove	San Diego Unified Port District
City of National City	

After the San Diego Water Board receives and considers the Orange County Copermittees' Report of Waste Discharge and makes any necessary changes to the Order, the Orange County Copermittees in Table 1b will become subject to waste discharge requirements set forth in this Order after expiration of Order No. R9-2009-0002, NPDES No. CAS0108740 on or after December 16, 2014.

Table 1b. Orange County Copermittees

City of Aliso Viejo	City of Rancho Santa Margarita
City of Dana Point	City of San Clemente
City of Laguna Beach	City of San Juan Capistrano
City of Laguna Hills	City of Laguna Woods
City of Laguna Niguel	County of Orange
City of Lake Forest	Orange County Flood Control District
City of Mission Viejo	

After the San Diego Water Board receives and considers the Riverside County Copermittees' Report of Waste Discharge and makes any necessary changes to this Order, the Riverside County Copermittees in Table 1c will become subject to waste discharge requirements set forth in this Order after expiration of Order No. R9-2010-0016, NPDES No. CAS0108766 on or after November 10, 2015.

Table 1c. Riverside County Copermittees

City of Murrieta	County of Riverside
City of Temecula	Riverside County Flood Control and Water Conservation District
City of Wildomar	

The Orange County Copermittees and Riverside County Copermittees may become subject to the requirements of this Order at a date earlier than the expiration date of their current Orders subject to the conditions described in Provision F.6 of this Order if the Copermittees in the respective county receive a notification of coverage from the San Diego Water Board.

The term Copermittee in this Order refers to any San Diego County, Orange County, or Riverside County Copermittee covered under this Order, unless specified otherwise.

This Order provides permit coverage for the Copermittee discharges described in Table 2.

Table 2. Discharge Locations and Receiving Waters

Discharge Points	Locations throughout San Diego Region
Discharge Description	Municipal Separate Storm Sewer System (MS4) Discharges
Receiving Waters	Inland Surface Waters, Enclosed Bays and Estuaries, and Coastal Ocean Waters of the San Diego Region

Table 3. Administrative Information

This Order was adopted by the San Diego Water Board on:	**Month Day, 2013**
This Order will become effective on:	**Month Day, 2013**
This Order will expire on:	**Month Day, 2018**
The Copermittees must file a Report of Waste Discharge in accordance with Title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than 180 days in advance of the Order expiration date.	

I, David W. Gibson, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on Month Day, 2013.

TENTATIVE

David W. Gibson
Executive Officer

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I. FINDINGS

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), finds that:

JURISDICTION

1. **MS4 Ownership or Operation.** Each of the Copermittees owns or operates an MS4, through which it discharges storm water and non-storm water into waters of the U.S. within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the U.S.

2. **Legal and Regulatory Authority.** This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]) adopted by the United States Environmental Protection Agency (USEPA), and chapter 5.5, division 7 of the California Water Code (CWC) (commencing with section 13370). This Order serves as an NPDES permit for discharges from MS4s to surface waters. This Order also serves as waste discharge requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

   The federal regulations make it clear that the Copermittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators (40 CFR 122.26(a)(3)(vi)). This Order does not require the Copermittees to manage storm water outside of their jurisdictional boundaries, but rather to work collectively to improve storm water management within watersheds.

3. **CWA NPDES Permit Conditions.** Pursuant to CWA section 402(p)(3)(B), NPDES permits for storm water discharges from MS4s must include requirements to effectively prohibit non-storm water discharges into MS4s, and require controls to reduce the discharge of pollutants in storm water to the maximum extent practicable (MEP), and to require other provisions as the San Diego Water Board determines are appropriate to control such pollutants. This Order prescribes conditions to assure compliance with the CWA requirements for owners and operators of MS4s to effectively prohibit non-storm water discharges into the MS4s, and require controls to reduce the discharge of pollutants in storm water from the MS4s to the MEP.

4. **CWA and CWC Monitoring Requirements.** CWA section 308(a) and 40 CFR 122.41(h),(j)-(l) and 122.48 require that NPDES permits must specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s

Deleted: The San Diego Water Board has the legal authority to issue a regional MS4 permit pursuant to its authority under CWA section 402(p)(3)(B) and 40 CFR 122.26(a)(1)(v). The USEPA also made it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide permits (55 Federal Register [FR] 47990, 48039-48042). The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees and San Diego Water Board.¶

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also specify additional monitoring and reporting requirements in 40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c). CWC section 13383 authorizes the San Diego Water Board to establish monitoring, inspection, entry, reporting and recordkeeping requirements. This Order establishes monitoring and reporting requirements to implement federal and State requirements.

5. **Total Maximum Daily Loads.** CWA section 303(d)(1)(A) requires that "[e]ach state shall identify those waters within its boundaries for which the effluent limitations…are not stringent enough to implement any water quality standard applicable to such waters." The CWA also requires states to establish a priority ranking of impaired water bodies known as Water Quality Limited Segments and to establish Total Maximum Daily Loads (TMDLs) for such waters. This priority list of impaired water bodies is called the Clean Water Act Section 303(d) List of Water Quality Limited Segments, commonly referred to as the 303(d) List. The CWA requires the 303(d) List to be updated every two years.

   TMDLs are numerical calculations of the maximum amount of a pollutant that a water body can assimilate and still meet water quality standards. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point sources (waste load allocations or WLAs) and non-point sources (load allocations or LAs), background contribution, plus a margin of safety. Discharges from MS4s are point source discharges. The federal regulations (40 CFR 122.44(d)(1)(vii)(B)) require that NPDES permits to incorporate water quality based effluent limitations (WQBELs) developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, consistent with the assumptions and requirements of any available WLA for the discharge. Requirements of this Order implement the TMDLs adopted by the San Diego Water Board and approved by USEPA.

6. **Non-Storm Water Discharges.** Pursuant to CWA section 402(p)(3)(B)(ii), this Order requires each Copermittee to effectively prohibit discharges of non-storm water into its MS4. Nevertheless, non-storm water discharges into and from the MS4s continue to be reported to the San Diego Water Board by the Copermittees and other persons. Monitoring conducted by the Copermittees, as well as the 303(d) List, have identified dry weather, non-storm water discharges from the MS4s as a source of pollutants causing or contributing to receiving water quality impairments in the San Diego Region. The federal regulations (40 CFR 122.26(d)(2)(iv)(B)(1)) require the Copermittees to have a program to prevent illicit discharges to the MS4. The federal regulations, however, allow for specific categories of non-storm water discharges to be addressed as illicit discharges only where such discharges are identified as sources of pollutants to waters of the U.S.

   Deleted: or flows

7. **In-Stream Treatment Systems.** Pursuant to federal regulations (40 CFR 131.10(a)), in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S. Authorizing the construction of a runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to

accepting waste assimilation as an appropriate use for that water body. Runoff treatment must occur prior to the discharge of runoff into receiving waters. Treatment control best management practices (BMPs) must not be constructed in waters of the U.S. Construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body.

DISCHARGE CHARACTERISTICS AND RUNOFF MANAGEMENT

8. **Point Source Discharges of Pollutants.** Discharges from the MS4s may contain waste, as defined in the CWC, and pollutants that adversely affect the quality of the waters of the state. A discharge from an MS4 is a "discharge of pollutants from a point source" into waters of the U.S. as defined in the CWA. Storm water and non-storm water discharges from the MS4s may contain pollutants that cause or threaten to cause a violation of surface water quality standards, as outlined in the Water Quality Control Plan for the San Diego Basin (Basin Plan). Storm water and non-storm water discharges from the MS4s are subject to the conditions and requirements established in the Basin Plan for point source discharges.

9. **Potential Beneficial Use Impairment.** The discharge of pollutants and/or increased flows from MS4s may cause or threaten to cause the concentration of pollutants to exceed applicable receiving water quality objectives and impair or threaten to impair designated beneficial uses resulting in a condition of pollution, contamination, or nuisance.

10. **Pollutants Generated by Land Development.** Land development has created and continues to create new sources of non-storm water discharges and pollutants in storm water discharges as human population density increases. This brings higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash. Pollutants from these sources are dumped or washed off the surface by non-storm water or storm water flows into and from the MS4s. When development converts natural vegetated pervious ground cover to impervious surfaces such as paved highways, streets, rooftops, and parking lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving a developed area without BMPs will contain greater pollutant loads and have significantly greater runoff volume, velocity, and peak flow rate than pre-development runoff from the same area.

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11. **Runoff Discharges to Receiving Waters.** The MS4s discharge runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within the eleven hydrologic units comprising the San Diego Region. Historic and current development makes use of natural drainage patterns and features as conveyances for runoff. Numerous receiving water bodies and water body segments have been designated as impaired by the San Diego Water Board pursuant to CWA section 303(d).

Deleted: Rivers, streams and creeks in developed areas used in this manner are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and receiving water.

12. **Pollutants in Runoff.** The most common pollutants in runoff discharged from the MS4s include total suspended solids, sediment, pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., cadmium, copper, lead, and zinc), petroleum products and polynuclear aromatic hydrocarbons, synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus), oxygen-demanding substances (e.g., decaying vegetation, animal waste), detergents, and trash. As operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. These discharges may cause or contribute to a condition of pollution or a violation of water quality standards.

Deleted: By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not prohibit or otherwise control.

13. **Human Health and Aquatic Life Impairment.** Pollutants in runoff discharged from the MS4s can threaten and adversely affect human health and aquatic organisms. Adverse responses of organisms to chemicals or physical agents in runoff range from physiological responses such as impaired reproduction or growth anomalies to mortality. Increased volume, velocity, rate, and duration of storm water runoff greatly accelerate the erosion of downstream natural channels. This alters stream channels and habitats and can adversely affect aquatic and terrestrial organisms.

14. **Water Quality Effects.** The Copermittees' water quality monitoring data submitted to date documents persistent exceedances of Basin Plan water quality objectives for runoff-related pollutants at various watershed monitoring stations. Persistent toxicity has also been observed at several watershed monitoring stations. In addition, bioassessment data indicate that the majority of the monitored receiving waters have Poor to Very Poor Index of Biological Integrity (IBI) ratings. These findings indicate that runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in the San Diego Region. Non-storm water discharges from the MS4s have been shown to contribute significant levels of pollutants and flow in arid, developed Southern California watersheds, and contribute significantly to exceedances of applicable receiving water quality objectives.

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15. **Non-Storm Water and Storm Water Discharges.** The discharge of pollutants from the MS4 is subject to the MEP standard notwithstanding whether the pollutants are transported by stormwater or non-stormwater. Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s, namely identified illicit discharges and pollutants from unlawful dumping, must be effectively prohibited.

Deleted: Non-storm water discharges from the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard of CWA section 402(p)(3)(B)(iii), which is explicitly for "Municipal … *Stormwater Discharges* (emphasis added)" from the MS4s.

16. **Best Management Practices.** Waste and pollutants which are deposited and accumulate in MS4 drainage structures may be discharged from these structures to waters of the U.S. unless they are removed. These discharges may cause or contribute to, or threaten to cause or contribute to, a condition of pollution in receiving waters. For this reason, pollutants in storm water discharges from the MS4s can be and must be effectively reduced in runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Pollution prevention is the reduction or elimination of pollutant generation at its source and is the best "first line of defense". Source control BMPs (both structural and non-structural) minimize the contact between pollutants and runoff, therefore

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keeping pollutants onsite and out of receiving waters. Treatment control BMPs remove pollutants that have been mobilized by storm water or non-storm water flows.

17. **BMP Implementation.** Runoff needs to be addressed during the three major phases of development (planning, construction, and use) in order to reduce the discharge of storm water pollutants to the MEP, effectively prohibit non-storm water discharges, and protect receiving waters. Development which is not guided by water quality planning policies and principles can result in increased pollutant load discharges, flow rates, and flow durations which can negatively affect receiving water beneficial uses. Construction sites without adequate BMP implementation result in sediment runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. Existing development can generate substantial pollutant loads which are discharged in runoff to receiving waters. Retrofitting areas of existing development with storm water pollutant control and hydromodification management BMPs may, in many cases be necessary to address storm water discharges from existing development that may cause or contribute to a condition of pollution or a violation of water quality standards.

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18. **Long Term Planning and Implementation.** Federal regulations require municipal storm water permits to expire 5 years from adoption, after which the permit must be renewed and reissued. The San Diego Water Board recognizes that the degradation of water quality and impacts to beneficial uses of the waters in the San Diego Region occurred over several decades. The San Diego Water Board further recognizes that a decade or more may be necessary to realize demonstrable improvement to the quality of waters in the Region. This Order includes a long term planning and implementation approach that will require more than a single permit term to complete.

WATER QUALITY STANDARDS

19. **Basin Plan.** The San Diego Water Board adopted the Water Quality Control Plan for the San Diego Basin (Basin Plan) on September 8, 1994 that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for receiving waters addressed through the plan. The Basin Plan was subsequently approved by the State Water Resources Control Board (State Water Board) on December 13, 1994. Subsequent revisions to the Basin Plan have also been adopted by the San Diego Water Board and approved by the State Water Board. Requirements of this Order implement the Basin Plan.

The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Process Supply (PROC), Industrial

Service Supply (IND), Ground Water Recharge (GWR), Contact Water Recreation (REC1), Non-contact Water Recreation (REC2), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Freshwater Replenishment (FRSH), Hydropower Generation (POW), and Preservation of Biological Habitats of Special Significance (BIOL). The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region: Navigation (NAV), Commercial and Sport Fishing (COMM), Estuarine Habitat (EST), Marine Habitat (MAR), Aquaculture (AQUA), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN), and Shellfish Harvesting (SHELL).

20. **Ocean Plan.** The State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, and 2005. The State Water Board adopted the latest amendment on April 21, 2005 and it became effective on February 14, 2006. The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean. Requirements of this Order implement the Ocean Plan.

    The Ocean Plan identifies the following beneficial uses of ocean waters of the state to be protected: Industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture; preservation and enhancement of designated Areas of Special Biological Significance; rare and endangered species; marine habitat; fish spawning and shellfish harvesting

21. **Sediment Quality Control Plan**. On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes: 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

22. **National Toxics Rule and California Toxics Rule.** USEPA adopted the National Toxics Rule (NTR) on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the NTR applied in California. On May 18, 2000, USEPA adopted the California Toxics Rule (CTR). The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants.

23. **Antidegradation Policy.** This Order is in conformance with the federal Antidegradation Policy described in 40 CFR 131.12, and State Water Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality*

Waters in California. Federal regulations at 40 CFR 131.12 require that the State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. State Water Board Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies.

CONSIDERATIONS UNDER FEDERAL AND STATE LAW

24. **Coastal Zone Act Reauthorization Amendments.** Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states with approved coastal zone management programs to address non-point source pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point source pollution: agriculture, silviculture, urban, marinas, and hydromodification. This Order addresses the management measures required for the urban category, with the exception of septic systems. The runoff management programs developed pursuant to this Order fulfills the need for coastal cities to develop a runoff non-point source plan identified in the Non-Point Source Program Strategy and Implementation Plan. The San Diego Water Board addresses septic systems through the administration of other programs.

25. **Endangered Species Act.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 USC sections 1531 to 1544). This Order requires compliance with receiving water limits, and other requirements to protect the beneficial uses of waters of the State. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

26. **Report of Waste Discharge Process.** The waste discharge requirements set forth in this Order are based upon the Report of Waste Discharge submitted by the San Diego County Copermittees prior to the expiration of Order No. R9-2007-0001 (NPDES No. CAS0109266). The Orange County and Riverside County Copermittees are not immediately covered by the waste discharge requirements in this Order. The San Diego Water Board understands that each municipality is unique. The Order will continue to use the Report of Waste Discharge process prior to initially making Orange County or Riverside County Copermittees subject to the requirements of this Order.

Deleted: although the Counties share watersheds and geographical boundaries

The federal regulations (40 CFR 122.21(d)(2)) and CWC section 13376 impose a duty on the Copermittees to reapply for continued coverage through submittal of a Report of Waste Discharge no later than 180 days prior to expiration of a currently effective permit. This requirement is set forth in the Orange County Copermittees'

and Riverside County Copermittees' currently effective permits at Provisions K.2.b and K.2.c, respectively. The Orange County Permit, Order No. R9-2009-0002 (NPDES No. CAS0108740) expires on December 16, 2014 and the Riverside County MS4 Permit, Order No. R9-2010-0016 (NPDES No. CAS0108766) expires on November 10, 2015.

Unless the Orange County or Riverside County Copermittees apply for and receive early coverage under this Order, the Orange County Copermittees' and the Riverside County Copermittees' respective permits will be superseded by this Order upon expiration of their respective permits, subject to any necessary revisions to the requirements of this Order made after the San Diego Water Board considers their respective Reports of Waste Discharge through the public process provided in 40 CFR 124.

27. **Integrated Report and Clean Water Act Section 303(d) List.** The San Diego Water Board and State Water Board submit an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. USEPA issued its *Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act* on July 29, 2005, which advocates the use of a five category approach for classifying the attainment status of water quality standards for water bodies in the Integrated Report. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 in the Integrated Report are placed on the 303(d) List.

    Water bodies with available data and/or information that indicate at least one beneficial use is not being supported or is threatened, but a TMDL is not required, are included in Category 4 in the Integrated Report. Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

    Implementation of the requirements of this Order may allow the San Diego Water Board to include surface waters impaired by discharges from the Copermittees' MS4s in Category 4 in the Integrated Report for consideration during the next 303(d) List submittal by the State to USEPA.

28. **Economic Considerations.** The California Supreme Court has ruled that although CWC section 13263 requires the State and Regional Water Boards (collectively Water Boards) to consider factors set forth in CWC section 13241 when issuing an NPDES permit, the Water Board may not consider the factors to justify imposing pollutant restrictions that are less stringent than the applicable federal regulations require. (*City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th

613, 618, 626-627.) However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

As noted in the following finding, the San Diego Water Board finds that the requirements in this permit are more stringent than the minimum federal requirements. Therefore, a CWC section 13241 analysis is required for permit requirements that implement the effective prohibition on the discharge of non-storm water into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determined appropriate to control such pollutants, as those requirements are mandated by federal law. The economic analysis is provided in the Fact Sheet.

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Deleted: Notwithstanding the above, the San Diego Water Board has developed an economic analysis of the requirements in this Order.

Deleted: <#>**Unfunded Mandates.** This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following: ¶
¶
<#>This Order implements federally mandated requirements under CWA section 402 (33 USC section 1342(p)(3)(B)). ¶
¶
<#>The local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental and new dischargers who are issued NPDES permits for storm water and non-storm water discharges. ¶
¶
<#>The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order. ¶
¶
<#>The Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)) and in lieu of numeric restrictions on their MS4 discharges (i.e. effluent limitations). ¶
¶
<#>The local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under State law predates the enactment of Article XIIIB, Section (6) of the California Constitution. ¶
¶
<#>The provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state develops a TMDL, federal law requires that permits must contain water quality based effluent limitations consistent with the assumptions and requirements of any applicable wasteload allocation (40 CFR 122.44(d)(1)(vii)(B)). ¶
¶
See the Fact Sheet for further discussion of unfunded mandates.¶

29. **California Environmental Quality Act.** The issuance of waste discharge requirements and an NPDES permit for the discharge of runoff from MS4s to waters of the U.S. is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 et seq.) in accordance with CWC section 13389.

STATE WATER BOARD DECISIONS

30. **Compliance with Prohibitions and Limitations.** The receiving water limitation language specified in this Order is consistent with language recommended by the USEPA and established in State Water Board Order WQ 99-05, *Own Motion Review of the Petition of Environmental Health Coalition to Review Waste Discharge Requirements Order No. 96-03, NPDES Permit No. CAS0108740*, adopted by the State Water Board on June 17, 1999. The receiving water limitation language in this Order requires storm water discharges from MS4s to not cause or contribute to a violation of water quality standards, which is to be achieved through an iterative approach requiring the implementation of improved and better-tailored BMPs over time. Implementation of the iterative approach to comply with receiving water limitations based on applicable water quality standards is necessary to ensure that storm water discharges from the MS4 will not ultimately cause or contribute to violations of water quality standards and will not create conditions of pollution, contamination, or nuisance.

31. **Special Conditions for Areas of Special Biological Significance.** On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving an exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges. State Water Board Resolution No. 2012-0012 requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions

were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject terms and conditions of State Water Board Resolution No. 2012-0012. The Special Protections contained in Attachment B to Resolution No. 2012-0012, applicable to these discharges, are hereby incorporated into this Order as if fully set forth herein.

ADMINISTRATIVE FINDINGS

32. **Executive Officer Delegation of Authority.** The San Diego Water Board by prior resolution has delegated all matters that may legally be delegated to its Executive Officer to act on its behalf pursuant to CWC section 13223. Therefore, the Executive Officer is authorized to act on the San Diego Water Board's behalf on any matter within this Order unless such delegation is unlawful under CWC section 13223 or this Order explicitly states otherwise.

33. **Standard Provisions.** Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR 122.42, are provided in Attachment B to this Order.

34. **Fact Sheet.** The Fact Sheet for this Order contains background information, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of this Order. The Fact Sheet is hereby incorporated into this Order and constitutes part of the Findings of this Order.

35. **Public Notice.** In accordance with State and federal laws and regulations, the San Diego Water Board notified the Copermittees, and interested agencies and persons of its intent to prescribe waste discharge requirements for the control of discharges into and from the MS4s to waters of the U.S. and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet.

36. **Public Hearing.** The San Diego Water Board held a public hearing on Month Day, 2013 and heard and considered all comments pertaining to the terms and conditions of this Order. Details of the public hearing are provided in the Fact Sheet.

37. **Effective Date.** This Order serves as an NPDES permit pursuant to CWA section 401 or amendments thereto, and becomes effective fifty (50) days after the date of its adoption, provided that the Regional Administrator, USEPA, Region IX, does not object to this Order.

38. **Review by the State Water Board.** Any person aggrieved by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with CWC section 13320 and California Code of Regulations, title 23,

sections 2050, et seq. The State Water Board must receive the petition by 5:00 p.m., 30 days after the San Diego Water Board action, except that if the thirtieth day following the action falls on a Saturday, Sunday or State holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

THEREFORE, IT IS HEREBY ORDERED that the Copermittees, in order to meet the provisions contained in division 7 of the CWC and regulations adopted thereunder, and the provisions of the CWA and regulations adopted thereunder, must each comply with the following:

II. PROVISIONS

A. PROHIBITIONS AND LIMITATIONS

The purpose of this provision is to describe the conditions under which storm water from and non-storm water discharges into the MS4s are effectively prohibited or limited. The goal of the prohibitions and limitations is to protect the water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through the implementation of water quality improvement strategies and runoff management programs that effectively prohibit non-storm water discharges into the Copermittees' MS4s, and reduce pollutants in storm water discharges from the Copermittees' MS4s to the MEP. The process for determining compliance with the Discharge Prohibitions (A.1), Receiving Water Limitations (A.2), and Effluent Limitations (A.3, including effluent limitations derived from the TMDL requirements – Attachment E) is defined in Provision A.4.

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1. Discharge Prohibitions

a. Except as provided for in Provisions A.1.e or A.4, discharges from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the state are prohibited.

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b. Non-storm water discharges into MS4s are to be effectively prohibited, unless such discharges are either authorized by a separate NPDES permit, or the discharge is a category of non-storm water discharges that must be addressed pursuant to Provisions E.2.a.(1)-(5) of this Order.

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c. Discharges from MS4s are subject to all waste discharge prohibitions in the Basin Plan, included in Attachment A to this Order.

d. Storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 applicable to these discharges, included in Attachment A to this Order. All other discharges from the Copermittees' MS4s to ASBS are prohibited.

e. For discharges associated with water body pollutant combinations addressed in a TMDL in Attachment E of this Order, the affected Copermittees shall achieve compliance as outlined in Attachment E.

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2. Receiving Water Limitations

a. Discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters, including but not limited to all applicable provisions contained in the list below to the extent that they remain in effect and are operative, unless such discharges are being addressed by the Copermittee(s) through the processes set forth in this Order (Provision A.4 and Attachment E). Where a TMDL has been developed and its terms have been incorporated into this Order (in a manner that is consistent with the waste load allocations set forth in the TMDL), a Permittee shall also be considered in compliance with such TMDL-related requirements provided in this Order, if it is timely and in good faith implementing the MEP-compliant control measures otherwise established by this Order.

(1) The San Diego Water Board's Basin Plan, including beneficial uses, water quality objectives, and implementation plans;

(2) State Water Board plans for water quality control including the following:

(a) Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries (Thermal Plan), and

(b) The Ocean Plan, including beneficial uses, water quality objectives, and implementation plans;

(3) State Water Board policies for water and sediment quality control including the following:

(a) Water Quality Control Policy for the Enclosed Bays and Estuaries of California,

(b) Sediment Quality Control Plan which includes the following narrative objectives for bays and estuaries:

(i) Pollutants in sediments shall not be present in quantities that, alone or in combination, are toxic to benthic communities, and

(ii) Pollutants shall not be present in sediments at levels that will bioaccumulate in aquatic life to levels that are harmful to human health,

(c) The Statement of Policy with Respect to Maintaining High Quality of Waters in California;[1]

[1] State Water Board Resolution No. 68-16

(4) Priority pollutant criteria promulgated by the USEPA through the following:

(a) National Toxics Rule (NTR)[2] (promulgated on December 22, 1992 and amended on May 4, 1995), and

(b) California Toxics Rule (CTR).[3,4]

b. Discharges from MS4s composed of storm water runoff must not alter natural ocean water quality in an ASBS.

c. For receiving water limitations associated with a water body pollutant combination addressed in a TMDL in Attachment E of this Order, the affected Copermittees shall achieve compliance as outlined in Attachment E.

3. Effluent Limitations

a. TECHNOLOGY BASED EFFLUENT LIMITATIONS

Pollutants in storm water discharges from MS4s must be reduced to the MEP.[5]

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

This Order establishes water quality based effluent limitations (WQBELs) consistent with the assumptions and requirements of all available TMDL waste load allocations (WLAs) assigned to discharges from the Copermittees' MS4s. Each Copermittee must comply with applicable WQBELs established for the TMDLs in Attachment E to this Order, pursuant to the applicable TMDL compliance schedules.

4. Compliance with Discharge Prohibitions, Receiving Water Limitations, and Effluent Limitations

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Each Copermittee must achieve compliance with Provisions A.1, A.2, and A.3 of this Order through timely implementation of control measures and other actions as specified in Provisions B and E of this Order, including any modifications. The Water Quality Improvement Plans required under Provision B must be designed and adapted to ultimately achieve compliance with Provisions A.1, A2, and A.3.

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a. Except as provided in Parts 4.c, 4.d, 4.e, or 4.f below, discharges from the MS4

[2] 40 CFR 131.36
[3] 65 Federal Register 31682-31719 (May 18, 2000), adding Section 131.38 to 40 CFR
[4] If a water quality objective and a CTR criterion are in effect for the same priority pollutant, the more stringent of the two applies, unless a previous regulatory action (i.e., TMDL) has specified otherwise.
[5] This does not apply to MS4 discharges which receive subsequent treatment to reduce pollutants in storm water discharges to the MEP prior to entering receiving waters (e.g., low flow diversions to the sanitary sewer). Runoff treatment must occur prior to the discharge of runoff into receiving waters per Finding 7.

for which a Permittee is responsible shall not cause or contribute to an exceedance of any applicable water quality standard.

b. Except as provided in Parts 4.c, 4.d, 4.e, or 4.f below, discharges from the MS4 of storm water, or non-storm water, for which a Permittee is responsible, shall not cause a condition of nuisance.

c. In instances where discharges from the MS4 for which the permittee is responsible (1) causes or contributes to an exceedance of any applicable water quality standard or causes a condition of nuisance in the receiving water; (2) the receiving water is not subject to an approved TMDL that is in effect for the constituent(s) involved; and (3) the constituent(s) associated with the discharge is otherwise not specifically addressed by a provision of this Order (such as specific scheduled actions in a Water Quality Improvement Plan), the Permittee shall comply with the following iterative procedure:

(a) Submit a report to the Regional Water Board that:

(i) Summarizes and evaluates water quality data associated with the pollutant of concern in the context of applicable water quality objectives including the magnitude and frequency of the exceedances.

(ii) Includes a work plan to identify the sources of the constituents of concern (including those not associated with the MS4 such that non-MS4 sources can be pursued).

(iii) Describes the strategy and schedule for implementing best management practices (BMPs) and other controls (including those that are currently being implemented) that will address the Permittee's sources of constituents that are causing or contributing to the exceedances of an applicable water quality standard or causing a condition of nuisance, and are reflective of the severity of the exceedances. The strategy shall demonstrate that the selection of BMPs will address the Permittee's sources of constituents and include a mechanism for tracking BMP implementation. The strategy shall provide for future refinement pending the results of the source identification work plan noted in 4.c.(a)(ii) above.

(iv) Outlines, if necessary, additional monitoring to evaluate improvement in water quality and, if appropriate, special studies that will be undertaken to support future management decisions.

(v) Includes a methodology (ies) that will assess the effectiveness of the BMPs to address the exceedances.

(vi) This report may be submitted in conjunction with the Annual Report unless the Regional Water Board directs an earlier submittal.

Deleted: If exceedance(s) of water quality standards persist in receiving waters notwithstanding implementation of this Order, the Copermittees must comply with the following procedures:

Deleted: <#>For exceedance(s) of a water quality standard in the process of being addressed by the Water Quality Improvement Plan, the Copermittee(s) must implement the Water Quality Improvement Plan as accepted by the San Diego Water Board, and update the Water Quality Improvement Plan, as necessary, pursuant to Provision F.2.c;¶
<#>¶
Upon a determination by either the Copermittees or the San Diego Water Board that discharges from the MS4 are causing or contributing to a new exceedance of an applicable water quality standard not addressed by the Water Quality Improvement Plan, the Copermittees must submit the following updates to the Water Quality Improvement Plan pursuant to Provision F.2.c or as part of the Annual Report required under Provision F.3.b, unless the San Diego Water Board directs an earlier submittal

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¶
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Water quality improvement strategies (i.e. BMPs, retrofitting projects, stream and/or habitat rehabilitation or restoration projects, adjustments to jurisdictional runoff management programs, etc.) that will be implemented to reduce or eliminate any pollutants or conditions that are causing or contributing to the exceedance of water quality standards,¶
¶
Updates to the schedule for implementation of the existing and additional water quality improvement strategies, and¶
¶
Updates to the monitoring and assessment program to track progress toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a of this Order;

(b) Submit any modifications to the report required by the Regional Water Board within 60 days of notification. The report is deemed approved within 60 days of its submission if no response is received from the Regional Water Board.

(c) Implement the actions specified in the report in accordance with the acceptance or approval, including the implementation schedule and any modifications to this Order.

(d) As long as the Permittee has complied with the procedure set forth above and is implementing the actions, the Permittee does not have to repeat the same procedure for continuing or recurring exceedances of the same receiving water limitations unless directed by the Regional Water Board to develop additional BMPs.

(e) The information developed pursuant to A.4.c must be evaluated and incorporated into the Water Quality Improvement Plans and/or the Jurisdictional Runoff Management Plans, as needed.

d. For Receiving Water Limitations associated with waterbody-pollutant combinations addressed in an adopted TMDL that is in effect and that has been incorporated in this Order, a Permittee that is in compliance with Attachment E (Total Maximum Daily Load Provisions) is in compliance with Parts 4.a and 4.b above. For Receiving Water Limitations associated with waterbody-pollutant combinations on the CWA 303(d) list, which are not otherwise addressed by Attachment E or other applicable pollutant-specific provision of this Order, a Permittee that is in compliance with Part 4.c is in compliance with Parts 4.a and 4.b.

e. Alternatively, a Permittee that is in compliance with Provision B (Development and Implementation of Water Quality Improvement Plans) is in compliance with Parts 4.a and 4.b above.

f. If a Permittee is found to have discharges from the MS4 for which it is responsible that causes an exceedance of an applicable water quality standard in the receiving water or causes a condition of nuisance in the receiving water, the Permittee shall be in compliance with Parts 4.a and 4.b above, if the Permittee is in compliance with Parts 4.c, 4.d, or 4.e, or requirements otherwise covered by a provision of this Order specifically addressing the constituent in question, as applicable.

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The San Diego Water Board may require the incorporation of additional modifications to the Water Quality Improvement Plan required under Provision B. The applicable Copermittees must submit any modifications to the update to the Water Quality Improvement Plan within 90 days of notification that additional modifications are required by the San Diego Water Board, or as otherwise directed

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<#>Within 90 days of the San Diego Water Board determination that the update to the Water Quality Improvement Plan meets the requirements of this Order, the applicable Copermittees must revise the jurisdictional runoff management program documents to incorporate the updated water quality improvement strategies that have been and will be implemented, the implementation schedule, and any additional monitoring required; and¶
¶
<#>Each Copermittee must implement the updated Water Quality Improvement Plan.¶

Deleted: The procedure set forth above to achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order do not have to be repeated for continuing or recurring exceedances of the same water quality standard(s) following implementation of scheduled actions unless directed to do otherwise by the San Diego Water Board.

Deleted: Nothing in Provisions A.4.a and A.4.b prevents the San Diego Water Board from enforcing any provision of this Order while the applicable Copermittees prepare and implement the above update to the Water Quality Improvement Plan and jurisdictional runoff management programs.

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B. WATER QUALITY IMPROVEMENT PLANS[6]

The purpose of this provision is to develop Water Quality Improvement Plans (WQIPs) that guide the Copermittees' jurisdictional runoff management programs towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plans is to address the impacts of MS4 discharges so that such discharges do not impair the water quality and designated beneficial uses of waters of the state. Therefore, implementation of the WQIPs also provides the basis for complying with Provisions II.A.1, II.A.2, and II.A.3, as described in Provision II.A.4. This goal will be accomplished through an adaptive planning and management process that identifies the highest priority water quality conditions within a watershed and implements strategies through the jurisdictional runoff management programs to achieve improvements in the quality of discharges from the MS4s and receiving waters. As such, the requirements outlined in Provision E may be modified for consistency with the WQIP priorities for the applicable Watershed Management Area, if appropriate justification is provided.

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1. Watershed Management Areas

The Copermittees must develop a Water Quality Improvement Plan for each of the Watershed Management Areas in Table B-1. A total of ten Water Quality Improvement Plans must be developed for the San Diego Region.

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
San Juan (901.00)	South Orange County	- Aliso Creek - San Juan Creek - San Mateo Creek - Pacific Ocean - Heisler Park ASBS	- City of Aliso Viejo[1] - City of Dana Point[1] - City of Laguna Beach[1] - City of Laguna Hills[1] - City of Laguna Niguel[1] - City of Laguna Woods[1] - City of Lake Forest[1] - City of Mission Viejo[1] - City of Rancho Santa Margarita[1] - City of San Clemente[1] - City of San Juan Capistrano[1] - County of Orange[1] - Orange County Flood Control District[1]
Santa Margarita (902.00)	Santa Margarita River	- Murrieta Creek - Temecula Creek - Santa Margarita River - Santa Margarita Lagoon - Pacific Ocean	- City of Murrieta[2] - City of Temecula[2] - City of Wildomar[2] - County of Riverside[2] - County of San Diego[3] - Riverside County Flood Control and Water Conservation District[2]

[6] Once developed and approved, the Water Quality Improvement Plan and corresponding Jurisdictional Runoff Management Plan will functionally replace the Load Reduction Plans.

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
San Luis Rey (903.00)	San Luis Rey River	- San Luis Rey River - San Luis Rey Estuary - Pacific Ocean	- City of Oceanside - City of Vista - County of San Diego
Carlsbad (904.00)	Carlsbad	- Loma Alta Slough - Buena Vista Lagoon - Agua Hedionda Lagoon - Batiquitos Lagoon - San Elijo Lagoon - Pacific Ocean	- City of Carlsbad - City of Encinitas - City of Escondido - City of Oceanside - City of San Marcos - City of Solana Beach - City of Vista - County of San Diego
San Dieguito (905.00)	San Dieguito River	- San Dieguito River - San Dieguito Lagoon - Pacific Ocean	- City of Del Mar - City of Escondido - City of Poway - City of San Diego - City of Solana Beach - County of San Diego
Penasquitos (906.00)	Penasquitos	- Los Penasquitos Lagoon - Pacific Ocean	- City of Del Mar - City of Poway - City of San Diego - County of San Diego
	Mission Bay	- Mission Bay - Pacific Ocean - San Diego Marine Life Refuge ASBS	- City of San Diego
San Diego (907.00)	San Diego River	- San Diego River - Pacific Ocean	- City of El Cajon - City of La Mesa - City of San Diego - City of Santee - County of San Diego
Pueblo San Diego (908.00) Sweetwater (909.00) Otay (910.00)	San Diego Bay	- Sweetwater River - Otay River - San Diego Bay - Pacific Ocean	- City of Chula Vista - City of Coronado - City of Imperial Beach - City of La Mesa - City of Lemon Grove - City of National City - City of San Diego - County of San Diego - San Diego County Regional Airport Authority - San Diego Unified Port District
Tijuana (911.00)	Tijuana River	- Tijuana River - Tijuana Estuary - Pacific Ocean	- City of Imperial Beach - City of San Diego - County of San Diego

Notes:
1. The Orange County Copermittees will be covered under this Order after expiration of Order No. R9-2009-0002, or earlier if the Orange County Copermittees meet the conditions in Provision F.6.
2. The Riverside County Copermittees will be covered under this Order after expiration of Order No. R9-2010-0016, or earlier if the Riverside County Copermittees meet the conditions in Provision F.6.
3. The County of San Diego is required to implement the requirements of Provision B for its jurisdiction within the Santa Margarita River Watershed Management Area until the Riverside County Copermittees have been notified of coverage under this Order.

2. Priority Water Quality Conditions

The Copermittees must identify the water quality priorities within each Watershed Management Area that will be addressed by the Water Quality Improvement Plan. Where appropriate, Watershed Management Areas may be separated into subwatersheds to focus water quality prioritization and jurisdictional runoff management program implementation efforts by receiving water.

a. Assessment of Receiving Water Conditions

The Copermittees must consider the following, at a minimum, to identify water quality priorities based on impacts of MS4 discharges on receiving water beneficial uses:

(1) Receiving waters listed as impaired on the CWA Section 303(d) List of Water Quality Limited Segments (303(d) List);

(2) TMDLs adopted and under development by the San Diego Water Board;

(3) Receiving waters recognized as sensitive or highly valued by the Copermittees, including estuaries designated under the National Estuary Program under CWA section 320, wetlands defined by the State or U.S. Fish and Wildlife Service's National Wetlands Inventory as wetlands, and receiving waters identified as ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (Attachment A);

(4) The receiving water limitations of Provision A.2;

(5) Known historical versus current physical, chemical, and biological water quality conditions;

(6) Available, relevant, and appropriately collected and analyzed physical, chemical, and biological receiving water monitoring data, including, but not limited to, data describing:

(a) Chemical constituents,

(b) Water quality parameters (i.e. pH, temperature, conductivity, etc.),

(c) Toxicity Identification Evaluations for both receiving water column and sediment,

(d) Trash impacts,

(e) Bioassessments, and

(f) Physical habitat;

(7) Available evidence of erosional impacts in receiving waters due to accelerated flows (i.e. hydromodification);

(8) Available evidence of adverse impacts to the chemical, physical, and biological integrity of receiving waters; and

(9) The potential improvements in the overall condition of the Watershed Management Area that can be achieved.

b. ASSESSMENT OF IMPACTS FROM MS4 DISCHARGES

The Copermittees must consider the following, at a minimum, to identify the potential impacts to receiving waters that may be caused or contributed to by discharges from the Copermittees' MS4s:

(1) The discharge prohibitions of Provision A.1 and effluent limitations of Provision A.3; and

(2) Available, relevant, and appropriately collected and analyzed storm water and non-storm water monitoring data from the Copermittees' MS4 outfalls;

(3) Locations of each Copermittee's MS4 outfalls that discharge to receiving waters;

(4) Locations of MS4 outfalls that are known to persistently discharge non-storm water to receiving waters likely causing or contributing to impacts on receiving water beneficial uses;

(5) Locations of MS4 outfalls that are known to discharge pollutants in storm water causing or contributing to impacts on receiving water beneficial uses; and

(6) The potential improvements in the quality of discharges from the MS4 that can be achieved.

c. IDENTIFICATION OF PRIORITY WATER QUALITY CONDITIONS

(1) The Copermittees must use the information gathered for Provisions B.2.a and B.2.b to develop a list of priority water quality conditions as pollutants, stressors and/or receiving water conditions that are the highest threat to receiving water quality or that most adversely affect the physical, chemical, and biological integrity of receiving waters. The list must include the following information for each priority water quality condition:

(a) The beneficial use(s) associated with the priority water quality condition;

(b) The geographic extent of the priority water quality condition within the Watershed Management Area, if known;

(c) The temporal extent of the priority water quality condition (e.g., dry weather and/or wet weather);

(d) The Copermittees with MS4s discharges that may cause or contribute to the priority water quality condition; and

(e) An assessment of the adequacy of and data gaps in the monitoring data to characterize the conditions causing or contributing to the priority water quality condition, including a consideration of spatial and temporal variation.

(2) The Copermittees must identify the highest priority water quality conditions to be addressed by the Water Quality Improvement Plan, and provide a rationale for selecting a subset of the water quality conditions identified pursuant to Provision B.2.c.(1) as the highest priorities.

d. IDENTIFICATION OF MS4 SOURCES OF POLLUTANTS AND/OR STRESSORS

The Copermittees must identify and prioritize known and suspected sources of storm water and non-storm water pollutants and/or other stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c. The identification of known and suspected sources of pollutants and/or stressors that cause or contribute to the highest priority water quality conditions as identified for Provision B.2.c must consider the following:

(1) Pollutant generating facilities, areas, and/or activities within the Watershed Management Area, including:

(a) Each Copermittee's inventory of construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas,

(b) Publicly owned parks and/or recreational areas,

(c) Open space areas,

(d) All currently operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste, and

(e) Areas not within the Copermittees' jurisdictions (e.g., Phase II MS4s, tribal lands, state lands, federal lands) that are known or suspected to be discharging to the Copermittees' MS4s;

(2) Locations of the Copermittees' MS4s, including the following:

(a) All MS4 outfalls that discharge to receiving waters, and

(b) Locations of major structural controls for storm water and non-storm water (e.g., retention basins, detention basins, major infiltration devices, etc.);

(3) Other known and suspected sources of non-storm water or pollutants in storm water discharges to receiving waters within the Watershed Management Area, including the following:

(a) Other MS4 outfalls (e.g., Phase II Municipal and Caltrans),

(b) Other NPDES permitted discharges,

(c) Any other discharges that may be considered point sources (e.g., private outfalls), and

(d) Any other discharges that may be considered non-point sources (e.g., agriculture, wildlife or other natural sources);

(4) Review of available data, including but not limited to:

(a) Findings from the Copermittees' illicit discharge detection and elimination programs,

(b) Findings from the Copermittees' MS4 outfall discharge monitoring,

(c) Findings from the Copermittees' receiving water monitoring,

(d) Findings from the Copermittees' MS4 outfall discharge and receiving water assessments, and

(e) Other available, relevant, and appropriately collected data, information, or studies related to pollutant sources and/or stressors that contribute to the highest priority water quality conditions as identified for Provision B.2.c.

(5) The adequacy of the available data to identify and prioritize sources and/or stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c.

e. NUMERIC GOALS AND SCHEDULES

The Copermittees must develop and incorporate action levels, interim and final numeric goals[7] and schedules into the Water Quality Improvement Plan. Numeric goals must be used to support Water Quality Improvement Plan implementation and measure progress towards addressing the highest priority water quality conditions identified under Provision B.2.c. Action levels and numeric goals, themselves, are not enforceable compliance standards, effluent limitations, or receiving water limitations. When establishing numeric goals and corresponding schedules, the Copermittees must consider the following:

(1) Final numeric goals must be based on measureable criteria or indicators, to be achieved in the receiving waters and/or MS4 discharges for the highest priority water quality conditions which will be capable of demonstrating the protection of water quality standards in receiving waters;

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(2) Interim numeric goals must be based on measureable criteria or indicators capable of demonstrating incremental progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges; and

(3) Schedules must be adequate for measuring progress toward achieving the interim and final numeric goals required for Provisions B.2.e.(1) and B.2.e.(2). Schedules must incorporate the following:

(a) Interim dates for achieving the interim numeric goals,

(b) Compliance schedules for any applicable TMDLs in Attachment E to this Order,

(c) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A),

(d) Achievement of the final numeric goals in the receiving waters and/or MS4 discharges for the highest water quality priorities must be as soon as possible, and

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Final dates for achieving the final numeric goals must not initially extend more than 10 years beyond the effective date of this Order, unless a longer period of time is authorized by the San Diego Water Board Executive Officer or the schedule includes an applicable TMDL in Attachment E to this Order.

(4) The schedules for achieving the interim and final goals will be evaluated with each annual report [F.3.b.(1)(d)] and/or as a part of the ROWD development [B.5.a] to determine if they should be modified.

[7] Interim and final numeric goals may take a variety of forms such as TMDL established WQBELs, action levels, pollutant concentration, load reductions, number of impaired water bodies delisted from the List of Water Quality Impaired Segments, Index of Biotic Integrity (IBI) scores, or other appropriate metrics. Interim and final numeric goals are not necessarily limited to one criterion or indicator, but may include multiple criteria and/or indicators. Except for TMDL established WQBELs, interim and final numeric goals and corresponding schedules may be revised through the adaptive management process under Provision B.5.

3. Water Quality Improvement Strategies and Schedules

The Copermittees must develop specific water quality improvement strategies to address the highest priority water quality conditions identified within a Watershed Management Area. The water quality improvement strategies must address the highest priority water quality conditions by preventing or eliminating non-storm water discharges to and from the MS4, reducing pollutants in storm water discharges from the MS4 to the MEP, and protecting the water quality standards of receiving waters.

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a. WATER QUALITY IMPROVEMENT STRATEGIES

The Copermittees must identify and prioritize water quality improvement strategies based on their likely effectiveness and efficiency, and implement strategies to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, improve the physical, chemical, and biological receiving water conditions, and achieve the interim and final numeric goals in accordance with the schedules required for Provision B.2.e.(3). The following water quality improvement strategies must be included and described in the Water Quality Improvement Plan:

(1) Specific strategies and/or activities that may be implemented by one or more Copermittees within their jurisdictions through the jurisdictional runoff management programs that will address the highest priority water quality conditions within the Watershed Management Area, in accordance with the following requirements:

(a) Strategies and/or activities must, at a minimum, be described for each jurisdictional runoff management program component where strategies to address the highest priority water quality conditions are required under Provision E;

(b) The Water Quality Improvement Plan must describe the circumstances or conditions when and where the strategies or/activities should be or will be implemented, but specific details about how each Copermittee will implement the strategies and/or activities within its jurisdiction are not required; and

(c) Descriptions of strategies and/or activities must include any monitoring, information collection, special studies, and/or data analysis that is necessary to assess the effectiveness of the strategy and/or activity toward addressing the highest priority water quality conditions.

(2) Additional strategies and/or activities that may be implemented within the Watershed Management Area on a jurisdictional, sub-watershed, or watershed scale by one or more Copermittees, not specifically required under Provision E, which are designed to achieve the interim and final numeric goals identified in Provisions B.2.e.(1) and B.2.e.(2);

b. IMPLEMENTATION SCHEDULES

(1) The Copermittees must develop schedules for implementing the water quality improvement strategies identified under Provision B.3.a to achieve the interim and final numeric goals identified under Provision B.2.e.(1) and B.2.e.(2). Schedules must be developed for both the water quality improvement strategies implemented by each Copermittee within its jurisdiction and for strategies that the Copermittees choose to implement on a collaborative basis.

(2) The Copermittees must incorporate the implementation compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

4. Water Quality Improvement Monitoring and Assessment Program

a. The Copermittees in each Watershed Management Area must develop and incorporate an integrated monitoring and assessment program into the Water Quality Improvement Plan that assesses: 1) the progress toward achieving the numeric goals and schedules, 2) the progress toward addressing the highest priority water quality conditions for each Watershed Management Area, and 3) each Copermittee's overall efforts to implement the Water Quality Improvement Plan.

b. The monitoring and assessment program must incorporate the monitoring and assessment requirements of Provision D, which may allow the Copermittees to modify the program to be consistent with and focus on the highest priority water quality conditions for each Watershed Management Area.

c. For Watershed Management Areas with applicable TMDLs, the monitoring and assessment program must incorporate the specific monitoring and assessment requirements of Attachment E.

d. For Watershed Management Areas with any ASBS, the water quality monitoring and assessment program must incorporate the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

5. Iterative Approach and Adaptive Management Process

The Copermittees in each Watershed Management Area must implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1, A.2, and A.3, and must include the following:

Deleted: A.1.a, A.1.c and A.2.a

a. RE-EVALUATION OF PRIORITY WATER QUALITY CONDITIONS

The priority water quality conditions, and numeric goals and corresponding schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.2.c and B.2.e, may be re-evaluated by the Copermittees as needed during the term of this Order as part of the Annual Report. Re-evaluation and recommendations for modifications to the priority water quality conditions, and numeric goals and corresponding schedules must be provided in the Report of Waste Discharge, and must consider the following:

(1) Achieving the outcome of improved water quality in MS4 discharges and receiving waters through implementation of the water quality improvement strategies identified in the Water Quality Improvement Plan;

(2) Progress toward achieving interim and final numeric goals in receiving waters and/or MS4 discharges for the highest priority water quality conditions in the Watershed Management Area,

(3) Progress toward achieving outcomes according to established schedules;

(4) New information developed when the requirements of Provisions B.2.a-c have been re-evaluated;

(5) New policies or regulations that may affect identified numeric goals;

(6) Spatial and temporal accuracy of monitoring data collected to inform prioritization of water quality conditions and implementation strategies to address the highest priority water quality conditions;

(7) Availability of new information and data from sources other than the jurisdictional runoff management programs within the Watershed Management Area that informs the effectiveness of the actions implemented by the Copermittees;

(8) San Diego Water Board recommendations; and

(9) Recommendations for modifications solicited through a public participation process.

b. ADAPTATION OF STRATEGIES AND SCHEDULES

The water quality improvement strategies and schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.3, must be re-evaluated and adapted as new information becomes available to result in more effective and efficient measures to achieve the numeric goals established pursuant to Provision B.2.e. Re-evaluation of and modifications to the water quality improvement strategies must be provided in the Annual Report, and must consider the following:

(1) Modifications to the priority water quality conditions, and numeric goals and corresponding schedules based on Provision B.5.a;

(2) Measurable or demonstrable reductions of non-storm water discharges to and from each Copermittee's MS4;

(3) Measurable or demonstrable reductions of pollutants in storm water discharges from each Copermittee's MS4 to the MEP;

(4) New information developed when the requirements of Provisions B.2.b and B.2.d have been re-evaluated;

(5) Efficiency in implementing the Water Quality Improvement Plan;

(6) San Diego Water Board recommendations; and

(7) Recommendations for modifications solicited through a public participation process.

c. ADAPTATION OF MONITORING AND ASSESSMENT PROGRAM

The water quality improvement monitoring and assessment program, included in the Water Quality Improvement Plan pursuant to Provisions B.4, must be re-evaluated and adapted when new information becomes available. Re-evaluation and recommendations for modifications to the monitoring and assessment program, pursuant to the requirements of Provision D, may be provided in the Annual Report, but must be provided in the Report of Waste Discharge.

6. Water Quality Improvement Plan Submittal, Updates, and Implementation

a. The Copermittees must submit the Water Quality Improvement Plans in accordance with the requirements of Provision F.1.

b. The Copermittees must submit proposed updates to the Water Quality Improvement Plan for acceptance by the San Diego Water Board Executive Officer in accordance with the requirements of Provision F.2.c.

c. The Copermittees must commence with implementation of the Water Quality Improvement Plans immediately after acceptance by the San Diego Water Board, in accordance with the schedules, or subsequently updated schedules, within the Water Quality Improvement Plan.

C. ACTION LEVELS

The purpose of this provision is for the Copermittees to incorporate numeric non-stormwater action levels (NALs) and stormwater action levels (SALs) in the Water Quality Improvement Plans (WQIP) and numeric non-stormwater action levels (NALs) in the Illicit Discharge Detection and Elimination (IDDE) Program.

- For the purposes of the WQIPs, the goal of the action levels is to guide the implementation efforts and measure progress towards the protection of the high priority water quality conditions and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through monitoring and assessing the quality of the MS4 discharges during the implementation of the Water Quality Improvement Plans.

- For the purposes of the IDDE program, the goal of the action levels is to assist in the effective prohibition of non-stormwater discharges into the MS4.

Action levels will be developed and incorporated into the WQIP (Provision B) and the IDDE Program (Provision E). Depending upon the goals/objectives for the use of the action levels and the priority receiving water conditions, the constituents and values at which they are set may differ between watersheds. Copermittees may develop Watershed Management Area specific numeric action levels for non-stormwater and stormwater MS4 discharges using an approach approved by the Regional Board or use the default non-stormwater and stormwater action levels prescribed in C.1 and C.2 below.

The Copermittees will submit the action levels as a part of the WQIP and JURMP submittals. The action levels currently established will serve as the interim action levels until revised action levels are completed and approved. Exceedances of the action levels are not subject to enforcement or non-compliance actions under this Order.

1. Default Non-Storm Water Action Levels[8]

The following non-stormwater action levels (NALs) must be incorporated in the WQIPs and IDDE program if the Copermittees have not developed their own NALs for the identified high priority constituents using an approach approved by the Regional Board EO.

a. The following NALs must be incorporated:

(1) Non-Storm Water Discharges from MS4s to Ocean Surf Zone

[8] NALs are not considered by the San Diego Water Board to be enforceable limitations.

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Deleted: Water Quality Improvement Plan

Deleted: The Copermittees must develop and incorporate numeric non-storm water action levels (NALs) into the Water Quality Improvement Plan to: 1) support the development and prioritization of water quality improvement strategies for addressing non-storm water discharges to and from the MS4s, 2) assess the effectiveness of the water quality improvement strategies toward addressing MS4 non-storm water discharges, required pursuant to Provision D.4.b.(1), and 3) support the detection and elimination of non-storm water and illicit discharges to and from the MS4, required pursuant to Provision E.2.

Deleted: [9]

Table C-1. Non-Storm Water Action Levels for Discharges from MS4s to Ocean Surf Zone

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Total Coliform	MPN/100 ml	1,000	-	10,000/1,000[1]	OP
Fecal Coliform	MPN/100 ml	200[2]	-	400	OP
Enterococci	MPN/100 ml	35	-	104[3]	OP

Abbreviations/Acronyms
AMAL – average monthly action level
OP – Ocean Plan water quality objective
MDAL – maximum daily action level
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Total coliform density NAL is 1,000 MPN/100 ml when the fecal/total coliform ratio exceeds 0.1.
2. Fecal coliform density NAL is 200 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas."

(2) Non-Storm Water Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Table C-2. Non-Storm Water Action Levels for Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Turbidity	NTU	75	-	225	OP
pH	Units	Within limit of 6.0 to 9.0 at all times			OP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	35	-	104[3]	BP
Priority Pollutants	ug/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
OP – Ocean Plan water quality objective
NTU – Nephelometric Turbidity Units
ug/L – micrograms per liter
MDAL – maximum daily action level
BP – Basin Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas" and is not applicable to waterbodies that are not designated with the water contact recreation (REC-1) beneficial use.

Table C-3. Non-Storm Water Action Levels for Priority Pollutants

Parameter	Units	Freshwater (CTR)		Saltwater (CTR)	
		MDAL	AMAL	MDAL	AMAL
Cadmium	ug/L	**	**	16	8
Copper	ug/L	*	*	5.8	2.9
Chromium III	ug/L	**	**	-	-
Chromium VI	ug/L	16	8.1	83	41
Lead	ug/L	*	*	14	2.9
Nickel	ug/L	**	**	14	6.8
Silver	ug/L	*	*	2.2	1.1
Zinc	ug/L	*	*	95	47

Abbreviations/Acronyms:
CTR – California Toxic Rule
AMAL – average monthly action level
ug/L – micrograms per liter
MDAL – maximum daily action level

Notes:
* Action levels developed on a case-by-case basis (see below)

** Action levels developed on a case-by-case basis (see below), but calculated criteria are not to exceed Maximum Contaminant Levels (MCLs) under the California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64431

The Cadmium, Copper, Chromium (III), Lead, Nickel, Silver and Zinc NALs for MS4 discharges to freshwater receiving waters will be developed on a case-by-case basis because the freshwater criteria are based on site-specific water quality data (receiving water hardness). For these priority pollutants, the following equations (40 CFR 131.38.b.2) will be required:

Cadmium (Total Recoverable)	= exp(0.7852[ln(hardness)] - 2.715)
Chromium III (Total Recoverable)	= exp(0.8190[ln(hardness)] + 0.6848)
Copper (Total Recoverable)	= exp(0.8545[ln(hardness)] - 1.702)
Lead (Total Recoverable)	= exp(1.273[ln(hardness)] - 4.705)
Nickel (Total Recoverable)	= exp(.8460[ln(hardness)] + 0.0584)
Silver (Total Recoverable)	= exp(1.72[ln(hardness)] - 6.52)
Zinc (Total Recoverable)	= exp(0.8473[ln(hardness)] + 0.884)

(3) Non-Storm Water Discharges from MS4s to Inland Surface Waters

Table C-4. Non-Storm Water Action Levels for Discharges from MS4s to Inland Surface Waters

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Dissolved Oxygen	mg/L	Not less than 5.0 in WARM waters and not less than 6.0 in COLD waters			BP
Turbidity	NTU	-	20	See MDAL	BP
pH	Units	Within limit of 6.5 to 8.5 at all times			BP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	33	-	61[3]	BP
Total Nitrogen	mg/L	-	1.0	See MDAL	BP
Total Phosphorus	mg/L	-	0.1	See MDAL	BP
MBAS	mg/L	-	0.5	See MDAL	BP
Iron	mg/L	-	0.3	See MDAL	BP
Manganese	mg/L	-	0.05	See MDAL	BP
Priority Pollutants	ug/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
BP – Basin Plan water quality objective
COLD – cold freshwater habitat beneficial use
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
MDAL – maximum daily action level
WARM – warm freshwater habitat beneficial use
MBAS – Methylene Blue Active Substances
MPN/100 ml – most probable number per 100 milliliters
ug/L – micrograms per liter

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for freshwater "designated beach areas" and is not applicable to waterbodies that are not designated with the water contact recreation (REC-1) beneficial use.

b. If not identified in Provision C.1.a, NALs must be identified, developed and incorporated in the Water Quality Improvement Plan for any pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in waters of the state associated with the highest priority water quality conditions related to non-storm water discharges from the MS4s. NALs must be based on:

(1) Applicable water quality standards which may be dependent upon site-specific or receiving water-specific conditions or assumptions to be identified by the Copermittees; or

(2) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. Dry weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.b may be utilized to develop or revise NALs based on watershed-specific data, subject to San Diego Water Board Executive Officer approval.

Deleted: <#>For the NALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary NALs specific to the Watershed Management Area at levels greater than the NALs required by Provisions C.1.a and C.1.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for addressing non-storm water discharges to and from the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and from the MS4. The secondary NALs may be developed using an approach acceptable to the San Diego Water Board.¶
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2. Default Storm Water Action Levels[10]

The Copermittees must develop and incorporate numeric storm water action levels (SALs) in the Water Quality Improvement Plans to: 1) support the development and prioritization of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s, and 2) assess the effectiveness of the water quality improvement strategies toward reducing pollutants in storm water discharges, required pursuant to Provision D.4.b.(2).[11]

The following stormwater action levels (SALs) must be incorporated in the WQIPs if the Copermittees have not developed their own SALs for the identified high priority constituents using an approach approved by the Regional Board EO.

a. The following SALs for discharges of storm water from the MS4 must be incorporated:

Table C-5. Storm Water Action Levels for Discharges from MS4s to Receiving Waters

Parameter	Units	Action Level
Turbidity	NTU	126
Nitrate & Nitrite (Total)	mg/L	2.6
Phosphorus (Total P)	mg/L	1.46
Cadmium (Total Cd)*	µg/L	3.0
Copper (Total Cu)*	µg/L	127
Lead (Total Pb)*	µg/L	250
Zinc (Total Zn)*	µg/L	976

Abbreviations/Acronyms:
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
ug/L – micrograms per liter

Notes:
* The sampling must include a measure of receiving water hardness at each MS4 outfall. If a total metal concentration exceeds the corresponding metals SAL in Table C-5, that concentration must be compared to the California Toxics Rule criteria and the USEPA 1-hour maximum concentration for the detected level of receiving water hardness associated with that sample. If it is determined that the sample's total metal concentration for that specific metal exceeds that SAL, but does not exceed the applicable USEPA 1-hour maximum concentration criterion for the measured level of hardness, then the sample result will not be considered above the SAL for that measurement.

[10] SALs are not considered by the San Diego Water Board to be enforceable limitations.
[11] The Copermittees may utilize SALs or other benchmarks currently established by the Copermittees as interim SALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

b. If not identified in Provision C.2.a, SALs must be identified, developed and incorporated in the Water Quality Improvement Plan for pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in waters of the state associated with the highest water quality priorities related to storm water discharges from the MS4s. SALs must be based on:

(1) Federal and State water quality guidance and/or water quality standards; and

(2) Site-specific or receiving water-specific conditions; or

(3) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. Wet weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.c may be used to develop or revise SALs based upon watershed-specific data, subject to San Diego Water Board Executive Officer approval.

Deleted: For the SALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary SALs specific to the Watershed Management Area at levels greater than the SALs required by Provisions C.2.a and C.2.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s. The secondary SALs may be developed based on the approaches recommended by the State Water Board's Storm Water Panel

Deleted: [12] or using an approach acceptable to the San Diego Water Board.¶
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D. MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS

The purpose of this provision is for the Copermittees to monitor and assess the impact on the chemical, physical, and biological conditions of receiving waters caused by discharges from the Copermittees' MS4s under wet weather and dry weather conditions. The goal of the monitoring and assessment program is to inform the Copermittees about the nexus between the health of receiving waters and the water quality condition of the discharges from their MS4s. This goal will be accomplished through monitoring and assessing the conditions of the receiving waters, discharges from the MS4s, pollutant sources and/or stressors, and effectiveness of the water quality improvement strategies implemented as part of the Water Quality Improvement Plans.

1. Receiving Water Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the condition of the receiving waters in each Watershed Management Area during dry weather and wet weather. Following acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct long-term receiving water monitoring during implementation of the Water Quality Improvement Plan to assess the long term trends and determine if conditions in receiving waters are improving. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following receiving water monitoring procedures:

a. TRANSITIONAL RECEIVING WATER MONITORING

Until the monitoring requirements of Provisions D.1.b-e are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following receiving water monitoring in the Watershed Management Area:

(1) Continue the receiving water monitoring programs required in Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016;

(2) Continue the monitoring in the Hydromodification Management Plans approved by the San Diego Water Board;

(3) Participate in the following regional receiving water monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring,

(b) Southern California Bight Regional Monitoring, and

(c) Sediment Quality Monitoring;

(4) Implement the monitoring programs developed as part of any implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) for the TMDLs in Attachment E to this Order; and

(5) For Watershed Management Areas with ASBS, implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

b. LONG-TERM RECEIVING WATER MONITORING STATIONS

The Copermittees must select at least one long-term receiving water monitoring station from among the existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees to be representative of the receiving water quality in the Watershed Management Area. Additional long-term receiving water monitoring stations must be selected where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

c. DRY WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three dry weather monitoring events at each of the long-term receiving water monitoring stations. At least one monitoring event must be conducted during the dry season (May 1 – September 30) and at least one monitoring event must be conducted during a dry weather period during the wet season (October 1

– April 30), after the first wet weather event of the season, with an antecedent dry period of at least 72 hours following a storm event producing measureable rainfall of greater than 0.1 inch.

(1) Dry Weather Receiving Water Field Observations

For each dry weather monitoring event, the Copermittees must record field observations consistent with Table D-1 at each long-term receiving water monitoring station.

Table D-1. Field Observations for Receiving Water Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) • Station description (i.e. deposits or stains, vegetation condition, structural condition, and observable biology) • Presence and assessment of trash in and around station

(2) Dry Weather Receiving Water Field Monitoring

For each dry weather monitoring event, if conditions allow the collection of the data, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

Table D-2. Field Monitoring Parameters for Receiving Water Monitoring Stations

Parameters
• pH • Temperature • Specific conductivity • Dissolved oxygen • Turbidity

(3) Dry Weather Receiving Water Analytical Monitoring

For each dry weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable NAL constituents, and

(v) Constituents listed in Table D-3.

Table D-3. Analytical Monitoring Constituents for Receiving Water Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Pesticides	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Mercury • Nickel • Selenium • Thallium • Zinc	• Organophosphate Pesticides • Pyrethroid Pesticides	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Total Coliform at inland receiving water monitoring stations.

Deleted: Fecal

(4) Dry Weather Receiving Water Toxicity Monitoring

For each dry weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for toxicity in accordance with Table D-4:

Table D-4. Dry Weather Toxicity Testing for Receiving Water Monitoring Stations

Freshwater Organism	Test Approach	USEPA Protocol[2]
Pimephales promelas	1 acute 1 chronic[1]	EPA-821-R-02-012
Hyalella Azteca	1 acute 1 chronic[1]	EPA-821-R-02-012
Psuedokirchneriella subcapitata	1 acute 1 chronic[1]	EPA-821-R-02-013

Notes:
1. Chronic toxicity testing is not required at receiving water monitoring stations located at mass loading stations if the channel flows are diverted year-round during dry weather conditions to the sanitary sewer for treatment.
2. USEPA protocols must be utilized for toxicity testing unless alternate toxicity testing protocols have been approved by the San Diego Water Board.

(5) Dry Weather Receiving Water Bioassessment Monitoring

Bioassessment monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must conduct bioassessment monitoring during at least one dry weather monitoring event at each long-term receiving water monitoring station as follows:

(a) The following bioassessment samples and measurements must be collected:

(i) Macroinvertebrate samples must be collected in accordance with the "Reachwide Benthos (Multihabitat) Procedure" in the most current Surface Water Ambient Monitoring Program (SWAMP) Bioassessment Standard Operating Procedures (SOP), and amendments, as applicable;[13]

(ii) The "Full" suite of physical habitat characterization measurements must be collected in accordance with the most current SWAMP Bioassessment SOP, and as summarized in the SWAMP Stream Habitat Characterization Form – Full Version;[14] and

(iii) Freshwater algae samples must be collected in accordance with the

[13] Ode, P.R.. 2007. Standard operating procedures for collecting macroinvertebrate samples and associated physical and chemical data for ambient bioassessments in California. California State Water Resources Control Board Surface Water Ambient Monitoring Program (SWAMP) Bioassessment SOP 001. http://www.swrcb.ca.gov/water_issues/programs/swamp/tools.shtml#monitoring
[14] Available at:
http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/reports/fieldforms_fullversion052908.pdf

SWAMP Standard Operating Procedures for Collecting Algae Samples.[15] Analysis of samples must include algal taxonomic composition (diatoms and soft algae) and algal biomass.

(b) The bioassessment samples, measurements, and appropriate water chemistry data must be used to calculate the following:

(i) An Index of Biological Integrity (IBI) for macroinvertebrates for each monitoring station where bioassessment monitoring was conducted, based on the most current calculation method;[16] and

(ii) An IBI for algae for each monitoring station where bioassessment monitoring was conducted, when a calculation method is developed.[17]

(c) In lieu of the requirements of Provision D.1.c.(5)(a), the Copermittees may conduct the bioassessment monitoring in accordance with the "Triad" assessment approach[18] to calculate the IBIs required for Provision D.1.c.(5)(b). The Copermittees must conduct sampling, analysis, and reporting of specified in-stream biological and habitat data according to the protocols specified in the SCCWRP Technical Report No. 539, or subsequent protocols, if developed.

(6) Dry Weather Receiving Water Hydromodification Monitoring

In addition to the hydromodification monitoring conducted as part of the Copermittees' Hydromodification Management Plans, hydromodification monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must collect the following hydromodification monitoring observations and measurements within an appropriate domain of analysis during at least one dry weather monitoring event for each long-term receiving water monitoring station:

(a) Channel conditions, including:

(i) Channel dimensions,

[15] Fetscher et al. 2009. Standard Operating Procedures for Collecting Stream Algae Samples and Associated Physical Habitat and Chemical Data for Ambient Bioassessments in California.
[16] The most current calculation method at the time the Order was adopted is outlined in "A Quantitative Tool for Assessing the Integrity of Southern California Coastal Streams" (Ode, et al. 2005. Environmental Management. Vol. 35, No. 1, pp. 1-13). If an updated or new calculation method is developed, either both (i.e. current and updated/new) methods must be used, or historical IBIs must be recalculated with the updated or new calculation method.
[17] When a calculation method is developed, IBIs must be calculated for all available and appropriate historical data.
[18] Stormwater Monitoring Coalition Model Monitoring Technical Committee, 2004. Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California. Technical Report #419. August 2004.

(ii) Hydrologic and geomorphic conditions, and

(iii) Presence and condition of vegetation and habitat;

(b) Location of discharge points;

(c) Habitat integrity;

(d) Photo documentation of existing erosion and habitat impacts, with location (i.e. latitude and longitude coordinates) where photos were taken;

(e) Measurement or estimate of dimensions of any existing channel bed or bank eroded areas, including length, width, and depth of any incisions; and

(f) Known or suspected cause(s) of existing downstream erosion or habitat impact, including flow, soil, slope, and vegetation conditions, as well as upstream land uses and contributing new and existing development.

d. WET WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three wet weather monitoring events at each long-term receiving water monitoring station. At least one wet weather monitoring event must be conducted during the first wet weather event of the wet season (October 1 – April 30), and at least one wet weather monitoring event during a wet weather event that occurs after February 1.

(1) Wet Weather Receiving Water Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each long-term receiving water monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event;

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(c) Station condition (i.e. deposits or stains, vegetation condition, structural

condition, observable biology); and

(d) Presence and assessment of trash in and around station.

(2) Wet Weather Receiving Water Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

(3) Wet Weather Receiving Water Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) Constituents listed in Table D-3.

(4) Wet Weather Receiving Water Toxicity Monitoring

For each wet weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for toxicity in accordance with Table D-5:

Table D-5. Wet Weather Toxicity Testing for Receiving Water Monitoring Stations

Freshwater Organism	Test Approach	USEPA Protocol[1]
Pimephales promelas	1 acute	EPA-821-R-02-012
Hyalella Azteca	1 acute	EPA-821-R-02-012
Psuedokirchneriella subcapitata	1 acute	EPA-821-R-02-013

Notes:
1. USEPA protocols must be utilized for toxicity testing unless alternate toxicity testing protocols have been approved by the San Diego Water Board.

e. OTHER RECEIVING WATER MONITORING REQUIREMENTS

(1) Regional Monitoring

The Copermittees must participate in the following regional receiving waters monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring; and

(b) Southern California Bight Regional Monitoring.

(2) Sediment Quality Monitoring

The Copermittees must perform sediment monitoring to assess compliance with sediment quality receiving water limits applicable to MS4 discharges to enclosed bays and estuaries. The monitoring may be performed either by individual or multiple Copermittees to assess compliance with receiving water limits, or through participation in a water body monitoring coalition. The Copermittees must identify sediment sampling stations that are spatially representative of the sediment within the water body segment or region of interest. Sediment quality monitoring must be conducted in conformance with the monitoring requirements set forth in the State Water Board Sediment Quality Control Plan.

(3) ASBS Monitoring

For Watershed Management Areas with ASBS, the Copermittees must implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

f. ALTERNATIVE WATERSHED MONITORING REQUIREMENTS

The San Diego Water Board may direct the Copermittees to participate in an effort to develop alternative watershed monitoring with other regulated entities, other interested parties, and the San Diego Water Board to refine, coordinate, and implement regional monitoring and assessment programs to determine the status and trends of water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams.

In lieu of the Receiving Water Monitoring Program requirements specified in 1.a to 1.d, the Copermittees may participate in the development and implementation of monitoring for the collaborative receiving waters monitoring program. It is expected that a regional monitoring will allow for a more effective and efficient receiving waters monitoring program. The regional monitoring plan must be submitted to the Executive Officer for review and approval. Documentation of participation and monitoring shall be included in the annual report.

2. MS4 Outfall Discharge Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the discharges from the MS4 outfalls in each Watershed Management Area during dry weather and wet weather. Following acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct MS4 outfall discharge monitoring during implementation of the Water Quality Improvement Plan to assess the effectiveness of their jurisdictional runoff management programs toward effectively prohibiting non-storm water discharges and reducing pollutants in storm water discharges to and from their MS4s. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following MS4 outfall monitoring procedures:

a. TRANSITIONAL MS4 OUTFALL DISCHARGE MONITORING

Until the monitoring requirements of Provisions D.2.b-c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following MS4 outfall discharge monitoring in the Watershed Management Area:

(1) MS4 Outfall Discharge Monitoring Station Inventory

Each Copermittee must identify all major MS4 outfalls that discharge directly to receiving waters within its jurisdiction and geo-locate those outfalls on a map of the MS4 pursuant to Provision E.2.b.(1). This information must be compiled into a MS4 outfall discharge monitoring station inventory, and must include the following information:

(a) Latitude and longitude of MS4 outfall point of discharge;

(b) Watershed Management Area;

(c) Hydrologic subarea;

(d) Outlet size;

(e) Accessibility (i.e. safety and without disturbance of critical habitat);

(f) Approximate drainage area; and

(g) Classification of whether the MS4 outfall is known to have persistent dry weather flows, transient dry weather flows, no dry weather flows, or unknown dry weather flows.

(2) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Until the monitoring requirements of Provision D.2.b are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, each Copermittee must perform dry weather MS4 outfall field screening monitoring to identify non-storm water and illicit discharges within its jurisdiction in accordance with Provision E.2.c, to determine which discharges are transient flows and which are persistent flows, and prioritize the dry weather MS4 discharges that will be investigated and eliminated in accordance with Provision E.2.d. Each Copermittee must conduct the following dry weather MS4 outfall discharge field screening monitoring within its jurisdiction:

(a) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Frequency

Each Copermittee must field screen the MS4 outfalls in its inventory developed pursuant to Provision D.2.a.(1) as follows:

(i) For Copermittees with less than 125 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area,

at least 80 percent of the outfalls must be visually inspected two times per year during dry weather conditions.

(ii) For Copermittees with 125 major MS4 outfalls or more, but less than or equal to 500, that discharge to receiving waters within a Watershed Management Area all the outfalls must be visually inspected at least annually during dry weather conditions.

(iii) For Copermittees with more than 500 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 500 outfalls must be visually inspected at least annually during dry weather conditions. Copermittees with more than 500 major MS4 outfalls within a Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(iv) For Copermittees with more than 500 major MS4 outfalls within its jurisdiction that are located in more than one Watershed Management Area, at least 500 major MS4 outfalls within its inventory must be visually inspected at least annually during dry weather conditions. Copermittees with more than 500 major MS4 outfalls in more than one Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(v) Inspections of major MS4 outfalls conducted in response to public reports and staff or contractor reports and notifications may count toward the required visual inspections of MS4 outfall discharge monitoring stations.

(b) Transitional Dry Weather MS4 Outfall Discharge Field Screening Visual Observations

(i) An antecedent dry period of at least 72 hours following any storm event producing measurable rainfall greater than 0.1 inch is required prior to conducting field screening visual observations during a field screening monitoring event.

(ii) During the field screening monitoring event, each Copermittee must record visual observations consistent with Table D-6 at each MS4 outfall discharge monitoring station inspected.

Table D-6. Field Screening Visual Observations for MS4 Outfall Discharge Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) - Flow source(s) suspected or identified from non-storm water source investigation - Flow source(s) eliminated during non-storm water source identification • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) - Known or suspected source(s) of pooled or ponded water • Station description (i.e. deposits or stains, vegetation condition, structural condition, observable biology) • Presence and assessment of trash in and around station • Evidence or signs of illicit connections or illegal dumping

(iii) Each Copermittee must implement the requirements of Provisions E.2.d.(2)(c)-(e) based on the field observations.

(iv) Each Copermittee must evaluate field observations together with existing information available from prior reports, inspections and monitoring results to determine whether any observed flowing, pooled, or ponded waters are likely to be transient or persistent flow.[19]

(c) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Records

[19] Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

Based upon the results of the transitional dry weather MS4 outfall discharge field screening monitoring conducted pursuant to Provisions D.2.a.(2)(a)-(b), each Copermittee must update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow.

(3) Transitional Wet Weather MS4 Outfall Discharge Monitoring

Until the monitoring requirements of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(a) Transitional Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees must select at least five wet weather MS4 outfall discharge monitoring stations from the inventories developed pursuant to Provision D.2.a.(1) that are representative of storm water discharges from areas consisting primarily of residential, commercial, industrial, and typical mixed-use land uses present within the Watershed Management Area.

(b) Transitional Wet Weather MS4 Outfall Discharge Monitoring Frequency

Each wet weather MS4 outfall discharge monitoring station selected pursuant to Provision D.2.a.(3)(a) must be monitored twice during the wet season (October 1 – April 30). One wet weather monitoring event must be conducted during the first wet weather event of the wet season, and one wet weather monitoring event at least a month after the first wet weather event of the wet season.

Transitional wet weather MS4 outfall discharge monitoring may begin in year 2 of the transitional period once the MS4 outfall discharge monitoring stations have been inventoried and evaluated pursuant to Provision D.2.a.(1)

(c) Transitional Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(i) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and

the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(ii) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(iii) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(iv) Presence and assessment of trash in and around station.

(d) Transitional Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(e) Transitional Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, and indicator bacteria;

(iv) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

[a] Time-weighted composites collected over the length of the storm event or the first 24 hour period, whichever is shorter, composed of discrete samples, which may be collected through the use of automated equipment, or

[b] Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

[c] If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during

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the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours;

(v) Only one analysis of the composite of aliquots is required;

(vi) The samples must be analyzed for the following constituents:

[a] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List with the exception of toxicity[20],

[b] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and

[c] Constituents listed in in Table D-7.

[e] The Copermittee may be relieved of analytical monitoring requirements [a] to [c] if supporting information can be provided or has historical data that can demonstrate or provide justification that the analysis of the constituent is not necessary.

[20] Copermittees may provide an alternate approach to evaluate and identify the cause of toxicity currently affecting receiving waters and to iteratively adapt the monitoring program to address these chemical stressors in their MS4 outfall discharges in the monitoring plan which is subject to Regional Board approval.

Table D-7. Analytical Monitoring Constituents for Wet Weather MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Nickel • Selenium • Thallium • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Total Coliform for dishcarges to inland surface waters.

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(f) Other Transitional Wet Weather MS4 Outfall Discharge Monitoring

The San Diego County Copermittees must continue the wet weather MS4 outfall monitoring program developed under Order No. R9-2007-0001, as approved by the San Diego Water Board, through its planned completion.

b. DRY WEATHER MS4 OUTFALL DISCHARGE MONITORING

Each Copermittee must perform dry weather MS4 outfall monitoring to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. Each Copermittee must conduct the following dry weather MS4 outfall discharge monitoring within its jurisdiction:

(1) Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Each Copermittee must continue to perform the dry weather MS4 outfall discharge field screening monitoring in accordance with the requirements of Provision D.2.a.(2). The Copermittee may adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of persistent flow non-storm water discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of visual inspections performed is equivalent to the number of visual inspections required under Provision D.2.a.(2)(a).

(2) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring

Each Copermittee must perform non-storm water persistent flow MS4 outfall discharge monitoring to determine which persistent non-storm water discharges contain concentrations of pollutants below NALs, and which persistent non-storm water discharges impact receiving water quality during dry weather. Each Copermittee must conduct the following non-storm water persistent flow MS4 outfall discharge monitoring within its jurisdiction:

(a) Prioritization of Non-Storm Water Persistent Flow MS4 Outfalls

Based upon the dry weather MS4 outfall discharge field screening monitoring records developed pursuant to Provision D.2.a.(2)(c), each Copermittee must identify and prioritize the MS4 outfalls with persistent flows based on the highest priority water quality conditions identified in the Water Quality Improvement Plan and any additional criteria developed by the Copermittee, which may include historical data and data from sources other than what the Copermittee collects.

(b) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring Frequency

(i) Based on the prioritization of major MS4 outfalls developed under Provision D.2.b.(2)(a), each Copermittee must identify, at a minimum, the 10 highest priority major MS4 outfalls with non-storm water persistent flows that the Copermittee will monitor within each Watershed Management Area within its jurisdiction. The location of the highest priority non-storm water persistent flow MS4 outfall monitoring stations must be identified on the map required pursuant to Provision E.2.b.(1).

(ii) Each of the highest priority non-storm water persistent flow MS4 outfall monitoring stations identified pursuant to Provision D.2.b.(2)(b)(i) must be monitored under dry weather conditions at least semi-annually until one of the following occurs:

[a] The non-storm water discharges have been effectively eliminated (i.e. no flowing, pooled, or ponded water) for three consecutive dry weather monitoring events; or

[b] The source(s) of the persistent flows has been identified as a category of non-storm water discharges that does not require an NPDES permit and does not have to be addressed as an illicit discharge because it was not identified as a source of pollutants (i.e. constituents in non-storm water discharge do not exceed NALs), and the persistent flow can be re-prioritized to a lower priority; or

[c] The constituents in the persistent flow non-storm water discharge do not exceed NALs, and the persistent flow can be re-prioritized to a lower priority; or

[d] The source(s) of the persistent flows has been identified as a non-storm water discharge authorized by a separate NPDES permit.

(iii) Where the criteria under Provision D.2.b.(2)(c)(ii) are not met, but the threat to water quality has been reduced by the Copermittee, the highest priority persistent flow MS4 outfall monitoring stations may be reprioritized accordingly for continued dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1).

(iv) Each Copermittee must document removal or re-prioritization of the highest priority persistent flow MS4 outfall monitoring stations identified under Provision D.2.b.(2)(b) in the Annual Report. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized MS4 major outfall in the Watershed Management Area within its jurisdiction, unless there are no remaining qualifying major MS4 outfalls within the Copermittee's jurisdiction in the Watershed Management Area.

(c) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Observations

During each semi-annual monitoring event, each Copermittee must record field observations consistent with Table D-6 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(d) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Monitoring

During each semi-annual monitoring event, if conditions allow the collection of the data, each Copermittee must monitor and record the parameters in Table D-2 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(e) Non-Storm Water Persistent Flow MS4 Outfall Discharge Analytical Monitoring

During each semi-annual monitoring event in which measurable flow is present, each Copermittee must collect and analyze samples from each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Collect grab or composite samples to be analyzed for the following constituents:

[a] Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,
[b] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List with the exception of toxicity[21],
[c] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,
[d] Applicable NAL constituents, and
[e] Constituents listed in Table D-8, unless the Copermittee has historical data that can demonstrate or provide justification that the analysis of the constituent is not necessary.
[f] The Copermittee may be relieved of analytical monitoring requirements if supporting information can be provided or has historical data that can demonstrate or provide justification that the analysis of the constituent is not necessary.

Table D-8. Analytical Monitoring Constituents for Persistent Flow MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Total Hardness • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Cadmium • Copper • Lead • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Total Coliform for discharges to inland surface waters.

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[21] Copermittees may provide an alternate approach to evaluate and identify the cause of toxicity currently affecting receiving waters and to iteratively adapt the monitoring program to address these chemical stressors in their MS4 outfall discharges in the monitoring plan which is subject to Regional Board approval.

(iv) If the Copermittee identifies and eliminates the source of the persistent flow non-storm water discharge, analysis of the sample is not required.

c. WET WEATHER MS4 OUTFALL DISCHARGE MONITORING

The Copermittees must perform wet weather MS4 outfall monitoring to identify sources of pollutants in storm water discharges from the MS4s in the Watershed Management Area. The Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(1) Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees may adjust the wet weather MS4 outfall discharge monitoring locations and frequencies in the Watershed Management Area, as needed, to identify sources of pollutants in storm water discharges from MS4s in the Watershed Management Area in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of stations is at least equivalent to the number of stations required under Provision D.2.a.(3)(a).

(2) Wet Weather MS4 Outfall Discharge Monitoring Frequency

The Copermittees must monitor the wet weather MS4 outfall discharge monitoring stations in the Watershed Management Area at an appropriate frequency to identify sources of pollutants in storm water discharges from the MS4s causing or contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan.

(3) Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(d) Presence and assessment of trash in and around station.

(4) Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(5) Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites collected over the length of the storm event or the first 24 hour period, whichever is shorter, composed of discrete samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

(iii) If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours.

(e) Only one analysis of the composite of aliquots is required;

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(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List, with the exception of toxicity[22],

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and

(iv) Applicable SAL constituents.

(v) The Copermittee may be relieved of analytical monitoring requirements if supporting information can be provided or has historical data that can demonstrate or provide justification that the analysis of the constituent is not necessary.

[22] Copermittees may provide an alternate approach to evaluate and identify the cause of toxicity currently affecting receiving waters and to iteratively adapt the monitoring program to address these chemical stressors in their MS4 outfall discharges in the monitoring plan which is subject to Regional Board approval.

3. Special Studies

a. Within the term of this Order, the Copermittees must develop and implement the following special studies:

(1) At least three special studies in each Watershed Management Area to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that cause or contribute to highest priority water quality conditions identified in the Water Quality Improvement Plan.

(2) At least two special studies for the San Diego Region to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that are impacting receiving waters on a regional basis in the San Diego Region.

(3) One of the three special studies in each Watershed Management Area may be replaced by a special study implemented pursuant to Provision D.3.a.(2).

b. The special studies must, at a minimum, be in conformance with the following criteria:

(1) The special studies must be related to the highest priority water quality conditions identified by the Copermittees in the Watershed Management Area and/or for the entire San Diego Region;

(2) The special studies developed pursuant to Provision D.3.a.(1) must:

(a) Be implemented within the applicable Watershed Management Area, and

(b) Require some form of participation by all the Copermittees within the Watershed Management Area;

(3) The special studies developed pursuant to Provision D.3.a.(2) must:

(a) Be implemented within the San Diego Region, and

(b) Require some form of participation by all Copermittees covered under the requirements of this Order.

c. Special studies developed to identify sources of pollutants and/or stressors should be pollutant and/or stressor specific and based on historical monitoring data and monitoring performed pursuant to Provisions D.1 and D.2. Development of source identification special studies should include the following:

(1) A compilation of known information on the specific pollutant and/or stressor, including data on potential sources and movement of the pollutant and/or

stressor within the watershed. Data generated by the Copermittees and others, as well as information available from a literature research on the pollutant and/or stressor should be compiled and analyzed as appropriate.

(2) An identification of data gaps, based on the compiled information generated on the specific pollutant and/or stressor in Provision D.3.d.(1). Source identification special studies should be developed to fill identified data gaps.

(3) A monitoring plan that will collect and provide data the Copermittees can utilize to do the following:

(a) Quantify the relative loading or impact of a pollutant and/or stressor from a particular source or pollutant generating activity;

(b) Improve understanding of the fate of a pollutant and/or stressor in the environment;

(c) Develop an inventory of known and suspected sources of a pollutant and/or stressor in the Watershed Management Area; and/or

(d) Prioritize known and suspected sources of a pollutant and/or stressor based on relative magnitude in discharges, geographical distribution (i.e., regional or localized), frequency of occurrence in discharges, human health risk, and controllability.

d. Special studies initiated prior to the acceptance of the Water Quality Improvement Plan that meet the requirements of Provision D.3.b and are completed during the term of this Order may be utilized to fulfill the special study requirements of Provision D.3.a.

e. The Copermittees must submit the monitoring plans for the special studies in the Water Quality Improvement Plans required pursuant to Provision F.1.

f. The Copermittees are encouraged to share the results of the special studies regionally among the Copermittees to provide information useful in improving and adapting the management of non-storm water and storm water runoff through the implementation of the Water Quality Improvement Plans.

4. Assessment Requirements

Each Copermittee must evaluate the data collected pursuant to Provisions D.1, D.2 and D.3, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E, to assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a. Assessments must be performed as described in the following provisions:

a. RECEIVING WATERS ASSESSMENTS

(1) The Copermittees must assess and report the conditions of the receiving waters in the Watershed Management Area as follows:

(a) Based on data collected pursuant to Provision D.1.a, the assessments under Provision D.4.a.(2) must be included in the first Annual Report required pursuant to Provision F.3.b.(1).

(b) Based on the data collected pursuant to Provisions D.1.a-e, the assessments required under Provision D.4.a.(2) must be included in the Report of Waste Discharge required pursuant to Provision F.5.b.

(2) The Copermittees must assess the status and trends of receiving water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under dry weather and wet weather conditions. For each of the three types of receiving waters in each Watershed Management Area the Copermittees must:

(a) Determine whether or not the conditions of the receiving waters are protective of the designated beneficial uses;

(b) Identify the most critical beneficial uses that must be protected to ensure overall health of the receiving water;

(c) Determine whether or not those critical beneficial uses are being protected;

(d) Identify short-term and/or long-term improvements or degradation of those critical beneficial uses;

(e) Identify data gaps in the monitoring data necessary to assess Provisions D.4.a.(2)(a)-(d).

b. MS4 OUTFALL DISCHARGES ASSESSMENTS

(1) <u>Non-Storm Water Discharges Reduction Assessments</u>

(a) Each Copermittee must assess and report the progress of its illicit discharge detection and elimination program, required to be implemented pursuant to Provision E.2, toward effectively prohibiting non-storm water and illicit discharges into the MS4 within its jurisdiction as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(2), the assessments under Provision D.4.b.(1)(b) must be included in the first Annual Report required pursuant to Provision F.3.b.(1).

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(ii) Based on the data collected pursuant to Provisions D.2.b, the assessments required under Provision D.4.b.(1)(c) must be included in the first Annual Report required pursuant to Provision F.3.b.(1), and annually thereafter.

(iii) Based on the data collected pursuant to Provisions D.2.b, the assessment required under Provision D.4.b.(1)(c) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.a.(2), each Copermittee must assess and report the following:

(i) Identify the known and suspected controllable sources (e.g. facilities, areas, land uses, pollutant generating activities) of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area;

(ii) Identify sources of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area that have been reduced or eliminated; and

(iii) Identify modifications to the field screening monitoring locations and frequencies for the MS4 outfalls in its inventory necessary to identify and eliminate sources of persistent flow non-storm water discharges pursuant to Provision D.2.b.(1).

(c) Based on the dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b, each Copermittee must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(1)(b);

(ii) Based on the data collected and applicable NALs in the Water Quality Improvement Plan, rank the MS4 outfalls in the Copermittee's jurisdiction according to potential threat to receiving water quality, and produce a prioritized list of major MS4 outfalls for follow-up action to update the Water Quality Improvement Plan, with the goal of eliminating persistent flow non-storm water discharges and/or pollutant loads in order of the ranked priority list through targeted programmatic actions and source investigations;

(iii) For the highest priority major MS4 outfalls with persistent flows that are in exceedance of NALs, identify the known and suspected sources within the Copermittee's jurisdiction in the Watershed Management Area that may cause or contribute to the NAL exceedances;

(iv) Each Copermittee must analyze the data collected pursuant to Provision D.2.b, and utilize a model or other method, to calculate or estimate the non-storm water volumes and pollutant loads discharged from all the major MS4s outfalls in its jurisdiction identified as having persistent dry weather flows during the monitoring year. These calculations or estimates must be updated annually. Each Copermittee must calculate or estimate:

[a] Annual non-storm water volumes and pollutant loads discharged from the Copermittee's major MS4 outfalls to receiving waters within the Copermittee's jurisdiction, with an estimate of the percent contribution from each known and suspected source for each MS4 outfall;

[b] Annual non-storm water volumes and pollutant loads from areas or facilities subject to the Copermittee's legal authority that are discharged from the Copermittee's major MS4 outfalls to downstream receiving waters.

(v) Each Copermittee must review the data collected pursuant to Provision D.2.b and findings from the assessments required pursuant to Provision D.4.b.(1)(c)(i)-(iv) on an annual basis to:

[a] Identify reductions and progress in achieving reductions in non-storm water and illicit discharges to the Copermittee's MS4 in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction, with an estimate, if possible, of the non-storm water volume and/or pollutant load reductions attributable to specific water quality strategies implemented by the Copermittee; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittee in the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction.

(vi) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(v).

(2) <u>Storm Water Pollutant Discharges Reduction Assessments</u>

(a) The Copermittees must assess and report the progress of the water quality improvement strategies, required to be implemented pursuant to Provisions B and E, toward reducing pollutants in storm water discharges from the MS4s within the Watershed Management Area as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(3), the assessments under Provision D.4.b.(2)(b) must be included in the first Annual Report required pursuant to Provision F.3.b.(1).

(ii) Based on the data collected pursuant to Provisions D.2.c, the assessments required under Provision D.4.b.(2)(c) must be included in the first Annual Report required pursuant to Provision F.3.b.(1), and annually thereafter.

(iii) Based on the data collected pursuant to Provisions D.2.c, the assessment required under Provisions D.4.b.(2)(c)-(d) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.a.(3) the Copermittees must assess and report the following:

(i) The Copermittees must analyze the monitoring data collected pursuant to Provision D.2.a.(3), and utilize a watershed model or other method, to calculate or estimate storm water volumes and pollutant loads discharged from the MS4s in each Copermittee's jurisdiction within the Watershed Management Area. The Copermittees must calculate or estimate the following for each monitoring year:

[a] The average storm water runoff coefficient for each land use type within the Watershed Management Area;

[b] The volume of storm water discharged from the Copermittee's major MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch;

[c] The pollutant loads discharged from the Copermittee's major MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch; and

[d] The percent contribution of storm water volumes and pollutant loads discharged from each land use type within the drainage basin to the Copermittee's major MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch.

(ii) Identify modifications to the wet weather MS4 outfall discharge monitoring locations and/or frequencies necessary to identify sources pollutants in storm water discharges from the MS4s in the Watershed Management Area pursuant to Provision D.2.c.(1).

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(c) Based on the wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.c the Copermittees must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(2)(b);

(ii) Based on the data collected and applicable SALs in the Water Quality Improvement Plan, rank the MS4 outfalls in the Watershed Management Area according to potential threat to receiving water quality, and produce a prioritized list of major MS4 outfalls for follow-up action to update the Water Quality Improvement Plan;

(iii) The Copermittees must review the data collected pursuant to Provision D.2.c and findings from the assessments required pursuant to Provisions D.4.b.(2)(c)(i)-(ii) on an annual basis to:

[a] Identify reductions or progress in achieving reductions in pollutant concentrations and/or pollutant loads from different land uses and/or drainage areas discharging from the Copermittees' MS4s in the Watershed Management Area;

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[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters within the Watershed Management Area to the MEP, with an estimate, if possible, of the pollutant load reductions attributable to specific water quality strategies implemented by the Copermittees; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittees in the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters in the Watershed Management Area to the MEP.

(iv) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(iii).

(d) The Copermittees must evaluate all the data collected pursuant to Provision D.2.c, and incorporate new outfall monitoring data into time series plots for each long-term monitoring constituent for the Watershed Management Area, and perform statistical trends analysis on the cumulative long-term wet weather MS4 outfall discharge water quality data set.

c. Special Studies Assessments

The Copermittees must annually evaluate the results and findings from the special studies developed and implemented pursuant to Provision D.3, and assess their relevance to the Copermittees' efforts to characterize receiving water conditions, understand sources of pollutants and/or stressors, and control

and reduce the discharges of pollutants from the MS4 outfalls to receiving waters in the Watershed Management Area. The Copermittees must report the results of the special studies assessments applicable to the Watershed Management Area, and identify any necessary modifications or updates to the Water Quality Improvement Plan based on the results in the Annual Reports required pursuant to Provision F.3.b.

d. INTEGRATED ASSESSMENT OF WATER QUALITY IMPROVEMENT PLAN

As part of the iterative approach and adaptive management process required for the Water Quality Improvement Plan pursuant to Provision B.5, the Copermittees in each Watershed Management Area must integrate the data collected pursuant to Provisions D.1-D.3, the findings from the assessments required pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to assess the effectiveness of, and identify necessary modifications to, the Water Quality Improvement Plan as follows:

(1) The Copermittees must re-evaluate the priority water quality conditions and numeric goals for the Watershed Management Area, as needed, during the term of this Order pursuant to Provision B.5.a. The re-evaluation and recommendations for modifications to the priority water quality conditions, and/or numeric goals and corresponding schedules may be provided in the Annual Reports required pursuant to Provision F.3.b, but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The priority water quality conditions and numeric goals for the Watershed Management Area must be re-evaluated as follows:

(a) Re-evaluate the receiving water conditions in the Watershed Management Area in accordance with Provision B.2.a;

(b) Re-evaluate the impacts on receiving waters in the Watershed Management Area from MS4 discharges in accordance with Provision B.2.b;

(c) Re-evaluate the identification of MS4 sources of pollutants and/or stressors in accordance with Provision B.2.d;

(d) Identify beneficial uses of the receiving waters that are protected in accordance with Provision D.4.a;

(e) Evaluate the progress toward achieving the interim and final numeric goals for protecting beneficial uses in the receiving waters.

(2) The Copermittees must re-evaluate the water quality improvement strategies for the Watershed Management Area during the term of this Order pursuant to Provision B.5.b. The re-evaluation and recommendations for modifications

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to the water quality improvement strategies and schedules must be provided in the Annual Reports required pursuant to Provision F.3.b, and provided in the Report of Waste Discharge pursuant to Provision F.5.b. The water quality improvement strategies for the Watershed Management Area must be re-evaluated as follows:

(a) Identify the non-storm water and storm water pollutant loads from the Copermittees' MS4 outfalls in the Watershed Management Area, calculated or estimated pursuant to Provisions D.4.b;

(b) Identify the non-storm water and storm water pollutant load reductions, or other improvements to receiving water or water quality conditions, that are necessary to attain the interim and final numeric goals for protecting beneficial uses in the receiving waters;

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(c) Identify the non-storm water and storm water pollutant load reductions, or other improvements to the quality of MS4 discharges, that are necessary for the Copermittees to demonstrate that non-storm water and storm water discharges from their MS4s are not causing or contributing to exceedances of receiving water limitations;

(d) Evaluate the progress of the water quality improvement strategies toward achieving the interim and final numeric goals for protecting beneficial uses in the receiving waters.

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(3) The Copermittees must re-evaluate and adapt the water quality monitoring and assessment program for the Watershed Management Area when new information becomes available to improve the monitoring and assessment program pursuant to Provision B.5.c. The re-evaluation and recommendations for modifications to the monitoring and assessment program may be provided in the Annual Reports required pursuant to Provision F.3.b, but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. Modifications to the water quality monitoring and assessment program must be consistent with the requirements of Provision D.1-D.3. The re-evaluation of the water quality monitoring and assessment program for the Watershed Management Area must consider the data gaps identified by the assessments required pursuant to Provisions D.4.a-b, and results of the special studies implemented pursuant to Provision D.4.c.

5. Monitoring Provisions

Each Copermittee must comply with all the monitoring, reporting, and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

E. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS

The purpose of this provision is for each Copermittee to implement a program to control non-stormwater discharges into and stormwater discharges from the MS4 within its jurisdiction and to focus and prioritize those implementation actions based on the highest water quality priorities identified within the associated Water Quality Improvement Plan. The goal of the jurisdictional runoff management programs is to implement strategies and actions that effectively prohibit non-storm water discharges into the MS4 and reduce the discharge of pollutants in storm water to the MEP. This goal will be accomplished through implementing the jurisdictional runoff management programs in accordance with the water quality priorities and strategies identified in the Water Quality Improvement Plans.

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Each Copermittee must update its jurisdictional runoff management program document, in accordance with Provision F.2.a, to incorporate the requirements of Provision E consistent with the highest water quality priorities as identified in the corresponding Water Quality Improvement Plan. Until the Copermittee has updated its jurisdictional runoff management program document with the requirements of Provision E, the Copermittee must continue implementing its current jurisdictional runoff management program.

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1. Legal Authority Establishment and Enforcement

a. Each Copermittee must establish, maintain, and enforce adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 through statute, ordinance, permit, contract, order, or similar means. This legal authority must, at a minimum, authorize the Copermittee to:

(1) Effectively prohibit and eliminate all illicit discharges and illicit connections into its MS4;

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(2) Control the contribution of pollutants in discharges of runoff associated with industrial and construction activity into its MS4 and control the quality of runoff from industrial and construction sites[23];

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(3) Control the discharge of spills, dumping, or disposal of materials other than storm water into its MS4;

(4) Control through interagency agreements among Copermittees the contribution of pollutants from one portion of the MS4 to another portion of the MS4;

(5) Control, by coordinating and cooperating with other owners of the MS4 such

[23] The Copermittees will only be responsible for administering and enforcing the codes and ordinances applicable to their jurisdictions (i.e., a municipality is not responsible for administering and/or enforcing a permit issued by the State of California).

as Caltrans, the U.S. federal government, or sovereign Native American Tribes through interagency agreements, where possible, the contribution of pollutants from their portion of the MS4 to the portion of the MS4 within the Copermittee's jurisdiction;

(6) Require compliance with conditions in its statutes, ordinances, permits, contracts, orders, or similar means to hold dischargers to its MS4 accountable for their contributions of pollutants and flows;

(7) Require the use of BMPs to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(8)

(9) Utilize enforcement mechanisms to require compliance with its statutes, ordinances, permits, contracts, orders, or similar means; and

(10) Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with its statutes, ordinances, permits, contracts, orders, or similar means and with the requirements of this Order, including the effective prohibition of illicit discharges and connections to its MS4. The Copermittee's ordinance must include adequate legal authority, to the extent permitted by California and Federal Law and subject to the limitations on municipal action under the constitutions of California and the United States. The Copermittee must also have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from industrial facilities, including construction sites, discharging into its MS4.

b. With the first Annual Report required pursuant to Provision F.3.b, each Copermittee must submit a statement certified by its Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative that the Copermittee has taken the necessary steps to obtain and maintain full legal authority within its jurisdiction to implement and enforce each of the requirements contained in this Order.

2. Illicit Discharge Detection and Elimination

Each Copermittee must implement a program to actively detect and eliminate illicit discharges and improper disposal into the MS4, or otherwise require the discharger to apply for and obtain a separate NPDES permit. The illicit discharge detection and elimination program must be implemented in accordance with the strategies identified in the Water Quality Improvement Plan. The requirements of the jurisdictional runoff management programs as outlined below may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality Improvement Plan(s).

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a. STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the illicit discharge detection and elimination program to address illicit discharges and connections that the Copermittee has identified as potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate BMPs, focus education, and/or increase/decrease frequency of inspections in specific areas); and

(2) The strategies and/or activities must be consistent with the requirements of Provisions E.2.a-d and the strategies identified in the Water Quality Improvement Plan.

b. NON-STORM WATER DISCHARGES

Each Copermittee must address non-storm water discharges as illicit discharges, where the likelihood exists that they are a source of pollutants to the waters of the state, unless the discharge is either identified as a discharge authorized by a separate NPDES permit, or identified as a category of non-storm water discharges that must be addressed pursuant to the following requirements:

(1) Discharges of non-storm water from water line flushing and water main breaks to the MS4 must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG 679001 (Order No. R9-2010-0003, or subsequent order). This category includes water line flushing and water main break discharges from water purveyors issued a water supply permit by the California Department of Public Health or federal military installations. Discharges from recycled or reclaimed water lines to the MS4 must be addressed as illicit discharges, unless the discharges have coverage under a separate NPDES permit.

(2) Discharges of non-storm water to the MS4 from the following categories must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a source of pollutants to receiving waters:

(a) Diverted stream flows;

(b) Rising ground waters;

(c) Uncontaminated ground water infiltration to MS4s;

Comment [K1]: It is recommended that this Provision (2.e) be moved to Provision 2.a

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<#>Uncontaminated pumped ground water;¶
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Discharges from foundation drains;

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<#>Water from crawl space pumps; and¶
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<#>Water from footing drains.[19]¶
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(d) Uncontaminated pumped ground water;

(e) Discharges from foundation drains;[25]

(f) Springs;

(g) Water from crawl space pumps;

(h) Water from footing drains;[24]

(i) Flows from riparian habitats and wetlands;

(j) Discharges from potable water sources;

(k) Discharges from foundation drains;[26] and

(l) Discharges from footing drains.[26]

(3) Discharges of non-storm water into the MS4 from the following categories must be controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means, where there is evidence that those discharges are a source of pollutants to waters of the state. Discharges of non-storm water into the MS4 from the following categories not controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means must be addressed by the Copermittee as illicit discharges.

(a) Air conditioning condensation

The discharge of air conditioning condensation must be directed to landscaped areas or other pervious surfaces where feasible.

(b) Individual residential vehicle washing

(i) The discharge of wash water must be directed to landscaped areas or other pervious surfaces where feasible; and

(ii) Minimize the use of water for vehicle washing, use as little washing detergent and other vehicle wash products as possible, wash vehicles at commercial wash facilities, and implement other practices or behaviors that will prevent the discharge of pollutants associated

[25] Provision E.2.a.(1) only applies to this category on non-storm water if the system is designed to be located at or below the highest historical groundwater table to actively or passively extract groundwater during any part of the year.

[26] Provision E.2.a.(3) only applies to this category of non-storm water discharge if the system is designed to be located above the highest historical groundwater table at all times of the year, and the system is only expected to discharge non-storm water under unusual circumstances.

with individual residential vehicle washing from entering the MS4.

(c) Dechlorinated swimming pool discharges

(i) Eliminate residual chlorine, algaecide, filter backwash, or other pollutants from swimming pools prior to discharging to the MS4; and

(ii) The discharge of saline swimming pool water must be directed to the sanitary sewer, landscaped areas, or other pervious surfaces that can accommodate the volume of water, unless the saline swimming pool water can be discharged via a pipe or concrete channel directly to a naturally saline water body (e.g. Pacific Ocean).

(4) Firefighting discharges to the MS4 must continue to be addressed by the Copermittees as follows:

(a) Non-emergency firefighting discharges

(i) Building fire suppression system maintenance discharges (e.g. sprinkler line flushing) to the MS4 must be addressed as illicit discharges.

(ii) Non-emergency firefighting discharges (i.e., discharges from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems) must be addressed by a program, to be developed and implemented by the Copermittee in conjunction with the local Fire Authority/District, to reduce or eliminate pollutants in such discharges from entering the MS4.

(b) Emergency firefighting discharges (i.e., flows necessary for the protection of life or property) do not require BMPs and need not be prohibited.

(5) If the Copermittee or San Diego Water Board identifies any category of non-storm water discharges listed under Provisions E.2.a.(1)-(4) as a source of pollutants to receiving waters, the category must be prohibited through ordinance, order, or similar means and addressed as an illicit discharge.

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Each Copermittee should develop and encourage implementation of BMPs to reduce or eliminate pollutants in emergency firefighting discharges to the MS4s and receiving waters within its jurisdiction. During emergency situations, priority of efforts should be directed toward life, property, and the environment (in descending order). BMPs should not interfere with immediate emergency response operations or impact public health and safety.¶

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(7) Each Copermittee must, where feasible, reduce or eliminate non-storm water discharges listed under Provisions E.2.a.(1)-(4) into its MS4 whether or not the non-storm water discharge has been identified as an illicit discharge, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit.

c. Prevent And Detect Illicit Discharges And Connections

Each Copermittee must include the following measures within its program to prevent and detect illicit discharges to the MS4:

(1) Each Copermittee must maintain an updated map of its entire MS4 and the corresponding drainage areas. The accuracy of the MS4 map must be confirmed during the field screening required pursuant to Provision E.2.c. The MS4 map must be included as part of the jurisdictional runoff management program document. Any geographic information system (GIS)

layers or files used by the Copermittee to maintain the MS4 map must be made available to the San Diego Water Board upon request. The MS4 map must identify the following:

(a) All segments of the MS4 owned, operated, and maintained by the Copermittee;

(b) All known locations of inlets that discharge and/or collect runoff into the Copermittee's MS4;

(c) All known locations of connections with other MS4s not owned or operated by the Copermittee (e.g. Caltrans MS4s);

(d) All known locations of MS4 outfalls and private outfalls that discharge runoff collected from areas within the Copermittee's jurisdiction;

(e) All segments of receiving waters within the Copermittee's jurisdiction that receive and convey runoff discharged from the Copermittee's MS4 outfalls;

(f) Locations of the MS4 outfalls, identified pursuant to Provision D.2.a.(1), within its jurisdiction; and

(g) Locations of the non-storm water persistent flow MS4 outfall discharge monitoring stations, identified pursuant to Provision D.2.b.(2)(b), within its jurisdiction.

(2) Each Copermittee must use Copermittee personnel and contractors to assist in identifying and reporting illicit discharges and connections during their daily employment activities.

(3) Each Copermittee must promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges into or from the MS4, including the following methods for public reporting:

(a) Operate a public hotline, which can be Copermittee-specific or shared by the Copermittees, and must be capable of receiving reports in both English and Spanish 24 hours per day and seven days per week; and

(b) Designate an e-mail address for receiving electronic reports from the public, which can be Copermittee-specific or shared by the Copermittees, and must be prominently displayed on the Copermittee's webpage and the Regional Clearinghouse required pursuant to Provision F.4.

(4) Each Copermittee must implement practices and procedures (including a notification mechanism) to prevent, respond to, contain, and clean up any

spills that may discharge into the MS4 within its jurisdiction from any source. The Copermittee must coordinate, to the extent possible, with spill response teams to prevent entry of spills into the MS4, and prevent contamination of surface water, ground water, and soil. The Copermittee must coordinate spill prevention, containment, and response activities throughout all appropriate Copermittee departments, programs, and agencies.

(5) Each Copermittee must implement practices and procedures to prevent and limit infiltration of seepage from sanitary sewers (including private laterals and failing septic systems) to the MS4.

(6) Each Copermittee must coordinate, when necessary, with upstream Copermittees and/or entities to prevent illicit discharges from upstream sources into the MS4 within its jurisdiction.

d. FIELD SCREENING

Each Copermittee must conduct field screening (i.e. visual observations, field testing, and/or analytical testing) of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect illicit discharges and connections to the MS4 in accordance with the dry weather MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

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e. INVESTIGATE AND ELIMINATE ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to investigate and eliminate illicit discharges to the MS4:

(1) Each Copermittee must prioritize and determine when follow-up investigations will be performed in response to visual observations and/or water quality monitoring data collected during an investigation of a detected non-storm water or illicit discharge into or from the MS4. The criteria for prioritizing investigations must consider the following:

(a) Pollutants identified as causing or contributing to the highest water quality priorities identified in the Water Quality Improvement Plan;

(b) Pollutants identified as causing or contributing, or threatening to cause or contribute to impairments in water bodies on the 303(d) List and/or in environmentally sensitive areas (ESAs), located within its jurisdiction;

(c) Pollutants identified from sources or land uses known to exist within the area, drainage basin, or watershed that discharges to the portion of the MS4 within its jurisdiction included in the investigation;

(d) Pollutants identified as causing or contributing to an exceedance of an

NAL described in Provision C.1; and

(e) Pollutants identified as an immediate and significant threat to human health or the environment.

(2) Each Copermittee must implement procedures to investigate and inspect portions of its MS4 that, based on reports or notifications, field screening, or other appropriate information, indicate a reasonable potential of receiving, containing, or discharging pollutants due to illicit discharges or illicit connections. The procedures must include the following:

(a) Each Copermittee must develop criteria to:

(i) Assess the validity of each report or notification received; and

(ii) Prioritize the response to each report or notification received.

(b) Each Copermittee must prioritize and respond to each valid report or notification (e.g., public reports, staff or contractor reports and notifications, etc.) of an incident in a timely manner.

(c) Each Copermittee must investigate and seek to identify the source(s) of illicit discharges or illicit connections observed into and from the MS4 during the field screening required pursuant to Provision D.2.b.(1) as follows:

(i) Obvious illicit discharges must be immediately investigated to identify the source(s);

(ii) The investigation must include field investigations to identify sources or potential sources for the discharge, unless the source or potential source has already been identified during previous investigations; and

(iii) The investigation may include follow-up field investigations and/or reviewing Copermittee inventories and other land use data to identify potential sources of the discharge.

(d) Each Copermittee must maintain records and a database of the following information:

(i) Location of incident, including hydrologic subarea, portion of MS4 receiving the illicit discharge or connection, and point of discharge or potential discharge from MS4 to receiving water;

(ii) Source of information initiating the investigation (e.g., public reports, staff or contractor reports and notifications, field screening, etc.);

(iii) Date the information used to initiate the investigation was received;

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(iv) Date the investigation was initiated;

(v) Dates of follow-up investigations;

(vi) Identified or suspected source of the illicit discharge or connection, if determined;

(vii) Known or suspected related incidents, if any;

(viii) Result of the investigation; and

(ix) If a source cannot be identified and the investigation is not continued, a rationale for why a discharge does not pose a threat to water quality and/or does not require additional investigation.

(e) Each Copermittee must track and seek to identify the source(s) of illicit discharges or connections from the MS4 where there is evidence of illicit discharges or connections having been discharged into or from the MS4 (e.g., pooled water), in accordance with MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.

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(3) Each Copermittee must initiate the implementation of procedures, in a timely manner, to eliminate all detected and identified illicit discharges and connections within its jurisdiction. The procedures must include the following responses:

(a) Each Copermittee must enforce its legal authority, as required under Provision E.1, to eliminate illicit discharges and connections to the MS4.

(b) If the Copermittee identifies the source as a controllable source, the Copermittee must implement its Enforcement Response Plan pursuant to Provision E.6 and enforce its legal authority to prohibit and eliminate illicit discharges and connections to its MS4.

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(c) If the Copermittee identifies the source of the discharge as a category of non-storm water discharges in Provision E.2.a, and the discharge is in exceedance of the NALs, then the Copermittee must determine if: (1) this is an isolated incident or set of circumstances that will be addressed through its Enforcement Response Plan pursuant to Provision E.6, or (2) the category of discharge must be addressed through the prohibition of that category of discharge as an illicit discharge pursuant to Provision E.2.a.(6).

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(d) If the Copermittee suspects the source of the illicit discharge or connection as natural in origin (i.e. non-anthropogenically influenced) and in conveyance into the MS4, then the Copermittee must document and provide the data and evidence necessary to demonstrate to the San Diego Water Board that it is natural in origin and does not require further investigation.

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(e) If the Copermittee is unable to identify and document the source of a recurring illicit discharges or connections into or from the MS4, then the Copermittee must address the discharge and update its jurisdictional runoff management program to address the common and suspected sources of the discharge within its jurisdiction in accordance with the Copermittee's priorities.

(4) Each Copermittee must submit a summary of the illicit discharges and connections investigated and eliminated within its jurisdiction with each Annual Report required under Provision F.3.b of this Order.

3. Development Planning

Each Copermittee must use their land use and planning authorities to implement a development planning program in accordance with the strategies identified in the Water Quality Improvement Plan. The requirements of the jurisdictional runoff management programs as outlined below may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality Improvement Plan(s).

a. STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the development planning program to address development and redevelopment projects that may become sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate BMPs, focus education, increase frequency of verifications and/or inspections, alternative compliance options);

(2) Each Copermittee must identify areas within its jurisdiction where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting and/or stream, channel, or habitat rehabilitation projects;

(3) Each Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify regional alternative compliance projects that Priority Development Projects may be allowed or should be encouraged to implement or participate in implementing; and

(4) The strategies and/or activities must be consistent with the requirements of Provisions E.3.b-d and E.3.f-g and the strategies identified in the Water Quality Improvement Plan.

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<#>STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS ¶
¶
Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the illicit discharge detection and elimination program to address non-storm water and illicit discharges and connections that the Copermittee has identified as potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:¶
¶
<#>Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, and/or increase/decrease frequency of inspections in specific areas); and¶
¶
<#>The strategies and/or activities must be consistent with the requirements of Provisions E.2.a-d and the strategies identified in the Water Quality Improvement Plan.¶

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Comment [K2]: It is recommended that this Provision (3.g) be moved to Provision 3.a

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b. BMP REQUIREMENTS FOR ALL DEVELOPMENT PROJECTS

Each Copermittee must prescribe the following BMP requirements during the planning process (i.e. prior to project approval and issuance of local permits) for all development projects (regardless of project type or size), where local permits are issued, including unpaved roads and flood management projects:

(1) General Requirements

(a) Onsite BMPs must be located so as to remove pollutants from runoff prior to its discharge to any receiving waters, and as close to the source as possible; and

(b) Structural BMPs must not be constructed within a waters of the U.S. or waters of the state.

(2) Source Control BMP Requirements

The following source control BMPs must be implemented at all development projects where applicable and feasible:

(a) Prevention of illicit discharges into the MS4;

(b) Storm drain system stenciling or signage;

(c) Properly designed outdoor material storage areas;

(d) Properly designed outdoor work areas;

(e) Properly designed trash storage areas; and

(f) Any additional BMPs necessary to minimize pollutant generation at each project.

(3) Low Impact Development (LID) BMP Requirements

The following LID BMPs must be implemented at all development projects where applicable and feasible:

(a) Maintenance or restoration of natural storage reservoirs and drainage corridors (including topographic depressions, areas of permeable soils, natural swales, and ephemeral and intermittent streams);[27]

[27] Development projects proposing to dredge or fill materials in waters of the U.S. must obtain a CWA Section 401 Water Quality Certification. Projects proposing to dredge or fill waters of the state must obtain waste discharge requirements.

(b) Buffer zones for natural water bodies (where buffer zones are technically infeasible, require project applicant to include other buffers such as trees, access restrictions, etc.);

(c) Conservation of natural areas within the project footprint including existing trees, other vegetation, and soils;

(d) Construction of streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided public safety is not compromised;

(e) Minimization of the impervious footprint of the project;

(f) Minimization of soil compaction to landscaped areas;

(g) Disconnection of impervious surfaces through distributed pervious areas;

(h) Landscaped or other pervious areas designed and constructed to effectively receive and infiltrate, retain and/or treat runoff from impervious areas, prior to discharging to the MS4;

(i) Small collection strategies located at, or as close as possible to, the source (i.e. the point where storm water initially meets the ground) to minimize the transport of runoff and pollutants to the MS4 and receiving waters;

(j) Use of permeable materials for projects with low traffic areas and appropriate soil conditions;

(k) Landscaping with native or drought tolerant species; and

(l) Harvesting and using precipitation.

c. PRIORITY DEVELOPMENT PROJECTS

(1) Definition of Priority Development Project

Priority Development Projects include the following:

(a) All new development projects that fall under the Priority Development Project categories listed under Provision E.3.b.(2); and

(b) Those redevelopment projects that create, add, or replace at least 5,000 square feet of impervious surfaces on an already developed site, and the redevelopment project is a Priority Development Project category listed under Provision E.3.b.(2) (where redevelopment results in an increase of less than fifty percent of the impervious surfaces of a previously existing

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development, and the existing development was not subject to Priority Development Project requirements, the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) apply only to the addition or replacement, and not to the entire development; where redevelopment results in an increase of more than fifty percent of the impervious surfaces of a previously existing development, and was not subject to previous Priority Project Development requirements, the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) apply to the entire development).

(2) Priority Development Project Categories

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This category includes commercial, industrial, residential, mixed-use, and public development projects on public or private land which fall under the planning and building authority of the Copermittee.

(b) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

(c) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812), where the land area for development is 5,000 square feet or more.

(d) Hillside development projects. This category includes any development which creates 5,000 square feet or more of impervious surface which is located in an area with known erosive soil conditions, where the development will grade on any natural slope that is twenty-five percent or greater.

(e) Environmentally sensitive areas (ESAs). This category includes any development located within, directly adjacent to, or discharging directly to an ESA, which either creates 2,500 square feet of impervious surface on a proposed project site or increases the area of imperviousness of a proposed project site to 10 percent or more of its naturally occurring condition. “Directly adjacent to” means situated within 200 feet of the ESA. “Discharging directly to” means outflow from a drainage conveyance system that collects runoff from the subject development or redevelopment site and terminates at or in receiving waters within the ESA.

(f) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce that has 5,000 square feet or more of

impervious surface.

(g) Streets, roads, highways, and freeways. This category is defined as any paved impervious surface that is 5,000 square feet or more used for the transportation of automobiles, trucks, motorcycles, and other internal combustion vehicles.

(h) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

(i) Large development projects. This category includes any post-construction pollutant-generating new development projects that result in the disturbance of one acre or more of land.

(3) Priority Development Project Exemptions

Each Copermittee has the discretion to exempt the following projects from being defined as Priority Development Projects:

(a) Sidewalks, bicycle lanes, driveways, parking lots, or trails that meet the following criteria:

(i) Designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas; OR

(ii) Designed and constructed to be hydraulically disconnected from paved streets or roads; OR

(iii) Designed and constructed with permeable pavements or surfaces in accordance with USEPA Green Streets guidance.[28]

(b) Any impervious surface that is 5,000 square feet or more used for the transportation of automobiles, trucks, motorcycles, and other vehicles that follows the USEPA guidance regarding Managing Wet Weather with Green Infrastructure: Green Streets1to the MEP. ;

(c) Single-family residential projects that are not part of a larger development or proposed subdivision.

[32] This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals.

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<#>Must be a retrofitting project implemented as part of an alternative compliance project option under Provision E.3.c.(3)(b)(v) to achieve the performance requirements of Provisions E.3.c.(1) and/or E.3.c.(2) for a Priority Development Project; AND¶
¶
<#>Designed and constructed in accordance with the USEPA Green Streets guidance.[29]¶

Deleted: New single family residences that meet the following criteria:

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Deleted: <#>Must not be constructed as part of a larger development or proposed subdivision; AND¶
¶
<#>Designed and constructed to be certified under the U.S. Green Building Council (USGCB) Leadership in Energy and Environmental Design (LEED) for Homes green building certification program, receiving at least four (4) Surface Water Management credits under the Sustainable Sites category;[30] OR¶
¶
<#>Designed and constructed with structural BMPs that will achieve the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite.¶

Deleted: [28] See "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).¶

(d) Flood control and stream restoration projects.

(e) Emergency public safety projects in any of the Priority Development Categories may be excluded if the delay caused due to the requirement for a SSMP compromises public safety, public health and/or environmental protection.

Deleted: Redevelopment of existing single family residences that meet the following criteria:

Deleted: Designed and constructed to be certified under the USGCB LEED for Homes green building certification program, receiving at least four (4) Surface Water Management credits under the Sustainable Sites category;

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¶
Designed and constructed with structural BMPs that will achieve the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite

d. PRIORITY DEVELOPMENT PROJECT STRUCTURAL BMP PERFORMANCE REQUIREMENTS

In addition to the BMP requirements listed for all development projects under Provision E.3.a, Priority Development Projects must also implement structural BMPs that conform to performance requirements below. If watershed-specific performance requirements are developed as part of a Water Quality Improvement Plan; these requirements would take precedence over the general performance requirements below. The watershed-specific requirement must provide at least equal protection as the general performance requirements below.

(1) On-site Storm Water Pollutant Control Structural BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite structural BMPs to control pollutants in storm water that may be discharged from a project as follows:

(a) Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite the pollutants contained in the design capture volume. The design capture volume is equivalent to:

(i) The volume of storm water runoff produced from a 24-hour 85th percentile storm event;[32] OR

(ii) The average annual volume of storm water runoff that would be retained onsite annually if the site was fully undeveloped and naturally vegetated, as determined using continuous simulation modeling or other techniques based on site-specific soil conditions and typical native vegetative cover.

(b) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) to comply with the storm water

[32] This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals.

pollutant control BMP performance requirements of Provision E.3.c.(1)(a).

(c) If a Priority Development project is allowed to utilize alternative compliance pursuant to Provisions E.3.c.(1)(b), flow-thru conventional treatment control BMPs must be implemented to treat the portion of the design capture volume that is not retained onsite. Additionally, project applicants must mitigate for the portion of the pollutant load in the design capture volume that is not retained onsite through one or more alternative compliance options under Provision E.3.c.(3). Conventional treatment control BMPs must be sized and designed to:

(i) Remove pollutants from storm water to the MEP;

(ii) Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;

(iii) Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Conventional treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of conventional treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

(2) On-site Hydromodification Management Structural BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite structural BMPs to manage hydromodification to ensure that storm water runoff discharged from a project does not cause adverse hydromodification impacts in the downstream receiving waters.

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The Copermittees in each Watershed Management Area may establish, as part of the WQIP, watershed specific requirements that will apply to priority development projects based on the susceptibility of the receiving waters to hydromodification impacts and historic receiving water changes from development. If watershed specific requirements are developed they will supersede requirements in the HMP. The watershed specific requirements must include the following:

(a) Post-project runoff flow rates and durations must not exceed the performance standard for runoff flow rates and durations to be determined as part of the development of the WQIPs for each Watershed Management Area by more than 10 percent (for the range of flows that

result in increased potential for erosion, or degraded instream habitat conditions downstream of Priority Development Projects).

(i) In evaluating the range of flows that results in increased potential for erosion of natural (non-hardened) channels, the lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks.

(ii) The Copermittees may use monitoring results collected pursuant to Provision D.1.a.(2) to re-define the range of flows resulting in increased potential for erosion, or degraded instream habitat conditions, as warranted by the data.

Deleted: <#>For artificially hardened channels, analysis to identify the lower boundary must use characteristics of a natural stream segment similar to that found in the watershed. The lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or erodes the toe of the channel banks.¶

(b) Post-project runoff flow rates and durations must compensate for the loss of sediment supply due to the development project, should loss of sediment supply occur as a result of the development project.

(c) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) to comply with the performance requirements of Provisions E.3.c.(2)(a)-(b).

(d) Exemptions

Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provisions E.3.c.(2)(a)-(b) where the project:

(i) Discharges storm water runoff into existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;

(ii) Discharges storm water runoff into conveyance channels that are engineered for the capacity to convey the 10-year ultimate build out condition flow and are regularly maintained to ensure flow capacity all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean.

(iii) Discharges to large rivers where large rivers are defined as reaches for which the contributing drainage area exceeds 100 square miles and with a 100-year design flow in excess of 20,000 cfs.

(iv) Discharges from infill redevelopment projects that meet criteria to be established in updates to the Copermittees' HMPs.

(v) Flood control and stream restoration projects.

(vi) Is a redevelopment Priority Development Project that meets the alternative compliance requirements of Provision E.3.c.(3)(b)(ii); or

(vii) Discharges storm water runoff into other areas identified by the San Diego Water Board as exempt from the requirements of Provisions E.3.c.(2)(a)-(b).

If the Copermittees in a Watershed Management Area select not to develop watershed specific requirements, development projects will be subject to the current Copermitee HMPs inclusive of the exemptions identified in Section E.3.c.(2)(d) that will integrated into updated Copermittee HMPs.

(3) Alternative Compliance to Onsite Structural BMP Performance Requirements

(a) Applicability

At the discretion of each Copermittee, Priority Development Projects may be allowed to utilize an alternative option to comply with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) under the following conditions:

(i) The Copermittee must determine that implementation of the alternative compliance option will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite;

(ii) The alternative compliance options must be designed by a registered professional engineer, geologist, architect, or landscape architect;

(iii) The alternative compliance options must be implemented within the same hydrologic unit as the Priority Development Project, and preferably within the same hydrologic subarea;

(iv) Receiving waters must not be utilized to convey storm water runoff to the alternative compliance options;

(v) The pollutants in storm water runoff from the Priority Development Project must be treated to the MEP by the alternative compliance options prior to being discharged to receiving waters;

(vi) Unless otherwise allowed by Provision E.3.c.(3)(b), the alternative compliance options must have a net result of at least the same level of pollutant removal as would have been achieved if the Priority Development Project had fully complied with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1) onsite;

(vii) Unless otherwise allowed by Provision E.3.c.(3)(b), the alternative

compliance options must have a net result of at least the same level of protection from potential downstream and upstream erosion in the receiving water as would have been achieved if the Priority Development Project had fully complied with the hydromodification management BMP performance requirements of Provision E.3.c.(2) onsite; and

(viii) The alternative compliance options utilized by the Priority Development Project to comply with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) must have reliable sources of funding for operation and maintenance.

(b) Alternative Compliance Project Options

The Copermittee may allow implementation of one or more of the following project options as part of an alternative approach to complying with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2):

(i) *Onsite LID Biofiltration Treatment Control BMPs*

The Copermittee may allow Priority Development Projects to utilize onsite LID biofiltration treatment control BMPs to comply with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1). Onsite LID biofiltration treatment control BMPs must be sized and designed to:

[a] Remove pollutants from storm water to the MEP; AND
[b] Have an appropriate surface loading rate to prevent erosion, scour and channeling within the BMP; AND
[c] Biofilter up to the design capture volume that is not reliably retained onsite, and if necessary, mitigate for the portion of the pollutant load in the design capture volume not retained onsite through one or more alternative compliance project, in-lieu fee and/or water quality credit system options below.

(ii) *Watershed-Based Planned Development Projects*

The Copermittee may allow Priority Development Projects greater than 100 acres in total project size (or smaller than 100 acres in size yet part of a larger common plan of development that is over 100 acres) to comply with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2). The Priority Development Project must comply with the following conditions:

[a] The Priority Development Project was planned utilizing watershed and/or subwatershed based water quality, hydrologic, and fluvial geomorphologic planning principles that implement regional LID BMPs in accordance with the performance and location criteria of

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[c] Biofilter at least 1.5 times the design capture volume that is not reliably retained onsite; OR

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The Copermittee may allow redevelopment Priority Development Projects to comply with the hydromodification management BMP performance requirements of Provision E.3.c.(2) where the project is designed and constructed to be certified under the USGCB LEED for New Construction and Major Renovations green building certification program. The Priority Development Project must receive at least one (1) Site Design credit and two (2) Stormwater Design credits under the Sustainable Sites category.[33] In addition, the existing and future configuration of the receiving water must not be unnaturally altered or adversely impacted by storm water flow rates and durations discharged from the site.¶

this Order and acceptable to the San Diego Water Board;

[b] Regional BMPs may be used provided that the BMPs capture and retain the volume of runoff produced from the design capture volume defined in Provision E.3.c.(1)(a)(i) and that such controls are located upstream of receiving waters;

[c] Regional BMPs must clearly exhibit that they will not result in a net impact from pollutant loadings over and above the impact caused by capture and retention of the design capture volume;

[d] Any portion of the design capture volume that is not retained by the regional BMPs must be treated using biofiltration BMPs; and

[e] Where regional BMPs are demonstrated to the Copermittee as technically infeasible to retain the entire design capture volume, any volume up to and including the design capture volume not retained by regional BMPs, nor treated by biofiltration BMPs, must be treated using conventional treatment control BMPs and the project applicant must implement additional alternative compliance project, in-lieu fee and/or water quality credit system options below.

(iii) *Offsite Regional BMPs*

[a] The Copermittee may allow Priority Development Projects to utilize offsite regional BMPs to comply with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1) if the offsite regional BMPs have the capacity to receive and retain the design capture volume that is not reliably retained onsite.

[b] The Copermittee may allow Priority Development Projects to utilize offsite regional BMPs to comply with the hydromodification management BMP performance requirements of Provision E.3.c.(2) if the offsite regional BMPs have the capacity to manage the storm water flows rates and durations from the site such that the receiving waters are protected from the potential for increased erosion that would be caused if the unmanaged portion of the runoff was discharged from the site.

(iv) *Offsite Retrofitting Projects*

The Copermittee may allow Priority Development Projects to utilize offsite retrofitting projects to comply with the storm water pollutant control and hydromodification management BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) if the retrofitting projects have been identified within the strategies included in the Water Quality Improvement Plan, or identified as potential retrofitting projects by the Copermittee pursuant to Provision E.5.

(v) *Offsite Channel, Stream, or Habitat Rehabilitation Projects*

The Copermittee may allow Priority Development Projects to utilize

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offsite channel, stream, or habitat rehabilitation projects to comply with the hydromodification management BMP performance requirements of Provision E.3.c.(2) if the rehabilitation projects have been identified within the strategies included in the Water Quality Improvement Plan, or identified as potential channel rehabilitation projects by the Copermittee pursuant to Provision E.5. The channel, stream, or habitat rehabilitation project cannot be utilized for pollutant treatment except where artificial wetlands are constructed and located upstream of receiving waters.

(vi) *Offsite Regional Water Supply Augmentation Projects*

The Copermittee may allow Priority Development Projects to utilize offsite regional water supply augmentation projects (i.e. groundwater recharge, recycled water, storm water harvesting) to comply with Provisions E.3.c.(1) and E.3.c.(2) if the projects have been identified within the strategies included in the Water Quality Improvement Plan.

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(vii) *Project Applicant Proposed Alternative Compliance Projects*

The Copermittee may allow one or more Priority Development Project applicant(s) to propose and implement alternative compliance projects to comply with Provisions E.3.c.(1) and E.3.c.(2) if the alternative compliance projects are consistent with, and will address the highest water quality priorities of the Water Quality Improvement Plan, and comply with the requirements of Provision E.3.c.(3)(a).

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(c) Alternative Compliance In-Lieu Fee Option

The Copermittee may develop and implement an alternative compliance in-lieu fee option, individually or with other Copermittees and/or entities, as a means for designing, developing, constructing, operating and maintaining offsite alternative compliance projects under Provision E.3.c.(3)(b). Priority Development Projects allowed to utilize the alternative compliance in-lieu fee option must comply with the following conditions:

(i) The in-lieu fee should be collected and held in accordance with the Mitigation Fee Act and all other applicable development fee laws.

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Deleted: transferred to the Copermittee (for public projects) or an escrow account (for private projects) prior to the date construction of the Priority Development Project is initiated.

(ii) If the in-lieu fee is applied to the development, design and construction of offsite alternative compliance projects, the following conditions must be met:

[a] The offsite alternative compliance projects must allow the Priority Development Project to comply with the onsite BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2);

[b] The offsite alternative compliance projects must be constructed

as soon as possible, but no later than 4 years after the certificate of occupancy is granted for the first Priority Development Project that contributed funds toward the construction of the offsite alternative compliance projects, unless a longer period of time is authorized by the San Diego Water Board Executive Officer;

[c] The in-lieu fee for the Priority Development Project must include mitigation of the pollutant loads and increased storm water flow rates and durations that are allowed to discharge from the site before the offsite alternative compliance projects are constructed; and

[d]

Deleted: The in-lieu fee must also include the cost to operate and maintain the offsite alternative compliance projects.

(iii) If the in-lieu fee is applied to the operation and maintenance of offsite alternative compliance projects that have already been constructed, the offsite alternative compliance projects must allow the Priority Development Project to comply with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2).

(d) Alternative Compliance Water Quality Credit System Option

The Copermittee may develop and implement an alternative compliance water quality credit system option, individually or with other Copermittees and/or entities. Any credit system that a Copermittee chooses to implement must be submitted to the San Diego Water Board Executive Officer for review and acceptance as part of the Water Quality Improvement Plan.

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Deleted: provided that such a credit system clearly exhibits that it will not allow discharges from Priority Development Projects to cause or contribute to a net impact over and above the impact caused by projects meeting the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2).

(4) Long-Term Structural BMP Maintenance

Each Copermittee must require the project applicant to submit proof of the mechanism under which ongoing long-term maintenance of all structural BMPs will be conducted.

(5) Infiltration and Groundwater Protection

(a) Structural BMPs designed to primarily function as large, centralized infiltration devices (such as large infiltration trenches and infiltration basins) must not cause or contribute to an exceedance of an applicable groundwater quality objective. At a minimum, such infiltration BMPs must be in conformance with the design criteria listed below, unless the development project applicant demonstrates to the Copermittee that one or more of the specific design criteria listed below are not necessary to protect groundwater quality. The design criteria listed below do not apply to small infiltration systems dispersed throughout a development project.

(i) Runoff must undergo pretreatment such as sedimentation or filtration

prior to infiltration;

(ii) Pollution prevention and source control BMPs must be implemented at a level appropriate to protect groundwater quality at sites where infiltration BMPs are to be used;

(iii) Infiltration BMPs must be adequately maintained to remove pollutants in storm water to the MEP;

(iv) The vertical distance from the base of any infiltration BMP to the seasonal high groundwater mark must be at least 10 feet. Where groundwater basins do not support beneficial uses, this vertical distance criteria may be reduced, provided groundwater quality is maintained;

(v) The soil through which infiltration is to occur must have physical and chemical characteristics (e.g., appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses;

(vi) Infiltration BMPs must not be used for areas of industrial or light industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee, unless first treated or filtered to remove pollutants prior to infiltration; and

(vii) Infiltration BMPs must be located a minimum of 100 feet horizontally from any water supply wells.

(b) The Copermittee may develop, individually or with other Copermittees, alternative mandatory design criteria to that listed above for infiltration BMPs which are designed to primarily function as centralized infiltration devices. Before implementing the alternative design criteria in the development planning process the Copermitee(s) must:

(i) Notify the San Diego Water Board of the intent to implement the alternative design criteria submitted; and

(ii) Comply with any conditions set by the San Diego Water Board.

e. BMP DESIGN MANUAL UPDATE

Each Copermittee must update its BMP Design Manual[34] pursuant to Provision F.2.b. Until the Copermittee has updated its BMP Design Manual with the requirements of Provisions E.3.a-c, the Copermittee must continue implementing its current BMP Design Manual. Unless directed otherwise by the San Diego Water Board, the Copermittee must implement the BMP Design Manual within 180 days of completing the update. The update of the BMP Design Manual must include the following:

[34] The BMP Design Manual was formerly known as the Standard Storm Water Mitigation Plan under Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016.

(1) Updated procedures to determine the nature and extent of storm water requirements applicable to a potential development or redevelopment projects. These procedures must inform project applicants of the storm water management requirements applicable to their project including, but not limited to, general requirements for all development projects, structural BMP design procedures and requirements, hydromodification management requirements, requirements specific to phased projects, and procedures specific to private developments and public improvement projects;

(2) Updated procedures to identify pollutants and conditions of concern for selecting the most appropriate structural BMPs that consider, at a minimum, the following:

(a) Receiving water quality (including pollutants for which receiving waters are listed as impaired under the CWA section 303(d) List);

(b) Pollutants, stressors, and/or receiving water conditions that cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(c) Land use type of the project and pollutants associated with that land use type; and

(d) Pollutants expected to be present onsite.

(3) Updated procedures for designing structural BMPs, including any updated performance requirements to be consistent with the requirements of Provision E.3.c for all structural BMPs listed in the BMP Design Manual;

(4) Long-term maintenance criteria for each structural BMP listed in the BMP Design Manual; and

(5) Alternative compliance criteria, in accordance with the requirements under Provision E.3.c.(3), if the Copermittee elects to allow Priority Development Projects within its jurisdiction to utilize alternative compliance.

f. PRIORITY DEVELOPMENT PROJECT BMP IMPLEMENTATION AND OVERSIGHT

Each Copermittee must implement a program that requires and confirms structural BMPs on all Priority Development Projects are designed, constructed, and maintained to remove pollutants in storm water to the MEP.

(1) Structural BMP Approval and Verification Process

(a) Each Copermittee must require and confirm that for all Priority Development Project applications that have not received prior lawful approval by the Copermittee by 18 months after the commencement of

coverage under this Order, the requirements of Provision E.3 are implemented. For project applications that have received prior lawful approval by 18 months after the commencement of coverage under this Order, the Copermittee may allow previous land development requirements to apply.

(b) Each Copermittee must identify the roles and responsibilities of various municipal departments in implementing the structural BMP requirements, including each stage of a project from application review and approval through BMP maintenance and inspections.

(c) Each Copermittee must require and confirm that appropriate easements and ownerships are properly recorded in public records and the information is conveyed to all appropriate parties when there is a change in project or site ownership.

(d) Each Copermittee must require and confirm that prior to occupancy and/or intended use of any portion of the Priority Development Project, each structural BMP is inspected to verify that it has been constructed and is operating in compliance with all of its specifications, plans, permits, ordinances, and the requirements of this Order.

(2) Priority Development Project Inventory and Prioritization

(a) Each Copermittee must develop, maintain, and update at least annually, a watershed-based database to track and inventory all Priority Development Projects and associated structural BMPs within its jurisdiction. Inventories must be accurate and complete beginning from January 2002 for the San Diego County Copermittees, February 2003 for the Orange County Copermittees, and July 2005 for the Riverside County Copermittees. The use of an automated database system, such as GIS, is highly recommended. The database must include, at a minimum, the following information:

(i) Priority Development Project location (address and hydrologic subarea);

(ii) Descriptions of structural BMP type(s);

(iii) Date(s) of construction;

(iv) Party responsible for structural BMP maintenance;

(v) Dates and findings of structural BMP maintenance verifications; and

(vi) Corrective actions and/or resolutions.

(b) Each Copermittee must prioritize the Priority Development Projects with structural BMPs within its jurisdiction. The designation of Priority Development Projects as high priority must consider the following:

(i) The highest water quality priorities identified in the Water Quality Improvement Plan;

(ii) Receiving water quality;

(iii) Number and sizes of structural BMPs;

(iv) Recommended maintenance frequency of structural BMPs;

(v) Likelihood of operation and maintenance issues of structural BMPs;

(vi) Land use and expected pollutants generated; and

(vii) Compliance record.

(3) Structural BMP Maintenance Verifications and Inspections

Each Copermittee is required to verify that structural BMPs on each Priority Development Project are adequately maintained, and continue to operate effectively to remove pollutants in storm water to the MEP through inspections, self-certifications, surveys, or other equally effective approaches.

(a) All (100 percent) of the structural BMPs at Priority Development Projects that are designated as high priority must be inspected directly by the Copermittee annually prior to each rainy season;

(b) For verifications performed through a means other than direct Copermittee inspection, adequate documentation must be required by the Copermittee to provide assurance that the required maintenance of structural BMPs at each Priority Development Project has been completed; and

(c) Appropriate follow-up measures (including re-inspections, enforcement, etc.) must be conducted to ensure that structural BMPs at each Priority Development Project continue to reduce pollutants in storm water to the MEP as originally designed.

g. DEVELOPMENT PROJECT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all development projects, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

Deleted: <#>STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS ¶
¶
Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the development planning program to address development and redevelopment projects that may become sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:¶
¶
<#>Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, increase frequency of verifications and/or inspections, alternative compliance options);¶
¶
<#>Each Copermittee must identify areas within its jurisdiction where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting and/or stream, channel, or habitat rehabilitation projects;¶
¶
<#>Each Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify regional alternative compliance projects that Priority Development Projects may be allowed or should be encouraged to implement or participate in implementing; and¶
¶
<#>The strategies and/or activities must be consistent with the requirements of Provisions E.3.a-c and E.3.e-f and the strategies identified in the Water Quality Improvement Plan.¶

4. Construction Management

Each Copermittee must implement a construction management program in accordance with the strategies identified in the Water Quality Improvement Plan. The requirements of the jurisdictional runoff management programs as outlined below may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality improvement Plan(s).

Deleted: and includes, at a minimum, the following requirements:

a. STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Comment [K3]: It is recommended that this Provision (4.f) be moved to Provision 4.a

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the construction management program to address construction sites that the Copermittee has identified as potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate BMPs, focus education, and/or increase/decrease frequency of inspections for specific types of sites and/or activities); and

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(2) The strategies and/or activities must be consistent with the requirements of Provisions E.4.c-e and the strategies identified in the Water Quality Improvement Plan.

b. PROJECT APPROVAL PROCESS

Prior to issuance of any local permit(s) that allows the commencement of construction projects that involve ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff, each Copermittee must:

(1) Require a site-specific pollution control, construction BMP, and/or erosion and sediment control plan, to be submitted by the project applicant to the Copermittee;

(2) Confirm the pollution control, construction BMP, and/or erosion and sediment control plan, complies with the local grading ordinance, other applicable local ordinances, and the requirements of this Order;

(3) Confirm the pollution control, construction BMP, and/or erosion and sediment control plan, includes seasonally appropriate and effective BMPs and management measures described in Provision E.4.c, as applicable to the project; and

(4) Verify that the project applicant has obtained coverage under the Construction General Permit.

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c. CONSTRUCTION SITE INVENTORY AND TRACKING

(1) Each Copermittee must maintain, and update at least quarterly, a watershed-based inventory of all construction projects issued a local permit that allows ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff. The use of an automated database system, such as GIS, is highly recommended. The inventory must include:

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(a) Relevant contact information for each site (e.g., name, address, phone, and email for the owner and contractor);

(b) The basic site information including location (address and hydrologic subarea), Waste Discharge Identification (WDID) number (if applicable), size of the site, and approximate area of disturbance;

(c) Whether or not the site is considered a high threat to water quality, as defined in Provision E.4.b.(2) below;

(d) The project start and anticipated completion dates;

(e) Current construction phase;

(f) The required inspection frequency, as defined in the Copermittee's jurisdictional runoff management program document;

(g) The date the Copermittee accepted and/or approved the site-specific pollution control, construction BMP, and/or erosion and sediment control plan; and

(h) Whether or not there are ongoing enforcement actions administered to the site.

(2) Each Copermittee must identify all construction sites within its jurisdiction that represent a high threat to downstream surface water quality. The designation of construction sites as high threat to water quality must consider the following:

(a) Sites located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Sites located within the same hydrologic subarea and tributary to a water body segment listed as impaired for sediment on the CWA section 303(d) List;

(c) Sites located within, directly adjacent to, or discharging directly to a receiving water within an ESA; and

(d) Other sites determined by the Copermittees or the San Diego Water Board as a high threat to water quality.

d. CONSTRUCTION SITE BMP IMPLEMENTATION

Each Copermittee must implement, or require the implementation of effective BMPs to reduce discharges of pollutants in storm water from construction sites to the MEP, and prevent non-storm water discharges from construction sites into the MS4. These BMPs must be site specific, seasonally appropriate, and construction phase appropriate. BMPs must be implemented at each construction site year round. Dry season BMP implementation must plan for and address unseasonal rain events that may occur during the dry season (May 1 through September 30). Copermittees must implement, or require the implementation of, BMPs in the following categories:

(1) Project Planning;

(2) Good Site Management "Housekeeping", including waste management;

(3) Non-storm Water Management;

(4) Erosion Control;

(5) Sediment Control;

(6) Run-on and Run-off Control; and

(7) Active/Passive Sediment Treatment Systems, where applicable.

e. CONSTRUCTION SITE INSPECTIONS

Each Copermittee must conduct construction site inspections to require and confirm compliance with its local permits and applicable local ordinances, and the requirements of this Order. Priority for site inspections must consider threat to water quality pursuant to Provision E.4.b as well as the nature of the construction activity, topography, and the characteristics of soils and receiving water quality.

(1) Inspection Frequency

(a) Each Copermittee must conduct inspections at all inventoried sites, including high threat to water quality sites, at an appropriate frequency for each phase of construction to ensure the site reduces the discharge of pollutants in storm water from construction sites to the MEP, and prevents non-storm water discharges from entering the MS4.

(b) Each Copermittee must establish appropriate inspection frequencies for high threat to water quality sites, and all other sites, for each phase of construction. Inspection frequencies appropriate for addressing the highest water quality priorities identified in the Water Quality Improvement Plan, and for complying with the requirements of this Order must be identified in each Copermittee's jurisdictional runoff management program document.

(c) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e., re-inspection, enforcement) necessary to require and confirm site compliance with its local permits and applicable local ordinances, and the requirements of this Order.

(2) Inspection Content

Inspections of construction sites by the Copermittee must include, at a minimum:

(a) Verification of coverage under the Construction General Permit (Notice of Intent (NOI) and/or WDID number) during initial inspections, when applicable;

(b) Assessment of compliance with its local permits and applicable local ordinances related to pollution prevention, including the implementation and maintenance of applicable BMPs;

(c) Assessment of BMP adequacy and effectiveness;

(d) Visual observations of actual non-storm water discharges;

(e) Visual observations of actual or potential discharge of sediment and/or construction related materials from the site;

(f) Visual observations of actual or potential illicit connections; and

(g) If any violations are found and BMP corrections are needed, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried construction sites. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Site name, location (address and hydrologic subarea), and WDID number (if applicable);

(b) Inspection date;

(c) Weather condition during inspection;

(d) Description of problems observed with BMPs and indication of need for BMP addition/repair/replacement and any scheduled re-inspection, and date of re-inspection;

(e) Descriptions of any other specific inspection comments which must, at a minimum, include rationales for longer compliance time;

(f) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(g) Resolution of problems noted and date problems fixed.

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f. CONSTRUCTION SITE ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried construction sites, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

5. Existing Development Management

Each Copermittee must implement an existing development management program in accordance with the strategies identified in the Water Quality Improvement Plan. The requirements of the jurisdictional runoff management programs as outlined below may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality improvement Plan(s).

a. STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Each Copermittee must implement the water quality improvement strategies, where necessary, to address areas of existing development within its jurisdiction that are identified as sources of pollutants and/or stressors contributing to the highest priority water quality conditions in the Watershed Management Area. For the existing development management program, the following strategies must be implemented:

(1) Specific Existing Development Management Program Strategies

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Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the construction management program to address construction sites that the Copermittee has identified as potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:¶
¶
<#>Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, and/or increase/decrease frequency of inspections for specific types of sites and/or activities); and¶
¶
<#>The strategies and/or activities must be consistent with the requirements of Provisions E.4.c-e and the strategies identified in the Water Quality Improvement Plan.¶

Deleted: and includes, at a minimum, the following requirements:

Comment [K4]: It is recommended that this Provision (5.e) be moved to Provision 5.a

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented within its jurisdiction to address areas of existing development that the Copermittee has identified as sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(a) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate BMPs, focus education, and/or increase/decrease frequency of inspections for specific types of facilities, areas and/or activities);

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(b) The facilities and/or areas within the Copermittee's jurisdiction where the strategies and/or activities will be implemented; and

(c) The strategies and/or activities must be consistent with the requirements of Provisions E.5.b-d and the strategies identified in the Water Quality Improvement Plan.

a. EXISTING DEVELOPMENT INVENTORY AND TRACKING

Each Copermittee must maintain, and update at least annually, a watershed-based inventory of the existing development within its jurisdiction that may discharge a high priority pollutant load to and from the MS4. The use of an automated database system, such as GIS, is highly recommended. The inventory must, at a minimum, evaluate and include the following if identified as a source of a high priority pollutant:

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(1) Name, location (hydrological subarea and address, if applicable) of the following types of existing development with its jurisdiction:

(a) Commercial facilities or areas;

(b) Industrial facilities;

(c) Municipal facilities, including:

(i) MS4 and related structures,[35]

(ii) Roads, streets, and highways,

(iii) Parking facilities,

(iv) Municipal airfields,

(v) Parks and recreation facilities,

[35] The inventory may refer to the MS4 map required to be maintained pursuant to Provision E.2.b.(1).

(vi) Flood management projects and flood control devices and structures,

(vii) Operating or closed municipal landfills,

(viii) Publicly owned treatment works (including water and wastewater treatment plants) and sanitary sewer collection systems,

(ix) Corporate yards, including maintenance and storage yards for materials, waste, equipment, and vehicles,

(x) Hazardous waste collection facilities,

(xi) Other treatment, storage or disposal facilities for municipal waste, and

(xii) Other municipal facilities that the Copermittee determines may contribute a significant high priority pollutant load to the MS4; and

(d) Residential areas, which may be designated by one or more of the following:

(i) Residential management area,

(ii) Drainage basin or area,

(iii) Land use (e.g., single family, multi-family, rural),

(iv) Neighborhood,

(v) Common Interest Area,

(vi) Home Owner Association,

(vii) Mobile home park, and/or

(viii) Other designations accepted by the San Diego Water Board Executive Officer.

(2) A description of the facility or area, including the following information:

(a) Classification as commercial, industrial, municipal, or residential;

(b) Status of facility or area as active or inactive;

(c) Identification if a business is a mobile business;

(d) SIC Code or NAICS Code, if applicable;

(e) Industrial General Permit NOI and/or WDID number, if applicable;

(f) Identification if a residential area is or includes a Common Interest Area / Home Owner Association, or mobile home park;

(g) Identification of the high priority pollutants potentially generated by the facility or area;

(h) Whether the facility or area is adjacent to an ESA;

(i) Whether the facility or area is tributary to and within the same hydrologic subarea as a water body segment listed as impaired on the CWA section 303(d) List and generates pollutants for which the water body segment is impaired; and

(3) An annually updated map showing the location of inventoried existing development, watershed boundaries, and water bodies.

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<#>Whether the facility or area contributes or potentially contributes to the highest priority water quality conditions identified in the Water Quality Improvement Plan.¶

b. EXISTING DEVELOPMENT BMP IMPLEMENTATION AND MAINTENANCE

Each Copermittee must designate a set of BMPs required for all inventoried existing development, including special event venues. The designated BMPs must be specific to the identified high priority facility or area types and high priority pollutant generating activities, as appropriate.

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(1) Commercial, Industrial, and Municipal Facilities and Areas

(a) Pollution Prevention

Each Copermittee must require the use of pollution prevention methods by the commercial, industrial, and municipal facilities and areas in its inventoried existing development.

(b) BMP Implementation

Each Copermittee must implement, or require the implementation of, designated BMPs at commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development.

(c) BMP Operation and Maintenance

(i) Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development.

(ii) Each Copermittee must implement a schedule of operation and maintenance activities for its MS4 and related structures (including but not limited to catch basins, storm drain inlets, detention basins, etc.), and verify proper operation of all its municipal structural treatment controls designed to reduce pollutants (including floatables) in storm water discharges to or from its MS4s and related

drainage structures. Operation and maintenance activities may include, but is not limited to, the following:

[a] Inspections of the MS4 and related structures;
[b] Cleaning of the MS4 and related structures; and
[c] Proper disposal of materials removed from cleaning of the MS4 and related structures.

(iii) Each Copermittee must implement a schedule of operation and maintenance for public streets, unpaved roads, paved roads, and paved highways and freeways within its jurisdiction to minimize pollutants that can be discharged in storm water.

(iv) Each Copermittee must implement controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers. Copermittees that operate both a municipal sanitary sewer system and a MS4 must implement controls and measures to prevent and eliminate seeping sewage from infiltrating the MS4. Copermittees that do not operate both a municipal sanitary sewer system and a MS4 must coordinate with sewering agencies to keep themselves informed of relevant and appropriate maintenance activities and sanitary sewage projects in their jurisdiction that may cause or contribute to seepage of sewage into the MS4.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must implement BMPs, or require the implementation of BMPs, to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development. Such BMPs must include, as appropriate, educational activities, permits, certifications and other measures for applicators and distributors.

(2) <u>Residential Areas</u>

(a) Pollution Prevention

Each Copermittee must promote and encourage the use of pollution prevention methods, where appropriate, by the residential areas in its inventoried existing development.

(b) BMP Implementation

Each Copermittee must promote and encourage the implementation of designated BMPs at residential areas in its inventoried existing development.

(c) BMP Operation and Maintenance

Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at residential areas in its inventoried existing development.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must promote and encourage the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from residential areas in its inventoried existing development.

c. EXISTING DEVELOPMENT INSPECTIONS

Each Copermittee must conduct inspections of inventoried existing development to ensure compliance with applicable local ordinances and permits, and the requirements of this Order.

(1) Inspection Frequency

(a) Each Copermittee must establish appropriate inspection frequencies for inventoried existing development in accordance with the following requirements:

(i) At a minimum, inventoried existing development must be inspected once every five years utilizing one or more of the following methods:

[a] Drive-by inspections by Copermittee municipal and contract staff,
[b] Onsite inspections by Copermittee municipal and contract staff, and/or
[c] Inspections by volunteer monitoring or patrol programs trained by the Copermittee;

(ii) The frequency of inspections must be appropriate to confirm that BMPs are being implemented to reduce the discharge of pollutants in storm water from the MS4 to the MEP and effectively prohibit non-storm water discharges into the MS4;

(iii) The frequency of inspections must be based on the potential for a facility or area to discharge non-storm water and pollutants in storm water, and should reflect the priorities set forth in the Water Quality Improvement Plan;

(iv) Each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried

existing development;[36] and

(v) Inventoried existing development must be inspected by the Copermittee, as needed, in response to valid public complaints and findings from the Copermittee's municipal and contract staff or volunteer monitoring or patrol program inspections.

(b) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e. education and outreach, re-inspection, enforcement) necessary to require and confirm compliance with its applicable local ordinances and permits and the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

(2) Inspection Content

(a) Inspections of existing development by the Copermittee or volunteer monitoring or patrol programs must include, at a minimum:

(i) Visual inspections for actual non-storm water discharges;

(ii) Visual inspections for actual or potential discharge of pollutants;

(iii) Visual inspections for actual or potential illicit connections; and

(iv) Verification that the description of the facility or area in the inventory, required pursuant to Provision E.5.a.(2), has not changed.

(b) Onsite inspections of existing development by the Copermittee must include, at a minimum:

(i) Assessment of compliance with its applicable local ordinances and permits related to non-storm water and storm water discharges and runoff;

(ii) Assessment of the implementation of the designated BMPs;

(iii) Verification of coverage under the Industrial General Permit, when applicable; and

(iv) If any problems or violations are found, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

[36] If any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspection may count toward the total annual inspection requirement. This requirement excludes linear municipal facilities (i.e., MS4, streets, roads and highways).

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried existing development. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Name and location of facility or area (address and hydrologic subarea) consistent with the inventory name and location, pursuant to Provision E.5.a.(1);

(b) Inspection and re-inspection date(s);

(c) Inspection method(s) (i.e. drive-by, onsite);

(d) Observations and findings from the inspection(s);

(e) For onsite inspections of existing development by Copermittee municipal or contract staff, the records must also include, as applicable:

(i) Description of any problems or violations found during the inspection(s),

(ii) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6, and

(iii) The date problems or violations were resolved.

d. EXISTING DEVELOPMENT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried existing development, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

e. RETROFITTING AREAS OF EXISTING DEVELOPMENT

(2) Retrofitting Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to retrofit areas of existing development within its jurisdiction to address identified sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify areas of existing development as candidates for retrofitting, focusing on areas where retrofitting will address

Deleted: STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Deleted: Each Copermittee must implement the water quality improvement strategies, where necessary, to address areas of existing development within its jurisdiction that are identified as sources of pollutants and/or stressors contributing to the highest priority water quality conditions in the Watershed Management Area. For the existing development management program, the following strategies must be implemented:¶
¶
<#>Specific Existing Development Management Program Strategies¶
¶
Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented within its jurisdiction to address areas of existing development that the Copermittee has identified as sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:¶
¶
<#>Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, and/or increase/decrease frequency of inspections for specific types of facilities, areas and/or activities); ¶
¶
<#>The facilities and/or areas within the Copermittee's jurisdiction where the strategies and/or activities will be implemented; and¶
¶
<#>The strategies and/or activities must be consistent with the requirements of Provisions E.5.b-d and the strategies identified in the Water Quality Improvement Plan.¶
¶

pollutants and/or stressors that contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for retrofitting projects may be utilized to reduce pollutants that may be discharged in storm water from areas of existing development, and/or address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of retrofitting projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting projects; and

(e) Where retrofitting projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional retrofitting projects (i.e. projects that can receive and/or treat storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment) adjacent to and/or downstream of the areas of existing development.

(3) Stream, Channel and/or Habitat Rehabilitation in Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to rehabilitate streams, channels, and/or habitats in areas of existing development within its jurisdiction or just downstream of its jurisdiction to address the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Candidates for stream, channel, and/or habitat rehabilitation projects may be utilized to address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters, rehabilitate channelized or hydromodified streams, restore wetland and riparian habitat, restore watershed functions, and/or protect beneficial uses of receiving waters;

Deleted: <#>Each Copermittee must identify streams, channels, and/or habitats in areas of existing development as candidates for rehabilitation, focusing on areas where stream, channel, and/or habitat rehabilitation projects will address the highest priority water quality conditions identified in the Water Quality Improvement Plan;¶

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(b) Each Copermittee must develop a strategy to facilitate the implementation of stream, channel, and/or habitat rehabilitation projects in areas of

existing development identified as candidates;

(c) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance stream, channel, and/or habitat rehabilitation projects; and

(d) Where stream, channel, and/or habitat rehabilitation projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional stream, channel, and/or habitat rehabilitation projects (i.e. projects that can receive storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment).

6. Enforcement Response Plans

Each Copermittee must develop and implement an Enforcement Response Plan as part of its jurisdictional runoff management program document. The Enforcement Response Plan must describe the applicable approaches and options to enforce its legal authority established pursuant to Provision E.1, as necessary, to achieve compliance with the requirements of this Order. Copermittees may continue to utilize and implement established, equivalent guidelines and procedures for enforcement. The Enforcement Response Plan must include the following:

a. ENFORCEMENT RESPONSE PLAN COMPONENTS

The Enforcement Response Plan must include and/or address the following individual components:

(1) Illicit Discharge Detection and Elimination Enforcement Component;

(2) Development Planning Enforcement Component;

(3) Construction Management Enforcement Component; and

(4) Existing Development Enforcement Component.

b. ENFORCEMENT RESPONSE APPROACHES AND OPTIONS

Each component of the Enforcement Response Plan must describe the enforcement response approaches that the Copermittee will implement to compel compliance with its statutes, ordinances, permits, contracts, orders, or similar means, and the requirements of this Order. The description must include the protocols for implementing progressively stricter enforcement responses. The

enforcement response approaches must include appropriate sanctions to compel compliance, including, at a minimum, the following tools or their equivalent:

(1) Verbal and written notices of violation;

(2) Cleanup requirements;

(3) Fines;

(4) Bonding requirements;

(5) Administrative and criminal penalties;

(6) Liens;

(7) Stop work orders; and

(8) Permit and occupancy denials.

c. CORRECTION OF VIOLATIONS

(1) Violations must be corrected in a timely manner with the goal of correcting the violations within 30 calendar days after the violations are discovered, or prior to the next predicted rain event, whichever is sooner.

(2) If more than 30 calendar days are required to achieve compliance, then a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

d. PROGRESSIVE ENFORCEMENT

(1) The Enforcement Response Plan must include a definition of "progressive enforcement". Progressive enforcement must include a series of enforcement actions that match the severity of the violations and include distinct, progressive steps. Progressive enforcement may be defined differently for development planning, construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and/or residential areas.

(2) Where the Copermittee determines progressive enforcement is not required, a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

(3) Progressive enforcement actions must continue to increase in severity, as necessary, to compel compliance as soon as possible.

e. REPORTING OF NON-COMPLIANT SITES

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(1) Each Copermittee must notify the San Diego Water Board in writing within 2 working days of issuing escalated enforcement (as defined in the Copermittee's Enforcement Response Plan) to a construction site that poses a significant threat to water quality as a result of violations or other non-compliance with its permits and applicable local ordinances, and the requirements of this Order. Written notification may be provided electronically by email.

(2) Each Copermittee must notify the San Diego Water Board of non-filers under the Industrial General Permit and Construction General Permit by email to Nonfilers_R9@waterboards.ca.gov.

7. Public Education and Participation

Each Copermittee must implement, individually or with other Copermittees, a public education and participation program in accordance with the strategies identified in the Water Quality Improvement Plan to promote and encourage the development of programs, management practices, and behaviors that reduce the discharge of pollutants in storm water to the MEP, prevent controllable non-storm water discharges from entering the MS4, and protect water quality standards in receiving waters. The requirements of the jurisdictional runoff management programs as outlined below may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality improvement Plan(s).

a. STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Comment [K5]: It is recommended that this Provision (7.c) be moved to Provision 7.a

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented within its jurisdiction, as applicable, to educate the public and encourage public participation to address potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) The target audiences and/or areas within the Copermittee's jurisdiction where the strategies and/or activities will be implemented;

(2) Provide specific details about how the strategies and/or activities will be implemented (e.g. educational topics, materials and/or activities, public outreach and participation programs and/or opportunities);

(3) Each Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify and implement regional public education and participation activities, programs and opportunities;

(4) Each Copermittee must incorporate a mechanism for evaluating and assessing educational and other public outreach activities, as needed, to identify progress and incorporate modifications necessary to increase the effectiveness of the public education and participation program.

B. PUBLIC EDUCATION

The public education program component implemented within the Copermittee's jurisdiction may include the following:

(1) Educational activities, public information activities, and other appropriate outreach activities intended to reduce pollutants associated with the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(2) Educational activities, public information activities, and other appropriate outreach activities to facilitate the proper management and disposal of used oil and toxic materials; and

(3) Appropriate education and training measures for specific target audiences, such as construction site operators, residents, underserved target audiences and school-aged children, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed, based on high risk behaviors and pollutants of concern.

C. PUBLIC PARTICIPATION

The public participation program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) A process for members of the public to participate in updating the highest priority water quality conditions, numeric goals, and water quality improvement strategies in the Water Quality Improvement Plan.

(2) Opportunities for members of the public to participate in providing the Copermittee recommendations for improving the effectiveness of the water quality improvement strategies implemented within its jurisdiction.

(3) Opportunities for members of the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or protection of the quality of receiving waters.

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Deleted: application of pesticides, herbicides and fertilizer and other pollutants of concern in storm water discharges to and from its MS4 to the MEP, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed to address the

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<#>STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS¶
¶
Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented within its jurisdiction, as applicable, to educate the public and encourage public participation to address potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:¶
¶
<#>The target audiences and/or areas within the Copermittee's jurisdiction where the strategies and/or activities will be implemented; ¶
¶
<#>Provide specific details about how the strategies and/or activities will be implemented (e.g. educational topics, materials and/or activities, public outreach and participation programs and/or opportunities);¶
¶
<#>Each Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify and implement regional public education and participation activities, programs and opportunities;¶
¶
<#>Each Copermittee must incorporate a mechanism for evaluating and assessing educational and other public outreach activities, as needed, to identify progress and incorporate modifications necessary to increase the effectiveness of the public education and participation program.¶

8. Fiscal Analysis

a. Each Copermittee must secure the resources necessary to meet all the

requirements of this Order.

b. Each Copermittee must conduct an annual fiscal analysis of its jurisdictional runoff management program in its entirety. The fiscal analysis must include the following:

(1) Identification of the various categories of expenditures necessary to implement the requirements of this Order, including a description of the specific capital, operation and maintenance, and other expenditure items to be accounted for in each category of expenditures;

(2) The staff resources needed and allocated to meet the requirements of this Order, including any development, implementation, and enforcement activities required;

(3) The estimated expenditures for Provisions E.8.b.(1) and E.8.b.(2) for the current fiscal year; and

(4) The source(s) of funds that are proposed to meet the necessary expenditures described in Provisions E.8.b.(1) and E.8.b.(2), including legal restrictions on the use of such funds, for the current fiscal year and next fiscal year.

c. Each Copermittee must submit a summary of the annual fiscal analysis with each Annual Report required pursuant to Provision F.3.b.

d. Each Copermittee must provide the documentation used to develop the summary of the annual fiscal analysis upon request by the San Diego Water Board.

F. REPORTING

The purpose of this provision is to determine and document compliance with the requirements set forth in this Order. The goal of reporting is to communicate to the San Diego Water Board and the people of the State of California the implementation status of each jurisdictional runoff management program and compliance with the requirements of this Order. This goal is to be accomplished through the submittal of specific deliverables to the San Diego Water Board by the Copermittees.

1. Water Quality Improvement Plans

The Copermittees for each Watershed Management Area must develop and submit the Water Quality Improvement Plan in accordance with the following requirements:

a. WATER QUALITY IMPROVEMENT PLAN DEVELOPMENT

Each Water Quality Improvement Plan must be developed in accordance with the following process:

(1) Priority Water Quality Conditions and Numeric Goals

(a) The Copermittees must implement a public participation process to solicit data and information to be utilized in the development and identification of the priority water quality conditions for the Watershed Management Area.

(b) The Copermittees are encouraged to involve the public and key stakeholders as early and often as possible during the development of the priority water quality conditions and numeric goals to be included in the Water Quality Improvement Plan.

(c) Within 6 months after the commencement of coverage under this Order, the Copermittees must develop and submit the Water Quality Improvement Plan requirements of Provision B.2 to the San Diego Water Board. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of 30 days.

(d) Within 30 days of receiving the public comments, the Copermittees must revise the priority water quality conditions and numeric goals based on comments received and/or recommendations or direction from the San Diego Water Board Executive Officer.

(2) Water Quality Improvement Strategies and Schedules

(a) The Copermittees are encouraged to involve the public and key stakeholders as early and often as possible during the development of the water quality improvement strategies and schedules to be included in the Water Quality Improvement Plan.

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(b) Within 3 months after the development of the priority water quality conditions and numeric goals, the Copermittees must develop and submit the Water Quality Improvement Plan requirements of Provision B.3 to the San Diego Water Board. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of 30 days.

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(c) Within 30 days of receiving the public comments, the Copermittees must revise the water quality improvement strategies and schedules based on comments received and/or recommendations or direction from the San Diego Water Board Executive Officer.

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b. WATER QUALITY IMPROVEMENT PLAN SUBMITTAL

(1) Within 18 months after the commencement of coverage under this Order, the Copermittees for each Watershed Management Area must submit a complete Water Quality Improvement Plan in accordance with the requirements of Provision B to the San Diego Water Board. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of 30 days.

(2) Based on the comments received, the San Diego Water Board will determine whether to hold a public hearing or to limit public input to submittal of written comments. If no hearing is held the San Diego Water Board will notify the Copermittees within 6 months that the Water Quality Improvement Plan has been accepted as complete following its review and determination that the Water Quality Improvement Plan meets the requirements of this Order.

(3) Within 60 days of receiving comments, the Copermittees must revise the Water Quality Improvement Plan based on comments received and/or recommendations or direction from the San Diego Water Board Executive Officer.

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(4) The Water Quality Improvement Plan must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of the finalization of the Water Quality Improvement Plan and acceptance by the San Diego Water Board.

2. Updates

a. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATES

Each Copermittee must update its jurisdictional runoff management program document in accordance with the following requirements:

(1) Each Copermittee is encouraged to involve the public and key stakeholders as early and often as possible to solicit recommendations for updates to its jurisdictional runoff management program document.

(2) Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E no later than 6 months after the completion of the corresponding Water Quality Improvement Plan and acceptance of the Water Quality Improvement Plan by the San Diego Water Board.

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(3) Each Copermittee must submit updates to its jurisdictional runoff management program, with a rationale for the modifications, either in the Annual Report required pursuant to Provision F.3.b, and/or as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The requested updates are considered accepted by the San Diego Water Board if no response is provided to the Copermittee after 3 months of submitting the request.

(4) The Copermittee must revise the modifications as directed by the San Diego Water Board Executive Officer.

(5) Updated jurisdictional runoff management program documents must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of completing the updates ~~submitting the Annual Report~~.

D. BMP DESIGN MANUAL UPDATES

Each Copermittee must update its BMP Design Manual in accordance with the following requirements:

(1) Each Copermittee must update its BMP Design Manual to incorporate the requirements of Provisions E.3.a-d no later than 18 months after the commencement of coverage under this Order.

(2) Subsequent updates must be consistent with the requirements of Provisions E.3.a-d and must be submitted as part of the Annual Reports required pursuant to Provision F.3.b, and/or as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The requested updates are considered accepted by the San Diego Water Board if no response is provided to the Copermittee after 3 months of submitting the request.

(3) Updated BMP Design Manuals must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of completing the updates.

E. WATER QUALITY IMPROVEMENT PLAN UPDATES

The Water Quality Improvement Plans must be updated in accordance with the following process:

(1) The Copermittees must implement a public participation process to solicit data and information to be utilized in updating the Water Quality Improvement Plan.

(2) The Copermittees are encouraged to involve the public and key stakeholders as early and often as possible during the updates to the Water Quality Improvement Plan.

(3) The Copermittees for each Watershed Management Area must submit requested updates to the Water Quality Improvement Plan, with the public input received and the rationale for the requested updates, either in the Annual Reports required pursuant to Provision F.3.b, and/or as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The requested updates are considered accepted by the San Diego Water Board if no response is provided to the Copermittee after 3 months of submitting the request.

(4) The Copermittees must revise the requested updates as directed by the San Diego Water Board Executive Officer.

(5) Updated Water Quality Improvement Plans must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance of the requested updates by the San Diego Water Board.

3. Progress Reporting

a. PROGRESS REPORT PRESENTATIONS

The Copermittees for each Watershed Management Area must appear before the San Diego Water Board, as requested by the San Diego Water Board, to provide progress reports on the implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs.

B. ANNUAL REPORTS

(1) Transitional Period JRMP Reports: Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report no later than October 31 of each year prior to the implementation of updated JRMP programs pursuant to F.2.a. Each Copermittee must submit the information on the Jurisdictional Runoff Management Program specific to the area within its jurisdiction in each Watershed Management Area.

(2) Transitional Period Monitoring Report: The transitional period monitoring conducted pursuant to D.1.a and D.2.a. shall be reported in a single report that covers the entire reporting period from the initiation of the transitional period monitoring (as described in D.1.a and D.2.a.), through September 30th following approval of the Water Quality Improvement Plan. The Transitional Period Monitoring Report shall include the assessments required per D.4.a.(1)(a), D.4.b.(1)(a) and D.4.b.(2)(a); and be submitted by January 31st following completion of the above mentioned transitional period.

(3) Post-Transitional Annual Reports – Following the initial transitional period after enrollment into this Order, the Copermittees for each Watershed Management Area must submit a combined Annual Report for each reporting period no later than January 31 of the following year. The annual reporting period consists of two periods: 1) July 1 to June 30 of the following year for the jurisdictional runoff management programs, 2) October 1 to September 30 of the following year for the monitoring and assessment programs. Annual Reports must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Each Annual Report must include the following:

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Deleted: The first Annual Report must be prepared for the reporting period beginning July 1 after commencement of coverage under this Order, and upon San Diego Water Board determination that the Water Quality Improvement Plan meets the requirements of this Order to June 30 in the following year for the jurisdictional runoff management programs, and September 30 in the following year for the monitoring and assessment programs.

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, summarized and presented in tabular and graphical form;

(b) Progress of the special studies required pursuant to Provision D.3, and the results or findings when a special study, or each phase of a special study, is completed;

(c) The findings from the assessments required pursuant to Provision D.4;

(d) The progress of implementing the Water Quality Improvement Plan, including, but not limited to, the following:

(i) The progress toward achieving the interim and final numeric goals for the highest water quality priorities for the Watershed Management Area,

(ii) The water quality improvement strategies that were implemented and/or no longer implemented by each of the Copermittees during the reporting period and previous reporting periods, and are planned to be implemented during the next reporting period,

(iii) Proposed modifications to the water quality improvement strategies, with public input received and rationale for the proposed modifications,

(iv) Previously proposed modifications or updates incorporated into the Water Quality Improvement Plan and/or each Copermittee's

jurisdictional runoff management program document and implemented by the Copermittees in the Watershed Management Area, and

(v) Proposed modifications or updates to the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document;

(e) For each Water Quality Improvement Plan, the progress of implementing the corresponding Jurisdictional Urban Runoff Management Programs. Each Copermittee should report on the items listed below. The individual JRMP annual reports may be included as attachments to the corresponding WQIP annual report. The JRMP annual report should include, but not be limited to, the following:

(i) The water quality improvement strategies that were implemented and/or no longer implemented by each of the Copermittees during the reporting period and previous reporting periods, and are planned to be implemented during the next reporting period,

(ii) Proposed modifications to the water quality improvement strategies, with public input received and rationale for the proposed modifications,

(iii) Previously proposed modifications or updates incorporated into each Copermittee's jurisdictional runoff management program document and implemented by the Copermittees in the Watershed Management Area, and

(iv) Proposed modifications or updates to each Copermittee's jurisdictional runoff management program document;

(4) Until the Copermittees have updated their jurisdictional runoff management programs consistent with Provision F.2.a, the Copermittees must continue to utilize the current jurisdictional runoff management program annual reporting format. Each Copermittee must submit the information on the Jurisdictional Runoff Management Program Annual Report Form specific to the area within its jurisdiction in each Watershed Management Area.

(5) Each Copermittee must provide any data or documentation utilized in developing the Annual Report upon request by the San Diego Water Board. Any monitoring data utilized in developing the Annual Report must be uploaded to the California Environmental Data Exchange Network (CEDEN).[37] Any monitoring and assessment data utilized in developing the Annual Report must be provided on the Regional Clearinghouse required

Deleted: <#>A completed Jurisdictional Runoff Management Program Annual Report Form (Attachment D or accepted revision) for each Copermittee in the Watershed Management Area, certified by a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative. ¶
¶
Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (Attachment D or accepted revision) no later than October 31 of each year

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[37] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

pursuant to Provision F.4.

F. REGIONAL MONITORING AND ASSESSMENT REPORT

Comment [K6]: This was moved from F.5.c since it is a part of the ROWD.

Deleted: <#>The Copermittees must submit a Regional Monitoring and Assessment Report no later than 180 days in advance of the expiration date of this Order. The Regional Monitoring and Assessment Report may be submitted as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The Copermittees must review the receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, and findings from the assessments required pursuant to Provision D.4, to assess the following:¶
¶
<#>The beneficial uses of the receiving waters within the San Diego Region that are protected or must be restored;¶
¶
<#>The progress toward restoring impacted beneficial uses in the receiving waters within the San Diego Region; and¶
¶
<#>Pollutants or conditions of emerging concern that may impact beneficial uses in the receiving waters within the San Diego Region.¶
¶
<#>The Regional Monitoring and Assessment Report must include recommendations for improving the implementation and assessment of the Water Quality Improvement Plans and jurisdictional runoff management programs. ¶
¶
<#>Each Copermittee must provide any data or documentation utilized in developing the Regional Monitoring and Assessment Report upon request by the San Diego Water Board. Any monitoring and assessment data utilized in developing the Regional Monitoring and Assessment Report must be provided on the Regional Clearinghouse required pursuant to Provision F.4.¶
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4. Regional Clearinghouse

The Copermittees must develop, update, and maintain an internet-based Regional Clearinghouse that is made available to the public no later than 18 months after the effective date of this Order. The Copermittees may elect to develop and maintain the clearinghouse(s) provided by other Copermittees or agencies.

a. The Copermittees, through the Regional Clearinghouse, must make the following documents and data available, organized by Watershed Management Area, which may be linked to other internet-based data portals and databases where the original documents are stored:

(1) Water Quality Improvement Plan for the Watershed Management Area, and all updated versions with date of update;

(2) Annual Reports for the Watershed Management Area;

(3) Jurisdictional Runoff Management Program document for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(4) BMP Design Manual for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(5) Reports from special studies (e.g. source identification, BMP effectiveness assessment) conducted in the Watershed Management Area;

(6) Monitoring data collected pursuant to Provision D for each Watershed Management Area must be uploaded to CEDEN,[38] with links to the uploaded data; and

(7) Available GIS data, layers, and/or shapefiles used to develop the maps generated and maintained by the Copermittees for the Water Quality Improvement Plans, Annual Reports, and jurisdictional runoff management program documents.

b. The Copermittees, through the Regional Clearinghouse, must make the following information and documents available:

[38] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

(1) Contact information (point of contact, phone number, email address, and mailing address) for each Copermittee;

(2) Public hotline number for reporting non-storm water and illicit discharges for each Copermittee;

(3) Email address for reporting non-storm water and illicit discharges for each Copermittee;

(4) Link to each Copermittee's website, if available, where the public may find additional information about the Copermittee's storm water management program and for requesting records for the implementation of its program;

(5) Information about opportunities for the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and the protection of the quality of receiving waters; and

Deleted: and/or restoration

(6) Reports from regional monitoring programs in which the Copermittees participate (e.g. Southern California Monitoring Coalition, Southern California Coastal Water Research Project Bight Monitoring);

(7) Regional Monitoring and Assessment Reports; and

(8) Any other information, data, and documents the Copermittees determine as appropriate for making available to the public.

5. Report of Waste Discharge

a. The Orange County Copermittees and the Riverside County Copermittees are required to submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders. The San Diego Water Board will review and consider the Reports of Waste Discharge to determine whether modification to this Order, pursuant to the requirements of Provision H, will be required prior the Orange County Copermittees and/or Riverside County Copermittees becoming covered under this Order. The current Orders for the Orange County Copermittees and Riverside County Copermittees are rescinded upon notification of coverage under this Order except for enforcement purposes.

b. The Copermittees subject to the requirements of this Order must submit to the San Diego Water Board a complete Report of Waste Discharge as an application for the re-issuance of this Order and NPDES permit. The Report of Waste Discharge must be submitted no later than 180 days in advance of the expiration date of this Order. The Report of Waste Discharge must contain the following minimum information:

(1) Names and addresses of the Copermittees;

(2) Names and titles of the primary contacts of the Copermittees;

(3) Proposed changes to the Copermittees' Water Quality Improvement Plans and the supporting justification;

(4) Proposed changes to the Copermittees' jurisdictional runoff management programs and the supporting justification;

(5) Any other information necessary for the re-issuance of this Order;

(6) Any information to be included as part of the Report of Waste Discharge pursuant to the requirements of this Order; and

(7) Any other information required by federal regulations for NPDES permit reissuance.

c. The Copermittees must submit a Regional Monitoring and Assessment Report no later than 180 days in advance of the expiration date of this Order. The Copermittees must review the receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, and findings from the assessments required pursuant to Provision D.4, to assess the following:

(a) The beneficial uses of the receiving waters within the San Diego Region that are protected;

(b) The progress toward protecting the impacted beneficial uses in the receiving waters within the San Diego Region; and

(c) Pollutants or conditions of concern that may impact beneficial uses in the receiving waters within the San Diego Region.

(1) The Regional Monitoring and Assessment Report must include recommendations for improving the implementation and assessment of the Water Quality Improvement Plans and jurisdictional runoff management programs.

(2) Each Copermittee must provide any data or documentation utilized in developing the Regional Monitoring and Assessment Report upon request by the San Diego Water Board. Any monitoring and assessment data utilized in developing the Regional Monitoring and Assessment Report must be provided on the Regional Clearinghouse required pursuant to Provision F.4.

Comment [K7]: This was moved from F.3.c to this section since it is a part of the ROWD.

Deleted: The Regional Monitoring and Assessment Report may be submitted as part of the Report of Waste Discharge required pursuant to Provision F.5.b.

Deleted: or must be restored

Deleted: restoring

Deleted: emerging

6. Application for Early Coverage

a. The Orange County Copermittees, collectively, or Riverside County Copermittees, collectively, may apply for early coverage under this Order by submitting a Report of Waste Discharge Form 200, with a written request for early coverage under this Order and identification of the necessary changes to this Order, if any, that the Copermittees are recommending based on the ROWD submittal.

b. The San Diego Water Board will review the application for early coverage and will make any necessary changes to this Order. A notification of coverage under this Order will be issued to the Copermittees in the respective county by the San Diego Water Board upon completion of the early coverage application requirements and consideration of any necessary changes to this Order. The effective coverage date will be specified in the notification of coverage. The Copermittees in the respective county are authorized to have MS4 discharges pursuant to the requirements of this Order starting on the effective coverage date specified in the notification of coverage. The existing Order for the respective county is rescinded upon the effective coverage date specified in the notification of coverage except for enforcement purposes.

c. The timelines specified within this Order will be initiated based on the effective coverage date (as specified within the notification of coverage).

7. Reporting Provisions

Each Copermittee must comply with all the reporting and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

G. PRINCIPAL WATERSHED COPERMITTEE RESPONSIBILITIES

1. The Copermittees within each Watershed Management Area must designate a Principal Watershed Copermittee and notify the San Diego Water Board of the name of the Principal Watershed Copermittee. An individual Copermittee should not be designated a Principal Watershed Copermittee for more than two Watershed Management Areas. The notification may be submitted with the Water Quality Improvement Plan required pursuant to Provision F.1 of this Order.

2. The Principal Watershed Copermittee is responsible for, at a minimum, the following:

a. Serving as liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues, and when necessary and appropriate, representing the Copermittees in the Watershed Management Area before the San Diego Water Board.

b. Facilitating the development of the Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order

c. Coordinating the submittal of the deliverables required by Provisions F.1, F.2, F.3.a, and F.3.b of this Order.

d. Coordinating and developing, with the other Principal Watershed Copermittees, the requirements of Provisions F.3.c, F.4, and F.5.b of this Order.

H. MODIFICATION OF PROGRAMS

1. Modifications of the Order may be initiated by the San Diego Water Board or by the Copermittees. Requests by Copermittees must be made to the San Diego Water Board.

2. Minor modifications to the Order may be made by the San Diego Water Board where the proposed modification complies with all the prohibitions and limitations, and other requirements of this Order.

3. Proposed modifications to the Order that are not minor require amendment of this Order in accordance with this Order's rules, policies, and procedures.

4. The San Diego Water Board may re-open and modify this Order at any time prior to its expiration, after opportunity for public comment and a public hearing, if the State Water Board determines that revisions are warranted to those provisions of the Order addressing compliance with water quality standards in the receiving water and/or those provisions of the Order establishing an iterative process for implementation of management practices to assure compliance with water quality standards in the receiving water.

5. The San Diego Water Board will review any applications received for early coverage under this Order (Provision F.6) as well as any general applications received for coverage under this Order and will consider any necessary changes to this Order based on the newly-obtained information and/or reports received as a part of the application process. Within the applications for coverage under this Order, the Copermittees shall identify the changes that are proposed to this Order.

6. Modifications of the Order shall be initiated to incorporate provisions as a result of future amendments to the Basin Plan, such as a new or revised water quality objectives or the adoption or reconsideration of a TMDL, including the program of implementation. As soon as practicable, but no later than 6 months of the effective date of a revised TMDL where the revisions warrant a change to the provisions of this Order, the Regional Water Board shall modify this Order consistent with the assumptions and requirements of the revised WLA(s), including the program of implementation.

7. Modification to the Order shall be considered 18 months prior to the compliance date for WQBELs where the compliance mechanism is based upon numeric effluent limitations. The intent of the reconsideration is to evaluate the inclusion of provisions or modifications to WQBELs in Attachment E of this Order prior to the final compliance deadlines that would allow an action-based, BMP compliance demonstration approach with regard to final WQBELs.

I. STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

Each Copermittee must comply with all the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

ATTACHMENT A

DISCHARGE PROHIBITIONS AND SPECIAL PROTECTIONS

1. Basin Plan Waste Discharge Prohibitions

California Water Code Section 13243 provides that a Regional Water Board, in a water quality control plan, may specify certain conditions or areas where the discharge of waste or certain types of waste is not permitted. The following waste discharge prohibitions in the Water Quality Control Plan for the San Diego Basin (Basin Plan) are applicable to any person, as defined by Section 13050(c) of the California Water Code, who is a citizen, domiciliary, or political agency or entity of California whose activities in California could affect the quality of waters of the state within the boundaries of the San Diego Region.

1. The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in California Water Code Section 13050, is prohibited.

2. The discharge of waste to land, except as authorized by waste discharge requirements or the terms described in California Water Code Section 13264 is prohibited.

3. The discharge of pollutants or dredged or fill material to waters of the United States except as authorized by a National Pollutant Discharge Elimination System (NPDES) permit or a dredged or fill material permit (subject to the exemption described in California Water Code Section 13376) is prohibited.

4. Discharges of recycled water to lakes or reservoirs used for municipal water supply or to inland surface water tributaries thereto are prohibited, unless this San Diego Water Board issues a NPDES permit authorizing such a discharge; the proposed discharge has been approved by the State Department of Health Services (DHS) and the operating agency of the impacted reservoir; and the discharger has an approved fail-safe long-term disposal alternative.

5. The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the San Diego Water Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

6. The discharge of waste in a manner causing flow, ponding, or surfacing on lands not owned or under the control of the discharger is prohibited, unless the discharge is authorized by the San Diego Water Board.

7. The dumping, deposition, or discharge of waste directly into waters of the state, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the San Diego Water Board.

8. Any discharge to a storm water conveyance system that is not composed entirely of "*storm water*" is prohibited unless authorized by the San Diego Water Board. [The federal regulations, 40 CFR 122.26(b)(13), define storm water as storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from fire fighting activities.] [§122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

9. The unauthorized discharge of treated or untreated sewage to waters of the state or to a storm water conveyance system is prohibited.

10. The discharge of industrial wastes to conventional septic tank/subsurface disposal systems, except as authorized by the terms described in California Water Code Section 13264, is prohibited.

11. The discharge of radioactive wastes amenable to alternative methods of disposal into the waters of the state is prohibited.

12. The discharge of any radiological, chemical, or biological warfare agent into waters of the state is prohibited.

13. The discharge of waste into a natural or excavated site below historic water levels is prohibited unless the discharge is authorized by the San Diego Water Board.

14. The discharge of sand, silt, clay, or other earthen materials from any activity, including land grading and construction, in quantities which cause deleterious bottom deposits, turbidity or discoloration in waters of the state or which unreasonably affect, or threaten to affect, beneficial uses of such waters is prohibited.

15. The discharge of treated or untreated sewage from vessels to Mission Bay, Oceanside Harbor, Dana Point Harbor, or other small boat harbors is prohibited.

16. The discharge of untreated sewage from vessels to San Diego Bay is prohibited.

17. The discharge of treated sewage from vessels to portions of San Diego Bay that are less than 30 feet deep at mean lower low water (MLLW) is prohibited.

18. The discharge of treated sewage from vessels, which do not have a properly functioning US Coast Guard certified Type I or Type II marine sanitation device, to portions of San Diego Bay that are greater than 30 feet deep at mean lower low water (MLLW) is prohibited.

2. Attachment B to State Water Board Resolution 2012-0012

Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges

I. PROVISIONS FOR POINT SOURCE DISCHARGES OF STORM WATER AND NONPOINT SOURCE WASTE DISCHARGES

The following terms, prohibitions, and special conditions (hereafter collectively referred to as special conditions) are established as limitations on point source storm water and nonpoint source discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in Areas of Special Biological Significance (ASBS), as required for State Water Quality Protection Areas pursuant to California Public Resources Code Sections 36700(f) and 36710(f). These Special Protections are adopted by the State Water Board as part of the California Ocean Plan (Ocean Plan) General Exception.

The special conditions are organized by category of discharge. The State Water Resources Control Board (State Water Board) and Regional Water Quality Control Boards (Regional Water Boards) will determine categories and the means of regulation for those categories [e.g., Point Source Storm Water National Pollutant Discharge Elimination System (NPDES) or Nonpoint Source].

A. PERMITTED POINT SOURCE DISCHARGES OF STORM WATER

1. General Provisions for Permitted Point Source Discharges of Storm Water

   a. Existing storm water discharges into an ASBS are allowed only under the following conditions:

      (1) The discharges are authorized by an NPDES permit issued by the State Water Board or Regional Water Board;

      (2) The discharges comply with all of the applicable terms, prohibitions, and special conditions contained in these Special Protections; and

      (3) The discharges:

         (i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

         (ii) Are designed to prevent soil erosion;

         (iii) Occur only during wet weather;

         (iv) Are composed of only storm water runoff.

   b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

   c. The discharge of trash is prohibited.

d. Only discharges from existing storm water outfalls are allowed. Any proposed or new storm water runoff discharge shall be routed to existing storm water discharge outfalls and shall not result in any new contribution of waste to an ASBS (i.e., no additional pollutant loading). “Existing storm water outfalls” are those that were constructed or under construction prior to January 1, 2005. “New contribution of waste” is defined as any addition of waste beyond what would have occurred as of January 1, 2005. A change to an existing storm water outfall, in terms of re-location or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges are prohibited except as provided below:

(1) The term “non-storm water discharges” means any waste discharges from a municipal separate storm sewer system (MS4) or other NPDES permitted storm drain system to an ASBS that are not composed entirely of storm water.

(2) (i) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability or occur naturally:

(a) Discharges associated with emergency fire fighting operations.

(b) Foundation and footing drains.

(c) Water from crawl space or basement pumps.

(d) Hillside dewatering.

(e) Naturally occurring groundwater seepage via a storm drain.

(f) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(ii) An NPDES permitting authority may authorize non-storm water discharges to an MS4 with a direct discharge to an ASBS only to the extent the NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

2. Compliance Plans for Inclusion in Storm Water Management Plans (SWMP) and Storm Water Pollution Prevention Plans (SWPPP).

The discharger shall specifically address the prohibition of non-storm water runoff and the requirement to maintain natural water quality for storm water discharges to an ASBS in an ASBS Compliance Plan to be included in its SWMP or a SWPPP, as appropriate to permit type. If a statewide permit includes a SWMP, then the discharger shall prepare a stand-alone compliance plan for ASBS discharges. The ASBS Compliance Plan is subject to approval by the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (for permits issued by Regional Water Boards).

a. The Compliance Plan shall include a map of surface drainage of storm water runoff, showing areas of sheet runoff, prioritize discharges, and describe any structural Best Management Practices (BMPs) already employed and/or BMPs to be employed in the future. Priority discharges are those that pose the greatest water quality threat and which are identified to require installation of structural BMPs. The map shall also show the storm water conveyances in relation to other features such as service areas, sewage conveyances and treatment facilities, landslides, areas prone to erosion, and waste and hazardous material storage areas, if applicable. The SWMP or SWPPP shall also include a procedure for updating the map and plan when changes are made to the storm water conveyance facilities.

b. The ASBS Compliance Plan shall describe the measures by which all non-authorized non-storm water runoff (e.g., dry weather flows) has been eliminated, how these measures will be maintained over time, and how these measures are monitored and documented.

c. For Municipal Separate Storm Sewer System (MS4s), the ASBS Compliance Plan shall require minimum inspection frequencies as follows:

   (1) The minimum inspection frequency for construction sites shall be weekly during rainy season;

   (2) The minimum inspection frequency for industrial facilities shall be monthly during the rainy season;

   (3) The minimum inspection frequency for commercial facilities (e.g., restaurants) shall be twice during the rainy season; and

   (4) Storm water outfall drains equal to or greater than 18 inches (457 mm) in diameter or width shall be inspected once prior to the beginning of the rainy season and once during the rainy season and maintained to remove trash and other anthropogenic debris.

d. The ASBS Compliance Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff, that are necessary to comply with these special conditions, will be achieved through BMPs. Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that such installation would pose a threat to health or safety. BMPs to control storm water runoff discharges (at the end-of-pipe) during a design storm shall be designed to achieve on average the following target levels:

   (1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

   (2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges. The baseline for the reduction is the effective date of the Exception. The baseline for these determinations is the effective date of the Exception, and the

reductions must be achieved and documented within four (4) years of the effective date.

e. The ASBS Compliance Plan shall address erosion control and the prevention of anthropogenic sedimentation in ASBS. The natural habitat conditions in the ASBS shall not be altered as a result of anthropogenic sedimentation.

f. The ASBS Compliance Plan shall describe the non-structural BMPs currently employed and planned in the future (including those for construction activities), and include an implementation schedule. The ASBS Compliance Plan shall include non-structural BMPs that address public education and outreach. Education and outreach efforts must adequately inform the public that direct discharges of pollutants from private property not entering an MS4 are prohibited. The ASBS Compliance Plan shall also describe the structural BMPs, including any low impact development (LID) measures, currently employed and planned for higher threat discharges and include an implementation schedule. To control storm water runoff discharges (at the end-of-pipe) during a design storm, permittees must first consider using LID practices to infiltrate, use, or evapotranspirate storm water runoff on-site.

g. The BMPs and implementation schedule shall be designed to ensure that natural water quality conditions in the receiving water are achieved and maintained by either reducing flows from impervious surfaces or reducing pollutant loading, or some combination thereof.

h. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents in storm water runoff that alter natural ocean water quality and the sources of these constituents.

(2) The report shall describe BMPs that are currently being implemented, BMPs that are identified in the SWMP or SWPPP for future implementation, and any additional BMPs that may be added to the SWMP or SWPPP to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the BMPs.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits), the discharger shall revise its ASBS Compliance Plan to incorporate any new or modified BMPs that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised SWMP or SWPPP, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural ocean water quality conditions due to the same constituent.

(5) Compliance with this section does not excuse violations of any term, prohibition, or condition contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within one year from the effective date of the Exception, the discharger shall submit a written ASBS Compliance Plan to the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that describes its strategy to comply with these special conditions, including the requirement to maintain natural water quality in the affected ASBS. The ASBS Compliance Plan shall include a time schedule to implement appropriate non-structural and structural controls (implementation schedule) to comply with these special conditions for inclusion in the discharger's SWMP or SWPPP, as appropriate to permit type.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these special conditions shall be implemented.

d. Within four (4) years of the effective date of the Exception, any structural controls identified in the ASBS Compliance Plan that are necessary to comply with these special conditions shall be operational.

e. Within four (4) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water, pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data, and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

   If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

   The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

(1) for municipalities, a demonstration of significant hardship to discharger ratepayers, by showing the relationship of storm water fees to annual household income for residents within the discharger's jurisdictional area, and the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or
(2) for other governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process.

B. NONPOINT SOURCE DISCHARGES

[NOT INCLUDED]
[PROVISIONS FOR NONPOINT SOURCE DISCHARGES NOT APPLICABLE]

II. ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES

[NOT INCLUDED]
[ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES NOT APPLICABLE]

III. ADDITIONAL REQUIREMENTS – WATERFRONT AND MARINE OPERATIONS

[NOT INCLUDED]
[ADDITIONAL REQUIREMENTS FOR WATERFRONT AND MARINE OPERATIONS NOT APPLICABLE]

IV. MONITORING REQUIREMENTS

Monitoring is mandatory for all dischargers to assure compliance with the Ocean Plan. Monitoring requirements include both: (A) core discharge monitoring, and (B) ocean receiving water monitoring. The State and Regional Water Boards must approve sampling site locations and any adjustments to the monitoring programs. All ocean receiving water and reference area monitoring must be comparable with the Water Boards' Surface Water Ambient Monitoring Program (SWAMP).

Safety concerns: Sample locations and sampling periods must be determined considering safety issues. Sampling may be postponed upon notification to the State and Regional Water Boards if hazardous conditions prevail.

Analytical Chemistry Methods: All constituents must be analyzed using the lowest minimum detection limits comparable to the Ocean Plan water quality objectives. For metal analysis, all samples, including storm water effluent, reference samples, and ocean receiving water samples, must be analyzed by the approved analytical method with the lowest minimum detection limits (currently Inductively Coupled Plasma/Mass Spectrometry) described in the Ocean Plan.

A. CORE DISCHARGE MONITORING PROGRAM

1. General sampling requirements for timing and storm size:

   Runoff must be collected during a storm event that is greater than 0.1 inch and generates runoff, and at least 72 hours from the previously measurable storm event. Runoff samples shall be collected when post-storm receiving water is sampled, and analyzed for the same constituents as receiving water and reference site samples (see section IV B) as described below.

2. Runoff flow measurements

   a. For municipal/industrial storm water outfalls in existence as of December 31, 2007, 18 inches (457mm) or greater in diameter/width (including multiple outfall pipes in combination having a width of 18 inches, runoff flows must be measured or calculated, using a method acceptable to and approved by the State and Regional Water Boards.
   b. This will be reported annually for each precipitation season to the State and Regional Water Boards.

3. Runoff samples – storm events

   a. For outfalls equal to or greater than 18 inches (0.46m) in diameter or width:

      (1) samples of storm water runoff shall be analyzed during the same storm as receiving water samples for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination, ; and

      (2) samples of storm water runoff shall be analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS

      (3) If an applicant has no outfall greater than 36 inches, then storm water runoff from the applicant's largest outfall shall be further analyzed during the same storm as receiving water samples for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates).

   b. For outfalls equal to or greater than 36 inches (0.91m) in diameter or width:

      (1) samples of storm water runoff shall be analyzed during the same storm as receiving water samples for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

      (2) samples of storm water runoff shall be further analyzed during the same storm as receiving water samples for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates) and

(3) samples of storm water runoff shall be analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

c. For an applicant not participating in a regional monitoring program [see below in Section IV (B)] in addition to (a.) and (b.) above, a minimum of the two largest outfalls or 20 percent of the larger outfalls, whichever is greater, shall be sampled (flow weighted composite samples) at least three times annually during wet weather (storm event) and analyzed for all Ocean Plan Table A constituents, Table B constituents for marine aquatic life protection (except for toxicity, only chronic toxicity for three species shall be required), DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, and Ocean Plan indicator bacteria. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one (the largest) such discharge shall be sampled annually in each Region.

4. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may reduce or suspend core monitoring once the storm runoff is fully characterized. This determination may be made at any point after the discharge is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

B. OCEAN RECEIVING WATER AND REFERENCE AREA MONITORING PROGRAM

In addition to performing the Core Discharge Monitoring Program in Section II.A above, all applicants having authorized discharges must perform ocean receiving water monitoring. In order to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS, dischargers may choose either (1) an individual monitoring program, or (2) participation in a regional integrated monitoring program.

1. Individual Monitoring Program: The requirements listed below are for those dischargers who elect to perform an individual monitoring program to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within the affected ASBS. In addition to Core Discharge Monitoring, the following additional monitoring requirements shall be met:

   a. Three times annually, during wet weather (storm events), the receiving water at the point of discharge from the outfalls described in section (IV)(A)(3)(c) above shall be sampled and analyzed for Ocean Plan Table A constituents, Table B constituents for marine aquatic life, DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, salinity, chronic toxicity (three species), and Ocean Plan indicator bacteria.

      The sample location for the ocean receiving water shall be in the surf zone at the point of discharges; this must be at the same location where storm water runoff is sampled. Receiving water shall be sampled at approximately the same time prior to (pre-storm) and during (or immediately after) the same storm (post storm). Reference water quality shall also be sampled and analyzed for the same constituents pre-storm and post-storm, during the same storms when receiving water is sampled. Reference stations will be determined by the State Water Board's Division of Water Quality and the applicable Regional Water Board(s).

b. Sediment sampling shall occur at least three times during every five (5) year period. The subtidal sediment (sand or finer, if present) at the discharge shall be sampled and analyzed for Ocean Plan Table B constituents for marine aquatic life, DDT, PCBs, PAHs, pyrethroids, and OP pesticides. For sediment toxicity testing, only an acute toxicity test using the amphipod Eohaustorius estuarius must be performed.

c. A quantitative survey of intertidal benthic marine life shall be performed at the discharge and at a reference site. The survey shall be performed at least once every five (5) year period. The survey design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The results of the survey shall be completed and submitted to the State Water Board and Regional Water Board at least six months prior to the end of the permit cycle.

d. Once during each five (5) year period, a bioaccumulation study shall be conducted to determine the concentrations of metals and synthetic organic pollutants at representative discharge sites and at representative reference sites. The study design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The bioaccumulation study may include California mussels (Mytilus californianus) and/or sand crabs (Emerita analoga or Blepharipoda occidentalis). Based on the study results, the Regional Water Board and the State Water Board's Division of Water Quality, may adjust the study design in subsequent permits, or add or modify additional test organisms (such as shore crabs or fish), or modify the study design appropriate for the area and best available sensitive measures of contaminant exposure.

e. Marine Debris: Representative quantitative observations for trash by type and source shall be performed along the coast of the ASBS within the influence of the discharger's outfalls. The design, including locations and frequency, of the marine debris observations is subject to approval by the Regional Water Board and State Water Board's Division of Water Quality.

f. The monitoring requirements of the Individual Monitoring Program in this section are minimum requirements. After a minimum of one (1) year of continuous water quality monitoring of the discharges and ocean receiving waters, the Executive Director of the State Water Board (statewide permits) or Executive officer of the Regional Water Board (Regional Water Board permits) may require additional monitoring, or adjust, reduce or suspend receiving water and reference station monitoring. This determination may be made at any point after the discharge and receiving water is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

2. Regional Integrated Monitoring Program: Dischargers may elect to participate in a regional integrated monitoring program, in lieu of an individual monitoring program, to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS. This regional approach shall characterize natural water quality, pre- and post-storm, in ocean reference areas near the mouths of identified open space watersheds and the effects of the discharges on natural water quality (physical, chemical, and toxicity) in the ASBS receiving waters, and should include benthic marine aquatic life and bioaccumulation components. The design of the ASBS stratum of a regional integrated monitoring program may deviate from the otherwise prescribed individual monitoring approach (in Section IV.B.1) if approved by the State Water Board's Division of Water Quality and the Regional Water Boards.

a. Ocean reference areas shall be located at the drainages of flowing watersheds with minimal development (in no instance more than 10% development), and shall not be located in CWA Section 303(d) listed waterbodies or have tributaries that are 303(d) listed. Reference areas shall be free of wastewater discharges and anthropogenic non-storm water runoff. A minimum of low threat storm runoff discharges (e.g. stream highway overpasses and campgrounds) may be allowed on a case-by-case basis. Reference areas shall be located in the same region as the ASBS receiving water monitoring occurs. The reference areas for each Region are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean reference water samples must be collected from each station, each from a separate storm. A minimum of one reference location shall be sampled for each ASBS receiving water site sampled per responsible party. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

b. ASBS ocean receiving water must be sampled in the surf zone at the location where the runoff makes contact with ocean water (i.e. at "point zero"). Ocean receiving water stations must be representative of worst-case discharge conditions (i.e. co-located at a large drain greater than 36 inches, or if drains greater than 36 inches are not present in the ASBS then the largest drain greater than18 inches.) Ocean receiving water stations are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean receiving water samples must be collected during each storm season from each station, each from a separate storm. A minimum of one receiving water location shall be sampled in each ASBS per responsible party in that ASBS. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

c. Reference and receiving water sampling shall commence during the first full storm season following the adoption of these special conditions, and post-storm samples shall be collected when annual storm water runoff is sampled. Sampling shall occur in a minimum of two storm seasons. For those ASBS dischargers that have already participated in the Southern California Bight 2008 ASBS regional monitoring effort, sampling may be limited to only one storm season.

d. Receiving water and reference samples shall be analyzed for the same constituents as storm water runoff samples. At a minimum, constituents to be sampled and analyzed in reference and discharge receiving waters must include oil and grease, total suspended solids, Ocean Plan Table B metals for protection of marine life, Ocean Plan PAHs, pyrethroids, OP pesticides, ammonia, nitrate, phosphates, and critical life stage chronic toxicity for three species. In addition, within the range of the southern sea otter, indicator bacteria or some other measure of fecal contamination shall be analyzed.

3. Waterfront and Marine Operations: In addition to the above requirements for ocean receiving water monitoring, additional monitoring must be performed for marinas and boat launch and pier facilities:

a. For all marina or mooring field operators, in mooring fields with 10 or more occupied moorings, the ocean receiving water must be sampled for Ocean Plan indicator bacteria,

residual chlorine, copper, zinc, grease and oil, methylene blue active substances (MBAS), and ammonia nitrogen.

(1) For mooring field operators opting for an individual monitoring program (Section IV.B.1 above), this sampling must occur weekly (on the weekend) from May through October.

(2) For mooring field operators opting to participate in a regional integrated monitoring program (Section IV.B.2 above), this sampling must occur monthly from May through October on a high use weekend in each month. The Water Boards may allow a reduction in the frequency of sampling, through the regional monitoring program, after the first year of monitoring.

b. For all mooring field operators, the subtidal sediment (sand or finer, if present) within mooring fields and below piers shall be sampled and analyzed for Ocean Plan Table B metals (for marine aquatic life beneficial use), acute toxicity, PAHs, and tributyltin. For sediment toxicity testing, only an acute toxicity test using the amphipod Eohaustorius estuarius must be performed. This sampling shall occur at least three times during a five (5) year period. For mooring field operators opting to participate in a regional integrated monitoring program, the Water Boards may allow a reduction in the frequency of sampling after the first sampling effort's results are assessed.

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ATTACHMENT B

STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

1. Standard Permit Provisions

Code of Federal Regulations Title 40 Section 122.41 (40 CFR 122.41) includes conditions, or provisions, that apply to all National Pollutant Discharge Elimination System (NPDES) permits. Additional provisions applicable to NPDES permits are in 40 CFR 122.42. All applicable provisions in 40 CFR 122.41 and 40 CFR 122.42 must be incorporated into this Order and NPDES permit. The applicable 40 CFR 122.41 and 40 CFR 122.42 provisions are as follows:

a. DUTY TO COMPLY [40 CFR 122.41(a)]

The Copermittee must comply with all of the provisions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

(1) The Copermittee must comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement. [40 CFR 122.41(a)(1)]

(2) The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to a civil penalty not to exceed $25,000 per day for each violation. The CWA provides that any person who *negligently* violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than 2 years, or both. Any person who *knowingly* violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both. Any person who knowingly violates Section 301, 302, 303, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, and who knows at that time that he thereby places another person in imminent danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of

not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.
[40 CFR 122.41(a)(2)]

(3) Any person may be assessed an administrative penalty by the San Diego Regional Water Quality Control Board (San Diego Water Board), State Water Resources Control Board (State Water Board), or United States Environmental Protection Agency (USEPA) for violating Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.
[40 CFR 122.41(a)(3)]

b. DUTY TO REAPPLY [40 CFR 122.41(b)]

If a Copermittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Copermittee must apply for and obtain a new permit.

c. NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE [40 CFR 122.41(c)]

It shall not be a defense for a Copermittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

d. DUTY TO MITIGATE [40 CFR 122.41(d)]

The Copermittee must take all reasonable steps to minimize or prevent any discharge or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

e. PROPER OPERATION AND MAINTENANCE [40 CFR 122.41(e)]

The Copermittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Copermittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by a Copermittee only when the operation is necessary to achieve compliance with the conditions of this permit.

f. PERMIT ACTIONS [40 CFR 122.41(f)]

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Copermittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

g. PROPERTY RIGHTS [40 CFR 122.41(g)]

This permit does not convey any property rights of any sort, or any exclusive privilege.

h. DUTY TO PROVIDE INFORMATION [40 CFR 122.41(h)]

The Copermittee must furnish to the San Diego Water Board, State Water Board, or USEPA within a reasonable time, any information which the San Diego Water Board, State Water Board, or USPEA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Copermittee must also furnish to the San Diego Water Board, State Water Board, or USPEA upon request, copies of records required to be kept by this permit.

i. INSPECTION AND ENTRY [40 CFR 122.41(i)]

The Copermittee must allow the San Diego Water Board, State Water Board, USEPA, and/or their authorized representative (including an authorized contractor acting as their representative), upon presentation of credentials and other documents as may be required by law, to:

(1) Enter upon the Copermittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit; [40 CFR 122.41(i)(1)]

(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit; [40 CFR 122.41(i)(2)]

(3) Inspect and photograph at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; [40 CFR 122.41(i)(3)] and

(4) Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location. [40 CFR 122.41(i)(4)]

j. MONITORING AND RECORDS [40 CFR 122.41(j)]

(1) Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity. [40 CFR 122.41(j)(1)]

(2) Except for records of monitoring information required by this permit related to the Copermittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five (5) years (or longer as required by 40 CFR Part 503), the

Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time. [40 CFR 122.41(j)(2)]

(3) Records for monitoring information must include: [40 CFR 122.41(j)(3)]

(a) The date, exact place, and time of sampling or measurements; [40 CFR 122.41(j)(3)(i)]
(b) The individual(s) who performed the sampling or measurements; [40 CFR 122.41(j)(3)(ii)]
(c) The date(s) analyses were performed; [40 CFR 122.41(j)(3)(iii)]
(d) The individual(s) who performed the analyses; [40 CFR 122.41(j)(3)(iv)]
(e) The analytical techniques or methods used; [40 CFR 122.41(j)(3)(v)] and
(f) The results of such analyses. [40 CFR 122.41(j)(3)(vi)]

(4) Monitoring must be conducted according to test procedures under 40 CFR Part 136 unless another method is required under 40 CFR Subchapters N or O. [40 CFR 122.41(j)(4)]

In the case of pollutants for which there are no approved methods under 40 CFR Part 136 or otherwise required under 40 CFR Subchapters N and O, monitoring must be conducted according to a test procedure specified in the permit for such pollutants. [40 CFR 122.44(i)(1)(iv)]

(5) The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. [40 CFR 122.41(j)(5)]

k. SIGNATORY REQUIREMENT [40 CFR 122.41(k)]

(1) All applications, reports, or information submitted to the San Diego Water Board, State Water Board, or USEPA must be signed and certified. (See 40 CFR 122.22) [40 CFR 122.41(k)(1)]

(a) *For a municipality, State, Federal, or other public agency.* [All applications must be signed] [b]y either a principal executive officer or ranking elected official. [40 CFR 122.22(a)(3)]

(b) All reports required by permits, and other information requested by the San Diego Water Board, State Water Board, or USEPA must be signed by a person described in paragraph (a) of this section, or by a duly authorized representative of that person. A person is a duly authorized representative only if: [40 CFR 122.22(b)]

(i) The authorization is made in writing by a person described in paragraph (a) of this section; [40 CFR 122.22(b)(1)]

(ii) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company, (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) [40 CFR 122.22(b)(2)] and,

(iii) The written authorization is submitted to the San Diego Water Board and State Water Board. [40 CFR 122.22(b)(3)]

(c) *Changes to authorization.* If an authorization under paragraph (b) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (b) of this section must be submitted to the San Diego Water Board prior to or together with any reports, information, or applications to be signed by an authorized representative. [40 CFR 122.22(c)]

(d) *Certification.* Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." [40 CFR 122.22(d)]

(2) The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both. [40 CFR 122.41(k)(2)]

I. REPORTING REQUIREMENTS [40 CFR 122.41(l)]

(1) *Planned changes.* The Copermittee must give notice to the San Diego Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when: [40 CFR 122.41(l)(1)]

(a) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); [40 CFR 122.41(l)(1)(i)] or

(b) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which

are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1).
[40 CFR 122.41(l)(1)(ii)]

(c) The alteration or addition results in a significant change in the Copermittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. [40 CFR 122.41(l)(1)(iii)]

(2) *Anticipated noncompliance*. The Copermittee must give advance notice to the San Diego Water Board or State Water Board of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.
[40 CFR 122.41(l)(2)]

(3) *Transfers*. This permit is not transferable to any person except after notice to the San Diego Water Board. The San Diego Water Board may require modification or revocation and reissuance of the permit to change the name of the Copermittee and incorporate such other requirements as may be necessary under the CWA.
[40 CFR 122.41(l)(3)]

(4) *Monitoring reports.* Monitoring results must be reported at the intervals specified elsewhere in this permit. [40 CFR 122.41(l)(4)]

(a) Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the San Diego Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices. [40 CFR 122.41(l)(4)(i)]

(b) If the Copermittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or another method required for an industry-specific waste stream under 40 CFR Subchapters N or O, the results of this monitoring must be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the San Diego Water Board or State Water Board.
[40 CFR 122.41(l)(4)(ii)]

(c) Calculations for all limitations which require averaging of measurements must utilize an arithmetic mean unless otherwise specified in the permit.
[40 CFR 122.41(l)(4)(iii)]

(5) *Compliance schedules*. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date. [40 CFR 122.41(l)(5)]

(6) *Twenty-four hour reporting.*

(a) The Copermittee must report any noncompliance that may endanger health or the environment. Any information must be provided orally within 24 hours from the time the Copermittee becomes aware of the circumstances. A written submission must also be provided within five (5) days of the time the Copermittee becomes aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6)(i)]

(b) The following must be included as information which must be reported within 24 hours under this paragraph: [40 CFR 122.41(l)(6)(ii)]

(i) Any unanticipated bypass that exceeds any effluent limitation in the permit (See 40 CFR 122.41(g)). [40 CFR 122.41(l)(6)(ii)(A)]
(ii) Any upset which exceeds any effluent limitation in the permit. [40 CFR 122.41(l)(6)(ii)(B)] and,
(iii) Violation of a maximum daily discharge limitation for any of the pollutants listed by the San Diego Water Board in the permit to be reported within 24 hours. (See 40 CFR 122.44(g)) [40 CFR 122.41(l)(6)(ii)(C)]

(c) The San Diego Water Board may waive the above-required written report on a case-by-case basis if the oral report has been received within 24 hours. [40 CFR 122.41(l)(6)(iii)]

(7) *Other noncompliance.* The Copermittee must report all instances of noncompliance not reported in accordance with the standard provisions required under 40 CFR 122.41(l)(4), (5), and (6), at the time monitoring reports are submitted. The reports must contain the information listed in the standard provisions required under 40 CFR 122.41(l)(6). [40 CFR 122.41(l)(7))]

(8) *Other information.* When the Copermittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the San Diego Water Board, State Water Board, or USEPA, the Copermittee must promptly submit such facts or information. [40 CFR 122.41(l)(8)]

m. BYPASS [40 CFR 122.41(m)]

(1) *Definitions.*

(a) "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. [40 CFR 122.41(m)(1)(i)] or

(b) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be

expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
[40 CFR 122.41(m)(1)(ii)]

(2) *Bypass not exceeding limitations*. The Copermittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the standard provisions required under 40 CFR 122.41(m)(3) and (4).
[40 CFR 122.41(m)(2)]

(3) *Notice.*

(a) *Anticipated bypass*. If the Copermittee knows in advance of the need for a bypass, it must submit a notice, if possible at least ten days before the date of the bypass. [40 CFR 122.41(m)(3)(i)] or

(b) *Unanticipated bypass*. The Copermittee must submit notice of an unanticipated bypass in accordance with the standard provisions required under 40 CFR 122.41(l)(6) (24-hour notice).
[40 CFR 122.41(m)(3)(ii)]

(4) *Prohibition of Bypass.*

(a) Bypass is prohibited, and the San Diego Water Board may take enforcement action against a Copermittee for bypass, unless:
[40 CFR 122.41(m)(4)(i)]

(i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; [40 CFR 122.41(m)(4)(i)(A)]
(ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance;
[40 CFR 122.41(m)(4)(i)(B)] and,
(iii) The Copermittee submitted notice in accordance with the standard provisions required under 40 CFR 122.41(m)(3).
[40 CFR 122.41(m)(4)(i)(C)]

(b) The San Diego Water Board may approve an anticipated bypass, after considering its adverse effects, if the San Diego Water Board determines that it will meet the three conditions listed above.
[40 CFR 122.41(m)(4)(ii)]

n. UPSET [40 CFR 122.41(n)]

(1) *Definition.* "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Copermittee. An upset does not

include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. [40 CFR 122.41(n)(1)]

(2) *Effect of an upset*. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the standard provisions required under 40 CFR 122.41(n)(3) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. [40 CFR 122.41(n)(2)]

(3) *Conditions necessary for a demonstration of upset*. A Copermittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that: [40 CFR 122.41(n)(3)]

(a) An upset occurred and that the Copermittee can identify the cause(s) of the upset; [40 CFR 122.41(n)(3)(i)]
(b) The permitted facility was at the time being properly operated; [40 CFR 122.41(n)(3)(ii)] and
(c) The Copermittee submitted notice of the upset in accordance with the standard provisions required under 40 CFR 122.41(l)(6)(ii)(B) (24-hour notice). [40 CFR 122.41(n)(3)(iii)]
(d) The Copermittee complied with any remedial measures pursuant to the standard provisions required under 40 CFR 122.41(d). [40 CFR 122.41(n)(3)(iii)]

(4) *Burden of proof*. In any enforcement proceeding, the Copermittee seeking to establish the occurrence of an upset has the burden of proof. [40 CFR 122.41(n)(4)]

o. STANDARD PERMIT PROVISIONS FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS [40 CFR 122.42(c)]

The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the San Diego Water Board or State Water Board under 40 CFR 122.26(a)(1)(v) must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report must include:

(1) The status of implementing the components of the storm water management program that are established as permit conditions; [40 CFR 122.42(c)(1)]

(2) Proposed changes to the storm water management programs that are established as permit conditions. Such proposed changes must be consistent with 40 CFR 122.26(d)(2)(iii); [40 CFR 122.42(c)(2)] and

(3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under 40 CFR 122.26(d)(2)(iv) and (v); [40 CFR 122.42(c)(3)]

(4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; [40 CFR 122.42(c)(4)]

(5) Annual expenditures and budget for year following each annual report; [40 CFR 122.42(c)(5)]

(6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; [40 CFR 122.42(c)(6)]

(7) Identification of water quality improvements or degradation. [40 CFR 122.42(c)(7)]

p. STANDARD PERMIT PROVISIONS FOR STORM WATER DISCHARGES [40 CFR 122.42(d)]

The initial permits for discharges composed entirely of storm water issued pursuant to 40 CFR 122.26(e)(7) must require compliance with the conditions of the permit as expeditiously as practicable, but in no event later than three years after the date of issuance of the permit.

2. General Provisions

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. The general provisions applicable to this Order and NPDES permit are as follows:

a. DISCHARGE OF WASTE IS A PRIVILEGE

No discharge of waste into the waters of the State, whether or not such discharge is made pursuant to waste discharge requirements, shall create a vested right to continue such discharge. All discharges of waste into waters of the State are privileges, not rights. [CWC Section 13263(g)]

b. DURATION OF ORDER AND NPDES PERMIT

(1) *Effective date*. This Order and NPDES permit becomes effective on the 50th day after its adoption provided the USEPA has no objection. If the USEPA objects to its issuance, this Order shall not become effective until such objection is withdrawn. This Order supersedes Order No. R9-2007-0001 upon the effective date of this Order, and supersedes Order Nos. R9-2009-0002 and R9-2010-0016 upon their expiration or earlier notice of coverage.

(2) *Expiration*. This Order and NPDES permit expires five years after its effective date. [40 CFR 122.46(a)]

(3) *Continuation of expired order*. After this Order and NPDES permit expires, the terms and conditions of this Order and NPDES permit are automatically continued pending issuance of a new permit if all requirements of the federal NPDES regulations on the continuation of expired permits (40 CFR 122.6) are complied with.

c. AVAILABILITY

A copy of this Order must be kept at a readily accessible location and must be available to on-site personnel at all times.

d. CONFIDENTIALITY OF INFORMATION

Except as provided for in 40 CFR 122.7, no information or documents submitted in accordance with or in application for this Order will be considered confidential, and all such information and documents shall be available for review by the public at the San Diego Water Board office.

Claims of confidentiality for the following information will be denied:
[40 CFR 122.7(b)]

(1) The name and address of any permit applicant or Copermittee;
[40 CFR 122.7(b)(1)] and

(2) Permit applications and attachments, permits, and effluent data.
[40 CFR 122.7(b)(2)]

e. EFFLUENT LIMITATIONS

(1) *Interim effluent limitations*. The Copermittee must comply with any interim effluent limitations as established by addendum, enforcement action, or revised waste discharge requirements which have been, or may be, adopted by the San Diego Water Board.

(2) *Other effluent limitations and standards*. If any applicable toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant and that standard or prohibition is more stringent than any limitation on the pollutant in the permit, the San Diego Water Board shall institute proceedings under these regulations to modify or revoke and reissue the permit to conform to the toxic effluent standard or prohibition. [40 CFR 122.44(b)(1)]

f. DUTY TO MINIMIZE OR CORRECT ADVERSE IMPACTS

The Copermittee must take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this Order, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the noncompliance.

g. PERMIT ACTIONS

The filing of a request by the Copermittee for modification, revocation and reissuance, or termination of this Order, or a notification of planned change in or anticipated noncompliance with this Order does not stay any condition of this Order. (See 40 CFR 122.41(f)) In addition, the following provisions apply to this Order:

(1) Upon application by any affected person, or on its own motion, the San Diego Water Board may review and revise the requirements in this Order. All requirements must be reviewed periodically. [CWC Section 13263(e)]

(2) This Order may be terminated or modified for cause, including, but not limited to, all of the following: [CWC Section 13381]

(a) Violation of any condition contained in the requirements of this Order. [CWC Section 13381(a)]

(b) Obtaining the requirements in this Order by misrepresentation, or failure to disclose fully all relevant facts. [CWC Section 13381(b)]

(c) A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge. [CWC Section 13381(c)]

(3) When this Order is transferred to a new owner or operator, such requirements as may be necessary under the CWC may be incorporated into this Order.

h. NPDES PERMITTED NON-STORM WATER DISCHARGES

The San Diego Water Board has, in prior years, issued a limited number of individual NPDES permits for non-storm water discharges to MS4s. The San Diego Water Board or State Water Board may in the future, upon prior notice to the Copermittee(s), issue an NPDES permit for any non-storm water discharge (or class of non-storm water discharges) to an MS4.

i. MONITORING

In addition to the standard provisions required under 40 CFR 122.41(j) and (l)(4), the following general monitoring provisions apply to this Order:

(1) Where procedures are not otherwise specified in Order, sampling, analysis and quality assurance/quality control must be conducted in accordance with the Quality Assurance Management Plan (QAMP) for the State of California's Surface Water Ambient Monitoring Program (SWAMP), adopted by the State Water Resources Control Board (State Water Board).

(2) Pursuant to 40 CFR 122.41(j)(2) and CWC Section 13383(a), each Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five (5) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time.

(3) All chemical, bacteriological, and toxicity analyses must be conducted at a laboratory certified for such analyses by the California Department of Public Health or a laboratory approved by the San Diego Water Board.

(4) For priority toxic pollutants that are identified in the California Toxics Rule (CTR) (65 Fed. Reg. 31682), the Copermittees must instruct their laboratories to establish calibration standards that are equivalent to or lower than the Minimum Levels (MLs) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP). If a Copermittee can demonstrate that a particular ML is not attainable, in accordance with procedures set forth in 40 CFR Part 136, the lowest quantifiable concentration of the lowest calibration standard analyzed by a specific analytical procedure (assuming that all the method specified sample weights, volumes, and processing steps have been followed) may be used instead of the ML listed in Appendix 4 of the SIP. The Copermittee must submit documentation from the laboratory to the San Diego Water Board for approval prior to raising the ML for any priority toxic pollutant.

j. ENFORCEMENT

(1) The San Diego Water Board is authorized to enforce the terms of this Order under several provisions of the CWC, including, but not limited to, CWC Sections 13385, 13386, and 13387.

(2) Nothing in this Order shall be construed to protect the Copermittee from its liabilities under federal, state, or local laws.

(3) The CWC provides for civil and criminal penalties comparable to, and in some cases greater than, those provided for under the CWA.

(4) Except as provided in the standard conditions required under 40 CFR 122.41(m) and (n), nothing in this Order shall be construed to relieve the Copermittee from civil or criminal penalties for noncompliance.

(5) Nothing in this Order shall be construed to preclude the institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties to which the Copermittee is or may be subject to under Section 311 of the CWA.

(6) Nothing in this Order shall be construed to preclude institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authoring preserved by Section 510 of the CWA.

k. SEVERABILITY

The provisions of this Order are severable, and if any provision of this Order, or the application of any provisions of this Order to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this Order shall not be affected thereby.

l. APPLICATIONS

Any application submitted by a Copermittee for reissuance or modification of this Order must satisfy all applicable requirements specified in federal regulations as well as any additional requirements for submittal of a Report of Waste Discharge specified in the CWC and the California Code of Regulations.

m. IMPLEMENTATION

All plans, reports and subsequent amendments submitted in compliance with this Order must be implemented immediately (or as otherwise specified). All submittals by Copermittees must be adequate to implement the requirements of this Order.

n. REPORT SUBMITTALS

(1) All report submittals must include an executive summary, introduction, conclusion, recommendations, and signed certified statement.

(2) Each Copermittee must submit a signed certified statement covering its responsibilities for each applicable submittal.

(3) The Principal Watershed Copermittee(s) must submit a signed certified statement covering its responsibilities for each applicable submittal and the sections of the submittals for which it is responsible.

(4) Unless otherwise directed, the Copermittees must submit one hard copy and one electronic copy of each report required under this Order to the San Diego Water Board, and one electronic copy to the USEPA.

(5) The Copermittees must submit reports and provide notifications as required by this Order to the following:

EXECUTIVE OFFICER
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
9174 SKY PARK COURT, SUITE 100
SAN DIEGO CA 92123-4340
Telephone: (858) 467-2952 Fax: (858) 571-6972

EUGENE BROMLEY
US ENVIRONMENTAL PROTECTION AGENCY
REGION IX
PERMITS ISSUANCE SECTION (W-5-1)
75 HAWTHORNE STREET
SAN FRANCISCO CA 94105

ATTACHMENT C

ACRONYMS AND ABBREVIATIONS

AMAL	Average Monthly Action Level
ASBS	Area(s) of Special Biological Significance
BMP	Best Management Practice
Basin Plan	Water Quality Control Plan for the San Diego Basin
CEQA	California Environmental Quality Act
CCR	California Code of Regulations
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWC	California Water Code
CZARA	Coastal Zone Act Reauthorization Amendments of 1990
ESAs	Environmentally Sensitive Areas
GIS	Geographic Information System
IBI	Index of Biological Integrity
LID	Low Impact Development
MDAL	Maximum Daily Action Level
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
NAL	Non-Storm Water Action Level
NAICS	North American Industry Classification System
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
ROWD	Report of Waste Discharge (application for NPDES reissuance)
SAL	Storm Water Action Level
San Diego Water Board	California Regional Water Quality Control Board, San Diego Region
SIC	Standard Industrial Classification Code
State Water Board	State Water Resources Control Board
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
WDID	Waste Discharge Identification Number
WLA	Waste Load Allocation
WQBEL	Water Quality Based Effluent Limitation

DEFINITIONS

Active/Passive Sediment Treatment - Using mechanical, electrical or chemical means to flocculate or coagulate suspended sediment for removal from runoff from construction sites prior to discharge.

Anthropogenic Litter – Trash generated from human activities, not including sediment.

Average Monthly Action Level – The highest allowable average of daily discharges over a calendar month.

Beneficial Uses - The uses of water necessary for the survival or wellbeing of man, plants, and wildlife. These uses of water serve to promote tangible and intangible economic, social, and environmental goals. "Beneficial Uses" of the waters of the State that may be protected include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. Existing beneficial uses are uses that were attained in the surface or ground water on or after November 28, 1975; and potential beneficial uses are uses that would probably develop in future years through the implementation of various control measures. "Beneficial Uses" are equivalent to "Designated Uses" under federal law. [California Water Code Section 13050(f)].

Best Management Practices (BMPs) - Defined in 40 CFR 122.2 as schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Bioassessment - The use of biological community information to evaluate the biological integrity of a water body and its watershed. With respect to aquatic ecosystems, bioassessment is the collection and analysis of samples of the benthic macroinvertebrate community together with physical/habitat quality measurements associated with the sampling site and the watershed to evaluate the biological condition (i.e. biotic integrity) of a water body.

Biofiltration - Practices that use vegetation and amended soils to detain and treat runoff from impervious areas. Treatment is through filtration, infiltration, adsorption, ion exchange, and biological uptake of pollutants.

Biological Integrity - Defined in Karr J.R. and D.R. Dudley. 1981. Ecological perspective on water quality goals. *Environmental Management* 5:55-68 as: "A balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitat of the region." Also referred to as ecosystem health.

BMP Design Manual – A plan developed to eliminate, reduce, or mitigate the impacts of runoff from development projects, including Priority Development Projects.

Channel Rehabilitation and Improvement – Remedial measures or activities for the purpose of improving the environmental health of streams, channels, or river systems. Techniques may vary from in-stream restoration techniques to off-line stormwater management practices

installed in the system corridor or upland areas. Rehabilitation techniques may include, but are not limited to the following: riparian zone restoration, constructed wetlands, bank stabilization, channel modifications, and daylighting of drainage systems. Effectiveness may be measured in various manners, including: assessments of habitat, reduced streambank erosion, and/or restoration of water and sediment transport balance.

Clean Water Act Section 303(d) Water Body - An impaired water body in which water quality does not meet applicable water quality standards and/or is not expected to meet water quality standards, even after the application of technology based pollution controls required by the CWA. The discharge of runoff to these water bodies by the Copermittees is significant because these discharges can cause or contribute to violations of applicable water quality standards.

Construction Site – Any project, including projects requiring coverage under the Construction General Permit, that involves soil disturbing activities including, but not limited to, clearing, grading, disturbances to ground such as stockpiling, and excavation.

Contamination - As defined in the Porter-Cologne Water Quality Control Act, contamination is "an impairment of the quality of waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste whether or not waters of the State are affected."

Copermittee – A permittee to a NPDES permit that is only responsible for permit conditions relating to the discharge for which it is operator [40 CFR 122.26(b)(1)]. For the purposes of this Order, a Copermittee may include the following jurisdictions: an incorporated city within the County of Orange, County of Riverside, or County of San Diego in the San Diego Region, the County of Orange, the County of Riverside, the County of San Diego, the Orange County Flood Control District, the Riverside County Water Conservation and Flood Control District, the San Diego Regional Airport Authority, or the San Diego Unified Port District.

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Copermittees – All of the individual Copermittees, collectively.

Critical Channel Flow (Qc) – The channel flow that produces the critical shear stress that initiates bed movement or that erodes the toe of channel banks. When measuring Qc, it should be based on the weakest boundary material – either bed or bank.

Daily Discharge – Defined as either: (1) the total mass of the constituent discharged over the calendar day or any 24 hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g. concentration.)

The Daily Discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day, or other 24 hour period other than a day), or by the arithmetic mean of analytical results from one or more grab samples taken over the course of a day.

Development Projects - Construction, rehabilitation, redevelopment, or reconstruction of any public or private residential project, industrial, commercial, or any other projects.

Dry Season –May 1 to September 30.

Dry Weather – Weather is considered dry if the preceding 72 hours has been without measurable precipitation (>0.1 inch).

Enclosed Bays – Enclosed bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost bay works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays do not include inland surface waters or ocean waters.

Erosion – When land is diminished or worn away due to wind, water, or glacial ice. Often the eroded debris (silt or sediment) becomes a pollutant via storm water runoff. Erosion occurs naturally but can be intensified by land clearing activities such as farming, development, road building, and timber harvesting.

Environmentally Sensitive Areas (ESAs) - Areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; areas designated as preserves or their equivalent under the Natural Communities Conservation Program within the Cities and County of Orange; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.

Estuaries – Waters, including coastal lagoons, located at the mouth of streams that serve as areas of mixing fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and ocean water. Estuaries do not include inland surface waters or ocean waters.

Existing Development – Any area that has been developed and exists for municipal, commercial, industrial, or residential purposes, uses, or activities. May include areas that are not actively used for its originally developed purpose, but may be re-purposed or redeveloped for another use or activity.

Flow Duration – The long-term period of time that flows occur above a threshold that causes significant sediment transport and may cause excessive erosion damage to creeks and streams (not a single storm event duration). The simplest way to visualize this is to consider a histogram of pre- and post-project flows using long-term records of hourly data. To maintain pre-development flow duration means that the total number of hours (counts) within each range of flows in a flow-duration histogram cannot increase between the pre- and post-development condition. Flow duration within the range of geomorphologically significant flows is important for managing erosion.

Grading - The cutting and/or filling of the land surface to a desired slope or elevation.

Hazardous Material – Any substance that poses a threat to human health or the environment due to its toxicity, corrosiveness, ignitability, explosive nature or chemical reactivity. These also include materials named by the USEPA in 40 CFR 116 to be reported if a designated quantity of the material is spilled into the waters of the U.S. or emitted into the environment.

Hazardous Waste - Hazardous waste is defined as "any waste which, under Section 600 of Title 22 of this code, is required to be managed according to Chapter 30 of Division 4.5 of Title 22 of this code" [CCR Title 22, Division 4.5, Chapter 11, Article 1].

Household Hazardous Waste – Paints, cleaning products, and other wastes generated during home improvement or maintenance activities.

Hydromodification – The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

Illicit Connection – Any man-made conveyance or drainage system through which the discharge of any pollutant to the stormwater drainage system occurs or may occur.

Deleted: Any connection to the MS4 that conveys an illicit discharge.

Illicit Discharge - Any discharge to a MS4 that is not composed entirely of storm water except discharges pursuant to a NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer) and discharges resulting from fire fighting activities [40 CFR 122.26(b)(2)].

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Inactive Areas – Areas of construction activity that are not active and those that have been active and are not scheduled to be re-disturbed for at least 14 days.

Infiltration – Water other than wastewater that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow [40 CFR 35.2005(20)]. In the context of low impact development, infiltration may also be defined as the percolation of water into the ground. Infiltration is often expressed as a rate (inches per hour), which is determined through an infiltration test.

Inland Surface Waters – Includes all surface waters of the State that do not include the ocean, enclosed bays, or estuaries.

Jurisdictional Runoff Management Program Document – A written description of the specific jurisdictional runoff management measures and programs that each Copermittee will implement to comply with this Order and ensure that storm water pollutant discharges in runoff are reduced to the MEP and do not cause or contribute to a violation of water quality standards.

Low Impact Development (LID) – A storm water management and land development strategy that emphasizes conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions.

Low Impact Development Best Management Practices (LID BMPs) – LID BMPs include schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States through storm water management and land development strategies that emphasize conservation sand the use of on-site natural features integrated with engineered, small-scale hydrologic controls to

more closely reflect pre-development hydrologic functions. LID BMPs include retention practices that do not allow runoff, such as infiltration, rain water harvesting and reuse, and evapotranspiration. LID BMPs also include flow-through practices such as biofiltration that may have some discharge of storm water following pollutant reduction.

Major Outfall – As defined in the Code of Federal Regulations, a major outfall is a MS4 outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (i.e. discharge from a single conveyance other than a circular pipe which is associated with a drainage are of more than 50 acres); or, for MS4s that receive storm water from lands zoned for industrial activity (based on comprehensive zoning plans or equivalent), a MS4 outfall that discharges from a single pipe with an inside diameter of 12 inches or more or from its equivalent (i.e. discharge from other than a circular pipe associated with a drainage area of 2 acres or more).

Maximum Daily Action Level (MDAL) –The highest allowable daily discharge of a pollutant, over a calendar day (or 24 hour period). For pollutants with action levels expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with action levels expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

Maximum Extent Practicable (MEP) – The technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) for storm water that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) <u>in combination</u> with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than BAT. A definition for MEP is not provided either in the statute or in the regulations. Instead the definition of MEP is dynamic and will be defined by the following process over time: municipalities propose their definition of MEP by way of their runoff management programs. Their total collective and individual activities conducted pursuant to the runoff management programs becomes their proposal for MEP as it applies both to their overall effort, as well as to specific activities (e.g., MEP for street sweeping, or MEP for MS4 maintenance). In the absence of a proposal acceptable to the San Diego Water Board, the San Diego Water Board defines MEP.

In a memo dated February 11, 1993, entitled "Definition of Maximum Extent Practicable," Elizabeth Jennings, Senior Staff Counsel, SWRCB addressed the achievement of the MEP standard as follows:

> "*To achieve the MEP standard, municipalities must employ whatever Best Management Practices (BMPs) are technically feasible (i.e., are likely to be effective) and are not cost prohibitive. The major emphasis is on technical feasibility. Reducing pollutants to the MEP means choosing effective BMPs, and rejecting applicable BMPs only where other effective BMPs will serve the same purpose, or the BMPs would not be technically feasible, or the cost would be prohibitive. In selecting BMPs to achieve the MEP standard, the following factors may be useful to consider:*
>
> *a. Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?*
> *b. Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?*
> *c. Public Acceptance: Does the BMP have public support?*

d. Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?
e. Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc.?

The final determination regarding whether a municipality has reduced pollutants to the maximum extent practicable can only be made by the Regional or State Water Boards, and not by the municipal discharger. If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit derived, it would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs that would address a pollutant source, or to pick a BMP based solely on cost, which would be clearly less effective. In selecting BMPs the municipality must make a serious attempt to comply and practical solutions may not be lightly rejected. In any case, the burden would be on the municipal discharger to show compliance with its permit. After selecting a menu of BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented."

Monitoring Year – October 1 to September 30

Municipal Separate Storm Sewer System (MS4) – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designated or used for collecting or conveying storm water; (iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.26.

National Pollutant Discharge Elimination System (NPDES) - The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the CWA.

Non-Storm Water - All discharges to and from a MS4 that do not originate from precipitation events (i.e., all discharges from a MS4 other than storm water). Non-storm water includes illicit discharges and NPDES permitted discharges.

Nuisance - As defined in the Porter-Cologne Water Quality Control Act, a nuisance is "anything which meets all of the following requirements: 1) Is injurious to health, or is indecent, or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. 2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. 3) Occurs during, or as a result of, the treatment or disposal of wastes."

Ocean Waters – the territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the State Board's California Ocean Plan.

Order – Unless otherwise specified, refers to this Order, Order No. R9-2013-0001 (NPDES No. CAS0109266)

Persistent Flow - Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

Person - A person is defined as an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof [40 CFR 122.2].

Point Source - Any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, landfill leachate collection systems, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

Pollutant - Any agent that may cause or contribute to the degradation of water quality such that a condition of pollution or contamination is created or aggravated.

Pollution - As defined in the Porter-Cologne Water Quality Control Act, pollution is "the alteration of the quality of the waters of the State by waste, to a degree that unreasonably affects the either of the following: 1) The waters for beneficial uses; or 2) Facilities that serve these beneficial uses." Pollution may include contamination.

Pollution Prevention - Pollution prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control BMPs, treatment control BMPs, or disposal.

Pre-Development Runoff Conditions – Runoff conditions that existed onsite before the existing development was constructed, or exists onsite before planned development activities occur.

Priority Development Projects - New development and redevelopment projects defined under Provision E.3.b of Order No. R9-2012-0011.

Progressive Enforcement -. A series of enforcement actions that increase in severity commensurate with the violation. Such enforcement actions may include verbal and written notices of violation, fines, stop work orders, administrative penalties, criminal penalties, etc.

Rainy Season (aka Wet Season) –October 1 to April 30

Receiving Waters – Waters of the United States.

Receiving Water Limitations - Waste discharge requirements issued by the San Diego Water Board typically include both: (1) "Effluent Limitations" (or "Discharge Limitations") that specify the technology-based or water-quality-based effluent limitations; and (2) "Receiving Water

Limitations" that specify the water quality objectives in the Basin Plan as well as any other limitations necessary to attain those objectives. In summary, the "Receiving Water Limitations" provision is the provision used to implement the requirements of CWA section 402(p)(3)(B).

Redevelopment - The creation, addition, and or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include trenching and resurfacing associated with utility work; parking lots, resurfacing existing roadways; cutting and reconfiguring of surface parking lots; new sidewalk construction, pedestrian ramps, or bike lane on existing roads; and routine replacement of damaged pavement, such as pothole repair.

Regional Clearinghouse – A central location for the collection, classification, and distribution of information including, but not limited to, plans, reports, manuals, data, contact information, and/or links to such documents and information. The clearinghouse(s) may be organized by the following regions: Watershed Management Areas, County jurisdictions, and/or the San Diego Regional Water Quality Control Board jurisdiction.

Reporting Period – The period of information that is reported in the Annual Report. The reporting period consists of two components: 1) July 1 to June 30, consistent with the fiscal year, for the implementation of the jurisdictional runoff management programs, and 2) October 1 to September 30, consistent with the monitoring year for the monitoring and assessment programs. Together, these two time periods constitute the reporting year for the Annual Report due January 31 following the end of the monitoring year.

Retain –Keep or hold in a particular place, condition, or position without discharge to surface waters.

Retrofitting – Storm water management practice put into place after development has occurred in watersheds where the practices previously did not exist. Retrofitting of developed areas is intended to improve water quality, protect downstream channels, reduce flooding, or meet other specific objectives. Retrofitting developed areas may include, but is not limited to replacing roofs with green roofs, disconnecting downspouts or impervious surfaces to drain to pervious surfaces, replacing impervious surfaces with pervious surfaces, installing rain barrels, installing rain gardens, and trash area enclosures.

Runoff - All flows in a storm water conveyance system that consists of the following components: (1) storm water (wet weather flows) and (2) non-storm water including dry weather flows.

San Diego Water Board – As used in this document the term "San Diego Water Board" is synonymous with the term "Regional Board" as defined in Water Code section 13050(b) and is intended to refer to the California Regional Water Quality Control Board for the San Diego Region as specified in Water Code Section 13200.

Sediment - Soil, sand, and minerals washed from land into water. Sediment resulting from anthropogenic sources (i.e. human induced land disturbance activities) is considered a pollutant. This Order regulates only the discharges of sediment from anthropogenic sources and does not regulate naturally occurring sources of sediment. Sediment can destroy fish-

nesting areas, clog animal habitats, and cloud waters so that sunlight does not reach aquatic plants.

Source Control BMP – Land use or site planning practices, or structural or nonstructural measures that aim to prevent runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between pollutants and runoff.

Storm Water – Per 40 CFR 122.26(b)(13), means storm water runoff, snowmelt runoff and surface runoff and drainage.

Deleted: Surface runoff and drainage pertains to runoff and drainage resulting from precipitation events.

Stream, Channel, or Habitat Rehabilitation – Measures or activities for the purpose of improving or restoring the environmental health (i.e. physical, chemical and biological integrity) of streams, channels, or river systems. Rehabilitation techniques may include, but are not limited to, riparian zone restoration, constructed wetlands, bank stabilization, channel reconfiguration, and daylighting drainage systems.

Structural BMPs - A subset of BMPs which detains, retains, filters, removes, or prevents the release of pollutants to surface waters from development projects in perpetuity, after construction of a project is completed.

Total Maximum Daily Load (TMDL) - The maximum amount of a pollutant that can be discharged into a water body from all sources (point and non-point) and still maintain water quality standards. Under CWA section 303(d), TMDLs must be developed for all water bodies that do not meet water quality standards after application of technology-based controls.

Toxicity - Adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies). The water quality objectives for toxicity provided in the Basin Plan, state in part…"All waters shall be free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life….The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge".

Treatment Control BMP – Any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media absorption or any other physical, biological, or chemical process.

Unpaved Road – Any long, narrow stretch without pavement used for traveling by motor passenger vehicles between two or more points. Unpaved roads are generally constructed of dirt, gravel, aggregate or macadam and may be improved or unimproved.

Waste - As defined in CWC Section 13050(d), "waste includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal."

Article 2 of CCR Title 23, Chapter 15 (Chapter 15) contains a waste classification system that applies to solid and semi-solid waste, which cannot be discharged directly or indirectly to water of the state and which therefore must be discharged to land for treatment, storage, or disposal in accordance with Chapter 15. There are four classifications of waste (listed in order of highest

to lowest threat to water quality): hazardous waste, designated waste, non-hazardous solid waste, and inert waste.

Water Quality Objective - Numerical or narrative limits on constituents or characteristics of water designated to protect designated beneficial uses of the water. [California Water Code Section 13050 (h)]. California's water quality objectives are established by the State and Regional Water Boards in the Water Quality Control Plans. Numeric or narrative limits for pollutants or characteristics of water designed to protect the beneficial uses of the water. In other words, a water quality objective is the maximum concentration of a pollutant that can exist in a receiving water and still generally ensure that the beneficial uses of the receiving water remain protected (i.e., not impaired). Since water quality objectives are designed specifically to protect the beneficial uses, when the objectives are violated the beneficial uses are, by definition, no longer protected and become impaired. This is a fundamental concept under the Porter Cologne Act. Equally fundamental is Porter Cologne's definition of pollution. A condition of pollution exists when the water quality needed to support designated beneficial uses has become unreasonably affected or impaired; in other words, when the water quality objectives have been violated. These underlying definitions (regarding beneficial use protection) are the reason why all waste discharge requirements implementing the federal NPDES regulations require compliance with water quality objectives. (Water quality objectives are also called water quality criteria in the CWA.)

Water Quality Standards - Water quality standards, as defined in Clean Water Act section 303(c) consist of the beneficial uses (e.g., swimming, fishing, municipal drinking water supply, etc.,) of a water body and criteria (referred to as water quality objectives in the California Water Code) necessary to protect those uses. Under the Water Code, the water boards establish beneficial uses and water quality objectives in water quality control or basin plans. Together with an anti-degradation policy, these beneficial uses and water quality objectives serve as water quality standards under the Clean Water Act. In Clean Water Act parlance, state beneficial uses are called "designated uses" and state water quality objectives are called "criteria." Throughout this Order, the relevant term is used depending on the statutory scheme.

Waters of the State - Any surface water or groundwater, including saline waters, within the boundaries of the State [CWC section 13050 (e)]. The definition of the Waters of the State is broader than that for the Waters of the United States in that all water in the State is considered to be a Waters of the State.

Deleted: water,

Deleted: underground

Deleted: regardless of circumstances or condition

Waters of the United States - As defined in the 40 CFR 122.2, the Waters of the U.S. are defined as: "(a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate "wetlands;" (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters otherwise defined as waters of the United States under this definition: (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial seas; and (g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waters of the United States do not include prior

converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA."

Watershed - That geographical area which drains to a specified point on a water course, usually a confluence of streams or rivers (also known as drainage area, catchment, or river basin).

Wet Season (aka Rainy Season) –October 1 to April 30

Wet Weather – Weather is considered wet if there is a storm event of 0.1 inches and greater preceded by 72 hours of dry weather, unless otherwise defined by another regulatory mechanism, such as a TMDL.

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ATTACHMENT D

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

Comment [K8]: It is recommended that this form be deleted and that the Copermittees use their existing reporting format and structure until the WQIPs and corresponding JRMPs are developed and/or updated.

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FY _____

I. COPERMITTEE INFORMATION			
Copermittee Name:			
Copermittee Primary Contact Name:			
Copermittee Primary Contact Information: Address: City:	County:	State:	Zip:
Telephone:	Fax:	Email:	

II. LEGAL AUTHORITY		
Has the Copermittee established adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 that complies with Order No. R9-2013-0001?	YES NO	☐ ☐
A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority?	YES NO	☐ ☐

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE		
Was an update of the jurisdictional runoff management program document required or recommended by the San Diego Water Board?	YES NO	☐ ☐
If YES to the question above, did the Copermittee update its jurisdictional runoff management program document and make it available on the Regional Clearinghouse?	YES NO	☐ ☐

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM		
Has the Copermittee implemented a program to actively detect and eliminate illicit discharges and connections to its MS4 that complies with Order No. R9-2013-0001?	YES NO	☐ ☐

Number of non-storm water discharges reported by the public	
Number of non-storm water discharges detected by Copermittee staff or contractors	
Number of non-storm water discharges investigated by the Copermittee	
Number of sources of non-storm water discharges identified	
Number of non-storm water discharges eliminated	
Number of sources of illicit discharges or connections identified	
Number of illicit discharges or connections eliminated	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

V. DEVELOPMENT PLANNING PROGRAM		
Has the Copermittee implemented a development planning program that complies with Order No. R9-2013-0001?	YES NO	☐ ☐
Was an update to the BMP Design Manual required or recommended by the San Diego Water Board?	YES NO	☐ ☐
If YES to the question above, did the Copermittee update its BMP Design Manual and make it available on the Regional Clearinghouse?	YES NO	☐ ☐

Number of proposed development projects in review	
Number of Priority Development Projects in review	
Number of Priority Development Projects approved	
Number of approved Priority Development Projects exempt from any BMP requirements	
Number of approved Priority Development Projects allowed alternative compliance	
Number of Priority Development Projects granted occupancy	

Number of completed Priority Development Projects in inventory	
Number of high priority Priority Development Project structural BMP inspections	
Number of Priority Development Project structural BMP violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

FY _____

VI. CONSTRUCTION MANAGEMENT PROGRAM

Has the Copermittee implemented a construction management program that complies with Order No. R9-2013-0001?	YES	☐
	NO	☐

Number of construction sites in inventory	
Number of active construction sites in inventory	
Number of inactive construction sites in inventory	
Number of construction sites closed/completed during reporting period	
Number of construction site inspections	
Number of construction site violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

Has the Copermittee implemented an existing development management program that complies with Order No. R9-2013-0001?	YES	☐
	NO	☐

	Municipal	Commercial	Industrial	Residential
Number of facilities or areas in inventory				
Number of existing development inspections				
Number of follow-up inspections				
Number of violations				
Number of enforcement actions issued				
Number of escalated enforcement actions issued				

VIII. PUBLIC EDUCATION AND PARTICIPATION

Has the Copermittee implemented a public education program component that complies with Order No. R9-2013-0001?	YES	☐
	NO	☐
Has the Copermittee implemented a public participation program component that complies with Order No. R9-2013-0001?	YES	☐
	NO	☐

IX. FISCAL ANALYSIS

Has the Copermittee attached to this form a summary of its fiscal analysis that complies with Order No. R9-2013-0001?	YES	☐
	NO	☐

X. CERTIFICATION

I [☐ Principal Executive Officer ☐ Ranking Elected Official ☐ Duly Authorized Representative] certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature	Date
Print Name	Title
Telephone Number	Email

ATTACHMENT E

SPECIFIC PROVISIONS FOR TOTAL MAXIMUM DAILY LOADS APPLICABLE TO ORDER NO. R9-2013-0001

These provisions implement Total Maximum Daily Loads (TMDLs), adopted by the San Diego Water Board and approved by USEPA under Clean Water Act section 303(c), which are applicable to discharges regulated under this Order. The provisions and schedules for implementation of the TMDLs described below must be incorporated into the Water Quality Improvement Plans, required pursuant to Provision B of this Order, for the specified Watershed Management Areas.

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed
2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin
3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed
4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek
5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay
6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2002-0123

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	August 14, 2002
State Water Board Approval Date:	July 16, 2003
Office of Administrative Law Approval Date:	September 11, 2003
US EPA Approval Date:	November 3, 2003

(3) TMDL Effective Date: September 11, 2003

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for Chollas Creek consist of the following:

(1) Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedule under Specific Provision 1.c:

Table 1.1
Receiving Water Limitations as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Diazinon	Acute	0.08 µg/L	1 hour
	Chronic	0.05 µg/L	4 days

(2) Effluent Limitations

Discharges from the MS4s must not contain concentrations that exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 1.c:

Table 1.2
Effluent Limitations as Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation	Averaging Period
Diazinon	Acute	0.072 µg/L	1 hour
	Chronic	0.045 µg/L	4 days

(3) Best Management Practices

The following BMPs for Chollas Creek must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area and implemented by the Responsible Copermittees:

(a) The Responsible Copermittees must implement BMPs to support the achievement of the WQBELs under Specific Provision 1.b for Chollas Creek.

(b) The Responsible Copermittees must implement the Diazinon Toxicity Control Plan and Diazinon Public Outreach/Education Program as described in the report titled, *Technical Report for Total Maximum Daily Load for Diazinon in Chollas Creek Watershed, San Diego County*, dated August 14, 2002, including subsequent modifications, in order to achieve the WQBELs under Specific Provision 1.b.

(c) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans as possible.

c. COMPLIANCE SCHEDULE

The Responsible Copermittees are required to achieve their respective WLAs by December 31, 2010. The Responsible Copermittees must be in compliance with the WQBELs under Specific Provision 1.b.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls for diazinon within the Chollas Creek watershed, and calculate or estimate the annual diazinon loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

e. COMPLIANCE DETERMINATION

Compliance with WQBELs of Specific Provision 1.b may be demonstrated via one of the following methods:

(1) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;

(2) There are no exceedances of the applicable receiving water limitations under Specific Provision 1.b.(1) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(3) There are no violations of the applicable effluent limitations under Specific Provision 1.b.(2) at the Responsible Copermittees' MS4 outfalls.

2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0019

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	September 22, 2005
Office of Administrative Law Approval Date:	December 2, 2005
US EPA Approval Date:	February 8, 2006

(3) TMDL Effective Date: December 2, 2005

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Shelter Island Yacht Basin

(6) Responsible Copermittee: City of San Diegot

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for Shelter Island Yacht Basin consist of the following:

(1) Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedule under Specific Provision 2.c:

Table 2.1
Receiving Water Limitations as Concentrations in Shelter Island Yacht Basin

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Dissolved Copper	Acute	4.8 µg/L	1 hour
	Chronic	3.1 µg/L	4 days

(2) Effluent Limitations

Discharges from the MS4s must not contain pollutant loads that exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 2.c:

Table 2.2
Effluent Limitations as Annual Loads in MS4 Discharges to Shelter Island Yacht Basin

Constituent	Effluent Limitation
Dissolved Copper	30 kg/yr

(3) Best Management Practices

The Responsible Copermittee must implement BMPs to support the achievement of the WQBELs under Specific Provision 2.b for Shelter Island Yacht Basin

c. COMPLIANCE SCHEDULE

The Responsible Copermittee is required to achieve the MS4 WLA by December 2, 2005. The Responsible Copermittee must be in compliance with the WQBELs under Specific Provision 2.b.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

The Responsible Copermittee must monitor the effluent of its MS4 outfalls for dissolved copper, and calculate or estimate the monthly and annual dissolved copper loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.(b)(2)of this Order. The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

e. COMPLIANCE DETERMINATION

Compliance with WQBELs of Specific Provision 2.b may be demonstrated via one of the following methods:

(1) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water;

(2) There are no exceedances of the applicable receiving water limitations under Specific Provision 2.b.(1) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(3) There are no violations of the applicable effluent limitations under Specific Provision 2.b.(2) at the Responsible Copermittee's MS4 outfalls.

3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0036

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	November 16, 2005
Office of Administrative Law Approval Date:	February 1, 2006
US EPA Approval Date:	March 22, 2006

(3) TMDL Effective Date: February 1, 2006

(4) Watershed Management Area: Santa Margarita River

(5) Water Body: Rainbow Creek

(6) Responsible Copermittee: County of San Diego

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for Rainbow Creek consist of the following

(1) Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedule under Specific Provision 3.c.(1):

Table 3.1
Receiving Water Limitations as Concentrations in Rainbow Creek

Constituent	Receiving Water Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(2) Effluent Limitations

(a) Discharges from the MS4s must not contain concentrations that exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 3.c.(1):

Table 3.2
Effluent Limitations as Concentrations in MS4 Discharges to Rainbow Creek

Constituent	Effluent Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(b) Pollutant loads from given land uses discharging to and from the MS4s must not exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 3.c.(1):

Table 3.3
Effluent Limitations as Annual Loads in MS4 Discharges to Rainbow Creek

Land Use	Total N	Total P
Commercial nurseries	116 kg/yr	3 kg/yr
Park	3 kg/yr	0.1 kg/yr
Residential areas	149 kg/yr	12 kg/yr
Urban areas	27 kg/yr	6 kg/yr

Interim effluent limitations expressed as pollutant loads are given in the compliance schedule under Specific Provision 3.0.

(3) Best Management Practices

(a) The Responsible Copermittee must implement BMPs to support the achievement of the WQBELs under Specific Provision 3.b for Rainbow Creek.

(b) The Responsible Copermittee should coordinate any BMPs implemented to address this TMDL with Caltrans and other sources as possible.

c. COMPLIANCE SCHEDULE

(1) Compliance Date

The Responsible Copermittee must be in compliance with the WQBELs under Specific Provision 3.b, by December 31, 2021.

(2) Interim Compliance Requirements

Table 3.4
Interim Effluent Limitations as Annual Loads in MS4 Discharges from Specific Land Uses to Rainbow Creek

	Total N Interim Effluent Limitations (kg/yr)			Total P Interim Effluent Limitations (kg/yr)		
	Interim Compliance Date			Interim Compliance Date		
Land Use	**2009**	**2013**	**2017**	**2009**	**2013**	**2017**
Commercial nurseries	390	299	196	20	16	10
Park	5	3	3	0.15	0.10	0.10
Residential areas	507	390	260	99	74	47
Urban areas	40	27	27	9	6	6

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

The Responsible Copermittee must implement the Sampling and Analysis Plan for Rainbow Creek Nutrient Reduction TMDL Implementation Water Quality Monitoring, dated January 2010. The results of any monitoring conducted during the reporting period, and assessment of whether the interim and final WQBELs have been achieved must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

e. COMPLIANCE DETERMINATION

(1) Compliance with interim compliance requirements of Specific Provision 3.c.(2) may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water;

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 3.b.(1) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls;

(c) There are no violations of the applicable effluent limitations under Specific Provision 3.b.(2)(a) at the Responsible Copermittee's MS4 outfalls;

(d) The pollutant loads from given land uses discharging to and from the MS4s do not exceed the applicable effluent limitations under Specific Provision 3.b.(2)(b); OR

(e) The Responsible Copermittee has submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim compliance requirements will be achieved by the interim compliance dates.

(2) Compliance with WQBELs of Specific Provision 3.b may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water;

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 3.b.(1) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls;

(c) There are no violations of the applicable effluent limitations under Specific Provision 3.b.(2)(a) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant loads from given land uses discharging to and from the MS4s do not exceed the applicable effluent limitations under Specific Provision 3.b.(2)(b).

4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2007-0043

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2007
State Water Board Approval Date:	July 15, 2008
Office of Administrative Law Approval Date:	October 22, 2008
US EPA Approval Date:	December 18, 2008

(3) TMDL Effective Date: October 22, 2008

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for Chollas Creek consist of the following:

(1) Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedule under Specific Provision 4.c.(1):

Table 4.1
Receiving Water Limitations as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$(0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$(0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$(0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$(0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER.

(2) Effluent Limitations

Discharges from the MS4s must not contain pollutant loads that exceed the following effluent limitations by the end of the compliance schedule under Specific Provision 4.c.(1):

Table 4.2
Effluent Limitations as Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER.

(3) Best Management Practices

(a) The Responsible Copermittees must implement BMPs to support the achievement of the WQBELs under Specific Provision 4.b for Chollas Creek.

(b) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans and the U.S. Navy as possible.

c. Compliance Schedule

(1) WLA Compliance Date

The Responsible Copermittees are required to achieve the WLA, thus must be in compliance with the WQBELs under Specific Provision 4.b, by October 22, 2028.

(2) Interim Compliance Requirements

The Responsible Copermittee must comply with the following interim WQBELs by the interim compliance date:

Table 4.3
Interim Effluent Limitations as Concentrations in MS4 Discharges to Chollas Creek

Interim Compliance Date	Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
October 22, 2018	Dissolved Copper	Acute	1.2 x 90% x (0.96) x $e^{[0.9422 \times \ln(\text{hardness}) - 1.700]}$ x WER*	1 hour
		Chronic	1.2 x 90% x (0.96) x $e^{[0.8545 \times \ln(\text{hardness}) - 1.702]}$ x WER*	4 days
	Dissolved Lead	Acute	1.2 x 90% x [1.46203 – 0.145712 x ln(hardness)] x $e^{[1.273 \times \ln(\text{hardness}) - 1.460]}$ x WER*	1 hour
		Chronic	1.2 x 90% x [1.46203 – 0.145712 x ln(hardness)] x $e^{[1.273 \times \ln(\text{hardness}) - 4.705]}$ x WER*	4 days
	Dissolved Zinc	Acute	1.2 x 90% x (0.978) x $e^{[0.8473 \times \ln(\text{hardness}) + 0.884]}$ x WER*	1 hour
		Chronic	1.2 x 90% x (0.986) x $e^{[0.8473 \times \ln(\text{hardness}) + 0.884]}$ x WER*	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*, when it is amended to include monitoring requirements for the Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls discharging to Chollas Creek for dissolved copper, lead, and zinc, and calculate or estimate the monthly and annual dissolved copper, lead, and zinc loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2)of this Order. The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

e. COMPLIANCE DETERMINATION

(1) Compliance with interim compliance requirements of Specific Provision 4.c.(2) may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 4.b.(1) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls;

(c) There are no violations of the applicable effluent limitations under Specific Provision 4.b.(2) at the Responsible Copermittees' MS4 outfalls; OR

(d) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim compliance requirements will be achieved by the interim compliance dates.

(2) Compliance with WQBELs of Specific Provision 4.b may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 4.b.(1) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(c) There are no violations of the applicable effluent limitations under Specific Provision 4.b.(2) at the Responsible Copermittees' MS4 outfalls.

5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2008-0027

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 11, 2008
State Water Board Approval Date:	June 16, 2009
Office of Administrative Law Approval Date:	September 15, 2009
US EPA Approval Date:	October 26, 2009

(3) TMDL Effective Date: September 15, 2009

(4) Watershed Management Areas: See Table 5.0

(5) Water Bodies: See Table 5.0

(6) Responsible Copermittees: See Table 5.0

Table 5.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County	Dana Point Harbor	Baby Beach	-City of Dana Point -County of Orange
San Diego Bay	San Diego Bay	Shelter Island Shoreline Park	- San Diego Unified Port District

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

The WQBELs for segments or areas of the water bodies listed in Table 5.0[39] consist of the following:

(1) Interim WQBELs – Effluent Limitations

The Responsible Copermittees for MS4 discharges to Baby Beach must comply with the following interim WQBELs by the interim compliance dates identified in Provision 5.d.(1)(b):

Table 5.1
Interim Effluent Limitations as Loads in MS4 Discharges to Baby Beach

Constituent	Effluent Limitation: Dry Weather Interim Effluent Limitation (Billion MPN/day)	Effluent Limitation: Wet Weather Interim Effluent Limitation (Billion MPN/30 days)
Total Coliform	4.50	NA
Fecal Coliform	0.50	NA
Enterococcus	0.40	
		150.5

(2) Final WQBELs - Effluent Limitations

(a) Discharges from the MS4s must not exceed the following mass-based effluent limitations by the end of the compliance schedules under Specific Provision 5.d.(1)(a) to demonstrate the discharge is not causing or contributing to a violation of receiving water quality standards:

Table 5.2
Effluent Limitations as Mass-Based limits in MS4 Discharges to the Water Body

Constituent	Effluent Limit: Dry Weather Billion MPN/Day	Effluent Limit: Wet Weather Billon MPN/30 days
Total Coliform	0.86	3,254
Fecal Coliform	0.17	112
Enterococcus	0.03	114

(b) If the final WQBELs are not met in the MS4 discharges, the Responsible Copermittees must demonstrate that the discharges from the MS4s are

[39] Per Resolution R9-2008-0027, the interim and final WQBELs only apply to waterbodies that remain on the 303(d) list for REC-1 water quality objectives due to impacts from controllable sources of bacteria. If waterbodies are put back on the list or delisted in subsequent iterations, the San Diego Water Board will revise the current NPDES requirements and/or issue additional waste discharge requirements to be consistent with these TMDLs.

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<#>Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedules under Specific Provisions 5.c.(1)(a) and 5.c.(2):¶
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Table 5.1¶
Receiving Water Limitations as Bacteria Densities in the Water Body¶ ...

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not causing or contributing to the exceedance of receiving water limitations. Such demonstration may be achieved by (1) demonstrating the attainment of the Receiving Water Limitations in Provision 5.c.(1), or (2) demonstrating that the natural and background sources appear to be the sole source of the continued impairment. The natural sources exclusion approach (NSEA) may be applied. The Municipal Dischargers are responsible for collection of the data to support the application of the NSEA to recalculate the TMDL.

(3) Best Management Practices

(a) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 5.0 must incorporate the Bacteria Load Reduction Plan (BLRP) required to be developed pursuant to Resolution No. R9-2008-0027.

(b) The Responsible Copermittee must implement BMPs to support the achievement of the WQBELs under Specific Provision 5.b for the segments or areas of the water bodies listed in Table 5.0

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c. Receiving Water Limitations

The Receiving Water Limitations for segments or areas of the water bodies listed in Table 5.0[40] consist of the following:

(1) Discharges from the MS4s must not cause or contribute to the violation of the following receiving water limitations by the end of the compliance schedules under Specific Provisions 5.d.(1)(a):

Table 5.3
Receiving Water Limitations as Bacteria Densities in the Water Body

Constituent	Receiving Water Limitations	
	Single Sample Maximum[1,2]	30-Day Geometric Mean[2]
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.

(2) If the above receiving water limitations are not met in the receiving water, the Responsible Copermittees must demonstrate that the discharges from the MS4s are not causing or contributing to the exceedance of receiving water

[40] Per Resolution R9-2008-0027, the Receiving Water Limitations only apply to waterbodies that remain on the 303(d) list for REC-1 water quality objectives due to impacts from controllable sources of bacteria. If waterbodies are put back on the list or delisted in subsequent iterations, the San Diego Water Board will revise the current NPDES requirements and/or issue additional waste discharge requirements to be consistent with these TMDLs.

limitations. Such demonstration may be achieved by demonstrating the attainment of the final WQBELs in Provision 5.b.(2).

(3) Best Management Practices

(c) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 5.0 must incorporate the Bacteria Load Reduction Plan (BLRP) required to be developed pursuant to Resolution No. R9-2008-0027.

(d) The Responsible Copermittee must implement BMPs to support the achievement of the Receiving Water Limitations under Specific Provision 5.0 for the segments or areas of the water bodies listed in Table 5.0

d. COMPLIANCE SCHEDULE

(1) Baby Beach in Dana Point Harbor

(a) Final Compliance Dates

The Responsible Copermittees for MS4 discharges to Baby Beach are required to achieve the WLA, thus must be in compliance with the WQBELs under Specific Provision 5.0, according to the following compliance schedule:

Table 5.4
Compliance Schedule Dates to Achieve Baby Beach WLAs

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform	September 15, 2014	September 15, 2009
Fecal Coliform		September 15, 2009
Enterococcus		September 15, 2019

(b) Interim Compliance Dates

The Responsible Copermittees for MS4 discharges to Baby Beach must comply with the following interim WQBELs by the interim compliance date:

Table 5.5
Compliance Schedule Dates to Achieve Interim WQBELs

Constituent	Interim Dry Weather Compliance Date	Interim Wet Weather Compliance Date
Total Coliform	September 15, 2012	NA
Fecal Coliform		NA
Enterococcus		September 15, 2016

(2) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park is required to achieve the WLA, thus must be in compliance with the

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Table 5.4¶
Interim Effluent Limitations as Loads in MS4 Discharges to Baby Beach¶
Constituent ...

WQBELs under Specific Provision 5.0, by December 31, 2012.

e. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

The BLRPs to be submitted by the Responsible Copermittees and approved by the Regional Board Executive Officer contain monitoring programs. Implementation of those Regional Board-approved monitoring programs constitutes compliance with the Monitoring Station and Monitoring Procedure requirements described below.

(1) Monitoring Stations

(a) Monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.41 If sources of bacteria from the MS4 persist at levels that exceed the applicable receiving water limitations, additional monitoring locations and/or other source identification methods shall be implemented to identify the controllable sources causing the chronic contamination.

(b) If natural and background sources appear to be the sole source of the impairment, Responsible Copermittees may select collect and provide additional data and the application of the NSEA to revise the TMDLs may be appropriate. Such revisions would be made to the TMDL via a Basin Plan Amendment and then subsequently incorporated into this Order consistent with Provision H.5.

(2) Monitoring Procedures

(a) The Responsible Copermittees must conduct the dry and wet weather monitoring consistent with the monitoring and reporting program developed as part of the BLRP. Dry weather samples collected from additional monitoring stations established to support application of the NSEA must be collected at an appropriate frequency to demonstrate bacteria loads from the identified controllable anthropogenic sources have been addressed and do not indicate a health risk.

(b) The Responsible Copermittees must collect wet weather monitoring samples within the first 24 hours of a storm event[42] of the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to support the application of the NSEA must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have

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[41] Commonly referred to as AB 411 monitoring
[42] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

been addressed and do not indicate a health risk.

(c) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs have been achieved.

(b) The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

f. COMPLIANCE DETERMINATION

(1) Compliance with interim compliance requirements of Specific Provision 5.(b)(1) may be demonstrated via one of the following methods:

(a) There is no discharge from the Responsible Copermittees' MS4s to the receiving water; OR

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 5.c in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(c) There are no violations of the applicable effluent limitations under Specific Provision 5.b.(2) at the Responsible Copermittees' MS4 outfalls; OR

(d) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the applicable effluent limitations under Specific Provision 5.b.(2); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the applicable receiving water limitations under Specific Provision 5.c. in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4 are not causing or contributing to the exceedances; OR

(f) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim compliance requirements will be achieved by the interim compliance dates.

(g) Upon the effective date of this Order, a Copermittee's full compliance with all of the following requirements shall constitute a Copermittee's compliance with provisions pertaining to interim WQBELs with compliance

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deadlines occurring prior to approval of a WQIP.

(i) Meets all interim and final deadlines for development of a WQIP,

(ii) Targets implementation of watershed control measures in its existing storm water management program, including watershed control measures to eliminate non-storm water discharges of pollutants through the MS4 to receiving waters, to address known contributions of pollutants from MS4 discharges that cause or contribute to the impairment(s) addressed by the TMDL(s), and

(iii) Receives final approval of its WQIP from the Regional Board.

(2) Compliance with final WQBELs of Specific Provision 5.b.(2) may be demonstrated via one of the following methods:

(a) There is no discharge from the Responsible Copermittees' MS4s to the receiving water;

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(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 5.c. in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls;

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(c) There are no violations of the applicable effluent limitations under Specific Provision 5.b.(2) at the Responsible Copermittees' MS4 outfalls;

(d) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the applicable effluent limitations under Specific Provision 5.b.(2); OR

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(e) The Responsible Copermittees can demonstrate that exceedances of the applicable receiving water limitations under Specific Provision 5.c in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4 are not causing or contributing to the exceedances.

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(f) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the final compliance requirements will be achieved by the final compliance dates. A Responsible Copermittee that does not implement its WQIP in accordance with the milestones and compliance schedules shall demonstrate compliance with the final WQBELs pursuant to Provision 5.f(2)(a – e).

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6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2010-0001

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 10, 2010
State Water Board Approval Date:	December 14, 2010
Office of Administrative Law Approval Date:	April 4, 2011
US EPA Approval Date:	June 22, 2011

(3) TMDL Effective Date: April 4, 2011

(4) Watershed Management Areas: See Table 6.0

(5) Water Bodies: See Table 6.0

(6) Responsible Copermittees: See Table 6.0

Table 6.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area	Water Body[1]	Segment or Area	Responsible Copermittees
South Orange County	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	-City of Laguna Beach -County of Orange -Orange County Flood Control District
		at Heisler Park - North	
	Pacific Ocean Shoreline	at Main Laguna Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Woods -County of Orange -Orange County Flood Control District
		Laguna Beach at Ocean Avenue	
		Laguna Beach at Cleo Street	
		Arch Cove at Bluebird Canyon Road	
		Laguna Beach at Dumond Drive	
	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Hills -City of Laguna Niguel -City of Laguna Woods -City of Lake Forest -City of Mission Viejo -County of Orange -Orange County Flood Control District
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	

	Aliso Creek Mouth	at mouth	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County (cont'd)	Pacific Ocean Shoreline	Aliso Beach at West Street	-City of Dana Point -City of Laguna Beach -City of Laguna Niguel -County of Orange -Orange County Flood Control District
		Aliso Beach at Table Rock Drive	
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)	
		at Salt Creek (large outlet)	
		Salt Creek Beach at Salt Creek service road	
		Salt Creek Beach at Strand Road	
	Pacific Ocean Shoreline	at San Juan Creek	-City of Dana Point -City of Laguna Hills -City of Laguna Niguel -City of Mission Viejo -City of Rancho Santa Margarita -City of San Juan Capistrano -County of Orange -Orange County Flood Control District
	San Juan Creek	lower 1 mile	
	San Juan Creek Mouth	at mouth	
	Pacific Ocean Shoreline	at Poche Beach	-City of Dana Point -City of San Clemente -County of Orange -Orange County Flood Control District
		Ole Hanson Beach Club Beach at Pico Drain	
		San Clemente City Beach at El Portal Street Stairs	
		San Clemente City Beach at Mariposa Street	
		San Clemente City Beach at Linda Lane	
		San Clemente City Beach at South Linda Lane	
		San Clemente City Beach at Lifeguard Headquarters	
		under San Clemente Municipal Pier	
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	
		San Clemente State Beach at Riviera Beach	
		Can Clemente State Beach at Cypress Shores	

San Luis Rey River	Pacific Ocean Shoreline	at San Luis Rey River mouth	-City of Oceanside -City of Vista -County of San Diego

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
Carlsbad	Pacific Ocean Shoreline	at Moonlight State Beach	-City of Carlsbad -City of Encinitas -City of Escondido -City of San Marcos -County of San Diego
San Dieguito River	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	-City of Del Mar -City of Escondido -City of Poway -City of San Diego -City of Solana Beach -County of San Diego
Penasquitos	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	-City of Del Mar -City of Poway -City of San Diego -County of San Diego
Mission Bay	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	-City of San Diego
		La Jolla Shores Beach at Caminito del Oro	
		La Jolla Shores Beach at Vallecitos	
		La Jolla Shores Beach at Avenida de la Playa	
		at Casa Beach, Children's Pool	
		South Casa Beach at Coast Boulevard	
		Whispering Sands Beach at Ravina Street	
		Windansea Beach at Vista de la Playa	
		Windansea Beach at Bonair Street	
		Windansea Beach at Playa del Norte	
		Windansea Beach at Palomar Avenue	
		at Tourmaline Surf Park	
		Pacific Beach at Grand Avenue	
	Tecolote Creek	Entire reach and tributaries	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I- Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
San Diego River	Forrester Creek	lower 1 mile	-City of El Cajon -City of Santee -County of San Diego
	San Diego River	lower 6 miles	-City of El Cajon -City of La Mesa -City of San Diego -City of Santee -County of San Diego
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	
San Diego Bay	Chollas Creek	lower 1.2 miles	-City of La Mesa -City of Lemon Grove -City of San Diego -County of San Diego - San Diego Unified Port District

1 These TMDL provisions do not apply to waterbodies, segments, or areas removed from the 303(d) list for REC-1 indicator bacteria numeric objectives, consistent with the assumptions and requirements of the Basin Plan Amendment. If the waterbodies are subsequently placed back on the 303(d) list for exceedances of the REC-1 indicator bacteria numeric objectives, all TMDL provisions will apply to those waterbodies and the Responsible Copermittees for those waterbodies.

b. WATER QUALITY BASED EFFLUENT LIMITATIONS[43]

The WQBELs for segments or areas of the water bodies listed in Table 6.0 consist of the following:

(1) Final Dry Weather WQBELs – Effluent Limitations

Table 6.1
Final Dry Weather WQBELs Expressed as Mass-Based Limits

	Effluent Limitation		
Waterbody	Total Coliform Billion MPN/month	Fecal Coliform Billion MPN/month	Enterococcus Billion MPN/month
San Joaquin Hills/ Laguna Hills HSAs (901.11 and 901.12)	1,134	227	40
Aliso HSA (901.13)	1,208	242	40
Dana Point HSA (901.14)	462	92	16

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[43] The Water Quality Based Effluent Limitations, both interim and final, do not apply to the waterbodies and the associated Responsible Copermittees for that waterbody if the waterbody segment in Table 6.0 is not on the 303(d) list for exceedances of the REC-1 numeric objectives for indicator bacteria. If the waterbody is subsequently placed back on the 303(d) for exceedances of the REC-1 numeric objectives for indicator bacteria, the WQBELs, both interim and final, will apply to the associated Responsible Copermittees for that waterbody.

Lower San Juan HSA (901.27)	8,342	1,665	275
San Clemente HA (901.30)		192	

(2) Final Wet Weather WQBELs – Effluent Limitations

Table 6.2
Final Wet Weather WQBELs Expressed as Mass-Based Limits

Waterbody	Effluent Limitation		
	Total Coliform Billion MPN/year	Fecal Coliform Billion MPN/year	Enterococcus Billion MPN/year
San Joaquin Hills/ Laguna Hills HSAs (901.11 and 901.12)	880,652	37,167	66,417
Aliso HSA (901.13)	8,923,264	477,069	735,490
Dana Point HSA (901.14)	3,404,008	152,446	219,528
Lower San Juan HSA (901.27)	16,093,160	1,156,419	1,385,094
San Clemente HA (901.30)	3,477,739	192,653	295,668

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(3) Best Management Practices

(a) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 6.0 must incorporate the Bacteria Load Reduction Plans (BLRPs) or Comprehensive Load Reduction Plans (CLRPs) required to be developed pursuant to Resolution No. R9-2010-0001. For segments or areas in Table 6.0 that have been delisted from the Clean Water Act Section 303(d) List of Water Quality Limited Segments, a BLRP and/or CLRP is not required.

(b) The Responsible Copermittee must implement BMPs to support the achievement of the WQBELs under Specific Provision 6. for the segments or areas of the water bodies listed in Table 6.0.

(c) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans and owners/operators of small MS4s as possible.

C. RECEIVING WATER LIMITATIONS

(1) Interim Dry Weather Receiving Water Limitations

The Responsible Copermittee must calculate the "existing" exceedance frequencies of the 30-day geometric mean water quality objectives for each of the indicator bacteria by analyzing the available monitoring data collected between January 1, 1996 and December 31, 2002. "Existing" exceedance

frequencies may be calculated by segment or area of a water body, or by water body, and/or by Watershed Management Area listed in Table 6.0. Separate "existing" exceedance frequencies must be calculated for beaches and creeks/creek mouths.

The Responsible Copermittees must achieve a 50 percent reduction in the "existing" exceedance frequency of the 30-day geometric mean Receiving Water Limitation for the segments or areas of the water bodies listed in Table 6.0[44]. A 50 percent reduction in the "existing" exceedance frequency is equivalent to half of the "existing" exceedance frequency of the 30-day geometric mean final Receiving Water Limitations.

The "existing" exceedance frequencies and the interim dry weather allowable exceedance frequencies (i.e. interim dry weather Receiving Water Limitations) calculated by the Responsible Copermittees must be included in the Water Quality Improvement Plans for the applicable Watershed Management Areas. Consistent with the assumptions and requirements of the Basin Plan Amendment, the Responsible Copermittees may provide evidence that indicates another controllable or uncontrollable source is responsible for the exceedances in the receiving waters. Responsible Copermittees may therefore include such demonstrations (including but not limited to reference system exceedance frequencies, natural source exclusion approach) as part of the "existing" exceedance frequency calculation.

The schedule for attaining the interim Receiving Water Limitations is specified in Provision 6.d.(3).

(2) Interim Wet Weather Receiving Water Limitations

The Responsible Copermittees must achieve a 50 percent reduction in the "existing" exceedance frequency of the applicable wet weather Receiving Water Limitation for the segments or areas of the water bodies listed in Table 6.0**Error! Bookmark not defined.**. A 50 percent reduction in the "existing" exceedance frequency is equivalent to half of the "existing" exceedance frequency of the applicable final Receiving Water Limitations. The exceedance frequency estimated to be equivalent to a 50 percent reduction in the "existing" exceedance frequency is shown in Table 6.4. Unless the Responsible Copermittees calculate a revised "existing" exceedance frequency that is part of an approved WQIP, the allowable existing exceedance frequencies in Table 6.3 shall apply.

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[44] The interim Receiving Water Limitations requirements do not apply to waterbodies that are not on the 303(d) list for exceedances of the REC-1 indicator bacteria numeric objectives. Consistent with the assumptions and requirements of the Basin Plan Amendment, no further action is required for these waterbodies. If the waterbodies are subsequently placed back on the 303(d) list for exceedances of the REC-1 indicator bacteria numeric objectives, all TMDL provisions will apply to these waterbodies and the Responsible Copermittees for those waterbodies.

As the wet weather Receiving Water Limitations include an allowable exceedance frequency, the 50 percent reduction shall not require Responsible Permittees to attain an exceedance frequency less than the final allowable exceedance frequency.

Where Responsible Copermittees elect to calculate a revised "existing" exceedance frequency, the "existing" exceedance frequencies and the interim wet weather allowable exceedance frequencies (i.e. interim wet weather Receiving Water Limitations) calculated by the Responsible Copermittees must be included in the Water Quality Improvement Plans for the applicable Watershed Management Areas. Consistent with the assumptions and requirements of the Basin Plan Amendment, the Responsible Copermittees may provide evidence that indicates another controllable or uncontrollable source is responsible for the exceedances in the receiving waters. Responsible Copermittees may therefore include such demonstrations (including but not limited to reference system antidegradation approach or natural source exclusion approach) as part of the "existing" exceedance frequency calculation.

The schedule for attaining the interim Receiving Water Limitations is specified in Provision 6.d(3).

Table 6.3
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies[45]

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Watershed Management Area	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies: Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	38%	37%	39%
		at Heisler Park - North			
	Pacific Ocean Shoreline	at Main Laguna Beach			
		Laguna Beach at Ocean Avenue			
		Laguna Beach at Cleo Street			
		Arch Cove at Bluebird Canyon Road			
		Laguna Beach at Dumond Drive			

[45] Responsible Copermittees may submit interim wet weather allowable exceedance frequencies as part of the WQIP. Upon approval of the WQIP, the interim allowable exceedance frequencies shall supersede the applicable exceedance frequencies in Table 6.3.

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	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	41%	41%	42%
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	41%	41%	42%
	Aliso Creek Mouth	at mouth	41%	41%	42%
	Pacific Ocean Shoreline	Aliso Beach at West Street	36%	36%	36%
		Aliso Beach at Table Rock Drive			
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)			
		at Salt Creek (large outlet)			
		Salt Creek Beach at Salt Creek service road			
		Salt Creek Beach at Strand Road			

Table 6.3 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

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Watershed Management Area	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies: Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County (cont'd)	Pacific Ocean Shoreline	at San Juan Creek	44%	44%	48%
	San Juan Creek	lower 1 mile	44%	44%	47%
	San Juan Creek Mouth	at mouth	44%	44%	47%
	Pacific	at Poche Beach	35%	35%	36%

	Ocean Shoreline	Ole Hanson Beach Club Beach at Pico Drain			
		San Clemente City Beach at El Portal Street Stairs			
		San Clemente City Beach at Mariposa Street			
		San Clemente City Beach at Linda Lane			
		San Clemente City Beach at South Linda Lane			
		San Clemente City Beach at Lifeguard Headquarters			
		under San Clemente Municipal Pier			
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)			
		San Clemente State Beach at Riviera Beach			
		Can Clemente State Beach at Cypress Shores			
San Luis Rey River	Pacific Ocean Shoreline	at San Luis Rey River mouth	45%	44%	47%
Carlsbad	Pacific Ocean Shoreline	at Moonlight State Beach	40%	40%	41%
San Dieguito River	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	33%	33%	36%

(3) Final Receiving Water Limitations[46]

(a) Discharges from the MS4s must not cause or contribute to the violation of the receiving water limitations in Table 6.4 by the end of the compliance schedules under Specific Provision 6.d.(2), unless the Responsible Copermittees provide evidence that indicates another controllable or

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[46] The Final Receiving Water Limitations requirements do not apply to waterbodies that are not on the 303(d) list for exceedances of the REC-1 indicator bacteria numeric objectives. Consistent with the assumptions and requirements of the Basin Plan Amendment, no further action is required for these waterbodies. If the waterbodies are subsequently placed back on the 303(d) list for exceedances of the REC-1 indicator bacteria numeric objectives, all TMDL provisions will apply to these waterbodies and the Responsible Copermittees for those waterbodies.

uncontrollable source is responsible for the exceedances in the receiving waters (a described in E.6.(3)(b)).

Table 6.4

Final Receiving Water Limitations as Bacteria Densities and Allowable Exceedance Frequencies in the Water Body

Constituent	Receiving Water Limitations: Single Sample Maximum[1,2] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[3]	30-Day Geometric Mean[2] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform[7]	10,000	22% / 0%	1,000	0%
Fecal Coliform	400	22% / 0%	200	0%
Enterococcus	104[4,6] / 61[5]	22% / 0%	35[4] / 33[5]	0%

Notes:
1. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved. (the geometric mean does not apply to wet weather days)
2. During dry weather days, only the 30-day geometric mean receiving water limitations are required to be achieved (the single sample maximum does not apply to dry weather days).
3. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. The 0% single sample maximum allowable exceedance frequency applies to dry weather days.
4. This *Enterococcus* receiving water limitation applies to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
5. This *Enterococcus* receiving water limitations applies to segments or areas of creeks or creek mouths listed in Table 6.0.
6. A wet weather receiving water limitation for Enterococcus of 104 MPN/100mL may be applied as a receiving water limitation for creeks, instead of 61 MPN/100mL, if one or more of the creeks addressed by these TMDLs (San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek, San Diego River, and/or Chollas Creek) is designated with a "moderately to lightly used area" or less frequent usage frequency in the Basin Plan. Otherwise, the wet weather receiving water limitation of 61 MPN/100mL for Enterococcus will be used to assess compliance with the wet weather allowable exceedance frequency.
7. Total Coliform Receiving Water Limitations only apply to the Pacific Ocean Shoreline segments listed in Table 6.0 and do not apply to the creeks or creek mouths listed in Table 6.0.

(b) If the above receiving water limitations are not met in the receiving water, the Responsible Copermittees must demonstrate that the discharges from the MS4s are not causing or contributing to the violation of receiving water limitations. Such demonstration may be achieved by (1) demonstrating that the discharges from the MS4s are meeting the effluent limitations under Specific Provision 6.b.(1) for dry weather discharges and Specific Provision 6.b.(2) for wet weather discharges, (2) through the attainment of the final WQBELs in Specific Provision 6.b.(1) for dry weather discharges and Specific Provision 6.b.(2) for wet weather discharges, (3) by providing data from their discharge points to the receiving waters, (4) by providing data collected at jurisdictional boundaries, and/or (5) by using other methods accepted by the San Diego Water Board, which may include but are not limited to the reference system antidegradation approach (RSAA) or natural sources exclusion approach (NSEA)[47].

(4) Best Management Practices

[47] Resolution R9-2008-0028

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Discharges from the MS4s must not contain densities that exceed the following effluent limitations by the end of the compliance schedules under Specific Provision 6.c.(1) to demonstrate the discharge is not causing or contributing to a violation of receiving water quality standards:¶
¶
Table 6.2¶
Effluent Limitations as Bacteria Densities and Allowable Exceedance Frequencies ¶
in MS4 Discharges to the Water Body¶ ...

(a) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 6.0 must incorporate the Bacteria Load Reduction Plans (BLRP) or Comprehensive Load Reduction Plans (CLRPs) required to be developed pursuant to Resolution No. R9-2010-0001. For segments or areas in Table 6.0 that have been delisted from the Clean Water Act Section 303(d) List of Water Quality Limited Segments, a BLRP and/or CLRP is not required.

(b) The Responsible Copermittee must implement BMPs to support the achievement of the Receiving Water Limitations under Specific Provision 6.c for the segments or areas of the water bodies listed in Table 6.0.

(c) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans and owners/operators of small MS4s as possible.

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d. Compliance Schedule

(1) WQBELs Compliance Dates

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The Responsible Copermittees for MS4 discharges to a segment or area of the water bodies listed in Table 6.0[48] are required to achieve the Wasteload Allocations (WLAs) defined as the WQBELs under Specific Provision 6.b, according to the following compliance schedule:

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Table 6.5

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Compliance Schedule Dates to Achieve Indicator Bacteria WLAs

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform*	April 4, 2021	April 4, 2031
Fecal Coliform		
Enterococcus		

* Total coliform receiving water limitations only apply to segments or areas of Pacific Ocean Shoreline listed in Table 6.0.

(2) Final Receiving Water Limitations Compliance Requirements

The Responsible Copermittees for MS4 discharges to a segment or area of the water bodies listed in Table 6.0[49] are required to achieve the Final

[48] The WQBELs (WLAs) do not apply to waterbodies that are not on the 303(d) list for exceedances of the REC-1 indicator bacteria numeric objectives. Consistent with the assumptions and requirements of the Basin Plan Amendment, no further action is required for these waterbodies. If the waterbodies are subsequently placed back on the 303(d) list or delisted in subsequent iterations, the San Diego Water Board will revise the current NPDES requirements and/or issue additional waste discharge requirements to be consistent with these TMDLs.

[49] The WQBELs (WLAs) do not apply to waterbodies that are not on the 303(d) list for exceedances of the REC-1 indicator bacteria numeric objectives. Consistent with the assumptions and requirements of the Basin Plan Amendment, no further action is required for these waterbodies. If the waterbodies are subsequently placed back on the 303(d) list for exceedances of the REC-1 indicator bacteria numeric

Receiving Water Limitations according to the following compliance schedule:

Table 6.6
Compliance Schedule Dates to Achieve Indicator Bacteria WLAs

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform*	April 4, 2021	April 4, 2031
Fecal Coliform		
Enterococcus		

* Total coliform receiving water limitations only apply to segments or areas of Pacific Ocean Shoreline listed in Table 6.0.

(3) Interim Receiving Water Limitations Compliance Requirements

The Responsible Copermittees must comply with the Interim Receiving Water Limitations by the interim compliance dates specified within the Regional Board approved CLRPs or BLRPs.

(4) Submittals to Support TMDL Basin Plan Amendment

The Responsible Copermittees are encouraged to submit data to support the TMDL reopener scheduled for April 2016 including but not limited to data related to implementation of the reference system antidegradation approach (RSAA), the natural sources exclusion approach (NSEA), reference watershed monitoring and beneficial use usage frequency.

e. Specific Monitoring and Assessment Requirements

(1) Monitoring and Assessment Requirements for Beaches

The BLRPs and CLRPs to be submitted by the Copermittees and approved by the Regional Board Executive Officer contain monitoring programs. Implementation of those Regional Board-approved monitoring programs constitutes compliance with the Monitoring Station and Monitoring Procedure requirements, described below.

Waterbodies that have been delisted are not required to develop and/or implement a BLRP or CLRP, including additional monitoring. Therefore, the monitoring requirements of this provision do not apply to delisted waterbodies. Delisted waterbodies shall continue monitoring consistent with Provision D.

(a) Monitoring Stations

For beaches addressed by the TMDL, monitoring locations should consist

objectives, all TMDL provisions will apply to these waterbodies and the Responsible Copermittees for those waterbodies.

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<#>Interim Dry Weather Receiving Water Limitations¶
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The Responsible Copermittee must calculate the "existing" exceedance frequencies of the 30-day geometric mean water quality objectives for each of the indicator bacteria by analyzing the available monitoring data collected between January 1, 1996 and December 31, 2002. "Existing" exceedance frequencies may be calculated by segment or area of a water body, or by water body, and/or by Watershed Management Area listed in Table 6.0. Separate "existing" exceedance frequencies must be calculated for beaches and creeks/creek mouths. ¶
¶
The Responsible Copermittees must achieve a 50 percent reduction in the "existing" exceedance frequency of the 30-day geometric mean WQBELs for the segments or areas of the water bodies listed in Table 6.0 by the interim compliance dates for achieving the interim dry weather WQBELs given in Table 6.5. A 50 percent reduction in the "existing" exceedance frequency is equivalent to half of the "existing" exceedance frequency of the 30-day geometric mean WQBELs.¶
¶
The "existing" exceedance frequencies and the interim dry weather allowable exceedance frequencies (i.e. interim dry weather WQBELs) calculated by the Responsible Copermittees must be included in the Water Quality Improvement Plans for the applicable Watershed Management Areas.¶
¶
¶
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<#>Interim Wet Weather Receiving Water Limitations¶
¶
The Responsible Copermittees must achieve the interim wet weather receiving water limitations in Table 6.4, expressed as interim allowable exceedance frequencies, by the interim compliance dates for achieving the interim wet weather WQBELs given in Table 6.5.¶
¶
Table 6.4¶
Interim Wet Weather Receiving Water Limitations Expressed as ¶
Interim Wet Weather Allowable Exceedance Frequencies¶
Watershed
...

of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[50] If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations at least once within the first 24 hours of the end of a storm event[51] of the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer in exceedance of the allowable exceedance frequencies in the receiving waters.

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(iii) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs for the Pacific Ocean Shoreline segments or areas listed in

[50] Commonly referred to as AB 411 monitoring

[51] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

Table 6.0 have been achieved.

(ii) The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

(2) Monitoring and Assessment Requirements for Creeks and Creek Mouths

The BLRPs and CLRPs to be submitted by the Copermittees and approved by the Regional Board Executive Officer contain monitoring programs. Implementation of those Regional Board-approved monitoring programs constitutes compliance with the Monitoring Station and Monitoring Procedure requirements, described below.

Waterbodies that have been delisted are not required to develop and/or implement a BLRP or CLRP, including additional monitoring. Therefore, the monitoring requirements of this provision do not apply to delisted waterbodies. Delisted waterbodies shall continue monitoring consistent with Provision D.

(a) Monitoring Stations

For creeks addressed by the TMDL, monitoring locations should consist of, at a minimum, a location at or near the mouth of the creek (e.g. Mass Loading Station or Mass Emission Station) and one or more locations upstream of the mouth (e.g. Watershed Assessment Station). If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations in accordance with the requirements of Provision D.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations within 24 hours of the end of a storm event[52] of the rainy season (i.e. October 1 through April 30).

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[52] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(iii) Samples collected from receiving water monitoring stations must be analyzed for fecal coliform and *Enterococcus* indicator bacteria.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the receiving water monitoring data to assess whether the interim and final receiving water WQBELs for the creeks and creek mouths listed in Table 6.0 have been achieved.

(ii) The Responsible Copermittee must identify and incorporate additional MS4 outfall and receiving water monitoring stations and/or adjust monitoring frequencies to identify sources causing exceedances of the receiving water WQBELs.

(iii) The monitoring and assessment results must be submitted as part of the Annual Reports required under Provision F.3.b of this Order.

f. COMPLIANCE DETERMINATION

(1) Compliance with interim compliance requirements of Specific Provision 6.c.(1) and Provision 6.c.(2) may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water; OR

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 6.c.(1) or Provision 6.c.(2) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(c) There are no violations of the applicable effluent limitations under Specific Provision 6.b.(1) or Provision 6.b.(2) at the Responsible Copermittees' MS4 outfalls; OR

(d) There are no exceedances of the applicable interim receiving water limitations under Specific Provision 6.c.(1) or Provision 6.c.(2) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(e) The Responsible Copermittees can demonstrate that exceedances of the applicable interim or final receiving water limitations under Specific Provision 6.c. in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4 are not causing or contributing to the exceedances; OR

(f) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim compliance requirements will be achieved by the interim compliance dates. OR

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(g) Upon the effective date of this Order, a Copermittee's full compliance with all of the following requirements shall constitute a Copermittee's compliance with provisions pertaining to interim WQBELs with compliance deadlines occurring prior to approval of a WQIP.

(i) Meets all interim and final deadlines for development of a WQIP,

(ii) Targets implementation of watershed control measures in its existing storm water management program, including watershed control measures to eliminate non-storm water discharges of pollutants through the MS4 to receiving waters, to address known contributions of pollutants from MS4 discharges that cause or contribute to the impairment(s) addressed by the TMDL(s), and

(iii) Receives final approval of its WQIP from the Regional Board.

(2) Compliance with WQBELs of Specific Provision 6.b may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water; OR

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 6.c.(3) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(c) There are no violations of the applicable effluent limitations under Specific Provision 6.b.(1) at the Responsible Copermittees' MS4 outfalls; OR

(d) The Responsible Copermittees can demonstrate that exceedances of the applicable final receiving water limitations under Specific Provision 6.c.(3) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4 are not causing or contributing to the exceedances, OR

(e) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the final compliance requirements will be achieved by the final compliance dates. A Responsible Copermittee that does not implement its WQIP in accordance with the milestones and compliance schedules shall demonstrate compliance with the final WQBELs pursuant to Provisions 6.f(2)(a-d).

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OMPOA

Otay Mesa Property Owners Association

January 11, 2013

Mr. Wayne Chiu, P.E.
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego California 92123-4340

SUBJECT: Comment – Tentative Order No.R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu

Dear Mr. Chui:

Everyone, from every edge of the political and economic spectrum, supports improved water quality and environmentally healthy watersheds. The Otay Mesa Property Owners Association ("OMPOA"), who represents the major landowners within the City portion of Otay Mesa, support the California Regional Water Quality Control Board's ("Board") goal of clean water for all users in the region.

However, after listening to public testimony at recent board workshops, and being briefed by co-permittees on the proposed Tentative Order No. R9-2013-0001, Regional MS4 Permit ("Tentative Order"), we are writing to express our significant reservations on the Tentative Order. In brief, our concerns fall into these broad categories:

1. **Existing Tentative Order No. R9-2007-0001**-- Over the last several years, local governments in San Diego have worked together with your staff and a host of technical experts to develop a Hydromodification Management Plan with reasonable and scientifically based standards. Your Board recently approved that Plan in July 2010. This draft permit ignores all of the good work invested in that Plan, which was developed at a significant cost to the public. The existing Plan has only been in effect for 2 years, with 3 years remaining prior to its expiration. Given the short timeframe that the existing Plan has been in practice, we do not yet have adequate data to determine if the measures within the existing Plan are sufficient. Pursuing a new tentative order at this time has not been scientifically validated and is premature.

2. **Legal Issues**--The attempt by Board staff to mandate a proposed in lieu fee for watershed and hydrologic unit improvements to projects that have no impacts and therefore, no nexus to the watershed or unit improvements is a direct violation of CEQA, according to multiple city attorneys who spoke to the issue at the December 12, 2012 public hearing. On such a key issue as a CEQA violation, why didn't Board counsel catch this error in advance in the draft permit?

3. **Clarity on Pre-Development vs. Pre-Project Conditions--**We are at a loss to find a definition of the term pre-development conditions in the Tentative Order. For such a significant determination and impact, the lack of clarity on this matter is concerning. In the most current public workshop on December 12, 2012, when a Board member

OMPOA

Otay Mesa Property Owners Association

pressed staff on this issue, the staff member was unable to clearly define what the term meant, how far back was a reasonable gauge of pre-development conditions and finally, when pressed about the source of a soils database found on the internet that would be used as a key determinant of compliance, staff was unable to describe the accuracy or source documents for the website's database.

4. **Hydromodification**--We disagree with the proposed deletion of the current exemption in the hydromodification permit approved by the Board in July of 2010 for projects that discharge stormwater into lined or engineered channels. Speaker after speaker in the public comment period of the December 12th workshop representing co-permittees and other stakeholders, gave numerous examples of the conflict they had with Board staff on this issue. Further, the potential waste of public and private dollars and man-hours spent on already approved permits under the current hydromod scheme would be shocking. And this leads to our next point.

5. **Fiscal Impact**--Why is there no credible economic analysis on the potential cost to the co-permittees and the public for the implementation of the Tentative Order? For a regulator, or staff, to propose such broad and sweeping changes to public policy, without any consequence to the cost of their grand ideal, is irresponsible.

6. **Coordination with neighboring regional boards and publication of previous similar experiences**--According to public testimony at the December 12th workshop, the neighboring regional water boards in North Orange County and the Inland Empire have already dealt with several of the issues contemplated in the San Diego Board's Tentative Order. Specific examples include pre-development vs. pre-project conditions. Why hasn't the experience of the neighboring boards on these critical issues been shared with the public so our decision could benefit from their experience?

When the total cost of environmental compliance from local, state and federal agencies is placed upon the backs of landowners in Otay Mesa and other parts of our region with other habitat and environmental mandates, the financial return on economic development will simply not pencil out. Proposed projects will not develop, jobs will not be created, economies will not grow and the dream of an emerging economy will die hard. The cost of doing business in California has already pushed many businesses and developers out of the state and disincentive developers further would be a catastrophic loss to California.

If implemented as written, this Tentative Order, and the actions of the Board, will further degrade San Diego's economy. We will have an economy based on sand and suntan oil, with a lower income workforce to match, instead of a healthy and diverse economic base with well-paying jobs for all San Diegans.

We urge the Board to delay implementation of the Proposed Order and revisit the untimely, unfunded mandate, poorly drafted terminology, the lack of key definitions, the apparent CEQA violations and unjust burden on industry and the economy. The Tentative Order is not ready for implementation and should not be considered until data from the existing 2010 Plan is fully understood. It would be a public travesty and irresponsible act by the Board to enact the Tentative Order in its current form at this premature stage.

3111 Camino del Rio North, Ste. 100
San Diego, CA 92108

OMPOA

Otay Mesa Property Owners Association

Sincerely,

Rob Hixson, Chairman
OMPOA

cc: Mayor Bob Filner
Mr. Allen Jones
Councilmember David Alvarez

3111 Camino del Rio North, Ste. 100
San Diego, CA 92108

From: Peter M. Hekman, Jr.
To: Chiu, Wayne@Waterboards
Subject: Comment - Tentative Order No. R9-2013-001, Regional MS$ Permit, Place ID: 786088Wchiu
Date: Friday, January 11, 2013 3:55:56 PM

This message is for Vice Chairman Strawn of the San Diego Regional Water Quality Control Board, and is submitted as a Citizen's Comment.
Please forward promptly. Thank you.

For:

Mr. Gary Strawn
Vice Chairman
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

RE: Comment – Tentative Order No. R9-2013-001, Regional MS4 Permit,

Place ID: 786088Wchiu

Dear Vice Chairman Strawn,

I am a private businessman, a sole proprietor, a 40 year military veteran, and an Engineer with a history of years of experience in environmental matters, both in industry as a company president involved almost totally in environmental matters and as a senior executive (Vice Admiral)in both the Navy and the Department of Energy (Senior Executive Corps ES-6) involved in major environmental issues. I presently serve as a volunteer on the SD Chamber of Commerce Military Affairs Committee, and work as a consultant in the field of environmental remediation and contaminant prevention.

I have reviewed the Tentative Order and find it very over-reaching in almost every instance. Moreover, it pits one citizen against another in a manner similar to the tactics utilized by totalitarian governments. Both the costs and the turmoil that will be brought about through your proposed enforcement mechanisms will prove to be extremely deleterious to the competitive viability of the business community of San Diego, and to its ordinary citizens, who will actually bear the costs, for nearly un-measurably small benefit.

I fully believe in, and support initiatives, to ensure clean, safe water in our region, and endorse attempts to do so both effectively and affordably. But this ill-thought out one-size-fits-all plan does neither. You need to go back to the drawing boards on this one that is "evidence-based" rather than "ideologically-based", and one that has the support of the entire community. Its time to start over. Yours is a bad plan whose time has not come.

Respectfully,

Peter M. Hekman, Jr., Consultant
5021 Via Papel, San Diego, CA 92122
858-546-1155 (O); 858-204-5744 (cel)
Phekman1@san.rr.com

PROJECT DESIGN CONSULTANTS | 701 B Street, Suite 800 San Diego, CA 92101 | 619.235.6471 tel 619.234.0349 fax | www.projectdesign.com

January 11, 2013

Mr. Wayne Chiu, P.E.
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, SAN DIEGO REGION
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

SUBJECT: Comment-Tentative Order No. R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu

Dear Wayne Chiu:

Project Design Consultants (PDC) appreciates the opportunity to provide comments on the subject of the Draft Regional MS4 Permit Tentative Order No. R9-2013-0001 (Draft MS4 permit). PDC is a multidisciplinary planning and engineering design firm with extensive technical experience designing stormwater controls for a wide variety of new development and redevelopment projects throughout San Diego and Riverside Counties. We are committed to the Regional Board's goal of improving water quality through cost-effective and innovative strategies.

We would like to acknowledge and thank Regional Board staff for conducting additional meetings for this Draft MS4 permit, and we are optimistic that Regional Board staff will make significant changes and improvements to the draft permit after receiving comments from the technical experts in the development community through the public comment process. We hope that Regional Board staff will rely heavily on the permit revisions suggested by the technical experts within this region in order to optimize the chance of success for water quality improvement.

Our overarching comments on the Draft MS4 permit are summarized below.

Comment #1 [Draft MS4 Permit Provision E.3.]: Overall, we would like to see permit language that appropriately prioritizes projects according to stormwater quality risk, instead of applying the same requirements to very small and very large projects. If almost every construction project is a priority project, then nothing is really prioritized. Small and medium sized projects should be subject to less restrictive treatment and hydromodification requirements than larger projects. Further, more distinctions and more flexibility should be made to accommodate alternative compliance mechanisms for different types of development (urban infill redevelopment, roadways, rail and transit projects, utility projects, etc.).

Comment #2 [Draft MS4 Permit Provision E.3.]: Overall, many of the permit provisions discourage redevelopment, and this is discouraging because redevelopment is preferred from an environmental perspective compared to new greenfield development.

Comment #3 [Draft MS4 Permit Provision E.3.b.(1).b]: In order to eliminate onerous requirements for redevelopment projects that propose very minor increases to existing levels of site imperviousness, revise the trigger for redevelopment priority development projects to be "<u>at least a net increase</u> of <u>x</u> square feet of impervious surfaces <u>above pre-project conditions</u>" instead of the creation, addition, or replacement of at least x square feet of impervious surfaces.

Comment #4 [Draft MS4 Permit Provision E.3.b.(2).a]: If priority development requirements are triggered for the threshold of 10,000 square feet of impervious area for *new* development, this

threshold should be the same for redevelopment projects per Provision E.3.b.(2).b, and restaurant projects per Provision E.3.b.(2).c, and hillside projects per Provision E.3.b.(2).d, and parking lots and street projects per Provisions E.3.b.(2).f and E.3.b.(2).g. We recommend changing 5,000 square feet throughout the permit to 10,000 square feet or larger.

Comment #5 [Draft MS4 Permit Provision E.3.b.(2).i]: Since stormwater pollution is highly correlated with high levels of imperviousness, the project category of "one acre of disturbance or more" should be removed as a priority project category so that projects that add extremely low amounts of impervious surfaces would not be required to comply with priority project requirements.

Comment #6 [Draft MS4 Permit Provision E.3.b.(3).a]: This section should be removed or revised. The current (R9-2007-0001 permit) version of the exemption for sidewalk and bicycle lane improvements should remain for the new permit. Particularly for redevelopment and retrofit projects, most sidewalk and bike lane improvement projects cannot be constructed to be hydraulically disconnected from adjacent streets and still be in compliance with public standards. Additionally, implementing hydromodification controls for these projects in urban areas is often times infeasible.

Comment #7 [Draft MS4 Permit Provision E.3.b.(3).b]: This exemption needs to be re-worded to allow more flexibility. Reconfiguring existing streets for the goal of increasing traffic safety should not trigger priority project requirements just because the project slightly increases the imperviousness above pre-project conditions. Due to the linear nature of roadways, hydromodification and treatment controls are much more difficult due to the large amount of run-on and limited spatial constraints. It would be more cost-effective to focus treatment efforts on other types of projects with larger stormwater quality impacts.

Comment #8 [Draft MS4 Permit Provision E.3.c.(1).a]: Most LID best management practices (BMPs) (for example, bioretention areas) are sized by rate instead of by volume. Therefore, a requirement of retention of the 24-hour 85th percentile water quality volume is not applicable to all LID BMPs.

Comment #9 [Draft MS4 Permit Provision E.3.c]: Given our region's predominance of clay and silt soils, retention should not be the default method of compliance. We propose that the designation of the menu of appropriate BMPs be determined by the Water Quality Improvement Plan (WQIP) process rather than a "one size fits all" strategy currently being proposed in the Draft MS4 permit.

Comment #10 [Draft MS4 Permit Provision E.3.c]: The draft language for all of the various compliance options (and alternative options including offsite options) should be revised to clarify the regulatory intent to reduce the confusion throughout the entire section.

Comment #11 [Draft MS4 Permit Provision E.3.c.(2).a]: Hydromodification requirements should reference *pre-project* instead of *pre-development* conditions. This distinction is crucial and the draft MS4 permit language requiring redevelopment sites to mimic pre-development conditions is an unrealistic standard without technical basis.

Comment #12 [Draft MS4 Permit Provision E.3.c.(2).a.ii]: Remove this impractical requirement for artificially hardened channels.

Comment #13 [Draft MS4 Permit Provision E.3.c.(2).b]: Remove this impractical requirement for sediment supply matching.

Comment #14 [Draft MS4 Permit Provision E.3.c.(2).d]: The current exemptions outlined in the current County of San Diego's Hydromodification Management Plan (HMP) should not be removed.

Rather, they should be expanded and added to in order to increase the flexibility of the program. The current HMP needs to be revised to make the requirements workable for real world projects. In addition, the low-flow thresholds need to be revised. The schedule for development of the HMP was extremely rushed and we felt that input from the technical experts was ignored during the development and approval of the HMP. We would like to see this plan be revised and then incorporated into the new permit in order for it to be reasonably applied to real-world development projects. Most designers agree that the final hydromodification requirements of the current HMP are unreasonable and/or infeasible to implement for most priority development projects. The climate, rainfall patterns, and soil conditions within Southern California are significantly different from other areas in the United States. Therefore, the stormwater regulations for treatment control BMPs and hydromodification controls need to be tailored to the local conditions and cannot be based on "one size fits all" approaches developed for other areas with different climates.

Comment #15 [Draft MS4 Permit Provision E.3.c.(3).b.i.c]: LID bioretention areas are sized by rate instead of volume. Therefore, a requirement of 1.5 times the design capture volume is erroneous and is not scientifically based.

Comment #16 [Draft MS4 Permit Provision E.3.c.(3).b.iv.a]: Revise condition to state that the regional BMP may treat the runoff, either by a volume-based or a flow-based BMP. The requirement of 1.1 times the design capture volume is confusing and is not scientifically based.

We appreciate the opportunity to comment on the Draft MS4 permit. We would welcome the opportunity to answer any questions or discuss the above or other issues.

Sincerely,

PROJECT DESIGN CONSULTANTS

Debby Reece

Debby Reece, MS, PE, LEED AP, QSD
Vice President - Engineering

Chelisa A. Pack

Chelisa A. Pack, MS, PE, QSD
Project Engineer

Cc: file

SAN DIEGO CANYONLANDS

San Diego Canyonlands

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January 11, 2013

Via e-mail to Wayne Chiu wchiu@waterboards.ca.gov
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

RE: Comments on Tentative Order Number: R9-2013-0001

Dear Mr. Chiu:

San Diego Canyonlands respectfully submits the following comments on the draft San Diego Regional Municipal Separate Storm Sewer System permit. Urban runoff is the San Diego region's most urgent pollution problem. In a region known for its beaches and strong tourism economy, polluted runoff makes our beaches and waterways unsafe for swimming, fishing and other recreation for at least 72 hours after every rain event. Even in dry weather, our "urban drool" from residents and businesses becomes a major pollution source.

By working together as a community, we can solve this challenging public health problem. The Water Quality Improvement Plans proposed in the draft permit have the potential to become powerful tools to help us improve water quality within our watersheds. However, the Copermittees cannot be tasked with creating these plans alone. Specifically:

- The Permit should require formation of a stakeholder advisory group for each watershed that includes representatives of environmental groups with knowledge of the watershed.
- This stakeholder advisory group should work closely with the Copermittees and a regional board staff member while the Water Quality Improvement Plans are being developed to ensure these plans aggressively pursue water quality gains.
- The stakeholder advisory process should include accountability and measureable milestones to ensure the goals of the Permit are being met.

By taking advantage of the knowledge and resources of diverse stakeholders like municipalities, businesses, non-profits and residents, our region can be on the cutting-edge of addressing urban runoff and creating healthier communities and watersheds. But this can only be achieved if these diverse voices are impacting the planning process in a meaningful way.

San Diego Canyonlands recognizes the challenge urban runoff presents to our region and we want to do our part to solve the problem. San Diego Canyonlands is interested in participating in a Water Quality Improvement Plan development process for all City of San Diego watersheds. San Diego Canyonlands urges the Regional Board to enhance the stakeholder participation opportunities during Water Quality Improvement Plan development and then approve the permit.

Respectfully Submitted,

Eric Bowlby

Eric Bowlby
Executive Director
San Diego Canyonlands
eric@sdcanyonlands.org

San Diego County Taxpayers Association

Targeting Waste • Promoting Efficiency

707 Broadway, Suite 905, San Diego, CA 92101 • P: (619) 234-6423 • F: (619) 234-7403 • www.sdcta.org

January 11, 2013

Mr. Wayne Chiu, P.E.
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, # 100
San Diego, CA 92123

Re: Comment - Draft Regional MS4 Permit - Tentative Order No.R9-2013-0001

Dear Mr. Chiu:

The San Diego County Taxpayers Association urges you and the San Diego Regional Water Quality Control Board to amend Tentative Order No.R9-2013-0001, the Draft Regional MS4 Permit, so that it encompasses reasonable, cost effective and scientifically based water quality improvement standards.

While we recognize the importance of clean and safe beaches and creeks, and place significant value in protecting water quality, it is critical that taxpayer investments be made based on demonstrated scientific methods. Appropriate thresholds of bacteria should be supported with well documented scientific evidence.

Currently, approximately $120 million of public money is spent annually to comply with the current Municipal Storm Water Permit. County of San Diego staff estimates the costs of attempting to comply with the proposed Bacteria TMDL requirements at between $2.6 billion and $4.9 billion over the next 18 years which raises serious concerns regarding the feasibility of achieving the draft compliance requirements. Requiring exorbitant spending to chase goals that may be unattainable is irresponsible. Until it can be stated with reasonable certainty that the Bacteria TMDL requirement can be met, it should not be incorporated into the MS4 Permit. In this time of fiscal challenge, the cost of complying with new unfunded mandates will no doubt come at the expense of core government services.

If you have any questions, please feel free to contact me at (619) 234-6423 or lani@sdcta.org.

Sincerely,

Lani Lutar
President and CEO

LL/sdk

CC: Members, California Regional Water Quality Control Board, San Diego Region
David Gibson, CA Regional Water Quality Control Board, San Diego Region Executive Officer

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January 11, 2013

Mr. Wayne Chiu, P.E.
California Regional Water Quality Control Board
San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

2013 JAN 11 P 1:46
SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD

VIA E-Mail: wchiu@waterboards.ca.gov

Re: Comment – Tentative Order No. R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu

Dear Mr. Chiu and Board Members:

The San Diego Gas & Electric Company (SDG&E) provides transmission and distribution of natural gas and electricity throughout San Diego County and southern Orange County. Delivery of these essential public services requires routine and emergency construction, operation and maintenance of its linear utility infrastructure. A primary mandate to utilities and other entities with linear facilities regulated by the California Public Utilities Commission and/ or other state and federal regulatory agencies is to provide safe and reliable service. The above-referenced draft MS4 permit (draft Permit) would impact SDG&E facilities in our service territory, which is located primarily within Region 9.

Our comments and recommended revisions to specific issues in the draft Permit are provided below.

Non-Storm Water Discharges

There is still confusion in the draft Permit regarding which non-storm water discharges are effectively prohibited and must be eliminated and those that are authorized. The draft Permit both states that it authorizes and prohibits non-storm water discharges but it is not always clear which are authorized and which are prohibited. In multiple locations (e.g. Finding 15), the draft Permit states that non-stormwater discharges into the MS4s must be "effectively prohibited" or eliminated. These sections conflict with other sections (Section II.A.1.b., for example), which state, consistent with EPA's regulations, that non-stormwater discharges authorized by a NPDES permit are authorized to be discharged to the MS4 system. One change that would help to clarify this issue would be to revise Finding 15 as follows:

> **Non-Storm Water and Storm Water Discharges.** Non-storm water discharges from the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard of CWA section 402(p)(3)(B)(iii), which is explicitly for "Municipal ... *Stormwater Discharges* (emphasis added)" from the MS4s. Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s must be effectively prohibited. ***However, consistent with EPA's regulations, the draft Permit authorizes discharges of non-storm water to MS4s that are either authorized by a separate NPDES permit, or the discharge is a category of non-storm water discharges or flows that must be addressed pursuant to Provisions E.2.a.(1)-(5) of this Order.***

Prohibition of Non-Storm Waters

Section E.2.a.6. would prohibit any category of non-stormwater under Section E.2.a.1-4. if it is found by the co-permittee or the Regional Board to be a source of pollutants to receiving waters. We recommend that this section be revised to also allow the co-permittees to designate different and/ or additional BMPs to be implemented as opposed to prohibiting the category of non-stormwater and suggest the following language:

> If the Copermittee or San Diego Water Board identifies any category of non-storm water discharges listed under Provisions E.2.a.(1)-(4) as a source of pollutants to receiving waters, the category must be prohibited through ordinance, order, or similar means and addressed as an illicit discharge. ***Alternately, the Copermittee can designate different and/ or additional BMPs to be implemented as opposed to prohibiting the category of non-stormwater.***

Building Fire Suppression System Maintenance Discharges

Section E.2.a.5.a.1. would require the co-permittees to treat building fire suppression system maintenance discharges (e.g., sprinkler line testing and flushing) as an illicit discharge. These discharges have historically been allowed under existing MS4 permits and municipal ordinances with the use of appropriate BMPs. These activities are mandated by code and insurance companies and are essential to maintain a safe and reliable fire water delivery system. Changing existing systems to discharge to the sewer may not be feasible and/ or be expensive due to the existing plumbing configurations. These discharges should continue to be authorized with the implementation of appropriate BMPs as determined by the MS4. If existing BMPs are found to be inadequate, different and/ or additional BMPs could be required to be implemented by the MS4.

Discharges to Areas of Special Biological Significance

The draft Permit should clarify that non-storm water discharges (e.g., potable hydrotest dewatering, groundwater dewatering discharges, etc.) made pursuant to NPDES permits to MS4 systems that discharge to Areas of Special Biological Significance (ASBS) are authorized. These types of discharges are critical to on-going infrastructure development, maintenance and operation and the State Water Board's March 2012 "Exceptions to the Ocean Plan for Discharges to Areas of Biological Significance" provides that the NPDES permitting authority can authorize these discharges to ASBS by making an appropriate finding in the applicable MS4 permit. **We urge the RWQCB to include the following language as part of Finding 32:**

> ***"The ASBS exception authorizes the discharge of non-stormwater to a MS4 when an NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS. Accordingly, the RWQCB finds that since NPDES permits for non-stormwater discharges contain conditions and requirements to protect water quality and many of these permits are for short-term and/ or intermittent discharges (e.g., discharges from utility vaults and underground structures, construction groundwater dewatering, hydrostatic test water discharges, potable water discharges), these discharges will not alter natural ocean water quality and herein authorizes their discharge to MS4 systems that discharge to ASBS."***

Further, the following Sections need to be revised to ensure consistency and support the above finding:

- Section II.A.1.d.:

  "Storm water discharges ***and non-stormwater discharges made pursuant to NPDES permits*** from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 applicable

to these discharges, included in Attachment A to this Order. All other discharges from the Copermittees' MS4s to ASBS are prohibited."

- Section 2.I.A.1.e.2.ii. in Attachment A needs to be revised to reference the above finding:

  "An NPDES permitting authority may authorize non-storm water discharges to an MS4 with a direct discharge to an ASBS only to the extent the NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS ***(see Permit Finding 32)***."

Non-stormwater Action Levels

The draft Permit should not subject non-stormwater discharges made pursuant to NPDES permits to action levels. Section II.C.1. would subject non-stormwater discharges to action levels. However, non-stormwater discharges that have NPDES permits are subject to their own discharge requirements. Setting additional, perhaps conflicting, requirements on these discharges is unnecessary and will lead to confusion. **We therefore urge the RWQCB to revise the draft Permit to clarify that the proposed non-stormwater action levels are not applicable to non-stormwater discharges that have NPDES permits.**

Development Planning

The draft Permit should not subject linear underground/ overhead (utility) projects (or LUPs) to permanent post-construction requirements. Section E.3. requires permanent BMPs for all development projects. LUP construction projects are regulated pursuant to the State Water Board's Stormwater Construction General Permit (CGP). Finding 76 in the CGP specifically excludes LUPs from permanent post-construction requirements due the nature of their construction. For consistency with the CGP, the draft Permit needs to clarify that Section E.3. is not applicable to LUPs as defined in the CGP. **We urge the RWQCB to make the following revisions:**

- Finding 10

  Pollutants Generated by Land Development. Land development has created and continues to create new sources of non-storm water discharges and pollutants in storm water discharges as human population density increases. This brings higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash. Pollutants from these sources are dumped or washed off the surface by non-storm water or storm water flows into and from the MS4s. When development converts natural vegetated pervious ground cover to impervious surfaces such as paved highways, streets, rooftops, and parking lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving a developed area without BMPs that can maintain pre-development conditions will contain greater pollutant loads and have significantly greater runoff volume, velocity, and peak flow rate than pre-development runoff from the same area. ***The nature of linear underground/ overhead projects (LUPs) is to return project sites to pre-construction conditions. Therefore, consistent with Finding 76 in the SWRCB's Storm Water Construction General Permit[1], LUPs are not subject to post-construction requirements.***

  [1] Order 2009-0009-DWQ, as amended by Orders 2010-0014-DWQ and 2012-0006-DWQ, contains the definition of Linear Underground/ Overhead Projects.

- Definition of "Development Project"

  "**Development Projects** - Construction, rehabilitation, redevelopment, or reconstruction of any public or private residential project, industrial, commercial, or any other projects. ***Development Projects do not include linear underground/ overhead projects as defined in the SWRCB Storm Water Construction General Permit (Order 2009-0009-DWQ, as amended by Orders 2010-0014-DWQ and 2012-0006-DWQ).***

The enclosed comments are in reference to the actual draft Permit language. We request that revisions consistent with these comments also be made to the draft Permit's Fact Sheet/ Technical Report.

Please call Fred Jacobsen at 858-637-3723 if you have any questions regarding our comments.

Thank you for this opportunity to provide you with our comments.

Sincerely,

Susan M Hector

Susan M. Hector
Environmental Programs Manager

SAN DIEGO GREEN BUILDING COUNCIL

January 11, 2013

Via e-mail to wchiu@waterboards.ca.gov
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

RE: Comments from the San Diego Green Building Council on Tentative Order Number: R9-2013-0001

Dear Mr. Wayne Chiu,

San Diego Green Building Council[1] respectfully submits[2] the following comments on the Revised Tentative Order No. R9-2013-0001: The San Diego Regional Municipal Separate Storm Sewer System permit.

BACKGROUND

The San Diego Green Building Council is a 501(c)(3) California non-profit corporation with the mission *to inspire, educate and collaborate within our communities to transform our built environment toward true sustainability*. Our support comes from the development, design, construction, facility management and other professional industries related to the built environment. We advocate for development that has reduced environmental impact, which is economically viable and socially responsible.

Support for these comments includes the San Diego chapter of the Association of Landscape Architects (ASLA). The ASLA is the national professional association representing landscape architects, promoting the profession, and advancing the practice through advocacy, education, communication, and fellowship. In addition, stewardship of the land has been a critical part of the mission of ASLA since its founding.

Water quality is critical to regional sustainability. Stormwater runoff is widely considered to be one of the world's most significant environmental problems. In the San Diego Region, storm drains discharge stormwater directly to our beaches without any treatment. Pollutants in runoff discharges impair receiving waters, threaten or harm the health of humans or aquatic organisms, and impair designated beneficial uses such as swimming at our local beaches. We encourage a science-based 'all-in' approach that incorporates site-based Low Impact Development (LID) strategies, urban infrastructure LID strategies and effective hydromodification management strategies. Our overall response to stormwater strategies in the administrative draft MS-4 can be summarized as: first *avoid*, then *reduce*, and only *delay* as a last resort (from the SUDS Sustainable Urban Drainage Systems program in the UK).

---

[1] *The San Diego Green Building Council officially recognized as the San Diego chapter of the US Green Building Council.*

[2] *These comments were prepared with support from our volunteer community, including Rosalind Haselbeck, Ph.D.- principal of Building Green Futures; and Landry Watson- Sustainability Director at DPR Construction.*

COMMENTS

I. The Final permit should require copermittees to engage local community planning groups in developing Water Quality Improvement Plans for their specific Watershed Management Areas.

As mentioned in comment XI regarding stakeholder engagement, we recommend that the Final permit includes at least prescriptive requirements for engaging local stakeholders such as "community planning groups" as implementation partners. Additionally, support for Water Quality Improvement Plans should utilize existing research venues like the Scripps Institute of Oceanography, or Coastkeeper, etc; and funding resources like municipal capital improvement plans.

II. The Final Permit should recognize the EPA's findings that Low Impact Development Best Management Practices are a cost-effective approach to improving water quality and enhancing community, and should emphasize LID methods in the BMP requirements for all development projects (see E.3.a.(2)).

Implementation of Low Impact Development (LID) strategies provide environmental and economic benefits and reduce negative downstream water quality impacts. In addition other public benefits are associated with LID strategies, such as cleaner air, reduced urban temperatures, increased energy efficiency, and landscape amenities. The Final Permit should include similar language to clarify the environmental and economic benefits of LID Best Management Practices (BMPs) that form the basis of the Regional Board's policy decisions relating to development planning.

The Tentative Order should clearly define the best-in-class BMPs and create a system to catalogue the implementation strategies used by the various copermittees. The database should include the measured water quality impacts from each site to be used as a resource for future projects and development.

In particular, where there are limited landscaped areas for infiltration and treatment of runoff, rainwater harvesting should be emphasized for non-potable indoor usage, such as toilet flushing and cooling tower make up water. Note that the draft 2013 CPC Ch 17 has greatly reduced the stringency in treatment of rainwater for indoor use (debris removal, 100 micron filtration, and Escherichia coli < 100 CFU/100 ml).

Further, rainwater catchment systems that effectively address stormwater mitigation by maintaining a design storm volume storage either via weather station or manually, should also be utilized.

III. The Final Permit should include both specified Stormwater standards with an option for prescriptive, third-party requirements such as LEED certification and the Sustainable SITES initiative, where applicable.

In some cases this will include addition or clarification of the existing permit language.

For those projects including Open Space or public/private campuses including industrial, retail and office parks, military complexes, airports, botanical gardens, streetscapes and plazas, residential and commercial developments; Final Permit should reference the Sustainable SITES Initiative. The Sustainable Sites Initiative (SITES™), is a voluntary certification program through the American Society of Landscape Architects, the Lady Bird Johnson Wildflower Center at The University of Texas at Austin and the United States Botanic Garden. Projects receiving at least credits 3.5 – Manage Stormwater on Site and 3.6. – Protect and Enhance On-Site Water Resources and Receiving Water Quality under the "Site Design - Water" category should be equivalent to the same exceptions offered for LEED. (http://www.sustainablesites.org/report/Guidelines%20and%20Performance%20Benchmarks_2009.pdf)

For both building scenarios, commercial and residential new construction, Final Permit language should reference specific LEED credits addressing stormwater quantity and quality management, native/adapted landscaping, open space requirements, and landscape water use (specifically reuse of non-potable water resources). Rating Systems available (http://new.usgbc.org/leed/rating-systems)

For single family homes, the Final Permit should include an exemption from PDP requirements when they meet specified stormwater standards, not limited to LEED credits.

IV. The Final Permit should re-examine the concept of "infeasible", and require developers to take a broader perspective in determining the feasible/infeasible nature of a project.

Allowing Copermittees to develop their own criteria as to what is "technically infeasible" runs the risk of Copermittees bowing to political pressure from special interest and can result in unfair completion for development between copermittees. The intent of the system approach to watershed management must require that all jurisdictions within that watershed have the same criteria for feasible; the Final Permit is the only way to ensure that there is uniform definition of "feasible" and "infeasible".

Conventional approaches to infiltration are typically based on soil structure (clay versus sandy loam) and don't take into account biological activity. Cost analysis for building biologically active soil that can infiltrate and store water effectively needs to be included. Furthermore, the concept of infiltration needs to be broadened to the concept of "hydration". Even clay soils can slow, sink, and spread rainwater when that water is delivered to plants at the appropriate time; during our winter rainy season.

In addition, there exist opportunities for the use of "engineered" or "suspended", to enhance the feasibility on a project, and enhance its capacity for infiltration.

V. The Final Permit should take an innovative approach to retrofitting areas of existing development, in particular for areas with the highest priority water quality conditions (see E.5.e.(2)).

Retrofitting areas of existing development can be an opportunity to both address areas with the highest priority water quality conditions but also for public education on stormwater mitigation principles. Recognize that for our Mediterranean climate, there is an opportunity to emphasize municipal capital improvement to capture the 'first flush' of contaminants, in addition to the 85th percentile storm. Implementing strategies on a bigger scale that benefits the community, such as curb cuts and green streets with educational signage, would be a great approach. There is good precedent for this approach elsewhere, such as Tucson, Arizona. For more information, see: http://watershedmg.org/green-streets/resources.

VI. The Final Permit should consider combining innovative with traditional stormwater mitigation strategies.

Low Impact Development (LID) techniques are typically viewed as small scale interventions that complement traditional detention basins but may not be able to fully meet the hydromodification requirements (peak flow and duration) of Priority Development Projects. Creative use of LID techniques can expand their capacity and effectiveness. For example: rainwater cisterns can provide a dual function with water conservation and stormwater mitigation. The design storm volume can be released from the cistern in response to a weather station at a rate determined by when the storm is expected, or manually by slow release of the pre-determined volume. The cistern can be sized to provide a sizable portion of the irrigation requirements. The design storm volume can be released into a bio-retention cell or other landscaped area. Detention basins can serve as the final overflow for underdrains from bioretention cells

or bio-swales to reduce the peak flow of stormwater runoff. The discharge from the detention basin in this case will have a reduced flow and reduced pollutant load due to pre-treatment. Again, the use of "engineered or suspended" soils should be explored.

VII. The Final Permit should emphasize green municipal infrastructure practices that can mitigate stormwater impacts.

The strategy of "green streets" OR "green infrastructure practice" includes street-side, in-street (traffic circles, median strips), and parking lots. All of these green infrastructure practices share common themes of curb cuts to bioretention cells at a lower elevation than the street. Stormwater is typically infiltrated on site with engineered soil or gravel. Overflow during peak storm events is either directed to the storm drain via an underdrain or infiltrated at a second site nearby.

All of these approaches produce "green swathes" in urban areas which mitigate stormwater and provide aesthetic and community benefits. Finally, the local residents have the opportunity to become "stewards of their watershed". There are great examples of green streets: Elmer Avenue in Los Angeles (see: http://www.treepeople.org/sun-valley-watershed#Elmer) as well as many examples in the city of Tucson (see: http://www.watershedmg.org/sites/default/files/greenstreets/WMG_GISWNH_1.0.pdf).

Note that doing projects with existing development that are transparent, such as curb cuts that produce green streets, provide an important opportunity for education. Ultimately visible solutions that are aesthetically pleasing can influence individuals and communities toward patterns of more responsible consumption and use of water due to their increased knowledge and experience.

This represents an opportunity for community planning groups to assist with implementation.

VIII. The Final Permit should incorporate methods for reducing pollutant discharge both on a regional scale, and within the watershed for smaller creeks and waterways – through the use of meaningful enforcement actions.

The proposed MS4 Permit does not adequately address efficacious measures to protect creek and coastal receiving waters while allowing contaminated discharges to persist without adequate enforcement actions. Lacking meaningful enforcement actions, inland cities as copermittees, persist in ignoring or circumventing water quality regulations with impunity while creek and coastal receiving waters and ESA habitats continue to be incrementally degraded by polluted dry weather flows. Damage to coastal habitats is cumulative and potentially expensive in terms of restoration.

IX. The Final Permit should take into account successes in other jurisdictions for reducing pollutant load to pre-development levels.

See reports from the city of Santa Monica on MTBE mitigation and urban watershed management (http://cfpub.epa.gov/npdes/stormwater/casestudies_specific.cfm?case_id=2).

X. The Final Permit should include a *graphic representation* of both political and natural boundaries as related to the area under jurisdiction of this order.

XI. The Final Permit should recognize the resources within each Watershed or municipality, and emphasize stakeholder engagement.

Urban runoff is the San Diego region's most urgent pollution problem. Arguably, it is the most difficult to solve. In a region known for its beaches and strong tourism economy, polluted runoff makes our beaches and waterways unsafe for swimming, fishing and other recreation for at least 72 hours after a rain event. Even in dry weather, our "urban drool" from residents and businesses overwatering lawns becomes a major pollution source.

The good news is by working together as a community, we can solve this challenging public health problem. The Water Quality Improvement Plans proposed in the draft permit have the potential to become powerful tools to help us improve water quality within our watersheds. However, the Copermittees cannot be tasked with creating these plans alone. Specifically:

- The Permit should require formation of a stakeholder advisory group for each watershed that includes representatives of environmental groups with knowledge of the watershed.
- This stakeholder advisory group should work closely with the Copermittees and a regional board staff member while the Water Quality Improvement Plans are being developed to ensure these plans aggressively pursue water quality gains.
- The stakeholder advisory process should include accountability and measureable milestones to ensure the goals of the Permit are being met.

By taking advantage of the knowledge and resources of diverse stakeholders like municipalities, businesses and residents, our region can be on the cutting-edge of addressing urban runoff and creating healthier communities and watersheds. But this can only be achieved if these diverse voices are impacting the planning process in a meaningful way.

USGBC-San Diego recognizes the challenge urban runoff presents to our region, and we want to do our part to solve the problem. USGBC-San Diego is interested in participating in a Water Quality Improvement Plan development process for watersheds in the San Diego Region.

USGBC-San Diego urges the Regional Board to enhance the stakeholder participation opportunities during Water Quality Improvement Plan development and then approve the permit.

CONCLUSION

In conclusion, the U.S. Green Building Council – San Diego appreciates the approach and effort the Regional Board and its staff have put towards developing an MS4 permit for the San Diego Region. We believe that this watershed system approach will better improve the environmental, economic and social impacts associated with current water quality in our region. We look forward to a constructive relationship with the Regional Board.

Respectfully submitted,

Douglas Kot
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San Diego Green Building Council
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With support from,

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January 11, 2012

Mr. Gary Strawn
Vice Chairman
California Regional Water Quality Control Board, San Diego
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Re: Comment—Tentative Order No. R9-2013-001, Regional MS4 Permit, Place ID: 786088Wchiu

Dear Vice Chair Strawn:

I am writing on behalf of the San Diego Regional Chamber of Commerce in response to the San Diego Regional Water Quality Control Board's Tentative Order R9-2012-0011 ("Permit") dated October 31, 2012. After reviewing the Permit, the Chamber and its members are concerned that it will impose expensive and untested regulations on local governments and businesses.

Clean, safe water is vital to the region's economy. The tourism industry is one of San Diego's largest. Maintaining its economic health requires clean water in our beaches and streams. It is important, however, that we use our limited resources wisely, and ensure that our efforts produce the desired outcome of improving water quality.

We applaud the Board's inclusion of Water Quality Improvement Plans (WQIP) as a first step in developing a cost-effective approach to improving our water. Analysis remains a critical component of a successful strategy, and we are glad to see that the Board is committed to finding the best possible solution to water quality improvement.

We are concerned, however, that the costs associated with enforcing and implementing the permit will have a negative impact on San Diego's economy. Our three primary areas of concern include: 1) the strict liability for exceeding water quality objectives; 2) the preemption of WQIPs by new and changing regulatory requirements prior to allowing the WQIPs to be developed and implemented; and 3) the lack of reliable funding sources to implement these regulatory changes.

It is necessary to hold individuals, businesses, and governments accountable, but it is critical that accountability measures are practical and have a demonstrable, positive benefit to the region's water. Because of these concerns, we respectfully request that the Permit focus on the timely development of effective and enforceable WQIPs, and that each of the WQIPs be developed through a process that ensures public participation. We ask also that the designation of appropriate Best Management Practices in each watershed be determined through the WQIP

process rather than the one size fits all strategy currently being proposed in the Permit. We ask further that until the Board adopts a WQIP for a watershed that the provisions of the existing Permit remain in place for that watershed. Finally, in order to avoid unnecessary litigation, we request that the Board adopt the WQIPs as Orders implementing the proposed Permit.

We urge you to adopt final permit language that is evidence-based and both environmentally and economically sustainable. Thank you for your consideration. Please contact Leah Hemze at lhemze@sdchamber.org if you have any questions.

Sincerely,

Mark Leslie
Interim President & CEO

CC: Mr. Wayne Chiu, California Regional Water Quality Control Board, San Diego

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January 11, 2013

VIA EMAIL
wchiu@waterboards.ca.gov

Wayne Chiu
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Re: **Comments - Tentative Order No. R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu**

Dear Mr. Chiu:

The San Diego Unified Port District (Port) submits the following comments to the revised Tentative Order No. R9-2013-0001, NPDES No. CAS0109266, *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4) Draining the Watersheds within the San Diego Region* (the Permit). Except to any extent inconsistent with the comments below and other comments submitted directly on behalf of the Port, the Port concurs with the San Diego Copermittees' comments throughout the process. The Port wishes to separately address several issues in the current draft Permit. The Port continues to support the objectives of the Permit and welcomes any opportunity to work with the Regional Board to improve the Permit.

1. Establish Connection between Discharge Prohibitions/Receiving Water Limitations and TMDL Compliance Schedules

The Permit as currently drafted includes specific provisions and schedules for implementation of total maximum daily loads (TMDLs) that have been incorporated into the Water Quality Control Plan for the San Diego Basin. *See* Permit, Attachment E. These compliance schedules have been incorporated into the Effluent Limitations provision of the Permit. Permit, II.A.3.b. ("Each Copermittee must comply with applicable WQBELs established from the TMDLs in Attachment E to this Order, pursuant to the applicable TMDL compliance schedule.").

However, no similar language is included in the Discharge Prohibitions (II.A.1.) or the Receiving Water Limitations (II.A.2.) provisions. The absence of similar language regarding TMDL compliance schedules in these provisions could potentially result in Copermittees being in violation of the Permit even though the TMDL implementation dates have not passed. In order for a Copermittee to be in compliance when the Permit becomes effective, it must also be in compliance with the applicable TMDL compliance schedule. Where a TMDL is in place, the Permit establishes compliance schedules for Discharge Prohibitions and Receiving Water Limitations that are in conflict with the TMDL compliance schedules.

The Port requests that the Discharge Prohibitions and Receiving Water Limitations provisions of the Permit be revised to make clear that the Copermittee shall not be in violation of these provisions when the Copermittee is complying with the applicable TMDL compliance schedule. Provision II.A.2.c., which appeared in the previous permit draft contains appropriate language linking the TMDL compliance schedules with the compliance schedules for Discharge Prohibitions and Receiving Water Limitations. The Port requests that similar language be included in Provisions II.A.1. and II.A.2. of the Permit.

2. Permit Compliance Should be Based on the Iterative Process and Implementing Provisions of TMDL and the WQIP Rather than Numeric Limits

The Permit provides that the Copermittees must be in compliance with numeric limits in order to meet water quality standards and to avoid violating the Permit. *See* Permit, II.A.1.a., II.A.1.c., II.A.2.a. The Permit also provides that each Copermittee must engage in an iterative process to implement water quality improvement strategies should water quality exceedances occur to achieve compliance with the discharge prohibitions and receiving water limitations. Permit, II.A.4. However, the Permit states that these provisions are "independently applicable, meaning that compliance with one provision does not provide a 'safe harbor' where there is no compliance with another provision." Permit, Fact Sheet, F-39.

Currently, the Permit creates a situation where the Copermittees may be in violation of the Permit the moment it goes into effect. There may be non-compliance with the Permit by a Copermittee where it is shown that a Copermittee is causing or contributing to an exceedance of water quality standards, even if that Copermittee is actively engaged in the iterative process.

While the Port acknowledges that the Regional Board may choose not to strictly enforce these permit conditions, the Copermittees remain potentially subject to an enforcement action by the Regional Board or a third-party citizen suit unless this point of compliance is clarified. The Regional Board has clear authority under the CWA and State Board policy to issue an MS4 permit that allows for iterative Best Management Practices (BMPs), rather than requiring strict adherence to water quality standards through numeric effluent limitations. *See* State Water Resources Control Board Order No. 2001-15, at pg. 8; *see also Defenders of Wildlife v. Browner,* 191 F.3d 1159, 1163, 165 (9th Cir. 1999).

Accordingly, the Permit should be revised to allow the Copermittees to achieve compliance by actively engaging in a BMP-based iterative process and by complying with implementation provisions of applicable TMDLs. The Port supports using the Receiving Water Limitations Language proposed by the California Stormwater Quality Association (CASQA), attached as Exhibit 1.

3. The Permit Should Clarify the Limits and Basis for Copermittee Liability for Any Exceedances

As noted, the Permit should clarify that Copermittee compliance is achieved through compliance with iterative approaches as set forth in the WQIP and any applicable BMPs, rather than any numeric limits. However, if numeric limits remain in the Permit, certain modifications should be made to avoid improper imposition of liability on Copermittees, consistent with the CWA. As discussed in the Port's comments to the previous draft of the Permit, dated September 14, 2012, the Permit should be revised to make clear that a Copermittee is only responsible for exceedances introduced into portions of MS4 facilities that it owns or operates, not merely discharges into or from all MS4 facilities within that Copermittee's geographical jurisdictional boundaries. There are numerous MS4 facilities and outfalls within the Port's tidelands jurisdictions which the Port does not own or operate. The language of the CWA, repeated in the Permit, confirms that a Copermittee is only responsible for MS4 facilities that it operates. (40 CFR 122.26(a)(3)(vi).)

For this reason, the Port cannot properly be liable for discharges into or from an MS4 facility merely because it is within the Port's tidelands jurisdiction – it must own or operate that MS4 facility. To clarify this point, the Port proposes adding the following language, which could be placed in the cover for the Permit, immediately preceding Table 2:

"The location of an MS4 facility within any Copermittee's jurisdiction boundaries does not, of itself, make the Copermittee an owner or operator of that MS4 facility."

Furthermore, the Permit must include additional provisions that ensure a Copermittee is not improperly held liable for discharges attributable to other Copermittees' MS4 inputs. Of key concern is the specter of liability for downstream MS4 operators. As one of the farthest downstream jurisdictions, the Port faces greater risk of being downstream of other Copermittees' input and discharges into the upstream MS4 facilities. The Permit should be revised to clarify that each Copermittee is liable for any input and discharges into and from its MS4 that may exceed numeric limits, but not for the input and discharges by other Copermittees, whether upstream or downstream. Unless such provisions are included, Copermittees such as the Port will face the risk of legally improper "end of the pipe" liability, even if it did not contribute any pollutants.

As written, the Permit lacks clarity regarding the appropriate basis for determining that any Copermittee has actually caused or contribute to an exceedance of water quality standards. As the Permit states, "[e]ach of the Copermittees owns or operates an MS4, through which it discharges storm water and non-storm water into water of the U.S. within the San Diego Region." Permit, Findings, I.1. It further states:

> The federal regulations make it clear that the Copermittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators (40 CFR 122.26(a)(3)(vi)). This Order does not require Copermittees to manage storm water outside of their jurisdiction boundaries, but rather to work collectively to improve storm water management within watersheds.

Permit, Findings, I.2. While this language is consistent with the CWA, additional provisions are needed to ensure that one Copermittee does not become liable for input and discharges from other Copermittees. The Port requests that the Permit include language clarifying that each Copermittee is only liable for its share of the excess pollutants that it introduces into its MS4 facilities and which result in exceedances of the receiving water limits.

Such a provision is necessary since a Copermittee on an MS4 permit is only responsible for its own discharges or those over which it has control, not discharges or inputs by other Copermittees. *Jones v. E.R. Shell Contractor, Inc.*, 333 F.Supp.2d 1344, 1348 (N.D. Ga. 2004). Similarly, both the California Water Code and the Clean Water Act contemplates that liability for violations shall fall upon the "person" responsible for the violations. *See* Cal. Water Code §§ 13263(f), 13350(a); 33 U.S.C. § 1319. A Copermittee that does not generate or add pollutants to its MS4 facilities cannot credibly be characterized as having discharged pollutants. Likewise, a Copermittee cannot properly be subject to liability for excess pollutants introduced into segments of the MS4 outside its jurisdiction. Copermittees cannot control such MS4 facilities and the CWA clearly does not require a Copermittee to exert such control.

To alleviate this problem and to ensure compliance with the applicable statutes and case law, the Port requests that the Permit be revised to explicitly state the each Copermittee is only liable for the portion of any excess pollutants that cause or contribute to any violations of the Permit that are introduced into the portion of the MS4 owned or operated by that Copermittee.

a. <u>The Permit Should Include the Appropriate Regional Board Burden of Proof to Establish Liability of a Copermittee for MS4 Discharges</u>

The Permit should also include provisions that will ensure one Copermittee is not held liable for pollutant discharges generated by or introduced into the MS4 facilities by other Copermittees. Without delineating the basis for assigning and/or apportioning liability among the Copermittees, there is an unacceptable risk that "end of pipe" Copermittees may be held liable for violations caused by pollutants generated and introduced into MS4 facilities primarily,

or even exclusively, by "upstream" Copermittees. In particular, as the trustee of the tidelands of the San Diego Bay, the Port is one of the Copermittees located farthest downstream. There is an attendant increased risk that in the event any pollutants are discharged into the San Diego Bay, such pollutants would not have originated from any Port MS4 facilities but from MS4 facilities farther upstream.

To ensure that the Regional Board does not hold Copermittees such as the Port responsible for pollutants introduced into or originating from other Copermittees' MS4 facilities, the Permit must be revised to include and clarify the Regional Board's burden of proof for establishing a particular Copermittees' liability. *See Rapanos v. United States*, 547 U.S. 715, 745 (2006); *see also Sackett v. E.P.A,* 622 F.3d 1139, 1145-1147 (9th Cir. 2010), reversed on other grounds, *Sackett v. E.P.A.* (2012) 132 S. Ct. 1367 ("We further interpret the CWA to require that penalties for noncompliance with a compliance order be assessed only after the EPA proves, in district court, and according to traditional rule of evidence and burdens of proof, that defendants violated the CWA in the manner alleged in the compliance order."). The Regional Board must have the affirmative duty to prove that a Copermittee introduced pollutants into the MS4 that are discharged in the violation of the Permit.

In contrast to this legally required approach, the Permit presently states that the Copermittees must comply with certain procedures to come into compliance in the event an exceedance occurs. *See* Permit, II.A.4.a. The language would effectively impose liability on all Copermittees until a Copermittee could prove that it did not contribute to the excess pollutants in the discharge, even though the Regional Board would not have raised, and would not legally be entitled to, a rebuttable presumption that the exceedance resulted from that particular Copermittee's actions. To prevent a Copermittee being put in the legally untenable position of having to prove its innocence in the first instance, the Regional Board should have an initial burden of proving that the exceedances relate to contribution by a particular Copermittee.

Accordingly, the Port requests that Section II.A.4.a. is revised to read:

> If exceedance(s) of water quality standards persist in receiving waters notwithstanding implementation of this Order, *upon a showing by the Regional Board by a preponderance of the evidence that the discharges of pollutant from the MS4 for which each Copermittee is an owner or operator caused or contributed to the exceedance(s) of the water quality standards, those* Copermittees must comply with the following procedures: (emphasis added).

b. <u>Monitoring Requirements Should be Revised to Include Monitoring that Will Ensure Jurisdiction Accountability</u>

As a further necessary safeguard against improperly broad or joint and several liability for discharges, the Permit must include provisions that will allow the Regional Board and the

Copermittees to determine the sources of any exceedances discharged to receiving waters. Unless the Permit requires such monitoring, there remains the risk that downstream Copermittees will be held liable for upstream discharges. This issue of identifying and establishing a Copermittee's violation of an MS4 permit is critical and has been the subject of recent judicial attention. The Port requests that the Permit include a monitoring program that meets and satisfies the evidentiary standards discussed in *Los Angeles County Flood Control District v. Natural Resources Defense Council, Inc., et al.*, No. 11-460 (U.S. Jan. 8, 2013) and *Natural Resources Defense Council, Inc. v. County of Los Angeles*, 673 F.3d 880 (9th Cir. 2011), necessary to establish a particular Copermittee's discharges and/or violations of the Permit. Without such monitoring, the risk persists that "end of pipe" Copermittees will be held liable for upstream jurisdictional discharges, without proper jurisdictional accountability.

We again emphasize that the Port is dedicated to the protection and enhancement of water quality and that the Port strongly supports the objectives of the Permit. We welcome the opportunity to work with the Regional Board in order to achieve our mutual goals. Please contact us if you have any questions or would like any clarification of the Port's position.

Very truly yours,

Scott E. Patterson

SEP/BPS
cc: William D. McMinn, Esq.

EXHIBIT 1

CASQA Proposal for Receiving Water Limitation Provision

D. RECEIVING WATER LIMITATIONS

1. Except as provided in Parts D.3, D.4, and D.5 below, discharges from the MS4 for which a Permittee is responsible shall not cause or contribute to an exceedance of any applicable water quality standard.

2. Except as provided in Parts D.3, D.4 and D.5, discharges from the MS4 of storm water, or non-storm water, for which a Permittee is responsible, shall not cause a condition of nuisance.

3. In instances where discharges from the MS4 for which the permittee is responsible (1) causes or contributes to an exceedance of any applicable water quality standard or causes a condition of nuisance in the receiving water; (2) the receiving water is not subject to an approved TMDL that is in effect for the constituent(s) involved; and (3) the constituent(s) associated with the discharge is otherwise not specifically addressed by a provision of this Order, the Permittee shall comply with the following iterative procedure:

    a. Submit a report to the State or Regional Water Board (as applicable) that:

        i. Summarizes and evaluates water quality data associated with the pollutant of concern in the context of applicable water quality objectives including the magnitude and frequency of the exceedances.

        ii. Includes a work plan to identify the sources of the constituents of concern (including those not associated with the MS4to help inform Regional or State Water Board efforts to address such sources).

        iii. Describes the strategy and schedule for implementing best management practices (BMPs) and other controls (including those that are currently being implemented) that will address the Permittee's sources of constituents that are causing or contributing to the exceedances of an applicable water quality standard or causing a condition of nuisance, and are reflective of the severity of the exceedances. The strategy shall demonstrate that the selection of BMPs will address the Permittee's sources of constituents and include a mechanism for tracking BMP implementation. The strategy shall provide for future refinement pending the results of the source identification work plan noted in D.3. ii above.

        iv. Outlines, if necessary, additional monitoring to evaluate improvement in water quality and, if appropriate, special studies that will be undertaken to support future management decisions.

        v. Includes a methodology (ies) that will assess the effectiveness of the BMPs to address the exceedances.

        vi. This report may be submitted in conjunction with the Annual Report unless the State or Regional Water Board directs an earlier submittal.

b. Submit any modifications to the report required by the State of Regional Water Board within 60 days of notification. The report is deemed approved within 60 days of its submission if no response is received from the State or Regional Water Board.

c. Implement the actions specified in the report in accordance with the acceptance or approval, including the implementation schedule and any modifications to this Order.

d. As long as the Permittee has complied with the procedure set forth above and is implementing the actions, the Permittee does not have to repeat the same procedure for continuing or recurring exceedances of the same receiving water limitations unless directed by the State Water Board or the Regional Water Board to develop additional BMPs.

4. For Receiving Water Limitations associated with waterbody-pollutant combinations addressed in an adopted TMDL that is in effect and that has been incorporated in this Order, the Permittees shall achieve compliance as outlined in Part XX (Total Maximum Daily Load Provisions) of this Order. For Receiving Water Limitations associated with waterbody-pollutant combinations on the CWA 303(d) list, which are not otherwise addressed by Part XX or other applicable pollutant-specific provision of this Order, the Permittees shall achieve compliance as outlined in Part D.3 of this Order.

5. If a Permittee is found to have discharges from its MS4 causing or contributing to an exceedance of an applicable water quality standard or causing a condition of nuisance in the receiving water, the Permittee shall be deemed in compliance with Parts D.1 and D.2 above, unless it fails to implement the requirements provided in Parts D.3 and D.4 or as otherwise covered by a provision of this order specifically addressing the constituent in question, as applicable.

Unified Port of San Diego

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January 11, 2013

Mr. Wayne Chiu
San Diego Regional Water Quality Control Board
9174 Sky Park Ct., Suite 100
San Diego, CA 92123-4340

Submitted via email: wchiu@waterboards.ca.gov

Subject: Comment – Tentative Order No. R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu

Dear Mr. Chiu,

The San Diego Unified Port District (Port) respectfully submits this comment letter regarding Tentative Order R9-2013-0001 National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) in the San Diego Region (Tentative Order).

The Port has been actively involved in the development process of the Tentative Order and we support the Regional Board's Water Quality Improvement Plan (WQIP) concept in the Tentative Order with its proposed flexibility to focus resources on the priority problems in the watershed. However, the Tentative Order also contains prescriptive requirements that are in addition to the WQIP and would be very costly and at times infeasible to implement. With constrained budgets and staff resources, these additional costs may unintentionally limit the ability to conduct other water quality efforts having greater environmental benefits for the Bay.

The Port has worked alongside the other San Diego County Municipal Copermitees (Copermitees) to collectively submit a red-line strikeout document recommending changes to the permit language. With the exception of the proposed WQIP-based compliance option, the Port fully supports the recommendations provided in the Copermittee red-line strike-out. This document will be submitted through the County of San Diego. The changes help to clarify permit compliance points and provide a more efficient monitoring program to support the end goal of improving water quality. We strongly encourage you to consider the Copermittee's proposal and the Port's comments listed below.

1. Jurisdictional Accountability

The Port is committed to our role as an environmental steward of San Diego Bay. That commitment is reflected in a number of programs both regulatory driven and beyond compliance, that are focused on protecting and rehabilitating the Bay's resources. The

Port's Stormwater Program is an important part of this effort. At the same time we recognize that discharges from upstream jurisdictions impact our efforts to protect bay water quality. San Diego Bay is the receiving water body for a large watershed in which the Port is located at the extreme end. We are aware that most discharges from the MS4 to San Diego Bay are from storm drain easements under the authority of other jurisdictions. With this in mind, we support jurisdictional accountability throughout the watershed and we encourage the Regional Board to incorporate these concepts throughout the Permit.

2. WQIP-based Compliance and Modifications to Provision A

The Regional Board staff has presented the WQIP as an iterative process that allows for adaptive management so that compliance with water quality standards is achieved over time. It is the Port's opinion that the WQIP process, as currently proposed in the Tentative Order, adequately allows for compliance based upon WQIP implementation. However, what is missing is the linkage between the Discharge Prohibitions, Effluent Limitations, and Receiving Water Limitations in Provision A and the iterative process set forth in the WQIPs.

Modifications to Provision A are required to ensure implementation of that iterative process. Without a modification, jurisdictions are potentially open to third-party lawsuits and their resources may be directed to addressing a one-time exceedance. The Port requests that the Permit establishes a clear linkage between compliance with Provision A to compliance with the WQIP and the other Provisions of the Permit.

3. WQIP Development Timeline

The Tentative Order proposes an aggressive schedule for WQIP development and JURMP program updates. The timeline for WQIP development (9 months) does not allow for adequate time between due dates for required deliverables. Concerns with the timeline are as follows:

- Formal agreements such as a Memorandum of Understanding and/or Cost Share agreements will be required within the watershed groups. Although the preliminary work may begin before permit adoption, the process cannot be completed until the Permit is adopted and the requirements are known. These agreements are integral to upholding jurisdictional accountability within the watershed groups. This process will take an estimated three months.

- The water quality priorities and goals are due within the first six months, followed by a two month public comment period. While this first deliverable deadline may be feasible, potential modifications to the priorities and goals may be necessary as a result of the public comments received. Should modifications to the priorities and goals be required, there will be little time to develop the strategies and schedules.

- Time is needed to address comments from the public or Regional Board throughout the process and to obtain management and jurisdictional governing body approvals. Governing body approvals take an average of three months.

The Port requests that the timeframe for permit deliverables is extended as outlined in the Copermittee's revised WQIP development schedule in the red-line strike-out submittal.

4. Illegal Discharges: Air Conditioning Condensation

The Tentative Order requires air conditioning condensation to be directed to landscaped areas or other pervious surfaces where feasible. Substantial structural modifications may be required to meet this requirement and discharges of this type may not be a priority pollutant source that is identified in the WQIP. The Port requests that the requirement to direct air conditioning condensation to landscaping be encouraged and not required.

5. Retention Requirement for Priority Development Projects

As proposed in the Tentative Order, Priority Development Projects are to implement BMPs to retain the volume of runoff equivalent to the design capture volume or the estimated volume that would be retained if the site was fully undeveloped. Due to the Port's location at the headwaters of San Diego Bay, a high groundwater table and existing soils with low infiltration rates, retention is not technically feasible on Port tidelands. The Port is at the bottom of the watershed so consequently retained runoff must be stored for a longer period of time after the peak of a storm. Large underground storage tanks to store the runoff would be infeasible because most tanks would have significant design constraints due to the high groundwater table, flat topography, and high receiving water elevation, making gravity flow drainage systems nearly impossible. Above ground storage tanks would be infeasible because most of Port tidelands are built-out and there is limited room for these facilities. Also, above ground storage tanks pose a vector hazard and a visual nuisance.

Similarly, the proposed alternative compliance options such as an offsite mitigation option or increasing the treatment area onsite also is not feasible for the Port. The land within the Port is largely built-out and area to use for additional treatment is extremely limited. Meeting this requirement would come at a cost to proposed projects that would make them infeasible. Furthermore, mitigation outside of the Port's jurisdiction is also not an option because the Port would not have the authority to enforce the implementation and maintenance of BMPs outside of its jurisdiction. The Port requests that the retention requirement be removed from the permit.

6. Predevelopment Design Reference Used for Hydromodification Controls

The Tentative Order requires the use of "**pre-development** (naturally occurring)" as a runoff reference condition for hydromodification controls. Establishing the

pre-development condition of a site requires a reference start date, which is not outlined in the draft, and also requires accepted and defensible references to the **pre-development** soils, vegetation and topography which are also not identified in the permit. This requirement will also create additional and unnecessary costs to each jurisdiction and to the project without additional water quality benefits. A recommended alternative would be the use of a "**pre-project**" runoff reference. This reference point is already being used by the Copermittees in the current MS4 permit and has been used in other MS4 permits in the State. The Port requests that the **pre-development** design reference in the permit is replaced with **pre-project**.

7. <u>Hydromodification Exemption</u>

An exemption to hydromodification requirements that is in the current MS4 permit has been removed in the Tentative Order. The exemption applies to projects that discharge to conveyance channels that are stabilized (i.e. concrete lined) all the way to the receiving water. Hydromodification requirements are included in the permit to mitigate for potential erosion and channel degradation downstream of a development project. Projects that discharge to a stabilized conveyance channel do not present potential erosive impacts downstream or channel degradation therefore, the imposition of hydromodification requirements on such projects is unnecessary and will not provide water quality benefits. The Port requests that the hydromodification exemption for projects that discharge to stabilized conveyance systems be reinserted in the permit.

On behalf of the Port, I wanted to thank you for providing us the opportunity to engage with you and the other stakeholders through the public workshops, and the ability to submit comments on the Tentative Order. Please contact Allison Vosskuhler at (619) 686-6434 or avosskuhler@portofsandiego.org if you have any questions or would like additional clarification on the information provided.

Sincerely,

Randa Coniglio

Randa Coniglio,
Executive Vice President, Operations
San Diego Unified Port District

cc: Paul Fanfera
Bill McMinn
Karen Holman
Allison Vosskuhler

DM#557567

San Diego Coastkeeper
2825 Dewey Road #200
San Diego, CA 92106

Building Industry Association of San Diego County
9201 Spectrum Center Blvd., Suite 110
San Diego, CA 92123

January 11, 2013

Via e-mail to wchiu@waterboards.ca.gov & hand delivery
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

RE: Comments on Tentative Order Number: R9-2013-0001

Dear Mr. Chiu:

San Diego Coastkeeper and the Building Industry Association of San Diego County respectfully submit the following joint comments on the draft San Diego Regional Municipal Separate Storm Sewer System permit, Tentative Order No. R9-2013-0001.

- The Water Quality Improvement Planning process should have more robust stakeholder input.

- Each Water Quality Improvement Plan should have a stakeholder advisory group that sits in Water Quality Improvement Plan meetings, consisting of an environmental representative with knowledge of the watershed, an independent engineer/hydrologist/scientist, and a regional board staff member.

- Water Quality Improvement Plans should be done consecutively, starting with the worst watershed first.

- Because infiltration may not be feasible everywhere in San Diego County, reasonable "off-ramps" for infiltration requirements are appropriate.

- The Water Quality Improvement Plan development process must solicit and include a menu of alternative compliance options developers could use within a watershed.

- Copermittees should create and publish a schedule of public input opportunities for Water Quality Improvement Plans.

- The Permit should specify that Copermittees must accept quality-controlled data received from third parties provided that the data has been development in conformity with the lasted version of Standard Methods of Water and Waste Water Analysis.

Respectfully submitted,

Jill Witkowski
Waterkeeper
San Diego Coastkeeper

Borre Winckel
President & CEO
BIA San Diego

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File Number: 0100-092378

January 11, 2013

Mr. Wayne Chiu, P.E.
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Re: Comment – Tentative Order No.R9-2013-0001, Regional MS4 Permit,
Place ID: 786088Wchiu

Dear Mr. Chiu:

This letter comments on the San Diego Regional Water Quality Control Board's Tentative Order R9-2012-0011 ("Permit") dated October 31, 2012. After reviewing the proposed Permit, I am convinced that the benefits of the Permit as drafted overreachs in a way that will result in detrimental consequences that cannot be overriden by the theoretical benefits hoped to be achieved. The Permit as currently drafted imposes expensive, onerous, and untested regulations on local governments, businesses, and residents. These new regulations will impact the region's economy in a way that far exceeds whatever water quality benefit may result.

I understand the importance of clean, safe water to the region. As a member of the business community, I too am interested in improving San Diego's water. It is important, however, that we use our limited resources wisely, and ensure that our efforts produce the desired outcome of improving water quality without shutting down our economy or placing unreasonable and infeasible burdens on our local governments, businesses and residents.

I applaud the Board's inclusion of Water Quality Improvement Plans (WQIP) as a first step in developing a cost-effective approach to improving our water. Analysis remains a critical component of a successful strategy, and I am glad to see that the Board is committed to finding the best possible solution to water quality improvement.

I am concerned, however, that the costs associated with enforcing and implementing the permit will have a negative impact on my business and San Diego's economy. The four primary areas of concern include: 1) the strict liability for exceeding water quality objectives; 2) the additional and changing requirements for development projects, impacting items such as storm water retention and discharge; 3) the preemption of WQIPs by new and changing regulatory requirements prior to allowing the WQIPs to be developed and implemented; and 4) the lack of reliable funding sources to implement these regulatory changes.

SheppardMullin

It is necessary to hold individuals, businesses and governments accountable, but it is critical that the accountability measures can be reasonably achieved and are likely to have a significant and positive impact on San Diego's water. Because of these concerns, I respectfully request that the Permit focus on the timely development of effective and enforceable WQIPs, and that each of the WQIPs be developed through a process that ensures public participation. I ask also that the designation of appropriate Best Management Practices in each watershed be determined through the WQIP process rather than the one size fits all strategy currently being proposed in the Permit. I ask further that until the Board adopts a WQIP for a watershed that the provisions of the existing Permit remain in place for that watershed. Finally, in order to avoid unnecessary litigation I request that the Board adopt the WQIPs as Orders implementing the proposed Permit.

I urge you to adopt final permit language that is evidence-based and both environmentally and economically sustainable. Thank you for your consideration. Please contact me if you have any questions.

Very truly yours,

Donna Jones

Donna D. Jones
for SHEPPARD, MULLIN, RICHTER & HAMPTON LLP

SMRH:407690211.1

cc: Leah Hemze

Southern California Gas Company

A Sempra Energy utility®

January 11, 2013

Mr. Wayne Chiu, P.E.
California Regional Water Quality Control Board
San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

VIA E-Mail: wchiu@waterboards.ca.gov

Re: Comment – Tentative Order No. R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu

Dear Mr. Chiu and Board Members:

The Southern California Gas Company (SCG) provides transmission and distribution of natural gas throughout San Diego County and southern Orange County. Delivery of these essential public services requires routine and emergency construction, operation and maintenance of its linear utility infrastructure. A primary mandate to utilities and other entities with linear facilities regulated by the California Public Utilities Commission and/ or other state and federal regulatory agencies is to provide safe and reliable service. The above-referenced draft MS4 permit (draft Permit) would impact SCG facilities in our service territory within Region 9.

Our comments and recommended revisions to specific issues in the draft Permit are provided below.

Non-Storm Water Discharges

There is still confusion in the draft Permit regarding which non-storm water discharges are prohibited and must be eliminated and those discharges that are authorized. The draft Permit both states that it authorizes and prohibits non-storm water discharges but it is not always clear which are authorized and which are prohibited. In multiple locations (e.g. Finding 15), the draft Permit states that non-stormwater discharges into the MS4s must be "effectively prohibited" or eliminated. This section conflicts with other sections (Section II.A.1.b., for example), which state, consistent with EPA's regulations, that non-stormwater discharges authorized by a NPDES permit are authorized to be discharged to the MS4 system. One change that would help to clarify this issue would be to revise Finding 15 as follows:

> **Non-Storm Water and Storm Water Discharges.** Non-storm water discharges from the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard of CWA section 402(p)(3)(B)(iii), which is explicitly for "Municipal … *Stormwater Discharges* (emphasis added)" from the MS4s. Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s must be effectively prohibited. ***However, consistent with EPA's regulations, the draft Permit authorizes discharges of non-storm water to MS4s that are either authorized by a separate NPDES permit, or the discharge is a category of non-storm water discharges or flows that must be addressed pursuant to Provisions E.2.a.(1)-(5) of this Order.***

Prohibition of Non-Storm Waters

Section E.2.a.6. would prohibit any category of non-stormwater under Section E.2.a.1-4. if it is found by the co-permittee or the Regional Board to be a source of pollutants to receiving waters. We recommend that this section be revised to also allow the co-permittees to designate different and/ or additional BMPs to be implemented as opposed to prohibiting the category of non-stormwater and suggest the following language:

> If the Copermittee or San Diego Water Board identifies any category of non-storm water discharges listed under Provisions E.2.a.(1)-(4) as a source of pollutants to receiving waters, the category must be prohibited through ordinance, order, or similar means and addressed as an illicit discharge. ***Alternately, the Copermittee can designate different and/ or additional BMPs to be implemented as opposed to prohibiting the category of non-stormwater.***

Building Fire Suppression System Maintenance Discharges

Section E.2.a.5.a.1. would require the co-permittees to treat building fire suppression system maintenance discharges (e.g., sprinkler line testing and flushing) as an illicit discharge. These discharges have historically been allowed under existing MS4 permits and municipal ordinances with the use of appropriate BMPs. These activities are mandated by code and insurance companies and are essential to maintain a safe and reliable fire water delivery system. Changing existing systems to discharge to the sewer may not be feasible and/ or be expensive due to the existing plumbing configurations. These discharges should continue to be authorized with the implementation of appropriate BMPs as determined by the MS4. If existing BMPs are found to be inadequate, different and/ or additional BMPs could be required to be implemented by the MS4.

Discharges to Areas of Special Biological Significance

The draft Permit should clarify that non-storm water discharges (e.g., potable hydrotest dewatering, groundwater dewatering discharges, etc.) made pursuant to NPDES permits to MS4 systems that discharge to Areas of Special Biological Significance (ASBS) are authorized. These types of discharges are critical to on-going infrastructure development, maintenance and operation and the State Water Board's March 2012 "Exceptions to the Ocean Plan for Discharges to Areas of Biological Significance" provides that the NPDES permitting authority can authorize these discharges to ASBS by making an appropriate finding in the applicable MS4 permit. **We urge the RWQCB to include the following language as part of Finding 32:**

> ***"The ASBS exception authorizes the discharge of non-stormwater to a MS4 when an NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS. Accordingly, the RWQCB finds that since NPDES permits for non-stormwater discharges contain conditions and requirements to protect water quality and many of these permits are for short-term and/ or intermittent discharges (e.g., discharges from utility vaults and underground structures, construction groundwater dewatering, hydrostatic test water discharges, potable water discharges), these discharges will not alter natural ocean water quality and herein authorizes their discharge to MS4 systems that discharge to ASBS."***

Further, the following Sections need to be revised to ensure consistency and support the above finding:

- **Section II.A.1.d.:**

  "Storm water discharges ***and non-stormwater discharges made pursuant to NPDES permits*** from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special

Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 applicable to these discharges, included in Attachment A to this Order. All other discharges from the Copermittees' MS4s to ASBS are prohibited."

- **Section 2.I.A.1.e.2.ii**. in Attachment A needs to be revised to reference the above finding:

  "An NPDES permitting authority may authorize non-storm water discharges to an MS4 with a direct discharge to an ASBS only to the extent the NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS ***(see Permit Finding 32)***."

Non-stormwater Action Levels

The draft Permit should not subject non-stormwater discharges made pursuant to NPDES permits to action levels. Section II.C.1. would subject non-stormwater discharges to action levels. However, non-stormwater discharges that have NPDES permits are subject to their own discharge requirements. Setting additional, perhaps conflicting, requirements on these discharges is unnecessary and will lead to confusion. **We therefore urge the RWQCB to revise the draft Permit to clarify that the proposed non-stormwater action levels are not applicable to non-stormwater discharges that have NPDES permits**.

Development Planning

The draft Permit should not subject linear underground/ overhead (utility) projects (or LUPs) to permanent post-construction requirements. Section E.3. requires permanent BMPs for all development projects. LUP construction projects are regulated pursuant to the State Water Board's Stormwater Construction General Permit (CGP). Finding 76 in the CGP specifically excludes LUPs from permanent post-construction requirements due the nature of their construction. For consistency with the CGP, the draft Permit needs to clarify that Section E.3. is not applicable to LUPs as defined in the CGP. **We urge the RWQCB to make the following revisions:**

- **Finding 10**

  Pollutants Generated by Land Development. Land development has created and continues to create new sources of non-storm water discharges and pollutants in storm water discharges as human population density increases. This brings higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash. Pollutants from these sources are dumped or washed off the surface by non-storm water or storm water flows into and from the MS4s. When development converts natural vegetated pervious ground cover to impervious surfaces such as paved highways, streets, rooftops, and parking lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving a developed area without BMPs that can maintain pre-development conditions will contain greater pollutant loads and have significantly greater runoff volume, velocity, and peak flow rate than pre-development runoff from the same area. ***The nature of linear underground/ overhead projects (LUPs) is to return project sites to pre-construction conditions. Therefore, consistent with Finding 76 in the SWRCB's Storm Water Construction General Permit[1], LUPs are not subject to post-construction requirements.***

  [1] Order 2009-0009-DWQ, as amended by Orders 2010-0014-DWQ and 2012-0006-DWQ, contains the definition of Linear Underground/ Overhead Projects.

- **Definition of "Development Project"**

  "Development Projects - Construction, rehabilitation, redevelopment, or reconstruction of any public or private residential project, industrial, commercial, or any other projects. ***Development Projects do not include linear underground/ overhead projects as defined in the SWRCB Storm Water Construction General Permit (Order 2009-0009-DWQ, as amended by Orders 2010-0014-DWQ and 2012-0006-DWQ).***

The enclosed comments are in reference to the language found in the draft Permit. We request that these revisions also be made to the draft Permit's Fact Sheet/Technical Report.

Thank you for this opportunity to provide you with our comments. Please call Dianne Franks at 213-215-7583 if you have any questions concerning this letter.

Sincerely,

Crystal Yancey-York
Environmental Programs Manager

Via e-mail to *wchiu@waterboards.ca.gov* January 11, 2013

Wayne Chiu
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100

San Diego, CA 92123-4340

RE: Comments on Tentative Order Number: R9-2013-0001

The South Laguna Civic Association, established in 1946, supports comments and recommendations submitted September 14, 2012 by the "Environmental Groups" regarding the administrative draft of the San Diego Regional Municipal Separate Storm Sewer System (MS4) Permit, Tentative Order No. R9-2013-0001 ("Administrative Draft Permit").

While a regional permit can provide improved levels of efficiency, smaller, high value habitats and coastal receiving waters established as critical marine life recovery areas may be overlooked. The Aliso Watershed in south Orange County represents an area requiring closer consideration.

Aliso Creek discharges 1 to 5 million gallons per day of dry weather urban runoff from known inland MS4 point sources. Twenty years of monitoring reports and over $20 million have clearly

identified at least one dozen offending storm drains with daily dry weather flows exceeding 150,000 gallons per day (GPD). Only one storm drain in Laguna Niguel has received a Clean-up and Abatement Order during this period.

As recently as 1982, surveys of Aliso Creek indicated no flows throughout the dry season. In fact, early ranching of Aliso Canyon with subsequent destruction of critical native trees and vegetation led to long drought conditions and widespread, fatal dehydration of cattle.

Today, the primary source of elevated creek flows originates exclusively from inland over-irrigation and careless discharges of recycled water. Non-native creek flows transport a toxic variety of pollutants and carcinogens from residential, commercial and municipal known point sources with measurable quantities of herbicide, pesticide, fertilizer, automotive and similar residues to protected creek, estuary and coastal receiving waters. Aliso Beach is permanently posted for contaminated water and remains a risk to public health and safety.
(Please see Exhibit A – 2011 Aliso Creek Daily Flow/e.g., August 1, 2011 @ 7.6cfs = 4.9 MGD)

Economics of Water Pollution

Water Districts profit significantly from the sales of recycled water yet fail to be held accountable by the SDRWQCB for illicit discharges generated specifically by careless over-irrigation. Over-irrigation produces hundreds of thousands of dollars in excess revenues each year to inland Water Districts that persistently ignore the impact of their product water. Profiting from water pollution discharges to protected receiving waters is illegal as adjudicated by Friends of the Earth v Laidlaw (2000) and other statutes and regulations.

"District Court found that Laidlaw had gained a total economic benefit of $1,092,581 as a result of its extended period of noncompliance with the permit's mercury discharge limit; nevertheless, the court concluded that a civil penalty of $405,800 was appropriate. In particular, the District Court found that the judgment's "total deterrent effect" would be adequate to forestall future violations..." (Friends of Earth, Inc. v. Laidlaw Environmental Services (TOC), Inc. - 528 U.S. 167 (1999)

In the Aliso Watershed, recycled water sold for irrigation and over watering produces an average creek discharge flow of 3 MGD during the nine month dry season. Sold at $1000 per Acre Foot (AF), this irrigation product water yields revenues to inland Water Districts of over $10 million during the five year MS4 Permit cycle. (calculation: 3 MGD = 9 AF x $1000/AF x 300 days = $ 2.7/year x 5 year permit cycle = $10 mil+).

Lacking effective enforcement measures by the SDRWQCB, these excessive and illegal profits encourage increased sales of irrigation water without any accountability for the obvious impacts of water products to protected creek and coastal receiving waters. The Irvine Ranch Water District, El Toro Water District, Santa Margarita Water District and Moulton Niguel Water District must not be allowed to profit from water pollution.

Persistent violations of MS4 requirements are acknowledged by all parties yet the SDRWQCB refuses to invoke effective enforcement measures and fines. Without economic disincentives, offending Water Districts gain illegal profits while inland cities accumulate tax property revenues from poorly

engineered development projects. Citations against the more egregious offending storm drain dischargers can release funds for effective mitigation measures and support incentives for regional MS4 compliance.

Environmentally Sensitive Areas (ESA)

The Aliso Watershed is a compact 34 square mile area suffering decades of neglect and pollution originating from poorly engineered residential developments among inland cities. Plans to add 17,000 new houses to South Orange County in the coming years will exacerbate the water pollution crisis facing Laguna Beach. Runoff management plans fail to control dry weather urban runoff and knowingly contribute directly to increased flows and erosion during routine storm events.

The Aliso Creek Wilderness Park remains degraded from erosion impacts to streambed habitat and threatens to expose critical sewage infrastructure transporting 10 to 15 million gallons of secondary sewage to the Aliso Creek Ocean Outfall only 1.2 miles offshore. A recent study by TetraTech for the South Orange County Wastewater Authority (SOCWA) determined the integrity of creek infrastructure to be capable of failure in as little as 5 years. Coastal receiving waters at the mouth of Aliso Creek are impaired by polluted urban runoff flowing at 1 to 5 million gallons per day (GPD). Aliso Creek is listed as a 303(d) Impaired Water Body by the Clean Water Act and continues to fail to meet present and previous MS4 Permit requirements. (Exhibit B – Aliso Creek Watershed 303(d) Impaired Waterbodies)

All Co-Permitees, as signatories to the MS4 Permit, are legally responsible for water quality in terms of coastal receiving waters. The regulatory and legal nexus is clear between unpermitted discharges by inland Co-Permitees, creek erosion and infrastructure damage, ocean pollution and public health hazards associated with these contaminated daily flows.

Aliso Beach, at the mouth of the federally listed contaminated creek, is permanently posted. However, coastal receiving waters are protected as the Laguna Beach State Marine Conservation Area established unanimously by the California Fish & Game Commission on January 1, 2012.

Laguna Beach State Marine Reserve

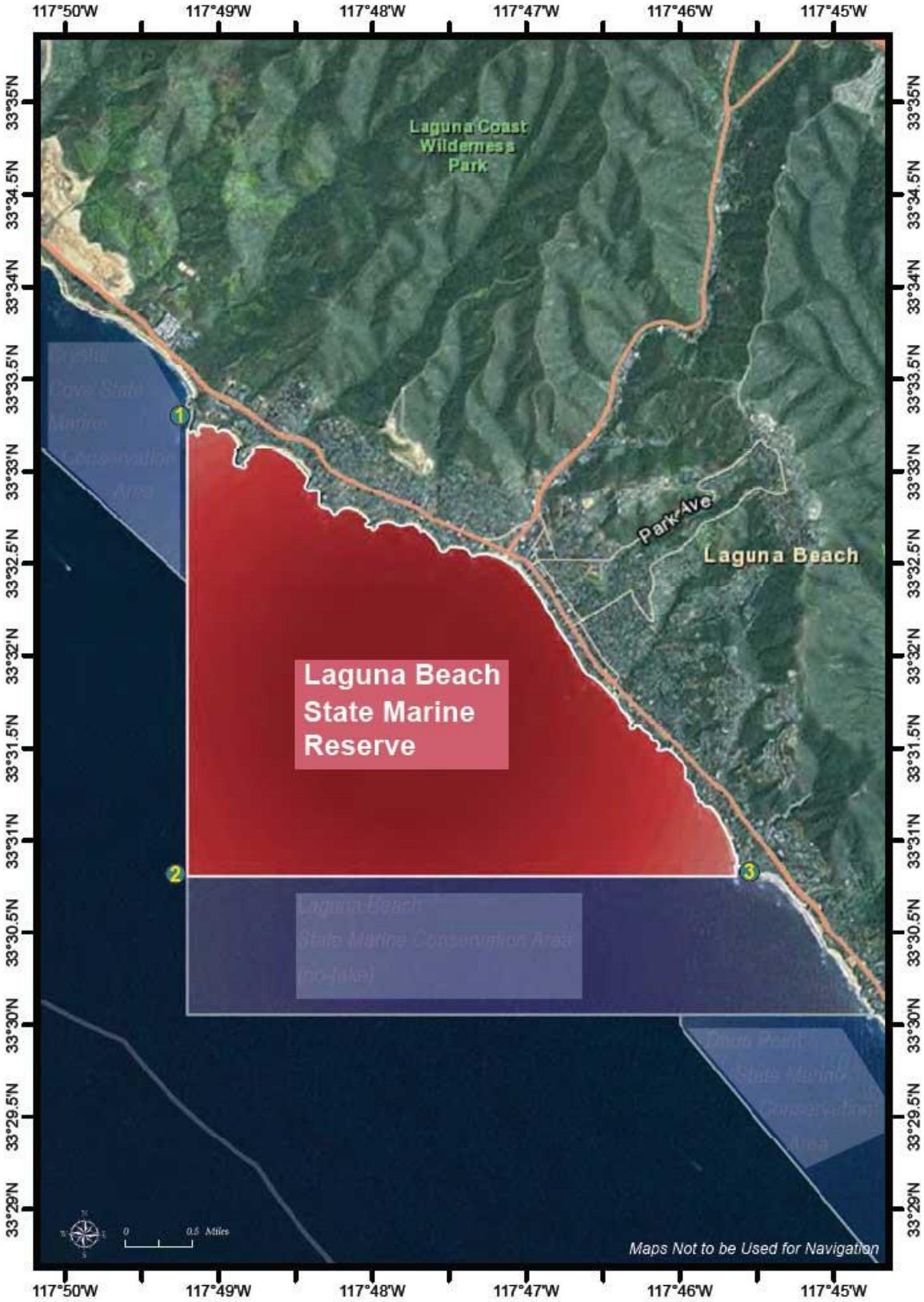

The proposed MS4 Permit does not adequately address efficacious measures to protect creek and coastal receiving waters while allowing contaminated discharges to persist without adequate enforcement actions. Lacking meaningful enforcement actions, inland cities as Co-Permitees, persist in ignoring or circumventing water quality regulations with impunity while creek and coastal receiving waters and ESA habitats continue to be incrementally degraded by polluted dry weather flows. Damage to coastal habitats is cumulative and potentially expensive in terms of restoration.

Likewise, failed Best Management Practices (BMP) stormwater facilities required as a Condition of Approval for inland residential, industrial and municipal developments are inadequately engineered devices incapable of mitigating elevated flows from stormwater events directed to creek and coastal receiving waters. The cumulative impacts of contaminated dry weather discharges and elevated stormwater flows have destroyed the functions of the Aliso Estuary (a protected coastal wetland), tidepools, fish nurseries and local kelp forests.

Shellfish areas in California receive the highest water quality protection standards. The economic value of shellfish to the economy is well established and place names such as Abalone Point, Mussel Cove, Shellfish Beach, etc. along Laguna Beach's coastal receiving waters suggests the prominence of shellfish habitat in the local area. Routine underwater surveys of mussel grounds near the mouth of Aliso Creek reveal large areas of dead shellfish likely exposed to the urban runoff plume. Dry weather discharges and elevated stormwater flows to Laguna Beach's coastal receiving waters are incompatible with protection of ESA Shellfish habitat and should be vigorously regulated and prohibited in the proposed MS4 Permit.

Laguna's coastal receiving waters are prime foraging grounds for protected marine life including coastal dolphins, gray whales and blue whales.

Safari/Marc Carpenter, via Associated Press

A blue whale surfacing at 1000 Steps, South Laguna

The California Coastal Act is specific in protecting the health and welfare of marine mammals among other species. Therefore, the proposed MS4 Permit must address water quality inconsistencies among regulating agencies.

1. California Coastal Act, Article 4, Section 30230. Recent summer sightings of federally protected Blue Fin Whales feeding at the location of the Aliso Ocean Outfall suggest the need for compliance with the Coastal Act. The unseasonal presence of marine mammals feeding on krill indicates the presence of phytoplankton populations sustained by nutrient rich urban runoff and offshore sewage discharge plumes migrating to surface waters. New research also highlights the presence of hormonal endocrine disruptors in recycled water and sewage discharges as a contributing factor in the feminization of male fish.

2. California Coastal Act, Article 4, Section 30231. The SDRWQCB overlooks requirements for "the biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of waste water discharges and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface water flow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams."

3. Water Reuse Law, Water Code Sections 461-465 and Water Reclamation Law, Water Code Sections 13500-13556 requiring beneficial reuse of inland water product to implement recycled water throughout Laguna Beach in achieving a State mandated 20% reduction in imported water by 2020.

The recent Army Corp of Engineers Study Area Map recognizes the relationship of MS4 regulated areas by incorporating the coastal receiving waters for lower Aliso Creek project considerations. No similar map or chart is available to track and monitor regulated coastal receiving waters subjected to the contaminated urban runoff "freshwater lens".

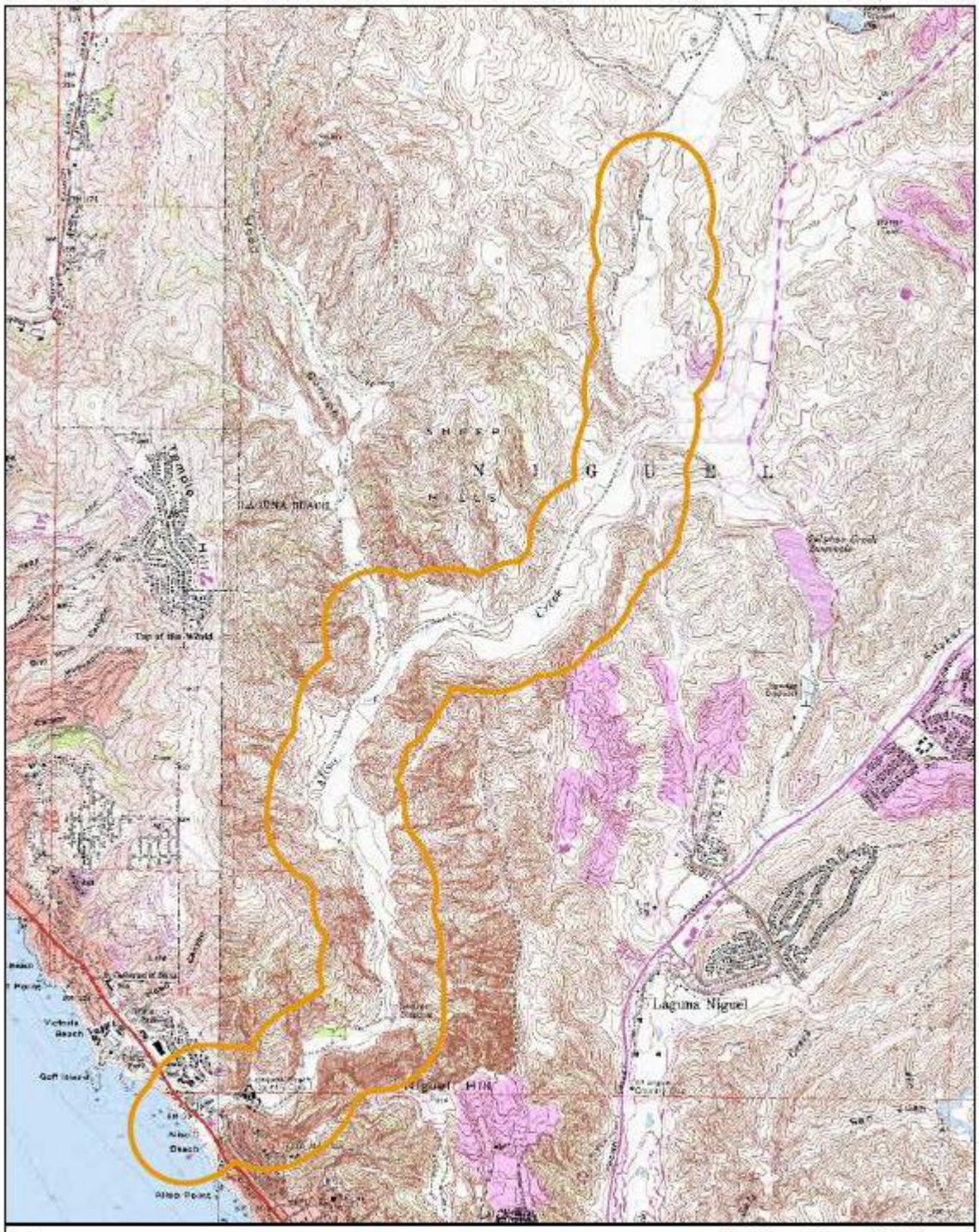

N

CDM

Legend

Study Area Boundary

0.25 0 0.25
Miles

U.S. Army Corps of Engineers
Aliso Creek Ecosystem Restoration Study
USGS Topographic Map

Figure 2.1-1

Urban Runoff, Secondary Sewage Discharges & Ocean Upwelling

Coastal receiving waters at the mouth of Aliso Creek are protected as the Laguna State Marine Conservation Area (SMCA). These important tidepool, rocky shore and kelp forest habitats, however, are subjected to multiple water pollution impacts from the combined urban creek urban runoff plume and Aliso Creek Ocean Outfall.

Ocean upwelling transports contaminates from the offshore sewage discharges to shore and mix with the visible creek urban runoff freshwater plume. Harmful algae blooms fed by these "nutrient rich" discharges plague coastal receiving waters and contribute to the destruction of kelp forests and shoreline fish nurseries. Beach visitors, often from regional low-income disadvantaged communities, suffer exposure to severe public health threats.

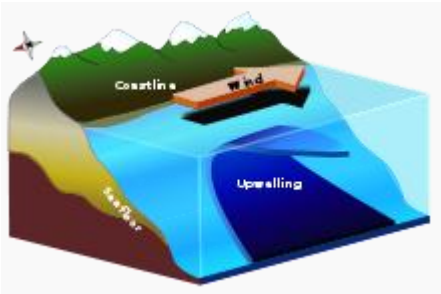

Multiple requests to South Coast Wastewater Authority for a comprehensive interactive map of the Aliso Creek coastal discharge plume and the Aliso Creek Ocean Outfall Plume are routinely ignored. An accurate map will identify protected coastal receiving water resources including tidepools, rocky fish nurseries and shellfish habitats, kelp forests, dolphin birthing and foraging grounds, as well as near shore whale migration routes. Charting dominant littoral currents and counter currents will reveal distribution patterns of urban runoff induced Harmful Algae Blooms and thermal plumes. Lacking such basic information, assurances of safe ocean water quality are presented without a fundamental scientific understanding of coastal dynamics.

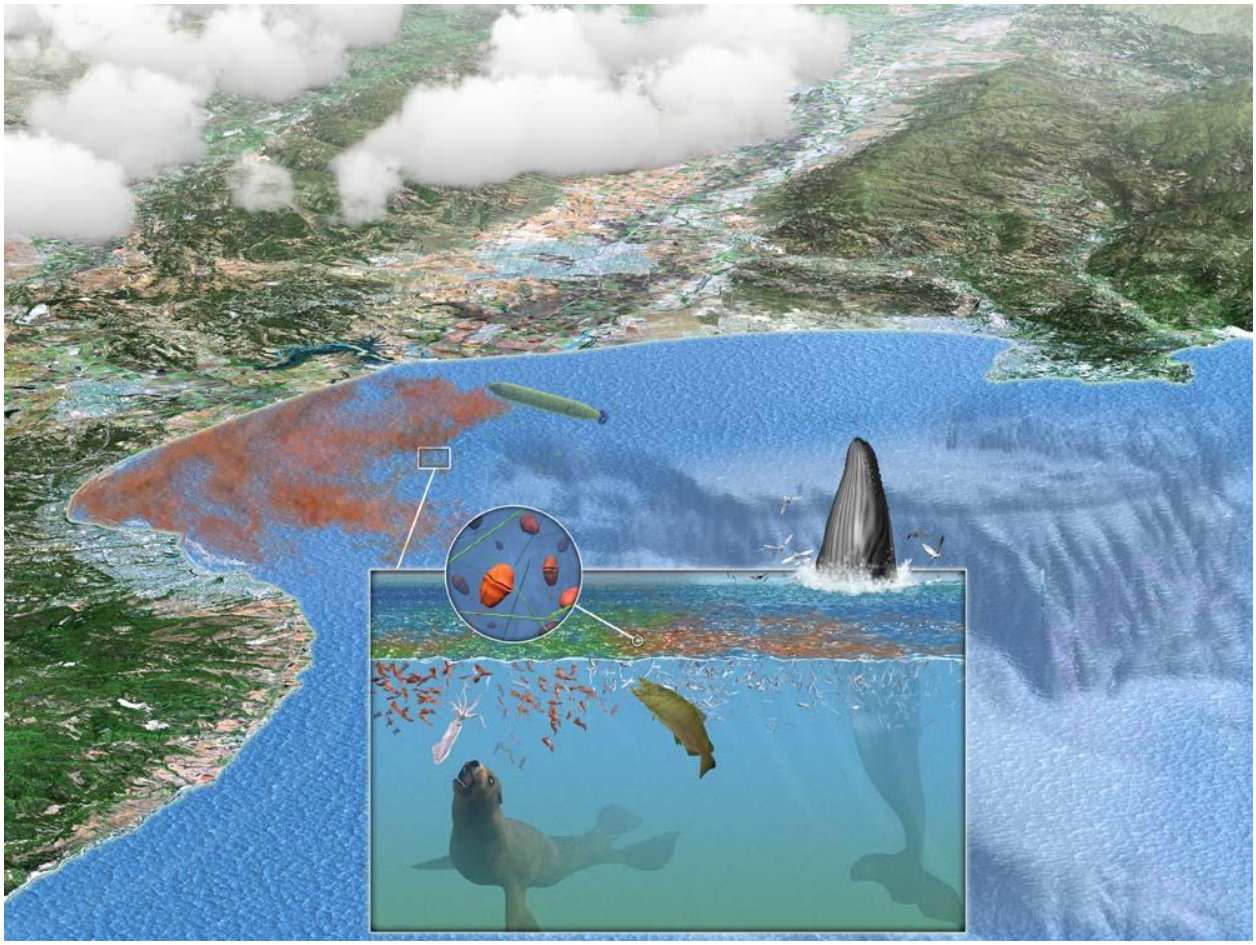

Dry weather urban runoff plumes to Laguna's coastal receiving waters feed summer-long Harmful Algae Blooms (HABs) contributing to domoic acid poisoning of sea lions, whales, shellfish and fishing resources.

Hydromodification

The rapid regional development of residential tracts over the past few decades has been accomplished using grading techniques to create long, flat terraced building sites. In an effort to simplify construction on flat sites, natural contours are replaced with cut and fill earthworks removing natural top soils before paving over hydric substrates and native deep root vegetation. These practices expose expansive clay soils.

Developers avoid expensive deep caissons to bedrock or multiple dewatering wells and simply pour concrete pads over unstable clay substrate. City leaders seeking increased tax revenues and development fees utilize engineers unfamiliar with local clay soils and the semi-arid ecology to approve massive grading plans that ultimately fail.

Unsuspecting homeowners subsequently experience extensive expansion and contraction of clay subsoils following annual storm events. As foundations fail, water supply lines, sewage lines and

related infrastructure become compromised requiring expensive repairs. By this time, however, developers have either moved or filed for bankruptcy protection leaving thousands of present homeowners without remediation opportunities. Engineers, city planners and elected officials, while complicit, are not held accountable through enforcement by the SDRWQCB. Poorly engineered residential developments with substandard clay soils continue to be approved to aggravate the condition and burden taxpayers for expensive repairs.

The Aliso Watershed is a clear example of faulty hydromodification design. Beginning with the construction of the federal Chet Holfield Ziggerat Complex, large areas of the native creek with valuable hydric soils were paved over for massive parking lots. The channelized creek lost critical inland wetlands and groundwater percolation sites with the removal of over 1500 feet of the creek ox bow. This wetland site historically provided water, fish and double canopy vegetative cover for the early "Nigueli"... the name of a Juaneno Native American village once located near a lagoon along Aliso Creek. The City of Laguna Niguel derives its name from the Spanish designation of this critical creek ox bow area.

Systematic destruction of vast native watershed trees and vegetation to support early ranching activities continue to plague the effectiveness of this and many watersheds in the San Diego region. Developers and complacent city planners exploiting degraded ranchlands simply continue the "biodegradation" while avoiding the true costs to the environment and taxpayers for their profiteering urbanization schemes. Facing unrelenting pressure from developers, water districts and municipalities, regulatory agencies charged with protecting critical creek and coastal receiving waters, fail to invoke effective enforcement with measurable water quality benefits.

Recommended Actions

Poorly engineered projects can be re-engineered to achieve mandated water quality objectives.

1. Maps of all creek and coastal receiving waters indicating water quality impacts can be created by SCCWRP, Scripps, NOAA or any number of competent university or regulatory groups. A Bioregional Watershed Map will identify degraded land elements, offending storm drain outlets and candidate areas for re-forestation and estuarine/coastal restoration.

2. On an annual basis, citations against the primary six known storm drain point sources in each watershed can incrementally compel clean-up and abatement throughout a given watershed bioregion without the burden of costs to abate all points of contamination at once. Failed Best Management Practices (BMPs) urban runoff facilities, required as a Condition of Approval for inland residential developments, can be retrofitted with dry weather diversions to local Publically Owned Treatment Works (POTWs) or, alternatively, re-engineered with deep groundwater injection wells.

3. Fines must be allocated to re-vegetate impaired watersheds and kelp forests to restore the native functions of semi-arid creeks and protected coastal receiving waters. A re-forested Aliso Canyon with a canopy similar to San Mateo Creek will qualify for California Cap and Trade

funding to offset costs. Restoration of natural habitats is demonstrated to be the best, most cost effective measure for improving watershed water quality.

4. Restoration of high value coastal wetlands and estuaries will guarantee protection of natural beach sand berms and provide measurable improvement to coastal receiving waters. Funds from the California Coastal Conservancy and other wetland recovery resources can offset costs.

5. Watershed restoration will offer multiple community benefits by reducing destructive stormwater flows, eliminating pollutants and increasing eco-tourist revenues to surrounding cities. Large street cisterns incorporating designs proposed by GeoSynTech for the re-development of the Aliso Golf Course can serve as a model for extensive rainwater harvest/reuse systems. Restoration of some or all of the 1500 foot Aliso Creek Ox Bow in Laguna Niguel can restore hydric soils to reduce stormwater impacts.

6. Increased use of recycled water for wildland fire suppression along the entire Highway 73 Toll Road bisecting the Laguna Greenbelt will maintain a healthy, fire safe wilderness area. Orange County Measure M and State Proposition funds are available to offset costs. Increased use of recycled water reduces ocean discharges to the Laguna State Marine Conservation Area.

7. A citywide network of recycled water for all of Laguna Beach will reduce imported water demand significantly and increase water security, disaster preparedness and fire suppression resources. Revenues from routine use for irrigation mandated Fuel Modification Zones will provide new revenue streams. Laguna Beach is the only Orange County city without a comprehensive recycled water program and remains a "once use" community of valuable imported water.

The MS4 Permit Renewal process offers the opportunity to advance beyond failed measures and begin the renewal of the region's unique watershed and coastal ecology. All Stakeholders can benefit through proactive initiatives and, as the overall watershed ecology improves, the cost savings from stormwater damage, water pollution, protracted litigation and public health threats will become evident. The South Laguna Civic Association has offered constructive, critical information and suggestions during the previous MS4 Permit cycle which have been largely ignored to the public's detriment.
(Exhibit C – SLCA Comments on Tentative Order No. R9-2007-0002 NPDES, No. CAS0108740)

Cooperation and courage are essential and the South Laguna Civic Association remains committed to working towards real, measurable, sustainable solutions. On behalf of our community and the many visitors from throughout the world to our shores, we thank you for your review and support of our recommended actions.

Michael Beanan

Vice President
South Laguna Civic Association

mike@southlaguna.org

Attachments

Exhibit A - Daily Mean Discharge in Cubic Feet/Second - Water Year Jul 2011 to Jan 30, 2012
Exhibit B - Aliso Creek Watershed 303(d) Impaired Waterbodies)
Exhibit C – SLCA Comments to Tentative Order No. R9-2007-0002 NPDES, No. CAS0108740

Exhibit A - Daily Mean Discharge in Cubic Feet/Second Water Year Jul 2011 to Jan 30, 2012

Day	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
1	5.5	7.6	5.7	4.9	4.9	4.9	5.6		
2	5.4	6.3	5.6	4.6	4.8	4.8	5.6		
3	5.3	5.6	5.6	4.6	4.8	5.2	5.7		
4	5.8	5.4	5.5	12	26	4.9	5.6		
5	5.8	5.4	5.9	145	13	5	5.9		
6	5.5	5.4	6	28	20	5.4	5.8		
7	5.4	5.5	5.6	10	11	5.7	5.7		
8	5.5	5.4	5.4	6.9	6.9	6	7.1		
9	5.8	5.7	5.4	5.8	5.7	6.5	6		
10	5.7	5.6	8.4	5.3	5.2	5.9	5.6		
11	5.7	6	7.8	5	5.1	5.7	5.7		
12	5.8	5.8	7.1	5	36	22	5.7		
13	5.7	5.8	5.7	5.1	18	16	5.8		
14	5.8	5.7	5.2	5.1	8.7	8	5.4		
15	6	5.6	5.2	4.9	6.3	38	5.5		
16	5.9	5.7	5.1	4.9	5.5	18	19		
17	5.9	5.7	5.4	5	5.3	8.2	7.4		
18	5.9	5.4	5.3	5.3	5.2	6.9	6.1		
19	5.9	5.7	5.1	5.4	5.1	6.3	5.7		
20	5.8	5.7	5.1	5.4	86	6.4	5.5		

21	5.8	5.6	5	5.6	36	6		69	
22	6	5.6	5	5.3	10	5.5		16	
23	5.9	5.8	5.1	5.5	7.2	5.4		56	
24	5.9	5.8	5.1	5.5	6.1	5.5		19	
25	6	5.7	5.1	5.6	5.6	5.5		9.2	
26	5.6	5.8	5.1	5.3	5.4	5.7		7.3	
27	5.6	5.6	5.2	4.9	5.3	5.8		6.6	
28	5.7	5.6	5	4.9	5	5.7		6.1	
29	5.9	5.6	5	4.7	5.1	5.5		5.9	
30	5.7	5.8	5	4.7	5.1	5.7		------	
							------	------	---
31	8.9	5.8	------	4.8	------	5.9		---	

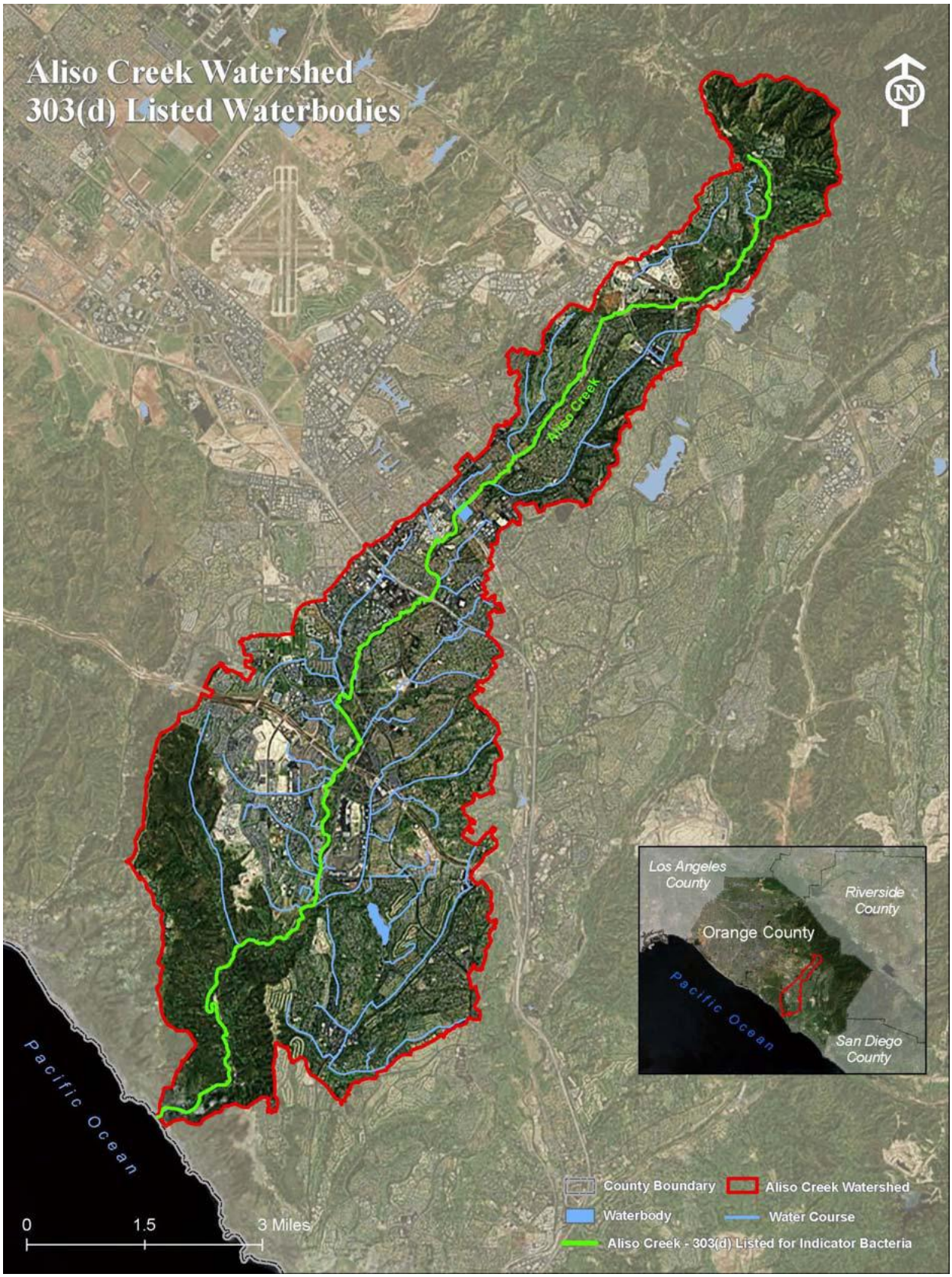
Aliso Creek Watershed
303(d) Listed Waterbodies
N
Aliso Creek
Pacific Ocean
Los Angeles County
Riverside County
Orange County
Pacific Ocean
San Diego County
0
1.5
3 Miles
County Boundary
Aliso Creek Watershed
Waterbody
Water Course
Aliso Creek - 303(d) Listed for Indicator Bacteria

Exhibit C - SLCA Comments to 2007 MS4 Permit

Jeremy Haas April 11, 2007
California Regional Water Quality Control Board
San Diego Region 9
9174 Sky Park Court, Suite 100
San Diego, CA 92123
RE: Tentative Order No. R9-2007-0002 NPDES, No. CAS0108740

The members of the community of South Laguna represented by the South Laguna Civic Association, established in 1946, recognizes urban runoff from dry weather flows continues to be discharged through regional storm drain systems permitted exclusively to convey rain water.

The proposed SDRWQCB Tentative Order No. R9-2007-0002 knowingly, willfully and intentionally perpetuates a threat to health and safety while contributing to degradation of local creek and coastal water resources by allowing MS4 storm drain systems to transport polluted water originating from the imported water supply industry.

Dry weather flow rates in the subject watershed presently exceed all previous flow rates and are recognized as the principle source of nutrient loading and ocean pollution. Chemical fingerprinting analysis of urban runoff by the Santa Margarita Water District attributes the source of 60% to 90% of urban runoff dry weather flows as originating from imported water sources in either Northern California or Colorado. Dry weather flows to storm drains are from anthropogenic influences rather than natural storm events.

Seminal research by the University of Southern California and others concludes urban runoff is responsible for feeding prolonged, destructive algae blooms along the Southern California Bight. In conveying inland sources of fertilizer and phosphates nutrients, dry weather urban runoff estimated at 5,000,000 gallons per day in the Aliso Watershed alone is causing increased outbreaks of domoic acid poisoning and deaths among sea mammals in Laguna Beach. The SDRWQCB fails to take into consideration impacts of uncontrolled dry season urban runoff on the health and welfare of coastal receiving waters. In spite of repeated requests, the SDRWQCB and Co-Permitees to not incorporate the urban runoff ocean plume into the watershed mapping procedure rendering decision making ineffective and monitoring activities scientifically incomplete.

As indicated in Staff Reports, the SDRWQCB, South Orange County Wastewater Authority (SOCWA), inland cities and County Co-Permitees continue to fail to Cleanup and Abate contaminated dry weather urban runoff flows and thereby violate key statues of the Porter-Cologne Act and Clean Water Act.
In allowing the County and City Co-Permitees to continue to discharge polluted urban runoff water flows, the members of the SLCA and the general public are denied access to safe, unpolluted coastal recreational opportunities while exposing them to known respiratory and digestive illnesses. The incremental and cumulative discharge from Aliso Watershed storm drains also knowingly and willfully contributes to potential health risks from consuming local fish.

Likewise, potential private property values are threatened by disclosures during real estate transactions of public health hazards emanating from polluted coastal waters.

Residences at the mouth of Aliso Creek are permanently damaged by summer urban runoff from erosion and stagnant ponds. Damage from urban runoff pollution to critical kelp habitats and marine mammals characteristic of South Laguna Marine Reserve off of Aliso Beach are well documented in the scientific literature.

The Aliso Watershed has more than 64 storm drains with elevated fecal coliform levels and excessive flow rates. The inability of the SDRWQCB over the past 20 years to control illegal dry weather discharges suggests a pattern of failed interventions portending a dangerous precedent of chronic future water pollution to the community of South Laguna with a population of 5,000 residents and the general beach visiting public.

The South Laguna Civic Association (SLCA) seeks a thorough review of the laws, regulations and facts pertaining to mismanagement of the subject MS4 Storm Drain Permit. Verifiable action capable of significant reductions in dry weather flow rates must be implemented. Numerical flow rate reduction, specific performance benchmark deadlines and significant penalties for non-compliance must be incorporated into any credible permitting process. Interception of urban runoff flows at known inland point sources is technologically feasible through deployment of approved Best Available Control Technologies presently used by the development, military and oil industries. If necessary, a watershed Cleanup and Abatement Order can accelerate permitting and fast track measures until such time full compliance is achieved.

Failure to mitigate or comply requires the SDRWQCB to be directed to California Water Code Section 13304(a) and following to seek an injunction against the County and offending cities or perform the work itself. Concurrent with the present evaluation of Tentative Order No. R9-2007-0002, the SLCA seeks emergency action due to significant, immediate and potential harm from known health risks associated with dry weather urban runoff conveying elevated levels of fecal coliform and other contaminates to South Laguna since:

1. Substantial harm to the community of South Laguna will continue to occur this summer from exposure to dry-weather flows of contaminated urban runoff in the subject watershed. The approval of a systematically flawed MS4 Storm Drain Program will establish a dangerous precedent in the Aliso Creek Watershed and other impaired watersheds in the State of California to the detriment of South Laguna's public health and safety as well as the protection of natural resources.

2. Neither the inland cities, County, SDRWQCB, SOCWA nor public will incur substantial harm from issuance of a comprehensive dry weather storm drain management program. The South Laguna Civic Association, in fact, will benefit from incremental reduction of contaminated flows from inland storm drains into creek and coastal receiving waters. Establishing a pattern of enforcement and full compliance with cleanup and abatement laws will initiate additional timely actions by the SDRWQCB to improve water quality in the Aliso Watershed and elsewhere. Costs associated with a comprehensive program to control dry weather flows can be minimized by fines, deployment of cost saving water conservation measures and revenues generated from beneficial reuse opportunities of 5 million gallons of urban runoff per day in the Aliso Watershed.

3. As indicated in this and other communications, substantial questions of fact and law are associated with the proposed Tentative Order No. R9-2007- 0002. The fact remains that immediate compliance and cessation of dry weather urban runoff is technologically and economically feasible as demonstrated by earlier diversions to the Moulton Niguel Water District's sewer treatment facility and, later, short term operation of mobilized urban runoff filtration units.

The narrative below cites a number of laws pertaining to enforcement of Cleanup and Abatement Orders (California Water Code Section 13304); the SWRCB Water Quality Enforcement Policy (February 19, 2002; pages 3,4,11,26, 39,42); regulations and policies governing Environmental Justice (Government Code Section 65040.12 and Public Resources Code Section 72000).

The County and City Co-Permitees concede their failure to Cleanup and Abate elevated levels of fecal coliform and increased urban runoff flow rates in the Aliso Watershed. The SDRWQCB does not comply with California Water Code Section 13304. Indeed, during the past 20 years, the Regional Board has failed to effectively intervene.

California Water Code Section 213300-13308, Chapter 5, provides the SDRWQCB Enforcement authority to issue a Cleanup and Abatement Order to remedy dry weather urban runoff.

Section 13304(a) "Upon failure of any person to comply with a cleanup and abatement order, the attorney general, at the request of the board, shall petition the Superior Court of the County for an issuance of an injunction requiring the person to comply with the order."

The SDRWQCB unwillingness to enforce compliance also violates Section 13304 (1)(b);(2)(a), (c), (e) to expend available money themselves to perform cleanup, abatement or remedial work; to intervene to perform the work itself; recover costs for cleanup and abatement work; and protect or prevent threatened probability of harm to persons, property or natural resources.

It is again worth noting, temporary compliance was achieved in 2003 utilizing mobilized water filtration units recognized among Best Management Practices (BMP). During its brief period of operation, the above BMP treated over 14 million gallons at JO3PO2 to reduce fecal coliform from 10,000 cfu's to less than 1. The SDRWQCB, SOCWA, Moulton Niguel Water District, City of Laguna Niguel and County dischargers arbitrarily elected to terminate this effective technology to experiment with low cost constructed wetlands, which ultimately failed to reach compliance levels for fecal coliform at the JO3PO2 outlet and took no effort to remove flows originating from abandoned imported water sources.

The SWRCB Water Quality Enforcement Policy (February 19, 2002; pages 3,4,11,26, 39,42) specifically directs the Regional Board to take action against the following:

- Any knowing, willful, or intentional violation of the (Porter Cologne Act)
- Any violation of (the Porter Cologne Act) that enables the violator to benefit economically from noncompliance, either by realizing reduced costs or by gaining a competitive edge advantage.
- Any violation that is a chronic violation or that is committed by a recalcitrant violator.
- Any violation that cannot be corrected in 30 days.

The SDRWQCB has taken no action pursuant to the above policies while proceeding to accommodate City and County Co-Permitees, Water Districts, SOCWA and developers at the expense of and detriment to the members of the SLCA and the general public.

Section 13350(m) of the Porter-Cologne Clean Water Act defines nuisance as anything which meets all of the following requirements:

1. Is injurious to health, or is indecent of offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life and property.

2. Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal.

3. Occurs during, or as a result of, the treatment or disposal of wastes.

Dry weather urban runoff meets and exceeds the legal definition of "nuisance" by virtue of it's widespread impacts to water quality variables. "Waste" refers to "waste water" knowingly and willfully generated by imported and reclaimed water sold at reduced rates that ignore significant post-irrigation dry weather urban runoff impacts.

Members of the South Laguna Civic Association are at particular risk of injurious health from frequent exposure to pollution in Aliso Creek and recreational coastal water activities. Such threats and illnesses create an obstruction to the free use of public property at local County parks, protect State Marine Reserves and beaches to thereby interfere with the comfortable enjoyment of life and property.
The extent of annoyance and damage is unequal with increasing harm to individuals such as swimmers, surfers, SCUBA divers, etc. with more frequent contact to polluted creek and ocean waters according to recent studies by the University of California, Irvine. Young children playing long hours at the beach and pregnant women are particularly high-risk populations.

The casual relationship occurring with the discharge of contaminated urban runoff wastewater with elevated fecal coliform levels is well established in scientific and medical literature as to impose a viable threat to the community of South Laguna. Government Code Section 65040.12 and Public Resources Code Section 72000 states:

"…the fair treatment of people of all races, cultures and income with respect to the development, adoption, implementation and enforcement of environmental laws, regulations and policies"

The proposed Tentative Order No. R9-2007-0002 is discriminatory and violates the State of California's definition of Environmental Justice.

As previously noted, the community of South Laguna and visitors to the Aliso Creek Watershed and Aliso Creek County Beach have entreated the SDRWQCB for decades for relief from polluted urban runoff flows resulting from the non-regulation or enforcement of the County/City's chronic storm drain discharges of dry season urban runoff. Local low income and working class residents have suffered damages to health, safety and liberty in their access to Aliso Creek and the Pacific Ocean.

Despite the obvious tangible and verifiable nature of these damages, South Laguna and the general public have yet to receive any effective regulatory assistance either from the State or Regional Water Boards. This failure to provide relief is not due to any lack of knowledge or information. The SDRWQCB has repeatedly and extensively investigated the mechanism by which storm drains physically convey fecal coliform bacteria and other contaminants downstream into the Aliso/Woods Canyon Regional Wilderness Park, South Laguna and the Aliso Creek County Beach. There remains no doubt that the City/County dry weather storm drain discharges are the cause of summer beach and ocean pollution.

Despite this clear and present causal relationship, the SDRWQCB and Staff have denied pleas from the public for remedial action in the form of abatement of nonseasonal storm drain urban runoff, beneficial reuse for sustainable treatment projects, water conservation and immediate temporary mobilized emergency capture/treatment options common among petrochemical, agribusiness and development economic sectors. In addition, the SDRWCB has not supplied a contingency emergency plan to protect our community and the public from current and summer dry weather MS4 storm drain discharges.

Instead, the Regional Board has relied on promulgating more general directives and future contamination tables, which may or may not be effective in abating polluted urban runoff. The proposed Tentative Order No. R9-2007-0002 is to accommodate the failures of inland Water Districts, SOCWA, Cities and County at the expense of the community, public and ocean ecology.

The SDRWQCB action when combined with the Staff and City/County history of ineffective action towards the residents and visitors of South Laguna, have the cumulative effect of giving second class status to the physical health and safety needs of the public in the Aliso Watershed. Thus any action by the Regional Board to approve the use of MS4 Storm Drain System to knowingly convey dry weather urban runoff flows is discriminatory and violates the State of California's definition of Environmental Justice.

Conclusion

The general regulations, requirements and studies pertaining to the Aliso Creek Watershed and associated MS4 Storm Drain System are clearly not effective in controlling water pollution or the effects of artificially elevated flow rates during the area's annual ten month dry season.

More than twenty years and $20 million dedicated to achieve compliance in a relatively small, compact 34 square miles residential development watershed is an enormous investment and, ultimately, waste of taxpayer revenues. The failure to achieve compliance represents a lost opportunity to demonstrate effective interventions to protect communities like South Laguna from polluted urban runoff and sends a message to the public that urban runoff pollution cannot be controlled.

Despite the various failed efforts over two decades, the fact remains numerous State laws are being violated by the SDRWCB for allowing the discharge of dry weather flows with elevated fecal coliform and related contaminate levels to continue to pollute daily the protected receiving waters of Aliso Creek and the Pacific Ocean. By this communication, the SLCA reserves the right to appeal any unfavorable decision perpetuating dry season urban runoff flows to Aliso Beach, South Laguna to the SWRCB and State Attorney General for timely relief.

The South Laguna Civic Association appreciates the efforts by the San Diego Regional Water Quality Control Board to consider the enormous impacts of uncontrolled dry weather urban runoff pollution before approving a genuinely effective Storm Drain Permit Program for the Aliso Watershed.

Respectfully submitted,

Michael Beanan, Director
South Laguna Civic Association
PO Box 9668
South Laguna, California, 92651

From: Colin F. MacKinnon
To: Chiu, Wayne@Waterboards
Subject: Public Comment on Water Permit
Date: Friday, January 11, 2013 1:32:52 PM

Mr. Gary Strawn
Vice Chairman
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Re: Comment—Tentative Order No. R9-2013-001, Regional MS4 Permit, Place ID: 786088Wchiu

Dear Vice Chair Strawn:
I am responding to the San Diego Regional Water Quality Control Board's Tentative Order R9-2012-0011 ("Permit") dated October 31, 2012. After reviewing the proposed Permit, I am concerned it will impose expensive, onerous, and untested regulations on local governments, businesses, and residents.

Everyone understands the importance of clean, safe water to the region. As a member of the business community, I too am interested in improving San Diego's water. It is important, however, that we use our limited resources wisely, and ensure that our efforts produce the desired outcome of improving water quality.

I applaud the Board's inclusion of Water Quality Improvement Plans (WQIP) as a first step in developing a cost-effective approach to improving our water. Analysis remains a critical component of a successful strategy, and I am glad to see that the Board is committed to finding the best possible solution to water quality improvement.

I am concerned, however, that the costs associated with enforcing and implementing the permit will have a negative impact on my business and San Diego's economy. The three primary areas of concern include:

1) the strict liability for exceeding water quality objectives;
2) the preemption of WQIPs by new and changing regulatory requirements prior to allowing the WQIPs to be developed and implemented; and
3) the lack of reliable funding sources to implement these regulatory changes.

It is necessary to hold individuals, businesses and governments accountable, but it is critical that accountability measures are practical with demonstrable, positive effects on water quality. Because of these concerns, I respectfully request that the Permit focus on the timely development of effective and enforceable WQIPs, and that each of the WQIPs be developed through a process that ensures public participation. I ask also that the designation of appropriate Best Management Practices in each watershed be determined through the WQIP process rather than the one size fits all strategy currently being proposed in the Permit. I ask further that until the Board adopts a WQIP for a watershed that the provisions of the existing Permit remain in place for that watershed. Finally, in order to avoid unnecessary litigation I request that the Board adopt the WQIPs as Orders implementing the proposed Permit.

I urge you to adopt final permit language that is evidence-based and both

environmentally and economically sustainable. Thank you for your consideration. Please contact me if you have any questions.

Sincerely,

Colin F. MacKinnon, CEO
Transition IT, LLC
619-517-2167

Transition IT
TransXfer
Cloud Blog

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

JAN 11 2013

Wayne Chui
San Diego Regional Water Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Re: Draft San Diego Regional MS4 Permit

Dear Mr. Chui:

The following are EPA Region 9's comments on the draft permit for the municipal separate storm sewer system (MS4) located within the jurisdiction of the San Diego Regional Board, which the Board released for public comment on October 31, 2012. We also provided comments on an early draft of this permit in a letter to the Board dated February 14, 2012. For the most part, we are pleased with the latest version of the permit and we commend the Board and its staff for their extensive efforts in developing this draft permit. We also offer the following comments for the Board's consideration:

A. *Total Maximum Daily Loads (TMDLs)*

In our February 14, 2012 letter, we also generally supported the Board's approach for incorporation of applicable TMDL requirements into the permit, i.e., incorporation of applicable wasteload allocations (WLAs) as numeric effluent limits. We urge the Board to retain this approach in the final permit as well since it will enhance enforceability and will most clearly ensure consistency with the WLAs.

Our February 14, 2012 letter had also suggested revisions of certain provisions of the early draft permit related to TMDLs; the October 31, 2012 draft permit has been substantially revised from the early draft and many of our early comments have been addressed. However, as discussed below, we still have certain concerns whether the monitoring requirements of the October 31, 2012 draft permit would be adequate to ensure compliance with the TMDLs.

Sections II.D.1 and 2 set forth the receiving water monitoring and MS4 outfall monitoring requirements of the draft permit. In general, a monitoring program would be developed and conducted by the permittees to assess the impacts of the discharges and the effectiveness of the Water Quality Improvement Plans (WQIPs), focusing on the highest priority water quality conditions. Compliance with applicable WLAs from TMDLs would be one of several competing priorities in selecting monitoring locations in the receiving waters and at MS4 outfalls.

Attachment E to the draft permit requires monitoring at MS4 outfalls or receiving water locations, but the locations to be monitored are not fully specified. Although TMDL compliance would presumably receive a high ranking in setting the monitoring program priorities, it is still not clear that appropriate monitoring locations would necessarily be selected to measure compliance with WLAs. As such, we recommend that Section II.D of the permit clarify that notwithstanding other monitoring priorities, at a minimum, appropriate monitoring locations must be selected to ensure compliance with all applicable WLAs and associated effluent limitations. The permit should specify that a mix of receiving water and representative end-of-pipe monitoring locations must be selected to ensure that the monitoring data collected will be sufficient to determine compliance with effluent limitations based on WLAs and to determine whether individual copermittees have caused or contributed to observed in-stream noncompliance. The permit should provide that the parties that develop and submit for Regional Board review a monitoring plan for a WQIP agree to the use of monitoring plan results for purposes of compliance determination.

Section II.D.2.c.(2) of the draft permit also requires monitoring at an "appropriate" frequency for the post-transitional period; the transitional monitoring program (Section II.D.2.a.(3)) would require twice/year monitoring during the wet season. We recommend the permit clarify the minimum monitoring frequency for the post-transitional period and suggest maintaining the twice/year frequency.

Attachment E also describes the specific provisions for TMDLs adopted and approved that are applicable to this tentative order. We note that a few of the compliance requirements provided in an existing TMDL were not included in this tentative order. We recommend that all applicable TMDL WLAs and compliance endpoints be included in Attachment E. For instance, the TMDL for Indicator Bacteria Project I – Twenty Beaches and Creeks in San Diego Region (including Tecolote Creek), provided both concentration-based and mass-based TMDLs. All identified TMDL WLAs and endpoints should be included in Attachment E to prevent confusion with the WLA requirements described and adopted in the TMDL.

Provision B.6 identifies the WQIP submittal, updates and implementation. Paragraph 3 under this Provision should clarify that the intent of all monitoring and assessment is to improve our evaluation of the waterbodies' conditions, including the 303(d) listed impaired waterbodies. We recommend paragraph 3 under Provision B.6 be modified to the following:

> *"All State identified impaired waterbodies within the Watershed Management Area should be placed on the 303(d) List as required under CWA Section 303(d) and 40 CFR §130.7(b)(4)). However, in specific cases supported by robust analytical documentation the implementation of the Water Quality Improvement Plans may demonstrate that TMDLs are not necessary for identified impaired waterbodies within the Watershed Management Area if the analytical record demonstrates that technology-based effluent limitations required by the CWA, more stringent effluent*

limitations required by state, local, or federal authority, and/or other pollution control requirements (e.g., best management practices) required by local, state or federal authority are together stringent enough to implement applicable water quality standards associated with the waterbody impairment causes within a reasonable period of time."

Finally, we reiterate our suggestion from the February 14, 2012 letter that a provision be added to the draft permit to address TMDLs approved during the term of the permit; we had suggested a provision similar to section O of the 2012 MS4 permit for the City of Salinas (NPDES permit No. CA0049981) available at: http://www.ci.salinas.ca.us/services/maintenance/pdf/NPDES_Permit.pdf. The provision requires the development and submittal (within one year of final TMDL approval) of a plan for complying with applicable WLAs. Such a provision would expedite compliance with the WLAs by the permittees.

B. Low Impact Development (LID) Requirements

In our February 14, 2012 letter, we generally supported the LID provisions of the early draft permit, and we continue to largely support the proposed LID requirements of the October 31, 2012 draft permit. The proposed requirements in the October 31, 2012 draft (beginning on page 78) are also similar to the requirements in other recent California MS4 permits such as those for Los Angeles and Orange Counties. As you know, Region 9 is encouraging the Boards to include measurable requirements in MS4 permits to enhance clarity and enforceability of the permits. We are pleased to see the inclusion of the measurable requirement for onsite management of the runoff from the 85% storm similar to other recent permits. However, we also note that Section II.E.3.c.(1)(a)(ii) of the October 31, 2012 draft permit provides a new alternative of retaining the volume (determined by modeling) that would retained under natural, undeveloped conditions. We are concerned that this option may create uncertainty and provide opportunities for subjective analyses that would be resource intensive and difficult to review. For this reason, and for consistency with other recent California MS4 permits, we recommend that Section II.E.3.c.(1)(a)(ii) of the proposed permit be removed. However, if this provision is retained, the permit and fact sheet should fully clarify that undeveloped conditions refer to natural conditions prior to any anthropogenic impacts.

We did raise a couple of questions regarding LID in our February 14, 2012 letter which we believe have been adequately addressed in the latest draft. We had been unclear concerning requirements related to biofiltration; the October 31, 2012 permit has been restructured in a way which clarifies the questions we had raised.

We had also suggested that the Board may want to consider off-site water supply augmentation projects as an acceptable alternative when onsite stormwater management is not feasible. Several recent studies have highlighted the many benefits (such as energy

savings) of increased stormwater infiltration for groundwater recharge. We note such a provision has been added to the draft permit, and we support this provision.

C. Water Quality Improvement Plan Review

In our February 14, 2012 letter, we had expressed concern whether the public would have an adequate opportunity to review draft WQIPs consistent with the 2005 decision by the Second Circuit Court in *Waterkeeper Alliance et al. v. EPA*, 399 F.3d 486, and the 2003 decision by the Ninth Circuit Court in *Environmental Defense Center, Inc. v. EPA*, 344 F.3d 832. We are pleased to see the draft permit (section F) and the fact sheet have been revised to clarify that the Board would be soliciting public comment concerning draft WQIPs submitted to the Board for approval during the term of the permit.

The fact sheet and the permit also describe the WQIPs as dynamic and evolving documents which are likely to be updated and modified over time in accordance with the iterative process. Although permittees must solicit public input in developing proposed updates that are submitted to the Board, it does not appear that public comment would necessarily be solicited concerning Board action in approving, disapproving or revising proposed updates; we suggest that an opportunity be provided for public comment on such Board actions similar to that provided when the original WQIPs are submitted.

D. Prescriptive BMP Requirements

In our February 14, 2012 letter, we expressed concern that the early draft permit would only require inspections of construction sites "at an appropriate frequency"; this provision has also been included in the October 31, 2012 draft permit. We noted in our comments that the existing San Diego MS4 permit includes specific frequencies for the inspections (such as once/two weeks, or once/month), as do other recent California MS4 permits such as the San Ana Board's 2009 MS4 permit for Orange County. As noted earlier, we are trying to improve the clarity and enforceability of MS4 permits and terms such as "an appropriate frequency" reduce clarity and make enforcement of the permit more difficult. Such provisions may also be insufficient to ensure compliance with the Clean Water Act's requirement to reduce pollutants in the discharges to the maximum extent practicable (MEP). We recommend that the permit specify the required frequency of construction site inspections.

Certain other provisions of the October 31, 2012 draft permit are also less prescriptive than the existing permit, such as the storm drain maintenance requirements and the inspection requirements for commercial and industrial facilities. We recognize that the Board is attempting to improve the environmental outcome of its stormwater program by shifting the focus from prescriptive BMPs to prescriptive water quality results, and we concur with the increased emphasis on water quality results. However, we are not convinced that the prescriptive BMPs of the existing permit are as significant

a burden as portrayed in the draft fact sheet, and we suggest they be retained for the most part in the new permit to ensure permit clarity, enforceability and compliance with MEP. To the extent the requirements for numeric water quality goals in the WQIPs would also ensure compliance with MEP, such requirements would be acceptable.

We recommend the permit or fact sheet also clarify that the numeric water quality goals (and the schedule for attainment of the goals) in the draft WQIPs would become enforceable permit requirements once the Plans are approved by the Board. EPA's 1999 regulations for Phase II MS4s (64 FR 68722, December 8, 1999) required similar measurable goals for stormwater management programs and intended that "goals" would be enforceable permit requirements once approved. Further, a wide variety of measurable goals were intended to be considered including measurable BMPs and measurable water quality improvements.

E. Action Levels

In our February 14, 2012 letter, we expressed concern that there did not seem to be any clear actions which would be required on the part of permittees if an action level concentration were exceeded. Although the draft fact sheet of October 31, 2012 provides additional insight into the Board's intent, we still believe the clarity and enforceability of the permit would be enhanced by adding clearer provisions for acting upon action level exceedences to the permit similar to the Board's 2009 permit for Orange County.

Footnote 7 in the proposed permit notes that NALs are not intended to be enforceable limitations. Provision II.C.1.b.(2) also provides that some NALs may be based on WLAs established in TMDLs included in Attachment E of the permit. We believe the Board intends the WLAs to be enforceable permit requirements; as such, we recommend NALs not be based on the WLAs. Instead, enforceable effluent limitations should be incorporated that are consistent with and ensure effective implementation of WLAs.

F. Toxicity Testing

The toxicity testing monitoring provisions proposed in the draft permit should be brought up to date with those in MS4 permits recently issued by the State Water Board (Caltrans MS4) and the Los Angeles Regional Water Board (Los Angeles MS4). Following the approach in these permits, only chronic toxicity monitoring should be required and biological toxicity test endpoints should be analyzed using the Test of Significant Toxicity hypothesis testing approach. At minimum, the permit should be revised to reflect the following requirements: (1) monitoring for chronic toxicity in fresh or marine waters shall be estimated as specified in U.S. EPA's short-term chronic toxicity methods in the most recent edition of 40 CFR 136; and (2) for chronic toxicity test samples (either stormwater or non-stormwater), the in-stream waste concentration (IWC) is 100 percent to calculate either a pass or fail test sample result following Appendix A in

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G. Permit Expiration Date

In our letter of February 14, 2012, we had expressed concern that the Board appeared to be considering a permit term longer than five years to accommodate the expiration dates of the current MS4 permits for Orange County and Riverside County. We noted such a provision would conflict with NPDES regulations at 40 CFR 122.46 which require that the term of a permit not exceed five years. We are pleased to see the proposed permit term has been revised to be consistent with this requirement.

We appreciate the opportunity to provide our views on the draft permit. If you would like to discuss these comments, please contact me at (415) 972-3464 or Eugene Bromley of the NPDES Permits Office at (415) 972-3510.

Sincerely,

David Smith, Manager
NPDES Permits Office (WTR-5)

California Regional Water Quality Control Board
San Diego Region

Response to Comments Report

Tentative Order No. R9-2013-0001
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT
AND
WASTE DISCHARGE REQUIREMENTS FOR
DISCHARGES FROM THE
MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s)
DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

March 27, 2013

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GENERAL COMMENTS
Gnl-1: *Implementation of the Tentative Order and its burdensome, untested regulations will be too costly.*

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

Gnl-1	GENERAL	
	COMMENT: *Implementation of the Tentative Order and its burdensome, untested regulations will be too costly.* Comments were submitted by members of the Building Industry, Community Planning Groups, Copermittees, Engineering/Design Consultants, State Government, Societies/Associations/Coalitions, and Other Entities generally expressing concerns with costs to implement requirements. Commenters also generally expressed support for practical, cost-effective, and scientifically based regulation.	**Building Industry / Industry** Associated General Contractors of America **Community Planning Groups** Jamul Dulzura Community Planning Group Julian Community Planning Group Pala Pauma Valley Community Sponsor Group Ramona Community Planning Group **Copermittees** County of San Diego San Diego County Fire Authority San Diego Unified Port District **Environmental Organizations** Clean Water Now **Engineering/Design Consultants** Latitude 33 Planning and Engineering **State/Federal Government** Senator Mark Wyland **Societies/Associations/Coalitions** BIOCOM East Otay Mesa Property Owners Association Otay Mesa Property Owners Association San Diego Association of Realtors San Diego County Taxpayers Association South County Economic Development Council **Other Entities** Carol Crossman Continental Maritime of San Diego Gable PR Hughes Marino Marston+Marston, Inc. National Enterprises Inc. Nuffer, Smith, Tucker, Inc. Peter Hekman Jr. San Diego Regional Chamber of Commerce Sheppard, Mullin, Richter & Hampton LLP Southern Cross Property Consultants Transition IT

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

Gnl-1	GENERAL	
	RESPONSE: The San Diego Water Board understands the concerns expressed by the commenters about the potential costs to implement the requirements, but disagrees that the requirements are burdensome and untested. Most of the requirements in the Tentative Order are not new to the San Diego Region. The Tentative Order incorporates many existing requirements from the MS4 permits for Orange and Riverside Counties. The San Diego Water Board has put considerable effort into developing a draft Regional MS4 permit (referred to as the Tentaitve Order) that that will jointly cover thirty-nine (39) municipal, county government, and special district entities (Copermittees) in San Diego County , southern Orange County abnd southwest Riverside County. The Tentaitve Order significantly modifies the prescriptive action-based regulatory approach of the current municipal storm water permits to an outcome-based approach, with a focus on measuring and achieving improvements in MS4 discharges and receiving water quality. A key feature of the Tentaitve Order is that it provides an adaptive management pathway for the Copermittees to select and address the highest priority water quality issues through a non-punitive iterative process. The proposed adaptive management permit provisions have great promise and will allow the Copermittees to more flexibly deploy resources to achieve goals that will yield the greatest water quality improvements in the most effective and efficient manner to restore and protect the quality of the San Diego Region's receiving waters. The regional approach of the Tentaitve Order offers the opportunity to better achieve regulatory consistency as well as maximum efficiency and economy of resources for both the San Diego Water Board and the Copermittees. The San Diego Water Board has carefully considered costs of both the Tentative Order and the TMDLs included in the Tentative Order and found them to be necessary. Consideration of costs is discussed under the Economic Considerations in Section IV of the Fact Sheet. The commenters assert that the Tentative Order is too expensive, but do not consider the costs of not addressing impacts from discharges from the MS4. In addition, the San Diego Water Board has significantly modified the structure and focus of the requirements in the Tentative Order to allow the Copermittees to more efficiently and cost effectively utilize their resources, which is expected to result in the realization of significant cost savings that could not be realized in the existing MS4 permits. The Tentative Order was developed over a two year period beginning in February 2011 through a participatory approach designed to actively engage key stakeholders, The transparent and comprehensive stakeholder participation process has resulted in a Tentative Order designed to be a strategic, cost-effective, and water	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

Gnl-1	GENERAL	
	quality outcome based permit. Strategic in that it allows for identifying the highest priority water quality conditions to be addressed first. Cost-effective in that the Copermittees are allowed to use their limited resources on the highest priority water quality conditions and can look for efficiencies on a watershed scale. The Tentative Order is water quality outcome based in that it has a clearly defined iterative and adaptive management process that fccuses on measuring and achieving improvements in MS4 discharges and receiving water quality. The Tenaitve Order evaluates success based on water quality monitoring data and assessment, not just completing a minimum number of actions without consideration if these actions are succeeding in improving water quality.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

Gnl-2	GENERAL	
	COMMENT: *Allow current permit requirements to remain in effect until Water Quality Improvement Plans are developed.* Comments were submitted by members of the Building Industry, Engineering/Design Consultants, Societies/Associations/Coalitions, and Other Entities generally requesting that the Copermittees be allowed to continue implementing the current permit requirements until Water Quality Improvement Plans are developed and implemented.	**Building Industry / Industry** Associated General Contractors of America Otay Land Company **Engineering/Design Consultants** Latitude 33 Planning and Engineering **Societies/Associations/Coalitions** BIOCOM San Diego Association of Realtors **Other Entities** Carol Crossman Continental Maritime of San Diego Gable PR Hughes Marino Marston+Marston, Inc. Nuffer, Smith, Tucker, Inc. San Diego Regional Chamber of Commerce Sheppard, Mullin, Richter & Hampton LLP Southern Cross Property Consultants Transition IT
	RESPONSE: The San Diego Water Board agrees that the jurisdictional runoff management program requirements of the current permits should remain in effect until the Water Quality Improvement Plans are developed and accepted. The jurisdictional runoff management program requirements of the existing MS4 permits will remain in effect until the Water Quality Improvement Plans are developed and implemented. The introductory paragraph to Provision E states, "*Until the Copermittee has updated its jurisdictional runoff management program document with the requirements of Provision E, the Copermittee must continue implementing its current jurisdictional runoff management program*." This includes the development planning requirements. The Copermittees, however, will be required to comply with the prohibitions and limitations, and implement the transitional monitoring requirements, transitional reporting requirements, and TMDL requirements upon adoption of the Tentative Order.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

Gnl-3	GENERAL	
	COMMENT: *Regional MS4 Permit approach allowing prioritization may result in the neglect of parts of the watershed.* The Environmental Groups and the South Laguna Civic Association submitted comments expressing support for the Regional MS4 Permit allowing the Copermittees to focus on priorities, but they also expressed concern that the approach may also result in the neglect of parts of the watersheds. The South Laguna Civic Association are particularly concerned that high value habitats and coastal receiving waters of the Aliso Creek watershed will continue to be impacted by runoff from residential developments. The Environmental Groups are concerned that there will be "orphaned" priorities, or one jurisdiction will carry most of the burden of implementing the water quality improvement strategies within the watershed.	**Environmental Organizations** Environmental Groups South Laguna Civic Association
	RESPONSE: The San Diego Water Board understands the concerns, but disagrees that the approach of the Regional MS4 Permit will result in the neglect of parts of the watershed. The San Diego Water Board developed the approach of the Regional MS4 Permit because the Copermittees are no longer focused on achieving outcomes of improved water quality, but compliance with actions that must be implemented. In effect, the current approach is actually resulting in the neglect of the entire watershed because of the "everything, everywhere" approach. When everything is a priority, nothing is a priority. In contrast, the approach of the Regional MS4 Permit is to re-focus the Copermittees' efforts toward achieving outcomes that will result in improvements in MS4 discharges and receiving water quality. While not all priorities will be addressed immediately, all priorities will be addressed at some point. In allowing the Copermittees to focus on the highest priorities, lower priorities may also be addressed by the strategies being implemented to address the highest priorities. The requirements of the Tentative Order also include several elements that are intended to provide the San Diego Water Board and the public the information necessary to determine if each Copermittee is participating in implementing the Water Quality Improvement Plans. The San Diego Water Board encourages the Environmental Organizations to remain involved during the development and implementation of the Water Quality Improvement Plans to provide recommendations to the Copermittees for the priority water quality conditions that should be addressed. By remaining involved, the environmental organizations can also understand the opportunities and constraints that are identified during the prioritization process.	

Gnl-4: *Meaningful enforcement of permit requirements is necessary to protect receiving waters.*

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

Gnl-4	GENERAL	
	COMMENT: *Meaningful enforcement of permit requirements is necessary to protect receiving waters.* The San Diego Green Building Council, Laguna Bluebelt Association, and South Laguna Civic Association each submitted comments that the Tentative Order must include requirements that result in meaningful enforcement actions. Without requirements for meaningful enforcement actions, the commenters are concerned that discharges from the MS4 and dry weather flows will continue to degrade water quality.	**Building Industry / Industry** San Diego Green Building Council **Environmental Organizations** Laguna Bluebelt Coalition South Laguna Civic Association
	RESPONSE: The San Diego Water Board agrees that meaningful enforcement actions are necessary to protect receiving waters. The requirements of the Tentative Order are all intended to result in the protection of the quality of receiving waters from MS4 discharges. The Tentative Order also includes requirements for the Copermittees to demonstrate that they are issuing enforcement actions in a timely manner to obtain compliance from sources that are discharging to their MS4s. Enforcement of the requirements of the Tentative Order by the San Diego Water Board may be necessary to compel the Copermittees to properly implement and enforce their legal authorities to adequately protect water quality. By issuing the Regional MS4 Permit, the San Diego Water Board expects to be able to reallocate its resources to better enforce permit requirements instead of developing permits and permit requirements.	

Gnl-5: *Include requirements to develop maps or charts to track and monitor coastal receiving waters subject to MS4 runoff flows and impacts.*

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

Gnl-5	GENERAL	
	COMMENT: *Include requirements to develop maps or charts to track and monitor coastal receiving waters subject to MS4 runoff flows and impacts.* The Laguna Bluebelt Coalition and South Laguna Civic Association expressed support for the creation of maps to show water quality impacted areas of all creeks and coastal receiving waters within the region. The South Laguna Civic Association would like an interactive map that identifies protected coastal receiving water resources and dominant littoral currents and counter currents to help identify distribution patterns of urban runoff induced algal plumes and thermal plumes.	**Environmental Organizations** Laguna Bluebelt Coalition South Laguna Civic Association
	RESPONSE: The San Diego Water Board has considered the concept, but does not agree this requirement is appropriate or necessary to be included in the requirements of the Tentative Order. The San Diego Water Board understands the desire for such spatial and temporal information to be available in a visual format. However, the creation and maintenance of such map would require the collection and processing of data that is beyond the scope of what is required to be measured and reported for the purposes of the Tentative Order.	

Gnl-6: *Increase use of recycled water to reduce need for imported water and discharges from MS4s.*

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

Gnl-6	GENERAL	
	COMMENT: *Increase use of recycled water to reduce need for imported water and discharges from MS4s.* The Laguna Bluebelt Coalition and South Laguna Civic Association expressed support for the increasing the use of recycled water to reduce imported water demand. The commenters contend that increasing recycled water use will reduce discharges to the ocean.	**Environmental Organizations** Laguna Bluebelt Coalition South Laguna Civic Association
	RESPONSE: The San Diego Water Board supports and promotes the use of recycled water. The Tentative Order does not prohibit the use of recycled water, but does limit the discharge of recycled water to receiving waters. The requirements of the Tentative Order do not specifically encourage the use of recycled water, nor is it appropriate for the Tentative Order to do so. Recycled water and the discharge of recycled water are regulated by the San Diego Water Board under separate regulatory mechanisms. The San Diego Water Board agrees that the recycling of wastewater, as well as recycling non-storm water discharges and retaining and using storm water runoff has the potential to reduce the need to import water to the San Diego Region. The San Diego Water Board encourages the Environmental Organizations to remain involved during the development and implementation of the Water Quality Improvement Plans to provide recommendations to the Copermittees for identifying opportunities to promote recycled water use and recycling of non-storm water and storm water discharges to and from the MS4.	

Gnl-7: *Portions of San Diego County in the Colorado River Region should not be subject to requirements of San Diego Region.*

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

Gnl-7	GENERAL	
	COMMENT: *Portions of San Diego County in the Colorado River Region should not be subject to requirements of San Diego Region.* The Julian Community Planning Group submitted a comment stating that the portion of San Diego County under the jurisdiction of the Colorado River Water Board should not be subject to the requirements of the Tentative Order.	**Community Planning Groups** Julian Community Planning Group
	RESPONSE: The San Diego Water Board agrees. The requirements of the Tentative Order are only applicable to the portion of San Diego County within the jurisdiction of the San Diego Water Board.	

Gnl-8: *Urban runoff is the San Diego Region's most urgent pollution problem.*

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

Gnl-8	GENERAL	
	COMMENT: *Urban runoff is the San Diego Region's most urgent pollution problem.* Several Environmental Organizations, the San Diego Green Building Council, and Other Entities submitted comments stating that urban runoff is the San Diego Region's most urgent problem. Most of the commenters also acknowledged that it is a difficult problem to solve, but they are willing to work together to help solve the problem.	**Building Industry / Industry** San Diego Green Building Council **Environmental Organizations** The Escondido Creek Conservancy Friends of Rose Canyon Creek / Rose Creek Watershed Alliance Laguna Bluebelt Coalition Los Penasquitos Lagoon Foundation Natural Resources Defense Council San Diego Canyonlands San Elijo Lagoon Conservancy **Other Entities** Curious Company Hector Valtierra
	RESPONSE: The San Diego Water Board agrees that runoff from developed and developing areas pose a significant problem to protecting water quality in the San Diego Region. The San Diego Water Board has developed the Regional MS4 Permit approach to allow the Copermittees to tap into the community and the resources the community is willing to provide to help address the problems associated with runoff from developed and developing areas. The San Diego Water Board encourages the community to remain involved during the development and implementation of the Water Quality Improvement Plans to provide recommendations to the Copermittees for identifying opportunities to the public for addressing problems associated with runoff from developed and developing areas.	

Gnl-9: *The term "prohibit" should be changed to "effectively prohibit" throughout Tentative Order when referring to non-storm water discharges.*

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

Gnl-9	GENERAL	
	COMMENT: *The term "prohibit" should be changed to "effectively prohibit" throughout Tentative Order when referring to non-storm water discharges.* The Orange County, Riverside County and San Diego County Copermittees each submitted comments requesting that the language of the Tentative Order be revised to "effectively prohibit" non-storm water discharges to the MS4 instead of just "prohibit" to be consistent with the language of the Clean Water Act. The Natural Resources Defense Council submitted comments that assert that the Clean Water Act and the Code of Federal Regulation require an absolute prohibition of non-storm water discharges, in any amount, to the MS4.	**Copermittees** Orange County Copermittees Riverside County Copermittees San Diego County Copermittees **Environmental Organizations** Natural Resources Defense Council
	RESPONSE: The San Diego Water Board agrees that the language of the Tentative Order should be consistent with the Clean Water Act and Code of Federal Regulations. The Clean Water Act requires MS4 permits to include a requirement that non-storm water discharges are to be "effectively prohibited" to the MS4. The Code of Federal Regulations requires each Copermittee to have the legal authority to "prohibit" non-storm water discharges to the MS4. The Phase I Final Rule clarifies what "effectively prohibit" means (55 FR 47995): "*Section 402(p)(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit (other than the permit for the discharge from the municipal separate storm sewer.)*" Where appropriate, the language in the Tentative Order has been revised to be consistent with the language of the Clean Water Act to include the term "effectively prohibit" instead of "prohibit" or "reduce and eliminate." In other cases, the language has been maintained to be consistent with the requirements of the Code of Federal Regulations requiring the Copermittees to establish the legal authority to "prohibit" non-storm water discharges to their MS4s and enforce that legal authority. The establishment and enforcement of the legal authority to "prohibit" non-storm water discharges to their MS4s is how the Copermittees will "effectively prohibit" non-storm water discharges to their MS4s.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

Gnl-10	GENERAL	
	COMMENT: *The requirements of the Tentative Order do not allow Copermittees to adaptively manage their programs.* The Riverside County Copermittees submitted comments contending that the requirements of the Tentative Order will not allow the Copermittees to adaptively manage their programs. In particular, the Riverside County Copermittees cite the prohibitions and limitations of Provision A and the development planning requirements of Provision E.3 as requirements that will limit their ability to adaptively manage.	**Copermittees** Riverside County Copermittees
	RESPONSE: The San Diego Water Board disagrees that the requirements of the Tentative Order will not allow the Copermittees to adaptively manage their programs. The approach used in developing the requirements in the Tentative Order departs significantly from the approach used in developing the requirements of previous and current permits. The current MS4 permits essentially prescribe the programs that must be implemented by each Copermittee, resulting in a focus on complying with the implementation of required actions. The current permits provide the Copermittees little or no ability to adaptively manage the programs to become more focused on achieving outcomes. In contrast, the requirements of the Tentative Order allow the Copermittees to strategically plan by identifying the highest priority pollutants or conditions in a specific watershed, goals and strategies to address those pollutants or conditions, and resources to implement the strategies. Furthermore, the Copermittees are provided the monitoring and assessment information that allows them to determine when those priorities, goals and strategies should be adjusted or are no longer appropriate. The Tentative Order is predicated on a new emphasis on water quality based outcomes (i.e., restoration or protection of water quality and beneficial uses) instead of a prescriptive action based regulatory approach (e.g., implementation of programs). The flexibility that is provided in the Tentative Order should not be mistaken as the San Diego Water Board wishing to grant full autonomy to the Copermittees to implement their jurisdictional runoff management programs. The requirements of the Clean Water Act and the Code of Federal Regulations must still be incorporated into the requirements of the Tentative Order. The Code of Federal Regulations includes several program components that must be implemented by the Copermittees. The USEPA has also provided guidance as to what minimum requirements should be included in those programs. The San Diego Water Board must balance the Copermittees' desire to have more flexibility to adjust their	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

Gnl-10	GENERAL	
	programs with the statutory requirements of the Clean Water Act and the California Water Code which hold the Copermittees accountable for compliance with a minimum set of requirements that are enforceable. Given that the Tentative Order already provides the Copermittees great latitude in adjusting their programs to focus their resources on achieving improved water quality, the San Diego Water Board has extended that flexibility further by incorporating additional opportunities into the revised Tentative Order for identifying and implementing more watershed-specific requirements in areas of the Tentative Order where the Copermittees perceive and assert there is little to no flexibility provided. Please see responses to comments A-1 and E3c-2.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

Gnl-11	GENERAL	
	COMMENT: *Implementation of current permit requirements and accomplishments of Orange and Riverside County Copermittees not being considered.* The Orange County and Riverside County Copermittees each submitted comments expressing concern that the Tentative Order has been developed without considering the programs and plans being developed under their current permit requirements, and does not acknowledge the accomplishments achieved by the Copermittees during the previous and current permit terms. In addition, the Orange County and Riverside County Copermittees each submitted comments that they must have an opportunity to propose changes to the requirements of the Tentative Order through the Report of Waste Discharge. The San Diego Green Building Council recommended that the Tentative Order also take into account successes that have been achieved in other jurisdictions outside of the San Diego Region.	**Building Industry / Industry** San Diego Green Building Council **Copermittees** Orange County Copermittees Riverside County Copermittees
	RESPONSE: The San Diego Water Board disagrees that the Tentative Order does not consider the implementation of current permit requirements, and accomplishments and successes of the Orange County and Riverside County Copermittees and other jurisdictions. Most of the requirements included in the Tentative Order are also in the current permits issued to the Orange County and Riverside Copermittees (Order Nos. R9-2009-0002 and R9-2010-0016). The current permits issued to the Orange County and Riverside County Copermittees include prohibitions and limitations, numeric action levels, and the same jurisdictional runoff management program components. The structural BMP performance standards (i.e. storm water pollutant control retention and hydromodification management) are effectively the same as in the Orange County and Riverside County MS4 permits. The Watershed Workplans of the current permits are very similar to, and are expected to serve as the basis of the Water Quality Improvement Plans. The monitoring program requirements are very similar, with potential reductions of monitoring requirements in several instances. The reporting requirements in the Tentative Order have actually been significantly reduced compared to the current permits. The San Diego Water Board expects the Orange County and Riverside County Copermittees' implementation of their current permit requirements will make the transition from to the Tentative Order much easier than the San Diego County Copermittees because so many of the MS4 permit requirements are similar, and in many cases more prescriptive, than the requirements of the Tentative Order. The flexibility of the requirements of the Tentative Order compared to their current permit requirements will provide the Orange County and Riverside	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

Gnl-11	GENERAL	
	County Copermittees many opportunities to identify more effective and efficient ways to utilize their resources to improve water quality. However, until the Orange County and Riverside County Copermittees obtain coverage under the Tentative Order, they will remain subject to the more prescriptive requirements of their current permits. Furthermore, the requirements of the Tentative Order were developed with a strong consideration of the current permit requirements being implemented by the Orange County and Riverside County Copermittees, as well the accomplishments of all the Copermittees in the San Diego Region. In fact, the Tentative Order was developed and improved based on comments received from the Orange County and Riverside County Copermittees during the 18 month administrative draft focused meeting and comment process. The Tentative Order was also developed considering the accomplishments and successes of other jurisdictions outside of the San Diego Region. The basis of incorporating an allowance for implementing a true iterative and adaptive management process is because of the accomplishments, successes, and failures observed by the San Diego Region's Copermittees, as well as those observed in other jurisdictions within California and other states. By allowing a true iterative and adaptive management process to be implemented, the San Diego Water Board expects the Copermittees to not only learn from each other's successes and failures within the San Diego Region, but the successes and failures from other jurisdictions outside the San Diego Region. The fact of the matter is that the requirements of the Tentative Order are more similar to the current permits issued to the Orange County and Riverside Copermittees than the current permit issued to the San Diego County Copermittees (Order No. R9-2007-0001). This is because most of these elements in the Tentative Order were developed based on the requirements in the current Orange County and Riverside County MS4 permits. The Tentative Order also allows the Orange County and Riverside County Copermittees to provide additional recommendations and propose changes for consideration by the Board based on their experiences and successes when they submit their Report of Waste Discharge for coverage under the Regional MS4 Permit.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

Gnl-12	GENERAL	
	COMMENT: *Updating the Basin Plan needs to be a priority of the San Diego Water Board.* The Riverside County Copermittees commented that the San Diego Water Board should make updating the Basin Plan with water quality objectives based on background conditions, beneficial uses of specific water bodies, and specific conditions that influence the water bodies a priority. The Riverside County Copermittees contend that without the updates, the desired outcomes the Copermittees include in the Water Quality Improvement Plans will be arbitrary and may not achieve desired beneficial use improvements, or be appropriate.	**Copermittees** Riverside County Copermittees
	RESPONSE: The San Diego Water Board agrees that updating the Basin Plan should be a priority. Updating the Basin Plan, however, is not within the scope of developing and issuing the Tentative Order. On many occasions, dischargers have asserted that the water quality standards are not achievable, and because they are not achievable they are not appropriate. The San Diego Water Board disagrees. The water quality standards in the Basin Plan are protective of water quality and are therefore appropriate. The San Diego Water Board maintains that because they are appropriate, they must be achieved to protect water quality. If the Copermittees believe a different water quality objective is appropriate and will protect water quality, the San Diego Water Board recommends that the Copermittees collect the data and develop the evidence to support a different water quality objective to be incorporated into the Basin Plan through an amendment to the Basin Plan. Until then, the water quality standards in the Basin Plan are considered appropriate and must be implemented in MS4 permits.	

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March 27, 2013

Gnl-13	GENERAL	
	COMMENT: *"Clarify" responsibilities of the Copermittees under the Tentative Order.* The Orange County, Riverside County and San Diego County Copermittees each submitted comments requesting that the requirements of the Tentative Order "clarify" the responsibilities of the Copermittees, consistent with the requirements of the Clean Water Act. The Copermittees requested revisions throughout the requirements of the Tentative Order to specify that the Copermittees must "effectively prohibit" non-storm water discharges "into the MS4" instead of "into and from the MS4," and control the discharge of "pollutants" not "pollutants in storm water" from the MS4 to the MEP. The Copermittees also requested including several qualifying phrases that the Copermittees could only operate "to the extent allowable" or "as applicable" or other such phrases to "clarify" the Copermittees were only responsible for implementing requirements subject to their legal authority The Natural Resources Defense Council (NRDC) expressed concern that the non-storm water action levels (NALs) may violate the effective prohibition of non-storm water discharges to the MS4. The NRDC requested that the Tentative Order be very clear that the Copermittees are responsible for prohibiting non-storm water discharges to the MS4. The Orange County and Riverside County Copermittees objected to language in the Tentative Order that implied the Copermittees were responsible for "enhancing" and "restoring" water quality in receiving waters, contending that they are only responsible for the discharges from their MS4s. The Orange County Copermittees also objected to the requirements for the Copermittees to evaluate stream channels for restoration, asserting the Copermittees are not responsible for restoring stream channels. The San Diego Unified Port District supported including requirements that result in jurisdictional accountability, recognizing that most of the discharges from the MS4 to San Diego Bay originate from upstream jurisdictions. The San Diego Unified Port District also provided requests for modifications to specify the downstream owners and operators of the MS4 are not responsible and should not be held liable for discharges and pollutants in discharges originating from upstream MS4s. The San Diego Unified Port District requested that the Tentative Order include requirements for the San Diego Water Board to demonstrate a Copermittee caused or contributed to an exceedance of water quality standards. The San Diego Unified Port District also encouraged the San Diego Water Board to include additional monitoring to ensure jurisdictional accountability.	**Copermittees** Orange County Copermittees Riverside County Copermittees San Diego County Copermittees San Diego Unified Port District San Diego Unified Port District / Brown and Winters **Environmental Organizations** Natural Resources Defense Council

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Gnl-13	GENERAL	
	RESPONSE: The San Diego Water Board reviewed and considered the recommendations and requests. The San Diego Water Board has revised the language in the Tentative Order to emphasize the Copermittees are responsible for "effectively prohibiting" non-storm water discharges "to the MS4." The language has not been revised from the control of "pollutants in storm water" to "pollutants" from the MS4 to the MEP. The San Diego Water Board maintains that the Copermittees are required to control "pollutants in storm water" to the MEP. Pollutants in non-storm water discharges are controlled through the effective prohibition of non-storm water discharges to the MS4. Please see the response to comments Gnl-9 and Fnd-3. The Tentative Order has also been revised to replace any language of "restoring water quality standards in receiving waters" to "protecting water quality standards in receiving waters from MS4 discharges." The San Diego Water Board generally did not revise the language with the qualifying phrases requested by the Copermittees. The Copermittees are required to establish the legal authority to implement the requirements of the Tentative Order. The Tentative Order does not require the Copermittees to implement requirements outside of their jurisdictions or outside of their legal authority. Please see response to comments E1-1 and E1-2. The San Diego Water Board appreciates the support expressed for the requirements that result in jurisdictional accountability. The San Diego Water Board agrees that the requirements of the Tentative Order must provide the San Diego Water Board the information necessary to account for each individual Copermittee's contribution toward improving or degrading water quality. This information will allow the San Diego Water Board to provide support to improve the Copermittee's programs, where needed, and the evidence necessary to enforce the requirements of the Tentative Order, when appropriate. The San Diego Water Board generally disagreed with the modifications to the Tentative Order requested by the San Diego Unified Port District. The San Diego Water Board maintains that the Copermittees are responsible for the discharges from their MS4s to receiving waters. If there are sources that originate from outside a Copermittee's jurisdiction, it is the Copermittee's responsibility to demonstrate to the San Diego Water Board that the source is outside of the Copermittee's legal authority to control. The San Diego Water Board considered the request by the San Diego Unified Port District for additional monitoring to ensure jurisdictional accountability. The San Diego Water Board included additional monitoring for this purpose. Please see response to comment D-5.	

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Gnl-14	GENERAL	
	COMMENT: *Request for consistency in MS4 permit requirements for Copermittees under the jurisdiction of multiple Regional Water Boards.* The Orange County Copermittees submitted comments requesting that the requirements in the Tentative Order be as consistent as possible with requirements in MS4 permits from other Regional Water Boards. The Orange County Copermittees include 5 municipalities that are split between 2 Regional Water Boards. The Orange County Copermittees provided recommended revisions to the Tentative Order aimed at creating greater uniformity and implementability for these 5 municipalities under two MS4 permits.	**Copermittees** Orange County Copermittees
	RESPONSE: The San Diego Water Board has reviewed and considered the recommended revisions. The San Diego Water Board understands implementing requirements that are not consistent between multiple Regional Water Board permits can present some challenges for a Copermittee. The requirements in the Tentative Order provide significantly more flexibility that will allow a Copermittee to align the implementation of its programs with the requirements of different permit requirements. The San Diego Water Board, however, has not and will not modify any requirements in the Tentative Order to reduce the accountability, enforceability or protectiveness to be more consistent with another Regional Water Board's permit requirements. For those areas of the MS4 permits where there are inconsistent requirements, the solution for the Copermittee would be to develop jurisdictional runoff management programs that implement the most protective elements of both Regional Water Boards' permit requirements and apply them throughout its jurisdiction. In doing so, the Copermittee will be in compliance with the requirements of both MS4 permits and have programs that will be most protective of water quality.	

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Gnl-15	GENERAL	
	COMMENT: *Findings and Fact Sheet do not provide adequate justification for new or modified requirements.* The Building Industry Association of Southern California and the Orange County Copermittees submitted comments asserting that the Findings and the Fact Sheet do not provide adequate justification for the new or modified requirements in the Tentative Order. The Building Industry Association of Southern California is particularly interested in the justification for the development planning structural BMP performance standards. The Orange County Copermittees provided examples of several specific requirements in the Tentative Order that they assert were not adequately justified.	**Building Industry / Industry** Building Industry Association of Southern California **Copermittees** Orange County Copermittees
	RESPONSE: The San Diego Water Board disagrees that the Findings and Fact Sheet do not provide adequate justification for the new or modified requirements in the Tentative Order. The San Diego Water Board understands that the commenters may not be satisfied with the justification for the requirements of the Tentative Order provided in the Findings and Fact Sheet. The San Diego Water Board maintains that the Findings and the Fact Sheet provide the background information, regulatory and legal citations, references and additional explanatory information and data in support of all the Findings and requirements in the Tentative Order.	

Gnl-16: *Recommendation for revising numbering system in the Tentative Order.*

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Gnl-16	GENERAL	
	COMMENT: *Recommendation for revising numbering system in the Tentative Order.* The Orange County Copermittees submitted comments recommending that the numbering system of the provisions in the Tentative Order provide the full number of the provision (e.g. A.1 instead of 1). The recommended revisions would assist and better orient the reader.	**Copermittees** Orange County Copermittees
	RESPONSE: The San Diego Water Board appreciates the recommendation. The San Diego Water Board understands that the length and the numerous subsections of the provisions in the Tentative Order can be difficult to navigate at times. The San Diego Water Board has included footers to assist the reader in navigating through the provisions of the Tentative Order. Additionally, the electronic PDF version of the Tentative Order will have bookmarks for the major provisions to assist in navigating the requirements of the Tentative Order.	

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Gnl-17	GENERAL	
	COMMENT: *Requests for changes to schedules and deadlines in the Tentative Order.* The Orange County, Riverside County and San Diego County Copermittees each submitted comments requesting changes to the schedules and deadlines for developing, submitting, and implementing several requirements in the Tentative Order. In particular, the requests were focused on additional time for developing the Water Quality Improvement Plans. The San Diego Unified Port District supported the requests. The BIA Regulated Community Coalition and Environmental Groups each submitted comments with recommendations to include more time for public participation during the development of the Water Quality Improvement Plans. The commenters provided several recommendations for modifications to the schedules and deadlines in the Tentative Order that would result in more time to develop and implement the Water Quality Improvement Plans and the monitoring and assessment programs.	**Building Industry / Industry** BIA Regulated Community Coalition **Copermittees** Orange County Copermittees Riverside County Copermittees San Diego County Copermittees San Diego Unified Port District **Environmental Organizations** Environmental Groups
	RESPONSE: The San Diego Water Board reviewed and considered the recommendations to change the schedules and deadlines in the Tentative Order. The San Diego Water Board generally agrees that additional time should be provided to develop the Water Quality Improvement Plans, to allow for a robust public participation process and to provide enough time to implement the optional requirements that have been included in the revised Tentative Order if the Copermittees choose to do so. The San Diego Water Board modified many of the schedules to provide additional flexibility in scheduling the development of several deliverables, as well as including later deadlines for submitting several deliverables. The requirements have also been modified to allow the Copermittees more control in developing the schedules for implementing the monitoring requirements in the Water Quality Improvement Plans. Please see the revisions to Provisions B.3 and F.1 in the revised Tentative Order, as well as the responses to comments B-3 and F1-1.	

Gnl-18: *Requests for additional opportunities to provide comments.*

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Gnl-18	GENERAL	
	COMMENT: *Requests for additional opportunities to provide comments.* The Riverside County Copermittees, Clean Water Now, and Environmental Groups each submitted comments expressing interest in additional opportunities to provide comments. The Riverside County Copermittees requested an additional public review and comment period after the Tentative Order is revised and the responses to comments are released by the San Diego Water Board. Clean Water Now expressed disappointment with the focused meeting process used in the development of the Tentative Order, and the lack of time available to have protracted discussions. The Environmental Groups requested additional opportunities for the public to participate and provide comments during the development of the Water Quality Improvement Plans.	**Copermittees** Riverside County Copermittees **Environmental Organizations** Clean Water Now Environmental Groups
	RESPONSE: The San Diego Water Board considered the requests for additional opportunities to provide comments. The San Diego Water Board disagrees that an additional public review and comment period needs to be provided after the revised Tentative Order and responses to comments are released. Federal regulations only require that the San Diego Water Board provide at least 30 days for public comment on the Tentative Order. The lengthy public review and comment period that was provided for the Tentative Order complies with and exceeds the statutory and regulatory requirements for bringing the Tentative Order before the Board for consideration and adoption. The San Diego Water Board released an administrative draft of the Tentative Order in April 2012, which went through a 5 month review and comment period, with several focused meetings to discuss the requirements. The administrative draft of the Tentative Order was significantly revised based on the comments and information received during the focused meetings and written comments received. The Tentative Order was released in October 2012 and the public comment period was closed in January 2013. The revised Tentative Order will be the third draft of the permit, with a second round of revisions, and revisions reflected in it were made in direct response to written comments received by the San Diego Water Board. The San Diego Water Board has already provided multiple opportunities to comment on the Tentative Order. An additional opportunity to submit written comments is not required or necessary. There will be an opportunity to make oral comments on the revisions to the Tentative Order at the San Diego Water Board hearing. The San Diego Water Board understands that the commenter wished to have more lengthy discussions during the focused meetings that were held during the administrative draft review and comment period. With the exception of the commenter, the San Diego Water Board has received very positive feedback on the focused	

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Gnl-18	GENERAL	
	meetings that were held. The focused meeting process was above and beyond what is required and the discussions that did take place were more inclusive than previous permit renewal processes. At each focused meeting the San Diego Water Board also extended invitations to everyone present for additional meetings outside the focused meetings. The San Diego Water Board had multiple additional in depth discussions with several groups outside of the focused meeting process on specific topics. If the commenter had contacted the San Diego Water Board for an additional meeting, the San Diego Water Board could have scheduled a meeting with the commenter to have more in depth discussions. The San Diego Water Board agrees that additional opportunities should be provided to the public to participate and comment during the development of the Water Quality Improvement Plans. The San Diego Water Board disagrees that Water Quality Improvement Plans are equivalent in meaning to “water quality control plans” as defined in Water Code section 13050, subdivision (j), requiring a public hearing for the acceptance of the Water Quality Improvement Plans. Please see response to comment B-3.	

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Gnl-19	GENERAL	
	COMMENT: *The maximum extent practicable (MEP) standard is the floor, not the limit, for MS4 permit requirements.* The Natural Resources Defense Council (NRDC) submitted comments asserting that the San Diego Water Board has the authority to include MS4 permit requirements that are more stringent than the MEP standard if necessary to ensure that discharges from the Copermittees' MS4s do not cause or contribute to exceedances of water quality standards in receiving waters. The NRDC cited several court decisions that support their position that the MEP standard is the floor for MS4 permit requirements, and the San Diego Water Board has the authority to impose additional more stringent requirements over and above MEP as determined to be appropriate.	**Environmental Organizations** Natural Resources Defense Council
	RESPONSE: The San Diego Water Board agrees that the MEP standard is the floor for permit requirements. In concept, the MEP standard is supposed to evolve and improve and become more stringent over time through an iterative process. In reality, in the current and previous permits issued by the San Diego Water Board, the MEP standard was essentially defined by the requirements of the MS4 permit and the iterative process only occurred when an MS4 permit was renewed by incorporating additional and more stringent requirements. Thus, the MEP standard became static rather than dynamic for each permit term, and only advanced with each permit renewal. This has resulted in multiple MS4 permits by the San Diego Water Board that have different requirements, each a little more stringent that the last one issued. In the Tentative Order the San Diego Water Board has incorporated a new regulatory approach that is expected to result in a more dynamic iterative process to advance the MEP standard during the permit term. Instead of dictating the actions that must be implemented by the Copermittees, and defining the MEP "floor" of requirements that will be utilized to determine compliance, the requirements of the Tentative Order define the iterative process that must be implemented to achieve water quality improvement outcomes through an ever advancing and improving MEP standard. With the exception of the TMDL requirements, the San Diego Water Board disagrees it is necessary to include requirements that are more stringent that the MEP standard. The approach incorporated into the Tentative Order redefines the MEP "floor" from being a "static floor" to a "dynamic floor" that is expected to rise as the Copermittees learn from their failures and successes while working toward achieving tangible improvements in water quality.	

Gnl-20: *Include graphical representation of areas covered by the Tentative Order.*

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Gnl-20	GENERAL	
	COMMENT: *Include graphical representation of areas covered by the Tentative Order.* The San Diego Green Building Council submitted comments recommending that the final permit include a graphic representation of both the political and natural boundaries related to the area under the jurisdiction of the Order.	**Building Industry / Industry** San Diego Green Building Council
	RESPONSE: The San Diego Water Board appreciates the recommendation. Including a graphical representation of the area under the jurisdiction of the Tentative Order is not necessary. The Tentative Order is expected to cover all the Phase I municipalities in the San Diego Region in a phased manner. The Tentative Order will no longer be issued to three separate counties or include requirements separated by political boundaries.	

Gnl-21: *Federal regulations require that the term of the Tentative Order not exceed five years.*

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Gnl-21	GENERAL	
	COMMENT: *Federal regulations require that the term of the Tentative Order not exceed five years.* The USEPA submitted comments that expressed concern that the San Diego Water Board was considering a permit term longer than five years. The USEPA supported a permit term that does not exceed five years.	**State/Federal Government** USEPA
	RESPONSE: The San Diego Water Board agrees that the term of the permit will not exceed five years.	

Gnl-22: *Identification of grammatical and typographical errors.*

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Gnl-22	GENERAL	
	COMMENT: *Identification of grammatical and typographical errors.* The San Diego County Copermittees submitted comments noting several grammatical and typographical errors in the text of the Tentative Order that should be corrected.	**Copermittees** San Diego County Copermittees
	RESPONSE: The San Diego Water Board appreciates the identification of grammatical and typographical errors. The San Diego Water Board has corrected the grammatical and typographical errors identified by the commenter. The San Diego Water Board has corrected any grammatical and typographical errors to the extent possible in the revised Tentative Order. If there are additional grammatical and typographical errors identified in the revised Tentative Order after adoption, the San Diego Water Board can correct them without re-opening the adopted Order if they are considered minor modifications pursuant to the requirements of Provision H.	

LEGAL COMMENTS
Lgl-1: *Concerns with strict liability for exceedances of water quality standards and receiving water limitations.*

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Lgl-1	LEGAL	
	COMMENT: *Concerns with strict liability for exceedances of water quality standards and receiving water limitations.* Comments were submitted by members of the Community Planning Groups, Copermittees, Engineering/Design Consultants, State Government, Societies/Associations/Coalitions, and Other Entities generally expressed concerns with the strict liability that the Copermittees are exposed to for exceedances of the water quality standards and receiving water limitations. The Copermittees submitted several comments that a recent Ninth Circuit Court of Appeals decision resulted in a new interpretation of precedential receiving water limitations language, or that it creates any new third party liability risks.	**Community Planning Groups** Jamul Dulzura Community Planning Group Ramona Community Planning Group **Copermittees** City of Dana Point City of Imperial Beach City of Laguna Hills City of Lake Forest City of Mission Viejo City of Rancho Santa Margarita City of San Juan Capistrano County of San Diego County of San Diego Office of County Counsel Orange County Copermittees Riverside County Copermittees San Diego Unified Port District / Brown and Winters **Engineering/Design Consultants** Latitude 33 Planning and Engineering **State/Federal Government** Senator Mark Wyland **Societies/Associations/Coalitions** BIOCOM San Diego Association of Realtors South County Economic Development Council **Other Entities** Carol Crossman Continental Maritime of San Diego Gable PR Hughes Marino Marston+Marston, Inc. Nuffer, Smith, Tucker, Inc. San Diego Regional Chamber of Commerce Sheppard, Mullin, Richter & Hampton LLP Southern Cross Property Consultants Transition IT
	RESPONSE: The San Diego Water Board disagrees that the recent Ninth Circuit Court of Appeals decision in NRDC v. County of Los Angeles (*Natural Resources Defense Council v. County of Los Angeles, et al.* (673 F.3d	

Lgl-1	LEGAL	
	1235 (9th Cir. 2011) (revd. on other grounds and remanded,*Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013))), adopted a new interpretation of precedential receiving water limitations language or that it creates any new third party liability risks. Rather the Ninth Circuit's interpretation is consistent with the San Diego Water Board's interpretation of the precedential receiving water limitations language that affords the San Diego Water Board with discretion to take enforcement action for violations of receiving water limitations and discharge prohibitions and also allows for citizen suit enforcement – in other words, engagement in the iterative process does not create a safe harbor from liability for violations of water quality standards. In precedential orders, the State Water Board exercised its discretion to require compliance with water quality standards by directing that MS4 permits contain provision requiring discharges of pollutants in storm water to be controlled so as not to cause or contribute to exceedances of water quality standards in receiving waters. (State Water Baord Order WQ-98-01 (*Environmental Heatlh Coalition*), and WQ 99-05 (*Environmental Health Coalition*.) Consistent with federal law, the State Water Board also found it appropriate to implement best management practices (BMPs) in lieu of imposing numeric water quality-based effluent limitations to meet water quality standards. (See SWRCB Orders WQ 91-03 (*Citizens for a Better Environment*), WQ 98-01 (*Environmental Health Coalition*), WQ 2001-15 (*Building Industry Association of San Diego County*); See also 40 CFR sec. 122.44(k); Interim Permitting Approach for Water Quality-Based Effluent Limitations in Storm Water Permits, USEPA, September 1995.) In these orders and USEPA guidance, the State Water Board and USEPA recognize that the storm water program will evolve over time to incorporate more stringent limitations, including improved BMPs, to meet water quality standards or numeric water quality based effluent limitations. While the State Water Board and San Diego Water Board in its recent MS4 permits have directed MS4 dischargers to achieve compliance with water quality standards through an "iterative process," using the State Water Board's precedential receiving water limitations language, the Water Boards have never interpreted the iterative process to provide a "safe harbor" for MS4 dischargers. Thus, the Ninth Circuit's recent opinion is consistent with the Water Boards' interpretation and does not create any new uncertainty or third party liability risks that did not previously exist. The San Diego Water Board recognizes and will continue to follow the State Water Board's process (commenced with a public workshop in November 2012) for reconsidering the precedential receiving water limits language and the possibility of creating a "safe harbor" from enforcement for violations of water quality	

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Lgl-1	LEGAL	
	standards while an MS4 discharger engages in an iterative process of improving its controls and practices. However, the Tentative Order has been revised to provide a discharge prohibitions and receiving water limitations compliances option. Please see response to comment A-1.	

Lgl-2: Concerns with the Copermittees' legal authority to impose requirements on development projects where a nexus between impact on the receiving water and the project cannot be established.

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Lgl-2	LEGAL	
	COMMENT: *Concerns with the Copermittees' legal authority to impose requirements on development projects where a nexus between impact on the receiving water and the project cannot be established.* Comments were submitted by members of the Copermittees, Societies/ Associations/Coalitions, and Other Entities generally expressed concerns with the Copermittees' legal authority to imposed requirements on development projects where a nexus between impact on the receiving water and the project cannot be established. The Copermittees assert that they would be subject to liability under takings clauses of the US and California Constitutions and the Mitigation Fee Act for requiring hydromodification management BMP requirements on new development or redevelopment projects that discharge to hardened channels where a hydromodification impact would be questionable and difficult to establish. Comments from the Societies/ Associations/Coalitions assert that allowing an in lieu fee for improvements to Priority Development Projects that do not cause hydromodification impacts is a direct violation of CEQA. In contrast, the South Laguna Civic Association asserts that the regulatory and legal nexus is clear between MS4 discharges and creek erosion and infrastructure damage, ocean pollution and public health hazards.	**Copermittees** City of Dana Point City of Imperial Beach City of Rancho Santa Margarita City of San Diego City Attorney County of San Diego Office of County Counsel Orange County Copermittees Riverside County Copermittees San Diego County Copermittees **Environmental Organizations** South Laguna Civic Association **Societies/Associations/Coalitions** East Otay Mesa Property Owners Association Otay Mesa Property Owners Association **Other Entities** National Enterprises Inc.
	RESPONSE: The San Diego Water Board recognizes the concerns of about the Copermittees' legal authority to impose hydromodification management requirements on development that causes no hydromodification impacts. Federal law mandates that permits issued to MS4s require management practices that will result in reducing pollutants to the maximum extent practicable. The state is required, by law, to select the BMPs. (See *NRDC v. USEPA* (9th Cir. 1992) 966 F.2d 1292; *Environmental Defense Center v. USEPA* (9th Cir. 2002) 344 F.3d 832, 855; *Rancho Cucamonga v. Regional Water Quality Control Bd., Santa Ana Region* (2006) 135 Cal.App.4th 1377, 1389.) The Tentative Order's requirements for Low Impact Development and hydromodification management controls are authorized by federal law. Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(2) provides that Copermittees develop and implement a management program which is to include "*A description of planning procedures including a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal separate storm sewers which receive discharges from areas of new development and significant redevelopment. Such plans shall address controls to reduce pollutants in discharges from municipal separate storm sewers after construction is completed*." The Tentative Order does not impose land use regulations, nor does it restrict or control local land-use decision-	

Lgl-2	LEGAL	
	making authority. Rather, the Tentative Order requires the permittees to fulfill Clean Water Act requirements and protect water quality in their land use decisions. The requirements in the Tentative Order allow for flexibility in compliance options to the extent allowable under the Clean Water Act. The substantive regulatory requirements of the Clean Water Act are a valid exercise of the federal government's enumerated powers and authority over navigable waters. (*NRDC v. USEPA* (9th Cir. 1998) 863 F.2d 1420, 1436.) Environmental regulation is not land use regulation, and therefore does not infringe upon local authority over land use decisions. (*California Coastal Commission v. Granite Rock* (1987) 480 U.S. 572. In addition, local land use planning must be consistent with general statewide laws. (*County of Los Angeles v.California State Water Resources Control Board* (2006) 143 Cal.App.4th 985, 1003.) Article 11, section 7, of the California Constitution states that a county or city may not enact laws that conflict with general laws. The Porter-Cologne Water Quality Control Act contains the California Legislature's finding that water quality is a matter of state-wide concern, requiring a statewide program administered at a regional level. (See, e.g., Wat. Code, § 13000; see also generally *Southern California Edison v. State Water Resources Control Board* (1981) 116 Cal.App.3d 751, 758.) Section 101 of the CWA has a companion policy statement, where Congress found that water quality is a matter of federal concern. The Tentative Order also does not dictate specific methods of compliance or dictate the manner in which the Copermittees use their land. Where the Tentative Order includes detailed requirements, it is to comply with the Clean Water Act and its regulations. USEPA's regulations mandate that certain requirements be included in MS4 permits in order to achieve the requirements of the Clean Water Act. Thus, federal law mandates that permits issued for MS4s require certain actions that will result in the elimination or reduction of pollutants to receiving waters and the state is required, by federal law, to select the controls necessary to meet this standard. (See *NRDC v. USEPA* (9th Cir. 1992) 966 F .2d 1292, 1308; *City of Rancho Cucamonga v. Regional Water Quality Control Bd., Santa Ana Region* (2006) 135 Cal.App.4th 1377, 1389-90.) The requirement that the Copermittees require Priority Development Projects to control post-project runoff flow rates and durations so that they do not exceed pre-development runoff flow rates and durations by more than ten percent is appropriate and necessary to reduce erosion and the discharge of pollutants into receiving waters. It does not require mitigation beyond redevelopment project impacts because the requirement lessens (although does not eliminate) the perpetuating impacts that originated upon initial land alteration (i.e., the project would continue to cause accelerated erosion) absent improved controls of post-project runoff flow rates and durations. The San Diego Water Board maintains that the Copermittees have authority to implement this	

Lgl-2	LEGAL	
	requirement, and that if implemented it would not rise to the level of a taking of private property. The pre-development condition provision is also consistent with the requirements in both the current Orange County and Riverside County MS4 permits. Please see response to comment E3c2-2. However, to remove the question of the nexus between a project's impact on an already hardened channel, the San Diego Water Board has included a hydromodification management exemption for projects that discharge to conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean. Please see response to comment E3c2-3. The hydromodification management requirements that may be imposed on projects with no hydromodification impacts has been modified, but in any case would not have violated CEQA because the mitigation requirement was not imposed as a result of a CEQA analysis.	

Lgl-3: *The Tentative Order must address water quality inconsistencies with the California Coastal Act and California Water Code.*

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Lgl-3	LEGAL	
	COMMENT: *The Tentative Order must address water quality inconsistencies with the California Coastal Act and California Water Code.* The South Laguna Civic Association submitted comments that asserts the Tentative Order is inconsistent with the California Coastal Act and the water reclamation requirements of the California Water Code. The commenter asserts that the Tentative Order must address the water quality inconsistencies.	**Environmental Organizations** South Laguna Civic Association
	RESPONSE: The Tentative Order is not issued pursuant to the requirements of the California Coastal Act. The Tentative Order is issued pursuant to and consistent with the requirements of the federal Clean Water Act, Code of Federal Regulations, and the California Water Code for discharges of non-storm water and discharges of pollutants in storm water from the Copermittees' MS4s to receiving waters. Compliance with the requirements of the Tentative Order should also allow the Copermittees to be in compliance with the requirements of the California Coastal Act. When and where applicable, however, the Copermittees may be required to comply with the California Coastal Act under other regulatory mechanisms. The Tentative Order is not required to implement the requirements of the California Coastal Act. The Tentative Order also is not the appropriate regulatory mechanism for implementing the water reclamation requirements of the California Water Code. The water reclamation requirements of the California Water Code are implemented by the San Diego Water Board under separate regulatory mechanisms.	

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Lgl-4	LEGAL	
	COMMENT: *San Diego Water Board has legal authority to not incorporate the Beaches and Creeks Bacteria TMDLs into the Tentative Order.* The County of San Diego and the County of San Diego Office of County Counsel each submitted comments that assert that the San Diego Water Board has the authority to not incorporate the Beaches and Creeks Bacteria TMDLs into the Tentative Order. The comments from the County cite the MEP standard, *Defenders of Wildlife v. Browner*, and a November 2010 USEPA memorandum as providing the the basis for the legal authority. The City of Lake Forest submitted comments that also cited *Defenders of Wildlife v. Browner* as providing the the basis for the legal authority to not incorporate TMDLs into the Tentative Order. The comments from the County also assert that the scientific basis of the Beaches and Creeks Bacteria TMDLs is flawed, the requirements of the TMDLs are not achievable, and the costs to implement the requirements of the TMDLs are not worth the benefits that may be achieved. The County requested that the San Diego Water Board elect not to include the Beaches and Creeks Bacteria TMDLs in the Tentative Order and re-evaluate the TMDL. Clean Water Now submitted comments alluded to "recent legal renderings" that called into question the TMDL provisions included in the Tentative Order. Conversely, the USEPA submitted comments in support of the the San Diego Water Board's approach for incorporating applicable TMDL requirements into the Tentative Order.	**Copermittees** City of Lake Forest County of San Diego County of San Diego Office of County Counsel **Environmental Organizations** Clean Water Now **State/Federal Government** USEPA
	RESPONSE: The San Diego Water Board disagrees that it has the legal authority to not incorporate the requirements of the Beaches and Creeks Bacteria TMDLs into the Tentative Order. Federal regulations under 40 CFR 122.44(d)(1)(vii)(B) require that NPDES permit requirements incorporate water quality based effluent limitations (WQBELs) that must be consistent with the requirements and assumptions of any available wasteload allocations (WLAs) developed under TMDLs. The federal regulations do not provide the option or discretion to not incorporate these WQBELs into NPDES permits. The San Diego Water Board is required to adopt and implement TMDLs through the MS4 permit, where the Copermittees' MS4 discharges are a source of the impairment. TMDLs are adopted by the San Diego Water Board pursuant to CWA section 303(d) and CWC sections 13240 and 13242. TMDL implementation programs consist of a description of the nature of actions that are necessary to achieve the WLAs (and LAs), a time schedule for the actions to be taken, and a description of the monitoring and reporting to be undertaken to	

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	determine compliance with the WLAs. Because TMDLs and their programs of implementation are adopted through the Basin Plan amendment process in California, the TMDL implementation program contained in a regional water board's basin plan becomes a regulation upon approval by the State of California Office of Administrative Law. All permits must implement the applicable water quality control plan (i.e. Basin Plan), including any applicable TMDL implementation programs (CWA §§ 303(d), 402(p)(3)(B)(iii); Cal. Water Code §§ 13263, 13377). These Basin Plan provisions thus become the applicable regulations that authorize an MS4 permit to include compliance schedules to achieve effluent limitations derived from TMDL WLAs. It is unclear whether the commenters understand that the TMDL implementation programs are the basis for the compliance schedules and, without the TMDL implementation program, Copermittees would be required to comply with final WQBELs immediately. Further, USEPA has set forth guidance regarding MS4 permits, that such permits must require compliance with applicable TMDLs to meet water quality standards. (See "Revisions to the November 22, 2002 Memorandum 'Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) (for Storm Water Sources and NPDES Requirements Based on Those WLAs.'" (USEPA Office of Water, Nov. 10, 2010.) "*Where a TMDL has been established and there is an accompanying implementation plan that provides a schedule for an MS4 to implement the TMDL, the permitting authority* [in this case, the Regional Water Board] *should consider the schedule as it decides whether and how to establish enforceable interim requirements and interim dates in the permit*." (Id.) The San Diego Water Board is aware that the USEPA memorandum is not legally binding, but finds it very instructive and it is appropriate to consider USEPA guidance, even if that guidance *may* be modified in some manner in the future. NPDES permits are intended to support the objective of the federal Clean Water Act "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*" (Clean Water Act section 101(a)). Water quality standards, which are the basis for the receiving water limitations in the Tentative Order, are the foundation for achieving this objective. To ensure that discharges do not cause or contribute to exceedances of water quality standards, receiving water limitations provisions are included in all NPDES permits issued pursuant to CWA section 402. Further, Clean Water Act section 402(p)(3)(B)(iii) requires permits for discharges from municipal storm sewers to "require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design, and engineering methods, *and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." [Emphasis added.] In its Phase I Stormwater Regulations, Final Rule, USEPA elaborated on these requirements, stating that, "permits for discharges from municipal separate storm sewer systems must require	

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	controls to reduce the discharge of pollutants to the maximum extent practicable, and where necessary, water quality-based controls." (See 55 Fed. Reg. 47990, 47994 (Nov. 16, 1990).) USEPA reiterated in its Phase II Stormwater Regulations, Final Rule, that MS4 "permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL." The Clean Water Act provides the San Diego Water Board, to the same extent as the Administrator of USEPA, the discretion to determine what controls are appropriate to protect water quality and achieve the objectives of the Clean Water Act. (See *Defenders of Wildlife v. Browner* (1999) 191 F.3d 1159, 1166.) As explained in the Tentative Order, compliance with the WLAs established in TMDLs is necessary to achieve compliance with water quality standards. The State Water Board and the San Diego Water Board have previously concluded that discharges from the MS4 contain pollutants that have the reasonable potential to cause or contribute to excursion above water quality standards. As such, receiving water limitations are included in the Tentative Order to ensure that individual and collective discharges from the MS4 do not cause or contribute to exceedances of water quality standards necessary to protect the beneficial uses of the receiving waters. Compliance with the WLAs established in TMDLs is necessary to achieve compliance with water quality standards. In recognition of the purpose of the NPDES program in supporting the objective of the Clean Water Act and utilizing its authority provided by CWA section 402(p)(3)(B)(iii), and considering USEPA's statements and guidance, the State Water Board has determined that MS4 permits must include compliance with water quality standards. (See State Water Board Order Nos. WQ91-03, WQ 98-01, WQ 99-05 and WQ 2001-15.) Accordingly, the provisions contained in 40 CFR 122.44(d), are applicable to MS4 permits. The San Diego Water Board also disagrees that incorporation of TMDL requirements is based on state law provisions of the Porter Cologne Water Quality Control Act and that consideration of the factors under Water Code section 13241 is required before the requirements may be implemented. TMDLs implement existing water quality objectives that are designed to protect designated beneficial uses. Numeric targets used by TMDLs to implement water quality standards are not designed to re-balance the policy interests underlying those standards. While policy considerations are important in developing water quality standards in the first instance, they are less important in formulating TMDLs that implement them. The statutory directive to adopt TMDLs in the first instance is to "implement the applicable water quality standards with seasonal variations and a margin of safety." (33 U.S.C. § 1313(c)(2)(A). See also 40 CFR §§ 131.10-13.) While consideration of economic	

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	factors may be appropriate in adopting TMDLs, a section 13241 economic analysis is not required either in the adoption of TMDLs or in the implementation through an NPDES permit. Additionally, the implementation plan included as part of the Beaches and Creeks Bacteria TMDLs requires the San Diego Water Board to incorporate the requirements of the TMDLs into the appropriate regulatory mechanisms to implement the TMDL requirements. If the requirements of the Beaches and Creeks Bacteria TMDLs are not incorporated into any regulatory mechanisms (e.g. NPDES permits), the TMDL requirements will not be implemented and will not be enforceable. Implementation of the TMDL requirements in regulatory mechanisms must be initiated as soon as possible to achieve the requirements of the TMDL within the compliance schedules of the TMDL. The San Diego Water Board is obligated to incorporate the requirements into the MS4 permit. Otherwise, the San Diego Water Board would be in conflict with its own implementation plan requirements within the Basin Plan as well as the requirements of the Code of Federal Regulations. Please also see response to comment Lgl-10.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

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Lgl-5	LEGAL	
	COMMENT: *San Diego Water Board does not have the legal authority to issue a regional MS4 permit.* The Orange County and Riverside County Copermittees each submitted comments asserting that the San Diego Water Board does not have the authority to issue a regional MS4 permit under the Clean Water Act. The Orange County Copermittees argue that while it geographically abuts San Diego County, there is extensive federal land separating MS4s within its county from other MS4s and the federal regulations to not allow the issuance of a regional MS4 permit without a "connection." The commenters also raised concerns over the regulatory requirement to file a Report of Waste Discharge before obtaining coverage under the Tentative Order.	**Copermittees** Orange County Copermittees Riverside County Copermittees
	RESPONSE: The San Diego Water Board disagrees that the federal regulations do not authorize the issuance of a region-wide MS4 permit coextensive with the jurisdictional boundaries of the San Diego Region. Despite the geographic separation, the San Diego Water Board has legal authority to issue a regional MS4 permti through its authority in the Clean Water Act. (See Attachement No. 2, September 7, 2012 Letter from San Diego Water Board Counsel on Legal Authority Supporting Issuance of a Regional MS4 Permit) Section 402, subpart (p)(3)(B) of the Clean Water Act states that "Permits for discharges from municipal storm sewers – (i) may be issued on a system- or jurisdiction-wide basis . . . ." The federal storm water regulations in 40 CFR at Part 122.26, subdivision (a)(1)(v) also state that the Director (the San Diego Water Board) may designate dischargers from municipal separate storm sewers on a system-wide or jurisdiction-wide basis, taking into consideration the following factors: (A) location of the the discharge with respect to waters of the United States; (B) the size of the discharge; (C) the quantity and nature of the pollutants discharged to waters of the United States and (D) other relevant factors. Consideration of these factors provides wide discretion to the San Diego Water Board in issuing MS4 permits. More specifically, the regulations permit issuance of system-wide permits covering all MS4s in "adjacent . . . large or medium separate storm sewer systems." (See 40 CFR sec. 122.26(a)(3)(iv). The regulations also support issuance of MS4 permits on watershed or "other basis" contemplating that such permits may "specify different conditions relating to different discharges covered by the permit, including different management programs for different drainage areas . . . ." (40 CFR Part 122.26(a)(3)(v).) The USEPA responses to comments for the above regulations also make clear that the permitting authority, in this case, the San Diego Water Board, has flexibility to establish system- or region-wide permits. In the Final	

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	Rule published in the Federal Register and containing USEPA's responses to comments, USEPA notes that paragraph (iv) of section 122.26(a)(3) would allow an entire system in a geographical region under the purview of a state agency to be designated under a permit. (National Pollutant Discharge Elimination System Permit Application Regulations for Storm Water Discharges, 55 Fed.Reg. 47990, 48030-48042 (Nov. 16, 1990).) It is important to note that a regional MS4 permit does not expand the requirements for each municipality beyond its borders as the federal regulations make clear that MS4 permittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators. (40 CFR Part 122.26(a)(3)(vi).) See also September 7, 2012, memorandum from Jessica Jahr and Catherine Hagan, State Water Board's Office of Chief Counsel, to Ryan Baron and David Huff, counsels for Orange and Riverside Counties, respectively which is incorporated into this response. The other objection commenters raise concerns the regulatory requirement to file a Report of Waste Discharge (ROWD). The Tentative Order does not cover or become effective for either the Orange County or Riverside County Copermittees until the earlier of (1) either or both Counties voluntarily seeks to be covered by the permit, once adopted, or (2) Orange or Riverside County timely submits its respective ROWD proposing changes or other recommendations to the Tentative Order and appropriate changes are made concurrent with permit coverage becoming effective as to one or each County. In other words, the obligation to submit a ROWD and for the San Diego Water Board to consider an ROWD has not been abandoned and the Tentative Order reflects that the San Diego Water Board will rely on the ROWD process to frame prospective revisions to the permit. And while neither county has yet filed its next ROWD, both have been provided with ample and extensive opportunities to participate fully in the development of this Tentative Order.	

Lgl-6	LEGAL	
	COMMENT: *The requirements of the Tentative Order are more stringent that Federal law and require a CWC 13241 analysis.* The Orange County and Riverside County Copermittees, City of Lake Forest, and the Building Industry Association of Southern California assert that several requirements of the Tentative Order go beyond the requirements of Federal law, thus an analysis pursuant to California Water code section 13241 is required. The commenters also make several assertions about the deficiencies they perceive with the economic considerations discussed in the Fact Sheet, and assert that a cost-benefit analysis needs to be included in the Fact Sheet discussion.	**Building Industry / Industry** Building Industry Association of Southern California **Copermittees** City of Lake Forest Orange County Copermittees Riverside County Copermittees
	RESPONSE: The San Diego Water Board disagrees that there are "many requirements in the Draft Permit which exceed the federal MEP standard." The San Diego Water Board is charged with construction of and administration of the Clean Water Act in the San Diego Region. In issuing MS4 permits, "*[t]he permitting agency has discretion to decide what practices, techniques, methods and other provisions are appropriate and necessary to control the discharge of pollutants*." (*City of Rancho Cucamonga v. Regional Water Quality Control Board-Santa Ana Region* (2006) 135 Cal.App.4th 1377,1389.) However, the "*Regional Board must comply with federal law requiring detailed conditions for NPDES permits*." (*Ibid.*) Further, USEPA expects the permitting authority to develop the specific practices that comply with the Clean Water Act on a permit-by-permit basis. (*NRDC v. USEPA* (9th Cir. 1992) 966 F.2d 1292, 1308.) To the extent the Board is exercising discretion in including certain permit requirements, the Board is exercising discretion required and/or authorized by federal law, not state law. (See *City of Rancho Cucamonga, supra,* 135 Cal.App.4th at 1389*; Building Industry Association of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 882-883.) Further, the MEP standard is a flexible standard that balances a number of considerations, including technical feasibility, cost, public acceptance, regulatory compliance, and effectiveness. (*Id.* at pp. 873, 874, 889.) Such considerations change over time with advances in technology and with experience gained in storm water management. (55 Fed. Reg. 47990, 48052 (Nov. 16, 1990).) Accordingly, a determination of whether the conditions contained in Tentative Order exceed the requirements of federal law cannot be based on a point by point comparison of the permit conditions with federal law. The appropriate focus is whether the permit conditions as a whole exceed the MEP standard. The commenters have failed to cite any evidence that demonstrates how requirements in the Tentative Order exceed the MEP	

Lgl-6	LEGAL	
	standard or applicable requriements of federal law. The commenters assert that provisions of the Tentative Order are more stringent than the requirements of the Clean Water Act and therefore require an analysis of the factors, including economic considerations, in Water Code section 13241 before the San Diego Water Board can approve such provisions. As indicated above, the San Diego Water Board disagrees that provisions of the Tentative Order are more stringent than requirements of the Clean Water Act. Because the Tentative Order is not more stringent than federal law, its adoption does not require the San Diego Water Board to consider Water Code section 13241 factors. The California Supreme Court in *City of Burbank v. State Water Resources Control Board, et al.,* ((2005) 35 Cal.4th 613) (*Burbank*), held: [Water Code s]ection 13377 specifies that wastewater discharge permits must meet the federal standards set by federal law. In effect, section 13377 forbids a regional board's consideration of any economic hardship on the part of the permit holder if doing so would result in the dilution of the requirements set by Congress in the Clean Water Act. That act prohibits the discharge of pollutants into the navigable waters of the United States unless there is compliance with federal law (33 U.S.C. § 1322(a)), and publicly operated wastewater treatment plants such as those before us here must comply with the act's clean water standards, regardless of cost [citations]. Because [Water Code] section 13263 cannot authorize what federal law forbids, it cannot authorize a regional board, when issuing a wastewater discharge permit, to use compliance costs to justify pollutant restrictions that do not comply with federal clean water standards." (*Burbank,* 35 Cal.4th at 625.) While the *Burbank* decision does require an analysis of Water Code section 13241 factors when the state adopts permit conditions that are more stringent than federal law (*id.* at 618) the Tentative Order reflects that all of the challenged provisions are necessary to implement federal law. Thus, the San Diego Water Board is not required to consider economic information to justify a "dilution of the requirements" established in federal law. Even when applicable, consideration of economic information pursuant to section 13241 does not require a cost-benefit analysis, as some commenters suggest. And section 13241 neither specifies how regional water boards must consider its enumerated factors nor does it require that regional water boards may specific findings documenting consideration of the factors. (See *California Ass'n of Sanitation Agencies, et al. v. State Water Resources Control Board, et al.,* (208 Cal.App.4th 1438, 1464 (2012).) Nonetheless, the Fact Sheet and Response to Comments reflect economic information that has either been developed or gathered by the San Diego Water Board or has been submitted by Copermittees or others as part of this proceeding. To the extent that economic information in connection with compliance and other costs associated with challenged permit provisions, the San Diego Water Board has fully considered this information. Under these circumstances, *Burbank* does not require more.	

Lgl-7	LEGAL	
	COMMENT: *The San Diego Water Board cannot determine whether a particular mandate is unfunded.* The Orange County, Riverside County and San Diego County Copermittees each submitted comments asserting that the San Diego Water Board does not have the legal authority to determine whether any provisions in the Tentative Order constitute a state mandate, and only the Commission on State Mandates can make the determination.	**Copermittees** Orange County Copermittees Riverside County Copermittees San Diego County Copermittees
	RESPONSE: The San Diego Water Board does not dispute that the Commission on State Mandate ultimately has jurisdiction to determine whether the State has imposed a mandate requiring state subvention. However, it is entirely appropriate for the San Diego Water Board to set forth its legal basis to support the provisions in the Tentative Order, finding them to be necessary and appropriate to meet the federal Clean Water Act standards. While the Commission may be expert in state mandates, it has no expertise in the field of water law. As indicated in response to comment Lgl-6, above, the San Diego Water Board does not agree that provisions in the Tentative Order exceed federal requirements of the Clean Water Act. The San Diego Water Board is charged by law with administering and constructing the Clean Water Act's requirements and is entitled to considerable deference in its interpretation of the Act. (See *Buidling Industry Ass'n of San Diego, supra,* 124 Cal.App.5th at pp. 873, 879 fn.9; *County of Los Angeles v. California State Water Resources Control Bd.* (2006) 143 Cal.App.4th 985, 997.) In issuing MS4 permits, "[t]he permitting agency has discretion to decide what practices, techniques, methods and other provisions are appropriate and necessary to control the discharge of pollutants." (*City of Rancho Cucamonga v. Regional Water Quality Control Board-Santa Ana Region* (2006) 135 Cal.App.4th 1377,1389.) However, the "Regional Board must comply with federal law requiring detailed conditions for NPDES permits." (*Ibid.*) Further, USEPA expects the permitting authority to develop the specific practices that comply with the Clean Water Act on a permit-by-permit basis. (*NRDC v. USEPA* (9th Cir. 1992) 966 F.2d 1292, 1308.) To the extent the Board is exercising discretion in including certain permit requirements, the Board is exercising discretion required and/or authorized by federal law, not state law. (See *City of Rancho Cucamonga, supra,* 135 Cal.App.4th at 1389*; Building Industry Association of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 882-883.) Further, the MEP standard is a flexible standard that balances a number of considerations, including technical feasibility, cost, public acceptance, regulatory compliance, and effectiveness. (*Id.* at pp. 873, 874, 889.) Such considerations change over time with advances in technology and with experience gained in storm water management. (55 Fed. Reg. 47990, 48052 (Nov. 16, 1990).) The San Diego Water Board's findings are the	

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	expert conclusions of the principal state agency charged with implementing the NPDES program in California. (Cal. Wat. Code §§ 13001, 13370.) The San Diego Water Board is not precluded from including provisions in the Tentative Order which commenters may contend are state mandates and it is well within the San Diego Water Board's authority to conclude, based on its expertise in administering the Clean Water Act, the the Tentative Order does not exceed federal law and is therefore not a state mandate subject to subvention.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

Lgl-8	LEGAL	
	COMMENT: *"Waters of the state" should be revised to "waters of the U.S" or "receiving waters" throughout the Tentative Order.* The Riverside County and San Diego County Copermittees each submitted comments objecting to applying the requirements of the Tentative Order to "waters of the state" instead of "waters of the U.S." which is consistent with the Clean Water Act, or "receiving waters." The Copermittees are concerned that "waters of the state" may include groundwater, which exceeds federal requirements. The Copermittees requested several revisions throughout the Tentative Order reflecting this comment.	**Copermittees** Riverside County Copermittees San Diego County Copermittees
	RESPONSE: The San Diego Water Board agrees that certain requirements of the Tentative Order should be revised to "waters of the U.S." or "receiving waters." Where applicable and appropriate, the San Diego Water Board revised "waters of the state" to "waters of the U.S." or "receiving waters" to limit the application of a requirement to surface waters. However, because the Tentative Order also serves as waste discharge requirements and incorporates the water quality standards of the Basin Plan (i.e. discharge prohibition A.1.a), the term "waters of the state" remains appropriate where the phrase exists in the applicable Basin Plan provision, incorporated into the Tentative Order. Because the Tentative Order regulates discharges of pollutants to waters of the United States, the San Diego Water Board does not anticipate there being any MS4 discharges to groundwaters that could violate the prohibition as to waters of the state. Additionaly, such provisions are not new to San Diego Region MS4 permits. .	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

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Lgl-9	LEGAL	
	COMMENT: *The Tentative Order cannot include requirements to regulate storm water flow.* The Riverside County and San Diego County Copermittees, the City of Lake Forest, and the BIA Regulated Community Coalition each submitted comments that assert the Tentative Order cannot include requirements (i.e. hydromodification management requirements) to regulate storm water flow. The commenters cite a recent court decision from Virgina (*Virginia Dept. of Transp. v. U.S. Environmental Protection* Agency) as the basis for this assertion. In contrast, the Los Penasquitos Lagoon Foundation requests that the Tentative Order finds discharges (i.e. flow) from the MS4s can generate and/or contribute to discharges of pollutants downstream of the MS4 outfalls (e.g. discharge of sediment due to scouring of the natural channels).	**Building Industry / Industry** BIA Regulated Community Coalition **Copermittees** City of Lake Forest Riverside County Copermittees San Diego County Copermittees **Environmental Organizations** Los Penasquitos Lagoon Foundation
	RESPONSE: The San Diego Water Board disagrees that the Tentative Order cannot include requirements that will result in decreasing the impact of pollutants in storm water runoff discharged from the MS4s on the physical, chemical, and biological integrity of receiving waters to the maximum extent practicable (MEP). The Tentative Order includes requirements to effectively prohibit non-storm water discharges to the MS4, and control the discharge of pollutants from the MS4 to the MEP, consistent with the requirements of the Clean Water Act and Code of Federal Regulations. If non-storm water discharges are effectively prohibited to the MS4s, there should be little to no flow from the MS4s to receiving waters. Thus, the Tentative Order already includes requirements to regulate non-storm water flow to and from the MS4s. In contrast, the MEP standard is a technologically based effluent limitation (TBEL) that applies specifically to storm water discharges from the MS4s. The Tentative Order includes development planning structural BMP requirements that act as BMP-based TBELs to implement the MEP standard for new development and significant redevelopment projects. While the development planning structural BMP requirements are separated into "*storm water pollutant control*" and "*hydromodification management*" BMP requirements, they are both for the control of pollutants in storm water discharges from the MS4 to the MEP. The hydromodification management BMP requirements of the Tentative Order do, to a significant extent, regulate flow. However, the primary purpose of the hydromodification management BMP requirements still stems from the requirement that MS4 permits include controls to reduce the discharge of pollutants in storm water from the MS4s to receiving waters. The increases in flows and durations caused by new development	

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	and significant redevelopment also results in increases to pollutants that are discharged in storm water from the MS4s to the receiving waters. The pollutants discharged will always be in excess of what would be generated in a natural environment, even with controls in place. Those increased pollutant loads associated with increased flows and durations of storm water discharging from the MS4s impact the chemical integrity (e.g. salinity, temperature, toxic pollutants), biological integrity (e.g. biological toxicity, supportable flora and fauna, habitat alteration), and physical integrity (e.g. destabilization of stream channels, excessive sediment deposition) of receiving waters. Thus, the hydromodification management BMP requirements of the Tentative Order are necessary to control the discharge of pollutants generated by new development and significant redevelopment projects in storm water discharges from the MS4 to the MEP, even if they do result in the regulation of flow. The recent district court decision from the Eastern District of Virginia (*Virginia Dept. of Transportation, et al. v. United States Environmental Protection Agency,* et al. (2013 WL 53741 (E.D.Va.) (Virginia Decision)) cited by commenters does not support their argument in the context of the Tentative Order. In the Virginia Decision, USEPA had established a TMDL limiting the flow rate of stormwater into a creek to 681.8 ft/acre-day. USEPA characterized the flow rate as a "surrogate" for sediment, a pollutant. USEPA recognized that flow in and of itself is not a pollutant. As some commenters acknowledge, the Virginia Decision is not precedential and does not bind the San Diego Water Board. More importantly, the decision is inapposite as it concerns section 303(d) of the Clean Water Act concerning total daily maximum loads (TMDLs) which sets forth a very specific requirement that for impaired water bodies, states must establish numeric loads "for those *pollutants* which the Administrator identifies under section 1314(a)(2) of this title are suitable for such calculation." Instead of setting a load for a pollutant, USEPA calculated a load for flow as a surrogate for the relevant pollutant. In contrast, as explained above, section 402(p) of the Clean Water Act provides that states issuing MS4 permits shall "require *controls* to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants." (CWA, § 402(p)(3)(B)(iii).) Following the directives of this section of the Clean Water Act, the Tentative Order establishes controls discussed above such as best management practices to remove pollutants in storm water, source control and restrictions on the flow rate and duration of post-construction runoff, the latter of which not only can	

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	contain pollutants but can affect the discharge of pollutants in the runoff. (See State Water Board Order No. WQ 2000-11 (p. 5) (*Cities of Bellflower, et al.*,) and State Water Board Order WQ 2001-15 (fn.23) (*Building Industry Association of San Diego).*). One commenter also cites to the Virginia Decision in requesting that the San Diego Water Board conform the TMDL provisions in the Tentative Order to the Virginia Decision. It is unclear how the commenter believes the Virginia Decision applies to the TMDL provisions in the Tentative Order, but as indicated above, the decision is not binding on the San Diego Water Board and any concerns with the loads established in TMDLs should most appropriately be raised in the context of the TMDL approval proceeding.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

Lgl-10	LEGAL	
	COMMENT: *The numeric WQBELs violate requirements of law because they are infeasible.* The Orange County Copermittees submitted comments that object to the incorporation of numeric WQBELs for TMDLs, and assert that the inclusion of the numeric WQBELs violate the law because they are infeasible (presumably, to achieve). The Copermittees assert that the WQBELs should be BMP-based and not numeric. The Copermittees cite a 2010 USEPA memorandum, 40 CFR 122.44(k), and the Caltrans MS4 permit as justification for BMP-based instead of numeric WQBELs in the Tentative Order.	**Copermittees** Orange County Copermittees
	RESPONSE: The San Diego Water Board disagrees that including numeric WQBELs for the TMDLs in the Tentative Order violate the requirements of law. The federal regulations under 40 CFR 122.44(d)(1)(vii)(B) require that NPDES permit requirements incorporate WQBELs that must be consistent with the requirements and assumptions of any available wasteload allocations (WLAs) developed under TMDLs. The federal regulations under 40 CFR 122.44(k) do not require WQBELs to be BMP-based if numeric effluent limitations are infeasible, but only that WQBELs that implement WLAs may be expressed in the form of BMPs. BMP-based WQBELs may be allowed if BMPs alone adequately implement WLAs, and additional controls are not necessary. This is consistent with a 2002 USEPA memorandum for "*Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs*." WQBELs are required for point source discharges that have the reasonable potential to cause or contribute to an excursion of water quality standards and technology based effluent limitations or standards are not sufficient to achieve water quality standards. Where a WLA has been assigned to a discharge in a TMDL, it is concluded that there is reasonable potential for the discharger to cause or contribute to an excursion of water quality standards. The 2010 USEPA memorandum for "*Revisions to the November 22, 2002 Memoradum 'Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs'"* cited by the Copermittees states, "*For the purpose of this memorandum, numeric WQBELs use numeric parameters such as pollutant concentrations, pollutant loads, or numeric parameters actings as surrogates for pollutants […].*" The memorandum goes on to recommend, "*Where the NPDES authority determine that MS4 discharges have a reasonable potential to cause or contribute to a water quality standard excursion, EPA recommends that, where feasible, the NPDES permitting authority exercise its discretion to include numeric effluent limitations necessary to meet water quality standards*." The "where feasible" in the memorandum applies to the NPDES permitting authority's discretion to include numeric effluent	

Lgl-10	LEGAL	
	limitations necessary to meet water quality standards, not to the feasibility of achieving the numeric effluent limitations. The State Water Board, in Order WQ 2006-0012 (Boeing), has made clear that "infeasibility" in the context of numeric effluent limitations refers to "the ability or propriety of establishing" numeric limits, as opposed to the feasibility of compliance. Please also see response to comment Lgl-4. The Caltrans MS4 permit is issued by the State Water Board. Even though the Caltrans MS4 permit may allow for BMP-based WQBELs, this does not require the San Diego Water Board to include BMP-based WQBELs in the Tentative Order regardless of any potential or apparent conflict. The San Diego Water Board will issue additional requirements to Caltrans with numeric WQBELs when and where warranted. The San Diego Water Board considered the feasibility of incorporating numeric WQBELs to implement the requirements of each of the TMDLs and has determined that they are feasible, and necessary, to include to meet water quality standards, consistent with the 2010 USEPA memorandum. Numeric WQBELs are also "additional controls" necessary to implement the WLAs, consistent with the 2002 USEPA memorandum. Each of the TMDLs in the Tentative Order, however, includes BMP-based WQBELs which must be implemented to achieve the numeric WQBELs. The Tentative Order requires the Copermittees to implement the BMP-based WQBELs to achieve the numeric WQBELs. This is consistent with the 40 CFR 122.44(d)(1)(vii)(B) and 40 CFR 122.44(k), and the recommendations of the 2010 USEPA memorandum. The Tentative Order has also been revised to include interim and final TMDL compliance determination options that allow the Copermittees to demonstrate that the BMP-based WQBELs will achieve the numeric WQBELs. The numeric WQBELs are necessary for the Copermittees to quantitatively demonstrate that the BMPs implemented are achieving the WLAs of the TMDLs. Please see response to comments AttE-1 and AttE-3. Thus, the Tentative Order appropriately includes numeric WQBELs and does not violate any requirements of law.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

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Lgl-11	LEGAL	
	COMMENT: *Storm water pollutant control retention requirements of the Tentative Order conflict with Rainwater Capture Act of 2012 (AB 1750).* The BIA Regulated Community Coalition commented that the Rainwater Capture Act does not provide the authority to collect and retain storm water from impervious surfaces other than rooftops. Thus, the BIA Regulated Community Coalition asserts that the storm water pollutant control retention requirements of the Tentative Order may be in conflict with the Rainwater Capture Act and the retention requirements of the Tentative Order should not be enforced.	**Building Industry / Industry** BIA Regulated Community Coalition
	RESPONSE: The San Diego Water Board disagrees that the storm water pollutant control retention requirements of the Tentative Order are in conflict with the Rainwater Capture Act. The Rainwater Capture Act provides additional clarification that the collection of rainwater from rooftops does not require a water right permit. The Rainwater Capture Act does not address collection of water from other surfaces, nor does it modify or alter existing law pertaining to appropriative water rights. Retention of rainwater or diffuse surface flow before it flows into a watercourse does not require a water right permit. The storm water pollutant control retention requirements of the Tentative Order are not in conflict with the Rainwater Capture Act or existing water rights law.	

FINDINGS
Fnd-1: *Requests for additional findings.*

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

Fnd-1	FINDINGS	
	COMMENT: *Requests for additional findings.* The Riverside County Copermittees requested several additional findings be included in the Tentative Order associated with water law, flooding, flood control acts, and limitations on legal authority. The County of San Diego and the County of San Diego Department of Environmental Health requested a finding with vector-related language.	**Copermittees** County of San Diego County of San Diego Department of Environmental Health Riverside County Copermittees
	RESPONSE: The San Diego Water Board considered the requests for the additional findings and determined that including the additional findings is not necessary. The requirements of the Tentative Order are consistent with the federal Clean Water Act, Code of Federal Regulations, and the California Water Code. The additional findings requested associated with water law, flooding, flood control acts, limitations on legal authority and vector-related issues are not necessary to establish that the requirements of the Tentative Order are consistent the federal Clean Water Act, Code of Federal Regulations, and the California Water Code. The San Diego Water Board did not include any additional findings as requested by the commenters. The San Diego Water Board did, however, incorporate an additional requirement under the general requirements of all development projects (new Provision E.3.a.(1)(c)) to avoid the creation of nuisance or pollution associated with vectors. Subsequently, additional discussion was also included in the Fact Sheet to encourage the design and implementation of BMPs in consultation with local vector control agencies and the California Department of Public Health.	

Fnd-2: *Findings 2 and 26: Remove language that states the San Diego Water Board has the authority to issue a regional MS4 permit.*

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

Fnd-2	FINDINGS	
	COMMENT: *Findings 2 and 26: Remove language that states the San Diego Water Board has the authority to issue a regional MS4 permit.* The Orange County and Riverside County Copermittees each submitted comments asserting that Findings 2 and 26 were inaccurate and the San Diego Water Board does not have the authority to issues a regional MS4 permit under the Clean Water Act.	**Copermittees** Orange County Copermittees Riverside County Copermittees
	RESPONSE: The San Diego Water Board disagrees that it does not have the authority to issue a regional MS4 permit. The San Diego Water Board maintains Findings 2 and 26 are accurate and the San Diego Water Board has the authority to issue a regional MS4 permit. Please see the response to comment Lgl-5.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

Fnd-3	FINDINGS	
	COMMENT: *Finding 3 and 15 (and elsewhere in the Tentative Order): Remove "in storm water" from "reduce discharges of pollutants in storm water to the maximum extent practicable."* The Riverside County and San Diego County Copermittees each submitted comments that objected to requiring the control of pollutants "in storm water" to the MEP. The Copermittees assert that the Tentative Order is inconsistent with the Clean Water Act and the control of pollutants to the MEP applies to both storm water and non-storm water. The BIA Regulated Community Coalition cited a recent court decision that they assert calls into question several findings, including Findings 3 and 15. Clean Water Now supported the BIA Regulated Community Coalition concerns and also alluded to court decisions that call into question several findings. In both cases, the commenters requested that the Tentative Order be delayed until a definitive interpretation of the legal decisions is made available.	**Building Industry / Industry** BIA Regulated Community Coalition **Copermittees** Riverside County Copermittees San Diego County Copermittees **Environmental Organizations** Clean Water Now
	RESPONSE: The San Diego Water Board disagrees that there is any inconsistency with the requirements of the Clean Water Act, or that the adoption of the Tentative Order should be delayed. Comments received assert that the "plain language" of the Clean Water Act states that the MEP standard applies to all pollutants discharged from the MS4, not just pollutants in storm water. The commenter, however, fails to acknowledge the "plain language" of the Clean Water Act that specifically makes a clear distinction that non-storm water discharges are to be effectively prohibited from entering the MS4. Since the "plain language" of the Clean Water Act states that non-storm water discharges to the MS4 are to be effectively prohibited (CWA section 402(p)(3)(B)(ii)), then no pollutants in non-storm water will enter the MS4 if the discharger is in compliance with this requirement. If no pollutants are entering the MS4 because non-storm water discharges are not entering the MS4, then clearly the very next requirement to control pollutant discharges from the MS4 be reduced to the MEP (CWA section 402(p)(3)(B)(iii)) intends that the discharge of pollutants only apply to storm water. Provisions A.1.b and A.3.a are consistent with CWA section 402(p)(3)(B)(ii) and CWA section 402(p)(3)(B)(iii), respectively, and the Fact Sheet further clarifies this distinction between non-storm water discharges and pollutants in storm water discharges. Findings 3 and 15 are consistent with the Clean Water Act have not be modified. The United States Supreme Court decision, *Los Angeles County Flood Control v. Natural Resources Defense Council* (2013) 133 S.Ct. 710 does not require any modifications to the Tentative Order.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

Fnd-4	FINDINGS	
	COMMENT: *Finding 7: Finding should be modified to support construction of BMPs in receiving waters.* The BIA Regulated Community Coalition submitted comments requesting revisions to Finding 7 to support the construction of BMPs in receiving waters. The commenter is concerned that the Tentative Order will not allow the construction of BMPs, or implementation of retrofitting or rehabilitation projects in waters of the U.S. or waters of the state to treat pollutants in storm water from areas of existing development. The commenter also requested a revision to Provision E.3.a.(1)(b) to reflect the requested revision to Finding 7.	**Building Industry / Industry** BIA Regulated Community Coalition
	RESPONSE: The San Diego Water Board disagrees revisions to Finding 7 are appropriate or necessary. Finding 7 correctly provides that pursuant to federal regulations under 40 CFR 131.10(a) waste transport or waste assimilation cannot be a designated use for any waters of the U.S. Thus, waters of the U.S. cannot be utilized for the treatment of pollutants in storm water discharges from the MS4s, and treatment control BMPs must not be constructed in waters of the U.S. to treat pollutants in storm water discharges from the MS4s. Finding 7 does not, however, include construction of BMPs for the treatment of pollutants in waters of the state. Thus, the San Diego Water Board has revised Provision E.3.a.(1)(b) to limit the prohibition of constructing structural BMPs in only waters of the U.S. consistent with 40 CFR 131.10(a).	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

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Fnd-5	FINDINGS	
	COMMENT: *Findings 8, 16 and 17: Findings should not include presumption that discharges from MS4s always contain waste or pollutants.* The Orange County and San Diego County Copermittees objected to Finding 8 stating that discharges from the MS4s contain waste, and does not acknowledge that there may not be pollutants in the discharges from the MS4s. The Copermittees requested revisions to Findings 8, 16 and 17 to reflect this position. The BIA Regulated Community Coalition cited a recent court decision that they assert calls into question several findings, including Finding 8. Clean Water Now supported the BIA Regulated Community Coalition concerns and also alluded to court decisions that call into question several findings. In both cases, the commenters requested that the Tentative Order be delayed until a definitive interpretation of the legal decisions is made available. In contrast, the Los Penasquitos Lagoon Foundation recommended that Finding 8 should also acknowledge pollutant discharges that are caused as a result of discharges from the MS4s (e.g. sediment discharged due to scouring of the receiving waters).	**Building Industry / Industry** BIA Regulated Community Coalition **Copermittees** Orange County Copermittees San Diego County Copermittees **Environmental Organizations** Clean Water Now Los Penasquitos Lagoon Foundation
	RESPONSE: The San Diego Water Board disagrees that Findings 8, 16, or 17 are inaccurate, or that the adoption of the Tentative Order should be delayed. The Tentative Order is implementing the requirements of the California Water Code as well as the requirements of the Clean Water Act. Under the California Water Code section 13376, any person discharging waste, or proposing to discharge wastes to waters of the state is not authorized to discharge waste unless issued waste discharge requirements. The requirements of the Clean Water Act, specific to discharges of pollutants to waters of the U.S. are also included in the California Water Code, Chapter 5.5 of Division 7. Thus, under the California Water Code, any person discharging pollutants, or proposing to discharge pollutants to waters of the U.S. is not authorized to discharge pollutants unless issued waste discharge requirements that include NPDES requirements. Waste discharge requirements that include NPDES requirements is also an NPDES permit under the Clean Water Act. The Clean Water Act requires municipalities to obtain NPDES permits to authorize discharges of pollutants from their MS4s. Commenters cite the definition of “waste” in the California Water Code to assert that the definition does not include storm water or any discharge that is not created by human activity. Comments received also assert that	

Fnd-5	FINDINGS	
	waste discharge requirements and NPDES permits cannot regulate the discharge of "pure storm water" and that not all discharges from the MS4 contain pollutants. Discharges from the MS4 are not "pure storm water." Storm water that flows over the surface of any developed area, which includes the MS4 itself, do not enter or discharge from the MS4 without coming into contact with pollutants or constituents that alter the storm water such that it is no longer "pure storm water." Thus, storm water discharges from the MS4 contains pollutants and contain waste. It is well-known and documented that urban runoff and storm water contains pollutants. (See, e.g., State Water Board Order WQ 2001-015 ("As we stated in Board Order WQ 95-2, the requirement to adopt permits for urban runoff is undisputed, and Regional Water Boards are not required to obtain any information on the impacts of runoff prior to issuing a permit (citation). It is also undisputed that urban runoff contains 'waste' within the meaning of Water code section 13050(d), and that the federal regulations define 'discharge of a polltuant' to include 'additions of pollutants into waters of the United States from surface runoff which is collected or channeled by man.' (40 C.F.R. § 122.2.) But it is the waste or pollutants in the runoff that meet these definitions of 'waste' and 'pollutant.' And not the runoff itself. [fn]. (p. 5.)) The Tentative Order is not regulating "pure storm water" but the discharge of storm water that is being discharged as a waste and contains pollutants. Finding 8 accurately states that discharges from the MS4s contain waste, as defined in the California Water Code. Finding 8 also accurately states that discharges from the MS4s contain pollutants that adversely affect the quality of waters of the state. Findings 16 and 17 also accurately conclude that BMPs and implementation of BMPs are necessary to remove waste and pollutants in storm water discharges from the MS4s. The San Diego Water Board does not understand the comments concerning the recent United States Supreme Court decision in Los Angeles County Flood Control District v. NRDC (133 S.Ct 710 (2013). The San Diego Water Board has reviewed the opinion and does not believe the opinion necessitates any changes to the Tentative Order.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

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Fnd-6	FINDINGS	
	COMMENT: *Finding 10: Finding should be modified to specify linear underground projects (LUPs) should not be subject to permanent post construction BMP requirements.* San Diego Gas and Electric and the Southern California Gas Company each submitted comments requesting revisions to Finding 10 to specify that linear underground/overhead (utility) projects (LUPs) are not subject to post construction requirements to be consistent with the State Water Board Construction General Permit findings.	**Building Industry / Industry** San Diego Gas and Electric Southern California Gas Company
	RESPONSE: The San Diego Water Board disagrees that revisions to Finding 10 are appropriate or necessary. Finding 10 accurately states that pollutants are generated by land development. Finding 10 discusses the generation of pollutants by land development in broad and general terms, and does not specify types of land development activities. Incorporating language into Finding 10 specific to LUPs is inappropriate and not necessary.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

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Fnd-7	FINDINGS	
	COMMENT: *Finding 11: Finding should not classify natural waters as part of the MS4, and cannot be classified as both an MS4 and receiving water.* The Orange County, Riverside County, and San Diego County Copermittees each submitted comments asserting that Finding 11 was inaccurate and the San Diego Water Board cannot classify natural waters as part of the MS4. The BIA Regulated Community Coalition cited a recent court decision that they assert calls into question several findings, including Finding 11. Clean Water Now supported the BIA Regulated Community Coalition concerns and also alluded to court decisions that call into question several findings. In both cases, the commenters requested that the Tentative Order be delayed until a definitive interpretation of the legal decisions is made available. In contrast, the Los Penasquitos Lagoon Foundation recommended that the language of Finding 11 should be maintained.	**Building Industry / Industry** BIA Regulated Community Coalition **Copermittees** Orange County Copermittees Riverside County Copermittees San Diego County Copermittees **Environmental Organizations** Clean Water Now Los Penasquitos Lagoon Foundation
	RESPONSE: The San Diego Water Board disagrees that Finding 11 is inaccurate, or that the adoption of the Tentative Order should be delayed. An MS4 is defined in the federal regulations as a conveyance or system of conveyances owned or operated by a Copermittee, and designed or used for collecting or conveying runoff. Therefore, the San Diego Water Board considers natural drainages that are used by the Copermittees as conveyances of runoff, as both part of the MS4 and as receiving waters. The State Water Board supports this approach. In reviewing a Petition on Order No. R9-2001-0001, the State Water Board stated "*We also agree with the Regional Water Board's concern, as stated in its response, that there may be instances where MS4s use 'waters of the United States as part of their sewer system* [...]" State Water Resources Control Board Order WQ 2001-15. Furthermore, the U.S. Supreme Court's 2006 *Rapanos* decision supports the conclusion that natural streams in developed areas can be both receiving waters and MS4s by confirming that ephemeral and intermittent streams can be waters of the U.S. subject to regulation under Clean Water Act section 404 and also be considered point sources of pollution discharges regulated under Clean Water Act section 402. (See *Rapanos, et al. v. United*	

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Fnd-7	FINDINGS	
	States and Carabell et al. v. United States Army Corps of Engineers, et al. (2006) 547 U.S. 715, 743-744.) Finding 11 is accurate and consistent with the Clean Water Act and NPDES regulations.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

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Fnd-8	FINDINGS	
	COMMENT: *Finding 12: Finding should not state that Copermittees provide free and open access to MS4s; Copermittees are not responsible for all discharges not prohibited.* The Orange County and Riverside County Copermittees each submitted comments objecting to Finding 12 stating that the Copermittees provide free and open access to MS4s. The Riverside County Copermittees also objected to Finding 12 stating that the Copermittees cannot passively receive and discharge pollutants from third parties. The Copermittees assert that they are not responsible for discharges from their MS4s that are from third parties that are subject to the jurisdiction of the San Diego Water Board.	**Copermittees** Orange County Copermittees Riverside County Copermittees
	RESPONSE: The San Diego Water Board disagrees that Finding 12 is inaccurate. The Copermittees have the option to request the authority to discharge from their MS4s under an NPDES permit or comply with the complete prohibition against the discharge of pollutants pursuant to Clean Water Act section 301(a) (33 U.S.C. § 1311(a)). These choices are provided by the federal Clean Water Act, not state laws. The Copermittees have opted to discharge from their MS4s under an NPDES permit. In doing so, they are responsible for discharges from the MS4s. Thus, Finding 12 correctly provides that the Copermittees provide free and open access to their MS4s and they are responsible for discharges into the MS4 that they do not prohibit or otherwise control. Finding 12 also correctly provides that the Copermittees cannot passively receive and discharge pollutants from third parties. The Copermittees have the responsibility of identifying the sources of discharges and pollutants from their MS4s. If the Copermittees are not actively identifying sources and cannot identify sources of discharges and pollutants to and from their MS4s, then the Copermittees are the source of the MS4s discharges and pollutants to receiving waters, even if they believe third parties are responsible for the discharges and pollutants. If, however, the Copermittees identify the sources of discharges and pollutants to or from the MS4s as outside of their legal authority to prohibit or otherwise control, then they are not passively receiving and discharging pollutants, even if they are providing free and open access to the MS4s. The data and information that the Copermittees collect to identify the third party sources can provide the evidence that the Copermittees are not responsible for the discharges and pollutants from the MS4s that can be attributed to third parties. Until the data and information are provided to identify those third parties, and demonstrate those parties are not subject to the Copermittees' legal authority, then the Copermittees are responsible for all of the discharges to and from their MS4s unless such discharges are authorized by a separate NPDES permit.	

Fnd-9: *Finding 15: Finding should state that the maximum extent practicable standard applies to both non-storm water and storm water, not just storm water.*

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Fnd-9	FINDINGS	
	COMMENT: *Finding 15: Finding should state that the maximum extent practicable standard applies to both non-storm water and storm water, not just storm water.* The Orange County, Riverside County and San Diego County Copermittees each submitted comments that assert Finding 15 is inaccurate. The Copermittees assert that the Tentative Order is inconsistent with the Clean Water Act and the MEP standard applies to both non-storm and water storm water, not just storm water. The BIA Regulated Community Coalition cited a recent court decision that they assert calls into question several findings, including Finding 15. Clean Water Now supported the BIA Regulated Community Coalition concerns and also alluded to court decisions that call into question several findings. In both cases, the commenters requested that the Tentative Order be delayed until a definitive interpretation of the legal decisions is made available. San Diego Gas and Electric and the Southern California Gas Company each submitted comments requesting revisions to Finding 15 to clarify that non-storm water discharge authorized by a NPDES permit are authorized to be discharged to the MS4s.	**Building Industry / Industry** BIA Regulated Community Coalition San Diego Gas and Electric Southern California Gas Company **Copermittees** Orange County Copermittees Riverside County Copermittees San Diego County Copermittees **Environmental Organizations** Clean Water Now
	RESPONSE: The San Diego Water Board disagrees that the MEP standard applies to both non-storm water and storm water. The San Diego Water Board also disagrees that Finding 15 should be revised. Finding 15 accurately states the requirements of the Clean Water Act. The San Diego Water Board maintains that MEP standard only applies to pollutants in storm water. The San Diego Water Board also maintains that Finding 15 does not need to be clarified to state that non-storm water discharge authorized by a NPDES permit are authorized to be discharged to the MS4s. Please see the responses to comments Fnd-3 and Fnd-8, and also see Memorandum from San Diego Water Board Counsel to San Diego Water Board dated 5 November 2009, incorporated by reference herein.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

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Fnd-10	FINDINGS	
	COMMENT: *Finding 27: Finding should state that implementation of the requirements of the Tentative Order "will" not "may" allow the San Diego Water Board to re-categorize impaired water bodies to Category 4 in the Integrated Report.* The San Diego County Copermittees requested that Finding 27 be revised to state that the requirements of the Tentative Order "will" allow the San Diego Water Board to re-categorize impaired water bodies to Category 4 in the Integrated Report, as opposed to only "may" allow the re-categorization.	**Copermittees** San Diego County Copermittees
	RESPONSE: The San Diego Water Board disagrees that revising Finding 27 is appropriate. Finding 27 is accurate to state that the implementation of the Water Quality Improvement Plan "may" allow the San Diego Water Board to re-categorize an impaired water body in Category 4 in the Integrated Report meaning a TMDL is not required. The Integrated Report is ultimately approved by the USEPA. The USEPA may not allow the San Diego Water Board to re-categorize an impaired water body from Category 5 (i.e. TMDL required) to Category 4 (i.e. TMDL not required) if they do not agree that the implementation of the requirements of the Tentative Order will result in attainment of the water quality standards.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

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Fnd-11	FINDINGS	
	COMMENT: *Finding 28: Finding should state that the requirements of the Tentative Order are more stringent than Federal law and require a CWC 13241 analysis.* The Orange County and Riverside County Copermittees each submitted comments objecting to Finding 28. The Copermittees assert that several requirements of the Tentative Order go beyond the requirements of Federal law, thus an analysis pursuant to California Water code section 13241 is required. The Copermittees make several assertions about the deficiencies they perceive with the economic considerations discussed in the Fact Sheet. The Copermittees assert that a cost-benefit analysis needs to be included in the Fact Sheet discussion. The BIA Regulated Community Coalition cited a recent court decision that they assert calls into question several findings, including Finding 28. Clean Water Now supported the BIA Regulated Community Coalition concerns and also alluded to court decisions that call into question several findings. In both cases, the commenters requested that the Tentative Order be delayed until a definitive interpretation of the legal decisions is made available.	**Building Industry / Industry** BIA Regulated Community Coalition **Copermittees** Orange County Copermittees Riverside County Copermittees **Environmental Organizations** Clean Water Now
	RESPONSE: The San Diego Water Board disagrees that provisions of the Tentative Order go beyond the requirements of the Clean Water Act or Code of Federal Regulations, or that the adoption of the Tentative Order should be delayed. The San Diego Water Board considered economic information in developing the Tentative Order using the best available information, but did not do so in accordance with an analysis pursuant to California Water code section 13241. The provisions of the Tentative Order are based on and fully supported by federal requirements, as demonstrated by the legal authority provided by the Clean Water Act and Code of Federal Regulations sections cited in the Fact Sheet. Thus, the San Diego Water Board maintains that an analysis pursuant to California Water code section 13241 is not required. Federal NPDES regulations do not require that the San Diego Water Board conduct a cost-benefit analysis. Please also see response to comment Lgl-6.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

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Fnd-12	FINDINGS	
	COMMENT: *Finding 29: San Diego Water Board cannot determine what is a state mandate.* The Orange County, Riverside County and San Diego County Copermittees each submitted comments objecting to Finding 29 generally asserting that the San Diego Water Board does not have the legal authority to determine whether any provisions in the Tentative Order constitute a state mandate, and only the Commission on State Mandates can make the determination. The County of San Diego also submitted a similar comment.	**Copermittees** County of San Diego Orange County Copermittees Riverside County Copermittees San Diego County Copermittees
	RESPONSE: The San Diego Water Board agrees that the Commission on State Mandates ultimately has jurisdiction to determine that a provision in the Tentative Order constitutes a state mandate. Finding 29 is, nonetheless, appropriate and necessary to express and support the San Diego Water Board's position that the Tentative Order is the result of a federal and not a state mandate. Please see the response to comment Lgl-7.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

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Fnd-13	FINDINGS	
	COMMENT: *Finding 31: Finding should support implementation of the iterative process to comply with prohibitions and limitations.* The Riverside County Copermittees submitted a comment related to Finding 31 requesting that the Tentative Order be revised to support the iterative process as a means to comply with the discharge prohibitions and receiving water limitations of Provision A. The Copermittees did not request or recommend any revisions to Finding 31, but requested revisions to Provision A to support implementation of the iterative process to comply with the discharge prohibitions and receiving water limitations.	**Copermittees** Riverside County Copermittees
	RESPONSE: The San Diego Water Board agrees that implementation of the iterative process is necessary to achieve compliance with the discharge prohibitions and receiving water limitations of Provision A. The San Diego Water Board did not make any revisions to Finding 31 or Provision A as requested by the commenter. The San Diego Water Board did, however, include an option as part of the Water Quality Improvement Plan requirements that each Copermittee may choose to implement to demonstrate compliance with the discharge prohibitions and receiving water limitations of Provision A. Please see response to comment A-1.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

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Fnd-14	FINDINGS	
	COMMENT: *Finding 32: Finding should clarify that NPDES permitted discharges to MS4s that discharge to ASBS are authorized.* San Diego Gas and Electric and Southern California Gas Company requested modifications to Finding 32 to specify that the San Diego Water Board finds that NPDES-permitted discharges to the MS4 that subsequently discharge to ASBS will not alter ocean water quality and the Tentative Order authorizes these NPDES-permitted discharges. The commenters are concerned that the Tentative Order does not clearly state that NPDES permitted discharges to the Copermittees' MS4s that then discharge to ASBS are authorized. The BIA Regulated Community Coalition cited a recent court decision that they assert calls into question several findings, including Finding 32. Clean Water Now supported the BIA Regulated Community Coalition concerns and also alluded to court decisions that call into question several findings. In both cases, the commenters requested that the Tentative Order be delayed until a definitive interpretation of the legal decisions is made available.	**Building Industry / Industry** BIA Regulated Community Coalition San Diego Gas and Electric Southern California Gas Company **Environmental Organizations** Clean Water Now
	RESPONSE: The San Diego Water Board disagrees that revisions to Finding 32 are appropriate or necessary, or that the adoption of the Tentative Order should be delayed. The Tentative Order requires discharges from the Copermittees' MS4 to be consistent with the requirements of Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 (Special Protections). The Tentative Order includes provisions that apply to the Copermittees' MS4 discharges to ASBS, thus the Copermittees are subject to the requirements of the Special Protections. Incorporating the requested language into Finding 32 to find that the San Diego Water Board authorizes discharges of other NPDES-permitted discharges to the MS4 is inappropriate and not necessary.	

PROVISION A: PROHIBITIONS AND LIMITATIONS
A-1: *Revise Provision A to clarify how compliance with prohibitions and limitations can be achieved.*

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A-1	PROVISION A: PROHIBITIONS AND LIMITATIONS	
	COMMENT: *Revise Provision A to clarify how compliance with prohibitions and limitations can be achieved*. The Orange County, Riverside County and San Diego County Copermittees each submitted comments requesting that the requirements of Provision A be modified to provide a clear linkage between the prohibitions and limitations of Provisions A.1 to A.3 with the iterative process required under Provision A.4 to be demonstrated through the implementation of the Water Quality Improvement Plans. The Copermittees are concerned that the language of Provision A, if not modified, will be interpreted as requiring strict and immediate compliance with the prohibitions and limitations, and the implementation of the iterative process would not be enough the demonstrate compliance with the prohibitions and limitations. Among the many recommended modifications to the requirements of Provision A, the Copermittees are generally requesting that the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c and A.2.a specifically state that implementation of Provision A.4 constitutes compliance. Furthermore, the Copermittees have requested that Provision A.4 explicitly state that the implementation of the iterative process constitutes compliance with any of the prohibitions and limitations under Provision A.1 to A.3, including compliance with the effective prohibitions of non-storm water discharges to the MS4s, the special protections for ASBS, and the TMDL requirements. Many Copermittees submitted separate comments in support of the requested modifications. One commenter from the Building Industry also requested similar modifications to the requirements of Provision A. In contrast, commenters from Environmental Organizations were strongly in support of maintaining the existing language and asserted that modifications to Provision A that would "weaken" the requirements, or provide "safe harbor" and would violate federal anti-backsliding requirements.	**Building Industry / Industry** BIA Regulated Community Coalition **Copermittees** City of Del Mar City of Imperial Beach City of Laguna Hills City of Lake Forest City of Mission Viejo City of Rancho Santa Margarita City of San Diego City of San Juan Capistrano County of San Diego County of San Diego Office of County Counsel Orange County Copermittees Riverside County Copermittees San Diego County Copermittees San Diego Unified Port District / Brown and Winters **Environmental Organizations** Environmental Groups Natural Resources Defense Council
	RESPONSE: The San Diego Water Board agrees with the comments from the Copermittees and their supporters, as well as the Environmental Organizations. The San Diego Water Board understands the concerns that the Copermittees have expressed regarding the requirements of Provision A and the apparent lack of a linkage between the iterative process under Provision A.4 and the strict compliance with the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c and A.2.a. This language, however, is consistent with the precedential language that was issued under State Water Board Order WQ-1999-05 and has been implemented in all MS4 permits issued by the San Diego Water Board since 2001. The State Water Board has not issued an order or taken other action to supersede the	

A-1	PROVISION A: PROHIBITIONS AND LIMITATIONS	
	precedential language. Under the Porter-Cologne Water Quality Control Act, waste discharge requirements must implement applicable water quality control plans, including water quality objectives. The discharge prohibitions and receiving water limitations of Provision A.1.a, A.1.c and A.2.a are consistent with this requirement, and are included in all NPDES permits and Waste Discharge Requirements issued by the San Diego Water Board. These are the fundamental requirements that protect water quality by ensuring that discharges comply with applicable water quality standards to ensire protection of receving water benficial uses. The San Diego Water Board does recognize an increasing body of monitoring data indicates that water quality standards are in fact not being met by many of the Copermitees' MS4 discharges. The San Diego Water Board has as a matter of practice chosen not to enforce the discharge prohibitions and receiving water limitations of Provision A.1.a, A.1.c or A.2.a if the Copermittees are actively engaged in implementing the other requirements of the MS4 permit. The focus of the previous MS4 permits and the San Diego Water Board has been on compliance with implementation of the actions required by the permit, rather than the water quality outcomes that are expected to be achieved. The San Diego Water Board has initiated enforcement against the Copermittees on several occasions for noncompliance with permit requirements. As noted by the Copermittees, however, the approach of the Tentative Order is a significant departure from the approach of previous MS4 permits. Previous MS4 permits did not provide the Copermittees enough flexibility to truly implement an iterative process to adaptively manage their programs to identify innovative new ways to improve the quality of discharges from their MS4s or in the receiving waters, because the actions required by the permit were relatively fixed and prescriptive. In contrast, the Tentative Order is structured to allow the Copermittees to take advantage of the iterative process and adaptively manage their programs to focus on achieving outcomes. The Tentative Order has been revised to provde an optional pathaway for the Copermittees to demonstrate compliance with the discharge prohibitions and receiving water limitations of Provision A.1.a, A.1.c or A.2.a through implementation of technically supported iterative and adaptive management processes applicable to specific pollutant/waterbodiy combinations. The appropriate location in the Tentative Order for providing this "compliance mechanism," however, is not under Provision A. Instead, the appropriate location is under Provision B. Under the requirements of Provision B for the development of the Water Quality Improvement Plans, the San Diego Water Board has added Provision B.3.c. Provision B.3.c explicitly provides that a Copermittee will be in compliance with the requirements of Provision A.1.a, A.1.c and A.2.a if a specific set of	

A-1	PROVISION A: PROHIBITIONS AND LIMITATIONS	
	requirements are incorporated and implemented as part of an accepted Water Quality Improvement Plan. Under this option, a Copermittee can demonstrate compliance with the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c and A.2.for specifc pollutant/waterbody combinations if the Water Quality Improvement Plan demonstrates through a robust technical analysis that the water quality improvement strategies the Copermittee plans on implementing will achieve applicable water quality stand based numeric goals by a certain date. The implementation must be verified through monitoring and assessments, and the goals, strategies and schedules in the plan can be adjusted accordingly based on those results. The more specific planning, implementation, monitoring and assessment program required under Provision B.3.c, combined with a clear set of numeric goals, strategies, and schedules that the Copermittee demonstrates will achieve compliance through, becomes the iterative and adaptive management process that the San Diego Water Board may accept as being in compliance with Provisions A.1.a, A.1.c and A.2.a, as well as Provision A.4. As recommended by the Environmental Organizations, the San Diego Water Board did not revise Provisions A.1.a, A.1.c, A.2.a and A.4, and the language of Provision A remains consistent with State Water Board Order WQ 1999-05. The addition of Provision B.3.c provides the linkage for compliance with the discharge prohibitions and receiving water limitations through the iterative process that the Copermittees and their supporters requested. The San Diego Water Board did modify Provision A.1.b to clarify how to demonstrate compliance with the effective prohibition of non-storm water discharges to the MS4s. The San Diego Water Board recognizes that the effective prohibition of non-storm water discharges to the MS4 is specifically required by the federal regulations to be achieved through the implementation of an illicit discharge detection and elimination program as specified under 40CFR122.26(d)(2)(iv)(B). Provision A.1.b has been revised to refer to Provision E.2, which is the illicit discharge detection and elimination program requirements that must be implemented by each Copermittee within its jurisdiction to effectively prohibit non-storm water discharges to its MS4. As for the requests to modify the requirements of Provision A to allow the Copermittees to utilize the Water Quality Improvement Plan to demonstrate compliance with the other requirements of Provision A pertaining to the special protections for ASBS and the TMDL requirements, the San Diego Water Board generally did not agree to modify the requirements as requested.	

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A-1	PROVISION A: PROHIBITIONS AND LIMITATIONS	
	The linkage for compliance with the ASBS requirements is provided under Provision A.1.d. Provision A.1.d specifies that discharges from MS4s to ASBS are authorized subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012. The provisions of the Special Protections are provided in Attachment A to the Order for easy reference, but the Special Protections are actually part of the Ocean Plan. The requirements for the Water Quality Improvement Plan take into account the requirements for the Special Protections. The development and implementation of the Water Quality Improvement Plans should allow the Copermittees that discharge to ASBS to demonstrate that they are in compliance with the Special Protections. As for the linkage for compliance with the TMDL requirements, the linkage is provided under Provision A.3.b. The Copermittees are required to comply with the WQBELs for the TMDLs in Attachment E. The requirements for the Water Quality Improvement Plan take into account the requirements for the TMDLs. The requirements of the TMDLs in Attachment E must be incorporated into the Water Quality Improvement Plan. The development and implementation of the Water Quality Improvement Plans should allow the Copermittees subject to TMDL requirements to demonstrate that they are in compliance with the WQBELs.	

A-2: The maximum extent practicable (MEP) standard applies to both non-storm water and storm water.

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A-2	PROVISION A: PROHIBITIONS AND LIMITATIONS	
	COMMENT: *The maximum extent practicable (MEP) standard applies to both non-storm water and storm water.* The Riverside County Copermittees submitted comments asserting that the MEP standard of the Clean Water Act and federal regulations applies to reducing pollutants in non-storm water discharges as well as in storm water discharges. Accordingly, non-storm water discharges are authorized to be discharged if pollutants in non-storm water are reduced to the MEP. The Riverside County Copermittees requested that the language be revised to reflect this concept throughout the Tentative Order. In contrast, the Natural Resources Defense Council (NRDC) submitted comments that the non-storm water action levels (NALs) in the permit may contradict the effective prohibition of non-storm water discharges to the MS4. The NRDC is concerned that stating that the NALs are not considered by the San Diego Water Board to be enforceable limitations could be interpreted as an authorization for discharges of non-storm water, which would be in conflict with the effective prohibition requirements of the Clean Water Act for non-storm water discharges to the MS4.	**Copermittees** Riverside County Copermittees **Environmental Organizations** Natural Resources Defense Council
	RESPONSE: The San Diego Water Board disagrees that the MEP standard applies to both non-storm water and storm water. Building on the effective prohibition against non-storm water discharges, the Clean Water Act requirement to reduce pollutants discharged from the MS4 to the MEP standard necessarily is limited to storm water discharges. (See Attachment 1 November 5, 2009 Memorandum from San Diego Water Board Counsel, Non-Storm Water Discharges) The San Diego Water Board disagrees that including the NALs in the permit may contradict the effective prohibition of non-storm water discharges to the MS4. Please see the responses to comments Fnd-3 and C-1.	

A-3: *The Copermittees should only be subject to "applicable" prohibitions and water quality standards in the Basin Plan, plans and policies.*

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A-3	PROVISION A: PROHIBITIONS AND LIMITATIONS	
	COMMENT: *The Copermittees should only be subject to "applicable" prohibitions and water quality standards in the Basin Plan, plans and policies.* The Riverside County Copermittees are concerned that there are prohibitions and water quality standards included in Provisions A.1.c and A.2.a that do not apply to their jurisdictions. Thus those prohibitions or water quality standards should be deleted or clarified to state that they are only applicable if those discharges or water bodies are within their jurisdictions.	**Copermittees** Riverside County Copermittees
	RESPONSE: The San Diego Water Board does not agree that it is necessary to delete or clarify any of the requirements under Provisions A.1.c or A.2.a. If there are discharge prohibitions that are not applicable, then there should not be any violations of those discharge prohibitions. Likewise, if there are water quality standards that are not applicable, there should not be any violations of those water quality standards. If, however, any of those prohibitions or water quality standards is applicable, the Copermittees are required to comply or demonstrate compliance with those prohibitions and water quality standards.	

PROVISION A.1: Discharge Prohibitions
A1-1: *MS4 discharges to environmentally sensitive area (ESA) shellfish habitat should be prohibited.*

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A1-1	PROVISION A.1: Discharge Prohibitions	
	COMMENT: *MS4 discharges to environmentally sensitive area (ESA) shellfish habitat should be prohibited.* The South Laguna Civic Association commented that dry weather discharges and elevated storm water flows are incompatible with the protection of ESA shellfish habitat and should be vigorously regulated and prohibited in the Tentative Order.	**Environmental Organizations** South Laguna Civic Association
	RESPONSE: The San Diego Water Board agrees that dry weather discharges and storm water flows should be regulated to protect ESA shellfish habitats. Provision A.1.a prohibits discharges from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the state. Provision A.2.c requires that discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters. And, specifically for dry weather discharges, Provision A.1.b requires the Copermittees to effectively prohibit non-storm water discharges to the MS4s. Thus, the Tentative Order includes requirements for MS4 discharges that are protective of ESAs.	

A1-2: *Specify that NPDES permitted discharges to MS4s discharging to ASBS are authorized.*

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A1-2	PROVISION A.1: Discharge Prohibitions	
	COMMENT: *Specify that NPDES permitted discharges to MS4s discharging to ASBS are authorized.* San Diego Gas and Electric and Southern California Gas Company requested modifications to Provision A.1.d to specify that storm water and non-storm water discharges from the Copermittees MS4s from ASBS "made pursuant to NPDES permit" are authorized under the Tentative Order. The commenters are concerned that the Tentative Order does not clearly state that NPDES permitted discharges to the Copermittees' MS4s that then discharge to ASBS are authorized.	**Building Industry / Industry** San Diego Gas and Electric Southern California Gas Company
	RESPONSE: The San Diego Water Board disagrees that it is necessary to revise Provision A.1.d. Provision A.1.d requires discharges from the Copermittees' MS4 to be consistent with the requirements of Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 (Special Protections). Provision A.1.d applies to the Copermittees' MS4 discharges to ASBS, thus the Copermittees are subject to the requirements of the Special Protections. If storm water and non-storm water discharges are authorized under an NPDES permit and discharged to a Copermittee's MS4, the Copermittee is responsible for identifying this NPDES permitted discharge to its MS4 that then discharges to ASBS. If the NPDES permitted discharge does not allow the Copermittees to be consistent with the requirements of the Special Protections, the Copermittees should notify the NPDES permitted discharger and/or the San Diego Water Board that the discharge must be brought into compliance with the requirements of the Special Protections. Additionally, please see the response to comment Fnd-14.	

PROVISION B: WATER QUALITY IMPROVEMENT PLANS
B-1: *Link compliance with prohibitions and limitations to development and implementation of Water Quality Improvement Plans.*

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

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B-1	PROVISION B: WATER QUALITY IMPROVEMENT PLANS	
	COMMENT: *Link compliance with prohibitions and limitations to development and implementation of Water Quality Improvement Plans.* The Orange County, Riverside County and San Diego County Copermittees each submitted comments requesting that they be allowed to utilize the development and implementation of the Water Quality Improvement Plans as a compliance mechanism for the prohibitions and limitations of Provisions A.1 to A.3. Several Copermittees submitted separate comments in support of the request. Comments submitted by the Environmental Groups were not in support of such an approach, but did support incorporating numeric goals into the Water Quality Improvement Plans that are based on water quality standards and using the Water Quality Improvement Plans to hold the Copermittees accountable for achieving the water quality standards.	**Copermittees** City of Del Mar City of Poway Orange County Copermittees Riverside County Copermittees San Diego County Copermittees San Diego Unified Port District **Environmental Organizations** Environmental Groups
	RESPONSE: The San Diego Water Board agrees with the comments from the Copermittees and the Environmental Organizations. The San Diego Water Board has added Provision B.3.c to provide a "pathway" to compliance with the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c and A.2.a. Please see the response to comment A-1. Several commenters indicated that including an analysis to demonstrate that the implementation of the water quality improvement strategies would achieve compliance with the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c and A.2.a is not necessary. The San Diego Water Board disagrees that the analysis is not necessary. Without the analysis, the San Diego Water Board would not be able to make a determination that the implementation of the water quality improvement strategies would result in the achievement of and compliance with Provisions A.1.a, A.1.c and A.2.a for specific pollutant /waterboady combinations. In addition, the required analysis provides another level of transparency that would allow the public to make a determination that the Copermittees are in fact implementing strategies that are making progress toward achieving the requirements of Provisions A.1.a, A.1.c and A.2.a. Thus, the analysis has been incorporated into the requirements of Provision B.3.c.	

B-2: *Support for the Water Quality Improvement Plan approach.*

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

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B-2	PROVISION B: WATER QUALITY IMPROVEMENT PLANS	
	COMMENT: *Support for the Water Quality Improvement Plan approach.* Comments were submitted by members of the Building Industry, Industry, the Copermittees, Environmental Organizations, Engineering/Design Consultants, Societies/Associations/Coalitions, and Other Entities generally supporting the approach in the Tentative Order to utilize the Water Quality Improvement development and implementation process as a more strategic, cost effective, holistic approach to improving water quality in the San Diego Region.	**Building Industry / Industry** American Society of Landscape Architects Associated General Contractors of America BIA Regulated Community Coalition Industrial Environmental Association Otay Land Company Otay Ranch New Homes **Copermittees** Orange County Copermittees Riverside County Copermittees San Diego Unified Port District **Environmental Organizations** The Escondido Creek Conservancy Friends of Rose Canyon Creek / Rose Creek Watershed Alliance Laguna Bluebelt Coalition San Diego Canyonlands San Elijo Lagoon Conservancy **Engineering/Design Consultants** Latitude 33 Planning and Engineering **Societies/Associations/Coalitions** BIOCOM San Diego Association of Realtors **Other Entities** Carol Crossman Continental Maritime of San Diego Curious Company Hector Valtierra Hughes Marino Marston+Marston, Inc. Nuffer, Smith, Tucker, Inc. San Diego Regional Chamber of Commerce Sheppard, Mullin, Richter & Hampton Southern Cross Property Consultants Transition IT
	RESPONSE: The San Diego Water Board appreciates the support expressed by the commenters for the Water Quality Improvement Plan and the more structured iterative and adaptive management process.	

B-3: *Ensure adequate public participation in the development and updating of the Water Quality Improvement Plans.*

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

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B-3	PROVISION B: WATER QUALITY IMPROVEMENT PLANS	
	COMMENT: *Ensure adequate public participation in the development and updating of the Water Quality Improvement Plans.* Comments were submitted by members of the Building Industry, Environmental Organizations, Engineering/Design Consultants, USEPA, Societies/Associations/Coalitions, and Other Entities requesting the requirements of the Tentative Order ensure that there is adequate public participation during the development of the Water Quality Improvement Plans. Comments from the Environmental Organizations, the San Diego Green Building Council, and a joint comment letter from San Diego Coastkeeper and the BIA, requested that the Tentative Order require the Copermittees to form a stakeholder advisory group with knowledge of the watersheds. The comments from the Environmental Groups recommending several additional requirements for public participation during the development of the Water Quality Improvement Plans, including: 1) Requiring the Copermittees to create a schedule for developing the Water Quality Improvement Plans, 2) Modifying the required formal public review requirements to occur after identifying priorities, after identifying strategies, and after identifying goals and assessment methods, 3) Requiring Water Quality Improvement Plans to be developed consecutively instead of concurrently, 4) Require approval of the Water Quality Improvement Plans at a public hearing, and 5) Require public participation during the adaptive management process.	**Building Industry / Industry** American Society of Landscape Architects Associated General Contractors of America BIA Regulated Community Coalition San Diego Green Building Council **Environmental Organizations** Environmental Groups The Escondido Creek Conservancy Friends of Rose Canyon Creek / Rose Creek Watershed Alliance Laguna Bluebelt Coalition Los Penasquitos Lagoon Foundation Natural Resources Defense Council San Diego Canyonlands San Diego Coastkeeper and BIA San Elijo Lagoon Conservancy **Engineering/Design Consultants** Latitude 33 Planning and Engineering **State/Federal Government** USEPA **Societies/Associations/Coalitions** BIOCOM San Diego Association of Realtors **Other Entities** Continental Maritime of San Diego Hector Valtierra Curious Company Carol Crossman Gable PR Marston+Marston, Inc. Nuffer, Smith, Tucker, Inc. San Diego Regional Chamber of Commerce Sheppard, Mullin, Richter & Hampton Southern Cross Property Consultants Transition IT
	RESPONSE: The San Diego Water Board agrees that the Tentative Order should ensure adequate public participation during the development and updating of the Water Quality Improvement Plans. The public participation requirements for the development and updates of the Water Quality Improvement Plan	

B-3	PROVISION B: WATER QUALITY IMPROVEMENT PLANS	
	are contained in Provisions F.1 and F.2.c. The San Diego Water Board has revised Provisions F.1 and F.2.c to include several of the elements into the public participation requirements as recommended by the commenters, and provide additional time for a robust public participation process to be included in the development of the Water Quality Improvement Plans. Provision F.1.a has been modified to include a set of public participation requirements for the development of the Water Quality Improvement Plan under Provision F.1.a.(1). Included in Provision F.1.a.(1) are requirements to: a) develop a publicly available and noticed schedule of the opportunities for the public to participate and provide comments during the development of the Water Quality Improvement Plan; b) form a Water Quality Improvement Consultation Panel that will consist of at least one San Diego Water Board staff, one representative of the environmental community, and one representative of the development community; and c) coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public as much time and opportunity as possible to participate during the development of the Water Quality Improvement Plans. The role of the Water Quality Improvement Consultation Panel is similar to the requested stakeholder advisory group, which will review the elements that the Copermittees propose to include in the Water Quality Improvement Plan after the public is provided an opportunity to provide data, information and recommendations for each element. The elements of the Water Quality Improvement Plan that require public review and comment remain the same, but have been revised and reorganized under Provisions F.1.a.(2) and F.1.a.(3). The Tentative Order required a public review of the priorities and goals and then a public review of the strategies and schedules. The revised Tentative Order has been modified to first require a public review of the priorities and potential water quality improvement strategies and then a review of the goals, strategies that Copermittees plan on implementing, and the schedules. In each case, the public will be provided an opportunity to provide data, information and recommendations and the Water Quality Improvement Consultation Panel will review the elements required to be developed with the Copermittees to provide recommendations or concurrence prior to submitting to the San Diego Water Board for a public review and comment period. Provisions B.2 and B.3 were also revised and reorganized to be consistent with revisions made to Provisions F.1.a.(2) and F.1.a.(3). Provision B.2.e was revised to require the Copermittees to identify the “potential” water quality improvement strategies that could be implemented to address the highest priority water quality conditions	

B-3	PROVISION B: WATER QUALITY IMPROVEMENT PLANS	
	identified by the Copermittees. The requirements for identifying numeric goals and schedules for achieving the goals were moved to Provision B.3. Thus the requirements of Provision B.2 will be subject to the public participation and development process requirements of Provision F.1.a.(2), and the requirements of Provision B.3 will be subject to the public participation and development process requirements of Provision F.1.a.(3). Provision F.1.b has also been revised to clarify the completed Water Quality Improvement Plan public review and acceptance process. The San Diego Water Board will make the determination if a public hearing to accept the Water Quality Improvement Plans will be required, or if public input will be limited to written comments. Provision F.1.b has been revised to clarify when the Water Quality Improvement Plans will be considered accepted. Finally, Provision F.2.c has been revised to clarify the requirements for public participation during the updates of the Water Quality Improvement Plans. The public will be provided an opportunity to provide data, information and recommendations and the Water Quality Improvement Consultation Panel will review the elements required to be developed with the Copermittees to provide recommendations or concurrence prior to submitting the requested updates to the San Diego Water Board.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

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B-4	PROVISION B: WATER QUALITY IMPROVEMENT PLANS	
	COMMENT: *Allow current permit requirements to remain in place until Water Quality Improvement Plans are developed.* Comments were submitted by members of the Building Industry, Engineering/Design Consultants, State Government, Societies/Associations/Coalitions, and Other Entities requesting the Tentative Order allow the requirements of the current permits to remain in place until the Water Quality Improvement Plans were developed. There was general concern that enforcement and implementation of the new requirements of the Tentative Order would preempt the Water Quality Improvement Plans before the Water Quality Improvement Plans had a chance to be developed.	**Building Industry / Industry** Associated General Contractors of America Otay Land Company Otay Ranch New Homes **Engineering/Design Consultants** Latitude 33 Planning and Engineering **State/Federal Government** Senator Mark Wyland **Societies/Associations/Coalitions** BIOCOM San Diego Association of Realtors **Other Entities** Continental Maritime of San Diego Carol Crossman Gable PR Hughes Marino Marston+Marston, Inc. Nuffer, Smith, Tucker, Inc. San Diego Regional Chamber of Commerce Sheppard, Mullin, Richter & Hampton Southern Cross Property Consultants Transition IT
	RESPONSE: The San Diego Water Board agrees that the jurisdictional runoff management program requirements should remain in place until the Water Quality Improvement Plans are developed and accepted by the San Diego Water Board. According to the second paragraph of the opening to Provision E, "*Until the Copermittee has updated its jurisdictional runoff management program document with the requirements of Provision E the Copermittee must continue implementing its current jurisdictional runoff management program*." Provision F.2.c does not require the jurisdictional runoff management program documents to be updated until 3 months after the acceptance of the Water Quality Improvement Plan. The Copermittees will be subject to requirements of Provision A (Prohibitions and Limitations), and responsible for implementing the requirements of Provision D (Monitoring and Assessment Program Requirements), Provision F (Reporting), and Attachment E (Specific Provisions for TMDLs) upon the effective date of the Tentative Order.	

B-5: *Adopt Water Quality Improvement Plans as Orders to implement the permit requirements.*

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B-5	PROVISION B: WATER QUALITY IMPROVEMENT PLANS	
	COMMENT: *Adopt Water Quality Improvement Plans as Orders to implement the requirements of the Tentative Order.* Comments were submitted by Engineering/Design Consultants, Societies/Associations/Coalitions, and Other Entities requesting that the San Diego Water Board adopt the Water Quality Improvement Plans as Orders to implement the requirements of the Tentative Order.	**Engineering/Design Consultants** Latitude 33 Planning and Engineering **Societies/Associations/Coalitions** BIOCOM San Diego Association of Realtors **Other Entities** Continental Maritime of San Diego Carol Crossman Gable PR Hughes Marino Marston+Marston, Inc. Nuffer, Smith, Tucker, Inc. San Diego Regional Chamber of Commerce Sheppard, Mullin, Richter & Hampton Southern Cross Property Consultants Transition IT
	RESPONSE: The San Diego Water Board disagrees with adopting the Water Quality Improvement Plans as Orders to implement the requirements of the Tentative Order. The Tentative Order, when adopted by the San Diego Water Board, is an Order issued to the Copermittees to implement the requirements of the Clean Water Act and Code of Federal Regulations. The Tentative Order includes specific requirements that must be included in the Water Quality Improvement Plans, which are to be developed by the Copermittees. The Water Quality Improvement Plans themselves, therefore, cannot and should not be adopted as Orders issued by the San Diego Water Board.	

B-6: *Align Water Quality Improvement Plan requirements with the Jurisdictional Runoff Management Program requirements.*

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

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B-6	PROVISION B: WATER QUALITY IMPROVEMENT PLANS	
	COMMENT*: Align Water Quality Improvement Plan requirements with the Jurisdictional Runoff Management Program requirements.* The Orange County, Riverside County and San Diego County Copermittees each submitted comments requesting that requirements in Provision E be allowed to be modified based on what is proposed in the Water Quality Improvement Plans. The Copermittees assert that the jurisdictional runoff management program requirements of Provision E are a "one size fits all" set of requirements, and the requirements of the Water Quality Improvement Plan become "additive" rather than "complimentary." Several Copermittees submitted separate comment letters supporting the concept by requesting the San Diego Water Board align the development and implementation of the Water Quality Improvement Plan better with the jurisdictional runoff management program requirements. The BIA Regulated Community Coalition also submitted comments supporting the concept. The Environmental Groups are concerned with the flexibility of the jurisdictional runoff management program requirements and commented that the Water Quality Improvement Plan should include a detailed list of activities and what activities each Copermittee will implement within its jurisdiction. The Environmental Groups are concerned that without this specificity in the Water Quality Improvement Plans, and the flexibility that is provided in the jurisdictional runoff management program requirements, would result in the burden of achieving water quality improvement within a watershed falling to only one or two Copermittees. The Environmental Groups would like to see a clearer commitment of what will be implemented by each Copermittee either in the Water Quality Improvement Plan or in the jurisdictional runoff management program documents for each Copermittee.	**Building Industry / Industry** BIA Regulated Community Coalition **Copermittees** City of Dana Point City of Laguna Hills City of Lake Forest City of Mission Viejo City of Rancho Santa Margarita City of San Juan Capistrano Orange County Copermittees Riverside County Copermittees San Diego County Copermittees **Environmental Organizations** Environmental Groups
	RESPONSE: The San Diego Water Board agrees that the Water Quality Improvement Plans and jurisdictional runoff management program requirements should be better aligned and clearly present the water quality improvement strategies that each Copermittee will implement within its jurisdiction. The San Diego Water Board does not agree that the jurisdictional runoff management program requirements of Provision E should be allowed to be modified by the Water Quality Improvement Plan. The revised Tentative Order requires the Copermittees to clearly present the water quality improvement strategies that each Copermittees will implement within its jurisdiction in the Water Quality Improvement Plan. Each Copermittee must incorporate the strategies that the Copermittee commits to implement, as identified in the Water Quality Improvement Plan, into its jurisdictional runoff management program document. Please see the response to comment E-1.	

B-7: *Recommendations for revisions to the introductory paragraph of Provision B.*

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B-7	PROVISION B: WATER QUALITY IMPROVEMENT PLANS	
	COMMENT: *Recommendations for revisions to the introductory paragraph of Provision B.* The Orange County, Riverside County and San Diego County Copermittees each submitted comments recommending revisions to the introductory paragraph under Provision B. The Copermittees recommended revising the goal statement to be focused more on MS4 discharges and not on receiving waters. The Copermittees also recommended adding a statement about the linkage between the Water Quality Improvement Plan and compliance with the prohibitions and limitations of Provision A.	**Copermittees** Orange County Copermittees Riverside County Copermittees San Diego County Copermittees
	RESPONSE: The San Diego Water Board disagrees with the recommended revisions to the introductory paragraph of Provision B. The recommended revisions by the Copermittees were not necessary and not appropriate for the introductory paragraph to Provision B. After considering the comments and recommendations from the Copermittees, however, the San Diego Water Board did make one minor revision to the introductory paragraph of Provision B. Please see the revised Tentative Order for the revision to the introductory paragraph to Provision B.	

PROVISION B.1: Watershed Management Areas
B1-1: *Allow San Diego County to use WURMP for the Santa Margarita River Watershed Management Area until the Riverside County Copermittees are covered under the Tentative Order.*

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

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B1-1	PROVISION B.1: Watershed Management Areas	
	COMMENT: *Allow San Diego County to use Watershed Urban Runoff Management Plan (WURMP) for the Santa Margarita River Watershed Management Area until the Riverside County Copermittees are covered under the Tentative Order.* The County of San Diego and the San Diego County Copermittees requested that the requirement to develop a Water Quality Improvement Plan for the Santa Margarita River Watershed Management Area be postponed until the Riverside County Copermittees become covered by the Tentative Order. The Riverside County Copermittees supported the request.	**Copermittees** County of San Diego Riverside County Copermittees San Diego County Copermittees
	RESPONSE: The San Diego Water Board agrees with the request. The San Diego Water Board has revised the footnote to Table B-1 to state that the County of San Diego is not required to develop a Water Quality Improvement Plan for the Santa Margarita River Watershed Management Area until the Riverside County Copermittees receive notification of coverage under the Tentative Order. Until then, the County of San Diego will be required to implement their jurisdictional runoff management program in conformance with the requirements of Order No. R9-2007-0001, and implement the transitional monitoring and assessment requirements of Provision D, the transitional reporting requirements of Provisions F.3.b, and the TMDL requirements in Attachment E.	

PROVISION B.2.e: Numeric Goals and Schedules
B2e-1: *Clearly state that numeric goals are enforceable or not enforceable limitations.*

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

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B2e-1	PROVISION B.2.e: Numeric Goals and Schedules	
	COMMENT: *Clearly state that numeric goals are enforceable or not enforceable limitations.* The Orange County, Riverside County and San Diego County Copermittees each submitted comments requesting that the Tentative Order specify that numeric goals are not enforceable limitations. In contrast, the USEPA recommended that the Tentative Order or Fact Sheet clarify that the numeric goals (and the schedule for attainment of the goals) would become enforceable requirements once the Water Quality Improvement Plans are accepted by the San Diego Water Board.	**Copermittees** Orange County Copermittees Riverside County Copermittees San Diego County Copermittees **State/Federal Government** USEPA
	RESPONSE: The San Diego Water Board disagrees that additional revisions are necessary to specify the numeric goals are not enforceable limitations. The San Diego Water Board agrees with the USEPA interpretation, but disagrees with the recommendation. The San Diego Water Board did not modify the language of Provision B.2.e (now Provision B.3.a.(1) in the revised Tentative Order) because the San Diego Water Board will utilize the numeric goals to determine if the Copermittees are making progress toward improving water quality. As part of the iterative and adaptive management process, the Copermittees are allowed to modify the numeric goals and the schedules for achieving the goals if the monitoring and assessments provide the rationale to do so. If, however, the Copermittees did not modify the numeric goals or the schedules to achieve the goals, and an interim or final goal was not achieved pursuant to the schedule, the San Diego Water Board would consider the failure to achieve the numeric goal a point of non-compliance. The non-compliance would include the failure to achieve the numeric goal within the schedule, the failure to implement the iterative and adaptive management process, and a demonstration that one or more prohibitions or limitations under Provision A have been violated. Thus, the numeric goals and schedules are enforceable.	

B2e-2: *Remove or modify the language for the 10 year limitation of the schedules to achieve numeric goals.*

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B2e-2	PROVISION B.2.e: Numeric Goals and Schedules	
	COMMENT: *Remove or modify the language for the 10 year limitation of the schedules to achieve numeric goals.* The Orange County and San Diego County Copermittees each submitted comments requesting modifications to the requirement to achieve the numeric goals within 10 years of the effective date of the Tentative Order. The Orange County Copermittees provided several reasons for removing the 10 year requirement. The San Diego County Copermittees requested that the Tentative Order clarify that the 10 year requirement be limited to achieving a goal that represents progress toward attainment of water quality standards.	**Copermittees** Orange County Copermittees San Diego County Copermittees
	RESPONSE: The San Diego Water Board agrees with the request to remove the requirement. The San Diego Water Board has removed the requirement that the Copermittees must include the final dates for achieving the numeric goals that do not initially extend more than 10 years beyond the effective date of the Tentative Order. In its place, the Copermittees must develop a schedule to achieve the numeric goals within a "reasonable period of time" that can be identified during the public participation process required for the development of the Water Quality Improvement Plans. The modifications are provided under Provision B.3.a.(2) of the revised Tentative Order.	

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B3-1	PROVISION B.3: Water Quality Improvement Strategies and Schedules	
	COMMENT*: Provide a mechanism for compliance with the prohibitions and limitations in Provision A through the Water Quality Improvement Plan.* The San Diego County Copermittees proposed modifications to the requirements of Provision B.3 to include a compliance mechanism that could be included in the Water Quality Improvement Plan to demonstrate compliance with the prohibitions and limitations in Provision A. The San Diego County Copermittees proposed including an option to perform a Reasonable Assurance Analysis to demonstrate that the water quality improvement strategies will attain discharge prohibitions, receiving water limitations, and effluent limitations. The San Diego Unified Port District submitted separate comments that did not support the inclusion of a compliance option utilizing the Water Quality Improvement Plan. The Orange County and Riverside County Copermittees supported the concept of allowing the Copermittees to demonstrate that the water quality improvement strategies in the Water Quality Improvement Plan will attain discharge prohibitions, receiving water limitations, and effluent limitations, but objected to requiring a Reasonable Assurance Analysis.	**Copermittees** Orange County Copermittees Riverside County Copermittees San Diego County Copermittees San Diego Unified Port District
	RESPONSE: The San Diego Water Board agrees with including an optional mechanism for compliance with the prohibitions and limitations in Provision A as part of Provision B.3. The San Diego Water Board has added Provision B.3.c as an optional mechanism that the Copermittees may utilize to demonstrate compliance with the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c and A.2.a. Please see the responses to comments A-1 and B-1.	

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B3-2	PROVISION B.3: Water Quality Improvement Strategies and Schedules	
	COMMENT: *Allow the Copermittees to "reduce" instead of "prevent and eliminate" non-storm water discharges through the Water Quality Improvement Plan.* Comments from the Building Industry included a recommendation to modify the language of Provision B.3 to allow the Copermittees to "reduce" non-storm water discharges instead of "prevent and eliminate" these discharges to the MS4.	**Building Industry / Industry** BIA Regulated Community Coalition
	RESPONSE: The San Diego Water Board disagrees with the proposed recommendations. The Clean Water Act requires MS4 permits to include a requirement that the MS4 dischargers must "effectively prohibit" non-storm water discharges to the MS4, not just "reduce" non-storm water discharges to the MS4. Provision B.3 included the phrase "prevent and eliminate" to specify what "effectively prohibit" means. To be consistent with the language in the Clean Water Act, the San Diego Water Board has revised "prevent and eliminate" to "effectively prohibit" in Provision B.3.	

PROVISION B.5: Iterative Approach and Adaptive Management Process
B5-1: *Recommendations for minor revisions to the language under iterative and adaptive management process requirements.*

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B5-1	PROVISION B.5: Iterative Approach and Adaptive Management Process	
	COMMENT: *Recommendations for minor revisions to the language under iterative and adaptive management process requirements.* The Riverside County and San Diego County Copermittees each submitted comments recommending minor revisions to the language under Provision B.5 to "clarify" the requirements or to be consistent with their comments regarding non-storm water discharges (see comment Gnl-13).	**Copermittees** Riverside County Copermittees San Diego County Copermittees
	RESPONSE: The San Diego Water Board disagrees with the recommended revisions to Provision B.5. The San Diego Water Board did not make any of the minor revisions recommended by the Copermittees as they were not necessary, not appropriate, or changed the intent of the requirement. The San Diego Water Board did, however, make several revisions to Provision B.5 to be consistent with the revisions made to Provisions B.2 and B.3, as discussed in the response to comment B-3.	

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B6-1	PROVISION B.6: Water Quality Improvement Plan Submittal, Updates, and Implementation	
	COMMENT: *Clarify that the implementation of Water Quality Improvement Plans may demonstrate TMDLs are not required.* The San Diego County Copermittees requested that the Tentative Order, under Finding 27, clarify that the implementation of the requirements "will" not "may" allow the San Diego Water Board to include an impaired water body in Category 4 in the Integrated Report (i.e. TMDL not required). The USEPA recommended including language in the Fact Sheet to clarify that the monitoring and assessments implemented as part of the Water Quality Improvement Plan may demonstrate that TMDLs are not necessary for water bodies listed on the 303(d) List.	**Copermittees** San Diego County Copermittees **State/Federal Government** USEPA
	RESPONSE: The San Diego Water Board disagrees with the request by the Copermittees. The San Diego Water Board agrees with the recommendation from the USEPA. Finding 27 is correct to state that the implementation of the Water Quality Improvement Plan "may" allow the San Diego Water Board to re-categorize an impaired water body in Category 4 in the Integrated Report meaning a TMDL is not required. Please see the response to comment Fnd-8. The San Diego Water Board has modified the Fact Sheet discussion for Provision B.6 as recommended by the USEPA.	

PROVISION C: ACTION LEVELS
C-1: *Clarify that action levels are enforceable or not enforceable limitations.*

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C-1	PROVISION C: ACTION LEVELS	
	COMMENT: *Clarify that action levels are enforceable or not enforceable limitations.* The Orange County, Riverside County and San Diego County Copermittees each submitted comments requesting that the Tentative Order clarify that the non-storm water action levels (NALs) and storm water action levels (SALs) developed pursuant to Provision C are not enforceable limitations. San Diego Gas and Electric and the Southern California Gas Company requested that the permit clarify that the NALs and SALs are not applicable to non-storm water discharges that have NPDES permits. The Natural Resources Defense Council is concerned that stating that the NALs are not considered by the San Diego Water Board to be enforceable limitations could be interpreted as an authorization for discharges of non-storm water, which would be in conflict with the effective prohibition requirements of the Clean Water Act for non-storm water discharges to the MS4. The USEPA also expressed concern that action levels based on wasteload allocations (WLAs) established as WQBELs in the TMDL requirements of Attachment E may be interpreted as not enforceable.	**Building Industry / Industry** San Diego Gas and Electric Southern California Gas Company **Copermittees** Orange County Copermittees Riverside County Copermittees San Diego County Copermittees **Environmental Organizations** Natural Resources Defense Council **State/Federal Government** USEPA
	RESPONSE: The San Diego Water Board agrees that additional clarification of the enforceability of the action levels is necessary. The San Diego Water Board did not revise the footnotes as requested by the Copermittees, but did revise the footnotes to clarify that NALs and SALs are not enforceable limitations unless they are based on WQBELs expressed as interim or final effluent limitations for any TMDLs in Attachment E and the interim or final compliance dates have passed. The San Diego Water Board also revised the introductory paragraph under Provision C.1 to specify that the NALs must be incorporated into the Water Quality Improvement Plans to support the development and prioritization of water quality improvement strategies for “effectively prohibiting” not just “addressing” non-storm water discharges to the MS4, consistent with the requirements of the Clean Water Act. Finally, the San Diego Water Board did not revise the requirements of Provision C to clarify that NALs do not apply to non-storm water discharges that have NPDES permits. The requirements of the Tentative Order, including the NALs and SALs, apply to the Copermittees’ MS4 discharges, not to other NPDES permitted discharges, thus it is not necessary or appropriate to specify that the NALs are not applicable to other NPDES permitted discharges.	

C-2: *Allow the Copermittees to develop action levels instead of prescribing required action levels.*

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C-2	PROVISION C: ACTION LEVELS	
	COMMENT: *Allow the Copermittees to develop action levels instead of prescribing required action levels.* The Orange County, Riverside County and San Diego County Copermittees each submitted comments requesting that they be allowed to develop or propose non-storm water action levels (NALs) and storm water action levels (SALs) as part of the Water Quality Improvement Plan development process rather than being required to include a prescribed set of NALs and SALs in addition to other NALs and SALs that may be developed as part of the Water Quality Improvement Plan. The Copermittees expressed concern that requiring the prescribed NALs and SALs under Provision C would result in unnecessary analyses for constituents that are not a priority identified in the Water Quality Improvement Plan. The Orange County and San Diego County Copermittees are concerned that the inclusion of the chemically-based prescribed action levels under Provision C may not be the best metric to measure progress toward protection and enhancement of receiving waters if the numeric goals are biologically- or physically-based.	**Copermittees** Orange County Copermittees Riverside County Copermittees San Diego County Copermittees
	RESPONSE: The San Diego Water Board disagrees with the request to remove the requirements to include the prescribed NALs and SALs in the Water Quality Improvement Plans. The NALs and SALs under Provision C have been included to support the development and prioritization of the water quality strategies that will be implemented based on the highest priority water quality conditions identified by the Copermittees in the Water Quality Improvement Plans. The NALs and SALs have been included as a tool that the Copermittees and the San Diego Water Board can utilize to determine if the Copermittees are implementing the requirements of the Clean Water Act for MS4 permits, which is to *effectively prohibit non-storm water discharges to the MS4* and *reduce pollutants in storm water discharges from the MS4 to the MEP*. The NALs and SALs are not new, and are included in both of the current MS4 permits issued to Orange County (Order No. R9-2009-0002) and Riverside County (Order No. R9-2010-0016). The Copermittees are required to effectively prohibit non-storm water discharges to their MS4s, which in turn should result in little to no discharges from their MS4s to receiving waters. If there are non-storm water discharges from the Copermittees' MS4s to receiving waters, those discharges should only be NPDES permitted discharges. Even if those discharges are NPDES permitted discharges, the Copermittees are responsible for demonstrating that those discharges are not illicit discharges by identifying the sources as	

C-2	PROVISION C: ACTION LEVELS	
	NPDES permitted discharges. The prescribed NALs in Table C-1 through C-4 are associated with most if not all the pollutants that are known or suspected to be causing or contributing to impairments in water bodies on the 303(d) List for the San Diego Region. The NALs are appropriately based on water quality objectives because non-storm water discharges that do not contain pollutants at levels in exceedance of the NALs are not expected to cause or contribute to exceedances of water quality standards in receiving waters. Thus, the prescribed NALs have been included to allow the Copermittees to prioritize their efforts in effectively prohibiting unpermitted non-storm water discharges to their MS4s, demonstrate that they have effectively prohibited non-storm water discharges to their MS4s that could cause or contribute to exceedances of water quality standards, or identify NPDES permitted sources that are resulting in discharges from their MS4s that are causing or contributing to exceedances of water quality standards in receiving waters. In any case, the prescribed NALs are necessary to allow the San Diego Water Board to determine if the Copermittees are effectively prohibiting non-storm water discharges to the MS4. In contrast, the prescribed SALs are not based on water quality objectives, but set at higher levels because the San Diego Water Board recognizes that reducing pollutants in wet weather discharges from the MS4s to water quality objectives is difficult. The prescribed SALs, however, will allow the Copermittees to prioritize their efforts in reducing pollutants in storm water discharges from their MS4s, and allow the San Diego Water Board to determine if the Copermittees are reducing pollutants in storm water discharges from their MS4s to the MEP. The San Diego Water Board disagrees with the concerns about monitoring for constituents that are not associated with the highest priority water quality conditions. Periodically analyzing non-storm water and storm water discharges from the Copermittees' MS4 for other pollutants other than those associated with the highest priority water quality conditions is necessary if the Copermittees would like to re-prioritize or identify new priority water quality conditions that will be addressed. The San Diego Water Board does recognize that there is a cost associated with analyzing for additional constituents. Thus, the San Diego Water Board has modified the MS4 outfall monitoring requirements to reduce the number of dry weather MS4 outfall monitoring stations that must be analyzed (see Provision D.2.b.(2)(b) of the revised Tentative Order), and provided the Copermittees some flexibility to modify the analytes for the wet weather MS4 outfall monitoring stations (see Provision D.2.c.(5)(f) of the revised Tentative Order).	

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C-2	PROVISION C: ACTION LEVELS	
	As for the concerns about the chemically-based NALs and the biologically- or physically-based numeric goals for receiving waters, the San Diego Water Board disagrees that they cannot be linked or may be incompatible. Biologically- or physically-based numeric goals will likely be measured in the receiving waters. The chemically-based NALs apply to the MS4 outfalls. The quality of the MS4 discharges and the improvement of biological or physical measurements can be linked. Both are likely necessary to demonstrate that MS4 discharges are either not causing or contributing to a biological or physical impairment of the receiving water, or an improvement in MS4 discharges is resulting in improvements in the biological or physical conditions of the receiving water. The San Diego Water Board did not revise Provision C as requested by the Copermittees.	

C-3: *Notes to Table C-3 should refer to CTR instead of including equations.*

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C-3	PROVISION C: ACTION LEVELS	
	COMMENT: *Notes to Table C-3 should refer to the California Toxics Rule (CTR) instead of including equations.* The San Diego County Copermittees recommended removing the equations to calculate the non-storm water action levels (NALs) for the priority pollutants from the notes under Table C-3 and instead refer to the CTR under 40 CFR 131.38(b)(2), where the equations can be found.	**Copermittees** San Diego County Copermittees
	RESPONSE: The San Diego Water Board agrees with the recommendations. The San Diego Water Board has revised the notes under Table C-3 to refer to 40 CFR 131.38(b)(2).	

C-4: *Action levels should be included for insecticides.*

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C-4	PROVISION C: ACTION LEVELS	
	COMMENT: *Action levels should be included for insecticides.* The Los Penasquitos Lagoon Foundation recommended specifying action levels for insecticides.	**Environmental Organizations** Los Penasquitos Lagoon Foundation
	RESPONSE: The San Diego Water Board disagrees with this recommendation. Provision C includes numeric actions levels for specific pollutants consistent with Order Nos. R9-2009-0002 and R9-2010-0016. Provisions C.1.b and C.2.b require the Copermittees to develop additional numeric action levels for pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance associated with the highest water quality priorities related to non-storm water and storm water discharges from the MS4s, respectively. If insecticides cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan, the Copermittees are required to incorporate numeric action levels into the Water Quality Improvement Plan for insecticides. The San Diego Water Board did not revise Provision C to specify action levels for insecticides.	

PROVISION D: MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS
D-1: *Revise monitoring and assessment requirements as recommended by San Diego County Copermittees.*

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D-1	PROVISION D: MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS	
	COMMENT: *Revise monitoring and assessment requirements as recommended by San Diego County Copermittees.* The San Diego County, Orange County, and Riverside County Copermittees designed a question driven monitoring and assessment program that would allow the Copermittees to adaptively manage their storm water programs more effectively and efficiently based on the monitoring data collected and the program assessments. The monitoring and reporting program in Provision D of the Tentative Order largely includes the monitoring and assessment program designed by the Copermittees. The commenters requested further revisions be made to the monitoring and assessment program in Provision D of the Tentative Order. Commenters from Environmental Organizations and Industry support the monitoring and assessment program in Provision D, however stress the importance of the Tentative Order requiring enough monitoring so that the Copermittees are able to track specific short, medium, and long term progress towards detecting and eliminating illicit discharges and improving water quality throughout the San Diego Region. Failing to require enough monitoring puts at risk a Copermittee's ability to detect increases in pollutant discharges and their effects on receiving water conditions.	**Building Industry / Industry** Industrial Environmental Association **Copermittees** City of San Diego City of Imperial Beach City of National City **Environmental Organizations** Environmental Groups
	RESPONSE: The San Diego Water Board agrees with the comments from the Copermittees as well as the Environmental Organizations and Industry. Provision D largely includes the question driven monitoring and assessment program collectively designed by the Copermittees. The program requires a sufficient amount of monitoring such that the Copermittees are able to track specific short, medium, and long term progress towards the goals established in the Water Quality Improvement Plan. Through development of the Water Quality Improvement Plans, the monitoring and assessment program required in Provision D can be modified to address specific needs and strategies developed to address the highest priority water quality conditions within each jurisdiction in each Watershed Management Area. The monitoring approach in Provision D has been further refined, based on the specific comments received on the Tentative Order, to allow Copermittees to more efficiently and effectively address the critical questions necessary to adaptively manage their storm water programs and achieve improved water quality within their jurisdiction and each watershed throughout the San Diego Region.	

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D-2	PROVISION D: MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS	
	COMMENT: *Include requirements to track and monitor progress toward watershed goals and health of watersheds.* The Coastal Environmental Rights Foundation, Environmental Health Coalition, and the San Diego Coastkeeper jointly provided comments expressing concern that the monitoring and assessment requirements of the Tentative Order are not robust enough to: 1) support the Copermittees' ability to track progress towards achieving the goals and requirements of the Clean Water Act and the San Diego Basin Plan (i.e. effectively prohibiting non-storm water discharges, reducing pollutants in storm water to the maximum extent practicable, supporting the beneficial uses of the receiving waters), 2) enable the San Diego Water Board to determine compliance with the requirements of the Tentative Order, and 3) inform the public of the Copermittees' compliance with the requirements of the Tentative Order and progress towards achieving its goals. Other commenters from the Environmental Organizations expressed their support to include more monitoring in the Tentative Order, specifically requesting monitoring that provides assurances that Copermittees are able to detect any increase in pollutant discharges from their MS4 systems and be better able to address them sooner rather than later. Commenters from Industry requested the monitoring approach be iterative, strategic, cost-effective and question–driven so that it can provide the Copermittees with cost-effective informed data to guide their future storm water program actions through coordination with the San Diego Water Board staff. Several other commenters provided topic specific comments related to the need for mapping of coastal receiving waters and creeks. The USEPA commented on the need to bring the toxicity sampling requirements up to date with those recently adopted in other general and regional MS4 permits, as well as clarification to the monitoring locations required for determining compliance with TMDLs.	**Building Industry / Industry** Industrial Environmental Association **Environmental Organizations** South Laguna Civic Association CERF, EHC and SDCK Environmental Groups Laguna Bluebelt Coalition **State/Federal Government** USEPA
	RESPONSE: The San Diego Water Board disagrees with commenters from the Environmental Organizations that the monitoring and assessment requirements of the Tentative Order are not robust enough to support the Copermittees' ability to track progress towards achieving goals and requirements of the Clean Water Act (CWA), the California Water Code (CWC), and the San Diego Basin Plan (i.e. effectively prohibiting non-storm water discharges, reducing pollutants in storm water to the maximum extent practicable, and supporting the beneficial uses of the receiving waters). Provision D includes a monitoring program structure that is expected to be refined through the Water Quality	

D-2	PROVISION D: MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS	
	Improvement Plan. The Provision D monitoring and assessment program should be customized to achieve the desired outcomes of the Water Quality Improvement Plan and ultimately the CWA and the CWC. The desired outcomes of the CWA and the CWC are about conditions in water bodies (chemical, physical, and biological integrity), and information about conditions in water bodies is essential to help guide the work of protection and restoration. The Tentative Order's monitoring and assessment program requires collection of chemical, physical, and biological data from outfalls and receiving waters designed to inform the Copermittees, the San Diego Water Board, and the public about the condition of the discharge and the conditions of the water bodies in the San Diego Region. The Tentative Order's assessment requirements are designed to take the data collected from the monitoring program and convert it to useful information about the successfulness of the Copermittees' storm water management programs to achieve the desired outcomes of the CWA and the CWC. The San Diego Water Board agrees with comments from Industry that the monitoring program needs to be iterative, strategic, cost-effective and question–driven. As part of the iterative approach and adaptive management requirements of the Tentative Order, Provision D.4 requires the Copermittees to integrate: 1) the data collected pursuant to Provision D.1 through D.3; 2) the assessment findings required pursuant to Provision D.4a-c; and, 3) information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to assess the effectiveness of, and any necessary modifications to, the Water Quality Improvement Plans. The requirements of the Tentative Order allow the Copermittees to adapt the monitoring based on watershed specific priority conditions within the confines of a robust Water Quality Improvement Plan development and implementation process. The San Diego Water Board agrees that the Tentative Order should be modified to increase clarity of what is required of each Copermittee, thus enabling the San Diego Water Board to better determine compliance. Several commenters provided suggested improvements to Provision D language. Selected modifications to Provision D of the Tentative Order were made to increase clarity of what is expected of the Copermittees throughout the iterative monitoring approach in efforts to increase specificity of what is minimally required and how compliance with the Tentative Order will be determined. The San Diego Water Board also agrees that the Tentative Order should be modified to increase the public's awareness of the Copermittees' compliance and progress towards achieving the goals of the Water Quality Improvement Plans. Provision F.1.a was modified to require the Copermittees implement a robust public participation process with multiple opportunities for public participation throughout the development of each component of the Water Quality Improvement Plan. Provision F.1.b provides the public another opportunity to	

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D-2	PROVISION D: MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS	
	submit comments on the Water Quality Improvement Plan during the acceptance process. The Copermittees are also required to include public participation during any updates to the Water Quality Improvement Plan. Finally, the data and information collected from monitoring, and the findings from the assessments will be reported in the Water Quality Improvement Plan Annual Reports. The San Diego Water Board has revised Provision D to be consistent with the toxicity sampling requirements included in the most recently adopted State Water Board and other Regional Water Board MS4 permits. Modifications were also made to Provision D requirements to clarify the monitoring locations for determining compliance with TMDLs.	

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D-3	PROVISION D: MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS	
	COMMENT: *Requests for changes to schedules for monitoring and monitoring reports*. The San Diego County Copermittees submitted comments requesting an extension to the duration of the transitional monitoring program to accommodate the acceptance process of the Water Quality Improvement Plan and municipal program budget cycles. The Orange County Copermittees also submitted a comment requesting the commencement of the wet weather transitional outfall monitoring be delayed to year 2 of the transitional period to allow time to inventory and evaluate MS4 outfalls as required by Provision D.2.a.(1).	**Copermittees** Orange County Copermittees San Diego County Copermittees
	RESPONSE: The San Diego Water Board agrees with the comment that the transitional monitoring program should be continued until such time that the monitoring program within a Water Quality Improvement Plan is accepted by the San Diego Water Board. Provision D.1.a. Receiving Water, D.2.a. MS4 Outfall Discharge Monitoring, D.2.a.(2) Dry Weather MS4 Outfall Discharge Field Screening, and D.2.a.(3) Wet Weather MS4 Outfall Discharge Monitoring have been revised to require the Copermittees to conduct the transitional monitoring program until the Water Quality Improvement Plan is accepted. The San Diego Water Board disagrees with the recommendation to begin wet weather transitional monitoring in year two of the transitional period. Municipalities have already mapped the location of their MS4s for operation and maintenance reasons. Municipalities are also already aware of the majority of information listed in Provision D.2.a.(1), therefore delaying the commencement of the transitional wet weather MS4 outfall monitoring is not appropriate and no change to the Tentative Order was necessary.	

D-4: Require the Copermittees to utilize monitoring data from third party sources.

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D-4	PROVISION D: MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS	
	COMMENT: *Require the Copermittees to utilize monitoring data from third party sources.* Comments submitted by Environmental Groups support the position that the Tentative Order should require the Copermittees to use third party data that meets particular criteria in their efforts to assess the watersheds and progress towards achieving water quality standards. The particular criteria would require third parties to maintain and make available for review the quality assurance plan, list of methods used, and standard operating procedures for the data. Additionally, the commenters requested the Tentative Order specify that data is "appropriate" if it has been collected using the latest Standard Methods of Water and Wastewater Analysis. The commenters further requested the Tentative Order require the Copermittees to solicit and evaluate third party data that meets the Tentative Order's criteria for collection, not just the data collected pursuant to Provisions D.1, D.2, and D.3 when evaluating the causes of water quality conditions. Lastly, the commenters support the position that the Copermittees should be allowed to partner with environmental groups or other third parties to complete regional special studies.	**Environmental Organizations** Environmental Groups
	RESPONSE: The San Diego Water Board agrees that the Copermittees should be required to use appropriately collected data from third parties during their efforts to assess conditions of the watershed. During development of the Water Quality Improvement Plan, the Copermittees are required under Provision B.2.a.(6) and Provision B.2.d.(4)(e) to consider available, relevant, and appropriately collected and analyzed data, information, or studies during their efforts to identify water quality priorities based on impacts of MS4 discharges on receiving waters and pollutant sources and/or stressors that contribute to the highest priority water quality conditions. Provision B.2.a.(6) and Provision B.2.d.(4)(e) allow the Copermittees to consider other data, not just data collected by the Copermittees. Additionally, Provision D.2 allows any data, "*not collected specifically for the Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of the Order*" to be used by the Copermittees in their MS4 outfall monitoring program. Lastly, the assessments required under Provision D.4 require evaluation of the data collected pursuant to Provisions D.1, D.2, and D.3, which isn't restricted to that data which is collected solely by the Copermittees, and which will be heavily influenced by the Water Quality Improvement Plans which are required to use "*other available, relevant, and appropriately collected data, information, and studies*." The San Diego Water Board agrees that the Copermittees should be allowed to partner with Environmental Groups or other third parties to complete regional special studies and additional language has been added to Provision D.3.	

D-5: *Include monitoring that will ensure compliance and jurisdictional accountability.*

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

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D-5	PROVISION D: MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS	
	COMMENT: *Include monitoring that will ensure compliance and jurisdictional accountability*. The Coastal Environmental Rights Foundation (CERF), Environmental Health Coalition (EHC), and the San Diego Coastkeeper (SDCK) collectively submitted comments in support of increasing the nature, frequency, and amount of monitoring in the Tentative Order. The commenters expressed concern that the "lax approach" to monitoring currently in the Tentative Order is not adequate to assess compliance with the requirements. The USEPA requested the Tentative Order be more specific with regards to required monitoring locations and minimum monitoring frequencies to determine compliance with the TMDLs in Attachment E. The San Diego Unified Port District specifically requested additional jurisdictional outfall monitoring be required to support the San Diego Water Board's and the Copermittees' ability to determine the sources of any exceedances(s) of water quality standard(s) in receiving waters.	**Copermittees** San Diego Unified Port District / Brown and Winters **Environmental Organizations** CERF, EHC and SDCK **State/Federal Government** USEPA
	RESPONSE: The San Diego Water Board generally disagrees with the comments from the Environmental Organizations that the monitoring approach in Tentative Order is too "lax." However, the San Diego Water Board agrees that certain monitoring provisions need additional specificity requiring minimum monitoring frequencies and monitoring at specific locations to track compliance with the TMDLs in Attachment E to the Tentative Order. The monitoring and assessment program in the Tentative Order is a question-driven monitoring approach largely designed to place monitoring resources where they are most needed. In order to answer the questions and accomplish efficiencies, the monitoring approach for non-storm water includes screenings, prioritization, and collection of data through visual observations. The Environmental Organizations call specific attention to the MS4 outfall screening required during the transitional monitoring period and monitoring the 10 highest priority non-storm water persistent flow MS4 outfall locations during the post transitional monitoring period. The San Diego Water Board considers this MS4 outfall screening approach necessary for the Copermittees to identify the highest priority non-storm water persistent flows and eliminate them. Elimination of non-storm water flows is a priority of the Tentative Order because eliminating non-storm water flows is consistent with the Clean Water Act requirement to effectively prohibit non-storm water discharges to the MS4. Elimination of non-storm water flows is the most effective way to prevent 100 percent of the pollutants in the non-storm water discharges from causing or contributing to exceedances in receiving water quality	

D-5	PROVISION D: MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS	
	standards. Therefore, the Tentative Order requires more attention (monitoring, screening, and sampling) at the outfalls to eliminate non-storm water flows. That attention is based on a prioritization to address the outfalls causing or contributing to the very highest priority water quality conditions first. The monitoring and assessment program is designed to be dynamic with collection of data during both wet and dry weather at the MS4 outfalls and in the receiving water. The San Diego Water Board has made revisions in response to comments to ensure the monitoring program in the Tentative Order will be sufficient to inform all stakeholders and the San Diego Water Board on the Copermittees' progress to effectively eliminate non-storm water flows, reduce pollutants in storm water to the maximum extent practicable, and protect conditions in the receiving waters from MS4 discharges. The monitoring and assessment program is adaptable through the Water Quality Improvement Plan to allow the Copermittees to address the highest water quality priorities in a focused manner, directing resources towards those areas or sources within their jurisdiction causing and contributing to the priority water quality conditions. To address the comment on public transparency, the San Diego Water Board has modified the Water Quality Improvement Plan Development process of Provision F.1.a to require the Copermittees to identify the opportunities for public involvement in the development of the Water Quality Improvement Plans. Provision F.4 requires Copermittees to place data and information available to the public on the Regional Clearinghouse. Additional public participation and notification requirements can be found in Provision F that address comments regarding the public access to information concerning the nexus between the health of the receiving waters and the water quality conditions of the discharges from the Copermittees' MS4s. The USEPA requested the Tentative Order to be more specific with regards to the monitoring required to determine compliance with the TMDLs in Attachment E. Provision D.2.c.(2) now requires wet weather outfall monitoring be conducted at least once per year (during the transitional monitoring the Copermittees are still required to sample twice per year), with a requirement that the Copermittees may need to increase the frequency of monitoring to identify pollutants in storm water discharges from the MS4s in order to, among other things, determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E. Additionally, language in Provision D.2.b.(2)(b) has been modified to require the Copermittees to consider, notwithstanding all other priorities, compliance with applicable TMDLs in Attachment E when selecting MS4 outfall monitoring locations. The San Diego Unified Port District specifically requested additional jurisdictional outfall monitoring be required	

D-5	PROVISION D: MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS	
	to support the San Diego Water Board's and the Copermittees' ability to determine the sources of any exceedances(s) of water quality standard(s) in receiving waters. The San Diego Water Board modified Provisions D.2.b.(2)(b) and D.2.c.(1)-(2) in response to USEPA's comments, thereby specifying a minimum frequency for MS4 outfall monitoring during wet weather and requiring both MS4 outfall and receiving water monitoring station locations be suitable to determine compliance with TMDLs in Attachment E, as well as suitable to determine progress towards achieving the goals of the Water Quality Improvement Plans. Provision D.4.b requires the Copermittees to utilize a watershed model to calculate or estimate the total flow volume and pollutant loadings during wet weather and dry weather discharges from the Copermittee's jurisdiction within the Watershed Management Area. These modifications to Provision D, along with the newly revised Water Quality Improvement Plan development process, address the comments on requiring more monitoring to determine compliance. Additionally, the Tentative Order does not preclude a Copermittee from collecting additional monitoring above what is required, if they deem it necessary to demonstrate that the sources are outside of their jurisdictional legal authority to control.	

D-6: *Provide the County of San Diego an alternative transitional monitoring and assessment program for the Santa Margarita River Watershed Management Area until the Riverside County Copermittees are covered under the permit.*

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D-6	PROVISION D: MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS	
	COMMENT: *Provide the County of San Diego an alternative transitional monitoring and assessment program for the Santa Margarita River Watershed Management Area until the Riverside County Copermittees are covered under the permit.* The monitoring and assessment program requirements should account for the phased coverage of the Riverside County Copermittees at a later date than the San Diego County Copermittees with regards to the Santa Margarita River Watershed Management Area.	**Copermittees** County of San Diego
	RESPONSE: The San Diego Water Board agrees with the commenter. Footnote 3 in Table B-1 of Provision B and Provision D.2.a.(3)(a)(iii), have been revised to allow the County of San Diego to delay development of the Water Quality Improvement Plan for the Santa Margarita River Watershed Management Area until the Riverside County Copermittees have been notified of coverage under the Tentative Order. Footnote 3 in Table B-1 of Provision B clarifies that the County of San Diego is not required to implement the requirements of Provision B until the Riverside County Copermittees have been notified of coverage, but are required to implement the requirements of Provision D and Attachment E for its jurisdiction within the Santa Margarita River Watershed Management Area. Additionally, Provision D.2.a.(3)(a)(iii) was added to specify that the County of San Diego must select at least two (2) wet weather MS4 outfall discharge monitoring stations, reduced from the 5 stations required in Provision D.2.a.(3)(a)(i), for the portion of the Santa Margarita River Watershed Management Area within its jurisdiction until the Riverside Copermittees are notified of coverage. After the Riverside Copermittees are notified of coverage, the County of San Diego in concert with the County of Riverside Copermittees must comply with Provision B requirements and prepare a Water Quality Improvement Plan and implement the monitoring and assessment requirements according to Provision D for the Santa Margarita River Watershed Management Area.	

PROVISION D.1: Receiving Water Monitoring Requirements
D1-1: *Requests for "clarifications" of receiving water monitoring requirements.*

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D1-1	PROVISION D.1: Receiving Water Monitoring Requirements	
	COMMENT: *Requests for "clarifications" of receiving water monitoring requirements.* The Riverside County Copermittees provided suggested changes to the language in Provision D to clarify that the receiving water monitoring required pursuant to Provision D.1.a.(3) and D.1.e must be conducted as applicable to the Watershed Management Area and the Copermittees' MS4 discharges. The Riverside County Copermittees want a distinction written into the requirements because some of the monitoring requirements only apply to MS4 discharges to certain water bodies and not all Copermittees within a Watershed Management Area will have discharges to that water body. The USEPA requested the Tentative Order be more specific with regards to the transitional and post transitional receiving water monitoring required (frequency and station location) to determine compliance with the TMDLs in Attachment E.	**Copermittees** Riverside County Copermittees **State/Federal Government** USEPA
	RESPONSE: The San Diego Water Board disagrees with the requested changes to Provisions D.1.a.(3) and D.1.e. The requested changes to Provision D.1.a.(3) were not incorporated because the intent is to require the Copermittees, during the transitional monitoring period, to participate in regional receiving water monitoring programs, as applicable to the Watershed Management Area, including participation in (a) Storm Water Monitoring Coalition Regional Monitoring, (b) Southern California Bight Regional Monitoring, and (c) Sediment Quality Monitoring. Provision D.1.a.(3) correctly conditions the requirement by stating, 'as applicable' to the Watershed Management Area. For example, the expectation is that the Riverside County Flood Control and Water Conservation District, a current member of the Southern California Stormwater Monitoring Coalition (SMC), participate in SMC monitoring within the Watershed Management Area(s), in which their jurisdiction lies. The SMC was formed in 2001 by cooperative agreement of the Phase I municipal storm water NPDES lead Copermittees (including the Riverside County Flood Control and Water Conservation District), the NPDES regulatory agencies in southern California (including the San Diego Water Board) and the Southern California Coastal Water Research Project. It is the goal of the SMC to develop the technical information necessary to better understand storm water mechanisms and impacts, and then develop the tools that will effectively and efficiently improve storm water management decision-making. The SMC develops and funds cooperative projects to improve knowledge of storm water quality management for all throughout the San Diego Region.	

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D1-1	PROVISION D.1: Receiving Water Monitoring Requirements	
	The requested changes to Provision D.1.e were not incorporated because the existing language is appropriate. Provision D.2.c.(2) has been revised to require wet weather MS4 outfall monitoring be conducted at least once per year after the Water Quality Improvement Plans are accepted, with a requirement that Copermittees may need to increase the frequency of monitoring in order to identify pollutants in storm water discharges from the MS4s in order to, among other things, determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E. During the transitional monitoring period, the Copermittees are still required to conduct wet weather MS4 outfall monitoring twice per year. Additionally, the language in Provision D.2.b.(2)(b) has been modified to require the Copermittees to consider, notwithstanding all other priorities, compliance with applicable TMDLs in Attachment E when selecting MS4 outfall monitoring locations.	

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D1-2	PROVISION D.1: Receiving Water Monitoring Requirements	
	COMMENT: *Requests for modifications to receiving water monitoring stations, frequency, and data collection requirements.* Comments submitted by the Copermittees ranged from a broad request to remove the entire coastal storm drain monitoring program from the receiving water monitoring requirements (San Diego County), adding an alternate compliance option in lieu of the receiving waters monitoring program previously adopted in their current permit (Orange County), to very specific additions to what is recorded during receiving water station field observations (Riverside County). Multiple Environmental Organizations supported the need to increase the amount of monitoring in order to 1) better inform the Copermittees of the nexus between the health of receiving waters and the water quality condition of their discharge, 2) be sufficient to fulfill the San Diego Water Board's need to assess compliance, and 3) be sufficient to fulfill the public's need to stay informed. The USEPA commented on the need for the receiving water requirements to include minimum monitoring frequencies and a minimum number of station locations to measure compliance with the WLAs and associated water quality based effluent limitations of the TMDLs in the Order. The Los Penasquitos Lagoon Foundation requested continuous flow monitoring at the base of tributaries to 303(d) listed water bodies and monitoring of groundwater seepages into 303(d) listed water bodies be added to the monitoring requirements of the Watershed Management Area including the Los Penasquitos Lagoon.	**Copermittees** Orange County Copermittees Riverside County Copermittees San Diego County Copermittees **Environmental Organizations** CERF, EHC, SDCK Los Penasquitos Lagoon Foundation **State / Federal Government** USEPA
	RESPONSE: The San Diego Water Board agrees with the request to discontinue the coastal storm drain monitoring program and has replaced it with the receiving water monitoring program of Provision D.1 along with the transitional outfall monitoring screening and post-transitional outfall monitoring program (Provision D.2). The San Diego Water Board disagrees with the requested changes to the field screening observations required in Tables D-1 and D-6. The requests included adding the requirement to record any observed connectivity between MS4 outfall discharges and flowing receiving waters during receiving water and outfall field screening efforts. This was not added to the required observations listed in Tables D-1 or D-6 because the observations are already required as part of the illicit connection and illegal discharge requirements of Provision E.2. Pursuant to Provision D.1.f Alternative Watershed Monitoring Requirements, the San Diego Water Board may	

D1-2	PROVISION D.1: Receiving Water Monitoring Requirements	
	direct the Copermittees to participate in an effort to develop alternative watershed monitoring with other regulated entities, other interested parties, and the San Diego Water Board to refine, coordinate, and implement regional monitoring and assessment programs to determine status and trends in receiving waters. This requirement calls attention to the San Diego Water Board's plan to involve the Copermittees in the development of regional monitoring and assessment programs. It further calls attention to the San Diego Waters Board's position that a regional monitoring and assessment program must include other regulated entities in addition to the Phase I Copermittees. The Draft Framework for Monitoring and Assessment in the San Diego Region lays out the San Diego Water Board's framework to develop a regional receiving water monitoring program. Prior to development and required implementation of a regional receiving water monitoring program, and to maintain historical water quality monitoring trends, the requirements of Provision D.1.a-f require Copermittees to continue the receiving water monitoring required by their current storm water permits until coverage under the Tentative Order commences, and the Water Quality Improvement Plans are accepted. The monitoring program in Provision D has been modified to include minimums (removing the language "as appropriate"). Required monitoring minimums also address concerns regarding the Copermittees' and the San Diego Water Board's ability to determine compliance with the requirements of the Tentative Order (including TMDLs). Additionally, the Water Quality Improvement Plan development process has been significantly changed to include more public participation. Furthermore, the Tentative Order recognizes that each Copermittee should evaluate the need to increase its monitoring above what is minimally required to the appropriate level necessary to achieve the goals of the Water Quality Improvement Plan. Within the process for a Copermittee to get a Water Quality Improvement Plan developed and accepted by the San Diego Water Board, the Environmental Organizations and the public at large will have opportunities to contribute their expertise and provide comments on the nature and extent of monitoring needed to measure progress towards achieving the goals of the Water Quality Improvement Plans. Each Copermittee must establish a public participation process to solicit data, information, and recommendations to be utilized in the development of the Water Quality Improvement Plan. The Tentative Order also requires the Copermittees to form a Water Quality Improvement Consultation Panel (Panel) to provide recommendations on the priorities, goals, and strategies of the Water Quality Improvement Plan. The Panel must include a member of the environmental community, a member of the development community, and a member of the San Diego Water Board staff. Any recommendations for monitoring specific to a particular Watershed Management Area, receiving water body, pollutant, or stressor could be provided by the Panel and	

D1-2	PROVISION D.1: Receiving Water Monitoring Requirements	
	addressed in the Water Quality Improvement Plan. The minimum monitoring required plus the monitoring needed to attain goals established in the Water Quality Improvement Plans will be sufficient to inform the Copermittees, the San Diego Water Board, the environmental groups, and the public on the nexus between the health of receiving waters and the water quality condition of the discharges, compliance with TMDLs, and progress towards achieving the goals of the Clean Water Act.	

D1-3: *Require Test of Significant Toxicity to be consistent with other recent MS4 permits.*

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D1-3	PROVISION D.1: Receiving Water Monitoring Requirements	
	COMMENT: *Require Test of Significant Toxicity to be consistent with other recent MS4 permits.* The USEPA commented that the toxicity monitoring requirements should be modified and to be consistent with the requirements in MS4 permits recently issued by the State Water Resources Control Board (Caltrans MS4 Permit) and the Los Angeles Regional Water Quality Control Board (Los Angeles County MS4 Permit).	**State/Federal Government** USEPA
	RESPONSE: The San Diego Water Board agrees that the toxicity testing and data analysis requirements in the Tentative Orders should be consistent with other recently adopted MS4 Permits. The recently adopted Caltrans and Los Angeles County MS4 Permits include updated toxicity data collection procedures and data analysis methods that are consistent with the Draft State Water Resources Control Board Policy for Toxicity Assessment and Control, June 2012 (Draft State Board Toxicity Policy). Provision D has been updated to remove the acute toxicity test requirements, and only require chronic toxicity test biological endpoint data be analyzed using the Test of Significant Toxicity t-test approach specified in National Pollutant Discharge Elimination System Test of Significant Toxicity Document (USEPA, EPA 833-R-10-003, 2010), and other minor changes to make the Tentative Order consistent with recently adopted MS4 permits.	

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D2-1	PROVISION D.2: MS4 Outfall Discharge Monitoring Requirements	
	COMMENT: *Requests for "clarifications" of MS4 outfall discharge monitoring requirements.* The San Diego County and Riverside County Copermittees requested the dry weather MS4 outfall field screening language in Provision D.2.a.(2) be modified to clarify the number of visual inspections at major outfall locations required per jurisdiction per Watershed Management Area. The Riverside County Copermittees additionally requested that the field screening only apply to those MS4 outfalls in a Copermittee's inventory that are 'accessible,' and clarification to the definition of persistent flow. USEPA supports the Copermittees' comments to improve clarity with respect to identification of MS4 outfall monitoring locations. USEPA further requested language specific enough to assure MS4 outfall monitoring locations are selected to include compliance points for the TMDLs in Attachment E.	**Copermittees** Riverside County Copermittees San Diego County Copermittees **State and Federal Government** USEPA
	RESPONSE: The San Diego Water Board generally agrees with comments from the Copermittees and USEPA. Additional language has been added to improve the clarity of Provision D.2.a.(2) for those jurisdictions with equal to or greater than 500 major MS4 outfalls within their inventory that are located within multiple Watershed Management Areas. The San Diego Water Board specifically retained language to allow for the Copermittees to conduct more than the minimum amount of visual inspections of their major MS4 outfalls should increased inspections be a part of the strategies specified to meet the goals of any Water Quality Improvement Plan. The San Diego Water Board disagrees with the comments requesting modifications to the persistent flow definition in Footnote 19. The San Diego Water Board maintains that the definition, as written, accomplishes the intent of the requested revision and does not need to be explicitly stated. Existing language in Provision D.2.a.(1)(e) addresses the comment about field screening "accessible" inventoried MS4 outfalls. The Copermittees can field screen an MS4 outfall location by screening a manhole just upgradient of the discharge where access is safe. Provisions D.2.b.(2)(b)(i) and D.2.c.(1) were modified to require additional outfall monitoring locations if the 5 chosen MS4 outfall locations were not sufficient to determine compliance with the TMDLs in the Tentative Order.	

D2-2: Requests for modifications to MS4 outfall monitoring stations, frequency, and data collection requirements.

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D2-2	PROVISION D.2: MS4 Outfall Discharge Monitoring Requirements	
	COMMENT: *Requests for modifications to MS4 outfall monitoring stations, frequency, and data collection requirements.* The Orange County, Riverside County and San Diego County Copermittees each requested modifications to the MS4 outfall monitoring stations, frequency, and data collection requirements. The San Diego County Copermittees requested the MS4 outfall discharge monitoring requirements be changed for the Santa Margarita River Watershed Management Area until the Riverside County Copermittees become covered under the Tentative Order, a reduction to the frequency of outfall sampling during the transitional period from annually to once per 2-year transitional period, a modification to the requirement to sample the 'first flush' during wet weather, a reduction to the number of dry weather outfall monitoring locations from 10 to 5, and an allowance for analytical testing to be reduced if demonstrated by supporting data. The Orange County and Riverside County Copermittees supported most of San Diego County Copermittees' requested revisions. Additionally, the Riverside County Copermittees commented on the disproportionality of the persistent flow MS4 outfall monitoring requirements, and the need to de-emphasize MS outfall monitoring locations if the discharge does not reach a receiving water due to infiltration, evaporation, or treatment. Environmental Organizations supported the need to increase the amount of monitoring in order to better inform the Copermittees of the nexus between the health of receiving waters and the water quality condition of their discharge, be sufficient to fulfill the San Diego Water Board's need to assess compliance, and be sufficient to fulfill the public's need to stay informed. The USEPA commented on the need for the MS4 outfall monitoring requirements to include minimum monitoring frequencies and a minimum number of MS4 outfall locations to measure compliance with the TMDLs.	**Copermittees** Orange County Copermittees Riverside County Copermittees San Diego County Copermittees **Environmental Organizations** CERF, EHC, SDCK **State / Federal Government** USEPA
	RESPONSE: The San Diego Water Board agreed with several of the requested modifications. Revisions to Provision D.2 were made where appropriate. The requirement to monitor at least 10 major outfalls was reduced to monitoring at least 5 major outfalls with persistent flows. To address comments from the USEPA, this requirement was also modified to require additional MS4 outfall monitoring locations, if the 5 chosen outfall locations were not sufficient to determine compliance with the TMDLs. If a smaller jurisdiction has less than 5 major MS4 outfalls with persistent flow,	

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D2-2	PROVISION D.2: MS4 Outfall Discharge Monitoring Requirements	
	they would be required to monitor all the MS4 outfalls with persistent flow until such time that they identify and terminate the discharge or met another criteria of Provision D.2.(2)(b)(ii). If any Copermittee eliminates all persistent flows from all of its MS4 outfalls, they would not be required to conduct dry weather MS4 outfall monitoring. The San Diego Water Board accepted most of the requested revisions from the Orange County Copermittees, except those concerning toxicity sampling and coliform sampling. Toxicity sampling was modified in response to comments provided by USEPA to make the toxicity requirements more consistent with recently adopted MS4 permits (i.e. Caltrans and Los Angeles County MS4 Permits). Please see the response to comment D1-3.	

PROVISION D.3: Special Studies
D3-1: *Request to reduce the number of special studies required.*

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D3-1	PROVISION D.3: Special Studies	
	COMMENT: *Request to reduce the number of special studies required.* The San Diego County Copermittees submitted a comment requesting a reduction in the number of required special studies from three to two per Watershed Management Area, and from two to one for the San Diego Region to account for the time and resources required to plan and develop the special studies, and integrate the plans for the special studies into the monitoring and assessment programs of the Water Quality Improvement Plans. This comment was supported by the Riverside County Copermittees.	**Copermittees** Riverside County Copermittees San Diego County Copermittees
	RESPONSE: The San Diego Water Board agrees with the commenters. Provision D.3 has been modified to reduce the number of required special studies from three to two per Watershed Management Area, and from two to one for the San Diego Region.	

D3-2: *Allow special studies initiated priorto the term of the Tentative Order to count toward required special studies.*

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D3-2	PROVISION D.3: Special Studies	
	COMMENT: *Allow special studies initiated prior to the term of the Tentative Order to count toward the required special studies.* The San Diego County Copermittees submitted a comment requesting that the special studies initiated prior to the term of the Tentative Order be allowed to count towards the special studies required in Provision D.3, citing that special studies are typically multi-year efforts that require multi-stage planning, funding approval/allocation, and analysis. This comment was supported by the Riverside County Copermittees.	**Copermittees** Riverside County Copermittees San Diego County Copermittees
	RESPONSE: The San Diego Water Board agrees with the commenters. Provision D.3 has been modified to allow the use of special studies initiate prior to adoption of the Tentative Order to comply with the requirements of Provision D.3.	

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D4-1	PROVISION D.4: Assessment Requirements	
	COMMENT: *Requests for "clarifications" of assessment requirements.* The San Diego County and Riverside County Copermittees submitted comments requesting clarifications be made to the assessment requirements of Provisions D.4.b.(1)-(2). The Copermittees concurred that the timing of reporting be compatible with completion of the assessments. The Riverside County Copermittees requested specific revisions to Provision D.4.b.(1)(c)(iv) concerning extrapolation of calculated flow volumes and pollutant loads; and assessment of jurisdictional accountability.	**Copermittees** Riverside County Copermittees San Diego County Copermittees
	RESPONSE: The San Diego Water Board agrees with the commenters. The San Diego Water Board modified Provision D.4.b.(1)(a) to add an annual assessment of data collected during the transition period and reporting as part of the Transitional Monitoring and Assessment Program Annual Report (Provision F.3.b.2). Provision D.4.b.(2)(a) requires assessment of MS4 outfall data collected after the transitional period and reporting as part of the Water Quality Improvement Plan Annual Report (Provision F.3.b.(3)). Requiring an annual report during the transitional years before the acceptance of the Water Quality Improvement Plan will allow Copermittees to perform 'complete' assessments and report on the progress for that year, whether it be a year within the transitional monitoring period or a year in which monitoring is conducted in accordance with the Water Quality Improvement Plan. Provisions D.4.b.(2)(c)(iv)[a]-[b] were modified to address comments concerning extrapolation of calculated flow volume and pollutant loads to outfalls that were not actually monitored. The assessment now requires the use of a model or other method to calculate or estimate the non-storm water volumes and pollutant loads collectively discharged from all the major MS4 outfalls in its jurisdiction identified as having persistent dry weather flows. To address the issue of jurisdictional accountability, the Copermittees are now required to identify and quantify (i.e. volume and pollutant loads) sources of non-storm water not subject to the Copermittee's legal authority that are discharged from the Copermittee's major MS4 outfalls to downstream receiving waters. The San Diego Water Board generally disagrees with the comment to require calculation of pollutant loads only for those priority water quality constituents identified in the Water Quality Improvement Plan. Calculation of all pollutant loads are required until a Copermittee collects sufficient data or other supporting information pursuant to Provision D.2.b.(2)(e)(iii)[e] to demonstrate analysis of a constituent is not necessary.	

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D4-1	PROVISION D.4: Assessment Requirements	
	The San Diego Water Board agrees with the comment that MS4 outfall assessments are to be done for the area covered by each Copermittee and that the data to be used by each Copermittee would include the data collected from any Flood Control District MS4 operated within its jurisdiction. The San Diego Water Board has not modified any language within Provision D.4 to address this comment because the language adequately addresses the comment without further modifications.	

D4-2: *Requests for modifications to assessment requirements.*

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D4-2	PROVISION D.4: Assessment Requirements	
	COMMENT: *Requests for modifications to assessment requirements.* The San Diego County Copermittees commented on the need for a longer assessment term (once per permit term rather than annually) to provide meaningful analysis of the annual pollutant load and flow calculations from MS4 outfalls during dry weather. The Copermittees further commented on the need to modify the requirements to calculate jurisdictional loads during wet weather, as well as modifications to clarify assessments necessary to track jurisdictional accountability. The Riverside County Copermittees agreed in large part with the comments provided by the San Diego County Copermittees. The Riverside County Copermittees also expressed a desire to clarify MS4 outfall assessments are to be done by each municipal Copermittee and that the data to be used by each municipal Copermittee include the data collected from any flood control district within its jurisdiction. Additionally, the Riverside County Copermittees expressed concern that the assessment requirements were requiring evaluations beyond their expertise and suggested pollutant loads only be calculated for priority pollutants. The Los Penasquitos Lagoon Foundation requested that the Tentative Order require the Copermittees to work with local land managers to assess the status and trends of receiving water quality conditions.	**Copermittees** Riverside County Copermittees San Diego County Copermittees **Environmental Organizations** Los Penasquitos Lagoon Foundation
	RESPONSE: The San Diego Water Board generally agreed with the need for a longer assessment term (once per permit term rather than annually) to provide meaningful analysis of the annual pollutant load and flow calculations from MS4 outfalls during dry weather and the need to modify the requirements to calculate jurisdictional loads during wet weather to the added area-based jurisdictional computational approach. The San Diego Water Board generally modified the Tentative Order where there was agreement with the comments. The San Diego Water Board, however, disagrees with the requests regarding MS4 outfall assessments for flood control districts, assessment requirements related to critical receiving water beneficial uses, and the suggestion that pollutant loads only be calculated for priority pollutants. The San Diego Water Board agrees with the comments provided by the Los Penasquitos Lagoon Foundation and required increased public participation and formation of a Water Quality Improvement Plan Consultation Panel in Provision F.1.a.	

PROVISION E: JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS
E-1: *Align the Jurisdictional Runoff Management Program requirements with the Water Quality Improvement Plan requirements.*

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

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E-1	PROVISION E: JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS	
	COMMENT: *Align the Jurisdictional Runoff Management Program requirements with the Water Quality Improvement Plan requirements.* The Orange County, Riverside County and San Diego County Copermittees each submitted comments requesting the requirements in Provision E be allowed to be modified based on what is proposed in the Water Quality Improvement Plans. The Copermittees assert that the requirements of Provision E are a "one size fits all" set of requirements, and the requirements of the Water Quality Improvement Plan become "additive" rather than "complimentary." Several Copermittees submitted separate comment letters supporting the concept by requesting the San Diego Water Board align the development and implementation of the Water Quality Improvement Plan better with the jurisdictional runoff management program requirements. The BIA Regulated Community Coalition also submitted comments supporting the concept. The Environmental Groups submitted comments expressing concern with the flexibility of the jurisdictional runoff management program requirements and requested that the Water Quality Improvement Plan include a detailed list of activities and what activities each Copermittee will implement within its jurisdiction. The Environmental Groups are concerned that without this specificity in the Water Quality Improvement Plans, and the flexibility that is provided in the jurisdictional runoff management program requirements would result in the burden of achieving water quality improvement within a watershed falling to only one or two Copermittees. The Environmental Groups would like to see a clearer commitment of what will be implemented by each Copermittee either in the Water Quality Improvement Plan or in the jurisdictional runoff management program documents for each Copermittee. The USEPA is also concerned with the flexibility that is provided by the requirements of Provision E. The USEPA prefers jurisdictional runoff management program requirements that include specific inspection frequencies.	**Building Industry / Industry** BIA Regulated Community Coalition **Copermittees** City of Dana Point City of Laguna Hills City of Lake Forest City of Mission Viejo City of Rancho Santa Margarita City of San Juan Capistrano Orange County Copermittees Riverside County Copermittees San Diego County Copermittees **Environmental Organizations** Environmental Groups **State/Federal Government** USEPA
	RESPONSE: The San Diego Water Board agrees that the Water Quality Improvement Plans and jurisdictional runoff management program requirements should be better aligned and clearly present the water quality improvement strategies that each Copermittee will implement within its jurisdiction. The San Diego Water Board does not agree that the jurisdictional runoff management program requirements of Provision E should be allowed to be modified by the Water Quality Improvement Plan.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

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E-1	PROVISION E: JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS	
	The San Diego Water Board has revised Provision B.3.b in the revised Tentative Order (formerly Provision B.3.a in the Tentative Order) to require the Copermittees to specify which water quality improvement strategies each Copermittee will commit to implementing within its jurisdiction as part of its jurisdictional runoff management program requirements under Provisions E.2-E-7, and the optional water quality improvement strategies that will be implemented by the Copermittee within its jurisdiction when necessary to achieve the numeric goals. The optional water quality improvement strategies are to be implemented by the Copermittee as necessary to contribute toward achieving the numeric goals. Provision B.3.b in the revised Tentative Order also includes requirements for the Copermittees to identify optional Watershed Management Area strategies that the Copermittees will implement when necessary to achieve the numeric goals. Each Copermittee must specify BMPs, education programs, inspection frequencies, incentive and enforcement programs that will be implemented within its jurisdiction as part of its jurisdictional runoff management program requirements under Provisions E.2-E-7. Provisions E.2.e, E.3.g, E.4.f, E.5.e.(1), and E.7.c were removed in the revised Tentative Order, and the introductory paragraphs of Provisions E.2-E.7 were revised to state that each component must be implemented in accordance with the jurisdictional strategies identified in the Water Quality Improvement Plan. These revisions were made to better align the requirements of the Water Quality Improvement Plans and the jurisdictional runoff management programs, and provide an additional layer of transparency to the public for the strategies that the Copermittees will be committing to implement versus those strategies that will be implemented only when necessary to achieve the numeric goals. The San Diego Water Board has not modified the inspection frequency requirements in Provisions E.2-E.7. The inspection frequency requirements provide a sufficient level of guidance and flexibility for allowing the Copermittees to develop appropriate inspection frequencies that will be committed to in the Water Quality Improvement Plans, and a minimum level of effort that is expected for areas associated with the highest priority water quality conditions. The inspection frequencies that the Copermittees commit to implementing as part of the Water Quality Improvement Plans will be utilized by the San Diego Water Board during its audits of the Copermittees' programs to determine compliance with the requirements of the Tentative Order.	

E-2: Allow San Diego County to use WURMP to guide jurisdictional runoff management program for the Santa Margarita River Watershed Management Area until the Riverside County Copermittees are covered under the permit.

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

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E-2	PROVISION E: JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS	
	COMMENT: *Allow San Diego County to use the Watershed Urban Runoff Management Plan (WURMP) to guide its jurisdictional runoff management program for the Santa Margarita River Watershed Management Area until the Riverside County Copermittees are covered under the Tentative Order.* The County of San Diego and the San Diego County Copermittees requested that the requirement to develop a Water Quality Improvement Plan and implementation of the requirements of Provision E for the Santa Margarita River Watershed Management Area be postponed until the Riverside County Copermittees become covered under the Tentative Order.	**Copermittees** County of San Diego San Diego County Copermittees
	RESPONSE: The San Diego Water Board agrees with the request. The second introductory paragraph of Provision E states, "*Until the Copermittee has updated its jurisdictional runoff management program document with the requirements of Provision E, the Copermittee must continue implementing its current jurisdictional runoff management program*." The County of San Diego will continue to implement the jurisdictional runoff management program requirements of Order No. R9-2007-0001 until the Riverside County Copermittees are notified of coverage under the Order and a Water Quality Improvement Plan is developed pursuant to the requirements of this Order. The County of San Diego may use its WURMP for the Santa Margarita River Watershed to guide its jurisdictional runoff management program until the Water Quality Improvement Plan is developed and accepted. Please also see the response to comment B1-1.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

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E1-1	PROVISION E.1: Legal Authority Establishment and Enforcement	
	COMMENT: *Specify that the legal authority established by the Copermittees only applies to the Copermittees' jurisdictions.* The Orange County, Riverside County and San Diego County Copermittees each submitted comments requesting that the requirements of Provision E.1 be modified to specify that the legal authority established by the Copermittees only apply "to the extent allowable by law" and only applies to discharges within their jurisdiction. The Julian Community Planning Group also commented that there are jurisdictions that a Copermittee has no authority to require compliance.	**Community Planning Groups** Julian Community Planning Group **Copermittees** Orange County Copermittees Riverside County Copermittees San Diego County Copermittees
	RESPONSE: The San Diego Water Board disagrees that it is necessary to specify that the legal authority established by the Copermittees is only applicable to their jurisdictions. The requirements of Provision E.1 are consistent with the requirements under 40CFR122.26(d)(2)(i)(A)-(F) and do not go beyond those requirements. The legal authority that each Copermittee is required to establish for its jurisdiction is logically only expected to apply to its jurisdiction. Provision E.1.a.(2) is consistent with 40CFR122.26(d)(2)(i)(A), which requires the Copermittee to "*Control through ordinance, permit, contract, order or similar means, the contribution of pollutants to the municipal storm sewer by storm water discharges associated with industrial activity and the quality of storm water discharged from sites of industrial activity*." 40CFR122.26(d)(2)(i)(A) does not make a distinction between industrial activity (which includes construction activity according to 40 CFR 122.26(b)(14)(x)) that is regulated by an NPDES permit, such as the Statewide Industrial and Construction General Permits, and those that are not. Even if there are industrial and construction sites regulated by the Statewide Industrial or Construction General Permits, those sites are still subject to the Copermittees ordinances and the Copermittee must have the legal authority to control discharges from those sites. Provisions E.1.a.(4) is consistent with 40CFR122.26(d)(2)(i)(D), which requires the Copermittee to "*Control through interagency agreements among coapplicants the contribution of pollutants from one portion of the municipal system to another portion of the municipal system*." The federal regulations require the Copermittees to enter into interagency agreements to control pollutants from one Copermittee's jurisdiction to another Copermittee's jurisdiction. Provision E.1.a.(4) does not require anything outside of the federal requirements.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

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E1-1	PROVISION E.1: Legal Authority Establishment and Enforcement	
	Provision E.1.a.(5) is consistent with the requirements in the Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016. The Copermittees should be working with other entities outside of their jurisdiction to reduce or eliminate pollutants being discharged into their jurisdictions and MS4s, especially if those are significant sources of pollutants. The "where possible" qualifier in the requirement gives the Copermittees some flexibility in working with other entities, but Provision E.1.a.(5) does not require the Copermittees to impose their legal authority upon entities outside their jurisdictions. Provision E.1.a.(10) is consistent with 40CFR122.26(d)(2)(i)(F), which requires the Copermittee to "*Carry out all inspection, surveillance and monitoring procedures necessary to determine compliance and noncompliance with permit conditions including the prohibition on illicit discharges to the municipal separate storm sewer*." The San Diego Water Board did not make revisions to the requirements of Provision E.1 requested by the Copermittees.	

E1-2: *Requests for "clarifications" for legal authority requirements.*

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

E1-2	PROVISION E.1: Legal Authority Establishment and Enforcement	
	COMMENT: *Requests for "clarifications" for legal authority requirements.* The Orange County, Riverside County and San Diego County Copermittees each submitted comments requesting several "clarification" to requirements of Provision E.1.a to be "consistent" with the requirements under 40CFR122.26(d)(2)(i)(A)-(F).	**Copermittees** Orange County Copermittees Riverside County Copermittees San Diego County Copermittees
	RESPONSE: The San Diego Water Board disagrees that the legal authority requirements under Provision E.1.a are not consistent with the requirements under 40CFR122.26(d)(2)(i)(A)-(F). The requirements of Provision E.1.a are consistent with the requirements under 40CFR122.26(d)(2)(i)(A)-(F) and do not go beyond those requirements. The requirements under 40CFR122.26(d)(2)(i)(A)-(F) apply to both non-storm water discharges *to* the MS4 and pollutants in storm water discharges *from* the MS4. Provision E.1.a.(1) is consistent with 40CFR122.26(d)(2)(i)(B), which requires the Copermittee to "[*operate pursuant to legal authority established…which authorizes or enables the applicant at a minimum to*…] *Prohibit through ordinance, order or similar means, illicit discharges to the municipal separate storm sewer*." The requirement under 40CFR122.26(d)(2)(i)(B) does not include the term "*effectively* prohibit" only "prohibit" illicit discharges to the MS4. Provision E.1.a.(2) is consistent with 40CFR122.26(d)(2)(i)(A), which requires the Copermittee to "[*operate pursuant to legal authority established…which authorizes or enables the applicant at a minimum to*…] *Control through ordinance, permit, contract, order or similar means, the contribution of pollutants to the municipal storm sewer by storm water discharges associated with industrial activity and the quality of storm water discharged from sites of industrial activity*." The requirement under 40CFR122.26(d)(2)(i)(A) does not make a distinction between industrial activity (which includes construction activity according to 40 CFR 122.26(b)(14)(x)) that is regulated by an NPDES permit, such as the Statewide Industrial and Construction General Permits, and those that are not. Provision E.1.a.(3) is consistent with 40CFR122.26(d)(2)(i)(C), which requires the Copermittee to ""[*operate pursuant to legal authority established…which authorizes or enables the applicant at a minimum to*…] *Control through ordinance, order or similar means the discharge to a municipal separate storm sewer of spills, dumping or disposal of materials other than storm water*."	

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E1-2	PROVISION E.1: Legal Authority Establishment and Enforcement	
	Provisions E.1.a.(6)-(9) are consistent with 40CFR122.26(d)(2)(i)(E), which requires the Copermittee to "[*operate pursuant to legal authority established…which authorizes or enables the applicant at a minimum to*…] *Require compliance with conditions in ordinances, permits, contracts or orders*." Provisions E.1.a.(6)-(9) provide more specificity about what "compliance with conditions in ordinances, permits, contracts or orders" includes. Provision E.1.a.(10) is consistent with 40CFR122.26(d)(2)(i)(F), which requires the Copermittee to ""[*operate pursuant to legal authority established…which authorizes or enables the applicant at a minimum to*…] *Carry out all inspection, surveillance and monitoring procedures necessary to determine compliance and noncompliance with permit conditions including the prohibition on illicit discharges to the municipal separate storm sewer*." The San Diego Water Board did not make revisions to the requirements of Provision E.1.a requested by the Copermittees.	

PROVISION E.2: Illicit Discharge Detection and Elimination
E2-1: *Non-storm water discharges must be addressed because of the impacts dry weather flows have on receiving waters.*

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

E2-1	PROVISION E.2: Illicit Discharge Detection and Elimination	
	COMMENT: *Non-storm water discharges must be addressed because of the impacts dry weather flows have on receiving waters.* The Los Penasquitos Lagoon Foundation and the South Laguna Civic Association each submitted comments expressing concerns about the impacts on receiving water due to dry weather flows. The Los Penasquitos Lagoon Foundation noted that dry weather discharges can create serious impacts to the beneficial uses of receiving waters that support salt marsh habitats. The South Laguna Civic Association noted that elevated creek flows originating from over-irrigation result in the discharge of several pollutants to protected creek, estuary and coastal receiving waters. The Los Penasquitos Lagoon Foundation requested that the Tentative Order provide mechanisms to allow the Copermittees to address dry weather flows regardless of whether or not constituents of concern are present in the flows. The South Laguna Civic Association advocated for effective enforcement measures by the San Diego Water Board to reduce discharges generated by over-irrigation.	**Environmental Organizations** Los Penasquitos Lagoon Foundation South Laguna Civic Association
	RESPONSE: The San Diego Water Board agrees that non-storm water discharges must be addressed. The approach to regulating non-storm water discharges in the Tentative Order has been modified compared to earlier permits. The Tentative Order focuses on "effectively prohibiting" or preventing and eliminating all non-NPDES-permitted non-storm water discharges to the MS4. The Tentative Order also requires the Copermittees to prohibit non-storm discharges associated with over-irrigation to the MS4. These two changes are expected to result in more actions implemented by the Copermittees to "effectively prohibit" non-storm water discharges to the MS4s and thereby non-storm water and pollutants from the MS4s to receiving waters. The San Diego Water Board agrees that the San Diego Water Board must enforce permit requirements more effectively. By issuing the Tentative Order, the San Diego Water Board expects to be able to reallocate its resources to better enforce permit requirements instead of developing permits and permit requirements. However, the San Diego Water Board also expects the public to provide data, information and evidence that will allow the San Diego Water Board to enforce the requirements of the Tentative Order.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

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E2-2	PROVISION E.2: Illicit Discharge Detection and Elimination	
	COMMENT: *Requests for "clarifications" of illicit discharge detection and elimination requirements.* The Riverside County and San Diego County Copermittees, the Industrial Environmental Association, the BIA Regulated Community Coalition, and the Los Penasquitos Lagoon Foundation each submitted comment letters recommending minor revisions to the language under Provision E.2 to "clarify" the requirements, or to be consistent the comments regarding non-storm water discharges (see comment Gnl-13).	**Building Industry / Industry** Industrial Environmental Association BIA Regulated Community Coalition **Copermittees** Riverside County Copermittees San Diego County Copermittees **Environmental Organizations** Los Penasquitos Lagoon Foundation
	RESPONSE: The San Diego Water Board reviewed and considered the requests for minor revisions to "clarify" the requirements under Provision E.2. Where the San Diego Water Board determined a revision requested by a commenter was appropriate and necessary to clarify a requirement, clarify a linkage to another requirement, or make it consistent with other revisions made in the Tentative Order, the San Diego Water Board made a revision under Provision E.2. In many cases, the requested revision was not appropriate, not necessary, or both. In such cases, the San Diego Water Board did not revise the language as requested. Please see Provision E.2 in the revised Tentative Order to see where revisions were made. Please also see the responses to the comments that follow, associated with Provision E.2, for revisions that were made for specific parts under Provision E.2.	

E2-3: *Requests to more clearly define the responsibility of each Copermittee to address sources non-storm water discharges originating outside of a Copermittee's jurisdiction or control.*

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

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E2-3	PROVISION E.2: Illicit Discharge Detection and Elimination	
	COMMENT: *Requests to more clearly define the responsibility of each Copermittee to address sources non-storm water discharges originating outside of a Copermittee's jurisdiction or control.* The Riverside County and San Diego County Copermittees each submitted comments requesting modifications to the language under Provisions E.2.b and E.2.d to better define or more clearly define the responsibilities of each Copermittee to address sources of non-storm water discharges originating outside of a Copermittee's jurisdiction or control. The San Diego County Copermittees requested a minor revision to Provision E.2.b.(6) changing "must" to "shall." The San Diego County Copermittees also requested a minor revision to Provision E.2.d.(1)(d) to include a consideration for natural sources in its prioritization of investigations. The Riverside County Copermittees did not include the comments in their comment letter, but did include similar revisions in a track changes version of the Tentative Order provided with their comments. The Riverside County Copermittees requested additions to Provision E.2.d.(3) to specify that a Copermittee is no longer responsible for eliminating a non-storm water discharge to its jurisdiction if the source is in an upstream jurisdiction, and allowing the Copermittee to charge the San Diego Water Board for identifying non-storm water discharges subject to the regulatory authority of the San Diego Water Board.	**Copermittees** Riverside County Copermittees San Diego County Copermittees
	RESPONSE: The San Diego Water Board disagrees with the requests. Revision of Provision E.2.b.(6) to change "must" to "shall" is unnecessary. In either case, the San Diego Water Board would interpret the language as the Copermittee is required to implement Provision E.2.b.(6). Revision of Provision E.2.d.(1)(d) is unnecessary. Provisions E.2.d.(1)(a)-(e) are the criteria that the Copermittee must consider in its prioritization of follow-up investigations. Nothing in Provisions E.2.d.(1)(a)-(e) prohibit the Copermittee from considering natural sources as part of its prioritization of follow-up investigations. The recommended revisions to Provision E.2.d.(3) are not necessary or appropriate. Provision E.2.b.(6) already requires the Copermittee to coordinate with upstream Copermittees to prevent illicit discharges to the MS4 within its jurisdiction. In addition, Provision E.1.a.(4) requires the Copermittee to "*Control through interagency agreements among coapplicants the contribution of pollutants from one portion of the municipal system to another portion of the municipal system*." The federal regulations require the Copermittees to enter into	

E2-3	PROVISION E.2: Illicit Discharge Detection and Elimination	
	interagency agreements to control pollutants from one Copermittee's jurisdiction to another Copermittee's jurisdiction. The request to allow a Copermittee to charge the San Diego Water Board for implementing an investigation of non-storm water discharges to its MS4 is inappropriate. Each Copermittee is required to effectively prohibit non-storm water discharges to their MS4s by enforcing its legal authority, unless a non-storm water discharge is authorized under an NPDES permit. If a non-storm water discharge originates from a source that is subject to the San Diego Water Board's authority and requires an NPDES permit, then the Copermittee is still responsible for identifying the source if it is resulting in a non-storm water discharge into and from the Copermittee's MS4. If the non-storm water discharge is not authorized under an NPDES permit, then it is an illicit discharge. The Copermittee must either eliminate the illicit discharge or require the discharger to obtain authorization from the San Diego Water Board under an NPDES permit. If a non-storm water discharge to the Copermittee's MS4 is an NPDES permitted discharge, then the Copermittee is responsible for demonstrating that the non-storm water discharge is not an illicit discharge by identifying the source as an NPDES permitted discharge. The Copermittee must provide the data and documentation to demonstrate that non-storm water discharges from its MS4 are authorized under separate NPDES requirements. Until the Copermittee demonstrates that a non-storm water discharge is an NPDES-permitted discharge, the Copermittee is responsible for the non-storm water discharge. The non-storm water source investigation and identification are part of the Copermittee's responsibility to demonstrate compliance with the requirements in the Tentative Order. The San Diego Water Board did not revise Provisions E.2.b or E.2.d.	

PROVISION E.2.a: Non-Storm Water Discharges
E2a-1: *Request to allow the Copermittees to "encourage" instead of "require" air conditioning condensate non-storm water discharges be directed to landscaped areas or other impervious surfaces.*

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

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E2a-1	PROVISION E.2.a: Non-Storm Water Discharges	
	COMMENT: *Request to allow the Copermittees to "encourage" instead of "require" air conditioning condensate non-storm water discharges be directed to landscaped areas or other impervious surfaces*. The City of National City, the San Diego County Copermittees, the San Diego Unified Port District, and the San Diego Port Tenants Association each submitted comments expressing concerns with requiring air conditioning condensate non-storm water discharges to be directed to landscaped areas or other permeable surfaces, if feasible. The City of National City, the San Diego County Copermittees, and the San Diego Unified Port District requested the language of Provision E.2.a.(4)(a) be revised to encourage instead of require air conditioning condensate non-storm water discharges be directed to landscaped areas or other permeable surfaces. The San Diego County Copermittees also requested the addition of "or to the sanitary sewer" at the end of the requirement. The City of National City opposed this addition. The San Diego Port Tenants Association requested that the requirement be limited to development or re-development projects.	**Copermittees** City of National City San Diego County Copermittees San Diego Unified Port District **Societies/Associations/Coalitions** San Diego Port Tenants Association
	RESPONSE: The San Diego Water Board agrees to revise the requirements to encourage instead of require air conditioning condensate non-storm water discharges be directed to landscaped areas or other permeable surfaces. The San Diego Water Board also agrees to add "to the sanitary sewer" as an additional option. The San Diego Water Board disagrees with limiting the requirement to development or re-development projects. Air conditioning condensate non-storm water discharges originate primarily from existing development, and the Clean Water Act requires the Copermittees to effectively prohibit non-storm water discharges to the MS4. Please see Provision E.2.a.(4)(a) in the revised Tentative Order to see the revisions.	

E2a-2: *Requests for modifications to requirements of fire-fighting non-storm water discharges.*

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

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E2a-2	PROVISION E.2.a: Non-Storm Water Discharges	
	COMMENT: *Requests for modifications to requirements of fire-fighting non-storm water discharges.* The Orange County, Riverside County, and San Diego County Copermittees each submitted comments objecting to the requirement to encourage the implementation of BMPs for emergency firefighting discharges and/or the requirement to address non-emergency firefighting discharges from building fire suppression systems as illicit discharges. The County of San Diego and San Diego County Fire Authority also objected to the requirement to encourage implementation of BMPs for emergency firefighting discharges. San Diego Gas and Electric, the Southern California Gas Company, and the San Diego Port Tenants Association also objected to the requirement to address non-emergency firefighting discharges from building fire suppression systems as illicit discharges. The Orange County and Riverside County Copermittees recommended removing Provision E.2.a.(5)(b) and specifying that emergency firefighting non-storm water discharges do not require BMPs and are not prohibited. The San Diego County Fire Authority recommended maintaining the existing requirements in Order No. R9-2007-0001, which is supported by the County of San Diego. The San Diego County Copermittees recommended revising Provision E.2.a.(5)(a)(i) to require the Copermittees to address non-emergency firefighting discharges from building fire suppression systems as illicit discharges "unless BMPs are implemented to prevent the discharge of pollutants to the MS4." The Riverside County Copermittees, County of San Diego, San Diego County Fire Authority, San Diego Gas and Electric, Southern California Gas Company, and San Diego Port Tenants Association supported the recommendation. The Orange County Copermittees did not provide a similar comment, but recommended that other non-emergency firefighting discharges be addressed by a program developed and implemented by the Copermittee "in conjunction with the local Fire Authority/District."	**Building Industry / Industry** San Diego Gas and Electric Southern California Gas Company **Copermittees** County of San Diego Orange County Copermittees Riverside County Copermittees San Diego County Copermittees San Diego County Fire Authority **Societies/Associations/Coalitions** San Diego Port Tenants Association
	RESPONSE: The San Diego Water Board has review and considered the recommendations from the commenters. The San Diego Water Board disagrees that the language in Provision E.2.a.(5)(b) requires the implementation of BMPs for emergency fire fighting discharges, or prohibits emergency fire fighting discharges to the MS4. Provision E.2.a.(5)(b) only requires the Copermittees to "encourage" the implementation of BMPs. Provision E.2.a.(5)(b) is a recommendation for the Copermittees to implement, not a requirement for compliance.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

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E2a-2	PROVISION E.2.a: Non-Storm Water Discharges	
	The San Diego Water Board agrees to the recommended revision to Provision E.2.a.(5)(a)(i). The San Diego Water Board does not agree that the recommended revision to Provision E.2.a.(5)(a)(ii) is necessary. The Copermittees would have to develop and implement the program to address non-emergency fire fighting discharges in conjunction or coordination with the local fire authority or fire district. Please see Provision E.2.a.(5) in the revised Tentative Order to see the revisions.	

E2a-3: *Clarify that non-storm water discharges authorized by a separate NPDES permit are authorized to be discharged to the MS4.*

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

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E2a-3	PROVISION E.2.a: Non-Storm Water Discharges	
	COMMENT: *Clarify that non-storm water discharges authorized by a separate NPDES permit are authorized to be discharged to the MS4.* The San Diego Port Tenants Association, San Diego Gas and Electric, and the Southern California Gas Company each submitted comments requesting language in the Tentative Order to specify that non-storm water discharges authorized by separate NPDES permits are authorized to discharge to the MS4.	**Building Industry / Industry** San Diego Gas and Electric Southern California Gas Company **Societies/Associations/Coalitions** San Diego Port Tenants Association
	RESPONSE: The San Diego Water Board disagrees that revision to the language in the Tentative Order are necessary or appropriate. Provision A.1.b has been revised to refer to Provision E.2, which is the illicit discharge detection and elimination program requirements that must be implemented by each Copermittee within its jurisdiction to effectively prohibit non-storm water discharges to its MS4. Provision A.1.b also specifies that the Copermittees are required to effectively prohibit non-storm water discharges to the MS4 *unless* such discharges are authorized by a separate NPDES permit. The San Diego Water Board did not revise the Tentative Order to include additional language.	

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E2a-4	PROVISION E.2.a: Non-Storm Water Discharges	
	COMMENT: *Objections to addressing non-storm water discharges related to extraction of groundwater as illicit discharges.* The Orange County, Riverside County, and San Diego County Copermittees each submitted comments objecting to the requirements to address non-storm water discharges related to extraction of groundwater as illicit discharges if they are not identified as sources of pollutants. The City of National City also submitted a comment with a similar objection. The Copermittees also objected to requiring non-storm water discharges related to extraction of groundwater to be enrolled under the General Groundwater Extraction NPDES Permits issued by the San Diego Water Board. The Copermittees recommended several revisions to Provisions E.2.a.(1) and E.2.a.(3) to modify, remove, and/or reorganize the requirements pertaining to non-storm water discharges related to groundwater extraction.	**Copermittees** City of National City Orange County Copermittees Riverside County Copermittees San Diego County Copermittees
	RESPONSE: The San Diego Water Board disagrees with the recommendations. The Clean Water Act requires NPDES permit for MS4s to effectively prohibit non-storm water discharges to the MS4. As explained in the Fact Sheet, the Phase I Final Rule clarifies that non-storm water discharges through an MS4 are not authorized under the CWA (55 FR 47995): "*Today's rule defines the term "illicit discharge" to describe any discharge through a municipal separate storm sewer system that is not composed entirely of storm water and that is not covered by an NPDES permit. Such illicit discharges are not authorized under the Clean Water Act. Section 402(p(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit*." Thus, all non-storm water discharges that do not have authorization under an NPDES permit must ultimately be removed (i.e. prevented or eliminated) from the MS4 or become subject to an NPDES permit. The requirements under Provisions E.2.a.(1) and E.2.a.(3) are consistent with the Clean Water Act, the Code of Federal Regulations and the clarification in the Phase I Final Rule for non-storm water discharges. The non-storm water categories listed under Provision E.2.a.(1) can be authorized by an NPDES permit because they are extracting groundwater for the purpose of dewatering, and the San Diego Water Board has two NPDES permits that can authorize these types of non-storm water discharges. These are not "conditionally exempt"	

E2a-4	PROVISION E.2.a: Non-Storm Water Discharges	
	non-storm water discharges as the Copermittees have asserted. If there are non-storm water discharges that result from groundwater extraction for dewatering and do not have authorization under an NPDES permit, the discharge is an illicit discharge. The non-storm water categories listed under Provision E.2.a.(3) generally are expected to be discharged from natural, uncontrollable, or unanticipated sources. Non-storm water discharges from foundation drains and footing drains designed to be above the groundwater table are not generally expected to occur. If they do occur, the Copermittee is expected to implement its illicit discharge detection and elimination program to determine if the discharge is transient or persistent, a source of pollutants or not, and whether the discharge must be eliminated in accordance with its priorities. In general, the requirements under Provision E.2 are focused on the ultimate removal of unauthorized non-storm water discharges to the MS4 to “effectively prohibit” non-storm water discharges to the MS4, as required by the Clean Water Act. The San Diego Water Board is not requiring the Copermittee to enforce any NPDES permits issued by the San Diego Water Board or State Water Board. The Copermittees are only required to enforce their legal authority to prohibit illicit discharges to their MS4s established pursuant to Provision E.1.a.(1). The San Diego Water Board did not revise Provisions E.2.a.(1) or E.2.a.(3).	

E2a-5: *Request to allow the Copermittees to focus on elimination of "non-storm water discharges that are a source of pollutants" not "non-storm water discharges."*

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E2a-5	PROVISION E.2.a: Non-Storm Water Discharges	
	COMMENT: *Request to allow the Copermittees to focus on elimination of "non-storm water discharges that are a source of pollutants" not "non-storm water discharges."* The Orange County and Riverside County Copermittees each requested that the requirements under Provision E.2.a be revised to allow the Copermittees to focus on eliminating non-storm water discharges that are a source of pollutants and not require the elimination of all non-storm water discharges. In contrast, the Los Penasquitos Lagoon Foundation requested that the requirements under Provision E.2 provide the Copermittees a mechanism to address illicit discharges regardless of whether or not constituents of concern are present within the flows.	**Copermittees** Orange County Copermittees Riverside County Copermittees **Environmental Organizations** Los Penasquitos Lagoon Foundation
	RESPONSE: The San Diego Water Board disagrees with the Copermittees' request. Provision E.2 does provide the Copermittees a mechanism to address illicit discharges regardless of whether or not constituents of concern are present within the flows. However, the Copermittees are required to prioritize the non-storm water discharges that they will address, and eliminate the highest priority non-storm water discharges first. Please see the response to comment E2a-4.	

E2a-6: *Request to allow the Copermittees to encourage the control of residential car washing non-storm water discharges through public education.*

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E2a-6	PROVISION E.2.a: Non-Storm Water Discharges	
	COMMENT: *Request to allow the Copermittees to encourage the control of residential car washing non-storm water discharges through public education.* The San Diego County Copermittees submitted a comment requesting the requirements of Provision E.2.a.(4)(b) be revised to allow the Copermittees to encourage the control of residential car washing non-storm water discharges through public education.	**Copermittees** San Diego County Copermittees
	RESPONSE: The San Diego Water Board reviewed and considered the requested revisions. The San Diego Water Board did not revise Provision E.2.a.(4)(b) as requested, but did make revisions to provide the flexibility to encourage the control of residential car washing non-storm water discharges through public education.	

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E2a-7	PROVISION E.2.a: Non-Storm Water Discharges	
	COMMENT*: Request for modification to requirements for swimming pool non-storm water discharges.* The San Diego County Copermittees requested a minor modification to Provision E.2.a.(4)(c) to add the phrase "should be managed as to:" for the non-storm water discharge requirements related to dechlorinated swimming pool discharges.	**Copermittees** San Diego County Copermittees
	RESPONSE: The San Diego Water Board reviewed and considered the requested revision. The revision to Provision E.2.a.(4)(c) does not provide any additional clarify and is not necessary. The San Diego Water Board did not revise Provision E.2.a.(4)(c) as requested.	

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E2a-8	PROVISION E.2.a: Non-Storm Water Discharges	
	COMMENT: *Objections to requiring the prohibition of over-irrigation non-storm water discharges.* The Riverside County Copermittees and the County of San Diego each submitted comments objecting to eliminating the non-storm water discharge categories associated with over-irrigation, which results in requiring the Copermittees to prohibit over-irrigation non-storm water discharges to the Copermittees' MS4s. The Copermittees requested that the non-storm water discharge categories associated with over-irrigation be put back into Provision E.2.a. In contrast, the Los Penasquitos Lagoon Foundation and the South Laguna Civic Association each submitted comments expressing concerns about the impacts on receiving water due to dry weather flows associated with over-irrigation. The Los Penasquitos Lagoon Foundation noted that dry weather discharges can create serious impacts to the beneficial uses of receiving waters that support salt marsh habitats. The South Laguna Civic Association noted that elevated creek flows originating from over-irrigation result in the discharge of several pollutants to protected creek, estuary and coastal receiving waters.	**Copermittees** County of San Diego Riverside County Copermittees **Environmental Organizations** Los Penasquitos Lagoon Foundation South Laguna Civic Association
	RESPONSE: The San Diego Water Board disagrees with the Copermittees' request. The Riverside County Copermittees assert that the Copermittees must identify the categories that are sources of pollutants that should be prohibited, not the San Diego Water Board. The San Diego Water Board disagrees. This is the responsibility of both the San Diego Water Board and/or the discharger. Either the San Diego Water Board or the discharger may identify categories that should be prohibited. The Phase I Rule (55 FR 48037) specifies that "*the Director [i.e. San Diego Water Board] may include permit conditions that either require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*." In this case, the San Diego Water Board has identified non-storm water runoff from landscape irrigation, irrigation water, and lawn watering (collectively, "over-irrigation") as a significant source of pollutants discharging to the MS4. The Fact Sheet cites a number of documents, from the state and all three counties of the San Diego Region, to justify the removal of these categories from the list of categories of non-storm water discharges into the MS4 not required to be prohibited. The San Diego Water Board maintains that the documentation cited in the Fact Sheet supports that removal of these categories. However, the comments from the Los Penasquitos Lagoon Foundation and the South Laguna Civic Association also support this conclusion. In addition, the removal of the non-storm water discharge categories associated with over-irrigation has already	

E2a-8	PROVISION E.2.a: Non-Storm Water Discharges	
	been adopted in the Orange County and Riverside County MS4 Permits (Order Nos. R9-2009-0002 and R9-2016-0016). The Riverside County Copermittees are already subject to the requirement to prohibit non-storm water discharge categories associated with over-irrigation, so the removal of these categories in the Tentative Order is consistent with their current requirements. Furthermore, the removal of the non-storm water discharge categories associated with over-irrigation is consistent with what is already required to be implemented by the Copermittees. The prohibition is consistent with the Water Conservation in Landscaping Act (AB1881), which required cities and counties to adopt landscape water conservation ordinances prohibiting runoff from inefficient landscape irrigation by January 1, 2010. The cities and counties were required to adopt ordinances that prohibit runoff from "the target landscape" to "adjacent property, non-irrigated areas, walks, roadways, parking lots, or structures." The Copermittees should have already adopted these ordinances and are required to enforce these ordinances to prohibit runoff associated with over-irrigation. The San Diego Water Board did not revise Provision E.2.a to include the non-storm water discharge categories associated with over-irrigation.	

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E2a-9	PROVISION E.2.a: Non-Storm Water Discharges	
	COMMENT: *Objection to requirement to reduce or eliminate non-storm water discharges whether or not a non-storm water discharge has been identified as an illicit discharge.* The Orange County, Riverside County, and San Diego County Copermittees each submitted comments objecting the requirement under Provision E.2.a.(7) to reduce or eliminate non-storm water discharges whether or not a non-storm water discharge has been identified as an illicit discharge. The San Diego County Copermittees recommended removing the phrase "whether or not the non-storm water discharge has been identified as an illicit discharge" and the Orange County and Riverside County Copermittees recommended removing Provision E.2.a.(7). In contrast, the Los Penasquitos Lagoon Foundation requested that the requirements under Provision E.2 provide the Copermittees a mechanism to address illicit discharges regardless of whether or not constituents of concern are present within the flows. The Los Penasquitos Lagoon Foundation noted that dry weather freshwater flows themselves can create serious impacts to the beneficial uses of receiving waters that support salt marsh habitats, especially when those flows have been changed from ephemeral to perennial.	**Copermittees** Orange County Copermittees Riverside County Copermittees San Diego County Copermittees **Environmental Organizations** Los Penasquitos Lagoon Foundation
	RESPONSE: The San Diego Water Board disagrees with the request to remove Provision E.2.a.(7), but agrees to modify the language. Provision E.2.a.(7) is consistent with Clean Water Act, the Code of Federal Regulations and the clarification in the Phase I Final Rule for non-storm water discharges. Please see response to comment E2a-4. The San Diego Water Board has revised Provision E.2.a.(7). Please see the revisions in the revised Tentative Order.	

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E2a-10	PROVISION E.2.a: Non-Storm Water Discharges	
	COMMENT: *Request for modifications to the requirements for water line flushing and water main breaks non-storm water discharges.* The Metropolitan Water District of Southern California submitted a request to modify Provision E.2.a.(2) to specify that non-storm water discharges from water purveyors and community water systems are authorized discharges and not illicit discharge if enrolled or regulated under NPDES Permit No. CAG 679001 (Order No. R9-2010-0003).	**Other Entities** Metropolitan Water District of Southern California
	RESPONSE: The San Diego Water Board disagrees with the request. Provision E.2.a.(2) is specific to the requirement for the Copermittees to identify whether or not a non-storm water discharge resulting from water line flushing or water main breaks are illicit discharges. These are two non-storm water discharge categories specifically identified in the Code of Federal Regulations that the Copermittees are required to address as illicit discharges if they are identified as a source of pollutants. The introductory paragraph to Provision E.2.a already specifies that non-storm water discharges authorized by a separate NPDES permit is not required to be addressed as an illicit discharge. Provision E.2.a.(2) further specifies that water line flushing and water main breaks covered under NPDES Permit No. CAG 679001 (Order No. R9-2010-0003) are not illicit discharges. The San Diego Water Board did not revise Provision E.2.a.(2).	

E2a-11: Request to allow the Copermittees to designate BMPs to be implemented if a category of non-storm water discharges is found to be a source of pollutants instead of requiring a prohibition of the category of non-storm water discharges.

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E2a-11	PROVISION E.2.a: Non-Storm Water Discharges	
	COMMENT: *Request to allow the Copermittees to designate BMPs to be implemented if a category of non-storm water discharges is found to be a source of pollutants instead of requiring a prohibition of the category of non-storm water discharges.* San Diego Gas and Electric and the Southern California Gas Company each submitted comments requesting Provision E.2.a.(6) be modified to provide an alternative that would allow the Copermittees to designate BMPs to be implemented if a category of non-storm water discharges is found to be source of pollutants, instead of requiring a prohibition of the category of non-storm water discharges.	**Building Industry / Industry** San Diego Gas and Electric Southern California Gas Company
	RESPONSE: The San Diego Water Board reviewed and considered the requested revision. The San Diego Water Board has revised Provision E.2.a.(6) to allow the Copermittees to propose controls to be implemented if a category of non-storm water discharges is found to be a source of pollutants. Please see Provision E.2.a.(6) in the revised Tentative Order.	

PROVISION E.3: Development Planning
E3-1: *Requests for "clarifications" for development planning requirements.*

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E3-1	PROVISION E.3: Development Planning	
	COMMENT: *Requests for "clarifications" for development planning requirements.* The Copermittees and others have submitted numerous recommendations for revisions to provide "clarity," improve readability, or correct the language in Provision E.3 of the Tentative Order.	**Building Industry / Industry** Building Industry Association of Southern California San Diego Green Building Council **Copermittees** City of Chula Vista Orange County Copermittees Riverside County Copermittees San Diego County Copermittees **Engineering/Design Consultants** Contech Engineered Solutions
	RESPONSE: The San Diego Water Board has reviewed and considered all the recommendations submitted by the commenters. In cases where the San Diego Water Board agreed that the recommendations would improve readability and were consistent with the intent of language or requirement, the recommendations were incorporated. In instances where the San Diego Water Board disagreed with the recommendations, the language in the Tentative Order was not changed.	

E3-2: *Requests for revisions to allow the construction of BMPs in waters of the state.*

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E3-2	PROVISION E.3: Development Planning	
	COMMENT: *Requests for revisions to allow the construction of BMPs in waters of the state.* The San Diego County Copermittees and the BIA Regulated Community Coalition have requested that Provision E.3.a.(1)(b) be revised to allow the implementation of structural BMPs within waters of the state, since the definition of waters of the state is broad and could be interpreted to prohibit storm drain inserts and other common BMPs. The requested revision that "BMPs must not be constructed within a waters of the U.S. unless authorized by the San Diego Water Board Executive Officer" is consistent with the San Diego Water Board's 401 Certification Program and would protect natural receiving waters from construction and the use of such waters to transport pollutants.	**Building Industry / Industry** BIA Regulated Community Coalition **Copermittees** City of Chula Vista San Diego County Copermittees
	RESPONSE: The San Diego Water Board agrees with this comment and has modified the language in the Tentative Order accordingly.	

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E3-3	PROVISION E.3: Development Planning	
	COMMENT: *Requests for revisions to Priority Development Project inventory requirements.* The San Diego County Copermittees have requested that the Tentative Order be revised such that updates to Priority Development Project databases occur "regularly" instead of "at least annually." Additionally, the City of Chula Vista requested the start date for Priority Development Project inventory begin December 2002 instead of January 2002, to reflect the start date for the San Diego County Copermittees' regulatory oversight process pursuant to Order No. 2001-01.	**Copermittees** City of Chula Vista San Diego County Copermittees
	RESPONSE: The San Diego Water Board disagrees that the frequency of updates to project inventories should be less frequent than on an annual basis. However, the San Diego Water Board agrees with the request that the start date be changed for San Diego County Copermittees and has revised the language in the Tentative Order appropriately.	

PROVISION E.3.b: Priority Development Projects
E3b-1: *Requests for revisions to development planning requirements to include different requirements for transportation projects.*

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E3b-1	PROVISION E.3.b: Priority Development Projects	
	COMMENT: *Requests for revisions to development planning requirements to include different requirements for transportation projects.* The San Diego County and Orange County Copermittees, the Riverside County Transportation Department, and others commented that transportation projects should be exempt from the requirement to implement pollutant control and hydromodification management BMPs set forth in the Tentative Order. Commenters contend that transportation projects should be allotted special consideration because, unlike other types of projects, they must also consider various design constraints having to do with limited right-of-way, utilities, street trees, fire truck access, and general public safety. Commenters recommended that transportation projects be held to USEPA Green Streets guidance as the design requirement.	**Building Industry / Industry** San Diego Green Building Council **Copermittees** City of Dana Point City of Imperial Beach Orange County Copermittees Riverside County Transportation Department
	RESPONSE: The San Diego Water Board generally agrees with the commenters regarding the unique constraints associated with existing roadways. The Tentative Order has been revised to provide an exemption from the Priority Development Project designation for projects where retrofitting of existing paved alleys, streets, or roads are designed and constructed in accordance with USEPA Green Street guidance. However, this exemption is only allowed for existing road and not new ones. This is because new roads are not yet spatially constrained and should be able to incorporate the pollutant control and hydromodification management BMPs during the planning stages. The Tentative Order also allows the Copermittees to incorporate alternative compliance options during the planning stages of the new road projects. The San Diego Water Board maintains that controlling pollutants and managing flows coming from roads is critical because roads are significant sources of pollutants and add significant new impervious surfaces. Commenters should also note that routine maintenance activities associated with transportation projects such as maintaining original line and grade, or repairing potholes, is not considered a Priority Development Project and is not subject to any structural BMP requirements.	

E3b-2: *Request for a clear definition of "directly discharges to" an Environmentally Sensitive Area (ESA).*

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E3b-2	PROVISION E.3.b: Priority Development Projects	
	COMMENT: *Request for a clear definition of "directly discharges to" an Environmentally Sensitive Area (ESA).* The San Diego County Copermittees and the City of Imperial Beach have requested that Provision B.3.b.(1) be revised to clearly define "directly discharges to" an ESA. The Copermittees are concerned that language in the Tentative Order is confusing and can be misinterpreted.	**Copermittees** City of Imperial Beach San Diego County Copermittees
	RESPONSE: The San Diego Water Board agrees with the comment. The San Diego Water Board revised the language in Provision B.3.b.(1) to more clearly define "directly discharges to."	

E3b-3	PROVISION E.3.b: Priority Development Projects	
	COMMENT: *Requests for modifications to the types of projects defined as Priority Development Projects and subject to the storm water pollutant control and hydromodification management structural BMP requirements.* The San Diego County, Orange County, and Riverside County Copermittees, several individual Copermittees, members of the Building Industry, Industry, Clean Water Now, and Engineering/Design Consultants submitted comments regarding the types of projects defined as Priority Development Projects. Clean Water Now expressed concern with the types of projects that are considered Priority Development Projects. The Copermittees, Building Industry, and Engineering/Design Consultants provided recommendations for the types of projects that should be defined as Priority Development Projects and therefore subject to the storm water pollutant control and hydromodification management structural BMP requirements, and the types of projects that should be exempt from those requirements. The Copermittees made several comments on this topic, which are summarized below: • Single family residences should be exempt because the requirements are complex and difficult for the regular homeowner to understand, and that the potential for pollutant generation is considerably less than an industrial or commercial site; • Driveways should not be included as Priority Development Projects because, unlike roads, driveways experience low daily trips. The Copermittees suggest implementing a lower performance standard for BMPs implemented on driveways than other Priority Development Projects; • The Tentative Order should include qualifiers for parking lots that would trigger Priority Development Project status only if they were uncovered; • Maintenance access roads should be exempt; • The Tentative Order should allow exemptions for parking lots and other projects that are constructed with permeable surfaces; • The Tentative Order should allow exemptions for flood control and emergency projects; • The exemptions allowed for LEED certified single family residences is inappropriate because the program encompasses other environmental considerations, and are outside the scope of storm water permitting; • Triggers for Priority Development status should be simultaneously based on soil type and square footage of impervious surface; • The Tentative Order should allow exemptions for "Watershed Protection Projects" that are undertaken to rehabilitate or prevent environmental, social, and economic damage to the watershed;	**Building Industry / Industry** American Society of Landscape Architects San Diego Green Building Council San Diego Gas and Electric Company Southern California Gas Company **Copermittees** City of Chula Vista City of Imperial Beach City of Poway Orange County Copermittees Riverside County Copermittees San Diego County Copermittees **Environmental Organizations** Clean Water Now **Engineering/Design Consultants** Contech Engineered Solutions Project Design Consultants

E3b-3	PROVISION E.3.b: Priority Development Projects	
	• The hillside development category should be removed because it is not needed. Some Engineering/Design Consultants suggested that Priority Development Projects be exempt if they are designed and constructed with specific materials or a voluntary certification program. San Diego Gas and Electric and the Southern California Gas Company commented that linear underground/overhead (utility) projects should be exempt from Priority Development Project status due to the nature of their construction.	
	RESPONSE: The San Diego Water Board generally disagrees with the requests to remove some project categories from Provision E.3.b, or to exempt certain types of projects from the requirement to implement storm water pollutant control and hydromodification management BMPs. Such BMPs are needed to protect water quality. The list of project categories in Provision E.3.b represents projects that result in the creation of significant areas of impervious surface and/or are pollutant generating in nature, which in turn contributes to pollutants in storm water discharges and altered flow regimes that cause accelerated erosion of channel bed and banks, and consequently degraded stream conditions. With the exception of driveways, the Priority Development Project categories have not changed substantially in San Diego Water MS4 permits. Provision E.3.b of the Tentative Order is consistent with the Fourth Term MS4 permits adopted by the San Diego Water Board for Orange County and Riverside County. Driveways were added as to the Priority Development Project categories because, although they experience much less traffic than roads, they still generate pollutants and create significant impervious surfaces that can impact downstream receiving waters, and must be mitigated. Similarly, even covered parking lots cause impacts for which mitigation is needed because rooftops also add to the impervious surface footprint. Research shows that even incremental increases in impervious surface, as low as 3-5 percent of the watershed area in the semi-arid climate of southern California, can result in degradation of receiving streams (Stein, E. and Zaleski, S., 2005. Technical Report 475, Managing Runoff to Protect Natural Streams: The Latest Development on Investigation and Management of Hydromodification in California. December 30, 2005.). Creation of impervious surface is a concern to the San Diego Water Board and construction with pervious materials that allow infiltration and other natural hydrologic processes are preferred. There is no need to exempt parking lots and other projects constructed with pervious materials from Priority Development Project status because they are not considered Priority Development Projects in the first place. Similarly, maintenance access roads as well as the majority of linear utility projects are not Priority Development Projects because they do not necessarily result in the placement of impervious surfaces above the threshold square footages	

E3b-3	PROVISION E.3.b: Priority Development Projects	
	associated with Priority Development Projects. Priority Development Project status is based on both the type of project being built and associated pollutants anticipated to be generated, and a threshold for the creation or replacement of impervious surface. Soil type comes into play in terms of meeting the retention requirement, which is discussed in the response to comment E3c1-1. The San Diego Water Board disagrees with the recommendation to define Priority Development Projects by soil type because this is accounted for in the size and type of BMPs as dictated by the retention requirement. The San Diego Water Board disagrees that hillside development projects should be exempt. These projects are susceptible to causing accelerated erosion and therefore must implement structural BMPs. The San Diego Water Board further disagrees that there should be exemptions for emergency projects or flood control projects. Provision E.3 describes requirements that pertain to development planning. Emergency situations, by definition, are not planning exercises and therefore do not involve the design and construction of a building or structure. The San Diego Water Board believes that it may be suitable to relax the structural BMP standards for, or exempt flood control projects, but not before projects are evaluated on a case-by-case basis. In many instances, environmentally friendly practices may be appropriate for implementation in flood control projects, but a variety of options would not be evaluated if the Tentative Order provided a blanket exemption. The San Diego Water Board disagrees that an exemption from the Priority Development Project structural BMP requirements should be provided for all single family residences. The definition of Priority Development Projects in the Tentative Order already excludes a majority of single family residences that may be developed or redeveloped. New single family residences must create 10,000 square feet or more of impervious surface, or 5,000 square feet or more of impervious surface as a Hillside Development, or 2,500 square feet or more of impervious surface if discharging directly to an Environmental Sensitive Area to be defined as a Priority Development Project. Redevelopment single family residence projects must create or replace 5,000 square feet or more of impervious surface, or 2,500 square feet or more of impervious surface if discharging directly to an Environmental Sensitive Area to be defined as a Priority Development Project. Single family residences that are defined as Priority Development Projects can have a significant impact on receiving water quality and it is appropriate for these projects to implement the Priority Development Project structural BMP requirements. The San Diego Water Board removed language pertaining to the option for single family residences to be designed and constructed with LEED certification to qualify as exempt from Priority Development Project status.	

E3b-3	PROVISION E.3.b: Priority Development Projects	
	This is because several commenters stated that including this requirements was outside the scope of water quality regulation, and that the LEED program was too specific of a certification requirement. To avoid any inconsistency regarding equivalent certification programs and for more streamlined requirements, this option, and hence the exemption allowed for single family residences, was removed. Single family residences large enough to trigger the size thresholds associated with Priority Development Projects are a source of pollutants and altered flow regimes, and therefore must be required to implement structural BMPs. The Copermittees must inspect such BMPs as part of their oversight programs to ensure that homeowners are properly maintaining the BMPs and the BMPs continue to operate as designed in order for the Copermittees to meet the MEP standard of the Clean Water Act. Finally, the San Diego Water Board disagrees that there should be an exemption for "Watershed Protection Projects." The commenters should note that Priority Development Projects are not only defined by square footage of impervious surface, but also the type of project being constructed. The types of projects described in the comment, such as erosion mitigation, restoration of rivers and ecosystems, or groundwater recharge, do not need to be explicitly provided exemptions because they would not be considered Priority Development Projects in the first place if they do not create or replace impervious surface in exceedance of the thresholds in the Tentative Order. The San Diego Water Board has also revised the Tentative Order to allow the Copermittees to provide exemptions for all types of projects. The Copermittees have the ability to exempt projects from meeting the hydromodification management requirements in areas where they have deemed it appropriate to do so. However, in order to utilize this option, Copermittees must first perform the optional Watershed Management Area Analysis described in Provision B.3.b.(4). Please see the response to Comment E3c-2 for further discussion of this option.	

E3b-4: *Redevelopment Priority Development Projects that were subject to previous structural BMP requirements should not be subject to new structural BMP requirements.*

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E3b-4	PROVISION E.3.b: Priority Development Projects	
	COMMENT: *Redevelopment Priority Development Projects that were subject to previous structural BMP requirements should not be subject to new structural BMP requirements*. The San Diego County, Orange County, and Riverside County Copermittees each submitted comments requesting that language be added to the Tentative Order that would specify structural BMP requirements are not applicable to Priority Development Projects (or portions thereof) if the project already has implemented structural BMPs pursuant to requirements of prior MS4 permits.	**Copermittees** Orange County Copermittees Riverside County Copermittees San Diego County Copermittees
	RESPONSE: The San Diego Water Board disagrees in concept with the Copermittees' request. Although some projects may already have structural BMPs onsite, the performance requirements of those BMPs do not necessarily meet the requirements of the Tentative Order. Order No. R9-2007-0001 does not have the numerical storm water pollutant control retention performance standard, therefore redevelopment sites that were subject to Order No. R9-2007-0001 must update their BMPs during the design phase. In some cases, redevelopment projects will already have BMPs that meet the storm water pollutant control and hydromodification management BMP requirements. In these instances, the requirements of the Tentative Order are met and there is no need to change the language.	

PROVISION E.3.c: Priority Development Project Structural BMP Performance Requirements
E3c-1: *The Tentative Order ignores regional comprehensive plans developed by municipalities and SANDAG.*

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E3c-1	PROVISION E.3.c: Priority Development Project Structural BMP Performance Requirements	
	COMMENT: *The Tentative Order ignores regional comprehensive plans developed by municipalities and SANDAG.* The Jamul Dulzura Community Planning Group and Julian Community Planning Group assert that the requirements in the Tentative Order are contradictory to plans developed by SANDAG and subsequently included in General Plans that include sound principles such as encouraging redevelopment. The Tentative Order's requirements amount to punishing or dis-incentivizing urban infill projects.	**Community Planning Groups** Jamul Dulzura Community Planning Group Julian Community Planning Group
	RESPONSE: The San Diego Water Board strongly disagrees that the requirements in the Tentative Order are contradictory to principles advocated in regional planning documents. In fact, the Tentative Order is heavily based on planning at the watershed scale, as represented in the Water Quality Improvement Plan requirements. The Tentative Orders increases flexibility for the Copermittees to address urban infill and redevelopment projects by not mandating only on-site BMPs. Redevelopment projects will be required to implement structural BMP requirements that are needed to protect downstream water quality. However, if a Copermittee finds that implementation of the required BMPs fully onsite will not result in meaningful improvements in either pollutant control or hydromodification management, then that Copermittee has the option to allow compliance elsewhere in the watershed where more substantial improvements can take place. There are no additional requirements for redevelopment projects versus new projects, therefore redevelopment projects are not being penalized, as suggested by the commenters. Furthermore, the Tentative Order has been revised to include an exemption from hydromodification management BMP requirements for Priority Development Projects that discharge to conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean. Additionally, more exemptions could be included on a watershed-specific basis if the Copermittees in the Watershed Management Area elect to perform the optional Watershed Management Area Analysis as described in Provision B.3.b.(4). Please see the response to Comment E3c-2 for further discussion of these options.	

E3c-2	PROVISION E.3.c: Priority Development Project Structural BMP Performance Requirements	
	COMMENT: *Request for requirements that allow development of watershed-specific structural BMP performance standards in Water Quality Improvement Plans.* The Orange County and San Diego County Copermittees assert that the Tentative Order requires a "one-size-fits-all" approach and request that the Tentative Order allows for watershed-specific performance requirements for structural BMPs. Members of the Building Industry, the City of Imperial Beach, Engineering/Design Consultants, Societies/Associations/Coalitions, and Other Entities requested or expressed support for a similar concept. The Environmental Groups support including alternative compliance options that provide "off-ramps" for the baseline "one size fits all" structural BMP performance requirements.	**Building Industry / Industry** American Society of Landscape Architects **Copermittees** City of Imperial Beach Orange County Copermittees San Diego County Copermittees **Environmental Organizations** Environmental Groups **Engineering/Design Consultants** Latitude 33 Planning and Engineering Project Design Consultants **Societies/Associations/Coalitions** BIOCOM **Other Entities** Carol Crossman Gable PR Hughes Marino Marston+Marston Nuffer, Smith, and Tucker San Diego Regional Chamber of Commerce Sheppard, Mullin, Richter & Hampton LLP Southern Cross Property Consultants Transition IT
	RESPONSE: The San Diego Water Board disagrees that the Tentative Order requires a "one-size-fits-all" approach for the implementation of structural BMPs. For the Priority Development Project structural BMP performance requirements, site specific conditions must be taken into account upon selecting appropriate BMPs. Provision E.3.c.(1)(a), which describes requirements for storm water pollutant control, the Tentative Order states that: *"Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapostranspire) onsite the volume of storm water runoff produced from a 24-hour 85th percentile storm event (design capture volume)."* While each Priority Development Project must retain the volume of storm water runoff produced from the 24-hour 85th percentile storm, the actual volume retained will vary based on site specific factors, namely soil type and associated infiltration rates. The requirement to retain the volume of water associated with this size storm is appropriate for the reasons stated in the response to comment E3c1-1.	

E3c-2	PROVISION E.3.c: Priority Development Project Structural BMP Performance Requirements	
	Similarly, Provision E.3.c.(2)(a), which describes requirements for hydromodification management, states that: "*Post-project runoff flow rates and durations must not exceed pre-development runoff flow rates and durations by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat conditions downstream of Priority Development Projects).*" This requirement involves implementing BMPs for "the range of flows that result in increased potential for erosion,…" which is necessarily a site-specific requirement. The range of flows that cause downstream erosion from one Priority Development Project may be different than the range of flows that cause erosion from another Priority Development Project located in a different area in the watershed. Therefore, very different BMPs might be required from the two sites. The San Diego Water Board agrees that greater improvements to water quality in the watersheds may be realized if Priority Development Projects were allowed to implement some requirements offsite, as opposed to strictly onsite. For this reason, the Tentative Order allows for "alternative compliance" in instances where the Copermittee determines that offsite measures will have a greater overall water quality benefit for the Watershed Management Area than if the Priority Development Project were to implement structural BMPs onsite. Consequently, watershed-specific structural BMP requirements are present in the Tentative Order in the form of allowable compliance offsite. The "alternative compliance program" has been substantially re-written for simplicity, and also to better align this program with the planning efforts of the Copermittees in the Water Quality Improvement Plans. The alternative compliance program, which is described in Provision E.3.c.(3), is an option for Priority Development Projects where the Copermittee has participated in the development of a Watershed Management Area Analysis as part of the Water Quality Improvement Plan (described in Provision B.3.b.(4)). Such an approach is consistent with the latest findings in hydromodification management by the scientific community. In the Southern California Coastal Water Research Project (SCCWRP) Technical Report No. 667, authors state: "*An effective [hydromodification] management program will likely include combinations of on-site measures (e.g., low-impact development techniques, flow-control basins), in-stream measures (e.g., stream habitat restoration), floodplain and riparian zone actions, and off-site measures. Off-site measures may include compensatory mitigation measures at upstream locations that are designed to help restore and manage flow and sediment yield in the watershed.*" Consistent with the ideas brought forth by the SCCWRP report, in the Watershed Management Area Analysis of Provision B.3.b.(4), which is optional, the Copermittees will develop watershed maps that include as much detail	

E3c-2	PROVISION E.3.c: Priority Development Project Structural BMP Performance Requirements	
	about factors that affect the hydrology of the watersheds as is available. Such factors included identification of areas suitable for infiltration, coarse sediment supply areas, and locating stream channel structures and constrictions. Once these factors are mapped and studied, the Copermittees can identify areas in the watersheds where "candidate projects" may be implemented that are expected to improve water quality in the watershed by providing more opportunity for infiltration, slowing down storm water flows, or attenuation of pollutants naturally via healthy stream habitat. These projects may be in the form of retrofitting existing development, rehabilitating degraded stream segments, identifying regional BMPs, purchasing land to preserve valuable floodplain functions, and any other projects that the Copermittees identify. Under the alternative compliance program, Priority Development Projects may be allowed to fund, partially fund, or implement a candidate project, in lieu of implementing structural BMPs onsite, if they enter into a voluntary agreement with the Copermittee permitting this arrangement. If compliance involves funding or implementing a project that is outside the jurisdiction of the Copermittee, then that Copermittee may enter into an inter-agency agreement with the appropriate jurisdiction(s). In response to several comments, the Tentative Order has been revised to include an exemption from hydromodification management BMP requirements for Priority Development Projects that discharge to conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean. Provision B.2.b.(4) provides an optional Watershed Management Area Analysis that may allow the Copermittees to identify additional areas within the watershed where it is appropriate to exempt Priority Development Projects from implementing hydromodification management BMPs. Exemptions other than the ones specified in the Tentative Order, then, would be applicable on a watershed basis, and would require supporting rationale. In summary, the Tentative Order includes requirements for site-specific structural BMP requirements and exemptions. In order for them to be realized, the Copermittees must perform up-front analysis to support both the alternative compliance program and watershed-specific hydromodification management BMP exemptions. The San Diego Water Board believes that this approach will allow for meaningful improvement to water quality in the watersheds, as well as the efficient use of resources for innovative projects, as opposed to requiring structural BMPs to be fully implemented on all sites.	

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E3c-3	PROVISION E.3.c: Priority Development Project Structural BMP Performance Requirements	
	COMMENT: *Request for modifications to Priority Development Project structural BMP infiltration and groundwater protection pre-treatment requirements.* The San Diego County Copermittees and the City of National City commented that pre-treatment for infiltration BMPs on areas of industrial or light industrial activity should only be required if significant pollutant levels are present or if source control BMPs will not provide pre-treatment. Contech Engineer Solutions expressed concern that without clear and specific pre-treatment standards for infiltration BMPs, the Copermittees will accept pre-treatment systems that will require significant maintenance to ensure proper operation. Contech Engineer Solutions recommended very specific design standards for pre-treatment systems.	**Copermittees** City of National City San Diego County Copermittees **Engineering/Design Consultants** Contech Engineered Solutions
	RESPONSE: The San Diego Water Board agrees with the Copermittees comments. The San Diego Water Board conceptually agrees with Contech Engineered Solutions, but disagrees that including such specific design standards are necessary. The San Diego Water Board has revised Provision E.3.c.(5)(a)(vi) to allow infiltration BMPs on industrial or light industrial areas if source control BMPs will not expose groundwater to activities that are a high threat. The San Diego Water Board did not revise Provision E.3.c.(5)(a)(i). The Copermittees are required to inspect BMPs at Priority Development Projects to confirm they continue to operate as designed. If structural BMPs on Priority Development Projects are not properly maintained, the Copermittees must enforce its ordinances to achieve compliance with its ordinances and the requirements of the Tentative Order.	

E3c-4: *General concerns associated with development planning structural BMP performance requirements.*

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E3c-4	PROVISION E.3.c: Priority Development Project Structural BMP Performance Requirements	
	COMMENT: *General concerns associated with the development planning structural BMP performance requirements.* Comments from members of the Building Industry, Community Planning Groups, the Copermittees, Environmental Organizations, State Government, Societies/Associations/Coalitions, and Other Entities expressed various concerns about the development planning structural BMP performance requirements for Priority Development Projects. Several commenters expressed concerns with the potential costs associated with enforcing and implementing the changing requirements for development projects, or the uncertainty of the impacts of those new requirements. The South Laguna Civic Association expressed concern that the current development planning requirements are already resulting in the degradation and destruction of creeks, wetlands, and coastal habitats. David Akers, P.E., expressed concern with current practices and supports requirements that will result in sustainable development. The City of Chula Vista questioned what should be done water collected in rain barrels and other retention facilities if there is a lack of demand during the rainy season.	**Building Industry / Industry** Associated General Contractors of America **Community Planning Groups** Julian Community Planning Group Ramona Community Planning Group **Copermittees** City of Chula Vista County of San Diego Orange County Copermittees **Environmental Organizations** Clean Water Now South Laguna Civic Association **Engineering/Design Consultants** David J. Akers, P.E. **State/Federal Government** Senator Mark Wyland **Societies/Associations/Coalitions** San Diego Association of Realtors South County Economic Development Council **Other Entities** Carol Crossman Continental Maritime of San Diego Nuffer, Smith, and Tucker Sheppard, Mullin, Richter & Hampton LLP Southern Cross Property Consultants
	RESPONSE: The San Diego Water Board understands the concerns that have been expressed by the commenters. Most of the requirements in the Tentative Order are not new to the San Diego Region. The Tentative Order incorporates many existing requirements from the MS4 permits in Orange and Riverside Counties. However, the Tentative Order also provides the Copermittees with more flexibility to use their limited resources in the most effective and efficient manner to protect the quality of the San Diego Region's receiving waters. The commenters generally are concerned with the costs of implementing the development planning structural BMP performance requirements, but do not consider the costs of not addressing impacts that have been caused by existing development, and may be caused by future development. The San Diego Water Board has significantly modified the structure and focus of the requirements in the Tentative Order to allow the	

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E3c-4	PROVISION E.3.c: Priority Development Project Structural BMP Performance Requirements	
	Copermittees to more efficiently and cost effectively utilize their resources, which is expected to result in the realization of significant cost savings that could not be realized in the existing MS4 permits. The development planning structural BMP performance requirements have also evolved significantly since 2001 because of the degradation and destruction of creeks, wetlands, and coastal habitats that have been observed as developed areas have expanded. Thus, the Tentative Order not only includes development planning requirements to protect against impacts to receiving waters that may be caused by future development, but also includes requirements that begin to address impacts that are being caused by existing development. The Tentative Order will allow the Copermittees to address existing development and new develop with a watershed-scale approach that is expected to lead to more sustainable configurations of the watersheds in the San Diego Region over the long term. The question posed regarding the use of retained storm water if there is a lack of demand is not new. The municipalities and several agencies in the San Diego Region have also posed questions about what can be done to address the sustainable water supply concerns that are being expressed as the population grows and demand for water increases. There may be ways to potentially link the two issues to create solutions to address the problems. The Tentative Order was developed to provide the flexibility that will allow the Copermittees to work with other agencies to perhaps identify solutions with mutual benefits.	

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E3c1-1	PROVISION E.3.c.(1): Storm Water Pollutant Control BMP Requirements	
	COMMENT: *Objections with storm water pollutant control retention BMP performance requirements for Priority Development Projects.* The San Diego County, Orange County, and Riverside County Copermittees and Engineering/Design Consultants contend that the storm water pollutant control retention requirement is infeasible for many Priority Development Projects due to poor soil types and other factors. The Industrial Environmental Association asserts that the Tentative Order does not provide sufficient detail for consistency among Copermittees in evaluating conditions for technical infeasibility. The Copermittees have requested that the term "runoff" be included in the description of "design capture volume." Other commenters stated that the retention standard will result in runoff "starved" receiving waters. Commenters also stated that the requirement to increase bioretention by 25 percent is arbitrary and without basis. Conversely, Natural Resources Defense Council argues that retention of the 85th percentile storm event is an appropriate performance standard and should be required at all sites, regardless of the specific site conditions. David Aker, P.E., also supports the requirement to retain storm water and contends that it is essential for sustainable development.	**Building Industry / Industry** BIA Regulated Community Coalition Building Industry Association of Southern California, Inc. Industrial Environmental Association Otay Land Company Otay Ranch New Homes San Diego Green Building Council **Copermittees** City of Chula Vista City of Vista County of San Diego Orange County Copermittees Riverside County Copermittees San Diego County Copermittees San Diego Unified Port District **Environmental Organizations** Natural Resources Defense Council **Engineering/Design Consultants** Contech Engineered Solutions David J. Akers, P.E. **State/Federal Government** USEPA
	RESPONSE: The San Diego Water Board disagrees with the Copermittees that the retention standard, as written in the Tentative Order, is inappropriate. The San Diego Water Board has recognized that the retention of the 85th percentile storm event is MEP, and already incorporated the performance standard in both the Orange County and Riverside County MS4 permits. Other MS4 permits in southern California (e.g., Ventura County, Los Angeles County) incorporate similar performance standards, and it is supported by USEPA. Commenters should note that under the Alternative Compliance Program described in Provision E.3.c.(3), Priority Development Projects will have the option to perform mitigation offsite "*if the Copermittee determines that the offsite project will have a greater overall water quality benefit for the Watershed Management Area than implementing BMPs onsite*." Theoretically, a Priority Development Project could make the case that retention of the design capture storm is not feasible, or that doing so would result in an unnatural water balance, therefore	

E3c1-1	PROVISION E.3.c.(1): Storm Water Pollutant Control BMP Requirements	
	offsite compliance is preferred. This option is only available to the Priority Development Project if the Copermittee elects to offer it. The San Diego Water Board disagrees that the Tentative Order should provide detail on what constitutes infeasibility because the Copermittees have the experience to make these determinations, and are free to develop consistency standards if the need arises. Language regarding the application of a site specific retention standard was removed because several commenters argued, and the San Diego Water Board agreed, that the analyses could be subjective and introduce uncertainty for the Copermittees in terms of determining compliance. Moreover, comparing the volume of runoff produced from an undeveloped site to that of a Priority Development Project would not be comparing equivalent pollutant levels, because the pollutants expected to be generated from a Priority Development Project would not have been present in runoff from undeveloped land. For simplicity, the language pertaining to site specific retention standards was removed. The word “runoff” was added to the description of “design capture volume” per the Copermittees’ requests. Similarly, the language pertaining to biofiltration LID BMPs was removed because the Alternative Compliance Program was restructured to better coincide with the Copermittee’s planning efforts in the Water Quality Improvement Plan.	

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E3c2-1	PROVISION E.3.c.(2): Hydromodification Management BMP Requirements	
	COMMENT: *Allow San Diego Copermittees to continue implementation of current San Diego Hydromodification Management Plan, as approved under Resolution No. R9-2010-0066.* The San Diego County Copermittees and several other commenters have requested that the *Hydromodification Management Plan for San Diego County* (HMP), which was approved by the San Diego Water Board in 2010 under Resolution No. R9-2010-0066, be memorialized in the Tentative Order as the standard for hydromodification management.	**Building Industry / Industry** Building Industry Association of Southern California, Inc. Otay Land Company Otay Ranch New Homes **Community Planning Groups** Jamul Dulzura Community Planning Group Pala Pauma Valley Community Sponsor Group **Copermittees** City of Chula Vista City of Del Mar City of Poway City of San Diego County of San Diego County of San Diego Office of County Counsel San Diego County Copermittees **Societies/Associations/Coalitions** East Otay Mesa Property Owners Association Otay Mesa Property Owners Association **Other Entities** National Enterprises Inc.
	RESPONSE: The San Diego Water Board disagrees with commenters that it is appropriate to reference the San Diego County HMP in the Tentative Order. The San Diego HMP does not include standards that are currently included in the Fourth Term MS4 permits for Orange and Riverside Counties. However, commenters should note that the requirements in the Tentative Order allow the San Diego Copermittees to use the information and analysis that was used to develop the San Diego HMP. In addition, the San Diego HMP will remain in effect until the Water Quality Improvement Plans are accepted by the San Diego Water Board. The San Diego Water Board is aware that the San Diego County Copermittees spent over $1 million to develop the HMP. This investment is not lost because the Tentative Order allows the Copermittees to build upon the	

E3c2-1	PROVISION E.3.c.(2): Hydromodification Management BMP Requirements	
	findings in the HMP; thus, the information developed is not irrelevant. For example, the San Diego HMP used an analysis to determine the range of flows for which Priority Development Projects must implement hydromodification management BMPs. This analysis includes evaluation of site specific conditions, including the level of susceptibility of the downstream receiving water to erosion. Further, the analysis includes a mechanism for Priority Development Projects to determine appropriately sized BMPs, depending on the condition of the downstream receiving water. This analysis is the crux of the San Diego HMP, and the Tentative Order allows its continued use. There are two important changes in the Tentative Order from Order No. R9-2007-0001 that the San Diego County HMP must make adjustments for. Firstly, the Tentative Order includes a requirement that Priority Development Projects use the "predevelopment" condition for evaluating the baseline hydrology for a specific site. The San Diego HMP, as written, can still be used because this requirement only affects the input variables used in the analysis. The San Diego Water Board is requiring the use of the pre-development condition for the reasons discussed in the Response to Comment E3c2-2. Secondly, in response to several comments, the Tentative Order has been revised to include an exemption from hydromodification management requirements for Priority Development Projects that discharge to conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean. Additional exemptions may be allowed on a watershed-basis only if the Copermittees perform a watershed-specific analysis, as part of the Water Quality Improvement Plan that justifies inclusion of exemptions. Much of this work has already been done by the San Diego County Copermittees in the HMP, as the HMP contains many exemptions above and beyond those described in Order No. R9-2007-0001. Again, the investment made in the HMP is not lost; the Copermittees must develop the Watershed Management Area Analysis described in Provision B.3.b.(4) of the Tentative Order and include the exemptions and rationale therein. Finally, the San Diego County Copermittees were notified before completion of the HMP that requirements pertaining to hydromodification management would likely change. As part of the development of the HMP, the Copermittees submitted a first draft on May 1, 2009. In a comment letter dated June 29, 2009, the San Diego Water Board stated that: "*Although the Permit (R9-2007-0001) does not specifically interpret "pre-project" conditions to reference pre-development (naturally occurring) conditions, the Copermittees are not restricted from implementing this more conservative standard. Tentative Order No. R9-2009-0002 (the draft Orange County Municipal Permit) dated June 18, 2009 contains this more restrictive language. The San Diego*	

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E3c2-1	PROVISION E.3.c.(2): Hydromodification Management BMP Requirements	
	Copermittees should be aware that the next iteration of the Permit may contain similar language. Additionally, the exceptions for hydromodification management measures included in the Permit (provision D.1.g.(3) for discharges into hardened channels will also likely be eliminated." Although this quote referred to text in the draft Orange County MS4 Permit, the requirements for using the pre-development baseline hydrology for hydromodification management were eventually included in the final versions of the MS4 permits for both Orange and Riverside Counties. Therefore the San Diego County Copermittees were well aware of the evolving requirements before their HMP was finalized.	

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E3c2-2	PROVISION E.3.c.(2): Hydromodification Management BMP Requirements	
	COMMENT: *Objections with requiring pre-development versus pre-project hydrology for hydromodification management BMP performance standards.* Comments submitted by Copermittees, Building Industry, Community Planning Groups, Engineering/Design Consultants, Societies/Associations/Coalitions, and Other Entities objected to the use of pre-development hydrology as a baseline for hydrograph matching (and therefore, BMP design) in the case of redevelopment projects, and that the pre-project design standard is the appropriate standard. Commenters argue that including the pre-development standard would be tantamount to requiring a Priority Development Project to mitigate beyond its impacts.	**Building Industry / Industry** San Diego Green Building Council **Community Planning Groups** Julian Community Planning Group Pala Pauma Valley Community Sponsor Group **Copermittees** City of National City City of Poway City of San Diego City of San Diego City Attorney County of San Diego County of San Diego Office of County Counsel Orange County Copermittees Riverside County Copermittees San Diego County Copermittees San Diego Unified Port District **Engineering/Design Consultants** Project Design Consultants **Societies/Associations/Coalitions** East Otay Mesa Property Owners Association Otay Mesa Property Owners Association **Other Entities** National Enterprises Inc.
	RESPONSE: The San Diego Water Board disagrees with the commenters that pre-project hydrology should be used as the baseline hydrology for redevelopment projects. The "pre-development" language in the Tentative Order has not been removed, but the qualifier "naturally occurring" has been removed from the text because some commenters stated that it caused confusion rather than providing clarity. The definition for "pre-development runoff condition" has been revised in Attachment C and discussion pertaining to this definition and how the San Diego Water Board expects Copermittees to interpret this phrase has been added to the Fact Sheet. Fundamentally, the San Diego Water Board believes that using a hydrology baseline that approximates that of an undeveloped, natural watershed is the only way to facilitate the return of more natural hydrological conditions	

E3c2-2	PROVISION E.3.c.(2): Hydromodification Management BMP Requirements	
	to already built-out watersheds. Using the pre-project hydrology as a baseline for redevelopment projects results in propagating the unnatural hydrology of urbanized areas, which is largely made up of impervious surfaces. Flows from impervious surfaces are highly erosive and consequently have detrimental effects on receiving waters in the San Diego Region. Furthermore, propagating the urbanized flow regime does not support conditions for restoring degraded or channelized stream segments, and would forever sentence such streams to the degraded state. Rehabilitating or restoring degraded stream segments is a critical component of the Tentative Order and is expected to be incorporated into Copermittee's strategies for improving water quality in the watersheds. Finally, the predevelopment standard is not requiring Priority Development Projects to mitigate beyond its impacts because the project would be perpetuating impacts that originated upon initial land alteration (i.e., the project would continue to cause accelerated erosion). Commenters have stated that it is impracticable to require hydromodification management BMPs to mimic the "pre-Columbian" hydrology because it would be impossible to know the historical conditions with any certainty. However, estimating the conditions of historical conditions is not the intent of this requirement. Rather, using the characteristics of a more natural hydrological condition than that of an urbanized setting is the intent. In terms of using a pre-development condition for the baseline hydrology, a Priority Development Project has a number of options for estimating this condition when it is not known. For example, a Priority Development Project may consult soil maps, such as those published by the National Resources Conservation Service (NRCS). These readily available maps show the soil types in a given area, regardless of whether or not the land has been developed. This information, along with information regarding existing grade, constitute sufficient data needed to approximate the pre-development condition and intent of the Tentative Order. Another option is for Priority Development Projects to use characteristics of a nearby open space area as an equivalent baseline. Or, a Priority Development Project may be able to research the geotechnical report associated with a structure upon its development. In any case, the San Diego Water Board asserts that the pre-development hydrology of the area in question can be roughly estimated. However, using the hydrology of a more natural condition, even if not precisely known, will provide significant benefit to receiving waters over using the hydrology associated with pervious (developed) surfaces. Therefore in order to support the basic objectives of the Clean Water Act, which are to *restore* and maintain the chemical, *physical*, and biological integrity of the nation's waters [emphasis added], the most appropriate standard to use for hydromodification management is the standard associated with the pre-development runoff condition.	

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E3c2-3	PROVISION E.3.c.(2): Hydromodification Management BMP Requirements	
	COMMENT: *Include exemptions from the implementation of hydromodification management BMPs where there is no threat of erosion to downstream receiving waters or there are special circumstances.* The Copermittees, Building Industry, Engineering/Design Consultants, and others have commented that the Tentative Order should restore exemptions for the implementation of hydromodification management BMPs where there is no threat of erosion to downstream receiving waters, such as concrete-lined or otherwise hardened channels. Commenters also argue that exemptions should be allowed for emergency projects or flood control projects.	**Building Industry / Industry** BIA Regulated Community Coalition Building Industry Association of Southern California **Copermittees** City of Chula Vista City of Dana Point City of Del Mar City of Imperial Beach City of Laguna Hills City of Lake Forest City of Mission Viejo City of Rancho Santa Margarita City of San Juan Capistrano Orange County Copermittees Riverside County Copermittees San Diego County Copermittees San Diego Unified Port District **Engineering/Design Consultants** Contech Engineered Solutions Project Design Consultants **Societies/Associations/Coalitions** East Otay Mesa Property Owners Association Otay Mesa Property Owners Association South County Economic Development Council **Other Entities** National Enterprises Inc.
	RESPONSE: The San Diego Water Board disagrees conceptually that blanket exemptions from hydromodification management BMP requirements should be granted to all redevelopment projects that discharge to hardened channels. Although the San Diego Water Board has not been advocating for the implementation of expensive BMPs to protect stream reaches that are not susceptible to erosion, the idea was to use the resources obtained from these low-threat Priority Development Projects on separate projects located elsewhere in the watershed, where protection from hydromodification is critical. In the most recent findings regarding hydromodification management, found in Southern California Coastal Water Research Project (SCCWRP) Technical Report No. 667, authors state: "*The exemption of many small projects from hydromodification controls can result in cumulative impacts to downstream waterbodies…*"	

E3c2-3	PROVISION E.3.c.(2): Hydromodification Management BMP Requirements	
	SCCWRP Technical Report No. 667 further states that: "*An effective management program will likely include combinations of on-site measures (e.g., low-impact development techniques, flow-control basins), in-stream measures (e.g., stream habitat restoration), floodplain and riparian zone actions, and off-site measures. Off-site measures may include compensatory mitigation measures at upstream locations that are designed to help restore and manage flow and sediment yield in the watershed* [Emphasis added]." The Tentative Order released on October 31, 2012 was written to incorporate these important watershed-based concepts. Nevertheless, several commenters voiced concern over the elimination of exemptions to hardened channels and other non-susceptible receiving waters. After careful consideration, the San Diego Water Board revised the Tentative Order to accommodate the re-introduction of exemptions. Provision E.3.c.(2) has been revised to include an exemption from hydromodification management requirements for Priority Development Projects that discharge to conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean. Additional exemptions may be allowed; however, they would occur on a watershed-specific basis, and must be defined and defended by the Copermittees. Under the newly created Provision B.3.b.(4), the Copermittees have been provided the option to perform a Watershed Management Area Analysis for the purpose of 1) characterizing the watersheds, 2) identifying alternative compliance projects that Priority Development Projects may use in lieu of implementing structural BMPs onsite, and 3) identifying areas within the watershed where it is appropriate to exempt Priority Development Projects from implementing hydromodification management BMPs. Exemptions, then, would be applicable on a watershed-specific basis, and would require supporting rationale. One reason why the San Diego Water Board has reservations regarding the idea of blanket exemptions is that allowing them without some sort of analysis is short-sighted. SCCWRP Technical Report 667 discusses the importance of watershed-based planning. The report states: "*There is usually also an exemption for projects discharging to hardened channels or waterbodies; however these exemptions may not be supportive of future stream restoration possibilities…*" Although the San Diego Water Board understands that hardened channels may sometimes provide essential flood control, there are situations where stream rehabilitation can take place, and concrete segments can be removed. For this reason, if the Copermittees choose to perform the Watershed Management Area Analysis,	

E3c2-3	PROVISION E.3.c.(2): Hydromodification Management BMP Requirements	
	they may be able to differentiate between hardened stream segments where the concrete will likely never be removed, and other stream segments where there is a possibility for future rehabilitation. Nevertheless, an exemption for concrete-lined channels has been added to the Tentative Order. Finally, the Copermittees commented that there should be exemptions allowed for emergency projects or flood control projects. The San Diego Water Board disagrees with the Copermittees in either case. Provision E.3 describes requirements that pertain to development planning. Emergency situations, by definition, are not planning exercises and therefore do not involve the design, approval, and construction of a building or structure. The San Diego Water Board believes that it may be appropriate to relax the structural BMP standards for, or altogether exempt flood control projects, but not before projects are evaluated on a case-by-case basis. In many instances, environmentally friendly practices may be appropriate for implementation in flood control projects, but a variety of options would not be evaluated by the project proponent if the Tentative Order allowed a blanket exemption.	

E3c2-4: *Objections with requirements to compensate for sediment supply.*

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E3c2-4	PROVISION E.3.c.(2): Hydromodification Management BMP Requirements	
	COMMENT: *Objections with requirements to compensate for sediment supply*. The Copermittees, Building Industry, and Engineering/Design Consultants have commented that management of sediment supply is a complicated and challenging issue, and more direction regarding the Tentative Order's intent should be provided. Commenters have also stated that it is inappropriate to require analysis of sediment supply on a site-by-site basis, and that it is better addressed at the regional level.	**Building Industry / Industry** BIA Regulated Community Coalition **Copermittees** City of Chula Vista County of San Diego San Diego County Copermittees **Engineering/Design Consultants** Contech Engineered Solutions Project Design Consultants
	RESPONSE: The San Diego Water Board agrees with the commenters that addressing the sediment supply issue when a Priority Development Project is under review is complicated and challenging. The intent of the Tentative Order is to protect the coarse sediment supply and ensure that Priority Development Projects will not impact the supply. Therefore, language pertaining to "compensating for" sediment supply has been removed. Instead, where a Copermittee is aware of areas where coarse sediment is naturally discharged to downstream receiving waters, then the San Diego Water Board expects the Copermittee to ensure the protection of this natural process by conditioning the Priority Development Project to either avoid the area, or implement measures that would allow the natural hydrologic process to continue. Please see Provision E.3.c.(2)(b) in the revised Tentative Order for the revisions.	

E3c2-5: *Monitoring and assessment program requirements will not provide information necessary to re-define the range of flows causing erosion.*

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E3c2-5	PROVISION E.3.c.(2): Hydromodification Management BMP Requirements	
	COMMENT: *Monitoring and assessment program requirements will not provide information necessary to re-define the range of flows causing erosion.* The City of Chula Vista commented that water quality monitoring as described in Provision D of the Tentative Order will not provide the necessary information to re-define the range of flows thought to cause erosion to receiving waters.	**Copermittees** City of Chula Vista
	RESPONSE: The San Diego Water Board disagrees that the monitoring and assessment program requirements cannot provide information necessary to re-evaluate or re-define the range of flows causing erosion. The water quality monitoring described in Provision D.1.a.(2) represents the minimum level of monitoring needed to comply with the Tentative Order. If the Copermittees elect to re-evaluate the range of flows that are thought to cause erosion to downstream receiving waters, as defined in the San Diego County HMP, then they may design a monitoring program that will provide the necessary information to do so.	

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E3c2-6	PROVISION E.3.c.(2): Hydromodification Management BMP Requirements	
	COMMENT: *The low-flow thresholds included in the San Diego County HMP need to be revised.* Project Design Consultants submitted comments suggesting that the schedule for development of the San Diego County HMP was extremely rushed, and technical expertise was ignored. The HMP should be revised and included in the Tentative Order.	**Engineering/Design Consultants** Project Design Consultants
	RESPONSE: The San Diego Water Board does not object to revising the low-flow thresholds included in the San Diego County HMP, provided that revisions are based on data acquired by the Copermittees. However, the process for updating this design standard in the HMP will occur on an ad-hoc basis and need not be referenced in the Tentative Order.	

E3c2-7: The hydromodification management BMP performance standards should allow the use of the erosion potential (Ep) method and in-stream metrics for compliance.

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E3c2-7	PROVISION E.3.c.(2): Hydromodification Management BMP Requirements	
	COMMENT: *The hydromodification management BMP performance standards should allow the use of the erosion potential (Ep) method and in-stream metrics for compliance.* The Building Industry Association of Southern California requests that the performance standards for hydromodification management allow the use of the Ep method. Requiring project-by-project flow duration control may not be as effective as a regionally-coordinated approach that combines upland control with in-stream remedies.	**Building Industry / Industry** Building Industry Association of Southern California
	RESPONSE: The San Diego Water Board considered the request and found that changes are not necessary. Although the language in Provision E.3.c.(2) does not specifically reference the concept of erosion potential, the Copermittees are not prohibited from using such an approach. Provision E.3.c.(2)(a) requires the Copermittees to require implementation of BMPs to ensure that post-project runoff flow rates and durations do not exceed pre-development runoff flow rates and durations by more than 10 percent (for the range of flows that are deemed to cause erosion). However, Provision E.3.c.(2)(c) allows a Priority Development Project to utilize the alternative compliance program in lieu of complying with the requirement to implement structural BMPs onsite. Priority Development Projects are allowed to comply with the hydromodification management requirements by funding, partially funding, or implementing an offsite project, such as stream rehabilitation (which can include stream stabilization). The San Diego Water Board agrees that a regionally-coordinated approach that includes in-stream remedies is more effective than requiring flow duration control BMPs on every Priority Development Project, and for this reason has written the Tentative Order to allow these metrics. However, ultimately, administration of the Alternative Compliance Program is at the discretion of the Copermittees. If the Copermittees find that administering the Alternative Compliance Program is too difficult, costly, or is not in a Copermittee's best interest, than they are not obligated to do so.	

E3c2-8: *There is insufficient data to suggest a need to change the hydromodification management requirements.*

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E3c2-8	PROVISION E.3.c.(2): Hydromodification Management BMP Requirements	
	COMMENT: *There is insufficient data to suggest a need to change the hydromodification management requirements.* The City of Mission Viejo, Orange County and San Diego County Copermittees have commented that there is no need to include new requirements for hydromodification management, as no new data has emerged suggesting a need for change and the Copermittees have only begun to implement their current HMPs.	**Copermittees** City of Mission Viejo Orange County Copermittees San Diego County Copermittees
	RESPONSE: The San Diego Water Board disagrees that there have been any fundamental changes to the hydromodification management requirements from those included in the Fourth Term storm water permits. The basic premise, which is requiring hydromodification management for erosive flows as defined by the Copermittees, has not changed. The San Diego County Copermittees spent considerable funds and effort to define the range of flows that cause erosive effects, and the Tentative Order does not trump those efforts. The San Diego Water Board disagrees with the notion that no new data has emerged regarding hydromodification management. Several commenters have referenced Southern California Coastal Water Research Project's latest findings in *Hydromodification Assessment and Management in California* (Technical Report 667). SCCWRP Technical Report 667 clearly states that: "*An effective management program will likely include combinations of on-site measures…in-stream measures…and offsite measures….*" Further, SCCWRP Technical Report 667 states that: "*The exemption of many small projects from hydromodification controls can result in cumulative impacts to downstream waterbodies.*" The requirements in the Tentative Order are consistent with the findings in this report and MS4 permits in Orange and Riverside Counties. The San Diego Water Board agrees with the underlying premise advocated in this report, which is that effective hydromodification programs begin with watershed-scale analysis and planning. Although the Copermittees have just recently begun implanting their HMPs, the changes needed to incorporate the requirements of the Tentative Order will not undermine the mechanics of the HMPs and therefore will not require substantial revisions. The incorporation of the pre-development baseline standards and inclusion of only qualified exemptions, resulting from thorough watershed analyses, is essential for protecting receiving streams from erosion caused by altered flow regimes.	

PROVISION E.3.c.(3): Alternative Compliance to Onsite Structural BMP Performance Requirements
E3c3-1: *Objections to the onsite LID biofiltration treatment control BMP performance standards.*

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E3c3-1	PROVISION E.3.c.(3): Alternative Compliance to Onsite Structural BMP Performance Requirements	
	COMMENT: *Objections to the onsite LID biofiltration treatment control BMP performance standards*. The San Diego County, Orange County, and Riverside County Copermittees and Engineering/Design Consultants have commented that there is no need to include a 1.5 times multiplier on biofiltration LID BMPs, and that doing so is technically unjustified.	**Building Industry / Industry** Building Industry Association of Southern California **Copermittees** City of Vista Orange County Copermittees Riverside County Copermittees **Engineering/Design Consultants** Contech Engineered Solutions Project Design Consultants
	RESPONSE: Provision E.3.c.(3) describing the Alternative Compliance Program has been substantially revised so that it coincides better with the watershed planning efforts of the Copermittees in the Water Quality Improvement Plans. As a result, the requirements related to LID biofiltration BMPs has been removed.	

E3c3-2: *Modify requirements to implement alternative compliance options.*

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E3c3-2	PROVISION E.3.c.(3): Alternative Compliance to Onsite Structural BMP Performance Requirements	
	COMMENT: *Modify requirements and process to implement alternative compliance options.* The San Diego County, Orange County, and Riverside County Copermittees, Engineering/Design Consultants, and Environmental Organizations have expressed concern with the process associated with the Alternative Compliance Program to Onsite Structural BMP Implementation. The Copermittees assert that this program should be administered by the San Diego Water Board, that more time than 4 years should be granted for alternative compliance project completion, and that the administrative costs would be prohibitive. The Environmental Organizations suggest that language be added to the Tentative Order to clearly indicate that the Copermittees are responsible for ensuring that alternative compliance projects are completed within the 4 year timeframe, and also expressed concerns as to whether the alternative compliance project would provide equal water quality benefits as implementing structural BMPs onsite. Engineering/Design Consultants submitted recommendations regarding how administration of the Alternative Compliance Program would work.	**Building Industry / Industry** American Society of Landscape Architects BIA Regulated Community Coalition Building Industry Association of Southern California San Diego Green Building Council **Copermittees** City of Imperial Beach County of San Diego Orange County Copermittees Riverside County Copermittees San Diego County Copermittees **Environmental Organizations** Environmental Groups Natural Resources Defense Council **Engineering/Design Consultants** Project Design Consultants
	RESPONSE: The San Diego Water Board disagrees with the Copermittees that the Alternative Compliance Program should be administered by the San Diego Water Board and not by the Copermittees. The Alternative Compliance Program is provided as an option to the Copermittees. The Copermittees are not required to implement the Alternative Compliance Program. If, however, the Copermittees do implement the Alternative Compliance Program, it is expected to coincide with the Copermittees' watershed planning efforts and assist the Copermittees in reaching their goals of reducing pollutants in storm water runoff leaving their MS4s. This is because the alternative compliance projects consist of projects such as retrofitting existing development, where pollutant treatment can be an added benefit where no treatment currently exists; or stream rehabilitation, where natural attenuation of pollutants can occur as an ancillary benefit to improved stream habitat. Other example projects are regional BMPs that receive runoff from multiple areas, or the preservation or purchase of critical floodplain land. The Tentative Order establishes requirements for the Copermittees and not the San Diego Water Board. Therefore, it would inappropriate for the San Diego Water Board administer this program, but could assist in its implementation by streamlining permits for stream rehabilitation and restoration... The San Diego Water Board understands that the initial costs for administering this program could be significant; however, there are fiscal benefits in that Priority Development Projects could provide the funding for projects that are expected to improve water quality, thereby negating the need for Copermittees to expend their resources on BMPs to accomplish the	

E3c3-2	PROVISION E.3.c.(3): Alternative Compliance to Onsite Structural BMP Performance Requirements	
	same thing. Finally, the Copermittees are not required to administer this program and can elect to administer BMPs strictly onsite. Provision E.3.c.(3) has been substantially revised for simplicity and to better coincide with the Copermittees' planning efforts, and all references to LEED certification have been removed. The San Diego Water Board further disagrees that more than 4 years should be granted for alternative compliance project completion. First of all, pollutants from the Priority Development Project are being discharged without treatment and there is not necessarily any equivalent treatment until the alternative compliance project is constructed (although temporal mitigation is required when there is a lag between the two projects). Second of all, the Tentative Order explicitly allows more time for projects where the Executive Officer approves additional time. The San Diego Water Board disagrees with the recommendation that the Tentative Order specify that the Copermittees are responsible for ensuring that the alternative compliance projects are completed within the 4 year time frame. The Tentative Order is issued to the San Diego County, Orange County, and Riverside County Copermittees; therefore all of these entities are responsible for complying with the requirements, and further discussion would be redundant. Finally, the San Diego Water Board agrees that the alternative compliance program presents some uncertainty regarding "greater water quality benefit" expected to come from these projects versus implementation of structural BMPs onsite. If the Copermittees elect to implement an Alternative Compliance Program, they are required to develop a list of potential candidate projects that can be implemented with the Watershed Management Area. The candidate projects will be included in the Water Quality Improvement Plans, which will be reviewed by the public and the San Diego Water Board before implementation takes place. The water quality benefits that can be achieved by implementing those candidate projects will likely be made evident during the public participation process in the development of the Water Quality Improvement Plans.	

E3c3-3: *Request for modifications to the alternative compliance water quality credit system option.*

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E3c3-3	PROVISION E.3.c.(3): Alternative Compliance to Onsite Structural BMP Performance Requirements	
	COMMENT: *Request for modifications to the alternative compliance water quality credit system option*. The Orange County Copermittees have requested that language pertaining to the water quality credit system be revised to remove the no-net impact limitations because certain projects may offer significant environmental benefits that are not necessarily related to water quality. The BIA Regulated Community Coalition recommended that any water quality credit system exercised by the Copermittees be included in the Water Quality Improvement Plans and be approved by the San Diego Water Board and not by its Executive Officer.	**Building Industry / Industry** BIA Regulated Community Coalition **Copermittees** Orange County Copermittees
	RESPONSE: The San Diego Water Board disagrees with the Orange County Copermittees that the no-net impact language should be removed from the Tentative Order. The optional credit system described in Provision E.3.c.(3)(d) is based on meeting the structural BMP performance standards as they pertain to protecting and improving water quality. A credit system that would allow other environmental benefits cannot necessarily ensure that water quality would be protected to the MEP standard, for which the performance standards are structured to achieve. The San Diego Water Board disagrees that a water quality credit system requires approval from San Diego Water Board instead of the Executive Officer because the provisions for such a credit system are clearly outlined in the Tentative Order. The Executive Officer will be able to determine whether or not the Copermittee has met the requirements as dictated in the Tentative Order. However, the public may request that any action taken by the Executive Officer be considered by the San Diego Water Board at any time.	

E3c3-4: *Define a list of preferred or "best-in-class" BMPs and include specific guidance regarding evaluation of treatment systems in the Tentative Order.*

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E3c3-4	PROVISION E.3.c.(3): Alternative Compliance to Onsite Structural BMP Performance Requirements	
	COMMENT: *Define a list of preferred or "best-in-class" BMPs and include specific guidance regarding evaluation of treatment systems in the Tentative Order.* The San Diego Green Building Council commented that the Tentative Order should clearly define the best-in-class BMPs and require the creation of a system to catalogue the implementation strategies used by the various Copermittees, and that the database should include the measured water quality impacts from each site. Such information can be used as a resource for future projects and development. Contech Engineered Solutions recommended that the Tentative Order include specific guidance regarding evaluation of proprietary treatment systems, and that the Copermittees need to conduct a performance and feasibility assessment of such systems.	**Building Industry / Industry** San Diego Green Building Council **Engineering/Design Consultants** Contech Engineered Solutions
	RESPONSE: The San Diego Water Board disagrees with this comments because 1) the San Diego Water Board cannot dictate the manner of compliance with any requirements or regulation for any of the programs it administers, and 2) a "best-in-class" BMP cannot be concretely defined because the MEP standard is dynamic (see Appendix C for the definition of MEP). The Copermittees may choose to share information regarding BMP performance and evaluation of proprietary treatment systems via the Regional Clearinghouse or other mechanism. The Copermittees have the experience and expertise to define what are the appropriate BMPs.	

E3c3-5: *Mitigation should not be required if flow-thru biofiltration LID BMPs are used.*

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E3c3-5	PROVISION E.3.c.(3): Alternative Compliance to Onsite Structural BMP Performance Requirements	
	COMMENT: *Mitigation should not be required if flow-thru biofiltration LID BMPs are used.* The Building Industry Association of Southern California submitted comments stating that the Tentative Order should not require mitigation for the portion of the design storm volume that is not retained onsite if this volume is treated by biofiltration LID BMPs prior to discharge. This requirement penalizes and dis-incentivizes the use of these BMPs.	**Building Industry / Industry** Building Industry Association of Southern California
	RESPONSE: The San Diego Water Board has included the requirement that mitigation is necessary for the portion of the design storm volume that is not retained onsite because, although this remaining volume of storm water would be treated, the MEP standard as represented by the structural BMP performance requirements would not have been met. The requirement for mitigation is not limited to the use of biofiltration BMPs; mitigation is required no matter what type of flow-thru treatment BMP is utilized by the Priority Development Project. Therefore the San Diego Water Board disagrees that this requirement is penalizing the Priority Development Project for the use of biofiltration LID BMPs, as suggested by the commenter. Retention of the 85th percentile storm is clearly the MEP standard for storm water pollutant control, as represented by the Tentative Order and recently adopted MS4 permits in the San Diego Region, other areas of southern California, and elsewhere in the United States. Retention of anything less than the design storm volume must be mitigated because the MEP standard has not been met.	

PROVISION E.4: Construction Management
E4-1: *Requests for "clarifications" for construction management requirements.*

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E4-1	PROVISION E.4: Construction Management	
	COMMENT: *Requests for "clarifications" for construction management requirements.* The San Diego County and Riverside County Copermittees submitted requests for specific modifications to the language of Provision E.4 attempting to increase clarity to what is required of the Copermittees and what the Copermittees are to require of private party construction sites within their jurisdiction. The USEPA provided general comments on the need for the construction requirements to include enough specificity to determine compliance with the Tentative Order.	**Copermittees** Riverside County Copermittees San Diego County Copermittees **State and Federal Government** USEPA
	RESPONSE: The San Diego Water Board generally agreed with the specific language modifications requested by the Copermittees and in many instances adjusted the language of Provision E.4 as requested. Specific changes were made to Provision E.4 to: 1) Remove the requirement for the Copermittees to verify a project applicant has obtained coverage under permits, other than the State Water Board's General Construction Storm Water Permit, 2) Use the term 'pollution control plan' consistently; 3) Require the Copermittees to conduct inspections and require BMPs at inventoried construction sites (based on the priority set in Provision E.4.b.2) to 'confirm' rather than 'ensure' the controls at the site reduce the discharge of pollutants in storm water from the site to the MEP; and 4) Require the Copermittees to conduct inspections and require BMPs at inventoried construction sites (based on the priority set in Provision E.4.b.2) that effectively prohibits non-storm water discharges from the site from entering the MS4. Modifications were also made to the opening paragraph of Provision E.4 requiring each Copermittee to implement a construction management program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1). Additionally, the San Diego Water Board made adjustments to Provision E.4 requirements setting minimum inspection frequencies equivalent to the amount required to confirm compliance with the Clean Water Act. Provision E.4.d(1)(a) specifically requires the Copermittees to conduct inspections at all inventoried sites, including high threat to water quality sites, at an frequency appropriate to confirm the site reduces the discharge of pollutants in storm water from the construction site to the MEP, and effectively prohibits non-storm water	

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E4-1	PROVISION E.4: Construction Management	
	discharges from entering the MS4. The San Diego Water Board supports the adaptive management approach in the Tentative Order and has structured the construction inspections to focus on those sites that represent a high priority to maintaining or protecting downstream surface water quality.	

E4-2: *Requests for modifications to construction site inventory, tracking, recordkeeping requirements.*

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E4-2	PROVISION E.4: Construction Management	
	COMMENT: *Requests for modifications to construction site inventory, tracking, recordkeeping requirements.* The Orange County, Riverside County and San Diego County Copermittees each submitted comments requesting changes to the construction management requirements that specific construction sites to be inventoried would include only those sites that involve any ground disturbance or soil disturbing activities, include a process for confirming adequate BMP implementation on inventoried sites, specify project 'completion' date not "anticipated completion" date; and 'weather condition during inspection' not 'approximate amount of rainfall since last inspection' on inspection forms, and require construction inventories to be updated quarterly not monthly. The Riverside County Copermittees provided recommended revisions to the construction requirements.	**Copermittees** Orange County Copermittees Riverside County Copermittees San Diego County Copermittees
	RESPONSE: The San Diego Water Board agreed with most of the changes requested by the commenters and modified Provision E.4 accordingly. However, the request to remove the requirement to include 'approximate amount of rainfall since last inspection' on the inspection forms, and the suggestion to include a process for confirming adequate construction BMP implementation for non-inventoried construction site were not incorporated into the revised Tentative Order. The San Diego Water Board is interested in site conditions after a significant rain event(s) therefore documenting the approximate amount of rainfall since the last inspection is required rather than the weather conditions during the inspection. A process for confirming adequate construction BMP implementation for non-inventoried sites can be developed and included in the jurisdictional program, but is not a requirement of the Tentative Order. The San Diego Water Board reviewed all of the recommended revisions provided by the Riverside County Copermittees. See Provision E.4 for those requested revisions that were incorporated into the Tentative Order.	

E4-3: *Request to only require verification of coverage under Construction General Permit, not "applicable permits."*

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E4-3	PROVISION E.4: Construction Management	
	COMMENT: *Request to only require verification of coverage under Construction General Permit, not "applicable permits."* The Copermittees commented that the requirement to verify permits other than the State Water Board's Construction General Permit is unnecessary because applicable permits are included as attachments to a construction projects SWPPP, and redundant with other environmental regulations.	**Copermittees** City of Chula Vista Orange County Copermittees Riverside County Copermittees San Diego County Copermittees
	RESPONSE: The San Diego Water Board agrees with the commenters. The San Diego Water Board modified the language in Provision E.4.a to require verification that the project applicant has obtained coverage under the Construction General Permit, only.	

PROVISION E.5: Existing Development Management
E5-1: *Concerns with inspections by volunteers.*

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E5-1	PROVISION E.5: Existing Development Management	
	COMMENT: *Concerns with inspections by volunteers.* The San Diego County Copermittees expressed concern with exposure to significant liability should a volunteer be injured in the course of an unauthorized inspection, or if private property is damaged during that inspection, or other unforeseen legal issues that result from volunteer groups conducting inspections of inventoried existing developments sites. Similar concerns were expressed by the Industrial Environmental Association and the San Diego Port Tenants Association.	**Building Industry / Industry** Industrial Environmental Association **Copermittees** San Diego County Copermittees **Societies/Associations/Coalitions** San Diego Port Tenants Association
	RESPONSE: The San Diego Water Board understands the position presented by the commenters and agrees that changes to the language in Provision E.5.c are necessary. Provision E.5.c was modified to restrict the use of Copermittee-trained volunteer monitoring or patrol programs to visual inspections of those inventoried facilities or areas that are publicly accessible. Additionally, the San Diego Water Board incorporated the Industrial Environmental Association's suggested change to the language of Provision E.5.c.(2). The ability of the Copermittee to use volunteer monitoring or patrol programs was included in the Tentative Order to give the Copermittees additional resources to accomplish the inspection requirements of Provision E.5.c. The Copermittees retain sole discretion on using volunteer monitoring or patrol programs to augment their inspection programs. The Copermittees also retain sole discretion to stipulate conditions (insurance, training, etc.) for which a volunteer monitoring or patrol program must comply in order assist them with inspections.	

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E5-2	PROVISION E.5: Existing Development Management	
	COMMENT: *Requests for modifications to existing development inventory and tracking requirements.* The San Diego County Copermittees and City of Santee each requested removal of 'mobile home parks' from the list of residential areas that should be included in its existing development inventory, citing the Mobile Home Park Act preempts a municipality's ability to regulate within the mobile home park. The Copermittees further requested modification to the language of Provision E.5.a to replace the phrase 'may discharge pollutants' with 'has the reasonable potential to discharge pollutants," claiming that the term 'may' is too broad and limits the Copermittees' ability to focus on those sites in their inventories identified as jurisdictional and watershed priorities. A specific comment was submitted by the City of Chula Vista asking that the Tentative Order allow use of more than one data management system to track the required information.	**Copermittees** City of Chula Vista City of Santee San Diego County Copermittees
	RESPONSE: The San Diego Water Board understands that a city does not have full access to regulate mobile home parks pursuant to the Mobile Home Park Act, but disagrees that the Copermittees do not have the legal authority to regulate discharges from and require BMPs at mobile home parks to their MS4s. The requirements of the Tentative Order are that each Copermittee maintain an inventory of its existing development that may discharge a pollutant load to and from the MS4. If a Copermittee has mobile home parks in its jurisdiction it must be included in its inventory so that the mobile home park gets considered in the Water Quality Improvement Plan priorities and strategies to address sources of pollutants. The comments included a description of what a city is allowed to regulate via its police powers, at mobile home parks. This list included access 'streets and roads' and parking. These are areas where potentially BMPs could be located if, through the Water Quality Improvement Plan process, it was determined that pollutants discharged from mobile home parks were a high priority water quality condition. Additionally, other scenarios could exist where discharges from mobile home parks are not considered a high priority, and inspections would occur much less often. Therefore, mobile home parks must remain within a Copermittee's existing development inventories, but can be dealt with according to the priorities, schedules and goals of the Water Quality Improvement Plan. Therefore, no change to the Tentative Order was made. The San Diego Water Board disagrees with the comment that the term 'may' should be replaced with 'reasonable potential.' The term 'may' is used to indicate possibility or probability that a pollutant load is discharged from an inventoried existing development facility or area. The term reasonable potential can imply the need to conduct a reasonable potential analysis, which is a far more involved process than a Copermittee making the determination that a facility possibly or probably discharges a pollutant load into its MS4. Nothing in	

E5-2	PROVISION E.5: Existing Development Management	
	the Tentative Order prevents a Copermittee from conducting a more robust analysis of the potential for pollutant loads to be discharged from its inventoried existing facilities or areas. Therefore, no change to the Tentative Order was made. The use of a GIS database to track inventoried facilities is only “highly recommended” in the Tentative Order, it is not explicitly required. Therefore a Copermittee can use one or more than one data management system to track the required information.	

E5-3: *Requests for modifications to existing development BMP implementation and maintenance requirements.*

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E5-3	PROVISION E.5: Existing Development Management	
	COMMENT: *Requests for modifications to existing development BMP implementation and maintenance requirements.* The Riverside County and San Diego County Copermittees submitted comments requesting a modification to the language of Provision E.5.b to specify each Copermittee only be required to designate a minimum set of BMPs for all inventoried existing development with the reasonable potential to discharge pollutant loads to their MS4. Commenters further suggest clarifying language for the required use of pollutant prevention methods (i.e. designated BMPs) in Provision E.5.b. A specific comment was made by the City of Chula Vista to removed 'freeways' from list of existing facilities the Copermittees are required to properly operate and maintain BMPs. The City of Chula Vista notes that freeways are under the jurisdiction of Caltrans, not a city.	**Copermittees** City of Chula Vista Riverside County Copermittees San Diego County Copermittees
	RESPONSE: The San Diego Water Board disagrees with the commenters request to modify the language of Provision E.5.b to specify each Copermittee only be required to designate a minimum set of BMPs for all inventoried existing development with the reasonable potential to discharge pollutant loads to their MS4. Provision E.5.b states that each Copermittee must designate a minimum set of BMPs required for all inventoried existing development, including special event venues. Any existing development that gets inventoried has been identified as a facility that may generate pollutant loads to and from the MS4 under Provision E.5.a. Therefore, if a facility is on the inventory, a Copermittee has already made the determination that the existing development possibly or probably generates a pollutant load. Therefore, no change to the Tentative Order was made. The San Diego Water Board agrees with the requests to clarify the language in Provisions E.5.b.(1)(b) and (d) to specify when a Copermittee must require implementation of BMPs at inventoried existing development not owned by the Copermittee, and when a Copermittee must implement BMPs on their own municipal facilities. The San Diego Water Board also agrees with the City of Chula Vista's request to remove 'freeways' from the list of existing facilities the Copermittees are required to properly operate and maintain BMPs.	

E5-4: *Requests for modifications to existing development inspection requirements.*

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March 27, 2013

E5-4	PROVISION E.5: Existing Development Management	
	COMMENT: *Requests for modifications to existing development inspection requirements.* The County of San Diego commented on the need for an exemption from the minimum annual inspection requirement of 20 percent for inventoried linear municipal facilities. Riverside County Copermittees requested the requirement to inspect at least 20 percent of its existing development inventory be deleted. The Tentative Order requires each inventoried existing development be inspected once every five years. Both San Diego County and Riverside County Copermittees commented on this minimum. San Diego County Copermittees want it changed to once per permit term, conversely Riverside County Copermittees support existing language of once per five years. The USEPA does not support relaxation to inspection frequencies because it weakens enforceability and the ability to determine compliance. The San Diego County Copermittees requested clarifying language be added to what must be included in a visual inspection of existing development.	**Copermittees** County of San Diego Riverside County Copermittees San Diego County Copermittees **State and Federal Government** USEPA
	RESPONSE: The San Diego Water Board agrees with the County of San Diego's comment concerning the need for exempting linear municipal facilities from the existing development annual inspection requirements due to the number of inspections required if such facilities are considered when calculating 20 percent of the existing development inventory. To address their comments, the language in Provision E.5.c.(1)(a)(iv) includes a footnote, which excludes linear municipal facilities (i.e. MS4 linear channels, sanitary sewer collections systems, streets, roads, and highways). MS4 inlets and basins are not mentioned in this footnote and are still required to be considered when determining 20 percent of inventoried development for the purposes of annual inspections. The San Diego Water Board expects MS4 inlets and basins to be inspected in order to confirm that BMPs are being implemented and maintained to reduce the discharge of pollutants in storm water from the MS4 to the MEP. Comments provided by the USEPA support leaving MS4 inlets and basins in the existing development inventory to strengthen permit enforceability and compliance determinations. The San Diego Water Board kept the existing development minimum inspection requirement of once every five years. This requirement is consistent with comments received by USEPA to include minimum requirements to strengthen permit enforceability and compliance determinations.	

E5-5: *Requests to limit existing development requirements to existing development with "reasonable potential" to discharge pollutants.*

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E5-5	PROVISION E.5: Existing Development Management	
	COMMENT: *Requests to limit existing development requirements to existing development with "reasonable potential" to discharge pollutants.* The San Diego County Copermittees requested the existing development requirements be limited to those existing facilities and areas of development with "reasonable potential" to discharge pollutants.	**Copermittees** San Diego County Copermittees
	RESPONSE: The San Diego Water Board disagrees that replacing the term 'may' with the phrase 'reasonable potential' in Provisions E.5.a-c will give a Copermittee more flexibility to focus on jurisdictional and watershed priorities. The Water Quality Improvement Plan will establish the priority water quality conditions within a Watershed Management Area to which a Copermittee will customize its jurisdictional program (i.e. inspection location and frequencies, pollutant reduction efforts (BMP implementation), retrofit opportunities, etc.). The term 'may' is used to indicate possibility or probability that a pollutant load is discharged from an inventoried existing development facility or area. The term 'reasonable potential' can imply the need to conduct a reasonable potential analysis, which is a far more involved process than a Copermittee making the determination that a facility or developed area possibly or probably discharges a pollutant load into its MS4. Nothing in the Tentative Order prevents a Copermittee from conducting a more robust analysis of the potential for existing development to discharge pollutant loads to and from the MS4. Therefore, no change to the Tentative Order was made.	

E5-6: *Request to allow the Copermittees to reallocate resources required for monitoring for retrofit and/or rehabilitation projects.*

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E5-6	PROVISION E.5: Existing Development Management	
	COMMENT: *Request to allow the Copermittees to reallocate resources required for monitoring for retrofit and/or rehabilitation projects.* The San Diego County Copermittees requested an addition to the requirements of Provision E.5.e to allow the Copermittees to reallocate resources required for monitoring for retrofit and/or rehabilitation projects.	**Copermittees** Riverside County Copermittees San Diego County Copermittees
	RESPONSE: The San Diego Water Board disagrees with the request and no change to the Tentative Order was made. Temporarily suspending the monitoring requirements of Provision D to fund a retrofit and/or rehabilitation process is inappropriate. The monitoring requirements in Provision D are the minimum necessary for the Copermittees to demonstrate that the water quality improvement strategies being implemented as part of the Water Quality Improvement Plan are making progress toward achieving the numeric goals.	

PROVISION E.5.e.(2): Retrofitting Areas of Existing Development
E5e2-1: *Retrofit existing development to improve water quality.*

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E5e2-1	PROVISION E.5.e.(2): Retrofitting Areas of Existing Development	
	COMMENT: *Retrofit existing development to improve water quality.* The San Diego Green Building Council and South Laguna Civic Association support retrofitting areas of existing development as a means to achieve mandated water quality objectives.	**Building Industry / Industry** San Diego Green Building Council **Environmental Organizations** South Laguna Civic Association
	RESPONSE: The San Diego Water Board agrees with the commenters and has developed requirements to encourage retrofitting to achieve reductions in pollutants discharged from MS4s and improved water quality conditions in the receiving waters.	

E5e2-2: *Requests to remove or modify retrofitting of existing development requirements.*

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E5e2-2	PROVISION E.5.e.(2): Retrofitting Areas of Existing Development	
	COMMENT: *Requests to remove or modify retrofitting of existing development requirements.* The Riverside County Copermittees generally requested the removal of the retrofit and stream/channel/habitat rehabilitation project requirements. However, the Riverside County Copermittees also submitted requests for specific retrofit language changes.	**Copermittees** Riverside County Copermittees
	RESPONSE: The San Diego Water Board disagrees with the requests to remove or modify the retrofitting of existing development requirements. The San Diego Water Board reviewed the requested language changes and did not make any of the revisions recommended as they were not necessary or changed the intent of the requirement. The requirements in the Tentative Order do not require any Copermittee to implement or require the implementation of a retrofitting project. The Tentative Order requires each Copermittee to describe a program that identifies those areas (public, private, or both) as good candidates for retrofitting. In areas where retrofitting projects within certain areas of existing development cannot be implemented by the Copermittee because of ownership (i.e. private property) or permitting, the Copermittee must develop strategies to facilitate the implementation of retrofitting projects if and when the opportunities become available. The San Diego Water Board did not remove or modify the requirements of Provision E.5.e.(2), but the requirements are now under Provision E.5.e.(1) in the revised Tentative Order.	

PROVISION E.5.e.(3): Stream, Channel and/or Habitat Rehabilitation in Areas of Existing Development
E5e3-1: *Rehabilitate receiving waters to improve water quality.*

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E5e3-1	PROVISION E.5.e.(3): Stream, Channel and/or Habitat Rehabilitation in Areas of Existing Development	
	COMMENT: *Rehabilitate receiving waters to improve water quality.* The Laguna Bluebelt Coalition and South Laguna Civic Association expressed support for rehabilitating high value coastal receiving waters to improve water quality.	**Environmental Organizations** Laguna Bluebelt Coalition South Laguna Civic Association
	RESPONSE: The San Diego Water Board agrees with the commenters that rehabilitation of coastal wetlands and estuaries are important to the improvement of water quality within the San Diego Region.	

E5e3-2: *Create map to identify creeks and coastal receiving waters impacted by discharges from storm drains and candidate areas for restoration.*

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E5e3-2	PROVISION E.5.e.(3): Stream, Channel and/or Habitat Rehabilitation in Areas of Existing Development	
	COMMENT: *Create map to identify creeks and coastal receiving waters impacted by discharges from storm drains and candidate areas for restoration.* The Laguna Bluebelt Coalition and South Laguna Civic Association expressed support for the creation of maps to show water quality impacted areas of all creeks and coastal receiving waters within the region. The commenters also supported identifying degraded land elements, offending storm drain outlets and candidate areas for re-forestation and estuarine/coastal restoration.	**Environmental Organizations** Laguna Bluebelt Coalition South Laguna Civic Association
	RESPONSE: The San Diego Water Board agrees that maps identifying candidate areas for restoration would be useful. The Copermittees have been provided an opportunity to create maps to assist in their efforts to comply with the requirements of the Tentative Order. Specifically, the Copermittees will have the option to generate a map and list of candidate projects, including stream, channel and habitat rehabilitation projects, which could potentially be used as alternative compliance options for Priority Development Projects, to be implemented in lieu of onsite structural BMP performance requirements. The optional Watershed Management Area Analysis is provided in Provision B.3.b.(4).	

E5e3-3: *Request for modifications to existing development stream, channel and/or habitat rehabilitation requirements.*

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E5e3-3	PROVISION E.5.e.(3): Stream, Channel and/or Habitat Rehabilitation in Areas of Existing Development	
	COMMENT: *Request for modifications to existing development stream, channel and/or habitat rehabilitation requirements.* The Orange County Copermittees requested a modification to the requirements of Provision E.5.e.(3) to allow a Copermittee to identify stream, channel, and/or habitat rehabilitation projects downstream of its jurisdiction. The Orange County Copermittees also requested the removal of Provision E.5.e.(3)(a) requiring each Copermittee to identify streams, channels, and/or habitats in areas of existing development as candidates for rehabilitation.	**Copermittees** Orange County Copermittees
	RESPONSE: The San Diego Water Board disagrees with the requests. The requirements of Provision E.5.e.(3) are to be implemented by each Copermittee within its jurisdiction. Allowing a Copermittee to identify stream, channel, and/or habitat rehabilitation projects downstream of its jurisdiction is not appropriate for this requirement. The Copermittee will, however, be able to identify stream, channel, and/or habitat rehabilitation projects downstream of its jurisdiction as potential alternative compliance options for Priority Development Projects if the Copermittees in the Watershed Management Area perform the optional Watershed Management Area Analysis and include it in the Water Quality Improvement Plan. The removal of Provision E.5.e.(3)(a) is not appropriate because without this requirement, the subsequent requirements could not be implemented by the Copermittee. The San Diego Water Board did not modify the requirements of Provision E.5.e.(3), but the requirements are now under Provision E.5.e.(2) in the revised Tentative Order.	

PROVISION E.6: Enforcement Response Plans
E6-1: *Specify criminal penalties are limited to intentional or criminally negligent acts.*

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E6-1	PROVISION E.6: Enforcement Response Plans	
	COMMENT: *Specify criminal penalties are limited to intentional or criminally negligent acts.* The Riverside County and San Diego County Copermittees each submitted comments requesting Provision E.6.b.(5) be modified to specify criminal penalties are limited to intentional or criminally negligent acts.	**Copermittees** Riverside County Copermittees San Diego County Copermittees
	RESPONSE: The San Diego Water Board disagrees that the revision is necessary. Provision E.6.b requires each Copermittee to list the enforcement response approaches that the Copermittee will implement within its jurisdiction to compel compliance with its statutes, ordinances, permits, contracts, order, or similar means, and the requirements of the Order. The Copermittee may specify in its Enforcement Response Plan that criminal penalties are limited to intentional or criminally negligent acts. The San Diego Water Board did not revise Provision E.6.b.(5).	

E6-2: *Notification to San Diego Water Board for "escalated" enforcement should be consistent with Construction General Permit.*

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

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E6-2	PROVISION E.6: Enforcement Response Plans	
	COMMENT: *Notification to San Diego Water Board for "escalated" enforcement should be consistent with Construction General Permit.* The Riverside County and San Diego County Copermittees each submitted comments requesting Provision E.6.e.(1) be modified to be consistent with the notification requirements of the Construction General Permit.	**Copermittees** Riverside County Copermittees San Diego County Copermittees
	RESPONSE: The San Diego Water Board agrees with the request. Provision E.6.e.(1) has been revised as requested.	

E6-3: *Revise the term "escalated enforcement" to "progressive enforcement."*

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E6-3	PROVISION E.6: Enforcement Response Plans	
	COMMENT: *Revise the term "escalated enforcement" to "progressive enforcement."* The Orange County and Riverside County Copermittees each submitted comments requesting Provision E.6.d be modified to be "Progressive Enforcement" instead of "Escalated Enforcement" because the term is more appropriate.	**Copermittees** Orange County Copermittees Riverside County Copermittees
	RESPONSE: The San Diego Water Board disagrees with the request. The Copermittees are expected to implement "progressive enforcement" in all cases of enforcement. For enforcement issues that are associated with the highest priority water quality conditions identified by the Copermittees in the Watershed Management Area, the Copermittees are expected to implement the enforcement more swiftly, meaning escalating its enforcement measures and resources to compel compliance with its statutes, ordinances, permits, contracts, order, or similar means, and the requirements of the Order as soon as possible. The term "escalated enforcement" correctly reflects this added level of urgency and focus to compel compliance. The San Diego Water Board did not revise Provision E.6.d.	

E6-4: *Allow the Copermittees to utilize existing guidelines and procedures for enforcement.*

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E6-4	PROVISION E.6: Enforcement Response Plans	
	COMMENT: *Allow the Copermittees to utilize existing guidelines and procedures for enforcement.* The Orange County and Riverside County Copermittees each submitted comments requesting the introductory paragraph of Provision E.6 be modified to specify that a Copermittee may utilize and implement established, equivalent guidelines and procedures for enforcement.	**Copermittees** Orange County Copermittees Riverside County Copermittees
	RESPONSE: The San Diego Water Board disagrees with the request. The Copermittees are allowed to utilize and implement their existing procedures if they meet the requirements of Provision E.6. Provision E.6, however, requires each Copermittee to develop an Enforcement Response Plan, included as part of its jurisdictional runoff management program document, which the San Diego Water Board and the public may utilize to determine if the Copermittee is indeed implementing its enforcement program according to its procedures. The Enforcement Response Plan is expected to be a tool the Copermittee can refer to when issuing enforcement actions to compel compliance with its statutes, ordinances, permits, contracts, order, or similar means, and the requirements of the Order. The Enforcement Response Plan is also expected to result in more consistent enforcement and enforcement actions by the Copermittee within its jurisdiction. The San Diego Water Board did not revise the introductory paragraph to Provision E.6.	

PROVISION E.7.a: Public Education
E7a-1: *Requests for modifications to public education requirements.*

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E7a-1	PROVISION E.7.a: Public Education	
	COMMENT: *Requests for modifications to public education requirements.* The Orange County, Riverside County and San Diego County Copermittees each submitted comments requesting the requirements in Provision E.7.a be modified to allow the Copermittees to focus their public education efforts on the highest priority water quality conditions, and remove or reduce the emphasis in the language that focuses on pesticides, herbicides and fertilizers.	**Copermittees** Orange County Copermittees Riverside County Copermittees San Diego County Copermittees
	RESPONSE: The San Diego Water Board disagrees with the requested modifications. The public education requirements under Provision E.7.a provide the Copermittees the flexibility to focus their public education efforts on the highest priority water quality conditions, while being consistent with federal regulations. Provision E.7.a.(1) is consistent with 40CFR122.26(d)(2)(iv)(A)(6), which requires each Copermittee to provide "*A description of a program to reduce to the maximum extent practicable, pollutants in discharges from municipal separate storm sewers associated with the application of pesticides, herbicides and fertilizer which will include…educational activities…*" Provision E.7.a.(1) has been expanded to include "*other pollutants of concern…as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed to address the highest priority water quality conditions…*" To be consistent with 40CFR122.26(d)(2)(iv)(A)(6), however, each Copermittee must have a program of educational activities to reduce pollutants associated with pesticides, herbicides and fertilizers to the MEP. The San Diego Water Board did not modify Provision E.7.a.	

PROVISION E.8: Fiscal Analysis
E8-1: *Request to remove requirement to secure resources to meet requirements of the permit.*

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E8-1	PROVISION E.8: Fiscal Analysis	
	COMMENT: *Request to remove requirement to secure resources to meet requirements of the Tentative Order.* The Riverside County Copermittees requested that Provision E.8.a, requiring each Copermittee to secure the resources necessary to meet all the requirements of the Order, be removed. The Riverside County Copermittees assert this requirement exceeds the requirements of the Clean Water Act.	**Copermittees** Riverside County Copermittees
	RESPONSE: The San Diego Water Board disagrees with the request. The Copermittees are responsible for securing the resources necessary to meet the requirements of the Tentative Order. Without securing the resources necessary to meet all requirements of the Tentative Order, the Copermittee would be unable to meet the requirements of the Tentative Order. Additionally, CWA section 402(p)(3)(B)(iii) requires that NPDES permits for storm water discharges from MS4s to "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable* [MEP], *including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." The requirement for each Copermittee to secure the resources necessary to meet all the requirements of the Order is considered "*such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." The San Diego Water Board did not remove the requirement.	

PROVISION F.1: Water Quality Improvement Plans
F1-1: *Requests for modifications to Water Quality Improvement Plan development process and schedule.*

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F1-1	PROVISION F.1: Water Quality Improvement Plans	
	COMMENT: *Requests for modifications to Water Quality Improvement Plan development process and schedule.* Comments from the Building Industry and the Copermittees requested modifications to the schedules for developing and updating the Water Quality Improvement Plans. Generally, the requests were for more time because of several different factors. The San Diego County Copermittees also requested several modifications to the content of the submittal required for each element of the Water Quality Improvement Plan. Comments from the Environmental Groups and USEPA were primarily concerned with the public participation process during the development of the Water Quality Improvement Plans. The concern was that the requirements of the Tentative Order did not allow for enough public participation, and they requested that additional opportunities be provided during the Water Quality Improvement Plan development and updates. The Environmental Groups also requested that the Water Quality Improvement Plans be required to be developed consecutively instead of concurrently.	**Building Industry / Industry** BIA Regulated Community Coalition **Copermittees** Orange County Copermittees Riverside County Copermittees San Diego County Copermittees San Diego Unified Port District **Environmental Organizations** Environmental Groups **State/Federal Government** USEPA
	RESPONSE: The San Diego Water Board agrees with the request to provide additional time to develop the Water Quality Improvement Plans, but disagrees with requiring the Water Quality Improvement Plans to be developed consecutively instead of concurrently. The San Diego Water Board also agrees with including additional opportunities for public participation during the Water Quality Improvement Plan development and update processes. The San Diego Water Board has modified the requirements of Provision F.1 to provide the Copermittees up to 24 months, instead of 18 months, to develop the Water Quality Improvement Plans. The schedules for developing and submitting the elements of the Water Quality Improvement Plan have also been modified to provide additional time, and additional flexibility to stagger the development of the Water Quality Improvement Plans to provide the public sufficient opportunity to provide data, information and recommendations. Please also see the response to comment B-3.	

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F3b-1	PROVISION F.3.b: Annual Reports	
	COMMENT: *Recommendations for modifications to Annual Report requirements.* Several commenters provided recommendations for modifications to the Annual Report requirements to clarify the requirements, include different requirements, or remove requirements. Ecolayers and the San Diego County Copermittees are concerned with the requirements related to uploading data to the California Environmental Data Exchange Network (CEDEN). Uploading data to CEDEN is not necessary according to Ecolayers. The Copermittees would like to limit the data uploads only to data generated by the Copermittees and not third parties. The Orange County, Riverside County, and San Diego County Copermittees all expressed concern about the transitional reporting period between the time the Tentative Order becomes effective and the date that the first Water Quality Improvement Plan Annual Reports are required. The Orange County Copermittees also expressed concern with the use of the Jurisdictional Runoff Management Program Annual Report Form (Form) in Attachment D to the Tentative Order. The Orange County Copermittees requested continuing the use of the current jurisdictional runoff management program annual reporting format instead of the Form. The Environmental Groups also expressed concern with the Form. The Environmental Groups are concerned that the Form would not adequately reflect the activities that each Copermittee was implementing within its jurisdiction and allow the public to understand how the Copermittees were implementing effective water quality improvement strategies.	**Copermittees** Orange County Copermittees Riverside County Copermittees San Diego County Copermittees **Environmental Organizations** Environmental Groups **Other Entities** Ecolayers
	RESPONSE: The San Diego Water Board agrees that modifying the Annual Report requirements is necessary to clarify transitional reporting requirements and Water Quality Improvement Plan reporting requirements. The San Diego Water Board does not agree that uploading data to CEDEN is unnecessary. Finally, the San Diego Water Board disagrees with replacing the Form with the current jurisdictional runoff management program annual reporting format. The San Diego Water Board has revised the Annual Report requirements under Provision F.3.b to include (1) Transitional Jurisdictional Runoff Management Program Annual Reports, (2) Transitional Monitoring and Assessment Program Annual Reports, and (3) Water Quality Improvement Plan Annual Reports. The Transitional Jurisdictional Runoff Management Program Annual Reports and Transitional Monitoring and	

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F3b-1	PROVISION F.3.b: Annual Reports	
	Assessment Program Annual Reports will be submitted by the Copermittees until the first Water Quality Improvement Plan Annual Reports are required. The Form is required for each Copermittee within each Watershed Management Area during the transitional reporting permit. Each Copermittee has the option to continue utilizing the current jurisdictional runoff management program annual reporting format in addition to the Form until the Water Quality Improvement Plan Annual Reports are required. The Form will continue to be required as part of the Water Quality Improvement Plan Annual Reports, but they are expected to be included as an appendix or attachment to the report. The San Diego Water Board will review the Forms to ensure that the Copermittees have certified that they are implementing their jurisdictional runoff management programs in compliance with the requirements. The San Diego Water Board will also utilize the Forms during audits of the Copermittees' jurisdictional runoff management programs and their records. The Water Quality Improvement Plan Annual Reports will provide the information that the Environmental Groups are interested in seeing as part of the annual reporting requirements. Provision F.3.b.(3)(d) requires each Copermittee to report the water quality improvement strategies that were implemented and/or no longer implemented by each of the Copermittees during the reporting period and previous reporting periods, and are planned to be implemented during the next reporting period. Finally, the San Diego Water Board has not removed the requirements to upload data to CEDEN, but has limited the data that is required to be uploaded to CEDEN to just data generated by the Copermittees.	

PROVISION F.3.c: Regional Monitoring and Assessment Report
F3c-1: *Requests for modifications to Regional Monitoring and Assessment Report requirements.*

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F3c-1	PROVISION F.3.c: Regional Monitoring and Assessment Report	
	COMMENT: *Requests for modifications to Regional Monitoring and Assessment Report requirements.* The Riverside County and San Diego County Copermittees each submitted requests for modifications to the Regional Monitoring and Assessment Report requirements. The Riverside County Copermittees recommended aligning the requirements with the Integrated Assessment of the Water Quality Improvement Plans. The San Diego County Copermittees recommended removing the requirement for the Regional Monitoring and Assessment Report as it appears to be duplicative with the Integrated Assessment of the Water Quality Improvement Plans. The San Diego County Copermittees also requested, if the Regional Monitoring and Assessment Report requirements remain, that data uploaded to the Regional Clearinghouse be limited only to data generated by the Copermittees and not third parties.	**Copermittees** Riverside County Copermittees San Diego County Copermittees
	RESPONSE: The San Diego Water Board disagrees with the requests to modify the Regional Monitoring and Assessment Report requirements. The San Diego Water Board agrees with limiting the data uploaded to the Regional Clearinghouse only to data generated by the Copermittees. The Regional Monitoring and Assessment Report is for the entire San Diego Region, not specific to each Watershed Management Area. The Regional Monitoring and Assessment Report may utilize the findings from the Integrated Assessments of the Water Quality Improvement Plans, but the Regional Monitoring and Assessment Report is intended to provide a “snapshot” of the conditions of the entire San Diego Region. The San Diego Water Board did not remove Provision F.3.c from the requirements. The San Diego Water Board did, however, revise Provision F.3.c.(3) to limit the data that is required to be uploaded to the Regional Clearinghouse to just data generated by the Copermittees.	

PROVISION F.4: Regional Clearinghouse
F4-1: *Request to allow the Copermittees to utilize existing mechanisms and linkages as part of the Regional Clearinghouse.*

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F4-1	PROVISION F.4: Regional Clearinghouse	
	COMMENT: *Request to allow the Copermittees to utilize existing mechanisms and linkages as part of the Regional Clearinghouse.* The Orange County and San Diego County Copermittees each submitted comments requesting the requirements in Provision F.4 be modified to allow the Copermittees to utilize their existing web-based systems. The Orange County and San Diego County Copermittees requested that language be added to Provision F.4 that specifies a Copermittee may elect to develop and maintain clearinghouses provided by other Copermittees or agencies.	**Copermittees** Orange County Copermittees San Diego County Copermittees
	RESPONSE: The San Diego Water Board agrees that the Copermittees should be allowed to utilize their existing web-based systems. Provision F.4.a allows the Copermittees to link the Regional Clearinghouse "*to other internet-based data portals and databases where the original documents are stored*." The Regional Clearinghouse, however, must be a single website that is linked to the other web-based systems. Provision G.2.d requires the Principal Watershed Copermittees to coordinate and develop the Regional Clearinghouse. The San Diego Water Board has added a footnote to the opening paragraph of Provision F.4 as requested by the San Diego County Copermittees, which is consistent with the language requested by the Orange County Copermittees.	

PROVISION G: PRINCIPAL WATERSHED COPERMITTEE RESPONSIBILITIES
G-1: *Request for "clarifications" of Copermittee responsibilities.*

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G-1	PROVISION G: PRINCIPAL WATERSHED COPERMITTEE RESPONSIBILITIES	
	COMMENT: *Request for "clarifications" of Copermittee responsibilities.* The San Diego County Copermittees requested that Provision G "clarifies" that all Copermittees have some responsibilities to implement the requirements of the permit, not just the Principal Watershed Copermittees. The San Diego County Copermittees also requested removal of the language recommending that an individual Copermittee should not be designated a Principal Watershed Copermittee for more than two Watershed Management Areas.	**Copermittees** San Diego County Copermittees
	RESPONSE: The San Diego Water Board agrees to clarify that all Copermittees are responsible for implementing the requirements. The San Diego Water Board disagrees that it is necessary to remove the recommendation that an individual Copermittee should not be designated a Principal Watershed Copermittee for more than two Watershed Management Areas. Provision G states that an individual Copermittee "should not" be designated a Principal Watershed Copermittee for more than two Watershed Management Areas. "Should not" indicates that it is a recommendation, not a requirement. The recommendation has been included to express the San Diego Water Board's desire for, as well as encourage, more Copermittees to assume leadership positions in developing Water Quality Improvement Plans and coordinating water quality improvement strategies among Copermittees in a Watershed Management Area and in the San Diego Region. The recommendation is not a requirement. Removal of a recommendation is not necessary. The San Diego Water Board has added Provision G.3 to specify that the Principal Watershed Copermittees are not responsible for ensuring that the other Copermittees in the Watershed Management Area are in compliance with the requirements, and that each Copermittee is responsible for implementing the requirements of the Tentative Order.	

PROVISION H: MODIFICATION OF PROGRAMS
H-1: *Request for an explicit re-opener provision in permit for TMDLs.*

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H-1	PROVISION H: MODIFICATION OF PROGRAMS	
	COMMENT: *Request for an explicit re-opener provision in permit for TMDLs.* The Orange County and San Diego County Copermittees and several individual Copermittees requested an explicit re-opener provision be included in the Tentative Order for when TMDLs may be amended.	**Copermittees** City of Dana Point City of Imperial Beach City of Laguna Niguel City of Mission Viejo City of Poway City of Rancho Santa Margarita City of San Diego Orange County Copermittees San Diego County Copermittees
	RESPONSE: The San Diego Water Board agrees with the request. The San Diego Water Board has revised Provision H.4 to explicitly state when the San Diego Water Board will re-open the Order for modifications. Provision H.4.c explicitly states that the San Diego Water Board will re-open the Order if any of the TMDLs in Attachment E are amended in the Basin Plan by the San Diego Water Board, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA.	

H-2: *Request to include language that the permit may be amended outside of the Water Quality Improvement Plan process.*

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H-2	PROVISION H: MODIFICATION OF PROGRAMS	
	COMMENT: *Request to include language that the permit may be amended outside of the Water Quality Improvement Plan process.* The San Diego County Copermittees have requested the San Diego Water Board include language in Provision H.3 that explicitly states the Tentative Order may be modified outside of the Water Quality Improvement Plan development and implementation process. The San Diego County Copermittees indicated that there may be frequent modifications to the permit requirements based on the Water Quality Improvement Plan development and implementation process.	**Copermittees** San Diego County Copermittees
	RESPONSE: The San Diego Water Board disagrees with the request. The Tentative Order has been structured to allow the iterative and adaptive management process to occur within the Water Quality Improvement Plan development and implementation process. The San Diego Water Board does not anticipate any need to modify the Order's requirements as a result of the implementation of the Water Quality Improvement Plans. In the event that the Order's requirements do need to be modified, the language currently in Provision H.3 is adequate for this purpose. Thus, the San Diego Water Board did not revise Provision H.3 as requested by the San Diego County Copermittees.	

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AttA-1	ATTACHMENT A: Discharge Prohibitions and Special Protections	
	COMMENT: *Requests for modifications to Areas of Special Biological Significance (ASBS) Special Protections requirements.* San Diego Gas and Electric and Southern California Gas Company requested modifications to Provision I.A.1.e.(2)(ii) of the Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges (Special Protections) in Attachment A to the Order. San Diego Gas and Electric and Southern California Gas Company requested Provision I.A.1.e.(2)(ii) be revised to include a reference to Finding 32 of the Order to be consistent with their comments regarding authorized non-storm water discharges to MS4s that discharge to ASBS (see comment Fnd-14).	**Building Industry / Industry** San Diego Gas and Electric Southern California Gas Company
	RESPONSE: The San Diego Water Board disagrees with the request. The Special Protections in Attachment A to the Tentative Order were adopted under Resolution No. 2012-0012 by the State Water Board, and are provided verbatim as a reference. Revising the provisions of the Special Protections, which are part of a resolution issued by the State Water Board, is not appropriate or necessary. The San Diego Water Board did not revise the Special Protections in Attachment A.	

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AttB-1	ATTACHMENT B: Standard Permit Provisions and General Provisions	
	COMMENT: *Requests for modifications to Standard Permit Provisions.* The Riverside County and San Diego County Copermittees each submitted comments requesting Standard Permit Provision 1.m be removed from the Standard Permit Provisions in Attachment B. The Copermittees are concerned that the bypass provisions of Standard Permit Provision 1.m would require the Copermittees to notify the San Diego Water Board whenever there is an anticipated or unanticipated bypass of storm water treatment BMPs.	**Copermittees** Riverside County Copermittees San Diego County Copermittees
	RESPONSE: The San Diego Water Board disagrees with the request. The Standard Permit Provisions in Attachment B are required to be included in all NPDES permits. Thus, it is inappropriate to remove any of the Standard Permit Provisions. Standard Permit Provision 1.m(1)(a) defines a bypass as the intentional diversion of waste streams from any portion of a treatment facility. As most storm water treatment BMPs are not expected to be attended and expected to operate without oversight, there are unlikely to be "intentional" diversions of waste streams. If, however, one or more Copermittees operate a storm water treatment control BMP that requires an "intentional" diversion of the waste stream, the San Diego Water Board expects the Copermittee(s) to comply with the requirements of Standard Permit Provision 1.m. The San Diego Water Board did not revise the Standard Permit Provisions in Attachment B.	

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AttB-2	ATTACHMENT B (Standard Permit Provisions and General Provisions)	
	COMMENT: *Requests for "clarifications" to the General Provisions.* The Riverside County and San Diego County Copermittees each submitted comments requesting "clarifications" to the General Provisions in Attachment B. The Copermittees requested that General Provision 2.h include language that specifies the Copermittees are not responsible for pollutants in its MS4 discharges originating from an NPDES-permitted non-storm water discharge. The Copermittees also requested that recordkeeping requirements of General Provision 2.i.(2) be deleted or revised to be consistent with Standard Permit Provision 1.j.(2).	**Copermittees** Riverside County Copermittees San Diego County Copermittees
	RESPONSE: The San Diego Water Board disagrees with the requests. Discharges to the Copermittees' MS4s authorized by a separate NPDES permit do not have to be prohibited, as specified in the requirements of Provisions A.1.b and E.2. The Copermittees, however, are responsible for identifying the sources of the discharges from its MS4 if it causes or contributes to exceedances of water quality standards in receiving waters. Please see the response to comment E2-3. The recordkeeping requirements of General Provision 2.i.(2) are not inconsistent with Standard Permit Provision 1.j.(2). Standard Permit Provision 1.j.2 requires records to be kept for a minimum of 3 years unless the San Diego Water Board extends this period, consistent with the Code of Federal Regulations requirement. The San Diego Water Board has extended the recordkeeping requirements of Standard Permit Provision 1.j.(2) with General Provision 2.i.(2) to a period of 5 years. Thus, there is no conflict or inconsistency. The San Diego Water Board did not revise the General Provisions in Attachment B.	

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AttC-1	ATTACHMENT C: Acronyms, Abbreviations, and Definitions	
	COMMENT: *Requests for additional or modified definitions.* Several comments were submitted by the Copermittees and Building Industry / Industry requesting modifications to existing definitions and/or the addition of new definitions to Attachment C to the Tentative Order.	**Building Industry / Industry** BIA Regulated Community Coalition San Diego Gas and Electric Southern California Gas Company **Copermittees** City of Chula Vista Orange County Copermittees Riverside County Copermittees San Diego County Copermittees
	RESPONSE: The San Diego Water Board reviewed and considered the requested modifications to existing definitions and additional definitions. Where the San Diego Water Board determined a modification to a definition requested by a commenter was appropriate and necessary to clarify a definition or make it consistent with other revisions made in the Tentative Order, the San Diego Water Board made a revision. Where the San Diego Water Board determined the addition of a definition requested by a commenter was appropriate and necessary, the San Diego Water Board added the definition. In several cases, the requested modification or addition was not appropriate, not necessary, or both. In such cases, the San Diego Water Board did not modify or add the definition as requested. Please see Attachment C in the revised Tentative Order to see the revisions that were made.	

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AttE-1	ATTACHMENT E: Specific Provisions for Total Maximum Daily Loads	
	COMMENT: *Link compliance with TMDL requirements to development and implementation of Water Quality Improvement Plans.* The San Diego County Copermittees submitted comments requesting that the development and implementation of the Water Quality Improvement Plans be a compliance mechanism for the TMDL requirements of Attachment E. The San Diego Unified Port District submitted separate comments in support of the request. The Orange County Copermittees submitted comments requesting that Provision A.1 and A.2 include language that specifies that compliance with the discharge prohibitions and receiving water limitations will be achieved through implementing the requirements of Attachment E. Comments from Environmental Groups were not in support of allowing compliance with the TMDL requirements through a "reasonable assurance analysis" included in the Water Quality Improvement Plan.	**Copermittees** City of San Diego Orange County Copermittees San Diego County Copermittees San Diego Unified Port District **Environmental Organizations** Environmental Groups
	RESPONSE: The San Diego Water Board agrees with the comments from the Copermittees. The San Diego Water Board disagrees with the comments from the Environmental Groups. The San Diego Water Board acknowledges that monitoring all MS4 outfalls or all receiving waters at all times to demonstrate compliance with the final WQBELs is difficult, likely to be cost prohibitive, and likely to be infeasible. Thus, the San Diego Water Board has included an option to the Compliance Determination requirements allowing the utilization of the Water Quality Improvement Plan to demonstrate compliance with the interim and final TMDL requirements. The compliance determination option provides the Copermittees a mechanism through an analysis to demonstrate that there is "reasonable assurance" that the interim and final numeric WQBELs are being achieved through the implementation of BMPs. Because the Water Quality Improvement Plans will undergo a public participation and review process, the San Diego Water Board is confident that a Water Quality Improvement Plan that includes such an analysis will allow the Copermittees to demonstrate that the final TMDL requirements are being achieved and will be acceptable to the public and the San Diego Water Board. For the interim TMDL compliance determination requirements, the Copermittees are allowed to demonstrate compliance by implementing a Water Quality Improvement Plan that has been accepted by the San Diego Water Board, with a "reasonable assurance" that the implementation of the BMPs will achieve the interim TMDL WQBELs within the interim compliance dates. The Copermittees will be provided considerable flexibility for	

AttE-1	ATTACHMENT E: Specific Provisions for Total Maximum Daily Loads	
	demonstrating compliance with achieving the interim WQBELs. For the final TMDL compliance determination requirements, the Copermittees are allowed to demonstrate compliance with the final WQBELs by implementing a Water Quality Improvement Plan that includes an analysis to demonstrate that the implementation of the BMPs required by the TMDL achieves compliance with one or more of the final numeric WQBELs. The Water Quality Improvement Plan must include monitoring and assessments to confirm that the Water Quality Improvement Plan is achieving the final TMDL requirement. The San Diego Water Board must accept and continue to accept the Water Quality Improvement Plan and analysis, and the Copermittees must continue to implement the BMPs and demonstrate through the analysis that the final numeric WQBELs are being achieved.	

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AttE-2	ATTACHMENT E: Specific Provisions for Total Maximum Daily Loads	
	COMMENT: *Requests for including TMDL requirements consistent with the TMDLs as developed or "as originally intended."* Several Copermittees submitted comments that the TMDLs have not been incorporated "as originally written and intended" or somehow inconsistent with the TMDLs as they were developed. The Orange County Copermittees specifically referred to the Baby Beach Bacteria TMDLs and the Beaches and Creeks Bacteria TMDLs, noting examples that they identified as "inconsistent" with the TMDLs in the Basin Plan. A comment from Clean Water Now seemed to imply that there was some inconsistencies present in the TMDL requirements "in light of recent legal renderings" though no specific legal interpretations or decisions were provided. The USEPA noted that the Beaches and Creeks Bacteria TMDLs included additional WLAs and compliance endpoints that were not included in Attachment E.	**Copermittees** City of Dana Point City of Imperial Beach City of Laguna Hills City of Lake Forest City of Mission Viejo City of Rancho Santa Margarita City of San Juan Capistrano Orange County Copermittees San Diego Unified Port District **Environmental Organizations** Clean Water Now **State/Federal Government** USEPA
	RESPONSE: The San Diego Water Board disagrees that the TMDL requirements in Attachment E are inconsistent with the TMDLs as developed or "as originally intended." The comments from the Copermittees and USEPA noted that several aspects of the TMDLs as they are in the Basin Plan are not included in the Tentative Order. The omission of those aspects of the TMDLs, however, does not mean that the TMDL requirements in Attachment E are inconsistent with the TMDLs as developed or "as originally intended." The TMDLs as developed are all intended to restore the water quality standards in receiving waters impaired by specific pollutants. The WLAs and LAs as developed are all intended to ensure that discharges from point and nonpoint sources to receiving waters will not cause or contribute to exceedances of water quality standards in receiving waters. The TMDL requirements in Attachment E are consistent with the intent of the TMDLs, and the WLAs for MS4s. In other words, the TMDL requirements in Attachment E are intended to ensure that discharges from the Responsible Copermittees' MS4s will not cause or contribute, and will continue to not cause or contribute to exceedances of water quality standards in receiving waters. According to each TMDL, when all point sources and nonpoint sources achieve their WLAs and LAs, including the WLAs for MS4s, the water quality standards in receiving waters will be restored. The San Diego Water Board included TMDL requirements in Attachment E that are entirely consistent with the requirements of the TMDLs as adopted and incorporated into the Basin Plan. The implementation plans of the	

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AttE-2	ATTACHMENT E: Specific Provisions for Total Maximum Daily Loads	
	TMDLs in the Basin Plan are essentially "instructions" for the San Diego Water Board to incorporate the requirements into the regulatory mechanisms that will implement the requirements of the TMDL to attain the water quality standards that are being impaired by a pollutant in a water body. In each case, the "instructions" provide the permit writer considerable flexibility in how to express the WLAs as WQBELs in the permit, but not as much flexibility in the compliance schedules for achieving the WLAs. Nonetheless, the San Diego Water Board has revised the TMDL requirements in Attachment E to include some of the additional aspects of the TMDLs as developed and included in the Basin Plan. Please see the following responses to comments pertaining to Attachment E.	

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AttE-3	ATTACHMENT E: Specific Provisions for Total Maximum Daily Loads	
	COMMENT: *Objections with how the Water Quality Based Effluent Limitations are included or expressed in the Tentative Order.* The Orange County and San Diego County Copermittees each submitted comments that objected to how the WQBELs for the TMDLs in Attachment E are included or expressed. The San Diego County Copermittees object to including receiving water limitations as a component of the WQBELs, and requested a clearer linkage between receiving water limitations and effluent limitations. The Orange County Copermittees had a similar objection. The San Diego County Copermittees also requested that the WQBELs expressed as effluent limitations specify that the concentration-based effluent limitations be applied on a watershed basis and not outfall by outfall. The Orange County Copermittees questioned the feasibility of the numeric WQBELs, and asserted that compliance with WQBELs should be based on implementation of BMPs. The Orange County Copermittees assert that a Reasonable Potential Analysis (RPA) is required before including WQBELs into the permit. The Orange County Copermittees also assert that the WQBELs for the Baby Beach Bacteria TMDLs and Beaches and Creeks Bacteria TMDLs are not consistent with the assumptions and requirements of the WLAs. In contrast, the USEPA generally supported the San Diego Water Board's approach for incorporating the TMDL requirements into the Tentative Order.	**Copermittees** Orange County Copermittees San Diego County Copermittees **State/Federal Government** USEPA
	RESPONSE: The San Diego Water Board has included WQBELs that are consistent with the requirements and assumptions of the TMDLs. WQBELs can be expressed as (1) conditions in receiving waters that are to be attained to restore or protect water quality standards in receiving waters, (2) conditions in discharges that will not cause or contribute to exceedances of water quality standards in receiving waters, (3) BMPs that will ensure discharges will not cause or contribute to exceedances of water quality standards in receiving waters, or (4) a combination of one or more of (1)-(3). The San Diego Water Board has incorporated (1)-(3) under the WQBEL requirements for each of the TMDLs in Attachment E. In most cases, if the WQBEL expressed as a receiving water limitation is achieved, the discharges from the MS4s are assumed to be in compliance with the TMDL requirements. If not, then the	

AttE-3	ATTACHMENT E: Specific Provisions for Total Maximum Daily Loads	
	Copermittees must demonstrate that discharges from the MS4s are not causing or contributing to the exceedances in the receiving waters by achieving the WQBELs expressed as effluent limitations. In every case, the Copermittees are required to implement BMPs to ensure that discharges from their MS4s do not cause or contribute to exceedances of water quality standards in receiving waters. Because there are TMDLs in the Basin Plan that have identified the MS4s as causing or contributing to exceedances of water quality standards, an RPA is not necessary to establish WQBELs. RPAs are only necessary if the San Diego Water Board decides to develop and incorporate WQBELs into an NPDES permit absent a TMDL. The WQBELs are also consistent with the assumptions and requirements of the WLAs. In each case, the WLAs are calculated based on numeric targets that are assumed to be able to restore or protect water quality standards in receiving waters and/or ensure discharges from the Responsible Copermittees' MS4s will not cause or contribute to exceedances of water quality standards in receiving waters. The numeric targets are required to be based on water quality objectives in the Basin Plan. Discharges from the MS4s are required to achieve the numeric targets for their discharges to protect water quality standards in receiving waters to meet the WLAs. The WQBELs for the TMDLs in Attachment E are consistent with the numeric targets, and thus consistent with the underlying assumptions and requirements of the numeric targets that are the basis of the WLAs. For the Baby Beach Bacteria TMDLs and Beaches and Creeks Bacteria TMDLs, the San Diego Water Board has not revised the concentration-based WQBELs, but has included WQBELs expressed as load-based effluent limitations. The Copermittees may utilize the load-based effluent limitations to demonstrate that the BMPs they are implementing are achieving their effluent limitations and not causing or contributing to exceedances of water quality standards in receiving waters. Please see the response to comment AttE-1.	

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AttE-4	ATTACHMENT E: Specific Provisions for Total Maximum Daily Loads	
	COMMENT: *Recommendation to reorganize the Specific Provisions for the TMDLs.* The San Diego County Copermittees recommended reorganizing the Specific Provisions of the TMDLs in Attachment E. To clearly outline the interim and final requirements and schedules, the San Diego County Copermittees recommended organizing the compliance dates, WQBELs, and compliance determination by final TMDL requirements and interim TMDL requirements.	**Copermittees** San Diego County Copermittees
	RESPONSE: The San Diego Water Board agrees with the recommendation. The San Diego Water Board reorganized the Specific Provisions for the TMDLs in Attachment E as recommended.	

AttE-5: *The San Diego Water Board does not have the authority to establish TMDLs for non-pollutants (surrogates).*

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AttE-5	ATTACHMENT E: Specific Provisions for Total Maximum Daily Loads	
	COMMENT: *The San Diego Water Board does not have the authority to establish TMDLs for non-pollutants (surrogates).* The BIA Regulated Community Coalition requested that that San Diego Water Board revise the TMDLs to conform with a U.S. District Court for the Eastern District of Virginia decision that TMDLs could not be established to regulate non-pollutants as surrogates for pollutants.	**Building Industry / Industry** BIA Regulated Community Coalition
	RESPONSE: The San Diego Water Board disagrees that the TMDLs need to be revised. The TMDLs in Attachment E are all based on reducing pollutant loads in MS4 discharges to ensure the Copermittees' MS4s will not cause or contribute to exceedances of water quality standards in receiving waters. The TMDLs in Attachment E do not establish any requirements to regulate non-pollutants as surrogates for pollutants.	

AttE-6: *Recommendation to add a provision to address TMDLs approved during the term of the Tentative Order.*

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AttE6-1	ATTACHMENT E: Specific Provisions for Total Maximum Daily Loads	
	COMMENT: *Recommendation to add a provision to address TMDLs approved during the term of the Tentative Order.* The USEPA recommended adding a provision to the requirements of the Tentative Order to address TMDLs approved during the term of the permit to expedite implementation of the TMDLs by the Copermittees.	**State/Federal Government** USEPA
	RESPONSE: The San Diego Water Board agrees with the recommendation. The San Diego Water Board has revised Provision F.2.c to include a requirement for the Copermittees to initiate an update to the applicable Water Quality Improvement Plans to incorporate the requirements of any TMDL Basin Plan amendments, applicable to the Copermittees, approved by the Office of Administrative Law and USEPA within the term of the Tentative Order.	

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AttE1-1	ATTACHMENT E 1: Chollas Creek Diazinon TMDL	
	COMMENT: *Request to revise WQBELs for Chollas Creek Diazinon TMDL based on recalculated criteria.* The San Diego County Copermittees assert that the Chollas Creek Diazinon TMDL is based on erroneous numeric targets due to an error discovered in the criteria used to develop the TMDL. The San Diego County Copermittees requested that the WQBELs for the Chollas Creek Diazinon TMDL be revised based on recalculated criteria, or remove the TMDL until the WQBELs can be "corrected."	**Copermittees** San Diego County Copermittees
	RESPONSE: The San Diego Water Board disagrees with the request. The Chollas Creek Diazinon TMDL was incorporated into the Basin Plan in September 2003. Until the Basin Plan is revised to include the "corrected" criteria as part of the numeric targets, the San Diego Water Board is required to include the TMDL requirements in the Tentative Order consistent with the requirements of the TMDL in the Basin Plan. The criteria utilized in the development of the Chollas Creek Diazinon TMDL are more protective than the "corrected" criteria cited by the commenter. Implementation of the Chollas Creek Diazinon TMDL with the WQBELs consistent with the numeric targets in the TMDL in the Basin Plan is protective of the water quality standards in receiving waters. According to the commenter, the "corrected" criteria were discovered in 2004. The commenter has had almost 9 years to approach the San Diego Water Board to request a revision to the TMDL in the Basin Plan. If the commenter would like to revise the numeric targets of the TMDL in the Basin Plan, the commenter must approach the TMDL and Basin Planning staff of the San Diego Water Board to request the change. Requesting the change through the MS4 permit development process is not the appropriate forum. The WQBELs for the Chollas Creek Diazinon TMDL were not revised.	

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AttE2-1	ATTACHMENT E 2: Shelter Island Yacht Basin Dissolved Copper TMDLs	
	COMMENT: *Request to include San Diego Unified Port District as MS4 operator in SIYB Dissolved Copper TMDL.* The City of San Diego requested that the San Diego Unified Port District be listed as a Responsible Copermittee under the dissolved copper TMDL for Shelter Island Yacht Basin.	**Copermittees** City of San Diego
	RESPONSE: The San Diego Water Board disagrees that the San Diego Unified Port District should be listed as a Responsible Copermittee under the Shelter Island Yacht Basin dissolved copper TMDL. The Shelter Island Yacht Basin dissolved copper TMDL adopted under Resolution No. R9-2005-0019 only listed the City of San Diego as an owner or operator of an MS4 that discharges to Shelter Island Yacht Basin. The TMDL provides a wasteload allocation (WLA) of 30 kg/yr for MS4 discharges by the City of San Diego only. This means that if the San Diego Unified Port District does in fact have MS4 discharges to Shelter Island Yacht Basin, the TMDL currently has assigned MS4 discharges from the San Diego Unified Port District a WLA of 0 kg/yr. Any discharge of dissolved copper from MS4s owned or operated by the San Diego Unified Port District to Shelter Island Yacht Basin would be in violation of its WLA and WQBELs expressed as effluent limitations.	

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AttE2-2	ATTACHMENT E 2: Shelter Island Yacht Basin Dissolved Copper TMDLs	
	COMMENT: *Request to revise WQBELs expressed as receiving water limitations for the Shelter Island Yacht Basin Dissolved Copper TMDL to include Water Effects Ratio.* The San Diego County Copermittees noted that the Water Effects Ratio (WER) term was incorporated into the Chollas Creek Dissolved Metals TMDLs and requested that the WQBELs expressed as receiving water limitations for the Shelter Island Yacht Basin Dissolved Copper TMDL include the WER term.	**Copermittees** San Diego County Copermittees
	RESPONSE: The San Diego Water Board agrees with the request. The San Diego Water Board has included a WER multiplier to the WQBELs expressed as receiving water limitations for the Shelter Island Yacht Basin Dissolved Copper TMDL. The WER is assumed to be 1.0 unless there is a site-specific and chemical-specific WER. The WER must be incorporated into the Basin Plan before it can be utilized in the calculation for the WQBELs expressed as receiving water limitations. The footnote includes this clarification. The San Diego Water Board also revised the footnotes for the WER term in the Chollas Creek Dissolved Metals TMDLs to clarify that the WER is assumed to be 1.0 unless a site-specific and chemical-specific WER is provided in the Basin Plan.	

AttE2-3: *Revise Shelter Island Yacht Basin Dissolved Copper TMDL requirements to allow for BMP-based compliance.*

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AttE2-3	ATTACHMENT E 2: Shelter Island Yacht Basin Dissolved Copper TMDLs	
	COMMENT: *Revise Shelter Island Yacht Basin Dissolved Copper TMDL requirements to allow for BMP-based compliance.* The San Diego County Copermittees requested that the Shelter Island Yacht Basin Dissolved Copper TMDL requirements be revised to allow for BMP-based compliance.	**Copermittees** San Diego County Copermittees
	RESPONSE: The San Diego Water Board agrees with the request to include a BMP-based compliance determination option. Please see the response to comment AttE-1.	

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AttE3-1	ATTACHMENT E 3: Rainbow Creek Total Nitrogen and Total Phosphorus TMDLs	
	COMMENT: *Request to remove the Rainbow Creek Total Nitrogen and Total Phosphorus TMDLs from the Tentative Order.* The County of San Diego and San Diego County Copermittees requested the Rainbow Creek Total Nitrogen and Total Phosphorus TMDLs be removed from Attachment E to the Tentative Order. The Copermittees noted that the TMDL, as it is incorporated in the Basin Plan, only identified a wasteload allocation (WLA) for Caltrans. The TMDL only assigns load allocation (LAs) for land uses to the County of San Diego. The Copermittees assert that only requirements for WLAs can be incorporated into an NPDES permit. The San Diego County Copermittees also requested, if the Rainbow Creek Total Nitrogen and Total Phosphorus TMDLs are not removed from Attachment E, that one of the compliance determination options allow the Responsible Copermittee to demonstrate compliance by "using its legal authority to reduce nutrient discharges from the land uses identified…to the maximum extent practicable."	**Copermittees** County of San Diego San Diego County Copermittees
	RESPONSE: The San Diego Water Board disagrees with the request to remove the Rainbow Creek Total Nitrogen and Total Phosphorus TMDLs from Attachment E. The San Diego Water Board also disagrees with allowing compliance by only achieving MEP. The Basin Plan states in the Rainbow Creek Total Nitrogen and Total Phosphorus TMDLs, "*In the event that a nonpoint source becomes a permitted discharge, the portion of the load allocation that is associated with the source can become a wasteload allocation*" (page 7-17 of the Basin Plan). The Rainbow Creek Total Nitrogen and Total Phosphorus TMDLs include several LAs that have been assigned to land uses that fall within the jurisdiction of the County of San Diego and discharge non-storm water and storm water to and from its MS4. Because these "nonpoint sources" are discharges subject to the requirements of an NPDES permit, they are permitted discharges. Thus they are effectively and appropriately considered WLAs that must be incorporated into the Tentative Order. The San Diego Water Board has revised and reorganized the format of the TMDL requirements in Attachment E, as requested by the Copermittees (see response to comment AttE-4). The reformatting and reorganization also resulted in the removal of the WLA term from the TMDL requirements. The introductory paragraph has been revised to specify that the TMDLs in Attachment E incorporate provisions that implement the LAs and WLAs applicable to discharges regulated under the Tentative Order.	

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AttE3-1	ATTACHMENT E 3: Rainbow Creek Total Nitrogen and Total Phosphorus TMDLs	
	The request by the Copermittees to include a compliance determination option of allowing compliance only by achieving MEP is not appropriate for a TMDL. TMDLs require the achievement of WQBELs when technology-based effluent limitations (TBELs) cannot achieve the attainment of water quality standards in receiving waters. The MEP standard is a TBEL. The Responsible Copermittee must achieve the WQBELs to either restore or protect water quality standards in receiving waters, or ensure discharges from the MS4 do not cause or contribute to exceedances of water quality standards in receiving waters. The San Diego Water Board did not remove the Rainbow Creek Total Nitrogen and Total Phosphorus TMDLs from Attachment E. The San Diego Water Board did not include a compliance determination option that allows compliance only by achieving MEP.	

ATTACHMENT E 4: Chollas Creek Dissolved Copper, Lead, and Zinc TMDLs
AttE4-1: *Request to revise the Chollas Creek Dissolved Copper, Lead, and Zinc TMDL requirements to allow for BMP-based compliance.*

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AttE4-1	ATTACHMENT E 4: Chollas Creek Dissolved Copper, Lead, and Zinc TMDLs	
	COMMENT: *Request to revise the Chollas Creek Dissolved Copper, Lead, and Zinc TMDL requirements to allow for BMP-based compliance.* The San Diego County Copermittees requested that the Chollas Creek Dissolved Copper, Lead, and Zinc TMDL requirements be revised to allow for BMP-based compliance.	**Copermittees** San Diego County Copermittees
	RESPONSE: The San Diego Water Board agrees with the request to include a BMP-based compliance determination option. Please see the response to comment AttE-1.	

ATTACHMENT E 5: Baby Beach and Shelter Island Shoreline Park Bacteria TMDLs
AttE5-1: *Request to revise the WQBELs of the Baby Beach and Shelter Island Shoreline Park Bacteria TMDL requirements to allow for load-based compliance.*

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

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AttE5-1	ATTACHMENT E 5: Baby Beach and Shelter Island Shoreline Park Bacteria TMDLs	
	COMMENT: *Request to revise the WQBELs of the Baby Beach and Shelter Island Shoreline Park Bacteria TMDL requirements to allow for load-based compliance.* The Orange County and San Diego County Copermittees, Environmental Groups, and the USEPA each commented that the bacteria TMDLs included load-based WLAs, expressed as mass loads, percent load reductions, or both, and recommended including load-based WQBELs. The Orange County and San Diego County Copermittees requested the WQBELs include load-based effluent limitations and allow compliance to be demonstrated with load-based effluent limitations instead of concentration-based effluent limitations. The Environmental Groups did not support allowing compliance determination solely through mass-loading numbers.	**Copermittees** Orange County Copermittees San Diego County Copermittees **Environmental Organizations** Environmental Groups **State/Federal Government** USEPA
	RESPONSE: The San Diego Water Board agrees with the request to include requirements that allow for load-based compliance with the Baby Beach and Shelter Island Shoreline Park Bacteria TMDLs. Please see the responses to comment AttE-1 and AttE-3.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

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AttE6-1	ATTACHMENT E 6: Beaches and Creeks Bacteria TMDLs	
	COMMENT: *Water bodies no longer listed on the 303(d) List should not be required to implement or comply with the requirements of the Beaches and Creeks Bacteria TMDLs.* The Orange County and San Diego County Copermittees and the Cities of Carlsbad, Del Mar and Encinitas submitted comments noting that the Beaches and Creeks Bacteria TMDLs included language that beach segments that were delisted from the 303(d) list are not subject to further action and not required to submit Bacteria Load Reduction Plans (BLRPs) or Comprehensive Load Reduction Plans (CLRPs) as long as monitoring continues to support compliance with REC-1 water quality standards. The Copermittees requested that the Beaches and Creeks Bacteria TMDLs be modified so the beach segments that are not included on the 303(d) list are not required to implement or comply with the Beaches and Creek Bacteria TMDLs requirements.	**Copermittees** City of Carlsbad City of Del Mar City of Encinitas Orange County Copermittees San Diego County Copermittees
	RESPONSE: The San Diego Water Board disagrees that beach segments that are not on the 303(d) List should not be required to implement or comply with the Beaches and Creek Bacteria TMDLs requirements. The Beaches and Creeks Bacteria TMDLs have been incorporated into the Basin Plan and apply to all the water bodies listed in the TMDL. The Copermittees cite the following from the introduction to the Beaches and Creeks TMDLs: "*Specific beach segments from some of the Pacific Ocean shorelines listed in the above table have been delisted from the 2008 303(d) list that was approved by the San Diego Board on December 16, 2009, and therefore are not subject to any further action as long as monitoring data continues to support compliance with water quality standards*" (Basin Plan page 7-60). This does not mean that the TMDLs do not apply to these segments, only that the current BMPs are working and additional actions (i.e. additional BMPs) are not necessary at this time. Under the TMDL Compliance Schedule for the Beaches and Creeks Bacteria TMDLs, the Basin Plan states: "*The TMDLs that address the Pacific Ocean shorelines identified in the 2002 303(d) List are assumed to be applicable to all the beaches located on the shorelines of the hydrologic subareas (HSAs), hydrologic areas (HAs), and hydrologic units (HUs) listed above, or as listed individually in the 2008 and future 303(d) Lists*" (Basin Plan page 7-106). This means that the TMDLs apply to the entire Pacific Ocean Shorelines identified in the TMDL and is not only where there are beach segments that are listed on the 303(d) List. Thus, it does not matter if a particular segment has been delisted, the TMDLs still apply to the entire Pacific Ocean Shoreline identified in the TMDL.	

AttE6-1	ATTACHMENT E 6: Beaches and Creeks Bacteria TMDLs	
	The TMDL Compliance Schedule also states, "*In some cases, receiving water limitations are already being met, resulting in the delisting of those segments or areas from the 2006 and/or 2008 303(d) Lists. The protection of the REC-1 beneficial use of those delisted segments or areas, however, must also be maintained, and those segments or areas must remain off future iterations of the 303(d) List… If receiving water limitations are exceeded in the future in those locations, the BLRPs or CLRPs must include the implementation of a BMP program that will ensure that the TMDLs will be achieved by the end of the TMDL compliance schedules*." (Basin Plan page 7-106). The Basin Plan continues, "*For watersheds in Table 7-52 where there are no longer any impairments listed on the 2008 303(d) List, the Phase I MS4s and Caltrans are not required to submit a BLRP or CLRP within 18 months of the effective date of these TMDLs. If, however, any segment of a waterbody for the watershed (Pacific Ocean shoreline, creek, or mouth as shown in Table7-36) is re-listed on a future 303(d) List for any type of indicator bacteria, the Phase I MS4s and Caltrans will be required to submit a BLRP or CLRP within 6 months of the adoption of the 303(d) List by the San Diego Regional Board*" (page 7-107). This means that a BLRP or CLRP is not required by the Basin Plan to be submitted within 18 months of the effective date of the TMDLs, but it also does not mean that the San Diego Water Board cannot require a BLRP or CLRP to be submitted. The Beaches and Creeks Bacteria TMDLs were developed when it was unknown when the Orange County and San Diego County MS4 Permits would be renewed to incorporate the requirements of the TMDLs. At the time the TMDLs were adopted, the Orange County MS4 Permit had just been renewed in 2009, and the San Diego County MS4 Permit was unlikely to be renewed before 2012. The San Diego Water Board wanted the implementation of the TMDLs to begin with the submittal of BLRPs or CLRPs, before the Orange County and San Diego County MS4 permits were expected to be renewed. Thus, the TMDL included the 18 month period of time for the Copermittees to develop the BLRPs or CLRPs to be required by the San Diego Water Board through an appropriate regulatory mechanism. The regulatory mechanism to compel the submittal of the BLRPs or CLRPs from the Copermittees could have been in the form of an investigative order, enforcement action, or a modification to the existing MS4 permits. The San Diego Water Board removed the 18 month BLRP or CLRP submittal requirement only for the watersheds where there were no bacteria impairments on the 2008 303(d) List because there was not the same level of urgency to begin implementation of the TMDL requirements as for those watersheds where there continue to be bacteria impairments. The removal of the 18 month BLRP or CLRP submittal requirement did not mean that a BLRP or CLRP would not be required to be developed as part of the TMDL requirements in the MS4 permit.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

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AttE6-1	ATTACHMENT E 6: Beaches and Creeks Bacteria TMDLs	
	The fact that the Beaches and Creeks Bacteria TMDLs are now part of the Basin Plan means that the TMDLs and the requirements of the TMDLs must be implemented through a regulatory mechanism to restore water quality standards in receiving waters and/or ensure discharges are not causing or contributing to exceedances of water quality standards in receiving waters. In this case, the Tentative Order is the regulatory mechanism that is implementing the requirements of the Beaches and Creeks Bacteria TMDLs to ensure that discharges from the Copermittees' MS4s will comply with the WLAs in the TMDL and not cause or contribute to exceedances of water quality standards in receiving waters. For segments or areas where there is no bacteria impairment identified on the 303(d) List, implementation of the Beaches and Creeks Bacteria TMDL requirements in the Tentative Order will ensure that discharges from the Copermittees' MS4s will continue to not cause or contribute to exceedances of water quality standards in receiving waters and remain off the 303(d) List. The Copermittees will be required to include the monitoring and assessments that are necessary to demonstrate that discharges from the Copermittees MS4s continue to not cause or contribute to exceedances of water quality standards in receiving waters and remain off the 303(d) List. The Copermittees will not be required to include additional BMPs in the Water Quality Improvement Plans if the existing BMPs are allowing the Copermittees to achieve the bacteria TMDL requirements. If, however, bacteria impairments result in the re-listing of any of these beach segments on the 303(d) List, the incorporation of the TMDL requirements in the Water Quality Improvement Plan will fulfill the CLRP requirements, and the Copermittees will be required to update the Water Quality Improvement Plan to ensure that discharges from the Copermittees' MS4s will not cause or contribute to exceedances of water quality standards in receiving waters by the final TMDL compliance date.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

AttE6-2	ATTACHMENT E 6: Beaches and Creeks Bacteria TMDLs	
	COMMENT: *Estimated costs to implement Beaches and Creeks Bacteria TMDLs are very high, and TMDLs may not be attainable.* Several community planning groups, the County of San Diego and the San Diego Taxpayers Association expressed concerns with the estimated costs of implementing the Beaches and Creeks Bacteria TMDLs. There were also concerns expressed about the feasibility of attaining the TMDLs. The commenters generally objected to including the Beaches and Creeks Bacteria TMDLs in the Tentative Order until there was some certainty that the expenses associated with implementing the TMDLs will result in the achievement of the TMDLs.	**Community Planning Groups** Pala Pauma Valley Community Sponsor Group Jamul Dulzura Community Planning Group Ramona Community Planning Group Julian Community Planning Group **Copermittees** County of San Diego County of San Diego Office of County Counsel **Societies/Associations/Coalitions** San Diego Taxpayers Association
	RESPONSE: The San Diego Water Board understands the concerns with the potential costs of implementing the requirements of the TMDLs, as well as the concerns with the feasibility of attaining the TMDLs. The costs associated with achieving the requirements of the Beaches and Creeks Bacteria TMDLs were considered during Basin Plan amendment process. The Beaches and Creeks Bacteria TMDL Basin Plan amendment was made available for public review and comment on several occasions. The San Diego Water Board adopted the Beaches and Creeks Bacteria TMDLs after considering the potential costs. The State Water Board, Office of Administrative Law, and the USEPA also approved the Beaches and Creeks Bacteria TMDLs. At this time it is difficult to predict the actual costs of complying with the Beaches and Creeks Bacteria TMDL requirements. Even the estimates that have been provided by the County of San Diego and the City of San Diego in their Comprehensive Load Reduction Plans acknowledge there is significant uncertainty in their cost estimates. While the cost estimates do provide some idea of the magnitudes of the potential costs for implementing BMPs and programs to achieve the TMDLs, the cost estimates fail to include or consider the potential cost savings or cost benefits that may be achieved or realized by implementing the Beaches and Creeks Bacteria TMDLs. The Beaches and Creeks Bacteria TMDL requirements provide the Copermittees a compliance schedule of up to 20 years. The Copermittees have not truly begun implementing the requirements of the TMDLs and have only questioned and raised concerns over the potential costs and feasibility of attaining the TMDLs before developing any information to demonstrate the TMDLs cannot, in fact, be attained or that the costs exceed the benefits of implementing the TMDLs.	

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AttE6-2	ATTACHMENT E 6: Beaches and Creeks Bacteria TMDLs	
	The San Diego Water Board is implementing the requirements of the federal Clean Water Act. The incorporation of the requirements of the Beaches and Creeks Bacteria TMDLs in the Tentative Order is required to implement the WLAs that have been assigned to the MS4s, which is supported by the USEPA. The San Diego Water Board has not removed the Beaches and Creeks Bacteria TMDLs from Attachment E to the Order.	

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AttE6-3	ATTACHMENT E 6: Beaches and Creeks Bacteria TMDLs	
	COMMENT: *Request to revise the WQBELs of the Beaches and Creeks Bacteria TMDL requirements to allow for load-based compliance.* The Orange County and San Diego County Copermittees, the City of Laguna Niguel, Environmental Groups, and the USEPA each commented that the bacteria TMDLs included load-based WLAs, expressed as mass loads, percent load reductions, or both, and recommended including load-based WQBELs. Several Copermittees submitted separate letters that supported the inclusion load-based WQBELs. The Orange County and San Diego County Copermittees requested the WQBELs include load-based effluent limitations and allow compliance to be demonstrated with load-based effluent limitations instead of concentration-based effluent limitations. The Environmental Groups did not support allowing compliance determination solely through mass-loading numbers.	**Copermittees** City of Dana Point City of Imperial Beach City of Laguna Niguel City of Mission Viejo City of Poway City of Rancho Santa Margarita City of San Diego Orange County Copermittees San Diego County Copermittees **Environmental Organizations** Environmental Groups **State/Federal Government** USEPA
	RESPONSE: The San Diego Water Board agrees with the request to include requirements that allow for load-based compliance with the Beaches and Creeks Bacteria TMDLs. Please see the responses to comment AttE-1 and AttE-3.	

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March 27, 2013

AttE6-4	ATTACHMENT E 6: Beaches and Creeks Bacteria TMDLs	
	COMMENT: *Request to revise the Beaches and Creeks Bacteria TMDL requirements to allow for BMP-based compliance.* The Orange County and San Diego County Copermittees requested that the Beaches and Creeks Bacteria TMDL requirements be revised to allow for BMP-based compliance. Several Copermittees submitted separate comments supporting the concept. Comments from Environmental Groups were not in support of allowing BMP-based compliance with the TMDL requirements through a "reasonable assurance analysis."	**Copermittees** City of Imperial Beach City of Poway City of San Diego Orange County Copermittees San Diego County Copermittees **Environmental Organizations** Environmental Groups
	RESPONSE: The San Diego Water Board agrees with the Copermittees' request. The San Diego Water Board disagrees with the Environmental Groups that BMP-based compliance option should not be provided. Please see the response to comment AttE-1.	

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AttE6-5	ATTACHMENT E 6: Beaches and Creeks Bacteria TMDLs	
	COMMENT: *Request to revise the Beaches and Creeks Bacteria TMDL requirements to allow for adjustment of interim TMDL compliance dates.* The Orange County and San Diego County Copermittees and the City of San Diego submitted comments noting that the Beaches and Creeks Bacteria TMDL included a provision that allows for the Copermittees to propose interim compliance dates if they develop a Comprehensive Load Reduction Plan, and requested the TMDL requirements be modified to allow for the interim TMDL compliance dates to be adjusted. The City of Imperial Beach supported the concept. The Environmental Groups requested that there be an assessment of progress toward achieving the interim goals within the term of the permit.	**Copermittees** City of Imperial Beach City of San Diego Orange County Copermittees San Diego County Copermittees **Environmental Organizations** Environmental Groups
	RESPONSE: The San Diego Water Board agrees with the Copermittees to allow for the interim TMDL compliance dates to be adjusted. The San Diego Water Board also agrees that there should be an assessment or progress toward achieving interim goals within the term of the permit. The Water Quality Improvement Plan is essentially the same as a CLRP. Including language allowing the Copermittees to adjust the interim TMDL compliance dates in the Water Quality Improvement Plan would not be inconsistent with the requirements of the Beaches and Creeks Bacteria TMDLs in the Basin Plan. Thus, the San Diego Water Board has included language in Specific Provision 6.c.(1) of the revised Tentative Order that allows the Copermittees to propose alternative interim TMDL compliance dates in the Water Quality Improvement Plan. The requirements of Provision B.3.a.(2)(b) in the revised Tentative Order also require the Copermittees to establish an interim goal that the Copermittees will work toward achieving within the term of the permit.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2013-0001

March 27, 2013

AttE6-6	ATTACHMENT E 6: Beaches and Creeks Bacteria TMDLs	
	COMMENT: *Requests to revise the WQBELs of the Beaches and Creeks Bacteria TMDLs requirements.* The City of Laguna Niguel submitted comments with information from a study being conducted by the Southern California Coastal Waters Research Project (SCCWRP) in cooperation with the Copermittees regarding bacteria loads that can be attributed to natural sources. The information provided by the City of Laguna Niguel was provided to support a request to include load-based WQBELs based on load reductions. The City of Laguna Niguel also requested that the load reductions be calculated using a baseline of 1996-2002 data instead of 2002-2011 data. The San Diego County Copermittees submitted comments noting that the total coliform water quality objectives only apply to ocean waters and should not be applied to creeks. The San Diego County Copermittees requested that the WQBELs expressed as receiving water limitations specify that the total coliform receiving water limitations only apply to beaches and not creeks.	**Copermittees** City of Laguna Niguel San Diego County Copermittees
	RESPONSE: The San Diego Water Board agrees with the requests from the City of Laguna Niguel and the San Diego County Copermittees. The San Diego Water Board has incorporated WQBELs expressed as load-based effluent limitations based on percent load reductions. Please see the response to comments AttE-1 and AttE-3. The San Diego Water Board revised the tables with the WQBELs expressed as receiving water limitations to be consistent with the tables in the Beaches and Creeks Bacteria TMDLs.	

AttE6-7: *Request to revise the Beaches and Creeks Bacteria TMDLs monitoring and assessment requirements to be consistent with TMDL Basin Plan amendment.*

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AttE6-7	ATTACHMENT E 6: Beaches and Creeks Bacteria TMDLs	
	COMMENT: *Request to revise the Beaches and Creeks Bacteria TMDLs monitoring and assessment requirements to be consistent with TMDL Basin Plan amendment.* The San Diego County Copermittees submitted comments requesting that the Beaches and Creeks Bacteria TMDLs monitoring and assessment requirements in the Order include the procedures to calculate wet weather exceedance frequencies as provided in the TMDL Basin Plan amendment.	**Copermittees** San Diego County Copermittees
	RESPONSE: The San Diego Water Board agrees with the request. Specific Provisions 6.d.(1)(c) and 6.d.(2)(c) have been modified to include the procedures for calculating the dry weather and wet weather exceedance frequencies for beaches and creeks.	

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California Regional Water Quality Control Board

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TO: Chairman Wright and San Diego Regional Water Quality Control Board Members

FROM: Catherine George Hagan, Senior Staff Counsel
Office of Chief Counsel

DATE: 5 November 2009

SUBJECT: Regulatory Authority for Imposing Numeric Effluent Limits on Dry Weather, Non-Storm Water Discharges, in Municipal Storm Water Permits

At the July 1, 2009, San Diego Regional Board Meeting, Regional Board members received public comments regarding the inclusion of regulations specific to non-storm water discharges in Tentative Order No. R9-2009-002, the reissuance of National Pollutant Discharge Elimination System (NPDES) Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) draining the watersheds of Orange County within the San Diego Region (South Orange County Municipal Storm Water Requirements). At the July meeting, Regional Board members requested that Board Counsel respond to public comments and Board member questions regarding the Regional Board regulation of non-storm water discharges. Commenters assert that the definition of "storm water" in the federal regulations includes drainage and surface runoff entirely unrelated to precipitation events. They also comment that regardless of whether a discharge is composed entirely of storm water or non-storm water, any pollutants discharged *from* an MS4 are subject to the maximum extent practicable (MEP) standard and related iterative process, despite the Clean Water Act's (CWA) requirement that discharges of non-storm water into an MS4 be "effectively prohibited." As a result, commenters assert that numeric effluent limitations on dry weather, non-storm water discharges are inappropriate. Board members also sought clarity on the claims by copermittees that many provisions in the Tentative Order are unfunded state mandates, requiring reimbursement by the State. This memorandum addresses both the non-storm water and unfunded mandate issues.

I. Regulatory Background

The Clean Water Act (CWA) employs the strategy of prohibiting the discharge of any pollutant from a point source into waters of the United States unless the discharger of the pollutant(s) obtains a NPDES permit pursuant to Section 402 of the Clean Water Act. The 1987 amendment to the CWA includes provision 402(p) that specifically addresses NPDES permitting requirements for storm water discharges from MS4s. Section 402(p) prohibits the discharge of pollutants from specified MS4s to waters of the United States except as authorized by an NPDES permit and identifies two substantive standards for MS4 storm

water permits. MS4 permits (1) "shall include a requirement to effectively prohibit non-stormwater discharges into the storm sewers[ ]" and (2) "shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or State determines appropriate for the control of such pollutants." (CWA Section 402(p)(3)(B)(ii-iii).)

On November 16, 1990, USEPA published regulations addressing storm water discharges from MS4s. (Vol. 55 Federal Register (Fed. Reg.) 47990 and following (Nov. 16, 1990).) The regulations establish minimum requirements for MS4 permits, and generally focus on the requirement that MS4s implement programs to reduce the amount of pollutants found in storm water discharges to the maximum extent practicable. However, the regulations also require the MS4's program to include an element to detect and remove illicit discharges and improper disposal into the storm sewer. (40 CFR § 122.26(d)(2)(iv)(B).) "Illicit discharges" defined in the regulations is the most closely applicable definition of "non-storm water" contained in federal law and the terms are often used interchangeably. The State Water Board has concluded that "U.S. EPA added the illicit discharge program requirement with the stated intent of implementing the Clean Water Act's provision requiring permits to 'effectively prohibit non-storm water discharges.'" (State Board Order WQ 2009-0008 (*County of Los Angeles)*, p. 4.)

II. Definition of Storm Water and Non-Storm Water

Federal regulations define "storm water" as "storm water runoff, snow melt runoff, and surface runoff and drainage." (40 C.F.R. § 122.26(b)(13).) While "surface runoff and drainage" is not defined in federal law, USEPA's preamble to the federal regulations demonstrates that the term is related to precipitation events such as rain and/or snowmelt. (55 Fed. Reg. 47990, 47995-96.) For example, USEPA states: "In response to the comments [on the proposed rule] which requested EPA to define the term 'storm water' broadly to include a number of classes of discharges which are not in any way related to precipitation events, EPA believes that this rulemaking is not an appropriate forum for addressing the appropriate regulation under the NPDES program of such non-storm water discharges . . . . Consequently, the final definition of storm water has not been expanded from what was proposed." (*Ibid.*) The State Water Board recently considered and rejected in its precedential *Los Angeles County* order, WQ 2009-0008, the very arguments made here by commenters that storm water includes dry weather flows, completely unrelated to precipitation events. The State Water Board concluded that "U.S. EPA has previously rejected the notion that 'storm water,' as defined at 40 Code of Federal Regulations section 122.26(b)(13), includes dry weather flows. In U.S. EPA's preamble to the storm water regulations, U.S. EPA rejected an attempt to define storm water to include categories of discharges 'not in any way related to precipitation events.' [Citations.]" (*County of Los Angeles,* Order WQ 2009-0008, p. 7.)

The storm water regulations themselves identify numerous categories of discharges including landscape irrigation, diverted stream flows, discharges from potable water sources, foundation drains, air conditioning condensation, irrigation water, springs, water from crawl space pumps, footing drains, lawn watering, individual residential car washing, and street

wash water as "non-storm water." While these types of discharges may be regulated under storm water permits, they are not considered storm water discharges. (40 CFR § 122.26(d)(2)(iv)(B).) Applicable regulations do not prohibit these and other categories of non-storm water discharges that are not expected to be a source of pollutants. But where, as in the Tentative Permit, certain categories of non-storm water discharges have been identified by the municipality to be sources of pollutants, they are no longer exempt and become subject to the effective prohibition requirement in section 402(p)(3)(B)(ii). This process would be wholly unnecessary if MEP were the governing standard for these non-storm water discharges.

Not only does a review of the storm water regulations and USEPA's discussion of the definition of storm water in its preamble to these regulations strongly support the interpretation that storm water includes only precipitation-related discharges, the Regional Board is bound to follow the State Water Board's interpretation of the definition of "storm water" set forth in the precedential State Water Board Order WQ 2009-0008 which rejects the commenters' interpretation. Therefore, while commenters assert that dry weather, non-precipitation related discharges are nonetheless storm water discharges (and therefore subject to the MEP standard in CWA section 402(p)(3)(B)(iii)), their interpretation is not supported and does not conform to applicable State Water Board precedent.

III. Non-Storm Water Regulation

Oral and written comments received by the Regional Board throughout this proceeding assert that the *discharge* of non-storm water, like storm water, from the MS4 is subject to the MEP standard and may not be regulated appropriately with numeric effluent limitations. Several commenters assert that once pollutants contained in prohibited non-storm water enter the MS4, the MEP standard and related iterative approach to storm water regulation is the most stringent means available to require those discharges to comply with water quality standards. In other words, the commenters assert that it is inappropriate for a Regional Board to regulate non-storm water discharges with numeric effluent limitations. As explained below, this interpretation is incorrect. Building on the effective prohibition against non-storm water discharges, the Clean Water Act requirement to reduce pollutants discharged from the MS4 to the MEP standard necessarily is limited to storm water discharges.

The Clean Water Act's municipal storm water MEP standard does not require storm water discharges to strictly meet water quality standards, as is required for other NPDES permitted discharges. This distinction reflects Congress's recognition that variability in flow and intensity of storm events render difficult strict compliance with water quality standards by MS4 permittees. In describing the controls that permits must include to reduce pollutants in storm water discharges to the MEP, the statute states that the controls shall include: "management practices, control techniques and system, design and engineering methods, and such other provisions as the [permit writer] determines appropriate for the control of such pollutants." (CWA § 402(p)(3)(B)(iii).)

In contrast, non-storm water discharges from the MS4 that are not authorized by separate NPDES permits, nor specifically exempted, are subject to requirements under the NPDES program, including discharge prohibitions, technology-based effluent limitations and water quality-based effluent limitations. (40 C.F.R. § 122.44.) USEPA's preamble to the storm

water regulations also supports the interpretation that regulation of non-storm water discharges through an MS4 is not limited to the MEP standard in CWA section 402(p)(3)(B)(iii):

> "Today's rule defines the term "illicit discharge" to describe any discharge through a municipal separate storm sewer system that is not composed entirely of storm water and that is not covered by an NPDES permit. Such illicit discharges are not authorized under the Clean Water Act. Section 402(p(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit." (55 Fed. Reg. 47990, 47995.)

USEPA has recently affirmed its support for the Tentative Order's regulatory approach to non-storm water discharges in comments submitted in this proceeding. As noted above, the State Water Board concluded in its recent Order WQ 2009-0008 that "U.S. EPA added the illicit discharge program requirement with the stated intent of implementing the Clean Water Act's provision requiring permits to 'effectively prohibit non-storm water discharges.'" (State Board Order WQ 2009-0008 (*County of Los Angeles)*, p. 4.) Along these same lines, the State Water Board also explained that "the Clean Water Act and the federal storm water regulations assign different performance requirements for storm water and non-storm water discharges. These distinctions in the guidance document . . . , the Clean Water Act, and the storm water regulations make it clear that a regulatory approach for storm water - such as the iterative approach we have previously endorsed - is not necessarily appropriate for non-storm water." (State Water Board Order WQ 2009-0008, *County of Los Angeles),* p. 9.)

Some commenters place extensive reliance on various State Water Board water quality orders, the State Water Board's expert storm water panel (also known as the "Blue Ribbon Panel") report entitled, *The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities* (June 2006), and other references, to assert that it is inappropriate to include numeric effluent limitations for dry weather non-storm water discharges from the MS4. It is important to note that the Blue Ribbon Panel neither considered nor made any determination on how non-storm water discharges from MS4s that adversely affect receiving waters are to be addressed. The discussion of the feasibility of numeric and/or narrative water quality-based effluent limitations and the MEP standard within these documents is applicable to discharges of storm water from MS4 systems, and does not pertain to non-storm water discharges from the MS4. Similarly, commenters also identify a superior court ruling in (*Cities of Arcadia, et al., v. State Water Resources Control Board* (Super. Ct. Orange County, 2007, No. 06CC02974)) (*Arcadia II*) to support its interpretation that numeric effluent limitations are not legally appropriate for the non-storm water discharges identified in the Tentative Order. Again, these references pertain to storm water and not non-storm water discharges and are inapposite here.

Federal law mandates that permits issued to MS4s must require management practices that will result in reducing storm water pollutants to the MEP yet at the same time requires that non-storm water discharges be effectively prohibited from entering the MS4.

Consistent with USEPA's position, the State Water Board has clearly indicated that Regional Boards are not limited by the iterative approach to storm water regulations in crafting appropriate regulations for non-storm water discharges. (State Water Board Order WQ 2009-0008, *County of Los Angeles),* p. 9.) The argument that non-storm water discharges, prohibited from entry into the MS4 in the first instance, should be held to comply with only the less stringent MEP standard developed for storm water discharges in recognition of the variable quality of storm events, is contrary to and potentially renders the "effectively prohibit" requirement in section 402(p)(3)(B)(ii) meaningless. While water quality based effluent limits, expressed as numeric effluent limitations, are not *required* to be imposed on dry weather, non-storm water discharges from the MS4, it is legally permissible to do so.[1]

IV. Water Code Section 13241

Many commenters assert that provisions in the Tentative Order, including NELs, storm water action levels (SALs), and implementation of the Baby Beach TMDL requirements, are new permit terms that exceed federal law. Therefore, the commenters argue that the Regional Board is required, but has failed, to consider Water Code section 13241 factors, including economic considerations, prior to approving any of these provisions. The City of Dana Point cites extensively to the California Supreme Court case, *City of Burbank v. State Water Resources Control Board, et al.* ((2005) 35 Cal.4th 613) (*Burbank*), particularly the concurring opinion of Justice Brown, as supportive of its assertions.

The *Burbank* court stated: "[Water Code s]ection 13377 specifies that wastewater discharge permits must meet the federal standards set by federal law. In effect, section 13377 forbids a regional board's consideration of any economic hardship on the part of the permit holder if doing so would result in the dilution of the requirements set by Congress in the Clean Water Act. That act prohibits the discharge of pollutants into the navigable waters of the United States unless there is compliance with federal law (33 U.S.C. § 1322(a)), and publicly operated wastewater treatment plants such as those before us here must comply with the act's clean water standards, regardless of cost [citations]. Because [Water Code] section 13263 cannot authorize what federal law forbids, it cannot authorize a regional board, when issuing a wastewater discharge permit, to use compliance costs to justify pollutant restrictions that do not comply with federal clean water standards." (*Burbank,* 35 Cal.4th at 625.*)*

While the Burbank decision does require an analysis of Water Code section 13241 factors when the state adopts permit conditions that are more stringent than federal law (*id. at 618*) the Tentative Order reflects that all of the challenged provisions are required to implement federal law. Thus, the Regional Board is not required to consider economic information to justify a "dilution of the requirements" established in federal law. Nonetheless, as staff has

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[1] Commenters have also claimed that TMDLs are inappropriately included as numeric effluent limitations on both dry and wet weather discharges. This is not the case. The Tentative Order requires the Copermittees to implement BMPs capable of achieving the interim and final Waste Load Allocations (WLA) and Numeric Targets in the approved TMDL. The BMPs apply to the discharges, while compliance with the WLAs and Numeric Targets occurs in receiving waters. Further, the Copermittees have 10 years to meet the final allocations and targets established for wet weather. Finally, these provisions within the Tentative Order comply with federal regulations [40 CFR 122.33(d)(1)(vii)(B)] by being consistent with the assumptions and requirements of the Waste Load Allocations of an adopted and applicable TMDL.

noted extensively in responses to comments, to the extent that economic information has been provided in connection with compliance and other costs associated with challenged permit provisions, staff has fully considered this information. Under these circumstances, the *Burbank* case does not require more.

V. Unfunded State Mandates

Both prior to and at the July 1, 2009, Regional Board meeting on an earlier version of the Tentative Order, commenters raised the issue of unfunded state mandates in connection with many of the proposed permit provisions. Board members indicated that they would appreciate clarification about the subject of unfunded state mandates. In recently submitted written comments, the City of Dana Point and others again assert that a number of the provisions in the Tentative Order go beyond what is required under federal law and therefore constitute unfunded state mandates that may not be imposed absent necessary funding first being made available to Permittees.

Commenters are correct that one factor to be considered in determining whether a requirement is an unfunded state mandate is whether the requirement goes beyond, or exceeds, what is required by federal law. However, the commenters are incorrect that the provisions in the Tentative Order exceed federal law. Moreover, there are a number of other factors that also must be established before a requirement will be found to be an unfunded state mandate warranting state reimbursement. Finally, unless and until a particular provision is determined by the State of California, Commission on State Mandates (Commission) to be an unfunded state mandate for which reimbursement is required, the Regional Board is not, as some commenters assert, precluded from adopting such provisions.

<u>State Mandate Law</u>

Article XIIIB, Section 6 of the California Constitution requires subvention of funds to reimburse local governments for state-mandated programs in specified situations. The process for establishing that a requirement is subject to reimbursement as an unfunded state mandate involves the filing by a local agency of a Test Claim with the Commission on State Mandates. There are several exceptions and limitations to the subvention requirements that provide bases for the Commission to determine that one or more provisions in a Test Claim are not subject to subvention. Article XIIIB, Section 6 provides, "Whenever the Legislature or any state agency mandates a new program or higher level of service on any local government, the State shall provide a subvention of funds to reimburse that local government for the costs of the program or increased level of service." Implementing statutes clarify that no subvention of funds is required if: (1) the mandate imposes a requirement that is mandated by a federal law or regulation and results in costs mandated by the federal government, unless the statute or executive order mandates costs that exceed the mandate in that federal law or regulation (Govt. Code, § 17556, subd. (c)); or (2) the local agency proposed the mandate (*id.*, subd. (a)); or (3) the local agency has the authority to levy service charges, fees, or assessments sufficient to pay (*id.*, subd. (d)).

Numerous judicial decisions have further defined limitations on the requirements for subvention of funds. Specifically, subvention is only required if expenditure of tax monies is

required, and not if the costs can be reallocated or paid for with fees. *(County of Los Angeles v. Commission on State Mandates* (2003) 110 Cal.App.4th 1176; *Redevelopment Agency v. Commission on State Mandates* (1997) 55 Cal.App.4th 976.) In addition, reimbursement to local agencies is required only for the costs involved in carrying out functions peculiar to government, not for expenses incurred by local agencies as an incidental impact of laws that apply generally to all state residents and entities. Laws of general application are not entitled to subvention. *County of Los Angeles v. State of California* (1987) 43 Cal.3d 46. The fact that a requirement may single out local governments is not dispositive; where local agencies are required to perform the same functions as private industry, no subvention is required. *City of Richmond v. Commission on State Mandates* (1998) 64 Cal.App.4th 1190.

If the Commission determines that provisions in a permit in fact constitute reimbursable state mandates, the determination may be challenged through the judicial process. There also exists a Commission process for determining appropriate reimbursement of state mandates. If a determination that a provision constitutes an unfunded state mandate is upheld, the State likely would decide whether to reimburse the local agency for the program or the Regional Board could decide to withdraw a provision from a permit.

Recent Commission Proceedings

Recently, the Commission issued a Final Statement of Decision in a storm water permit Test Claim filed by the County of Los Angeles and several additional co-permittee test claimants. (*Municipal Storm Water and Urban Runoff Discharges,* 03-TC-04, 03-TC-19, 03-TC-20, and 03-TC-21 (Los Angeles Regional Water Quality Control Board Order No. 01-182 (July 31, 2009) (County of Los Angeles Test Claim).) In the Commission's Statement of Decision, the Commission found that all but one of the challenged provisions issued by the Los Angeles Water Board in its MS4 permit did not qualify as unfunded state mandates as they did "not impose costs mandated by the state within the meaning of article XIII B, section 6 of the California Constitution because the claimants have fee authority (under Cal. Const. article XI, § 7) within the meaning of Government Code section 17556, subdivision (d), sufficient to pay for the activities in those parts of the permit." (County of Los Angeles Test Claim, Statement of Decision, p. 2.)

As you know, on June 20, 2008, the County of San Diego filed a Test Claim with the State of California, Commission on State Mandates (Commission), challenging multiple provisions in Order No. R9-2007-001 (National Pollutant Discharge Elimination System (NPDES) No. CAS0108758), Waste Discharge Requirements for Discharges of Urban Runoff From the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego County, the San Diego Unified Port District, and the San Diego County Regional Airport Authority), adopted on January 24, 2007 (2007 MS4 Permit). The County filed the Test Claim on behalf of 18 of the 20 MS4 Co-permittees (Claimants). Only the San Diego Unified Port District and the San Diego County Regional Airport Authority did not join in the Test Claim. The San Diego Water Board and State Water Board responded to the Test Claim. It is still pending and a draft staff analysis has not yet been issued for comment.

A similar process would need to be followed by the Orange County permittees in order to establish that any of the Tentative Order's provisions constitute unfunded state mandates entitling them to reimbursement by the state.

CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

September 7, 2012

Via U.S. Mail and E-Mail

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David H. K. Huff, Deputy County Counsel
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Subject: May 10, 2012, Letter from County of Orange, County Counsel and May 21, 2012, Letter from County of Riverside, County Counsel Re Regional Municipal Separate Storm Sewer System Permit

Messrs. Baron and Huff:

This letter responds to legal concerns raised in a May 10, 2012, letter from the County of Orange and the Orange County Flood Control District (collectively Orange County) and in a May 21, 2012, letter from the County of Riverside and Riverside County Flood Control & Water Conservation District (collectively Riverside County). Both letters question whether legal authority exists to support a Regional Municipal Separate Storm Sewer System (MS4) Permit (Regional MS4 Permit), as is under development by the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board). Orange County questions whether and how a regional MS4 permit application process is consistent with and can satisfy the individual permit application requirements in federal law as neither County is yet required to submit, nor has submitted a Report of Waste Discharge (ROWD) for the discharges covered under their respective MS4 Permits.

As a foundation for their concerns, the Counties maintain that the three groups of Copermittees (San Diego County, portions of Orange County and portions of Riverside County) presently regulated under three separate MS4 permits do not share an interconnected MS4, are not under common jurisdiction, contain separate and distinct watersheds, are

characterized by different hydrologic and climatic conditions and possess distinctly different water quality concerns.

The San Diego Water Board has the legal authority to issue a regional MS4 permit through its authority in the Clean Water Act. Section 402, subpart (p)(3)(B) of the Clean Water Act states that "Permits for discharges from municipal storm sewers—(i) may be issued on a system- or jurisdiction-wide basis . . . ." The federal storm water regulations in 40 Code of Federal Regulations (CFR) at Part 122.26, subdivision (a)(1)(v) also state that the Director may designate dischargers from municipal separate storm sewers on a system-wide or jurisdiction-wide basis. In making this determination, the Director may consider the following factors: (A) the location of the discharge with respect to waters of the United States; (B) the size of the discharge; (c) the quantity and nature of the pollutants discharged to waters of the United States; and (D) other relevant factors. (40 CFR Part 122.26(a)(1)(v).)

More specifically, the federal regulations provide that for large and medium MS4 systems, the San Diego Water Board may issue a regional permit. Specifically, the regulations provide:

> "(ii) The Director may either issue one system-wide permit covering all discharges from municipal separate storm sewers within a large or medium municipal storm sewer system or issue distinct permits for appropriate categories of discharges within a large or municipal separate storm sewer system including, but not limited to: all discharges owned or operated by the same municipality; located within the same jurisdiction; all discharges within a system that discharge to the same watershed; discharges within a system that are similar in nature; or for individual discharges from municipal separate storm sewers within the system.
>
> (iii) The operator of a discharge from a municipal separate storm sewer which is part of a large or medium municipal separate storm sewer system must either: (A) Participate in a permit application (to be a permittee or a co-permittee) with one or more other operator of discharges from the large or medium municipal storm sewer system which covers all, or a portion of all, discharges from the municipal separate storm sewer system; (B) Submit a distinct permit application which only covers discharges from the municipal separate storm sewers for which the operator is responsible; or (C) A regional authority may be responsible for submitting a permit application under the following guidelines . . . .
>
> (iv) One permit application may be submitted for all or a portion of all municipal separate storm sewers within adjacent or interconnected large or medium municipal separate storm sewer systems. The Director may issue one system-wide permit covering all, or a portion of all municipal separate storm sewers in adjacent or interconnected large or medium municipal separate storm sewer systems.
>
> (v) Permits for all or a portion of all discharges from large or medium municipal separate storm sewer systems that are issued on a system-wide, jurisdiction-

> wide, watershed or other basis may specify different conditions relating to different discharges covered by the permit, including different management programs for different drainage areas which contribute storm water to the system."

(40 CFR Part 122.26 (a)(3)(ii)-(v).)[1]

These regulations make it clear that the San Diego Water Board may issue a regional MS4 permit. The regulations also clarify that the permit may include different conditions for separate discharges covered by the permit. This allows the San Diego Water Board to ensure that suitable water quality conditions and provisions are identified for each watershed.

The United States Environmental Protection Agency's (USEPA) responses to comments for the above-mentioned regulations also make it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide permits. In the Final Rule published in the Federal Register and containing the responses to comments, USEPA notes that that paragraph (iv) (40 CFR § 122.26(a)(3)(iv)) would allow an entire system in a geographical region under the purview of a State agency to be designated under a permit. (National Pollutant Discharge Elimination System Permit Application Regulations for Storm Water Discharges, 55 FR 47990-01, 48042.) USEPA also states that many commenters wanted to allow the permitting authority broad discretion to establish system-wide permits, and that EPA believes that paragraphs (a)(1)(v) and (a)(3)(ii) allow for such broad discretion. (*Id.,* 47990-01, 48039-48042.)

Not only is it legally allowable for the San Diego Water Board to issue a regional MS4 permit, it is also appropriate for the San Diego Water Board to do so. Orange County argues that the three large metropolitan counties "do not share an interconnected municipal storm sewer system, are not under common jurisdiction, and contain separate and distinct watersheds."[2] However, the counties are connected through shared watersheds and/or are adjacent to each other. For example, the Santa Margarita watershed begins in Riverside County but drains into San Diego County. The Regional MS4 Permit creates watershed requirements that apply to multiple counties, which will ensure consistency of regulations in a watershed and result in overall cost savings for the Copermittees due to reduced redundancy in water quality monitoring. Even if the MS4s were not interconnected, the regulations make it clear the San Diego Water Board can require one permit for all MS4s that are adjacent. (40 CFR Part 122.26(a)(3)(iv).) Managing storm water on a watershed basis is expected to result in improved water quality, as the Regional MS4 Permit focuses the monitoring and management practices necessary to improve each watershed rather than arbitrary political boundaries. A single permit also allows San Diego Water Board staff to expend fewer resources developing multiple permits and more resources working cooperatively with all three current groups of Copermittees to ensure implementation of the permit results in improved water quality.

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[1] These regulations are applicable to California's NPDES program. (40 CFR §123.25.)

[2] Letter from the County of Orange, dated May 10, 2012, on page 1.

A regional MS4 permit also does not expand the requirements for each municipality beyond its borders as each municipality is only responsible for discharge within its jurisdictional boundaries. The federal regulations make it clear that Copermittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators. (40 CFR Part 122.26(a)(3)(vi).) The Administrative Draft Regional MS4 Permit does not require the Counties to manage storm water outside of their jurisdictional boundaries, but rather to work collectively to improve storm water management within watersheds.

The San Francisco region-wide permit from the Regional Water Quality Control Board, San Francisco Region, provides an example of a regional MS4 permit. Neither the USEPA nor the State Water Resources Control Board (State Water Board) objected to the San Francisco regional MS4 permit. While that permit was developed with consensus among the Copermittees, the Federal Regulations make it clear that the San Diego Water Board may impose a regional MS4 permit without a consensus. Another example of a regional MS4 permit is in Alaska, where the City of Fairbanks, the City of North Pole, the University of Alaska, and Department of Transportation and Public Facilities received a single permit, NPDES Permit No. AKS-053406.

The Regional MS4 Permit will continue to use the ROWD process prior to initially enrolling any Orange or Riverside County Copermittee into the Regional MS4 Permit or renewing the permit. The San Diego Water Board understands that each municipality is unique although the Counties share watersheds and geographical boundaries. As provided in their current MS4 permits, the Orange and Riverside County Copermittees will submit a ROWD no later than 180 days prior to expiration of their current permits. Staff at the San Diego Water Board will review the ROWDs to determine whether the Copermittees should be enrolled in the Regional MS4 Permit, what changes to the Regional MS4 Permit proposed in the ROWD are appropriate, and what is the proper level of public process for consideration of the issues raised in the ROWDs. The regional MS4 permit will continue to rely on the ROWD process to frame prospective revisions to the permit. Prior to release of the Public Comment Draft Permit, San Diego Water Board staff will consider whether changes to the text of the Administrative Draft are necessary for consistency with the intent to fully evaluate the ROWDs submitted by the Orange and Riverside County Copermittees as outlined above.

Please contact either me at 916-341-5168 or by e-mail at Jessica.jahr@waterboards.ca.gov or Catherine George Hagan at 858-467-2958 or by e-mail at catherine.hagan@waterboards.ca.gov if you have questions.

Respectfully,

Catherine George Hagan for

Jessica Jahr

cc: See next page

cc: David W. Gibson, Executive Officer (via e-mail only)
San Diego Water Board Interested Persons List (via e-mail only)

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

TENTATIVE
ORDER NO. R9-2013-0001
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The San Diego County Copermittees in Table 1a are subject to waste discharge requirements set forth in this Order.

Table 1a. San Diego County Copermittees

City of Carlsbad	City of Oceanside
City of Chula Vista	City of Poway
City of Coronado	City of San Diego
City of Del Mar	City of San Marcos
City of El Cajon	City of Santee
City of Encinitas	City of Solana Beach
City of Escondido	City of Vista
City of Imperial Beach	County of San Diego
City of La Mesa	San Diego County Regional Airport Authority
City of Lemon Grove	San Diego Unified Port District
City of National City	

After the San Diego Water Board receives and considers the Orange County Copermittees' Report of Waste Discharge and makes any necessary changes to this~~e~~ Order, the Orange County Copermittees in Table 1b will become subject to waste discharge requirements set forth in this Order after expiration of Order No. R9-2009-0002, NPDES No. CAS0108740 on or after December 16, 2014.

Table 1b. Orange County Copermittees

City of Aliso Viejo	City of Rancho Santa Margarita
City of Dana Point	City of San Clemente
City of Laguna Beach	City of San Juan Capistrano
City of Laguna Hills	City of Laguna Woods
City of Laguna Niguel	County of Orange
City of Lake Forest	Orange County Flood Control District
City of Mission Viejo	

After the San Diego Water Board receives and considers the Riverside County Copermittees' Report of Waste Discharge and makes any necessary changes to this Order, the Riverside County Copermittees in Table 1c will become subject to waste discharge requirements set forth in this Order after expiration of Order No. R9-2010-0016, NPDES No. CAS0108766 on or after November 10, 2015.

Table 1c. Riverside County Copermittees

City of Murrieta	County of Riverside
City of Temecula	Riverside County Flood Control and Water Conservation District
City of Wildomar	

The Orange County Copermittees and Riverside County Copermittees may become subject to the requirements of this Order at a date earlier than the expiration date of their current Orders subject to the conditions described in Provision F.6 of this Order if the Copermittees in the respective county receive a notification of coverage from the San Diego Water Board.

The term Copermittee in this Order refers to any San Diego County, Orange County, or Riverside County Copermittee covered under this Order, unless specified otherwise.

This Order provides permit coverage for the Copermittee discharges described in Table 2.

Table 2. Discharge Locations and Receiving Waters

Discharge Points	Locations throughout San Diego Region
Discharge Description	Municipal Separate Storm Sewer System (MS4) Discharges
Receiving Waters	Inland Surface Waters, Enclosed Bays and Estuaries, and Coastal Ocean Waters of the San Diego Region

Table 3. Administrative Information

This Order was adopted by the San Diego Water Board on:	**Month Day, 2013**
This Order will become effective on:	**Month Day, 2013**
This Order will expire on:	**Month Day, 2018**
The Copermittees must file a Report of Waste Discharge in accordance with Title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than 180 days in advance of the Order expiration date.	

I, David W. Gibson, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on Month Day, 2013.

TENTATIVE

David W. Gibson
Executive Officer

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Attachment B - Standard Permit Provisions and General Provisions B-1
Attachment C - Acronyms, Abbreviations and Definitions C-1
Attachment D - Jurisdictional Runoff Management Program Annual Report Form D-1
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Attachment F - Fact Sheet / Technical Report for Order No. R9-2013-0001 ..... F-1

I. FINDINGS

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), finds that:

JURISDICTION

1. **MS4 Ownership or Operation.** Each of the Copermittees owns or operates an MS4, through which it discharges storm water and non-storm water into waters of the U.S. within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the U.S.

2. **Legal and Regulatory Authority.** This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]) adopted by the United States Environmental Protection Agency (USEPA), and chapter 5.5, division 7 of the California Water Code (CWC) (commencing with section 13370). This Order serves as an NPDES permit for discharges from MS4s to surface waters. This Order also serves as waste discharge requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

   The San Diego Water Board has the legal authority to issue a regional MS4 permit pursuant to its authority under CWA section 402(p)(3)(B) and 40 CFR 122.26(a)(1)(v). The USEPA also made it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide permits (55 Federal Register [FR] 47990, 48039-48042). The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees and San Diego Water Board.

   The federal regulations make it clear that the Copermittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators (40 CFR 122.26(a)(3)(vi)). This Order does not require the Copermittees to manage storm water outside of their jurisdictional boundaries, but rather to work collectively to improve storm water management within watersheds.

3. **CWA NPDES Permit Conditions.** Pursuant to CWA section 402(p)(3)(B), NPDES permits for storm water discharges from MS4s must include requirements to effectively prohibit non-storm water discharges into MS4s, and require controls to reduce the discharge of pollutants in storm water to the maximum extent practicable (MEP), and to require other provisions as the San Diego Water Board determines are appropriate to control such pollutants. This Order prescribes conditions to assure compliance with the CWA requirements for owners and operators of MS4s to

effectively prohibit non-storm water discharges in-to the MS4s, and require controls to reduce the discharge of pollutants in storm water from the MS4s to the MEP.

4. **CWA and CWC Monitoring Requirements.** CWA section 308(a) and 40 CFR 122.41(h),(j)-(l) and 122.48 require that NPDES permits must specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s also specify additional monitoring and reporting requirements in 40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c). CWC section 13383 authorizes the San Diego Water Board to establish monitoring, inspection, entry, reporting and recordkeeping requirements. This Order establishes monitoring and reporting requirements to implement federal and State requirements.

5. **Total Maximum Daily Loads.** CWA section 303(d)(1)(A) requires that "[e]ach state shall identify those waters within its boundaries for which the effluent limitations…are not stringent enough to implement any water quality standard applicable to such waters." The CWA also requires states to establish a priority ranking of impaired water bodies known as Water Quality Limited Segments and to establish Total Maximum Daily Loads (TMDLs) for such waters. This priority list of impaired water bodies is called the Clean Water Act Section 303(d) List of Water Quality Limited Segments, commonly referred to as the 303(d) List. The CWA requires the 303(d) List to be updated every two years.

   TMDLs are numerical calculations of the maximum amount of a pollutant that a water body can assimilate and still meet water quality standards. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point sources (waste load allocations or WLAs) and non-point sources (load allocations or LAs), background contribution, plus a margin of safety. Discharges from MS4s are point source discharges. The federal regulations (40 CFR 122.44(d)(1)(vii)(B)) require that NPDES permits ~~to~~ incorporate water quality based effluent limitations (WQBELs) developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, consistent with the assumptions and requirements of any available WLA for the discharge. Requirements of this Order implement the TMDLs adopted by the San Diego Water Board and approved by USEPA as of the time this Order is issued. This Order establishes WQBELs consistent with the assumptions and requirements of all available TMDL WLAs assigned to discharges from the Copermittees' MS4s.

6. **Non-Storm Water Discharges.** Pursuant to CWA section 402(p)(3)(B)(ii), this Order requires each Copermittee to effectively prohibit discharges of non-storm water into its MS4. Nevertheless, non-storm water discharges into and from the MS4s continue to be reported to the San Diego Water Board by the Copermittees and other persons. Monitoring conducted by the Copermittees, as well as the 303(d) List, have identified dry weather, non-storm water discharges from the MS4s as a source of pollutants causing or contributing to receiving water quality impairments in the San Diego Region. The federal regulations (40 CFR 122.26(d)(2)(iv)(B)(1)) require the Copermittees to have a program to prevent illicit discharges to the MS4.

The federal regulations, however, allow for specific categories of non-storm water discharges or flows to be addressed as illicit discharges only where such discharges are identified as sources of pollutants to waters of the U.S.

7. **In-Stream Treatment Systems.** Pursuant to federal regulations (40 CFR 131.10(a)), in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S. Authorizing the construction of a runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to accepting waste assimilation as an appropriate use for that water body. Runoff treatment must occur prior to the discharge of runoff into receiving waters. Treatment control best management practices (BMPs) must not be constructed in waters of the U.S. Construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body.

DISCHARGE CHARACTERISTICS AND RUNOFF MANAGEMENT

8. **Point Source Discharges of Pollutants.** Discharges from the MS4s contain waste, as defined in the CWC, and pollutants that adversely affect the quality of the waters of the state. A discharge from an MS4 is a "discharge of pollutants from a point source" into waters of the U.S. as defined in the CWA. Storm water and non-storm water discharges from the MS4s contain pollutants that cause or threaten to cause a violation of surface water quality standards, as outlined in the Water Quality Control Plan for the San Diego Basin (Basin Plan). Storm water and non-storm water discharges from the MS4s are subject to the conditions and requirements established in the Basin Plan for point source discharges.

9. **Potential Beneficial Use Impairment.** The discharge of pollutants and/or increased flows from MS4s may cause or threaten to cause the concentration of pollutants to exceed applicable receiving water quality objectives and impair or threaten to impair designated beneficial uses resulting in a condition of pollution, contamination, or nuisance.

10. **Pollutants Generated by Land Development.** Land development has created and continues to create new sources of non-storm water discharges and pollutants in storm water discharges as human population density increases. This brings higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash. Pollutants from these sources are dumped or washed off the surface by non-storm water or storm water flows into and from the MS4s. When development converts natural vegetated pervious ground cover to impervious surfaces such as paved highways, streets, rooftops, and parking lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving a developed area without BMPs that can maintain pre-development runoff conditions will contain greater pollutant loads and have significantly greater runoff volume, velocity, and peak flow rate than pre-development runoff conditions from the same area.

11. **Runoff Discharges to Receiving Waters.** The MS4s discharge runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within the eleven hydrologic units comprising the San Diego Region. Historic and current development makes use of natural drainage patterns and features as conveyances for runoff. Rivers, streams and creeks in developed areas used in this manner are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and receiving water. Numerous receiving water bodies and water body segments have been designated as impaired by the San Diego Water Board pursuant to CWA section 303(d).

12. **Pollutants in Runoff.** The most common pollutants in runoff discharged from the MS4s include total suspended solids, sediment, pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., cadmium, copper, lead, and zinc), petroleum products and polynuclear aromatic hydrocarbons, synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus), oxygen-demanding substances (e.g., decaying vegetation, animal waste), detergents, and trash. As operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not prohibit or otherwise control. These discharges may cause or contribute to a condition of pollution or a violation of water quality standards.

13. **Human Health and Aquatic Life Impairment.** Pollutants in runoff discharged from the MS4s can threaten and adversely affect human health and aquatic organisms. Adverse responses of organisms to chemicals or physical agents in runoff range from physiological responses such as impaired reproduction or growth anomalies to mortality. Increased volume, velocity, rate, and duration of storm water runoff greatly accelerate the erosion of downstream natural channels. This alters stream channels and habitats and can adversely affect aquatic and terrestrial organisms.

14. **Water Quality Effects.** The Copermittees' water quality monitoring data submitted to date documents persistent exceedances of Basin Plan water quality objectives for runoff-related pollutants at various watershed monitoring stations. Persistent toxicity has also been observed at several watershed monitoring stations. In addition, bioassessment data indicate that the majority of the monitored receiving waters have Poor to Very Poor Index of Biological Integrity (IBI) ratings. These findings indicate that runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in the San Diego Region. Non-storm water discharges from the MS4s have been shown to contribute significant levels of pollutants and flow in arid, developed Southern California watersheds, and contribute significantly to exceedances of applicable receiving water quality objectives.

15. **Non-Storm Water and Storm Water Discharges.** Non-storm water discharges from the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard of CWA section 402(p)(3)(B)(iii), which is explicitly for "Municipal … *Stormwater Discharges* (emphasis added)" from the MS4s. Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s must be effectively prohibited.

16. **Best Management Practices.** Waste and pollutants which are deposited and accumulate in MS4 drainage structures will be discharged from these structures to waters of the U.S. unless they are removed. These discharges may cause or contribute to, or threaten to cause or contribute to, a condition of pollution in receiving waters. For this reason, pollutants in storm water discharges from the MS4s can be and must be effectively reduced in runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Pollution prevention is the reduction or elimination of pollutant generation at its source and is the best "first line of defense". Source control BMPs (both structural and non-structural) minimize the contact between pollutants and runoff, therefore keeping pollutants onsite and out of receiving waters. Treatment control BMPs remove pollutants that have been mobilized by storm water or non-storm water flows.

17. **BMP Implementation.** Runoff needs to be addressed during the three major phases of development (planning, construction, and use) in order to reduce the discharge of storm water pollutants to the MEP, effectively prohibit non-storm water discharges, and protect receiving waters. Development which is not guided by water quality planning policies and principles can result in increased pollutant load discharges, flow rates, and flow durations which can negatively affect receiving water beneficial uses. Construction sites without adequate BMP implementation result in sediment runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. Existing development can generate substantial pollutant loads which are discharged in runoff to receiving waters. Retrofitting areas of existing development with storm water pollutant control and hydromodification management BMPs is necessary to address storm water discharges from existing development that may cause or contribute to a condition of pollution or a violation of water quality standards.

18. **Long Term Planning and Implementation.** Federal regulations require municipal storm water permits to expire 5 years from adoption, after which the permit must be renewed and reissued. The San Diego Water Board recognizes that the degradation of water quality and impacts to beneficial uses of the waters in the San Diego Region occurred over several decades. The San Diego Water Board further recognizes that a decade or more may be necessary to realize demonstrable improvement to the quality of waters in the Region. This Order includes a long term planning and implementation approach that will require more than a single permit term to complete.

WATER QUALITY STANDARDS

19. **Basin Plan.** The San Diego Water Board adopted the Water Quality Control Plan for the San Diego Basin (Basin Plan) on September 8, 1994 that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for receiving waters addressed through the plan. The Basin Plan was subsequently approved by the State Water Resources Control Board (State Water Board) on December 13, 1994. Subsequent revisions to the Basin Plan have also been adopted by the San Diego Water Board and approved by the State Water Board. Requirements of this Order implement the Basin Plan.

    The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Process Supply (PROC), Industrial Service Supply (IND), Ground Water Recharge (GWR), Contact Water Recreation (REC1), Non-contact Water Recreation (REC2), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Freshwater Replenishment (FRSH), Hydropower Generation (POW), and Preservation of Biological Habitats of Special Significance (BIOL). The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region: Navigation (NAV), Commercial and Sport Fishing (COMM), Estuarine Habitat (EST), Marine Habitat (MAR), Aquaculture (AQUA), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN), and Shellfish Harvesting (SHELL).

20. **Ocean Plan.** The State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, and 2005. The State Water Board adopted the latest amendment on April 21, 2005 and it became effective on February 14, 2006. The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean. Requirements of this Order implement the Ocean Plan.

    The Ocean Plan identifies the following beneficial uses of ocean waters of the state to be protected: Industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture; preservation and enhancement of designated Areas of Special Biological Significance; rare and endangered species; marine habitat; fish spawning and shellfish harvesting

21. **Sediment Quality Control Plan**. On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes: 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health,

and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

22. **National Toxics Rule and California Toxics Rule.** USEPA adopted the National Toxics Rule (NTR) on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the NTR applied in California. On May 18, 2000, USEPA adopted the California Toxics Rule (CTR). The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants.

23. **Antidegradation Policy.** This Order is in conformance with the federal Antidegradation Policy described in 40 CFR 131.12, and State Water Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality Waters in California*. Federal regulations at 40 CFR 131.12 require that the State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. State Water Board Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies.

24. **Anti-Backsliding Requirements.** Section 402(o)(2) of the CWA and federal regulations at 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations may be relaxed. All effluent limitations in this Order are at least as stringent as effluent limitations in the previous permits.

CONSIDERATIONS UNDER FEDERAL AND STATE LAW

25. **Coastal Zone Act Reauthorization Amendments.** Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states with approved coastal zone management programs to address non-point source pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point source pollution: agriculture, silviculture, urban, marinas, and hydromodification. This Order addresses the management measures required for the urban category, with the exception of septic systems. The runoff management programs developed pursuant to this Order fulfills the need for coastal cities to develop a runoff non-point source plan identified in the Non-Point Source Program Strategy and Implementation Plan. The San Diego Water Board addresses septic systems through the administration of other programs.

26. **Endangered Species Act.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 USC sections 1531 to 1544). This Order requires compliance with receiving water limits, and other requirements to protect the beneficial uses of waters of the State. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

27. **Report of Waste Discharge Process.** The waste discharge requirements set forth in this Order are based upon the Report of Waste Discharge submitted by the San Diego County Copermittees prior to the expiration of Order No. R9-2007-0001 (NPDES No. CAS0109266). The Orange County and Riverside County Copermittees are not immediately covered by the waste discharge requirements in this Order. The San Diego Water Board understands that each municipality is unique although the Counties share watersheds and/or geographical boundaries. The Order will continue to use the Report of Waste Discharge process prior to initially making Orange County or Riverside County Copermittees subject to the requirements of this Order.

    The federal regulations (40 CFR 122.21(d)(2)) and CWC section 13376 impose a duty on the Copermittees to reapply for continued coverage through submittal of a Report of Waste Discharge no later than 180 days prior to expiration of a currently effective permit. This requirement is set forth in the Orange County Copermittees' and Riverside County Copermittees' currently effective permits at Provisions K.2.b and K.2.c, respectively. The Orange County Permit, Order No. R9-2009-0002 (NPDES No. CAS0108740) expires on December 16, 2014 and the Riverside County MS4 Permit, Order No. R9-2010-0016 (NPDES No. CAS0108766) expires on November 10, 2015.

    Unless the Orange County or Riverside County Copermittees apply for and receive early coverage under this Order, the Orange County Copermittees' and the Riverside County Copermittees' respective permits will be superseded by this Order upon expiration of their respective permits, subject to any necessary revisions to the requirements of this Order made after the San Diego Water Board considers their respective Reports of Waste Discharge through the public process provided in 40 CFR Part 124.

28. **Integrated Report and Clean Water Act Section 303(d) List.** The San Diego Water Board and State Water Board submit an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. USEPA issued its *Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act* on July 29, 2005, which advocates the use of a five category approach for classifying the attainment status of water quality standards for water bodies in the Integrated Report. Water bodies included in Category 5 in the Integrated Report

indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 in the Integrated Report are placed on the 303(d) List.

Water bodies with available data and/or information that indicate at least one beneficial use is not being supported or is threatened, but a TMDL is not required, are included in Category 4 in the Integrated Report. Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

Implementation of the requirements of this Order may allow the San Diego Water Board to include surface waters impaired by discharges from the Copermittees' MS4s in Category 4 in the Integrated Report for consideration during the next 303(d) List submittal by the State to USEPA.

29. **Economic Considerations.** The California Supreme Court has ruled that although CWC section 13263 requires the State and Regional Water Boards (collectively Water Boards) to consider factors set forth in CWC section 13241 when issuing an NPDES permit, the Water Board may not consider the factors to justify imposing pollutant restrictions that are less stringent than the applicable federal regulations require. (*City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 618, 626-627.) However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

As noted in the following finding, the San Diego Water Board finds that the requirements in this permit are not more stringent than the minimum federal requirements. Therefore, a CWC section 13241 analysis is not required for permit requirements that implement the effective prohibition on the discharge of non-storm water into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determined appropriate to control such pollutants, as those requirements are mandated by federal law. Notwithstanding the above, the San Diego Water Board has developed an economic analysis of the requirements in this Order. The economic analysis is provided in the Fact Sheet.

30. **Unfunded Mandates.** This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following:

a. This Order implements federally mandated requirements under CWA section 402 (33 USC section 1342(p)(3)(B)).

b. The local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental and new dischargers who are issued NPDES permits for storm water and non-storm water discharges.

c. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order.

d. The Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)) and in lieu of numeric restrictions on their MS4 discharges (i.e. effluent limitations).

e. The local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under State law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

f. The provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state develops a TMDL, federal law requires that permits must contain water quality based effluent limitations consistent with the assumptions and requirements of any applicable wasteload allocation (40 CFR 122.44(d)(1)(vii)(B)).

See the Fact Sheet for further discussion of unfunded mandates.

31. California Environmental Quality Act. The issuance of waste discharge requirements and an NPDES permit for the discharge of runoff from MS4s to waters of the U.S. is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 et seq.) in accordance with CWC section 13389.

STATE WATER BOARD DECISIONS

32. Compliance with Prohibitions and Limitations. The receiving water limitation language specified in this Order is consistent with language recommended by the USEPA and established in State Water Board Order WQ 99-05, *Own Motion Review of the Petition of Environmental Health Coalition to Review Waste Discharge Requirements Order No. 96-03, NPDES Permit No. CAS0108740*, adopted by the State Water Board on June 17, 1999. The receiving water limitation language in this Order requires storm water discharges from MS4s to not cause or contribute to a violation of water quality standards, which is to be achieved through an iterative approach requiring the implementation of improved and better-tailored BMPs over time. Implementation of the iterative approach to comply with receiving water limitations based on applicable water quality standards is necessary to ensure that storm water discharges from the MS4 will not ultimately cause or contribute to

violations of water quality standards and will not create conditions of pollution, contamination, or nuisance.

33. **Special Conditions for Areas of Special Biological Significance.** On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving an exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges. State Water Board Resolution No. 2012-0012 requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject terms and conditions of State Water Board Resolution No. 2012-0012. The Special Protections contained in Attachment B to Resolution No. 2012-0012, applicable to these discharges, are hereby incorporated into this Order as if fully set forth herein.

ADMINISTRATIVE FINDINGS

34. **Executive Officer Delegation of Authority.** The San Diego Water Board by prior resolution has delegated all matters that may legally be delegated to its Executive Officer to act on its behalf pursuant to CWC section 13223. Therefore, the Executive Officer is authorized to act on the San Diego Water Board's behalf on any matter within this Order unless such delegation is unlawful under CWC section 13223 or this Order explicitly states otherwise.

35. **Standard Provisions.** Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR 122.42, are provided in Attachment B to this Order.

36. **Fact Sheet.** The Fact Sheet for this Order contains background information, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of this Order. The Fact Sheet is hereby incorporated into this Order and constitutes part of the Findings of this Order.

37. **Public Notice.** In accordance with State and federal laws and regulations, the San Diego Water Board notified the Copermittees, and interested agencies and persons of its intent to prescribe waste discharge requirements for the control of discharges into and from the MS4s to waters of the U.S. and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet.

38. **Public Hearing.** The San Diego Water Board held a public hearing on Month Day, 2013 and heard and considered all comments pertaining to the terms and conditions of this Order. Details of the public hearing are provided in the Fact Sheet.

39. **Effective Date.** This Order serves as an NPDES permit pursuant to CWA section 401 or amendments thereto, and becomes effective fifty (50) days after the date of its adoption, provided that the Regional Administrator, USEPA, Region IX, does not object to this Order.

40. **Review by the State Water Board.** Any person aggrieved by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with CWC section 13320 and California Code of Regulations, title 23, sections 2050, et seq. The State Water Board must receive the petition by 5:00 p.m., 30 days after the San Diego Water Board action, except that if the thirtieth day following the action falls on a Saturday, Sunday or State holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

THEREFORE, IT IS HEREBY ORDERED that the Copermittees, in order to meet the provisions contained in division 7 of the CWC (commencing with section 13000) and regulations adopted thereunder, and the provisions of the CWA and regulations adopted thereunder, must each comply with the ~~following:~~ the requirements of this Order. This action in no way prevents the San Diego Water Board from taking enforcement action for past violations of the previous Order. If any part of this Order is subject to a temporary stay of enforcement, unless otherwise specified, the Copermittees must comply with the analogous portions of the previous Order, which will remain in effect for all purposes during the pendency of the stay.

II. PROVISIONS

A. PROHIBITIONS AND LIMITATIONS

The purpose of this provision is to describe the conditions under which storm water and non-storm water discharges into and from MS4s are prohibited or limited. The goal of the prohibitions and limitations is to protect the water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through the implementation of water quality improvement strategies and runoff management programs that effectively prohibit non-storm water discharges into the Copermittees' MS4s, and reduce pollutants in storm water discharges from the Copermittees' MS4s to the MEP.

1. Discharge Prohibitions

a. Discharges from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the state are prohibited.

b. Non-storm water discharges into MS4s are to be effectively prohibited, through the implementation of Provision E.2, unless such discharges are ~~either~~ authorized by a separate NPDES permit~~, or the discharge is a category of non-storm water discharges or flows that must be addressed pursuant to Provisions E.2.a.(1)-(5) of this Order~~.

c. Discharges from MS4s are subject to all waste discharge prohibitions in the Basin Plan, included in Attachment A to this Order.

d. Storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 applicable to these discharges, included in Attachment A to this Order. All other discharges from the Copermittees' MS4s to ASBS are prohibited.

2. Receiving Water Limitations

a. Discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters, including but not limited to all applicable provisions contained in:

(1) The San Diego Water Board's Basin Plan, including beneficial uses, water quality objectives, and implementation plans;

(2) State Water Board plans for water quality control including the following:

(a) Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries (Thermal Plan), and

(b) The Ocean Plan, including beneficial uses, water quality objectives, and implementation plans;

(3) State Water Board policies for water and sediment quality control including the following:

(a) Water Quality Control Policy for the Enclosed Bays and Estuaries of California,

(b) Sediment Quality Control Plan which includes the following narrative objectives for bays and estuaries:

(i) Pollutants in sediments shall not be present in quantities that, alone or in combination, are toxic to benthic communities, and

(ii) Pollutants shall not be present in sediments at levels that will bioaccumulate in aquatic life to levels that are harmful to human health,

(c) The Statement of Policy with Respect to Maintaining High Quality of Waters in California;[1]

(4) Priority pollutant criteria promulgated by the USEPA through the following:

(a) National Toxics Rule (NTR)[2] (promulgated on December 22, 1992 and amended on May 4, 1995), and

(b) California Toxics Rule (CTR).[3,4]

b. Discharges from MS4s composed of storm water runoff must not alter natural ocean water quality in an ASBS.

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[1] State Water Board Resolution No. 68-16
[2] 40 CFR 131.36
[3] 65 Federal Register 31682-31719 (May 18, 2000), adding Section 131.38 to 40 CFR
[4] If a water quality objective and a CTR criterion are in effect for the same priority pollutant, the more stringent of the two applies.

3. Effluent Limitations

a. Technology Based Effluent Limitations

Pollutants in storm water discharges from MS4s must be reduced to the MEP.[5]

b. Water Quality Based Effluent Limitations

~~This Order establishes water quality based effluent limitations (WQBELs) consistent with the assumptions and requirements of all available TMDL waste load allocations (WLAs) assigned to discharges from the Copermittees' MS4s.~~ Each Copermittee must comply with applicable WQBELs established for the TMDLs in Attachment E to this Order, pursuant to the applicable TMDL compliance schedules.

4. Compliance with Discharge Prohibitions and Receiving Water Limitations

Each Copermittee must achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order through timely implementation of control measures and other actions as specified in Provisions B and E of this Order, including any modifications. The Water Quality Improvement Plans required under Provision B must be designed and adapted to ultimately achieve compliance with Provisions A.1.a, A.1.c and A.2.a.

a. If exceedance(s) of water quality standards persist in receiving waters notwithstanding implementation of this Order, the Copermittees must comply with the following procedures:

(1) For exceedance(s) of a water quality standard in the process of being addressed by the Water Quality Improvement Plan, the Copermittee(s) must implement the Water Quality Improvement Plan as accepted by the San Diego Water Board, and update the Water Quality Improvement Plan, as necessary, pursuant to Provision F.2.c;

(2) Upon a determination by either the Copermittees or the San Diego Water Board that discharges from the MS4 are causing or contributing to a new exceedance of an applicable water quality standard not addressed by the Water Quality Improvement Plan, the Copermittees must submit the following updates to the Water Quality Improvement Plan pursuant to Provision F.2.c or as part of the Water Quality Improvement Plan Annual Report required under Provision F.3.b, unless the San Diego Water Board directs an earlier submittal:

[5] This does not apply to MS4 discharges which receive subsequent treatment to reduce pollutants in storm water discharges to the MEP prior to entering receiving waters (e.g., low flow diversions to the sanitary sewer). Runoff treatment must occur prior to the discharge of runoff into receiving waters per Finding 7.

(a) The water quality improvement strategies being implemented that are effective and will continue to be implemented,

(b) Water quality improvement strategies (i.e. BMPs, retrofitting projects, stream and/or habitat rehabilitation ~~or restoration~~ projects, adjustments to jurisdictional runoff management programs, etc.) that will be implemented to reduce or eliminate any pollutants or conditions that are causing or contributing to the exceedance of water quality standards,

(c) Updates to the schedule for implementation of the existing and additional water quality improvement strategies, and

(d) Updates to the monitoring and assessment program to track progress toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a of this Order;

(3) The San Diego Water Board may require the incorporation of additional modifications to the Water Quality Improvement Plan required under Provision B. The applicable Copermittees must submit any modifications to the update to the Water Quality Improvement Plan within 90 days of notification that additional modifications are required by the San Diego Water Board, or as otherwise directed;

(4) Within 90 days of the San Diego Water Board determination that the update to the Water Quality Improvement Plan meets the requirements of this Order, the applicable Copermittees must revise the jurisdictional runoff management program documents to incorporate the updated water quality improvement strategies that have been and will be implemented, the implementation schedule, and any additional monitoring required; and

(5) Each Copermittee must implement the updated Water Quality Improvement Plan.

b. The procedure set forth above to achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order do not have to be repeated for continuing or recurring exceedances of the same water quality standard(s) following implementation of scheduled actions unless directed to do otherwise by the San Diego Water Board.

c. Nothing in Provisions A.4.a and A.4.b prevents the San Diego Water Board from enforcing any provision of this Order while the applicable Copermittees prepare and implement the above update to the Water Quality Improvement Plan and jurisdictional runoff management programs.

B. WATER QUALITY IMPROVEMENT PLANS

The purpose of this provision is to develop Water Quality Improvement Plans that guide the Copermittees' jurisdictional runoff management programs towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plans is to protect, preserve, and enhance~~, and restore~~ the water quality and designated beneficial uses of waters of the state. This goal will be accomplished through an adaptive planning and management process that identifies the highest priority water quality conditions within a watershed and implements strategies through the jurisdictional runoff management programs to achieve improvements in the quality of discharges from the MS4s and receiving waters.

1. Watershed Management Areas

The Copermittees must develop a Water Quality Improvement Plan for each of the Watershed Management Areas in Table B-1. A total of ten Water Quality Improvement Plans must be developed for the San Diego Region.

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
San Juan (901.00)	South Orange County	- Aliso Creek - San Juan Creek - San Mateo Creek - Pacific Ocean - Heisler Park ASBS	- City of Aliso Viejo[1] - City of Dana Point[1] - City of Laguna Beach[1] - City of Laguna Hills[1] - City of Laguna Niguel[1] - City of Laguna Woods[1] - City of Lake Forest[1] - City of Mission Viejo[1] - City of Rancho Santa Margarita[1] - City of San Clemente[1] - City of San Juan Capistrano[1] - County of Orange[1] - Orange County Flood Control District[1]
Santa Margarita (902.00)	Santa Margarita River	- Murrieta Creek - Temecula Creek - Santa Margarita River - Santa Margarita Lagoon - Pacific Ocean	- City of Murrieta[2] - City of Temecula[2] - City of Wildomar[2] - County of Riverside[2] - County of San Diego[3] - Riverside County Flood Control and Water Conservation District[2]
San Luis Rey (903.00)	San Luis Rey River	- San Luis Rey River - San Luis Rey Estuary - Pacific Ocean	- City of Oceanside - City of Vista - County of San Diego

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
Carlsbad (904.00)	Carlsbad	- Loma Alta Slough - Buena Vista Lagoon - Agua Hedionda Lagoon - Batiquitos Lagoon - San Elijo Lagoon - Pacific Ocean	- City of Carlsbad - City of Encinitas - City of Escondido - City of Oceanside - City of San Marcos - City of Solana Beach - City of Vista - County of San Diego
San Dieguito (905.00)	San Dieguito River	- San Dieguito River - San Dieguito Lagoon - Pacific Ocean	- City of Del Mar - City of Escondido - City of Poway - City of San Diego - City of Solana Beach - County of San Diego
Penasquitos (906.00)	Penasquitos	- Los Penasquitos Lagoon - Pacific Ocean	- City of Del Mar - City of Poway - City of San Diego - County of San Diego
	Mission Bay	- Mission Bay - Pacific Ocean - San Diego Marine Life Refuge ASBS	- City of San Diego
San Diego (907.00)	San Diego River	- San Diego River - Pacific Ocean	- City of El Cajon - City of La Mesa - City of San Diego - City of Santee - County of San Diego
Pueblo San Diego (908.00) Sweetwater (909.00) Otay (910.00)	San Diego Bay	- Sweetwater River - Otay River - San Diego Bay - Pacific Ocean	- City of Chula Vista - City of Coronado - City of Imperial Beach - City of La Mesa - City of Lemon Grove - City of National City - City of San Diego - County of San Diego - San Diego County Regional Airport Authority - San Diego Unified Port District
Tijuana (911.00)	Tijuana River	- Tijuana River - Tijuana Estuary - Pacific Ocean	- City of Imperial Beach - City of San Diego - County of San Diego

Notes:
1. The Orange County Copermittees will be covered under this Order after expiration of Order No. R9-2009-0002, or earlier if the Orange County Copermittees meet the conditions in Provision F.6.
2. The Riverside County Copermittees will be covered under this Order after expiration of Order No. R9-2010-0016, or earlier if the Riverside County Copermittees meet the conditions in Provision F.6.
3. The County of San Diego is not required to implement the requirements of Provision B for its jurisdiction within the Santa Margarita River Watershed Management Area until the Riverside County Copermittees have been notified of coverage under this Order. The County of San Diego is required to implement the requirements of Provisions D, F.3.b, and Attachment E until the Riverside County Copermittees have been notified of coverage under this Order.

2. Priority Water Quality Conditions

The Copermittees must identify the water quality priorities within each Watershed Management Area that will be addressed by the Water Quality Improvement Plan. Where appropriate, Watershed Management Areas may be separated into subwatersheds to focus water quality prioritization and jurisdictional runoff management program implementation efforts by receiving water.

a. Assessment of Receiving Water Conditions

The Copermittees must consider the following, at a minimum, to identify water quality priorities based on impacts of MS4 discharges on receiving water beneficial uses:

(1) Receiving waters listed as impaired on the CWA Section 303(d) List of Water Quality Limited Segments (303(d) List);

(2) TMDLs adopted and under development by the San Diego Water Board;

(3) Receiving waters recognized as sensitive or highly valued by the Copermittees, including estuaries designated under the National Estuary Program under CWA section 320, wetlands defined by the State or U.S. Fish and Wildlife Service's National Wetlands Inventory as wetlands, waters having the Preservation of Biological Habitats of Special Significance (BOIL) beneficial use designation, and receiving waters identified as ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (Attachment A);

(4) The receiving water limitations of Provision A.2;

(5) Known historical versus current physical, chemical, and biological water quality conditions;

(6) Available, relevant, and appropriately collected and analyzed physical, chemical, and biological receiving water monitoring data, including, but not limited to, data describing:

(a) Chemical constituents,

(b) Water quality parameters (i.e. pH, temperature, conductivity, etc.),

(c) Toxicity Identification Evaluations for both receiving water column and sediment,

(d) Trash impacts,

(e) Bioassessments, and

(f) Physical habitat;

(7) Available evidence of erosional impacts in receiving waters due to accelerated flows (i.e. hydromodification);

(8) Available evidence of adverse impacts to the chemical, physical, and biological integrity of receiving waters; and

(9) The potential improvements in the overall condition of the Watershed Management Area that can be achieved.

b. ASSESSMENT OF IMPACTS FROM MS4 DISCHARGES

The Copermittees must consider the following, at a minimum, to identify the potential impacts to receiving waters that may be caused or contributed to by discharges from the Copermittees' MS4s:

(1) The discharge prohibitions of Provision A.1 and effluent limitations of Provision A.3; and

(2) Available, relevant, and appropriately collected and analyzed storm water and non-storm water monitoring data from the Copermittees' MS4 outfalls;

(3) Locations of each Copermittee's MS4 outfalls that discharge to receiving waters;

(4) Locations of MS4 outfalls that are known to persistently discharge non-storm water to receiving waters likely causing or contributing to impacts on receiving water beneficial uses;

(5) Locations of MS4 outfalls that are known to discharge pollutants in storm water causing or contributing to impacts on receiving water beneficial uses; and

(6) The potential improvements in the quality of discharges from the MS4 that can be achieved.

c. IDENTIFICATION OF PRIORITY WATER QUALITY CONDITIONS

(1) The Copermittees must use the information gathered for Provisions B.2.a and B.2.b to develop a list of priority water quality conditions as pollutants, stressors and/or receiving water conditions that are the highest threat to receiving water quality or that most adversely affect the ~~physical, chemical, and biological integrity~~ quality of receiving waters. The list must include the following information for each priority water quality condition:

(a) The beneficial use(s) associated with the priority water quality condition;

(b) The geographic extent of the priority water quality condition within the Watershed Management Area, if known;

(c) The temporal extent of the priority water quality condition (e.g., dry weather and/or wet weather);

(d) The Copermittees with MS4s discharges that may cause or contribute to the priority water quality condition; and

(e) An assessment of the adequacy of and data gaps in the monitoring data to characterize the conditions causing or contributing to the priority water quality condition, including a consideration of spatial and temporal variation.

(2) The Copermittees must identify the highest priority water quality conditions to be addressed by the Water Quality Improvement Plan, and provide a rationale for selecting a subset of the water quality conditions identified pursuant to Provision B.2.c.(1) as the highest priorities.

d. IDENTIFICATION OF MS4 SOURCES OF POLLUTANTS AND/OR STRESSORS

The Copermittees must identify and prioritize known and suspected sources of storm water and non-storm water pollutants and/or other stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c. The identification of known and suspected sources of pollutants and/or stressors that cause or contribute to the highest priority water quality conditions as identified for Provision B.2.c must consider the following:

(1) Pollutant generating facilities, areas, and/or activities within the Watershed Management Area, including:

(a) Each Copermittee's inventory of construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas,

(b) Publicly owned parks and/or recreational areas,

(c) Open space areas,

(d) All currently operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste, and

(e) Areas not within the Copermittees' jurisdictions (e.g., Phase II MS4s, tribal lands, state lands, federal lands) that are known or suspected to be

discharging to the Copermittees' MS4s;

(2) Locations of the Copermittees' MS4s, including the following:

(a) All MS4 outfalls that discharge to receiving waters, and

(b) Locations of major structural controls for storm water and non-storm water (e.g., retention basins, detention basins, major infiltration devices, etc.);

(3) Other known and suspected sources of non-storm water or pollutants in storm water discharges to receiving waters within the Watershed Management Area, including the following:

(a) Other MS4 outfalls (e.g., Phase II Municipal and Caltrans),

(b) Other NPDES permitted discharges,

(c) Any other discharges that may be considered point sources (e.g., private outfalls), and

(d) Any other discharges that may be considered non-point sources (e.g., agriculture, wildlife or other natural sources);

(4) Review of available data, including but not limited to:

(a) Findings from the Copermittees' illicit discharge detection and elimination programs,

(b) Findings from the Copermittees' MS4 outfall discharge monitoring,

(c) Findings from the Copermittees' receiving water monitoring,

(d) Findings from the Copermittees' MS4 outfall discharge and receiving water assessments, and

(e) Other available, relevant, and appropriately collected data, information, or studies related to pollutant sources and/or stressors that contribute to the highest priority water quality conditions as identified for Provision B.2.c.

(5) The adequacy of the available data to identify and prioritize sources and/or stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c.

e. Identification of Potential Water Quality Improvement Strategies

The Copermittees must evaluate the findings identified under Provisions B.2.a-d, and identify potential strategies that can result in improvements to water quality in MS4 discharges and/or receiving waters within the Watershed Management Area. Potential water quality improvement strategies that may be implemented

within the Watershed Management Area must include the following:

(1) Structural BMPs, non-structural BMPs, incentives, or programs that can potentially be implemented to address the highest priority water quality conditions identified under Provision B.2.c, or MS4 sources of pollutants or stressors identified under Provision B.2.d,

(2) Retrofitting projects in areas of existing development within the Watershed Management Area that can potentially be implemented to reduce MS4 sources of pollutants or stressors identified under Provision B.2.d causing or contributing to the highest priority water quality conditions identified under Provision B.2.c, and

(3) Stream, channel, and/or habitat rehabilitation projects within the Watershed Management Area that can potentially be implemented to protect and/or improve conditions in receiving waters from MS4 pollutants and/or stressors identified under Provision B.2.d causing or contributing to the highest priority water quality conditions identified under Provision B.2.c.

3. Water Quality Improvement Goals, Strategies and Schedules

The Copermittees must identify and develop specific water quality improvement goals and strategies to address the highest priority water quality conditions identified within a Watershed Management Area. The water quality improvement goals and strategies must address the highest priority water quality conditions by effectively prohibiting non-storm water discharges to the MS4, reducing pollutants in storm water discharges from the MS4 to the MEP, and protecting the water quality standards of receiving waters.

a. WATER QUALITY IMPROVEMENT ~~NUMERIC~~ GOALS AND SCHEDULES

(1) Numeric Goals

The Copermittees must develop and incorporate ~~interim and final~~ numeric goals[6] ~~and schedules~~ into the Water Quality Improvement Plan. Numeric goals must be used to support Water Quality Improvement Plan implementation and measure reasonable progress towards addressing the highest priority water quality conditions identified under Provision B.2.c. ~~When establishing numeric goals and corresponding schedules, t~~The Copermittees must ~~consider~~ establish and incorporate the following numeric

[6] Interim and final numeric goals may take a variety of forms such as TMDL established WQBELs, action levels, pollutant concentration, load reductions, number of impaired water bodies delisted from the List of Water Quality Impaired Segments, Index of Biotic Integrity (IBI) scores, or other appropriate metrics. Interim and final numeric goals are not necessarily limited to one criterion or indicator, but may include multiple criteria and/or indicators. Except for TMDL established WQBELs, interim and final numeric goals and corresponding schedules may be revised through the adaptive management process under Provision B.5.

goals in the Water Quality Improvement Plan:

~~(1)~~ (a) Final numeric goals must be based on measureable criteria or indicators capable of demonstrating one or more of the following:~~, to be achieved in the receiving waters and/or MS4 discharges for the highest priority water quality conditions which will be capable of demonstrating the achievement of the restoration and/or protection of water quality standards in receiving waters; and~~

(i) Discharges from the Copermittees' MS4s will not cause or contribute to exceedances of water quality standards in receiving waters, AND/OR

(ii) The conditions of receiving waters and associated habitat are protected from MS4 discharges, AND/OR

(iii) Beneficial uses of receiving waters are protected from MS4 discharges and will be supported.

~~(2)~~ (b) Interim numeric goals must be based on measureable criteria or indicators capable of demonstrating reasonable incremental progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges as follows:~~; and~~

(i) One or more interim numeric goals may be established to demonstrate progress toward achieving each final numeric goal,

(ii) For each final numeric goal, at least one interim numeric goal must be expressed as a reasonable increment toward achievement of the final numeric goal,

(iii) For each final numeric goal, reasonable interim numeric goals must be established to be accomplished during each 5 year period between the acceptance of the Water Quality Improvement Plan and the achievement of the final numeric goals.

~~(3)~~
(2) Schedules for Achieving Numeric Goals

The Copermittees must develop and incorporate schedules for achieving the numeric goals into the Water Quality Improvement Plan. The ~~S~~schedules must ~~be~~ demonstrate reasonable ~~adequate for measuring~~ progress toward achieving the ~~interim and~~ final numeric goals required for Provision~~s~~ B.3.a.(1) ~~B.2.e.(1) and B.2.e.(2)~~. The Copermittees must incorporate the ~~S~~schedules for achieving the numeric goals into the Water Quality Improvement Plan based on the following considerations ~~must incorporate the following~~:

(a) Final dates for achieving all final numeric goals must be established considering the following: ~~Interim dates for achieving the interim numeric~~

goals,

(b) (i) Final Ccompliance dates schedules for any applicable TMDLs in Attachment E to this Order;,

(c) (ii) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);,

(d) (iii) Achievement of the final numeric goals in the receiving waters and/or MS4 discharges for the highest water quality priorities must be as soon as possible;, and

(e) (iv) Final dates for achieving the final numeric goals must reflect a realistic assessment of the shortest practicable time required based on the temporal and spatial extent and factors associated with the highest priority water quality conditions identified under Provision B.2.c, and taking into account the time reasonably required to implement the water quality improvement strategies required pursuant to Provision B.3.b not initially extend more than 10 years beyond the effective date of this Order, unless a longer period of time is authorized by the San Diego Water Board Executive Officer or the schedule includes an applicable TMDL in Attachment E to this Order.

(b) Interim dates for achieving all interim numeric goals must be established considering the following:

(i) Interim compliance dates for any applicable TMDLs in Attachment E to this Order;

(ii) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(iii) Interim dates for achieving the interim numeric goals must reflect a realistic assessment of the shortest practicable time reasonably required, taking into account the time needed to implement new or significantly expanded programs and securing financing, if necessary; and

(iv) For each final numeric goal, at least one interim numeric goal must be established that the Copermittees will work toward achieving within the term of this Order.

3. Water Quality Improvement Strategies and Schedules

The Copermittees must develop specific water quality improvement strategies to address the highest priority water quality conditions identified within a Watershed Management Area. The water quality improvement strategies must address the highest priority water quality conditions by preventing or eliminating non-storm water

~~discharges to and from the MS4, reducing pollutants in storm water discharges from the MS4 to the MEP, and restoring and/or protecting the water quality standards of receiving waters.~~

b. WATER QUALITY IMPROVEMENT STRATEGIES AND SCHEDULES

Based on the likely effectiveness and efficiency of the potential water quality improvement strategies identified under Provision B.2.e to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a, ~~T~~the Copermittees must identify ~~and prioritize water quality improvement~~ the strategies ~~based on their likely effectiveness and efficiency, and implement strategies to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, improve the physical, chemical, and biological receiving water conditions, and achieve the interim and final numeric goals in accordance with the schedules required for Provision B.2.e.(3). The following water quality improvement strategies must be included and described in the Water Quality Improvement Plan~~ that will be implemented in each Watershed Management Area as follows:

(1) Jurisdictional Strategies

~~Specific strategies and/or activities that may be implemented by one or more Copermittees within their jurisdictions through the jurisdictional runoff management programs that will address the highest priority water quality conditions within the Watershed Management Area, in accordance with the following requirements:~~

(a) Each Copermittee in the Watershed Management Area must identify the strategies that will be implemented within its jurisdiction ~~Strategies and/or activities~~as part of its jurisdictional runoff management program requirements under Provisions E.2 through E.7, including descriptions of the following: ~~must, at a minimum, be described for each jurisdictional runoff management program component where strategies to address the highest priority water quality conditions are required under Provision E;~~

(i) For each of the inventories developed for its jurisdiction, as required under Provisions D.2.a.(1), E.3.e.(2), E.4.c, and E.5.a, each Copermittee must identify the known and suspected areas or sources causing or contributing to the highest priority water quality conditions in the Watershed Management Area that the Copermittee will focus on in its efforts to effectively prohibit non-storm water discharges to its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, and achieve the interim and final numeric goals identified

under Provision B.3.a;

(ii) BMPs that each Copermittee will implement, or require to be implemented, as applicable, for those areas or sources within its jurisdiction;

(iii) Education programs that each Copermittee will implement, as applicable, for those areas or sources within its jurisdiction;

(iv) Frequencies that each Copermittee will conduct inspections on those areas or sources within its jurisdiction;

(v) Incentive and enforcement programs that each Copermittee will implement, as applicable, for those areas or sources within its jurisdiction; and

(vi) Any other BMPs, incentives, or programs that each Copermittee will implement for those areas or sources within its jurisdiction.

(b) Identify the optional jurisdictional strategies that each Copermittee will implement within its jurisdiction, as necessary, to effectively prohibit non-storm water discharges to its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. Descriptions of the optional jurisdictional strategies must include: ~~The Water Quality Improvement Plan must describe the circumstances or conditions when and where the strategies or/activities should be or will be implemented, but specific details about how each Copermittee will implement the strategies and/or activities within its jurisdiction are not required; and~~

(i) BMPs, incentives, or programs that may be implemented by the Copermittee within its jurisdiction in addition to the requirements of Provisions B.3.b.(1)(a);

(ii) Incentives or programs that may be implemented by the Copermittee to encourage or implement projects to retrofit areas of existing development within its jurisdiction;

(iii) Incentives or programs that may be implemented by the Copermittee to encourage or implement projects that will rehabilitate the conditions of channels or habitats within its jurisdiction;

(iv) The funds and/or resources that must be secured by the Copermittee to implement the optional strategies described for Provisions E.3.b.(1)(b)(i)-(iii) within its jurisdiction; and

(v) The circumstances necessary to trigger implementation of the optional jurisdictional strategies, in addition to the requirements of Provisions B.3.b.(1)(a), to achieve the interim and final numeric goals within the schedules established under Provision B.3.a.

(c) Identify the strategies that will be implemented by the Copermittee in coordination with or with the cooperation of other agencies (e.g. Caltrans, water districts, school districts) and/or entities (e.g. non-governmental organizations) within its jurisdiction. ~~Descriptions of strategies and/or activities must include any monitoring, information collection, special studies, and/or data analysis that is necessary to assess the effectiveness of the strategy and/or activity toward addressing the highest priority water quality conditions.~~

(2) Watershed Management Area Strategies

The Copermittees must identify the optional regional or multi-jurisdictional strategies that will be implemented in the Watershed Management Area, as necessary, to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. Descriptions of the optional regional or multi-jurisdictional strategies must include: ~~Additional strategies and/or activities that may be implemented within the Watershed Management Area on a jurisdictional, sub-watershed, or watershed scale by one or more Copermittees, not specifically required under Provision E, which are designed to achieve the interim and final numeric goals identified in Provisions B.2.e.(1) and B.2.e.(2);~~

(a) Regional or multi-jurisdictional BMPs, incentives, or programs that may be implemented by the Copermittees in the Watershed Management Area;

(b) Incentives or programs that may be implemented by the Copermittees in the Watershed Management Area to encourage or implement regional or multi-jurisdictional projects to retrofit areas of existing development;

(c) Incentives or programs that may be implemented by the Copermittees to encourage or implement regional or multi-jurisdictional projects that will rehabilitate the conditions of channels, streams, or habitats within the Watershed Management Area;

(d) The funds and/or resources that must be secured by the Copermittees to implement the optional strategies described for Provisions E.3.b.(2)(a)-(c) within the Watershed Management Area; and

(e) The circumstances necessary to trigger implementation of the optional regional or multi-jurisdictional strategies to achieve the interim and final numeric goals within the schedules established under Provision B.3.a.

~~c. IMPLEMENTATION SCHEDULES~~

~~(1)~~
(3) Schedules for Implementing Strategies

The Copermittees must develop reasonable schedules for implementing the water quality improvement strategies identified under Provisions B.3.b.(1) and B.3.b.(2)(a) ~~B.3.a~~ to achieve the interim and final numeric goals identified and schedules established under Provision B.3.a ~~B.2.e.(1) and B.2.e.(2)~~. The Copermittees must incorporate the schedules to implement the water quality improvement strategies into the Water Quality Improvement Plan as follows:

(a) ~~Schedules~~ Each Copermittee must ~~be~~ develop~~ed~~ schedules for ~~both~~ the ~~water quality improvement~~ jurisdictional strategies ~~implemented by each Copermittee within its jurisdiction~~ identified pursuant to Provisions B.3.b.(1)(a)-(b). Each schedule must specify: ~~and for strategies that the Copermittees choose to implement on a collaborative basis.~~

(i) If each jurisdictional strategy identified pursuant to Provision B.3.b.(1)(a) will or will not be initiated upon acceptance of the Water Quality Improvement Plan;

(ii) For each jurisdictional strategy identified pursuant to Provision B.3.b.(1)(a) that will not be initiated upon approval of the Water Quality Improvement Plan, the shortest practicable time in which each jurisdictional strategy will be initiated after acceptance of the Water Quality Improvement Plan;

(iii) For each optional jurisdictional strategy identified pursuant to Provision B.3.b.(1)(b), a realistic assessment of the shortest practicable time required to:

[a] Secure the resources needed to fund the optional jurisdictional strategy, and
[b] Procure the resources, materials, labor, and applicable permits necessary to initiate implementation of the optional jurisdictional strategy;

(iv) If each jurisdictional strategy identified pursuant to Provisions B.3.b.(1)(a)-(b) is expected to be continuously implemented (e.g. inspections) or completed within a schedule (e.g. construction of structural BMP); and

(v) If a jurisdictional strategy identified pursuant to Provisions B.3.b.(1)(a)-(b) is expected to be completed within a schedule, the anticipated time to complete based on a realistic assessment of the shortest practicable time required.

(b) The Copermittees in the Watershed Management Area must develop schedules for the regional or multi-jurisdictional strategies identified pursuant to Provision B.3.b.(2). Each schedule must specify:

(i) A realistic assessment of the shortest practicable time to:

[a] Secure the resources needed to fund the optional regional or multi-jurisdictional strategy, and
[b] Procure the resources, materials, labor, and permits necessary to initiate the implementation of the optional regional or multi-jurisdictional strategy;

(ii) If each regional or multi-jurisdictional strategy identified pursuant to Provision B.3.b.(2) is expected to be continuously implemented (e.g. inspections) or completed within a schedule (e.g. construction of structural BMP); and

(iii) If a regional or multi-jurisdictional strategy and/or activity identified pursuant to Provisions B.3.b.(2) is expected to be completed within a schedule, the anticipated time to complete based on a realistic assessment of the shortest practicable time required.

~~(1) The Copermittees must incorporate the implementation compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).~~

(4) Optional Watershed Management Area Analysis

(a) For each Watershed Management Area, the Copermittees have the option to perform a Watershed Management Area Analysis for the purpose of developing watershed-specific requirements for structural BMP implementation, as described in Provision E.3.c.(3). The Watershed Management Area Analysis must include GIS layers (maps) as output. The analysis must include the following information, to the extent it is available, in order to characterize the Watershed Management Areas:

(i) A description of dominant hydrologic processes, such as areas where infiltration or overland flow likely dominates;

(ii) A description of existing streams in the watershed, including bed material and composition, and if they are perennial or ephemeral;

(iii) Current and anticipated future land uses;

(iv) Potential coarse sediment yield areas; and

(v) Locations of existing flood control structures and channel structures, such as stream armoring, constrictions, grade control structures, and hydromodification or flood management basins.

(b) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify and compile a list of candidate projects that could potentially be used as

alternative compliance options for Priority Development Projects, to be implemented in lieu of onsite structural BMP performance requirements described in Provisions E.3.c.(1) and E.3.c.(2). Specifically, the Copermittees must identify in each Watershed Management Area:

(i) Opportunities for stream or riparian area rehabilitation;

(ii) Opportunities for retrofitting existing infrastructure to incorporate storm water retention or treatment;

(iii) Opportunities for regional BMPs;

(iv) Opportunities for groundwater recharge projects;

(v) Opportunities for water supply augmentation projects; and

(vi) Opportunities for land purchases to preserve floodplain functions.

(c) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify areas within the Watershed Management Area where it is appropriate to allow Priority Development Projects to be exempt from the hydromodification management BMP performance requirements described in Provision E.3.c.(2), including supporting rationale.

c. Discharge Prohibitions and Receiving Water Limitations Compliance Option

(1) The Copermittees may utilize implementation of the water quality improvement strategies in the Water Quality Improvement Plan to demonstrate compliance with the requirements of Provisions A.1.a, A.1.c and A.2.a. For each Copermittee in the Watershed Management Area that chooses to utilize this option, the Copermittee will be in compliance with Provisions A.1.a, A.1.c and A.2.a if:

(a) Numeric goals and schedules developed pursuant to Provision B.3.a include the following numeric goals:

(i) WQBELs expressed as concentration-based or load-based effluent limitations applicable to the Watershed Management Area established by the TMDLs in Attachment E to this Order; and

(ii) Numeric goals applicable to the Copermittee's MS4 discharges expressed as concentration-based or load-based effluent limitations for all other pollutants listed on the Clean Water Act Section 303(d) List of Water Quality Impaired Segments[7] for the receiving waters in the Watershed Management Area that do not have a TMDL developed; and

[7] 2002 and subsequent 303(d) Lists

(iii) Numeric goals for receiving waters that will protect the conditions of the receiving waters and attain water quality standards.

(b) An analysis utilizing a watershed model or other watershed analytical tools is performed. The results must be included in the Water Quality Improvement Plan to quantitatively demonstrate that the implementation of the water quality improvement strategies required under Provision B.3.b will achieve the numeric goals within the established schedules required under Provision B.3.a. The analysis may be performed individually or jointly by the Copermittees choosing to utilize this option in the Watershed Management Area, and must be updated as part of the iterative approach and adaptive management process required under Provisions B.5.a-b.

(c) The Water Quality Improvement Plan specifies the monitoring and assessments (i.e. MS4 outfall discharge, receiving water, and/or special studies) that will be performed by the Copermittee to confirm the implementation of the water quality improvement strategies within its jurisdiction is making progress toward achieving the numeric goals in accordance with the established schedules developed pursuant to Provision B.3.c.(1)(a). The monitoring and assessments must be incorporated into the monitoring and assessment program required pursuant to Provision B.4. The monitoring and assessments must be updated as part of the iterative approach and adaptive management process required under Provision B.5.c.

(d) The numeric goals proposed pursuant to Provision B.3.c.(1)(a), the analysis performed pursuant to Provision B.3.c.(1)(b) and the specific monitoring and assessments proposed pursuant to Provision B.3.c.(1)(c) have been reviewed and receive concurrence by a majority of the Water Quality Improvement Consultation Panel (see Provision F.1.a.(1)(b)). Updates must also receive concurrence by a majority of the Water Quality Improvement Consultation Panel.

(2) Each Copermittee that chooses to utilize this option will, for the pollutant/water body combinations covered by the analysis, be in compliance with Provisions A.1.a, A.1.c and A.2.a when the Water Quality Improvement Plan, incorporating the requirements of Provision B.3.c.(1), is accepted by the San Diego Water Board.

(3) The Copermittee will, for the pollutant/water body combinations covered by the analysis, remain in compliance with Provisions A.1.a, A.1.c and A.2.a during the term of this Order as long as:

(a) The results of the analysis performed pursuant to Provision B.3.c.(1)(d) is accepted and continues to be accepted by the San Diego Water Board Executive Officer as part of the Water Quality Improvement Plan; AND

(b) The Copermittee continues to implement the water quality improvement strategies within its jurisdiction developed pursuant to Provision B.3.b.(1) in accordance with the schedules for implementing the strategies established pursuant to Provision B.3.b.(3)(a); AND

(c) The Copermittee continues to perform the monitoring and assessments specified in the Water Quality Improvement Plan, developed and implemented pursuant to Provision B.3.c.(1)(c), to demonstrate its progress toward achieving the numeric goals applicable to its MS4 discharges in accordance with the interim and final dates for achieving the numeric goals established pursuant to Provision B.3.a.(2); AND

(d) The Copermittees in the Watershed Management Area continue to implement the requirements of Provision A.4.a.

4. Water Quality Improvement Monitoring and Assessment Program

a. The Copermittees in each Watershed Management Area must develop and incorporate an integrated monitoring and assessment program into the Water Quality Improvement Plan that assesses: 1) the progress toward achieving the numeric goals and schedules, 2) the progress toward addressing the highest priority water quality conditions for each Watershed Management Area, and 3) each Copermittee's overall efforts to implement the Water Quality Improvement Plan.

b. The monitoring and assessment program must incorporate the monitoring and assessment requirements of Provision D, which may allow the Copermittees to modify the program to be consistent with and focus on the highest priority water quality conditions for each Watershed Management Area.

c. For Watershed Management Areas with applicable TMDLs, the monitoring and assessment program must incorporate the specific monitoring and assessment requirements of Attachment E.

d. For Watershed Management Areas with any ASBS, the water quality monitoring and assessment program must incorporate the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

5. Iterative Approach and Adaptive Management Process

The Copermittees in each Watershed Management Area must implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a, and must include the following:

a. Re-Evaluation of Priority Water Quality Conditions

The priority water quality conditions and potential water quality improvement strategies~~, and numeric goals and corresponding schedules,~~ included in the Water Quality Improvement Plan pursuant to Provision~~s~~ B.2.c ~~and B.2.e~~, may be re-evaluated by the Copermittees as needed during the term of this Order as part of the Water Quality Improvement Plan Annual Report. Re-evaluation and recommendations for modifications to the priority water quality conditions and potential water quality improvement strategies~~, and numeric goals and corresponding schedules~~ must be provided in the Report of Waste Discharge, and must consider the following:

(1) Achieving the outcome of improved water quality in MS4 discharges and receiving waters through implementation of the water quality improvement strategies identified in the Water Quality Improvement Plan;

~~(2) Progress toward achieving interim and final numeric goals in receiving waters and/or MS4 discharges for the highest priority water quality conditions in the Watershed Management Area,~~

~~(3) Progress toward achieving outcomes according to established schedules;~~

(2~~4~~) New information developed when the requirements of Provisions B.2.a-c have been re-evaluated;

~~(5) New policies or regulations that may affect identified numeric goals;~~

(3~~6~~) Spatial and temporal accuracy of monitoring data collected to inform prioritization of water quality conditions and implementation strategies to address the highest priority water quality conditions;

(4~~7~~) Availability of new information and data from sources other than the jurisdictional runoff management programs within the Watershed Management Area that informs the effectiveness of the actions implemented by the Copermittees;

(5~~8~~) San Diego Water Board recommendations; and

(6~~9~~) Recommendations for modifications solicited through a public participation process.

b. Adaptation of Goals, Strategies and Schedules

The water quality improvement goals, strategies and schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.3, must be re-evaluated and adapted as new information becomes available to result in more effective and efficient measures to ~~achieve the numeric goals established~~ address the highest priority water quality conditions identified pursuant to

Provision B.2.c~~e~~. Re-evaluation of and modifications to the water quality improvement goals, strategies and schedules must be provided in the Water Quality Improvement Plan Annual Report, and must consider the following:

(1) Modifications to the priority water quality conditions~~, and numeric goals and corresponding schedules~~ based on Provision B.5.a;

(2) Progress toward achieving interim and final numeric goals in receiving waters and MS4 discharges for the highest priority water quality conditions in the Watershed Management Area,

(3) Progress toward achieving outcomes according to established schedules;

(4) New policies or regulations that may affect identified numeric goals;

~~(2)~~
(5) Measurable or demonstrable reductions of non-storm water discharges to and from each Copermittee's MS4;

~~(3)~~
(6) Measurable or demonstrable reductions of pollutants in storm water discharges from each Copermittee's MS4 to the MEP;

~~(4)~~
(7) New information developed when the requirements of Provisions B.2.b and B.2.d have been re-evaluated;

~~(5)~~
(8) Efficiency in implementing the Water Quality Improvement Plan;

~~(6)~~
(9) San Diego Water Board recommendations; and

~~(7)~~
(10) Recommendations for modifications solicited through a public participation process.

C. ADAPTATION OF MONITORING AND ASSESSMENT PROGRAM

The water quality improvement monitoring and assessment program, included in the Water Quality Improvement Plan pursuant to Provision~~s~~ B.4, must be re-evaluated and adapted when new information becomes available. Re-evaluation and recommendations for modifications to the monitoring and assessment program, pursuant to the requirements of Provision D, may be provided in the Water Quality Improvement Plan Annual Report, but must be provided in the Report of Waste Discharge.

6. Water Quality Improvement Plan Submittal, Updates, and Implementation

a. The Copermittees must submit and commence implementation of the Water Quality Improvement Plans in accordance with the requirements of Provision F.1.

b. The Copermittees must submit proposed updates to the Water Quality Improvement Plan for acceptance by the San Diego Water Board Executive Officer in accordance with the requirements of Provision F.2.c.

~~**c.** The Copermittees must commence with implementation of the Water Quality Improvement Plans immediately after acceptance by the San Diego Water Board, in accordance with the schedules, or subsequently updated schedules, within the Water Quality Improvement Plan.~~

C. ACTION LEVELS

The purpose of this provision is for the Copermittees to incorporate numeric action levels in the Water Quality Improvement Plans. The goal of the action levels is to guide Water Quality Improvement Plan implementation efforts and measure progress towards the protection of water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through monitoring and assessing the quality of the MS4 discharges during the implementation of the Water Quality Improvement Plans.

1. Non-Storm Water Action Levels[8]

The Copermittees must develop and incorporate numeric non-storm water action levels (NALs) into the Water Quality Improvement Plan to: 1) support the development and prioritization of water quality improvement strategies for ~~addressing~~ effectively prohibiting non-storm water discharges to ~~and from~~ the MS4s, 2) assess the effectiveness of the water quality improvement strategies toward addressing MS4 non-storm water discharges, required pursuant to Provision D.4.b.(1), and 3) support the detection and elimination of non-storm water and illicit discharges to ~~and from~~ the MS4, required pursuant to Provision E.2.[9]

a. The following NALs must be incorporated:

(1) Non-Storm Water Discharges from MS4s to Ocean Surf Zone

Table C-1. Non-Storm Water Action Levels for Discharges from MS4s to Ocean Surf Zone

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Total Coliform	MPN/100 ml	1,000	-	10,000/1,000[1]	OP
Fecal Coliform	MPN/100 ml	200[2]	-	400	OP
Enterococci	MPN/100 ml	35	-	104[3]	OP

Abbreviations/Acronyms
AMAL – average monthly action level
OP – Ocean Plan water quality objective
MDAL – maximum daily action level
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Total coliform density NAL is 1,000 MPN/100 ml when the fecal/total coliform ratio exceeds 0.1.
2. Fecal coliform density NAL is 200 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas."

[8] NALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, unless the NAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed.

[9] The Copermittees may utilize NALs or other benchmarks currently established by the Copermittees as interim NALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

(2) Non-Storm Water Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Table C-2. Non-Storm Water Action Levels for Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Turbidity	NTU	75	-	225	OP
pH	Units	Within limit of 6.0 to 9.0 at all times			OP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	35	-	104[3]	BP
Priority Pollutants	ug/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
OP – Ocean Plan water quality objective
NTU – Nephelometric Turbidity Units
ug/L – micrograms per liter
MDAL – maximum daily action level
BP – Basin Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas" and is not applicable to waterbodies that are not designated with the water contact recreation (REC-1) beneficial use.

Table C-3. Non-Storm Water Action Levels for Priority Pollutants

Parameter	Units	Freshwater (CTR)		Saltwater (CTR)	
		MDAL	AMAL	MDAL	AMAL
Cadmium	ug/L	**	**	16	8
Copper	ug/L	*	*	5.8	2.9
Chromium III	ug/L	**	**	-	-
Chromium VI	ug/L	16	8.1	83	41
Lead	ug/L	*	*	14	2.9
Nickel	ug/L	**	**	14	6.8
Silver	ug/L	*	*	2.2	1.1
Zinc	ug/L	*	*	95	47

Abbreviations/Acronyms:
CTR – California Toxic Rule
AMAL – average monthly action level
ug/L – micrograms per liter
MDAL – maximum daily action level

Notes:
* Action levels developed on a case-by-case basis (see below)
** Action levels developed on a case-by-case basis (see below), but calculated criteria are not to exceed Maximum Contaminant Levels (MCLs) under the California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64431

The Cadmium, Copper, Chromium (III), Lead, Nickel, Silver and Zinc NALs for MS4 discharges to freshwater receiving waters will be developed on a case-by-case basis ~~because the freshwater criteria are~~ based on site-specific water quality data (receiving water hardness). For these priority pollutants, ~~the following equations (~~ refer to 40 CFR 131.38 ~~(~~b~~)~~ ~~(~~2~~)~~ ~~will be required:~~.

~~Cadmium (Total Recoverable) = exp(0.7852[ln(hardness)] - 2.715)~~
~~Chromium III (Total Recoverable) = exp(0.8190[ln(hardness)] + 0.6848)~~
~~Copper (Total Recoverable) = exp(0.8545[ln(hardness)] - 1.702)~~
~~Lead (Total Recoverable) = exp(1.273[ln(hardness)] - 4.705)~~
~~Nickel (Total Recoverable) = exp(.8460[ln(hardness)] + 0.0584)~~
~~Silver (Total Recoverable) = exp(1.72[ln(hardness)] - 6.52)~~
~~Zinc (Total Recoverable) = exp(0.8473[ln(hardness)] + 0.884)~~

(3) Non-Storm Water Discharges from MS4s to Inland Surface Waters

Table C-4. Non-Storm Water Action Levels for Discharges from MS4s to Inland Surface Waters

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Dissolved Oxygen	mg/L	Not less than 5.0 in WARM waters and not less than 6.0 in COLD waters			BP
Turbidity	NTU	-	20	See MDAL	BP
pH	Units	Within limit of 6.5 to 8.5 at all times			BP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	33	-	61[3]	BP
Total Nitrogen	mg/L	-	1.0	See MDAL	BP
Total Phosphorus	mg/L	-	0.1	See MDAL	BP
MBAS	mg/L	-	0.5	See MDAL	BP
Iron	mg/L	-	0.3	See MDAL	BP
Manganese	mg/L	-	0.05	See MDAL	BP
Priority Pollutants	ug/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
BP – Basin Plan water quality objective
COLD – cold freshwater habitat beneficial use
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
MDAL – maximum daily action level
WARM – warm freshwater habitat beneficial use
MBAS – Methylene Blue Active Substances
MPN/100 ml – most probable number per 100 milliliters
ug/L – micrograms per liter

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for freshwater "designated beach areas" and is not applicable to waterbodies that are not designated with the water contact recreation (REC-1) beneficial use.

b. If not identified in Provision C.1.a, NALs must be identified, developed and incorporated in the Water Quality Improvement Plan for any pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in receiving waters ~~of the state~~ associated with the highest priority water quality conditions related to non-storm water discharges from the MS4s. NALs must be based on:

(1) Applicable water quality standards which may be dependent upon site-specific or receiving water-specific conditions or assumptions to be identified by the Copermittees; or

(2) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the NALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary NALs specific to the Watershed Management Area at levels greater than the NALs required by Provisions C.1.a and C.1.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for ~~addressing~~ effectively prohibiting non-storm water discharges to ~~and from~~ the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and

from the MS4. The secondary NALs may be developed using an approach acceptable to the San Diego Water Board.

d. Dry weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.b may be utilized to develop or revise NALs based on watershed-specific data, subject to San Diego Water Board Executive Officer approval.

2. Storm Water Action Levels[10]

The Copermittees must develop and incorporate numeric storm water action levels (SALs) in the Water Quality Improvement Plans to: 1) support the development and prioritization of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s, and 2) assess the effectiveness of the water quality improvement strategies toward reducing pollutants in storm water discharges, required pursuant to Provision D.4.b.(2).[11]

a. The following SALs for discharges of storm water from the MS4 must be incorporated:

Table C-5. Storm Water Action Levels for Discharges from MS4s to Receiving Waters

Parameter	Units	Action Level
Turbidity	NTU	126
Nitrate & Nitrite (Total)	mg/L	2.6
Phosphorus (Total P)	mg/L	1.46
Cadmium (Total Cd)*	µg/L	3.0
Copper (Total Cu)*	µg/L	127
Lead (Total Pb)*	µg/L	250
Zinc (Total Zn)*	µg/L	976

Abbreviations/Acronyms:
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
ug/L – micrograms per liter

Notes:
* The sampling must include a measure of receiving water hardness at each MS4 outfall. If a total metal concentration exceeds the corresponding metals SAL in Table C-5, that concentration must be compared to the California Toxics Rule criteria and the USEPA 1-hour maximum concentration for the detected level of receiving water hardness associated with that sample. If it is determined that the sample's total metal concentration for that specific metal exceeds that SAL, but does not exceed the applicable USEPA 1-hour maximum concentration criterion for the measured level of hardness, then the sample result will not be considered above the SAL for that measurement.

[10] SALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, unless the SAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed.

[11] The Copermittees may utilize SALs or other benchmarks currently established by the Copermittees as interim SALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

b. If not identified in Provision C.2.a, SALs must be identified, developed and incorporated in the Water Quality Improvement Plan for pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in receiving waters ~~of the state~~ associated with the highest priority water quality ~~priorities~~ conditions related to storm water discharges from the MS4s. SALs must be based on:

(1) Federal and State water quality guidance and/or water quality standards; and

(2) Site-specific or receiving water-specific conditions; or

(3) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the SALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary SALs specific to the Watershed Management Area at levels greater than the SALs required by Provisions C.2.a and C.2.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s. The secondary SALs may be developed based on the approaches recommended by the State Water Board's Storm Water Panel[12] or using an approach acceptable to the San Diego Water Board.

d. Wet weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.c may be used to develop or revise SALs based upon watershed-specific data, subject to San Diego Water Board Executive Officer approval.

[12] Storm Water Panel Recommendations to the California State Water Resources Control Board: The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities (June 2006)

D. MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS

The purpose of this provision is for the Copermittees to monitor and assess the impact on the ~~chemical, physical, and biological~~ conditions of receiving waters caused by discharges from the Copermittees' MS4s under wet weather and dry weather conditions. The goal of the monitoring and assessment program is to inform the Copermittees about the nexus between the health of receiving waters and the water quality condition of the discharges from their MS4s. This goal will be accomplished through monitoring and assessing the conditions of the receiving waters, discharges from the MS4s, pollutant sources and/or stressors, and effectiveness of the water quality improvement strategies implemented as part of the Water Quality Improvement Plans.

1. Receiving Water Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the condition of the receiving waters in each Watershed Management Area during dry weather and wet weather. Following San Diego Water Board acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct long-term receiving water monitoring during implementation of the Water Quality Improvement Plan to assess the long term trends and determine if conditions in receiving waters are improving. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following receiving water monitoring procedures:

a. TRANSITIONAL RECEIVING WATER MONITORING

Until the monitoring requirements and schedules of Provisions D.1.b-e are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following receiving water monitoring in the Watershed Management Area:

(1) Continue the receiving water monitoring programs required in Order Nos. R9-2007-0001 (Monitoring and Reporting Program No. R9-2007-0001 Sections II.A.1-A.5), R9-2009-0002, and R9-2010-0016;

(2) Continue the monitoring in the Hydromodification Management Plans approved by the San Diego Water Board;

(3) Participate in the following regional receiving water monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring,

(b) Southern California Bight Regional Monitoring, and

(c) Sediment Quality Monitoring;

(4) Implement the monitoring programs developed as part of any implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) for the TMDLs in Attachment E to this Order; and

(5) For Watershed Management Areas with ASBS, implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

b. LONG-TERM RECEIVING WATER MONITORING STATIONS

The Copermittees must select at least one long-term receiving water monitoring station from among the existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees to be representative of the receiving water quality in the Watershed Management Area. Additional long-term receiving water monitoring stations must be selected where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

c. DRY WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three dry weather monitoring events at each of the long-term receiving water monitoring stations. At least one monitoring event must be conducted during the dry season (May 1 – September 30) and at least one monitoring event must be conducted during a dry weather period during the wet season (October 1 – April 30), after the first wet weather event of the season, with an antecedent dry period of at least 72 hours following a storm event producing measureable rainfall of greater than 0.1 inch.

(1) Dry Weather Receiving Water Field Observations

For each dry weather monitoring event, the Copermittees must record field observations consistent with Table D-1 at each long-term receiving water monitoring station.

Table D-1. Field Observations for Receiving Water Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) • Station description (i.e. deposits or stains, vegetation condition, structural condition, and observable biology) • Presence and assessment of trash in and around station

(2) Dry Weather Receiving Water Field Monitoring

For each dry weather monitoring event, if conditions allow the collection of the data, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

Table D-2. Field Monitoring Parameters for Receiving Water Monitoring Stations

Parameters
• pH • Temperature • Specific conductivity • Dissolved oxygen • Turbidity

(3) Dry Weather Receiving Water Analytical Monitoring

For each dry weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable NAL constituents, and

(v) Constituents listed in Table D-3.

Table D-3. Analytical Monitoring Constituents for Receiving Water Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Pesticides	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Mercury • Nickel • Selenium • Thallium • Zinc	• Organophosphate Pesticides • Pyrethroid Pesticides	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(4) Dry Weather Receiving Water Toxicity Monitoring

For each dry weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for aquatic toxicity in accordance with Table D-4.~~:~~ When the State Water Board's Policy for Toxicity Assessment and Control (Toxicity Policy) is approved and in effect, the San Diego Water Board Executive Officer may direct the Copermittees to replace current toxicity program elements with standardized procedures in the Toxicity Policy.

Table D-4. Dry Weather Chronic[1] Toxicity Testing for Receiving Water Monitoring Stations

~~Freshwater~~ Organism	Units	Test ~~Approach~~	USEPA Protocol[2]
Freshwater			
Pimephales promelas (Fathead Minnow)	Pass / Fail	Larval Survival and Growth ~~1 acute 1 chronic~~[1]	EPA-821-R-02-013~~2~~
Ceriodaphnia dubia ~~*Hyalella Azteca*~~ (Daphnid)	Pass / Fail	Survival and Production ~~1 acute 1 chronic~~[1]	EPA-821-R-02-013~~2~~
Selenastrum capricornutum ~~*Psuedokirchneriella subcapitata*~~ (Green Algae)	Pass / Fail	Growth ~~1 acute 1 chronic~~[1]	EPA-821-R-02-013
Marine and Estuarine			
Strongylocentrotus purpuratus (Purple Sea Urchin)	Pass / Fail	Embryo-Larval Development	EPA-600-R-95-136

Notes:
1. Chronic toxicity testing is not required at receiving water monitoring stations located at mass loading stations if the channel flows are diverted year-round during dry weather conditions to the sanitary sewer for treatment.
~~2. USEPA protocols must be utilized for toxicity testing unless alternate toxicity testing protocols have been approved by the San Diego Water Board.~~

(a) Freshwater Test Species and Methods: If samples are collected in receiving waters with salinity less than 1 ppt, the Copermittees must follow the methods for chronic toxicity tests as established in 40 CFR 136.3 using a single-concentration test design for routine monitoring, or a five-concentration test design for additional toxicity testing if the limitation is exceeded. The Copermittees must estimate the critical life stage chronic toxicity on undiluted samples in accordance with species and short term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms (EPA-821-R-02-013; Table IA, 40 CFR 136). Additional test species may be used by the Copermittees if approved by the San Diego Water Board Executive Officer. The Copermittees must conduct:

(i) A static renewal toxicity test with the fathead minnow, *Pimephales promelas* (Larval Survival and Growth Test Method 1000.0);

(ii) A static renewal toxicity test with the daphnid, *Ceriodaphnia dubia* (Survival and Reproduction Test Method 1002.0); and

(iii) A static renewal toxicity test with the green alga, *Selenastrum capricornutum* (also named *Raphidocelis subcapitata*) (Growth Test Method 1003.0).

(b) Marine and Estuarine Test Species and Methods: If samples are collected in receiving waters with salinity greater or equal to 1 ppt, the Copermittees must follow the methods for chronic toxicity tests as established in 40 CFR 136.3 using a single-concentration test design for routine monitoring, or a five-concentration test design for additional toxicity testing if the limitation is exceeded. The Copermittees must conduct the following critical life state chronic toxicity tests on undiluted samples in accordance with species and short term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms (EPA-600-R-95-136; 1995). Artificial sea salts must be used to increase sample salinity. The Copermittees must conduct a static non-renewal toxicity test with the purple sea urchin, *Strongylocentrotus purpuratus* (Embryo-larval Development Test Method). Additional species may be used by the Copermittees if approved by the San Diego Water Board Executive Officer.

(c) Holding Times: All toxicity tests must be conducted as soon as possible following sample collection. The 36-hour sample holding time for test initiation shall be targeted. However, no more than 72 hours shall elapse before the conclusion of sample collection and test initiation.

(d) Test Species Sensitivity Screening: To determine the most sensitive test species for freshwater, the Copermittees must screen 2 wet weather and 2 dry weather toxicity tests with a vertebrate, an invertebrate, and a plant species. After this screening period, subsequent monitoring must be conducted using the most sensitive test species. Alternatively, if a sensitive test species has already been determined, or if there is prior knowledge of potential toxicant(s) and a test species is sensitive to such toxicant(s), then monitoring must be conducted using only that test species. Sensitive test species determinations must also consider the most sensitive test species used for proximal receiving water monitoring. Rescreening must occur once each permit term.

(e) Chronic toxicity test biological endpoint data must be analyzed using the Test of Significant Toxicity t-test approach specified in *National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document* (USEPA, Office of Wastewater Management, Washington, D.C., EPA-833-R-10-003, 2010). For this monitoring program, the critical chronic instream waste concentration (IWC) is set at 100 percent receiving water (i.e. no dilution) for receiving water samples. A 100 percent

receiving water and a control must be tested.

(f) Toxicity Identification Evaluation (TIE) / Toxicity Reduction Evaluation (TRE): If chronic toxicity is detected in receiving waters, the Copermittees must discuss the need for conducting a TIE/TRE in the assessments required under Provision D.4.a.(2), and develop a plan for implementing the TIE/TRE to be incorporated in the Water Quality Improvement Plan.

(5) Dry Weather Receiving Water Bioassessment Monitoring

Bioassessment monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must conduct bioassessment monitoring during at least one dry weather monitoring event at each long-term receiving water monitoring station as follows:

(a) The following bioassessment samples and measurements must be collected:

(i) Macroinvertebrate samples must be collected in accordance with the "Reachwide Benthos (Multihabitat) Procedure" in the most current Surface Water Ambient Monitoring Program (SWAMP) Bioassessment Standard Operating Procedures (SOP), and amendments, as applicable;[13]

(ii) The "Full" suite of physical habitat characterization measurements must be collected in accordance with the most current SWAMP Bioassessment SOP, and as summarized in the SWAMP Stream Habitat Characterization Form – Full Version;[14] and

(iii) Freshwater algae samples must be collected in accordance with the SWAMP Standard Operating Procedures for Collecting Algae Samples.[15] Analysis of samples must include algal taxonomic composition (diatoms and soft algae) and algal biomass.

(b) The bioassessment samples, measurements, and appropriate water chemistry data must be used to calculate the following:

(i) An Index of Biological Integrity (IBI) for macroinvertebrates for each monitoring station where bioassessment monitoring was conducted,

[13] Ode, P.R.. 2007. Standard operating procedures for collecting macroinvertebrate samples and associated physical and chemical data for ambient bioassessments in California. California State Water Resources Control Board Surface Water Ambient Monitoring Program (SWAMP) Bioassessment SOP 001. http://www.swrcb.ca.gov/water_issues/programs/swamp/tools.shtml#monitoring
[14] Available at: http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/reports/fieldforms_fullversion052908.pdf
[15] Fetscher et al. 2009. Standard Operating Procedures for Collecting Stream Algae Samples and Associated Physical Habitat and Chemical Data for Ambient Bioassessments in California.

based on the most current calculation method;[16] and

(ii) An IBI for algae for each monitoring station where bioassessment monitoring was conducted, when a calculation method is developed.[17]

(c) In lieu of the requirements of Provision D.1.c.(5)(a), the Copermittees may conduct the bioassessment monitoring in accordance with the "Triad" assessment approach[18] to calculate the IBIs required for Provision D.1.c.(5)(b). The Copermittees must conduct sampling, analysis, and reporting of specified in-stream biological and habitat data according to the protocols specified in the SCCWRP Technical Report No. 539, or subsequent protocols, if developed.

(6) Dry Weather Receiving Water Hydromodification Monitoring

In addition to the hydromodification monitoring conducted as part of the Copermittees' Hydromodification Management Plans, hydromodification monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must collect the following hydromodification monitoring observations and measurements within an appropriate domain of analysis during at least one dry weather monitoring event for each long-term receiving water monitoring station:

(a) Channel conditions, including:

(i) Channel dimensions,

(ii) Hydrologic and geomorphic conditions, and

(iii) Presence and condition of vegetation and habitat;

(b) Location of discharge points;

(c) Habitat integrity;

(d) Photo documentation of existing erosion and habitat impacts, with location (i.e. latitude and longitude coordinates) where photos were taken;

[16] The most current calculation method at the time the Order was adopted is outlined in "A Quantitative Tool for Assessing the Integrity of Southern California Coastal Streams" (Ode, et al. 2005. Environmental Management. Vol. 35, No. 1, pp. 1-13). If an updated or new calculation method is developed, either both (i.e. current and updated/new) methods must be used, or historical IBIs must be recalculated with the updated or new calculation method.

[17] When a calculation method is developed, IBIs must be calculated for all available and appropriate historical data.

[18] Stormwater Monitoring Coalition Model Monitoring Technical Committee, 2004. Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California. Technical Report #419. August 2004.

(e) Measurement or estimate of dimensions of any existing channel bed or bank eroded areas, including length, width, and depth of any incisions; and

(f) Known or suspected cause(s) of existing downstream erosion or habitat impact, including flow, soil, slope, and vegetation conditions, as well as upstream land uses and contributing new and existing development.

d. WET WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three wet weather monitoring events at each long-term receiving water monitoring station. At least one wet weather monitoring event must be conducted during the first wet weather event of the wet season (October 1 – April 30), and at least one wet weather monitoring event during a wet weather event that occurs after February 1.

(1) Wet Weather Receiving Water Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each long-term receiving water monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event;

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(d) Presence and assessment of trash in and around station.

(2) Wet Weather Receiving Water Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

(3) Wet Weather Receiving Water Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) Constituents listed in Table D-3.

(4) Wet Weather Receiving Water Toxicity Monitoring

For each wet weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for chronic aquatic toxicity in accordance with Provisions D.1.c.(4)(a)-(f). ~~Table D-5:~~

~~**Table D-5. Wet Weather Toxicity Testing for Receiving Water Monitoring Stations**~~

~~Freshwater Organism~~	~~Test Approach~~	~~USEPA Protocol[1]~~
~~*Pimephales promelas*~~	~~1 acute~~	~~EPA-821-R-02-012~~
~~*Hyalella Azteca*~~	~~1 acute~~	~~EPA-821-R-02-012~~
~~*Psuedokirchneriella subcapitata*~~	~~1 acute~~	~~EPA-821-R-02-013~~

~~Notes:~~
~~1. USEPA protocols must be utilized for toxicity testing unless alternate toxicity testing protocols have been approved by the San Diego Water Board.~~

e. OTHER RECEIVING WATER MONITORING REQUIREMENTS

(1) Regional Monitoring

The Copermittees must participate in the following regional receiving waters monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring; and

(b) Southern California Bight Regional Monitoring.

(2) Sediment Quality Monitoring

The Copermittees must perform sediment monitoring to assess compliance with sediment quality receiving water limits applicable to MS4 discharges to enclosed bays and estuaries. The monitoring may be performed either by individual or multiple Copermittees to assess compliance with receiving water limits, or through participation in a water body monitoring coalition. ~~The Copermittees must identify sediment sampling stations that are spatially representative of the sediment within the water body segment or region of interest. Sediment quality monitoring must be conducted in conformance with the monitoring requirements set forth in the State Water Board Sediment Quality Control Plan.~~ A Sediment Monitoring Plan which satisfies the requirements of the State Water Board's Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part 1 Sediment Quality (Sediment Control Plan) must be submitted as part of the monitoring and assessment program in the Water Quality Improvement Plan.

(a) The Sediment Monitoring Plan design must include the following:

(i) The elements required under Section VII.D (Receiving Water Limits

Monitoring Frequency) and Section VII.E (Sediment Monitoring) of the Sediment Control Plan;

(ii) A Quality Assurance Project Plan (QAPP) describing the project objectives and organization, functional activities, and quality assurance/quality control protocols for the water and sediment monitoring; and

(iii) A schedule for completion of all sample collection and analysis activities and submission of Sediment Monitoring Reports.

(b) The Copermittees must implement the Sediment Monitoring Plan in accordance with the schedule contained in the Sediment Monitoring Plan, unless otherwise directed in writing by the San Diego Water Board Executive Officer.

(c) The Copermittees must incorporate a Sediment Monitoring Report as part of the Water Quality Improvement Plan Annual Report in accordance with the schedule contained in the Sediment Monitoring Plan, unless otherwise directed in writing by the San Diego Water Board Executive Officer. The Sediment Monitoring Report must contain the following information:

(i) Analysis: An evaluation, interpretation and tabulation of the water and sediment monitoring data, including interpretations and conclusions as to whether applicable Receiving Water Limitations in this Order have been attained at each sample station;

(ii) Sample Location Map: The locations, type, and number of samples shall be identified and shown on a site map; and

(iii) California Environmental Data Exchange Network: A statement certifying that the monitoring data and results have been uploaded into the California Environmental Data Exchange Network (CEDEN).

(d) Based on the Sediment Monitoring Report conclusions the San Diego Water Board may require a human health risk assessment to determine if the human health objective contained in Receiving Water Limitations in Provision A.2.a.(3)(b)(ii) has been attained at each sample station. In conducting a risk assessment, the Copermittees must consider any applicable and relevant information, including California Environmental Protection Agency's (Cal/EPA) Office of Environmental Health Hazard Assessment (OEHHA) policies for fish consumption and risk assessment, Cal/EPA's Department of Toxic Substances Control (DTSC) Risk Assessment, and USEPA Human Health Risk Assessment policies.

(3) ASBS Monitoring

For Watershed Management Areas with ASBS, the Copermittees must implement the monitoring requirements of Attachment B to State Water Board

Resolution No. 2012-0012, included in Attachment A to this Order.

f. ALTERNATIVE WATERSHED MONITORING REQUIREMENTS

The San Diego Water Board may direct the Copermittees to participate in an effort to develop alternative watershed monitoring with other regulated entities, other interested parties, and the San Diego Water Board to refine, coordinate, and implement regional monitoring and assessment programs to determine the status and trends of water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams.

2. MS4 Outfall Discharge Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the discharges from the MS4 outfalls in each Watershed Management Area during dry weather and wet weather. Following San Diego Water Board acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct MS4 outfall discharge monitoring during implementation of the Water Quality Improvement Plan to assess the effectiveness of their jurisdictional runoff management programs toward effectively prohibiting non-storm water discharges into the MS4 and reducing pollutants in storm water discharges ~~to and~~ from their MS4s to the MEP. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following MS4 outfall monitoring procedures:

a. TRANSITIONAL MS4 OUTFALL DISCHARGE MONITORING

Until the monitoring requirements and schedules of Provisions D.2.b-c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following MS4 outfall discharge monitoring in the Watershed Management Area:

(1) MS4 Outfall Discharge Monitoring Station Inventory

Each Copermittee must identify all major MS4 outfalls that discharge directly to receiving waters within its jurisdiction and geo-locate those outfalls on a map of the MS4 pursuant to Provision E.2.b.(1). This information must be compiled into a MS4 outfall discharge monitoring station inventory, and must include the following information:

(a) Latitude and longitude of MS4 outfall point of discharge;

(b) Watershed Management Area;

(c) Hydrologic subarea;

(d) Outlet size;

(e) Accessibility (i.e. safety and without disturbance of critical habitat);

(f) Approximate drainage area; and

(g) Classification of whether the MS4 outfall is known to have persistent dry weather flows, transient dry weather flows, no dry weather flows, or unknown dry weather flows.

(2) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Until the monitoring requirements and schedules of Provision D.2.b are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, each Copermittee must perform dry weather MS4 outfall field screening monitoring to identify non-storm water and illicit discharges within its jurisdiction in accordance with Provision E.2.c, to determine which discharges are transient flows and which are persistent flows, and prioritize the dry weather MS4 discharges that will be investigated and eliminated in accordance with Provision E.2.d. ~~Each Copermittee must conduct the following dry weather MS4 outfall discharge field screening monitoring within its jurisdiction:~~

(a) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Frequency

Each Copermittee must field screen the MS4 outfalls in its inventory developed pursuant to Provision D.2.a.(1) as follows:

(i) For Copermittees with less than 125 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 80 percent of the outfalls must be visually inspected two times per year during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls see Provision D.2.a.(2)(a)(iv).

(ii) For Copermittees with 125 major MS4 outfalls or more, but less than or equal to 500, that discharge to receiving waters within a Watershed Management Area all the outfalls must be visually inspected at least annually during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls see Provision D.2.a.(2)(a)(iv).

(iii) For Copermittees with more than 500 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 500 outfalls must be visually inspected at least annually during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls see Provision D.2.a.(2)(a)(iv). Copermittees with more than 500 major MS4 outfalls within a Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(iv) For any Copermittee~~s~~ with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major MS4 outfalls within its jurisdiction ~~that are located in more than one Watershed Management Area~~, at least 500 major MS4 outfalls within its inventory must be visually inspected at least annually during dry weather conditions. Copermittees with more than 500 major MS4 outfalls in more than one Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(v) Inspections of major MS4 outfalls conducted in response to public reports and staff or contractor reports and notifications may count toward the required visual inspections of MS4 outfall discharge monitoring stations.

(b) Transitional Dry Weather MS4 Outfall Discharge Field Screening Visual Observations

(i) An antecedent dry period of at least 72 hours following any storm event producing measurable rainfall greater than 0.1 inch is required

prior to conducting field screening visual observations during a field screening monitoring event.

(ii) During the field screening monitoring event, each Copermittee must record visual observations consistent with Table D-5~~6~~ at each MS4 outfall discharge monitoring station inspected.

Table D-5~~6~~. Field Screening Visual Observations for MS4 Outfall Discharge Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) - Flow source(s) suspected or identified from non-storm water source investigation - Flow source(s) eliminated during non-storm water source identification • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) - Known or suspected source(s) of pooled or ponded water • Station description (i.e. deposits or stains, vegetation condition, structural condition, observable biology) • Presence and assessment of trash in and around station • Evidence or signs of illicit connections or illegal dumping

(iii) Each Copermittee must implement the requirements of Provisions E.2.d.(2)(c)-(e) based on the field observations.

(iv) Each Copermittee must evaluate field observations together with existing information available from prior reports, inspections and monitoring results to determine whether any observed flowing, pooled, or ponded waters are likely to be transient or persistent flow.[19]

(c) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Records

Based upon the results of the transitional dry weather MS4 outfall discharge field screening monitoring conducted pursuant to Provisions D.2.a.(2)(a)-(b), each Copermittee must update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow.

[19] Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

(3) Transitional Wet Weather MS4 Outfall Discharge Monitoring

Until the monitoring requirements and schedules of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(a) Transitional Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees must select wet weather MS4 outfall discharge monitoring stations from the inventories developed pursuant to Provision D.2.a.(1) for each Watershed Management Area as follows:

(i) ~~a~~At least five wet weather MS4 outfall discharge monitoring stations ~~from the inventories developed pursuant to Provision D.2.a.(1)~~ that are representative of storm water discharges from areas consisting primarily of residential, commercial, industrial, and typical mixed-use land uses present within the Watershed Management Area;~~.~~

(ii) At least one wet weather MS4 outfall discharge monitoring station for each Copermittee within the Watershed Management Area; and

(iii) The County of San Diego may select at least two (2) wet weather MS4 outfall discharge monitoring stations for the portion of the Santa Margarita River Watershed Management Area within its jurisdiction to be monitored during the transitional period until the Riverside County Copermittees are notified of coverage under this Order. After the Riverside County Copermittees are notified of coverage under this Order, the Copermittees in the Watershed Management Area must select wet weather MS4 outfall discharge monitoring stations consistent with the requirements above.

(b) Transitional Wet Weather MS4 Outfall Discharge Monitoring Frequency

Each wet weather MS4 outfall discharge monitoring station selected pursuant to Provision D.2.a.(3)(a) must be monitored twice during the wet season (October 1 – April 30). ~~One~~ The wet weather monitoring events must be selected to be representative of the range of hydrological conditions experienced in the region. At least 10 percent of samples must be conducted during the first wet weather event of the wet season, ~~and one wet weather monitoring event at least a month after the first wet weather event of the wet season~~ to include at least one such sample in each Watershed Management Area..

(c) Transitional Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(i) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(ii) The flow rates and volumes measured or estimated from the MS4 outfall (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

~~(iii) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and~~

~~(iv) Presence and assessment of trash in and around station.~~

(d) Transitional Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(e) Transitional Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, and indicator bacteria;

(iv) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

[a] Time-weighted composites collected over the length of the storm event or the first 24 hour period whichever is shorter, composed

of ~~24~~ discrete ~~hourly~~ samples, which may be collected through the use of automated equipment, or

[b] Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

[c] If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours;

(v) Only one analysis of the composite of aliquots is required;

(vi) The samples must be analyzed for the following constituents:

[a] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

[b] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and

[c] Constituents listed in in Table D-6~~7~~.

Table D-6~~7~~. Analytical Monitoring Constituents for Wet Weather MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Nickel • Selenium • Thallium • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(f) Other Transitional Wet Weather MS4 Outfall Discharge Monitoring

The San Diego County Copermittees must continue the wet weather MS4 outfall monitoring program developed under Order No. R9-2007-0001, as approved by the San Diego Water Board, through its planned completion.

b. DRY WEATHER MS4 OUTFALL DISCHARGE MONITORING

Each Copermittee must perform dry weather MS4 outfall monitoring to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. Each Copermittee must conduct the following dry weather MS4 outfall discharge monitoring within its jurisdiction:

(1) Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Each Copermittee must continue to perform the dry weather MS4 outfall discharge field screening monitoring in accordance with the requirements of Provision D.2.a.(2). The Copermittee may adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of persistent flow non-storm water discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of visual inspections performed is equivalent to the number of visual inspections required under Provision D.2.a.(2)(a).

(2) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring

Each Copermittee must perform non-storm water persistent flow MS4 outfall discharge monitoring to determine which persistent non-storm water discharges contain concentrations of pollutants below NALs, and which persistent non-storm water discharges impact receiving water quality during dry weather. Each Copermittee must conduct the following non-storm water persistent flow MS4 outfall discharge monitoring within its jurisdiction:

(a) Prioritization of Non-Storm Water Persistent Flow MS4 Outfalls

Based upon the dry weather MS4 outfall discharge field screening monitoring records developed pursuant to Provision D.2.a.(2)(c), each Copermittee must identify and prioritize the MS4 outfalls with persistent flows based on the highest priority water quality conditions identified in the Water Quality Improvement Plan and any additional criteria developed by the Copermittee, which may include historical data and data from sources other than what the Copermittee collects.

(b) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring Frequency

(i) Based on the prioritization of major MS4 outfalls developed under Provision D.2.b.(2)(a), each Copermittee must identify, at a minimum, the ~~10~~ 5 highest priority major MS4 outfalls with non-storm water persistent flows that the Copermittee will monitor within its jurisdiction in each Watershed Management Area ~~within its jurisdiction~~. For Responsible Copermittees identified by a TMDL in Attachment E of this Order, if the 5 chosen outfall locations are not sufficient to determine compliance with the TMDL(s), then each Responsible Copermittee must identify additional MS4 outfall monitoring locations within its jurisdiction sufficient to address compliance with the TMDL(s). If a Copermittee has less than 5 major outfalls within a Watershed Management Area, then the Copermittee must monitor all of its major MS4 outfalls with persistent flows within each Watershed Management Area. The location of the highest priority non-storm water persistent flow MS4 outfall monitoring stations must be identified on the map required pursuant to Provision E.2.b.(1). The map must specify which MS4 outfalls are being monitored for compliance with a TMDL.

(ii) Each of the highest priority non-storm water persistent flow MS4 outfall monitoring stations identified pursuant to Provision D.2.b.(2)(b)(i) must be monitored under dry weather conditions at least semi-annually until one of the following occurs:

[a] The non-storm water discharges have been effectively eliminated (i.e. no flowing, pooled, or ponded water) for three consecutive dry weather monitoring events; or
[b] The source(s) of the persistent flows has been identified as a category of non-storm water discharges that does not require an NPDES permit and does not have to be addressed as an illicit discharge because it was not identified as a source of pollutants (i.e. constituents in non-storm water discharge do not exceed NALs), and the persistent flow can be re-prioritized to a lower priority; or
[c] The constituents in the persistent flow non-storm water discharge do not exceed NALs, and the persistent flow can be re-prioritized to a lower priority; or
[d] The source(s) of the persistent flows has been identified as a non-storm water discharge authorized by a separate NPDES permit.

(iii) Where the criteria under Provision D.2.b.(2)(c)(ii) are not met, but the threat to water quality has been reduced by the Copermittee, the highest priority persistent flow MS4 outfall monitoring stations may be reprioritized accordingly for continued dry weather MS4 outfall

discharge field screening monitoring required pursuant to Provision D.2.b.(1).

(iv) Each Copermittee must document removal or re-prioritization of the highest priority persistent flow MS4 outfall monitoring stations identified under Provision D.2.b.(2)(b) in the Water Quality Improvement Plan Annual Report. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized major MS4 ~~major~~ outfall in the Watershed Management Area within its jurisdiction, unless there are no remaining qualifying major MS4 outfalls within the Copermittee's jurisdiction in the Watershed Management Area.

(c) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Observations

During each semi-annual monitoring event, each Copermittee must record field observations consistent with Table D-5~~6~~ at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(d) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Monitoring

During each semi-annual monitoring event, if conditions allow the collection of the data, each Copermittee must monitor and record the parameters in Table D-2 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(e) Non-Storm Water Persistent Flow MS4 Outfall Discharge Analytical Monitoring

During each semi-annual monitoring event in which measurable flow is present, each Copermittee must collect and analyze samples from each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Collect grab or composite samples to be analyzed at a qualified laboratory for the following constituents:

[a] Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

[b] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section

303(d) List,

[c] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

[d] Applicable NAL constituents, and

[e] Constituents listed in Table D-7~~8.~~, ~~unless t~~The Copermittees ~~has~~ may adjust the list of constituents for the Watershed Management Area if historical data or supporting information can be provided that ~~can~~ demonstrates or ~~provide~~ justifies~~cation that~~ the analysis of ~~the~~ a constituent is not necessary.

Table D-7~~8~~. Analytical Monitoring Constituents for Persistent Flow MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Total Hardness • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Cadmium • Copper • Lead • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(iv) If the Copermittee identifies and eliminates the source of the persistent flow non-storm water discharge, analysis of the sample is not required.

c. WET WEATHER MS4 OUTFALL DISCHARGE MONITORING

The Copermittees must perform wet weather MS4 outfall monitoring to identify ~~sources of~~ pollutants in storm water discharges from the MS4s ~~in the Watershed Management Area~~, to guide pollutant source identification efforts, and to determine compliance with the WQBELs associated with the applicable TMDLs in Attachments E of this Order. The Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(1) Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees may adjust the wet weather MS4 outfall discharge monitoring locations ~~and frequencies~~ in the Watershed Management Area, as needed, to identify ~~sources of~~ pollutants in storm water discharges from

MS4s, to guide pollutant source identification efforts, and to determine compliance with the WQBELs associated with the applicable TMDLs in Attachments E of this Order ~~in the Watershed Management Area~~ in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of stations is at least equivalent to the number of stations required under Provision D.2.a.(3)(a). Additional outfall monitoring locations, above the minimum per jurisdiction, may be required to demonstrate compliance with the WQBELs associated with the applicable TMDLs in Attachments E.

(2) Wet Weather MS4 Outfall Discharge Monitoring Frequency

The Copermittees must monitor the wet weather MS4 outfall discharge monitoring stations in the Watershed Management Area ~~at an appropriate frequency~~ at least once (1) per year. The Copermittees may need to increase the frequency of monitoring in order to identify ~~sources of~~ pollutants in storm water discharges from the MS4s causing or contributing to the highest priority water quality conditions, to guide pollutant source identification efforts, or to determine compliance with the WQBELs associated with the applicable TMDLs in Attachments E of this Order ~~identified in the Water Quality Improvement Plan~~.

(3) Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

~~(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and~~

~~(d) Presence and assessment of trash in and around station.~~

(4) Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(5) Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites collected over the length of the storm event or the first 24 hour period, whichever is shorter , composed of ~~24~~ discrete ~~hourly~~ samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

(iii) If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours.

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d)

List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, ~~and~~

(iv) Applicable SAL constituents, ~~.~~ and

(v) The Copermittees may adjust the analytical monitoring required for the Watershed Management Area, if the Copermittees have historical data or supporting information that can demonstrate or provide justification that the analysis of a constituent is not necessary.

3. Special Studies

a. Within the term of this Order, the Copermittees must ~~develop and implement~~ initiate the following special studies:

(1) At least two ~~three~~ special studies in each Watershed Management Area to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that cause or contribute to highest priority water quality conditions identified in the Water Quality Improvement Plan.

(2) At least one ~~two~~ special study~~ies~~ for the San Diego Region to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that are impacting receiving waters on a regional basis in the San Diego Region.

(3) One of the two ~~three~~ special studies in each Watershed Management Area may be replaced by a special study implemented pursuant to Provision D.3.a.(2).

b. The special studies must, at a minimum, be in conformance with the following criteria:

(1) The special studies must be related to the highest priority water quality conditions identified by the Copermittees in the Watershed Management Area and/or for the entire San Diego Region;

(2) The special studies developed pursuant to Provision D.3.a.(1) must:

(a) Be implemented within the applicable Watershed Management Area, and

(b) Require some form of participation by all the Copermittees within the Watershed Management Area;

(3) The special studies developed pursuant to Provision D.3.a.(2) must:

(a) Be implemented within the San Diego Region, and

(b) Require some form of participation by all Copermittees covered under the requirements of this Order.

(4) The Copermittees are encouraged to partner with environmental groups or third parties knowledgeable of watershed conditions to complete the required special studies.

c. Special studies developed to identify sources of pollutants and/or stressors should be pollutant and/or stressor specific and based on historical monitoring data and monitoring performed pursuant to Provisions D.1 and D.2. Development of source identification special studies should include the following:

(1) A compilation of known information on the specific pollutant and/or stressor, including data on potential sources and movement of the pollutant and/or stressor within the watershed. Data generated by the Copermittees and others, as well as information available from a literature research on the pollutant and/or stressor should be compiled and analyzed as appropriate.

(2) An identification of data gaps, based on the compiled information generated on the specific pollutant and/or stressor in Provision D.3.d.(1). Source identification special studies should be developed to fill identified data gaps.

(3) A monitoring plan that will collect and provide data the Copermittees can utilize to do the following:

(a) Quantify the relative loading or impact of a pollutant and/or stressor from a particular source or pollutant generating activity;

(b) Improve understanding of the fate of a pollutant and/or stressor in the environment;

(c) Develop an inventory of known and suspected sources of a pollutant and/or stressor in the Watershed Management Area; and/or

(d) Prioritize known and suspected sources of a pollutant and/or stressor based on relative magnitude in discharges, geographical distribution (i.e., regional or localized), frequency of occurrence in discharges, human health risk, and controllability.

d. Special studies initiated prior to ~~the acceptance of the Water Quality Improvement Plan~~ the effective date of this Order that meet the requirements of Provision D.3.b and are ~~completed~~ implemented during the term of this Order as part of the Water Quality Improvement Plan may be utilized to fulfill the special

study requirements of Provision D.3.a. Special studies completed before the Water Quality Improvement Plan is accepted by the San Diego Water Board cannot be utilized to fulfill the special study requirements of Provision D.3.a.

e. The Copermittees must submit the monitoring plans for the special studies in the Water Quality Improvement Plans required pursuant to Provision F.1.

f. The Copermittees are encouraged to share the results of the special studies regionally among the Copermittees to provide information useful in improving and adapting the management of non-storm water and storm water runoff through the implementation of the Water Quality Improvement Plans.

4. Assessment Requirements

Each Copermittee must evaluate the data collected pursuant to Provisions D.1, D.2 and D.3, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E, to assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a. Assessments must be performed as described in the following provisions:

a. RECEIVING WATERS ASSESSMENTS

(1) The Copermittees must assess and report the conditions of the receiving waters in the Watershed Management Area as follows:

(a) Based on data collected pursuant to Provision D.1.a, the assessments under Provision D.4.a.(2) must be included in the ~~first Annual~~ Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2~~1~~).

(b) Based on the data collected pursuant to Provisions D.1.a-e, the assessments required under Provision D.4.a.(2) must be included in the Report of Waste Discharge required pursuant to Provision F.5.b.

(2) The Copermittees must assess the status and trends of receiving water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under dry weather and wet weather conditions. For each of the three types of receiving waters in each Watershed Management Area the Copermittees must:

(a) Determine whether or not the conditions of the receiving waters are meeting the numeric goals established pursuant to Provision B.3.a ~~protective of the designated beneficial uses~~;

(b) Identify the most critical beneficial uses that must be protected ~~or restored~~

to ensure overall health of the receiving water;

(c) Determine whether or not those critical beneficial uses are being protected ~~and where those beneficial used must be restored~~;

(d) Identify short-term and/or long-term improvements or degradation of those critical beneficial uses;

(e) Determine whether or not the strategies established in the Water Quality Improvement Plan contribute towards progress in achieving the interim and final numeric goals of the Water Quality Improvement Plan; and

(f) Identify data gaps in the monitoring data necessary to assess Provisions D.4.a.(2)(a)-(e~~d~~).

b. MS4 OUTFALL DISCHARGES ASSESSMENTS

(1) Non-Storm Water Discharges Reduction Assessments

(a) Each Copermittee must assess and report the progress of its illicit discharge detection and elimination program, required to be implemented pursuant to Provision E.2, toward ~~reducing and~~ effectively prohibiting non-storm water and illicit discharges into the MS4 within its jurisdiction as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(2), the assessments under Provision D.4.b.(1)(b) must be included in the ~~first Annual~~ Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2~~1~~).

(ii) Based on the data collected pursuant to Provisions D.2.b, the assessments required under Provision D.4.b.(1)(c) must be included in the ~~first~~ Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3~~1~~)~~, and annually thereafter~~.

(iii) Based on the data collected pursuant to Provisions D.2.b, the assessment required under Provision D.4.b.(1)(c) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.a.(2), each Copermittee must assess and report the following:

(i) Identify the known and suspected controllable sources (e.g. facilities, areas, land uses, pollutant generating activities) of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area;

(ii) Identify sources of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area that have been reduced or eliminated; and

(iii) Identify modifications to the field screening monitoring locations and frequencies for the MS4 outfalls in its inventory necessary to identify and eliminate sources of persistent flow non-storm water discharges pursuant to Provision D.2.b.(1).

(c) Based on the dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b, each Copermittee must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(1)(b);

(ii) Based on the data collected and applicable NALs in the Water Quality Improvement Plan, rank the MS4 outfalls in the Copermittee's jurisdiction according to potential threat to receiving water quality, and produce a prioritized list of major MS4 outfalls for follow-up action to update the Water Quality Improvement Plan, with the goal of eliminating persistent flow non-storm water discharges and/or pollutant loads in order of the ranked priority list through targeted programmatic actions and source investigations;

(iii) For the highest priority major MS4 outfalls with persistent flows that are in exceedance of NALs, identify the known and suspected sources within the Copermittee's jurisdiction in the Watershed Management Area that may cause or contribute to the NAL exceedances;

(iv) Each Copermittee must analyze the data collected pursuant to Provision D.2.b, and utilize a model or other method, to calculate or estimate the non-storm water volumes and pollutant loads collectively discharged from all the major MS4s outfalls in its jurisdiction identified as having persistent dry weather flows during the monitoring year. These calculations or estimates must be updated annually. ~~Each Copermittee must calculate or estimate:~~

[a] Each Copermittee must calculate or estimate the ~~A~~annual non-storm water volumes and pollutant loads collectively discharged from the Copermittee's major MS4 outfalls to receiving waters within the Copermittee's jurisdiction, with an estimate of the percent contribution from each known ~~and suspected~~ source for each MS4 outfall;

[b] Each Copermittee must ~~A~~annually identify and quantify (i.e. volume and pollutant loads) sources of non-storm water ~~volumes and pollutant loads from areas or facilities~~ not subject to the Copermittee's legal authority that are discharged from the

Copermittee's major MS4 outfalls to downstream receiving waters.

(v) Each Copermittee must review the data collected pursuant to Provision D.2.b and findings from the assessments required pursuant to Provision D.4.b.(1)(c)(i)-(iv) ~~on an annual basis~~ at least once during the term of this Order to:

[a] Identify reductions and progress in achieving reductions in non-storm water and illicit discharges to the Copermittee's MS4 in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction, with an estimate, if possible, of the non-storm water volume and/or pollutant load reductions attributable to specific water quality strategies implemented by the Copermittee; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittee in the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction.

(vi) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(v).

(2) Storm Water Pollutant Discharges Reduction Assessments

(a) The Copermittees must assess and report the progress of the water quality improvement strategies, required to be implemented pursuant to Provisions B and E, toward reducing pollutants in storm water discharges from the MS4s within the Watershed Management Area as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(3), the assessments under Provision D.4.b.(2)(b) must be included in the ~~first Annual~~ Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2~~1~~).

(ii) Based on the data collected pursuant to Provisions D.2.c, the assessments required under Provision D.4.b.(2)(c) must be included in the ~~first~~ Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(1)~~, and annually thereafter~~.

(iii) Based on the data collected pursuant to Provisions D.2.c, the assessment required under Provisions D.4.b.(2)(c)-(d) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.a.(3) the Copermittees must assess and report the following:

(i) The Copermittees must analyze the monitoring data collected pursuant to Provision D.2.a.(3), and utilize a watershed model or other method, to calculate or estimate ~~storm water volumes and pollutant loads discharged from the MS4s in each Copermittee's jurisdiction within the Watershed Management Area. The Copermittees must calculate or estimate~~ the following for each monitoring year:

[a] The average storm water runoff coefficient for each land use type within the Watershed Management Area;

[b] The volume of storm water and pollutant loads discharged from each of the Copermittee's ~~major~~ monitored MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch;

[c] The total flow volume and pollutant loadings discharged from the Copermittee's jurisdiction within the Watershed Management Area over the course of the wet season, extrapolated from the data produced from the monitored MS4 outfalls; ~~The pollutant loads discharged from each of the Copermittee's major MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch;~~ and

[d] The percent contribution of storm water volumes and pollutant loads discharged from each land use type within the drainage basin to each of the Copermittee's major MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch.

(ii) Identify modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify ~~sources~~ pollutants in storm water discharges from the MS4s in the Watershed Management Area pursuant to Provision D.2.c.(1).

(c) Based on the wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.c the Copermittees must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(2)(b);

(ii) Based on the data collected and applicable SALs in the Water Quality Improvement Plan, ~~rank the MS4 outfalls in the Watershed Management Area according to potential threat to receiving water~~

~~quality, and produce a prioritized list of major MS4 outfalls~~ analyze and compare the monitoring data to the analyses and assumptions used to develop the Water Quality Improvement Plans, including strategies developed pursuant to Provision B.3, and evaluate whether those analyses and assumptions should be updated as a component of the adaptive management efforts pursuant to Provision B.5 for follow-up action to update the Water Quality Improvement Plan;

(iii) The Copermittees must review the data collected pursuant to Provision D.2.c and findings from the assessments required pursuant to Provisions D.4.b.(2)(c)(i)-(ii) ~~on an annual basis~~ at least once during the term of this Order to:

[a] Identify reductions ~~and~~ or progress in achieving reductions in pollutant concentrations and/or pollutant loads from different land uses and/or drainage areas discharging from the Copermittees' MS4s in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters within the Watershed Management Area to the MEP, with an estimate, if possible, of the pollutant load reductions attributable to specific water quality strategies implemented by the Copermittees; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittees in the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters in the Watershed Management Area to the MEP.

(iv) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(iii).

(d) The Copermittees must evaluate all the data collected pursuant to Provision D.2.c, and incorporate new outfall monitoring data into time series plots for each long-term monitoring constituent for the Watershed Management Area, and perform statistical trends analysis on the cumulative long-term wet weather MS4 outfall discharge water quality data set.

c. Special Studies Assessments

The Copermittees must annually evaluate the results and findings from the special studies developed and implemented pursuant to Provision D.3, and assess their relevance to the Copermittees' efforts to characterize receiving water conditions, understand sources of pollutants and/or stressors, and control and reduce the discharges of pollutants from the MS4 outfalls to receiving waters

in the Watershed Management Area. The Copermittees must report the results of the special studies assessments applicable to the Watershed Management Area, and identify any necessary modifications or updates to the Water Quality Improvement Plan based on the results in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.

d. INTEGRATED ASSESSMENT OF WATER QUALITY IMPROVEMENT PLAN

As part of the iterative approach and adaptive management process required for the Water Quality Improvement Plan pursuant to Provision B.5, the Copermittees in each Watershed Management Area must integrate the data collected pursuant to Provisions D.1-D.3, the findings from the assessments required pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to assess the effectiveness of, and identify necessary modifications to, the Water Quality Improvement Plan as follows:

(1) The Copermittees must re-evaluate the priority water quality conditions and numeric goals for the Watershed Management Area, as needed, during the term of this Order pursuant to Provision B.5.a. The re-evaluation and recommendations for modifications to the priority water quality conditions, and/or numeric goals and corresponding schedules may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b, but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The priority water quality conditions and numeric goals for the Watershed Management Area must be re-evaluated as follows:

(a) Re-evaluate the receiving water conditions in the Watershed Management Area in accordance with Provision B.2.a;

(b) Re-evaluate the impacts on receiving waters in the Watershed Management Area from MS4 discharges in accordance with Provision B.2.b;

(c) Re-evaluate the identification of MS4 sources of pollutants and/or stressors in accordance with Provision B.2.d;

(d) Identify beneficial uses of the receiving waters that are protected ~~or must be restored~~ in accordance with Provision D.4.a;

(e) Evaluate the progress toward achieving the interim and final numeric goals for ~~restoring~~ protecting impacted beneficial uses in the receiving waters.

(2) The Copermittees must re-evaluate the water quality improvement strategies for the Watershed Management Area during the term of this Order pursuant to Provision B.5.b. The re-evaluation and recommendations for modifications

to the water quality improvement strategies and schedules ~~must~~ may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b, ~~and~~ but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The water quality improvement strategies for the Watershed Management Area must be re-evaluated as follows:

(a) Identify the non-storm water and storm water pollutant loads from the Copermittees' MS4 outfalls in the Watershed Management Area, calculated or estimated pursuant to Provisions D.4.b;

(b) Identify the non-storm water and storm water pollutant load reductions, or other improvements to receiving water or water quality conditions, that are necessary to attain the interim and final numeric goals identified in the Water Quality Improvement Plan for ~~restoring impacted~~ protecting beneficial uses in the receiving waters;

(c) Identify the non-storm water and storm water pollutant load reductions, or other improvements to the quality of MS4 discharges, that are necessary for the Copermittees to demonstrate that non-storm water and storm water discharges from their MS4s are not causing or contributing to exceedances of receiving water limitations;

(d) Evaluate the progress of the water quality improvement strategies toward achieving the interim and final numeric goals identified in the Water Quality Improvement Plan for ~~restoring impacted~~ protecting beneficial uses in the receiving waters.

(3) The Copermittees must re-evaluate and adapt the water quality monitoring and assessment program for the Watershed Management Area when new information becomes available to improve the monitoring and assessment program pursuant to Provision B.5.c. The re-evaluation and recommendations for modifications to the monitoring and assessment program may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b, but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. Modifications to the water quality monitoring and assessment program must be consistent with the requirements of Provision D.1-D.3. The re-evaluation of the water quality monitoring and assessment program for the Watershed Management Area must consider the data gaps identified by the assessments required pursuant to Provisions D.4.a-b, and results of the special studies implemented pursuant to Provision D.4.c.

5. Monitoring Provisions

Each Copermittee must comply with all the monitoring, reporting, and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

E. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS

The purpose of this provision is for each Copermittee to implement a program to control the contribution of pollutants to and the discharges from the MS4 within its jurisdiction. The goal of the jurisdictional runoff management programs is to implement strategies that effectively prohibit non-storm water discharges to the MS4 and reduce the discharge of pollutants in storm water to the MEP. This goal will be accomplished through implementing the jurisdictional runoff management programs in accordance with the strategies identified in the Water Quality Improvement Plans.

Each Copermittee must update its jurisdictional runoff management program document, in accordance with Provision F.2.a, to incorporate all the requirements of Provision E. Until the Copermittee has updated its jurisdictional runoff management program document with the requirements of Provision E, the Copermittee must continue implementing its current jurisdictional runoff management program.

1. Legal Authority Establishment and Enforcement

a. Each Copermittee must establish, maintain, and enforce adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 through statute, ordinance, permit, contract, order, or similar means. This legal authority must, at a minimum, authorize the Copermittee to:

(1) Prohibit and eliminate all illicit discharges and illicit connections to its MS4;

(2) Control the contribution of pollutants in discharges of runoff associated with industrial and construction activity to its MS4 and control the quality of runoff from industrial and construction sites, including industrial and construction sites which have coverage under the statewide General Permit for Discharges of Storm Water Associated with Industrial Activities (Industrial General Permit) or General Permit for Discharges of Storm Water Associated with Construction Activities (Construction General Permit), as well as to those sites which do not;

(3) Control the discharge of spills, dumping, or disposal of materials other than storm water into its MS4;

(4) Control through interagency agreements among Copermittees the contribution of pollutants from one portion of the MS4 to another portion of the MS4;

(5) Control, by coordinating and cooperating with other owners of the MS4 such as Caltrans, the U.S. federal government, or sovereign Native American Tribes through interagency agreements, where possible, the contribution of pollutants from their portion of the MS4 to the portion of the MS4 within the Copermittee's jurisdiction;

(6) Require compliance with conditions in its statutes, ordinances, permits, contracts, orders, or similar means to hold dischargers to its MS4 accountable for their contributions of pollutants and flows;

(7) Require the use of BMPs to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(8) Require documentation on the effectiveness of BMPs implemented to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(9) Utilize enforcement mechanisms to require compliance with its statutes, ordinances, permits, contracts, orders, or similar means; and

(10) Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with its statutes, ordinances, permits, contracts, orders, or similar means and with the requirements of this Order, including the prohibition of illicit discharges and connections to its MS4; the Copermittee must also have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from industrial facilities, including construction sites, discharging into its MS4.

b. With the first Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b, each Copermittee must submit a statement certified by its Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative that the Copermittee has taken the necessary steps to obtain and maintain full legal authority within its jurisdiction to implement and enforce each of the requirements contained in this Order.

2. Illicit Discharge Detection and Elimination

Each Copermittee must implement a program to actively detect and eliminate illicit discharges and improper disposal into the MS4, or otherwise require the discharger to apply for and obtain a separate NPDES permit. The illicit discharge detection and elimination program must be implemented in accordance with the strategies ~~identified~~ in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include, at a minimum, the following requirements:

a. Non-Storm Water Discharges

Each Copermittee must address all non-storm water discharges as illicit discharges, unless a non-storm water discharge is either identified as a discharge authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to the following requirements:

(1) Discharges of non-storm water to the MS4 from the following categories must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG919001 (Order No. R9-2007-0034, or subsequent order) for discharges to San Diego Bay, or NPDES Permit No. CAG919002 (Order No. R9-2008-0002, or subsequent order) for discharges to surface waters other than San Diego Bay:

(1) Uncontaminated pumped ground water;

(2) Discharges from foundation drains;[20]

(3) Water from crawl space pumps; and

(4) Water from footing drains.[20]

(2) Discharges of non-storm water from water line flushing and water main breaks to the MS4 must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG 679001 (Order No. R9-2010-0003, or subsequent order). This category includes water line flushing and water main break discharges from water purveyors issued a water supply permit by the California Department of Public Health or federal military installations. Discharges from recycled or reclaimed water lines to the MS4 must be addressed as illicit discharges, unless the discharges have coverage under a separate NPDES permit.

(3) Discharges of non-storm water to the MS4 from the following categories must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a source of pollutants to receiving waters:

(a) Diverted stream flows;

(b) Rising ground waters;

(c) Uncontaminated ground water infiltration to MS4s;

(d) Springs;

(e) Flows from riparian habitats and wetlands;

(f) Discharges from potable water sources;

[20] Provision E.2.a.(1) only applies to this category of~~n~~ non-storm water if the system is designed to be located at or below the ~~highest historical~~ groundwater table to actively or passively extract groundwater during any part of the year.

(g) Discharges from foundation drains;[21] and

(h) Discharges from footing drains.[21]

(4) Discharges of non-storm water to the MS4 from the following categories must be controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means. Discharges of non-storm water to the MS4 from the following categories not controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means must be addressed by the Copermittee as illicit discharges.

(a) Air conditioning condensation

The discharge of air conditioning condensation ~~must~~ should be directed to landscaped areas or other pervious surfaces, or to the sanitary sewer, where feasible.

(b) Individual residential vehicle washing

(i) The discharge of wash water ~~must~~ should be directed to landscaped areas or other pervious surfaces where feasible; and

(ii) ~~Minimize t~~The ~~use~~ minimization of water ~~for vehicle washing, use as little~~, washing detergent and other vehicle wash products used for residential vehicle washing ~~as possible, wash vehicles at commercial wash facilities~~, and the implementation of other practices or behaviors that will prevent the discharge of pollutants associated with individual residential vehicle washing from entering the MS4 must be encouraged.

(c) Dechlorinated swimming pool discharges

(i) ~~Eliminate r~~Residual chlorine, algaecide, filter backwash, or other pollutants from swimming pools must be eliminated prior to discharging to the MS4; and

(ii) The discharge of saline swimming pool water must be directed to the sanitary sewer, landscaped areas, or other pervious surfaces that can accommodate the volume of water, unless the saline swimming pool water can be discharged via a pipe or concrete channel directly to a naturally saline water body (e.g. Pacific Ocean).

(5) Firefighting discharges to the MS4 must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a significant source of pollutants to receiving

[21] Provision E.2.a.(3) only applies to this category of non-storm water discharge if the system is designed to be located above the ~~highest historical~~ groundwater table at all times of the year, and the system is only expected to discharge non-storm water under unusual circumstances.

waters. Firefighting discharges to the MS4 not identified as a significant source of pollutants to receiving waters, must be addressed, at a minimum, as follows:

(a) Non-emergency firefighting discharges

(i) Building fire suppression system maintenance discharges (e.g. sprinkler line flushing) to the MS4 must be addressed as illicit discharges unless BMPs are implemented to prevent pollutants associated with such discharges to the MS4.

(ii) Non-emergency firefighting discharges (i.e., discharges from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems) must be addressed by a program, to be developed and implemented by the Copermittee, to reduce or eliminate pollutants in such discharges from entering the MS4.

(b) Emergency firefighting discharges

Each Copermittee should develop and encourage implementation of BMPs to reduce or eliminate pollutants in emergency firefighting discharges to the MS4s and receiving waters within its jurisdiction. During emergency situations, priority of efforts should be directed toward life, property, and the environment (in descending order). BMPs should not interfere with immediate emergency response operations or impact public health and safety.

(6) If the Copermittee or San Diego Water Board identifies any category of non-storm water discharges listed under Provisions E.2.a.(1)-(4) as a source of pollutants to receiving waters, the category must be prohibited through ordinance, order, or similar means and addressed as an illicit discharge. Alternatively, the Copermittee may propose controls to be implemented for the category of non-storm water discharges as part of the Water Quality Improvement Plan instead of prohibiting the category of non-storm water discharges, and implement the controls if accepted by the San Diego Water Board as part of the Water Quality Improvement Plan.

(7) Each Copermittee must, where feasible and priorities and resources allow, reduce or eliminate non-storm water discharges listed under Provisions E.2.a.(1)-(4) into its MS4 ~~whether or not the non-storm water discharge has been identified as an illicit discharge~~, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit.

b. PREVENT AND DETECT ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to prevent and detect illicit discharges to the MS4:

(1) Each Copermittee must maintain an updated map of its entire MS4 and the corresponding drainage areas. The accuracy of the MS4 map must be confirmed during the field screening required pursuant to Provision E.2.c. The MS4 map must be included as part of the jurisdictional runoff management program document. Any geographic information system (GIS) layers or files used by the Copermittee to maintain the MS4 map must be made available to the San Diego Water Board upon request. The MS4 map must identify the following:

(a) All segments of the MS4 owned, operated, and maintained by the Copermittee;

(b) All known locations of inlets that discharge and/or collect runoff into the Copermittee's MS4;

(c) All known locations of connections with other MS4s not owned or operated by the Copermittee (e.g. Caltrans MS4s);

(d) All known locations of MS4 outfalls and private outfalls that discharge runoff collected from areas within the Copermittee's jurisdiction;

(e) All segments of receiving waters within the Copermittee's jurisdiction that receive and convey runoff discharged from the Copermittee's MS4 outfalls;

(f) Locations of the MS4 outfalls, identified pursuant to Provision D.2.a.(1), within its jurisdiction; and

(g) Locations of the non-storm water persistent flow MS4 outfall discharge monitoring stations, identified pursuant to Provision D.2.b.(2)(b), within its jurisdiction.

(2) Each Copermittee must use Copermittee personnel and contractors to assist in identifying and reporting illicit discharges and connections during their daily employment activities.

(3) Each Copermittee must promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges to or from the MS4, including the following methods for public reporting:

(a) Operate a public hotline, which can be Copermittee-specific or shared by the Copermittees, and must be capable of receiving reports in both English and Spanish 24 hours per day and seven days per week; and

(b) Designate an e-mail address for receiving electronic reports from the

public, which can be Copermittee-specific or shared by the Copermittees, and must be prominently displayed on the Copermittee's webpage and the Regional Clearinghouse required pursuant to Provision F.4.

(4) Each Copermittee must implement practices and procedures (including a notification mechanism) to prevent, respond to, contain, and clean up any spills that may discharge into the MS4 within its jurisdiction from any source. The Copermittee must coordinate, to the extent possible, with spill response teams to prevent entry of spills into the MS4, and prevent contamination of surface water, ground water, and soil. The Copermittee must coordinate spill prevention, containment, and response activities throughout all appropriate Copermittee departments, programs, and agencies.

(5) Each Copermittee must implement practices and procedures to prevent and limit infiltration of seepage from sanitary sewers (including private laterals and failing septic systems) to the MS4.

(6) Each Copermittee must coordinate, when necessary, with upstream Copermittees and/or entities to prevent illicit discharges from upstream sources into the MS4 within its jurisdiction.

c. Field Screening

Each Copermittee must conduct field screening (i.e. visual observations, field testing, and/or analytical testing) of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4 in accordance with the dry weather MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

d. Investigate and Eliminate Illicit Discharges And Connections

Each Copermittee must include the following measures within its program to investigate and eliminate illicit discharges to the MS4:

(1) Each Copermittee must prioritize and determine when follow-up investigations will be performed in response to visual observations and/or water quality monitoring data collected during an investigation of a detected non-storm water or illicit discharge to or from the MS4. The criteria for prioritizing investigations must consider the following:

(a) Pollutants identified as causing or contributing to the highest water quality priorities identified in the Water Quality Improvement Plan;

(b) Pollutants identified as causing or contributing, or threatening to cause or contribute to impairments in water bodies on the 303(d) List and/or in environmentally sensitive areas (ESAs), located within its jurisdiction;

(c) Pollutants identified from sources or land uses known to exist within the area, drainage basin, or watershed that discharges to the portion of the MS4 within its jurisdiction included in the investigation;

(d) Pollutants identified as causing or contributing to an exceedance of a NAL in the Water Quality Improvement Plan; and

(e) Pollutants identified as a threat to human health or the environment.

(2) Each Copermittee must implement procedures to investigate and inspect portions of its MS4 that, based on reports or notifications, field screening, or other appropriate information, indicate a reasonable potential of receiving, containing, or discharging pollutants due to illicit discharges, illicit connections, or other sources of non-storm water. The procedures must include the following:

(a) Each Copermittee must develop criteria to:

(i) Assess the validity of each report or notification received; and

(ii) Prioritize the response to each report or notification received.

(b) Each Copermittee must prioritize and respond to each valid report or notification (e.g., public reports, staff or contractor reports and notifications, etc.) of an incident in a timely manner.

(c) In accordance with the requirements of Provision E.2.d.(1), ~~E~~each Copermittee must investigate and seek to identify the source(s) of discharges of non-storm water where flows are observed in and from the MS4 during the field screening required pursuant to Provision D.2.b.(1) as follows:

(i) Obvious illicit discharges must be immediately investigated to identify the source(s) of non-storm water discharges;

(ii) The investigation must include field investigations to identify sources or potential sources for the discharge, unless the source or potential source has already been identified during previous investigations; and

(iii) The investigation may include follow-up field investigations and/or reviewing Copermittee inventories and other land use data to identify potential sources of the discharge.

(d) Each Copermittee must maintain records and a database of the following information:

(i) Location of incident, including hydrologic subarea, portion of MS4

receiving the non-storm water or illicit discharge, and point of discharge or potential discharge from MS4 to receiving water;

(ii) Source of information initiating the investigation (e.g., public reports, staff or contractor reports and notifications, field screening, etc.);

(iii) Date the information used to initiate the investigation was received;

(iv) Date the investigation was initiated;

(v) Dates of follow-up investigations;

(vi) Identified or suspected source of the illicit discharge or connection, if determined;

(vii) Known or suspected related incidents, if any;

(viii) Result of the investigation; and

(ix) If a source cannot be identified and the investigation is not continued, document the response pursuant to the requirements of Provision E.2.d.(3) ~~a rationale for why a discharge does not pose a threat to water quality and/or does not require additional investigation~~.

(e) Each Copermittee must ~~track~~ maintain records and, in accordance with the priorities of the Water Quality Improvement Plan, seek to identify the source(s) of non-storm water discharges from the MS4 where there is evidence of non-storm water having been discharged into or from the MS4 (e.g., pooled water), in accordance with MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.

(3) Each Copermittee must initiate the implementation of procedures, in a timely manner, to eliminate all detected and identified illicit discharges and connections within its jurisdiction. The procedures must include the following responses:

(a) Each Copermittee must enforce its legal authority, as required under Provision E.1, to eliminate illicit discharges and connections to the MS4.

(b) If the Copermittee identifies the source as a controllable source of non-storm water or illicit discharge or connection, the Copermittee must implement its Enforcement Response Plan pursuant to Provision E.6 and enforce its legal authority to prohibit and eliminate illicit discharges and connections to its MS4.

(c) If the Copermittee identifies the source of the discharge as a category of non-storm water discharges in Provision E.2.a, and the discharge is in exceedance of NALs in the Water Quality Improvement Plan, then the Copermittee must determine if: (1) this is an isolated incident or set of circumstances that will be addressed through its Enforcement Response Plan pursuant to Provision E.6, or (2) the category of discharge must be

addressed through the prohibition of that category of discharge as an illicit discharge pursuant to Provision E.2.a.(6).

(d) If the Copermittee suspects the source of the non-storm water discharge as natural in origin (i.e. non-anthropogenically influenced) and in conveyance into the MS4, then the Copermittee must document and provide the data and evidence necessary to demonstrate to the San Diego Water Board that it is natural in origin and does not require further investigation.

(e) If the Copermittee is unable to identify and document the source of a recurring non-storm water discharge to or from the MS4, then the Copermittee must address the discharge as an illicit discharge and update its jurisdictional runoff management program to address the common and suspected sources of the non-storm water discharge within its jurisdiction in accordance with the Copermittee's priorities.

(4) Each Copermittee must submit a summary of the non-storm water discharges and illicit discharges and connections investigated and eliminated within its jurisdiction with each Water Quality Improvement Plan Annual Report required under Provision F.3.b of this Order.

~~e. STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS~~

~~Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the illicit discharge detection and elimination program to address non-storm water and illicit discharges and connections that the Copermittee has identified as potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:~~

~~(1) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, and/or increase/decrease frequency of inspections in specific areas); and~~

~~(2) The strategies and/or activities must be consistent with the requirements of Provisions E.2.a-d and the strategies identified in the Water Quality Improvement Plan.~~

3. Development Planning

Each Copermittee must use their land use and planning authorities to implement a development planning program in accordance with the strategies ~~identified~~ in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. BMP REQUIREMENTS FOR ALL DEVELOPMENT PROJECTS

Each Copermittee must prescribe the following BMP requirements during the planning process (i.e. prior to project approval and issuance of local permits) for all development projects (regardless of project type or size), where local permits are issued, including unpaved roads and flood management projects:

(1) General Requirements

(a) Onsite BMPs must be located so as to remove pollutants from runoff prior to its discharge to any receiving waters, and as close to the source as possible; ~~and~~

(b) Structural BMPs must not be constructed within a waters of the U.S. ~~or waters of the state.~~

(c) Onsite BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors (e.g. mosquitos, rodents, or flies).

(2) Source Control BMP Requirements

The following source control BMPs must be implemented at all development projects where applicable and feasible:

(a) Prevention of illicit discharges into the MS4;

(b) Storm drain system stenciling or signage;

(c) Protect ~~Properly designed~~ outdoor material storage areas from rainfall, run-on, runoff, and wind dispersal;

(d) Protect materials stored in ~~Properly designed~~ outdoor work areas from rainfall, run-on, runoff, and wind dispersal;

(e) Protect ~~Properly designed~~ trash storage areas from rainfall, run-on, runoff, and wind dispersal; and

(f) Any additional BMPs determined to be necessary by the Copermittee to minimize pollutant generation at each project.

(3) Low Impact Development (LID) BMP Requirements

The following LID BMPs must be implemented at all development projects where applicable and feasible:

(a) Maintenance or restoration of natural storage reservoirs and drainage

corridors (including topographic depressions, areas of permeable soils, natural swales, and ephemeral and intermittent streams);[22]

(b) Buffer zones for natural water bodies (where buffer zones are technically infeasible, require project applicant to include other buffers such as trees, access restrictions, etc.);

(c) Conservation of natural areas within the project footprint including existing trees, other vegetation, and soils;

(d) Construction of streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided public safety is not compromised;

(e) Minimization of the impervious footprint of the project;

(f) Minimization of soil compaction to landscaped areas;

(g) Disconnection of impervious surfaces through distributed pervious areas;

(h) Landscaped or other pervious areas designed and constructed to effectively receive and infiltrate, retain and/or treat runoff from impervious areas, prior to discharging to the MS4;

(i) Small collection strategies located at, or as close as possible to, the source (i.e. the point where storm water initially meets the ground) to minimize the transport of runoff and pollutants to the MS4 and receiving waters;

(j) Use of permeable materials for projects with low traffic areas and appropriate soil conditions;

(k) Landscaping with native or drought tolerant species; and

(l) Harvesting and using precipitation.

b. PRIORITY DEVELOPMENT PROJECTS

Priority Development Projects are land development projects that fall under the planning and building authority of the Copermittee for which the Copermittee must impose specific requirements, in addition to those described in Provision E.3.a, including the implementation of structural BMPs to meet the performance requirements described in Provisions E.3.c.

[22] Development projects proposing to dredge or fill materials in waters of the U.S. must obtain a CWA Section 401 Water Quality Certification. Projects proposing to dredge or fill waters of the state must obtain waste discharge requirements.

(1) Definition of Priority Development Project

Priority Development Projects include the following:

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site), or redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site). This category includes commercial, industrial, residential, mixed-use, and public development projects on public or private land. ~~All new development projects that fall under the Priority Development Project categories listed under Provision E.3.b.(2) (where a new development project feature, such as a parking lot, falls into a Priority Development Project category, the entire project footprint is subject to Priority Development Project requirements); and~~

(b) New projects that create 5,000 square feet or more of impervious surface (collectively over the entire project site), and support one or more of the following uses: ~~Those redevelopment projects that create, add, or replace at least 5,000 square feet of impervious surfaces on an already developed site, and the redevelopment project is a Priority Development Project category listed under Provision E.3.b.(2) (where redevelopment results in an increase of less than fifty percent of the impervious surfaces of a previously existing development, and the existing development was not subject to Priority Development Project requirements, the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) apply only to the addition or replacement, and not to the entire development; where redevelopment results in an increase of more than fifty percent of the impervious surfaces of a previously existing development, the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) apply to the entire development).~~

~~(2) Priority Development Project Categories~~

~~(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This category includes commercial, industrial, residential, mixed-use, and public development projects on public or private land which fall under the planning and building authority of the Copermittee.~~

~~(b) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.~~

~~(c)~~ (i) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for

immediate consumption (SIC code 5812)~~, where the land area for development is 5,000 square feet or more~~.

~~(d)~~ (ii) Hillside development projects. This category includes ~~any~~ development ~~which creates 5,000 square feet or more of impervious surface which is located in an area with known erosive soil conditions, where the development will grade~~ on any natural slope that is twenty-five percent or greater.

~~(e) Environmentally sensitive areas (ESAs). This category includes any development located within, directly adjacent to, or discharging directly to an ESA, which either creates 2,500 square feet of impervious surface on a proposed project site or increases the area of imperviousness of a proposed project site to 10 percent or more of its naturally occurring condition. "Directly adjacent to" means situated within 200 feet of the ESA. "Discharging directly to" means outflow from a drainage conveyance system that collects runoff from the subject development or redevelopment site and terminates at or in receiving waters within the ESA.~~

~~(f)~~ (iii) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce ~~that has 5,000 square feet or more of impervious surface~~.

~~(g)~~ (iv) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface ~~that is 5,000 square feet or more~~ used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

~~(h) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.~~

~~(i) Large development projects. This category includes any post-construction pollutant-generating new development projects that result in the disturbance of one acre or more of land.~~

(c) New or redevelopment projects that create or replace 2,500 square feet or more of impervious surface (collectively over the entire project site), and discharging directly to an Environmentally Sensitive Area (ESA). "Discharging directly to" includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands).

(d) New development projects that support one or more of the following uses:

(i) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial

Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

(ii) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

(e) New or redevelopment projects that result in the disturbance of one or more acre of land and are expected to generate pollutants post construction.

(2) Special Considerations for Redevelopment Projects

The structural BMP performance requirements of Provisions E.3.c. are applicable to redevelopment Priority Development Projects, as defined in E.3.b.(1), as follows:

(a) Where redevelopment results in the creation or replacement of impervious surface in an amount of less than fifty percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provisions E.3.c apply only to the creation or replacement of impervious surface, and not the entire development; or

(b) Where redevelopment results in the creation or replacement of impervious surface in an amount of more than fifty percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provisions E.3.c apply to the entire development.

(3) Priority Development Project Exemptions

Each Copermittee has the discretion to exempt the following projects from being defined as Priority Development Projects:

(a) New or retrofit paved sidewalks, bicycle lanes, or trails that meet the following criteria:

(i) Designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas; OR

(ii) Designed and constructed to be hydraulically disconnected from paved streets or roads; OR

(iii) Designed and constructed with permeable pavements or surfaces in accordance with USEPA Green Streets guidance.[23]

[23] See "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).

(b) Retrofitting of existing paved alleys, streets or roads that ~~meet the following criteria:~~ are designed and constructed in accordance with the USEPA Green Streets guidance.[24]

~~(i) Must be two lanes or less; AND~~

~~(ii) Must be a retrofitting project implemented as part of an alternative compliance project option under Provision E.3.c.(3)(b)(v) to achieve the performance requirements of Provisions E.3.c.(1) and/or E.3.c.(2) for a Priority Development Project; AND~~

~~(iii) Designed and constructed in accordance with the USEPA Green Streets guidance.~~

~~(c) New single family residences that meet the following criteria:~~

~~(i) Must not be constructed as part of a larger development or proposed subdivision; AND~~

~~(ii) Designed and constructed to be certified under the U.S. Green Building Council (USGCB) Leadership in Energy and Environmental Design (LEED) for Homes green building certification program, receiving at least four (4) Surface Water Management credits under the Sustainable Sites category;[25] OR~~

~~(iii) Designed and constructed with structural BMPs that will achieve the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite.~~

~~(d) Redevelopment of existing single family residences that meet the following criteria:~~

~~(i) Designed and constructed to be certified under the USGCB LEED for Homes green building certification program, receiving at least four (4) Surface Water Management credits under the Sustainable Sites category;[26] OR~~

~~(ii) Designed and constructed with structural BMPs that will achieve the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite.~~

c. Priority Development Project Structural BMP Performance Requirements

In addition to the BMP requirements listed for all development projects under

[24] Ibid.
~~[25] See LEED for Homes rating system at http://www.usgbc.org~~
~~[26] See LEED for Homes rating system at http://www.usgbc.org~~

Provision E.3.a, Priority Development Projects must also implement structural BMPs that conform to performance requirements described below.

(1) Storm Water Pollutant Control BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite structural BMPs to control pollutants in storm water that may be discharged from a project as follows:

(a) Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite 100 percent of the pollutants contained in the volume of storm water runoff produced from a 24-hour 85th percentile storm event (design capture volume);[27]. ~~The design capture volume is equivalent to:~~

~~(i) The volume of storm water produced from a 24-hour 85th percentile storm event; OR~~

~~(ii) The volume of storm water that would be retained onsite if the site was fully undeveloped and naturally vegetated, as determined using continuous simulation modeling techniques based on site-specific soil conditions and typical native vegetative cover.~~

(b) If a Copermittee determines that implementing BMPs to retain the full design capture volume onsite for a Priority Development Project is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize flow-thru treatment control BMPs to achieve the equivalent pollutant load removal described in Provision E.3.c.(1)(a). Biofiltration LID BMPs must be considered as a first option before other types of flow-thru treatment control BMPs may be considered.

(c) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) ~~to comply~~ in lieu of complying with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1)(a). The Priority Development Project must mitigate for the portion of the pollutant load in the design capture volume not retained onsite if Provision E.3.(c)(3) is utilized.

(d) If a Priority Development project is allowed to utilize alternative

[27] This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals.

compliance ~~pursuant to Provisions E.3.c.(1)(b)~~, flow-thru ~~conventional~~ treatment control BMPs must be implemented to treat the portion of the design capture volume that is not retained onsite. ~~Additionally, project applicants must mitigate for the portion of the pollutant load in the design capture volume that is not retained onsite through one or more alternative compliance options under Provision E.3.c.(3). Conventional~~ Flow-thru treatment control BMPs must be sized and designed to:

(i) Remove pollutants from storm water to the MEP;

(ii) Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;

(iii) Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. ~~Conventional~~ Flow-thru treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of ~~conventional~~ flow-thru treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

(2) Hydromodification Management BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite ~~structural~~ BMPs to manage hydromodification that may be caused by storm water runoff discharged from a project as follows:

(a) Post-project runoff conditions (flow rates and durations) must not exceed pre-development ~~(naturally occurring)~~ runoff conditions ~~flow rates and durations~~ by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat ~~conditions~~ downstream of Priority Development Projects).

(i) In evaluating the range of flows that results in increased potential for erosion of natural (non-hardened) channels, the lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks.

~~(ii) For artificially hardened channels, analysis to identify the lower boundary must use characteristics of a natural stream segment similar to that found in the watershed. The lower boundary must correspond with the critical channel flow that produces the critical~~

~~shear stress that initiates channel bed movement or erodes the toe of the channel banks.~~

~~(iii)~~

(ii) The Copermittees may use monitoring results collected pursuant to Provision D.1.a.(2) to re-define the range of flows resulting in increased potential for erosion, or degraded instream habitat conditions, as warranted by the data.

(b) Each Priority Development Project must avoid known critical sediment yield areas or implement measures that allow coarse sediment to be discharged to receiving waters, such that the sediment supply is unaffected by the project. ~~Post-project runoff flow rates and durations must compensate for the loss of sediment supply due to the development project, should loss of sediment supply occur as a result of the development project.~~

(c) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) ~~to comply~~ in lieu of complying with the performance requirements of Provision~~s~~ E.3.c.(2)(a)~~-(b)~~. The Priority Development Project must mitigate for the post-project runoff conditions not fully managed onsite if Provision E.3.(c)(3) is utilized.

(d) Exemptions

Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provisions E.3.c.(2)(a)~~-(b)~~ where the project discharges storm water runoff to:

(i) ~~Discharges storm water runoff into e~~Existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;

(ii) Conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; ~~Is a redevelopment Priority Development Project that meets the alternative compliance requirements of Provision E.3.c.(3)(b)(ii);~~ or

(iii) An area identified by the Copermittees as appropriate for an exemption by the Watershed Management Area Analysis incorporated into the Water Quality Improvement Plan pursuant to Provision B.3.b.(4). ~~Discharges storm water runoff into other areas identified by the San Diego Water Board as exempt from the requirements of Provisions E.3.c.(2)(a)-(b).~~

(3) Alternative Compliance Program to Onsite Structural BMP Implementation ~~Performance Requirements~~

~~(a) Applicability~~

At the discretion of each Copermittee, Priority Development Projects may be allowed to ~~utilize an alternative option to comply with~~ participate in an alternative compliance program in lieu of implementing the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2), provided that the Water Quality Improvement Plan includes the optional Watershed Management Area Analysis described in Provision B.3.b.(4). The alternative compliance program is available to a Priority Development Project only if the Priority Development Project applicant enters into a voluntary agreement with the Copermittee authorizing this arrangement. In addition to the voluntary agreement, relief from implementing structural BMPs onsite may be authorized by the Copermittee under the following conditions:

(a) Watershed Management Area Analysis Candidate Projects

The Priority Development Project applicant agrees to fund, contribute funds to, or implement a candidate project identified by the Copermittees in the Watershed Management Area Analysis included in the Water Quality Improvement Plan, pursuant to Provisions B.3.b.(4) subject to the following conditions:

(i) The Copermittee must determine that implementation of the ~~alternative compliance option~~ candidate project will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite;

(ii) If the Priority Development Project applicant chooses to fully or partially fund a candidate project, then the in-lieu fee structure described in Provision E.3.c.(3)(c) must be followed;

(iii) If the Priority Development Project applicant chooses to fully or partially fund a candidate project, then the Copermittee must ensure that the funds to be obtained from the Priority Development Project applicant are sufficient to mitigate for impacts caused by not fully implementing structural BMPs onsite, pursuant to the performance requirements described in Provisions E.3.c.(1) and E.3.c.(2);

(iv) If the Priority Development Project applicant chooses to implement a candidate project, then the Copermittee must ensure that pollutant control and/or hydromodification management within the candidate project are sufficient to mitigate for impacts caused by not implementing structural BMPs fully onsite, pursuant to the performance requirements described in Provisions E.3.c.(1) and E.3.c.(2);

(v) The voluntary agreement to fund, partially fund, or implement a candidate project must include reliable sources of funding for operation and maintenance of the candidate project;

(vi) Design of the candidate project must be conducted under ~~by~~ an appropriately qualified ~~registered professional~~ engineer, geologist, architect, ~~or~~ landscape architect, or other professional, licenses where applicable, and competent and proficient in the fields pertinent to the candidate project design;

~~(ii) The alternative compliance options must be implemented within the same hydrologic unit as the Priority Development Project, and preferably within the same hydrologic subarea;~~

(vii) The candidate project must be constructed as soon as possible, but no later than 4 years after the certificate of occupancy is granted for the first Priority Development Project that contributed funds toward the construction of the candidate project, unless a longer period of time is authorized by the San Diego Water Board Executive Officer;

(viii) If the candidate project is constructed after the Priority Development Project is constructed, the Copermittee must require temporal mitigation for pollutant loads and altered flows that are discharged from the Priority Development Project; and

(ix) Receiving waters must not be utilized to convey untreated storm water runoff from the Priority Development Project to the ~~alternative compliance options~~ candidate project;

~~(iii) The pollutants in storm water runoff from the Priority Development Project must be treated to the MEP by the alternative compliance options prior to being discharged to receiving waters;~~

~~(iv) Unless otherwise allowed by Provision E.3.c.(3)(b), the alternative compliance options must have a net result of at least the same level of pollutant removal as would have been achieved if the Priority Development Project had fully complied with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1) onsite;~~

~~(v) Unless otherwise allowed by Provision E.3.c.(3)(b), the alternative compliance options must have a net result of at least the same level of protection from potential downstream and upstream erosion in the receiving water as would have been achieved if the Priority Development Project had fully complied with the hydromodification management BMP performance requirements of Provision E.3.c.(2) onsite; and~~

~~(vi) The alternative compliance options utilized by the Priority Development Project to comply with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) must have reliable sources of~~

~~funding for operation and maintenance.~~

~~(b) Alternative Compliance Project Options~~
(b) Project Applicant Proposed Alternative Compliance Projects

The Copermittee may allow a Priority Development Project applicant to propose and fund, contribute funds to, or implement an alternative compliance project not identified by the Watershed Management Area Analysis included in the Water Quality Improvement Plan pursuant to Provisions B.3.b.(4). This option is allowed provided the Copermittee determines that implementation of the alternative compliance project will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite, and is subject to the requirements described in Provisions E.3.c.(3)(a)(ii)-(ix). ~~implementation of one or more of the following project options as part of an alternative approach to complying with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2):~~

~~(i) *Onsite LID Biofiltration Treatment Control BMPs*~~

~~The Copermittee may allow Priority Development Projects to utilize onsite LID biofiltration treatment control BMPs to comply with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1). Onsite LID biofiltration treatment control BMPs must be sized and designed to:~~

~~[a] Remove pollutants from storm water to the MEP; AND~~
~~[b] Have an appropriate surface loading rate to prevent erosion, scour and channeling within the BMP; AND~~
~~[c] Biofilter at least 1.5 times the design capture volume that is not reliably retained onsite; OR~~
~~[d] Biofilter up to the design capture volume that is not reliably retained onsite, AND 1) treat the remaining portion of the design capture volume not retained onsite with conventional treatment control BMPs in accordance with Provision E.3.c.(1)(c), and 2) if necessary, mitigate for the portion of the pollutant load in the design capture volume not retained onsite through one or more alternative compliance project, in-lieu fee and/or water quality credit system options below.~~

~~(ii) *LEED Certified Redevelopment Projects*~~

~~The Copermittee may allow redevelopment Priority Development Projects to comply with the hydromodification management BMP performance requirements of Provision E.3.c.(2) where the project is designed and constructed to be certified under the USGCB LEED for New Construction and Major Renovations green building certification program. The Priority Development Project must receive at least one~~

~~(1) Site Design credit and two (2) Stormwater Design credits under the Sustainable Sites category.[28] In addition, the existing and future configuration of the receiving water must not be unnaturally altered or adversely impacted by storm water flow rates and durations discharged from the site.~~

~~(iii) *Watershed-Based Planned Development Projects*~~

~~The Copermittee may allow Priority Development Projects greater than 100 acres in total project size (or smaller than 100 acres in size yet part of a larger common plan of development that is over 100 acres) to comply with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2). The Priority Development Project must comply with the following conditions:~~

~~[a] The Priority Development Project was planned utilizing watershed and/or subwatershed based water quality, hydrologic, and fluvial geomorphologic planning principles that implement regional LID BMPs in accordance with the performance and location criteria of this Order and acceptable to the San Diego Water Board;~~

~~[b] Regional LID BMPs may be used provided that the BMPs capture and retain the volume of runoff produced from the design capture volume defined in Provision E.3.c.(1)(a)(i) and that such controls are located upstream of receiving waters;~~

~~[c] Regional LID BMPs must clearly exhibit that they will not result in a net impact from pollutant loadings over and above the impact caused by capture and retention of the design capture volume;~~

~~[d] Any portion of the design capture volume that is not retained by the regional LID BMPs must be treated using biofiltration BMPs; and~~

~~[e] Where regional LID BMPs are demonstrated to the Copermittee as technically infeasible to retain the entire design capture volume, any volume up to and including the design capture volume not retained by regional LID BMPs, nor treated by biofiltration BMPs, must be treated using conventional treatment control BMPs and the project applicant must implement additional alternative compliance project, in-lieu fee and/or water quality credit system options below.~~

~~(iv) *Offsite Regional BMPs*~~

~~[a] The Copermittee may allow Priority Development Projects to utilize offsite regional BMPs to comply with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1) if the offsite regional BMPs have the capacity to receive~~

~~[28] See LEED for New Construction and Major Renovations rating system at http://www.usgbc.org~~

~~and retain at least 1.1 times the design capture volume that is not reliably retained onsite.~~

~~[b] The Copermittee may allow Priority Development Projects to utilize offsite regional BMPs to comply with the hydromodification management BMP performance requirements of Provision E.3.c.(2) if the offsite regional BMPs have the capacity to manage the storm water flows rates and durations from the site such that the receiving waters are protected from the potential for increased erosion that would be caused if the unmanaged portion of the runoff was discharged from the site.~~

~~(v) *Offsite Retrofitting Projects*~~

~~The Copermittee may allow Priority Development Projects to utilize offsite retrofitting projects to comply with the storm water pollutant control and hydromodification management BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) if the retrofitting projects have been identified within the strategies included in the Water Quality Improvement Plan, or identified as potential retrofitting projects by the Copermittee pursuant to Provision E.5.~~

~~(vi) *Offsite Channel, Stream, or Habitat Rehabilitation Projects*~~

~~The Copermittee may allow Priority Development Projects to utilize offsite channel, stream, or habitat rehabilitation projects to comply with the hydromodification management BMP performance requirements of Provision E.3.c.(2) if the rehabilitation projects have been identified within the strategies included in the Water Quality Improvement Plan, or identified as potential channel rehabilitation projects by the Copermittee pursuant to Provision E.5. The channel, stream, or habitat rehabilitation project cannot be utilized for pollutant treatment except where artificial wetlands are constructed and located upstream of receiving waters.~~

~~(vii) *Offsite Regional Water Supply Augmentation Projects*~~

~~The Copermittee may allow Priority Development Projects to utilize offsite regional water supply augmentation projects (i.e. groundwater recharge, recycled water, storm water harvesting) to comply with the storm water pollutant control and hydromodification management BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) if the projects have been identified within the strategies included in the Water Quality Improvement Plan.~~

~~(viii) *Project Applicant Proposed Alternative Compliance Projects*~~

~~The Copermittee may allow one or more Priority Development Project applicant(s) to propose and implement alternative compliance projects to comply with the storm water pollutant control and hydromodification management BMP performance requirements of~~

~~Provisions E.3.c.(1) and E.3.c.(2) if the alternative compliance projects are consistent with, and will address the highest water quality priorities of the Water Quality Improvement Plan, and comply with the requirements of Provision E.3.c.(3)(a).~~

(c) Alternative Compliance In-Lieu Fee Structure ~~Option~~

If a Copermittee chooses to allow a Priority Development Project applicant to fund, or partially fund a candidate project or an alternative compliance project, then the Copermittee must develop and implement an in-lieu fee structure. ~~The Copermittee may develop and implement an alternative compliance in-lieu fee option,~~ This may be developed individually or with other Copermittees and/or entities, as a means for designing, developing, constructing, operating and maintaining offsite alternative compliance projects. The in-lieu fee must be transferred to the Copermittee (for public projects) or an escrow account (for private projects) prior to the construction of the Priority Development Project. ~~under Provision E.3.c.(3)(b). Priority Development Projects allowed to utilize the alternative compliance in-lieu fee option must comply with the following conditions:~~

~~(i) The in-lieu fee must be transferred to the Copermittee (for public projects) or an escrow account (for private projects) prior to the date construction of the Priority Development Project is initiated.~~

~~(ii) If the in-lieu fee is applied to the development, design and construction of offsite alternative compliance projects, the following conditions must be met:~~

~~[a] The offsite alternative compliance projects must allow the Priority Development Project to comply with the onsite BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2);~~

~~[b] The offsite alternative compliance projects must be constructed as soon as possible, but no later than 4 years after the certificate of occupancy is granted for the first Priority Development Project that contributed funds toward the construction of the offsite alternative compliance projects, unless a longer period of time is authorized by the San Diego Water Board Executive Officer;~~

~~[c] The in-lieu fee for the Priority Development Project must include mitigation of the pollutant loads and increased storm water flow rates and durations that are allowed to discharge from the site before the offsite alternative compliance projects are constructed; and~~

~~[d] The in-lieu fee must also include the cost to operate and maintain the offsite alternative compliance projects.~~

~~(iii) If the in-lieu fee is applied to the operation and maintenance of offsite~~

~~alternative compliance projects that have already been constructed, the offsite alternative compliance projects must allow the Priority Development Project to comply with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2).~~

(d) Alternative Compliance Water Quality Credit System Option

The Copermittee may develop and implement an alternative compliance water quality credit system option, individually or with other Copermittees and/or entities, provided that such a credit system clearly exhibits that it will not allow discharges from Priority Development Projects to cause or contribute to a net impact over and above the impact caused by projects meeting the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2). Any credit system that a Copermittee chooses to implement must be submitted to the San Diego Water Board Executive Officer for review and acceptance as part of the Water Quality Improvement Plan.

(4) Long-Term Structural BMP Maintenance

Each Copermittee must require the project applicant to submit proof of the mechanism under which ongoing long-term maintenance of all structural BMPs will be conducted.

(5) Infiltration and Groundwater Protection

(a) Structural BMPs designed to primarily function as large, centralized infiltration devices (such as large infiltration trenches and infiltration basins) must not cause or contribute to an exceedance of an applicable groundwater quality objective. At a minimum, such infiltration BMPs must be in conformance with the design criteria listed below, unless the development project applicant demonstrates to the Copermittee that one or more of the specific design criteria listed below are not necessary to protect groundwater quality. The design criteria listed below do not apply to small infiltration systems dispersed throughout a development project.

(i) Runoff must undergo pretreatment such as sedimentation or filtration prior to infiltration;

(ii) Pollution prevention and source control BMPs must be implemented at a level appropriate to protect groundwater quality at sites where infiltration BMPs are to be used;

(iii) Infiltration BMPs must be adequately maintained to remove pollutants in storm water to the MEP;

(iv) The vertical distance from the base of any infiltration BMP to the seasonal high groundwater mark must be at least 10 feet. Where

groundwater basins do not support beneficial uses, this vertical distance criteria may be reduced, provided groundwater quality is maintained;

(v) The soil through which infiltration is to occur must have physical and chemical characteristics (e.g., appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses;

(vi) Infiltration BMPs must not be used for areas of industrial or light industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee, unless source control BMPs to prevent exposure of high threat activities are implemented, or runoff from such activities is first treated or filtered to remove pollutants prior to infiltration; and

(vii) Infiltration BMPs must be located a minimum of 100 feet horizontally from any water supply wells.

(b) The Copermittee may develop, individually or with other Copermittees, alternative mandatory design criteria to that listed above for infiltration BMPs which are designed to primarily function as centralized infiltration devices. Before implementing the alternative design criteria in the development planning process the Copermitee(s) must:

(i) Notify the San Diego Water Board of the intent to implement the alternative design criteria submitted; and

(ii) Comply with any conditions set by the San Diego Water Board.

d. BMP DESIGN MANUAL UPDATE

Each Copermittee must update its BMP Design Manual[29] pursuant to Provision F.2.b. Until the Copermittee has updated its BMP Design Manual with the requirements of Provisions E.3.a-c, the Copermittee must continue implementing its current BMP Design Manual. Unless directed otherwise by the San Diego Water Board, the Copermittee must implement the BMP Design Manual within 180 days of completing the update. The update of the BMP Design Manual must include the following:

(1) Updated procedures to determine the nature and extent of storm water requirements applicable to a potential development or redevelopment projects. These procedures must inform project applicants of the storm water management requirements applicable to their project including, but not limited to, general requirements for all development projects, structural BMP design procedures and requirements, hydromodification management requirements,

[29] The BMP Design Manual was formerly known as the Standard Storm Water Mitigation Plan under Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016.

requirements specific to phased projects, and procedures specific to private developments and public improvement projects;

(2) Updated procedures to identify pollutants and conditions of concern for selecting the most appropriate structural BMPs that consider, at a minimum, the following:

(a) Receiving water quality (including pollutants for which receiving waters are listed as impaired under the CWA section 303(d) List);

(b) Pollutants, stressors, and/or receiving water conditions that cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(c) Land use type of the project and pollutants associated with that land use type; and

(d) Pollutants expected to be present onsite.

(3) Updated procedures for designing structural BMPs, including any updated performance requirements to be consistent with the requirements of Provision E.3.c for all structural BMPs listed in the BMP Design Manual;

(4) Long-term maintenance criteria for each structural BMP listed in the BMP Design Manual; and

(5) Alternative compliance criteria, in accordance with the requirements under Provision E.3.c.(3), if the Copermittee elects to allow Priority Development Projects within its jurisdiction to utilize alternative compliance.

e. PRIORITY DEVELOPMENT PROJECT BMP IMPLEMENTATION AND OVERSIGHT

Each Copermittee must implement a program that requires and confirms structural BMPs on all Priority Development Projects are designed, constructed, and maintained to remove pollutants in storm water to the MEP.

(1) Structural BMP Approval and Verification Process

(a) Each Copermittee must require and confirm that for all Priority Development Project applications that have not received prior lawful approval by the Copermittee by 18 months after the commencement of coverage under this Order, the requirements of Provision E.3 are implemented. For project applications that have received prior lawful approval by 18 months after the commencement of coverage under this Order, the Copermittee may allow previous land development requirements to apply.

(b) Each Copermittee must identify the roles and responsibilities of its various

municipal departments in implementing the structural BMP requirements, including each stage of a project from application review and approval through BMP maintenance and inspections.

(c) Each Copermittee must require and confirm that appropriate easements and ownerships are properly recorded in public records and the information is conveyed to all appropriate parties when there is a change in project or site ownership.

(d) Each Copermittee must require and confirm that prior to occupancy and/or intended use of any portion of the Priority Development Project, each structural BMP is inspected to verify that it has been constructed and is operating in compliance with all of its specifications, plans, permits, ordinances, and the requirements of this Order.

(2) Priority Development Project Inventory and Prioritization

(a) Each Copermittee must develop, maintain, and update at least annually, a watershed-based database to track and inventory all Priority Development Projects and associated structural BMPs within its jurisdiction. Inventories must be accurate and complete beginning from ~~January~~ December 2002 for the San Diego County Copermittees, February 2003 for the Orange County Copermittees, and July 2005 for the Riverside County Copermittees. The use of an automated database system, such as GIS, is highly recommended. The database must include, at a minimum, the following information:

(i) Priority Development Project location (address and hydrologic subarea);

(ii) Descriptions of structural BMP type(s);

(iii) Date(s) of construction;

(iv) Party responsible for structural BMP maintenance;

(v) Dates and findings of structural BMP maintenance verifications; and

(vi) Corrective actions and/or resolutions, when applicable.

(b) Each Copermittee must prioritize the Priority Development Projects with structural BMPs within its jurisdiction. The designation of Priority Development Projects as high priority must consider the following:

(i) The highest water quality priorities identified in the Water Quality Improvement Plan;

(ii) Receiving water quality;

(iii) Number and sizes of structural BMPs;

(iv) Recommended maintenance frequency of structural BMPs;

(v) Likelihood of operation and maintenance issues of structural BMPs;

(vi) Land use and expected pollutants generated; and

(vii) Compliance record.

(3) Structural BMP Maintenance Verifications and Inspections

Each Copermittee is required to verify that structural BMPs on each Priority Development Project are adequately maintained, and continue to operate effectively to remove pollutants in storm water to the MEP through inspections, self-certifications, surveys, or other equally effective approaches.

(a) All (100 percent) of the structural BMPs at Priority Development Projects that are designated as high priority must be inspected directly by the Copermittee annually prior to each rainy season;

(b) For verifications performed through a means other than direct Copermittee inspection, adequate documentation must be required by the Copermittee to provide assurance that the required maintenance of structural BMPs at each Priority Development Project has been completed; and

(c) Appropriate follow-up measures (including re-inspections, enforcement, etc.) must be conducted to ensure that structural BMPs at each Priority Development Project continue to reduce pollutants in storm water to the MEP as originally designed.

f. DEVELOPMENT PROJECT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all development projects, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

~~g. STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS~~

~~Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the development planning program to address development and redevelopment projects that may become sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:~~

~~(1) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, increase frequency of verifications and/or inspections, alternative compliance options);~~

~~(2) Each Copermittee must identify areas within its jurisdiction where Priority~~

~~Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting and/or stream, channel, or habitat rehabilitation projects;~~

~~(3) Each Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify regional alternative compliance projects that Priority Development Projects may be allowed or should be encouraged to implement or participate in implementing; and~~

~~(4) The strategies and/or activities must be consistent with the requirements of Provisions E.3.a-c and E.3.e-f and the strategies identified in the Water Quality Improvement Plan.~~

4. Construction Management

Each Copermittee must implement a construction management program in accordance with the strategies ~~identified~~ in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. Project Approval Process

Prior to issuance of any local permit(s) that allows the commencement of construction projects that involve ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff, each Copermittee must:

(1) Require a ~~site-specific~~ pollution control plan, construction BMP plan, and/or an erosion and sediment control plan, to be submitted by the project applicant to the Copermittee;

(2) Confirm the pollution control plan, construction BMP plan, and/or erosion and sediment control plan, complies with the local grading ordinance, other applicable local ordinances, and the requirements of this Order;

(3) Confirm the pollution control, construction BMP, and/or erosion and sediment control plan, includes seasonally appropriate and effective BMPs and management measures described in Provision E.4.c, as applicable to the project; and

(4) Verify that the project applicant has obtained coverage under ~~applicable permits, including, but not limited to~~ the statewide Construction General Permit~~, Clean Water Act Section 401 Water Quality Certification and Section 404 Permit, and California Department of Fish and Game Streambed Alteration Agreement~~.

b. CONSTRUCTION SITE INVENTORY AND TRACKING

(1) Each Copermittee must maintain~~,~~ and update, at least ~~monthly~~ quarterly, a watershed-based inventory of all construction projects issued a local permit that allows ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff. The use of an automated database system, such as GIS, is highly recommended. The inventory must include:

(a) Relevant contact information for each site (e.g., name, address, phone, and email for the owner and contractor);

(b) The basic site information including location (address and hydrologic subarea), Waste Discharge Identification (WDID) number (if applicable), size of the site, and approximate area of disturbance;

(c) Whether or not the site is considered a high threat to water quality, as defined in Provision E.4.b.(2) below;

(d) The project start and ~~anticipated~~ completion dates;

~~(e) Current construction phase;~~

~~(f)~~
(e) The required inspection frequency, as defined in the Copermittee's jurisdictional runoff management program document;

~~(g)~~
(f) The date the Copermittee accepted ~~and/~~or approved the ~~site-specific~~ pollution control plan, construction BMP plan, and/or erosion and sediment control plan; and

~~(h)~~
(g) Whether or not there are ongoing enforcement actions administered to the site.

(2) Each Copermittee must identify all construction sites within its jurisdiction that represent a high threat to downstream surface water quality. The designation of construction sites as high threat to water quality must consider the following:

(a) Sites located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Sites located within the same hydrologic subarea and tributary to a water body segment listed as impaired for sediment on the CWA section 303(d) List;

(c) Sites located within, directly adjacent to, or discharging directly to a receiving water within an ESA; and

(d) Other sites determined by the Copermittees or the San Diego Water Board as a high threat to water quality.

c. CONSTRUCTION SITE BMP IMPLEMENTATION

Each Copermittee must implement, or require the implementation of effective BMPs to reduce discharges of pollutants in storm water from construction sites to the MEP, and ~~prevent~~ effectively prohibit non-storm water discharges from construction sites into the MS4. These BMPs must be site specific, seasonally appropriate, and construction phase appropriate. BMPs must be implemented at each construction site year round. Dry season BMP implementation must plan for and address unseasonal rain events that may occur during the dry season (May 1 through September 30). Copermittees must implement, or require the implementation of, BMPs in the following categories:

(1) Project Planning;

(2) Good Site Management "Housekeeping", including waste management;

(3) Non-storm Water Management;

(4) Erosion Control;

(5) Sediment Control;

(6) Run-on and Run-off Control; and

(7) Active/Passive Sediment Treatment Systems, where applicable.

d. CONSTRUCTION SITE INSPECTIONS

Each Copermittee must conduct construction site inspections to require and confirm compliance with its local permits and applicable local ordinances, and the requirements of this Order. Priority for site inspections must consider threat to water quality pursuant to Provision E.4.b as well as the nature of the construction activity, topography, and the characteristics of soils and receiving water quality.

(1) Inspection Frequency

(a) Each Copermittee must conduct inspections at all inventoried sites, including high threat to water quality sites, at an appropriate frequency for each phase of construction to ~~ensure~~ confirm the site reduces the discharge of pollutants in storm water from construction sites to the MEP, and ~~prevents~~ effectively prohibits non-storm water discharges from entering the MS4.

(b) Each Copermittee must establish appropriate inspection frequencies for high threat to water quality sites, and all other sites, for each phase of construction. Inspection frequencies appropriate for addressing the highest water quality priorities identified in the Water Quality Improvement Plan, and for complying with the requirements of this Order must be identified in each Copermittee's jurisdictional runoff management program document.

(c) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e., re-inspection, enforcement) necessary to require and confirm site compliance with its local permits and applicable local ordinances, and the requirements of this Order.

(2) Inspection Content

Inspections of construction sites by the Copermittee must include, at a minimum:

(a) Verification of coverage under the Construction General Permit (Notice of Intent (NOI) and/or WDID number) during initial inspections, when applicable;

(b) Assessment of compliance with its local permits and applicable local ordinances related to pollution prevention, including the implementation and maintenance of applicable BMPs;

(c) Assessment of BMP adequacy and effectiveness;

(d) Visual observations of actual non-storm water discharges;

(e) Visual observations of actual or potential discharge of sediment and/or construction related materials from the site;

(f) Visual observations of actual or potential illicit connections; and

(g) If any violations are found and BMP corrections are needed, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried construction sites. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Site name, location (address and hydrologic subarea), and WDID number (if applicable);

(b) Inspection date;

(c) Approximate amount of rainfall since last inspection;

(d) Description of problems observed with BMPs and indication of need for BMP addition/repair/replacement and any scheduled re-inspection, and date of re-inspection;

(e) Descriptions of any other specific inspection comments which must, at a minimum, include rationales for longer compliance time;

(f) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(g) Resolution of problems noted and date problems fixed.

e. CONSTRUCTION SITE ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried construction sites, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

~~**f. STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS**~~

~~Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the construction management program to address construction sites that the Copermittee has identified as potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:~~

~~(1) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, and/or increase/decrease frequency of inspections for specific types of sites and/or activities); and~~

~~(2) The strategies and/or activities must be consistent with the requirements of Provisions E.4.c-e and the strategies identified in the Water Quality Improvement Plan.~~

5. Existing Development Management

Each Copermittee must implement an existing development management program in accordance with the strategies ~~identified~~ in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. Existing Development Inventory and Tracking

Each Copermittee must maintain, and update at least annually, a watershed-based inventory of the existing development within its jurisdiction that may discharge a pollutant load to and from the MS4. The use of an automated database system, such as GIS, is highly recommended. The inventory must, at a minimum, include:

(1) Name, location (hydrological subarea and address, if applicable) of the following types of existing development with its jurisdiction:

(a) Commercial facilities or areas;

(b) Industrial facilities;

(c) Municipal facilities, including:

(i) MS4 and related structures,[30]

(ii) Roads, streets, and highways,

(iii) Parking facilities,

(iv) Municipal airfields,

(v) Parks and recreation facilities,

(vi) Flood management facilities, ~~and~~ flood control devices and structures,

(vii) Operating or closed municipal landfills,

(viii) Publicly owned treatment works (including water and wastewater treatment plants) and sanitary sewer collection systems,

(ix) Corporate yards, including maintenance and storage yards for materials, waste, equipment, and vehicles,

(x) Hazardous waste collection facilities,

(xi) Other treatment, storage or disposal facilities for municipal waste, and

[30] The inventory may refer to the MS4 map required to be maintained pursuant to Provision E.2.b.(1).

(xii) Other municipal facilities that the Copermittee determines may contribute a significant pollutant load to the MS4; and

(d) Residential areas, which may be designated by one or more of the following:

(i) Residential management area,

(ii) Drainage basin or area,

(iii) Land use (e.g., single family, multi-family, rural),

(iv) Neighborhood,

(v) Common Interest Area,

(vi) Home Owner Association,

(vii) Mobile home park, and/or

(viii) Other designations accepted by the San Diego Water Board Executive Officer.

(2) A description of the facility or area, including the following information:

(a) Classification as commercial, industrial, municipal, or residential;

(b) Status of facility or area as active or inactive;

(c) Identification if a business is a mobile business;

(d) SIC Code or NAICS Code, if applicable;

(e) Industrial General Permit NOI and/or WDID number, if applicable;

(f) Identification if a residential area is or includes a Common Interest Area / Home Owner Association, or mobile home park;

(g) Identification of pollutants generated and potentially generated by the facility or area;

(h) Whether the facility or area is adjacent to an ESA;

(i) Whether the facility or area is tributary to and within the same hydrologic subarea as a water body segment listed as impaired on the CWA section 303(d) List and generates pollutants for which the water body segment is impaired; and

~~(j) Whether the facility or area contributes or potentially contributes to the highest priority water quality conditions identified in the Water Quality~~

~~Improvement Plan.~~

(3) An annually updated map showing the location of inventoried existing development, watershed boundaries, and water bodies.

b. EXISTING DEVELOPMENT BMP IMPLEMENTATION AND MAINTENANCE

Each Copermittee must designate a minimum set of BMPs required for all inventoried existing development, including special event venues. The designated minimum BMPs must be specific to facility or area types and pollutant generating activities, as appropriate.

(1) Commercial, Industrial, and Municipal Facilities and Areas

(a) Pollution Prevention

Each Copermittee must require the use of pollution prevention methods by the commercial, industrial, and municipal facilities and areas in its inventoried existing development to address the priorities and strategies in the Water Quality Improvement Plan.

(b) BMP Implementation

Each Copermittee must ~~implement, or~~ require the implementation of~~,~~ designated BMPs at commercial facilities and areas, industrial facilities, and implement designated BMPs at municipal facilities in its inventoried existing development.

(c) BMP Operation and Maintenance

(i) Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development.

(ii) Each Copermittee must implement a schedule of operation and maintenance activities for its MS4 and related structures (including but not limited to catch basins, storm drain inlets, detention basins, etc.), and verify proper operation of all its municipal structural treatment controls designed to reduce pollutants (including floatables) in storm water discharges to or from its MS4s and related drainage structures. Operation and maintenance activities may include, but is not limited to, the following:

[a] Inspections of the MS4 and related structures;
[b] Cleaning of the MS4 and related structures; and
[c] Proper disposal of materials removed from cleaning of the MS4 and related structures.

(iii) Each Copermittee must implement a schedule of operation and maintenance for public streets, unpaved roads, paved roads, and paved highways ~~and freeways~~ within its jurisdiction to minimize pollutants that can be discharged in storm water.

(iv) Each Copermittee must implement controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers. Copermittees that operate both a municipal sanitary sewer system and a MS4 must implement controls and measures to prevent and eliminate seeping sewage from infiltrating the MS4. Copermittees that do not operate both a municipal sanitary sewer system and a MS4 must coordinate with sewering agencies to keep themselves informed of relevant and appropriate maintenance activities and sanitary sewage projects in their jurisdiction that may cause or contribute to seepage of sewage into the MS4.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must ~~implement BMPs, or~~ require the implementation of BMPs~~,~~ to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from commercial facilities and areas~~,~~ and industrial facilities, and implement BMPs at municipal facilities in its inventoried existing development. Such BMPs must include, as appropriate, educational activities, permits, certifications and other measures for applicators and distributors.

(2) Residential Areas

(a) Pollution Prevention

Each Copermittee must promote and encourage the use of pollution prevention methods, where appropriate, by the residential areas in its inventoried existing development.

(b) BMP Implementation

Each Copermittee must promote and encourage the implementation of designated BMPs at residential areas in its inventoried existing development.

(c) BMP Operation and Maintenance

Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at residential areas in its inventoried existing development.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must promote and encourage the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from residential areas in its inventoried existing development.

c. EXISTING DEVELOPMENT INSPECTIONS

Each Copermittee must conduct inspections of inventoried existing development to ensure compliance with applicable local ordinances and permits, and the requirements of this Order.

(1) Inspection Frequency

(a) Each Copermittee must establish appropriate inspection frequencies for inventoried existing development in accordance with the following requirements:

(i) At a minimum, inventoried existing development must be inspected once every five years utilizing one or more of the following methods:

[a] Drive-by inspections by Copermittee municipal and contract staff,
[b] Onsite inspections by Copermittee municipal and contract staff, and/or
[c] Visual ~~i~~inspections of publicly accessible inventoried facilities or areas by volunteer monitoring or patrol programs that have been trained by the Copermittee;

(ii) The frequency of inspections must be appropriate to confirm that BMPs are being implemented to reduce the discharge of pollutants in storm water from the MS4 to the MEP and effectively prohibit non-storm water discharges to the MS4;

(iii) The frequency of inspections must be based on the potential for a facility or area to discharge non-storm water and pollutants in storm water, and should reflect the priorities set forth in the Water Quality Improvement Plan;

(iv) Each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development;[31] and

[31] If any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspection may count toward the total annual inspection requirement.

(v) Inventoried existing development must be inspected by the Copermittee, as needed, in response to valid public complaints ~~and findings from the Copermittee's municipal and contract staff or volunteer monitoring or patrol program inspections~~.

(b) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e. education and outreach, re-inspection, enforcement) necessary to require and confirm compliance with its applicable local ordinances and permits and the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

(2) Inspection Content

(a) Inspections of existing development ~~by the Copermittee or volunteer monitoring or patrol programs~~ must include, at a minimum:

(i) Visual inspections for the presence of actual non-storm water discharges;

(ii) Visual inspections for the presence of actual or potential discharge of pollutants;

(iii) Visual inspections for the presence of actual or potential illicit connections; and

(iv) Verification that the description of the facility or area in the inventory, required pursuant to Provision E.5.a.(2), has not changed.

(b) Onsite inspections of existing development by the Copermittee must include, at a minimum:

(i) Assessment of compliance with its applicable local ordinances and permits related to non-storm water and storm water discharges and runoff;

(ii) Assessment of the implementation of the designated BMPs;

(iii) Verification of coverage under the Industrial General Permit, when applicable; and

(iv) If any problems or violations are found, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

This requirement excludes linear municipal facilities (i.e., MS4 linear channels, sanitary sewer collection systems, streets, roads and highways).

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried existing development. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Name and location of facility or area (address and hydrologic subarea) consistent with the inventory name and location, pursuant to Provision E.5.a.(1);

(b) Inspection and re-inspection date(s);

(c) Inspection method(s) (i.e. drive-by, onsite);

(d) Observations and findings from the inspection(s);

(e) For onsite inspections of existing development by Copermittee municipal or contract staff, the records must also include, as applicable:

(i) Description of any problems or violations found during the inspection(s),

(ii) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6, and

(iii) The date problems or violations were resolved.

d. EXISTING DEVELOPMENT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried existing development, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

e. RETROFITTING AND REHABILITATING AREAS OF EXISTING DEVELOPMENT ~~STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS~~

~~Each Copermittee must implement the water quality improvement strategies, where necessary, to address areas of existing development within its jurisdiction that are identified as sources of pollutants and/or stressors contributing to the highest priority water quality conditions in the Watershed Management Area. For the existing development management program, the following strategies must be implemented:~~

~~(1) Specific Existing Development Management Program Strategies~~

~~Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented within its jurisdiction to address areas of existing development that the Copermittee has identified as sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:~~

~~(a) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, and/or increase/decrease frequency of inspections for specific types of facilities, areas and/or activities);~~

~~(b) The facilities and/or areas within the Copermittee's jurisdiction where the strategies and/or activities will be implemented; and~~

~~(c) The strategies and/or activities must be consistent with the requirements of Provisions E.5.b-d and the strategies identified in the Water Quality Improvement Plan.~~

~~(2)~~
(1) Retrofitting Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to retrofit areas of existing development within its jurisdiction to address identified sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify areas of existing development as candidates for retrofitting, focusing on areas where retrofitting will address pollutants and/or stressors that contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for retrofitting projects may be utilized to reduce pollutants that may be discharged in storm water from areas of existing development, and/or address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of retrofitting projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting projects; and

(e) Where retrofitting projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional retrofitting projects (i.e. projects that can receive and/or treat storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment) adjacent to and/or downstream of the areas of existing development.

~~(3)~~
(2) Stream, Channel and/or Habitat Rehabilitation in Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to rehabilitate streams, channels, and/or habitats in areas of existing development within its jurisdiction to address the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify streams, channels, and/or habitats in areas of existing development as candidates for rehabilitation, focusing on areas where stream, channel, and/or habitat rehabilitation projects will address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for stream, channel, and/or habitat rehabilitation projects may be utilized to address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters, rehabilitate channelized or hydromodified streams, restore wetland and riparian habitat, restore watershed functions, and/or restore beneficial uses of receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of stream, channel, and/or habitat rehabilitation projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance stream, channel, and/or habitat rehabilitation projects; and

(e) Where stream, channel, and/or habitat rehabilitation projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with

other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional stream, channel, and/or habitat rehabilitation projects (i.e. projects that can receive storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment).

6. Enforcement Response Plans

Each Copermittee must develop and implement an Enforcement Response Plan as part of its jurisdictional runoff management program document. The Enforcement Response Plan must describe the applicable approaches and options to enforce its legal authority established pursuant to Provision E.1, as necessary, to achieve compliance with the requirements of this Order. The Enforcement Response Plan must be in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include the following:

a. Enforcement Response Plan Components

The Enforcement Response Plan must include the following individual components:

(1) Illicit Discharge Detection and Elimination Enforcement Component;

(2) Development Planning Enforcement Component;

(3) Construction Management Enforcement Component; and

(4) Existing Development Enforcement Component.

b. Enforcement Response Approaches and Options

Each component of the Enforcement Response Plan must describe the enforcement response approaches that the Copermittee will implement to compel compliance with its statutes, ordinances, permits, contracts, orders, or similar means, and the requirements of this Order. The description must include the protocols for implementing progressively stricter enforcement responses. The enforcement response approaches must include appropriate sanctions to compel compliance, including, at a minimum, the following tools or their equivalent:

(1) Verbal and written notices of violation;

(2) Cleanup requirements;

(3) Fines;

(4) Bonding requirements;

(5) Administrative and criminal penalties;

(6) Liens;

(7) Stop work orders; and

(8) Permit and occupancy denials.

c. CORRECTION OF VIOLATIONS

(1) Violations must be corrected in a timely manner with the goal of correcting the violations within 30 calendar days after the violations are discovered, or prior to the next predicted rain event, whichever is sooner.

(2) If more than 30 calendar days are required to achieve compliance, then a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

d. ESCALATED ENFORCEMENT

(1) The Enforcement Response Plan must include a definition of "escalated enforcement." Escalated enforcement must include any enforcement scenario where a violation or other non-compliance is determined to cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan. Escalated enforcement may be defined differently for development planning, construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas.

(2) Where the Copermittee determines escalated enforcement is not required, a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

(3) Escalated enforcement actions must continue to increase in severity, as necessary, to compel compliance as soon as possible.

e. REPORTING OF NON-COMPLIANT SITES

(1) Each Copermittee must notify the San Diego Water Board in writing within ~~2 working~~ five (5) calendar days of issuing escalated enforcement (as defined in the Copermittee's Enforcement Response Plan) to a construction site that poses a significant threat to water quality as a result of violations or other non-compliance with its permits and applicable local ordinances, and the requirements of this Order. Written notification may be provided electronically by email to the appropriate San Diego Water Board staff.

(2) Each Copermittee must notify the San Diego Water Board ~~of non-filers~~ any

persons required to obtain coverage under the statewide Industrial General Permit and Construction General Permit and failing to do so, within five (5) calendar days from the time the Copermittee become aware of the circumstances. Written notification may be provided electronically by email to Nonfilers_R9@waterboards.ca.gov.

7. Public Education and Participation

Each Copermittee must implement, individually or with other Copermittees, a public education and participation program in accordance with the strategies identified in the Water Quality Improvement Plan to promote and encourage the development of programs, management practices, and behaviors that reduce the discharge of pollutants in storm water to the MEP, prevent controllable non-storm water discharges from entering the MS4, and protect water quality standards in receiving waters. The public education and participation program must be implemented in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include, at a minimum, the following requirements:

a. Public Education

The public education program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) Educational activities, public information activities, and other appropriate outreach activities intended to reduce pollutants associated with the application of pesticides, herbicides and fertilizer and other pollutants of concern in storm water discharges to and from its MS4 to the MEP, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed to address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(2) Educational activities, public information activities, and other appropriate outreach activities to facilitate the proper management and disposal of used oil and toxic materials; and

(3) Appropriate education and training measures for specific target audiences, such as construction site operators, residents, underserved target audiences and school-aged children, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed, based on high risk behaviors and pollutants of concern.

b. Public Participation

The public participation program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) A process for members of the public to participate in updating the highest priority water quality conditions, numeric goals, and water quality improvement strategies in the Water Quality Improvement Plan.

(2) Opportunities for members of the public to participate in providing the Copermittee recommendations for improving the effectiveness of the water quality improvement strategies implemented within its jurisdiction.

(3) Opportunities for members of the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or ~~restoration and~~ protection of the quality of receiving waters.

~~c. STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS~~

~~Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented within its jurisdiction, as applicable, to educate the public and encourage public participation to address potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:~~

~~(1) The target audiences and/or areas within the Copermittee's jurisdiction where the strategies and/or activities will be implemented;~~

~~(2) Provide specific details about how the strategies and/or activities will be implemented (e.g. educational topics, materials and/or activities, public outreach and participation programs and/or opportunities);~~

~~(3) Each Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify and implement regional public education and participation activities, programs and opportunities;~~

~~(4) Each Copermittee must incorporate a mechanism for evaluating and assessing educational and other public outreach activities, as needed, to identify progress and incorporate modifications necessary to increase the effectiveness of the public education and participation program.~~

8. Fiscal Analysis

a. Each Copermittee must secure the resources necessary to meet all the requirements of this Order.

b. Each Copermittee must conduct an annual fiscal analysis of its jurisdictional runoff management program in its entirety. The fiscal analysis must include the

following:

(1) Identification of the various categories of expenditures necessary to implement the requirements of this Order, including a description of the specific capital, operation and maintenance, and other expenditure items to be accounted for in each category of expenditures;

(2) The staff resources needed and allocated to meet the requirements of this Order, including any development, implementation, and enforcement activities required;

(3) The estimated expenditures for Provisions E.8.b.(1) and E.8.b.(2) for the current fiscal year; and

(4) The source(s) of funds that are proposed to meet the necessary expenditures described in Provisions E.8.b.(1) and E.8.b.(2), including legal restrictions on the use of such funds, for the current fiscal year and next fiscal year.

c. Each Copermittee must submit a summary of the annual fiscal analysis with each Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.

d. Each Copermittee must provide the documentation used to develop the summary of the annual fiscal analysis upon request by the San Diego Water Board.

F. REPORTING

The purpose of this provision is to determine and document compliance with the requirements set forth in this Order. The goal of reporting is to communicate to the San Diego Water Board and the people of the State of California the implementation status of each jurisdictional runoff management program and compliance with the requirements of this Order. This goal is to be accomplished through the submittal of specific deliverables to the San Diego Water Board by the Copermittees.

1. Water Quality Improvement Plans

The Copermittees for each Watershed Management Area must develop and submit the Water Quality Improvement Plan in accordance with the following requirements:

a. WATER QUALITY IMPROVEMENT PLAN DEVELOPMENT

Each Water Quality Improvement Plan must be developed in accordance with the following process:

(1) Public Participation Process

The Copermittees must implement a public participation process to solicit data, information, and recommendations to be utilized in the development of the Water Quality Improvement Plan. The public participation process must include the following:

(a) The Copermittees must develop a publicly available and noticed schedule of the opportunities for the public to participate and provide comments during the development of the Water Quality Improvement Plan. The schedule may be adjusted as necessary by the Copermittees, provided the public is provided timely notification of the changes to the schedule.

(b) The Copermittees must form a Water Quality Improvement Consultation Panel to provide recommendations during the development of the Water Quality Improvement Plan. The Water Quality Improvement Consultation Panel must consist of at least the following members:

(i) A representative of the San Diego Water Board,

(ii) A representative of the environmental community familiar with the water quality conditions of concern of the receiving waters in the Watershed Management Area, preferably from an environmental interest group associated with a water body within the Watershed Management Area, and

(iii) A representative of the development community familiar with the opportunities and constraints for implementing structural BMPs, retrofitting projects, and stream, channel or habitat rehabilitation

projects in the Watershed Management Area, preferably with relevant engineering, hydrology, and/or geomorphology experience in the Watershed Management Area.

(c) The Copermittees must coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public as much time and opportunity as possible to participate during the development of the Water Quality Improvement Plans.

~~(1)~~
(2) Priority Water Quality Conditions ~~and Numeric Goals~~

(a) The Copermittees must ~~implement a public participation process to~~ solicit data, ~~and~~ information and recommendations from the public to be utilized in the development and identification of the priority water quality conditions and potential water quality improvement strategies for the Watershed Management Area.

(b) The Copermittees ~~are encouraged to involve the public and key stakeholders as early and often as possible during the development of~~ must review the priority water quality conditions ~~and numeric goals to be~~ the Copermittees plan on including~~ed~~ in the Water Quality Improvement Plan with the Water Quality Improvement Consultation Panel to receive recommendations or concurrence.

(c) The Copermittees must consider revisions to the priority water quality conditions based on recommendations from the Water Quality Improvement Consultation Panel.

(d) The Copermittees must include all the potential water quality improvement strategies identified by the public and the Water Quality Improvement Consultation Panel with the submittal of the priority water quality conditions to the San Diego Water Board.

~~(c)~~
(e) ~~Within 6 months after the commencement of coverage under this Order, t~~The Copermittees must ~~develop and~~ submit the Water Quality Improvement Plan requirements of Provision B.2 to the San Diego Water Board as early as 6 months and no later than 12 months after the commencement of coverage under this Order. Upon receipt, ~~T~~the San Diego Water Board will issue a public notice and ~~solicit public comments on the Water Quality Improvement Plan~~ release the proposed priority water quality conditions and potential water quality improvement strategies for public review and comment for a minimum of 30 ~~60~~ days.

~~(d)~~
(f) The Copermittees must ~~revise~~ consider revisions to the priority water

quality conditions and ~~numeric goals~~ potential water quality improvement strategies developed pursuant to Provision B.2 based on public comments received by the close of the comment period ~~and/or recommendations or direction from the San Diego Water Board Executive Officer~~.

~~(2)~~
(3) Water Quality Improvement Goals, Strategies and Schedules

(a) The Copermittees must solicit recommendations from the public on potential numeric goals for the highest priority water quality conditions identified for the Watershed Management Area, and recommendations on the strategies that should be implemented to achieve the potential numeric goals.

~~(a)~~
(b) The Copermittees ~~are encouraged to involve the public and key stakeholders as early and often as possible during the development of the water quality improvement strategies and schedules to be included in the Water Quality Improvement Plan.~~must consult with the Water Quality Improvement Consultation Panel and consider revisions to the following items based on the Panel's recommendations:

(i) The numeric goals and schedules the Copermittees propose to include in the Water Quality Improvement Plan;

(ii) The water quality improvement strategies and schedules the Copermittees propose to implement in the Watershed Management Area and include in the Water Quality Improvement Plan;

(iii) If the Copermittees choose to implement Provision B.3.b.(4), the results of the Watershed Management Area Analysis the Copermittees proposed to incorporate into the Water Quality Improvement Plan; and

(iv) If the Copermittees choose to implement Provision B.3.c, the numeric goals proposed pursuant to Provision B.3.c.(1), the analysis performed pursuant to Provision B.3.c.(2) and the specific monitoring and assessments proposed pursuant to Provision B.3.c.(3).

~~(b)~~
(c) ~~Within 9 months after the commencement of coverage under this Order, t~~The Copermittees must ~~develop and~~ submit the Water Quality Improvement Plan requirements of Provision B.3 to the San Diego Water Board as early as 9 months and no later than 18 months after the commencement of coverage under this Order. Upon receipt, ~~T~~the San Diego Water Board will issue a public notice ~~and solicit public comments on the Water Quality Improvement Plan~~ release the proposed water quality improvement goals, strategies and schedules for public review and

comment for a minimum of 30 ~~60~~ days.

~~(c)~~
(d) The Copermittees must ~~revise~~ consider revisions to the water quality improvement goals, strategies and schedules developed pursuant to Provision B.3 based on public comments received by the close of the comment period ~~and/or recommendations or direction from the San Diego Water Board Executive Officer~~.

b. WATER QUALITY IMPROVEMENT PLAN SUBMITTAL AND IMPLEMENTATION

(1) Within ~~18~~ 24 months after the commencement of coverage under this Order, the Copermittees for each Watershed Management Area must submit a complete Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order to the San Diego Water Board. The San Diego Water Board will issue a public notice and ~~solicit public comments on~~ release the Water Quality Improvement Plan for public review and comment for a minimum of 30 days.

(2) The Copermittees must consider revisions to the Water Quality Improvement Plan based on written comments received by the close of the public comment period.

(3) The Copermittees must promptly submit any revisions to the Water Quality Improvement Plan to the San Diego Water Board no later than 60 days of the close of the public comment period.

~~(2)~~
(4) If issues concerning the Water Quality Improvement Plan are resolved informally through discussions among the Copermittees, the San Diego Water Board and interested parties, the San Diego Water Board Executive Officer may provide written certification to the Copermittees that the Water Quality Improvement Plan meets the requirements of Provision B. However, if the Executive Officer determines that significant issues with the Water Quality Improvement Plan remain, the matter will be scheduled for San Diego Water Board consideration at a public meeting. ~~Based on the comments received, the San Diego Water Board will determine whether to hold a public hearing or to limit public input to submittal of written comments. If no hearing is held the San Diego Water Board will notify the Copermittees within 6 months that the Water Quality Improvement Plan has been accepted as complete following its review and determination that the Water Quality Improvement Plan meets the requirements of this Order.~~

(5) The Copermittees must commence with implementation of the Water Quality Improvement Plan, in accordance with the water quality improvement strategies and schedules therein, upon written notification of concurrence with

the Water Quality Improvement Plan by the San Diego Water Board Executive Officer.

(7) During implementation of the Water Quality Improvement Plan after implementation the Copermittees must correct any deficiencies in the Plan identified by the San Diego Water Board no later than 90 days following a request by the Board to do so.

(8) The Water Quality Improvement Plan must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of ~~acceptance~~ receiving notification of concurrence with the Water Quality Improvement Plan by the San Diego Water Board Executive Officer.

2. Updates

a. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATES

Each Copermittee must update its jurisdictional runoff management program document in accordance with the following requirements:

(1) Each Copermittee is encouraged to ~~involve the~~ seek public and key stakeholder participation and comments, as early and often as possible ~~to solicit recommendations for~~ during the process of developing updates to its jurisdictional runoff management program document.

(2) Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E no later than ~~18~~ 3 months after San Diego Water Board notification of concurrence with the Water Quality Improvement Plan ~~the commencement of coverage under this Order~~.

(3) Each Copermittee must submit updates to its jurisdictional runoff management program, with ~~a~~ the supporting rationale for the modifications, either in the Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge required pursuant to Provision F.5.b.

(4) The Copermittee must revise ~~the~~ proposed modifications to its jurisdictional runoff management program as directed by the San Diego Water Board Executive Officer.

(5) Updated jurisdictional runoff management program documents must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of submitting the Water Quality Improvement Plan Annual Report.

b. BMP DESIGN MANUAL UPDATES

Each Copermittee must update its BMP Design Manual in accordance with the following requirements:

(1) Each Copermittee must update its BMP Design Manual to incorporate the requirements of Provisions E.3.a-d no later than ~~18~~ 3 months after San Diego Water Board notification of concurrence with the Water Quality Improvement Plan by the San Diego Water Board Executive Officer ~~the commencement of coverage under this Order~~.

(2) Subsequent updates to the BMP Design Manual must be consistent with the requirements of Provisions E.3.a-d and must be submitted as part of the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge required pursuant to Provision F.5.b.

(3) Updated BMP Design Manuals must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of completing the update.

c. WATER QUALITY IMPROVEMENT PLAN UPDATES

(1) The Water Quality Improvement Plans must be updated in accordance with the following process:

~~(1)~~ (a) The Copermittees must develop and implement a public participation process to ~~solicit~~ obtain data, ~~and~~ information and recommendations ~~to be utilized in~~ for updating the Water Quality Improvement Plan. The public participation process must provide for a publicly available and noticed schedule of opportunities for the public to participate and provide comments during the development of updates to the Water Quality Improvement Plan.

~~(2)~~ (b) The Copermittees ~~are encouraged to involve the public and key stakeholders as early and often as possible during the~~ must consult with the Water Quality Improvement Consultation Panel on proposed updates ~~to~~ of the Water Quality Improvement Plan, and consider the Water Quality Improvement Consultation Panel's recommendations in finalizing the proposed updates.

~~(3)~~ (c) The Copermittees for each Watershed Management Area must submit ~~requested~~ 1) proposed updates to the Water Quality Improvement Plan and supporting rationale, ~~with the public input~~ and 2) recommendations received from the public and the Water Quality Improvement Consultation Panel and the rationale for the requested updates, either in the Water

Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The ~~requested~~ updates submitted will be deemed accepted for inclusion in the Water Quality Improvement Plan ninety (90) days after submission unless otherwise directed in writing by the San Diego Water Board Executive Officer ~~are considered accepted by the San Diego Water Board if no response is provided to the Copermittee after 3 months of submitting the request~~.

~~(4)~~ (d) The Copermittees must revise the requested updates as directed by the San Diego Water Board Executive Officer.

~~(5)~~ (e) Updated Water Quality Improvement Plans must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance of the requested updates by the San Diego Water Board.

(2) No later that six months following Office of Administrative Law and USEPA approval of any TMDL Basin Plan amendment with wasteload allocations (WLAs) assigned to the Copermittees during the term of this Order, the Copermittees must initiate an update to the applicable Water Quality Improvement Plans in accordance with Provision F.1 or Provision F.2.c.(1) to incorporate the requirements of the TMDL WLAs.

3. Progress Reporting

a. Progress Report Presentations

The Copermittees for each Watershed Management Area must periodically appear before the San Diego Water Board, as requested by the ~~San Diego Water~~ Board, to provide progress reports on the implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs.

b. Annual Reports

(1) Transitional Jurisdictional Runoff Management Program Annual Reports

(a) Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D of this Order or a revised form accepted by the San Diego Water Board) no later than October 31 of each year for each jurisdictional runoff management program reporting period (i.e. July 1 to June 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted.

(b) Each Copermittee must submit the information on the Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D of

this Order or a revised form accepted by the San Diego Water Board) specific to the area within its jurisdiction in each Watershed Management Area.

(c) In addition to submitting the Jurisdictional Runoff Management Program Annual Report Form during the transitional reporting period, each Copermittee may continue to utilize and submit the jurisdictional runoff management program annual reporting format of its previous NPDES permit until the first Water Quality Improvement Plan Annual Report is required to be submitted.

(2) Transitional Monitoring and Assessment Program Annual Reports

The Copermittees for each Watershed Management Area must submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted under this Order. The Transitional Monitoring and Assessment Program Annual Reports must include:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1.a and D.2.a, summarized and presented in tabular and graphical form; and

(b) The findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

(3) Water Quality Improvement Plan Annual Reports

The Copermittees for each Watershed Management Area must submit a~~n~~ Water Quality Improvement Plan Annual Report for each reporting period no later than January 31 of the following year. The annual reporting period consists of two different periods: 1) July 1 to June 30 of the following year for the jurisdictional runoff management programs, 2) October 1 to September 30 of the following year for the monitoring and assessment programs. ~~The first Annual Report must be prepared for the reporting period beginning July 1 after commencement of coverage under this Order, and upon San Diego Water Board determination that the Water Quality Improvement Plan meets the requirements of this Order to June 30 in the following year for the jurisdictional runoff management programs, and September 30 in the following year for the monitoring and assessment programs.~~ The Water Quality Improvement Plan Annual Reports must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Each Annual Report must include the following:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, summarized and presented in tabular and graphical form;

(b) The ~~P~~progress of the special studies required pursuant to Provision D.3, and the ~~results or~~ findings, interpretations and conclusions of ~~when~~ a special study, or each phase of a special study, upon its completion ~~is completed~~;

(c) The findings, interpretations and conclusions from the assessments required pursuant to Provision D.4;

(d) The progress of implementing the Water Quality Improvement Plan, including, but not limited to, the following:

(i) The progress toward achieving the interim and final numeric goals for the highest water quality priorities for the Watershed Management Area,

(ii) The water quality improvement strategies that were implemented and/or no longer implemented by each of the Copermittees during the reporting period and previous reporting periods,

(iii) The water quality improvement strategies ~~and are~~ planned ~~to be~~ for implemention~~ed~~ during the next reporting period,

~~(iii)~~
(iv) Proposed modifications to the water quality improvement strategies, ~~with~~ the public ~~input~~ comments received and the supporting rationale for the proposed modifications,

~~(iv)~~
(v) Previous~~ly proposed~~ modifications or updates incorporated into the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document and implemented by the Copermittees in the Watershed Management Area, and

~~(v)~~
(vi) Proposed modifications or updates to the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document;

(e) A completed Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D of this Order or a revised form accepted ~~revision~~ by the San Diego Water Board) for each Copermittee in the Watershed Management Area, certified by a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative.

(f) Each Copermittee must provide any data or documentation utilized in developing the Water Quality Improvement Plan Annual Report upon request by the San Diego Water Board. Any Copermittee monitoring data utilized in developing the Water Quality Improvement Plan Annual Report must be uploaded to the California Environmental Data Exchange Network (CEDEN).[32] Any Copermittee monitoring and assessment data utilized in developing the Water Quality Improvement Plan Annual Report must be available for access on the Regional Clearinghouse required pursuant to Provision F.4.

~~(2) Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (Attachment D or accepted revision) no later than October 31 of each year until the first Annual Report is required to be submitted. Each Copermittee must submit the information on the Jurisdictional Runoff Management Program Annual Report Form specific to the area within its jurisdiction in each Watershed Management Area.~~

~~(3) Each Copermittee must provide any data or documentation utilized in developing the Annual Report upon request by the San Diego Water Board. Any monitoring data utilized in developing the Annual Report must be uploaded to the California Environmental Data Exchange Network (CEDEN). Any monitoring and assessment data utilized in developing the Annual Report must be provided on the Regional Clearinghouse required pursuant to Provision F.4.~~

c. Regional Monitoring and Assessment Report

(1) The Copermittees must submit a Regional Monitoring and Assessment Report no later than 180 days ~~in advance of~~ prior to the expiration date of this Order. The Regional Monitoring and Assessment Report may be submitted as part of the Report of Waste Discharge required pursuant to Provision F.5.b. ~~The~~ In preparing the report the Copermittees must ~~review~~ consider the receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, and the findings, interpretations and conclusions from the assessments required pursuant to Provision D.4.~~, to~~ Based on the consideration the report must assess the following:

(a) The beneficial uses of the receiving waters within the San Diego Region that are ~~protected~~ supported and not adversely affected by the Copermittees' MS4 discharges ~~or must be restored~~;

[32] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

(b) The beneficial uses of the receiving waters within the San Diego Region that are adversely impacted by the Copermittees' MS4 discharges;

~~(b)~~
(c) The progress toward ~~restoring impacted~~ protecting the beneficial uses in the receiving waters within the San Diego Region from the Copermittees' discharges; and

~~(c)~~
(d) Pollutants or conditions of emerging concern that may impact beneficial uses in the receiving waters within the San Diego Region.

(2) The Regional Monitoring and Assessment Report must include recommendations for improving the implementation and assessment of the Water Quality Improvement Plans and jurisdictional runoff management programs.

(3) Each Copermittee must provide any data or documentation utilized in developing the Regional Monitoring and Assessment Report upon request by the San Diego Water Board. Any Copermittee monitoring and assessment data utilized in developing the Regional Monitoring and Assessment Report must be ~~provided~~ available for access on the Regional Clearinghouse required pursuant to Provision F.4.

4. Regional Clearinghouse

The Copermittees must develop, update, and maintain an internet-based Regional Clearinghouse that is made available to the public no later than 18 months after the effective date of this Order.[33]

a. The Copermittees, through the Regional Clearinghouse, must make the following documents and data available for access, and organized by Watershed Management Area.~~, which~~ The documents and data may be linked to other internet-based data portals and databases where the original documents are stored:

(1) Water Quality Improvement Plan for the Watershed Management Area, and all updated versions with date of update;

(2) Annual Reports for the Watershed Management Area;

(3) Jurisdictional Runoff Management Program document for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

[33] The Copermittees may develop, update and maintain the clearinghouse(s) of other Copermittees or agencies.

(4) BMP Design Manual for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(5) Reports from special studies (e.g. source identification, BMP effectiveness assessment) conducted in the Watershed Management Area;

(6) Monitoring data collected pursuant to Provision D for each Watershed Management Area must be uploaded to CEDEN,[34] with links to the uploaded data; and

(7) Available GIS data, layers, and/or shapefiles used to develop the maps generated and maintained by the Copermittees for the Water Quality Improvement Plans, Annual Reports, and jurisdictional runoff management program documents.

b. The Copermittees, through the Regional Clearinghouse, must make the following information and documents available for access:

(1) Contact information (point of contact, phone number, email address, and mailing address) for each Copermittee;

(2) Public hotline number for reporting non-storm water and illicit discharges for each Copermittee;

(3) Email address for reporting non-storm water and illicit discharges for each Copermittee;

(4) Link to each Copermittee's website, if available, where the public may find additional information about the Copermittee's storm water management program and for requesting records for the implementation of its program;

(5) Information about opportunities for the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or ~~restoration and~~ protection of the quality of receiving waters; and

(6) Reports from regional monitoring programs in which the Copermittees participate (e.g. Southern California Monitoring Coalition, Southern California Coastal Water Research Project Bight Monitoring);

(7) Regional Monitoring and Assessment Reports; and

(8) Any other information, data, and documents the Copermittees determine as appropriate for making available to the public.

[34] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

5. Report of Waste Discharge

a. The Orange County Copermittees and the Riverside County Copermittees are required to submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders. The San Diego Water Board will review and consider the Reports of Waste Discharge to determine whether modification to this Order, pursuant to the requirements of Provision H, will be required prior to the Orange County Copermittees and/or Riverside County Copermittees ~~becoming covered~~ obtaining coverage under this Order. The current Orders for the Orange County Copermittees and Riverside County Copermittees are rescinded upon ~~notification~~ the date of effective coverage under this Order except for enforcement purposes.

b. The Copermittees subject to the requirements of this Order must submit to the San Diego Water Board a complete Report of Waste Discharge as an application for the re-issuance of this Order and NPDES permit. The Report of Waste Discharge must be submitted no later than 180 days in advance of the expiration date of this Order. The Report of Waste Discharge must contain the following minimum information:

(1) Names and addresses of the Copermittees;

(2) Names and titles of the primary contacts of the Copermittees;

(3) Proposed changes to the Copermittees' Water Quality Improvement Plans and the supporting justification;

(4) Proposed changes to the Copermittees' jurisdictional runoff management programs and the supporting justification;

(5) Any other information necessary for the re-issuance of this Order;

(6) Any information to be included as part of the Report of Waste Discharge pursuant to the requirements of this Order; and

(7) Any other information required by federal regulations for NPDES permit reissuance.

6. Application for Early Coverage

a. The Orange County Copermittees, collectively, or Riverside County Copermittees, collectively, may apply for early coverage under this Order by submitting a Report of Waste Discharge Form 200, with a written request for early coverage under this Order.

b. The San Diego Water Board will review the application for early coverage. A notification of coverage under this Order will be issued to the Copermittees in the respective county by the San Diego Water Board upon completion of the early

coverage application requirements. The effective coverage date will be specified in the notification of coverage. The Copermittees in the respective county are authorized to have MS4 discharges pursuant to the requirements of this Order starting on the effective coverage date specified in the notification of coverage. The existing Order for the respective county is rescinded upon the effective coverage date specified in the notification of coverage except for enforcement purposes.

7. Reporting Provisions

Each Copermittee must comply with all the reporting and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

G. PRINCIPAL WATERSHED COPERMITTEE RESPONSIBILITIES

1. The Copermittees within each Watershed Management Area must designate a Principal Watershed Copermittee and notify the San Diego Water Board of the name of the Principal Watershed Copermittee. An individual Copermittee should not be designated a Principal Watershed Copermittee for more than two Watershed Management Areas. The notification may be submitted with the Water Quality Improvement Plan required pursuant to Provision F.1 of this Order.

2. The Principal Watershed Copermittee is responsible for, at a minimum, the following:

a. Serving as liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues, and when necessary and appropriate, representing the Copermittees in the Watershed Management Area before the San Diego Water Board.

b. Facilitating the development of the Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order

c. Coordinating the submittal of the deliverables required by Provisions F.1, F.2, F.3.a, and F.3.b of this Order.

d. Coordinating and developing, with the other Principal Watershed Copermittees, the requirements of Provisions F.3.c, F.4, and F.5.b of this Order.

3. The Principal Watershed Copermittee is not responsible for ensuring that the other Copermittees within the Watershed Management Area are in compliance with the requirements of this Order. Each Copermittee within the Watershed Management Area is responsible for complying with the requirements of this Order.

H. MODIFICATION OF ORDER ~~PROGRAMS~~

1. Modifications of the Order may be initiated by the San Diego Water Board or by the Copermittees. Requests by Copermittees must be made to the San Diego Water Board.

2. Minor modifications to the Order may be made by the San Diego Water Board where the proposed modification complies with all the prohibitions and limitations, and other requirements of this Order.

3. This Order may also be re-opened and modified, revoked and, reissued or terminated in accordance with the provisions of 40 CFR 122.44, 122.62 to 122.64, and 124.5. Causes for taking such actions include, but are not limited to, failure to comply with any condition of this Order and permit, and endangerment to human health or the environment resulting from the permitted activity. ~~Proposed modifications to the Order that are not minor require amendment of this Order in accordance with this Order's rules, policies, and procedures.~~

4. ~~The San Diego Water Board may re-open and modify t~~This Order ~~at any time prior to its expiration, after opportunity for public comment and a public hearing,~~ may be re-opened for modification for cause including but not limited to the following:

   a. ~~if t~~The State Water Board determines that revisions are warranted, and the San Diego Water Board concurs that revisions are necessary to those provisions of the Order addressing compliance with water quality standards in the receiving water and/or those provisions of the Order establishing an iterative process for implementation of management practices to assure compliance with water quality standards in the receiving water;

   b. An application for early coverage under this Order is received pursuant to Provision F.6;

   c. Any of the TMDLs in Attachment E to this Order are amended in the Basin Plan by San Diego Water Board, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA;

   d. The Basin Plan is amended by San Diego Water Board to incorporate a new TMDL, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA; or

   e. Updating or revising the monitoring and reporting requirements is determined to be necessary, at the discretion of the San Diego Water Board. Such modification(s) may include, but is (are) not limited to, revision(s) to: (i) implement recommendations from Southern California Coastal Water Research Project (SCCWRP), (ii) develop, refine, implement, and/or coordinate a regional monitoring program, (iii) develop and implement improved monitoring and

assessment programs in keeping with San Diego Water Board Resolution No. R9-2012-0069, Resolution in Support of a Regional Monitoring Framework, and/or (iv) add provisions to require the Copermittees to evaluate and provide information on cost and values of the monitoring and reporting program..

5. The San Diego Water Board, after opportunity for public comment and a public hearing, will re-open and consider modifications to this Order when the Orange County Copermittees or the Riverside County Copermittees submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders.

I. STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

Each Copermittee must comply with all the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

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ATTACHMENT A

DISCHARGE PROHIBITIONS AND SPECIAL PROTECTIONS

1. Basin Plan Waste Discharge Prohibitions

California Water Code Section 13243 provides that a Regional Water Board, in a water quality control plan, may specify certain conditions or areas where the discharge of waste or certain types of waste is not permitted. The following waste discharge prohibitions in the Water Quality Control Plan for the San Diego Basin (Basin Plan) are applicable to any person, as defined by Section 13050(c) of the California Water Code, who is a citizen, domiciliary, or political agency or entity of California whose activities in California could affect the quality of waters of the state within the boundaries of the San Diego Region.

1. The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in California Water Code Section 13050, is prohibited.

2. The discharge of waste to land, except as authorized by waste discharge requirements or the terms described in California Water Code Section 13264 is prohibited.

3. The discharge of pollutants or dredged or fill material to waters of the United States except as authorized by a National Pollutant Discharge Elimination System (NPDES) permit or a dredged or fill material permit (subject to the exemption described in California Water Code Section 13376) is prohibited.

4. Discharges of recycled water to lakes or reservoirs used for municipal water supply or to inland surface water tributaries thereto are prohibited, unless this San Diego Water Board issues a NPDES permit authorizing such a discharge; the proposed discharge has been approved by the State Department of Health Services (DHS) and the operating agency of the impacted reservoir; and the discharger has an approved fail-safe long-term disposal alternative.

5. The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the San Diego Water Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

6. The discharge of waste in a manner causing flow, ponding, or surfacing on lands not owned or under the control of the discharger is prohibited, unless the discharge is authorized by the San Diego Water Board.

7. The dumping, deposition, or discharge of waste directly into waters of the state, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the San Diego Water Board.

8. Any discharge to a storm water conveyance system that is not composed entirely of "*storm water*" is prohibited unless authorized by the San Diego Water Board. [The federal regulations, 40 CFR 122.26(b)(13), define storm water as storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from fire fighting activities.] [§122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

9. The unauthorized discharge of treated or untreated sewage to waters of the state or to a storm water conveyance system is prohibited.

10. The discharge of industrial wastes to conventional septic tank/subsurface disposal systems, except as authorized by the terms described in California Water Code Section 13264, is prohibited.

11. The discharge of radioactive wastes amenable to alternative methods of disposal into the waters of the state is prohibited.

12. The discharge of any radiological, chemical, or biological warfare agent into waters of the state is prohibited.

13. The discharge of waste into a natural or excavated site below historic water levels is prohibited unless the discharge is authorized by the San Diego Water Board.

14. The discharge of sand, silt, clay, or other earthen materials from any activity, including land grading and construction, in quantities which cause deleterious bottom deposits, turbidity or discoloration in waters of the state or which unreasonably affect, or threaten to affect, beneficial uses of such waters is prohibited.

15. The discharge of treated or untreated sewage from vessels to Mission Bay, Oceanside Harbor, Dana Point Harbor, or other small boat harbors is prohibited.

16. The discharge of untreated sewage from vessels to San Diego Bay is prohibited.

17. The discharge of treated sewage from vessels to portions of San Diego Bay that are less than 30 feet deep at mean lower low water (MLLW) is prohibited.

18. The discharge of treated sewage from vessels, which do not have a properly functioning US Coast Guard certified Type I or Type II marine sanitation device, to portions of San Diego Bay that are greater than 30 feet deep at mean lower low water (MLLW) is prohibited.

2. Attachment B to State Water Board Resolution 2012-0012

Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges

I. PROVISIONS FOR POINT SOURCE DISCHARGES OF STORM WATER AND NONPOINT SOURCE WASTE DISCHARGES

The following terms, prohibitions, and special conditions (hereafter collectively referred to as special conditions) are established as limitations on point source storm water and nonpoint source discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in Areas of Special Biological Significance (ASBS), as required for State Water Quality Protection Areas pursuant to California Public Resources Code Sections 36700(f) and 36710(f). These Special Protections are adopted by the State Water Board as part of the California Ocean Plan (Ocean Plan) General Exception.

The special conditions are organized by category of discharge. The State Water Resources Control Board (State Water Board) and Regional Water Quality Control Boards (Regional Water Boards) will determine categories and the means of regulation for those categories [e.g., Point Source Storm Water National Pollutant Discharge Elimination System (NPDES) or Nonpoint Source].

A. PERMITTED POINT SOURCE DISCHARGES OF STORM WATER

1. General Provisions for Permitted Point Source Discharges of Storm Water

   a. Existing storm water discharges into an ASBS are allowed only under the following conditions:

      (1) The discharges are authorized by an NPDES permit issued by the State Water Board or Regional Water Board;

      (2) The discharges comply with all of the applicable terms, prohibitions, and special conditions contained in these Special Protections; and

      (3) The discharges:

         (i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

         (ii) Are designed to prevent soil erosion;

         (iii) Occur only during wet weather;

         (iv) Are composed of only storm water runoff.

   b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

   c. The discharge of trash is prohibited.

d. Only discharges from existing storm water outfalls are allowed. Any proposed or new storm water runoff discharge shall be routed to existing storm water discharge outfalls and shall not result in any new contribution of waste to an ASBS (i.e., no additional pollutant loading). “Existing storm water outfalls” are those that were constructed or under construction prior to January 1, 2005. “New contribution of waste” is defined as any addition of waste beyond what would have occurred as of January 1, 2005. A change to an existing storm water outfall, in terms of re-location or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges are prohibited except as provided below:

(1) The term “non-storm water discharges” means any waste discharges from a municipal separate storm sewer system (MS4) or other NPDES permitted storm drain system to an ASBS that are not composed entirely of storm water.

(2) (i) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability or occur naturally:

(a) Discharges associated with emergency fire fighting operations.

(b) Foundation and footing drains.

(c) Water from crawl space or basement pumps.

(d) Hillside dewatering.

(e) Naturally occurring groundwater seepage via a storm drain.

(f) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(ii) An NPDES permitting authority may authorize non-storm water discharges to an MS4 with a direct discharge to an ASBS only to the extent the NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

2. Compliance Plans for Inclusion in Storm Water Management Plans (SWMP) and Storm Water Pollution Prevention Plans (SWPPP).

The discharger shall specifically address the prohibition of non-storm water runoff and the requirement to maintain natural water quality for storm water discharges to an ASBS in an ASBS Compliance Plan to be included in its SWMP or a SWPPP, as appropriate to permit type. If a statewide permit includes a SWMP, then the discharger shall prepare a stand-alone compliance plan for ASBS discharges. The ASBS Compliance Plan is subject to approval by the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (for permits issued by Regional Water Boards).

a. The Compliance Plan shall include a map of surface drainage of storm water runoff, showing areas of sheet runoff, prioritize discharges, and describe any structural Best Management Practices (BMPs) already employed and/or BMPs to be employed in the future. Priority discharges are those that pose the greatest water quality threat and which are identified to require installation of structural BMPs. The map shall also show the storm water conveyances in relation to other features such as service areas, sewage conveyances and treatment facilities, landslides, areas prone to erosion, and waste and hazardous material storage areas, if applicable. The SWMP or SWPPP shall also include a procedure for updating the map and plan when changes are made to the storm water conveyance facilities.

b. The ASBS Compliance Plan shall describe the measures by which all non-authorized non-storm water runoff (e.g., dry weather flows) has been eliminated, how these measures will be maintained over time, and how these measures are monitored and documented.

c. For Municipal Separate Storm Sewer System (MS4s), the ASBS Compliance Plan shall require minimum inspection frequencies as follows:

   (1) The minimum inspection frequency for construction sites shall be weekly during rainy season;

   (2) The minimum inspection frequency for industrial facilities shall be monthly during the rainy season;

   (3) The minimum inspection frequency for commercial facilities (e.g., restaurants) shall be twice during the rainy season; and

   (4) Storm water outfall drains equal to or greater than 18 inches (457 mm) in diameter or width shall be inspected once prior to the beginning of the rainy season and once during the rainy season and maintained to remove trash and other anthropogenic debris.

d. The ASBS Compliance Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff, that are necessary to comply with these special conditions, will be achieved through BMPs. Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that such installation would pose a threat to health or safety. BMPs to control storm water runoff discharges (at the end-of-pipe) during a design storm shall be designed to achieve on average the following target levels:

   (1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

   (2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges. The baseline for the reduction is the effective date of the Exception. The baseline for these determinations is the effective date of the Exception, and the

reductions must be achieved and documented within four (4) years of the effective date.

e. The ASBS Compliance Plan shall address erosion control and the prevention of anthropogenic sedimentation in ASBS. The natural habitat conditions in the ASBS shall not be altered as a result of anthropogenic sedimentation.

f. The ASBS Compliance Plan shall describe the non-structural BMPs currently employed and planned in the future (including those for construction activities), and include an implementation schedule. The ASBS Compliance Plan shall include non-structural BMPs that address public education and outreach. Education and outreach efforts must adequately inform the public that direct discharges of pollutants from private property not entering an MS4 are prohibited. The ASBS Compliance Plan shall also describe the structural BMPs, including any low impact development (LID) measures, currently employed and planned for higher threat discharges and include an implementation schedule. To control storm water runoff discharges (at the end-of-pipe) during a design storm, permittees must first consider using LID practices to infiltrate, use, or evapotranspirate storm water runoff on-site.

g. The BMPs and implementation schedule shall be designed to ensure that natural water quality conditions in the receiving water are achieved and maintained by either reducing flows from impervious surfaces or reducing pollutant loading, or some combination thereof.

h. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents in storm water runoff that alter natural ocean water quality and the sources of these constituents.

(2) The report shall describe BMPs that are currently being implemented, BMPs that are identified in the SWMP or SWPPP for future implementation, and any additional BMPs that may be added to the SWMP or SWPPP to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the BMPs.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits), the discharger shall revise its ASBS Compliance Plan to incorporate any new or modified BMPs that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised SWMP or SWPPP, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural ocean water quality conditions due to the same constituent.

(5) Compliance with this section does not excuse violations of any term, prohibition, or condition contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within one year from the effective date of the Exception, the discharger shall submit a written ASBS Compliance Plan to the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that describes its strategy to comply with these special conditions, including the requirement to maintain natural water quality in the affected ASBS. The ASBS Compliance Plan shall include a time schedule to implement appropriate non-structural and structural controls (implementation schedule) to comply with these special conditions for inclusion in the discharger's SWMP or SWPPP, as appropriate to permit type.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these special conditions shall be implemented.

d. Within four (4) years of the effective date of the Exception, any structural controls identified in the ASBS Compliance Plan that are necessary to comply with these special conditions shall be operational.

e. Within four (4) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water, pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data, and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

   If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

   The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

(1) for municipalities, a demonstration of significant hardship to discharger ratepayers, by showing the relationship of storm water fees to annual household income for residents within the discharger's jurisdictional area, and the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or
(2) for other governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process.

B. NONPOINT SOURCE DISCHARGES

[NOT INCLUDED]
[PROVISIONS FOR NONPOINT SOURCE DISCHARGES NOT APPLICABLE]

II. ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES

[NOT INCLUDED]
[ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES NOT APPLICABLE]

III. ADDITIONAL REQUIREMENTS – WATERFRONT AND MARINE OPERATIONS

[NOT INCLUDED]
[ADDITIONAL REQUIREMENTS FOR WATERFRONT AND MARINE OPERATIONS NOT APPLICABLE]

IV. MONITORING REQUIREMENTS

Monitoring is mandatory for all dischargers to assure compliance with the Ocean Plan. Monitoring requirements include both: (A) core discharge monitoring, and (B) ocean receiving water monitoring. The State and Regional Water Boards must approve sampling site locations and any adjustments to the monitoring programs. All ocean receiving water and reference area monitoring must be comparable with the Water Boards' Surface Water Ambient Monitoring Program (SWAMP).

Safety concerns: Sample locations and sampling periods must be determined considering safety issues. Sampling may be postponed upon notification to the State and Regional Water Boards if hazardous conditions prevail.

Analytical Chemistry Methods: All constituents must be analyzed using the lowest minimum detection limits comparable to the Ocean Plan water quality objectives. For metal analysis, all samples, including storm water effluent, reference samples, and ocean receiving water samples, must be analyzed by the approved analytical method with the lowest minimum detection limits (currently Inductively Coupled Plasma/Mass Spectrometry) described in the Ocean Plan.

A. CORE DISCHARGE MONITORING PROGRAM

1. General sampling requirements for timing and storm size:

   Runoff must be collected during a storm event that is greater than 0.1 inch and generates runoff, and at least 72 hours from the previously measurable storm event. Runoff samples shall be collected when post-storm receiving water is sampled, and analyzed for the same constituents as receiving water and reference site samples (see section IV B) as described below.

2. Runoff flow measurements

   a. For municipal/industrial storm water outfalls in existence as of December 31, 2007, 18 inches (457mm) or greater in diameter/width (including multiple outfall pipes in combination having a width of 18 inches, runoff flows must be measured or calculated, using a method acceptable to and approved by the State and Regional Water Boards.
   b. This will be reported annually for each precipitation season to the State and Regional Water Boards.

3. Runoff samples – storm events

   a. For outfalls equal to or greater than 18 inches (0.46m) in diameter or width:

      (1) samples of storm water runoff shall be analyzed during the same storm as receiving water samples for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination, ; and

      (2) samples of storm water runoff shall be analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS

      (3) If an applicant has no outfall greater than 36 inches, then storm water runoff from the applicant's largest outfall shall be further analyzed during the same storm as receiving water samples for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates).

   b. For outfalls equal to or greater than 36 inches (0.91m) in diameter or width:

      (1) samples of storm water runoff shall be analyzed during the same storm as receiving water samples for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

      (2) samples of storm water runoff shall be further analyzed during the same storm as receiving water samples for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates) and

(3) samples of storm water runoff shall be analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

c. For an applicant not participating in a regional monitoring program [see below in Section IV (B)] in addition to (a.) and (b.) above, a minimum of the two largest outfalls or 20 percent of the larger outfalls, whichever is greater, shall be sampled (flow weighted composite samples) at least three times annually during wet weather (storm event) and analyzed for all Ocean Plan Table A constituents, Table B constituents for marine aquatic life protection (except for toxicity, only chronic toxicity for three species shall be required), DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, and Ocean Plan indicator bacteria. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one (the largest) such discharge shall be sampled annually in each Region.

4. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may reduce or suspend core monitoring once the storm runoff is fully characterized. This determination may be made at any point after the discharge is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

B. OCEAN RECEIVING WATER AND REFERENCE AREA MONITORING PROGRAM

In addition to performing the Core Discharge Monitoring Program in Section II.A above, all applicants having authorized discharges must perform ocean receiving water monitoring. In order to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS, dischargers may choose either (1) an individual monitoring program, or (2) participation in a regional integrated monitoring program.

1. Individual Monitoring Program: The requirements listed below are for those dischargers who elect to perform an individual monitoring program to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within the affected ASBS. In addition to Core Discharge Monitoring, the following additional monitoring requirements shall be met:

   a. Three times annually, during wet weather (storm events), the receiving water at the point of discharge from the outfalls described in section (IV)(A)(3)(c) above shall be sampled and analyzed for Ocean Plan Table A constituents, Table B constituents for marine aquatic life, DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, salinity, chronic toxicity (three species), and Ocean Plan indicator bacteria.

      The sample location for the ocean receiving water shall be in the surf zone at the point of discharges; this must be at the same location where storm water runoff is sampled. Receiving water shall be sampled at approximately the same time prior to (pre-storm) and during (or immediately after) the same storm (post storm). Reference water quality shall also be sampled and analyzed for the same constituents pre-storm and post-storm, during the same storms when receiving water is sampled. Reference stations will be determined by the State Water Board's Division of Water Quality and the applicable Regional Water Board(s).

b. Sediment sampling shall occur at least three times during every five (5) year period. The subtidal sediment (sand or finer, if present) at the discharge shall be sampled and analyzed for Ocean Plan Table B constituents for marine aquatic life, DDT, PCBs, PAHs, pyrethroids, and OP pesticides. For sediment toxicity testing, only an acute toxicity test using the amphipod Eohaustorius estuarius must be performed.

c. A quantitative survey of intertidal benthic marine life shall be performed at the discharge and at a reference site. The survey shall be performed at least once every five (5) year period. The survey design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The results of the survey shall be completed and submitted to the State Water Board and Regional Water Board at least six months prior to the end of the permit cycle.

d. Once during each five (5) year period, a bioaccumulation study shall be conducted to determine the concentrations of metals and synthetic organic pollutants at representative discharge sites and at representative reference sites. The study design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The bioaccumulation study may include California mussels (Mytilus californianus) and/or sand crabs (Emerita analoga or Blepharipoda occidentalis). Based on the study results, the Regional Water Board and the State Water Board's Division of Water Quality, may adjust the study design in subsequent permits, or add or modify additional test organisms (such as shore crabs or fish), or modify the study design appropriate for the area and best available sensitive measures of contaminant exposure.

e. Marine Debris: Representative quantitative observations for trash by type and source shall be performed along the coast of the ASBS within the influence of the discharger's outfalls. The design, including locations and frequency, of the marine debris observations is subject to approval by the Regional Water Board and State Water Board's Division of Water Quality.

f. The monitoring requirements of the Individual Monitoring Program in this section are minimum requirements. After a minimum of one (1) year of continuous water quality monitoring of the discharges and ocean receiving waters, the Executive Director of the State Water Board (statewide permits) or Executive officer of the Regional Water Board (Regional Water Board permits) may require additional monitoring, or adjust, reduce or suspend receiving water and reference station monitoring. This determination may be made at any point after the discharge and receiving water is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

2. Regional Integrated Monitoring Program: Dischargers may elect to participate in a regional integrated monitoring program, in lieu of an individual monitoring program, to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS. This regional approach shall characterize natural water quality, pre- and post-storm, in ocean reference areas near the mouths of identified open space watersheds and the effects of the discharges on natural water quality (physical, chemical, and toxicity) in the ASBS receiving waters, and should include benthic marine aquatic life and bioaccumulation components. The design of the ASBS stratum of a regional integrated monitoring program may deviate from the otherwise prescribed individual monitoring approach (in Section IV.B.1) if approved by the State Water Board's Division of Water Quality and the Regional Water Boards.

a. Ocean reference areas shall be located at the drainages of flowing watersheds with minimal development (in no instance more than 10% development), and shall not be located in CWA Section 303(d) listed waterbodies or have tributaries that are 303(d) listed. Reference areas shall be free of wastewater discharges and anthropogenic non-storm water runoff. A minimum of low threat storm runoff discharges (e.g. stream highway overpasses and campgrounds) may be allowed on a case-by-case basis. Reference areas shall be located in the same region as the ASBS receiving water monitoring occurs. The reference areas for each Region are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean reference water samples must be collected from each station, each from a separate storm. A minimum of one reference location shall be sampled for each ASBS receiving water site sampled per responsible party. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

b. ASBS ocean receiving water must be sampled in the surf zone at the location where the runoff makes contact with ocean water (i.e. at "point zero"). Ocean receiving water stations must be representative of worst-case discharge conditions (i.e. co-located at a large drain greater than 36 inches, or if drains greater than 36 inches are not present in the ASBS then the largest drain greater than18 inches.) Ocean receiving water stations are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean receiving water samples must be collected during each storm season from each station, each from a separate storm. A minimum of one receiving water location shall be sampled in each ASBS per responsible party in that ASBS. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

c. Reference and receiving water sampling shall commence during the first full storm season following the adoption of these special conditions, and post-storm samples shall be collected when annual storm water runoff is sampled. Sampling shall occur in a minimum of two storm seasons. For those ASBS dischargers that have already participated in the Southern California Bight 2008 ASBS regional monitoring effort, sampling may be limited to only one storm season.

d. Receiving water and reference samples shall be analyzed for the same constituents as storm water runoff samples. At a minimum, constituents to be sampled and analyzed in reference and discharge receiving waters must include oil and grease, total suspended solids, Ocean Plan Table B metals for protection of marine life, Ocean Plan PAHs, pyrethroids, OP pesticides, ammonia, nitrate, phosphates, and critical life stage chronic toxicity for three species. In addition, within the range of the southern sea otter, indicator bacteria or some other measure of fecal contamination shall be analyzed.

3. Waterfront and Marine Operations: In addition to the above requirements for ocean receiving water monitoring, additional monitoring must be performed for marinas and boat launch and pier facilities:

a. For all marina or mooring field operators, in mooring fields with 10 or more occupied moorings, the ocean receiving water must be sampled for Ocean Plan indicator bacteria, residual chlorine, copper, zinc, grease and oil, methylene blue active substances (MBAS), and ammonia nitrogen.

   (1) For mooring field operators opting for an individual monitoring program (Section IV.B.1 above), this sampling must occur weekly (on the weekend) from May through October.

   (2) For mooring field operators opting to participate in a regional integrated monitoring program (Section IV.B.2 above), this sampling must occur monthly from May through October on a high use weekend in each month. The Water Boards may allow a reduction in the frequency of sampling, through the regional monitoring program, after the first year of monitoring.

b. For all mooring field operators, the subtidal sediment (sand or finer, if present) within mooring fields and below piers shall be sampled and analyzed for Ocean Plan Table B metals (for marine aquatic life beneficial use), acute toxicity, PAHs, and tributyltin. For sediment toxicity testing, only an acute toxicity test using the amphipod Eohaustorius estuarius must be performed. This sampling shall occur at least three times during a five (5) year period. For mooring field operators opting to participate in a regional integrated monitoring program, the Water Boards may allow a reduction in the frequency of sampling after the first sampling effort's results are assessed.

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ATTACHMENT B

STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

1. Standard Permit Provisions

Code of Federal Regulations Title 40 Section 122.41 (40 CFR 122.41) includes conditions, or provisions, that apply to all National Pollutant Discharge Elimination System (NPDES) permits. Additional provisions applicable to NPDES permits are in 40 CFR 122.42. All applicable provisions in 40 CFR 122.41 and 40 CFR 122.42 must be incorporated into this Order and NPDES permit. The applicable 40 CFR 122.41 and 40 CFR 122.42 provisions are as follows:

a. DUTY TO COMPLY [40 CFR 122.41(a)]

The Copermittee must comply with all of the provisions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

(1) The Copermittee must comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement. [40 CFR 122.41(a)(1)]

(2) The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to a civil penalty not to exceed $25,000 per day for each violation. The CWA provides that any person who *negligently* violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than 2 years, or both. Any person who *knowingly* violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both. Any person who knowingly violates Section 301, 302, 303, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, and who knows at that time that he thereby places another person in imminent danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of

not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.
[40 CFR 122.41(a)(2)]

(3) Any person may be assessed an administrative penalty by the San Diego Regional Water Quality Control Board (San Diego Water Board), State Water Resources Control Board (State Water Board), or United States Environmental Protection Agency (USEPA) for violating Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.
[40 CFR 122.41(a)(3)]

b. DUTY TO REAPPLY [40 CFR 122.41(b)]

If a Copermittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Copermittee must apply for and obtain a new permit.

c. NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE [40 CFR 122.41(c)]

It shall not be a defense for a Copermittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

d. DUTY TO MITIGATE [40 CFR 122.41(d)]

The Copermittee must take all reasonable steps to minimize or prevent any discharge or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

e. PROPER OPERATION AND MAINTENANCE [40 CFR 122.41(e)]

The Copermittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Copermittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by a Copermittee only when the operation is necessary to achieve compliance with the conditions of this permit.

f. PERMIT ACTIONS [40 CFR 122.41(f)]

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Copermittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

g. PROPERTY RIGHTS [40 CFR 122.41(g)]

This permit does not convey any property rights of any sort, or any exclusive privilege.

h. DUTY TO PROVIDE INFORMATION [40 CFR 122.41(h)]

The Copermittee must furnish to the San Diego Water Board, State Water Board, or USEPA within a reasonable time, any information which the San Diego Water Board, State Water Board, or USPEA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Copermittee must also furnish to the San Diego Water Board, State Water Board, or USPEA upon request, copies of records required to be kept by this permit.

i. INSPECTION AND ENTRY [40 CFR 122.41(i)]

The Copermittee must allow the San Diego Water Board, State Water Board, USEPA, and/or their authorized representative (including an authorized contractor acting as their representative), upon presentation of credentials and other documents as may be required by law, to:

(1) Enter upon the Copermittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit; [40 CFR 122.41(i)(1)]

(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit; [40 CFR 122.41(i)(2)]

(3) Inspect and photograph at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; [40 CFR 122.41(i)(3)] and

(4) Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location. [40 CFR 122.41(i)(4)]

j. MONITORING AND RECORDS [40 CFR 122.41(j)]

(1) Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity. [40 CFR 122.41(j)(1)]

(2) Except for records of monitoring information required by this permit related to the Copermittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five (5) years (or longer as required by 40 CFR Part 503), the

Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time. [40 CFR 122.41(j)(2)]

(3) Records for monitoring information must include: [40 CFR 122.41(j)(3)]

(a) The date, exact place, and time of sampling or measurements; [40 CFR 122.41(j)(3)(i)]
(b) The individual(s) who performed the sampling or measurements; [40 CFR 122.41(j)(3)(ii)]
(c) The date(s) analyses were performed; [40 CFR 122.41(j)(3)(iii)]
(d) The individual(s) who performed the analyses; [40 CFR 122.41(j)(3)(iv)]
(e) The analytical techniques or methods used; [40 CFR 122.41(j)(3)(v)] and
(f) The results of such analyses. [40 CFR 122.41(j)(3)(vi)]

(4) Monitoring must be conducted according to test procedures under 40 CFR Part 136 unless another method is required under 40 CFR Subchapters N or O. [40 CFR 122.41(j)(4)]

In the case of pollutants for which there are no approved methods under 40 CFR Part 136 or otherwise required under 40 CFR Subchapters N and O, monitoring must be conducted according to a test procedure specified in the permit for such pollutants. [40 CFR 122.44(i)(1)(iv)]

(5) The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. [40 CFR 122.41(j)(5)]

k. SIGNATORY REQUIREMENT [40 CFR 122.41(k)]

(1) All applications, reports, or information submitted to the San Diego Water Board, State Water Board, or USEPA must be signed and certified. (See 40 CFR 122.22) [40 CFR 122.41(k)(1)]

(a) *For a municipality, State, Federal, or other public agency.* [All applications must be signed] [b]y either a principal executive officer or ranking elected official. [40 CFR 122.22(a)(3)]

(b) All reports required by permits, and other information requested by the San Diego Water Board, State Water Board, or USEPA must be signed by a person described in paragraph (a) of this section, or by a duly authorized representative of that person. A person is a duly authorized representative only if: [40 CFR 122.22(b)]

(i) The authorization is made in writing by a person described in paragraph (a) of this section; [40 CFR 122.22(b)(1)]

(ii) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company, (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) [40 CFR 122.22(b)(2)] and,

(iii) The written authorization is submitted to the San Diego Water Board and State Water Board. [40 CFR 122.22(b)(3)]

(c) *Changes to authorization.* If an authorization under paragraph (b) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (b) of this section must be submitted to the San Diego Water Board prior to or together with any reports, information, or applications to be signed by an authorized representative. [40 CFR 122.22(c)]

(d) *Certification.* Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." [40 CFR 122.22(d)]

(2) The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both. [40 CFR 122.41(k)(2)]

I. REPORTING REQUIREMENTS [40 CFR 122.41(l)]

(1) *Planned changes.* The Copermittee must give notice to the San Diego Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when: [40 CFR 122.41(l)(1)]

(a) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); [40 CFR 122.41(l)(1)(i)] or

(b) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which

are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1).
[40 CFR 122.41(l)(1)(ii)]

(c) The alteration or addition results in a significant change in the Copermittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. [40 CFR 122.41(l)(1)(iii)]

(2) *Anticipated noncompliance*. The Copermittee must give advance notice to the San Diego Water Board or State Water Board of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.
[40 CFR 122.41(l)(2)]

(3) *Transfers*. This permit is not transferable to any person except after notice to the San Diego Water Board. The San Diego Water Board may require modification or revocation and reissuance of the permit to change the name of the Copermittee and incorporate such other requirements as may be necessary under the CWA.
[40 CFR 122.41(l)(3)]

(4) *Monitoring reports.* Monitoring results must be reported at the intervals specified elsewhere in this permit. [40 CFR 122.41(l)(4)]

(a) Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the San Diego Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices. [40 CFR 122.41(l)(4)(i)]

(b) If the Copermittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or another method required for an industry-specific waste stream under 40 CFR Subchapters N or O, the results of this monitoring must be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the San Diego Water Board or State Water Board.
[40 CFR 122.41(l)(4)(ii)]

(c) Calculations for all limitations which require averaging of measurements must utilize an arithmetic mean unless otherwise specified in the permit.
[40 CFR 122.41(l)(4)(iii)]

(5) *Compliance schedules*. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date. [40 CFR 122.41(l)(5)]

(6) *Twenty-four hour reporting.*

(a) The Copermittee must report any noncompliance that may endanger health or the environment. Any information must be provided orally within 24 hours from the time the Copermittee becomes aware of the circumstances. A written submission must also be provided within five (5) days of the time the Copermittee becomes aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6)(i)]

(b) The following must be included as information which must be reported within 24 hours under this paragraph: [40 CFR 122.41(l)(6)(ii)]

(i) Any unanticipated bypass that exceeds any effluent limitation in the permit (See 40 CFR 122.41(g)). [40 CFR 122.41(l)(6)(ii)(A)]
(ii) Any upset which exceeds any effluent limitation in the permit. [40 CFR 122.41(l)(6)(ii)(B)] and,
(iii) Violation of a maximum daily discharge limitation for any of the pollutants listed by the San Diego Water Board in the permit to be reported within 24 hours. (See 40 CFR 122.44(g)) [40 CFR 122.41(l)(6)(ii)(C)]

(c) The San Diego Water Board may waive the above-required written report on a case-by-case basis if the oral report has been received within 24 hours. [40 CFR 122.41(l)(6)(iii)]

(7) *Other noncompliance.* The Copermittee must report all instances of noncompliance not reported in accordance with the standard provisions required under 40 CFR 122.41(l)(4), (5), and (6), at the time monitoring reports are submitted. The reports must contain the information listed in the standard provisions required under 40 CFR 122.41(l)(6). [40 CFR 122.41(l)(7))]

(8) *Other information.* When the Copermittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the San Diego Water Board, State Water Board, or USEPA, the Copermittee must promptly submit such facts or information. [40 CFR 122.41(l)(8)]

m. BYPASS [40 CFR 122.41(m)]

(1) *Definitions.*

(a) "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. [40 CFR 122.41(m)(1)(i)] or

(b) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be

expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
[40 CFR 122.41(m)(1)(ii)]

(2) *Bypass not exceeding limitations*. The Copermittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the standard provisions required under 40 CFR 122.41(m)(3) and (4).
[40 CFR 122.41(m)(2)]

(3) *Notice.*

(a) *Anticipated bypass*. If the Copermittee knows in advance of the need for a bypass, it must submit a notice, if possible at least ten days before the date of the bypass. [40 CFR 122.41(m)(3)(i)] or

(b) *Unanticipated bypass*. The Copermittee must submit notice of an unanticipated bypass in accordance with the standard provisions required under 40 CFR 122.41(l)(6) (24-hour notice).
[40 CFR 122.41(m)(3)(ii)]

(4) *Prohibition of Bypass.*

(a) Bypass is prohibited, and the San Diego Water Board may take enforcement action against a Copermittee for bypass, unless:
[40 CFR 122.41(m)(4)(i)]

(i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; [40 CFR 122.41(m)(4)(i)(A)]
(ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance;
[40 CFR 122.41(m)(4)(i)(B)] and,
(iii) The Copermittee submitted notice in accordance with the standard provisions required under 40 CFR 122.41(m)(3).
[40 CFR 122.41(m)(4)(i)(C)]

(b) The San Diego Water Board may approve an anticipated bypass, after considering its adverse effects, if the San Diego Water Board determines that it will meet the three conditions listed above.
[40 CFR 122.41(m)(4)(ii)]

n. UPSET [40 CFR 122.41(n)]

(1) *Definition.* "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Copermittee. An upset does not

include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. [40 CFR 122.41(n)(1)]

(2) *Effect of an upset*. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the standard provisions required under 40 CFR 122.41(n)(3) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. [40 CFR 122.41(n)(2)]

(3) *Conditions necessary for a demonstration of upset*. A Copermittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that: [40 CFR 122.41(n)(3)]

(a) An upset occurred and that the Copermittee can identify the cause(s) of the upset; [40 CFR 122.41(n)(3)(i)]
(b) The permitted facility was at the time being properly operated; [40 CFR 122.41(n)(3)(ii)] and
(c) The Copermittee submitted notice of the upset in accordance with the standard provisions required under 40 CFR 122.41(l)(6)(ii)(B) (24-hour notice). [40 CFR 122.41(n)(3)(iii)]
(d) The Copermittee complied with any remedial measures pursuant to the standard provisions required under 40 CFR 122.41(d). [40 CFR 122.41(n)(3)(iii)]

(4) *Burden of proof*. In any enforcement proceeding, the Copermittee seeking to establish the occurrence of an upset has the burden of proof. [40 CFR 122.41(n)(4)]

o. STANDARD PERMIT PROVISIONS FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS [40 CFR 122.42(c)]

The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the San Diego Water Board or State Water Board under 40 CFR 122.26(a)(1)(v) must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report must include:

(1) The status of implementing the components of the storm water management program that are established as permit conditions; [40 CFR 122.42(c)(1)]

(2) Proposed changes to the storm water management programs that are established as permit conditions. Such proposed changes must be consistent with 40 CFR 122.26(d)(2)(iii); [40 CFR 122.42(c)(2)] and

(3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under 40 CFR 122.26(d)(2)(iv) and (v); [40 CFR 122.42(c)(3)]

(4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; [40 CFR 122.42(c)(4)]

(5) Annual expenditures and budget for year following each annual report; [40 CFR 122.42(c)(5)]

(6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; [40 CFR 122.42(c)(6)]

(7) Identification of water quality improvements or degradation. [40 CFR 122.42(c)(7)]

p. STANDARD PERMIT PROVISIONS FOR STORM WATER DISCHARGES [40 CFR 122.42(d)]

The initial permits for discharges composed entirely of storm water issued pursuant to 40 CFR 122.26(e)(7) must require compliance with the conditions of the permit as expeditiously as practicable, but in no event later than three years after the date of issuance of the permit.

2. General Provisions

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. The general provisions applicable to this Order and NPDES permit are as follows:

a. DISCHARGE OF WASTE IS A PRIVILEGE

No discharge of waste into the waters of the State, whether or not such discharge is made pursuant to waste discharge requirements, shall create a vested right to continue such discharge. All discharges of waste into waters of the State are privileges, not rights. [CWC Section 13263(g)]

b. DURATION OF ORDER AND NPDES PERMIT

(1) *Effective date*. This Order and NPDES permit becomes effective on the 50th day after its adoption provided the USEPA has no objection. If the USEPA objects to its issuance, this Order shall not become effective until such objection is withdrawn. This Order supersedes Order No. R9-2007-0001 upon the effective date of this Order, and supersedes Order Nos. R9-2009-0002 and R9-2010-0016 upon their expiration or earlier notice of coverage.

(2) *Expiration*. This Order and NPDES permit expires five years after its effective date. [40 CFR 122.46(a)]

(3) *Continuation of expired order*. After this Order and NPDES permit expires, the terms and conditions of this Order and NPDES permit are automatically continued pending issuance of a new permit if all requirements of the federal NPDES regulations on the continuation of expired permits (40 CFR 122.6) are complied with.

c. AVAILABILITY

A copy of this Order must be kept at a readily accessible location and must be available to on-site personnel at all times.

d. CONFIDENTIALITY OF INFORMATION

Except as provided for in 40 CFR 122.7, no information or documents submitted in accordance with or in application for this Order will be considered confidential, and all such information and documents shall be available for review by the public at the San Diego Water Board office.

Claims of confidentiality for the following information will be denied:
[40 CFR 122.7(b)]

(1) The name and address of any permit applicant or Copermittee; [40 CFR 122.7(b)(1)] and

(2) Permit applications and attachments, permits, and effluent data. [40 CFR 122.7(b)(2)]

e. EFFLUENT LIMITATIONS

(1) *Interim effluent limitations*. The Copermittee must comply with any interim effluent limitations as established by addendum, enforcement action, or revised waste discharge requirements which have been, or may be, adopted by the San Diego Water Board.

(2) *Other effluent limitations and standards*. If any applicable toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant and that standard or prohibition is more stringent than any limitation on the pollutant in the permit, the San Diego Water Board shall institute proceedings under these regulations to modify or revoke and reissue the permit to conform to the toxic effluent standard or prohibition. [40 CFR 122.44(b)(1)]

f. DUTY TO MINIMIZE OR CORRECT ADVERSE IMPACTS

The Copermittee must take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this Order, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the noncompliance.

g. PERMIT ACTIONS

The filing of a request by the Copermittee for modification, revocation and reissuance, or termination of this Order, or a notification of planned change in or anticipated noncompliance with this Order does not stay any condition of this Order. (See 40 CFR 122.41(f)) In addition, the following provisions apply to this Order:

(1) Upon application by any affected person, or on its own motion, the San Diego Water Board may review and revise the requirements in this Order. All requirements must be reviewed periodically. [CWC Section 13263(e)]

(2) This Order may be terminated or modified for cause, including, but not limited to, all of the following: [CWC Section 13381]

(a) Violation of any condition contained in the requirements of this Order. [CWC Section 13381(a)]

(b) Obtaining the requirements in this Order by misrepresentation, or failure to disclose fully all relevant facts. [CWC Section 13381(b)]

(c) A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge. [CWC Section 13381(c)]

(3) When this Order is transferred to a new owner or operator, such requirements as may be necessary under the CWC may be incorporated into this Order.

h. NPDES Permitted Non-Storm Water Discharges

The San Diego Water Board has, in prior years, issued a limited number of individual NPDES permits for non-storm water discharges to MS4s. The San Diego Water Board or State Water Board may in the future, upon prior notice to the Copermittee(s), issue an NPDES permit for any non-storm water discharge (or class of non-storm water discharges) to an MS4.

i. Monitoring

In addition to the standard provisions required under 40 CFR 122.41(j) and (l)(4), the following general monitoring provisions apply to this Order:

(1) Where procedures are not otherwise specified in Order, sampling, analysis and quality assurance/quality control must be conducted in accordance with the Quality Assurance Management Plan (QAMP) for the State of California's Surface Water Ambient Monitoring Program (SWAMP), adopted by the State Water Resources Control Board (State Water Board).

(2) Pursuant to 40 CFR 122.41(j)(2) and CWC Section 13383(a), each Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five (5) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time.

(3) All chemical, bacteriological, and toxicity analyses must be conducted at a laboratory certified for such analyses by the California Department of Public Health or a laboratory approved by the San Diego Water Board.

(4) For priority toxic pollutants that are identified in the California Toxics Rule (CTR) (65 Fed. Reg. 31682), the Copermittees must instruct their laboratories to establish calibration standards that are equivalent to or lower than the Minimum Levels (MLs) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP). If a Copermittee can demonstrate that a particular ML is not attainable, in accordance with procedures set forth in 40 CFR Part 136, the lowest quantifiable concentration of the lowest calibration standard analyzed by a specific analytical procedure (assuming that all the method specified sample weights, volumes, and processing steps have been followed) may be used instead of the ML listed in Appendix 4 of the SIP. The Copermittee must submit documentation from the laboratory to the San Diego Water Board for approval prior to raising the ML for any priority toxic pollutant.

j. ENFORCEMENT

(1) The San Diego Water Board is authorized to enforce the terms of this Order under several provisions of the CWC, including, but not limited to, CWC Sections 13385, 13386, and 13387.

(2) Nothing in this Order shall be construed to protect the Copermittee from its liabilities under federal, state, or local laws.

(3) The CWC provides for civil and criminal penalties comparable to, and in some cases greater than, those provided for under the CWA.

(4) Except as provided in the standard conditions required under 40 CFR 122.41(m) and (n), nothing in this Order shall be construed to relieve the Copermittee from civil or criminal penalties for noncompliance.

(5) Nothing in this Order shall be construed to preclude the institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties to which the Copermittee is or may be subject to under Section 311 of the CWA.

(6) Nothing in this Order shall be construed to preclude institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authoring preserved by Section 510 of the CWA.

k. SEVERABILITY

The provisions of this Order are severable, and if any provision of this Order, or the application of any provisions of this Order to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this Order shall not be affected thereby.

l. APPLICATIONS

Any application submitted by a Copermittee for reissuance or modification of this Order must satisfy all applicable requirements specified in federal regulations as well as any additional requirements for submittal of a Report of Waste Discharge specified in the CWC and the California Code of Regulations.

m. IMPLEMENTATION

All plans, reports and subsequent amendments submitted in compliance with this Order must be implemented immediately (or as otherwise specified). All submittals by Copermittees must be adequate to implement the requirements of this Order.

n. REPORT SUBMITTALS

(1) All report submittals must include an executive summary, introduction, conclusion, recommendations, and signed certified statement.

(2) Each Copermittee must submit a signed certified statement covering its responsibilities for each applicable submittal.

(3) The Principal Watershed Copermittee(s) must submit a signed certified statement covering its responsibilities for each applicable submittal and the sections of the submittals for which it is responsible.

(4) Unless otherwise directed, the Copermittees must submit one hard copy and one electronic copy of each report required under this Order to the San Diego Water Board, and one electronic copy to the USEPA.

(5) The Copermittees must submit reports and provide notifications as required by this Order to the following:

EXECUTIVE OFFICER
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
9174 SKY PARK COURT, SUITE 100
SAN DIEGO CA 92123-4340
Telephone: (858) 467-2952 Fax: (858) 571-6972

EUGENE BROMLEY
US ENVIRONMENTAL PROTECTION AGENCY
REGION IX
PERMITS ISSUANCE SECTION (W-5-1)
75 HAWTHORNE STREET
SAN FRANCISCO CA 94105

ATTACHMENT C

ACRONYMS AND ABBREVIATIONS

AMAL	Average Monthly Action Level
ASBS	Area(s) of Special Biological Significance
BMP	Best Management Practice
Basin Plan	Water Quality Control Plan for the San Diego Basin
CEQA	California Environmental Quality Act
CCR	California Code of Regulations
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWC	California Water Code
CZARA	Coastal Zone Act Reauthorization Amendments of 1990
ESAs	Environmentally Sensitive Areas
GIS	Geographic Information System
IBI	Index of Biological Integrity
LID	Low Impact Development
MDAL	Maximum Daily Action Level
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
NAL	Non-Storm Water Action Level
NAICS	North American Industry Classification System
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
ROWD	Report of Waste Discharge (application for NPDES reissuance)
SAL	Storm Water Action Level
San Diego Water Board	California Regional Water Quality Control Board, San Diego Region
SIC	Standard Industrial Classification Code
State Water Board	State Water Resources Control Board
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
WDID	Waste Discharge Identification Number
WLA	Waste Load Allocation
WQBEL	Water Quality Based Effluent Limitation

DEFINITIONS

Active/Passive Sediment Treatment - Using mechanical, electrical or chemical means to flocculate or coagulate suspended sediment for removal from runoff from construction sites prior to discharge.

Anthropogenic Litter – Trash generated from human activities, not including sediment.

Average Monthly Action Level – The highest allowable average of daily discharges over a calendar month.

Beneficial Uses - The uses of water necessary for the survival or wellbeing of man, plants, and wildlife. These uses of water serve to promote tangible and intangible economic, social, and environmental goals. "Beneficial Uses" of the waters of the State that may be protected include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. Existing beneficial uses are uses that were attained in the surface or ground water on or after November 28, 1975; and potential beneficial uses are uses that would probably develop in future years through the implementation of various control measures. "Beneficial Uses" are equivalent to "Designated Uses" under federal law. [California Water Code Section 13050(f)].

Best Management Practices (BMPs) - Defined in 40 CFR 122.2 as schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Bioassessment - The use of biological community information to evaluate the biological integrity of a water body and its watershed. With respect to aquatic ecosystems, bioassessment is the collection and analysis of samples of the benthic macroinvertebrate community together with physical/habitat quality measurements associated with the sampling site and the watershed to evaluate the biological condition (i.e. biotic integrity) of a water body.

Biofiltration - Practices that use vegetation and amended soils to detain and treat runoff from impervious areas. Treatment is through filtration, infiltration, adsorption, ion exchange, and biological uptake of pollutants.

Biological Integrity - Defined in Karr J.R. and D.R. Dudley. 1981. Ecological perspective on water quality goals. *Environmental Management* 5:55-68 as: "A balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitat of the region." Also referred to as ecosystem health.

BMP Design Manual – A plan developed to eliminate, reduce, or mitigate the impacts of runoff from development projects, including Priority Development Projects.

Chronic Toxicity – A measurement of sublethal effect (e.g. reduced growth, reproduction) to experimental test organisms exposed to an effluent or receiving waters compared to that of the control organisms.

Clean Water Act Section 303(d) Water Body - An impaired water body in which water quality does not meet applicable water quality standards and/or is not expected to meet water quality standards, even after the application of technology based pollution controls required by the CWA. The discharge of runoff to these water bodies by the Copermittees is significant because these discharges can cause or contribute to violations of applicable water quality standards.

Construction Site – Any project, including projects requiring coverage under the Construction General Permit, that involves soil disturbing activities including, but not limited to, clearing, grading, disturbances to ground such as stockpiling, and excavation.

Contamination - As defined in the Porter-Cologne Water Quality Control Act, contamination is "an impairment of the quality of waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste whether or not waters of the State are affected."

Copermittee – A permittee to a NPDES permit that is only responsible for permit conditions relating to the discharge for which it is operator [40 CFR 122.26(b)(1)]. For the purposes of this Order, a Copermittee is one of the individual permittees identified in Tables 1a-1c of this Order. ~~An incorporated city within the County of Orange, County of Riverside, or County of San Diego in the San Diego Region, the County of Orange, the County of Riverside, the County of San Diego, the Orange County Flood Control District, the Riverside County Water Conservation and Flood Control District, the San Diego Regional Airport Authority, or the San Diego Unified Port District.~~

Copermittees – All of the individual Copermittees, collectively.

Critical Channel Flow (Qc) – The channel flow that produces the critical shear stress that initiates bed movement or that erodes the toe of channel banks. When measuring Qc, it should be based on the weakest boundary material – either bed or bank.

Daily Discharge – Defined as either: (1) the total mass of the constituent discharged over the calendar day or any 24 hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g. concentration.)

The Daily Discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day, or other 24 hour period other than a day), or by the arithmetic mean of analytical results from one or more grab samples taken over the course of a day.

Development Projects - Construction, rehabilitation, redevelopment, or reconstruction of any public or private ~~residential project, industrial, commercial, or any other~~ projects.

Dry Season –May 1 to September 30.

Dry Weather – Weather is considered dry if the preceding 72 hours has been without measurable precipitation (>0.1 inch).

Enclosed Bays – Enclosed bays are indentations along the coast that enclose an area of

oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost bay works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays do not include inland surface waters or ocean waters.

Erosion – When land is diminished or worn away due to wind, water, or glacial ice. Often the eroded debris (silt or sediment) becomes a pollutant via storm water runoff. Erosion occurs naturally but can be intensified by land clearing activities such as farming, development, road building, and timber harvesting.

Environmentally Sensitive Areas (ESAs) - Areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; areas designated as preserves or their equivalent under the Natural Communities Conservation Program within the Cities and County of Orange; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.

Estuaries – Waters, including coastal lagoons, located at the mouth of streams that serve as areas of mixing fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and ocean water. Estuaries do not include inland surface waters or ocean waters.

Existing Development – Any area that has been developed and exists for municipal, commercial, industrial, or residential purposes, uses, or activities. May include areas that are not actively used for its originally developed purpose, but may be re-purposed or redeveloped for another use or activity.

Flow Duration – The long-term period of time that flows occur above a threshold that causes significant sediment transport and may cause excessive erosion damage to creeks and streams (not a single storm event duration). The simplest way to visualize this is to consider a histogram of pre- and post-project flows using long-term records of hourly data. To maintain pre-development flow duration means that the total number of hours (counts) within each range of flows in a flow-duration histogram cannot increase between the pre- and post-development condition. Flow duration within the range of geomorphologically significant flows is important for managing erosion.

Grading - The cutting and/or filling of the land surface to a desired slope or elevation.

Groundwater – Subsurface water that occurs beneath the water table in soils and geologic formations that are fully saturated.

Hazardous Material – Any substance that poses a threat to human health or the environment due to its toxicity, corrosiveness, ignitability, explosive nature or chemical reactivity. These also include materials named by the USEPA in 40 CFR 116 to be reported if a designated quantity of the material is spilled into the waters of the U.S. or emitted into the environment.

Hazardous Waste - Hazardous waste is defined as "any waste which, under Section 600 of Title 22 of this code, is required to be managed according to Chapter 30 of Division 4.5 of Title 22 of this code" [CCR Title 22, Division 4.5, Chapter 11, Article 1].

Household Hazardous Waste – Paints, cleaning products, and other hazardous wastes generated during home improvement or maintenance activities.

Hydromodification – The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

Illicit Connection – Any man-made conveyance or drainage system through which a non-storm water discharge to the stormwater drainage system occurs or may occur. Any connection to the MS4 that conveys an illicit discharge.

Illicit Discharge - Any discharge to the MS4 that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from fire fighting activities [40 CFR 122.26(b)(2)].

Inactive Areas – Areas of construction activity that are not active and those that have been active and are not scheduled to be re-disturbed for at least 14 days.

Infiltration – In the context of low impact development, infiltration is defined as the percolation of water into the ground. Infiltration is often expressed as a rate (inches per hour), which is determined through an infiltration test. In the context of non-storm water, infiltration is ~~W~~water other than wastewater that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow [40 CFR 35.2005(20)].

Inland Surface Waters – Includes all surface waters of the State that do not include the ocean, enclosed bays, or estuaries.

Jurisdictional Runoff Management Program Document – A written description of the specific jurisdictional runoff management measures and programs that each Copermittee will implement to comply with this Order and ensure that storm water pollutant discharges in runoff are reduced to the MEP and do not cause or contribute to a violation of water quality standards.

Low Impact Development (LID) – A storm water management and land development strategy that emphasizes conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions.

Low Impact Development Best Management Practices (LID BMPs) – LID BMPs include schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States through storm water management and land development strategies that emphasize conservation sand

the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions. LID BMPs include retention practices that do not allow runoff, such as infiltration, rain water harvesting and reuse, and evapotranspiration. LID BMPs also include flow-through practices such as biofiltration that may have some discharge of storm water following pollutant reduction.

Major Outfall – As defined in the Code of Federal Regulations, a major outfall is a MS4 outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (i.e. discharge from a single conveyance other than a circular pipe which is associated with a drainage area of more than 50 acres); or, for MS4s that receive storm water from lands zoned for industrial activity (based on comprehensive zoning plans or equivalent), a MS4 outfall that discharges from a single pipe with an inside diameter of 12 inches or more or from its equivalent (i.e. discharge from other than a circular pipe associated with a drainage area of 2 acres or more).

Maximum Daily Action Level (MDAL) –The highest allowable daily discharge of a pollutant, over a calendar day (or 24 hour period). For pollutants with action levels expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with action levels expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

Maximum Extent Practicable (MEP) – The technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) for storm water that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) in combination with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than BAT. A definition for MEP is not provided either in the statute or in the regulations. Instead the definition of MEP is dynamic and will be defined by the following process over time: municipalities propose their definition of MEP by way of their runoff management programs. Their total collective and individual activities conducted pursuant to the runoff management programs becomes their proposal for MEP as it applies both to their overall effort, as well as to specific activities (e.g., MEP for street sweeping, or MEP for MS4 maintenance). In the absence of a proposal acceptable to the San Diego Water Board, the San Diego Water Board defines MEP.

In a memo dated February 11, 1993, entitled "Definition of Maximum Extent Practicable," Elizabeth Jennings, Senior Staff Counsel, SWRCB addressed the achievement of the MEP standard as follows:

> "*To achieve the MEP standard, municipalities must employ whatever Best Management Practices (BMPs) are technically feasible (i.e., are likely to be effective) and are not cost prohibitive. The major emphasis is on technical feasibility. Reducing pollutants to the MEP means choosing effective BMPs, and rejecting applicable BMPs only where other effective BMPs will serve the same purpose, or the BMPs would not be technically feasible, or the cost would be prohibitive. In selecting BMPs to achieve the MEP standard, the following factors may be useful to consider:*
>
> *a. Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?*
> *b. Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?*

c. *Public Acceptance: Does the BMP have public support?*
d. *Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?*
e. *Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc.?*

The final determination regarding whether a municipality has reduced pollutants to the maximum extent practicable can only be made by the Regional or State Water Boards, and not by the municipal discharger. If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit derived, it would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs that would address a pollutant source, or to pick a BMP based solely on cost, which would be clearly less effective. In selecting BMPs the municipality must make a serious attempt to comply and practical solutions may not be lightly rejected. In any case, the burden would be on the municipal discharger to show compliance with its permit. After selecting a menu of BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented."

Monitoring Year – October 1 to September 30

Municipal Separate Storm Sewer System (MS4) – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designated or used for collecting or conveying storm water; (iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.26.

National Pollutant Discharge Elimination System (NPDES) - The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the CWA.

Non-Storm Water - All discharges to and from a MS4 that do not originate from precipitation events (i.e., all discharges from a MS4 other than storm water). Non-storm water includes illicit discharges and NPDES permitted discharges.

Nuisance - As defined in the Porter-Cologne Water Quality Control Act, a nuisance is "anything which meets all of the following requirements: 1) Is injurious to health, or is indecent, or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. 2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. 3) Occurs during, or as a result of, the

treatment or disposal of wastes."

Ocean Waters – ~~t~~The territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the State Board's California Ocean Plan.

Order – Unless otherwise specified, refers to this Order, Order No. R9-2013-0001 (NPDES No. CAS0109266)

Outfall - Outfall means a point source as defined by 40 CFR 122.2 at the point where a municipal separate storm sewer discharges to waters of the US and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels or other conveyances which connect segments of the same stream or other waters of the US and are used to convey waters of the US.

Persistent Flow - Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

Person - A person is defined as an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof [40 CFR 122.2].

Point Source - Any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, landfill leachate collection systems, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

Pollutant - Any agent that may cause or contribute to the degradation of water quality such that a condition of pollution or contamination is created or aggravated.

Pollution - As defined in the Porter-Cologne Water Quality Control Act, pollution is "the alteration of the quality of the waters of the State by waste, to a degree that unreasonably affects the either of the following: 1) The waters for beneficial uses; or 2) Facilities that serve these beneficial uses." Pollution may include contamination.

Pollution Prevention - Pollution prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control BMPs, treatment control BMPs, or disposal.

Pre-Development Runoff Conditions – Approximate flow rates and durations that exist or existed onsite before land development occurs. For new development projects, this equates to runoff conditions immediately before project construction. For redevelopment projects, this equates to runoff conditions from the project footprint assuming infiltration characteristics of the underlying soil, and existing grade. Runoff coefficients of concrete or asphalt must not be used. A redevelopment Priority Development Project must use available information pertaining to existing underlying soil type and onsite existing grade to estimate pre-development runoff conditions. ~~Runoff conditions that existed onsite before the existing development was constructed, or exists onsite before planned development activities occur.~~

Priority Development Projects - New development and redevelopment projects defined under Provision E.3.b of Order No. R9-2013-0001~~-2012-0011~~.

Rainy Season (aka Wet Season) –October 1 to April 30

Receiving Waters – Waters of the United States.

Receiving Water Limitations - Waste discharge requirements issued by the San Diego Water Board typically include both: (1) "Effluent Limitations" (or "Discharge Limitations") that specify the technology-based or water-quality-based effluent limitations; and (2) "Receiving Water Limitations" that specify the water quality objectives in the Basin Plan as well as any other limitations necessary to attain those objectives. In summary, the "Receiving Water Limitations" provision is the provision used to implement the requirements of CWA section 402(p)(3)(B).

Redevelopment - The creation~~, addition,~~ and/or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include trenching and resurfacing associated with utility work; resurfacing existing roadways; new sidewalk construction, pedestrian ramps, or bike lane on existing roads; and routine replacement of damaged pavement, such as pothole repair.

Regional Clearinghouse – A central location for the collection and distribution of information developed and maintained by the Copermittees including, but not limited to, plans, reports, manuals, data, contact information, and/or links to such documents and information.

Rehabilitation - Remedial measures or activities for the purpose of improving or restoring the beneficial uses of streams, channels or river systems. Techniques may vary from in-stream restoration techniques to off-linestormwater management practices installed in the system corridor or upland areas, or a combination of in-stream and out of stream techniques. Rehabilitation techniques may include, but are not limited to the following: riparian zone restoration, constructed wetlands, channel modifications that improve habitat and stability, and daylighting of drainage systems.

Reporting Period – The period of information that is reported in the Water Quality Improvement Plan Annual Report. The reporting period consists of two components: 1) July 1 to June 30, consistent with the fiscal year, for the implementation of the jurisdictional runoff management programs, and 2) October 1 to September 30, consistent with the monitoring year for the monitoring and assessment programs. Together, these two time periods constitute the reporting year for the Water Quality Improvement Plan Annual Report due January 31 following the end of the monitoring year.

Retain –Keep or hold in a particular place, condition, or position without discharge to surface waters.

Retrofitting – Storm water management practice put into place after development has occurred in watersheds where the practices previously did not exist or are ineffective. Retrofitting of developed areas is intended to improve water quality, protect downstream channels, reduce flooding, or meet other specific objectives. Retrofitting developed areas may include, but is not limited to replacing roofs with green roofs, disconnecting downspouts or impervious surfaces to

drain to pervious surfaces, replacing impervious surfaces with pervious surfaces, installing rain barrels, installing rain gardens, and trash area enclosures.

Runoff - All flows in a storm water conveyance system that consists of the following components: (1) storm water (wet weather flows) and (2) non-storm water including dry weather flows.

San Diego Water Board – As used in this document the term "San Diego Water Board" is synonymous with the term "Regional Board" as defined in Water Code section 13050(b) and is intended to refer to the California Regional Water Quality Control Board for the San Diego Region as specified in Water Code Section 13200.

Sediment - Soil, sand, and minerals washed from land into water. Sediment resulting from anthropogenic sources (i.e. human induced land disturbance activities) is considered a pollutant. This Order regulates only the discharges of sediment from anthropogenic sources and does not regulate naturally occurring sources of sediment. Sediment can destroy fish-nesting areas, clog animal habitats, and cloud waters so that sunlight does not reach aquatic plants.

Source Control BMP – Land use or site planning practices, or structural or nonstructural measures that aim to prevent runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between pollutants and runoff.

Storm Water – Per 40 CFR 122.26(b)(13), means storm water runoff, snowmelt runoff and surface runoff and drainage. Surface runoff and drainage pertains to runoff and drainage resulting from precipitation events.

~~**Stream, Channel, or Habitat Rehabilitation** – Measures or activities for the purpose of improving or restoring the environmental health (i.e. physical, chemical and biological integrity) of streams, channels, or river systems. Rehabilitation techniques may include, but are not limited to, riparian zone restoration, constructed wetlands, bank stabilization, channel reconfiguration, and daylighting drainage systems.~~

Structural BMPs - A subset of BMPs which detains, retains, filters, removes, or prevents the release of pollutants to surface waters from development projects in perpetuity, after construction of a project is completed.

Test of Significant Toxicity (TST) - A statistical approach used to analyze toxicity test data. The TST incorporates a restated null hypothesis, Welch's t-test, and biological effect thresholds for chronic and acute toxicity.

Total Maximum Daily Load (TMDL) - The maximum amount of a pollutant that can be discharged into a water body from all sources (point and non-point) and still maintain water quality standards. Under CWA section 303(d), TMDLs must be developed for all water bodies that do not meet water quality standards after application of technology-based controls.

Toxicity - Adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies). The water quality objectives for toxicity provided in the Basin Plan, state in part…"All waters shall be free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life….The survival of aquatic life in

surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge".

Toxicity Identification Evaluation (TIE) - A set of procedures for identifying the specific chemical(s) responsible for toxicity. These procedures are performed in three phases (characterization, identification, and confirmation) using aquatic organism toxicity tests).

Toxicity Reduction Evaluation (TRE) - A study conducted in a step-wise process designed to identify the causative agents of effluent or ambient toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in toxicity. The first steps of the TRE consist of the collection of data relevant to the toxicity, including additional toxicity testing, and an evaluation of facility operations and maintenance practices, and best management practices. A Toxicity Identification Evaluation (TIE) may be required as part of the TRE, if appropriate.

Treatment Control BMP – Any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media absorption or any other physical, biological, or chemical process.

Unpaved Road – Any long, narrow stretch without pavement used for traveling by motor passenger vehicles between two or more points. Unpaved roads are generally constructed of dirt, gravel, aggregate or macadam and may be improved or unimproved.

Waste - As defined in CWC Section 13050(d), "waste includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal."

Article 2 of CCR Title 23, Chapter 15 (Chapter 15) contains a waste classification system that applies to solid and semi-solid waste, which cannot be discharged directly or indirectly to water of the state and which therefore must be discharged to land for treatment, storage, or disposal in accordance with Chapter 15. There are four classifications of waste (listed in order of highest to lowest threat to water quality): hazardous waste, designated waste, non-hazardous solid waste, and inert waste.

Water Quality Objective - Numerical or narrative limits on constituents or characteristics of water designated to protect designated beneficial uses of the water. [California Water Code Section 13050 (h)]. California's water quality objectives are established by the State and Regional Water Boards in the Water Quality Control Plans. Numeric or narrative limits for pollutants or characteristics of water designed to protect the beneficial uses of the water. In other words, a water quality objective is the maximum concentration of a pollutant that can exist in a receiving water and still generally ensure that the beneficial uses of the receiving water remain protected (i.e., not impaired). Since water quality objectives are designed specifically to protect the beneficial uses, when the objectives are violated the beneficial uses are, by definition, no longer protected and become impaired. This is a fundamental concept under the Porter Cologne Act. Equally fundamental is Porter Cologne's definition of pollution. A condition of pollution exists when the water quality needed to support designated beneficial uses has become unreasonably affected or impaired; in other words, when the water quality objectives have been violated. These underlying definitions (regarding beneficial use protection) are the reason why all waste discharge requirements implementing the federal NPDES regulations

require compliance with water quality objectives. (Water quality objectives are also called water quality criteria in the CWA.)

Water Quality Standards - Water quality standards, as defined in Clean Water Act section 303(c) consist of the beneficial uses (e.g., swimming, fishing, municipal drinking water supply, etc.,) of a water body and criteria (referred to as water quality objectives in the California Water Code) necessary to protect those uses. Under the Water Code, the water boards establish beneficial uses and water quality objectives in water quality control or basin plans. Together with an anti-degradation policy, these beneficial uses and water quality objectives serve as water quality standards under the Clean Water Act. In Clean Water Act parlance, state beneficial uses are called "designated uses" and state water quality objectives are called "criteria." Throughout this Order, the relevant term is used depending on the statutory scheme.

Waters of the State - Any water, surface or underground, including saline waters within the boundaries of the State [CWC section 13050 (e)]. The definition of the Waters of the State is broader than that for the Waters of the United States in that all water in the State is considered to be a Waters of the State regardless of circumstances or condition.

Waters of the United States - As defined in the 40 CFR 122.2, the Waters of the U.S. are defined as: "(a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate "wetlands;" (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters otherwise defined as waters of the United States under this definition: (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial seas; and (g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA."

Watershed - That geographical area which drains to a specified point on a water course, usually a confluence of streams or rivers (also known as drainage area, catchment, or river basin).

Wet Season (aka Rainy Season) –October 1 to April 30

Wet Weather – Weather is considered wet up to 72 hours after ~~if there is~~ a storm event of 0.1 inches and greater ~~and the following 72 hours~~, unless otherwise defined by another regulatory mechanism (e.g. a TMDL).

ATTACHMENT D

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

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JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

FY _____

I. COPERMITTEE INFORMATION

Copermittee Name:

Copermittee Primary Contact Name:

Copermittee Primary Contact Information:
Address:
City: County: State: Zip:
Telephone: Fax: Email:

II. LEGAL AUTHORITY

Has the Copermittee established adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐
A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority?	**YES**	☐
	NO	☐

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

Was an update of the jurisdictional runoff management program document required or recommended by the San Diego Water Board?	**YES**	☐
	NO	☐
If YES to the question above, did the Copermittee update its jurisdictional runoff management program document and make it available on the Regional Clearinghouse?	**YES**	☐
	NO	☐

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

Has the Copermittee implemented a program to actively detect and eliminate illicit discharges and connections to its MS4 that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

Number of non-storm water discharges reported by the public	
Number of non-storm water discharges detected by Copermittee staff or contractors	
Number of non-storm water discharges investigated by the Copermittee	
Number of sources of non-storm water discharges identified	
Number of non-storm water discharges eliminated	
Number of sources of illicit discharges or connections identified	
Number of illicit discharges or connections eliminated	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

V. DEVELOPMENT PLANNING PROGRAM

Has the Copermittee implemented a development planning program that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐
Was an update to the BMP Design Manual required or recommended by the San Diego Water Board?	**YES**	☐
	NO	☐
If YES to the question above, did the Copermittee update its BMP Design Manual and make it available on the Regional Clearinghouse?	**YES**	☐
	NO	☐

Number of proposed development projects in review	
Number of Priority Development Projects in review	
Number of Priority Development Projects approved	
Number of approved Priority Development Projects exempt from any BMP requirements	
Number of approved Priority Development Projects allowed alternative compliance	
Number of Priority Development Projects granted occupancy	

Number of completed Priority Development Projects in inventory	
Number of high priority Priority Development Project structural BMP inspections	
Number of Priority Development Project structural BMP violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM
FY _____

VI. CONSTRUCTION MANAGEMENT PROGRAM

Has the Copermittee implemented a construction management program that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

Number of construction sites in inventory	
Number of active construction sites in inventory	
Number of inactive construction sites in inventory	
Number of construction sites closed/completed during reporting period	
Number of construction site inspections	
Number of construction site violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

Has the Copermittee implemented an existing development management program that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

	Municipal	Commercial	Industrial	Residential
Number of facilities or areas in inventory				
Number of existing development inspections				
Number of follow-up inspections				
Number of violations				
Number of enforcement actions issued				
Number of escalated enforcement actions issued				

VIII. PUBLIC EDUCATION AND PARTICIPATION

Has the Copermittee implemented a public education program component that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐
Has the Copermittee implemented a public participation program component that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

IX. FISCAL ANALYSIS

Has the Copermittee attached to this form a summary of its fiscal analysis that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

X. CERTIFICATION

I [☐ Principal Executive Officer ☐ Ranking Elected Official ☐ Duly Authorized Representative] certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature	Date
Print Name	Title
Telephone Number	Email

ATTACHMENT E

SPECIFIC PROVISIONS FOR TOTAL MAXIMUM DAILY LOADS APPLICABLE TO ORDER NO. R9-2013-0001

These provisions implement load allocations (LAs) and wasteload allocations (WLAs) of the Total Maximum Daily Loads (TMDLs)~~,~~ adopted by the San Diego Water Board and approved by USEPA under Clean Water Act section 303(c), ~~which are~~ applicable to discharges regulated under this Order. The provisions and schedules for implementation of the TMDLs described below must be incorporated into the Water Quality Improvement Plans, required pursuant to Provision B of this Order, for the specified Watershed Management Areas.

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed
2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin
3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed
4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek
5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay
6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2002-0123

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	August 14, 2002
State Water Board Approval Date:	July 16, 2003
Office of Administrative Law Approval Date:	September 11, 2003
US EPA Approval Date:	November 3, 2003

(3) TMDL Effective Date: September 11, 2003

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS ~~WATER QUALITY BASED EFFLUENT LIMITATIONS~~

The ~~WQBELs~~ final diazinon TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must be in compliance with the final TMDL compliance requirements as of December 31, 2010.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the ~~violation~~ exceedance of the following receiving water limitations ~~by the end of the compliance schedule under Specific Provision 1.c~~:

Table 1.1
Final Receiving Water Limitations Expressed as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Diazinon	Acute	0.08 µg/L	1 hour
	Chronic	0.05 µg/L	4 days

(b) Final Effluent Limitations

Discharges from the MS4s ~~must not~~ containing concentrations that do not exceed the following effluent limitations will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 1.b.(3)(a) ~~by the end of the compliance schedule under Specific Provision 1.c~~:

Table 1.2
Final Effluent Limitations Expressed as Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation	Averaging Period
Diazinon	Acute	0.072 µg/L	1 hour
	Chronic	0.045 µg/L	4 days

(c) Best Management Practices

The following BMPs for Chollas Creek must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area and implemented by the Responsible Copermittees:

(i) The Responsible Copermittees must implement BMPs to ~~support the~~ achieve~~ment of~~ the ~~WQBELs~~ receiving water limitations under Specific Provision 1.b.(2)(a) and/or the effluent limitations under Specific Provision 1.b.(2)(b) for Chollas Creek.

(ii) The Responsible Copermittees must implement the Diazinon Toxicity Control Plan and Diazinon Public Outreach/Education Program as described in the report titled, *Technical Report for Total Maximum Daily Load for Diazinon in Chollas Creek Watershed, San Diego County*, dated August 14, 2002, including subsequent modifications, in order to achieve the ~~WQBELs under Specific Provision 1.b~~ receiving water limitations under Specific Provision 1.b.(2)(a) and/or the effluent limitations under Specific Provision 1.b.(2)(b).

(iii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 1.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 1.b.(2)(b) at the Responsible Copermittees' MS4 outfalls; OR

(d) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 1.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 1.b.(2)(c) achieves compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 1.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 1.d, to demonstrate compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c).

c. INTERIM TMDL COMPLIANCE ~~SCHEDULE~~ REQUIREMENTS

The Responsible Copermittees must be in compliance with the final diazinon TMDL compliance requirements as of December 31, 2010.~~The Responsible Copermittees are required to achieve their respective WLAs by December 31, 2010. The Responsible Copermittees must be in compliance with the WQBELs under Specific Provision 1.b.~~

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls for diazinon within the Chollas Creek watershed, and calculate or estimate the annual diazinon loads, in accordance with the requirements of Provisions D.2,

D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

~~e. COMPLIANCE DETERMINATION~~

~~Compliance with WQBELs of Specific Provision 1.b may be demonstrated via one of the following methods:~~

~~(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;~~

~~(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 1.b.(1) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR~~

~~(c) There are no violations of the applicable effluent limitations under Specific Provision 1.b.(2) at the Responsible Copermittees' MS4 outfalls.~~

2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0019

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	September 22, 2005
Office of Administrative Law Approval Date:	December 2, 2005
US EPA Approval Date:	February 8, 2006

(3) TMDL Effective Date: December 2, 2005

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Shelter Island Yacht Basin

(6) Responsible Copermittee: City of San Diego~~t~~

b. FINAL TMDL COMPLIANCE REQUIREMENTS ~~WATER QUALITY BASED EFFLUENT LIMITATIONS~~

The ~~WQBELs~~ final dissolved copper TMDL compliance requirements for Shelter Island Yacht Basin consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittee must be in compliance with the final TMDL compliance requirements as of December 2, 2005.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the ~~violation~~ exceedance of the following receiving water limitations ~~by the end of the compliance schedule under Specific Provision 2.c~~:

Table 2.1
Final Receiving Water Limitations Expressed as Concentrations in Shelter Island Yacht Basin

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Dissolved Copper	Acute	4.8 µg/L x WER*	1 hour
	Chronic	3.1 µg/L x WER*	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(b) Final Effluent Limitations

Discharges from the MS4s ~~must not~~ containing pollutant loads that do not exceed the following effluent limitations will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 2.b.(3)(a) ~~by the end of the compliance schedule under Specific Provision 2.c~~:

Table 2.2
Final Effluent Limitations as Expressed as Annual Loads in MS4 Discharges to Shelter Island Yacht Basin

Constituent	Effluent Limitation
Dissolved Copper	30 kg/yr

(c) Best Management Practices

The Responsible Copermittee must implement BMPs to ~~support the~~ achieve~~ment of~~ the ~~WQBELs under Specific Provision 2.b~~ receiving water limitations under Specific Provision 2.b.(2)(a) and/or the effluent limitations under Specific Provision 2.b.(2)(b) for Shelter Island Yacht Basin. The BMPs must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 2.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 2.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittee develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 2.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision

2.b.(2)(c) achieves compliance with Specific Provisions 2.b.(3)(a), 2.b.(3)(b) and/or 2.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 2.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 2.d, to demonstrate compliance with Specific Provisions 2.b.(3)(a), 2.b.(3)(b) and/or 2.b.(3)(c).

c. INTERIM TMDL COMPLIANCE ~~SCHEDULE~~ REQUIREMENTS

The Responsible Copermittees must be in compliance with the final dissolved copper TMDL compliance requirements as of December 2, 2005. ~~The Responsible Copermittee is required to achieve the MS4 WLA by December 2, 2005. The Responsible Copermittee must be in compliance with the WQBELs under Specific Provision 2.b.~~

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

The Responsible Copermittee must monitor the effluent of its MS4 outfalls for dissolved copper, and calculate or estimate the monthly and annual dissolved copper loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.(b)(2)of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

~~e. COMPLIANCE DETERMINATION~~

~~Compliance with WQBELs of Specific Provision 2.b may be demonstrated via one of the following methods:~~

~~(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water;~~

~~(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 2.b.(1) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR~~

~~(c) There are no violations of the applicable effluent limitations under Specific Provision 2.b.(2) at the Responsible Copermittee's MS4 outfalls.~~

3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0036

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	November 16, 2005
Office of Administrative Law Approval Date:	February 1, 2006
US EPA Approval Date:	March 22, 2006

(3) TMDL Effective Date: February 1, 2006

(4) Watershed Management Area: Santa Margarita River

(5) Water Body: Rainbow Creek

(6) Responsible Copermittee: County of San Diego

b. FINAL TMDL COMPLIANCE REQUIREMENTS ~~WATER QUALITY BASED EFFLUENT LIMITATIONS~~

The ~~WQBELs~~ final total nitrogen and total phosphorus TMDL compliance requirements for Rainbow Creek consist of the following

(1) Final TMDL Compliance Date

The Responsible Copermittee must comply with final TMDL compliance requirements by December 31, 2021.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the ~~violation~~ exceedance of the following receiving water limitations by the ~~end of the~~ compliance ~~schedule~~ date under Specific Provision 3.b.(1)~~c.(1)~~:

Table 3.1
Final Receiving Water Limitations Expressed as Concentrations in Rainbow Creek

Constituent	Receiving Water Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(b) Final Effluent Limitations

(i) Discharges from the MS4s ~~must not~~ containing concentrations that do not exceed the following effluent limitations by the ~~end of the~~ compliance date ~~schedule~~ under Specific Provision 3.b.(1)~~c.(1)~~ will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 3.b.(2)(a):

Table 3.2
Final Effluent Limitations Expressed as Concentrations in MS4 Discharges to Rainbow Creek

Constituent	Effluent Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 ~~0.1~~ mg/L

(ii) Annual ~~P~~pollutant loads from given land uses discharging to and from the MS4s ~~must~~ that do not exceed the following ~~effluent limitations~~ annual loads by the ~~end of the~~ compliance ~~schedule~~ date under Specific Provision 3.b.(1)~~c.(1)~~ will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 3.b.(2)(a):

Table 3.3
Final Effluent Limitations Expressed as Annual Loads in MS4 Discharges to Rainbow Creek

Land Use	Total N	Total P
Commercial nurseries	116 kg/yr	3 kg/yr
Park	3 kg/yr	0.1 kg/yr
Residential areas	149 kg/yr	12 kg/yr
Urban areas	27 kg/yr	6 kg/yr

~~Interim effluent limitations expressed as pollutant loads are given in the compliance schedule under Specific Provision 3.0.~~

(c) Best Management Practices

(i) The Responsible Copermittee must implement BMPs to ~~support the~~ achieve~~ment of~~ the ~~WQBELs under Specific Provision 3.b~~ receiving water limitations under Specific Provision 3.b.(2)(a) and/or the effluent limitations under Specific Provision 3.b.(2)(b) for Rainbow Creek.

(ii) The Responsible Copermittee should coordinate any BMPs implemented to address this TMDL with Caltrans and other sources as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance

date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 3.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 3.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the final effluent limitations under Specific Provision 3.b.(2)(b)(ii); OR

(e) The Responsible Copermittee develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 3.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 2.b.(2)(c) achieves compliance with Specific Provisions 3.b.(3)(a), 3.b.(3)(b), 3.b.(3)(c) and/or 3.b.(3)(d),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 3.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 3.d, to demonstrate compliance with Specific Provisions 3.b.(3)(a), 3.b.(3)(b), 3.b.(3)(c) and/or 3.b.(3)(d).

c. INTERIM TMDL COMPLIANCE ~~SCHEDULE~~ REQUIREMENTS

The interim total nitrogen and total phosphorus TMDL compliance requirements for Rainbow Creek consist of the following:

(1) Interim Compliance Dates and WQBELs

The Responsible Copermittee must ~~be in compliance~~ comply with the interim WQBELs, expressed as annual loads, by December 31 of the interim compliance year given in Table 3.4 ~~under Specific Provision 3.b, by~~

~~December 31, 2021~~.

~~(1) Interim Compliance Requirements~~

Table 3.4
Interim Water Quality Based Effluent Limitations Expressed as Annual Loads in MS4 Discharges from Specific Land Uses to Rainbow Creek

	Total N Interim Effluent Limitations (kg/yr)			Total P Interim Effluent Limitations (kg/yr)		
	Interim Compliance Date			Interim Compliance Date		
Land Use	**2009**	**2013**	**2017**	**2009**	**2013**	**2017**
Commercial nurseries	390	299	196	20	16	10
Park	5	3	3	0.15	0.10	0.10
Residential areas	507	390	260	99	74	47
Urban areas	40	27	27	9	6	6

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 3.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 3.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the final effluent limitations under Specific Provision 3.b.(2)(b)(ii); OR

(e) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the interim effluent limitations under Specific Provision 3.c.(1); OR

(f) The Responsible Copermittee has submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

d. Specific Monitoring and Assessment Requirements

(1) The Responsible Copermittee must incorporate into the Water Quality Improvement Plan and implement the Sampling and Analysis Plan for

Rainbow Creek Nutrient Reduction TMDL Implementation Water Quality Monitoring, dated January 2010.

(2) The results of any monitoring conducted during the reporting period, and assessment of whether the interim and final ~~WQBELs~~ TMDL compliance requirements have been achieved must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

~~e. COMPLIANCE DETERMINATION~~

~~(1) Compliance with interim compliance requirements of Specific Provision 3.c.(2) may be demonstrated via one of the following methods:~~

~~(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water;~~

~~(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 3.b.(1) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls;~~

~~(c) There are no violations of the applicable effluent limitations under Specific Provision 3.b.(2)(a) at the Responsible Copermittee's MS4 outfalls;~~

~~(d) The pollutant loads from given land uses discharging to and from the MS4s do not exceed the applicable effluent limitations under Specific Provision 3.b.(2)(b); OR~~

~~(e) The Responsible Copermittee has submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim compliance requirements will be achieved by the interim compliance dates.~~

~~(2) Compliance with WQBELs of Specific Provision 3.b may be demonstrated via one of the following methods:~~

~~(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water;~~

~~(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 3.b.(1) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls;~~

~~(c) There are no violations of the applicable effluent limitations under Specific Provision 3.b.(2)(a) at the Responsible Copermittee's MS4 outfalls; OR~~

~~(d) The pollutant loads from given land uses discharging to and from the MS4s do not exceed the applicable effluent limitations under Specific Provision 3.b.(2)(b).~~

4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2007-0043

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2007
State Water Board Approval Date:	July 15, 2008
Office of Administrative Law Approval Date:	October 22, 2008
US EPA Approval Date:	December 18, 2008

(3) TMDL Effective Date: October 22, 2008

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS ~~WATER QUALITY BASED EFFLUENT LIMITATIONS~~

The ~~WQBELs~~ final dissolved copper, lead, and zinc TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must comply with the final TMDL compliance requirements by October 22, 2028.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the ~~violation~~ exceedance of the following receiving water limitations by the ~~end of the~~ compliance ~~schedule~~ date under Specific Provision 4.b.(1)~~c.(1)~~:

Table 4.1
Final Receiving Water Limitations Expressed as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$(0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$(0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$(0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$(0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(b) Final Effluent Limitations

Discharges from the MS4s ~~must not~~ containing pollutant loads that do not exceed the following effluent limitations by the ~~end of the~~ compliance date ~~schedule~~ under Specific Provision 4.b.(1)~~c.(1)~~ will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 4.b.(2)(a):

Table 4.2
Final Effluent Limitations as Expressed Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(c) Best Management Practices

(i) The Responsible Copermittees must implement BMPs to ~~support the~~ achieve~~ment of~~ the ~~WQBELs under Specific Provision 4.b~~ receiving water limitations under Specific Provision 4.b.(2)(a) and/or the

effluent limitations under Specific Provision 4.b.(2)(b) for Chollas Creek.

(ii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans and the U.S. Navy as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 4.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 4.b.(2)(b) at the Responsible Copermittees' MS4 outfalls; OR

(d) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 4.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 4.b.(2)(c) achieves compliance with Specific Provisions 4.b.(3)(a), 4.b.(3)(b) and/or 4.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 4.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 4.d, to demonstrate compliance with Specific Provisions 4.b.(3)(a), 4.b.(3)(b) and/or 4.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS ~~SCHEDULE~~

The interim dissolved copper, lead, and zinc TMDL compliance requirements for Chollas Creek consist of the following:

(1) Interim Compliance Date and WQBELs ~~Requirements~~

The Responsible Copermittee must comply with the ~~following~~ interim WQBELs, expressed as concentrations, by the interim compliance date given in Table 4.3:

Table 4.3
Interim Water Quality Based Effluent Limitations Expressed as Concentrations in MS4 Discharges to Chollas Creek

Interim Compliance Date	Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
October 22, 2018	Dissolved Copper	Acute	1.2 x 90% x (0.96) x $e^{[0.9422 \times \ln(\text{hardness}) - 1.700]}$ x WER*	1 hour
		Chronic	1.2 x 90% x (0.96) x $e^{[0.8545 \times \ln(\text{hardness}) - 1.702]}$ x WER*	4 days
	Dissolved Lead	Acute	1.2 x 90% x [1.46203 – 0.145712 x ln(hardness)] x $e^{[1.273 \times \ln(\text{hardness}) - 1.460]}$ x WER*	1 hour
		Chronic	1.2 x 90% x [1.46203 – 0.145712 x ln(hardness)] x $e^{[1.273 \times \ln(\text{hardness}) - 4.705]}$ x WER*	4 days
	Dissolved Zinc	Acute	1.2 x 90% x (0.978) x $e^{[0.8473 \times \ln(\text{hardness}) + 0.884]}$ x WER*	1 hour
		Chronic	1.2 x 90% x (0.986) x $e^{[0.8473 \times \ln(\text{hardness}) + 0.884]}$ x WER*	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water; OR

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 4.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 4.b.(2)(b) at the Responsible Copermittees' MS4 outfalls; OR

(d) There are no exceedances of the interim effluent limitations under Specific Provision 4.c.(1) at the Responsible Copermittees' MS4 outfalls; OR

(e) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water

Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance date.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*, when it is amended to include monitoring requirements for the Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls discharging to Chollas Creek for dissolved copper, lead, and zinc, and calculate or estimate the monthly and annual dissolved copper, lead, and zinc loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2)of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

~~**e. COMPLIANCE DETERMINATION**~~

~~(1) Compliance with interim compliance requirements of Specific Provision 4.c.(2) may be demonstrated via one of the following methods:~~

~~(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;~~

~~(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 4.b.(1) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls;~~

~~(c) There are no violations of the applicable effluent limitations under Specific Provision 4.b.(2) at the Responsible Copermittees' MS4 outfalls; OR~~

~~(d) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim compliance requirements will be achieved by the interim compliance dates.~~

~~(2) Compliance with WQBELs of Specific Provision 4.b may be demonstrated via~~

~~one of the following methods:~~

~~(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;~~

~~(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 4.b.(1) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR~~

~~(c) There are no violations of the applicable effluent limitations under Specific Provision 4.b.(2) at the Responsible Copermittees' MS4 outfalls.~~

5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2008-0027

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 11, 2008
State Water Board Approval Date:	June 16, 2009
Office of Administrative Law Approval Date:	September 15, 2009
US EPA Approval Date:	October 26, 2009

(3) TMDL Effective Date: September 15, 2009

(4) Watershed Management Areas: See Table 5.0

(5) Water Bodies: See Table 5.0

(6) Responsible Copermittees: See Table 5.0

Table 5.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County	Dana Point Harbor	Baby Beach	-City of Dana Point -County of Orange
San Diego Bay	San Diego Bay	Shelter Island Shoreline Park	- San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS ~~WATER QUALITY BASED EFFLUENT LIMITATIONS~~

The ~~WQBELs~~ final indicator bacteria TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Final TMDL Compliance Dates

(a) Baby Beach in Dana Point Harbor

The Responsible Copermittees for MS4 discharges to Baby Beach must be in compliance with the final TMDL compliance requirements according to the following compliance dates:

Table 5.1
Compliance Dates to Achieve Final TMDL Compliance Requirements For Baby Beach in Dana Point Harbor

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform	September 15, 2014	September 15, 2009
Fecal Coliform		September 15, 2009
Enterococcus		September 15, 2019

(b) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park must be in compliance with the final TMDL compliance requirements as of December 31, 2012.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

~~(a)~~

Discharges from the MS4s must not cause or contribute to the ~~violation~~ exceedance of the following receiving water limitations by the ~~end of the~~ compliance ~~schedules~~ dates under Specific Provision~~s~~ 5.b.(1)~~c.(1)(a) and 5.c.(2)~~:

Table 5.2~~1~~
Final Receiving Water Limitations Expressed as Bacteria Densities in the Water Body

Constituent	Receiving Water Limitations	
	Single Sample Maximum[1,2]	30-Day Geometric Mean[2]
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.

~~(b) If the above receiving water limitations are not met in the receiving water, the Responsible Copermittees must demonstrate that the discharges from the MS4s are not causing or contributing to the exceedance of receiving water limitations.~~

(b) Final Effluent Limitations

(i) Discharges from the MS4s ~~must not~~ containing indicator bacteria densities that do not exceed the following effluent limitations by the ~~end of the~~ compliance dates ~~schedules~~ under Specific Provision~~s~~ 5.b.(1)~~c.(1)(a) and 5.c.(2) to demonstrate the discharge~~ will not cause or contribute to exceedances of the receiving water limitations under

Specific Provision 5.b.(2)(a) ~~is not causing or contributing to a violation of receiving water quality standards~~:

Table 5.3a~~2~~
Final Effluent Limitations as Expressed as Bacteria Densities in MS4 Discharges to the Water Body

Constituent	Effluent Limitations	
	Single Sample Maximum[1,2]	30-Day Geometric Mean[2]
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.

~~Interim effluent limitations expressed as pollutant loads are given in the compliance schedule under Specific Provision 5.c.~~

(ii) Discharges from the MS4s containing indicator bacteria loads that do not exceed the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.4a
Final Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to the Baby Beach in Dana Point Harbor

Constituent	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	0.86×10^9 MPN/day	$3{,}254 \times 10^9$ MPN/30days
Fecal Coliform	0.17×10^9 MPN/day	112×10^9 MPN/30days
Enterococcus	0.03×10^9 MPN/day	114×10^9 MPN/30days

Table 5.4b
Final Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to the Shelter Island Shoreline Park in San Diego Bay

Constituent	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	0 MPN/day	198×10^9 MPN/30days
Fecal Coliform	0 MPN/day	8×10^9 MPN/30days
Enterococcus	0 MPN/day	26×10^9 MPN/30days

(iii) Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.5a
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to ~~the~~ Baby Beach in Dana Point Harbor*

Constituent	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	90.4%	0%
Fecal Coliform	82.7%	0%
Enterococcus	96.2%	62.4%

Notes:
* The percent load reductions are relative to data collected between 1996-2002. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittees' MS4s must not exceed the loads in Table 5.4a, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the water body.

Table 5.5b
*Final Effluent Limitations Expressed as Percent Load Reductions** in MS4 Discharges to ~~the~~ Shelter Island Shoreline Park in San Diego Bay*

Constituent	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	0%	0%
Fecal Coliform	0%	0%
Enterococcus	0%	0%

Notes:
* The percent load reductions are relative to data collected between 1999-2004. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittee's MS4s must not exceed the loads in Table 5.4b, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the water body.

(c) Best Management Practices

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 5.0 must incorporate the Bacteria Load Reduction Plan (BLRP) required to be developed pursuant to Resolution No. R9-2008-0027.

(ii) The Responsible Copermittee must implement BMPs to ~~support the~~ achieve~~ment of~~ the ~~WQBELs under Specific Provision 5.0~~ receiving water limitations under Specific Provision 5.b.(2)(a) and/or the effluent limitations under Specific Provision 5.b.(2)(b) for the segments or areas of the water bodies listed in Table 5.0

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible Copermittees' MS4 outfalls; OR

(d) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.c.(2)(b)(ii); OR

(e) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 5.c.(2)(b)(iii); OR

(f) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(g) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 5.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 5.b.(2)(c) achieves compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 5.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 5.d, to demonstrate compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f).

c. INTERIM TMDL COMPLIANCE ~~SCHEDULE~~ REQUIREMENTS

The interim indicator bacteria TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Baby Beach in Dana Point Harbor

(a) Interim ~~WLA~~ TMDL Compliance Dates and WQBELs

~~The Responsible Copermittees for MS4 discharges to Baby Beach are required to achieve the WLA, thus must be in compliance with the WQBELs under Specific Provision 5.0, according to the following compliance schedule:~~

~~**Table 5.3**~~
~~*Compliance Schedule Dates to Achieve Baby Beach WLAs*~~

~~Constituent~~	~~Dry Weather WLA Compliance Date~~	~~Wet Weather WLA Compliance Date~~
~~Total Coliform~~	~~September 15, 2014~~	~~September 15, 2009~~
~~Fecal Coliform~~		~~September 15, 2009~~
~~*Enterococcus*~~		~~September 15, 2019~~

~~(b) Interim Compliance Requirements~~

The Responsible Copermittees for MS4 discharges to Baby Beach must comply with the following interim WQBELs by the interim compliance dates given in Tables 5.6a~~5~~ and/or 5.6b:

Table 5.6a~~4~~
Interim Water Quality Based Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to Baby Beach in Dana Point Harbor

Constituent	Interim Compliance Dates	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	4.93×10^9 MPN/day	$3{,}254 \times 10^9$ MPN/30days* ~~NA*~~
Fecal Coliform	September 15, 2012	0.59×10^9 MPN/day	112×10^9 MPN/30days* ~~NA*~~
Enterococcus	September 15, 2012	0.42×10^9 MPN/day	301×10^9 MPN/30days* ~~NA**~~
	September 15, 2016	0.03×10^9 MPN/day ~~NA*~~	207×10^9 MPN/30days

Notes:
* Same as the final effluent limitations in Table 5.4a.~~The WQBELs under Specific Provision 5.b.(2) must already be achieved by the given interim compliance date.~~
~~** There is no corresponding interim WQBEL for the given interim compliance date.~~

Table 5.6b
Interim Water Quality Based Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to Baby Beach in Dana Point Harbor*

Constituent	Interim Compliance Dates	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	45.2%	0%**
Fecal Coliform	September 15, 2012	41.4%	0%**
Enterococcus	September 15, 2012	48.1%	0%**
	September 15, 2016	96.2%**	31.2%

Notes:
* The percent load reductions are relative to data collected between 1996-2002. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittees' MS4s must not exceed the loads in Table 5.6a, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's

MS4s to the waterbody.
** Same as the final effluent limitations in Table 5.5a.

(b) Interim Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(i) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water; OR

(ii) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(iii) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible Copermittees' MS4 outfalls; OR

(iv) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.b(2)(b)(ii); OR

(v) The Responsible Copermittees can demonstrate that exceedances of the applicable receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(vi) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the interim effluent limitations under Table 5.6a of Specific Provision 5.c.(1)(a); OR

(vii) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the interim effluent limitations under Table 5.6b of Specific Provision 5.c.(1)(a); OR

(viii) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

(2) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park ~~is required to achieve the WLA, thus~~ must be in compliance with the ~~WQBELs under Specific Provision 5.0, by~~ final indicator bacteria TMDL requirements as of December 31, 2012.

d. Specific Monitoring and Assessment Requirements

(1) Monitoring Stations

Monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[35] If discharges of bacteria from the MS4 exceed~~ances of~~ the applicable interim or final WQBELs ~~receiving water limitations are observed in the monitoring data~~, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(2) Monitoring Procedures

(a) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) The Responsible Copermittees must collect wet weather monitoring samples within the first 24 hours of ~~the first~~ a storm event[36] of the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(c) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(3) Assessment and Reporting Requirements

[35] Commonly referred to as AB 411 monitoring
[36] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(a) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs have been achieved.

(b) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to correlate elevated bacteria levels with known or suspected sewage spills from wastewater collection systems and treatment plants or boats.

(c) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

~~e. COMPLIANCE DETERMINATION~~

~~(1) Compliance with interim compliance requirements of Specific Provision 5.c.(1)(b) may be demonstrated via one of the following methods:~~

~~(i) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;~~

~~(ii) There are no exceedances of the applicable receiving water limitations under Specific Provision 5.b.(1)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls;~~

~~(iii) There are no violations of the applicable effluent limitations under Specific Provision 5.b.(2) at the Responsible Copermittees' MS4 outfalls;~~

~~(iv) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the applicable effluent limitations under Specific Provision 5.c.(1)(b);~~

~~(v) The Responsible Copermittees can demonstrate that exceedances of the applicable receiving water limitations under Specific Provision 5.b.(1)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4 are not causing or contributing to the exceedances; OR~~

~~(vi) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim compliance requirements will be achieved by the interim compliance dates.~~

~~(2) Compliance with WQBELs of Specific Provision 5.b may be demonstrated via one of the following methods:~~

~~(i) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;~~

~~(ii) There are no exceedances of the applicable receiving water limitations under Specific Provision 5.b.(1)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls;~~

~~(iii) There are no violations of the applicable effluent limitations under Specific Provision 5.b.(2) at the Responsible Copermittees' MS4 outfalls;~~

~~(iv) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the applicable effluent limitations under Specific Provision 5.c.(1)(b); OR~~

~~(v) The Responsible Copermittees can demonstrate that exceedances of the applicable receiving water limitations under Specific Provision 5.b.(1)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4 are not causing or contributing to the exceedances.~~

6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2010-0001

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 10, 2010
State Water Board Approval Date:	December 14, 2010
Office of Administrative Law Approval Date:	April 4, 2011
US EPA Approval Date:	June 22, 2011

(3) TMDL Effective Date: April 4, 2011

(4) Watershed Management Areas: See Table 6.0

(5) Water Bodies: See Table 6.0

(6) Responsible Copermittees: See Table 6.0

Table 6.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	-City of Laguna Beach -County of Orange -Orange County Flood Control District
		at Heisler Park - North	
	Pacific Ocean Shoreline	at Main Laguna Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Woods -County of Orange -Orange County Flood Control District
		Laguna Beach at Ocean Avenue	
		Laguna Beach at Cleo Street	
		Arch Cove at Bluebird Canyon Road	
		Laguna Beach at Dumond Drive	
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Hills -City of Laguna Niguel -City of Laguna Woods -City of Lake Forest -City of Mission Viejo -County of Orange -Orange County Flood Control District
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	
	Aliso Creek Mouth	at mouth	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
South Orange County ~~(cont'd)~~ Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	-City of Dana Point -City of Laguna Beach -City of Laguna Niguel -County of Orange -Orange County Flood Control District
		Aliso Beach at Table Rock Drive	
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)	
		at Salt Creek (large outlet)	
		Salt Creek Beach at Salt Creek service road	
		Salt Creek Beach at Strand Road	
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	-City of Dana Point -City of Laguna Hills -City of Laguna Niguel -City of Mission Viejo -City of Rancho Santa Margarita -City of San Juan Capistrano -County of Orange -Orange County Flood Control District
	San Juan Creek	lower 1 mile	
	San Juan Creek Mouth	at mouth	
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	-City of Dana Point -City of San Clemente -County of Orange -Orange County Flood Control District
		Ole Hanson Beach Club Beach at Pico Drain	
		San Clemente City Beach at El Portal Street Stairs	
		San Clemente City Beach at Mariposa Street	
		San Clemente City Beach at Linda Lane	
		San Clemente City Beach at South Linda Lane	
		San Clemente City Beach at Lifeguard Headquarters	
		under San Clemente Municipal Pier	
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	
		San Clemente State Beach at Riviera Beach	
		Can Clemente State Beach at Cypress Shores	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	-City of Oceanside -City of Vista -County of San Diego
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	-City of Carlsbad -City of Encinitas -City of Escondido -City of San Marcos -County of San Diego
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	-City of Del Mar -City of Escondido -City of Poway -City of San Diego -City of Solana Beach -County of San Diego
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	-City of Del Mar -City of Poway -City of San Diego -County of San Diego
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	-City of San Diego
		La Jolla Shores Beach at Caminito del Oro	
		La Jolla Shores Beach at Vallecitos	
		La Jolla Shores Beach at Avenida de la Playa	
		at Casa Beach, Children's Pool	
		South Casa Beach at Coast Boulevard	
		Whispering Sands Beach at Ravina Street	
		Windansea Beach at Vista de la Playa	
		Windansea Beach at Bonair Street	
		Windansea Beach at Playa del Norte	
		Windansea Beach at Palomar Avenue	
		at Tourmaline Surf Park	
		Pacific Beach at Grand Avenue	
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I- Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	-City of El Cajon -City of Santee -County of San Diego
	San Diego River	lower 6 miles	-City of El Cajon -City of La Mesa -City of San Diego -City of Santee -County of San Diego
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	-City of La Mesa -City of Lemon Grove -City of San Diego -County of San Diego - San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS~~WATER QUALITY BASED EFFLUENT LIMITATIONS~~

The ~~WQBELs~~ final indicator bacteria TMDL compliance requirements for ~~segments or areas of~~ the water bodies listed in Table 6.0 consist of the following:

(1) Final TMDL Compliance Dates

The Responsible Copermittees for MS4 discharges to the water bodies listed in Table 6.0 must be in compliance with the final TMDL compliance requirements according to the following compliance dates:

Table 6.1
Compliance Dates to Achieve Final TMDL Compliance Requirements

Constituent	Dry Weather TMDL Compliance Date	Wet Weather TMDL Compliance Date
Total Coliform	April 4, 2021	April 4, 2031
Fecal Coliform		
Enterococcus		

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations
~~(a)~~

Discharges from the MS4s must not cause or contribute to the ~~violation~~ exceedance of the following receiving water limitations by the ~~end of the~~ compliance ~~schedules~~ dates under Specific Provision 6.b.(1)~~c.(1)~~:

~~**Table 6.21**~~
~~*Final Receiving Water Limitations as Expressed as Bacteria Densities and*~~

~~*Allowable Exceedance Frequencies in the Water Body*~~

~~Constituent~~	~~Receiving Water Limitations~~			
	~~Single Sample Maximum[1,2] (MPN/100mL)~~	~~Single Sample Maximum Allowable Exceedance Frequency[3]~~	~~30-Day Geometric Mean[2] (MPN/100mL)~~	~~30-Day Geometric Mean Allowable Exceedance Frequency~~
~~Total Coliform[4]~~	~~10,000~~	~~22% / 0%~~	~~1,000~~	~~0%~~
~~Fecal Coliform~~	~~400~~	~~22% / 0%~~	~~200~~	~~0%~~
~~*Enterococcus*~~	~~104[54] / 61[65]~~	~~22% / 0%~~	~~35[54] / 33[65]~~	~~0%~~

~~Notes:~~

~~1. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.~~
~~2. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.~~
~~3. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. The 0% single sample maximum allowable exceedance frequency applies to dry weather days.~~
~~4. This *Enterococcus* receiving water limitation applies to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.~~
~~5. This *Enterococcus* receiving water limitations applies to segments or areas of creeks or creek mouths listed in Table 6.0.~~

Table 6.2a

Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Beaches

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform	10,000	22% / 0%	1,000	0%
Fecal Coliform	400	22% / 0%	200	0%
Enterococcus	104	22% / 0%	35	0%

Notes:

a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. The 0% single sample maximum allowable exceedance frequency applies to dry weather days.

Table 6.2b

Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Creeks

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Fecal Coliform	400	22% / 0%	200	0%
Enterococcus	61 (104)[d]	22% / 0%	33	0%

Notes:

a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. The 0% single sample maximum allowable exceedance frequency applies to dry weather days.
d. A single sample maximum of 104 MPN/100ml for *Enterococcus* may be applied as a receiving water limitation for creeks, instead of 60 MPN/100mL, if one or more of the creeks addressed by these TMDLs (San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek, San Diego River, and/or Chollas Creek) is designated with a "moderately to lightly used area" or less frequent usage frequency in the Basin Plan. Otherwise, the single sample axmimum of 61 MPN/100mL for *Enterococcus* must be used to assess compliance with the allowable exceedance frequency.

~~Interim receiving water limitations expressed as allowable exceedance frequencies are given in the compliance schedule under Specific Provision 6.c.~~

~~(a) If the above receiving water limitations are not met in the receiving water, the Responsible Copermittees must demonstrate that the discharges from the MS4s are not causing or contributing to the violation of receiving water limitations. The Copermittee must provide data that demonstrate the discharges from the MS4s are meeting the effluent limitations under Specific Provision 6.b.(2).~~

(b) Final Effluent Limitations

(i) Discharges from the MS4s ~~must not~~ containing indicator bacteria densities that do not exceed the following effluent limitations by the ~~end of the~~ compliance dates ~~schedules~~ under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a) ~~to demonstrate the discharge is not causing or contributing to a violation of receiving water quality standards~~:

Table 6.2
Final Effluent Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies in MS4 Discharges to the Water Body

Constituent	Concentration-Based Effluent Limitations			
	Single Sample Maximum[~~1,2~~a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[~~3~~c]	30-Day Geometric Mean[~~2~~b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform[d]	10,000	22% / 0%	1,000	0%
Fecal Coliform	400	22% / 0%	200	0%
Enterococcus	104[e~~4~~] / 61[f~~5~~]	22% / 0%	35[e~~4~~] / 33[f~~5~~]	0%

Notes:
a~~1~~. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
b~~2~~. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.
c~~3~~. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. The 0% single sample maximum allowable exceedance frequency applies to dry weather days
d~~4~~. Total coliform effluent limitations only apply to MS4 outfalls that discharge to the Pacific Ocean Shorelines and creek mouths listed in Table 6.0.
e. This *Enterococcus* effluent limitation applies to MS4 discharges to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
f~~5~~. This *Enterococcus* effluent limitation applies to MS4 discharges to segments or areas of creeks or creek mouths listed in Table 6.0.

(ii) Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the compliance dates under Specific Provision 6.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a):

Table 6.3
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watershed and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
South Orange County	San Joaquin Hills HSA (901.11) and Laguna Hills HSA (901.12) - Pacific Ocean Shoreline	91.78%	91.72%	98.28%	46.85%	52.07%	51.26%
	Aliso HSA (901.13) - Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	95.47%	95.58%	99.13%	25.29%	26.62%	27.52% (27.37%)**
	Dana Point HSA (901.14) - Pacific Ocean Shoreline	95.04%	95.03%	98.98%	13.15%	14.86%	15.16%
	Lower San Juan HSA (901.27) - Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	72.96%	74.21%	94.94%	19.21%	12.82%	27.12% (26.90%)**
	San Clemente HA (901.30) - Pacific Ocean Shoreline	94.28%	94.23%	98.83%	23.85%	24.58%	25.26%
San Luis Rey River	San Luis Rey HU (903.00) - Pacific Ocean Shoreline	38.13%	39.09%	87.38%	5.62%	3.12%	11.69%

Table 6.3 (Cont'd)
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watershed and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
Carlsbad	**San Marcos HA** (904.50) - Pacific Ocean Shoreline	82.82%	82.55%	96.03%	18.47%	18.98%	20.19%
San Dieguito River	**San Dieguito HU** (905.00) - Pacific Ocean Shoreline	14.39%	20.72%	83.48%	4.29%	1.46%	7.72%
Penasquitos	**Miramar Reservoir HA** (906.10) - Pacific Ocean Shoreline	96.50%	96.59%	99.42%	1.61%	1.99%	1.93%
Mission Bay	**Scripps HA** (906.30) - Pacific Ocean Shoreline	96.44%	96.42%	99.25%	16.32%	21.14%	18.82%
	Tecolote HA (906.50) - Tecolote Creek	94.51%	94.59%	98.94%	16.51%	20.47%	18.15% (18.08%)**
San Diego River	**Mission San Diego HSA** (907.11) and **Santee HSA** (907.12) - Pacific Ocean Shoreline - Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles)	74.03%	69.44%	93.96%	38.14%	53.22%	42.74% (42.47%)**
San Diego Bay	**Chollas HSA** (908.22) - Chollas Creek	92.06%	92.15%	98.46%	17.82%	24.84%	21.46% (21.36%)**

Notes:
* The percent load reductions are based on reducing loads compared to pollutant loads from 2001 to 2002.
** The alternative *Enterococcus* percent load reduction was calculated based on a numeric target of 104 MPN/100mL instead of 61 MPN/100mL, protective of the REC-1 "moderately to lightly used area" usage frequency that is protective of freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative pollutant load reductions can be utilized.

~~Interim effluent limitations expressed as allowable exceedance frequencies are given in the compliance schedule under Specific Provision 6.c.~~

(c) Best Management Practices

(i) The Water Quality Improvement Plans for the applicable Watershed

Management Areas in Table 6.0 must incorporate the Comprehensive Load Reduction Plans (CLRPs) required to be developed pursuant to Resolution No. R9-2010-0001. ~~For segments or areas in Table 6.0 that have been delisted from the Clean Water Act Section 303(d) List of Water Quality Limited Segments, a CLRP is not required.~~

(ii) The Responsible Copermittee must implement BMPs to ~~support the~~ achieve~~ment of~~ the ~~WQBELs under Specific Provision 6.b~~ receiving water limitations under Specific Provision 6.b.(2)(a) and/or the effluent limitations under Specific Provision 6.b.(2)(b) for the segments or areas of the water bodies listed in Table 6.0.

(iii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans, ~~and~~ owners/operators of small MS4s, and agricultural dischargers as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible Copermittees' MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(f) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 6.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 6.b.(2)(c) achieves compliance with Specific Provisions 6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), and/or 6.b.(3)(e),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 6.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 6.d, to demonstrate compliance with Specific Provisions 5.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), 6.b.(3)(e) and/or 6.b.(3)(f).

c. INTERIM TMDL COMPLIANCE ~~SCHEDULE~~ REQUIREMENTS

The interim indicator bacteria TMDL compliance requirements for the water bodies listed in Table 6.0 consist of the following:

(1) ~~WLA~~ Interim TMDL Compliance Dates

The Responsible Copermittees must achieve compliance with the interim TMDL compliance requirements, as determined in accordance with Specific Provision 6.c.(3), by the interim compliance dates given in Table 6.4, unless alternative interim compliance dates are accepted by the San Diego Water Board Executive Officer as part of the Water Quality Improvement Plan.

Table 6.4
Interim Compliance Dates to Achieve Interim TMDL Compliance Requirements

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	April 4, 2016	April 4, 2021
		at Heisler Park - North		
	Pacific Ocean Shoreline	at Main Laguna Beach	April 4, 2016	April 4, 2021
		Laguna Beach at Ocean Avenue		
		Laguna Beach at Cleo Street		
		Arch Cove at Bluebird Canyon Road		
		Laguna Beach at Dumond Drive		
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	April 4, 2016	April 4, 2021
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	April 4, 2018	April 4, 2021
	Aliso Creek Mouth	at mouth	April 4, 2018	April 4, 2021
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	April 4, 2016	April 4, 2021
		Aliso Beach at Table Rock Drive		
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)		
		at Salt Creek (large outlet)		
		Salt Creek Beach at Salt Creek service road	April 4, 2017	April 4, 2021
		Salt Creek Beach at Strand Road	April 4, 2017	April 4, 2021

Table 6.4 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates	
			Interim Dry Weather WQBELs	Interim Wet Weather WQBELs
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	April 4, 2016	April 4, 2021
	San Juan Creek	lower 1 mile	April 4, 2018	April 4, 2021
	San Juan Creek Mouth	at mouth	April 4, 2016	April 4, 2021
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	April 4, 2016	April 4, 2021
		Ole Hanson Beach Club Beach at Pico Drain	April 4, 2016	April 4, 2021
		San Clemente City Beach at El Portal Street Stairs	April 4, 2017	April 4, 2021
		San Clemente City Beach at Mariposa Street		
		San Clemente City Beach at Linda Lane	April 4, 2016	April 4, 2021
		San Clemente City Beach at South Linda Lane	April 4, 2018	April 4, 2021
		San Clemente City Beach at Lifeguard Headquarters	April 4, 2017	April 4, 2021
		under San Clemente Municipal Pier		
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	April 4, 2018	April 4, 2021
		San Clemente State Beach at Riviera Beach	April 4, 2016	April 4, 2021
		Can Clemente State Beach at Cypress Shores	April 4, 2017	April 4, 2021
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	April 4, 2017	April 4, 2021
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	April 4, 2016	April 4, 2021
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	April 4, 2016	April 4, 2021

Table 6.4 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates	
			Interim Dry Weather WQBELs	Interim Wet Weather WQBELs
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	April 4, 2016	April 4, 2021
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	April 4, 2016	April 4, 2021
		La Jolla Shores Beach at Caminito del Oro		
		La Jolla Shores Beach at Vallecitos		
		La Jolla Shores Beach at Avenida de la Playa		
		at Casa Beach, Children's Pool		
		South Casa Beach at Coast Boulevard		
		Whispering Sands Beach at Ravina Street		
		Windansea Beach at Vista de la Playa		
		Windansea Beach at Bonair Street		
		Windansea Beach at Playa del Norte		
		Windansea Beach at Palomar Avenue		
		at Tourmaline Surf Park		
		Pacific Beach at Grand Avenue		
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries		
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	April 4, 2018	April 4, 2021
	San Diego River	lower 6 miles		
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach		
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	April 4, 2018	April 4, 2021

~~The Responsible Copermittees for MS4 discharges to a segment or area of the water bodies listed in Table 6.0 are required to achieve the WLA, thus~~

~~must be in compliance with the WQBELs under Specific Provision 6.b, according to the following compliance schedule:~~

~~**Table 6.3**~~
~~*Compliance Schedule Dates to Achieve Indicator Bacteria WLAs*~~

~~Constituent~~	~~Dry Weather WLA Compliance Date~~	~~Wet Weather WLA Compliance Date~~
~~Total Coliform*~~	~~April 4, 2021~~	~~April 4, 2031~~
~~Fecal Coliform~~		
~~*Enterococcus*~~		

~~* Total coliform receiving water limitations only apply to segments or areas of Pacific Ocean Shoreline listed in Table 6.0.~~

(2) Interim Water Quality Based Effluent Limitations ~~Compliance Requirements~~

The Responsible Copermittees for discharges to the water bodies in Table 6.0 must comply with the following interim WQBELs by the interim compliance dates given in Specific Provision 6.c.(1):

(a) Interim ~~Dry Weather~~ Receiving Water Limitations

(i) *Interim Dry Weather Receiving Water Limitations*

The Responsible Copermittee must calculate the "existing" exceedance frequencies of the 30-day geometric mean water quality objectives for each of the indicator bacteria by analyzing the available monitoring data collected between January 1, 1996 and December 31, 2002. "Existing" exceedance frequencies may be calculated by ~~segment or area of a water body, or by~~ water body~~,~~ and/or by Watershed Management Area listed in Table 6.0. Separate "existing" exceedance frequencies must be calculated for beaches and creeks/creek mouths.

The Responsible Copermittees must achieve a 50 percent reduction in the "existing" exceedance frequency of the 30-day geometric mean WQBELs for ~~the segments or areas of~~ the water bodies listed in Table 6.0 by the interim compliance dates ~~for achieving the interim dry weather WQBELs~~ given in Table 6.5. A 50 percent reduction in the "existing" exceedance frequency is equivalent to half of the "existing" exceedance frequency of the 30-day geometric mean WQBELs.

The "existing" exceedance frequencies and the interim dry weather allowable exceedance frequencies (i.e. interim dry weather receiving water limitations ~~WQBELs~~) calculated by the Responsible Copermittees must be included in the Water Quality Improvement Plans for the applicable Watershed Management Areas.

(ii) *Interim Wet Weather Receiving Water Limitations*

The Responsible Copermittees must achieve the interim wet weather receiving water limitations in Table 6.5~~4~~, expressed as interim wet

weather allowable exceedance frequencies, by the interim compliance dates ~~for achieving the interim wet weather WQBELs~~ given in Table 6.4~~5~~.

Table 6.5~~4~~
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	38%	37%	39%
		at Heisler Park - North			
	Pacific Ocean Shoreline	at Main Laguna Beach			
		Laguna Beach at Ocean Avenue			
		Laguna Beach at Cleo Street			
		Arch Cove at Bluebird Canyon Road			
		Laguna Beach at Dumond Drive			
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	41%	41%	42%
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	41%	41%	42%
	Aliso Creek Mouth	at mouth	41%	41%	42%
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	36%	36%	36%
		Aliso Beach at Table Rock Drive			
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)			
		at Salt Creek (large outlet)			
		Salt Creek Beach at Salt Creek service road			
		Salt Creek Beach at Strand Road			

Table 6.54 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County ~~(cont'd)~~ Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	44%	44%	48%
	San Juan Creek	lower 1 mile	44%	44%	47%
	San Juan Creek Mouth	at mouth	44%	44%	47%
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	35%	35%	36%
		Ole Hanson Beach Club Beach at Pico Drain			
		San Clemente City Beach at El Portal Street Stairs			
		San Clemente City Beach at Mariposa Street			
		San Clemente City Beach at Linda Lane			
		San Clemente City Beach at South Linda Lane			
		San Clemente City Beach at Lifeguard Headquarters			
		under San Clemente Municipal Pier			
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)			
		San Clemente State Beach at Riviera Beach			
		Can Clemente State Beach at Cypress Shores			
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	45%	44%	47%
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	40%	40%	41%
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	33%	33%	36%

Table 6.54 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	26%	26%	26%
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	37%	37%	37%
		La Jolla Shores Beach at Caminito del Oro			
		La Jolla Shores Beach at Vallecitos			
		La Jolla Shores Beach at Avenida de la Playa			
		at Casa Beach, Children's Pool			
		South Casa Beach at Coast Boulevard			
		Whispering Sands Beach at Ravina Street			
		Windansea Beach at Vista de la Playa			
		Windansea Beach at Bonair Street			
		Windansea Beach at Playa del Norte			
		Windansea Beach at Palomar Avenue			
		at Tourmaline Surf Park			
		Pacific Beach at Grand Avenue			
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries	49%	49%	51%
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	46%	43%	49%
	San Diego River	lower 6 miles	46%	43%	49%
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	46%	43%	51%
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	41%	41%	43%

(b) Interim Effluent Limitations

Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the interim compliance dates under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.c.(2)(a):

Table 6.6
Interim Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watersheds and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
South Orange County	San Joaquin Hills HSA (901.11) and Laguna Hills HSA (901.12) - Pacific Ocean Shoreline	45.89%	45.86%	49.14%	23.43%	26.04%	25.63%
	Aliso HSA (901.13) - Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	47.74%	47.79%	49.57%	12.65%	13.31%	13.76% (13.69%)**
	Dana Point HSA (901.14) - Pacific Ocean Shoreline	47.52%	47.52%	49.49%	6.58%	7.43%	7.58%
	Lower San Juan HSA (901.27) - Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	36.48%	37.11%	47.47%	9.61%	6.41%	13.56% (13.45%)**
	San Clemente HA (901.30) - Pacific Ocean Shoreline	47.14%	47.12%	49.42%	11.93%	12.29%	12.63%
San Luis Rey River	San Luis Rey HU (903.00) - Pacific Ocean Shoreline	19.07%	19.55%	43.69%	2.81%	1.56%	5.85%
Carlsbad	San Marcos HA (904.50) - Pacific Ocean Shoreline	41.41%	41.28%	48.02%	9.24%	9.49%	10.10%

Table 6.6 (Cont'd)
Interim Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watersheds and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
San Dieguito River	**San Dieguito HU** (905.00) - Pacific Ocean Shoreline	7.20%	10.36%	41.74%	2.15%	0.73%	3.86%
Penasquitos	**Miramar Reservoir HA** (906.10) - Pacific Ocean Shoreline	48.25%	48.30%	49.71%	0.81%	1.00%	0.97%
Mission Bay	**Scripps HA** (906.30) - Pacific Ocean Shoreline	48.22%	48.21%	49.63%	8.16%	10.57%	9.41%
	Tecolote HA (906.50) - Tecolote Creek	47.26%	47.30%	49.47%	8.26%	10.24%	9.08% (9.04%)**
San Diego River	**Mission San Diego HSA** (907.11) and **Santee HSA** (907.12) - Pacific Ocean Shoreline - Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles)	37.02%	34.72%	46.98%	19.07%	26.61%	21.37% (21.24%)**
San Diego Bay	**Chollas HSA** (908.22) - Chollas Creek	46.03%	46.08%	49.23%	8.91%	12.42%	10.73% (10.68%)**

Notes:
* The percent load reductions are based on reducing loads compared to pollutant loads from 2001 to 2002.
** The alternative *Enterococcus* percent load reduction was calculated based on a numeric target of 104 MPN/100mL instead of 61 MPN/100mL, protective of the REC-1 "moderately to lightly used area" usage frequency that is protective of freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative pollutant load reductions can be utilized.

~~(b) Interim Compliance Dates~~

~~The Responsible Copermittees must achieve the interim receiving water limitations under Specific Provisions 6.c.(2)(a) and 6.c.(2)(b) by the interim compliance dates given in Table 6.5.~~

~~**Table 6.5**~~
~~*Interim Compliance Dates to Achieve Interim WQBELs*~~

~~Watershed Management Area~~	~~Water Body~~	~~Segment or Area~~	~~Interim Compliance Dates~~ ~~Interim Dry Weather WQBELs~~	~~Interim Wet Weather WQBELs~~
~~South Orange County~~	~~Pacific Ocean Shoreline~~	~~Cameo Cove at Irvine Cove Drive – Riviera Way~~	~~April 4, 2016~~	~~April 4, 2021~~
		~~at Heisler Park – North~~		
	~~Pacific Ocean Shoreline~~	~~at Main Laguna Beach~~	~~April 4, 2016~~	~~April 4, 2021~~
		~~Laguna Beach at Ocean Avenue~~		
		~~Laguna Beach at Cleo Street~~		
		~~Arch Cove at Bluebird Canyon Road~~		
		~~Laguna Beach at Dumond Drive~~		
	~~Pacific Ocean Shoreline~~	~~Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach~~	~~April 4, 2016~~	~~April 4, 2021~~
	~~Aliso Creek~~	~~Entire reach (7.2 miles) and associated tributaries:~~ ~~- Aliso Hills Channel~~ ~~- English Canyon Creek~~ ~~- Dairy Fork Creek~~ ~~- Sulfur Creek~~ ~~- Wood Canyon Creek~~	~~April 4, 2018~~	~~April 4, 2021~~
	~~Aliso Creek Mouth~~	~~at mouth~~	~~April 4, 2018~~	~~April 4, 2021~~
	~~Pacific Ocean Shoreline~~	~~Aliso Beach at West Street~~	~~April 4, 2016~~	~~April 4, 2021~~
		~~Aliso Beach at Table Rock Drive~~		
		~~100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)~~		
		~~at Salt Creek (large outlet)~~		
		~~Salt Creek Beach at Salt Creek service road~~	~~April 4, 2017~~	~~April 4, 2021~~
		~~Salt Creek Beach at Strand Road~~	~~April 4, 2017~~	~~April 4, 2021~~

~~**Table 6.5** (Cont'd)~~
~~*Interim Compliance Dates to Achieve Interim WQBELs*~~

~~Watershed Management Area~~	~~Water Body~~	~~Segment or Area~~	~~Interim Compliance Dates~~ ~~Interim Dry Weather WQBELs~~	~~Interim Wet Weather WQBELs~~
~~South Orange County (cont'd)~~	~~Pacific Ocean Shoreline~~	~~at San Juan Creek~~	~~April 4, 2016~~	~~April 4, 2021~~
	~~San Juan Creek~~	~~lower 1 mile~~	~~April 4, 2018~~	~~April 4, 2021~~
	~~San Juan Creek Mouth~~	~~at mouth~~	~~April 4, 2016~~	~~April 4, 2021~~
	~~Pacific Ocean Shoreline~~	~~at Poche Beach~~	~~April 4, 2016~~	~~April 4, 2021~~
		~~Ole Hanson Beach Club Beach at Pico Drain~~	~~April 4, 2016~~	~~April 4, 2021~~
		~~San Clemente City Beach at El Portal Street Stairs~~	~~April 4, 2017~~	~~April 4, 2021~~
		~~San Clemente City Beach at Mariposa Street~~		
		~~San Clemente City Beach at Linda Lane~~	~~April 4, 2016~~	~~April 4, 2021~~
		~~San Clemente City Beach at South Linda Lane~~	~~April 4, 2018~~	~~April 4, 2021~~
		~~San Clemente City Beach at Lifeguard Headquarters~~	~~April 4, 2017~~	~~April 4, 2021~~
		~~under San Clemente Municipal Pier~~		
		~~San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)~~	~~April 4, 2018~~	~~April 4, 2021~~
		~~San Clemente State Beach at Riviera Beach~~	~~April 4, 2016~~	~~April 4, 2021~~
		~~Can Clemente State Beach at Cypress Shores~~	~~April 4, 2017~~	~~April 4, 2021~~
~~San Luis Rey River~~	~~Pacific Ocean Shoreline~~	~~at San Luis Rey River mouth~~	~~April 4, 2017~~	~~April 4, 2021~~
~~Carlsbad~~	~~Pacific Ocean Shoreline~~	~~at Moonlight State Beach~~	~~April 4, 2016~~	~~April 4, 2021~~
~~San Dieguito River~~	~~Pacific Ocean Shoreline~~	~~at San Dieguito Lagoon mouth~~	~~April 4, 2016~~	~~April 4, 2021~~

~~**Table 6.5** (Cont'd)~~
~~*Interim Compliance Dates to Achieve Interim WQBELs*~~

~~Watershed Management Area~~	~~Water Body~~	~~Segment or Area~~	~~Interim Compliance Dates~~ ~~Interim Dry Weather WQBELs~~	~~Interim Wet Weather WQBELs~~
~~Penasquitos~~	~~Pacific Ocean Shoreline~~	~~Torrey Pines State Beach at Del Mar (Anderson Canyon)~~	~~April 4, 2016~~	~~April 4, 2021~~
~~Mission Bay~~	~~Pacific Ocean Shoreline~~	~~La Jolla Shores Beach at El Paseo Grande~~	~~April 4, 2016~~	~~April 4, 2021~~
		~~La Jolla Shores Beach at Caminito del Oro~~		
		~~La Jolla Shores Beach at Vallecitos~~		
		~~La Jolla Shores Beach at Avenida de la Playa~~		
		~~at Casa Beach, Children's Pool~~		
		~~South Casa Beach at Coast Boulevard~~		
		~~Whispering Sands Beach at Ravina Street~~		
		~~Windansea Beach at Vista de la Playa~~		
		~~Windansea Beach at Bonair Street~~		
		~~Windansea Beach at Playa del Norte~~		
		~~Windansea Beach at Palomar Avenue~~		
		~~at Tourmaline Surf Park~~		
		~~Pacific Beach at Grand Avenue~~		
	~~Tecolote Creek~~	~~Entire reach and tributaries~~		
~~San Diego River~~	~~Forrester Creek~~	~~lower 1 mile~~	~~April 4, 2018~~	~~April 4, 2021~~
	~~San Diego River~~	~~lower 6 miles~~		
	~~Pacific Ocean Shoreline~~	~~at San Diego River mouth at Dog Beach~~		
~~San Diego Bay~~	~~Chollas Creek~~	~~lower 1.2 miles~~	~~April 4, 2018~~	~~April 4, 2021~~

(3) Interim TMDL Compliance Determination

Compliance with the interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible Copermittees' MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(f) There are no exceedances of the interim receiving water limitations under Specific Provision 6.c.(2)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(g) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the interim effluent limitations under Specific Provision 6.c.(2)(b); OR

(h) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

d. Specific Monitoring and Assessment Requirements

(1) Monitoring and Assessment Requirements for Beaches

(a) Monitoring Stations

For beaches addressed by the TMDL, monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[37] If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

[37] Commonly referred to as AB 411 monitoring

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations at least once within the first 24 hours of the end of ~~first~~ a storm event[38] ~~of~~ during the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer in exceedance of the allowable exceedance frequencies in the receiving waters.

(iii) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs for the Pacific Ocean Shoreline segments or areas listed in Table 6.0 have been achieved.

(ii) Dry weather exceedance frequencies must be calculated as follows:

[a] 30-day geometric means must be calculated from the results of any dry weather samples collected from the segments or areas for each water body listed in Table 6.0;

[b] The method and number of samples need for calculating the 30-day geometric means must be consistent with the number of samples required by the Ocean Plan;

[c] Where there are multiple segments or areas associated with a water body listed in Table 6.0, the Copermittees may calculate geometric means for each segment or area, or combine the dry weather monitoring data from all the segments or areas to

[38] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

calculate geometric means for the water body;

[d] The exceedance frequency must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the dry season.

(iii) Wet weather exceedance frequencies must be calculated as follows:

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;

[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;

[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the highest bacteria density result reported from wet weather samples collected; and

[d] The single sample maximum exceedance frequency must be calculated by dividing the number of wet weather days that exceed the single sample maximum receiving water limitations in Table 6.2 by the total number of wet weather days during the rainy season.

[e] The data collected for dry weather must be used in addition to the data collected for wet weather to calculate the wet weather 30-day geometric means. The exceedance frequency of the wet weather 30-day geometric means must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the wet season.

(iv) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) Monitoring and Assessment Requirements for Creeks and Creek Mouths

(a) Monitoring Stations

For creeks addressed by the TMDL, monitoring locations should consist of, at a minimum, a location at or near the mouth of the creek (e.g. Mass Loading Station or Mass Emission Station) and one or more locations

upstream of the mouth (e.g. Watershed Assessment Station). If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations in accordance with the requirements of Provision D.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations within the first 24 hours of the end of ~~first~~ a storm event[39] ~~of~~ during the rainy season (i.e. October 1 through April 30).

(iii) Samples collected from receiving water monitoring stations must be analyzed for fecal coliform and *Enterococcus* indicator bacteria.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the receiving water monitoring data to assess whether the interim and final receiving water WQBELs for the creeks and creek mouths listed in Table 6.0 have been achieved.

(ii) Dry weather exceedance frequencies must be calculated as follows:

[a] 30-day geometric means must be calculated from the results of any dry weather samples collected from the segment or area for each water body listed in Table 6.0;
[b] The method and number of samples need for calculating the 30-day geometric means must be consistent with the number of samples required by the Basin Plan;
[c] The exceedance frequency must be calculated by dividing the number of 30-day geometric means that exceed the 30-day geometric mean receiving water limitations in Table 6.2 by the total number of 30-day geometric means calculated from samples collected during the dry season.

(iii) Wet weather exceedance frequencies must be calculated as follows:

[39] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;

[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;

[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the highest bacteria density result reported from wet weather samples collected; and

[d] The exceedance frequency must be calculated by dividing the number of wet weather days that exceed the single sample maximum receiving water limitations in Table 6.2 by the total number of wet weather days during the rainy season.

[e] The data collected for dry weather must be used in addition to the data collected for wet weather to calculate the wet weather 30-day geometric means. The exceedance frequency of the wet weather 30-day geometric means must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the wet season.

(iv) The Responsible Copermittee must identify and incorporate additional MS4 outfall and receiving water monitoring stations and/or adjust monitoring frequencies to identify sources causing exceedances of the receiving water WQBELs.

(v) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

~~e. COMPLIANCE DETERMINATION~~

~~(1) Compliance with interim compliance requirements of Specific Provision 6.c.(2) may be demonstrated via one of the following methods:~~

~~(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;~~

~~(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 6.b.(1) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls;~~

~~(c) There are no violations of the applicable effluent limitations under Specific Provision 6.b.(2) at the Responsible Copermittees' MS4 outfalls;~~

~~(d) There are no exceedances of the applicable interim receiving water limitations under Specific Provision 6.c.(2) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls;~~

~~(e) The Responsible Copermittees can demonstrate that exceedances of the applicable interim or final receiving water limitations under Specific Provision 6.b.(1)(a) or 6.c.(2) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4 are not causing or contributing to the exceedances; OR~~

~~(f) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim compliance requirements will be achieved by the interim compliance dates.~~

~~(2) Compliance with WQBELs of Specific Provision 6.b may be demonstrated via one of the following methods:~~

~~(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water;~~

~~(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 6.b.(1) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls;~~

~~(c) There are no violations of the applicable effluent limitations under Specific Provision 6.b.(2) at the Responsible Copermittees' MS4 outfalls; OR~~

~~The Responsible Copermittees can demonstrate that exceedances of the applicable final receiving water limitations under Specific Provision 6.b.(1)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4 are not causing or contributing to the exceedances.~~

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ATTACHMENT F

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

FACT SHEET / TECHNICAL REPORT

FOR

TENTATIVE
ORDER NO. R9-2013-0001
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

MONTH DAY, 2013

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I. FACT SHEET FORMAT

This Fact Sheet briefly sets forth the principal facts and the significant factual, legal, methodological, and policy questions that the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) considered in preparing Order No. R9-2013-0001 (Order). In accordance with the Code of Federal Regulations (CFR) Title 40 Parts 124.8 and 124.56 (40 CFR 124.8 and 40 CFR 124.56), this Fact Sheet includes, but is not limited to, the following information:

1. Contact information
2. Public process and notification procedures
3. Background of municipal storm water permits
4. Regional MS4 Permit approach
5. Economic considerations
6. Applicable statutes, regulations, plans and policies
7. Discussion of the provisions in the Order

Tentative Order No. R9-2013-0001 was distributed for public review on October 31, 2012. The San Diego Water Board accepted written comments on the Tentative Order until January 11, 2013. A public hearing was subsequently held on ~~Month Day~~April 10 and 11, 2013 to receive oral comments from interested persons.

The San Diego Water Board files applicable to the issuance of Order No. R9-2013-0001 are incorporated into the administrative record in support of the findings and requirements of the Order.

II. CONTACT INFORMATION

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The Order and other related documents can be downloaded from the San Diego Water Board website at

http://www.swrcb.ca.gov/rwqcb9/water_issues/programs/stormwater/index.shtml

The documents referenced in this Fact Sheet and in Order No. R9-2013-0001 are available for public review at the San Diego Water Board office, located at the address listed above. Public records are available for inspection during regular business hours, from 8:00 am to 5:00 pm Monday through Friday. To schedule an appointment to inspect public records, contact the San Diego Water Board Records Management Officer at 858-467-2952.

COPERMITTEES

Orange County Copermittees

- County of Orange
  - City of Aliso Viejo
  - City of Dana Point
  - City of Laguna Beach
  - City of Laguna Hills
  - City of Laguna Niguel
  - City of Laguna Woods
  - City of Lake Forest
  - City of Mission Viejo
  - City of Ranch Santa Margarita
  - City of San Clemente
  - City of San Juan Capistrano
  - Orange County Flood Control District

Riverside County Copermittees

- County of Riverside
  - City of Murrieta
  - City of Temecula
  - City of Wildomar
  - Riverside County Flood Control and Water Conservation District

San Diego County Copermittees

- County of San Diego
  - City of Carlsbad
  - City of Chula Vista
  - City of Coronado
  - City of Del Mar
  - City of El Cajon
  - City of Encinitas
  - City of Escondido
  - City of Imperial Beach
  - City of La Mesa
  - City of Lemon Grove
  - City of National City
  - City of Oceanside
  - City of Poway
  - City of San Diego
  - City of San Marcos
  - City of Santee
  - City of Solana Beach
  - City of Vista
  - San Diego County Regional Airport Authority
  - San Diego Unified Port District

III. PUBLIC PROCESS AND NOTIFICATION PROCEDURES

The San Diego Water Board followed the schedule listed below for the preparation of Order No. R9-2013-0001:

1. On February 8, 2011, the San Diego Water Board met with the San Diego County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No. R9-2007-0001.

2. Between February and May 2011, the San Diego Water Board met with select San Diego County, Orange County, and Riverside County Copermittees, as well as representatives of the environmental community to discuss concepts and receive recommendations for elements to be incorporated in a Regional Municipal Separate Storm Sewer System Permit (Regional MS4 Permit).

3. On June 27, 2011 the San Diego Water Board received the Report of Waste Discharge from the San Diego County Copermittees for the renewal of their NPDES permit, Order No. R9-2007-0001.

4. On April 9, 2012, the San Diego Water Board released an administrative draft of Tentative Order No. R9-2013-0001 for preliminary informal comments and feedback.

5. On April 25, 2012, the San Diego Water Board held an informal public workshop to present the administrative draft of Tentative Order No. R9-2013-0001 and receive verbal comments.

6. Between June and August 2012, the San Diego Water Board held four (4) focused meetings with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community, and USEPA) to discuss and receive preliminary comments and feedback about specific elements in the administrative draft of Tentative Order No. R9-2013-0001.

7. On September 5, 2012, the San Diego Water Board held an informal public workshop to present the modifications that were expected to be incorporated into the Tentative Order based on the preliminary comments and feedback received during the focused meetings held between June and August 2012.

8. Informal written comments on the administrative draft of Tentative Order No. R9-2013-0001 were accepted until September 14, 2012.

9. On October 12, 2012, the San Diego Water Board released a revised administrative draft of Tentative Order No. R9-2013-0001.

10. On October 24, 2012, the San Diego Water Board held a focused meeting with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community, and USEPA) to discuss modifications incorporated into the administrative draft of Tentative Order No. R9-2013-0001.

11. On October 31, 2012, the San Diego Water Board released Tentative Order No. R9-2013-0001 for formal public review and comment.

12. On November 13, 2012 and December 12, 2012, the San Diego Water Board held a formal public Board workshop to present the public draft of Tentative Order No. R9-2013-0001 and receive verbal comments.

13. Formal written comments on the public draft of Tentative Order No. R9-2013-0001 were accepted until January 11, 2013.

14. A public hearing of Tentative Order No. R9-2013-0001 was conducted on ~~Month Day~~April 10 and 11, 2013.

IV. BACKGROUND OF THE SAN DIEGO REGION MUNICIPAL STORM WATER PERMITS

In developed and developing areas, storm water runoff is commonly transported through municipal separate storm sewer systems (MS4s) and discharged into local receiving water bodies. As the storm water runs off and flows over the land or impervious surfaces (e.g., paved streets, parking lots, and building rooftops), it accumulates debris, chemicals, sediment, and other pollutants that can adversely affect receiving water quality if discharged untreated. The United States Environmental Protection Agency (USEPA) recognizes wet weather flows from urban areas as the number one source of estuarine pollution in coastal communities,[1] such as those within the San Diego Region.

The federal Clean Water Act (CWA) was amended in 1987 to address and regulate discharges of storm water associated with industrial activities and from municipal storm sewers. With the amendments, many municipalities throughout the United States were obligated for the first time to obtain National Pollutant Discharge Elimination System (NPDES) permits for discharges of storm water from their MS4s.

In response to the CWA 1987 amendment, as well as the pending federal NPDES regulations which would implement the amendment, the San Diego Water Board issued "early" MS4 permits. The San Diego Water Board adopted and issued Order Nos. 90-38, 90-42, and 90-46 to regulate storm water discharges from the MS4s in Orange County, San Diego County, and Riverside County, respectively, within the San Diego Region on July 16, 1990.

The "early" MS4 permits, or First Term Permits, were issued prior to the November 1990 promulgation of the final federal NPDES storm water regulations. By issuing these First Term Permits before the federal regulations took effect, the San Diego Water Board was able to provide the Copermittees additional flexibility in addressing and managing storm water discharges. The First Term Permits contained the essentials of the 1990 regulations, and required the Copermittees to develop and implement runoff management programs, but provided little specificity about what was required to be included in or actually achieved by those programs.

The flexibility provided in the First Term Permits was generally continued through the Second Term Permits. The combination of the lack of specificity in the First and Second Term Permits, a general lack of meaningful action by the Copermittees and a general lack of corresponding reaction (i.e. enforcement) by the San Diego Water Board during the first ten years of the storm water program, resulted in few substantive steps towards achieving improvements in the quality of receiving waters or storm water discharges from the MS4s.

[1] US EPA. 1999. 40 CFR Parts 9, 122, 123, and 124. National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. 64 FR 68727.

From 2001, the regulatory approach incorporated into Third Term Permits was a significant departure from the regulatory approach of the First and Second Term Permits. The Third Term Permits issued by the San Diego Water Board included more detailed requirements that outlined the minimum level of implementation required for the Copermittees' programs to meet the maximum extent practicable (MEP) standard for storm water. The Third Term Permits included more detail to emphasize and enhance the jurisdictional runoff management programs developed by the Copermittees and introduced requirements for developing and implementing watershed-based programs.

The Third Term Permits also incorporated two precedent setting decisions by the State Water Board. In Order WQ 99-05, the State Water Board established receiving water limitation language to be included in all MS4 permits. The State Water Board's precedential language clarified that municipal storm water permits must include provisions requiring discharges to be controlled to attain water quality standards in receiving waters. Unlike previously adopted versions of the receiving water limitation language in the First and Second Term Permits, the language no longer stated that "*violations of water quality standards are not violations of the municipal storm water permit under certain conditions*." In addition, the receiving water limitation language no longer indicated that the "*implementation of best management practices is the 'functional equivalent' of meeting water quality standards*." State Water Board Order WQ 99-05 specifically requires language in MS4 permits for the Copermittees to comply with water quality standards based discharge prohibitions and receiving water limitations through timely implementation of control measures and other actions to reduce pollutants in discharges. (See State Water Board Order WQ 99-05 (*Environmental Health Coalition*)).

In Order WQ 2000-11, also a precedential decision, the State Water Board addressed design standards for structural post-construction best management practices (BMPs) for new development and significant redevelopment. The State Water Board found that the design standards, which require that runoff generated by 85 percent of storm events from specific development categories be infiltrated or treated, reflect the MEP standard. State Water Board Order WQ 2000-11 also found that the post-construction BMP provisions, or Standard Storm Water Mitigation Plan (SSMP) provisions, constitute MEP for addressing storm water pollutant discharges resulting from specific development categories.

The Third Term San Diego County and Orange County Permits (Order Nos. 2001-01 and R9-2002-0001, respectively) were appealed to the State Water Board. Minor modifications were made by the State Water Board, but the requirements were largely upheld. In State Water Board Order WQ 2001-15, the State Water Board upheld the Third Term San Diego County Permit requirements with certain modifications. The State Water Board removed the prohibition of storm water discharges *into* the MS4 that cause or contribute to exceedances of water quality objectives. The revision allows for treatment of pollutants in storm water runoff after the pollutants have entered the MS4. State Water Board Order WQ 2001-15 otherwise upheld all the other requirements of the permit.

In addition to the modification to the discharge prohibition in Order WQ 2001-15, the State Water Board refined Order WQ 99-05 by making clear that the Copermittees may use an iterative approach to achieving compliance with water quality standards that involves ongoing assessments and revisions. Thus, the language for the discharge prohibitions and receiving water limitations was revised to explicitly require the Copermittees to implement an iterative process of assessments and revisions to comply with the discharge prohibitions and receiving water limitations. The San Diego Water Board retained the authority to enforce receiving water limitations and discharge prohibitions even if the Copermittee is engaged in the iterative process.

The Third Term San Diego County Permit was subsequently challenged in the Superior Court of the State of California and the Court of Appeal~~s~~, Fourth Appellate District. The Court of Appeal~~s~~, Fourth Appellate District, found that the approach of the Third Term San Diego County Permit to regulating discharges into the MS4 was appropriate (*Building Industry Ass'n. v. State Water Resources Control Bd., et al.,* 124 Cal.App.4th 866 (2004)). The State of California Supreme Court denied review sought by the Building Industry Association in March 2005.

The Fourth Term Permits, or current MS4 permits, began with the adoption of Order No. R9-2007-0001 issued to the Copermittees of San Diego County in January 2007. Order Nos. R9-2009-0002 and R9-2010-0016 were subsequently issued to the Copermittees of Orange County and Riverside County. The Fourth Term Permits continued to include more detailed requirements to be implemented by each Copermittee's jurisdictional runoff management program. The Fourth Term Permits also include requirements to further emphasize a watershed management approach and for more coordination among jurisdictional runoff management programs. In addition, the Fourth Term Permits included more requirements for assessing the effectiveness of the runoff management programs being implemented by the Copermittees. The intent of the inclusion of additional requirements was to enhance and better define elements of the permit that were expected to be incorporated into the iterative process for managing runoff from each Copermittee's jurisdiction and within the watersheds of the San Diego Region.

The Fourth Term Permits include several new and emerging approaches for managing storm water runoff and discharges. Low impact development (LID) requirements are included for development and significant redevelopment to reduce pollutants in storm water runoff from sites through more natural processes such as infiltration and biofiltration closer to the source, rather than utilizing conventional mechanical end-of-pipe treatment systems. Hydrograph modification (hydromodification) management requirements also are included to mitigate the potential for increased erosion in receiving waters due to increased runoff rates and durations often caused by development and increased impervious surfaces. The Fourth Term Orange County and Riverside County Permits introduced requirements to identify areas of existing development where retrofitting with LID projects would be feasible and could be implemented to reduce storm water runoff and pollutants in storm water discharges.

The Fourth Term Orange County and Riverside County Permits included a clearer distinction between storm water and non-storm water discharges. The term “urban runoff” was completely removed, and a distinction between storm water (wet weather) runoff and non-storm water (dry weather) runoff was emphasized. This clarification was made to prevent any potential misunderstanding that regulation under the MS4 permits is limited only to urbanized areas, and to prevent non-storm water runoff from being managed in the same manner as storm water runoff. The term “urban runoff” is not defined in the Code of Federal Regulations (CFR) or Federal Register (FR) in the regulation of MS4 discharges. According to the CWA 402(p)(3)(B)(ii), MS4 permits must include a requirement to effectively prohibit non-storm water discharges into the MS4s.

Finally, for the Fourth Term Orange County and Riverside County Permits the San Diego Water Board found that non-storm water discharges to the MS4 from over application of irrigation water are sources of pollutants. The San Diego Water Board found that non-storm water discharges resulting from over-irrigation must be prohibited from entering the MS4 in accordance with the requirements of the CWA and pursuant to 40 CFR 122.26(d)(2)(iv)(B)(1).

The requirements of the Fourth Term Permits issued to the Copermittees in each county within the San Diego Region now have substantively the same core requirements such as discharge prohibitions, receiving water limitations, jurisdictional runoff management program components, and monitoring program requirements. There are, however, several inconsistencies that exist among the three Fourth Term Permits which complicate oversight and implementation of the permits by the San Diego Water Board.

The Fourth Term San Diego County Permit expired in January 2012. The Fourth Term Orange County and Riverside County Permits will expire in December 2014 and November 2015, respectively. Issuing the Fifth Term Permits within five years for three counties under three different permits would require the San Diego Water Board to expend significant time and resources for the issuance of the permits through three separate public proceedings, thereby greatly reducing the time and resources available to oversee implementation and compliance. Multiple permits also create confusion for determining compliance among regulated entities, especially for the land development community.

The San Diego Water Board has acknowledged that issuing a single MS4 permit for all the Copermittees in the San Diego Region can and is expected to result in more consistent implementation, improve communication among agencies within watersheds crossing multiple jurisdictions, and minimize resources spent with each permit renewal process. Within the findings of the Fourth Term Riverside County Permit issued in November 2010, the San Diego Water Board notified the public of its intent to develop and issue a single Regional MS4 Permit.

V. REGIONAL MS4 PERMIT APPROACH

The Fifth Term Permit, or Regional MS4 Permit, shifts the focus of the permit requirements from a minimum level of actions to be implemented by the Copermittees to identifying outcomes to be achieved by those actions. Order No. R9-2013-0001 represents an important paradigm shift in the approach for MS4 permits within the San Diego Region.

Historical Permitting Approach

The First and Second Term Permits were very broad and provided little specificity about what was required to be developed and implemented by the Copermittees. The Third Term Permits began to become more specific about the minimum level of implementation required by the Copermittees. The Fourth Term Permits, or current permits, subsequently increased in specificity. The MS4 permits have progressively become more detailed and focused on specifying the minimum level of actions expected to be implemented by the Copermittees. As detailed and specific as the MS4 permits have become, however, they include very little detail about what the desired outcomes of the required actions are expected to achieve. Compliance with the permit requirements has essentially been tracking numbers of actions and reporting, not tracking progress or actual improvements in the quality of receiving waters or discharges from the MS4s. The result has been an increase in actions being implemented by the Copermittees with little or no ability or expectations to determine whether or not improvements in water quality are being achieved.

The Fourth Term Permits result in significant resource expenditure by the Copermittees to report permit compliance information to the San Diego Water Board in the form of annual jurisdictional runoff management program, watershed program, and monitoring program reports. The San Diego Water Board must then expend much of its limited resources on reviewing more than 50 voluminous reports submitted annually by the Copermittees. The information currently reported by the Copermittees is of limited value when trying to measure progress toward achieving improvements in the quality of receiving waters or discharges from the MS4s. Oversight of the MS4 permits is further complicated by the inconsistencies among the requirements issued to the Orange County, San Diego County, and Riverside County Copermittees under three separate MS4 permits.

Under the Fourth Term Permits, the Copermittees must expend a significant portion of their limited resources collecting data of limited value, and putting together reports to submit that information to the San Diego Water Board. Likewise, the San Diego Water Board must expend most of its limited resources reviewing reports, and developing permits instead of working directly with the Copermittees to identify solutions to problems causing impacts to water quality. This is an unsustainable course that will continue to demand more resources from the Copermittees and the San Diego Water Board, and would continue to result in unknown water quality benefits.

New Permitting Approach

The goal of the Regional MS4 Permit is twofold: 1) bring a consistent set of MS4 permit requirements to all of the Copermittees within the San Diego Region; and, 2) provide an MS4 permit with requirements that will allow the Copermittees to focus their efforts and resources on achieving goals and desired outcomes toward the improvement of water quality rather than completing specific actions.

The overall approach included in the Regional MS4 Permit with respect to the jurisdictional runoff management programs will not differ significantly from the current permits. The general requirements for the jurisdictional runoff management program components and compliance with those requirements will remain and be applied consistently throughout the San Diego Region under the Regional MS4 Permit.

The most significant difference in the new permitting approach is the specific manner of implementation for those jurisdictional runoff management programs. Implementation will be based on decisions made by the Copermittees in accordance with what they have identified as their highest priority water quality conditions. In other words, the Copermittees will have significant control in how to implement the jurisdictional runoff management programs to best utilize their available resources in addressing a specific set of priorities effectively, instead of trying to address all the water quality priorities ineffectively.

The Copermittees are given the responsibility of identifying their highest priority water quality conditions that they intend to address. The Copermittees will develop goals that can be used to measure and demonstrate progress or improvements toward addressing those priorities. In addition to the goals, the Copermittees will provide a schedule for achieving the goals for those highest priorities. The measurement of progress toward achieving the goals for those highest priorities requires a better defined and more focused program of monitoring and assessment than under the Fourth Term Permits.

The monitoring and assessment program must be designed to inform the Copermittees of their progress, and the need for modifications in their jurisdictional runoff management programs and schedules to achieve their goals to improve water quality. The monitoring and assessment program requirements will have a more central role in the Regional MS4 Permit than in earlier permits. The monitoring and assessment requirements must also be designed to enable the Copermittees to focus and direct their efforts in implementing their jurisdictional runoff management programs toward their stated desired outcomes to improve the quality of receiving waters and/or discharges from the MS4s.

By providing an MS4 permit that allows the Copermittees to make more decisions about how to utilize and focus their resources, along with a better defined monitoring and assessment program to inform their water quality management decisions, the Copermittees will have the opportunity to:

1) *Plan strategically*. The Copermittees must have the ability to identify their available resources and develop and implement long term plans that can organize, collect, and use those resources in the most strategically advantageous and efficient manner possible. This ability to develop long term plans will allow the Copermittees to focus and utilize their resources in a more concerted way over the short term and long term to address specific water quality priorities through stated desired outcomes.

2) *Manage adaptively*. The Copermittees must be given the ability to modify their plans as additional information and data are collected from the monitoring and assessment programs. The Copermittees' plans may require modifications to the programs, priorities, goals, strategies, and/or schedules in order for the Copermittees to achieve a stated desired outcome.

3) *Identify synergies*. The Copermittees must be given more flexibility to identify efficiencies within and among their jurisdictional runoff management programs as the strategies are developed and implemented to increase the Copermittees' collective effectiveness. The Copermittees must also be able to identify and utilize resources available from other agencies and entities to further augment and enhance their jurisdictional runoff management programs and/or to collectively work with those other agencies and entities toward achieving a stated desired outcome.

The Regional MS4 Permit requirements will provide the Copermittees the flexibility and responsibility to decide what actions will be necessary to achieve an outcome that is tailored and designed by the Copermittees to improve specific prioritized water quality conditions. The San Diego Water Board expects the approach of the Regional MS4 Permit to give the Copermittees a greater sense of ownership for restoring the quality of receiving waters in the San Diego Region by becoming an integral part of the decision making process in identifying water quality conditions to be addressed, as well as determining the best use of their resources.

VI. ECONOMIC CONSIDERATIONS

Statutory Considerations

California Water Code (CWC) section 13241 requires the San Diego Water Board to consider certain factors, including economic considerations, in the adoption of water quality objectives. CWC section 13263 requires the San Diego Water Board to take into consideration the provisions of CWC section 13241 in adopting waste discharge requirements.

In *City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, the California Supreme Court considered whether Regional Water Boards must comply with CWC section 13241 when issuing waste discharge requirements under CWC section 13263(a) by taking into account the costs a permittee will incur in complying with the permit requirements. The Court concluded that whether it is necessary to consider such cost information "*depends on whether those restrictions meet or exceed the requirements of the federal Clean Water Act.*" (*Id.* at p. 627.) The Court ruled that Regional Water Boards may not consider the factors in CWC section 13241, including economics, to justify imposing pollutant restrictions that are less stringent than applicable federal law requires. (*Id.* At pp. 618, 626-627 ["*[Water Code section 13377 specifies that [] discharge permits issued by California's regional boards must meet the federal standards set by federal law. In effect, section 13377 forbids a regional board's consideration of any economic hardship on the part of the permit holder if doing so would result in the dilution of the requirements set by Congress in the Clean Water Act...Because CWC section 13263 cannot authorize what federal law forbids, it cannot authorize a regional board, when issuing a [] discharge permit, to use compliance costs to justify pollutant restrictions that do not comply with federal clean water standards*."]). However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Regional Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

As discussed in Section VII.F, Unfunded State Mandates, the San Diego Water Board finds that the requirements in this Order are not more stringent than the minimum federal requirements. Among other requirements, federal law requires MS4 permits to include requirements to effectively prohibit non-storm water discharges into the MS4s, in addition to requiring controls to reduce the discharge of pollutants in storm water to the MEP, and other provisions as USEPA or the State determines are appropriate for the control of pollutants in MS4 discharges.

The requirements in this Order may be more specific or detailed than those enumerated in federal regulations under 40 CFR 122.26 or in the USEPA guidance. However, the requirements have been designed to be consistent with and within the federal statutory mandates described in CWA section 402(p)(3)(B)(ii) and (iii) and the related federal regulations and guidance. Consistent with federal law, all of the

conditions in this Order could have been included in a permit adopted by USEPA in the absence of the in lieu authority of California to issue NPDES permits.

Moreover, the inclusion of numeric WQBELs in this Order does not cause this Order to be more stringent than federal law. Federal law authorizes both narrative and numeric effluent limitations to meet state water quality standards. The inclusion of WQBELs as discharge specifications in an NPDES permit in order to achieve compliance with water quality standards is not a more stringent requirement than the inclusion of BMP based permit limitations to achieve water quality standards (State Water Board Order No. WQ 2006-0012 (*Boeing*)). Therefore, consideration of the factors set forth in CWC section 13241 is not required for permit requirements to implement the effective prohibition on the discharge of non-storm water discharges into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determine appropriate to control such pollutants, as those requirements are mandated by federal law.

Included in the provisions of the Order are monitoring and reporting requirements that are designed to demonstrate that the Copermittees are implementing programs to comply with the CWA municipal storm water requirements. CWA section 308(a) and 40 CFR 122.41(h), (j)-(l), 122.44(i) and 122.48 require that all NPDES permits specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s (40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c)) also specify additional monitoring and reporting requirements. In addition to the federal requirements of the CWA, the San Diego Water Board also has the authority in CWC 13383 to establish monitoring, reporting, and recordkeeping requirements that implement federal and state laws and regulations through NPDES permits. .

The monitoring and assessment information that will be reported to the San Diego Water Board is necessary to determine if the Copermittees are making progress toward achieving compliance with the discharge prohibitions, receiving water limitations, and effluent limitations under Provision A of the Order. The monitoring and assessment information that will be reported is also expected to be key to the iterative approach and adaptive management process that is required to be implemented by the Copermittees if they cannot meet the discharge prohibitions and receiving water limitations under the present conditions, which is also part of the requirements under Provision A of the Order.

Notwithstanding the above, the San Diego Water Board has considered cost information in issuing this Order, as discussed below. The San Diego Water Board has also considered all of the evidence that has been presented to the San Diego Water Board regarding the CWC section 13241 factors in adopting this Order. The San Diego Water Board finds that the requirements in this Order are reasonably necessary to protect beneficial uses identified in the Basin Plan and the economic information related to costs of compliance and other CWC section 13241 factors are not sufficient to justify failing to protect those beneficial uses. Where appropriate, the

San Diego Water Board has provided or will consider providing the Copermittees with additional time to implement control measures to achieve final WQBELs and/or water quality standards.

Cost Information

Discussions of the financial and economic ramifications of municipal storm water management programs tend to focus on the significant costs incurred by municipalities in developing and implementing the programs. When considering the cost of implementing the programs, however, it is also important to consider the alternative costs that are incurred when programs are not fully implemented, as well as the economic benefits which result from effective program implementation.

The recent financial and economic conditions have amplified the concerns about the costs incurred by the municipalities in developing and implementing their programs. The reduction in resources resulting from the recent financial and economic conditions has been cited by many of the Copermittees as a justification for reducing the requirements that must be met by their programs. While the recent conditions are a cause for concern in the short term, these programs also have an opportunity to identify and implement improvements and efficiencies before the next period of growth and development, resulting in more effective and sustainable programs over the long term.

In addition, it is very difficult to ascertain the true cost of implementation of the Copermittees' management programs because of inconsistencies in reporting by the Copermittees. Reported costs of compliance for the same program element can vary widely from city to city, often by a very wide margin that is not easily explained.[2] Despite these problems, efforts have been made to identify management program costs, which can be helpful in understanding the costs of program implementation.

The San Diego Water Board recognizes that the Copermittees will incur costs in implementing this Order, potentially above and beyond the costs from the Copermittees' prior permits. The San Diego Water Board also recognizes that, due to California's current economic condition, many Copermittees currently have limited staff and resources to implement actions to address its MS4 discharges. Based on the economic considerations below, the San Diego Water Board has provided the Copermittees a significant amount of flexibility to choose how to implement the requirements of the Order.

The Order also allows the Copermittees to customize their plans, programs, and monitoring requirements. In the end, it is up to the Copermittees to determine the effective BMPs and measures necessary to comply with this Order. The Copermittees can choose to implement the least expensive measures that are effective in meeting the requirements of this Order. This Order also does not require the Copermittees to

[2] LARWQCB, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.

fully implement all requirements within a single permit term. Where appropriate, the Board has provided the Copermittees with additional time outside of the permit term to implement control measures to achieve final WQBELs and/or water quality standards.

The San Diego Water Board has considered available cost information associated with compliance with this Order. It is not possible to predict accurately the cost impact of the requirements that involve an unknown level of implementation or that depend on environmental variables that are as yet undefined. Only general conclusions can be drawn from this information.

Estimated Municipal Storm Water Program Implementation Costs

The USEPA, the State Water Board, and the California Regional Water Quality Control Boards (Regional Water Boards) have attempted to evaluate the costs of implementing municipal storm water programs. The assessments have demonstrated that the true costs are difficult to ascertain and reported costs vary widely. In addition, reported fiscal analyses tend to neglect the costs incurred to municipalities when storm water and non-storm water runoff is not effectively managed, which are incurred as a result of pollution, contamination, nuisance, and damage to ecosystems, property, and human health. Nonetheless, they provide a useful context for considering the costs of requirements within Order No. R9-2013-0001.

In 1999, the USEPA reported on multiple studies it conducted to determine the cost of management programs. A study of Phase II municipalities determined that the annual cost of the Phase II program was expected to be $9.16 per household. The USEPA also studied 35 Phase I municipalities, finding costs to be $9.08 per household annually, similar to those anticipated for Phase II municipalities.[3]

The State Water Board commissioned a study by the California State University, Sacramento to assess costs of the Phase I MS4 program. This study includes an assessment of costs incurred by Phase I MS4s throughout the state to implement their programs. Annual cost per household in the study ranged from $18 to $46, with the Fresno-Clovis Metropolitan Area representing the lower end of the range, and the City of Encinitas (in San Diego County) representing the upper end of the range.[4]

A study on Phase I MS4 program costs was also conducted by the California Regional Water Quality Control Board, Los Angeles Region (Los Angeles Water Board), where program costs reported in the municipalities' annual reports were assessed. The Los Angeles Water Board estimated that average per household cost to implement the MS4 program in Los Angeles County was $12.50. [5]

[3] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791-68792.
[4] State Water Board, 2005. NPDES Stormwater Cost Survey. P. ii.
[5] Los Angeles Water Board, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.

It is important to note that reported program costs are not all attributable to solely complying with MS4 permits. Many program components, and their associated costs, existed before any MS4 permits were ever issued. For example, street sweeping and trash collection costs cannot be solely or even principally attributable to MS4 permit compliance, since these practices have long been expected from and implemented by municipalities.

Therefore, true program cost resulting from MS4 permit requirements is some fraction of reported costs. The California State University, Sacramento study found that only 38 percent of program costs are new costs fully attributable to MS4 permits. The remainder of the program costs was either pre-existing or resulted from enhancement of pre-existing programs.[6] In 2000, the County of Orange found that even lower amounts of program costs are solely attributable to MS4 permit compliance, reporting that the amount attributable to implement the County or Orange Drainage Area Management Plan (DAMP), was less than 20 percent of the total budget. The remaining 80 percent was attributable to pre-existing programs.[7] More current data from the County of Orange is not used in this discussion because the County of Orange no longer reports such information.

Estimated Value of Healthy Water Quality

Economic considerations of municipal storm water management programs cannot be limited only to program costs. Evaluation of programs must also consider information on the benefits derived from environmental protection and improvement.[8] Attention is often focused on municipal storm water management program costs, but the programs must also be viewed in terms of their value to the public.

Placing a value on healthy receiving waters is very difficult. Often the value of receiving waters with good water quality manifests in other forms, such as tourism, recreational opportunities, and/or increased property values. When surface water bodies are degraded, thereby degrading the habitat within and adjacent to the water bodies, the public loses the value and benefits associated with being able to use the area in and around the water bodies. Surface waters that are able to support the beneficial uses designated in the Basin Plan can sustain plants and wildlife that can attract visitors and residents, providing aesthetic, recreational, as well as monetary value to the public. At this time, however, there have been no studies for the San Diego Region to quantify the added value that surface waters with healthy water quality can provide.

[6] State Water Board, 2005. NPDES Stormwater Cost Survey. P. 58.
[7] County of Orange, 2000. A NPDES Annual Progress Report. P. 60.
[8] Ribaudo M.O. and D. Heelerstein. 1992, *Estimating Water Quality Benefits: Theoretical and Methodological Issues.* U.S. Department of Agriculture. Technical Bulletin No. 1808.

USEPA has estimated that household willingness to pay for improvements in fresh water quality for fishing and boating is approximately $158-$210.[9] This estimate can be considered conservative, since it does not include important considerations such as marine waters benefits, wildlife benefits, or flood control benefits. Another study conducted by California State University, Sacramento reported that the annual household willingness to pay for statewide clean water is approximately $180.[10]

A study conducted by the University of Southern California and University of California, Los Angeles assessed the costs and benefits of implementing various approaches for achieving compliance with the MS4 permits in the Los Angeles region. The study found that non-structural systems would cost $2.8 billion but provide $5.6 billion in benefit. If structural systems were determined to be needed, the study found that total costs would be $5.7 to $7.4 billion, while benefits could reach $18 billion.[11] Costs are anticipated to be borne over many years, probably at least ten years.

As can be seen, the benefits of the municipal storm water management programs are expected to considerably exceed their costs. Such findings are corroborated by USEPA, which found that the benefits of implementation of its Phase II storm water rule would also outweigh the costs.[12]

[9] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68793.
[10] State Water Board, 2005. NPDES Stormwater Cost Survey. P. iv.
[11] Los Angeles Water Board, 2004. Alternative Approaches to Stormwater Control.
[12] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791.

VII. APPLICABLE STATUTES, REGULATIONS, PLANS AND POLICIES

A. Legal Authorities – Federal Clean Water Act and California Water Code

This Order is issued pursuant to section 402 of the CWA and implementing regulations adopted by the USEPA and chapter 5.5, division 7 of the CWC (commencing with section 13370). This Order serves as an NPDES permit for point source discharges to surface waters. This Order also serves as waste discharge requirements pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

The objective of the CWA is "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*." To carry out this objective, the CWA requires the implementation of permit programs to regulate the discharge of pollutants and dredged or fill material to the navigable waters of the U.S. and to regulate the use and disposal of sewage sludge. CWA section 402 provides the legal authority to issue a permit for the discharge of pollutants to waters of the U.S. under the NPDES. The CWA provides that NPDES permits may be issued by states which are authorized to implement the provisions of that act. California became authorized to implement the NPDES permit program on May 14, 1973.

The Porter-Cologne Water Quality Control Act (Division 7, commencing with CWC section 13000) established the State Water Resources Control Board (State Water Board) and nine Regional Water Quality Control Boards (Regional Water Boards) as the principal state agencies with primary responsibility for the coordination and control of water quality. CWC section 13200(f) established the San Diego Water Board, which has the primary responsibility for the coordination and control of water quality in the San Diego Region, which includes all the basins draining into the Pacific Ocean between the southern boundary of the Santa Ana Region and the California-Mexico boundary. The San Diego Water Board implements the CWA through Chapter 5.5 of the CWC, commencing with section 13370. CWC section 13377 provides the San Diego Water Board the legal authority to issue waste discharge requirements to ensure compliance with all applicable provisions of the CWA and acts amendatory thereof or supplementary, thereto, to implement water quality control plans, or for the protection of beneficial uses, or to prevent nuisance.

CWA section 402(p) requires the USEPA or authorized state to issue NPDES permits for storm water discharges from municipal separate storm sewer systems (MS4s) to waters of the U.S. CWA section 402(p)(3)(B)(ii) requires that NPDES permits for storm water discharges from MS4s "*effectively prohibit non-storm water discharges*" into the MS4s. CWA section 402(p)(3)(B)(iii) requires that NPDES permits for storm water discharges from MS4s to "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable* [MEP], *including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control*

of such pollutants."

The USEPA published implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]), which prescribe permit application requirements for storm water discharges from MS4s pursuant to CWA 402(p), on November 16, 1990. The USEPA published an Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems, which provided guidance on permit application requirements for regulated MS4s, on May 17, 1996. The federal regulations in 40 CFR 122 and guidance issued by USEPA serve as the foundation for the provisions of Order No. R9-2013-0001. The legal authorities provided by the above statutes and regulations are included as part of the discussions in Section VIII of this Fact Sheet.

B. Legal Authority for the Permit Issued on a Region-wide Basis

CWA section 402(p)(3)(B) provides the San Diego Water Board the legal authority to issue an NPDES permit for the San Diego Region as compared to separate MS4 permits based upon County- and partial County-wide boundaries as they exist within the San Diego Region. CWA section 402(p)(3)(B) states that "*Permits for discharges from municipal storm sewers- (i) may be issued on a system- or jurisdiction-wide basis ....*" The federal regulations in 40 CFR 122.26(a)(1)(v) also state that the San Diego Water Board "*may designate dischargers from municipal separate storm sewers on a system-wide or jurisdiction-wide basis. In making this determination, the [San Diego Water Board] may consider the following factors: (A) the location of the discharge with respect to waters of the United States; (B) the size of the discharge; (C) the quantity and nature of the pollutants discharged to waters of the United States; and (D) other relevant factors*."

More specifically, the federal regulations provide that for large and medium MS4 systems, the San Diego Water Board may issue a regional permit. Specifically, the federal regulation in 40 CFR 122.26(a)(3) provide:

"*(ii) The Director may either issue one system-wide permit covering all discharges from municipal separate storm sewers within a large or medium municipal storm sewer system or issue distinct permits for appropriate categories of discharges within a large or municipal separate storm sewer system including, but not limited to: all discharges owned or operated by the same municipality; located within the same jurisdiction; all discharges within a system that discharge to the same watershed; discharges within a system that are similar in nature; or for individual discharges from municipal separate storm sewers within the system.*

(iii) The operator of a discharge from a municipal separate storm sewer which is part of a large or medium municipal separate storm sewer system must either: (A) Participate in a permit application (to be a permittee or a co-permittee) with one or more other operator of discharges from the large or medium municipal storm sewer system which covers all, or a portion of all, discharges from the

municipal separate storm sewer system; (B) Submit a distinct permit application which only covers discharges from the municipal separate storm sewers for which the operator is responsible; or (C) A regional authority may be responsible for submitting a permit application under the following guidelines....

(iv) One permit application may be submitted for all or a portion of all municipal separate storm sewers within adjacent or interconnected large or medium municipal separate storm sewer systems. The Director may issue one systemwide permit covering all, or a portion of all municipal separate storm sewers in adjacent or interconnected large or medium municipal separate storm sewer systems.

(v) Permits for all or a portion of all discharges from large or medium municipal separate storm sewer systems that are issued on a system-wide, jurisdiction-wide, watershed or other basis may specify different conditions relating to different discharges covered by the permit, including different management programs for different drainage areas which contribute storm water to the system."

Based on these regulations, the San Diego Water Board may issue a region-wide MS4 permit. The regulations also clarify that the permit may include different conditions for separate discharges covered by the permit. This allows the San Diego Water Board to ensure that suitable water quality conditions and provisions are identified for each watershed.

The USEPA's responses to comments in the Final Rule for the above-mentioned regulations also make it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide, permits. In the Final Rule published in the Federal Register and containing the responses to comments, USEPA notes that 40 CFR 122.26(a)(3)(iv) would allow an entire system in a geographical region under the purview of a State agency to be designated under a permit.[13] USEPA also states that many commenters wanted to allow the permitting authority broad discretion to establish system-wide permits, and that EPA believes that paragraphs 40 CFR 122.26 (a)(1)(v) and (a)(3)(ii) allow for such broad discretion.[14]

This Order creates watershed requirements that apply to multiple counties. The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees. Managing storm water on a regional and watershed basis is expected to result in improved water quality, as the Order focuses on monitoring and management practices necessary to improve each watershed rather than political boundaries. A single permit also allows the San Diego Water Board staff to expend fewer resources developing successive multiple permits and allows more resources to be devoted to working cooperatively with all three current groups of Copermittees to ensure implementation of this Order results in improved water quality.

[13] 55 Federal Register 47990-01, 48042
[14] Ibid

C. Federal and California Endangered Species Acts

This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2115.5) or the Federal Endangered Species Act (16 United States Code [USC] sections 1531 to 1544). This Order requires compliance with requirements to protect the beneficial uses of waters of the U.S. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

D. California Environmental Quality Act

The action to adopt an NPDES Permit is exempt from the provisions of Chapter 3 of the California Environmental Quality Act (CEQA) (Public Resources Code section 21100, et seq.) pursuant to CWC section 13389. (*County of Los Angeles v. Cal. Water Boards* (2006) 143 Cal.App.4th 985.)

E. State and Federal Regulations, Plans and Policies

The legal authority provided by the following regulations, plans, and policies are also included as part of the discussions in Section VIII of this Fact Sheet.

Water Quality Control Plan for the San Diego Basin

The CWA requires the San Diego Water Board to establish water quality standards for each water body in its region. Water quality standards include beneficial uses, water quality objectives and criteria that are established at levels sufficient to protect beneficial uses, and an antidegradation policy to prevent degrading of waters. On September 8, 1994, the San Diego Water Board adopted the *Water Quality Control Plan for the San Diego Basin (*Basin Plan). The Basin Plan designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters in the San Diego Region. The San Diego Water Board has amended the Basin Plan on multiple occasions since 1994. In addition, the Basin Plan implements State Water ~~Water~~ Board Resolution No. 88-63, which established state policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply. Beneficial uses applicable to the surface water bodies that receive discharges from the MS4s within the San Diego Region generally include those listed below:

The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region:

- Municipal and Domestic Supply (MUN)
- Agricultural Supply (AGR)
- Industrial Process Supply (PROC)
- Industrial Service Supply (IND)
- Ground Water Recharge (GWR)
- Contact Water Recreation (REC1)
- Non-contact Water Recreation (REC2)
- Warm Freshwater Habitat (WARM)
- Cold Freshwater Habitat (COLD)
- Wildlife Habitat (WILD)
- Rare, Threatened, or Endangered Species (RARE)
- Freshwater Replenishment (FRSH)
- Hydropower Generation (POW)
- Preservation of Biological Habitats of Special Significance (BIOL)

The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region:

- Navigation (NAV)
- Commercial and Sport Fishing (COMM)
- Estuarine Habitat (EST)
- Marine Habitat (MAR)
- Aquaculture (AQUA)
- Migration of Aquatic Organisms (MIGR)
- Spawning, Reproduction, and/or Early Development (SPWN)
- Shellfish Harvesting (SHELL)

Pursuant to Water Code sections 13263 and 13377, the requirements of this Order implement the Basin Plan.

<u>Water Quality Control Plan for Ocean Waters of California, California Ocean Plan</u>

In 1972, the State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan). The State Water Board adopted the most recent amended Ocean Plan on September 15, 2009. The Office of Administrative Law approved it on March 10, 2010. On October 8, 2010, USEPA approved the 2009 Ocean Plan. The Ocean Plan is applicable, in its entirety, to ocean waters of the State. In order to protect beneficial uses, the Ocean Plan establishes water quality objectives and a program of implementation. Pursuant to Water Code sections 13263 and 13377, the requirements of this Order implement the Ocean Plan. The Ocean Plan identifies the beneficial uses of ocean waters of the State to be protected as summarized below:

- Industrial water supply
- Water contact and non-contact recreation, including aesthetic enjoyment;

navigation
- Commercial and sport fishing
- Mariculture
- Preservation and enhancement of designated Areas of Special Biological Significance
- Rare and endangered species
- Marine habitat
- Fish spawning and shellfish harvesting

On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving an exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges. The State Water Board Resolution No. 2012-0012 requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject terms and conditions of State Water Board Resolution No. 2012-0012. The Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 applicable to these discharges are hereby incorporated in this Order as if fully set forth herein. Requirements of this Order implement the Ocean Plan.

Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality

On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

Antidegradation Policy

Federal regulations (40 CFR 131.12) require that the state water quality standards include an antidegradation policy consistent with the federal antidegradation policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16 ("Statement of Policy with Respect to Maintaining the Quality of the Waters of the State"). State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law.

The San Diego Water Board's Basin Plan implements and incorporates by reference

both the State and federal antidegradation policies. State Water Board Resolution No. 68-16 and 40 CFR 131.12 require the San Diego Water Board to maintain high quality waters of the State until it is demonstrated that any change in quality will be consistent with maximum benefit to the people of the State, will not unreasonably affect beneficial uses, and will not result in water quality less than that described in the San Diego Water Boards' policies. State Water Board Resolution No. 68-16 requires that discharges of waste be regulated to meet best practicable treatment or control to assure that pollution or nuisance will not occur and the highest water quality consistent with the maximum benefit to the people of the State be maintained.

The discharges permitted in this Order are consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Board Resolution No. 68-16. Many of the water bodies within the area covered by this Order are of high quality. The Order requires the Copermittees to meet best practicable treatment or control to meet water quality standards. As required by 40 CFR 122.44(a), the Copermittees must comply with the "maximum extent practicable" technology-based standard set forth in CWA section 402(p) for discharges of pollutants in storm water from the MS4s.

Many of the waters within the area covered by this Order are impaired and listed on the State's CWA Section 303(d) List and the San Diego Water Board has established TMDLs to address the impairments. This Order requires the Copermittees to comply with permit provisions to implement the WLAs set forth in the TMDLs in order to restore the beneficial uses of the impaired water bodies consistent with the assumptions and requirements of the TMDLs. This Order includes requirements to develop and implement storm water management programs, achieve WQBELs, and effectively prohibit non-storm water discharges into the MS4. The issuance of this Order does not authorize an increase in the amount of discharge of waste.

Anti-Backsliding Requirements

CWA sections 402(o) and 303(d)(4) and 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations or conditions may be relaxed. All effluent limitations and other conditions in this Order are at least as stringent as the effluent limitations in the previous permits issued to the San Diego County Copermittees, the Orange County Copermittees and the Riverside County Copermittees.

Clean Water Act Section 303(d) List

CWA section 303(d)(1) requires each State to identify specific water bodies within its boundaries where water quality standards are not being met or are not expected to be met after implementation of technology-based effluent limitations on point sources. Water bodies that do not meet water quality standards are considered impaired and are placed on the state's "303(d) List." Periodically, USEPA approves the State's 303(d) List.

Most recently, USEPA approved the State's 2010 303(d) List of impaired water bodies on October 11, 2011, which includes certain receiving waters in the San Diego Region. For each listed water body, the state or USEPA is required to establish a TMDL of each pollutant impairing the water quality standards in that water body. A TMDL is a tool for implementing water quality standards and is based on the relationship between pollution sources and in-stream water quality conditions. The TMDL establishes the allowable pollutant loadings for a water body and thereby provides the basis to establish water quality-based controls. These controls should provide the pollution reduction necessary for a water body to meet water quality standards.

A TMDL is the sum of the allowable pollutant loads of a single pollutant from all contributing point sources (the waste load allocations or WLAs) and non-point sources (load allocations of LAs) plus the contribution from background sources and a margin of safety (40 CFR 130.2(i)). MS4 discharges are considered point source discharges. For 303(d)-listed water bodies and pollutants in the San Diego Region, the San Diego Water Board or USEPA develops and adopts TMDLs that specify these requirements.

Since 2002, the San Diego Water Board has established six (6) TMDLs to remedy water quality impairments in various water bodies within the San Diego Region (see Attachment E to the Order). These TMDLs identify MS4 discharges as a source of pollutants to these water bodies, and, as required, establish WLAs for MS4 discharges to reduce the amount of pollutant discharged to receiving waters. CWA section 402(p)(3)(B)(iii) requires the San Diego Water Board to impose permit conditions, including: "management practices, control techniques and system, design and engineering methods, and *such other provisions as the Administrator or the State determines appropriate for the control of such pollutants."* (Emphasis added.) CWA section 402(a)(1) also requires states to issue permits with conditions necessary to carry out the provisions of the CWA. Federal regulations also require that NDPES permits contain WQBELs consistent with the assumptions and requirements of all available WLAs (40 CFR 122.44(d)(1)(vii)(B)). CWC section 13377 also requires that NPDES permits include limitations necessary to implement water quality control plans. Therefore, this Order includes WQBELs and other provisions to implement the TMDL WLAs assigned to Copermittees regulated by this Order.

<u>Other Regulations, Plans and Policies</u>

This Order implements all other applicable federal regulations and State regulations, plans and policies, including the California Toxics Rule at 40 CFR 131.38 (Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California Rule [California Toxics Rule or CTR]), and State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP).

F. Unfunded State Mandates

Article XIII B, Section 6(a) of the California Constitution provides that whenever "*any state agency mandates a new program or higher level of service on any local government, the state shall provide a subvention of funds to reimburse that local government for the costs of the program or increased level of service*." The requirements of this Order do not constitute state mandates that are subject to a subvention of funds for several reasons, including, but not limited to, the following.

First, the requirements of this Order do not constitute a new program or a higher level of service as compared to the requirements contained in the previous Fourth Term Permits. The overarching requirement to impose controls to reduce the pollutants in discharges from MS4s is dictated by the CWA and is not new to this permit cycle (33 USC section 1342(p)(3)(B)). The inclusion of new and advanced measures as the MS4 programs evolve and mature over time is anticipated under the CWA (55 FR 47990, 48052 (Nov. 16, 1990)), and to the extent requirements in this Order are interpreted as new advanced measures, they do not constitute a new program or higher level of service.

Second, and more broadly, mandates imposed by federal law, rather than by a state agency, are exempt from the requirement that the local agency's expenditures be reimbursed (Cal. Const., art. XIII B, section 9, subd. (b)). This Order implements federally mandated requirements under the CWA and its requirements are therefore not subject to subvention of funds. This includes federal requirements to effectively prohibit non-storm water discharges, to reduce the discharge of pollutants in storm water to the MEP, and to include such other provisions as the Administrator or the State determines appropriate for the control of such pollutants (33 USC section 1342(p)(3)(B)). Federal cases have held these provisions require the development of permits and permit provisions on a case-by-case basis to satisfy federal requirements. (*Natural Resources Defense Council, Inc., v. USEPA* (9th Cir. 1992) 966 F.2d 1292, 1308, fn. 17.)

The authority exercised under this Order is not reserved state authority under the CWA's savings clause (cf. *Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 627-628 [relying on 33 USC section 1370, which allows a state to develop requirements which are not "less stringent" than federal requirements]), but instead is part of a federal mandate to develop pollutant reduction requirements for municipal separate storm sewer systems. To this extent, it is entirely federal authority that forms the legal basis to establish the permit provisions. (See, *City of Rancho Cucamonga v. Regional Water Quality Control Board, Santa Ana Region* (2006) 135 Cal.App.4th 1377, 1389; *Building Industry Ass'n of San Diego Co. v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 882-883.)

The MEP standard is a flexible standard that balances a number of considerations, including technical feasibility, cost, public acceptance, regulatory compliance, and effectiveness. (*Building Ind. Ass'n., supra,* 124 Cal.App.4th at pp. 873-874, 889.) Such considerations change over time with advances in technology and with experience

gained in storm water management (55 FR 47990, 48052 (Nov. 16, 1990)). Accordingly, a determination of whether the conditions contained in this Order exceed the requirements of federal law cannot be based on a point by point comparison of the permit conditions and the ~~sic~~ minimum control measures that are required "at a minimum" to reduce pollutants to the maximum extent practicable and to protect water quality (40 CFR 122.34). Rather, the appropriate focus is whether the permit conditions, as a whole, exceed the MEP standard.

In recent months, the County of Los Angeles and County of Sacramento Superior Courts have granted writs setting aside decisions of the Commission on State Mandates that held certain requirements in Phase I permits constituted unfunded mandates. In both cases, the courts have found that the correct analysis in determining whether an MS4 permit constituted a state mandate was to evaluate whether the permit as a whole ~~– and not a specific permit provision –~~ exceeds the MEP standard. (*State of Cal. v~~V~~. Comm. on State Mandates* (Super. Ct. Sacramento County, 2012, No. 34-2010-80000604), *State of California v. County of Los Angeles* (Super. Ct. Los Angeles County, 2011, No. BS130730.) Both cases are currently pending appeal.

The requirements of the Order, taken as a whole rather than individually, are necessary to reduce the discharge of pollutants to the MEP and to protect water quality. The San Diego Water Board finds that the requirements of the Order are practicable, do not exceed federal law, and thus do not constitute an unfunded mandate. These findings are the expert conclusions of the principal state agency charged with implementing the NPDES program in California (CWC sections 13001, 13370).

It should also be noted that the provisions in this Order to effectively prohibit non-storm water discharges are also mandated by the CWA (33 USC section 1342(p)(3)(B)(ii)). Likewise, the provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state establishes or adopts a TMDL, federal law requires that permits must contain effluent limitations consistent with the assumptions and requirements of any applicable waste load allocation in a TMDL (40 CFR 122.44(d)(1)(vii)(B)).

Third, the local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental dischargers who are issued NPDES permits for storm water discharges. With a few inapplicable exceptions, the CWA regulates the discharge of pollutants from point sources (33 USC section 1342) and the Porter-Cologne Act regulates the discharge of waste (CWC section 13263), both without regard to the source of the pollutant or waste. As a result, the "costs incurred by local agencies" to protect water quality reflect an overarching regulatory scheme that places similar requirements on governmental and non-governmental dischargers. (See *County of Los Angeles v. State of California* (1987) 43 Cal.3d 46, 57-58 [finding comprehensive workers' compensation scheme did not create a cost for local agencies that was subject to state subvention].)

The CWA and the Porter-Cologne Act largely regulate storm water with an even hand, but to the extent there is any relaxation of this even-handed regulation, it is in favor of the local agencies. Generally, the CWA requires point source dischargers, including dischargers of storm water associated with industrial or construction activity, to comply strictly with water quality standards (33 USC section 1311(b)(1)(C); *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159, 1164-1165 [noting that industrial discharges must strictly comply with water quality standards]). As discussed in prior State Water Board decisions, certain provisions of this Order do not require strict compliance with water quality standards (State Water Board Order No. WQ 2001-0015, p. 7). Those provisions of this Order regulate the discharge of waste in municipal storm water under the CWA's MEP standard, not the BAT/BCT standard that applies to other types of discharges. These provisions, therefore, regulate the discharge of waste in municipal storm water more leniently than the discharge of waste from non-governmental sources.

Fourth, the Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)). To the extent that the local agency Copermittees have voluntarily availed themselves of the permit, the program is not a state mandate. (Accord, *County of San Diego v. State of California* (1997) 15 Cal.4th 68, 107-108.)

Fifth, the local agency Copermittees' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under state law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

Finally, even if any of the permit provisions could be considered unfunded mandates, under Government Code section 17556, subdivision (d), a state mandate is not subject to reimbursement if the local agency has the authority to charge a fee. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order, subject to certain voting requirements contained in the California Constitution. (See Cal. Const., Art. XIII D, section 6, subd. (c); see also *Howard Jarvis Taxpayers Ass'n v. City of Salinas* (2002) 98 Cal.App.4th 1351, 1358-1359.) The Fact Sheet demonstrates that numerous activities contribute to the pollutant loading in the MS4. Local agencies can levy service charges, fees, or assessments on these activities, independent of real property ownership. (See, e.g., *Apartment Ass'n of Los Angeles County, Inc., v. City of Los Angeles* (2001(24 Cal.4th 830, 842 [upholding inspection fees associated with renting property].) The authority and ability of a local agency to defray the cost of a program without raising taxes indicates that a program does not entail a cost subject to subvention. (*Clovis Unified School Dist. V. Chiang* (2010) 188 Cal.App.4th 794, 812, citing *Connell v. Sup. Ct.* (1997) 59 Cal.App.4th 382, 401; *County of Fresno v. State of California* (1991) 53 Cal. 3d. 482, 487-488.)

VIII. PROVISIONS

The provisions (i.e. NPDES permit requirements) of the Order are discussed below.

A. Prohibitions and Limitations

Purpose: Provision A includes the prohibitions and limitations requirements that are the foundation of all the subsequent requirements included in the Order. Compliance with the prohibitions and limitations will restore and protect receiving waters from impacts that may be caused by discharges into and from the Copermittees' MS4s and ultimately achieve the objective of the CWA.

In meeting the requirements set forth in the Order, the Copermittees must be cognizant that the prohibitions and limitations exist and will be the standard by which the San Diego Water Board will be measuring the progress and success of their implementation of the NPDES permit requirements.

***Discussion*:** The objective of the CWA is to "*restore and maintain the chemical, physical, and biological integrity of the Nation's waters*." The CWA requires the implementation of NPDES permit programs to regulate discharges of pollutants and dredged or fill material to the navigable waters of the U.S. For discharges into and from MS4s, the CWA requires the NPDES permits to "*effectively prohibit non-stormwater discharges into the storm sewers*" and "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable.*"

Provision A includes limitations, consistent with the requirements of the CWA for discharges from MS4s. Provision A expresses these limitations as discharge prohibitions, receiving water limitations, and effluent limitations. Compliance with the discharge prohibitions and receiving water limitations is also explicitly described, in conformance with precedential State Water Board Orders.

More specific and detailed discussions of the requirements of Provision A are provided below.

Provision A.1 (Discharge Prohibitions) prohibits the discharge of specific types of waste into and/or from the Copermittees' MS4s.

Provision A.1.a restates and reiterates Basin Plan Waste Discharge Prohibition 1, by prohibiting discharges into and from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the

state. The terms pollution,[15] contamination,[16] and nuisance[17] are defined under CWC 13050. Provision A.1.c incorporates all the waste discharge prohibitions of the Basin Plan into the requirements of the Order. The waste discharge prohibitions from the Basin Plan have been reproduced and provided in Attachment A to the Order.

Provision A.1.b requires non-storm water discharges into the MS4s to be effectively prohibited, consistent with the requirements of the CWA for MS4 permits to "*effectively prohibit non-stormwater discharges into the storm sewers*." The effective prohibition is required to be implemented by each Copermittee within its jurisdiction through the illicit discharge detection and elimination requirements under Provision E.2. The prohibition does not apply to NPDES permitted discharges into the Copermittees' MS4s. ~~The prohibition also refers to the requirements of Provisions E.2.a.(1)-(5), which has specific requirements for the Copermittees to address certain types of non-storm water discharges if they enter the MS4.~~

The CWA employs the strategy of prohibiting the discharge of any pollutant from a point source into waters of the United States unless the discharger of the pollutant(s) obtains an NPDES permit pursuant to CWA Section 402. The 1987 amendment to the CWA includes provision 402(p) that specifically addresses NPDES permitting requirements for storm water discharges from MS4s. CWA section 402(p) prohibits the discharge of pollutants from specified MS4s to waters of the U.S. except as authorized by an NPDES permit and identifies two substantive standards for MS4 storm water permits. MS4 permits (1) "*shall include a requirement to effectively prohibit nonstormwater discharges into the storm sewers*" and (2) "*shall require controls to reduce the discharge of pollutants to~~,~~ the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or State determines appropriate for the control of such pollutants*." (CWA section 402(p)(3)(B)(ii-iii).)

In November 1990, the USEPA published regulations addressing storm water discharges from MS4s (55 FR 47990 and following (Nov. 16, 1990) (Phase I Final Rule)). The regulations establish minimum requirements for MS4 permits, and generally focus on the requirement that MS4s implement programs to reduce the amount of pollutants found in storm water discharges to the MEP. The CWA's

[15] CWC 13050(l): "(1) 'Pollution' means an alteration of the quality of waters of the state by waste to a degree which unreasonably affects either of the following: (A) The water for beneficial uses. (B) Facilities which serve beneficial uses. (2) 'Pollution' may include "contamination.

[16] CWC 13050(k): "Contamination' means an impairment of the quality of waters of the state by waste to a degree which creates a hazard to public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste, whether or not waters of the state are affected."

[17] CWC 13050(m): "Nuisance' means anything which meets all of the following requirements: (1) Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. (2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. (3) Occurs during, or as a result of, the treatment or disposal of wastes."

municipal storm water MEP standard does not require storm water discharges to strictly meet water quality standards, as is required for other NPDES permitted discharges. Compliance is achieved through an iterative approach of continuous implementation of improved BMPs. This distinction reflects Congress's recognition that variability in flow and intensity of storm events render difficult strict compliance with water quality standards by MS4 permittees. In describing the controls that permits must include to reduce pollutants in storm water discharges to the MEP, the statute (CWA section 402(p)(3)(B)(iii)) states that the controls shall include: "*management practices, control techniques and system, design and engineering methods, and such other provisions as the [permit writer] determines appropriate for the control of such pollutants*."

In contrast, non-storm water discharges from the MS4 that are not authorized by separate NPDES permits~~, nor specifically included in a category of non-storm water discharges only required to be addressed if identified as a source of pollutants (see 40 CFR 122.26(d)(2)(iv)(B)),~~ are subject to requirements under the NPDES program, including discharge prohibitions, technology based effluent limitations and water quality-based effluent limitations (40 CFR 122.44). The regulations also require the Copermittee's program to include an element to detect and remove illicit discharges and improper disposal into the storm sewer (40 CFR 122.26(d)(2)(iv)(B)).

While "non-storm water" is not defined in the CWA or federal regulations, the federal regulations (at 40 CFR 122.26(b)(2)) define "*illicit discharge*" as *"any discharge to a municipal separate storm sewer that is not composed entirely of storm water and that is not covered by an NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer and discharges resulting from fire fighting activities)*." This definition is the most closely applicable definition of "non-storm water" contained in federal law. As stated in the Phase I Final Rule, USEPA added the illicit discharge program requirement to begin implementation of the 'effective prohibition' requirement to detect and control non-storm water discharges to their municipal system.

Thus, federal law mandates that permits issued to MS4s must require management practices that will result in reducing storm water pollutants to the MEP yet at the same time requires that non-storm water discharges be effectively prohibited from entering the MS4. "Effectively" prohibit does not mean that non-storm water discharges are authorized to be discharged into and from the Copermittees' MS4s. The Phase I Final Rule clarifies what "effectively prohibit" means (55 FR 47995):

> "*Section 402(p)(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit (other than the permit for the discharge from the municipal separate storm sewer)~~.~~*" [Emphasis added].

Consistent with federal law, unless non-storm water discharges to the MS4 are authorized by a separate NPDES permit ~~or are specifically included in a category of non-storm water discharges only required to be addressed if identified as a source of pollutants under federal regulations~~, non-storm water discharges are appropriately subject to the effective prohibition requirement in the CWA and Regional Water Boards are not limited by the iterative MEP approach to storm water regulation in crafting appropriate regulations for non-storm water discharges.

The federal regulations (40CFR122.26(d)(2)(i)(B)) require the Copermittees to establish the legal authority which authorizes or enables the Copermittees to prohibit illicit discharges to the MS4s. The federal regulations (40 CFR 122.26(d)(2)(vi)(B)(1)) require the Copermittees to "*implement and enforce an ordinance, order or similar means*" to prevent non-storm water discharges to their MS4s. Thus, the Copermittees are required to "*effectively*" prohibit non-storm water discharges to their MS4s through enforcing their legal authority established under "*ordinance, order or similar means*" and either remove those discharges to their MS4s, or require those discharges to obtain coverage under a separate NPDES permit. More detail about the program that must be implemented to "*effectively*" prohibit non-storm water discharges to the Copermittees' MS4s is provided under the discussion for Provision E.2.

Provision A.1.d was included to be consistent Resolution No. 2012-0012, adopted by the State Water Board on March 20, 2012. Provision A.1.d prohibits discharges from MS4s to Areas of Special Biological Significance (ASBS), except for storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach to the Heisler Park ASBS subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012. The pertinent Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 are provided in Attachment A to the Order.

Provision A.2 (Receiving Water Limitations) specifies the condition of the receiving waters that must be achieved when there are discharges from the Copermittees' MS4s. Receiving water limitations are included in all NPDES permits issued pursuant to the CWA section 402. CWA section 402(p)(3)(B)(iii) authorizes the inclusion of "*such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." This requirement gives USEPA or the State permitting authority, in this case the San Diego Water Board, discretion to determine what permit conditions are necessary to control pollutants.

In its Phase I Final Rule (see 55 FR 47990, 47994 (Nov. 16, 1990)), USEPA elaborated on these requirements, stating that, "*permits for discharges from municipal separate storm sewer systems must require controls to reduce the discharge of pollutants to the maximum extent practicable, and where necessary water quality-based controls*." USEPA reiterated in its Phase II Final Rule (64 FR 68722, 68737), that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a*

TMDL, and timing requirements for implementation of a TMDL." CWC section 13377 also requires that NPDES permits include limitations necessary to implement water quality control plans. Both the State Water Board and the San Diego Water Board have previously concluded that discharges from the MS4 contain pollutants that have the reasonable potential to cause or contribute to excursions above water quality standards. As such, inclusion of receiving water limitations is appropriate to control MS4 discharges.

The inclusion of receiving water limitations is also consistent with the Ninth Circuit Court of Appeals' ruling in *Defenders of Wildlife v. Browner* (191 F.3d 1159, 1166 (1999)) that the permitting authority has discretion regarding the nature and timing of requirements that it includes as MS4 permit conditions to attain water quality standards. The Ninth Circuit Court of Appeals recently explained that, "*[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*" (*Natural Resources Defense Council v. County of Los Angeles* (9th Cir. 2011) 673 F.3d 880, 886 (~~review granted by the Supreme Court on other grounds).)~~revd. On other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013)))

The receiving water limitations included in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan or in water quality control plans or policies adopted by the State Water Board, including State Water Board Resolution No. 68-16, or in federal regulations, including but not limited to 40 CFR 131.12 and 131.38. The water quality objectives in the Basin Plan and other State Water Board plans and policies have been approved by USEPA and combined with designated beneficial uses constitute the water quality standards required under federal law.

Provision A.2.a requires that discharges from the Copermittees' MS4s must not cause or contribute to the violation of water quality standards in receiving waters. The water quality standards of the receiving waters must be protected from the impacts that may be caused by the Copermittees' MS4 discharges. Water quality standards applicable to the surface waters in the San Diego Region must be achieved through meeting the technology based standard of MEP through an iterative process of improved management actions. Provision A.2.a is also consistent with State Water Board Order WQ 99-05 precedent-setting language requiring discharges from MS4s to attain receiving water quality standards. The water quality control plans and policies with water quality standards applicable to the waters in the San Diego Region are included under Provision A.2.a.

Provisions A.2.b was included to be consistent with the requirements of State Water Board Resolution No. 2012-0012, adopted on March 20, 2012.

Provision A.3 (Effluent Limitations) specifies the condition of the discharges from the Copermittees' MS4s that must be achieved if and when there are discharges.

Consistent with CWA section 301(b)(1)(A) and 40 CFR 122.44(a), Provision A.3.a includes the technology-based effluent limitations that must be included in the Order. The technology-based effluent limits, representing the minimum level of control that must be imposed in a permit under CWA section 402, requires that pollutants in discharges of storm water from the Copermittees' MS4s be reduced to the MEP. This provision applies specifically to storm water discharges. Non-storm water discharges must be effectively prohibited, as required under Provision A.1.b. Non-storm water (dry weather) discharges from the MS4 are not considered storm water (wet weather) discharges and therefore are not subject to the MEP standard.

The technology-based MEP standard is an ever-evolving, flexible, and advancing concept. Neither Congress nor USEPA has specifically defined the term "maximum extent practicable." Congress established this flexible MEP standard so that the administrative bodies would have "*the tools to meet the fundamental goals of the Clean Water Act in the context of storm water pollution*." (*Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 884.) As knowledge about controlling storm water runoff and discharges continues to evolve, so does the knowledge which constitutes MEP. Reducing the discharge of pollutants in storm water from the MS4 to the MEP requires the Copermittees to assess each program component and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP.

The San Diego Water Board or the State Water Board ultimately define MEP, and may include requirements that provide specific guidance on what is expected to demonstrate MEP. It is the responsibility of the Copermittees to propose actions that implement BMPs to reduce storm water pollution to the MEP. In other words, the Copermittees' runoff management programs developed and implemented under the Order are the Copermittees' proposals ~~of~~ for achieving MEP. Their total collective and individual activities conducted pursuant to their runoff management programs become their proposal for achieving MEP as it applies both to their overall effort, as well as to specific activities. Provisions B through E of the Order provides a minimum framework to guide the Copermittees in achieving the MEP standard for discharges of pollutants in storm water.

Provision A.3.b incorporates any water quality based effluent limitations (WQBELs) applicable to the MS4s established for TMDLs adopted and approved for the San Diego Region and requires the Copermittees to comply with those WQBELs. This is consistent with 40 CFR 122.44(d)(1)(vii)(B), which requires that NPDES permits to incorporate WQBELs "*developed to protect a narrative water quality criterion, a numeric water quality criterion, or both…consistent with the assumptions and requirements of any available wasteload allocation for the discharge...*"

Pursuant to CWA section 303(d), for surface water bodies identified as impaired by one or more pollutants, the San Diego Water Board is required to establish TMDLs "*at a level necessary to implement the applicable water quality standards with seasonal variations and a margin of safety which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality*." The TMDLs identify sources of the pollutants causing the impairments and assign portions of the TMDL as WLAs to point sources, which include MS4s.

WLAs must be expressed in NPDES permits as WQBELs, which may include one or more numeric components such as numeric effluent limits, and/or receiving water limitations, and/or BMP requirements. Because numeric targets for TMDLs typically include a component that will be protective of water quality standards, a TMDL will likely include one or more numeric receiving water limitations and/or effluent limitations as part of the assumptions or requirements of the TMDL. Any numeric receiving water limitations and/or effluent limitations developed as part of the assumptions or requirements of a TMDL must be incorporated and included as part of ~~a~~ WQBELs for the MS4s.

Because the development and approval of new TMDLs, or modification of existing TMDLs, may occur during the term of this Order, the specific provisions of those TMDLs, including effluent limitations applicable to MS4s are provided within Attachment E to the Order. Attachment E will be updated with new TMDLs and modifications to existing TMDLs in a timely manner as they occur.

Provision A.4 (Compliance with Discharge Prohibitions and Receiving Water Limitations) describes the process required to be implemented by the Copermittees if compliance with the discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a are not being achieved under current conditions.

In its Phase II Stormwater Regulations, Final Rule, USEPA states that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL.*"[18] In a series of comment letters on MS4 permits issued by various Regional Water Boards, USEPA has also reiterated that MS4 discharges must meet water quality standards.[19] In addition, the Ninth Circuit Court of Appeals explained in a recent ruling that, *"[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*"[20]

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[18] Phase II Stormwater Regulations, Final Rule, 64 Fed. Reg. 68722, 68737.
[19] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.
[20] NRDC v. County of Los Angeles (9th Cir. 2011), 673 F.3d 880, 886 (revd. on other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133

Water quality standards for the San Diego Region are established in the Basin Plan. The water quality standards of the Basin Plan are incorporated into this Order as the discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a. The discharge prohibitions and receiving water limitations in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations or prohibitions to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan, water quality control plans or policies adopted by the State Water Board, including Resolution No. 68-16, or federal regulations, including but not limited to, 40 CFR 131.12 and 131.38. The waste discharge prohibitions and water quality objectives in the Basin Plan have been approved by USEPA and combined with the designated beneficial uses constitute the water quality standards required under federal law.

Under federal law (CWA section 402(p)(3)(B)(iii)), an MS4 permit must include "*controls to reduce the discharge of pollutants to the maximum extent practicable...and such other provision as...the State determines appropriate for control of such pollutants*." The State Water Board has previously determined that limitations necessary to meet water quality standards are appropriate for the control of pollutants discharged by MS4s and must be included in MS4 permits. (State Water Board Orders WQ 91-03, 98-01, 99-05, 2001-15; see also *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159.) This Order prohibits discharges that cause or contribute to violations of water quality standards.

The discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a are included in this Order to ensure that discharges from the MS4s do not cause or contribute to exceedances of water quality objectives necessary to protect the beneficial uses of the receiving waters.

Provision A.4 is consistent with the precedent-setting language in State Water Board Order WQ 99-05 required to be included in municipal storm water permits. State Water Board Order WQ 2001-15 refined Order WQ 99-05 by requiring an iterative approach to compliance with water quality standards involving ongoing assessments and revisions, as referred to as the "iterative process." The "iterative process" is a fundamental NPDES requirement for municipal storm water permits to achieve the objectives of the CWA.

The State Water Board and Regional Water Boards have stated that the provisions under Provisions A.1.a, A.1.c, A.2.a, and A.4 are independently applicable, meaning that compliance with one provision does not provide a "safe harbor" where there is non-compliance with another provision (i.e., compliance with the Provision A.4 does

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S.Ct. 710 (2013))). ~~On July 13, 2012, the United States Supreme Court granted review of this case on other grounds.~~ See also, *Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 884-886, citing *Defenders of Wildlife v. Browning,* (9th Cir. 1999) 191 F.3d 1159.)

not shield a Copermittee who may have violated Provision A.1.a, A.1.c, or A.2.a from an enforcement action). The intent of Provision A.4 is to ensure that the Copermittees have the necessary storm water management programs and controls in place, and that they are modified by the Copermittees in a timely fashion when necessary, so that compliance with Provisions A.1.a, A.1.c, and/or A.2.a is achieved as soon as possible. USEPA expressed the importance of this independent applicability in a series of comment letters on MS4 permits proposed by various Regional Water Boards. At that time, USEPA expressly objected to certain MS4 permits that included language stating, *"permittees will not be in violation of this [receiving water limitation] provision … [if certain steps are taken to evaluate and improve the effectiveness of the jurisdictional runoff management programs],"* concluding that this phrase would not comply with the CWA.[21]

The Ninth Circuit held in *Natural Resources Defense Council v. County of Los Angeles* (2011) 673 F3d. 880, 886 (~~certiorari granted on other grounds)~~revd. on other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013))) that engagement in the iterative process does not provide a safe harbor from liability for violations of permit terms prohibiting exceedances of water quality standards. The Ninth Circuit holding is consistent with the position of the State and Regional Water Boards that exceedances of water quality standards in an MS4 permit constitute violations of permit terms subject to enforcement by the Water Boards or through a citizen suit. While the Water Boards have generally directed dischargers to achieve compliance by improving control measures through the iterative process, the San Diego Water Board retains the discretion to take other appropriate enforcement and the iterative process does not shield dischargers from citizen suits under the CWA.

The requirements of Provision A.4, therefore, are required to be implemented until the water quality standards expressed under Provisions A.1.a, A.1.c, and A.2.a are achieved. The CWA requires MS4 permits to "*require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." The requirements of this Order have been deemed or determined to be "appropriate" to achieve water quality standards in receiving waters.

Part of the "*controls*" required by the Order is the process described in Provision A.4. Provision A.4 includes the process that is ultimately expected to achieve compliance with the requirement that discharges from the MS4 do not cause or contribute to violations of water quality standards in the receiving waters. The implementation of Provision A.4 is required when the Copermittees or the San Diego Water Board have

[21] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.

determined that discharges from the MS4 are causing or contributing to violations of water quality standards in the receiving waters.

The Copermittees must effectively prohibit non-storm water discharges into the MS4s, reduce the discharge of pollutants in storm water from the MS4s to the MEP, and ensure that their MS4 discharges do not cause or contribute to violations of water quality standards. If the Copermittees have effectively prohibited non-storm water discharges and reduced storm water pollutant discharges to the MEP, but their discharges are still causing or contributing to violations of water quality standards, Provision A.4 provides a clear "iterative process" for the Copermittees to follow.

Provision A.4 essentially requires the Copermittees to implement additional BMPs until MS4 discharges no longer cause or contribute to a violation of water quality standards.

In assessing compliance and potential enforcement actions, the San Diego Water Board looks at the Copermittees' efforts in total to meet the requirements of Provisions A.1.a, A.1.c, A.2.a and Provision A.4. The Copermittees need to demonstrate that they are making improvements to their programs and making progress toward achieving the discharge prohibitions and receiving water limitations in Provisions A.1.a, A.1.c, and A.2.a by implementing the requirements of Provision A.4. The San Diego Water Board would consider these efforts prior to strictly enforcing the requirements of Provisions A.1.a, A.1.c, and A.2.a. Causes of exceedances of the receiving water limitations can often be more difficult to identify and attribute solely to the Copermittees' MS4s. The intent of the Order is to provide the Copermittees more clarity and flexibility in addressing these exceedances through the iterative approach and adaptive management process until the requirements under Provisions A.1.a, A.1.c, and A.2.a are fully achieved.

An exception to the iterative approach and adaptive management process would be in receiving waters subject to adopted and approved TMDLs. For TMDLs that are incorporated into the Order, there is a specific date for compliance to be achieved, after which the iterative approach and adaptive management process required under Provision A.4 no longer provides the flexibility to achieve compliance. Where compliance dates for a TMDL have passed, compliance with the WQBELs incorporated into the Order ~~to be consistent with the assumptions and requirements of a WLA~~ established by a TMDL in Attachment E to protect water quality standards is required. Thus, after the interim or final compliance dates for a TMDL have passed, if the discharges from the Copermittees' MS4s are causing or contributing to a violation of WQBELs, exceedances of WQBELs must be strictly enforced by the San Diego Water Board. In the meantime, however, the Copermittees are in compliance with the interim or final TMDL requirements in Attachment E as long as the interim or final WQBELs are being achieved in accordance with the interim or final compliance dates.

The San Diego Water Board recognizes that there is an apparent disparity between the Copermittees being able to demonstrate and be in compliance with the TMDLs in Attachment E and the discharge prohibitions and receiving water limitations in

Provisions A.1.a, A.1.c, and A.2.a. Thus, similar to the TMDL requirements in Attachment E, the Order establishes a process under Provision B.3.c that the Copermittees may choose to utilize to demonstrate and be in compliance with the discharge prohibitions and receiving water limitations in Provisions A.1.a, A.1.c, and A.2.a. This process is described in more detail under the discussion for Provision B.3.

B. Water Quality Improvement Plans

Purpose: Provision B includes requirements for the Copermittees to develop and implement Water Quality Improvement Plans to ultimately comply with the prohibitions and limitations under Provision A. The Water Quality Improvement Plans will provide the Copermittees a comprehensive program that can achieve the requirements of the CWA. Implementation of the Water Quality Improvement Plans will also improve the quality of the receiving waters in the San Diego Region.

The Water Quality Improvement Plan is the backbone of the Regional MS4 Permit requirements. Provision B provides the guidance, criteria, and minimum expectations and requirements for the elements of the Water Quality Improvement Plan to be developed and implemented by the Copermittees. The Water Quality Improvement Plans will be implemented in the Watershed Management Area by the Copermittees within their jurisdictions through their jurisdictional runoff management programs.

The Water Quality Improvement Plan also incorporates a program to monitor and assess the progress of the Copermittees' jurisdictional runoff management programs toward improving the quality of discharges from the MS4s, as well as tracking improvements to the quality of receiving waters. A process to adapt and improve the effectiveness of the Water Quality Improvement Plans has also been incorporated into the requirements of Provision B to be consistent with the "iterative approach" required to achieve compliance with discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a, pursuant to the requirements of Provision A.4.

The Water Quality Improvement Plans have also been structured to incorporate the requirements of any TMDLs that have been adopted for the San Diego Region. Incorporating the requirements of the TMDLs into the requirements of Provision B allows the Copermittees to develop a single plan, instead of separate plans, to coordinate their non-storm water and storm water runoff management programs. The Water Quality Improvement Plans allow the Copermittees to meet the requirements of this Order, as well as fulfill the requirements of the TMDLs ~~WLAs that have been assigned to discharges from the MS4s~~.

As an added benefit, if the Copermittees demonstrate that impaired water bodies within the Watershed Management Area listed on the 303(d) List will be addressed with their Water Quality Improvement Plans in a reasonable period of time, the San Diego Water Board may be able to remove the water bodies from the 303(d) List, which would greatly reduce the need for the San Diego Water Board to develop additional TMDLs that would have to be incorporated into the Order and implemented by the Copermittees.

***Discussion*:** The federal NPDES regulations require the Copermittees to develop a proposed management program (40 CFR 122.26(d)(2)(iv)). The proposed

management program must include "*a comprehensive planning process*" and "*where necessary intergovernmental coordination*" for the "*duration of the permit.*" The Water Quality Improvement Plan is the Copermittees' "*comprehensive planning process*" document for the proposed management program that will be implemented within a Watershed Management Area. Implementation of the Water Quality Improvement Plan requires "*intergovernmental coordination*" among the Copermittees for at least the "*duration of the permit*," and likely into and beyond the next iteration of the permit.

Developing Water Quality Improvement Plans based upon watersheds is consistent with federal regulations that support the development of permit conditions, as well as implementation of storm water management programs, at a watershed scale (40 CFR 122.26(a)(3)(ii), 122.26(a)(3)(v), and 122.26(d)(2)(iv)). In 2003, USEPA issued a Watershed-Based NPDES Permitting Policy Statement (USEPA, 2003) that defines watershed-based permitting as an approach that produces NPDES permits that are issued to point sources on a geographic or watershed basis. In this policy statement, USEPA explains that "*[t]he utility of this tool relies heavily on a detailed, integrated, and inclusive watershed planning process*." USEPA identifies a number of important benefits of watershed permitting, including more environmentally effective results, the ability to emphasize measuring the effectiveness of targeted actions on improvements in water quality, reduced cost of improving the quality of the nation's waters and more effective implementation of watershed plans, including TMDLs, among others.

An emphasis on watersheds is appropriate at this stage in the San Diego Region's MS4 program to shift the focus to more targeted, water quality driven planning and implementation. Addressing discharges on a watershed scale focuses on water quality results by emphasizing the receiving waters in the watershed. The conditions of the receiving waters drive management actions, which in turn focus measures to address pollutant contributions from MS4 discharges.

The Water Quality Improvement Plan gives the Copermittees the responsibility of developing a comprehensive plan to coordinate the efforts of their jurisdictional runoff management programs for addressing the problems related to MS4 discharges causing impacts to water quality in the Watershed Management Area. The development of the plan provides the Copermittees the opportunity to provide significant input on how to implement their jurisdictional runoff management programs, and how to best utilize their available resources in addressing a focused set of priorities that they believe will result in measureable improvements to water quality within the Watershed Management Area.

The Copermittees are encouraged to separate the Watershed Management Area into subwatersheds, as appropriate. This allows the Copermittees to identify priorities applicable to a subset of the Copermittees or specific water bodies or areas within the Watershed Management Area.

Included in the requirements for the elements to be included in the Water Quality Improvement Plan are monitoring and assessment requirements that are necessary to

implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order. In addition to the federal requirements of the CWA section 308(a) and 40 CFR 122.26(d), the San Diego Water Board has the authority to establish monitoring, reporting, and recordkeeping requirements for NPDES permits under CWC 13383.

More specific and detailed discussions of the requirements of Provision B are provided below.

Provision B.1 (Watershed Management Areas) requires the Copermittees to develop a Water Quality Improvement Plan for each of the Watershed Management Areas defined by the San Diego Water Board.

Pursuant to 40 CFR 122.26(d)(2)(iv), proposed management programs "*may impose controls on a…watershed basis…*" The Water Quality Improvement Plan is the Copermittees' proposed management program. A Water Quality Improvement Plan must be developed for each Watershed Management Area identified in the Order.

The Watershed Management Areas are identified in Table B-1. Table B-1 establishes ten (10) Watershed Management Areas, and identifies the Copermittees that are responsible for developing and implementing the Water Quality Improvement Plan for each Watershed Management Area.

The Copermittees from each of the three counties within the San Diego Region are expected to be phased in as their respective NPDES municipal storm water permits expire. Because Order No. R9-2007-0001 expired in January 2012, the San Diego County Copermittees are covered under the Regional MS4 Permit on the effective date of the Order.

After San Diego Water Board receives and considers the Reports of Waste Discharge required to be submitted by the Orange County Copermittees and Riverside County Copermittees pursuant to the requirements of their current permits, and make any necessary changes to the Order, the Orange County Copermittees and Riverside County Copermittees will be covered under the Regional MS4 Permit after Order No. R9-2009-0002 expires in November 2014, and Order No. R9-2010-0016 expires in December 2015, respectively.

The Orange County Copermittees and Riverside County Copermittees also have the option to obtain coverage under the Regional MS4 Permit earlier than their respective permit expiration dates. The process to apply for early coverage is described Provision F.6.

Because the Santa Margarita River Watershed Management Area includes Copermittees from both San Diego County and Riverside County, a footnote to Table B-1 has been included to specify that the requirements of Provision B ~~must be~~ are not required to be implemented by the County of San Diego until the Riverside County

Copermittees have received a notice of coverage under the Order ~~Regional MS4 Permit~~. Until the Riverside County Copermittees are notified of coverage under the Order, the County of San Diego is subject to the prohibitions and limitations under Provision A, responsible for continuing to implement its existing jurisdictional runoff management program, and responsible for implementing the transitional monitoring and assessment requirements of Provision D, the transitional annual reporting requirements of Provision F.3.b, and the TMDL requirements of Attachment E to the Order.

Provision B.2 (Priority Water Quality Conditions) requires the Copermittees in each Watershed Management Area to identify the highest priority water quality conditions which will be the focus of the Water Quality Improvement Plan implementation.

Provisions B.2.a and B.2.b provide the criteria that must be assessed when characterizing the receiving water quality and potential impacts from MS4 discharges of the receiving waters within the Watershed Management Area. The criteria are based primarily on the requirements in 40 CFR 122.26(d)(1)(iv)(C) and (C)(1)-(9). Characterizing the receiving water quality and identifying the potential impacts caused by MS4 discharges to receiving waters in the Watershed Management Area is necessary to identify the impacts to receiving waters associated with MS4 discharges that are of the most concern to the Copermittees.

Based on the information required to be considered under Provisions B.2.a and B.2.b, Provision B.2.c requires to Copermittees to identify the highest priority water quality conditions related to discharges from the MS4s that will be the primary focus of the Water Quality Improvement Plan in the Watershed Management Area. Addressing and improving these highest priority water quality conditions will become the focus of each Copermittee's jurisdictional runoff management program as the Water Quality Improvement Plan is implemented in the Watershed Management Area. The highest priority water quality conditions are expected to include source of pollutants and/or stressors, and/or receiving water conditions, that the Copermittees consider the highest threats or most likely to have adverse impacts on the physical, chemical, and biological integrity of receiving waters. Addressing these threats and/or adverse impacts should restore the physical, chemical, and biological integrity of receiving waters, and result in the restoration and protection of the beneficial uses of the receiving waters in the Watershed Management Area.

Provision B.2.d requires the Copermittees to identify known and suspected sources of pollutants and/or stressors contributing to the highest priority water quality conditions. The requirements of Provision B.2.d are based primarily on the requirements in 40 CFR 122.26(d)(1)(iii)(B)(1)-(6). The Copermittees are required to evaluate several factors in the identification of those sources. The Copermittees must consider and evaluate the following: (1) the land uses that may contribute toward impacts to receiving waters, (2) the locations of the Copermittees' MS4s that can convey and discharge runoff and pollutants to receiving waters, (3) other sources that discharge into the Copermittees' MS4s and receiving waters, and (4) other information and data

that can help the Copermittees to evaluate the relative importance of or contribution from those sources toward the highest priority water quality conditions. Identifying the known and suspected sources, and their relative contribution toward the highest priority water quality conditions, will help the Copermittees to focus, direct, and prioritize their resources and implementation efforts within their jurisdictions.

Provision B.2.e requires the Copermittees to identify potential strategies that can result in improvements to water quality in MS4 discharges and/or receiving waters within the Watershed Management Area. Potential water quality improvement strategies will not necessarily be implemented by the Copermittees, but provide a "menu" of options that the Copermittees will consider for implementation. The public participation process that will be implemented during the development of the Water Quality Improvement Plan is where the potential water quality improvement strategies will be identified.

Provision B.3 (Water Quality Improvement Goals, Strategies and Schedules) requires the Copermittees in each Watershed Management Area to identify the goals that the Copermittees' jurisdictional runoff management programs will work toward achieving to address and improve the highest priority water quality conditions identified under Provision B.2.c; the strategies that will be implemented by the Copermittees within their jurisdictions and the Watershed Management Area to achieve the goals; and, the schedules for implementing the strategies and achieving the goals. The element of the Water Quality Improvement Plan required under Provision B.3 is where the "*comprehensive planning*" and "*intergovernmental coordination*" [40 CFR 122.26(d)(2)(iv)] of the Copermittees' actions for the proposed management programs within the Watershed Management Area is required to be described.

Provision ~~B.2.e~~ B.3.a requires the Copermittees to identify interim and final numeric goals, and schedules to achieve those goals as part of the Water Quality Improvement Plans. Provision ~~B.2.e~~ B.3.a.(1) requires the Copermittees to identify two types of numeric goals to be achieved:

(1) Final numeric goals in the receiving waters and/or MS4 discharges that will ~~be able to restore and~~ result in the protection of the water quality standards of the receiving waters for the highest priority water quality conditions identified by the Copermittees for Provision B.2.c. These final numeric goals are the ultimate goals for the Water Quality Improvement Plan, and the achievement and maintenance of these final numeric goals will indicate that one or more beneficial uses have been successfully restored and/or protected from MS4 discharges.

(2) Interim numeric goals that can be used by the Copermittees to demonstrate progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges for the highest priority water quality conditions in the Watershed Management Area. Achievement of the interim numeric goals will demonstrate to the San Diego Water Board that the Copermittees' implementation efforts are progressing toward achieving the final numeric goals.

Provision ~~B.2.e~~ B.3.a.(1) does not specify what the interim and final numeric goals must be based on, ~~. The numeric goals~~ but they essentially must be designed to achieve compliance with water quality standards in the receiving waters. To that end, the interim goals must be based on measureable criteria or indicators capable of demonstrating progress toward achieving the numeric goals."

The interim and final numeric goals can be based on the water quality objectives in the Basin Plan. The water quality objectives in the Basin Plan, however, consist of numeric and narrative water quality objectives. Numeric water quality objectives can be directly used as numeric goals. Narrative water quality objectives, on the other hand, will require some interpretation to identify numeric goals. The achievement of multiple numeric goals based on the water quality objectives, used in combination, may be necessary to demonstrate that beneficial uses have been restored and/or protected.

The Copermittees could also propose other numeric goals that are not necessarily water quality objectives from the Basin Plan. For example, the Copermittees could propose a numeric goal that consists of achieving some percent improvement of a measureable indicator, such as acreage of a specific habitat or increase in a specific plant or animal species population. Other examples may include pollutant load reductions, number of impaired waterbodies delisted from the List of Water Quality Impaired Segments, Index of Biological Integrity (IBI) scores, etc.

The Copermittees may choose to develop interim numeric goals based on the final numeric goals they develop, such as incremental steps toward ultimately achieving the final numeric goals. The Copermittees may also choose to develop interim numeric goals that are based on other measureable indicators that can indirectly indicate improvements and progress toward the final numeric goals.

There are no limits to the types of interim numeric goals that could be proposed by the Copermittees, other than the goals must be based on measureable criteria or indicators capable of demonstrating progress toward achieving the numeric goals. Likewise, there are no limits to the types of final numeric goals that could be proposed by the Copermittees, other than the goals must "*restore and protect the water quality standards of the receiving waters.*"

Finally, Provision ~~B.2.e~~ B.3.a.(2) also requires the Copermittees to develop schedules for measuring progress and achieving the interim and final numeric goals. Several criteria are included for the development of the schedules, but the Copermittees are required to achieve the numeric goals as soon as possible, consistent with federal NPDES regulations (40 CFR 122.47(a)(1)).

The Copermittees are also required ~~by~~ to incorporate any compliance schedules ~~that are included in~~ for any applicable ASBS or TMDL requirements. Applicable ASBS and TMDL compliance schedules are set forth in Attachment A and Attachment E to the Order, respectively. The information provided by the Copermittees under Provision

~~B.2.e~~ B.3.a.(2) will be used by the Copermittees and the San Diego Water Board to gauge and track the progress of the Copermittees' efforts in addressing the highest priority water quality conditions identified in the Water Quality Improvement Plan.

~~Provision B.3 (Water Quality Improvement Strategies) requires the Copermittees in each Watershed Management Area to identify the strategies which will be implemented by the Copermittees' jurisdictional runoff management programs to address and improve the highest priority water quality conditions identified under Provision B.2. The element of the Water Quality Improvement Plan required under Provision B.3 is where the "*comprehensive planning*" and "*intergovernmental coordination*" [40 CFR 122.26(d)(2)(iv)] of the Copermittees' actions for the proposed management programs within the Watershed Management Area is expected to be described.~~

Provision B.3.b requires the Copermittees to identify the strategies and schedules to implement those strategies as part of the Water Quality Improvement Plans. Provision B.3.b requires the Copermittees to identify the water quality improvement strategies that will be and may be implemented within the Watershed Management Area to 1) reduce of pollutants in storm water discharged from the MS4 to the MEP, 2) ~~prevent or eliminate controllable~~ effectively prohibit non-storm water discharges from entering the MS4, ~~3) achieve of demonstrable improvements in the physical, chemical, and biological receiving water conditions, 4~~3) ~~restore and~~ protect water quality standards in receiving waters by controlling MS4 discharges so that they do not cause or contribute to exceedances of receiving water limitations, and ~~5~~4) achieve applicable WQBELs that implement TMDLs. The Copermittees will select the strategies to be implemented based on the likely effectiveness and efficiency of the potential water quality improvement strategies identified under Provision B.2.e to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, and/or achieve the interim and final numeric goals identified under Provision B.3.a.

Provision B.3.b.(1) requires each Copermittee to identify the strategies that will be or may be implemented within its jurisdiction. Each Copermittee is required to describe the strategies it is committed to implementing as part of its jurisdictional runoff management requirements under Provisions E.2 through E.7, and the optional jurisdictional strategies that the Copermittee will implement, as necessary, to achieve the numeric goals.

Each Copermittee is expected to implement the optional jurisdictional strategies identified under Provisions B.3.b.(1)(b) when the jurisdictional strategies it has committed to implement under Provision B.3.b.(2)(a) are not making adequate progress toward the interim and final numeric goals in accordance with the schedules established under Provision B.3.a. Provision B.3.b.(1)(b)(v) requires each Copermittee to describe the circumstances necessary to trigger implementation of the optional jurisdictional strategies, in addition to the requirements of Provisions B.3.b.(1)(a).

The San Diego Water Board recognizes that there may be optional jurisdictional strategies that will likely require funding and/or resources for planning, permitting, procurement of labor and materials, and implementation. Thus, Provision B.3.b.(1)(b)(iv) requires each Copermittee to describe the funding and/or resources that are necessary to implement these optional jurisdictional strategies. This information may provide interested groups and members of the public an understanding of the resources that they could provide or assist in obtaining to implement these optional jurisdictional strategies.

~~The Copermittees are expected to provide a description of all the actions and potential actions that they will implement over the course of a schedule that they develop. The implementation actions may include, but are not limited to, inspection and enforcement strategies, resource identification and development efforts, non-structural and structural controls, retrofitting projects, stream and habitat rehabilitation/restoration projects, and agency and department coordination efforts. Water quality improvement strategies that will be implemented within the Watershed Management Area may need to be different within each Copermittees' jurisdiction. The descriptions in the Water Quality Improvement Plan are not expected to specify exactly what strategies each Copermittee will implement within its jurisdiction, but enough information to allow the San Diego Water Board to determine when and where the strategies may be or should be implemented. Specific information about how those strategies will be implemented will be provided in each Copermittee's jurisdictional runoff management program document.~~

Provision B.3.b.(2) requires the Copermittees in the Watershed Management Area to identify the regional or multi-jurisdictional strategies that may be implemented, as necessary, to achieve the numeric goals. Similar to the requirements of Provision B.3.b.(1)(b), these regional or multi-jurisdictional strategies will likely require funding and/or resources for planning, permitting, procurement of labor and materials, and implementation, and San Diego Water Board recognizes that these strategies may be difficult to implement with only Copermittee resources. Thus, Provision B.3.b.(2)(d) requires the Copermittees to describe the funding and/or resources necessary to implement these optional regional or multi-jurisdictional strategies. This information may provide interested groups and members of the public an understanding of the resources that they could provide or assist in obtaining to implement these optional regional or multi-jurisdictional strategies.

Provision B.3.b.(3) requires ~~T~~the Copermittees ~~must also~~ to develop and include schedules in the Water Quality Improvement Plan for implementing the water quality improvement strategies identified under Provisions B.3.b.(1) and B.3.b.(2). The schedule for implementing the water quality improvement strategies will be used by the Copermittees and San Diego Water Board to measure and demonstrate the progress of the Copermittees' implementation efforts toward reducing pollutants in storm water discharged from the MS4 to the MEP, and eliminating illicit non-storm water discharges from entering the MS4.

Provision B.3.b.(4) provides the Copermittees in each Watershed Management Area the option of implementing watershed-specific structural BMP requirements for Priority Development Projects. Historically, storm water permits have included very specific performance standards for permanent, structural BMPs. These standards describe the expectation for the capture or treatment of pollutants and control of excessive flow before storm water is discharged from a site. The Copermittees were also allowed to develop waiver programs for Priority Development Projects to avoid implementing the structural BMPs; however, the waiver programs were not necessarily tied into any sort of holistic watershed strategy. The result is that implementation of BMP requirements is largely done on a site-by-site basis. This requires proper design on the part of the Priority Development Project and strict oversight on the part of the Copermittee.

Provision B.3.b.(4) promotes the evaluation of multiple strategies for water quality improvement, in addition to the implementation of permanent structural BMPs, on a watershed-scale versus the site-by-site approach. In a report issued by the Southern California Coastal Water Research Project (SCCWRP) and several other research institutions, the report emphasized that a successful hydromodification management program will involve watershed analysis as a first step, and that integrating multiple watershed-based strategies is preferable over a site-by-site approach. Indeed, the report states that the watershed analysis "…*should lead to identification of existing opportunities and constraints that can be used to help prioritize areas of greater concern, areas of restoration potential, infrastructure constraints, and pathways for potential cumulative effects*."[22] Provision B.3.b.(4) promotes the findings and recommendations of the report by providing a pathway for Copermittees to develop an integrated approach to their land development programs.

Under Provision B.3.b.(4), the Copermittees in a Watershed Management Area must first perform an analysis by gathering as much information pertaining to the physical characteristics of the Watershed Management Area as possible. This includes, for example, identifying potential areas of coarse sediment supply, present and anticipated future land uses, and locations of physical structures within receiving streams and upland areas that affect the watershed hydrology (such as bridges, culverts, and flood management basins). Once this information is collected, the Copermittees must produce GIS layers (maps) that include this information.

From there, the Copermittees must use the results of the Watershed Management Area Analysis to identify and compile a list of candidate projects that could potentially be used as alternative compliance options for Priority Development Projects. Such projects include, for example, opportunities for stream or riparian area rehabilitation, opportunities for retrofitting existing infrastructure to incorporate storm water retention or treatment, and opportunities for regional BMPs, among others. Once these candidate projects are identified, Copermittees may allow Priority Development

[22] 2012. ED Stein, F Federico, DB Booth, BP Bledsoe, C Bowles, Z Rubin, GM Kondolf, A Sengupta. Technical Report 667. Southern California Coastal Water Research Project. Costa Mesa, CA.

Projects to fund, partially fund, or completely implement these candidate projects. The Copermittees must first find that implementing such a candidate project would provide greater overall benefit to the watershed than requiring implementation of the structural BMPs onsite, and also enter into a voluntary agreement with the Priority Development Project that authorizes this arrangement. The Copermittees may use Provision B.3.b.(4) as both 1) a mechanism to reach their stated goals of the Water Quality Improvement Plan by using Priority Development Projects to either fund or implement projects that will provide water quality benefit, and 2) an alternative to requiring strict adherence to the structural BMP design standards.

Additionally, Provision B.3.b.(4) allows the Copermittees to use the results of the Watershed Management Area Analysis to identify areas within the Watershed Management Area where it is appropriate to allow Priority Development Projects to be exempt from the hydromodification management BMP performance requirements. Provision E.3.c.(2) already allows exemptions for Priority Development Projects that discharge to a conveyance channel whose bed and bank are concrete lined from the point of discharge to an enclosed embayment or the Pacific Ocean. However, there may be cases where further exemptions are warranted. The Copermittees may identify such cases on a watershed basis and include them in the Watershed Management Area Analysis; however, they must provide the supporting rationale to support all claims for exemptions.

Provision B.3.b.(4) provides an innovative pathway for Copermittees to regulate their land development programs by allowing alternative compliance in lieu of implementing structural BMPs on each and every Priority Development Project. This approach facilitates the integration of watershed-scale solutions for improving overall water quality and assisting Copermittees to achieve their stated goals of the Water Quality Improvement Plan. The San Diego Water Board understands, however, that undertaking this approach, which involves extensive planning, could be resource intensive for the Copermittees. Therefore, the Watershed Management Area Analysis is optional and not a requirement. The Copermittees can choose not to perform the watershed planning and mapping exercise described in Provision B.3.b.(4), and instead choose to require strict implementation of the structural BMPs onsite, pursuant to Provision E.3.b.

Finally, Provision B.3.c has been included to provide the Copermittees an option to demonstrate and be in compliance with the requirements of Provisions A.1.a, A.1.c and A.2.a. One or more Copermittees within a Watershed Management Area can choose to implement this option. This option is only expected to be utilized by the Copermittees that wish to clearly demonstrate and be in compliance with the requirements of Provisions A.1.a, A.1.c and A.2.a.

In order for a Copermittee to utilize this option, the Copermittee is required to include three components in the Water Quality Improvement Plan. The first component is a comprehensive set of numeric goals that will demonstrate the requirements of Provisions A.1.a, A.1.c and A.2.a will be achieved. The criteria provided in the Order

will require the Copermittee to demonstrate that the discharges from its MS4s will not cause or contribute to exceedances of water quality objectives in the receiving waters, and the receiving waters will be protected from the Copermittee's MS4 discharges.

The second component is an analysis utilizing a watershed model or other watershed analytical tools. The analysis must demonstrate that the implementation of the water quality improvement strategies required under Provision B.3.b will achieve the numeric goals within the established schedules required under Provision B.3.a. Because the development of the analysis may require significant resources, the Order allows the Copermittees in each Watershed Management Area that choose to implement this option to perform the analysis individually, or pool their resources for the analysis collectively.

The San Diego Water Board does not expect the analysis to be a "guarantee" that the water quality improvement strategies will achieve the numeric goals within the established schedules. The analysis, however, must "reasonably" and "quantitatively" demonstrate that the implementation of the water quality improvement strategies can achieve the numeric goals within the established schedules. However, as more data and information are collected to demonstrate progress toward achieving the numeric goals, the numeric goals, water quality improvement strategies and schedules may need to be updated. When these updates occur, the Copermittees that choose to utilize this option must also update the analysis.

Thus, the third component is the key component that will allow a Copermittee to demonstrate the implementation of the water quality improvement strategies within its jurisdiction is making progress toward achieving the numeric goals. Each Copermittee must specify the monitoring and assessments that will be performed to confirm the implementation of the water quality improvement strategies are making progress toward achieving the numeric goals within the established schedules.

These three components must then be reviewed by the Water Quality Improvement Consultation Panel. The Water Quality Improvement Consultation Panel is required to be formed as part of the public participation process for the development of the Water Quality Improvement Plans. The Water Quality Improvement Consultation Panel is described under Provision F.1.a.(1)(b). Review by the Water Quality Improvement Consultation Panel has been included to provide an additional layer of input, support, and accountability for the implementation of this option.

Compliance with the requirements of Provisions A.1.a, A.1.c and A.2.a begins when the Water Quality Improvement Plan, incorporating the requirements of Provision B.3.c.(1), is accepted by the San Diego Water Board. Each Copermittee that chooses to implement and continues to implement this option will be in compliance with the requirements of Provisions A.1.a, A.1.c and A.2.a as long as the San Diego Water Board continues to accept the analysis, and subsequent updates, and the Copermittee continues to implement the strategies, monitoring and assessments as incorporated in the Water Quality Improvement Plan in accordance with Provision B.3.c.(1).

Provision B.4 (Water Quality Improvement Monitoring and Assessment) requires the Copermittees to develop an integrated monitoring and assessment program to track the progress of the Water Quality Improvement Plan toward meeting the implementation goals and schedules, and improving the water quality of the Watershed Management Area. Provision B.4 is the part of the Water Quality Improvement Plan where the Copermittees describe the monitoring data that will be collected, which is not only necessary to implement the "iterative approach" required by Provision A.4, but inform the adaptive management and "*comprehensive planning process*" that allows the Copermittees to make adjustments and modifications to the Water Quality Improvement Plans and the jurisdictional runoff management programs.

Provision B.4 requires the Copermittees, at a minimum, to include the requirements of Provision D as part of the water quality improvement monitoring and assessment program for the Water Quality Improvement Plan. The Copermittees, however, are not limited to the requirements of Provision D and may include additional monitoring and assessment methods to track progress toward improving water quality in the Watershed Management Area.

In addition to incorporating the requirements of Provision D, the water quality improvement monitoring and assessment program must incorporate any monitoring and assessment requirements specified for any applicable TMDLs included in Attachment E to the Order, and the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 for Watershed Management Areas with ASBS.

The monitoring and assessments required to be incorporated into the Water Quality Improvement Plan are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order.

Provision B.5 (Iterative Approach and Adaptive Management Process) requires the Copermittees to implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a.

Provision B.5 requires the Copermittees in each Watershed Management Area to re-evaluate the highest priority water quality conditions and potential water quality improvement strategies ~~numeric goals~~, the water quality improvement goals, strategies and schedules, and the water quality improvement monitoring and assessment program and provide recommendations for modifying those elements to improve the effectiveness of the Water Quality Improvement Plan. The re-evaluation of the Water Quality Improvement Plan is part of the assessment requirements of Provision D.

Provision B.6 (Water Quality Improvement Plan Submittal, Updates, and Implementation) requires to Copermittees to submit, update, and implement the Water Quality Improvement Plans.

The requirements for the process to develop and submit the Water Quality Improvement Plans is described in more detail under the discussion for Provision F.1. The process will include several opportunities for the public to provide input during the development of the Water Quality Improvement Plans. The process for updating the Water Quality Improvement Plans is described in more detail under the discussion for Provision F.3.c. Upon acceptance of the Water Quality Improvement Plan and updates, the Copermittees are required to immediately begin implementing the Water Quality Improvement Plan and subsequent updates.

The Water Quality Improvement Plan is expected to be a dynamic document that will evolve over time. The Water Quality Improvement Plan is also expected to be a long term plan that focuses the Copermittees' efforts and resources on a limited set of priority water quality conditions, with the ultimate goal of protecting all the beneficial uses of the receiving waters within the Watershed Management Area from impacts that may be caused or contributed to by MS4 discharges. As the Copermittees collect data, implement their jurisdictional runoff management programs, and review the results from their water quality improvement monitoring and assessment program, the Water Quality Improvement Plan is expected to be continually reviewed and updated until compliance with Provisions A.1.a, A.1.b, and A.2.a is achieved.

However, in specific cases supported by robust analytical documentation the ~~I~~implementation of the Water Quality Improvement Plans may ~~also~~ demonstrate that TMDLs are not ~~required~~ necessary for identified impaired water bodies within the Watershed Management Area if the analytical record demonstrates that~~. Impaired water bodies are not required to be placed on the 303(d) List, thus do not require a TMDL, if~~ technology-based effluent limitations required by the CWA, more stringent effluent limitations required by state, local, or federal authority, and/or other pollution control requirements (e.g., best management practices) required by local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time.[23]

The San Diego Water Board submits an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. According to USEPA guidance for the Integrated Report,[24] water bodies are placed in one of five categories. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 are placed on the 303(d) List.

[23] 40 CFR 130.7(b)(1)
[24] USEPA, 2005. Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act

Category 4 in the Integrated Report is for water bodies where available data and/or information indicate that at least one beneficial use is not being supported or is threatened, but a TMDL is not needed.[25] Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

Impaired water bodies can be included in Category 4a if a TMDL has been adopted and approved. The TMDLs in Attachment E to the Order implement the requirements of the TMDLs adopted by the San Diego Water Board, and approved by the State Water Board and USEPA. The water bodies in Attachment E will be included in Category 4a in the Integrated Report and removed from the 303(d) List.

Impaired water bodies can be included in Category 4b if there are *acceptable* "pollution control requirements" required by a local, state or federal authority stringent enough to implement applicable water quality standards within a reasonable period of time (e.g., a compliance date is set). When evaluating whether a particular set of pollution controls are "requirements," the USEPA considers a number of factors, including: (1) the authority (local, state, federal) under which the controls are required and will be implemented with respect to sources contributing to the water quality impairment (examples may include: self-executing state or local regulations, permits, and contracts and grant/funding agreements that require implementation of necessary controls), (2) existing commitments made by the sources and completion or soon to be completed implementation of the controls (including an analysis of the amount of actual implementation that has already occurred), (3) the certainty of dedicated funding for the implementation of the controls, and (4) other relevant factors as determined by USEPA depending on case-specific circumstances.[26]

Impaired water bodies can be included in Category 4c if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution. Pollution, as defined by the CWA is "the man-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of water."[27] In other cases, pollution does not result from a pollutant and a TMDL is not required. Examples of circumstances where an impaired segment may be placed in Category 4c include segments impaired solely due to lack of adequate flow, stream channelization, or hydromodification. In these situations, there may be water quality management actions that can address the cause(s) of the impairment, but a TMDL may not be required to implement the actions.

[25] Ibid
[26] Ibid
[27] CWA section 502(19)

The Water Quality Improvement Plans will require the implementation of pollution controls and water quality management actions (i.e. water quality improvement strategies) which can result in the attainment of water quality standards in water bodies impaired by discharges from the Copermittees' MS4s. The Water Quality Improvement Plans also include requirements that are expected to attain water quality standards in a reasonable period of time. The San Diego Water Board considers the Water Quality Improvement Plans to be a commitment by the Copermittees to develop, plan, budget for, and implement pollution controls that will attain water quality standards in receiving waters in a reasonable period of time, or as soon as possible. The results of the Copermittees' efforts in implementing the Water Quality Improvement Plans can be used to re-evaluate the condition of the impaired water bodies during the next update to the 303(d) List.

After the Copermittees submit the Water Quality Improvement Plans and demonstrate that water quality standards are being attained or will be attained in a reasonable period of time, the San Diego Water Board may re-evaluate the water bodies on the 303(d) List. These water bodies on the 303(d) List may be re-evaluated and placed into Category 4b or Category 4c in the Integrated Report. The water bodies placed in Category 4b or Category 4c in the Integrated Report must show a record that the water bodies are attaining water quality standards or supporting the identified beneficial uses, or will attain water quality standards or support identified beneficial uses in a reasonable period of time, in order for the water bodies to be appropriately removed from the 303(d) List.

C. Action Levels

Purpose: Provision C includes requirements for the Copermittees to identify and include numeric action levels in the Water Quality Improvement Plan to direct and focus the Copermittees' jurisdictional runoff management program implementation efforts for controlling MS4 discharges to receiving waters.

***Discussion*:** Under Provision C, the numeric action levels required are for non-storm water discharges and storm water discharges. The non-storm water action levels (NALs) are applicable to non-storm water discharges from the Copermittees' MS4s, which can occur year-round. The storm water action levels (SALs) are applicable to storm water discharges from the Copermittees' MS4s, which occur during the rainy season defined as the period between October 1 and April 30.

The action levels required by Provision C are based on the action level requirements that were developed and incorporated into Order Nos. R9-2009-0002 and R9-2010-0016, the Orange County and Riverside County MS4 Permits, respectively. The Fact Sheets for these Orders provide detailed discussions about the development of the numeric NALs and SALs included in this Order.

Order Nos. R9-2009-0002 and R9-2010-0016 required the Copermittees to perform prescribed actions if the NALs or SALs are exceeded. The actions required under Order Nos. R9-2009-0002 and R9-2010-0016 generally included conducting additional monitoring and source investigations when a discharge from the MS4 is observed to exceed one or more NALs and/or SALs.

For this Order, however, the action levels of Provision C are to be used by the Copermittees to prioritize the actions to be implemented as part of the Water Quality Improvement Plan. Monitoring data collected by the Copermittees from MS4 outfalls will be compared with the NALs and SALs. Exceedances of the NALs and SALs will not require the Copermittees to immediately identify sources causing exceedances, but will provide some numeric indicator levels that can give the Copermittees a way to measure the relative severity of a pollutant contributing to receiving water quality impacts.

NALs and SALs must be included in the Water Quality Improvement Plans to be used by the Copermittees in directing and focusing their water quality improvement strategies. The Copermittees are expected to utilize the NALs and SALs to help focus their implementation efforts on addressing pollutants that have the most significant potential or observed impacts to receiving waters. The NALs and SALs will be used as part of the MS4 discharges assessments required under Provision D.4.b. The NALs and SALs may also be used by the Copermittees as the numeric goals to be achieved in MS4 discharges and/or receiving waters as the Water Quality Improvement Plans are implemented.

More specific and detailed discussions of the requirements of Provision C are provided below.

Provision C.1 (Non-storm Water Action Levels) requires the Copermittees to incorporate NALs into the Water Quality Improvement Plan for pollutants and/or constituents that are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions identified in the Water Quality Improvement Plan related to non-storm water discharges from the MS4s. NALs generally must be consistent with the water quality objectives found within the Basin Plan.

The NALs have been included to ensure that the Copermittees are implementing and complying with several requirements of the MS4 permit. The federal CWA requires permits for municipal storm sewer systems to "*effectively prohibit non-storm water discharges into the storm sewers*." The federal NPDES regulations, which were promulgated to implement the CWA requirements for discharges from municipal storm sewers, require a program to address illicit discharges, which are non-storm water discharges. Provision A.1.b prohibits "*[n]on-storm water discharges into MS4s*" unless the non-storm water discharge authorized by a separate NPDES permit~~, or is a category of non-storm water specified in Provisions E.2.a.(1)-(5) that does not need to be addressed through ordinance, order or similar means and is not a source of pollutants~~. The NALs will be used as part of the illicit discharge detection and elimination program required pursuant to Provision E.2, as well as part of the MS4 discharges assessments required pursuant to Provision D.4.b.

Provision A.1.a prohibits non-storm water discharges from the MS4 from "*causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state.*" In addition, pursuant to Provision A.2.a, non-storm water discharges "*must not cause or contribute to the violation of water quality standards in any receiving waters*."

Ideally, the Copermittees' jurisdictional runoff management programs will eliminate all non-storm water discharges entering the MS4s within their jurisdictions. The complete elimination of non-storm water discharges to the Copermittees' MS4s would be in compliance with the CWA requirements for non-storm water discharges, as well as the prohibitions and limitations of Provisions A.1.a and A.2.a.

The federal regulations, however, also refer to several non-storm water discharge categories that must be addressed as illicit discharges if they are found to be a source of pollutants. The federal regulations thus identify some non-storm water discharges that are not required to be addressed as illicit discharges if they are not a source of pollutants (e.g. non-storm water discharges specified in Provisions E.2.a.(1)-(5)). Thus, these regulations imply that some non-storm water discharges into and from the MS4 may occur even if non-storm water discharges are "effectively" prohibited by the Copermittees.

If the source of a non-storm water discharge is identified as a category of non-storm water specified in Provisions E.2.a.(1)-(5), the NALs can be used to determine the category of non-storm water discharges is a source of pollutants. For other non-storm water discharges not specified in Provisions E.2.a.(1)-(5), the CWA requires those discharges to be "*effectively"* prohibited by removing the discharge to the MS4 through enforcement of the Copermittees' legal authority established under "*ordinance, order or similar means*~~.~~" to prohibit illicit discharges to the MS4s.

If there are non-storm water discharges that are not required to be addressed as illicit discharges~~, however~~, those discharges must comply, at a minimum, with the discharge prohibitions and receiving water limitations of Provision A. Thus, the non-storm water discharges from the MS4 must be at levels that will not cause or contribute to a condition of pollution, contamination, or nuisance (Provision A.1.a), and must not cause or contribute to a violation of water quality standards in receiving waters (Provision A.2.a) to be consistent with the discharge prohibitions and receiving water limitations of Provisions A.1.a and A.2.a.

Furthermore, the San Diego Region has predominantly intermittent and ephemeral rivers and streams which vary in flow volume and duration at spatial and temporal scales. For most of these river and stream systems, non-storm water discharges from the MS4 are likely to be the most significant or the only source contributing to surface flows present within the receiving water, especially during the dry season.

Therefore, because of the prohibitions and limitations of Provision A.1.a and A.2.a, and the likelihood that non-storm water discharges from the MS4 are the most significant or only source contributing to surface flows present within the receiving water, NALs generally must be consistent with the water quality objectives found within the Basin Plan. Non-storm water discharges that are meeting the NALs would not be expected to cause or contribute to an exceedance of water quality objectives in receiving waters, which would be consistent with the discharge prohibitions and receiving water limitations of Provisions A.1.a and A.2.a.

Exceedances of the NALs would then provide an indication of the relative severity of a pollutant in non-storm water discharges from the MS4 contributing to potential or observed receiving water quality impacts. The relative severity or significance of a pollutant in non-storm water discharges from the MS4 will provide the Copermittees a valuable source of information that can be used to identify priority water quality conditions within a Watershed Management Area and within each Copermittee's jurisdiction.

Tables C-1 through C-4 under Provision C.1.a specify numeric NALs for several parameters or pollutant constituents for non-storm water discharges from the MS4 to several water body types. The NALs for MS4 discharges given under Provision C.1.a are based on the water quality objectives for inland surface waters in the Basin Plan, and the water quality objectives for ocean waters in the Ocean Plan. The NALs for most of the metals were calculated based on the State Policy for Implementation of

Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP). The NALs provided in Tables C-1 through C-4 must be included in the Water Quality Improvement Plans required to be developed pursuant to Provision B.

Provision C.1.b requires the Copermittees to identify NALs for pollutants and/or constituents, not specified in Provision C.1.a, which are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions of the Watershed Management Area related to non-storm water discharges from the MS4s. The NALs must be based on the water quality objectives in the Basin Plan. The NALs identified under Provision C.1.b must be included in the Water Quality Improvement Plan.

The San Diego Water Board recognizes that some of the NALs required pursuant to Provisions C.1.a and C.1.b may be exceeded more frequently than not. Thus, Provision C.1.c has been included in the Order to provide the Copermittees the option to develop secondary NALs that are set at levels greater than the levels required pursuant to Provisions C.1.a and C.1.b to further refine the prioritization and assessment of water quality improvement strategies for addressing non-storm water discharges to and from the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and from the MS4.

Provision C.2 (Storm Water Action Levels) requires the Copermittees to incorporate SALs into the Water Quality Improvement Plan for pollutants and/or constituents causing or contributing, or may be causing or contributing, to the highest priority water quality conditions identified in the Water Quality Improvement Plan related to storm water discharges from the MS4s.

The SALs have been included to ensure that the Copermittees are implementing and complying with several requirements of the MS4 permit. Provision A.1.a prohibits storm water discharges from the MS4 from "*causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state.*" In addition, pursuant to Provision A.2.a, storm water discharges "*must not cause or contribute to the violation of water quality standards in any receiving waters*."

Provision A.3.a, however, implicitly acknowledges that compliance with Provisions A.1.a and A.2.a cannot be achieved immediately for discharges of storm water from the MS4 by applying the MEP standard. Thus, Provision A.4 requires the Copermittees to implement an iterative approach to demonstrate that MEP is being achieved. This approach is supported by USEPA.

The federal CWA requires permits for municipal storm sewer systems to "*require controls to reduce the discharge of pollutants [in storm water] to the maximum extent practicable*, *including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State*

determines appropriate for the control of such pollutants." MEP is an ever-evolving, flexible, and advancing concept. As knowledge about controlling storm water runoff and discharges evolves, so does the knowledge which constitutes MEP. Reducing the discharge of storm water pollutants from the MS4 to the MEP requires the Copermittees to assess their jurisdictional runoff management programs and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP. The SALs provide the Copermittees measureable goals that may be used to demonstrate the achievement of MEP for reducing pollutants in storm water discharges from the MS4. The SALs will be used as part of the MS4 discharges assessments required under Provision D.4.a.

In June of 2006, the State Water Board's Blue Ribbon Storm Water Panel released its report titled "*The Feasibility of Numerical Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities*." In the recommendations, the Blue Ribbon panel proposed storm water effluent limitations which are computed using statistical based population approaches. The SALs specified in Table C-5 under Provision C.2.a were developed from a regional subset of nationwide Phase I MS4 data by using USEPA Rain Zone 6 (arid west) data.[28] Additionally, utilization of regional data is appropriate due to the addition of data into the nationwide Phase I MS4 monitoring dataset in February 2008. This additional data increased the number of USEPA Rain Zone 6 samples to more than 400, and included additional monitoring events within Southern California.

Utilizing data from USEPA Rain Zone 6 resulted in SALs which closely reflect the environmental conditions experienced in the San Diego Region. The localized subset of data includes sampling events from multiple Southern California locations including Orange, San Diego, Riverside, Los Angeles, and San Bernardino Counties. The dataset includes samples taken from highly built-out impervious areas and from storm events representative of Southern California conditions.

The SALs for cadmium, copper, lead and zinc require the measurement of hardness and to provide more specificity in the assessment of samples with SALs for total metal concentrations. While USEPA Rain Zone 6 data include a large sample size for concentrations of total metals, the impact the concentration will have on receiving waters will vary with receiving water hardness. Since it is the goal of the SALs, through the iterative process and MEP standard, to have MS4 storm water discharges meet all applicable water quality objectives, the hardness of the receiving water should be used when assessing the total metal concentration of a sample.

Thus, when there is an exceedance of a SAL for a metal, the Copermittee must determine if that exceedance is above the existing applicable water quality objectives based upon the hardness of the receiving water. The water quality objectives Copermittees must use to assess total metal SAL exceedances are the California Toxic Rule (CTR) and USEPA National Recommended Water Quality Criteria for

[28] Data used to develop SAL were obtained from http://rpitt.eng.ua.edu/Research/ms4/mainms4.shtml

Freshwater Aquatic Life 1 hour maximum concentrations. The 1 hour maximum concentration is to be used for comparison since it is expected to most replicate the impacts to waters of the State from the first flush following a precipitation event.

The statistically calculated SALs given in Table C-5 are at levels greater than the water quality objectives in the Basin Plan or Ocean Plan. Because the objective of the CWA is to "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*", meaning eventually pollutants in storm water discharges must be reduced to a level that cannot cause or contribute to an exceedance of water quality objectives in receiving waters, over time the SALs are expected to be reduced to a level that is based on the water quality objectives rather than statistical calculations. The San Diego Water Board will review the SALs as more data for discharges of storm water from the MS4s are collected, and revise them as conditions improve and the MEP standard advances. For the Water Quality Improvement Plans required under this Order, the SALs identified under Provision C.2.a must be included.

Provision C.2.b requires the Copermittees to identify SALs for pollutants and/or constituents, not specified in Provision C.2.a, which are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions of the Watershed Management Area related to storm water discharges from the MS4s. The SALs identified under Provision C.2.b must be included in the Water Quality Improvement Plan.

The San Diego Water Board recognizes that some of the SALs required pursuant to Provisions C.2.a and C.2.b may be exceeded more frequently than not. Thus, Provision C.2.c has been included in the Order to provide the Copermittees the option to develop secondary SALs that are set at levels greater than the levels required pursuant to Provisions C.2.a and C.2.b to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s.

D. Monitoring and Assessment Program Requirements

Purpose: Provision D includes minimum monitoring and assessment requirements that must be developed and implemented by the Copermittees as part of the Water Quality Improvement Plans. Implementation of the monitoring and assessment requirements of Provision D will allow the Copermittees to demonstrate that the requirements of the CWA to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP are being achieved. Implementation of the monitoring and assessment requirements of Provision D will also allow the Copermittees and the San Diego Water Board to track improvements to the water quality in the San Diego Region. The monitoring and assessment program requirements are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order.

***Discussion*:** The San Diego Water Board recognized that changes to the monitoring and assessment requirements of the Fourth Term Permit were necessary to improve the usefulness and usability of monitoring data collected by the Copermittees to support their jurisdictional storm water programs more efficiently and with increased effectiveness. The data collected are needed to better inform the Copermittees' understanding of the physical, chemical, and biological condition of the receiving waters and the quality of the MS4 discharges. The monitoring program needs to provide opportunities for the Copermittees to integrate regional monitoring efforts into municipal storm water monitoring requirements to provide a cost-effective approach to monitoring and avoid duplication of efforts.

The requirements in Provision D were largely recommended by the Copermittees as an outcome of the San Diego Water Boards Focused Meeting process. The monitoring and assessment program requirements now require collection of more specific information necessary for each Copermittee to adapt its jurisdictional runoff management program in such a way that focuses resources on a watershed's highest priority water quality conditions. The monitoring and assessment program will require the Copermittees to collect data that can be utilized to answer both watershed level management questions (e.g. Are the chemical, physical, and biological conditions of a receiving water protective, or likely protective of beneficial uses?), and specific jurisdictional runoff management program activity questions (e.g. Are the water quality improvement strategies of the jurisdictional program effectively eliminating non-storm water discharges to the MS4?).

The monitoring data collected and assessment information that will be reported to the San Diego Water Board are necessary to determine if the Copermittees are complying with the prohibitions and limitations of Provision A. The required monitoring and assessments that must be reported to the San Diego Water Board will be utilized for three purposes:

(1) Inform the Copermittees, San Diego Water Board, and the public on the progress

of the Copermittees' efforts to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP;

(2) Inform the Copermittees, San Diego Water Board, and the public on the condition of water bodies receiving discharges from the Copermittees' MS4, and the progress of the Copermittees' water quality improvement implementation efforts toward improving the receiving water quality; and

(3) Inform the Copermittees, the San Diego Water Board, and the public on the effectiveness of the Water Quality Improvement Plan toward achieving (1) and (2).

The monitoring and assessment information reported pursuant to Provision F is also expected to be key to the iterative approach and adaptive management process required under Provision A.4 and implemented through the Water Quality Improvement Plan required under Provision B. As required by Provision A.4, the iterative approach and adaptive management process is required if the Copermittees cannot meet the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c, and/or A.2.a under the present conditions.

Provision D provides the minimum monitoring and assessment requirements that must be included in each Water Quality Improvement Plan to be developed and implemented by the Copermittees. The Copermittees, however, are not limited to the requirements of Provision D and may include additional methods to track progress toward improving water quality in a Watershed Management Area.

More specific and detailed discussions of the requirements of Provision D are provided below.

<u>Provision D.1 (Receiving Water Monitoring Requirements)</u> specifies the minimum receiving water monitoring that the Copermittees must conduct within the Watershed Management Area and include as part of the Water Quality Improvement Plan.

Provision D.1 establishes minimum monitoring requirements that must be conducted by the Copermittees within each Watershed Management Area. Provision D.1 requires the Copermittees to collect and develop the data and information necessary to determine potential impacts to the beneficial uses in the receiving waters due to discharges from the MS4s. The monitoring required under Provision D.1 will also provide the data that will allow the Copermittees to gauge the effectiveness and progress of its Water Quality Improvement Plan implementation efforts toward improving the quality of receiving waters.

The receiving water monitoring requirements of Provision D.1 are focused primarily on monitoring the conditions and response of the receiving waters to the Copermittees' collective implementation efforts to reduce receiving water impacts that may be

caused by the discharges from the MS4s. The preference of the San Diego Water Board is for the Copermittees to spend their resources achieving tangible and observable improvements in receiving water conditions instead of collecting samples and analyzing data that has consistently indicated that receiving water conditions are degraded and require improvement. In general, the ability to measure potential improvements in receiving water conditions due to any actions implemented by the Copermittees as part of the Water Quality Improvement Plan may require several years before a response can be observed. Thus, the frequency of collecting receiving water monitoring data has been kept to a minimum.

During the transitional period between adoption of this Order and San Diego Water Board acceptance of a Water Quality Improvement Plan, the Copermittees must conduct receiving water monitoring in accordance with Provision D.1.a. This approach to collecting receiving water data is different from what was required in the Fourth Term Permits, but one that truly embraces the concept of an integrated, cost-effective, streamlined receiving water monitoring approach.

Provision D.1.a requires Copermittees to continue performing the receiving water monitoring programs required in Order Nos. R-2007-0001, R9-2009-002, and R9-2010-0016; plus participation in: hydromodification management plan monitoring approved by the San Diego Water Board, monitoring plans as part of load reduction plans (either Bacteria Load Reduction Plans or Comprehensive Load Reduction Plans) for TMDLs in Attachment E of the Order, Storm Water Monitoring Coalition Regional Monitoring, Southern California Bight Regional Monitoring, Sediment Quality Monitoring, and ASBS Monitoring as applicable to a Watershed Management Area.

Provision D.1.a also provides an opportunity for the Copermittees to use third party data to meet receiving water monitoring requirements where feasible. Allowing the Copermittees to use the data currently collected through its participation in existing regional receiving water programs and that of third parties provides an efficiency of resources in obtaining the data necessary to inform the Copermittees and the San Diego Water Board about the physical, chemical, and biological conditions of the receiving waters, which can also help to focus the receiving water monitoring during the implementation of the Water Quality Improvement Plan. Once a Water Quality Improvement Plan is developed for a Watershed Management Area in compliance with Provision B of this Order, the transitional period is over and Copermittees are required to conduct receiving water monitoring according to the requirements of Provision D.1.b-e.

Provision D.1.b requires each Copermittee to identify at least one long term receiving water monitoring station to be representative of receiving water quality within each Watershed Management Area. Long term receiving water monitoring stations can be located at any existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees. The requirements under Provision D.1.b. are consistent with 40 CFR 122.26(d)(2)(iii)(D), which specifies that a "*monitoring program*

for representative data collection for the term of the permit" may include "*instream locations.*" For each Watershed Management Area, at least one long term watershed monitoring station is required to be established and monitored. The Copermittees may choose to establish additional long term monitoring stations where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

Provision D.1.b. requires the Copermittees to locate the long term receiving water monitoring station at one of these existing receiving water monitoring stations to provide the Copermittees an opportunity to experience monitoring cost savings while continuing to collect the necessary data to assess the status and trends of receiving water quality conditions in 1) coastal water, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under both dry weather and wet weather conditions. Ideally these stations will continue to be monitored as part of the receiving water monitoring for each Watershed Management Area to maintain a consistent set of locations and a period of data that can be built upon with the monitoring required under this Order.

The receiving water monitoring requirements are separated into monitoring required during dry weather conditions pursuant to Provision D.1.c, and wet weather conditions pursuant to Provision D.1.d.

At each long term monitoring station the Copermittees must conduct at least three dry weather monitoring events as required pursuant to Provision D.1.c and at least three wet weather monitoring events as required pursuant to Provision D.1.d per permit term. Provision D.1.c and D.1.d require the Copermittees to monitor priority water quality conditions identified in the Water Quality Improvement Plan, constituents listed as causing impairment of receiving waters in the Watershed Management Area, applicable NALs, toxicity, constituents listed in Tables D-2 and D-3, and constituents for implementation plans (e.g. Bacteria Load Reduction Plans and Comprehensive Load Reduction Plans). Required toxicity monitoring was changed to reflect an updated understanding of the unique challenges associated with sampling storm water for toxicity. Copermittees are required to sample storm water for toxicity during each dry weather and each wet weather event pursuant to Provision D.1.c.(4) and D.1.d.(4). Required toxicity monitoring is now consistent with the State Water Resources Control Board Policy for Toxicity Assessment and Control (Draft june2012) and recently adopted MS4 permits for Caltrans and Los Angeles Water Board. Receiving water monitoring efforts in this Order have been streamlined to redirect resources to monitoring efforts that better support pollutant reduction solutions with an increasing emphasis on MS4 outfall monitoring, source identification and source abatement activities.

In addition to the receiving water monitoring requirements under Provisions D.1.b-d, Provision D.1.e requires the Copermittees participate in and/or conduct other types of receiving water monitoring. As recommended and requested by the Copermittees, Provision D.1.e.(1) requires the Copermittees to participate in existing regional monitoring, as applicable to each Watershed Management Area. Existing regional monitoring includes monitoring conducted by the Storm Water Monitoring Coalition

and for the Southern California Bight. Participation in and use of monitoring data collected from these existing regional water quality monitoring programs provide the Copermittees a greater opportunity for efficiency in the use of their resources to manage their storm water programs and those controllable discharges under their authority.

The State Water Resources Control Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part 1 Sediment Quality which became effective August 25, 2009 (Sediment Quality Monitoring Policy). Provision D.1.e.(2) requires any Copermittees with MS4 discharges to an enclosed bay or estuary to monitoring the sediments in the enclosed bay or estuary receiving water in accordance with the sediment quality monitoring procedures as prescribed in the Sediment Quality Monitoring Policy.

The State Water Board adopted Resolution No. 2012-0012 which approved exceptions to the California Ocean Plan for selected discharges into Areas of Special Biological Significance (ASBS), including special protections for beneficial uses. State Board Resolution No. 2012-0012 became effective on March 20, 2012, and Attachment B to the Resolution established limitations on point source storm water discharges to ASBS. Copermittees with MS4s that discharge to an ASBS must monitor its discharge to assure compliance with State Board Resolution No. 2012-0012 as required pursuant to Provision D.1.e.(3).

The San Diego Water Board is currently developing a regional monitoring strategy to assess the conditions of receiving waters in the San Diego Region. The monitoring requirements of Provision D.1 are expected to be incorporated or serve as a foundation of this regional monitoring strategy, but may require some modifications. When the San Diego Water Board develops an alternative regional monitoring strategy, the Copermittees will be required to participate in the development and implementation of the alternative regional monitoring program pursuant to Provision D.1.f.

Provision D.2 (MS4 Outfall Discharge Monitoring Requirements) specifies the minimum MS4 outfall discharge monitoring requirements that the Copermittees must incorporate and implement as part of the Water Quality Improvement Plan.

The dry weather MS4 outfall discharge monitoring requirements are included under Provisions D.2.a.(2) and D.2.b. The dry weather MS4 outfall discharge monitoring requirements are part of the "*program, including a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer*" required by 40 CFR 122.26(d)(2)(iv)(B), which is expected to achieve compliance with the CWA section 402(p)(3)(B)(ii) statutory requirement for municipal storm water permits to require the Copermittees to "*effectively prohibit non-storm water discharges into the storm sewers*." The dry weather MS4 outfall discharge monitoring data

collection requirements are based on requirements under 40 CFR 122.26(d)(1)(iv)(D) and 122.26(d)(2)(iv)(B)(3).

The dry weather MS4 outfall discharge monitoring requirements are designed to provide wide spatial and temporal coverage of each jurisdiction to better understand the extent and magnitude of non-storm water discharges to receiving waters, and make a distinction between persistent and transient non-storm water flows. This information is expected to allow each Copermittee to focus its resources on eliminating and controlling the highest priority threats to receiving water quality, as well as integrating other elements of the storm water programs (e.g. complaint call response) and third party data to efficiently and effectively assist in efforts to eliminate non-storm water discharges.

The dry weather MS4 outfall discharge monitoring requirements of Provision D.2.a.(2) and D.2.b are separated into monitoring required before and after the San Diego Water Board accepts the Copermittees' Water Quality Improvement Plan. Outfall monitoring conducted prior to acceptance of the Water Quality Improvement Plan is referred to in the Order as Transitional MS4 Outfall Discharge Monitoring. Provision D.2.a.(2) includes the transitional dry weather MS4 outfall discharge monitoring requirements.

The requirements under Provision D.2.a.(2) are based on the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B), which include the requirements for a monitoring program to identify, detect, and eliminate illicit connections and illegal discharges to the MS4s. The federal regulations (40 CFR 122.26(d)(1)(iv)(D)) require the monitoring program to include "*a field screening analysis for illicit connections and illegal dumping [that]…[a]t a minimum, include[s] a narrative description, for either each field screening point or major outfall, of visual observations made during dry weather periods.*" The federal regulations (40 CFR 122.26(d)(1)(v)(B)) require the monitoring program to include "*inspection procedures and methods for detecting and preventing illicit discharges, and describe areas where this program has been implemented.*" Furthermore, the monitoring program is required by federal regulations (40 CFR 122.26(d)(2)(iv)(B)) to include "*a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer.*"

Dry weather transitional MS4 outfall discharge monitoring requires each Copermittee to field screen (inspect) its major MS4 outfalls to classify the MS4 outfall locations as having persistent dry weather flows, transient dry weather flows, or no dry weather flows. To account for the variance in size of the 39 jurisdictions covered under this Order, the Copermittees recommended a tiered approach to the number of major MS4 outfalls that must be inspected. Provision D.2.a.(2)(a) provides a tiered approach to the number of major MS4 outfalls that must be visually inspected per jurisdiction as well as a minimum frequency each Copermittee must inspect each major MS4 outfall per year. This tiered approach is based on the total number of major MS4 outfalls within a Copermittees jurisdiction within each Watershed Management Area.

Based on the field screening, each Copermittee is required to make a determination whether any observed flowing, pooled, or ponded waters are transient or persistent flows. Based on this field screening information, other jurisdictional program information, and third party information, each Copermittee is required to prioritize the MS4 outfalls within its jurisdiction for follow up investigation and elimination of the non-storm water discharge, as part of its illicit discharge detection and elimination program required pursuant to Provision E.2. In accordance with the requirements of Provision E.2, each Copermittee is required to immediately investigate obvious illicit discharges (e.g. outfall discharges with unusual color, unusual odor, or high flows).

This approach allows a Copermittee to use all of its resources, as well as leverage resources and information provided by third parties, to effectively eliminate non-storm water discharges from its MS4 outfalls. If the source of the non-storm water discharge cannot be immediately eliminated, the Copermittee uses the persistent flow or transient flow classification along with other programmatic implementation data to prioritize the MS4 outfalls for future investigation. In accordance with the adaptive management approach deployed throughout this Order, Provision D.2.a.(2)(c) requires each Copermittee to update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow. The requirement of Provision D.2.a.(2)(c) assures that each Copermittee is collecting data that can be used to demonstrate compliance with the CWA requirement that each Copermittee must implement a program to "*effectively prohibit non-storm water discharges into the [MS4]*" and with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

Provision D.2.b describes the dry weather MS4 outfall discharge monitoring required to be incorporated and implemented as part of the Water Quality Improvement Plan. Dry weather MS4 outfall discharge monitoring must be performed by each Copermittee to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to E.2.d~~3~~. The emphasis of the dry weather MS4 outfall discharge monitoring required pursuant to Provision D.2.b is consistent with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

Provision D.2.b.(1) requires each Copermittee to continue field screening its major MS4 outfalls and identifying those with persistent flows and transient flows, as conducted during the transitional period (i.e. before the Water Quality Improvement Plan was developed). However, each Copermittee now has the flexibility to adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of non-storm water persistent flow discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan. In order to ensure a minimum number of outfalls are inspected, Provision D.2.b.(1) requires the number of visual

inspections be equal to the number of visual inspections required in the tiered inspection program pursuant to Provision D.2.a.(2)(a).

Provision D.2.b.(2)(b) requires each Copermittee to monitor a minimum of ~~10~~ 5 major MS4 outfalls with persistent flows identified as the highest priorities within a Copermittee's jurisdiction, ~~and~~ within each Watershed Management Area. In other words, Copermittees located in more than one Watershed Management Area must identify at least ~~10~~ 5 major MS4 outfalls with persistent flows ~~per~~ in its jurisdiction in each Watershed Management Area. If a Copermittee is located in more than one Watershed Management Area, ~~but there are~~ and they have less than ~~10~~ 5 major MS4 outfalls with persistent flows ~~within the area of its jurisdiction located in the~~ per jurisdictional area per Watershed Management Area, all of the ~~those~~ major MS4 outfalls must be identified as ~~the~~ high~~est~~ priority dry weather persistent flow MS4 outfalls. The Copermittees identified as Responsible Copermittees by a TMDL in Attachment E of the Order may need to monitor more than 5 dry weather major MS4 outfall locations to determine compliance with the requirements of the TMDL(s).

Monitoring must occur at the highest priority outfall locations at least semi-annually until the non-storm water discharges have been eliminated for three consecutive dry weather monitoring events; identified to be authorized by a separate NPDES Permit; or reprioritized to a lower priority. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized MS4 major outfall in the Copermittee's jurisdiction within the Watershed Management Area, unless there are no remaining qualifying major MS4 outfalls within the Copermittees jurisdiction. The Copermittees must continually update their dry weather persistent flow MS4 outfall discharge monitoring locations with the next highest priority non-storm water flow that have yet to be eliminated until all persistent and transient flows are eliminated or its threat reduced.

Non-storm water persistent flow MS4 outfall discharge monitoring data collected during each semi-annual monitoring event, must be collected and analyzed according to the requirements of Provision D.2.b.(2)(b)–(e). These monitoring requirements are consistent with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

The wet weather MS4 outfall discharge monitoring requirements are included under Provisions D.2.a.(3) and D.2.c. The wet weather MS4 outfall discharge monitoring requirements are necessary for the Copermittees to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable, using management practices, control techniques and system, design and engineering methods, and such other provisions which are appropriate*" required by 40CFR 122.26(d)(2)(iv), which is expected to achieve compliance with the CWA section 402(p)(3)(B)(iii) statutory requirement for municipal storm water permits to require "*controls to reduce the discharge of pollutants [in storm water] to the maximum extent practicable*." The wet weather MS4 outfall discharge monitoring data collection

requirements are based on requirements under 40 CFR 122.26(d)(2)(iii), 122.26(d)(2)(iii)(A) and 122.26(d)(2)(iii)(A)(1)-(4), and 40 CFR 122.21(g)(7)(i)-(ii).

The wet weather MS4 outfall discharge monitoring requirements of Provision D.2.a.(3) and D.2.c are separated into monitoring required before and after the San Diego Water Board accepts the Copermittees' Water Quality Improvement Plan. Outfall monitoring conducted prior to acceptance of the Water Quality Improvement Plan is referred to in the Order as Transitional MS4 Outfall Discharge Monitoring. Provision D.2.a.(3) includes the transitional wet weather MS4 outfall discharge monitoring requirements.

Until the wet weather MS4 outfall discharge monitoring requirements of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board, the Copermittees must comply with the requirements of transitional wet weather MS4 outfall monitoring requirements pursuant to Provision D.2.a.(3). Provision D.2.a.(3) requires each Copermittee to sample, at least five of the major MS4 outfalls inventoried pursuant to Provision D.2.a.(1) twice per wet season for the monitoring data required to be collected pursuant to Provision D.2.a.(3)(c)-(e).

At a minimum, the five sampling locations chosen must be representative of storm water discharges from residential, commercial, industrial, and typical mixed-use land uses present within a Watershed Management Area. The San Diego Water Board expects the Copermittees to extrapolate from these data to similar land uses throughout the Watershed Management Area to better inform the Water Quality Improvement Plan development process by prioritizing drainages for implementation of storm water control efforts required pursuant to Provision E.

Provision D.2.c describes the wet weather MS4 outfall discharge monitoring required to be included and implemented as part of the Water Quality Improvement Plan. Provision D.2.c provides the Copermittees the flexibility to adjust the wet weather MS4 outfall discharge monitoring locations and frequencies in the Watershed Management Area, as needed, to identify sources of pollutants in storm water discharges from MS4s in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan.

Although Provision D.2.c.(1) allows the Copermittees to adaptively manage the wet weather MS4 outfall discharge monitoring locations and frequencies, the provision requires a minimum of at least five wet weather outfall stations to be monitored. Provision D.2.c.(2) further ~~requires~~ allows the Copermittees to modify the monitoring frequency at each wet weather MS4 outfall station to meet the goals of the Water Quality Improvement Plan as long as the monitoring frequency occurs at least once per year and is at an appropriate frequency to identify sources of pollutants in storm water discharges, guide pollutant source identification efforts, or determine compliance with the requirements of the applicable TMDLs in Attachment E to the Order.

The wet weather MS4 outfall discharge monitoring requirements of Provisions D.2.c.(3) and D.2.c.(4) are the same as the transitional wet weather MS4 outfall discharge monitoring. In contrast, the requirements of Provision D.2.c.(5) are focused on collecting analytical data specific to the highest priority water quality conditions in the Watershed Management Area identified in the Water Quality Improvement Plan. The wet weather MS4 outfall discharge monitoring data collection requirements are consistent with the requirements under 40 CFR 122.26(d)(2)(iii), 122.26(d)(2)(iii)(A) and 122.26(d)(2)(iii)(A)(1)-(4), and 40 CFR 122.21(g)(7)(i)-(ii).

Provision D.3 (Special Studies) requires the Copermittees to develop special studies that will be conducted for each Watershed Management Area and the entire San Diego Region. Data collected pursuant to Provision D.3 is to be used by the Copermittees to improve the effectiveness of the strategies implemented by the jurisdictional runoff management programs toward achieving the numeric goals identified in the Water Quality Improvement Plans and ultimately achieve compliance with the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c, and A.2.a, which is consistent with the requirements of Provision A.4.

Special studies are often necessary to fill data gaps or provide more refined information that allow the Copermittees to better manage the generation or elimination of pollutants and discharges to and from the MS4. In the Fourth Term Permits, the Copermittees have been required to implement special studies as directed by the San Diego Water Board. The special studies required by this Order provide the Copermittees more flexibility to identify and implement special studies that will be most useful to improving the effectiveness of their jurisdictional runoff management programs.

Provision D.3.a.(1) requires the Copermittees to develop and conduct at least ~~three~~ two special studies per Watershed Management Area, to be determined by the Copermittees. One of the ~~three~~ two special studies may be accomplished through participation in a Regional Special Study required under Provision D.3.a.(2). The requirements provide the Copermittees great latitude in identifying and developing the special studies. Watershed Management Area special studies are required, at a minimum, to: (a) relate in some way to the highest water quality priorities identified by the Copermittees in the Water Quality Improvement Plan, (b) be conducted within the Watershed Management Area, and (c) include some form of participation (e.g. contribution of funds, personnel services, project management) by all the responsible Copermittees within the Watershed Management Area.

Examples of Watershed Management Area special studies might include, but are not limited to: (1) focused pollutant source identification studies, (2) BMP effectiveness and/or comparison studies, (3) pilot tests for new or emerging pollutant control methods, (4) receiving water pollutant or stressor source identification and/or mitigation studies, or (5) pollutant fate and transport studies. The Watershed Management Area special studies are expected to provide data that can be utilized by the Copermittees to improve the Water Quality Improvement Plan or implementation of

the Copermittees' jurisdictional runoff management programs to address the highest priority water quality conditions.

Provision D.3.a.(2) requires the Copermittees to develop at least one special study~~ies~~ that will be conducted for the entire San Diego region. The regional special study~~ies~~ ~~are~~ is expected to provide data that can be utilized by the Copermittees to improve the Water Quality Improvement Plan or implementation of the Copermittees' jurisdictional runoff management programs to identify or address regional water quality concerns and priorities.

An example of a regional special study would be to develop and establish allowable exceedance frequencies of the bacteria water quality objectives for several types of water bodies, during different wet and dry weather conditions the San Diego region. The special study would be related to bacteria, which is a priority for the San Diego region due to the adoption of "*Bacteria TMDL Project I – Beaches and Creeks in the San Diego Region*." The study results could be used to inform the Copermittees and the San Diego Water Board about the indictor bacteria water quality objective exceedance frequencies that occur in natural or reference watersheds.

Provision D.4 (Assessment Requirements) specifies the assessments that the Copermittees are required to perform, based on the monitoring data collected, and will be reported as part of the Annual Report for the Water Quality Improvement Plan implementation. Provision D.4 requires the Copermittees assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c, and A.2.a.

Provision D.4 specifies the assessments that Copermittees must perform for each Watershed Management Area to assess the effectiveness of each Copermittee's jurisdictional runoff management program and the Water Quality Improvement Plan. The effectiveness of each Copermittee's jurisdictional runoff management program and Water Quality Improvement Plan is measured through these types of assessments: (a) Receiving Waters Assessments (b) MS4 Outfall Discharges Assessments, (c) Special Studies Assessments, and (d) Integrated Assessment of Water Quality Improvement Plan.

Provision D.4.a requires the Copermittees to assess the status of receiving water conditions annually during the transitional monitoring period (during development of the Water Quality Improvement Plan) and after acceptance of the Water Quality Improvement Plan. The monitoring data collected pursuant to Provision D.1 will be evaluated, among other information, to assess the condition of a Watershed Management Area's streams, coastal waters, enclosed bays, harbors, estuaries, and lagoons. The focus of the receiving waters assessments is to measure progress toward the objective of the CWA to "*restore and maintain the chemical, physical, and biological integrity of the Nation's waters*" as the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program are implemented within a Watershed Management Area. Provision D.4.a is consistent with 40 CFR

122.42(c)(7) which requires the Copermittees to annually report the *"[i]dentification of water quality improvements or degradation."*

Provision D.4.b includes the MS4 outfall discharges assessment requirements. The focus of MS4 outfall discharges assessments is to determine if the Copermittees' are implementing programs that comply with the requirements of the CWA for MS4 permits to "*effectively prohibit non-stormwater discharges into the storm sewers*" and "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable.*" The monitoring data collected pursuant to Provisions D.2 will be evaluated, among other information, to assess the effectiveness of the transitional MS4 outfall field screening monitoring, the implementation of the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program. The MS4 outfall discharge assessments consist of Non-Storm Water Discharges Reduction Assessments and Storm Water Pollutant Discharges Reduction Assessments.

The Non-Storm Water Discharges Reduction Assessments are how each Copermittee will demonstrate that its jurisdictional runoff management program implementation efforts are achieving the CWA requirement to "*effectively prohibit non-stormwater discharges into the storm sewers.*" Provision D.4.b.(1) requires each Copermittee to assess and report on its illicit discharge detection and elimination program required pursuant to Provision E.2 to reduce and effectively prohibit non-storm water and illicit discharges into the MS4 within its jurisdiction. The Non-Storm Water Discharges Reduction Assessments include specific assessment requirements applicable to each Copermittee.

As each Copermittee collects and analyzes the data collected pursuant to dry weather MS4 outfall discharges monitoring requirements of Provisions D.2.a.(2) and D.2.b, Provision D.4.b.(1) requires each Copermittee to assess the progress, assess the effectiveness of its current actions, and identify modifications necessary to increase the effectiveness of its actions toward reducing and eliminating non-storm water and illicit discharges to its MS4. The findings from these assessments are expected to be utilized by the Copermittee as part of its procedures to prioritize the non-storm water discharges that will be addressed by its Illicit Discharge Detection and Elimination program required pursuant to Provision E.2.

The assessment requirements of Provision D.4.a.(1) are consistent with 40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(3) which require "*procedures…to investigate portions of the separate storm sewer system that, <u>based on the results of the field screen, or other appropriate information</u> [emphasis added], indicate a reasonable potential of contain illicit discharges or other sources of non-storm water*" as part of a "*program…to detect and remove…illicit discharges and improper disposal into the storm sewer.*" The assessment requirements of Provision D.4.a.(1) are also consistent with 40 CFR122.42(c)(1) requires the Copermittees to annually report the "*status of implementing the components of the storm water management program that are established as permit conditions.*"

The Storm Water Pollutant Discharges Reduction Assessment is how the Copermittees in each Watershed Management Area will demonstrate that their jurisdictional runoff management program implementation efforts are achieving the CWA requirement to "*reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable*." Provision D.4.b.(2) requires the Copermittees in each Watershed Management Area to assess and report the progress of the Copermittees' efforts to reduce pollutants in storm water discharges from the MS4s to the MEP. The Storm Water Pollutant Discharges Reduction Assessments include specific assessment requirements during both the transitional monitoring period and after acceptance of the Water Quality Improvement Plan applicable to the Watershed Management Area and each Copermittee.

As the Copermittees collect and analyze the data collected pursuant to wet weather MS4 outfall discharges monitoring requirements of Provisions D.2.a.(3) and D.2.c, Provision D.4.b.(2) requires the Copermittees to assess runoff conditions during the transitional period, and the progress of the Water Quality Improvement Plan strategies toward reducing pollutants in storm water from the MS4 to the MEP. The findings from these assessments are expected to be utilized by the Copermittees to identify any modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify sources of pollutants in storm water discharges from the MS4s, as well as focus, modify, and improve the water quality improvement strategies implemented by each Copermittee within its jurisdiction to reduce pollutants in storm water discharges to the MEP.

The assessment requirements of Provision ~~D.4.a.(1)~~ D.4.b.(2) are consistent with 40 CFR 122.26(d)(2)(iii)(B) which requires "*[e]stimates of the annual pollutant load of the cumulative discharges to waters of the United States from all identified municipal outfalls…during a storm event…accompanied by a description of the procedures for estimating constituent loads and concentrations, including any modeling, data analysis, and calculation methods.*" The assessment requirements of Provision D.4.a.(2) are consistent with 40 CFR 122.26(d)(2)(v) which requires that each Copermittee assesses the *"estimated reductions in loadings of pollutants from discharges of municipal storm sewer constituents from municipal storm sewer systems expected as the result of the municipal storm water quality management program."* The assessment requirements of Provision ~~D.4.a.(2)~~ D.4.b.(2) are also consistent with 40 CFR122.42(c)(1) requires the Copermittees to annually report the "*status of implementing the components of the storm water management program that are established as permit conditions.*"

Provision D.4.c includes the special studies assessment requirements. Performing special studies are how the Copermittees will address data gaps identified during the development of and updates to the Water Quality Improvement Plan The relevant findings from the special studies assessments are expected to be incorporated as part of the applicable receiving water assessments, MS4 outfall discharge assessments,

and integrated water quality improvement assessments required in Provision D.4.a, D.4.b, and D.4.d, respectively.

The assessment requirements in Provision D.4.d are part of the iterative approach and adaptive management process required by Provision A.4. The Copermittees are required to integrate the data collected pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision D to re-evaluate the Water Quality Improvement Plan.

The monitoring data collected pursuant to Provisions D.1 and D.2, and the results of the assessment required pursuant to Provisions D.4.a-c, will be used to determine whether the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program are effective, or require modifications or improvements to become more effective to achieve the requirements of the CWA. The assessments required by Provision D.4.d are consistent with 40 CFR 122.42(c)(1) which requires that the Copermittees to report the *"[t]he status of implementing the components of the storm water management program that are established as permit conditions."*

E. Jurisdictional Runoff Management Programs

Purpose: Provision E includes the requirements for the jurisdictional runoff management programs to be implemented by each of the Copermittees. Compliance with the requirements for the jurisdictional runoff management programs will allow the Copermittees to demonstrate that they are implementing programs to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP. The jurisdictional runoff management program document prepared by each Copermittee will also provide the details for implementing the water quality improvement strategies identified in the Water Quality Improvement Plan specifically within its jurisdiction.

***Discussion*:** Implementation of the jurisdictional runoff management program requirements under Provision E is how the Copermittees "*effectively prohibit non-stormwater discharges into the storm sewers*", and outlines the "*controls to reduce the discharge of pollutants to the maximum extent practicable"* consistent with the federal regulations under 40 CFR 122.26. The jurisdictional runoff management program is part of the "*comprehensive planning process*" that is required pursuant to 40 CFR 122.26(d)(2)(iv). Where the Water Quality Improvement Plan is the "*comprehensive planning process*" on a Watershed Management Area scale, requiring "*intergovernmental coordination*", the jurisdictional runoff management program document is the "*comprehensive planning process*" on a jurisdictional scale that should be coordinated with the other Copermittees in the Watershed Management Area to achieve the goals of the Water Quality Improvement Plan.

The jurisdictional runoff management program requirements are included to provide each Copermittee criteria that can be used to demonstrate that its storm water management program is implementing the "*comprehensive planning process*" within its jurisdiction to "*effectively prohibit non-stormwater discharges into the storm sewers*", and to identify and implement the most effective "*controls to reduce the discharge of pollutants to the maximum extent practicable"* in accordance with the performance standards given in the CWA.

Provision E includes the requirements for each of the components that must be included in the Copermittee's jurisdictional runoff management program document that will be implemented by the Copermittee within its jurisdiction. Implementation of the components of each Copermittee's jurisdictional runoff management program must ~~be consistent with~~ incorporate the water quality improvement strategies identified by each Copermittee in the Water Quality Improvement Plans, described pursuant to Provision B.3.b.(1)(a).

More specific and detailed discussions of the requirements of Provision E are provided below.

Provision E.1 (Legal Authority Establishment and Enforcement) requires to each Copermittee to establish and enforce sufficient legal authority to control discharges to the MS4 within its jurisdiction.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system*" and be able to demonstrate that it can "*operate pursuant to legal authority established by statute, ordinance or series of contracts.*" Provision E.1.a describes the minimum legal authorities each Copermittee must establish for itself within its jurisdiction to control discharges to its MS4 The requirements of Provision E.1.a are consistent with the requirements set forth in 40 CFR 122.26(d)(2)(i)(A)-(F).

The certification statement required from each Copermittee by Provision E.1.b is included to provide the San Diego Water Board additional documentation that each Copermittee has established the legal authorities consistent with Provision E.1.a and 40 CFR 122.26(d)(2)(i)(A)-(F), and the Copermittee can "*operate pursuant to legal authority established by statute, ordinance or series of contracts.*"

Provision E.2 (Illicit Discharge Detection and Elimination) requires each to Copermittee to implement an illicit discharge detection and elimination program to effectively prohibit non-storm water discharges to the MS4 by actively detecting and eliminating illicit discharges and disposal into its MS4.

Provision E.2 establishes the minimum requirements that each Copermittee must implement within its jurisdiction to ~~prevent and eliminate illicit discharges, and~~ effectively prohibit non-storm water discharges~~,~~ from entering its MS4. The federal CWA requires permits for municipal storm sewer systems to "*effectively prohibit non-storm water discharges into the storm sewers*." The federal regulations (40CFR122.26(d)(2)(i)(B)) require each Copermitee to establish the legal authority to prohibit illicit discharges to its MS4s. Under 40 CFR 122.26(d)(2)(iv)(B), each Copermittee must implement a "*program…to detect and remove…illicit discharges and improper disposal into the storm sewer.*" The federal NPDES regulations, under 40 CFR 122.26(b)(2), define illicit discharges as "*any discharge to a municipal separate storm sewer that is not composed entirely of storm water*. Thus, non-storm water discharges are not authorized to enter the MS4 and are considered to be illicit discharges, unless authorized by a separate NPDES permit.

The Phase I Final Rule clarifies that non-storm water discharges through an MS4 are not authorized under the CWA (55 FR 47995):

> "*Today's rule defines the term "illicit discharge" to describe any discharge through a municipal separate storm sewer system that is not composed entirely of storm water and that is not covered by an NPDES permit. Such illicit discharges are not authorized under the Clean Water Act. Section 402(p(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm*

sewer…Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit."

The federal NPDES requirements for the program to address illicit discharges must include "*inspections, to implement and enforce an ordinance, orders, or other similar means to prevent illicit discharges to the MS4*." The federal NPDES regulations also reference several categories of "*non-storm water discharges or flows* [which] *shall be addressed where such discharges are identified…as sources of pollutants to waters of the United States*." The Phase I Final Rule (55 FR 48037) further clarified the requirements of 40 CFR 122.26(d)(2)(iv)(B)(1) as follows:

"*EPA is clarifying that section 402(p)(3)(B) of the CWA (which requires permits for municipal separate storm sewers to 'effectively' prohibit non-storm water discharges) does not require permits for municipalities to prohibit certain discharges or flows of nonstorm water to waters of the United States through municipal separate storm sewers in all cases*."

In previous iterations of the municipal storm water permits for the San Diego Region, these categories were simply listed and referred to as categories of non-storm water discharges "not prohibited" unless identified as a source of pollutants. The Copermittees have often referred to these categories as "exempt" discharges. In both cases, however, the language is inconsistent with the federal CWA and NPDES regulations. And, the clarification provided in the Phase I Final Rule does not specifically state that such discharges are "not prohibited" or "exempt" or in any way authorized. The federal NPDES regulations do, however, state that specific categories of non-storm water discharges must be "*addressed*" if identified as "*sources of pollutants to waters of the United States*."

The language of Provision E.2.a has been revised to be fully consistent with the language of the CWA and the requirements of the federal regulations under 40 CFR 122.26(d)(2)(iv)(B)(1). Provision E.2.a requires each Copermittee to address <u>all</u> types of non-storm water discharges into its MS4 as illicit discharges, <u>unless</u> the discharge is authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to Provisions E.2.a.(1) through E.2.a.(5). Only non-NPDES-permitted non-storm water discharges identified as a category of non-storm water discharges under Provisions E.2.a.(1) through E.2.a.(5) <u>and</u> *not identified as a source of pollutants* do not have to be addressed as illicit discharges. <u>Categories of non-storm water discharges that meet the requirements of Provisions E.2.a.(1) through E.2.a.(5) do not have to be addressed by the Copermittee as illicit discharges.</u>

Several of the non-storm water categories listed in 40 CFR 122.26(d)(2)(iv)(B)(1) have not been included in Provisions E.2.a.(1) through E.2.a.(5), including: street wash water, landscape irrigation, irrigation water, and lawn watering. Because these are no longer included within the categories listed under Provisions E.2.a.(1) through

E.2.a.(5), the Copermittees must prohibit these types of non-storm water discharges from entering the MS4. This is consistent with the clarification of 40 CFR 122.26(d)(2)(iv)(B)(1) in the Phase I Final Rule (55 FR 48037), which states:

> "*[T]he Director may include permit conditions that either require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*."

Street wash water is a category of non-storm water discharges that was removed when the Third Term Permits were issued. Street wash water is a source of several pollutants (e.g., metals, oil and grease, petroleum hydrocarbons, chlorinated solvents, sediment) which are generated during the street washing process. The removal of this category requires the Copermittees to prohibit this type of non-storm water discharge from entering the MS4.

The landscape irrigation, irrigation water, and lawn watering categories, collectively referred to hereafter as "over-irrigation" discharges, were removed from the list of non-storm water discharge categories in the Fourth Term Orange County and Riverside County Permits. Non-storm water discharges resulting from over-irrigation have been found to be a source of several types of pollutants (e.g., nutrients, bacteria, pesticides, sediment) in receiving waters. The San Diego Water Board and the Copermittees have identified categories of non-storm water discharges associated with over-irrigation as a source of pollutants and conveyance of pollutants to the MS4 and waters of the United States in the following documents:

- **SmartTimer/Edgescape Evaluation Program (SEEP) Grant Application**

  The State Water Board allocated grant funding to the SEEP project grant application submitted in 2006, which targeted irrigation runoff by retrofitting areas of existing development and documenting the conservation and runoff improvements. The basis of this grant project is that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 is a source and conveyance of pollutants. In addition, the grant application indicated that this alteration of natural flows is impacting the beneficial uses of waters of the state and U.S. Results from the study indicate that that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 *is* a source and conveyance of pollutants. The results of this study can be applied broadly to any area where over-irrigation takes place. The grant application included the following statements:

  > "*Irrigation runoff contributes flow & pollutant loads to creeks and beaches that are 303(d) listed for bacteria indicators.*"
  >
  > "*Regional program managers agree that the reduction and/or elimination of irrigation-related urban flows and associated pollutant loads may be key to successful attainment of water quality and beneficial use goals as outlined in the San Diego Basin Plan and Bacteria TMDL over the long term.*"

"*Elevated dry-weather storm drain flows, composed primarily … of landscape irrigation water wasted as runoff, carry pollutants that impair recreational use and aquatic habitats all along Southern California's urbanized coastline. Storm drain systems carry the wasted water, along with landscape derived pollutants such as bacteria, nutrients and pesticides, to local creeks and the ocean. Given the local Mediterranean climate, excessive perennial dry season stream flows are an unnatural hydrologic pattern, causing species shifts in local riparian communities and warm, unseasonal contaminated freshwater plumes in the near-shore marine environment.*"

- **2006-2007 Orange County Watershed Action Plan Annual Reports**

The Watershed Action Plan Annual Reports for the 2006-2007 reporting period were submitted by the County of Orange, Orange County Flood Control District and Copermittees within the San Juan Creek, Laguna Coastal Streams, Aliso Creek, and Dana Point Coastal Streams Watersheds. San Juan Creek, Laguna Coastal Streams, Aliso Creek and Dana Point Coastal Streams are all currently 303(d) listed as impaired for indicator bacteria within their watersheds and/or in the Pacific Ocean at the discharge points of their watersheds. The Orange County Copermittees, within their Watershed Action Strategy Table for fecal indicator bacteria included the following:

"*Support programs to reduce or eliminate the discharge of anthropogenic dry weather nuisance flow throughout the…watershed. Dry weather flow is the transport medium for bacteria and other 303(d) constituents of concern.*"

Additionally, they state that "*conditions in the MS4 contribute to high seasonal bacteria propagation in-pipe during warm weather. Landscape irrigation is a major contributor to dry weather flow, both as surface runoff due to over-irrigation and overspray onto pavements; and as subsurface seepage that finds its way into the MS4*."

- **Fiscal Year 2008 Carlsbad Watershed Urban Runoff Management Program Annual Report**

The Carlsbad Watershed Urban Runoff Management Program Annual Report for Fiscal Year 2008 was submitted by the Carlsbad Watershed Copermittees (Cities of Carlsbad, Encinitas, Escondido, Oceanside, San Marcos, Solana Beach, and Vista, and the County of San Diego). In the Annual Report, the Carlsbad Watershed Copermittees stated the following:

"The Carlsbad Watershed Management Area (WMA) collective watershed strategy identifies bacteria, sediment, and nutrients as high priority water quality pollutants in the Agua Hedionda (904.3 – bacteria and sediment), Buena Vista (904.2 – bacteria), and San Marcos Creek (904.5 – nutrients) Hydrologic Areas.

Bacteria, sediment, and nutrients have been identified as potential discharges from over-irrigation."

- **2007-2008 San Diego Bay Watershed Urban Runoff Management Program Annual Report**

  The San Diego Bay Watershed Urban Runoff Management Program 2007-2008 Annual Report was submitted by the San Diego Bay Watershed Copermittees (Cities of Chula Vista, Coronado, Imperial Beach, La Mesa, Lemon Grove, National City, and San Diego, the County of San Diego, the Port of San Diego, and the San Diego County Airport Authority). In Appendix D of the Annual Report, titled "Likely Sources of Pollutants", the San Diego Bay Watershed Copermittees identified over-irrigation of lawns as a pollutant generating activity from business and/or residential land uses for bacteria, pesticides, and sediment.

- **Copermittee Public Education Materials**

  The Orange County Public Works *Tips for Landscape & Gardening* public education brochure states: "*Fertilizers, pesticides and other chemicals that are left on yards or driveways can be blown or washed into storm drains that flow to the ocean. Overwatering lawns can also send materials into storm drains*."

  The Riverside County Flood Control and Water Conservation District *Landscape and Garden* public education brochure states: *"Soil, yard wastes, over-watering and garden chemicals become part of the urban runoff mix that winds its way through streets, gutters and storm drains before entering lakes, rivers, streams, etc. Urban runoff pollution contaminates water and harms aquatic life!"*

- **Los Penasquitos Lagoon Sedimentation/Siltation TMDL Technical Report**

  The Los Penasquitos Lagoon Sedimentation/Siltation TMDL technical report was prepared for the City of San Diego and USEPA in October 2010. The technical report was included as a technical supporting document attached to the Sediment TMDL for Los Penasquitos Lagoon staff report prepared by the San Diego Water Board, dated June 13, 2012. Under the Source Assessment section, the technical report states the following:

  "*Dry weather loading is dominated by nuisance flows from urban land use activities such as car washing, sidewalk washing, and lawn over-irrigation, which pick up and transport sediment into receiving waters.*"

These documents confirm that non-storm water discharges associated with over-irrigation are a source of pollutants and should be addressed as illicit discharges to the MS4. Prohibiting non-storm water discharges associated with over-irrigation, however,

is not a new requirement for the Copermittees because it is also consistent with and required by the Water Conservation in Landscaping Act (AB 1881, Laird).

The Water Conservation in Landscaping Act required the Department of Water Resources (DWR) to prepare a Model Water Efficient Landscape Ordinance for use by local agencies (e.g. the Copermittees). All local agencies were required to adopt a water efficient landscape ordinance by January 1, 2010. Local agencies could adopt the Water Efficient Landscape Ordinance developed by DWR, or an ordinance considered at least as effective as the Model Ordinance. The Water Efficient Landscape Ordinance includes a requirement that local agencies prohibit runoff from irrigation (§ 493.2):

> "*Local agencies shall prevent water waste resulting from inefficient landscape irrigation by* <u>*prohibiting runoff from leaving the target landscape*</u> *[emphasis added] due to low head drainage, overspray, or other similar conditions where water flows onto adjacent property, non-irrigated areas, walks, roadways, parking lots, or structures. Penalties for violation of these prohibitions shall be established locally*."

Furthermore, non-storm water discharges from over-irrigation not only transport and discharge pollutants to receiving waters, but are also a likely source of the dry weather flows causing changes to habitat within and along the receiving water bodies. Examples of habitat changes from the dry weather flows include perennialization of ephemeral streams, and conversion of saltwater and brackish water marsh habitats to freshwater marsh habitats (e.g. Los Penasquitos Lagoon). Both of these examples have resulted in the promotion of invasive species in several areas of the San Diego Region.

The removal of the over-irrigation discharges categories does not require the Copermittees to strictly prohibit lawn and landscape irrigation, but does require the prohibition of excessive irrigation water that results in non-storm water discharges to the MS4. Non-storm water discharges to the MS4 from over-irrigation must be addressed as illicit discharges by the Copermittees pursuant to the requirements of Provision E.2.

The remaining non-storm water categories listed in 40 CFR 122.26(d)(2)(iv)(B)(1) are listed under Provisions E.2.a.(1) through E.2.a.(5) and generally fall into four categories: (1) non-storm water discharges subject to existing San Diego Water Board waste discharge requirements and NPDES permits; (2) non-storm water discharges generally not expected to be a source of pollutants to receiving waters; (3) non-storm water discharges likely to contain pollutants requiring some form of control to address the pollutants prior to discharging to the MS4; and (4) non-storm water discharges or flows associated with firefighting.

Provisions E.2.a.(1) and E.2.a.(2) include several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) for which the San Diego Water Board already has developed general waste discharge requirements and NPDES

permits to address the discharges. The Copermittees are only required to address these types of non-storm water discharges as illicit discharges if the Copermittees or the San Diego Water Board identifies these non-storm water discharges not having coverage under the applicable NPDES permit~~ or as a source of pollutants to receiving waters~~. ~~Generally, if these types of non-storm water discharges have coverage under an NPDES permit and are identified as a source of pollutants to receiving waters, the Copermittees would be expected to identify the responsible dischargers and report their identities to the San Diego Water Board. The San Diego Water Board would then have the responsibility to enforce the NPDES permit and/or waste discharge requirements.~~

Provision E.2.a.(3) includes several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) which are generally not expected to be a source of pollutants to receiving waters, many of which originate from what are typically natural, uncontrollable sources. The Copermittees are only required to address these types of non-storm water discharges as illicit discharges if the Copermittees or the San Diego Water Board identifies these non-storm water discharges as a source of pollutants to receiving waters. Because many of these sources are generally uncontrollable, enforcing a prohibition may not be a possibility for the Copermittees. The Copermittees would be able to address these non-storm water discharges by preventing these non-storm water discharges from entering the MS4. This could potentially be achieved by sealing their MS4 structures so the discharges cannot enter the MS4.

Provision E.2.a.(4) includes several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) that are likely to contain pollutants requiring some form of control to address the pollutants prior to discharging to the MS4. At this time, an outright prohibition of these types of non-storm water discharges does not yet appear to be warranted. Thus, Provision E.2.a.(4) has includes several requirements for the Copermittees to control the pollutants from these types of non-storm water discharges. This is consistent with the clarification of the federal regulations in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board has the authority to require the Copermittees to "*control any of these types of discharges where appropriate*."

Unlike non-storm water discharges from over-irrigation, these types of non-storm water discharges are not expected to occur in close proximity to each other or very frequently. Provided these types of non-storm water discharges are controlled as required in Provision E.2.a.(4), the Copermittees would only be required to address these types of non-storm water discharges as illicit discharges if the Copermittee or the San Diego Water Board identifies these non-storm water discharges as a source of pollutants to receiving waters.

Provision E.2.a.(5) includes specific requirements for fire fighting discharges and flows. The requirements for non-storm water discharges and flows associated with fire

fighting have been separated into requirements for: a) non-emergency fire fighting discharges and flows, and b) emergency fire fighting discharges and flows.

The San Diego Water Board has found that discharges from building fire suppression system maintenance (e.g. fire sprinklers) contain waste and potentially a significant source of pollutants to receiving waters. As such, the San Diego Water Board is requiring these discharges be addressed as illicit discharges by the Copermittees. Thus, the discharges to the MS4 are to be prohibited via ordinance, order or similar means. For other non-emergency fire fighting discharges and flows (i.e., flows from controlled or practice blazes, fire fighting training, and maintenance activities not associated with building fire suppression systems), the Copermittees are required to develop and implement a program to address pollutants in these non-storm water discharges and flows. This is consistent with the clarification of the federal regulations in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board has the authority to require the Copermittees to "*control any of these types of discharges where appropriate*."

For emergency fire fighting discharges and flows, the Phase I Final Rule (55 FR 48037) has clarified the requirements of 40 CFR 122.26(d)(2)(iv)(B)(1) pertaining to emergency fire fighting flows and discharges, which states:

> "*In the case of fire fighting it is not the intention of these rules to prohibit in any circumstances the protection of life and public or private property through the use of water or other fire retardants that flow into separate storm sewers*."

Thus, the requirements have been made to be consistent with the guidance provided by the Phase I Final Rule. The Order recommends that the Copermittees develop and encourage implementation of BMPs to reduce or eliminate the discharge of pollutants from emergency fire fighting flows to the MS4s and receiving waters. The Order does not include any requirements that should be interpreted as requiring the implementation of BMPs for emergency fire fighting flows to the MS4s and receiving waters.

The Copermittees are expected to review the dry weather MS4 outfall discharge monitoring data they collect to determine if and when there are non-storm water discharges to or from their MS4s that are a source of pollutants to receiving waters. If the Copermittees identify one of the types of non-storm water discharges listed in Provisions E.2.a.(1) through E.2.a.(4) as a source of pollutants to receiving waters based on the review and evaluation of monitoring data, Provision E.2.a.(6) requires the Copermittees to prohibit those categories of discharges from entering the MS4 through ordinance, order or similar means. In addition, Provision E.2.a.(6) ~~also~~ clarifies that the San Diego Water Board may identify categories of non-storm water discharges or flows listed under Provisions E.2.a.(1) through E.2.a.(4) that must be prohibited.

Provision E.2.a.(6) also provides the Copermittees an option to propose controls to be implemented for the category of non-storm water discharges as part of the Water

Quality Improvement Plan instead of prohibiting the category of non-storm water discharges. If the Water Quality Improvement Plan is accepted by the San Diego Water Board with the proposed controls, the Copermittees will not be required to prohibit the category of non-storm water discharges to their MS4s as long as the controls are implemented. This is consistent with the clarification of 40 CFR 122.26(d)(2)(iv)(B)(1) in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board may "*require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*."

Finally, Provision E.2.a.(7) has been included in the requirements for non-storm water discharges to clarify that any non-storm water discharges to the Copermittee's MS4, even those identified pursuant to Provisions E.2.a.(1) through E.2.a.(4), must be reduced or eliminated, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit. Provision E.2.a.(7) is consistent with the requirements of CWA section 402(p)(3)(B)(ii) and 40 CFR 122.26(d)(1)(v)(B), as clarified in the Phase I Final Rule (55 FR 47995) that "*[u]ltimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit*." However, the reduction or elimination of those non-storm water discharges are expected to be achieved as feasible, in accordance with the priorities in the Water Quality Improvement Plan and when the resources are available to the Copermittee.

Consistent with 40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(1), each Copermittee must implement a "*program…to prevent illicit discharges to the municipal storm sewer system*" and "*detect…illicit discharges and improper disposal into the storm sewer.*" Provision E.2.b requires each Copermittee to implement measures to prevent and detect illicit discharges and connections to its MS4 as part of its illicit discharge detection and elimination program.

As part of the program to prevent and detect illicit discharges to the MS4, 40 CFR 122.26(d)(2)(iv)(B)(2) requires "*procedures to conduct on-going field screening activities during the life of the permit, including areas or locations that will be evaluated by such field screens*." As part of the procedures, each Copermittee is required to maintain an updated map of its entire MS4 and the corresponding drainage areas within its jurisdiction. Having knowledge about where inlets, access points, connections with other MS4s, and outfalls are located is necessary for each Copermittees to track, identify, and eliminate illicit discharges and connections. Thus, Provision E.2.b.(1) of the Order specifies that the map must include the segments of the storm sewer system owned, operated, and maintained by the Copermittee, and include locations of all known inlets, connections with other MS4s, and outfalls to the Copermittee's MS4. The remaining requirements of Provision E.2.b are consistent with the requirements of 40 CFR 122.26(d)(2)(iv)(B)(3)-(7) related to implementing measures to prevent and detect illicit discharges and connections to the MS4.

Provision E.2.c requires each Copermittee to conduct field screening and monitoring of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm

water and illicit discharges and connections to the MS4. Field screening is a required element of the program to detect and eliminate illicit discharges and connections to the MS4, pursuant to 40 CFR 122.26(d)(2)(iv)(B)(2). The field screening requirement will be implemented through the dry weather MS4 outfall discharge monitoring required under Provisions D.2.a.(2) and D.2.b.(1).

Provision E.2.d specifies the measures each Copermittee must implement to eliminate illicit discharges and connections to its MS4. Elimination of illicit discharges and connections to the MS4 is consistent with the requirement of 40 CFR 122.26(d)(2)(iv)(B) "*to detect and remove [emphasis added]…illicit discharges and improper disposal into the storm sewer*" and will achieve the CWA requirement for MS4 permits to "*effectively prohibit non-storm water discharges into the storm sewers*."

Generally, each Copermittee is responsible for prioritizing its efforts to eliminate non-storm water and illicit discharges or connections to its MS4 based on field screening and monitoring data, NALs, illicit discharge investigation records, and the known or suspected sources. Sources of non-storm water and illicit discharges or connections must be eliminated by enforcing the legal authority established by each Copermittee pursuant to Provision E.1.

~~Finally, Provision E.2.e requires the Copermittee to include the strategies and/or activities identified in the Water Quality Improvement Plan that the Copermittee will implement as part of the illicit discharge detection and elimination program within its jurisdiction. The Water Quality Improvement Plan is expected to include several strategies and options that the Copermittee can and should implement within its jurisdiction. The Copermittee is expected to describe and provide the details of when, where, and how those strategies will be implemented within its jurisdiction.~~

~~The San Diego Water Board will utilize the information provided in the jurisdictional runoff management program document pursuant to Provision E.2.e to gauge and assess the Copermittee's efforts in trying to address the highest priority water quality conditions identified in the Water Quality Improvement Plan within its jurisdiction.~~

Provision E.3 (Development Planning) requires each Copermittee to use its land use and planning authority to implement a development planning program to control and reduce the discharge of pollutants in storm water from new development and significant redevelopment to the MEP. Proper implementation of the development planning program will also contribute toward effectively prohibiting non-storm water discharges from development projects to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." As part of the management program, 40 CFR 122.26(d)(2)(iv)(A)(2) requires "*planning procedures including a comprehensive master plan to develop, implement and enforce controls to*

reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment."

Land ~~D~~development ~~typically includes the construction of impervious surfaces such as sidewalks, driveways, roads, and rooftops~~ generally alters the natural conditions of the land by removing vegetative cover, compacting soil, and/or placement of concrete, asphalt, or other impervious surfaces. These impervious surfaces ~~generate and~~ concentrate urban pollutants (such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not found in high concentrations in the natural environment. Pollutants that accumulate on impervious surfaces are not easily biodegraded nor ~~not~~ subject to natural treatment processes. ~~When it rains, these pollutants are transported in storm water runoff from these impervious surfaces into receiving waters, resulting in poor water quality and degradation of beneficial uses.~~

~~In addition to the generation of pollutants, development generally alters the natural conditions of the land by removing vegetative cover, reducing the perviousness of the surface, and reducing the capacity of storm water that can be intercepted, captured, stored, infiltrated, evaporated, and/or evapotranspired. The alteration of the natural conditions and addition of impervious surfaces associated with development causes water quality problems. Hydrograph modification, or hydromodification, is the change in the natural watershed hydrologic processes and runoff characteristics caused by development or other land use changes that result in increased stream flows, altered sediment transport, and morphological changes to channels receiving the runoff.~~

Impervious surfaces greatly affect the natural hydrology of the land because they do not allow natural infiltration and treatment of storm water runoff to take place. Instead, storm water runoff from impervious surfaces is typically directed through pipes, curbs, gutters, and other hardscape into receiving waters, with little treatment, at significantly increased volumes and accelerated flow rates over what would occur naturally. The increased pollutant loads, storm water volume, discharge rates and velocities, and discharge durations from the MS4 adversely impact stream habitat by causing accelerated, unnatural erosion and scouring within creek bed and banks. Placement of impervious surfaces also encapsulates "good" sediment (such as sand, gravel, rocks and cobbles) that would normally replenish creek beds and banks to help stabilize them. Collectively, these changes to natural hydrologic processes are termed hydrograph modification, or hydromodification.

Hydromodification, which is caused by both altered storm water flow and altered sediment flow regimes, is largely responsible for degradation of creeks, streams, and associated habitats in the San Diego Region. In an ongoing study by the Stormwater Monitoring Coalition to assess the health of streams throughout Southern California, researchers found that three of the four highest risk stressors to creeks (percent sands and fines present, channel alteration, and riparian disturbance) were related to physical habitat.[29] Researchers studying flood frequencies in Riverside County have

[29] Assessing the Health of Southern California Streams, Stormwater Monitoring Coalition, Fact Sheet

found that increases in watershed imperviousness of only 9-22 percent can result in increases in peak flow rates for the two-year storm event of up to 100 percent.[30] Such changes in runoff have significant impacts on channel morphology.

In addition, a technical report issued by the Southern California Coastal Water Research Project (SCCWRP) stated that "*[r]ecent studies indicate that California's intermittent and ephemeral streams are more susceptible to the effects of hydromodification than streams from other parts of the United States. Physical degradation of stream channels in the central and eastern United States can initially be detected when watershed impervious cover approaches 10 percent, although biological effects (which may be more difficult to detect) may occur at lower levels. In contrast, initial response of streams in the semi-arid portions of California appears to occur between 3 and 5 percent impervious cover*."[31] These studies highlight the extent to which impacts originating from impervious surfaces created by land development are responsible for the degradation of creek and stream habitat.

This is consistent with what USEPA has noted, that "*[m]ost stormwater runoff is the result of the man-made hydrologic modifications that normally accompany development. The addition of impervious surfaces, soil compaction, and tree and vegetation removal result in alterations to the movement of water through the environment. As interception, evapotranspiration, and infiltration are reduced and precipitation is converted to overland flow, these modifications affect not only the characteristics of the developed site but also the watershed in which the development is located. Stormwater has been identified as one of the leading sources of pollution for all waterbody types in the United States. Furthermore, the impacts of stormwater pollution are not static; they usually increase with more development and urbanization*."[32]

Reducing the impact from the increased pollutant loads and flows generated by impervious surfaces ~~added to~~ within a watershed is essential to protecting and restoring the integrity of the receiving waters. Provision E.3 includes the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment*." The requirements of Provision E.3 will 1) minimize the generation and discharge of pollutants in storm water from the MS4, and 2) minimize the potential of storm water discharges from the MS4 from causing altered flow regimes and excessive downstream erosion in receiving waters.

[30] Schueler and Holland, 2000. Storm Water Strategies for Arid and Semi-Arid Watersheds (Article 66). The Practice of Watershed Protection.
[31] Stein, E. and Zaleski, S., 2005. Technical Report 475, Managing Runoff to Protect Natural Streams: The Latest Development on Investigation and Management of Hydromodification in California. December 30, 2005.
[32] USEPA, 2007. Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices, December 2007.

~~Provision E.3 is based on the requirements of the Fourth Term Permits for Orange County and Riverside County, and do not differ significantly from the Fourth Term Permit for San Diego County. Provision E.3 has been modified to allow the more holistic, long-term planning approach of the Water Quality Improvement Plan to be incorporated into each Copermitee's development planning. The result will be greater pollutant removal from storm water runoff, and improvements and/or rehabilitation of the functionality and hydrologic regimes of a Watershed Management Area. Alternative compliance options have been included in Provision E.3, which will result in multiple beneficial outcomes within a jurisdiction, a subwatershed, a receiving water body, and/or a Watershed Management Area.~~

~~Incorporating a holistic and long-term planning approach into each Copermittee's development planning program is essential to reducing the impact of development on receiving waters. Development projects that convert natural open space areas into urbanized areas result in the generation and discharge of pollutants associated with anthropogenic activities, and significant modifications to the hydrologic flow regimes. Both adversely affect the chemical, physical, and biological conditions of receiving waters. Redevelopment projects, on the other hand, are opportunities to reduce the generation of pollutants and restore more natural hydrologic flow regimes in areas of existing development, which can contribute toward restoring or rehabilitating the chemical, physical, and biological conditions of impacted and/or impaired receiving waters.~~

~~To improve the health and functionality of the receiving waters in a Watershed Management Area, planning and land use practices must change to reduce the various impacts due to hydromodification and pollutants associated with storm water runoff from developing and developed areas. Planning principles to preserve, enhance, and restore the functionality and hydrologic regimes were incorporated into the development planning provisions of all the Third and Fourth Term Permits within the San Diego Region. Provision E.3 of this Order focuses on mitigating the effects of development by continuing to include these principles, as well as promote the concept of utilizing storm water as a resource. By doing so, pollutants in storm water runoff generated within developing and developed areas will be treated more naturally, and storm water will be discharged to receiving waters at discharge rates that are not unnaturally erosive, thereby resulting in conditions that are more supportive of healthy and sustainable water bodies.~~

The requirements of Provision E.3.a ~~are~~ include the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment*" applicable to all development projects, regardless of size or purpose of development. ~~These requirements are based on and consistent with the requirements for all development projects in the Fourth Term Permits for San Diego, Orange, and Riverside Counties (Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016, respectively).~~ In general, all development projects must implement onsite

BMPs to remove pollutants from runoff prior to its discharge to any receiving waters, as close to the pollutant generating source as possible, and structural BMPs must not be constructed within waters of the U.S.

Furthermore, the onsite BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors (e.g. mosquitos, rodents, and flies). If not properly designed or maintained, certain BMPs implemented or required by municipalities may create a habitat for vectors. Monitoring studies conducted by the California Department of Public Health (CDPH) have documented that mosquitoes opportunistically breed in structural storm water BMPs, particularly those that hold standing water for over 96 hours. Certain site design features that hold standing water may similarly produce mosquitoes.

Structural BMPs and site design features should incorporate design, construction, and maintenance principles to promote drainage within 96 hours to minimize standing water available to mosquitoes. Nuisances and public health impacts resulting from vector breeding can be prevented with close collaboration and cooperative effort between municipalities and local vector control agencies and the CDPH during the development and implementation of storm water runoff management programs. The CDPH also has issued guidance for BMP implementation that will minimize potential nuisances and public health impacts resulting from vector breeding.[33]

All development projects are required to implement source control BMPs that will minimize the generation of pollutants. Additionally, each development project must implement, where applicable and feasible, low impact development (LID) BMPs to mimic the natural hydrology of the site and retain and/or treat pollutants in storm water runoff prior to discharging to and from the MS4.

The LID Center defines LID as "*a comprehensive land planning and engineering design approach with a goal of maintaining and enhancing the pre-development hydrologic regime of urban and developing watersheds.*"[34] LID designs seek to control storm water at the source, using small-scale integrated site design and management practices to mimic the natural hydrology of a site, retain storm water runoff by minimizing soil compaction and impervious surfaces, and disconnect storm water runoff from conveyances to the storm drain system.

LID BMPs may utilize interception, storage, evaporation, evapotranspiration, infiltration, and filtration processes to retain and/or treat pollutants in storm water before it is discharged from a site. Because of these numerous options, the San Diego Water Board expects that every development project will be able to implement

[33] California Department of Public Health, 2012. Best Management Practices for Mosquito Control in California. (http://www.cdph.ca.gov/HealthInfo/discond/Documents/BMPforMosquitoControl07-12.pdf)
[34] www.lowimpactdevelopment.org

some form of LID BMPs. Examples of LID BMPs include using permeable pavements, rain gardens, rain barrels, grassy swales, soil amendments, and native plants.

Provision E.3.a also includes requirements for all development projects to, where feasible, landscape with native and/or low water use plants to minimize the discharge of non-storm water discharges associated with excessive irrigation, as well as harvest (i.e., storage) and use precipitation to promote the concept of utilizing storm water as a resource.

While all development projects are subject to the requirements of Provision E.3.a, Provision E.3.b identifies Priority Development Projects that exceed given size thresholds and/or fit under specific use categories. Priority Development Projects are required to incorporate specific performance criteria for structural BMPs ~~incorporated~~ into the project plan to reduce the generation of pollutants, and address potential impacts from hydromodification.

The Priority Development Project categories are based on the requirements of the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), and do not differ significantly from the Fourth Term Permit for San Diego County. Furthermore, the Priority Development Project categories are consistent with Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), and Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit).

~~Priority Development Projects generally include new development and significant redevelopment projects that can generate large amounts of pollutants, or have large areas of impervious surface that will contribute to adverse impacts in receiving waters. Placement of impervious surfaces within the environment not only generates and accumulates significant amounts of pollutants that will be transported in storm water runoff, but also drastically modifies the natural hydrologic processes within the watersheds.~~

~~Impervious surfaces do not allow natural infiltration and treatment of storm water runoff to take place. Instead, storm water runoff from impervious surfaces have typically been directed through pipes, curbs, gutters, and other hardscape into receiving waters, with little treatment at significantly increased volumes and accelerated flow rates over what would occur naturally. The increased pollutant loads, storm water volume, discharge rates and velocities, and discharge durations discharged from the MS4 adversely impacts the flora and fauna of receiving waters, and causes increased, unnatural erosion and scouring within creek bed and banks. Placement of impervious surfaces also encapsulates "good" sediment (such as sand, gravel, rocks and cobbles) that would normally replenish creek beds and banks to help stabilize them.~~

~~This increased and unnatural erosion, which is caused by both altered storm water flow and altered sediment flow regimes, is largely responsible for degradation of creeks, streams, and associated habitats in the San Diego Region. In an ongoing~~

~~study by the Stormwater Monitoring Coalition to assess the health of streams throughout Southern California, researchers found that three of the four highest risk stressors to creeks (percent sands and fines present, channel alteration, and riparian disturbance) were related to physical habitat.[35] Researchers studying flood frequencies in Riverside County have found that increases in watershed imperviousness of only 9-22 percent can result in increases in peak flow rates for the two-year storm event of up to 100 percent.[36] Such changes in runoff have significant impacts on channel morphology.~~

~~In addition, a technical report issued by the Southern California Coastal Water Research Project (SCCWRP) stated that "*[r]ecent studies indicate that California's intermittent and ephemeral streams are more susceptible to the effects of hydromodification than streams from other parts of the United States. Physical degradation of stream channels in the central and eastern United States can initially be detected when watershed impervious cover approaches 10 percent, although biological effects (which may be more difficult to detect) may occur at lower levels. In contrast, initial response of streams in the semi-arid portions of California appears to occur between 3 and 5 percent impervious cover.*"[37] These studies highlight the extent to which impacts originating from impervious surfaces created by development are responsible for the degradation and hydromodification of creeks and streams.~~

Because of the impact of relatively small increases in watershed impervious surfaces ~~in a watershed can have on~~ to receiving waters, Provision ~~E.3.b.(2)(g)~~ E.3.b.(1)(b)(iv) has been updated to include large driveways that are 5,000 square feet or more. ~~Although they generally do not carry heavy traffic, paved, impervious driveways that are 5,000 square feet or more create significant areas of impervious surface that contribute to altered flow regimes, and are also sometimes used for storage of motor vehicles that can generate significant amounts of pollutants.~~ The San Diego Water Board finds that large driveways can exacerbate altered flow regimes if not properly controlled.

Provision E.3.b.(3) describes projects that are exempt from Priority Development Project status. These include new or retrofit paved sidewalks, bicycle lanes, or trails that are designed and constructed to direct runoff to vegetated areas or be hydraulically disconnected from paved areas. The exemptions have been provided to encourage these types of projects because they provide multiple environmental benefits, such as promoting walking rather than driving, which will in turn improve air quality. Additionally, retrofitting of existing alleys, streets, or roads are exempt from Priority Development Project status if they are constructed using USEPA Green

~~[35] Assessing the Health of Southern California Streams, Stormwater Monitoring Coalition, Fact Sheet~~
~~[36] Schueler and Holland, 2000. Storm Water Strategies for Arid and Semi-Arid Watersheds (Article 66). The Practice of Watershed Protection.~~
~~[37] Stein, E. and Zaleski, S., 2005. Technical Report 475, Managing Runoff to Protect Natural Streams: The Latest Development on Investigation and Management of Hydromodification in California. December 30, 2005.~~

Streets guidance[38]. By doing so, retrofitting of these types of projects is encouraged. The San Diego Water Board recognizes that there are spatial constraints associated with these projects, and implementation of structural BMPs are not always feasible.

~~The Copermittees have identified several types of projects that they assert would be cost prohibitive if they were categorized as Priority Development Projects, and would discourage development or redevelopment within their jurisdictions. Many of these types of projects may not pose a threat when considered individually. However, collectively and cumulatively, several of these projects would likely cause significant impacts to receiving waters if they were all located within a subwatershed, watershed, and/or Watershed Management Area. Thus, these types of development projects should be required to implement structural BMPs that Priority Development Projects are required to implement to be protective of water quality.~~

~~Provision E.3.b.(3), however, does provide exemptions for several of these types of development projects identified by the Copermittees from being defined as Priority Development Projects. Development projects that are not Priority Development Projects are not required to be included in the inventory of Priority Development Projects that must be maintained by each Copermittee pursuant to Provision E.3.e.(2). In addition, structural BMPs on development projects that are not Priority Development Projects are not required to be inspected pursuant to Provision E.3.e.(3). Inspections of development projects that are not Priority Development Projects, however, will be performed as part of the existing development inspections required pursuant to Provision E.5.c.~~

~~The exemptions under Provision E.3.b.(3) are provided for development projects that meet certain conditions. The exemptions have been provided as an incentive for the Copermittees to encourage and promote the implementation of LID design concepts and green infrastructure and building principles. The conditions for allowing those exemptions have been included to provide an incentive for developers to implement LID design concepts and green infrastructure and building principles. Development projects that meet the conditions of Provision E.3.b.(3) are not expected to be cost prohibitive and also expected to be protective of water quality.~~

For development projects identified as Priority Development Projects, the requirements of Provision E.3.c are the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment.*" Provisions E.3.c.(1)-(3) describe the performance criteria for the structural BMPs that must be implemented for each Priority Development Project defined by Provision E.3.b.

[38] "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).

~~Provisions E.3.c.(1)-(3) and emphasize preserving natural watershed hydrology by requiring retention of storm water and management of flows to maintain or mimic the natural hydrology of a site. The holistic and long-term planning approach of the Water Quality Improvement Plans is incorporated into Provisions E.3.c.(1)-(3) by encouraging the Copermittees to improve or rehabilitate watershed functionality and flow regimes with a combination of strategies.~~

Provision E.3.c.(1) describes the storm water pollutant control BMP requirements that must be implemented by all Priority Development Projects. The purpose of Provision E.3.c.(1) is to reduce pollutants in storm water runoff to the MEP from Priority Development Projects before it is discharged to the MS4. Of all the available treatment processes available, retention of storm water, and therefore capture of the pollutants in the storm water, will achieve 100 percent pollutant removal efficiency for the volume of storm water retained. No other method of treatment can achieve 100 percent pollutant removal efficiency. Thus, retention of as much storm water onsite is the most effective way to reduce pollutants in storm water discharges to, and consequently from the MS4, and controls pollutants in storm water discharges from a site to the MEP.

Under Provision E.3.c.(1)(a)~~(i)~~, retention of the pollutants in the runoff produced from the 85th percentile storm event ("design capture volume") is the ~~default~~ design standard ~~that~~ to which Priority Development Projects must comply ~~use to implement to mimic the pre-development retention volume ("design capture volume")~~. Since the 85th percentile storm event has previously been used as the numeric design standard for treatment control BMPs, ~~the~~ this same size storm event ~~has been applied~~ is used as the numeric design standard for ~~the~~ storm water retention ~~pollutant control BMP requirements~~. This is the MEP standard recognized by the San Diego Water Board and is consistent with the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), as well as Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), ~~and~~ Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit), and Los Angeles Water Board Order No. R4-2012-0175 (Los Angeles County MS4 Permit).

The 85th percentile storm event is the event that has a precipitation total greater than or equal to 85 percent of all storm events over a given period of record in a specific area or location. For example, to determine what the 85th percentile storm event is in a specific location, all 24 hour storms that have recorded values over a 30 year period would be tabulated and a 85th percentile storm would be determined from this record (i.e., 15 percent of the storms would be greater than the number determined to be the 85th percentile storm). Most jurisdictions in the San Diego Region have already developed isopluvial maps that can provide this type of information. The 85th percentile storm might be determined to be a number such as 1.0 inch, and this would be multiplied by the total area of the project footprint producing runoff to calculate the design capture volume. The Priority Development Project designer would then select a system of BMPs that would retain (i.e. intercept, store, infiltrate, ~~store,~~ evaporate, or

evapotranspire~~, or harvest and use~~) 100 percent of the pollutants contained in the design capture volume~~, based on the 85th percentile storm event,~~ onsite.

~~Retention of all storm water and all pollutants in storm water onsite for the 85th percentile storm event, however, may not always mimic the natural pre-development retention volume. Retention of the volume generated by the 85th percentile storm event also may not be practical, nor desirable, as storm water flows are a necessary component of the natural hydrologic processes in a watershed.~~

~~The optimum amount of storm water retained onsite would mimic the pre-development retention volume of the project site. Mimicking the pre-development retention volume is an approach USEPA allows for federal development projects. USEPA issued guidance on implementing storm water runoff requirements for federal projects that requires the retention of the 95th percentile storm event as the default design standard to mimic the pre-development hydrology of a project site.[39] The USEPA guidance also provided an option to develop a site-specific design standard. Similar to the USEPA guidance for federal facilities, Provision E.3.c.(1)(a)(ii) provides an option to develop a site specific design capture volume that would mimic the pre-development retention volume of the project site.~~

Retention BMPs ~~be designed to capture a specific volume, and may take some time for the intercepted or captured storm water to infiltrate, evaporate, evapotranspire, or be used. Retention of the design capture volume, however, will capture and retain a significant portion of the pollutants generated and accumulated on~~ are necessary to capture and retain pollutants generated from a Priority Development Project. In a recent study performed by SCCWRP in the Los Angeles Region, they found "*that the magnitude of constituent load associated with storm water runoff depends, at least in part, on the amount of time available for pollutant build-up on land surfaces. The extended dry period that typically occurs in arid climates such as southern California maximizes the time for constituents to build-up on land surfaces, resulting in proportionally higher concentrations and loads during initial storms of the season*."[40] This implies that the "first flush" of a rainy season and the first storm events after long antecedent dry periods tend to have the highest pollutant loads. Capturing and retaining the pollutant loads of the "first flush" of a rainy season and the first storm events after long antecedent dry periods will reduce a significant portion of the pollutants in storm water discharged to and from the MS4.

The San Diego Water Board, however, acknowledges that in some situations ~~retaining~~ retention of the full design capture volume ~~fully~~ onsite may not be technically feasible.~~,~~ In this event, the Copermittee may allow the Priority Development Project to utilize

~~[39] USEPA, 2009. Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act, EPA 841-B-09-001. December 2009.~~

[40] Stein, E.D., Tiefenthaler, L.L., and Schiff, K.C., 2007. Technical Report 510, Sources, Patterns and Mechanisms of Storm Water Pollutant Loading from Watershed and Land Uses of the Greater Los Angeles Area, California, USA. March 20, 2007.

flow-thru treatment control BMPs to achieve the equivalent pollutant load removal that would have been achieved if the design capture volume were fully retained onsite, pursuant to Provision E.3.c.(1)(b). Biofiltration LID BMPs must be considered as a first option before other types of flow-thru treatment control BMPs may be considered because of the ancillary benefits they provide, such as reduction in flow rates and creation of habitat. In any event, no matter what types of BMPs (or combination of BMPs) are chosen, 100 percent of the pollutants contained in the design capture volume must not be allowed to be discharged from the Priority Development Project.

The San Diego Water Board further recognizes that, in addition to not being technically feasible, retention of the full design capture storm onsite may be cost prohibitive, or may not provide ~~any overall~~ as much water quality benefit~~s~~ to the Watershed Management Area as would implementing BMPs elsewhere in the watershed. Thus, Provision E.3.c.(1)(c~~b~~) allows for the use of a combination of onsite retention BMPs, and the implementation of an ~~alternative compliance options~~ Alternative Compliance Program described in Provision E.3.c.(3). Provision E.3.c.(3) is discussed in more detail below.

If the full design capture volume is not retained onsite because a Copermittee grants ~~the~~ a Priority Development Project permission to utilize the Alternative Compliance Program ~~is allowed to implement alternative compliance options~~, then the pollutants in the portion of the design capture volume that are not reliably retained onsite must still be reduced to the MEP. Thus, flow-thru ~~conventional~~ treatment control BMPs are required to be implemented on Priority Development Projects in addition to the retention BMPs ~~and/or biofiltration BMPs~~. The requirements of Provision E.3.c.(1)(d~~c~~) include the performance standards for flow-thru ~~conventional~~ treatment control BMPs, consistent with the Fourth Term Permits in the San Diego Region.

Where~~as~~ the purpose of the requirements under Provision E.3.c.(1) is to reduce pollutants in storm water runoff to the MEP, the purpose of the requirements under Provision E.3.c.(2) is to maintain or restore more natural hydrologic flow regimes to prevent ~~increased~~ accelerated, unnatural erosion in downstream receiving waters, also to the MEP standard. Provision E.3.c.(2) describes hydromodification management BMP requirements that must be implemented by all Priority Development Projects.

~~The development planning requirements under the Fourth Term Permits required the Copermittees in San Diego County, Orange County, and Riverside County to develop Hydromodification Management Plans (HMPs). Because the Copermittees have already developed HMPs, there is no longer a requirement to develop these plans. The Copermittees in each county, however, must update to their respective HMPs, as needed, to incorporate the hydromodification management BMP requirements of Provision E.3.c.(2).~~

The performance criteria for the implementation of hydromodification management BMPs on Priority Development Projects are consistent with the requirements in the Fourth Term Permits for Orange and Riverside Counties (Order Nos. R9-2009-0002

and R9-2010-0016, respectively). Modifications to the Orange County and Riverside County Hydromodification Management Plans (HMPs) will likely be minor, or may not be necessary. The HMP for San Diego County~~, however,~~ will likely require some minor modifications to incorporate the requirements of Provision E.3.c.(2) and become consistent with the Orange County and Riverside County HMPs. The San Diego Water Board does not, however, expect that it will be necessary for the San Diego County Copermittees to develop a new approach or significantly re-write the San Diego County HMP. This is because the premise of the hydromodification management BMP requirements, which are to control storm water runoff conditions (flow rates and durations) for Copermittee-defined range of flows, is unchanged from all Fourth Term Permits in the San Diego Region.

Provision E.3.c.(2)(a) requires that post-project ~~flow rates and durations~~ runoff conditions mimic the *pre-development* runoff conditions, and not the *pre-project* runoff conditions~~ of the Fourth Term San Diego County Permit~~. ~~This includes assuming artificially hardened channels receiving storm water discharges from a Priority Development Project have the characteristics of a natural stream segment similar to that found in the watershed. Provision E.3.c.(2)(a) will primarily apply to redevelopment projects and artificially hardened channels, whose pre-project conditions have already significantly altered the natural hydrologic regime. This will allow more natural hydrologic flow regimes to eventually be restored in the developed areas of the Watershed Management Areas, which can in turn allow hydromodified streams and creeks to eventually be restored or rehabilitated.~~ Fundamentally, the San Diego Water Board believes that using a hydrology baseline that approximates that of an undeveloped, natural watershed is the only way to facilitate the return of more natural hydrological conditions to already built-out watersheds, and ultimately improved stream health. On the other hand, using the *pre-project* hydrology as a baseline for redevelopment projects results in propagating the unnatural hydrology of urbanized areas. Propagating the urbanized flow regime does not support conditions for restoring degraded or channelized stream segments, and would forever sentence such streams to the degraded state. Furthermore, reducing the volume of storm water runoff associated with the urbanized flow regime will also result in reducing the discharge of pollutants into receiving waters, since storm water runoff from impervious surfaces contains untreated pollutants.

The San Diego Water Board understands that approximating the pre-development runoff condition associated with a redevelopment site is not necessarily straightforward because factors such as natural grade and native vegetation for the site cannot be precisely known. Therefore, the San Diego Water Board does not expect project designers to estimate historical conditions associated with redevelopment sites. Rather, the San Diego Water Board expects project designers and the Copermittees to approximate pre-development runoff conditions using the parameters of a *pervious* area rather than an *impervious* area. This means that for redevelopment sites, approximating pre-development runoff conditions equates to using existing onsite grade and assuming the infiltration characteristics of the underlying soil. A redevelopment Priority Development Project must not use runoff coefficients of

concrete or asphalt to estimate pre-development runoff conditions. Rather, redevelopment projects must use available information pertaining to existing underlying soil type (such as soil maps published by the National Resource Conservation Service), onsite existing grade, and any other readily available pertinent information to estimate pre-development runoff conditions.

The San Diego Water Board understands, indeed asserts, that the pre-development hydrology of an area in question can only be roughly estimated and cannot be precisely known. However, using the hydrology of a natural condition, even if not precisely known, will provide significant benefit to receiving waters over using the hydrology associated with pervious (developed) surfaces. Therefore in order to achieve the goals of the Clean Water Act, which are to "***restore*** *and maintain the chemical,* ***physical****, and biological integrity of the nation's waters* [emphasis added]," the most appropriate standard to use for hydromodification management is the standard associated with the pre-development condition.

Provision E.3.c.(2)(b) requires ~~hydromodification management BMPs to compensate for sediment loss in cases where the development would cause loss of sediment supply as a result of the project. Maintaining the pre-development flows and durations from a Priority Development Project will significantly reduce the potential for increased erosion caused by development. Loss of natural sediment because pervious areas covered by the impervious surfaces on the Priority Development Project, however, can still cause increased, unnatural erosion in receiving waters. Runoff that is discharged from a Priority Development Project that lacks sediment becomes "sediment hungry" and can result in increased erosion upstream and downstream from the point of discharge~~ Priority Development Projects to avoid known critical sediment yield areas or implement measures that would allow coarse sediment to be discharged to receiving waters, such that the natural sediment supply is unaffected by the project. This is necessary because coarse sediment supply is as much an issue for causing erosive conditions to receiving streams as are accelerated flows.

The San Diego Water Board recognizes that in some situations implementing the hydromodification management BMP requirements fully onsite may not be technically feasible, may be cost prohibitive, or may not provide any overall water quality benefits to the Watershed Management Area. Thus, Provision E.3.c.(2)(c) allows for the use of a combination of onsite hydromodification management BMPs and alternative compliance options described in Provision E.3.c.(3). ~~The San Diego County Copermittees may incorporate the alternative compliance options into their HMP. Provision E.3.c.(3) is discussed in more detail below.~~

Provision E.3.c.(3) allows for "alternative compliance" in instances where the Copermittee determines that offsite measures will have a greater overall water quality benefit for the Watershed Management Area than if the Priority Development Project were to implement structural BMPs onsite. Consequently, watershed-specific structural BMP requirements are present in this Order in the form of allowable compliance offsite. The Alternative Compliance Program to Onsite Structural BMP Implementation

Provision is intended to integrate with the Copermittees' planning efforts in the Water Quality Improvement Plans.

The Alternative Compliance Program is an option for Priority Development Projects where the governing Copermittee has participated in the development of a Watershed Management Area Analysis as part of the Water Quality Improvement Plan (described in Provision B.3.b.(4)). Such an approach is consistent with the latest findings in hydromodification management by the scientific community. In a Technical Report entitled *Hydromodification Assessment and Management in California,*[41] the report state:

> *"An effective [hydromodification] management program will likely include combinations of on-site measures (e.g., low-impact development techniques, flow-control basins), in-stream measures (e.g., stream habitat restoration), floodplain and riparian zone actions, and off-site measures. Off-site measures may include compensatory mitigation measures at upstream locations that are designed to help restore and manage flow and sediment yield in the watershed."*

Consistent with the ideas brought forth in the report, in the Watershed Management Area Analysis of Provision B.3.b.(4), which is optional, the Copermittees will develop watershed maps that include as much detail about factors that affect the hydrology of the watersheds as is available. Such factors included identification of areas suitable for infiltration, coarse sediment supply areas, and locating stream channel structures and constrictions. Once these factors are mapped and studied, the Copermittees can identify areas in the watersheds where "candidate projects" may be implemented that are expected to improve water quality in the watershed by providing more opportunity for infiltration, slowing down storm water flows, or attenuation of pollutants naturally via healthy stream habitat. These projects may be in the form of retrofitting existing development, rehabilitating degraded stream segments, identifying regional BMPs, purchasing land to preserve valuable floodplain functions, and any other projects that the Copermittees identify.

Under the Alternative Compliance Program, Priority Development Projects may be allowed to fund, partially fund, or implement a candidate project, in lieu of implementing structural BMPs onsite, if they enter into a voluntary agreement with the governing Copermittee permitting this arrangement. Project proponents may also propose an alternative project not previously identified by the Copermittees. In either case, whether a project proponent implements a candidate project identified by the Copermittees or a separate alternative compliance project, the governing Copermittee must determine that implementation of the project will have a greater overall water quality benefit for the Watershed Management Area than fully implementing structural BMPs onsite. If alternative compliance involves funding or implementing a project that

[41] 2012. ED Stein, F Federico, DB Booth, BP Bledsoe, C Bowles, Z Rubin, GM Kondolf, A Sengupta. Technical Report 667. Southern California Coastal Water Research Project. Costa Mesa, CA.

is outside the jurisdiction of the governing Copermittee, then that Copermittee may enter into an inter-agency agreement with the appropriate jurisdiction.

Finally, Provision E.3.c.(2)(d) allows Priority Development Projects to be exempt from the hydromodification management BMP requirements ~~under Provisions E.3.c.(3)(a)-(b) if a limited set of conditions are met~~ if there is no threat of erosion to downstream receiving waters, i.e. the receiving stream is concrete lined from the point of discharge all the way to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean. If the Copermittees believe that more exemptions are warranted, then they must perform the optional Watershed Management Area Analysis of Provision B.2.b.(4). Additional exemptions other than those specified in this Order may be established on a watershed basis, provided the Copermittees perform the analysis, provide supporting rationale for the exemptions, and complete the Water Quality Improvement Plan approval process pursuant to Provision F.1.

~~Provision E.3.c.(3) describes the alternative compliance options that each Copermittee may allow Priority Development Projects within its jurisdiction to utilize to meet the structural BMP performance criteria of Provisions E.3.c.(1) and E.3.c.(2). Such allowances are not required and are at the discretion of each Copermittee. Provision E.3.c.(3) was included because the San Diego Water Board recognizes that various site specific conditions can make complying with the structural BMP performance criteria requirements fully onsite difficult or impractical, and implementing the alternative compliance options can potentially realize or achieve greater water quality benefits for the Watershed Management Area.~~

~~Provision E.3.c.(3)(a) includes the conditions that must be met for a Copermittee to allow a Priority Development Project to utilize the alternative compliance options to comply with the structural BMP performance criteria of Provisions E.3.c.(1) and E.3.c.(2). Priority Development Projects that cannot comply with the requirements of Provision E.3.c.(3)(a) must be required by the Copermittee to comply with the requirements of Provisions E.3.c.(1) and E.3.c.(2) fully onsite.~~

~~Provisions E.3.c.(3)(b)-(d) describe the alternative compliance options that the Copermittee may develop and/or allow to be implemented by Priority Development Projects. The descriptions include the conditions that must be met for the alternative compliance option to be allowed to be utilized by a Priority Development Project. For the alternative compliance project options under Provision E.3.c.(3)(b), the descriptions also specify if the alternative compliance options may only be implemented to comply with the storm water pollutant control BMP requirements of Provision E.3.c.(1), hydromodification management BMP requirements of Provision E.3.c.(2), or both.~~

Provisions E.3.c.(4) and E.3.c.(5) were included under the BMP requirements applicable to all development projects in the Fourth Term Permits for San Diego, Orange, and Riverside Counties (Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016, respectively). In this Order, the long-term BMP maintenance and

infiltration and groundwater protection requirements ~~were move under the structural BMP performance requirements of Provision E.3.c and only~~ apply to structural BMPs implemented by Priority Development Projects only.

Provision E.3.d requires the Copermittees to update their BMP Design Manual as needed to incorporate the requirements of Provision E.3. The BMP Design Manual is formerly known as the Standard Storm Water Mitigation Plan, or SSMP, and was renamed so that the title has a more accurate description of the document content. The contents of the BMP Design Manual are largely unchanged from the previous Standard Storm Water Mitigation Plans required under the Fourth Term Permits. The BMP Design Manual fulfills the 40 CFR 122.26(d)(2)(iv)(A)(2) requirement that the Copermittee's development planning program includes "*a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment*."

As part of the "*planning procedures*", 40 CFR 122.26(d)(2)(iv)(A)(2) requires the procedures to "*address controls to reduce pollutants in discharges from municipal separate storm sewers after construction is completed*." The requirements applicable to the implementation and oversight of structural BMPs at Priority Development Projects are provided under Provision E.3.e.

Proper installation of the structural BMPs approved for a Priority Development Project is necessary to ensure that pollutants in storm water discharges will be reduced to the MEP after the project is completed. In addition to the proper installation of structural BMPs, the maintenance of structural BMPs on Priority Development Projects is necessary to ensure that pollutants in storm water discharges will continue to be reduced to the MEP. Provision E.3.e.(1) includes the minimum requirements that each Copermittee must implement to ensure structural BMPs are properly installed and will be properly maintained.

The requirements under Provision E.3.e.(2)-(3) are necessary to demonstrate each Copermittee is implementing a program that complies with Provisions E.3.b-c and E.3.e.(1), and ensure structural BMPs at Priority Development Project will continue to be able to reduce pollutants in storm water discharges to the MEP.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary for any development projects to compel compliance with the requirements of Provision E.3 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.3.f requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

~~Finally, Provision E.3.g requires the Copermittee to include the strategies and/or activities identified in the Water Quality Improvement Plan that the Copermittee will implement as part of the development planning program within its jurisdiction. The Water Quality Improvement Plan is expected to include several strategies and options that the Copermittee can and should implement within its jurisdiction. The Copermittee is expected to describe and provide the details of when, where, and how those strategies will be implemented within its jurisdiction.~~

~~Provision E.3.g specifically requires the Copermittee to identify areas within its jurisdiction where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting and/or stream, channel, or habitat rehabilitation projects. This requirement has been included to promote and encourage cooperation between the Copermittees and the development community to implement projects that can reduce pollutants in storm water runoff from areas of existing development, and stabilize or rehabilitate channels, stream and/or habitats that have been hydromodified because of existing development.~~

~~Furthermore, Provision E.3.g encourages the Copermittee to collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify regional alternative compliance projects that Priority Development Projects may be allowed or should be encouraged to implement or participate in implementing. This requirement has been included to promote and encourage more collaboration and coordination, as well as long term planning, among Copermittees and other entities in the Watershed Management Area.~~

~~The San Diego Water Board will utilize the information provided in the jurisdictional runoff management program document pursuant to Provision E.3.g to gauge and assess the Copermittee's efforts in trying to address the highest priority water quality conditions identified in the Water Quality Improvement Plan within its jurisdiction.~~

<u>Provision E.4 (Construction Management)</u> requires each Copermittee to implement a construction management program to control and reduce the discharge of pollutants in storm water from construction sites to the MEP. Proper implementation of the construction management program will also contribute toward effectively prohibiting non-storm water discharges from construction sites to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." As part of the management program, 40 CFR 122.26(d)(2)(iv)(D) requires "*a program to implement and maintain structural and non-structural best management practices to reduce pollutants in storm water runoff from construction sites to the municipal storm sewer system.*"

Construction sites can be significant sources of sediment, trash, and other pollutants to receiving waters. Although sediment is naturally occurring in the natural environment, the discharge of sediment under unnatural conditions is problematic to receiving waters. Fine sediment in creeks causes high turbidity that interferes with the functionality of native flora and fauna in local creeks. For example, turbidity interferes with both photosynthesis of water-philic plants, as well as successful foraging and reproduction of benthic macroinvertebrates. Sediment can also make it difficult for fish to breathe because it clogs fish gills. Other pollutants such as heavy metals or pesticides can adhere to sediment and are transported to receiving waters during storm events, where they dissolve in the water column and become bioavailable to aquatic organisms. Sediment is recognized as a major stressor to surface waters and is responsible for the impairment of several lagoons and creeks in the San Diego Region.

Provision E.4 includes requirements that each Copermittee must implement to minimize the discharge of sediment and other pollutants from construction sites to the MS4 within its jurisdiction. The requirements under Provision E.4 are consistent with the Fourth Term Permits for San Diego, Orange, and Riverside Counties. Therefore, Copermittees are expected to implement the requirements seamlessly, with minimal changes to their existing construction management programs. The Copermittees, however, are given more flexibility to run their programs as needed to maximize efficiency, and also to be consistent with the Water Quality Improvement Plan for the Watershed Management Area.

As part of the construction management program, 40 CFR 122.26(d)(2)(iv)(D)(1) requires "*procedures for site planning which incorporate consideration of potential water quality impacts.*" Provision E.4.a describes the minimum elements each Copermittee is required to include as part of the construction site planning and project approval process. The construction site planning and approval process is based primarily on ensuring each project had an adequate site-specific pollution control, construction BMP, and/or erosion and sediment control plan that will be implemented to minimize the discharge of pollutants in storm water to the MEP, and minimize impacts to receiving waters.

The requirements under Provision E.4.b provide the data and information necessary to identify "*priorities for inspecting sites and enforcing control measures*" required pursuant to 40 CFR 122.26(d)(2)(iv)(D)(3). Under Provision E.4.b, each Copermittee must identify construction sites that are considered a high threat to downstream surface waters. Designation of "high threat to water quality" construction sites will necessitate the Copermittees to develop criteria to identify such sites. Provision E.4.b.(2) describes a list of factors that must be considered when the Copermittee considers threat to water quality. For example, a Copermittee must identify sites as "high threat to water quality" if it is located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions, according to the Water Quality Improvement Plan. This ensures that construction

management program implementation is compatible with the Copermittee's identified highest priority water quality conditions.

Pursuant to 40 CFR 122.26(d)(2)(iv)(D)(2) each Copermittee is required describe "*requirements for nonstructural and structural best management practices*" at construction sites. Provision E.4.c includes the types of construction site BMPs that the Copermittees must implement, or require the implementation of, at each construction site to reduce pollutants in storm water discharges to the MEP.

Each Copermittee is expected to require the implementation of appropriate BMPs given specific site conditions, the season and likelihood of rain events, and construction phase (i.e. grading vs. vertical construction). This means that throughout the life of the project construction, the appropriate BMPs will vary, especially if the construction of the project spans multiple wet seasons. As opposed to describing specific minimum BMPs that must be implemented, the Order describes major BMP categories that should be considered for each site.

Each Copermittee is expected to use its 20 years of storm water experience and knowledge to require implementation of appropriate BMPs from the various categories at each construction site within its jurisdiction. For example, the San Diego Water Board expects that each site will be required to implement erosion control and sediment control ~~at each construction site~~. The San Diego Water Board also expects each Copermittee to require implementation of active/passive sediment treatment systems at sites where other BMPs have been tried and are known to be inadequate, and discharges of sediment are causing or contributing to water quality impairment downstream. Each Copermittee is granted flexibility in specifying the minimum level of BMP requirements at each site, but the San Diego Water Board expects each site to be capable of controlling pollutants in storm water discharges to the MEP and preventing illicit discharges.

The requirements under Provision E.4.d are necessary to demonstrate that each Copermittee is implementing a program that complies with Provisions E.4.a and E.4.c and ensure BMPs at construction sites will reduce pollutants in storm water discharges to the MEP.

Provision E.4.d does not include minimum required inspection frequencies for construction sites. Each Copermittee must use its experience and knowledge to specify an appropriate inspection frequency for both high priority and lower priority sites in their jurisdictional runoff management program documents, and in accordance with the Water Quality Improvement Plan. Appropriate inspection frequencies may vary by Copermittee, but the San Diego Water Board expects that the stated frequency will be adequate for each Copermittee to properly oversee the construction sites within its jurisdiction, confirm BMPs are implemented to reduce pollutants in storm water discharges from constructions sites to the MEP, and make needed changes to its program on an ongoing basis as necessary.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary for any development projects to compel compliance with the requirements of Provision E.4 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.4.e requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

~~Finally, Provision E.4.f requires the Copermittee to include the strategies and/or activities identified in the Water Quality Improvement Plan that the Copermittee will implement as part of the construction management program within its jurisdiction. The Water Quality Improvement Plan is expected to include several strategies and options that the Copermittee can and should implement within its jurisdiction. The Copermittee is expected to describe and provide the details of when, where, and how those strategies will be implemented within its jurisdiction.~~

~~The San Diego Water Board will utilize the information provided in the jurisdictional runoff management program document pursuant to Provision E.4.f to gauge and assess the Copermittee's efforts in trying to address the highest priority water quality conditions identified in the Water Quality Improvement Plan within its jurisdiction.~~

Provision E.5 (Existing Development Management) requires each Copermittee to implement an existing development management program to control and reduce the discharge of pollutants in storm water from areas of existing development to the MEP. Proper implementation of the existing development management program will also contribute toward effectively prohibiting non-storm water discharges from areas of existing development to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." Within 40 CFR 122.26(d)(2)(iv)(A) and (C), the management program is required to reduce impacts on receiving waters and reduce pollutants in storm water discharges to the MEP from commercial and residential areas, industrial facilities, and municipal facilities.

Commercial and residential areas, industrial facilities, and municipal facilities must be addressed by each Copermittee with the existing development management program required under Provision E.5. All other areas within each Copermittee's jurisdiction should be either undeveloped open space, or areas that are being developed or under construction. Areas being developed or under construction will be addressed by the Copermittee under the requirements of Provision E.3 (Development Planning) or Provision E.4 (Construction Management).

Areas of existing development typically include impervious surfaces such as sidewalks, driveways, roads, and rooftops, which generate and concentrate pollutants (such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not found in high concentrations in the natural environment. Pollutants that accumulate on impervious surfaces are not easily biodegraded or not subject to natural treatment processes. When it rains, these pollutants are transported in storm water runoff from these impervious surfaces into receiving waters, resulting in poor water quality and degradation of beneficial uses.

In addition to the generation of pollutants, areas of existing development have generally altered the natural conditions of the land and removed vegetative cover, reduced the perviousness of the surface, and reduced the capacity of storm water that can be intercepted, captured, stored, infiltrated, evaporated, and/or evapotranspired. The alteration of the natural conditions and the impervious surfaces associated with areas of existing development causes water quality problems due to the alteration of natural flow regimes within the watersheds;~~,~~ resulting in hydromodification of channels, streams, and habitats that exist within or adjacent to the areas of existing development.

Thus, storm water discharges from areas of existing development are responsible for poor water quality, degraded habitats, and hydromodified channels throughout the developed portions of the watersheds in the San Diego Region. To improve the health and functionality of the receiving waters in a Watershed Management Area, land use practices and the amount of impervious surfaces in areas of existing development must change to reduce the various impacts caused by hydromodification and pollutants from storm water runoff generated in developed areas. Each Copermittee must be aggressive ~~in tackling~~ to address pollutant sources and runoff from areas of existing development to be able to reduce pollutants in storm water discharges from the MS4 to the MEP.

There is some overlap in the requirements under Provision E.5 with the requirements under Provisions E.2 (Illicit Discharge Detection and Elimination), E.3 (Development Planning), and E.4 (Construction Management). Illicit discharges frequently originate from areas of existing development. New development projects, when completed will become some type of residential, commercial, industrial or municipal existing development. Redevelopment projects are, by definition, redeveloping areas of existing development. And, redevelopment projects become construction sites located in areas of existing development. Much of the data and information collected, inspections performed, and enforcement actions taken for the requirements under Provisions E.2 to E.4 may also be utilized by the existing development management program. The requirements under Provision E.5, however, are focused primarily on reducing pollutants generated in areas of existing development that can be transported in storm water runoff and discharged to and from the MS4.

The requirements under Provision E.5 build upon existing program elements being implemented by the Copermittees. Provision E.5 is generally consistent with the

existing development requirements of the Fourth Term Permits for Orange and Riverside Counties (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), but modified to provide more flexibility to implement the programs so resources can be better focused toward addressing the highest priority water quality conditions identified in the Water Quality Improvement Plans.

For a Copermittee to properly manage areas of existing development, having knowledge of what development exists within its jurisdiction is essential. ~~The requirements under~~ Provision E.5.a ~~for~~ require each Copermittee to maintain a watershed-based inventory of all the existing development within its jurisdiction. ~~are~~ This requirement is necessary for each Copermittee to implement the requirements of Provision E.5.b-e.

As opposed to just maintaining separate inventories based on the type of site, each Copermittee must maintain a watershed-based inventory that includes all types of existing development within its jurisdiction. By utilizing a watershed-based inventory, the Copermittees within a Watershed Management Area can combine their inventories and review the inventories by watershed in addition to by jurisdiction. Pollutant sources and strategies for abatement can then be evaluated on a watershed level, as opposed to evaluating sources and strategies strictly by type of site.

Provision E.5.a includes the information that must be included in the inventory. Provision E.5.a.(1) specifies what facilities or areas must be included in the inventory. A commercial type of existing development may be identified in the inventory as a facility (e.g. individual building, individual business) or an area (e.g. shopping center, commercial zone). An industrial type of existing development must be identified in the inventory by facility (e.g. individual industrial entity). A municipal type of existing development must be identified in the inventory by facility, with a list of specific municipal facilities that must be included in the inventory. A residential type of existing development must be identified by areas to be designated by the Copermittee. For each of the facilities and areas identified in the Copermittee's inventory developed pursuant to Provision E.5.a.(1), Provision E.5.a.(2) specifies the information that must be included in the description for the facility or area.

Provision E.5.a.(3) requires each Copermittee to maintain an updated map showing the location of inventoried existing development, watershed boundaries, and water bodies. This requirement was included because this information is expected to help the Copermittees in a Watershed Management Area identify and prioritize sources of pollutants and/or stressors in areas of existing development that contribute toward the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Knowledge of the ~~sources of~~ existing development that are likely to be sources of pollutants contributing to the highest priority water quality conditions is expected to be a key element in the Copermittees' development of the water quality improvement strategies that will be included in the Water Quality Improvement Plans. The

strategies described in the Water Quality Improvement Plans will direct efforts within the existing development management programs implemented by each Copermittee.

Pursuant to 40 CFR 122.26(d)(2)(iv)(A) each Copermittee is required describe "*structural and source control measures to reduce pollutants*" in storm water runoff discharged from areas of existing development. Provision E.5.b includes the BMP implementation and maintenance requirements that the each Copermittee must require at areas of existing development to reduce pollutants in storm water discharges to the MEP. The San Diego Water Board, however, recognizes that BMP implementation and maintenance for residential areas will require much more education and encouragement through less authoritative measures than for commercial, industrial and municipal facilities and areas. Thus, the BMP implementation and maintenance requirements have been separated between requirements under Provision E.5.b.(1) for commercial, industrial and municipal facilities and areas, and Provision E.5.b.(2) for residential areas.

Most of the requirements in Provision E.5.b are consistent with the related requirements in the Fourth Term Permits. The level of specificity, however, has been changed to allow each Copermittee the flexibility to implement its program to achieve maximum efficiency, and to perform functions that will address the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Each Copermittee is expected to require the implementation of appropriate BMPs to address the expected pollutants from each facility or area. The Third and Fourth Term Permits described specific minimum BMPs that must be implemented at various sites. This Order, however, requires each Copermittee to designate minimum BMPs themselves and require implementation. Consistent with the Fourth Term Permits, each Copermittee is required to maintain, or require the maintenance of, all BMPs as needed.

The BMP implementation and maintenance requirements include a schedule of operation and maintenance activities for the MS4 and related structures (such as catch basins, storm drain inlets, and detention basins), as well as public streets and roads. Public streets and roads specifically include public unpaved roads. The San Diego Water Board identified, through investigations and complaints, sediment discharges from unpaved roads as a significant source of water quality problems in the San Diego Region. ~~Enforcement and i~~Inspection activities conducted by the San Diego Water Board since the Third Term Permits ~~were issued~~ have found a lack of source control for many unpaved roads within the jurisdiction of the Copermittees.

Unpaved roads are a source of sediment that can be discharged in runoff to receiving waters, especially during storm events. Erosion of unpaved roadways occurs when soil particles are loosened and carried away from the roadway base, ditch, or road bank by water, wind, traffic, or other transport means. Exposed soils, high runoff velocities and volumes, sandy or silty soil types, and poor compaction increase the potential for erosion.

Road construction, culvert installation, and other maintenance activities can disturb the soil and drainage patterns to streams in undeveloped areas, causing excess runoff and thereby erosion and the release of sediment. Poorly designed unpaved roads can act as preferential drainage pathways that carry runoff and sediment into natural streams, impacting water quality. In addition, other public works activities along unpaved roads have the potential to significantly affect sediment discharge and transport within streams and other waterways, which can degrade the beneficial uses of those waterways.

USEPA also recognizes that discharges from unpaved roads pose a significant potential threat to water quality. USEPA guidance[42] emphasizes the threat of unpaved roads to water quality:

> "*Dirt and gravel roads are a major potential source of these pollutants [sediment] and pollutants that bind to sediment such as oils, nutrients, pesticides, herbicides, and other toxic substances. Many roads have unstable surfaces and bases. Roads act like dams, concentrating flows that accelerate erosion of road materials and roadsides. Both unstable surfaces and accelerated erosion then lead to sediment and dust.*"

There are several guidance documents, developed by the USEPA,[43] the US Forest Service,[44] the University of California,[45] and others, that include design and construction specifications and BMPs that are readily available for implementation by public entities. Implementing design and other source control BMPs for unpaved roads in the region is necessary to reduce and minimize the impacts of sediment discharged during storm events from unpaved roads to the MS4s and receiving waters.

Provision E.5.c describes existing development site inspection frequency, content, and tracking that each Copermittee must incorporate into their existing development management programs. The requirements under Provision E.5.c are necessary to demonstrate each Copermittee is implementing a program that complies with Provision E.5.b and ensure BMPs implemented in areas of existing development will reduce pollutants in storm water discharges to the MEP. Provision E.5.c has been modified to include a minimum of once every 5 years for all inventoried facilities and areas of existing development, utilizing one or more methods of inspection.

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[42] USEPA, 2006. Environmentally Sensitive Maintenance for Dirt and Gravel Roads. Gesford and Anderson, USEPA-PA-2005.
[43] Ibid
[44] US Forest Service, 1996. Forest Service Specifications for Construction of Roads & Bridges. EM-7720-100. Revised August 1996.
[45] University of California Division of Agriculture and Natural Resources, 2007. Rural Roads: A Construction and Maintenance Guide of California Landowners. Publication 8262.

In addition to onsite inspections, the methods of inspection have been expanded to include drive-by inspections. Inspections may be performed by the Copermittee's municipal and contract staff, or by volunteer monitoring or patrol programs. Volunteer monitoring or patrol programs are not expected to enforce the Copermittee's ordinances, or to inspect areas or facilities where members of the public are not allowed access. Volunteer monitoring or patrol programs must be trained by the Copermittee, and are only expected to collect visual observations. By utilizing drive-by inspections and volunteer monitoring or patrol programs, the Copermittees will be able to maximize and efficiently use their resources to identify and address sources of pollutants in areas of existing development.

The municipal and contract staff of each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial, industrial, and municipal facilities and areas in its inventoried existing development pursuant to Provision E.5.c.(1)(a)(iv). An "equivalent" of at least 20 percent means if any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspection may count toward the total annual inspection requirement. Linear municipal facilities (i.e., MS4 linear channels, sanitary sewer collection systems, streets, roads and highways) in the Copermittee's existing development inventory are not subject to the inspection frequency requirement of Provision E.5.c.(1)(a)(iv).

The inspection content specified in Provision E.5.c.(2)(a) includes the information required to be collected during an inspection by any method. The inspection content specified in Provision E.5.c.(2)(a) includes additional information that must be collected when a Copermittee's municipal or contract staff perform an onsite inspection. Provision E.5.c.(3) specifies the information that each Copermittee must maintain in its existing development inspection records.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary to compel compliance with the requirements of Provision E.5 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.5.d requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

~~Finally, Provision E.5.e requires the Copermittee to include the strategies and/or activities identified in the Water Quality Improvement Plan that the Copermittee will implement as part of the existing development management program within its jurisdiction. The Water Quality Improvement Plan is expected to include several strategies and options that the Copermittee can and should implement within its jurisdiction. The Copermittee is expected to describe and provide the details of when, where, and how those strategies will be implemented within its jurisdiction.~~

Provisions ~~E.5.e.(2)-(3)~~ E.5.e.(1)-(2) specifically require the Copermittee to identify areas of existing development as candidates for retrofitting, and streams, channels, and/or habitats as candidates for rehabilitation. Provisions ~~E.5.e.(2)-(3)~~ E.5.e.(1)-(2) are based on the retrofitting requirements of the Fourth Term Permits for Orange and Riverside Counties, but modified to also include identifying projects to rehabilitate channels within areas of existing development. The requirements have also been modified to be more focused on utilizing these types of projects for addressing the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Interest and opportunity to retrofit areas of existing development and rehabilitate channels located in areas of existing development has been observed in several programs the San Diego Water Board oversees (e.g., CWA Section 401 Water Quality Certification program, supplemental environmental projects, and grant programs). Each jurisdiction has miles and miles of streets that could be retrofitted to become green streets. Reshaping landscaped areas from convex to concave configurations can detain storm water instead of directing runoff as quickly as possible to the MS4. Retrofit projects could also include simply replacing impervious surfaces with permeable surfaces.

Retrofitting projects do not necessarily have to be expensive. Retrofitting projects could be as simple as redirecting downspouts from roofs to pervious or landscaped areas instead of to hardscaped areas discharging directly to the MS4, providing rain barrels to harvest storm water from downspouts for use at a later time, or planting more trees in areas with little vegetation to provide canopy that can intercept storm water. The San Diego Water Board encourages the Copermittees to identify simple, low-cost retrofitting opportunities that can be easily implemented, in addition to other more expensive retrofitting and channel rehabilitation projects.

Rehabilitation of channels, streams, and/or habitat will require more significant planning and resources to implement. There are, however, also abundant opportunities to rehabilitate channels, streams and/or habitats in or adjacent to areas of existing development. Each Watershed Management Area likely has several creeks and stream reaches that have been undergrounded, artificially hardened, or hydromodified that could be rehabilitated to be more sustainably configured, which would slow down storm water flows and potentially have more assimilative capacity for pollutants while still being supportive of designated beneficial uses.

The San Diego Water Board recognizes that it may be infeasible to implement retrofitting or channel rehabilitation projects within certain areas of a Copermittee's jurisdictions. For such areas, the Copermittee must instead identify, develop, and implement regional retrofitting and channel rehabilitation projects (i.e. projects that can retain and/or treat storm water from one or more areas of existing development) adjacent to and/or downstream of the areas of existing development.

Provisions ~~E.5.e.(2) (3)~~ E.5.e.(1)-(2) do not require the implementation of retrofitting and rehabilitation projects, but do require the Copermittee to develop a program with strategies~~y~~ to facilitate the implementation of these types of projects in areas of existing development. The strategies~~y~~ ~~is~~ are expected to include allowing and encouraging Priority Development Projects to implement ~~these~~ retrofitting types of projects ~~to comply~~ as a means of compliance with the structural BMP performance criteria requirements of Provisions E.3.c.(1) and E.3.c.(2).

~~The San Diego Water Board will utilize the information provided in the jurisdictional runoff management program document pursuant to Provision E.5.e to gauge and assess the Copermittee's efforts in trying to address the highest priority water quality conditions identified in the Water Quality Improvement Plan within its jurisdiction.~~

Provision E.6 (Enforcement Response Plans) requires each Copermittee to develop an Enforcement Response Plan as part of its jurisdictional runoff management program document. Proper implementation of the Enforcement Response Plans is necessary to effectively prohibit non-storm water discharges to the MS4, and reduce the discharge of pollutants in storm water from the MS4 to the MEP.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system*" and be able to demonstrate that it can "*operate pursuant to legal authority established by statute, ordinance or series of contracts*" to control the discharge of non-storm water and pollutants in storm water to and from its MS4. Pursuant to 40 CFR 122.26(d)(2)(i)(E) each Copermittee is specifically required to have the legal authority to "*[r]equire compliance with conditions in ordinances, permits, contracts or order*s."

The requirements under Provision E.6 are necessary to demonstrate that each Copermittee can enforce its legal authority to *"effectively prohibit non-stormwater discharges"* and "*reduce the discharge of pollutants to the maximum extent practicable*" as well as "*[r]equire compliance with conditions in ordinances, permits, contracts or order*."

The Enforcement Response Plan required under Provision E.6 will serve as a reference for the Copermittee and the San Diego Water Board to determine if consistent enforcement actions are being implemented to achieve timely and effective compliance from all public and private entities that are not in compliance with the Copermittee's ordinances, permits, or other requirements. The Enforcement Response Plan must contain clear direction for the Copermittee to take immediate enforcement action, when appropriate and necessary, in their illicit discharge detection and elimination, development planning, construction management, and existing development management programs.

If the entities subject to the Copermittee's legal authority do not implement appropriate corrective actions in a timely manner, or if violations repeat, the Copermittee must take

progressively stricter responses to enforce its legal authority and achieve compliance with its ordinances, permits, or other requirements to *"effectively prohibit non-stormwater discharges"* and "*reduce the discharge of pollutants to the maximum extent practicable.*"

Provision E.7 (Public Education and Participation) requires each Copermittee to implement a public education and participation program. Proper implementation of the public education and participation program as part of its jurisdictional runoff management program will contribute toward effectively prohibiting non-storm water discharges to the MS4, and toward the reduction of pollutants in storm water from the MS4 to the MEP.

Provision E.7 establishes the minimum requirements that each Copermittee must implement to engage members of the public as part of its jurisdictional runoff management program. In the Fourth Term Permits, the public education program requirements and the public participation requirements were included as separate jurisdictional runoff management program components. In this Order, the public education requirements have been consolidated with the public participation requirements, as both sets of requirements are related to the engagement of the public by each Copermittee. Engagement of the public is critical for the success of each Copermittee's jurisdictional runoff management program.

The Copermittees have been implementing public education programs for the last 20 years, which are now well established. The specificity of expected public education program elements of the Fourth Term Permits has been removed. For the most part, the public education program requirements in Provision E.7.a have been reduced to a set of requirements that are specifically included in the federal regulations under 40 CFR 122.26(d)(2)(iv)(A)(6), 122.26(d)(2)(B)(6) and 122.26(d)(2)(D)(4), which should already be incorporated into each Copermittee's existing public education program. Each Copermittee is expected to utilize the information and data collected from the monitoring and assessments conducted within the Watershed Management Area, and from its inventories and inspections to best direct its public education program resources toward addressing the highest priority water quality conditions identified within the Water Quality Improvement Plan.

According to 40 CFR 122.26(d)(2)(iv), public participation is required to be included as part of the "*comprehensive planning process*", which includes the development and implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs. The requirements under Provision E.7.b specify the opportunities that the public must be provided to be involved in the "*comprehensive planning process*", as required by to 40 CFR 122.26(d)(2)(iv).

Provision E.8 (Fiscal Analysis) requires each Copermittee to secure the resources and provide an analysis of the resources that will be necessary to implement the requirements of the Order. Adequate fiscal resources are necessary for a jurisdictional runoff management program to effectively prohibit non-storm water

discharges to the MS4, and reduce pollutants in storm water from the MS4 to the MEP.

According to 40 CFR 122.26(d)(2)(vi), each Copermittee is responsible for providing "*a fiscal analysis of the necessary capital and operation and maintenance expenditures necessary to accomplish the activities*" required by this Order, including "*a description of the source of funds that are proposed to meet the necessary expenditures, including legal restrictions on the use of such funds.*" The fiscal analysis requirements of Provision E.8 are consistent with 40 CFR 122.26(d)(2)(vi).

The San Diego Water Board has chosen not to require a description of fiscal benefits realized from implementation of the jurisdictional runoff management programs. This is a recommendation from the National Association of Flood and Stormwater Management Agencies.[46] For instance, the fiscal analysis requirements do not address city-wide fiscal benefits of protection (e.g., public health, tourism, property values, economic activity, beneficial uses, etc.), even though many costs currently reported to the San Diego Water Board are for related activities. This type of assessment may help Copermittees improve the allocation of resources and it may help the Copermittees secure adequate funding for the program. Qualitative assessments, however, could be overly subjective and most Copermittees likely lack the ability to provide accurate quantitative assessments. The San Diego Water Board encourages the Copermittees to consider means for conducting assessments of fiscal benefits derived from the programs. Such assessments could be conducted on a regional scale similar to studies of program costs conducted by the State Water Board.[47]

[46] National Association of Flood and Stormwater Management Agencies. 2006. *Guidance for Municipal Stormwater Funding.* Prepared under a grant provided by the USEPA.
[47] State Water Board, 2005. NPDES Stormwater Cost Survey.

F. Reporting

Purpose: Provision F includes the requirements for the documents and reports that the Copermittees must prepare and provide to the San Diego Water Board. The documents prepared by the Copermittees and provided to the San Diego Water Board and made available to the public will provide the documentation that the Copermittees are complying with the requirements of the Order.

***Discussion*:** Provision F requires the Copermittees to prepare several documents and reports that must be provided to the San Diego Water Board and made available to the public. The reporting requirements have been significantly reduced compared to the Fourth Term Permit reporting requirements. The reduction in reporting requirements was recommended by the San Diego County Copermittees in the Report of Water Discharge submitted in June 2011.

More specific and detailed discussions of the requirements of Provision F are provided below.

Provision F.1 (Water Quality Improvement Plans) requires the Copermittees in each Watershed Management Area to develop and submit a Water Quality Improvement Plan in accordance with the requirements of Provision B.

Of all the requirements of Provision F, the Water Quality Improvement Plans will likely be the documents requiring the most significant effort to develop. The content of the Water Quality Improvement Plans, however, is expected to include content that should already have been developed for the Watershed Plans and several elements that are included in the Monitoring and Reporting Programs required under the Fourth Term Permits.

Because the Water Quality Improvement Plan is part of the "*comprehensive planning process*~~" requiring~~ *which involves public participation*," Provision F.1 includes requirements to give multiple opportunities to the public to provide input on the content of the plans.

Provision F.1.a.(1) specifies the elements that the Copermittees must include in the public participation process for the development of the Water Quality Improvement Plans. In order for the public to be aware of the opportunities to provide input, Provision F.1.a.(1)(a) requires the Copermittees to develop a publicly available and noticed schedule of the opportunities for the public to participate and provide comments during the development of the Water Quality Improvement Plan. These opportunities are when the public can provide the data, information, and recommendations that the Copermittees can consider during the development of the Water Quality Improvement Plans.

The San Diego Water Board recognizes, however, that the Copermittees cannot be expected to incorporate all the data, information, and recommendations that the public may provide into the Water Quality Improvement Plans. The Copermittees will have to review the data, information, and recommendations received and make some decisions on what to incorporate into the Water Quality Improvement Plans. Before the Copermittees finalize their decisions, members of the public should be allowed to review the Copermittees' decisions. Thus, Provision F.1.a.(1)(b) requires the Copermittees to form a Water Quality Improvement Consultation Panel (Panel).

The Panel will consist of a member from the environmental community and a member from the development community familiar with the Watershed Management Area. A representative from the San Diego Water Board staff will also be part of the Panel. The Copermittees may choose to include additional members, but the Panel is only required to include three panel members.

The Panel will serve as an additional public participation and input mechanism during the development of the Water Quality Improvement Plans. The knowledge and expertise from these Panel members are expected to provide the Copermittees valuable direction during their decision-making process. The Copermittees will review the content of their planned submittals with the Panel members to receive recommendations or concurrence. If the Panel provides recommendations, the Copermittees must consider revisions to the Water Quality Improvement Plan submittals.

The San Diego Water Board recognizes that the development of multiple Water Quality Improvement Plans concurrently may limit the ability of the public to review and provide comments to the Copermittees. Thus, Provision F.1.a.(1)(c) requires the Copermittees to coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public as much time and opportunity as possible to participate during the development of the Water Quality Improvement Plans.

Provision F.1.a.(2) requires the Copermittees to develop and submit the first Water Quality Improvement Plan component, in accordance with the requirements of Provision B.2, which includes the identification of the priority water quality conditions and potential water quality improvement strategies. The public must be provided an opportunity to provide data, information and recommendations from the public to be utilized in the development and identification of the priority water quality conditions and potential water quality improvement strategies for the Watershed Management Area. The Copermittees must consult with the Panel and consider making revisions. The Copermittees may submit the requirements of Provision B.2 as early as 6 months and no later than 12 months after the commencement of coverage under this Order. After the requirements of Provision B.2 are submitted to the San Diego Water Board, the public will be provided another opportunity to provide comments.

Provision F.1.a.(3) requires the Copermittees to develop and submit the second Water Quality Improvement Plan component, in accordance with the requirements of Provision B.3, which includes the identification of the numeric goals for the highest priority water quality conditions identified for the Watershed Management Area, and the strategies that will be implemented to achieve the potential numeric goals. The Copermittees may also develop the Optional Watershed Management Area Analysis, in accordance with the requirements of Provision B.2.b.(4), and/or Discharge Prohibitions and Receiving Water Limitations Compliance Option, in accordance with the requirements of Provision B.3.c, as part of this submittal. The public must be provided an opportunity to provide data, information and recommendations to be utilized in the development and identification of the numeric goals and water quality improvement strategies for the Watershed Management Area. The Copermittees must consult with the Panel and consider making revisions. The Copermittees may submit the requirements of Provision B.3 as early as 9 months and no later than 18 months after the commencement of coverage under this Order. After the requirements of Provision B.3 are submitted to the San Diego Water Board, the public will be provided another opportunity to provide comments.

Finally, Provision F.1.b describes the process for the submittal and implementation of the Water Quality Improvement Plans. The complete Water Quality Improvement Plans are required to be submitted by the Copermittees within ~~18~~ 24 months after ~~adoption of~~ the commencement of coverage under this Order. The San Diego Water Board will provide the public an opportunity to provide comments on each complete Water Quality Improvement Plan.

The San Diego Water Board will review each Water Quality Improvement Plan and the public comments received to determine if the Copermittees have submitted a Water Quality Improvement Plan that meets the requirements of Provision B. If a Water Quality Improvement Plan does not meet the requirements of Provision B, the Copermittees will be considered out of compliance and directed in writing by the San Diego Water Board Executive Officer to correct the deficiencies.

When a Water Quality Improvement Plan meets the requirements of Provision B, the San Diego Water Board will determine whether to hold a public hearing or to limit public input to submittal of written comments before accepting the Water Quality Improvement Plan. Implementation of the Water Quality Improvement Plan must begin within 30 days of acceptance.

The San Diego Water Board expects that any deficiencies in the Water Quality Improvement Plan will be identified either in the public comments or during the review by the San Diego Water Board before implementation begins. In the event any deficiencies are identified after the implementation of the Water Quality Improvement Plan, Provision F.1.b.(7) clarifies that the San Diego Water Board maintains the right to require the Copermittees to correct any deficiencies that may be identified.

Provision F.2 (Updates) requires the Copermittees to update specific documents that the Copermittees will utilize to implement the requirements of this Order.

Each Copermittee is required to continue implementing a jurisdictional runoff management program, as required under Provision E. Implementation of each Copermittee's jurisdictional runoff management program is directed by its jurisdictional runoff management program document. Provision F.2.a requires each Copermittee to update its jurisdictional runoff management program document to be consistent with the requirements of Provision E within ~~18~~ 3 months after the acceptance of the Water Quality Improvement Plan ~~adoption of this Order~~.

Likewise, each Copermittee must continue to require new development and redevelopment projects to implement BMPs to control pollutants in storm water runoff. The control of pollutants in storm water runoff from development and redevelopment projects within each Copermittee's jurisdiction is guided and directed by its BMP Design Manual, formerly known as a Standard Storm Water Mitigation Plan (SSMP). Provision F.2.b requires each Copermittee to update its BMP Design Manual to be consistent with the requirements of Provision E.3 within ~~18~~ 3 months after the acceptance of the Water Quality Improvement Plan ~~adoption of this Order~~.

In general, the requirements of the Order should not necessitate a complete rewrite of each Copermittee's jurisdictional runoff management program document or BMP Design Manual, as was required by the Third Term Permits. The jurisdictional runoff management program and BMP Design Manual requirements of this Order are not significantly different than the requirements of the Fourth Term Permits. Thus, only sections of the Order which are new or have been significantly changed should warrant revisions to specific sections of the Copermittee's jurisdictional runoff management program document and BMP Design Manual.

Finally, the Water Quality Improvement Plans are expected to require updates as the iterative approach and adaptive management process included in the Water Quality Improvement Plan, as required under Provision B.5, is implemented by the Copermittees. Provision F.2.c.(1) requires the Copermittees to implement a public participation process for the proposed updates, review the proposed updates with the Panel, and submit the updates to the Water Quality Improvement Plan as part of the Annual Reports required under Provision F.3.b.

Also, because TMDLs are likely to be developed, adopted and approved during the term of the Order, Provision F.2.c.(2) has been included to expedite the incorporation of TMDLs into the Copermittees' Water Quality Improvement Plans as part of the update process, potentially before the Order is re-opened to incorporated the requirements of the new TMDLs.

Provision F.3 (Progress Reporting) requires the Copermittees to report on the progress of implementing the Water Quality Improvement Plans.

The requirements of Provision F.3 are to report the progress toward improving water quality that the Copermittees are achieving with the implementation of the Water Quality Improvement Plans and each Copermittee's jurisdictional runoff management program. The Progress Report Presentations required under Provision F.3.a are included to provide the Copermittees an opportunity to communicate directly with the San Diego Water Board and the public. The Progress Report Presentations will also provide the members of the San Diego Water Board and members of the public an opportunity to become more acquainted with the Copermittees and their projects and programs to address non-storm water and storm water discharges into and from their MS4s.

The Annual Report requirements of Provision F.3.b are a consolidation of several reporting requirements from the Fourth Term Permits, including the Jurisdictional Runoff Management Program Annual Reports, the Watershed Annual Reports, and the Monitoring and Reporting Program Annual Reports. Furthermore, the Annual Report requirements are consistent with the requirements under 40 CFR 122.42(c).

Pursuant to 40 CFR 122.42(c), "*[t]he operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the Director…must submit an annual report*", which must include the following:

(1) *The status of implementing the components of the storm water management program that are established as permit conditions* [40 CFR 122.42(c)(1)];

(2) *Proposed changes to the storm water management programs that are established as permit conditions* [40 CFR 122.42(c)(2)];

(3) *Revisions, if necessary, to the assessment of controls and fiscal analysis* [40 CFR 122.42(c)(3)];

(4) *A summary of data, including monitoring data, that is accumulated throughout the reporting year* [40 CFR 122.42(c)(4)];

(5) *Annual expenditures and budget for year following each annual report* [40 CFR 122.42(c)(5)];

(6) *A summary describing the number and nature of enforcement actions, inspections, and public education programs* [40 CFR 122.42(c)(6)];

(7) *Identification of water quality improvements or degradation* [40 CFR 122.42(c)(7)].

Under the Fourth Term Permits, each Copermittee is responsible for submitting a Jurisdictional Runoff Management Program Annual Report; the Copermittees in each designated watershed are responsible for submitting a Watershed Annual Report; and the Copermittees from each county are responsible for submitting a Monitoring and Reporting Program Annual Report.

There are 39 Copermittees in the San Diego Region, each required to prepare and submit a Jurisdictional Runoff Management Program Annual Report. There are 9 designated watersheds in San Diego County, 6 designated watersheds in Orange County, and 1 designated watershed in Riverside County for a total of 16 designated watersheds, each requiring a Watershed Annual Report. There are 3 sets of Copermittees in 3 counties in the San Diego Region, requiring Copermittees from each county to prepare and submit a Monitoring and Reporting Program Annual Report. Thus each Copermittee is currently required to prepare, or participate in the preparation of at least 3 annual reports. In addition, the San Diego County Copermittees are required to prepare and submit a Regional Urban Runoff Management Plan Annual Report.

In total, there are 59 annual reports that are prepared by the Copermittees and submitted to the San Diego Water Board for the Fourth Term Permits. The preparation of these annual reports requires significant time and resources from each Copermittee, which could otherwise be expended on actions that could improve water quality within its jurisdiction. In turn, significant time and resources are required from the San Diego Water Board staff to review these reports, which could otherwise be expended on working directly with the Copermittees to improve their implementation efforts toward restoring and protecting water quality.

Until the Water Quality Improvement Plans are developed, there will be a transitional period during which the Copermittees will continue to implement their existing jurisdictional runoff management programs. There will also be a transitional period during which the Copermittees will implement the transitional monitoring and assessment requirements of Provision D. During the transitional period, the Copermittees will submit annual reports pursuant to the requirements of Provisions F.3.b.(1) and F.3.b.(2).

Provision F.3.b.(1) includes the transitional annual reporting requirements for each Copermittee's jurisdictional runoff management program. The reporting of the jurisdictional runoff management program implementation efforts have been reduced to a single 2-page form. Each Copermittee is required to complete and submit a Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D or a revised form accepted by the San Diego Water Board) no later than October 31 of each year for each jurisdictional runoff management program reporting period (i.e. July 1 to June 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted. The Jurisdictional Runoff Management Program Annual Report Form will certify that each Copermittee has implemented its jurisdictional runoff management program in accordance with the requirements of Provision E. Each Copermittee may choose to continue to utilize and submit the jurisdictional runoff management program annual reporting format of its current Order until the first Water Quality Improvement Plan Annual Report is required to be submitted.

Provision F.3.b.(2) includes the transitional annual reporting requirements for the transitional monitoring and assessment program for each Watershed Management Area. The Copermittees in the Watershed Management Area are required to submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted. The Transitional Monitoring and Assessment Program Annual Report is required to include the transitional period monitoring data collected pursuant to Provisions D.1.a and D.2.a, and the findings from the transitional period findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

Provision F.3.b.(3) includes the Water Quality Improvement Plan Annual Report requirements. ~~only requires~~ Only one Water Quality Improvement Plan Annual Report is required for each of the 10 Watershed Management Areas designated under Provision B.1, which is a significant reduction in the number of annual reports required to be prepared and submitted by the Copermittees. The Water Quality Improvement Plan Annual Report will document the Copermittees' efforts to implement the Water Quality Improvement Plan. Each Water Quality Improvement Plan Annual Report will be focused primarily on reporting the analysis of the monitoring data collected pursuant to Provisions D.1-D.3 during the reporting period, and the assessments that are required pursuant to Provision D.4 based on the data. The monitoring data analyses and the assessments that are provided in the Water Quality Improvement Plan Annual Report will be the core of the report. The reporting of the jurisdictional runoff management program implementation efforts have been reduced to a single 2-page form, and will no longer be the primary focus of the reporting requirements as in the Third and Fourth Term Permits.

~~The~~ Each Copermittee will continue to prepare and submit a Jurisdictional Runoff Management Program Annual Report Form ~~(see Attachment D to the Order) will~~ as part of the Water Quality Improvement Plan Annual Report to certify that each Copermittee has implemented its jurisdictional runoff management program in accordance with the requirements of Provision E. Instead of reviewing a voluminous report from each Copermittee, as was required under the Third and Fourth Term Permits, the San Diego Water Board will conduct audits of each Copermittee's jurisdictional runoff management program to investigate and confirm the information provided by each Copermittee on its Jurisdictional Runoff Management Program Annual Report Form. The audits will allow the San Diego Water Board to become more familiar with the each Copermittee's jurisdictional runoff management program, and each Copermittee will become more informed about the expectations of the San Diego Water Board.

The reduction in the number and content of the Water Quality Improvement Plan Annual Reports should result in significant time, cost and resource savings for the Copermittees, as well as the San Diego Water Board. Those savings should offset a significant portion of any additional costs that may be incurred to develop the Water

Quality Improvement Plans and to implement the monitoring and assessment program requirements of Provision D.

The reporting period for the Water Quality Improvement Plan Annual Reports consists of two periods. Because the jurisdictional runoff management programs are typically budgeted and implemented during a fiscal year, the information provided on the Jurisdictional Runoff Management Program Annual Report Forms will cover the period from July 1 to June 30 of the following year.

The Water Quality Improvement Plan Annual Reports, however, are focused primarily on the monitoring data and the assessments based on the monitoring data. The monitoring data is collected during the monitoring year, which begins October 1 and ends September 30 of the following year. The monitoring year begins after the beginning of the fiscal year and ends after the end of the fiscal year. Therefore, to accommodate and capture the information collected during the fiscal year and the monitoring year, the Annual Report reporting period incorporates both periods.

Finally, Provision F.3.c requires the Copermittees to develop and submit a Regional Monitoring and Assessment Report. The Regional Monitoring and Assessment Report is similar to the Long Term Effectiveness Assessment required under the Fourth Term San Diego County Permit. The Regional Monitoring and Assessment Report is expected to utilize the entire body of data and information collected by the Copermittees during the term of this Order to assess improvements to water quality on a regional scale.

Provision F.4 (Regional Clearinghouse) requires the Copermittees to develop, update, and maintain an internet-based Regional Clearinghouse that can be used to store, disseminate, and share the Copermittees' documents, monitoring data, special studies, and any other data or information.

Most of the documents and data that are generated by the Copermittees can be provided in electronic format, and made available to the San Diego Water Board and the public on the internet. The San Diego Water Board has been gradually transitioning its document submittal requirements to electronic submittals. Provision F.4 has been included to further these efforts.

Provision F.4 has also been included to improve the exchange and availability of information among the Copermittees, as well as between the Copermittees and the San Diego Water Board. Provision F.4 will also make the information generated during the implementation of the Order more accessible to the public.

Provision F.5 (Report of Waste Discharge) requires the Copermittees to submit a Report of Waste Discharge to reapply for renewal of the Order prior to its expiration, in accordance with 40 CFR 122.21(d)(2) and CWC section 13376.

Because the Orange County and Riverside County Copermittees will not be subject to the requirements of this Order until they are notified of coverage, Provision F.5.a describes the process of submitting their Reports of Waste Discharge pursuant to the requirements of their current permits to obtain coverage under this Order.

For the Copermittees subject to the requirements of this Order, Provision F.5.b requires the Copermittees to submit a Report of Waste Discharge 180 days in advance of the expiration of this Order Provision F.5.b also describes the minimum information to be included in the Report of Waste Discharge, based on USEPA guidance "Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems", dated May 17, 1996.

Provision F.6 (Application for Early Coverage) describes the process that would allow the Orange County and/or Riverside County Copermittees to obtain coverage under this Order earlier than the expiration of their current Orders.

If the Orange County and/or Riverside County Copermittees choose to obtain coverage under this Order earlier than the expiration of their current Orders, the preparation and submittal of a Report of Waste Discharge, as required by the Fourth Term Permits, will not be necessary. The existing Order for the respective county will be rescinded upon the effective coverage date under this Order, except for enforcement purposes.

G. Principal Watershed Copermittee Responsibilities

Purpose: Provision G includes the requirements for the Principal Watershed Copermittee designated by the Copermittees in each Watershed Management Area.

***Discussion*:** Unlike previous NPDES requirements, there will no longer be a single Principal Copermittee. Provision G.1 requires the Copermittees to designate a Principal Watershed Copermittee for each Watershed Management Area. There are ten (10) Watershed Management Areas in the San Diego Region, as defined in Table B-1 under Provision B.1 of the Order. An individual Copermittee should not be the Principal Watershed Copermittee for more than two (2) Watershed Management Areas. There could be up to 10 Principal Water Copermittees designated for the Watershed Management Areas in the San Diego Region.

Provision G.2 describes the minimum responsibilities of each Principal Watershed Copermittee. The primary responsibility of the Principal Watershed Copermittees is to serve as the liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues. Ideally, the Principal Watershed Copermittee can represent the interests of all the Copermittees within a Watershed Management Area during discussions or meetings to facilitate communication with the San Diego Water Board. The Principal Watershed Copermittees are also responsible for facilitating and coordinating the implementation efforts of the Copermittees and submittals of required documents and reports.

The Principal Watershed Copermittee is responsible for facilitating the efforts of the Copermittees within the Watershed Management Area to develop the Water Quality Improvement Plan required under Provision B, and submit it for approval in accordance with Provision F.1. The Principal Watershed Copermittee is also responsible for coordinating the submittal of the document updates, Progress Report Presentations, and Annual Reports required from the Copermittees within each Watershed Management Area under Provisions F.2, F.3.a, and F.3.b. The Principal Watershed Copermittees are responsible for coordinating with each other to develop and submit the Regional Clearinghouse, Regional Monitoring and Assessment Report, and the Report of Waste Discharge required under Provisions F.3.c, F.4, and F.5.

The designated Principal Watershed Copermittee for each Watershed Management Area does not necessarily have to serve as the Principal Watershed Copermittee for the entire term of the Order. If the Copermittees in a Watershed Management Area choose to designate a new Principal Watershed Copermittee, the change may be submitted as part of the Annual Report required under Provision F.3.b, with an update to the Water Quality Improvement Plan in accordance with Provision F.2.c.

Provision G.3 specifies that the Principal Watershed Copermittee is not responsible for ensuring that the other Copermittees within the Watershed Management Area are in compliance with the requirements of this Order

H. Modification of Order ~~Programs~~

Purpose: Provision H provides the conditions under which modifications to Order No. R9-2013-0001 may occur.

***Discussion*:** Provision H allows for modifications to Order No. R9-2013-0001. Minor modifications may be made by the San Diego Water Board Executive Officer without a public notice or public hearing. Minor modifications are defined under 40 CFR 122.63. Minor modifications under 40 CFR 122.63 potentially applicable to this Order are the following:

- Correcting typographical errors;
- Requiring more frequent monitoring or reporting by the Copermittees;
- Changing an interim compliance date in a schedule of compliance, provided the new date is not more than 120 days after the date specified in the existing permit and does not interfere with attainment of the final compliance date requirement.

Modifications that are not one of the above minor modifications will require re-opening the Order, subject to the requirements of 40 CFR 122.44, 122.62 to 122.64, and 124.5~~(c)(1)-(3)~~, but only for the specific provisions subject to the modification. Modifications of the Order that are not minor require a draft Order with the proposed modifications made available for public review, a public notice and comment period, and a public hearing. Comments on the provisions not subject to the proposed modifications are not required to be considered in the San Diego Water Board's responses to comments or during the public hearing.

Provision H.4 was included ~~specifically to allow for~~ to specify that the Order ~~to~~ will be re-opened for modifications if ~~to make modifications to the requirements of Provision A should new language addressing compliance with water quality standards in the receiving waters be developed and issued by~~ the State Water Board determines revisions to Provision A are warranted, an application for early coverage under the Order is received pursuant to Provision F.6, the Basin Plan is amended to modify an existing TMDL or incorporate a new TMDL, or the monitoring and assessment program requirements need to be updated or revised.

Provision H.5 was included to specify that the San Diego Water Board will re-open and consider modifications to this Order when the Orange County Copermittees or the Riverside County Copermittees submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders

I. Standard Permit Provisions and General Provisions

Purpose: Provision I incorporates the standard permit provisions required to be included in all NPDES permits, as well as several other general provisions.

***Discussion*:** Provision I refers to Attachment B to the Order. Attachment B expressly incorporates the conditions applicable to all NPDES permits as provided under 40 CFR 122.41(a)-(n), as well as the applicable conditions for MS4s and storm water discharges provided under 40 CFR 122.42(c) and 40 CFR 122.42(d), respectively. Attachment B also includes several general provisions that are typically included in or applicable to waste discharge requirements issued by the San Diego Water Board.

IX. ATTACHMENTS

The attachments to the Order are discussed below. The discussions describe the content of the attachments.

Attachment A – Discharge Prohibitions and Special Protections

Section 1 of Attachment A includes the Waste Discharge Prohibitions from the Basin Plan. They have been provided verbatim in their entirety.

Section 2 of Attachment A includes the "*Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges*" applicable to permitted point source discharges of storm water, adopted under State Water Board Resolution No. 2012-0012. The terms, prohibitions, and special conditions (collectively referred to as special conditions) are established as limitations on point source storm water discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in ASBS, as required for State Water Quality Protection Areas pursuant to California Public Resources Code sections 36700(f) and 36710(f). These Special Protections were adopted by the State Water Board as part of the Ocean Plan General Exception.

Attachment B – Standard Permit Provisions and General Provisions

Conditions applicable to all NPDES permits, as required under 40 CFR 122.41, and conditions applicable to MS4s and storm water discharges, as required under 40 CFR 122.42(c) and 122.42(d), respectively are provided in Attachment B to the Order. They have been provided expressly in their entirety.

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. These general provisions are typically included in or applicable to waste discharge requirements issued by the San Diego Water Board. Many of the general provisions were developed by the State Water Board. Where a general provision is derived from statute or regulation, a citation of the statute or regulation section is provided. General provisions that do not provide a citation are included under the authority provided CWC 13377.

Attachment C – Acronyms, Abbreviations and Definitions

The acronyms and abbreviations that are used in the Order are provided in Attachment C. Attachment C also includes definitions that may provide an explanation or description of the meaning or intent of specific terms or phrases included in the Order.

Attachment D – Jurisdictional Runoff Management Program Annual Report Form

An example of the Jurisdictional Runoff Management Program Annual Report Form required to be submitted by each Copermittee as part of the Annual Reports required under Provision F.3.b.(1)(e) is provided as Attachment D to the Order. An electronic version of the form will be available from the San Diego Water Board after the adoption of the Order.

The Jurisdictional Runoff Management Program Annual Report Form includes the minimum information necessary to demonstrate that the Copermittee is implementing and in compliance with the requirements of Provision E, and includes much of the information required to be reported pursuant to 40 CFR 122.42(c).

The information that must be provided on the Jurisdictional Runoff Management Program Annual Report Form is limited to the fiscal year, which begins July 1 and ends June 30 of the following year. The information expected to be provided by the Copermittees in each section of the Jurisdictional Runoff Management Program Annual Report Form is discussed below.

I. COPERMITTEE INFORMATION

The name of the Copermittee (e.g. name of city, county, or special district) and the contact information for the storm water program manager are provided under this section.

II. LEGAL AUTHORITY

The Copermittee must confirm whether or not the legal authorities under Provision E.1.a have been established for itself within its jurisdiction.

The Copermittee must also confirm whether or not a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority, as required under Provision E.1.b. The certification statement required by Provision E.1.b is only required to be submitted with the first Annual Report required under Provision F.3.b.

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

The Copermittee must inform the San Diego Water Board whether or not an update to its jurisdictional runoff management program document was required or recommended by the San Diego Water Board during the reporting period. An update to the jurisdictional runoff management program is required under Provision F.2.a. The San Diego Water Board may recommend modifications to the jurisdictional runoff management program as part of the iterative approach and adaptive management process required under Provision B.5, which may result in an update that is necessary for the Copermittee's jurisdictional runoff management document.

If an update was required or recommended, the Copermittee must confirm whether or not the update was completed and made available on the Regional Clearinghouse within the reporting period. If no update was required or recommended, an answer is not required. If the answer is NO, meaning the required or recommended update was not completed and/or made available on the Regional Clearinghouse, the Copermittee must attach a schedule for the completion of the update and/or posting of the updated document on the Regional Clearinghouse.

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

The Copermittee must confirm whether or not a program was implemented during the fiscal year to actively detect and eliminate illicit discharges and connections in accordance with the requirements under Provision E.2.

In addition to confirming that a program to detect and eliminate illicit discharges was implemented during the reporting period, the Copermittee is also required to report on several items related to the program. The information that must be reported is limited to the fiscal year for the Annual Report.

All non-storm water discharges are considered illicit discharges unless the source is identified as one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5). If a non-storm water discharge is identified as one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5), the discharge is a non-storm water discharge, but not an illicit discharge. If a non-storm water discharge is identified but in not one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5), the discharge is both a non-storm water discharge and an illicit discharge.

V. DEVELOPMENT PLANNING PROGRAM

The Copermittee must confirm whether or not a development planning program was implemented during the fiscal year in accordance with the requirements under Provision E.3.

The Copermittee must also inform the San Diego Water Board whether or not an update to its BMP Design Manual was required or recommended by the San Diego Water Board during the fiscal year. An update to the BMP Design Manual is required under Provision F.2.b. The San Diego Water Board may recommend modifications to the BMP Design Manual, which may result in an update that is necessary for Copermittee's the BMP Design Manual.

If an update was required or recommended, the Copermittee must confirm whether or not the update was completed and made available on the Regional Clearinghouse within the reporting period. If no update was required or recommended, an answer is not required. If the answer is NO, meaning the required or recommended update was not completed and/or made available on the Regional Clearinghouse, the Copermittee must attach a schedule for the completion of the update and/or posting of the updated document on the Regional Clearinghouse.

The Copermittee is also required to report on several items related to the program. For the development and redevelopment projects that are reviewed under the program, the Copermittee must report the total number projects submitted for review during the fiscal year. Of those projects, the Copermittee must report the number that are Priority Development Projects, as defined under Provision E.3.b.(1). The Copermittee must also report the number of Priority Development Projects that were approved and/or granted occupancy during the fiscal year, regardless of when the project was originally submitted for review. Any projects that were approved during the fiscal year and granted any exemptions from the BMP Design Manual requirements and/or allowed to implement alternative compliance options in accordance with Provision E.3.c.(3) must be reported.

Finally, the Copermittee must also report on several items related to its oversight of permanent BMPs on Priority Development Projects within its jurisdiction, as required under Provision E.3.e. The information that must be reported is limited to the fiscal year for the Annual Report.

VI. CONSTRUCTION MANAGEMENT PROGRAM

The Copermittee must confirm whether or not a construction management program was implemented during the fiscal year in accordance with the requirements under Provision E.4.

The Copermittee is also required to report on several items related to its oversight construction projects within its jurisdiction. The information that must be reported is limited to the fiscal year for the Annual Report.

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

The Copermittee must confirm whether or not an existing development management program was implemented during the fiscal year in accordance with the requirements under Provision E.5.

The Copermittee is also required to report on several items related to its oversight in areas of existing development within its jurisdiction. The information that must be reported is limited to the fiscal year for the Annual Report. The information must also be separated into four categories of existing development: municipal, commercial, industrial, and residential.

VIII. PUBLIC EDUCATION AND PARTICIPATION

The Copermittee must confirm whether or not a public education program component was implemented during the fiscal year in accordance with the requirements under Provision E.7.a.

The Copermittee must also confirm whether or not a public participation program component was implemented during the fiscal year in accordance with the requirements under Provision E.7.b.

IX. FISCAL ANALYSIS

The Copermittee must confirm a summary of its fiscal analysis, conducted in accordance with the requirements under Provision E.8, has been attached to the form.

X. CERTIFICATION

A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative must sign and certify the Jurisdictional Runoff Management Program Annual Report Form. The appropriate box must be checked to indicate the whether the a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative is signing the form.

Attachment E – Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2013-0001

Attachment E provides specific provisions for implementing the load allocations (LAs) and wasteload allocations (WLAs) of Total Maximum Daily Loads (TMDLs) adopted by the San Diego Water Board and approved by USEPA in which the Copermittees are identified as responsible for discharges subject to the requirements of the TMDLs ~~meeting an assigned wasteload allocation (WLA)~~. Federal regulations require that NPDES requirements incorporate water quality based effluent limitations (WQBELs) that must be consistent with the requirements and assumptions of any available WLAs,[48] which may be expressed as numeric effluent limitations, when feasible, and/or as a best management practice (BMP) program of expanded or better-tailored BMPs.[49] Where the TMDL includes WLAs that provide numeric pollutant load or pollutant parameter objectives, the WLA has been, where feasible, translated into numeric WQBELs.[50]

For each TMDL in Attachment E, ~~five~~ four sections are included:

a. Applicability: This section provides the resolution under which the TMDL Basin Plan amendment was adopted and approved, with the applicable adoption and approval dates. This section also gives the effective date of the TMDL and where the TMDL is applicable (i.e. Watershed Management Area and water body). The Copermittees that are responsible for implementing the specific provisions are also given in this section.

b. Final TMDL Compliance Requirements~~Water Quality Based Effluent Limitations~~: For each TMDL, the final TMDL compliance requirements consist of the final TMDL compliance date(s), the final WQBELs, and the final TMDL compliance determination requirements. ~~t~~The final WQBELs are expressed in terms of receiving water limitations, effluent limitations, and/or best management practices (BMPs). The final WQBELs for the TMDLs are incorporated by reference into Provision A of the Order. The final WQBELs become enforceable when the final TMDL compliance dates have passed. Applicable BMPs within the final WQBELs must be incorporated into the Water Quality Improvement Plans. Compliance with the final WQBELs will be determined in accordance with the options provided under the final TMDL compliance determination requirements.

c. Interim TMDL Compliance Requirements~~Compliance Schedule~~: ~~The final date for compliance with the WLA assigned to the Copermittees is provided in this section.~~ If the final TMDL compliance date has not passed and there are interim TMDL compliance requirements, they are included in this section ~~as well~~. ~~The WQBELs become enforceable when the final compliance date has passed.~~ If there are interim WQBELs with interim compliance dates, the interim WQBELs become enforceable when the corresponding interim compliance dates have passed. Compliance with the interim WQBELs will be determined in accordance with the options provided under the interim TMDL compliance determination requirements.

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[48] 40 CFR 122.44(d)(1)(vii)(B)
[49] 40 CFR 122.44(k)(2) and 40 CFR 122.44(k)(3)
[50] November 12, 2010 Memorandum from the USEPA, Revisions to the November 22, 2002 Memorandum "Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLA""

d. Specific Monitoring and Assessment Requirements: If there are specific monitoring and assessment requirements that cannot be met with the monitoring and assessment program requirements under Provision D of the Order, the additional requirements are included in this section.

~~**e.** Compliance Determination: There may be several options to demonstrate compliance with the WQBELs. If there is more than one option to demonstrate compliance with the WQBELs, the options are provided in this section.~~

The requirements of the TMDLs are based on and consistent with the assumptions and requirements of any available ~~WLAs for~~ adopted and approved TMDLs that have been incorporated into the Basin Plan. Modifications to the requirements for the TMDLs in Attachment E cannot be made unless the TMDLs are modified in the Basin Plan.

A modification to any aspect of a TMDL in the Basin Plan requires a Basin Plan amendment. A Basin Plan amendment to modify a TMDL will require the San Diego Water Board to adopt a resolution to amend the Basin Plan, which includes a separate public process. When the San Diego Water Board adopts a Basin Plan amendment, it subsequently requires approval from the State Water Board, the Office of Administrative Law, and the USEPA before it becomes effective.

If and when the TMDLs are a modified in the Basin Plan, the San Diego Water Board will revise the requirements of the TMDL in accordance with the Basin Plan amendment. When a Basin Plan amendment to modify a TMDL becomes effective, the San Diego Water Board will modify the requirements of the TMDL pursuant to the requirements of Provision H.4 of the Order as soon as possible.

This Notice was sent on 3/06/2013 via US Mail to the attached list of Copermittees and Resource Agencies

April 10 and 11, 2013
Item No. 8
Supporting Document No. 8

011440

CALIFORNIA REGIONAL WATER QUALITY CONTORL BOARD
SAN DIEGO REGION

NOTICE OF PUBLIC HEARING

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) is scheduled to hold a public hearing to consider adoption of Tentative Order No. R9-2013-0001, NPDES No. CAS0109266, *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Tentative Order).

The Tentative Order is a regional MS4 permit that proposes to jointly cover all 39 Copermittees within the San Diego Region (i.e., South Orange County, Southwestern Riverside County, and San Diego County), in a phased manner as their current MS4 permits expire or upon request for earlier coverage prior to permit expiration. The Tentative Order covers multiple discharge points to multiple receiving waters throughout the San Diego Water Board Region. All MS4 Copermittees in the San Diego Region are therefore on notice that they may ultimately be regulated under the Tentative Order, if adopted.

The public hearing on this matter is scheduled on April 10 and 11, 2013 in the Board Room, San Diego Water Board, 9174 Sky Park Court, Suite 100, San Diego, CA 92123-4340. The item will be heard during the meetings that will start at 9:00 A.M. on each day. The location, however, may be changed prior to the meetings. The meeting agendas, which will indicate any changes, will be posted at http://www.waterboards.ca.gov/sandiego/board_info/agendas/, at least two weeks prior to the meeting dates.

All written comments including testimony, technical documentation and factual information pertaining to the terms and conditions of the Tentative Order to be considered by the San Diego Water Board were required to be submitted **by 5:00 pm on January 11, 2013**. The scope of oral testimony at the public hearing will be strictly limited to summarizing the previously submitted written comments, commenting on revisions to the Tentative Order made in response to comments, and making policy statements. No additional written materials will be accepted or provided to the San Diego Water Board Members.

Information related to this matter, including the Tentative Order is available and may be reviewed at the San Diego Water Board's office or on the San Diego Water Board's web page at: http://www.waterboards.ca.gov/rwqcb9/water_issues/programs/stormwater/index.shtml

A more detailed Notice of Public Hearing will be available on or about March 15, 2013.

Please contact Wayne Chiu at (858) 637-5558 or wchiu@waterboards.ca.gov for questions or comments regarding this hearing notice.

Please bring the foregoing to the attention of any person known to you who would be interested in this matter.

DAVID W. GIBSON
Executive Officer
March 5, 2013

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California Water Boards

Edmund G. Brown Jr.
Governor

Matthew Rodriquez
Secretary for
Environmental Protection

California Regional Water Quality Control Board, San Diego Region

HEARING PROCEDURES AND ORDER OF PROCEEDINGS

Public Hearing to Consider Adoption of Tentative Order No. R9-2013-0001, NPDES No. CAS01092662 and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds Within the San Diego Region

April 10 and 11, 2013
Beginning at 9:00 a.m. Each Day
California Regional Water Quality Control Board, San Diego Region
Regional Water Board Room
San Diego Water Board Office Building
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

By prior public notice dated March 5, 2013, the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) announced its intent to conduct a public hearing on April 10 and 11, 2013, to receive testimony and comments and consider adoption of Tentative Order No. R9-2013-0001, NPDES No. CAS0109266, *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Tentative Order). This Order of Proceedings sets forth additional details on the procedures and order of presentations the San Diego Water Board will follow at the public hearing.

SCOPE OF HEARING

The Tentative Order was released for public review and comment on October 31, 2012. The written comment period ended January 11, 2013. All timely written comments received are posted on the San Diego Water Board website, at http://www.waterboards.ca.gov/rwqcb9/water_issues/programs/stormwater/index.shtml. No subsequently filed written comments have been accepted into the record at this time. Other than speaker cards and copies of electronic presentations (see below) no new written materials will be accepted into the record at the April 10-11, 2013 hearing. As indicated in prior notices, the scope of oral testimony at the public hearing will be strictly limited to summarizing the previously submitted written comments, commenting on revisions to the Tentative Order made since the written comment period closed, and making policy statements. No new issues may be raised at the hearing.

HEARING PROCESS

During the public hearing, San Diego Water Board staff will present an overview of the Tentative Order, written responses to comments received and recommended revisions to the Tentative Order. For this proceeding, San Diego Water Board staff will begin, followed by representatives of the following parties: 1) the San Diego County, Orange County and Riverside County Copermittees; 2) U.S. Environmental Protection Agency; 3) Environmental Non-governmental Organizations (NGOs); and 4) Building Industry Groups.[1] Participants within these groups are encouraged to consolidate their presentations to save hearing time and/or avoid duplication.

After these presentations, the San Diego Water Board will hear from the public (interested persons), subject to times certain (see below). Interested persons with similar concerns or opinions are encouraged to choose one representative to speak, and are encouraged to coordinate their presentations with each other and to summarize their written comments. Interested persons may not cede their unused time to others, but the Chair will entertain requests for extra time from interested persons speaking on behalf of multiple interested persons.

Speakers will be interrupted not earlier than 4:00 p.m. on April 10 so that the San Diego Water Board can hear from interested persons other than representatives of the groups identified by name in this order of proceedings. At 9:15 a.m. on April 11, or as soon thereafter as practicable, elected officials will be invited to speak.

ORDER OF PROCEEDINGS

Chair's opening remarks, introductory items, administration of the oath to persons who intend to testify	**10 minutes**
San Diego Water Board Staff Presentation	**1.5 Hours**
San Diego County, Orange County and Riverside County Copermittees	**3 Hours (Total)**
US Environmental Protection Agency	**30 Minutes (Total)**
Environmental NGOs – (The Escondido Creek Conservancy, Coastkeeper, San Diego Canyonlands, Natural Resources Defense Council, Los Penasquitos Lagoon Foundation, Laguna Bluebelt Coalition, Friends of Rose Canyon Creek, Clean Water Now, Coastal Environmental Rights Foundation, Environmental Health Coalition, San Elijo Lagoon Conservancy, South Laguna Civic Association)	**1 Hour (Total)**

[1] These participants have been identified based upon prior participation through written comments, stakeholder meetings and public workshops held in November and December 2012.

Building Industry/Industry- (Association of General Contractors, Otay Land Company, Otay Ranch New Homes, American Society of Landscape Architects, BIA Regulated Coalition, BIA of Southern California, Industrial Environmental Association, San Diego Gas & Electric, San Diego Green Building Council, Southern California Gas Company)	**1 Hour (Total)**
Interested Persons (Time Certain at 4 p.m. on April 10, 2013)	**3 Minutes Each**
Elected Officials' comments (Time Certain at 9:15 a.m. on April 11, 2013)	**5 Minutes Each**

This allocated time includes time for any opening statement, main presentation, rebuttal and/or closing argument. San Diego Water Board Members and Counsel may ask questions at any time. Time for questions and answers will not count against the above time limits.

OBJECTIONS TO PROCEDURES

Other than as provided in this document, the San Diego Water Board intends to conduct this public hearing in a generally informal manner. Participants requesting alternative procedures, with procedural requests outside of the scope of this notice, or requesting more time to speak, must submit their requests or objections in writing to the San Diego Water Board staff member identified below no later than 5:00 pm on March 22, 2013. The San Diego Water Board will endeavor to accommodate reasonable requests and to respond to procedural objections and requests prior to the hearing. Untimely objections will be deemed waived.

POWER POINT AND OTHER COMPUTER DISPLAYS

Participants may use PowerPoint and other computer displays during their presentation to convey information electronically on the San Diego Water Board's computer. These displays will only be accepted if they summarize the information contained in documents that were timely submitted in compliance with deadlines cited above and in prior notices. They will not be accepted if they contain any new testimony or evidence. Please note that any person planning to use an electronic presentation at the hearing is required to provide a sufficient number of printed copies of the presentation for distribution to board members and staff and a reasonable number of copies to be available for the public to access during the hearing. An electronic copy of any presentation used during the hearing must be left with the San Diego Water Board's Executive Assistant for inclusion in the record. Electronic presentations will be posted on the San Diego Water Board's website as soon as practicable.

DOCUMENT AVAILABILITY

The Tentative Order, and attachments thereto, timely received comment letters on the Tentative Order, and other information and documents relied upon are posted on the San Diego Water Board website at: http://www.waterboards.ca.gov/rwqcb9/water_issues/programs/stormwater/index.shtml. A revised Tentative Order reflecting revisions since the written comment deadline and a

responses to comments document will be available shortly. Parties and interested persons will be notified by e-mail when those documents are posted on the Board's website.

These documents are also available for inspection and copying between the hours of 8:00 a.m. and 5:00 p.m. at the following address:

California Regional Water Quality Control Board
San Diego Region
9174 Sky Park Court, Suite 100,
San Diego, California 92123-4340

Arrangements for file review and/or obtaining copies of documents in the Administrative Record may be made by contacting the San Diego Water Board at (858) 467-2952. Appointments are encouraged so the documents can be readily available upon arrival. All timely received comment letters on the Tentative Order and responses to comments and other subsequent relevant documents will be available online as they are generated.

Staff Contact for Further Information
For questions or comments concerning this notice, please contact Wayne Chiu by phone at (858) 637-5558, or by email at wchiu@waterboards.ca.gov.

James G. Smith, AEO
for David W. Gibson

March 15, 2013

cc:
Distribution via email:
(see attached address list)

San Diego County Copermittees
Orange County Copermittees
Riverside County Copermittees
Resource Agencies

Distribution list via email:

San Diego County MS4 Permit Lyris List
Riverside County MS4 Permit Lyris List
Orange County MS4 Permit Lyris List
San Diego Water Board Agenda Lyris List

Tech Staff Info & Use	
Order No.	R9-2013-0001
Party (GT/CIWQS) ID	536787
File No.	n/a
WDID	n/a
NPDES No.	CAS0109266
Reg. Measure ID	387335
Place ID	786088
Person ID	n/a
Inspection ID	n/a

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CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

BOARD MEETING PARTICIPATION SIGN-IN SHEET

APRIL 10, 2013 – 9:00 A.M. – SAN DIEGO

****PLEASE PRINT LEGIBLY****

Name	Representing	Telephone No.	Email
Khosro Amirpour	City of Chula Vista	619 397 6111	Kamirpour@chulavista.ca
Tracy Drobnicki	City of Laguna Beach	949 497 0781	
Lisa Zawaski	Dana Point	949.248.3584	lzawaski@danapoint.org
Devin Slaven	City of Lake Forest	949-461-3436	dslaven@lakeforestca.gov
Jo Anne Wheat	County of S		
Ziad Marzouki	San Juan Capistrano	949.234-4413	zmarzouki@sanjuancapistrano.org
Arsalan Dadkhah	D-MAX	856 6600	
David Pohl	ESA	760 4973310	dpohl@esassoc.com
Mikhail Ogawa	Del Mar	619 994 7074	mikhail@ogawaeng.com
Paul Hartmann	Orange County	760 730-9446	paulh@lwd.com
Brett Gamble	MWE	760 803 2917	brett@mwgroupweng.com
David Garcia	RCFC & WCD		
Kris Weber	Hunsaker & Assoc.	949-458-5430	kweber@hunsaker.com
Eric Lamell	RCFC & WCD	951-955-8585	elamell@rcflood.org
Scott Brucker	RCFC & WCD	951-955-0843	sebrucker@rcflood.org
Claudio Padres	"	951-955-1205	cmpadres@rcflood.org
John Quenzer	City of National City	553 596 6600	jquenzer@nationalcity.com
Jeff Wong	City of Escondido	760 839-4545	jwong@escondido.org
James Wood	City of Carlsbad	760 602-7589	james.wood@carlsbadca.gov
Dave Renfrew	Weston Solutions	760-795-6903	dave.renfrew@westonsolutions.com
Roger Butow	Clean Water Now	949 715-1912	rogerbutow@cwn.com
Michael Hazard	O.C. Coastkeeper	949 690 7510	EMHazard@[illegible]
Dennis Bowling	RICK ENGINEERING	619 691 1441	dbowling@rickengineering.com
Brian Gordon	US Navy	619 532-2273	brian.gordon@navy.mil
Chris Haynes	US Navy	619 532-2273	chris.haynes@navy.mil
Karen Cowan	Larry Walker Assoc.	310 394-1036	Karenc@lwa.com
Stewart McClure	Clean Water Solutions	760 578-2575	
Joe Arthur	Clearwater Solutions	951-315-7777	mulesse53@hotmail.com
Doug Friedman	County of Orange	714 667-8841	doug.friedman@ocpw.ocgov.com
Ben Syz	Port of San Diego	760 437 4485	bsyz@[illegible]
Matthew Huber	Green Rock OFS	760-525-9834	Matthew@GreenRockOFS.com
Kathryn Horning	Helix Water	619-235-1516	khorning@helixwater.com
Ed Othmer	URS	619.881.9292	Ed.Othmer@urs.com
Ron Kemp	City of Carlsbad	760 434 2891	
Elaine Cutler	City of Carlsbad	760 602 2400	
Erik Steedbeck	City of Encinitas	760-943-2108	estedbeck@encinitasca.gov
Todd Snyder	County of S.D.	858 694-3482	todd.snyder@sdcounty.ca.gov
Cid Tesoro	County of SD	858 694-3672	cid.tesoro@sdcounty.ca.gov
Matt Little	City of Coronado	619-522-7312	mlittle@coronado.ca.us

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

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Name	Representing	Telephone No.	Email
Kim Godby	Coronado	619 522-7387	kgodby@coronado.ca.us
Rae Beimer	City of RSM	7147886934	rbeimer@cityofrsm.org
Ryan Waterman	BPA Cecilia	858-794-4100	rwaterman@stoel.com
Lee Kaminetz	San Diego Airport Auth	619-400-2429	lkaminet@san.org
Annie Martin	"	619-400-2401	amartin@san.org
Drew Kleis	City of San Diego	858-541-4329	akleis@sandiego.gov
JOE PARCO	CITY OF RANCHO SANTA MARG	949-635-1813	jparco@cityofrsm.org
KACEN CLAPPER	COUNTY OF ORANGE	714-955-0652	KACEN.clapper@ocpw.ocgov
MARK STEPHENS	SELF	619 234-6355	MSDESMTNS@GMAIL.com
Trevor Alsop	Geosyntec	619-810-2090	talsop@geosyntec.com
Heather Stroud	City of SD	619 533 5872	hstroud@sandiego.gov
Deborah Mosley	County of San Diego	619-204-5831	deborah.mosley@sdcounty.ca.gov
STEVE STRAPAC	CITY OF POWAY	858-668-4653	SSTRAPAC@POWAY.ORG
Tracy Cline	County SD		
Garth Engelhorn	Weston	760-644-0967	garth.engelhorn@westonsolutions.com
Allison Rosskopf	Port	619.686.6434	
Kip Strugham	City of San Diego	619 236 6581	
Cheryl Filan	City of Vista	760-862-4803	cfilan@cityofvista.com
Mike Zarley	Kitchell Environmental Svcs.	619 798 7463	mzarley@kitchell.com
DOUGLAS KOT	SAN DIEGO USGBC	619 944 8607	doug@usgbc-sd.org
Ruth Kolb	City San Diego	858.541.4326	rkolb@sandiego.gov
Matt O'Malley	Surfrider	619 241 1894	matt@omalleylawgroup.com
Kris McFadden	City of SD	858 541 4320	kmcfadden@sandiego.gov
Bryn Evans	URS	858 8129292	bryn.evans@urs.com
Julia Chung Hear	Surfrider SD	619-246-8881	julia@surfridersd.org
Doug Liden	EPA	619 235 4763	liden.douglas@epa.gov
Jesse Gipe	Senator Joel Anderson	818 302-5210	jesse.gipe@sen.ca.gov
Sherri McPherson	County of SD	858 495-5285	sherri.mcpherson@sdcounty.ca.gov
David Marx	Geosyntec	619-810-4030	dmarx@geosyntec.com
Daniel Apt	Orange County	949-330-4117	dapt@rbf.com
Scott Taylor	Orange County	949 246-6246	staylor@rbf.com
Jim Rasmus	SAN DIEGO	858 945 8075	RASMUSJB@BP.com
Scott Smith	CITY OF OCEANSIDE	760.435.5074	SSMITH@CI.OCEANSIDE.CA.US
Jill Witkowski	San Diego Coastkeeper	619-758-7743	jill@sdcoastkeeper.org
Fred Jacobsen	SDGE	619 858-637-3723	fjacobsen@semprautilities.com
Adrianna Kripke	San Diego Gas & Electric	619 696 2476	akripke@semprautilities.com
Nancy Palmer	City of Laguna Niguel	949-362-4384	npalmer@cityoflagunaniguel.org
JACK MONGER	IEA	619-522-9000	Jack.Monger@iea-sd.com
HELEN DAVIES	CITY OF SANTEE	619 258 4100 x177	hdavies@cs.santee.ca.us

-CA-45

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

BOARD MEETING PARTICIPATION SIGN-IN SHEET

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Name	Representing	Telephone No.	Email
Mo. Lahsaie	City of O/Side	760-435-5803	mlahsaie@ci.oceanside.ca.us
Amanda Archenhold	AMEC	858-514-6468	amanda.archenhold@amec.com
JAIME CAMPOS	CITY OF EL CAJON	619-441-5554	scamposcityofelcajon
Robert Stone	QUANTUM OZONE INC	858-859-7097	RDSstormwater2013@gmail.com
Pete Shuffer	Quantum Ozone INC.	" " "	" " "
EMMA SAKAGUCHI	QUANTUM OZONE INC	858-858-7097	emma.quantumozone@gmail.com
W GATES	SDGE	(858)637-3726	
Sharri Sellhorn	SeaWorld	619-224-3637	
KHALIQUE KHAN	CAMP PENDLETON	760 763-1969	khalique.khan@usmc.mil
JOHN ERDENSOHN	LATITUDE 33	(858) 751-0633	JOHN.ERDENSOHN@LATITUDE33.COM
ALDO LICITRA	CITY OF TEMECULA	951 308 6387	ALDO.LICITRA@CITYOFTEMECULA.ORG
Billy Walker	City of Oceanside	760 435-5164	bwalker@ci.oceanside.ca.us
Nancy Gardiner	Weston Solutions	858 337 4061	nancy.gardiner@westonsolutions.com
Rosanna Lacarra	LaRuc Environmental	760 533 1875	rosanna@laruc environmental.com
JOHN ADRIANY	CHEMMETRICS	john.adriany@yahoo.com	
Soumya Chennapragada	NV5	607-342-2614	soumya.chennapragada@nv5.com
Lisa Skytech	Brown Caldwell	858-571-6739	lskytech@brwncald.com
JAY SHRAKE	AMEC	858-514-8859	jay.shrake@amec.com
Krishna Hysler	AMEC	858 514 6462	krishna.schneider@amec.com
Bill Baber	ABC-SD	619-316-0592	WRBLAW@FLASH.NET
Enca Pagan	City of San Marcos	760-744-1050	epagan@sanmarcos.net
Chris Helmer	City of Imperial Beach	619-628-1370	chelmer@cityofib.org
Jenna Voss	County of Orange	714 955 0612	jenna.voss@ocpw.ocgov.com
M.A. SKARPANICH	COUNTY OF ORANGE	714.299.1863	on record
Michelle Hellerud	SDAR	619 886-8890	Michelle@SDRealtyGals.com
Rebecca Polkinghorne	SDAR	619-846-3040	rebecca@sdrealtygals.com
Taryn Kijolsing	Solana Beach	858-720-2487	tkijolsing@cosb.org
Bill McMinn	PORT	619-686-6249	BMcMinn@PortofSD
Mary Kay Faryan	NavRe South West	619-532-4301	marykay.faryan@navy.mil
Conrad Crompton	County of Orange	714 955-0659	Conrad.Crompton@ocpw.ocgov.com
Stephanie Gauvin	County of SD	858 694 3493	
LAURA EISENBERG	RANCHO MISSION VIEJO	949.240.3863	LEISENBERG@RMV.COM
ANN BECHTEL	Atkins	858 514 1024	Ann.Bechtel@atkinsglobal.com
Tim Holbrook	County of SD	858 614 7746	Tim.Holbrook@sdcounty.ca.gov
JOE AMES	CITY OF MISSION VIEJO	949 470 8419	james@cityofmissionviejo.org
Roshan Christoph	AMEC	858-514-6475	roshan.christoph@amec.com
Vicki M. Campbell	SDAR	619-787-0913	vicki@vickicampbell.com
OPPOSED ↑			

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

BOARD MEETING PARTICIPATION SIGN-IN SHEET

APRIL 10, 2013 – 9:00 A.M. – SAN DIEGO

****PLEASE PRINT LEGIBLY****

Name	Representing	Telephone No.	Email
Marilyn O'Neill	Nautilus Environmental	858 587 7333	marilyn@nautilusenvironmental.com
RAVI RAJAT	USCBC - SD	805-368-7670	RAVI@USCBC-SD.ORG
Efrem Bynon	San Diego Regional EDC	619-615-2968	eb@sandiegobusiness.org
Harry Orgovan	Chula Vista Kayak	619-422-3600	cvkayak@gmail.com
Christine Mailloux	Friends of Rose Canyon	858 558-7930	cmailloux@san.rr.com
Edgar Camerino	San Diego Highway Dev. Assoc.	619-291-0707	Ecamerino@rdengineering.com
RYAN VERSCHOOR	AMEC	514-6467	ryan.verschoor@amec.com
Christy Suppes	County of Orange	714-955-0673	christy.suppes@ocpw.ocgov.com
Sandra Moore	SD Coastkeepers	858-459-2220	sandramoore@mindspring.com
Colin Kelly	OC Coastkeeper/JEWK	714 850-1965	Colin@coastkeeper.org
MARK CORCORAN	SAN DIEGO SURFRIDER	619-886-8354	MARK@SURFRIDER.ORG
Shauna McKellar	SD Surfrider	(925) 437-9043	smckellar@gmail.com
Lori Jones	SD Surfrider	619 507-5222	cato1020@yahoo.com
[illegible]	SD Surfrider	(858) 248 2553	Sabrina.S.Garland@gmail.com
HARON RICHEN	SD SURFRIDER	732.856.8318	a.matthew.r@gmail.com
Micah Mitrosky	Coastkeeper	858-384-8573	[illegible]
Crystal Carson	Surfrider	8502940769	crystal@surfridersd.org
Randall Iwai	Surfrider San Diego	858-538-1782	randy@surfridersd.org
Natalie Shapiro	Coastkeeper	406-241-2153	bloomingtrilliums@yahoo.com
Ann Swanson	Sunset Cliffs Nat. Park Council	619-222-8141	ann@swanson2.com
Eric Swanson	Friends of Sunset Cliffs	619-222-9642	eric@swanson2.com
Izzy Tihanyi	Surf Diva Surf School	858 454-8273	izzy@surfdiva.com
Jonathan Parkinson	Me	858-663-1844	jlparkinson1@gmail.com
Terry Rodgers	Surfrider San Diego	858 736 6652	terry.rodgers@yahoo.com
Sunshine Johnson	Surfrider SD	619 838 6768	Sunshine@surfridersd.org
Jim Peugh	S.D. Audubon Society	619-224-4581	peugh@cox.net
Margie Johnson	Surfrider San Diego	619 776 6768	margiejhp@hotmail.com
VAIKKO ALLEN	CONTECH ENVIRONMENTAL SOLUTIONS	310-850-1736	vallen@conteches.com

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

011453

STATEMENT IN SUPPORT OF RECOMMENDED ACTION – ITEM 8
APRIL 10-11, 2013 – 9:00 A.M. – SAN DIEGO

	Signature	Please Print Name	Representing	Phone or Email
1.		Jill Witkowski	San Diego Coastkeeper	619.758.7743
2.		~~Tim Halbrook~~	~~San Diego County~~	~~tim.halbrook@sdcounty.ca.gov~~
3.		Matt O'Malley	Surfrider	matt@omalleylawgroup.com
4.	w/ amendment	Tilia Chunn-Heer	Surfrider	619-246-8881
5.		DOUGLAS KOT	SAN DIEGO USGBC	619-944-8607
6.		RAUL RAJAS	~~SAN DIEGO USGBC~~	~~805-368-7670~~
7.		Jamie Ortiz	Self	8583377446
8.		Harry Orgovan	Chula Vista Kayak	619-422-3600
9.	Christine Mailloux	Christine Mailloux	Friends of Rose Canyon	cmailloux@san.rr.com
10.		Sandra Moore	SD Coast Keeper	858-459-2220
11.	Lyle Bella	Lyle Bella	Surfrider	619 223 2759
12.	Allison Prange	Allison Prange	Surfrider	530-412-0505
13.		Adam Andrus	Surfrider	619-518-4515
14.		RODERICK MICHENER	SURFRIDER	roderick@surfriderd.org
15.		Shauna McKellar	Surfrider	(925) 437-9043
16.		SABRINA GARLAND	Surfrider	(858) 248-2553
17.		Lon. Jones	Surfrider	(619) 507-5222
18.		AARON RICHTER	SELF / SURFRIDER	(732) 856-8318
19.		MARK CORCOMAN	SURFRIDER	619-886-8354
20.		Patrick Mulvey	Surfrider	858-775-8712
21.		Travis Pritchard	San Diego Coastkeeper	619-758-7743
22.		Micah Hibosky	Coastkeeper	858-386-8573
23.		GAVIN SEEDORF QSP	THRESHOLD ENVIRO	(858) 688 3522
24.		Randall Iwai	Surfrider San Diego	(858) 538-1782
25.		Crystal Carson	"Support w/ amendment * No safe harbor clause!"	8502840769

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

011454

STATEMENT IN SUPPORT OF RECOMMENDED ACTION – ITEM 8
APRIL 10-11, 2013 – 9:00 A.M. – SAN DIEGO

	Signature	Please Print Name	Representing	Phone or Email
26.		Natalie Shapiro	Coastkeeper	(406)241-2153
27.		Ann E. Swanson	Sunset Cliffs	(619)222-8141
28.		Eric Swanson	Friends of " ", Inc	619-222-9642
29.		Izzy Tihany	Surf Diva	858 454 8273
30.		Haley Haggerstone	Surfrider Foundation	619 929 5350
31.		Terry Rodgers	Surfrider Foundation	858 736 6652
32.		MEGAN BAEHRENS	SELF	858-335-6314
33.		SCOTT HARRISON	SURFRIDER + 55 yr SD resident	619-722-5810
34.	Erin Campbell	Erin Campbell	self	805-698-8658
35.	Sumer Hasenin	Sumer Hasenin	City of SD	syhasenin@sandiegoga
36.				
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CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

011455

STATEMENT IN OPPOSITION TO RECOMMENDED ACTION – ITEM 8

APRIL 10-11, 2013 – 9:00 A.M. – SAN DIEGO

	Signature	Please Print Name	Representing	Phone or Email
1.	Richard Boon	RICHARD BOON	County of Orange	714 955 0670
2.	Ryan Baron	RYAN BARON	" "	" "
3.	JoAnn Weber	JoAnn Weber	County of San Diego	858-495-5310
4.	Richard Crompton	Richard Crompton	County of San Diego	858-694-2233
5.	Brad Fowler	BRAD FOWLER	CITY OF DANA POINT	949 248 3582
6.	Jason Uhler	Jason Uhler	Riverside County Flood Control	951 955 1273
7.	DAVID GARCIA	DAVID GARCIA	RCFC & WCD	951 955-1320
8.	Claudio Padres	Claudio Padres	"	951 955 1205
9.	MaryAnne Sporporich	MARYANNE SPORPORICH	County of Orange	714.299.1863
10.	ROGER BUTOW	ROGER BUTOW	CLEAN WATER NOW	949-715-1912
11.	MICHAEL HAZZARD	MICHAEL HAZZARD	CLEAN WATER NOW	(949) 690-2510
12.	DENNIS BOWLINE	DENNIS BOWLINE	RICK ENGINEERING	619 686-1441
13.	CHRIS CROMPTON	CHRIS CROMPTON	County of Orange	714 955-0630
14.	Scott Morris		County of SD	858-694-2482
15.	Todd Snyder	TODD SNYDER	COUNTY OF SD	858 694-3482
16.	Tony R Walker	Tony R Walker	Tony R. Walker Engineering	760 414 9212
17.	James E Whalen	JAMES E Whalen	J. Whalen Associates	619 683-5544
18.	ERIK STEENBOCK	ERIK STEENBOCK	CITY OF ENCINITAS	760 943-2128
19.	CID TESORO	CID TESORO	COUNTY OF SD	858-694-3672
20.	Drew Kleis	Drew Kleis	City of San Diego	858-541-4329
21.	Shane Horn	SHANE HORN	COUNTY OF RIVERSIDE	951. 955 1186
22.	J T Yean	J T YEAN	OCPW	714-667-8871
23.	Heather Stroud	Heather Stroud	City of San Diego	619 533 5872
24.	Mike Zarley	Mike Zarley		602 739 1117
25.	[redacted]	[redacted]	[redacted]	[redacted]

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

011456

STATEMENT IN OPPOSITION TO RECOMMENDED ACTION – ITEM 8
APRIL 10-11, 2013 – 9:00 A.M. – SAN DIEGO

	Signature	Please Print Name	Representing	Phone or Email
26.		Sumer Hasenin	City of SD	syhasenin@sandiego.gov
27.		Thomas Fuller	BIA / DECATUR CORS.	thom.fuller@decaturenvironmental.com
28.		Kaitlin Murphy	Murphy Development	kmurphy@murphydev.com
29.		JAMES TOSTADO	HIBISCUS REAL ESTATE	858-752-2652
30.		Barry Gerigo	Pacifica Cinco	760-741-7988
31.		Michelle Hellerud	SDAR San Diego	619 886-8890
32.		Rebecca Pollack-Rude	SDAR San Diego	619.846.3040
33.		Devin Shaver	City of Lake Forest	949-461-3436
34.		Deborah Mosley	County of SD	619-304-5831
35.		Stephanie Gaines	" "	858-694-3493
36.		Efrem Bycer	San Diego Regional EDC	619-615-2968
37.		EDGAR CAMERINO	SAN DIEGO HIGHWAY DEL. ASSOC.	619-291-0707
38.		Valerie Allen	CONTECH	vallen@conteches.com
39.		Joe Kuhn	City of La Mesa	619-667-1340
40.		JoAnn Weber	County of San Diego	858-485-5317
41.		Gary Felien	Oceanside City Council	760-435-3551
42.		Richard Crompton	County San Diego	858-694-2233
43.		TROY BANKSTON	COUNTY OF SAN DIEGO	858 694-2125
44.		Noah Garrison	NRDC	310 434 2300
45.		Colin Kelly	OC COASTKEEPER / IRWK	3714850 1965
46.		ALDO LICITRA	CITY OF TEMECULA	951 308 6387
47.		MATT RICH	INDIVIDUAL	858.514.6478
48.		Luis Parra	TRWE / SDSU	951-775-6474
49.		Faith Picking	BIOCOM	858-455-0300 x113
50.		Fred Jacobsen	SDG&E	858-637-3723

NAME: Chris Haynes

AGENDA ITEM NO. 8

011457

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Navy - Water Program Engineer

ADDRESS: 937 N. Harbor Dr. TELEPHONE: 619.532.2285

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Chris Haynes hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/2013 Signature: Chris A. Haynes

NAME: Christine Mailloux AGENDA ITEM NO. 8 ✓

011458

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

PLEASE PRINT LEGIBLY

*I need to leave by 5pm

TITLE/AFFILIATION: Board Member, Friends of Rose Canyon

ADDRESS: 5868 Dirac St SD TELEPHONE: 858 558-7930

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Christine Mailloux hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4-10-13 Signature: Christine Mailloux

NAME: Livia Borak

AGENDA ITEM NO. 011459 8 ✓

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Coastal Environmental Rights Foundation

ADDRESS: 1140 S Coast HWY 101 Encinitas CA 92024 TELEPHONE: 760 942 8505

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Livia Borak hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/2013 Signature:

011460

NAME: Julia Chunn-Heer

AGENDA ITEM NO. 8

Support w/ request ammendment to "Safe-harbor"

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Campaign Coordinator, Surfrider San Diego

ADDRESS: 9883 Pacific Heights Blvd Ste D, San Diego 92121 TELEPHONE: 619-246-8881

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Julia Chunn-Heer hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/13

Signature:

NAME: ADAM HEER
(Cedd time to Julia Chunn-Heer)

AGENDA ITEM NO. 8 ✓
011461
with amendment

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: SURFRIDER

ADDRESS: 2221 Cambridge Ave Carlsbad, CA 92008 TELEPHONE: 760 271-8066

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, ADAM HEER hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/13 Signature: [signature]

NAME: Matt O'Malley

AGENDA ITEM NO. 8

011462

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Attorney, Surfrider San Diego

ADDRESS: 3151 Coursen Ave SD 92117 TELEPHONE:

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Matt O'Malley hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/13

Signature:

011463

NAME: Paloma Aguirre

AGENDA ITEM NO. 8
with ammendment

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: WILDCOAST

ADDRESS: 925 Seacoast Dr. TELEPHONE: 619.423.8665

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Paloma Aguirre hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/13 Signature:

NAME: Haley Haggerstone

AGENDA ITEM NO. 8
Support w/ amendment
011464

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Surfrider Foundation

ADDRESS: 2152 Abbott St TELEPHONE: 619-929-5350

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Haley Haggerstone hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/13 Signature: H. Haggerstone

NAME: Allison Prange

AGENDA ITEM NO. 8

011465

Support of amendment

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: SurfrideR

ADDRESS: 4778 Cass st #B San Diego Ca 92109 TELEPHONE: 530-412-0505

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Allison Prange hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/13

Signature: [illegible]

NAME: ALISON HINDLEY

AGENDA ITEM NO. 6 011466

Support of amendment

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Surfrider Foundation

ADDRESS: 4653 CARMEL MTN RD, SUITE 308, SAN DIEGO 92130 TELEPHONE: 858-212-9932

State your name and address (spell your last name) for the record prior to beginning your presentation. Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Alison Hindley hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/13 Signature: A Hindley

NAME: Lyle Beller

AGENDA ITEM NO. 8 011467

Support w/ amendment

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Self

ADDRESS: 4444 Cape May Ave, SD. 92107 TELEPHONE: 619 223 2759

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Lyle Beller hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 10 April 2013 Signature: Lyle Beller

NAME: Sandra Moore

AGENDA ITEM NO. 8

011468

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Resident / Concerned Citizen

ADDRESS: 7911 Calle de la Plata TELEPHONE: 858-459-2220

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Sandra Moore hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4-10-13 Signature: Sandra Moore

NAME: Jamie Ortiz

AGENDA ITEM NO. 8 with ammendment

011469

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: CEO Jamie Ortiz Communications

ADDRESS: 3050 Rue Dorliano #231 San Diego, CA TELEPHONE: 8583377446

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Jamie Ortiz hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4.10.13

Signature: Jamie Ortiz

NAME: Harry Orgovan **AGENDA ITEM NO.** 011470 8

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Chula Vista Kayak

ADDRESS: 620 W. Manor Dr. TELEPHONE: 619 422-3600

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Harry Orgovan hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4-10-13 Signature: Harry Orgovan

NAME: Jim Peugh

AGENDA ITEM NO. 011471 8

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Conservation Chair, SD Audubon Society

ADDRESS: 2776 Nipoma St, S.D 92106 TELEPHONE: 619-224-4591

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Jim Peugh hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: _____ Signature: James A. Peugh

NAME: RODERICK MICHENER

AGENDA ITEM NO. 8 011472
with ammendment

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: SURFRIDER SAN DIEGO

ADDRESS: 2681 A St, S.D. 92102 TELEPHONE: 619.244.2789

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Roderick Michener hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/13 Signature:

NAME: Belinda Smith

AGENDA ITEM NO. 8 with ammendment

011473

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Surfrider

ADDRESS: _____ TELEPHONE: 619 922 8972

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Belinda Smith hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4·10·13. Signature: Belinda Smith

NAME: Shauna McKellar

AGENDA ITEM NO. 8
with ammendment

011474

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Surfrider Foundation

ADDRESS: 3860 Elijah Ct 1016
San Diego CA 92130

TELEPHONE: (925) 437-9043

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Shauna McKellar hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/13

Signature: Shauna McKellar

NAME: Mark West

AGENDA ITEM NO. 8
with ammendment

011475

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: SURFRIDER

ADDRESS: 321 DAISY AVE IB CA 9183

TELEPHONE: (619) 807-9297

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Mark West hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/13

Signature: [signature]

NAME: Kristin Brinner **AGENDA ITEM NO.** 8

011476

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Surfrider

ADDRESS: 542 Via de la Valle #K TELEPHONE: 858-876-8293
Solana Beach CA 92075

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Kristin Brinner hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/13 Signature: [illegible]

011477

NAME: TODD T. CARDIFF **AGENDA ITEM NO.** B

must leave no later than 1pm

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: SURFRIDER

ADDRESS: 4559 COPELAND AVE SAN DIEGO. CA 92116 TELEPHONE: 619 546-5123

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, TODD T. CARDIFF hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4.10.2013 Signature: Todd T. Cardiff

NAME: MARK CORCORAN AGENDA ITEM NO. 011478 8

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: SURFRIDER SAN DIEGO

ADDRESS: 1368 CREST ROAD TELEPHONE: 619-886-8354

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, MARK CORCORAN hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4-10-13 Signature: MCorcoran

NAME: MEGAN BAEHRENS **AGENDA ITEM NO.** 8

011479

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: EXECUTIVE DIRECTOR / SAN DIEGO COASTKEEPER

ADDRESS: 2825 DEWEY RD #200 SAN DIEGO, CA 92106 TELEPHONE: 619.758.7743 X103

State your name and address (spell your last name) for the record prior to beginning your presentation. Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Megan Baehrens hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/13 Signature: M Baehrens

011480

NAME: Travis Pritchard **AGENDA ITEM NO.** 8

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Lab Manager / San Diego Coastkeeper

ADDRESS: 2825 Dewey Rd TELEPHONE: 619 758-7743

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Travis Pritchard hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/13 Signature:

011481

NAME: Randall Iwai leave @ 5:30 **AGENDA ITEM NO.** 8 with ammendment

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Surfrider Executive member

ADDRESS: 12866 Via Caballo Rojo TELEPHONE: (858) 538-1782

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Randall Iwai hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4-10-2013 Signature: Randall Iwai

NAME: crystal carson **AGENDA ITEM NO.** 8 with amendment

011482

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: surfrider board

ADDRESS: 802 5th St coronado CA 92118 TELEPHONE: 8502847769

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, crystal carson hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/2013 Signature:

011483

NAME: RAVI BAJAJ **AGENDA ITEM NO.** 6

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: PROJECT COORDINATOR / USGBC - SAN DIEGO (SURFRIDER + COASTKEEPER)

ADDRESS: 5010 SHOREHAM PL., SD CA 92122 TELEPHONE: 805-368-7670

State your name and address (spell your last name) for the record prior to beginning your presentation. Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Ravi Bajaj hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 04/10/2013 Signature:

NAME: Natalie Shapiro

AGENDA ITEM NO. 8

011484

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Volunteer with Coastkeeper

ADDRESS: 7835 Rush Rose Dr, #114
Carlsbad, CA 92009

TELEPHONE: (406) 241-2153

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Natalie Shapiro hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4-10-13

Signature: [illegible]

011485

NAME: Rogen Kube ("QB") **AGENDA ITEM NO.** 8

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Surfrider Foundation SD County Chapter

ADDRESS: San Diego TELEPHONE: 619-701-4027

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Rogen Kube hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/13 Signature:

011486

NAME: Jonathan Parkinson **AGENDA ITEM NO.** _____

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: RA / None

ADDRESS: 4964 Brighton Avenue TELEPHONE: 8586631844

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Jonathan Parkinson hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 04/10/13 Signature: _____

NAME: Izzy Tihangi

AGENDA ITEM NO. 8

011487

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Owner / operator Surf Diva Surf School

ADDRESS: 2160 Ave de la Plaza
La Jolla, CA 92037

TELEPHONE: 858 454-8273

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Izzy Tihangi hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/13

Signature:

NAME: Terry Rodgers AGENDA ITEM NO. 8

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Surfrider Foundation San Diego

ADDRESS: 3845 Arroyo Sorrento
San Diego, CA 92130

TELEPHONE: 858 7366652

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Terry Rodgers hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 10/April 2013 Signature: Ty Rodgers

NAME: Rick Alexander

AGENDA ITEM NO. R-9-2013-001

011489

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: SD CRAB

ADDRESS: 1520 MERRITT DR. EL CAJON

TELEPHONE: 619-593-0539

State your name and address (spell your last name) for the record prior to beginning your presentation. Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Rick Alexander hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/13

Signature:

011490

NAME: JOHN T. ALTMAN **AGENDA ITEM NO.** R9-2013001

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: JT ALTMAN & ASSOCIATES / BROKER

ADDRESS: 5694 Mission Ctr Rd, #307 TELEPHONE: 619/890-2581

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, JT ALTMAN hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/13 Signature:

011491

NAME: Lisa "Chris" Anderson

AGENDA ITEM NO. R9-2013-0001

REQUEST ~~TO SPEAK~~ To Register IN OPPOSITION TO RECOMMENDED ACTION

PLEASE PRINT LEGIBLY

TITLE/AFFILIATION: Realtor, Greater San Diego Association of Realtors.

ADDRESS: 16711 Wilkup Rd. TELEPHONE: 760-803-2001

State your name and address (spell your last name) for the record prior to beginning your presentation. Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Lisa "Chris" Anderson hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/13 Signature: _____

011492

NAME: Tina Apaipony **AGENDA ITEM NO.** R9-2013-0001

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: _____

ADDRESS: _____ TELEPHONE: _____

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Tina Apaipony hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/13 Signature: _____

ORDER R9-2013-0001

011493

NAME: William Baber

AGENDA ITEM NO. _____

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: ASSOCIATED BUILDERS + CONTRACTORS OF SAN DIEGO

ADDRESS: POWAY CA 13895 KIRKHAM WAY

TELEPHONE: 619-316-0592

State your name and address (spell your last name) for the record prior to beginning your presentation. Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, WILLIAM BABER hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/13

Signature: William Baber

NAME: Scott Bailey

AGENDA ITEM NO. R9-2013-0001

011494

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Huntley Estates

ADDRESS: 3455 Ingraham St TELEPHONE: 858-200-0087

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Scott Bailey hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, ~~orally~~ or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: _____ Signature: SBB

NAME: NEIL ALAN BALL

AGENDA ITEM NO. R7 2 of 3 001

011495

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: OWNER / ALAN BALL GROUP

ADDRESS: 4212 VIA RAVELLO RANCHO SANTA FE, CA 92091

TELEPHONE: 858-829-2471

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, NEIL BALL hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4-10-13

Signature:

NAME: Ben Boyce AGENDA ITEM NO. 8

011496

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Senior VP, Laer Pearce & Assoc.

ADDRESS: 4556 Del Mar Ave SD, CA 92107 TELEPHONE: 619/680-0011

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Ben Boyce hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/11/13 Signature: [signature]

I don't intend to speak, but would like to register my opposition to the permit as drafted.

NAME: Ranch+Country Realty, Inc.

AGENDA ITEM NO. R9 011497 2013-0001

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Broker Associate

ADDRESS: P.O. Box 655, Julian, CA. 92036 TELEPHONE: 760-765-0818

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Jane Braun-Darché hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4-10-13

Signature: Jane Braun Darché

NAME: Jim Browne

AGENDA ITEM NO. R-9 2013-0001

011498

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Real Living Lifestyles Real Estate

ADDRESS: 1905 Calle Barcelona, #230, Carlsbad TELEPHONE: 760-415-2600

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Jim Browne hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/13

Signature: J. Browne

NAME: Kevin M. Burke

AGENDA ITEM NO. R9-2013 -0001

011499

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Broker/Owner Burke Real Estate Consultants San Diego 92130

ADDRESS: 12526 High Bluff Drive, #300 TELEPHONE: 858 7558580

State your name and address (spell your last name) for the record prior to beginning your presentation. Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Kevin M. Burke hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 10 APR 13

Signature: K. M. B

011500

NAME: Vicki M. Campbell

AGENDA ITEM NO. 129-2013
0001

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: SDAR -

ADDRESS: 4754 Rolando Blvd SD 92115 TELEPHONE: 619-787-0913

I AM NOT speaking

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Vicki M. Campbell hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4-10-13 Signature: Vicki M. Campbell

011501

NAME: Vicky Campbell **AGENDA ITEM NO.** R92013-0001

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: SAN Diego Assoc. of Realtors

ADDRESS: 3091 Clairemont Dr. TELEPHONE: 619-587-2496

State your name and address (spell your last name) for the record prior to beginning your presentation. Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Vicky Campbell hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/13 Signature: Vicky L. Campbell

NAME: Yamon Cheng

AGENDA ITEM NO. R9-20013 001

011502

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: USA Realty and Loans

ADDRESS: 4848 Mercury St. Suite 125, San Diego CA 92111 TELEPHONE: 858-207-8310

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Yamon Cheng hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 04/10/2013 Signature: [signature]

011503

NAME: Lauren Cremascoli **AGENDA ITEM NO.** R9-2013-0001

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Pam Mathison & Associates

ADDRESS: 4121 Mt. Hukee, San Diego, Ca. 92117 TELEPHONE: 619-276-1430

State your name and address (spell your last name) for the record prior to beginning your presentation. Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Lauren Cremascoli hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/13 Signature: Lauren Cremascoli

NAME: RICHARD CROSSAN

AGENDA ITEM NO. R9-2013-0001

011504

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: WILLIS ALLEN REAL ESTATE

ADDRESS: P.O. BOX 1520, NATIONAL CITY CA 91951 TELEPHONE: (619) 434-1144

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, RICHARD CROSSAN hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: April 10, 2013

Signature: R. Crossan

NAME: Liguya Cruz

AGENDA ITEM NO. R-9-2013 -0001

011505

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Broker/Realtor - Liguya Realty Grp

ADDRESS: _____ TELEPHONE: 858-829-5452

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Liguya Cruz hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/12

Signature: _____

011506

NAME: THOMAS ELLIS **AGENDA ITEM NO.** R9-2013000(

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: ATLANTIC & PACIFIC REAL ESTATE

ADDRESS: 3111 CAMINO DEL RIO NO. TELEPHONE: 619-253-6479
SAN DIEGO, CALIF.

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, THOMAS ELLIS hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: APRIL 10, 2013 Signature:

NAME: Craig Everett

AGENDA ITEM NO. 011507 R9-2013001

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Advent Real Estate & Property Management

ADDRESS: 4603 Mission Blvd Suite 213 San Diego CA 92109

TELEPHONE: 8584010557

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Craig Everett hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/13

Signature: [illegible]

NAME: VIRGINIA FIEG

AGENDA ITEM NO. R9-2013-0001

011508

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: OFC MANAGER / TRIDENT REALTY GROUP

ADDRESS: 6COG INNOVATION WAY TELEPHONE: 858-774-7063

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, VIRGINIA FIEG hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/13

Signature:

011509

NAME: STEVE FRAIOLI **AGENDA ITEM NO.** R9-2013-0001

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: BROKER / OWNER

ADDRESS: 11956 BERNARDO PLAZA DR #434 TELEPHONE: 619-887-0746

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, STEVEN FRAIOLI hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/13 Signature:

NAME: Eric Ginder **AGENDA ITEM NO.** R4 2013-001

011510

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Attorney - White and Bisgyt, LLP

ADDRESS: 990 Canterbury Pl., Escondido, Ca TELEPHONE: 760-742-3200

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Eric Ginder hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4-10-2013 Signature:

NAME: Jesse Gipe Pink? AGENDA ITEM NO. 8 011511

REQUEST TO ADDRESS REGIONAL BOARD

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

*****PLEASE PRINT LEGIBLY*****

MEETING DATE: 04/10/13

SUBJECT OF TESTIMONY: Opposition to new MS4 regulations

IS WRITTEN TESTIMONY BEING SUBMITTED? YES ☐ NO ☒

TITLE/AFFILIATION: District Representative / California Senator Joel Anderson

ADDRESS: 500 Fesler St Suite 201 El Cajon CA 92020

TELEPHONE: 619 396 5916

☐ CHECK HERE IF YOU ARE REQUESTING A FORMAL HEARING TO SUBMIT SWORN TESTIMONY OR EVIDENCE FOR THE RECORD.

Please state your name and address for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE YOUR COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

011512

NAME: Richard Hagen

AGENDA ITEM NO. R9-2013-0001

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Broker Pacific Sotheby's International Realty

ADDRESS: 2850 Wimble Pl. #102 San Diego CA 92106 TELEPHONE: 619 269-2766

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Richard Hagen hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 11-10-13 Signature:

011513

NAME: LINDA HARBERT

AGENDA ITEM NO. R9-2013-0001

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Manger Coldwell Banker

ADDRESS: 16363 Bernardo Center S.D Ca 92128 TELEPHONE: 858-676-6130

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, LINDA HARBERT hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/13

Signature: Linda Harbert

R9-2013-0001
011514

NAME: Michelle Hellerud **AGENDA ITEM NO.** _____

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Michelle Hellerud SDAR Member

ADDRESS: 7180 Barker Way TELEPHONE: 619 886-8890

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Michelle Hellerud hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/2013 Signature: [signature]

NAME: Bill Horn **AGENDA ITEM NO.** 8 011515

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Supervisor, County of San Diego

ADDRESS: 1600 Pacific Hwy, SD TELEPHONE: _____

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Bill Horn hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/11/13 Signature: _____

011516

NAME: Karen Jedele **AGENDA ITEM NO.** R9-~~2012-0001~~ 2013-0001

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Burke Real Estate Consultants - Real Estate Salesperson

ADDRESS: 1135 Larkspur Ln Carlsbad, CA 92008 TELEPHONE: 858-869-4431

State your name and address (spell your last name) for the record prior to beginning your presentation. Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Karen Jedele hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/13 Signature: [signature]

011517

NAME: Leslie Kilpatrick

AGENDA ITEM NO: R9-2013-001

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: SAN DIEGO ASSOCIATION OF REALTORS

ADDRESS: 1630 Gregory St
San Diego CA 92102

TELEPHONE: 619 696 6989

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Leslie Kilpatrick hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/13

Signature: Leslie Kilpatrick

011518

NAME: Amy Kitchens

AGENDA ITEM NO. R9-20130001

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Realtor®/Agent GNP Premier Partners

ADDRESS: 11828 Rancho Bernardo Rd TELEPHONE: (619) 507-2271

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Amy Kitchens hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: _____ Signature: _____

011519

NAME: ROBERT F. KEVANE

AGENDA ITEM NO. R-9

2013-0001

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: SAN DIEGO ASSOCIATION OF REALTORS

ADDRESS: 8480 LA MESA BLVD., LA MESA

TELEPHONE: 619-697-2001

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, ROBERT F. KEVANE hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/13

Signature: Robert F. Kevane

011520

NAME: LEONA KLINE

AGENDA ITEM NO. R9-2013-001

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Broker/Officer - KW METRO

ADDRESS: 3965 5th Ave. TELEPHONE: 619-233-5935

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, LEONA KLINE hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/2013 Signature: Leona Kline

011521

NAME: BARBARA KREIS **AGENDA ITEM NO.** 19-2013-0001

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: SAN DIEGO BOARD OF REALTORS

ADDRESS: 4849 RONSON CT TELEPHONE: 619 985 5592

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Barbara Kreis hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/13 Signature: Barbara Kreis

NAME: ART KRYK **AGENDA ITEM NO.** R9-2013-0001

011522

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: REALTOR® — SDAR & WILLIS ALLEN REAL ESTATE

ADDRESS: 360 FIFTH AVE. TELEPHONE: (619) 339-9297

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, ART KRYK hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/13 Signature: Arthur J. Kryk Jr.

NAME: Yuzana Kyaw **AGENDA ITEM NO.** R9-2013-0001

011523

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Burke RE Consultant

ADDRESS: 12526 High Bluff Dr, #300 TELEPHONE: 619-870-7219
San Diego CA 92130

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Yuzana hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/2013 Signature: Yuzana M Kyaw

NAME: James Lawson

AGENDA ITEM NO. R9-2013-0001

011524

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: NAIOP San Diego

ADDRESS: 2488 Historic Decatur Rd. #200, San Diego CA 92106 TELEPHONE: 619-546-7451

State your name and address (spell your last name) for the record prior to beginning your presentation. Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, James Lawson hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/11/13

Signature:

011525

NAME: Linda Lee **AGENDA ITEM NO.** R9-2013-0001

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: GNath San Diego Assoc. of REALTORS

ADDRESS: 4845 Ronson Ct SD CA 92111 TELEPHONE: 858-720-9695

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Linda Lee hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/13 Signature: Linda Lee

NAME: BILL KLEES

AGENDA ITEM NO. 9-
2013-001

011526

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: SEAPORT REALTORS

ADDRESS: 1537 ROSECRANS SYE D TELEPHONE: 619-225-8200

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, BILL KLEES hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/13 Signature: Bill Klees

NAME: JORDAN MARKS

AGENDA ITEM NO. 011527

UPDATE - RA-2013-0001

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: GREATER SAN DIEGO ASSOCIATION OF REALTORS

ADDRESS: 4845 RONSON CT., SD, CA 92111 TELEPHONE: 858-715-8000

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, JORDAN MARKS hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/13

Signature:

NAME: PAM Mathison

AGENDA ITEM NO. R9-2013-0001

011528

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Pam Mathison & Associates

ADDRESS: 4121 Mt. Hukee Ave TELEPHONE: 858-541-1536

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Pamela Mathison hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/13

Signature: Pamela Mathison

NAME: Denise Matthis

AGENDA ITEM NO. R9 2013-0001

011529

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Denise E Matthis

ADDRESS: 10755 Scripps Poway Pky TELEPHONE: 858 484-4079

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Denise Matthis hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4-10-13

Signature: DE Matthis

NAME: Julie Meavoy

AGENDA ITEM NO. R9-2000-13 0001

011530

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: President / CEO Greater San Diego Association of Realtors

ADDRESS: 4845 Ronson Ct. San Diego, CA 92111

TELEPHONE: 858-715-8000

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Julie Meavoy hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4-10-13

Signature: [illegible]

NAME: Greg Neville **AGENDA ITEM NO.** 011531 R9-2013-0001

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Pacific Land Group

ADDRESS: 701 Palomar Airport Rd. Suite 300, Carlsbad, CA 92011 TELEPHONE: 760-579-8910

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Greg Neville hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4-10-13 Signature:

NAME: Jenni Nguyen

AGENDA ITEM NO. R9-2013-001

011532

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Keller Williams Realty · La Jolla

ADDRESS: _____ TELEPHONE: _____

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Jenni Nguyen hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/13

Signature: _____

011533

NAME: Jacqueline Oliver

AGENDA ITEM NO. R9-2013-0001

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Broker/Owner (SDAR)

ADDRESS: 402 W. Broadway #1050 TELEPHONE: 619-544-9909

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Jacqueline Oliver hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4-10-13 Signature: Jacqueline Oliver

011534

NAME: Karen Peterson **AGENDA ITEM NO.** R9-2013-0001

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Member, San Diego Assoc. of Realtors / Realty Experts

ADDRESS: 16825 Dominican Dr. TELEPHONE: 858-361-5771

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Karen Peterson hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4-10-13 Signature: Karen Peterson

NAME: Faith Picking

AGENDA ITEM NO. #8

011535

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: BIOCOM

ADDRESS: 4510 Executive Drive, Plaza One
SD CA 92121

TELEPHONE: (858) 455-0300 x113

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Faith Picking hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/11/2013

Signature: Faith Picking

NAME: Rebecca Pollack Rude AGENDA ITEM NO. R9-2013-0001

011536

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: ~~Att~~ Rebecca Rude SDAR

ADDRESS: 310 Travelodge Dr TELEPHONE: 619-846-3046

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Rebecca Pollack Rude hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/2013 Signature: RR

NAME: Ryan Purdy

ORDER R9-2013-0001
AGENDA ITEM NO. _____

011537

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Greater San Diego Association of REALTORS

ADDRESS: 4845 Ponsor Ct. SD 92111 TELEPHONE: (858) 715-8005

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Ryan Purdy hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4-10-13 Signature: [signature]

011538

NAME: BRANDON ROBBIN

AGENDA ITEM NO. ORDER. R9-2013-0001

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: GREATER SAN DIEGO ASSOCIATION OF REALTORS

ADDRESS: 4845 TONSON CT, SD, CA 92111 TELEPHONE: 858-715-3000

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, BRANDON ROBBIN hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/13 Signature:

NAME: Lupe L Sat

AGENDA ITEM NO. R9-2013-001

011539

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: McMillin Realty, Vice President of Sales

ADDRESS: 4210 Bonita Road, Suite B Bonita TELEPHONE: 619-701-7707

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Lupe L Sat hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/13

Signature: Lupe Sat

NAME: Cory Shepard **AGENDA ITEM NO.** R9-2013-0001

011540

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Coldwell Banker West

ADDRESS: 2300 Boswell Road, Stue 100 TELEPHONE: 619-889-8498

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Cory Shepard hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4-10-13 Signature: Cory Shepard

011541

NAME: Alkarim Shivji

AGENDA ITEM NO. R9-2013-0001

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: California Real Estate + Mortgage

ADDRESS: 9460 Mira Mesa Blvd #2 TELEPHONE: 858-663 9505

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Alkarim Shivji hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4-10-13 Signature:

011542

NAME: METAMERY SIMON **AGENDA ITEM NO.** R9-2013-001

R-9-2013-0001

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: MET REALTY GROUP

ADDRESS: 4888 MERCURY ST #105 SD CA 92111 TELEPHONE: 858-732-0747

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, METAMERY SIMON hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/13 Signature: M Simon

NAME: ED SMITH **AGENDA ITEM NO.** R9 2013 0001

011543

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: ED SMITH

ADDRESS: 7777 ALVARADO RD LA MESA CA 91942 TELEPHONE: 619 778 8899

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, ED SMITH hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/13 Signature:

011544

NAME: Mountain Trust

AGENDA ITEM NO. R9-20130001

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: _____

ADDRESS: _____ TELEPHONE: _____

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Sarah Smith hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4-10-13 Signature: _____

NAME: PETER SOLZCKI **AGENDA ITEM NO.** R9-2013-0001

011545

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: GENERAL COUNSEL, SDAR

ADDRESS: 2366 FRONT ST. S.D. 92101 TELEPHONE: 619 231-8300

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, PETER K. SOLZCKI hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4-10-13 Signature: [signature]

011546

NAME: Kate Speir

AGENDA ITEM NO. R9-2013-0001

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Vice President of Risk Management / SDAR

ADDRESS: 4849 Ronson Ct Ste 211 SD, CA ~~92123~~ 92111

TELEPHONE: 858 715 8022

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Kate Speir hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/13

Signature: Kate Speir

011547

NAME: ELLEN STEINBERG **AGENDA ITEM NO.** R9/2013/001

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: SIGNATURE REALTY

ADDRESS: 3545 CAMINO DEL RIO SOUTH SUIT A TELEPHONE:

SD CA 92108

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, ELLEN STEINBERG hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 04.10.13 Signature:

NAME: JAMES SULLIVAN **AGENDA ITEM NO.** R9-2013-0001

011548

R9-2013-0001

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Willis Allen Real Estate

ADDRESS: 1131 Wall St. La Jolla Ca 92037 TELEPHONE: 954-735-5462

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, JAMES SULLIVAN hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/13 Signature: [signature]

NAME: Dorothy E Surdi

AGENDA ITEM NO. R9-2013-0001

011549

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: COMMERCIAL REAL ESTATE AGENT
SPERRY VAN NESS FINEST CITY

ADDRESS: 4849 Ronson Ct #216 SD 92111-1805 TELEPHONE: 858 349 2007

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Dorothy E Surdi hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4-10-2013 Signature: D E Surdi

NAME: Jim Taylor

AGENDA ITEM NO. R9-2013-0001

011550

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Managing Director Sperry Van Ness FC Commercial

ADDRESS: 4849 Ronson Ct #216 San Diego CA 92111

TELEPHONE: 858-452-9100

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Jim Taylor hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4-10-13

Signature:

011551

NAME: Fiona Theseira **AGENDA ITEM NO.** R9-
2013-0001

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: REALTOR® Keller Williams Realty

ADDRESS: 7050 Friars Rd # 100 TELEPHONE: 858-344 2213
San Diego CA 92108

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Fiona Theseira hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/13 Signature: F Theseira

NAME: ANN THROCKMORTON **AGENDA ITEM NO.** R9-2013-0001

011552

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Member, Greater San Diego Association of REALTORS

ADDRESS: 4925 REGLA COURT SAN DIEGO, CA. 92122 TELEPHONE: 619.994.2871

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Ann Throckmorton hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/2013 Signature: Ann M. Throckmorton

011553

NAME: Tory Walker **AGENDA ITEM NO.** 8

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: President ~~TORY WALKER~~ / Tory R Walker Engineering, Inc

ADDRESS: 122 Civic Ctr. Drive, #206, Vista, CA TELEPHONE: (760) 414 9212

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, TORY WALKER hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10 & 4/11/13 Signature: Tory R Walker

NAME: Ryan Waterman **AGENDA ITEM NO.** 8

011554

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Of Counsel / BIA Coalition

ADDRESS: 12255 El Camino Real, Ste. 100 TELEPHONE: 858-794-4100
San Diego, CA 92130

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Ryan Waterman hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/11/2013 Signature:

011555

NAME: K. Won

AGENDA ITEM NO. R9-2013-001

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: KELLER WILLIAMS REALTY

ADDRESS: 12780 HIGH BLUFF, SAN DIEGO, CA 92130 TELEPHONE: (858) 720-1900

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, K. Won hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 2013 Signature: [illegible]

NAME: Elena Yu

AGENDA ITEM NO. R92013-0001

011556

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Real Living Lifestyles

ADDRESS: 11155 E. Ocean Air Dri
San Diego, CA 92130

TELEPHONE: (858) 405-5175

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Elena Yu hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4-10-2013

Signature: Elena Yu

NAME: ROGER BUTOW **AGENDA ITEM NO.** 8

011557

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: EXECUTIVE DIRECTOR CLEAN WATER NOW

ADDRESS: P.O. BOX 4711 LAGUNA BEACH TELEPHONE: 949-715-1912

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Roger Butow hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: April 10, 2013 Signature: Roger S Butow

011558

NAME: SEAN KARAFIN **AGENDA ITEM NO.** 8

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: ECONOMIC POLICY ANALYST / SD COUNTY TAXPAYERS ASSOC

ADDRESS: 707 BROADWAY #905, SD CA 92101 TELEPHONE: (619) 234-6423

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, SEAN KARAFIN hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/13 Signature: [illegible]

NAME: Barry Grigg AGENDA ITEM NO. 8

011559

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: The Political & Economic Conservative Alliance of San Diego

ADDRESS: 1716 Balmoral Ct San Marcos TELEPHONE: 760-741-7988

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Barry Grigg hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 10 April 2013 Signature: Barry Grigg

NAME: BRAD FOWLER

AGENDA ITEM NO. 8

011560

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: DIRECTOR OF PUBLIC WORKS

ADDRESS: 33282 GOLDEN LANTERN, DANA POINT, CA 92629 TELEPHONE: 949 337 0512

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, BRAD FOWLER hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: APRIL 10/11, 2013

Signature: BRAD FOWLER

NAME: Efrem Byser

AGENDA ITEM NO. 8

011561

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: San Diego Regional Economic Development Corporation

ADDRESS: 530 B ST 7th Floor San Diego, CA 92101

TELEPHONE: 619-615-2968

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Efrem Byser hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: April 10, 2013

Signature: Efrem Byser

NAME: VAIKKO ALLEN

AGENDA ITEM NO. 8

011562

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: DIRECTOR OF STORMWATER REGULATORY MANAGEMENT

ADDRESS: OSAI CA

TELEPHONE: 310-850-1736

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, VAIKKO ALLEN hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/13

Signature:

NAME: AARON PORESKY **AGENDA ITEM NO.** 8

011563

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: PROJECT ENGINEER, GEOSYNTEC

ADDRESS: 621 SW MORRISON ST TELEPHONE: 541 760 8104

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, AARON PORESKY hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/13 Signature: [signature]

NAME: Bob Collacott AGENDA ITEM NO. 8

011564

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Private Citizen

ADDRESS: 1210 Buena Vista San Clemente TELEPHONE: 714 692 5186

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Bob Collacott hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/2013 Signature:

NAME: ~~Supervisor~~ Greg Cox Chairman

AGENDA ITEM NO. 8

011565

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Chairman of the Board of Supervisors, County of San Diego

ADDRESS: 1600 Pacific Hwy TELEPHONE: _____

State your name and address (spell your last name) for the record prior to beginning your presentation. Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, GREG COX hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/11/13 Signature: Greg Cox

NAME: Jerry Kern AGENDA ITEM NO. 8

011566

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Deputy Mayor, City of Oceanside

ADDRESS: 300 N. Coast Hwy, Oceanside TELEPHONE: 760.435.3032

State your name and address (spell your last name) for the record prior to beginning your presentation. Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Jerry Kern hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/11/13 Signature: [signature]

NAME: Patricia ~~[illegible]~~ Bates

AGENDA ITEM NO. 8

011567

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Supervisor, 5th District, County of Orange

ADDRESS: 333 W. Santa Ana Blvd, Santa Ana

TELEPHONE: 714 834 3350

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, PATRICIA C. BATES hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4-11-2013

Signature: Patricia C. Bates

NAME: Cheryl Cox **AGENDA ITEM NO.** 8

011568

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Mayor, City of Chula Vista

ADDRESS: 3rd Ave, Chula Vista 91910 TELEPHONE:

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Cheryl Cox hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/13 Signature: [signature]

011569

NAME: Gary Felien

AGENDA ITEM NO. 8

Water run off regs

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Oceanside City Council

ADDRESS: 300 N Coast Hwy Oceanside 92054 TELEPHONE: 760-435-3551

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Gary Felien hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/11/13 Signature: Gary Felien

NAME: Ron Morrison

AGENDA ITEM NO. 8

011570

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: National City Mayor Ron Morrison

ADDRESS: 1243 National City Blvd N.C. TELEPHONE: 619 336 4236

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Ron Morrison hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: _____ Signature: _____

011571

NAME: STEVEN WEINBERG **AGENDA ITEM NO.** 8

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: MAYOR - CITY OF DANA POINT

ADDRESS: 33282 GOLDENLANTERN, DP CA 92629 TELEPHONE: 949 637-6990

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, STEVEN WEINBERG hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 11 APRIL, 2013 Signature:

NAME: James H. Knott III

AGENDA ITEM NO. B

011572

Stormwater Permit

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Utilities Commissioner - City of Oceanside

ADDRESS: 127 Shenvi Lane

TELEPHONE: (760) 721-6554

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, James H. Knott III hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 11 Apr 2013

Signature:

R9-2013-0001

011573

NAME: Mayor Bob Filner

AGENDA ITEM NO. 8

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Mayor of San Diego

ADDRESS: 202 C Street 92101 TELEPHONE: 858-541-4354

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Mayor Bob Filner hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4-10-13

Signature: Bill Harris for Mayor Filner
Bill Harris City of San Diego

NAME: Kristen Huyck **AGENDA ITEM NO.** 8

011574

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Legislative Assist for Riverside County Supervisor Kevin Jeffries

ADDRESS: 4080 Lemon Ave, Riverside TELEPHONE: (951) 955-1018

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Kristen Huyck hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: April 11, 2013 Signature: [illegible]

NAME: Jason Uhley

AGENDA ITEM NO. 6

011575

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Chief of Watershed Protection Division, Riverside Co. Flood & Water Conservation District

ADDRESS: 1995 Market St. Riverside CA 92501

TELEPHONE: 951-955-1200

State your name and address (spell your last name) for the record prior to beginning your presentation. Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Jason Uhley hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/12/13

Signature: J Uhley

NAME: DAVID GARCIA

AGENDA ITEM NO. 8

011576

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: SENIOR CIVIL ENGINEER / RCFC & WCD RIVERSIDE COUNTY Flood Control and Water Conservation DISTRICT

ADDRESS: 1995 MARKET ST

TELEPHONE: 951-955-1330

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, D. GARCIA hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/11/13

Signature:

NAME: Patricia Romo AGENDA ITEM NO. 8

011577

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Assistant Director / Riverside County Transportation Dept

ADDRESS: Riverside TELEPHONE: 951-955-6740

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Patricia Romo hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/11/13 Signature: Romo

011578

NAME: Richard Crompton **AGENDA ITEM NO.** MS4 Permit

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Director Public Works / County of San Diego

ADDRESS: 5510 Overland Ave, SD CA 92123 TELEPHONE: (858) 694-2233

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Richard Crompton hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/11/13 Signature: [illegible]

NAME: James O'Day **AGENDA ITEM NO.** 8

011579

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: County of S.D.

ADDRESS: 1600 Pacific Hwy, San Diego, CA TELEPHONE: 619 531-4869

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, James O'Day hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/11/13 Signature: [signature]

NAME: Todd Snyder

AGENDA ITEM NO. 8

011580

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: County of San Diego

ADDRESS: 5570 Overland Ave, Suite 410 San Diego, CA

TELEPHONE: 619 955 0403

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Todd Snyder hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/11/13

Signature: Todd Snyder

011581

NAME: KEN SUSILO **AGENDA ITEM NO.** 8

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: PRINCIPAL / GEOSYNTEC CONSULTANTS

ADDRESS: 345 S. SEPULVEDA, SUITE 500, 90034 TELEPHONE: 310.957.6100

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, KEN SUSILO hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/13 Signature:

011582

NAME: BILL BROWN **AGENDA ITEM NO.** 8

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: PARTNER BROWN OWNERS / PORT OF SAN DIEGO

ADDRESS: 120 BIENVENIDA TELEPHONE: 760 633-4435

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, William Brown hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/11/13 Signature: [illegible]

NAME: David Burhenn

AGENDA ITEM NO. 8

011583

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Counsel for Riverside G. Copermittees

ADDRESS: 624 S. Grand Ave. Ste 2200 LA 90017 TELEPHONE: 213-629-8788

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, David Burhenn hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/13

Signature:

011584

NAME: Jill Witkowski **AGENDA ITEM NO.** 8

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Waterkeeper San Diego Coastkeeper

ADDRESS: 2525 Dewey Rd TELEPHONE: 619-758-7743

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Jill Witkowski hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/11/13 Signature:

NAME: Noah Garrison

AGENDA ITEM NO. 8

011585

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Attorney - Natural Resources Defense Council

ADDRESS: 1314 2nd St Santa Monica, CA 90401 TELEPHONE: 310 434 2300

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Noah Garrison hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/11/13

Signature:

011586

NAME: Colin Kelly **AGENDA ITEM NO.** 8

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Staff Attorney / Orange County Coastkeeper / Inland Empire Waterkeeper

ADDRESS: 3151 Airway Ave, Ste F-110, Costa Mesa CA 92626 TELEPHONE: 714 850 1965

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Colin Kelly hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/11/13 Signature: C Kelly

NAME: JIM WHALEN

AGENDA ITEM NO. 8

011587

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: PRESIDENT, J. WHALEN ASSOCIATES

ADDRESS: 1660 HOTEL CIRCLE N, SUITE 225 TELEPHONE: 619-683-5544

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, James E Whalen hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/13

Signature:

011588

NAME: DENNIS BOWLING **AGENDA ITEM NO.** 8

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: PRINCIPAL / RICK ENGINEERING

ADDRESS: 5620 FRIARS RD SD 92110 TELEPHONE: 619 688 1447

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, DENNIS BOWLING hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/11/13 Signature:

011589

NAME: Mark Grey **AGENDA ITEM NO.** _____

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: BIA / Southern CA / CICWQ

ADDRESS: 3910 11th St. Riverside, CA TELEPHONE: 909-525-0623

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Mark Grey hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/11/13 Signature: Mark G

NAME: SHAWN WEEDON

AGENDA ITEM NO. 8

011590

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: ASSOCIATE / GEOCON INC / BIA

ADDRESS: 6960 FLANDERS DR. SAN DIEGO CA 92121 TELEPHONE: (858) 558-6900

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, SHAWN WEEDON hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/2013

Signature:

011591

NAME: Luis Parra **AGENDA ITEM NO.** 8

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Applied Hydrology/Applied Hydraulics Professor, SDSU

ADDRESS: [redacted] 3220 Civic Center Dr, Vista, CA, 92596 TELEPHONE: 951-7756474

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Luis Parra hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/11/2013 Signature: [signature]

011592

NAME: MICHAEL McSWEENEY **AGENDA ITEM NO.** R9-2013-0006

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: SR. Public Policy Advisor / BIA

ADDRESS: 9201 Spectrum Center Blvd #110 SD 92123 TELEPHONE: 858 450 1221

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Michael McSweeney hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/11/13 Signature: [signature]

R9-2013
011593

NAME: Laurie Madigan **AGENDA ITEM NO.** 0001

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Executive Director

ADDRESS: 877 Island Ave #508 San Diego CA 92101 TELEPHONE: 619-990-6727

State your name and address (spell your last name) for the record prior to beginning your presentation. Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Laurie Madigan hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/11/13 Signature: Laurie Madigan

011594

NAME: Fred Jacobsen **AGENDA ITEM NO.** 8

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Principal Environmental Specialist/SDG&E (BIA Member)

ADDRESS: 8315 Century Park Ct S.D. 92123 TELEPHONE: 858-637-3723

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Fredrik J Jacobsen hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/11/13 Signature: [signature]

NAME: Colin Kelly

AGENDA ITEM NO. 4 M54

011595

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Orange County Coastkeeper / Inland Empire Waterkeeper

ADDRESS: Orange County TELEPHONE: _____

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Colin Kelly hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/13 Signature: _____

NAME: Richard Crompton **AGENDA ITEM NO.** MS4 Permit

011596

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Director Public Works, County of San Diego

ADDRESS: 5510 Overland Ave, Suite 410 San Diego, CA 92123 TELEPHONE: (858)694-2233

State your name and address (spell your last name) for the record prior to beginning your presentation. Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Richard Crompton hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/13 Signature: Richard E Crompton

NAME: DENNIS BOWLING **AGENDA ITEM NO.** 8

011597

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: PRINCIPAL - RICK ENGINEERING / BIA

ADDRESS: 5620 FRIARS RD, SAN DIEGO 92110 TELEPHONE: 619 688-1447

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, DENNIS BOWLING hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/13 Signature:

011598

NAME: Jill Witkowski **AGENDA ITEM NO.** 8

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: San Diego Coastkeeper, Waterkeeper

ADDRESS: 2825 Dewey Rd TELEPHONE: 619.758.774

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Jill Witkowski hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/13 Signature:

011599

NAME: Noah Garrison **AGENDA ITEM NO.** MS4

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Natural Resources Defense Council

ADDRESS: Los Angeles TELEPHONE: 310 434 2300

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Noah Garrison hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/13 Signature:

011600

NAME: Lois Parra **AGENDA ITEM NO.** 8

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Assoc. Professor, SDSU & Sr. Project Mgr., TRWE

ADDRESS: 122 Civic Center Drive, #122 Vista, CA 92084 TELEPHONE: (760) 414-9212

State your name and address (spell your last name) for the record prior to beginning your presentation. Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Lois Parra hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/2013 Signature: _____

011601

NAME: Ryan Waterman **AGENDA ITEM NO.** 8

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Of Counsel / BIA Coalition.

ADDRESS: 12255 El Camino Real, Ste. 100 TELEPHONE: 858-794-4100

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Ryan Waterman hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/2013 Signature:

011602

NAME: James O'Day

AGENDA ITEM NO. M&4 PERMIT

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: County of San Diego

ADDRESS: 1600 Pacific Hwy, San Diego, CA TELEPHONE: 619/531-4865

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, James R. O'Day hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/10/13 Signature: [signature]

011603

NAME: Mary Anne Skorpanich **AGENDA ITEM NO.** 8

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: OC Watersheds Manager, County of Orange

ADDRESS: 2301 N. Glassell St., Orange TELEPHONE: 714-955-0601

State your name and address (spell your last name) for the record prior to beginning your presentation. Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, M.A. Skorpanich hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4-11-2013 Signature:

011604

NAME: DAVID GARCIA **AGENDA ITEM NO.** 8

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: SENIOR CIVIL ENGINEER Riverside Co. Flood + Water Conservation District

ADDRESS: 1995 Market St Riverside CA 92501 TELEPHONE: 951-955-1330

State your name and address (spell your last name) for the record prior to beginning your presentation. Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, David Garcia hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/12/15 Signature:

Regional MS4 Permit

Tentative Order No. R9-2013-0001

Regional Water Quality Control Board
San Diego Region

WHY

011607

011608

011609

011610

011611

A sustainable future for our children

HOW

An effective permit is required for water quality improvement and protection

Effectively prohibit non-storm water discharges into storm sewers

Require controls to reduce the discharge of pollutants in storm water to the maximum extent practicable

Restore and maintain the physical, chemical, and biological integrity of receiving waters

WHAT

The Current Paradigm…

Action oriented

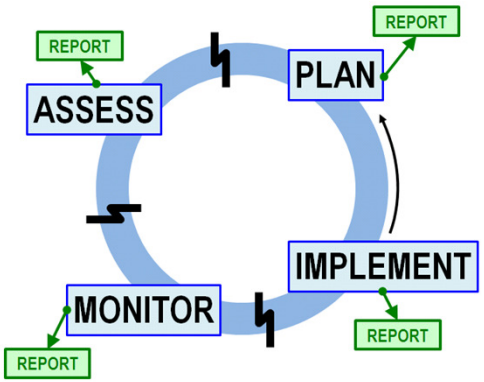

Time for a New Paradigm…

Action oriented

Outcome oriented

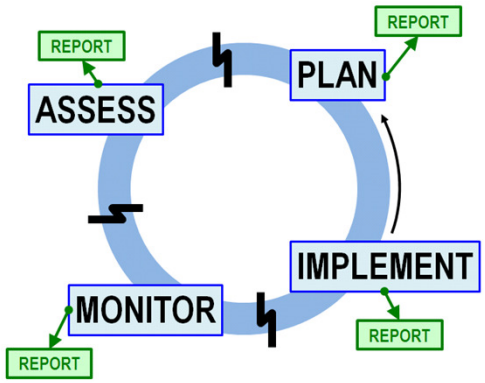

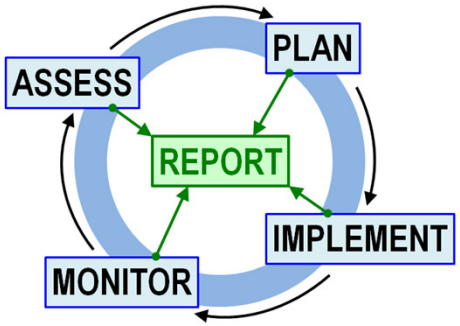

Permit Development Process

2+ Years

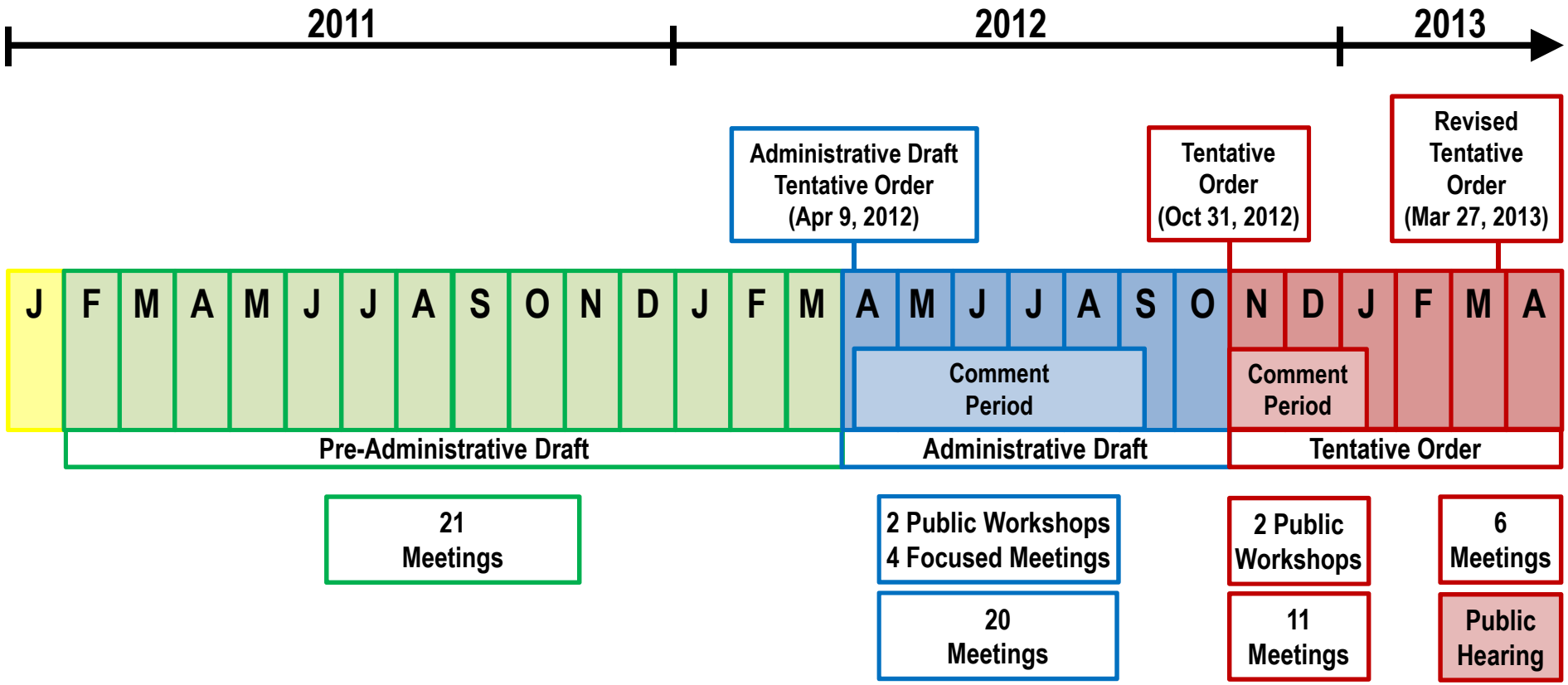

Permit Development Process
2+ Years

50+ Meetings and Presentations

4 Focused Meetings

4 Public Workshops

2 Public Comment Periods

Action oriented

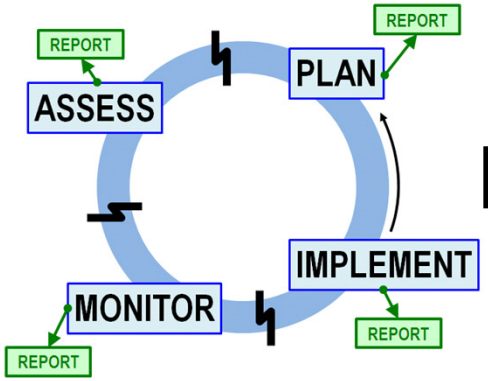

Outcome oriented

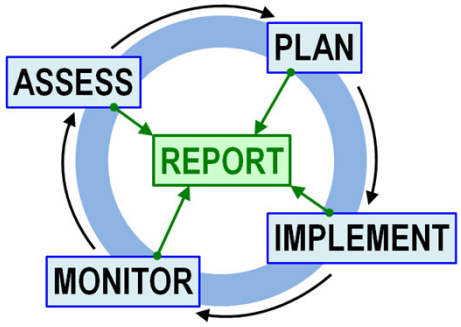

Water Quality Improvement Plan

Remaining Areas of Concern

- Development Planning
  Structural BMP Requirements
- Total Maximum Daily Loads
- Compliance with
  Prohibitions and Limitations

Development Planning
Structural BMP Requirements
Comments/Objections

No hydromodification exemptions

"One size fits all"

Pre-development vs. pre-project

Development Planning
Structural BMP Requirements

Comments/Objections

Responses/Solutions

No hydromodification exemptions

Added concrete channel exemption

"One size fits all"

Added Watershed Management Area Analysis

Pre-development vs. pre-project

Added clarification to definition

Total Maximum Daily Loads

Comments/Objections

Basis of TMDLs

Want adjustable interim compliance dates

Want more compliance determination options

Total Maximum Daily Loads

Comments/Objections

Responses/Solutions

Basis of TMDLs

Added re-opener provision

Want adjustable interim compliance dates

Added adjustable interim compliance dates

Want more compliance determination options

Added more compliance determination options

Compliance with Prohibitions and Limitations

Comments/Objections

Want “pathway to compliance” and protection from enforcement or citizen suits

Compliance with Prohibitions and Limitations

Comments/Objections

Responses/Solutions

Want “pathway to compliance”
and protection from enforcement
or citizen suits

Added Discharge Prohibitions and Receiving Water Limitations Compliance Option

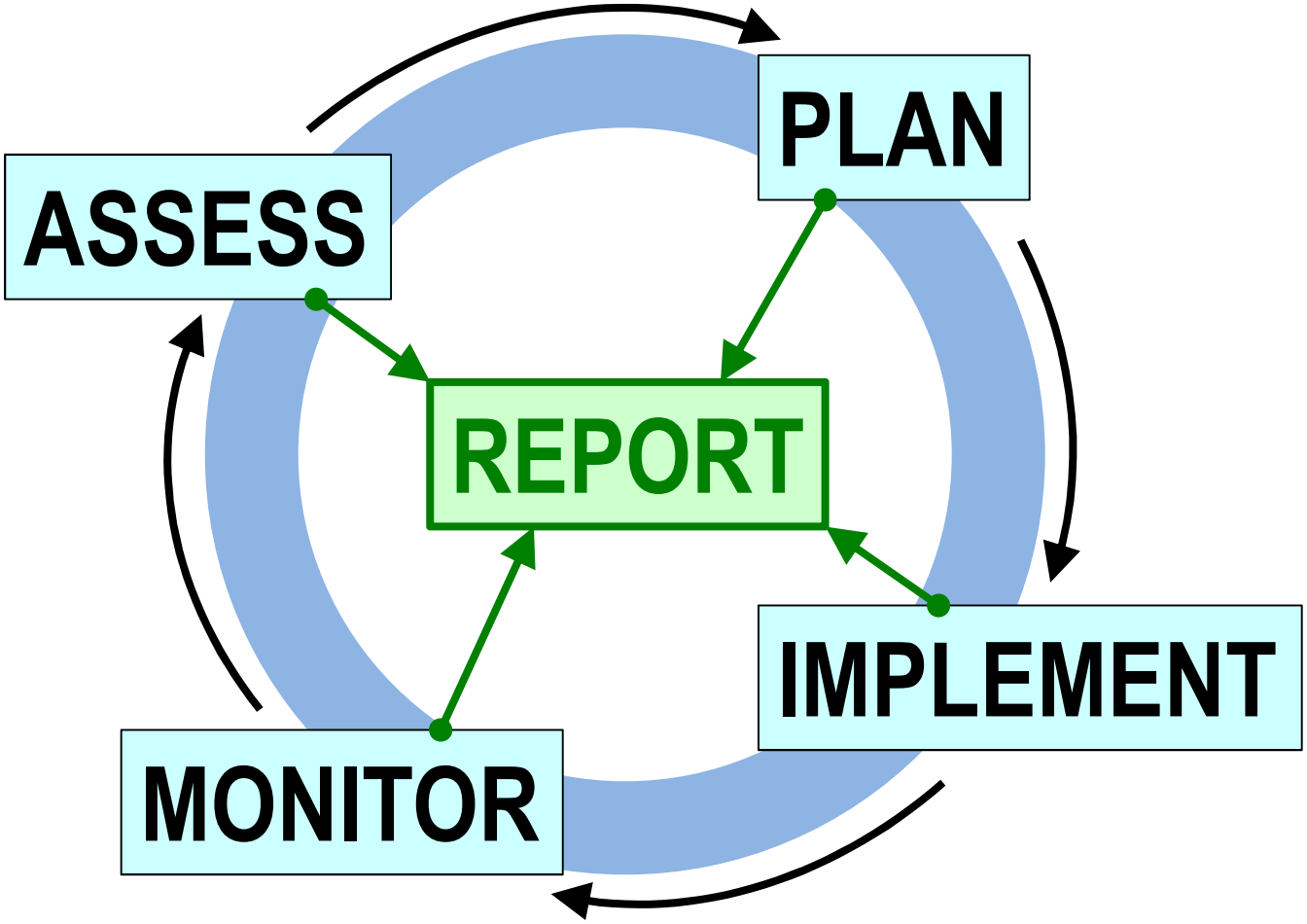
PLAN
ASSESS
REPORT
IMPLEMENT
MONITOR

011629

CAUTION

011632

A sustainable future for our children

Wayne Chiu, P.E.
Water Resource Control Engineer
Regional Water Quality Control Board
San Diego Region

San Diego County Copermittees

San Diego Regional Water Quality Control Board
Order R9-2013-0001
Adoption Hearing
April 10-11, 2013

Procedural Objections

Overview

1. **Water Quality Improvement Plan**
2. **TMDLs**
3. **Land Development**
4. **Monitoring**
5. **Action Levels**

Water Quality Improvement Plans (Provisions B and F)

Water Quality Improvement Plan Compliance Option

- **Issue:**
  - Permit language requires all Copermittees to implement strategies or else all Copermittees are out of compliance
  - Compliance for each Copermittee should be determined on an individual basis

- **Proposed Solution:**
  - Change the tense of "Copermittees" to singular instead of plural

- **Suggested Language:**

B.3.c.(3)(d): The Copermittee~~s~~ in the Watershed Management Area continue**s** to implement the requirements of Provision A.4.a.

Water Quality Improvement Plan Compliance Option

- **Issue:**
  - The phrase "continues to be accepted" by the Regional Board Executive Officer is arbitrary

- **Proposed Solution:**
  - Maintain the association of the term "accepted" with required submittals or updates

- **Suggested Language:**

The results of the analysis performed pursuant to Provision B.3.c.(1)(d) is accepted ~~**and continues to be accepted**~~ by the San Diego Water Board Executive Officer as part of the Water Quality Improvement Plan; AND

Approval of Water Quality Improvement Plan

- **Issue:**
  - Inconsistencies in terminology is confusing:
    (e.g., “approve” vs. “accept“ vs. “concur“ vs. “certification”)
  - Lack of explicit comments provided by the Regional Board on the WQIP “Priority Conditions” and “Numeric Goals” submittals

- **Proposed Solutions:**
  - Use “approved” throughout or if the use of synonyms are intentional, provide definitions for each term
  - In addition to public comments, explicitly state that the Regional Board will provide comments on Conditions and Goals to limit substantial changes late in WQIP development process

- **Suggested Language:**
  - See attached redline.

Multiple sections in
Provision F. Pages 113-124

Timeline for WQIP and JRMP Updates

- **Issue:**

The Permit requires two types of updates with short timelines that don't match the iterative process:

1. The Permit allows for required "mid-course" corrections within 90 days
2. Jurisdictional Runoff Management Plan update schedule is not feasible given the time and resources required to complete JRMP updates

- **Proposed Solution:**
  - Align update timelines with the annual updates

Timeline for WQIP and JRMP Updates (cont'd)

- **Suggested Language:**

WQIP: "During implementation of the Water Quality Improvement Plan ~~after implementation~~ the Copermittees must correct any deficiencies in the Plan identified by the San Diego Water Board ~~no later than 90 days~~ **in the updates submitted with the Annual Report** following a request by the Board to do so."

JRMP: "Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E ~~no later than 3 months after~~ **concurrent with submittal of** ~~San Diego Water Board notification of concurrence with~~ the Water Quality Improvement Plan. **Each Copermittee must provide updates based on comments received from the San Diego Water Board in the subsequent Annual Report."**

F.1.b.(7) Page 116 and
F.2.a.(2) Page 117

Timeline for WQIP and JRMP Updates (cont'd)

- **Suggested Language:**

"Within 90 days of the San Diego Water Board determination that the ~~update~~ **modification** to the Water Quality Improvement Plan **pursuant to A.4.a.(3)** meets the requirements of this Order, the applicable Copermittees must revise the jurisdictional runoff management program documents to incorporate the updated water quality improvement strategies that have been and will be implemented, the implementation schedule, and any additional monitoring required; and"

Provision A.4.a.(4) page 16
(redline page 16)

Water Quality Improvement Plan Compliance Option

- **Issue:**
  - ASBS has been excluded from B.3.c, and thus ASBS discharges are not covered by the WQIP-based compliance option.
  - Critical to include ASBS in WQIP Compliance Option, and allow the WQIP to be used as the ASBS Compliance Plan.
- **Proposed Solution:**
  - Include Provision A.1.d and A.2.b in the compliance coverage under B.3.c for consistency with Attachment A.

Provisions B.3.c.(1-3) pages 30 to 32
(redline pages 31 to 33)

Water Quality Improvement Plan Compliance Option (cont'd)

- **Suggested Language:**

B.3.c (1) "The Copermittees may utilize implementation of the water quality improvement strategies in the Water Quality Improvement Plan to demonstrate compliance with the requirements of Provisions A.1.a, A.1.c**,** ~~**and**~~ **A.1.d,** A.2.a**, and A.2.b**. For each Copermittee in the Watershed Management Area that chooses to utilize this option, the Copermittee will be in compliance with Provisions A.1.a, A.1.c**,** ~~**and**~~ **A.1.d,** A.2.a**, and A.2.b** if…"

B.3.c (2) "Each Copermittee that chooses to utilize this option will, for the pollutant/water body combinations covered by the analysis, be in compliance with Provisions A.1.a, A.1.c**,** ~~**and**~~ **A.1.d,** A.2.a**, and A.2.b** when the Water Quality Improvement Plan, incorporating the requirements of Provision B.3.c.(1), is accepted by the San Diego Water Board."

B.3.c (3) "The Copermittee will, for the pollutant/water body combinations covered by the analysis, remain in compliance with Provisions A.1.a, A.1.c**,** ~~**and**~~ **A.1.d,** A.2.a**, and A.2.b** during the term of this Order as long as:"

Provisions B.3.c.(1-3) pages 30 to 32 (redline pages 31 to 33)

Receiving Water Limitations

- **Issue:**
  - Strict compliance with water quality standards is not required and that compliance may be achieved through the iterative process.
  - The Tentative Order provides an extremely rigorous compliance process as set forth in Provisions B and E and Attachment E.
  - Provision A should be directly linked to this compliance process.

- **Proposed Solution:**
  - Add the suggested language below after each provision of A.1 and A.2 to provide the important linkage.

- **Suggested Language:**

"unless such discharges are addressed by the Copermittees through Provision B.3.c."

Provision A pages 13 and 14 (redline pages 13 and 14)

Water Quality Improvement Consultation Panel

- **Issue:**
  - Provision B.3.c.(1)(d) requires majority concurrence of the Water Quality Improvement Consultation Panel before a Copermittee may use the compliance option.
  - Requiring majority concurrence by representatives of NGOs and the development community :
    - Creates conflict of interest issues as well as open meeting concerns
    - Improperly delegates Regional Board authority
    - Impermissibly impairs each Copermittees' local decision-making authority

- **Suggested Language:**

"The numeric goals proposed pursuant to Provision B.3.c.(1)(a), the analysis performed pursuant to Provision B.3.c.(1)(b) and the specific monitoring and assessments proposed pursuant to Provision B.3.c.(1)(c) have been reviewed ~~**and receive concurrence by a majority of**~~ **by** the Water Quality Improvement Consultation Panel (see Provision F.1.a.(1)(b)). Updates must also **be reviewed by** ~~**receive concurrence by a majority of**~~ the Water Quality Improvement Consultation Panel."

Provisions B.3.c.(1)(d) page 31
(redline page 32)

Total Maximum Daily Loads (Attachment E)

TMDL Effluent Limitations

- **Issue:**
  - Concentration-based limitations should be applied on a watershed-basis, not outfall-by-outfall.
  - The Copermittees should be able to target the highest polluting outfalls to protect receiving waters.

- **Proposed Solution:**
  - For each WQBEL table with concentration-based WQBELs, insert a footnote to allow Copermittees to manage stormwater quality on a watershed-basis.
  - The footnote for each concentration-based WQBEL table would read as follows:

- **Suggested Language:**

"Concentrations shall be determined on a flow-weighted basis across all outfalls within a jurisdiction, not outfall-by-outfall."

Shelter Island Copper TMDL

- **Issue:**
  - The Water Effect Ratio (WER) was incorporated into Table 2.1 but not Table 2.2
  - Could make effluent limitation inconsistent with receiving water limitation.
  - Basin Plan Amendment includes re-calculation language

- **Proposed Solution:**
  - Insert the re-calculation language from the TMDL

- **Suggested Language:**

Constituent	Effluent Limitation
Dissolved Copper	30 kg/yr *

*** If the water quality objectives for dissolved copper in SIYB are changed in the future, then the MOS, TMDL and allocations will be re-calculated using the method shown in Appendix D of Resolution NO. R9-2005-0019.**

Attachment E.2.b.(2)(b) page E-6 (redline page E-7)

TMDL Limitations

- **Issue:**
  - Language for the Concentration-based and Mass-based limitations implies that Copermittees may have to meet <u>both</u> to comply with the TMDL
  - The Compliance Determination options allow for mass-based <u>or</u> concentration based compliance options
  - An "or" statement is already used for the Baby Beach Bacteria TMDL interim effluent limitations (Attachment E-25)

- **Proposed Solution:**
  - Be consistent with Compliance Determination Provisions by inserting "or" statements in each Final Effluent Limitation provision.

Attachment E.3.b.(2)(b)(i) and (ii) Page E-9;
Attachment E.5.b.(2)(b)(i), (ii), and (iii); Pages E-20-21
Attachment E.6.b.(2)(b); Page 32

TMDL Limitations (cont'd)

- **Proposed Solution (Cont.):**
  - The following is a proposed revision to Attachment E.6.b on Page E-35 that could be utilized to revise all applicable TMDLs:

- **Suggested Language:**

Attachment E.6.b.(2)(b) Final Effluent Limitations

"**Discharges from the MS4s containing indicator bacteria densities that do not exceed those identified in 6.b.(2)(b)(i) or indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the effluent limitations identified in 6.b.(2)(b)(ii) will not cause or contribute to exceedances of the receiving water limitations.**"

Attachment E.3.b.(2)(b)(i) and (ii) page E-9 (redline page E-10);
Attachment E.5.b.(2)(b)(i), (ii), and (iii); pages E-20 to E-21 (redline pages E-21 to E-23)
Attachment E.6.b.(2)(b); page E-32 (redline page E-35)

Bacteria TMDL Waterbodies

- **Issue:**
  - Bacteria TMDL states “no further action is required” for delisted water bodies
  - If water bodies are meeting receiving water limitations, extensive TMDL monitoring is unwarranted
  - Can demonstrate waterbodies are continuing to meet receiving water limitations with targeted alternative monitoring program
  - Board Staff agreed in principal, requested proposed language

- **Proposed Solution:**
  - Add suggested text to Section 6 of Attachment E.

Attachment E.6.d pages E-47 to E-50 (redline pages E-52 to E-57)

Bacteria TMDL Waterbodies (Cont.)

- **Suggested Language to Attachment E:**

Add: 6.d.(1)(b)(iv): **"Where segments or areas have been delisted from the 303(d) list because waterbody receiving water limitations are already being met, the Responsible Copermittees may propose alternative monitoring procedures than required in 6.d.(1)(b) (i - iii) above. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any future updates required under Provisions F.1. and F.2. of this Order."**

Add: E.6.d.(1)(c)(v): **"Where segments or areas have been delisted from the 303(d) list because waterbody receiving water limitations are already being met, the Responsible Copermittees may propose alternative assessment procedures than required in 6.d.(1)(c) (i - iii) above. The alternative assessment procedures must be submitted as a part of the Water Quality Improvement Plans or any future updates required under Provisions F.1. and F.2. of this Order."**

Attachment E.6.d pages E-47 to E-50 (redline pages E-52 to E-57)

Bacteria TMDL Waterbodies (Cont.)

•Suggested Language to Attachment E (Cont.):

Add: 6.d.(2)(b)(iv): **"Where segments or areas have been delisted from the 303(d) list because waterbody receiving water limitations are already being met, the Responsible Copermittees may propose alternative monitoring procedures than required in 6.d.(2)(b) (i - iii) above. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any future updates required under Provisions F.1. and F.2. of this Order."**

Add: 6.d.(2)(c)(vi): **"Where segments or areas have been delisted from the 303(d) list because waterbody receiving water limitations are already being met, the Responsible Copermittees may propose alternative assessment procedures than required in 6.d.(2)(c) (i - iv) above. The alternative assessment procedures must be submitted as a part of the Water Quality Improvement Plans or any future updates required under Provisions F.1. and F.2. of this Order."**

Attachment E.6.d pages E-47 to E-50 (redline pages E-52 to E-57)

Bacteria TMDL Exceedance Frequency

- **Issue:**
  - Tables 6.2a and 6.2b include a "/ 0%" allowable exceedance frequency.
  - This appears to be a typo, leftover from the tables that were deleted.
    - The allowable exceedance frequency for wet weather days is always 22% and never 0%.

- **Proposed Solution:**
  - Remove the typo "/0%" from Tables 6.2a and 6.2b.

- **Suggested Language:**

- "~~/0%~~"

Attachment E.6.b.(2) pages E-31 to E-32 (redline pages E-33 to E-38)

Incorporation of New TMDLs into WQIPs

- **Issue:**
  - Permit requires update of WQIPs to incorporate wasteload allocations of newly adopted TMDLs.
    - TMDLs are not self-enforcing. (City of Arcadia v. U.S. Environmental Protection Agency (9th Cir. 2005) 411 F.3d 1103.)
  - Regional Board must use its permitting authority to make the WLAs of a newly-adopted TMDL enforceable
  - The Regional Board cannot compel Co-Permittees to incorporate new WLA into WQIP.
- **Proposed Solution:**
  - Strike this requirement.
  - At a minimum: Revise Provision F.2.c.(2) to require WQIPs to be updated in the next annual update following incorporation of the TMDL into the permit.

Provision F.2.c.(2) page 118 (redline page 132)

TMDL Compliance Language

- **Issue:**
  - The Permit language requires all Copermittees to implement strategies or all Copermittees are out of compliance
  - Compliance for each Copermittee should be determined on an individual basis

- **Proposed Solution:**
  - Change the tense to singular instead of plural

- **Suggested Language:**

Change Copermittees' to Copermittee's

TMDL Compliance Language

- **Issue:**
  - Minor grammatical clarification.

- **Proposed Solution:**
  - Revise "~~and/or~~" to "<u>or</u>".

- **Suggested Language:**

"…compliance with Specific Provisions 6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), and~~/or~~ 6.b.(3)(e)."

"…compliance with Specific Provisions 5.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), 6.b.(3)(e) and~~/or~~ 6.b.(3)(f)."

TMDL Compliance Language

- **Issue:**
  - Attachment E suggests that Receiving Water Limitations are WQBELs.
    - WQBEL = restriction on quantity of pollutant that may be *discharged from a point source* into a receiving water. 40 C.F.R. § 122.44(d).
    - RWL = water quality standard applicable in *receiving water*. *Not* an end-of-pipe numeric effluent limitation.
    - Confusion occurs throughout Attachment E

- **Suggested Language:**

"b. Final TMDL Compliance Requirements

……

(2) Final Water ~~**Quality Based Effluent Limitations**~~ Receiving Water Limitations

~~**(a) Final Receiving Water Limitations**~~

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations:

……

(3)~~**(b)**~~ Final Effluent Limitations"

Land Development

Retain On-site 100% of Pollutants

- New MEP = 100% pollutant removal
  - not attained on demonstration projects
  - drinking water treatment can't achieve
- Typical constraints (soils, space) will result in infeasibility for most development sites
- If 100% removal is not attainable on-site using retention or flow-thru, must use Alternative Compliance or <u>deny development</u>.

Provision E.3.c.(1)(a) and (b) page 87-88 (redline page 93)

Retention Examples

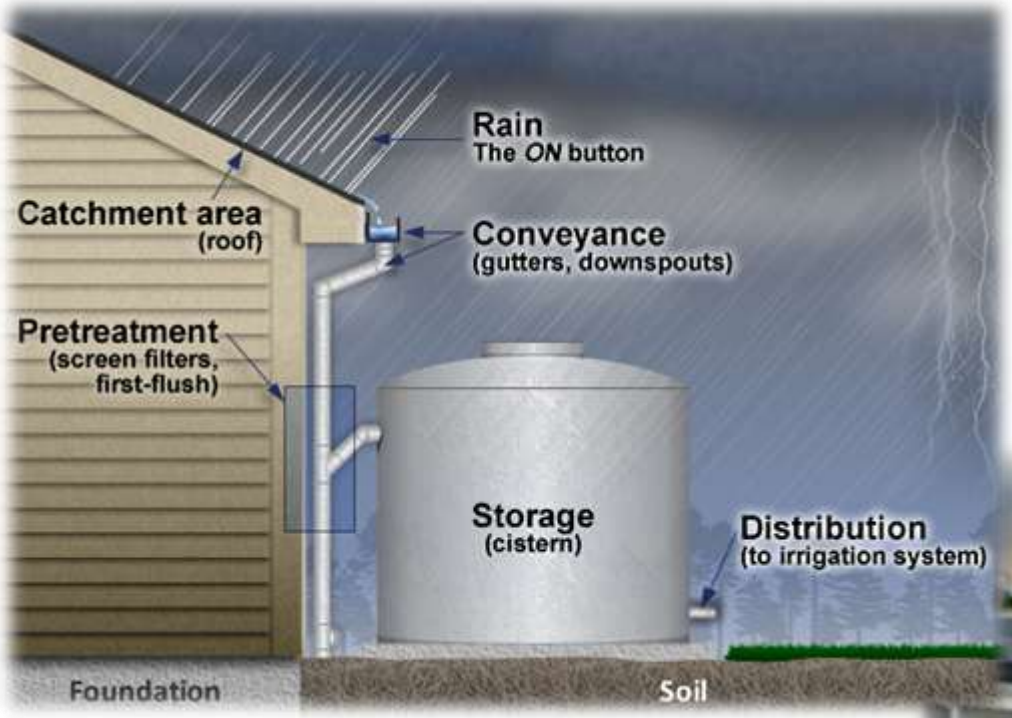

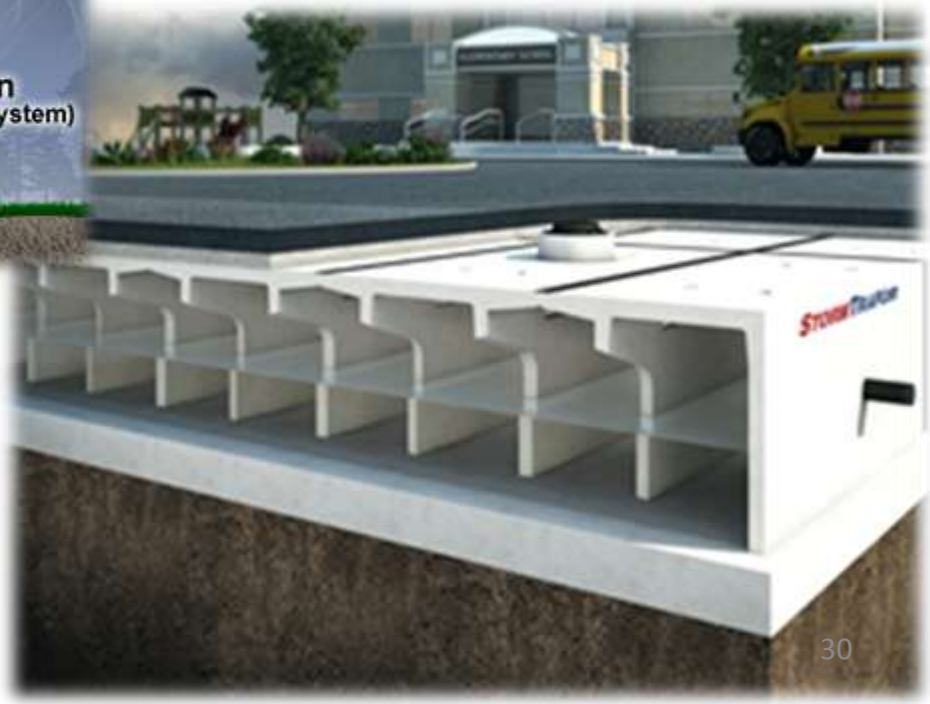

Effective BMPs but not 100%

Delete 100% and treat captured volume:

(1) Storm Water Pollutant Control BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite structural BMPs to control pollutants in storm water that may be discharged from a project as follows:

(a) Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite ~~100 percent of the~~ pollutants contained in the volume of storm water runoff produced from a 24-hour 85th percentile storm event (design capture volume);

(b) If a Copermittee determines that implementing BMPs to retain the full design capture volume onsite for a Priority Development Project is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize flow-thru treatment control BMPs to treat the design capture volume ~~to achieve the equivalent pollutant load removal~~ described in Provision E.3.c.(1)(a). Biofiltration LID BMPs must be considered as a first option before other types of flow-thru treatment control BMPs may be considered.

(c) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1)(a)...

Provision E.3.c.(1)(a) page 87 (redline page 93)

Alternative Compliance

- New change: Optional WQIP watershed analysis
- Disincentive for Jurisdictions
  - Too prescriptive, complex and costly for tax payers
  - Controversy complicates WQIP timeline
- For jurisdictions that opt-out:
  - No option for applicants
  - Prevents applicant found mitigation
- Allow WQIP to propose Alt.Comp. framework
- Allow applicant to propose mitigation

Provision B.3.b.(4) pages 29-30 (redline pages 30-31)
Provision E.3.c.(3)(b) page 91 (redline page 98)

Delete to allow WQIP process to define details:

(4) Optional Watershed Management Area Analysis

(a) For each Watershed Management Area, the Copermittees have the option to perform a Watershed Management Area Analysis for the purpose of developing watershed-specific requirements for structural BMP implementation, as described in Provision E.3.c.(3). The Watershed Management Area Analysis must include GIS layers (maps) as output. ~~The analysis must include the following information, to the extent it is available, in order to characterize the Watershed Management Areas:~~

- ~~**A description of dominant hydrologic processes, such as areas where infiltration or overland flow likely dominates;**~~
- ~~**A description of existing streams in the watershed, including bed material and composition, and if they are perennial or ephemeral;**~~
- ~~**Current and anticipated future land uses;**~~
- ~~**Potential coarse sediment yield areas; and**~~
- ~~**Locations of existing flood control structures and channel structures, such as stream armoring, constrictions, grade control structures, and hydromodification or flood management basins.**~~

(b) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify and compile a list of candidate projects that could potentially be used as alternative compliance options for Priority Development Projects, to be implemented in lieu of onsite structural BMP performance requirements described in Provisions E.3.c.(1) and E.3.c.(2). ~~Specifically, the Copermittees~~ ~~must identify~~ ~~in each Watershed Management Area:~~

- ~~**Opportunities for stream or riparian area rehabilitation;**~~
- ~~**Opportunities for retrofitting existing infrastructure to incorporate storm water retention or treatment;**~~
- ~~**Opportunities for regional BMPs;**~~
- ~~**Opportunities for groundwater recharge projects;**~~
- ~~**Opportunities for water supply augmentation projects; and**~~
- ~~**Opportunities for land purchases to preserve floodplain functions.**~~

Provision B.3.b.(4) pages 29-30 (redline pages 30-31)

Allow applicant identified mitigation:

(b) Project Applicant Proposed Alternative Compliance Projects

The Copermittee may allow a Priority Development Project applicant to propose and fund, contribute funds to, or implement an alternative compliance project not identified by the Watershed Management Area Analysis included in the Water Quality Improvement Plan pursuant to Provisions B.3.b.(4)**, or where one has not yet been created.** This option is allowed provided the Copermittee determines that implementation of the alternative compliance project will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite, and is subject to the requirements described in Provisions E.3.c.(3)(a)(ii)-(ix).

Provision E.3.c.(3)(b) page 91 (redline page 98)

HMP Exemptions

- Retain current San Diego HMP exemptions
  - Vetted via technical and stakeholder process
  - Approved via Resolution R9-2010-0066
- Inappropriate to repeat within WQIP
  - Repeats costly tax-payer process
  - Inconsistent application and implementation
  - Modify HMP <u>after</u> completed assessment

Provision E.3.c.(2)(d) page 89 (redline page 95)
Provision B.3.b.(4) page 29-30 (redline pages 30-31)

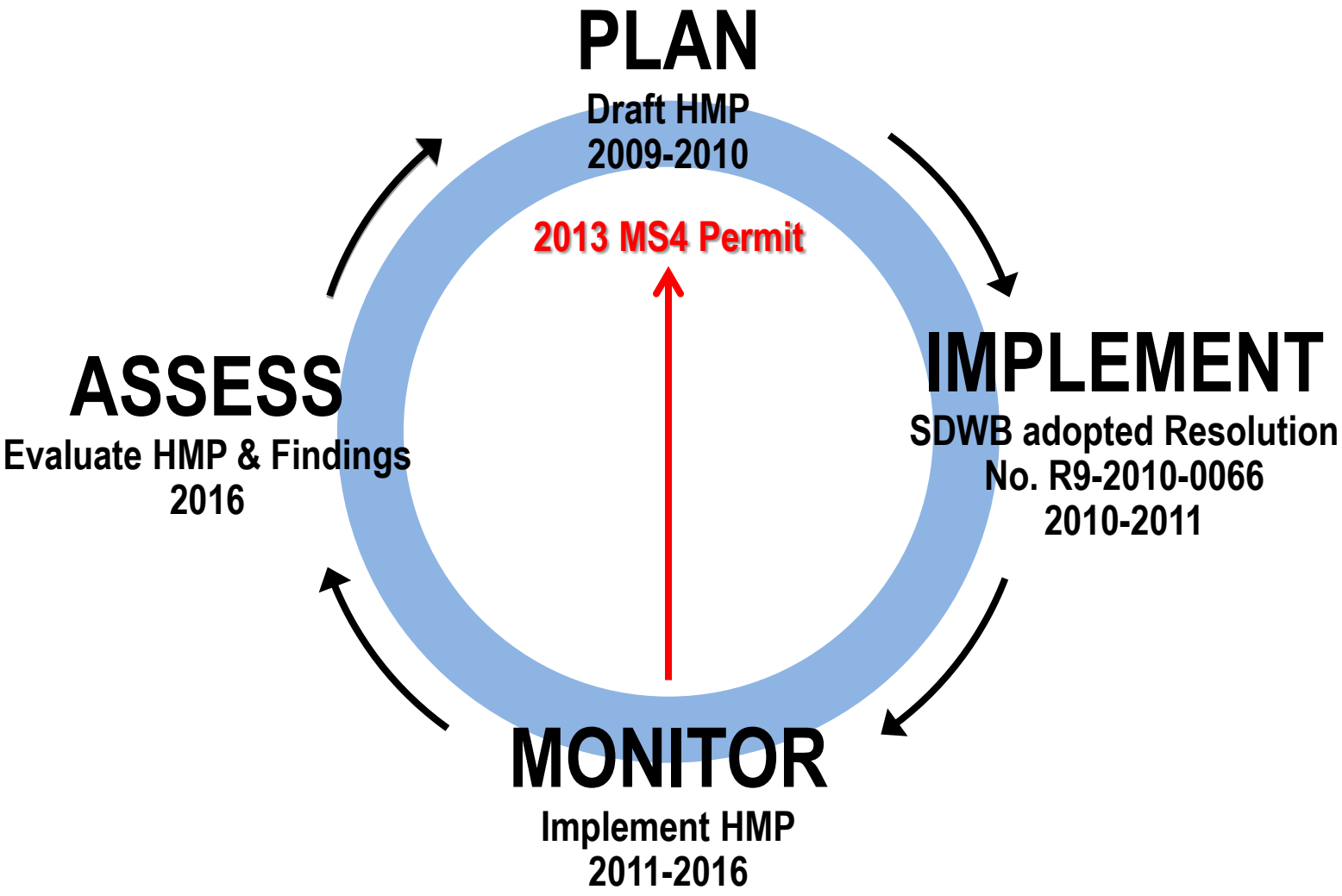
PLAN
Draft HMP
2009-2010
2013 MS4 Permit
IMPLEMENT
SDWB adopted Resolution
No. R9-2010-0066
2010-2011
MONITOR
Implement HMP
2011-2016
ASSESS
Evaluate HMP & Findings
2016

Include previously approved exemptions:

(d) Exemptions

Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provisions E.3.c.(2)(a) where the project discharges storm water runoff to:

(i) Existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;

(ii) Conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; or

(iii) Exemptions previously approved via resolution by the San Diego Regional Water Quality Control Board or an area identified by the Copermittees as appropriate for an exemption by the Watershed Management Area Analysis incorporated into the Water Quality Improvement Plan pursuant to Provision B.3.b.(4).

Provision E.3.c.(2)(d)(iii) page 89 (redline page 95)

Prior Lawful Approval

- Inconsistent timing:
  - Prior lawful approval 18 months after adoption
  - WQIP is now 24+ months
  - BMP Design Manual is 3 months after WQIPs
- Not able to provide existing applicants with new direction without the BMP Design Manual.
- Align with BMP Design Manual

Provision E.3.e.(1)(a) page 94 (redline page 104)

Align timing with acceptance of BMP Design Manual:

(1) Structural BMP Approval and Verification Process

(a) Each Copermittee must require and confirm that for all Priority Development Project applications that have not received prior lawful approval by the Copermittee **on or before the acceptance date of the BMP Design Manual** ~~**18 months after the commencement of coverage under this Order,**~~ the requirements of Provision E.3 are implemented. For project applications that have received prior lawful approval ~~**by**~~ **on or before the acceptance date of the BMP Design Manual** ~~**18 months after the commencement of coverage under this Order**~~, the Copermittee may allow previous land development requirements to apply.

Provision E.3.e.(1)(a) page 94 (redline page 104)

Priority Development Projects

- Redevelopment threshold is more stringent than new development
- Redevelopment has a positive impact on water quality and should be encouraged
- Project must create/replace 5,000 sq. ft. of impervious surface AND the existing development meets a PDP category

Provision E.3.b.(1)(a) page 85 (redline page 89)

Redevelopment Threshold

Oct 2012 Tent. Order

Existing **Greater than** 10,000 sf impervious + Add/replace 5,000 sf impervious = PDP

March 2013 Tent. Order

Existing **Less than** 10,000 sf impervious + Add/replace 5,000 sf impervious = PDP

Provision E.3.b.(1)(a) page 85 (redline page 89)

Change PDP redevelopment language:

Priority Development Projects include the following:

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site), or redevelopment[1] projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site). This category includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

[1] "If the existing development combined with the redevelopment does not meet any of the size thresholds for new development, then this rule does not apply."

Provision E.3.b.(1)(a) page 85 (redline page 89)

Single Family Residential (SFR)

- SFR alternative removed from PDP exemptions
- Include SFR alternative with use of pre-identified BMPs
  - Complies with Source Control, LID, & Structural BMPs
  - Streamlines SFR approval process
  - Less cumbersome on small residences
  - Focuses jurisdictional resources on significant polluters

Provision E.3.b.(3)(c) page 87 (redline page 92)

Add SFR alternative:

(3) Priority Development Project Exemptions

Each Copermittee has the discretion to exempt the following projects from being defined as Priority Development Projects:

(a) New or retrofit paved sidewalks, bicycle lanes, or trails that meet the following criteria:

(i) Designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas; OR

(ii) Designed and constructed to be hydraulically disconnected from paved streets or roads; OR

(iii) Designed and constructed with permeable pavements or surfaces in accordance with USEPA Green Streets guidance.

(b) Retrofitting of existing paved alleys, streets or roads that are designed and constructed in accordance with the USEPA Green Streets guidance.

(c) New single family residences that meet the following criteria:

(i) Must not be constructed as part of a larger development or proposed subdivision; AND

(ii) Designed and constructed with structural BMPs that will achieve the performance requirements of Provisions E.3.c.(1) or E.3.c.(2) onsite.

(d) Redevelopment of existing single family residences that meet the following criteria:

(i) Designed and constructed with structural BMPs that will achieve the performance requirements of Provisions E.3.c.(1) or E.3.c.(2) onsite.

Provision E.3.b.(3)(c) page 87 (redline page 92)

Pre-development

- Mitigation for impacts not caused by project
  - Lacks nexus
  - Liability exposure
  - Infringes on police power
- Alternative Compliance unenforceable
  - Fee based on impacts
  - Mitigation Fee Act "reasonable relationship"
- Response to Comments left unresolved

Provision E.3.c.(2)(a) page 89 (redline page 94)
Provision E.3.c.(3)(a)(iii) page 90 (redline page 96)

Replace with pre-project:

(a) Post-project runoff conditions (flow rates and durations) must not exceed ~~pre-development~~ pre-project runoff conditions by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat downstream of Priority Development Projects).

"Pre-~~Development~~ Project Runoff Conditions" defined:

- "Approximate flow rates and durations that exist or existed onsite before land development occurs. For new development ~~and redevelopment~~ projects, this equates to runoff conditions immediately before project construction. ~~For redevelopment projects, this equates to runoff conditions from the project footprint assuming infiltration characteristics of the underlying soil, and existing grade. Runoff coefficients of concrete or asphalt must not be used. A redevelopment Priority Development Project must use available information pertaining to existing underlying soil type and onsite existing grade to estimate pre-development runoff conditions."~~

Provision E.3.c.(2)(a) page 89 (redline page 94)

Monitoring and Assessment

Monitoring (Cont.)

- **Issue:**
  - The San Diego Copermittees requested Wet Weather MS4 Outfall Monitoring to be twice during the transition period (once per year) instead of twice per year.
    - Copermittees already have robust data sets for residential & commercial land uses(similar or greater # than LA data sets). An additional 250 random wet weather samples provide baseline
    - 51 annual events instead of 102 is adequate to complete the industrial land use data set and provide additional baseline

- **Proposed Solution:**
  - Revise Transitional Wet Weather MS4 Outfall Monitoring to once per year for consistency with the new minimum WQIP requirements.

- **Suggested Language:**

"Each wet weather MS4 outfall discharge monitoring station selected pursuant to Provision D.2.a.(3)(a) must be monitored ~~twice~~ **once** during the wet season (October 1 – April 30)."

Provision D.2.a.(3)(b) page 56 (redline page 58)

Monitoring (Cont.)

- **Issue:**
  - Special Studies completed prior to acceptance of the WQIP (first 2 years of permit term) are not applicable towards the special study requirements of D.3.a.
    - Special studies should count towards permit requirements regardless of the timing of WQIP acceptance.

- **Proposed Solution:**
  - Strike the additional language or revise

- **Suggested Language:**

"Special studies completed before the **effective date of this Order** ~~**Water Quality Improvement Plan is accepted by the San Diego Water Board**~~ cannot be utilized to fulfill the special study requirements of Provision D.3.a."

Provision D.3.d page 66 (redline page 68)

Monitoring (Cont.)

- **Issue:**
  - Copermittees are required to annually conduct a spreadsheet exercise to estimate discharge concentration & volumes from each land use area for each major MS4 outfall for each storm event:
    Annual – No additional benefit/ Request analysis once per permit term (due to variability there is no benefit to conducting this analysis annually)
    Thousands of outfalls - No additional benefit to outfall by outfall approach, aggregate outfalls at hydrologic subarea (scale of modeling)
    Duplicative requirement - Annual estimates from monitored outfalls will be extrapolated to estimate individual jurisdictional loads (D.4.b.(2)(b)[c])

- **Proposed Solution:**
  - Request to reduce the frequency to one year during the permit term and to provide the flexibility of conducting the analysis on the hydrological subarea level instead of on individual major MS4 outfalls

Provision D.4.b.(2)(b)(i)[d] page 70 (redline page 73)

Monitoring (Cont.)

- **Suggested Language:**

"**For one year during the permit term, provide** ~~T~~**t**he percent contribution of storm water volumes and pollutant loads discharged from each land use type within the drainage basin to each of the Copermittee's major MS4 outfalls in its jurisdiction to receiving waters **or from each hydrologic subarea (HSA)** ~~**within the Watershed Management Area**~~ for each storm event with measurable rainfall greater than 0.1 inch."

Provision D.4.b.(2)(b)(i)[d] page 70 (redline page 73)

Monitoring

- **Issue:**
  - A new requirement is the Transitional Monitoring and Assessment Program Annual Report.
    - Assuming the Copermittee transitional program begins before Oct 1, this could be due on January 31, 2014. Copermittees budget for FY 2013-2014 was finalized in January 2013 and this report was not included.

- **Proposed Solution:**
  - To accommodate the Copermittees budgeting timeline, require first transitional report for San Diego Copermittees be due on January 31, 2015 and include monitoring results from Oct 1, 2012 through Sept 30, 2014.
  - Inserting the word "complete" to denote that the report is not due until after the first complete monitoring season (October 1 through September 30) will allow necessary lead time for budgeting.

- **Suggested Language:**

"The Copermittees for each Watershed Management Area must submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each <u>complete</u> transitional monitoring and assessment program reporting period (i.e. October 1 to September 30)…"

F.3.b.(2) page 119 (redline page 133)

TMDLs (Cont.)

- **Issue:**
  - The Assessment and Reporting Requirements add a compliance calculation requirement that is not from the TMDL:
  - "Part [c]: If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the highest bacteria density result reported from wet weather samples collected."
    - The Bacteria TMDL only speaks to intra-storm event <u>*days*</u> that are not sampled. It does not require application of results from sampled *storms* to non-sampled storms. This is very stringent and not sound science.
    - Page A-54 of Bacteria TMDL states "Because of the many issues related to collecting wet weather samples from multiple sites within a short time frame, dischargers are expected to develop a wet weather monitoring and sampling approach in their BLRPs or CLRPs." Plans submitted in October 2012 and will be implemented upon Permit adoption.
    - Santa Monica Bacteria TMDL and other LA Bacteria TMDLs base wet weather interim compliance using only <u>sampled</u> storms.

Attachment E.6.d.(1)(c)(iii)[c] and E.6.d.(2)(c)(iii)[c] pages E-48 and E-50 (redline pages E-54 and E-56)

TMDLs (Cont.)

- **Proposed Solution:**
  - Strike subsection [c] from both sections.

- **Suggested Language:**

~~[c]: If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the highest bacteria density result reported from wet weather samples collected.~~

Attachment E.6.d.(1)(c)(iii)[c] and E.6.d.(2)(c)(iii)[c] pages E-48 and E-50 (redline pages E-54 and E-56)

Action Levels

Action Levels

- **Issue:**
  - The Tentative Order provides a clear linkage between Provision B and Provision C and states that the Water Quality Improvement Plan should guide the customization of NALs/SALs to meet the highest water quality priorities in a given watershed.

- **Proposed Solution:**
  - Copermittees should be allowed to customize NALs/SALs

Provisions C.1.a , C.1.b , C.2.a , and C.2.b, pages 35 to 39 (redline pages 37 to 41)

Action Levels (cont'd)

- **Suggested Language:**

C.1.a:"The following NALs must be incorporated, **if the Copermittees do not establish numeric action levels within the Water Quality Improvement Plan based on watershed priorities:** " C.1.b: "~~**If not identified in Provision C.1.a,**~~ NALs must be identified, developed, and incorporated in the Water Quality Improvement Plans…."
C.2.a: "The following SALs for discharges of storm water from the MS4 must be incorporated, **if the Copermittees do not establish numeric action levels within the Water Quality Improvement Plan based on watershed priorities:** "
C.2.b: "~~**If not identified in Provision C.1.a,**~~ SALs must be identified, developed, and incorporated in the Water Quality Improvement Plans…."

Provisions C.1.a , C.1.b , C.2.a , and C.2.b, pages 35 to 39 (redline pages 37 to 41)

NAL/SAL Footnote Revisions

- **Issue:**
  - Revisions to footnotes 8 and 10 regarding NALs and SALs arguably makes them independently enforceable compliance points.
    - Compliance points for WQBELs are in Attachment E. If NAL/SAL is a WQBEL, it should not be enforceable independent of Attachment E.
    - Footnotes create potential for backdoor attempt to undermine alternative compliance options in Attachment E.
  - Recommended revision to make clear that WQBELs are enforced only through TMDL provisions in Attachment E:

- **Suggested Language:**

"NALs/SALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations~~,~~. ~~unless~~ **However, in instances where** the NAL/SAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed**, exceedances of the WQBEL that is the basis of the NAL/SAL may result in a violation of provisions in Attachment E**."

Provision C pages 35 and 38 (redline page 37 and 40)

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

TENTATIVE
ORDER NO. R9-2013-0001
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The San Diego County Copermittees in Table 1a are subject to waste discharge requirements set forth in this Order.

Table 1a. San Diego County Copermittees

City of Carlsbad	City of Oceanside
City of Chula Vista	City of Poway
City of Coronado	City of San Diego
City of Del Mar	City of San Marcos
City of El Cajon	City of Santee
City of Encinitas	City of Solana Beach
City of Escondido	City of Vista
City of Imperial Beach	County of San Diego
City of La Mesa	San Diego County Regional Airport Authority
City of Lemon Grove	San Diego Unified Port District
City of National City	

After the San Diego Water Board receives and considers the Orange County Copermittees' Report of Waste Discharge and makes any necessary changes to this Order, the Orange County Copermittees in Table 1b will become subject to waste discharge requirements set forth in this Order after expiration of Order No. R9-2009-0002, NPDES No. CAS0108740 on or after December 16, 2014.

Table 1b. Orange County Copermittees

City of Aliso Viejo	City of Rancho Santa Margarita
City of Dana Point	City of San Clemente
City of Laguna Beach	City of San Juan Capistrano
City of Laguna Hills	City of Laguna Woods
City of Laguna Niguel	County of Orange
City of Lake Forest	Orange County Flood Control District
City of Mission Viejo	

After the San Diego Water Board receives and considers the Riverside County Copermittees' Report of Waste Discharge and makes any necessary changes to this Order, the Riverside County Copermittees in Table 1c will become subject to waste discharge requirements set forth in this Order after expiration of Order No. R9-2010-0016, NPDES No. CAS0108766 on or after November 10, 2015.

Table 1c. Riverside County Copermittees

City of Murrieta	County of Riverside
City of Temecula	Riverside County Flood Control and Water Conservation District
City of Wildomar	

The Orange County Copermittees and Riverside County Copermittees may become subject to the requirements of this Order at a date earlier than the expiration date of their current Orders subject to the conditions described in Provision F.6 of this Order if the Copermittees in the respective county receive a notification of coverage from the San Diego Water Board.

The term Copermittee in this Order refers to any San Diego County, Orange County, or Riverside County Copermittee covered under this Order, unless specified otherwise.

This Order provides permit coverage for the Copermittee discharges described in Table 2.

Table 2. Discharge Locations and Receiving Waters

Discharge Points	Locations throughout San Diego Region
Discharge Description	Municipal Separate Storm Sewer System (MS4) Discharges
Receiving Waters	Inland Surface Waters, Enclosed Bays and Estuaries, and Coastal Ocean Waters of the San Diego Region

Table 3. Administrative Information

This Order was adopted by the San Diego Water Board on:	**Month Day, 2013**
This Order will become effective on:	**Month Day, 2013**
This Order will expire on:	**Month Day, 2018**
The Copermittees must file a Report of Waste Discharge in accordance with Title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than 180 days in advance of the Order expiration date.	

I, David W. Gibson, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on Month Day, 2013.

TENTATIVE
David W. Gibson
Executive Officer

San Diego Copermittees 4/10/13

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San Diego Copermittees 4/10/13

I. FINDINGS

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), finds that:

JURISDICTION

1. **MS4 Ownership or Operation.** Each of the Copermittees owns or operates an MS4, through which it discharges storm water and non-storm water into waters of the U.S. within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the U.S.

2. **Legal and Regulatory Authority.** This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]) adopted by the United States Environmental Protection Agency (USEPA), and chapter 5.5, division 7 of the California Water Code (CWC) (commencing with section 13370). This Order serves as an NPDES permit for discharges from MS4s to surface waters. This Order also serves as waste discharge requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

   The San Diego Water Board has the legal authority to issue a regional MS4 permit pursuant to its authority under CWA section 402(p)(3)(B) and 40 CFR 122.26(a)(1)(v). The USEPA also made it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide permits (55 Federal Register [FR] 47990, 48039-48042). The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees and San Diego Water Board.

   The federal regulations make it clear that the Copermittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators (40 CFR 122.26(a)(3)(vi)). This Order does not require the Copermittees to manage storm water outside of their jurisdictional boundaries, but rather to work collectively to improve storm water management within watersheds.

3. **CWA NPDES Permit Conditions.** Pursuant to CWA section 402(p)(3)(B), NPDES permits for storm water discharges from MS4s must include requirements to effectively prohibit non-storm water discharges into MS4s, and require controls to reduce the discharge of pollutants in storm water to the maximum extent practicable (MEP), and to require other provisions as the San Diego Water Board determines are appropriate to control such pollutants. This Order prescribes conditions to assure compliance with the CWA requirements for owners and operators of MS4s to

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effectively prohibit non-storm water discharges into the MS4s, and require controls to reduce the discharge of pollutants in storm water from the MS4s to the MEP.

4. **CWA and CWC Monitoring Requirements.** CWA section 308(a) and 40 CFR 122.41(h),(j)-(l) and 122.48 require that NPDES permits must specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s also specify additional monitoring and reporting requirements in 40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c). CWC section 13383 authorizes the San Diego Water Board to establish monitoring, inspection, entry, reporting and recordkeeping requirements. This Order establishes monitoring and reporting requirements to implement federal and State requirements.

5. **Total Maximum Daily Loads.** CWA section 303(d)(1)(A) requires that "[e]ach state shall identify those waters within its boundaries for which the effluent limitations…are not stringent enough to implement any water quality standard applicable to such waters." The CWA also requires states to establish a priority ranking of impaired water bodies known as Water Quality Limited Segments and to establish Total Maximum Daily Loads (TMDLs) for such waters. The priority list of impaired water bodies is called the Clean Water Act Section 303(d) List of Water Quality Limited Segments, commonly referred to as the 303(d) List. The CWA requires the 303(d) List to be updated every two years.

   TMDLs are numerical calculations of the maximum amount of a pollutant that a water body can assimilate and still meet water quality standards. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point sources (waste load allocations or WLAs) and non-point sources (load allocations or LAs), background contribution, plus a margin of safety. Discharges from MS4s are point source discharges. The federal regulations (40 CFR 122.44(d)(1)(vii)(B)) require that NPDES permits incorporate water quality based effluent limitations (WQBELs) developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, consistent with the assumptions and requirements of any available WLA for the discharge. Requirements of this Order implement the TMDLs adopted by the San Diego Water Board and approved by USEPA as of the time this Order is issued. This Order establishes WQBELs consistent with the assumptions and requirements of all available TMDL WLAs assigned to discharges from the Copermittees' MS4s.

6. **Non-Storm Water Discharges.** Pursuant to CWA section 402(p)(3)(B)(ii), this Order requires each Copermittee to effectively prohibit discharges of non-storm water into its MS4. Nevertheless, non-storm water discharges into and from the MS4s continue to be reported to the San Diego Water Board by the Copermittees and other persons. Monitoring conducted by the Copermittees, as well as the 303(d) List, have identified dry weather, non-storm water discharges from the MS4s as a source of pollutants causing or contributing to receiving water quality impairments in the San Diego Region. The federal regulations (40 CFR 122.26(d)(2)(iv)(B)(1)) require the Copermittees to have a program to prevent illicit discharges to the MS4.

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The federal regulations, however, allow for specific categories of non-storm water discharges or flows to be addressed as illicit discharges only where such discharges are identified as sources of pollutants to waters of the U.S.

7. **In-Stream Treatment Systems.** Pursuant to federal regulations (40 CFR 131.10(a)), in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S. Authorizing the construction of a runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to accepting waste assimilation as an appropriate use for that water body. Runoff treatment must occur prior to the discharge of runoff into receiving waters. Treatment control best management practices (BMPs) must not be constructed in waters of the U.S. Construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body.

DISCHARGE CHARACTERISTICS AND RUNOFF MANAGEMENT

8. **Point Source Discharges of Pollutants.** Discharges from the MS4s contain waste, as defined in the CWC, and pollutants that adversely affect the quality of the waters of the state. A discharge from an MS4 is a "discharge of pollutants from a point source" into waters of the U.S. as defined in the CWA. Storm water and non-storm water discharges from the MS4s contain pollutants that cause or threaten to cause a violation of surface water quality standards, as outlined in the Water Quality Control Plan for the San Diego Basin (Basin Plan). Storm water and non-storm water discharges from the MS4s are subject to the conditions and requirements established in the Basin Plan for point source discharges.

9. **Potential Beneficial Use Impairment.** The discharge of pollutants and/or increased flows from MS4s may cause or threaten to cause the concentration of pollutants to exceed applicable receiving water quality objectives and impair or threaten to impair designated beneficial uses resulting in a condition of pollution, contamination, or nuisance.

10. **Pollutants Generated by Land Development.** Land development has created and continues to create new sources of non-storm water discharges and pollutants in storm water discharges as human population density increases. This brings higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash. Pollutants from these sources are dumped or washed off the surface by non-storm water or storm water flows into and from the MS4s. When development converts natural vegetated pervious ground cover to impervious surfaces such as paved highways, streets, rooftops, and parking lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving a developed area without BMPs that can maintain pre-development runoff conditions will contain greater pollutant loads and have significantly greater runoff volume, velocity, and peak flow rate than pre-development runoff conditions from the same area.

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11. **Runoff Discharges to Receiving Waters.** The MS4s discharge runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within the eleven hydrologic units comprising the San Diego Region. Historic and current development makes use of natural drainage patterns and features as conveyances for runoff. Rivers, streams and creeks in developed areas used in this manner are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and receiving water. Numerous receiving water bodies and water body segments have been designated as impaired by the San Diego Water Board pursuant to CWA section 303(d).

12. **Pollutants in Runoff.** The most common pollutants in runoff discharged from the MS4s include total suspended solids, sediment, pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., cadmium, copper, lead, and zinc), petroleum products and polynuclear aromatic hydrocarbons, synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus), oxygen-demanding substances (e.g., decaying vegetation, animal waste), detergents, and trash. As operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not prohibit or otherwise control. These discharges may cause or contribute to a condition of pollution or a violation of water quality standards.

13. **Human Health and Aquatic Life Impairment.** Pollutants in runoff discharged from the MS4s can threaten and adversely affect human health and aquatic organisms. Adverse responses of organisms to chemicals or physical agents in runoff range from physiological responses such as impaired reproduction or growth anomalies to mortality. Increased volume, velocity, rate, and duration of storm water runoff greatly accelerate the erosion of downstream natural channels. This alters stream channels and habitats and can adversely affect aquatic and terrestrial organisms.

14. **Water Quality Effects.** The Copermittees' water quality monitoring data submitted to date documents persistent exceedances of Basin Plan water quality objectives for runoff-related pollutants at various watershed monitoring stations. Persistent toxicity has also been observed at several watershed monitoring stations. In addition, bioassessment data indicate that the majority of the monitored receiving waters have Poor to Very Poor Index of Biological Integrity (IBI) ratings. These findings indicate that runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in the San Diego Region. Non-storm water discharges from the MS4s have been shown to contribute significant levels of pollutants and flow in arid, developed Southern California watersheds, and contribute significantly to exceedances of applicable receiving water quality objectives.

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15. **Non-Storm Water and Storm Water Discharges.** Non-storm water discharges from the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard of CWA section 402(p)(3)(B)(iii), which is explicitly for "Municipal ... *Stormwater Discharges* (emphasis added)" from the MS4s. Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s must be effectively prohibited.

16. **Best Management Practices.** Waste and pollutants which are deposited and accumulate in MS4 drainage structures will be discharged from these structures to waters of the U.S. unless they are removed. These discharges may cause or contribute to, or threaten to cause or contribute to, a condition of pollution in receiving waters. For this reason, pollutants in storm water discharges from the MS4s can be and must be effectively reduced in runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Pollution prevention is the reduction or elimination of pollutant generation at its source and is the best "first line of defense". Source control BMPs (both structural and non-structural) minimize the contact between pollutants and runoff, therefore keeping pollutants onsite and out of receiving waters. Treatment control BMPs remove pollutants that have been mobilized by storm water or non-storm water flows.

17. **BMP Implementation.** Runoff needs to be addressed during the three major phases of development (planning, construction, and use) in order to reduce the discharge of storm water pollutants to the MEP, effectively prohibit non-storm water discharges, and protect receiving waters. Development which is not guided by water quality planning policies and principles can result in increased pollutant load discharges, flow rates, and flow durations which can negatively affect receiving water beneficial uses. Construction sites without adequate BMP implementation result in sediment runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. Existing development can generate substantial pollutant loads which are discharged in runoff to receiving waters. Retrofitting areas of existing development with storm water pollutant control and hydromodification management BMPs is necessary to address storm water discharges from existing development that may cause or contribute to a condition of pollution or a violation of water quality standards.

18. **Long-Term Planning and Implementation.** Federal regulations require municipal storm water permits to expire 5 years from adoption, after which the permit must be renewed and reissued. The San Diego Water Board recognizes that the degradation of water quality and impacts to beneficial uses of the waters in the San Diego Region occurred over several decades. The San Diego Water Board further recognizes that a decade or more may be necessary to realize demonstrable improvement to the quality of waters in the Region. This Order includes a long term planning and implementation approach that will require more than a single permit term to complete.

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WATER QUALITY STANDARDS

19. **Basin Plan.** The San Diego Water Board adopted the Water Quality Control Plan for the San Diego Basin (Basin Plan) on September 8, 1994 that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for receiving waters addressed through the plan. The Basin Plan was subsequently approved by the State Water Resources Control Board (State Water Board) on December 13, 1994. Subsequent revisions to the Basin Plan have also been adopted by the San Diego Water Board and approved by the State Water Board. Requirements of this Order implement the Basin Plan.

    The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Process Supply (PROC), Industrial Service Supply (IND), Ground Water Recharge (GWR), Contact Water Recreation (REC1), Non-contact Water Recreation (REC2), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Freshwater Replenishment (FRSH), Hydropower Generation (POW), and Preservation of Biological Habitats of Special Significance (BIOL). The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region: Navigation (NAV), Commercial and Sport Fishing (COMM), Estuarine Habitat (EST), Marine Habitat (MAR), Aquaculture (AQUA), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN), and Shellfish Harvesting (SHELL).

20. **Ocean Plan.** The State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, and 2005. The State Water Board adopted the latest amendment on April 21, 2005 and it became effective on February 14, 2006. The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean. Requirements of this Order implement the Ocean Plan.

    The Ocean Plan identifies the following beneficial uses of ocean waters of the state to be protected: Industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture; preservation and enhancement of designated Areas of Special Biological Significance; rare and endangered species; marine habitat; fish spawning and shellfish harvesting

21. **Sediment Quality Control Plan**. On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes: 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health,

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and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

22. **National Toxics Rule and California Toxics Rule.** USEPA adopted the National Toxics Rule (NTR) on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the NTR applied in California. On May 18, 2000, USEPA adopted the California Toxics Rule (CTR). The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants.

23. **Antidegradation Policy.** This Order is in conformance with the federal Antidegradation Policy described in 40 CFR 131.12, and State Water Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality Waters in California*. Federal regulations at 40 CFR 131.12 require that the State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. State Water Board Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies.

24. **Anti-Backsliding Requirements.** Section 402(o)(2) of the CWA and federal regulations at 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations may be relaxed. All effluent limitations in this Order are at least as stringent as effluent limitations in the previous permits.

CONSIDERATIONS UNDER FEDERAL AND STATE LAW

25. **Coastal Zone Act Reauthorization Amendments.** Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states with approved coastal zone management programs to address non-point source pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point source pollution: agriculture, silviculture, urban, marinas, and hydromodification. This Order addresses the management measures required for the urban category, with the exception of septic systems. The runoff management programs developed pursuant to this Order fulfills the need for coastal cities to develop a runoff non-point source plan identified in the Non-Point Source Program Strategy and Implementation Plan. The San Diego Water Board addresses septic systems through the administration of other programs.

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26. **Endangered Species Act.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 USC sections 1531 to 1544). This Order requires compliance with receiving water limits, and other requirements to protect the beneficial uses of waters of the State. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

27. **Report of Waste Discharge Process.** The waste discharge requirements set forth in this Order are based upon the Report of Waste Discharge submitted by the San Diego County Copermittees prior to the expiration of Order No. R9-2007-0001 (NPDES No. CAS0109266). The Orange County and Riverside County Copermittees are not immediately covered by the waste discharge requirements in this Order. The San Diego Water Board understands that each municipality is unique although the Counties share watersheds and/or geographical boundaries. The Order will continue to use the Report of Waste Discharge process prior to initially making Orange County or Riverside County Copermittees subject to the requirements of this Order.

The federal regulations (40 CFR 122.21(d)(2)) and CWC section 13376 impose a duty on the Copermittees to reapply for continued coverage through submittal of a Report of Waste Discharge no later than 180 days prior to expiration of a currently effective permit. This requirement is set forth in the Orange County Copermittees' and Riverside County Copermittees' currently effective permits at Provisions K.2.b and K.2.c, respectively. The Orange County Permit, Order No. R9-2009-0002 (NPDES No. CAS0108740) expires on December 16, 2014 and the Riverside County MS4 Permit, Order No. R9-2010-0016 (NPDES No. CAS0108766) expires on November 10, 2015.

Unless the Orange County or Riverside County Copermittees apply for and receive early coverage under this Order, the Orange County Copermittees' and the Riverside County Copermittees' respective permits will be superseded by this Order upon expiration of their respective permits, subject to any necessary revisions to the requirements of this Order made after the San Diego Water Board considers their respective Reports of Waste Discharge through the public process provided in 40 CFR Part 124.

28. **Integrated Report and Clean Water Act Section 303(d) List.** The San Diego Water Board and State Water Board submit an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. USEPA issued its *Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act* on July 29, 2005, which advocates the use of a five category approach for classifying the attainment status of water quality standards for water bodies in the Integrated Report. Water bodies included in Category 5 in the Integrated Report

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indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 in the Integrated Report are placed on the 303(d) List.

Water bodies with available data and/or information that indicate at least one beneficial use is not being supported or is threatened, but a TMDL is not required, are included in Category 4 in the Integrated Report. Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

Implementation of the requirements of this Order may allow the San Diego Water Board to include surface waters impaired by discharges from the Copermittees' MS4s in Category 4 in the Integrated Report for consideration during the next 303(d) List submittal by the State to USEPA.

29. **Economic Considerations.** The California Supreme Court has ruled that although CWC section 13263 requires the State and Regional Water Boards (collectively Water Boards) to consider factors set forth in CWC section 13241 when issuing an NPDES permit, the Water Board may not consider the factors to justify imposing pollutant restrictions that are less stringent than the applicable federal regulations require. (*City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 618, 626-627.) However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

As noted in the following finding, the San Diego Water Board finds that the requirements in this permit are not more stringent than the minimum federal requirements. Therefore, a CWC section 13241 analysis is not required for permit requirements that implement the effective prohibition on the discharge of non-storm water into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determined appropriate to control such pollutants, as those requirements are mandated by federal law. Notwithstanding the above, the San Diego Water Board has developed an economic analysis of the requirements in this Order. The economic analysis is provided in the Fact Sheet.

30. **Unfunded Mandates.** This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following:

a. This Order implements federally mandated requirements under CWA section 402 (33 USC section 1342(p)(3)(B)).

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b. The local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental and new dischargers who are issued NPDES permits for storm water and non-storm water discharges.

c. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order.

d. The Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)) and in lieu of numeric restrictions on their MS4 discharges (i.e. effluent limitations).

e. The local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under State law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

f. The provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state develops a TMDL, federal law requires that permits must contain water quality based effluent limitations consistent with the assumptions and requirements of any applicable wasteload allocation (40 CFR 122.44(d)(1)(vii)(B)).

See the Fact Sheet for further discussion of unfunded mandates.

31. **California Environmental Quality Act.** The issuance of waste discharge requirements and an NPDES permit for the discharge of runoff from MS4s to waters of the U.S. is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 et seq.) in accordance with CWC section 13389.

STATE WATER BOARD DECISIONS

32. **Compliance with Prohibitions and Limitations.** The receiving water limitation language specified in this Order is consistent with language recommended by the USEPA and established in State Water Board Order WQ 99-05, *Own Motion Review of the Petition of Environmental Health Coalition to Review Waste Discharge Requirements Order No. 96-03, NPDES Permit No. CAS0108740*, adopted by the State Water Board on June 17, 1999. The receiving water limitation language in this Order requires storm water discharges from MS4s to not cause or contribute to a violation of water quality standards, which is to be achieved through an iterative approach requiring the implementation of improved and better-tailored BMPs over time. Implementation of the iterative approach to comply with receiving water limitations based on applicable water quality standards is necessary to ensure that storm water discharges from the MS4 will not ultimately cause or contribute to

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violations of water quality standards and will not create conditions of pollution, contamination, or nuisance.

33. **Special Conditions for Areas of Special Biological Significance.** On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving an exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges. State Water Board Resolution No. 2012-0012 requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject terms and conditions of State Water Board Resolution No. 2012-0012. The Special Protections contained in Attachment B to Resolution No. 2012-0012, applicable to these discharges, are hereby incorporated into this Order as if fully set forth herein.

ADMINISTRATIVE FINDINGS

34. **Executive Officer Delegation of Authority.** The San Diego Water Board by prior resolution has delegated all matters that may legally be delegated to its Executive Officer to act on its behalf pursuant to CWC section 13223. Therefore, the Executive Officer is authorized to act on the San Diego Water Board's behalf on any matter within this Order unless such delegation is unlawful under CWC section 13223 or this Order explicitly states otherwise.

35. **Standard Provisions.** Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR 122.42, are provided in Attachment B to this Order.

36. **Fact Sheet.** The Fact Sheet for this Order contains background information, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of this Order. The Fact Sheet is hereby incorporated into this Order and constitutes part of the Findings of this Order.

37. **Public Notice.** In accordance with State and federal laws and regulations, the San Diego Water Board notified the Copermittees, and interested agencies and persons of its intent to prescribe waste discharge requirements for the control of discharges into and from the MS4s to waters of the U.S. and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet.

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38. **Public Hearing.** The San Diego Water Board held a public hearing on Month Day, 2013 and heard and considered all comments pertaining to the terms and conditions of this Order. Details of the public hearing are provided in the Fact Sheet.

39. **Effective Date.** This Order serves as an NPDES permit pursuant to CWA section 401 or amendments thereto, and becomes effective fifty (50) days after the date of its adoption, provided that the Regional Administrator, USEPA, Region IX, does not object to this Order.

40. **Review by the State Water Board.** Any person aggrieved by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with CWC section 13320 and California Code of Regulations, title 23, sections 2050, et seq. The State Water Board must receive the petition by 5:00 p.m., 30 days after the San Diego Water Board action, except that if the thirtieth day following the action falls on a Saturday, Sunday or State holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

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THEREFORE, IT IS HEREBY ORDERED that the Copermittees, in order to meet the provisions contained in division 7 of the CWC (commencing with section 13000) and regulations adopted thereunder, and the provisions of the CWA and regulations adopted thereunder, must each comply with the the requirements of this Order. This action in no way prevents the San Diego Water Board from taking enforcement action for past violations of the previous Order. If any part of this Order is subject to a temporary stay of enforcement, unless otherwise specified, the Copermittees must comply with the analogous portions of the previous Order, which will remain in effect for all purposes during the pendency of the stay.

II. PROVISIONS

A. PROHIBITIONS AND LIMITATIONS

The purpose of this provision is to describe the conditions under which storm water and non-storm water discharges into and from MS4s are prohibited or limited. The goal of the prohibitions and limitations is to protect the water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through the implementation of water quality improvement strategies and runoff management programs that effectively prohibit non-storm water discharges into the Copermittees' MS4s, and reduce pollutants in storm water discharges from the Copermittees' MS4s to the MEP.

1. Discharge Prohibitions

Unless such discharges are addressed by the Copermittee through B.3.c:

a. Discharges from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the state are prohibited.

b. Non-storm water discharges into MS4s are to be effectively prohibited, through the implementation of Provision E.2, unless such discharges are authorized by a separate NPDES permit.

c. Discharges from MS4s are subject to all waste discharge prohibitions in the Basin Plan, included in Attachment A to this Order.

d. Storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 applicable to these discharges, included in Attachment A to this Order. All other discharges from the Copermittees' MS4s to ASBS are prohibited.

2. Receiving Water Limitations

Unless such discharges are addressed by the Copermittee through B.3.c:

a. Discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters, including but not limited to all applicable provisions contained in:

(1) The San Diego Water Board's Basin Plan, including beneficial uses, water quality objectives, and implementation plans;

(2) State Water Board plans for water quality control including the following:

(a) Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries (Thermal Plan), and

(b) The Ocean Plan, including beneficial uses, water quality objectives, and implementation plans;

(3) State Water Board policies for water and sediment quality control including the following:

(a) Water Quality Control Policy for the Enclosed Bays and Estuaries of California,

(b) Sediment Quality Control Plan which includes the following narrative objectives for bays and estuaries:

(i) Pollutants in sediments shall not be present in quantities that, alone or in combination, are toxic to benthic communities, and

(ii) Pollutants shall not be present in sediments at levels that will bioaccumulate in aquatic life to levels that are harmful to human health,

(c) The Statement of Policy with Respect to Maintaining High Quality of Waters in California;[1]

(4) Priority pollutant criteria promulgated by the USEPA through the following:

(a) National Toxics Rule (NTR)[2] (promulgated on December 22, 1992 and amended on May 4, 1995), and

(b) California Toxics Rule (CTR).[3,4]

[1] State Water Board Resolution No. 68-16
[2] 40 CFR 131.36
[3] 65 Federal Register 31682-31719 (May 18, 2000), adding Section 131.38 to 40 CFR

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b. Discharges from MS4s composed of storm water runoff must not alter natural ocean water quality in an ASBS.

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[4] If a water quality objective and a CTR criterion are in effect for the same priority pollutant, the more stringent of the two applies.

3. Effluent Limitations

a. TECHNOLOGY BASED EFFLUENT LIMITATIONS

Pollutants in storm water discharges from MS4s must be reduced to the MEP.[5]

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

Each Copermittee must comply with applicable WQBELs established for the TMDLs in Attachment E to this Order, pursuant to the applicable TMDL compliance schedules.

4. Compliance with Discharge Prohibitions and Receiving Water Limitations

Each Copermittee must achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order through timely implementation of control measures and other actions as specified in Provisions B and E of this Order, including any modifications. The Water Quality Improvement Plans required under Provision B must be designed and adapted to ultimately achieve compliance with Provisions A.1.a, A.1.c and A.2.a.

a. If exceedance(s) of water quality standards persist in receiving waters notwithstanding implementation of this Order, the Copermittees must comply with the following procedures:

(1) For exceedance(s) of a water quality standard in the process of being addressed by the Water Quality Improvement Plan, the Copermittee(s) must implement the Water Quality Improvement Plan as accepted by the San Diego Water Board, and update the Water Quality Improvement Plan, as necessary, pursuant to Provision F.2.c;

(2) Upon a determination by either the Copermittees or the San Diego Water Board that discharges from the MS4 are causing or contributing to a new exceedance of an applicable water quality standard not addressed by the Water Quality Improvement Plan, the Copermittees must submit the following updates to the Water Quality Improvement Plan pursuant to Provision F.2.c or as part of the Water Quality Improvement Plan Annual Report required under Provision F.3.b, unless the San Diego Water Board directs an earlier submittal:

(a) The water quality improvement strategies being implemented that are effective and will continue to be implemented,

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[5] This does not apply to MS4 discharges which receive subsequent treatment to reduce pollutants in storm water discharges to the MEP prior to entering receiving waters (e.g., low flow diversions to the sanitary sewer). Runoff treatment must occur prior to the discharge of runoff into receiving waters per Finding 7.

(b) Water quality improvement strategies (i.e. BMPs, retrofitting projects, stream and/or habitat rehabilitation projects, adjustments to jurisdictional runoff management programs, etc.) that will be implemented to reduce or eliminate any pollutants or conditions that are causing or contributing to the exceedance of water quality standards,

(c) Updates to the schedule for implementation of the existing and additional water quality improvement strategies, and

(d) Updates to the monitoring and assessment program to track progress toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a of this Order;

(3) The San Diego Water Board may require the incorporation of additional modifications to the Water Quality Improvement Plan required under Provision B. The applicable Copermittees must submit any modifications to the update to the Water Quality Improvement Plan within 90 days of notification that additional modifications are required by the San Diego Water Board, or as otherwise directed;

(4) Within 90 days of the San Diego Water Board determination that the ~~update~~ modification to the Water Quality Improvement Plan pursuant to A.4.a.(3) meets the requirements of this Order, the applicable Copermittees must revise the jurisdictional runoff management program documents to incorporate the updated water quality improvement strategies that have been and will be implemented, the implementation schedule, and any additional monitoring required; and

(5) Each Copermittee must implement the updated Water Quality Improvement Plan.

b. The procedure set forth above to achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order do not have to be repeated for continuing or recurring exceedances of the same water quality standard(s) following implementation of scheduled actions unless directed to do otherwise by the San Diego Water Board.

c. Nothing in Provisions A.4.a and A.4.b prevents the San Diego Water Board from enforcing any provision of this Order while the applicable Copermittees prepare and implement the above update to the Water Quality Improvement Plan and jurisdictional runoff management programs.

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B. WATER QUALITY IMPROVEMENT PLANS

The purpose of this provision is to develop Water Quality Improvement Plans that guide the Copermittees' jurisdictional runoff management programs towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plans is to protect, preserve, and enhance the water quality and designated beneficial uses of waters of the state. This goal will be accomplished through an adaptive planning and management process that identifies the highest priority water quality conditions within a watershed and implements strategies through the jurisdictional runoff management programs to achieve improvements in the quality of discharges from the MS4s and receiving waters.

1. Watershed Management Areas

The Copermittees must develop a Water Quality Improvement Plan for each of the Watershed Management Areas in Table B-1. A total of ten Water Quality Improvement Plans must be developed for the San Diego Region.

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
San Juan (901.00)	South Orange County	- Aliso Creek - San Juan Creek - San Mateo Creek - Pacific Ocean - Heisler Park ASBS	- City of Aliso Viejo[1] - City of Dana Point[1] - City of Laguna Beach[1] - City of Laguna Hills[1] - City of Laguna Niguel[1] - City of Laguna Woods[1] - City of Lake Forest[1] - City of Mission Viejo[1] - City of Rancho Santa Margarita[1] - City of San Clemente[1] - City of San Juan Capistrano[1] - County of Orange[1] - Orange County Flood Control District[1]
Santa Margarita (902.00)	Santa Margarita River	- Murrieta Creek - Temecula Creek - Santa Margarita River - Santa Margarita Lagoon - Pacific Ocean	- City of Murrieta[2] - City of Temecula[2] - City of Wildomar[2] - County of Riverside[2] - County of San Diego[3] - Riverside County Flood Control and Water Conservation District[2]
San Luis Rey (903.00)	San Luis Rey River	- San Luis Rey River - San Luis Rey Estuary - Pacific Ocean	- City of Oceanside - City of Vista - County of San Diego

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Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
Carlsbad (904.00)	Carlsbad	- Loma Alta Slough - Buena Vista Lagoon - Agua Hedionda Lagoon - Batiquitos Lagoon - San Elijo Lagoon - Pacific Ocean	- City of Carlsbad - City of Encinitas - City of Escondido - City of Oceanside - City of San Marcos - City of Solana Beach - City of Vista - County of San Diego
San Dieguito (905.00)	San Dieguito River	- San Dieguito River - San Dieguito Lagoon - Pacific Ocean	- City of Del Mar - City of Escondido - City of Poway - City of San Diego - City of Solana Beach - County of San Diego
Penasquitos (906.00)	Penasquitos	- Los Penasquitos Lagoon - Pacific Ocean	- City of Del Mar - City of Poway - City of San Diego - County of San Diego
	Mission Bay	- Mission Bay - Pacific Ocean - San Diego Marine Life Refuge (ASBS)	- City of San Diego
San Diego (907.00)	San Diego River	- San Diego River - Pacific Ocean	- City of El Cajon - City of La Mesa - City of San Diego - City of Santee - County of San Diego
Pueblo San Diego (908.00) Sweetwater (909.00) Otay (910.00)	San Diego Bay	- Sweetwater River - Otay River - San Diego Bay - Pacific Ocean	- City of Chula Vista - City of Coronado - City of Imperial Beach - City of La Mesa - City of Lemon Grove - City of National City - City of San Diego - County of San Diego - San Diego County Regional Airport Authority - San Diego Unified Port District
Tijuana (911.00)	Tijuana River	- Tijuana River - Tijuana Estuary - Pacific Ocean	- City of Imperial Beach - City of San Diego - County of San Diego

Notes
1. The Orange County Copermittees will be covered under this Order after expiration of Order No. R9-2009-0002, or earlier if the Orange County Copermittees meet the conditions in Provision F.6.
2. The Riverside County Copermittees will be covered under this Order after expiration of Order No. R9-2010-0016, or earlier if the Riverside County Copermittees meet the conditions in Provision F.6.
3. The County of San Diego is not required to implement the requirements of Provision B for its jurisdiction within the Santa Margarita River Watershed Management Area until the Riverside County Copermittees have been notified of coverage under this Order. The County of San Diego is required to implement the requirements of Provisions D, F.3.b, and Attachment E until the Riverside County Copermittees have been notified of coverage under this Order.

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2. Priority Water Quality Conditions

The Copermittees must identify the water quality priorities within each Watershed Management Area that will be addressed by the Water Quality Improvement Plan. Where appropriate, Watershed Management Areas may be separated into subwatersheds to focus water quality prioritization and jurisdictional runoff management program implementation efforts by receiving water.

a. Assessment of Receiving Water Conditions

The Copermittees must consider the following, at a minimum, to identify water quality priorities based on impacts of MS4 discharges on receiving water beneficial uses:

(1) Receiving waters listed as impaired on the CWA Section 303(d) List of Water Quality Limited Segments (303(d) List);

(2) TMDLs adopted and under development by the San Diego Water Board;

(3) Receiving waters recognized as sensitive or highly valued by the Copermittees, including estuaries designated under the National Estuary Program under CWA section 320, wetlands defined by the State or U.S. Fish and Wildlife Service's National Wetlands Inventory as wetlands, waters having the Preservation of Biological Habitats of Special Significance (BOIL) beneficial use designation, and receiving waters identified as ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (Attachment A);

(4) The receiving water limitations of Provision A.2;

(5) Known historical versus current physical, chemical, and biological water quality conditions;

(6) Available, relevant, and appropriately collected and analyzed physical, chemical, and biological receiving water monitoring data, including, but not limited to, data describing:

(a) Chemical constituents,

(b) Water quality parameters (i.e. pH, temperature, conductivity, etc.),

(c) Toxicity Identification Evaluations for both receiving water column and sediment,

(d) Trash impacts,

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(e) Bioassessments, and

(f) Physical habitat;

(7) Available evidence of erosional impacts in receiving waters due to accelerated flows (i.e. hydromodification);

(8) Available evidence of adverse impacts to the chemical, physical, and biological integrity of receiving waters; and

(9) The potential improvements in the overall condition of the Watershed Management Area that can be achieved.

b. ASSESSMENT OF IMPACTS FROM MS4 DISCHARGES

The Copermittees must consider the following, at a minimum, to identify the potential impacts to receiving waters that may be caused or contributed to by discharges from the Copermittees' MS4s:

(1) The discharge prohibitions of Provision A.1 and effluent limitations of Provision A.3; and

(2) Available, relevant, and appropriately collected and analyzed storm water and non-storm water monitoring data from the Copermittees' MS4 outfalls;

(3) Locations of each Copermittee's MS4 outfalls that discharge to receiving waters;

(4) Locations of MS4 outfalls that are known to persistently discharge non-storm water to receiving waters likely causing or contributing to impacts on receiving water beneficial uses;

(5) Locations of MS4 outfalls that are known to discharge pollutants in storm water causing or contributing to impacts on receiving water beneficial uses; and

(6) The potential improvements in the quality of discharges from the MS4 that can be achieved.

c. IDENTIFICATION OF PRIORITY WATER QUALITY CONDITIONS

(1) The Copermittees must use the information gathered for Provisions B.2.a and B.2.b to develop a list of priority water quality conditions as pollutants, stressors and/or receiving water conditions that are the highest threat to receiving water quality or that most adversely affect the quality of receiving waters. The list must include the following information for each priority water quality condition:

(a) The beneficial use(s) associated with the priority water quality condition;

(b) The geographic extent of the priority water quality condition within the Watershed Management Area, if known;

(c) The temporal extent of the priority water quality condition (e.g., dry weather and/or wet weather);

(d) The Copermittees with MS4s discharges that may cause or contribute to the priority water quality condition; and

(e) An assessment of the adequacy of and data gaps in the monitoring data to characterize the conditions causing or contributing to the priority water quality condition, including a consideration of spatial and temporal variation.

(2) The Copermittees must identify the highest priority water quality conditions to be addressed by the Water Quality Improvement Plan, and provide a rationale for selecting a subset of the water quality conditions identified pursuant to Provision B.2.c.(1) as the highest priorities.

d. IDENTIFICATION OF MS4 SOURCES OF POLLUTANTS AND/OR STRESSORS

The Copermittees must identify and prioritize known and suspected sources of storm water and non-storm water pollutants and/or other stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c. The identification of known and suspected sources of pollutants and/or stressors that cause or contribute to the highest priority water quality conditions as identified for Provision B.2.c must consider the following:

(1) Pollutant generating facilities, areas, and/or activities within the Watershed Management Area, including:

(a) Each Copermittee's inventory of construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas,

(b) Publicly owned parks and/or recreational areas,

(c) Open space areas,

(d) All currently operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste, and

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(e) Areas not within the Copermittees' jurisdictions (e.g., Phase II MS4s, tribal lands, state lands, federal lands) that are known or suspected to be discharging to the Copermittees' MS4s;

(2) Locations of the Copermittees' MS4s, including the following:

(a) All MS4 outfalls that discharge to receiving waters, and

(b) Locations of major structural controls for storm water and non-storm water (e.g., retention basins, detention basins, major infiltration devices, etc.);

(3) Other known and suspected sources of non-storm water or pollutants in storm water discharges to receiving waters within the Watershed Management Area, including the following:

(a) Other MS4 outfalls (e.g., Phase II Municipal and Caltrans),

(b) Other NPDES permitted discharges,

(c) Any other discharges that may be considered point sources (e.g., private outfalls), and

(d) Any other discharges that may be considered non-point sources (e.g., agriculture, wildlife or other natural sources);

(4) Review of available data, including but not limited to:

(a) Findings from the Copermittees' illicit discharge detection and elimination programs,

(b) Findings from the Copermittees' MS4 outfall discharge monitoring,

(c) Findings from the Copermittees' receiving water monitoring,

(d) Findings from the Copermittees' MS4 outfall discharge and receiving water assessments, and

(e) Other available, relevant, and appropriately collected data, information, or studies related to pollutant sources and/or stressors that contribute to the highest priority water quality conditions as identified for Provision B.2.c.

(5) The adequacy of the available data to identify and prioritize sources and/or stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c.

e. IDENTIFICATION OF POTENTIAL WATER QUALITY IMPROVEMENT STRATEGIES

The Copermittees must evaluate the findings identified under Provisions B.2.a-d, and identify potential strategies that can result in improvements to water quality

in MS4 discharges and/or receiving waters within the Watershed Management Area. Potential water quality improvement strategies that may be implemented within the Watershed Management Area must include the following:

(1) Structural BMPs, non-structural BMPs, incentives, or programs that can potentially be implemented to address the highest priority water quality conditions identified under Provision B.2.c, or MS4 sources of pollutants or stressors identified under Provision B.2.d,

(2) Retrofitting projects in areas of existing development within the Watershed Management Area that can potentially be implemented to reduce MS4 sources of pollutants or stressors identified under Provision B.2.d causing or contributing to the highest priority water quality conditions identified under Provision B.2.c, and

(3) Stream, channel, and/or habitat rehabilitation projects within the Watershed Management Area that can potentially be implemented to protect and/or improve conditions in receiving waters from MS4 pollutants and/or stressors identified under Provision B.2.d causing or contributing to the highest priority water quality conditions identified under Provision B.2.c.

3. Water Quality Improvement Goals, Strategies and Schedules

The Copermittees must identify and develop specific water quality improvement goals and strategies to address the highest priority water quality conditions identified within a Watershed Management Area. The water quality improvement goals and strategies must address the highest priority water quality conditions by effectively prohibiting non-storm water discharges to the MS4, reducing pollutants in storm water discharges from the MS4 to the MEP, and protecting the water quality standards of receiving waters.

a. WATER QUALITY IMPROVEMENT GOALS AND SCHEDULES

(1) Numeric Goals

The Copermittees must develop and incorporate numeric goals[6] into the Water Quality Improvement Plan. Numeric goals must be used to support Water Quality Improvement Plan implementation and measure reasonable progress towards addressing the highest priority water quality conditions identified under Provision B.2.c. The Copermittees must establish and

[6] Interim and final numeric goals may take a variety of forms such as TMDL established WQBELs, action levels, pollutant concentration, load reductions, number of impaired water bodies delisted from the List of Water Quality Impaired Segments, Index of Biotic Integrity (IBI) scores, or other appropriate metrics. Interim and final numeric goals are not necessarily limited to one criterion or indicator, but may include multiple criteria and/or indicators. Except for TMDL established WQBELs, interim and final numeric goals and corresponding schedules may be revised through the adaptive management process under Provision B.5.

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incorporate the following numeric goals in the Water Quality Improvement Plan:

(a) Final numeric goals must be based on measureable criteria or indicators capable of demonstrating one or more of the following:

(i) Discharges from the Copermittees' MS4s will not cause or contribute to exceedances of water quality standards in receiving waters, AND/OR

(ii) The conditions of receiving waters and associated habitat are protected from MS4 discharges, AND/OR

(iii) Beneficial uses of receiving waters are protected from MS4 discharges and will be supported.

(b) Interim numeric goals must be based on measureable criteria or indicators capable of demonstrating reasonable incremental progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges as follows:

(i) One or more interim numeric goals may be established to demonstrate progress toward achieving each final numeric goal,

(ii) For each final numeric goal, at least one interim numeric goal must be expressed as a reasonable increment toward achievement of the final numeric goal,

(iii) For each final numeric goal, reasonable interim numeric goals must be established to be accomplished during each 5 year period between the acceptance of the Water Quality Improvement Plan and the achievement of the final numeric goals.

(2) Schedules for Achieving Numeric Goals

The Copermittees must develop and incorporate schedules for achieving the numeric goals into the Water Quality Improvement Plan. The schedules must demonstrate reasonable progress toward achieving the final numeric goals required for Provision B.3.a.(1). The Copermittees must incorporate the schedules for achieving the numeric goals into the Water Quality Improvement Plan based on the following considerations:

(a) Final dates for achieving all final numeric goals must be established considering the following:

(i) Final compliance dates for any applicable TMDLs in Attachment E to this Order;

(ii) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(iii) Achievement of the final numeric goals for the highest water quality priorities must be as soon as possible;

(iv) Final dates for achieving the final numeric goals must reflect a realistic assessment of the shortest practicable time required based on the temporal and spatial extent and factors associated with the highest priority water quality conditions identified under Provision B.2.c, and taking into account the time reasonably required to implement the water quality improvement strategies required pursuant to Provision B.3.b.

(b) Interim dates for achieving all interim numeric goals must be established considering the following:

(i) Interim compliance dates for any applicable TMDLs in Attachment E to this Order;

(ii) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(iii) Interim dates for achieving the interim numeric goals must reflect a realistic assessment of the shortest practicable time reasonably required, taking into account the time needed to implement new or significantly expanded programs and securing financing, if necessary; and

(iv) For each final numeric goal, at least one interim numeric goal must be established that the Copermittees will work toward achieving within the term of this Order.

b. WATER QUALITY IMPROVEMENT STRATEGIES AND SCHEDULES

Based on the likely effectiveness and efficiency of the potential water quality improvement strategies identified under Provision B.2.e to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a, the Copermittees must identify the strategies that will be implemented in each Watershed Management Area as follows:

(1) Jurisdictional Strategies

(a) Each Copermittee in the Watershed Management Area must identify the strategies that will be implemented within its jurisdiction as part of its jurisdictional runoff management program requirements under Provisions E.2 through E.7, including descriptions of the following:

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(i) For each of the inventories developed for its jurisdiction, as required under Provisions D.2.a.(1), E.3.e.(2), E.4.c, and E.5.a, each Copermittee must identify the known and suspected areas or sources causing or contributing to the highest priority water quality conditions in the Watershed Management Area that the Copermittee will focus on in its efforts to effectively prohibit non-storm water discharges to its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, and achieve the interim and final numeric goals identified under Provision B.3.a;

(ii) BMPs that each Copermittee will implement, or require to be implemented, as applicable, for those areas or sources within its jurisdiction;

(iii) Education programs that each Copermittee will implement, as applicable, for those areas or sources within its jurisdiction;

(iv) Frequencies that each Copermittee will conduct inspections on those areas or sources within its jurisdiction;

(v) Incentive and enforcement programs that each Copermittee will implement, as applicable, for those areas or sources within its jurisdiction; and

(vi) Any other BMPs, incentives, or programs that each Copermittee will implement for those areas or sources within its jurisdiction.

(b) Identify the optional jurisdictional strategies that each Copermittee will implement within its jurisdiction, as necessary, to effectively prohibit non-storm water discharges to its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. Descriptions of the optional jurisdictional strategies must include:

(i) BMPs, incentives, or programs that may be implemented by the Copermittee within its jurisdiction in addition to the requirements of Provisions B.3.b.(1)(a);

(ii) Incentives or programs that may be implemented by the Copermittee to encourage or implement projects to retrofit areas of existing development within its jurisdiction.

(iii) Incentives or programs that may be implemented by the Copermittee to encourage or implement projects that will rehabilitate the conditions of channels or habitats within its jurisdiction;

(iv) The funds and/or resources that must be secured by the Copermittee to implement the optional strategies described for Provisions E.3.b.(1)(b)(i)-(iii) within its jurisdiction; and

(v) The circumstances necessary to trigger implementation of the optional jurisdictional strategies, in addition to the requirements of Provisions B.3.b.(1)(a), to achieve the interim and final numeric goals within the schedules established under Provision B.3.a.

(c) Identify the strategies that will be implemented by the Copermittee in coordination with or with the cooperation of other agencies (e.g. Caltrans, water districts, school districts) and/or entities (e.g. non-governmental organizations) within its jurisdiction.

(2) Watershed Management Area Strategies

The Copermittees must identify the optional regional or multi-jurisdictional strategies that will be implemented in the Watershed Management Area, as necessary, to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. Descriptions of the optional regional or multi-jurisdictional strategies must include:

(a) Regional or multi-jurisdictional BMPs, incentives, or programs that may be implemented by the Copermittees in the Watershed Management Area;

(b) Incentives or programs that may be implemented by the Copermittees in the Watershed Management Area to encourage or implement regional or multi-jurisdictional projects to retrofit areas of existing development.

(c) Incentives or programs that may be implemented by the Copermittees to encourage or implement regional or multi-jurisdictional projects that will rehabilitate the conditions of channels, streams, or habitats within the Watershed Management Area;

(d) The funds and/or resources that must be secured by the Copermittees to implement the optional strategies described for Provisions E.3.b.(2)(a)-(c) within the Watershed Management Area; and

(e) The circumstances necessary to trigger implementation of the optional regional or multi-jurisdictional strategies to achieve the interim and final numeric goals within the schedules established under Provision B.3.a.

(3) Schedules for Implementing Strategies

The Copermittees must develop reasonable schedules for implementing the water quality improvement strategies identified under Provisions B.3.b.(1) and B.3.b.(2)(a) to achieve the interim and final numeric goals identified and schedules established under Provision B.3.a. The Copermittees must

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incorporate the schedules to implement the water quality improvement strategies into the Water Quality Improvement Plan as follows:

(a) Each Copermittee must develop schedules for the jurisdictional strategies identified pursuant to Provisions B.3.b.(1)(a)-(b). Each schedule must specify:

(i) If each jurisdictional strategy identified pursuant to Provision B.3.b.(1)(a) will or will not be initiated upon acceptance of the Water Quality Improvement Plan;

(ii) For each jurisdictional strategy identified pursuant to Provision B.3.b.(1)(a) that will not be initiated upon approval of the Water Quality Improvement Plan, the shortest practicable time in which each jurisdictional strategy will be initiated after acceptance of the Water Quality Improvement Plan;

(iii) For each optional jurisdictional strategy identified pursuant to Provision B.3.b.(1)(b), a realistic assessment of the shortest practicable time required to:

[a] Secure the resources needed to fund the optional jurisdictional strategy, and
[b] Procure the resources, materials, labor, and applicable permits necessary to initiate implementation of the optional jurisdictional strategy;

(iv) If each jurisdictional strategy identified pursuant to Provisions B.3.b.(1)(a)-(b) is expected to be continuously implemented (e.g. inspections) or completed within a schedule (e.g. construction of structural BMP), and

(v) If a jurisdictional strategy identified pursuant to Provisions B.3.b.(1)(a)-(b) is expected to be completed within a schedule, the anticipated time to complete based on a realistic assessment of the shortest practicable time required.

(b) The Copermittees in the Watershed Management Area must develop schedules for the regional or multi-jurisdictional strategies identified pursuant to Provision B.3.b.(2). Each schedule must specify:

(i) A realistic assessment of the shortest practicable time to:

[a] Secure the resources needed to fund the optional regional or multi-jurisdictional strategy, and
[b] Procure the resources, materials, labor, and permits necessary to initiate the implementation of the optional regional or multi-jurisdictional strategy;

(ii) If each regional or multi-jurisdictional strategy identified pursuant to Provision B.3.b.(2) is expected to be continuously implemented (e.g. inspections) or completed within a schedule (e.g. construction of structural BMP); and

(iii) If a regional or multi-jurisdictional strategy and/or activity identified pursuant to Provisions B.3.b.(2) is expected to be completed within a schedule, the anticipated time to complete based on a realistic assessment of the shortest practicable time required.

(4) Optional Watershed Management Area Analysis

(a) For each Watershed Management Area, the Copermittees have the option to perform a Watershed Management Area Analysis for the purpose of developing watershed-specific requirements for structural BMP implementation, as described in Provision E.3.c.(3). The Watershed Management Area Analysis must include GIS layers (maps) as output. ~~The analysis must include the following information, to the extent it is available, in order to characterize the Watershed Management Areas:~~

~~(i) A description of dominant hydrologic processes, such as areas where infiltration or overland flow likely dominates;~~

~~(ii) A description of existing streams in the watershed, including bed material and composition, and if they are perennial or ephemeral;~~

~~(iii) Current and anticipated future land uses;~~

~~(iv) Potential coarse sediment yield areas; and~~

~~(v) Locations of existing flood control structures and channel structures, such as stream armoring, constrictions, grade control structures, and hydromodification or flood management basins.~~

(b) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify and compile a list of candidate projects that could ~~potentially be~~ used as alternative compliance options for Priority Development Projects, to be implemented in lieu of onsite structural BMP performance requirements described in Provisions E.3.c.(1) and E.3.c.(2). ~~Specifically, the Copermittees must identify in each Watershed Management Area:~~

opport. such as

~~(i) Opportunities for stream or riparian area rehabilitation;~~

~~(ii) Opportunities for retrofitting existing infrastructure to incorporate storm water retention or treatment;~~

~~(iii) Opportunities for regional BMPs;~~

~~(iv) Opportunities for groundwater recharge projects;~~

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~~(v) Opportunities for water supply augmentation projects; and~~

~~(vi) Opportunities for land purchases to preserve floodplain functions.~~

(c) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify areas within the Watershed Management Area where it is appropriate to allow Priority Development Projects to be exempt from the hydromodification management BMP performance requirements described in Provision E.3.c.(2), including supporting rationale.

c. DISCHARGE PROHIBITIONS AND RECEIVING WATER LIMITATIONS COMPLIANCE OPTION

(1) The Copermittees may utilize implementation of the water quality improvement strategies in the Water Quality Improvement Plan to demonstrate compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, ~~and~~ A.2.a and A.2.b. For each Copermittee in the Watershed Management Area that chooses to utilize this option, the Copermittee will be in compliance with Provisions A.1.a, A.1.c, A.1.d, ~~and~~ A.2.a and A.2.b if:

(a) Numeric goals and schedules developed pursuant to Provision B.3.a include the following numeric goals:

(i) WQBELs expressed as concentration-based or load-based effluent limitations applicable to the Watershed Management Area established by the TMDLs in Attachment E to this Order; and

(ii) Numeric goals applicable to the Copermittee's MS4 discharges expressed as concentration-based or load-based effluent limitations for all other pollutants listed on the Clean Water Act Section 303(d) List of Water Quality Impaired Segments[7] for the receiving waters in the Watershed Management Area that do not have a TMDL developed; and

(iii) Numeric goals for receiving waters that will protect the conditions of the receiving waters and attain water quality standards.

(b) An analysis utilizing a watershed model or other watershed analytical tools is performed. The results must be included in the Water Quality Improvement Plan to quantitatively demonstrate that the implementation of the water quality improvement strategies required under Provision B.3.b will achieve the numeric goals within the established schedules required under Provision B.3.a. The analysis may be performed individually or jointly by the Copermittees choosing to utilize this option in the Watershed Management Area, and must be updated as part of the iterative approach and adaptive management process required under Provisions B.5.a-b.

[7] 2002 and subsequent 303(d) Lists

(c) The Water Quality Improvement Plan specifies the monitoring and assessments (i.e. MS4 outfall discharge, receiving water, and/or special studies) that will be performed by the Copermittee to confirm the implementation of the water quality improvement strategies within its jurisdiction is making progress toward achieving the numeric goals in accordance with the established schedules developed pursuant to Provision B.3.c.(1)(a). The monitoring and assessments must be incorporated into the monitoring and assessment program required pursuant to Provision B.4. The monitoring and assessments must be updated as part of the iterative approach and adaptive management process required under Provision B.5.c.

(d) The numeric goals proposed pursuant to Provision B.3.c.(1)(a), the analysis performed pursuant to Provision B.3.c.(1)(b), and the specific monitoring and assessments proposed pursuant to Provision B.3.c.(1)(c) have been reviewed ~~and receive concurrence~~ by a majority of the Water Quality Improvement Consultation Panel (see Provision F.1.a.(1)(b)). Updates must also ~~receive concurrence~~be reviewed by ~~a majority of~~ the Water Quality Improvement Consultation Panel.

(2) Each Copermittee that chooses to utilize this option will, for the pollutant/water body combinations covered by the analysis, be in compliance with Provisions A.1.a, A.1.c, A.1.d, ~~and~~ A.2.a, and A.2.b during development of and when the Water Quality Improvement Plan, incorporating the requirements of Provision B.3.c.(1), is ~~accepted~~ approved by the San Diego Water Board.

(3) The Copermittee will, for the pollutant/water body combinations covered by the analysis, remain in compliance with Provisions A.1.a, A.1.c, A.1.d ~~and~~ A.2.a, and A.2.b during the term of this Order as long as:

(a) The results of the analysis performed pursuant to Provision B.3.c.(1)(d) is ~~accepted and continues to be accepted~~approved by the San Diego Water Board Executive Officer as part of the Water Quality Improvement Plan; AND

(b) The Copermittee continues to implement the water quality improvement strategies within its jurisdiction developed pursuant to Provision B.3.b.(1) in accordance with the schedules for implementing the strategies established pursuant to Provision B.3.b.(3)(a); AND

(c) The Copermittee continues to perform the monitoring and assessments specified in the Water Quality Improvement Plan, developed and implemented pursuant to Provision B.3.c.(1)(c), to demonstrate its progress toward achieving the numeric goals applicable to its MS4 discharges in accordance with the interim and final dates for achieving the

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numeric goals established pursuant to Provision B.3.a.(2); AND

(d) The Copermittees in the Watershed Management Area continues to implement the requirements of Provision A.4.a.

4. Water Quality Improvement Monitoring and Assessment Program

a. The Copermittees in each Watershed Management Area must develop and incorporate an integrated monitoring and assessment program into the Water Quality Improvement Plan that assesses: 1) the progress toward achieving the numeric goals and schedules, 2) the progress toward addressing the highest priority water quality conditions for each Watershed Management Area, and 3) each Copermittee's overall efforts to implement the Water Quality Improvement Plan.

b. The monitoring and assessment program must incorporate the monitoring and assessment requirements of Provision D, which may allow the Copermittees to modify the program to be consistent with and focus on the highest priority water quality conditions for each Watershed Management Area.

c. For Watershed Management Areas with applicable TMDLs, the monitoring and assessment program must incorporate the specific monitoring and assessment requirements of Attachment E.

d. For Watershed Management Areas with any ASBS, the water quality monitoring and assessment program must incorporate the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

5. Iterative Approach and Adaptive Management Process

The Copermittees in each Watershed Management Area must implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a, and must include the following:

a. RE-EVALUATION OF PRIORITY WATER QUALITY CONDITIONS

The priority water quality conditions and potential water quality improvement strategies included in the Water Quality Improvement Plan pursuant to Provision B.2.c, may be re-evaluated by the Copermittees as needed during the term of this Order as part of the Water Quality Improvement Plan Annual Report. Re-evaluation and recommendations for modifications to the priority water quality conditions and potential water quality improvement strategies must be provided

in the Report of Waste Discharge, and must consider the following:

(1) Achieving the outcome of improved water quality in MS4 discharges and receiving waters through implementation of the water quality improvement strategies identified in the Water Quality Improvement Plan;

(2) New information developed when the requirements of Provisions B.2.a-c have been re-evaluated;

(3) Spatial and temporal accuracy of monitoring data collected to inform prioritization of water quality conditions and implementation strategies to address the highest priority water quality conditions;

(4) Availability of new information and data from sources other than the jurisdictional runoff management programs within the Watershed Management Area that informs the effectiveness of the actions implemented by the Copermittees;

(5) San Diego Water Board recommendations; and

(6) Recommendations for modifications solicited through a public participation process.

b. ADAPTATION OF GOALS, STRATEGIES AND SCHEDULES

The water quality improvement goals, strategies and schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.3, must be re-evaluated and adapted as new information becomes available to result in more effective and efficient measures to address the highest priority water quality conditions identified pursuant to Provision B.2.c. Re-evaluation of and modifications to the water quality improvement goals, strategies and schedules must be provided in the Water Quality Improvement Plan Annual Report, and must consider the following:

(1) Modifications to the priority water quality conditions based on Provision B.5.a;

(2) Progress toward achieving interim and final numeric goals in receiving waters and MS4 discharges for the highest priority water quality conditions in the Watershed Management Area,

(3) Progress toward achieving outcomes according to established schedules;

(4) New policies or regulations that may affect identified numeric goals;

(5) Measurable or demonstrable reductions of non-storm water discharges to and from each Copermittee's MS4;

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(6) Measurable or demonstrable reductions of pollutants in storm water discharges from each Copermittee's MS4 to the MEP;

(7) New information developed when the requirements of Provisions B.2.b and B.2.d have been re-evaluated;

(8) Efficiency in implementing the Water Quality Improvement Plan;

(9) San Diego Water Board recommendations; and

(10) Recommendations for modifications solicited through a public participation process.

c. ADAPTATION OF MONITORING AND ASSESSMENT PROGRAM

The water quality improvement monitoring and assessment program, included in the Water Quality Improvement Plan pursuant to Provision B.4, must be re-evaluated and adapted when new information becomes available. Re-evaluation and recommendations for modifications to the monitoring and assessment program, pursuant to the requirements of Provision D, may be provided in the Water Quality Improvement Plan Annual Report but must be provided in the Report of Waste Discharge.

6. **Water Quality Improvement Plan Submittal, Updates, and Implementation**

a. The Copermittees must submit and commence implementation of the Water Quality Improvement Plans in accordance with the requirements of Provision F.1.

b. The Copermittees must submit proposed updates to the Water Quality Improvement Plan for acceptance by the San Diego Water Board Executive Officer in accordance with the requirements of Provision F.2.c.

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C. ACTION LEVELS

The purpose of this provision is for the Copermittees to incorporate numeric action levels in the Water Quality Improvement Plans. The goal of the action levels is to guide Water Quality Improvement Plan implementation efforts and measure progress towards the protection of water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through monitoring and assessing the quality of the MS4 discharges during the implementation of the Water Quality Improvement Plans.

1. Non-Storm Water Action Levels[8]

The Copermittees must develop and incorporate numeric non-storm water action levels (NALs) into the Water Quality Improvement Plan to: 1) support the development and prioritization of water quality improvement strategies for effectively prohibiting non-storm water discharges to the MS4s, 2) assess the effectiveness of the water quality improvement strategies toward addressing MS4 non-storm water discharges, required pursuant to Provision D.4.b.(1) and 3) support the detection and elimination of non-storm water and illicit discharges to the MS4, required pursuant to Provision E.2.[9]

a. The following NALs must be incorporated, if the Copermittees do not establish numeric action levels within the Water Quality Improvement Plan based on watershed priorities:

(1) Non-Storm Water Discharges from MS4s to Ocean Surf Zone

Table C-1. Non-Storm Water Action Levels for Discharges from MS4s to Ocean Surf Zone

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Total Coliform	MPN/100 ml	1,000	-	10,000/1,000[1]	OP
Fecal Coliform	MPN/100 ml	200[2]	-	400	OP
Enterococci	MPN/100 ml	35	-	104[3]	OP

Abbreviations/Acronyms
AMAL – average monthly action level
OP – Ocean Plan water quality objective
MDAL – maximum daily action level
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Total coliform density NAL is 1,000 MPN/100 ml when the fecal/total coliform ratio exceeds 0.1.
2. Fecal coliform density NAL is 200 MPN per 100 ml during any 30 day period
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas."

[8] NALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, ~~unless~~ However, in instances where the NAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed, exceedances of the WQBEL that is the basis of the NAL/SAL may result in a violation of provisions in Attachment E.

[9] The Copermittees may utilize NALs or other benchmarks currently established by the Copermittees as interim NALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

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(2) Non-Storm Water Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Table C-2. Non-Storm Water Action Levels for Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Turbidity	NTU	75	-	225	OP
pH	Units	Within limit of 6.0 to 9.0 at all times			OP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	35	-	104[3]	BP
Priority Pollutants	ug/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
OP – Ocean Plan water quality objective
NTU – Nephelometric Turbidity Units
ug/L – micrograms per liter
MDAL – maximum daily action level
BP – Basin Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas" and is not applicable to waterbodies that are not designated with the water contact recreation (REC-1) beneficial use.

Table C-3. Non-Storm Water Action Levels for Priority Pollutants

Parameter	Units	Freshwater (CTR)		Saltwater (CTR)	
		MDAL	AMAL	MDAL	AMAL
Cadmium	ug/L	*	**	16	8
Copper	ug/L	*	*	5.8	2.9
Chromium III	ug/L	**	**	-	-
Chromium VI	ug/L	16	8.1	83	41
Lead	ug/L	*	*	14	2.9
Nickel	ug/L	**	**	14	6.8
Silver	ug/L	*	*	2.2	1.1
Zinc	ug/L	*	*	95	47

Abbreviations/Acronyms:
CTR – California Toxic Rule
AMAL – average monthly action level
ug/L – micrograms per liter
MDAL – maximum daily action level

Notes:
* Action levels developed on a case-by-case basis (see below)
** Action levels developed on a case-by-case basis (see below), but calculated criteria are not to exceed Maximum Contaminant Levels (MCLs) under the California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64431.
The Cadmium, Copper, Chromium (III), Lead, Nickel, Silver and Zinc NALs for MS4 discharges to freshwater receiving waters will be developed on a case-by-case basis based on site-specific water quality data (receiving water hardness). For these priority pollutants, refer to 40 CFR 131.38(b)(2).

(3) Non-Storm Water Discharges from MS4s to Inland Surface Waters

Table C-4. Non-Storm Water Action Levels for Discharges from MS4s to Inland Surface Waters

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Dissolved Oxygen	mg/L	Not less than 5.0 in WARM waters and not less than 6.0 in COLD waters			BP
Turbidity	NTU	-	20	See MDAL	BP
pH	Units	Within limit of 6.5 to 8.5 at all times			BP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	33	-	61[3]	BP
Total Nitrogen	mg/L	-	1.0	See MDAL	BP
Total Phosphorus	mg/L	-	0.1	See MDAL	BP
MBAS	mg/L	-	0.5	See MDAL	BP
Iron	mg/L	-	0.3	See MDAL	BP
Manganese	mg/L	-	0.05	See MDAL	BP
Priority Pollutants	ug/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
BP – Basin Plan water quality objective
COLD – cold freshwater habitat beneficial use
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
MDAL – maximum daily action level
WARM – warm freshwater habitat beneficial use
MBAS – Methylene Blue Active Substances
MPN/100 ml – most probable number per 100 milliliters
ug/L – micrograms per liter

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for freshwater "designated beach areas" and is not applicable to waterbodies that are not designated with the water contact recreation (REC-1) beneficial use.

b. ~~If not identified in Provision C.1.a,~~ NALs must be identified, developed and incorporated in the Water Quality Improvement Plan for any pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in receiving waters associated with the highest priority water quality conditions related to non-storm water discharges from the MS4s. NALs must be based on:

(1) Applicable water quality standards which may be dependent upon site-specific or receiving water-specific conditions or assumptions to be identified by the Copermittees; or

(2) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the NALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary NALs specific to the Watershed Management Area at levels greater than the NALs required by Provisions C.1.a and C.1.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for effectively prohibiting non-storm water discharges to the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and from the MS4. The

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secondary NALs may be developed using an approach acceptable to the San Diego Water Board.

d. Dry weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.b may be utilized to develop or revise NALs based on watershed-specific data, subject to San Diego Water Board Executive Officer approval.

2. Storm Water Action Levels[10]

The Copermittees must develop and incorporate numeric storm water action levels (SALs) in the Water Quality Improvement Plans to: 1) support the development and prioritization of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s, and 2) assess the effectiveness of the water quality improvement strategies toward reducing pollutants in storm water discharges, required pursuant to Provision D.4.b.(2).[11]

a. The following SALs for discharges of storm water from the MS4 must be incorporated, if the Copermittees do not establish numeric action levels within the Water Quality Improvement Plan based on watershed priorities:

Table C-5. Storm Water Action Levels for Discharges from MS4s to Receiving Waters

Parameter	Units	Action Level
Turbidity	NTU	126
Nitrate & Nitrite (Total)	mg/L	2.6
Phosphorus (Total P)	mg/L	1.46
Cadmium (Total Cd)*	µg/L	3.0
Copper (Total Cu)*	µg/L	127
Lead (Total Pb)*	µg/L	250
Zinc (Total Zn)*	µg/L	976

Abbreviations/Acronyms
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
ug/L – micrograms per liter

Notes:
* The sampling must include a measure of receiving water hardness at each MS4 outfall. If a total metal concentration exceeds the corresponding metals SAL in Table C-5, that concentration must be compared to the California Toxics Rule criteria and the USEPA 1-hour maximum concentration for the detected level of receiving water hardness associated with that sample. If it is determined that the sample's total metal concentration for that specific metal exceeds that SAL, but does not exceed the applicable USEPA 1-hour maximum concentration criterion for the measured level of hardness, then the sample result will not be considered above the SAL for that measurement

[10] SALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, ~~unless~~. However, in instances where the SAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed, exceedances of the WQBEL that is the basis of the NAL/SAL may result in a violation of provisions in Attachment E.

[11] The Copermittees may utilize SALs or other benchmarks currently established by the Copermittees as interim SALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

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b. ~~If not identified in Provision C.2.a,~~ SALs must be identified, developed and incorporated in the Water Quality Improvement Plan for pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in receiving waters associated with the highest priority water quality conditions related to storm water discharges from the MS4s. SALs must be based on:

(1) Federal and State water quality guidance and/or water quality standards; and

(2) Site-specific or receiving water-specific conditions; or

(3) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the SALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary SALs specific to the Watershed Management Area at levels greater than the SALs required by Provisions C.2.a and C.2.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s. The secondary SALs may be developed based on the approaches recommended by the State Water Board's Storm Water Panel[12] or using an approach acceptable to the San Diego Water Board.

d. Wet weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.c may be used to develop or revise SALs based upon watershed-specific data, subject to San Diego Water Board Executive Officer approval.

[12] Storm Water Panel Recommendations to the California State Water Resources Control Board: The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities (June 2006)

D. MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS

The purpose of this provision is for the Copermittees to monitor and assess the impact on the conditions of receiving waters caused by discharges from the Copermittees' MS4s under wet weather and dry weather conditions. The goal of the monitoring and assessment program is to inform the Copermittees about the nexus between the health of receiving waters and the water quality condition of the discharges from their MS4s. This goal will be accomplished through monitoring and assessing the conditions of the receiving waters, discharges from the MS4s, pollutant sources and/or stressors, and effectiveness of the water quality improvement strategies implemented as part of the Water Quality Improvement Plans.

1. Receiving Water Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the condition of the receiving waters in each Watershed Management Area during dry weather and wet weather. Following San Diego Water Board acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct long-term receiving water monitoring during implementation of the Water Quality Improvement Plan to assess the long term trends and determine if conditions in receiving waters are improving. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following receiving water monitoring procedures:

a. TRANSITIONAL RECEIVING WATER MONITORING

Until the monitoring requirements and schedules of Provisions D.1.b-e are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following receiving water monitoring in the Watershed Management Area:

(1) Continue the receiving water monitoring programs required in Order Nos. R9-2007-0001 (Monitoring and Reporting Program No. R9-2007-0001 Sections II.A.1-A.5), R9-2009-0002, and R9-2010-0016;

(2) Continue the monitoring in the Hydromodification Management Plans approved by the San Diego Water Board;

(3) Participate in the following regional receiving water monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring,

(b) Southern California Bight Regional Monitoring, and

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(c) Sediment Quality Monitoring;

(4) Implement the monitoring programs developed as part of any implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) for the TMDLs in Attachment E to this Order; and

(5) For Watershed Management Areas with ASBS, implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

b. LONG-TERM RECEIVING WATER MONITORING STATIONS

The Copermittees must select at least one long-term receiving water monitoring station from among the existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees to be representative of the receiving water quality in the Watershed Management Area. Additional long-term receiving water monitoring stations must be selected where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

c. DRY WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three dry weather monitoring events at each of the long-term receiving water monitoring stations. At least one monitoring event must be conducted during the dry season (May 1 – September 30) and at least one monitoring event must be conducted during a dry weather period during the wet season (October 1 – April 30), after the first wet weather event of the season, with an antecedent dry period of at least 72 hours following a storm event producing measureable rainfall of greater than 0.1 inch.

(1) Dry Weather Receiving Water Field Observations

For each dry weather monitoring event, the Copermittees must record field observations consistent with Table D-1 at each long-term receiving water monitoring station.

Table D-1. Field Observations for Receiving Water Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) • Station description (i.e. deposits or stains, vegetation condition, structural condition, and observable biology) • Presence and assessment of trash in and around station

(2) Dry Weather Receiving Water Field Monitoring

For each dry weather monitoring event, if conditions allow the collection of the data, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station

Table D-2. Field Monitoring Parameters for Receiving Water Monitoring Stations

Parameters
• pH • Temperature • Specific conductivity • Dissolved oxygen • Turbidity

(3) Dry Weather Receiving Water Analytical Monitoring

For each dry weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

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(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for waterbodies where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable NAL constituents, and

(v) Constituents listed in Table D-3.

Table D-3. Analytical Monitoring Constituents for Receiving Water Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Pesticides	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Mercury • Nickel • Selenium • Thallium • Zinc	• Organophosphate Pesticides • Pyrethroid Pesticides	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform

(4) Dry Weather Receiving Water Toxicity Monitoring

For each dry weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for aquatic toxicity in accordance with Table D-4. When the State Water Board's Policy for Toxicity Assessment and Control (Toxicity Policy) is approved and in effect, the San Diego Water Board Executive Officer may direct the Copermittees to replace current toxicity program elements with standardized procedures in the Toxicity Policy.

Table D-4. Dry Weather Chronic[1] Toxicity Testing for Receiving Water Monitoring Stations

Organism	Units	Test	USEPA Protocol
Freshwater			
Pimephales promelas (Fathead Minnow)	Pass / Fail	Larval Survival and Growth	EPA-821-R-02-013
Ceriodaphnia dubia (Daphnid)	Pass / Fail	Survival and Production	EPA-821-R-02-013
Selenastrum capricornutum (Green Algae)	Pass / Fail	Growth	EPA-821-R-02-013
Marine and Estuarine			
Strongylocentrotus purpuratus (Purple Sea Urchin)	Pass / Fail	Embryo-Larval Development	EPA-600-R-95-136

Notes:
1. Chronic toxicity testing is not required at receiving water monitoring stations located at mass loading stations if the channel flows are diverted year-round during dry weather conditions to the sanitary sewer for treatment.

(a) Freshwater Test Species and Methods: If samples are collected in receiving waters with salinity less than 1 ppt, the Copermittees must follow the methods for chronic toxicity tests as established in 40 CFR 136.3 using a single-concentration test design for routine monitoring, or a five-concentration test design for additional toxicity testing if the limitation is exceeded. The Copermittees must estimate the critical life stage chronic toxicity on undiluted samples in accordance with species and short term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms (EPA-821-R-02-013; Table IA, 40 CFR 136). Additional test species may be used by the Copermittees if approved by the San Diego Water Board Executive Officer. The Copermittees must conduct:

(i) A static renewal toxicity test with the fathead minnow, *Pimephales promelas* (Larval Survival and Growth Test Method 1000.0);

(ii) A static renewal toxicity test with the daphnid, *Ceriodaphnia dubia* (Survival and Reproduction Test Method 1002.0); and

(iii) A static renewal toxicity test with the green alga, *Selenastrum capricornutum* (also named *Raphidocelis subcapitata*) (Growth Test Method 1003.0).

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(b) Marine and Estuarine Test Species and Methods: If samples are collected in receiving waters with salinity greater or equal to 1 ppt, the Copermittees must follow the methods for chronic toxicity tests as established in 40 CFR 136.3 using a single-concentration test design for routine monitoring, or a five-concentration test design for additional toxicity testing if the limitation is exceeded. The Copermittees must conduct the following critical life state chronic toxicity tests on undiluted samples in accordance with species and short term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms (EPA-600-R-95-136; 1995). Artificial sea salts must be used to increase sample salinity. The Copermittees must conduct a static non-renewal toxicity test with the purple sea urchin, *Strongylocentrotus purpuratus* (Embryo-larval Development Test Method). Additional species may be used by the Copermittees if approved by the San Diego Water Board Executive Officer.

(c) Holding Times: All toxicity tests must be conducted as soon as possible following sample collection. The 36-hour sample holding time for test initiation shall be targeted. However, no more than 72 hours shall elapse before the conclusion of sample collection and test initiation.

(d) Test Species Sensitivity Screening: To determine the most sensitive test species for freshwater, the Copermittees must screen 2 wet weather and 2 dry weather toxicity tests with a vertebrate, an invertebrate, and a plant species. After this screening period, subsequent monitoring must be conducted using the most sensitive test species. Alternatively, if a sensitive test species has already been determined, or if there is prior knowledge of potential toxicant(s) and a test species is sensitive to such toxicant(s), then monitoring must be conducted using only that test species. Sensitive test species determinations must also consider the most sensitive test species used for proximal receiving water monitoring. Rescreening must occur once each permit term.

(e) Chronic toxicity test biological endpoint data must be analyzed using the Test of Significant Toxicity t-test approach specified in *National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document* (USEPA, Office of Wastewater Management, Washington, D.C., EPA-833-R-10-003, 2010). For this monitoring program, the critical chronic instream waste concentration (IWC) is set at 100 percent receiving water (i.e. no dilution) for receiving water samples. A 100 percent receiving water and a control must be tested.

(f) Toxicity Identification Evaluation (TIE) / Toxicity Reduction Evaluation (TRE): If chronic toxicity is detected in receiving waters, the Copermittees must discuss the need for conducting a TIE/TRE in the assessments required under Provision D.4.a.(2), and develop a plan for implementing the TIE/TRE to be incorporated in the Water Quality Improvement Plan.

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(5) Dry Weather Receiving Water Bioassessment Monitoring

Bioassessment monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must conduct bioassessment monitoring during at least one dry weather monitoring event at each long-term receiving water monitoring station as follows:

(a) The following bioassessment samples and measurements must be collected:

(i) Macroinvertebrate samples must be collected in accordance with the "Reachwide Benthos (Multihabitat) Procedure" in the most current Surface Water Ambient Monitoring Program (SWAMP) Bioassessment Standard Operating Procedures (SOP), and amendments, as applicable;[13]

(ii) The "Full" suite of physical habitat characterization measurements must be collected in accordance with the most current SWAMP Bioassessment SOP, and as summarized in the SWAMP Stream Habitat Characterization Form – Full Version;[14] and

(iii) Freshwater algae samples must be collected in accordance with the SWAMP Standard Operating Procedures for Collecting Algae Samples.[15] Analysis of samples must include algal taxonomic composition (diatoms and soft algae) and algal biomass.

(b) The bioassessment samples, measurements, and appropriate water chemistry data must be used to calculate the following:

(i) An Index of Biological Integrity (IBI) for macroinvertebrates for each monitoring station where bioassessment monitoring was conducted, based on the most current calculation method;[16] and

[13] Ode, P.R. 2007. Standard operating procedures for collecting macroinvertebrate samples and associated physical and chemical data for ambient bioassessments in California. California State Water Resources Control Board Surface Water Ambient Monitoring Program (SWAMP) Bioassessment SOP 001. http://www.swrcb.ca.gov/water_issues/programs/swamp/tools.shtml#monitoring

[14] Available at: http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/reports/fieldforms_fullversion052908.pdf

[15] Fetscher et al. 2009. Standard Operating Procedures for Collecting Stream Algae Samples and Associated Physical Habitat and Chemical Data for Ambient Bioassessments in California.

[16] The most current calculation method at the time the Order was adopted is outlined in "A Quantitative Tool for Assessing the Integrity of Southern California Coastal Streams" (Ode, et al. 2005. Environmental Management. Vol. 35, No. 1, pp. 1-13). If an updated or new calculation method is developed, either both (i.e. current and updated/new) methods must be used, or historical IBIs must be recalculated with the updated or new calculation method.

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(ii) An IBI for algae for each monitoring station where bioassessment monitoring was conducted, when a calculation method is developed.[17]

(c) In lieu of the requirements of Provision D.1.c.(5)(a), the Copermittees may conduct the bioassessment monitoring in accordance with the "Triad" assessment approach[18] to calculate the IBIs required for Provision D.1.c.(5)(b). The Copermittees must conduct sampling, analysis, and reporting of specified in-stream biological and habitat data according to the protocols specified in the SCCWRP Technical Report No. 539, or subsequent protocols, if developed.

(6) Dry Weather Receiving Water Hydromodification Monitoring

In addition to the hydromodification monitoring conducted as part of the Copermittees' Hydromodification Management Plans, hydromodification monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must collect the following hydromodification monitoring observations and measurements within an appropriate domain of analysis during at least one dry weather monitoring event for each long-term receiving water monitoring station:

(a) Channel conditions, including:

(i) Channel dimensions;

(ii) Hydrologic and geomorphic conditions, and

(iii) Presence and condition of vegetation and habitat;

(b) Location of discharge points;

(c) Habitat integrity;

(d) Photo documentation of existing erosion and habitat impacts, with location (i.e. latitude and longitude coordinates) where photos were taken;

(e) Measurement or estimate of dimensions of any existing channel bed or bank eroded areas, including length, width, and depth of any incisions; and

[17] When a calculation method is developed, IBIs must be calculated for all available and appropriate historical data.
[18] Stormwater Monitoring Coalition Model Monitoring Technical Committee, 2004. Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California. Technical Report #419. August 2004.

(f) Known or suspected cause(s) of existing downstream erosion or habitat impact, including flow, soil, slope, and vegetation conditions, as well as upstream land uses and contributing new and existing development.

d. WET WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three wet weather monitoring events at each long-term receiving water monitoring station. At least one wet weather monitoring event must be conducted during the first wet weather event of the wet season (October 1 – April 30), and at least one wet weather monitoring event during a wet weather event that occurs after February 1.

(1) Wet Weather Receiving Water Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each long-term receiving water monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event;

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(d) Presence and assessment of trash in and around station.

(2) Wet Weather Receiving Water Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

(3) Wet Weather Receiving Water Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

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(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) Constituents listed in Table D-3.

(4) Wet Weather Receiving Water Toxicity Monitoring

For each wet weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for chronic aquatic toxicity in accordance with Provisions D.1.c.(4)(a)-(f).

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e. OTHER RECEIVING WATER MONITORING REQUIREMENTS

(1) Regional Monitoring

The Copermittees must participate in the following regional receiving waters monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring; and

(b) Southern California Bight Regional Monitoring.

(2) Sediment Quality Monitoring

The Copermittees must perform sediment monitoring to assess compliance with sediment quality receiving water limits applicable to MS4 discharges to enclosed bays and estuaries. The monitoring may be performed either by individual or multiple Copermittees to assess compliance with receiving water limits, or through participation in a water body monitoring coalition. A Sediment Monitoring Plan which satisfies the requirements of the State Water Board's Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part 1 Sediment Quality (Sediment Control Plan) must be submitted as part of the monitoring and assessment program in the Water Quality Improvement Plan.

(a) The Sediment Monitoring Plan design must include the following:

(i) The elements required under Section VII.D (Receiving Water Limits Monitoring Frequency) and Section VII.E (Sediment Monitoring) of the Sediment Control Plan;

(ii) A Quality Assurance Project Plan (QAPP) describing the project objectives and organization, functional activities, and quality assurance/quality control protocols for the water and sediment monitoring; and

(iii) A schedule for completion of all sample collection and analysis activities and submission of Sediment Monitoring Reports.

(b) The Copermittees must implement the Sediment Monitoring Plan in accordance with the schedule contained in the Sediment Monitoring Plan, unless otherwise directed in writing by the San Diego Water Board Executive Officer.

(c) The Copermittees must incorporate a Sediment Monitoring Report as part of the Water Quality Improvement Plan Annual Report in accordance with the schedule contained in the Sediment Monitoring Plan, unless otherwise directed in writing by the San Diego Water Board Executive Officer. The Sediment Monitoring Report must contain the following information:

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(i) Analysis: An evaluation, interpretation and tabulation of the water and sediment monitoring data, including interpretations and conclusions as to whether applicable Receiving Water Limitations in this Order have been attained at each sample station;

(ii) Sample Location Map: The locations, type, and number of samples shall be identified and shown on a site map; and

(iii) California Environmental Data Exchange Network: A statement certifying that the monitoring data and results have been uploaded into the California Environmental Data Exchange Network (CEDEN).

(d) Based on the Sediment Monitoring Report conclusions the San Diego Water Board may require a human health risk assessment to determine if the human health objective contained in Receiving Water Limitations in Provision A.2.a.(3)(b)(ii) has been attained at each sample station. In conducting a risk assessment, the Copermittees must consider any applicable and relevant information, including California Environmental Protection Agency's (Cal/EPA) Office of Environmental Health Hazard Assessment (OEHHA) policies for fish consumption and risk assessment, Cal/EPA's Department of Toxic Substances Control (DTSC) Risk Assessment, and USEPA Human Health Risk Assessment policies.

(3) ASBS Monitoring

For Watershed Management Areas with ASBS, the Copermittees must implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

f. Alternative Watershed Monitoring Requirements

The San Diego Water Board may direct the Copermittees to participate in an effort to develop alternative watershed monitoring with other regulated entities, other interested parties, and the San Diego Water Board to refine, coordinate, and implement regional monitoring and assessment programs to determine the status and trends of water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams.

2. MS4 Outfall Discharge Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the discharges from the MS4 outfalls in each Watershed Management Area during dry weather and wet weather. Following San Diego Water Board acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct MS4 outfall discharge monitoring during implementation of the Water Quality Improvement Plan to assess the effectiveness of their jurisdictional runoff

management programs toward effectively prohibiting non-storm water discharges into the MS4 and reducing pollutants in storm water discharges from their MS4s to the MEP. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following MS4 outfall monitoring procedures:

a. Transitional MS4 Outfall Discharge Monitoring

Until the monitoring requirements and schedules of Provisions D.2.b-c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following MS4 outfall discharge monitoring in the Watershed Management Area:

(1) MS4 Outfall Discharge Monitoring Station Inventory

Each Copermittee must identify all major MS4 outfalls that discharge directly to receiving waters within its jurisdiction and geolocate those outfalls on a map of the MS4 pursuant to Provision E.2.b.(1). This information must be compiled into a MS4 outfall discharge monitoring station inventory, and must include the following information:

(a) Latitude and longitude of MS4 outfall point of discharge;

(b) Watershed Management Area;

(c) Hydrologic subarea;

(d) Outlet size;

(e) Accessibility (i.e. safety and without disturbance of critical habitat);

(f) Approximate drainage area; and

(g) Classification of whether the MS4 outfall is known to have persistent dry weather flows, transient dry weather flows, no dry weather flows, or unknown dry weather flows.

(2) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Until the monitoring requirements and schedules of Provision D.2.b are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, each Copermittee must perform dry weather MS4 outfall field screening monitoring to identify non-storm water and illicit discharges within its jurisdiction in accordance with

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Provision E.2.c, to determine which discharges are transient flows and which are persistent flows, and prioritize the dry weather MS4 discharges that will be investigated and eliminated in accordance with Provision E.2.d.

(a) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Frequency

Each Copermittee must field screen the MS4 outfalls in its inventory developed pursuant to Provision D.2.a.(1) as follows:

(i) For Copermittees with less than 125 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 80 percent of the outfalls must be visually inspected two times per year during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls see Provision D.2.a.(2)(a)(iv).

(ii) For Copermittees with 125 major MS4 outfalls or more, but less than or equal to 500, that discharge to receiving waters within a Watershed Management Area all the outfalls must be visually inspected at least annually during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls see Provision D.2.a.(2)(a)(iv).

(iii) For Copermittees with more than 500 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 500 outfalls must be visually inspected at least annually during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls see Provision D.2.a.(2)(a)(iv). Copermittees with more than 500 major MS4 outfalls within a Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(iv) For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major MS4 outfalls within its jurisdiction, at least 500 major MS4 outfalls within its

inventory must be visually inspected at least annually during dry weather conditions. Copermittees with more than 500 major MS4 outfalls in more than one Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(v) Inspections of major MS4 outfalls conducted in response to public reports and staff or contractor reports and notifications may count toward the required visual inspections of MS4 outfall discharge monitoring stations.

(b) Transitional Dry Weather MS4 Outfall Discharge Field Screening Visual Observations

(i) An antecedent dry period of at least 72 hours following any storm event producing measurable rainfall greater than 0.1 inch is required prior to conducting field screening visual observations during a field screening monitoring event.

(ii) During the field screening monitoring event, *each* Copermittee must record visual observations consistent with Table D-5 at each MS4 outfall discharge monitoring station inspected.

Table D-5. Field Screening Visual Observations for MS4 Outfall Discharge Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) - Flow source(s) suspected or identified from non-storm water source investigation - Flow source(s) eliminated during non-storm water source identification • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) - Known or suspected source(s) of pooled or ponded water • Station description (i.e. deposits or stains, vegetation condition, structural condition, observable biology)

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- Presence and assessment of trash in and around station
- Evidence or signs of illicit connections or illegal dumping

(iii) Each Copermittee must implement the requirements of Provisions E.2.d.(2)(c)-(e) based on the field observations.

(iv) Each Copermittee must evaluate field observations together with existing information available from prior reports, inspections and monitoring results to determine whether any observed flowing, pooled, or ponded waters are likely to be transient or persistent flow.[19]

(c) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Records

Based upon the results of the transitional dry weather MS4 outfall discharge field screening monitoring conducted pursuant to Provisions D.2.a.(2)(a)-(b), each Copermittee must update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow.

(3) Transitional Wet Weather MS4 Outfall Discharge Monitoring

Until the monitoring requirements and schedules of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(a) Transitional Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees must select wet weather MS4 outfall discharge monitoring stations from the inventories developed pursuant to Provision D.2.a.(1) for each Watershed Management Area as follows:

(i) At least five wet weather MS4 outfall discharge monitoring stations that are representative of storm water discharges from areas consisting primarily of residential, commercial, industrial, and typical mixed-use land uses present within the Watershed Management Area;

(ii) At least one wet weather MS4 outfall discharge monitoring station for each Copermittee within the Watershed Management Area; and

[19] Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

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(iii) The County of San Diego may select at least two (2) wet weather MS4 outfall discharge monitoring stations for the portion of the Santa Margarita River Watershed Management Area within its jurisdiction to be monitored during the transitional period until the Riverside County Copermittees are notified of coverage under this Order. After the Riverside County Copermittees are notified of coverage under this Order, the Copermittees in the Watershed Management Area must select wet weather MS4 outfall discharge monitoring stations consistent with the requirements above.

(b) Transitional Wet Weather MS4 Outfall Discharge Monitoring Frequency

Each wet weather MS4 outfall discharge monitoring station selected pursuant to Provision D.2.a.(3)(a) must be monitored ~~twice~~ once during the wet season (October 1 – April 30). The wet weather monitoring events must be selected to be representative of the range of hydrological conditions experienced in the region. At least 10 percent of samples must be conducted during the first wet weather event of the wet season, to include at least one such sample in each Watershed Management Area..

(c) Transitional Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(i) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(ii) The flow rates and volumes measured or estimated from the MS4 outfall (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(d) Transitional Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(e) Transitional Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and

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analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, and indicator bacteria;

(iv) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

[a] Time-weighted composites collected over the length of the storm event or the first 24 hour period whichever is shorter, composed of discrete samples, which may be collected through the use of automated equipment, or

[b] Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

[c] If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours;

(v) Only one analysis of the composite of aliquots is required;

(vi) The samples must be analyzed for the following constituents:

[a] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

[b] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the *Copermittees* are listed responsible parties under the TMDLs in Attachment E to this *Order, and*

[c] Constituents listed in in Table D-6.

Table D-6. Analytical Monitoring Constituents for Wet Weather MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Nickel • Selenium • Thallium • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1 Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2 *E. Coli* may be substituted for Fecal Coliform.

(f) Other Transitional Wet Weather MS4 Outfall Discharge Monitoring

The San Diego County Copermittees must continue the wet weather MS4 outfall monitoring program developed under Order No. R9-2007-0001, as approved by the San Diego Water Board, through its planned completion.

b. Dry Weather MS4 Outfall Discharge Monitoring

Each Copermittee must perform dry weather MS4 outfall monitoring to identify *non-storm* water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. Each Copermittee must conduct the following dry weather MS4 outfall discharge monitoring within its jurisdiction:

(1) Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Each Copermittee must continue to perform the dry weather MS4 outfall discharge *field screening* monitoring in accordance with the requirements of Provision D.2.a.(2). The Copermittee may adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of persistent flow non-storm water discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of visual inspections performed is equivalent to the number of visual inspections required under Provision D.2.a.(2)(a).

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(2) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring

Each Copermittee must perform non-storm water persistent flow MS4 outfall discharge monitoring to determine which persistent non-storm water discharges contain concentrations of pollutants below NALs, and which persistent non-storm water discharges impact receiving water quality during dry weather. Each Copermittee must conduct the following non-storm water persistent flow MS4 outfall discharge monitoring within its jurisdiction:

(a) Prioritization of Non-Storm Water Persistent Flow MS4 Outfalls

Based upon the dry weather MS4 outfall discharge field screening monitoring records developed pursuant to Provision D.2.a.(2)(c), each Copermittee must identify and prioritize the MS4 outfalls with persistent flows based on the highest priority water quality conditions identified in the Water Quality Improvement Plan and any additional criteria developed by the Copermittee, which may include historical data and data from sources other than what the Copermittee collects.

(b) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring Frequency

(i) Based on the prioritization of major MS4 outfalls developed under Provision D.2.b.(2)(a), each Copermittee must identify, at a minimum, the 5 highest priority major MS4 outfalls with non-storm water persistent flows that the Copermittee will monitor within its jurisdiction in each Watershed Management Area. For Responsible Copermittees identified by a TMDL in Attachment E of this Order, if the 5 chosen outfall locations are not sufficient to determine compliance with the TMDL(s), then each Responsible Copermittee must identify additional MS4 outfall monitoring locations within its jurisdiction sufficient to address compliance with the TMDL(s). If a Copermittee has less than 5 major outfalls within a Watershed Management Area, then the Copermittee must monitor all of its major MS4 outfalls with persistent flows within each Watershed Management Area. The location of the highest priority non-storm water persistent flow MS4 outfall monitoring stations must be identified on the map required pursuant to Provision E.2.b.(1). The map must specify which MS4 outfalls are being monitored for compliance with a TMDL.

(ii) Each of the highest priority non-storm water persistent flow MS4 outfall monitoring stations identified pursuant to Provision D.2.b.(2)(b)(i) must be monitored under dry weather conditions at least semi-annually until one of the following occurs:

[a] The non-storm water discharges have been effectively eliminated (i.e. no flowing, pooled, or ponded water) for three consecutive dry weather monitoring events; or

[b] The source(s) of the persistent flows has been identified as a category of non-storm water discharges that does not require an NPDES permit and does not have to be addressed as an illicit discharge because it was not identified as a source of pollutants (i.e. constituents in non-storm water discharge do not exceed NALs), and the persistent flow can be re-prioritized to a lower priority; or

[c] The constituents in the persistent flow non-storm water discharge do not exceed NALs, and the persistent flow can be re-prioritized to a lower priority; or

[d] The source(s) of the persistent flows has been identified as a non-storm water discharge authorized by a separate NPDES permit.

(iii) Where the criteria under Provision D.2.b.(2)(b)(ii) are not met, but the threat to water quality has been reduced by the Copermittee, the highest priority persistent flow MS4 outfall monitoring stations may be reprioritized accordingly for continued dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1).

(iv) Each Copermittee must document removal or re-prioritization of the highest priority persistent flow MS4 outfall monitoring stations identified under Provision D.2.b.(2)(b) in the Water Quality Improvement Plan Annual Report. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized major MS4 outfall in the Watershed Management Area within its jurisdiction, unless there are no remaining qualifying major MS4 outfalls within the Copermittee's jurisdiction in the Watershed Management Area.

(c) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Observations

During each semi-annual monitoring event, each Copermittee must record field observations consistent with Table D-5 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(d) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Monitoring

During each semi-annual monitoring event, if conditions allow the collection of the data, each Copermittee must monitor and record the parameters in Table D-2 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction

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(e) Non-Storm Water Persistent Flow MS4 Outfall Discharge Analytical Monitoring

During each semi-annual monitoring event in which measurable flow is present, each Copermittee must collect and analyze samples from each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Collect grab or composite samples to be analyzed at a qualified laboratory for the following constituents:

[a] Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,
[b] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,
[c] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the *Copermittees* are listed responsible parties under the TMDLs in Attachment E to this Order,
[d] Applicable WQBEL constituents, and
[e] Constituents listed in Table D-7. The Copermittees may adjust the list of constituents for the Watershed Management Area if historical data or supporting information can be provided that demonstrates or justifies the analysis of a constituent is not necessary

Table D-7. Analytical Monitoring Constituents for Persistent Flow MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Total Hardness • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Cadmium • Copper • Lead • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate
2. *E. Coli* may be substituted for Fecal Coliform

(iv) If the Copermittee identifies and eliminates the source of the persistent flow non-storm water discharge, analysis of the sample is not required.

c. **WET WEATHER MS4 OUTFALL DISCHARGE MONITORING**

The Copermittees must perform wet weather MS4 outfall monitoring to identify pollutants in storm water discharges from the MS4s, to guide pollutant source identification efforts, and to determine compliance with the WQBELs associated with the applicable TMDLs in Attachments E of this Order. The Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(1) Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees may adjust the wet weather MS4 outfall discharge monitoring locations in the Watershed Management Area, as needed, to identify pollutants in storm water discharges from MS4s, to guide pollutant source identification efforts, and to determine compliance with the WQBELs associated with the applicable TMDLs in Attachments E of this Order in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of stations is at least equivalent to the number of stations required under Provision D.2.a.(3)(a). Additional outfall monitoring locations, above the minimum per jurisdiction, may be required to demonstrate compliance with the WQBELs associated with the applicable TMDLs in Attachments E.

(2) Wet Weather MS4 Outfall Discharge Monitoring Frequency

The Copermittees must monitor the wet weather MS4 outfall discharge monitoring stations in the Watershed Management Area at least once (1) per year. The Copermittees may need to increase the frequency of monitoring in order to identify pollutants in storm water discharges from the MS4s causing or contributing to the highest priority water quality conditions, to guide pollutant source identification efforts, or to determine compliance with the WQBELs associated with the applicable TMDLs in Attachments E of this Order.

(3) Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm

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event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(4) Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(5) Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites collected over the length of the storm event or the first 24 hour period, whichever is shorter , composed of discrete samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

(iii) If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours.

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) The Copermittees may adjust the analytical monitoring required for the Watershed Management Area, if the Copermittees have historical data or supporting information that can demonstrate or provide justification that the analysis of a constituent is not necessary.

3. Special Studies

a. Within the term of this Order, the Copermittees must initiate the following special studies:

(1) At least two special studies in each Watershed Management Area to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that cause or contribute to highest priority water quality conditions identified in the Water Quality Improvement Plan.

(2) At least one special study for the San Diego Region to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that are impacting receiving waters on a regional basis in the San Diego Region.

(3) One of the two special studies in each Watershed Management Area may be replaced by a special study implemented pursuant to Provision D.3.a.(2).

b. The special studies must, at a minimum, be in conformance with the following criteria:

(1) The special studies must be related to the highest priority water quality conditions identified by the Copermittees in the Watershed Management Area and/or for the entire San Diego Region;

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(2) The special studies developed pursuant to Provision D.3.a.(1) must:

(a) Be implemented within the applicable Watershed Management Area, and

(b) Require some form of participation by all the Copermittees within the Watershed Management Area;

(3) The special studies developed pursuant to Provision D.3.a.(2) must:

(a) Be implemented within the San Diego Region, and

(b) Require some form of participation by all Copermittees covered under the requirements of this Order.

(4) The Copermittees are encouraged to partner with environmental groups or third parties knowledgeable of watershed conditions to complete the required special studies.

c. Special studies developed to identify sources of pollutants and/or stressors should be pollutant and/or stressor specific and based on historical monitoring data and monitoring performed pursuant to Provisions D.1 and D.2. Development of source identification special studies should include the following:

(1) A compilation of known information on the specific pollutant and/or stressor, including data on potential sources and movement of the pollutant and/or stressor within the watershed. Data generated by the Copermittees and others, as well as information available from a literature research on the pollutant and/or stressor should be compiled and analyzed as appropriate.

(2) An identification of data gaps, based on the compiled information generated on the specific pollutant and/or stressor in Provision D.3.d.(1). Source identification special studies should be developed to fill identified data gaps.

(3) A monitoring plan that will collect and provide data the Copermittees can utilize to do the following:

(a) Quantify the relative loading or impact of a pollutant and/or stressor from a particular source or pollutant generating activity;

(b) Improve understanding of the fate of a pollutant and/or stressor in the environment;

(c) Develop an inventory of known and suspected sources of a pollutant and/or stressor in the Watershed Management Area; and/or

(d) Prioritize known and suspected sources of a pollutant and/or stressor based on relative magnitude in discharges, geographical distribution (i.e., regional or localized), frequency of occurrence in discharges, human health risk, and controllability.

d. Special studies initiated prior to the effective date of this Order that meet the requirements of Provision D.3.b and are implemented during the term of this Order as part of the Water Quality Improvement Plan may be utilized to fulfill the special study requirements of Provision D.3.a. Special studies completed before the ~~Water Quality Improvement Plan is accepted by the San Diego Water Board~~effective date of this Order cannot be utilized to fulfill the special study requirements of Provision D.3.a.

e. The Copermittees must submit the monitoring plans for the special studies in the Water Quality Improvement Plans required pursuant to Provision F.1.

f. The Copermittees are encouraged to share the results of the special studies regionally among the Copermittees to provide information useful in improving and adapting the management of non-storm water and storm water runoff through the implementation of the Water Quality Improvement Plans.

4. Assessment Requirements

Each Copermittee must evaluate the data collected pursuant to Provisions D.1, D.2 and D.3, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E, to assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a. Assessments must be performed as described in the following provisions:

a. RECEIVING WATERS ASSESSMENTS

(1) The Copermittees must assess and report the conditions of the receiving waters in the Watershed Management Area as follows:

(a) Based on data collected pursuant to Provision D.1.a, the assessments under Provision D.4.a.(2) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(b) Based on the data collected pursuant to Provisions D.1.a-e, the assessments required under Provision D.4.a.(2) must be included in the Report of Waste Discharge required pursuant to Provision F.5.b.

(2) The Copermittees must assess the status and trends of receiving water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries,

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and lagoons, and 3) streams under dry weather and wet weather conditions. For each of the three types of receiving waters in each Watershed Management Area the Copermittees must:

(a) Determine whether or not the conditions of the receiving waters are meeting the numeric goals established pursuant to Provision B.3.a;

(b) Identify the most critical beneficial uses that must be protected to ensure overall health of the receiving water;

(c) Determine whether or not those critical beneficial uses are being protected;

(d) Identify short-term and/or long-term improvements or degradation of those critical beneficial uses;

(e) Determine whether or not the strategies established in the Water Quality Improvement Plan contribute towards progress in achieving the interim and final numeric goals of the Water Quality Improvement Plan; and

(f) Identify data gaps in the monitoring data necessary to assess Provisions D.4.a.(2)(a)-(e).

b. MS4 Outfall Discharges Assessments

(1) Non-Storm Water Discharges Reduction Assessments

(a) Each Copermittee must assess and report the progress of its illicit discharge detection and elimination program, required to be implemented pursuant to Provision E.2, toward effectively prohibiting non-storm water and illicit discharges into the MS4 within its jurisdiction as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(2), the assessments under Provision D.4.b.(1)(b) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(ii) Based on the data collected pursuant to Provisions D.2.b, the assessments required under Provision D.4.b.(1)(c) must be included in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

(iii) Based on the data collected pursuant to Provisions D.2.b, the assessment required under Provision D.4.b.(1)(c) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.a.(2), each Copermittee must assess and report the following:

(i) Identify the known and suspected controllable sources (e.g. facilities, areas, land uses, pollutant generating activities) of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area;

(ii) Identify sources of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area that have been reduced or eliminated; and

(iii) Identify modifications to the field screening monitoring locations and frequencies for the MS4 outfalls in its inventory necessary to identify and eliminate sources of persistent flow non-stormwater discharges pursuant to Provision D.2.b.(1).

(c) Based on the dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b, each Copermittee must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(1)(b);

(ii) Based on the data collected and applicable NALs in the Water Quality Improvement Plan, rank the MS4 outfalls in the Copermittee's jurisdiction according to potential threat to receiving water quality, and produce a prioritized list of major MS4 outfalls for follow-up action to update the Water Quality Improvement Plan, with the goal of eliminating persistent flow non-storm water discharges and/or pollutant loads in order of the ranked priority list through targeted programmatic actions and source investigations;

(iii) For the highest priority major MS4 outfalls with persistent flows that are in exceedance of NALs, identify the known and suspected sources within the Copermittee's jurisdiction in the Watershed Management Area that may cause or contribute to the NAL exceedances;

(iv) Each Copermittee must analyze the data collected pursuant to Provision D.2.b, and utilize a model or other method, to calculate or estimate the non-storm water volumes and pollutant loads collectively discharged from all the major MS4s outfalls in its jurisdiction identified as having persistent dry weather flows during the monitoring year. These calculations or estimates must be updated annually.

[a] Each Copermittee must calculate or estimate the annual non-storm water volumes and pollutant loads collectively discharged

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from the Copermittee's major MS4 outfalls to receiving waters within the Copermittee's jurisdiction, with an estimate of the percent contribution from each known source for each MS4 outfall;

[b] Each Copermittee must annually identify and quantify (i.e. volume and pollutant loads) sources of non-storm water not subject to the Copermittee's legal authority that are discharged from the Copermittee's major MS4 outfalls to downstream receiving waters.

(v) Each Copermittee must review the data collected pursuant to Provision D.2.b and findings from the assessments required pursuant to Provision D.4.b.(1)(c)(i)-(iv) at least once during the term of this Order to:

[a] Identify reductions and progress in achieving reductions in non-storm water and illicit discharges to the Copermittee's MS4 in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction, with an estimate, if possible, of the non-storm water volume and/or pollutant load reductions attributable to specific water quality strategies implemented by the Copermittee; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittee in the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction.

(vi) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(v).

(2) Storm Water Pollutant Discharges Reduction Assessments

(a) The Copermittees must assess and report the progress of the water quality improvement strategies, required to be implemented pursuant to Provisions B and E, toward reducing pollutants in storm water discharges from the MS4s within the Watershed Management Area as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(3), the assessments under Provision D.4.b.(2)(b) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(ii) Based on the data collected pursuant to Provisions D.2.c, the assessments required under Provision D.4.b.(2)(c) must be included

in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(1).

(iii) Based on the data collected pursuant to Provisions D.2.c, the assessment required under Provisions D.4.b.(2)(c)-(d) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.a.(3) the Copermittees must assess and report the following:

(i) The Copermittees must analyze the monitoring data collected pursuant to Provision D.2.a.(3), and utilize a watershed model or other method, to calculate or estimate the following for each monitoring year:

[a] The average storm water runoff coefficient for each land use type within the Watershed Management Area;

[b] The volume of storm water and pollutant loads discharged from each of the Copermittee's monitored MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch;

[c] The total flow volume and pollutant loadings discharged from the Copermittee's jurisdiction within the Watershed Management Area over the course of the wet season, extrapolated from the data produced from the monitored MS4 outfalls; and

[d] For one year during the permit term, ~~T~~the percent contribution of storm water volumes and pollutant loads discharged from each land use type within the drainage basin to each of the Copermittee's major MS4 outfalls in its jurisdiction to receiving waters or from each hydrologic subarea (HSA)~~within the Watershed Management Area~~ for each storm event with measurable rainfall greater than 0.1 inch.

(ii) Identify modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify pollutants in storm water discharges from the MS4s in the Watershed Management Area pursuant to Provision D.2.c.(1).

(c) Based on the wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.c the Copermittees must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(2)(b);

(ii) Based on the data collected and applicable SALs in the Water Quality Improvement Plan, analyze and compare the monitoring data to the analyses and assumptions used to develop the Water Quality

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Improvement Plans, including strategies developed pursuant to Provision B.3, and evaluate whether those analyses and assumptions should be updated as a component of the adaptive management efforts pursuant to Provision B.5 for follow-up action to update the Water Quality Improvement Plan;

(iii) The Copermittees must review the data collected pursuant to Provision D.2.c and findings from the assessments required pursuant to Provisions D.4.b.(2)(c)(i)-(ii) at least once during the term of this Order to:

[a] Identify reductions or progress in achieving reductions in pollutant concentrations and/or pollutant loads from different land uses and/or drainage areas discharging from the Copermittees' MS4s in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters within the Watershed Management Area to the MEP, with an estimate, if possible, of the pollutant load reductions attributable to specific water quality strategies implemented by the Copermittees; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittees in the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters in the Watershed Management Area to the MEP.

(iv) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(iii).

(d) The Copermittees must evaluate all the data collected pursuant to Provision D.2.c, and incorporate new outfall monitoring data into time series plots for each long-term monitoring constituent for the Watershed Management Area, and perform statistical trends analysis on the cumulative long-term wet weather MS4 outfall discharge water quality data set.

c. **Special Studies Assessments**

The Copermittees must annually evaluate the results and findings from the special studies developed and implemented pursuant to Provision D.3, and assess their relevance to the Copermittees' efforts to characterize receiving water conditions, understand sources of pollutants and/or stressors, and control and reduce the discharges of pollutants from the MS4 outfalls to receiving waters in the Watershed Management Area. The Copermittees must report the results of the special studies assessments applicable to the Watershed Management Area, and identify any necessary modifications or updates to the Water Quality

Improvement Plan based on the results in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.

d. **Integrated Assessment of Water Quality Improvement Plan**

As part of the iterative approach and adaptive management process required for the Water Quality Improvement Plan pursuant to Provision B.5, the Copermittees in each Watershed Management Area must integrate the data collected pursuant to Provisions D.1-D.3, the findings from the assessments required pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to assess the effectiveness of, and identify necessary modifications to, the Water Quality Improvement Plan as follows:

(1) The Copermittees must re-evaluate the priority water quality conditions and numeric goals for the Watershed Management Area, as needed, during the term of this Order pursuant to Provision B.5.a. The re-evaluation and recommendations for modifications to the priority water quality conditions, and/or numeric goals and corresponding schedules may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b, but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The priority water quality conditions and numeric goals for the Watershed Management Area must be re-evaluated as follows:

(a) Re-evaluate the receiving water conditions in the Watershed Management Area in accordance with Provision B.2.a;

(b) Re-evaluate the impacts on receiving waters in the Watershed Management Area from MS4 discharges in accordance with Provision B.2.b;

(c) Re-evaluate the identification of MS4 sources of pollutants and/or stressors in accordance with Provision B.2.d;

(d) Identify beneficial uses of the receiving waters that are protected in accordance with Provision D.4.a;

(e) Evaluate the progress toward achieving the interim and final numeric goals for protecting impacted beneficial uses in the receiving waters.

(2) The Copermittees must re-evaluate the water quality improvement strategies for the Watershed Management Area during the term of this Order pursuant to Provision B.5.b. The re-evaluation and recommendations for modifications to the water quality improvement strategies and schedules may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b, but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The water quality improvement

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strategies for the Watershed Management Area must be re-evaluated as follows:

(a) Identify the non-storm water and storm water pollutant loads from the Copermittees' MS4 outfalls in the Watershed Management Area, calculated or estimated pursuant to Provisions D.4.b;

(b) Identify the non-storm water and storm water pollutant load reductions, or other improvements to receiving water or water quality conditions, that are necessary to attain the interim and final numeric goals identified in the Water Quality Improvement Plan for protecting beneficial uses in the receiving waters;

(c) Identify the non-storm water and storm water pollutant load reductions, or other improvements to the quality of MS4 discharges that are necessary for the Copermittees to demonstrate that non-storm water and storm water discharges from their MS4s are not causing or contributing to exceedances of receiving water limitations;

(d) Evaluate the progress of the water quality improvement strategies toward achieving the interim and final numeric goals identified in the Water Quality Improvement Plan for protecting beneficial uses in the receiving waters.

(3) The Copermittees must re-evaluate and adapt the water quality monitoring and assessment program for the Watershed Management Area when new information becomes available to improve the monitoring and assessment program pursuant to Provision B.5.c. The re-evaluation and recommendations for modifications to the monitoring and assessment program may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b, but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. Modifications to the water quality monitoring and assessment program must be consistent with the requirements of Provision D.1-D.3. The re-evaluation of the water quality monitoring and assessment program for the Watershed Management Area must consider the data gaps identified by the assessments required pursuant to Provisions D.4.a-b, and results of the special studies implemented pursuant to Provision D.4.c.

5. Monitoring Provisions

Each Copermittee must comply with all the monitoring, reporting, and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

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E. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS

The purpose of this provision is for each Copermittee to implement a program to control the contribution of pollutants to and the discharges from the MS4 within its jurisdiction. The goal of the jurisdictional runoff management programs is to implement strategies that effectively prohibit non-storm water discharges to the MS4 and reduce the discharge of pollutants in storm water to the MEP. This goal will be accomplished through implementing the jurisdictional runoff management programs in accordance with the strategies identified in the Water Quality Improvement Plans.

Each Copermittee must update its jurisdictional runoff management program document, in accordance with Provision F.2.a, to incorporate all the requirements of Provision E. Until the Copermittee has updated its jurisdictional runoff management program document with the requirements of Provision E, the Copermittee must continue implementing its current jurisdictional runoff management program.

1. Legal Authority Establishment and Enforcement

a. Each Copermittee must establish, maintain, and enforce adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 through statute, ordinance, permit, contract, order, or similar means. This legal authority must, at a minimum, authorize the Copermittee to:

(1) Prohibit and eliminate all illicit discharges and illicit connections to its MS4;

(2) Control the contribution of pollutants in discharges of runoff associated with industrial and construction activity to its MS4 and control the quality of runoff from industrial and construction sites, including industrial and construction sites which have coverage under the statewide General Permit for Discharges of Storm Water Associated with Industrial Activities (Industrial General Permit) or General Permit for Discharges of Storm Water Associated with Construction Activities (Construction General Permit), as well as those sites which do not;

(3) Control the discharge of spills, dumping, or disposal of materials other than storm water into its MS4;

(4) Control through interagency agreements among Copermittees the contribution of pollutants from one portion of the MS4 to another portion of the MS4;

(5) Control, by coordinating and cooperating with other owners of the MS4 such as Caltrans, the U.S. federal government, or sovereign Native American Tribes through interagency agreements, where possible, the contribution of pollutants from their portion of the MS4 to the portion of the MS4 within the Copermittee's jurisdiction;

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(6) Require compliance with conditions in its statutes, ordinances, permits, contracts, orders, or similar means to hold dischargers to its MS4 accountable for their contributions of pollutants and flows;

(7) Require the use of BMPs to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(8) Require documentation on the effectiveness of BMPs implemented to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(9) Utilize enforcement mechanisms to require compliance with its statutes, ordinances, permits, contracts, orders, or similar means; and

(10) Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with its statutes, ordinances, permits, contracts, orders, or similar means and with the requirements of this Order, including the prohibition of illicit discharges and connections to its MS4; the Copermittee must also have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from industrial facilities, including construction sites, discharging into its MS4.

b. With the first Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b, each Copermittee must submit a statement certified by its Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative that the Copermittee has taken the necessary steps to obtain and maintain full legal authority within its jurisdiction to implement and enforce each of the requirements contained in this Order.

2. Illicit Discharge Detection and Elimination

Each Copermittee must implement a program to actively detect and eliminate illicit discharges and improper disposal into the MS4, or otherwise require the discharger to apply for and obtain a separate NPDES permit. The illicit discharge detection and elimination program must be implemented in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include, at a minimum, the following requirements:

a. NON-STORM WATER DISCHARGES

Each Copermittee must address all non-storm water discharges as illicit discharges, unless a non-storm water discharge is either identified as a discharge authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to the following requirements:

(1) Discharges of non-storm water to the MS4 from the following categories must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG919001 (Order No. R9-2007-0034, or subsequent order) for discharges to San Diego Bay, or NPDES Permit No. CAG919002 (Order No. R9-2008-0002, or subsequent order) for discharges to surface waters other than San Diego Bay:

(1) Uncontaminated pumped ground water;

(2) Discharges from foundation drains;[20]

(3) Water from crawl space pumps; and

(4) Water from footing drains.[20]

(2) Discharges of non-storm water from water line flushing and water main breaks to the MS4 must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG 679001 (Order No. R9-2010-0003, or subsequent order). This category includes water line flushing and water main break discharges from water purveyors issued a water supply permit by the California Department of Public Health or federal military installations. Discharges from recycled or reclaimed water lines to the MS4 must be addressed as illicit discharges, unless the discharges have coverage under a separate NPDES permit.

(3) Discharges of non-storm water to the MS4 from the following categories must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a source of pollutants to receiving waters:

(a) Diverted stream flows;

(b) Rising ground waters;

(c) Uncontaminated ground water infiltration to MS4s;

(d) Springs;

(e) Flows from riparian habitats and wetlands;

(f) Discharges from potable water sources;

[20] Provision E.2.a.(1) only applies to this category of non-storm water if the system is designed to be located at or below the groundwater table to actively or passively extract groundwater during any part of the year.

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(g) Discharges from foundation drains;[21] and

(h) Discharges from footing drains.[21]

(4) Discharges of non-storm water to the MS4 from the following categories must be controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means. Discharges of non-storm water to the MS4 from the following categories not controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means must be addressed by the Copermittee as illicit discharges.

(a) Air conditioning condensation

The discharge of air conditioning condensation should be directed to landscaped areas or other pervious surfaces, or to the sanitary sewer, where feasible.

(b) Individual residential vehicle washing

(i) The discharge of wash water should be directed to landscaped areas or other pervious surfaces where feasible; and

(ii) The minimization of water, washing detergent and other vehicle wash products used for residential vehicle washing , and the implementation of other practices or behaviors that will prevent the discharge of pollutants associated with individual residential vehicle washing from entering the MS4 must be encouraged.

(c) Dechlorinated swimming pool discharges

(i) Residual chlorine, algaecide, filter backwash, or other pollutants from swimming pools must be eliminated prior to discharging to the MS4; and

(ii) The discharge of saline swimming pool water must be directed to the sanitary sewer, landscaped areas, or other pervious surfaces that can accommodate the volume of water, unless the saline swimming pool water can be discharged via a pipe or concrete channel directly to a naturally saline water body (e.g. Pacific Ocean).

(5) Firefighting discharges to the MS4 must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a significant source of pollutants to receiving waters. Firefighting discharges to the MS4 not identified as a significant source of pollutants to receiving waters, must be addressed, at a minimum, as follows:

[21] Provision E.2.a.(3) only applies to this category of non-storm water discharge if the system is designed to be located above the groundwater table at all times of the year, and the system is only expected to discharge non-storm water under unusual circumstances.

(a) Non-emergency firefighting discharges

(i) Building fire suppression system maintenance discharges (e.g. sprinkler line flushing) to the MS4 must be addressed as illicit discharges unless BMPs are implemented to prevent pollutants associated with such discharges to the MS4.

(ii) Non-emergency firefighting discharges (i.e., discharges from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems) must be addressed by a program, to be developed and implemented by the Copermittee, to reduce or eliminate pollutants in such discharges from entering the MS4.

(b) Emergency firefighting discharges

Each Copermittee should develop and encourage implementation of BMPs to reduce or eliminate pollutants in emergency firefighting discharges to the MS4s and receiving waters within its jurisdiction. During emergency situations, priority of efforts should be directed toward life, property, and the environment (in descending order). BMPs should not interfere with immediate emergency response operations or impact public health and safety.

(6) If the Copermittee or San Diego Water Board *identifies any* category of non-storm water discharges listed under Provisions E.2.a.(1)-(4) as a source of pollutants to receiving waters, the category must be prohibited through ordinance, order, or similar means and addressed as an illicit discharge. Alternatively, the Copermittee may propose controls to be implemented for the category of non-storm water discharges as part of the Water Quality Improvement Plan instead of prohibiting the category of non-storm water discharges, and implement the controls if accepted by the San Diego Water Board as part of the Water Quality Improvement Plan.

(7) Each Copermittee must, where feasible and priorities and resources allow, *reduce or eliminate* non-storm water discharges listed under Provisions E.2.a.(1)-(4) into its MS4, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit.

b. Prevent And Detect Illicit Discharges And Connections

Each Copermittee must include the following measures within its program to prevent and detect illicit discharges to the MS4:

(1) Each Copermittee must maintain an updated map of its entire MS4 and the corresponding drainage areas. The accuracy of the MS4 map must be confirmed during the field screening required pursuant to Provision E.2.c.

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The MS4 map must be included as part of the jurisdictional runoff management program document. Any geographic information system (GIS) layers or files used by the Copermittee to maintain the MS4 map must be made available to the San Diego Water Board upon request. The MS4 map must identify the following:

(a) All segments of the MS4 owned, operated, and maintained by the Copermittee;

(b) All known locations of inlets that discharge and/or collect runoff into the Copermittee's MS4;

(c) All known locations of connections with other MS4s not owned or operated by the Copermittee (e.g. Caltrans MS4s);

(d) All known locations of MS4 outfalls and private outfalls that discharge runoff collected from areas within the Copermittee's jurisdiction;

(e) All segments of receiving waters within the Copermittee's jurisdiction that receive and convey runoff discharged from the Copermittee's MS4 outfalls;

(f) Locations of the MS4 outfalls, identified pursuant to Provision D.2.a.(1), within its jurisdiction; and

(g) Locations of the non-storm water persistent flow MS4 outfall discharge monitoring stations, identified pursuant to Provision D.2.b.(2)(b), within its jurisdiction.

(2) Each Copermittee must use Copermittee personnel and contractors to assist in identifying and reporting illicit discharges and connections during their daily employment activities.

(3) Each Copermittee must promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges to or from the MS4, including the following methods for public reporting:

(a) Operate a public hotline, which can be Copermittee-specific or shared by the Copermittees, and must be capable of receiving reports in both English and Spanish 24 hours per day and seven days per week; and

(b) Designate an e-mail address for receiving electronic reports from the public, which can be Copermittee-specific or shared by the Copermittees, and must be prominently displayed on the Copermittee's webpage and the Regional Clearinghouse required pursuant to Provision F.4.

(4) Each Copermittee must implement practices and procedures (including a notification mechanism) to prevent, respond to, contain, and clean up any spills that may discharge into the MS4 within its jurisdiction from any source. The Copermittee must coordinate, to the extent possible, with spill response teams to prevent entry of spills into the MS4, and prevent contamination of surface water, ground water, and soil. The Copermittee must coordinate spill prevention, containment, and response activities throughout all appropriate Copermittee departments, programs, and agencies.

(5) Each Copermittee must implement practices and procedures to prevent and limit infiltration of seepage from sanitary sewers (including private laterals and failing septic systems) to the MS4.

(6) Each Copermittee must coordinate, when necessary, with upstream Copermittees and/or entities to prevent illicit discharges from upstream sources into the MS4 within its jurisdiction.

c. FIELD SCREENING

Each Copermittee must conduct field screening (i.e. visual observations, field testing, and/or analytical testing) of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4 in accordance with the dry weather MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

d. INVESTIGATE AND ELIMINATE ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to investigate and eliminate illicit discharges to the MS4:

(1) Each Copermittee must prioritize and determine when follow-up investigations will be performed in response to visual observations and/or water quality monitoring data collected during an investigation of a detected non-storm water or illicit discharge to or from the MS4. The criteria for prioritizing investigations must consider the following:

(a) Pollutants identified as causing or contributing to the highest water quality priorities identified in the Water Quality Improvement Plan;

(b) Pollutants identified as causing or contributing, or threatening to cause or contribute to impairments in water bodies on the 303(d) List and/or in environmentally sensitive areas (ESAs), located within its jurisdiction;

(c) Pollutants identified from sources or land uses known to exist within the area, drainage basin, or watershed that discharges to the portion of the MS4 within its jurisdiction included in the investigation;

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(d) Pollutants identified as causing or contributing to an exceedance of a NAL in the Water Quality Improvement Plan; and

(e) Pollutants identified as a threat to human health or the environment.

(2) Each Copermittee must implement procedures to investigate and inspect portions of its MS4 that, based on reports or notifications, field screening, or other appropriate information, indicate a reasonable potential of receiving, containing, or discharging pollutants due to illicit discharges, illicit connections, or other sources of non-storm water. The procedures must include the following:

(a) Each Copermittee must develop criteria to:

(i) Assess the validity of each report or notification received; and

(ii) Prioritize the response to each report or notification received.

(b) Each Copermittee must prioritize and respond to each valid report or notification (e.g., public reports, staff or contractor reports and notifications, etc.) of an incident in a timely manner.

(c) In accordance with the requirements of Provision E.2.d.(1), each Copermittee must investigate and seek to identify the source(s) of discharges of non-storm water where flows are observed in *and from* the MS4 during the field screening required pursuant to Provision D.2.b.(1) as follows:

(i) Obvious illicit discharges must be immediately investigated to identify the source(s) of non-storm water discharges;

(ii) The investigation must include field investigations to identify sources or potential sources for the discharge, unless the source or potential source has already been identified during previous investigations; and

(iii) The investigation may include follow-up field investigations and/or reviewing Copermittee inventories and other land use data to identify potential sources of the discharge.

(d) Each Copermittee must maintain records and a database of the following information:

(i) Location of incident, including hydrologic subarea, portion of MS4 receiving the non-storm water or illicit discharge, and point of discharge or potential discharge from MS4 to receiving water;

(ii) Source of information initiating the investigation (e.g., public reports, staff or contractor reports and notifications, field screening, etc.);

(iii) Date the information used to initiate the investigation was received;

(iv) Date the investigation was initiated;

(v) Dates of follow-up investigations;

(vi) Identified or suspected source of the illicit discharge or connection, if determined;

(vii) Known or suspected related incidents, if any;

(viii) Result of the investigation; and

(ix) If a source cannot be identified and the investigation is not continued, document the response pursuant to the requirements of Provision E.2.d.(3).

(e) Each Copermittee must maintain records and, in accordance with the priorities of the Water Quality Improvement Plan, seek to identify the source(s) of non-storm water discharges from the MS4 where there is evidence of non-storm water having been discharged into or from the MS4 (e.g., pooled water), in accordance with MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.

(3) Each Copermittee must initiate the implementation of procedures, in a timely manner, to eliminate all detected and identified illicit discharges and connections within its jurisdiction. The procedures must include the following responses:

(a) Each Copermittee must enforce its legal authority, as required under Provision E.1, to eliminate illicit discharges and connections to the MS4.

(b) If the Copermittee identifies the source as a controllable source of non-storm water or illicit discharge or connection, the Copermittee must implement its Enforcement Response Plan pursuant to Provision E.6 and enforce its legal authority to prohibit and eliminate illicit discharges and connections to its MS4.

(c) If the Copermittee identifies the source of the discharge as a category of non-storm water discharges in Provision E.2.a, and the discharge is in exceedance of NALs in the Water Quality Improvement Plan then the Copermittee must determine if: (1) this is an isolated incident or set of circumstances that will be addressed through its Enforcement Response Plan pursuant to Provision E.6, or (2) the category of discharge must be addressed through the prohibition of that category of discharge as an illicit discharge pursuant to Provision E.2.a.(6).

(d) If the Copermittee suspects the source of the non-storm water discharge as natural in origin (i.e. non-anthropogenically influenced) and in conveyance into the MS4, then the Copermittee must document and

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provide the data and evidence necessary to demonstrate to the San Diego Water Board that it is natural in origin and does not require further investigation.

(e) If the Copermittee is unable to identify and document the source of a recurring non-storm water discharge to or from the MS4, then the Copermittee must address the discharge as an illicit discharge and update its jurisdictional runoff management program to address the common and suspected sources of the non-storm water discharge within its jurisdiction in accordance with the Copermittee's priorities.

(4) Each Copermittee must submit a summary of the non-storm water discharges and illicit discharges and connections investigated and eliminated within its jurisdiction with each Water Quality Improvement Plan Annual Report required under Provision F.3.b of this Order.

3. Development Planning

Each Copermittee must use their land use and planning authorities to implement a development planning program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. BMP Requirements for All Development Projects

Each Copermittee must prescribe the following BMP requirements during the planning process (i.e. prior to project approval and issuance of local permits) for all development projects (regardless of project type or size), where local permits are issued, including unpaved roads and flood management projects:

(1) General Requirements

(a) Onsite BMPs must be located so as to remove pollutants from runoff prior to its discharge to any receiving waters, and as close to the source as possible;

(b) Structural BMPs must not be constructed within a waters of the U.S.

(c) Onsite BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors (e.g. mosquitos, rodents, or flies).

(2) Source Control BMP Requirements

The following source control BMPs must be implemented at all development projects where applicable and feasible:

(a) Prevention of illicit discharges into the MS4;

(b) Storm drain system stenciling or signage;

(c) Protect outdoor material storage areas from rainfall, run-on, runoff, and wind dispersal;

(d) Protect materials stored in outdoor work areas from rainfall, run-on, runoff, and wind dispersal;

(e) Protect trash storage areas from rainfall, run-on, runoff, and wind dispersal; and

(f) Any additional BMPs determined to be necessary by the Copermittee to minimize pollutant generation at each project.

(3) Low Impact Development (LID) BMP Requirements

The following LID BMPs must be implemented at all development projects where applicable and feasible:

(a) Maintenance or restoration of natural storage reservoirs and drainage corridors (including topographic depressions, areas of permeable soils, natural swales, and ephemeral and intermittent streams);[22]

(b) Buffer zones for natural water bodies (where buffer zones are technically infeasible, require project applicant to include other buffers such as trees, access restrictions, etc.);

(c) Conservation of natural areas within the project footprint including existing trees, other vegetation, and soils;

(d) Construction of streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided public safety is not compromised;

(e) Minimization of the impervious footprint of the project;

(f) Minimization of soil compaction to landscaped areas;

(g) Disconnection of impervious surfaces through distributed pervious areas;

[22] Development projects proposing to dredge or fill materials in waters of the U.S. must obtain a CWA Section 401 Water Quality Certification. Projects proposing to dredge or fill waters of the state must obtain waste discharge requirements.

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(h) Landscaped or other pervious areas designed and constructed to effectively receive and infiltrate, retain and/or treat runoff from impervious areas, prior to discharging to the MS4;

(i) Small collection strategies located at, or as close as possible to, the source (i.e. the point where storm water initially meets the ground) to minimize the transport of runoff and pollutants to the MS4 and receiving waters;

(j) Use of permeable materials for projects with low traffic areas and appropriate soil conditions;

(k) Landscaping with native or drought tolerant species; and

(l) Harvesting and using precipitation.

b. PRIORITY DEVELOPMENT PROJECTS

Priority Development Projects are land development projects that fall under the planning and building authority of the Copermittee for which the Copermittee must impose specific requirements, in addition to those described in Provision E.3.a, including the implementation of structural BMPs to meet the performance requirements described in Provisions E.3.c.

(1) Definition of Priority Development Project

Priority Development Projects include the following:

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site), or redevelopment[23] projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site). This category includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(b) New projects that create 5,000 square feet or more of impervious surface (collectively over the entire project site), and support one or more of the following uses:

(i) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812).

[23] If the existing development combined with the redevelopment does not meet any of the size thresholds for new development, then this rule does not apply.

(ii) Hillside development projects. This category includes development on any natural slope that is twenty-five percent or greater.

(iii) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce.

(iv) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

(c) New or redevelopment projects that create or replace 2,500 square feet or more of impervious surface (collectively over the entire project site), and discharging directly to an Environmentally Sensitive Area (ESA). "Discharging directly to" includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands).

(d) New development projects that support one or more of the following uses:

(i) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

(ii) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

(e) New or redevelopment projects that result in the disturbance of one or more acre of land and are expected to generate pollutants post construction.

(2) Special Considerations for Redevelopment Projects

The structural BMP performance requirements of Provisions E.3.c. are applicable to redevelopment Priority Development Projects, as defined in E.3.b.(1), as follows:

(a) Where redevelopment results in the creation or replacement of impervious surface in an amount of less than fifty percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provisions E.3.c apply only to the creation or replacement of impervious surface, and not the entire development; or

(b) Where redevelopment results in the creation or replacement of impervious

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surface in an amount of more than fifty percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provisions E.3.c apply to the entire development.

(3) Priority Development Project Exemptions

Each Copermittee has the discretion to exempt the following projects from being defined as Priority Development Projects:

(a) New or retrofit paved sidewalks, bicycle lanes, or trails that meet the following criteria:

(i) Designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas; OR

(ii) Designed and constructed to be hydraulically disconnected from paved streets or roads; OR

(iii) Designed and constructed with permeable pavements or surfaces in accordance with USEPA Green Streets guidance.[24]

(b) Retrofitting of existing paved alleys, streets or roads that are designed and constructed in accordance with the USEPA Green Streets guidance.[25]

(c) New single family residences that meet the following criteria:
(i) Must not be constructed as part of a larger development or proposed subdivision; AND
(ii) Designed and constructed with structural BMPs that will achieve the performance requirements of Provisions E.3.c.(1) or E.3.c.(2) onsite.

(d) Redevelopment of existing single family residences that meet the following criteria:
(iv)(i) Designed and constructed with structural BMPs that will achieve the performance requirements of Provisions E.3.c.(1) or E.3.c.(2) onsite.

c. PRIORITY DEVELOPMENT PROJECT STRUCTURAL BMP PERFORMANCE REQUIREMENTS

In addition to the BMP requirements listed for all development projects under Provision E.3.a, Priority Development Projects must also implement structural BMPs that conform to performance requirements described below.

[24] See "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).
[25] Ibid.

(1) Storm Water Pollutant Control BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite structural BMPs to control pollutants in storm water that may be discharged from a project as follows:

(a) Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite ~~100 percent of the~~ pollutants contained in the volume of storm water runoff produced from a 24-hour 85th percentile storm event (design capture volume);[26]

(b) If a Copermittee determines that implementing BMPs to retain the full design capture volume onsite for a Priority Development Project is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize flow-thru treatment control BMPs to treat the design capture volume ~~achieve the equivalent pollutant load removal~~ described in Provision E.3.c.(1)(a). Biofiltration LID BMPs must be considered as a first option before other types of flow-thru treatment control BMPs may be considered.

(c) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1)(a). The Priority Development Project must mitigate for the portion of the pollutant load in the design capture volume not retained onsite if Provision E.3.(c)(3) is utilized.

(d) If a Priority Development project is allowed to utilize alternative compliance, flow-thru treatment control BMPs must be implemented to treat the portion of the design capture volume that is not retained onsite. Flow-thru treatment control BMPs must be sized and designed to:

(i) Remove pollutants from storm water to the MEP;

(ii) Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm

[26] This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals.

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event), as determined from the local historical rainfall record, multiplied by a factor of two;

(iii) Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Flow-thru treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of flow-thru treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

(2) Hydromodification Management BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite BMPs to manage hydromodification that may be caused by storm water runoff discharged from a project as follows:

(a) Post-project runoff conditions (flow rates and durations) must not exceed pre-projectdevelopment runoff conditions by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat downstream of Priority Development Projects).

(i) In evaluating the range of flows that results in increased potential for erosion of natural (non-hardened) channels, the lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks.

(ii) The Copermittees may use monitoring results collected pursuant to Provision D.1.a.(2) to re-define the range of flows resulting in increased potential for erosion, or degraded instream habitat conditions, as warranted by the data.

(b) Each Priority Development Project must avoid known critical sediment yield areas or implement measures that allow coarse sediment to be discharged to receiving waters, such that the sediment supply is unaffected by the project.

(c) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the performance requirements of Provision E.3.c.(2)(a). The Priority Development Project must mitigate for the post-project runoff conditions not fully managed onsite if Provision E.3.(c)(3) is utilized.

(d) Exemptions

Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provisions E.3.c.(2)(a) where the project discharges storm water runoff to:

(i) Existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;

(ii) Conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; or

(iii) Exemptions previously approved via resolution by the San Diego Regional Water Quality Control Board or Aan area identified by the Copermittees as appropriate for an exemption by the Watershed Management Area Analysis incorporated into the Water Quality Improvement Plan pursuant to Provision B.3.b.(4).

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(3) Alternative Compliance Program to Onsite Structural BMP Implementation

At the discretion of each Copermittee, Priority Development Projects may be allowed to participate in an alternative compliance program in lieu of implementing the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2), provided that the Water Quality Improvement Plan includes the optional Watershed Management Area Analysis described in Provision B.3.b.(4). The alternative compliance program is available to a Priority Development Project only if the Priority Development Project applicant enters into a voluntary agreement with the Copermittee authorizing this arrangement. In addition to the voluntary agreement, relief from implementing structural BMPs onsite may be authorized by the Copermittee under the following conditions:

(a) Watershed Management Area Analysis Candidate Projects

The Priority Development Project applicant agrees to fund, contribute funds to, or implement a candidate project identified by the Copermittees in the Watershed Management Area Analysis included in the Water Quality Improvement Plan, pursuant to Provisions B.3.b.(4) subject to the following conditions:

(i) The Copermittee must determine that implementation of the candidate project will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite;

(ii) If the Priority Development Project applicant chooses to fully or partially fund a candidate project, then the in-lieu fee structure described in Provision E.3.c.(3)(c) must be followed;

(iii) If the Priority Development Project applicant chooses to fully or partially fund a candidate project, then the Copermittee must ensure that the funds to be obtained from the Priority Development Project applicant are sufficient to mitigate for impacts caused by not fully implementing structural BMPs onsite, pursuant to the performance requirements described in Provisions E.3.c.(1) and E.3.c.(2);

(iv) If the Priority Development Project applicant chooses to implement a candidate project, then the Copermittee must ensure that pollutant control and/or hydromodification management within the candidate project are sufficient to mitigate for impacts caused by not implementing structural BMPs fully onsite, pursuant to the performance requirements described in Provisions E.3.c.(1) and E.3.c.(2);

(v) The voluntary agreement to fund, partially fund, or implement a candidate project must include reliable sources of funding for operation and maintenance of the candidate project;

(vi) Design of the candidate project must be conducted under an appropriately qualified engineer, geologist, architect, landscape architect, or other professional, licenses where applicable, and competent and proficient in the fields pertinent to the candidate project design;

(vii) The candidate project must be constructed as soon as possible, but no later than 4 years after the certificate of occupancy is granted for the first Priority Development Project that contributed funds toward the construction of the candidate project, unless a longer period of time is authorized by the San Diego Water Board Executive Officer;

(viii) If the candidate project is constructed after the Priority Development Project is constructed, the Copermittee must require temporal mitigation for pollutant loads and altered flows that are discharged from the Priority Development Project; and

(ix) Receiving waters must not be utilized to convey untreated storm water runoff from the Priority Development Project to the candidate project;

(b) Project Applicant Proposed Alternative Compliance Projects

The Copermittee may allow a Priority Development Project applicant to propose and fund, contribute funds to, or implement an alternative compliance project not identified by the Watershed Management Area Analysis included in the Water Quality Improvement Plan pursuant to Provisions B.3.b.(4), or where one has not yet been created. This option is allowed provided the Copermittee determines that implementation of the alternative compliance project will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite, and is subject to the requirements described in Provisions E.3.c.(3)(a)(ii)-(ix).

(c) Alternative Compliance In-Lieu Fee Structure

If a Copermittee chooses to allow a Priority Development Project applicant to fund, or partially fund a candidate project or an alternative compliance project, then the Copermittee must develop and implement an in-lieu fee structure. This may be developed individually or with other Copermittees and/or entities, as a means for designing, developing, constructing, operating and maintaining offsite alternative compliance projects. The in-lieu fee must be transferred to the Copermittee (for public projects) or an escrow account (for private projects) prior to the construction of the Priority Development Project.

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(d) Alternative Compliance Water Quality Credit System Option

The Copermittee may develop and implement an alternative compliance water quality credit system option, individually or with other Copermittees and/or entities, provided that such a credit system clearly exhibits that it will not allow discharges from Priority Development Projects to cause or contribute to a net impact over and above the impact caused by projects meeting the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2). Any credit system that a Copermittee chooses to implement must be submitted to the San Diego Water Board Executive Officer for review and acceptance as part of the Water Quality Improvement Plan.

(4) Long-Term Structural BMP Maintenance

Each Copermittee must require the project applicant to submit proof of the mechanism under which ongoing long-term maintenance of all structural BMPs will be conducted.

(5) Infiltration and Groundwater Protection

(a) Structural BMPs designed to primarily function as large, centralized infiltration devices (such as large infiltration trenches and infiltration basins) must not cause or contribute to an exceedance of an applicable groundwater quality objective. At a minimum, such infiltration BMPs must be in conformance with the design criteria listed below, unless the development project applicant demonstrates to the Copermittee that one or more of the specific design criteria listed below are not necessary to protect groundwater quality. The design criteria listed below do not apply to small infiltration systems dispersed throughout a development project.

(i) Runoff must undergo pretreatment such as sedimentation or filtration prior to infiltration;

(ii) Pollution prevention and source control BMPs must be implemented at a level appropriate to protect groundwater quality at sites where infiltration BMPs are to be used;

(iii) Infiltration BMPs must be adequately maintained to remove pollutants in storm water to the MEP;

(iv) The vertical distance from the base of any infiltration BMP to the seasonal high groundwater mark must be at least 10 feet. Where groundwater basins do not support beneficial uses, this vertical distance criteria may be reduced, provided groundwater quality is maintained;

(v) The soil through which infiltration is to occur must have physical and chemical characteristics (e.g., appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses;

(vi) Infiltration BMPs must not be used for areas of industrial or light industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee, unless source control BMPs to prevent exposure of high threat activities are implemented, or runoff from such activities is first treated or filtered to remove pollutants prior to infiltration; and

(vii) Infiltration BMPs must be located a minimum of 100 feet horizontally from any water supply wells.

(b) The Copermittee may develop, individually or with other Copermittees, alternative mandatory design criteria to that listed above for infiltration BMPs which are designed to primarily function as centralized infiltration devices. Before implementing the alternative design criteria in the development planning process the Copermittee(s) must:

(i) Notify the San Diego Water Board of the intent to implement the alternative design criteria submitted; and

(ii) Comply with any conditions set by the San Diego Water Board.

d. BMP Design Manual Update

Each Copermittee must update its BMP Design Manual[27] pursuant to Provision F.2.b. Until the Copermittee has updated its BMP Design Manual with the requirements of Provisions E.3.a-c, the Copermittee must continue implementing its current BMP Design Manual. Unless directed otherwise by the San Diego Water Board, the Copermittee must implement the BMP Design Manual within 180 days of completing the update. The update of the BMP Design Manual must include the following:

(1) Updated procedures to determine the nature and extent of storm water requirements applicable to a potential development or redevelopment projects. These procedures must inform project applicants of the storm water management requirements applicable to their project including, but not limited to, general requirements for all development projects, structural BMP design procedures and requirements, hydromodification management requirements, requirements specific to phased projects, and procedures specific to private developments and public improvement projects;

[27] The BMP Design Manual was formerly known as the Standard Storm Water Mitigation Plan under Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016.

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(2) Updated procedures to identify pollutants and conditions of concern for selecting the most appropriate structural BMPs that consider, at a minimum, the following:

(a) Receiving water quality (including pollutants for which receiving waters are listed as impaired under the CWA section 303(d) List);

(b) Pollutants, stressors, and/or receiving water conditions that cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(c) Land use type of the project and pollutants associated with that land use type; and

(d) Pollutants expected to be present onsite.

(3) Updated procedures for designing structural BMPs, including any updated performance requirements to be consistent with the requirements of Provision E.3.c for all structural BMPs listed in the BMP Design Manual;

(4) Long-term maintenance criteria for each structural BMP listed in the BMP Design Manual; and

(5) Alternative compliance criteria, in accordance with the requirements under Provision E.3.c.(3), if the Copermittee elects to allow Priority Development Projects within its jurisdiction to utilize alternative compliance.

e. PRIORITY DEVELOPMENT PROJECT BMP IMPLEMENTATION AND OVERSIGHT

Each Copermittee must implement a program that requires and confirms structural BMPs on all Priority Development Projects are designed, constructed, and maintained to remove pollutants in storm water to the MEP.

(1) Structural BMP Approval and Verification Process

(a) Each Copermittee must require and confirm that for all Priority Development Project applications that have not received prior lawful approval by the Copermittee on or before the acceptance date of the BMP Design Manual~~by 18 months after the commencement of coverage under this Order~~, the requirements of Provision E.3 are implemented. For project applications that have received prior lawful approval on or before the acceptance date of the BMP Design Manual ~~by 18 months after the commencement of coverage under this Order~~, the Copermittee may allow previous land development requirements to apply.

(b) Each Copermittee must identify the roles and responsibilities of its various

municipal departments in implementing the structural BMP requirements, including each stage of a project from application review and approval through BMP maintenance and inspections.

(c) Each Copermittee must require and confirm that appropriate easements and ownerships are properly recorded in public records and the information is conveyed to all appropriate parties when there is a change in project or site ownership.

(d) Each Copermittee must require and confirm that prior to occupancy and/or intended use of any portion of the Priority Development Project, each structural BMP is inspected to verify that it has been constructed and is operating in compliance with all of its specifications, plans, permits, ordinances, and the requirements of this Order.

(2) Priority Development Project Inventory and Prioritization

(a) Each Copermittee must develop, maintain, and update at least annually, a watershed-based database to track and inventory all Priority Development Projects and associated structural BMPs within its jurisdiction. Inventories must be accurate and complete beginning from December 2002 for the San Diego County Copermittees, February 2003 for the Orange County Copermittees, and July 2005 for the Riverside County Copermittees. The use of an automated database system, such as GIS, is highly recommended. The database must include, at a minimum, the following information:

(i) Priority Development Project location (address and hydrologic subarea);

(ii) Descriptions of structural BMP type(s);

(iii) Date(s) of construction;

(iv) Party responsible for structural BMP maintenance;

(v) Dates and findings of structural BMP maintenance verifications; and

(vi) Corrective actions and/or resolutions, when applicable.

(b) Each Copermittee must prioritize the Priority Development Projects with structural BMPs within its jurisdiction. The designation of Priority Development Projects as high priority must consider the following:

(i) The highest water quality priorities identified in the Water Quality Improvement Plan;

(ii) Receiving water quality;

(iii) Number and sizes of structural BMPs;

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(iv) Recommended maintenance frequency of structural BMPs;

(v) Likelihood of operation and maintenance issues of structural BMPs;

(vi) Land use and expected pollutants generated; and

(vii) Compliance record.

(3) Structural BMP Maintenance Verifications and Inspections

Each Copermittee is required to verify that structural BMPs on each Priority Development Project are adequately maintained, and continue to operate effectively to remove pollutants in storm water to the MEP through inspections, self-certifications, surveys, or other equally effective approaches.

(a) All (100 percent) of the structural BMPs at Priority Development Projects that are designated as high priority must be inspected directly by the Copermittee annually prior to each rainy season;

(b) For verifications performed through a means other than direct Copermittee inspection, adequate documentation must be required by the Copermittee to provide assurance that the required maintenance of structural BMPs at each Priority Development Project has been completed; and

(c) Appropriate follow-up measures (including re-inspections, enforcement, etc.) must be conducted to ensure that structural BMPs at each Priority Development Project continue to reduce pollutants in storm water to the MEP as originally designed.

f. DEVELOPMENT PROJECT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all development projects, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

4. Construction Management

Each Copermittee must implement a construction management program in accordance with the *strategies* in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. PROJECT APPROVAL PROCESS

Prior to issuance of any local permit(s) that allows the commencement of construction projects that involve ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff, each Copermittee

must:

(1) Require a pollution control plan, construction BMP plan, and/or an erosion and sediment control plan, to be submitted by the project applicant to the Copermittee;

(2) Confirm the pollution control plan, construction BMP plan, and/or erosion and sediment control plan, complies with the local grading ordinance, other applicable local ordinances, and the requirements of this Order;

(3) Confirm the pollution control, construction BMP, and/or erosion and sediment control plan, includes seasonally appropriate and effective BMPs and management measures described in Provision E.4.c, as applicable to the project; and

(4) Verify that the project applicant has obtained coverage under the statewide Construction General Permit.

b. CONSTRUCTION SITE INVENTORY AND TRACKING

(1) Each Copermittee must maintain and update, at least quarterly, a watershed-based inventory of all construction projects issued a local permit that allows ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff. The use of an automated database system, such as GIS, is highly recommended. The inventory must include:

(a) Relevant contact information for each site (e.g., name, address, phone, and email for the owner and contractor);

(b) The basic site information including location (address and hydrologic subarea), Waste Discharge Identification (WDID) number (if applicable), size of the site, and approximate area of disturbance;

(c) Whether or not the *site is considered* a high threat to water quality, as defined in Provision E.4.b.(2) below;

(d) The project start and completion dates;

(e) The required inspection frequency, as defined in the Copermittee's jurisdictional runoff management program document;

(f) The date the Copermittee accepted or approved the pollution control plan, construction BMP plan, and/or erosion and sediment control plan; and

(g) Whether or not there are ongoing enforcement actions administered to the site.

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(2) Each Copermittee must identify all construction sites within its jurisdiction that represent a high threat to downstream surface water quality. The designation of construction sites as high threat to water quality must consider the following:

(a) Sites located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Sites located within the same hydrologic subarea and tributary to a water body segment listed as impaired for sediment on the CWA section 303(d) List;

(c) Sites located within, directly adjacent to, or discharging directly to a receiving water within an ESA; and

(d) Other sites determined by the Copermittees or the San Diego Water Board as a high threat to water quality.

c. CONSTRUCTION SITE BMP IMPLEMENTATION

Each Copermittee must implement, or require the implementation of effective BMPs to reduce discharges of pollutants in storm water from construction sites to the MEP, and effectively prohibit non-storm water discharges from construction sites into the MS4. These BMPs must be site specific, seasonally appropriate, and construction phase appropriate. BMPs must be implemented at each construction site year round. Dry season BMP implementation must plan for and address unseasonal rain events that may occur during the dry season (May 1 through September 30). Copermittees must implement, or require the implementation of BMPs in the following categories:

(1) Project Planning;

(2) Good Site Management "Housekeeping", including waste management;

(3) Non-storm Water Management;

(4) Erosion Control;

(5) Sediment Control;

(6) Run-on and Run-off Control; and

(7) Active/Passive Sediment Treatment Systems, where applicable.

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d. CONSTRUCTION SITE INSPECTIONS

Each Copermittee must conduct construction site inspections to require and confirm compliance with its local permits and applicable local ordinances, and the requirements of this Order. Priority for site inspections must consider threat to water quality pursuant to Provision E.4.b as well as the nature of the construction activity, topography, and the characteristics of soils and receiving water quality.

(1) Inspection Frequency

(a) Each Copermittee must conduct inspections at all inventoried sites, including high threat to water quality sites, at an appropriate frequency for each phase of construction to confirm the site reduces the discharge of pollutants in storm water from construction sites to the MEP, and effectively prohibits non-storm water discharges from entering the MS4.

(b) Each Copermittee must establish appropriate inspection frequencies for high threat to water quality sites, and all other sites, for each phase of construction. Inspection frequencies appropriate for addressing the highest water quality priorities identified in the Water Quality Improvement Plan, and for complying with the requirements of this Order must be identified in each Copermittee's jurisdictional runoff management program document.

(c) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e., re-inspection, enforcement) necessary to require and confirm site compliance with its local permits and applicable local ordinances, and the requirements of this Order.

(2) Inspection Content

Inspections of construction sites by the Copermittee must include, at a minimum:

(a) Verification of coverage under the Construction General Permit (Notice of Intent (NOI) and/or WDID number) during initial inspections, when applicable;

(b) Assessment of compliance with its local permits and applicable local ordinances related to pollution prevention, including the implementation and maintenance of applicable BMPs;

(c) Assessment of BMP adequacy and effectiveness;

(d) Visual observations of actual non-storm water discharges;

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(e) Visual observations of actual or potential discharge of sediment and/or construction related materials from the site;

(f) Visual observations of actual or potential illicit connections; and

(g) If any violations are found and BMP corrections are needed, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried construction sites. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Site name, location (address and hydrologic subarea), and WDID number (if applicable);

(b) Inspection date;

(c) Approximate amount of rainfall since last inspection;

(d) Description of problems observed with BMPs and indication of need for BMP addition/repair/replacement and any scheduled re-inspection, and date of re-inspection;

(e) Descriptions of any other specific inspection comments which must, at a minimum, include rationales for longer compliance time;

(f) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(g) Resolution of problems noted and date problems fixed.

e. CONSTRUCTION SITE ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried construction sites, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

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5. Existing Development Management

Each Copermittee must implement an existing development management program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. EXISTING DEVELOPMENT INVENTORY AND TRACKING

Each Copermittee must maintain, and update at least annually, a watershed-based inventory of the existing development within its jurisdiction that may discharge a pollutant load to and from the MS4. The use of an automated database system, such as GIS, is highly recommended. The inventory must, at a minimum, include:

(1) Name, location (hydrological subarea and address, if applicable) of the following types of existing development with its jurisdiction:

(a) Commercial facilities or areas;

(b) Industrial facilities;

(c) Municipal facilities, including:

(i) MS4 and related structures,[28]

(ii) Roads, streets, and highways,

(iii) Parking facilities,

(iv) Municipal airfields,

(v) Parks and recreation facilities,

(vi) Flood management facilities, flood control devices and structures,

(vii) Operating or closed municipal landfills,

(viii) Publicly owned treatment works (including water and wastewater treatment plants) and sanitary sewer collection systems,

(ix) Corporate yards, including maintenance and storage yards for materials, waste, equipment, and vehicles,

(x) Hazardous waste collection facilities,

(xi) Other treatment, storage or disposal facilities for municipal waste, and

(xii) Other municipal facilities that the Copermittee determines may contribute a significant pollutant load to the MS4; and

[28] The inventory may refer to the MS4 map required to be maintained pursuant to Provision E.2.b.(1).

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(d) Residential areas, which may be designated by one or more of the following:

(i) Residential management area,

(ii) Drainage basin or area,

(iii) Land use (e.g., single family, multi-family, rural),

(iv) Neighborhood,

(v) Common Interest Area,

(vi) Home Owner Association,

(vii) Mobile home park, and/or

(viii) Other designations accepted by the San Diego Water Board Executive Officer.

(2) A description of the facility or area, including the following information:

(a) Classification as commercial, industrial, municipal, or residential;

(b) Status of facility or area as active or inactive;

(c) Identification if a business is a mobile business;

(d) SIC Code or NAICS Code, if applicable;

(e) Industrial General Permit NOI and/or WDID number, if applicable;

(f) Identification if a residential area is or includes a Common Interest Area / Home Owner Association, or mobile home park;

(g) Identification of pollutants generated and potentially generated by the facility or area;

(h) Whether the facility or area is adjacent to an ESA;

(i) Whether the facility or area is tributary to and within the same hydrologic subarea as a water body segment listed as impaired on the CWA section 303(d) List and generates pollutants for which the water body segment is impaired; and

(3) An annually updated map showing the location of inventoried existing development, watershed boundaries, and water bodies.

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b. EXISTING DEVELOPMENT BMP IMPLEMENTATION AND MAINTENANCE

Each Copermittee must designate a minimum set of BMPs required for all inventoried existing development, including special event venues. The designated minimum BMPs must be specific to facility or area types and pollutant generating activities, as appropriate.

(1) Commercial, Industrial, and Municipal Facilities and Areas

(a) Pollution Prevention

Each Copermittee must require the use of pollution prevention methods by the commercial, industrial, and municipal facilities and areas in its inventoried existing development to address the priorities and strategies in the Water Quality Improvement Plan.

(b) BMP Implementation

Each Copermittee must require the implementation of designated BMPs at commercial facilities and areas, industrial facilities, and implement designated BMPs at municipal facilities in its inventoried existing development.

(c) BMP Operation and Maintenance

(i) Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development.

(ii) Each Copermittee must implement a schedule of operation and maintenance activities for its MS4 and related structures (including but not limited to catch basins, storm drain inlets, detention basins, etc.), and verify proper operation of all its municipal structural treatment controls designed to reduce pollutants (including floatables) in storm water discharges to or from its MS4s and related drainage structures. Operation and maintenance activities may include, but is not limited to, the following:

[a] Inspections of the MS4 and related structures;
[b] Cleaning of the MS4 and related structures; and
[c] Proper disposal of materials removed from cleaning of the MS4 and related structures.

(iii) Each Copermittee must implement a schedule of operation and maintenance for public streets, unpaved roads, paved roads, and paved highways within its jurisdiction to minimize pollutants that can be discharged in storm water.

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(iv) Each Copermittee must implement controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers. Copermittees that operate both a municipal sanitary sewer system and a MS4 must implement controls and measures to prevent and eliminate seeping sewage from infiltrating the MS4. Copermittees that do not operate both a municipal sanitary sewer system and a MS4 must coordinate with sewering agencies to keep themselves informed of relevant and appropriate maintenance activities and sanitary sewage projects in their jurisdiction that may cause or contribute to seepage of sewage into the MS4.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must require the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from commercial facilities and areas and industrial facilities, and implement BMPs at municipal facilities in its inventoried existing development. Such BMPs must include, as appropriate, educational activities, permits, certifications and other measures for applicators and distributors.

(2) Residential Areas

(a) Pollution Prevention

Each Copermittee must promote and encourage the use of pollution prevention methods, where appropriate, by the residential areas in its inventoried existing development.

(b) BMP Implementation

Each Copermittee must promote and encourage the implementation of designated BMPs at residential areas in its inventoried existing development.

(c) BMP Operation and Maintenance

Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at residential areas in its inventoried existing development.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must promote and encourage the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the

application, storage, and disposal of pesticides, herbicides and fertilizers from residential areas in its inventoried existing development.

c. EXISTING DEVELOPMENT INSPECTIONS

Each Copermittee must conduct inspections of inventoried existing development to ensure compliance with applicable local ordinances and permits, and the requirements of this Order.

(1) Inspection Frequency

(a) Each Copermittee must establish appropriate inspection frequencies for inventoried existing development in accordance with the following requirements:

(i) At a minimum, inventoried existing development must be inspected once every five years utilizing one or more of the following methods:

[a] Drive-by inspections by Copermittee municipal and contract staff,
[b] Onsite inspections by Copermittee municipal and contract staff, and/or
[c] Visual inspections of publicly accessible inventoried facilities or areas by volunteer monitoring or patrol programs that have been trained by the Copermittee;

(ii) The frequency of inspections must be appropriate to confirm that BMPs are being implemented to reduce the discharge of pollutants in storm water from the MS4 to the MEP and effectively prohibit non-storm water discharges to the MS4;

(iii) The frequency of inspections must be based on the potential for a facility or area to discharge non-storm water and pollutants in storm water, and should reflect the priorities set forth in the Water Quality Improvement Plan;

(iv) Each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development;[29] and

(v) Inventoried existing development must be inspected by the Copermittee, as needed, in response to valid public complaints.

(b) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e. education and outreach, re-inspection, enforcement)

[29] If any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspection may count toward the total annual inspection requirement. This requirement excludes linear municipal facilities (i.e., MS4 linear channels, sanitary sewer collection systems, streets, roads and highways).

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necessary to require and confirm compliance with its applicable local ordinances and permits and the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

(2) Inspection Content

(a) Inspections of existing development must include, at a minimum:

(i) Visual inspections for the presence of actual non-storm water discharges;

(ii) Visual inspections for the presence of actual or potential discharge of pollutants;

(iii) Visual inspections for the presence of actual or potential illicit connections; and

(iv) Verification that the description of the facility or area in the inventory, required pursuant to Provision E.5.a.(2), has not changed.

(b) Onsite inspections of existing development by the Copermittee must include, at a minimum:

(i) Assessment of compliance with its applicable local ordinances and permits related to non-storm water and storm water discharges and runoff;

(ii) Assessment of the implementation of the designated BMPs;

(iii) Verification of coverage under the Industrial General Permit, when applicable; and

(iv) If any problems or violations are found, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried existing development. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Name and location of facility or area (address and hydrologic subarea) consistent with the inventory name and location, pursuant to Provision E.5.a.(1);

(b) Inspection and re-inspection date(s);

(c) Inspection method(s) (i.e. drive-by, onsite);

(d) Observations and findings from the inspection(s);

(e) For onsite inspections of existing development by Copermittee municipal or contract staff, the records must also include, as applicable:

(i) Description of any problems or violations found during the inspection(s),

(ii) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6, and

(iii) The date problems or violations were resolved.

d. EXISTING DEVELOPMENT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried existing development, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

e. RETROFITTING AND REHABILITATING AREAS OF EXISTING DEVELOPMENT

(1) Retrofitting Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to retrofit areas of existing development within its jurisdiction to address identified sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify areas of existing development as candidates for retrofitting, focusing on areas where retrofitting will address pollutants and/or stressors that contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for retrofitting projects may be utilized to reduce pollutants that may be discharged in storm water from areas of existing development, and/or address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of retrofitting projects in areas of existing development identified as candidates;

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(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting projects; and

(e) Where retrofitting projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional retrofitting projects (i.e. projects that can receive and/or treat storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment) adjacent to and/or downstream of the areas of existing development.

(2) Stream, Channel and/or Habitat Rehabilitation in Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to rehabilitate streams, channels, and/or habitats in areas of existing development within its jurisdiction to address the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify streams, channels, and/or habitats in areas of existing development as candidates for rehabilitation, focusing on areas where stream, channel, and/or habitat rehabilitation projects will address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for stream, channel, and/or habitat rehabilitation projects may be utilized to address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters, rehabilitate channelized or hydromodified streams, restore wetland and riparian habitat, restore watershed functions, and/or restore beneficial uses of receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of stream, channel, and/or habitat rehabilitation projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance stream, channel, and/or habitat rehabilitation projects; and

(e) Where stream, channel, and/or habitat rehabilitation projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional stream, channel, and/or habitat rehabilitation projects (i.e. projects that can receive storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment).

6. Enforcement Response Plans

Each Copermittee must develop and implement an Enforcement Response Plan as part of its jurisdictional runoff management program document. The Enforcement Response Plan must describe the applicable approaches and options to enforce its legal authority established pursuant to Provision E.1, as necessary, to achieve compliance with the requirements of this Order. The Enforcement Response Plan must be in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include the following:

a. Enforcement Response Plan Components

The Enforcement Response Plan must include the following individual components:

(1) Illicit Discharge Detection and Elimination Enforcement Component;

(2) Development Planning Enforcement Component;

(3) Construction Management Enforcement Component; and

(4) Existing Development Enforcement Component.

b. Enforcement Response Approaches and Options

Each component of the Enforcement Response Plan must describe the enforcement response approaches that the Copermittee will implement to compel compliance with its statutes, ordinances, permits, contracts, orders, or similar means, and the requirements of this Order. The description must include the protocols for implementing progressively stricter enforcement responses. The enforcement response approaches must include appropriate sanctions to compel compliance, including, at a minimum the following tools or their equivalent:

(1) Verbal and written notices of violation;

(2) Cleanup requirements;

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(3) Fines;

(4) Bonding requirements;

(5) Administrative and criminal penalties;

(6) Liens;

(7) Stop work orders; and

(8) Permit and occupancy denials.

c. CORRECTION OF VIOLATIONS

(1) Violations must be corrected in a timely manner with the goal of correcting the violations within 30 calendar days after the violations are discovered, or prior to the next predicted rain event, whichever is sooner.

(2) If more than 30 calendar days are required to achieve compliance, then a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

d. ESCALATED ENFORCEMENT

(1) The Enforcement Response Plan must include a definition of "escalated enforcement." Escalated enforcement must include any enforcement scenario where a violation or other non-compliance is determined to cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan. Escalated enforcement may be defined differently for development planning, construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas.

(2) Where the Copermittee determines escalated enforcement is not required, a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

(3) Escalated enforcement actions must continue to increase in severity, as necessary, to compel compliance as soon as possible.

e. REPORTING OF NON-COMPLIANT SITES

(1) Each Copermittee must notify the San Diego Water Board in writing within five (5) calendar days of issuing escalated enforcement (as defined in the Copermittee's Enforcement Response Plan) to a construction site that poses a significant threat to water quality as a result of violations or other non-compliance with its permits and applicable local ordinances, and the

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requirements of this Order. Written notification may be provided electronically by email to the appropriate San Diego Water Board staff.

(2) Each Copermittee must notify the San Diego Water Board any persons required to obtain coverage under the statewide Industrial General Permit and Construction General Permit and failing to do so, within five (5) calendar days from the time the Copermittee become aware of the circumstances. Written notification may be provided electronically by email to Nonfilers_R9@waterboards.ca.gov.

7. **Public Education and Participation**

Each Copermittee must implement, individually or with other Copermittees, a public education and participation program in accordance with the strategies identified in the Water Quality Improvement Plan to promote and encourage the development of programs, management practices, and behaviors that reduce the discharge of pollutants in storm water to the MEP, prevent controllable non-storm water discharges from entering the MS4, and protect water quality standards in receiving waters. The public education and participation program must be implemented in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include, at a minimum, the following requirements:

a. PUBLIC EDUCATION

The public education program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) Educational activities, public information activities, and other appropriate outreach activities intended to reduce pollutants associated with the application of pesticides, herbicides and fertilizer and other pollutants of concern in storm water discharges to and from its MS4 to the MEP, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed to address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(2) Educational activities, public information activities, and other appropriate outreach activities to facilitate the proper management and disposal of used oil and toxic materials; and

(3) Appropriate education and training measures for specific target audiences, such as construction site operators, residents, underserved target audiences and school-aged children, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed, based on high risk behaviors and pollutants of concern.

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b. Public Participation

The public participation program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) A process for members of the public to participate in updating the highest priority water quality conditions, numeric goals, and water quality improvement strategies in the Water Quality Improvement Plan.

(2) Opportunities for members of the public to participate in providing the Copermittee recommendations for improving the effectiveness of the water quality improvement strategies implemented within its jurisdiction.

(3) Opportunities for members of the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or protection of the quality of receiving waters.

8. Fiscal Analysis

a. Each Copermittee must secure the resources necessary to meet all the requirements of this Order.

b. Each Copermittee must conduct an annual fiscal analysis of its jurisdictional runoff management program in its entirety. The fiscal analysis must include the following:

(1) Identification of the various categories of expenditures necessary to implement the requirements of this Order, including a description of the specific capital, operation and maintenance, and other expenditure items to be accounted for in each category of expenditures;

(2) The staff resources needed and allocated to meet the requirements of this Order, including any development, implementation, and enforcement activities required;

(3) The estimated expenditures for Provisions E.8.b.(1) and E.8.b.(2) for the current fiscal year; and

(4) The source(s) of funds that are proposed to meet the necessary expenditures described in Provisions E.8.b.(1) and E.8.b.(2), including legal restrictions on the use of such funds, for the current fiscal year and next fiscal year.

c. Each Copermittee must submit a summary of the annual fiscal analysis with each Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.

d. Each Copermittee must provide the documentation used to develop the summary of the annual fiscal analysis upon request by the San Diego Water Board.

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F. REPORTING

The purpose of this provision is to determine and document compliance with the requirements set forth in this Order. The goal of reporting is to communicate to the San Diego Water Board and the people of the State of California the implementation status of each jurisdictional runoff management program and compliance with the requirements of this Order. This goal is to be accomplished through the submittal of specific deliverables to the San Diego Water Board by the Copermittees.

1. Water Quality Improvement Plans

The Copermittees for each Watershed Management Area must develop and submit the Water Quality Improvement Plan in accordance with the following requirements:

a. Water Quality Improvement Plan Development

Each Water Quality Improvement Plan must be developed in accordance with the following process:

(1) Public Participation Process

The Copermittees must implement a public participation process to solicit data, information, and recommendations to be utilized in the development of the Water Quality Improvement Plan. The public participation process must include the following:

(a) The Copermittees must develop a publicly available and noticed schedule of the opportunities for the public to participate and provide comments during the development of the Water Quality Improvement Plan. The schedule may be adjusted as necessary by the Copermittees, provided the public is provided timely notification of the changes to the schedule.

(b) The Copermittees must form a Water Quality Improvement Consultation Panel to provide recommendations during the development of the Water Quality Improvement Plan. The Water Quality Improvement Consultation Panel must consist of at least the following members:

(i) A representative of the San Diego Water Board,

(ii) A representative of the environmental community familiar with the water quality conditions of concern of the receiving waters in the Watershed Management Area, preferably from an environmental interest group associated with a water body within the Watershed Management Area, and

(iii) A representative of the development community familiar with the opportunities and constraints for implementing structural BMPs, retrofitting projects, and stream, channel or habitat rehabilitation

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projects in the Watershed Management Area, preferably with relevant engineering, hydrology, and/or geomorphology experience in the Watershed Management Area.

(c) The Copermittees ~~must~~ are encouraged to coordinate the schedules for the public participation process among the Watershed Management Areas where possible to provide the public as much time and opportunity as possible to participate during the development of the Water Quality Improvement Plans.

(2) Priority Water Quality Conditions

(a) The Copermittees must solicit data, information and recommendations from the public to be utilized in the development and identification of the priority water quality conditions and potential water quality improvement strategies for the Watershed Management Area.

(b) The Copermittees must review the priority water quality conditions the Copermittees plan on including in the Water Quality Improvement Plan with the Water Quality Improvement Consultation Panel to receive recommendations or concurrence.

(c) The Copermittees must consider revisions to the priority water quality conditions based on recommendations from the Water Quality Improvement Consultation Panel.

(d) The Copermittees must include all the potential water quality improvement strategies identified by the public and the Water Quality Improvement Consultation Panel with the submittal of the priority water quality conditions to the San Diego Water Board.

(e) The Copermittees must *submit* the Water Quality Improvement Plan requirements of Provision B.2 to the San Diego Water Board as early as 6 months and no later than 12 months after the commencement of coverage under this Order. Upon receipt, the San Diego Water Board will issue a public notice and release the proposed priority water quality conditions and *potential water quality improvement strategies for public review and* comment for a minimum of 30 days. The San Diego Water Board will also provide comments during the public review period.

(f) The Copermittees must consider revisions to the priority water quality conditions and potential water quality *improvement strategies developed pursuant* to Provision B.2 based on San Diego Water Board comments and public comments received by the close of the comment period.

(3) Water Quality Improvement Goals, Strategies and Schedules

(a) The Copermittees must solicit recommendations from the public on potential numeric goals for the highest priority water quality conditions identified for the Watershed Management Area, and recommendations on the strategies that should be implemented to achieve the potential numeric goals.

(b) The Copermittees must consult with the Water Quality Improvement Consultation Panel and consider revisions to the following items based on the Panel's recommendations:

(i) The numeric goals and schedules the Copermittees propose to include in the Water Quality Improvement Plan;

(ii) The water quality improvement strategies and schedules the Copermittees propose to implement in the Watershed Management Area and include in the Water Quality Improvement Plan;

(iii) If the Copermittees choose to implement Provision B.3.b.(4), the results of the Watershed Management Area Analysis the Copermittees proposed to incorporate into the Water Quality Improvement Plan; and

(iv) If the Copermittees choose to *implement Provision* B.3.c, the numeric goals proposed pursuant to Provision B.3.c.(1), the analysis performed pursuant to Provision B.3.c.(2) and the *specific* monitoring and assessments proposed pursuant to Provision B.3.c.(3).

(c) The Copermittees must *submit* the Water Quality Improvement Plan requirements of Provision B.3 to the San Diego Water Board as early as 9 months and no later than 18 months after the commencement of coverage under this Order. Upon receipt, the San Diego Water Board will issue a public notice release the proposed water quality improvement goals, *strategies and schedules for public review and comment for a minimum of* 30 days. The San Diego Water Board will also provide comments during the public review period.

(d) The Copermittees must consider revisions to the water quality improvement goals, *strategies and schedules developed pursuant* to Provision B.3 based on San Diego Water Board comments and public comments received by the close of the comment period.

b. WATER QUALITY IMPROVEMENT PLAN SUBMITTAL AND IMPLEMENTATION

(1) Within 24 months after the commencement of coverage under this Order, the Copermittees for each Watershed Management Area must submit a complete Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order to the San Diego Water Board. The San Diego

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Water Board will issue a public notice and release the Water Quality Improvement Plan for public review and comment for a minimum of 30 days.

(2) The Copermittees must consider revisions to the Water Quality Improvement Plan based on written comments received by the close of the public comment period.

(3) The Copermittees must promptly submit any revisions to the Water Quality Improvement Plan to the San Diego Water Board no later than 60 days of the close of the public comment period.

(4) If issues concerning the Water Quality Improvement Plan are resolved informally through discussions among the Copermittees, the San Diego Water Board and *interested parties*, the San Diego Water Board Executive Officer may provide ~~written certification~~notice of approval to the Copermittees that the Water Quality Improvement Plan meets the requirements of Provision B. However, if the Executive Officer determines that significant issues with the Water Quality Improvement Plan remain, the matter will be scheduled for San Diego Water Board consideration at a public meeting.

(5) The Copermittees must commence with implementation of the Water Quality *Improvement Plan*, in accordance with the water quality improvement strategies and schedules therein, upon written notification of ~~concurrence~~ approval ~~with~~of the Water Quality Improvement Plan by the San Diego Water Board Executive Officer.

(7) *During implementation of the Water* Quality Improvement Plan ~~after implementation~~ the Copermittees must *correct any deficiencies in the Plan* identified by the San Diego Water Board in the updates submitted with the Annual Report ~~no later than 90 days~~ following a request by the Board to do so.

(8) The Water Quality Improvement Plan must be made *available* on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of receiving notification of concurrence with the Water Quality Improvement Plan by the San Diego Water Board Executive Officer.

2. Updates

a. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATES

Each Copermittee must update its jurisdictional runoff management program document in accordance with the following requirements:

(1) Each Copermittee is encouraged to seek public and key stakeholder participation and comments, as early and often as possible during the

process of developing updates to its jurisdictional runoff management program document.

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(2) Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E ~~no later than 3 months after San Diego Water Board notification of concurrence~~ concurrent with submittal of ~~with~~ the Water Quality Improvement Plan. Each Copermittee must provide updates based on comments received from the San Diego Water Board in the subsequent Annual Report.

(3) Each Copermittee must submit updates to its jurisdictional runoff management program, with the supporting rationale for the modifications, either in the Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge required pursuant to Provision F.5.b.

(4) The Copermittee must revise proposed modifications to its jurisdictional runoff management program as directed by the San Diego Water Board Executive Officer.

(5) Updated jurisdictional runoff management program documents must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of submitting the Water Quality Improvement Plan Annual Report.

b. **BMP Design Manual Updates**

Each Copermittee must update its BMP Design Manual in accordance with the following requirements:

(1) Each Copermittee must update its BMP Design Manual to incorporate the requirements of Provisions E.3.a-d no later than 3 months after San Diego Water Board notification of concurrence with the Water Quality Improvement Plan by the San Diego Water Board Executive Officer.

(2) Subsequent updates to the BMP Design Manual must be consistent with the requirements of Provisions E.3.a-d and must be submitted as part of the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge required pursuant to Provision F.5.b.

(3) Updated BMP Design Manuals must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of completing the update.

c. **Water Quality Improvement Plan Updates**

(1) The Water Quality Improvement Plans must be updated in accordance with the following process:

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(a) The Copermittees must develop and implement a public participation process to obtain data, information and recommendations for updating the Water Quality Improvement Plan. The public participation process must provide for a publicly available and noticed schedule of opportunities for the public to participate and provide comments during the development of updates to the Water Quality Improvement Plan.

(b) The Copermittees must consult with the Water Quality Improvement Consultation Panel on proposed updates of the Water Quality Improvement Plan, and consider the Water Quality Improvement Consultation Panel's recommendations in finalizing the proposed updates.

(c) The Copermittees for each Watershed Management Area must submit 1) proposed updates to the Water Quality Improvement Plan and supporting rationale, and 2) recommendations received from the public and the Water Quality Improvement Consultation Panel and the rationale for the requested updates, either in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The updates submitted will be deemed accepted for inclusion in the Water Quality Improvement Plan ninety (90) days after submission unless otherwise directed in writing by the San Diego Water Board Executive Officer.

(d) The Copermittees must revise the requested updates as directed by the San Diego Water Board Executive Officer. in the subsequent Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b.

(e) Updated Water Quality Improvement Plans must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance approval of the requested updates by the San Diego Water Board.

(2) No later that six months. fFollowing incorporation of Office of Administrative Law and USEPA approval of any TMDL Basin Plan amendment into the MS4 Permit with wasteload allocations (WLAs) assigned to the Copermittees during the term of this Order, the Copermittees must initiate an update to the applicable Water Quality Improvement Plans in accordance with Provision F.1 or Provision F.2.c.(1) to incorporate the requirements of the TMDL WLAs. in the subsequent Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b.

3. Progress Reporting

a. Progress Report Presentations

The Copermittees for each Watershed Management Area must periodically appear before the San Diego Water Board, as requested by the Board, to provide progress reports on the implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs.

b. Annual Reports

(1) Transitional Jurisdictional Runoff Management Program Annual Reports

(a) Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D of this Order or a revised form accepted by the San Diego Water Board) no later than October 31 of each year for each jurisdictional runoff management program reporting period (i.e. July 1 to June 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted.

(b) Each Copermittee must submit the information on the Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D of this Order or a revised form accepted by the San Diego Water Board) specific to the area within its jurisdiction in each Watershed Management Area.

(c) In addition to submitting the Jurisdictional Runoff Management Program Annual Report Form during the transitional reporting period, each Copermittee may continue to utilize and submit the jurisdictional runoff management program annual reporting format of its previous NPDES permit until the first Water Quality Improvement Plan Annual Report is required to be submitted.

(2) Transitional Monitoring and Assessment Program Annual Reports

The Copermittees for each Watershed Management Area must submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted under this Order. The Transitional Monitoring and Assessment Program Annual Reports must include:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1.a and D.2.a, summarized and presented in tabular and graphical form; and

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(b) The findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

(3) Water Quality Improvement Plan Annual Reports

The Copermittees for each Watershed Management Area must submit a Water Quality Improvement Plan Annual Report for each reporting period no later than January 31 of the following year. The annual reporting period consists of two different periods: 1) July 1 to June 30 of the following year for the jurisdictional runoff management programs, 2) October 1 to September 30 of the following year for the monitoring and assessment programs. The Water Quality Improvement Plan Annual Reports must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Each Annual Report must include the following:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, summarized and presented in tabular and graphical form;

(b) The progress of the special studies required pursuant to Provision D.3, and the findings, interpretations and conclusions of a special study, or each phase of a special study, upon its completion;

(c) The findings, interpretations and conclusions from the assessments required pursuant to Provision D.4;

(d) The progress of implementing the Water Quality Improvement Plan, including, but not limited to, the following:

(i) The progress toward achieving the interim and final numeric goals for the highest water quality priorities for the Watershed Management Area;

(ii) The water quality improvement strategies that were implemented and/or no longer implemented by each of the Copermittees during the reporting period and previous reporting periods,

(iii) The water quality improvement strategies planned for implemention during the next reporting period,

(iv) Proposed modifications to the water quality improvement strategies, the public comments received and the supporting rationale for the proposed modifications,

(v) Previous modifications or updates incorporated into the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document and implemented by the Copermittees in the Watershed Management Area, and

(vi) Proposed modifications or updates to the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document;

(e) A completed Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D of this Order or a revised form accepted by the San Diego Water Board) for each Copermittee in the Watershed Management Area, certified by a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative.

(f) Each Copermittee must provide any data or documentation utilized in developing the Water Quality Improvement Plan Annual Report upon request by the San Diego Water Board. Any Copermittee monitoring data utilized in developing the Water Quality Improvement Plan Annual Report must be uploaded to the California Environmental Data Exchange Network (CEDEN).[30] Any Copermittee monitoring and assessment data utilized in developing the Water Quality Improvement Plan Annual Report must be available for access on the Regional Clearinghouse required pursuant to Provision F.4.

c. REGIONAL MONITORING AND ASSESSMENT REPORT

(1) The Copermittees must submit a Regional Monitoring and Assessment Report no later than 180 days prior to the expiration date of this Order. The Regional Monitoring and Assessment Report may be submitted as part of the Report of Waste Discharge required pursuant to Provision F.5.b. In preparing the report the Copermittees must consider the receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, and the findings, interpretations and conclusions from the assessments required pursuant to Provision D.4. Based on the consideration the report must assess the following:

(a) The beneficial uses of the receiving waters within the San Diego Region that are supported and not adversely affected by the Copermittees' MS4 discharges;

(b) The beneficial uses of the receiving waters within the San Diego Region that are adversely impacted by the Copermittees' MS4 discharges;

(c) The progress toward protecting the beneficial uses in the receiving waters within the San Diego Region from the Copermittees' discharges; and

(d) Pollutants or conditions of emerging concern that may impact beneficial

[30] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

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uses in the receiving waters within the San Diego Region.

(2) The Regional Monitoring and Assessment Report must include recommendations for improving the implementation and assessment of the Water Quality Improvement Plans and jurisdictional runoff management programs.

(3) Each Copermittee must provide any data or documentation utilized in developing the Regional Monitoring and Assessment Report upon request by the San Diego Water Board. Any Copermittee monitoring and assessment data utilized in developing the Regional Monitoring and Assessment Report must be available for access on the Regional Clearinghouse required pursuant to Provision F.4.

4. Regional Clearinghouse

The Copermittees must develop, update, and maintain an internet-based Regional Clearinghouse that is made available to the public no later than 18 months after the effective date of this Order.[31]

a. The Copermittees, through the Regional Clearinghouse, must make the following documents and data available for access and organized by Watershed Management Area. The documents and data may be linked to other internet-based data portals and databases where the original documents are stored:

(1) Water Quality Improvement Plan for the Watershed Management Area, and all updated versions with date of update;

(2) Annual Reports for the Watershed Management Area;

(3) Jurisdictional Runoff Management Program document for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(4) BMP Design Manual for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(5) Reports from special studies (e.g. source identification, BMP effectiveness assessment) conducted in the Watershed Management Area;

[31] The Copermittees may develop, update and maintain the clearinghouse(s) of other Copermittees or agencies.

(6) Monitoring data collected pursuant to Provision D for each Watershed Management Area must be uploaded to CEDEN,[32] with links to the uploaded data; and

(7) Available GIS data, layers, and/or shapefiles used to develop the maps generated and maintained by the Copermittees for the Water Quality Improvement Plans, Annual Reports, and jurisdictional runoff management program documents.

b. The Copermittees, through the Regional Clearinghouse, must make the following information and documents available for access:

(1) Contact information (point of contact, phone number, email address, and mailing address) for each Copermittee;

(2) Public hotline number for reporting non-storm water and illicit discharges for each Copermittee;

(3) Email address for reporting non-storm water and illicit discharges for each Copermittee;

(4) Link to each Copermittee's website, if available, where the public may find additional information about the Copermittee's storm water management program and for requesting records for the implementation of its program;

(5) Information about opportunities for the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or protection of the quality of receiving waters; and

(6) Reports from regional monitoring programs in which the Copermittees participate (e.g. Southern California Monitoring Coalition, Southern California Coastal Water Research Project Bight Monitoring);

(7) Regional Monitoring and Assessment Reports; and

(8) Any other information, data, and documents the Copermittees determine as appropriate for making available to the public.

[32] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

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5. **Report of Waste Discharge**

   a. The Orange County Copermittees and the Riverside County Copermittees are required to submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders. The San Diego Water Board will review and consider the Reports of Waste Discharge to determine whether modification to this Order, pursuant to the requirements of Provision H, will be required prior to the Orange County Copermittees and/or Riverside County Copermittees obtaining coverage under this Order. The current Orders for the Orange County Copermittees and Riverside County Copermittees are rescinded upon the date of effective coverage under this Order except for enforcement purposes.

   b. The Copermittees subject to the requirements of this Order must submit to the San Diego Water Board a complete Report of Waste Discharge as an application for the re-issuance of this Order and NPDES permit. The Report of Waste Discharge must be submitted no later than 180 days in advance of the expiration date of this Order. The Report of Waste Discharge must contain the following minimum information:

      (1) Names and addresses of the Copermittees;

      (2) Names and titles of the primary contacts of the Copermittees;

      (3) Proposed changes to the Copermittees' Water Quality Improvement Plans and the supporting justification;

      (4) Proposed changes to the Copermittees' jurisdictional runoff management programs and the supporting justification;

      (5) Any other information necessary for the re-issuance of this Order;

      (6) Any information to be included as part of the Report of Waste Discharge pursuant to the requirements of this Order; and

      (7) Any other information required by federal regulations for NPDES permit reissuance.

6. **Application for Early Coverage**

   a. The Orange County Copermittees, collectively, or Riverside County Copermittees, collectively, may apply for early coverage under this Order by submitting a Report of Waste Discharge Form 200, with a written request for early coverage under this Order.

   b. The San Diego Water Board will review the application for early coverage. A notification of coverage under this Order will be issued to the Copermittees in the respective county by the San Diego Water Board upon completion of the early coverage application requirements. The effective coverage date will be specified in the notification of coverage. The Copermittees in the respective county are authorized to have MS4 discharges pursuant to the requirements of this Order starting on the effective coverage date specified in the notification of coverage. The existing Order for the respective county is rescinded upon the effective coverage date specified in the notification of coverage except for enforcement purposes.

7. **Reporting Provisions**

   Each Copermittee must comply with all the reporting and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

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PROVISION F: REPORTING
F.6. Application for Early Coverage
F.7. Reporting Provisions

G. PRINCIPAL WATERSHED COPERMITTEE RESPONSIBILITIES

1. The Copermittees within each Watershed Management Area must designate a Principal Watershed Copermittee and notify the San Diego Water Board of the name of the Principal Watershed Copermittee. An individual Copermittee should not be designated a Principal Watershed Copermittee for more than two Watershed Management Areas. The notification may be submitted with the Water Quality Improvement Plan required pursuant to Provision F.1 of this Order.

2. The Principal Watershed Copermittee is responsible for, at a minimum, the following:

   a. Serving as liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues, and when necessary and appropriate, representing the Copermittees in the Watershed Management Area before the San Diego Water Board.

   b. Facilitating the development of the Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order

   c. Coordinating the submittal of the deliverables required by Provisions F.1, F.2, F.3.a, and F.3.b of this Order.

   d. Coordinating and developing, with the other Principal Watershed Copermittees, the requirements of Provisions F.3.c, F.4, and F.5.b of this Order.

3. The Principal Watershed Copermittee is not responsible for ensuring that the other Copermittees within the Watershed Management Area are in compliance with the requirements of this Order. Each Copermittee within the Watershed Management Area is responsible for complying with the requirements of this Order.

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H. MODIFICATION OF ORDER

1. Modifications of the Order may be initiated by the San Diego Water Board or by the Copermittees. Requests by Copermittees must be made to the San Diego Water Board.

2. Minor modifications to the Order may be made by the San Diego Water Board where the proposed modification complies with all the prohibitions and limitations, and other requirements of this Order.

3. This Order may also be re-opened and modified, revoked and, reissued or terminated in accordance with the provisions of 40 CFR 122.44, 122.62 to 122.64, and 124.5. Causes for taking such actions include, but are not limited to, failure to comply with any condition of this Order and permit, and endangerment to human health or the environment resulting from the permitted activity.

4. This Order may be re-opened for modification for cause including but not limited to the following:

   a. The State Water Board determines that revisions are warranted, and the San Diego Water Board concurs that revisions are necessary to those provisions of the Order addressing compliance with water quality standards in the receiving water and/or those provisions of the Order establishing an iterative process for implementation of management practices to assure compliance with water quality standards in the receiving water;

   b. An application for early coverage under this Order is received pursuant to Provision F.6;

   c. Any of the TMDLs in Attachment E to this Order are amended in the Basin Plan by San Diego Water Board, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA;

   d. The Basin Plan is amended by San Diego Water Board to incorporate a new TMDL, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA; or

   e. Updating or revising the monitoring and reporting requirements is determined to be necessary, at the discretion of the San Diego Water Board. Such modification(s) may include, but is (are) not limited to, revision(s) to: (i) implement recommendations from Southern California Coastal Water Research Project (SCCWRP), (ii) develop, refine, implement, and/or coordinate a regional monitoring program, (iii) develop and implement improved monitoring and assessment programs in keeping with San Diego Water Board Resolution No. R9-2012-0069, Resolution in Support of a Regional Monitoring Framework, and/or (iv) add provisions to require the Copermittees to evaluate and provide information on cost and values of the monitoring and reporting program.

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5. The San Diego Water Board, after opportunity for public comment and a public hearing, will re-open and consider modifications to this Order when the Orange County Copermittees or the Riverside County Copermittees submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders.

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I. STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

Each Copermittee must comply with all the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

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ATTACHMENT A

DISCHARGE PROHIBITIONS AND SPECIAL PROTECTIONS

1. Basin Plan Waste Discharge Prohibitions

California Water Code Section 13243 provides that a Regional Water Board, in a water quality control plan, may specify certain conditions or areas where the discharge of waste or certain types of waste is not permitted. The following waste discharge prohibitions in the Water Quality Control Plan for the San Diego Basin (Basin Plan) are applicable to any person, as defined by Section 13050(c) of the California Water Code, who is a citizen, domiciliary, or political agency or entity of California whose activities in California could affect the quality of waters of the state within the boundaries of the San Diego Region.

1. The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in California Water Code Section 13050, is prohibited.

2. The discharge of waste to land, except as authorized by waste discharge requirements or the terms described in California Water Code Section 13264 is prohibited.

3. The discharge of pollutants or dredged or fill material to waters of the United States except as authorized by a National Pollutant Discharge Elimination System (NPDES) permit or a dredged or fill material permit (subject to the exemption described in California Water Code Section 13376) is prohibited.

4. Discharges of recycled water to lakes or reservoirs used for municipal water supply or to inland surface water tributaries thereto are prohibited, unless this San Diego Water Board issues a NPDES permit authorizing such a discharge; the proposed discharge has been approved by the State Department of Health Services (DHS) and the operating agency of the impacted reservoir; and the discharger has an approved fail-safe long-term disposal alternative.

5. The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the San Diego Water Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

6. The discharge of waste in a manner causing flow, ponding, or surfacing on lands not owned or under the control of the discharger is prohibited, unless the discharge is authorized by the San Diego Water Board.

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7. The dumping, deposition, or discharge of waste directly into waters of the state, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the San Diego Water Board.

8. Any discharge to a storm water conveyance system that is not composed entirely of "*storm water*" is prohibited unless authorized by the San Diego Water Board. [The federal regulations, 40 CFR 122.26(b)(13), define storm water as storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from fire fighting activities.] [§122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

9. The unauthorized discharge of treated or untreated sewage to waters of the state or to a storm water conveyance system is prohibited.

10. The discharge of industrial wastes to conventional septic tank/subsurface disposal systems, except as authorized by the terms described in California Water Code Section 13264, is prohibited.

11. The discharge of radioactive wastes amenable to alternative methods of disposal into the waters of the state is prohibited.

12. The discharge of any radiological, chemical, or biological warfare agent into waters of the state is prohibited.

13. The discharge of waste into a natural or excavated site below historic water levels is prohibited unless the discharge is authorized by the San Diego Water Board.

14. The discharge of sand, silt, clay, or other earthen materials from any activity, including land grading and construction, in quantities which cause deleterious bottom deposits, turbidity or discoloration in waters of the state or which unreasonably affect, or threaten to affect, beneficial uses of such waters is prohibited.

15. The discharge of treated or untreated sewage from vessels to Mission Bay, Oceanside Harbor, Dana Point Harbor, or other small boat harbors is prohibited.

16. The discharge of untreated sewage from vessels to San Diego Bay is prohibited.

17. The discharge of treated sewage from vessels to portions of San Diego Bay that are less than 30 feet deep at mean lower low water (MLLW) is prohibited.

18. The discharge of treated sewage from vessels, which do not have a properly functioning US Coast Guard certified Type I or Type II marine sanitation device, to portions of San Diego Bay that are greater than 30 feet deep at mean lower low water (MLLW) is prohibited.

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2. Attachment B to State Water Board Resolution 2012-0012

Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges

I. PROVISIONS FOR POINT SOURCE DISCHARGES OF STORM WATER AND NONPOINT SOURCE WASTE DISCHARGES

The following terms, prohibitions, and special conditions (hereafter collectively referred to as special conditions) are established as limitations on point source storm water and nonpoint source discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in Areas of Special Biological Significance (ASBS), as required for State Water Quality Protection Areas pursuant to California Public Resources Code Sections 36700(f) and 36710(f). These Special Protections are adopted by the State Water Board as part of the California Ocean Plan (Ocean Plan) General Exception.

The special conditions are organized by category of discharge. The State Water Resources Control Board (State Water Board) and Regional Water Quality Control Boards (Regional Water Boards) will determine categories and the means of regulation for those categories [e.g., Point Source Storm Water National Pollutant Discharge Elimination System (NPDES) or Nonpoint Source].

A. PERMITTED POINT SOURCE DISCHARGES OF STORM WATER

1. General Provisions for Permitted Point Source Discharges of Storm Water

   a. Existing storm water discharges into an ASBS are allowed only under the following conditions:

      (1) The discharges are authorized by an NPDES permit issued by the State Water Board or Regional Water Board;

      (2) The discharges comply with all of the applicable terms, prohibitions, and special conditions contained in these Special Protections; and

      (3) The discharges:

         (i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

         (ii) Are designed to prevent soil erosion;

         (iii) Occur only during wet weather;

         (iv) Are composed of only storm water runoff.

   b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

   c. The discharge of trash is prohibited.

   d. Only discharges from existing storm water outfalls are allowed. Any proposed or new storm water runoff discharge shall be routed to existing storm water discharge outfalls and shall not result in any new contribution of waste to an ASBS (i.e., no additional pollutant loading). "Existing storm water outfalls" are those that were constructed or under construction prior to January 1, 2005. "New contribution of waste" is defined as any addition of waste beyond what would have occurred as of January 1, 2005. A change to an existing storm water outfall, in terms of re-location or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

   e. Non-storm water discharges are prohibited except as provided below:

      (1) The term "non-storm water discharges" means any waste discharges from a municipal separate storm sewer system (MS4) or other NPDES permitted storm drain system to an ASBS that are not composed entirely of storm water.

      (2) (i) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability or occur naturally:

         (a) Discharges associated with emergency firefighting operations.

         (b) Foundation and footing drains.

         (c) Water from crawl space or basement pumps.

         (d) Hillside dewatering.

         (e) Naturally occurring groundwater seepage via a storm drain.

         (f) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

      (ii) An NPDES permitting authority may authorize non-storm water discharges to an MS4 with a direct discharge to an ASBS only to the extent the NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS.

      (3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

2. Compliance Plans for Inclusion in Storm Water Management Plans (SWMP) and Storm Water Pollution Prevention Plans (SWPPP).

   The discharger shall specifically address the prohibition of non-storm water runoff and the requirement to maintain natural water quality for storm water discharges to an ASBS in an ASBS Compliance Plan to be included in its SWMP or a SWPPP, as appropriate to permit type. If a statewide permit includes a SWMP, then the discharger shall prepare a stand-alone compliance plan for ASBS discharges. The ASBS Compliance Plan is subject to approval by the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (for permits issued by Regional Water Boards).

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a. The Compliance Plan shall include a map of surface drainage of storm water runoff, showing areas of sheet runoff, prioritize discharges, and describe any structural Best Management Practices (BMPs) already employed and/or BMPs to be employed in the future. Priority discharges are those that pose the greatest water quality threat and which are identified to require installation of structural BMPs. The map shall also show the storm water conveyances in relation to other features such as service areas, sewage conveyances and treatment facilities, landslides, areas prone to erosion, and waste and hazardous material storage areas, if applicable. The SWMP or SWPPP shall also include a procedure for updating the map and plan when changes are made to the storm water conveyance facilities.

b. The ASBS Compliance Plan shall describe the measures by which all non-authorized non-storm water runoff (e.g., dry weather flows) has been eliminated, how these measures will be maintained over time, and how these measures are monitored and documented.

c. For Municipal Separate Storm Sewer System (MS4s), the ASBS Compliance Plan shall require minimum inspection frequencies as follows:

(1) The minimum inspection frequency for construction sites shall be weekly during rainy season;

(2) The minimum inspection frequency for industrial facilities shall be monthly during the rainy season;

(3) The minimum inspection frequency for commercial facilities (e.g., restaurants) shall be twice during the rainy season; and

(4) Storm water outfall drains equal to or greater than 18 inches (457 mm) in diameter or width shall be inspected once prior to the beginning of the rainy season and once during the rainy season and maintained to remove trash and other anthropogenic debris.

d. The ASBS Compliance Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff, that are necessary to comply with these special conditions, will be achieved through BMPs. Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that such installation would pose a threat to health or safety. BMPs to control storm water runoff discharges (at the end-of-pipe) during a design storm shall be designed to achieve on average the following target levels:

(1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

(2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges. The baseline for the reduction is the effective date of the Exception. The baseline for these determinations is the effective date of the Exception, and the

reductions must be achieved and documented within four (4) years of the effective date.

e. The ASBS Compliance Plan shall address erosion control and the prevention of anthropogenic sedimentation in ASBS. The natural habitat conditions in the ASBS shall not be altered as a result of anthropogenic sedimentation.

f. The ASBS Compliance Plan shall describe the non-structural BMPs currently employed and planned in the future (including those for construction activities), and include an implementation schedule. The ASBS Compliance Plan shall include non-structural BMPs that address public education and outreach. Education and outreach efforts must adequately inform the public that direct discharges of pollutants from private property not entering an MS4 are prohibited. The ASBS Compliance Plan shall also describe the structural BMPs, including any low impact development (LID) measures, currently employed and planned for higher threat discharges and include an implementation schedule. To control storm water runoff discharges (at the end-of-pipe) during a design storm, permittees must first consider using LID practices to infiltrate, use, or evapotranspirate storm water runoff on-site.

g. The BMPs and implementation schedule shall be designed to ensure that natural water quality conditions in the receiving water are achieved and maintained by either reducing flows from impervious surfaces or reducing pollutant loading, or some combination thereof.

h. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents in storm water runoff that alter natural ocean water quality and the sources of these constituents.

(2) The report shall describe BMPs that are currently being implemented, BMPs that are identified in the SWMP or SWPPP for future implementation, and any additional BMPs that may be added to the SWMP or SWPPP to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the BMPs.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits), the discharger shall revise its ASBS Compliance Plan to incorporate any new or modified BMPs that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised SWMP or SWPPP, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural ocean water quality conditions due to the same constituent.

(5) Compliance with this section does not excuse violations of any term, prohibition, or condition contained in these Special Protections.

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3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within one year from the effective date of the Exception, the discharger shall submit a written ASBS Compliance Plan to the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that describes its strategy to comply with these special conditions, including the requirement to maintain natural water quality in the affected ASBS. The ASBS Compliance Plan shall include a time schedule to implement appropriate non-structural and structural controls (implementation schedule) to comply with these special conditions for inclusion in the discharger's SWMP or SWPPP, as appropriate to permit type.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these special conditions shall be implemented.

d. Within four (4) years of the effective date of the Exception, any structural controls identified in the ASBS Compliance Plan that are necessary to comply with these special conditions shall be operational.

e. Within four (4) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water, pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data, and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

(1) for municipalities, a demonstration of significant hardship to discharger ratepayers, by showing the relationship of storm water fees to annual household income for residents within the discharger's jurisdictional area, and the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or
(2) for other governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process.

B. NONPOINT SOURCE DISCHARGES

[NOT INCLUDED]
[PROVISIONS FOR NONPOINT SOURCE DISCHARGES NOT APPLICABLE]

II. ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES

[NOT INCLUDED]
[ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES NOT APPLICABLE]

III. ADDITIONAL REQUIREMENTS – WATERFRONT AND MARINE OPERATIONS

[NOT INCLUDED]
[ADDITIONAL REQUIREMENTS FOR WATERFRONT AND MARINE OPERATIONS NOT APPLICABLE]

IV. MONITORING REQUIREMENTS

Monitoring is mandatory for all dischargers to assure compliance with the Ocean Plan. Monitoring requirements include both: (A) core discharge monitoring, and (B) ocean receiving water monitoring. The State and Regional Water Boards must approve sampling site locations and any adjustments to the monitoring programs. All ocean receiving water and reference area monitoring must be comparable with the Water Boards' Surface Water Ambient Monitoring Program (SWAMP).

Safety concerns: Sample locations and sampling periods must be determined considering safety issues. Sampling may be postponed upon notification to the State and Regional Water Boards if hazardous conditions prevail.

Analytical Chemistry Methods: All constituents must be analyzed using the lowest minimum detection limits comparable to the Ocean Plan water quality objectives. For metal analysis, all samples, including storm water effluent, reference samples, and ocean receiving water samples, must be analyzed by the approved analytical method with the lowest minimum detection limits (currently Inductively Coupled Plasma/Mass Spectrometry) described in the Ocean Plan.

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A. CORE DISCHARGE MONITORING PROGRAM

1. General sampling requirements for timing and storm size:

   Runoff must be collected during a storm event that is greater than 0.1 inch and generates runoff, and at least 72 hours from the previously measurable storm event. Runoff samples shall be collected when post-storm receiving water is sampled, and analyzed for the same constituents as receiving water and reference site samples (see section IV B) as described below.

2. Runoff flow measurements

   a. For municipal/industrial storm water outfalls in existence as of December 31, 2007, 18 inches (457mm) or greater in diameter/width (including multiple outfall pipes in combination having a width of 18 inches, runoff flows must be measured or calculated, using a method acceptable to and approved by the State and Regional Water Boards.
   b. This will be reported annually for each precipitation season to the State and Regional Water Boards.

3. Runoff samples – storm events

   a. For outfalls equal to or greater than 18 inches (0.46m) in diameter or width:

      (1) samples of storm water runoff shall be analyzed during the same storm as receiving water samples for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination, ; and

      (2) samples of storm water runoff shall be analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS

      (3) If an applicant has no outfall greater than 36 inches, then storm water runoff from the applicant's largest outfall shall be further analyzed during the same storm as receiving water samples for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates).

   b. For outfalls equal to or greater than 36 inches (0.91m) in diameter or width:

      (1) samples of storm water runoff shall be analyzed during the same storm as receiving water samples for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

      (2) samples of storm water runoff shall be further analyzed during the same storm as receiving water samples for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates) and

      (3) samples of storm water runoff shall be analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

   c. For an applicant not participating in a regional monitoring program [see below in Section IV (B)] in addition to (a.) and (b.) above, a minimum of the two largest outfalls or 20 percent of the larger outfalls, whichever is greater, shall be sampled (flow weighted composite samples) at least three times annually during wet weather (storm event) and analyzed for all Ocean Plan Table A constituents, Table B constituents for marine aquatic life protection (except for toxicity, only chronic toxicity for three species shall be required), DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, and Ocean Plan indicator bacteria. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one (the largest) such discharge shall be sampled annually in each Region.

4. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may reduce or suspend core monitoring once the storm runoff is fully characterized. This determination may be made at any point after the discharge is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

B. OCEAN RECEIVING WATER AND REFERENCE AREA MONITORING PROGRAM

In addition to performing the Core Discharge Monitoring Program in Section II.A above, all applicants having authorized discharges must perform ocean receiving water monitoring. In order to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS, dischargers may choose either (1) an individual monitoring program, or (2) participation in a regional integrated monitoring program.

1. Individual Monitoring Program: The requirements listed below are for those dischargers who elect to perform an individual monitoring program to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within the affected ASBS. In addition to Core Discharge Monitoring, the following additional monitoring requirements shall be met:

   a. Three times annually, during wet weather (storm events), the receiving water at the point of discharge from the outfalls described in section (IV)(A)(3)(c) above shall be sampled and analyzed for Ocean Plan Table A constituents, Table B constituents for marine aquatic life, DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, salinity, chronic toxicity (three species), and Ocean Plan indicator bacteria.

      The sample location for the ocean receiving water shall be in the surf zone at the point of discharges; this must be at the same location where storm water runoff is sampled. Receiving water shall be sampled at approximately the same time prior to (pre-storm) and during (or immediately after) the same storm (post storm). Reference water quality shall also be sampled and analyzed for the same constituents pre-storm and post-storm, during the same storms when receiving water is sampled. Reference stations will be determined by the State Water Board's Division of Water Quality and the applicable Regional Water Board(s).

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2. Attachment B to State Water Board Resolution No. 2012-0012

b. Sediment sampling shall occur at least three times during every five (5) year period. The subtidal sediment (sand or finer, if present) at the discharge shall be sampled and analyzed for Ocean Plan Table B constituents for marine aquatic life, DDT, PCBs, PAHs, pyrethroids, and OP pesticides. For sediment toxicity testing, only an acute toxicity test using the amphipod Eohaustorius estuarius must be performed.

c. A quantitative survey of intertidal benthic marine life shall be performed at the discharge and at a reference site. The survey shall be performed at least once every five (5) year period. The survey design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The results of the survey shall be completed and submitted to the State Water Board and Regional Water Board at least six months prior to the end of the permit cycle.

d. Once during each five (5) year period, a bioaccumulation study shall be conducted to determine the concentrations of metals and synthetic organic pollutants at representative discharge sites and at representative reference sites. The study design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The bioaccumulation study may include California mussels (Mytilus californianus) and/or sand crabs (Emerita analoga or Blepharipoda occidentalis). Based on the study results, the Regional Water Board and the State Water Board's Division of Water Quality, may adjust the study design in subsequent permits, or add or modify additional test organisms (such as shore crabs or fish), or modify the study design appropriate for the area and best available sensitive measures of contaminant exposure.

e. Marine Debris: Representative quantitative observations for trash by type and source shall be performed along the coast of the ASBS within the influence of the discharger's outfalls. The design, including locations and frequency, of the marine debris observations is subject to approval by the Regional Water Board and State Water Board's Division of Water Quality.

f. The monitoring requirements of the Individual Monitoring Program in this section are minimum requirements. After a minimum of one (1) year of continuous water quality monitoring of the discharges and ocean receiving waters, the Executive Director of the State Water Board (statewide permits) or Executive officer of the Regional Water Board (Regional Water Board permits) may require additional monitoring, or adjust, reduce or suspend receiving water and reference station monitoring. This determination may be made at any point after the discharge and receiving water is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

2. Regional Integrated Monitoring Program: Dischargers may elect to participate in a regional integrated monitoring program, in lieu of an individual monitoring program, to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS. This regional approach shall characterize natural water quality, pre- and post-storm, in ocean reference areas near the mouths of identified open space watersheds and the effects of the discharges on natural water quality (physical, chemical, and toxicity) in the ASBS receiving waters, and should include benthic marine aquatic life and bioaccumulation components. The design of the ASBS stratum of a regional integrated monitoring program may deviate from the otherwise prescribed individual monitoring approach (in Section IV.B.1) if approved by the State Water Board's Division of Water Quality and the Regional Water Boards

a. Ocean reference areas shall be located at the drainages of flowing watersheds with minimal development (in no instance more than 10% development), and shall not be located in CWA Section 303(d) listed waterbodies or have tributaries that are 303(d) listed. Reference areas shall be free of wastewater discharges and anthropogenic non-storm water runoff. A minimum of low threat storm runoff discharges (e.g. stream highway overpasses and campgrounds) may be allowed on a case-by-case basis. Reference areas shall be located in the same region as the ASBS receiving water monitoring occurs. The reference areas for each Region are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean reference water samples must be collected from each station, each from a separate storm. A minimum of one reference location shall be sampled for each ASBS receiving water site sampled per responsible party. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

b. ASBS ocean receiving water must be sampled in the surf zone at the location where the runoff makes contact with ocean water (i.e. at "point zero"). Ocean receiving water stations must be representative of worst-case discharge conditions (i.e. co-located at a large drain greater than 36 inches, or if drains greater than 36 inches are not present in the ASBS then the largest drain greater than18 inches). Ocean receiving water stations are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean receiving water samples must be collected during each storm season from each station, each from a separate storm. A minimum of one receiving water location shall be sampled in each ASBS per responsible party in that ASBS. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

c. Reference and receiving water sampling shall commence during the first full storm season following the adoption of these special conditions, and post-storm samples shall be collected when annual storm water runoff is sampled. Sampling shall occur in a minimum of two storm seasons. For those ASBS dischargers that have already participated in the Southern California Bight 2008 ASBS regional monitoring effort, sampling may be limited to only one storm season.

d. Receiving water and reference samples shall be analyzed for the same constituents as storm water runoff samples. At a minimum, constituents to be sampled and analyzed in reference and discharge receiving waters must include oil and grease, total suspended solids, Ocean Plan Table B metals for protection of marine life, Ocean Plan PAHs, pyrethroids, OP pesticides, ammonia, nitrate, phosphates, and critical life stage chronic toxicity for three species. In addition, within the range of the southern sea otter, indicator bacteria or some other measure of fecal contamination shall be analyzed.

3. Waterfront and Marine Operations: In addition to the above requirements for ocean receiving water monitoring, additional monitoring must be performed for marinas and boat launch and pier facilities:

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a. For all marina or mooring field operators, in mooring fields with 10 or more occupied moorings, the ocean receiving water must be sampled for Ocean Plan indicator bacteria, residual chlorine, copper, zinc, grease and oil, methylene blue active substances (MBAS), and ammonia nitrogen.

   (1) For mooring field operators opting for an individual monitoring program (Section IV.B.1 above), this sampling must occur weekly (on the weekend) from May through October.

   (2) For mooring field operators opting to participate in a regional integrated monitoring program (Section IV.B.2 above), this sampling must occur monthly from May through October on a high use weekend in each month. The Water Boards may allow a reduction in the frequency of sampling, through the regional monitoring program, after the first year of monitoring.

b. For all mooring field operators, the subtidal sediment (sand or fines, if present) within mooring fields and below piers shall be sampled and analyzed for Ocean Plan Table B metals (for marine aquatic life beneficial use), acute toxicity, PAHs, and tributyltin. For sediment toxicity testing, only an acute toxicity test using the amphipod Eohaustorius estuarius must be performed. This sampling shall occur at least three times during a five (5) year period. For mooring field operators opting to participate in a regional integrated monitoring program, the Water Boards may allow a reduction in the frequency of sampling after the first sampling effort's results are assessed.

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ATTACHMENT B

STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

1. Standard Permit Provisions

Code of Federal Regulations Title 40 Section 122.41 (40 CFR 122.41) includes conditions, or provisions, that apply to all National Pollutant Discharge Elimination System (NPDES) permits. Additional provisions applicable to NPDES permits are in 40 CFR 122.42. All applicable provisions in 40 CFR 122.41 and 40 CFR 122.42 must be incorporated into this Order and NPDES permit. The applicable 40 CFR 122.41 and 40 CFR 122.42 provisions are as follows:

a. DUTY TO COMPLY [40 CFR 122.41(a)]

The Copermittee must comply with all of the provisions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

(1) The Copermittee must comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement. [40 CFR 122.41(a)(1)]

(2) The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to a civil penalty not to exceed $25,000 per day for each violation. The CWA provides that any person who *negligently* violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than 2 years, or both. Any person who *knowingly* violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both. Any person who knowingly violates Section 301, 302, 303, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, and who knows at that time that he thereby places another person in imminent danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of

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not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.
[40 CFR 122.41(a)(2)]

(3) Any person may be assessed an administrative penalty by the San Diego Regional Water Quality Control Board (San Diego Water Board), State Water Resources Control Board (State Water Board), or United States Environmental Protection Agency (USEPA) for violating Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.
[40 CFR 122.41(a)(3)]

b. DUTY TO REAPPLY [40 CFR 122.41(b)]

If a Copermittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Copermittee must apply for and obtain a new permit.

c. NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE [40 CFR 122.41(c)]

It shall not be a defense for a Copermittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

d. DUTY TO MITIGATE [40 CFR 122.41(d)]

The Copermittee must take all reasonable steps to minimize or prevent any discharge or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

e. PROPER OPERATION AND MAINTENANCE [40 CFR 122.41(e)]

The Copermittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Copermittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by a Copermittee only when the operation is necessary to achieve compliance with the conditions of this permit.

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f. **PERMIT ACTIONS** [40 CFR 122.41(f)]

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Copermittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

g. **PROPERTY RIGHTS** [40 CFR 122.41(g)]

This permit does not convey any property rights of any sort, or any exclusive privilege.

h. **DUTY TO PROVIDE INFORMATION** [40 CFR 122.41(h)]

The Copermittee must furnish to the San Diego Water Board, State Water Board, or USEPA within a reasonable time, any information which the San Diego Water Board, State Water Board, or USPEA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Copermittee must also furnish to the San Diego Water Board, State Water Board, or USPEA upon request, copies of records required to be kept by this permit.

i. **INSPECTION AND ENTRY** [40 CFR 122.41(i)]

The Copermittee must allow the San Diego Water Board, State Water Board, USEPA, and/or their authorized representative (including an authorized contractor acting as their representative), upon presentation of credentials and other documents as may be required by law, to:

(1) Enter upon the Copermittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit; [40 CFR 122.41(i)(1)]

(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit; [40 CFR 122.41(i)(2)]

(3) Inspect and photograph at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; [40 CFR 122.41(i)(3)] and

(4) Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location. [40 CFR 122.41(i)(4)]

j. **MONITORING AND RECORDS** [40 CFR 122.41(j)]

(1) Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity. [40 CFR 122.41(j)(1)]

(2) Except for records of monitoring information required by this permit related to the Copermittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five (5) years (or longer as required by 40 CFR Part 503), the

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Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time. [40 CFR 122.41(j)(2)]

(3) Records for monitoring information must include: [40 CFR 122.41(j)(3)]

(a) The date, exact place, and time of sampling or measurements; [40 CFR 122.41(j)(3)(i)]
(b) The individual(s) who performed the sampling or measurements; [40 CFR 122.41(j)(3)(ii)]
(c) The date(s) analyses were performed; [40 CFR 122.41(j)(3)(iii)]
(d) The individual(s) who performed the analyses; [40 CFR 122.41(j)(3)(iv)]
(e) The analytical techniques or methods used; [40 CFR 122.41(j)(3)(v)] and
(f) The results of such analyses. [40 CFR 122.41(j)(3)(vi)]

(4) Monitoring must be conducted according to test procedures under 40 CFR Part 136 unless another method is required under 40 CFR Subchapters N or O. [40 CFR 122.41(j)(4)]

In the case of pollutants for which there are no approved methods under 40 CFR Part 136 or otherwise required under 40 CFR Subchapters N and O, monitoring must be conducted according to a test procedure specified in the permit for such pollutants. [40 CFR 122.44(i)(1)(iv)]

(5) The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. [40 CFR 122.41(j)(5)]

k. **SIGNATORY REQUIREMENT** [40 CFR 122.41(k)]

(1) All applications, reports, or information submitted to the San Diego Water Board, State Water Board, or USEPA must be signed and certified. (See 40 CFR 122.22) [40 CFR 122.41(k)(1)]

(a) *For a municipality, State, Federal, or other public agency.* [All applications must be signed] [b]y either a principal executive officer or ranking elected official. [40 CFR 122.22(a)(3)]

(b) All reports required by permits, and other information requested by the San Diego Water Board, State Water Board, or USEPA must be signed by a person described in paragraph (a) of this section, or by a duly authorized representative of that person. A person is a duly authorized representative only if: [40 CFR 122.22(b)]

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(i) The authorization is made in writing by a person described in paragraph (a) of this section; [40 CFR 122.22(b)(1)]

(ii) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company, (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) [40 CFR 122.22(b)(2)] and,

(iii) The written authorization is submitted to the San Diego Water Board and State Water Board. [40 CFR 122.22(b)(3)]

(c) *Changes to authorization.* If an authorization under paragraph (b) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (b) of this section must be submitted to the San Diego Water Board prior to or together with any reports, information, or applications to be signed by an authorized representative. [40 CFR 122.22(c)]

(d) *Certification.* Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." [40 CFR 122.22(d)]

(2) The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both. [40 CFR 122.41(k)(2)]

I. Reporting Requirements [40 CFR 122.41(l)]

(1) *Planned changes.* The Copermittee must give notice to the San Diego Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when: [40 CFR 122.41(l)(1)]

(a) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); [40 CFR 122.41(l)(1)(i)] or

(b) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which

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are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1). [40 CFR 122.41(l)(1)(ii)]

(c) The alteration or addition results in a significant change in the Copermittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. [40 CFR 122.41(l)(1)(iii)]

(2) *Anticipated noncompliance.* The Copermittee must give advance notice to the San Diego Water Board or State Water Board of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements. [40 CFR 122.41(l)(2)]

(3) *Transfers.* This permit is not transferable to any person except after notice to the San Diego Water Board. The San Diego Water Board may require modification or revocation and reissuance of the permit to change the name of the Copermittee and incorporate such other requirements as may be necessary under the CWA. [40 CFR 122.41(l)(3)]

(4) *Monitoring reports.* Monitoring results must be reported at the intervals specified elsewhere in this permit. [40 CFR 122.41(l)(4)]

(a) Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the San Diego Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices. [40 CFR 122.41(l)(4)(i)]

(b) If the Copermittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or another method required for an industry-specific waste stream under 40 CFR Subchapters N or O, the results of this monitoring must be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the San Diego Water Board or State Water Board. [40 CFR 122.41(l)(4)(ii)]

(c) Calculations for all limitations which require averaging of measurements must utilize an arithmetic mean unless otherwise specified in the permit. [40 CFR 122.41(l)(4)(iii)]

(5) *Compliance schedules.* Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date. [40 CFR 122.41(l)(5)]

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(6) *Twenty-four hour reporting.*

(a) The Copermittee must report any noncompliance that may endanger health or the environment. Any information must be provided orally within 24 hours from the time the Copermittee becomes aware of the circumstances. A written submission must also be provided within five (5) days of the time the Copermittee becomes aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6)(i)]

(b) The following must be included as information which must be reported within 24 hours under this paragraph: [40 CFR 122.41(l)(6)(ii)]

(i) Any unanticipated bypass that exceeds any effluent limitation in the permit (See 40 CFR 122.41(g)). [40 CFR 122.41(l)(6)(ii)(A)]
(ii) Any upset which exceeds any effluent limitation in the permit. [40 CFR 122.41(l)(6)(ii)(B)] and,
(iii) Violation of a maximum daily discharge limitation for any of the pollutants listed by the San Diego Water Board in the permit to be reported within 24 hours. (See 40 CFR 122.44(g)). [40 CFR 122.41(l)(6)(ii)(C)]

(c) The San Diego Water Board may waive the above-required written report on a case-by-case basis if the oral report has been received within 24 hours. [40 CFR 122.41(l)(6)(iii)]

(7) *Other noncompliance.* The Copermittee must report all instances of noncompliance not reported in accordance with the standard provisions required under 40 CFR 122.41(l)(4), (5), and (6), at the time monitoring reports are submitted. The reports must contain the information listed in the standard provisions required under 40 CFR 122.41(l)(6). [40 CFR 122.41(l)(7))]

(8) *Other information.* When the Copermittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the San Diego Water Board, State Water Board, or USEPA, the Copermittee must promptly submit such facts or information. [40 CFR 122.41(l)(8)]

m. BYPASS [40 CFR 122.41(m)]

(1) *Definitions.*

(a) "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. [40 CFR 122.41(m)(1)(i)] or

(b) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be

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expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production. [40 CFR 122.41(m)(1)(ii)]

(2) *Bypass not exceeding limitations.* The Copermittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the standard provisions required under 40 CFR 122.41(m)(3) and (4). [40 CFR 122.41(m)(2)]

(3) *Notice.*

(a) *Anticipated bypass.* If the Copermittee knows in advance of the need for a bypass, it must submit a notice, if possible at least ten days before the date of the bypass. [40 CFR 122.41(m)(3)(i)] or

(b) *Unanticipated bypass.* The Copermittee must submit notice of an unanticipated bypass in accordance with the standard provisions required under 40 CFR 122.41(l)(6) (24-hour notice). [40 CFR 122.41(m)(3)(ii)]

(4) *Prohibition of Bypass.*

(a) Bypass is prohibited, and the San Diego Water Board may take enforcement action against a Copermittee for bypass, unless: [40 CFR 122.41(m)(4)(i)]

(i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; [40 CFR 122.41(m)(4)(i)(A)]
(ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; [40 CFR 122.41(m)(4)(i)(B)] and,
(iii) The Copermittee submitted notice in accordance with the standard provisions required under 40 CFR 122.41(m)(3). [40 CFR 122.41(m)(4)(i)(C)]

(b) The San Diego Water Board may approve an anticipated bypass, after considering its adverse effects, if the San Diego Water Board determines that it will meet the three conditions listed above. [40 CFR 122.41(m)(4)(ii)]

n. UPSET [40 CFR 122.41(n)]

(1) *Definition.* "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Copermittee. An upset does not

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include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. [40 CFR 122.41(n)(1)]

(2) *Effect of an upset.* An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the standard provisions required under 40 CFR 122.41(n)(3) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. [40 CFR 122.41(n)(2)]

(3) *Conditions necessary for a demonstration of upset.* A Copermittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that: [40 CFR 122.41(n)(3)]

(a) An upset occurred and that the Copermittee can identify the cause(s) of the upset; [40 CFR 122.41(n)(3)(i)]
(b) The permitted facility was at the time being properly operated; [40 CFR 122.41(n)(3)(ii)] and
(c) The Copermittee submitted notice of the upset in accordance with the standard provisions required under 40 CFR 122.41(l)(6)(ii)(B) (24-hour notice). [40 CFR 122.41(n)(3)(iii)]
(d) The Copermittee complied with any remedial measures pursuant to the standard provisions required under 40 CFR 122.41(d). [40 CFR 122.41(n)(3)(iii)]

(4) *Burden of proof.* In any enforcement proceeding, the Copermittee seeking to establish the occurrence of an upset has the burden of proof. [40 CFR 122.41(n)(4)]

o. STANDARD PERMIT PROVISIONS FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS [40 CFR 122.42(c)]

The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the San Diego Water Board or State Water Board under 40 CFR 122.26(a)(1)(v) must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report must include:

(1) The status of implementing the components of the storm water management program that are established as permit conditions; [40 CFR 122.42(c)(1)]

(2) Proposed changes to the storm water management programs that are established as permit conditions. Such proposed changes must be consistent with 40 CFR 122.26(d)(2)(iii); [40 CFR 122.42(c)(2)] and

(3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under 40 CFR 122.26(d)(2)(iv) and (v); [40 CFR 122.42(c)(3)]

(4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; [40 CFR 122.42(c)(4)]

(5) Annual expenditures and budget for year following each annual report; [40 CFR 122.42(c)(5)]

(6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; [40 CFR 122.42(c)(6)]

(7) Identification of water quality improvements or degradation. [40 CFR 122.42(c)(7)]

p. STANDARD PERMIT PROVISIONS FOR STORM WATER DISCHARGES [40 CFR 122.42(d)]

The initial permits for discharges composed entirely of storm water issued pursuant to 40 CFR 122.26(e)(7) must require compliance with the conditions of the permit as expeditiously as practicable, but in no event later than three years after the date of issuance of the permit.

2. General Provisions

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. The general provisions applicable to this Order and NPDES permit are as follows:

a. DISCHARGE OF WASTE IS A PRIVILEGE

No discharge of waste into the waters of the State, whether or not such discharge is made pursuant to waste discharge requirements, shall create a vested right to continue such discharge. All discharges of waste into waters of the State are privileges, not rights. [CWC Section 13263(g)]

b. DURATION OF ORDER AND NPDES PERMIT

(1) *Effective date.* This Order and NPDES permit becomes effective on the 50th day after its adoption provided the USEPA has no objection. If the USEPA objects to its issuance, this Order shall not become effective until such objection is withdrawn. This Order supersedes Order No. R9-2007-0001 upon the effective date of this Order, and supersedes Order Nos. R9-2009-0002 and R9-2010-0016 upon their expiration or earlier notice of coverage.

(2) *Expiration.* This Order and NPDES permit expires five years after its effective date. [40 CFR 122.46(a)]

(3) *Continuation of expired order.* After this Order and NPDES permit expires, the terms and conditions of this Order and NPDES permit are automatically continued pending issuance of a new permit if all requirements of the federal NPDES regulations on the continuation of expired permits (40 CFR 122.6) are complied with.

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c. **AVAILABILITY**

A copy of this Order must be kept at a readily accessible location and must be available to on-site personnel at all times.

d. **CONFIDENTIALITY OF INFORMATION**

Except as provided for in 40 CFR 122.7, no information or documents submitted in accordance with or in application for this Order will be considered confidential, and all such information and documents shall be available for review by the public at the San Diego Water Board office.

Claims of confidentiality for the following information will be denied: [40 CFR 122.7(b)]

(1) The name and address of any permit applicant or Copermittee, [40 CFR 122.7(b)(1)] and

(2) Permit applications and attachments, permits, and effluent data [40 CFR 122.7(b)(2)]

e. **EFFLUENT LIMITATIONS**

(1) *Interim effluent limitations*. The Copermittee must comply with any interim effluent limitations as established by addendum, enforcement action, or revised waste discharge requirements which have been, or may be, adopted by the San Diego Water Board.

(2) *Other effluent limitations and standards*. If any applicable toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant and that standard or prohibition is more stringent than any limitation on the pollutant in the permit, the San Diego Water Board shall institute proceedings under these regulations to modify or revoke and reissue the permit to conform to the toxic effluent standard or prohibition. [40 CFR 122.44(b)(1)]

f. **DUTY TO MINIMIZE OR CORRECT ADVERSE IMPACTS**

The Copermittee must take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this Order, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the noncompliance.

g. **PERMIT ACTIONS**

The filing of a request by the Copermittee for modification, revocation and reissuance, or termination of this Order, or a notification of planned change in or anticipated noncompliance with this Order does not stay any condition of this Order. (See 40 CFR 122.41(f)) In addition, the following provisions apply to this Order:

(1) Upon application by any affected person, or on its own motion, the San Diego Water Board may review and revise the requirements in this Order. All requirements must be reviewed periodically. [CWC Section 13263(e)]

(2) This Order may be terminated or modified for cause, including, but not limited to, all of the following: [CWC Section 13381]

(a) Violation of any condition contained in the requirements of this Order. [CWC Section 13381(a)]

(b) Obtaining the requirements in this Order by misrepresentation, or failure to disclose fully all relevant facts. [CWC Section 13381(b)]

(c) A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge. [CWC Section 13381(c)]

(3) When this Order is transferred to a new owner or operator, such requirements as may be necessary under the CWC may be incorporated into this Order.

h. **NPDES PERMITTED NON-STORM WATER DISCHARGES**

The San Diego Water Board has, in prior years, issued a limited number of individual NPDES permits for non-storm water discharges to MS4s. The San Diego Water Board or State Water Board may in the future, upon prior notice to the Copermittee(s), issue an NPDES permit for any non-storm water discharge (or class of non-storm water discharges) to an MS4.

i. **MONITORING**

In addition to the standard provisions required under 40 CFR 122.41(j) and (l)(4), the following general monitoring provisions apply to this Order:

(1) Where procedures are not otherwise specified in Order, sampling, analysis and quality assurance/quality control must be conducted in accordance with the Quality Assurance Management Plan (QAMP) for the State of California's Surface Water Ambient Monitoring Program (SWAMP), adopted by the State Water Resources Control Board (State Water Board).

(2) Pursuant to 40 CFR 122.41(j)(2) and CWC Section 13383(a), each Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five (5) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time.

(3) All chemical, bacteriological, and toxicity analyses must be conducted at a laboratory certified for such analyses by the California Department of Public Health or a laboratory approved by the San Diego Water Board.

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(4) For priority toxic pollutants that are identified in the California Toxics Rule (CTR) (65 Fed. Reg. 31682), the Copermittees must instruct their laboratories to establish calibration standards that are equivalent to or lower than the Minimum Levels (MLs) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP). If a Copermittee can demonstrate that a particular ML is not attainable, in accordance with procedures set forth in 40 CFR Part 136, the lowest quantifiable concentration of the lowest calibration standard analyzed by a specific analytical procedure (assuming that all the method specified sample weights, volumes, and processing steps have been followed) may be used instead of the ML listed in Appendix 4 of the SIP. The Copermittee must submit documentation from the laboratory to the San Diego Water Board for approval prior to raising the ML for any priority toxic pollutant.

j. **ENFORCEMENT**

(1) The San Diego Water Board is authorized to enforce the terms of this Order under several provisions of the CWC, including, but not limited to, CWC Sections 13385, 13386, and 13387.

(2) Nothing in this Order shall be construed to protect the Copermittee from its liabilities under federal, state, or local laws.

(3) The CWC provides for civil and criminal penalties comparable to, and in some cases greater than, those provided for under the CWA.

(4) Except as provided in the standard conditions required under 40 CFR 122.41(m) and (n), nothing in this Order shall be construed to relieve the Copermittee from civil or criminal penalties for noncompliance.

(5) Nothing in this Order shall be construed to preclude the institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties to which the Copermittee is or may be subject to under Section 311 of the CWA.

(6) Nothing in this Order shall be construed to preclude institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authoring preserved by Section 510 of the CWA.

k. **SEVERABILITY**

The provisions of this Order are severable, and if any provision of this Order, or the application of any provisions of this Order to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this Order shall not be affected thereby.

l. **APPLICATIONS**

Any application submitted by a Copermittee for reissuance or modification of this Order must satisfy all applicable requirements specified in federal regulations as well as any additional requirements for submittal of a Report of Waste Discharge specified in the CWC and the California Code of Regulations.

m. **IMPLEMENTATION**

All plans, reports and subsequent amendments submitted in compliance with this Order must be implemented immediately (or as otherwise specified). All submittals by Copermittees must be adequate to implement the requirements of this Order.

n. **REPORT SUBMITTALS**

(1) All report submittals must include an executive summary, introduction, conclusion, recommendations, and signed certified statement.

(2) Each Copermittee must submit a signed certified statement covering its responsibilities for each applicable submittal.

(3) The Principal Watershed Copermittee(s) must submit a signed certified statement covering its responsibilities for each applicable submittal and the sections of the submittals for which it is responsible.

(4) Unless otherwise directed, the Copermittees must submit one hard copy and one electronic copy of each report required under this Order to the San Diego Water Board, and one electronic copy to the USEPA.

(5) The Copermittees must submit reports and provide notifications as required by this Order to the following:

EXECUTIVE OFFICER
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
9174 SKY PARK COURT, SUITE 100
SAN DIEGO CA 92123-4340
Telephone: (858) 467-2952 Fax: (858) 571-6972

EUGENE BROMLEY
US ENVIRONMENTAL PROTECTION AGENCY
REGION IX
PERMITS ISSUANCE SECTION (W-5-1)
75 HAWTHORNE STREET
SAN FRANCISCO CA 94105

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ATTACHMENT C

ACRONYMS AND ABBREVIATIONS

AMAL	Average Monthly Action Level
ASBS	Area(s) of Special Biological Significance
BMP	Best Management Practice
Basin Plan	Water Quality Control Plan for the San Diego Basin
CEQA	California Environmental Quality Act
CCR	California Code of Regulations
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWC	California Water Code
CZARA	Coastal Zone Act Reauthorization Amendments of 1990
ESAs	Environmentally Sensitive Areas
GIS	Geographic Information System
IBI	Index of Biological Integrity
LID	Low Impact Development
MDAL	Maximum Daily Action Level
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
NAL	Non-Storm Water Action Level
NAICS	North American Industry Classification System
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
ROWD	Report of Waste Discharge (application for NPDES reissuance)
SAL	Storm Water Action Level
San Diego Water Board	California Regional Water Quality Control Board, San Diego Region
SIC	Standard Industrial Classification Code
State Water Board	State Water Resources Control Board
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
WDID	Waste Discharge Identification Number
WLA	Waste Load Allocation
WQBEL	Water Quality Based Effluent Limitation

DEFINITIONS

Active/Passive Sediment Treatment - Using mechanical, electrical or chemical means to flocculate or coagulate suspended sediment for removal from runoff from construction sites prior to discharge.

Anthropogenic Litter – Trash generated from human activities, not including sediment.

Average Monthly Action Level – The highest allowable average of daily discharges over a calendar month.

Beneficial Uses - The uses of water necessary for the survival or wellbeing of man, plants, and wildlife. These uses of water serve to promote tangible and intangible economic, social, and environmental goals. "Beneficial Uses" of the waters of the State that may be protected include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. Existing beneficial uses are uses that were attained in the surface or ground water on or after November 28, 1975; and potential beneficial uses are uses that would probably develop in future years through the implementation of various control measures. "Beneficial Uses" are equivalent to "Designated Uses" under federal law. [California Water Code Section 13050(f)].

Best Management Practices (BMPs) - Defined in 40 CFR 122.2 as schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Bioassessment - The use of biological community information to evaluate the biological integrity of a water body and its watershed. With respect to aquatic ecosystems, bioassessment is the collection and analysis of samples of the benthic macroinvertebrate community together with physical/habitat quality measurements associated with the sampling site and the watershed to evaluate the biological condition (i.e. biotic integrity) of a water body.

Biofiltration - Practices that use vegetation and amended soils to detain and treat runoff from impervious areas. Treatment is through filtration, infiltration, adsorption, ion exchange, and biological uptake of pollutants.

Biological Integrity - Defined in Karr J.R. and D.R. Dudley. 1981. Ecological perspective on water quality goals. *Environmental Management* 5:55-68 as: "A balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitat of the region." Also referred to as ecosystem health.

BMP Design Manual – A plan developed to eliminate, reduce, or mitigate the impacts of runoff from development projects, including Priority Development Projects.

Chronic Toxicity – A measurement of sublethal effect (e.g. reduced growth, reproduction) to experimental test organisms exposed to an effluent or receiving waters compared to that of the control organisms.

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Clean Water Act Section 303(d) Water Body - An impaired water body in which water quality does not meet applicable water quality standards and/or is not expected to meet water quality standards, even after the application of technology based pollution controls required by the CWA. The discharge of runoff to these water bodies by the Copermittees is significant because these discharges can cause or contribute to violations of applicable water quality standards.

Construction Site – Any project, including projects requiring coverage under the Construction General Permit, that involves soil disturbing activities including, but not limited to, clearing, grading, disturbances to ground such as stockpiling, and excavation.

Contamination - As defined in the Porter-Cologne Water Quality Control Act, contamination is "an impairment of the quality of waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste whether or not waters of the State are affected."

Copermittee – A permittee to a NPDES permit that is only responsible for permit conditions relating to the discharge for which it is operator [40 CFR 122.26(b)(1)]. For the purposes of this Order, a Copermittee is one of the individual permittees identified in Tables 1a-1c of this Order.

Copermittees – All of the individual Copermittees, collectively.

Critical Channel Flow (Qc) – The channel flow that produces the critical shear stress that initiates bed movement or that erodes the toe of channel banks. When measuring Qc, it should be based on the weakest boundary material – either bed or bank.

Daily Discharge – Defined as either: (1) the total mass of the constituent discharged over the calendar day or any 24 hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g. concentration.)

The Daily Discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day, or other 24 hour period other than a day), or by the arithmetic mean of analytical results from one or more grab samples taken over the course of a day.

Development Projects - Construction, rehabilitation, redevelopment, or reconstruction of any public or private projects.

Dry Season – May 1 to September 30.

Dry Weather – Weather is considered dry if the preceding 72 hours has been without measurable precipitation (>0.1 inch).

Enclosed Bays – Enclosed bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost bay works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays do not include inland surface waters or ocean waters.

Erosion – When land is diminished or worn away due to wind, water, or glacial ice. Often the eroded debris (silt or sediment) becomes a pollutant via storm water runoff. Erosion occurs naturally but can be intensified by land clearing activities such as farming, development, road building, and timber harvesting.

Environmentally Sensitive Areas (ESAs) - Areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; areas designated as preserves or their equivalent under the Natural Communities Conservation Program within the Cities and County of Orange; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.

Estuaries – Waters, including coastal lagoons, located at the mouth of streams that serve as areas of mixing fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and ocean water. Estuaries do not include inland surface waters or ocean waters.

Existing Development – Any area that has been developed and exists for municipal, commercial, industrial, or residential purposes, uses, or activities. May include areas that are not actively used for its originally developed purpose, but may be re-purposed or redeveloped for another use or activity.

Flow Duration – The long-term period of time that flows occur above a threshold that causes significant sediment transport and may cause excessive erosion damage to creeks and streams (not a single storm event duration). The simplest way to visualize this is to consider a histogram of pre- and post-project flows using long-term records of hourly data. To maintain pre-development flow duration means that the total number of hours (counts) within each range of flows in a flow-duration histogram cannot increase between the pre- and post-development condition. Flow duration within the range of geomorphologically significant flows is important for managing erosion.

Grading - The cutting and/or filling of the land surface to a desired slope or elevation.

Groundwater – Subsurface water that occurs beneath the water table in soils and geologic formations that are fully saturated.

Hazardous Material – Any substance that poses a threat to human health or the environment due to its toxicity, corrosiveness, ignitability, explosive nature or chemical reactivity. These also include materials named by the USEPA in 40 CFR 116 to be reported if a designated quantity of the material is spilled into the waters of the U.S. or emitted into the environment.

Hazardous Waste - Hazardous waste is defined as "any waste which, under Section 600 of Title 22 of this code, is required to be managed according to Chapter 30 of Division 4.5 of Title 22 of this code" [CCR Title 22, Division 4.5, Chapter 11, Article 1].

Household Hazardous Waste – Paints, cleaning products, and other hazardous wastes generated during home improvement or maintenance activities.

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Hydromodification – The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

Illicit Connection – Any man-made conveyance or drainage system through which a non-storm water discharge to the stormwater drainage system occurs or may occur. Any connection to the MS4 that conveys an illicit discharge.

Illicit Discharge - Any discharge to the MS4 that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from fire fighting activities [40 CFR 122.26(b)(2)].

Inactive Areas – Areas of construction activity that are not active and those that have been active and are not scheduled to be re-disturbed for at least 14 days.

Infiltration – In the context of low impact development, infiltration is defined as the percolation of water into the ground. Infiltration is often expressed as a rate (inches per hour), which is determined through an infiltration test. In the context of non-storm water, infiltration is water other than wastewater that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow [40 CFR 35.2005(20)].

Inland Surface Waters – Includes all surface waters of the State that do not include the ocean, enclosed bays, or estuaries.

Jurisdictional Runoff Management Program Document – A written description of the specific jurisdictional runoff management measures and programs that each Copermittee will implement to comply with this Order and ensure that storm water pollutant discharges in runoff are reduced to the MEP and do not cause or contribute to a violation of water quality standards.

Low Impact Development (LID) – A storm water management and land development strategy that emphasizes conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions.

Low Impact Development Best Management Practices (LID BMPs) – LID BMPs include schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States through storm water management and land development strategies that emphasize conservation sand the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions. LID BMPs include retention practices that do not allow runoff, such as infiltration, rain water harvesting and reuse, and evapotranspiration. LID BMPs also include flow-through practices such as biofiltration that may have some discharge of storm water following pollutant reduction.

Major Outfall – As defined in the Code of Federal Regulations, a major outfall is a MS4 outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (i.e. discharge from a single conveyance other than a circular pipe which is associated with a drainage area of more than 50 acres); or, for MS4s that receive storm water from lands zoned for industrial activity (based on comprehensive zoning plans or equivalent), a MS4 outfall that discharges from a single pipe with an inside diameter of 12 inches or more or from its equivalent (i.e. discharge from other than a circular pipe associated with a drainage area of 2 acres or more).

Maximum Daily Action Level (MDAL) –The highest allowable daily discharge of a pollutant, over a calendar day (or 24 hour period). For pollutants with action levels expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with action levels expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

Maximum Extent Practicable (MEP) – The technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) for storm water that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) in combination with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than BAT. A definition for MEP is not provided either in the statute or in the regulations. Instead the definition of MEP is dynamic and will be defined by the following process over time: municipalities propose their definition of MEP by way of their runoff management programs. Their total collective and individual activities conducted pursuant to the runoff management programs becomes their proposal for MEP as it applies both to their overall effort, as well as to specific activities (e.g., MEP for street sweeping, or MEP for MS4 maintenance). In the absence of a proposal acceptable to the San Diego Water Board, the San Diego Water Board defines MEP.

In a memo dated February 11, 1993, entitled "Definition of Maximum Extent Practicable," Elizabeth Jennings, Senior Staff Counsel, SWRCB addressed the achievement of the MEP standard as follows:

> *"To achieve the MEP standard, municipalities must employ whatever Best Management Practices (BMPs) are technically feasible (i.e., are likely to be effective) and are not cost prohibitive. The major emphasis is on technical feasibility. Reducing pollutants to the MEP means choosing effective BMPs, and rejecting applicable BMPs only where other effective BMPs will serve the same purpose, or the BMPs would not be technically feasible, or the cost would be prohibitive. In selecting BMPs to achieve the MEP standard, the following factors may be useful to consider:*
>
> *a. Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?*
> *b. Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?*
> *c. Public Acceptance: Does the BMP have public support?*
> *d. Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?*
> *e. Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc.?*

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The final determination regarding whether a municipality has reduced pollutants to the maximum extent practicable can only be made by the Regional or State Water Boards, and not by the municipal discharger. If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit derived, it would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs that would address a pollutant source, or to pick a BMP based solely on cost, which would be clearly less effective. In selecting BMPs the municipality must make a serious attempt to comply and practical solutions may not be lightly rejected. In any case, the burden would be on the municipal discharger to show compliance with its permit. After selecting a menu of BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented."

Monitoring Year – October 1 to September 30

Municipal Separate Storm Sewer System (MS4) – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designated or used for collecting or conveying storm water; (iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.26.

National Pollutant Discharge Elimination System (NPDES) - The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the CWA.

Non-Storm Water - All discharges to and from a MS4 that do not originate from precipitation events (i.e., all discharges from a MS4 other than storm water). Non-storm water includes illicit discharges and NPDES permitted discharges.

Nuisance - As defined in the Porter-Cologne Water Quality Control Act, a nuisance is "anything which meets all of the following requirements: 1) Is injurious to health, or is indecent, or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. 2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. 3) Occurs during, or as a result of, the treatment or disposal of wastes."

Ocean Waters – The territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the State Board's California Ocean Plan.

Order – Unless otherwise specified, refers to this Order, Order No. R9-2013-0001 (NPDES No. CAS0109266)

Outfall - Outfall means a point source as defined by 40 CFR 122.2 at the point where a municipal separate storm sewer discharges to waters of the US and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels or other conveyances which connect segments of the same stream or other waters of the US and are used to convey waters of the US.

Persistent Flow - Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

Person - A person is defined as an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof [40 CFR 122.2].

Point Source - Any discernible, confined, and discrete conveyance including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, landfill leachate collection systems, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

Pollutant - Any agent that may cause or contribute to the degradation of water quality such that a condition of pollution or contamination is created or aggravated.

Pollution - As defined in the Porter-Cologne Water Quality Control Act, pollution is "the alteration of the quality of the waters of the State by waste, to a degree that unreasonably affects the either of the following: 1) The waters for beneficial uses; or 2) Facilities that serve these beneficial uses." Pollution may include contamination.

Pollution Prevention - Pollution prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control BMPs, treatment control BMPs, or disposal.

Pre-~~Development~~ Project Runoff Conditions – Approximate flow rates and durations that exist or existed onsite before land development occurs. For new development ~~and redevelopment~~ projects, this equates to runoff conditions immediately before project construction. ~~For redevelopment projects, this equates to runoff conditions from the project footprint assuming infiltration characteristics of the underlying soil, and existing grade. Runoff coefficients of concrete or asphalt must not be used. A redevelopment Priority Development Project must use available information pertaining to existing underlying soil type and onsite existing grade to estimate pre-development runoff conditions.~~

Priority Development Projects - New development and redevelopment projects defined under Provision E.3.b of Order No. R9-2013-0001.

Rainy Season (aka Wet Season) –October 1 to April 30

Receiving Waters – Waters of the United States.

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Receiving Water Limitations - Waste discharge requirements issued by the San Diego Water Board typically include both: (1) "Effluent Limitations" (or "Discharge Limitations") that specify the technology-based or water-quality-based effluent limitations; and (2) "Receiving Water Limitations" that specify the water quality objectives in the Basin Plan as well as any other limitations necessary to attain those objectives. In summary, the "Receiving Water Limitations" provision is the provision used to implement the requirements of CWA section 402(p)(3)(B).

Redevelopment - The creation and/or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include trenching and resurfacing associated with utility work; resurfacing existing roadways; new sidewalk construction, pedestrian ramps, or bike lane on existing roads; and routine replacement of damaged pavement, such as pothole repair.

Regional Clearinghouse – A central location for the collection and distribution of information developed and maintained by the Copermittees including, but not limited to, plans, reports, manuals, data, contact information, and/or links to such documents and information.

Rehabilitation - Remedial measures or activities for the purpose of improving or restoring the beneficial uses of streams, channels or river systems. Techniques may vary from in-stream restoration techniques to off-linestormwater management practices installed in the system corridor or upland areas, or a combination of in-stream and out of stream techniques Rehabilitation techniques may include, but are not limited to the following: riparian zone restoration, constructed wetlands, channel modifications that improve habitat and stability, and daylighting of drainage systems.

Reporting Period – The period of information that is reported in the Water Quality Improvement Plan Annual Report. The reporting period consists of two components: 1) July 1 to June 30, consistent with the fiscal year, for the implementation of the jurisdictional runoff management programs, and 2) October 1 to September 30, consistent with the monitoring year for the monitoring and assessment programs. Together, these two time periods constitute the reporting year for the Water Quality Improvement Plan Annual Report due January 31 following the end of the monitoring year.

Retain –Keep or hold in a particular place, condition, or position without discharge to surface waters.

Retrofitting – Storm water management practice put into place after development has occurred in watersheds where the practices previously did not exist or are ineffective. Retrofitting of developed areas is intended to improve water quality, protect downstream channels, reduce flooding, or meet other specific objectives. Retrofitting developed areas may include, but is not limited to replacing roofs with green roofs, disconnecting downspouts or impervious surfaces to drain to pervious surfaces, replacing impervious surfaces with pervious surfaces, installing rain barrels, installing rain gardens, and trash area enclosures.

Runoff - All flows in a storm water conveyance system that consists of the following components: (1) storm water (wet weather flows) and (2) non-storm water including dry weather flows.

San Diego Water Board – As used in this document the term "San Diego Water Board" is synonymous with the term "Regional Board" as defined in Water Code section 13050(b) and is intended to refer to the California Regional Water Quality Control Board for the San Diego Region as specified in Water Code Section 13200.

Sediment - Soil, sand, and minerals washed from land into water. Sediment resulting from anthropogenic sources (i.e. human induced land disturbance activities) is considered a pollutant. This Order regulates only the discharges of sediment from anthropogenic sources and does not regulate naturally occurring sources of sediment. Sediment can destroy fish-nesting areas, clog animal habitats, and cloud waters so that sunlight does not reach aquatic plants.

Source Control BMP – Land use or site planning practices, or structural or nonstructural measures that aim to prevent runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between pollutants and runoff.

Storm Water – Per 40 CFR 122.26(b)(13), means storm water runoff, snowmelt runoff and surface runoff and drainage. Surface runoff and drainage pertains to runoff and drainage resulting from precipitation events.

Structural BMPs - A subset of BMPs which detains, retains, filters, removes, or prevents the release of pollutants to surface waters from development projects in perpetuity, after construction of a project is completed.

Test of Significant Toxicity (TST) - A statistical approach used to analyze toxicity test data. The TST incorporates a restated null hypothesis, Welch's t-test, and biological effect thresholds for chronic and acute toxicity.

Total Maximum Daily Load (TMDL) - The maximum amount of a pollutant that can be discharged into a water body from all sources (point and non-point) and still maintain water quality standards. Under CWA section 303(d), TMDLs must be developed for all water bodies that do not meet water quality standards after application of technology-based controls.

Toxicity - Adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies). The water quality objectives for toxicity provided in the Basin Plan, state in part..."All waters shall be free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life....The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge"

Toxicity Identification Evaluation (TIE) - A set of procedures for identifying the specific chemical(s) responsible for toxicity. These procedures are performed in three phases (characterization, identification, and confirmation) using aquatic organism toxicity tests).

Toxicity Reduction Evaluation (TRE) - A study conducted in a step-wise process designed to identify the causative agents of effluent or ambient toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in toxicity. The first steps of the TRE consist of the collection of data relevant to the toxicity, including additional toxicity testing, and an evaluation of facility operations and maintenance practices,

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and best management practices. A Toxicity Identification Evaluation (TIE) may be required as part of the TRE, if appropriate.

Treatment Control BMP – Any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media absorption or any other physical, biological, or chemical process.

Unpaved Road – Any long, narrow stretch without pavement used for traveling by motor passenger vehicles between two or more points. Unpaved roads are generally constructed of dirt, gravel, aggregate or macadam and may be improved or unimproved.

Waste - As defined in CWC Section 13050(d), "waste includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal."

Article 2 of CCR Title 23, Chapter 15 (Chapter 15) contains a waste classification system that applies to solid and semi-solid waste, which cannot be discharged directly or indirectly to water of the state and which therefore must be discharged to land for treatment, storage, or disposal in accordance with Chapter 15. There are four classifications of waste (listed in order of highest to lowest threat to water quality): hazardous waste, designated waste, non-hazardous solid waste, and inert waste.

Water Quality Objective - Numerical or narrative limits on constituents or characteristics of water designated to protect designated beneficial uses of the water. [California Water Code Section 13050 (h)]. California's water quality objectives are established by the State and Regional Water Boards in the Water Quality Control Plans. Numeric or narrative limits for pollutants or characteristics of water designed to protect the beneficial uses of the water. In other words, a water quality objective is the maximum concentration of a pollutant that can exist in a receiving water and still generally ensure that the beneficial uses of the receiving water remain protected (i.e., not impaired). Since water quality objectives are designed specifically to protect the beneficial uses, when the objectives are violated the beneficial uses are, by definition, no longer protected and become impaired. This is a fundamental concept under the Porter Cologne Act. Equally fundamental is Porter Cologne's definition of pollution. A condition of pollution exists when the water quality needed to support designated beneficial uses has become unreasonably affected or impaired; in other words, when the water quality objectives have been violated. These underlying definitions (regarding beneficial use protection) are the reason why all waste discharge requirements implementing the federal NPDES regulations require compliance with water quality objectives. (Water quality objectives are also called water quality criteria in the CWA.)

Water Quality Standards - Water quality standards, as defined in Clean Water Act section 303(c) consist of the beneficial uses (e.g., swimming, fishing, municipal drinking water supply, etc.,) of a water body and criteria (referred to as water quality objectives in the California Water Code) necessary to protect those uses. Under the Water Code, the water boards establish beneficial uses and water quality objectives in water quality control or basin plans. Together with an anti-degradation policy, these beneficial uses and water quality objectives serve as water quality standards under the Clean Water Act. In Clean Water Act parlance, state beneficial uses are called "designated uses" and state water quality objectives are called "criteria." Throughout this Order, the relevant term is used depending on the statutory scheme.

Waters of the State - Any water, surface or underground, including saline waters within the boundaries of the State [CWC section 13050 (e)]. The definition of the Waters of the State is broader than that for the Waters of the United States in that all water in the State is considered to be a Waters of the State regardless of circumstances or condition.

Waters of the United States - As defined in the 40 CFR 122.2, the Waters of the U.S. are defined as: "(a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate "wetlands;" (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters otherwise defined as waters of the United States under this definition; (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial seas; and (g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA."

Watershed - That geographical area which drains to a specified point on a water course, usually a confluence of streams or rivers (also known as drainage area, catchment, or river basin).

Wet Season (aka Rainy Season) – October 1 to April 30

Wet Weather – Weather is considered wet up to 72 hours after a storm event of 0.1 inches and greater, unless otherwise defined by another regulatory mechanism (e.g. a TMDL).

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ATTACHMENT D

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM

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JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

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I. COPERMITTEE INFORMATION

Copermittee Name:

Copermittee Primary Contact Name:

Copermittee Primary Contact Information:
Address:
City: County: State: Zip:
Telephone: Fax: Email:

II. LEGAL AUTHORITY

Has the Copermittee established adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 that complies with Order No. R9-2013-0001?	YES ☐ NO ☐
A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority?	YES ☐ NO ☐

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

Was an update of the jurisdictional runoff management program document required or recommended by the San Diego Water Board?	YES ☐ NO ☐
If YES to the question above, did the Copermittee update its jurisdictional runoff management program document and make it available on the Regional Clearinghouse?	YES ☐ NO ☐

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

Has the Copermittee implemented a program to actively detect and eliminate illicit discharges and connections to its MS4 that complies with Order No. R9-2013-0001?	YES ☐ NO ☐

Number of non-storm water discharges reported by the public	
Number of non-storm water discharges detected by Copermittee staff or contractors	
Number of non-storm water discharges investigated by the Copermittee	
Number of sources of non-storm water discharges identified	
Number of non-storm water discharges eliminated	
Number of sources of illicit discharges or connections identified	
Number of illicit discharges or connections eliminated	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

V. DEVELOPMENT PLANNING PROGRAM

Has the Copermittee implemented a development planning program that complies with Order No. R9-2013-0001?	YES ☐ NO ☐
Was an update to the BMP Design Manual required or recommended by the San Diego Water Board?	YES ☐ NO ☐
If YES to the question above, did the Copermittee update its BMP Design Manual and make it available on the Regional Clearinghouse?	YES ☐ NO ☐

Number of proposed development projects in review	
Number of Priority Development Projects in review	
Number of Priority Development Projects approved	
Number of approved Priority Development Projects exempt from any BMP requirements	
Number of approved Priority Development Projects allowed alternative compliance	
Number of Priority Development Projects granted occupancy	

Number of completed Priority Development Projects in inventory	
Number of high priority Priority Development Project structural BMP inspections	
Number of Priority Development Project structural BMP violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

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VI. CONSTRUCTION MANAGEMENT PROGRAM

Has the Copermittee implemented a construction management program that complies with Order No. R9-2013-0001?	YES ☐ NO ☐

Number of construction sites in inventory	
Number of active construction sites in inventory	
Number of inactive construction sites in inventory	
Number of construction sites closed/completed during reporting period	
Number of construction site inspections	
Number of construction site violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

Has the Copermittee implemented an existing development management program that complies with Order No. R9-2013-0001?	YES ☐ NO ☐

	Municipal	Commercial	Industrial	Residential
Number of facilities or areas in inventory				
Number of existing development inspections				
Number of follow-up inspections				
Number of violations				
Number of enforcement actions issued				
Number of escalated enforcement actions issued				

VIII. PUBLIC EDUCATION AND PARTICIPATION

Has the Copermittee implemented a public education program component that complies with Order No. R9-2013-0001?	YES ☐ NO ☐
Has the Copermittee implemented a public participation program component that complies with Order No. R9-2013-0001?	YES ☐ NO ☐

IX. FISCAL ANALYSIS

Has the Copermittee attached to this form a summary of its fiscal analysis that complies with Order No. R9-2013-0001?	YES ☐ NO ☐

X. CERTIFICATION

I [☐ Principal Executive Officer ☐ Ranking Elected Official ☐ Duly Authorized Representative] certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature _____ Date _____

Print Name _____ Title _____

Telephone Number _____ Email _____

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ATTACHMENT E

SPECIFIC PROVISIONS FOR TOTAL MAXIMUM DAILY LOADS APPLICABLE TO ORDER NO. R9-2013-0001

These provisions implement load allocations (LAs) and wasteload allocations (WLAs) of the Total Maximum Daily Loads (TMDLs) adopted by the San Diego Water Board and approved by USEPA under Clean Water Act section 303(c), applicable to discharges regulated under this Order. The provisions and schedules for implementation of the TMDLs described below must be incorporated into the Water Quality Improvement Plans, required pursuant to Provision B of this Order, for the specified Watershed Management Areas.

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed
2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin
3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed
4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek
5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay
6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

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1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2002-0123

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	August 14, 2002
State Water Board Approval Date:	July 16, 2003
Office of Administrative Law Approval Date:	September 11, 2003
US EPA Approval Date:	November 3, 2003

(3) TMDL Effective Date: September 11, 2003

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final diazinon TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must be in compliance with the final TMDL compliance requirements as of December 31, 2010.

(2) Final ~~Water Quality Based Effluent~~ Receiving Water Limitations

~~(a) Final Receiving Water Limitations~~

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations:

Table 1.1
Final Receiving Water Limitations Expressed as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Diazinon	Acute	0.08 µg/L	1 hour
	Chronic	0.05 µg/L	4 days

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(3~~b~~)_–Final Effluent Limitations

Discharges from the MS4s containing concentrations that do not exceed the following effluent limitations will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 1.b.(3)(a):

Table 1.2
Final Effluent Limitations Expressed as Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation	Averaging Period
Diazinon	Acute	0.072 µg/L	1 hour
	Chronic	0.045 µg/L	4 days

1 Concentrations shall be determined on a flow-weighted basis across all outfalls within a jurisdiction, not outfall by outfall

(4~~c~~)_–Best Management Practices

The following BMPs for Chollas Creek must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area and implemented by the Responsible Copermittees:

(i) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 1.b.(2)(a) ~~and/~~or the effluent limitations under Specific Provision 1.b.(2)(b) for Chollas Creek.

(ii) The Responsible Copermittees must implement the Diazinon Toxicity Control Plan and Diazinon Public Outreach/Education Program as described in the report titled, *Technical Report for Total Maximum Daily Load for Diazinon in Chollas Creek Watershed, San Diego County*, dated August 14, 2002, including subsequent modifications, in order to achieve the receiving water limitations under Specific Provision 1.b.(2)(a) ~~and/~~or the effluent limitations under Specific Provision 1.b.(2)(b).

(iii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans as possible.

(3) (5) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 1.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 1.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 1.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 1.b.(2)(c) achieves compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) ~~and/~~or 1.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continues to implement the BMPs required under Specific Provision 1.b.(2)(c), AND

(v) The Responsible Copermittees continues to perform the specific monitoring and assessments specified in Specific Provision 1.d, to demonstrate compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) ~~and/~~or 1.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The Responsible Copermittees must be in compliance with the final diazinon TMDL compliance requirements as of December 31, 2010.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls for diazinon within the Chollas Creek watershed, and calculate or estimate the annual diazinon loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

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2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0019

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	September 22, 2005
Office of Administrative Law Approval Date:	December 2, 2005
US EPA Approval Date:	February 8, 2006

(3) TMDL Effective Date: December 2, 2005

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Shelter Island Yacht Basin

(6) Responsible Copermittee: City of San Diego

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final dissolved copper TMDL compliance requirements for Shelter Island Yacht Basin consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittee must be in compliance with the final TMDL compliance requirements as of December 2, 2005.

(2) Final ~~Water Quality Based Effluent~~ Receiving Water Limitations

~~(a) Final Receiving Water Limitations~~

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations:

Table 2.1
Final Receiving Water Limitations Expressed as Concentrations in Shelter Island Yacht Basin

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Dissolved Copper	Acute	4.8 µg/L x WER*	1 hour
	Chronic	3.1 µg/L x WER*	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(3~~b~~) --Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 2.b.(3)(a):

Table 2.2
Final Effluent Limitations as Expressed as Annual Loads in MS4 Discharges to Shelter Island Yacht Basin

Constituent	Effluent Limitation
Dissolved Copper	30 kg/yr*

* If the water quality objectives for dissolved copper in SIYB are changed in the future, then the MOS, TMDL and allocations will be re-calculated using the method shown in Appendix D of Resolution NO. R9-2005-0019.

(4~~c~~) Best Management Practices

The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 2.b.(2)(a) ~~and~~/or the effluent limitations under Specific Provision 2.b.(2)(b) for Shelter Island Yacht Basin. The BMPs must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area.

(3) (5)Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 2.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 2.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittee develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 2.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision

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2.b.(2)(c) achieves compliance with Specific Provisions 2.b.(3)(a), 2.b.(3)(b) ~~and~~/or 2.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 2.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 2.d, to demonstrate compliance with Specific Provisions 2.b.(3)(a), 2.b.(3)(b) ~~and~~/or 2.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The Responsible Copermittees must be in compliance with the final dissolved copper TMDL compliance requirements as of December 2, 2005.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

The Responsible Copermittee must monitor the effluent of its MS4 outfalls for dissolved copper, and calculate or estimate the monthly and annual dissolved copper loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.(b)(2)of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

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3. **Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed**

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0036

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	November 16, 2005
Office of Administrative Law Approval Date:	February 1, 2006
US EPA Approval Date:	March 22, 2006

(3) TMDL Effective Date: February 1, 2006

(4) Watershed Management Area: Santa Margarita River

(5) Water Body: Rainbow Creek

(6) Responsible Copermittee: County of San Diego

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final total nitrogen and total phosphorus TMDL compliance requirements for Rainbow Creek consist of the following

(1) Final TMDL Compliance Date

The Responsible Copermittee must comply with final TMDL compliance requirements by December 31, 2021.

(2) Final ~~Water Quality Based Effluent~~Receiving Water Limitations

~~(a) Final Receiving Water Limitations~~

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance date under Specific Provision 3.b.(1):

Table 3.1
Final Receiving Water Limitations Expressed as Concentrations in Rainbow Creek

Constituent	Receiving Water Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

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(3~~b~~)—_Final Effluent Limitations

Discharges from the MS4s that do not exceed the effluent limitations presented in Table 3.2 or the annual loads presented in Table 3.3 by the compliance date under Specific Provision 3.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 3.b.(2)(a).

(i) Discharges from the MS4s containing concentrations that do not exceed the following effluent limitations by the compliance date under Specific Provision 3.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 3.b.(2)(a):

Table 3.2
Final Effluent Limitations Expressed as Concentrations in MS4 Discharges to Rainbow Creek

Constituent	Effluent Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

[1] Concentrations shall be determined on a flow weighted basis across all outfalls within a jurisdiction, not outfall by outfall.

(ii) Annual pollutant loads from given land uses discharging to and from the MS4s that do not exceed the following annual loads by the compliance date under Specific Provision 3.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 3.b.(2)(a):

Table 3.3
Final Effluent Limitations Expressed as Annual Loads in MS4 Discharges to Rainbow Creek

Land Use	Total N	Total P
Commercial nurseries	116 kg/yr	3 kg/yr
Park	3 kg/yr	0.1 kg/yr
Residential areas	149 kg/yr	12 kg/yr
Urban areas	27 kg/yr	6 kg/yr

(4~~c~~) Best Management Practices

(i) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 3.b.(2)(a) ~~and/~~or the effluent limitations under Specific Provision 3.b.(2)(b) for Rainbow Creek.

(ii) The Responsible Copermittee should coordinate any BMPs implemented to address this TMDL with Caltrans and other sources as possible.

(3) (5)Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 3.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 3.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the final effluent limitations under Specific Provision 3.b.(2)(b)(ii); OR

(e) The Responsible Copermittee develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 3.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 2.b.(2)(c) achieves compliance with Specific Provisions 3.b.(3)(a), 3.b.(3)(b), 3.b.(3)(c) ~~and/~~or 3.b.(3)(d),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittee~~s~~ continue to implement the BMPs required under Specific Provision 3.b.(2)(c), AND

(v) The Responsible Copermittee~~s~~ continue to perform the specific monitoring and assessments specified in Specific Provision 3.d, to demonstrate compliance with Specific Provisions 3.b.(3)(a), 3.b.(3)(b), 3.b.(3)(c) ~~and/~~or 3.b.(3)(d).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim total nitrogen and total phosphorus TMDL compliance requirements for Rainbow Creek consist of the following:

(1) Interim Compliance Dates and WQBELs

The Responsible Copermittee must comply with the interim WQBELs, expressed as annual loads, by December 31 of the interim compliance year given in Table 3.4.

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Table 3.4
Interim Water Quality Based Effluent Limitations Expressed as Annual Loads in MS4 Discharges from Specific Land Uses to Rainbow Creek

	Total N Interim Effluent Limitations (kg/yr)			Total P Interim Effluent Limitations (kg/yr)		
Commercial nurseries	390	299	196	20	16	10
Park	5	3	3	0.15	0.10	0.10
Residential areas	507	390	260	99	74	47
Urban areas	40	27	27	9	6	6

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 3.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 3.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the final effluent limitations under Specific Provision 3.b.(2)(b)(ii); OR

(e) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the interim effluent limitations under Specific Provision 3.c.(1); OR

(f) The Responsible Copermittee has submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

d. Specific Monitoring and Assessment Requirements

(1) The Responsible Copermittee must incorporate into the Water Quality Improvement Plan and implement the Sampling and Analysis Plan for Rainbow Creek Nutrient Reduction TMDL Implementation Water Quality Monitoring, dated January 2010.

(2) The results of any monitoring conducted during the reporting period, and assessment of whether the interim and final TMDL compliance requirements have been achieved must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

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ATTACHMENT E: SPECIFIC PROVISIONS FOR TOTAL MAXIMUM DAILY LOADS
3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed

4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2007-0043

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2007
State Water Board Approval Date:	July 15, 2008
Office of Administrative Law Approval Date:	October 22, 2008
US EPA Approval Date:	December 18, 2008

(3) TMDL Effective Date: October 22, 2008

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final dissolved copper, lead, and zinc TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must comply with the final TMDL compliance requirements by October 22, 2028.

(2) Final ~~Receiving~~ Water ~~Quality Based Effluent~~ Limitations

~~(a) Final Receiving Water Limitations~~

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance date under Specific Provision 4.b.(1):

Table 4.1
Final Receiving Water Limitations Expressed as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$(0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$(0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$(0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$(0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(3~~b~~) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations by the compliance date under Specific Provision 4.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 4.b.(2)(a):

Table 4.2
Final Effluent Limitations as Expressed Concentrations inMS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.
1 Concentrations shall be determined on a flow-weighted basis across all outfalls within a jurisdiction, not outfall-by-outfall.

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(4~~6~~) Best Management Practices

(i) The Responsible Copermittee~~s~~ must implement BMPs to achieve the receiving water limitations under Specific Provision 4.b.(2)(a) ~~and/~~or the effluent limitations under Specific Provision 4.b.(2)(b) for Chollas Creek.

(ii) The Responsible Copermittee~~s~~ should coordinate any BMPs implemented to address this TMDL with Caltrans and the U.S. Navy as possible.

(3) (5)Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's~~'~~ MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 4.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's~~'~~ MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 4.b.(2)(b) at the Responsible Copermittee's~~'~~ MS4 outfalls; OR

(d) The Responsible Copermittee~~s~~ develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 4.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 4.b.(2)(c) achieves compliance with Specific Provisions 4.b.(3)(a), 4.b.(3)(b) ~~and/~~or 4.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittee~~s~~ continues to implement the BMPs required under Specific Provision 4.b.(2)(c), AND

(v) The Responsible Copermittee~~s~~ continues to perform the specific monitoring and assessments specified in Specific Provision 4.d, to demonstrate compliance with Specific Provisions 4.b.(3)(a), 4.b.(3)(b) ~~and/~~or 4.b.(3)(c).

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c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim dissolved copper, lead, and zinc TMDL compliance requirements for Chollas Creek consist of the following:

(1) Interim Compliance Date and WQBELs

The Responsible Copermittee must comply with the interim WQBELs, expressed as concentrations, by the interim compliance date given in Table 4.3:

Table 4.3
Interim Water Quality Based Effluent Limitations Expressed as Concentrations in MS4 Discharges to Chollas Creek

Interim Compliance Date	Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
October 22, 2018	Dissolved Copper	Acute	1.2 x 90% x (0.96) x $e^{[0.9422 \times \ln(\text{hardness}) - 1.700]}$ x WER*	1 hour
		Chronic	1.2 x 90% x (0.96) x $e^{[0.8545 \times \ln(\text{hardness}) - 1.702]}$ x WER*	4 days
	Dissolved Lead	Acute	1.2 x 90% x [1.46203 – 0.145712 x ln(hardness)] x $e^{[1.273 \times \ln(\text{hardness}) - 1.460]}$ x WER*	1 hour
		Chronic	1.2 x 90% x [1.46203 – 0.145712 x ln(hardness)] x $e^{[1.273 \times \ln(\text{hardness}) - 4.705]}$ x WER*	4 days
	Dissolved Zinc	Acute	1.2 x 90% x (0.978) x $e^{[0.8473 \times \ln(\text{hardness}) + 0.884]}$ x WER*	1 hour
		Chronic	1.2 x 90% x (0.986) x $e^{[0.8473 \times \ln(\text{hardness}) + 0.884]}$ x WER*	4 days

Notes
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.
1 Concentrations shall be determined on a flow-weighted basis across all outfalls within a jurisdiction, not outfall by outfall.

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's~~'~~ MS4s to the receiving water; OR

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 4.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's~~'~~ MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 4.b.(2)(b) at the Responsible Copermittee's~~'~~ MS4 outfalls; OR

(d) There are no exceedances of the interim effluent limitations under Specific

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Provision 4.c.(1) at the Responsible Copermittee's MS4 outfalls; OR

(e) The Responsible Copermittees ~~have~~ has submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance date.

d. Specific Monitoring and Assessment Requirements

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*, when it is amended to include monitoring requirements for the Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls discharging to Chollas Creek for dissolved copper, lead, and zinc, and calculate or estimate the monthly and annual dissolved copper, lead, and zinc loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

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5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

a. Applicability

(1) TMDL Basin Plan Amendment: Resolution No. R9-2008-0027

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 11, 2008
State Water Board Approval Date:	June 16, 2009
Office of Administrative Law Approval Date:	September 15, 2009
US EPA Approval Date:	October 26, 2009

(3) TMDL Effective Date: September 15, 2009

(4) Watershed Management Areas: See Table 5.0

(5) Water Bodies: See Table 5.0

(6) Responsible Copermittees: See Table 5.0

Table 5.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County	Dana Point Harbor	Baby Beach	-City of Dana Point -County of Orange
San Diego Bay	San Diego Bay	Shelter Island Shoreline Park	- San Diego Unified Port District

b. Final TMDL Compliance Requirements

The final indicator bacteria TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Final TMDL Compliance Dates

(a) Baby Beach in Dana Point Harbor

The Responsible Copermittees for MS4 discharges to Baby Beach must be in compliance with the final TMDL compliance requirements according to the following compliance dates:

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Table 5.1
Compliance Dates to Achieve Final TMDL Compliance Requirements For Baby Beach in Dana Point Harbor

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform	September 15, 2014	September 15, 2009
Fecal Coliform		September 15, 2009
Enterococcus		September 15, 2019

(b) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park must be in compliance with the final TMDL compliance requirements as of December 31, 2012.

(2) Final ~~Water Quality Based Effluent~~ Receiving Water Limitations

~~(a) Final Receiving Water Limitations~~

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance dates under Specific Provision 5.b.(1):

Table 5.2
Final Receiving Water Limitations Expressed as Bacteria Densities in the Water Body

Constituent	Receiving Water Limitations	
	Single Sample Maximum[1]	30-Day Geometric Mean[2]
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.

(~~b~~3) Final Effluent Limitations

Discharges from the MS4s that do not exceed the effluent limitations presented in Table 5.3a or indicator bacteria loads from the Responsible Copermittee's MS4s that are less than or equal to the loads presented in Table 5.4a or Table 5.4b, or indicator bacteria percent load reductions from the Responsible Copermittee's MS4s that are greater than or equal to the effluent limitations identified in Table 5.5a or Table 5.5b by the compliance date under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a).

(i) Discharges from the MS4s containing indicator bacteria densities that do not exceed the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.3a
Final Effluent Limitations as Expressed as Bacteria Densities in MS4 Discharges to the Water Body

Constituent	Effluent Limitations	
	Single Sample Maximum[1]	30-Day Geometric Mean[2]
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.
3. Concentrations shall be determined on a flow-weighted basis across all outfalls within a jurisdiction, not outfall-by-outfall.

(ii) Discharges from the MS4s containing indicator bacteria loads that do not exceed the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.4a
Final Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to the Baby Beach in Dana Point Harbor

Constituent	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	0.86×10^9 MPN/day	$3{,}254 \times 10^9$ MPN/30days
Fecal Coliform	0.17×10^9 MPN/day	112×10^9 MPN/30days
Enterococcus	0.03×10^9 MPN/day	114×10^9 MPN/30days

Table 5.4b
Final Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to the Shelter Island Shoreline Park in San Diego Bay

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Constituent	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	0 MPN/day	198×10^9 MPN/30days
Fecal Coliform	0 MPN/day	8×10^9 MPN/30days
Enterococcus	0 MPN/day	26×10^9 MPN/30days

(iii) Indicator bacteria percent load reductions from the Responsible Copermittee's MS4s that are greater than or equal to the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.5a

Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to Baby Beach in Dana Point Harbor*

Constituent	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	90.4%	0%
Fecal Coliform	82.7%	0%
Enterococcus	96.2%	62.4%

Notes

* The percent load reductions are relative to data collected between 1996-2002. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittee's MS4s must not exceed the loads in Table 5.4a, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the water body.

Table 5.5b

*Final Effluent Limitations Expressed as Percent Load Reductions** in MS4 Discharges to Shelter Island Shoreline Park in San Diego Bay*

Constituent	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	0%	0%
Fecal Coliform	0%	0%
Enterococcus	0%	0%

Notes

** The percent load reductions are relative to data collected between 1999-2004. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittee's MS4s must not exceed the loads in Table 5.4b, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the water body.

(4~~c~~) Best Management Practices

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 5.0 must incorporate the Bacteria Load Reduction Plan (BLRP) required to be developed pursuant to Resolution No. R9-2008-0027.

(ii) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 5.b.(2)(a) ~~and~~/or the effluent limitations under Specific Provision 5.b.(2)(b) for the segments or areas of the water bodies listed in Table 5.0

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ATTACHMENT E: SPECIFIC PROVISIONS FOR TOTAL MAXIMUM DAILY LOADS
5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

(3) (5) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant loads discharging from the Responsible Copermittee's MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.c.(2)(b)(ii); OR

(e) The pollutant load reductions for discharges from the Responsible Copermittee's MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 5.c.(2)(b)(iii); OR

(f) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(g) The Responsible Copermittees develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 5.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 5.b.(2)(c) achieves compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continues to implement the BMPs required under Specific Provision 5.b.(2)(c), AND

(v) The Responsible Copermittees continues to perform the specific monitoring and assessments specified in Specific Provision 5.d, to demonstrate compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim indicator bacteria TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Baby Beach in Dana Point Harbor

(a) Interim TMDL Compliance Dates and WQBELs

The Responsible Copermittees for MS4 discharges to Baby Beach must comply with the following interim WQBELs by the interim compliance dates given in Tables 5.6a and/or 5.6b:

Table 5.6a
Interim Water Quality Based Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to Baby Beach in Dana Point Harbor

Constituent	Interim Compliance Dates	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	4.93×10^9 MPN/day	$3{,}254 \times 10^9$ MPN/30days*
Fecal Coliform	September 15, 2012	0.59×10^9 MPN/day	112×10^9 MPN/30days*
Enterococcus	September 15, 2012	0.42×10^9 MPN/day	301×10^9 MPN/30days*
	September 15, 2016	0.03×10^9 MPN/day *	207×10^9 MPN/30days

Notes:
* Same as the final effluent limitations in Table 5.4a.

Table 5.6b
Interim Water Quality Based Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to Baby Beach in Dana Point Harbor*

Constituent	Interim Compliance Dates	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	45.2%	0%**
Fecal Coliform	September 15, 2012	41.4%	0%**
Enterococcus	September 15, 2012	48.1%	0%**
	September 15, 2016	96.2%**	31.2%

Notes:
* The percent load reductions are relative to data collected between 1996-2002. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittee's MS4s must not exceed the loads in Table 5.6a, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the waterbody.
** Same as the final effluent limitations in Table 5.5a.

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(b) Interim Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(i) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(ii) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(iii) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(iv) The pollutant loads discharging from the Responsible Copermittee's MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.b(2)(b)(ii); OR

(v) The Responsible Copermittees can demonstrate that exceedances of the applicable receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittee's MS4s are not causing or contributing to the exceedances; OR

(vi) The pollutant loads discharging from the Responsible Copermittee's MS4 outfalls do not exceed the interim effluent limitations under Table 5.6a of Specific Provision 5.c.(1)(a); OR

(vii) The pollutant load reductions for discharges from the Responsible Copermittee's MS4 outfalls are greater than or equal to the interim effluent limitations under Table 5.6b of Specific Provision 5.c.(1)(a); OR

(viii) The Responsible Copermittees ~~have~~ has submitted and ~~are~~ is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

(2) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park must be in compliance with the final indicator bacteria TMDL requirements as of December 31, 2012.

d. Specific Monitoring and Assessment Requirements

(1) Monitoring Stations

Monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[33] If discharges of bacteria from the MS4 exceed the applicable interim or final WQBELs, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(2) Monitoring Procedures

(a) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) The Responsible Copermittees must collect wet weather monitoring samples within the first 24 hours of a storm event[34] of the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(c) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

[33] Commonly referred to as AB 411 monitoring

[34] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

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(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs have been achieved.

(b) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to correlate elevated bacteria levels with known or suspected sewage spills from wastewater collection systems and treatment plants or boats.

(c) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

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6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

a. Applicability

(1) TMDL Basin Plan Amendment: Resolution No. R9-2010-0001

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 10, 2010
State Water Board Approval Date:	December 14, 2010
Office of Administrative Law Approval Date:	April 4, 2011
US EPA Approval Date:	June 22, 2011

(3) TMDL Effective Date: April 4, 2011

(4) Watershed Management Areas: See Table 6.0

(5) Water Bodies: See Table 6.0

(6) Responsible Copermittees: See Table 6.0

Table 6.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
South Orange County San Joaquin Hills HSA (901 11) and Laguna Beach HSA (901 12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	-City of Laguna Beach -County of Orange -Orange County Flood Control District
		at Heisler Park - North	
	Pacific Ocean Shoreline	at Main Laguna Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Woods -County of Orange -Orange County Flood Control District
		Laguna Beach at Ocean Avenue	
		Laguna Beach at Cleo Street	
		Arch Cove at Bluebird Canyon Road	
		Laguna Beach at Dumond Drive	
South Orange County Aliso HSA (901 13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Hills -City of Laguna Niguel -City of Laguna Woods -City of Lake Forest -City of Mission Viejo -County of Orange -Orange County Flood Control District
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	
	Aliso Creek Mouth	at mouth	

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Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	-City of Dana Point -City of Laguna Beach -City of Laguna Niguel -County of Orange -Orange County Flood Control District
		Aliso Beach at Table Rock Drive	
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)	
		at Salt Creek (large outlet)	
		Salt Creek Beach at Salt Creek service road	
		Salt Creek Beach at Strand Road	
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	-City of Dana Point -City of Laguna Hills -City of Laguna Niguel -City of Mission Viejo -City of Rancho Santa Margarita -City of San Juan Capistrano -County of Orange -Orange County Flood Control District
	San Juan Creek	lower 1 mile	
	San Juan Creek Mouth	at mouth	
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	-City of Dana Point -City of San Clemente -County of Orange -Orange County Flood Control District
		Ole Hanson Beach Club Beach at Pico Drain	
		San Clemente City Beach at El Portal Street Stairs	
		San Clemente City Beach at Mariposa Street	
		San Clemente City Beach at Linda Lane	
		San Clemente City Beach at South Linda Lane	
		San Clemente City Beach at Lifeguard Headquarters	
		under San Clemente Municipal Pier	
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	
		San Clemente State Beach at Riviera Beach	
		Can Clemente State Beach at Cypress Shores	

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Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	-City of Oceanside -City of Vista -County of San Diego
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	-City of Carlsbad -City of Encinitas -City of Escondido -City of San Marcos -County of San Diego
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	-City of Del Mar -City of Escondido -City of Poway -City of San Diego -City of Solana Beach -County of San Diego
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	-City of Del Mar -City of Poway -City of San Diego -County of San Diego
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	-City of San Diego
		La Jolla Shores Beach at Caminito del Oro	
		La Jolla Shores Beach at Vallecitos	
		La Jolla Shores Beach at Avenida de la Playa	
		at Casa Beach, Children's Pool	
		South Casa Beach at Coast Boulevard	
		Whispering Sands Beach at Ravina Street	
		Windansea Beach at Vista de la Playa	
		Windansea Beach at Bonair Street	
		Windansea Beach at Playa del Norte	
		Windansea Beach at Palomar Avenue	
		at Tourmaline Surf Park	
		Pacific Beach at Grand Avenue	
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries	

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Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I- Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	-City of El Cajon -City of Santee -County of San Diego
	San Diego River	lower 6 miles	-City of El Cajon -City of La Mesa -City of San Diego -City of Santee -County of San Diego
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	-City of La Mesa -City of Lemon Grove -City of San Diego -County of San Diego - San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final indicator bacteria TMDL compliance requirements for the water bodies listed in Table 6.0 consist of the following:

(1) Final TMDL Compliance Dates

The Responsible Copermittees for MS4 discharges to the water bodies listed in Table 6.0 must be in compliance with the final TMDL compliance requirements according to the following compliance dates:

Table 6.1
Compliance Dates to Achieve Final TMDL Compliance Requirements

Constituent	Dry Weather TMDL Compliance Date	Wet Weather TMDL Compliance Date
Total Coliform	April 4, 2021	April 4, 2031
Fecal Coliform		
Enterococcus		

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(2) Final Receiving Water ~~Quality Based Effluent~~ Limitations

~~(a) Final Receiving Water Limitations~~

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance dates under Specific Provision 6.b.(1):

Table 6.2a
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Beaches

	Wet Weather Days		Dry Weather Days	
Constituent	Single Sample Maximum[a] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform	10,000	22% ~~/ 0%~~	1,000	0%
Fecal Coliform	400	22% ~~/ 0%~~	200	0%
Enterococcus	104	22% ~~/ 0%~~	35	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. The 0% single sample maximum allowable exceedance frequency applies to dry weather days.

Table 6.2b
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Creeks

	Wet Weather Days		Dry Weather Days	
Constituent	Single Sample Maximum[a] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Fecal Coliform	400	22% ~~/ 0%~~	200	0%
Enterococcus	61 (104)	22% ~~/ 0%~~	33	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. The 0% single sample maximum allowable exceedance frequency applies to dry weather days.
d. A single sample maximum of 104 MPN/100ml for *Enterococcus* may be applied as a receiving water limitation for creeks, instead of 60 MPN/100mL, if one or more of the creeks addressed by these TMDLs (San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek, San Diego River, and/or Chollas Creek) is designated with a "moderately to lightly used area" or less frequent usage frequency in the Basin Plan. Otherwise, the single sample axmimum of 61 MPN/100mL for *Enterococcus* must be used to assess compliance with the allowable exceedance frequency.

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(3~~b~~) Final Effluent Limitations

Discharges from the MS4s that do not exceed the effluent limitations presented in Table 6.2 or indicator bacteria percent load reductions from the Responsible Copermittee's MS4s that are greater than or equal to the effluent limitations identified in Table 6.3 by the compliance date under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a).

(i) Discharges from the MS4s containing indicator bacteria densities that do not exceed the following effluent limitations by the compliance dates under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a):

Table 6.2
Final Effluent Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies in MS4 Discharges to the Water Body

	Concentration-Based Effluent Limitations			
		Single Sample Maximum		30-Day Geometric Mean
Constituent	Single Sample Maximum[a,b] (MPN/100mL)	Allowable Exceedance Frequency	30-Day Geometric Mean[b] (MPN/100mL)	Allowable Exceedance Frequency
Total Coliform[d]	10,000	22% / ~~0%~~	1,000	0%
Fecal Coliform	400	22% / ~~0%~~	200	0%
Enterococcus	104[e] / 61[f]	22% / ~~0%~~	35[e] / 33[f]	0%

Notes
a. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. The 0% single sample maximum allowable exceedance frequency applies to dry weather days.
d. Total coliform effluent limitations only apply to MS4 outfalls that discharge to the Pacific Ocean Shorelines and creek mouths listed in Table 6.0.
e. This *Enterococcus* effluent limitation applies to MS4 discharges to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
f. This *Enterococcus* effluent limitation applies to MS4 discharges to segments or areas of creeks or creek mouths listed in Table 6.0.
g. Concentrations shall be determined on a flow-weighted basis across all outfalls within a jurisdiction, not outfall-by-outfall.

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(ii) Indicator bacteria percent load reductions from the Responsible Copermittee's MS4s that are greater than or equal to the following effluent limitations by the compliance dates under Specific Provision 6.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a):

Table 6.3
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

		Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
Watershed Management Areas	Watershed and Water Bodies	Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
South Orange County	**San Joaquin Hills HSA (901.11) and Laguna Hills HSA (901.12)** - Pacific Ocean Shoreline	91.78%	91.72%	98.28%	[illegible]	52.07%	51.26%
	Aliso HSA (901.13) - Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	95.47%	[illegible]	99.13%	25.29%	26.62%	27.52% (27.37%)**
	Dana Point HSA (901.14) - Pacific Ocean Shoreline	95.04%	95.03%	98.98%	13.15%	14.86%	15.16%
	Lower San Juan HSA (901.27) - Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	72.96%	74.21%	94.94%	19.21%	12.82%	27.12% (26.90%)**
	San Clemente HA (901.30) - Pacific Ocean Shoreline	94.28%	94.23%	98.83%	23.85%	24.58%	25.26%
San Luis Rey River	**San Luis Rey HU (903.00)** - Pacific Ocean Shoreline	38.13%	39.09%	87.38%	5.62%	3.12%	11.69%

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Table 6.3 (Cont'd)
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watershed and Water Bodies	Load-Based Effluent Limitations: Dry Weather Total Coliform	Dry Weather Fecal Coliform	Dry Weather Entero-coccus	Wet Weather Total Coliform	Wet Weather Fecal Coliform	Wet Weather Entero-coccus
Carlsbad	San Marcos HA (904.50) - Pacific Ocean Shoreline	82.82%	82.55%	96.03%	18.47%	18.98%	20.19%
San Dieguito River	San Dieguito HU (905.00) - Pacific Ocean Shoreline	14.39%	20.72%	83.48%	4.29%	1.46%	7.72%
Penasquitos	Miramar Reservoir HA (906.10) - Pacific Ocean Shoreline	96.50%	96.59%	99.42%	1.61%	1.99%	1.93%
Mission Bay	Scripps HA (906.30) - Pacific Ocean Shoreline	96.44%	96.42%	99.25%	16.32%	21.14%	18.82%
	Tecolote HA (906.50) - Tecolote Creek	94.31%	94.59%	98.94%	16.51%	20.47%	18.15% (18.08%)**
San Diego River	Mission San Diego HSA (907.11) and Santee HSA (907.12) - Pacific Ocean Shoreline - Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles)	74.03%	69.44%	93.96%	38.14%	53.22%	42.74% (42.47%)**
San Diego Bay	Chollas HSA (908.22) - Chollas Creek	92.06%	92.15%	98.46%	17.82%	24.84%	21.46% (21.36%)**

Notes:
* The percent load reductions are based on reducing loads compared to pollutant loads from 2001 to 2002.
** The alternative *Enterococcus* percent load reduction was calculated based on a numeric target of 104 MPN/100mL instead of 61 MPN/100mL, protective of the REC-1 "moderately to lightly used area" usage frequency that is protective of freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative pollutant load reductions can be utilized.

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(~~4~~6) Best Management Practices

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 6.0 must incorporate the Comprehensive Load Reduction Plans (CLRPs) required to be developed pursuant to Resolution No. R9-2010-0001.

(ii) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 6.b.(2)(a) ~~and~~/or the effluent limitations under Specific Provision 6.b.(2)(b) for the segments or areas of the water bodies listed in Table 6.0.

(iii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans, owners/operators of small MS4s, and agricultural dischargers as possible.

(3) (5) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittee's MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittee~~s~~ can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittee's MS4s are not causing or contributing to the exceedances; OR

(f) The Responsible Copermittee~~s~~ develop~~s~~ and implement~~s~~ the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 6.b.(2)(c) as part of the Water Quality Improvement Plan,

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(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 6.b.(2)(c) achieves compliance with Specific Provisions 6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), ~~and/~~or 6.b.(3)(e),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittee~~s~~ continues to implement the BMPs required under Specific Provision 6.b.(2)(c), AND

(v) The Responsible Copermittee~~s~~ continues to perform the specific monitoring and assessments specified in Specific Provision 6.d, to demonstrate compliance with Specific Provisions 6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), 6.b.(3)(e) ~~and/~~or 6.b.(3)(f).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim indicator bacteria TMDL compliance requirements for the water bodies listed in Table 6.0 consist of the following:

(1) Interim TMDL Compliance Dates

The Responsible Copermittees must achieve compliance with the interim TMDL compliance requirements as determined in accordance with Specific Provision 6.c.(3), by the interim compliance dates given in Table 6.4, unless alternative interim compliance dates are accepted by the San Diego Water Board Executive Officer as part of the Water Quality Improvement Plan.

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Table 6.4
Interim Compliance Dates to Achieve Interim TMDL Compliance Requirements

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	April 4, 2016	April 4, 2021
		at Heisler Park - North		
	Pacific Ocean Shoreline	at Main Laguna Beach	April 4, 2016	April 4, 2021
		Laguna Beach at Ocean Avenue		
		Laguna Beach at Cleo Street		
		Arch Cove at Bluebird Canyon Road		
		Laguna Beach at Dumond Drive		
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	April 4, 2016	April 4, 2021
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	April 4, 2018	April 4, 2021
	Aliso Creek Mouth	at mouth	April 4, 2018	April 4, 2021
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	April 4, 2016	April 4, 2021
		Aliso Beach at Table Rock Drive		
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)		
		at Salt Creek (large outlet)		
		Salt Creek Beach at Salt Creek service road	April 4, 2017	April 4, 2021
		Salt Creek Beach at Strand Road	April 4, 2017	April 4, 2021

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Table 6.4 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	April 4, 2016	April 4, 2021
	San Juan Creek	lower 1 mile	April 4, 2018	April 4, 2021
	San Juan Creek Mouth	at mouth	April 4, 2016	April 4, 2021
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	April 4, 2016	April 4, 2021
		Ole Hanson Beach Club Beach at Pico Drain	April 4, 2016	April 4, 2021
		San Clemente City Beach at El Portal Street Stairs	April 4, 2017	April 4, 2021
		San Clemente City Beach at Mariposa Street		
		San Clemente City Beach at Linda Lane	April 4, 2016	April 4, 2021
		San Clemente City Beach at South Linda Lane	April 4, 2018	April 4, 2021
		San Clemente City Beach at Lifeguard Headquarters	April 4, 2017	April 4, 2021
		Under San Clemente Municipal Pier		
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	April 4, 2018	April 4, 2021
		San Clemente State Beach at Riviera Beach	April 4, 2016	April 4, 2021
		Can Clemente State Beach at Cypress Shores	April 4, 2017	April 4, 2021
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	April 4, 2017	April 4, 2021
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	April 4, 2016	April 4, 2021
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	April 4, 2016	April 4, 2021

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Table 6.4 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	April 4, 2016	April 4, 2021
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	April 4, 2016	April 4, 2021
		La Jolla Shores Beach at Caminito del Oro		
		La Jolla Shores Beach at Vallecitos		
		La Jolla Shores Beach at Avenida de la Playa		
		at Casa Beach, Children's Pool		
		South Casa Beach at Coast Boulevard		
		Whispering Sands Beach at Ravina Street		
		Windansea Beach at Vista de la Playa		
		Windansea Beach at Bonair Street		
		Windansea Beach at Playa del Norte		
		Windansea Beach at Palomar Avenue		
		at Tourmaline Surf Park		
		Pacific Beach at Grand Avenue		
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries		
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	April 4, 2018	April 4, 2021
	San Diego River	lower 6 miles		
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach		
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	April 4, 2018	April 4, 2021

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(2) Interim Water Quality Based Effluent Limitations

The Responsible Copermittees for discharges to the water bodies in Table 6.0 must comply with the following interim WQBELs by the interim compliance dates given in Specific Provision 6.c.(1):

(a) Interim Receiving Water Limitations

(i) *Interim Dry Weather Receiving Water Limitations*

The Responsible Copermittee must calculate the "existing" exceedance frequencies of the 30-day geometric mean water quality objectives for each of the indicator bacteria by analyzing the available monitoring data collected between January 1, 1996 and December 31, 2002. "Existing" exceedance frequencies may be calculated by water body and/or by Watershed Management Area listed in Table 6.0. Separate "existing" exceedance frequencies must be calculated for beaches and creeks/creek mouths.

The Responsible Copermittees must achieve a 50 percent reduction in the "existing" exceedance frequency of the 30-day geometric mean WQBELs for the water bodies listed in Table 6.0 by the interim compliance dates given in Table 6.5. A 50 percent reduction in the "existing" exceedance frequency is equivalent to half of the "existing" exceedance frequency of the 30-day geometric mean WQBELs.

The "existing" exceedance frequencies and the interim dry weather allowable exceedance frequencies (i.e. interim dry weather receiving water limitations) calculated by the Responsible Copermittees must be included in the Water Quality Improvement Plans for the applicable Watershed Management Areas.

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(ii) *Interim Wet Weather Receiving Water Limitations*

The Responsible Copermittees must achieve the interim wet weather receiving water limitations in Table 6.5, expressed as interim wet weather allowable exceedance frequencies, by the interim compliance dates given in Table 6.4.

Table 6.5
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies: Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	38%	37%	39%
		at Heisler Park - North			
		at Main Laguna Beach			
		Laguna Beach at Ocean Avenue			
		Laguna Beach at Cleo Street			
		Arch Cove at Bluebird Canyon Road			
		Laguna Beach at Dumond Drive			
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	41%	41%	42%
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	41%	41%	42%
	Aliso Creek Mouth	at mouth	41%	41%	42%
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	36%	36%	36%
		Aliso Beach at Table Rock Drive			
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)			
		at Salt Creek (large outlet)			
		Salt Creek Beach at Salt Creek service road			
		Salt Creek Beach at Strand Road			

San Diego Copermittees 4/10/13

Table 6.5 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies: Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	44%	44%	48%
	San Juan Creek	lower 1 mile	44%	44%	47%
	San Juan Creek Mouth	at mouth	44%	44%	47%
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	35%	35%	36%
		Ole Hanson Beach Club Beach at Pico Drain			
		San Clemente City Beach at El Portal Street Stairs			
		San Clemente City Beach at Mariposa Street			
		San Clemente City Beach at Linda Lane			
		San Clemente City Beach at South Linda Lane			
		San Clemente City Beach at Lifeguard Headquarters			
		under San Clemente Municipal Pier			
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)			
		San Clemente State Beach at Riviera Beach			
		Can Clemente State Beach at Cypress Shores			
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	45%	44%	47%
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	40%	40%	41%
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	33%	33%	36%

San Diego Copeland Lees 4/10/13

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Table 6.5 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies: Total Coliform	Fecal Coliform	*Entero-coccus*
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	26%	26%	26%
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	37%	37%	37%
		La Jolla Shores Beach at Caminito del Oro			
		La Jolla Shores Beach at Vallecitos			
		La Jolla Shores Beach at Avenida de la Playa			
		at Casa Beach, Children's Pool			
		South Casa Beach at Coast Boulevard			
		Whispering Sands Beach at Ravina Street			
		Windansea Beach at Vista de la Playa			
		Windansea Beach at Bonair Street			
		Windansea Beach at Playa del Norte			
		Windansea Beach at Palomar Avenue			
		at Tourmaline Surf Park			
		Pacific Beach at Grand Avenue			
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries	49%	49%	51%
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	46%	43%	49%
	San Diego River	lower 6 miles	46%	43%	49%
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	46%	43%	51%
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	41%	41%	43%

San Diego Copeland Lees 4/10/13

(b) Interim Effluent Limitations

Indicator bacteria percent load reductions from the Responsible Copermittee's' MS4s that are greater than or equal to the following effluent limitations by the interim compliance dates under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.c.(2)(a):

Table 6.6
Interim Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watersheds and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
South Orange County	**San Joaquin Hills HSA** (901.11) and **Laguna Hills HSA** (901.12) - Pacific Ocean Shoreline	45.89%	45.86%	49.14%	[illegible]	26.04%	25.63%
	Aliso HSA (901.13) - Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	47.74%	47.79%	49.57%	12.65%	13.31%	13.76% (13.69%)**
	Dana Point HSA (901.14) - Pacific Ocean Shoreline	47.52%	47.52%	49.49%	6.58%	7.43%	7.58%
	Lower San Juan HSA (901.27) - Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	36.48%	37.11%	47.47%	9.81%	6.41%	13.56% (13.45%)**
	San Clemente HA (901.30) - Pacific Ocean Shoreline	47.14%	47.12%	49.42%	11.93%	12.29%	12.63%
San Luis Rey River	**San Luis Rey HU** (903.00) - Pacific Ocean Shoreline	19.07%	19.55%	43.69%	2.81%	1.56%	5.85%
Carlsbad	**San Marcos HA** (904.50) - Pacific Ocean Shoreline	41.41%	41.28%	48.02%	9.24%	9.49%	10.10%

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Table 6.6 (Cont'd)
Interim Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watersheds and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
San Dieguito River	**San Dieguito HU** (905.00) - Pacific Ocean Shoreline	7.20%	10.36%	41.74%	2.15%	0.73%	3.8[illegible]%
Penasquitos	**Miramar Reservoir HA** (906.10) - Pacific Ocean Shoreline	48.25%	48.30%	49.71%	0.81%	[illegible]00%	0.97%
Mission Bay	**Scripps HA** (906.30) - Pacific Ocean Shoreline	48.22%	48.21%	49.63%	8.16%	10.57%	9.41%
	Tecolote HA (906.50) - Tecolote Creek	47.26%	47.30%	[illegible]	8.26%	10.24%	9.08% (9.04%)**
San Diego River	**Mission San Diego HSA** (907.11) and **Santee HSA** (907.12) - Pacific Ocean Shoreline - Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles)	37.[illegible]	34.72%	46.98%	19.07%	26.61%	21.37% (21.24%)**
San Diego Bay	**Cholla HSA** (908.2[illegible]) - Chollas Creek	46.03%	46.08%	49.23%	8.91%	12.42%	10.73% (10.68%)**

Notes:
* The percent load reductions are based on reducing loads compared to pollutant loads from 2001 to 2002.
** The alternative *Enterococcus* percent load reduction was calculated based on a numeric target of 104 MPN/100mL instead of 61 MPN/100mL, protective of the REC-1 "moderately to lightly used area" usage frequency that is protective of freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative pollutant load reductions can be utilized.

(3) Interim TMDL Compliance Determination

Compliance with the interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's' MS4s to the receiving water; OR

San Diego Copermittees 4/10/13

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's' MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible Copermittee s MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittee s MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittee s MS4s are not causing or contributing to the exceedances; OR

(f) There are no exceedances of the interim receiving water limitations under Specific Provision 6.c.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's' MS4 outfalls; OR

(g) The pollutant load reductions for discharges from the Responsible Copermittee s' MS4 outfalls are greater than or equal to the interim effluent limitations under Specific Provision 6.c.(2)(b); OR

(h) The Responsible Copermittees ~~have~~ has submitted and ~~are~~ is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) Monitoring and Assessment Requirements for Beaches

(a) Monitoring Stations

For beaches addressed by the TMDL, monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[35] If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources

[35] Commonly referred to as AB 411 monitoring

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causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations at least once within the first 24 hours of the end of a storm event[36] during the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer in exceedance of the allowable exceedance frequencies in the receiving waters.

(iii) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(iv) Where segments or areas have been delisted from the 303(d) list because waterbody receiving water limitations are already being met, the Responsible Copermittees may propose alternative monitoring procedures than required in 6.d.(1)(b) (i - iii) above. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any future updates required under Provisions F.1. and F.2. of this Order.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs for the Pacific Ocean Shoreline segments or areas listed in Table 6.0 have been achieved.

[36] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

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(ii) Dry weather exceedance frequencies must be calculated as follows:

[a] 30-day geometric means must be calculated from the results of any dry weather samples collected from the segments or areas for each water body listed in Table 6.0;

[b] The method and number of samples need for calculating the 30-day geometric means must be consistent with the number of samples required by the Ocean Plan;

[c] Where there are multiple segments or areas associated with a water body listed in Table 6.0, the Copermittees may calculate geometric means for each segment or area, or combine the dry weather monitoring data from all the segments or areas to calculate geometric means for the water body;

[d] The exceedance frequency must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the dry season.

(iii) Wet weather exceedance frequencies must be calculated as follows:

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;

[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;

~~[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the highest bacteria density result reported from wet weather samples collected; and~~

[d] The single sample maximum exceedance frequency must be calculated by dividing the number of wet weather days that exceed the single sample maximum receiving water limitations in Table 6.2 by the total number of wet weather days during the rainy season.

[e] The data collected for dry weather must be used in addition to the data collected for wet weather to calculate the wet weather 30-day geometric means. The exceedance frequency of the wet weather 30-day geometric means must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the wet season.

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(iv) ~~(iv)~~ The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(v) Where segments or areas have been delisted from the 303(d) list because waterbody receiving water limitations are already being met, the Responsible Copermittees may propose alternative assessment procedures than required in 6.d.(1)(c) (i - iii) above. The alternative assessment procedures must be submitted as a part of the Water Quality Improvement Plans or any future updates required under Provisions F.1. and F.2. of this Order.

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(2) Monitoring and Assessment Requirements for Creeks and Creek Mouths

(a) Monitoring Stations

For creeks addressed by the TMDL, monitoring locations should consist of, at a minimum, a location at or near the mouth of the creek (e.g. Mass Loading Station or Mass Emission Station) and one or more locations upstream of the mouth (e.g. Watershed Assessment Station). If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations in accordance with the requirements of Provision D.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations within the first 24 hours of the end of a storm event[37] during the rainy season (i.e. October 1 through April 30).

(iii) Samples collected from receiving water monitoring stations must be analyzed for fecal coliform and *Enterococcus* indicator bacteria.

~~(iii)~~(iv) Where segments or areas have been delisted from the 303(d) list because waterbody receiving water limitations are already being met, the Responsible Copermittees may propose alternative monitoring procedures than required in 6.d.(2)(b) (i - iii) above. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any future updates required under Provisions F.1. and F.2. of this Order.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the receiving water monitoring data to assess whether the interim and final receiving water WQBELs for the creeks and creek mouths listed in Table 6.0 have been achieved.

[37] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

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(ii) Dry weather exceedance frequencies must be calculated as follows:

[a] 30-day geometric means must be calculated from the results of any dry weather samples collected from the segment or area for each water body listed in Table 6.0;

[b] The method and number of samples need for calculating the 30-day geometric means must be consistent with the number of samples required by the Basin Plan;

[c] The exceedance frequency must be calculated by dividing the number of 30-day geometric means that exceed the 30-day geometric mean receiving water limitations in Table 6.2 by the total number of 30-day geometric means calculated from samples collected during the dry season.

(iii) Wet weather exceedance frequencies must be calculated as follows:

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;

[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;

~~[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the highest bacteria density result reported from wet weather samples collected; and~~

[d] The exceedance frequency must be calculated by dividing the number of wet weather days that exceed the single sample maximum receiving water limitations in Table 6.2 by the total number of wet weather days during the rainy season.

[e] The data collected for dry weather must be used in addition to the data collected for wet weather to calculate the wet weather 30-day geometric means. The exceedance frequency of the wet weather 30-day geometric means must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the wet season.

(iv) The Responsible Copermittee must identify and incorporate additional MS4 outfall and receiving water monitoring stations and/or adjust monitoring frequencies to identify sources causing exceedances of the receiving water WQBELs.

(iv) ~~(v)~~ The monitoring and assessment results must be submitted as part

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of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(iv)(v) Where segments or areas have been delisted from the 303(d) list because waterbody receiving water limitations are already being met, the Responsible Copermittees may propose alternative assessment procedures than required in 6.d.(2)(c) (i - iv) above. The alternative assessment procedures must be submitted as a part of the Water Quality Improvement Plans or any future updates required under Provisions F.1. and F.2. of this Order.

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Richard Boon and Ryan Baron, County of Orange
Scott Taylor, RBF
Nancy Palmer, City of Laguna Niguel

April 10 - 11, 2013

Regional Permit Adoption Hearing

COUNTY OF ORANGE CALIFORNIA

Overview

- Introduction
- Regulatory Issues
- Critical Legal Concerns
- Critical Technical Issues
- Critical TMDL Concerns
- Conclusion & Questions

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Stakeholder Process

10/31/12

4/10/13

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Timing – Where are We At?

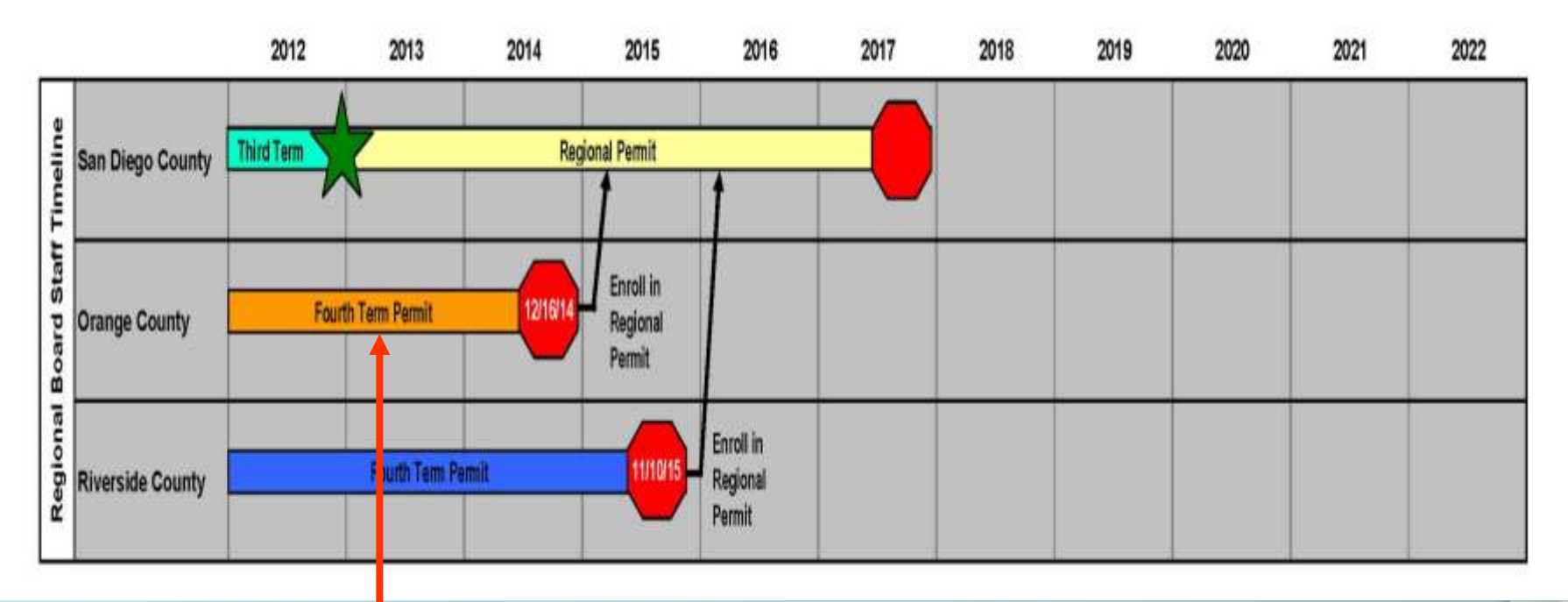

We Are Here

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MS4 Permitting

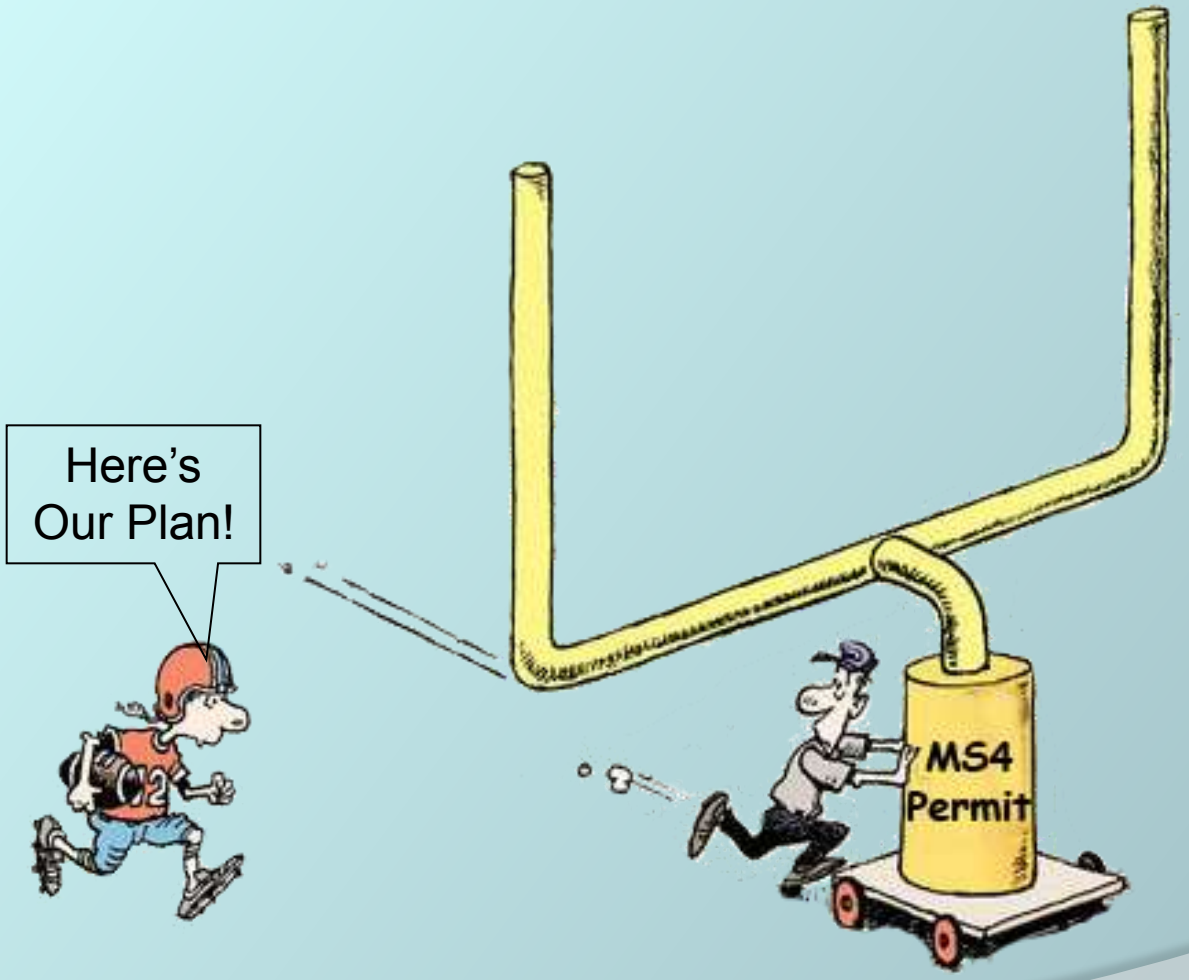

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Where are we at?

- Bacteria
- Metals
- Toxic Organics
- Receiving Waters
- Low Impact Development (LID)

Bacteria - Where are we at?

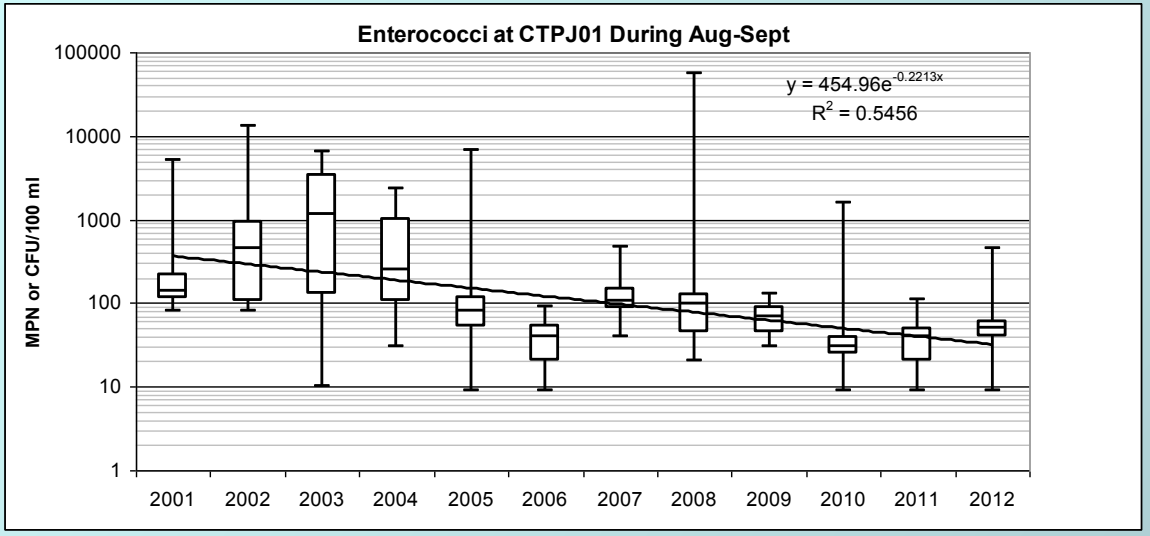

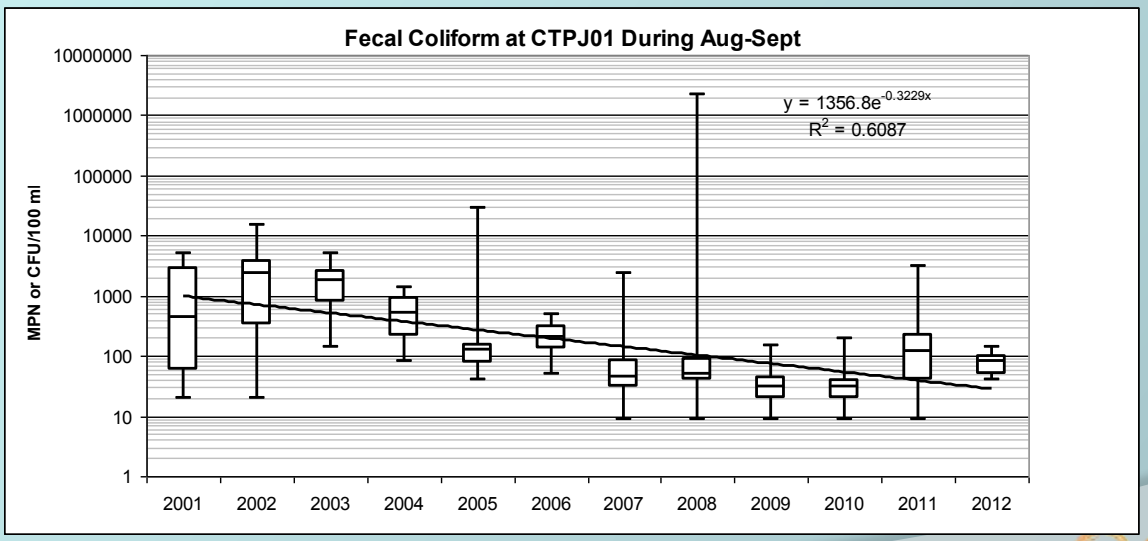

- 20% reduction in bacteria concentrations In Aliso Creek since 2001

-Reduction in concentrations observed in all OC watersheds

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Bacteria - Where are we at?

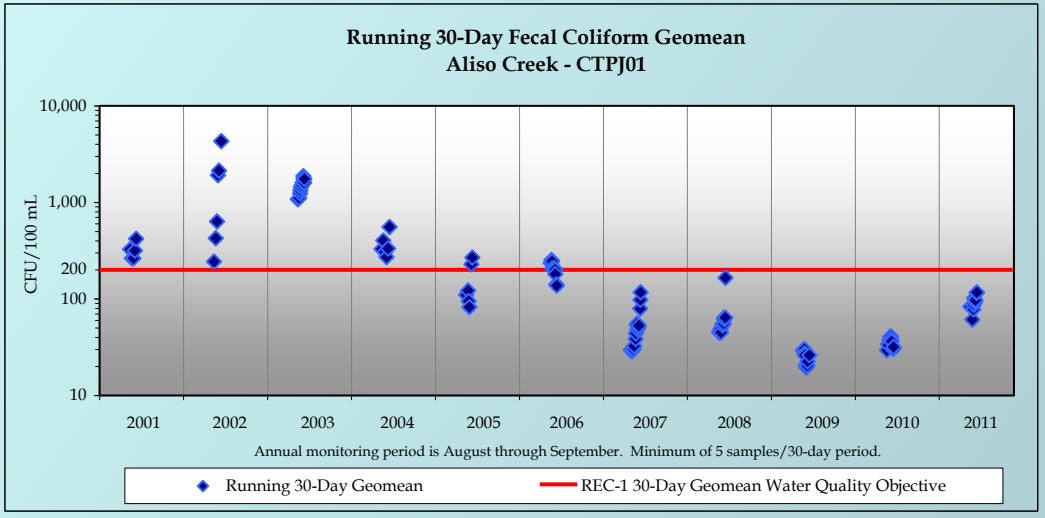

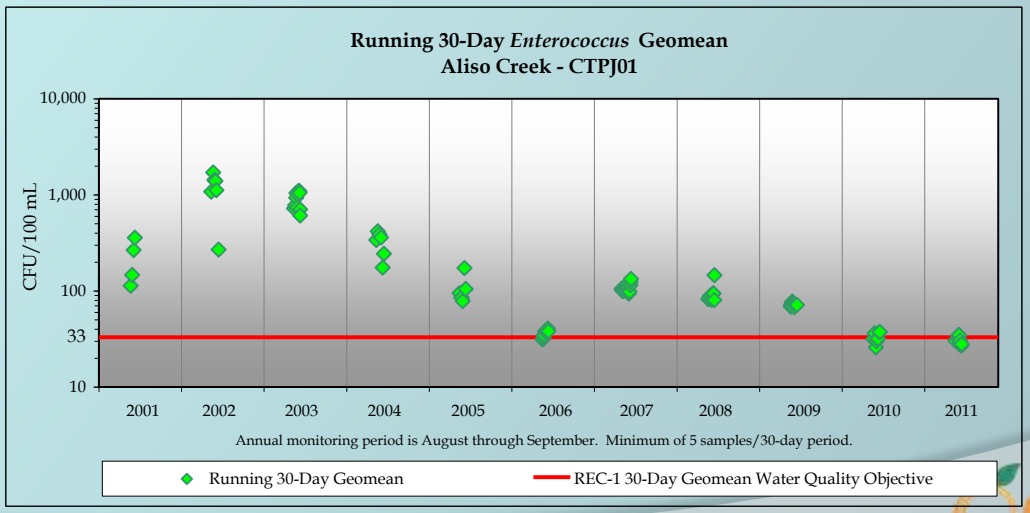

Lower Aliso Creek Watershed now appears to be attaining REC-1 In dry weather

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Metals - Where are we at?

Table 4: SDR Exceedance of CTR Acute Criteria For Dissolved Metals: 2011-12

				Exceeded Freshwater Aute CTR Criteria												Exceeded Saltwater CTR Acute Criteria											
		Sample #		Cd		Cu		Ni		Pb		Se		Zn		Cd		Cu		Ni		Pb		Se		Zn	
Station	Monitoring Program	Dry	St	Dry	St	Dry	St	Dry	St	Dry	St	Dry	St	Dry	St	Dry	St	Dry	St	Dry	St	Dry	St	Dry	St	Dry	St
REF-FC	Bioassessment	1		0		0		0		0		0		0													
REF-TCAS	Bioassessment	1		0		0		0		0		0		0													
SC-MB	Bioassessment	1		0		0		0		0		1		0													
SJC-74	Bioassessment	1		0		0		0		0		1		0													
SMC01934	Bioassessment	1		0		0		0		0		0		0													
SMC01987	Bioassessment	1		0		0		0		0		0		0													
ACM1d	Ambient Coastal Receiving Waters	1	2													0	0	0	0	0	0	0	0	0	0	0	0
LB2d	Ambient Coastal Receiving Waters	1														0	0	0	0	0	0	0	0	0	0	0	0
LB3d	Ambient Coastal Receiving Waters		2													0	0	0	0	0	0	0	0	0	0	0	0
SCM1d	Ambient Coastal Receiving Waters	1	2													0	0	0	0	0	0	0	0	0	0	0	0
SJC1d	Ambient Coastal Receiving Waters		2													0	0	0	0	0	0	0	0	0	0	0	0
ACJ01	Mass Emissions	2	5	0	0	0	0	0	0	0	0	2	0	0	1												
LCWI02	Mass Emissions	2	4	0	0	0	1	0	0	0	0	0	0	0	0												
PDCM01	Mass Emissions	2	5	0	0	0	0	0	0	0	0	2	2	0	0												
SDCM02	Mass Emissions	2	5	0	0	0	0	0	0	0	0	2	4	0	0												
SJNL01	Mass Emissions		4	0	0	0	0	0	0	0	0	0	0	0	0												
TCOL02	Mass Emissions	2	5	0	0	0	0	0	0	0	0	0	0	0	0												

Exceedances of CTR for selenium and copper only

No toxicity ever attributed to metals

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Copper - Where are we at?

- Principal sources of copper in urban runoff: vehicle braking, architectural copper and ornamental ponds/swimming pools.
- SB346 (Kehoe) 2010: Requires changes in composition of vehicle brakepads for water quality protection

  Vehicle Brakepads

  2021 – No more than 5% Cu by weight

  2025 – No more than 0.5% Cu by weight

- CASQA work product

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Toxicity - Where are we at?

- Summary of Toxicity California Watersheds – SWRCB – 2010
  - Of the 992 sites in the assessment,48% had at least 1 sample in which toxicity was measured
  - With the exception of ammonia, all of these ambient TIEs implicated pesticides, primarily OPs and more recently pyrethroids – SWRCB, 2010.

Figure 1. Magnitude of toxicity at all California sites assessed, based on the most sensitive species (test endpoint) in either water or sediment samples at each site.

Pesticides - Where are we at?

Urban Surface Water Protection Regulations – DPR - Effective 7/19/12

Regulations will reduce quantity of pyrethroid pesticides carried directly into stormdrains will be reduced by 80-90%
- Jorgenson, 2011

CASQA work product

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Beaches - Where are we at?

Heal The Bay 2012 Beach Water Quality Report Card Highlights

Orange County: Water quality at beaches in Orange County this past summer was excellent overall with 93% of beaches receiving an A grade.

The historically poor water quality at Doheny Beach continues to show improvement, receiving an A grade for the second consecutive summer. Last summer, two of four monitoring locations at Dana Point's Baby Beach received C grades. Both locations improved to A and B grades in this report

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Coastal Waters – Where are We At?

- **SCCWRP, 2012 – 40 Years of the CWA**

  Mass emissions of many other pollutants from all major sources combined (large and small coastal POTWs, runoff, and industrial discharges) have also declined substantially since 1971. Toxic contaminants such as trace metals have decreased by up to 99%.

- **BEACHES**

  Since the Clean Beaches Initiative started in 2001, the number of beaches with poor grades (D or F) during the summer (AB 411) period has dropped from 12% to 5%, and now nearly 95% of all beaches in southern California receive annual grades of A or B.

LID in OC – Where Are We At?

Water Quality Management Plans

- Comprehensive Model WQMP, Technical Guidance, Training Program and HMP
  - Developed through a collabo process by experts in LID & Hydromodification and Engir Council recognition

- 284 sites (9,021 acres) installed LID BMPs in Santa Ana Region in FY2011-12

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Channel Rehabilitation: Where Are We At?

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MS4 Permitting: Where Are We At?

4th Term Permit

-415 “Musts”

Regional Permit

- 1,079 “Musts”

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MS4 Permitting: Where Are We At?

- Regional Permitting will create 3 programs for Orange County
- Contrary to all prior staff assurances

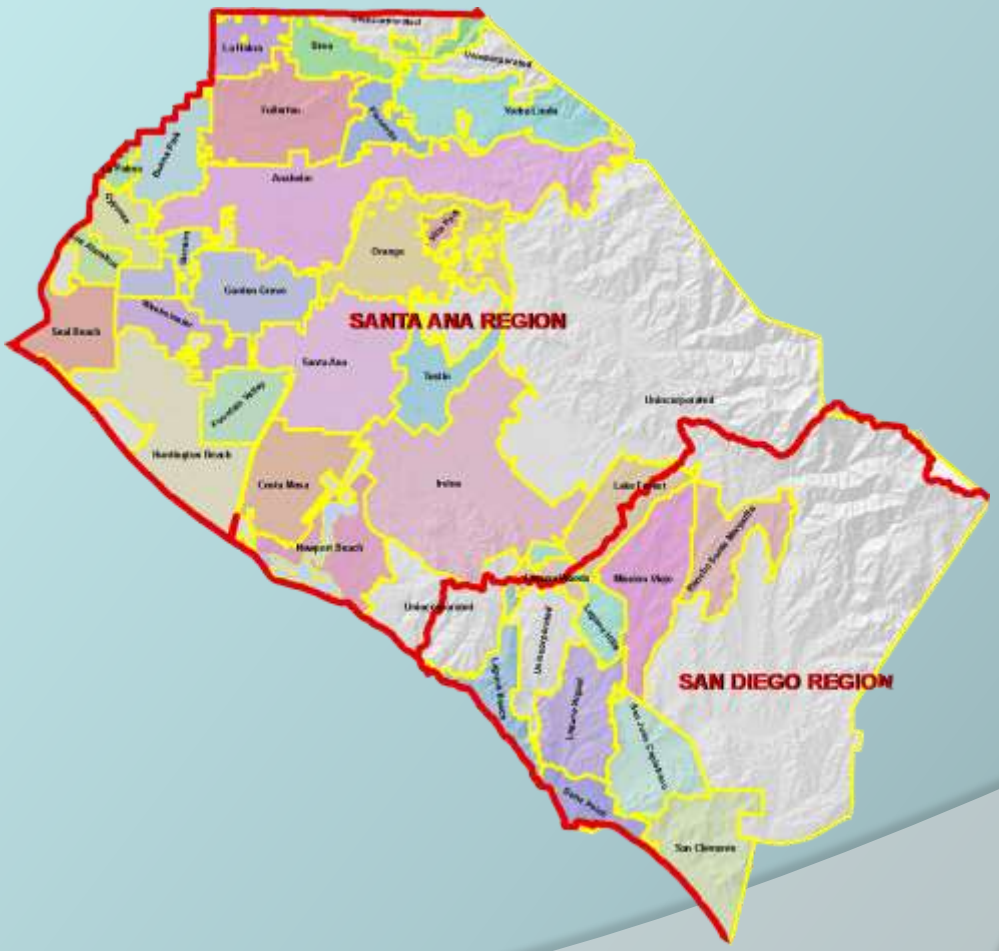

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How It All Adds Up

- Regional Board Staff lost faith in stakeholder process
- Current program is working
- Absent an understanding of progress, efficacy and increasing complexity of MS4 permit cannot be evaluated

Changes To Permit & Process

- Explicitly acknowledge progress – state of the environment
- Re-rail the stakeholder process
- Direct staff to coordinate with Region 8 for split jurisdictions

Critical Regulatory Issues

Compliance Needs to be Attainable

- Issue: Receiving Water Limitations and Ninth Circuit Decision

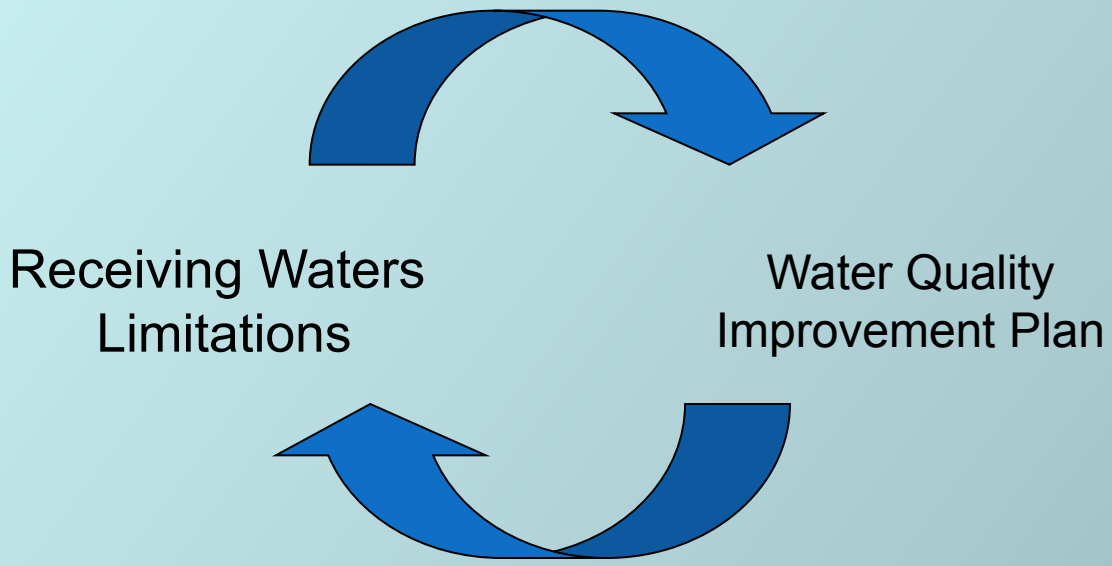

How It All Adds Up

- Instantaneous compliance with WQS is unattainable
- Threat of Third Party Litigation is Real – City of Stockton, City of Malibu & County of LA
- Updating the Basin Plan is a Priority

Action Levels

- Purpose:
  - Guide implementation and measure progress
  - Strategy development and assessment
  - Support the IDDE program
- Problem: NALs are defined numerics and are inflexible
- Solution: Allow customization of action levels based on ambient conditions

How It All Adds Up

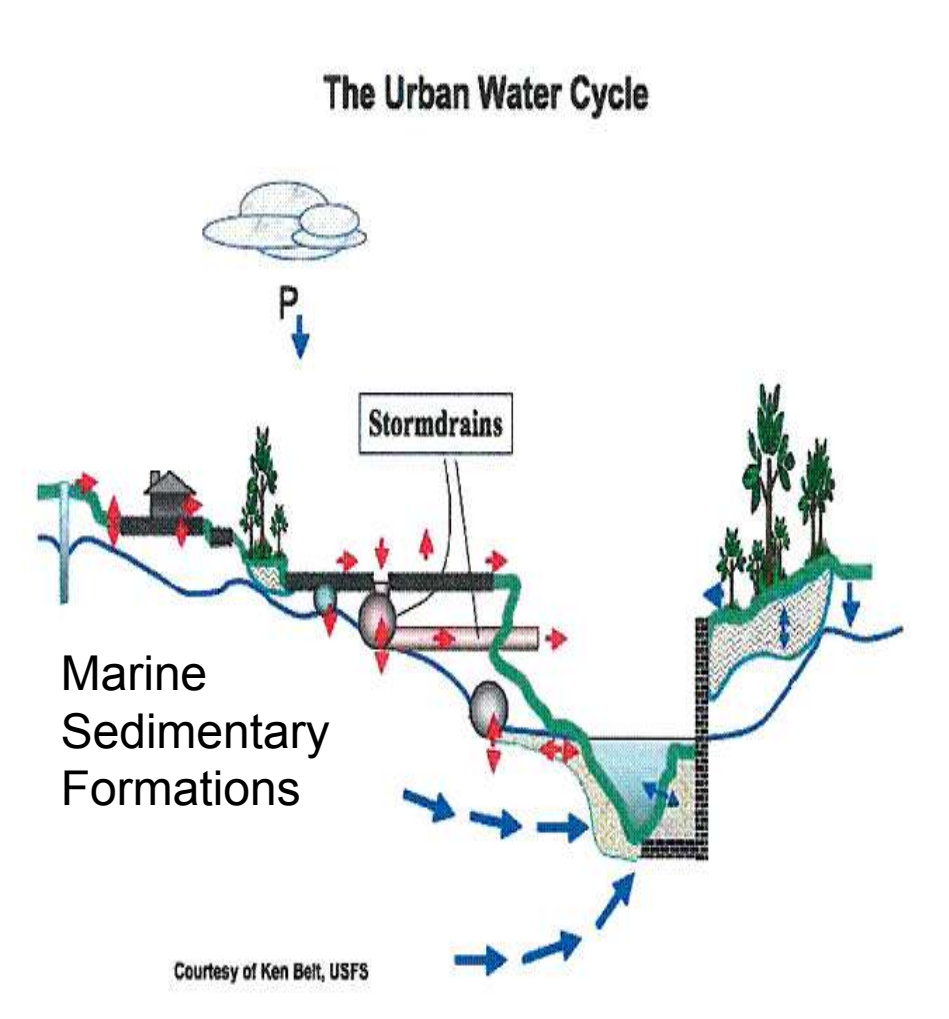

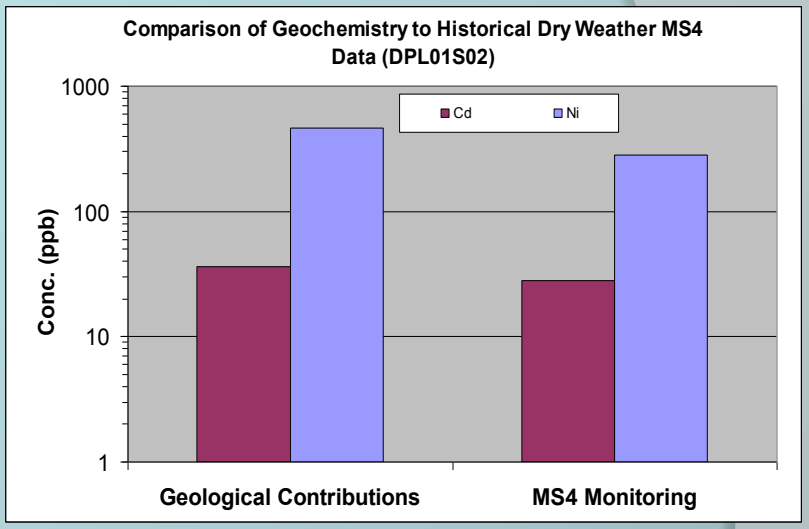

Subsurface flow in a pipe must be eliminated or permitted?

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How It All Adds Up

	NAL Exceedances 2011 - 12		DW Reconnaissance Program Action Level* Exceedances May-September 2010	
Constituent	**Number**	**%**	**Number**	**%**
pH	1	1.5	12	5.1
MBAS	1	1.5	2	0.8
Turbidity	6	8.8	3	1.3
Dissolved Oxygen	1	1.5	2	0.8
Fecal Coliform	36	52.9	0	0
Enterococcus	64	94.1	1	0.4
Total P / Ortho PO4	59	86.8	6	2.5
Total N / Nitrate	63	92.6	22	9.3
Nickel	10	14.5	18	7.6
Cadmium	22	32.4	11	4.7
Zinc	2	2.9		
Total # of Site Visits	**68**		**236**	

Where sub-surface flow exceeds NALs, NALs no longer work as investigative tool

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WQIP & JURMP

- The Water Quality Improvement Plan (WQIP) represents a significant advance for stormwater management.
- The WQIP framework allows the program to focus on the high priority water quality conditions.
- Jurisdictional programs provide requirements that must be implemented, regardless of WQIP approach.

How It All Adds Up

- Negates the Intent and Purpose of the WQIP approach – a strategic, priority driven process
- OC supports the watershed approach, however the watershed and jurisdictional provisions need to be complementary

Changes To Permit

- Defer Adoption pending State Board direction on RWLs or Re-Opener
- Allow for derivation of NALs from dry weather data set
- Align WQIP Programs in Provision B with JRMP Programs in Provision E
  - Add language to allow modification and prioritization of Provision E requirements

Legal Comments

Ryan Baron, County Counsel
County of Orange

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1990 EPA Rulemaking

- In implementing the permitting system for stormwater discharges called for in the 1987 CWA Amendments, EPA rulemaking examined how to define a “system,” and a “system” would be issued a permit
- Rulemaking only examined individually owned MS4s and MS4s within same geographic area defined as watershed or political boundary of the discharger (i.e., state owned roads, county, or regional stormwater authority)
- Multiple smaller systems could be defined as a “system” based on common physical factors and a unified stormwater management plan
- A region-wide permit would be issued only after an application by a regional stormwater management authority, 40 CFR 122.26(a)(3)(iv)

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No Common Physical Factors

- MS4 is not interconnected with Riverside or San Diego
- Different political boundaries
- No region-wide stormwater management program
- Permit recognizes three separate systems and no unifying program (pg. 1)
- San Juan Hydrologic Unit drains to Pacific Ocean (pg. 17)
- Differences in geography, soil conditions, coastal and inland areas
- Differences in drainage patterns, types of discharges, quantity and nature of pollutants
- Different census areas
- Effectively a general permit
- **Single consideration is cost**

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No Basis for Regional Permit

Reason is to reduce internal Board staff costs

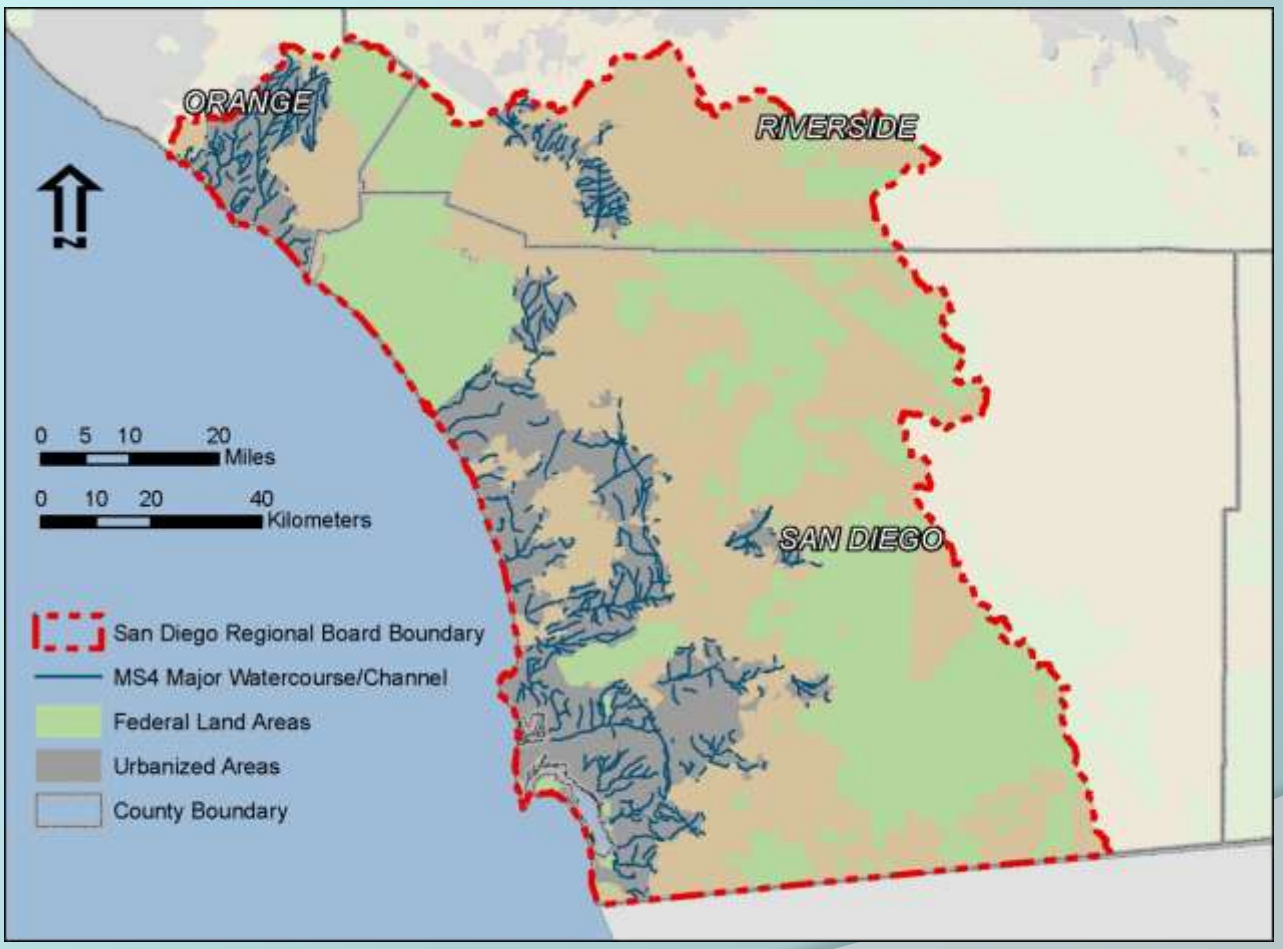

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No Application Requirement

- Application is required 40 CFR 122.21
- Application contains quantitative data and other evidence by which to make findings, conclusions of law, establish programs, and approve a permit to a system
- Without it, no substantial evidence
- ROWD is after the fact

Exclude Orange County

- OC objects to regional permit inclusion and participates under protest
- Issue a permit to San Diego
- Let OC programs run their course
- Co-permittees will consider region-wide permit in 2014 ROWD
- If region-wide permit is applied for, extend OC permit until 2017 to align permit terms

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WQIP Consultation Panel

- Improperly delegates Board approval authority to private parties not regulated by Permit with no limit on discretion and not subject to judicial review
- Courts have consistently struck down delegation of quasi-judicial powers to private groups, such as aspects of permitting and licensing
- Regional Board responsibility
- Existing OC governing structure

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011850

Critical Technical Issues Land Development

Scott Taylor
RBF

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BMP Treatment Criteria

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New BMP treatment criteria would require significant program changes

011852

- **Issue:** The new BMP treatment criteria requires retention of 100% of the pollutants from the 24-hr 85th percentile storm event instead volume retention in current permit.

- **Basis:** This would require revising the entire land development program and include:
  - Significant cost
  - Staff & applicant time
  - Revisions to program guidance
    - Model WQMP
    - Technical Guidance Document
    - Training Modules

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BMP Treatment Permit Change

011853

- **Specify that the current 4th term permit criteria & current programs meet compliance**
- **Direct staff to meet with Copermittees to discuss this issue and work out a solution**
- **Requested Modification:**
  - **Section E.3.b.(1)(a)**
    - *Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite ~~100 percent of the pollutants contained in~~ the volume of storm water runoff produced from a 24-hour 85th percentile storm event (design capture volume);*[27]
    - **Modify Footnote 27:** "The current 4th term permit BMP criteria and their associated programs for Orange and Riverside Counties meet compliance with this criteria. This volume…"

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Streets, Roads, Highways

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Land Development requirements must recognize unique aspects of roadways

- **Issue:** Roadways are fundamentally different than other land development projects, due to specific constraints.
- **Basis:**
  - Does not consider roadway constraints; inflexible
  - Potential to impede retrofit roadway projects
  - USEPA “Green Streets” - used in all other So Cal MS4 permits - national standard
  - Costs - not a prudent expenditure of public funds

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Retrofit of Existing Roadways

011856

- Constraints
  - Slope
  - Existing Drainage/Storm Drain
  - Limited Right-of-Way
  - Physical Constraints
  - Utilities
  - Geotechnical
  - Structural Concerns
  - Street Trees
  - Parking
  - Fire Truck Access

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Sample Roadway WQ Treatment Cost Comparison

011857

⊙ Offsite Retrofit using bioretention

- Drainage Area: 5,500 sq.ft.
- Total capital cost:$79,426
- Bioretention cost: $18,932
- Cost per cubic foot of WQV: **$61.27 /cu.ft.**
- Treatment per Capital Cost: **23.8%**

⊙ Onsite Retrofit using "Green Streets"

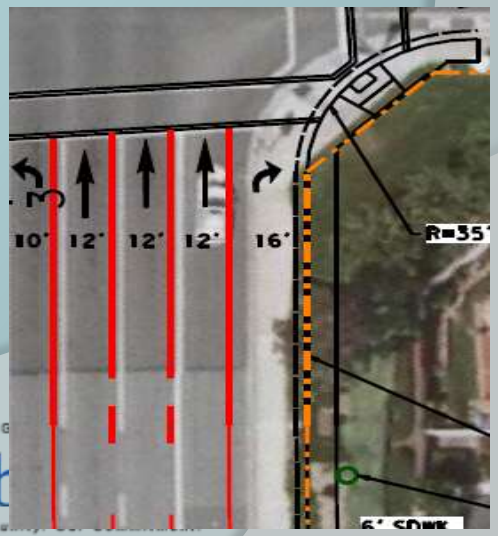

- Drainage Area: 5,500 sq. ft.
- Total capital cost: $62,444
- Green Street BMP cost: $1,950
- Cost per cubic foot of WQV: **$6.31/cu.ft.**
- Treatment per Capital Cost**: 3.1%**

Roadways: Permit Change

011858

- **Specify that the Copermittees have the option to develop roadway specific post-construction guidance and criteria starting with the USEPA Green Streets Guidance**
  - Convene a stakeholder group (Copermittees, RB Staff, interested parties) to develop the guidance and criteria

- **Requested Modification:**
  - **Section E.3.b.(3)(c) (new exemption)**
    - *Any impervious surface that is 5,000 square feet or more used for the transportation of automobiles, trucks, motorcycles, and other vehicles that follows the post-construction BMP roadway guidance developed by the Copermittees. The Copermittees have the option to develop post-construction BMP roadway guidance which shall meet the following criteria:*
      - *(i) Be developed by the Copermittees in collaboration with Regional Board staff and other interested stakeholders within 18 months of the adoption date of the Tentative Order.*
      - *(ii) Be based on the USEPA guidance regarding Managing Wet Weather with Green Infrastructure: Green Streets[1] to the MEP*

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Other Land Development Issues

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Other Land Development Issues

- **Provision E.3.b.(1)(b) –** Redevelopment projects that have WQ treatment BMPs should <u>not</u> be subject to the PDP requirements
- **Provision E.3.c.(2)(a) –** Hydromodification criteria being "pre-development" instead of "pre-project"
- **Provision E.3.c.(2)(b)** – Hydromodification provisions require sediment supply to be <u>unaffected</u> by the project – "one size fits all" & inconsistent with SCCWRP 667 Report
- **Provision E.3.c.(1)(d) –** Flow-thru BMPs required for alternative compliance projects
- **Provision E.3.c.(3) -** Alternative Compliance Projects
  - Required to have greater overall water quality benefit for the WMA;
  - Copermittee temporal mitigation for incomplete alt. compliance projects

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Critical Bacteria TMDL Concerns

Baby Beach
Beaches and Creeks

Nancy Palmer
City of Laguna Niguel
Bacteria TMDL Stakeholder Advisory Group

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We've come a long way…

- Stakeholders shared many concerns over 10 years of TMDL development and adoptions into the Basin Plan, and over months of initial drafts of Regional MS4 Permit
- Extensive comments were submitted
- Several key issues have been resolved
- Certain issues recognized as needing to be addressed in the TMDL re-opener

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Some Permit Requirements Still Inconsistent with Key Adopted TMDL Basin Plan Provisions

011863

- Permit must recognize delisted beaches under both bacteria TMDLs
- Receiving water limitations in the permit must be the same as the receiving water limitations in the adopted TMDL
- Calculations of exceedance frequencies in the permit must be consistent with the requirements in the TMDLs

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State 303(d) List of Impaired Waters

- Waterbodies are placed on Statewide 303(d) List of Impaired Waters when water quality doesn't adequately meet objectives
- Placement on 303(d) List triggers requirement for development of TMDLs
- Waterbodies demonstrating sufficient and sustained improvement can be formally removed from the State 303(d) List
- Several waterbodies in the TMDLs have already been de-listed, and more will be

TMDLs and Basin Plan Amendments Recognize Delisted Beaches

The prioritized list above recognizes that there are segments or areas where bacterial water quality improvements are most likely to occur first (Priority 1), and segments or areas where bacterial water quality improvements are most likely to require more time to achieve (Priority 3). In some cases, receiving water limitations are already being met, resulting in the delisting of those segments or areas from the 2006 and/or 2008 303(d) Lists. The protection of the REC-1 beneficial use of those delisted segments or areas, however, must also be maintained, and those segments or areas must remain off future iterations of the 303(d) List.

"In some cases, receiving water limitations are already being met, resulting in the delisting of those segments or areas from the 2006 and/or 2008 303(d) Lists."

San Diego Basin Plan
Page 7-106 (20 Beaches TMDL)

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Delisted Waters Still Monitored

Therefore, if the water quality data support delisting before the NPDES requirement revisions are considered, specific objectives of this Implementation Plan are as follows:

1. Persons responsible for monitoring the impaired shoreline segments of Baby Beach and Shelter Island Shoreline Park for bacteria will continue with the monitoring program to ensure REC-1 water quality objectives are maintained.

2. If REC-1 water quality objectives are exceeded, actions outlined in Attachment B of Order Nos. R9-2007-0001 and R9-2002-0001 in section II.C, Coastal Storm Drain Outfall Monitoring, and any subsequent amendment or renewal, will be implemented.

3. If sources of bacteria persist at levels that exceed water quality standards, then the persons responsible will take appropriate actions to identify and eliminate the controllable source or sources of the chronic contamination. If natural and background sources appear to be the sole source of the impairment, application of the NSEA to revise the TMDLs may be appropriate.

If the impaired shoreline segments of BB and SISP remain on or are put back on the List during subsequent iterations of the 303(d) listing process due to impacts from controllable sources of bacteria, the San Diego Water Board will revise the current NPDES requirements and/or issue additional waste discharge requirements to be consistent with these TMDLs.

"if the water quality data support delisting… **continue with the monitoring program** to ensure REC-1 water quality objectives are maintained"

San Diego Basin Plan
Page 7-47 (Baby Beach TMDL)

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Monitoring Confirms Compliance

The TMDLs that have been developed for the Pacific Ocean shorelines are applicable to all the beaches located on the shorelines of the hydrologic subareas (HSAs), hydrologic areas (HAs), and hydrologic units (HUs) listed above. Beginning with the 2008 303(d) List, specific beach segments of the Pacific Ocean shoreline are listed individually. Specific beach segments from some of the Pacific Ocean shorelines listed in the above table have been delisted from the 2008 303(d) list that was approved by the San Diego Board on December 16, 2009, and therefore are not subject to any further action as long as monitoring data continues to support compliance with water quality standards.

"Specific beach segments from some of the Pacific Ocean shorelines listed in the above table have been delisted from the 2008 303(d) list…and therefore are **not subject to any further action as long as monitoring data continue to support compliance** with water quality standards."

San Diego Basin Plan
Page 7-60 (20 Beaches TMDL)

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Draft MS4 Permit Inconsistent with Basin Plan TMDL Provisions

- Draft Permit text does not acknowledge that waterbodies formally 303(d) de-listed by the State are no longer considered impaired
- Formal de-listing from 303(d) should be recognized and ***added*** as a demonstration of compliance with the TMDLs

Issue #2: Basin Plan Beaches TMDL Receiving Water Limitations

011869

Table 7-48. Receiving Water Limitations for Beaches

Indicator Bacteria	Wet Weather Days [a]		Dry Weather Days [b]	
	Wet Weather Numeric Objective [c] (MPN/100mL)	Wet Weather Allowable Exceedance [d] Frequency	Dry Weather Numeric Objective [e] (MPN/100mL)	Dry Weather Allowable Exceedance Frequency
Fecal Coliform	400	22%	200	0%
Total Coliform	10,000	22%	1,000	0%
Enterococcus	104	22%	35	0%

a. Wet weather days defined as days with rainfall events of 0.2 inches or greater and the following 72 hours.

b. Dry weather days defined as days with less than 0.2 inch of rainfall observed on each of the previous 3 days.

c. Wet weather numeric objectives based on the single sample maximum water quality objectives in the California Ocean Plan (2005). Compliance with the wet weather TMDLs in the receiving water is based on the frequency that the wet weather days in any given year exceed the wet weather numeric objective, but 30-day geometric mean must also be met.

d. The wet weather allowable exceedance frequency is set at 22%. In the calculation of the wet weather TMDLs, the San Diego Regional Board chose to apply the 22 percent allowable exceedance frequency as determined for Leo Carillo Beach in Los Angeles County. At the time the wet weather watershed model was developed, the 22 percent exceedance frequency from Los Angeles County was the only reference beach exceedance frequency available. The 22 percent allowable exceedance frequency used to calculate the wet weather TMDLs is justified because the San Diego Region watersheds' exceedance frequencies will likely be close to the value calculated for Leo Carillo Beach, and is consistent with the exceedance frequency that was applied by the Los Angeles Regional Board.

e Dry weather numeric objectives based on the 30-day geometric mean water quality objectives in the California Ocean Plan (2005). Compliance with the dry weather TMDLs in the receiving water is based on the frequency that the dry weather days in any given year exceed the dry weather numeric objective.

San Diego Basin Plan Bacteria Beaches TMDL Provisions, Page 7-94

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Inconsistency: Draft Permit Receiving Water Limitations

011870

Table 6.2a

Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Beaches

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform	10,000	22% 0%	1,000	0%
Fecal Coliform	400	22% 0%	200	0%
Enterococcus	104	22% 0%	35	0%

Notes:

e Dry weather numeric objectives based on the 30-day geometric mean water quality objectives in the California Ocean Plan (2005).

c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. The 0% single sample maximum allowable exceedance frequency applies to dry weather days.

Draft Regional MS4 Permit
Attachment E-34 Beaches

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Basin Plan Creeks TMDL Receiving Water Limitations

011871

Table 7-49. Receiving Water Limitations for Creeks

Indicator Bacteria	Wet Weather Days [a]		Dry Weather Days [b]	
	Wet Weather Numeric Objective [c] (MPN/100mL)	Wet Weather Allowable Exceedance [d] Frequency	Dry Weather Numeric Objective [e] (MPN/100mL)	Dry Weather Allowable Exceedance Frequency
Fecal Coliform	400	22%	200	0%
Enterococcus	61 (104) [f]	22%	33	0%

a. Wet weather days defined as days with rainfall events of 0.2 inches or greater and the following 72 hours.

b. Dry weather days defined as days with less than 0.2 inch of rainfall observed on each of the previous 3 days.

c. Wet weather numeric objectives based on the single sample maximum (or equivalent) water quality objectives in the Water Quality Control Plan for the San Diego Basin (1994). Compliance with the wet weather TMDLs in the receiving water is based on the frequency that the wet weather days in any given year exceed the wet weather numeric objective, but 30-day geometric mean must also be met.

d. The wet weather allowable exceedance frequency is set at 22%. In the calculation of the wet weather TMDLs, the San Diego Regional Board chose to apply the 22 percent allowable exceedance frequency as determined for Leo Carillo Beach in Los Angeles County. At the time the wet weather watershed model was developed, the 22 percent exceedance frequency from Los Angeles County was the only reference beach exceedance frequency available. The 22 percent allowable exceedance frequency used to calculate the wet weather TMDLs is justified because the San Diego Region watersheds' exceedance frequencies will likely be close to the value calculated for Leo Carillo Beach, and is consistent with the exceedance frequency that was applied by the Los Angeles Regional Board.

e. Dry weather numeric objectives based on the 30-day geometric mean (or equivalent) water quality objectives in Water Quality Control Plan for the San Diego Basin (1994). Compliance with the dry weather TMDLs in the receiving water is based on the frequency that the dry weather days in any given year exceed the dry weather numeric objective.

f. A wet weather numeric objective for *Enterococcus* of 104 MPN/100mL may be applied as a receiving water limitation for creeks, instead of 61 MPN/100mL, if one or more of the creeks addressed by these TMDLs (San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek, San Diego River, and/or Chollas Creek) is designated with a "moderately to lightly used area" or less frequent usage frequency in the Basin Plan. Otherwise, the wet weather numeric objective of 61 MPN/100mL for Enterococcus will be used to assess compliance with the wet weather allowable exceedance frequency.

San Diego Basin Plan Creeks TMDL Provisions, Page 7-94

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Inconsistencies: Draft Permit Receiving Water Limitations

Table 6.2b

Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Creeks

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Fecal Coliform	400	22% 0%	200	0%
Enterococcus	61 (104)[d]	22% 0%	33	0%

Notes:

a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.

b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.

c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. The 0% single sample maximum allowable exceedance frequency applies to dry weather days.

e. Dry weather numeric objectives based on the 30-day geometric mean (or equivalent) water quality objectives in Water Quality Control Plan for the San Diego Basin (1994). Compliance with the dry weather TMDLs in the receiving water is based on the frequency that

Draft Regional Permit Creeks TMDL provisions, Attachment E-34

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Draft Permit Inconsistent with Basin Plan TMDL Provisions

- Establishing single-sample maximum concentrations as a compliance requirement for dry weather contradicts the intent of stakeholder driven TMDL process and the approved Basin Plan
- Dry weather compliance is based on 30-day geomeans and loading, not on single samples
- This unwarranted embellishment should be **deleted** from the Draft Permit

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Issue #3: Basin Plan TMDL Provisions for Wet Weather Data Extrapolation

creek). Because of the many issues related to collecting wet weather samples from multiple sites within a short time frame, dischargers are expected to develop a wet weather monitoring and sampling approach in their BLRPs or CLRPs. If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event shall be equal to the results from that one sample. If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all the wet weather days not sampled shall be equal to the highest bacteria density result reported from samples collected. The exceedance frequency shall

"If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event shall be equal to the results from that one sample."

Scientifically debatable, but issue deferred at the BPA adoption to the 5-year re-opener , pending better research data findings

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Inconsistency: Draft Permit Wet Weather Data Extrapolation

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;

[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;

[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the highest bacteria density result reported from wet weather samples collected; and

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Embellishment Unwarranted and Unvetted by Process or Science

- Assuming all unsampled storm events have the highest concentration of any samples is an *unwarranted punitive expansion* of the approved TMDL Basin Plan provision
- TMDL BPA instead provides for Permittees to develop a sampling plan in CLRP
- This unvetted provision should be ***deleted*** from the Draft Regional MS4 Permit

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How It All Adds Up

- Creates Permit requirements that are inconsistent with the San Diego Basin Plan, inconsistent with the Regional Board intent, and ***go beyond*** the requirements of the adopted TMDLs
- ***Draft Permit requirements should be corrected prior to adoption***

Requested Corrections: Consistency between Tentative Order and Basin Plan

011878

- Recognize delisted beaches consistent with the Basin Plan: **delisted beaches are compliant**
- Apply receiving water limitations consistent with Basin Plan: **dry weather receiving water limitations is geomean standard only**
- Wet weather data extrapolation consistent with Basin Plan: **remove provision pertaining to non-sampled storm events**

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Correction Request

- **Requested addition to Baby Beach TMDL compliance provisions**
  - Add a new provision as Attachment E, Provision 5.b(3)(h):
    - "The waterbody is delisted from the 303(d) list"
  - Add a new provision as Attachment E, Provision 5.c(1)(b)(ix):
    - "The waterbody is delisted from the 303(d) list"

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Correction Request (cont'd)

- **Requested addition to Regional Permit Beaches and Creeks Bacteria TMDL compliance provisions:**
  - Add a new Final TMDL Compliance Determination provision as Attachment E, Provision 6.b(3)(g):
    - "The waterbody is delisted from the 303(d) list"
  - Add a new Interim TMDL Compliance Determination provision as Attachment E, Provision 6.c(3)(i):
    - "The waterbody is delisted from the 303(d) list"

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Correction to Final Receiving Water Limitations

- Replace Table 6.2a with Table 7-48 from the San Diego Basin Plan
- Replace Table 6.2b with Table 7-49 from the San Diego Basin Plan

Correction Requested to Wet Weather Data Extrapolation

011882

- Delete Provision E.6.d(1)(c)(iii)[c]

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Conclusion

There are too many issues to resolve today

Direct staff to go back to work with the stakeholders to bring back a revised Tentative Order with broad support.

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Questions

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
9174 Sky Park Court, Suite 100
San Diego, California

MINUTES OF MEETING
APRIL 10, 2013

At 9:00 a.m., Chairman Morales called to order the meeting of the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) at the Regional Water Quality Control Board, 9174, Sky Park Court, San Diego, California.

Item 1 – Roll Call and Introductions
Board Members present: Henry Abarbanel, Eric Anderson, Sharon Kalemkiarian, Tomas Morales, and Gary Strawn. Dr. Abarbanel excused himself at 4:45 p.m.

Staff Present: David Gibson, James Smith, Chris Witte, Julie Chan, David Barker, Eric Becker, Laurie Walsh, Christina Arias, Wayne Chiu, Barry Pulver, Cynthia Gorham, Mike Porter, Debbie Woodward, Sean McClain, John Anderson, Sue Pease, Ben Neill, Carey Nagoda, Eric Rosenbaum, John Odermatt, Chiara Clemente, Lisa Honma.

Others present on behalf of the San Diego Water Board: State Water Resources Control Board – Frances Spivy-Weber, Catherine Hagan, Nathan Jacobsen. California Court Reporters – Tammy Rampone.

Public Attendance: Khosro Aminpour, City of Chula Vista; Tristan Ingebristen, City of Laguna Niguel; Lisa Zawaski, Dana Point; Devin Slaven, City of Lake Forest; Jo Ann Weber, County of San Diego; Ziad Mazbovai, San Juan Capistrano; Arsalan Dadkhah, San Juan Capistrano; David Pohl, ESA; Mikhail Ogawa, Del Mar; Paul Hartman, Orange County; Brett Gamble, MOE; David Garcia, RCFC & WCD; Kris Weber, Hofstetler & Associates; Eric Lameci, RCFC & WCD; Scott Bruckner, RCFC & WCD; Claudio Padres, RCFC & WCD; John Guenzor, City of National City; Jeff Wong, City of Escondido; James Wood, City of Carlsbad; Dave Renfrew, Westen Solutions; Roger Butow, Clean Water Now; Michael Hazzard, Clean Water Now; Dennis Bowling, Rick Engineering; Brian Gordon, U.S. Navy; Chris Haynes, U.S. Navy; Karen Cowan, Larry Weber Associates; Stewart McClure, Clear Water Solutions; Joe Arthur, Clear Water Solutions; Doug Friedman, County of Orange; Ben Syz, Port of San Diego; Matthew Heber, Green Reactions; Kathryn Morning, Allen Matrias; Ed Othmer, URS; Ron Kemp, City of Carlsbad; Elaine Lukey, City of Carlsbad; Erik Steedbeck, City of Encinitas; Todd Snyder, County of San Diego; Cid Tesoro, County of San Diego; Matt Little, City of Coronado; Kim Godby, City of Coronado; Rae Beimer, City of Rancho Santa Margarita; Ryan Waterman, BIA Coalition; Lee Kaminetz, San Diego Airport Authority; Annie Martin, San Diego Airport Authority; Drew Kleis, City of San Diego; Joe Parco, City of Rancho Santa Margarita; Racen Clapper, County of Orange; Mark Stephens; Trevor Alsop, Geosyntec; Heather Stroud, City of San Diego; Deborah Mosley, County of San Diego; Steve Strapac, City of Poway; Tracy Cline, County of San Diego; Garth Engelhorn, Weston; Allison Ross Kiehle, Port of San Diego; Kip Striden, City of San

Diego; Cheryl Filcin, City of Vista; Mike Zarley, Kitchell Environmental Services; Douglas Kot, San Diego USGBC; Ruth Kolb, City of San Diego; Kris McFadden, City of San Diego; Matt O'Malley, Surfrider; Bryn Evans, URS; Julia Chunn-Heer, Surfrider San Diego; Doug Liden, USEPA; Jesse Gipe, Senator Joel Anderson; Sheryl McPherson, County of San Diego; David Manx, Geosyntec; Daniel Apt, Orange County; Scott Taylor, Orange County; Jim Rasmus, City of San Diego; Scott Smith, City of Oceanside; Jill Witkowski, San Diego Coastkeeper; Fred Jacobsen, SDG&E; Adrianna Kripke, SDG&E; Nancy Palmer, City of Laguna Niguel; Jack Monger, IEA; Helen Davies, City of Santee; Mo Lahsaie, City of Oceanside; Amanda Arkenhold, AMEC; Jaime Campos, City of El Cajon; Robert Stone, Quantum Ozone, Inc.; Emma Sakaguchi, Quantum Ozone, Inc.; W. Gaters, SDG&E; Shari Selhount, Sea World; Khalique Khan, Camp Pendleton; John Earpensohn, Latitude 33; Aldo Licitra, City of Temecula; Billy Walker, City of Oceanside; Nancy Gardiner, Weston Solutions; Rosanna Lacarra, LaRue Environmental; Joan Adriany, Cinemetrics; Soumya Chennapragada, NV5; Lisa Skirtech, Brown & Caldwell; Jay Strake, AMEC; Kristina Husler, AMEC; Bill Baber, ABC-SD; Erica Ryan, City of San Marcos; Chris Helmer, City of Imperial Beach; Jenna Koss, County of Orange; Mary Anne Skorpanich, County of Orange; Michelle Helleruch, SDAR; Rebecca Pollack Rude, SDAR; Taryn Kiplsong, Solana Beach; Bill McMinn, Port of San Diego; Mary Kay Faryar, Navy Reg South West; Chris Crompton, County of Orange; Stephanie Gaier, County of San Diego; Laura Eisenberg, Rancho Mission Viejo; Ann Bechtel, Atkins; Tim Holbrook, County of San Diego; Joe Ames, City of Mission Viejo; Roshan Christoph, AMEC; Vicki M. Campbell, SDAR; Marilyn O'Neill, Nautilus Environmental; Ravi Bajaj, USCBC-SD; Efiem Byar, San Diego Regional EDC: Harry Orgovan, Chula Vista Kayak; Christine Mailloux, Friends of Rose Canyon; Edgar Camerino, San Diego Fishing Development Association; Ryan Verschoor, AMEC; Christy Suppes, County of Orange; Sandra Moore, San Diego Coastkeeper; Colin Kelly, Orange County Coastkeeper/JEWK; Mark Corcoran, Surfrider San Diego; Shauna McKellar, Surfrider San Diego; Lori Jones, Surfrider San Diego; Sabrina Garland, Surfrider San Diego; Aaron Richter, Surfrider San Diego; Micah Mitrosky, Coastkeeper; Crystal Carson, Surfrider; Randall Iwai, Surfrider San Diego; Natalie Shapiro, Coastkeeper; Ann Swanson, Sunset Cliffs National Park; Eric Swanson, Friends of Sunset Cliffs; Izzy Tihanyi, Surf Diva Surf School; Jonathan Parkinson; Terry Rodgers, Surfrider San Diego; Sunshine Johnson, Surfrider San Diego; Jim Peugh, San Diego Audubon Society; Margie Johnson, Surfrider San Diego; Vaikko Allen, Contech Engineering Solutions.

Item 2 – Public Forum

Roger Butow spoke about the need to improve public access to Board meetings via teleconferencing or other methods.

Item 3 – Minutes of Board Meeting: March 13, 2013

Mr. Anderson moved that the minutes be approved, and the motion was seconded by Ms. Kalemkiarian. The minutes were approved by unanimous vote.

Item 4 – Chairman's, Board Members', State Water Board liaison's, and Executive Officer's Reports. These items are for Board discussion only. No public testimony will be allowed, and the Board will take no formal action.

Mr. Morales provided an update regarding the Chairs' meeting in March and the recent Chairs' conference call.

Fran Spivy-Weber provided updates on the State Board's activities.

Mr. Gibson provided an update on Board staff activities and Practical Vision outreach meetings that took place in the last month and that will take place prior to the next Board meeting.

Item 5 – Recognition: Resolution of Appreciation for former Chairman Grant Destache (Tentative Resolution No. R9-2013-0061. (*David Gibson*)

Mr. Morales read the Resolution and thanked Mr. Destache for his service.
Mr. Destache accepted the Resolution and thanked the Board and staff.

Consent Calendar: Items 6 and 7 are considered non-controversial issues. (NOTE: If there is public interest, concern, or discussion regarding any consent calendar item or a request for a public hearing, then the item(s) will be removed from the consent calendar and considered after all other agenda items have been completed.)

Item 6 – NPDES Permit Amendment: Waste Discharge Requirements for SeaWorld Parks & Entertainment, Inc., a Delaware Corporation, SeaWorld, LLC, DBA SeaWorld San Diego (Tentative Order No. R9-2013-0034). (*Michelle Mata*)

Item 7 – Adoption of Emergency, Abandoned, and Recalcitrant Annual Priority Site List: Former Santa Ysabel Chevron Service Station (Tentative Resolution No. R9-2013-0010). (*Sue Pease*)

A motion was made by Dr. Abarbanel and seconded by Mr. Anderson to adopt the Consent Calendar. A vote was taken, and the motion passed unanimously.

Remainder of the Agenda (Non-Consent Items):

Item 8 – Public Hearing: Issuance of a NPDES Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region (Tentative Order No. R9-2013-0001, NPDES No. CAS0109266). (*Wayne Chiu, Laurie Walsh, Christina Arias*)

Mr. Morales gave his opening remarks, and Board members made disclosures regarding their participation in the proceeding.

Attorneys for the San Diego County, Riverside County, and Orange County copermittees raised procedural objections, including an objection to holding the hearing today and asked the Board to postpone it until May.

Mr. Morales noted the objection for the record and continued his opening remarks.

Mr. Morales called a recess at 10:19 a.m. and reconvened the meeting at 10:33 a.m.

Mr. Morales administered the oath to those planning to testify in the hearing.

Mr. Chiu made the staff presentation, followed by questions from the Board members and cross-examination from interested parties.

Doug Liden gave the USEPA presentation in support of the MS4 Permit and answered the Board members' questions.

[Closed Session announcement: Ms. Hagan announced that the Board would discuss closed session item a during the lunch break.]

Mr. Morales called a recess for lunch and Closed Session at 12:00 p.m. and reconvened the regular meeting at 1:00 p.m.

The San Diego County copermittees made their presentation, followed by the Orange County and Riverside County copermittees. San Diego Coastkeeper asked some cross-examination questions of San Diego County

Mr. Morales called a recess at 2:20 p.m. and reconvened the meeting at 2:30 p.m. He then called a recess at 3:47 p.m. and reconvened the meeting at 4:03 p.m.

The following people commented on the Tentative Order:

Chris Haynes, U.S. Navy
Christine Mailloux, Friends of Rose Canyon
Livia Borak, Coastal Environmental Rights Foundation
Julia Chunn-Heer, Surfrider San Diego
Matt O'Malley, Surfrider San Diego
Paloma Aguirre, WildCoast
Haley Haggerstone, Surfrider Foundation
Allison Prange, Surfrider
Alison Hindley, Surfrider Foundation
Lyle Beller, resident of San Diego
Sandra Moore, resident of La Jolla
Jamie Ortiz, resident of Point Loma
Harry Orgovan, Chula Vista Kayak

Jim Peugh, San Diego Audubon Society

Mr. Morales called a recess at 5:00 p.m. and reconvened the meeting at 5:15 p.m.

Roderick Michener, Surfrider San Diego
Belinda Smith, Surfrider
Shauna McKellar, Surfrider Foundation
Mark West, Surfrider
Kristin Brinner, Surfrider
Todd Cardiff, Surfrider
Mark Corcoran, Surfrider San Diego
Megan Baehrens, San Diego Coastkeeper
Travis Pritchard, San Diego Coastkeeper
Randall Iwai, Surfrider
Crystal Carson, Surfrider
Ravi Bajaj, USGBC, San Diego
Natalie Shapiro, Coastkeeper
Roger Kube, Surfrider San Diego
Jonathan Parkinson, resident of Ocean Beach
Izzy Tihanyi, Surf Diva Surf School
Terry Rodgers, Surfrider San Diego

The following people registered support for the permit, but did not speak:

Douglas Kot, San Diego USGBC
Adam Andrews, Surfrider
Sabrina Garland, Surfrider
Lori Jones, Surfrider
Aaron Richter, Surfrider
Patrick Mulvey, Surfrider
Micah Mitrosky, Coastkeeper
Gavin Seedorf, Threshold Enviro
Ann Swanson, Sunset Cliffs
Eric Swanson, Friends of Sunset Cliffs
Scott Harrison, Surfrider
Erin Campbell
Sumer Hasenin, City of San Diego
Roger Butow, Clean Water Now
Sean Karaffin, San Diego County Taxpayers Association
Barry Grigg, The Political & Economic Conservative Alliance of San Diego
Brad Fowler, City of Dana Point
Efiem Byer, San Diego Regional Economic Development Corporation
Vaikko Allen, resident of Ojai
Aaron Poresky, Geosyntec
Bob Callacott, resident of San Clemente

The following people registered opposition to the permit, but did not speak:

Rick Alexander, San Diego CRAS
John Altman, JT Altman & Associates
Chris Anderson, Greater San Diego Association of Realtors
Tina Apaipony
William Baber, Associated Builders & Contractors of San Diego
Scott Bailey, Huntley Estates
Neil Alan Ball, Alan Ball Group
Troy Bankston, County of San Diego
Ben Boyce, Laer Pearce & Associates
Jane Brown-Darché, Ranch & Country Realty, Inc.
Jim Browne, Real Living Lifestyles Real Estate
Kevin Burke, Burke Real Estate Consultants
Vicki Campbell, San Diego Association of Realtors
Edgar Camerino, San Diego Highway Development Association
Yawan Cheng, USA Realty and Loans
Lauren Cremascoli, Pam Matthison & Associates
Chris Crompton, County of Orange
Richard Crossman, Willis Allen Real Estate
Ligaya Cruz, Ligaya Realty Group
Thomas Ellis, Atlantic & Pacific Real Estate
Craig Everett, Advent Real Estate & Property Management
Virginia Field, Trident Realty Group
Steve Fraioli
Stephanie Gaines, County of San Diego
Eric Ginder, White & Bogart, LLP
Jesse Gipe, California Senator Joel Anderson
Richard Hagen, Pacific Sotheb's International Realty
Linda Harbert, Coldwell Banker
Michael Hazzard, Clean Water Now
Michelle Hellerund, San Diego Association of Realtors
Bill Horn, San Diego County Supervisor
Karen Jedele, Burke Real Estate Consultants
Robert Kevane, San Diego Association of Realtors
Leslie Kilpatrick, San Diego Association of Realtors
Amy Kitchens, GNP Premier Partners
Leona Kline, KW Metro
Barbara Kreis, San Diego Board of Realtors
Art Kryk, San Diego Association of Realtors
Joe Kuhn, City of La Mesa
Yuzana Kyaw, Burke Real Estate Consultants
James Lawson, NAIOP San Diego
Linda Lee, Greater San Diego Association of Realtors

Bill Lees, Seaport Realtors
Aldo Licitra, City of Temecula
Jordan Marks, Greater San Diego Association of Realtors
Pam Mathison, Pam Mathison & Associates
Denise Matthis, resident of Poway
Mike Mercurio, Greater San Diego Association of Realtors
Deborah Mosley, County of San Diego
Katilin Murphy, Murphy Development
Greg Neville, Pacific Land Group
Jenni Nguyen, Keller Williams Realty, La Jolla
Jacqueline Oliver, San Diego Association of Realtors
Claudio Padres, RCFC & WCD
Karen Peterson, Realty Experts
Faith Picking, BIOCOM
Rebecca Pollack Rude, San Diego Association of Realtors
Ryan Purdy, Greater San Diego Association of Realtors
Brandon Robbin, Greater San Diego Association of Realtors
Lupe Sato, McMillin Realty
Cory Shepard, Coldwell Banker West
Alkarim Shivji, California Real Estate & Mortgage
Metamepy Simon, Met Realty Group
David Slaven, City of Lake Forest
Ed Smith, resident of La Mesa
Sarah Smith, Mountain Trust
Peter Solzcki, San Diego Association of Realtors
Kate Speir, San Diego Association of Realtors
Eric Steenbock, City of Encinitas
Ellen Steinberg, Signature Realty
James Sullivan, Willis Allen Real Estate
Dorothy Surdi, Speary Van Ness Finest City Commercial
Jim Taylor, Speary Van Ness Finest City Commercial
Cid Tesoro, County of San Diego
Fiona Theseira, Keller Williams Realty
Ann Throckmorton, Greater San Diego Association of Realtors
James Tostado, Hibiscus Real Estate
Tory Walker, Tory R. Walker Engineering, Inc.
Ryan Waterman, BIA Coalition
Jo Ann Weber, County of San Diego
K. Won, Keller Williams Realty
J. T. Yean, OCPW
Elena Yu, Real Living Lifestyles
Mike Zarley

CLOSED SESSION

The Board may meet in closed session to consider personnel matters [Authority: Government Code Section 11126(a)]; to deliberate on a decision to be reached based upon evidence introduced in a hearing [Authority: Government Code Section 11126(c)(3)]; or to discuss matters in litigation, including discussion of initiated litigation, significant exposure to litigation, or decisions to initiate litigation [Authority: Government Code Section 11126(3)]. Litigation items that may be discussed are listed below by the type of item:

Civil Actions (Judicial and Administrative, other than Petitions for Review filed with the State Water Board)

a. *People of the State of California Ex Rel. the Regional Water Quality Control Board, San Diego Region v. Edward Drusina, an individual in his capacity as Commissioner of the International Boundary and Water Commission, United States Section, et al.,* Complaint for Violations of the Clean Water Act and Related State Law Claims. United States District Court, Southern District of California, Case No. 01-CV-027BTM(JFS) (filed February 2001). *(David Gibson)*

b. *In re: Test Claim on California Regional Water Quality Control Board, San Diego Region, Order No. R9-2007-001, (NPDES No. CAS0108758) Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego County, the San Diego Unified Port District, and the San Diego County Regional Airport Authority adopted on January 24, 2007. Test Claim filed by San Diego County, et al., with Commission on State Mandates, No. 07-TC-09* (filed June 2008). *(Catherine George Hagan)*

c. *California Regional Water Quality Control Board, San Diego Region v. Bill and Heidi Dickerson, Larry and Penelope Gunning and Perry & Papenhausen, Inc.* Complaint for Damages for Breach of Contract and for Specific Performance. San Diego County Superior Court, Case No. 37-2010-00096011-CU-CO-CTL (filed July 2010). *(Jeremy Haas)*

d. *State of California Department of Finance, State Water Resources Control Board, And California Regional Water Quality Control Board, San Diego Region v. Commission on State Mandates.* Petition for Writ of Administrative Mandamus. Sacramento County Superior Court, Case No. 34-2010-80000604 (filed July 2010). *(Catherine George Hagan)*

e. *In re: Citizens Development Corporation, Debtor and Debtor in Possession*, Case No. 10-15142-LT11. United States Bankruptcy Court, Southern District of California. (San Diego Water Board Claim in Bankruptcy) (filed June 2011). (*Catherine George Hagan*)

f. *Test Claim on California Regional Water Quality Control Board, San Diego Region, Order No. R9-2009-0002, (NPDES No. CAS0108740) Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of Orange, the Incorporated Cities of the County of Orange, and the Orange County Flood Control District adopted on December 16, 2009. Test Claim filed by County of Orange, et al., with Commission on State Mandates, No. 10-TC-11* (filed June 2011). *(Catherine George Hagan)*

g. *Test Claim on California Regional Water Quality Control Board, San Diego Region, Order No. R9-2010-0016 (NPDES No. CAS0108766) adopted November 10, 2010, County of Riverside, Riverside County Flood Control and Water Conservation District, and the Cities of Murrieta, Temecula and Wildomar, Co-Claimants, filed with Commission on State Mandates, No. 11-TC-03 (filed November 2011). (Catherine George Hagan)*

Petitions for Review Pending Before State Water Resources Control Board[1]

h. Petitions of the National Fireworks Association and Fireworks & Stage FX America Inc., Coastal Environmental Rights Foundation, and San Diego Coastkeeper (General National Pollutant Discharge Elimination System (NPDES) Permit Order No. R9-2011-0022 (NPDES No. CAG999002) for Residual Firework Pollutant Waste Discharges to Waters of the United States in the San Diego Region from the Public Display of Fireworks), SWRCB/OCC Files A-2164(a)-(c), filed June and July 2011. *(Michelle Mata)*

i. Petition of Citizens Development Corporation (Water Code Section 13267 Investigative Order No. R9-2011-0033 dated September 14, 2011, Requiring Submission of Technical Reports Pertaining to Investigation of Lake San Marcos Nutrient Impairment, San Diego County), SWRCB/OCC File A-2185, filed October 2011. (*Laurie Walsh*)

j. Petition of City of San Diego (Time Schedule Order No. R9-2011-0052 dated September 14, 2011, for the Kinder Morgan Energy Partners, Mission Valley Terminal Remediation Dewatering Discharge to Murphy Canyon Creek, San Diego County), SWRCB/OCC File A-2186, filed October 2011. (*Ben Neill*)

k. Petition of Jack Eitzen (Administrative Assessment of Civil Liability Order Nos. R9-2011-0048 and R9-2011-0049 against Jack Eitzen for 38175 and 38155 Via Vista Grande, Murrieta, Riverside County), issued October 12, 2011), SWRCB/OCC File A-2193, filed November 2011. (*Rebecca Stewart*)

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[1] Petitions for review of San Diego Water Board actions or inactions filed with the State Water Board being held in abeyance by the State Water Board are not listed in the agenda. The titles of these matters are available at the San Diego Water Board. Please contact Catherine George Hagan at chagan@waterboards.ca.gov or 858-467-2958 for more information.

l. Petitions for Review of San Diego Bay Shipyard Sediment Cleanup and Abatement Order No. R9-2012-0024 for National Steel and Shipbuilding Company (NASSCO), BAE Systems, San Diego Ship Repair (BAE Systems), Campbell Industries, City of San Diego, San Diego Gas & Electric (SDG&E) and San Diego Unified Port District (Port District) issued March 14, 2012. Petitions for Review and Requests for Stay filed by NASSCO, BAE Systems and City of San Diego. Petitions for Review w/o requests for stay filed by SDG&E, Star & Crescent Boat Company and Port District. SWRCB/OCC File A-2205(a) – (e), filed April 2012. (*Frank Melbourn)*

m. Petition of NASSCO for Review of Resolution No. R9-2012-0025 (Certifying Final Environmental Impact Report for San Diego Bay Shipyard Sediment Cleanup and Abatement Order No. R9-2012-0024), adopted March 14, 2012, SWRCB/OCC File A-XXXX, filed April 2012. (*Frank Melbourn)*

n. Petition of South Laguna Civic Association for Review of Order No. R9-2012-0013, NPDES No. CA0107611, NPDES Permit Reissuance: South Orange County Waste Authority, Discharges to the Pacific Ocean via Aliso Creek Ocean Outfall, adopted April 11, 2012, SWRCB/OCC File A-2211, filed May 2012. (*Joann Lim*)

o. Petition of City of San Diego for Review of Resolution No. R9-2012-0045, re NPDES Permit Notice of Enrollment Amendment for Kinder Morgan Energy Partners, June 13, 2012, SWRCB/OCC File A-XXXX, filed July 2012. (*Ben Neill*)

p. Petition of Fallbrook Public Utility District for Review of Order No. R9-2012-0004, NPDES Permit and Waste Discharge Requirements for Fallbrook Public Utility District Wastewater Treatment Plant No. 1 for Discharge to the Pacific Ocean via the Oceanside Ocean Outfall, adopted August 8, 2012, SWRCB/OCC File A-2226, filed September 2012. (*Joann Lim*)

The closed session was held, and the Board discussed item *a*.

The meeting was adjourned at 6:27 p.m., to be reconvened at 9:00 a.m. on Thursday, April 11, 2013.

These minutes were prepared by:

Christina A. Witte

Chris Witte
Executive Assistant

Signed by:

David W. Gibson

David Gibson
Executive Officer

Audio Recordings
April 10, 2013 Board Meeting
Item No. 8

MS4 Permit Hearing (1).WMA
MS4 Permit Hearing (2).WMA
MS4 Permit Hearing (3).WMA

Audio Recordings
April 10, 2013 Board Meeting
Item No. 8

MS4 Permit Hearing (4).WMA
MS4 Permit Hearing (5).WMA
MS4 Permit Hearing (6).WMA

011897

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

BOARD MEETING PARTICIPATION SIGN-IN SHEET

APRIL 11, 2013 – 9:00 A.M. – SAN DIEGO

****PLEASE PRINT LEGIBLY****

Name	Representing	Telephone No.	Email
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Crystal Stein	" "	714 955 0670	
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Kris Mehradden			
Dave Fiers			
Bill Harris			
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011898

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

BOARD MEETING PARTICIPATION SIGN-IN SHEET

APRIL 11, 2013 – 9:00 A.M. – SAN DIEGO

****PLEASE PRINT LEGIBLY****

Name	Representing	Telephone No.	Email
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Mikhail Ogawa	Del Mar	619 994 7074	mikhail@ogawa.org
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Mo. Lahsaie	City of Oside	760-435-5893	
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MATT RICH	AMEC	858-514-6478	MATT.RICH@AMEC.com
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CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

BOARD MEETING PARTICIPATION SIGN-IN SHEET

APRIL 11, 2013 – 9:00 A.M. – SAN DIEGO

****PLEASE PRINT LEGIBLY****

Name	Representing	Telephone No.	Email
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KEN SVSILO	GEOSYNTEC	310 957 6100	ksvsilo@geosyntec.com

011900

Presentation of the Riverside County Copermittees

Jason Uhley
Chief of Watershed Protection
Riverside County Flood Control and Water Conservation District

ROWD

* Riverside County 2010 Permit Still Effective
* ROWD Will Potentially Reopen All Permit Issues
* Reform of the Tentative Order Will Reduce the Administrative Burden for the Board, Staff, Copermittees and other Stakeholders

Riverside County

A partner in protecting water resources

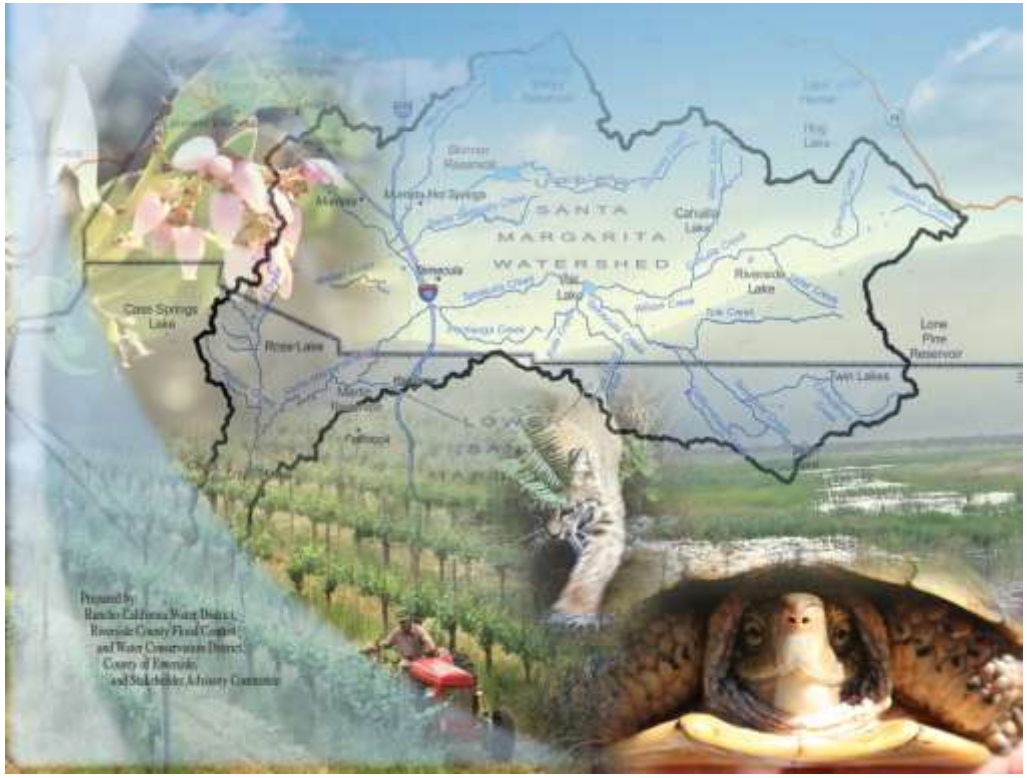
SANTA
MARGARITA
WATERSHED
Lake Elsinore
Riverside Lake
Cole Springs Lake
Lake Perris
Lake Skinner
Lake Hemet
Lake Cahuilla
Lake Henshaw
Lake Mathews
Lake Norco
Lake Evans
Lake Tamarisk
Lake Cleveland
Lake Rubidoux
Lake Ramona
Lake Vail
Lake Jackson
Lake Nichols
Lake Lake
Lake Lake
Lake Lake

Staff's Goal: A time to be BOLD

* Adaptive
* Strategic
* Synergistic

Vision not realized

Changes are substantive

* 61 new pages of permit text due to edits
* 258 pages of response to comments
* 9 working days to review revisions

Direct Staff and Stakeholders to meet and resolve issues.

How do Permit changes stack up?

* New WQIP provisions are unnecessarily complex, cumbersome, and unattainable.

RWL Compliance Option Needs Work

(iii) Numeric goals for receiving waters that will protect the conditions of the receiving waters and attain water quality standards.

ISSUE – Allow WQIP to work

All program elements should be "adaptable", including Provisions C, D and E

* Use limited resources to achieve highest priority outcomes
* Balance Santa Ana and San Diego MS4 Permit programs where appropriate to improve program performance

WQIP revisions still subject to stakeholder and Board review

Other WQIP Comments

* Support related comments by Orange
* Water Quality Consultation Panels should advise, but not consent

How do Permit changes stack up?

* New WQIP provisions are unnecessarily complex, cumbersome, and unattainable.

* Revised Development Provisions interfere with nascent “best practice” habits

Existing vs. New Development Requirements

* Existing Permits
  * Retain Design Capture Volume onsite;
  * If infeasible; biotreat non-retained portion
  * If infeasible; consider other BMPs or alternatives

Inconsistent with statewide practice

MS4 Permit	Volume Based Biofiltration Option
2010 Riverside Co. Permit	X
2009 Orange Co. Permit	X
2009 Ventura Permit	X
2013 Phase II MS4 Permit	X
2012 Los Angeles Co. Permit	X
2009 Bay Area Permit	X

Inconsistent with statewide practice

MS4 Permit	Volume Based Biofiltration Option	Pollutant Load based Biofiltration Option
2010 Riverside Co. Permit	X	
2009 Orange Co. Permit	X	
2009 Ventura Permit	X	
2013 Phase II MS4 Permit	X	
2012 Los Angeles Co. Permit	X	
2009 Bay Area Permit	X	
This Tentative Order		X

Existing vs. New Development Requirements

* Existing Permits
  * Retain Design Capture Volume onsite;
  * If infeasible; biotreat non-retained portion
  * If infeasible; consider other BMPs or alternatives

* This Permit
  * If you can't capture the water, capture the equivalent amount of pollutants

Functional equivalent to retention sounds like a simple standard - but

* Pollutant is specific to:
  * Development type
  * Downstream receiving waters
* Subject to acts of God
  * Spills
  * Illegal Activities
  * Extreme storms and weather
* Millions already invested in developing an effective development management plan IS JUST ROLLING OUT

New Development Program

- Continuous improvement program for 2012 LID BMP Handbook

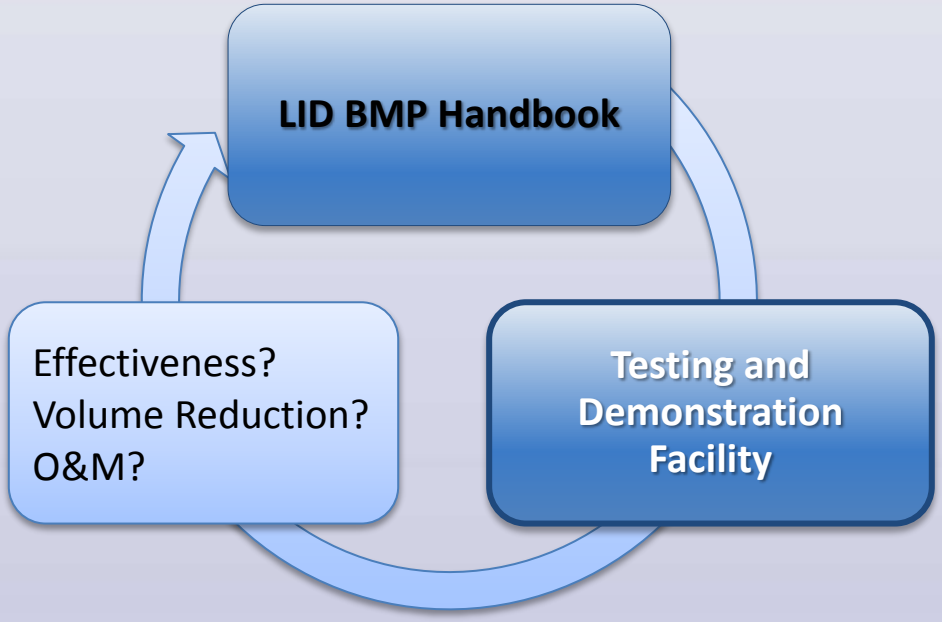

Riverside County

Multi-million dollar investment in LID

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

Low Impact Development Testing and Demonstration Facility – Post-Project

Permeable Pavers

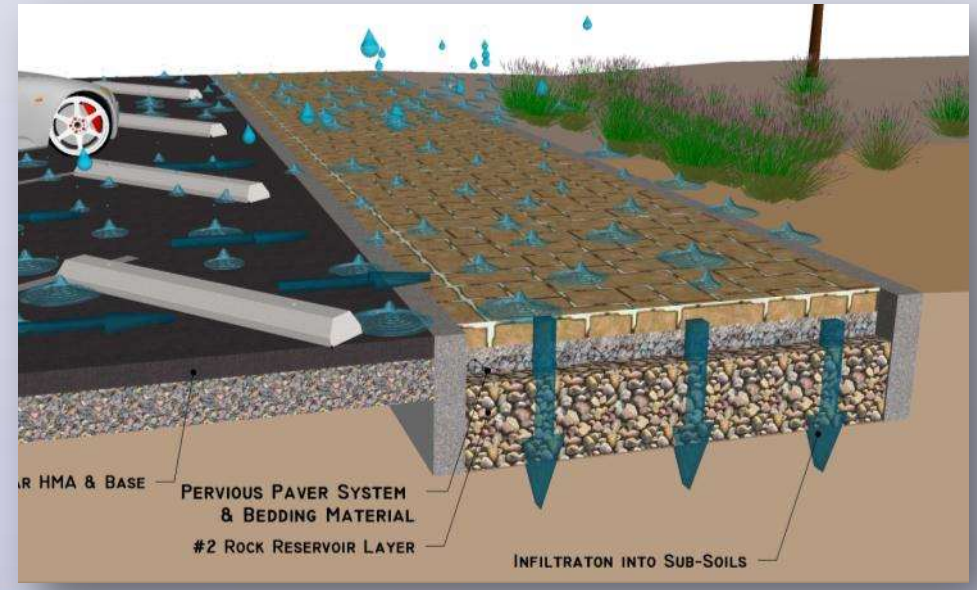

Testing / Observations:

- Design & Construction
- Durability
  - walkways vs. parking stalls vs. drive aisles
- Maintenance

Permeable Concrete (Parking stalls)

011919

Testing / Observations:

- Design & Construction
- Durability
- Maintenance
- Water Quality
- Volume / Hydrograph changes

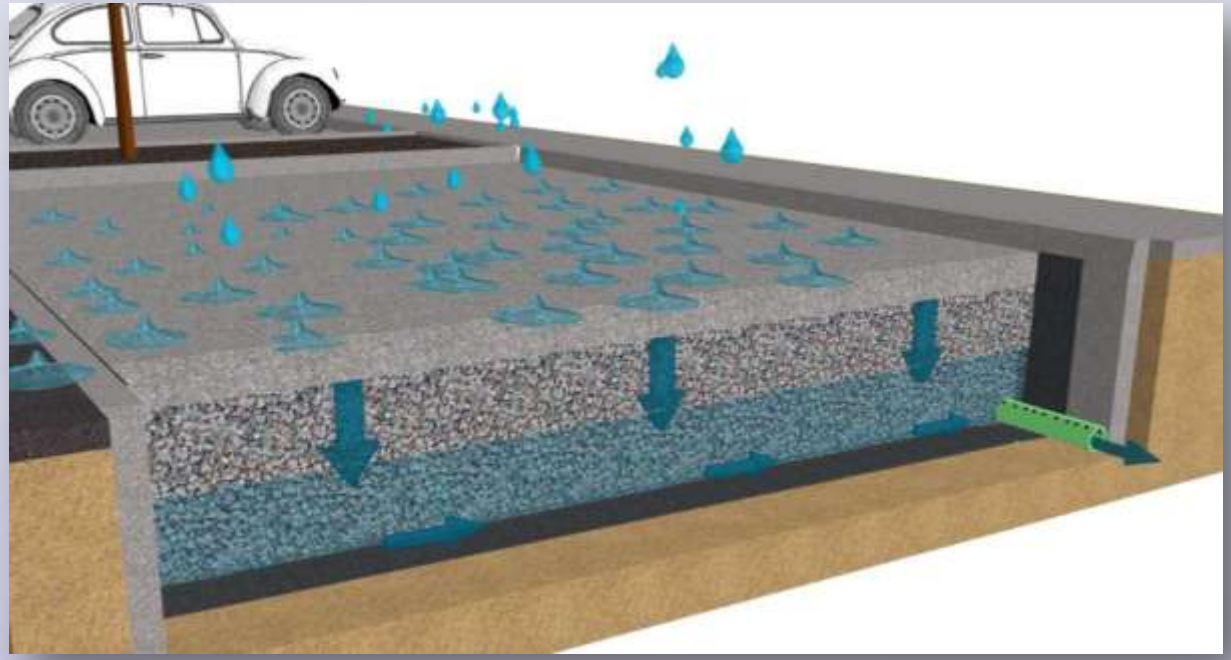

Permeable Asphalt (drive aisle)

011920

Testing / Observations:

- Design & Construction
- Durability
- Maintenance
- Water Quality improvements
- Volume / Hydrograph changes

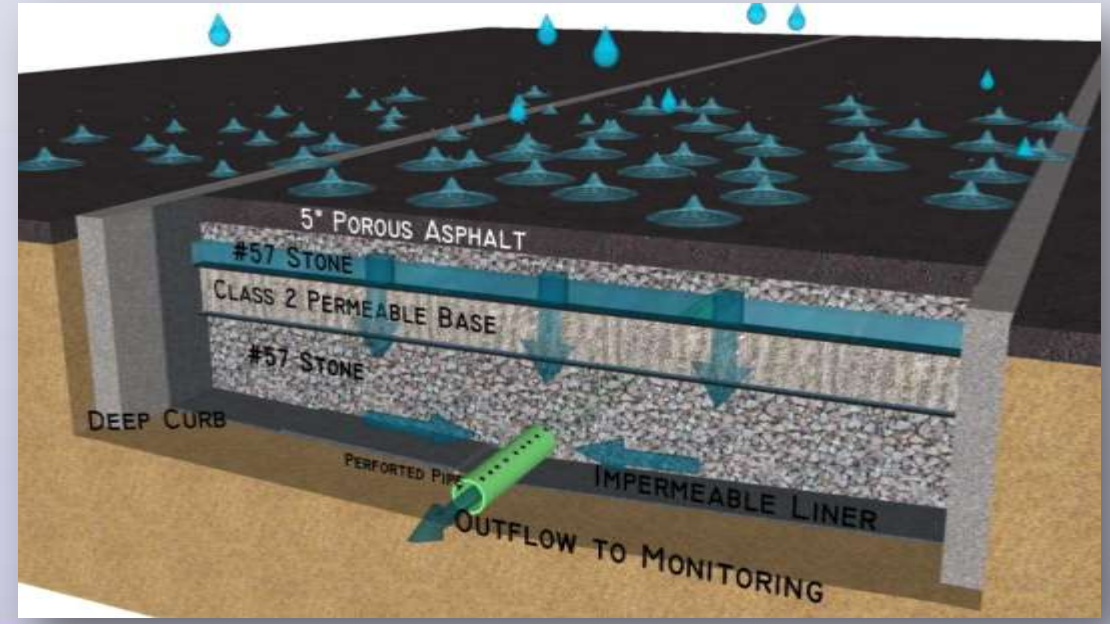

Biofiltration (in-ground)

011921

Testing / Observations:

- Design & Construction
- Vegetation Durability
- Engineered Media performance
- Maintenance
- Water Quality (as Bioretention)
- Water Quality (as a swale)
- Volume / Hydrograph changes

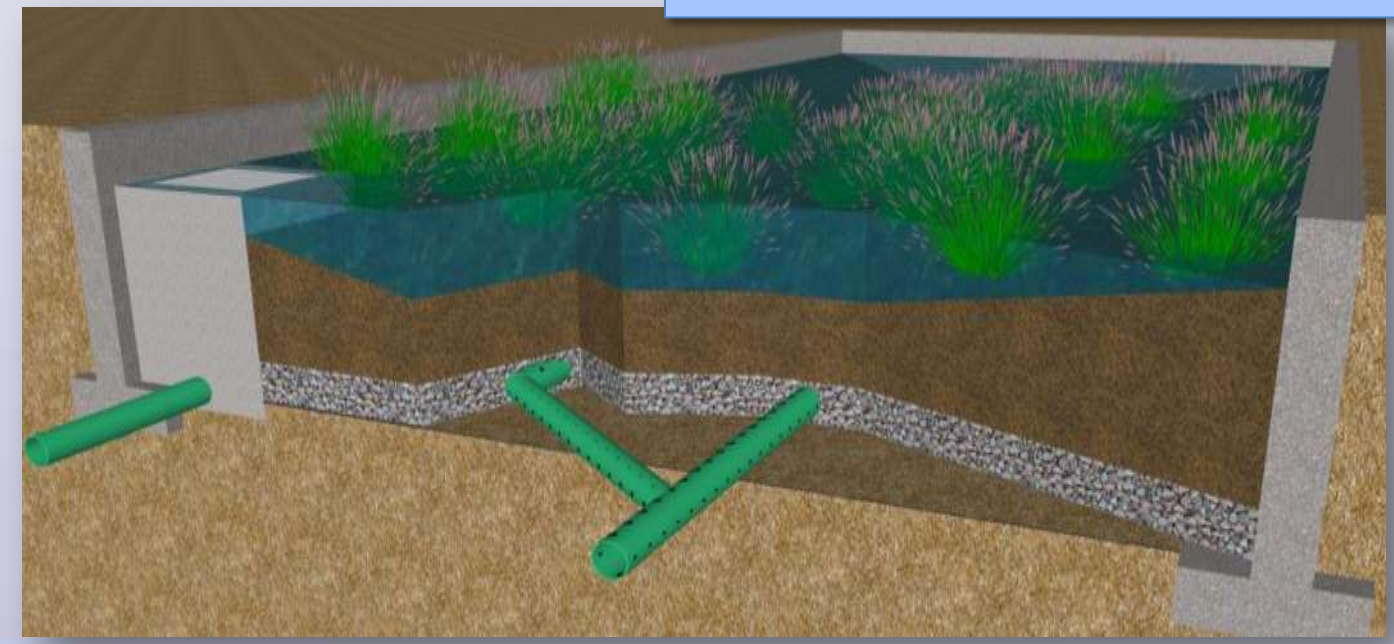

Biofiltration (above-ground planter boxes)

011922

Testing / Observations:

- Design & Construction considerations
- Vegetation Durability
- Engineered Media performance
- Maintenance considerations
- Water Quality improvements (through soil media)
- Volume / Hydrograph changes

Infiltration Basin

Testing / Observations:

- Design & Construction Infiltration Characteristics over time
- Maintenance

Monitoring Station

- 10 automated composite samplers
- Flow Meters

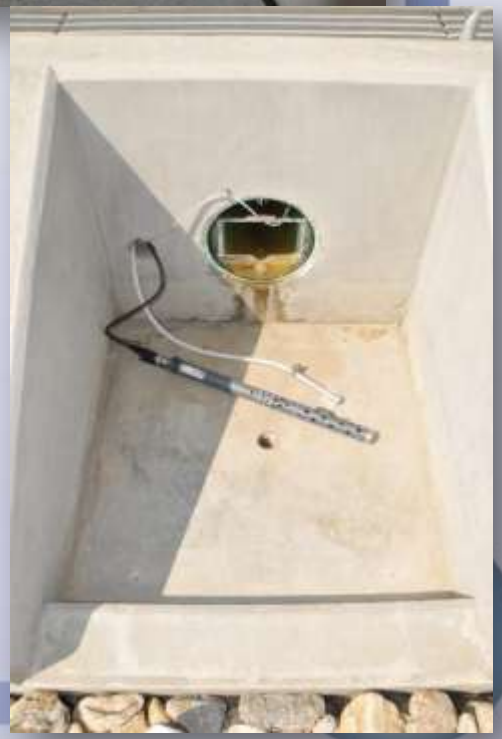

ASCE

(1) Storm Water Pollutant Control BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite structural BMPs to control pollutants in storm water that may be discharged from a project as follows:

(a) Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite ~~100 percent of the pollutants contained in~~ the volume of storm water runoff produced from a 24-hour 85th percentile storm event (design capture volume).[25]

(b) If a Copermittee determines that implementing BMPs to retain the full design capture volume onsite for a Priority Development Project is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize flow-thru treatment control BMPs to treat the design capture volume ~~to achieve the equivalent pollutant load removal~~ described in Provision E.3.c.(1)(a).

(i) Biofiltration LID BMPs must be considered as a first option before other types of flow-thru treatment control BMPs may be considered. The total volume of the Biofiltration BMPs, including pore spaces and pre-filter detention volume, shall be sized to hold at least 0.75 times the portion of the design capture volume that is not otherwise retained onsite.

~~(i)~~(ii) If Biofiltration is not feasible, a priority development project is allowed to utilize other flow-thru treatment control BMPs pursuant to Provision E.3.c.(1)(d) below.

David Garcia

Senior Civil Engineer

Riverside County Flood Control and Water Conservation District

Three items of concern

1. **Sediment Transport**

Hydromod Management BMP RequirementsE.3.c.(2)

2. **Alternative Compliance Program** to Onsite Structural BMP Implementation E.3.c.(3) page 96

3. **Proposed- Flood Control Projects Exemption**

Concern 1: Sediment Transport Hydromod Management BMP Requirements E.3.c.(2)

011929

New Permit requirement:

Each Priority Development Project must avoid known critical sediment yield areas or implement measures that allow coarse sediment to be discharged to receiving waters, such that the sediment supply is unaffected by the project.

Recommendation:

E.3.c.(2)(b)

(b) Each Priority Development Project must avoid impacts to receiving waters from known critical sediment yield areas or implement measures that allow coarse sediment to be discharged to receiving waters, such that the ~~sediment supply~~receiving water is unaffected by the project to the MEP.

Concern 2: Alternative Compliance Program to Onsite Structural BMP Implementation E.3.c.(3)

011930

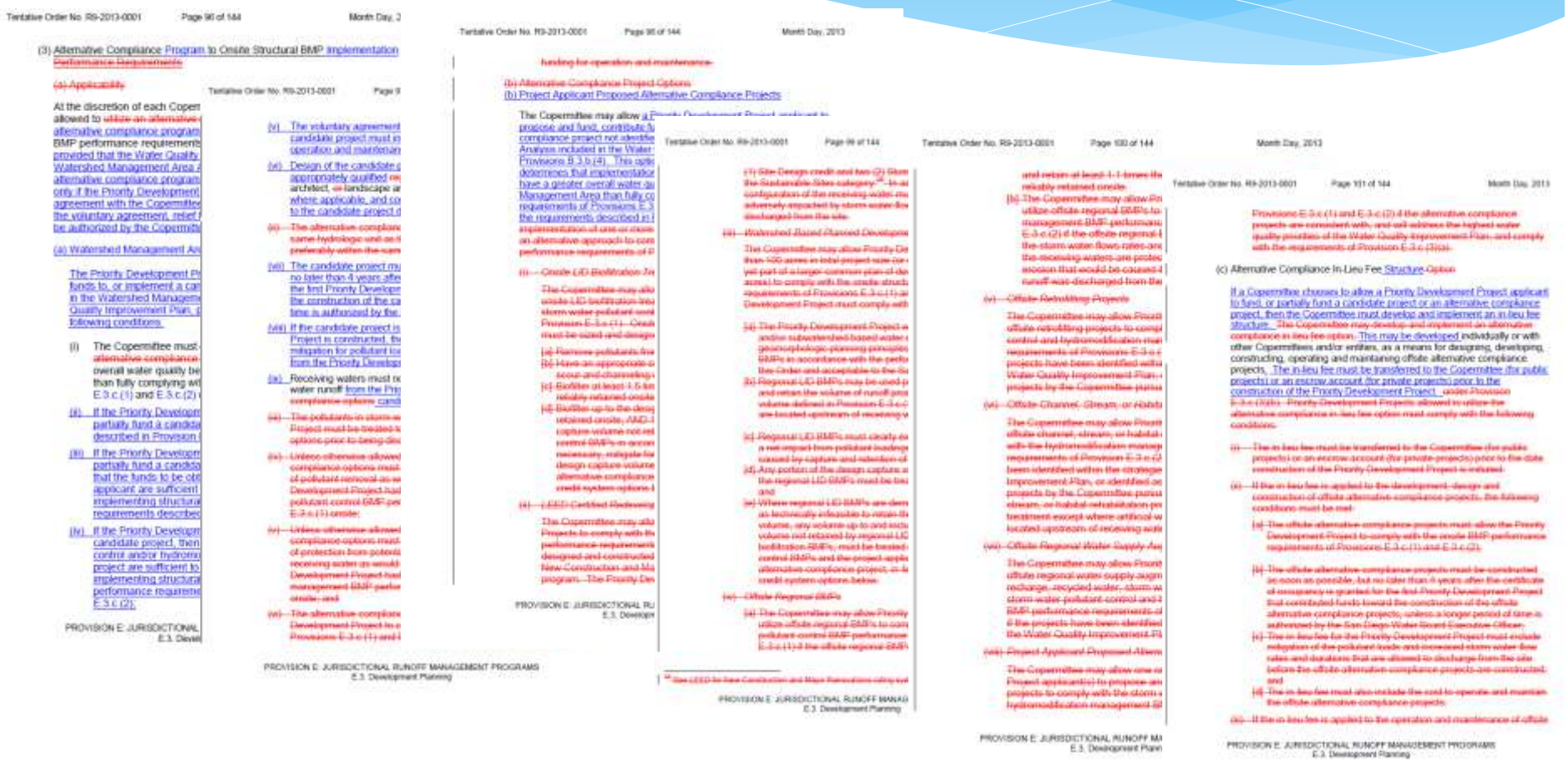

Alternative Compliance Program

Goal: Provide opportunity for cost effective multi-purpose, multi-function regional projects

* Leverage third party resources
* Facilitates watershed scale solutions

Complications- prescription potentially negates benefit

Alternative Compliance Issues

-No alternative compliance option for Critical Sediment Yield areas

-Temporary mitigation required

Concern 2: Recommendations

E.3.c.(2)(c) and (d)

(c) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the performance requirements of Provision E.3.c.(2)(a)-(b). The Priority Development Project must mitigate for the post-project runoff conditions not fully managed onsite if Provision E.3.(c)(3) is utilized.

(d) Exemptions

Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provisions E.3.c.(2)(a)-(b) where the project discharges storm water runoff to:

Remove E.3.c.(3)(a) viii and ix

~~(viii) If the candidate project is constructed after the Priority Development Project is constructed, the Copermittee must require temporal mitigation for pollutant loads and altered flows that are discharged from the Priority Development Project; and~~

~~(ix) Receiving waters must not be utilized to convey untreated storm water runoff from the Priority Development Project to the candidate project;~~

Concern 3: Need Flood Control Project Exemption

Our mission: Protect our watersheds

Flood control projects are watershed protection projects, they consist of:

-Flood risk reduction
-Protection from catastrophic environmental disasters.
-Erosion mitigation
-Stream restoration
-Slope stability
-Water reclamation

Concern 3: Need Flood Control Project Exemption

Response to comments (E3B-3) Pg. 166

The San Diego Water Board further disagrees that there should be exemptions for emergency projects or flood control projects….The San Diego Water Board believes that it may be suitable to relax the structural BMP standards for, or exempt flood control projects, but not before projects are evaluated on a case-by-case basis.

* We do not see the flexibility provided for in the permit

Concern 3: Recommendations

Proposed E.3.b.(3)(c)

~~(b)~~(c) Flood control and watershed management projects that have minimized the need for impervious surfaces to the MEP, consistent with requirements to protect public health and safety.

Concern 3: Recommendations cont..

Maintenance is critical

Add Language from LA Permit to the Attachment C: Definition of "Redevelopment:

Redevelopment - The creation and/or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include trenching and resurfacing associated with utility work; resurfacing existing roadways; new sidewalk construction, pedestrian ramps, or bike lane on existing roads; ~~and~~ routine replacement of damaged pavement, such as pothole repair; and routine maintenance to maintain original line and grade, hydraulic capacity or original purpose of facility; and emergency construction activities required to immediately protect public health and safety.

Patricia Romo

Assistant Director
Riverside County Transportation and Land Management Agency

Transportation Projects

- Linear
- Publicly funded
- Limited public right of way

Transportation Projects

- **Add "Redevelopment" Projects to Provision E.3.(b)(3)(b) – PDP**

- **Exemptions - Provide for USEPA Green Streets Guidance**
  - Redevelopment Projects
    - Constraints
      - Limited ROW
      - Linear in Nature
      - Utilities
      - Strict Timelines on State and Federal Funding
      - Improvements required for Public Safety

Transportation Projects

* **Consistency with Provisions of Riverside County MS4 Permit (R9-2010-0016) and other So. Cal. Existing MS4 Permits**
  - Riv. Co. WQMP/TPG submitted July 2, 2012
  - Provides for certainty in 2015

* **Benefits of TPG**
  - Would incorporate LID BMPs to the MEP
  - Allows time sensitive projects to proceed without delay
  - Ensures projects do not get "shelved" due to costly individual projects
  - Eliminates need to condemn property for the purpose of treating runoff from site specific project
  - Meets Public expectation – Safe Roads
  - Reduces costly litigation from delaying needed road enhancements

Final Request

* Direct Staff and stakeholders to meet to resolve remaining permit issues and develop a broadly supported order.

* Consider specific redline provisions provided.

* Build Permit that is not only adaptive, strategic and synergistic; but also reasonable, cost effective and science-based.

(3) Priority Development Project Exemptions

Each Copermittee has the discretion to exempt the following projects from being defined as Priority Development Projects:

(a) New or retrofit paved sidewalks, bicycle lanes, or trails that meet the following criteria:

(i) Designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas; OR

(ii) Designed and constructed to be hydraulically disconnected from paved streets or roads; OR

(iii) Designed and constructed with permeable pavements or surfaces in accordance with USEPA Green Streets guidance.[23]

(b) New development~~, R~~retrofitting or redevelopment of existing paved alleys, streets or roads that are designed and constructed in accordance with the USEPA Green Streets guidance.[24]

~~(b)~~(c) Flood control and watershed management projects that have minimized the need for impervious surfaces to the MEP, consistent with requirements to protect public health and safety.

c. PRIORITY DEVELOPMENT PROJECT STRUCTURAL BMP PERFORMANCE REQUIREMENTS

In addition to the BMP requirements listed for all development projects under Provision E.3.a, Priority Development Projects must also implement structural BMPs that conform to performance requirements described below.

(1) Storm Water Pollutant Control BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite structural BMPs to control pollutants in storm water that may be discharged from a project as follows:

(a) Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite ~~100 percent of the pollutants contained in~~ the volume of storm water runoff produced from a 24-hour 85th percentile storm event (design capture volume);[25]

[23] See "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).
[24] Ibid.
[25] This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are

(b) If a Copermittee determines that implementing BMPs to retain the full design capture volume onsite for a Priority Development Project is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize flow-thru treatment control BMPs to treat the design capture volume ~~to achieve the equivalent pollutant load removal~~ described in Provision E.3.c.(1)(a).

(i) Biofiltration LID BMPs must be considered as a first option before other types of flow-thru treatment control BMPs may be considered. The total volume of the Biofiltration BMPs, including pore spaces and pre-filter detention volume, shall be sized to hold at least 0.75 times the portion of the design capture volume that is not otherwise retained onsite.

~~(i)~~(ii) If Biofiltration is not feasible, a priority development project is allowed to utilize other flow-thru treatment control BMPs pursuant to Provision E.3.c.(1)(d) below.

~~(b)~~(c) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1)(a). The Priority Development Project alternative compliance project must mitigate for the portion of the pollutant load in the design capture volume not retained onsite if Provision E.3.(c)(3) is utilized.

~~(c)~~(d) ~~If a Priority Development project is allowed to utilize alternative compliance, flow-thru treatment control BMPs must be implemented to treat the portion of the design capture volume that is not retained onsite.~~ Flow-thru treatment control BMPs must be sized and designed to:

(i) Remove pollutants from storm water to the MEP;

(ii) Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;

(iii) Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Flow-thru treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility

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to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals.

analysis has been conducted which exhibits that implementation of flow-thru treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

(2) Hydromodification Management BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite BMPs to manage hydromodification that may be caused by storm water runoff discharged from a project as follows:

(a) Post-project runoff conditions (flow rates and durations) must not exceed pre-development runoff conditions by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat downstream of Priority Development Projects).

(i) In evaluating the range of flows that results in increased potential for erosion of natural (non-hardened) channels, the lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks.

(ii) The Copermittees may use monitoring results collected pursuant to Provision D.1.a.(2) to re-define the range of flows resulting in increased potential for erosion, or degraded instream habitat conditions, as warranted by the data.

(b) Each Priority Development Project must avoid impacts to receiving waters from known critical sediment yield areas or implement measures that allow coarse sediment to be discharged to receiving waters, such that the ~~sediment supply~~receiving water is unaffected by the project to the MEP.

(c) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the performance requirements of Provision E.3.c.(2)(a)-(b). The Priority Development Project must mitigate for the post-project runoff conditions not fully managed onsite if Provision E.3.(c)(3) is utilized.

(d) Exemptions

Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provisions E.3.c.(2)(a)-(b) where the project discharges storm water runoff to:

(i) Existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific

(v) The voluntary agreement to fund, partially fund, or implement a candidate project must include reliable sources of funding for operation and maintenance of the candidate project;

(vi) Design of the candidate project must be conducted under an appropriately qualified engineer, geologist, architect, landscape architect, or other professional, licenses where applicable, and competent and proficient in the fields pertinent to the candidate project design; and

(vii) The candidate project must be constructed as soon as possible, but no later than 4 years after the certificate of occupancy is granted for the first Priority Development Project that contributed funds toward the construction of the candidate project, unless a longer period of time is authorized by the San Diego Water Board Executive Officer.~~; and~~

~~(viii) If the candidate project is constructed after the Priority Development Project is constructed, the Copermittee must require temporal mitigation for pollutant loads and altered flows that are discharged from the Priority Development Project; and~~

~~(ix) Receiving waters must not be utilized to convey untreated storm water runoff from the Priority Development Project to the candidate project;~~

(b) Project Applicant Proposed Alternative Compliance Projects

The Copermittee may allow a Priority Development Project applicant to propose and fund, contribute funds to, or implement an alternative compliance project not identified by the Watershed Management Area Analysis included in the Water Quality Improvement Plan pursuant to Provisions B.3.b.(4). This option is allowed provided the Copermittee determines that implementation of the alternative compliance project will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite, and is subject to the requirements described in Provisions E.3.c.(3)(a)(ii)-(~~ix~~vii).

(c) Alternative Compliance In-Lieu Fee Structure

If a Copermittee chooses to allow a Priority Development Project applicant to fund, or partially fund a candidate project or an alternative compliance project, then the Copermittee must develop and implement an in-lieu fee structure. This may be developed individually or with other Copermittees and/or entities, as a means for designing, developing, constructing, operating and maintaining offsite alternative compliance projects. The in-lieu fee must be transferred to the Copermittee (for public projects) or an escrow account (for private projects) prior to the construction of the

Receiving Water Limitations - Waste discharge requirements issued by the San Diego Water Board typically include both: (1) "Effluent Limitations" (or "Discharge Limitations") that specify the technology-based or water-quality-based effluent limitations; and (2) "Receiving Water Limitations" that specify the water quality objectives in the Basin Plan as well as any other limitations necessary to attain those objectives. In summary, the "Receiving Water Limitations" provision is the provision used to implement the requirements of CWA section 402(p)(3)(B).

Redevelopment - The creation and/or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include trenching and resurfacing associated with utility work; resurfacing existing roadways; new sidewalk construction, pedestrian ramps, or bike lane on existing roads; ~~and~~ routine replacement of damaged pavement, such as pothole repair; and routine maintenance to maintain original line and grade, hydraulic capacity or original purpose of facility; and emergency construction activities required to immediately protect public health and safety.

Regional Clearinghouse – A central location for the collection and distribution of information developed and maintained by the Copermittees including, but not limited to, plans, reports, manuals, data, contact information, and/or links to such documents and information.

Rehabilitation - Remedial measures or activities for the purpose of improving or restoring the beneficial uses of streams, channels or river systems. Techniques may vary from in-stream restoration techniques to off-linestormwater management practices installed in the system corridor or upland areas, or a combination of in-stream and out of stream techniques. Rehabilitation techniques may include, but are not limited to the following: riparian zone restoration, constructed wetlands, channel modifications that improve habitat and stability, and daylighting of drainage systems.

Reporting Period – The period of information that is reported in the Water Quality Improvement Plan Annual Report. The reporting period consists of two components: 1) July 1 to June 30, consistent with the fiscal year, for the implementation of the jurisdictional runoff management programs, and 2) October 1 to September 30, consistent with the monitoring year for the monitoring and assessment programs. Together, these two time periods constitute the reporting year for the Water Quality Improvement Plan Annual Report due January 31 following the end of the monitoring year.

Retain –Keep or hold in a particular place, condition, or position without discharge to surface waters.

Retrofitting – Storm water management practice put into place after development has occurred in watersheds where the practices previously did not exist or are ineffective. Retrofitting of developed areas is intended to improve water quality, protect downstream channels, reduce flooding, or meet other specific objectives. Retrofitting developed areas may include, but is not limited to replacing roofs with green roofs, disconnecting downspouts or impervious surfaces to drain to pervious surfaces, replacing impervious surfaces with pervious surfaces, installing rain barrels, installing rain gardens, and trash area enclosures.

Runoff - All flows in a storm water conveyance system that consists of the following

011948

County of San Diego

Comments of Tentative Order No. R9-2013-0001

April 10-11, 2013

Provision A – Receiving Water Limitations SDRWQCB Response LGL-1

- Response LGL-1 asserts nothing has changed as a result of *NRDC* Ninth Circuit opinion.

- The reality is that a court has now issued a ruling with the result that, unless compliance with RWL language is linked to the iterative process, copermittees can be sued for RWL violations at any time.

- Tentative Order, as issued, does not support the WQIP iterative process, it undermines it.

Provision A – Receiving Water Limitations SDRWQCB Response LGL-1

- MS4 Permit holders seek what Congress intended – MEP to be achieved over time due to unique challenges of stormwater control.
- Including a prohibition that Ninth Circuit interprets as immediately enforceable at third parties' election is bad policy.
- Response glosses over language of State Board Order WQ 2001-15 endorsing compliance with water quality standards over time.

Provision A – Receiving Water Limitations SDRWQCB Response LGL-1

SOLUTION

- Remove RWL Language; thereby permitting the iterative process you have created to work – discretion exists under *Browner,* as even acknowledged in State Board Order WQ 2001-15;

Or in the alternative,

- Define Compliance in Concrete Terms in Provision A – Linked to the WQIP and Iterative Process.

- Unless Provision A is directly linked, the WQIP process created and supported by copermittees is impaired.

Bacteria TMDL Numeric Effluent Limitations SDRWQCB Response LGL-4

Reliance on USEPA November 12, 2010 Memorandum is Legally Improper:

- EPA Region 9 affirms the Memo is a basis for supporting incorporating NELs into the Permit.
- Memo Has Still Not Been Reviewed for Propriety by US Office of Management and Budget.
- Regardless, under recent U.S. Court of Appeal decision in *Iowa League of Cities v. EPA No. 11-3412* (8th Cir., March 25, 2013) the Memo constitutes improper rule making and cannot support SDRWQCB's analysis.

Bacteria TMDL Numeric Effluent Limitations SDRWQCB Response LGL-4

- Your responses affirm SDRWQCB's discretion under *Browner* in support of various permit provisions.

- However, your response disavows SDRWQCB's discretion to recognize the flawed scientific basis for Bacteria TMDL provisions and revisit the bacteria WLAs through a Basin Plan amendment process.

- SDRWQCB has absolute discretion under CWA 402 and Browner to fix a flawed Bacteria TMDL which, when implemented through this permit, will cost billions with unknown public dollar benefit to clean water efforts.

Bacteria TMDL Numeric Effluent Limitations SDRWQCB Response LGL-4

- State Board Order WQO 2002-15, "In general, the Board agrees that, where a Regional Water Quality Control Board has evidence that a designated use does not exist and likely it cannot be feasibly attained, it is unreasonable to require a discharger to incur control costs to protect that use." See also, *California Assn. of Sanitation Agencies v. State Water Resources Control Board* 208 Cal.App.4th 1438 (2012)

- This principle of unreasonable costs for an infeasible result should be reviewed in context of Bacteria TMDL.

Bacteria TMDL Numeric Effluent Limitations SDRWQCB Response LGL-4

- Costs of compliance with Bacteria TMDL NELs has been reliably quantified. Range of $2.8B-$5.1B.
- The assertion in response to comments that we fail to factor in costs of not implementing TMDL is misplaced.
- Fact Sheet affirms that no reliable study has quantified economic value of TMDL. (F-19)
- To contrary, PLNU Study (April 2011) just released to public shows cost outweighs benefit by 6 to 1 ratio.

Bacteria TMDL Numeric Effluent Limitations SDRWQCB Response LGL-4

SOLUTION

- Do not Incorporate Bacteria TMDL Numeric Effluent Limitations into this Permit.
- Open a process to revisit the Basin Plan Amendment for Bacteria in Beaches/Creeks that is scientifically sound, incorporates recent and nearly completed studies, has positive cost-benefit to taxpayers.

011957

Technical Concerns with the Inclusion of Bacteria TMDL into the San Diego Region MS4 Permit

Todd Snyder, County of San Diego
Ken Susilo, PE, D.WRE, CPSWQ, Geosyntec Consultants

011958

Science (Reference Approach)

- Reference Watershed Exceeds Wet Weather TMDL Standard about 50% of the Wet Time (Dry over 85%)

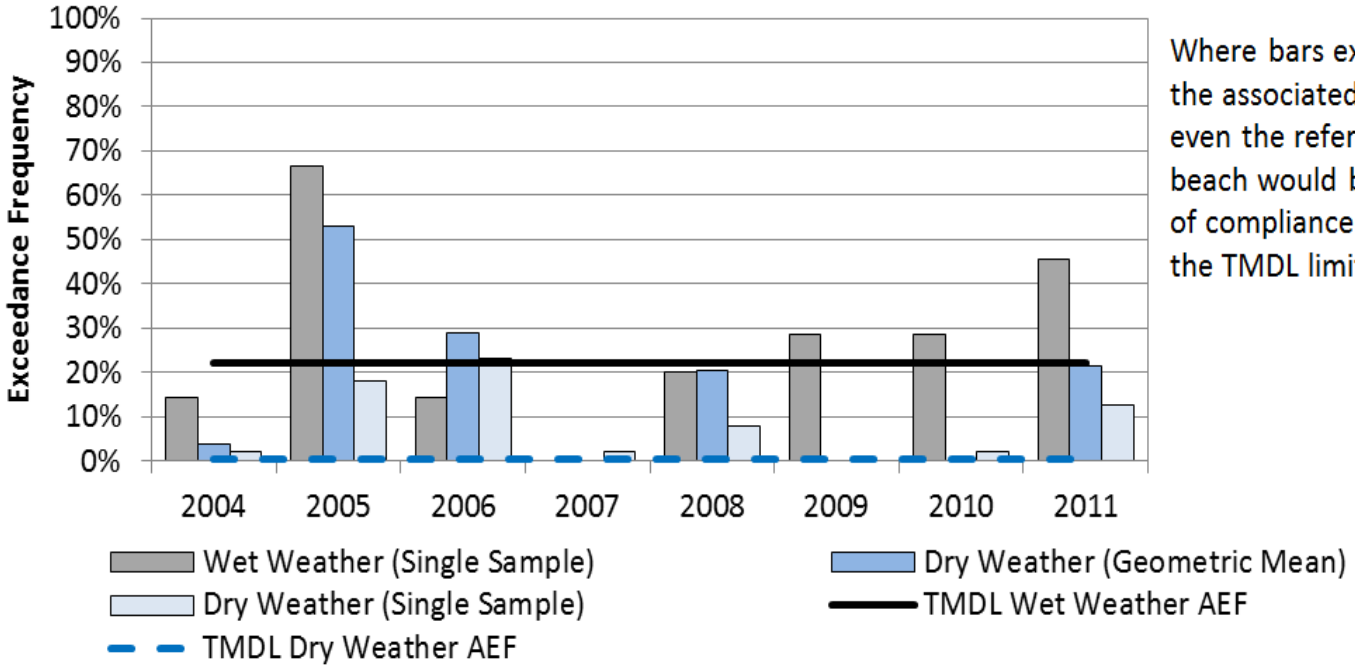

Where bars exceed the associated AEF, even the reference beach would be out of compliance with the TMDL limits.

Notes:

1. 30-day Rolling GM - Geometric mean calculation performed every week, on the dry weather samples within the previous 30-days period, if 5 or more samples have been taken in the 30-day period.

Attainability (BMP Performance vs WQBELs)

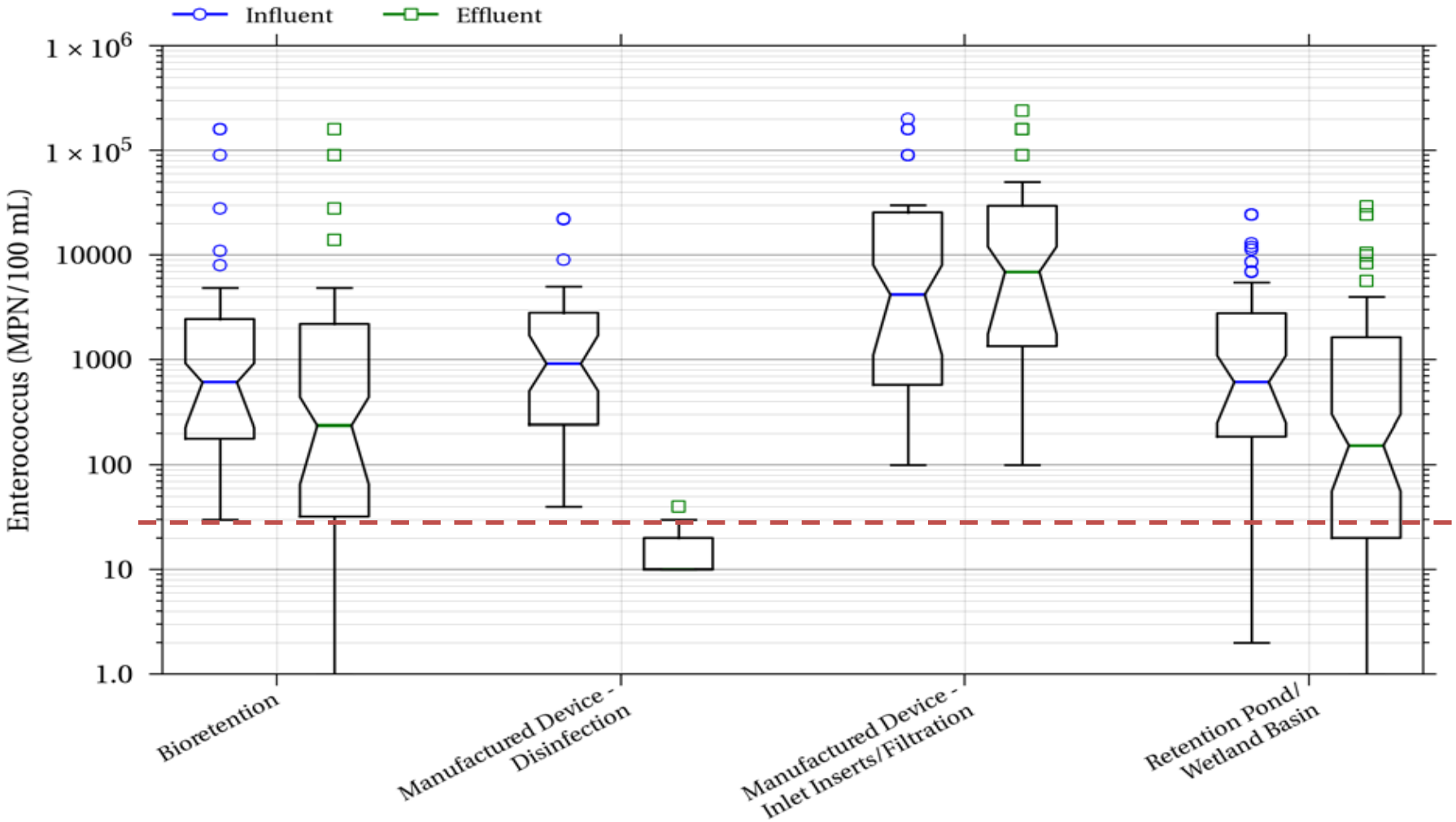

Clary, J., B. Steets, J. Jones, E. Strecker, M. Leisenring.
Fecal Indicator Bacteria Reduction in Urban Runoff. October 2012. <www.stormh20.com>.

011960

Benefit-Cost (Public Health Benefits)

Regional Public Health Cost Estimates from Los Angeles and Orange County (Given et al, 2006)

	Wet Season (Nov-Apr)		Dry Season (May-Oct)	Total
Health Costs[a]	$1.6M-$8.5M		$19.3M -$40.8	$20.9-$49.3
% of Total Cost	8-17%		80-92%	
Days	Wet Season Wet Weather	Wet Season Dry Weather	Dry Season Dry Weather	
Number of Days	40[b]	141	184	
Adjusted Health Costs	$360K-$1,883K	$20.5M - $47.4M		
Adjusted Percent of Total Health Cost	**2-4%**	**96-98%**		

[a] Given, et al., 2006.

[b] Estimate based on six month wet season (181 days). Costs assumed to be proportional to days within season.

011961

Benefit-Cost* (Comparative Public Health Basis)

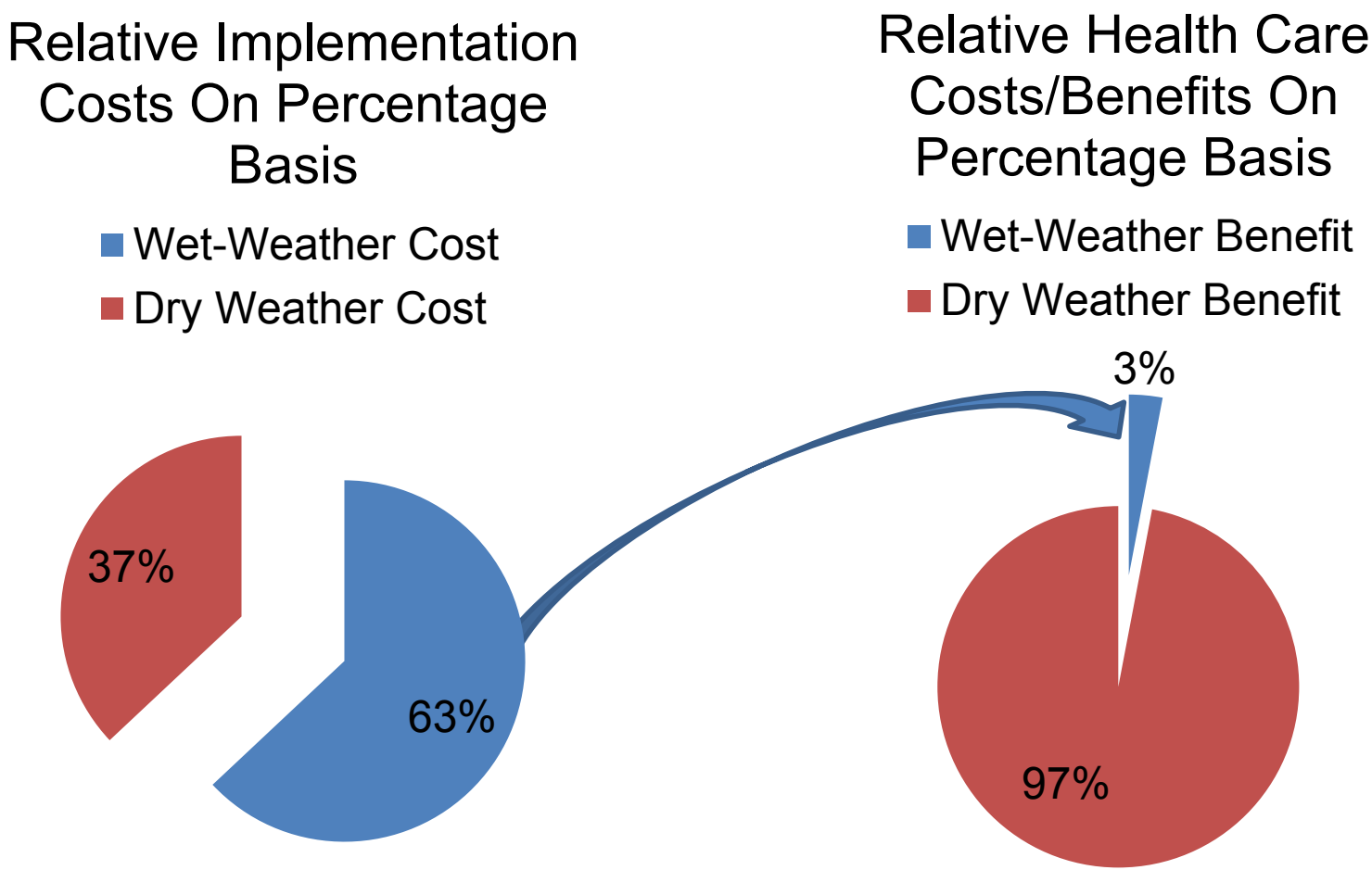

Costs estimated from the average of high and low estimates from the San Diego river and San Luis Rey Watershed CLRPs

011962

Benefit-Cost (Composite Wet-Dry Study)

- City of San Diego-commissioned study performed by economists at Point Loma Nazarene University (April 2011)
  - Estimated costs to City of San Diego $3.7B
  - Estimated benefits $617M
    - Implicit Beach Value (off limit days from 40 to 8)
    - Economic Value (direct spending + multiplier)
    - Health Care Savings (GI, Acute Respiratory Disease, Ear Infection, Eye Infection)
  - Costs outweigh benefits by 6 to 1.

Recommendations

- Do Not Incorporate Bacteria TMDL Numeric Effluent Limitations into this Permit.

- Open a process to revisit the Basin Plan Amendment for Bacteria in Beaches/Creeks that is scientifically sound, incorporates recent and nearly completed studies, has positive cost-benefit to taxpayers.

San Diego Unified Port District: Tentative Order No. R9-2013-0001 Regional MS4 Permit Hearing Presentation

April 10-11, 2013

Jurisdictional Monitoring

- Port agrees with Regional Board that jurisdictional monitoring is necessary to determine source of exceedances
  - Ability for Copermittee to conduct additional, voluntary monitoring, above requirements in MS4 Permit is key
- Location of additional stations is critical
  - Monitoring at MS4 outfalls and receiving water not sufficient to identify sources of pollutants outside of Copermittee's legal authority to control
    - *See NRDC, Inc. v. County of Los Angeles* (9th Cir. 2011) 673 F.3d 880; *Los Angeles Flood Control Dist. v. NRDC, Inc.* (U.S. Supreme Court 2013) 133 S. Ct. 710

MS4 Owner/Operator Liability

- Copermittee should only be liable for discharges from MS4 facility **owned or operated** by the Copermittee
  - Liability cannot be assigned based on discharges from MS4 facility that is **located** within a Copermittee's geographic jurisdiction
- Liability based on modeling of storm water is not appropriate
  - *See Virginia Dep't of Transp. v. U.S. EPA, et al.*, No. 1:12-CV-775 (E.D. Va. Jan. 3, 2013)
- Particularly relevant for Port
  - Port's jurisdiction overlaps with jurisdiction of several Copermittees/contains MS4 facilities not owned/operated by Port
- Regional Board appears to acknowledge that MS4 liability requires ownership or operation of MS4 facility
- Port proposes that the MS4 Permit be revised to state:
  - "The location of an MS4 facility within any Copermittee's jurisdiction boundaries does not, of itself, make the Copermittee an owner or operator of that MS4 facility."

TMDLs Should not be Incorporated into MS4 Permit

- Regional Board has discretion not to incorporate TMDLs into MS4 Permit
  - TMDLs not in prior MS4 permits
- TMDLs are not a good fit for MS4 Permit
  - Incorporating TMDL compliance schedules/requirements into MS4 Permit may create numeric limits
  - Given legal issues and potential uncertainty of TMDL enforceability, inclusion of TMDLs may subject MS4 Permit to collateral challenge
- Economic considerations/compliance costs cannot be considered by Regional Board to set numeric limits in the MS4 Permit that are less stringent than federal standards
  - *See City of Burbank v. State Water Resources Bd.* (2005) 35 Cal.4th 613
- Copermittees willing to implement BMPs to MEP
  - More reasonable approach than including TMDLs in MS4 Permit

011968

San Diego Regional MS4 Permit

Environmental Group Testimony

April 10-11, 2013

Jill Witkowski, San Diego Coastkeeper
Noah Garrison, Natural Resources Defense Council
Colin Kelly, Orange County Coastkeeper and
Inland Empire Waterkeeper

011969

The Good:
ity Improvem

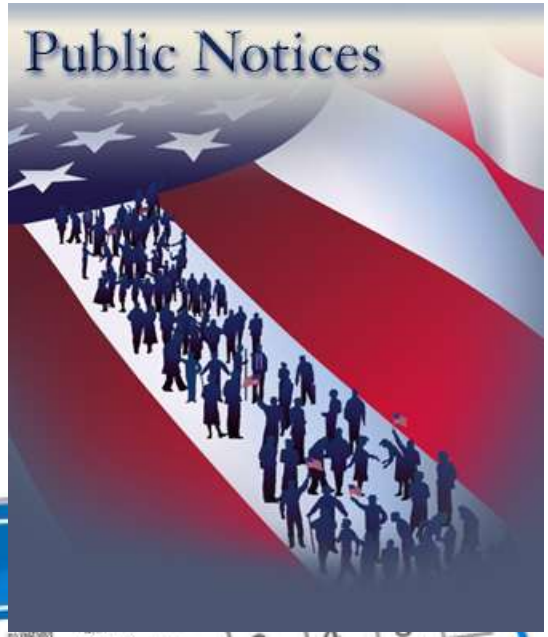

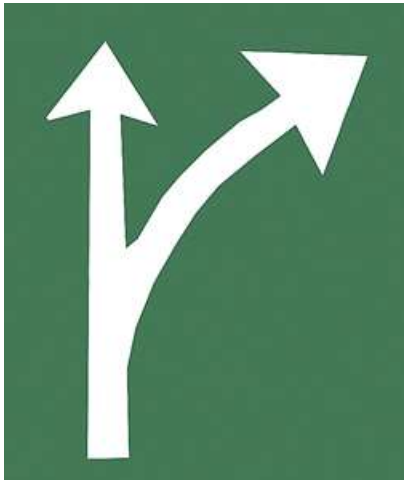

The Good:
Development Requirements

Retain volume same as undeveloped condition, determined through modeling

vs.

"THE POISON PILL"

The Clean Water Act

(OC Register)

(LA Times)

The Proposed Receiving Water Limitation Compliance Option

Proposed "Compliance Option" approach under section II.B.3.c is an impractical and illegal "Safe Harbor"

- Proposes safe harbors where none existed in previous permit
- Violates Anti-Backsliding Requirements
- Violates Antidegradation Requirements
  - Where no TMDLs exist, allows lowering of water quality while WQIPs are being implemented.
- Requires intensive staff and stakeholder resources.

Beneficial Uses and Water Quality Standards

State must adopt water quality standards – include maximum permissible pollutant levels sufficiently stringent to protect public health and enhance water quality consistent with designated uses.

33 U.S.C. §§ 1311(b)(1)(C), 1313

Water quality standards provide a basis for regulating discharges "to prevent water quality from falling below acceptable levels."

PUD No. 1 of Jefferson County v. Washington Dep't of Ecology (1994) 511 U.S. 700, 704

Receiving Water Limitations

2001 San Diego MS4 Permit:

Discharges from the MS4 that cause or contribute to the violation of Water Quality Standards or water quality objectives are prohibited.

Receiving Water Limitations

9th Circuit Court of Appeals:

> "no such 'safe harbor' is present in this Permit . . . . [there is] no textual support for the proposition that compliance with certain provisions shall forgive non-compliance with the discharge prohibitions."

Natural Resources Defense Council v. County of Los Angeles (2011) 673 F.3d 880, 897

2013 Tentative Order:

> "The Copermittees may utilize implementation of the . . . Water Quality Improvement Plan to demonstrate compliance . . . For each Copermittee in the Watershed Management Area that chooses to utilize this option, the Copermittee will be in compliance with Provisions A.1.a, A.1.c and A.2.a. . ."

Permit at section II.B.3.c.(1)

Receiving Water Limitations

"we conclude the Permit's Water Quality Standards are proper under federal law."

Building Industry Assoc. of San Diego County v. State Water Resources Control Bd. (2004) 124 Cal.App.4th 866, 880

The Regional Board "included Parts 2.1 and 2.2 in the Permit without a 'safe harbor.'" These are independently enforceable requirements that prohibit discharges that cause or contribute to a violation of Water Quality Standards.

L.A. County Mun. Storm Water Permit Litigation, No. BS 080548 at 7 (L.A. Super. Ct. March 24, 2005)

Anti-Backsliding

Anti-Backsliding:

"when a permit is renewed or reissued, interim effluent limitations, standards, or conditions must be at least as stringent as the final effluent limitations, standards, or conditions in the previous permit."

40 C.F.R. 122.44(l)(1)

Anti-Backsliding

- The RWL provisions have been in effect since 2001.
- Neither the 2001 or 2007 Permits contained a safe harbor for receiving water violations - the 9th Circuit decision or Supreme Court decisions did not change that.
- EPA Region 3 Letter – additional time to comply violates anti-backsliding provision.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

AUG 0 8 2012

Mr. Jay Sakai, Director
Water Management Administration
Maryland Department of the Environment
1800 Washington Boulevard
Baltimore, Maryland 21230

"Backsliding is prohibited in NPDES permits. . . . Allowing additional time to complete a task that was required by the previous permit constitutes a less stringent condition and violates the prohibition against anti-backsliding."

referenced permit pursuant to 40 C.F.R. §§ 123.44(b)(1) and (c)(1) and Section III.A of the MOA. As further explained herein, EPA believes that several substantive requirements for MS4 permits, as required by the federal Clean Water Act, 33 U.S.C. §§ 1251 *et seq.* (CWA), and its implementing regulations, have not been incorporated into the Prince George's County permit.

EPA's objection to the draft permit and identification of revisions needed before EPA can remove the objection, *see* 40 C.F.R. § 123.44(b)(2)(ii), are described below:

1. **Water Quality Standards**

Federal regulations require that all NPDES permits contain limitations to control discharges which may cause, have the reasonable potential to cause or contribute to an excursion above water quality standards. 40 C.F.R. §122.44(d)(1)(i). Part VI of the draft Prince George's County permit (Enforcement and Penalties) contains general language

Printed on 100% recycled/recyclable paper with 100% post-consumer fiber and process chlorine free.
Customer Service Hotline: 1-800-438-2474

Exhibit 7-2 Application of anti-backsliding requirements

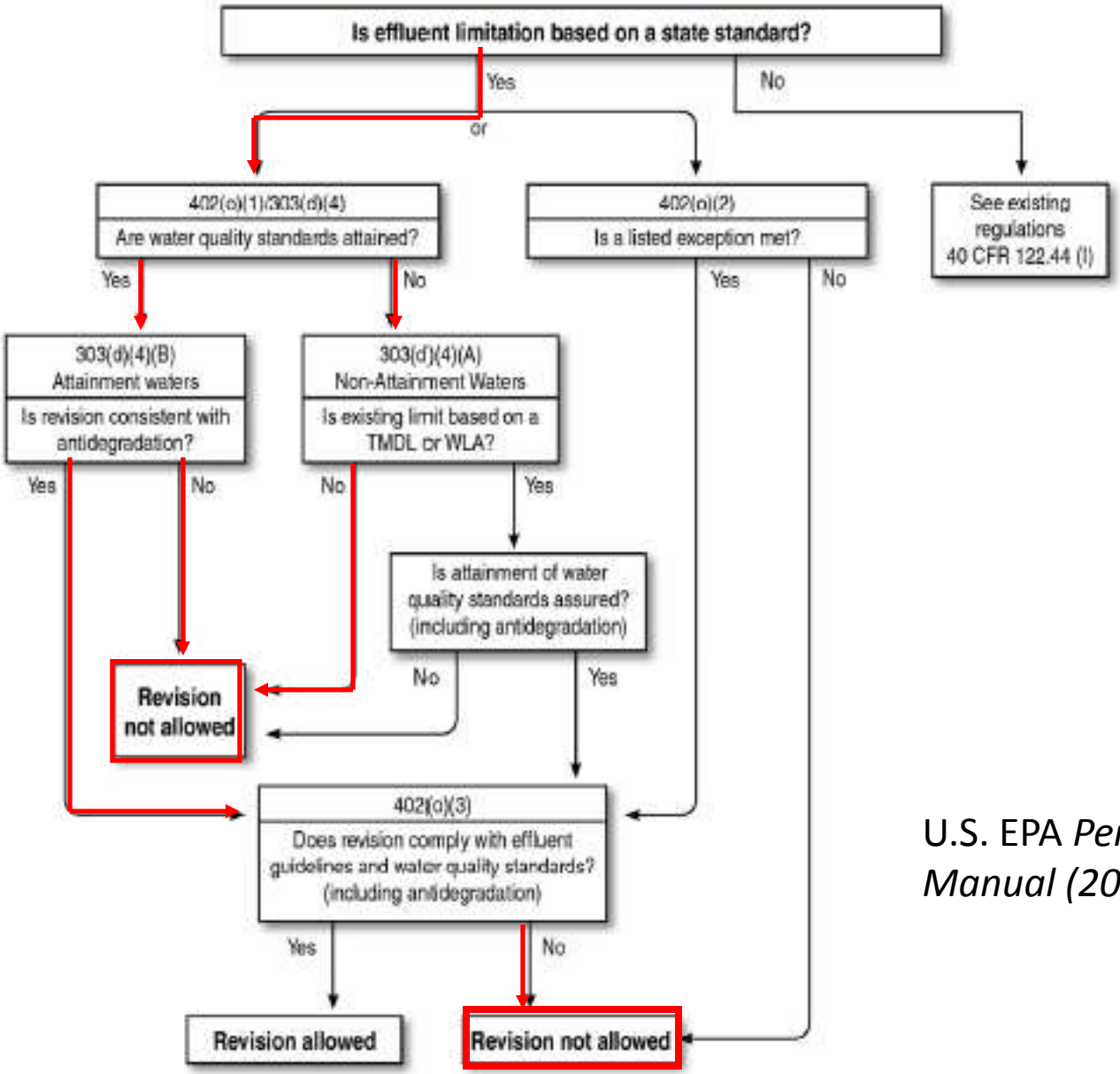

U.S. EPA *Permit Writers' Manual (2010)*

If Not an Effluent Limit…

Anti-Backsliding:

"when a permit is renewed or reissued, interim effluent limitations, *standards, or conditions* must be at least as stringent as the final effluent limitations, standards, or conditions in the previous permit."

40 C.F.R. 122.44(l)(1)

Antidegradation Policy

Protects existing uses and water quality necessary to support existing uses, or, for “high quality” waters, protects water quality better than necessary for “fishable/swimmable” uses.

Water quality may only be lowered in certain limited circumstances. In no case may water quality be lowered to a level which would interfere with existing or designated uses.

See, State Bd. Resolution 68-16,

40 CFR § 131.12

Violates Antidegradation Policy

- Where no TMDLs exist, allows lowering of water quality during and after plan development

- Unimpaired waters must be protected, not made a lower priority because they are not polluted or lack TMDLs.

Impaired Waters and TMDLs

TMDLs are the means for bringing impaired waterways back into compliance for pollutants such as bacteria, metals, trash, etc.

Clean Water Act NPDES permits must be consistent with the waste load allocation ("WLA") in each TMDL.

(40 C.F.R. § 122.44(d)(1)(vii)(B)

"When we're talking about outcome-based, we're really talking about receiving waters"

Major Problems B.3.c(1)(b)

- Hinges on "watershed model or other watershed analysis"
  - No standards (who can perform, peer review, data upon which it can be based)
  - Not enough data available for robust analysis
  - Bacteria TMDL = good example of problems
  - "**Will** achieve numeric goals within establish schedules" (p 32) v. "'reasonably' and 'quantitatively' demonstrate that… strategies **can** achieve goals within established schedules." (F-53)

Major Problems B.3(c)(1)(b)

- "strategies required under Provision B.3.b."
  - No reference in Provision B.3.b to new requirements under B.3.c
- Achieve goals within schedules "required by B.3.a" = only for priority pollution issues
  - Probably mean B.3.c(1)(a)
- Lack of cross-reference = confusion

Major Problems: B.3.c.(1)(c)

- Monitoring and assessment
  - No guidance as to frequency or minimums
  - 5 years or more?!
  - Compliance schedule = 40 C.F.R. 122.47
    - "time between interim dates shall not exceed one year"
    - "a schedule of compliance shall be available only when necessary to allow a reasonable opportunity to attain compliance with requirements issued or revised less than three years before *recommencement of* discharge"
    - But, are they even allowed for continuing dischargers?
      - *No, not under anti-backsliding*

Major Problems B.3.c(1)(d)

- Review and concurrence by majority of Consultation Panel
  - Insufficient public involvement
- Major Modification under 40 C.F.R. 122.62
  - Must receive request under 40 C.F.R. 124.5
  - Must follow public notice and comment procedures unless minor modification (122.63)
  - Allowed for compliance schedules for good cause = "act of God, strike, flood, or materials shortage or other events over which the permittee has little or no control and for which there is no reasonably available remedy."

Major Problems B.3.c(2)

- Copermittee will “be in compliance… when the Water Quality Improvement Plan, incorporating requirements of B.3.c(1) is accepted by San Diego Water Board.”
  - No guarantee of hearing F.1.b(4)
  - “Executive Officer may provide written certification to the Copermittees”

Major Problems B.3.c(3)

- "Remain in compliance as long as…"
  - Results of analysis "accepted and continued to be accepted"
  - Continue to implement, monitor and assess, "demonstrate progress"
  - No periodic review, no deal breaker, no bright line for when compliance removed
    - If not in compliance, does it automatically trigger enforcement?
  - Connect to other Copermittees implementing iterative process

BAD POLICY

Low Impact Development

Environmental Services, City of Portland, Oregon/Kevin Robert Perry

LID is Cost Effective

011997

Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices

focused on the latter issue, and the news is good. In the vast majority of cases, the U.S. Environmental Protection Agency (EPA) has found that implementing well-chosen LID practices saves money for developers, property owners, and communities while protecting and restoring water quality.

Feasibility of Retention

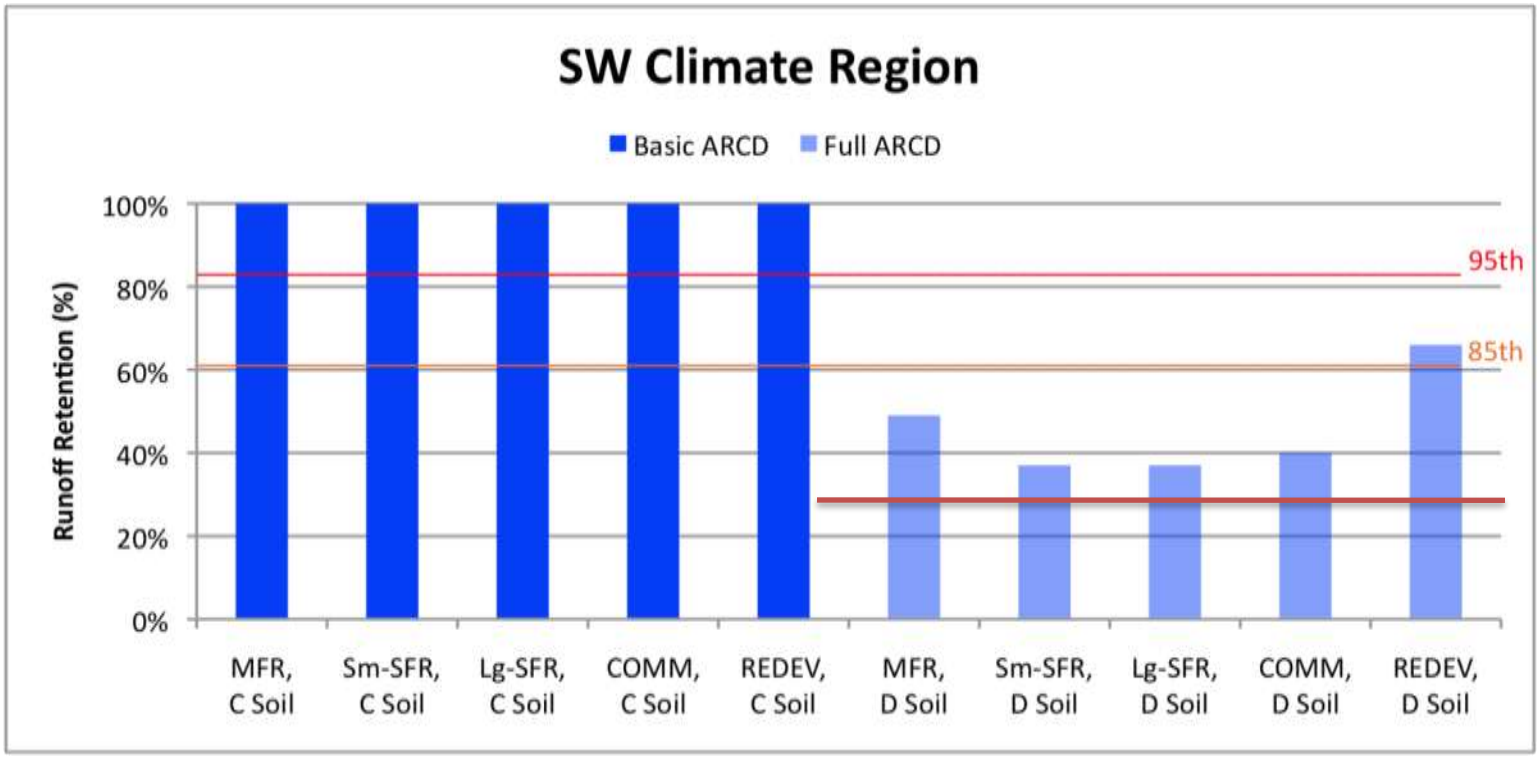

Top Ten National Sources of Impairments for Rivers and Streams

Description of this table

011999

	EPA Source Name	Total Miles Impaired by Source
1	AGRICULTURE	113,662.70
2	UNKNOWN	91,823.72
3	HYDROMODIFICATION	79,399.66
4	HABITAT ALTERATIONS (NOT DIRECTLY RELATED TO HYDROMODIFICATION)	51,297.85
5	NATURAL	41,764.05
6	URBAN-RELATED RUNOFF/STORMWATER	38,114.89

			BENEFICIAL USE							
			FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD
Chollas Creek [3,4]	8.22	+			○	●		●		●
					○	●		●		●
					○	●		●		●
South Chollas Valley	8.22	+			○	●		●		●
unnamed intermittent streams	8.31	+			○	●		●		●
Paradise Creek	8.32	+			○	●		●		●

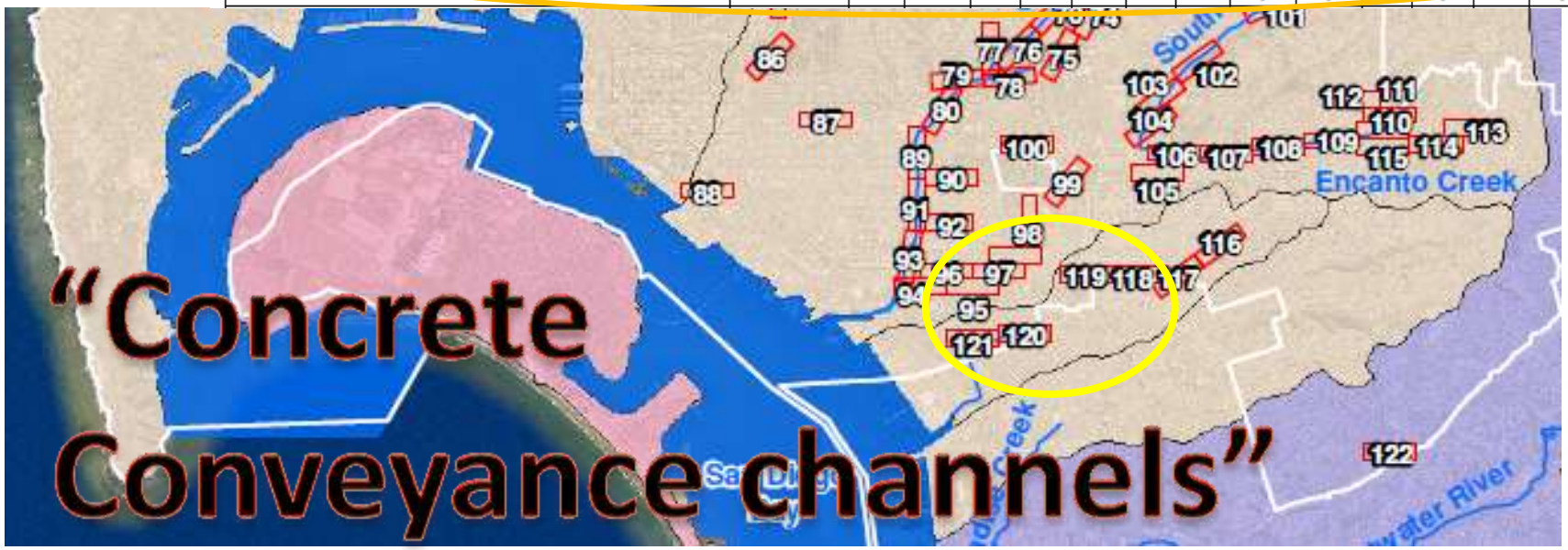

118-119	88000258 88000260	Pueblo San Diego	Solola Channel	3.264	C
120-121	88000056 88000058 88000060 88000062 88000064	Pueblo San Diego	Cottonwood Channel	2.370	C

Current State of Area Waterbodies

- Co-Permittees have had years to meet water quality standards .
- Many co-permittees do not acknowledge they contribute to exceedances of WQS
- The Regional Board has rarely undertaken enforcement of the existing permit – even where the public health is at risk

303d Listed Waterbodies

- Orange County
  - Aliso Creek
  - Arroyo Trabuco Creek
  - Dana Point Harbor
  - Laguna Canyon Channel
  - Oso Creek
  - Prima Deshecha Creek
  - Segunda Deshecha Creek
  - San Juan Creek
  - Pacific Ocean

303d Listed Waterbodies

- Riverside County
  - Long Canyon Creek
  - Warm Springs Creek
  - Temecula Creek

Temecula Creek

Beach Closures

- San Diego County reported nearly 300 closing or advisory days in 2011 from all sources, and Orange County more than 750. Stormwater is the largest cause.
- Depending on the cost model used, for Orange County alone, excess cases of gastrointestinal illness from swimming in bacteria contaminated beachwater cost:
  - between $6 million and $16 million per year, or;
  - when willingness to pay *not* to get sick is included, between $56 million and $136 million per year.

Case Study: Orange County

- In 1999, Huntington Beach was closed for much of the summer due to elevated levels of bacteria.
- Many signs point to urban runoff.
- An economic study of a hypothetical closure of Huntington Beach due to poor water quality indicates:
  - One day = losses of $100,000
  - One month = losses of $3.5 million
  - Three months (season) = losses of $9 million

Case Study: San Clemente

- Poche Beach
  - Regular on Heal the Bay's Annual "Beach Bummer" list
  - Watershed Study
  - Poche Creek Runoff Treatment Facility

June 2011

Riverside County

- Regional “hot spot” of large scale new development during this permit’s term
- Shift from agricultural to urban
- Impacts of this permit will be felt for decades

Water Quality Realities

- Permits are a vision of where we are going
- A working document vs. a static plan cementing the status quo
- Decisions have impacts and act as precedent for future decision makers

Suggested Improvements to RWQCB Tentative Order No. R9-2013-0001

Coalition Members

The Associated General Contractors San Diego Chapter

CICWQ

BOMA San Diego 50 Years 1963-2013

Alliance for Habitat Conservation

BIA 75 Years in San Diego — Advocates for Progress. Connections for Business.

SDCAA San Diego County Apartment Association

90 Years Proudly Serving Our Members

San Diego Regional Chamber of Commerce

ABC San Diego Chapter — Associated Builders and Contractors, Inc.

NAIOP Commercial Real Estate Development Association San Diego Chapter

Business Leadership Alliance — Strengthening the voice of business

SDAR San Diego Association of Realtors — The Trusted Voice of San Diego Real Estate

ASLA San Diego

Coalition's Technical Experts

- Dennis Bowling, PE, MS,--Rick Engineering
- Mark Grey, PhD—Technical Director, CICWQ- Construction Industry Coalition Water Quality
- Luis Parra, PhD, PE, MS, CPSWQ, ToR, D.WRE.—Tory R. Walker Engineering, Inc.
- Tory Walker, PE, CFM, LEED GA—Tory R. Walker Engineering Inc.
- Shawn Weedon, PE—GEOCON San Diego
- Jim Whalen, Environmental Consultant— J Whalen & Associates

What we support

- The development of Water Quality Improvement Plans as the Core of the Permit
  - An open process involving all of the stakeholders
  - A blue-ribbon panel consisting of experts to assist in the development of the WQIPs
  - An outcome-based process that will achieve cleaner stormwater
  - Watershed/regional solutions—not a property-by-property approach

Request for additional time

- The Tentative Order, R9-2013-001, is **388 pages**
- Of the first 148 pages (Cover sheets, finding and provisions) there are 138 pages with changes 92%
- Attachments A-F contain 236 pages, no changes in A or B (27 pages) 0%
- 9 pages of changes (out of 12) in Attachment C 75%
- Attachments D&E every page has a change 100%
- Attachment F, 109 out of 136 pages have changes 80%
- Comment letters, staff responses, reports, draft permit, court cases, correspondence, etc. are 2,271 pages total

Request for additional time

- Revised permit was released on March 27th 2013
- Coalition Sent RWQCB letter on April 1st requesting extension to review revisions and comments
- 14 calendar days before adoption hearing
- 8 working days including Good Friday
- **81%** of the revised permit's pages contained changes or strikeout
- 8 working days is not a *reasonable* amount of time to review the changes and consult with fellow stakeholders and RWQCB staff

Suggested Improvements

012014

- Preserve the existing Hydromodification Management Standards while the WQIPs are being developed
- Keep urban infill Hydromodification Management Standard exemptions per the existing San Diego HMP process; modify, if shown necessary, as part of WQIPs
- Provide more time to develop the WQIPs
- Delete “Retain....100% of the pollutants....” added to the latest draft Order in Section E3C(1)(a). See slide #14 for suggested revision
- Redefine Priority Development Projects for large area, low impervious projects
- Change land use restrictions as they pertain to sediment transport
- Change the definition of Ground Water

Hydromodification Management Standards

- Concerns:
  - The Coalition and RWQCB staff agree it is the intent of the Tentative Order that current hydromodification management standards will remain in place until such time as the WQIPs are approved by the RWQCB
  - The Coalition believes that the current hydromodification management standards should be based on good science. Given the limited resources available to the Co-permittees, the Coalition believes that the current hydromodification management standards should be presumed appropriate unless shown otherwise through the development of the WQIPs

(*See* Bowling, D., Grey, M., Parra, L., Walker, T., Weedon, S.F., "San Diego Regional Water Quality Control Board Draft MS4 Permit: A Case Study" http://www.cicwq.com/)

Hydromodification Management Standards

012016

- Background:
- More than one million dollars of cumulative effort went into the development of a HMP for San Diego County.
  - Copermittees paid a consultant team $1,000,000.00.
  - 14 member Technical Advisory Committee participated in 11 meetings and additional hours of research and review.
  - Other interested parties donated time at TAC meetings and additional hours of research and review.
  - RWQCB reviewed the HMP and *approved* the Final HMP July 14, 2010.

Hydromodification Management Standards

012017

- Concerns:
- The Tentative Order invalidates or removes exemptions that were included in the *approved* Final HMP.
  - Exemptions that are based on reducing existing impervious area and reducing peak flows will be invalidated by the requirement to consider pre-development conditions as a baseline rather than pre-project conditions.
  - This list of criteria for exemptions omits certain exemptions that were included in Order No. R9-2007-0001.

(*See* Bowling, D., Grey, M., Parra, L., Walker, T., Weedon, S.F., "San Diego Regional Water Quality Control Board Draft MS4 Permit: A Case Study" http://www.cicwq.com/)

Hydromodification Management Standards

- Concerns:

The following have been omitted from the list of exemptions in Provision E.3.c.(2)(d):

  - Channels that are "significantly hardened (e.g., with rip-rap, shotcrete, etc.)“
  - Projects where "the sub-watersheds below the projects' discharge points are highly impervious (e.g., >70%) and the potential for single-project and/or cumulative impacts is minimal" have been omitted from the list of exemptions.
  - The list of exemptions does not acknowledge exempt river reaches that were approved as part of the Final HMP dated March 2011 (portions of Otay River, San Diego River, San Dieguito River, San Luis Rey River, and Sweetwater River).

  – These will now require new analysis and public review through the WQIP process, despite being *approved* in the Final HMP.

(*See* Bowling, D., Grey, M., Parra, L., Walker, T., Weedon, S.F., "San Diego Regional Water Quality Control Board Draft MS4 Permit: A Case Study" http://www.cicwq.com/)

Hydromodification Management Standards

012019

- Recommendations:
  - Add the following two findings to the Tentative Order:
    - The Regional Board finds that the hydromodification management standards approved in the Final HMP for San Diego County based on Order No. R9-2007-0001 shall apply until the such time as the WQIPs have been developed.
    - The Regional Board finds that there is substantial evidence to support the use of the current hydromodification management standards in each WQIP unless there are unique characteristics in the watershed to the contrary.

See Bowling, D., Grey, M., Parra, L., Walker, T., Weedon, S.F., "San Diego Regional Water Quality Control Board Draft MS4 Permit: A Case Study" http://www.cicwq.com/

Storm Water Pollutant Control BMP Requirements

- Concerns:
  - LID and Onsite Retention Requirements are largely infeasible within the Region
    - Infiltration difficult because of soil conditions
    - Harvest and Reuse raise additional concerns—reliable demand
    - Requirements have unintended consequences
  - There is no evidentiary support for ability to comply with 100% Pollutant Retention Requirement
    - Conflicts with other regional requirements
    - Conflicts with USEPA LID guidelines
  - *See* Bowling, D., Grey, M., Parra, L., Walker, T., Weedon, S.F., "San Diego Regional Water Quality Control Board Draft MS4 Permit: A Case Study" http://www.cicwq.com/

Storm Water Pollutant Control BMP Requirements

- Concerns:
  - New language was added to Section E.3.C.(1)(a) & (b)
  - 100% pollutant retention is <u>practically</u> impossible--especially for bacteria and nutrients--unless infiltration of the entire DCV is shown to be feasible, or if reliable harvested water demand exists
  - Existing, adopted, 4th term Phase I MS4 permits in California contain clear, unambiguous retention standard language that recognize technical feasibility analysis procedures and a prescribed LID BMP selection hierarchy
  - The standard is not legally enforceable
    - Exceeds the MEP and BAT/BCT standards for discharges
    - Exceeds the water quality objectives for receiving waters
    - Exceeds requirements for POTWs and for meeting drinking water standards
  - *See* Bowling, D., Grey, M., Parra, L., Walker, T., Weedon, S.F., "San Diego Regional Water Quality Control Board Draft MS4 Permit: A Case Study" http://www.cicwq.com/

Storm Water Pollutant Control BMP Requirements

012022

Recommendation:

<u>Revise Sections E.3.C.(1)(a) (b) to read:</u>

(a) "Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite the pollutants contained in the volume of storm water runoff produced from a 24-hour 85th percentile storm event."

(b) "If a Co-permittee determines that implementing BMPs to retain the full design capture volume onsite for a Priority Development Project is not technically feasible, then the Co-permittee may allow the Priority Development Project to utilize flow-thru treatment control BMPs, selected and designed to remove pollutants to the MEP, for the portion of the design capture volume that cannot be reliably retained. Biofiltration LID BMPs must be considered as a first option before other types of flow-thru treatment control BMPs may be considered."

(*See* Bowling, D., Grey, M., Parra, L., Walker, T., Weedon, S.F., "San Diego Regional Water Quality Control Board Draft MS4 Permit: A Case Study" http://www.cicwq.com/)

Unintended Consequences

- No runoff deprives Effluent Dependent Watersheds of water to sustain critical habitat

Otay River, Looking East (SR 125 bridge in background)

Unintended Consequences

- Pollutants redistributed onsite during reuse of captured water

- Has US Fish & Wildlife, US Army Corps of Engineers, CA Fish & Wildlife agreed with this provision?

US Army Corps of Engineers®

CALIFORNIA DEPARTMENT OF FISH & WILDLIFE

U.S. FISH & WILDLIFE SERVICE

Geologic Unintended Consequences

- La Jolla Landslide

- La Jolla Landslide

Water in Clay Soils-Ardath Shale-Clay Soil Group D

Unintended Consequences

Water migration through concrete slab

Change the definition of Ground Water

- Concern:
  - The current definition of Ground Water in the permit remains vague.
  - Determining what constitutes ground water requires professional expertise.
- Recommendation:
  - Revise the definition in the draft permit as follows:
  - Groundwater – Subsurface water that occurs beneath the water table as determined by a Licensed Professional Geologist or Engineer

(*See* Bowling, D., Grey, M., Parra, L., Walker, T., Weedon, S.F., "San Diego Regional Water Quality Control Board Draft MS4 Permit: A Case Study" http://www.cicwq.com/)

Change restrictions as they pertain to sediment balance/land use

- Concern:
  - The current language concerning sediment balance appears to require Co-permittees to modify their zoning ordinances to prohibit development of properties that are potential sources of “coarse sediment”
  - Such a requirement appears to conflict with the RWQCB’s authority to impose land use regulations and potentially constitutes a taking (*See* Bowling, D., Grey, M., Parra, L., Walker, T., Weedon, S.F., "San Diego Regional Water Quality Control Board Draft MS4 Permit: A Case Study" http://www.cicwq.com/)
- Recommendation: Include a finding in the draft Order to state that the RWQCB does not have the authority to require Copermittees to revise their land use regulations

Typical Urban In-fill Project

Rationale to keep the urban infill exemption

- 4th & Nutmeg Streets, San Diego-Bankers Hill, NW Corner
- Street View- Podium type construction with underground parking

Revise the pre-existing condition standard for urban infill projects

- Concerns:
  - Requiring that urban infill projects use a “pre-development condition” standard conflicts with other land use policies and State laws such as AB-32 & SB-375
- Recommendation:
  - Keep the urban infill project exemption from the pre-development condition standard; use the pre-project condition standard

(*See* Bowling, D., Grey, M., Parra, L., Walker, T., Weedon, S.F., "San Diego Regional Water Quality Control Board Draft MS4 Permit: A Case Study" http://www.cicwq.com/)

Change the definition of Priority Development Projects for large area low impervious projects

- Concern:
  - The current definition of PDP permits pulls in projects such as renewable energy and public parks that have more than 10,000 square feet of impervious area but are less than 3% total impervious area
  - Recommendation:
  - Revise the permit to remove from the definition of PDP projects those projects with over 10,000 square feet of impervious area but less than 3% total impervious area

(*See* Bowling, D., Grey, M., Parra, L., Walker, T., Weedon, S.F., "San Diego Regional Water Quality Control Board Draft MS4 Permit: A Case Study" http://www.cicwq.com/)

Provide more time to develop the WQIPs

- Concerns:
  - This will be the first attempt to develop WQIPs
  - This is an ambitious effort which will likely include issues that have not been anticipated
  - There is no assurance at this time that eight **high quality** WQIPs can be produced within 24 months.
- Recommendation:
  - Modify the draft Order to grant more time for Co-permittees to develop the WQIPs when cause is shown

See Bowling, D., Grey, M., Parra, L., Walker, T., Weedon, S.F., "San Diego Regional Water Quality Control Board Draft MS4 Permit: A Case Study" http://www.cicwq.com/

Alternative Compliance

- We need to ensure that Alternative Compliance methods and framework need to be included beyond the limited options included in the permit
- Need to ensure project applicants can actually ***use*** the option of Alternative Compliance
- Copermittees have a valid point of needing resources to maintain retrofit devices installed as result of Alternative Compliance

Conclusions

- We seek to build on the collaborative effort started by RWQCB, with co-permittees and NGOs
- Take as much time as necessary to develop a consensus based permit
- The HMP deserves the time to see measurable results
- WQIPs are supported by all stakeholders-Let's get it done right

San Diego Regional Water Quality Control Board

SDG&E Presentation

April 10-11, 2013 Public Hearing on Tentative Order R9-2013-0001

(San Diego Regional MS4 Permit)

San Diego Gas & Electric Company

- Provides essential public services:
  - 3.4 million natural gas & electric customers
- Service territory:
  - 4,000 square miles
  - San Diego County
  - Southern Orange County

San Diego Gas & Electric Company

- We have a fiduciary responsibility to serve our rate payers in the most safe, reliable and responsible manner
- Important that regulatory requirements are appropriate and reasonable for our type of operations
- SDG&E constructs, maintains & operates linear infrastructure crucial to providing our services
- SWRCB refers to utility linear construction as “Linear Underground/overhead Projects (or LUPs)

Tentative Order

- Requesting changes to the permit
- Include more appropriate language regarding the application of post-construction BMPs to LUPs

Tentative Order

- Post-Construction BMPs
  - Apply to all "Development Projects"

- Definition of "Development Projects" is very broad
  - Does not distinguish between:
    - Typical land development projects (e.g., residential/commercial); and
    - Linear footprint projects (e.g., power lines)

Tentative Order

- Very different types of projects
- Typical land development has new impervious surfaces (e.g., roads, roofs, parking lots) located within a discrete area
- New impervious surfaces (e.g., power poles) associated with LUPs are:
  - Small in area
  - Spread out along the length of the project

Tentative Order

- Post-Construction BMPs
  - Low impact development and hydromodification have focused on traditional land development
    - Increased amounts of impervious surfaces located within a discrete area
  - LUPs do not have significant new areas of impervious surfaces located in a discrete area

Tentative Order

- Post-Construction BMPs
  - Low impact development and hydromodification
    - Application of post-construction BMPs to LUPs would fix a problem that does not exist

Tentative Order

- Permit includes two types of thresholds that trigger post-construction BMPs
  - Based on amount of soil disturbance
  - Based on amount of new impervious surfaces
- SWRCB permits also use these thresholds
- We have worked with the SWRCB to appropriately address LUPs

SWRCB Storm Water Permits

Construction General Permit

- Soil disturbance based threshold (≥1 acre)
- Exempts linear underground/ overhead projects from post-construction BMPs

Finding 73

"LUP projects are not subject to post-construction requirements due to the nature of their construction to return project sites to preconstruction conditions."

SWRCB Storm Water Permits

Small MS4 General Permit

- Impervious surface based threshold

- Clarifies that post-construction BMPs:
  - Are only required for LUPs when the newly constructed contiguous impervious surface exceeds the threshold; and
  - If applicable, then only to the specific location that exceeds the threshold

Tentative Order Thresholds

- Permit includes both thresholds types:
  - Area of land disturbance (≥1 acre)
  - Area of new impervious surfaces (multiple)
- Thresholds count areas "collectively over the entire project site"
  - Small sites spread over the length of a long line could exceed the threshold
- Does not distinguish between:
    - Traditional projects; and
    - Linear Underground/ overhead Projects

Post-Construction BMPs for LUPs

- Result of applying these requirements to LUPs:
  - Inconsistency with SWRCB permits
  - Applies a solution
    - Where a problem does not exist
    - Intended to address roofs, roads, parking lots with new impervious surfaces located on a lot or parcel
    - Not intended for small new impervious surfaces (pole foundation) located along the length of a LUP
    - Inconsistent with the reasons for the requirements
    - Would create many implementation issues for LUPs

Solution for LUPs

- Request changes to the permit
- Two options:

Option 1

– Insert language to clarify that LUPs are not "Development Projects" and are not subject to the development planning requirements in Section E.3.

Solution for LUPs

Option 1

- **Finding 10** - Add the following sentence:

  "The nature of linear underground/ overhead projects (LUPs) is to return project sites to pre-construction conditions. Therefore, consistent with Finding 73 in the SWRCB's Storm Water Construction General Permit[FN], LUPs are not subject to the development planning requirements (i.e., Section E.3.).

  [FN]Order 2009-0009-DWQ, as amended by Orders 2010-0014-DWQ and 2012-0006-DWQ

Solution for LUPs

Option 1 (cont.)

- **Definition of "Development Project"** - Add the following sentence:

  "Development Projects do not include linear underground/ overhead projects (LUPs)."

- **Definition of "LUPs"** - Add the definition from the SWRCB Construction General Permit

- **Fact Sheet** - Make changes consistent with the changes identified above

Solution for LUPs

Option 2

- Insert language that clarifies that:
  - LUPs are not subject to the ≥1 acre land disturbance threshold
  - LUPs are only subject to the impervious surface thresholds when a discrete location on a LUP has a newly constructed contiguous impervious surface exceeding a threshold
  - Where exceeded, the permit requirements only apply to that discrete location

Solution for LUPs

Option 2 (cont.)

- **Finding 10** - Add the following sentence:

  "The nature of linear underground/ overhead projects (LUPs) is to return project sites to pre-construction conditions. Therefore, consistent with Finding 73 in the SWRCB's Storm Water Construction General Permit[FN], LUPs are not defined as a Priority Development Project based on the LUP's area of land disturbance (Section E.3.b.1.e.). Additionally, LUPs are not defined as a Priority Development Project based on the LUP's amount of new impervious surface unless a LUP has a discrete location with newly constructed contiguous impervious surface that exceeds one of the impervious surface thresholds in Section E.3.b. Further, when the LUP has a discrete location with newly constructed contiguous impervious surface that exceeds one of the impervious surface thresholds in Section E.3.b, only that specific discrete location is subject to the structural BMP performance requirements in Section E.3.c.

  [FN]Order 2009-0009-DWQ, as amended by Orders 2010-0014-DWQ and 2012-0006-DWQ"

Solution for LUPs

Option 2 (cont.)

- **Definition of "LUPs"** - Add the definition from the SWRCB Construction General Permit

Solution for LUPs

Option 2 (cont.)

- **Section E.3.b.1.** – Add a footnote to the first sentence:

Priority Development Projects include the following"[FN]":

"[FN]LUPs are not defined as a Priority Development Project based on the LUP's amount of new impervious surface unless a LUP has a discrete location with newly constructed contiguous impervious surface that exceeds one of the impervious surface thresholds in Section E.3.b. Further, when a LUP has a discrete location with newly constructed contiguous impervious surface that exceeds one of the impervious surface thresholds in Section E.3.b., only that specific discrete location is subject to the structural BMP performance requirements in Section E.3.c."

Solution for LUPs

Option 2 (cont.)

- **Section E.3.b.1.e.** - Add a footnote to this section that states:

  New or redevelopment projects that result in the disturbance of one or more acre of land and are expected to generate pollutants post construction.“FN”:

  “FNThis section does apply to LUPs, which are not defined as Priority Development Projects based upon the LUP’s area of land disturbance.”

Solution for LUPs

Option 2 (cont.)

- Fact Sheet - Make changes consistent with the changes identified above

Summary

- As written, permit would apply post-construction BMPs equally to traditional projects and LUPs
- This incorrectly applies a water quality solution to a problem that does not exist on LUPs
- We request changes to the permit language to correct this issue
- Two possible options
- We recommend Option 1

Reference – CGP Definition of LUPs

"Linear Underground/Overhead Projects (LUPs) include, but are not limited to, any conveyance, pipe, or pipeline for the transportation of any gaseous, liquid (including water and wastewater for domestic municipal services), liquiescent, or slurry substance; any cable line or wire for the transmission of electrical energy; any cable line or wire for communications (e.g., telephone, telegraph, radio, or television messages); and associated ancillary facilities. Construction activities associated with LUPs include, but are not limited to, (a) those activities necessary for the installation of underground and overhead linear facilities (e.g., conduits, substructures, pipelines, towers, poles, cables, wires, connectors, switching, regulating and transforming equipment, and associated ancillary facilities); and include, but are not limited to, (b) underground utility mark-out, potholing, concrete and asphalt cutting and removal, trenching, excavation, boring and drilling, access road and pole/tower pad and cable/wire pull station, substation construction, substructure installation, construction of tower footings and/or foundations, pole and tower installations, pipeline installations, welding, concrete and/ or pavement repair or replacement, and stockpile/borrow locations."

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
9174 Sky Park Court, Suite 100
San Diego, California

MINUTES OF MEETING
APRIL 11, 2013

At 9:00 a.m., Chairman Morales called to order the meeting of the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) at the Regional Water Quality Control Board, 9174, Sky Park Court, San Diego, California.

Item 9 – Roll Call and Introductions
Board Members present: Eric Anderson, Sharon Kalemkiarian, Tomas Morales, and Gary Strawn. Henry Abarbanel arrived at 11:25 a.m. Tomás Morales excused himself at 12:25 p.m. and returned at 4:07 p.m. Ms. Kalemkiarian excused herself at 6:07 p.m.

Staff Present: David Gibson, James Smith, Chris Witte, David Barker, Eric Becker, Laurie Walsh, Christina Arias, Wayne Chiu, Jeremy Haas, Barry Pulver, Eric Rosenbaum, Chiara Clemente, Chris Means, Ben Neill, Jody Ebsen, Debbie Woodward, Julie Chan, Sean McClain.

Others present on behalf of the San Diego Water Board: State Water Resources Control Board – Catherine Hagan, Nathan Jacobsen. California Court Reporters – Delise Martinelli, Gloria Mazon.

Public Attendance: Heather Stroud, City of San Diego; Helen Davies, City of Santee; Steve Horn, County of Riverside; Devin Slaven, City of Lake Forest; Trevor Alsop, Geosyntec; Billy Walker, City of Oceanside; Dennis Bowling, Rick Engineering; Brett Bennetts, Brown & Caldwell; Joe Kuhn, City of La Mesa; Lee Kaminetz, San Diego Airport Authority; Jeff O'Connor, Otay Land Company; Thom Fuller, Decater Advisors; Mayor Bob Filner, City of San Diego; Jeff Warner, City of Escondido; Ryan Waterman, Steel Rives; Altisori Vosskuhler, Port of San Diego; Patricia Romo, Riverside County; Karen Holman, Port of San Diego; Jennifer Shook, Orange County Dept. of Public Works; Mary Anne Skorpanich, County of Orange; Richard Boon, County of Orange; Doug Friedman, County of Orange; Deborah Mosley, County of San Diego; Ruth Kolb, City of San Diego; Kris McFadden, City of San Diego; Drew Kleis, City of San Diego; Bill Harris, City of San Diego; Rhalippe Khom, Camp Pendleton; Christine Sloan, County of San Diego; John Quenzer, City of National City; Colin Kelly, Orange County Coastkeeper/IEWK; Kelly Barker, City of Del Mar; Fred Jacobsen, SDG&E; James Wood, City of Carlsbad; Elaine Lukey, City of Carlsbad; Kim Goodby, City of Coronado; Bryn Evans, URS; Paul Hartman, County of Orange; Sam Smith, City of Oceanside; Lisa Zawaki, City of Dana Point; Mikhail Ogawa, City of Del Mar; Mo Lahsaie, City of Oceanside; Amanda Archenhold, AMEC; Rachel Davenport, AMEC; Kathryn Morning, Allen Watkins; Matt Rich, AMEC; Marilyn O'Neil, Nautilus; Jaime Campos, City of El Cajon; Luis Parra, SDSU-TRWE; Michael Drennan, Black & Veatch; W. Gabel, SDG&E; Erik Steenbock, City of Encinitas; James H. Knott, City of Oceanside; Daniel Apt,

Orange County; Scott Taylor, Orange County; Erica Ryan, City of San Marcos; Douglas Kot, San Diego USGBC; Faith Picking, Biocom; Rosanna Lacarra, La Rue Environmental; Nancy Gardiner, Weston Solutions; Vaikko Allen, Contech; Ziad Mazboudi, City of San Juan Capistrano; Cheryl Filler, City of Vista; Lisa Austin, Geosyntec Consultants; Khosro Aminpour, City of Chula Vista; Borre Winckel, BIA; Rae Beimer, City of Rancho Santa Margarita; Jason Uhley, RCFC &WCD; Karen Cowan, Larry Walker Associates; Brian Gordon, U.S. Navy; Shawn Weedon, Geocon/BIA; Joe Ames, City of Mission Viejo; Mike Nagy, San Diego Regional Chamber of Commerce; Christian Braun, Geosyntec Consultants; Claudia Steiding, Riverside County Transportation Department; Ken Susilo, Geosyntec.

Item 10 – Public Forum

There were no speakers for the Public Forum.

Item 11 – Continuation of non-consent Agenda items from April 10, 2013.

Mr. Morales made opening remarks and administered the oath to all persons intending to testify.

The Board took testimony from the following elected officials:

Mayor Bob Filner, San Diego
Chairman Greg Cox, San Diego County Board of Supervisors
Deputy Mayor Jerry Kern, City of Oceanside
Supervisor Patricia Bates, 5th District, County of Orange
Mayor Cheryl Cox, City of Chula Vista
Councilman Gary Felien, City of Oceanside
Mayor Ron Morrison, City of National City
Mayor Steven Weinberg, City of Dana Point
Commissioner James Knott, Utilities Commissioner, City of Oceanside
Kristen Huyck, Legislative Assistant for Riverside County Supervisor Kevin Jeffries

Mr. Morales called a recess at 10:00 a.m. and reconvened the meeting at 10:14 a.m.

The Riverside County copermittees made their presentation, after which they answered the Board members' questions.

Mr. Morales called a recess at 11:39 a.m. and reconvened the meeting at 11:51 a.m.

San Diego County representatives made their presentation, followed by Bill Brown for the Port of San Diego and David Burhenn for the Riverside County copermittees.

Mr. Strawn called a recess for lunch at 1:00 p.m. and reconvened the meeting at 3:30 p.m.

The environmental groups San Diego Coastkeeper, Orange County Coastkeeper, Inland Empire Waterkeeper, and the Natural Resources Defense Council made their presentation and answered the Board members' questions.

Mr. Morales called a recess at 4:53 p.m. and reconvened the meeting at 5:08 p.m.

The Building Industry Coalition gave their presentation, after which they answered the Board members' questions.

Mr. Morales called a recess at 6:15 p.m. and reconvened the meeting at 6:25 p.m.

Board staff summarized the concerns expressed during the hearing and stated that an errata sheet would be prepared to address those concerns. Chairman Morales continued the hearing until May 8, 2013, stating that written public comments from designated parties on the Cost Benefit Analysis submitted by San Diego County would be accepted no later than 5:00 p.m. Friday, April 26, 2013.

There being no further business, the meeting was adjourned at 6:45 p.m.

These minutes were prepared by:

Chris Witte
Executive Assistant

Signed by:

David Gibson
Executive Officer

Audio Recordings
April 11, 2013 Board Meeting
Item No. 8

MS4 Permit Hearing (7).WMA
MS4 Permit Hearing (8).WMA
MS4 Permit Hearing (9).WMA
MS4 Permit Hearing (10).WMA
MS4 Permit Hearing (11).WMA
MS4 Permit Hearing (12).WMA

From: lyris@swrcb18.waterboards.ca.gov
To: Chiu, Wayne@Waterboards
Subject: NOW POSTED ! Proposed Errata to Tentative Order R9-2013-0001 & Public Hearing Continuation Notice
Date: Friday, April 19, 2013 4:03:24 PM

This is a message from the California Regional Water Quality Control Board, San Diego Region (9).

The San Diego Water Board has continued the public hearing regarding Tentative Order R9-2013-0001 *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Tentative Order) opened on April 10, 2013 because more time is warranted to discuss proposed changes to the requirements of the Tentative Order.

During the April 10 and 11 hearing, San Diego Water Board staff proposed additional changes to the Tentative Order based on testimony received. The proposed changes summarized by staff on April 11 are presented in Errata Sheet Tentative Order R9-2013-0001 - Option 1, which reflects removal of Provision B.3.c, and Errata Sheet - Tentative Order R9-2013-0001 - Option 2 which reflects specific changes to Provision B.3.c. Otherwise the Errata Sheets are identical.

Also available is the May 8, 2013 Public Hearing Continuation Notice on Tentative Order R9-2013-0001. The Public Hearing Continuation Notice describes the procedural matters set by the San Diego Water Board for the May 8, 2013 continued hearing on Tentative Order R9-2013-0001.

The Errata Sheets and the May 8, 2013 Public Hearing Continuation Notice are now available on the San Diego Water Board website.
http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

Laurie Walsh P.E.
San Diego Water Board
858-467-2970
lwalsh@waterboards.ca.gov

You are currently subscribed to reg9_sandiegoco_ms4permit as: wchiu@waterboards.ca.gov.
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California Water Boards

Edmund G. Brown Jr. Governor

Matthew Rodriguez Secretary for Environmental Protection

California Regional Water Quality Control Board, San Diego Region

NOTICE OF PUBLIC HEARING CONTINUATION

The public hearing opened on April 10 and 11, 2013 will be continued to discuss

Tentative Order No. R9-2013-0001, NPDES No. CAS0109266
National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region

Wednesday, May 8, 2013
9:00 a.m.
California Regional Water Quality Control Board, San Diego Region
Regional Water Board Room
San Diego Water Board Office Building
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

SUBJECT OF PUBLIC HEARING

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) will continue the public hearing on May 8, 2013 at its regularly scheduled public meeting to consider adoption of Tentative Order No. R9-2013-0001, NPDES No. CAS0109266, *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Tentative Order). The San Diego Water Board has continued the public hearing regarding the Tentative Order opened on April 10, 2013 because more time is warranted to discuss proposed changes to the requirements of the Tentative Order. During the April 10 and 11 hearing, San Diego Water Board staff proposed additional changes to Tentative Order based on testimony received. These proposed changes, or Errata, summarized on April 11 are now available and have been provided to stakeholders.

BACKGROUND

The Tentative Order is a regional MS4 permit that proposes to jointly cover all 39 Copermittees within the San Diego Region (i.e., South Orange County, Southwestern Riverside County, and San Diego County), in a phased manner as their current MS4 permits expire or upon request for earlier coverage prior to permit expiration. The Tentative Order covers multiple discharge points to multiple receiving waters throughout the San Diego Water Board Region. All MS4 Copermittees in the San Diego Region are therefore on notice that they may ultimately be regulated under the Tentative Order, if adopted.

PROCEDURAL MATTERS

The written comment period for the Tentative Order closed on **January 11, 2013.** A limited number of written documents were admitted after the close of the written comment period based upon rulings by the San Diego Water Board. Of these, the San Diego Water Board admitted into the record on April 11, 2013, a document labeled "April 2011 Meeting Water Quality Standards for San Diego's Recreational Waters, a Cost Benefit Analysis" prepared by the City of San Diego and offered for inclusion in the record by the County of San Diego. As determined by the San Diego Water Board on April 11, designated parties may submit written comments on the above document not later than **5 p.m. on April 26, 2013.** No additional written materials will be accepted or provided to the San Diego Water Board Members.

The scope of the continued hearing on May 8 will be limited. Designated Parties with time remaining from their original blocks of time will be permitted to use their remaining time for rebuttal testimony and/or closing comments only. According to the San Diego Water Board's records, the Copermittees, Environmental Groups, and Building Industry Coalition have 36, 5, and 13 minutes remaining, respectively, for this purpose.

In addition, the San Diego Water Board will allow Parties and the public the following additional blocks of time to orally comment on the Errata prepared by San Diego Water Board Staff and on the document, "April 2011 Meeting Water Quality Standards for San Diego's Recreational Waters, a Cost Benefit Analysis" admitted on April 11, 2013. Parties and Interested Persons may also use this time to comment on revisions to the Tentative Order released March 27, 2013, to the extent that they lacked sufficient time to review and respond to these revisions before the April hearing.[1]

Copermittees: 45 minutes
Environmental Groups: 15 minutes
Building Industry Coalition: 15 minutes
Interested Persons: 15 minutes

The San Diego Water Board will not permit the Parties to combine their new allocations of time with their time for rebuttal testimony and closing arguments and strongly discourages repetitive testimony and argument. In addition, Board Member and Board Counsel may ask questions at any time. Time for questions and responses will not count against allocated time.

INFORMATION REGARDING HEARING

Information related to this matter, including the Tentative Order, the April 19, 2013 Errata, and earlier Hearing Procedures, is available and may be reviewed at the San Diego Water Board's office or on the

[1] On April 11, 2013, the San Diego Water Board asked the Parties to identify any areas of revisions released March 27, 2013 for which they lacked sufficient time to review and no party responded. In the event that Parties have limited additional comments, however, the Board will allow it within these blocks of time.

San Diego Water Board's web page at:

http://www.waterboards.ca.gov/rwqcb9/water_issues/programs/stormwater/index.shtml

Please contact Wayne Chiu at (858) 637-5558 or wchiu@waterboards.ca.gov for questions or comments regarding this hearing notice.

Please bring the foregoing to the attention of any person known to you who would be interested in this matter.

DAVID W. GIBSON
Executive Officer
April 19, 2013

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
San Diego Region

Errata Sheet
(OPTION 1)
Tentative Order No. R9-2013-0001
NPDES No. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The following changes to the revised version of Tentative Order No. R9-2013-0001, released March 27, 2013, are based on the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) Public Hearing testimony presented during Agenda Item No. 8 at the April 10 and 11, 2013 San Diego Water Board Meeting. The changes to the Tentative Order listed below are shown in underline/strikeout format to indicate added and removed language, respectively.

FINDINGS Errata

1) Discharge Characteristics and Runoff Management Findings

Add the following finding after Finding 17, and renumber the subsequent findings appropriately:

18. Water Quality Improvements. Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges to the MS4s and control pollutants in storm water discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the Clean Water Act.

PROVISION A Errata

1) Provision A.4.a.(4)

(4) Within 90 days of the San Diego Water Board determination that the ~~update~~ modifications to the Water Quality Improvement Plan required under Provision A.4.a.(3) meet the requirements of this Order, the applicable Copermittees must

revise the jurisdictional runoff management program documents to incorporate the ~~updated~~ modified water quality improvement strategies that have been and will be implemented, the implementation schedule, and any additional monitoring required; and

PROVISION B Errata

1) Provision B Introductory Paragraph

The purpose of this provision is to develop Water Quality Improvement Plans that guide the Copermittees' jurisdictional runoff management programs towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plans is to further the Clean Water Act's objective to protect, preserve, ~~and~~ enhance, and restore the water quality and designated beneficial uses of waters of the state. This goal will be accomplished through an adaptive planning and management process that identifies the highest priority water quality conditions within a watershed and implements strategies through the jurisdictional runoff management programs to achieve improvements in the quality of discharges from the MS4s and receiving waters.

2) Provision B.3.b.(4)(b)

(b) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify and compile a list of candidate projects that could potentially be used as alternative compliance options for Priority Development Projects, to be implemented in lieu of onsite structural BMP performance requirements described in Provisions E.3.c.(1) and E.3.c.(2). Specifically, the Copermittees must identify opportunities to be included in the list for candidate projects in each Watershed Management Area, such as:

(i) ~~Opportunities for s~~Stream or riparian area rehabilitation;

(ii) ~~Opportunities for r~~Retrofitting existing infrastructure to incorporate storm water retention or treatment;

(iii) ~~Opportunities for r~~Regional BMPs;

(iv) ~~Opportunities for g~~Groundwater recharge projects;

(v) ~~Opportunities for w~~Water supply augmentation projects; and

(vi) ~~Opportunities for l~~Land purchases to preserve floodplain functions.

3) Provision B.3.c

~~**c. DISCHARGE PROHIBITIONS AND RECEIVING WATER LIMITATIONS COMPLIANCE OPTION**~~

~~(1) The Copermittees may utilize implementation of the water quality improvement strategies in the Water Quality Improvement Plan to demonstrate compliance with the requirements of Provisions A.1.a, A.1.c and A.2.a. For each Copermittee in the Watershed Management Area that chooses to utilize this option, the Copermittee will be in compliance with Provisions A.1.a, A.1.c and A.2.a if:~~

~~(a) Numeric goals and schedules developed pursuant to Provision B.3.a include the following numeric goals:~~

~~(i) WQBELs expressed as concentration-based or load-based effluent limitations applicable to the Watershed Management Area established by the TMDLs in Attachment E to this Order; and~~

~~(ii) Numeric goals applicable to the Copermittee's MS4 discharges expressed as concentration-based or load-based effluent limitations for all other pollutants listed on the Clean Water Act Section 303(d) List of Water Quality Impaired Segments[1] for the receiving waters in the Watershed Management Area that do not have a TMDL developed; and~~

~~(iii) Numeric goals for receiving waters that will protect the conditions of the receiving waters and attain water quality standards.~~

~~(b) An analysis utilizing a watershed model or other watershed analytical tools is performed. The results must be included in the Water Quality Improvement Plan to quantitatively demonstrate that the implementation of the water quality improvement strategies required under Provision B.3.b will achieve the numeric goals within the established schedules required under Provision B.3.a. The analysis may be performed individually or jointly by the Copermittees choosing to utilize this option in the Watershed Management Area, and must be updated as part of the iterative approach and adaptive management process required under Provisions B.5.a-b.~~

~~(c) The Water Quality Improvement Plan specifies the monitoring and assessments (i.e. MS4 outfall discharge, receiving water, and/or special studies) that will be performed by the Copermittee to confirm the implementation of the water quality improvement strategies within its jurisdiction is making progress toward achieving the numeric goals in accordance with the established schedules developed pursuant to Provision B.3.c.(1)(a). The monitoring and assessments must be incorporated into the monitoring and assessment program required~~

~~[1] 2002 and subsequent 303(d) Lists~~

~~pursuant to Provision B.4. The monitoring and assessments must be updated as part of the iterative approach and adaptive management process required under Provision B.5.c.~~

~~(d) The numeric goals proposed pursuant to Provision B.3.c.(1)(a), the analysis performed pursuant to Provision B.3.c.(1)(b) and the specific monitoring and assessments proposed pursuant to Provision B.3.c.(1)(c) have been reviewed and receive concurrence by a majority of the Water Quality Improvement Consultation Panel (see Provision F.1.a.(1)(b)). Updates must also receive concurrence by a majority of the Water Quality Improvement Consultation Panel.~~

~~(2) Each Copermittee that chooses to utilize this option will, for the pollutant/water body combinations covered by the analysis, be in compliance with Provisions A.1.a, A.1.c and A.2.a when the Water Quality Improvement Plan, incorporating the requirements of Provision B.3.c.(1), is accepted by the San Diego Water Board.~~

~~(3) The Copermittee will, for the pollutant/water body combinations covered by the analysis, remain in compliance with Provisions A.1.a, A.1.c and A.2.a during the term of this Order as long as:~~

~~(a) The results of the analysis performed pursuant to Provision B.3.c.(1)(d) is accepted and continues to be accepted by the San Diego Water Board Executive Officer as part of the Water Quality Improvement Plan; AND~~

~~(b) The Copermittee continues to implement the water quality improvement strategies within its jurisdiction developed pursuant to Provision B.3.b.(1) in accordance with the schedules for implementing the strategies established pursuant to Provision B.3.b.(3)(a); AND~~

~~(c) The Copermittee continues to perform the monitoring and assessments specified in the Water Quality Improvement Plan, developed and implemented pursuant to Provision B.3.c.(1)(c), to demonstrate its progress toward achieving the numeric goals applicable to its MS4 discharges in accordance with the interim and final dates for achieving the numeric goals established pursuant to Provision B.3.a.(2); AND~~

~~(d) The Copermittees in the Watershed Management Area continue to implement the requirements of Provision A.4.a.~~

PROVISION D Errata

1) Provision D.2.a.(3)(b)

(b) Transitional Wet Weather MS4 Outfall Discharge Monitoring Frequency

Each wet weather MS4 outfall discharge monitoring station selected pursuant to Provision D.2.a.(3)(a) must be monitored ~~twice~~ once during the wet season (October 1 – April 30). The wet weather monitoring events must be selected to be representative of the range of hydrological conditions experienced in the region. At least 10 percent of samples must be conducted during the first wet weather event of the wet season, to include at least one such sample in each Watershed Management Area.~~.~~

2) Provision D.3.d

(d) Special studies initiated prior to the effective date of this Order that meet the requirements of Provision D.3.b and are implemented during the term of this Order as part of the Water Quality Improvement Plan may be utilized to fulfill the special study requirements of Provision D.3.a. Special studies completed before the effective date of this Order ~~Water Quality Improvement Plan is accepted by the San Diego Water Board~~ cannot be utilized to fulfill the special study requirements of Provision D.3.a.

3) Provision D.4.b.(2)(b)(i)[d]

[d] The percent contribution of storm water volumes and pollutant loads discharged from each land use type within ~~the~~ each hydrologic subarea with a major MS4 outfall to receiving waters or within each major MS4 outfall to receiving waters ~~drainage basin to each of~~ in the Copermittee's ~~major MS4 outfalls in its~~ jurisdiction ~~to receiving waters~~ within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch.

PROVISION E Errata

1) Provision E.3.b.(1)

(1) Definition of Priority Development Project

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site)~~, or redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site)~~. This ~~category~~ includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(b) Redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site on an existing site of 10,000 square feet or more of impervious surfaces). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

~~(b)~~
(c) New or redevelopment projects that create 5,000 square feet or more of impervious surface (collectively over the entire project site), and support one or more of the following uses:

2) Provision E.3.c.(1)

(a) Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite ~~100 percent of~~ the pollutants contained in the volume of storm water runoff produced from a 24-hour 85th percentile storm event (design capture volume)~~;~~.

~~(b)~~ (i) If a Copermittee determines that implementing BMPs to retain the full design capture volume onsite for a Priority Development Project is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize ~~flow-thru treatment control~~ biofiltration BMPs. Biofiltration BMPs must be sized and designed to: ~~achieve the equivalent pollutant load removal described in Provision E.3.c.(1)(a). Biofiltration LID BMPs must be considered as a first option before other types of flow-thru treatment control BMPs may be considered.~~

[a] Treat 1.5 times the design capture volume not reliably retained onsite; OR
[b] Treat the design capture volume not reliably retained onsite with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite.
[c] Have an appropriate loading rate to prevent erosion, scour, and channeling within the BMP.

(ii) If a Copermittee determines that biofiltration is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize flow-thru treatment control BMPs to treat runoff leaving the site, AND mitigate for the design capture volume not reliably retained onsite pursuant to Provision E.3.(c)(1)(b). Flow thru treatment control BMPs must be sized and designed to:

[a] Remove pollutants from storm water to the MEP;
[b] Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm

event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;

[c] Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Flow-thru treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of flow-thru treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

~~(c)~~

(b) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1)(a). The Priority Development Project must mitigate for the portion of the pollutant load in the design capture volume not retained onsite if Provision E.3.(c)(3) is utilized. If a Priority Development Project is allowed to utilize alternative compliance, flow-thru treatment control BMPs must be implemented to treat the portion of the design capture volume that is not reliably retained onsite. Flow-thru treatment control BMPs must be sized and designed in accordance with Provision E.3.c.(1)(a)(ii)[a]-[c].

~~(d) If a Priority Development project is allowed to utilize alternative compliance, flow-thru treatment control BMPs must be implemented to treat the portion of the design capture volume that is not retained onsite. Flow-thru treatment control BMPs must be sized and designed to:~~

~~(i) Remove pollutants from storm water to the MEP;~~

~~(ii) Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;~~

~~(iii) Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Flow-thru treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of flow-thru treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.~~

3) Provision E.3.c.(2)(b)

(b) Each Priority Development Project must avoid ~~known~~ critical sediment yield areas known to the Copermittee or identified by the Watershed Management Area Analysis pursuant to Provision B.3.b.(4), or implement measures that allow critical coarse sediment to be discharged to receiving waters, such that there is no net impact to the receiving water ~~sediment supply is unaffected by the project~~.

4) Provision E.3.c.(3)(a)(ix)

~~(ix) Receiving waters must not be utilized to convey untreated storm water runoff from the Priority Development Project to the candidate project;~~

5) Provision E.3.c.(3)(b)

(b) Retrofitting or redevelopment of existing paved alleys, streets or roads that are designed and constructed in accordance with the USEPA Green Streets guidance.

6) Provision E.3.e.(1)(a)

(a) Each Copermittee must require and confirm that for all Priority Development Project applications that have not received prior lawful approval by the Copermittee by the time the BMP Design Manual is updated pursuant to Provision E.3.d ~~18 months after the commencement of coverage under this Order~~, the requirements of Provision E.3 are implemented. For project applications that have received prior lawful approval ~~by 18 months after~~ before the BMP Design Manual is updated pursuant to Provision E.3.d ~~commencement of coverage under this Order~~, the Copermittee may allow previous land development requirements to apply.

PROVISION F Errata

1) Provisions F.1 and F.2

Delete the terms "~~certification~~" and "~~notification of concurrence~~" and replace with "notification of acceptance" throughout Provisions F.1 and F.2.

2) Provision F.1.a.(1)(c)

(c) The Copermittees must coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public ~~as much~~ time and opportunity ~~as possible~~ to participate during the development of the Water Quality Improvement Plans.

3) Provision F.1.b.(7)

(7) During implementation of the Water Quality Improvement Plan ~~after implementation~~ the Copermittees must correct any deficiencies in the Plan identified by the San Diego Water Board ~~no later than 90 days~~ in the updates submitted with the Water Quality Improvement Plan Annual Report following a request by the Board to do so.

4) Provision F.2.a.(2)

(2) Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E ~~no later than 3 months after San Diego Water Board notification of concurrence with~~ concurrent with the submittal of the Water Quality Improvement Plan. Each Copermittee must correct any deficiencies in the jurisdictional runoff management program document based on comments received from the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report.

5) Provision F.2.b.(1)

(1) Each Copermittee must update its BMP Design Manual to incorporate the requirements of Provisions E.3.a-d ~~no later than 3 months after San Diego Water Board notification of concurrence with~~ concurrent with the submittal of the Water Quality Improvement Plan ~~by the San Diego Water Board Executive Officer~~. Each Copermittee must correct any deficiencies in the BMP Design Manual based on comments received from the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report.

6) Provision F.3.b.(2)

(2) Transitional Monitoring and Assessment Program Annual Reports

The Copermittees for each Watershed Management Area must submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted under this Order. The Transitional Monitoring and Assessment Program Annual Reports must include:

ATTACHMENT E Errata

1) Attachment E, Specific Provision 1.b.(3)(a)-(c)

Delete "~~Copermittees'~~" and replace with "Copermittee's"

2) Attachment E, Specific Provision 1.d

Add the following after Specific Provision 1.d.(2):

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 1.b.(2)(b), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

3) Attachment E, Specific Provision 2.b.(2)(b), Table 2.2

Table 2.2
Final Effluent Limitations as Expressed as Annual Loads in MS4 Discharges to Shelter Island Yacht Basin

Constituent	Effluent Limitation
Dissolved Copper	30 g/yr*

* If the water quality objectives for dissolved copper in Shelter Island Yacht Basin are changed in the future, then the margin of safety (MOS), TMDL and allocations will be recalculated using the *Method for Recalculation of the Total Maximum Daily Load for Dissolved Copper in the Shelter Island Yacht Basin, San Diego Bay* in the Basin Plan (p. 7-14).

4) Attachment E, Specific Provision 3.d

Add the following after Specific Provision 3.d.(2):

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 3.b.(2)(b)(i), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

5) Attachment E, Specific Provision 4.b.(3)(a)-(c)

Delete "~~Copermittees'~~" and replace with "Copermittee's"

6) Attachment E, Specific Provision 4.c.(2)(a)-(d)

Delete "~~Copermittees'~~" and replace with "Copermittee's"

7) Attachment E, Specific Provision 4.d

Add the following after Specific Provision 4.d.(2):

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 4.b.(2)(b), dry and wet weather discharge

concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

8) Attachment E, Specific Provision 5.b.(3)(a)-(c)

Delete "~~Copermittees'~~" and replace with "Copermittee's"

9) Attachment E, Specific Provision 5.c.(1)(b)(i)-(iii)

Delete "~~Copermittees'~~" and replace with "Copermittee's"

10) Attachment E, Specific Provision 5.d.(3)

Add the following after Specific Provision 5.d.(3)(a) and renumber subsequent provisions appropriately:

(b) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 5.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

11) Attachment E, Specific Provision 6.b.(2)(a), Table 6.2a

Table 6.2a
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Beaches

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform	10,000	22% ~~/ 0%~~	1,000	0%
Fecal Coliform	400	22% ~~/ 0%~~	200	0%
Enterococcus	104	22% ~~/ 0%~~	35	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. ~~The 0% single sample maximum allowable exceedance frequency applies to dry weather days.~~ For dry weather days the single sample allowable exceedance frequency must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan.

12) Attachment E, Specific Provision 6.b.(2)(a), Table 6.2b

Table 6.2b
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Creeks

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Fecal Coliform	400	22% ~~/ 0%~~	200	0%
Enterococcus	61 (104)	22% ~~/ 0%~~	33	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. ~~The 0% single sample maximum allowable exceedance frequency applies to dry weather days.~~ For dry weather days the single sample allowable exceedance frequency must be consistent with the single sample maximum REC-1 water quality objectives in the Basin Plan.
d. A single sample maximum of 104 MPN/100ml for *Enterococcus* may be applied as a receiving water limitation for creeks, instead of 61~~0~~ MPN/100mL, if one or more of the creeks addressed by these TMDLs (San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek, San Diego River, and/or Chollas Creek) is designated with a "moderately to lightly used area" or less frequent usage frequency in the Basin Plan. Otherwise, the single sample max~~m~~imum of 61 MPN/100mL for *Enterococcus* must be used to assess compliance with the allowable exceedance frequency.

13) Attachment E, Specific Provision 6.b.(2)(b), Table 6.2

Table 6.2c
Final Effluent Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies in MS4 Discharges to the Water Body

Constituent	Concentration-Based Effluent Limitations			
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform[d]	10,000	22% ~~/ 0%~~	1,000	0%
Fecal Coliform	400	22% ~~/ 0%~~	200	0%
Enterococcus	104[e] / 61[f]	22% ~~/ 0%~~	35[e] / 33[f]	0%

Notes:
a. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. ~~The 0% single sample maximum allowable exceedance frequency applies to dry weather days.~~ For dry weather days the single sample allowable exceedance frequency must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan for discharges to beaches, and the Basin Plan for discharges to creeks and creek mouths.
d. Total coliform effluent limitations only apply to MS4 outfalls that discharge to the Pacific Ocean Shorelines and creek mouths listed in Table 6.0.
e. This *Enterococcus* effluent limitation applies to MS4 discharges to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
f. This *Enterococcus* effluent limitation applies to MS4 discharges to segments or areas of creeks or creek mouths listed in Table 6.0.

14) Attachment E, Specific Provision 6.b.(3)(a)-(c)

Delete "~~Copermittees'~~" and replace with "Copermittee's"

15) Attachment E, Specific Provision 6.c.(3)(a)-(c)

Delete "~~Copermittees'~~" and replace with "Copermittee's"

16) Attachment E, Specific Provision 6.d.(1)(b)

Add the following after Specific Provision 6.d.(1)(b)(iii):

(iv) For Pacific Ocean Shoreline segments or areas listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

17) Attachment E, Specific Provision 6.d.(1)(c)

Add the following after Specific Provision 6.d.(1)(c)(iii) and renumber subsequent provisions appropriately:

(iv) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

18) Attachment E, Specific Provision 6.d.(1)(c)(iii)[c]

[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria density~~y~~ies ~~result~~ reported from ~~wet weather samples collected~~ each of the storm events sampled; and

19) Attachment E, Specific Provision 6.d.(2)(b)

Add the following after Specific Provision 6.d.(2)(b)(iii):

(iv) For creeks or creek mouths listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies

continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

20) Attachment E, Specific Provision 6.d.(2)(c)

Add the following after Specific Provision 6.d.(2)(c)(iv) and renumber subsequent provisions appropriately:

(v) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

21) Attachment E, Specific Provision 6.d.(2)(c)(iii)[c]

[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria density~~y~~ies ~~result~~ reported from ~~wet weather samples collected~~ each of the storm events sampled; and

ATTACHMENT F Errata

1) Attachment F, Under the Fact Sheet discussion of Provision B

Purpose: Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges to the MS4s and control pollutants in storm water discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the Clean Water Act.

Provision B includes requirements for the Copermittees to develop and implement Water Quality Improvement Plans to ultimately comply with the prohibitions and limitations under Provision A. The Water Quality Improvement Plans will provide the Copermittees a comprehensive program that can achieve the requirements and further the objectives of the CWA. Implementation of the Water Quality Improvement Plans will also improve the quality of the receiving waters in the San Diego Region.

2) Attachment F, Under the Fact Sheet discussion of Provision B.3

~~Finally, Provision B.3.c has been included to provide the Copermittees an option to demonstrate and be in compliance with the requirements of Provisions A.1.a, A.1.c and A.2.a. One or more Copermittees within a Watershed Management Area can choose to implement this option. This option is only expected to be utilized by the Copermittees that wish to clearly demonstrate and be in compliance with the requirements of Provisions A.1.a, A.1.c and A.2.a.~~

~~In order for a Copermittee to utilize this option, the Copermittee is required to include three components in the Water Quality Improvement Plan. The first component is a comprehensive set of numeric goals that will demonstrate the requirements of Provisions A.1.a, A.1.c and A.2.a will be achieved. The criteria provided in the Order will require the Copermittee to demonstrate that the discharges from its MS4s will not cause or contribute to exceedances of water quality objectives in the receiving waters, and the receiving waters will be protected from the Copermittee's MS4 discharges.~~

~~The second component is an analysis utilizing a watershed model or other watershed analytical tools. The analysis must demonstrate that the implementation of the water quality improvement strategies required under Provision B.3.b will achieve the numeric goals within the established schedules required under Provision B.3.a. Because the development of the analysis may require significant resources, the Order allows the Copermittees in each Watershed Management Area that choose to implement this option to perform the analysis individually, or pool their resources for the analysis collectively.~~

~~The San Diego Water Board does not expect the analysis to be a "guarantee" that the water quality improvement strategies will achieve the numeric goals within the established schedules. The analysis, however, must "reasonably" and "quantitatively" demonstrate that the implementation of the water quality improvement strategies can achieve the numeric goals within the established schedules. However, as more data and information are collected to demonstrate progress toward achieving the numeric goals, the numeric goals, water quality improvement strategies and schedules may need to be updated. When these updates occur, the Copermittees that choose to utilize this option must also update the analysis.~~

~~Thus, the third component is the key component that will allow a Copermittee to demonstrate the implementation of the water quality improvement strategies within its jurisdiction is making progress toward achieving the numeric goals. Each Copermittee must specify the monitoring and assessments that will be performed to confirm the implementation of the water quality improvement strategies are making progress toward achieving the numeric goals within the established schedules.~~

~~These three components must then be reviewed by the Water Quality Improvement~~

~~Consultation Panel. The Water Quality Improvement Consultation Panel is required to be formed as part of the public participation process for the development of the Water Quality Improvement Plans. The Water Quality Improvement Consultation Panel is described under Provision F.1.a.(1)(b). Review by the Water Quality Improvement Consultation Panel has been included to provide an additional layer of input, support, and accountability for the implementation of this option.~~

~~Compliance with the requirements of Provisions A.1.a, A.1.c and A.2.a begins when the Water Quality Improvement Plan, incorporating the requirements of Provision B.3.c.(1), is accepted by the San Diego Water Board. Each Copermittee that chooses to implement and continues to implement this option will be in compliance with the requirements of Provisions A.1.a, A.1.c and A.2.a as long as the San Diego Water Board continues to accept the analysis, and subsequent updates, and the Copermittee continues to implement the strategies, monitoring and assessments as incorporated in the Water Quality Improvement Plan in accordance with Provision B.3.c.(1).~~

3) Attachment F, Under the Fact Sheet discussion of Provision D.2

Until the wet weather MS4 outfall discharge monitoring requirements of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board, the Copermittees must comply with the requirements of transitional wet weather MS4 outfall monitoring requirements pursuant to Provision D.2.a.(3). Provision D.2.a.(3) requires each Copermittee to sample, at least five of the major MS4 outfalls inventoried pursuant to Provision D.2.a.(1) ~~twice~~ once per wet season for the monitoring data required to be collected pursuant to Provision D.2.a.(3)(c)-(e).

4) Attachment F, Under the Fact Sheet discussion of Provision E.3

The 85th percentile storm event is the event that has a precipitation total greater than or equal to 85 percent of all storm events over a given period of record in a specific area or location. For example, to determine what the 85th percentile storm event is in a specific location, all 24 hour storms that have recorded values over a 30 year period would be tabulated and a 85th percentile storm would be determined from this record (i.e., 15 percent of the storms would be greater than the number determined to be the 85th percentile storm). Most jurisdictions in the San Diego Region have already developed isopluvial maps that can provide this type of information. The 85th percentile storm might be determined to be a number such as 1.0 inch, and this would be multiplied by the total area of the project footprint producing runoff to calculate the design capture volume. The Priority Development Project designer would then select a system of BMPs that would retain (i.e. intercept, store, infiltrate, evaporate, or evapotranspire) ~~100 percent of~~ the pollutants contained in the design capture volume onsite.

Retention BMPs are necessary to capture and retain pollutants generated from a Priority Development Project. In a recent study performed by SCCWRP in the Los Angeles Region, they found "*that the magnitude of constituent load associated with storm water runoff depends, at least in part, on the amount of time available for pollutant build-up on land surfaces. The extended dry period that typically occurs in arid climates such as southern California maximizes the time for constituents to build-up on land surfaces, resulting in proportionally higher concentrations and loads during initial storms of the season*."[2] This implies that the "first flush" of a rainy season and the first storm events after long antecedent dry periods tend to have the highest pollutant loads. Capturing and retaining the pollutant loads of the "first flush" of a rainy season and the first storm events after long antecedent dry periods will reduce a significant portion of the pollutants in storm water discharged to and from the MS4.

The San Diego Water Board, however, acknowledges that in some situations retention of the full design capture volume onsite may not be technically feasible. In this event, the Copermittee may allow the Priority Development Project to utilize biofiltration BMPs to treat 1.5 times the design capture volume not reliably retained onsite, or biofiltration BMPs with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite ~~flow-thru treatment control BMPs to achieve the equivalent pollutant load removal that would have been achieved if the design capture volume were fully retained onsite, pursuant to Provision E.3.c.(1)(b). Biofiltration LID BMPs must be considered as a first option before other types of flow-thru treatment control BMPs may be considered because of the ancillary benefits they provide, such as reduction in flow rates and creation of habitat. In any event, no matter what types of BMPs (or combination of BMPs) are chosen, 100 percent of the pollutants contained in the design capture volume must not be allowed to be discharged from the Priority Development Project~~.

The 1.5 multiplier is based on the finding in the Ventura County Technical Guidance Manual that biofiltration of 1.5 times the design capture volume not retained onsite will provide approximately the same pollutant removal as retention of the design capture volume on an annual basis.[3] This standard is consistent with the Los Angeles Water Board's Los Angeles and Ventura County municipal storm water permits (Order Nos. R4-2012-0175 and R4-2010-0108, respectively). The flow-thru design of 0.75 times the portion of the design capture volume not reliably retained onsite is consistent with the San Diego Water Board's Orange County and Riverside County municipal storm water permits (Order Nos. R9-2009-0002 and R9-2010-0016, respectively).

[2] Stein, E.D., Tiefenthaler, L.L., and Schiff, K.C., 2007. Technical Report 510, Sources, Patterns and Mechanisms of Storm Water Pollutant Loading from Watershed and Land Uses of the Greater Los Angeles Area, California, USA. March 20, 2007.
[3] Ventura Countywide Stormwater Management Program. 2011. Ventura Technical Guidance Manual, Manual Update, 2011.

The San Diego Water Board further recognizes that, in addition to not being technically feasible, retention of the full design capture storm onsite may be cost prohibitive, or may not provide as much water quality benefit to the Watershed Management Area as would implementing BMPs elsewhere in the watershed. Thus, Provision ~~E.3.c.(1)(c)~~ E.3.c.(1)(b) allows for the use of a combination of onsite retention BMPs, and the implementation of an Alternative Compliance Program described in Provision E.3.c.(3). Provision E.3.c.(3) is discussed in more detail below.

If the full design capture volume is not retained onsite either because biofiltration is not technically feasible, or a Copermittee grants a Priority Development Project permission to utilize the Alternative Compliance Program, then the pollutants in the portion of the design capture volume that are not reliably retained onsite must still be reduced to the MEP. Thus, flow-thru treatment control BMPs are required to be implemented on Priority Development Projects in addition to the retention BMPs. The requirements of Provisions ~~E.3.c.(1)(d)~~ E.3.c.(1)(a)(i)[a]-[c] include the performance standards for flow-thru treatment control BMPs, consistent with the Fourth Term Permits in the San Diego Region.

5) Attachment F, Under the Fact Sheet discussion of Provision F.1

The San Diego Water Board recognizes that the development of multiple Water Quality Improvement Plans concurrently may limit the ability of the public to review and provide comments to the Copermittees. Thus, Provision F.1.a.(1)(c) requires the Copermittees to coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public ~~as much~~ time and opportunity ~~as possible~~ to participate during the development of the Water Quality Improvement Plans.

6) Attachment F, Under the Fact Sheet discussion of Provision F.3

Provision F.3.b.(2) includes the transitional annual reporting requirements for the transitional monitoring and assessment program for each Watershed Management Area. The Copermittees in the Watershed Management Area are required to submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted. The Transitional Monitoring and Assessment Program Annual Report is required to include the transitional period monitoring data collected pursuant to Provisions D.1.a and D.2.a, and the findings from the transitional period findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
San Diego Region

Errata Sheet
(OPTION 2)
Tentative Order No. R9-2013-0001
NPDES No. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The following changes to the revised version of Tentative Order No. R9-2013-0001, released March 27, 2013, are based on the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) Public Hearing testimony presented during Agenda Item No. 8 at the April 10 and 11, 2013 San Diego Water Board Meeting. The changes to the Tentative Order listed below are shown in underline/strikeout format to indicate added and removed language, respectively.

FINDINGS Errata

1) Discharge Characteristics and Runoff Management Findings

Add the following finding after Finding 17, and renumber the subsequent findings appropriately:

18. Water Quality Improvements. Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges to the MS4s and control pollutants in storm water discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the Clean Water Act.

PROVISION A Errata

1) Provision A.4.a.(4)

(4) Within 90 days of the San Diego Water Board determination that the ~~update~~ modifications to the Water Quality Improvement Plan required under Provision A.4.a.(3) meet the requirements of this Order, the applicable Copermittees must

revise the jurisdictional runoff management program documents to incorporate the ~~updated~~ modified water quality improvement strategies that have been and will be implemented, the implementation schedule, and any additional monitoring required; and

PROVISION B Errata

1) Provision B Introductory Paragraph

The purpose of this provision is to develop Water Quality Improvement Plans that guide the Copermittees' jurisdictional runoff management programs towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plans is to further the Clean Water Act's objective to protect, preserve, ~~and~~ enhance, and restore the water quality and designated beneficial uses of waters of the state. This goal will be accomplished through an adaptive planning and management process that identifies the highest priority water quality conditions within a watershed and implements strategies through the jurisdictional runoff management programs to achieve improvements in the quality of discharges from the MS4s and receiving waters.

2) Provision B.3.b.(4)(b)

(b) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify and compile a list of candidate projects that could potentially be used as alternative compliance options for Priority Development Projects, to be implemented in lieu of onsite structural BMP performance requirements described in Provisions E.3.c.(1) and E.3.c.(2). Specifically, the Copermittees must identify opportunities to be included in the list for candidate projects in each Watershed Management Area, such as:

(i) ~~Opportunities for s~~Stream or riparian area rehabilitation;

(ii) ~~Opportunities for r~~Retrofitting existing infrastructure to incorporate storm water retention or treatment;

(iii) ~~Opportunities for r~~Regional BMPs;

(iv) ~~Opportunities for g~~Groundwater recharge projects;

(v) ~~Opportunities for w~~Water supply augmentation projects; and

(vi) ~~Opportunities for l~~Land purchases to preserve floodplain functions.

3) Provision B.3.c

Revise references to "Provisions A.1.a, A.1.c and A.2.a" to "Provisions A.1.a, A.1.c, A.1.d, A.2.a and A.2.b~~a~~" throughout the requirements of the Provision B.3.c.

4) Provision B.3.c.(1)(d)

(d) The numeric goals proposed pursuant to Provision B.3.c.(1)(a), the analysis performed pursuant to Provision B.3.c.(1)(b) and the specific monitoring and assessments proposed pursuant to Provision B.3.c.(1)(c) have been reviewed ~~and receive concurrence~~ by ~~a majority of~~ the Water Quality Improvement Consultation Panel (see Provision F.1.a.(1)(b)) for any recommendations. Updates must ~~also receive concurrence~~ be reviewed by ~~a majority of~~ the Water Quality Improvement Consultation Panel for any recommendations.

5) Provision B.3.c.(3)(a)

(a) The results of the analysis performed pursuant to Provision B.3.c.(1)(d) is accepted ~~and continues to be accepted~~ by the San Diego Water Board Executive Officer as part of the Water Quality Improvement Plan and as part of subsequent updates to the Water Quality Improvement Plan; AND

6) Provision B.3.c.(3)(d)

(d) The Copermittee~~s in the Watershed Management Area~~ continues to implement the requirements of Provision A.4.a.

PROVISION D Errata

1) Provision D.2.a.(3)(b)

(b) Transitional Wet Weather MS4 Outfall Discharge Monitoring Frequency

Each wet weather MS4 outfall discharge monitoring station selected pursuant to Provision D.2.a.(3)(a) must be monitored ~~twice~~ once during the wet season (October 1 – April 30). The wet weather monitoring events must be selected to be representative of the range of hydrological conditions experienced in the region. At least 10 percent of samples must be conducted during the first wet weather event of the wet season, to include at least one such sample in each Watershed Management Area.~~.~~

2) Provision D.3.d

(d) Special studies initiated prior to the effective date of this Order that meet the requirements of Provision D.3.b and are implemented during the term of this Order as part of the Water Quality Improvement Plan may be utilized to fulfill the special study requirements of Provision D.3.a. Special studies completed before the effective date of this Order ~~Water Quality Improvement Plan is accepted by the San Diego Water Board~~ cannot be utilized to fulfill the special study requirements of Provision D.3.a.

3) Provision D.4.b.(2)(b)(i)[d]

[d] The percent contribution of storm water volumes and pollutant loads discharged from each land use type within ~~the~~ each hydrologic subarea with a major MS4 outfall to receiving waters or within each major MS4 outfall to receiving waters ~~drainage basin to each of~~ in the Copermittee's ~~major MS4 outfalls in its~~ jurisdiction ~~to receiving waters~~ within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch.

PROVISION E Errata

1) Provision E.3.b.(1)

(1) Definition of Priority Development Project

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site)~~, or redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site)~~. This ~~category~~ includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(b) Redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site on an existing site of 10,000 square feet or more of impervious surfaces). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

~~(b)~~
(c) New or redevelopment projects that create 5,000 square feet or more of impervious surface (collectively over the entire project site), and support one or more of the following uses:

2) Provision E.3.c.(1)

(a) Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite ~~100 percent of~~ the pollutants contained in the volume of storm water runoff produced from a 24-hour 85th percentile storm event (design capture volume)~~;~~.

~~(b)~~ (i) If a Copermittee determines that implementing BMPs to retain the full design capture volume onsite for a Priority Development Project is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize ~~flow-thru treatment control~~ biofiltration BMPs. Biofiltration BMPs must be sized and designed to: ~~achieve the equivalent~~

~~pollutant load removal described in Provision E.3.c.(1)(a). Biofiltration LID BMPs must be considered as a first option before other types of flow-thru treatment control BMPs may be considered.~~

[a] Treat 1.5 times the design capture volume not reliably retained onsite; OR

[b] Treat the design capture volume not reliably retained onsite with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite.

[c] Have an appropriate loading rate to prevent erosion, scour, and channeling within the BMP.

(ii) If a Copermittee determines that biofiltration is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize flow-thru treatment control BMPs to treat runoff leaving the site, AND mitigate for the design capture volume not reliably retained onsite pursuant to Provision E.3.(c)(1)(b). Flow thru treatment control BMPs must be sized and designed to:

[a] Remove pollutants from storm water to the MEP;

[b] Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;

[c] Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Flow-thru treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of flow-thru treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

~~(c)~~

(b) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1)(a). The Priority Development Project must mitigate for the portion of the pollutant load in the design capture volume not retained onsite if Provision E.3.(c)(3) is utilized. If a Priority Development Project is allowed to utilize alternative compliance, flow-thru treatment control BMPs must be implemented to treat the portion of the design capture volume that is not reliably retained onsite. Flow-thru treatment control BMPs must be sized and designed in accordance with Provision E.3.c.(1)(a)(ii)[a]-[c].

~~(d) If a Priority Development project is allowed to utilize alternative compliance, flow-thru treatment control BMPs must be implemented to treat the portion of the design capture volume that is not retained onsite. Flow-thru treatment control BMPs must be sized and designed to:~~

~~(i) Remove pollutants from storm water to the MEP;~~

~~(ii) Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;~~

~~(iii) Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Flow-thru treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of flow-thru treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.~~

3) Provision E.3.c.(2)(b)

(b) Each Priority Development Project must avoid ~~known~~ critical sediment yield areas known to the Copermittee or identified by the Watershed Management Area Analysis pursuant to Provision B.3.b.(4), or implement measures that allow critical coarse sediment to be discharged to receiving waters, such that there is no net impact to the receiving water ~~sediment supply is unaffected by the project~~.

4) Provision E.3.c.(3)(a)(ix)

~~(ix) Receiving waters must not be utilized to convey untreated storm water runoff from the Priority Development Project to the candidate project;~~

5) Provision E.3.c.(3)(b)

(b) Retrofitting or redevelopment of existing paved alleys, streets or roads that are designed and constructed in accordance with the USEPA Green Streets guidance.

6) Provision E.3.e.(1)(a)

(a) Each Copermittee must require and confirm that for all Priority Development Project applications that have not received prior lawful approval by the Copermittee by the time the BMP Design Manual is updated pursuant to Provision E.3.d ~~18 months after the commencement of coverage under this~~

~~Order~~, the requirements of Provision E.3 are implemented. For project applications that have received prior lawful approval ~~by 18 months after~~ before the BMP Design Manual is updated pursuant to Provision E.3.d ~~commencement of coverage under this Order~~, the Copermittee may allow previous land development requirements to apply.

PROVISION F Errata

1) Provisions F.1 and F.2

Delete the terms "~~certification~~" and "~~notification of concurrence~~" and replace with "notification of acceptance" throughout Provisions F.1 and F.2.

2) Provision F.1.a.(1)(c)

(c) The Copermittees must coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public ~~as much~~ time and opportunity ~~as possible~~ to participate during the development of the Water Quality Improvement Plans.

3) Provision F.1.b.(7)

(7) During implementation of the Water Quality Improvement Plan ~~after implementation~~ the Copermittees must correct any deficiencies in the Plan identified by the San Diego Water Board ~~no later than 90 days~~ in the updates submitted with the Water Quality Improvement Plan Annual Report following a request by the Board to do so.

4) Provision F.2.a.(2)

(2) Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E ~~no later than 3 months after San Diego Water Board notification of concurrence with~~ concurrent with the submittal of the Water Quality Improvement Plan. Each Copermittee must correct any deficiencies in the jurisdictional runoff management program document based on comments received from the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report.

5) Provision F.2.b.(1)

(1) Each Copermittee must update its BMP Design Manual to incorporate the requirements of Provisions E.3.a-d ~~no later than 3 months after San Diego Water Board notification of concurrence with~~ concurrent with the submittal of the Water Quality Improvement Plan ~~by the San Diego Water Board Executive Officer~~. Each Copermittee must correct any deficiencies in the BMP Design Manual based on comments received from the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report.

6) Provision F.3.b.(2)

(2) Transitional Monitoring and Assessment Program Annual Reports

The Copermittees for each Watershed Management Area must submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted under this Order. The Transitional Monitoring and Assessment Program Annual Reports must include:

ATTACHMENT E Errata

1) Attachment E, Specific Provision 1.b.(3)(a)-(c)

Delete "~~Copermittees'~~" and replace with "Copermittee's"

2) Attachment E, Specific Provision 1.d

Add the following after Specific Provision 1.d.(2):

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 1.b.(2)(b), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

3) Attachment E, Specific Provision 2.b.(2)(b), Table 2.2

Table 2.2
Final Effluent Limitations as Expressed as Annual Loads in MS4 Discharges to Shelter Island Yacht Basin

Constituent	Effluent Limitation
Dissolved Copper	30 g/yr*

* If the water quality objectives for dissolved copper in Shelter Island Yacht Basin are changed in the future, then the margin of safety (MOS), TMDL and allocations will be recalculated using the *Method for Recalculation of the Total Maximum Daily Load for Dissolved Copper in the Shelter Island Yacht Basin, San Diego Bay* in the Basin Plan (pp. 7-14).

4) Attachment E, Specific Provision 3.d

Add the following after Specific Provision 3.d.(2):

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 3.b.(2)(b)(i), dry and wet weather discharge

concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

5) Attachment E, Specific Provision 4.b.(3)(a)-(c)

Delete "~~Copermittees'~~" and replace with "Copermittee's"

6) Attachment E, Specific Provision 4.c.(2)(a)-(d)

Delete "~~Copermittees'~~" and replace with "Copermittee's"

7) Attachment E, Specific Provision 4.d

Add the following after Specific Provision 4.d.(2):

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 4.b.(2)(b), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

8) Attachment E, Specific Provision 5.b.(3)(a)-(c)

Delete "~~Copermittees'~~" and replace with "Copermittee's"

9) Attachment E, Specific Provision 5.c.(1)(b)(i)-(iii)

Delete "~~Copermittees'~~" and replace with "Copermittee's"

10) Attachment E, Specific Provision 5.d.(3)

Add the following after Specific Provision 5.d.(3)(a) and renumber subsequent provisions appropriately:

(b) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 5.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

11) Attachment E, Specific Provision 6.b.(2)(a), Table 6.2a

Table 6.2a
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Beaches

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform	10,000	22% ~~/ 0%~~	1,000	0%
Fecal Coliform	400	22% ~~/ 0%~~	200	0%
Enterococcus	104	22% ~~/ 0%~~	35	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. ~~The 0% single sample maximum allowable exceedance frequency applies to dry weather days.~~ For dry weather days the single sample allowable exceedance frequency must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan.

12) Attachment E, Specific Provision 6.b.(2)(a), Table 6.2b

Table 6.2b
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Creeks

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Fecal Coliform	400	22% ~~/ 0%~~	200	0%
Enterococcus	61 (104)	22% ~~/ 0%~~	33	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. ~~The 0% single sample maximum allowable exceedance frequency applies to dry weather days.~~ For dry weather days the single sample allowable exceedance frequency must be consistent with the single sample maximum REC-1 water quality objectives in the Basin Plan.
d. A single sample maximum of 104 MPN/100ml for *Enterococcus* may be applied as a receiving water limitation for creeks, instead of 61~~0~~ MPN/100mL, if one or more of the creeks addressed by these TMDLs (San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek, San Diego River, and/or Chollas Creek) is designated with a "moderately to lightly used area" or less frequent usage frequency in the Basin Plan. Otherwise, the single sample max~~m~~imum of 61 MPN/100mL for *Enterococcus* must be used to assess compliance with the allowable exceedance frequency.

13) Attachment E, Specific Provision 6.b.(2)(b), Table 6.2

Table 6.2c
Final Effluent Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies in MS4 Discharges to the Water Body

Constituent	Concentration-Based Effluent Limitations			
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform[d]	10,000	22% ~~/ 0%~~	1,000	0%
Fecal Coliform	400	22% ~~/ 0%~~	200	0%
Enterococcus	104[e] / 61[f]	22% ~~/ 0%~~	35[e] / 33[f]	0%

Notes:
a. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. ~~The 0% single sample maximum allowable exceedance frequency applies to dry weather days.~~ For dry weather days the single sample allowable exceedance frequency must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan for discharges to beaches, and the Basin Plan for discharges to creeks and creek mouths.
d. Total coliform effluent limitations only apply to MS4 outfalls that discharge to the Pacific Ocean Shorelines and creek mouths listed in Table 6.0.
e. This *Enterococcus* effluent limitation applies to MS4 discharges to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
f. This *Enterococcus* effluent limitation applies to MS4 discharges to segments or areas of creeks or creek mouths listed in Table 6.0.

14) Attachment E, Specific Provision 6.b.(3)(a)-(c)

Delete "~~Copermittees'~~" and replace with "Copermittee's"

15) Attachment E, Specific Provision 6.c.(3)(a)-(c)

Delete "~~Copermittees'~~" and replace with "Copermittee's"

16) Attachment E, Specific Provision 6.d.(1)(b)

Add the following after Specific Provision 6.d.(1)(b)(iii):

(iv) For Pacific Ocean Shoreline segments or areas listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

17) Attachment E, Specific Provision 6.d.(1)(c)

Add the following after Specific Provision 6.d.(1)(c)(iii) and renumber subsequent provisions appropriately:

(iv) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

18) Attachment E, Specific Provision 6.d.(1)(c)(iii)[c]

[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria density~~y~~ies ~~result~~ reported from ~~wet weather samples collected~~ each of the storm events sampled; and

19) Attachment E, Specific Provision 6.d.(2)(b)

Add the following after Specific Provision 6.d.(2)(b)(iii):

(iv) For creeks or creek mouths listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

20) Attachment E, Specific Provision 6.d.(2)(c)

Add the following after Specific Provision 6.d.(2)(c)(iv) and renumber subsequent provisions appropriately:

(v) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

21) Attachment E, Specific Provision 6.d.(2)(c)(iii)[c]

[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average

of the highest bacteria densityies result reported from wet weather samples collected each of the storm events sampled; and

ATTACHMENT F Errata

1) Attachment F, Under the Fact Sheet discussion of Provision B

Purpose: Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges to the MS4s and control pollutants in storm water discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the Clean Water Act.

Provision B includes requirements for the Copermittees to develop and implement Water Quality Improvement Plans to ultimately comply with the prohibitions and limitations under Provision A. The Water Quality Improvement Plans will provide the Copermittees a comprehensive program that can achieve the requirements and further the objectives of the CWA. Implementation of the Water Quality Improvement Plans will also improve the quality of the receiving waters in the San Diego Region.

2) Attachment F, Under the Fact Sheet discussion of Provision D.2

Until the wet weather MS4 outfall discharge monitoring requirements of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board, the Copermittees must comply with the requirements of transitional wet weather MS4 outfall monitoring requirements pursuant to Provision D.2.a.(3). Provision D.2.a.(3) requires each Copermittee to sample, at least five of the major MS4 outfalls inventoried pursuant to Provision D.2.a.(1) twice once per wet season for the monitoring data required to be collected pursuant to Provision D.2.a.(3)(c)-(e).

3) Attachment F, Under the Fact Sheet discussion of Provision E.3

The 85th percentile storm event is the event that has a precipitation total greater than or equal to 85 percent of all storm events over a given period of record in a specific area or location. For example, to determine what the 85th percentile storm event is in a specific location, all 24 hour storms that have recorded values over a 30 year period would be tabulated and a 85th percentile storm would be determined from this record (i.e., 15 percent of the storms would be greater than the number determined to be the 85th percentile storm). Most jurisdictions in the San Diego Region have

already developed isopluvial maps that can provide this type of information. The 85th percentile storm might be determined to be a number such as 1.0 inch, and this would be multiplied by the total area of the project footprint producing runoff to calculate the design capture volume. The Priority Development Project designer would then select a system of BMPs that would retain (i.e. intercept, store, infiltrate, evaporate, or evapotranspire) ~~100 percent of~~ the pollutants contained in the design capture volume onsite.

Retention BMPs are necessary to capture and retain pollutants generated from a Priority Development Project. In a recent study performed by SCCWRP in the Los Angeles Region, they found "*that the magnitude of constituent load associated with storm water runoff depends, at least in part, on the amount of time available for pollutant build-up on land surfaces. The extended dry period that typically occurs in arid climates such as southern California maximizes the time for constituents to build-up on land surfaces, resulting in proportionally higher concentrations and loads during initial storms of the season*."[1] This implies that the "first flush" of a rainy season and the first storm events after long antecedent dry periods tend to have the highest pollutant loads. Capturing and retaining the pollutant loads of the "first flush" of a rainy season and the first storm events after long antecedent dry periods will reduce a significant portion of the pollutants in storm water discharged to and from the MS4.

The San Diego Water Board, however, acknowledges that in some situations retention of the full design capture volume onsite may not be technically feasible. In this event, the Copermittee may allow the Priority Development Project to utilize biofiltration BMPs to treat 1.5 times the design capture volume not reliably retained onsite, or biofiltration BMPs with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite ~~flow-thru treatment control BMPs to achieve the equivalent pollutant load removal that would have been achieved if the design capture volume were fully retained onsite, pursuant to Provision E.3.c.(1)(b). Biofiltration LID BMPs must be considered as a first option before other types of flow thru treatment control BMPs may be considered because of the ancillary benefits they provide, such as reduction in flow rates and creation of habitat. In any event, no matter what types of BMPs (or combination of BMPs) are chosen, 100 percent of the pollutants contained in the design capture volume must not be allowed to be discharged from the Priority Development Project~~.

The 1.5 multiplier is based on the finding in the Ventura County Technical Guidance Manual that biofiltration of 1.5 times the design capture volume not retained onsite will provide approximately the same pollutant removal as retention of the design

[1] Stein, E.D., Tiefenthaler, L.L., and Schiff, K.C., 2007. Technical Report 510, Sources, Patterns and Mechanisms of Storm Water Pollutant Loading from Watershed and Land Uses of the Greater Los Angeles Area, California, USA. March 20, 2007.

capture volume on an annual basis.[2] This standard is consistent with the Los Angeles Water Board's Los Angeles and Ventura County municipal storm water permits (Order Nos. R4-2012-0175 and R4-2010-0108, respectively). The flow-thru design of 0.75 times the portion of the design capture volume not reliably retained onsite is consistent with the San Diego Water Board's Orange County and Riverside County municipal storm water permits (Order Nos. R9-2009-0002 and R9-2010-0016, respectively).

The San Diego Water Board further recognizes that, in addition to not being technically feasible, retention of the full design capture storm onsite may be cost prohibitive, or may not provide as much water quality benefit to the Watershed Management Area as would implementing BMPs elsewhere in the watershed. Thus, Provision ~~E.3.c.(1)(c)~~ E.3.c.(1)(b) allows for the use of a combination of onsite retention BMPs, and the implementation of an Alternative Compliance Program described in Provision E.3.c.(3). Provision E.3.c.(3) is discussed in more detail below.

If the full design capture volume is not retained onsite either because biofiltration is not technically feasible, or a Copermittee grants a Priority Development Project permission to utilize the Alternative Compliance Program, then the pollutants in the portion of the design capture volume that are not reliably retained onsite must still be reduced to the MEP. Thus, flow-thru treatment control BMPs are required to be implemented on Priority Development Projects in addition to the retention BMPs. The requirements of Provisions ~~E.3.c.(1)(d)~~ E.3.c.(1)(a)(i)[a]-[c] include the performance standards for flow-thru treatment control BMPs, consistent with the Fourth Term Permits in the San Diego Region.

4) Attachment F, Under the Fact Sheet discussion of Provision F.1

The San Diego Water Board recognizes that the development of multiple Water Quality Improvement Plans concurrently may limit the ability of the public to review and provide comments to the Copermittees. Thus, Provision F.1.a.(1)(c) requires the Copermittees to coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public ~~as much~~ time and opportunity ~~as possible~~ to participate during the development of the Water Quality Improvement Plans.

5) Attachment F, Under the Fact Sheet discussion of Provision F.3

Provision F.3.b.(2) includes the transitional annual reporting requirements for the transitional monitoring and assessment program for each Watershed Management Area. The Copermittees in the Watershed Management Area are required to submit a Transitional Monitoring and Assessment Program Annual Report no later than

2 Ventura Countywide Stormwater Management Program. 2011. Ventura Technical Guidance Manual, Manual Update, 2011.

January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted. The Transitional Monitoring and Assessment Program Annual Report is required to include the transitional period monitoring data collected pursuant to Provisions D.1.a and D.2.a, and the findings from the transitional period findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

From: lyris@swrcb18.waterboards.ca.gov
To: Chiu, Wayne@Waterboards
Subject: May 8, 2013 Continuation of Public Hearing on Tentative Order No. R9-2013-0001 San Diego Regional MS4 Permit
Date: Thursday, May 02, 2013 3:00:45 PM

This is a message from the California Regional Water Quality Control Board, San Diego Region (9).

Parties and Interested Persons,

All documents pertaining to Item No. 9, Issuance of a NPDES Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region are now posted on the San Diego Water Boards website at http://www.waterboards.ca.gov/sandiego/board_info/agendas/2013/May/May8.shtml

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CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
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CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
San Diego Region

Errata Sheet
(OPTION 1)
CORRECTED
Tentative Order No. R9-2013-0001
NPDES No. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The following changes to the revised version of Tentative Order No. R9-2013-0001, released March 27, 2013, are based on the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) Public Hearing testimony presented during Agenda Item No. 8 at the April 10 and 11, 2013 San Diego Water Board Meeting. The changes to the Tentative Order listed below are shown in underline/strikeout format to indicate added and removed language, respectively.

GENERAL Errata

Correct typographical and grammatical errors.

FINDINGS Errata

1) Discharge Characteristics and Runoff Management Findings

Add the following finding after Finding 17, and renumber the subsequent findings appropriately:

18. Water Quality Improvements. Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges to the MS4s and control pollutants in storm water discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the Clean Water Act.

PROVISION A Errata

1) Provision A.4.a.(4)

(4) Within 90 days of the San Diego Water Board determination that the ~~update~~ modifications to the Water Quality Improvement Plan required under Provision A.4.a.(3) meet~~s~~ the requirements of this Order, the applicable Copermittees must revise the jurisdictional runoff management program documents to incorporate the ~~updated~~ modified water quality improvement strategies that have been and will be implemented, the implementation schedule, and any additional monitoring required; and

PROVISION B Errata

1) Provision B Introductory Paragraph

The purpose of this provision is to develop Water Quality Improvement Plans that guide the Copermittees' jurisdictional runoff management programs towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plans is to further the Clean Water Act's objective to protect, preserve, ~~and~~ enhance, and restore the water quality and designated beneficial uses of waters of the state. This goal will be accomplished through an adaptive planning and management process that identifies the highest priority water quality conditions within a watershed and implements strategies through the jurisdictional runoff management programs to achieve improvements in the quality of discharges from the MS4s and receiving waters.

2) Provision B.3.b.(4)(b)

(b) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify and compile a list of candidate projects that could potentially be used as alternative compliance options for Priority Development Projects, to be implemented in lieu of onsite structural BMP performance requirements described in Provisions E.3.c.(1) and E.3.c.(2). Specifically, the Copermittees must identify opportunities to be included in the list for candidate projects in each Watershed Management Area, such as:

(i) ~~Opportunities for s~~Stream or riparian area rehabilitation;

(ii) ~~Opportunities for r~~Retrofitting existing infrastructure to incorporate storm water retention or treatment;

(iii) ~~Opportunities for r~~Regional BMPs;

(iv) ~~Opportunities for g~~Groundwater recharge projects;

(v) ~~Opportunities for w~~Water supply augmentation projects; and

(vi) ~~Opportunities for l~~Land purchases to preserve floodplain functions.

3) Provision B.3.c

~~c. DISCHARGE PROHIBITIONS AND RECEIVING WATER LIMITATIONS COMPLIANCE OPTION~~

~~(1) The Copermittees may utilize implementation of the water quality improvement strategies in the Water Quality Improvement Plan to demonstrate compliance with the requirements of Provisions A.1.a, A.1.c and A.2.a. For each Copermittee in the Watershed Management Area that chooses to utilize this option, the Copermittee will be in compliance with Provisions A.1.a, A.1.c and A.2.a if:~~

~~(a) Numeric goals and schedules developed pursuant to Provision B.3.a include the following numeric goals:~~

~~(i) WQBELs expressed as concentration-based or load-based effluent limitations applicable to the Watershed Management Area established by the TMDLs in Attachment E to this Order; and~~

~~(ii) Numeric goals applicable to the Copermittee's MS4 discharges expressed as concentration-based or load-based effluent limitations for all other pollutants listed on the Clean Water Act Section 303(d) List of Water Quality Impaired Segments[1] for the receiving waters in the Watershed Management Area that do not have a TMDL developed; and~~

~~(iii) Numeric goals for receiving waters that will protect the conditions of the receiving waters and attain water quality standards.~~

~~(b) An analysis utilizing a watershed model or other watershed analytical tools is performed. The results must be included in the Water Quality Improvement Plan to quantitatively demonstrate that the implementation of the water quality improvement strategies required under Provision B.3.b will achieve the numeric goals within the established schedules required under Provision B.3.a. The analysis may be performed individually or jointly by the Copermittees choosing to utilize this option in the Watershed Management Area, and must be updated as part of the iterative approach and adaptive management process required under Provisions B.5.a-b.~~

~~(c) The Water Quality Improvement Plan specifies the monitoring and assessments (i.e. MS4 outfall discharge, receiving water, and/or special studies) that will be performed by the Copermittee to confirm the implementation of the water quality improvement strategies within its jurisdiction is making progress toward achieving the numeric goals in accordance with the established schedules developed pursuant to Provision B.3.c.(1)(a). The monitoring and assessments must be~~

~~[1] 2002 and subsequent 303(d) Lists~~

~~incorporated into the monitoring and assessment program required pursuant to Provision B.4. The monitoring and assessments must be updated as part of the iterative approach and adaptive management process required under Provision B.5.c.~~

~~(d) The numeric goals proposed pursuant to Provision B.3.c.(1)(a), the analysis performed pursuant to Provision B.3.c.(1)(b) and the specific monitoring and assessments proposed pursuant to Provision B.3.c.(1)(c) have been reviewed and receive concurrence by a majority of the Water Quality Improvement Consultation Panel (see Provision F.1.a.(1)(b)). Updates must also receive concurrence by a majority of the Water Quality Improvement Consultation Panel.~~

~~(2) Each Copermittee that chooses to utilize this option will, for the pollutant/water body combinations covered by the analysis, be in compliance with Provisions A.1.a, A.1.c and A.2.a when the Water Quality Improvement Plan, incorporating the requirements of Provision B.3.c.(1), is accepted by the San Diego Water Board.~~

~~(3) The Copermittee will, for the pollutant/water body combinations covered by the analysis, remain in compliance with Provisions A.1.a, A.1.c and A.2.a during the term of this Order as long as:~~

~~(a) The results of the analysis performed pursuant to Provision B.3.c.(1)(d) is accepted and continues to be accepted by the San Diego Water Board Executive Officer as part of the Water Quality Improvement Plan; AND~~

~~(b) The Copermittee continues to implement the water quality improvement strategies within its jurisdiction developed pursuant to Provision B.3.b.(1) in accordance with the schedules for implementing the strategies established pursuant to Provision B.3.b.(3)(a); AND~~

~~(c) The Copermittee continues to perform the monitoring and assessments specified in the Water Quality Improvement Plan, developed and implemented pursuant to Provision B.3.c.(1)(c), to demonstrate its progress toward achieving the numeric goals applicable to its MS4 discharges in accordance with the interim and final dates for achieving the numeric goals established pursuant to Provision B.3.a.(2); AND~~

~~(d) The Copermittees in the Watershed Management Area continue to implement the requirements of Provision A.4.a.~~

PROVISION D Errata

1) Provision D.2.a.(3)(b)

(b) Transitional Wet Weather MS4 Outfall Discharge Monitoring Frequency

Each wet weather MS4 outfall discharge monitoring station selected pursuant to Provision D.2.a.(3)(a) must be monitored ~~twice~~ once during the wet season (October 1 – April 30). The wet weather monitoring events must be selected to be representative of the range of hydrological conditions experienced in the region. At least 10 percent of samples must be conducted during the first wet weather event of the wet season, to include at least one such sample in each Watershed Management Area.~~.~~

2) Provision D.3.d

(d) Special studies initiated prior to the effective date of this Order that meet the requirements of Provision D.3.b and are implemented during the term of this Order as part of the Water Quality Improvement Plan may be utilized to fulfill the special study requirements of Provision D.3.a. Special studies completed before the effective date of this Order ~~Water Quality Improvement Plan is accepted by the San Diego Water Board~~ cannot be utilized to fulfill the special study requirements of Provision D.3.a.

3) Provision D.4.b.(2)(b)(i)[d]

[d] The percent contribution of storm water volumes and pollutant loads discharged from each land use type within ~~the~~ each hydrologic subarea with a major MS4 outfall to receiving waters or within each major MS4 outfall to receiving waters ~~drainage basin to each of~~ in the Copermittee's ~~major MS4 outfalls in its~~ jurisdiction ~~to receiving waters~~ within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch.

PROVISION E Errata

1) Provision E.3.b.(1)

(1) Definition of Priority Development Project

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site)~~, or redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site)~~. This ~~category~~ includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(b) Redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site on an existing site of 10,000 square feet or more of impervious surfaces). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

~~(b)~~
(c) New or redevelopment projects that create 5,000 square feet or more of impervious surface (collectively over the entire project site), and support one or more of the following uses:

2) Provision ~~E.3.c.(3)(b)~~ E.3.b.(3)(b)

(b) Retrofitting or redevelopment of existing paved alleys, streets or roads that are designed and constructed in accordance with the USEPA Green Streets guidance.

3) Provision E.3.c.(1)

(a) Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite ~~100 percent of~~ the pollutants contained in the volume of storm water runoff produced from a 24-hour 85th percentile storm event (design capture volume)~~;~~.

~~(b)~~ (i) If a Copermittee determines that implementing BMPs to retain the full design capture volume onsite for a Priority Development Project is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize ~~flow-thru treatment control~~ biofiltration BMPs. Biofiltration BMPs must be sized and designed to: ~~achieve the equivalent pollutant load removal described in Provision E.3.c.(1)(a). Biofiltration LID BMPs must be considered as a first option before other types of flow-thru treatment control BMPs may be considered.~~

[a] Treat 1.5 times the design capture volume not reliably retained onsite; OR
[b] Treat the design capture volume not reliably retained onsite with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite.
[c] Have an appropriate loading rate to prevent erosion, scour, and channeling within the BMP.

(ii) If a Copermittee determines that biofiltration is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize flow-thru treatment control BMPs to treat runoff leaving the site, AND mitigate for

the design capture volume not reliably retained onsite pursuant to Provision E.3.(c)(1)(b). Flow thru treatment control BMPs must be sized and designed to:

[a] Remove pollutants from storm water to the MEP;
[b] Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;
[c] Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Flow-thru treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of flow-thru treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

~~(c)~~
(b) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1)(a). The Priority Development Project must mitigate for the portion of the pollutant load in the design capture volume not retained onsite if Provision E.3.~~(~~c.~~)~~(3) is utilized. If a Priority Development Project is allowed to utilize alternative compliance, flow-thru treatment control BMPs must be implemented to treat the portion of the design capture volume that is not reliably retained onsite. Flow-thru treatment control BMPs must be sized and designed in accordance with Provision E.3.c.(1)(a)(ii)[a]-[c].

~~(d) If a Priority Development project is allowed to utilize alternative compliance, flow-thru treatment control BMPs must be implemented to treat the portion of the design capture volume that is not retained onsite. Flow-thru treatment control BMPs must be sized and designed to:~~

~~(i) Remove pollutants from storm water to the MEP;~~

~~(ii) Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;~~

~~(iii) Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Flow-thru treatment control BMPs with a low removal efficiency ranking must only be~~

~~approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of flow-thru treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.~~

4) Provision E.3.c.(2)(b)

(b) Each Priority Development Project must avoid ~~known~~ critical sediment yield areas known to the Copermittee or identified by the Watershed Management Area Analysis pursuant to Provision B.3.b.(4), or implement measures that allow critical coarse sediment to be discharged to receiving waters, such that there is no net impact to the receiving water ~~sediment supply is unaffected by the project~~.

5) Provision E.3.c.(3)(a)(ix)

~~(ix) Receiving waters must not be utilized to convey untreated storm water runoff from the Priority Development Project to the candidate project;~~

6) Provision E.3.e.(1)(a)

(a) Each Copermittee must require and confirm that for all Priority Development Project applications that have not received prior lawful approval by the Copermittee by the time the BMP Design Manual is updated pursuant to Provision E.3.d ~~18 months after the commencement of coverage under this Order~~, the requirements of Provision E.3 are implemented. For project applications that have received prior lawful approval ~~by 18 months after~~ before the BMP Design Manual is updated pursuant to Provision E.3.d ~~commencement of coverage under this Order~~, the Copermittee may allow previous land development requirements to apply.

PROVISION F Errata

1) Provisions F.1 and F.2

Delete the terms "~~certification~~" and "~~notification of concurrence~~" and replace with "notification of acceptance" throughout Provisions F.1 and F.2.

2) Provision F.1.a.(1)(c)

(c) The Copermittees must coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public ~~as much~~ time and opportunity ~~as possible~~ to participate during the development of the Water Quality Improvement Plans.

3) Provision F.1.b.(7)

(7) During implementation of the Water Quality Improvement Plan ~~after implementation~~ the Copermittees must correct any deficiencies in the Plan identified by the San Diego Water Board ~~no later than 90 days~~ in the updates submitted with the Water Quality Improvement Plan Annual Report following a request by the Board to do so.

4) Provision F.2.a.(2)

(2) Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E ~~no later than 3 months after San Diego Water Board notification of concurrence with~~ concurrent with the submittal of the Water Quality Improvement Plan. Each Copermittee must correct any deficiencies in the jurisdictional runoff management program document based on comments received from the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report.

5) Provision F.2.b.(1)

(1) Each Copermittee must update its BMP Design Manual to incorporate the requirements of Provisions E.3.a-d ~~no later than 3 months after San Diego Water Board notification of concurrence with~~ concurrent with the submittal of the Water Quality Improvement Plan ~~by the San Diego Water Board Executive Officer~~. Each Copermittee must correct any deficiencies in the BMP Design Manual based on comments received from the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report.

6) Provision F.3.b.(2)

(2) Transitional Monitoring and Assessment Program Annual Reports

The Copermittees for each Watershed Management Area must submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted under this Order. The Transitional Monitoring and Assessment Program Annual Reports must include:

ATTACHMENT E Errata

1) Attachment E, Specific Provision 1.b.(3)(a)-(c)

Delete "~~Copermittees'~~" and replace with "Copermittee's"

2) Attachment E, Specific Provision 1.d

Add the following after Specific Provision 1.d.(2):

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 1.b.(2)(b), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

3) Attachment E, Specific Provision 2.b.(2)(b), Table 2.2

Table 2.2
Final Effluent Limitations as Expressed as Annual Loads in MS4 Discharges to Shelter Island Yacht Basin

Constituent	Effluent Limitation
Dissolved Copper	30 g/yr*

* If the water quality objectives for dissolved copper in Shelter Island Yacht Basin are changed in the future, then the margin of safety (MOS), TMDL and allocations will be recalculated using the *Method for Recalculation of the Total Maximum Daily Load for Dissolved Copper in the Shelter Island Yacht Basin, San Diego Bay* in the Basin Plan (p. 7-14).

4) Attachment E, Specific Provision 3.d

Add the following after Specific Provision 3.d.(2):

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 3.b.(2)(b)(i), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

5) Attachment E, Specific Provision 4.b.(3)(a)-(c)

Delete "~~Copermittees'~~" and replace with "Copermittee's"

6) Attachment E, Specific Provision 4.c.(2)(a)-(d)

Delete "~~Copermittees'~~" and replace with "Copermittee's"

7) Attachment E, Specific Provision 4.d

Add the following after Specific Provision 4.d.(2):

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 4.b.(2)(b) or 4.c.(1), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

8) Attachment E, Specific Provision 5.b.(3)(a)-(c)

Delete "~~Copermittees'~~" and replace with "Copermittee's"

9) Attachment E, Specific Provision 5.c.(1)(b)(i)-(iii)

Delete "~~Copermittees'~~" and replace with "Copermittee's"

10) Attachment E, Specific Provision 5.d.(3)

Add the following after Specific Provision 5.d.(3)(a) and renumber subsequent provisions appropriately:

(b) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 5.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

11) Attachment E, Specific Provision 6.b.(2)(a), Table 6.2a

Table 6.2a
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Beaches

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform	10,000	22% ~~/ 0%~~	1,000	0%
Fecal Coliform	400	22% ~~/ 0%~~	200	0%
Enterococcus	104	22% ~~/ 0%~~	35	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. ~~The 0% single sample maximum allowable exceedance frequency applies to dry weather days.~~ For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan.

12) Attachment E, Specific Provision 6.b.(2)(a), Table 6.2b

Table 6.2b
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Creeks

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Fecal Coliform	400	22% ~~/ 0%~~	200	0%
Enterococcus	61 (104)	22% ~~/ 0%~~	33	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. ~~The 0% single sample maximum allowable exceedance frequency applies to dry weather days.~~ For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Basin Plan.
d. A single sample maximum of 104 MPN/100ml for *Enterococcus* may be applied as a receiving water limitation for creeks, instead of 61~~0~~ MPN/100mL, if one or more of the creeks addressed by these TMDLs (San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek, San Diego River, and/or Chollas Creek) is designated with a "moderately to lightly used area" or less frequent usage frequency in the Basin Plan. Otherwise, the single sample max~~m~~imum of 61 MPN/100mL for *Enterococcus* must be used to assess compliance with the allowable exceedance frequency.

13) Attachment E, Specific Provision 6.b.(2)(b), Table 6.2

Table 6.2c
Final Effluent Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies in MS4 Discharges to the Water Body

Constituent	Concentration-Based Effluent Limitations			
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform[d]	10,000	22% ~~/ 0%~~	1,000	0%
Fecal Coliform	400	22% ~~/ 0%~~	200	0%
Enterococcus	104[e] / 61[f]	22% ~~/ 0%~~	35[e] / 33[f]	0%

Notes:
a. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. ~~The 0% single sample maximum allowable exceedance frequency applies to dry weather days.~~ For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan for discharges to beaches, and the Basin Plan for discharges to creeks and creek mouths.
d. Total coliform effluent limitations only apply to MS4 outfalls that discharge to the Pacific Ocean Shorelines and creek mouths listed in Table 6.0.
e. This *Enterococcus* effluent limitation applies to MS4 discharges to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
f. This *Enterococcus* effluent limitation applies to MS4 discharges to segments or areas of creeks or creek mouths listed in Table 6.0.

14) Attachment E, Specific Provision 6.b.(3)(a)-(c)

Delete "~~Copermittees'~~" and replace with "Copermittee's"

15) Attachment E, Specific Provision 6.c.(3)(a)-(c)

Delete "~~Copermittees'~~" and replace with "Copermittee's"

16) Attachment E, Specific Provision 6.d.(1)(b)

Add the following after Specific Provision 6.d.(1)(b)(iii):

(iv) For Pacific Ocean Shoreline segments or areas listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

17) Attachment E, Specific Provision 6.d.(1)(c)

Add the following after Specific Provision 6.d.(1)(c)(iii) and renumber subsequent provisions appropriately:

(iv) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

18) Attachment E, Specific Provision 6.d.(1)(c)(iii)[c]

[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria density~~y~~ies ~~result~~ reported from ~~wet weather samples collected~~ each of the storm events sampled; and

19) Attachment E, Specific Provision 6.d.(2)(b)

Add the following after Specific Provision 6.d.(2)(b)(iii):

(iv) For creeks or creek mouths listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

20) Attachment E, Specific Provision 6.d.(2)(c)

Add the following after Specific Provision 6.d.(2)(c)(iv) and renumber subsequent provisions appropriately:

(v) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

21) Attachment E, Specific Provision 6.d.(2)(c)(iii)[c]

[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria density~~y~~ies ~~result~~ reported from ~~wet weather samples collected~~ each of the storm events sampled; and

ATTACHMENT F Errata

1) Attachment F, Under the Fact Sheet discussion of Provision A.4

~~The San Diego Water Board recognizes that there is an apparent disparity between the Copermittees being able to demonstrate and be in compliance with the TMDLs in Attachment E and the discharge prohibitions and receiving water limitations in Provisions A.1.a, A.1.c, and A.2.a. Thus, similar to the TMDL requirements in Attachment E, the Order establishes a process under Provision B.3.c that the Copermittees may choose to utilize to demonstrate and be in compliance with the discharge prohibitions and receiving water limitations in Provisions A.1.a, A.1.c, and A.2.a. This process is described in more detail under the discussion for Provision B.3.~~

2) Attachment F, Under the Fact Sheet discussion of Provision B

Purpose: Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges to the MS4s and control pollutants in storm water discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the Clean Water Act.

Provision B includes requirements for the Copermittees to develop and implement Water Quality Improvement Plans to ultimately comply with the prohibitions and limitations under Provision A. The Water Quality Improvement Plans will provide the Copermittees a comprehensive program that can achieve the requirements and further the objectives of the CWA. Implementation of the Water Quality Improvement Plans will also improve the quality of the receiving waters in the San Diego Region.

3) Attachment F, Under the Fact Sheet discussion of Provision B.3

~~Finally, Provision B.3.c has been included to provide the Copermittees an option to demonstrate and be in compliance with the requirements of Provisions A.1.a, A.1.c and A.2.a. One or more Copermittees within a Watershed Management Area can choose to implement this option. This option is only expected to be utilized by the Copermittees that wish to clearly demonstrate and be in compliance with the requirements of Provisions A.1.a, A.1.c and A.2.a.~~

~~In order for a Copermittee to utilize this option, the Copermittee is required to include three components in the Water Quality Improvement Plan. The first component is a comprehensive set of numeric goals that will demonstrate the requirements of Provisions A.1.a, A.1.c and A.2.a will be achieved. The criteria provided in the Order will require the Copermittee to demonstrate that the discharges from its MS4s will not cause or contribute to exceedances of water quality objectives in the receiving waters, and the receiving waters will be protected from the Copermittee's MS4 discharges.~~

~~The second component is an analysis utilizing a watershed model or other watershed analytical tools. The analysis must demonstrate that the implementation of the water quality improvement strategies required under Provision B.3.b will achieve the numeric goals within the established schedules required under Provision B.3.a. Because the development of the analysis may require significant resources, the Order allows the Copermittees in each Watershed Management Area that~~

~~choose to implement this option to perform the analysis individually, or pool their resources for the analysis collectively.~~

~~The San Diego Water Board does not expect the analysis to be a "guarantee" that the water quality improvement strategies will achieve the numeric goals within the established schedules. The analysis, however, must "reasonably" and "quantitatively" demonstrate that the implementation of the water quality improvement strategies can achieve the numeric goals within the established schedules. However, as more data and information are collected to demonstrate progress toward achieving the numeric goals, the numeric goals, water quality improvement strategies and schedules may need to be updated. When these updates occur, the Copermittees that choose to utilize this option must also update the analysis.~~

~~Thus, the third component is the key component that will allow a Copermittee to demonstrate the implementation of the water quality improvement strategies within its jurisdiction is making progress toward achieving the numeric goals. Each Copermittee must specify the monitoring and assessments that will be performed to confirm the implementation of the water quality improvement strategies are making progress toward achieving the numeric goals within the established schedules.~~

~~These three components must then be reviewed by the Water Quality Improvement Consultation Panel. The Water Quality Improvement Consultation Panel is required to be formed as part of the public participation process for the development of the Water Quality Improvement Plans. The Water Quality Improvement Consultation Panel is described under Provision F.1.a.(1)(b). Review by the Water Quality Improvement Consultation Panel has been included to provide an additional layer of input, support, and accountability for the implementation of this option.~~

~~Compliance with the requirements of Provisions A.1.a, A.1.c and A.2.a begins when the Water Quality Improvement Plan, incorporating the requirements of Provision B.3.c.(1), is accepted by the San Diego Water Board. Each Copermittee that chooses to implement and continues to implement this option will be in compliance with the requirements of Provisions A.1.a, A.1.c and A.2.a as long as the San Diego Water Board continues to accept the analysis, and subsequent updates, and the Copermittee continues to implement the strategies, monitoring and assessments as incorporated in the Water Quality Improvement Plan in accordance with Provision B.3.c.(1).~~

4) Attachment F, Under the Fact Sheet discussion of Provision D.2

Until the wet weather MS4 outfall discharge monitoring requirements of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board, the Copermittees must comply with the requirements of transitional wet weather MS4 outfall monitoring requirements pursuant to Provision D.2.a.(3). Provision D.2.a.(3) requires the Copermittees in each ~~Copermittee~~ Watershed Management Area to sample, at least five of the major MS4 outfalls inventoried pursuant to Provision D.2.a.(1) ~~twice~~ once per wet season for the monitoring data required to be collected pursuant to Provision D.2.a.(3)(c)-(e). Provision D.2.a.(3) further requires at least one major MS4 outfall monitoring station be located in each Copermittee's jurisdiction within the Watershed Management Area.

5) Attachment F, Under the Fact Sheet discussion of Provision E.3

The 85th percentile storm event is the event that has a precipitation total greater than or equal to 85 percent of all storm events over a given period of record in a specific area or location. For example, to determine what the 85th percentile storm event is in a specific location, all 24 hour storms that have recorded values over a 30 year period would be tabulated and a 85th percentile storm would be determined from this record (i.e., 15 percent of the storms would be greater than the number determined to be the 85th percentile storm). Most jurisdictions in the San Diego Region have already developed isopluvial maps that can provide this type of information. The 85th percentile storm might be determined to be a number such as 1.0 inch, and this would be multiplied by the total area of the project footprint producing runoff to calculate the design capture volume. The Priority Development Project designer would then select a system of BMPs that would retain (i.e. intercept, store, infiltrate, evaporate, or evapotranspire) ~~100 percent of~~ the pollutants contained in the design capture volume onsite.

Retention BMPs are necessary to capture and retain pollutants generated from a Priority Development Project. In a recent study performed by SCCWRP in the Los Angeles Region, they found "*that the magnitude of constituent load associated with storm water runoff depends, at least in part, on the amount of time available for pollutant build-up on land surfaces. The extended dry period that typically occurs in arid climates such as southern California maximizes the time for constituents to build-up on land surfaces, resulting in proportionally higher concentrations and loads during initial storms of the season*."[2] This implies that the "first flush" of a rainy season and the first storm events after long antecedent dry periods tend to have the highest pollutant loads. Capturing and retaining the pollutant loads of the "first flush" of a rainy season and the first storm events after long antecedent dry periods will

[2] Stein, E.D., Tiefenthaler, L.L., and Schiff, K.C., 2007. Technical Report 510, Sources, Patterns and Mechanisms of Storm Water Pollutant Loading from Watershed and Land Uses of the Greater Los Angeles Area, California, USA. March 20, 2007.

reduce a significant portion of the pollutants in storm water discharged to and from the MS4.

The San Diego Water Board, however, acknowledges that in some situations retention of the full design capture volume onsite may not be technically feasible. In this event, the Copermittee may allow the Priority Development Project to utilize biofiltration BMPs to treat 1.5 times the design capture volume not reliably retained onsite, or biofiltration BMPs with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite ~~flow-thru treatment control BMPs to achieve the equivalent pollutant load removal that would have been achieved if the design capture volume were fully retained onsite, pursuant to Provision E.3.c.(1)(b). Biofiltration LID BMPs must be considered as a first option before other types of flow-thru treatment control BMPs may be considered because of the ancillary benefits they provide, such as reduction in flow rates and creation of habitat. In any event, no matter what types of BMPs (or combination of BMPs) are chosen, 100 percent of the pollutants contained in the design capture volume must not be allowed to be discharged from the Priority Development Project~~.

The 1.5 multiplier is based on the finding in the Ventura County Technical Guidance Manual that biofiltration of 1.5 times the design capture volume not retained onsite will provide approximately the same pollutant removal as retention of the design capture volume on an annual basis.[3] This standard is consistent with the Los Angeles Water Board's Los Angeles and Ventura County municipal storm water permits (Order Nos. R4-2012-0175 and R4-2010-0108, respectively). The flow-thru design of 0.75 times the portion of the design capture volume not reliably retained onsite is consistent with the San Diego Water Board's Orange County and Riverside County municipal storm water permits (Order Nos. R9-2009-0002 and R9-2010-0016, respectively).

The San Diego Water Board further recognizes that, in addition to not being technically feasible, retention of the full design capture storm onsite may be cost prohibitive, or may not provide as much water quality benefit to the Watershed Management Area as would implementing BMPs elsewhere in the watershed. Thus, Provision ~~E.3.c.(1)(c)~~ E.3.c.(1)(b) allows for the use of a combination of onsite retention BMPs, and the implementation of an Alternative Compliance Program described in Provision E.3.c.(3). Provision E.3.c.(3) is discussed in more detail below.

If the full design capture volume is not retained onsite either because biofiltration is not technically feasible, or a Copermittee grants a Priority Development Project permission to utilize the Alternative Compliance Program, then the pollutants in the portion of the design capture volume that are not reliably retained onsite must still be reduced to the MEP. Thus, flow-thru treatment control BMPs are required to be implemented on Priority Development Projects in addition to the retention BMPs.

[3] Ventura Countywide Stormwater Management Program. 2011. Ventura Technical Guidance Manual, Manual Update, 2011.

The requirements of Provisions ~~E.3.c.(1)(d)~~ E.3.c.(1)(a)(ii)[a]-[c] include the performance standards for flow-thru treatment control BMPs, consistent with the Fourth Term Permits in the San Diego Region.

6) Attachment F, Under the Fact Sheet discussion of Provision F.1

The San Diego Water Board recognizes that the development of multiple Water Quality Improvement Plans concurrently may limit the ability of the public to review and provide comments to the Copermittees. Thus, Provision F.1.a.(1)(c) requires the Copermittees to coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public ~~as much~~ time and opportunity ~~as possible~~ to participate during the development of the Water Quality Improvement Plans.

7) Attachment F, Under the Fact Sheet discussion of Provision F.2

Each Copermittee is required to continue implementing a jurisdictional runoff management program, as required under Provision E. Implementation of each Copermittee's jurisdictional runoff management program is directed by its jurisdictional runoff management program document. Provision F.2.a requires each Copermittee to update its jurisdictional runoff management program document to be consistent with the requirements of Provision E ~~within 3 months after the acceptance~~ concurrent with the submittal of the Water Quality Improvement Plan.

Likewise, each Copermittee must continue to require new development and redevelopment projects to implement BMPs to control pollutants in storm water runoff. The control of pollutants in storm water runoff from development and redevelopment projects within each Copermittee's jurisdiction is guided and directed by its BMP Design Manual, formerly known as a Standard Storm Water Mitigation Plan (SSMP). Provision F.2.b requires each Copermittee to update its BMP Design Manual to be consistent with the requirements of Provision E.3 ~~within 3 months after the acceptance~~ concurrent with the submittal of the Water Quality Improvement Plan.

8) Attachment F, Under the Fact Sheet discussion of Provision F.3

Provision F.3.b.(2) includes the transitional annual reporting requirements for the transitional monitoring and assessment program for each Watershed Management Area. The Copermittees in the Watershed Management Area are required to submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted. The Transitional Monitoring and Assessment Program Annual Report is required to include the transitional period monitoring data collected pursuant to Provisions D.1.a and D.2.a, and the findings from the transitional period findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

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CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
San Diego Region

Errata Sheet
(OPTION 2)
CORRECTED
Tentative Order No. R9-2013-0001
NPDES No. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The following changes to the revised version of Tentative Order No. R9-2013-0001, released March 27, 2013, are based on the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) Public Hearing testimony presented during Agenda Item No. 8 at the April 10 and 11, 2013 San Diego Water Board Meeting. The changes to the Tentative Order listed below are shown in underline/strikeout format to indicate added and removed language, respectively.

GENERAL Errata

Correct typographical and grammatical errors.

FINDINGS Errata

1) Discharge Characteristics and Runoff Management Findings

Add the following finding after Finding 17, and renumber the subsequent findings appropriately:

18. Water Quality Improvements. Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges to the MS4s and control pollutants in storm water discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the Clean Water Act.

PROVISION A Errata

1) Provision A.4.a.(4)

(4) Within 90 days of the San Diego Water Board determination that the ~~update~~ modifications to the Water Quality Improvement Plan required under Provision A.4.a.(3) meet~~s~~ the requirements of this Order, the applicable Copermittees must revise the jurisdictional runoff management program documents to incorporate the ~~updated~~ modified water quality improvement strategies that have been and will be implemented, the implementation schedule, and any additional monitoring required; and

PROVISION B Errata

1) Provision B Introductory Paragraph

The purpose of this provision is to develop Water Quality Improvement Plans that guide the Copermittees' jurisdictional runoff management programs towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plans is to further the Clean Water Act's objective to protect, preserve, ~~and~~ enhance, and restore the water quality and designated beneficial uses of waters of the state. This goal will be accomplished through an adaptive planning and management process that identifies the highest priority water quality conditions within a watershed and implements strategies through the jurisdictional runoff management programs to achieve improvements in the quality of discharges from the MS4s and receiving waters.

2) Provision B.3.b.(4)(b)

(b) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify and compile a list of candidate projects that could potentially be used as alternative compliance options for Priority Development Projects, to be implemented in lieu of onsite structural BMP performance requirements described in Provisions E.3.c.(1) and E.3.c.(2). Specifically, the Copermittees must identify opportunities to be included in the list for candidate projects in each Watershed Management Area, such as:

(i) ~~Opportunities for s~~Stream or riparian area rehabilitation;

(ii) ~~Opportunities for r~~Retrofitting existing infrastructure to incorporate storm water retention or treatment;

(iii) ~~Opportunities for r~~Regional BMPs;

(iv) ~~Opportunities for g~~Groundwater recharge projects;

(v) ~~Opportunities for w~~Water supply augmentation projects; and

(vi) ~~Opportunities for l~~Land purchases to preserve floodplain functions.

3) Provision B.3.c

Revise references to "Provisions A.1.a, A.1.c and A.2.a" to "Provisions A.1.a, A.1.c, A.1.d, A.2.a and A.2.b~~a~~" throughout the requirements of the Provision B.3.c.

4) Provision B.3.c.(1)(d)

(d) The numeric goals proposed pursuant to Provision B.3.c.(1)(a), the analysis performed pursuant to Provision B.3.c.(1)(b) and the specific monitoring and assessments proposed pursuant to Provision B.3.c.(1)(c) have been reviewed ~~and receive concurrence~~ by ~~a majority of~~ the Water Quality Improvement Consultation Panel (see Provision F.1.a.(1)(b)) for any recommendations. Updates must also ~~receive concurrence~~ be reviewed by ~~a majority of~~ the Water Quality Improvement Consultation Panel for any recommendations.

5) Provision B.3.c.(3)(a)

(a) The results of the analysis performed pursuant to Provision B.3.c.(1)(b~~d~~) is accepted ~~and continues to be accepted~~ by the San Diego Water Board Executive Officer as part of the Water Quality Improvement Plan and as part of subsequent updates to the Water Quality Improvement Plan; AND

6) Provision B.3.c.(3)(d)

(d) The Copermittee~~s in the Watershed Management Area~~ continues to implement the requirements of Provision A.4.a.

PROVISION D Errata

1) Provision D.2.a.(3)(b)

(b) Transitional Wet Weather MS4 Outfall Discharge Monitoring Frequency

Each wet weather MS4 outfall discharge monitoring station selected pursuant to Provision D.2.a.(3)(a) must be monitored ~~twice~~ once during the wet season (October 1 – April 30). The wet weather monitoring events must be selected to be representative of the range of hydrological conditions experienced in the region. At least 10 percent of samples must be conducted during the first wet weather event of the wet season, to include at least one such sample in each Watershed Management Area.~~.~~

2) Provision D.3.d

(d) Special studies initiated prior to the effective date of this Order that meet the requirements of Provision D.3.b and are implemented during the term of this Order as part of the Water Quality Improvement Plan may be utilized to fulfill the special study requirements of Provision D.3.a. Special studies completed before the effective date of this Order ~~Water Quality Improvement Plan is accepted by the San Diego Water Board~~ cannot be utilized to fulfill the special study requirements of Provision D.3.a.

3) Provision D.4.b.(2)(b)(i)[d]

[d] The percent contribution of storm water volumes and pollutant loads discharged from each land use type within ~~the~~ each hydrologic subarea with a major MS4 outfall to receiving waters or within each major MS4 outfall to receiving waters ~~drainage basin to each of~~ in the Copermittee's ~~major MS4 outfalls in its~~ jurisdiction ~~to receiving waters~~ within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch.

PROVISION E Errata

1) Provision E.3.b.(1)

(1) Definition of Priority Development Project

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site)~~, or redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site)~~. This ~~category~~ includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(b) Redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site on an existing site of 10,000 square feet or more of impervious surfaces). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

~~(b)~~
(c) New or redevelopment projects that create 5,000 square feet or more of impervious surface (collectively over the entire project site), and support one or more of the following uses:

2) Provision ~~E.3.c.(3)(b)~~ E.3.b.(3)(b)

(b) Retrofitting or redevelopment of existing paved alleys, streets or roads that are designed and constructed in accordance with the USEPA Green Streets guidance.

3) Provision E.3.c.(1)

(a) Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite ~~100 percent of~~ the pollutants contained in the volume of storm water runoff produced from a 24-hour 85th percentile storm event (design capture volume)~~;~~.

~~(b)~~ (i) If a Copermittee determines that implementing BMPs to retain the full design capture volume onsite for a Priority Development Project is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize ~~flow-thru treatment control~~ biofiltration BMPs. Biofiltration BMPs must be sized and designed to: ~~achieve the equivalent pollutant load removal described in Provision E.3.c.(1)(a). Biofiltration LID BMPs must be considered as a first option before other types of flow-thru treatment control BMPs may be considered.~~

[a] Treat 1.5 times the design capture volume not reliably retained onsite; OR
[b] Treat the design capture volume not reliably retained onsite with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite.
[c] Have an appropriate loading rate to prevent erosion, scour, and channeling within the BMP.

(ii) If a Copermittee determines that biofiltration is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize flow-thru treatment control BMPs to treat runoff leaving the site, AND mitigate for the design capture volume not reliably retained onsite pursuant to Provision E.3.(c)(1)(b). Flow thru treatment control BMPs must be sized and designed to:

[a] Remove pollutants from storm water to the MEP;
[b] Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;

[c] Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Flow-thru treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of flow-thru treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

~~(c)~~

(b) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1)(a). The Priority Development Project must mitigate for the portion of the pollutant load in the design capture volume not retained onsite if Provision E.3.~~(~~c.~~)~~(3) is utilized. If a Priority Development Project is allowed to utilize alternative compliance, flow-thru treatment control BMPs must be implemented to treat the portion of the design capture volume that is not reliably retained onsite. Flow-thru treatment control BMPs must be sized and designed in accordance with Provision E.3.c.(1)(a)(ii)[a]-[c].

~~(d) If a Priority Development project is allowed to utilize alternative compliance, flow-thru treatment control BMPs must be implemented to treat the portion of the design capture volume that is not retained onsite. Flow-thru treatment control BMPs must be sized and designed to:~~

~~(i) Remove pollutants from storm water to the MEP;~~

~~(ii) Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;~~

~~(iii) Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Flow-thru treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of flow-thru treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.~~

4) Provision E.3.c.(2)(b)

(b) Each Priority Development Project must avoid ~~known~~ critical sediment yield areas known to the Copermittee or identified by the Watershed Management Area Analysis pursuant to Provision B.3.b.(4), or implement measures that allow critical coarse sediment to be discharged to receiving waters, such that there is no net impact to the receiving water ~~sediment supply is unaffected by the project~~.

5) Provision E.3.c.(3)(a)(ix)

~~(ix) Receiving waters must not be utilized to convey untreated storm water runoff from the Priority Development Project to the candidate project;~~

6) Provision E.3.e.(1)(a)

(a) Each Copermittee must require and confirm that for all Priority Development Project applications that have not received prior lawful approval by the Copermittee by the time the BMP Design Manual is updated pursuant to Provision E.3.d ~~18 months after the commencement of coverage under this Order~~, the requirements of Provision E.3 are implemented. For project applications that have received prior lawful approval ~~by 18 months after~~ before the BMP Design Manual is updated pursuant to Provision E.3.d ~~commencement of coverage under this Order~~, the Copermittee may allow previous land development requirements to apply.

PROVISION F Errata

1) Provisions F.1 and F.2

Delete the terms "~~certification~~" and "~~notification of concurrence~~" and replace with "notification of acceptance" throughout Provisions F.1 and F.2.

2) Provision F.1.a.(1)(c)

(c) The Copermittees must coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public ~~as much~~ time and opportunity ~~as possible~~ to participate during the development of the Water Quality Improvement Plans.

3) Provision F.1.b.(7)

(7) During implementation of the Water Quality Improvement Plan ~~after implementation~~ the Copermittees must correct any deficiencies in the Plan identified by the San Diego Water Board ~~no later than 90 days~~ in the updates submitted with the Water Quality Improvement Plan Annual Report following a request by the Board to do so.

4) Provision F.2.a.(2)

(2) Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E ~~no later than 3 months after San Diego Water Board notification of concurrence with~~ concurrent with the submittal of the Water Quality Improvement Plan. Each Copermittee must correct any deficiencies in the jurisdictional runoff management program document based on comments received from the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report.

5) Provision F.2.b.(1)

(1) Each Copermittee must update its BMP Design Manual to incorporate the requirements of Provisions E.3.a-d ~~no later than 3 months after San Diego Water Board notification of concurrence with~~ concurrent with the submittal of the Water Quality Improvement Plan ~~by the San Diego Water Board Executive Officer~~. Each Copermittee must correct any deficiencies in the BMP Design Manual based on comments received from the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report.

6) Provision F.3.b.(2)

(2) Transitional Monitoring and Assessment Program Annual Reports

The Copermittees for each Watershed Management Area must submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted under this Order. The Transitional Monitoring and Assessment Program Annual Reports must include:

ATTACHMENT E Errata

1) Attachment E, Specific Provision 1.b.(3)(a)-(c)

Delete "~~Copermittees'~~" and replace with "Copermittee's"

2) Attachment E, Specific Provision 1.d

Add the following after Specific Provision 1.d.(2):

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 1.b.(2)(b), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

3) Attachment E, Specific Provision 2.b.(2)(b), Table 2.2

Table 2.2
Final Effluent Limitations as Expressed as Annual Loads in MS4 Discharges to Shelter Island Yacht Basin

Constituent	Effluent Limitation
Dissolved Copper	30 g/yr*

* If the water quality objectives for dissolved copper in Shelter Island Yacht Basin are changed in the future, then the margin of safety (MOS), TMDL and allocations will be recalculated using the *Method for Recalculation of the Total Maximum Daily Load for Dissolved Copper in the Shelter Island Yacht Basin, San Diego Bay* in the Basin Plan (pp. 7-14).

4) Attachment E, Specific Provision 3.d

Add the following after Specific Provision 3.d.(2):

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 3.b.(2)(b)(i), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

5) Attachment E, Specific Provision 4.b.(3)(a)-(c)

Delete "~~Copermittees'~~" and replace with "Copermittee's"

6) Attachment E, Specific Provision 4.c.(2)(a)-(d)

Delete "~~Copermittees'~~" and replace with "Copermittee's"

7) Attachment E, Specific Provision 4.d

Add the following after Specific Provision 4.d.(2):

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 4.b.(2)(b) or 4.c.(1), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

8) Attachment E, Specific Provision 5.b.(3)(a)-(c)

Delete "~~Copermittees'~~" and replace with "Copermittee's"

9) Attachment E, Specific Provision 5.c.(1)(b)(i)-(iii)

Delete "~~Copermittees'~~" and replace with "Copermittee's"

10) Attachment E, Specific Provision 5.d.(3)

Add the following after Specific Provision 5.d.(3)(a) and renumber subsequent provisions appropriately:

(b) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 5.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

11) Attachment E, Specific Provision 6.b.(2)(a), Table 6.2a

Table 6.2a
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Beaches

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform	10,000	22% ~~/ 0%~~	1,000	0%
Fecal Coliform	400	22% ~~/ 0%~~	200	0%
Enterococcus	104	22% ~~/ 0%~~	35	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. ~~The 0% single sample maximum allowable exceedance frequency applies to dry weather days.~~ For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan.

12) Attachment E, Specific Provision 6.b.(2)(a), Table 6.2b

Table 6.2b
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Creeks

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Fecal Coliform	400	22% ~~/ 0%~~	200	0%
Enterococcus	61 (104)	22% ~~/ 0%~~	33	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. ~~The 0% single sample maximum allowable exceedance frequency applies to dry weather days.~~ For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Basin Plan.
d. A single sample maximum of 104 MPN/100ml for *Enterococcus* may be applied as a receiving water limitation for creeks, instead of 61~~0~~ MPN/100mL, if one or more of the creeks addressed by these TMDLs (San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek, San Diego River, and/or Chollas Creek) is designated with a "moderately to lightly used area" or less frequent usage frequency in the Basin Plan. Otherwise, the single sample max~~m~~imum of 61 MPN/100mL for *Enterococcus* must be used to assess compliance with the allowable exceedance frequency.

13) Attachment E, Specific Provision 6.b.(2)(b), Table 6.2

Table 6.2c
Final Effluent Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies in MS4 Discharges to the Water Body

Constituent	Concentration-Based Effluent Limitations			
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform[d]	10,000	22% ~~/ 0%~~	1,000	0%
Fecal Coliform	400	22% ~~/ 0%~~	200	0%
Enterococcus	104[e] / 61[f]	22% ~~/ 0%~~	35[e] / 33[f]	0%

Notes:
a. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. ~~The 0% single sample maximum allowable exceedance frequency applies to dry weather days.~~ For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan for discharges to beaches, and the Basin Plan for discharges to creeks and creek mouths.
d. Total coliform effluent limitations only apply to MS4 outfalls that discharge to the Pacific Ocean Shorelines and creek mouths listed in Table 6.0.
e. This *Enterococcus* effluent limitation applies to MS4 discharges to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
f. This *Enterococcus* effluent limitation applies to MS4 discharges to segments or areas of creeks or creek mouths listed in Table 6.0.

14) Attachment E, Specific Provision 6.b.(3)(a)-(c)

Delete "~~Copermittees'~~" and replace with "Copermittee's"

15) Attachment E, Specific Provision 6.c.(3)(a)-(c)

Delete "~~Copermittees'~~" and replace with "Copermittee's"

16) Attachment E, Specific Provision 6.d.(1)(b)

Add the following after Specific Provision 6.d.(1)(b)(iii):

(iv) For Pacific Ocean Shoreline segments or areas listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

17) Attachment E, Specific Provision 6.d.(1)(c)

Add the following after Specific Provision 6.d.(1)(c)(iii) and renumber subsequent provisions appropriately:

(iv) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

18) Attachment E, Specific Provision 6.d.(1)(c)(iii)[c]

[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria density~~y~~ies ~~result~~ reported from ~~wet weather samples collected~~ each of the storm events sampled; and

19) Attachment E, Specific Provision 6.d.(2)(b)

Add the following after Specific Provision 6.d.(2)(b)(iii):

(iv) For creeks or creek mouths listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

20) Attachment E, Specific Provision 6.d.(2)(c)

Add the following after Specific Provision 6.d.(2)(c)(iv) and renumber subsequent provisions appropriately:

(v) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

21) Attachment E, Specific Provision 6.d.(2)(c)(iii)[c]

[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria density~~y~~ies ~~result~~ reported from ~~wet weather samples collected~~ each of the storm events sampled; and

ATTACHMENT F Errata

1) Attachment F, Under the Fact Sheet discussion of Provision A.4

The San Diego Water Board recognizes that there is an apparent disparity between the Copermittees being able to demonstrate and be in compliance with the TMDLs in Attachment E and the discharge prohibitions and receiving water limitations in Provisions A.1.a, A.1.c, and A.2.a. Thus, similar to the TMDL requirements in Attachment E, the Order establishes a process under Provision B.3.c that the Copermittees may choose to utilize to demonstrate and be in compliance with the discharge prohibitions and receiving water limitations in Provisions A.1.a, A.1.c, and A.2.a, as well as Provisions A.1.d and A.2.b. This process is described in more detail under the discussion for Provision B.3.

2) Attachment F, Under the Fact Sheet discussion of Provision B

Purpose: Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges to the MS4s and control pollutants in storm water discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the Clean Water Act.

Provision B includes requirements for the Copermittees to develop and implement Water Quality Improvement Plans to ultimately comply with the prohibitions and limitations under Provision A. The Water Quality Improvement Plans will provide the Copermittees a comprehensive program that can achieve the requirements and further the objectives of the CWA. Implementation of the Water Quality Improvement Plans will also improve the quality of the receiving waters in the San Diego Region.

3) Attachment F, Under the Fact Sheet discussion of Provision B.3

Finally, Provision B.3.c has been included to provide the Copermittees an option to demonstrate and be in compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2.a and A.2.b~~a~~. One or more Copermittees within a Watershed Management Area can choose to implement this option. This option is only expected to be utilized by the Copermittees that wish to clearly demonstrate and be in compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2.a and A.2.b~~a~~.

In order for a Copermittee to utilize this option, the Copermittee is required to include three components in the Water Quality Improvement Plan. The first component is a comprehensive set of numeric goals that will demonstrate the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2.a and A.2.b~~a~~ will be achieved. The criteria provided in the Order will require the Copermittee to demonstrate that the discharges from its MS4s will not cause or contribute to exceedances of water quality objectives in the receiving waters, and the receiving waters will be protected from the Copermittee's MS4 discharges.

The second component is an analysis utilizing a watershed model or other watershed analytical tools. The analysis must demonstrate that the implementation of the water quality improvement strategies required under Provision B.3.b will achieve the numeric goals within the established schedules required under Provision B.3.a. Because the development of the analysis may require significant resources,

the Order allows the Copermittees in each Watershed Management Area that choose to implement this option to perform the analysis individually, or pool their resources for the analysis collectively.

The San Diego Water Board does not expect the analysis to be a "guarantee" that the water quality improvement strategies will achieve the numeric goals within the established schedules. The analysis, however, must "reasonably" and "quantitatively" demonstrate that the implementation of the water quality improvement strategies can achieve the numeric goals within the established schedules. However, as more data and information are collected to demonstrate progress toward achieving the numeric goals, the numeric goals, water quality improvement strategies and schedules may need to be updated. When these updates occur, the Copermittees that choose to utilize this option must also update the analysis.

Thus, the third component is the key component that will allow a Copermittee to demonstrate the implementation of the water quality improvement strategies within its jurisdiction is making progress toward achieving the numeric goals. Each Copermittee must specify the monitoring and assessments that will be performed to confirm the implementation of the water quality improvement strategies are making progress toward achieving the numeric goals within the established schedules.

These three components must then be reviewed by the Water Quality Improvement Consultation Panel. The Water Quality Improvement Consultation Panel is required to be formed as part of the public participation process for the development of the Water Quality Improvement Plans. The Water Quality Improvement Consultation Panel is described under Provision F.1.a.(1)(b). Review by the Water Quality Improvement Consultation Panel has been included to provide an additional layer of input, support, and accountability for the implementation of this option.

Compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2.a and A.2.b~~a~~ begins when the Water Quality Improvement Plan, incorporating the requirements of Provision B.3.c.(1), is accepted by the San Diego Water Board. Each Copermittee that chooses to implement and continues to implement this option will be in compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2.a and A.2.b~~a~~ as long as the San Diego Water Board ~~continues to~~ accepts the analysis as part of the Water Quality Improvement Plan, and subsequent updates, and the Copermittee continues to implement the strategies, monitoring and assessments as incorporated in the Water Quality Improvement Plan in accordance with Provision B.3.c.(1).

4) Attachment F, Under the Fact Sheet discussion of Provision D.2

Until the wet weather MS4 outfall discharge monitoring requirements of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board, the Copermittees must comply with the requirements of transitional wet weather MS4 outfall monitoring requirements pursuant to Provision D.2.a.(3). Provision D.2.a.(3) requires the Copermittees in each ~~Copermittee~~ Watershed Management Area to sample, at least five of the major MS4 outfalls inventoried pursuant to Provision D.2.a.(1) ~~twice~~ once per wet season for the monitoring data required to be collected pursuant to Provision D.2.a.(3)(c)-(e). Provision D.2.a.(3) further requires at least one major MS4 outfall monitoring station be located in each Copermittee's jurisdiction within the Watershed Management Area.

5) Attachment F, Under the Fact Sheet discussion of Provision E.3

The 85th percentile storm event is the event that has a precipitation total greater than or equal to 85 percent of all storm events over a given period of record in a specific area or location. For example, to determine what the 85th percentile storm event is in a specific location, all 24 hour storms that have recorded values over a 30 year period would be tabulated and a 85th percentile storm would be determined from this record (i.e., 15 percent of the storms would be greater than the number determined to be the 85th percentile storm). Most jurisdictions in the San Diego Region have already developed isopluvial maps that can provide this type of information. The 85th percentile storm might be determined to be a number such as 1.0 inch, and this would be multiplied by the total area of the project footprint producing runoff to calculate the design capture volume. The Priority Development Project designer would then select a system of BMPs that would retain (i.e. intercept, store, infiltrate, evaporate, or evapotranspire) ~~100 percent of~~ the pollutants contained in the design capture volume onsite.

Retention BMPs are necessary to capture and retain pollutants generated from a Priority Development Project. In a recent study performed by SCCWRP in the Los Angeles Region, they found "*that the magnitude of constituent load associated with storm water runoff depends, at least in part, on the amount of time available for pollutant build-up on land surfaces. The extended dry period that typically occurs in arid climates such as southern California maximizes the time for constituents to build-up on land surfaces, resulting in proportionally higher concentrations and loads during initial storms of the season*."[1] This implies that the "first flush" of a rainy season and the first storm events after long antecedent dry periods tend to have the highest pollutant loads. Capturing and retaining the pollutant loads of the "first flush" of a rainy season and the first storm events after long antecedent dry periods will

[1] Stein, E.D., Tiefenthaler, L.L., and Schiff, K.C., 2007. Technical Report 510, Sources, Patterns and Mechanisms of Storm Water Pollutant Loading from Watershed and Land Uses of the Greater Los Angeles Area, California, USA. March 20, 2007.

reduce a significant portion of the pollutants in storm water discharged to and from the MS4.

The San Diego Water Board, however, acknowledges that in some situations retention of the full design capture volume onsite may not be technically feasible. In this event, the Copermittee may allow the Priority Development Project to utilize biofiltration BMPs to treat 1.5 times the design capture volume not reliably retained onsite, or biofiltration BMPs with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite ~~flow-thru treatment control BMPs to achieve the equivalent pollutant load removal that would have been achieved if the design capture volume were fully retained onsite, pursuant to Provision E.3.c.(1)(b). Biofiltration LID BMPs must be considered as a first option before other types of flow-thru treatment control BMPs may be considered because of the ancillary benefits they provide, such as reduction in flow rates and creation of habitat. In any event, no matter what types of BMPs (or combination of BMPs) are chosen, 100 percent of the pollutants contained in the design capture volume must not be allowed to be discharged from the Priority Development Project~~.

The 1.5 multiplier is based on the finding in the Ventura County Technical Guidance Manual that biofiltration of 1.5 times the design capture volume not retained onsite will provide approximately the same pollutant removal as retention of the design capture volume on an annual basis.[2] This standard is consistent with the Los Angeles Water Board's Los Angeles and Ventura County municipal storm water permits (Order Nos. R4-2012-0175 and R4-2010-0108, respectively). The flow-thru design of 0.75 times the portion of the design capture volume not reliably retained onsite is consistent with the San Diego Water Board's Orange County and Riverside County municipal storm water permits (Order Nos. R9-2009-0002 and R9-2010-0016, respectively).

The San Diego Water Board further recognizes that, in addition to not being technically feasible, retention of the full design capture storm onsite may be cost prohibitive, or may not provide as much water quality benefit to the Watershed Management Area as would implementing BMPs elsewhere in the watershed. Thus, Provision ~~E.3.c.(1)(c)~~ E.3.c.(1)(b) allows for the use of a combination of onsite retention BMPs, and the implementation of an Alternative Compliance Program described in Provision E.3.c.(3). Provision E.3.c.(3) is discussed in more detail below.

If the full design capture volume is not retained onsite either because biofiltration is not technically feasible, or a Copermittee grants a Priority Development Project permission to utilize the Alternative Compliance Program, then the pollutants in the portion of the design capture volume that are not reliably retained onsite must still be reduced to the MEP. Thus, flow-thru treatment control BMPs are required to be implemented on Priority Development Projects in addition to the retention BMPs.

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2 Ventura Countywide Stormwater Management Program. 2011. Ventura Technical Guidance Manual, Manual Update, 2011.

The requirements of Provisions ~~E.3.c.(1)(d)~~ E.3.c.(1)(a)(ii)[a]-[c] include the performance standards for flow-thru treatment control BMPs, consistent with the Fourth Term Permits in the San Diego Region.

6) Attachment F, Under the Fact Sheet discussion of Provision F.1

The San Diego Water Board recognizes that the development of multiple Water Quality Improvement Plans concurrently may limit the ability of the public to review and provide comments to the Copermittees. Thus, Provision F.1.a.(1)(c) requires the Copermittees to coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public ~~as much~~ time and opportunity ~~as possible~~ to participate during the development of the Water Quality Improvement Plans.

7) Attachment F, Under the Fact Sheet discussion of Provision F.2

Each Copermittee is required to continue implementing a jurisdictional runoff management program, as required under Provision E. Implementation of each Copermittee's jurisdictional runoff management program is directed by its jurisdictional runoff management program document. Provision F.2.a requires each Copermittee to update its jurisdictional runoff management program document to be consistent with the requirements of Provision E ~~within 3 months after the acceptance~~ concurrent with the submittal of the Water Quality Improvement Plan.

Likewise, each Copermittee must continue to require new development and redevelopment projects to implement BMPs to control pollutants in storm water runoff. The control of pollutants in storm water runoff from development and redevelopment projects within each Copermittee's jurisdiction is guided and directed by its BMP Design Manual, formerly known as a Standard Storm Water Mitigation Plan (SSMP). Provision F.2.b requires each Copermittee to update its BMP Design Manual to be consistent with the requirements of Provision E.3 ~~within 3 months after the acceptance~~ concurrent with the submittal of the Water Quality Improvement Plan.

8) Attachment F, Under the Fact Sheet discussion of Provision F.3

Provision F.3.b.(2) includes the transitional annual reporting requirements for the transitional monitoring and assessment program for each Watershed Management Area. The Copermittees in the Watershed Management Area are required to submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted. The Transitional Monitoring and Assessment Program Annual Report is required to include the transitional period monitoring data collected pursuant to Provisions D.1.a and D.2.a, and the findings from the transitional period findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

From: lyris@swrcb18.waterboards.ca.gov
To: Chiu, Wayne@Waterboards
Subject: San Diego Regional MS4 Tentative Order -- Order on Procedural Issues and Order of Proceedings for May 8, 2013 Continued Public Hearing
Date: Thursday, May 02, 2013 10:10:48 AM
Attachments: 2013-0501 Order_Proceedings ContinuedPH.pdf

This is a message from the California Regional Water Quality Control Board, San Diego Region (9).

Parties and Interested Persons,

Attached is a memo signed by the San Diego Water Board Chair resolving outstanding procedural issues related to the San Diego Regional Water Quality Control Board's proceeding to consider Tentative Order No. R9-2013-0001, the San Diego Regional MS4 Permit.

The Chair's memo will also be posted on the San Diego Water Board's website at http://www.waterboards.ca.gov/rwqcb9/water_issues/programs/stormwater/index.shtml

Laurie Walsh, PE
Water Resource Control Engineer
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123
Tel. 858-467-2970

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD
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STATE OF CALIFORNIA
REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

MEETING NOTICE AND AGENDA[1]

Wednesday, May 8, 2013
9:00 a.m.

Water Quality Control Board
Board Meeting Room
9174 Sky Park Court
San Diego, California

The purpose of this meeting is for the San Diego Water Board to obtain testimony and information from concerned and affected persons and to make decisions based on the information received. Persons who want to submit written comments or evidence on any agenda item must comply with the procedures described in the agenda and agenda notes. Persons wishing to speak at the meeting should complete an attendance card (see Note F, attached to this Notice). The San Diego Water Board requests that all lengthy comments be submitted in writing in advance of the meeting date. To ensure that the San Diego Water Board members and staff have the opportunity to review and consider written material, comments should be received in the San Diego Water Board's office no later than noon on Tuesday, April 23, 2013* and should indicate the agenda item to which it is applicable. If the submitted written material is more than 5 pages or contains foldouts, color graphics, maps, etc., 15 copies must be submitted for distribution to the Board members and staff. Written material submitted after 5:00 P.M. on Tuesday, April 30, 2013, will not be provided to the Board members and may not be considered by the San Diego Water Board (See Note D, attached to this Notice).

****PLEASE NOTE THAT SOME ITEMS ON THE AGENDA MAY HAVE BEEN PREVIOUSLY NOTICED WITH EARLIER DEADLINES FOR SUBMITTING WRITTEN COMMENTS OR MAY HAVE A SEPARATE HEARING PROCEDURES DOCUMENT THAT ESTABLISHES DIFFERENT DEADLINES OR PROCEDURES FOR SUBMITTING WRITTEN MATERIALS. IN THOSE CASES THE DIFFERENT DEADLINES OR PROCEDURES APPLY.***

Comments on agenda items will be accepted by E-mail subject to the same conditions set forth for other written submissions as long as the total submittal (including attachments) does not exceed five printed pages in length. E-mail must be submitted to: rb9agenda@waterboards.ca.gov. Type the word “Agenda” in the subject line.

[1] Versión en español disponible también en:
http://www.waterboards.ca.gov/sandiego/board_info/agendas/index.shtml

Pursuant to Title 23, California Code of Regulations, section 648.4, the San Diego Water Board may refuse to admit written testimony or evidence into the record if it is not submitted to the San Diego Water Board in a timely manner and shall refuse to do so if admitting it would prejudice any party or the board, unless the proponent demonstrates that compliance with the deadline would create an unreasonable hardship.

NOTE D, attached to this Notice, refers to the procedures that will be followed by the San Diego Water Board in contested adjudicatory matters if a separate Hearing Procedures Document has not been issued for a particular agenda item. Parties requesting an alternate hearing process must do so in accord with the directions in NOTE D. Any such request, together with supporting material, must be received in the San Diego Water Board's office no later than noon on Tuesday, April 23, 2013.

Copies of the agenda items to be considered by the San Diego Water Board are posted on the San Diego Water Board's website at http://www.waterboards.ca.gov/sandiego/board_info/agendas

Except for items designated as time certain, there are no set times for agenda items. Items may be taken out of order at the discretion of the Chairman.

1. Roll Call and Introductions.

2. PUBLIC FORUM: Any person may address the Board regarding a matter within the Board's jurisdiction that is not related to an item on this Meeting agenda and is not scheduled for a future Meeting. **Comments will generally be limited to three minutes, unless otherwise directed by the Board Chairperson**. Any person wishing to make a longer presentation should contact the Executive Officer at least ten days prior to the meeting.

3. Minutes of Board Meeting: April 10-11, 2013.

4. Chairman's, Board Members', State Board liaison's and Executive Officer's Reports: These items are for Board discussion only. No public testimony will be allowed, and the Board will take no formal action.

5. Information Item: Water Quality Management Training Requirement of the Agricultural and Nursery Operations Waiver and the University of California Cooperative Extension Irrigated Lands Education Program. The Board will take no formal action. (*Julie Chan*)

6. Information Item: University of California, San Diego's Phase II MS4 Permit. (*Tony Felix*)

7. General NPDES Permit Issuance: General Waste Discharge Requirements for Discharges from Boatyards and Boat Maintenance and Repair Facilities Adjacent to Surface Waters within the San Diego Region (Tentative Order No. R9-2013-0026, NPDES No. CAG719001). (*Kristin Schwall and Michelle Mata*)

Ex parte communications are allowed in this matter subject to the disclosure requirements of Water Code section 13287, <u>except that ex parte communications are prohibited for a period beginning 14 days before the board meeting at which the proposed order is scheduled for board action</u>. For communications concerning any issue in this proceeding, ex parte communications are prohibited starting on April 24, 2013. If the board does not take action on May 8, 2013, the ex parte prohibition will remain in place until the board, the Chair, or the Executive Officer directs otherwise. Once lifted, the prohibition on ex parte communications may be reinstated for 14 days before the day of the board meeting to which the decision is continued. The board will provide notice via the Lyris email list for this item if the prohibition is lifted and/or reinstated.

8. Administrative Civil Liability: Settlement Agreement and Stipulation for Order and Administrative Civil Liability Order, City of San Diego, Sanitary Sewer Overflow to Los Peñasquitos Creek, Peñasquitos Lagoon, and the Pacific Ocean. Settlement to resolve violations of Order Nos. 2006-0003-DWQ and R9-2007-0005 as set forth in Tentative Order No. R9-2013-0032. The Settlement would impose monetary liability of $1,245,414 against the City of San Diego, of which $622,707 in liability would be paid to the State Water Resources Control Board's Cleanup and Abatement Account and $622,707 in liability would be suspended upon successful completion of an Enhanced Compliance Action as described in Tentative Order No. R9-2013-0032. (*Barry Pulver*)

9. Public Hearing: Issuance of a NPDES Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region (Tentative Order No. R9-2013-0001, NPDES No. CAS0109266). Continued from April 11, 2013. (*Wayne Chiu, Laurie Walsh, Christina Arias*)

10. Arrangements for Next Meeting and Adjournment:
    Wednesday, June 19, 2013 - 9:00 a.m.
    Water Quality Control Board
    Regional Board Meeting Room
    9174 Sky Park Court
    San Diego, California

11. CLOSED SESSION

The Board may meet in closed session to consider personnel matters [Authority: Government Code section 11126(a)]; to deliberate on a decision to be reached based upon evidence introduced in a hearing [Authority: Government Code section 11126(c)(3)]; or to discuss matters in litigation, including discussion of initiated litigation, significant exposure to litigation, or decisions to initiate litigation [Authority: Government Code section 11126(e)]. Litigation items that may be discussed are listed below by the type of item:

Civil Actions (Judicial and Administrative, other than Petitions for Review filed with the State Water Board)

a. *People of the State of California Ex Rel. the Regional Water Quality Control Board, San Diego Region v. Edward Drusina, an individual in his capacity as Commissioner of the International Boundary and Water Commission, United States Section, et al.,* Complaint for Violations of the Clean Water Act and Related State Law Claims. United States District Court, Southern District of California, Case No. 01-CV-027BTM(JFS) (filed February 2001). *(David Gibson)*

b. *In re: Test Claim on California Regional Water Quality Control Board, San Diego Region, Order No. R9-2007-001, (NPDES No. CAS0108758) Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego County, the San Diego Unified Port District, and the San Diego County Regional Airport Authority adopted on January 24, 2007. Test Claim filed by San Diego County, et al., with Commission on State Mandates, No. 07-TC-09* (filed June 2008). *(Catherine George Hagan)*

c. *State of California Department of Finance, State Water Resources Control Board, And California Regional Water Quality Control Board, San Diego Region v. Commission on State Mandates.* Petition for Writ of Administrative Mandamus. Sacramento County Superior Court, Case No. 34-2010-80000604 (filed July 2010). *(Catherine George Hagan)*

d. *In re: Citizens Development Corporation, Debtor and Debtor in Possession*, Case No. 10-15142-LT11. United States Bankruptcy Court, Southern District of California. (San Diego Water Board Claim in Bankruptcy) (filed June 2011). (*Catherine George Hagan*)

e. *Test Claim on California Regional Water Quality Control Board, San Diego Region, Order No. R9-2009-0002, (NPDES No. CAS0108740) Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of Orange, the Incorporated Cities of the County of Orange, and the Orange County Flood Control District adopted on December 16, 2009. Test Claim filed by County of Orange, et al., with Commission on State Mandates, No. 10-TC-11* (filed June 2011). *(Catherine George Hagan)*

f. *Test Claim on California Regional Water Quality Control Board, San Diego Region, Order No. R9-2010-0016 (NPDES No. CAS0108766) adopted November 10, 2010, County of Riverside, Riverside County Flood Control and Water Conservation District, and the Cities of Murrieta, Temecula and Wildomar, Co-Claimants, filed with Commission on State Mandates, No. 11-TC-03 (filed November 2011). (Catherine George Hagan)*

Petitions for Review Pending Before State Water Resources Control Board[2]

g. Petitions of the National Fireworks Association and Fireworks & Stage FX America Inc., Coastal Environmental Rights Foundation, and San Diego Coastkeeper (General National Pollutant Discharge Elimination System (NPDES) Permit Order No. R9-2011-0022 (NPDES No. CAG999002) for Residual Firework Pollutant Waste Discharges to Waters of the United States in the San Diego Region from the Public Display of Fireworks), SWRCB/OCC Files A-2164(a)-(c), filed June and July 2011. *(Michelle Mata)*

h. Petition of Citizens Development Corporation (Water Code Section 13267 Investigative Order No. R9-2011-0033 dated September 14, 2011, Requiring Submission of Technical Reports Pertaining to Investigation of Lake San Marcos Nutrient Impairment, San Diego County), SWRCB/OCC File A-2185, filed October 2011. (*Laurie Walsh*)

i. Petition of City of San Diego (Time Schedule Order No. R9-2011-0052 dated September 14, 2011, for the Kinder Morgan Energy Partners, Mission Valley Terminal Remediation Dewatering Discharge to Murphy Canyon Creek, San Diego County), SWRCB/OCC File A-2186, filed October 2011. (*Ben Neill*)

j. Petition of Jack Eitzen (Administrative Assessment of Civil Liability Order Nos. R9-2011-0048 and R9-2011-0049 against Jack Eitzen for 38175 and 38155 Via Vista Grande, Murrieta, Riverside County), issued October 12, 2011), SWRCB/OCC File A-2193, filed November 2011. (*Rebecca Stewart*)

k. Petitions for Review of San Diego Bay Shipyard Sediment Cleanup and Abatement Order No. R9-2012-0024 for National Steel and Shipbuilding Company (NASSCO), BAE Systems, San Diego Ship Repair (BAE Systems), Campbell Industries, City of San Diego, San Diego Gas & Electric (SDG&E) and San Diego Unified Port District (Port District) issued March 14, 2012. Petitions for Review and Requests for Stay filed by NASSCO, BAE Systems and City of San Diego. Petitions for Review w/o requests for stay filed by SDG&E, Star & Crescent Boat Company and Port District. SWRCB/OCC File A-2205(a) – (e), filed April 2012. (*Frank Melbourn)*

l. Petition of NASSCO for Review of Resolution No. R9-2012-0025 (Certifying Final Environmental Impact Report for San Diego Bay Shipyard Sediment Cleanup and Abatement Order No. R9-2012-0024), adopted March 14, 2012, SWRCB/OCC File A-XXXX, filed April 2012. (*Frank Melbourn)*

m. Petition of South Laguna Civic Association for Review of Order No. R9-2012-0013, NPDES No. CA0107611, NPDES Permit Reissuance: South Orange

[2] Petitions for review of San Diego Water Board actions or inactions filed with the State Water Board being held in abeyance by the State Water Board are not listed in the agenda. The titles of these matters are available at the San Diego Water Board. Please contact Catherine George Hagan at chagan@waterboards.ca.gov or 858-467-2958 for more information.

County Waste Authority, Discharges to the Pacific Ocean via Aliso Creek Ocean Outfall, adopted April 11, 2012, SWRCB/OCC File A-2211, filed May 2012. (*Joann Lim*)

n. Petition of City of San Diego for Review of Resolution No. R9-2012-0045, re NPDES Permit Notice of Enrollment Amendment for Kinder Morgan Energy Partners, June 13, 2012, SWRCB/OCC File A-XXXX, filed July 2012. (*Ben Neill*)

NOTIFICATIONS

A. **Completed Cleanup Action – 30 Day Public Notice**. City Cleaners, 224 Ocean Avenue, Laguna Beach, California - The San Diego Water Board intends to issue a no further action letter for completion of cleanup of pollutants at City Cleaners located in Laguna Beach, California. This public notice fulfills the San Diego Water Board's obligation to inform the public of the proposed actions pursuant to the State and Regional Water Quality Control Boards' Public Participation guidance document. Impacted soil and groundwater have been remediated via in-situ bioaugmentation and soil vapor extraction. The residual concentrations of waste constituents in soil and groundwater do not appear to pose a threat to human health or the environment and the unauthorized release case can be closed. Additional details about the case are available from the GeoTracker website at: http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=SL0605959158 to obtain recent groundwater and remediation status reports. Provided no significant issues arise during the public notification period, the San Diego Water Board will issue a no further action letter after May 7, 2013. (*Barry Pulver*)

B. **Follow the Board Meeting on Twitter**: Updates on the progress of the San Diego Water Board meeting will be posted on Twitter at www.twitter.com/SDWaterBoard. The San Diego Water Board's use of Twitter is a courtesy and is for informational purposes only. It is not always reliable, and is not a substitute for personal attendance at a Board meeting.

DIRECTIONS TO MEETING

From Downtown: I-15 north – take the Aero Drive exit – turn left (west). Proceed to the 3rd stoplight, which is Ruffin Road – turn right. Turn left on Sky Park Court (stoplight). Our building is located at the end of the court – veer to the right into the parking lot.

From the North: I-15 south – take the Balboa Ave. exit – turn right (west). Proceed to the 2nd stoplight, which is Ruffin Road – turn left. Turn right onto Sky Park Court (stoplight). Our building is located at the end of the court – veer to the right into the parking lot.

State of California
Regional Water Quality Control Board
San Diego Region

EXECUTIVE OFFICER SUMMARY REPORT
May 8, 2013

ITEM: 9

SUBJECT: Public Hearing (continued): Issuance of an NPDES Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region (Tentative Order No. R9-2013-0001, NPDES No. CAS0109266) (*Wayne Chiu, Laurie Walsh, Christina Arias*).

PURPOSE: To receive public testimony and consider adoption of Tentative Order No. R9-2013-0001 (Tentative Order).

RECOMMENDATION: Adoption of the revised Tentative Order No. R9-2013-0001, with Option 1 Errata or Option 2 Errata, is recommended.

DISCUSSION: This Executive Officer Summary Report (EOSR) supplements the EOSR provided for Item 8 of the April 10 and 11, 2013 San Diego Water Board meeting. At that meeting, the San Diego Water Board opened a two-day public hearing to consider adoption of the Tentative Order which was attended by over 200 people each day. The San Diego Water Board heard extensive testimony on the Tentative Order from a large diverse group of stakeholders including USEPA, Copermittees, elected leaders, representatives from the building industry and various other industries, environmental non-governmental organizations, and other interested persons. The testimony included many requests that the San Diego Water Board postpone or extend the hearing to provide more time for parties and interested persons to review and respond to responses to comments and revisions to the Tentative Order prepared by San Diego Water Board staff.

The testimony also covered a variety of topics on the Tentative Order pertaining to the land development requirements, the incorporation of total maximum daily loads (TMDLs), and the discharge prohibitions and receiving waters limitations. With respect to the discharge prohibitions and receiving waters limitations issue, the testimony focused

on whether or not it was appropriate to include the "Compliance Option" to meet water quality standards described in the revised Tentative Order at Provision II.B.3.c, Discharge Prohibition and Receiving Water Limitations Compliance Option. The Compliance Option provides the Copermitees with a pathway to achieve compliance with the discharge prohibitions and receiving waters limitations through development and implementation of technically sound, well supported strategies designed to attain compliance with water quality standards in receiving waters by a specified date. The Copermittees argued that the Compliance Option was too limited and asserted that that Tentative Order should instead define compliance with the discharge prohibitions and receiving waters limitations as being attained if the discharger is actively engaged in the iterative process of implementing the Water Quality Improvement Plan to comply with the Maximum Extent Practicable (MEP) discharge standard over time. Environmental groups asserted that the Compliance Option, or any other compliance option, was unnecessary and would inappropriately provide "safe harbor" to dischargers by creating a partial or complete exemption from San Diego Water Board enforcement action(s) and citizen lawsuits for violations of water quality standards.

At the conclusion of the hearing proceedings on April 11, the San Diego Water Board continued the public hearing to today's meeting to allow more time for discussion of proposed revisions to the Tentative Order. San Diego Water Board staff was directed to prepare any remaining revisions to the Tentative Order based on consideration of the testimony at the April 10 and 11 public hearing. The San Diego Water Board further directed that staff prepare two options discussed further below for the Tentative Order regarding the Compliance Option.

Final Revisions to the Tentative Order

San Diego Water Board staff is proposing final revisions to the Tentative Order for the San Diego Water Board's consideration. These revisions include corrections for typographical errors and incorporate suggestions and clarifications offered by the stakeholders in their public testimony. The key revisions include:

1) A new Finding acknowledging improvements to water quality made as a result of municipal storm water programs in place since 1990;

2) Modifications to the treatment control best management practices (BMP) requirements to remove the requirement to retain "100 percent of" pollutants on a Priority Development Project site;

3) The addition of "redevelopment" road projects that may utilize USEPA Green Streets guidance for compliance;

4) The addition of the phrase "**and restore**" [the water quality and designated beneficial uses of waters of the state] in the introductory paragraph describing the purpose of the Water Quality Improvement Plan; and

5) An option for Responsible Copermittees to propose alternative monitoring procedures for beaches, creeks, and creek mouths that have been de-listed from the Clean Water Act Section 303(d) List.

Option 1 and Option 2 Errata

The above Tentative Order revisions are presented in an errata document that is formatted in the form of two options for consideration. Option 1 Errata (**Supporting Document 1**) incorporates the above “Final Revisions” but deletes the Compliance Option referenced above (Section Provision II. B.3.c of the revised Tentative Order) entirely. Option 2 Errata (**Supporting Document 2**) incorporates the above “Final Revisions” and retains the Compliance Option with some adjustments. The modifications to the Compliance Option include the addition of Areas of Special Biological Significance (ASBS), removal of the requirement for a majority concurrence from the Water Quality Improvement Consultation Panel, and clarification that Copermittees choosing the Compliance Option are doing so independent of neighboring Copermittees. A revised Tentative Order incorporating Option 1 and Option 2 Errata is contained in **Supporting Document 3**.

Cost Benefit Analysis Report

Finally, the San Diego County Copermittees requested that an additional cost benefit analysis report be added to the administrative record for the Tentative Order. The cost benefit analysis report prepared by the City of San Diego

Transportation and Storm Water Department and entitled *Meeting Water Quality Standards for San Diego's Recreational Waters: A Cost Benefit Analysis,* dated April 2011 (**Supporting Document 4**), examines the costs of compliance for the City of San Diego with TMDLs. The San Diego Water Board Chair invited designated parties wishing to submit comments on the cost benefit analysis report, to submit them to the San Diego Water Board no later than 5:00 p.m. on Friday, April 26, 2013. Copies of comments received will be included in a supplemental Executive Officer Summary Report.

SUPPORTING DOCUMENTS:

1. Option 1 Errata (removal of Provision II.B.3.c)
2. Option 2 Errata (retention of Provision II. B.3.c, with modifications)
3. Revised Tentative Order incorporating Option 1 and Option 2 Errata
4. City of San Diego Report, *Meeting Water Quality Standards for San Diego's Recreational Waters: A Cost Benefit Analysis* dated April 2011.

PUBLIC NOTICE: Notice of continuance of this item was provided to interested persons via email on April 19, 2013. Notice was also provided in the Meeting Notice and Agenda for the May 8, 2013 Board meeting, which is posted on the San Diego Water Board website.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
San Diego Region

Errata Sheet
(OPTION 1)
Tentative Order No. R9-2013-0001
NPDES No. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The following changes to the revised version of Tentative Order No. R9-2013-0001, released March 27, 2013, are based on the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) Public Hearing testimony presented during Agenda Item No. 8 at the April 10 and 11, 2013 San Diego Water Board Meeting. The changes to the Tentative Order listed below are shown in underline/strikeout format to indicate added and removed language, respectively.

FINDINGS Errata

1) Discharge Characteristics and Runoff Management Findings

Add the following finding after Finding 17, and renumber the subsequent findings appropriately:

18. Water Quality Improvements. Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges to the MS4s and control pollutants in storm water discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the Clean Water Act.

PROVISION A Errata

1) Provision A.4.a.(4)

(4) Within 90 days of the San Diego Water Board determination that the ~~update~~ modifications to the Water Quality Improvement Plan required under Provision A.4.a.(3) meet the requirements of this Order, the applicable Copermittees must

revise the jurisdictional runoff management program documents to incorporate the ~~updated~~ modified water quality improvement strategies that have been and will be implemented, the implementation schedule, and any additional monitoring required; and

PROVISION B Errata

1) Provision B Introductory Paragraph

The purpose of this provision is to develop Water Quality Improvement Plans that guide the Copermittees' jurisdictional runoff management programs towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plans is to further the Clean Water Act's objective to protect, preserve, ~~and~~ enhance, and restore the water quality and designated beneficial uses of waters of the state. This goal will be accomplished through an adaptive planning and management process that identifies the highest priority water quality conditions within a watershed and implements strategies through the jurisdictional runoff management programs to achieve improvements in the quality of discharges from the MS4s and receiving waters.

2) Provision B.3.b.(4)(b)

(b) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify and compile a list of candidate projects that could potentially be used as alternative compliance options for Priority Development Projects, to be implemented in lieu of onsite structural BMP performance requirements described in Provisions E.3.c.(1) and E.3.c.(2). Specifically, the Copermittees must identify opportunities to be included in the list for candidate projects in each Watershed Management Area, such as:

(i) ~~Opportunities for s~~Stream or riparian area rehabilitation;

(ii) ~~Opportunities for r~~Retrofitting existing infrastructure to incorporate storm water retention or treatment;

(iii) ~~Opportunities for r~~Regional BMPs;

(iv) ~~Opportunities for g~~Groundwater recharge projects;

(v) ~~Opportunities for w~~Water supply augmentation projects; and

(vi) ~~Opportunities for l~~Land purchases to preserve floodplain functions.

3) Provision B.3.c

~~c. Discharge Prohibitions and Receiving Water Limitations Compliance Option~~

~~(1) The Copermittees may utilize implementation of the water quality improvement strategies in the Water Quality Improvement Plan to demonstrate compliance with the requirements of Provisions A.1.a, A.1.c and A.2.a. For each Copermittee in the Watershed Management Area that chooses to utilize this option, the Copermittee will be in compliance with Provisions A.1.a, A.1.c and A.2.a if:~~

~~(a) Numeric goals and schedules developed pursuant to Provision B.3.a include the following numeric goals:~~

~~(i) WQBELs expressed as concentration-based or load-based effluent limitations applicable to the Watershed Management Area established by the TMDLs in Attachment E to this Order; and~~

~~(ii) Numeric goals applicable to the Copermittee's MS4 discharges expressed as concentration-based or load-based effluent limitations for all other pollutants listed on the Clean Water Act Section 303(d) List of Water Quality Impaired Segments[1] for the receiving waters in the Watershed Management Area that do not have a TMDL developed; and~~

~~(iii) Numeric goals for receiving waters that will protect the conditions of the receiving waters and attain water quality standards.~~

~~(b) An analysis utilizing a watershed model or other watershed analytical tools is performed. The results must be included in the Water Quality Improvement Plan to quantitatively demonstrate that the implementation of the water quality improvement strategies required under Provision B.3.b will achieve the numeric goals within the established schedules required under Provision B.3.a. The analysis may be performed individually or jointly by the Copermittees choosing to utilize this option in the Watershed Management Area, and must be updated as part of the iterative approach and adaptive management process required under Provisions B.5.a-b.~~

~~(c) The Water Quality Improvement Plan specifies the monitoring and assessments (i.e. MS4 outfall discharge, receiving water, and/or special studies) that will be performed by the Copermittee to confirm the implementation of the water quality improvement strategies within its jurisdiction is making progress toward achieving the numeric goals in accordance with the established schedules developed pursuant to Provision B.3.c.(1)(a). The monitoring and assessments must be incorporated into the monitoring and assessment program required~~

[1] ~~2002 and subsequent 303(d) Lists~~

~~pursuant to Provision B.4. The monitoring and assessments must be updated as part of the iterative approach and adaptive management process required under Provision B.5.c.~~

~~(d) The numeric goals proposed pursuant to Provision B.3.c.(1)(a), the analysis performed pursuant to Provision B.3.c.(1)(b) and the specific monitoring and assessments proposed pursuant to Provision B.3.c.(1)(c) have been reviewed and receive concurrence by a majority of the Water Quality Improvement Consultation Panel (see Provision F.1.a.(1)(b)). Updates must also receive concurrence by a majority of the Water Quality Improvement Consultation Panel.~~

~~(2) Each Copermittee that chooses to utilize this option will, for the pollutant/water body combinations covered by the analysis, be in compliance with Provisions A.1.a, A.1.c and A.2.a when the Water Quality Improvement Plan, incorporating the requirements of Provision B.3.c.(1), is accepted by the San Diego Water Board.~~

~~(3) The Copermittee will, for the pollutant/water body combinations covered by the analysis, remain in compliance with Provisions A.1.a, A.1.c and A.2.a during the term of this Order as long as:~~

~~(a) The results of the analysis performed pursuant to Provision B.3.c.(1)(d) is accepted and continues to be accepted by the San Diego Water Board Executive Officer as part of the Water Quality Improvement Plan; AND~~

~~(b) The Copermittee continues to implement the water quality improvement strategies within its jurisdiction developed pursuant to Provision B.3.b.(1) in accordance with the schedules for implementing the strategies established pursuant to Provision B.3.b.(3)(a); AND~~

~~(c) The Copermittee continues to perform the monitoring and assessments specified in the Water Quality Improvement Plan, developed and implemented pursuant to Provision B.3.c.(1)(c), to demonstrate its progress toward achieving the numeric goals applicable to its MS4 discharges in accordance with the interim and final dates for achieving the numeric goals established pursuant to Provision B.3.a.(2); AND~~

~~(d) The Copermittees in the Watershed Management Area continue to implement the requirements of Provision A.4.a.~~

Tentative Order No. R9-2013-0001 April 11, 2013
Errata Sheet (OPTION 1)

PROVISION D Errata

1) Provision D.2.a.(3)(b)

(b) Transitional Wet Weather MS4 Outfall Discharge Monitoring Frequency

Each wet weather MS4 outfall discharge monitoring station selected pursuant to Provision D.2.a.(3)(a) must be monitored ~~twice~~ once during the wet season (October 1 – April 30). The wet weather monitoring events must be selected to be representative of the range of hydrological conditions experienced in the region. At least 10 percent of samples must be conducted during the first wet weather event of the wet season, to include at least one such sample in each Watershed Management Area.~~.~~

2) Provision D.3.d

(d) Special studies initiated prior to the effective date of this Order that meet the requirements of Provision D.3.b and are implemented during the term of this Order as part of the Water Quality Improvement Plan may be utilized to fulfill the special study requirements of Provision D.3.a. Special studies completed before the effective date of this Order ~~Water Quality Improvement Plan is accepted by the San Diego Water Board~~ cannot be utilized to fulfill the special study requirements of Provision D.3.a.

3) Provision D.4.b.(2)(b)(i)[d]

[d] The percent contribution of storm water volumes and pollutant loads discharged from each land use type within ~~the~~ each hydrologic subarea with a major MS4 outfall to receiving waters or within each major MS4 outfall to receiving waters ~~drainage basin to each of~~ in the Copermittee's ~~major MS4 outfalls in its~~ jurisdiction ~~to receiving waters~~ within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch.

PROVISION E Errata

1) Provision E.3.b.(1)

(1) Definition of Priority Development Project

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site)~~, or redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site)~~. This ~~category~~ includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(b) Redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site on an existing site of 10,000 square feet or more of impervious surfaces). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

~~(b)~~
(c) New or redevelopment projects that create 5,000 square feet or more of impervious surface (collectively over the entire project site), and support one or more of the following uses:

2) Provision E.3.c.(1)

(a) Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite ~~100 percent of~~ the pollutants contained in the volume of storm water runoff produced from a 24-hour 85th percentile storm event (design capture volume)~~;~~.

~~(b)~~ (i) If a Copermittee determines that implementing BMPs to retain the full design capture volume onsite for a Priority Development Project is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize ~~flow-thru treatment control~~ biofiltration BMPs. Biofiltration BMPs must be sized and designed to: ~~achieve the equivalent pollutant load removal described in Provision E.3.c.(1)(a). Biofiltration LID BMPs must be considered as a first option before other types of flow-thru treatment control BMPs may be considered.~~

[a] Treat 1.5 times the design capture volume not reliably retained onsite; OR
[b] Treat the design capture volume not reliably retained onsite with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite.
[c] Have an appropriate loading rate to prevent erosion, scour, and channeling within the BMP.

(ii) If a Copermittee determines that biofiltration is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize flow-thru treatment control BMPs to treat runoff leaving the site, AND mitigate for the design capture volume not reliably retained onsite pursuant to Provision E.3.(c)(1)(b). Flow thru treatment control BMPs must be sized and designed to:

[a] Remove pollutants from storm water to the MEP;
[b] Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm

event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;

[c] Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Flow-thru treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of flow-thru treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

~~(c)~~

(b) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1)(a). The Priority Development Project must mitigate for the portion of the pollutant load in the design capture volume not retained onsite if Provision E.3.(c)(3) is utilized. If a Priority Development Project is allowed to utilize alternative compliance, flow-thru treatment control BMPs must be implemented to treat the portion of the design capture volume that is not reliably retained onsite. Flow-thru treatment control BMPs must be sized and designed in accordance with Provision E.3.c.(1)(a)(ii)[a]-[c].

~~(d) If a Priority Development project is allowed to utilize alternative compliance, flow-thru treatment control BMPs must be implemented to treat the portion of the design capture volume that is not retained onsite. Flow-thru treatment control BMPs must be sized and designed to:~~

~~(i) Remove pollutants from storm water to the MEP;~~

~~(ii) Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;~~

~~(iii) Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Flow-thru treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of flow-thru treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.~~

3) Provision E.3.c.(2)(b)

(b) Each Priority Development Project must avoid ~~known~~ critical sediment yield areas known to the Copermittee or identified by the Watershed Management Area Analysis pursuant to Provision B.3.b.(4), or implement measures that allow critical coarse sediment to be discharged to receiving waters, such that there is no net impact to the receiving water ~~sediment supply is unaffected by the project~~.

4) Provision E.3.c.(3)(a)(ix)

~~(ix) Receiving waters must not be utilized to convey untreated storm water runoff from the Priority Development Project to the candidate project;~~

5) Provision E.3.c.(3)(b)

(b) Retrofitting or redevelopment of existing paved alleys, streets or roads that are designed and constructed in accordance with the USEPA Green Streets guidance.

6) Provision E.3.e.(1)(a)

(a) Each Copermittee must require and confirm that for all Priority Development Project applications that have not received prior lawful approval by the Copermittee by the time the BMP Design Manual is updated pursuant to Provision E.3.d ~~18 months after the commencement of coverage under this Order~~, the requirements of Provision E.3 are implemented. For project applications that have received prior lawful approval ~~by 18 months after~~ before the BMP Design Manual is updated pursuant to Provision E.3.d ~~commencement of coverage under this Order~~, the Copermittee may allow previous land development requirements to apply.

PROVISION F Errata

1) Provisions F.1 and F.2

Delete the terms "~~certification~~" and "~~notification of concurrence~~" and replace with "notification of acceptance" throughout Provisions F.1 and F.2.

2) Provision F.1.a.(1)(c)

(c) The Copermittees must coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public ~~as much~~ time and opportunity ~~as possible~~ to participate during the development of the Water Quality Improvement Plans.

3) Provision F.1.b.(7)

(7) During implementation of the Water Quality Improvement Plan ~~after implementation~~ the Copermittees must correct any deficiencies in the Plan identified by the San Diego Water Board ~~no later than 90 days~~ in the updates submitted with the Water Quality Improvement Plan Annual Report following a request by the Board to do so.

4) Provision F.2.a.(2)

(2) Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E ~~no later than 3 months after San Diego Water Board notification of concurrence with~~ concurrent with the submittal of the Water Quality Improvement Plan. Each Copermittee must correct any deficiencies in the jurisdictional runoff management program document based on comments received from the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report.

5) Provision F.2.b.(1)

(1) Each Copermittee must update its BMP Design Manual to incorporate the requirements of Provisions E.3.a-d ~~no later than 3 months after San Diego Water Board notification of concurrence with~~ concurrent with the submittal of the Water Quality Improvement Plan ~~by the San Diego Water Board Executive Officer~~. Each Copermittee must correct any deficiencies in the BMP Design Manual based on comments received from the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report.

6) Provision F.3.b.(2)

(2) Transitional Monitoring and Assessment Program Annual Reports

The Copermittees for each Watershed Management Area must submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted under this Order. The Transitional Monitoring and Assessment Program Annual Reports must include:

ATTACHMENT E Errata

1) Attachment E, Specific Provision 1.b.(3)(a)-(c)

Delete "~~Copermittees'~~" and replace with "Copermittee's"

2) Attachment E, Specific Provision 1.d

Add the following after Specific Provision 1.d.(2):

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 1.b.(2)(b), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

3) Attachment E, Specific Provision 2.b.(2)(b), Table 2.2

Table 2.2
Final Effluent Limitations as Expressed as Annual Loads in MS4 Discharges to Shelter Island Yacht Basin

Constituent	Effluent Limitation
Dissolved Copper	30 g/yr*

* If the water quality objectives for dissolved copper in Shelter Island Yacht Basin are changed in the future, then the margin of safety (MOS), TMDL and allocations will be recalculated using the *Method for Recalculation of the Total Maximum Daily Load for Dissolved Copper in the Shelter Island Yacht Basin, San Diego Bay* in the Basin Plan (p. 7-14).

4) Attachment E, Specific Provision 3.d

Add the following after Specific Provision 3.d.(2):

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 3.b.(2)(b)(i), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

5) Attachment E, Specific Provision 4.b.(3)(a)-(c)

Delete "~~Copermittees'~~" and replace with "Copermittee's"

6) Attachment E, Specific Provision 4.c.(2)(a)-(d)

Delete "~~Copermittees'~~" and replace with "Copermittee's"

7) Attachment E, Specific Provision 4.d

Add the following after Specific Provision 4.d.(2):

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 4.b.(2)(b), dry and wet weather discharge

concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

8) Attachment E, Specific Provision 5.b.(3)(a)-(c)

Delete "~~Copermittees'~~" and replace with "Copermittee's"

9) Attachment E, Specific Provision 5.c.(1)(b)(i)-(iii)

Delete "~~Copermittees'~~" and replace with "Copermittee's"

10) Attachment E, Specific Provision 5.d.(3)

Add the following after Specific Provision 5.d.(3)(a) and renumber subsequent provisions appropriately:

(b) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 5.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

11) Attachment E, Specific Provision 6.b.(2)(a), Table 6.2a

Table 6.2a
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Beaches

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform	10,000	22% ~~/ 0%~~	1,000	0%
Fecal Coliform	400	22% ~~/ 0%~~	200	0%
Enterococcus	104	22% ~~/ 0%~~	35	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. ~~The 0% single sample maximum allowable exceedance frequency applies to dry weather days.~~ For dry weather days the single sample allowable exceedance frequency must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan.

12) Attachment E, Specific Provision 6.b.(2)(a), Table 6.2b

Table 6.2b
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Creeks

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Fecal Coliform	400	22% ~~/ 0%~~	200	0%
Enterococcus	61 (104)	22% ~~/ 0%~~	33	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. ~~The 0% single sample maximum allowable exceedance frequency applies to dry weather days.~~ For dry weather days the single sample allowable exceedance frequency must be consistent with the single sample maximum REC-1 water quality objectives in the Basin Plan.
d. A single sample maximum of 104 MPN/100ml for *Enterococcus* may be applied as a receiving water limitation for creeks, instead of 61~~0~~ MPN/100mL, if one or more of the creeks addressed by these TMDLs (San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek, San Diego River, and/or Chollas Creek) is designated with a "moderately to lightly used area" or less frequent usage frequency in the Basin Plan. Otherwise, the single sample max~~m~~imum of 61 MPN/100mL for *Enterococcus* must be used to assess compliance with the allowable exceedance frequency.

13) Attachment E, Specific Provision 6.b.(2)(b), Table 6.2

Table 6.2c
Final Effluent Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies in MS4 Discharges to the Water Body

Constituent	Concentration-Based Effluent Limitations			
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform[d]	10,000	22% ~~/ 0%~~	1,000	0%
Fecal Coliform	400	22% ~~/ 0%~~	200	0%
Enterococcus	104[e] / 61[f]	22% ~~/ 0%~~	35[e] / 33[f]	0%

Notes:
a. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. ~~The 0% single sample maximum allowable exceedance frequency applies to dry weather days.~~ For dry weather days the single sample allowable exceedance frequency must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan for discharges to beaches, and the Basin Plan for discharges to creeks and creek mouths.
d. Total coliform effluent limitations only apply to MS4 outfalls that discharge to the Pacific Ocean Shorelines and creek mouths listed in Table 6.0.
e. This *Enterococcus* effluent limitation applies to MS4 discharges to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
f. This *Enterococcus* effluent limitation applies to MS4 discharges to segments or areas of creeks or creek mouths listed in Table 6.0.

14) Attachment E, Specific Provision 6.b.(3)(a)-(c)

Delete "~~Copermittees'~~" and replace with "Copermittee's"

15) Attachment E, Specific Provision 6.c.(3)(a)-(c)

Delete "~~Copermittees'~~" and replace with "Copermittee's"

16) Attachment E, Specific Provision 6.d.(1)(b)

Add the following after Specific Provision 6.d.(1)(b)(iii):

(iv) For Pacific Ocean Shoreline segments or areas listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

17) Attachment E, Specific Provision 6.d.(1)(c)

Add the following after Specific Provision 6.d.(1)(c)(iii) and renumber subsequent provisions appropriately:

(iv) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

18) Attachment E, Specific Provision 6.d.(1)(c)(iii)[c]

[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria density~~y~~ies ~~result~~ reported from ~~wet weather samples collected~~ each of the storm events sampled; and

19) Attachment E, Specific Provision 6.d.(2)(b)

Add the following after Specific Provision 6.d.(2)(b)(iii):

(iv) For creeks or creek mouths listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies

continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

20) Attachment E, Specific Provision 6.d.(2)(c)

Add the following after Specific Provision 6.d.(2)(c)(iv) and renumber subsequent provisions appropriately:

(v) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

21) Attachment E, Specific Provision 6.d.(2)(c)(iii)[c]

[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria density~~y~~ies ~~result~~ reported from ~~wet weather samples collected~~ each of the storm events sampled; and

ATTACHMENT F Errata

1) Attachment F, Under the Fact Sheet discussion of Provision B

Purpose: Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges to the MS4s and control pollutants in storm water discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the Clean Water Act.

Provision B includes requirements for the Copermittees to develop and implement Water Quality Improvement Plans to ultimately comply with the prohibitions and limitations under Provision A. The Water Quality Improvement Plans will provide the Copermittees a comprehensive program that can achieve the requirements and further the objectives of the CWA. Implementation of the Water Quality Improvement Plans will also improve the quality of the receiving waters in the San Diego Region.

2) Attachment F, Under the Fact Sheet discussion of Provision B.3

~~Finally, Provision B.3.c has been included to provide the Copermittees an option to demonstrate and be in compliance with the requirements of Provisions A.1.a, A.1.c and A.2.a. One or more Copermittees within a Watershed Management Area can choose to implement this option. This option is only expected to be utilized by the Copermittees that wish to clearly demonstrate and be in compliance with the requirements of Provisions A.1.a, A.1.c and A.2.a.~~

~~In order for a Copermittee to utilize this option, the Copermittee is required to include three components in the Water Quality Improvement Plan. The first component is a comprehensive set of numeric goals that will demonstrate the requirements of Provisions A.1.a, A.1.c and A.2.a will be achieved. The criteria provided in the Order will require the Copermittee to demonstrate that the discharges from its MS4s will not cause or contribute to exceedances of water quality objectives in the receiving waters, and the receiving waters will be protected from the Copermittee's MS4 discharges.~~

~~The second component is an analysis utilizing a watershed model or other watershed analytical tools. The analysis must demonstrate that the implementation of the water quality improvement strategies required under Provision B.3.b will achieve the numeric goals within the established schedules required under Provision B.3.a. Because the development of the analysis may require significant resources, the Order allows the Copermittees in each Watershed Management Area that choose to implement this option to perform the analysis individually, or pool their resources for the analysis collectively.~~

~~The San Diego Water Board does not expect the analysis to be a "guarantee" that the water quality improvement strategies will achieve the numeric goals within the established schedules. The analysis, however, must "reasonably" and "quantitatively" demonstrate that the implementation of the water quality improvement strategies can achieve the numeric goals within the established schedules. However, as more data and information are collected to demonstrate progress toward achieving the numeric goals, the numeric goals, water quality improvement strategies and schedules may need to be updated. When these updates occur, the Copermittees that choose to utilize this option must also update the analysis.~~

~~Thus, the third component is the key component that will allow a Copermittee to demonstrate the implementation of the water quality improvement strategies within its jurisdiction is making progress toward achieving the numeric goals. Each Copermittee must specify the monitoring and assessments that will be performed to confirm the implementation of the water quality improvement strategies are making progress toward achieving the numeric goals within the established schedules.~~

~~These three components must then be reviewed by the Water Quality Improvement~~

~~Consultation Panel. The Water Quality Improvement Consultation Panel is required to be formed as part of the public participation process for the development of the Water Quality Improvement Plans. The Water Quality Improvement Consultation Panel is described under Provision F.1.a.(1)(b). Review by the Water Quality Improvement Consultation Panel has been included to provide an additional layer of input, support, and accountability for the implementation of this option.~~

~~Compliance with the requirements of Provisions A.1.a, A.1.c and A.2.a begins when the Water Quality Improvement Plan, incorporating the requirements of Provision B.3.c.(1), is accepted by the San Diego Water Board. Each Copermittee that chooses to implement and continues to implement this option will be in compliance with the requirements of Provisions A.1.a, A.1.c and A.2.a as long as the San Diego Water Board continues to accept the analysis, and subsequent updates, and the Copermittee continues to implement the strategies, monitoring and assessments as incorporated in the Water Quality Improvement Plan in accordance with Provision B.3.c.(1).~~

3) Attachment F, Under the Fact Sheet discussion of Provision D.2

Until the wet weather MS4 outfall discharge monitoring requirements of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board, the Copermittees must comply with the requirements of transitional wet weather MS4 outfall monitoring requirements pursuant to Provision D.2.a.(3). Provision D.2.a.(3) requires each Copermittee to sample, at least five of the major MS4 outfalls inventoried pursuant to Provision D.2.a.(1) ~~twice~~ once per wet season for the monitoring data required to be collected pursuant to Provision D.2.a.(3)(c)-(e).

4) Attachment F, Under the Fact Sheet discussion of Provision E.3

The 85th percentile storm event is the event that has a precipitation total greater than or equal to 85 percent of all storm events over a given period of record in a specific area or location. For example, to determine what the 85th percentile storm event is in a specific location, all 24 hour storms that have recorded values over a 30 year period would be tabulated and a 85th percentile storm would be determined from this record (i.e., 15 percent of the storms would be greater than the number determined to be the 85th percentile storm). Most jurisdictions in the San Diego Region have already developed isopluvial maps that can provide this type of information. The 85th percentile storm might be determined to be a number such as 1.0 inch, and this would be multiplied by the total area of the project footprint producing runoff to calculate the design capture volume. The Priority Development Project designer would then select a system of BMPs that would retain (i.e. intercept, store, infiltrate, evaporate, or evapotranspire) ~~100 percent of~~ the pollutants contained in the design capture volume onsite.

Retention BMPs are necessary to capture and retain pollutants generated from a Priority Development Project. In a recent study performed by SCCWRP in the Los Angeles Region, they found "*that the magnitude of constituent load associated with storm water runoff depends, at least in part, on the amount of time available for pollutant build-up on land surfaces. The extended dry period that typically occurs in arid climates such as southern California maximizes the time for constituents to build-up on land surfaces, resulting in proportionally higher concentrations and loads during initial storms of the season*."[2] This implies that the "first flush" of a rainy season and the first storm events after long antecedent dry periods tend to have the highest pollutant loads. Capturing and retaining the pollutant loads of the "first flush" of a rainy season and the first storm events after long antecedent dry periods will reduce a significant portion of the pollutants in storm water discharged to and from the MS4.

The San Diego Water Board, however, acknowledges that in some situations retention of the full design capture volume onsite may not be technically feasible. In this event, the Copermittee may allow the Priority Development Project to utilize biofiltration BMPs to treat 1.5 times the design capture volume not reliably retained onsite, or biofiltration BMPs with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite ~~flow-thru treatment control BMPs to achieve the equivalent pollutant load removal that would have been achieved if the design capture volume were fully retained onsite, pursuant to Provision E.3.c.(1)(b). Biofiltration LID BMPs must be considered as a first option before other types of flow-thru treatment control BMPs may be considered because of the ancillary benefits they provide, such as reduction in flow rates and creation of habitat. In any event, no matter what types of BMPs (or combination of BMPs) are chosen, 100 percent of the pollutants contained in the design capture volume must not be allowed to be discharged from the Priority Development Project~~.

The 1.5 multiplier is based on the finding in the Ventura County Technical Guidance Manual that biofiltration of 1.5 times the design capture volume not retained onsite will provide approximately the same pollutant removal as retention of the design capture volume on an annual basis.[3] This standard is consistent with the Los Angeles Water Board's Los Angeles and Ventura County municipal storm water permits (Order Nos. R4-2012-0175 and R4-2010-0108, respectively). The flow-thru design of 0.75 times the portion of the design capture volume not reliably retained onsite is consistent with the San Diego Water Board's Orange County and Riverside County municipal storm water permits (Order Nos. R9-2009-0002 and R9-2010-0016, respectively).

[2] Stein, E.D., Tiefenthaler, L.L., and Schiff, K.C., 2007. Technical Report 510, Sources, Patterns and Mechanisms of Storm Water Pollutant Loading from Watershed and Land Uses of the Greater Los Angeles Area, California, USA. March 20, 2007.
[3] Ventura Countywide Stormwater Management Program. 2011. Ventura Technical Guidance Manual, Manual Update, 2011.

The San Diego Water Board further recognizes that, in addition to not being technically feasible, retention of the full design capture storm onsite may be cost prohibitive, or may not provide as much water quality benefit to the Watershed Management Area as would implementing BMPs elsewhere in the watershed. Thus, Provision ~~E.3.c.(1)(c)~~ E.3.c.(1)(b) allows for the use of a combination of onsite retention BMPs, and the implementation of an Alternative Compliance Program described in Provision E.3.c.(3). Provision E.3.c.(3) is discussed in more detail below.

If the full design capture volume is not retained onsite either because biofiltration is not technically feasible, or a Copermittee grants a Priority Development Project permission to utilize the Alternative Compliance Program, then the pollutants in the portion of the design capture volume that are not reliably retained onsite must still be reduced to the MEP. Thus, flow-thru treatment control BMPs are required to be implemented on Priority Development Projects in addition to the retention BMPs. The requirements of Provisions ~~E.3.c.(1)(d)~~ E.3.c.(1)(a)(i)[a]-[c] include the performance standards for flow-thru treatment control BMPs, consistent with the Fourth Term Permits in the San Diego Region.

5) Attachment F, Under the Fact Sheet discussion of Provision F.1

The San Diego Water Board recognizes that the development of multiple Water Quality Improvement Plans concurrently may limit the ability of the public to review and provide comments to the Copermittees. Thus, Provision F.1.a.(1)(c) requires the Copermittees to coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public ~~as much~~ time and opportunity ~~as possible~~ to participate during the development of the Water Quality Improvement Plans.

6) Attachment F, Under the Fact Sheet discussion of Provision F.3

Provision F.3.b.(2) includes the transitional annual reporting requirements for the transitional monitoring and assessment program for each Watershed Management Area. The Copermittees in the Watershed Management Area are required to submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted. The Transitional Monitoring and Assessment Program Annual Report is required to include the transitional period monitoring data collected pursuant to Provisions D.1.a and D.2.a, and the findings from the transitional period findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
San Diego Region

Errata Sheet
(OPTION 2)
Tentative Order No. R9-2013-0001
NPDES No. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The following changes to the revised version of Tentative Order No. R9-2013-0001, released March 27, 2013, are based on the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) Public Hearing testimony presented during Agenda Item No. 8 at the April 10 and 11, 2013 San Diego Water Board Meeting. The changes to the Tentative Order listed below are shown in underline/strikeout format to indicate added and removed language, respectively.

FINDINGS Errata

1) Discharge Characteristics and Runoff Management Findings

Add the following finding after Finding 17, and renumber the subsequent findings appropriately:

18. Water Quality Improvements. Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges to the MS4s and control pollutants in storm water discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the Clean Water Act.

PROVISION A Errata

1) Provision A.4.a.(4)

(4) Within 90 days of the San Diego Water Board determination that the ~~update~~ modifications to the Water Quality Improvement Plan required under Provision A.4.a.(3) meet the requirements of this Order, the applicable Copermittees must

revise the jurisdictional runoff management program documents to incorporate the ~~updated~~ modified water quality improvement strategies that have been and will be implemented, the implementation schedule, and any additional monitoring required; and

PROVISION B Errata

1) Provision B Introductory Paragraph

The purpose of this provision is to develop Water Quality Improvement Plans that guide the Copermittees' jurisdictional runoff management programs towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plans is to further the Clean Water Act's objective to protect, preserve, ~~and~~ enhance, and restore the water quality and designated beneficial uses of waters of the state. This goal will be accomplished through an adaptive planning and management process that identifies the highest priority water quality conditions within a watershed and implements strategies through the jurisdictional runoff management programs to achieve improvements in the quality of discharges from the MS4s and receiving waters.

2) Provision B.3.b.(4)(b)

(b) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify and compile a list of candidate projects that could potentially be used as alternative compliance options for Priority Development Projects, to be implemented in lieu of onsite structural BMP performance requirements described in Provisions E.3.c.(1) and E.3.c.(2). Specifically, the Copermittees must identify opportunities to be included in the list for candidate projects in each Watershed Management Area, such as:

(i) ~~Opportunities for s~~Stream or riparian area rehabilitation;

(ii) ~~Opportunities for r~~Retrofitting existing infrastructure to incorporate storm water retention or treatment;

(iii) ~~Opportunities for r~~Regional BMPs;

(iv) ~~Opportunities for g~~Groundwater recharge projects;

(v) ~~Opportunities for w~~Water supply augmentation projects; and

(vi) ~~Opportunities for l~~Land purchases to preserve floodplain functions.

3) Provision B.3.c

Revise references to "Provisions A.1.a, A.1.c and A.2.a" to "Provisions A.1.a, A.1.c, A.1.d, A.2.a and A.2.b~~a~~" throughout the requirements of the Provision B.3.c.

4) Provision B.3.c.(1)(d)

(d) The numeric goals proposed pursuant to Provision B.3.c.(1)(a), the analysis performed pursuant to Provision B.3.c.(1)(b) and the specific monitoring and assessments proposed pursuant to Provision B.3.c.(1)(c) have been reviewed ~~and receive concurrence~~ by ~~a majority of~~ the Water Quality Improvement Consultation Panel (see Provision F.1.a.(1)(b)) for any recommendations. Updates must ~~also receive concurrence~~ be reviewed by ~~a majority of~~ the Water Quality Improvement Consultation Panel for any recommendations.

5) Provision B.3.c.(3)(a)

(a) The results of the analysis performed pursuant to Provision B.3.c.(1)(d) is accepted ~~and continues to be accepted~~ by the San Diego Water Board Executive Officer as part of the Water Quality Improvement Plan and as part of subsequent updates to the Water Quality Improvement Plan; AND

6) Provision B.3.c.(3)(d)

(d) The Copermittee~~s in the Watershed Management Area~~ continues to implement the requirements of Provision A.4.a.

PROVISION D Errata

1) Provision D.2.a.(3)(b)

(b) Transitional Wet Weather MS4 Outfall Discharge Monitoring Frequency

Each wet weather MS4 outfall discharge monitoring station selected pursuant to Provision D.2.a.(3)(a) must be monitored ~~twice~~ once during the wet season (October 1 – April 30). The wet weather monitoring events must be selected to be representative of the range of hydrological conditions experienced in the region. At least 10 percent of samples must be conducted during the first wet weather event of the wet season, to include at least one such sample in each Watershed Management Area.~~.~~

2) Provision D.3.d

(d) Special studies initiated prior to the effective date of this Order that meet the requirements of Provision D.3.b and are implemented during the term of this Order as part of the Water Quality Improvement Plan may be utilized to fulfill the special study requirements of Provision D.3.a. Special studies completed before the effective date of this Order ~~Water Quality Improvement Plan is accepted by the San Diego Water Board~~ cannot be utilized to fulfill the special study requirements of Provision D.3.a.

3) Provision D.4.b.(2)(b)(i)[d]

[d] The percent contribution of storm water volumes and pollutant loads discharged from each land use type within ~~the~~ each hydrologic subarea with a major MS4 outfall to receiving waters or within each major MS4 outfall to receiving waters ~~drainage basin to each of~~ in the Copermittee's ~~major MS4 outfalls in its~~ jurisdiction ~~to receiving waters~~ within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch.

PROVISION E Errata

1) Provision E.3.b.(1)

(1) Definition of Priority Development Project

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site)~~, or redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site)~~. This ~~category~~ includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(b) Redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site on an existing site of 10,000 square feet or more of impervious surfaces). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

~~(b)~~
(c) New or redevelopment projects that create 5,000 square feet or more of impervious surface (collectively over the entire project site), and support one or more of the following uses:

2) Provision E.3.c.(1)

(a) Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite ~~100 percent of~~ the pollutants contained in the volume of storm water runoff produced from a 24-hour 85th percentile storm event (design capture volume)~~;~~.

~~(b)~~ (i) If a Copermittee determines that implementing BMPs to retain the full design capture volume onsite for a Priority Development Project is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize ~~flow-thru treatment control~~ biofiltration BMPs. Biofiltration BMPs must be sized and designed to: ~~achieve the equivalent~~

~~pollutant load removal described in Provision E.3.c.(1)(a). Biofiltration LID BMPs must be considered as a first option before other types of flow-thru treatment control BMPs may be considered.~~

[a] Treat 1.5 times the design capture volume not reliably retained onsite; OR

[b] Treat the design capture volume not reliably retained onsite with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite.

[c] Have an appropriate loading rate to prevent erosion, scour, and channeling within the BMP.

(ii) If a Copermittee determines that biofiltration is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize flow-thru treatment control BMPs to treat runoff leaving the site, AND mitigate for the design capture volume not reliably retained onsite pursuant to Provision E.3.(c)(1)(b). Flow thru treatment control BMPs must be sized and designed to:

[a] Remove pollutants from storm water to the MEP;

[b] Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;

[c] Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Flow-thru treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of flow-thru treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

~~(c)~~

(b) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1)(a). The Priority Development Project must mitigate for the portion of the pollutant load in the design capture volume not retained onsite if Provision E.3.(c)(3) is utilized. If a Priority Development Project is allowed to utilize alternative compliance, flow-thru treatment control BMPs must be implemented to treat the portion of the design capture volume that is not reliably retained onsite. Flow-thru treatment control BMPs must be sized and designed in accordance with Provision E.3.c.(1)(a)(ii)[a]-[c].

~~(d) If a Priority Development project is allowed to utilize alternative compliance, flow-thru treatment control BMPs must be implemented to treat the portion of the design capture volume that is not retained onsite. Flow-thru treatment control BMPs must be sized and designed to:~~

~~(i) Remove pollutants from storm water to the MEP;~~

~~(ii) Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;~~

~~(iii) Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Flow-thru treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of flow-thru treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.~~

3) Provision E.3.c.(2)(b)

(b) Each Priority Development Project must avoid ~~known~~ critical sediment yield areas known to the Copermittee or identified by the Watershed Management Area Analysis pursuant to Provision B.3.b.(4), or implement measures that allow critical coarse sediment to be discharged to receiving waters, such that there is no net impact to the receiving water ~~sediment supply is unaffected by the project~~.

4) Provision E.3.c.(3)(a)(ix)

~~(ix) Receiving waters must not be utilized to convey untreated storm water runoff from the Priority Development Project to the candidate project;~~

5) Provision E.3.c.(3)(b)

(b) Retrofitting or redevelopment of existing paved alleys, streets or roads that are designed and constructed in accordance with the USEPA Green Streets guidance.

6) Provision E.3.e.(1)(a)

(a) Each Copermittee must require and confirm that for all Priority Development Project applications that have not received prior lawful approval by the Copermittee by the time the BMP Design Manual is updated pursuant to Provision E.3.d ~~18 months after the commencement of coverage under this~~

~~Order~~, the requirements of Provision E.3 are implemented. For project applications that have received prior lawful approval ~~by 18 months after~~ before the BMP Design Manual is updated pursuant to Provision E.3.d ~~commencement of coverage under this Order~~, the Copermittee may allow previous land development requirements to apply.

PROVISION F Errata

1) Provisions F.1 and F.2

Delete the terms "~~certification~~" and "~~notification of concurrence~~" and replace with "notification of acceptance" throughout Provisions F.1 and F.2.

2) Provision F.1.a.(1)(c)

(c) The Copermittees must coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public ~~as much~~ time and opportunity ~~as possible~~ to participate during the development of the Water Quality Improvement Plans.

3) Provision F.1.b.(7)

(7) During implementation of the Water Quality Improvement Plan ~~after implementation~~ the Copermittees must correct any deficiencies in the Plan identified by the San Diego Water Board ~~no later than 90 days~~ in the updates submitted with the Water Quality Improvement Plan Annual Report following a request by the Board to do so.

4) Provision F.2.a.(2)

(2) Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E ~~no later than 3 months after San Diego Water Board notification of concurrence with~~ concurrent with the submittal of the Water Quality Improvement Plan. Each Copermittee must correct any deficiencies in the jurisdictional runoff management program document based on comments received from the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report.

5) Provision F.2.b.(1)

(1) Each Copermittee must update its BMP Design Manual to incorporate the requirements of Provisions E.3.a-d ~~no later than 3 months after San Diego Water Board notification of concurrence with~~ concurrent with the submittal of the Water Quality Improvement Plan ~~by the San Diego Water Board Executive Officer~~. Each Copermittee must correct any deficiencies in the BMP Design Manual based on comments received from the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report.

6) Provision F.3.b.(2)

(2) Transitional Monitoring and Assessment Program Annual Reports

The Copermittees for each Watershed Management Area must submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted under this Order. The Transitional Monitoring and Assessment Program Annual Reports must include:

ATTACHMENT E Errata

1) Attachment E, Specific Provision 1.b.(3)(a)-(c)

Delete "~~Copermittees'~~" and replace with "Copermittee's"

2) Attachment E, Specific Provision 1.d

Add the following after Specific Provision 1.d.(2):

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 1.b.(2)(b), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

3) Attachment E, Specific Provision 2.b.(2)(b), Table 2.2

Table 2.2
Final Effluent Limitations as Expressed as Annual Loads in MS4 Discharges to Shelter Island Yacht Basin

Constituent	Effluent Limitation
Dissolved Copper	30 g/yr*

* If the water quality objectives for dissolved copper in Shelter Island Yacht Basin are changed in the future, then the margin of safety (MOS), TMDL and allocations will be recalculated using the *Method for Recalculation of the Total Maximum Daily Load for Dissolved Copper in the Shelter Island Yacht Basin, San Diego Bay* in the Basin Plan (pp. 7-14).

4) Attachment E, Specific Provision 3.d

Add the following after Specific Provision 3.d.(2):

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 3.b.(2)(b)(i), dry and wet weather discharge

concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

5) Attachment E, Specific Provision 4.b.(3)(a)-(c)

Delete "~~Copermittees'~~" and replace with "Copermittee's"

6) Attachment E, Specific Provision 4.c.(2)(a)-(d)

Delete "~~Copermittees'~~" and replace with "Copermittee's"

7) Attachment E, Specific Provision 4.d

Add the following after Specific Provision 4.d.(2):

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 4.b.(2)(b), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

8) Attachment E, Specific Provision 5.b.(3)(a)-(c)

Delete "~~Copermittees'~~" and replace with "Copermittee's"

9) Attachment E, Specific Provision 5.c.(1)(b)(i)-(iii)

Delete "~~Copermittees'~~" and replace with "Copermittee's"

10) Attachment E, Specific Provision 5.d.(3)

Add the following after Specific Provision 5.d.(3)(a) and renumber subsequent provisions appropriately:

(b) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 5.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

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11) Attachment E, Specific Provision 6.b.(2)(a), Table 6.2a

Table 6.2a
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Beaches

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform	10,000	22% ~~/ 0%~~	1,000	0%
Fecal Coliform	400	22% ~~/ 0%~~	200	0%
Enterococcus	104	22% ~~/ 0%~~	35	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. ~~The 0% single sample maximum allowable exceedance frequency applies to dry weather days.~~ For dry weather days the single sample allowable exceedance frequency must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan.

12) Attachment E, Specific Provision 6.b.(2)(a), Table 6.2b

Table 6.2b
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Creeks

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Fecal Coliform	400	22% ~~/ 0%~~	200	0%
Enterococcus	61 (104)	22% ~~/ 0%~~	33	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. ~~The 0% single sample maximum allowable exceedance frequency applies to dry weather days.~~ For dry weather days the single sample allowable exceedance frequency must be consistent with the single sample maximum REC-1 water quality objectives in the Basin Plan.
d. A single sample maximum of 104 MPN/100ml for *Enterococcus* may be applied as a receiving water limitation for creeks, instead of 61~~0~~ MPN/100mL, if one or more of the creeks addressed by these TMDLs (San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek, San Diego River, and/or Chollas Creek) is designated with a "moderately to lightly used area" or less frequent usage frequency in the Basin Plan. Otherwise, the single sample max~~m~~imum of 61 MPN/100mL for *Enterococcus* must be used to assess compliance with the allowable exceedance frequency.

13) Attachment E, Specific Provision 6.b.(2)(b), Table 6.2

Table 6.2c
Final Effluent Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies in MS4 Discharges to the Water Body

Constituent	Concentration-Based Effluent Limitations			
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform[d]	10,000	22% ~~/ 0%~~	1,000	0%
Fecal Coliform	400	22% ~~/ 0%~~	200	0%
Enterococcus	104[e] / 61[f]	22% ~~/ 0%~~	35[e] / 33[f]	0%

Notes:
a. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. ~~The 0% single sample maximum allowable exceedance frequency applies to dry weather days.~~ For dry weather days the single sample allowable exceedance frequency must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan for discharges to beaches, and the Basin Plan for discharges to creeks and creek mouths.
d. Total coliform effluent limitations only apply to MS4 outfalls that discharge to the Pacific Ocean Shorelines and creek mouths listed in Table 6.0.
e. This *Enterococcus* effluent limitation applies to MS4 discharges to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
f. This *Enterococcus* effluent limitation applies to MS4 discharges to segments or areas of creeks or creek mouths listed in Table 6.0.

14) Attachment E, Specific Provision 6.b.(3)(a)-(c)

Delete "~~Copermittees'~~" and replace with "Copermittee's"

15) Attachment E, Specific Provision 6.c.(3)(a)-(c)

Delete "~~Copermittees'~~" and replace with "Copermittee's"

16) Attachment E, Specific Provision 6.d.(1)(b)

Add the following after Specific Provision 6.d.(1)(b)(iii):

(iv) For Pacific Ocean Shoreline segments or areas listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

17) Attachment E, Specific Provision 6.d.(1)(c)

Add the following after Specific Provision 6.d.(1)(c)(iii) and renumber subsequent provisions appropriately:

(iv) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

18) Attachment E, Specific Provision 6.d.(1)(c)(iii)[c]

[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria density~~y~~ies ~~result~~ reported from ~~wet weather samples collected~~ each of the storm events sampled; and

19) Attachment E, Specific Provision 6.d.(2)(b)

Add the following after Specific Provision 6.d.(2)(b)(iii):

(iv) For creeks or creek mouths listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

20) Attachment E, Specific Provision 6.d.(2)(c)

Add the following after Specific Provision 6.d.(2)(c)(iv) and renumber subsequent provisions appropriately:

(v) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

21) Attachment E, Specific Provision 6.d.(2)(c)(iii)[c]

[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average

of the highest bacteria density~~y~~ies ~~result~~ reported from ~~wet weather samples collected~~ each of the storm events sampled; and

ATTACHMENT F Errata

1) Attachment F, Under the Fact Sheet discussion of Provision B

Purpose: Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges to the MS4s and control pollutants in storm water discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the Clean Water Act.

Provision B includes requirements for the Copermittees to develop and implement Water Quality Improvement Plans to ultimately comply with the prohibitions and limitations under Provision A. The Water Quality Improvement Plans will provide the Copermittees a comprehensive program that can achieve the requirements and further the objectives of the CWA. Implementation of the Water Quality Improvement Plans will also improve the quality of the receiving waters in the San Diego Region.

2) Attachment F, Under the Fact Sheet discussion of Provision D.2

Until the wet weather MS4 outfall discharge monitoring requirements of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board, the Copermittees must comply with the requirements of transitional wet weather MS4 outfall monitoring requirements pursuant to Provision D.2.a.(3). Provision D.2.a.(3) requires each Copermittee to sample, at least five of the major MS4 outfalls inventoried pursuant to Provision D.2.a.(1) ~~twice~~ once per wet season for the monitoring data required to be collected pursuant to Provision D.2.a.(3)(c)-(e).

3) Attachment F, Under the Fact Sheet discussion of Provision E.3

The 85th percentile storm event is the event that has a precipitation total greater than or equal to 85 percent of all storm events over a given period of record in a specific area or location. For example, to determine what the 85th percentile storm event is in a specific location, all 24 hour storms that have recorded values over a 30 year period would be tabulated and a 85th percentile storm would be determined from this record (i.e., 15 percent of the storms would be greater than the number determined to be the 85th percentile storm). Most jurisdictions in the San Diego Region have

already developed isopluvial maps that can provide this type of information. The 85th percentile storm might be determined to be a number such as 1.0 inch, and this would be multiplied by the total area of the project footprint producing runoff to calculate the design capture volume. The Priority Development Project designer would then select a system of BMPs that would retain (i.e. intercept, store, infiltrate, evaporate, or evapotranspire) ~~100 percent of~~ the pollutants contained in the design capture volume onsite.

Retention BMPs are necessary to capture and retain pollutants generated from a Priority Development Project. In a recent study performed by SCCWRP in the Los Angeles Region, they found "*that the magnitude of constituent load associated with storm water runoff depends, at least in part, on the amount of time available for pollutant build-up on land surfaces. The extended dry period that typically occurs in arid climates such as southern California maximizes the time for constituents to build-up on land surfaces, resulting in proportionally higher concentrations and loads during initial storms of the season*."[1] This implies that the "first flush" of a rainy season and the first storm events after long antecedent dry periods tend to have the highest pollutant loads. Capturing and retaining the pollutant loads of the "first flush" of a rainy season and the first storm events after long antecedent dry periods will reduce a significant portion of the pollutants in storm water discharged to and from the MS4.

The San Diego Water Board, however, acknowledges that in some situations retention of the full design capture volume onsite may not be technically feasible. In this event, the Copermittee may allow the Priority Development Project to utilize biofiltration BMPs to treat 1.5 times the design capture volume not reliably retained onsite, or biofiltration BMPs with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite ~~flow-thru treatment control BMPs to achieve the equivalent pollutant load removal that would have been achieved if the design capture volume were fully retained onsite, pursuant to Provision E.3.c.(1)(b). Biofiltration LID BMPs must be considered as a first option before other types of flow-thru treatment control BMPs may be considered because of the ancillary benefits they provide, such as reduction in flow rates and creation of habitat. In any event, no matter what types of BMPs (or combination of BMPs) are chosen, 100 percent of the pollutants contained in the design capture volume must not be allowed to be discharged from the Priority Development Project~~.

The 1.5 multiplier is based on the finding in the Ventura County Technical Guidance Manual that biofiltration of 1.5 times the design capture volume not retained onsite will provide approximately the same pollutant removal as retention of the design

[1] Stein, E.D., Tiefenthaler, L.L., and Schiff, K.C., 2007. Technical Report 510, Sources, Patterns and Mechanisms of Storm Water Pollutant Loading from Watershed and Land Uses of the Greater Los Angeles Area, California, USA. March 20, 2007.

capture volume on an annual basis.[2] This standard is consistent with the Los Angeles Water Board's Los Angeles and Ventura County municipal storm water permits (Order Nos. R4-2012-0175 and R4-2010-0108, respectively). The flow-thru design of 0.75 times the portion of the design capture volume not reliably retained onsite is consistent with the San Diego Water Board's Orange County and Riverside County municipal storm water permits (Order Nos. R9-2009-0002 and R9-2010-0016, respectively).

The San Diego Water Board further recognizes that, in addition to not being technically feasible, retention of the full design capture storm onsite may be cost prohibitive, or may not provide as much water quality benefit to the Watershed Management Area as would implementing BMPs elsewhere in the watershed. Thus, Provision ~~E.3.c.(1)(c)~~ E.3.c.(1)(b) allows for the use of a combination of onsite retention BMPs, and the implementation of an Alternative Compliance Program described in Provision E.3.c.(3). Provision E.3.c.(3) is discussed in more detail below.

If the full design capture volume is not retained onsite either because biofiltration is not technically feasible, or a Copermittee grants a Priority Development Project permission to utilize the Alternative Compliance Program, then the pollutants in the portion of the design capture volume that are not reliably retained onsite must still be reduced to the MEP. Thus, flow-thru treatment control BMPs are required to be implemented on Priority Development Projects in addition to the retention BMPs. The requirements of Provisions ~~E.3.c.(1)(d)~~ E.3.c.(1)(a)(i)[a]-[c] include the performance standards for flow-thru treatment control BMPs, consistent with the Fourth Term Permits in the San Diego Region.

4) Attachment F, Under the Fact Sheet discussion of Provision F.1

The San Diego Water Board recognizes that the development of multiple Water Quality Improvement Plans concurrently may limit the ability of the public to review and provide comments to the Copermittees. Thus, Provision F.1.a.(1)(c) requires the Copermittees to coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public ~~as much~~ time and opportunity ~~as possible~~ to participate during the development of the Water Quality Improvement Plans.

5) Attachment F, Under the Fact Sheet discussion of Provision F.3

Provision F.3.b.(2) includes the transitional annual reporting requirements for the transitional monitoring and assessment program for each Watershed Management Area. The Copermittees in the Watershed Management Area are required to submit a Transitional Monitoring and Assessment Program Annual Report no later than

2 Ventura Countywide Stormwater Management Program. 2011. Ventura Technical Guidance Manual, Manual Update, 2011.

January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted. The Transitional Monitoring and Assessment Program Annual Report is required to include the transitional period monitoring data collected pursuant to Provisions D.1.a and D.2.a, and the findings from the transitional period findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

TENTATIVE
ORDER NO. R9-2013-0001
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The San Diego County Copermittees in Table 1a are subject to waste discharge requirements set forth in this Order.

Table 1a. San Diego County Copermittees

City of Carlsbad	City of Oceanside
City of Chula Vista	City of Poway
City of Coronado	City of San Diego
City of Del Mar	City of San Marcos
City of El Cajon	City of Santee
City of Encinitas	City of Solana Beach
City of Escondido	City of Vista
City of Imperial Beach	County of San Diego
City of La Mesa	San Diego County Regional Airport Authority
City of Lemon Grove	San Diego Unified Port District
City of National City	

After the San Diego Water Board receives and considers the Orange County Copermittees' Report of Waste Discharge and makes any necessary changes to this Order, the Orange County Copermittees in Table 1b will become subject to waste discharge requirements set forth in this Order after expiration of Order No. R9-2009-0002, NPDES No. CAS0108740 on or after December 16, 2014.

Table 1b. Orange County Copermittees

City of Aliso Viejo	City of Rancho Santa Margarita
City of Dana Point	City of San Clemente
City of Laguna Beach	City of San Juan Capistrano
City of Laguna Hills	City of Laguna Woods
City of Laguna Niguel	County of Orange
City of Lake Forest	Orange County Flood Control District
City of Mission Viejo	

After the San Diego Water Board receives and considers the Riverside County Copermittees' Report of Waste Discharge and makes any necessary changes to this Order, the Riverside County Copermittees in Table 1c will become subject to waste discharge requirements set forth in this Order after expiration of Order No. R9-2010-0016, NPDES No. CAS0108766 on or after November 10, 2015.

Table 1c. Riverside County Copermittees

City of Murrieta	County of Riverside
City of Temecula	Riverside County Flood Control and Water Conservation District
City of Wildomar	

The Orange County Copermittees and Riverside County Copermittees may become subject to the requirements of this Order at a date earlier than the expiration date of their current Orders subject to the conditions described in Provision F.6 of this Order if the Copermittees in the respective county receive a notification of coverage from the San Diego Water Board.

The term Copermittee in this Order refers to any San Diego County, Orange County, or Riverside County Copermittee covered under this Order, unless specified otherwise.

This Order provides permit coverage for the Copermittee discharges described in Table 2.

Table 2. Discharge Locations and Receiving Waters

Discharge Points	Locations throughout San Diego Region
Discharge Description	Municipal Separate Storm Sewer System (MS4) Discharges
Receiving Waters	Inland Surface Waters, Enclosed Bays and Estuaries, and Coastal Ocean Waters of the San Diego Region

Table 3. Administrative Information

This Order was adopted by the San Diego Water Board on:	**Month Day, 2013**
This Order will become effective on:	**Month Day, 2013**
This Order will expire on:	**Month Day, 2018**
The Copermittees must file a Report of Waste Discharge in accordance with Title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than 180 days in advance of the Order expiration date.	

I, David W. Gibson, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on Month Day, 2013.

TENTATIVE

David W. Gibson
Executive Officer

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Attachment F - Fact Sheet / Technical Report for Order No. R9-2013-0001 ..... F-1

I. FINDINGS

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), finds that:

JURISDICTION

1. **MS4 Ownership or Operation.** Each of the Copermittees owns or operates an MS4, through which it discharges storm water and non-storm water into waters of the U.S. within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the U.S.

2. **Legal and Regulatory Authority.** This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]) adopted by the United States Environmental Protection Agency (USEPA), and chapter 5.5, division 7 of the California Water Code (CWC) (commencing with section 13370). This Order serves as an NPDES permit for discharges from MS4s to surface waters. This Order also serves as waste discharge requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

   The San Diego Water Board has the legal authority to issue a regional MS4 permit pursuant to its authority under CWA section 402(p)(3)(B) and 40 CFR 122.26(a)(1)(v). The USEPA also made it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide permits (55 Federal Register [FR] 47990, 48039-48042). The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees and San Diego Water Board.

   The federal regulations make it clear that the Copermittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators (40 CFR 122.26(a)(3)(vi)). This Order does not require the Copermittees to manage storm water outside of their jurisdictional boundaries, but rather to work collectively to improve storm water management within watersheds.

3. **CWA NPDES Permit Conditions.** Pursuant to CWA section 402(p)(3)(B), NPDES permits for storm water discharges from MS4s must include requirements to effectively prohibit non-storm water discharges into MS4s, and require controls to reduce the discharge of pollutants in storm water to the maximum extent practicable (MEP), and to require other provisions as the San Diego Water Board determines are appropriate to control such pollutants. This Order prescribes conditions to assure compliance with the CWA requirements for owners and operators of MS4s to

effectively prohibit non-storm water discharges into the MS4s, and require controls to reduce the discharge of pollutants in storm water from the MS4s to the MEP.

4. **CWA and CWC Monitoring Requirements.** CWA section 308(a) and 40 CFR 122.41(h),(j)-(l) and 122.48 require that NPDES permits must specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s also specify additional monitoring and reporting requirements in 40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c). CWC section 13383 authorizes the San Diego Water Board to establish monitoring, inspection, entry, reporting and recordkeeping requirements. This Order establishes monitoring and reporting requirements to implement federal and State requirements.

5. **Total Maximum Daily Loads.** CWA section 303(d)(1)(A) requires that "[e]ach state shall identify those waters within its boundaries for which the effluent limitations…are not stringent enough to implement any water quality standard applicable to such waters." The CWA also requires states to establish a priority ranking of impaired water bodies known as Water Quality Limited Segments and to establish Total Maximum Daily Loads (TMDLs) for such waters. This priority list of impaired water bodies is called the Clean Water Act Section 303(d) List of Water Quality Limited Segments, commonly referred to as the 303(d) List. The CWA requires the 303(d) List to be updated every two years.

   TMDLs are numerical calculations of the maximum amount of a pollutant that a water body can assimilate and still meet water quality standards. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point sources (waste load allocations or WLAs) and non-point sources (load allocations or LAs), background contribution, plus a margin of safety. Discharges from MS4s are point source discharges. The federal regulations (40 CFR 122.44(d)(1)(vii)(B)) require that NPDES permits incorporate water quality based effluent limitations (WQBELs) developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, consistent with the assumptions and requirements of any available WLA for the discharge. Requirements of this Order implement the TMDLs adopted by the San Diego Water Board and approved by USEPA as of the time this Order is issued. This Order establishes WQBELs consistent with the assumptions and requirements of all available TMDL WLAs assigned to discharges from the Copermittees' MS4s.

6. **Non-Storm Water Discharges.** Pursuant to CWA section 402(p)(3)(B)(ii), this Order requires each Copermittee to effectively prohibit discharges of non-storm water into its MS4. Nevertheless, non-storm water discharges into and from the MS4s continue to be reported to the San Diego Water Board by the Copermittees and other persons. Monitoring conducted by the Copermittees, as well as the 303(d) List, have identified dry weather, non-storm water discharges from the MS4s as a source of pollutants causing or contributing to receiving water quality impairments in the San Diego Region. The federal regulations (40 CFR 122.26(d)(2)(iv)(B)(1)) require the Copermittees to have a program to prevent illicit discharges to the MS4.

The federal regulations, however, allow for specific categories of non-storm water discharges or flows to be addressed as illicit discharges only where such discharges are identified as sources of pollutants to waters of the U.S.

7. **In-Stream Treatment Systems.** Pursuant to federal regulations (40 CFR 131.10(a)), in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S. Authorizing the construction of a runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to accepting waste assimilation as an appropriate use for that water body. Runoff treatment must occur prior to the discharge of runoff into receiving waters. Treatment control best management practices (BMPs) must not be constructed in waters of the U.S. Construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body.

DISCHARGE CHARACTERISTICS AND RUNOFF MANAGEMENT

8. **Point Source Discharges of Pollutants.** Discharges from the MS4s contain waste, as defined in the CWC, and pollutants that adversely affect the quality of the waters of the state. A discharge from an MS4 is a “discharge of pollutants from a point source” into waters of the U.S. as defined in the CWA. Storm water and non-storm water discharges from the MS4s contain pollutants that cause or threaten to cause a violation of surface water quality standards, as outlined in the Water Quality Control Plan for the San Diego Basin (Basin Plan). Storm water and non-storm water discharges from the MS4s are subject to the conditions and requirements established in the Basin Plan for point source discharges.

9. **Potential Beneficial Use Impairment.** The discharge of pollutants and/or increased flows from MS4s may cause or threaten to cause the concentration of pollutants to exceed applicable receiving water quality objectives and impair or threaten to impair designated beneficial uses resulting in a condition of pollution, contamination, or nuisance.

10. **Pollutants Generated by Land Development.** Land development has created and continues to create new sources of non-storm water discharges and pollutants in storm water discharges as human population density increases. This brings higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash. Pollutants from these sources are dumped or washed off the surface by non-storm water or storm water flows into and from the MS4s. When development converts natural vegetated pervious ground cover to impervious surfaces such as paved highways, streets, rooftops, and parking lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving a developed area without BMPs that can maintain pre-development runoff conditions will contain greater pollutant loads and have significantly greater runoff volume, velocity, and peak flow rate than pre-development runoff conditions from the same area.

11. **Runoff Discharges to Receiving Waters.** The MS4s discharge runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within the eleven hydrologic units comprising the San Diego Region. Historic and current development makes use of natural drainage patterns and features as conveyances for runoff. Rivers, streams and creeks in developed areas used in this manner are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and receiving water. Numerous receiving water bodies and water body segments have been designated as impaired by the San Diego Water Board pursuant to CWA section 303(d).

12. **Pollutants in Runoff.** The most common pollutants in runoff discharged from the MS4s include total suspended solids, sediment, pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., cadmium, copper, lead, and zinc), petroleum products and polynuclear aromatic hydrocarbons, synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus), oxygen-demanding substances (e.g., decaying vegetation, animal waste), detergents, and trash. As operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not prohibit or otherwise control. These discharges may cause or contribute to a condition of pollution or a violation of water quality standards.

13. **Human Health and Aquatic Life Impairment.** Pollutants in runoff discharged from the MS4s can threaten and adversely affect human health and aquatic organisms. Adverse responses of organisms to chemicals or physical agents in runoff range from physiological responses such as impaired reproduction or growth anomalies to mortality. Increased volume, velocity, rate, and duration of storm water runoff greatly accelerate the erosion of downstream natural channels. This alters stream channels and habitats and can adversely affect aquatic and terrestrial organisms.

14. **Water Quality Effects.** The Copermittees' water quality monitoring data submitted to date documents persistent exceedances of Basin Plan water quality objectives for runoff-related pollutants at various watershed monitoring stations. Persistent toxicity has also been observed at several watershed monitoring stations. In addition, bioassessment data indicate that the majority of the monitored receiving waters have Poor to Very Poor Index of Biological Integrity (IBI) ratings. These findings indicate that runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in the San Diego Region. Non-storm water discharges from the MS4s have been shown to contribute significant levels of pollutants and flow in arid, developed Southern California watersheds, and contribute significantly to exceedances of applicable receiving water quality objectives.

15. **Non-Storm Water and Storm Water Discharges.** Non-storm water discharges from the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard of CWA section 402(p)(3)(B)(iii), which is explicitly for "Municipal … *Stormwater Discharges* (emphasis added)" from the MS4s. Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s must be effectively prohibited.

16. **Best Management Practices.** Waste and pollutants which are deposited and accumulate in MS4 drainage structures will be discharged from these structures to waters of the U.S. unless they are removed. These discharges may cause or contribute to, or threaten to cause or contribute to, a condition of pollution in receiving waters. For this reason, pollutants in storm water discharges from the MS4s can be and must be effectively reduced in runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Pollution prevention is the reduction or elimination of pollutant generation at its source and is the best "first line of defense". Source control BMPs (both structural and non-structural) minimize the contact between pollutants and runoff, therefore keeping pollutants onsite and out of receiving waters. Treatment control BMPs remove pollutants that have been mobilized by storm water or non-storm water flows.

17. **BMP Implementation.** Runoff needs to be addressed during the three major phases of development (planning, construction, and use) in order to reduce the discharge of storm water pollutants to the MEP, effectively prohibit non-storm water discharges, and protect receiving waters. Development which is not guided by water quality planning policies and principles can result in increased pollutant load discharges, flow rates, and flow durations which can negatively affect receiving water beneficial uses. Construction sites without adequate BMP implementation result in sediment runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. Existing development can generate substantial pollutant loads which are discharged in runoff to receiving waters. Retrofitting areas of existing development with storm water pollutant control and hydromodification management BMPs is necessary to address storm water discharges from existing development that may cause or contribute to a condition of pollution or a violation of water quality standards.

18. **Water Quality Improvements.** Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges to the MS4s and control pollutants in storm water discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the Clean Water Act.

19. **Long Term Planning and Implementation.** Federal regulations require municipal storm water permits to expire 5 years from adoption, after which the permit must be renewed and reissued. The San Diego Water Board recognizes that the degradation of water quality and impacts to beneficial uses of the waters in the San Diego Region occurred over several decades. The San Diego Water Board further recognizes that a decade or more may be necessary to realize demonstrable improvement to the quality of waters in the Region. This Order includes a long term planning and implementation approach that will require more than a single permit term to complete.

WATER QUALITY STANDARDS

20. **Basin Plan.** The San Diego Water Board adopted the Water Quality Control Plan for the San Diego Basin (Basin Plan) on September 8, 1994 that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for receiving waters addressed through the plan. The Basin Plan was subsequently approved by the State Water Resources Control Board (State Water Board) on December 13, 1994. Subsequent revisions to the Basin Plan have also been adopted by the San Diego Water Board and approved by the State Water Board. Requirements of this Order implement the Basin Plan.

The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Process Supply (PROC), Industrial Service Supply (IND), Ground Water Recharge (GWR), Contact Water Recreation (REC1), Non-contact Water Recreation (REC2), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Freshwater Replenishment (FRSH), Hydropower Generation (POW), and Preservation of Biological Habitats of Special Significance (BIOL). The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region: Navigation (NAV), Commercial and Sport Fishing (COMM), Estuarine Habitat (EST), Marine Habitat (MAR), Aquaculture (AQUA), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN), and Shellfish Harvesting (SHELL).

21. **Ocean Plan.** The State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, and 2005. The State Water Board adopted the latest amendment on April 21, 2005 and it became effective on February 14, 2006. The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean. Requirements of this Order implement the Ocean Plan.

The Ocean Plan identifies the following beneficial uses of ocean waters of the state to be protected: Industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture;

preservation and enhancement of designated Areas of Special Biological Significance; rare and endangered species; marine habitat; fish spawning and shellfish harvesting

22. **Sediment Quality Control Plan**. On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes: 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

23. **National Toxics Rule and California Toxics Rule.** USEPA adopted the National Toxics Rule (NTR) on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the NTR applied in California. On May 18, 2000, USEPA adopted the California Toxics Rule (CTR). The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants.

24. **Antidegradation Policy.** This Order is in conformance with the federal Antidegradation Policy described in 40 CFR 131.12, and State Water Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality Waters in California*. Federal regulations at 40 CFR 131.12 require that the State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. State Water Board Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies.

25. **Anti-Backsliding Requirements.** Section 402(o)(2) of the CWA and federal regulations at 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations may be relaxed. All effluent limitations in this Order are at least as stringent as effluent limitations in the previous permits.

CONSIDERATIONS UNDER FEDERAL AND STATE LAW

26. **Coastal Zone Act Reauthorization Amendments.** Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states with approved coastal zone management programs to address non-point source

pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point source pollution: agriculture, silviculture, urban, marinas, and hydromodification. This Order addresses the management measures required for the urban category, with the exception of septic systems. The runoff management programs developed pursuant to this Order fulfills the need for coastal cities to develop a runoff non-point source plan identified in the Non-Point Source Program Strategy and Implementation Plan. The San Diego Water Board addresses septic systems through the administration of other programs.

27. **Endangered Species Act.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 USC sections 1531 to 1544). This Order requires compliance with receiving water limits, and other requirements to protect the beneficial uses of waters of the State. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

28. **Report of Waste Discharge Process.** The waste discharge requirements set forth in this Order are based upon the Report of Waste Discharge submitted by the San Diego County Copermittees prior to the expiration of Order No. R9-2007-0001 (NPDES No. CAS0109266). The Orange County and Riverside County Copermittees are not immediately covered by the waste discharge requirements in this Order. The San Diego Water Board understands that each municipality is unique although the Counties share watersheds and/or geographical boundaries. The Order will continue to use the Report of Waste Discharge process prior to initially making Orange County or Riverside County Copermittees subject to the requirements of this Order.

The federal regulations (40 CFR 122.21(d)(2)) and CWC section 13376 impose a duty on the Copermittees to reapply for continued coverage through submittal of a Report of Waste Discharge no later than 180 days prior to expiration of a currently effective permit. This requirement is set forth in the Orange County Copermittees' and Riverside County Copermittees' currently effective permits at Provisions K.2.b and K.2.c, respectively. The Orange County Permit, Order No. R9-2009-0002 (NPDES No. CAS0108740) expires on December 16, 2014 and the Riverside County MS4 Permit, Order No. R9-2010-0016 (NPDES No. CAS0108766) expires on November 10, 2015.

Unless the Orange County or Riverside County Copermittees apply for and receive early coverage under this Order, the Orange County Copermittees' and the Riverside County Copermittees' respective permits will be superseded by this Order upon expiration of their respective permits, subject to any necessary revisions to the requirements of this Order made after the San Diego Water Board considers their respective Reports of Waste Discharge through the public process provided in 40 CFR Part 124.

29. **Integrated Report and Clean Water Act Section 303(d) List.** The San Diego Water Board and State Water Board submit an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. USEPA issued its *Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act* on July 29, 2005, which advocates the use of a five category approach for classifying the attainment status of water quality standards for water bodies in the Integrated Report. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 in the Integrated Report are placed on the 303(d) List.

    Water bodies with available data and/or information that indicate at least one beneficial use is not being supported or is threatened, but a TMDL is not required, are included in Category 4 in the Integrated Report. Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

    Implementation of the requirements of this Order may allow the San Diego Water Board to include surface waters impaired by discharges from the Copermittees' MS4s in Category 4 in the Integrated Report for consideration during the next 303(d) List submittal by the State to USEPA.

30. **Economic Considerations.** The California Supreme Court has ruled that although CWC section 13263 requires the State and Regional Water Boards (collectively Water Boards) to consider factors set forth in CWC section 13241 when issuing an NPDES permit, the Water Board may not consider the factors to justify imposing pollutant restrictions that are less stringent than the applicable federal regulations require. (*City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 618, 626-627.) However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

    As noted in the following finding, the San Diego Water Board finds that the requirements in this permit are not more stringent than the minimum federal requirements. Therefore, a CWC section 13241 analysis is not required for permit requirements that implement the effective prohibition on the discharge of non-storm water into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determined appropriate to control such pollutants, as those requirements are mandated by federal law. Notwithstanding the above, the San Diego Water Board has developed an economic analysis of the requirements in this Order. The economic analysis is provided in the Fact Sheet.

31. **Unfunded Mandates.** This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following:

   a. This Order implements federally mandated requirements under CWA section 402 (33 USC section 1342(p)(3)(B)).

   b. The local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental and new dischargers who are issued NPDES permits for storm water and non-storm water discharges.

   c. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order.

   d. The Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)) and in lieu of numeric restrictions on their MS4 discharges (i.e. effluent limitations).

   e. The local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under State law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

   f. The provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state develops a TMDL, federal law requires that permits must contain water quality based effluent limitations consistent with the assumptions and requirements of any applicable wasteload allocation (40 CFR 122.44(d)(1)(vii)(B)).

   See the Fact Sheet for further discussion of unfunded mandates.

32. **California Environmental Quality Act.** The issuance of waste discharge requirements and an NPDES permit for the discharge of runoff from MS4s to waters of the U.S. is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 et seq.) in accordance with CWC section 13389.

STATE WATER BOARD DECISIONS

33. **Compliance with Prohibitions and Limitations.** The receiving water limitation language specified in this Order is consistent with language recommended by the USEPA and established in State Water Board Order WQ 99-05, *Own Motion Review of the Petition of Environmental Health Coalition to Review Waste Discharge Requirements Order No. 96-03, NPDES Permit No. CAS0108740*, adopted by the

State Water Board on June 17, 1999. The receiving water limitation language in this Order requires storm water discharges from MS4s to not cause or contribute to a violation of water quality standards, which is to be achieved through an iterative approach requiring the implementation of improved and better-tailored BMPs over time. Implementation of the iterative approach to comply with receiving water limitations based on applicable water quality standards is necessary to ensure that storm water discharges from the MS4 will not ultimately cause or contribute to violations of water quality standards and will not create conditions of pollution, contamination, or nuisance.

34. **Special Conditions for Areas of Special Biological Significance.** On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving an exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges. State Water Board Resolution No. 2012-0012 requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject terms and conditions of State Water Board Resolution No. 2012-0012. The Special Protections contained in Attachment B to Resolution No. 2012-0012, applicable to these discharges, are hereby incorporated into this Order as if fully set forth herein.

ADMINISTRATIVE FINDINGS

35. **Executive Officer Delegation of Authority.** The San Diego Water Board by prior resolution has delegated all matters that may legally be delegated to its Executive Officer to act on its behalf pursuant to CWC section 13223. Therefore, the Executive Officer is authorized to act on the San Diego Water Board's behalf on any matter within this Order unless such delegation is unlawful under CWC section 13223 or this Order explicitly states otherwise.

36. **Standard Provisions.** Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR 122.42, are provided in Attachment B to this Order.

37. **Fact Sheet.** The Fact Sheet for this Order contains background information, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of this Order. The Fact Sheet is hereby incorporated into this Order and constitutes part of the Findings of this Order.

38. **Public Notice.** In accordance with State and federal laws and regulations, the San Diego Water Board notified the Copermittees, and interested agencies and persons of its intent to prescribe waste discharge requirements for the control of discharges into and from the MS4s to waters of the U.S. and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet.

39. **Public Hearing.** The San Diego Water Board held a public hearing on Month Day, 2013 and heard and considered all comments pertaining to the terms and conditions of this Order. Details of the public hearing are provided in the Fact Sheet.

40. **Effective Date.** This Order serves as an NPDES permit pursuant to CWA section 401 or amendments thereto, and becomes effective fifty (50) days after the date of its adoption, provided that the Regional Administrator, USEPA, Region IX, does not object to this Order.

41. **Review by the State Water Board.** Any person aggrieved by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with CWC section 13320 and California Code of Regulations, title 23, sections 2050, et seq. The State Water Board must receive the petition by 5:00 p.m., 30 days after the San Diego Water Board action, except that if the thirtieth day following the action falls on a Saturday, Sunday or State holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

THEREFORE, IT IS HEREBY ORDERED that the Copermittees, in order to meet the provisions contained in division 7 of the CWC (commencing with section 13000) and regulations adopted thereunder, and the provisions of the CWA and regulations adopted thereunder, must each comply with the the requirements of this Order. This action in no way prevents the San Diego Water Board from taking enforcement action for past violations of the previous Order. If any part of this Order is subject to a temporary stay of enforcement, unless otherwise specified, the Copermittees must comply with the analogous portions of the previous Order, which will remain in effect for all purposes during the pendency of the stay.

II. PROVISIONS

A. PROHIBITIONS AND LIMITATIONS

The purpose of this provision is to describe the conditions under which storm water and non-storm water discharges into and from MS4s are prohibited or limited. The goal of the prohibitions and limitations is to protect the water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through the implementation of water quality improvement strategies and runoff management programs that effectively prohibit non-storm water discharges into the Copermittees' MS4s, and reduce pollutants in storm water discharges from the Copermittees' MS4s to the MEP.

1. Discharge Prohibitions

a. Discharges from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the state are prohibited.

b. Non-storm water discharges into MS4s are to be effectively prohibited, through the implementation of Provision E.2, unless such discharges are authorized by a separate NPDES permit.

c. Discharges from MS4s are subject to all waste discharge prohibitions in the Basin Plan, included in Attachment A to this Order.

d. Storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 applicable to these discharges, included in Attachment A to this Order. All other discharges from the Copermittees' MS4s to ASBS are prohibited.

2. Receiving Water Limitations

a. Discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters, including but not limited to all applicable provisions contained in:

(1) The San Diego Water Board's Basin Plan, including beneficial uses, water quality objectives, and implementation plans;

(2) State Water Board plans for water quality control including the following:

(a) Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries (Thermal Plan), and

(b) The Ocean Plan, including beneficial uses, water quality objectives, and implementation plans;

(3) State Water Board policies for water and sediment quality control including the following:

(a) Water Quality Control Policy for the Enclosed Bays and Estuaries of California,

(b) Sediment Quality Control Plan which includes the following narrative objectives for bays and estuaries:

(i) Pollutants in sediments shall not be present in quantities that, alone or in combination, are toxic to benthic communities, and

(ii) Pollutants shall not be present in sediments at levels that will bioaccumulate in aquatic life to levels that are harmful to human health,

(c) The Statement of Policy with Respect to Maintaining High Quality of Waters in California;[1]

(4) Priority pollutant criteria promulgated by the USEPA through the following:

(a) National Toxics Rule (NTR)[2] (promulgated on December 22, 1992 and amended on May 4, 1995), and

(b) California Toxics Rule (CTR).[3,4]

b. Discharges from MS4s composed of storm water runoff must not alter natural ocean water quality in an ASBS.

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[1] State Water Board Resolution No. 68-16
[2] 40 CFR 131.36
[3] 65 Federal Register 31682-31719 (May 18, 2000), adding Section 131.38 to 40 CFR
[4] If a water quality objective and a CTR criterion are in effect for the same priority pollutant, the more stringent of the two applies.

3. Effluent Limitations

a. TECHNOLOGY BASED EFFLUENT LIMITATIONS

Pollutants in storm water discharges from MS4s must be reduced to the MEP.[5]

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

Each Copermittee must comply with applicable WQBELs established for the TMDLs in Attachment E to this Order, pursuant to the applicable TMDL compliance schedules.

4. Compliance with Discharge Prohibitions and Receiving Water Limitations

Each Copermittee must achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order through timely implementation of control measures and other actions as specified in Provisions B and E of this Order, including any modifications. The Water Quality Improvement Plans required under Provision B must be designed and adapted to ultimately achieve compliance with Provisions A.1.a, A.1.c and A.2.a.

a. If exceedance(s) of water quality standards persist in receiving waters notwithstanding implementation of this Order, the Copermittees must comply with the following procedures:

(1) For exceedance(s) of a water quality standard in the process of being addressed by the Water Quality Improvement Plan, the Copermittee(s) must implement the Water Quality Improvement Plan as accepted by the San Diego Water Board, and update the Water Quality Improvement Plan, as necessary, pursuant to Provision F.2.c;

(2) Upon a determination by either the Copermittees or the San Diego Water Board that discharges from the MS4 are causing or contributing to a new exceedance of an applicable water quality standard not addressed by the Water Quality Improvement Plan, the Copermittees must submit the following updates to the Water Quality Improvement Plan pursuant to Provision F.2.c or as part of the Water Quality Improvement Plan Annual Report required under Provision F.3.b, unless the San Diego Water Board directs an earlier submittal:

(a) The water quality improvement strategies being implemented that are effective and will continue to be implemented,

[5] This does not apply to MS4 discharges which receive subsequent treatment to reduce pollutants in storm water discharges to the MEP prior to entering receiving waters (e.g., low flow diversions to the sanitary sewer). Runoff treatment must occur prior to the discharge of runoff into receiving waters per Finding 7.

(b) Water quality improvement strategies (i.e. BMPs, retrofitting projects, stream and/or habitat rehabilitation projects, adjustments to jurisdictional runoff management programs, etc.) that will be implemented to reduce or eliminate any pollutants or conditions that are causing or contributing to the exceedance of water quality standards,

(c) Updates to the schedule for implementation of the existing and additional water quality improvement strategies, and

(d) Updates to the monitoring and assessment program to track progress toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a of this Order;

(3) The San Diego Water Board may require the incorporation of additional modifications to the Water Quality Improvement Plan required under Provision B. The applicable Copermittees must submit any modifications to the update to the Water Quality Improvement Plan within 90 days of notification that additional modifications are required by the San Diego Water Board, or as otherwise directed;

(4) Within 90 days of the San Diego Water Board determination that the ~~update~~ modifications to the Water Quality Improvement Plan required under Provision A.4.a.(3) meet~~s~~ the requirements of this Order, the applicable Copermittees must revise the jurisdictional runoff management program documents to incorporate the ~~updated~~ modified water quality improvement strategies that have been and will be implemented, the implementation schedule, and any additional monitoring required; and

(5) Each Copermittee must implement the updated Water Quality Improvement Plan.

b. The procedure set forth above to achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order do not have to be repeated for continuing or recurring exceedances of the same water quality standard(s) following implementation of scheduled actions unless directed to do otherwise by the San Diego Water Board.

c. Nothing in Provisions A.4.a and A.4.b prevents the San Diego Water Board from enforcing any provision of this Order while the applicable Copermittees prepare and implement the above update to the Water Quality Improvement Plan and jurisdictional runoff management programs.

B. WATER QUALITY IMPROVEMENT PLANS

The purpose of this provision is to develop Water Quality Improvement Plans that guide the Copermittees' jurisdictional runoff management programs towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plans is to further the Clean Water Act's objective to protect, preserve, ~~and~~ enhance, and restore the water quality and designated beneficial uses of waters of the state. This goal will be accomplished through an adaptive planning and management process that identifies the highest priority water quality conditions within a watershed and implements strategies through the jurisdictional runoff management programs to achieve improvements in the quality of discharges from the MS4s and receiving waters.

1. Watershed Management Areas

The Copermittees must develop a Water Quality Improvement Plan for each of the Watershed Management Areas in Table B-1. A total of ten Water Quality Improvement Plans must be developed for the San Diego Region.

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
San Juan (901.00)	South Orange County	- Aliso Creek - San Juan Creek - San Mateo Creek - Pacific Ocean - Heisler Park ASBS	- City of Aliso Viejo[1] - City of Dana Point[1] - City of Laguna Beach[1] - City of Laguna Hills[1] - City of Laguna Niguel[1] - City of Laguna Woods[1] - City of Lake Forest[1] - City of Mission Viejo[1] - City of Rancho Santa Margarita[1] - City of San Clemente[1] - City of San Juan Capistrano[1] - County of Orange[1] - Orange County Flood Control District[1]
Santa Margarita (902.00)	Santa Margarita River	- Murrieta Creek - Temecula Creek - Santa Margarita River - Santa Margarita Lagoon - Pacific Ocean	- City of Murrieta[2] - City of Temecula[2] - City of Wildomar[2] - County of Riverside[2] - County of San Diego[3] - Riverside County Flood Control and Water Conservation District[2]
San Luis Rey (903.00)	San Luis Rey River	- San Luis Rey River - San Luis Rey Estuary - Pacific Ocean	- City of Oceanside - City of Vista - County of San Diego

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
Carlsbad (904.00)	Carlsbad	- Loma Alta Slough - Buena Vista Lagoon - Agua Hedionda Lagoon - Batiquitos Lagoon - San Elijo Lagoon - Pacific Ocean	- City of Carlsbad - City of Encinitas - City of Escondido - City of Oceanside - City of San Marcos - City of Solana Beach - City of Vista - County of San Diego
San Dieguito (905.00)	San Dieguito River	- San Dieguito River - San Dieguito Lagoon - Pacific Ocean	- City of Del Mar - City of Escondido - City of Poway - City of San Diego - City of Solana Beach - County of San Diego
Penasquitos (906.00)	Penasquitos	- Los Penasquitos Lagoon - Pacific Ocean	- City of Del Mar - City of Poway - City of San Diego - County of San Diego
	Mission Bay	- Mission Bay - Pacific Ocean - San Diego Marine Life Refuge ASBS	- City of San Diego
San Diego (907.00)	San Diego River	- San Diego River - Pacific Ocean	- City of El Cajon - City of La Mesa - City of San Diego - City of Santee - County of San Diego
Pueblo San Diego (908.00) Sweetwater (909.00) Otay (910.00)	San Diego Bay	- Sweetwater River - Otay River - San Diego Bay - Pacific Ocean	- City of Chula Vista - City of Coronado - City of Imperial Beach - City of La Mesa - City of Lemon Grove - City of National City - City of San Diego - County of San Diego - San Diego County Regional Airport Authority - San Diego Unified Port District
Tijuana (911.00)	Tijuana River	- Tijuana River - Tijuana Estuary - Pacific Ocean	- City of Imperial Beach - City of San Diego - County of San Diego

Notes:
1. The Orange County Copermittees will be covered under this Order after expiration of Order No. R9-2009-0002, or earlier if the Orange County Copermittees meet the conditions in Provision F.6.
2. The Riverside County Copermittees will be covered under this Order after expiration of Order No. R9-2010-0016, or earlier if the Riverside County Copermittees meet the conditions in Provision F.6.
3. The County of San Diego is not required to implement the requirements of Provision B for its jurisdiction within the Santa Margarita River Watershed Management Area until the Riverside County Copermittees have been notified of coverage under this Order. The County of San Diego is required to implement the requirements of Provisions D, F.3.b, and Attachment E until the Riverside County Copermittees have been notified of coverage under this Order.

2. Priority Water Quality Conditions

The Copermittees must identify the water quality priorities within each Watershed Management Area that will be addressed by the Water Quality Improvement Plan. Where appropriate, Watershed Management Areas may be separated into subwatersheds to focus water quality prioritization and jurisdictional runoff management program implementation efforts by receiving water.

a. Assessment of Receiving Water Conditions

The Copermittees must consider the following, at a minimum, to identify water quality priorities based on impacts of MS4 discharges on receiving water beneficial uses:

(1) Receiving waters listed as impaired on the CWA Section 303(d) List of Water Quality Limited Segments (303(d) List);

(2) TMDLs adopted and under development by the San Diego Water Board;

(3) Receiving waters recognized as sensitive or highly valued by the Copermittees, including estuaries designated under the National Estuary Program under CWA section 320, wetlands defined by the State or U.S. Fish and Wildlife Service's National Wetlands Inventory as wetlands, waters having the Preservation of Biological Habitats of Special Significance (BOIL) beneficial use designation, and receiving waters identified as ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (Attachment A);

(4) The receiving water limitations of Provision A.2;

(5) Known historical versus current physical, chemical, and biological water quality conditions;

(6) Available, relevant, and appropriately collected and analyzed physical, chemical, and biological receiving water monitoring data, including, but not limited to, data describing:

(a) Chemical constituents,

(b) Water quality parameters (i.e. pH, temperature, conductivity, etc.),

(c) Toxicity Identification Evaluations for both receiving water column and sediment,

(d) Trash impacts,

(e) Bioassessments, and

(f) Physical habitat;

(7) Available evidence of erosional impacts in receiving waters due to accelerated flows (i.e. hydromodification);

(8) Available evidence of adverse impacts to the chemical, physical, and biological integrity of receiving waters; and

(9) The potential improvements in the overall condition of the Watershed Management Area that can be achieved.

b. ASSESSMENT OF IMPACTS FROM MS4 DISCHARGES

The Copermittees must consider the following, at a minimum, to identify the potential impacts to receiving waters that may be caused or contributed to by discharges from the Copermittees' MS4s:

(1) The discharge prohibitions of Provision A.1 and effluent limitations of Provision A.3; and

(2) Available, relevant, and appropriately collected and analyzed storm water and non-storm water monitoring data from the Copermittees' MS4 outfalls;

(3) Locations of each Copermittee's MS4 outfalls that discharge to receiving waters;

(4) Locations of MS4 outfalls that are known to persistently discharge non-storm water to receiving waters likely causing or contributing to impacts on receiving water beneficial uses;

(5) Locations of MS4 outfalls that are known to discharge pollutants in storm water causing or contributing to impacts on receiving water beneficial uses; and

(6) The potential improvements in the quality of discharges from the MS4 that can be achieved.

c. IDENTIFICATION OF PRIORITY WATER QUALITY CONDITIONS

(1) The Copermittees must use the information gathered for Provisions B.2.a and B.2.b to develop a list of priority water quality conditions as pollutants, stressors and/or receiving water conditions that are the highest threat to receiving water quality or that most adversely affect the quality of receiving waters. The list must include the following information for each priority water quality condition:

(a) The beneficial use(s) associated with the priority water quality condition;

(b) The geographic extent of the priority water quality condition within the Watershed Management Area, if known;

(c) The temporal extent of the priority water quality condition (e.g., dry weather and/or wet weather);

(d) The Copermittees with MS4s discharges that may cause or contribute to the priority water quality condition; and

(e) An assessment of the adequacy of and data gaps in the monitoring data to characterize the conditions causing or contributing to the priority water quality condition, including a consideration of spatial and temporal variation.

(2) The Copermittees must identify the highest priority water quality conditions to be addressed by the Water Quality Improvement Plan, and provide a rationale for selecting a subset of the water quality conditions identified pursuant to Provision B.2.c.(1) as the highest priorities.

d. IDENTIFICATION OF MS4 SOURCES OF POLLUTANTS AND/OR STRESSORS

The Copermittees must identify and prioritize known and suspected sources of storm water and non-storm water pollutants and/or other stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c. The identification of known and suspected sources of pollutants and/or stressors that cause or contribute to the highest priority water quality conditions as identified for Provision B.2.c must consider the following:

(1) Pollutant generating facilities, areas, and/or activities within the Watershed Management Area, including:

(a) Each Copermittee's inventory of construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas,

(b) Publicly owned parks and/or recreational areas,

(c) Open space areas,

(d) All currently operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste, and

(e) Areas not within the Copermittees' jurisdictions (e.g., Phase II MS4s, tribal lands, state lands, federal lands) that are known or suspected to be discharging to the Copermittees' MS4s;

(2) Locations of the Copermittees' MS4s, including the following:

(a) All MS4 outfalls that discharge to receiving waters, and

(b) Locations of major structural controls for storm water and non-storm water (e.g., retention basins, detention basins, major infiltration devices, etc.);

(3) Other known and suspected sources of non-storm water or pollutants in storm water discharges to receiving waters within the Watershed Management Area, including the following:

(a) Other MS4 outfalls (e.g., Phase II Municipal and Caltrans),

(b) Other NPDES permitted discharges,

(c) Any other discharges that may be considered point sources (e.g., private outfalls), and

(d) Any other discharges that may be considered non-point sources (e.g., agriculture, wildlife or other natural sources);

(4) Review of available data, including but not limited to:

(a) Findings from the Copermittees' illicit discharge detection and elimination programs,

(b) Findings from the Copermittees' MS4 outfall discharge monitoring,

(c) Findings from the Copermittees' receiving water monitoring,

(d) Findings from the Copermittees' MS4 outfall discharge and receiving water assessments, and

(e) Other available, relevant, and appropriately collected data, information, or studies related to pollutant sources and/or stressors that contribute to the highest priority water quality conditions as identified for Provision B.2.c.

(5) The adequacy of the available data to identify and prioritize sources and/or stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c.

e. IDENTIFICATION OF POTENTIAL WATER QUALITY IMPROVEMENT STRATEGIES

The Copermittees must evaluate the findings identified under Provisions B.2.a-d, and identify potential strategies that can result in improvements to water quality

in MS4 discharges and/or receiving waters within the Watershed Management Area. Potential water quality improvement strategies that may be implemented within the Watershed Management Area must include the following:

(1) Structural BMPs, non-structural BMPs, incentives, or programs that can potentially be implemented to address the highest priority water quality conditions identified under Provision B.2.c, or MS4 sources of pollutants or stressors identified under Provision B.2.d,

(2) Retrofitting projects in areas of existing development within the Watershed Management Area that can potentially be implemented to reduce MS4 sources of pollutants or stressors identified under Provision B.2.d causing or contributing to the highest priority water quality conditions identified under Provision B.2.c, and

(3) Stream, channel, and/or habitat rehabilitation projects within the Watershed Management Area that can potentially be implemented to protect and/or improve conditions in receiving waters from MS4 pollutants and/or stressors identified under Provision B.2.d causing or contributing to the highest priority water quality conditions identified under Provision B.2.c.

3. Water Quality Improvement Goals, Strategies and Schedules

The Copermittees must identify and develop specific water quality improvement goals and strategies to address the highest priority water quality conditions identified within a Watershed Management Area. The water quality improvement goals and strategies must address the highest priority water quality conditions by effectively prohibiting non-storm water discharges to the MS4, reducing pollutants in storm water discharges from the MS4 to the MEP, and protecting the water quality standards of receiving waters.

a. WATER QUALITY IMPROVEMENT GOALS AND SCHEDULES

(1) Numeric Goals

The Copermittees must develop and incorporate numeric goals[6] into the Water Quality Improvement Plan. Numeric goals must be used to support Water Quality Improvement Plan implementation and measure reasonable progress towards addressing the highest priority water quality conditions identified under Provision B.2.c. The Copermittees must establish and

[6] Interim and final numeric goals may take a variety of forms such as TMDL established WQBELs, action levels, pollutant concentration, load reductions, number of impaired water bodies delisted from the List of Water Quality Impaired Segments, Index of Biotic Integrity (IBI) scores, or other appropriate metrics. Interim and final numeric goals are not necessarily limited to one criterion or indicator, but may include multiple criteria and/or indicators. Except for TMDL established WQBELs, interim and final numeric goals and corresponding schedules may be revised through the adaptive management process under Provision B.5.

incorporate the following numeric goals in the Water Quality Improvement Plan:

(a) Final numeric goals must be based on measureable criteria or indicators capable of demonstrating one or more of the following:

(i) Discharges from the Copermittees' MS4s will not cause or contribute to exceedances of water quality standards in receiving waters, AND/OR

(ii) The conditions of receiving waters and associated habitat are protected from MS4 discharges, AND/OR

(iii) Beneficial uses of receiving waters are protected from MS4 discharges and will be supported.

(b) Interim numeric goals must be based on measureable criteria or indicators capable of demonstrating reasonable incremental progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges as follows:

(i) One or more interim numeric goals may be established to demonstrate progress toward achieving each final numeric goal,

(ii) For each final numeric goal, at least one interim numeric goal must be expressed as a reasonable increment toward achievement of the final numeric goal,

(iii) For each final numeric goal, reasonable interim numeric goals must be established to be accomplished during each 5 year period between the acceptance of the Water Quality Improvement Plan and the achievement of the final numeric goals.

(2) Schedules for Achieving Numeric Goals

The Copermittees must develop and incorporate schedules for achieving the numeric goals into the Water Quality Improvement Plan. The schedules must demonstrate reasonable progress toward achieving the final numeric goals required for Provision B.3.a.(1). The Copermittees must incorporate the schedules for achieving the numeric goals into the Water Quality Improvement Plan based on the following considerations:

(a) Final dates for achieving all final numeric goals must be established considering the following:

(i) Final compliance dates for any applicable TMDLs in Attachment E to this Order;

(ii) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(iii) Achievement of the final numeric goals for the highest water quality priorities must be as soon as possible;

(iv) Final dates for achieving the final numeric goals must reflect a realistic assessment of the shortest practicable time required based on the temporal and spatial extent and factors associated with the highest priority water quality conditions identified under Provision B.2.c, and taking into account the time reasonably required to implement the water quality improvement strategies required pursuant to Provision B.3.b.

(b) Interim dates for achieving all interim numeric goals must be established considering the following:

(i) Interim compliance dates for any applicable TMDLs in Attachment E to this Order;

(ii) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(iii) Interim dates for achieving the interim numeric goals must reflect a realistic assessment of the shortest practicable time reasonably required, taking into account the time needed to implement new or significantly expanded programs and securing financing, if necessary; and

(iv) For each final numeric goal, at least one interim numeric goal must be established that the Copermittees will work toward achieving within the term of this Order.

b. WATER QUALITY IMPROVEMENT STRATEGIES AND SCHEDULES

Based on the likely effectiveness and efficiency of the potential water quality improvement strategies identified under Provision B.2.e to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a, the Copermittees must identify the strategies that will be implemented in each Watershed Management Area as follows:

(1) Jurisdictional Strategies

(a) Each Copermittee in the Watershed Management Area must identify the strategies that will be implemented within its jurisdiction as part of its jurisdictional runoff management program requirements under Provisions E.2 through E.7, including descriptions of the following:

(i) For each of the inventories developed for its jurisdiction, as required under Provisions D.2.a.(1), E.3.e.(2), E.4.c, and E.5.a, each Copermittee must identify the known and suspected areas or sources causing or contributing to the highest priority water quality conditions in the Watershed Management Area that the Copermittee will focus on in its efforts to effectively prohibit non-storm water discharges to its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, and achieve the interim and final numeric goals identified under Provision B.3.a;

(ii) BMPs that each Copermittee will implement, or require to be implemented, as applicable, for those areas or sources within its jurisdiction;

(iii) Education programs that each Copermittee will implement, as applicable, for those areas or sources within its jurisdiction;

(iv) Frequencies that each Copermittee will conduct inspections on those areas or sources within its jurisdiction;

(v) Incentive and enforcement programs that each Copermittee will implement, as applicable, for those areas or sources within its jurisdiction; and

(vi) Any other BMPs, incentives, or programs that each Copermittee will implement for those areas or sources within its jurisdiction.

(b) Identify the optional jurisdictional strategies that each Copermittee will implement within its jurisdiction, as necessary, to effectively prohibit non-storm water discharges to its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. Descriptions of the optional jurisdictional strategies must include:

(i) BMPs, incentives, or programs that may be implemented by the Copermittee within its jurisdiction in addition to the requirements of Provisions B.3.b.(1)(a);

(ii) Incentives or programs that may be implemented by the Copermittee to encourage or implement projects to retrofit areas of existing development within its jurisdiction;

(iii) Incentives or programs that may be implemented by the Copermittee to encourage or implement projects that will rehabilitate the conditions of channels or habitats within its jurisdiction;

(iv) The funds and/or resources that must be secured by the Copermittee to implement the optional strategies described for Provisions E.3.b.(1)(b)(i)-(iii) within its jurisdiction; and

(v) The circumstances necessary to trigger implementation of the optional jurisdictional strategies, in addition to the requirements of Provisions B.3.b.(1)(a), to achieve the interim and final numeric goals within the schedules established under Provision B.3.a.

(c) Identify the strategies that will be implemented by the Copermittee in coordination with or with the cooperation of other agencies (e.g. Caltrans, water districts, school districts) and/or entities (e.g. non-governmental organizations) within its jurisdiction.

(2) Watershed Management Area Strategies

The Copermittees must identify the optional regional or multi-jurisdictional strategies that will be implemented in the Watershed Management Area, as necessary, to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. Descriptions of the optional regional or multi-jurisdictional strategies must include:

(a) Regional or multi-jurisdictional BMPs, incentives, or programs that may be implemented by the Copermittees in the Watershed Management Area;

(b) Incentives or programs that may be implemented by the Copermittees in the Watershed Management Area to encourage or implement regional or multi-jurisdictional projects to retrofit areas of existing development;

(c) Incentives or programs that may be implemented by the Copermittees to encourage or implement regional or multi-jurisdictional projects that will rehabilitate the conditions of channels, streams, or habitats within the Watershed Management Area;

(d) The funds and/or resources that must be secured by the Copermittees to implement the optional strategies described for Provisions E.3.b.(2)(a)-(c) within the Watershed Management Area; and

(e) The circumstances necessary to trigger implementation of the optional regional or multi-jurisdictional strategies to achieve the interim and final numeric goals within the schedules established under Provision B.3.a.

(3) Schedules for Implementing Strategies

The Copermittees must develop reasonable schedules for implementing the water quality improvement strategies identified under Provisions B.3.b.(1) and B.3.b.(2)(a) to achieve the interim and final numeric goals identified and schedules established under Provision B.3.a. The Copermittees must

incorporate the schedules to implement the water quality improvement strategies into the Water Quality Improvement Plan as follows:

(a) Each Copermittee must develop schedules for the jurisdictional strategies identified pursuant to Provisions B.3.b.(1)(a)-(b). Each schedule must specify:

(i) If each jurisdictional strategy identified pursuant to Provision B.3.b.(1)(a) will or will not be initiated upon acceptance of the Water Quality Improvement Plan;

(ii) For each jurisdictional strategy identified pursuant to Provision B.3.b.(1)(a) that will not be initiated upon approval of the Water Quality Improvement Plan, the shortest practicable time in which each jurisdictional strategy will be initiated after acceptance of the Water Quality Improvement Plan;

(iii) For each optional jurisdictional strategy identified pursuant to Provision B.3.b.(1)(b), a realistic assessment of the shortest practicable time required to:

[a] Secure the resources needed to fund the optional jurisdictional strategy, and
[b] Procure the resources, materials, labor, and applicable permits necessary to initiate implementation of the optional jurisdictional strategy;

(iv) If each jurisdictional strategy identified pursuant to Provisions B.3.b.(1)(a)-(b) is expected to be continuously implemented (e.g. inspections) or completed within a schedule (e.g. construction of structural BMP); and

(v) If a jurisdictional strategy identified pursuant to Provisions B.3.b.(1)(a)-(b) is expected to be completed within a schedule, the anticipated time to complete based on a realistic assessment of the shortest practicable time required.

(b) The Copermittees in the Watershed Management Area must develop schedules for the regional or multi-jurisdictional strategies identified pursuant to Provision B.3.b.(2). Each schedule must specify:

(i) A realistic assessment of the shortest practicable time to:

[a] Secure the resources needed to fund the optional regional or multi-jurisdictional strategy, and
[b] Procure the resources, materials, labor, and permits necessary to initiate the implementation of the optional regional or multi-jurisdictional strategy;

(ii) If each regional or multi-jurisdictional strategy identified pursuant to Provision B.3.b.(2) is expected to be continuously implemented (e.g. inspections) or completed within a schedule (e.g. construction of structural BMP); and

(iii) If a regional or multi-jurisdictional strategy and/or activity identified pursuant to Provisions B.3.b.(2) is expected to be completed within a schedule, the anticipated time to complete based on a realistic assessment of the shortest practicable time required.

(4) Optional Watershed Management Area Analysis

(a) For each Watershed Management Area, the Copermittees have the option to perform a Watershed Management Area Analysis for the purpose of developing watershed-specific requirements for structural BMP implementation, as described in Provision E.3.c.(3). The Watershed Management Area Analysis must include GIS layers (maps) as output. The analysis must include the following information, to the extent it is available, in order to characterize the Watershed Management Areas:

(i) A description of dominant hydrologic processes, such as areas where infiltration or overland flow likely dominates;

(ii) A description of existing streams in the watershed, including bed material and composition, and if they are perennial or ephemeral;

(iii) Current and anticipated future land uses;

(iv) Potential coarse sediment yield areas; and

(v) Locations of existing flood control structures and channel structures, such as stream armoring, constrictions, grade control structures, and hydromodification or flood management basins.

(b) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify and compile a list of candidate projects that could potentially be used as alternative compliance options for Priority Development Projects, to be implemented in lieu of onsite structural BMP performance requirements described in Provisions E.3.c.(1) and E.3.c.(2). Specifically, the Copermittees must identify opportunities to be included in the list of candidate projects in each Watershed Management Area, such as:

(i) ~~Opportunities for s~~Stream or riparian area rehabilitation;

(ii) ~~Opportunities for r~~Retrofitting existing infrastructure to incorporate storm water retention or treatment;

(iii) ~~Opportunities for r~~Regional BMPs;

(iv) ~~Opportunities for g~~Groundwater recharge projects;

(v) ~~Opportunities for w~~Water supply augmentation projects; and

(vi) ~~Opportunities for l~~Land purchases to preserve floodplain functions.

(c) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify areas within the Watershed Management Area where it is appropriate to allow Priority Development Projects to be exempt from the hydromodification management BMP performance requirements described in Provision E.3.c.(2), including supporting rationale.

Provision B.3.c OPTION 1

~~**c. Discharge Prohibitions and Receiving Water Limitations Compliance Option**~~

~~(1) The Copermittees may utilize implementation of the water quality improvement strategies in the Water Quality Improvement Plan to demonstrate compliance with the requirements of Provisions A.1.a, A.1.c and A.2.a. For each Copermittee in the Watershed Management Area that chooses to utilize this option, the Copermittee will be in compliance with Provisions A.1.a, A.1.c and A.2.a if:~~

~~(a) Numeric goals and schedules developed pursuant to Provision B.3.a include the following numeric goals:~~

~~(i) WQBELs expressed as concentration-based or load-based effluent limitations applicable to the Watershed Management Area established by the TMDLs in Attachment E to this Order; and~~

~~(ii) Numeric goals applicable to the Copermittee's MS4 discharges expressed as concentration-based or load-based effluent limitations for all other pollutants listed on the Clean Water Act Section 303(d) List of Water Quality Impaired Segments[7] for the receiving waters in the Watershed Management Area that do not have a TMDL developed; and~~

~~(iii) Numeric goals for receiving waters that will protect the conditions of the receiving waters and attain water quality standards.~~

~~(b) An analysis utilizing a watershed model or other watershed analytical tools is performed. The results must be included in the Water Quality Improvement Plan to quantitatively demonstrate that the implementation of the water quality improvement strategies required under Provision B.3.b will achieve the numeric goals within the established schedules required under Provision B.3.a. The analysis may be performed individually or jointly by the Copermittees choosing to utilize this option in the Watershed~~

~~[7] 2002 and subsequent 303(d) Lists~~

~~Management Area, and must be updated as part of the iterative approach and adaptive management process required under Provisions B.5.a-b.~~

~~(c) The Water Quality Improvement Plan specifies the monitoring and assessments (i.e. MS4 outfall discharge, receiving water, and/or special studies) that will be performed by the Copermittee to confirm the implementation of the water quality improvement strategies within its jurisdiction is making progress toward achieving the numeric goals in accordance with the established schedules developed pursuant to Provision B.3.c.(1)(a). The monitoring and assessments must be incorporated into the monitoring and assessment program required pursuant to Provision B.4. The monitoring and assessments must be updated as part of the iterative approach and adaptive management process required under Provision B.5.c.~~

~~(d) The numeric goals proposed pursuant to Provision B.3.c.(1)(a), the analysis performed pursuant to Provision B.3.c.(1)(b) and the specific monitoring and assessments proposed pursuant to Provision B.3.c.(1)(c) have been reviewed and receive concurrence by a majority of the Water Quality Improvement Consultation Panel (see Provision F.1.a.(1)(b)). Updates must also receive concurrence by a majority of the Water Quality Improvement Consultation Panel.~~

~~(2) Each Copermittee that chooses to utilize this option will, for the pollutant/water body combinations covered by the analysis, be in compliance with Provisions A.1.a, A.1.c and A.2.a when the Water Quality Improvement Plan, incorporating the requirements of Provision B.3.c.(1), is accepted by the San Diego Water Board.~~

~~(3) The Copermittee will, for the pollutant/water body combinations covered by the analysis, remain in compliance with Provisions A.1.a, A.1.c and A.2.a during the term of this Order as long as:~~

~~(a) The results of the analysis performed pursuant to Provision B.3.c.(1)(d) is accepted and continues to be accepted by the San Diego Water Board Executive Officer as part of the Water Quality Improvement Plan; AND~~

~~(b) The Copermittee continues to implement the water quality improvement strategies within its jurisdiction developed pursuant to Provision B.3.b.(1) in accordance with the schedules for implementing the strategies established pursuant to Provision B.3.b.(3)(a); AND~~

~~(c) The Copermittee continues to perform the monitoring and assessments specified in the Water Quality Improvement Plan, developed and implemented pursuant to Provision B.3.c.(1)(c), to demonstrate its progress toward achieving the numeric goals applicable to its MS4 discharges in accordance with the interim and final dates for achieving the~~

~~numeric goals established pursuant to Provision B.3.a.(2); AND~~

~~(d) The Copermittees in the Watershed Management Area continue to implement the requirements of Provision A.4.a.~~

Provision B.3.c OPTION 2

c. DISCHARGE PROHIBITIONS AND RECEIVING WATER LIMITATIONS COMPLIANCE OPTION

(1) The Copermittees may utilize implementation of the water quality improvement strategies in the Water Quality Improvement Plan to demonstrate compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2.a and A.2.b~~a~~. For each Copermittee in the Watershed Management Area that chooses to utilize this option, the Copermittee will be in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2.a and A.2.b~~a~~ if:

(a) Numeric goals and schedules developed pursuant to Provision B.3.a include the following numeric goals:

(i) WQBELs expressed as concentration-based or load-based effluent limitations applicable to the Watershed Management Area established by the TMDLs in Attachment E to this Order; and

(ii) Numeric goals applicable to the Copermittee's MS4 discharges expressed as concentration-based or load-based effluent limitations for all other pollutants listed on the Clean Water Act Section 303(d) List of Water Quality Impaired Segments[8] for the receiving waters in the Watershed Management Area that do not have a TMDL developed; and

(iii) Numeric goals for receiving waters that will protect the conditions of the receiving waters and attain water quality standards.

(b) An analysis utilizing a watershed model or other watershed analytical tools is performed. The results must be included in the Water Quality Improvement Plan to quantitatively demonstrate that the implementation of the water quality improvement strategies required under Provision B.3.b will achieve the numeric goals within the established schedules required under Provision B.3.a. The analysis may be performed individually or jointly by the Copermittees choosing to utilize this option in the Watershed Management Area, and must be updated as part of the iterative approach and adaptive management process required under Provisions B.5.a-b.

(c) The Water Quality Improvement Plan specifies the monitoring and assessments (i.e. MS4 outfall discharge, receiving water, and/or special studies) that will be performed by the Copermittee to confirm the implementation of the water quality improvement strategies within its

[8] 2002 and subsequent 303(d) Lists

jurisdiction is making progress toward achieving the numeric goals in accordance with the established schedules developed pursuant to Provision B.3.c.(1)(a). The monitoring and assessments must be incorporated into the monitoring and assessment program required pursuant to Provision B.4. The monitoring and assessments must be updated as part of the iterative approach and adaptive management process required under Provision B.5.c.

(d) The numeric goals proposed pursuant to Provision B.3.c.(1)(a), the analysis performed pursuant to Provision B.3.c.(1)(b) and the specific monitoring and assessments proposed pursuant to Provision B.3.c.(1)(c) have been reviewed ~~and receive concurrence~~ by ~~a majority of~~ the Water Quality Improvement Consultation Panel (see Provision F.1.a.(1)(b)) for any recommendations. Updates must ~~also receive concurrence~~ be reviewed by ~~a majority of~~ the Water Quality Improvement Consultation Panel for any recommendations.

(2) Each Copermittee that chooses to utilize this option will, for the pollutant/water body combinations covered by the analysis, be in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2.a and A.2.b~~a~~ when the Water Quality Improvement Plan, incorporating the requirements of Provision B.3.c.(1), is accepted by the San Diego Water Board.

(3) The Copermittee will, for the pollutant/water body combinations covered by the analysis, remain in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2.a and A.2.b~~a~~ during the term of this Order as long as:

(a) The results of the analysis performed pursuant to Provision B.3.c.(1)(d) is accepted ~~and continues to be accepted~~ by the San Diego Water Board Executive Officer as part of the Water Quality Improvement Plan and as part of subsequent updates to the Water Quality Improvement Plan; AND

(b) The Copermittee continues to implement the water quality improvement strategies within its jurisdiction developed pursuant to Provision B.3.b.(1) in accordance with the schedules for implementing the strategies established pursuant to Provision B.3.b.(3)(a); AND

(c) The Copermittee continues to perform the monitoring and assessments specified in the Water Quality Improvement Plan, developed and implemented pursuant to Provision B.3.c.(1)(c), to demonstrate its progress toward achieving the numeric goals applicable to its MS4 discharges in accordance with the interim and final dates for achieving the numeric goals established pursuant to Provision B.3.a.(2); AND

(d) The Copermittee~~s in the Watershed Management Area~~ continues to implement the requirements of Provision A.4.a.

4. Water Quality Improvement Monitoring and Assessment Program

a. The Copermittees in each Watershed Management Area must develop and incorporate an integrated monitoring and assessment program into the Water Quality Improvement Plan that assesses: 1) the progress toward achieving the numeric goals and schedules, 2) the progress toward addressing the highest priority water quality conditions for each Watershed Management Area, and 3) each Copermittee's overall efforts to implement the Water Quality Improvement Plan.

b. The monitoring and assessment program must incorporate the monitoring and assessment requirements of Provision D, which may allow the Copermittees to modify the program to be consistent with and focus on the highest priority water quality conditions for each Watershed Management Area.

c. For Watershed Management Areas with applicable TMDLs, the monitoring and assessment program must incorporate the specific monitoring and assessment requirements of Attachment E.

d. For Watershed Management Areas with any ASBS, the water quality monitoring and assessment program must incorporate the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

5. Iterative Approach and Adaptive Management Process

The Copermittees in each Watershed Management Area must implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a, and must include the following:

a. RE-EVALUATION OF PRIORITY WATER QUALITY CONDITIONS

The priority water quality conditions and potential water quality improvement strategies included in the Water Quality Improvement Plan pursuant to Provision B.2.c, may be re-evaluated by the Copermittees as needed during the term of this Order as part of the Water Quality Improvement Plan Annual Report. Re-evaluation and recommendations for modifications to the priority water quality conditions and potential water quality improvement strategies must be provided in the Report of Waste Discharge, and must consider the following:

(1) Achieving the outcome of improved water quality in MS4 discharges and receiving waters through implementation of the water quality improvement strategies identified in the Water Quality Improvement Plan;

(2) New information developed when the requirements of Provisions B.2.a-c have been re-evaluated;

(3) Spatial and temporal accuracy of monitoring data collected to inform prioritization of water quality conditions and implementation strategies to address the highest priority water quality conditions;

(4) Availability of new information and data from sources other than the jurisdictional runoff management programs within the Watershed Management Area that informs the effectiveness of the actions implemented by the Copermittees;

(5) San Diego Water Board recommendations; and

(6) Recommendations for modifications solicited through a public participation process.

b. ADAPTATION OF GOALS, STRATEGIES AND SCHEDULES

The water quality improvement goals, strategies and schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.3, must be re-evaluated and adapted as new information becomes available to result in more effective and efficient measures to address the highest priority water quality conditions identified pursuant to Provision B.2.c. Re-evaluation of and modifications to the water quality improvement goals, strategies and schedules must be provided in the Water Quality Improvement Plan Annual Report, and must consider the following:

(1) Modifications to the priority water quality conditions based on Provision B.5.a;

(2) Progress toward achieving interim and final numeric goals in receiving waters and MS4 discharges for the highest priority water quality conditions in the Watershed Management Area,

(3) Progress toward achieving outcomes according to established schedules;

(4) New policies or regulations that may affect identified numeric goals;

(5) Measurable or demonstrable reductions of non-storm water discharges to and from each Copermittee's MS4;

(6) Measurable or demonstrable reductions of pollutants in storm water discharges from each Copermittee's MS4 to the MEP;

(7) New information developed when the requirements of Provisions B.2.b and B.2.d have been re-evaluated;

(8) Efficiency in implementing the Water Quality Improvement Plan;

(9) San Diego Water Board recommendations; and

(10) Recommendations for modifications solicited through a public participation process.

c. ADAPTATION OF MONITORING AND ASSESSMENT PROGRAM

The water quality improvement monitoring and assessment program, included in the Water Quality Improvement Plan pursuant to Provision B.4, must be re-evaluated and adapted when new information becomes available. Re-evaluation and recommendations for modifications to the monitoring and assessment program, pursuant to the requirements of Provision D, may be provided in the Water Quality Improvement Plan Annual Report, but must be provided in the Report of Waste Discharge.

6. Water Quality Improvement Plan Submittal, Updates, and Implementation

a. The Copermittees must submit and commence implementation of the Water Quality Improvement Plans in accordance with the requirements of Provision F.1.

b. The Copermittees must submit proposed updates to the Water Quality Improvement Plan for acceptance by the San Diego Water Board Executive Officer in accordance with the requirements of Provision F.2.c.

C. ACTION LEVELS

The purpose of this provision is for the Copermittees to incorporate numeric action levels in the Water Quality Improvement Plans. The goal of the action levels is to guide Water Quality Improvement Plan implementation efforts and measure progress towards the protection of water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through monitoring and assessing the quality of the MS4 discharges during the implementation of the Water Quality Improvement Plans.

1. Non-Storm Water Action Levels[9]

The Copermittees must develop and incorporate numeric non-storm water action levels (NALs) into the Water Quality Improvement Plan to: 1) support the development and prioritization of water quality improvement strategies for effectively prohibiting non-storm water discharges to the MS4s, 2) assess the effectiveness of the water quality improvement strategies toward addressing MS4 non-storm water discharges, required pursuant to Provision D.4.b.(1), and 3) support the detection and elimination of non-storm water and illicit discharges to the MS4, required pursuant to Provision E.2.[10]

a. The following NALs must be incorporated:

(1) Non-Storm Water Discharges from MS4s to Ocean Surf Zone

Table C-1. Non-Storm Water Action Levels for Discharges from MS4s to Ocean Surf Zone

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Total Coliform	MPN/100 ml	1,000	-	10,000/1,000[1]	OP
Fecal Coliform	MPN/100 ml	200[2]	-	400	OP
Enterococci	MPN/100 ml	35	-	104[3]	OP

Abbreviations/Acronyms
AMAL – average monthly action level
OP – Ocean Plan water quality objective
MDAL – maximum daily action level
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Total coliform density NAL is 1,000 MPN/100 ml when the fecal/total coliform ratio exceeds 0.1.
2. Fecal coliform density NAL is 200 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas."

[9] NALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, unless the NAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed.
[10] The Copermittees may utilize NALs or other benchmarks currently established by the Copermittees as interim NALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

(2) Non-Storm Water Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Table C-2. Non-Storm Water Action Levels for Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Turbidity	NTU	75	-	225	OP
pH	Units	Within limit of 6.0 to 9.0 at all times			OP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	35	-	104[3]	BP
Priority Pollutants	ug/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
OP – Ocean Plan water quality objective
NTU – Nephelometric Turbidity Units
ug/L – micrograms per liter
MDAL – maximum daily action level
BP – Basin Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas" and is not applicable to waterbodies that are not designated with the water contact recreation (REC-1) beneficial use.

Table C-3. Non-Storm Water Action Levels for Priority Pollutants

Parameter	Units	Freshwater (CTR)		Saltwater (CTR)	
		MDAL	AMAL	MDAL	AMAL
Cadmium	ug/L	**	**	16	8
Copper	ug/L	*	*	5.8	2.9
Chromium III	ug/L	**	**	-	-
Chromium VI	ug/L	16	8.1	83	41
Lead	ug/L	*	*	14	2.9
Nickel	ug/L	**	**	14	6.8
Silver	ug/L	*	*	2.2	1.1
Zinc	ug/L	*	*	95	47

Abbreviations/Acronyms:
CTR – California Toxic Rule
AMAL – average monthly action level
ug/L – micrograms per liter
MDAL – maximum daily action level

Notes:
* Action levels developed on a case-by-case basis (see below)
** Action levels developed on a case-by-case basis (see below), but calculated criteria are not to exceed Maximum Contaminant Levels (MCLs) under the California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64431

The Cadmium, Copper, Chromium (III), Lead, Nickel, Silver and Zinc NALs for MS4 discharges to freshwater receiving waters will be developed on a case-by-case basis based on site-specific water quality data (receiving water hardness). For these priority pollutants, refer to 40 CFR 131.38(b)(2).

(3) Non-Storm Water Discharges from MS4s to Inland Surface Waters

Table C-4. Non-Storm Water Action Levels for Discharges from MS4s to Inland Surface Waters

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Dissolved Oxygen	mg/L	Not less than 5.0 in WARM waters and not less than 6.0 in COLD waters			BP
Turbidity	NTU	-	20	See MDAL	BP
pH	Units	Within limit of 6.5 to 8.5 at all times			BP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	33	-	61[3]	BP
Total Nitrogen	mg/L	-	1.0	See MDAL	BP
Total Phosphorus	mg/L	-	0.1	See MDAL	BP
MBAS	mg/L	-	0.5	See MDAL	BP
Iron	mg/L	-	0.3	See MDAL	BP
Manganese	mg/L	-	0.05	See MDAL	BP
Priority Pollutants	ug/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
BP – Basin Plan water quality objective
COLD – cold freshwater habitat beneficial use
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
MDAL – maximum daily action level
WARM – warm freshwater habitat beneficial use
MBAS – Methylene Blue Active Substances
MPN/100 ml – most probable number per 100 milliliters
ug/L – micrograms per liter

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for freshwater "designated beach areas" and is not applicable to waterbodies that are not designated with the water contact recreation (REC-1) beneficial use.

b. If not identified in Provision C.1.a, NALs must be identified, developed and incorporated in the Water Quality Improvement Plan for any pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in receiving waters associated with the highest priority water quality conditions related to non-storm water discharges from the MS4s. NALs must be based on:

(1) Applicable water quality standards which may be dependent upon site-specific or receiving water-specific conditions or assumptions to be identified by the Copermittees; or

(2) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the NALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary NALs specific to the Watershed Management Area at levels greater than the NALs required by Provisions C.1.a and C.1.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for effectively prohibiting non-storm water discharges to the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and from the MS4. The

secondary NALs may be developed using an approach acceptable to the San Diego Water Board.

d. Dry weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.b may be utilized to develop or revise NALs based on watershed-specific data, subject to San Diego Water Board Executive Officer approval.

2. Storm Water Action Levels[11]

The Copermittees must develop and incorporate numeric storm water action levels (SALs) in the Water Quality Improvement Plans to: 1) support the development and prioritization of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s, and 2) assess the effectiveness of the water quality improvement strategies toward reducing pollutants in storm water discharges, required pursuant to Provision D.4.b.(2).[12]

a. The following SALs for discharges of storm water from the MS4 must be incorporated:

Table C-5. Storm Water Action Levels for Discharges from MS4s to Receiving Waters

Parameter	Units	Action Level
Turbidity	NTU	126
Nitrate & Nitrite (Total)	mg/L	2.6
Phosphorus (Total P)	mg/L	1.46
Cadmium (Total Cd)*	µg/L	3.0
Copper (Total Cu)*	µg/L	127
Lead (Total Pb)*	µg/L	250
Zinc (Total Zn)*	µg/L	976

Abbreviations/Acronyms:
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
ug/L – micrograms per liter

Notes:
* The sampling must include a measure of receiving water hardness at each MS4 outfall. If a total metal concentration exceeds the corresponding metals SAL in Table C-5, that concentration must be compared to the California Toxics Rule criteria and the USEPA 1-hour maximum concentration for the detected level of receiving water hardness associated with that sample. If it is determined that the sample's total metal concentration for that specific metal exceeds that SAL, but does not exceed the applicable USEPA 1-hour maximum concentration criterion for the measured level of hardness, then the sample result will not be considered above the SAL for that measurement.

[11] SALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, unless the SAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed.
[12] The Copermittees may utilize SALs or other benchmarks currently established by the Copermittees as interim SALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

b. If not identified in Provision C.2.a, SALs must be identified, developed and incorporated in the Water Quality Improvement Plan for pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in receiving waters associated with the highest priority water quality conditions related to storm water discharges from the MS4s. SALs must be based on:

(1) Federal and State water quality guidance and/or water quality standards; and

(2) Site-specific or receiving water-specific conditions; or

(3) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the SALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary SALs specific to the Watershed Management Area at levels greater than the SALs required by Provisions C.2.a and C.2.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s. The secondary SALs may be developed based on the approaches recommended by the State Water Board's Storm Water Panel[13] or using an approach acceptable to the San Diego Water Board.

d. Wet weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.c may be used to develop or revise SALs based upon watershed-specific data, subject to San Diego Water Board Executive Officer approval.

[13] Storm Water Panel Recommendations to the California State Water Resources Control Board: The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities (June 2006)

D. MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS

The purpose of this provision is for the Copermittees to monitor and assess the impact on the conditions of receiving waters caused by discharges from the Copermittees' MS4s under wet weather and dry weather conditions. The goal of the monitoring and assessment program is to inform the Copermittees about the nexus between the health of receiving waters and the water quality condition of the discharges from their MS4s. This goal will be accomplished through monitoring and assessing the conditions of the receiving waters, discharges from the MS4s, pollutant sources and/or stressors, and effectiveness of the water quality improvement strategies implemented as part of the Water Quality Improvement Plans.

1. Receiving Water Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the condition of the receiving waters in each Watershed Management Area during dry weather and wet weather. Following San Diego Water Board acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct long-term receiving water monitoring during implementation of the Water Quality Improvement Plan to assess the long term trends and determine if conditions in receiving waters are improving. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following receiving water monitoring procedures:

a. TRANSITIONAL RECEIVING WATER MONITORING

Until the monitoring requirements and schedules of Provisions D.1.b-e are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following receiving water monitoring in the Watershed Management Area:

(1) Continue the receiving water monitoring programs required in Order Nos. R9-2007-0001 (Monitoring and Reporting Program No. R9-2007-0001 Sections II.A.1-A.5), R9-2009-0002, and R9-2010-0016;

(2) Continue the monitoring in the Hydromodification Management Plans approved by the San Diego Water Board;

(3) Participate in the following regional receiving water monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring,

(b) Southern California Bight Regional Monitoring, and

(c) Sediment Quality Monitoring;

(4) Implement the monitoring programs developed as part of any implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) for the TMDLs in Attachment E to this Order; and

(5) For Watershed Management Areas with ASBS, implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

b. LONG-TERM RECEIVING WATER MONITORING STATIONS

The Copermittees must select at least one long-term receiving water monitoring station from among the existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees to be representative of the receiving water quality in the Watershed Management Area. Additional long-term receiving water monitoring stations must be selected where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

c. DRY WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three dry weather monitoring events at each of the long-term receiving water monitoring stations. At least one monitoring event must be conducted during the dry season (May 1 – September 30) and at least one monitoring event must be conducted during a dry weather period during the wet season (October 1 – April 30), after the first wet weather event of the season, with an antecedent dry period of at least 72 hours following a storm event producing measureable rainfall of greater than 0.1 inch.

(1) Dry Weather Receiving Water Field Observations

For each dry weather monitoring event, the Copermittees must record field observations consistent with Table D-1 at each long-term receiving water monitoring station.

Table D-1. Field Observations for Receiving Water Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) • Station description (i.e. deposits or stains, vegetation condition, structural condition, and observable biology) • Presence and assessment of trash in and around station

(2) Dry Weather Receiving Water Field Monitoring

For each dry weather monitoring event, if conditions allow the collection of the data, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

Table D-2. Field Monitoring Parameters for Receiving Water Monitoring Stations

Parameters
• pH • Temperature • Specific conductivity • Dissolved oxygen • Turbidity

(3) Dry Weather Receiving Water Analytical Monitoring

For each dry weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable NAL constituents, and

(v) Constituents listed in Table D-3.

Table D-3. Analytical Monitoring Constituents for Receiving Water Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Pesticides	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Mercury • Nickel • Selenium • Thallium • Zinc	• Organophosphate Pesticides • Pyrethroid Pesticides	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(4) Dry Weather Receiving Water Toxicity Monitoring

For each dry weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for aquatic toxicity in accordance with Table D-4. When the State Water Board's Policy for Toxicity Assessment and Control (Toxicity Policy) is approved and in effect, the San Diego Water Board Executive Officer may direct the Copermittees to replace current toxicity program elements with standardized procedures in the Toxicity Policy.

Table D-4. Dry Weather Chronic[1] Toxicity Testing for Receiving Water Monitoring Stations

Organism	Units	Test	USEPA Protocol
Freshwater			
Pimephales promelas (Fathead Minnow)	Pass / Fail	Larval Survival and Growth	EPA-821-R-02-013
Ceriodaphnia dubia (*Daphnid*)	Pass / Fail	Survival and Production	EPA-821-R-02-013
Selenastrum capricornutum (Green Algae)	Pass / Fail	Growth	EPA-821-R-02-013
Marine and Estuarine			
Strongylocentrotus purpuratus *(Purple Sea Urchin)*	Pass / Fail	Embryo-Larval Development	EPA-600-R-95-136

Notes:
1. Chronic toxicity testing is not required at receiving water monitoring stations located at mass loading stations if the channel flows are diverted year-round during dry weather conditions to the sanitary sewer for treatment.

(a) Freshwater Test Species and Methods: If samples are collected in receiving waters with salinity less than 1 ppt, the Copermittees must follow the methods for chronic toxicity tests as established in 40 CFR 136.3 using a single-concentration test design for routine monitoring, or a five-concentration test design for additional toxicity testing if the limitation is exceeded. The Copermittees must estimate the critical life stage chronic toxicity on undiluted samples in accordance with species and short term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms (EPA-821-R-02-013; Table IA, 40 CFR 136). Additional test species may be used by the Copermittees if approved by the San Diego Water Board Executive Officer. The Copermittees must conduct:

(i) A static renewal toxicity test with the fathead minnow, *Pimephales promelas* (Larval Survival and Growth Test Method 1000.0);

(ii) A static renewal toxicity test with the daphnid, *Ceriodaphnia dubia* (Survival and Reproduction Test Method 1002.0); and

(iii) A static renewal toxicity test with the green alga, *Selenastrum capricornutum* (also named *Raphidocelis subcapitata*) (Growth Test Method 1003.0).

(b) Marine and Estuarine Test Species and Methods: If samples are collected in receiving waters with salinity greater or equal to 1 ppt, the Copermittees must follow the methods for chronic toxicity tests as established in 40 CFR 136.3 using a single-concentration test design for routine monitoring, or a five-concentration test design for additional toxicity testing if the limitation is exceeded. The Copermittees must conduct the following critical life state chronic toxicity tests on undiluted samples in accordance with species and short term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms (EPA-600-R-95-136; 1995). Artificial sea salts must be used to increase sample salinity. The Copermittees must conduct a static non-renewal toxicity test with the purple sea urchin, *Strongylocentrotus purpuratus* (Embryo-larval Development Test Method). Additional species may be used by the Copermittees if approved by the San Diego Water Board Executive Officer.

(c) Holding Times: All toxicity tests must be conducted as soon as possible following sample collection. The 36-hour sample holding time for test initiation shall be targeted. However, no more than 72 hours shall elapse before the conclusion of sample collection and test initiation.

(d) Test Species Sensitivity Screening: To determine the most sensitive test species for freshwater, the Copermittees must screen 2 wet weather and 2 dry weather toxicity tests with a vertebrate, an invertebrate, and a plant species. After this screening period, subsequent monitoring must be conducted using the most sensitive test species. Alternatively, if a sensitive test species has already been determined, or if there is prior knowledge of potential toxicant(s) and a test species is sensitive to such toxicant(s), then monitoring must be conducted using only that test species. Sensitive test species determinations must also consider the most sensitive test species used for proximal receiving water monitoring. Rescreening must occur once each permit term.

(e) Chronic toxicity test biological endpoint data must be analyzed using the Test of Significant Toxicity t-test approach specified in *National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document* (USEPA, Office of Wastewater Management, Washington, D.C., EPA-833-R-10-003, 2010). For this monitoring program, the critical chronic instream waste concentration (IWC) is set at 100 percent receiving water (i.e. no dilution) for receiving water samples. A 100 percent receiving water and a control must be tested.

(f) Toxicity Identification Evaluation (TIE) / Toxicity Reduction Evaluation (TRE): If chronic toxicity is detected in receiving waters, the Copermittees must discuss the need for conducting a TIE/TRE in the assessments required under Provision D.4.a.(2), and develop a plan for implementing the TIE/TRE to be incorporated in the Water Quality Improvement Plan.

(5) Dry Weather Receiving Water Bioassessment Monitoring

Bioassessment monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must conduct bioassessment monitoring during at least one dry weather monitoring event at each long-term receiving water monitoring station as follows:

(a) The following bioassessment samples and measurements must be collected:

(i) Macroinvertebrate samples must be collected in accordance with the "Reachwide Benthos (Multihabitat) Procedure" in the most current Surface Water Ambient Monitoring Program (SWAMP) Bioassessment Standard Operating Procedures (SOP), and amendments, as applicable;[14]

(ii) The "Full" suite of physical habitat characterization measurements must be collected in accordance with the most current SWAMP Bioassessment SOP, and as summarized in the SWAMP Stream Habitat Characterization Form – Full Version;[15] and

(iii) Freshwater algae samples must be collected in accordance with the SWAMP Standard Operating Procedures for Collecting Algae Samples.[16] Analysis of samples must include algal taxonomic composition (diatoms and soft algae) and algal biomass.

(b) The bioassessment samples, measurements, and appropriate water chemistry data must be used to calculate the following:

(i) An Index of Biological Integrity (IBI) for macroinvertebrates for each monitoring station where bioassessment monitoring was conducted, based on the most current calculation method;[17] and

[14] Ode, P.R.. 2007. Standard operating procedures for collecting macroinvertebrate samples and associated physical and chemical data for ambient bioassessments in California. California State Water Resources Control Board Surface Water Ambient Monitoring Program (SWAMP) Bioassessment SOP 001. http://www.swrcb.ca.gov/water_issues/programs/swamp/tools.shtml#monitoring

[15] Available at: http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/reports/fieldforms_fullversion052908.pdf

[16] Fetscher et al. 2009. Standard Operating Procedures for Collecting Stream Algae Samples and Associated Physical Habitat and Chemical Data for Ambient Bioassessments in California.

[17] The most current calculation method at the time the Order was adopted is outlined in "A Quantitative Tool for Assessing the Integrity of Southern California Coastal Streams" (Ode, et al. 2005. Environmental Management. Vol. 35, No. 1, pp. 1-13). If an updated or new calculation method is developed, either both (i.e. current and updated/new) methods must be used, or historical IBIs must be recalculated with the updated or new calculation method.

(ii) An IBI for algae for each monitoring station where bioassessment monitoring was conducted, when a calculation method is developed.[18]

(c) In lieu of the requirements of Provision D.1.c.(5)(a), the Copermittees may conduct the bioassessment monitoring in accordance with the "Triad" assessment approach[19] to calculate the IBIs required for Provision D.1.c.(5)(b). The Copermittees must conduct sampling, analysis, and reporting of specified in-stream biological and habitat data according to the protocols specified in the SCCWRP Technical Report No. 539, or subsequent protocols, if developed.

(6) Dry Weather Receiving Water Hydromodification Monitoring

In addition to the hydromodification monitoring conducted as part of the Copermittees' Hydromodification Management Plans, hydromodification monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must collect the following hydromodification monitoring observations and measurements within an appropriate domain of analysis during at least one dry weather monitoring event for each long-term receiving water monitoring station:

(a) Channel conditions, including:

(i) Channel dimensions,

(ii) Hydrologic and geomorphic conditions, and

(iii) Presence and condition of vegetation and habitat;

(b) Location of discharge points;

(c) Habitat integrity;

(d) Photo documentation of existing erosion and habitat impacts, with location (i.e. latitude and longitude coordinates) where photos were taken;

(e) Measurement or estimate of dimensions of any existing channel bed or bank eroded areas, including length, width, and depth of any incisions; and

[18] When a calculation method is developed, IBIs must be calculated for all available and appropriate historical data.
[19] Stormwater Monitoring Coalition Model Monitoring Technical Committee, 2004. Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California. Technical Report #419. August 2004.

(f) Known or suspected cause(s) of existing downstream erosion or habitat impact, including flow, soil, slope, and vegetation conditions, as well as upstream land uses and contributing new and existing development.

d. WET WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three wet weather monitoring events at each long-term receiving water monitoring station. At least one wet weather monitoring event must be conducted during the first wet weather event of the wet season (October 1 – April 30), and at least one wet weather monitoring event during a wet weather event that occurs after February 1.

(1) Wet Weather Receiving Water Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each long-term receiving water monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event;

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(d) Presence and assessment of trash in and around station.

(2) Wet Weather Receiving Water Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

(3) Wet Weather Receiving Water Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) Constituents listed in Table D-3.

(4) Wet Weather Receiving Water Toxicity Monitoring

For each wet weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for chronic aquatic toxicity in accordance with Provisions D.1.c.(4)(a)-(f).

e. OTHER RECEIVING WATER MONITORING REQUIREMENTS

(1) Regional Monitoring

The Copermittees must participate in the following regional receiving waters monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring; and

(b) Southern California Bight Regional Monitoring.

(2) Sediment Quality Monitoring

The Copermittees must perform sediment monitoring to assess compliance with sediment quality receiving water limits applicable to MS4 discharges to enclosed bays and estuaries. The monitoring may be performed either by individual or multiple Copermittees to assess compliance with receiving water limits, or through participation in a water body monitoring coalition. A Sediment Monitoring Plan which satisfies the requirements of the State Water Board's Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part 1 Sediment Quality (Sediment Control Plan) must be submitted as part of the monitoring and assessment program in the Water Quality Improvement Plan.

(a) The Sediment Monitoring Plan design must include the following:

(i) The elements required under Section VII.D (Receiving Water Limits Monitoring Frequency) and Section VII.E (Sediment Monitoring) of the Sediment Control Plan;

(ii) A Quality Assurance Project Plan (QAPP) describing the project objectives and organization, functional activities, and quality assurance/quality control protocols for the water and sediment monitoring; and

(iii) A schedule for completion of all sample collection and analysis activities and submission of Sediment Monitoring Reports.

(b) The Copermittees must implement the Sediment Monitoring Plan in accordance with the schedule contained in the Sediment Monitoring Plan, unless otherwise directed in writing by the San Diego Water Board Executive Officer.

(c) The Copermittees must incorporate a Sediment Monitoring Report as part of the Water Quality Improvement Plan Annual Report in accordance with the schedule contained in the Sediment Monitoring Plan, unless otherwise directed in writing by the San Diego Water Board Executive Officer. The Sediment Monitoring Report must contain the following information:

(i) Analysis: An evaluation, interpretation and tabulation of the water and sediment monitoring data, including interpretations and conclusions as to whether applicable Receiving Water Limitations in this Order have been attained at each sample station;

(ii) Sample Location Map: The locations, type, and number of samples shall be identified and shown on a site map; and

(iii) California Environmental Data Exchange Network: A statement certifying that the monitoring data and results have been uploaded into the California Environmental Data Exchange Network (CEDEN).

(d) Based on the Sediment Monitoring Report conclusions the San Diego Water Board may require a human health risk assessment to determine if the human health objective contained in Receiving Water Limitations in Provision A.2.a.(3)(b)(ii) has been attained at each sample station. In conducting a risk assessment, the Copermittees must consider any applicable and relevant information, including California Environmental Protection Agency's (Cal/EPA) Office of Environmental Health Hazard Assessment (OEHHA) policies for fish consumption and risk assessment, Cal/EPA's Department of Toxic Substances Control (DTSC) Risk Assessment, and USEPA Human Health Risk Assessment policies.

(3) ASBS Monitoring

For Watershed Management Areas with ASBS, the Copermittees must implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

f. ALTERNATIVE WATERSHED MONITORING REQUIREMENTS

The San Diego Water Board may direct the Copermittees to participate in an effort to develop alternative watershed monitoring with other regulated entities, other interested parties, and the San Diego Water Board to refine, coordinate, and implement regional monitoring and assessment programs to determine the status and trends of water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams.

2. MS4 Outfall Discharge Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the discharges from the MS4 outfalls in each Watershed Management Area during dry weather and wet weather. Following San Diego Water Board acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct MS4 outfall discharge monitoring during implementation of the Water Quality Improvement Plan to assess the effectiveness of their jurisdictional runoff

management programs toward effectively prohibiting non-storm water discharges into the MS4 and reducing pollutants in storm water discharges from their MS4s to the MEP. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following MS4 outfall monitoring procedures:

a. TRANSITIONAL MS4 OUTFALL DISCHARGE MONITORING

Until the monitoring requirements and schedules of Provisions D.2.b-c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following MS4 outfall discharge monitoring in the Watershed Management Area:

(1) MS4 Outfall Discharge Monitoring Station Inventory

Each Copermittee must identify all major MS4 outfalls that discharge directly to receiving waters within its jurisdiction and geo-locate those outfalls on a map of the MS4 pursuant to Provision E.2.b.(1). This information must be compiled into a MS4 outfall discharge monitoring station inventory, and must include the following information:

(a) Latitude and longitude of MS4 outfall point of discharge;

(b) Watershed Management Area;

(c) Hydrologic subarea;

(d) Outlet size;

(e) Accessibility (i.e. safety and without disturbance of critical habitat);

(f) Approximate drainage area; and

(g) Classification of whether the MS4 outfall is known to have persistent dry weather flows, transient dry weather flows, no dry weather flows, or unknown dry weather flows.

(2) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Until the monitoring requirements and schedules of Provision D.2.b are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, each Copermittee must perform dry weather MS4 outfall field screening monitoring to identify non-storm water and illicit discharges within its jurisdiction in accordance with Provision E.2.c, to determine which discharges are transient flows and which

are persistent flows, and prioritize the dry weather MS4 discharges that will be investigated and eliminated in accordance with Provision E.2.d.

(a) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Frequency

Each Copermittee must field screen the MS4 outfalls in its inventory developed pursuant to Provision D.2.a.(1) as follows:

(i) For Copermittees with less than 125 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 80 percent of the outfalls must be visually inspected two times per year during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls see Provision D.2.a.(2)(a)(iv).

(ii) For Copermittees with 125 major MS4 outfalls or more, but less than or equal to 500, that discharge to receiving waters within a Watershed Management Area all the outfalls must be visually inspected at least annually during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls see Provision D.2.a.(2)(a)(iv).

(iii) For Copermittees with more than 500 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 500 outfalls must be visually inspected at least annually during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls see Provision D.2.a.(2)(a)(iv). Copermittees with more than 500 major MS4 outfalls within a Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(iv) For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major MS4 outfalls within its jurisdiction, at least 500 major MS4 outfalls within its inventory must be visually inspected at least annually during dry

weather conditions. Copermittees with more than 500 major MS4 outfalls in more than one Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(v) Inspections of major MS4 outfalls conducted in response to public reports and staff or contractor reports and notifications may count toward the required visual inspections of MS4 outfall discharge monitoring stations.

(b) Transitional Dry Weather MS4 Outfall Discharge Field Screening Visual Observations

(i) An antecedent dry period of at least 72 hours following any storm event producing measurable rainfall greater than 0.1 inch is required prior to conducting field screening visual observations during a field screening monitoring event.

(ii) During the field screening monitoring event, each Copermittee must record visual observations consistent with Table D-5 at each MS4 outfall discharge monitoring station inspected.

Table D-5. Field Screening Visual Observations for MS4 Outfall Discharge Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) - Flow source(s) suspected or identified from non-storm water source investigation - Flow source(s) eliminated during non-storm water source identification • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) - Known or suspected source(s) of pooled or ponded water • Station description (i.e. deposits or stains, vegetation condition, structural condition, observable biology) • Presence and assessment of trash in and around station • Evidence or signs of illicit connections or illegal dumping

(iii) Each Copermittee must implement the requirements of Provisions E.2.d.(2)(c)-(e) based on the field observations.

(iv) Each Copermittee must evaluate field observations together with existing information available from prior reports, inspections and monitoring results to determine whether any observed flowing, pooled, or ponded waters are likely to be transient or persistent flow.[20]

(c) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Records

Based upon the results of the transitional dry weather MS4 outfall discharge field screening monitoring conducted pursuant to Provisions D.2.a.(2)(a)-(b), each Copermittee must update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow.

(3) Transitional Wet Weather MS4 Outfall Discharge Monitoring

Until the monitoring requirements and schedules of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(a) Transitional Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees must select wet weather MS4 outfall discharge monitoring stations from the inventories developed pursuant to Provision D.2.a.(1) for each Watershed Management Area as follows:

(i) At least five wet weather MS4 outfall discharge monitoring stations that are representative of storm water discharges from areas consisting primarily of residential, commercial, industrial, and typical mixed-use land uses present within the Watershed Management Area;

(ii) At least one wet weather MS4 outfall discharge monitoring station for each Copermittee within the Watershed Management Area; and

(iii) The County of San Diego may select at least two (2) wet weather MS4 outfall discharge monitoring stations for the portion of the Santa

[20] Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

Margarita River Watershed Management Area within its jurisdiction to be monitored during the transitional period until the Riverside County Copermittees are notified of coverage under this Order. After the Riverside County Copermittees are notified of coverage under this Order, the Copermittees in the Watershed Management Area must select wet weather MS4 outfall discharge monitoring stations consistent with the requirements above.

(b) Transitional Wet Weather MS4 Outfall Discharge Monitoring Frequency

Each wet weather MS4 outfall discharge monitoring station selected pursuant to Provision D.2.a.(3)(a) must be monitored ~~twice~~ once during the wet season (October 1 – April 30). The wet weather monitoring events must be selected to be representative of the range of hydrological conditions experienced in the region. At least 10 percent of samples must be conducted during the first wet weather event of the wet season, to include at least one such sample in each Watershed Management Area..

(c) Transitional Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(i) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(ii) The flow rates and volumes measured or estimated from the MS4 outfall (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(d) Transitional Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(e) Transitional Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, and indicator bacteria;

(iv) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

[a] Time-weighted composites collected over the length of the storm event or the first 24 hour period whichever is shorter, composed of discrete samples, which may be collected through the use of automated equipment, or

[b] Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

[c] If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours;

(v) Only one analysis of the composite of aliquots is required;

(vi) The samples must be analyzed for the following constituents:

[a] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

[b] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and

[c] Constituents listed in in Table D-6.

Table D-6. Analytical Monitoring Constituents for Wet Weather MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Nickel • Selenium • Thallium • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(f) Other Transitional Wet Weather MS4 Outfall Discharge Monitoring

The San Diego County Copermittees must continue the wet weather MS4 outfall monitoring program developed under Order No. R9-2007-0001, as approved by the San Diego Water Board, through its planned completion.

b. DRY WEATHER MS4 OUTFALL DISCHARGE MONITORING

Each Copermittee must perform dry weather MS4 outfall monitoring to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. Each Copermittee must conduct the following dry weather MS4 outfall discharge monitoring within its jurisdiction:

(1) Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Each Copermittee must continue to perform the dry weather MS4 outfall discharge field screening monitoring in accordance with the requirements of Provision D.2.a.(2). The Copermittee may adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of persistent flow non-storm water discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of visual inspections performed is equivalent to the number of visual inspections required under Provision D.2.a.(2)(a).

(2) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring

Each Copermittee must perform non-storm water persistent flow MS4 outfall discharge monitoring to determine which persistent non-storm water discharges contain concentrations of pollutants below NALs, and which persistent non-storm water discharges impact receiving water quality during dry weather. Each Copermittee must conduct the following non-storm water persistent flow MS4 outfall discharge monitoring within its jurisdiction:

(a) Prioritization of Non-Storm Water Persistent Flow MS4 Outfalls

Based upon the dry weather MS4 outfall discharge field screening monitoring records developed pursuant to Provision D.2.a.(2)(c), each Copermittee must identify and prioritize the MS4 outfalls with persistent flows based on the highest priority water quality conditions identified in the Water Quality Improvement Plan and any additional criteria developed by the Copermittee, which may include historical data and data from sources other than what the Copermittee collects.

(b) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring Frequency

(i) Based on the prioritization of major MS4 outfalls developed under Provision D.2.b.(2)(a), each Copermittee must identify, at a minimum, the 5 highest priority major MS4 outfalls with non-storm water persistent flows that the Copermittee will monitor within its jurisdiction in each Watershed Management Area. For Responsible Copermittees identified by a TMDL in Attachment E of this Order, if the 5 chosen outfall locations are not sufficient to determine compliance with the TMDL(s), then each Responsible Copermittee must identify additional MS4 outfall monitoring locations within its jurisdiction sufficient to address compliance with the TMDL(s). If a Copermittee has less than 5 major outfalls within a Watershed Management Area, then the Copermittee must monitor all of its major MS4 outfalls with persistent flows within each Watershed Management Area. The location of the highest priority non-storm water persistent flow MS4 outfall monitoring stations must be identified on the map required pursuant to Provision E.2.b.(1). The map must specify which MS4 outfalls are being monitored for compliance with a TMDL.

(ii) Each of the highest priority non-storm water persistent flow MS4 outfall monitoring stations identified pursuant to Provision D.2.b.(2)(b)(i) must be monitored under dry weather conditions at least semi-annually until one of the following occurs:

[a] The non-storm water discharges have been effectively eliminated (i.e. no flowing, pooled, or ponded water) for three consecutive dry weather monitoring events; or

[b] The source(s) of the persistent flows has been identified as a category of non-storm water discharges that does not require an NPDES permit and does not have to be addressed as an illicit discharge because it was not identified as a source of pollutants (i.e. constituents in non-storm water discharge do not exceed NALs), and the persistent flow can be re-prioritized to a lower priority; or

[c] The constituents in the persistent flow non-storm water discharge do not exceed NALs, and the persistent flow can be re-prioritized to a lower priority; or

[d] The source(s) of the persistent flows has been identified as a non-storm water discharge authorized by a separate NPDES permit.

(iii) Where the criteria under Provision D.2.b.(2)(c)(ii) are not met, but the threat to water quality has been reduced by the Copermittee, the highest priority persistent flow MS4 outfall monitoring stations may be reprioritized accordingly for continued dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1).

(iv) Each Copermittee must document removal or re-prioritization of the highest priority persistent flow MS4 outfall monitoring stations identified under Provision D.2.b.(2)(b) in the Water Quality Improvement Plan Annual Report. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized major MS4 outfall in the Watershed Management Area within its jurisdiction, unless there are no remaining qualifying major MS4 outfalls within the Copermittee's jurisdiction in the Watershed Management Area.

(c) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Observations

During each semi-annual monitoring event, each Copermittee must record field observations consistent with Table D-5 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(d) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Monitoring

During each semi-annual monitoring event, if conditions allow the collection of the data, each Copermittee must monitor and record the parameters in Table D-2 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(e) Non-Storm Water Persistent Flow MS4 Outfall Discharge Analytical Monitoring

During each semi-annual monitoring event in which measurable flow is present, each Copermittee must collect and analyze samples from each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Collect grab or composite samples to be analyzed at a qualified laboratory for the following constituents:

[a] Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,
[b] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,
[c] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,
[d] Applicable NAL constituents, and
[e] Constituents listed in Table D-7. The Copermittees may adjust the list of constituents for the Watershed Management Area if historical data or supporting information can be provided that demonstrates or justifies the analysis of a constituent is not necessary.

Table D-7. Analytical Monitoring Constituents for Persistent Flow MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Total Hardness • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Cadmium • Copper • Lead • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(iv) If the Copermittee identifies and eliminates the source of the persistent flow non-storm water discharge, analysis of the sample is not required.

c. WET WEATHER MS4 OUTFALL DISCHARGE MONITORING

The Copermittees must perform wet weather MS4 outfall monitoring to identify pollutants in storm water discharges from the MS4s, to guide pollutant source identification efforts, and to determine compliance with the WQBELs associated with the applicable TMDLs in Attachments E of this Order. The Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(1) Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees may adjust the wet weather MS4 outfall discharge monitoring locations in the Watershed Management Area, as needed, to identify pollutants in storm water discharges from MS4s, to guide pollutant source identification efforts, and to determine compliance with the WQBELs associated with the applicable TMDLs in Attachments E of this Order in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of stations is at least equivalent to the number of stations required under Provision D.2.a.(3)(a). Additional outfall monitoring locations, above the minimum per jurisdiction, may be required to demonstrate compliance with the WQBELs associated with the applicable TMDLs in Attachments E.

(2) Wet Weather MS4 Outfall Discharge Monitoring Frequency

The Copermittees must monitor the wet weather MS4 outfall discharge monitoring stations in the Watershed Management Area at least once (1) per year. The Copermittees may need to increase the frequency of monitoring in order to identify pollutants in storm water discharges from the MS4s causing or contributing to the highest priority water quality conditions, to guide pollutant source identification efforts, or to determine compliance with the WQBELs associated with the applicable TMDLs in Attachments E of this Order.

(3) Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm

event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(4) Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(5) Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites collected over the length of the storm event or the first 24 hour period, whichever is shorter , composed of discrete samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

(iii) If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours.

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) The Copermittees may adjust the analytical monitoring required for the Watershed Management Area, if the Copermittees have historical data or supporting information that can demonstrate or provide justification that the analysis of a constituent is not necessary.

3. Special Studies

a. Within the term of this Order, the Copermittees must initiate the following special studies:

(1) At least two special studies in each Watershed Management Area to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that cause or contribute to highest priority water quality conditions identified in the Water Quality Improvement Plan.

(2) At least one special study for the San Diego Region to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that are impacting receiving waters on a regional basis in the San Diego Region.

(3) One of the two special studies in each Watershed Management Area may be replaced by a special study implemented pursuant to Provision D.3.a.(2).

b. The special studies must, at a minimum, be in conformance with the following criteria:

(1) The special studies must be related to the highest priority water quality conditions identified by the Copermittees in the Watershed Management Area and/or for the entire San Diego Region;

(2) The special studies developed pursuant to Provision D.3.a.(1) must:

(a) Be implemented within the applicable Watershed Management Area, and

(b) Require some form of participation by all the Copermittees within the Watershed Management Area;

(3) The special studies developed pursuant to Provision D.3.a.(2) must:

(a) Be implemented within the San Diego Region, and

(b) Require some form of participation by all Copermittees covered under the requirements of this Order.

(4) The Copermittees are encouraged to partner with environmental groups or third parties knowledgeable of watershed conditions to complete the required special studies.

c. Special studies developed to identify sources of pollutants and/or stressors should be pollutant and/or stressor specific and based on historical monitoring data and monitoring performed pursuant to Provisions D.1 and D.2. Development of source identification special studies should include the following:

(1) A compilation of known information on the specific pollutant and/or stressor, including data on potential sources and movement of the pollutant and/or stressor within the watershed. Data generated by the Copermittees and others, as well as information available from a literature research on the pollutant and/or stressor should be compiled and analyzed as appropriate.

(2) An identification of data gaps, based on the compiled information generated on the specific pollutant and/or stressor in Provision D.3.d.(1). Source identification special studies should be developed to fill identified data gaps.

(3) A monitoring plan that will collect and provide data the Copermittees can utilize to do the following:

(a) Quantify the relative loading or impact of a pollutant and/or stressor from a particular source or pollutant generating activity;

(b) Improve understanding of the fate of a pollutant and/or stressor in the environment;

(c) Develop an inventory of known and suspected sources of a pollutant and/or stressor in the Watershed Management Area; and/or

(d) Prioritize known and suspected sources of a pollutant and/or stressor based on relative magnitude in discharges, geographical distribution (i.e., regional or localized), frequency of occurrence in discharges, human health risk, and controllability.

d. Special studies initiated prior to the effective date of this Order that meet the requirements of Provision D.3.b and are implemented during the term of this Order as part of the Water Quality Improvement Plan may be utilized to fulfill the special study requirements of Provision D.3.a. Special studies completed before the effective date of this Order ~~Water Quality Improvement Plan is accepted by the San Diego Water Board~~ cannot be utilized to fulfill the special study requirements of Provision D.3.a.

e. The Copermittees must submit the monitoring plans for the special studies in the Water Quality Improvement Plans required pursuant to Provision F.1.

f. The Copermittees are encouraged to share the results of the special studies regionally among the Copermittees to provide information useful in improving and adapting the management of non-storm water and storm water runoff through the implementation of the Water Quality Improvement Plans.

4. Assessment Requirements

Each Copermittee must evaluate the data collected pursuant to Provisions D.1, D.2 and D.3, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E, to assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a. Assessments must be performed as described in the following provisions:

a. Receiving Waters Assessments

(1) The Copermittees must assess and report the conditions of the receiving waters in the Watershed Management Area as follows:

(a) Based on data collected pursuant to Provision D.1.a, the assessments under Provision D.4.a.(2) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(b) Based on the data collected pursuant to Provisions D.1.a-e, the assessments required under Provision D.4.a.(2) must be included in the Report of Waste Discharge required pursuant to Provision F.5.b.

(2) The Copermittees must assess the status and trends of receiving water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries,

and lagoons, and 3) streams under dry weather and wet weather conditions. For each of the three types of receiving waters in each Watershed Management Area the Copermittees must:

(a) Determine whether or not the conditions of the receiving waters are meeting the numeric goals established pursuant to Provision B.3.a;

(b) Identify the most critical beneficial uses that must be protected to ensure overall health of the receiving water;

(c) Determine whether or not those critical beneficial uses are being protected;

(d) Identify short-term and/or long-term improvements or degradation of those critical beneficial uses;

(e) Determine whether or not the strategies established in the Water Quality Improvement Plan contribute towards progress in achieving the interim and final numeric goals of the Water Quality Improvement Plan; and

(f) Identify data gaps in the monitoring data necessary to assess Provisions D.4.a.(2)(a)-(e).

b. MS4 OUTFALL DISCHARGES ASSESSMENTS

(1) Non-Storm Water Discharges Reduction Assessments

(a) Each Copermittee must assess and report the progress of its illicit discharge detection and elimination program, required to be implemented pursuant to Provision E.2, toward effectively prohibiting non-storm water and illicit discharges into the MS4 within its jurisdiction as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(2), the assessments under Provision D.4.b.(1)(b) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(ii) Based on the data collected pursuant to Provisions D.2.b, the assessments required under Provision D.4.b.(1)(c) must be included in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

(iii) Based on the data collected pursuant to Provisions D.2.b, the assessment required under Provision D.4.b.(1)(c) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.a.(2), each Copermittee must assess and report the following:

(i) Identify the known and suspected controllable sources (e.g. facilities, areas, land uses, pollutant generating activities) of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area;

(ii) Identify sources of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area that have been reduced or eliminated; and

(iii) Identify modifications to the field screening monitoring locations and frequencies for the MS4 outfalls in its inventory necessary to identify and eliminate sources of persistent flow non-storm water discharges pursuant to Provision D.2.b.(1).

(c) Based on the dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b, each Copermittee must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(1)(b);

(ii) Based on the data collected and applicable NALs in the Water Quality Improvement Plan, rank the MS4 outfalls in the Copermittee's jurisdiction according to potential threat to receiving water quality, and produce a prioritized list of major MS4 outfalls for follow-up action to update the Water Quality Improvement Plan, with the goal of eliminating persistent flow non-storm water discharges and/or pollutant loads in order of the ranked priority list through targeted programmatic actions and source investigations;

(iii) For the highest priority major MS4 outfalls with persistent flows that are in exceedance of NALs, identify the known and suspected sources within the Copermittee's jurisdiction in the Watershed Management Area that may cause or contribute to the NAL exceedances;

(iv) Each Copermittee must analyze the data collected pursuant to Provision D.2.b, and utilize a model or other method, to calculate or estimate the non-storm water volumes and pollutant loads collectively discharged from all the major MS4s outfalls in its jurisdiction identified as having persistent dry weather flows during the monitoring year. These calculations or estimates must be updated annually.

[a] Each Copermittee must calculate or estimate the annual non-storm water volumes and pollutant loads collectively discharged

from the Copermittee's major MS4 outfalls to receiving waters within the Copermittee's jurisdiction, with an estimate of the percent contribution from each known source for each MS4 outfall;

[b] Each Copermittee must annually identify and quantify (i.e. volume and pollutant loads) sources of non-storm water not subject to the Copermittee's legal authority that are discharged from the Copermittee's major MS4 outfalls to downstream receiving waters.

(v) Each Copermittee must review the data collected pursuant to Provision D.2.b and findings from the assessments required pursuant to Provision D.4.b.(1)(c)(i)-(iv) at least once during the term of this Order to:

[a] Identify reductions and progress in achieving reductions in non-storm water and illicit discharges to the Copermittee's MS4 in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction, with an estimate, if possible, of the non-storm water volume and/or pollutant load reductions attributable to specific water quality strategies implemented by the Copermittee; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittee in the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction.

(vi) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(v).

(2) <u>Storm Water Pollutant Discharges Reduction Assessments</u>

(a) The Copermittees must assess and report the progress of the water quality improvement strategies, required to be implemented pursuant to Provisions B and E, toward reducing pollutants in storm water discharges from the MS4s within the Watershed Management Area as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(3), the assessments under Provision D.4.b.(2)(b) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(ii) Based on the data collected pursuant to Provisions D.2.c, the assessments required under Provision D.4.b.(2)(c) must be included

in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(1).

(iii) Based on the data collected pursuant to Provisions D.2.c, the assessment required under Provisions D.4.b.(2)(c)-(d) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.a.(3) the Copermittees must assess and report the following:

(i) The Copermittees must analyze the monitoring data collected pursuant to Provision D.2.a.(3), and utilize a watershed model or other method, to calculate or estimate the following for each monitoring year:

[a] The average storm water runoff coefficient for each land use type within the Watershed Management Area;
[b] The volume of storm water and pollutant loads discharged from each of the Copermittee's monitored MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch;
[c] The total flow volume and pollutant loadings discharged from the Copermittee's jurisdiction within the Watershed Management Area over the course of the wet season, extrapolated from the data produced from the monitored MS4 outfalls; and
[d] The percent contribution of storm water volumes and pollutant loads discharged from each land use type within ~~the~~ each hydrologic subarea with a major MS4 outfall to receiving waters or within each major MS4 outfall to receiving waters ~~drainage basin to each of~~ in the Copermittee's ~~major MS4 outfalls in its~~ jurisdiction ~~to receiving waters~~ within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch.

(ii) Identify modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify pollutants in storm water discharges from the MS4s in the Watershed Management Area pursuant to Provision D.2.c.(1).

(c) Based on the wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.c the Copermittees must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(2)(b);

(ii) Based on the data collected and applicable SALs in the Water Quality Improvement Plan, analyze and compare the monitoring data

to the analyses and assumptions used to develop the Water Quality Improvement Plans, including strategies developed pursuant to Provision B.3, and evaluate whether those analyses and assumptions should be updated as a component of the adaptive management efforts pursuant to Provision B.5 for follow-up action to update the Water Quality Improvement Plan;

(iii) The Copermittees must review the data collected pursuant to Provision D.2.c and findings from the assessments required pursuant to Provisions D.4.b.(2)(c)(i)-(ii) at least once during the term of this Order to:

[a] Identify reductions or progress in achieving reductions in pollutant concentrations and/or pollutant loads from different land uses and/or drainage areas discharging from the Copermittees' MS4s in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters within the Watershed Management Area to the MEP, with an estimate, if possible, of the pollutant load reductions attributable to specific water quality strategies implemented by the Copermittees; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittees in the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters in the Watershed Management Area to the MEP.

(iv) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(iii).

(d) The Copermittees must evaluate all the data collected pursuant to Provision D.2.c, and incorporate new outfall monitoring data into time series plots for each long-term monitoring constituent for the Watershed Management Area, and perform statistical trends analysis on the cumulative long-term wet weather MS4 outfall discharge water quality data set.

c. Special Studies Assessments

The Copermittees must annually evaluate the results and findings from the special studies developed and implemented pursuant to Provision D.3, and assess their relevance to the Copermittees' efforts to characterize receiving water conditions, understand sources of pollutants and/or stressors, and control and reduce the discharges of pollutants from the MS4 outfalls to receiving waters in the Watershed Management Area. The Copermittees must report the results of the special studies assessments applicable to the Watershed Management

Area, and identify any necessary modifications or updates to the Water Quality Improvement Plan based on the results in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.

d. INTEGRATED ASSESSMENT OF WATER QUALITY IMPROVEMENT PLAN

As part of the iterative approach and adaptive management process required for the Water Quality Improvement Plan pursuant to Provision B.5, the Copermittees in each Watershed Management Area must integrate the data collected pursuant to Provisions D.1-D.3, the findings from the assessments required pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to assess the effectiveness of, and identify necessary modifications to, the Water Quality Improvement Plan as follows:

(1) The Copermittees must re-evaluate the priority water quality conditions and numeric goals for the Watershed Management Area, as needed, during the term of this Order pursuant to Provision B.5.a. The re-evaluation and recommendations for modifications to the priority water quality conditions, and/or numeric goals and corresponding schedules may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b, but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The priority water quality conditions and numeric goals for the Watershed Management Area must be re-evaluated as follows:

(a) Re-evaluate the receiving water conditions in the Watershed Management Area in accordance with Provision B.2.a;

(b) Re-evaluate the impacts on receiving waters in the Watershed Management Area from MS4 discharges in accordance with Provision B.2.b;

(c) Re-evaluate the identification of MS4 sources of pollutants and/or stressors in accordance with Provision B.2.d;

(d) Identify beneficial uses of the receiving waters that are protected in accordance with Provision D.4.a;

(e) Evaluate the progress toward achieving the interim and final numeric goals for protecting impacted beneficial uses in the receiving waters.

(2) The Copermittees must re-evaluate the water quality improvement strategies for the Watershed Management Area during the term of this Order pursuant to Provision B.5.b. The re-evaluation and recommendations for modifications to the water quality improvement strategies and schedules may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b, but must at least be provided in the Report of Waste

Discharge pursuant to Provision F.5.b. The water quality improvement strategies for the Watershed Management Area must be re-evaluated as follows:

(a) Identify the non-storm water and storm water pollutant loads from the Copermittees' MS4 outfalls in the Watershed Management Area, calculated or estimated pursuant to Provisions D.4.b;

(b) Identify the non-storm water and storm water pollutant load reductions, or other improvements to receiving water or water quality conditions, that are necessary to attain the interim and final numeric goals identified in the Water Quality Improvement Plan for protecting beneficial uses in the receiving waters;

(c) Identify the non-storm water and storm water pollutant load reductions, or other improvements to the quality of MS4 discharges, that are necessary for the Copermittees to demonstrate that non-storm water and storm water discharges from their MS4s are not causing or contributing to exceedances of receiving water limitations;

(d) Evaluate the progress of the water quality improvement strategies toward achieving the interim and final numeric goals identified in the Water Quality Improvement Plan for protecting beneficial uses in the receiving waters.

(3) The Copermittees must re-evaluate and adapt the water quality monitoring and assessment program for the Watershed Management Area when new information becomes available to improve the monitoring and assessment program pursuant to Provision B.5.c. The re-evaluation and recommendations for modifications to the monitoring and assessment program may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b, but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. Modifications to the water quality monitoring and assessment program must be consistent with the requirements of Provision D.1-D.3. The re-evaluation of the water quality monitoring and assessment program for the Watershed Management Area must consider the data gaps identified by the assessments required pursuant to Provisions D.4.a-b, and results of the special studies implemented pursuant to Provision D.4.c.

5. Monitoring Provisions

Each Copermittee must comply with all the monitoring, reporting, and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

E. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS

The purpose of this provision is for each Copermittee to implement a program to control the contribution of pollutants to and the discharges from the MS4 within its jurisdiction. The goal of the jurisdictional runoff management programs is to implement strategies that effectively prohibit non-storm water discharges to the MS4 and reduce the discharge of pollutants in storm water to the MEP. This goal will be accomplished through implementing the jurisdictional runoff management programs in accordance with the strategies identified in the Water Quality Improvement Plans.

Each Copermittee must update its jurisdictional runoff management program document, in accordance with Provision F.2.a, to incorporate all the requirements of Provision E. Until the Copermittee has updated its jurisdictional runoff management program document with the requirements of Provision E, the Copermittee must continue implementing its current jurisdictional runoff management program.

1. Legal Authority Establishment and Enforcement

a. Each Copermittee must establish, maintain, and enforce adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 through statute, ordinance, permit, contract, order, or similar means. This legal authority must, at a minimum, authorize the Copermittee to:

(1) Prohibit and eliminate all illicit discharges and illicit connections to its MS4;

(2) Control the contribution of pollutants in discharges of runoff associated with industrial and construction activity to its MS4 and control the quality of runoff from industrial and construction sites, including industrial and construction sites which have coverage under the statewide General Permit for Discharges of Storm Water Associated with Industrial Activities (Industrial General Permit) or General Permit for Discharges of Storm Water Associated with Construction Activities (Construction General Permit), as well as to those sites which do not;

(3) Control the discharge of spills, dumping, or disposal of materials other than storm water into its MS4;

(4) Control through interagency agreements among Copermittees the contribution of pollutants from one portion of the MS4 to another portion of the MS4;

(5) Control, by coordinating and cooperating with other owners of the MS4 such as Caltrans, the U.S. federal government, or sovereign Native American Tribes through interagency agreements, where possible, the contribution of pollutants from their portion of the MS4 to the portion of the MS4 within the Copermittee's jurisdiction;

(6) Require compliance with conditions in its statutes, ordinances, permits, contracts, orders, or similar means to hold dischargers to its MS4 accountable for their contributions of pollutants and flows;

(7) Require the use of BMPs to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(8) Require documentation on the effectiveness of BMPs implemented to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(9) Utilize enforcement mechanisms to require compliance with its statutes, ordinances, permits, contracts, orders, or similar means; and

(10) Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with its statutes, ordinances, permits, contracts, orders, or similar means and with the requirements of this Order, including the prohibition of illicit discharges and connections to its MS4; the Copermittee must also have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from industrial facilities, including construction sites, discharging into its MS4.

b. With the first Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b, each Copermittee must submit a statement certified by its Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative that the Copermittee has taken the necessary steps to obtain and maintain full legal authority within its jurisdiction to implement and enforce each of the requirements contained in this Order.

2. Illicit Discharge Detection and Elimination

Each Copermittee must implement a program to actively detect and eliminate illicit discharges and improper disposal into the MS4, or otherwise require the discharger to apply for and obtain a separate NPDES permit. The illicit discharge detection and elimination program must be implemented in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include, at a minimum, the following requirements:

a. Non-Storm Water Discharges

Each Copermittee must address all non-storm water discharges as illicit discharges, unless a non-storm water discharge is either identified as a discharge authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to the following requirements:

(1) Discharges of non-storm water to the MS4 from the following categories must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG919001 (Order No. R9-2007-0034, or subsequent order) for discharges to San Diego Bay, or NPDES Permit No. CAG919002 (Order No. R9-2008-0002, or subsequent order) for discharges to surface waters other than San Diego Bay:

(1) Uncontaminated pumped ground water;

(2) Discharges from foundation drains;[21]

(3) Water from crawl space pumps; and

(4) Water from footing drains.[21]

(2) Discharges of non-storm water from water line flushing and water main breaks to the MS4 must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG 679001 (Order No. R9-2010-0003, or subsequent order). This category includes water line flushing and water main break discharges from water purveyors issued a water supply permit by the California Department of Public Health or federal military installations. Discharges from recycled or reclaimed water lines to the MS4 must be addressed as illicit discharges, unless the discharges have coverage under a separate NPDES permit.

(3) Discharges of non-storm water to the MS4 from the following categories must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a source of pollutants to receiving waters:

(a) Diverted stream flows;

(b) Rising ground waters;

(c) Uncontaminated ground water infiltration to MS4s;

(d) Springs;

(e) Flows from riparian habitats and wetlands;

(f) Discharges from potable water sources;

[21] Provision E.2.a.(1) only applies to this category of non-storm water if the system is designed to be located at or below the groundwater table to actively or passively extract groundwater during any part of the year.

(g) Discharges from foundation drains;[22] and

(h) Discharges from footing drains.[22]

(4) Discharges of non-storm water to the MS4 from the following categories must be controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means. Discharges of non-storm water to the MS4 from the following categories not controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means must be addressed by the Copermittee as illicit discharges.

(a) Air conditioning condensation

The discharge of air conditioning condensation should be directed to landscaped areas or other pervious surfaces, or to the sanitary sewer, where feasible.

(b) Individual residential vehicle washing

(i) The discharge of wash water should be directed to landscaped areas or other pervious surfaces where feasible; and

(ii) The minimization of water, washing detergent and other vehicle wash products used for residential vehicle washing , and the implementation of other practices or behaviors that will prevent the discharge of pollutants associated with individual residential vehicle washing from entering the MS4 must be encouraged.

(c) Dechlorinated swimming pool discharges

(i) Residual chlorine, algaecide, filter backwash, or other pollutants from swimming pools must be eliminated prior to discharging to the MS4; and

(ii) The discharge of saline swimming pool water must be directed to the sanitary sewer, landscaped areas, or other pervious surfaces that can accommodate the volume of water, unless the saline swimming pool water can be discharged via a pipe or concrete channel directly to a naturally saline water body (e.g. Pacific Ocean).

(5) Firefighting discharges to the MS4 must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a significant source of pollutants to receiving waters. Firefighting discharges to the MS4 not identified as a significant source of pollutants to receiving waters, must be addressed, at a minimum, as follows:

[22] Provision E.2.a.(3) only applies to this category of non-storm water discharge if the system is designed to be located above the groundwater table at all times of the year, and the system is only expected to discharge non-storm water under unusual circumstances.

(a) Non-emergency firefighting discharges

(i) Building fire suppression system maintenance discharges (e.g. sprinkler line flushing) to the MS4 must be addressed as illicit discharges unless BMPs are implemented to prevent pollutants associated with such discharges to the MS4.

(ii) Non-emergency firefighting discharges (i.e., discharges from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems) must be addressed by a program, to be developed and implemented by the Copermittee, to reduce or eliminate pollutants in such discharges from entering the MS4.

(b) Emergency firefighting discharges

Each Copermittee should develop and encourage implementation of BMPs to reduce or eliminate pollutants in emergency firefighting discharges to the MS4s and receiving waters within its jurisdiction. During emergency situations, priority of efforts should be directed toward life, property, and the environment (in descending order). BMPs should not interfere with immediate emergency response operations or impact public health and safety.

(6) If the Copermittee or San Diego Water Board identifies any category of non-storm water discharges listed under Provisions E.2.a.(1)-(4) as a source of pollutants to receiving waters, the category must be prohibited through ordinance, order, or similar means and addressed as an illicit discharge. Alternatively, the Copermittee may propose controls to be implemented for the category of non-storm water discharges as part of the Water Quality Improvement Plan instead of prohibiting the category of non-storm water discharges, and implement the controls if accepted by the San Diego Water Board as part of the Water Quality Improvement Plan.

(7) Each Copermittee must, where feasible and priorities and resources allow, reduce or eliminate non-storm water discharges listed under Provisions E.2.a.(1)-(4) into its MS4, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit.

b. PREVENT AND DETECT ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to prevent and detect illicit discharges to the MS4:

(1) Each Copermittee must maintain an updated map of its entire MS4 and the corresponding drainage areas. The accuracy of the MS4 map must be confirmed during the field screening required pursuant to Provision E.2.c.

The MS4 map must be included as part of the jurisdictional runoff management program document. Any geographic information system (GIS) layers or files used by the Copermittee to maintain the MS4 map must be made available to the San Diego Water Board upon request. The MS4 map must identify the following:

(a) All segments of the MS4 owned, operated, and maintained by the Copermittee;

(b) All known locations of inlets that discharge and/or collect runoff into the Copermittee's MS4;

(c) All known locations of connections with other MS4s not owned or operated by the Copermittee (e.g. Caltrans MS4s);

(d) All known locations of MS4 outfalls and private outfalls that discharge runoff collected from areas within the Copermittee's jurisdiction;

(e) All segments of receiving waters within the Copermittee's jurisdiction that receive and convey runoff discharged from the Copermittee's MS4 outfalls;

(f) Locations of the MS4 outfalls, identified pursuant to Provision D.2.a.(1), within its jurisdiction; and

(g) Locations of the non-storm water persistent flow MS4 outfall discharge monitoring stations, identified pursuant to Provision D.2.b.(2)(b), within its jurisdiction.

(2) Each Copermittee must use Copermittee personnel and contractors to assist in identifying and reporting illicit discharges and connections during their daily employment activities.

(3) Each Copermittee must promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges to or from the MS4, including the following methods for public reporting:

(a) Operate a public hotline, which can be Copermittee-specific or shared by the Copermittees, and must be capable of receiving reports in both English and Spanish 24 hours per day and seven days per week; and

(b) Designate an e-mail address for receiving electronic reports from the public, which can be Copermittee-specific or shared by the Copermittees, and must be prominently displayed on the Copermittee's webpage and the Regional Clearinghouse required pursuant to Provision F.4.

(4) Each Copermittee must implement practices and procedures (including a notification mechanism) to prevent, respond to, contain, and clean up any spills that may discharge into the MS4 within its jurisdiction from any source. The Copermittee must coordinate, to the extent possible, with spill response teams to prevent entry of spills into the MS4, and prevent contamination of surface water, ground water, and soil. The Copermittee must coordinate spill prevention, containment, and response activities throughout all appropriate Copermittee departments, programs, and agencies.

(5) Each Copermittee must implement practices and procedures to prevent and limit infiltration of seepage from sanitary sewers (including private laterals and failing septic systems) to the MS4.

(6) Each Copermittee must coordinate, when necessary, with upstream Copermittees and/or entities to prevent illicit discharges from upstream sources into the MS4 within its jurisdiction.

c. FIELD SCREENING

Each Copermittee must conduct field screening (i.e. visual observations, field testing, and/or analytical testing) of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4 in accordance with the dry weather MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

d. INVESTIGATE AND ELIMINATE ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to investigate and eliminate illicit discharges to the MS4:

(1) Each Copermittee must prioritize and determine when follow-up investigations will be performed in response to visual observations and/or water quality monitoring data collected during an investigation of a detected non-storm water or illicit discharge to or from the MS4. The criteria for prioritizing investigations must consider the following:

(a) Pollutants identified as causing or contributing to the highest water quality priorities identified in the Water Quality Improvement Plan;

(b) Pollutants identified as causing or contributing, or threatening to cause or contribute to impairments in water bodies on the 303(d) List and/or in environmentally sensitive areas (ESAs), located within its jurisdiction;

(c) Pollutants identified from sources or land uses known to exist within the area, drainage basin, or watershed that discharges to the portion of the MS4 within its jurisdiction included in the investigation;

(d) Pollutants identified as causing or contributing to an exceedance of a NAL in the Water Quality Improvement Plan; and

(e) Pollutants identified as a threat to human health or the environment.

(2) Each Copermittee must implement procedures to investigate and inspect portions of its MS4 that, based on reports or notifications, field screening, or other appropriate information, indicate a reasonable potential of receiving, containing, or discharging pollutants due to illicit discharges, illicit connections, or other sources of non-storm water. The procedures must include the following:

(a) Each Copermittee must develop criteria to:

(i) Assess the validity of each report or notification received; and

(ii) Prioritize the response to each report or notification received.

(b) Each Copermittee must prioritize and respond to each valid report or notification (e.g., public reports, staff or contractor reports and notifications, etc.) of an incident in a timely manner.

(c) In accordance with the requirements of Provision E.2.d.(1), each Copermittee must investigate and seek to identify the source(s) of discharges of non-storm water where flows are observed in and from the MS4 during the field screening required pursuant to Provision D.2.b.(1) as follows:

(i) Obvious illicit discharges must be immediately investigated to identify the source(s) of non-storm water discharges;

(ii) The investigation must include field investigations to identify sources or potential sources for the discharge, unless the source or potential source has already been identified during previous investigations; and

(iii) The investigation may include follow-up field investigations and/or reviewing Copermittee inventories and other land use data to identify potential sources of the discharge.

(d) Each Copermittee must maintain records and a database of the following information:

(i) Location of incident, including hydrologic subarea, portion of MS4 receiving the non-storm water or illicit discharge, and point of discharge or potential discharge from MS4 to receiving water;

(ii) Source of information initiating the investigation (e.g., public reports, staff or contractor reports and notifications, field screening, etc.);

(iii) Date the information used to initiate the investigation was received;

(iv) Date the investigation was initiated;

(v) Dates of follow-up investigations;

(vi) Identified or suspected source of the illicit discharge or connection, if determined;

(vii) Known or suspected related incidents, if any;

(viii) Result of the investigation; and

(ix) If a source cannot be identified and the investigation is not continued, document the response pursuant to the requirements of Provision E.2.d.(3).

(e) Each Copermittee must maintain records and, in accordance with the priorities of the Water Quality Improvement Plan, seek to identify the source(s) of non-storm water discharges from the MS4 where there is evidence of non-storm water having been discharged into or from the MS4 (e.g., pooled water), in accordance with MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.

(3) Each Copermittee must initiate the implementation of procedures, in a timely manner, to eliminate all detected and identified illicit discharges and connections within its jurisdiction. The procedures must include the following responses:

(a) Each Copermittee must enforce its legal authority, as required under Provision E.1, to eliminate illicit discharges and connections to the MS4.

(b) If the Copermittee identifies the source as a controllable source of non-storm water or illicit discharge or connection, the Copermittee must implement its Enforcement Response Plan pursuant to Provision E.6 and enforce its legal authority to prohibit and eliminate illicit discharges and connections to its MS4.

(c) If the Copermittee identifies the source of the discharge as a category of non-storm water discharges in Provision E.2.a, and the discharge is in exceedance of NALs in the Water Quality Improvement Plan, then the Copermittee must determine if: (1) this is an isolated incident or set of circumstances that will be addressed through its Enforcement Response Plan pursuant to Provision E.6, or (2) the category of discharge must be addressed through the prohibition of that category of discharge as an illicit discharge pursuant to Provision E.2.a.(6).

(d) If the Copermittee suspects the source of the non-storm water discharge as natural in origin (i.e. non-anthropogenically influenced) and in conveyance into the MS4, then the Copermittee must document and

provide the data and evidence necessary to demonstrate to the San Diego Water Board that it is natural in origin and does not require further investigation.

(e) If the Copermittee is unable to identify and document the source of a recurring non-storm water discharge to or from the MS4, then the Copermittee must address the discharge as an illicit discharge and update its jurisdictional runoff management program to address the common and suspected sources of the non-storm water discharge within its jurisdiction in accordance with the Copermittee's priorities.

(4) Each Copermittee must submit a summary of the non-storm water discharges and illicit discharges and connections investigated and eliminated within its jurisdiction with each Water Quality Improvement Plan Annual Report required under Provision F.3.b of this Order.

3. Development Planning

Each Copermittee must use their land use and planning authorities to implement a development planning program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. BMP Requirements for All Development Projects

Each Copermittee must prescribe the following BMP requirements during the planning process (i.e. prior to project approval and issuance of local permits) for all development projects (regardless of project type or size), where local permits are issued, including unpaved roads and flood management projects:

(1) General Requirements

(a) Onsite BMPs must be located so as to remove pollutants from runoff prior to its discharge to any receiving waters, and as close to the source as possible;

(b) Structural BMPs must not be constructed within a waters of the U.S.

(c) Onsite BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors (e.g. mosquitos, rodents, or flies).

(2) Source Control BMP Requirements

The following source control BMPs must be implemented at all development projects where applicable and feasible:

(a) Prevention of illicit discharges into the MS4;

(b) Storm drain system stenciling or signage;

(c) Protect outdoor material storage areas from rainfall, run-on, runoff, and wind dispersal;

(d) Protect materials stored in outdoor work areas from rainfall, run-on, runoff, and wind dispersal;

(e) Protect trash storage areas from rainfall, run-on, runoff, and wind dispersal; and

(f) Any additional BMPs determined to be necessary by the Copermittee to minimize pollutant generation at each project.

(3) Low Impact Development (LID) BMP Requirements

The following LID BMPs must be implemented at all development projects where applicable and feasible:

(a) Maintenance or restoration of natural storage reservoirs and drainage corridors (including topographic depressions, areas of permeable soils, natural swales, and ephemeral and intermittent streams);[23]

(b) Buffer zones for natural water bodies (where buffer zones are technically infeasible, require project applicant to include other buffers such as trees, access restrictions, etc.);

(c) Conservation of natural areas within the project footprint including existing trees, other vegetation, and soils;

(d) Construction of streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided public safety is not compromised;

(e) Minimization of the impervious footprint of the project;

(f) Minimization of soil compaction to landscaped areas;

(g) Disconnection of impervious surfaces through distributed pervious areas;

[23] Development projects proposing to dredge or fill materials in waters of the U.S. must obtain a CWA Section 401 Water Quality Certification. Projects proposing to dredge or fill waters of the state must obtain waste discharge requirements.

(h) Landscaped or other pervious areas designed and constructed to effectively receive and infiltrate, retain and/or treat runoff from impervious areas, prior to discharging to the MS4;

(i) Small collection strategies located at, or as close as possible to, the source (i.e. the point where storm water initially meets the ground) to minimize the transport of runoff and pollutants to the MS4 and receiving waters;

(j) Use of permeable materials for projects with low traffic areas and appropriate soil conditions;

(k) Landscaping with native or drought tolerant species; and

(l) Harvesting and using precipitation.

b. PRIORITY DEVELOPMENT PROJECTS

Priority Development Projects are land development projects that fall under the planning and building authority of the Copermittee for which the Copermittee must impose specific requirements, in addition to those described in Provision E.3.a, including the implementation of structural BMPs to meet the performance requirements described in Provisions E.3.c.

(1) Definition of Priority Development Project

Priority Development Projects include the following:

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site)~~, or redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site)~~. This ~~category~~ includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(b) Redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site on an existing site of 10,000 square feet or more of impervious surfaces). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

~~(b)~~
(c) New and redevelopment projects that create 5,000 square feet or more of impervious surface (collectively over the entire project site), and support one or more of the following uses:

(i) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812).

(ii) Hillside development projects. This category includes development on any natural slope that is twenty-five percent or greater.

(iii) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce.

(iv) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

~~(c)~~
(d) New or redevelopment projects that create or replace 2,500 square feet or more of impervious surface (collectively over the entire project site), and discharging directly to an Environmentally Sensitive Area (ESA). "Discharging directly to" includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands).

~~(d)~~
(e) New development projects that support one or more of the following uses:

(i) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

(ii) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

~~(e)~~
(f) New or redevelopment projects that result in the disturbance of one or more acre of land and are expected to generate pollutants post construction.

(2) Special Considerations for Redevelopment Projects

The structural BMP performance requirements of Provisions E.3.c. are applicable to redevelopment Priority Development Projects, as defined in E.3.b.(1), as follows:

(a) Where redevelopment results in the creation or replacement of impervious surface in an amount of less than fifty percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provisions E.3.c apply only to the creation or replacement of impervious surface, and not the entire development; or

(b) Where redevelopment results in the creation or replacement of impervious surface in an amount of more than fifty percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provisions E.3.c apply to the entire development.

(3) Priority Development Project Exemptions

Each Copermittee has the discretion to exempt the following projects from being defined as Priority Development Projects:

(a) New or retrofit paved sidewalks, bicycle lanes, or trails that meet the following criteria:

(i) Designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas; OR

(ii) Designed and constructed to be hydraulically disconnected from paved streets or roads; OR

(iii) Designed and constructed with permeable pavements or surfaces in accordance with USEPA Green Streets guidance.[24]

(b) Retrofitting or redevelopment of existing paved alleys, streets or roads that are designed and constructed in accordance with the USEPA Green Streets guidance.[25]

c. Priority Development Project Structural BMP Performance Requirements

In addition to the BMP requirements listed for all development projects under Provision E.3.a, Priority Development Projects must also implement structural BMPs that conform to performance requirements described below.

(1) Storm Water Pollutant Control BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite structural BMPs to control pollutants in storm water that may be discharged from a project as follows:

[24] See "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).
[25] Ibid.

(a) Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite ~~100 percent of~~ the pollutants contained in the volume of storm water runoff produced from a 24-hour 85th percentile storm event (design capture volume);[26]

~~(b)~~ (i) If a Copermittee determines that implementing BMPs to retain the full design capture volume onsite for a Priority Development Project is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize ~~flow-thru treatment control~~ biofiltration BMPs. Biofiltration BMPs must be sized and designed to: ~~achieve the equivalent pollutant load removal described in Provision E.3.c.(1)(a). Biofiltration LID BMPs must be considered as a first option before other types of flow-thru treatment control BMPs may be considered.~~

[a] Treat 1.5 times the design capture volume not reliably retained onsite; OR
[b] Treat the design capture volume not reliably retained onsite with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite.
[c] Have an appropriate loading rate to prevent erosion, scour, and channeling within the BMP.

(ii) If a Copermittee determines that biofiltration is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize flow-thru treatment control BMPs to treat runoff leaving the site, AND mitigate for the design capture volume not reliably retained onsite pursuant to Provision E.3.c.(1)(b). Flow thru treatment control BMPs must be sized and designed to:

[a] Remove pollutants from storm water to the MEP;
[b] Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;

[26] This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals.

[c] Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Flow-thru treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of flow-thru treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

~~(c)~~

(b) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1)(a). The Priority Development Project must mitigate for the portion of the pollutant load in the design capture volume not retained onsite if Provision E.3.~~(~~c.~~)~~(3) is utilized. If a Priority Development Project is allowed to utilize alternative compliance, flow-thru treatment control BMPs must be implemented to treat the portion of the design capture volume that is not reliably retained onsite. Flow-thru treatment control BMPs must be sized and designed in accordance with Provision E.3.c.(1)(a)(ii)[a]-[c].

~~(d) If a Priority Development project is allowed to utilize alternative compliance, flow-thru treatment control BMPs must be implemented to treat the portion of the design capture volume that is not retained onsite. Flow-thru treatment control BMPs must be sized and designed to:~~

~~(i) Remove pollutants from storm water to the MEP;~~

~~(ii) Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;~~

~~(iii) Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Flow-thru treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of flow-thru treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.~~

(2) Hydromodification Management BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite BMPs to manage hydromodification that may be caused by storm water runoff discharged from a project as follows:

(a) Post-project runoff conditions (flow rates and durations) must not exceed pre-development runoff conditions by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat downstream of Priority Development Projects).

(i) In evaluating the range of flows that results in increased potential for erosion of natural (non-hardened) channels, the lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks.

(ii) The Copermittees may use monitoring results collected pursuant to Provision D.1.a.(2) to re-define the range of flows resulting in increased potential for erosion, or degraded instream habitat conditions, as warranted by the data.

(b) Each Priority Development Project must avoid ~~known~~ critical sediment yield areas known to the Copermittee or identified by the Watershed Management Area Analysis pursuant to Provision B.3.b.(4), or implement measures that allow critical coarse sediment to be discharged to receiving waters, such that there is no net impact to the receiving water ~~sediment supply is unaffected by the project~~.

(c) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the performance requirements of Provision E.3.c.(2)(a). The Priority Development Project must mitigate for the post-project runoff conditions not fully managed onsite if Provision E.3.~~(~~c.~~)~~(3) is utilized.

(d) Exemptions

Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provisions E.3.c.(2)(a) where the project discharges storm water runoff to:

(i) Existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;

(ii) Conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; or

(iii) An area identified by the Copermittees as appropriate for an exemption by the Watershed Management Area Analysis incorporated into the Water Quality Improvement Plan pursuant to Provision B.3.b.(4).

(3) Alternative Compliance Program to Onsite Structural BMP Implementation

At the discretion of each Copermittee, Priority Development Projects may be allowed to participate in an alternative compliance program in lieu of implementing the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2), provided that the Water Quality Improvement Plan includes the optional Watershed Management Area Analysis described in Provision B.3.b.(4). The alternative compliance program is available to a Priority Development Project only if the Priority Development Project applicant enters into a voluntary agreement with the Copermittee authorizing this arrangement. In addition to the voluntary agreement, relief from implementing structural BMPs onsite may be authorized by the Copermittee under the following conditions:

(a) Watershed Management Area Analysis Candidate Projects

The Priority Development Project applicant agrees to fund, contribute funds to, or implement a candidate project identified by the Copermittees in the Watershed Management Area Analysis included in the Water Quality Improvement Plan, pursuant to Provisions B.3.b.(4) subject to the following conditions:

(i) The Copermittee must determine that implementation of the candidate project will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite;

(ii) If the Priority Development Project applicant chooses to fully or partially fund a candidate project, then the in-lieu fee structure described in Provision E.3.c.(3)(c) must be followed;

(iii) If the Priority Development Project applicant chooses to fully or partially fund a candidate project, then the Copermittee must ensure that the funds to be obtained from the Priority Development Project applicant are sufficient to mitigate for impacts caused by not fully implementing structural BMPs onsite, pursuant to the performance requirements described in Provisions E.3.c.(1) and E.3.c.(2);

(iv) If the Priority Development Project applicant chooses to implement a candidate project, then the Copermittee must ensure that pollutant

control and/or hydromodification management within the candidate project are sufficient to mitigate for impacts caused by not implementing structural BMPs fully onsite, pursuant to the performance requirements described in Provisions E.3.c.(1) and E.3.c.(2);

(v) The voluntary agreement to fund, partially fund, or implement a candidate project must include reliable sources of funding for operation and maintenance of the candidate project;

(vi) Design of the candidate project must be conducted under an appropriately qualified engineer, geologist, architect, landscape architect, or other professional, licenses where applicable, and competent and proficient in the fields pertinent to the candidate project design;

(vii) The candidate project must be constructed as soon as possible, but no later than 4 years after the certificate of occupancy is granted for the first Priority Development Project that contributed funds toward the construction of the candidate project, unless a longer period of time is authorized by the San Diego Water Board Executive Officer;

(viii) If the candidate project is constructed after the Priority Development Project is constructed, the Copermittee must require temporal mitigation for pollutant loads and altered flows that are discharged from the Priority Development Project; and

~~(ix) Receiving waters must not be utilized to convey untreated storm water runoff from the Priority Development Project to the candidate project;~~

(b) Project Applicant Proposed Alternative Compliance Projects

The Copermittee may allow a Priority Development Project applicant to propose and fund, contribute funds to, or implement an alternative compliance project not identified by the Watershed Management Area Analysis included in the Water Quality Improvement Plan pursuant to Provisions B.3.b.(4). This option is allowed provided the Copermittee determines that implementation of the alternative compliance project will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite, and is subject to the requirements described in Provisions E.3.c.(3)(a)(ii)-(ix).

(c) Alternative Compliance In-Lieu Fee Structure

If a Copermittee chooses to allow a Priority Development Project applicant to fund, or partially fund a candidate project or an alternative compliance project, then the Copermittee must develop and implement an in-lieu fee structure. This may be developed individually or with other Copermittees

and/or entities, as a means for designing, developing, constructing, operating and maintaining offsite alternative compliance projects. The in-lieu fee must be transferred to the Copermittee (for public projects) or an escrow account (for private projects) prior to the construction of the Priority Development Project.

(d) Alternative Compliance Water Quality Credit System Option

The Copermittee may develop and implement an alternative compliance water quality credit system option, individually or with other Copermittees and/or entities, provided that such a credit system clearly exhibits that it will not allow discharges from Priority Development Projects to cause or contribute to a net impact over and above the impact caused by projects meeting the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2). Any credit system that a Copermittee chooses to implement must be submitted to the San Diego Water Board Executive Officer for review and acceptance as part of the Water Quality Improvement Plan.

(4) Long-Term Structural BMP Maintenance

Each Copermittee must require the project applicant to submit proof of the mechanism under which ongoing long-term maintenance of all structural BMPs will be conducted.

(5) Infiltration and Groundwater Protection

(a) Structural BMPs designed to primarily function as large, centralized infiltration devices (such as large infiltration trenches and infiltration basins) must not cause or contribute to an exceedance of an applicable groundwater quality objective. At a minimum, such infiltration BMPs must be in conformance with the design criteria listed below, unless the development project applicant demonstrates to the Copermittee that one or more of the specific design criteria listed below are not necessary to protect groundwater quality. The design criteria listed below do not apply to small infiltration systems dispersed throughout a development project.

(i) Runoff must undergo pretreatment such as sedimentation or filtration prior to infiltration;

(ii) Pollution prevention and source control BMPs must be implemented at a level appropriate to protect groundwater quality at sites where infiltration BMPs are to be used;

(iii) Infiltration BMPs must be adequately maintained to remove pollutants in storm water to the MEP;

(iv) The vertical distance from the base of any infiltration BMP to the

seasonal high groundwater mark must be at least 10 feet. Where groundwater basins do not support beneficial uses, this vertical distance criteria may be reduced, provided groundwater quality is maintained;

(v) The soil through which infiltration is to occur must have physical and chemical characteristics (e.g., appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses;

(vi) Infiltration BMPs must not be used for areas of industrial or light industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee, unless source control BMPs to prevent exposure of high threat activities are implemented, or runoff from such activities is first treated or filtered to remove pollutants prior to infiltration; and

(vii) Infiltration BMPs must be located a minimum of 100 feet horizontally from any water supply wells.

(b) The Copermittee may develop, individually or with other Copermittees, alternative mandatory design criteria to that listed above for infiltration BMPs which are designed to primarily function as centralized infiltration devices. Before implementing the alternative design criteria in the development planning process the Copermitee(s) must:

(i) Notify the San Diego Water Board of the intent to implement the alternative design criteria submitted; and

(ii) Comply with any conditions set by the San Diego Water Board.

d. BMP DESIGN MANUAL UPDATE

Each Copermittee must update its BMP Design Manual[27] pursuant to Provision F.2.b. Until the Copermittee has updated its BMP Design Manual with the requirements of Provisions E.3.a-c, the Copermittee must continue implementing its current BMP Design Manual. Unless directed otherwise by the San Diego Water Board, the Copermittee must implement the BMP Design Manual within 180 days of completing the update. The update of the BMP Design Manual must include the following:

(1) Updated procedures to determine the nature and extent of storm water requirements applicable to a potential development or redevelopment projects. These procedures must inform project applicants of the storm water management requirements applicable to their project including, but not limited

[27] The BMP Design Manual was formerly known as the Standard Storm Water Mitigation Plan under Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016.

to, general requirements for all development projects, structural BMP design procedures and requirements, hydromodification management requirements, requirements specific to phased projects, and procedures specific to private developments and public improvement projects;

(2) Updated procedures to identify pollutants and conditions of concern for selecting the most appropriate structural BMPs that consider, at a minimum, the following:

(a) Receiving water quality (including pollutants for which receiving waters are listed as impaired under the CWA section 303(d) List);

(b) Pollutants, stressors, and/or receiving water conditions that cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(c) Land use type of the project and pollutants associated with that land use type; and

(d) Pollutants expected to be present onsite.

(3) Updated procedures for designing structural BMPs, including any updated performance requirements to be consistent with the requirements of Provision E.3.c for all structural BMPs listed in the BMP Design Manual;

(4) Long-term maintenance criteria for each structural BMP listed in the BMP Design Manual; and

(5) Alternative compliance criteria, in accordance with the requirements under Provision E.3.c.(3), if the Copermittee elects to allow Priority Development Projects within its jurisdiction to utilize alternative compliance.

e. PRIORITY DEVELOPMENT PROJECT BMP IMPLEMENTATION AND OVERSIGHT

Each Copermittee must implement a program that requires and confirms structural BMPs on all Priority Development Projects are designed, constructed, and maintained to remove pollutants in storm water to the MEP.

(1) Structural BMP Approval and Verification Process

(a) Each Copermittee must require and confirm that for all Priority Development Project applications that have not received prior lawful approval by the Copermittee by the time the BMP Design Manual is updated pursuant to Provision E.3.d ~~18 months after the commencement of coverage under this Order~~, the requirements of Provision E.3 are implemented. For project applications that have received prior lawful

approval by ~~18 months after~~ before the BMP Design Manual is updated pursuant to Provision E.3.d ~~commencement of coverage under this Order~~, the Copermittee may allow previous land development requirements to apply.

(b) Each Copermittee must identify the roles and responsibilities of its various municipal departments in implementing the structural BMP requirements, including each stage of a project from application review and approval through BMP maintenance and inspections.

(c) Each Copermittee must require and confirm that appropriate easements and ownerships are properly recorded in public records and the information is conveyed to all appropriate parties when there is a change in project or site ownership.

(d) Each Copermittee must require and confirm that prior to occupancy and/or intended use of any portion of the Priority Development Project, each structural BMP is inspected to verify that it has been constructed and is operating in compliance with all of its specifications, plans, permits, ordinances, and the requirements of this Order.

(2) Priority Development Project Inventory and Prioritization

(a) Each Copermittee must develop, maintain, and update at least annually, a watershed-based database to track and inventory all Priority Development Projects and associated structural BMPs within its jurisdiction. Inventories must be accurate and complete beginning from December 2002 for the San Diego County Copermittees, February 2003 for the Orange County Copermittees, and July 2005 for the Riverside County Copermittees. The use of an automated database system, such as GIS, is highly recommended. The database must include, at a minimum, the following information:

(i) Priority Development Project location (address and hydrologic subarea);

(ii) Descriptions of structural BMP type(s);

(iii) Date(s) of construction;

(iv) Party responsible for structural BMP maintenance;

(v) Dates and findings of structural BMP maintenance verifications; and

(vi) Corrective actions and/or resolutions, when applicable.

(b) Each Copermittee must prioritize the Priority Development Projects with structural BMPs within its jurisdiction. The designation of Priority Development Projects as high priority must consider the following:

(i) The highest water quality priorities identified in the Water Quality Improvement Plan;

(ii) Receiving water quality;

(iii) Number and sizes of structural BMPs;

(iv) Recommended maintenance frequency of structural BMPs;

(v) Likelihood of operation and maintenance issues of structural BMPs;

(vi) Land use and expected pollutants generated; and

(vii) Compliance record.

(3) Structural BMP Maintenance Verifications and Inspections

Each Copermittee is required to verify that structural BMPs on each Priority Development Project are adequately maintained, and continue to operate effectively to remove pollutants in storm water to the MEP through inspections, self-certifications, surveys, or other equally effective approaches.

(a) All (100 percent) of the structural BMPs at Priority Development Projects that are designated as high priority must be inspected directly by the Copermittee annually prior to each rainy season;

(b) For verifications performed through a means other than direct Copermittee inspection, adequate documentation must be required by the Copermittee to provide assurance that the required maintenance of structural BMPs at each Priority Development Project has been completed; and

(c) Appropriate follow-up measures (including re-inspections, enforcement, etc.) must be conducted to ensure that structural BMPs at each Priority Development Project continue to reduce pollutants in storm water to the MEP as originally designed.

f. DEVELOPMENT PROJECT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all development projects, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

4. Construction Management

Each Copermittee must implement a construction management program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. PROJECT APPROVAL PROCESS

Prior to issuance of any local permit(s) that allows the commencement of construction projects that involve ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff, each Copermittee must:

(1) Require a pollution control plan, construction BMP plan, and/or an erosion and sediment control plan, to be submitted by the project applicant to the Copermittee;

(2) Confirm the pollution control plan, construction BMP plan, and/or erosion and sediment control plan, complies with the local grading ordinance, other applicable local ordinances, and the requirements of this Order;

(3) Confirm the pollution control, construction BMP, and/or erosion and sediment control plan, includes seasonally appropriate and effective BMPs and management measures described in Provision E.4.c, as applicable to the project; and

(4) Verify that the project applicant has obtained coverage under the statewide Construction General Permit.

b. CONSTRUCTION SITE INVENTORY AND TRACKING

(1) Each Copermittee must maintain and update, at least quarterly, a watershed-based inventory of all construction projects issued a local permit that allows ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff. The use of an automated database system, such as GIS, is highly recommended. The inventory must include:

(a) Relevant contact information for each site (e.g., name, address, phone, and email for the owner and contractor);

(b) The basic site information including location (address and hydrologic subarea), Waste Discharge Identification (WDID) number (if applicable), size of the site, and approximate area of disturbance;

(c) Whether or not the site is considered a high threat to water quality, as defined in Provision E.4.b.(2) below;

(d) The project start and completion dates;

(e) The required inspection frequency, as defined in the Copermittee's jurisdictional runoff management program document;

(f) The date the Copermittee accepted or approved the pollution control plan, construction BMP plan, and/or erosion and sediment control plan; and

(g) Whether or not there are ongoing enforcement actions administered to the site.

(2) Each Copermittee must identify all construction sites within its jurisdiction that represent a high threat to downstream surface water quality. The designation of construction sites as high threat to water quality must consider the following:

(a) Sites located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Sites located within the same hydrologic subarea and tributary to a water body segment listed as impaired for sediment on the CWA section 303(d) List;

(c) Sites located within, directly adjacent to, or discharging directly to a receiving water within an ESA; and

(d) Other sites determined by the Copermittees or the San Diego Water Board as a high threat to water quality.

c. Construction Site BMP Implementation

Each Copermittee must implement, or require the implementation of effective BMPs to reduce discharges of pollutants in storm water from construction sites to the MEP, and effectively prohibit non-storm water discharges from construction sites into the MS4. These BMPs must be site specific, seasonally appropriate, and construction phase appropriate. BMPs must be implemented at each construction site year round. Dry season BMP implementation must plan for and address unseasonal rain events that may occur during the dry season (May 1 through September 30). Copermittees must implement, or require the implementation of, BMPs in the following categories:

(1) Project Planning;

(2) Good Site Management “Housekeeping”, including waste management;

(3) Non-storm Water Management;

(4) Erosion Control;

(5) Sediment Control;

(6) Run-on and Run-off Control; and

(7) Active/Passive Sediment Treatment Systems, where applicable.

d. CONSTRUCTION SITE INSPECTIONS

Each Copermittee must conduct construction site inspections to require and confirm compliance with its local permits and applicable local ordinances, and the requirements of this Order. Priority for site inspections must consider threat to water quality pursuant to Provision E.4.b as well as the nature of the construction activity, topography, and the characteristics of soils and receiving water quality.

(1) Inspection Frequency

(a) Each Copermittee must conduct inspections at all inventoried sites, including high threat to water quality sites, at an appropriate frequency for each phase of construction to confirm the site reduces the discharge of pollutants in storm water from construction sites to the MEP, and effectively prohibits non-storm water discharges from entering the MS4.

(b) Each Copermittee must establish appropriate inspection frequencies for high threat to water quality sites, and all other sites, for each phase of construction. Inspection frequencies appropriate for addressing the highest water quality priorities identified in the Water Quality Improvement Plan, and for complying with the requirements of this Order must be identified in each Copermittee's jurisdictional runoff management program document.

(c) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e., re-inspection, enforcement) necessary to require and confirm site compliance with its local permits and applicable local ordinances, and the requirements of this Order.

(2) Inspection Content

Inspections of construction sites by the Copermittee must include, at a minimum:

(a) Verification of coverage under the Construction General Permit (Notice of Intent (NOI) and/or WDID number) during initial inspections, when applicable;

(b) Assessment of compliance with its local permits and applicable local ordinances related to pollution prevention, including the implementation and maintenance of applicable BMPs;

(c) Assessment of BMP adequacy and effectiveness;

(d) Visual observations of actual non-storm water discharges;

(e) Visual observations of actual or potential discharge of sediment and/or construction related materials from the site;

(f) Visual observations of actual or potential illicit connections; and

(g) If any violations are found and BMP corrections are needed, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried construction sites. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Site name, location (address and hydrologic subarea), and WDID number (if applicable);

(b) Inspection date;

(c) Approximate amount of rainfall since last inspection;

(d) Description of problems observed with BMPs and indication of need for BMP addition/repair/replacement and any scheduled re-inspection, and date of re-inspection;

(e) Descriptions of any other specific inspection comments which must, at a minimum, include rationales for longer compliance time;

(f) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(g) Resolution of problems noted and date problems fixed.

e. CONSTRUCTION SITE ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried construction sites, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

5. Existing Development Management

Each Copermittee must implement an existing development management program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. Existing Development Inventory and Tracking

Each Copermittee must maintain, and update at least annually, a watershed-based inventory of the existing development within its jurisdiction that may discharge a pollutant load to and from the MS4. The use of an automated database system, such as GIS, is highly recommended. The inventory must, at a minimum, include:

(1) Name, location (hydrological subarea and address, if applicable) of the following types of existing development with its jurisdiction:

(a) Commercial facilities or areas;

(b) Industrial facilities;

(c) Municipal facilities, including:

(i) MS4 and related structures,[28]

(ii) Roads, streets, and highways,

(iii) Parking facilities,

(iv) Municipal airfields,

(v) Parks and recreation facilities,

(vi) Flood management facilities, flood control devices and structures,

(vii) Operating or closed municipal landfills,

(viii) Publicly owned treatment works (including water and wastewater treatment plants) and sanitary sewer collection systems,

(ix) Corporate yards, including maintenance and storage yards for materials, waste, equipment, and vehicles,

(x) Hazardous waste collection facilities,

(xi) Other treatment, storage or disposal facilities for municipal waste, and

(xii) Other municipal facilities that the Copermittee determines may contribute a significant pollutant load to the MS4; and

[28] The inventory may refer to the MS4 map required to be maintained pursuant to Provision E.2.b.(1).

(d) Residential areas, which may be designated by one or more of the following:

(i) Residential management area,

(ii) Drainage basin or area,

(iii) Land use (e.g., single family, multi-family, rural),

(iv) Neighborhood,

(v) Common Interest Area,

(vi) Home Owner Association,

(vii) Mobile home park, and/or

(viii) Other designations accepted by the San Diego Water Board Executive Officer.

(2) A description of the facility or area, including the following information:

(a) Classification as commercial, industrial, municipal, or residential;

(b) Status of facility or area as active or inactive;

(c) Identification if a business is a mobile business;

(d) SIC Code or NAICS Code, if applicable;

(e) Industrial General Permit NOI and/or WDID number, if applicable;

(f) Identification if a residential area is or includes a Common Interest Area / Home Owner Association, or mobile home park;

(g) Identification of pollutants generated and potentially generated by the facility or area;

(h) Whether the facility or area is adjacent to an ESA;

(i) Whether the facility or area is tributary to and within the same hydrologic subarea as a water body segment listed as impaired on the CWA section 303(d) List and generates pollutants for which the water body segment is impaired; and

(3) An annually updated map showing the location of inventoried existing development, watershed boundaries, and water bodies.

b. EXISTING DEVELOPMENT BMP IMPLEMENTATION AND MAINTENANCE

Each Copermittee must designate a minimum set of BMPs required for all inventoried existing development, including special event venues. The designated minimum BMPs must be specific to facility or area types and pollutant generating activities, as appropriate.

(1) Commercial, Industrial, and Municipal Facilities and Areas

(a) Pollution Prevention

Each Copermittee must require the use of pollution prevention methods by the commercial, industrial, and municipal facilities and areas in its inventoried existing development to address the priorities and strategies in the Water Quality Improvement Plan.

(b) BMP Implementation

Each Copermittee must require the implementation of designated BMPs at commercial facilities and areas, industrial facilities, and implement designated BMPs at municipal facilities in its inventoried existing development.

(c) BMP Operation and Maintenance

(i) Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development.

(ii) Each Copermittee must implement a schedule of operation and maintenance activities for its MS4 and related structures (including but not limited to catch basins, storm drain inlets, detention basins, etc.), and verify proper operation of all its municipal structural treatment controls designed to reduce pollutants (including floatables) in storm water discharges to or from its MS4s and related drainage structures. Operation and maintenance activities may include, but is not limited to, the following:

[a] Inspections of the MS4 and related structures;
[b] Cleaning of the MS4 and related structures; and
[c] Proper disposal of materials removed from cleaning of the MS4 and related structures.

(iii) Each Copermittee must implement a schedule of operation and maintenance for public streets, unpaved roads, paved roads, and paved highways within its jurisdiction to minimize pollutants that can be discharged in storm water.

(iv) Each Copermittee must implement controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers. Copermittees that operate both a municipal sanitary sewer system and a MS4 must implement controls and measures to prevent and eliminate seeping sewage from infiltrating the MS4. Copermittees that do not operate both a municipal sanitary sewer system and a MS4 must coordinate with sewering agencies to keep themselves informed of relevant and appropriate maintenance activities and sanitary sewage projects in their jurisdiction that may cause or contribute to seepage of sewage into the MS4.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must require the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from commercial facilities and areas and industrial facilities, and implement BMPs at municipal facilities in its inventoried existing development. Such BMPs must include, as appropriate, educational activities, permits, certifications and other measures for applicators and distributors.

(2) <u>Residential Areas</u>

(a) Pollution Prevention

Each Copermittee must promote and encourage the use of pollution prevention methods, where appropriate, by the residential areas in its inventoried existing development.

(b) BMP Implementation

Each Copermittee must promote and encourage the implementation of designated BMPs at residential areas in its inventoried existing development.

(c) BMP Operation and Maintenance

Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at residential areas in its inventoried existing development.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must promote and encourage the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the

application, storage, and disposal of pesticides, herbicides and fertilizers from residential areas in its inventoried existing development.

c. EXISTING DEVELOPMENT INSPECTIONS

Each Copermittee must conduct inspections of inventoried existing development to ensure compliance with applicable local ordinances and permits, and the requirements of this Order.

(1) Inspection Frequency

(a) Each Copermittee must establish appropriate inspection frequencies for inventoried existing development in accordance with the following requirements:

(i) At a minimum, inventoried existing development must be inspected once every five years utilizing one or more of the following methods:

[a] Drive-by inspections by Copermittee municipal and contract staff,
[b] Onsite inspections by Copermittee municipal and contract staff, and/or
[c] Visual inspections of publicly accessible inventoried facilities or areas by volunteer monitoring or patrol programs that have been trained by the Copermittee;

(ii) The frequency of inspections must be appropriate to confirm that BMPs are being implemented to reduce the discharge of pollutants in storm water from the MS4 to the MEP and effectively prohibit non-storm water discharges to the MS4;

(iii) The frequency of inspections must be based on the potential for a facility or area to discharge non-storm water and pollutants in storm water, and should reflect the priorities set forth in the Water Quality Improvement Plan;

(iv) Each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development;[29] and

(v) Inventoried existing development must be inspected by the Copermittee, as needed, in response to valid public complaints.

(b) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e. education and outreach, re-inspection, enforcement)

[29] If any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspection may count toward the total annual inspection requirement. This requirement excludes linear municipal facilities (i.e., MS4 linear channels, sanitary sewer collection systems, streets, roads and highways).

necessary to require and confirm compliance with its applicable local ordinances and permits and the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

(2) Inspection Content

(a) Inspections of existing development must include, at a minimum:

(i) Visual inspections for the presence of actual non-storm water discharges;

(ii) Visual inspections for the presence of actual or potential discharge of pollutants;

(iii) Visual inspections for the presence of actual or potential illicit connections; and

(iv) Verification that the description of the facility or area in the inventory, required pursuant to Provision E.5.a.(2), has not changed.

(b) Onsite inspections of existing development by the Copermittee must include, at a minimum:

(i) Assessment of compliance with its applicable local ordinances and permits related to non-storm water and storm water discharges and runoff;

(ii) Assessment of the implementation of the designated BMPs;

(iii) Verification of coverage under the Industrial General Permit, when applicable; and

(iv) If any problems or violations are found, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried existing development. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Name and location of facility or area (address and hydrologic subarea) consistent with the inventory name and location, pursuant to Provision E.5.a.(1);

(b) Inspection and re-inspection date(s);

(c) Inspection method(s) (i.e. drive-by, onsite);

(d) Observations and findings from the inspection(s);

(e) For onsite inspections of existing development by Copermittee municipal or contract staff, the records must also include, as applicable:

(i) Description of any problems or violations found during the inspection(s),

(ii) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6, and

(iii) The date problems or violations were resolved.

d. EXISTING DEVELOPMENT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried existing development, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

e. RETROFITTING AND REHABILITATING AREAS OF EXISTING DEVELOPMENT

(1) Retrofitting Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to retrofit areas of existing development within its jurisdiction to address identified sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify areas of existing development as candidates for retrofitting, focusing on areas where retrofitting will address pollutants and/or stressors that contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for retrofitting projects may be utilized to reduce pollutants that may be discharged in storm water from areas of existing development, and/or address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of retrofitting projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting projects; and

(e) Where retrofitting projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional retrofitting projects (i.e. projects that can receive and/or treat storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment) adjacent to and/or downstream of the areas of existing development.

(2) Stream, Channel and/or Habitat Rehabilitation in Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to rehabilitate streams, channels, and/or habitats in areas of existing development within its jurisdiction to address the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify streams, channels, and/or habitats in areas of existing development as candidates for rehabilitation, focusing on areas where stream, channel, and/or habitat rehabilitation projects will address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for stream, channel, and/or habitat rehabilitation projects may be utilized to address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters, rehabilitate channelized or hydromodified streams, restore wetland and riparian habitat, restore watershed functions, and/or restore beneficial uses of receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of stream, channel, and/or habitat rehabilitation projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance stream, channel, and/or habitat rehabilitation projects; and

(e) Where stream, channel, and/or habitat rehabilitation projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional stream, channel, and/or habitat rehabilitation projects (i.e. projects that can receive storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment).

6. Enforcement Response Plans

Each Copermittee must develop and implement an Enforcement Response Plan as part of its jurisdictional runoff management program document. The Enforcement Response Plan must describe the applicable approaches and options to enforce its legal authority established pursuant to Provision E.1, as necessary, to achieve compliance with the requirements of this Order. The Enforcement Response Plan must be in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include the following:

a. Enforcement Response Plan Components

The Enforcement Response Plan must include the following individual components:

(1) Illicit Discharge Detection and Elimination Enforcement Component;

(2) Development Planning Enforcement Component;

(3) Construction Management Enforcement Component; and

(4) Existing Development Enforcement Component.

b. Enforcement Response Approaches and Options

Each component of the Enforcement Response Plan must describe the enforcement response approaches that the Copermittee will implement to compel compliance with its statutes, ordinances, permits, contracts, orders, or similar means, and the requirements of this Order. The description must include the protocols for implementing progressively stricter enforcement responses. The enforcement response approaches must include appropriate sanctions to compel compliance, including, at a minimum, the following tools or their equivalent:

(1) Verbal and written notices of violation;

(2) Cleanup requirements;

(3) Fines;

(4) Bonding requirements;

(5) Administrative and criminal penalties;

(6) Liens;

(7) Stop work orders; and

(8) Permit and occupancy denials.

c. CORRECTION OF VIOLATIONS

(1) Violations must be corrected in a timely manner with the goal of correcting the violations within 30 calendar days after the violations are discovered, or prior to the next predicted rain event, whichever is sooner.

(2) If more than 30 calendar days are required to achieve compliance, then a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

d. ESCALATED ENFORCEMENT

(1) The Enforcement Response Plan must include a definition of "escalated enforcement." Escalated enforcement must include any enforcement scenario where a violation or other non-compliance is determined to cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan. Escalated enforcement may be defined differently for development planning, construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas.

(2) Where the Copermittee determines escalated enforcement is not required, a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

(3) Escalated enforcement actions must continue to increase in severity, as necessary, to compel compliance as soon as possible.

e. REPORTING OF NON-COMPLIANT SITES

(1) Each Copermittee must notify the San Diego Water Board in writing within five (5) calendar days of issuing escalated enforcement (as defined in the Copermittee's Enforcement Response Plan) to a construction site that poses a significant threat to water quality as a result of violations or other non-compliance with its permits and applicable local ordinances, and the

requirements of this Order. Written notification may be provided electronically by email to the appropriate San Diego Water Board staff.

(2) Each Copermittee must notify the San Diego Water Board any persons required to obtain coverage under the statewide Industrial General Permit and Construction General Permit and failing to do so, within five (5) calendar days from the time the Copermittee become aware of the circumstances. Written notification may be provided electronically by email to Nonfilers_R9@waterboards.ca.gov.

7. Public Education and Participation

Each Copermittee must implement, individually or with other Copermittees, a public education and participation program in accordance with the strategies identified in the Water Quality Improvement Plan to promote and encourage the development of programs, management practices, and behaviors that reduce the discharge of pollutants in storm water to the MEP, prevent controllable non-storm water discharges from entering the MS4, and protect water quality standards in receiving waters. The public education and participation program must be implemented in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include, at a minimum, the following requirements:

a. Public Education

The public education program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) Educational activities, public information activities, and other appropriate outreach activities intended to reduce pollutants associated with the application of pesticides, herbicides and fertilizer and other pollutants of concern in storm water discharges to and from its MS4 to the MEP, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed to address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(2) Educational activities, public information activities, and other appropriate outreach activities to facilitate the proper management and disposal of used oil and toxic materials; and

(3) Appropriate education and training measures for specific target audiences, such as construction site operators, residents, underserved target audiences and school-aged children, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed, based on high risk behaviors and pollutants of concern.

b. PUBLIC PARTICIPATION

The public participation program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) A process for members of the public to participate in updating the highest priority water quality conditions, numeric goals, and water quality improvement strategies in the Water Quality Improvement Plan.

(2) Opportunities for members of the public to participate in providing the Copermittee recommendations for improving the effectiveness of the water quality improvement strategies implemented within its jurisdiction.

(3) Opportunities for members of the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or protection of the quality of receiving waters.

8. Fiscal Analysis

a. Each Copermittee must secure the resources necessary to meet all the requirements of this Order.

b. Each Copermittee must conduct an annual fiscal analysis of its jurisdictional runoff management program in its entirety. The fiscal analysis must include the following:

(1) Identification of the various categories of expenditures necessary to implement the requirements of this Order, including a description of the specific capital, operation and maintenance, and other expenditure items to be accounted for in each category of expenditures;

(2) The staff resources needed and allocated to meet the requirements of this Order, including any development, implementation, and enforcement activities required;

(3) The estimated expenditures for Provisions E.8.b.(1) and E.8.b.(2) for the current fiscal year; and

(4) The source(s) of funds that are proposed to meet the necessary expenditures described in Provisions E.8.b.(1) and E.8.b.(2), including legal restrictions on the use of such funds, for the current fiscal year and next fiscal year.

c. Each Copermittee must submit a summary of the annual fiscal analysis with each Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.

d. Each Copermittee must provide the documentation used to develop the summary of the annual fiscal analysis upon request by the San Diego Water Board.

F. REPORTING

The purpose of this provision is to determine and document compliance with the requirements set forth in this Order. The goal of reporting is to communicate to the San Diego Water Board and the people of the State of California the implementation status of each jurisdictional runoff management program and compliance with the requirements of this Order. This goal is to be accomplished through the submittal of specific deliverables to the San Diego Water Board by the Copermittees.

1. Water Quality Improvement Plans

The Copermittees for each Watershed Management Area must develop and submit the Water Quality Improvement Plan in accordance with the following requirements:

a. WATER QUALITY IMPROVEMENT PLAN DEVELOPMENT

Each Water Quality Improvement Plan must be developed in accordance with the following process:

(1) Public Participation Process

The Copermittees must implement a public participation process to solicit data, information, and recommendations to be utilized in the development of the Water Quality Improvement Plan. The public participation process must include the following:

(a) The Copermittees must develop a publicly available and noticed schedule of the opportunities for the public to participate and provide comments during the development of the Water Quality Improvement Plan. The schedule may be adjusted as necessary by the Copermittees, provided the public is provided timely notification of the changes to the schedule.

(b) The Copermittees must form a Water Quality Improvement Consultation Panel to provide recommendations during the development of the Water Quality Improvement Plan. The Water Quality Improvement Consultation Panel must consist of at least the following members:

(i) A representative of the San Diego Water Board,

(ii) A representative of the environmental community familiar with the water quality conditions of concern of the receiving waters in the Watershed Management Area, preferably from an environmental interest group associated with a water body within the Watershed Management Area, and

(iii) A representative of the development community familiar with the opportunities and constraints for implementing structural BMPs, retrofitting projects, and stream, channel or habitat rehabilitation

projects in the Watershed Management Area, preferably with relevant engineering, hydrology, and/or geomorphology experience in the Watershed Management Area.

(c) The Copermittees must coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public ~~as much~~ time and opportunity ~~as possible~~ to participate during the development of the Water Quality Improvement Plans.

(2) Priority Water Quality Conditions

(a) The Copermittees must solicit data, information and recommendations from the public to be utilized in the development and identification of the priority water quality conditions and potential water quality improvement strategies for the Watershed Management Area.

(b) The Copermittees must review the priority water quality conditions the Copermittees plan on including in the Water Quality Improvement Plan with the Water Quality Improvement Consultation Panel to receive recommendations or concurrence.

(c) The Copermittees must consider revisions to the priority water quality conditions based on recommendations from the Water Quality Improvement Consultation Panel.

(d) The Copermittees must include all the potential water quality improvement strategies identified by the public and the Water Quality Improvement Consultation Panel with the submittal of the priority water quality conditions to the San Diego Water Board.

(e) The Copermittees must submit the Water Quality Improvement Plan requirements of Provision B.2 to the San Diego Water Board as early as 6 months and no later than 12 months after the commencement of coverage under this Order. Upon receipt, the San Diego Water Board will issue a public notice and release the proposed priority water quality conditions and potential water quality improvement strategies for public review and comment for a minimum of 30 days.

(f) The Copermittees must consider revisions to the priority water quality conditions and potential water quality improvement strategies developed pursuant to Provision B.2 based on public comments received by the close of the comment period.

(3) Water Quality Improvement Goals, Strategies and Schedules

(a) The Copermittees must solicit recommendations from the public on potential numeric goals for the highest priority water quality conditions

identified for the Watershed Management Area, and recommendations on the strategies that should be implemented to achieve the potential numeric goals.

(b) The Copermittees must consult with the Water Quality Improvement Consultation Panel and consider revisions to the following items based on the Panel's recommendations:

(i) The numeric goals and schedules the Copermittees propose to include in the Water Quality Improvement Plan;

(ii) The water quality improvement strategies and schedules the Copermittees propose to implement in the Watershed Management Area and include in the Water Quality Improvement Plan;

(iii) If the Copermittees choose to implement Provision B.3.b.(4), the results of the Watershed Management Area Analysis the Copermittees proposed to incorporate into the Water Quality Improvement Plan; and

(iv) If the Copermittees choose to implement Provision B.3.c, the numeric goals proposed pursuant to Provision B.3.c.(1), the analysis performed pursuant to Provision B.3.c.(2) and the specific monitoring and assessments proposed pursuant to Provision B.3.c.(3).

(c) The Copermittees must submit the Water Quality Improvement Plan requirements of Provision B.3 to the San Diego Water Board as early as 9 months and no later than 18 months after the commencement of coverage under this Order. Upon receipt, the San Diego Water Board will issue a public notice release the proposed water quality improvement goals, strategies and schedules for public review and comment for a minimum of 30 days.

(d) The Copermittees must consider revisions to the water quality improvement goals, strategies and schedules developed pursuant to Provision B.3 based on public comments received by the close of the comment period.

b. WATER QUALITY IMPROVEMENT PLAN SUBMITTAL AND IMPLEMENTATION

(1) Within 24 months after the commencement of coverage under this Order, the Copermittees for each Watershed Management Area must submit a complete Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order to the San Diego Water Board. The San Diego Water Board will issue a public notice and release the Water Quality Improvement Plan for public review and comment for a minimum of 30 days.

(2) The Copermittees must consider revisions to the Water Quality Improvement Plan based on written comments received by the close of the public comment period.

(3) The Copermittees must promptly submit any revisions to the Water Quality Improvement Plan to the San Diego Water Board no later than 60 days of the close of the public comment period.

(4) If issues concerning the Water Quality Improvement Plan are resolved informally through discussions among the Copermittees, the San Diego Water Board and interested parties, the San Diego Water Board Executive Officer may provide written ~~certification~~ notification of acceptance to the Copermittees that the Water Quality Improvement Plan meets the requirements of Provision B. However, if the Executive Officer determines that significant issues with the Water Quality Improvement Plan remain, the matter will be scheduled for San Diego Water Board consideration at a public meeting.

(5) The Copermittees must commence with implementation of the Water Quality Improvement Plan, in accordance with the water quality improvement strategies and schedules therein, upon written ~~notification of concurrence~~ notification of acceptance with the Water Quality Improvement Plan by the San Diego Water Board Executive Officer.

~~(7)~~
(6) During implementation of the Water Quality Improvement Plan ~~after implementation~~ the Copermittees must correct any deficiencies in the Plan identified by the San Diego Water Board ~~no later than 90 days~~ in the updates submitted with the Water Quality Improvement Plan Annual Report following a request by the Board to do so.

~~(8)~~
(7) The Water Quality Improvement Plan must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of receiving ~~notification of concurrence~~ notification of acceptance with the Water Quality Improvement Plan by the San Diego Water Board Executive Officer.

2. Updates

a. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATES

Each Copermittee must update its jurisdictional runoff management program document in accordance with the following requirements:

(1) Each Copermittee is encouraged to seek public and key stakeholder participation and comments, as early and often as possible during the

process of developing updates to its jurisdictional runoff management program document.

(2) Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E ~~no later than 3 months after San Diego Water Board notification of concurrence with~~ concurrent with the submittal of the Water Quality Improvement Plan. Each Copermittee must correct any deficiencies in the jurisdictional runoff management program document based on comments received from the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report.

(3) Each Copermittee must submit updates to its jurisdictional runoff management program, with the supporting rationale for the modifications, either in the Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge required pursuant to Provision F.5.b.

(4) The Copermittee must revise proposed modifications to its jurisdictional runoff management program as directed by the San Diego Water Board Executive Officer.

(5) Updated jurisdictional runoff management program documents must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of submitting the Water Quality Improvement Plan Annual Report.

b. BMP DESIGN MANUAL UPDATES

Each Copermittee must update its BMP Design Manual in accordance with the following requirements:

(1) Each Copermittee must update its BMP Design Manual to incorporate the requirements of Provisions E.3.a-d ~~no later than 3 months after San Diego Water Board notification of concurrence with~~ concurrent with the submittal of the Water Quality Improvement Plan ~~by the San Diego Water Board Executive Officer~~. Each Copermittee must correct any deficiencies in the BMP Design Manual based on comments received from the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report.

(2) Subsequent updates to the BMP Design Manual must be consistent with the requirements of Provisions E.3.a-d and must be submitted as part of the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge required pursuant to Provision F.5.b.

(3) Updated BMP Design Manuals must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of completing the update.

c. WATER QUALITY IMPROVEMENT PLAN UPDATES

(1) The Water Quality Improvement Plans must be updated in accordance with the following process:

(a) The Copermittees must develop and implement a public participation process to obtain data, information and recommendations for updating the Water Quality Improvement Plan. The public participation process must provide for a publicly available and noticed schedule of opportunities for the public to participate and provide comments during the development of updates to the Water Quality Improvement Plan.

(b) The Copermittees must consult with the Water Quality Improvement Consultation Panel on proposed updates of the Water Quality Improvement Plan, and consider the Water Quality Improvement Consultation Panel's recommendations in finalizing the proposed updates.

(c) The Copermittees for each Watershed Management Area must submit 1) proposed updates to the Water Quality Improvement Plan and supporting rationale, and 2) recommendations received from the public and the Water Quality Improvement Consultation Panel and the rationale for the requested updates, either in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The updates submitted will be deemed accepted for inclusion in the Water Quality Improvement Plan ninety (90) days after submission unless otherwise directed in writing by the San Diego Water Board Executive Officer.

(d) The Copermittees must revise the requested updates as directed by the San Diego Water Board Executive Officer.

(e) Updated Water Quality Improvement Plans must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance of the requested updates by the San Diego Water Board.

(2) No later than~~t~~ six months following Office of Administrative Law and USEPA approval of any TMDL Basin Plan amendment with wasteload allocations (WLAs) assigned to the Copermittees during the term of this Order, the Copermittees must initiate an update to the applicable Water Quality Improvement Plans in accordance with Provision F.1 or Provision F.2.c.(1) to incorporate the requirements of the TMDL WLAs.

3. Progress Reporting

a. Progress Report Presentations

The Copermittees for each Watershed Management Area must periodically appear before the San Diego Water Board, as requested by the Board, to provide progress reports on the implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs.

b. Annual Reports

(1) Transitional Jurisdictional Runoff Management Program Annual Reports

(a) Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D of this Order or a revised form accepted by the San Diego Water Board) no later than October 31 of each year for each jurisdictional runoff management program reporting period (i.e. July 1 to June 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted.

(b) Each Copermittee must submit the information on the Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D of this Order or a revised form accepted by the San Diego Water Board) specific to the area within its jurisdiction in each Watershed Management Area.

(c) In addition to submitting the Jurisdictional Runoff Management Program Annual Report Form during the transitional reporting period, each Copermittee may continue to utilize and submit the jurisdictional runoff management program annual reporting format of its previous NPDES permit until the first Water Quality Improvement Plan Annual Report is required to be submitted.

(2) Transitional Monitoring and Assessment Program Annual Reports

The Copermittees for each Watershed Management Area must submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted under this Order. The Transitional Monitoring and Assessment Program Annual Reports must include:

(a) The receiving water and MS4 outfall discharge monitoring data collected

pursuant to Provisions D.1.a and D.2.a, summarized and presented in tabular and graphical form; and

(b) The findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

(3) Water Quality Improvement Plan Annual Reports

The Copermittees for each Watershed Management Area must submit a Water Quality Improvement Plan Annual Report for each reporting period no later than January 31 of the following year. The annual reporting period consists of two different periods: 1) July 1 to June 30 of the following year for the jurisdictional runoff management programs, 2) October 1 to September 30 of the following year for the monitoring and assessment programs. The Water Quality Improvement Plan Annual Reports must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Each Annual Report must include the following:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, summarized and presented in tabular and graphical form;

(b) The progress of the special studies required pursuant to Provision D.3, and the findings, interpretations and conclusions of a special study, or each phase of a special study, upon its completion;

(c) The findings, interpretations and conclusions from the assessments required pursuant to Provision D.4;

(d) The progress of implementing the Water Quality Improvement Plan, including, but not limited to, the following:

(i) The progress toward achieving the interim and final numeric goals for the highest water quality priorities for the Watershed Management Area,

(ii) The water quality improvement strategies that were implemented and/or no longer implemented by each of the Copermittees during the reporting period and previous reporting periods,

(iii) The water quality improvement strategies planned for implemention during the next reporting period,

(iv) Proposed modifications to the water quality improvement strategies, the public comments received and the supporting rationale for the proposed modifications,

(v) Previous modifications or updates incorporated into the Water Quality

Improvement Plan and/or each Copermittee's jurisdictional runoff management program document and implemented by the Copermittees in the Watershed Management Area, and

(vi) Proposed modifications or updates to the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document;

(e) A completed Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D of this Order or a revised form accepted by the San Diego Water Board) for each Copermittee in the Watershed Management Area, certified by a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative.

(f) Each Copermittee must provide any data or documentation utilized in developing the Water Quality Improvement Plan Annual Report upon request by the San Diego Water Board. Any Copermittee monitoring data utilized in developing the Water Quality Improvement Plan Annual Report must be uploaded to the California Environmental Data Exchange Network (CEDEN).[30] Any Copermittee monitoring and assessment data utilized in developing the Water Quality Improvement Plan Annual Report must be available for access on the Regional Clearinghouse required pursuant to Provision F.4.

C. REGIONAL MONITORING AND ASSESSMENT REPORT

(1) The Copermittees must submit a Regional Monitoring and Assessment Report no later than 180 days prior to the expiration date of this Order. The Regional Monitoring and Assessment Report may be submitted as part of the Report of Waste Discharge required pursuant to Provision F.5.b. In preparing the report the Copermittees must consider the receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, and the findings, interpretations and conclusions from the assessments required pursuant to Provision D.4. Based on the consideration the report must assess the following:

(a) The beneficial uses of the receiving waters within the San Diego Region that are supported and not adversely affected by the Copermittees' MS4 discharges;

(b) The beneficial uses of the receiving waters within the San Diego Region that are adversely impacted by the Copermittees' MS4 discharges;

[30] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

(c) The progress toward protecting the beneficial uses in the receiving waters within the San Diego Region from the Copermittees' discharges; and

(d) Pollutants or conditions of emerging concern that may impact beneficial uses in the receiving waters within the San Diego Region.

(2) The Regional Monitoring and Assessment Report must include recommendations for improving the implementation and assessment of the Water Quality Improvement Plans and jurisdictional runoff management programs.

(3) Each Copermittee must provide any data or documentation utilized in developing the Regional Monitoring and Assessment Report upon request by the San Diego Water Board. Any Copermittee monitoring and assessment data utilized in developing the Regional Monitoring and Assessment Report must be available for access on the Regional Clearinghouse required pursuant to Provision F.4.

4. Regional Clearinghouse

The Copermittees must develop, update, and maintain an internet-based Regional Clearinghouse that is made available to the public no later than 18 months after the effective date of this Order.[31]

a. The Copermittees, through the Regional Clearinghouse, must make the following documents and data available for access, and organized by Watershed Management Area. The documents and data may be linked to other internet-based data portals and databases where the original documents are stored:

(1) Water Quality Improvement Plan for the Watershed Management Area, and all updated versions with date of update;

(2) Annual Reports for the Watershed Management Area;

(3) Jurisdictional Runoff Management Program document for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(4) BMP Design Manual for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(5) Reports from special studies (e.g. source identification, BMP effectiveness assessment) conducted in the Watershed Management Area;

[31] The Copermittees may develop, update and maintain the clearinghouse(s) of other Copermittees or agencies.

(6) Monitoring data collected pursuant to Provision D for each Watershed Management Area must be uploaded to CEDEN,[32] with links to the uploaded data; and

(7) Available GIS data, layers, and/or shapefiles used to develop the maps generated and maintained by the Copermittees for the Water Quality Improvement Plans, Annual Reports, and jurisdictional runoff management program documents.

b. The Copermittees, through the Regional Clearinghouse, must make the following information and documents available for access:

(1) Contact information (point of contact, phone number, email address, and mailing address) for each Copermittee;

(2) Public hotline number for reporting non-storm water and illicit discharges for each Copermittee;

(3) Email address for reporting non-storm water and illicit discharges for each Copermittee;

(4) Link to each Copermittee's website, if available, where the public may find additional information about the Copermittee's storm water management program and for requesting records for the implementation of its program;

(5) Information about opportunities for the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or protection of the quality of receiving waters; and

(6) Reports from regional monitoring programs in which the Copermittees participate (e.g. Southern California Monitoring Coalition, Southern California Coastal Water Research Project Bight Monitoring);

(7) Regional Monitoring and Assessment Reports; and

(8) Any other information, data, and documents the Copermittees determine as appropriate for making available to the public.

[32] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

5. Report of Waste Discharge

a. The Orange County Copermittees and the Riverside County Copermittees are required to submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders. The San Diego Water Board will review and consider the Reports of Waste Discharge to determine whether modification to this Order, pursuant to the requirements of Provision H, will be required prior to the Orange County Copermittees and/or Riverside County Copermittees obtaining coverage under this Order. The current Orders for the Orange County Copermittees and Riverside County Copermittees are rescinded upon the date of effective coverage under this Order except for enforcement purposes.

b. The Copermittees subject to the requirements of this Order must submit to the San Diego Water Board a complete Report of Waste Discharge as an application for the re-issuance of this Order and NPDES permit. The Report of Waste Discharge must be submitted no later than 180 days in advance of the expiration date of this Order. The Report of Waste Discharge must contain the following minimum information:

(1) Names and addresses of the Copermittees;

(2) Names and titles of the primary contacts of the Copermittees;

(3) Proposed changes to the Copermittees' Water Quality Improvement Plans and the supporting justification;

(4) Proposed changes to the Copermittees' jurisdictional runoff management programs and the supporting justification;

(5) Any other information necessary for the re-issuance of this Order;

(6) Any information to be included as part of the Report of Waste Discharge pursuant to the requirements of this Order; and

(7) Any other information required by federal regulations for NPDES permit reissuance.

6. Application for Early Coverage

a. The Orange County Copermittees, collectively, or Riverside County Copermittees, collectively, may apply for early coverage under this Order by submitting a Report of Waste Discharge Form 200, with a written request for early coverage under this Order.

b. The San Diego Water Board will review the application for early coverage. A notification of coverage under this Order will be issued to the Copermittees in the

respective county by the San Diego Water Board upon completion of the early coverage application requirements. The effective coverage date will be specified in the notification of coverage. The Copermittees in the respective county are authorized to have MS4 discharges pursuant to the requirements of this Order starting on the effective coverage date specified in the notification of coverage. The existing Order for the respective county is rescinded upon the effective coverage date specified in the notification of coverage except for enforcement purposes.

7. Reporting Provisions

Each Copermittee must comply with all the reporting and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

G. PRINCIPAL WATERSHED COPERMITTEE RESPONSIBILITIES

1. The Copermittees within each Watershed Management Area must designate a Principal Watershed Copermittee and notify the San Diego Water Board of the name of the Principal Watershed Copermittee. An individual Copermittee should not be designated a Principal Watershed Copermittee for more than two Watershed Management Areas. The notification may be submitted with the Water Quality Improvement Plan required pursuant to Provision F.1 of this Order.

2. The Principal Watershed Copermittee is responsible for, at a minimum, the following:

a. Serving as liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues, and when necessary and appropriate, representing the Copermittees in the Watershed Management Area before the San Diego Water Board.

b. Facilitating the development of the Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order

c. Coordinating the submittal of the deliverables required by Provisions F.1, F.2, F.3.a, and F.3.b of this Order.

d. Coordinating and developing, with the other Principal Watershed Copermittees, the requirements of Provisions F.3.c, F.4, and F.5.b of this Order.

3. The Principal Watershed Copermittee is not responsible for ensuring that the other Copermittees within the Watershed Management Area are in compliance with the requirements of this Order. Each Copermittee within the Watershed Management Area is responsible for complying with the requirements of this Order.

H. MODIFICATION OF ORDER

1. Modifications of the Order may be initiated by the San Diego Water Board or by the Copermittees. Requests by Copermittees must be made to the San Diego Water Board.

2. Minor modifications to the Order may be made by the San Diego Water Board where the proposed modification complies with all the prohibitions and limitations, and other requirements of this Order.

3. This Order may also be re-opened and modified, revoked and, reissued or terminated in accordance with the provisions of 40 CFR 122.44, 122.62 to 122.64, and 124.5. Causes for taking such actions include, but are not limited to, failure to comply with any condition of this Order and permit, and endangerment to human health or the environment resulting from the permitted activity.

4. This Order may be re-opened for modification for cause including but not limited to the following:

a. The State Water Board determines that revisions are warranted, and the San Diego Water Board concurs that revisions are necessary to those provisions of the Order addressing compliance with water quality standards in the receiving water and/or those provisions of the Order establishing an iterative process for implementation of management practices to assure compliance with water quality standards in the receiving water;

b. An application for early coverage under this Order is received pursuant to Provision F.6;

c. Any of the TMDLs in Attachment E to this Order are amended in the Basin Plan by San Diego Water Board, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA;

d. The Basin Plan is amended by San Diego Water Board to incorporate a new TMDL, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA; or

e. Updating or revising the monitoring and reporting requirements is determined to be necessary, at the discretion of the San Diego Water Board. Such modification(s) may include, but is (are) not limited to, revision(s) to: (i) implement recommendations from Southern California Coastal Water Research Project (SCCWRP), (ii) develop, refine, implement, and/or coordinate a regional monitoring program, (iii) develop and implement improved monitoring and assessment programs in keeping with San Diego Water Board Resolution No. R9-2012-0069, Resolution in Support of a Regional Monitoring Framework, and/or (iv) add provisions to require the Copermittees to evaluate and provide information on cost and values of the monitoring and reporting program.

5. The San Diego Water Board, after opportunity for public comment and a public hearing, will re-open and consider modifications to this Order when the Orange County Copermittees or the Riverside County Copermittees submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders.

I. STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

Each Copermittee must comply with all the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

ATTACHMENT A

DISCHARGE PROHIBITIONS AND SPECIAL PROTECTIONS

1. Basin Plan Waste Discharge Prohibitions

California Water Code Section 13243 provides that a Regional Water Board, in a water quality control plan, may specify certain conditions or areas where the discharge of waste or certain types of waste is not permitted. The following waste discharge prohibitions in the Water Quality Control Plan for the San Diego Basin (Basin Plan) are applicable to any person, as defined by Section 13050(c) of the California Water Code, who is a citizen, domiciliary, or political agency or entity of California whose activities in California could affect the quality of waters of the state within the boundaries of the San Diego Region.

1. The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in California Water Code Section 13050, is prohibited.

2. The discharge of waste to land, except as authorized by waste discharge requirements or the terms described in California Water Code Section 13264 is prohibited.

3. The discharge of pollutants or dredged or fill material to waters of the United States except as authorized by a National Pollutant Discharge Elimination System (NPDES) permit or a dredged or fill material permit (subject to the exemption described in California Water Code Section 13376) is prohibited.

4. Discharges of recycled water to lakes or reservoirs used for municipal water supply or to inland surface water tributaries thereto are prohibited, unless this San Diego Water Board issues a NPDES permit authorizing such a discharge; the proposed discharge has been approved by the State Department of Health Services (DHS) and the operating agency of the impacted reservoir; and the discharger has an approved fail-safe long-term disposal alternative.

5. The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the San Diego Water Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

6. The discharge of waste in a manner causing flow, ponding, or surfacing on lands not owned or under the control of the discharger is prohibited, unless the discharge is authorized by the San Diego Water Board.

7. The dumping, deposition, or discharge of waste directly into waters of the state, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the San Diego Water Board.

8. Any discharge to a storm water conveyance system that is not composed entirely of "*storm water*" is prohibited unless authorized by the San Diego Water Board. [The federal regulations, 40 CFR 122.26(b)(13), define storm water as storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from fire fighting activities.] [§122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

9. The unauthorized discharge of treated or untreated sewage to waters of the state or to a storm water conveyance system is prohibited.

10. The discharge of industrial wastes to conventional septic tank/subsurface disposal systems, except as authorized by the terms described in California Water Code Section 13264, is prohibited.

11. The discharge of radioactive wastes amenable to alternative methods of disposal into the waters of the state is prohibited.

12. The discharge of any radiological, chemical, or biological warfare agent into waters of the state is prohibited.

13. The discharge of waste into a natural or excavated site below historic water levels is prohibited unless the discharge is authorized by the San Diego Water Board.

14. The discharge of sand, silt, clay, or other earthen materials from any activity, including land grading and construction, in quantities which cause deleterious bottom deposits, turbidity or discoloration in waters of the state or which unreasonably affect, or threaten to affect, beneficial uses of such waters is prohibited.

15. The discharge of treated or untreated sewage from vessels to Mission Bay, Oceanside Harbor, Dana Point Harbor, or other small boat harbors is prohibited.

16. The discharge of untreated sewage from vessels to San Diego Bay is prohibited.

17. The discharge of treated sewage from vessels to portions of San Diego Bay that are less than 30 feet deep at mean lower low water (MLLW) is prohibited.

18. The discharge of treated sewage from vessels, which do not have a properly functioning US Coast Guard certified Type I or Type II marine sanitation device, to portions of San Diego Bay that are greater than 30 feet deep at mean lower low water (MLLW) is prohibited.

2. Attachment B to State Water Board Resolution 2012-0012

Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges

I. PROVISIONS FOR POINT SOURCE DISCHARGES OF STORM WATER AND NONPOINT SOURCE WASTE DISCHARGES

The following terms, prohibitions, and special conditions (hereafter collectively referred to as special conditions) are established as limitations on point source storm water and nonpoint source discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in Areas of Special Biological Significance (ASBS), as required for State Water Quality Protection Areas pursuant to California Public Resources Code Sections 36700(f) and 36710(f). These Special Protections are adopted by the State Water Board as part of the California Ocean Plan (Ocean Plan) General Exception.

The special conditions are organized by category of discharge. The State Water Resources Control Board (State Water Board) and Regional Water Quality Control Boards (Regional Water Boards) will determine categories and the means of regulation for those categories [e.g., Point Source Storm Water National Pollutant Discharge Elimination System (NPDES) or Nonpoint Source].

A. PERMITTED POINT SOURCE DISCHARGES OF STORM WATER

1. General Provisions for Permitted Point Source Discharges of Storm Water

   a. Existing storm water discharges into an ASBS are allowed only under the following conditions:

      (1) The discharges are authorized by an NPDES permit issued by the State Water Board or Regional Water Board;

      (2) The discharges comply with all of the applicable terms, prohibitions, and special conditions contained in these Special Protections; and

      (3) The discharges:

         (i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

         (ii) Are designed to prevent soil erosion;

         (iii) Occur only during wet weather;

         (iv) Are composed of only storm water runoff.

   b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

   c. The discharge of trash is prohibited.

d. Only discharges from existing storm water outfalls are allowed. Any proposed or new storm water runoff discharge shall be routed to existing storm water discharge outfalls and shall not result in any new contribution of waste to an ASBS (i.e., no additional pollutant loading). “Existing storm water outfalls” are those that were constructed or under construction prior to January 1, 2005. “New contribution of waste” is defined as any addition of waste beyond what would have occurred as of January 1, 2005. A change to an existing storm water outfall, in terms of re-location or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges are prohibited except as provided below:

(1) The term “non-storm water discharges” means any waste discharges from a municipal separate storm sewer system (MS4) or other NPDES permitted storm drain system to an ASBS that are not composed entirely of storm water.

(2) (i) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability or occur naturally:

(a) Discharges associated with emergency fire fighting operations.

(b) Foundation and footing drains.

(c) Water from crawl space or basement pumps.

(d) Hillside dewatering.

(e) Naturally occurring groundwater seepage via a storm drain.

(f) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(ii) An NPDES permitting authority may authorize non-storm water discharges to an MS4 with a direct discharge to an ASBS only to the extent the NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

2. Compliance Plans for Inclusion in Storm Water Management Plans (SWMP) and Storm Water Pollution Prevention Plans (SWPPP).

The discharger shall specifically address the prohibition of non-storm water runoff and the requirement to maintain natural water quality for storm water discharges to an ASBS in an ASBS Compliance Plan to be included in its SWMP or a SWPPP, as appropriate to permit type. If a statewide permit includes a SWMP, then the discharger shall prepare a stand-alone compliance plan for ASBS discharges. The ASBS Compliance Plan is subject to approval by the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (for permits issued by Regional Water Boards).

a. The Compliance Plan shall include a map of surface drainage of storm water runoff, showing areas of sheet runoff, prioritize discharges, and describe any structural Best Management Practices (BMPs) already employed and/or BMPs to be employed in the future. Priority discharges are those that pose the greatest water quality threat and which are identified to require installation of structural BMPs. The map shall also show the storm water conveyances in relation to other features such as service areas, sewage conveyances and treatment facilities, landslides, areas prone to erosion, and waste and hazardous material storage areas, if applicable. The SWMP or SWPPP shall also include a procedure for updating the map and plan when changes are made to the storm water conveyance facilities.

b. The ASBS Compliance Plan shall describe the measures by which all non-authorized non-storm water runoff (e.g., dry weather flows) has been eliminated, how these measures will be maintained over time, and how these measures are monitored and documented.

c. For Municipal Separate Storm Sewer System (MS4s), the ASBS Compliance Plan shall require minimum inspection frequencies as follows:

   (1) The minimum inspection frequency for construction sites shall be weekly during rainy season;

   (2) The minimum inspection frequency for industrial facilities shall be monthly during the rainy season;

   (3) The minimum inspection frequency for commercial facilities (e.g., restaurants) shall be twice during the rainy season; and

   (4) Storm water outfall drains equal to or greater than 18 inches (457 mm) in diameter or width shall be inspected once prior to the beginning of the rainy season and once during the rainy season and maintained to remove trash and other anthropogenic debris.

d. The ASBS Compliance Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff, that are necessary to comply with these special conditions, will be achieved through BMPs. Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that such installation would pose a threat to health or safety. BMPs to control storm water runoff discharges (at the end-of-pipe) during a design storm shall be designed to achieve on average the following target levels:

   (1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

   (2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges. The baseline for the reduction is the effective date of the Exception. The baseline for these determinations is the effective date of the Exception, and the

reductions must be achieved and documented within four (4) years of the effective date.

e. The ASBS Compliance Plan shall address erosion control and the prevention of anthropogenic sedimentation in ASBS. The natural habitat conditions in the ASBS shall not be altered as a result of anthropogenic sedimentation.

f. The ASBS Compliance Plan shall describe the non-structural BMPs currently employed and planned in the future (including those for construction activities), and include an implementation schedule. The ASBS Compliance Plan shall include non-structural BMPs that address public education and outreach. Education and outreach efforts must adequately inform the public that direct discharges of pollutants from private property not entering an MS4 are prohibited. The ASBS Compliance Plan shall also describe the structural BMPs, including any low impact development (LID) measures, currently employed and planned for higher threat discharges and include an implementation schedule. To control storm water runoff discharges (at the end-of-pipe) during a design storm, permittees must first consider using LID practices to infiltrate, use, or evapotranspirate storm water runoff on-site.

g. The BMPs and implementation schedule shall be designed to ensure that natural water quality conditions in the receiving water are achieved and maintained by either reducing flows from impervious surfaces or reducing pollutant loading, or some combination thereof.

h. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents in storm water runoff that alter natural ocean water quality and the sources of these constituents.

(2) The report shall describe BMPs that are currently being implemented, BMPs that are identified in the SWMP or SWPPP for future implementation, and any additional BMPs that may be added to the SWMP or SWPPP to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the BMPs.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits), the discharger shall revise its ASBS Compliance Plan to incorporate any new or modified BMPs that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised SWMP or SWPPP, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural ocean water quality conditions due to the same constituent.

(5) Compliance with this section does not excuse violations of any term, prohibition, or condition contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within one year from the effective date of the Exception, the discharger shall submit a written ASBS Compliance Plan to the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that describes its strategy to comply with these special conditions, including the requirement to maintain natural water quality in the affected ASBS. The ASBS Compliance Plan shall include a time schedule to implement appropriate non-structural and structural controls (implementation schedule) to comply with these special conditions for inclusion in the discharger's SWMP or SWPPP, as appropriate to permit type.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these special conditions shall be implemented.

d. Within four (4) years of the effective date of the Exception, any structural controls identified in the ASBS Compliance Plan that are necessary to comply with these special conditions shall be operational.

e. Within four (4) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water, pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data, and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

   If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

   The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

(1) for municipalities, a demonstration of significant hardship to discharger ratepayers, by showing the relationship of storm water fees to annual household income for residents within the discharger's jurisdictional area, and the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or
(2) for other governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process.

B. NONPOINT SOURCE DISCHARGES

[NOT INCLUDED]
[PROVISIONS FOR NONPOINT SOURCE DISCHARGES NOT APPLICABLE]

II. ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES

[NOT INCLUDED]
[ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES NOT APPLICABLE]

III. ADDITIONAL REQUIREMENTS – WATERFRONT AND MARINE OPERATIONS

[NOT INCLUDED]
[ADDITIONAL REQUIREMENTS FOR WATERFRONT AND MARINE OPERATIONS NOT APPLICABLE]

IV. MONITORING REQUIREMENTS

Monitoring is mandatory for all dischargers to assure compliance with the Ocean Plan. Monitoring requirements include both: (A) core discharge monitoring, and (B) ocean receiving water monitoring. The State and Regional Water Boards must approve sampling site locations and any adjustments to the monitoring programs. All ocean receiving water and reference area monitoring must be comparable with the Water Boards' Surface Water Ambient Monitoring Program (SWAMP).

Safety concerns: Sample locations and sampling periods must be determined considering safety issues. Sampling may be postponed upon notification to the State and Regional Water Boards if hazardous conditions prevail.

Analytical Chemistry Methods: All constituents must be analyzed using the lowest minimum detection limits comparable to the Ocean Plan water quality objectives. For metal analysis, all samples, including storm water effluent, reference samples, and ocean receiving water samples, must be analyzed by the approved analytical method with the lowest minimum detection limits (currently Inductively Coupled Plasma/Mass Spectrometry) described in the Ocean Plan.

A. CORE DISCHARGE MONITORING PROGRAM

1. General sampling requirements for timing and storm size:

   Runoff must be collected during a storm event that is greater than 0.1 inch and generates runoff, and at least 72 hours from the previously measurable storm event. Runoff samples shall be collected when post-storm receiving water is sampled, and analyzed for the same constituents as receiving water and reference site samples (see section IV B) as described below.

2. Runoff flow measurements

   a. For municipal/industrial storm water outfalls in existence as of December 31, 2007, 18 inches (457mm) or greater in diameter/width (including multiple outfall pipes in combination having a width of 18 inches, runoff flows must be measured or calculated, using a method acceptable to and approved by the State and Regional Water Boards.
   b. This will be reported annually for each precipitation season to the State and Regional Water Boards.

3. Runoff samples – storm events

   a. For outfalls equal to or greater than 18 inches (0.46m) in diameter or width:

      (1) samples of storm water runoff shall be analyzed during the same storm as receiving water samples for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination, ; and

      (2) samples of storm water runoff shall be analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS

      (3) If an applicant has no outfall greater than 36 inches, then storm water runoff from the applicant's largest outfall shall be further analyzed during the same storm as receiving water samples for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates).

   b. For outfalls equal to or greater than 36 inches (0.91m) in diameter or width:

      (1) samples of storm water runoff shall be analyzed during the same storm as receiving water samples for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

      (2) samples of storm water runoff shall be further analyzed during the same storm as receiving water samples for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates) and

(3) samples of storm water runoff shall be analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

c. For an applicant not participating in a regional monitoring program [see below in Section IV (B)] in addition to (a.) and (b.) above, a minimum of the two largest outfalls or 20 percent of the larger outfalls, whichever is greater, shall be sampled (flow weighted composite samples) at least three times annually during wet weather (storm event) and analyzed for all Ocean Plan Table A constituents, Table B constituents for marine aquatic life protection (except for toxicity, only chronic toxicity for three species shall be required), DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, and Ocean Plan indicator bacteria. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one (the largest) such discharge shall be sampled annually in each Region.

4. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may reduce or suspend core monitoring once the storm runoff is fully characterized. This determination may be made at any point after the discharge is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

B. OCEAN RECEIVING WATER AND REFERENCE AREA MONITORING PROGRAM

In addition to performing the Core Discharge Monitoring Program in Section II.A above, all applicants having authorized discharges must perform ocean receiving water monitoring. In order to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS, dischargers may choose either (1) an individual monitoring program, or (2) participation in a regional integrated monitoring program.

1. Individual Monitoring Program: The requirements listed below are for those dischargers who elect to perform an individual monitoring program to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within the affected ASBS. In addition to Core Discharge Monitoring, the following additional monitoring requirements shall be met:

   a. Three times annually, during wet weather (storm events), the receiving water at the point of discharge from the outfalls described in section (IV)(A)(3)(c) above shall be sampled and analyzed for Ocean Plan Table A constituents, Table B constituents for marine aquatic life, DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, salinity, chronic toxicity (three species), and Ocean Plan indicator bacteria.

      The sample location for the ocean receiving water shall be in the surf zone at the point of discharges; this must be at the same location where storm water runoff is sampled. Receiving water shall be sampled at approximately the same time prior to (pre-storm) and during (or immediately after) the same storm (post storm). Reference water quality shall also be sampled and analyzed for the same constituents pre-storm and post-storm, during the same storms when receiving water is sampled. Reference stations will be determined by the State Water Board's Division of Water Quality and the applicable Regional Water Board(s).

b. Sediment sampling shall occur at least three times during every five (5) year period. The subtidal sediment (sand or finer, if present) at the discharge shall be sampled and analyzed for Ocean Plan Table B constituents for marine aquatic life, DDT, PCBs, PAHs, pyrethroids, and OP pesticides. For sediment toxicity testing, only an acute toxicity test using the amphipod Eohaustorius estuarius must be performed.

c. A quantitative survey of intertidal benthic marine life shall be performed at the discharge and at a reference site. The survey shall be performed at least once every five (5) year period. The survey design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The results of the survey shall be completed and submitted to the State Water Board and Regional Water Board at least six months prior to the end of the permit cycle.

d. Once during each five (5) year period, a bioaccumulation study shall be conducted to determine the concentrations of metals and synthetic organic pollutants at representative discharge sites and at representative reference sites. The study design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The bioaccumulation study may include California mussels (Mytilus californianus) and/or sand crabs (Emerita analoga or Blepharipoda occidentalis). Based on the study results, the Regional Water Board and the State Water Board's Division of Water Quality, may adjust the study design in subsequent permits, or add or modify additional test organisms (such as shore crabs or fish), or modify the study design appropriate for the area and best available sensitive measures of contaminant exposure.

e. Marine Debris: Representative quantitative observations for trash by type and source shall be performed along the coast of the ASBS within the influence of the discharger's outfalls. The design, including locations and frequency, of the marine debris observations is subject to approval by the Regional Water Board and State Water Board's Division of Water Quality.

f. The monitoring requirements of the Individual Monitoring Program in this section are minimum requirements. After a minimum of one (1) year of continuous water quality monitoring of the discharges and ocean receiving waters, the Executive Director of the State Water Board (statewide permits) or Executive officer of the Regional Water Board (Regional Water Board permits) may require additional monitoring, or adjust, reduce or suspend receiving water and reference station monitoring. This determination may be made at any point after the discharge and receiving water is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

2. Regional Integrated Monitoring Program: Dischargers may elect to participate in a regional integrated monitoring program, in lieu of an individual monitoring program, to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS. This regional approach shall characterize natural water quality, pre- and post-storm, in ocean reference areas near the mouths of identified open space watersheds and the effects of the discharges on natural water quality (physical, chemical, and toxicity) in the ASBS receiving waters, and should include benthic marine aquatic life and bioaccumulation components. The design of the ASBS stratum of a regional integrated monitoring program may deviate from the otherwise prescribed individual monitoring approach (in Section IV.B.1) if approved by the State Water Board's Division of Water Quality and the Regional Water Boards.

a. Ocean reference areas shall be located at the drainages of flowing watersheds with minimal development (in no instance more than 10% development), and shall not be located in CWA Section 303(d) listed waterbodies or have tributaries that are 303(d) listed. Reference areas shall be free of wastewater discharges and anthropogenic non-storm water runoff. A minimum of low threat storm runoff discharges (e.g. stream highway overpasses and campgrounds) may be allowed on a case-by-case basis. Reference areas shall be located in the same region as the ASBS receiving water monitoring occurs. The reference areas for each Region are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean reference water samples must be collected from each station, each from a separate storm. A minimum of one reference location shall be sampled for each ASBS receiving water site sampled per responsible party. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

b. ASBS ocean receiving water must be sampled in the surf zone at the location where the runoff makes contact with ocean water (i.e. at "point zero"). Ocean receiving water stations must be representative of worst-case discharge conditions (i.e. co-located at a large drain greater than 36 inches, or if drains greater than 36 inches are not present in the ASBS then the largest drain greater than18 inches.) Ocean receiving water stations are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean receiving water samples must be collected during each storm season from each station, each from a separate storm. A minimum of one receiving water location shall be sampled in each ASBS per responsible party in that ASBS. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

c. Reference and receiving water sampling shall commence during the first full storm season following the adoption of these special conditions, and post-storm samples shall be collected when annual storm water runoff is sampled. Sampling shall occur in a minimum of two storm seasons. For those ASBS dischargers that have already participated in the Southern California Bight 2008 ASBS regional monitoring effort, sampling may be limited to only one storm season.

d. Receiving water and reference samples shall be analyzed for the same constituents as storm water runoff samples. At a minimum, constituents to be sampled and analyzed in reference and discharge receiving waters must include oil and grease, total suspended solids, Ocean Plan Table B metals for protection of marine life, Ocean Plan PAHs, pyrethroids, OP pesticides, ammonia, nitrate, phosphates, and critical life stage chronic toxicity for three species. In addition, within the range of the southern sea otter, indicator bacteria or some other measure of fecal contamination shall be analyzed.

3. Waterfront and Marine Operations: In addition to the above requirements for ocean receiving water monitoring, additional monitoring must be performed for marinas and boat launch and pier facilities:

a. For all marina or mooring field operators, in mooring fields with 10 or more occupied moorings, the ocean receiving water must be sampled for Ocean Plan indicator bacteria, residual chlorine, copper, zinc, grease and oil, methylene blue active substances (MBAS), and ammonia nitrogen.

   (1) For mooring field operators opting for an individual monitoring program (Section IV.B.1 above), this sampling must occur weekly (on the weekend) from May through October.

   (2) For mooring field operators opting to participate in a regional integrated monitoring program (Section IV.B.2 above), this sampling must occur monthly from May through October on a high use weekend in each month. The Water Boards may allow a reduction in the frequency of sampling, through the regional monitoring program, after the first year of monitoring.

b. For all mooring field operators, the subtidal sediment (sand or finer, if present) within mooring fields and below piers shall be sampled and analyzed for Ocean Plan Table B metals (for marine aquatic life beneficial use), acute toxicity, PAHs, and tributyltin. For sediment toxicity testing, only an acute toxicity test using the amphipod Eohaustorius estuarius must be performed. This sampling shall occur at least three times during a five (5) year period. For mooring field operators opting to participate in a regional integrated monitoring program, the Water Boards may allow a reduction in the frequency of sampling after the first sampling effort's results are assessed.

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ATTACHMENT B

STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

1. Standard Permit Provisions

Code of Federal Regulations Title 40 Section 122.41 (40 CFR 122.41) includes conditions, or provisions, that apply to all National Pollutant Discharge Elimination System (NPDES) permits. Additional provisions applicable to NPDES permits are in 40 CFR 122.42. All applicable provisions in 40 CFR 122.41 and 40 CFR 122.42 must be incorporated into this Order and NPDES permit. The applicable 40 CFR 122.41 and 40 CFR 122.42 provisions are as follows:

a. DUTY TO COMPLY [40 CFR 122.41(a)]

The Copermittee must comply with all of the provisions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

(1) The Copermittee must comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement. [40 CFR 122.41(a)(1)]

(2) The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to a civil penalty not to exceed $25,000 per day for each violation. The CWA provides that any person who *negligently* violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than 2 years, or both. Any person who *knowingly* violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both. Any person who knowingly violates Section 301, 302, 303, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, and who knows at that time that he thereby places another person in imminent danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of

not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.
[40 CFR 122.41(a)(2)]

(3) Any person may be assessed an administrative penalty by the San Diego Regional Water Quality Control Board (San Diego Water Board), State Water Resources Control Board (State Water Board), or United States Environmental Protection Agency (USEPA) for violating Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.
[40 CFR 122.41(a)(3)]

b. DUTY TO REAPPLY [40 CFR 122.41(b)]

If a Copermittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Copermittee must apply for and obtain a new permit.

c. NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE [40 CFR 122.41(c)]

It shall not be a defense for a Copermittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

d. DUTY TO MITIGATE [40 CFR 122.41(d)]

The Copermittee must take all reasonable steps to minimize or prevent any discharge or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

e. PROPER OPERATION AND MAINTENANCE [40 CFR 122.41(e)]

The Copermittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Copermittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by a Copermittee only when the operation is necessary to achieve compliance with the conditions of this permit.

f. PERMIT ACTIONS [40 CFR 122.41(f)]

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Copermittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

g. PROPERTY RIGHTS [40 CFR 122.41(g)]

This permit does not convey any property rights of any sort, or any exclusive privilege.

h. DUTY TO PROVIDE INFORMATION [40 CFR 122.41(h)]

The Copermittee must furnish to the San Diego Water Board, State Water Board, or USEPA within a reasonable time, any information which the San Diego Water Board, State Water Board, or USPEA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Copermittee must also furnish to the San Diego Water Board, State Water Board, or USPEA upon request, copies of records required to be kept by this permit.

i. INSPECTION AND ENTRY [40 CFR 122.41(i)]

The Copermittee must allow the San Diego Water Board, State Water Board, USEPA, and/or their authorized representative (including an authorized contractor acting as their representative), upon presentation of credentials and other documents as may be required by law, to:

(1) Enter upon the Copermittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit; [40 CFR 122.41(i)(1)]

(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit; [40 CFR 122.41(i)(2)]

(3) Inspect and photograph at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; [40 CFR 122.41(i)(3)] and

(4) Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location. [40 CFR 122.41(i)(4)]

j. MONITORING AND RECORDS [40 CFR 122.41(j)]

(1) Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity. [40 CFR 122.41(j)(1)]

(2) Except for records of monitoring information required by this permit related to the Copermittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five (5) years (or longer as required by 40 CFR Part 503), the

Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time. [40 CFR 122.41(j)(2)]

(3) Records for monitoring information must include: [40 CFR 122.41(j)(3)]

(a) The date, exact place, and time of sampling or measurements; [40 CFR 122.41(j)(3)(i)]
(b) The individual(s) who performed the sampling or measurements; [40 CFR 122.41(j)(3)(ii)]
(c) The date(s) analyses were performed; [40 CFR 122.41(j)(3)(iii)]
(d) The individual(s) who performed the analyses; [40 CFR 122.41(j)(3)(iv)]
(e) The analytical techniques or methods used; [40 CFR 122.41(j)(3)(v)] and
(f) The results of such analyses. [40 CFR 122.41(j)(3)(vi)]

(4) Monitoring must be conducted according to test procedures under 40 CFR Part 136 unless another method is required under 40 CFR Subchapters N or O. [40 CFR 122.41(j)(4)]

In the case of pollutants for which there are no approved methods under 40 CFR Part 136 or otherwise required under 40 CFR Subchapters N and O, monitoring must be conducted according to a test procedure specified in the permit for such pollutants. [40 CFR 122.44(i)(1)(iv)]

(5) The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. [40 CFR 122.41(j)(5)]

k. SIGNATORY REQUIREMENT [40 CFR 122.41(k)]

(1) All applications, reports, or information submitted to the San Diego Water Board, State Water Board, or USEPA must be signed and certified. (See 40 CFR 122.22) [40 CFR 122.41(k)(1)]

(a) *For a municipality, State, Federal, or other public agency.* [All applications must be signed] [b]y either a principal executive officer or ranking elected official. [40 CFR 122.22(a)(3)]

(b) All reports required by permits, and other information requested by the San Diego Water Board, State Water Board, or USEPA must be signed by a person described in paragraph (a) of this section, or by a duly authorized representative of that person. A person is a duly authorized representative only if: [40 CFR 122.22(b)]

(i) The authorization is made in writing by a person described in paragraph (a) of this section; [40 CFR 122.22(b)(1)]

(ii) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company, (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) [40 CFR 122.22(b)(2)] and,

(iii) The written authorization is submitted to the San Diego Water Board and State Water Board. [40 CFR 122.22(b)(3)]

(c) *Changes to authorization.* If an authorization under paragraph (b) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (b) of this section must be submitted to the San Diego Water Board prior to or together with any reports, information, or applications to be signed by an authorized representative. [40 CFR 122.22(c)]

(d) *Certification.* Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." [40 CFR 122.22(d)]

(2) The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both. [40 CFR 122.41(k)(2)]

I. REPORTING REQUIREMENTS [40 CFR 122.41(l)]

(1) *Planned changes.* The Copermittee must give notice to the San Diego Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when: [40 CFR 122.41(l)(1)]

(a) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); [40 CFR 122.41(l)(1)(i)] or

(b) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which

are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1). [40 CFR 122.41(l)(1)(ii)]

(c) The alteration or addition results in a significant change in the Copermittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. [40 CFR 122.41(l)(1)(iii)]

(2) *Anticipated noncompliance*. The Copermittee must give advance notice to the San Diego Water Board or State Water Board of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements. [40 CFR 122.41(l)(2)]

(3) *Transfers*. This permit is not transferable to any person except after notice to the San Diego Water Board. The San Diego Water Board may require modification or revocation and reissuance of the permit to change the name of the Copermittee and incorporate such other requirements as may be necessary under the CWA. [40 CFR 122.41(l)(3)]

(4) *Monitoring reports.* Monitoring results must be reported at the intervals specified elsewhere in this permit. [40 CFR 122.41(l)(4)]

(a) Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the San Diego Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices. [40 CFR 122.41(l)(4)(i)]

(b) If the Copermittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or another method required for an industry-specific waste stream under 40 CFR Subchapters N or O, the results of this monitoring must be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the San Diego Water Board or State Water Board. [40 CFR 122.41(l)(4)(ii)]

(c) Calculations for all limitations which require averaging of measurements must utilize an arithmetic mean unless otherwise specified in the permit. [40 CFR 122.41(l)(4)(iii)]

(5) *Compliance schedules*. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date. [40 CFR 122.41(l)(5)]

(6) *Twenty-four hour reporting.*

(a) The Copermittee must report any noncompliance that may endanger health or the environment. Any information must be provided orally within 24 hours from the time the Copermittee becomes aware of the circumstances. A written submission must also be provided within five (5) days of the time the Copermittee becomes aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6)(i)]

(b) The following must be included as information which must be reported within 24 hours under this paragraph: [40 CFR 122.41(l)(6)(ii)]

(i) Any unanticipated bypass that exceeds any effluent limitation in the permit (See 40 CFR 122.41(g)). [40 CFR 122.41(l)(6)(ii)(A)]
(ii) Any upset which exceeds any effluent limitation in the permit. [40 CFR 122.41(l)(6)(ii)(B)] and,
(iii) Violation of a maximum daily discharge limitation for any of the pollutants listed by the San Diego Water Board in the permit to be reported within 24 hours. (See 40 CFR 122.44(g)) [40 CFR 122.41(l)(6)(ii)(C)]

(c) The San Diego Water Board may waive the above-required written report on a case-by-case basis if the oral report has been received within 24 hours. [40 CFR 122.41(l)(6)(iii)]

(7) *Other noncompliance.* The Copermittee must report all instances of noncompliance not reported in accordance with the standard provisions required under 40 CFR 122.41(l)(4), (5), and (6), at the time monitoring reports are submitted. The reports must contain the information listed in the standard provisions required under 40 CFR 122.41(l)(6). [40 CFR 122.41(l)(7))]

(8) *Other information.* When the Copermittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the San Diego Water Board, State Water Board, or USEPA, the Copermittee must promptly submit such facts or information. [40 CFR 122.41(l)(8)]

m. BYPASS [40 CFR 122.41(m)]

(1) *Definitions.*

(a) "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. [40 CFR 122.41(m)(1)(i)] or

(b) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be

expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
[40 CFR 122.41(m)(1)(ii)]

(2) *Bypass not exceeding limitations*. The Copermittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the standard provisions required under 40 CFR 122.41(m)(3) and (4).
[40 CFR 122.41(m)(2)]

(3) *Notice.*

(a) *Anticipated bypass*. If the Copermittee knows in advance of the need for a bypass, it must submit a notice, if possible at least ten days before the date of the bypass. [40 CFR 122.41(m)(3)(i)] or

(b) *Unanticipated bypass*. The Copermittee must submit notice of an unanticipated bypass in accordance with the standard provisions required under 40 CFR 122.41(l)(6) (24-hour notice).
[40 CFR 122.41(m)(3)(ii)]

(4) *Prohibition of Bypass.*

(a) Bypass is prohibited, and the San Diego Water Board may take enforcement action against a Copermittee for bypass, unless:
[40 CFR 122.41(m)(4)(i)]

(i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; [40 CFR 122.41(m)(4)(i)(A)]
(ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance;
[40 CFR 122.41(m)(4)(i)(B)] and,
(iii) The Copermittee submitted notice in accordance with the standard provisions required under 40 CFR 122.41(m)(3).
[40 CFR 122.41(m)(4)(i)(C)]

(b) The San Diego Water Board may approve an anticipated bypass, after considering its adverse effects, if the San Diego Water Board determines that it will meet the three conditions listed above.
[40 CFR 122.41(m)(4)(ii)]

n. UPSET [40 CFR 122.41(n)]

(1) *Definition.* "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Copermittee. An upset does not

include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. [40 CFR 122.41(n)(1)]

(2) *Effect of an upset*. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the standard provisions required under 40 CFR 122.41(n)(3) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. [40 CFR 122.41(n)(2)]

(3) *Conditions necessary for a demonstration of upset*. A Copermittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that: [40 CFR 122.41(n)(3)]

(a) An upset occurred and that the Copermittee can identify the cause(s) of the upset; [40 CFR 122.41(n)(3)(i)]
(b) The permitted facility was at the time being properly operated; [40 CFR 122.41(n)(3)(ii)] and
(c) The Copermittee submitted notice of the upset in accordance with the standard provisions required under 40 CFR 122.41(l)(6)(ii)(B) (24-hour notice). [40 CFR 122.41(n)(3)(iii)]
(d) The Copermittee complied with any remedial measures pursuant to the standard provisions required under 40 CFR 122.41(d). [40 CFR 122.41(n)(3)(iii)]

(4) *Burden of proof*. In any enforcement proceeding, the Copermittee seeking to establish the occurrence of an upset has the burden of proof. [40 CFR 122.41(n)(4)]

o. STANDARD PERMIT PROVISIONS FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS [40 CFR 122.42(c)]

The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the San Diego Water Board or State Water Board under 40 CFR 122.26(a)(1)(v) must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report must include:

(1) The status of implementing the components of the storm water management program that are established as permit conditions; [40 CFR 122.42(c)(1)]

(2) Proposed changes to the storm water management programs that are established as permit conditions. Such proposed changes must be consistent with 40 CFR 122.26(d)(2)(iii); [40 CFR 122.42(c)(2)] and

(3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under 40 CFR 122.26(d)(2)(iv) and (v); [40 CFR 122.42(c)(3)]

(4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; [40 CFR 122.42(c)(4)]

(5) Annual expenditures and budget for year following each annual report; [40 CFR 122.42(c)(5)]

(6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; [40 CFR 122.42(c)(6)]

(7) Identification of water quality improvements or degradation. [40 CFR 122.42(c)(7)]

p. STANDARD PERMIT PROVISIONS FOR STORM WATER DISCHARGES [40 CFR 122.42(d)]

The initial permits for discharges composed entirely of storm water issued pursuant to 40 CFR 122.26(e)(7) must require compliance with the conditions of the permit as expeditiously as practicable, but in no event later than three years after the date of issuance of the permit.

2. General Provisions

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. The general provisions applicable to this Order and NPDES permit are as follows:

a. DISCHARGE OF WASTE IS A PRIVILEGE

No discharge of waste into the waters of the State, whether or not such discharge is made pursuant to waste discharge requirements, shall create a vested right to continue such discharge. All discharges of waste into waters of the State are privileges, not rights. [CWC Section 13263(g)]

b. DURATION OF ORDER AND NPDES PERMIT

(1) *Effective date*. This Order and NPDES permit becomes effective on the 50th day after its adoption provided the USEPA has no objection. If the USEPA objects to its issuance, this Order shall not become effective until such objection is withdrawn. This Order supersedes Order No. R9-2007-0001 upon the effective date of this Order, and supersedes Order Nos. R9-2009-0002 and R9-2010-0016 upon their expiration or earlier notice of coverage.

(2) *Expiration*. This Order and NPDES permit expires five years after its effective date. [40 CFR 122.46(a)]

(3) *Continuation of expired order*. After this Order and NPDES permit expires, the terms and conditions of this Order and NPDES permit are automatically continued pending issuance of a new permit if all requirements of the federal NPDES regulations on the continuation of expired permits (40 CFR 122.6) are complied with.

c. AVAILABILITY

A copy of this Order must be kept at a readily accessible location and must be available to on-site personnel at all times.

d. CONFIDENTIALITY OF INFORMATION

Except as provided for in 40 CFR 122.7, no information or documents submitted in accordance with or in application for this Order will be considered confidential, and all such information and documents shall be available for review by the public at the San Diego Water Board office.

Claims of confidentiality for the following information will be denied: [40 CFR 122.7(b)]

(1) The name and address of any permit applicant or Copermittee; [40 CFR 122.7(b)(1)] and

(2) Permit applications and attachments, permits, and effluent data. [40 CFR 122.7(b)(2)]

e. EFFLUENT LIMITATIONS

(1) *Interim effluent limitations*. The Copermittee must comply with any interim effluent limitations as established by addendum, enforcement action, or revised waste discharge requirements which have been, or may be, adopted by the San Diego Water Board.

(2) *Other effluent limitations and standards*. If any applicable toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant and that standard or prohibition is more stringent than any limitation on the pollutant in the permit, the San Diego Water Board shall institute proceedings under these regulations to modify or revoke and reissue the permit to conform to the toxic effluent standard or prohibition. [40 CFR 122.44(b)(1)]

f. DUTY TO MINIMIZE OR CORRECT ADVERSE IMPACTS

The Copermittee must take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this Order, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the noncompliance.

g. PERMIT ACTIONS

The filing of a request by the Copermittee for modification, revocation and reissuance, or termination of this Order, or a notification of planned change in or anticipated noncompliance with this Order does not stay any condition of this Order. (See 40 CFR 122.41(f)) In addition, the following provisions apply to this Order:

(1) Upon application by any affected person, or on its own motion, the San Diego Water Board may review and revise the requirements in this Order. All requirements must be reviewed periodically. [CWC Section 13263(e)]

(2) This Order may be terminated or modified for cause, including, but not limited to, all of the following: [CWC Section 13381]

(a) Violation of any condition contained in the requirements of this Order. [CWC Section 13381(a)]

(b) Obtaining the requirements in this Order by misrepresentation, or failure to disclose fully all relevant facts. [CWC Section 13381(b)]

(c) A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge. [CWC Section 13381(c)]

(3) When this Order is transferred to a new owner or operator, such requirements as may be necessary under the CWC may be incorporated into this Order.

h. NPDES PERMITTED NON-STORM WATER DISCHARGES

The San Diego Water Board has, in prior years, issued a limited number of individual NPDES permits for non-storm water discharges to MS4s. The San Diego Water Board or State Water Board may in the future, upon prior notice to the Copermittee(s), issue an NPDES permit for any non-storm water discharge (or class of non-storm water discharges) to an MS4.

i. MONITORING

In addition to the standard provisions required under 40 CFR 122.41(j) and (l)(4), the following general monitoring provisions apply to this Order:

(1) Where procedures are not otherwise specified in Order, sampling, analysis and quality assurance/quality control must be conducted in accordance with the Quality Assurance Management Plan (QAMP) for the State of California's Surface Water Ambient Monitoring Program (SWAMP), adopted by the State Water Resources Control Board (State Water Board).

(2) Pursuant to 40 CFR 122.41(j)(2) and CWC Section 13383(a), each Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five (5) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time.

(3) All chemical, bacteriological, and toxicity analyses must be conducted at a laboratory certified for such analyses by the California Department of Public Health or a laboratory approved by the San Diego Water Board.

(4) For priority toxic pollutants that are identified in the California Toxics Rule (CTR) (65 Fed. Reg. 31682), the Copermittees must instruct their laboratories to establish calibration standards that are equivalent to or lower than the Minimum Levels (MLs) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP). If a Copermittee can demonstrate that a particular ML is not attainable, in accordance with procedures set forth in 40 CFR Part 136, the lowest quantifiable concentration of the lowest calibration standard analyzed by a specific analytical procedure (assuming that all the method specified sample weights, volumes, and processing steps have been followed) may be used instead of the ML listed in Appendix 4 of the SIP. The Copermittee must submit documentation from the laboratory to the San Diego Water Board for approval prior to raising the ML for any priority toxic pollutant.

j. ENFORCEMENT

(1) The San Diego Water Board is authorized to enforce the terms of this Order under several provisions of the CWC, including, but not limited to, CWC Sections 13385, 13386, and 13387.

(2) Nothing in this Order shall be construed to protect the Copermittee from its liabilities under federal, state, or local laws.

(3) The CWC provides for civil and criminal penalties comparable to, and in some cases greater than, those provided for under the CWA.

(4) Except as provided in the standard conditions required under 40 CFR 122.41(m) and (n), nothing in this Order shall be construed to relieve the Copermittee from civil or criminal penalties for noncompliance.

(5) Nothing in this Order shall be construed to preclude the institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties to which the Copermittee is or may be subject to under Section 311 of the CWA.

(6) Nothing in this Order shall be construed to preclude institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authoring preserved by Section 510 of the CWA.

k. SEVERABILITY

The provisions of this Order are severable, and if any provision of this Order, or the application of any provisions of this Order to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this Order shall not be affected thereby.

l. APPLICATIONS

Any application submitted by a Copermittee for reissuance or modification of this Order must satisfy all applicable requirements specified in federal regulations as well as any additional requirements for submittal of a Report of Waste Discharge specified in the CWC and the California Code of Regulations.

m. IMPLEMENTATION

All plans, reports and subsequent amendments submitted in compliance with this Order must be implemented immediately (or as otherwise specified). All submittals by Copermittees must be adequate to implement the requirements of this Order.

n. REPORT SUBMITTALS

(1) All report submittals must include an executive summary, introduction, conclusion, recommendations, and signed certified statement.

(2) Each Copermittee must submit a signed certified statement covering its responsibilities for each applicable submittal.

(3) The Principal Watershed Copermittee(s) must submit a signed certified statement covering its responsibilities for each applicable submittal and the sections of the submittals for which it is responsible.

(4) Unless otherwise directed, the Copermittees must submit one hard copy and one electronic copy of each report required under this Order to the San Diego Water Board, and one electronic copy to the USEPA.

(5) The Copermittees must submit reports and provide notifications as required by this Order to the following:

EXECUTIVE OFFICER
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
9174 SKY PARK COURT, SUITE 100
SAN DIEGO CA 92123-4340
Telephone: (858) 467-2952 Fax: (858) 571-6972

EUGENE BROMLEY
US ENVIRONMENTAL PROTECTION AGENCY
REGION IX
PERMITS ISSUANCE SECTION (W-5-1)
75 HAWTHORNE STREET
SAN FRANCISCO CA 94105

ATTACHMENT C

ACRONYMS AND ABBREVIATIONS

AMAL	Average Monthly Action Level
ASBS	Area(s) of Special Biological Significance
BMP	Best Management Practice
Basin Plan	Water Quality Control Plan for the San Diego Basin
CEQA	California Environmental Quality Act
CCR	California Code of Regulations
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWC	California Water Code
CZARA	Coastal Zone Act Reauthorization Amendments of 1990
ESAs	Environmentally Sensitive Areas
GIS	Geographic Information System
IBI	Index of Biological Integrity
LID	Low Impact Development
MDAL	Maximum Daily Action Level
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
NAL	Non-Storm Water Action Level
NAICS	North American Industry Classification System
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
ROWD	Report of Waste Discharge (application for NPDES reissuance)
SAL	Storm Water Action Level
San Diego Water Board	California Regional Water Quality Control Board, San Diego Region
SIC	Standard Industrial Classification Code
State Water Board	State Water Resources Control Board
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
WDID	Waste Discharge Identification Number
WLA	Waste Load Allocation
WQBEL	Water Quality Based Effluent Limitation

DEFINITIONS

Active/Passive Sediment Treatment - Using mechanical, electrical or chemical means to flocculate or coagulate suspended sediment for removal from runoff from construction sites prior to discharge.

Anthropogenic Litter – Trash generated from human activities, not including sediment.

Average Monthly Action Level – The highest allowable average of daily discharges over a calendar month.

Beneficial Uses - The uses of water necessary for the survival or wellbeing of man, plants, and wildlife. These uses of water serve to promote tangible and intangible economic, social, and environmental goals. "Beneficial Uses" of the waters of the State that may be protected include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. Existing beneficial uses are uses that were attained in the surface or ground water on or after November 28, 1975; and potential beneficial uses are uses that would probably develop in future years through the implementation of various control measures. "Beneficial Uses" are equivalent to "Designated Uses" under federal law. [California Water Code Section 13050(f)].

Best Management Practices (BMPs) - Defined in 40 CFR 122.2 as schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Bioassessment - The use of biological community information to evaluate the biological integrity of a water body and its watershed. With respect to aquatic ecosystems, bioassessment is the collection and analysis of samples of the benthic macroinvertebrate community together with physical/habitat quality measurements associated with the sampling site and the watershed to evaluate the biological condition (i.e. biotic integrity) of a water body.

Biofiltration - Practices that use vegetation and amended soils to detain and treat runoff from impervious areas. Treatment is through filtration, infiltration, adsorption, ion exchange, and biological uptake of pollutants.

Biological Integrity - Defined in Karr J.R. and D.R. Dudley. 1981. Ecological perspective on water quality goals. *Environmental Management* 5:55-68 as: "A balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitat of the region." Also referred to as ecosystem health.

BMP Design Manual – A plan developed to eliminate, reduce, or mitigate the impacts of runoff from development projects, including Priority Development Projects.

Chronic Toxicity – A measurement of sublethal effect (e.g. reduced growth, reproduction) to experimental test organisms exposed to an effluent or receiving waters compared to that of the control organisms.

Clean Water Act Section 303(d) Water Body - An impaired water body in which water quality does not meet applicable water quality standards and/or is not expected to meet water quality standards, even after the application of technology based pollution controls required by the CWA. The discharge of runoff to these water bodies by the Copermittees is significant because these discharges can cause or contribute to violations of applicable water quality standards.

Construction Site – Any project, including projects requiring coverage under the Construction General Permit, that involves soil disturbing activities including, but not limited to, clearing, grading, disturbances to ground such as stockpiling, and excavation.

Contamination - As defined in the Porter-Cologne Water Quality Control Act, contamination is "an impairment of the quality of waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste whether or not waters of the State are affected."

Copermittee – A permittee to a NPDES permit that is only responsible for permit conditions relating to the discharge for which it is operator [40 CFR 122.26(b)(1)]. For the purposes of this Order, a Copermittee is one of the individual permittees identified in Tables 1a-1c of this Order.

Copermittees – All of the individual Copermittees, collectively.

Critical Channel Flow (Qc) – The channel flow that produces the critical shear stress that initiates bed movement or that erodes the toe of channel banks. When measuring Qc, it should be based on the weakest boundary material – either bed or bank.

Daily Discharge – Defined as either: (1) the total mass of the constituent discharged over the calendar day or any 24 hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g. concentration.)

The Daily Discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day, or other 24 hour period other than a day), or by the arithmetic mean of analytical results from one or more grab samples taken over the course of a day.

Development Projects - Construction, rehabilitation, redevelopment, or reconstruction of any public or private projects.

Dry Season –May 1 to September 30.

Dry Weather – Weather is considered dry if the preceding 72 hours has been without measurable precipitation (>0.1 inch).

Enclosed Bays – Enclosed bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost bay works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays do not include inland surface waters or ocean waters.

Erosion – When land is diminished or worn away due to wind, water, or glacial ice. Often the eroded debris (silt or sediment) becomes a pollutant via storm water runoff. Erosion occurs naturally but can be intensified by land clearing activities such as farming, development, road building, and timber harvesting.

Environmentally Sensitive Areas (ESAs) - Areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; areas designated as preserves or their equivalent under the Natural Communities Conservation Program within the Cities and County of Orange; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.

Estuaries – Waters, including coastal lagoons, located at the mouth of streams that serve as areas of mixing fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and ocean water. Estuaries do not include inland surface waters or ocean waters.

Existing Development – Any area that has been developed and exists for municipal, commercial, industrial, or residential purposes, uses, or activities. May include areas that are not actively used for its originally developed purpose, but may be re-purposed or redeveloped for another use or activity.

Flow Duration – The long-term period of time that flows occur above a threshold that causes significant sediment transport and may cause excessive erosion damage to creeks and streams (not a single storm event duration). The simplest way to visualize this is to consider a histogram of pre- and post-project flows using long-term records of hourly data. To maintain pre-development flow duration means that the total number of hours (counts) within each range of flows in a flow-duration histogram cannot increase between the pre- and post-development condition. Flow duration within the range of geomorphologically significant flows is important for managing erosion.

Grading - The cutting and/or filling of the land surface to a desired slope or elevation.

Groundwater – Subsurface water that occurs beneath the water table in soils and geologic formations that are fully saturated.

Hazardous Material – Any substance that poses a threat to human health or the environment due to its toxicity, corrosiveness, ignitability, explosive nature or chemical reactivity. These also include materials named by the USEPA in 40 CFR 116 to be reported if a designated quantity of the material is spilled into the waters of the U.S. or emitted into the environment.

Hazardous Waste - Hazardous waste is defined as “any waste which, under Section 600 of Title 22 of this code, is required to be managed according to Chapter 30 of Division 4.5 of Title 22 of this code” [CCR Title 22, Division 4.5, Chapter 11, Article 1].

Household Hazardous Waste – Paints, cleaning products, and other hazardous wastes generated during home improvement or maintenance activities.

Hydromodification – The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

Illicit Connection – Any man-made conveyance or drainage system through which a non-storm water discharge to the stormwater drainage system occurs or may occur. Any connection to the MS4 that conveys an illicit discharge.

Illicit Discharge - Any discharge to the MS4 that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from fire fighting activities [40 CFR 122.26(b)(2)].

Inactive Areas – Areas of construction activity that are not active and those that have been active and are not scheduled to be re-disturbed for at least 14 days.

Infiltration – In the context of low impact development, infiltration is defined as the percolation of water into the ground. Infiltration is often expressed as a rate (inches per hour), which is determined through an infiltration test. In the context of non-storm water, infiltration is water other than wastewater that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow [40 CFR 35.2005(20)].

Inland Surface Waters – Includes all surface waters of the State that do not include the ocean, enclosed bays, or estuaries.

Jurisdictional Runoff Management Program Document – A written description of the specific jurisdictional runoff management measures and programs that each Copermittee will implement to comply with this Order and ensure that storm water pollutant discharges in runoff are reduced to the MEP and do not cause or contribute to a violation of water quality standards.

Low Impact Development (LID) – A storm water management and land development strategy that emphasizes conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions.

Low Impact Development Best Management Practices (LID BMPs) – LID BMPs include schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States through storm water management and land development strategies that emphasize conservation sand the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions. LID BMPs include retention practices that do not allow runoff, such as infiltration, rain water harvesting and reuse, and evapotranspiration. LID BMPs also include flow-through practices such as biofiltration that may have some discharge of storm water following pollutant reduction.

Major Outfall – As defined in the Code of Federal Regulations, a major outfall is a MS4 outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (i.e. discharge from a single conveyance other than a circular pipe which is associated with a drainage area of more than 50 acres); or, for MS4s that receive storm water from lands zoned for industrial activity (based on comprehensive zoning plans or equivalent), a MS4 outfall that discharges from a single pipe with an inside diameter of 12 inches or more or from its equivalent (i.e. discharge from other than a circular pipe associated with a drainage area of 2 acres or more).

Maximum Daily Action Level (MDAL) –The highest allowable daily discharge of a pollutant, over a calendar day (or 24 hour period). For pollutants with action levels expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with action levels expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

Maximum Extent Practicable (MEP) – The technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) for storm water that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) in combination with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than BAT. A definition for MEP is not provided either in the statute or in the regulations. Instead the definition of MEP is dynamic and will be defined by the following process over time: municipalities propose their definition of MEP by way of their runoff management programs. Their total collective and individual activities conducted pursuant to the runoff management programs becomes their proposal for MEP as it applies both to their overall effort, as well as to specific activities (e.g., MEP for street sweeping, or MEP for MS4 maintenance). In the absence of a proposal acceptable to the San Diego Water Board, the San Diego Water Board defines MEP.

In a memo dated February 11, 1993, entitled "Definition of Maximum Extent Practicable," Elizabeth Jennings, Senior Staff Counsel, SWRCB addressed the achievement of the MEP standard as follows:

> "*To achieve the MEP standard, municipalities must employ whatever Best Management Practices (BMPs) are technically feasible (i.e., are likely to be effective) and are not cost prohibitive. The major emphasis is on technical feasibility. Reducing pollutants to the MEP means choosing effective BMPs, and rejecting applicable BMPs only where other effective BMPs will serve the same purpose, or the BMPs would not be technically feasible, or the cost would be prohibitive. In selecting BMPs to achieve the MEP standard, the following factors may be useful to consider:*
>
> *a. Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?*
> *b. Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?*
> *c. Public Acceptance: Does the BMP have public support?*
> *d. Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?*
> *e. Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc.?*

The final determination regarding whether a municipality has reduced pollutants to the maximum extent practicable can only be made by the Regional or State Water Boards, and not by the municipal discharger. If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit derived, it would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs that would address a pollutant source, or to pick a BMP based solely on cost, which would be clearly less effective. In selecting BMPs the municipality must make a serious attempt to comply and practical solutions may not be lightly rejected. In any case, the burden would be on the municipal discharger to show compliance with its permit. After selecting a menu of BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented."

Monitoring Year – October 1 to September 30

Municipal Separate Storm Sewer System (MS4) – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designated or used for collecting or conveying storm water; (iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.26.

National Pollutant Discharge Elimination System (NPDES) - The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the CWA.

Non-Storm Water - All discharges to and from a MS4 that do not originate from precipitation events (i.e., all discharges from a MS4 other than storm water). Non-storm water includes illicit discharges and NPDES permitted discharges.

Nuisance - As defined in the Porter-Cologne Water Quality Control Act, a nuisance is "anything which meets all of the following requirements: 1) Is injurious to health, or is indecent, or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. 2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. 3) Occurs during, or as a result of, the treatment or disposal of wastes."

Ocean Waters – The territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the State Board's California Ocean Plan.

Order – Unless otherwise specified, refers to this Order, Order No. R9-2013-0001 (NPDES No. CAS0109266)

Outfall - Outfall means a point source as defined by 40 CFR 122.2 at the point where a municipal separate storm sewer discharges to waters of the US and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels or other conveyances which connect segments of the same stream or other waters of the US and are used to convey waters of the US.

Persistent Flow - Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

Person - A person is defined as an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof [40 CFR 122.2].

Point Source - Any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, landfill leachate collection systems, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

Pollutant - Any agent that may cause or contribute to the degradation of water quality such that a condition of pollution or contamination is created or aggravated.

Pollution - As defined in the Porter-Cologne Water Quality Control Act, pollution is "the alteration of the quality of the waters of the State by waste, to a degree that unreasonably affects the either of the following: 1) The waters for beneficial uses; or 2) Facilities that serve these beneficial uses." Pollution may include contamination.

Pollution Prevention - Pollution prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control BMPs, treatment control BMPs, or disposal.

Pre-Development Runoff Conditions – Approximate flow rates and durations that exist or existed onsite before land development occurs. For new development projects, this equates to runoff conditions immediately before project construction. For redevelopment projects, this equates to runoff conditions from the project footprint assuming infiltration characteristics of the underlying soil, and existing grade. Runoff coefficients of concrete or asphalt must not be used. A redevelopment Priority Development Project must use available information pertaining to existing underlying soil type and onsite existing grade to estimate pre-development runoff conditions.

Priority Development Projects - New development and redevelopment projects defined under Provision E.3.b of Order No. R9-2013-0001.

Rainy Season (aka Wet Season) –October 1 to April 30

Receiving Waters – Waters of the United States.

Receiving Water Limitations - Waste discharge requirements issued by the San Diego Water Board typically include both: (1) "Effluent Limitations" (or "Discharge Limitations") that specify the technology-based or water-quality-based effluent limitations; and (2) "Receiving Water Limitations" that specify the water quality objectives in the Basin Plan as well as any other limitations necessary to attain those objectives. In summary, the "Receiving Water Limitations" provision is the provision used to implement the requirements of CWA section 402(p)(3)(B).

Redevelopment - The creation and/or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include trenching and resurfacing associated with utility work; resurfacing existing roadways; new sidewalk construction, pedestrian ramps, or bike lane on existing roads; and routine replacement of damaged pavement, such as pothole repair.

Regional Clearinghouse – A central location for the collection and distribution of information developed and maintained by the Copermittees including, but not limited to, plans, reports, manuals, data, contact information, and/or links to such documents and information.

Rehabilitation - Remedial measures or activities for the purpose of improving or restoring the beneficial uses of streams, channels or river systems. Techniques may vary from in-stream restoration techniques to off-linestormwater management practices installed in the system corridor or upland areas, or a combination of in-stream and out of stream techniques. Rehabilitation techniques may include, but are not limited to the following: riparian zone restoration, constructed wetlands, channel modifications that improve habitat and stability, and daylighting of drainage systems.

Reporting Period – The period of information that is reported in the Water Quality Improvement Plan Annual Report. The reporting period consists of two components: 1) July 1 to June 30, consistent with the fiscal year, for the implementation of the jurisdictional runoff management programs, and 2) October 1 to September 30, consistent with the monitoring year for the monitoring and assessment programs. Together, these two time periods constitute the reporting year for the Water Quality Improvement Plan Annual Report due January 31 following the end of the monitoring year.

Retain –Keep or hold in a particular place, condition, or position without discharge to surface waters.

Retrofitting – Storm water management practice put into place after development has occurred in watersheds where the practices previously did not exist or are ineffective. Retrofitting of developed areas is intended to improve water quality, protect downstream channels, reduce flooding, or meet other specific objectives. Retrofitting developed areas may include, but is not limited to replacing roofs with green roofs, disconnecting downspouts or impervious surfaces to drain to pervious surfaces, replacing impervious surfaces with pervious surfaces, installing rain barrels, installing rain gardens, and trash area enclosures.

Runoff - All flows in a storm water conveyance system that consists of the following components: (1) storm water (wet weather flows) and (2) non-storm water including dry weather flows.

San Diego Water Board – As used in this document the term "San Diego Water Board" is synonymous with the term "Regional Board" as defined in Water Code section 13050(b) and is intended to refer to the California Regional Water Quality Control Board for the San Diego Region as specified in Water Code Section 13200.

Sediment - Soil, sand, and minerals washed from land into water. Sediment resulting from anthropogenic sources (i.e. human induced land disturbance activities) is considered a pollutant. This Order regulates only the discharges of sediment from anthropogenic sources and does not regulate naturally occurring sources of sediment. Sediment can destroy fish-nesting areas, clog animal habitats, and cloud waters so that sunlight does not reach aquatic plants.

Source Control BMP – Land use or site planning practices, or structural or nonstructural measures that aim to prevent runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between pollutants and runoff.

Storm Water – Per 40 CFR 122.26(b)(13), means storm water runoff, snowmelt runoff and surface runoff and drainage. Surface runoff and drainage pertains to runoff and drainage resulting from precipitation events.

Structural BMPs - A subset of BMPs which detains, retains, filters, removes, or prevents the release of pollutants to surface waters from development projects in perpetuity, after construction of a project is completed.

Test of Significant Toxicity (TST) - A statistical approach used to analyze toxicity test data. The TST incorporates a restated null hypothesis, Welch's t-test, and biological effect thresholds for chronic and acute toxicity.

Total Maximum Daily Load (TMDL) - The maximum amount of a pollutant that can be discharged into a water body from all sources (point and non-point) and still maintain water quality standards. Under CWA section 303(d), TMDLs must be developed for all water bodies that do not meet water quality standards after application of technology-based controls.

Toxicity - Adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies). The water quality objectives for toxicity provided in the Basin Plan, state in part…"All waters shall be free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life….The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge".

Toxicity Identification Evaluation (TIE) - A set of procedures for identifying the specific chemical(s) responsible for toxicity. These procedures are performed in three phases (characterization, identification, and confirmation) using aquatic organism toxicity tests).

Toxicity Reduction Evaluation (TRE) - A study conducted in a step-wise process designed to identify the causative agents of effluent or ambient toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in toxicity. The first steps of the TRE consist of the collection of data relevant to the toxicity, including additional toxicity testing, and an evaluation of facility operations and maintenance practices,

and best management practices. A Toxicity Identification Evaluation (TIE) may be required as part of the TRE, if appropriate.

Treatment Control BMP – Any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media absorption or any other physical, biological, or chemical process.

Unpaved Road – Any long, narrow stretch without pavement used for traveling by motor passenger vehicles between two or more points. Unpaved roads are generally constructed of dirt, gravel, aggregate or macadam and may be improved or unimproved.

Waste - As defined in CWC Section 13050(d), "waste includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal."

Article 2 of CCR Title 23, Chapter 15 (Chapter 15) contains a waste classification system that applies to solid and semi-solid waste, which cannot be discharged directly or indirectly to water of the state and which therefore must be discharged to land for treatment, storage, or disposal in accordance with Chapter 15. There are four classifications of waste (listed in order of highest to lowest threat to water quality): hazardous waste, designated waste, non-hazardous solid waste, and inert waste.

Water Quality Objective - Numerical or narrative limits on constituents or characteristics of water designated to protect designated beneficial uses of the water. [California Water Code Section 13050 (h)]. California's water quality objectives are established by the State and Regional Water Boards in the Water Quality Control Plans. Numeric or narrative limits for pollutants or characteristics of water designed to protect the beneficial uses of the water. In other words, a water quality objective is the maximum concentration of a pollutant that can exist in a receiving water and still generally ensure that the beneficial uses of the receiving water remain protected (i.e., not impaired). Since water quality objectives are designed specifically to protect the beneficial uses, when the objectives are violated the beneficial uses are, by definition, no longer protected and become impaired. This is a fundamental concept under the Porter Cologne Act. Equally fundamental is Porter Cologne's definition of pollution. A condition of pollution exists when the water quality needed to support designated beneficial uses has become unreasonably affected or impaired; in other words, when the water quality objectives have been violated. These underlying definitions (regarding beneficial use protection) are the reason why all waste discharge requirements implementing the federal NPDES regulations require compliance with water quality objectives. (Water quality objectives are also called water quality criteria in the CWA.)

Water Quality Standards - Water quality standards, as defined in Clean Water Act section 303(c) consist of the beneficial uses (e.g., swimming, fishing, municipal drinking water supply, etc.,) of a water body and criteria (referred to as water quality objectives in the California Water Code) necessary to protect those uses. Under the Water Code, the water boards establish beneficial uses and water quality objectives in water quality control or basin plans. Together with an anti-degradation policy, these beneficial uses and water quality objectives serve as water quality standards under the Clean Water Act. In Clean Water Act parlance, state beneficial uses are called "designated uses" and state water quality objectives are called "criteria." Throughout this Order, the relevant term is used depending on the statutory scheme.

Waters of the State - Any water, surface or underground, including saline waters within the boundaries of the State [CWC section 13050 (e)]. The definition of the Waters of the State is broader than that for the Waters of the United States in that all water in the State is considered to be a Waters of the State regardless of circumstances or condition.

Waters of the United States - As defined in the 40 CFR 122.2, the Waters of the U.S. are defined as: "(a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate "wetlands;" (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters otherwise defined as waters of the United States under this definition: (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial seas; and (g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA."

Watershed - That geographical area which drains to a specified point on a water course, usually a confluence of streams or rivers (also known as drainage area, catchment, or river basin).

Wet Season (aka Rainy Season) –October 1 to April 30

Wet Weather – Weather is considered wet up to 72 hours after a storm event of 0.1 inches and greater, unless otherwise defined by another regulatory mechanism (e.g. a TMDL).

ATTACHMENT D

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

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JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

FY _____

I. COPERMITTEE INFORMATION			
Copermittee Name:			
Copermittee Primary Contact Name:			
Copermittee Primary Contact Information: Address: City:	County:	State:	Zip:
Telephone:	Fax:	Email:	

II. LEGAL AUTHORITY		
Has the Copermittee established adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 that complies with Order No. R9-2013-0001?	**YES** **NO**	☐ ☐
A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority?	**YES** **NO**	☐ ☐

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE		
Was an update of the jurisdictional runoff management program document required or recommended by the San Diego Water Board?	**YES** **NO**	☐ ☐
If YES to the question above, did the Copermittee update its jurisdictional runoff management program document and make it available on the Regional Clearinghouse?	**YES** **NO**	☐ ☐

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM		
Has the Copermittee implemented a program to actively detect and eliminate illicit discharges and connections to its MS4 that complies with Order No. R9-2013-0001?	**YES** **NO**	☐ ☐

Number of non-storm water discharges reported by the public	
Number of non-storm water discharges detected by Copermittee staff or contractors	
Number of non-storm water discharges investigated by the Copermittee	
Number of sources of non-storm water discharges identified	
Number of non-storm water discharges eliminated	
Number of sources of illicit discharges or connections identified	
Number of illicit discharges or connections eliminated	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

V. DEVELOPMENT PLANNING PROGRAM		
Has the Copermittee implemented a development planning program that complies with Order No. R9-2013-0001?	**YES** **NO**	☐ ☐
Was an update to the BMP Design Manual required or recommended by the San Diego Water Board?	**YES** **NO**	☐ ☐
If YES to the question above, did the Copermittee update its BMP Design Manual and make it available on the Regional Clearinghouse?	**YES** **NO**	☐ ☐

Number of proposed development projects in review	
Number of Priority Development Projects in review	
Number of Priority Development Projects approved	
Number of approved Priority Development Projects exempt from any BMP requirements	
Number of approved Priority Development Projects allowed alternative compliance	
Number of Priority Development Projects granted occupancy	

Number of completed Priority Development Projects in inventory	
Number of high priority Priority Development Project structural BMP inspections	
Number of Priority Development Project structural BMP violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM
FY _____

VI. CONSTRUCTION MANAGEMENT PROGRAM

Has the Copermittee implemented a construction management program that complies with Order No. R9-2013-0001?	YES	☐
	NO	☐

Number of construction sites in inventory	
Number of active construction sites in inventory	
Number of inactive construction sites in inventory	
Number of construction sites closed/completed during reporting period	
Number of construction site inspections	
Number of construction site violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

Has the Copermittee implemented an existing development management program that complies with Order No. R9-2013-0001?	YES	☐
	NO	☐

	Municipal	Commercial	Industrial	Residential
Number of facilities or areas in inventory				
Number of existing development inspections				
Number of follow-up inspections				
Number of violations				
Number of enforcement actions issued				
Number of escalated enforcement actions issued				

VIII. PUBLIC EDUCATION AND PARTICIPATION

Has the Copermittee implemented a public education program component that complies with Order No. R9-2013-0001?	YES	☐
	NO	☐
Has the Copermittee implemented a public participation program component that complies with Order No. R9-2013-0001?	YES	☐
	NO	☐

IX. FISCAL ANALYSIS

Has the Copermittee attached to this form a summary of its fiscal analysis that complies with Order No. R9-2013-0001?	YES	☐
	NO	☐

X. CERTIFICATION

I [☐ Principal Executive Officer ☐ Ranking Elected Official ☐ Duly Authorized Representative] certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature	Date
Print Name	Title
Telephone Number	Email

ATTACHMENT E

SPECIFIC PROVISIONS FOR TOTAL MAXIMUM DAILY LOADS APPLICABLE TO ORDER NO. R9-2013-0001

These provisions implement load allocations (LAs) and wasteload allocations (WLAs) of the Total Maximum Daily Loads (TMDLs) adopted by the San Diego Water Board and approved by USEPA under Clean Water Act section 303(c), applicable to discharges regulated under this Order. The provisions and schedules for implementation of the TMDLs described below must be incorporated into the Water Quality Improvement Plans, required pursuant to Provision B of this Order, for the specified Watershed Management Areas.

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed
2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin
3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed
4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek
5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay
6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2002-0123

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	August 14, 2002
State Water Board Approval Date:	July 16, 2003
Office of Administrative Law Approval Date:	September 11, 2003
US EPA Approval Date:	November 3, 2003

(3) TMDL Effective Date: September 11, 2003

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final diazinon TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must be in compliance with the final TMDL compliance requirements as of December 31, 2010.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations:

Table 1.1
Final Receiving Water Limitations Expressed as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Diazinon	Acute	0.08 µg/L	1 hour
	Chronic	0.05 µg/L	4 days

(b) Final Effluent Limitations

Discharges from the MS4s containing concentrations that do not exceed the following effluent limitations will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 1.b.(3)(a):

Table 1.2
Final Effluent Limitations Expressed as Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation	Averaging Period
Diazinon	Acute	0.072 µg/L	1 hour
	Chronic	0.045 µg/L	4 days

(c) Best Management Practices

The following BMPs for Chollas Creek must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area and implemented by the Responsible Copermittees:

(i) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 1.b.(2)(a) and/or the effluent limitations under Specific Provision 1.b.(2)(b) for Chollas Creek.

(ii) The Responsible Copermittees must implement the Diazinon Toxicity Control Plan and Diazinon Public Outreach/Education Program as described in the report titled, *Technical Report for Total Maximum Daily Load for Diazinon in Chollas Creek Watershed, San Diego County*, dated August 14, 2002, including subsequent modifications, in order to achieve the receiving water limitations under Specific Provision 1.b.(2)(a) and/or the effluent limitations under Specific Provision 1.b.(2)(b).

(iii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible ~~Copermittees'~~ Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 1.b.(2)(a) in the receiving water at, or downstream of the Responsible ~~Copermittees'~~ Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 1.b.(2)(b) at the Responsible ~~Copermittees'~~ Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 1.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 1.b.(2)(c) achieves compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 1.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 1.d, to demonstrate compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The Responsible Copermittees must be in compliance with the final diazinon TMDL compliance requirements as of December 31, 2010.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls for diazinon within the Chollas Creek watershed, and calculate or estimate the annual diazinon loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment

Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 1.b.(2)(b), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0019

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	September 22, 2005
Office of Administrative Law Approval Date:	December 2, 2005
US EPA Approval Date:	February 8, 2006

(3) TMDL Effective Date: December 2, 2005

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Shelter Island Yacht Basin

(6) Responsible Copermittee: City of San Diego

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final dissolved copper TMDL compliance requirements for Shelter Island Yacht Basin consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittee must be in compliance with the final TMDL compliance requirements as of December 2, 2005.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations:

Table 2.1
Final Receiving Water Limitations Expressed as Concentrations in Shelter Island Yacht Basin

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Dissolved Copper	Acute	4.8 µg/L x WER*	1 hour
	Chronic	3.1 µg/L x WER*	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 2.b.(3)(a):

Table 2.2
Final Effluent Limitations as Expressed as Annual Loads in MS4 Discharges to Shelter Island Yacht Basin

Constituent	Effluent Limitation
Dissolved Copper	30 kg/yr*

* If the water quality objectives for dissolved copper in Shelter Island Yacht Basin are changed in the future, then the margin of safety (MOS), TMDL and allocations will be recalculated using the *Method for Recalculation of the Total Maximum Daily Load for Dissolved Copper in the Shelter Island Yacht Basin, San Diego Bay* in the Basin Plan (p. 7-14).

(c) Best Management Practices

The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 2.b.(2)(a) and/or the effluent limitations under Specific Provision 2.b.(2)(b) for Shelter Island Yacht Basin. The BMPs must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 2.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 2.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittee develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 2.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate

that the implementation of the BMPs required under Provision 2.b.(2)(c) achieves compliance with Specific Provisions 2.b.(3)(a), 2.b.(3)(b) and/or 2.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 2.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 2.d, to demonstrate compliance with Specific Provisions 2.b.(3)(a), 2.b.(3)(b) and/or 2.b.(3)(c).

c. Interim TMDL Compliance Requirements

The Responsible Copermittees must be in compliance with the final dissolved copper TMDL compliance requirements as of December 2, 2005.

d. Specific Monitoring and Assessment Requirements

The Responsible Copermittee must monitor the effluent of its MS4 outfalls for dissolved copper, and calculate or estimate the monthly and annual dissolved copper loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.(b)(2)of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0036

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	November 16, 2005
Office of Administrative Law Approval Date:	February 1, 2006
US EPA Approval Date:	March 22, 2006

(3) TMDL Effective Date: February 1, 2006

(4) Watershed Management Area: Santa Margarita River

(5) Water Body: Rainbow Creek

(6) Responsible Copermittee: County of San Diego

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final total nitrogen and total phosphorus TMDL compliance requirements for Rainbow Creek consist of the following

(1) Final TMDL Compliance Date

The Responsible Copermittee must comply with final TMDL compliance requirements by December 31, 2021.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance date under Specific Provision 3.b.(1):

Table 3.1
Final Receiving Water Limitations Expressed as Concentrations in Rainbow Creek

Constituent	Receiving Water Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing concentrations that do not exceed the following effluent limitations by the compliance date under Specific Provision 3.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 3.b.(2)(a):

Table 3.2
Final Effluent Limitations Expressed as Concentrations in MS4 Discharges to Rainbow Creek

Constituent	Effluent Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(ii) Annual pollutant loads from given land uses discharging to and from the MS4s that do not exceed the following annual loads by the compliance date under Specific Provision 3.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 3.b.(2)(a):

Table 3.3
Final Effluent Limitations Expressed as Annual Loads in MS4 Discharges to Rainbow Creek

Land Use	Total N	Total P
Commercial nurseries	116 kg/yr	3 kg/yr
Park	3 kg/yr	0.1 kg/yr
Residential areas	149 kg/yr	12 kg/yr
Urban areas	27 kg/yr	6 kg/yr

(c) Best Management Practices

(i) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 3.b.(2)(a) and/or the effluent limitations under Specific Provision 3.b.(2)(b) for Rainbow Creek.

(ii) The Responsible Copermittee should coordinate any BMPs implemented to address this TMDL with Caltrans and other sources as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 3.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 3.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the final effluent limitations under Specific Provision 3.b.(2)(b)(ii); OR

(e) The Responsible Copermittee develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 3.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 2.b.(2)(c) achieves compliance with Specific Provisions 3.b.(3)(a), 3.b.(3)(b), 3.b.(3)(c) and/or 3.b.(3)(d),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 3.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 3.d, to demonstrate compliance with Specific Provisions 3.b.(3)(a), 3.b.(3)(b), 3.b.(3)(c) and/or 3.b.(3)(d).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim total nitrogen and total phosphorus TMDL compliance requirements for Rainbow Creek consist of the following:

(1) Interim Compliance Dates and WQBELs

The Responsible Copermittee must comply with the interim WQBELs, expressed as annual loads, by December 31 of the interim compliance year given in Table 3.4.

Table 3.4
Interim Water Quality Based Effluent Limitations Expressed as Annual Loads in MS4 Discharges from Specific Land Uses to Rainbow Creek

	Total N Interim Effluent Limitations (kg/yr)			Total P Interim Effluent Limitations (kg/yr)		
	Interim Compliance Date			Interim Compliance Date		
Land Use	**2009**	**2013**	**2017**	**2009**	**2013**	**2017**
Commercial nurseries	390	299	196	20	16	10
Park	5	3	3	0.15	0.10	0.10
Residential areas	507	390	260	99	74	47
Urban areas	40	27	27	9	6	6

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 3.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 3.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the final effluent limitations under Specific Provision 3.b.(2)(b)(ii); OR

(e) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the interim effluent limitations under Specific Provision 3.c.(1); OR

(f) The Responsible Copermittee has submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

d. Specific Monitoring and Assessment Requirements

(1) The Responsible Copermittee must incorporate into the Water Quality Improvement Plan and implement the Sampling and Analysis Plan for Rainbow Creek Nutrient Reduction TMDL Implementation Water Quality Monitoring, dated January 2010.

(2) The results of any monitoring conducted during the reporting period, and assessment of whether the interim and final TMDL compliance requirements have been achieved must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 3.b.(2)(b)(i), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2007-0043

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2007
State Water Board Approval Date:	July 15, 2008
Office of Administrative Law Approval Date:	October 22, 2008
US EPA Approval Date:	December 18, 2008

(3) TMDL Effective Date: October 22, 2008

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final dissolved copper, lead, and zinc TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must comply with the final TMDL compliance requirements by October 22, 2028.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance date under Specific Provision 4.b.(1):

Table 4.1
Final Receiving Water Limitations Expressed as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$(0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$(0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$(0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$(0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations by the compliance date under Specific Provision 4.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 4.b.(2)(a):

Table 4.2
Final Effluent Limitations as Expressed Concentrations inMS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(c) Best Management Practices

(i) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 4.b.(2)(a) and/or the effluent limitations under Specific Provision 4.b.(2)(b) for Chollas Creek.

(ii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans and the U.S. Navy as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible ~~Copermittees'~~ Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 4.b.(2)(a) in the receiving water at, or downstream of the Responsible ~~Copermittees'~~ Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 4.b.(2)(b) at the Responsible ~~Copermittees'~~ Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 4.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 4.b.(2)(c) achieves compliance with Specific Provisions 4.b.(3)(a), 4.b.(3)(b) and/or 4.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 4.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 4.d, to demonstrate compliance with Specific Provisions 4.b.(3)(a), 4.b.(3)(b) and/or 4.b.(3)(c).

c. Interim TMDL Compliance Requirements

The interim dissolved copper, lead, and zinc TMDL compliance requirements for Chollas Creek consist of the following:

(1) Interim Compliance Date and WQBELs

The Responsible Copermittee must comply with the interim WQBELs, expressed as concentrations, by the interim compliance date given in Table 4.3:

Table 4.3
Interim Water Quality Based Effluent Limitations Expressed as Concentrations in MS4 Discharges to Chollas Creek

Interim Compliance Date	Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
October 22, 2018	Dissolved Copper	Acute	$1.2 \times 90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
	Dissolved Lead	Acute	$1.2 \times 90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
	Dissolved Zinc	Acute	$1.2 \times 90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible ~~Copermittees'~~ Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 4.b.(2)(a) in the receiving water at, or downstream of the Responsible ~~Copermittees'~~ Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 4.b.(2)(b) at the Responsible ~~Copermittees'~~ Copermittee's MS4

outfalls; OR

(d) There are no exceedances of the interim effluent limitations under Specific Provision 4.c.(1) at the Responsible ~~Copermittees'~~ Copermittee's MS4 outfalls; OR

(e) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance date.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*, when it is amended to include monitoring requirements for the Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls discharging to Chollas Creek for dissolved copper, lead, and zinc, and calculate or estimate the monthly and annual dissolved copper, lead, and zinc loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2)of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 4.b.(2)(b), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2008-0027

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 11, 2008
State Water Board Approval Date:	June 16, 2009
Office of Administrative Law Approval Date:	September 15, 2009
US EPA Approval Date:	October 26, 2009

(3) TMDL Effective Date: September 15, 2009

(4) Watershed Management Areas: See Table 5.0

(5) Water Bodies: See Table 5.0

(6) Responsible Copermittees: See Table 5.0

Table 5.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County	Dana Point Harbor	Baby Beach	-City of Dana Point -County of Orange
San Diego Bay	San Diego Bay	Shelter Island Shoreline Park	- San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final indicator bacteria TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Final TMDL Compliance Dates

(a) Baby Beach in Dana Point Harbor

The Responsible Copermittees for MS4 discharges to Baby Beach must be in compliance with the final TMDL compliance requirements according to the following compliance dates:

Table 5.1
Compliance Dates to Achieve Final TMDL Compliance Requirements For Baby Beach in Dana Point Harbor

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform	September 15, 2014	September 15, 2009
Fecal Coliform		September 15, 2009
Enterococcus		September 15, 2019

(b) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park must be in compliance with the final TMDL compliance requirements as of December 31, 2012.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance dates under Specific Provision 5.b.(1):

Table 5.2
Final Receiving Water Limitations Expressed as Bacteria Densities in the Water Body

	Receiving Water Limitations	
Constituent	Single Sample Maximum[1,2]	30-Day Geometric Mean[2]
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing indicator bacteria densities that do not exceed the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.3a
Final Effluent Limitations as Expressed as Bacteria Densities in MS4 Discharges to the Water Body

	Effluent Limitations	
Constituent	**Single Sample Maximum[1,2]**	**30-Day Geometric Mean[2]**
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.

(ii) Discharges from the MS4s containing indicator bacteria loads that do not exceed the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.4a
Final Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to the Baby Beach in Dana Point Harbor

Constituent	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	0.86×10^9 MPN/day	$3{,}254 \times 10^9$ MPN/30days
Fecal Coliform	0.17×10^9 MPN/day	112×10^9 MPN/30days
Enterococcus	0.03×10^9 MPN/day	114×10^9 MPN/30days

Table 5.4b
Final Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to the Shelter Island Shoreline Park in San Diego Bay

Constituent	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	0 MPN/day	198×10^9 MPN/30days
Fecal Coliform	0 MPN/day	8×10^9 MPN/30days
Enterococcus	0 MPN/day	26×10^9 MPN/30days

(iii) Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.5a
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to Baby Beach in Dana Point Harbor*

Constituent	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	90.4%	0%
Fecal Coliform	82.7%	0%
Enterococcus	96.2%	62.4%

Notes:
* The percent load reductions are relative to data collected between 1996-2002. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittees' MS4s must not exceed the loads in Table 5.4a, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the water body.

Table 5.5b
*Final Effluent Limitations Expressed as Percent Load Reductions** in MS4 Discharges to Shelter Island Shoreline Park in San Diego Bay*

Constituent	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	0%	0%
Fecal Coliform	0%	0%
Enterococcus	0%	0%

Notes:
* The percent load reductions are relative to data collected between 1999-2004. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittee's MS4s must not exceed the loads in Table 5.4b, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the water body.

(c) Best Management Practices

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 5.0 must incorporate the Bacteria Load Reduction Plan (BLRP) required to be developed pursuant to Resolution No. R9-2008-0027.

(ii) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 5.b.(2)(a) and/or the effluent limitations under Specific Provision 5.b.(2)(b) for the segments or areas of the water bodies listed in Table 5.0

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible ~~Copermittees'~~ Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible ~~Copermittees'~~ Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible ~~Copermittees'~~ Copermittee's MS4 outfalls; OR

(d) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.c.(2)(b)(ii); OR

(e) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 5.c.(2)(b)(iii); OR

(f) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(g) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 5.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 5.b.(2)(c) achieves compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 5.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 5.d, to demonstrate compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim indicator bacteria TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Baby Beach in Dana Point Harbor

(a) Interim TMDL Compliance Dates and WQBELs

The Responsible Copermittees for MS4 discharges to Baby Beach must comply with the following interim WQBELs by the interim compliance dates given in Tables 5.6a and/or 5.6b:

Table 5.6a
Interim Water Quality Based Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to Baby Beach in Dana Point Harbor

Constituent	Interim Compliance Dates	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	4.93×10^9 MPN/day	$3{,}254 \times 10^9$ MPN/30days*
Fecal Coliform	September 15, 2012	0.59×10^9 MPN/day	112×10^9 MPN/30days*
Enterococcus	September 15, 2012	0.42×10^9 MPN/day	301×10^9 MPN/30days*
	September 15, 2016	0.03×10^9 MPN/day *	207×10^9 MPN/30days

Notes:
* Same as the final effluent limitations in Table 5.4a.

Table 5.6b
Interim Water Quality Based Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to Baby Beach in Dana Point Harbor*

Constituent	Interim Compliance Dates	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	45.2%	0%**
Fecal Coliform	September 15, 2012	41.4%	0%**
Enterococcus	September 15, 2012	48.1%	0%**
	September 15, 2016	96.2%**	31.2%

Notes:
* The percent load reductions are relative to data collected between 1996-2002. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittees' MS4s must not exceed the loads in Table 5.6a, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the waterbody.
** Same as the final effluent limitations in Table 5.5a.

(b) Interim Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(i) There is no direct or indirect discharge from the Responsible ~~Copermittees'~~ Copermittee's MS4s to the receiving water; OR

(ii) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible ~~Copermittees'~~ Copermittee's MS4 outfalls; OR

(iii) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible ~~Copermittees'~~ Copermittee's MS4 outfalls; OR

(iv) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.b(2)(b)(ii); OR

(v) The Responsible Copermittees can demonstrate that exceedances of the applicable receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(vi) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the interim effluent limitations under Table 5.6a of Specific Provision 5.c.(1)(a); OR

(vii) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the interim effluent limitations under Table 5.6b of Specific Provision 5.c.(1)(a); OR

(viii) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

(2) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park must be in compliance with the final indicator bacteria TMDL requirements as of December 31, 2012.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) Monitoring Stations

Monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[33] If discharges of bacteria from the MS4 exceed the applicable interim or final WQBELs, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(2) Monitoring Procedures

(a) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) The Responsible Copermittees must collect wet weather monitoring samples within the first 24 hours of a storm event[34] of the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(c) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

[33] Commonly referred to as AB 411 monitoring

[34] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs have been achieved.

(b) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 5.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

~~(b)~~
(c) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to correlate elevated bacteria levels with known or suspected sewage spills from wastewater collection systems and treatment plants or boats.

~~(c)~~
(d) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2010-0001

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 10, 2010
State Water Board Approval Date:	December 14, 2010
Office of Administrative Law Approval Date:	April 4, 2011
US EPA Approval Date:	June 22, 2011

(3) TMDL Effective Date: April 4, 2011

(4) Watershed Management Areas: See Table 6.0

(5) Water Bodies: See Table 6.0

(6) Responsible Copermittees: See Table 6.0

Table 6.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	-City of Laguna Beach -County of Orange -Orange County Flood Control District
		at Heisler Park - North	
	Pacific Ocean Shoreline	at Main Laguna Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Woods -County of Orange -Orange County Flood Control District
		Laguna Beach at Ocean Avenue	
		Laguna Beach at Cleo Street	
		Arch Cove at Bluebird Canyon Road	
		Laguna Beach at Dumond Drive	
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Hills -City of Laguna Niguel -City of Laguna Woods -City of Lake Forest -City of Mission Viejo -County of Orange -Orange County Flood Control District
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	
	Aliso Creek Mouth	at mouth	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	-City of Dana Point -City of Laguna Beach -City of Laguna Niguel -County of Orange -Orange County Flood Control District
		Aliso Beach at Table Rock Drive	
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)	
		at Salt Creek (large outlet)	
		Salt Creek Beach at Salt Creek service road	
		Salt Creek Beach at Strand Road	
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	-City of Dana Point -City of Laguna Hills -City of Laguna Niguel -City of Mission Viejo -City of Rancho Santa Margarita -City of San Juan Capistrano -County of Orange -Orange County Flood Control District
	San Juan Creek	lower 1 mile	
	San Juan Creek Mouth	at mouth	
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	-City of Dana Point -City of San Clemente -County of Orange -Orange County Flood Control District
		Ole Hanson Beach Club Beach at Pico Drain	
		San Clemente City Beach at El Portal Street Stairs	
		San Clemente City Beach at Mariposa Street	
		San Clemente City Beach at Linda Lane	
		San Clemente City Beach at South Linda Lane	
		San Clemente City Beach at Lifeguard Headquarters	
		under San Clemente Municipal Pier	
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	
		San Clemente State Beach at Riviera Beach	
		Can Clemente State Beach at Cypress Shores	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	-City of Oceanside -City of Vista -County of San Diego
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	-City of Carlsbad -City of Encinitas -City of Escondido -City of San Marcos -County of San Diego
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	-City of Del Mar -City of Escondido -City of Poway -City of San Diego -City of Solana Beach -County of San Diego
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	-City of Del Mar -City of Poway -City of San Diego -County of San Diego
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	-City of San Diego
		La Jolla Shores Beach at Caminito del Oro	
		La Jolla Shores Beach at Vallecitos	
		La Jolla Shores Beach at Avenida de la Playa	
		at Casa Beach, Children's Pool	
		South Casa Beach at Coast Boulevard	
		Whispering Sands Beach at Ravina Street	
		Windansea Beach at Vista de la Playa	
		Windansea Beach at Bonair Street	
		Windansea Beach at Playa del Norte	
		Windansea Beach at Palomar Avenue	
		at Tourmaline Surf Park	
		Pacific Beach at Grand Avenue	
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I- Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	-City of El Cajon -City of Santee -County of San Diego
	San Diego River	lower 6 miles	-City of El Cajon -City of La Mesa -City of San Diego -City of Santee -County of San Diego
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	-City of La Mesa -City of Lemon Grove -City of San Diego -County of San Diego - San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final indicator bacteria TMDL compliance requirements for the water bodies listed in Table 6.0 consist of the following:

(1) Final TMDL Compliance Dates

The Responsible Copermittees for MS4 discharges to the water bodies listed in Table 6.0 must be in compliance with the final TMDL compliance requirements according to the following compliance dates:

Table 6.1
Compliance Dates to Achieve Final TMDL Compliance Requirements

Constituent	Dry Weather TMDL Compliance Date	Wet Weather TMDL Compliance Date
Total Coliform	April 4, 2021	April 4, 2031
Fecal Coliform		
Enterococcus		

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance dates under Specific Provision 6.b.(1):

Table 6.2a

Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Beaches

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform	10,000	22% ~~/ 0%~~	1,000	0%
Fecal Coliform	400	22% ~~/ 0%~~	200	0%
Enterococcus	104	22% ~~/ 0%~~	35	0%

Notes:

a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. ~~The 0% single sample maximum allowable exceedance frequency applies to dry weather days.~~ For dry weather days the single sample allowable exceedance frequency must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan.

Table 6.2b

Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Creeks

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Fecal Coliform	400	22% ~~/ 0%~~	200	0%
Enterococcus	61 (104)	22% ~~/ 0%~~	33	0%

Notes:

a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. ~~The 0% single sample maximum allowable exceedance frequency applies to dry weather days.~~ For dry weather days the single sample allowable exceedance frequency must be consistent with the single sample maximum REC-1 water quality objectives in the Basin Plan.
d. A single sample maximum of 104 MPN/100ml for *Enterococcus* may be applied as a receiving water limitation for creeks, instead of 61~~0~~ MPN/100mL, if one or more of the creeks addressed by these TMDLs (San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek, San Diego River, and/or Chollas Creek) is designated with a "moderately to lightly used area" or less frequent usage frequency in the Basin Plan. Otherwise, the single sample max~~m~~imum of 61 MPN/100mL for *Enterococcus* must be used to assess compliance with the allowable exceedance frequency.

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing indicator bacteria densities that do not exceed the following effluent limitations by the compliance dates under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a):

Table 6.2c

Final Effluent Limitations Expressed as -Bacteria Densities and Allowable Exceedance Frequencies in MS4 Discharges to the Water Body

Constituent	Concentration-Based Effluent Limitations			
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform[d]	10,000	22% ~~/ 0%~~	1,000	0%
Fecal Coliform	400	22% ~~/ 0%~~	200	0%
Enterococcus	104[e] / 61[f]	22% ~~/ 0%~~	35[e] / 33[f]	0%

Notes:

a. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. ~~The 0% single sample maximum allowable exceedance frequency applies to dry weather days~~ For dry weather days the single sample allowable exceedance frequency must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan for discharges to beaches, and the Basin Plan for discharges to creeks and creek mouths.
d. Total coliform effluent limitations only apply to MS4 outfalls that discharge to the Pacific Ocean Shorelines and creek mouths listed in Table 6.0.
e. This *Enterococcus* effluent limitation applies to MS4 discharges to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
f. This *Enterococcus* effluent limitation applies to MS4 discharges to segments or areas of creeks or creek mouths listed in Table 6.0.

(ii) Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the compliance dates under Specific Provision 6.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a):

Table 6.3
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watershed and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
South Orange County	**San Joaquin Hills HSA** (901.11) and **Laguna Hills HSA** (901.12) - Pacific Ocean Shoreline	91.78%	91.72%	98.28%	46.85%	52.07%	51.26%
	Aliso HSA (901.13) - Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	95.47%	95.58%	99.13%	25.29%	26.62%	27.52% (27.37%)**
	Dana Point HSA (901.14) - Pacific Ocean Shoreline	95.04%	95.03%	98.98%	13.15%	14.86%	15.16%
	Lower San Juan HSA (901.27) - Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	72.96%	74.21%	94.94%	19.21%	12.82%	27.12% (26.90%)**
	San Clemente HA (901.30) - Pacific Ocean Shoreline	94.28%	94.23%	98.83%	23.85%	24.58%	25.26%
San Luis Rey River	**San Luis Rey HU** (903.00) - Pacific Ocean Shoreline	38.13%	39.09%	87.38%	5.62%	3.12%	11.69%

Table 6.3 (Cont'd)

Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watershed and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
Carlsbad	**San Marcos HA** (904.50) - Pacific Ocean Shoreline	82.82%	82.55%	96.03%	18.47%	18.98%	20.19%
San Dieguito River	**San Dieguito HU** (905.00) - Pacific Ocean Shoreline	14.39%	20.72%	83.48%	4.29%	1.46%	7.72%
Penasquitos	**Miramar Reservoir HA** (906.10) - Pacific Ocean Shoreline	96.50%	96.59%	99.42%	1.61%	1.99%	1.93%
Mission Bay	**Scripps HA** (906.30) - Pacific Ocean Shoreline	96.44%	96.42%	99.25%	16.32%	21.14%	18.82%
	Tecolote HA (906.50) - Tecolote Creek	94.51%	94.59%	98.94%	16.51%	20.47%	18.15% (18.08%)**
San Diego River	**Mission San Diego HSA** (907.11) and **Santee HSA** (907.12) - Pacific Ocean Shoreline - Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles)	74.03%	69.44%	93.96%	38.14%	53.22%	42.74% (42.47%)**
San Diego Bay	**Chollas HSA** (908.22) - Chollas Creek	92.06%	92.15%	98.46%	17.82%	24.84%	21.46% (21.36%)**

Notes:

* The percent load reductions are based on reducing loads compared to pollutant loads from 2001 to 2002.

** The alternative *Enterococcus* percent load reduction was calculated based on a numeric target of 104 MPN/100mL instead of 61 MPN/100mL, protective of the REC-1 "moderately to lightly used area" usage frequency that is protective of freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative pollutant load reductions can be utilized.

(c) Best Management Practices

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 6.0 must incorporate the Comprehensive Load Reduction Plans (CLRPs) required to be developed pursuant to Resolution No. R9-2010-0001.

(ii) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 6.b.(2)(a) and/or the effluent limitations under Specific Provision 6.b.(2)(b) for the segments or areas of the water bodies listed in Table 6.0.

(iii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans, owners/operators of small MS4s, and agricultural dischargers as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible ~~Copermittees'~~ Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible ~~Copermittees'~~ Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible ~~Copermittees'~~ Copermittee's MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(f) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 6.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 6.b.(2)(c) achieves compliance with Specific Provisions 6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), and/or 6.b.(3)(e),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 6.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 6.d, to demonstrate compliance with Specific Provisions ~~5~~6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), 6.b.(3)(e) and/or 6.b.(3)(f).

c. Interim TMDL Compliance Requirements

The interim indicator bacteria TMDL compliance requirements for the water bodies listed in Table 6.0 consist of the following:

(1) Interim TMDL Compliance Dates

The Responsible Copermittees must achieve compliance with the interim TMDL compliance requirements, as determined in accordance with Specific Provision 6.c.(3), by the interim compliance dates given in Table 6.4, unless alternative interim compliance dates are accepted by the San Diego Water Board Executive Officer as part of the Water Quality Improvement Plan.

Table 6.4
Interim Compliance Dates to Achieve Interim TMDL Compliance Requirements

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	April 4, 2016	April 4, 2021
		at Heisler Park - North		
	Pacific Ocean Shoreline	at Main Laguna Beach	April 4, 2016	April 4, 2021
		Laguna Beach at Ocean Avenue		
		Laguna Beach at Cleo Street		
		Arch Cove at Bluebird Canyon Road		
		Laguna Beach at Dumond Drive		
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	April 4, 2016	April 4, 2021
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	April 4, 2018	April 4, 2021
	Aliso Creek Mouth	at mouth	April 4, 2018	April 4, 2021
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	April 4, 2016	April 4, 2021
		Aliso Beach at Table Rock Drive		
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)		
		at Salt Creek (large outlet)		
		Salt Creek Beach at Salt Creek service road	April 4, 2017	April 4, 2021
		Salt Creek Beach at Strand Road	April 4, 2017	April 4, 2021

Table 6.4 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	April 4, 2016	April 4, 2021
	San Juan Creek	lower 1 mile	April 4, 2018	April 4, 2021
	San Juan Creek Mouth	at mouth	April 4, 2016	April 4, 2021
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	April 4, 2016	April 4, 2021
		Ole Hanson Beach Club Beach at Pico Drain	April 4, 2016	April 4, 2021
		San Clemente City Beach at El Portal Street Stairs	April 4, 2017	April 4, 2021
		San Clemente City Beach at Mariposa Street		
		San Clemente City Beach at Linda Lane	April 4, 2016	April 4, 2021
		San Clemente City Beach at South Linda Lane	April 4, 2018	April 4, 2021
		San Clemente City Beach at Lifeguard Headquarters	April 4, 2017	April 4, 2021
		under San Clemente Municipal Pier		
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	April 4, 2018	April 4, 2021
		San Clemente State Beach at Riviera Beach	April 4, 2016	April 4, 2021
		Can Clemente State Beach at Cypress Shores	April 4, 2017	April 4, 2021
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	April 4, 2017	April 4, 2021
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	April 4, 2016	April 4, 2021
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	April 4, 2016	April 4, 2021

Table 6.4 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates	
			Interim Dry Weather WQBELs	Interim Wet Weather WQBELs
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	April 4, 2016	April 4, 2021
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	April 4, 2016	April 4, 2021
		La Jolla Shores Beach at Caminito del Oro		
		La Jolla Shores Beach at Vallecitos		
		La Jolla Shores Beach at Avenida de la Playa		
		at Casa Beach, Children's Pool		
		South Casa Beach at Coast Boulevard		
		Whispering Sands Beach at Ravina Street		
		Windansea Beach at Vista de la Playa		
		Windansea Beach at Bonair Street		
		Windansea Beach at Playa del Norte		
		Windansea Beach at Palomar Avenue		
		at Tourmaline Surf Park		
		Pacific Beach at Grand Avenue		
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries		
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	April 4, 2018	April 4, 2021
	San Diego River	lower 6 miles		
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach		
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	April 4, 2018	April 4, 2021

(2) Interim Water Quality Based Effluent Limitations

The Responsible Copermittees for discharges to the water bodies in Table 6.0 must comply with the following interim WQBELs by the interim compliance dates given in Specific Provision 6.c.(1):

(a) Interim Receiving Water Limitations

(i) *Interim Dry Weather Receiving Water Limitations*

The Responsible Copermittee must calculate the "existing" exceedance frequencies of the 30-day geometric mean water quality objectives for each of the indicator bacteria by analyzing the available monitoring data collected between January 1, 1996 and December 31, 2002. "Existing" exceedance frequencies may be calculated by water body and/or by Watershed Management Area listed in Table 6.0. Separate "existing" exceedance frequencies must be calculated for beaches and creeks/creek mouths.

The Responsible Copermittees must achieve a 50 percent reduction in the "existing" exceedance frequency of the 30-day geometric mean WQBELs for the water bodies listed in Table 6.0 by the interim compliance dates given in Table 6.5. A 50 percent reduction in the "existing" exceedance frequency is equivalent to half of the "existing" exceedance frequency of the 30-day geometric mean WQBELs.

The "existing" exceedance frequencies and the interim dry weather allowable exceedance frequencies (i.e. interim dry weather receiving water limitations) calculated by the Responsible Copermittees must be included in the Water Quality Improvement Plans for the applicable Watershed Management Areas.

(ii) *Interim Wet Weather Receiving Water Limitations*

The Responsible Copermittees must achieve the interim wet weather receiving water limitations in Table 6.5, expressed as interim wet weather allowable exceedance frequencies, by the interim compliance dates given in Table 6.4.

Table 6.5
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	38%	37%	39%
		at Heisler Park - North			
	Pacific Ocean Shoreline	at Main Laguna Beach			
		Laguna Beach at Ocean Avenue			
		Laguna Beach at Cleo Street			
		Arch Cove at Bluebird Canyon Road			
		Laguna Beach at Dumond Drive			
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	41%	41%	42%
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	41%	41%	42%
	Aliso Creek Mouth	at mouth	41%	41%	42%
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	36%	36%	36%
		Aliso Beach at Table Rock Drive			
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)			
		at Salt Creek (large outlet)			
		Salt Creek Beach at Salt Creek service road			
		Salt Creek Beach at Strand Road			

Table 6.5 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	44%	44%	48%
	San Juan Creek	lower 1 mile	44%	44%	47%
	San Juan Creek Mouth	at mouth	44%	44%	47%
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	35%	35%	36%
		Ole Hanson Beach Club Beach at Pico Drain			
		San Clemente City Beach at El Portal Street Stairs			
		San Clemente City Beach at Mariposa Street			
		San Clemente City Beach at Linda Lane			
		San Clemente City Beach at South Linda Lane			
		San Clemente City Beach at Lifeguard Headquarters			
		under San Clemente Municipal Pier			
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)			
		San Clemente State Beach at Riviera Beach			
		Can Clemente State Beach at Cypress Shores			
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	45%	44%	47%
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	40%	40%	41%
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	33%	33%	36%

Table 6.5 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	26%	26%	26%
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	37%	37%	37%
		La Jolla Shores Beach at Caminito del Oro			
		La Jolla Shores Beach at Vallecitos			
		La Jolla Shores Beach at Avenida de la Playa			
		at Casa Beach, Children's Pool			
		South Casa Beach at Coast Boulevard			
		Whispering Sands Beach at Ravina Street			
		Windansea Beach at Vista de la Playa			
		Windansea Beach at Bonair Street			
		Windansea Beach at Playa del Norte			
		Windansea Beach at Palomar Avenue			
		at Tourmaline Surf Park			
		Pacific Beach at Grand Avenue			
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries	49%	49%	51%
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	46%	43%	49%
	San Diego River	lower 6 miles	46%	43%	49%
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	46%	43%	51%
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	41%	41%	43%

(b) Interim Effluent Limitations

Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the interim compliance dates under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.c.(2)(a):

Table 6.6
Interim Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watersheds and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
South Orange County	**San Joaquin Hills HSA** (901.11) and **Laguna Hills HSA** (901.12) - Pacific Ocean Shoreline	45.89%	45.86%	49.14%	23.43%	26.04%	25.63%
	Aliso HSA (901.13) - Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	47.74%	47.79%	49.57%	12.65%	13.31%	13.76% (13.69%)**
	Dana Point HSA (901.14) - Pacific Ocean Shoreline	47.52%	47.52%	49.49%	6.58%	7.43%	7.58%
	Lower San Juan HSA (901.27) - Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	36.48%	37.11%	47.47%	9.61%	6.41%	13.56% (13.45%)**
	San Clemente HA (901.30) - Pacific Ocean Shoreline	47.14%	47.12%	49.42%	11.93%	12.29%	12.63%
San Luis Rey River	**San Luis Rey HU** (903.00) - Pacific Ocean Shoreline	19.07%	19.55%	43.69%	2.81%	1.56%	5.85%
Carlsbad	**San Marcos HA** (904.50) - Pacific Ocean Shoreline	41.41%	41.28%	48.02%	9.24%	9.49%	10.10%

Table 6.6 (Cont'd)
Interim Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watersheds and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
San Dieguito River	**San Dieguito HU** (905.00) - Pacific Ocean Shoreline	7.20%	10.36%	41.74%	2.15%	0.73%	3.86%
Penasquitos	**Miramar Reservoir HA** (906.10) - Pacific Ocean Shoreline	48.25%	48.30%	49.71%	0.81%	1.00%	0.97%
Mission Bay	**Scripps HA** (906.30) - Pacific Ocean Shoreline	48.22%	48.21%	49.63%	8.16%	10.57%	9.41%
	Tecolote HA (906.50) - Tecolote Creek	47.26%	47.30%	49.47%	8.26%	10.24%	9.08% (9.04%)**
San Diego River	**Mission San Diego HSA** (907.11) and **Santee HSA** (907.12) - Pacific Ocean Shoreline - Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles)	37.02%	34.72%	46.98%	19.07%	26.61%	21.37% (21.24%)**
San Diego Bay	**Chollas HSA** (908.22) - Chollas Creek	46.03%	46.08%	49.23%	8.91%	12.42%	10.73% (10.68%)**

Notes:
* The percent load reductions are based on reducing loads compared to pollutant loads from 2001 to 2002.
** The alternative *Enterococcus* percent load reduction was calculated based on a numeric target of 104 MPN/100mL instead of 61 MPN/100mL, protective of the REC-1 "moderately to lightly used area" usage frequency that is protective of freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative pollutant load reductions can be utilized.

(3) Interim TMDL Compliance Determination

Compliance with the interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible ~~Copermittees'~~ Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible ~~Copermittees'~~ Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible ~~Copermittees'~~ Copermittee's MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(f) There are no exceedances of the interim receiving water limitations under Specific Provision 6.c.(2)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(g) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the interim effluent limitations under Specific Provision 6.c.(2)(b); OR

(h) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

d. Specific Monitoring and Assessment Requirements

(1) Monitoring and Assessment Requirements for Beaches

(a) Monitoring Stations

For beaches addressed by the TMDL, monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[35] If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source

[35] Commonly referred to as AB 411 monitoring

identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations at least once within the first 24 hours of the end of a storm event[36] during the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer in exceedance of the allowable exceedance frequencies in the receiving waters.

(iii) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(iv) For Pacific Ocean Shoreline segments or areas listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the dry weather and

[36] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

wet weather monitoring data to assess whether the interim and final WQBELs for the Pacific Ocean Shoreline segments or areas listed in Table 6.0 have been achieved.

(ii) Dry weather exceedance frequencies must be calculated as follows:

[a] 30-day geometric means must be calculated from the results of any dry weather samples collected from the segments or areas for each water body listed in Table 6.0;
[b] The method and number of samples need for calculating the 30-day geometric means must be consistent with the number of samples required by the Ocean Plan;
[c] Where there are multiple segments or areas associated with a water body listed in Table 6.0, the Copermittees may calculate geometric means for each segment or area, or combine the dry weather monitoring data from all the segments or areas to calculate geometric means for the water body;
[d] The exceedance frequency must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the dry season.

(iii) Wet weather exceedance frequencies must be calculated as follows:

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;
[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;
[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria density~~y~~ies ~~result~~ reported from ~~wet weather samples collected~~ each storm event sampled; and
[d] The single sample maximum exceedance frequency must be calculated by dividing the number of wet weather days that exceed the single sample maximum receiving water limitations in Table 6.2 by the total number of wet weather days during the rainy season.
[e] The data collected for dry weather must be used in addition to the data collected for wet weather to calculate the wet weather 30-day geometric means. The exceedance frequency of the wet weather 30-day geometric means must be calculated by dividing

the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the wet season.

(iv) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

~~(iv)~~

(v) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) Monitoring and Assessment Requirements for Creeks and Creek Mouths

(a) Monitoring Stations

For creeks addressed by the TMDL, monitoring locations should consist of, at a minimum, a location at or near the mouth of the creek (e.g. Mass Loading Station or Mass Emission Station) and one or more locations upstream of the mouth (e.g. Watershed Assessment Station). If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations in accordance with the requirements of Provision D.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations within the first 24 hours of the end of a storm event[37] during the rainy season (i.e. October 1 through April 30).

[37] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(iii) Samples collected from receiving water monitoring stations must be analyzed for fecal coliform and *Enterococcus* indicator bacteria.

(iv) For creeks or creek mouths listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the receiving water monitoring data to assess whether the interim and final receiving water WQBELs for the creeks and creek mouths listed in Table 6.0 have been achieved.

(ii) Dry weather exceedance frequencies must be calculated as follows:

[a] 30-day geometric means must be calculated from the results of any dry weather samples collected from the segment or area for each water body listed in Table 6.0;
[b] The method and number of samples need for calculating the 30-day geometric means must be consistent with the number of samples required by the Basin Plan;
[c] The exceedance frequency must be calculated by dividing the number of 30-day geometric means that exceed the 30-day geometric mean receiving water limitations in Table 6.2 by the total number of 30-day geometric means calculated from samples collected during the dry season.

(iii) Wet weather exceedance frequencies must be calculated as follows:

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;
[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;
[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria density~~y~~ies ~~result~~ reported from ~~wet weather samples collected~~ each of the storm

events sampled; and

[d] The exceedance frequency must be calculated by dividing the number of wet weather days that exceed the single sample maximum receiving water limitations in Table 6.2 by the total number of wet weather days during the rainy season.

[e] The data collected for dry weather must be used in addition to the data collected for wet weather to calculate the wet weather 30-day geometric means. The exceedance frequency of the wet weather 30-day geometric means must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the wet season.

(iv) The Responsible Copermittee must identify and incorporate additional MS4 outfall and receiving water monitoring stations and/or adjust monitoring frequencies to identify sources causing exceedances of the receiving water WQBELs.

(v) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

~~(v)~~

(vi) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

ATTACHMENT F

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

FACT SHEET / TECHNICAL REPORT

FOR

TENTATIVE
ORDER NO. R9-2013-0001
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

MONTH DAY, 2013

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I. FACT SHEET FORMAT

This Fact Sheet briefly sets forth the principal facts and the significant factual, legal, methodological, and policy questions that the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) considered in preparing Order No. R9-2013-0001 (Order). In accordance with the Code of Federal Regulations (CFR) Title 40 Parts 124.8 and 124.56 (40 CFR 124.8 and 40 CFR 124.56), this Fact Sheet includes, but is not limited to, the following information:

1. Contact information
2. Public process and notification procedures
3. Background of municipal storm water permits
4. Regional MS4 Permit approach
5. Economic considerations
6. Applicable statutes, regulations, plans and policies
7. Discussion of the provisions in the Order

Tentative Order No. R9-2013-0001 was distributed for public review on October 31, 2012. The San Diego Water Board accepted written comments on the Tentative Order until January 11, 2013. A public hearing was subsequently held on April 10 and 11, 2013 to receive oral comments from interested persons.

The San Diego Water Board files applicable to the issuance of Order No. R9-2013-0001 are incorporated into the administrative record in support of the findings and requirements of the Order.

II. CONTACT INFORMATION

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The Order and other related documents can be downloaded from the San Diego Water Board website at

http://www.swrcb.ca.gov/rwqcb9/water_issues/programs/stormwater/index.shtml

The documents referenced in this Fact Sheet and in Order No. R9-2013-0001 are available for public review at the San Diego Water Board office, located at the address listed above. Public records are available for inspection during regular business hours, from 8:00 am to 5:00 pm Monday through Friday. To schedule an appointment to inspect public records, contact the San Diego Water Board Records Management Officer at 858-467-2952.

COPERMITTEES

Orange County Copermittees

- County of Orange
  - City of Aliso Viejo
  - City of Dana Point
  - City of Laguna Beach
  - City of Laguna Hills
  - City of Laguna Niguel
  - City of Laguna Woods
  - City of Lake Forest
  - City of Mission Viejo
  - City of Ranch Santa Margarita
  - City of San Clemente
  - City of San Juan Capistrano
  - Orange County Flood Control District

Riverside County Copermittees

- County of Riverside
  - City of Murrieta
  - City of Temecula
  - City of Wildomar
  - Riverside County Flood Control and Water Conservation District

San Diego County Copermittees

- County of San Diego
  - City of Carlsbad
  - City of Chula Vista
  - City of Coronado
  - City of Del Mar
  - City of El Cajon
  - City of Encinitas
  - City of Escondido
  - City of Imperial Beach
  - City of La Mesa
  - City of Lemon Grove
  - City of National City
  - City of Oceanside
  - City of Poway
  - City of San Diego
  - City of San Marcos
  - City of Santee
  - City of Solana Beach
  - City of Vista
  - San Diego County Regional Airport Authority
  - San Diego Unified Port District

III. PUBLIC PROCESS AND NOTIFICATION PROCEDURES

The San Diego Water Board followed the schedule listed below for the preparation of Order No. R9-2013-0001:

1. On February 8, 2011, the San Diego Water Board met with the San Diego County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No. R9-2007-0001.

2. Between February and May 2011, the San Diego Water Board met with select San Diego County, Orange County, and Riverside County Copermittees, as well as representatives of the environmental community to discuss concepts and receive recommendations for elements to be incorporated in a Regional Municipal Separate Storm Sewer System Permit (Regional MS4 Permit).

3. On June 27, 2011 the San Diego Water Board received the Report of Waste Discharge from the San Diego County Copermittees for the renewal of their NPDES permit, Order No. R9-2007-0001.

4. On April 9, 2012, the San Diego Water Board released an administrative draft of Tentative Order No. R9-2013-0001 for preliminary informal comments and feedback.

5. On April 25, 2012, the San Diego Water Board held an informal public workshop to present the administrative draft of Tentative Order No. R9-2013-0001 and receive verbal comments.

6. Between June and August 2012, the San Diego Water Board held four (4) focused meetings with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community, and USEPA) to discuss and receive preliminary comments and feedback about specific elements in the administrative draft of Tentative Order No. R9-2013-0001.

7. On September 5, 2012, the San Diego Water Board held an informal public workshop to present the modifications that were expected to be incorporated into the Tentative Order based on the preliminary comments and feedback received during the focused meetings held between June and August 2012.

8. Informal written comments on the administrative draft of Tentative Order No. R9-2013-0001 were accepted until September 14, 2012.

9. On October 12, 2012, the San Diego Water Board released a revised administrative draft of Tentative Order No. R9-2013-0001.

10. On October 24, 2012, the San Diego Water Board held a focused meeting with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community, and USEPA) to discuss modifications incorporated into the administrative draft of Tentative Order No. R9-2013-0001.

11. On October 31, 2012, the San Diego Water Board released Tentative Order No. R9-2013-0001 for formal public review and comment.

12. On November 13, 2012 and December 12, 2012, the San Diego Water Board held a formal public Board workshop to present the public draft of Tentative Order No. R9-2013-0001 and receive verbal comments.

13. Formal written comments on the public draft of Tentative Order No. R9-2013-0001 were accepted until January 11, 2013.

14. A public hearing of Tentative Order No. R9-2013-0001 was conducted on April 10 and 11, 2013.

IV. BACKGROUND OF THE SAN DIEGO REGION MUNICIPAL STORM WATER PERMITS

In developed and developing areas, storm water runoff is commonly transported through municipal separate storm sewer systems (MS4s) and discharged into local receiving water bodies. As the storm water runs off and flows over the land or impervious surfaces (e.g., paved streets, parking lots, and building rooftops), it accumulates debris, chemicals, sediment, and other pollutants that can adversely affect receiving water quality if discharged untreated. The United States Environmental Protection Agency (USEPA) recognizes wet weather flows from urban areas as the number one source of estuarine pollution in coastal communities,[1] such as those within the San Diego Region.

The federal Clean Water Act (CWA) was amended in 1987 to address and regulate discharges of storm water associated with industrial activities and from municipal storm sewers. With the amendments, many municipalities throughout the United States were obligated for the first time to obtain National Pollutant Discharge Elimination System (NPDES) permits for discharges of storm water from their MS4s.

In response to the CWA 1987 amendment, as well as the pending federal NPDES regulations which would implement the amendment, the San Diego Water Board issued "early" MS4 permits. The San Diego Water Board adopted and issued Order Nos. 90-38, 90-42, and 90-46 to regulate storm water discharges from the MS4s in Orange County, San Diego County, and Riverside County, respectively, within the San Diego Region on July 16, 1990.

The "early" MS4 permits, or First Term Permits, were issued prior to the November 1990 promulgation of the final federal NPDES storm water regulations. By issuing these First Term Permits before the federal regulations took effect, the San Diego Water Board was able to provide the Copermittees additional flexibility in addressing and managing storm water discharges. The First Term Permits contained the essentials of the 1990 regulations, and required the Copermittees to develop and implement runoff management programs, but provided little specificity about what was required to be included in or actually achieved by those programs.

The flexibility provided in the First Term Permits was generally continued through the Second Term Permits. The combination of the lack of specificity in the First and Second Term Permits, a general lack of meaningful action by the Copermittees and a general lack of corresponding reaction (i.e. enforcement) by the San Diego Water Board during the first ten years of the storm water program, resulted in few substantive steps towards achieving improvements in the quality of receiving waters or storm water discharges from the MS4s.

[1] US EPA. 1999. 40 CFR Parts 9, 122, 123, and 124. National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. 64 FR 68727.

From 2001, the regulatory approach incorporated into Third Term Permits was a significant departure from the regulatory approach of the First and Second Term Permits. The Third Term Permits issued by the San Diego Water Board included more detailed requirements that outlined the minimum level of implementation required for the Copermittees' programs to meet the maximum extent practicable (MEP) standard for storm water. The Third Term Permits included more detail to emphasize and enhance the jurisdictional runoff management programs developed by the Copermittees and introduced requirements for developing and implementing watershed-based programs.

The Third Term Permits also incorporated two precedent setting decisions by the State Water Board. In Order WQ 99-05, the State Water Board established receiving water limitation language to be included in all MS4 permits. The State Water Board's precedential language clarified that municipal storm water permits must include provisions requiring discharges to be controlled to attain water quality standards in receiving waters. Unlike previously adopted versions of the receiving water limitation language in the First and Second Term Permits, the language no longer stated that "*violations of water quality standards are not violations of the municipal storm water permit under certain conditions*." In addition, the receiving water limitation language no longer indicated that the "*implementation of best management practices is the 'functional equivalent' of meeting water quality standards*." State Water Board Order WQ 99-05 specifically requires language in MS4 permits for the Copermittees to comply with water quality standards based discharge prohibitions and receiving water limitations through timely implementation of control measures and other actions to reduce pollutants in discharges. (See State Water Board Order WQ 99-05 (*Environmental Health Coalition*)).

In Order WQ 2000-11, also a precedential decision, the State Water Board addressed design standards for structural post-construction best management practices (BMPs) for new development and significant redevelopment. The State Water Board found that the design standards, which require that runoff generated by 85 percent of storm events from specific development categories be infiltrated or treated, reflect the MEP standard. State Water Board Order WQ 2000-11 also found that the post-construction BMP provisions, or Standard Storm Water Mitigation Plan (SSMP) provisions, constitute MEP for addressing storm water pollutant discharges resulting from specific development categories.

The Third Term San Diego County and Orange County Permits (Order Nos. 2001-01 and R9-2002-0001, respectively) were appealed to the State Water Board. Minor modifications were made by the State Water Board, but the requirements were largely upheld. In State Water Board Order WQ 2001-15, the State Water Board upheld the Third Term San Diego County Permit requirements with certain modifications. The State Water Board removed the prohibition of storm water discharges *into* the MS4 that cause or contribute to exceedances of water quality objectives. The revision allows for treatment of pollutants in storm water runoff after the pollutants have entered the MS4. State Water Board Order WQ 2001-15 otherwise upheld all the other requirements of the permit.

In addition to the modification to the discharge prohibition in Order WQ 2001-15, the State Water Board refined Order WQ 99-05 by making clear that the Copermittees may use an iterative approach to achieving compliance with water quality standards that involves ongoing assessments and revisions. Thus, the language for the discharge prohibitions and receiving water limitations was revised to explicitly require the Copermittees to implement an iterative process of assessments and revisions to comply with the discharge prohibitions and receiving water limitations. The San Diego Water Board retained the authority to enforce receiving water limitations and discharge prohibitions even if the Copermittee is engaged in the iterative process.

The Third Term San Diego County Permit was subsequently challenged in the Superior Court of the State of California and the Court of Appeal, Fourth Appellate District. The Court of Appeal, Fourth Appellate District, found that the approach of the Third Term San Diego County Permit to regulating discharges into the MS4 was appropriate (*Building Industry Ass'n. v. State Water Resources Control Bd., et al.,* 124 Cal.App.4th 866 (2004)). The State of California Supreme Court denied review sought by the Building Industry Association in March 2005.

The Fourth Term Permits, or current MS4 permits, began with the adoption of Order No. R9-2007-0001 issued to the Copermittees of San Diego County in January 2007. Order Nos. R9-2009-0002 and R9-2010-0016 were subsequently issued to the Copermittees of Orange County and Riverside County. The Fourth Term Permits continued to include more detailed requirements to be implemented by each Copermittee's jurisdictional runoff management program. The Fourth Term Permits also include requirements to further emphasize a watershed management approach and for more coordination among jurisdictional runoff management programs. In addition, the Fourth Term Permits included more requirements for assessing the effectiveness of the runoff management programs being implemented by the Copermittees. The intent of the inclusion of additional requirements was to enhance and better define elements of the permit that were expected to be incorporated into the iterative process for managing runoff from each Copermittee's jurisdiction and within the watersheds of the San Diego Region.

The Fourth Term Permits include several new and emerging approaches for managing storm water runoff and discharges. Low impact development (LID) requirements are included for development and significant redevelopment to reduce pollutants in storm water runoff from sites through more natural processes such as infiltration and biofiltration closer to the source, rather than utilizing conventional mechanical end-of-pipe treatment systems. Hydrograph modification (hydromodification) management requirements also are included to mitigate the potential for increased erosion in receiving waters due to increased runoff rates and durations often caused by development and increased impervious surfaces. The Fourth Term Orange County and Riverside County Permits introduced requirements to identify areas of existing development where retrofitting with LID projects would be feasible and could be implemented to reduce storm water runoff and pollutants in storm water discharges.

The Fourth Term Orange County and Riverside County Permits included a clearer distinction between storm water and non-storm water discharges. The term “urban runoff” was completely removed, and a distinction between storm water (wet weather) runoff and non-storm water (dry weather) runoff was emphasized. This clarification was made to prevent any potential misunderstanding that regulation under the MS4 permits is limited only to urbanized areas, and to prevent non-storm water runoff from being managed in the same manner as storm water runoff. The term “urban runoff” is not defined in the Code of Federal Regulations (CFR) or Federal Register (FR) in the regulation of MS4 discharges. According to the CWA 402(p)(3)(B)(ii), MS4 permits must include a requirement to effectively prohibit non-storm water discharges into the MS4s.

Finally, for the Fourth Term Orange County and Riverside County Permits the San Diego Water Board found that non-storm water discharges to the MS4 from over application of irrigation water are sources of pollutants. The San Diego Water Board found that non-storm water discharges resulting from over-irrigation must be prohibited from entering the MS4 in accordance with the requirements of the CWA and pursuant to 40 CFR 122.26(d)(2)(iv)(B)(1).

The requirements of the Fourth Term Permits issued to the Copermittees in each county within the San Diego Region now have substantively the same core requirements such as discharge prohibitions, receiving water limitations, jurisdictional runoff management program components, and monitoring program requirements. There are, however, several inconsistencies that exist among the three Fourth Term Permits which complicate oversight and implementation of the permits by the San Diego Water Board.

The Fourth Term San Diego County Permit expired in January 2012. The Fourth Term Orange County and Riverside County Permits will expire in December 2014 and November 2015, respectively. Issuing the Fifth Term Permits within five years for three counties under three different permits would require the San Diego Water Board to expend significant time and resources for the issuance of the permits through three separate public proceedings, thereby greatly reducing the time and resources available to oversee implementation and compliance. Multiple permits also create confusion for determining compliance among regulated entities, especially for the land development community.

The San Diego Water Board has acknowledged that issuing a single MS4 permit for all the Copermittees in the San Diego Region can and is expected to result in more consistent implementation, improve communication among agencies within watersheds crossing multiple jurisdictions, and minimize resources spent with each permit renewal process. Within the findings of the Fourth Term Riverside County Permit issued in November 2010, the San Diego Water Board notified the public of its intent to develop and issue a single Regional MS4 Permit.

V. REGIONAL MS4 PERMIT APPROACH

The Fifth Term Permit, or Regional MS4 Permit, shifts the focus of the permit requirements from a minimum level of actions to be implemented by the Copermittees to identifying outcomes to be achieved by those actions. Order No. R9-2013-0001 represents an important paradigm shift in the approach for MS4 permits within the San Diego Region.

Historical Permitting Approach

The First and Second Term Permits were very broad and provided little specificity about what was required to be developed and implemented by the Copermittees. The Third Term Permits began to become more specific about the minimum level of implementation required by the Copermittees. The Fourth Term Permits, or current permits, subsequently increased in specificity. The MS4 permits have progressively become more detailed and focused on specifying the minimum level of actions expected to be implemented by the Copermittees. As detailed and specific as the MS4 permits have become, however, they include very little detail about what the desired outcomes of the required actions are expected to achieve. Compliance with the permit requirements has essentially been tracking numbers of actions and reporting, not tracking progress or actual improvements in the quality of receiving waters or discharges from the MS4s. The result has been an increase in actions being implemented by the Copermittees with little or no ability or expectations to determine whether or not improvements in water quality are being achieved.

The Fourth Term Permits result in significant resource expenditure by the Copermittees to report permit compliance information to the San Diego Water Board in the form of annual jurisdictional runoff management program, watershed program, and monitoring program reports. The San Diego Water Board must then expend much of its limited resources on reviewing more than 50 voluminous reports submitted annually by the Copermittees. The information currently reported by the Copermittees is of limited value when trying to measure progress toward achieving improvements in the quality of receiving waters or discharges from the MS4s. Oversight of the MS4 permits is further complicated by the inconsistencies among the requirements issued to the Orange County, San Diego County, and Riverside County Copermittees under three separate MS4 permits.

Under the Fourth Term Permits, the Copermittees must expend a significant portion of their limited resources collecting data of limited value, and putting together reports to submit that information to the San Diego Water Board. Likewise, the San Diego Water Board must expend most of its limited resources reviewing reports, and developing permits instead of working directly with the Copermittees to identify solutions to problems causing impacts to water quality. This is an unsustainable course that will continue to demand more resources from the Copermittees and the San Diego Water Board, and would continue to result in unknown water quality benefits.

New Permitting Approach

The goal of the Regional MS4 Permit is twofold: 1) bring a consistent set of MS4 permit requirements to all of the Copermittees within the San Diego Region; and, 2) provide an MS4 permit with requirements that will allow the Copermittees to focus their efforts and resources on achieving goals and desired outcomes toward the improvement of water quality rather than completing specific actions.

The overall approach included in the Regional MS4 Permit with respect to the jurisdictional runoff management programs will not differ significantly from the current permits. The general requirements for the jurisdictional runoff management program components and compliance with those requirements will remain and be applied consistently throughout the San Diego Region under the Regional MS4 Permit.

The most significant difference in the new permitting approach is the specific manner of implementation for those jurisdictional runoff management programs. Implementation will be based on decisions made by the Copermittees in accordance with what they have identified as their highest priority water quality conditions. In other words, the Copermittees will have significant control in how to implement the jurisdictional runoff management programs to best utilize their available resources in addressing a specific set of priorities effectively, instead of trying to address all the water quality priorities ineffectively.

The Copermittees are given the responsibility of identifying their highest priority water quality conditions that they intend to address. The Copermittees will develop goals that can be used to measure and demonstrate progress or improvements toward addressing those priorities. In addition to the goals, the Copermittees will provide a schedule for achieving the goals for those highest priorities. The measurement of progress toward achieving the goals for those highest priorities requires a better defined and more focused program of monitoring and assessment than under the Fourth Term Permits.

The monitoring and assessment program must be designed to inform the Copermittees of their progress, and the need for modifications in their jurisdictional runoff management programs and schedules to achieve their goals to improve water quality. The monitoring and assessment program requirements will have a more central role in the Regional MS4 Permit than in earlier permits. The monitoring and assessment requirements must also be designed to enable the Copermittees to focus and direct their efforts in implementing their jurisdictional runoff management programs toward their stated desired outcomes to improve the quality of receiving waters and/or discharges from the MS4s.

By providing an MS4 permit that allows the Copermittees to make more decisions about how to utilize and focus their resources, along with a better defined monitoring and assessment program to inform their water quality management decisions, the Copermittees will have the opportunity to:

1) *Plan strategically*. The Copermittees must have the ability to identify their available resources and develop and implement long term plans that can organize, collect, and use those resources in the most strategically advantageous and efficient manner possible. This ability to develop long term plans will allow the Copermittees to focus and utilize their resources in a more concerted way over the short term and long term to address specific water quality priorities through stated desired outcomes.

2) *Manage adaptively*. The Copermittees must be given the ability to modify their plans as additional information and data are collected from the monitoring and assessment programs. The Copermittees' plans may require modifications to the programs, priorities, goals, strategies, and/or schedules in order for the Copermittees to achieve a stated desired outcome.

3) *Identify synergies*. The Copermittees must be given more flexibility to identify efficiencies within and among their jurisdictional runoff management programs as the strategies are developed and implemented to increase the Copermittees' collective effectiveness. The Copermittees must also be able to identify and utilize resources available from other agencies and entities to further augment and enhance their jurisdictional runoff management programs and/or to collectively work with those other agencies and entities toward achieving a stated desired outcome.

The Regional MS4 Permit requirements will provide the Copermittees the flexibility and responsibility to decide what actions will be necessary to achieve an outcome that is tailored and designed by the Copermittees to improve specific prioritized water quality conditions. The San Diego Water Board expects the approach of the Regional MS4 Permit to give the Copermittees a greater sense of ownership for restoring the quality of receiving waters in the San Diego Region by becoming an integral part of the decision making process in identifying water quality conditions to be addressed, as well as determining the best use of their resources.

VI. ECONOMIC CONSIDERATIONS

Statutory Considerations

California Water Code (CWC) section 13241 requires the San Diego Water Board to consider certain factors, including economic considerations, in the adoption of water quality objectives. CWC section 13263 requires the San Diego Water Board to take into consideration the provisions of CWC section 13241 in adopting waste discharge requirements.

In *City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, the California Supreme Court considered whether Regional Water Boards must comply with CWC section 13241 when issuing waste discharge requirements under CWC section 13263(a) by taking into account the costs a permittee will incur in complying with the permit requirements. The Court concluded that whether it is necessary to consider such cost information "*depends on whether those restrictions meet or exceed the requirements of the federal Clean Water Act.*" (*Id.* at p. 627.) The Court ruled that Regional Water Boards may not consider the factors in CWC section 13241, including economics, to justify imposing pollutant restrictions that are less stringent than applicable federal law requires. (*Id.* At pp. 618, 626-627 ["*[Water Code section 13377 specifies that [] discharge permits issued by California's regional boards must meet the federal standards set by federal law. In effect, section 13377 forbids a regional board's consideration of any economic hardship on the part of the permit holder if doing so would result in the dilution of the requirements set by Congress in the Clean Water Act...Because CWC section 13263 cannot authorize what federal law forbids, it cannot authorize a regional board, when issuing a [] discharge permit, to use compliance costs to justify pollutant restrictions that do not comply with federal clean water standards*."]). However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Regional Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

As discussed in Section VII.F, Unfunded State Mandates, the San Diego Water Board finds that the requirements in this Order are not more stringent than the minimum federal requirements. Among other requirements, federal law requires MS4 permits to include requirements to effectively prohibit non-storm water discharges into the MS4s, in addition to requiring controls to reduce the discharge of pollutants in storm water to the MEP, and other provisions as USEPA or the State determines are appropriate for the control of pollutants in MS4 discharges.

The requirements in this Order may be more specific or detailed than those enumerated in federal regulations under 40 CFR 122.26 or in the USEPA guidance. However, the requirements have been designed to be consistent with and within the federal statutory mandates described in CWA section 402(p)(3)(B)(ii) and (iii) and the related federal regulations and guidance. Consistent with federal law, all of the

conditions in this Order could have been included in a permit adopted by USEPA in the absence of the in lieu authority of California to issue NPDES permits.

Moreover, the inclusion of numeric WQBELs in this Order does not cause this Order to be more stringent than federal law. Federal law authorizes both narrative and numeric effluent limitations to meet state water quality standards. The inclusion of WQBELs as discharge specifications in an NPDES permit in order to achieve compliance with water quality standards is not a more stringent requirement than the inclusion of BMP based permit limitations to achieve water quality standards (State Water Board Order No. WQ 2006-0012 (*Boeing*)). Therefore, consideration of the factors set forth in CWC section 13241 is not required for permit requirements to implement the effective prohibition on the discharge of non-storm water discharges into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determine appropriate to control such pollutants, as those requirements are mandated by federal law.

Included in the provisions of the Order are monitoring and reporting requirements that are designed to demonstrate that the Copermittees are implementing programs to comply with the CWA municipal storm water requirements. CWA section 308(a) and 40 CFR 122.41(h), (j)-(l), 122.44(i) and 122.48 require that all NPDES permits specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s (40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c)) also specify additional monitoring and reporting requirements. In addition to the federal requirements of the CWA, the San Diego Water Board also has the authority in CWC 13383 to establish monitoring, reporting, and recordkeeping requirements that implement federal and state laws and regulations through NPDES permits. .

The monitoring and assessment information that will be reported to the San Diego Water Board is necessary to determine if the Copermittees are making progress toward achieving compliance with the discharge prohibitions, receiving water limitations, and effluent limitations under Provision A of the Order. The monitoring and assessment information that will be reported is also expected to be key to the iterative approach and adaptive management process that is required to be implemented by the Copermittees if they cannot meet the discharge prohibitions and receiving water limitations under the present conditions, which is also part of the requirements under Provision A of the Order.

Notwithstanding the above, the San Diego Water Board has considered cost information in issuing this Order, as discussed below. The San Diego Water Board has also considered all of the evidence that has been presented to the San Diego Water Board regarding the CWC section 13241 factors in adopting this Order. The San Diego Water Board finds that the requirements in this Order are reasonably necessary to protect beneficial uses identified in the Basin Plan and the economic information related to costs of compliance and other CWC section 13241 factors are not sufficient to justify failing to protect those beneficial uses. Where appropriate, the

San Diego Water Board has provided or will consider providing the Copermittees with additional time to implement control measures to achieve final WQBELs and/or water quality standards.

Cost Information

Discussions of the financial and economic ramifications of municipal storm water management programs tend to focus on the significant costs incurred by municipalities in developing and implementing the programs. When considering the cost of implementing the programs, however, it is also important to consider the alternative costs that are incurred when programs are not fully implemented, as well as the economic benefits which result from effective program implementation.

The recent financial and economic conditions have amplified the concerns about the costs incurred by the municipalities in developing and implementing their programs. The reduction in resources resulting from the recent financial and economic conditions has been cited by many of the Copermittees as a justification for reducing the requirements that must be met by their programs. While the recent conditions are a cause for concern in the short term, these programs also have an opportunity to identify and implement improvements and efficiencies before the next period of growth and development, resulting in more effective and sustainable programs over the long term.

In addition, it is very difficult to ascertain the true cost of implementation of the Copermittees' management programs because of inconsistencies in reporting by the Copermittees. Reported costs of compliance for the same program element can vary widely from city to city, often by a very wide margin that is not easily explained.[2] Despite these problems, efforts have been made to identify management program costs, which can be helpful in understanding the costs of program implementation.

The San Diego Water Board recognizes that the Copermittees will incur costs in implementing this Order, potentially above and beyond the costs from the Copermittees' prior permits. The San Diego Water Board also recognizes that, due to California's current economic condition, many Copermittees currently have limited staff and resources to implement actions to address its MS4 discharges. Based on the economic considerations below, the San Diego Water Board has provided the Copermittees a significant amount of flexibility to choose how to implement the requirements of the Order.

The Order also allows the Copermittees to customize their plans, programs, and monitoring requirements. In the end, it is up to the Copermittees to determine the effective BMPs and measures necessary to comply with this Order. The Copermittees can choose to implement the least expensive measures that are effective in meeting the requirements of this Order. This Order also does not require the Copermittees to

[2] LARWQCB, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.

fully implement all requirements within a single permit term. Where appropriate, the Board has provided the Copermittees with additional time outside of the permit term to implement control measures to achieve final WQBELs and/or water quality standards.

The San Diego Water Board has considered available cost information associated with compliance with this Order. It is not possible to predict accurately the cost impact of the requirements that involve an unknown level of implementation or that depend on environmental variables that are as yet undefined. Only general conclusions can be drawn from this information.

Estimated Municipal Storm Water Program Implementation Costs

The USEPA, the State Water Board, and the California Regional Water Quality Control Boards (Regional Water Boards) have attempted to evaluate the costs of implementing municipal storm water programs. The assessments have demonstrated that the true costs are difficult to ascertain and reported costs vary widely. In addition, reported fiscal analyses tend to neglect the costs incurred to municipalities when storm water and non-storm water runoff is not effectively managed, which are incurred as a result of pollution, contamination, nuisance, and damage to ecosystems, property, and human health. Nonetheless, they provide a useful context for considering the costs of requirements within Order No. R9-2013-0001.

In 1999, the USEPA reported on multiple studies it conducted to determine the cost of management programs. A study of Phase II municipalities determined that the annual cost of the Phase II program was expected to be $9.16 per household. The USEPA also studied 35 Phase I municipalities, finding costs to be $9.08 per household annually, similar to those anticipated for Phase II municipalities.[3]

The State Water Board commissioned a study by the California State University, Sacramento to assess costs of the Phase I MS4 program. This study includes an assessment of costs incurred by Phase I MS4s throughout the state to implement their programs. Annual cost per household in the study ranged from $18 to $46, with the Fresno-Clovis Metropolitan Area representing the lower end of the range, and the City of Encinitas (in San Diego County) representing the upper end of the range.[4]

A study on Phase I MS4 program costs was also conducted by the California Regional Water Quality Control Board, Los Angeles Region (Los Angeles Water Board), where program costs reported in the municipalities' annual reports were assessed. The Los Angeles Water Board estimated that average per household cost to implement the MS4 program in Los Angeles County was $12.50. [5]

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[3] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791-68792.
[4] State Water Board, 2005. NPDES Stormwater Cost Survey. P. ii.
[5] Los Angeles Water Board, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.

It is important to note that reported program costs are not all attributable to solely complying with MS4 permits. Many program components, and their associated costs, existed before any MS4 permits were ever issued. For example, street sweeping and trash collection costs cannot be solely or even principally attributable to MS4 permit compliance, since these practices have long been expected from and implemented by municipalities.

Therefore, true program cost resulting from MS4 permit requirements is some fraction of reported costs. The California State University, Sacramento study found that only 38 percent of program costs are new costs fully attributable to MS4 permits. The remainder of the program costs was either pre-existing or resulted from enhancement of pre-existing programs.[6] In 2000, the County of Orange found that even lower amounts of program costs are solely attributable to MS4 permit compliance, reporting that the amount attributable to implement the County or Orange Drainage Area Management Plan (DAMP), was less than 20 percent of the total budget. The remaining 80 percent was attributable to pre-existing programs.[7] More current data from the County of Orange is not used in this discussion because the County of Orange no longer reports such information.

Estimated Value of Healthy Water Quality

Economic considerations of municipal storm water management programs cannot be limited only to program costs. Evaluation of programs must also consider information on the benefits derived from environmental protection and improvement.[8] Attention is often focused on municipal storm water management program costs, but the programs must also be viewed in terms of their value to the public.

Placing a value on healthy receiving waters is very difficult. Often the value of receiving waters with good water quality manifests in other forms, such as tourism, recreational opportunities, and/or increased property values. When surface water bodies are degraded, thereby degrading the habitat within and adjacent to the water bodies, the public loses the value and benefits associated with being able to use the area in and around the water bodies. Surface waters that are able to support the beneficial uses designated in the Basin Plan can sustain plants and wildlife that can attract visitors and residents, providing aesthetic, recreational, as well as monetary value to the public. At this time, however, there have been no studies for the San Diego Region to quantify the added value that surface waters with healthy water quality can provide.

[6] State Water Board, 2005. NPDES Stormwater Cost Survey. P. 58.
[7] County of Orange, 2000. A NPDES Annual Progress Report. P. 60.
[8] Ribaudo M.O. and D. Heelerstein. 1992, *Estimating Water Quality Benefits: Theoretical and Methodological Issues.* U.S. Department of Agriculture. Technical Bulletin No. 1808.

USEPA has estimated that household willingness to pay for improvements in fresh water quality for fishing and boating is approximately $158-$210.[9] This estimate can be considered conservative, since it does not include important considerations such as marine waters benefits, wildlife benefits, or flood control benefits. Another study conducted by California State University, Sacramento reported that the annual household willingness to pay for statewide clean water is approximately $180.[10]

A study conducted by the University of Southern California and University of California, Los Angeles assessed the costs and benefits of implementing various approaches for achieving compliance with the MS4 permits in the Los Angeles region. The study found that non-structural systems would cost $2.8 billion but provide $5.6 billion in benefit. If structural systems were determined to be needed, the study found that total costs would be $5.7 to $7.4 billion, while benefits could reach $18 billion.[11] Costs are anticipated to be borne over many years, probably at least ten years.

As can be seen, the benefits of the municipal storm water management programs are expected to considerably exceed their costs. Such findings are corroborated by USEPA, which found that the benefits of implementation of its Phase II storm water rule would also outweigh the costs.[12]

[9] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68793.
[10] State Water Board, 2005. NPDES Stormwater Cost Survey. P. iv.
[11] Los Angeles Water Board, 2004. Alternative Approaches to Stormwater Control.
[12] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791.

VII. APPLICABLE STATUTES, REGULATIONS, PLANS AND POLICIES

A. Legal Authorities – Federal Clean Water Act and California Water Code

This Order is issued pursuant to section 402 of the CWA and implementing regulations adopted by the USEPA and chapter 5.5, division 7 of the CWC (commencing with section 13370). This Order serves as an NPDES permit for point source discharges to surface waters. This Order also serves as waste discharge requirements pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

The objective of the CWA is "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*." To carry out this objective, the CWA requires the implementation of permit programs to regulate the discharge of pollutants and dredged or fill material to the navigable waters of the U.S. and to regulate the use and disposal of sewage sludge. CWA section 402 provides the legal authority to issue a permit for the discharge of pollutants to waters of the U.S. under the NPDES. The CWA provides that NPDES permits may be issued by states which are authorized to implement the provisions of that act. California became authorized to implement the NPDES permit program on May 14, 1973.

The Porter-Cologne Water Quality Control Act (Division 7, commencing with CWC section 13000) established the State Water Resources Control Board (State Water Board) and nine Regional Water Quality Control Boards (Regional Water Boards) as the principal state agencies with primary responsibility for the coordination and control of water quality. CWC section 13200(f) established the San Diego Water Board, which has the primary responsibility for the coordination and control of water quality in the San Diego Region, which includes all the basins draining into the Pacific Ocean between the southern boundary of the Santa Ana Region and the California-Mexico boundary. The San Diego Water Board implements the CWA through Chapter 5.5 of the CWC, commencing with section 13370. CWC section 13377 provides the San Diego Water Board the legal authority to issue waste discharge requirements to ensure compliance with all applicable provisions of the CWA and acts amendatory thereof or supplementary, thereto, to implement water quality control plans, or for the protection of beneficial uses, or to prevent nuisance.

CWA section 402(p) requires the USEPA or authorized state to issue NPDES permits for storm water discharges from municipal separate storm sewer systems (MS4s) to waters of the U.S. CWA section 402(p)(3)(B)(ii) requires that NPDES permits for storm water discharges from MS4s "*effectively prohibit non-storm water discharges*" into the MS4s. CWA section 402(p)(3)(B)(iii) requires that NPDES permits for storm water discharges from MS4s to "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable* [MEP], *including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control*

of such pollutants."

The USEPA published implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]), which prescribe permit application requirements for storm water discharges from MS4s pursuant to CWA 402(p), on November 16, 1990. The USEPA published an Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems, which provided guidance on permit application requirements for regulated MS4s, on May 17, 1996. The federal regulations in 40 CFR 122 and guidance issued by USEPA serve as the foundation for the provisions of Order No. R9-2013-0001. The legal authorities provided by the above statutes and regulations are included as part of the discussions in Section VIII of this Fact Sheet.

B. Legal Authority for the Permit Issued on a Region-wide Basis

CWA section 402(p)(3)(B) provides the San Diego Water Board the legal authority to issue an NPDES permit for the San Diego Region as compared to separate MS4 permits based upon County- and partial County-wide boundaries as they exist within the San Diego Region. CWA section 402(p)(3)(B) states that "*Permits for discharges from municipal storm sewers- (i) may be issued on a system- or jurisdiction-wide basis ....*" The federal regulations in 40 CFR 122.26(a)(1)(v) also state that the San Diego Water Board "*may designate dischargers from municipal separate storm sewers on a system-wide or jurisdiction-wide basis. In making this determination, the [San Diego Water Board] may consider the following factors: (A) the location of the discharge with respect to waters of the United States; (B) the size of the discharge; (C) the quantity and nature of the pollutants discharged to waters of the United States; and (D) other relevant factors*."

More specifically, the federal regulations provide that for large and medium MS4 systems, the San Diego Water Board may issue a regional permit. Specifically, the federal regulation in 40 CFR 122.26(a)(3) provide:

"*(ii) The Director may either issue one system-wide permit covering all discharges from municipal separate storm sewers within a large or medium municipal storm sewer system or issue distinct permits for appropriate categories of discharges within a large or municipal separate storm sewer system including, but not limited to: all discharges owned or operated by the same municipality; located within the same jurisdiction; all discharges within a system that discharge to the same watershed; discharges within a system that are similar in nature; or for individual discharges from municipal separate storm sewers within the system.*

(iii) The operator of a discharge from a municipal separate storm sewer which is part of a large or medium municipal separate storm sewer system must either: (A) Participate in a permit application (to be a permittee or a co-permittee) with one or more other operator of discharges from the large or medium municipal storm sewer system which covers all, or a portion of all, discharges from the

municipal separate storm sewer system; (B) Submit a distinct permit application which only covers discharges from the municipal separate storm sewers for which the operator is responsible; or (C) A regional authority may be responsible for submitting a permit application under the following guidelines....

(iv) One permit application may be submitted for all or a portion of all municipal separate storm sewers within adjacent or interconnected large or medium municipal separate storm sewer systems. The Director may issue one systemwide permit covering all, or a portion of all municipal separate storm sewers in adjacent or interconnected large or medium municipal separate storm sewer systems.

(v) Permits for all or a portion of all discharges from large or medium municipal separate storm sewer systems that are issued on a system-wide, jurisdiction-wide, watershed or other basis may specify different conditions relating to different discharges covered by the permit, including different management programs for different drainage areas which contribute storm water to the system."

Based on these regulations, the San Diego Water Board may issue a region-wide MS4 permit. The regulations also clarify that the permit may include different conditions for separate discharges covered by the permit. This allows the San Diego Water Board to ensure that suitable water quality conditions and provisions are identified for each watershed.

The USEPA's responses to comments in the Final Rule for the above-mentioned regulations also make it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide, permits. In the Final Rule published in the Federal Register and containing the responses to comments, USEPA notes that 40 CFR 122.26(a)(3)(iv) would allow an entire system in a geographical region under the purview of a State agency to be designated under a permit.[13] USEPA also states that many commenters wanted to allow the permitting authority broad discretion to establish system-wide permits, and that EPA believes that paragraphs 40 CFR 122.26 (a)(1)(v) and (a)(3)(ii) allow for such broad discretion.[14]

This Order creates watershed requirements that apply to multiple counties. The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees. Managing storm water on a regional and watershed basis is expected to result in improved water quality, as the Order focuses on monitoring and management practices necessary to improve each watershed rather than political boundaries. A single permit also allows the San Diego Water Board staff to expend fewer resources developing successive multiple permits and allows more resources to be devoted to working cooperatively with all three current groups of Copermittees to ensure implementation of this Order results in improved water quality.

[13] 55 Federal Register 47990-01, 48042
[14] Ibid

C. Federal and California Endangered Species Acts

This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2115.5) or the Federal Endangered Species Act (16 United States Code [USC] sections 1531 to 1544). This Order requires compliance with requirements to protect the beneficial uses of waters of the U.S. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

D. California Environmental Quality Act

The action to adopt an NPDES Permit is exempt from the provisions of Chapter 3 of the California Environmental Quality Act (CEQA) (Public Resources Code section 21100, et seq.) pursuant to CWC section 13389. (*County of Los Angeles v. Cal. Water Boards* (2006) 143 Cal.App.4th 985.)

E. State and Federal Regulations, Plans and Policies

The legal authority provided by the following regulations, plans, and policies are also included as part of the discussions in Section VIII of this Fact Sheet.

Water Quality Control Plan for the San Diego Basin

The CWA requires the San Diego Water Board to establish water quality standards for each water body in its region. Water quality standards include beneficial uses, water quality objectives and criteria that are established at levels sufficient to protect beneficial uses, and an antidegradation policy to prevent degrading of waters. On September 8, 1994, the San Diego Water Board adopted the *Water Quality Control Plan for the San Diego Basin (*Basin Plan). The Basin Plan designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters in the San Diego Region. The San Diego Water Board has amended the Basin Plan on multiple occasions since 1994. In addition, the Basin Plan implements State Water Board Resolution No. 88-63, which established state policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply. Beneficial uses applicable to the surface water bodies that receive discharges from the MS4s within the San Diego Region generally include those listed below:

The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region:

- Municipal and Domestic Supply (MUN)
- Agricultural Supply (AGR)
- Industrial Process Supply (PROC)
- Industrial Service Supply (IND)
- Ground Water Recharge (GWR)
- Contact Water Recreation (REC1)
- Non-contact Water Recreation (REC2)
- Warm Freshwater Habitat (WARM)
- Cold Freshwater Habitat (COLD)
- Wildlife Habitat (WILD)
- Rare, Threatened, or Endangered Species (RARE)
- Freshwater Replenishment (FRSH)
- Hydropower Generation (POW)
- Preservation of Biological Habitats of Special Significance (BIOL)

The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region:

- Navigation (NAV)
- Commercial and Sport Fishing (COMM)
- Estuarine Habitat (EST)
- Marine Habitat (MAR)
- Aquaculture (AQUA)
- Migration of Aquatic Organisms (MIGR)
- Spawning, Reproduction, and/or Early Development (SPWN)
- Shellfish Harvesting (SHELL)

Pursuant to Water Code sections 13263 and 13377, the requirements of this Order implement the Basin Plan.

Water Quality Control Plan for Ocean Waters of California, California Ocean Plan

In 1972, the State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan). The State Water Board adopted the most recent amended Ocean Plan on September 15, 2009. The Office of Administrative Law approved it on March 10, 2010. On October 8, 2010, USEPA approved the 2009 Ocean Plan. The Ocean Plan is applicable, in its entirety, to ocean waters of the State. In order to protect beneficial uses, the Ocean Plan establishes water quality objectives and a program of implementation. Pursuant to Water Code sections 13263 and 13377, the requirements of this Order implement the Ocean Plan. The Ocean Plan identifies the beneficial uses of ocean waters of the State to be protected as summarized below:

- Industrial water supply
- Water contact and non-contact recreation, including aesthetic enjoyment;

navigation
- Commercial and sport fishing
- Mariculture
- Preservation and enhancement of designated Areas of Special Biological Significance
- Rare and endangered species
- Marine habitat
- Fish spawning and shellfish harvesting

On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving an exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges. The State Water Board Resolution No. 2012-0012 requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject terms and conditions of State Water Board Resolution No. 2012-0012. The Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 applicable to these discharges are hereby incorporated in this Order as if fully set forth herein. Requirements of this Order implement the Ocean Plan.

Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality

On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

Antidegradation Policy

Federal regulations (40 CFR 131.12) require that the state water quality standards include an antidegradation policy consistent with the federal antidegradation policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16 ("Statement of Policy with Respect to Maintaining the Quality of the Waters of the State"). State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law.

The San Diego Water Board's Basin Plan implements and incorporates by reference

both the State and federal antidegradation policies. State Water Board Resolution No. 68-16 and 40 CFR 131.12 require the San Diego Water Board to maintain high quality waters of the State until it is demonstrated that any change in quality will be consistent with maximum benefit to the people of the State, will not unreasonably affect beneficial uses, and will not result in water quality less than that described in the San Diego Water Boards' policies. State Water Board Resolution No. 68-16 requires that discharges of waste be regulated to meet best practicable treatment or control to assure that pollution or nuisance will not occur and the highest water quality consistent with the maximum benefit to the people of the State be maintained.

The discharges permitted in this Order are consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Board Resolution No. 68-16. Many of the water bodies within the area covered by this Order are of high quality. The Order requires the Copermittees to meet best practicable treatment or control to meet water quality standards. As required by 40 CFR 122.44(a), the Copermittees must comply with the "maximum extent practicable" technology-based standard set forth in CWA section 402(p) for discharges of pollutants in storm water from the MS4s.

Many of the waters within the area covered by this Order are impaired and listed on the State's CWA Section 303(d) List and the San Diego Water Board has established TMDLs to address the impairments. This Order requires the Copermittees to comply with permit provisions to implement the WLAs set forth in the TMDLs in order to restore the beneficial uses of the impaired water bodies consistent with the assumptions and requirements of the TMDLs. This Order includes requirements to develop and implement storm water management programs, achieve WQBELs, and effectively prohibit non-storm water discharges into the MS4. The issuance of this Order does not authorize an increase in the amount of discharge of waste.

Anti-Backsliding Requirements

CWA sections 402(o) and 303(d)(4) and 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations or conditions may be relaxed. All effluent limitations and other conditions in this Order are at least as stringent as the effluent limitations in the previous permits issued to the San Diego County Copermittees, the Orange County Copermittees and the Riverside County Copermittees.

Clean Water Act Section 303(d) List

CWA section 303(d)(1) requires each State to identify specific water bodies within its boundaries where water quality standards are not being met or are not expected to be met after implementation of technology-based effluent limitations on point sources. Water bodies that do not meet water quality standards are considered impaired and are placed on the state's "303(d) List." Periodically, USEPA approves the State's 303(d) List.

Most recently, USEPA approved the State's 2010 303(d) List of impaired water bodies on October 11, 2011, which includes certain receiving waters in the San Diego Region. For each listed water body, the state or USEPA is required to establish a TMDL of each pollutant impairing the water quality standards in that water body. A TMDL is a tool for implementing water quality standards and is based on the relationship between pollution sources and in-stream water quality conditions. The TMDL establishes the allowable pollutant loadings for a water body and thereby provides the basis to establish water quality-based controls. These controls should provide the pollution reduction necessary for a water body to meet water quality standards.

A TMDL is the sum of the allowable pollutant loads of a single pollutant from all contributing point sources (the waste load allocations or WLAs) and non-point sources (load allocations of LAs) plus the contribution from background sources and a margin of safety (40 CFR 130.2(i)). MS4 discharges are considered point source discharges. For 303(d)-listed water bodies and pollutants in the San Diego Region, the San Diego Water Board or USEPA develops and adopts TMDLs that specify these requirements.

Since 2002, the San Diego Water Board has established six (6) TMDLs to remedy water quality impairments in various water bodies within the San Diego Region (see Attachment E to the Order). These TMDLs identify MS4 discharges as a source of pollutants to these water bodies, and, as required, establish WLAs for MS4 discharges to reduce the amount of pollutant discharged to receiving waters. CWA section 402(p)(3)(B)(iii) requires the San Diego Water Board to impose permit conditions, including: "management practices, control techniques and system, design and engineering methods, and *such other provisions as the Administrator or the State determines appropriate for the control of such pollutants."* (Emphasis added.) CWA section 402(a)(1) also requires states to issue permits with conditions necessary to carry out the provisions of the CWA. Federal regulations also require that NDPES permits contain WQBELs consistent with the assumptions and requirements of all available WLAs (40 CFR 122.44(d)(1)(vii)(B)). CWC section 13377 also requires that NPDES permits include limitations necessary to implement water quality control plans. Therefore, this Order includes WQBELs and other provisions to implement the TMDL WLAs assigned to Copermittees regulated by this Order.

Other Regulations, Plans and Policies

This Order implements all other applicable federal regulations and State regulations, plans and policies, including the California Toxics Rule at 40 CFR 131.38 (Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California Rule [California Toxics Rule or CTR]), and State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP).

F. Unfunded State Mandates

Article XIII B, Section 6(a) of the California Constitution provides that whenever "*any state agency mandates a new program or higher level of service on any local government, the state shall provide a subvention of funds to reimburse that local government for the costs of the program or increased level of service*." The requirements of this Order do not constitute state mandates that are subject to a subvention of funds for several reasons, including, but not limited to, the following.

First, the requirements of this Order do not constitute a new program or a higher level of service as compared to the requirements contained in the previous Fourth Term Permits. The overarching requirement to impose controls to reduce the pollutants in discharges from MS4s is dictated by the CWA and is not new to this permit cycle (33 USC section 1342(p)(3)(B)). The inclusion of new and advanced measures as the MS4 programs evolve and mature over time is anticipated under the CWA (55 FR 47990, 48052 (Nov. 16, 1990)), and to the extent requirements in this Order are interpreted as new advanced measures, they do not constitute a new program or higher level of service.

Second, and more broadly, mandates imposed by federal law, rather than by a state agency, are exempt from the requirement that the local agency's expenditures be reimbursed (Cal. Const., art. XIII B, section 9, subd. (b)). This Order implements federally mandated requirements under the CWA and its requirements are therefore not subject to subvention of funds. This includes federal requirements to effectively prohibit non-storm water discharges, to reduce the discharge of pollutants in storm water to the MEP, and to include such other provisions as the Administrator or the State determines appropriate for the control of such pollutants (33 USC section 1342(p)(3)(B)). Federal cases have held these provisions require the development of permits and permit provisions on a case-by-case basis to satisfy federal requirements. (*Natural Resources Defense Council, Inc., v. USEPA* (9th Cir. 1992) 966 F.2d 1292, 1308, fn. 17.)

The authority exercised under this Order is not reserved state authority under the CWA's savings clause (cf. *Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 627-628 [relying on 33 USC section 1370, which allows a state to develop requirements which are not "less stringent" than federal requirements]), but instead is part of a federal mandate to develop pollutant reduction requirements for municipal separate storm sewer systems. To this extent, it is entirely federal authority that forms the legal basis to establish the permit provisions. (See, *City of Rancho Cucamonga v. Regional Water Quality Control Board, Santa Ana Region* (2006) 135 Cal.App.4th 1377, 1389; *Building Industry Ass'n of San Diego Co. v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 882-883.)

The MEP standard is a flexible standard that balances a number of considerations, including technical feasibility, cost, public acceptance, regulatory compliance, and effectiveness. (*Building Ind. Ass'n., supra,* 124 Cal.App.4th at pp. 873-874, 889.) Such considerations change over time with advances in technology and with experience

gained in storm water management (55 FR 47990, 48052 (Nov. 16, 1990)). Accordingly, a determination of whether the conditions contained in this Order exceed the requirements of federal law cannot be based on a point by point comparison of the permit conditions and the minimum control measures that are required "at a minimum" to reduce pollutants to the maximum extent practicable and to protect water quality (40 CFR 122.34). Rather, the appropriate focus is whether the permit conditions, as a whole, exceed the MEP standard.

In recent months, the County of Los Angeles and County of Sacramento Superior Courts have granted writs setting aside decisions of the Commission on State Mandates that held certain requirements in Phase I permits constituted unfunded mandates. In both cases, the courts have found that the correct analysis in determining whether an MS4 permit constituted a state mandate was to evaluate whether the permit as a whole exceeds the MEP standard. (*State of Cal. v. Comm. on State Mandates* (Super. Ct. Sacramento County, 2012, No. 34-2010-80000604), *State of California v. County of Los Angeles* (Super. Ct. Los Angeles County, 2011, No. BS130730.) Both cases are currently pending appeal.

The requirements of the Order, taken as a whole rather than individually, are necessary to reduce the discharge of pollutants to the MEP and to protect water quality. The San Diego Water Board finds that the requirements of the Order are practicable, do not exceed federal law, and thus do not constitute an unfunded mandate. These findings are the expert conclusions of the principal state agency charged with implementing the NPDES program in California (CWC sections 13001, 13370).

It should also be noted that the provisions in this Order to effectively prohibit non-storm water discharges are also mandated by the CWA (33 USC section 1342(p)(3)(B)(ii)). Likewise, the provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state establishes or adopts a TMDL, federal law requires that permits must contain effluent limitations consistent with the assumptions and requirements of any applicable waste load allocation in a TMDL (40 CFR 122.44(d)(1)(vii)(B)).

Third, the local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental dischargers who are issued NPDES permits for storm water discharges. With a few inapplicable exceptions, the CWA regulates the discharge of pollutants from point sources (33 USC section 1342) and the Porter-Cologne Act regulates the discharge of waste (CWC section 13263), both without regard to the source of the pollutant or waste. As a result, the "costs incurred by local agencies" to protect water quality reflect an overarching regulatory scheme that places similar requirements on governmental and non-governmental dischargers. (See *County of Los Angeles v. State of California* (1987) 43 Cal.3d 46, 57-58 [finding comprehensive workers' compensation scheme did not create a cost for local agencies that was subject to state subvention].)

The CWA and the Porter-Cologne Act largely regulate storm water with an even hand, but to the extent there is any relaxation of this even-handed regulation, it is in favor of the local agencies. Generally, the CWA requires point source dischargers, including dischargers of storm water associated with industrial or construction activity, to comply strictly with water quality standards (33 USC section 1311(b)(1)(C); *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159, 1164-1165 [noting that industrial discharges must strictly comply with water quality standards]). As discussed in prior State Water Board decisions, certain provisions of this Order do not require strict compliance with water quality standards (State Water Board Order No. WQ 2001-0015, p. 7). Those provisions of this Order regulate the discharge of waste in municipal storm water under the CWA's MEP standard, not the BAT/BCT standard that applies to other types of discharges. These provisions, therefore, regulate the discharge of waste in municipal storm water more leniently than the discharge of waste from non-governmental sources.

Fourth, the Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)). To the extent that the local agency Copermittees have voluntarily availed themselves of the permit, the program is not a state mandate. (Accord, *County of San Diego v. State of California* (1997) 15 Cal.4th 68, 107-108.)

Fifth, the local agency Copermittees' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under state law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

Finally, even if any of the permit provisions could be considered unfunded mandates, under Government Code section 17556, subdivision (d), a state mandate is not subject to reimbursement if the local agency has the authority to charge a fee. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order, subject to certain voting requirements contained in the California Constitution. (See Cal. Const., Art. XIII D, section 6, subd. (c); see also *Howard Jarvis Taxpayers Ass'n v. City of Salinas* (2002) 98 Cal.App.4th 1351, 1358-1359.) The Fact Sheet demonstrates that numerous activities contribute to the pollutant loading in the MS4. Local agencies can levy service charges, fees, or assessments on these activities, independent of real property ownership. (See, e.g., *Apartment Ass'n of Los Angeles County, Inc., v. City of Los Angeles* (2001(24 Cal.4th 830, 842 [upholding inspection fees associated with renting property].) The authority and ability of a local agency to defray the cost of a program without raising taxes indicates that a program does not entail a cost subject to subvention. (*Clovis Unified School Dist. V. Chiang* (2010) 188 Cal.App.4th 794, 812, citing *Connell v. Sup. Ct.* (1997) 59 Cal.App.4th 382, 401; *County of Fresno v. State of California* (1991) 53 Cal. 3d. 482, 487-488.)

VIII. PROVISIONS

The provisions (i.e. NPDES permit requirements) of the Order are discussed below.

A. Prohibitions and Limitations

Purpose: Provision A includes the prohibitions and limitations requirements that are the foundation of all the subsequent requirements included in the Order. Compliance with the prohibitions and limitations will restore and protect receiving waters from impacts that may be caused by discharges into and from the Copermittees' MS4s and ultimately achieve the objective of the CWA.

In meeting the requirements set forth in the Order, the Copermittees must be cognizant that the prohibitions and limitations exist and will be the standard by which the San Diego Water Board will be measuring the progress and success of their implementation of the NPDES permit requirements.

***Discussion*:** The objective of the CWA is to "*restore and maintain the chemical, physical, and biological integrity of the Nation's waters*." The CWA requires the implementation of NPDES permit programs to regulate discharges of pollutants and dredged or fill material to the navigable waters of the U.S. For discharges into and from MS4s, the CWA requires the NPDES permits to "*effectively prohibit non-stormwater discharges into the storm sewers*" and "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable.*"

Provision A includes limitations, consistent with the requirements of the CWA for discharges from MS4s. Provision A expresses these limitations as discharge prohibitions, receiving water limitations, and effluent limitations. Compliance with the discharge prohibitions and receiving water limitations is also explicitly described, in conformance with precedential State Water Board Orders.

More specific and detailed discussions of the requirements of Provision A are provided below.

Provision A.1 (Discharge Prohibitions) prohibits the discharge of specific types of waste into and/or from the Copermittees' MS4s.

Provision A.1.a restates and reiterates Basin Plan Waste Discharge Prohibition 1, by prohibiting discharges into and from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the

state. The terms pollution,[15] contamination,[16] and nuisance[17] are defined under CWC 13050. Provision A.1.c incorporates all the waste discharge prohibitions of the Basin Plan into the requirements of the Order. The waste discharge prohibitions from the Basin Plan have been reproduced and provided in Attachment A to the Order.

Provision A.1.b requires non-storm water discharges into the MS4s to be effectively prohibited, consistent with the requirements of the CWA for MS4 permits to "*effectively prohibit non-stormwater discharges into the storm sewers*." The effective prohibition is required to be implemented by each Copermittee within its jurisdiction through the illicit discharge detection and elimination requirements under Provision E.2. The prohibition does not apply to NPDES permitted discharges into the Copermittees' MS4s.

The CWA employs the strategy of prohibiting the discharge of any pollutant from a point source into waters of the United States unless the discharger of the pollutant(s) obtains an NPDES permit pursuant to CWA Section 402. The 1987 amendment to the CWA includes provision 402(p) that specifically addresses NPDES permitting requirements for storm water discharges from MS4s. CWA section 402(p) prohibits the discharge of pollutants from specified MS4s to waters of the U.S. except as authorized by an NPDES permit and identifies two substantive standards for MS4 storm water permits. MS4 permits (1) "*shall include a requirement to effectively prohibit nonstormwater discharges into the storm sewers*" and (2) "*shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or State determines appropriate for the control of such pollutants*." (CWA section 402(p)(3)(B)(ii-iii).)

In November 1990, the USEPA published regulations addressing storm water discharges from MS4s (55 FR 47990 and following (Nov. 16, 1990) (Phase I Final Rule)). The regulations establish minimum requirements for MS4 permits, and generally focus on the requirement that MS4s implement programs to reduce the amount of pollutants found in storm water discharges to the MEP. The CWA's municipal storm water MEP standard does not require storm water discharges to strictly meet water quality standards, as is required for other NPDES permitted discharges. Compliance is achieved through an iterative approach of continuous

[15] CWC 13050(l): "(1) 'Pollution' means an alteration of the quality of waters of the state by waste to a degree which unreasonably affects either of the following: (A) The water for beneficial uses. (B) Facilities which serve beneficial uses. (2) 'Pollution' may include "contamination.

[16] CWC 13050(k): "Contamination' means an impairment of the quality of waters of the state by waste to a degree which creates a hazard to public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste, whether or not waters of the state are affected."

[17] CWC 13050(m): "Nuisance' means anything which meets all of the following requirements: (1) Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. (2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. (3) Occurs during, or as a result of, the treatment or disposal of wastes."

implementation of improved BMPs. This distinction reflects Congress's recognition that variability in flow and intensity of storm events render difficult strict compliance with water quality standards by MS4 permittees. In describing the controls that permits must include to reduce pollutants in storm water discharges to the MEP, the statute (CWA section 402(p)(3)(B)(iii)) states that the controls shall include: "*management practices, control techniques and system, design and engineering methods, and such other provisions as the [permit writer] determines appropriate for the control of such pollutants*."

In contrast, non-storm water discharges from the MS4 that are not authorized by separate NPDES permits are subject to requirements under the NPDES program, including discharge prohibitions, technology based effluent limitations and water quality-based effluent limitations (40 CFR 122.44). The regulations also require the Copermittee's program to include an element to detect and remove illicit discharges and improper disposal into the storm sewer (40 CFR 122.26(d)(2)(iv)(B)).

While "non-storm water" is not defined in the CWA or federal regulations, the federal regulations (at 40 CFR 122.26(b)(2)) define "*illicit discharge*" as *"any discharge to a municipal separate storm sewer that is not composed entirely of storm water and that is not covered by an NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer and discharges resulting from fire fighting activities)*." This definition is the most closely applicable definition of "non-storm water" contained in federal law. As stated in the Phase I Final Rule, USEPA added the illicit discharge program requirement to begin implementation of the 'effective prohibition' requirement to detect and control non-storm water discharges to their municipal system.

Thus, federal law mandates that permits issued to MS4s must require management practices that will result in reducing storm water pollutants to the MEP yet at the same time requires that non-storm water discharges be effectively prohibited from entering the MS4. "Effectively" prohibit does not mean that non-storm water discharges are authorized to be discharged into and from the Copermittees' MS4s. The Phase I Final Rule clarifies what "effectively prohibit" means (55 FR 47995):

> "*Section 402(p)(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…<u>Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit</u> (other than the permit for the discharge from the municipal separate storm sewer)*" [Emphasis added].

Consistent with federal law, unless non-storm water discharges to the MS4 are authorized by a separate NPDES permit, non-storm water discharges are appropriately subject to the effective prohibition requirement in the CWA and Regional

Water Boards are not limited by the iterative MEP approach to storm water regulation in crafting appropriate regulations for non-storm water discharges.

The federal regulations (40CFR122.26(d)(2)(i)(B)) require the Copermittees to establish the legal authority which authorizes or enables the Copermittees to prohibit illicit discharges to the MS4s. The federal regulations (40 CFR 122.26(d)(2)(vi)(B)(1)) require the Copermittees to "*implement and enforce an ordinance, order or similar means*" to prevent non-storm water discharges to their MS4s. Thus, the Copermittees are required to "*effectively*" prohibit non-storm water discharges to their MS4s through enforcing their legal authority established under "*ordinance, order or similar means*" and either remove those discharges to their MS4s, or require those discharges to obtain coverage under a separate NPDES permit. More detail about the program that must be implemented to "*effectively*" prohibit non-storm water discharges to the Copermittees' MS4s is provided under the discussion for Provision E.2.

Provision A.1.d was included to be consistent Resolution No. 2012-0012, adopted by the State Water Board on March 20, 2012. Provision A.1.d prohibits discharges from MS4s to Areas of Special Biological Significance (ASBS), except for storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach to the Heisler Park ASBS subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012. The pertinent Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 are provided in Attachment A to the Order.

Provision A.2 (Receiving Water Limitations) specifies the condition of the receiving waters that must be achieved when there are discharges from the Copermittees' MS4s. Receiving water limitations are included in all NPDES permits issued pursuant to the CWA section 402. CWA section 402(p)(3)(B)(iii) authorizes the inclusion of "*such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." This requirement gives USEPA or the State permitting authority, in this case the San Diego Water Board, discretion to determine what permit conditions are necessary to control pollutants.

In its Phase I Final Rule (see 55 FR 47990, 47994 (Nov. 16, 1990)), USEPA elaborated on these requirements, stating that, "*permits for discharges from municipal separate storm sewer systems must require controls to reduce the discharge of pollutants to the maximum extent practicable, and where necessary water quality-based controls*." USEPA reiterated in its Phase II Final Rule (64 FR 68722, 68737), that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL*." CWC section 13377 also requires that NPDES permits include limitations necessary to implement water quality control plans. Both the State Water Board and the San Diego Water Board have previously concluded that discharges from the MS4 contain pollutants that have the reasonable potential to cause or contribute to excursions above water quality

standards. As such, inclusion of receiving water limitations is appropriate to control MS4 discharges.

The inclusion of receiving water limitations is also consistent with the Ninth Circuit Court of Appeals' ruling in *Defenders of Wildlife v. Browner* (191 F.3d 1159, 1166 (1999)) that the permitting authority has discretion regarding the nature and timing of requirements that it includes as MS4 permit conditions to attain water quality standards. The Ninth Circuit Court of Appeals recently explained that, "*[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*" (*Natural Resources Defense Council v. County of Los Angeles* (9th Cir. 2011) 673 F.3d 880, 886 (revd. On other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013)))

The receiving water limitations included in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan or in water quality control plans or policies adopted by the State Water Board, including State Water Board Resolution No. 68-16, or in federal regulations, including but not limited to 40 CFR 131.12 and 131.38. The water quality objectives in the Basin Plan and other State Water Board plans and policies have been approved by USEPA and combined with designated beneficial uses constitute the water quality standards required under federal law.

Provision A.2.a requires that discharges from the Copermittees' MS4s must not cause or contribute to the violation of water quality standards in receiving waters. The water quality standards of the receiving waters must be protected from the impacts that may be caused by the Copermittees' MS4 discharges. Water quality standards applicable to the surface waters in the San Diego Region must be achieved through meeting the technology based standard of MEP through an iterative process of improved management actions. Provision A.2.a is also consistent with State Water Board Order WQ 99-05 precedent-setting language requiring discharges from MS4s to attain receiving water quality standards. The water quality control plans and policies with water quality standards applicable to the waters in the San Diego Region are included under Provision A.2.a.

Provisions A.2.b was included to be consistent with the requirements of State Water Board Resolution No. 2012-0012, adopted on March 20, 2012.

<u>Provision A.3 (Effluent Limitations)</u> specifies the condition of the discharges from the Copermittees' MS4s that must be achieved if and when there are discharges.

Consistent with CWA section 301(b)(1)(A) and 40 CFR 122.44(a), Provision A.3.a includes the technology-based effluent limitations that must be included in the Order.

The technology-based effluent limits, representing the minimum level of control that must be imposed in a permit under CWA section 402, requires that pollutants in discharges of storm water from the Copermittees' MS4s be reduced to the MEP. This provision applies specifically to storm water discharges. Non-storm water discharges must be effectively prohibited, as required under Provision A.1.b. Non-storm water (dry weather) discharges from the MS4 are not considered storm water (wet weather) discharges and therefore are not subject to the MEP standard.

The technology-based MEP standard is an ever-evolving, flexible, and advancing concept. Neither Congress nor USEPA has specifically defined the term "maximum extent practicable." Congress established this flexible MEP standard so that the administrative bodies would have "*the tools to meet the fundamental goals of the Clean Water Act in the context of storm water pollution*." (*Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 884.) As knowledge about controlling storm water runoff and discharges continues to evolve, so does the knowledge which constitutes MEP. Reducing the discharge of pollutants in storm water from the MS4 to the MEP requires the Copermittees to assess each program component and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP.

The San Diego Water Board or the State Water Board ultimately define MEP, and may include requirements that provide specific guidance on what is expected to demonstrate MEP. It is the responsibility of the Copermittees to propose actions that implement BMPs to reduce storm water pollution to the MEP. In other words, the Copermittees' runoff management programs developed and implemented under the Order are the Copermittees' proposals for achieving MEP. Their total collective and individual activities conducted pursuant to their runoff management programs become their proposal for achieving MEP as it applies both to their overall effort, as well as to specific activities. Provisions B through E of the Order provides a minimum framework to guide the Copermittees in achieving the MEP standard for discharges of pollutants in storm water.

Provision A.3.b incorporates any water quality based effluent limitations (WQBELs) applicable to the MS4s established for TMDLs adopted and approved for the San Diego Region and requires the Copermittees to comply with those WQBELs. This is consistent with 40 CFR 122.44(d)(1)(vii)(B), which requires that NPDES permits to incorporate WQBELs "*developed to protect a narrative water quality criterion, a numeric water quality criterion, or both…consistent with the assumptions and requirements of any available wasteload allocation for the discharge...*"

Pursuant to CWA section 303(d), for surface water bodies identified as impaired by one or more pollutants, the San Diego Water Board is required to establish TMDLs "*at a level necessary to implement the applicable water quality standards with seasonal variations and a margin of safety which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality*." The

TMDLs identify sources of the pollutants causing the impairments and assign portions of the TMDL as WLAs to point sources, which include MS4s.

WLAs must be expressed in NPDES permits as WQBELs, which may include one or more numeric components such as numeric effluent limits, and/or receiving water limitations, and/or BMP requirements. Because numeric targets for TMDLs typically include a component that will be protective of water quality standards, a TMDL will likely include one or more numeric receiving water limitations and/or effluent limitations as part of the assumptions or requirements of the TMDL. Any numeric receiving water limitations and/or effluent limitations developed as part of the assumptions or requirements of a TMDL must be incorporated and included as part of WQBELs for the MS4s.

Because the development and approval of new TMDLs, or modification of existing TMDLs, may occur during the term of this Order, the specific provisions of those TMDLs, including effluent limitations applicable to MS4s are provided within Attachment E to the Order. Attachment E will be updated with new TMDLs and modifications to existing TMDLs in a timely manner as they occur.

Provision A.4 (Compliance with Discharge Prohibitions and Receiving Water Limitations) describes the process required to be implemented by the Copermittees if compliance with the discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a are not being achieved under current conditions.

In its Phase II Stormwater Regulations, Final Rule, USEPA states that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL.*"[18] In a series of comment letters on MS4 permits issued by various Regional Water Boards, USEPA has also reiterated that MS4 discharges must meet water quality standards.[19] In addition, the Ninth Circuit Court of Appeals explained in a recent ruling that, *"[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*"[20]

[18] Phase II Stormwater Regulations, Final Rule, 64 Fed. Reg. 68722, 68737.
[19] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.
[20] NRDC v. County of Los Angeles (9th Cir. 2011), 673 F.3d 880, 886 (revd. on other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013))). See also, *Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 884-886, citing *Defenders of Wildlife v. Browning,* (9th Cir. 1999) 191 F.3d 1159.)

Water quality standards for the San Diego Region are established in the Basin Plan. The water quality standards of the Basin Plan are incorporated into this Order as the discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a. The discharge prohibitions and receiving water limitations in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations or prohibitions to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan, water quality control plans or policies adopted by the State Water Board, including Resolution No. 68-16, or federal regulations, including but not limited to, 40 CFR 131.12 and 131.38. The waste discharge prohibitions and water quality objectives in the Basin Plan have been approved by USEPA and combined with the designated beneficial uses constitute the water quality standards required under federal law.

Under federal law (CWA section 402(p)(3)(B)(iii)), an MS4 permit must include "*controls to reduce the discharge of pollutants to the maximum extent practicable...and such other provision as...the State determines appropriate for control of such pollutants*." The State Water Board has previously determined that limitations necessary to meet water quality standards are appropriate for the control of pollutants discharged by MS4s and must be included in MS4 permits. (State Water Board Orders WQ 91-03, 98-01, 99-05, 2001-15; see also *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159.) This Order prohibits discharges that cause or contribute to violations of water quality standards.

The discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a are included in this Order to ensure that discharges from the MS4s do not cause or contribute to exceedances of water quality objectives necessary to protect the beneficial uses of the receiving waters.

Provision A.4 is consistent with the precedent-setting language in State Water Board Order WQ 99-05 required to be included in municipal storm water permits. State Water Board Order WQ 2001-15 refined Order WQ 99-05 by requiring an iterative approach to compliance with water quality standards involving ongoing assessments and revisions, as referred to as the "iterative process." The "iterative process" is a fundamental NPDES requirement for municipal storm water permits to achieve the objectives of the CWA.

The State Water Board and Regional Water Boards have stated that the provisions under Provisions A.1.a, A.1.c, A.2.a, and A.4 are independently applicable, meaning that compliance with one provision does not provide a "safe harbor" where there is non-compliance with another provision (i.e., compliance with the Provision A.4 does not shield a Copermittee who may have violated Provision A.1.a, A.1.c, or A.2.a from an enforcement action). The intent of Provision A.4 is to ensure that the Copermittees have the necessary storm water management programs and controls in place, and that they are modified by the Copermittees in a timely fashion when necessary, so that compliance with Provisions A.1.a, A.1.c, and/or A.2.a is achieved as soon as possible. USEPA expressed the importance of this independent applicability in a series of

comment letters on MS4 permits proposed by various Regional Water Boards. At that time, USEPA expressly objected to certain MS4 permits that included language stating, *"permittees will not be in violation of this [receiving water limitation] provision … [if certain steps are taken to evaluate and improve the effectiveness of the jurisdictional runoff management programs],"* concluding that this phrase would not comply with the CWA.[21]

The Ninth Circuit held in *Natural Resources Defense Council v. County of Los Angeles* (2011) 673 F3d. 880, 886 (revd. on other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013))) that engagement in the iterative process does not provide a safe harbor from liability for violations of permit terms prohibiting exceedances of water quality standards. The Ninth Circuit holding is consistent with the position of the State and Regional Water Boards that exceedances of water quality standards in an MS4 permit constitute violations of permit terms subject to enforcement by the Water Boards or through a citizen suit. While the Water Boards have generally directed dischargers to achieve compliance by improving control measures through the iterative process, the San Diego Water Board retains the discretion to take other appropriate enforcement and the iterative process does not shield dischargers from citizen suits under the CWA.

The requirements of Provision A.4, therefore, are required to be implemented until the water quality standards expressed under Provisions A.1.a, A.1.c, and A.2.a are achieved. The CWA requires MS4 permits to "*require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." The requirements of this Order have been deemed or determined to be "appropriate" to achieve water quality standards in receiving waters.

Part of the "*controls*" required by the Order is the process described in Provision A.4. Provision A.4 includes the process that is ultimately expected to achieve compliance with the requirement that discharges from the MS4 do not cause or contribute to violations of water quality standards in the receiving waters. The implementation of Provision A.4 is required when the Copermittees or the San Diego Water Board have determined that discharges from the MS4 are causing or contributing to violations of water quality standards in the receiving waters.

The Copermittees must effectively prohibit non-storm water discharges into the MS4s, reduce the discharge of pollutants in storm water from the MS4s to the MEP, and ensure that their MS4 discharges do not cause or contribute to violations of water quality standards. If the Copermittees have effectively prohibited non-storm water

[21] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.

discharges and reduced storm water pollutant discharges to the MEP, but their discharges are still causing or contributing to violations of water quality standards, Provision A.4 provides a clear "iterative process" for the Copermittees to follow.

Provision A.4 essentially requires the Copermittees to implement additional BMPs until MS4 discharges no longer cause or contribute to a violation of water quality standards.

In assessing compliance and potential enforcement actions, the San Diego Water Board looks at the Copermittees' efforts in total to meet the requirements of Provisions A.1.a, A.1.c, A.2.a and Provision A.4. The Copermittees need to demonstrate that they are making improvements to their programs and making progress toward achieving the discharge prohibitions and receiving water limitations in Provisions A.1.a, A.1.c, and A.2.a by implementing the requirements of Provision A.4. The San Diego Water Board would consider these efforts prior to strictly enforcing the requirements of Provisions A.1.a, A.1.c, and A.2.a. Causes of exceedances of the receiving water limitations can often be more difficult to identify and attribute solely to the Copermittees' MS4s. The intent of the Order is to provide the Copermittees more clarity and flexibility in addressing these exceedances through the iterative approach and adaptive management process until the requirements under Provisions A.1.a, A.1.c, and A.2.a are fully achieved.

An exception to the iterative approach and adaptive management process would be in receiving waters subject to adopted and approved TMDLs. For TMDLs that are incorporated into the Order, there is a specific date for compliance to be achieved, after which the iterative approach and adaptive management process required under Provision A.4 no longer provides the flexibility to achieve compliance. Where compliance dates for a TMDL have passed, compliance with the WQBELs incorporated into the Order established by a TMDL in Attachment E to protect water quality standards is required. Thus, after the interim or final compliance dates for a TMDL have passed, if the discharges from the Copermittees' MS4s are causing or contributing to a violation of WQBELs, exceedances of WQBELs must be strictly enforced by the San Diego Water Board. In the meantime, however, the Copermittees are in compliance with the interim or final TMDL requirements in Attachment E as long as the interim or final WQBELs are being achieved in accordance with the interim or final compliance dates.

The San Diego Water Board recognizes that there is an apparent disparity between the Copermittees being able to demonstrate and be in compliance with the TMDLs in Attachment E and the discharge prohibitions and receiving water limitations in Provisions A.1.a, A.1.c, and A.2.a. Thus, similar to the TMDL requirements in Attachment E, the Order establishes a process under Provision B.3.c that the Copermittees may choose to utilize to demonstrate and be in compliance with the discharge prohibitions and receiving water limitations in Provisions A.1.a, A.1.c, and A.2.a. This process is described in more detail under the discussion for Provision B.3.

B. Water Quality Improvement Plans

Purpose: Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges to the MS4s and control pollutants in storm water discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the Clean Water Act.

Provision B includes requirements for the Copermittees to develop and implement Water Quality Improvement Plans to ultimately comply with the prohibitions and limitations under Provision A. The Water Quality Improvement Plans will provide the Copermittees a comprehensive program that can achieve the requirements and further the objectives of the CWA. Implementation of the Water Quality Improvement Plans will also improve the quality of the receiving waters in the San Diego Region.

The Water Quality Improvement Plan is the backbone of the Regional MS4 Permit requirements. Provision B provides the guidance, criteria, and minimum expectations and requirements for the elements of the Water Quality Improvement Plan to be developed and implemented by the Copermittees. The Water Quality Improvement Plans will be implemented in the Watershed Management Area by the Copermittees within their jurisdictions through their jurisdictional runoff management programs.

The Water Quality Improvement Plan also incorporates a program to monitor and assess the progress of the Copermittees' jurisdictional runoff management programs toward improving the quality of discharges from the MS4s, as well as tracking improvements to the quality of receiving waters. A process to adapt and improve the effectiveness of the Water Quality Improvement Plans has also been incorporated into the requirements of Provision B to be consistent with the "iterative approach" required to achieve compliance with discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a, pursuant to the requirements of Provision A.4.

The Water Quality Improvement Plans have also been structured to incorporate the requirements of any TMDLs that have been adopted for the San Diego Region. Incorporating the requirements of the TMDLs into the requirements of Provision B allows the Copermittees to develop a single plan, instead of separate plans, to coordinate their non-storm water and storm water runoff management programs. The Water Quality Improvement Plans allow the Copermittees to meet the requirements of this Order, as well as fulfill the requirements of the TMDLs.

As an added benefit, if the Copermittees demonstrate that impaired water bodies

within the Watershed Management Area listed on the 303(d) List will be addressed with their Water Quality Improvement Plans in a reasonable period of time, the San Diego Water Board may be able to remove the water bodies from the 303(d) List, which would greatly reduce the need for the San Diego Water Board to develop additional TMDLs that would have to be incorporated into the Order and implemented by the Copermittees.

***Discussion*:** The federal NPDES regulations require the Copermittees to develop a proposed management program (40 CFR 122.26(d)(2)(iv)). The proposed management program must include "*a comprehensive planning process*" and "*where necessary intergovernmental coordination*" for the "*duration of the permit.*" The Water Quality Improvement Plan is the Copermittees' "*comprehensive planning process*" document for the proposed management program that will be implemented within a Watershed Management Area. Implementation of the Water Quality Improvement Plan requires "*intergovernmental coordination*" among the Copermittees for at least the "*duration of the permit*," and likely into and beyond the next iteration of the permit.

Developing Water Quality Improvement Plans based upon watersheds is consistent with federal regulations that support the development of permit conditions, as well as implementation of storm water management programs, at a watershed scale (40 CFR 122.26(a)(3)(ii), 122.26(a)(3)(v), and 122.26(d)(2)(iv)). In 2003, USEPA issued a Watershed-Based NPDES Permitting Policy Statement (USEPA, 2003) that defines watershed-based permitting as an approach that produces NPDES permits that are issued to point sources on a geographic or watershed basis. In this policy statement, USEPA explains that "*[t]he utility of this tool relies heavily on a detailed, integrated, and inclusive watershed planning process*." USEPA identifies a number of important benefits of watershed permitting, including more environmentally effective results, the ability to emphasize measuring the effectiveness of targeted actions on improvements in water quality, reduced cost of improving the quality of the nation's waters and more effective implementation of watershed plans, including TMDLs, among others.

An emphasis on watersheds is appropriate at this stage in the San Diego Region's MS4 program to shift the focus to more targeted, water quality driven planning and implementation. Addressing discharges on a watershed scale focuses on water quality results by emphasizing the receiving waters in the watershed. The conditions of the receiving waters drive management actions, which in turn focus measures to address pollutant contributions from MS4 discharges.

The Water Quality Improvement Plan gives the Copermittees the responsibility of developing a comprehensive plan to coordinate the efforts of their jurisdictional runoff management programs for addressing the problems related to MS4 discharges causing impacts to water quality in the Watershed Management Area. The development of the plan provides the Copermittees the opportunity to provide significant input on how to implement their jurisdictional runoff management programs, and how to best utilize their available resources in addressing a focused set of priorities that they believe will result in measureable improvements to water quality

within the Watershed Management Area.

The Copermittees are encouraged to separate the Watershed Management Area into subwatersheds, as appropriate. This allows the Copermittees to identify priorities applicable to a subset of the Copermittees or specific water bodies or areas within the Watershed Management Area.

Included in the requirements for the elements to be included in the Water Quality Improvement Plan are monitoring and assessment requirements that are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order. In addition to the federal requirements of the CWA section 308(a) and 40 CFR 122.26(d), the San Diego Water Board has the authority to establish monitoring, reporting, and recordkeeping requirements for NPDES permits under CWC 13383.

More specific and detailed discussions of the requirements of Provision B are provided below.

Provision B.1 (Watershed Management Areas) requires the Copermittees to develop a Water Quality Improvement Plan for each of the Watershed Management Areas defined by the San Diego Water Board.

Pursuant to 40 CFR 122.26(d)(2)(iv), proposed management programs "*may impose controls on a…watershed basis…*" The Water Quality Improvement Plan is the Copermittees' proposed management program. A Water Quality Improvement Plan must be developed for each Watershed Management Area identified in the Order.

The Watershed Management Areas are identified in Table B-1. Table B-1 establishes ten (10) Watershed Management Areas, and identifies the Copermittees that are responsible for developing and implementing the Water Quality Improvement Plan for each Watershed Management Area.

The Copermittees from each of the three counties within the San Diego Region are expected to be phased in as their respective NPDES municipal storm water permits expire. Because Order No. R9-2007-0001 expired in January 2012, the San Diego County Copermittees are covered under the Regional MS4 Permit on the effective date of the Order.

After San Diego Water Board receives and considers the Reports of Waste Discharge required to be submitted by the Orange County Copermittees and Riverside County Copermittees pursuant to the requirements of their current permits, and make any necessary changes to the Order, the Orange County Copermittees and Riverside County Copermittees will be covered under the Regional MS4 Permit after Order No. R9-2009-0002 expires in November 2014, and Order No. R9-2010-0016 expires in December 2015, respectively.

The Orange County Copermittees and Riverside County Copermittees also have the option to obtain coverage under the Regional MS4 Permit earlier than their respective permit expiration dates. The process to apply for early coverage is described Provision F.6.

Because the Santa Margarita River Watershed Management Area includes Copermittees from both San Diego County and Riverside County, a footnote to Table B-1 has been included to specify that the requirements of Provision B are not required to be implemented by the County of San Diego until the Riverside County Copermittees have received a notice of coverage under the Order. Until the Riverside County Copermittees are notified of coverage under the Order, the County of San Diego is subject to the prohibitions and limitations under Provision A, responsible for continuing to implement its existing jurisdictional runoff management program, and responsible for implementing the transitional monitoring and assessment requirements of Provision D, the transitional annual reporting requirements of Provision F.3.b, and the TMDL requirements of Attachment E to the Order.

Provision B.2 (Priority Water Quality Conditions) requires the Copermittees in each Watershed Management Area to identify the highest priority water quality conditions which will be the focus of the Water Quality Improvement Plan implementation.

Provisions B.2.a and B.2.b provide the criteria that must be assessed when characterizing the receiving water quality and potential impacts from MS4 discharges of the receiving waters within the Watershed Management Area. The criteria are based primarily on the requirements in 40 CFR 122.26(d)(1)(iv)(C) and (C)(1)-(9). Characterizing the receiving water quality and identifying the potential impacts caused by MS4 discharges to receiving waters in the Watershed Management Area is necessary to identify the impacts to receiving waters associated with MS4 discharges that are of the most concern to the Copermittees.

Based on the information required to be considered under Provisions B.2.a and B.2.b, Provision B.2.c requires to Copermittees to identify the highest priority water quality conditions related to discharges from the MS4s that will be the primary focus of the Water Quality Improvement Plan in the Watershed Management Area. Addressing and improving these highest priority water quality conditions will become the focus of each Copermittee's jurisdictional runoff management program as the Water Quality Improvement Plan is implemented in the Watershed Management Area. The highest priority water quality conditions are expected to include source of pollutants and/or stressors, and/or receiving water conditions, that the Copermittees consider the highest threats or most likely to have adverse impacts on the physical, chemical, and biological integrity of receiving waters. Addressing these threats and/or adverse impacts should restore the physical, chemical, and biological integrity of receiving waters, and result in the restoration and protection of the beneficial uses of the receiving waters in the Watershed Management Area.

Provision B.2.d requires the Copermittees to identify known and suspected sources of

pollutants and/or stressors contributing to the highest priority water quality conditions. The requirements of Provision B.2.d are based primarily on the requirements in 40 CFR 122.26(d)(1)(iii)(B)(1)-(6). The Copermittees are required to evaluate several factors in the identification of those sources. The Copermittees must consider and evaluate the following: (1) the land uses that may contribute toward impacts to receiving waters, (2) the locations of the Copermittees' MS4s that can convey and discharge runoff and pollutants to receiving waters, (3) other sources that discharge into the Copermittees' MS4s and receiving waters, and (4) other information and data that can help the Copermittees to evaluate the relative importance of or contribution from those sources toward the highest priority water quality conditions. Identifying the known and suspected sources, and their relative contribution toward the highest priority water quality conditions, will help the Copermittees to focus, direct, and prioritize their resources and implementation efforts within their jurisdictions.

Provision B.2.e requires the Copermittees to identify potential strategies that can result in improvements to water quality in MS4 discharges and/or receiving waters within the Watershed Management Area. Potential water quality improvement strategies will not necessarily be implemented by the Copermittees, but provide a "menu" of options that the Copermittees will consider for implementation. The public participation process that will be implemented during the development of the Water Quality Improvement Plan is where the potential water quality improvement strategies will be identified.

Provision B.3 (Water Quality Improvement Goals, Strategies and Schedules) requires the Copermittees in each Watershed Management Area to identify the goals that the Copermittees' jurisdictional runoff management programs will work toward achieving to address and improve the highest priority water quality conditions identified under Provision B.2.c; the strategies that will be implemented by the Copermittees within their jurisdictions and the Watershed Management Area to achieve the goals; and, the schedules for implementing the strategies and achieving the goals. The element of the Water Quality Improvement Plan required under Provision B.3 is where the "*comprehensive planning*" and "*intergovernmental coordination*" [40 CFR 122.26(d)(2)(iv)] of the Copermittees' actions for the proposed management programs within the Watershed Management Area is required to be described.

Provision B.3.a requires the Copermittees to identify interim and final numeric goals, and schedules to achieve those goals as part of the Water Quality Improvement Plans. Provision B.3.a.(1) requires the Copermittees to identify two types of numeric goals to be achieved:

(1) Final numeric goals in the receiving waters and/or MS4 discharges that will result in the protection of the water quality standards of the receiving waters for the highest priority water quality conditions identified by the Copermittees for Provision B.2.c. These final numeric goals are the ultimate goals for the Water Quality Improvement Plan, and the achievement and maintenance of these final numeric goals will indicate that one or more beneficial uses have been successfully restored and/or protected from MS4 discharges.

(2) Interim numeric goals that can be used by the Copermittees to demonstrate progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges for the highest priority water quality conditions in the Watershed Management Area. Achievement of the interim numeric goals will demonstrate to the San Diego Water Board that the Copermittees' implementation efforts are progressing toward achieving the final numeric goals.

Provision B.3.a.(1) does not specify what the interim and final numeric goals must be based on, but they essentially must be designed to achieve compliance with water quality standards in the receiving waters. To that end, the interim goals must be based on measureable criteria or indicators capable of demonstrating progress toward achieving the numeric goals."

The interim and final numeric goals can be based on the water quality objectives in the Basin Plan. The water quality objectives in the Basin Plan, however, consist of numeric and narrative water quality objectives. Numeric water quality objectives can be directly used as numeric goals. Narrative water quality objectives, on the other hand, will require some interpretation to identify numeric goals. The achievement of multiple numeric goals based on the water quality objectives, used in combination, may be necessary to demonstrate that beneficial uses have been restored and/or protected.

The Copermittees could also propose other numeric goals that are not necessarily water quality objectives from the Basin Plan. For example, the Copermittees could propose a numeric goal that consists of achieving some percent improvement of a measureable indicator, such as acreage of a specific habitat or increase in a specific plant or animal species population. Other examples may include pollutant load reductions, number of impaired waterbodies delisted from the List of Water Quality Impaired Segments, Index of Biological Integrity (IBI) scores, etc.

The Copermittees may choose to develop interim numeric goals based on the final numeric goals they develop, such as incremental steps toward ultimately achieving the final numeric goals. The Copermittees may also choose to develop interim numeric goals that are based on other measureable indicators that can indirectly indicate improvements and progress toward the final numeric goals.

There are no limits to the types of interim numeric goals that could be proposed by the Copermittees, other than the goals must be based on measureable criteria or indicators capable of demonstrating progress toward achieving the numeric goals. Likewise, there are no limits to the types of final numeric goals that could be proposed by the Copermittees, other than the goals must "*restore and protect the water quality standards of the receiving waters.*"

Finally, Provision B.3.a.(2) also requires the Copermittees to develop schedules for measuring progress and achieving the interim and final numeric goals. Several criteria

are included for the development of the schedules, but the Copermittees are required to achieve the numeric goals as soon as possible, consistent with federal NPDES regulations (40 CFR 122.47(a)(1)).

The Copermittees are also required to incorporate any compliance schedules for any applicable ASBS or TMDL requirements. Applicable ASBS and TMDL compliance schedules are set forth in Attachment A and Attachment E to the Order, respectively. The information provided by the Copermittees under Provision B.3.a.(2) will be used by the Copermittees and the San Diego Water Board to gauge and track the progress of the Copermittees' efforts in addressing the highest priority water quality conditions identified in the Water Quality Improvement Plan.
Provision B.3.b requires the Copermittees to identify the strategies and schedules to implement those strategies as part of the Water Quality Improvement Plans. Provision B.3.b requires the Copermittees to identify the water quality improvement strategies that will be and may be implemented within the Watershed Management Area to 1) reduce of pollutants in storm water discharged from the MS4 to the MEP, 2) effectively prohibit non-storm water discharges from entering the MS4, 3) protect water quality standards in receiving waters by controlling MS4 discharges so that they do not cause or contribute to exceedances of receiving water limitations, and 4) achieve applicable WQBELs that implement TMDLs. The Copermittees will select the strategies to be implemented based on the likely effectiveness and efficiency of the potential water quality improvement strategies identified under Provision B.2.e to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, and/or achieve the interim and final numeric goals identified under Provision B.3.a.

Provision B.3.b.(1) requires each Copermittee to identify the strategies that will be or may be implemented within its jurisdiction. Each Copermittee is required to describe the strategies it is committed to implementing as part of its jurisdictional runoff management requirements under Provisions E.2 through E.7, and the optional jurisdictional strategies that the Copermittee will implement, as necessary, to achieve the numeric goals.

Each Copermittee is expected to implement the optional jurisdictional strategies identified under Provisions B.3.b.(1)(b) when the jurisdictional strategies it has committed to implement under Provision B.3.b.(2)(a) are not making adequate progress toward the interim and final numeric goals in accordance with the schedules established under Provision B.3.a. Provision B.3.b.(1)(b)(v) requires each Copermittee to describe the circumstances necessary to trigger implementation of the optional jurisdictional strategies, in addition to the requirements of Provisions B.3.b.(1)(a).

The San Diego Water Board recognizes that there may be optional jurisdictional strategies that will likely require funding and/or resources for planning, permitting, procurement of labor and materials, and implementation. Thus, Provision B.3.b.(1)(b)(iv) requires each Copermittee to describe the funding and/or resources

that are necessary to implement these optional jurisdictional strategies. This information may provide interested groups and members of the public an understanding of the resources that they could provide or assist in obtaining to implement these optional jurisdictional strategies.

Provision B.3.b.(2) requires the Copermittees in the Watershed Management Area to identify the regional or multi-jurisdictional strategies that may be implemented, as necessary, to achieve the numeric goals. Similar to the requirements of Provision B.3.b.(1)(b), these regional or multi-jurisdictional strategies will likely require funding and/or resources for planning, permitting, procurement of labor and materials, and implementation, and San Diego Water Board recognizes that these strategies may be difficult to implement with only Copermittee resources. Thus, Provision B.3.b.(2)(d) requires the Copermittees to describe the funding and/or resources necessary to implement these optional regional or multi-jurisdictional strategies. This information may provide interested groups and members of the public an understanding of the resources that they could provide or assist in obtaining to implement these optional regional or multi-jurisdictional strategies.

Provision B.3.b.(3) requires the Copermittees to develop and include schedules in the Water Quality Improvement Plan for implementing the water quality improvement strategies identified under Provisions B.3.b.(1) and B.3.b.(2). The schedule for implementing the water quality improvement strategies will be used by the Copermittees and San Diego Water Board to measure and demonstrate the progress of the Copermittees' implementation efforts toward reducing pollutants in storm water discharged from the MS4 to the MEP, and eliminating illicit non-storm water discharges from entering the MS4.

Provision B.3.b.(4) provides the Copermittees in each Watershed Management Area the option of implementing watershed-specific structural BMP requirements for Priority Development Projects. Historically, storm water permits have included very specific performance standards for permanent, structural BMPs. These standards describe the expectation for the capture or treatment of pollutants and control of excessive flow before storm water is discharged from a site. The Copermittees were also allowed to develop waiver programs for Priority Development Projects to avoid implementing the structural BMPs; however, the waiver programs were not necessarily tied into any sort of holistic watershed strategy. The result is that implementation of BMP requirements is largely done on a site-by-site basis. This requires proper design on the part of the Priority Development Project and strict oversight on the part of the Copermittee.

Provision B.3.b.(4) promotes the evaluation of multiple strategies for water quality improvement, in addition to the implementation of permanent structural BMPs, on a watershed-scale versus the site-by-site approach. In a report issued by the Southern California Coastal Water Research Project (SCCWRP) and several other research institutions, the report emphasized that a successful hydromodification management program will involve watershed analysis as a first step, and that integrating multiple watershed-based strategies is preferable over a site-by-site approach. Indeed, the

report states that the watershed analysis "…*should lead to identification of existing opportunities and constraints that can be used to help prioritize areas of greater concern, areas of restoration potential, infrastructure constraints, and pathways for potential cumulative effects*."[22] Provision B.3.b.(4) promotes the findings and recommendations of the report by providing a pathway for Copermittees to develop an integrated approach to their land development programs.

Under Provision B.3.b.(4), the Copermittees in a Watershed Management Area must first perform an analysis by gathering as much information pertaining to the physical characteristics of the Watershed Management Area as possible. This includes, for example, identifying potential areas of coarse sediment supply, present and anticipated future land uses, and locations of physical structures within receiving streams and upland areas that affect the watershed hydrology (such as bridges, culverts, and flood management basins). Once this information is collected, the Copermittees must produce GIS layers (maps) that include this information.

From there, the Copermittees must use the results of the Watershed Management Area Analysis to identify and compile a list of candidate projects that could potentially be used as alternative compliance options for Priority Development Projects. Such projects include, for example, opportunities for stream or riparian area rehabilitation, opportunities for retrofitting existing infrastructure to incorporate storm water retention or treatment, and opportunities for regional BMPs, among others. Once these candidate projects are identified, Copermittees may allow Priority Development Projects to fund, partially fund, or completely implement these candidate projects. The Copermittees must first find that implementing such a candidate project would provide greater overall benefit to the watershed than requiring implementation of the structural BMPs onsite, and also enter into a voluntary agreement with the Priority Development Project that authorizes this arrangement. The Copermittees may use Provision B.3.b.(4) as both 1) a mechanism to reach their stated goals of the Water Quality Improvement Plan by using Priority Development Projects to either fund or implement projects that will provide water quality benefit, and 2) an alternative to requiring strict adherence to the structural BMP design standards.

Additionally, Provision B.3.b.(4) allows the Copermittees to use the results of the Watershed Management Area Analysis to identify areas within the Watershed Management Area where it is appropriate to allow Priority Development Projects to be exempt from the hydromodification management BMP performance requirements. Provision E.3.c.(2) already allows exemptions for Priority Development Projects that discharge to a conveyance channel whose bed and bank are concrete lined from the point of discharge to an enclosed embayment or the Pacific Ocean. However, there may be cases where further exemptions are warranted. The Copermittees may identify such cases on a watershed basis and include them in the Watershed

[22] 2012. ED Stein, F Federico, DB Booth, BP Bledsoe, C Bowles, Z Rubin, GM Kondolf, A Sengupta. Technical Report 667. Southern California Coastal Water Research Project. Costa Mesa, CA.

Management Area Analysis; however, they must provide the supporting rationale to support all claims for exemptions.

Provision B.3.b.(4) provides an innovative pathway for Copermittees to regulate their land development programs by allowing alternative compliance in lieu of implementing structural BMPs on each and every Priority Development Project. This approach facilitates the integration of watershed-scale solutions for improving overall water quality and assisting Copermittees to achieve their stated goals of the Water Quality Improvement Plan. The San Diego Water Board understands, however, that undertaking this approach, which involves extensive planning, could be resource intensive for the Copermittees. Therefore, the Watershed Management Area Analysis is optional and not a requirement. The Copermittees can choose not to perform the watershed planning and mapping exercise described in Provision B.3.b.(4), and instead choose to require strict implementation of the structural BMPs onsite, pursuant to Provision E.3.b.

Provision B.3.c OPTION 1

~~Finally, Provision B.3.c has been included to provide the Copermittees an option to demonstrate and be in compliance with the requirements of Provisions A.1.a, A.1.c and A.2.a. One or more Copermittees within a Watershed Management Area can choose to implement this option. This option is only expected to be utilized by the Copermittees that wish to clearly demonstrate and be in compliance with the requirements of Provisions A.1.a, A.1.c and A.2.a.~~

~~In order for a Copermittee to utilize this option, the Copermittee is required to include three components in the Water Quality Improvement Plan. The first component is a comprehensive set of numeric goals that will demonstrate the requirements of Provisions A.1.a, A.1.c and A.2.a will be achieved. The criteria provided in the Order will require the Copermittee to demonstrate that the discharges from its MS4s will not cause or contribute to exceedances of water quality objectives in the receiving waters, and the receiving waters will be protected from the Copermittee's MS4 discharges.~~

~~The second component is an analysis utilizing a watershed model or other watershed analytical tools. The analysis must demonstrate that the implementation of the water quality improvement strategies required under Provision B.3.b will achieve the numeric goals within the established schedules required under Provision B.3.a. Because the development of the analysis may require significant resources, the Order allows the Copermittees in each Watershed Management Area that choose to implement this option to perform the analysis individually, or pool their resources for the analysis collectively.~~

~~The San Diego Water Board does not expect the analysis to be a "guarantee" that the water quality improvement strategies will achieve the numeric goals within the established schedules. The analysis, however, must "reasonably" and "quantitatively" demonstrate that the implementation of the water quality improvement strategies can achieve the numeric goals within the established schedules. However, as more data~~

~~and information are collected to demonstrate progress toward achieving the numeric goals, the numeric goals, water quality improvement strategies and schedules may need to be updated. When these updates occur, the Copermittees that choose to utilize this option must also update the analysis.~~

~~Thus, the third component is the key component that will allow a Copermittee to demonstrate the implementation of the water quality improvement strategies within its jurisdiction is making progress toward achieving the numeric goals. Each Copermittee must specify the monitoring and assessments that will be performed to confirm the implementation of the water quality improvement strategies are making progress toward achieving the numeric goals within the established schedules.~~

~~These three components must then be reviewed by the Water Quality Improvement Consultation Panel. The Water Quality Improvement Consultation Panel is required to be formed as part of the public participation process for the development of the Water Quality Improvement Plans. The Water Quality Improvement Consultation Panel is described under Provision F.1.a.(1)(b). Review by the Water Quality Improvement Consultation Panel has been included to provide an additional layer of input, support, and accountability for the implementation of this option.~~

~~Compliance with the requirements of Provisions A.1.a, A.1.c and A.2.a begins when the Water Quality Improvement Plan, incorporating the requirements of Provision B.3.c.(1), is accepted by the San Diego Water Board. Each Copermittee that chooses to implement and continues to implement this option will be in compliance with the requirements of Provisions A.1.a, A.1.c and A.2.a as long as the San Diego Water Board continues to accept the analysis, and subsequent updates, and the Copermittee continues to implement the strategies, monitoring and assessments as incorporated in the Water Quality Improvement Plan in accordance with Provision B.3.c.(1).~~

Provision B.3.c OPTION 2

Finally, Provision B.3.c has been included to provide the Copermittees an option to demonstrate and be in compliance with the requirements of Provisions A.1.a, A.1.c and A.2.a. One or more Copermittees within a Watershed Management Area can choose to implement this option. This option is only expected to be utilized by the Copermittees that wish to clearly demonstrate and be in compliance with the requirements of Provisions A.1.a, A.1.c and A.2.a.

In order for a Copermittee to utilize this option, the Copermittee is required to include three components in the Water Quality Improvement Plan. The first component is a comprehensive set of numeric goals that will demonstrate the requirements of Provisions A.1.a, A.1.c and A.2.a will be achieved. The criteria provided in the Order will require the Copermittee to demonstrate that the discharges from its MS4s will not cause or contribute to exceedances of water quality objectives in the receiving waters, and the receiving waters will be protected from the Copermittee's MS4 discharges.

The second component is an analysis utilizing a watershed model or other watershed

analytical tools. The analysis must demonstrate that the implementation of the water quality improvement strategies required under Provision B.3.b will achieve the numeric goals within the established schedules required under Provision B.3.a. Because the development of the analysis may require significant resources, the Order allows the Copermittees in each Watershed Management Area that choose to implement this option to perform the analysis individually, or pool their resources for the analysis collectively.

The San Diego Water Board does not expect the analysis to be a "guarantee" that the water quality improvement strategies will achieve the numeric goals within the established schedules. The analysis, however, must "reasonably" and "quantitatively" demonstrate that the implementation of the water quality improvement strategies can achieve the numeric goals within the established schedules. However, as more data and information are collected to demonstrate progress toward achieving the numeric goals, the numeric goals, water quality improvement strategies and schedules may need to be updated. When these updates occur, the Copermittees that choose to utilize this option must also update the analysis.

Thus, the third component is the key component that will allow a Copermittee to demonstrate the implementation of the water quality improvement strategies within its jurisdiction is making progress toward achieving the numeric goals. Each Copermittee must specify the monitoring and assessments that will be performed to confirm the implementation of the water quality improvement strategies are making progress toward achieving the numeric goals within the established schedules.

These three components must then be reviewed by the Water Quality Improvement Consultation Panel. The Water Quality Improvement Consultation Panel is required to be formed as part of the public participation process for the development of the Water Quality Improvement Plans. The Water Quality Improvement Consultation Panel is described under Provision F.1.a.(1)(b). Review by the Water Quality Improvement Consultation Panel has been included to provide an additional layer of input, support, and accountability for the implementation of this option.

Compliance with the requirements of Provisions A.1.a, A.1.c and A.2.a begins when the Water Quality Improvement Plan, incorporating the requirements of Provision B.3.c.(1), is accepted by the San Diego Water Board. Each Copermittee that chooses to implement and continues to implement this option will be in compliance with the requirements of Provisions A.1.a, A.1.c and A.2.a as long as the San Diego Water Board continues to accept the analysis, and subsequent updates, and the Copermittee continues to implement the strategies, monitoring and assessments as incorporated in the Water Quality Improvement Plan in accordance with Provision B.3.c.(1).

Provision B.4 (Water Quality Improvement Monitoring and Assessment) requires the Copermittees to develop an integrated monitoring and assessment program to track the progress of the Water Quality Improvement Plan toward meeting the implementation goals and schedules, and improving the water quality of the

Watershed Management Area. Provision B.4 is the part of the Water Quality Improvement Plan where the Copermittees describe the monitoring data that will be collected, which is not only necessary to implement the "iterative approach" required by Provision A.4, but inform the adaptive management and "*comprehensive planning process*" that allows the Copermittees to make adjustments and modifications to the Water Quality Improvement Plans and the jurisdictional runoff management programs.

Provision B.4 requires the Copermittees, at a minimum, to include the requirements of Provision D as part of the water quality improvement monitoring and assessment program for the Water Quality Improvement Plan. The Copermittees, however, are not limited to the requirements of Provision D and may include additional monitoring and assessment methods to track progress toward improving water quality in the Watershed Management Area.

In addition to incorporating the requirements of Provision D, the water quality improvement monitoring and assessment program must incorporate any monitoring and assessment requirements specified for any applicable TMDLs included in Attachment E to the Order, and the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 for Watershed Management Areas with ASBS.

The monitoring and assessments required to be incorporated into the Water Quality Improvement Plan are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order.

Provision B.5 (Iterative Approach and Adaptive Management Process) requires the Copermittees to implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a.

Provision B.5 requires the Copermittees in each Watershed Management Area to re-evaluate the highest priority water quality conditions and potential water quality improvement strategies, the water quality improvement goals, strategies and schedules, and the water quality improvement monitoring and assessment program and provide recommendations for modifying those elements to improve the effectiveness of the Water Quality Improvement Plan. The re-evaluation of the Water Quality Improvement Plan is part of the assessment requirements of Provision D.

Provision B.6 (Water Quality Improvement Plan Submittal, Updates, and Implementation) requires to Copermittees to submit, update, and implement the Water Quality Improvement Plans.

The requirements for the process to develop and submit the Water Quality Improvement Plans is described in more detail under the discussion for Provision F.1. The process will include several opportunities for the public to provide input during the

development of the Water Quality Improvement Plans. The process for updating the Water Quality Improvement Plans is described in more detail under the discussion for Provision F.3.c. Upon acceptance of the Water Quality Improvement Plan and updates, the Copermittees are required to immediately begin implementing the Water Quality Improvement Plan and subsequent updates.

The Water Quality Improvement Plan is expected to be a dynamic document that will evolve over time. The Water Quality Improvement Plan is also expected to be a long term plan that focuses the Copermittees' efforts and resources on a limited set of priority water quality conditions, with the ultimate goal of protecting all the beneficial uses of the receiving waters within the Watershed Management Area from impacts that may be caused or contributed to by MS4 discharges. As the Copermittees collect data, implement their jurisdictional runoff management programs, and review the results from their water quality improvement monitoring and assessment program, the Water Quality Improvement Plan is expected to be continually reviewed and updated until compliance with Provisions A.1.a, A.1.b, and A.2.a is achieved.

However, in specific cases supported by robust analytical documentation the implementation of the Water Quality Improvement Plans may demonstrate that TMDLs are not necessary for identified impaired water bodies within the Watershed Management Area if the analytical record demonstrates that technology-based effluent limitations required by the CWA, more stringent effluent limitations required by state, local, or federal authority, and/or other pollution control requirements (e.g., best management practices) required by local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time.[23]

The San Diego Water Board submits an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. According to USEPA guidance for the Integrated Report,[24] water bodies are placed in one of five categories. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 are placed on the 303(d) List.

Category 4 in the Integrated Report is for water bodies where available data and/or information indicate that at least one beneficial use is not being supported or is threatened, but a TMDL is not needed.[25] Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable

[23] 40 CFR 130.7(b)(1)
[24] USEPA, 2005. Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act
[25] Ibid

period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

Impaired water bodies can be included in Category 4a if a TMDL has been adopted and approved. The TMDLs in Attachment E to the Order implement the requirements of the TMDLs adopted by the San Diego Water Board, and approved by the State Water Board and USEPA. The water bodies in Attachment E will be included in Category 4a in the Integrated Report and removed from the 303(d) List.

Impaired water bodies can be included in Category 4b if there are *acceptable* "pollution control requirements" required by a local, state or federal authority stringent enough to implement applicable water quality standards within a reasonable period of time (e.g., a compliance date is set). When evaluating whether a particular set of pollution controls are "requirements," the USEPA considers a number of factors, including: (1) the authority (local, state, federal) under which the controls are required and will be implemented with respect to sources contributing to the water quality impairment (examples may include: self-executing state or local regulations, permits, and contracts and grant/funding agreements that require implementation of necessary controls), (2) existing commitments made by the sources and completion or soon to be completed implementation of the controls (including an analysis of the amount of actual implementation that has already occurred), (3) the certainty of dedicated funding for the implementation of the controls, and (4) other relevant factors as determined by USEPA depending on case-specific circumstances.[26]

Impaired water bodies can be included in Category 4c if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution. Pollution, as defined by the CWA is "the man-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of water."[27] In other cases, pollution does not result from a pollutant and a TMDL is not required. Examples of circumstances where an impaired segment may be placed in Category 4c include segments impaired solely due to lack of adequate flow, stream channelization, or hydromodification. In these situations, there may be water quality management actions that can address the cause(s) of the impairment, but a TMDL may not be required to implement the actions.

The Water Quality Improvement Plans will require the implementation of pollution controls and water quality management actions (i.e. water quality improvement strategies) which can result in the attainment of water quality standards in water bodies impaired by discharges from the Copermittees' MS4s. The Water Quality Improvement Plans also include requirements that are expected to attain water quality standards in a reasonable period of time. The San Diego Water Board considers the Water Quality Improvement Plans to be a commitment by the Copermittees to

[26] Ibid
[27] CWA section 502(19)

develop, plan, budget for, and implement pollution controls that will attain water quality standards in receiving waters in a reasonable period of time, or as soon as possible. The results of the Copermittees' efforts in implementing the Water Quality Improvement Plans can be used to re-evaluate the condition of the impaired water bodies during the next update to the 303(d) List.

After the Copermittees submit the Water Quality Improvement Plans and demonstrate that water quality standards are being attained or will be attained in a reasonable period of time, the San Diego Water Board may re-evaluate the water bodies on the 303(d) List. These water bodies on the 303(d) List may be re-evaluated and placed into Category 4b or Category 4c in the Integrated Report. The water bodies placed in Category 4b or Category 4c in the Integrated Report must show a record that the water bodies are attaining water quality standards or supporting the identified beneficial uses, or will attain water quality standards or support identified beneficial uses in a reasonable period of time, in order for the water bodies to be appropriately removed from the 303(d) List.

C. Action Levels

Purpose: Provision C includes requirements for the Copermittees to identify and include numeric action levels in the Water Quality Improvement Plan to direct and focus the Copermittees' jurisdictional runoff management program implementation efforts for controlling MS4 discharges to receiving waters.

***Discussion*:** Under Provision C, the numeric action levels required are for non-storm water discharges and storm water discharges. The non-storm water action levels (NALs) are applicable to non-storm water discharges from the Copermittees' MS4s, which can occur year-round. The storm water action levels (SALs) are applicable to storm water discharges from the Copermittees' MS4s, which occur during the rainy season defined as the period between October 1 and April 30.

The action levels required by Provision C are based on the action level requirements that were developed and incorporated into Order Nos. R9-2009-0002 and R9-2010-0016, the Orange County and Riverside County MS4 Permits, respectively. The Fact Sheets for these Orders provide detailed discussions about the development of the numeric NALs and SALs included in this Order.

Order Nos. R9-2009-0002 and R9-2010-0016 required the Copermittees to perform prescribed actions if the NALs or SALs are exceeded. The actions required under Order Nos. R9-2009-0002 and R9-2010-0016 generally included conducting additional monitoring and source investigations when a discharge from the MS4 is observed to exceed one or more NALs and/or SALs.

For this Order, however, the action levels of Provision C are to be used by the Copermittees to prioritize the actions to be implemented as part of the Water Quality Improvement Plan. Monitoring data collected by the Copermittees from MS4 outfalls will be compared with the NALs and SALs. Exceedances of the NALs and SALs will not require the Copermittees to immediately identify sources causing exceedances, but will provide some numeric indicator levels that can give the Copermittees a way to measure the relative severity of a pollutant contributing to receiving water quality impacts.

NALs and SALs must be included in the Water Quality Improvement Plans to be used by the Copermittees in directing and focusing their water quality improvement strategies. The Copermittees are expected to utilize the NALs and SALs to help focus their implementation efforts on addressing pollutants that have the most significant potential or observed impacts to receiving waters. The NALs and SALs will be used as part of the MS4 discharges assessments required under Provision D.4.b. The NALs and SALs may also be used by the Copermittees as the numeric goals to be achieved in MS4 discharges and/or receiving waters as the Water Quality Improvement Plans are implemented.

More specific and detailed discussions of the requirements of Provision C are provided below.

Provision C.1 (Non-storm Water Action Levels) requires the Copermittees to incorporate NALs into the Water Quality Improvement Plan for pollutants and/or constituents that are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions identified in the Water Quality Improvement Plan related to non-storm water discharges from the MS4s. NALs generally must be consistent with the water quality objectives found within the Basin Plan.

The NALs have been included to ensure that the Copermittees are implementing and complying with several requirements of the MS4 permit. The federal CWA requires permits for municipal storm sewer systems to "*effectively prohibit non-storm water discharges into the storm sewers*." The federal NPDES regulations, which were promulgated to implement the CWA requirements for discharges from municipal storm sewers, require a program to address illicit discharges, which are non-storm water discharges. Provision A.1.b prohibits "*[n]on-storm water discharges into MS4s*" unless the non-storm water discharge authorized by a separate NPDES permit. The NALs will be used as part of the illicit discharge detection and elimination program required pursuant to Provision E.2, as well as part of the MS4 discharges assessments required pursuant to Provision D.4.b.

Provision A.1.a prohibits non-storm water discharges from the MS4 from "*causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state.*" In addition, pursuant to Provision A.2.a, non-storm water discharges "*must not cause or contribute to the violation of water quality standards in any receiving waters*."

Ideally, the Copermittees' jurisdictional runoff management programs will eliminate all non-storm water discharges entering the MS4s within their jurisdictions. The complete elimination of non-storm water discharges to the Copermittees' MS4s would be in compliance with the CWA requirements for non-storm water discharges, as well as the prohibitions and limitations of Provisions A.1.a and A.2.a.

The federal regulations, however, also refer to several non-storm water discharge categories that must be addressed as illicit discharges if they are found to be a source of pollutants. The federal regulations thus identify some non-storm water discharges that are not required to be addressed as illicit discharges if they are not a source of pollutants (e.g. non-storm water discharges specified in Provisions E.2.a.(1)-(5)). Thus, these regulations imply that some non-storm water discharges into and from the MS4 may occur even if non-storm water discharges are "effectively" prohibited by the Copermittees.

If the source of a non-storm water discharge is identified as a category of non-storm water specified in Provisions E.2.a.(1)-(5), the NALs can be used to determine the category of non-storm water discharges is a source of pollutants. For other non-storm

water discharges not specified in Provisions E.2.a.(1)-(5), the CWA requires those discharges to be "*effectively"* prohibited by removing the discharge to the MS4 through enforcement of the Copermittees' legal authority established under "*ordinance, order or similar means*" to prohibit illicit discharges to the MS4s.

If there are non-storm water discharges that are not required to be addressed as illicit discharges, those discharges must comply, at a minimum, with the discharge prohibitions and receiving water limitations of Provision A. Thus, the non-storm water discharges from the MS4 must be at levels that will not cause or contribute to a condition of pollution, contamination, or nuisance (Provision A.1.a), and must not cause or contribute to a violation of water quality standards in receiving waters (Provision A.2.a) to be consistent with the discharge prohibitions and receiving water limitations of Provisions A.1.a and A.2.a.

Furthermore, the San Diego Region has predominantly intermittent and ephemeral rivers and streams which vary in flow volume and duration at spatial and temporal scales. For most of these river and stream systems, non-storm water discharges from the MS4 are likely to be the most significant or the only source contributing to surface flows present within the receiving water, especially during the dry season.

Therefore, because of the prohibitions and limitations of Provision A.1.a and A.2.a, and the likelihood that non-storm water discharges from the MS4 are the most significant or only source contributing to surface flows present within the receiving water, NALs generally must be consistent with the water quality objectives found within the Basin Plan. Non-storm water discharges that are meeting the NALs would not be expected to cause or contribute to an exceedance of water quality objectives in receiving waters, which would be consistent with the discharge prohibitions and receiving water limitations of Provisions A.1.a and A.2.a.

Exceedances of the NALs would then provide an indication of the relative severity of a pollutant in non-storm water discharges from the MS4 contributing to potential or observed receiving water quality impacts. The relative severity or significance of a pollutant in non-storm water discharges from the MS4 will provide the Copermittees a valuable source of information that can be used to identify priority water quality conditions within a Watershed Management Area and within each Copermittee's jurisdiction.

Tables C-1 through C-4 under Provision C.1.a specify numeric NALs for several parameters or pollutant constituents for non-storm water discharges from the MS4 to several water body types. The NALs for MS4 discharges given under Provision C.1.a are based on the water quality objectives for inland surface waters in the Basin Plan, and the water quality objectives for ocean waters in the Ocean Plan. The NALs for most of the metals were calculated based on the State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP). The NALs provided in Tables C-1

through C-4 must be included in the Water Quality Improvement Plans required to be developed pursuant to Provision B.

Provision C.1.b requires the Copermittees to identify NALs for pollutants and/or constituents, not specified in Provision C.1.a, which are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions of the Watershed Management Area related to non-storm water discharges from the MS4s. The NALs must be based on the water quality objectives in the Basin Plan. The NALs identified under Provision C.1.b must be included in the Water Quality Improvement Plan.

The San Diego Water Board recognizes that some of the NALs required pursuant to Provisions C.1.a and C.1.b may be exceeded more frequently than not. Thus, Provision C.1.c has been included in the Order to provide the Copermittees the option to develop secondary NALs that are set at levels greater than the levels required pursuant to Provisions C.1.a and C.1.b to further refine the prioritization and assessment of water quality improvement strategies for addressing non-storm water discharges to and from the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and from the MS4.

Provision C.2 (Storm Water Action Levels) requires the Copermittees to incorporate SALs into the Water Quality Improvement Plan for pollutants and/or constituents causing or contributing, or may be causing or contributing, to the highest priority water quality conditions identified in the Water Quality Improvement Plan related to storm water discharges from the MS4s.

The SALs have been included to ensure that the Copermittees are implementing and complying with several requirements of the MS4 permit. Provision A.1.a prohibits storm water discharges from the MS4 from "*causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state.*" In addition, pursuant to Provision A.2.a, storm water discharges "*must not cause or contribute to the violation of water quality standards in any receiving waters*."

Provision A.3.a, however, implicitly acknowledges that compliance with Provisions A.1.a and A.2.a cannot be achieved immediately for discharges of storm water from the MS4 by applying the MEP standard. Thus, Provision A.4 requires the Copermittees to implement an iterative approach to demonstrate that MEP is being achieved. This approach is supported by USEPA.

The federal CWA requires permits for municipal storm sewer systems to "*require controls to reduce the discharge of pollutants [in storm water] to the maximum extent practicable*, *including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants.*" MEP is an ever-evolving, flexible, and advancing concept. As knowledge about controlling storm water runoff

and discharges evolves, so does the knowledge which constitutes MEP. Reducing the discharge of storm water pollutants from the MS4 to the MEP requires the Copermittees to assess their jurisdictional runoff management programs and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP. The SALs provide the Copermittees measureable goals that may be used to demonstrate the achievement of MEP for reducing pollutants in storm water discharges from the MS4. The SALs will be used as part of the MS4 discharges assessments required under Provision D.4.a.

In June of 2006, the State Water Board's Blue Ribbon Storm Water Panel released its report titled "*The Feasibility of Numerical Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities*." In the recommendations, the Blue Ribbon panel proposed storm water effluent limitations which are computed using statistical based population approaches. The SALs specified in Table C-5 under Provision C.2.a were developed from a regional subset of nationwide Phase I MS4 data by using USEPA Rain Zone 6 (arid west) data.[28] Additionally, utilization of regional data is appropriate due to the addition of data into the nationwide Phase I MS4 monitoring dataset in February 2008. This additional data increased the number of USEPA Rain Zone 6 samples to more than 400, and included additional monitoring events within Southern California.

Utilizing data from USEPA Rain Zone 6 resulted in SALs which closely reflect the environmental conditions experienced in the San Diego Region. The localized subset of data includes sampling events from multiple Southern California locations including Orange, San Diego, Riverside, Los Angeles, and San Bernardino Counties. The dataset includes samples taken from highly built-out impervious areas and from storm events representative of Southern California conditions.

The SALs for cadmium, copper, lead and zinc require the measurement of hardness and to provide more specificity in the assessment of samples with SALs for total metal concentrations. While USEPA Rain Zone 6 data include a large sample size for concentrations of total metals, the impact the concentration will have on receiving waters will vary with receiving water hardness. Since it is the goal of the SALs, through the iterative process and MEP standard, to have MS4 storm water discharges meet all applicable water quality objectives, the hardness of the receiving water should be used when assessing the total metal concentration of a sample.

Thus, when there is an exceedance of a SAL for a metal, the Copermittee must determine if that exceedance is above the existing applicable water quality objectives based upon the hardness of the receiving water. The water quality objectives Copermittees must use to assess total metal SAL exceedances are the California Toxic Rule (CTR) and USEPA National Recommended Water Quality Criteria for Freshwater Aquatic Life 1 hour maximum concentrations. The 1 hour maximum

[28] Data used to develop SAL were obtained from http://rpitt.eng.ua.edu/Research/ms4/mainms4.shtml

concentration is to be used for comparison since it is expected to most replicate the impacts to waters of the State from the first flush following a precipitation event.

The statistically calculated SALs given in Table C-5 are at levels greater than the water quality objectives in the Basin Plan or Ocean Plan. Because the objective of the CWA is to "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*", meaning eventually pollutants in storm water discharges must be reduced to a level that cannot cause or contribute to an exceedance of water quality objectives in receiving waters, over time the SALs are expected to be reduced to a level that is based on the water quality objectives rather than statistical calculations. The San Diego Water Board will review the SALs as more data for discharges of storm water from the MS4s are collected, and revise them as conditions improve and the MEP standard advances. For the Water Quality Improvement Plans required under this Order, the SALs identified under Provision C.2.a must be included.

Provision C.2.b requires the Copermittees to identify SALs for pollutants and/or constituents, not specified in Provision C.2.a, which are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions of the Watershed Management Area related to storm water discharges from the MS4s. The SALs identified under Provision C.2.b must be included in the Water Quality Improvement Plan.

The San Diego Water Board recognizes that some of the SALs required pursuant to Provisions C.2.a and C.2.b may be exceeded more frequently than not. Thus, Provision C.2.c has been included in the Order to provide the Copermittees the option to develop secondary SALs that are set at levels greater than the levels required pursuant to Provisions C.2.a and C.2.b to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s.

D. Monitoring and Assessment Program Requirements

Purpose: Provision D includes minimum monitoring and assessment requirements that must be developed and implemented by the Copermittees as part of the Water Quality Improvement Plans. Implementation of the monitoring and assessment requirements of Provision D will allow the Copermittees to demonstrate that the requirements of the CWA to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP are being achieved. Implementation of the monitoring and assessment requirements of Provision D will also allow the Copermittees and the San Diego Water Board to track improvements to the water quality in the San Diego Region. The monitoring and assessment program requirements are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order.

***Discussion*:** The San Diego Water Board recognized that changes to the monitoring and assessment requirements of the Fourth Term Permit were necessary to improve the usefulness and usability of monitoring data collected by the Copermittees to support their jurisdictional storm water programs more efficiently and with increased effectiveness. The data collected are needed to better inform the Copermittees' understanding of the physical, chemical, and biological condition of the receiving waters and the quality of the MS4 discharges. The monitoring program needs to provide opportunities for the Copermittees to integrate regional monitoring efforts into municipal storm water monitoring requirements to provide a cost-effective approach to monitoring and avoid duplication of efforts.

The requirements in Provision D were largely recommended by the Copermittees as an outcome of the San Diego Water Boards Focused Meeting process. The monitoring and assessment program requirements now require collection of more specific information necessary for each Copermittee to adapt its jurisdictional runoff management program in such a way that focuses resources on a watershed's highest priority water quality conditions. The monitoring and assessment program will require the Copermittees to collect data that can be utilized to answer both watershed level management questions (e.g. Are the chemical, physical, and biological conditions of a receiving water protective, or likely protective of beneficial uses?), and specific jurisdictional runoff management program activity questions (e.g. Are the water quality improvement strategies of the jurisdictional program effectively eliminating non-storm water discharges to the MS4?).

The monitoring data collected and assessment information that will be reported to the San Diego Water Board are necessary to determine if the Copermittees are complying with the prohibitions and limitations of Provision A. The required monitoring and assessments that must be reported to the San Diego Water Board will be utilized for three purposes:

(1) Inform the Copermittees, San Diego Water Board, and the public on the progress

of the Copermittees' efforts to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP;

(2) Inform the Copermittees, San Diego Water Board, and the public on the condition of water bodies receiving discharges from the Copermittees' MS4, and the progress of the Copermittees' water quality improvement implementation efforts toward improving the receiving water quality; and

(3) Inform the Copermittees, the San Diego Water Board, and the public on the effectiveness of the Water Quality Improvement Plan toward achieving (1) and (2).

The monitoring and assessment information reported pursuant to Provision F is also expected to be key to the iterative approach and adaptive management process required under Provision A.4 and implemented through the Water Quality Improvement Plan required under Provision B. As required by Provision A.4, the iterative approach and adaptive management process is required if the Copermittees cannot meet the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c, and/or A.2.a under the present conditions.

Provision D provides the minimum monitoring and assessment requirements that must be included in each Water Quality Improvement Plan to be developed and implemented by the Copermittees. The Copermittees, however, are not limited to the requirements of Provision D and may include additional methods to track progress toward improving water quality in a Watershed Management Area.

More specific and detailed discussions of the requirements of Provision D are provided below.

Provision D.1 (Receiving Water Monitoring Requirements) specifies the minimum receiving water monitoring that the Copermittees must conduct within the Watershed Management Area and include as part of the Water Quality Improvement Plan.

Provision D.1 establishes minimum monitoring requirements that must be conducted by the Copermittees within each Watershed Management Area. Provision D.1 requires the Copermittees to collect and develop the data and information necessary to determine potential impacts to the beneficial uses in the receiving waters due to discharges from the MS4s. The monitoring required under Provision D.1 will also provide the data that will allow the Copermittees to gauge the effectiveness and progress of its Water Quality Improvement Plan implementation efforts toward improving the quality of receiving waters.

The receiving water monitoring requirements of Provision D.1 are focused primarily on monitoring the conditions and response of the receiving waters to the Copermittees' collective implementation efforts to reduce receiving water impacts that may be

caused by the discharges from the MS4s. The preference of the San Diego Water Board is for the Copermittees to spend their resources achieving tangible and observable improvements in receiving water conditions instead of collecting samples and analyzing data that has consistently indicated that receiving water conditions are degraded and require improvement. In general, the ability to measure potential improvements in receiving water conditions due to any actions implemented by the Copermittees as part of the Water Quality Improvement Plan may require several years before a response can be observed. Thus, the frequency of collecting receiving water monitoring data has been kept to a minimum.

During the transitional period between adoption of this Order and San Diego Water Board acceptance of a Water Quality Improvement Plan, the Copermittees must conduct receiving water monitoring in accordance with Provision D.1.a. This approach to collecting receiving water data is different from what was required in the Fourth Term Permits, but one that truly embraces the concept of an integrated, cost-effective, streamlined receiving water monitoring approach.

Provision D.1.a requires Copermittees to continue performing the receiving water monitoring programs required in Order Nos. R-2007-0001, R9-2009-002, and R9-2010-0016; plus participation in: hydromodification management plan monitoring approved by the San Diego Water Board, monitoring plans as part of load reduction plans (either Bacteria Load Reduction Plans or Comprehensive Load Reduction Plans) for TMDLs in Attachment E of the Order, Storm Water Monitoring Coalition Regional Monitoring, Southern California Bight Regional Monitoring, Sediment Quality Monitoring, and ASBS Monitoring as applicable to a Watershed Management Area.

Provision D.1.a also provides an opportunity for the Copermittees to use third party data to meet receiving water monitoring requirements where feasible. Allowing the Copermittees to use the data currently collected through its participation in existing regional receiving water programs and that of third parties provides an efficiency of resources in obtaining the data necessary to inform the Copermittees and the San Diego Water Board about the physical, chemical, and biological conditions of the receiving waters, which can also help to focus the receiving water monitoring during the implementation of the Water Quality Improvement Plan. Once a Water Quality Improvement Plan is developed for a Watershed Management Area in compliance with Provision B of this Order, the transitional period is over and Copermittees are required to conduct receiving water monitoring according to the requirements of Provision D.1.b-e.

Provision D.1.b requires each Copermittee to identify at least one long term receiving water monitoring station to be representative of receiving water quality within each Watershed Management Area. Long term receiving water monitoring stations can be located at any existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees. The requirements under Provision D.1.b. are consistent with 40 CFR 122.26(d)(2)(iii)(D), which specifies that a "*monitoring program*

for representative data collection for the term of the permit" may include "*instream locations.*" For each Watershed Management Area, at least one long term watershed monitoring station is required to be established and monitored. The Copermittees may choose to establish additional long term monitoring stations where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

Provision D.1.b. requires the Copermittees to locate the long term receiving water monitoring station at one of these existing receiving water monitoring stations to provide the Copermittees an opportunity to experience monitoring cost savings while continuing to collect the necessary data to assess the status and trends of receiving water quality conditions in 1) coastal water, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under both dry weather and wet weather conditions. Ideally these stations will continue to be monitored as part of the receiving water monitoring for each Watershed Management Area to maintain a consistent set of locations and a period of data that can be built upon with the monitoring required under this Order.

The receiving water monitoring requirements are separated into monitoring required during dry weather conditions pursuant to Provision D.1.c, and wet weather conditions pursuant to Provision D.1.d.

At each long term monitoring station the Copermittees must conduct at least three dry weather monitoring events as required pursuant to Provision D.1.c and at least three wet weather monitoring events as required pursuant to Provision D.1.d per permit term. Provision D.1.c and D.1.d require the Copermittees to monitor priority water quality conditions identified in the Water Quality Improvement Plan, constituents listed as causing impairment of receiving waters in the Watershed Management Area, applicable NALs, toxicity, constituents listed in Tables D-2 and D-3, and constituents for implementation plans (e.g. Bacteria Load Reduction Plans and Comprehensive Load Reduction Plans). Required toxicity monitoring was changed to reflect an updated understanding of the unique challenges associated with sampling storm water for toxicity. Copermittees are required to sample storm water for toxicity during each dry weather and each wet weather event pursuant to Provision D.1.c.(4) and D.1.d.(4). Required toxicity monitoring is now consistent with the State Water Resources Control Board Policy for Toxicity Assessment and Control (Draft june2012) and recently adopted MS4 permits for Caltrans and Los Angeles Water Board. Receiving water monitoring efforts in this Order have been streamlined to redirect resources to monitoring efforts that better support pollutant reduction solutions with an increasing emphasis on MS4 outfall monitoring, source identification and source abatement activities.

In addition to the receiving water monitoring requirements under Provisions D.1.b-d, Provision D.1.e requires the Copermittees participate in and/or conduct other types of receiving water monitoring. As recommended and requested by the Copermittees, Provision D.1.e.(1) requires the Copermittees to participate in existing regional monitoring, as applicable to each Watershed Management Area. Existing regional monitoring includes monitoring conducted by the Storm Water Monitoring Coalition

and for the Southern California Bight. Participation in and use of monitoring data collected from these existing regional water quality monitoring programs provide the Copermittees a greater opportunity for efficiency in the use of their resources to manage their storm water programs and those controllable discharges under their authority.

The State Water Resources Control Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part 1 Sediment Quality which became effective August 25, 2009 (Sediment Quality Monitoring Policy). Provision D.1.e.(2) requires any Copermittees with MS4 discharges to an enclosed bay or estuary to monitoring the sediments in the enclosed bay or estuary receiving water in accordance with the sediment quality monitoring procedures as prescribed in the Sediment Quality Monitoring Policy.

The State Water Board adopted Resolution No. 2012-0012 which approved exceptions to the California Ocean Plan for selected discharges into Areas of Special Biological Significance (ASBS), including special protections for beneficial uses. State Board Resolution No. 2012-0012 became effective on March 20, 2012, and Attachment B to the Resolution established limitations on point source storm water discharges to ASBS. Copermittees with MS4s that discharge to an ASBS must monitor its discharge to assure compliance with State Board Resolution No. 2012-0012 as required pursuant to Provision D.1.e.(3).

The San Diego Water Board is currently developing a regional monitoring strategy to assess the conditions of receiving waters in the San Diego Region. The monitoring requirements of Provision D.1 are expected to be incorporated or serve as a foundation of this regional monitoring strategy, but may require some modifications. When the San Diego Water Board develops an alternative regional monitoring strategy, the Copermittees will be required to participate in the development and implementation of the alternative regional monitoring program pursuant to Provision D.1.f.

Provision D.2 (MS4 Outfall Discharge Monitoring Requirements) specifies the minimum MS4 outfall discharge monitoring requirements that the Copermittees must incorporate and implement as part of the Water Quality Improvement Plan.

The dry weather MS4 outfall discharge monitoring requirements are included under Provisions D.2.a.(2) and D.2.b. The dry weather MS4 outfall discharge monitoring requirements are part of the "*program, including a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer*" required by 40 CFR 122.26(d)(2)(iv)(B), which is expected to achieve compliance with the CWA section 402(p)(3)(B)(ii) statutory requirement for municipal storm water permits to require the Copermittees to "*effectively prohibit non-storm water discharges into the storm sewers*." The dry weather MS4 outfall discharge monitoring data

collection requirements are based on requirements under 40 CFR 122.26(d)(1)(iv)(D) and 122.26(d)(2)(iv)(B)(3).

The dry weather MS4 outfall discharge monitoring requirements are designed to provide wide spatial and temporal coverage of each jurisdiction to better understand the extent and magnitude of non-storm water discharges to receiving waters, and make a distinction between persistent and transient non-storm water flows. This information is expected to allow each Copermittee to focus its resources on eliminating and controlling the highest priority threats to receiving water quality, as well as integrating other elements of the storm water programs (e.g. complaint call response) and third party data to efficiently and effectively assist in efforts to eliminate non-storm water discharges.

The dry weather MS4 outfall discharge monitoring requirements of Provision D.2.a.(2) and D.2.b are separated into monitoring required before and after the San Diego Water Board accepts the Copermittees' Water Quality Improvement Plan. Outfall monitoring conducted prior to acceptance of the Water Quality Improvement Plan is referred to in the Order as Transitional MS4 Outfall Discharge Monitoring. Provision D.2.a.(2) includes the transitional dry weather MS4 outfall discharge monitoring requirements.

The requirements under Provision D.2.a.(2) are based on the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B), which include the requirements for a monitoring program to identify, detect, and eliminate illicit connections and illegal discharges to the MS4s. The federal regulations (40 CFR 122.26(d)(1)(iv)(D)) require the monitoring program to include "*a field screening analysis for illicit connections and illegal dumping [that]…[a]t a minimum, include[s] a narrative description, for either each field screening point or major outfall, of visual observations made during dry weather periods.*" The federal regulations (40 CFR 122.26(d)(1)(v)(B)) require the monitoring program to include "*inspection procedures and methods for detecting and preventing illicit discharges, and describe areas where this program has been implemented.*" Furthermore, the monitoring program is required by federal regulations (40 CFR 122.26(d)(2)(iv)(B)) to include "*a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer.*"

Dry weather transitional MS4 outfall discharge monitoring requires each Copermittee to field screen (inspect) its major MS4 outfalls to classify the MS4 outfall locations as having persistent dry weather flows, transient dry weather flows, or no dry weather flows. To account for the variance in size of the 39 jurisdictions covered under this Order, the Copermittees recommended a tiered approach to the number of major MS4 outfalls that must be inspected. Provision D.2.a.(2)(a) provides a tiered approach to the number of major MS4 outfalls that must be visually inspected per jurisdiction as well as a minimum frequency each Copermittee must inspect each major MS4 outfall per year. This tiered approach is based on the total number of major MS4 outfalls within a Copermittees jurisdiction within each Watershed Management Area.

Based on the field screening, each Copermittee is required to make a determination whether any observed flowing, pooled, or ponded waters are transient or persistent flows. Based on this field screening information, other jurisdictional program information, and third party information, each Copermittee is required to prioritize the MS4 outfalls within its jurisdiction for follow up investigation and elimination of the non-storm water discharge, as part of its illicit discharge detection and elimination program required pursuant to Provision E.2. In accordance with the requirements of Provision E.2, each Copermittee is required to immediately investigate obvious illicit discharges (e.g. outfall discharges with unusual color, unusual odor, or high flows).

This approach allows a Copermittee to use all of its resources, as well as leverage resources and information provided by third parties, to effectively eliminate non-storm water discharges from its MS4 outfalls. If the source of the non-storm water discharge cannot be immediately eliminated, the Copermittee uses the persistent flow or transient flow classification along with other programmatic implementation data to prioritize the MS4 outfalls for future investigation. In accordance with the adaptive management approach deployed throughout this Order, Provision D.2.a.(2)(c) requires each Copermittee to update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow. The requirement of Provision D.2.a.(2)(c) assures that each Copermittee is collecting data that can be used to demonstrate compliance with the CWA requirement that each Copermittee must implement a program to "*effectively prohibit non-storm water discharges into the [MS4]*" and with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

Provision D.2.b describes the dry weather MS4 outfall discharge monitoring required to be incorporated and implemented as part of the Water Quality Improvement Plan. Dry weather MS4 outfall discharge monitoring must be performed by each Copermittee to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to E.2.d. The emphasis of the dry weather MS4 outfall discharge monitoring required pursuant to Provision D.2.b is consistent with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

Provision D.2.b.(1) requires each Copermittee to continue field screening its major MS4 outfalls and identifying those with persistent flows and transient flows, as conducted during the transitional period (i.e. before the Water Quality Improvement Plan was developed). However, each Copermittee now has the flexibility to adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of non-storm water persistent flow discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan. In order to ensure a minimum number of outfalls are inspected, Provision D.2.b.(1) requires the number of visual

inspections be equal to the number of visual inspections required in the tiered inspection program pursuant to Provision D.2.a.(2)(a).

Provision D.2.b.(2)(b) requires each Copermittee to monitor a minimum of 5 major MS4 outfalls with persistent flows identified as the highest priorities within a Copermittee's jurisdiction, within each Watershed Management Area. In other words, Copermittees located in more than one Watershed Management Area must identify at least 5 major MS4 outfalls with persistent flows in its jurisdiction in each Watershed Management Area. If a Copermittee is located in more than one Watershed Management Area, and they have less than 5 major MS4 outfalls with persistent flows per jurisdictional area per Watershed Management Area, all of the major MS4 outfalls must be identified as high priority dry weather persistent flow MS4 outfalls. The Copermittees identified as Responsible Copermittees by a TMDL in Attachment E of the Order may need to monitor more than 5 dry weather major MS4 outfall locations to determine compliance with the requirements of the TMDL(s).

Monitoring must occur at the highest priority outfall locations at least semi-annually until the non-storm water discharges have been eliminated for three consecutive dry weather monitoring events; identified to be authorized by a separate NPDES Permit; or reprioritized to a lower priority. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized MS4 major outfall in the Copermittee's jurisdiction within the Watershed Management Area, unless there are no remaining qualifying major MS4 outfalls within the Copermittees jurisdiction. The Copermittees must continually update their dry weather persistent flow MS4 outfall discharge monitoring locations with the next highest priority non-storm water flow that have yet to be eliminated until all persistent and transient flows are eliminated or its threat reduced.

Non-storm water persistent flow MS4 outfall discharge monitoring data collected during each semi-annual monitoring event, must be collected and analyzed according to the requirements of Provision D.2.b.(2)(b)–(e). These monitoring requirements are consistent with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

The wet weather MS4 outfall discharge monitoring requirements are included under Provisions D.2.a.(3) and D.2.c. The wet weather MS4 outfall discharge monitoring requirements are necessary for the Copermittees to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable, using management practices, control techniques and system, design and engineering methods, and such other provisions which are appropriate*" required by 40CFR 122.26(d)(2)(iv), which is expected to achieve compliance with the CWA section 402(p)(3)(B)(iii) statutory requirement for municipal storm water permits to require "*controls to reduce the discharge of pollutants [in storm water] to the maximum extent practicable*." The wet weather MS4 outfall discharge monitoring data collection requirements are based on requirements under 40 CFR 122.26(d)(2)(iii), 122.26(d)(2)(iii)(A) and 122.26(d)(2)(iii)(A)(1)-(4), and 40 CFR 122.21(g)(7)(i)-(ii).

The wet weather MS4 outfall discharge monitoring requirements of Provision D.2.a.(3) and D.2.c are separated into monitoring required before and after the San Diego Water Board accepts the Copermittees' Water Quality Improvement Plan. Outfall monitoring conducted prior to acceptance of the Water Quality Improvement Plan is referred to in the Order as Transitional MS4 Outfall Discharge Monitoring. Provision D.2.a.(3) includes the transitional wet weather MS4 outfall discharge monitoring requirements.

Until the wet weather MS4 outfall discharge monitoring requirements of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board, the Copermittees must comply with the requirements of transitional wet weather MS4 outfall monitoring requirements pursuant to Provision D.2.a.(3). Provision D.2.a.(3) requires each Copermittee to sample, at least five of the major MS4 outfalls inventoried pursuant to Provision D.2.a.(1) ~~twice~~ once per wet season for the monitoring data required to be collected pursuant to Provision D.2.a.(3)(c)-(e).

At a minimum, the five sampling locations chosen must be representative of storm water discharges from residential, commercial, industrial, and typical mixed-use land uses present within a Watershed Management Area. The San Diego Water Board expects the Copermittees to extrapolate from these data to similar land uses throughout the Watershed Management Area to better inform the Water Quality Improvement Plan development process by prioritizing drainages for implementation of storm water control efforts required pursuant to Provision E.

Provision D.2.c describes the wet weather MS4 outfall discharge monitoring required to be included and implemented as part of the Water Quality Improvement Plan. Provision D.2.c provides the Copermittees the flexibility to adjust the wet weather MS4 outfall discharge monitoring locations and frequencies in the Watershed Management Area, as needed, to identify sources of pollutants in storm water discharges from MS4s in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan.

Although Provision D.2.c.(1) allows the Copermittees to adaptively manage the wet weather MS4 outfall discharge monitoring locations and frequencies, the provision requires a minimum of at least five wet weather outfall stations to be monitored. Provision D.2.c.(2) further allows the Copermittees to modify the monitoring frequency at each wet weather MS4 outfall station to meet the goals of the Water Quality Improvement Plan as long as the monitoring frequency occurs at least once per year and is at an appropriate frequency to identify sources of pollutants in storm water discharges, guide pollutant source identification efforts, or determine compliance with the requirements of the applicable TMDLs in Attachment E to the Order.

The wet weather MS4 outfall discharge monitoring requirements of Provisions D.2.c.(3) and D.2.c.(4) are the same as the transitional wet weather MS4 outfall

discharge monitoring. In contrast, the requirements of Provision D.2.c.(5) are focused on collecting analytical data specific to the highest priority water quality conditions in the Watershed Management Area identified in the Water Quality Improvement Plan. The wet weather MS4 outfall discharge monitoring data collection requirements are consistent with the requirements under 40 CFR 122.26(d)(2)(iii), 122.26(d)(2)(iii)(A) and 122.26(d)(2)(iii)(A)(1)-(4), and 40 CFR 122.21(g)(7)(i)-(ii).

Provision D.3 (Special Studies) requires the Copermittees to develop special studies that will be conducted for each Watershed Management Area and the entire San Diego Region. Data collected pursuant to Provision D.3 is to be used by the Copermittees to improve the effectiveness of the strategies implemented by the jurisdictional runoff management programs toward achieving the numeric goals identified in the Water Quality Improvement Plans and ultimately achieve compliance with the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c, and A.2.a, which is consistent with the requirements of Provision A.4.

Special studies are often necessary to fill data gaps or provide more refined information that allow the Copermittees to better manage the generation or elimination of pollutants and discharges to and from the MS4. In the Fourth Term Permits, the Copermittees have been required to implement special studies as directed by the San Diego Water Board. The special studies required by this Order provide the Copermittees more flexibility to identify and implement special studies that will be most useful to improving the effectiveness of their jurisdictional runoff management programs.

Provision D.3.a.(1) requires the Copermittees to develop and conduct at least two special studies per Watershed Management Area, to be determined by the Copermittees. One of the two special studies may be accomplished through participation in a Regional Special Study required under Provision D.3.a.(2). The requirements provide the Copermittees great latitude in identifying and developing the special studies. Watershed Management Area special studies are required, at a minimum, to: (a) relate in some way to the highest water quality priorities identified by the Copermittees in the Water Quality Improvement Plan, (b) be conducted within the Watershed Management Area, and (c) include some form of participation (e.g. contribution of funds, personnel services, project management) by all the responsible Copermittees within the Watershed Management Area.

Examples of Watershed Management Area special studies might include, but are not limited to: (1) focused pollutant source identification studies, (2) BMP effectiveness and/or comparison studies, (3) pilot tests for new or emerging pollutant control methods, (4) receiving water pollutant or stressor source identification and/or mitigation studies, or (5) pollutant fate and transport studies. The Watershed Management Area special studies are expected to provide data that can be utilized by the Copermittees to improve the Water Quality Improvement Plan or implementation of the Copermittees' jurisdictional runoff management programs to address the highest priority water quality conditions.

Provision D.3.a.(2) requires the Copermittees to develop at least one special study that will be conducted for the entire San Diego region. The regional special study is expected to provide data that can be utilized by the Copermittees to improve the Water Quality Improvement Plan or implementation of the Copermittees' jurisdictional runoff management programs to identify or address regional water quality concerns and priorities.

An example of a regional special study would be to develop and establish allowable exceedance frequencies of the bacteria water quality objectives for several types of water bodies, during different wet and dry weather conditions the San Diego region. The special study would be related to bacteria, which is a priority for the San Diego region due to the adoption of "*Bacteria TMDL Project I – Beaches and Creeks in the San Diego Region*." The study results could be used to inform the Copermittees and the San Diego Water Board about the indictor bacteria water quality objective exceedance frequencies that occur in natural or reference watersheds.

Provision D.4 (Assessment Requirements) specifies the assessments that the Copermittees are required to perform, based on the monitoring data collected, and will be reported as part of the Annual Report for the Water Quality Improvement Plan implementation. Provision D.4 requires the Copermittees assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c, and A.2.a.

Provision D.4 specifies the assessments that Copermittees must perform for each Watershed Management Area to assess the effectiveness of each Copermittee's jurisdictional runoff management program and the Water Quality Improvement Plan. The effectiveness of each Copermittee's jurisdictional runoff management program and Water Quality Improvement Plan is measured through these types of assessments: (a) Receiving Waters Assessments (b) MS4 Outfall Discharges Assessments, (c) Special Studies Assessments, and (d) Integrated Assessment of Water Quality Improvement Plan.

Provision D.4.a requires the Copermittees to assess the status of receiving water conditions annually during the transitional monitoring period (during development of the Water Quality Improvement Plan) and after acceptance of the Water Quality Improvement Plan. The monitoring data collected pursuant to Provision D.1 will be evaluated, among other information, to assess the condition of a Watershed Management Area's streams, coastal waters, enclosed bays, harbors, estuaries, and lagoons. The focus of the receiving waters assessments is to measure progress toward the objective of the CWA to "*restore and maintain the chemical, physical, and biological integrity of the Nation's waters*" as the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program are implemented within a Watershed Management Area. Provision D.4.a is consistent with 40 CFR 122.42(c)(7) which requires the Copermittees to annually report the *"[i]dentification of water quality improvements or degradation."*

Provision D.4.b includes the MS4 outfall discharges assessment requirements. The focus of MS4 outfall discharges assessments is to determine if the Copermittees' are implementing programs that comply with the requirements of the CWA for MS4 permits to "*effectively prohibit non-stormwater discharges into the storm sewers*" and "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable.*" The monitoring data collected pursuant to Provisions D.2 will be evaluated, among other information, to assess the effectiveness of the transitional MS4 outfall field screening monitoring, the implementation of the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program. The MS4 outfall discharge assessments consist of Non-Storm Water Discharges Reduction Assessments and Storm Water Pollutant Discharges Reduction Assessments.

The Non-Storm Water Discharges Reduction Assessments are how each Copermittee will demonstrate that its jurisdictional runoff management program implementation efforts are achieving the CWA requirement to "*effectively prohibit non-stormwater discharges into the storm sewers.*" Provision D.4.b.(1) requires each Copermittee to assess and report on its illicit discharge detection and elimination program required pursuant to Provision E.2 to reduce and effectively prohibit non-storm water and illicit discharges into the MS4 within its jurisdiction. The Non-Storm Water Discharges Reduction Assessments include specific assessment requirements applicable to each Copermittee.

As each Copermittee collects and analyzes the data collected pursuant to dry weather MS4 outfall discharges monitoring requirements of Provisions D.2.a.(2) and D.2.b, Provision D.4.b.(1) requires each Copermittee to assess the progress, assess the effectiveness of its current actions, and identify modifications necessary to increase the effectiveness of its actions toward reducing and eliminating non-storm water and illicit discharges to its MS4. The findings from these assessments are expected to be utilized by the Copermittee as part of its procedures to prioritize the non-storm water discharges that will be addressed by its Illicit Discharge Detection and Elimination program required pursuant to Provision E.2.

The assessment requirements of Provision D.4.a.(1) are consistent with 40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(3) which require "*procedures…to investigate portions of the separate storm sewer system that, <u>based on the results of the field screen, or other appropriate information</u> [emphasis added], indicate a reasonable potential of contain illicit discharges or other sources of non-storm water*" as part of a "*program…to detect and remove…illicit discharges and improper disposal into the storm sewer.*" The assessment requirements of Provision D.4.a.(1) are also consistent with 40 CFR122.42(c)(1) requires the Copermittees to annually report the "*status of implementing the components of the storm water management program that are established as permit conditions.*"

The Storm Water Pollutant Discharges Reduction Assessment is how the Copermittees in each Watershed Management Area will demonstrate that their jurisdictional runoff management program implementation efforts are achieving the CWA requirement to "*reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable*." Provision D.4.b.(2) requires the Copermittees in each Watershed Management Area to assess and report the progress of the Copermittees' efforts to reduce pollutants in storm water discharges from the MS4s to the MEP. The Storm Water Pollutant Discharges Reduction Assessments include specific assessment requirements during both the transitional monitoring period and after acceptance of the Water Quality Improvement Plan applicable to the Watershed Management Area and each Copermittee.

As the Copermittees collect and analyze the data collected pursuant to wet weather MS4 outfall discharges monitoring requirements of Provisions D.2.a.(3) and D.2.c, Provision D.4.b.(2) requires the Copermittees to assess runoff conditions during the transitional period, and the progress of the Water Quality Improvement Plan strategies toward reducing pollutants in storm water from the MS4 to the MEP. The findings from these assessments are expected to be utilized by the Copermittees to identify any modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify sources of pollutants in storm water discharges from the MS4s, as well as focus, modify, and improve the water quality improvement strategies implemented by each Copermittee within its jurisdiction to reduce pollutants in storm water discharges to the MEP.

The assessment requirements of Provision D.4.b.(2) are consistent with 40 CFR 122.26(d)(2)(iii)(B) which requires "*[e]stimates of the annual pollutant load of the cumulative discharges to waters of the United States from all identified municipal outfalls…during a storm event…accompanied by a description of the procedures for estimating constituent loads and concentrations, including any modeling, data analysis, and calculation methods.*" The assessment requirements of Provision D.4.a.(2) are consistent with 40 CFR 122.26(d)(2)(v) which requires that each Copermittee assesses the *"estimated reductions in loadings of pollutants from discharges of municipal storm sewer constituents from municipal storm sewer systems expected as the result of the municipal storm water quality management program."* The assessment requirements of Provision D.4.b.(2) are also consistent with 40 CFR122.42(c)(1) requires the Copermittees to annually report the "*status of implementing the components of the storm water management program that are established as permit conditions.*"

Provision D.4.c includes the special studies assessment requirements. Performing special studies are how the Copermittees will address data gaps identified during the development of and updates to the Water Quality Improvement Plan The relevant findings from the special studies assessments are expected to be incorporated as part of the applicable receiving water assessments, MS4 outfall discharge assessments, and integrated water quality improvement assessments required in Provision D.4.a, D.4.b, and D.4.d, respectively.

The assessment requirements in Provision D.4.d are part of the iterative approach and adaptive management process required by Provision A.4. The Copermittees are required to integrate the data collected pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision D to re-evaluate the Water Quality Improvement Plan.

The monitoring data collected pursuant to Provisions D.1 and D.2, and the results of the assessment required pursuant to Provisions D.4.a-c, will be used to determine whether the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program are effective, or require modifications or improvements to become more effective to achieve the requirements of the CWA. The assessments required by Provision D.4.d are consistent with 40 CFR 122.42(c)(1) which requires that the Copermittees to report the *"[t]he status of implementing the components of the storm water management program that are established as permit conditions."*

E. Jurisdictional Runoff Management Programs

Purpose: Provision E includes the requirements for the jurisdictional runoff management programs to be implemented by each of the Copermittees. Compliance with the requirements for the jurisdictional runoff management programs will allow the Copermittees to demonstrate that they are implementing programs to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP. The jurisdictional runoff management program document prepared by each Copermittee will also provide the details for implementing the water quality improvement strategies identified in the Water Quality Improvement Plan specifically within its jurisdiction.

***Discussion*:** Implementation of the jurisdictional runoff management program requirements under Provision E is how the Copermittees "*effectively prohibit non-stormwater discharges into the storm sewers*", and outlines the "*controls to reduce the discharge of pollutants to the maximum extent practicable"* consistent with the federal regulations under 40 CFR 122.26. The jurisdictional runoff management program is part of the "*comprehensive planning process*" that is required pursuant to 40 CFR 122.26(d)(2)(iv). Where the Water Quality Improvement Plan is the "*comprehensive planning process*" on a Watershed Management Area scale, requiring "*intergovernmental coordination*", the jurisdictional runoff management program document is the "*comprehensive planning process*" on a jurisdictional scale that should be coordinated with the other Copermittees in the Watershed Management Area to achieve the goals of the Water Quality Improvement Plan.

The jurisdictional runoff management program requirements are included to provide each Copermittee criteria that can be used to demonstrate that its storm water management program is implementing the "*comprehensive planning process*" within its jurisdiction to "*effectively prohibit non-stormwater discharges into the storm sewers*", and to identify and implement the most effective "*controls to reduce the discharge of pollutants to the maximum extent practicable"* in accordance with the performance standards given in the CWA.

Provision E includes the requirements for each of the components that must be included in the Copermittee's jurisdictional runoff management program document that will be implemented by the Copermittee within its jurisdiction. Implementation of the components of each Copermittee's jurisdictional runoff management program must incorporate the water quality improvement strategies identified by each Copermittee in the Water Quality Improvement Plans, described pursuant to Provision B.3.b.(1)(a).

More specific and detailed discussions of the requirements of Provision E are provided below.

Provision E.1 (Legal Authority Establishment and Enforcement) requires to each Copermittee to establish and enforce sufficient legal authority to control discharges to the MS4 within its jurisdiction.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system*" and be able to demonstrate that it can "*operate pursuant to legal authority established by statute, ordinance or series of contracts.*" Provision E.1.a describes the minimum legal authorities each Copermittee must establish for itself within its jurisdiction to control discharges to its MS4 The requirements of Provision E.1.a are consistent with the requirements set forth in 40 CFR 122.26(d)(2)(i)(A)-(F).

The certification statement required from each Copermittee by Provision E.1.b is included to provide the San Diego Water Board additional documentation that each Copermittee has established the legal authorities consistent with Provision E.1.a and 40 CFR 122.26(d)(2)(i)(A)-(F), and the Copermittee can "*operate pursuant to legal authority established by statute, ordinance or series of contracts.*"

Provision E.2 (Illicit Discharge Detection and Elimination) requires each to Copermittee to implement an illicit discharge detection and elimination program to effectively prohibit non-storm water discharges to the MS4 by actively detecting and eliminating illicit discharges and disposal into its MS4.

Provision E.2 establishes the minimum requirements that each Copermittee must implement within its jurisdiction to effectively prohibit non-storm water discharges from entering its MS4. The federal CWA requires permits for municipal storm sewer systems to "*effectively prohibit non-storm water discharges into the storm sewers*." The federal regulations (40CFR122.26(d)(2)(i)(B)) require each Copermitee to establish the legal authority to prohibit illicit discharges to its MS4s. Under 40 CFR 122.26(d)(2)(iv)(B), each Copermittee must implement a "*program…to detect and remove…illicit discharges and improper disposal into the storm sewer.*" The federal NPDES regulations, under 40 CFR 122.26(b)(2), define illicit discharges as "*any discharge to a municipal separate storm sewer that is not composed entirely of storm water*. Thus, non-storm water discharges are not authorized to enter the MS4 and are considered to be illicit discharges, unless authorized by a separate NPDES permit.

The Phase I Final Rule clarifies that non-storm water discharges through an MS4 are not authorized under the CWA (55 FR 47995):

> "*Today's rule defines the term "illicit discharge" to describe any discharge through a municipal separate storm sewer system that is not composed entirely of storm water and that is not covered by an NPDES permit. Such illicit discharges are not authorized under the Clean Water Act. Section 402(p(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…Ultimately, such non-storm water discharges through a municipal separate*

> *storm sewer must either be removed from the system or become subject to an NPDES permit*."

The federal NPDES requirements for the program to address illicit discharges must include "*inspections, to implement and enforce an ordinance, orders, or other similar means to prevent illicit discharges to the MS4*." The federal NPDES regulations also reference several categories of "*non-storm water discharges or flows* [which] *shall be addressed where such discharges are identified…as sources of pollutants to waters of the United States*." The Phase I Final Rule (55 FR 48037) further clarified the requirements of 40 CFR 122.26(d)(2)(iv)(B)(1) as follows:

> "*EPA is clarifying that section 402(p)(3)(B) of the CWA (which requires permits for municipal separate storm sewers to 'effectively' prohibit non-storm water discharges) does not require permits for municipalities to prohibit certain discharges or flows of nonstorm water to waters of the United States through municipal separate storm sewers in all cases*."

In previous iterations of the municipal storm water permits for the San Diego Region, these categories were simply listed and referred to as categories of non-storm water discharges "not prohibited" unless identified as a source of pollutants. The Copermittees have often referred to these categories as "exempt" discharges. In both cases, however, the language is inconsistent with the federal CWA and NPDES regulations. And, the clarification provided in the Phase I Final Rule does not specifically state that such discharges are "not prohibited" or "exempt" or in any way authorized. The federal NPDES regulations do, however, state that specific categories of non-storm water discharges must be "*addressed*" if identified as "*sources of pollutants to waters of the United States*."

The language of Provision E.2.a has been revised to be fully consistent with the language of the CWA and the requirements of the federal regulations under 40 CFR 122.26(d)(2)(iv)(B)(1). Provision E.2.a requires each Copermittee to address <u>all</u> types of non-storm water discharges into its MS4 as illicit discharges, <u>unless</u> the discharge is authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to Provisions E.2.a.(1) through E.2.a.(5). Only non-NPDES-permitted non-storm water discharges identified as a category of non-storm water discharges under Provisions E.2.a.(1) through E.2.a.(5) <u>and</u> *not identified as a source of pollutants* do not have to be addressed as illicit discharges. Categories of non-storm water discharges that meet the requirements of Provisions E.2.a.(1) through E.2.a.(5) do not have to be addressed by the Copermittee as illicit discharges.

Several of the non-storm water categories listed in 40 CFR 122.26(d)(2)(iv)(B)(1) have not been included in Provisions E.2.a.(1) through E.2.a.(5), including: street wash water, landscape irrigation, irrigation water, and lawn watering. Because these are no longer included within the categories listed under Provisions E.2.a.(1) through E.2.a.(5), the Copermittees must prohibit these types of non-storm water discharges

from entering the MS4. This is consistent with the clarification of 40 CFR 122.26(d)(2)(iv)(B)(1) in the Phase I Final Rule (55 FR 48037), which states:

> "*[T]he Director may include permit conditions that either require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*."

Street wash water is a category of non-storm water discharges that was removed when the Third Term Permits were issued. Street wash water is a source of several pollutants (e.g., metals, oil and grease, petroleum hydrocarbons, chlorinated solvents, sediment) which are generated during the street washing process. The removal of this category requires the Copermittees to prohibit this type of non-storm water discharge from entering the MS4.

The landscape irrigation, irrigation water, and lawn watering categories, collectively referred to hereafter as "over-irrigation" discharges, were removed from the list of non-storm water discharge categories in the Fourth Term Orange County and Riverside County Permits. Non-storm water discharges resulting from over-irrigation have been found to be a source of several types of pollutants (e.g., nutrients, bacteria, pesticides, sediment) in receiving waters. The San Diego Water Board and the Copermittees have identified categories of non-storm water discharges associated with over-irrigation as a source of pollutants and conveyance of pollutants to the MS4 and waters of the United States in the following documents:

- **SmartTimer/Edgescape Evaluation Program (SEEP) Grant Application**

  The State Water Board allocated grant funding to the SEEP project grant application submitted in 2006, which targeted irrigation runoff by retrofitting areas of existing development and documenting the conservation and runoff improvements. The basis of this grant project is that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 is a source and conveyance of pollutants. In addition, the grant application indicated that this alteration of natural flows is impacting the beneficial uses of waters of the state and U.S. Results from the study indicate that that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 *is* a source and conveyance of pollutants. The results of this study can be applied broadly to any area where over-irrigation takes place. The grant application included the following statements:

  > "*Irrigation runoff contributes flow & pollutant loads to creeks and beaches that are 303(d) listed for bacteria indicators.*"
  >
  > "*Regional program managers agree that the reduction and/or elimination of irrigation-related urban flows and associated pollutant loads may be key to successful attainment of water quality and beneficial use goals as outlined in the San Diego Basin Plan and Bacteria TMDL over the long term.*"
  >
  > "*Elevated dry-weather storm drain flows, composed primarily … of landscape*

irrigation water wasted as runoff, carry pollutants that impair recreational use and aquatic habitats all along Southern California's urbanized coastline. Storm drain systems carry the wasted water, along with landscape derived pollutants such as bacteria, nutrients and pesticides, to local creeks and the ocean. Given the local Mediterranean climate, excessive perennial dry season stream flows are an unnatural hydrologic pattern, causing species shifts in local riparian communities and warm, unseasonal contaminated freshwater plumes in the near-shore marine environment."

- **2006-2007 Orange County Watershed Action Plan Annual Reports**

The Watershed Action Plan Annual Reports for the 2006-2007 reporting period were submitted by the County of Orange, Orange County Flood Control District and Copermittees within the San Juan Creek, Laguna Coastal Streams, Aliso Creek, and Dana Point Coastal Streams Watersheds. San Juan Creek, Laguna Coastal Streams, Aliso Creek and Dana Point Coastal Streams are all currently 303(d) listed as impaired for indicator bacteria within their watersheds and/or in the Pacific Ocean at the discharge points of their watersheds. The Orange County Copermittees, within their Watershed Action Strategy Table for fecal indicator bacteria included the following:

"*Support programs to reduce or eliminate the discharge of anthropogenic dry weather nuisance flow throughout the…watershed. Dry weather flow is the transport medium for bacteria and other 303(d) constituents of concern.*"

Additionally, they state that "*conditions in the MS4 contribute to high seasonal bacteria propagation in-pipe during warm weather. Landscape irrigation is a major contributor to dry weather flow, both as surface runoff due to over-irrigation and overspray onto pavements; and as subsurface seepage that finds its way into the MS4*."

- **Fiscal Year 2008 Carlsbad Watershed Urban Runoff Management Program Annual Report**

The Carlsbad Watershed Urban Runoff Management Program Annual Report for Fiscal Year 2008 was submitted by the Carlsbad Watershed Copermittees (Cities of Carlsbad, Encinitas, Escondido, Oceanside, San Marcos, Solana Beach, and Vista, and the County of San Diego). In the Annual Report, the Carlsbad Watershed Copermittees stated the following:

"The Carlsbad Watershed Management Area (WMA) collective watershed strategy identifies bacteria, sediment, and nutrients as high priority water quality pollutants in the Agua Hedionda (904.3 – bacteria and sediment), Buena Vista (904.2 – bacteria), and San Marcos Creek (904.5 – nutrients) Hydrologic Areas. Bacteria, sediment, and nutrients have been identified as potential discharges

from over-irrigation."

- **2007-2008 San Diego Bay Watershed Urban Runoff Management Program Annual Report**

  The San Diego Bay Watershed Urban Runoff Management Program 2007-2008 Annual Report was submitted by the San Diego Bay Watershed Copermittees (Cities of Chula Vista, Coronado, Imperial Beach, La Mesa, Lemon Grove, National City, and San Diego, the County of San Diego, the Port of San Diego, and the San Diego County Airport Authority). In Appendix D of the Annual Report, titled "Likely Sources of Pollutants", the San Diego Bay Watershed Copermittees identified over-irrigation of lawns as a pollutant generating activity from business and/or residential land uses for bacteria, pesticides, and sediment.

- **Copermittee Public Education Materials**

  The Orange County Public Works *Tips for Landscape & Gardening* public education brochure states: "*Fertilizers, pesticides and other chemicals that are left on yards or driveways can be blown or washed into storm drains that flow to the ocean. Overwatering lawns can also send materials into storm drains*."

  The Riverside County Flood Control and Water Conservation District *Landscape and Garden* public education brochure states: *"Soil, yard wastes, over-watering and garden chemicals become part of the urban runoff mix that winds its way through streets, gutters and storm drains before entering lakes, rivers, streams, etc. Urban runoff pollution contaminates water and harms aquatic life!"*

- **Los Penasquitos Lagoon Sedimentation/Siltation TMDL Technical Report**

  The Los Penasquitos Lagoon Sedimentation/Siltation TMDL technical report was prepared for the City of San Diego and USEPA in October 2010. The technical report was included as a technical supporting document attached to the Sediment TMDL for Los Penasquitos Lagoon staff report prepared by the San Diego Water Board, dated June 13, 2012. Under the Source Assessment section, the technical report states the following:

  > "*Dry weather loading is dominated by nuisance flows from urban land use activities such as car washing, sidewalk washing, and lawn over-irrigation, which pick up and transport sediment into receiving waters.*"

These documents confirm that non-storm water discharges associated with over-irrigation are a source of pollutants and should be addressed as illicit discharges to the MS4. Prohibiting non-storm water discharges associated with over-irrigation, however,

is not a new requirement for the Copermittees because it is also consistent with and required by the Water Conservation in Landscaping Act (AB 1881, Laird).

The Water Conservation in Landscaping Act required the Department of Water Resources (DWR) to prepare a Model Water Efficient Landscape Ordinance for use by local agencies (e.g. the Copermittees). All local agencies were required to adopt a water efficient landscape ordinance by January 1, 2010. Local agencies could adopt the Water Efficient Landscape Ordinance developed by DWR, or an ordinance considered at least as effective as the Model Ordinance. The Water Efficient Landscape Ordinance includes a requirement that local agencies prohibit runoff from irrigation (§ 493.2):

> "*Local agencies shall prevent water waste resulting from inefficient landscape irrigation by* <u>*prohibiting runoff from leaving the target landscape*</u> *[emphasis added] due to low head drainage, overspray, or other similar conditions where water flows onto adjacent property, non-irrigated areas, walks, roadways, parking lots, or structures. Penalties for violation of these prohibitions shall be established locally*."

Furthermore, non-storm water discharges from over-irrigation not only transport and discharge pollutants to receiving waters, but are also a likely source of the dry weather flows causing changes to habitat within and along the receiving water bodies. Examples of habitat changes from the dry weather flows include perennialization of ephemeral streams, and conversion of saltwater and brackish water marsh habitats to freshwater marsh habitats (e.g. Los Penasquitos Lagoon). Both of these examples have resulted in the promotion of invasive species in several areas of the San Diego Region.

The removal of the over-irrigation discharges categories does not require the Copermittees to strictly prohibit lawn and landscape irrigation, but does require the prohibition of excessive irrigation water that results in non-storm water discharges to the MS4. Non-storm water discharges to the MS4 from over-irrigation must be addressed as illicit discharges by the Copermittees pursuant to the requirements of Provision E.2.

The remaining non-storm water categories listed in 40 CFR 122.26(d)(2)(iv)(B)(1) are listed under Provisions E.2.a.(1) through E.2.a.(5) and generally fall into four categories: (1) non-storm water discharges subject to existing San Diego Water Board waste discharge requirements and NPDES permits; (2) non-storm water discharges generally not expected to be a source of pollutants to receiving waters; (3) non-storm water discharges likely to contain pollutants requiring some form of control to address the pollutants prior to discharging to the MS4; and (4) non-storm water discharges or flows associated with firefighting.

Provisions E.2.a.(1) and E.2.a.(2) include several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) for which the San Diego Water Board already has developed general waste discharge requirements and NPDES

permits to address the discharges. The Copermittees are only required to address these types of non-storm water discharges as illicit discharges if the Copermittees or the San Diego Water Board identifies these non-storm water discharges not having coverage under the applicable NPDES permit.

Provision E.2.a.(3) includes several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) which are generally not expected to be a source of pollutants to receiving waters, many of which originate from what are typically natural, uncontrollable sources. The Copermittees are only required to address these types of non-storm water discharges as illicit discharges if the Copermittees or the San Diego Water Board identifies these non-storm water discharges as a source of pollutants to receiving waters. Because many of these sources are generally uncontrollable, enforcing a prohibition may not be a possibility for the Copermittees. The Copermittees would be able to address these non-storm water discharges by preventing these non-storm water discharges from entering the MS4. This could potentially be achieved by sealing their MS4 structures so the discharges cannot enter the MS4.

Provision E.2.a.(4) includes several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) that are likely to contain pollutants requiring some form of control to address the pollutants prior to discharging to the MS4. At this time, an outright prohibition of these types of non-storm water discharges does not yet appear to be warranted. Thus, Provision E.2.a.(4) has includes several requirements for the Copermittees to control the pollutants from these types of non-storm water discharges. This is consistent with the clarification of the federal regulations in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board has the authority to require the Copermittees to "*control any of these types of discharges where appropriate*."

Unlike non-storm water discharges from over-irrigation, these types of non-storm water discharges are not expected to occur in close proximity to each other or very frequently. Provided these types of non-storm water discharges are controlled as required in Provision E.2.a.(4), the Copermittees would only be required to address these types of non-storm water discharges as illicit discharges if the Copermittee or the San Diego Water Board identifies these non-storm water discharges as a source of pollutants to receiving waters.

Provision E.2.a.(5) includes specific requirements for fire fighting discharges and flows. The requirements for non-storm water discharges and flows associated with fire fighting have been separated into requirements for: a) non-emergency fire fighting discharges and flows, and b) emergency fire fighting discharges and flows.

The San Diego Water Board has found that discharges from building fire suppression system maintenance (e.g. fire sprinklers) contain waste and potentially a significant source of pollutants to receiving waters. As such, the San Diego Water Board is requiring these discharges be addressed as illicit discharges by the Copermittees.

Thus, the discharges to the MS4 are to be prohibited via ordinance, order or similar means. For other non-emergency fire fighting discharges and flows (i.e., flows from controlled or practice blazes, fire fighting training, and maintenance activities not associated with building fire suppression systems), the Copermittees are required to develop and implement a program to address pollutants in these non-storm water discharges and flows. This is consistent with the clarification of the federal regulations in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board has the authority to require the Copermittees to "*control any of these types of discharges where appropriate*."

For emergency fire fighting discharges and flows, the Phase I Final Rule (55 FR 48037) has clarified the requirements of 40 CFR 122.26(d)(2)(iv)(B)(1) pertaining to emergency fire fighting flows and discharges, which states:

> "*In the case of fire fighting it is not the intention of these rules to prohibit in any circumstances the protection of life and public or private property through the use of water or other fire retardants that flow into separate storm sewers*."

Thus, the requirements have been made to be consistent with the guidance provided by the Phase I Final Rule. The Order recommends that the Copermittees develop and encourage implementation of BMPs to reduce or eliminate the discharge of pollutants from emergency fire fighting flows to the MS4s and receiving waters. The Order does not include any requirements that should be interpreted as requiring the implementation of BMPs for emergency fire fighting flows to the MS4s and receiving waters.

The Copermittees are expected to review the dry weather MS4 outfall discharge monitoring data they collect to determine if and when there are non-storm water discharges to or from their MS4s that are a source of pollutants to receiving waters. If the Copermittees identify one of the types of non-storm water discharges listed in Provisions E.2.a.(1) through E.2.a.(4) as a source of pollutants to receiving waters based on the review and evaluation of monitoring data, Provision E.2.a.(6) requires the Copermittees to prohibit those categories of discharges from entering the MS4 through ordinance, order or similar means. In addition, Provision E.2.a.(6) clarifies that the San Diego Water Board may identify categories of non-storm water discharges or flows listed under Provisions E.2.a.(1) through E.2.a.(4) that must be prohibited.

Provision E.2.a.(6) also provides the Copermittees an option to propose controls to be implemented for the category of non-storm water discharges as part of the Water Quality Improvement Plan instead of prohibiting the category of non-storm water discharges. If the Water Quality Improvement Plan is accepted by the San Diego Water Board with the proposed controls, the Copermittees will not be required to prohibit the category of non-storm water discharges to their MS4s as long as the controls are implemented. This is consistent with the clarification of 40 CFR 122.26(d)(2)(iv)(B)(1) in the Phase I Final Rule (55 FR 48037), which states the San

Diego Water Board may "*require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*."

Finally, Provision E.2.a.(7) has been included in the requirements for non-storm water discharges to clarify that any non-storm water discharges to the Copermittee's MS4, even those identified pursuant to Provisions E.2.a.(1) through E.2.a.(4), must be reduced or eliminated, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit. Provision E.2.a.(7) is consistent with the requirements of CWA section 402(p)(3)(B)(ii) and 40 CFR 122.26(d)(1)(v)(B), as clarified in the Phase I Final Rule (55 FR 47995) that "*[u]ltimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit*." However, the reduction or elimination of those non-storm water discharges are expected to be achieved as feasible, in accordance with the priorities in the Water Quality Improvement Plan and when the resources are available to the Copermittee.

Consistent with 40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(1), each Copermittee must implement a "*program…to prevent illicit discharges to the municipal storm sewer system*" and "*detect…illicit discharges and improper disposal into the storm sewer.*" Provision E.2.b requires each Copermittee to implement measures to prevent and detect illicit discharges and connections to its MS4 as part of its illicit discharge detection and elimination program.

As part of the program to prevent and detect illicit discharges to the MS4, 40 CFR 122.26(d)(2)(iv)(B)(2) requires "*procedures to conduct on-going field screening activities during the life of the permit, including areas or locations that will be evaluated by such field screens*." As part of the procedures, each Copermittee is required to maintain an updated map of its entire MS4 and the corresponding drainage areas within its jurisdiction. Having knowledge about where inlets, access points, connections with other MS4s, and outfalls are located is necessary for each Copermittees to track, identify, and eliminate illicit discharges and connections. Thus, Provision E.2.b.(1) of the Order specifies that the map must include the segments of the storm sewer system owned, operated, and maintained by the Copermittee, and include locations of all known inlets, connections with other MS4s, and outfalls to the Copermittee's MS4. The remaining requirements of Provision E.2.b are consistent with the requirements of 40 CFR 122.26(d)(2)(iv)(B)(3)-(7) related to implementing measures to prevent and detect illicit discharges and connections to the MS4.

Provision E.2.c requires each Copermittee to conduct field screening and monitoring of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4. Field screening is a required element of the program to detect and eliminate illicit discharges and connections to the MS4, pursuant to 40 CFR 122.26(d)(2)(iv)(B)(2). The field screening requirement will be implemented through the dry weather MS4 outfall discharge monitoring required under Provisions D.2.a.(2) and D.2.b.(1).

Provision E.2.d specifies the measures each Copermittee must implement to eliminate illicit discharges and connections to its MS4. Elimination of illicit discharges and connections to the MS4 is consistent with the requirement of 40 CFR 122.26(d)(2)(iv)(B) "*to detect and remove [emphasis added]…illicit discharges and improper disposal into the storm sewer*" and will achieve the CWA requirement for MS4 permits to "*effectively prohibit non-storm water discharges into the storm sewers*."

Generally, each Copermittee is responsible for prioritizing its efforts to eliminate non-storm water and illicit discharges or connections to its MS4 based on field screening and monitoring data, NALs, illicit discharge investigation records, and the known or suspected sources. Sources of non-storm water and illicit discharges or connections must be eliminated by enforcing the legal authority established by each Copermittee pursuant to Provision E.1.

Provision E.3 (Development Planning) requires each Copermittee to use its land use and planning authority to implement a development planning program to control and reduce the discharge of pollutants in storm water from new development and significant redevelopment to the MEP. Proper implementation of the development planning program will also contribute toward effectively prohibiting non-storm water discharges from development projects to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." As part of the management program, 40 CFR 122.26(d)(2)(iv)(A)(2) requires "*planning procedures including a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment*."

Land development generally alters the natural conditions of the land by removing vegetative cover, compacting soil, and/or placement of concrete, asphalt, or other impervious surfaces. These impervious surfaces concentrate urban pollutants (such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not found in high concentrations in the natural environment. Pollutants that accumulate on impervious surfaces are not easily biodegraded nor subject to natural treatment processes.

Impervious surfaces greatly affect the natural hydrology of the land because they do not allow natural infiltration and treatment of storm water runoff to take place. Instead, storm water runoff from impervious surfaces is typically directed through pipes, curbs, gutters, and other hardscape into receiving waters, with little treatment, at significantly increased volumes and accelerated flow rates over what would occur naturally. The increased pollutant loads, storm water volume, discharge rates and velocities, and discharge durations from the MS4 adversely impact stream habitat by causing accelerated, unnatural erosion and scouring within creek bed and banks. Placement

of impervious surfaces also encapsulates "good" sediment (such as sand, gravel, rocks and cobbles) that would normally replenish creek beds and banks to help stabilize them. Collectively, these changes to natural hydrologic processes are termed hydrograph modification, or hydromodification.

Hydromodification, which is caused by both altered storm water flow and altered sediment flow regimes, is largely responsible for degradation of creeks, streams, and associated habitats in the San Diego Region. In an ongoing study by the Stormwater Monitoring Coalition to assess the health of streams throughout Southern California, researchers found that three of the four highest risk stressors to creeks (percent sands and fines present, channel alteration, and riparian disturbance) were related to physical habitat.[29] Researchers studying flood frequencies in Riverside County have found that increases in watershed imperviousness of only 9-22 percent can result in increases in peak flow rates for the two-year storm event of up to 100 percent.[30] Such changes in runoff have significant impacts on channel morphology.

In addition, a technical report issued by the Southern California Coastal Water Research Project (SCCWRP) stated that "*[r]ecent studies indicate that California's intermittent and ephemeral streams are more susceptible to the effects of hydromodification than streams from other parts of the United States. Physical degradation of stream channels in the central and eastern United States can initially be detected when watershed impervious cover approaches 10 percent, although biological effects (which may be more difficult to detect) may occur at lower levels. In contrast, initial response of streams in the semi-arid portions of California appears to occur between 3 and 5 percent impervious cover*."[31] These studies highlight the extent to which impacts originating from impervious surfaces created by land development are responsible for the degradation of creek and stream habitat.

This is consistent with what USEPA has noted, that "*[m]ost stormwater runoff is the result of the man-made hydrologic modifications that normally accompany development. The addition of impervious surfaces, soil compaction, and tree and vegetation removal result in alterations to the movement of water through the environment. As interception, evapotranspiration, and infiltration are reduced and precipitation is converted to overland flow, these modifications affect not only the characteristics of the developed site but also the watershed in which the development is located. Stormwater has been identified as one of the leading sources of pollution for all waterbody types in the United States. Furthermore, the impacts of stormwater*

[29] Assessing the Health of Southern California Streams, Stormwater Monitoring Coalition, Fact Sheet
[30] Schueler and Holland, 2000. Storm Water Strategies for Arid and Semi-Arid Watersheds (Article 66). The Practice of Watershed Protection.
[31] Stein, E. and Zaleski, S., 2005. Technical Report 475, Managing Runoff to Protect Natural Streams: The Latest Development on Investigation and Management of Hydromodification in California. December 30, 2005.

pollution are not static; they usually increase with more development and urbanization."[32]

Reducing the impact from the increased pollutant loads and flows generated by impervious surfaces within a watershed is essential to protecting and restoring the integrity of the receiving waters. Provision E.3 includes the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment*." The requirements of Provision E.3 will 1) minimize the generation and discharge of pollutants in storm water from the MS4, and 2) minimize the potential of storm water discharges from the MS4 from causing altered flow regimes and excessive downstream erosion in receiving waters.

The requirements of Provision E.3.a include the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment*" applicable to all development projects, regardless of size or purpose of development. In general, all development projects must implement onsite BMPs to remove pollutants from runoff prior to its discharge to any receiving waters, as close to the pollutant generating source as possible, and structural BMPs must not be constructed within waters of the U.S.

Furthermore, the onsite BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors (e.g. mosquitos, rodents, and flies). If not properly designed or maintained, certain BMPs implemented or required by municipalities may create a habitat for vectors. Monitoring studies conducted by the California Department of Public Health (CDPH) have documented that mosquitoes opportunistically breed in structural storm water BMPs, particularly those that hold standing water for over 96 hours. Certain site design features that hold standing water may similarly produce mosquitoes.

Structural BMPs and site design features should incorporate design, construction, and maintenance principles to promote drainage within 96 hours to minimize standing water available to mosquitoes. Nuisances and public health impacts resulting from vector breeding can be prevented with close collaboration and cooperative effort between municipalities and local vector control agencies and the CDPH during the development and implementation of storm water runoff management programs. The CDPH also has issued guidance for BMP implementation that will minimize potential nuisances and public health impacts resulting from vector breeding.[33]

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[32] USEPA, 2007. Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices, December 2007.

[33] California Department of Public Health, 2012. Best Management Practices for Mosquito Control in California. (http://www.cdph.ca.gov/HealthInfo/discond/Documents/BMPforMosquitoControl07-12.pdf)

All development projects are required to implement source control BMPs that will minimize the generation of pollutants. Additionally, each development project must implement, where applicable and feasible, low impact development (LID) BMPs to mimic the natural hydrology of the site and retain and/or treat pollutants in storm water runoff prior to discharging to and from the MS4.

The LID Center defines LID as "*a comprehensive land planning and engineering design approach with a goal of maintaining and enhancing the pre-development hydrologic regime of urban and developing watersheds.*"[34] LID designs seek to control storm water at the source, using small-scale integrated site design and management practices to mimic the natural hydrology of a site, retain storm water runoff by minimizing soil compaction and impervious surfaces, and disconnect storm water runoff from conveyances to the storm drain system.

LID BMPs may utilize interception, storage, evaporation, evapotranspiration, infiltration, and filtration processes to retain and/or treat pollutants in storm water before it is discharged from a site. Because of these numerous options, the San Diego Water Board expects that every development project will be able to implement some form of LID BMPs. Examples of LID BMPs include using permeable pavements, rain gardens, rain barrels, grassy swales, soil amendments, and native plants.

Provision E.3.a also includes requirements for all development projects to, where feasible, landscape with native and/or low water use plants to minimize the discharge of non-storm water discharges associated with excessive irrigation, as well as harvest (i.e., storage) and use precipitation to promote the concept of utilizing storm water as a resource.

While all development projects are subject to the requirements of Provision E.3.a, Provision E.3.b identifies Priority Development Projects that exceed given size thresholds and/or fit under specific use categories. Priority Development Projects are required to incorporate specific performance criteria for structural BMPs into the project plan to reduce the generation of pollutants, and address potential impacts from hydromodification.

The Priority Development Project categories are based on the requirements of the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), and do not differ significantly from the Fourth Term Permit for San Diego County. Furthermore, the Priority Development Project categories are consistent with Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), and Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit).

[34] www.lowimpactdevelopment.org

Because of the impact of relatively small increases in watershed impervious surfaces to receiving waters, Provision E.3.b.(1)(b)(iv) has been updated to include large driveways that are 5,000 square feet or more. The San Diego Water Board finds that large driveways can exacerbate altered flow regimes if not properly controlled.

Provision E.3.b.(3) describes projects that are exempt from Priority Development Project status. These include new or retrofit paved sidewalks, bicycle lanes, or trails that are designed and constructed to direct runoff to vegetated areas or be hydraulically disconnected from paved areas. The exemptions have been provided to encourage these types of projects because they provide multiple environmental benefits, such as promoting walking rather than driving, which will in turn improve air quality. Additionally, retrofitting of existing alleys, streets, or roads are exempt from Priority Development Project status if they are constructed using USEPA Green Streets guidance[35]. By doing so, retrofitting of these types of projects is encouraged. The San Diego Water Board recognizes that there are spatial constraints associated with these projects, and implementation of structural BMPs are not always feasible.

For development projects identified as Priority Development Projects, the requirements of Provision E.3.c are the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment.*" Provisions E.3.c.(1)-(3) describe the performance criteria for the structural BMPs that must be implemented for each Priority Development Project defined by Provision E.3.b.

Provision E.3.c.(1) describes the storm water pollutant control BMP requirements that must be implemented by all Priority Development Projects. The purpose of Provision E.3.c.(1) is to reduce pollutants in storm water runoff to the MEP from Priority Development Projects before it is discharged to the MS4. Of all the available treatment processes available, retention of storm water, and therefore capture of the pollutants in the storm water, will achieve 100 percent pollutant removal efficiency for the volume of storm water retained. No other method of treatment can achieve 100 percent pollutant removal efficiency. Thus, retention of as much storm water onsite is the most effective way to reduce pollutants in storm water discharges to, and consequently from the MS4, and controls pollutants in storm water discharges from a site to the MEP.

Under Provision E.3.c.(1)(a), retention of the pollutants in the runoff produced from the 85th percentile storm event ("design capture volume") is the design standard to which Priority Development Projects must comply. Since the 85th percentile storm event has previously been used as the numeric design standard for treatment control BMPs, this same size storm event is used as the numeric design standard for storm water

[35] "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).

retention. This is the MEP standard recognized by the San Diego Water Board and is consistent with the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), as well as Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit) , and Los Angeles Water Board Order No. R4-2012-0175 (Los Angeles County MS4 Permit).

The 85th percentile storm event is the event that has a precipitation total greater than or equal to 85 percent of all storm events over a given period of record in a specific area or location. For example, to determine what the 85th percentile storm event is in a specific location, all 24 hour storms that have recorded values over a 30 year period would be tabulated and a 85th percentile storm would be determined from this record (i.e., 15 percent of the storms would be greater than the number determined to be the 85th percentile storm). Most jurisdictions in the San Diego Region have already developed isopluvial maps that can provide this type of information. The 85th percentile storm might be determined to be a number such as 1.0 inch, and this would be multiplied by the total area of the project footprint producing runoff to calculate the design capture volume. The Priority Development Project designer would then select a system of BMPs that would retain (i.e. intercept, store, infiltrate, evaporate, or evapotranspire) ~~100 percent of~~ the pollutants contained in the design capture volume onsite.

Retention BMPs are necessary to capture and retain pollutants generated from a Priority Development Project. In a recent study performed by SCCWRP in the Los Angeles Region, they found "*that the magnitude of constituent load associated with storm water runoff depends, at least in part, on the amount of time available for pollutant build-up on land surfaces. The extended dry period that typically occurs in arid climates such as southern California maximizes the time for constituents to build-up on land surfaces, resulting in proportionally higher concentrations and loads during initial storms of the season*."[36] This implies that the "first flush" of a rainy season and the first storm events after long antecedent dry periods tend to have the highest pollutant loads. Capturing and retaining the pollutant loads of the "first flush" of a rainy season and the first storm events after long antecedent dry periods will reduce a significant portion of the pollutants in storm water discharged to and from the MS4.

The San Diego Water Board, however, acknowledges that in some situations retention of the full design capture volume onsite may not be technically feasible. In this event, the Copermittee may allow the Priority Development Project to biofiltration BMPs to treat 1.5 times the design capture volume not reliably retained onsite, or biofiltration BMPs with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design

[36] Stein, E.D., Tiefenthaler, L.L., and Schiff, K.C., 2007. Technical Report 510, Sources, Patterns and Mechanisms of Storm Water Pollutant Loading from Watershed and Land Uses of the Greater Los Angeles Area, California, USA. March 20, 2007.

capture volume not reliably retained onsite ~~utilize flow-thru treatment control BMPs to achieve the equivalent pollutant load removal that would have been achieved if the design capture volume were fully retained onsite, pursuant to Provision E.3.c.(1)(b). Biofiltration LID BMPs must be considered as a first option before other types of flow-thru treatment control BMPs may be considered because of the ancillary benefits they provide, such as reduction in flow rates and creation of habitat. In any event, no matter what types of BMPs (or combination of BMPs) are chosen, 100 percent of the pollutants contained in the design capture volume must not be allowed to be discharged from the Priority Development Project.~~

The 1.5 multiplier is based on the finding in the Ventura County Technical Guidance Manual that biofiltration of 1.5 times the design capture volume not retained onsite will provide approximately the same pollutant removal as retention of the design capture volume on an annual basis.[37] This standard is consistent with the Los Angeles Water Board's Los Angeles and Ventura County municipal storm water permits (Order Nos. R4-2012-0175 and R4-2010-0108, respectively). The flow-thru design of 0.75 times the portion of the design capture volume not reliably retained onsite is consistent with the San Diego Water Board's Orange County and Riverside County municipal storm water permits (Order Nos. R9-2009-0002 and R9-2010-0016, respectively).

The San Diego Water Board further recognizes that, in addition to not being technically feasible, retention of the full design capture storm onsite may be cost prohibitive, or may not provide as much water quality benefit to the Watershed Management Area as would implementing BMPs elsewhere in the watershed. Thus, Provision ~~E.3.c.(1)(c)~~ E.3.c.(1)(c) allows for the use of a combination of onsite retention BMPs, and the implementation of an Alternative Compliance Program described in Provision E.3.c.(3). Provision E.3.c.(3) is discussed in more detail below.

If the full design capture volume is not retained onsite either because biofiltration is not technically feasible, or a Copermittee grants a Priority Development Project permission to utilize the Alternative Compliance Program, then the pollutants in the portion of the design capture volume that are not reliably retained onsite must still be reduced to the MEP. Thus, flow-thru treatment control BMPs are required to be implemented on Priority Development Projects in addition to the retention BMPs. The requirements of Provisions ~~E.3.c.(1)(d)~~ E.3.c.(1)(a)[a]-[c] include the performance standards for flow-thru treatment control BMPs, consistent with the Fourth Term Permits in the San Diego Region.

Whereas the purpose of the requirements under Provision E.3.c.(1) is to reduce pollutants in storm water runoff to the MEP, the purpose of the requirements under Provision E.3.c.(2) is to maintain or restore more natural hydrologic flow regimes to prevent accelerated, unnatural erosion in downstream receiving waters, also to the

[37] Ventura Countywide Stormwater Management Program. 2011. Ventura Technical Guidance Manual, Manual Update, 2011.

MEP standard. Provision E.3.c.(2) describes hydromodification management BMP requirements that must be implemented by all Priority Development Projects.

The performance criteria for the implementation of hydromodification management BMPs on Priority Development Projects are consistent with the requirements in the Fourth Term Permits for Orange and Riverside Counties (Order Nos. R9-2009-0002 and R9-2010-0016, respectively). Modifications to the Orange County and Riverside County Hydromodification Management Plans (HMPs) will likely be minor, or may not be necessary. The HMP for San Diego County will likely require some minor modifications to incorporate the requirements of Provision E.3.c.(2) and become consistent with the Orange County and Riverside County HMPs. The San Diego Water Board does not, however, expect that it will be necessary for the San Diego County Copermittees to develop a new approach or significantly re-write the San Diego County HMP. This is because the premise of the hydromodification management BMP requirements, which are to control storm water runoff conditions (flow rates and durations) for Copermittee-defined range of flows, is unchanged from all Fourth Term Permits in the San Diego Region.

Provision E.3.c.(2)(a) requires that post-project runoff conditions mimic the *pre-development* runoff conditions, and not the *pre-project* runoff conditions. Fundamentally, the San Diego Water Board believes that using a hydrology baseline that approximates that of an undeveloped, natural watershed is the only way to facilitate the return of more natural hydrological conditions to already built-out watersheds, and ultimately improved stream health. On the other hand, using the *pre-project* hydrology as a baseline for redevelopment projects results in propagating the unnatural hydrology of urbanized areas. Propagating the urbanized flow regime does not support conditions for restoring degraded or channelized stream segments, and would forever sentence such streams to the degraded state. Furthermore, reducing the volume of storm water runoff associated with the urbanized flow regime will also result in reducing the discharge of pollutants into receiving waters, since storm water runoff from impervious surfaces contains untreated pollutants.

The San Diego Water Board understands that approximating the pre-development runoff condition associated with a redevelopment site is not necessarily straightforward because factors such as natural grade and native vegetation for the site cannot be precisely known. Therefore, the San Diego Water Board does not expect project designers to estimate historical conditions associated with redevelopment sites. Rather, the San Diego Water Board expects project designers and the Copermittees to approximate pre-development runoff conditions using the parameters of a *pervious* area rather than an *impervious* area. This means that for redevelopment sites, approximating pre-development runoff conditions equates to using existing onsite grade and assuming the infiltration characteristics of the underlying soil. A redevelopment Priority Development Project must not use runoff coefficients of concrete or asphalt to estimate pre-development runoff conditions. Rather, redevelopment projects must use available information pertaining to existing underlying soil type (such as soil maps published by the National Resource

Conservation Service), onsite existing grade, and any other readily available pertinent information to estimate pre-development runoff conditions.

The San Diego Water Board understands, indeed asserts, that the pre-development hydrology of an area in question can only be roughly estimated and cannot be precisely known. However, using the hydrology of a natural condition, even if not precisely known, will provide significant benefit to receiving waters over using the hydrology associated with pervious (developed) surfaces. Therefore in order to achieve the goals of the Clean Water Act, which are to "***restore*** *and maintain the chemical,* ***physical****, and biological integrity of the nation's waters* [emphasis added]," the most appropriate standard to use for hydromodification management is the standard associated with the pre-development condition.

Provision E.3.c.(2)(b) requires Priority Development Projects to avoid known critical sediment yield areas or implement measures that would allow coarse sediment to be discharged to receiving waters, such that the natural sediment supply is unaffected by the project. This is necessary because coarse sediment supply is as much an issue for causing erosive conditions to receiving streams as are accelerated flows.

The San Diego Water Board recognizes that in some situations implementing the hydromodification management BMP requirements fully onsite may not be technically feasible, may be cost prohibitive, or may not provide any overall water quality benefits to the Watershed Management Area. Thus, Provision E.3.c.(2)(c) allows for the use of a combination of onsite hydromodification management BMPs and alternative compliance options described in Provision E.3.c.(3).

Provision E.3.c.(3) allows for "alternative compliance" in instances where the Copermittee determines that offsite measures will have a greater overall water quality benefit for the Watershed Management Area than if the Priority Development Project were to implement structural BMPs onsite. Consequently, watershed-specific structural BMP requirements are present in this Order in the form of allowable compliance offsite. The Alternative Compliance Program to Onsite Structural BMP Implementation Provision is intended to integrate with the Copermittees' planning efforts in the Water Quality Improvement Plans.

The Alternative Compliance Program is an option for Priority Development Projects where the governing Copermittee has participated in the development of a Watershed Management Area Analysis as part of the Water Quality Improvement Plan (described in Provision B.3.b.(4)). Such an approach is consistent with the latest findings in hydromodification management by the scientific community. In a Technical Report entitled *Hydromodification Assessment and Management in California,*[38] the report state:

[38] 2012. ED Stein, F Federico, DB Booth, BP Bledsoe, C Bowles, Z Rubin, GM Kondolf, A Sengupta. Technical Report 667. Southern California Coastal Water Research Project. Costa Mesa, CA.

> *"An effective [hydromodification] management program will likely include combinations of on-site measures (e.g., low-impact development techniques, flow-control basins), in-stream measures (e.g., stream habitat restoration), floodplain and riparian zone actions, and off-site measures. Off-site measures may include compensatory mitigation measures at upstream locations that are designed to help restore and manage flow and sediment yield in the watershed."*

Consistent with the ideas brought forth in the report, in the Watershed Management Area Analysis of Provision B.3.b.(4), which is optional, the Copermittees will develop watershed maps that include as much detail about factors that affect the hydrology of the watersheds as is available. Such factors included identification of areas suitable for infiltration, coarse sediment supply areas, and locating stream channel structures and constrictions. Once these factors are mapped and studied, the Copermittees can identify areas in the watersheds where "candidate projects" may be implemented that are expected to improve water quality in the watershed by providing more opportunity for infiltration, slowing down storm water flows, or attenuation of pollutants naturally via healthy stream habitat. These projects may be in the form of retrofitting existing development, rehabilitating degraded stream segments, identifying regional BMPs, purchasing land to preserve valuable floodplain functions, and any other projects that the Copermittees identify.

Under the Alternative Compliance Program, Priority Development Projects may be allowed to fund, partially fund, or implement a candidate project, in lieu of implementing structural BMPs onsite, if they enter into a voluntary agreement with the governing Copermittee permitting this arrangement. Project proponents may also propose an alternative project not previously identified by the Copermittees. In either case, whether a project proponent implements a candidate project identified by the Copermittees or a separate alternative compliance project, the governing Copermittee must determine that implementation of the project will have a greater overall water quality benefit for the Watershed Management Area than fully implementing structural BMPs onsite. If alternative compliance involves funding or implementing a project that is outside the jurisdiction of the governing Copermittee, then that Copermittee may enter into an inter-agency agreement with the appropriate jurisdiction.

Finally, Provision E.3.c.(2)(d) allows Priority Development Projects to be exempt from the hydromodification management BMP requirements if there is no threat of erosion to downstream receiving waters, i.e. the receiving stream is concrete lined from the point of discharge all the way to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean. If the Copermittees believe that more exemptions are warranted, then they must perform the optional Watershed Management Area Analysis of Provision B.2.b.(4). Additional exemptions other than those specified in this Order may be established on a watershed basis, provided the Copermittees perform the analysis, provide supporting rationale for the exemptions, and complete the Water Quality Improvement Plan approval process pursuant to Provision F.1.

Provisions E.3.c.(4) and E.3.c.(5) were included under the BMP requirements applicable to all development projects in the Fourth Term Permits for San Diego, Orange, and Riverside Counties (Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016, respectively). In this Order, the long-term BMP maintenance and infiltration and groundwater protection requirements apply to structural BMPs implemented by Priority Development Projects only.

Provision E.3.d requires the Copermittees to update their BMP Design Manual as needed to incorporate the requirements of Provision E.3. The BMP Design Manual is formerly known as the Standard Storm Water Mitigation Plan, or SSMP, and was renamed so that the title has a more accurate description of the document content. The contents of the BMP Design Manual are largely unchanged from the previous Standard Storm Water Mitigation Plans required under the Fourth Term Permits. The BMP Design Manual fulfills the 40 CFR 122.26(d)(2)(iv)(A)(2) requirement that the Copermittee's development planning program includes "*a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment*."

As part of the "*planning procedures*", 40 CFR 122.26(d)(2)(iv)(A)(2) requires the procedures to "*address controls to reduce pollutants in discharges from municipal separate storm sewers after construction is completed*." The requirements applicable to the implementation and oversight of structural BMPs at Priority Development Projects are provided under Provision E.3.e.

Proper installation of the structural BMPs approved for a Priority Development Project is necessary to ensure that pollutants in storm water discharges will be reduced to the MEP after the project is completed. In addition to the proper installation of structural BMPs, the maintenance of structural BMPs on Priority Development Projects is necessary to ensure that pollutants in storm water discharges will continue to be reduced to the MEP. Provision E.3.e.(1) includes the minimum requirements that each Copermittee must implement to ensure structural BMPs are properly installed and will be properly maintained.

The requirements under Provision E.3.e.(2)-(3) are necessary to demonstrate each Copermittee is implementing a program that complies with Provisions E.3.b-c and E.3.e.(1), and ensure structural BMPs at Priority Development Project will continue to be able to reduce pollutants in storm water discharges to the MEP.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary for any development projects to compel compliance with the requirements of Provision E.3 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.3.f requires each Copermittee to enforce its legal authority

established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Provision E.4 (Construction Management) requires each Copermittee to implement a construction management program to control and reduce the discharge of pollutants in storm water from construction sites to the MEP. Proper implementation of the construction management program will also contribute toward effectively prohibiting non-storm water discharges from construction sites to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." As part of the management program, 40 CFR 122.26(d)(2)(iv)(D) requires "*a program to implement and maintain structural and non-structural best management practices to reduce pollutants in storm water runoff from construction sites to the municipal storm sewer system.*"

Construction sites can be significant sources of sediment, trash, and other pollutants to receiving waters. Although sediment is naturally occurring in the natural environment, the discharge of sediment under unnatural conditions is problematic to receiving waters. Fine sediment in creeks causes high turbidity that interferes with the functionality of native flora and fauna in local creeks. For example, turbidity interferes with both photosynthesis of water-philic plants, as well as successful foraging and reproduction of benthic macroinvertebrates. Sediment can also make it difficult for fish to breathe because it clogs fish gills. Other pollutants such as heavy metals or pesticides can adhere to sediment and are transported to receiving waters during storm events, where they dissolve in the water column and become bioavailable to aquatic organisms. Sediment is recognized as a major stressor to surface waters and is responsible for the impairment of several lagoons and creeks in the San Diego Region.

Provision E.4 includes requirements that each Copermittee must implement to minimize the discharge of sediment and other pollutants from construction sites to the MS4 within its jurisdiction. The requirements under Provision E.4 are consistent with the Fourth Term Permits for San Diego, Orange, and Riverside Counties. Therefore, Copermittees are expected to implement the requirements seamlessly, with minimal changes to their existing construction management programs. The Copermittees, however, are given more flexibility to run their programs as needed to maximize efficiency, and also to be consistent with the Water Quality Improvement Plan for the Watershed Management Area.

As part of the construction management program, 40 CFR 122.26(d)(2)(iv)(D)(1) requires "*procedures for site planning which incorporate consideration of potential water quality impacts.*" Provision E.4.a describes the minimum elements each Copermittee is required to include as part of the construction site planning and project

approval process. The construction site planning and approval process is based primarily on ensuring each project had an adequate site-specific pollution control, construction BMP, and/or erosion and sediment control plan that will be implemented to minimize the discharge of pollutants in storm water to the MEP, and minimize impacts to receiving waters.

The requirements under Provision E.4.b provide the data and information necessary to identify "*priorities for inspecting sites and enforcing control measures*" required pursuant to 40 CFR 122.26(d)(2)(iv)(D)(3). Under Provision E.4.b, each Copermittee must identify construction sites that are considered a high threat to downstream surface waters. Designation of "high threat to water quality" construction sites will necessitate the Copermittees to develop criteria to identify such sites. Provision E.4.b.(2) describes a list of factors that must be considered when the Copermittee considers threat to water quality. For example, a Copermittee must identify sites as "high threat to water quality" if it is located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions, according to the Water Quality Improvement Plan. This ensures that construction management program implementation is compatible with the Copermittee's identified highest priority water quality conditions.

Pursuant to 40 CFR 122.26(d)(2)(iv)(D)(2) each Copermittee is required describe "*requirements for nonstructural and structural best management practices*" at construction sites. Provision E.4.c includes the types of construction site BMPs that the Copermittees must implement, or require the implementation of, at each construction site to reduce pollutants in storm water discharges to the MEP.

Each Copermittee is expected to require the implementation of appropriate BMPs given specific site conditions, the season and likelihood of rain events, and construction phase (i.e. grading vs. vertical construction). This means that throughout the life of the project construction, the appropriate BMPs will vary, especially if the construction of the project spans multiple wet seasons. As opposed to describing specific minimum BMPs that must be implemented, the Order describes major BMP categories that should be considered for each site.

Each Copermittee is expected to use its 20 years of storm water experience and knowledge to require implementation of appropriate BMPs from the various categories at each construction site within its jurisdiction. For example, the San Diego Water Board expects that each site will be required to implement erosion control and sediment control. The San Diego Water Board also expects each Copermittee to require implementation of active/passive sediment treatment systems at sites where other BMPs have been tried and are known to be inadequate, and discharges of sediment are causing or contributing to water quality impairment downstream. Each Copermittee is granted flexibility in specifying the minimum level of BMP requirements at each site, but the San Diego Water Board expects each site to be capable of controlling pollutants in storm water discharges to the MEP and preventing illicit discharges.

The requirements under Provision E.4.d are necessary to demonstrate that each Copermittee is implementing a program that complies with Provisions E.4.a and E.4.c and ensure BMPs at construction sites will reduce pollutants in storm water discharges to the MEP.

Provision E.4.d does not include minimum required inspection frequencies for construction sites. Each Copermittee must use its experience and knowledge to specify an appropriate inspection frequency for both high priority and lower priority sites in their jurisdictional runoff management program documents, and in accordance with the Water Quality Improvement Plan. Appropriate inspection frequencies may vary by Copermittee, but the San Diego Water Board expects that the stated frequency will be adequate for each Copermittee to properly oversee the construction sites within its jurisdiction, confirm BMPs are implemented to reduce pollutants in storm water discharges from constructions sites to the MEP, and make needed changes to its program on an ongoing basis as necessary.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary for any development projects to compel compliance with the requirements of Provision E.4 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.4.e requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

<u>Provision E.5 (Existing Development Management)</u> requires each Copermittee to implement an existing development management program to control and reduce the discharge of pollutants in storm water from areas of existing development to the MEP. Proper implementation of the existing development management program will also contribute toward effectively prohibiting non-storm water discharges from areas of existing development to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." Within 40 CFR 122.26(d)(2)(iv)(A) and (C), the management program is required to reduce impacts on receiving waters and reduce pollutants in storm water discharges to the MEP from commercial and residential areas, industrial facilities, and municipal facilities.

Commercial and residential areas, industrial facilities, and municipal facilities must be addressed by each Copermittee with the existing development management program required under Provision E.5. All other areas within each Copermittee's jurisdiction should be either undeveloped open space, or areas that are being developed or under construction. Areas being developed or under construction will be addressed by the

Copermittee under the requirements of Provision E.3 (Development Planning) or Provision E.4 (Construction Management).

Areas of existing development typically include impervious surfaces such as sidewalks, driveways, roads, and rooftops, which generate and concentrate pollutants (such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not found in high concentrations in the natural environment. Pollutants that accumulate on impervious surfaces are not easily biodegraded or not subject to natural treatment processes. When it rains, these pollutants are transported in storm water runoff from these impervious surfaces into receiving waters, resulting in poor water quality and degradation of beneficial uses.

In addition to the generation of pollutants, areas of existing development have generally altered the natural conditions of the land and removed vegetative cover, reduced the perviousness of the surface, and reduced the capacity of storm water that can be intercepted, captured, stored, infiltrated, evaporated, and/or evapotranspired. The alteration of the natural conditions and the impervious surfaces associated with areas of existing development causes water quality problems due to the alteration of natural flow regimes within the watersheds; resulting in hydromodification of channels, streams, and habitats that exist within or adjacent to the areas of existing development.

Thus, storm water discharges from areas of existing development are responsible for poor water quality, degraded habitats, and hydromodified channels throughout the developed portions of the watersheds in the San Diego Region. To improve the health and functionality of the receiving waters in a Watershed Management Area, land use practices and the amount of impervious surfaces in areas of existing development must change to reduce the various impacts caused by hydromodification and pollutants from storm water runoff generated in developed areas. Each Copermittee must be aggressive to address pollutant sources and runoff from areas of existing development to be able to reduce pollutants in storm water discharges from the MS4 to the MEP.

There is some overlap in the requirements under Provision E.5 with the requirements under Provisions E.2 (Illicit Discharge Detection and Elimination), E.3 (Development Planning), and E.4 (Construction Management). Illicit discharges frequently originate from areas of existing development. New development projects, when completed will become some type of residential, commercial, industrial or municipal existing development. Redevelopment projects are, by definition, redeveloping areas of existing development. And, redevelopment projects become construction sites located in areas of existing development. Much of the data and information collected, inspections performed, and enforcement actions taken for the requirements under Provisions E.2 to E.4 may also be utilized by the existing development management program. The requirements under Provision E.5, however, are focused primarily on reducing pollutants generated in areas of existing development that can be transported in storm water runoff and discharged to and from the MS4.

The requirements under Provision E.5 build upon existing program elements being implemented by the Copermittees. Provision E.5 is generally consistent with the existing development requirements of the Fourth Term Permits for Orange and Riverside Counties (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), but modified to provide more flexibility to implement the programs so resources can be better focused toward addressing the highest priority water quality conditions identified in the Water Quality Improvement Plans.

For a Copermittee to properly manage areas of existing development, having knowledge of what development exists within its jurisdiction is essential. Provision E.5.a require each Copermittee to maintain a watershed-based inventory of all the existing development within its jurisdiction. This requirement is necessary for each Copermittee to implement the requirements of Provision E.5.b-e.

As opposed to just maintaining separate inventories based on the type of site, each Copermittee must maintain a watershed-based inventory that includes all types of existing development within its jurisdiction. By utilizing a watershed-based inventory, the Copermittees within a Watershed Management Area can combine their inventories and review the inventories by watershed in addition to by jurisdiction. Pollutant sources and strategies for abatement can then be evaluated on a watershed level, as opposed to evaluating sources and strategies strictly by type of site.

Provision E.5.a includes the information that must be included in the inventory. Provision E.5.a.(1) specifies what facilities or areas must be included in the inventory. A commercial type of existing development may be identified in the inventory as a facility (e.g. individual building, individual business) or an area (e.g. shopping center, commercial zone). An industrial type of existing development must be identified in the inventory by facility (e.g. individual industrial entity). A municipal type of existing development must be identified in the inventory by facility, with a list of specific municipal facilities that must be included in the inventory. A residential type of existing development must be identified by areas to be designated by the Copermittee. For each of the facilities and areas identified in the Copermittee's inventory developed pursuant to Provision E.5.a.(1), Provision E.5.a.(2) specifies the information that must be included in the description for the facility or area.

Provision E.5.a.(3) requires each Copermittee to maintain an updated map showing the location of inventoried existing development, watershed boundaries, and water bodies. This requirement was included because this information is expected to help the Copermittees in a Watershed Management Area identify and prioritize sources of pollutants and/or stressors in areas of existing development that contribute toward the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Knowledge of the existing development that are likely to be sources of pollutants contributing to the highest priority water quality conditions is expected to be a key

element in the Copermittees' development of the water quality improvement strategies that will be included in the Water Quality Improvement Plans. The strategies described in the Water Quality Improvement Plans will direct efforts within the existing development management programs implemented by each Copermittee.

Pursuant to 40 CFR 122.26(d)(2)(iv)(A) each Copermittee is required describe "*structural and source control measures to reduce pollutants*" in storm water runoff discharged from areas of existing development. Provision E.5.b includes the BMP implementation and maintenance requirements that the each Copermittee must require at areas of existing development to reduce pollutants in storm water discharges to the MEP. The San Diego Water Board, however, recognizes that BMP implementation and maintenance for residential areas will require much more education and encouragement through less authoritative measures than for commercial, industrial and municipal facilities and areas. Thus, the BMP implementation and maintenance requirements have been separated between requirements under Provision E.5.b.(1) for commercial, industrial and municipal facilities and areas, and Provision E.5.b.(2) for residential areas.

Most of the requirements in Provision E.5.b are consistent with the related requirements in the Fourth Term Permits. The level of specificity, however, has been changed to allow each Copermittee the flexibility to implement its program to achieve maximum efficiency, and to perform functions that will address the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Each Copermittee is expected to require the implementation of appropriate BMPs to address the expected pollutants from each facility or area. The Third and Fourth Term Permits described specific minimum BMPs that must be implemented at various sites. This Order, however, requires each Copermittee to designate minimum BMPs themselves and require implementation. Consistent with the Fourth Term Permits, each Copermittee is required to maintain, or require the maintenance of, all BMPs as needed.

The BMP implementation and maintenance requirements include a schedule of operation and maintenance activities for the MS4 and related structures (such as catch basins, storm drain inlets, and detention basins), as well as public streets and roads. Public streets and roads specifically include public unpaved roads. The San Diego Water Board identified, through investigations and complaints, sediment discharges from unpaved roads as a significant source of water quality problems in the San Diego Region. Inspection activities conducted by the San Diego Water Board since the Third Term Permits have found a lack of source control for many unpaved roads within the jurisdiction of the Copermittees.

Unpaved roads are a source of sediment that can be discharged in runoff to receiving waters, especially during storm events. Erosion of unpaved roadways occurs when soil particles are loosened and carried away from the roadway base, ditch, or road bank by water, wind, traffic, or other transport means. Exposed soils, high runoff

velocities and volumes, sandy or silty soil types, and poor compaction increase the potential for erosion.

Road construction, culvert installation, and other maintenance activities can disturb the soil and drainage patterns to streams in undeveloped areas, causing excess runoff and thereby erosion and the release of sediment. Poorly designed unpaved roads can act as preferential drainage pathways that carry runoff and sediment into natural streams, impacting water quality. In addition, other public works activities along unpaved roads have the potential to significantly affect sediment discharge and transport within streams and other waterways, which can degrade the beneficial uses of those waterways.

USEPA also recognizes that discharges from unpaved roads pose a significant potential threat to water quality. USEPA guidance[39] emphasizes the threat of unpaved roads to water quality:

> "*Dirt and gravel roads are a major potential source of these pollutants [sediment] and pollutants that bind to sediment such as oils, nutrients, pesticides, herbicides, and other toxic substances. Many roads have unstable surfaces and bases. Roads act like dams, concentrating flows that accelerate erosion of road materials and roadsides. Both unstable surfaces and accelerated erosion then lead to sediment and dust.*"

There are several guidance documents, developed by the USEPA,[40] the US Forest Service,[41] the University of California,[42] and others, that include design and construction specifications and BMPs that are readily available for implementation by public entities. Implementing design and other source control BMPs for unpaved roads in the region is necessary to reduce and minimize the impacts of sediment discharged during storm events from unpaved roads to the MS4s and receiving waters.

Provision E.5.c describes existing development site inspection frequency, content, and tracking that each Copermittee must incorporate into their existing development management programs. The requirements under Provision E.5.c are necessary to demonstrate each Copermittee is implementing a program that complies with Provision E.5.b and ensure BMPs implemented in areas of existing development will reduce pollutants in storm water discharges to the MEP. Provision E.5.c has been modified to include a minimum of once every 5 years for all inventoried facilities and areas of existing development, utilizing one or more methods of inspection.

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[39] USEPA, 2006. Environmentally Sensitive Maintenance for Dirt and Gravel Roads. Gesford and Anderson, USEPA-PA-2005.
[40] Ibid
[41] US Forest Service, 1996. Forest Service Specifications for Construction of Roads & Bridges. EM-7720-100. Revised August 1996.
[42] University of California Division of Agriculture and Natural Resources, 2007. Rural Roads: A Construction and Maintenance Guide of California Landowners. Publication 8262.

In addition to onsite inspections, the methods of inspection have been expanded to include drive-by inspections. Inspections may be performed by the Copermittee's municipal and contract staff, or by volunteer monitoring or patrol programs. Volunteer monitoring or patrol programs are not expected to enforce the Copermittee's ordinances, or to inspect areas or facilities where members of the public are not allowed access. Volunteer monitoring or patrol programs must be trained by the Copermittee, and are only expected to collect visual observations. By utilizing drive-by inspections and volunteer monitoring or patrol programs, the Copermittees will be able to maximize and efficiently use their resources to identify and address sources of pollutants in areas of existing development.

The municipal and contract staff of each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial, industrial, and municipal facilities and areas in its inventoried existing development pursuant to Provision E.5.c.(1)(a)(iv). An "equivalent" of at least 20 percent means if any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspection may count toward the total annual inspection requirement. Linear municipal facilities (i.e., MS4 linear channels, sanitary sewer collection systems, streets, roads and highways) in the Copermittee's existing development inventory are not subject to the inspection frequency requirement of Provision E.5.c.(1)(a)(iv).

The inspection content specified in Provision E.5.c.(2)(a) includes the information required to be collected during an inspection by any method. The inspection content specified in Provision E.5.c.(2)(a) includes additional information that must be collected when a Copermittee's municipal or contract staff perform an onsite inspection. Provision E.5.c.(3) specifies the information that each Copermittee must maintain in its existing development inspection records.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary to compel compliance with the requirements of Provision E.5 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.5.d requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Provisions E.5.e.(1)-(2) specifically require the Copermittee to identify areas of existing development as candidates for retrofitting, and streams, channels, and/or habitats as candidates for rehabilitation. Provisions E.5.e.(1)-(2) are based on the retrofitting requirements of the Fourth Term Permits for Orange and Riverside Counties, but modified to also include identifying projects to rehabilitate channels within areas of existing development. The requirements have also been modified to be more focused

on utilizing these types of projects for addressing the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Interest and opportunity to retrofit areas of existing development and rehabilitate channels located in areas of existing development has been observed in several programs the San Diego Water Board oversees (e.g., CWA Section 401 Water Quality Certification program, supplemental environmental projects, and grant programs). Each jurisdiction has miles and miles of streets that could be retrofitted to become green streets. Reshaping landscaped areas from convex to concave configurations can detain storm water instead of directing runoff as quickly as possible to the MS4. Retrofit projects could also include simply replacing impervious surfaces with permeable surfaces.

Retrofitting projects do not necessarily have to be expensive. Retrofitting projects could be as simple as redirecting downspouts from roofs to pervious or landscaped areas instead of to hardscaped areas discharging directly to the MS4, providing rain barrels to harvest storm water from downspouts for use at a later time, or planting more trees in areas with little vegetation to provide canopy that can intercept storm water. The San Diego Water Board encourages the Copermittees to identify simple, low-cost retrofitting opportunities that can be easily implemented, in addition to other more expensive retrofitting and channel rehabilitation projects.

Rehabilitation of channels, streams, and/or habitat will require more significant planning and resources to implement. There are, however, also abundant opportunities to rehabilitate channels, streams and/or habitats in or adjacent to areas of existing development. Each Watershed Management Area likely has several creeks and stream reaches that have been undergrounded, artificially hardened, or hydromodified that could be rehabilitated to be more sustainably configured, which would slow down storm water flows and potentially have more assimilative capacity for pollutants while still being supportive of designated beneficial uses.

The San Diego Water Board recognizes that it may be infeasible to implement retrofitting or channel rehabilitation projects within certain areas of a Copermittee's jurisdictions. For such areas, the Copermittee must instead identify, develop, and implement regional retrofitting and channel rehabilitation projects (i.e. projects that can retain and/or treat storm water from one or more areas of existing development) adjacent to and/or downstream of the areas of existing development.

Provisions E.5.e.(1)-(2) do not require the implementation of retrofitting and rehabilitation projects, but do require the Copermittee to develop a program with strategies to facilitate the implementation of these types of projects in areas of existing development. The strategies are expected to include allowing and encouraging Priority Development Projects to implement retrofitting types of projects as a means of compliance with the structural BMP performance criteria requirements of Provisions E.3.c.(1) and E.3.c.(2).

Provision E.6 (Enforcement Response Plans) requires each Copermittee to develop an Enforcement Response Plan as part of its jurisdictional runoff management program document. Proper implementation of the Enforcement Response Plans is necessary to effectively prohibit non-storm water discharges to the MS4, and reduce the discharge of pollutants in storm water from the MS4 to the MEP.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system*" and be able to demonstrate that it can "*operate pursuant to legal authority established by statute, ordinance or series of contracts*" to control the discharge of non-storm water and pollutants in storm water to and from its MS4. Pursuant to 40 CFR 122.26(d)(2)(i)(E) each Copermittee is specifically required to have the legal authority to "*[r]equire compliance with conditions in ordinances, permits, contracts or order*s."

The requirements under Provision E.6 are necessary to demonstrate that each Copermittee can enforce its legal authority to *"effectively prohibit non-stormwater discharges"* and "*reduce the discharge of pollutants to the maximum extent practicable*" as well as "*[r]equire compliance with conditions in ordinances, permits, contracts or order*."

The Enforcement Response Plan required under Provision E.6 will serve as a reference for the Copermittee and the San Diego Water Board to determine if consistent enforcement actions are being implemented to achieve timely and effective compliance from all public and private entities that are not in compliance with the Copermittee's ordinances, permits, or other requirements. The Enforcement Response Plan must contain clear direction for the Copermittee to take immediate enforcement action, when appropriate and necessary, in their illicit discharge detection and elimination, development planning, construction management, and existing development management programs.

If the entities subject to the Copermittee's legal authority do not implement appropriate corrective actions in a timely manner, or if violations repeat, the Copermittee must take progressively stricter responses to enforce its legal authority and achieve compliance with its ordinances, permits, or other requirements to *"effectively prohibit non-stormwater discharges"* and "*reduce the discharge of pollutants to the maximum extent practicable.*"

Provision E.7 (Public Education and Participation) requires each Copermittee to implement a public education and participation program. Proper implementation of the public education and participation program as part of its jurisdictional runoff management program will contribute toward effectively prohibiting non-storm water discharges to the MS4, and toward the reduction of pollutants in storm water from the MS4 to the MEP.

Provision E.7 establishes the minimum requirements that each Copermittee must implement to engage members of the public as part of its jurisdictional runoff management program. In the Fourth Term Permits, the public education program requirements and the public participation requirements were included as separate jurisdictional runoff management program components. In this Order, the public education requirements have been consolidated with the public participation requirements, as both sets of requirements are related to the engagement of the public by each Copermittee. Engagement of the public is critical for the success of each Copermittee's jurisdictional runoff management program.

The Copermittees have been implementing public education programs for the last 20 years, which are now well established. The specificity of expected public education program elements of the Fourth Term Permits has been removed. For the most part, the public education program requirements in Provision E.7.a have been reduced to a set of requirements that are specifically included in the federal regulations under 40 CFR 122.26(d)(2)(iv)(A)(6), 122.26(d)(2)(B)(6) and 122.26(d)(2)(D)(4), which should already be incorporated into each Copermittee's existing public education program. Each Copermittee is expected to utilize the information and data collected from the monitoring and assessments conducted within the Watershed Management Area, and from its inventories and inspections to best direct its public education program resources toward addressing the highest priority water quality conditions identified within the Water Quality Improvement Plan.

According to 40 CFR 122.26(d)(2)(iv), public participation is required to be included as part of the "*comprehensive planning process*", which includes the development and implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs. The requirements under Provision E.7.b specify the opportunities that the public must be provided to be involved in the "*comprehensive planning process*", as required by to 40 CFR 122.26(d)(2)(iv).

<u>Provision E.8 (Fiscal Analysis)</u> requires each Copermittee to secure the resources and provide an analysis of the resources that will be necessary to implement the requirements of the Order. Adequate fiscal resources are necessary for a jurisdictional runoff management program to effectively prohibit non-storm water discharges to the MS4, and reduce pollutants in storm water from the MS4 to the MEP.

According to 40 CFR 122.26(d)(2)(vi), each Copermittee is responsible for providing "*a fiscal analysis of the necessary capital and operation and maintenance expenditures necessary to accomplish the activities*" required by this Order, including "*a description of the source of funds that are proposed to meet the necessary expenditures, including legal restrictions on the use of such funds.*" The fiscal analysis requirements of Provision E.8 are consistent with 40 CFR 122.26(d)(2)(vi).

The San Diego Water Board has chosen not to require a description of fiscal benefits realized from implementation of the jurisdictional runoff management programs. This

is a recommendation from the National Association of Flood and Stormwater Management Agencies.[43] For instance, the fiscal analysis requirements do not address city-wide fiscal benefits of protection (e.g., public health, tourism, property values, economic activity, beneficial uses, etc.), even though many costs currently reported to the San Diego Water Board are for related activities. This type of assessment may help Copermittees improve the allocation of resources and it may help the Copermittees secure adequate funding for the program. Qualitative assessments, however, could be overly subjective and most Copermittees likely lack the ability to provide accurate quantitative assessments. The San Diego Water Board encourages the Copermittees to consider means for conducting assessments of fiscal benefits derived from the programs. Such assessments could be conducted on a regional scale similar to studies of program costs conducted by the State Water Board.[44]

[43] National Association of Flood and Stormwater Management Agencies. 2006. *Guidance for Municipal Stormwater Funding.* Prepared under a grant provided by the USEPA.
[44] State Water Board, 2005. NPDES Stormwater Cost Survey.

F. Reporting

Purpose: Provision F includes the requirements for the documents and reports that the Copermittees must prepare and provide to the San Diego Water Board. The documents prepared by the Copermittees and provided to the San Diego Water Board and made available to the public will provide the documentation that the Copermittees are complying with the requirements of the Order.

***Discussion*:** Provision F requires the Copermittees to prepare several documents and reports that must be provided to the San Diego Water Board and made available to the public. The reporting requirements have been significantly reduced compared to the Fourth Term Permit reporting requirements. The reduction in reporting requirements was recommended by the San Diego County Copermittees in the Report of Water Discharge submitted in June 2011.

More specific and detailed discussions of the requirements of Provision F are provided below.

Provision F.1 (Water Quality Improvement Plans) requires the Copermittees in each Watershed Management Area to develop and submit a Water Quality Improvement Plan in accordance with the requirements of Provision B.

Of all the requirements of Provision F, the Water Quality Improvement Plans will likely be the documents requiring the most significant effort to develop. The content of the Water Quality Improvement Plans, however, is expected to include content that should already have been developed for the Watershed Plans and several elements that are included in the Monitoring and Reporting Programs required under the Fourth Term Permits.

Because the Water Quality Improvement Plan is part of the "*comprehensive planning process which involves public participation*," Provision F.1 includes requirements to give multiple opportunities to the public to provide input on the content of the plans.

Provision F.1.a.(1) specifies the elements that the Copermittees must include in the public participation process for the development of the Water Quality Improvement Plans. In order for the public to be aware of the opportunities to provide input, Provision F.1.a.(1)(a) requires the Copermittees to develop a publicly available and noticed schedule of the opportunities for the public to participate and provide comments during the development of the Water Quality Improvement Plan. These opportunities are when the public can provide the data, information, and recommendations that the Copermittees can consider during the development of the Water Quality Improvement Plans.

The San Diego Water Board recognizes, however, that the Copermittees cannot be expected to incorporate all the data, information, and recommendations that the public

may provide into the Water Quality Improvement Plans. The Copermittees will have to review the data, information, and recommendations received and make some decisions on what to incorporate into the Water Quality Improvement Plans. Before the Copermittees finalize their decisions, members of the public should be allowed to review the Copermittees' decisions. Thus, Provision F.1.a.(1)(b) requires the Copermittees to form a Water Quality Improvement Consultation Panel (Panel).

The Panel will consist of a member from the environmental community and a member from the development community familiar with the Watershed Management Area. A representative from the San Diego Water Board staff will also be part of the Panel. The Copermittees may choose to include additional members, but the Panel is only required to include three panel members.

The Panel will serve as an additional public participation and input mechanism during the development of the Water Quality Improvement Plans. The knowledge and expertise from these Panel members are expected to provide the Copermittees valuable direction during their decision-making process. The Copermittees will review the content of their planned submittals with the Panel members to receive recommendations or concurrence. If the Panel provides recommendations, the Copermittees must consider revisions to the Water Quality Improvement Plan submittals.

The San Diego Water Board recognizes that the development of multiple Water Quality Improvement Plans concurrently may limit the ability of the public to review and provide comments to the Copermittees. Thus, Provision F.1.a.(1)(c) requires the Copermittees to coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public ~~as much~~ time and opportunity ~~as possible~~ to participate during the development of the Water Quality Improvement Plans.

Provision F.1.a.(2) requires the Copermittees to develop and submit the first Water Quality Improvement Plan component, in accordance with the requirements of Provision B.2, which includes the identification of the priority water quality conditions and potential water quality improvement strategies. The public must be provided an opportunity to provide data, information and recommendations from the public to be utilized in the development and identification of the priority water quality conditions and potential water quality improvement strategies for the Watershed Management Area. The Copermittees must consult with the Panel and consider making revisions. The Copermittees may submit the requirements of Provision B.2 as early as 6 months and no later than 12 months after the commencement of coverage under this Order. After the requirements of Provision B.2 are submitted to the San Diego Water Board, the public will be provided another opportunity to provide comments.

Provision F.1.a.(3) requires the Copermittees to develop and submit the second Water Quality Improvement Plan component, in accordance with the requirements of Provision B.3, which includes the identification of the numeric goals for the highest

priority water quality conditions identified for the Watershed Management Area, and the strategies that will be implemented to achieve the potential numeric goals. The Copermittees may also develop the Optional Watershed Management Area Analysis, in accordance with the requirements of Provision B.2.b.(4), and/or Discharge Prohibitions and Receiving Water Limitations Compliance Option, in accordance with the requirements of Provision B.3.c, as part of this submittal. The public must be provided an opportunity to provide data, information and recommendations to be utilized in the development and identification of the numeric goals and water quality improvement strategies for the Watershed Management Area. The Copermittees must consult with the Panel and consider making revisions. The Copermittees may submit the requirements of Provision B.3 as early as 9 months and no later than 18 months after the commencement of coverage under this Order. After the requirements of Provision B.3 are submitted to the San Diego Water Board, the public will be provided another opportunity to provide comments.

Finally, Provision F.1.b describes the process for the submittal and implementation of the Water Quality Improvement Plans. The complete Water Quality Improvement Plans are required to be submitted by the Copermittees within 24 months after the commencement of coverage under this Order. The San Diego Water Board will provide the public an opportunity to provide comments on each complete Water Quality Improvement Plan.

The San Diego Water Board will review each Water Quality Improvement Plan and the public comments received to determine if the Copermittees have submitted a Water Quality Improvement Plan that meets the requirements of Provision B. If a Water Quality Improvement Plan does not meet the requirements of Provision B, the Copermittees will be considered out of compliance and directed in writing by the San Diego Water Board Executive Officer to correct the deficiencies.

When a Water Quality Improvement Plan meets the requirements of Provision B, the San Diego Water Board will determine whether to hold a public hearing or to limit public input to submittal of written comments before accepting the Water Quality Improvement Plan. Implementation of the Water Quality Improvement Plan must begin within 30 days of acceptance.

The San Diego Water Board expects that any deficiencies in the Water Quality Improvement Plan will be identified either in the public comments or during the review by the San Diego Water Board before implementation begins. In the event any deficiencies are identified after the implementation of the Water Quality Improvement Plan, Provision F.1.b.(7) clarifies that the San Diego Water Board maintains the right to require the Copermittees to correct any deficiencies that may be identified.

<u>Provision F.2 (Updates)</u> requires the Copermittees to update specific documents that the Copermittees will utilize to implement the requirements of this Order.

Each Copermittee is required to continue implementing a jurisdictional runoff management program, as required under Provision E. Implementation of each Copermittee's jurisdictional runoff management program is directed by its jurisdictional runoff management program document. Provision F.2.a requires each Copermittee to update its jurisdictional runoff management program document to be consistent with the requirements of Provision E within 3 months after the acceptance of the Water Quality Improvement Plan.

Likewise, each Copermittee must continue to require new development and redevelopment projects to implement BMPs to control pollutants in storm water runoff. The control of pollutants in storm water runoff from development and redevelopment projects within each Copermittee's jurisdiction is guided and directed by its BMP Design Manual, formerly known as a Standard Storm Water Mitigation Plan (SSMP). Provision F.2.b requires each Copermittee to update its BMP Design Manual to be consistent with the requirements of Provision E.3 within 3 months after the acceptance of the Water Quality Improvement Plan.

In general, the requirements of the Order should not necessitate a complete rewrite of each Copermittee's jurisdictional runoff management program document or BMP Design Manual, as was required by the Third Term Permits. The jurisdictional runoff management program and BMP Design Manual requirements of this Order are not significantly different than the requirements of the Fourth Term Permits. Thus, only sections of the Order which are new or have been significantly changed should warrant revisions to specific sections of the Copermittee's jurisdictional runoff management program document and BMP Design Manual.

Finally, the Water Quality Improvement Plans are expected to require updates as the iterative approach and adaptive management process included in the Water Quality Improvement Plan, as required under Provision B.5, is implemented by the Copermittees. Provision F.2.c.(1) requires the Copermittees to implement a public participation process for the proposed updates, review the proposed updates with the Panel, and submit the updates to the Water Quality Improvement Plan as part of the Annual Reports required under Provision F.3.b.

Also, because TMDLs are likely to be developed, adopted and approved during the term of the Order, Provision F.2.c.(2) has been included to expedite the incorporation of TMDLs into the Copermittees' Water Quality Improvement Plans as part of the update process, potentially before the Order is re-opened to incorporated the requirements of the new TMDLs.

<u>Provision F.3 (Progress Reporting)</u> requires the Copermittees to report on the progress of implementing the Water Quality Improvement Plans.

The requirements of Provision F.3 are to report the progress toward improving water quality that the Copermittees are achieving with the implementation of the Water Quality Improvement Plans and each Copermittee's jurisdictional runoff management

program. The Progress Report Presentations required under Provision F.3.a are included to provide the Copermittees an opportunity to communicate directly with the San Diego Water Board and the public. The Progress Report Presentations will also provide the members of the San Diego Water Board and members of the public an opportunity to become more acquainted with the Copermittees and their projects and programs to address non-storm water and storm water discharges into and from their MS4s.

The Annual Report requirements of Provision F.3.b are a consolidation of several reporting requirements from the Fourth Term Permits, including the Jurisdictional Runoff Management Program Annual Reports, the Watershed Annual Reports, and the Monitoring and Reporting Program Annual Reports. Furthermore, the Annual Report requirements are consistent with the requirements under 40 CFR 122.42(c).

Pursuant to 40 CFR 122.42(c), "*[t]he operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the Director…must submit an annual report*", which must include the following:

(1) *The status of implementing the components of the storm water management program that are established as permit conditions* [40 CFR 122.42(c)(1)];

(2) *Proposed changes to the storm water management programs that are established as permit conditions* [40 CFR 122.42(c)(2)];

(3) *Revisions, if necessary, to the assessment of controls and fiscal analysis* [40 CFR 122.42(c)(3)];

(4) *A summary of data, including monitoring data, that is accumulated throughout the reporting year* [40 CFR 122.42(c)(4)];

(5) *Annual expenditures and budget for year following each annual report* [40 CFR 122.42(c)(5)];

(6) *A summary describing the number and nature of enforcement actions, inspections, and public education programs* [40 CFR 122.42(c)(6)];

(7) *Identification of water quality improvements or degradation* [40 CFR 122.42(c)(7)].

Under the Fourth Term Permits, each Copermittee is responsible for submitting a Jurisdictional Runoff Management Program Annual Report; the Copermittees in each designated watershed are responsible for submitting a Watershed Annual Report; and the Copermittees from each county are responsible for submitting a Monitoring and Reporting Program Annual Report.

There are 39 Copermittees in the San Diego Region, each required to prepare and submit a Jurisdictional Runoff Management Program Annual Report. There are 9

designated watersheds in San Diego County, 6 designated watersheds in Orange County, and 1 designated watershed in Riverside County for a total of 16 designated watersheds, each requiring a Watershed Annual Report. There are 3 sets of Copermittees in 3 counties in the San Diego Region, requiring Copermittees from each county to prepare and submit a Monitoring and Reporting Program Annual Report. Thus each Copermittee is currently required to prepare, or participate in the preparation of at least 3 annual reports. In addition, the San Diego County Copermittees are required to prepare and submit a Regional Urban Runoff Management Plan Annual Report.

In total, there are 59 annual reports that are prepared by the Copermittees and submitted to the San Diego Water Board for the Fourth Term Permits. The preparation of these annual reports requires significant time and resources from each Copermittee, which could otherwise be expended on actions that could improve water quality within its jurisdiction. In turn, significant time and resources are required from the San Diego Water Board staff to review these reports, which could otherwise be expended on working directly with the Copermittees to improve their implementation efforts toward restoring and protecting water quality.

Until the Water Quality Improvement Plans are developed, there will be a transitional period during which the Copermittees will continue to implement their existing jurisdictional runoff management programs. There will also be a transitional period during which the Copermittees will implement the transitional monitoring and assessment requirements of Provision D. During the transitional period, the Copermittees will submit annual reports pursuant to the requirements of Provisions F.3.b.(1) and F.3.b.(2).

Provision F.3.b.(1) includes the transitional annual reporting requirements for each Copermittee's jurisdictional runoff management program. The reporting of the jurisdictional runoff management program implementation efforts have been reduced to a single 2-page form. Each Copermittee is required to complete and submit a Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D or a revised form accepted by the San Diego Water Board) no later than October 31 of each year for each jurisdictional runoff management program reporting period (i.e. July 1 to June 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted. The Jurisdictional Runoff Management Program Annual Report Form will certify that each Copermittee has implemented its jurisdictional runoff management program in accordance with the requirements of Provision E. Each Copermittee may choose to continue to utilize and submit the jurisdictional runoff management program annual reporting format of its current Order until the first Water Quality Improvement Plan Annual Report is required to be submitted.

Provision F.3.b.(2) includes the transitional annual reporting requirements for the transitional monitoring and assessment program for each Watershed Management Area. The Copermittees in the Watershed Management Area are required to submit a

Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted. The Transitional Monitoring and Assessment Program Annual Report is required to include the transitional period monitoring data collected pursuant to Provisions D.1.a and D.2.a, and the findings from the transitional period findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

Provision F.3.b.(3) includes the Water Quality Improvement Plan Annual Report requirements. Only one Water Quality Improvement Plan Annual Report is required for each of the 10 Watershed Management Areas designated under Provision B.1, which is a significant reduction in the number of annual reports required to be prepared and submitted by the Copermittees. The Water Quality Improvement Plan Annual Report will document the Copermittees' efforts to implement the Water Quality Improvement Plan. Each Water Quality Improvement Plan Annual Report will be focused primarily on reporting the analysis of the monitoring data collected pursuant to Provisions D.1-D.3 during the reporting period, and the assessments that are required pursuant to Provision D.4 based on the data. The monitoring data analyses and the assessments that are provided in the Water Quality Improvement Plan Annual Report will be the core of the report. The reporting of the jurisdictional runoff management program implementation efforts have been reduced to a single 2-page form, and will no longer be the primary focus of the reporting requirements as in the Third and Fourth Term Permits.

Each Copermittee will continue to prepare and submit a Jurisdictional Runoff Management Program Annual Report Form as part of the Water Quality Improvement Plan Annual Report to certify that each Copermittee has implemented its jurisdictional runoff management program in accordance with the requirements of Provision E. Instead of reviewing a voluminous report from each Copermittee, as was required under the Third and Fourth Term Permits, the San Diego Water Board will conduct audits of each Copermittee's jurisdictional runoff management program to investigate and confirm the information provided by each Copermittee on its Jurisdictional Runoff Management Program Annual Report Form. The audits will allow the San Diego Water Board to become more familiar with the each Copermittee's jurisdictional runoff management program, and each Copermittee will become more informed about the expectations of the San Diego Water Board.

The reduction in the number and content of the Water Quality Improvement Plan Annual Reports should result in significant time, cost and resource savings for the Copermittees, as well as the San Diego Water Board. Those savings should offset a significant portion of any additional costs that may be incurred to develop the Water Quality Improvement Plans and to implement the monitoring and assessment program requirements of Provision D.

The reporting period for the Water Quality Improvement Plan Annual Reports consists of two periods. Because the jurisdictional runoff management programs are typically budgeted and implemented during a fiscal year, the information provided on the Jurisdictional Runoff Management Program Annual Report Forms will cover the period from July 1 to June 30 of the following year.

The Water Quality Improvement Plan Annual Reports, however, are focused primarily on the monitoring data and the assessments based on the monitoring data. The monitoring data is collected during the monitoring year, which begins October 1 and ends September 30 of the following year. The monitoring year begins after the beginning of the fiscal year and ends after the end of the fiscal year. Therefore, to accommodate and capture the information collected during the fiscal year and the monitoring year, the Annual Report reporting period incorporates both periods.

Finally, Provision F.3.c requires the Copermittees to develop and submit a Regional Monitoring and Assessment Report. The Regional Monitoring and Assessment Report is similar to the Long Term Effectiveness Assessment required under the Fourth Term San Diego County Permit. The Regional Monitoring and Assessment Report is expected to utilize the entire body of data and information collected by the Copermittees during the term of this Order to assess improvements to water quality on a regional scale.

Provision F.4 (Regional Clearinghouse) requires the Copermittees to develop, update, and maintain an internet-based Regional Clearinghouse that can be used to store, disseminate, and share the Copermittees' documents, monitoring data, special studies, and any other data or information.

Most of the documents and data that are generated by the Copermittees can be provided in electronic format, and made available to the San Diego Water Board and the public on the internet. The San Diego Water Board has been gradually transitioning its document submittal requirements to electronic submittals. Provision F.4 has been included to further these efforts.

Provision F.4 has also been included to improve the exchange and availability of information among the Copermittees, as well as between the Copermittees and the San Diego Water Board. Provision F.4 will also make the information generated during the implementation of the Order more accessible to the public.

Provision F.5 (Report of Waste Discharge) requires the Copermittees to submit a Report of Waste Discharge to reapply for renewal of the Order prior to its expiration, in accordance with 40 CFR 122.21(d)(2) and CWC section 13376.

Because the Orange County and Riverside County Copermittees will not be subject to the requirements of this Order until they are notified of coverage, Provision F.5.a describes the process of submitting their Reports of Waste Discharge pursuant to the requirements of their current permits to obtain coverage under this Order.

For the Copermittees subject to the requirements of this Order, Provision F.5.b requires the Copermittees to submit a Report of Waste Discharge 180 days in advance of the expiration of this Order Provision F.5.b also describes the minimum information to be included in the Report of Waste Discharge, based on USEPA guidance "Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems", dated May 17, 1996.

Provision F.6 (Application for Early Coverage) describes the process that would allow the Orange County and/or Riverside County Copermittees to obtain coverage under this Order earlier than the expiration of their current Orders.

If the Orange County and/or Riverside County Copermittees choose to obtain coverage under this Order earlier than the expiration of their current Orders, the preparation and submittal of a Report of Waste Discharge, as required by the Fourth Term Permits, will not be necessary. The existing Order for the respective county will be rescinded upon the effective coverage date under this Order, except for enforcement purposes.

G. Principal Watershed Copermittee Responsibilities

Purpose: Provision G includes the requirements for the Principal Watershed Copermittee designated by the Copermittees in each Watershed Management Area.

***Discussion*:** Unlike previous NPDES requirements, there will no longer be a single Principal Copermittee. Provision G.1 requires the Copermittees to designate a Principal Watershed Copermittee for each Watershed Management Area. There are ten (10) Watershed Management Areas in the San Diego Region, as defined in Table B-1 under Provision B.1 of the Order. An individual Copermittee should not be the Principal Watershed Copermittee for more than two (2) Watershed Management Areas. There could be up to 10 Principal Water Copermittees designated for the Watershed Management Areas in the San Diego Region.

Provision G.2 describes the minimum responsibilities of each Principal Watershed Copermittee. The primary responsibility of the Principal Watershed Copermittees is to serve as the liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues. Ideally, the Principal Watershed Copermittee can represent the interests of all the Copermittees within a Watershed Management Area during discussions or meetings to facilitate communication with the San Diego Water Board. The Principal Watershed Copermittees are also responsible for facilitating and coordinating the implementation efforts of the Copermittees and submittals of required documents and reports.

The Principal Watershed Copermittee is responsible for facilitating the efforts of the Copermittees within the Watershed Management Area to develop the Water Quality Improvement Plan required under Provision B, and submit it for approval in accordance with Provision F.1. The Principal Watershed Copermittee is also responsible for coordinating the submittal of the document updates, Progress Report Presentations, and Annual Reports required from the Copermittees within each Watershed Management Area under Provisions F.2, F.3.a, and F.3.b. The Principal Watershed Copermittees are responsible for coordinating with each other to develop and submit the Regional Clearinghouse, Regional Monitoring and Assessment Report, and the Report of Waste Discharge required under Provisions F.3.c, F.4, and F.5.

The designated Principal Watershed Copermittee for each Watershed Management Area does not necessarily have to serve as the Principal Watershed Copermittee for the entire term of the Order. If the Copermittees in a Watershed Management Area choose to designate a new Principal Watershed Copermittee, the change may be submitted as part of the Annual Report required under Provision F.3.b, with an update to the Water Quality Improvement Plan in accordance with Provision F.2.c.

Provision G.3 specifies that the Principal Watershed Copermittee is not responsible for ensuring that the other Copermittees within the Watershed Management Area are in compliance with the requirements of this Order

H. Modification of Order

Purpose: Provision H provides the conditions under which modifications to Order No. R9-2013-0001 may occur.

***Discussion*:** Provision H allows for modifications to Order No. R9-2013-0001. Minor modifications may be made by the San Diego Water Board Executive Officer without a public notice or public hearing. Minor modifications are defined under 40 CFR 122.63. Minor modifications under 40 CFR 122.63 potentially applicable to this Order are the following:

- Correcting typographical errors;
- Requiring more frequent monitoring or reporting by the Copermittees;
- Changing an interim compliance date in a schedule of compliance, provided the new date is not more than 120 days after the date specified in the existing permit and does not interfere with attainment of the final compliance date requirement.

Modifications that are not one of the above minor modifications will require re-opening the Order, subject to the requirements of 40 CFR 122.44, 122.62 to 122.64, and 124.5, but only for the specific provisions subject to the modification. Modifications of the Order that are not minor require a draft Order with the proposed modifications made available for public review, a public notice and comment period, and a public hearing. Comments on the provisions not subject to the proposed modifications are not required to be considered in the San Diego Water Board's responses to comments or during the public hearing.

Provision H.4 was included to specify that the Order will be re-opened for modifications if the State Water Board determines revisions to Provision A are warranted, an application for early coverage under the Order is received pursuant to Provision F.6, the Basin Plan is amended to modify an existing TMDL or incorporate a new TMDL, or the monitoring and assessment program requirements need to be updated or revised.

Provision H.5 was included to specify that the San Diego Water Board will re-open and consider modifications to this Order when the Orange County Copermittees or the Riverside County Copermittees submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders

I. Standard Permit Provisions and General Provisions

Purpose: Provision I incorporates the standard permit provisions required to be included in all NPDES permits, as well as several other general provisions.

***Discussion*:** Provision I refers to Attachment B to the Order. Attachment B expressly incorporates the conditions applicable to all NPDES permits as provided under 40 CFR 122.41(a)-(n), as well as the applicable conditions for MS4s and storm water discharges provided under 40 CFR 122.42(c) and 40 CFR 122.42(d), respectively. Attachment B also includes several general provisions that are typically included in or applicable to waste discharge requirements issued by the San Diego Water Board.

IX. ATTACHMENTS

The attachments to the Order are discussed below. The discussions describe the content of the attachments.

Attachment A – Discharge Prohibitions and Special Protections

Section 1 of Attachment A includes the Waste Discharge Prohibitions from the Basin Plan. They have been provided verbatim in their entirety.

Section 2 of Attachment A includes the "*Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges*" applicable to permitted point source discharges of storm water, adopted under State Water Board Resolution No. 2012-0012. The terms, prohibitions, and special conditions (collectively referred to as special conditions) are established as limitations on point source storm water discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in ASBS, as required for State Water Quality Protection Areas pursuant to California Public Resources Code sections 36700(f) and 36710(f). These Special Protections were adopted by the State Water Board as part of the Ocean Plan General Exception.

Attachment B – Standard Permit Provisions and General Provisions

Conditions applicable to all NPDES permits, as required under 40 CFR 122.41, and conditions applicable to MS4s and storm water discharges, as required under 40 CFR 122.42(c) and 122.42(d), respectively are provided in Attachment B to the Order. They have been provided expressly in their entirety.

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. These general provisions are typically included in or applicable to waste discharge requirements issued by the San Diego Water Board. Many of the general provisions were developed by the State Water Board. Where a general provision is derived from statute or regulation, a citation of the statute or regulation section is provided. General provisions that do not provide a citation are included under the authority provided CWC 13377.

Attachment C – Acronyms, Abbreviations and Definitions

The acronyms and abbreviations that are used in the Order are provided in Attachment C. Attachment C also includes definitions that may provide an explanation or description of the meaning or intent of specific terms or phrases included in the Order.

Attachment D – Jurisdictional Runoff Management Program Annual Report Form

An example of the Jurisdictional Runoff Management Program Annual Report Form required to be submitted by each Copermittee as part of the Annual Reports required under Provision F.3.b.(1)(e) is provided as Attachment D to the Order. An electronic version of the form will be available from the San Diego Water Board after the adoption of the Order.

The Jurisdictional Runoff Management Program Annual Report Form includes the minimum information necessary to demonstrate that the Copermittee is implementing and in compliance with the requirements of Provision E, and includes much of the information required to be reported pursuant to 40 CFR 122.42(c).

The information that must be provided on the Jurisdictional Runoff Management Program Annual Report Form is limited to the fiscal year, which begins July 1 and ends June 30 of the following year. The information expected to be provided by the Copermittees in each section of the Jurisdictional Runoff Management Program Annual Report Form is discussed below.

I. COPERMITTEE INFORMATION

The name of the Copermittee (e.g. name of city, county, or special district) and the contact information for the storm water program manager are provided under this section.

II. LEGAL AUTHORITY

The Copermittee must confirm whether or not the legal authorities under Provision E.1.a have been established for itself within its jurisdiction.

The Copermittee must also confirm whether or not a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority, as required under Provision E.1.b. The certification statement required by Provision E.1.b is only required to be submitted with the first Annual Report required under Provision F.3.b.

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

The Copermittee must inform the San Diego Water Board whether or not an update to its jurisdictional runoff management program document was required or recommended by the San Diego Water Board during the reporting period. An update to the jurisdictional runoff management program is required under Provision F.2.a. The San Diego Water Board may recommend modifications to the jurisdictional runoff management program as part of the iterative approach and adaptive management process required under Provision B.5, which may result in an update that is necessary for the Copermittee's jurisdictional runoff management document.

If an update was required or recommended, the Copermittee must confirm whether or not the update was completed and made available on the Regional Clearinghouse within the reporting period. If no update was required or recommended, an answer is not required. If the answer is NO, meaning the required or recommended update was not completed and/or made available on the Regional Clearinghouse, the Copermittee must attach a schedule for the completion of the update and/or posting of the updated document on the Regional Clearinghouse.

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

The Copermittee must confirm whether or not a program was implemented during the fiscal year to actively detect and eliminate illicit discharges and connections in accordance with the requirements under Provision E.2.

In addition to confirming that a program to detect and eliminate illicit discharges was implemented during the reporting period, the Copermittee is also required to report on several items related to the program. The information that must be reported is limited to the fiscal year for the Annual Report.

All non-storm water discharges are considered illicit discharges unless the source is identified as one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5). If a non-storm water discharge is identified as one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5), the discharge is a non-storm water discharge, but not an illicit discharge. If a non-storm water discharge is identified but in not one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5), the discharge is both a non-storm water discharge and an illicit discharge.

V. DEVELOPMENT PLANNING PROGRAM

The Copermittee must confirm whether or not a development planning program was implemented during the fiscal year in accordance with the requirements under Provision E.3.

The Copermittee must also inform the San Diego Water Board whether or not an update to its BMP Design Manual was required or recommended by the San Diego Water Board during the fiscal year. An update to the BMP Design Manual is required under Provision F.2.b. The San Diego Water Board may recommend modifications to the BMP Design Manual, which may result in an update that is necessary for Copermittee's the BMP Design Manual.

If an update was required or recommended, the Copermittee must confirm whether or not the update was completed and made available on the Regional Clearinghouse within the reporting period. If no update was required or recommended, an answer is not required. If the answer is NO, meaning the required or recommended update was not completed and/or made available on the Regional Clearinghouse, the Copermittee must attach a schedule for the completion of the update and/or posting of the updated document on the Regional Clearinghouse.

The Copermittee is also required to report on several items related to the program. For the development and redevelopment projects that are reviewed under the program, the Copermittee must report the total number projects submitted for review during the fiscal year. Of those projects, the Copermittee must report the number that are Priority Development Projects, as defined under Provision E.3.b.(1). The Copermittee must also report the number of Priority Development Projects that were approved and/or granted occupancy during the fiscal year, regardless of when the project was originally submitted for review. Any projects that were approved during the fiscal year and granted any exemptions from the BMP Design Manual requirements and/or allowed to implement alternative compliance options in accordance with Provision E.3.c.(3) must be reported.

Finally, the Copermittee must also report on several items related to its oversight of permanent BMPs on Priority Development Projects within its jurisdiction, as required under Provision E.3.e. The information that must be reported is limited to the fiscal year for the Annual Report.

VI. CONSTRUCTION MANAGEMENT PROGRAM

The Copermittee must confirm whether or not a construction management program was implemented during the fiscal year in accordance with the requirements under Provision E.4.

The Copermittee is also required to report on several items related to its oversight construction projects within its jurisdiction. The information that must be reported is limited to the fiscal year for the Annual Report.

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

The Copermittee must confirm whether or not an existing development management program was implemented during the fiscal year in accordance with the requirements under Provision E.5.

The Copermittee is also required to report on several items related to its oversight in areas of existing development within its jurisdiction. The information that must be reported is limited to the fiscal year for the Annual Report. The information must also be separated into four categories of existing development: municipal, commercial, industrial, and residential.

VIII. PUBLIC EDUCATION AND PARTICIPATION

The Copermittee must confirm whether or not a public education program component was implemented during the fiscal year in accordance with the requirements under Provision E.7.a.

The Copermittee must also confirm whether or not a public participation program component was implemented during the fiscal year in accordance with the requirements under Provision E.7.b.

IX. FISCAL ANALYSIS

The Copermittee must confirm a summary of its fiscal analysis, conducted in accordance with the requirements under Provision E.8, has been attached to the form.

X. CERTIFICATION

A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative must sign and certify the Jurisdictional Runoff Management Program Annual Report Form. The appropriate box must be checked to indicate the whether the a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative is signing the form.

Attachment E – Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2013-0001

Attachment E provides specific provisions for implementing the load allocations (LAs) and wasteload allocations (WLAs) of Total Maximum Daily Loads (TMDLs) adopted by the San Diego Water Board and approved by USEPA in which the Copermittees are identified as responsible for discharges subject to the requirements of the TMDLs. Federal regulations require that NPDES requirements incorporate water quality based effluent limitations (WQBELs) that must be consistent with the requirements and assumptions of any available WLAs,[45] which may be expressed as numeric effluent limitations, when feasible, and/or as a best management practice (BMP) program of expanded or better-tailored BMPs.[46] Where the TMDL includes WLAs that provide numeric pollutant load or pollutant parameter objectives, the WLA has been, where feasible, translated into numeric WQBELs.[47]

For each TMDL in Attachment E, four sections are included:

a. Applicability: This section provides the resolution under which the TMDL Basin Plan amendment was adopted and approved, with the applicable adoption and approval dates. This section also gives the effective date of the TMDL and where the TMDL is applicable (i.e. Watershed Management Area and water body). The Copermittees that are responsible for implementing the specific provisions are also given in this section.

b. Final TMDL Compliance Requirements: For each TMDL, the final TMDL compliance requirements consist of the final TMDL compliance date(s), the final WQBELs, and the final TMDL compliance determination requirements. The final WQBELs are expressed in terms of receiving water limitations, effluent limitations, and/or best management practices (BMPs). The final WQBELs for the TMDLs are incorporated by reference into Provision A of the Order. The final WQBELs become enforceable when the final TMDL compliance dates have passed. Applicable BMPs within the final WQBELs must be incorporated into the Water Quality Improvement Plans. Compliance with the final WQBELs will be determined in accordance with the options provided under the final TMDL compliance determination requirements.

c. Interim TMDL Compliance Requirements: If the final TMDL compliance date has not passed and there are interim TMDL compliance requirements, they are included in this section. If there are interim WQBELs with interim compliance dates, the interim WQBELs become enforceable when the corresponding interim compliance dates have passed. Compliance with the interim WQBELs will be determined in accordance with the options provided under the interim TMDL compliance determination requirements.

d. Specific Monitoring and Assessment Requirements: If there are specific monitoring and assessment requirements that cannot be met with the monitoring and assessment program

[45] 40 CFR 122.44(d)(1)(vii)(B)
[46] 40 CFR 122.44(k)(2) and 40 CFR 122.44(k)(3)
[47] November 12, 2010 Memorandum from the USEPA, Revisions to the November 22, 2002 Memorandum "Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLA""

requirements under Provision D of the Order, the additional requirements are included in this section.

The requirements of the TMDLs are based on and consistent with the assumptions and requirements of any available adopted and approved TMDLs that have been incorporated into the Basin Plan. Modifications to the requirements for the TMDLs in Attachment E cannot be made unless the TMDLs are modified in the Basin Plan.

A modification to any aspect of a TMDL in the Basin Plan requires a Basin Plan amendment. A Basin Plan amendment to modify a TMDL will require the San Diego Water Board to adopt a resolution to amend the Basin Plan, which includes a separate public process. When the San Diego Water Board adopts a Basin Plan amendment, it subsequently requires approval from the State Water Board, the Office of Administrative Law, and the USEPA before it becomes effective.

If and when the TMDLs are a modified in the Basin Plan, the San Diego Water Board will revise the requirements of the TMDL in accordance with the Basin Plan amendment. When a Basin Plan amendment to modify a TMDL becomes effective, the San Diego Water Board will modify the requirements of the TMDL pursuant to the requirements of Provision H.4 of the Order as soon as possible.

APRIL 2011

MEETING WATER QUALITY STANDARDS FOR SAN DIEGO'S RECREATIONAL WATERS: A Cost Benefit Analysis

Commissioned by The City of San Diego Transportation & Storm Water Department
Researched and produced by the Fermanian Business & Economic Institute

POINT LOMA
NAZARENE UNIVERSITY

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Meeting Quality Standards for San Diego's Recreational Waters: A Cost Benefit Analysis

April 2011

Commissioned by:
The City of San Diego
Transportation &
Storm Water Department

POINT LOMA
NAZARENE UNIVERSITY

Fermanian Business & Economic Institute
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LETTER TO THE READER

The Fermanian Business & Economic Institute is pleased to present its original research report, Meeting Quality Standards for San Diego's Recreational Waters: A Cost Benefit Analysis. Commissioned by the City of San Diego Transportation & Storm Water Department, our task was to present a cost/benefit analysis of a plan designed for San Diego to comply with water standards established at the federal, state, and local levels. In doing so, we intend to provide leaders in public policy, government, academia, business and other interested fields a highly readable, yet significant, economic analysis of a critical topic to all within our community.

Increasingly, public and private leaders, agencies and organizations need an independent and objective view of a technology, regulation, strategy, business, or economic process or trend. The Fermanian Business & Economic Institute's reputation for authoritative and objective insight frequently makes us a popular choice for important business, economic, and policy questions facing our region.

At the Fermanian Business & Economic Institute this is what we refer to as "actionable economics". We are grateful to the City of San Diego for its important service to our community in the important areas of water quality, conservation, and economic stewardship.

We look forward to additional opportunities to serve our community.

Randy M. Ataide, J.D.
Professor of Entrepreneurship
Executive Director
Fermanian Business & Economic Institute

About the Fermanian Business & Economic Institute

The Fermanian Business & Economic Institute (FBEI) is a strategic unit of Point Loma Nazarene University, providing the following services:

> Economic forecasting and events
> Expert business and economic commentary and speeches
> Economic consulting and related services
> Professional and executive development events
> Business and economic roundtables
> Economic studies and research
> Special projects

We take the integrity of our work very seriously. Representing the academic standards of our University and the professional credentials of the Economics community, we insist on maintaining an objective approach. The Institute accepts projects and contracts only on the condition that the conclusions will be derived on the basis of data, evidence, and careful analysis. We eschew any approach calling for a study that will "support a particular desired conclusion." Objectivity is a key feature of the ethical standards we embrace.

The focus of the Institute since we officially began in January 2010 has been to provide economic analysis and forecasts to assist various businesses, non-profit organizations, and governement organizations in San Diego. Projects we have undertaken include:

- A study of the economic impact of military construction spending, commissioned by the San Diego Military Advisory Council

- An analysis of the potential of Biomimicry (the field involved in taking solutions inspired by Nature to commercial application), commissioned by San Diego Zoo Global
- A study of the marginal costs of different solutions to meeting the region's water demands, commissioned by the Equinox Center
- An analysis of the outlook for California's housing and commercial real estate for the California Air Resources Board, commissioned by the Associated General Contractors
- Economic Forecasts for 2010 and 2011

We are currently working on a number of other projects, including

- An analysis of the economic costs of and solutions to homelessness in San Diego
- An economic analysis of commercial real estate development in Santee, California
- An economic structural and forecasting model of the chain link fence manufacturing industry

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EXECUTIVE SUMMARY

- San Diego features some of the best beaches and spectacular coastline in the world. In 2010, an estimated 24 million people visited the beaches located within the boundaries of the City of San Diego. In addition to a significant intangible value to its residents, the City's beaches generate sizable economic benefits. In 2010, the coastal areas within the City of San Diego saw taxable sales of $1.7 billion.

- Under the mandates from the Federal Clean Water Act, state legislation, and the San Diego Water Board, the City of San Diego is required to meet certain water quality standards. These are quantified in terms of Total Maximum Daily Loads (TMDLs) or the maximum amount of bacteria, metals, pesticides or other pollutants that a given water body can safely carry.

- Two major approaches have been considered to achieve the various water quality standards. The first would require large scale and costly investments in treatment systems and other infrastructure. An alternative strategy was developed by Weston Water Solutions, Inc. for the City of San Diego in 2007. (http://www.sandiego.gov/stormwater/plansreports/index.shtml) It features a tiered approach over 20 years and involves lower costs and smaller community impacts. The cost parameters of the tiered approach (referred to as "the Strategic Plan") are used in this report's analysis.

- The costs of the proposed Strategic Plan will still be sizable. Over the next 20 years, they are estimated to cumulate to a total of $3.7 billion.

- Considerable benefits would accrue from achieving the improvement in water quality envisioned under the Strategic Plan's objectives. They are estimated to cumulate to a total of $617 million over the next 20 years. However, the gap between the total costs and benefits of the Water Plan is considerable, with costs equal to six times the value of expected benefits.

- On a per household basis, San Diego City residents would see benefits from the Strategic Plan averaging an estimated $57 per year over the next 20 years versus costs of $351 per year.

- A gradual approach to improving water quality, involving lower cost solutions with a careful monitoring and identification of best management practices, would appear warranted. At the same time, more scientific research needs to be done to validate the relation between various standards and the goals of reduced health risk.

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PURPOSE OF THE STUDY

The purpose of this study is to present a cost/benefit analysis of a plan designed for the City of San Diego to comply with water standards established at the federal, state, and local levels. The cost and benefits are described over a 20-year period, commencing in 2011 and ending in 2030. Costs and benefits are presented in terms of annual dollar totals, cumulative sums over the 20-year period, and average costs and benefits per household.

Section I summarizes the mandates to improve water quality at the federal, state, and local areas. Section II analyzes the costs versus benefits. Section III discusses the importance of its beaches to San Diego and the record of water quality along its shoreline during the past decade. Section IV delineates the expenditures and investments required over the next 20 years to satisfy water quality requirements in a tiered approach. This approach is contrasted to a more infrastructure-intensive and expensive strategy that would be necessary to achieve water quality objectives over a much shorter and compressed time frame.

Section V analyzes the economic benefits of improved water quality in terms of (a) the implicit value households place on the access to beaches; (b) the economic value related to beach visits from both direct spending and ripple effects throughout the economy; and (c) the potential savings in health-related costs both in terms of direct medical expenses and reduced absences from work.

Section VI concludes with recommendations and action steps.

I. WATER QUALITY STANDARDS AND MANDATES

The Federal Clean Water Act of 1972 and California's Porter-Cologne Water Quality Control Act require the San Diego Water Board to determine water quality standards for each water body within its jurisdiction. Section 303(d) of the Clean Water Act also requires states to identify water bodies that do not meet water quality standards, to prioritize them, and to establish maximum levels of pollutants that all water bodies can receive and still be able to meet water quality standards.

These maximum levels of pollutants are described as TMDLs (Total Maximum Daily Loads). Pollutants that can contaminate water bodies include pathogens (bacteria and viruses), nutrients, sediments, pesticides, mercury, and various metals. TMDLs are established for each type of pollutant.

Contaminants of water bodies can come from point sources, such as industrial plants or sewage treatment plants. They can also result from general runoff as rainwater or water from car washing or watering of crops or lawns picks up various contaminants before flowing into streams, rivers, and the ocean. These pollutants can include oil and sand from roadways, chemicals, organic materials, and toxic substances, which flow to water bodies either directly or through storm drain collection systems. Water quality standards are set based on the intended purpose of each type of water body. Compliance to standards is monitored through regular collection of water samples from the various sites. Water policies are established that will both bring water bodies up to standards which will protect current users and prevent any future degradation of water in areas that already meet or exceed quality standards.

II. COSTS VERSUS BENEFITS

For any significant project or endeavor, it is important to weigh the costs relative to the benefits that will affect various stakeholders. The intent of this report is to present an unbiased, comprehensive, and realistic assessment of the costs and benefits that would accrue to the residents of the City of San Diego if the proposed Strategic Plan is adopted to meet the various water quality regulations.

Exhibit 1 summarizes the costs and benefits in terms of (a) the cumulative totals over the next 20 years; (b) the average annual figures over that 20-year span; and (c) the annual averages per household.

While total benefits are projected to cumulate to an estimated $617 million over the next 20 years, costs are expected to sum to $3.7 billion. This means that total costs will be six times the amount of projected overall benefits.

Exhibit 1

Benefits and Costs of the Strategic Plan
2011 dollars

	Benefits	Costs	Difference
Cumulative 20 -year totals (millions)	$617	$3,724	$(3,107)
Average annual totals (millions)	$31	$186	$(155)
Average annual amounts per household	$57	$351	$(294)

Source: FBEI

Exhibit 2

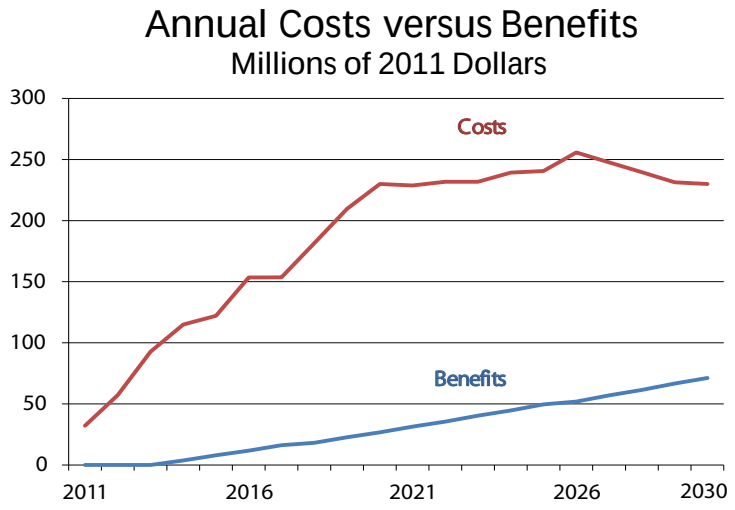

Source: FBEI

Annual costs are forecast to peak around the year of 2026 as some of the infrastructure projects reach their maximum build-out rates. In contrast, benefits continue to rise throughout the next two decades. (See Exhibit 2.) Improved water quality should lead to progressively larger numbers of beach days for visitation and spending. At the same time, a reduction in water pollution should yield increased health-related savings over time. Total costs will significantly outstrip estimated benefits throughout the next 20 years, with the gap averaging about $155 million per year.

San Diegans could also reap intangible benefits of becoming better stewards of our environment, but the gap between costs and benefits would still appear to be significant.

On a per household basis, the divergence between costs and benefits narrows slightly over time but also remains substantial. (See Exhibit 3.)

Average benefits per household are projected to average $57 per year over the period through 2030, while annual costs per household are forecast to average $351. This implies that the typical San Diego City household will pay an average of $294 more per year than the benefits received. (See Exhibit 4.)

Will San Diego residents be willing to pay the costs of improving water quality over the next two decades even those these costs are likely to exceed the benefits realized? San Diego City residents may place a greater value on improved water quality than described in this report. Improved water quality in other recreational areas could generate value above that relating to the beach and coastal areas focused on in this study. Non-beachgoers may also place a significant value in improving the quality of the area's beaches.

Yet, the sizable six-to-one gap between costs and benefits estimated in this study will be difficult to narrow substantially even with a significant boost to benefit estimates. At the same time, there is no guarantee

Exhibit 3

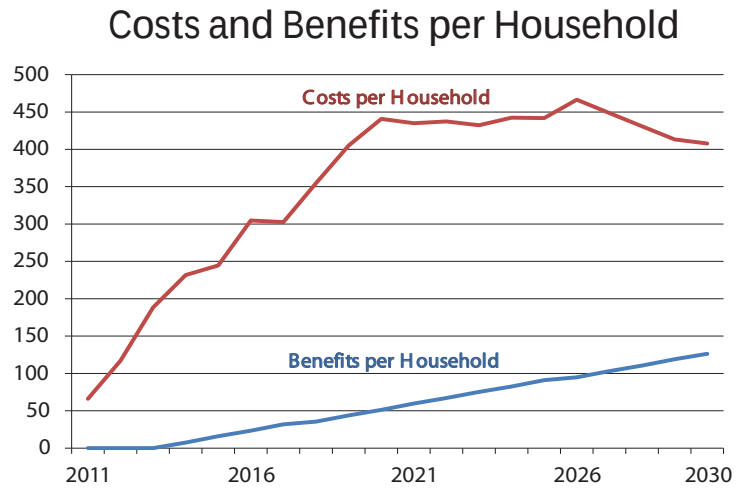

Source: FBEI

Exhibit 4

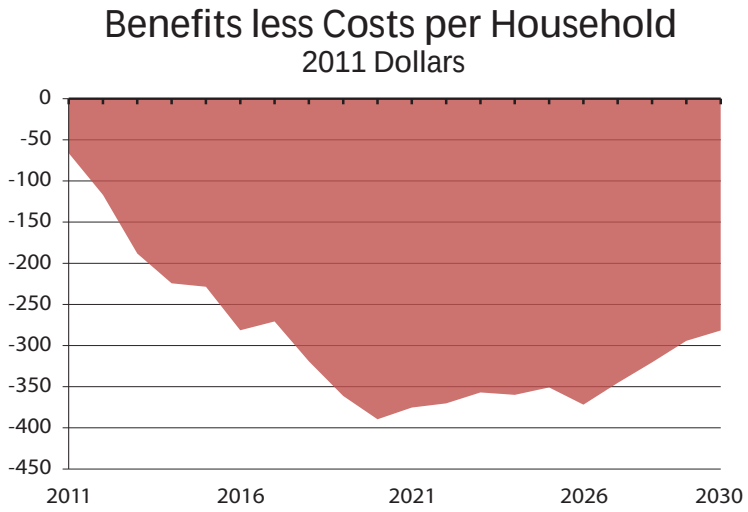

Source: FBEI

that achieving certain TMDL standards will achieve the increased number of days for beach access or the projected reduction in incidence of various illnesses. San Diego residents who never or rarely visit the area's beaches may be unwilling to pay the expense of water quality improvement, especially if it is marginal. Costs of implementing the various projects and elements of the Strategic Plan could also exceed current estimates.

These results suggest that policymakers will confront a major challenge. They will need to win the endorsement of the public for embarking on a sizable multi-year commitment to a spending program whose projected costs substantially exceed its projected benefits. These additional expenditures will aggravate further the City's budget problems and could imply even greater reductions in other programs or tax increases.

III. SAN DIEGO BEACHES

The Importance of San Diego's Beach Properties

San Diego features some of the best beaches and spectacular coastline in the world, which attract both local residents and visitors from outside the region. The area's coastal areas are a major reason why people choose to live in San Diego and are a primary driver of tourism.

In 2010, an estimated 24 million people visited the beaches located within the boundaries of the City of San Diego. This followed a record of 25 million city beach goers in 2009 in a year which featured better weather. (See Exhibit 5.)

The beaches within the City of San Diego's boundaries encompass some of the most prime shoreline, including Torrey Pines, La Jolla, Pacific Beach, Ocean Beach, and Point Loma. About sixty percent of those who visit San Diego City beaches reside within the City, accompanied by another forty percent from outside the immediate area. On any given day during the year, an average of about three percent of the City's residents visit its beaches. Attendance is much higher during weekends than week days and varies greatly during the year, with a much higher attendance during the peak summer months.

Exhibit 5

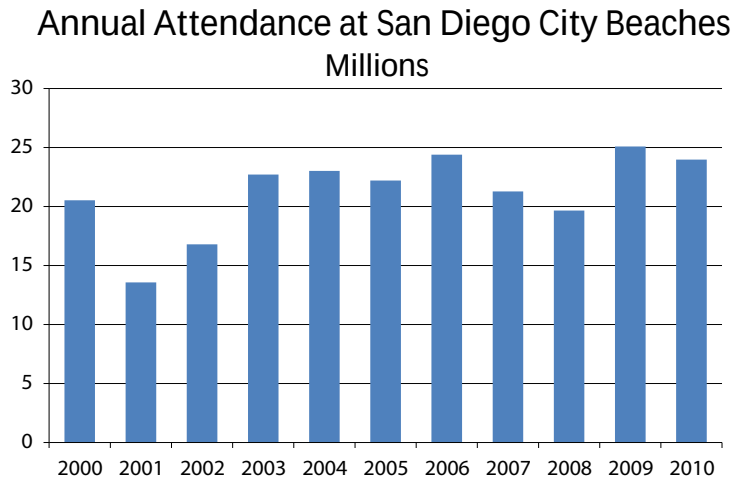

Source: City of San Diego Lifeguard Services

Spending by beach visitors generates a sizable volume of sales for hotels, restaurants, clothing stores, shops selling various accessories, and enterprises renting beach and sporting equipment (bicycles, surfboards, beach umbrellas, etc.). In 2010, the coastal areas within the City of San Diego saw taxable sales of $1.7 billion. Prior to the onset of the recession, this figure had reached a record of $2.0 billion in 2007. Pacific Beach accounts for the largest share, followed by La Jolla. (See Exhibit 6.)

Exhibit 6

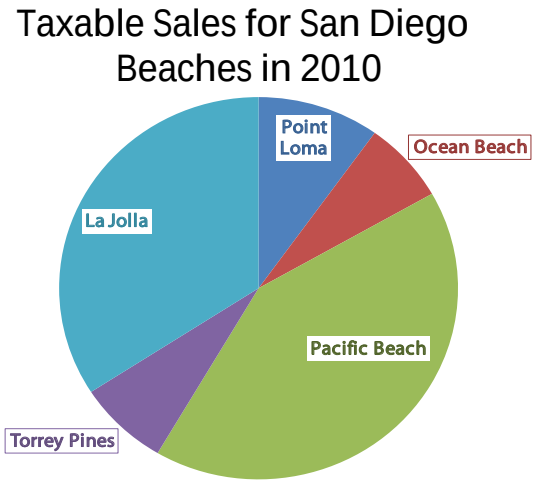

Source: MuniServices, LLC

The Record on Water Quality

The water quality of San Diego's beaches is constantly monitored and the public is alerted of any potential hazards. Beaches are closed if there is any report of a major incident, such as a sewer line break or fuel spill. Warnings are posted in cases where water sampling tests indicate unacceptably high levels of bacteria. In addition, because of the risk of contamination from runoff, general advisories are issued for the three days following each time it rains.

The water quality of San Diego City's beaches has improved markedly over the past decade. (See Exhibit 7.)

Total beach postings and closures because of noted contamination exceeded 1,950 in 2000. By 2010, this number had fallen to 40. Mission Bay beaches have registered a particularly sharp decline. Nearly 1,500 postings or closures were experienced in 2000.[1] By 2010, this number had shrunk to less than 20. Maintaining the higher quality of San Diego's shoreline quality in the future could be an ongoing challenge.

Exhibit 7

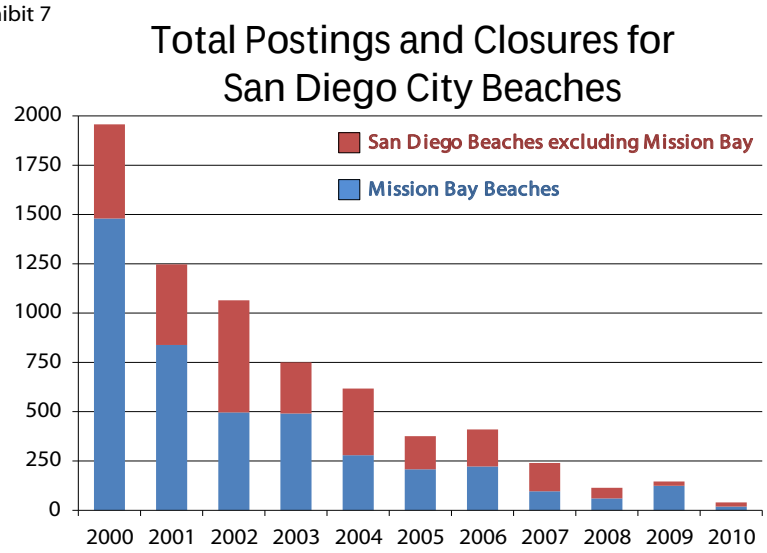

Source: City of San Diego Transportation & Storm Water Dept.

General rain advisories remain a significant impediment to beach access. (See Exhibit 8.) Since 2000, the number of days that San Diego beaches have been off limits to bathers because of possible pollution has averaged about 25 per year. (This count excludes the initial day of rain.) Reducing the potential contamination because of runoff could add materially to the accessibility of the area's beaches.

Exhibit 8

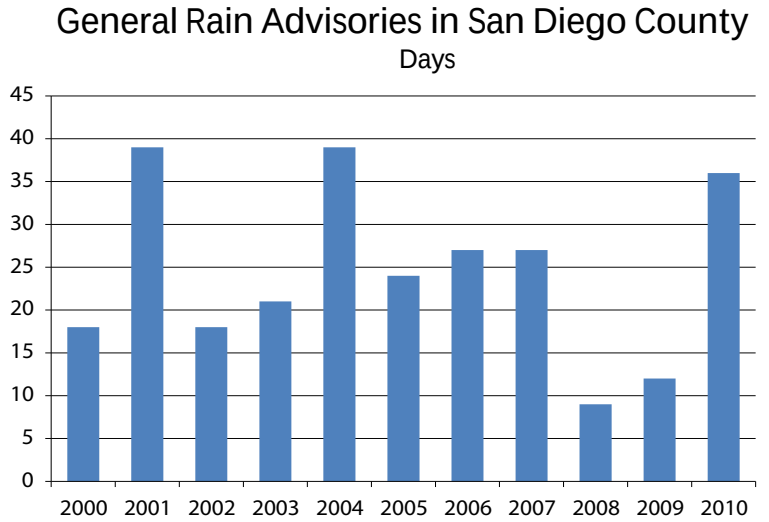

Source: City of San Diego Transportation & Storm Water Dept.

IV. THE COSTS OF ACHIEVING WATER QUALITY STANDARDS

Meeting the water standards dictated by the federal and state government, and as defined by the San Diego Water Board, will require sizable annual expenditures and investment over a number of years. The City of San Diego has worked on a number of water quality improvement plans in recent years that bring various watersheds into compliance with prescribed TDMLs.

The City and our consulting team developed a tiered approach that would enable us to meet water standards over the next twenty years (identified as the Strategic Plan in this report). This incorporates best management practices (BMPs) that have been deployed in various areas throughout the country.

An alternative approach that could achieve water quality objectives in a much shorter time period (ten years) would require much more infrastructure investment in treatment systems. Large storage capacity systems would also be necessary to equalize water flows prior to treatment. In addition to the sizable costs of completing these infrastructure investments in a relatively short time span, there would be considerable impacts on residential communities. Private property would need to be acquired through eminent domain. This process could face significant legal hurdles and make it difficult to achieve the prescribed water quality goals within the designated time period.

The alternative strategy considered in this report takes a more comprehensive or integrated approach over a longer time horizon. As proposed by Weston, it envisions three phases or tiers to comply not only with current TMDLs but also with future ones anticipated for bacteria, dissolved metals, and pesticides. This approach should help minimize the need for retro-fitting to meet new standards that might be imposed in later years.

The first phase or tier focuses largely on efforts to control potential water contamination at its source. This phase emphasizes education, targeted enforcement, enhanced development standards, greater permit analysis, and other steps to control pollution at the various sources. (See Exhibit 9.)

Exhibit 9

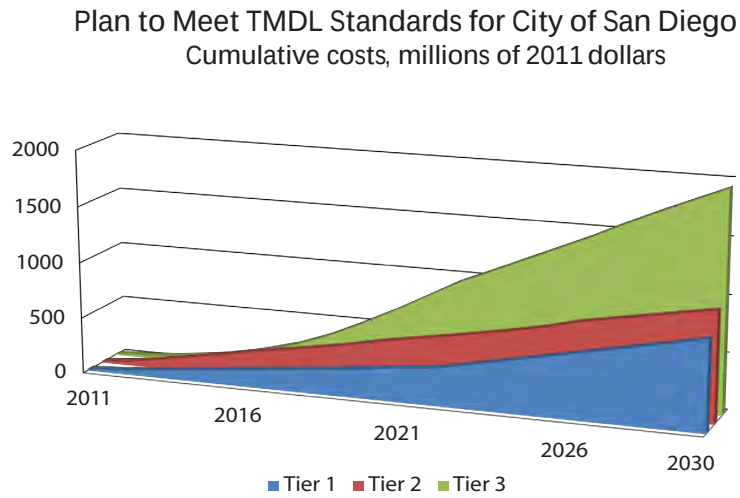

Source: Weston Solutions, Inc; FBEI

The second phase entails more expenditures but not on the scale of major investments in infrastructure. This tier calls for more aggressive street sweeping, increased targeted trash segregation, more active catchment cleaning, and additional trash debris cleanups.

It also proposes public-private partnerships to reduce dry weather flows and to undertake some projects for retro-fitting that have become necessary.

The recommended approach would be to monitor the success of the various programs in Tier 1 and Tier 2 to determine their success in meeting TMDL requirements. Pilot projects could be run in different areas to assess which solutions are most effective and should be adopted as BMPs.

The third tier, involving the more infrastructure and investment intensive projects, would then be phased in depending on the success of the various programs and BMPs of the first two tiers. Although Tier 1 and Tier 2 projects may not fully accomplish water quality goals, they should result in a significant reduction in runoff volumes and pollutant loads. Tier III would then include investments in infiltration projects and

Exhibit 10

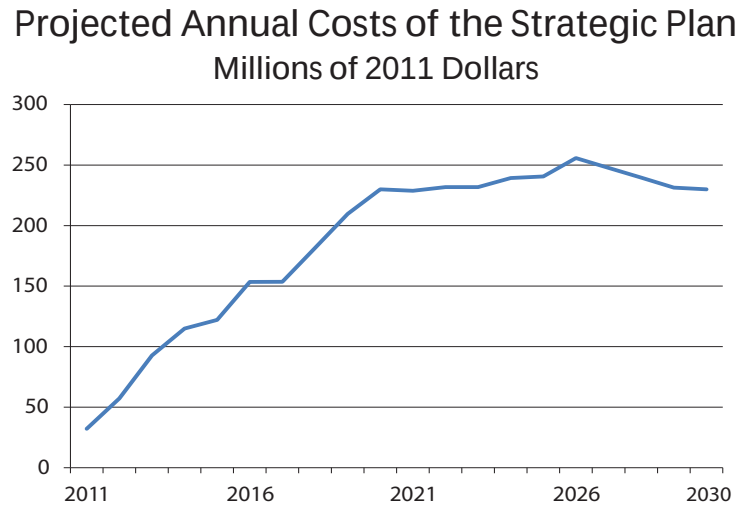

Source: Weston Solutions, Inc; FBEI

Exhibit 11

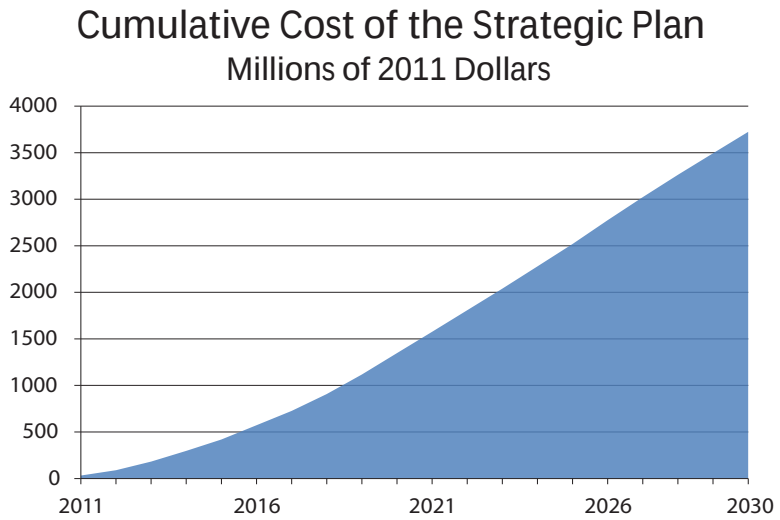

Source: Weston Solutions, Inc; FBEI

Exhibit 12

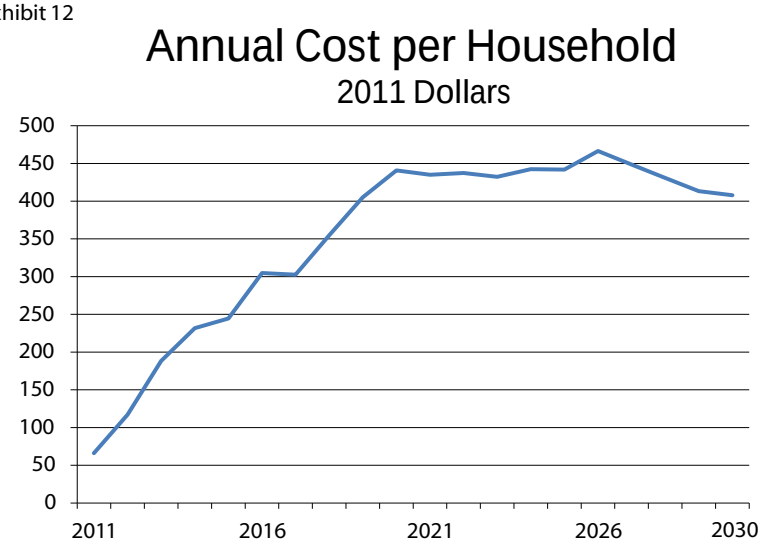

Source: Weston Solutions, Inc; FBEI

various multi-drainage area treatment systems on both smaller and larger scales. Even this more phased-in approach will be expensive. In current or 2011 dollars (not adjusted for price increases or inflation in future years), the cumulative cost over twenty years will be about $3.7 billion. This will amount to an average of $186 million per year over the next two decades. Based on population and household counts from the 2010 census, FBEI has estimated the number of households that will reside in the City of San Diego each year through 2030.[2] Using these projections, the average cost per San Diego household of the proposed Strategic Plan would be $351 per year over the next twenty years. (See Exhibits 10, 11, and 12.)

V. THE ECONOMIC BENEFITS OF ACHIEVING WATER QUALITY STANDARDS

The benefits of achieving certain water quality goals can be analyzed in three distinct dimensions as they would pertain to the beaches contained within the boundaries of the City of San Diego. First, beachgoers would benefit from a potential increase in the number of days they could safely enter the water. Second, the region could benefit from increased spending from visitors to the area's beaches. Third, improved water quality could yield health care savings both from lower direct medical expenses and reduced absences from work.

Over the next twenty years, total benefits are projected to cumulate to a total of $617 million in 2011 dollars. (See Exhibit 13.) They will average about $31 million per year or about $57 per household. (See Exhibit 14.)

Exhibit 13

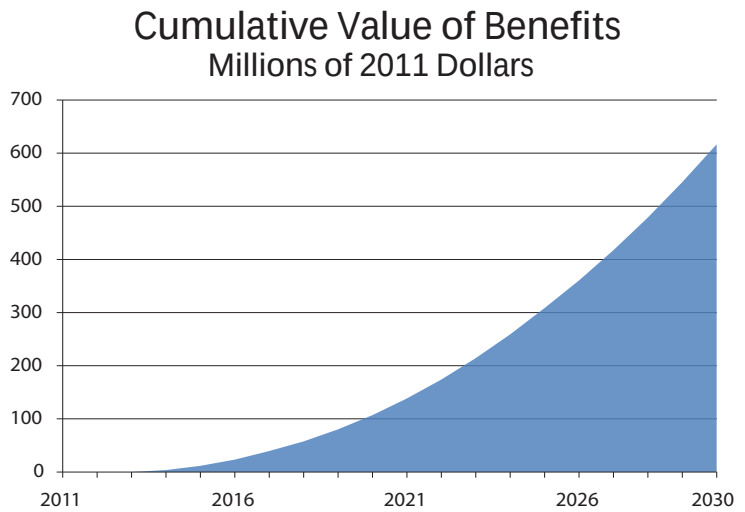

Source: FBEI

Exhibit 14

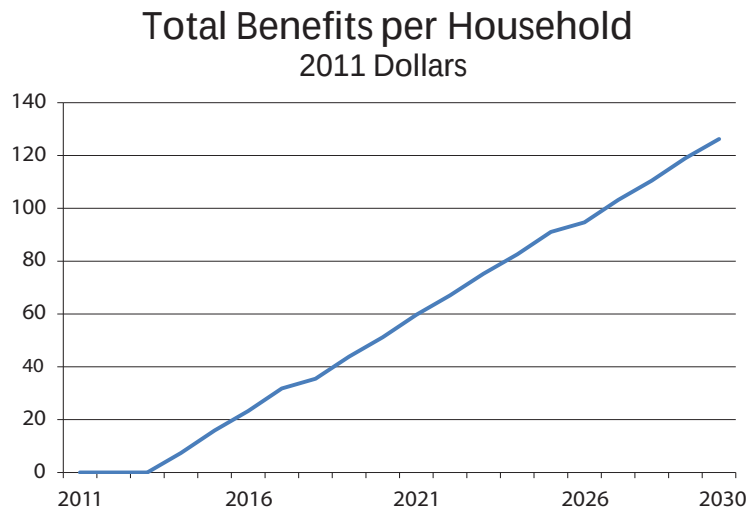

Source: FBEI

Implicit Beach Value

As discussed in Section II, on average, about 25 days a year are effectively closed to San Diego beachgoers because of general rain advisories. Another estimated 15 days are lost due to beach postings or closures as a result of sewer spills or other major contamination incidents or to water sampling tests indicating unacceptably high levels of pollution.

Exhibit 15

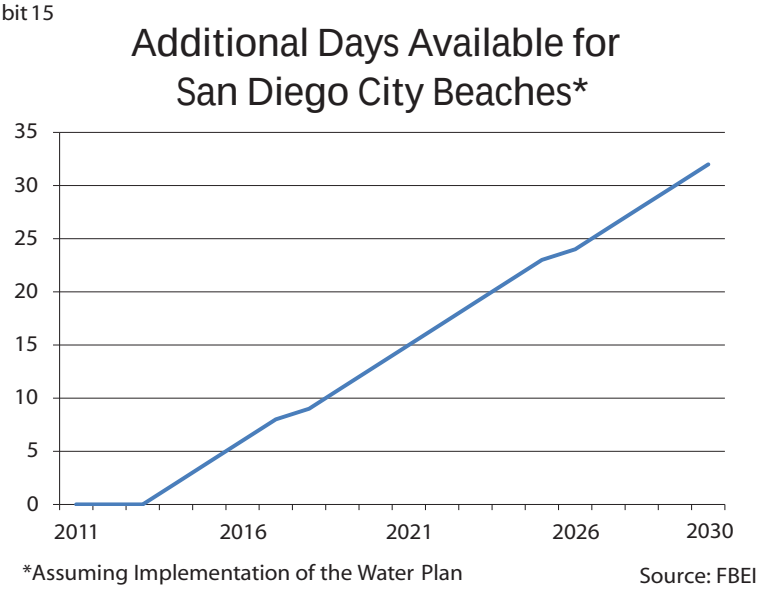

If an 80% reduction in pollution could be achieved, as described under TMDL requirements, the total number of days off limits to swimmers could be reduced from 40 to 8 over the next twenty years. This means that by 2030, beachgoers would have an additional 32 days per year of access. (See Exhibit 15.)

Exhibit 16

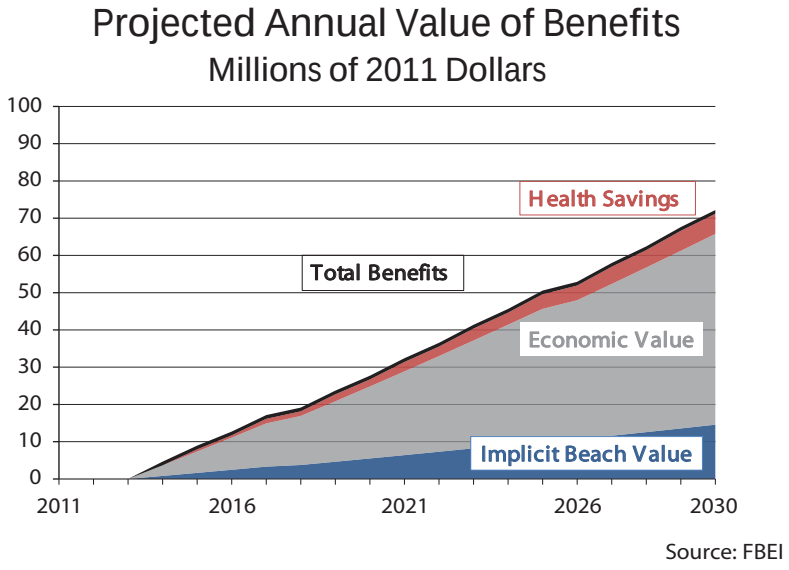

FBEI estimates that the annual value of this increased accessed to beaches (Implicit Beach Value) to San Diego City's residents could approach $15 million (2011 dollars) by 2030. (See Exhibit 16.)

Methodology: Because the costs of the Strategic Plan would be borne by San Diego City residents, FBEI focused on the benefits from a greater availability of beach days to them. Using our projections on San Diego City population growth, FBEI developed estimates of average daily beach attendance of San Diego residents over the next twenty years. These projections utilized our finding that, on any given day during the year, approximately 3% of the City's population visit its beaches.

How much would San Diego residents value an additional day of beach access during the year? Several studies have been done on placing an implicit value on an area's beaches.[3] FBEI selected a market-based approach and assigned the value of a beach day per person as the cost of parking ($10) that San Diego beachgoers might typically experience. Although some residents would not be willing to pay that much for an additional beach day, others would pay more.

The projected implicit values of increased beach access each year through 2030 was then derived from FBEI's estimates of average daily beach attendance, additional days available, and the value per person of each beach day.

Economic Value

Coastal communities in San Diego experience a sizable falloff in business on days when beaches are closed. Visitors from outside the region, staying for more than one day at hotels or other lodgings, are unlikely to cancel their plans. Beach postings or closures are generally implemented with little prior notice. Individuals on day trips may also opt to visit an area's restaurants and shops. Nevertheless, beach closures definitely impose losses on businesses dependent on those attracted to the sand and surf.

FBEI calculated the total economic value that additional beach days could generate for the City of San Diego. This includes not only the direct dollar effects of additional spending on various goods and services but also the various "multiplier" impacts as this spending ripples through the economy.

Exhibit 17

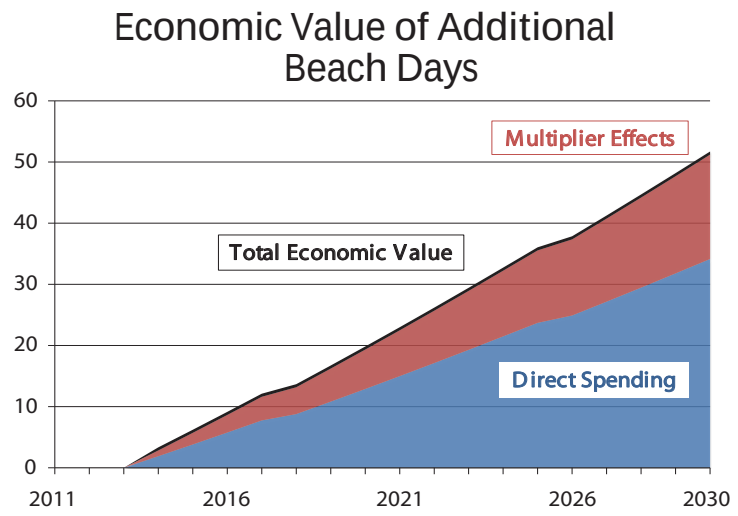

Source: FBEI

The total annual economic value of additional beach days resulting from the Strategic Plan's implementation could reach approximately $51 million (2011 dollars) by 2030. (See Exhibit 17.) About two-thirds of this would represent the impact of direct spending, with the additional amount representing the multiplier effects.

Methodology: Careful economic impact analysis requires that the changes in spending considered emanate from outside the area under review. For example, in the case of beach closings in San Diego, most San Diego City residents can be expected to spend their money at other venues within the City. In contrast, most visitors from outside the City deciding not to visit its beaches because of closures are likely to opt for activities and spending in their own or other areas.

This study, therefore, focused on potential changes in beach-related spending by non-City residents. In its first step of the analysis, FBEI estimated annual average beach attendance by non-City residents. These estimates reflected our forecasts of average attendance by City residents (see Methodology in section above) and historical data suggesting that non-City residents typically account for about 40% of daily attendance. (See Exhibit 18.)

Exhibit 18

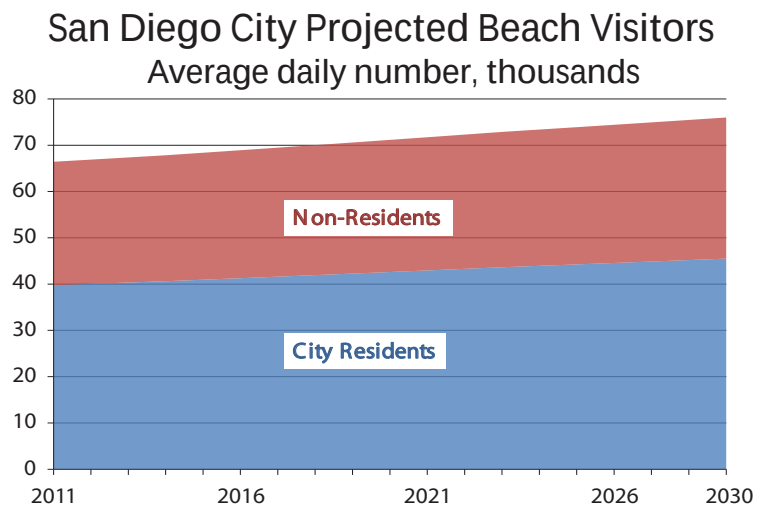

Source: FBEI

The second step involved determining the average value of daily spending at beaches. FBEI used survey data on average spending by daily beachgoers for Southern California beaches.[4] This data reflected spending at beaches in Los Angeles and Orange Counties during the summer of 2000 for parking, food & beverages, beach supplies, rental equipment, and other shopping. FBEI adjusted these numbers to current dollars based on different relevant Consumer Price Indexes. We also added an average expected daily per person expenditure of $10 for gasoline. The result was an estimated $35 per day for each person visiting San Diego beaches.

FBEI was then able to estimate the total amount of direct spending that could take place in San Diego each year by calculating the product of the number of additional beach days available, the average daily beach attendance by non-City residents, and the average expected spending per day ($35).

Multiplier effects were then analyzed. These have two components—"indirect" and "induced". Indirect effects include the supply chain effects or the impact on producers of various goods and services in the area benefiting from the additional spending by beachgoers. Induced effects reflect the additional economic impact of outlays by individuals and firms as they spend some of the additional income they earn either directly or indirectly from beachgoers.

The IMPLAN© V3.0 modeling program was utilized to determine the magnitude of the indirect and induced impacts of the additional assumed amounts of spending. This analysis indicated that a multiplier of 1.5 (the ratio of total economic effects to the amount of direct spending) would be appropriate. The relatively low number of this multiplier reflects the fact that many of the products purchased by beachgoers are produced outside of the City (e.g., gasoline, food, apparel, etc.).

FBEI then was able to calculate the total economic value for each year through 2030, combining the annual amounts of additional direct spending and the multiplier effects.

Health Care Savings

The potential health care benefits of improved water quality are difficult to quantify. San Diego County does not track incidents arising from possible beach water contamination. It is frequently difficult to isolate the cause of various ailments. For example, skin rash can often be the result of allergies or jelly fish stings rather than contaminants.

In addition, research done by Colford [5] on a cohort of nearly 9,000 beachgoers at Mission Bay indicated that, although there was some evidence of illness related to water exposure, there was little correlation between the measures now used to monitor water quality and the incidence of such illness.

FBEI's study attempts to estimate the potential health care savings that could be realized through improved water quality and a reduction of illness. Health care savings would include both a reduction in direct medical costs (doctor visits and medication) and the economic losses from possible absences of work. Our estimates indicate that total annual health care savings could reach $5.4 million (2011 dollars) by 2030. (See previous Exhibit 16.)

Methodology: The methodology used to estimated health care savings followed the approach utilized by Dwight, Fernandez, Baker, Semenza, and Olson.[6] Four primary illnesses associated with coastal water pollution were analyzed: Gastroenteritis (GI), Acute Respiratory Disease (ARD), ear infections, and eye infections.

Colford's research reported a 4-6% incidence among swimmers in Mission Bay of GI symptoms, although actual GI may not materialize. For the purpose of this study's analysis, the Strategic Plan is assumed to achieve a 0.8 percentage point reduction in the probability that a swimmer will incur GI by 2030.
Illness rates relative to the incidence of GI were used based on the work of Fleisher et al:[7] ARD (.337), ear infection (.551), and eye infection (.303). This work also estimated the percent of the four illnesses likely to result in a doctor visit as well as the number of days expected to be lost at work.

The number of individuals potentially affected by health care factors each day were projected based on FBEI's estimates of population growth, beach attendance by San Diego residents, and the proportion of beachgoers expected to swim or go in the water.[8] Doctor visits in San Diego can typically cost between $100 and $300 (excluding the amounts paid by insurance companies). FBEI assumed an average cost for medical treatment, including prescribed medicines, of $200 per incident. The cost of foregone earnings was derived from the average annual wage and salary projected by FBEI for 2011 ($50,329). This figure was used to estimate earnings losses due to the various illnesses after adjusting for the number of workdays per year and the probability that illness occurs on a weekend or holiday. (It should be noted that although some illnesses will affect non-wage earners, such as children, wages may be foregone because of the necessity of childcare.)

Exhibit 19 shows the total cost (2011 dollars) of each beach-related illness in terms of direct medical expenses and the losses resulting from work absence. These costs range from about $37 for an eye infection to about $111 for a serious respiratory ailment (ARD).

Exhibit 19

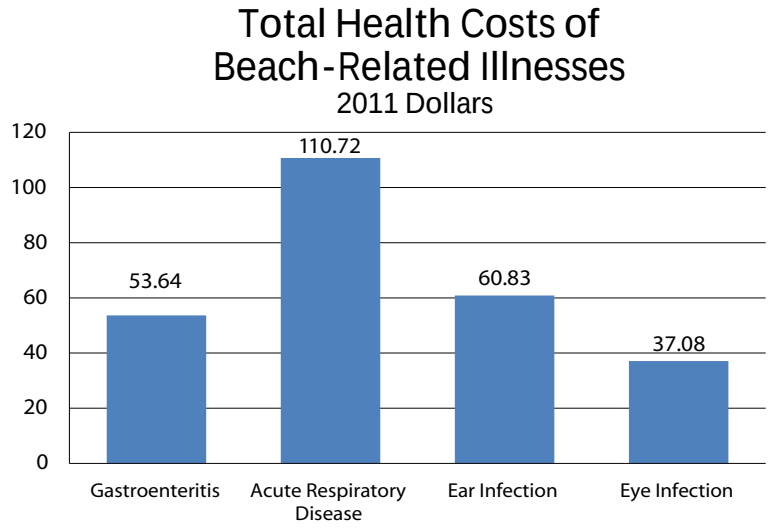

Source: FBEI

FBEI then calculated the total annual costs for possible health care savings per year using the expected reduction in probability for GI, the associated expected smaller incidents of the other three ailments, and the average total cost of each of the four illnesses.

VI. RECOMMENDATIONS AND ACTION STEPS

The task of complying with TMDL and water quality mandates at a time of major budget and funding constraints suggests several major recommendations:

1) A priority should be placed on solutions to improving water quality that will require relatively low amounts of expenditures and will not disrupt existing communities through acquisition and condemnation of private property. For example, a more frequent cleaning and regular maintenance of storm drains, intensified street sweeping, and increased trash pickup should be deployed.

2) Scientific studies need to be conducted to more carefully document the correlation between TMDL standards and the incidence or risk of various illnesses. Alternative indicators of water quality may be necessary.

3) Chambers of Commerce and other civic organizations in the beach areas (e.g., Ocean Beach Main Street Association) should be consulted on their recommendations and support for ways to reduce the flow of contaminants and pollutants.

4) A collaborative approach involving government, business, and academic experts should be used to help develop some of the most cost-effective approaches to achieving the various water quality standards.

5) As suggested in the Strategic Plan, efforts to control pollution at its various sources need to be enhanced through greater monitoring and enforcement.

6) A more complete analysis of the relative importance of various causes of pollution in general runoff needs to be conducted (e.g., car washing, lawn pesticides, etc.) Aggressive public education needs to then be conducted, with possible restrictions implemented if necessary.

7) New parking lots should be required to have porous payments and follow other best management practices to reduce runoff and existing lots should be retrofitted in strategic areas.

8) As emphasized in the Strategic Plan, various programs and projects should be carefully evaluated as they are implemented to identify best management practices. Major expenditures or investments should first be piloted in one area before expanding them on a wider scope.

9) Public-private partnerships should be formed to implement the various projects entailing significant spending or investment.

10) Data on illnesses related to swimming in San Diego City waters needs to be collected from health care providers and analyzed to better understand the scope and severity of water pollution risk in the area.

11) San Diego City residents should be polled with respect to their opinions about the current quality of the City's beaches and their willingness to pay for additional enhancements. This data needs to be analyzed to ascertain the difference in response between frequent and infrequent beachgoers.

12) Methods to pay for the cost of implementing the Strategic Plan need to be considered that would be the most equitable and efficient. For example, beachgoers might be asked to pay a somewhat larger share of the total cost burden through parking fees, sales taxes, or hotel fees because of the special value they place on clean beaches. In addition, or alternatively, water pollutants could be taxed more heavily.

13) Given its budget pressures and this study's finding of the sizable gap between expected costs and benefits, the City of San Diego should consider requesting relief from the San Diego Water Board in achieving various TDMLs or in extending the period in which they are accomplished. This would allow a more thorough analysis of the potential effectiveness of such standards in San Diego. It also would allow more time to determine if solutions featuring lower costs with smaller impacts on established communities can produce significant improvements in water quality.

In conclusion, the objective of improving the quality of San Diego's important beaches and other recreational water bodies is commendable. However, at a time when the economic recovery is still relatively fragile, a measured and thoughtful approach appears warranted. This is particularly true given this study's finding of a large divergence between expected costs and benefits.

ENDNOTES

1 Multiple closures and postings may be recorded for any given day reflecting the conditions at the various beaches within the jurisdiction of the City of San Diego.

2 Based on its annual projections for population and average household size, FBEI estimates indicate that the number of households in the City of San Diego will grow at an average rate of 0.74% per year through 2030.

3 See for example Pendleton & Kildrow (2006).

4 Several studies have estimated the impact of beach spending. See for example, reports by King (2001). FBEI's study used survey data collected by Wiley, Leeworthy & Stone (2006).

5 Colford, Wade, Schiff, Wright, Griffith, Sandhu, et al (2006).

6 Dwight, Fernandez, Baker, Semenza, & Olson (2005).

7 Fleisher, Kay, Wyer, & Godfree (1998).

8 Survey data collected by Colford et al (2006) included the percent of swimmers in data collected over the summer months in Mission Bay. FBEI estimated the probable percentages of swimmers in each month in deriving an expected annual average for San Diego beachgoers.

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AGENCIES AND INSTITUTIONS CONSULTED

California Department of Finance

California Employment Development Department

California Environmental Protection Agency State Water Resources Control Board

City of San Diego Financial Management

City of San Diego Lifeguard Services

City of San Diego Transportation & Storm Water Department

County of San Diego Department of Environmental Health

County of San Diego Land and Water Quality Division

Department of Environmental Analysis & Design

Ocean Beach Main Street Association

San Diego City Fire-Rescue Department

San Diego Coastkeeper

San Diego Convention & Visitors Bureau

U.S. Environmental Protection Agency

Weston Solutions, Inc.

AUTHOR BIOGRAPHIES

Lynn Reaser, Chief Economist

As a professional economist, Dr. Reaser brings extensive experience in the financial services sector with a keen ability to translate complex economic issues into understandable language with relevant and actionable implications. Dr. Reaser, a leading spokesperson for the University, conducts over 300 media interviews annually, including newspapers, magazines, television, radio, wire services, and the internet. She also addresses numerous domestic and international conferences and forecast events. She is presently a member of the PLNU School of Business Faculty, teaching managerial economics in the MBA program. Involved in public policy, she is the Chief Economist of the Council of Economic Advisors for California State Controller John Chiang, and is a participating economist in the S & P/Case-Shiller Real Estate Index and many other leading economic gauges and surveys. Dr. Reaser is active in many professional organizations including serving as past President of the National Association for Business Economics (NABE), which has also named her a Fellow for her contributions to the profession. This year, she received the NABE Outlook Award for the most accurate economic forecast in 2011-12.

Leading a skilled business and economic research team at the Fermanian Business & Economic Institute (FBEI), she is highly proficient at analyzing economic data, modeling, and forecasting, with special attention given to providing clear and concise recommendations for the reader. She brings an engaging, personal, and practical approach to writing and speaking on economic issues to all audiences with a passion towards using economics as a tool to assist people personally and in their enterprises. In her role as Chief Economist for the FBEI she provides actionable economic counsel to PLNU and its stakeholders. Guest lecturing, publishing, consulting, and public speaking are among many of her responsibilities. Consulting clients include Sempra Generation, San Diego Zoo Global, Equinox Center, San Diego Military Advisory Council, Jacobs and Cushman San Diego Food Bank, as well as other trade associations and professional organizations.

From 1999 to 2009, she served as the Chief Economist for the Bank of America Investment Strategies Group. Dr. Reaser provided the global and U.S. economic framework for investment strategy for high net-worth, institutional, and brokerage clients, encompassing over $500 billion under management. She previously served as Barnett Bank's (Bank of America) and First Interstate Bank's (Wells Fargo Corporation) Chief Economist. In these roles she furnished economic advice for all of the Bank's various business lines, including consumer finance, business banking, real estate, and wealth management, and built and led an extraordinarily cohesive team of professional economists who advised senior management on tactical and strategies involving all aspects of their business.

Previously she served as Chairman of the American Bankers' Association's Economic Advisory Council. She has also served on the Governor's Council of Economic Advisors for the State of California; Leadership Florida; Boston Economic Club; was a fiscal advisor to cities of Los Angeles and San Francisco; California's Economic Strategy Panel; Chairman of the Board of Economic Advisors to the Los Angeles Area Chamber of Commerce; President of the Economic Roundtable of Jacksonville; President of the Los Angeles Chapter of the National Association for Business Economics; and member of the Editorial Advisory Board, Contemporary Economic Policy. She holds a B.A. in Economics (cum laude) and a M.A. and Ph.D. in Economics, all from the University of California, Los Angeles. She resides in San Diego, Ca.

Dieter Mauerman, Business and Economic Research Associate

Dieter Mauerman joined the staff of the Fermanian Business and Economic Institute (FBEI) as Research Assistant in January 2010 and in January 2013 was promoted to his present role as Business and Economic Research Associate. His role at the FBEI includes conducting field research, data acquisition and analysis, and crafting communications of the results of research and analysis for a wide range of client projects and presentations. Mauerman also manages the research teams that are required for some of the FBEI's larger consulting projects. He is a pending graduate of the Masters of Business Administration program at PLNU, and is currently preparing his thesis. He was awarded a certificate in economic measurement from the National Association for Business Economics in 2010. A 2009 undergraduate in Business Administration from PLNU, Mauerman possesses a strong quantitative and qualitative base including accounting, statistics, finance, management, strategy, and other courses. He also studied in London at Kingston University in business and culture enhancing his knowledge of international business, and in 2011 he joined with PLNU faculty and staff in an extended business and economic trip to France and Portugal which included many meetings and sessions with leading economists of the European Union.

He honed his experience by his internship with Matrix Media Technologies in 2008. At Matrix he conducted Competitive and Market Research which located competition data that allowed for more in depth pricing and strategizing. He also performed Online Brand Analysis and Lead generation which included conducting keyword research for major brands while factoring in search volumes. He also had sales experience in the form of crafting communications and targeting current and future clients to bolster overall sales.

In the years leading up to and including High School, Mauerman was active in the Boy Scouts of America organization for the full 12 years possible. During the later years of his scouting experience he held many different positions of senior leadership. Mauerman was also nominated and then inducted to the National Honor Society of the Boy Scouts of America, The Order of the Arrow brotherhood which recognizes the most exemplary scouts of the organization. He finished his scouting career with the highest rank attainable within the organization, Eagle Scout. He resides in San Diego, Ca.

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State of California
Regional Water Quality Control Board
San Diego Region

SUPPLEMENTAL
EXECUTIVE OFFICER SUMMARY REPORT
May 8, 2013

ITEM: 9

SUBJECT: Public Hearing (continued): Issuance of an NPDES Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region (Tentative Order No. R9-2013-0001, NPDES No. CAS0109266) (*Wayne Chiu, Laurie Walsh, Christina Arias*).

PURPOSE: To receive public testimony and consider adoption of Tentative Order No. R9-2013-0001 (Tentative Order).

RECOMMENDATION: Adoption of the revised Tentative Order No. R9-2013-0001, with corrected Option 1 Errata or Option 2 Errata, is recommended.

DISCUSSION: This Executive Officer Summary Report (EOSR) supplements the EOSR provided for Item 9 of the May 8, 2013 San Diego Water Board meeting.

Cost Benefit Analysis Report

At the April 10 and 11, 2013 meeting, the San Diego Water Board allowed a cost benefit analysis report prepared by the City of San Diego Transportation and Storm Water Department entitled *Meeting Water Quality Standards for San Diego's Recreational Waters: A Cost Benefit Analysis* dated April 2011 (Cost Benefit Analysis) (**Supporting Document 4**) into the record. The City of San Diego funded this analysis to evaluate the costs of compliance for the City of San Diego with total maximum daily loads (TMDLs) for bacteria, metals, pesticides or other pollutants. The San Diego County Copermittees referenced this Cost Benefit Analysis in their April 2013 public hearing testimony before the San Diego Water Board in support of their request to remove the bacteria TMDL from the Tentative Order. The County of San Diego specifically requested the Cost Benefit Analysis be allowed into the record on the Tentative Order. The request was ***not*** made on behalf of all Copermittees as was stated in the first EOSR for Item 9.

The San Diego Water Board Chair invited designated parties wishing to submit comments on the Cost Benefit Analysis, to submit them to the San Diego Water Board no later than 5:00 p.m. on Friday, April 26, 2013. Timely submitted comment letters are included in **Supporting Document 5**. Comment letters were received from San Diego and Orange County Copermittees, Natural Resources Defense Council, San Diego and Orange County Coastkeeper, Inland Empire Waterkeeper, Building Industry Coalition, Clean Water Now, San Diego Taxpayers Association, and San Diego Regional Chamber of Commerce. Where comments referred to existing studies for support, only those studies already a part of the record for Tentative Order No. R9-2013-0001 are included in **Supporting Document 5**.

Cost Information

Regional Storm Water Program Expenditures FY 2011/2012 **(Supporting Document 6)** and the *Comprehensive Load Reduction Plan Estimated Cost* **(Supporting Document 7)** are included to assist the San Diego Water Board's discussion on costs. This information is already in the record and the cost spreadsheets were previously provided to the San Diego Water Board at the December 2012 workshop. The information used to generate the spreadsheets provided in Supporting Documents 6 and 7 was excerpted from the Copermittees 2012 Storm Water Program Jurisdictional Annual Reports **(Supporting Document 8)**.

Congressional and California Legislature Comments

Additionally, at its April 10 and 11, 2013 meeting, the San Diego Water Board Chair, accepted into the record, a letter addressed to USEPA from several Members of the United States Congress dated April 2, 2013. **(Supporting Document 9)** The San Diego Water Board also accepted into the record a letter addressed to the Board Chair from several California State Legislature Senators and Assembly Members dated April 4, 2013 **(Supporting Document 10).** The Congress Members comments included a request that USEPA review the Tentative Order for potential impact on local communities to ensure that costs of compliance and schedules are sustainable and reasonable. The comments from the California State Legislature Senators and Assembly Members included a request to delay adoption of the Tentative Order to allow for the State Water Board review of existing precedential receiving water language and further

Board and stakeholder review of estimated costs of compliance with the bacteria TMDL. The USEPA response to the United States Congress Members letter is included as **Supporting Document 11**.

Corrected Errata

The Errata presented in **Supporting Documents 1 and 2** were corrected to address additional typographical errors in the Tentative Order and Fact Sheet and to add needed revisions to the Fact Sheet (**Supporting Documents 12 and 13)**. The corrected sections of the Errata are highlighted in green.

SUPPORTING DOCUMENTS:

Supporting Documents 1-4 Previously Provided

5. Comment Letters on Cost Benefit Analysis
6. Regional Storm Water Program Expenditures
7. Regional Comprehensive Load Reduction Plan for Bacteria TMDL Estimated Cost
8. Storm Water Program Budget FY11/12 for 31 Copermittees
9. Comment Letter from United States Congress dated April 2, 2013
10. Comment Letter from California State Legislature dated April 4, 2013
11. USEPA Response to United States Congress Letter dated April 24, 2013
12. **Corrected** Option 1 Errata (removal of Provision II.B.3.c)
13. **Corrected** Option 2 Errata (retention of Provision II.B.3.c with modifications)

PUBLIC NOTICE:

Notice of continuance of this item was provided to interested persons via email on April 19, 2013. Notice was also provided in the Meeting Notice and Agenda for the May 8, 2013 Board meeting, which is posted on the San Diego Water Board website.

SAN DIEGO REGIONAL
WATER QUALITY
CONTROL BOARD
2013 APR 26 PM 2 31

County of San Diego

RICHARD E. CROMPTON
DIRECTOR

DEPARTMENT OF PUBLIC WORKS

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April 26, 2013

Wayne Chiu, P.E.
California Regional Water Quality Control Board
San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

TENTATIVE ORDER NO. R9-2013-0001: MEETING WATER QUALITY STANDARDS FOR SAN DIEGO'S RECREATIONAL WATERS: A COST BENEFIT ANALYSIS

Dear Mr. Chiu:

The County of San Diego (County) appreciates the opportunity to comment on the following document admitted into the record for Tentative Order No. R9-2013-0001 on April 11, 2013: *Meeting Water Quality Standards for San Diego's Recreational Waters: A Cost Benefit Analysis*. This report was commissioned by the City of San Diego and written by economists from the Fermanian Business & Economic Institute (FBEI) at Point Loma Nazarene University in April 2011.

To our knowledge, the FBEI Report is the only analysis that attempts to evaluate the relationship between the benefits and costs of implementing the Total Maximum Daily Load (TMDL) for Indicator Bacteria for Beaches and Creeks. The County's position is that it is absolutely essential to consider both costs and benefits before moving forward with a regulation of this magnitude. Moreover, because the County believes the TMDL exceeds the Maximum Extent Practicable (MEP) standard that was established for stormwater in the federal Clean Water Act, it is also our opinion that a cost-benefit analysis is required under the California Water Code.

The FBEI Report's conclusions support the County's previously stated recommendations to 1) open a process to revisit the Basin Plan Amendment for this TMDL that is scientifically sound, incorporates recent and nearly completed studies, and provides a positive cost-benefit to taxpayers, and 2) re-open the TMDL <u>before</u> it is incorporated into the MS4 permit. Specifically, the FBEI report concludes that the costs to comply with the TMDL within the City of San Diego outweigh the potential benefits of its implementation by a factor of six-to-one. It would be reasonable to assume that a similar conclusion would apply throughout the County.

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We note the following relevant recommendations from the FBEI Report (Section 6, pp. 27-28) for your consideration prior to adopting an MS4 permit that includes the Bacteria TMDL:

- "Scientific studies need to be conducted to more carefully document the correlation between TMDL standards and the incidence or risk of various illnesses. Alternative indicators of water quality may be necessary."

- "Data on illnesses related to swimming in San Diego City waters needs to be collected from health care providers and analyzed to better understand the scope and severity of water pollution risk in the area."

- "San Diego City residents should be polled with respect to their opinions about the current quality of the City's beaches and their willingness to pay for additional enhancements. This data needs to be analyzed to ascertain the difference in response between frequent and infrequent beachgoers."

In light of these and the other concerns we have expressed about the scientific basis and attainability of the TMDL in our written and oral comments, the County urges the Regional Board to exclude the Bacteria TMDL from the MS4 permit until these issues can be addressed in a responsible way for the taxpayers and citizens of San Diego County.

Sincerely,

CID TESORO, LUEG Program Manager
Department of Public Works

cc: David Gibson, Executive Officer
San Diego Regional Water Quality Control Board

ORANGE COUNTY
OC PublicWorks
Our Community. Our Commitment.

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April 26, 2013

By E-Mail

Wayne Chiu, P.E.
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4353

Subject: Tentative Order No. R9-2013-0001: Meeting Water Quality Standards for San Diego's Recreational Waters: A Cost Benefit Analysis

Dear Mr. Chiu:

The County appreciates the opportunity to comment on the subject document that has been admitted into the record for Tentative Order No. R9-2013-0001. The Analysis provides important information to allow your Board to make better policy decisions with respect to the implications of the Tentative Order. We support the comments of the County of San Diego, which highlighted some key issues from the Analysis pertaining to the incorporation of the Total Maximum Daily Load (TMDL) for Indicator Bacteria for Beaches and Creeks into the Tentative Order.

As a consequence of the inclusion of the Analysis into the record, conforming changes should also be made in Section VI of the Fact Sheet that currently assumes that information provided in the Analysis is not available. In a number of places the Fact Sheet points to the lack of study of the economic benefits and seems to imply, contrary to the findings of the Analysis, that economic benefits of the Tentative Order will outweigh costs:

Page F-17 "Discussions of the financial and economic ramifications of municipal storm water management programs tend to focus on the significant costs incurred by municipalities in developing and implementing the programs. When considering the cost of implementing the programs, however, it is also important to consider the alternative costs that are incurred when programs are not fully implemented, as well as the economic benefits which result from effective program implementation."

Page F-19 "Economic considerations of municipal storm water management programs cannot be limited only to program costs. Evaluation of programs must also consider information on the benefits derived from environmental protection and improvement. Attention is often focused on municipal storm water management program costs, but the programs must also be viewed in terms of their value to the public."

Please contact me directly at (714) 955-0601 if you have any questions.

Sincerely,

Mary Anne Skorpanich, Manager
OC Watersheds

c: David Gibson, San Diego Regional Board
South Orange County Permittees
Orange County Technical Advisory Committee
County of San Diego
Riverside County Flood Control and Water Conservation District
City of San Diego

May 8, 2013
Item No. 9
Supporting Document No. 5

April 26, 2013

Via electronic mail to wchiu@waterboards.ca.gov
Mr. Wayne Chiu
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123

Re: Objection to "April 2011 Meeting Water Quality Standards for San Diego's Recreational Waters, a Cost Benefit Analysis."

Dear Mr. Chiu:

The Natural Resources Defense Council, San Diego Coastkeeper, Orange County Coastkeeper, and Inland Empire Waterkeeper submit the following comments on San Diego County's request to include the document titled "April 2011 Meeting Water Quality Standards for San Diego's Recreational Waters, a Cost Benefit Analysis," ("San Diego Report") in the record for the Tentative National Pollutant Discharge Elimination System Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds Within the San Diego Region, Tentative Order No. R9-2013-0001, NPDES Permit No. CAS0109266 ("Tentative Order").

We note that the deadline for submission of written comments on the Tentative Order passed on January 11, 2013. San Diego County has claimed that failure to include the San Diego Report in the administrative record and allow the Board to consider it would cause the County undue prejudice. However, the County has failed to demonstrate prejudice beyond this cursory assertion, and therefore its inclusion in the record is not justified. Further, the overall focus of the San Diego Report appears to primarily cover cost of programs to meet the terms of total maximum daily load ("TMDL") requirements for bacteria at San Diego beaches. Neither the TMDL nor the TMDL's waste load allocations that must be incorporated into the permit may be properly challenged through the adoption process for the Tentative Order. Therefore, the report is irrelevant to the Tentative Order's adoption.

In the event that the Regional Board accepts the San Diego Report into the record, we note the following issues regarding its claims. First, the San Diego Report states that its analysis is based on "[a]n alternative strategy . . . developed by Weston Water Solutions, Inc. for the City of San Diego in 2007 [that] features a tiered approach over 20 years . . . (referred to as 'the Strategic Plan'.)"[1] However, we were unable to locate any report detailing a 20 year approach or cost analysis at the weblink provided in the report. The City of San Diego Storm Water Division's webpage contains a 2007 report called "Strategic Plan for Watershed Activity Implementation."

[1] San Diego Report, at Executive Summary.

That document explicitly states it represents a "strategy for identifying and implementing watershed activities within the City's jurisdictional boundaries over the next ***five*** years."[2] Without the ability to review the original source data or analysis forming the basis for cost claims made in the San Diego Report, we are unable to provide full comment on the document.

Second, in the event the "Strategic Plan for Watershed Activity Implementation" does form the basis for stormwater program implementation costs claimed in the San Diego Report, the Watershed Activity Implementation document appears to include costs for practices such as street sweeping, greater than 10 percent of total claimed program costs, as part of its Watershed Permit Activities Cost Estimate and Watershed TMDL Activities Cost Estimate.[3] As the Regional Board has properly noted, "street sweeping and trash collection costs cannot be solely or even principally attributable to MS4 permit compliance, since these practices have long been expected from and implemented by municipalities."[4]

The San Diego Report also contains several unsupported assertions in its methodology for determining economic benefits of stormwater regulation, including that "in the case of beach closings in San Diego, most San Diego City residents can be expected to spend their money at other venues within the City." The San Diego Report further fails to consider indirect or non-market costs for health impacts, including people's "willingness to pay" to avoid illness, which are well documented in other studies.[5]

Given the lack of demonstrated prejudice to San Diego County, we urge the Board to reject the County's request to incorporate the San Diego Report into the record. If the Board accepts the report, we request that the Regional Board additionally accept the attached documents, to the extent they are not contained in the record already, which detail public health costs and economic impacts of beach tourism in California and directly relate to the subject of the San Diego Report.

Respectfully Submitted,

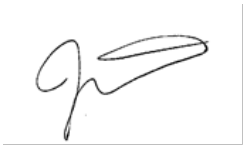

Noah Garrison
Project Attorney
Natural Resources Defense Council

Jill Witkowski
Waterkeeper
San Diego Coastkeeper

[2] City of San Diego, 2007, Strategic Plan for Watershed Activity Implementation, at Overview-1 (emphasis added).
[3] *Id*., at Appendix C, Appendix D.
[4] Tentative Order Fact Sheet, at F-19.
[5] See, e.g., Given, s., Pendleton, L.H., and Boehm, A.B., 2006, Regional Public Health Cost Estimates of Contaminated Coastal Waters: A Case Study of Gastroenteritis at Southern California Beaches, Environ. Sci. Technol, 40 (16), 4851-58.

Colin Kelly
Staff Attorney
Orange County Coastkeeper
Inland Empire Waterkeeper

Enclosures:

Given, S. Pendleton, L. Boehm, A. "Regional Public Health Cost Estimates of Contaminated Coastal Waters: A Case Study of Gastroenteritis at Southern California Beaches" *Environ. Sci. Technol.*, 2006, 40 (16), pp. 4851-485815 July 2006

Lew, D., Larson, D. "Valuing Recreation and Amenities at San Diego County Beaches" *Coastal Management*, 33:71–86, 2005

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Haile, R. Witte, J. et. al. "The Health Effects of Swimming in Ocean Water Contaminated by Storm Drain Runoff" *Epidemiology*, Vol. 10, No. 4. pp. 355-363. July 1999

Environ. Sci. Technol. **2006**, *40,* 4851−4858

Regional Public Health Cost Estimates of Contaminated Coastal Waters: A Case Study of Gastroenteritis at Southern California Beaches

SUZAN GIVEN,[†]
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We present estimates of annual public health impacts, both illnesses and cost of illness, attributable to excess gastrointestinal illnesses caused by swimming in contaminated coastal waters at beaches in southern California. Beach-specific enterococci densities are used as inputs to two epidemiological dose−response models to predict the risk of gastrointestinal illness at 28 beaches spanning 160 km of coastline in Los Angeles and Orange Counties. We use attendance data along with the health cost of gastrointestinal illness to estimate the number of illnesses among swimmers and their likely economic impact. We estimate that between 627,800 and 1,479,200 excess gastrointestinal illnesses occur at beaches in Los Angeles and Orange Counties each year. Using a conservative health cost of gastroenteritis, this corresponds to an annual economic loss of $21 or $51 million depending upon the underlying epidemiological model used (in year 2000 dollars). Results demonstrate that improving coastal water quality could result in a reduction of gastrointestinal illnesses locally and a concurrent savings in expenditures on related health care costs.

Introduction

Each year between 150 million and nearly 400 million visits are made to California (CA) beaches generating billions of dollars in expenditures, by tourists and local swimmers, and nonmarket values enjoyed mostly by local area residents (*1*, *2*). Nonmarket benefits represent the value society places on resources, such as beaches, beyond what people have to pay to enjoy these resources (see Pendleton and Kildow (*1*) for a review of the nonmarket value of CA beaches). In an effort to protect the health of beach swimmers, the CA State Legislature passed Assembly Bill 411 (AB411) in 1997 with formal guidance and regulations for beach water quality which are formally codified as a state statute (*3*). AB411 requires monitoring of bathing waters for fecal indicator bacteria (FIB, including total coliform (TC), fecal coliform (FC), and enterococci (ENT)) on at least a weekly basis during the dry season (1 April through 31 October) if the beach is visited by over 50,000 people annually or is located adjacent to a flowing storm drain. Beaches can be posted with health warnings if single-sample or geometric mean standards for TC, FC, and ENT exceed prescribed levels (see Supporting Information (SI) for standards).

Based on AB411 water quality criteria and their professional judgment, CA county health officials posted or closed beaches 3,985 days during 2004 (*4*). Sixty percent (2,408 beach-days) of these occurred at Los Angeles and Orange County (LAOC) beaches (*4*), and nearly all (93%) of the LAOC advisories and closures were caused by unknown sources of FIB. The number of beach closures and advisories in CA (and the country as a whole) rises each year as counties monitor more beaches (*4*). Needless to say, public awareness of coastal contamination issues is growing, and in some cases strongly influencing the development of programs to improve coastal water quality. For example, public pressure on the Orange County Sanitation District (OCSD) prevented them from reapplying for a waiver from the USEPA to release partially treated sewage to the coastal ocean. Instead, OCSD plans to implement a costly upgrade to their sewage treatment plant. New stormwater permits issued by CA Regional Water Boards require counties and municipalities to implement prevention and control programs to meet coastal water quality criteria. The cost of such mitigation measures is difficult to determine, yet cost has been used as an argument in court challenges to the permits (*4*). In 2004 elections, voters in the city of Los Angeles approved a measure to spend $500 million on stormwater mitigation (*5*).

To understand the potential public health benefits of cleaning up coastal waters, we need a better idea of the magnitude of health costs associated with illnesses that are due to coastal water contamination. Several previous studies address the potential economic impacts of swimming-related illnesses. Rabinovici et al. (*6*) and Hou et al. (*7*) focused on the economic and policy implications of varying beach closure and advisory policies at Lake Michigan and Huntington Beach, CA, respectively. Dwight et al. (*8*) estimated the per case medical costs associated with illnesses at two beaches in southern California and used this to make estimates of public health costs at two Orange County beaches. Our study is novel in that it provides the first regional estimates of the public health costs of coastal water quality impairment.

While many different illnesses are associated with swimming in contaminated marine waters, we focus our analysis on gastrointestinal illness (GI) because this is the most frequent adverse health outcome associated with exposure to FIB in coastal waters (*9*, *10*). We estimate daily excess GI based on attendance data, beach-specific water quality monitoring data, and two separate epidemiological models developed by Kay et al. (*11*) and Cabelli et al. (*12*) that model GI based on exposure to fecal streptococci and ENT, respectively. Finally, we provide estimates of the potential annual economic impact of GI associated with swimming at study beaches.

We conduct our analysis using data from 28 LAOC beaches during the year 2000. Together, these beaches span 160 km of coastline (Figure 1, Table S1). We limit our analysis to these beaches and the year 2000 in particular because we were able to obtain relatively complete daily and weekly attendance and water quality data for these beaches during

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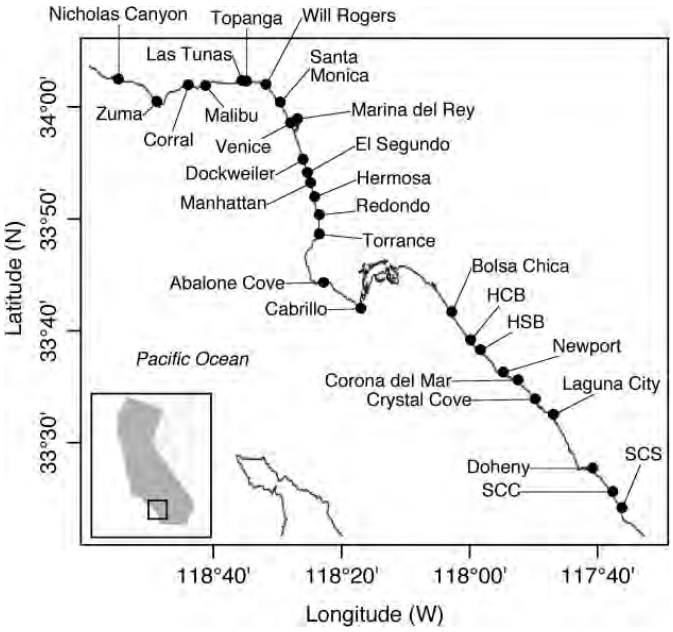

FIGURE 1. The 28 beaches considered in this study. HSB = Huntington State Beach, HCB= Huntington City Beach, SCC = San Clemente City Beach, and SCS = San Clemente State Beach.

this year. The 28 beaches represent a large, but incomplete, subset of the total beach shoreline in LAOC. Large stretches of relatively inaccessible beaches (e.g., portions of Laguna Beach, much of Malibu, and Broad Beach) were omitted from the analysis as were several large public beaches (e.g., Seal Beach and Long Beach) because of paucity of attendance and/or water quality data. The 1999−2000 and 2000−2001 winter rainy seasons were typical for southern CA (*13*), so 2000 was not particularly unique with respect to rainfall. A comparison of inter-annual water quality at a subset of beaches suggests that pollution levels in 2000 were moderate (data not shown). Thus, the estimates we provide can be viewed as typical for the region.

Methods

Number of Swimmers. Morton and Pendleton (*2*) compiled daily attendance data from lifeguards' records and beach management agencies. When data were missing, attendance was estimated using corresponding monthly median weekday or weekend values from previous years. (Table S1 shows the number of days in 2000 when data are available—for most beaches, this number approaches 366.) Because these data are based on actual counts, we do not need to factor in effects due to the issuance of advisories at a particular beach. Only a fraction of beach visitors enter the water. This fraction varies by month in southern CA from 9.56 to 43.62% (Table S2) (*14*). We applied the appropriate fraction to the attendance data to determine the number of individual swimmers exposed to coastal waters. Although research suggests the presence of FIB in sand in the study area (*15*, *16*), we do not consider the potential health risk that may arise from sand exposure because it has not been evaluated.

Water Quality Data. ENT data were obtained from the local monitoring agencies and are publicly available. Local monitoring agencies sample coastal waters at ankle depth in the early morning in sterile containers. Samples are returned to the lab and analyzed for ENT using USEPA methods. When ENT values are reported as being below or above the detection limit of the ENT assay, we assume that ENT densities were equal to the detection limit.

During 2000, monitoring rarely occurred on a daily basis; ENT densities were measured 14−100% of the 366 days in 2000, depending on monitoring site (Table S1). For example, Zuma beach was monitored once per week during the study period, while Cabrillo beach was monitored daily. To estimate ENT densities on unsampled days, we used a Monte Carlo technique. Normalized cumulative frequency distributions of observed ENT densities at each monitoring site were constructed for the 1999−2000 wet season (Nov 1, 1999 through Mar 31, 2000), 2000 dry season (April 1, 2000 through Oct 31, 2000), and the 2000−2001 wet season (Nov 1, 2000 through Mar 31, 2001). ENT densities on unsampled days during 2000 were estimated by randomly sampling from the appropriate seasonal distribution. Because day-to-day ENT concentrations at marine beaches are weakly correlated and variable (*17*), we chose not to follow the estimation method of Turbow et al. (*18*) who assumed a linear relationship between day-to-day ENT densities at two CA beaches. Comparisons between the Monte Carlo method and a method that simply used the monthly arithmetic average ENT density indicated the two provided similar results (data not shown).

The beaches in our study area (Figure 1) are of variable sizes; each beach may include 1−7 monitoring sites (Table S1). If more than one monitoring site exists within the boundaries of a beach, the arithmetic mean of ENT at the sites was used as a single estimate for ENT concentrations within the beach (*19*). There is considerable evidence that ENT densities at a beach vary rapidly over as little as 10 minutes (*17*, *20*). Therefore, even though we used up to 7 measurements or estimates to determine ENT at a beach on a given day, there is still uncertainty associated with our estimate because sampling is conducted at a single time each day.

Dose−Response. Of all the illnesses considered in the literature, GI is most commonly associated with exposure to polluted water (*10*−*12*, *21*−*26*). To estimate the risk of GI

TABLE 1. Dose–Response Models for Predicting GI[a]

name	original model	model converted to excess risk
model C (*12*)	$1000(P - P_o) = 24.2 \log_{10}(\text{ENT}) - 5.1$	$(P - P_0) = (24.2 \log_{10}(\text{ENT}) - 5.1)/1000$
model K (*11*)	$X = \text{Ln}(P/(1 - P)) = 0.201\ (\text{FS} - 32)^{1/2} - 2.36$	$(P - P_0) = (e^X/(1 + e^X)) - P_0$

[a] ENT = enterococci, FS = fecal streptococci. Both ENT and FS are in units of CFU or MPN per 100 mL water. P is the risk of GI for swimmers, P_0 is the background risk of GI.

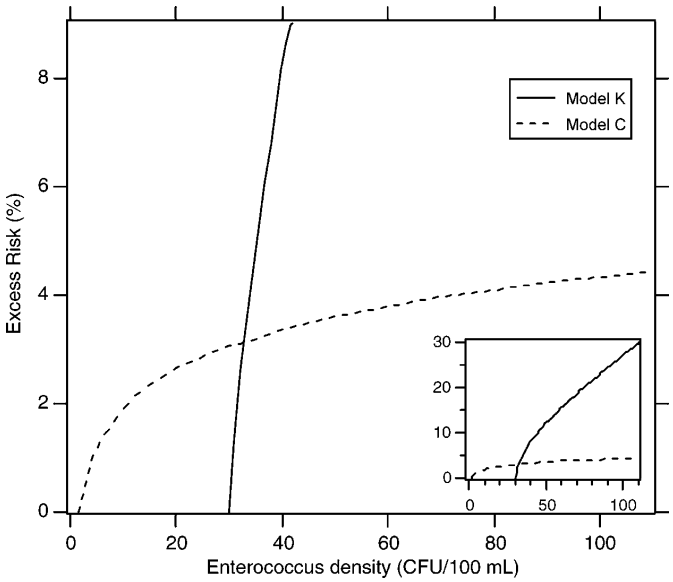

FIGURE 2. Dose–response relationships for the two epidemiological models. Excess risk of GI is shown as a function of ENT density. The inset more clearly shows the differences between the relationship for the randomized trial study (model K (*11*)) and the cohort study (model C (*12*)).

from swimming in contaminated marine waters in southern CA, we utilized two dose–response models (*11*, *12*) (Table 1) developed in epidemiology studies conducted elsewhere (in marine waters of the East U.S. coast and United Kingdom) (*18*, *27*). A local dose–response model for GI would be preferable, but does not exist. Haile et al. (*28*) conducted an epidemiology study at Los Angeles beaches and found that skin rash, eye and ear infections, significant respiratory disease, and GI were associated with swimming in waters with elevated FIB or near storm drains; however, they did not report dose–response models for illness and bacterial densities.

The two dose–response models (hereafter referred to as models C (*12*) and K (*11*)) are fundamentally different in that model C was derived from a prospective cohort study while model K was developed using a randomized trial study. Model C has been scrutinized in the literature (*20*, *26*, *29–31*). Among the criticisms are lack of ENT measurement precision and inappropriate pooling of data from marine and brackish waters. World Health Organization (WHO) experts (*10*) suggest that epidemiology studies that apply a randomized trial design, such as model K, offer a more precise dose–response relationship because they allow for better control over confounding variables and exposure (*26*). Thus, the WHO has embraced model K over cohort studies such as model C for assessing risk. We report GI estimates obtained from both models C and K in our study because they have both been applied in the literature (*8*, *18*), and form the basis for water quality criteria worldwide.

Models C and K were developed in waters suspected to be polluted with wastewater. The source of pollution at our study site during the dry season is largely unknown (*4*), although human viruses have been identified in LAOC coastal creeks and rivers (*32–36*) and an ENT source tracking study at one beach suggests sewage is a source (*37*). During the wet season, stormwater is a major source of FIB to coastal waters and Ahn et al. (*38*) detected human viruses in LAOC stormwater. Because we cannot confirm that all the ENT at our study site was from wastewater, there may be errors associated with the application of models C and K. In addition, there is evidence that dose–response relationships may be site specific (*30*). The results presented in our study should be interpreted in light of these limitations.

We converted incidence and odds, the dependent variables reported for model C and K, respectively, into risk of GI (P) (Table 1). P represents total risk of GI to the swimmer, and includes risk due to water exposure plus the background GI rate (P_0). Excess risk was calculated by subtracting the background risk from risk ($P - P_0$). While ENT is the independent variable for model C, model K requires fecal streptococci (FS), the larger bacterial group of which ENT are a subset, as the independent variable. We assumed that FS and ENT represent the same bacteria, following guidance from the WHO (*9*).

Models C and K provide different functional relationships between ENT and excess GI risk (Figure 2). Model C predicts relatively low, constant risks across moderate to high ENT densities relative to model K. At ENT less than 32 CFU/100 mL, model K predicts no excess risk; model C, however, does predict nonzero risks even at these low levels of contamination. The data range upon which each model was built varies considerably. Model C is based on measurements ranging

from 1.2−711 CFU/100 mL and model K is based on measurements from 0−35 to 158 CFU/100 mL. We extrapolated models C and K when ENT densities were outside the epidemiology study data ranges. Given the lack of epidemiological data on illness outside the ranges, extrapolation of the models represents a reasonable method of estimating excess GI.

Excess Illness Due To Swimming. The excess incidence of GI on day i at beach j ($GI_{i,j}$) is given by the following expression:

$$GI_{i,j} = A_{i,j} f_i (P_{i,j} - P_o) \quad (1)$$

$P_{i,j} - P_o$ is the excess risk of GI on day i at beach j as estimated from models C or K (Table 1), $A_{i,j}$ is the number of beach visitors, and f_i is the fraction of swimmers on day i (*14*). We assume P_0 is 0.06—the background risk for stomach pain as reported by Haile et al. (*28*) for beaches within Santa Monica Bay, CA. Daily values were summed across the year or season to estimate the number of excess GI per beach. Seasonal comparisons are useful in this region because of distinct differences between attendance and water quality between seasons. The wet season is defined as November through March and the dry season is defined as April through October. Note that the dry season corresponds to the season when state law mandates beach monitoring (*3*).

Public Health Costs of Coastal Water Pollution. GI can result in loss of time at work, a visit to the doctor, expenditures on medicine, and even significant nonmarket impacts that represent the "willingness-to-pay" of swimmers to avoid getting sick (sometimes referred to as psychic costs). Because there is a lack of information on the costs of waterborne GI, Rabinovici et al. (*6*) used the cost of a case of food-borne GI, $280 (year 2000 dollars) per illness from Mauskopf and French (*39*), as a proxy for the cost of water-borne GI for swimmers in the Great Lakes. The $280 per illness represents the willingness-to-pay to avoid GI and includes both market and nonmarket costs (*6*). Dwight et al. (*8*) conducted a cost of illness study for water-borne GI for two beaches in southern California (Huntington State Beach and Newport Beach) and determined the cost as $36.58 per illness in 2004 dollars based on lost work and medical costs. Discounting for inflation, this amount is equivalent to $33.35 in the year 2000 dollars. This value does not include lost recreational values or the willingness-to-pay to avoid getting sick from swimming. We use the more conservative estimate of Dwight et al. (*8*) to calculate the health costs of excess GI at LAOC beaches. However, we also provide more inclusive estimates of the cost of illness using Mauskopf and French's $280 willingness-to-pay value (*39*). Unless otherwise stated, all costs are reported in year 2000 dollars.

Results

Attendance and Swimmers. Beach attendance was higher during the dry season (from May through October) than in the wet season (November through April) (Figure 3). We estimate that the annual visitation to Los Angeles and Orange County (LAOC) beaches for the year 2000 approached 80 million visits.

Water Quality. Water quality (measured in terms of ENT concentration) varies widely across the beaches in the study. (Figure S1 shows the log-mean of ENT observations at each beach during the dry and wet seasons.) In general ENT densities are higher during the wet season compared to the dry. Water quality problems at a beach may exist chronically over the course of the year or may be confined to particularly wet days when precipitation washes bacteria into storm drains and into the sea. The most serious, acute water quality impairments can result in the issuance of a beach advisory or beach closure. According to CA state law, water quality exceeds safe levels for swimming if a single beach water sample has a concentration of ENT greater than 104 CFU/100 mL. Figure 4 illustrates the percentage of the days for which daily estimated ENT concentrations were in excess of the state single sample standard. Exceedances during the wet months generally outnumber exceedances during the dry months. The exceptions are Corral, Bolsa Chica, and Crystal Cove, which are all relatively clean beaches, even in the wet season. Doheny, Malibu, Marina Del Rey, Cabrillo, and Las Tunas had the worst water quality with over 33% of the daily estimates in 2000 greater than 104 CFU/100 mL, while Newport, Hermosa, Abalone Cove, Manhattan, Torrance, and Bolsa Chica had the best water quality with less than 5% of daily estimates under the standard.

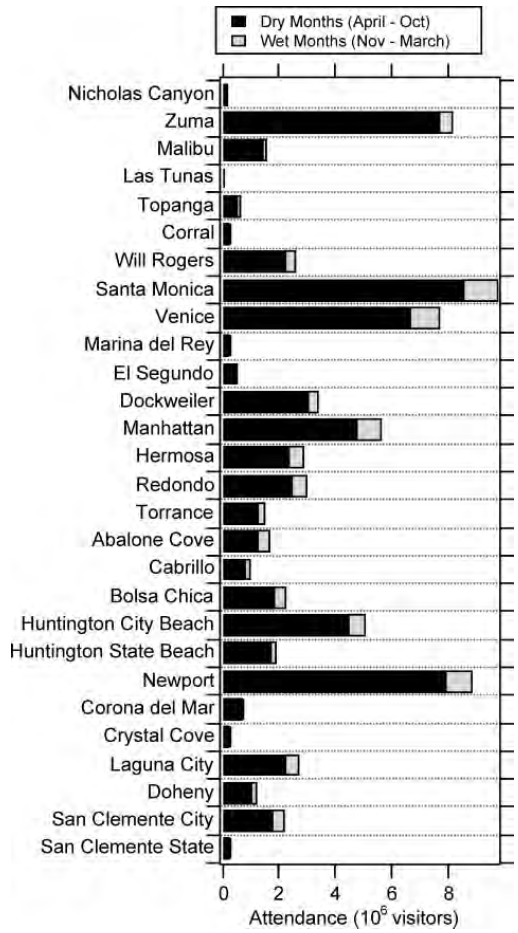

FIGURE 3. Beach attendance during wet and dry seasons 2000.

Estimates of Excess GI and Associated Public Health Costs due to Swimming. Figure 5 illustrates estimated annual excess GI at beaches based on models C and K; results are given for dry and wet months. Models C and K both indicate that Santa Monica, the beach with the highest attendance (Figure 3), has the highest excess GI of all beaches during wet and dry seasons. Both models predict that the three beaches with the lowest excess GI were San Clemente State, Nicholas Canyon, and Las Tunas, a direct result of these beaches being among the smallest and least visited in our study area (Figure 3).

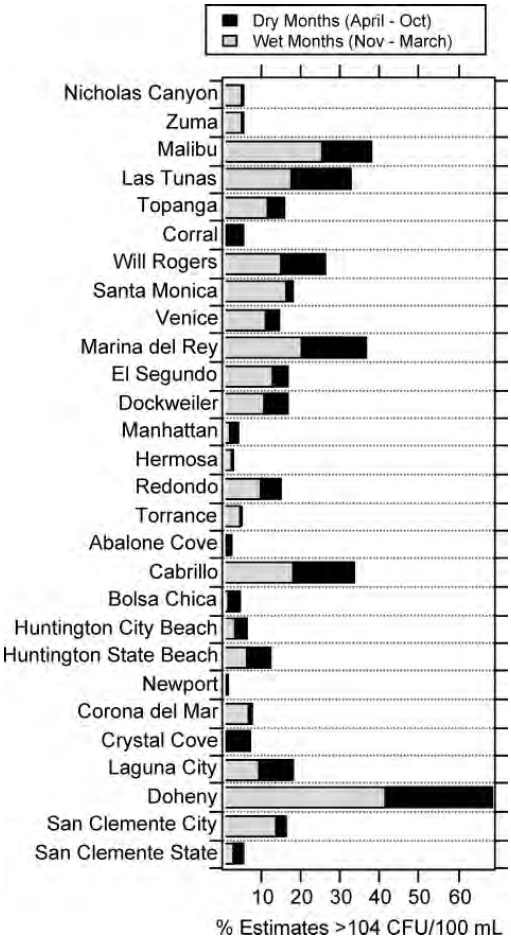

FIGURE 4. Percentage of days on which daily ENT estimates were greater than the CA Department of Health single-sample ENT standard of 104 CFU/100 mL.

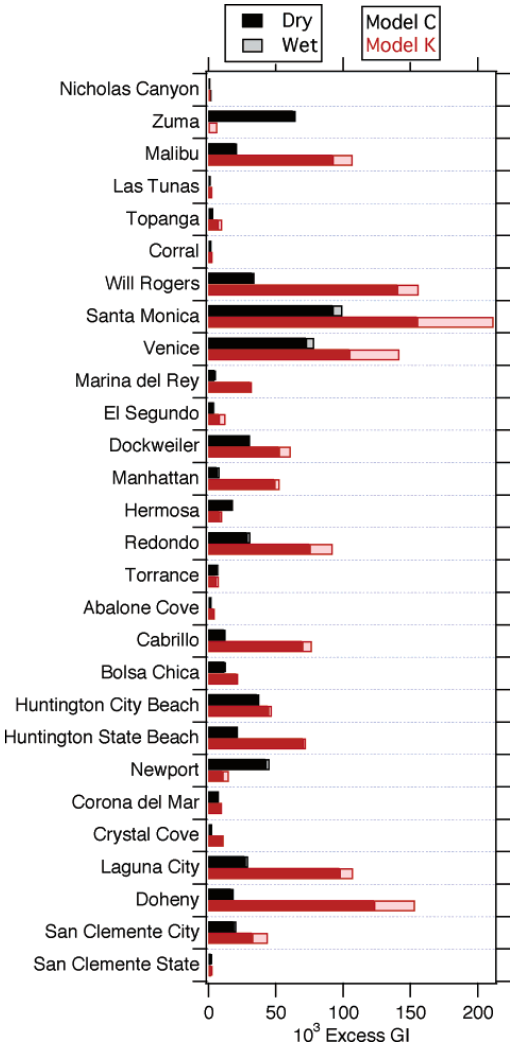

FIGURE 5. Excess GI by beach and season for models C and K.

There are marked seasonal differences between excess GI predictions. Although water quality is typically worse during the wet season compared to the dry (Figures 4 and S1), more excess GI are predicted for the dry season for most beaches. This result is driven by seasonal variation in attendance (Figure 3). The exceptions are model K predictions for Zuma that indicate 0 and 6647 excess GI during the dry and wet seasons, respectively. Zuma had no ENT densities greater than 32 CFU/100 mL during the dry season, hence the prediction of 0 excess GI.

Numerical predictions of excess GI for the entire year from model C and model K vary markedly between beaches. At 24 beaches, model K predicts between 18% and 700% greater excess GI than model C. The greatest difference in the estimated GI is at Doheny beach where models C and K predict 18,000 and 153,000 excess GI, respectively. At 4 beaches (Zuma, Hermosa, Torrance, and Newport), model K predicts between 1 and 90% lower incidence of GI than model C. These beaches are generally clean with ENT densities below the model K threshold of 32 CFU/100 mL for excess risk.

The public health burden of coastal contamination depends on both attendance and water quality. Figure 6 illustrates how excess GI, based on predictions from models C and K, varies as a function of water quality (percent of daily ENT estimates in exceedance of standard) and attendance. Red, yellow, and green symbols indicate beaches with increasing numbers of GI. If reduction of public health burden is a goal of local health care agencies, then beaches with a red symbol are candidates for immediate action. Nearly all beaches are categorized as high priority during the dry season based on model K (panels A and B). Model C indicates that dry weather mitigation measures at Venice, Zuma, Santa Monica, and Newport, some of the most visited beaches, would significantly reduce the public health burden (panel C), more so than wet weather mitigation measures (panel D).

Another way of prioritizing beach remediation is to examine the risk of GI relative to the USEPA guideline of 19 illnesses per 1000 swimmers (Figure S2). Model K indicates that at 19 and 15 of the 28 LAOC beaches during the wet and dry seasons, respectively, risk is greater than twice the EPA acceptable risk. Model C, on the other hand, indicates that only two beaches (Marina del Rey and Doheny) during the

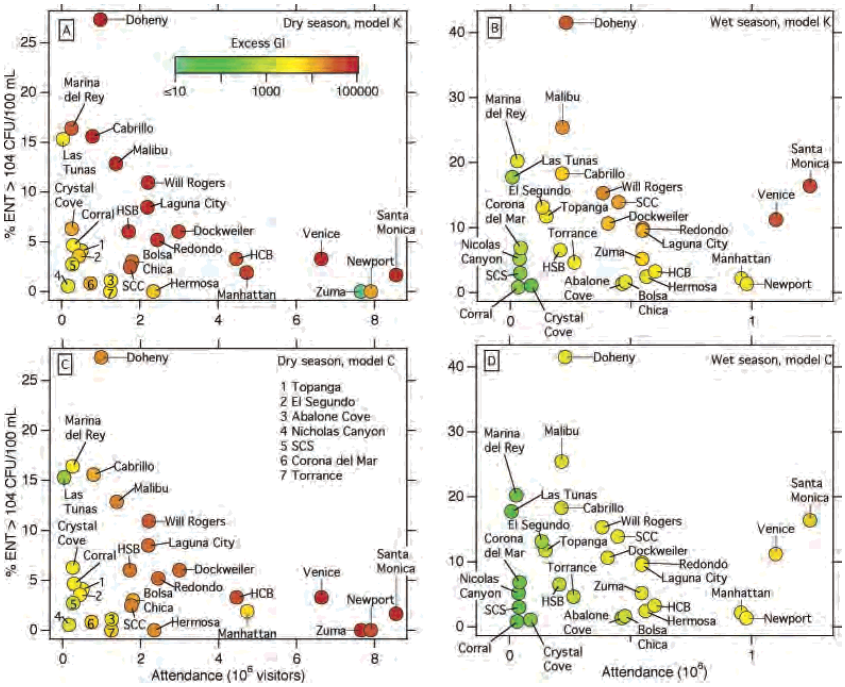

FIGURE 6. Excess GI at each beach as a function of % ENT in exceedance of the single sample standard and attendance. Results for the dry (panels A and C) and wet (panels B and D) seasons are shown for Models K (panels A and B) and C (panels C and D). Beaches are labeled; SCC is San Clemente City Beach, SCS is San Clemente State, HSB is Huntington State Beach, and HCB is Huntington City Beach. In panels A and C, numbers on symbols correspond to beaches, as indicated in the upper right corner of panel C. The color scale in panel A applies to all panels.

TABLE 2. Countywide Public Health Impacts and Costs for Wet and Dry Months (2000)

county/ region	season	GI cases model C	GI cases model K	health costs model C	health costs model K
Los Angeles					
	dry	394,000	804,000	$13,100,000	$28,800,000
	wet	33,800	189,000	$1,130,000	$6,310,000
	total	427,800	993,000	$14,230,000	$35,110,000
Orange					
	dry	185,000	420,000	$6,180,000	$14,000,000
	wet	15,000	66,200	$500,000	$2,210,000
	total	200,000	486,200	$6,680,000	$16,210,000
region total					
	dry	579,000	1,224,000	$19,280,000	$40,800,000
	wet	48,800	255,200	$1,630,000	$8,520,000
	total	627,800	1,479,200	$20,910,000	$51,320,000

dry season, and six (Marina del Rey, Doheny, Santa Monica, Las Tunas, Will Rogers, and Malibu) in the wet season fall into this "high" risk category.

Public Health Costs of Coastal Water Pollution. Table 2 summarizes the number of excess GI and associated public health costs during wet and dry periods by county and season. Based on the conservative cost of illness given by Dwight et al. (*8*), the estimated health costs of GI based on models C and K is over $21 million and $50 million, respectively. If we follow Rabinovici et al. (*6*) and use $280 per GI, the estimated public health impacts are $176 million based on model C and $414 million based on model K. For both LA and OC beaches, county-wide costs obtained using model K yield higher results than those obtained from model C, a direct result of the difference in GI estimates (Figures 5 and 6). Health costs are greater in the dry season compared to the wet suggesting that money may be well spent on dry-weather diversions.

Discussion

A significant public health burden, in terms of both numbers of GI and the costs of GI, is likely to result from beach water quality contamination in southern CA. The corollary to this finding is that water quality improvements in the region would result in public health benefits. Specifically, we make three key findings: (1) removing fecal contamination from coastal water in LAOC beaches could result in the prevention of between 627,800 and 1,479,200 GI and a public health cost of between $21 and $51 million (depending upon the epidemiological model used) each year in the region using the most conservative cost estimates and as much as $176 million or $414 million if we use the larger estimate of health costs (*6*, *39*); (2) even beaches within the same region differ significantly in the degree to which swimming poses a public health impact; and (3) public health risks differ between seasons. Findings (2) and (3) are not surprising given spatio–temporal variation in water quality (*17*, *40*) and attendance within the study site.

A previous study by Turbow et al. (*18*) estimated 36,778 excess HCGI (highly credible GI) per year from swimming at Newport and Huntington State beaches (*8*). Our estimates for the same stretch of shoreline are higher (68,011 and 87, 513 excess GI based on models C and K, respectively). Not only did we use a different measure of illness (GI vs. HCGI) we also used a Monte Carlo scheme to estimate ENT on unsampled days whereas Turbow et al. (*18*) used linear interpolation, and we used higher, empirically determined

(*14*) measures of the percent of beach goers that swim. Dwight et al. (*8*) used Turbow et al.'s (*18*) estimate to determine that the health costs of excess GI at the same beaches were $1.2 million. Our health cost estimates are higher ($2.3 and $2.9 million for models C and K, respectively), due to the higher incidence of ilness predicted by our models.

Beaches with chronic water quality problems are obvious candidates for immediate contamination mitigation. Many beaches in LAOC, however, are relatively clean and meet water quality standards on most days. Clean beaches with moderate to low levels of attendance do not represent a significant public health burden (Figure 6). Nevertheless, public health impacts are still substantial at heavily visited beaches (for instance those with over 6,000,000 visitors per year) even when water quality is good (e.g., Manhattan Beach) (Figure 6). Generally speaking, it will be more difficult to reduce contaminant levels at cleaner beaches. At beaches with high attendance and generally good water quality (like Newport Beach and Zuma), policy managers should continue dry weather source reduction efforts (e.g., education campaigns and watershed management), but should also recognize that the cost of eliminating all beach contamination may outweigh the marginal public health benefits of doing so.

Our estimates of the potential health benefits that might result from removing bacterial contamination from coastal water in LAOC beaches have limitations. First, we focus on a lower bound estimate of the health cost of GI that does not consider the amount a beach goer is willing to pay to avoid getting sick (estimates using higher, but less scientifically conservative estimates also are provided). Second, while we focus on the public health impacts from GI. Exposure to microbial pollution at beaches also increases the chance of suffering from various symptoms and illnesses (*28*, *41*). For instance, Haile et al. (*28*) and Fleisher et al. (*41*) document associations between water quality and respiratory illnesses, acute febrile illness, fever, diarrhea with blood, nausea, and vomiting, and earaches. Third, if the public believes swimming is associated with an increased risk of illness, they may be discouraged from going to the beach, resulting in a loss of beach-related expenditures to local businesses and recreational benefits to swimmers in addition to the loss in health benefits described here. Fourth, we consider GI occurring at a subset of LAOC beaches for which water quality and attendance data were available (Figure 1). Fifth, implicit in our analysis is the assumption that models C and K can be applied to LAOC beaches. Despite these limitations, the results reported here represent the best estimates possible in light of imperfect information. Future studies that establish dose−response relationships for the LAOC region or confirm incidence of swimming GI medically would improve estimates of public health burden and costs.

Acknowledgments

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Note Added after ASAP Publication

The Model C discussion in the Methods section published ASAP July 15, 2006 has been revised. The corrected version was published July 26, 2006.

Supporting Information Available

Tables S1 and S2, Figures S1 and S2, and the California state water quality standards. This material is available free of charge via the Internet at http://pubs.acs.org.

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ORIGINAL ARTICLES

The Health Effects of Swimming in Ocean Water Contaminated by Storm Drain Runoff

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Waters adjacent to the County of Los Angeles (CA) receive untreated runoff from a series of storm drains year round. Many other coastal areas face a similar situation. To our knowledge, there has not been a large-scale epidemiologic study of persons who swim in marine waters subject to such runoff. We report here results of a cohort study conducted to investigate this issue. Measures of exposure included distance from the storm drain, selected bacterial indicators (total and fecal coliforms, enterococci, and *Escherichia coli*), and a direct measure of enteric viruses. We found higher risks of a broad range of symptoms, including both upper respiratory and gastrointestinal, for subjects swimming (a) closer to storm drains, (b) in water with high levels of single bacterial indicators and a low ratio of total to fecal coliforms, and (c) in water where enteric viruses were detected. The strength and consistency of the associations we observed across various measures of exposure imply that there may be an increased risk of adverse health outcomes associated with swimming in ocean water that is contaminated with untreated urban runoff. (Epidemiology 1999;10:355–363)

Keywords: environmental epidemiology, gastrointestinal illness, ocean, recreational exposures, sewage, storm drains, waterborne illnesses, waterborne pathogens.

Runoff from a system of storm drains enters the Santa Monica Bay adjacent to Los Angeles County (CA). Even in the dry months of summer 10–25 million gallons of runoff (or non-storm water discharge) per day enter the bay from the storm drain system. Storm drain water is not subject to treatment and is discharged directly into the ocean. Total and fecal coliforms, as well as enterococci, are sometimes elevated in the surf zone adjacent to storm drain outlets; pathogenic human enteric viruses have also been isolated from storm drain effluents, even when levels of all commonly used indicators, including F2 male-specific bacteriophage, were low.[1]

Approximately 50–60 million persons visit Santa Monica Bay beaches annually. Concern about possible adverse health effects due to swimming in the bay has been raised by numerous interested parties.[2] Previous reports indicate that swimming in polluted water (for example, due to sewage) increases risks of numerous adverse health outcomes (Pruss[3] provides a recent review of this literature). To our knowledge, however, there has never been a large epidemiologic study of persons who swim in marine waters contaminated by heavy urban runoff.

These circumstances provided the motivation to study the possible health effects of swimming in the bay. We present here the main results from a large cohort study of people that addressed the issue of adverse health effects of swimming in ocean water subject to untreated urban runoff.

Methods

DESIGN AND SUBJECTS

The exposures of interest were distance swimming from storm drains, levels of bacterial indicators (total coli-

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forms, fecal coliforms, enterococcus, *Escherichia coli*) for pathogens that potentially produce acute illness, and human enteric viruses. We studied three beaches located in Santa Monica Bay (CA) that exhibited a wide range of pathogen indicator counts and a high density of swimmers (Santa Monica, Will Rogers, and Surfrider).

Persons who immersed their heads in the ocean water were potential subjects for this study. There was no restriction based on age, sex, or race. We excluded anyone who swam at the study beaches or in heavily polluted areas (that is, Mothers' Beach in Marina del Rey or near the Santa Monica Pier) within 7 days before the study date, or between the date of the beach interview and the telephone follow-up interview. We excluded subjects who swam on multiple days, as one of our primary questions was whether risk of health outcomes was associated with levels of indicator organisms on the specific day a subject entered the water. We targeted persons bathing within 100 yards upcoast or downcoast of the storm drain and persons bathing greater than 400 yards beyond a storm drain.

For this study, 22,085 subjects were interviewed on the beach from June 25 to September 14, 1995, to ascertain eligibility and willingness to participate. We found that 17,253 of these subjects were eligible and able to participate (that is, had a telephone and were able to speak English or Spanish). Of these, 15,492 (90% of the eligible subjects) agreed to participate. They were interviewed about their age, residence, and swimming, particularly immersion of the head into ocean water. The interviewer noted distance from the storm drain (within the categories 0, 1–50, 51–100, or 400 yards), gender, and race of the subject. (Distances from each drain were marked with inconspicuous objects such as beach towels and umbrellas.)

Nine to 14 days after the beach interview, subjects were interviewed by telephone to ascertain the occurrence(s) of: fever, chills, eye discharge, earache, ear discharge, skin rash, infected cuts, nausea, vomiting, diarrhea, diarrhea with blood, stomach pain, coughing, coughing with phlegm, nasal congestion, and sore throat. For this study we defined *a priori* three groupings of symptoms indicative of gastrointestinal illness or respiratory disease. In particular, following Cabelli *et al*,[4] subjects were classified as having highly credible gastrointestinal illness 1 (HCGI 1) if they experienced at least one of the following: (1) vomiting, (2) diarrhea and fever, or (3) stomach pain and fever. We also classified subjects as having highly credible gastrointestinal illness 2 (HCGI 2) if they had vomiting and fever. Finally, we classified subjects as having significant respiratory disease (SRD) if they had one of the following: (1) fever and nasal congestion, (2) fever and sore throat, or (3) coughing with phlegm.

We were able to contact and interview 13,278 subjects (86% follow-up). Of those interviewed, 1,485 were found to be ineligible because they swam (and immersed their heads) at a study beach or in heavily polluted waters between the day of the beach interview and the telephone follow-up. We excluded 107 subjects because they did not confirm immersing their faces in ocean water, leaving 11,686 subjects. One subject had a missing value for age, which we imputed (as the median value among all subjects) for inclusion in the adjusted analyses (discussed below). For the bacteriological analyses, we excluded an additional 1,227 subjects who had missing values, leaving 10,459 subjects. In the virus analyses we included only the 3,554 subjects who swam within 50 yards of the drain on days when viruses were measured (as the samples were collected only at the storm drain).

Collection and Analysis of Samples for Bacterial Indicators

Samples were collected on days that subjects were interviewed on the beaches. Each day, ankle depth samples were collected from each location (0 yards, 100 yards upcoast and downcoast of the drain, and one sample at 400 yards). One duplicate sample per site was collected daily. Samples were collected in sterile 1 liter polypropylene bottles and transferred on ice to the microbiology laboratory. All samples were analyzed for total coliforms, fecal coliforms, enterococcus, and *E. coli*. Densities of total and fecal coliforms and enterococci were determined using the appropriate membrane filtration techniques in Ref 5. *E. coli* densities were determined by membrane filtration using Hach Method 10029 for m-ColiBlue24 Broth.

Collection and Analysis of Samples for Enteric Viruses

For looking at enteric viruses, we collected samples from the three storm drain sites on Fridays, Saturdays, and Sundays, using Method 9510 C g of Ref 5. Ambient pH, temperature, conductivity, and total dissolved solids were measured. Samples as large as 100 gallons chosen to minimize the impacts of seawater dilution were filtered through electropositive filters at ambient pH. Adsorption filters were eluted in the field with 1 liter of sterile 3% beef extract adjusted to pH 9.0 with sodium hydroxide. Field eluates were reconcentrated in the laboratory using an organic reflocculation procedure.[6] All final concentrates were detoxified before analysis.[7]

All samples were analyzed for infectious human enteric viruses in Buffalo green monkey kidney cells (BGMK) by the plaque assay technique. Ten percent of the final concentrate was tested in this manner to determine whether there were a quantifiable number of viruses present. The remaining concentrate volume was divided in half and analyzed using the liquid overlay technique known as the cytopathic effect (CPE) assay.[8] The CPE assay generally detects a greater number of viruses than the plaque assay, but it is not quantitative. Flasks that did not exhibit CPE were considered to be negative for detectable infectious virus. We further examined any flask exhibiting CPE by the plaque-forming unit method to confirm the presence of infectious viruses.

Statistical Analysis

Our analysis addressed two main questions. First, are there different risks of specific outcomes among subjects swimming 0, 1–50, 51–100, and 400 or more yards from a storm drain? If pathogens in the storm drain result in increased acute illnesses, one would expect higher risks among swimmers closer to the drain. Second, are risks of specific outcomes associated with levels of specific bacterial indicators or enteric viruses?

To address the second question, we estimated risks arising from exposure to levels within categories defined *a priori* by existing standards or expert consensus. Specifically, for total coliforms we defined categories using 1,000 and 10,000 colony-forming units (cfu) per 100 ml as cutpoints, which are based on the California Code of Regulations (S.7958 in Title 17).[9] For fecal coliforms we created categories using cutpoints of 200 and 400 cfu per 100 ml, which reflect criteria set by the State Water Resources Control Board.[10] For enterococcus we used cutpoints of 35 and 104 cfu per 100 ml of water, which were established by the U.S. Environmental Protection Agency.[11] Finally, categories for *E. coli* were selected in meetings with staff from the Santa Monica Bay Restoration Project (SMBRP), Heal the Bay, and the Los Angeles County Department of Health Services. These meetings resulted in initially selecting categories based on cutpoints of 35 and 70 cfu per 100 ml, and then subsequently adding categories using cutpoints of 160 and 320 cfu per 100 ml; the latter were added because it is believed that *E. coli* comprises about 80% of the fecal coliforms. Using these knowledge-based categories, however, assumes a homogeneous risk between cutpoints. This might not be a reasonable assumption because the adequacy of these cutpoints is unclear, and because a large percentage of the subjects were in a single (that is, the lowest) category. Therefore, we further explored the bacteriological relations using categories defined by deciles.

In addition to considering total and fecal coliforms separately, we investigated the potential effect of the ratio of total to fecal coliforms. Motivation for this arose from our expectation that the risk of adverse health outcomes might be higher when the ratio is smaller, indicating a relatively greater proportion of fecal contamination. We used categories of this ratio defined by a cutpoint of 5 (where 5 corresponds to there being 5 times as much total as fecal coliform in the water). The human enteric virus exposure was reported as a dichotomous (that is, virus detected *vs* not detected) measure.

We first calculated simple descriptive statistics giving the number of subjects with each adverse health outcome who swam (1) at the prespecified distances from the drain or (2) in water with the prespecified levels of pathogens. From these counts we estimated the crude risk associated with each exposure. We then used logistic regression to estimate the adjusted relative risks of each outcome. For each exposure/outcome combination, we fit a separate model. All models adjusted for the potential confounding of: age (three categories: 0–12 years, 13–25 years, >25 years); sex; beach; race (four categories: white, black, Latino/a, and Asian/multiethnic/other); California *vs* out-of-state resident; and concern about potential health hazards at the beach (four categories: not at all, somewhat, a little, and very).

Results

Table 1 presents results for each of the adverse health outcomes by distance swimming from the storm drain. Across all distances, risks ranged from about 0.001 (that is, 1 per 1,000) for diarrhea with blood to about 0.1 for runny nose. The risk of numerous outcomes was higher for people who swam at the drain (0 yards away), in comparison with those who swam 1–50, 51–100, or >400 yards from the drain. In particular, we observed increases in risk for fever, chills, ear discharge, coughing with phlegm, HCGI 2, and SRD. In addition, the risks for eye discharge, earache, sore throat, infected cut, and HCGI 1 were also slightly elevated. A handful of outcomes exhibited small increased risks among swimmers at 1–50 yards (skin rash) or at 51–100 yards (cough, cough with phlegm, runny nose, and sore throat). Adjusted estimates of relative risk (RR) comparing swimmers at 0, 1–50, or 51–100 yards from the drain with swimmers at least 400 yards away from the drain showed similar relations as the aforementioned patterns of risks (Table 1). Among the positive associations for swimmers at the drain, RRs ranged in magnitude from about 1.2 (eye discharge, sore throat, HCGI 1) to 2.3 (earache), with varying degrees of precision; most of these RRs ranged from 1.4 to 1.6.

In Table 2 we see that the risk of skin rash increased for the highest prespecified category of total coliforms (that is, >10,000 cfu). Furthermore, the adjusted RR comparing swimmers exposed at this level *vs* those exposed to levels ≤1,000 cfu was 2.6. Whereas the RR for diarrhea with blood also suggested a positive association, this result was based on a single adverse health event (as evinced by the wide 95% CIs). When looking at deciles, in relation to the lowest exposure level (that is, the lowest 10%), we observed increased risks of skin rash at all other levels (Figure 1). The adjusted RRs ranged from 1.6 to 6.2, with five of the nine RRs in the 2–3 range. In addition, there were increased risks of HCGI 2 for all deciles except one (the eighth); the corresponding adjusted RRs ranged from 1.4 to 4.7, with varying levels of precision (Figure 1).

When looking at fecal coliforms, we again observed among those in the highest category (that is, >400 cfu) an increased risk for skin rash (Table 3). There were also *slight* increased risks for infected cut, runny nose, and diarrhea with blood in the highest category, as well as for nausea, vomiting, coughing, sore throat, and HCGI 2 in the middle category (200–400 cfu). The adjusted RRs also indicated positive associations for these outcomes (Table 3). When we used deciles to categorize subjects, however, in comparison with the lowest decile, we only observed marginal increased risks for infection and skin rash (not shown). In our investigation of the ratio of

TABLE 1. Adverse Health Outcomes by Distance Swimming from Drain: Number Ill, Acute Risks, Adjusted Relative Risk (RR) Estimates and 95% Confidence Intervals (CI)

	Distance from Drain (in Yards)										
	>400 (N = 3030)*		51–100 (N = 3311)			1–50 (N = 4518)			0 (N = 827)		
Outcome	No. Ill	Risk	No. Ill	Risk	RR (95% CI)†	No. Ill	Risk	RR (95% CI)†	No. Ill	Risk	RR (95% CI)†
Fever	138	0.046	158	0.048	1.06 (0.84–1.34)	208	0.046	1.07 (0.85–1.33)	59	0.071	1.61 (1.16–2.24)
Chills	72	0.024	85	0.026	1.07 (0.77–1.47)	108	0.024	1.05 (0.77–1.42)	31	0.037	1.60 (1.03–2.50)
Eye discharge	61	0.020	59	0.018	0.88 (0.61–1.27)	73	0.016	0.77 (0.55–1.09)	19	0.023	1.15 (0.67–1.98)
Earache	116	0.038	116	0.035	0.89 (0.68–1.16)	136	0.030	0.81 (0.63–1.04)	38	0.046	1.34 (0.91–1.98)
Ear discharge	21	0.007	19	0.006	0.78 (0.42–1.46)	25	0.006	0.80 (0.45–1.44)	13	0.016	2.09 (1.01–4.33)
Skin rash	23	0.008	30	0.009	1.16 (0.67–2.01)	53	0.012	1.50 (0.91–2.46)	4	0.005	0.62 (0.21–1.83)
Infected cut	17	0.006	16	0.005	0.79 (0.40–1.58)	37	0.008	1.51 (0.84–2.69)	6	0.007	1.48 (0.57–3.87)
Nausea	133	0.044	115	0.035	0.77 (0.60–1.00)	143	0.032	0.75 (0.59–0.95)	40	0.048	1.13 (0.78–1.65)
Vomiting	57	0.019	58	0.018	0.97 (0.67–1.40)	63	0.014	0.76 (0.53–1.09)	25	0.030	1.40 (0.85–2.31)
Diarrhea	204	0.067	163	0.049	0.70 (0.56–0.86)	202	0.045	0.69 (0.56–0.84)	53	0.064	1.04 (0.75–1.44)
Diarrhea with blood	7	0.002	2	0.001	0.26 (0.05–1.26)	3	0.001	0.27 (0.07–1.06)	2	0.002	0.87 (0.15–4.57)
Stomach pain	206	0.068	194	0.059	0.85 (0.70–1.05)	271	0.060	0.93 (0.77–1.12)	61	0.074	1.11 (0.82–1.51)
Cough	209	0.069	263	0.079	1.18 (0.97–1.42)	296	0.066	0.98 (0.82–1.18)	55	0.067	1.01 (0.73–1.38)
Cough and phlegm	90	0.030	114	0.034	1.16 (0.88–1.54)	143	0.032	1.09 (0.83–1.43)	39	0.047	1.65 (1.11–2.46)
Runny nose	273	0.090	351	0.106	1.18 (1.00–1.40)	371	0.082	0.95 (0.80–1.12)	74	0.089	1.10 (0.84–1.46)
Sore throat	190	0.063	244	0.074	1.17 (0.96–1.43)	304	0.067	1.12 (0.93–1.35)	59	0.071	1.25 (0.92–1.71)
HCGI 1	102	0.034	96	0.029	0.88 (0.66–1.17)	121	0.027	0.84 (0.64–1.10)	35	0.042	1.21 (0.81–1.82)
HCGI 2	26	0.009	28	0.008	1.04 (0.61–1.79)	32	0.007	0.90 (0.53–1.53)	15	0.018	1.64 (0.84–3.21)
Significant respiratory disease	139	0.046	177	0.053	1.18 (0.94–1.49)	205	0.045	1.03 (0.82–1.23)	63	0.076	1.78 (1.29–2.45)

The total number of swimmers in each category is given in parentheses (N). HCGI1, highly credible gastrointestinal illness with vomiting, diarrhea and fever or stomach pain and fever. HCGT2, highly credible gastrointestinal illness with vomiting and fever only. Significant respiratory disease, fever and nasal congestion, fever and sore throat or coughing with phlegm.
* Referent category (RR = 1.0).
† Adjusted for age, sex, beach, race, California *vs* out-of-state resident, and concern about potential health hazards at the beach.

total to fecal coliforms, we observed a consistent pattern of higher risks for diarrhea and HCGI 2 as the ratio category became lower (not shown, but available in Ref 12). Because any effect of this lower ratio should be stronger when there was a higher degree of contamination, indicated by total coliform counts in excess of 1,000 or 5,000 cfu, we then restricted our analysis to subjects swimming in water above these levels. In the first case, increased risks with decreasing cutpoints were observed for nausea, diarrhea, and HCGI 2.[12] When we restricted our investigation to subjects in water in which the total coliforms exceeded 5,000 cfu, we observed

TABLE 2. Adverse Health Outcomes by Total Coliform Levels: Number Ill, Acute Risks, Adjusted Relative Risk (RR) Estimates and 95% Confidence Intervals (CI)

	Total Coliforms (cfu/100ml)							
	≤1,000 (N = 7,574)*		>1,000–10,000 (N = 1,988)			>10,000 (N = 757)		
Outcome	No. Ill	Risk	No. Ill	Risk	RR†	No. Ill	Risk	RR†
Fever	368	0.049	88	0.044	0.92 (0.72–1.17)	42	0.055	1.23 (0.87–1.73)
Chills	193	0.025	51	0.026	1.03 (0.75–1.42)	9	0.012	0.51 (0.26–1.01)
Eye discharge	151	0.020	21	0.011	0.46 (0.29–0.74)	15	0.020	0.81 (0.47–1.41)
Earache	270	0.036	66	0.033	0.96 (0.72–1.27)	21	0.028	0.86 (0.54–1.38)
Ear discharge	51	0.007	15	0.008	1.22 (0.67–2.23)	2	0.003	0.46 (0.11–1.93)
Skin rash	65	0.009	14	0.007	0.75 (0.41–1.36)	19	0.025	2.59 (1.49–4.53)
Infected cut	49	0.006	11	0.006	0.97 (0.49–1.91)	3	0.004	0.82 (0.25–2.72)
Nausea	292	0.039	69	0.035	0.94 (0.72–1.24)	18	0.024	0.71 (0.43–1.16)
Vomiting	137	0.018	34	0.017	0.90 (0.61–1.33)	9	0.012	0.64 (0.32–1.29)
Diarrhea	434	0.057	85	0.043	0.80 (0.63–1.03)	33	0.044	0.95 (0.65–1.39)
Diarrhea with blood	8	0.001	2	0.001	1.08 (0.22–5.35)	1	0.001	1.73 (0.19–15.88)
Stomach pain	487	0.064	125	0.063	1.05 (0.85–1.29)	29	0.038	0.69 (0.47–1.02)
Cough	546	0.072	133	0.067	0.90 (0.73–1.10)	51	0.067	0.94 (0.69–1.28)
Cough and phlegm	267	0.035	58	0.029	0.81 (0.60–1.09)	27	0.036	1.03 (0.68–1.57)
Runny nose	703	0.093	170	0.086	0.93 (0.78–1.12)	67	0.089	1.06 (0.81–1.40)
Sore throat	534	0.071	116	0.058	0.83 (0.67–1.03)	47	0.062	0.95 (0.69–1.30)
HCGI 1	242	0.032	54	0.027	0.84 (0.62–1.14)	17	0.022	0.74 (0.44–1.23)
HCGI 2	72	0.010	16	0.008	0.89 (0.51–1.55)	5	0.007	0.83 (0.32–2.12)
Significant respiratory disease	396	0.052	84	0.042	0.80 (0.62–1.02)	42	0.055	1.11 (0.79–1.55)

The total number of swimmers in each category is given in parentheses (N).
* Referent category (RR = 1.0).
† Adjusted for age, sex, beach, race, California *vs* out-of-state resident, and concern about potential health hazards at the beach.

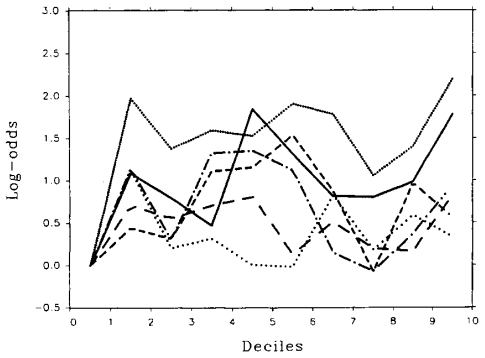

FIGURE 1. Log odds of adverse health outcomes by deciles of exposure for selected bacterial exposures. —, Total coliform and skin rash; – – – ·, total coliform and HCGI 2; · · ·, Enterococci and infected cut; — — —, *E coli* and eye discharge; ···, *E coli* and skin rash; · — ··, *E coli* and infected cut. HCGI 2 = highly credible gastrointestinal illness with vomiting and fever only.

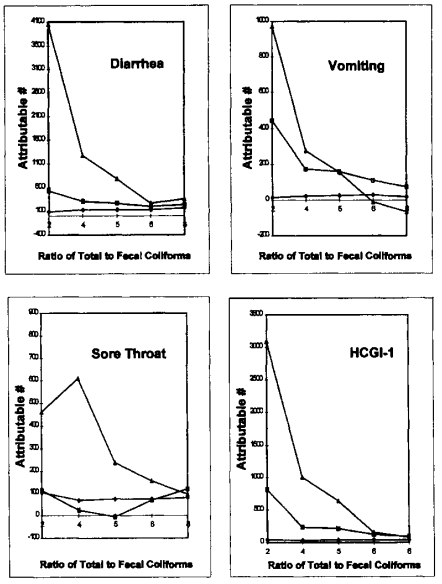

FIGURE 2. Selected attributable numbers/10,000 exposed subjects for total to fecal coliforms. ♦, All days; ■, >1000; ▲, > 5000. HCGI 1 = highly credible gastrointestinal illness with vomiting, diarrhea and fever or stomach pain and fever.

increased risks with eye discharge, ear discharge, skin rash, nausea, diarrhea, stomach pain, nasal congestion, HCGI 1, and HCGI 2.[12] There was a consistent pattern of stronger risk ratios as the cutpoint became lower (when the analyses were restricted to times when total coliforms exceeded 1,000 or 5,000 cfu), with the strongest effects generally observed with the cutpoint of 2, as illustrated in Figure 2 for diarrhea, vomiting, sore throat, and HCGI1.

Table 4 gives results for the relation among enterococci and the adverse health outcomes. Again, we observed an increased risk of skin rash among those in the highest category (that is, >104 cfu). In addition, comparing the highest to other categories of exposure, there

TABLE 3. Adverse Health Outcomes by Fecal Coliform Levels: Number Ill, Acute Risks, Adjusted Relative Risk (RR) Estimates and 95% Confidence Intervals (CI)

	Fecal Coliforms (cfu/100ml)							
	≤200 (N = 8,005)*		>200–400 (N = 768)			>400 (N = 1,636)		
Outcome	No. Ill	Risk	No. Ill	Risk	RR†	No. Ill	Risk	RR†
Fever	381	0.048	39	0.051	1.04 (0.74–1.46)	80	0.049	1.02 (0.80–1.32)
Chills	197	0.025	24	0.031	1.14 (0.74–1.76)	34	0.021	0.78 (0.54–1.14)
Eye discharge	149	0.019	11	0.014	0.70 (0.38–1.31)	30	0.018	0.97 (0.65–1.46)
Earache	275	0.034	26	0.04	0.93 (0.62–1.41)	57	0.035	1.00 (0.75–1.35)
Ear discharge	53	0.007	8	0.010	1.29 (0.60–2.73)	7	0.004	0.56 (0.25–1.24)
Skin rash	69	0.009	5	0.007	0.64 (0.26–1.60)	26	0.016	1.86 (1.17–2.95)
Infected cut	47	0.006	2	0.003	0.40 (0.10–1.65)	15	0.009	1.50 (0.83–2.74)
Nausea	289	0.036	38	0.049	1.29 (0.91–1.84)	57	0.035	0.93 (0.69–1.24)
Vomiting	133	0.017	18	0.023	1.33 (0.81–2.21)	31	0.019	1.07 (0.71–1.60)
Diarrhea	425	0.053	50	0.065	1.17 (0.86–1.60)	81	0.050	0.90 (0.70–1.15)
Diarrhea with blood	7	0.001	1	0.001	1.22 (0.15–10.01)	3	0.002	1.69 (0.42–6.75)
Stomach pain	495	0.062	51	0.066	1.04 (0.77–1.41)	103	0.063	0.98 (0.78–1.23)
Cough	551	0.069	70	0.091	1.34 (1.03–1.74)	117	0.072	1.06 (0.86–1.31)
Cough and phlegm	265	0.033	31	0.040	1.16 (0.79–1.70)	60	0.037	1.10 (0.82–1.47)
Runny nose	722	0.090	72	0.94	1.03 (0.79–1.33)	160	0.098	1.11 (0.93–1.34)
Sore throat	527	0.066	70	0.091	1.40 (1.07–1.82)	106	0.065	0.99 (0.80–1.24)
HCGI 1	239	0.030	28	0.036	1.18 (0.79–1.77)	50	0.031	0.99 (0.72–1.36)
HCGI 2	65	0.008	11	0.014	1.63 (0.85–3.12)	17	0.010	1.13 (0.65–1.95)
Significant respiratory disease	399	0.050	42	0.055	1.08 (0.77–1.50)	85	0.052	1.04 (0.81–1.33)

The total number of swimmers in each category is given in parentheses (N).
* Referent category (RR = 1.0).
† Adjusted for age, sex, beach, race, California vs out-of-state resident, and concern about potential health hazards at the beach.

TABLE 4. Adverse Health Outcomes by Enterococci Levels: Number Ill, Acute Risks, Adjusted Relative Risk (RR) Estimates and 95% Confidence Intervals (CI)

	Enterococci (cfu/100ml)							
	≤35 (N = 7,689)*		>35–104 (N = 1,863)			>104 (N = 857)		
Outcome	No. Ill	Risk	No. Ill	Risk	RR†	No. Ill	Risk	RR†
Fever	371	0.048	84	0.045	0.91 (0.71–1.16)	45	0.053	1.00 (0.72–1.40)
Chills	198	0.026	33	0.018	0.67 (0.46–0.97)	24	0.028	0.94 (0.60–1.48)
Eye discharge	149	0.019	25	0.013	0.69 (0.45–1.07)	16	0.019	1.01 (0.58–1.75)
Earache	270	0.035	57	0.031	0.82 (0.61–1.11)	31	0.036	0.88 (0.59–1.31)
Ear discharge	52	0.007	12	0.006	0.85 (0.45–1.62)	4	0.005	0.53 (0.19–1.51)
Skin rash	74	0.010	13	0.007	0.71 (0.39–1.30)	13	0.015	1.72 (0.89–3.31)
Infected cut	46	0.006	12	0.006	0.95 (0.49–1.82)	6	0.007	0.90 (0.37–2.18)
Nausea	271	0.035	72	0.039	1.07 (0.82–1.41)	41	0.048	1.19 (0.84–1.70)
Vomiting	130	0.017	34	0.018	1.13 (0.77–1.67)	18	0.021	1.20 (0.71–2.04)
Diarrhea	398	0.052	101	0.054	0.99 (0.78–1.25)	57	0.067	1.01 (0.75–1.36)
Diarrhea with blood	8	0.001	0	—	—	3	0.004	2.90 (0.66–12.68)
Stomach pain	464	0.060	126	0.068	1.09 (0.89–1.35)	59	0.069	0.97 (0.72–1.30)
Cough	554	0.072	121	0.065	0.91 (0.73–1.12)	63	0.074	1.00 (0.75–1.34)
Cough and phlegm	266	0.035	59	0.032	0.91 (0.68–1.22)	31	0.036	1.03 (0.69–1.54)
Runny nose	704	0.092	165	0.089	0.96 (0.80–1.15)	85	0.099	1.01 (0.79–1.30)
Sore throat	533	0.069	118	0.063	0.89 (0.72–1.10)	52	0.061	0.80 (0.59–1.09)
HCGI 1	230	0.030	51	0.027	0.92 (0.67–1.26)	36	0.042	1.31 (0.89–1.92)
HCGI 2	67	0.009	14	0.008	0.82 (0.46–1.48)	12	0.014	1.30 (0.67–2.51)
Significant respiratory disease	397	0.052	84	0.045	0.86 (0.67–1.11)	45	0.053	0.98 (0.70–1.37)

The total number of swimmers in each category is given in parentheses (N).
* Referent category (RR = 1.0).
† Adjusted for age, sex, beach, race, California *vs* out-of-state resident, and concern about potential health hazards at the beach.

were increased risks of nausea, vomiting, diarrhea with blood, HCGI 1, and HCGI 2. Our adjusted RRs suggested similar positive associations, except for diarrhea; although the risk increased from 0.05 to 0.07, the adjusted RR comparing the highest to lowest category was 1.0 (Table 4). When comparing the lowest to higher deciles, we observed increased risks in most categories for infected cut and skin rash (Figure 1). Other adverse health outcomes—infected cut, nausea, diarrhea, diarrhea with blood, HCGI 1, and HCGI 2—exhibited increased risks only in particular quantiles. In comparison with the lowest decile, the risk of each of these outcomes was higher in the 10th decile. For example, the risk for HCGI 2 was 0.007 in the first decile, but 0.015 in the 10th.

Table 5 presents results for *E. coli*. We once again found an increased risk of skin rash in the highest prespecified category (that is, >320 cfu). Furthermore, we observed slight increased risks in this highest category for eye discharge, earache, stomach pain, coughing with phlegm, runny nose, and HCGI 1 (Table 5). In our decile-based analysis, however, we only observed materially increased risks for eye discharge, skin rash, and infection (Figure 1).

Numerous adverse health outcomes exhibited higher risks among subjects swimming on days when samples were positive for viruses (Table 6). In particular, the risk of fever, eye discharge, vomiting, sore throat, HCGI 1, and HCGI 2, and to a lesser extent, chills, diarrhea, diarrhea with blood, cough, coughing with phlegm, and SRD were higher on days when viruses were detected. Our adjusted RR estimates showed similar relations, most ranging from 1.3 to 1.9 (Table 6). Additionally, adjusting for each bacterial indicator (one-at-a-time) also left these results essentially unchanged.[12] As expected, there was an association between presence of virus and fecal coliforms within 50 yards of the drain. The mean density of fecal coliforms when no virus was detected was 234.8 cfu (SD 542.5 cfu); whereas it was 2,233.8 (SD 2,634.1) when viruses were detected (N = 386). The median values were 47.8 and 452.6 cfu, respectively.

Discussion

We observed differences in risk for a number of outcomes when we compared subjects swimming at 0 yards *vs* 400+ yards. Most of the relative risks suggested an approximately 50% increase in risk. Furthermore, as evinced by both the risks and RRs, there is an apparent threshold of increased risk occurring primarily at the drain: no dose response is evinced with increasing closeness to the drain, but there is a jump in risk for many adverse health outcomes among those swimming at the drain. We also found that distance is a reasonably good surrogate for bacterial indicators, with higher levels observed closer to the drain.[12]

For bacterial indicators, we observed a relation among numerous higher exposures and adverse health outcomes. These increases were mostly restricted to the highest knowledge-based categories (no effect was observed below any existing standards). When looking at quantiles, we found higher risks of skin rash and infection at fairly low levels. In contrast with what one might expect, however, there was no clear dose-response pattern across increasing levels of bacteriological exposures.

TABLE 5. Adverse Health Outcomes by E. coli Levels: Number Ill, Acute Risks, Adjusted Relative Risk (RR) Estimates and 95% Confidence Intervals (CI)

	E. coli (cfu/100ml)													
	≤35 (N = 6,104)*		>35–75 (N = 1,620)			>75–160 (N = 1,145)			>160–320 (N = 518)			>320 (N = 991)		
Outcome	No. Ill	Risk	No. Ill	Risk	RR†	No. Ill	Risk	RR†	No. Ill	Risk	RR†	No. Ill	Risk	RR†
Fever	274	0.045	89	0.055	1.22 (0.95–1.56)	61	0.053	1.20 (0.90–1.60)	29	0.056	1.22 (0.81–1.84)	45	0.045	0.98 (0.70–1.37)
Chills	145	0.024	41	0.025	1.00 (0.70–1.44)	28	0.024	1.00 (0.66–1.52)	18	0.035	1.38 (0.82–2.33)	22	0.022	0.79 (0.49–1.26)
Eye discharge	116	0.019	30	0.019	0.99 (0.65–1.49)	14	0.012	0.65 (0.37–1.15)	6	0.012	0.61 (0.26–1.43)	23	0.023	1.36 (0.84–2.19)
Earache	214	0.035	45	0.028	0.75 (0.54–1.04)	33	0.029	0.78 (0.53–1.14)	18	0.035	0.91 (0.55–1.50)	47	0.047	1.25 (0.89–1.77)
Ear discharge	42	0.007	8	0.005	0.60 (0.28–1.28)	5	0.004	0.57 (0.22–1.46)	6	0.012	1.28 (0.52–3.15)	6	0.0066	0.67 (0.27–1.62)
Skin rash	57	0.009	15	0.009	1.01 (0.56–1.80)	7	0.006	0.66 (0.30–1.46)	6	0.012	1.21 (0.49–2.98)	15	0.015	2.04 (1.11–3.76)
Infected cut	42	0.007	7	0.004	0.53 (0.24–1.20)	3	0.003	0.33 (0.10–1.06)	3	0.006	0.66 (0.20–2.19)	9	0.009	1.02 (0.48–2.19)
Nausea	216	0.035	74	0.046	1.22 (0.93–1.61)	34	0.030	0.80 (0.55–1.16)	18	0.035	0.88 (0.53–1.46)	42	0.042	1.03 (0.73–1.47)
Vomiting	107	0.018	31	0.019	1.09 (0.72–1.64)	16	0.014	0.82 (0.48–1.40)	8	0.015	0.87 (0.41–1.85)	20	0.020	1.05 (0.63–1.74)
Diarrhea	310	0.051	101	0.062	1.14 (0.90–1.44)	63	0.055	1.00 (0.75–1.33)	25	0.048	0.80 (0.52–1.23)	56	0.057	0.91 (0.67–1.23)
Diarrhea with blood	5	0.001	3	0.002	2.06 (0.48–8.89)	1	0.001	1.03 (0.12–9.01)	2	0.004	3.98 (0.68–23.21)	0	—	—
Stomach pain	353	0.058	124	0.077	1.28 (1.03–1.59)	70	0.061	1.02 (0.78–1.33)	31	0.060	0.95 (0.64–1.40)	70	0.071	1.06 (0.80–1.40)
Cough	444	0.073	96	0.059	0.81 (0.64–1.02)	86	0.075	1.04 (0.82–1.33)	29	0.056	0.77 (0.51–1.14)	82	0.083	1.14 (0.88–1.48)
Cough and phlegm	226	0.037	41	0.025	0.66 (0.47–0.92)	34	0.030	0.78 (0.54–1.12)	11	0.021	0.53 (0.28–1.00)	43	0.043	1.12 (0.79–1.59)
Runny nose	566	0.093	136	0.084	0.87 (0.71–1.06)	105	0.092	0.96 (0.77–1.20)	38	0.073	0.76 (0.53–1.08)	108	0.109	1.12 (0.89–1.41)
Sore throat	417	0.068	99	0.061	0.86 (0.68–1.08)	82	0.072	1.02 (0.80–1.31)	29	0.056	0.78 (0.52–1.17)	75	0.076	1.04 (0.80–1.37)
HCGI 1	183	0.030	51	0.031	1.03 (0.75–1.42)	30	0.026	0.88 (0.59–1.30)	17	0.033	1.06 (0.63–1.80)	36	0.036	1.12 (0.76–1.64)
HCGI 2	48	0.008	21	0.013	1.55 (0.92–2.64)	8	0.007	0.85 (0.40–1.81)	6	0.012	1.25 (0.51–3.03)	10	0.010	1.04 (0.51–2.13)
Significant respiratory disease	319	0.052	71	0.044	0.82 (0.62–107)	58	0.051	0.96 (0.72–1.28)	21	0.041	0.74 (0.47–1.18)	56	0.057	1.03 (0.76–1.40)

The total number of swimmers in each category is given in parentheses (N).
* Referent category (RR = 1.0).
† Adjusted for age, sex, beach, race, California *vs* out-of-state resident, and concern about potential health hazards at the beach.

TABLE 6. Number Ill, Risks, and Adjusted Relative Risk (RR) Estimates of Adverse Health Outcomes by Virus

	Viruses				
	No (N = 3,168)*		Yes (N = 386)		
Outcome	No. Ill	Risk	No. Ill	Risk	RR (95% CI)†
Fever	126	0.040	23	0.060	1.56 (0.98–2.50)
Chills	65	0.021	10	0.026	1.25 (0.63–2.50)
Eye discharge	36	0.011	8	0.021	1.86 (0.85–4.09)
Earache	93	0.029	10	0.026	0.92 (0.47–1.80)
Ear discharge	15	0.005	0		
Skin rash	32	0.010	4	0.010	0.97 (0.34–2.82)
Infected cut	31	0.010	2	0.005	0.57 (0.13–2.40)
Nausea	101	0.032	12	0.031	0.93 (0.50–1.73)
Vomiting	44	0.014	10	0.026	1.86 (0.92–3.80)
Diarrhea	130	0.041	21	0.054	1.27 (0.78–2.07)
Diarrhea with blood	2	0.001	1	0.003	5.82 (0.45–75.72)
Stomach pain	191	0.060	23	0.060	0.92 (0.58–1.45)
Cough	181	0.057	28	0.073	1.22 (0.80–1.86)
Cough and phlegm	92	0.029	13	0.034	1.20 (0.66–2.18)
Runny nose	246	0.078	32	0.083	1.01 (0.68–1.49)
Sore throat	198	0.063	32	0.083	1.38 (0.93–2.06)
HCGI 1	72	0.023	15	0.039	1.69 (0.95–3.01)
HCGI 2	22	0.007	6	0.016	2.32 (0.91–5.88)
Significant respiratory disease	133	0.042	21	0.054	1.34 (0.83–2.18)

The total number of swimmers in each category is given in parentheses (N).
* Referent category (RR = 1.0).
† Adjusted for age, sex, beach, race, California *vs* out-of-state resident, and concern about potential health hazards at the beach.

When looking at the ratio of total to fecal coliforms using the entire dataset, no consistent pattern emerged.[12] This is not entirely surprising inasmuch as an analysis of all data points treats all ratios of similar numerical value equally. Thus, for example, even though a ratio of 5 when the total coliforms are very low may not increase risk, the same ratio may be associated with increased risks when the density of total coliforms is above 1,000 or 5,000 cfu. When the analysis was restricted to swimmers exposed to total coliform densities above 1,000 or 5,000 cfu, a consistent pattern emerged, with higher risks associated with low ratios.[12]

This is the first large-scale epidemiologic study that included measurements of viruses. A number of adverse health effects were reported more often on days when the samples were positive, suggesting assays for viruses may be informative for predicting risk. Norwalk-like viruses are a plausible cause of gastroenteritis.[4,13] Enteroviruses, the most common viruses in sewage effluent, can cause respiratory symptoms. Not only are viruses responsible for many of the symptoms associated with swimming in ocean water but also they die off at slower rates in sea water than do bacteria, and they can cause infection at a much lower dose.[14]

Our design substantially reduced the potential for confounding by restricting the study entirely to swimmers and making comparisons between groups of swimmers (for example, defined by distance from the drain) to estimate relative risks. Previous studies looking at the effects of exposure to polluted recreational water (for example, due to sewage outflows) have been criticized for comparing risks in swimmers with risks in nonswimmers.[4,14,15] In these earlier studies, background risks among subjects who swim *vs* those choosing not to swim may differ because there are many other (potentially noncontrollable) exposures/pathways that can produce the symptoms under investigation. By restricting the present study to swimmers, we have reduced potential differences between the background risks of exposed *vs* unexposed subjects (for example, swimmers choosing to swim at the drain *vs* those swimming at the same beach but farther away from the drain). Furthermore, we were able to adjust our relative risk estimates for a number of additional factors (listed above) that could confound the observed relations. Of course, this does not exclude the possibility that residual confounding in these factors, or other unknown factors, might have confounded the observed relations.

Nevertheless, any actual (that is, causal) effects may be higher than we observed in this study because both distance and pathogenic indicators are proxy measures of the true pathogenic agents. Also, recall that we excluded subjects who frequently entered the water at these beaches. If there is a dose-response relation such that higher cumulative exposures are associated with increased risk, then one may infer that persons who frequently enter the water and immerse their heads (for example, surfers) may have a higher risk of adverse health outcomes than the relatively infrequent swimmers included in this study.

In summary, we observed positive associations between adverse health effects and (1) distance from the drain, (2) bacterial indicators, and (3) presence of enteric viruses. Taken together, these results imply that there may be an increased risk of a broad range of adverse health effects associated with swimming in ocean water subject to urban runoff. Moreover, attributable numbers—that is, estimates of the number of new cases of an adverse health outcome that is attributable to the exposure of interest—reached well into the 100s per

10,000 exposed subjects for many of the positive associations observed here.[12] This finding implies that these risks might not be trivial when we consider the millions of persons who visit these beaches each year. Furthermore, the factors apparently contributing to the increased risk of adverse health outcomes observed here are not unique to Santa Monica Bay (similar levels of bacterial indicators are observed at many other beaches). Consequently, the prospect that untreated storm drain runoff poses a health risk to swimmers is probably relevant to many beaches subject to such runoff, including areas on the East, West, and Gulf coasts of North America, as well as numerous beaches on other continents.

Acknowledgments

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Brownstein Hyatt
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April 29, 2013

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Wayne Chiu, P.E., Water Resource Control Engineer
Eric Becker, P.E., Senior Water Resource Control Engineer
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4353

RE: Revised Tentative Order R9-2013-0001;
Cost Benefits Analysis and Errata Sheets posted April 19, 2013

Dear Messrs. Chiu and Becker:

This revised letter is being submitted in response to Mr. Becker's email of this date which rejected the April 26, 2013, letter from members of the Coalition that have participated in the process of the San Diego Regional Water Quality Control Board, Region 9's (RWQCB) development of Revised Tentative Order R9-2013-0001 published March 26, 2013. The Coalition consists of the following trade and professional associations, known as, the regulated community: Building Industry Association of San Diego County (BIASD), Business Leadership Alliance (BLA), Associated General Contractors, San Diego (AGC), NAIOP (National Association of Industrial & Office Properties), Associated Builders & Contractors (ABC), the San Diego Regional Chamber of Commerce (SDRRC), the San Diego Association of Realtors® (SDAR), the Alliance for Habitat Conservation, the Building Owners & Managers Association (BOMA), and the San Diego Chapter of the American Society of Landscape Architects. In its Ruling on Objections, Requests for Alternative Procedures, and Requests for Designation as Additional Parties to the Proceeding, dated April 3, 2013, the RWQCB designated the Coalition as a Designated Party to the proceedings.

Mr. Becker's email indicated that the Board was rejecting the Coalition's April 26 letter because it included written comments on the Board's proposed errata and provided the Coalition with an opportunity to submit a revised letter by 5:00 p.m. today that was limited to comments on the Cost Benefit Analysis. While the Coalition appreciates the opportunity to submit a revised version of its letter, please be advised that it does so under protest because, we respectfully submit and as indicated in the April 26 letter, the entire content of the letter was appropriate. Accordingly, we ask that both the April 26 letter and this letter be included in any administrative record of proceedings for the Permit.

The RWQCB held a hearing on Revised Tentative Order R9-2012-0001 on April 10 and 11, 2013. During the April 11, 2013, portion of those hearings the RWQCB admitted additional new evidence into the administrative record, including, but not limited to, a document labeled "April 2011 Meeting Water Quality Standards for San Diego's Recreational Waters, a Cost Benefit Analysis" (Hereinafter "Cost Benefit Analysis"). In his Notice of Public Hearing Continuation dated April 19, 2013, the Executive Officer of the RWQCB invited designated parties to submit written comments on the Cost Benefit Analysis prior to 5 p.m. April 26, 2013. Concurrent with the Executive Officer's Notice of Continuation, the RWQCB also released

two versions "Errata Sheets," with each version presented as a separate "Option," and without explanation as to which the Board proposes to utilize.

Continuing Request for Additional Time

The Coalition experts and counsel have had limited time to review and prepare comments on the Cost Benefit Analysis and the Errata Sheets. The Coalition became aware that it would be given an opportunity to make written comments on the Cost Benefit Analysis at approximately 4:30 PM on April 19, 2013, and the Errata Sheets were released at approximately the same time. Thus, designated parties have had six days to prepare written comments on this new evidence. The Coalition strongly recommends that the RWQCB continue the public hearing on the draft permit for at least 30 days to allow sufficient time for board members, affected parties, and the public to review and consider the new information about the Cost Benefits Analysis and the major changes to water quality strategies and regulation envisioned in the Errata Sheets. This is a situation that requires a comment period extension. *See* 40 C.F.R. §§124.14(a)(4), (b); 124.10; Water Code §13167.5; *State Water Resources Control Board v. Office of Administrative Law* (1993) 12 Cal.App.4th 697. The RWQCB's release of new information in support of the Revised Draft Permit and proposed further modifications to a permit, relying, in whole or in part, on newly admitted evidence, should be considered, in effect, the preparation of a modified draft permit and revised fact sheet with fewer than five working days to review these revisions prior to the meetings at which the RWQCB will consider the Revised Tentative Order for adoption. Under the authority cited above, the release of this modified permit must be accompanied by a corresponding additional comment period on the significantly revised draft Order.

The Cost Benefit Analysis

Based on the limited opportunity the Coalition has had to review the Cost Benefit Analysis, it believes some general comments are in order. The Coalition members are not directly regulated by municipal stormwater permits; the Coalition is concerned that limited public funds will be required to be spent to implement unattainable requirements that lack scientific basis. The Coalition shares the goal of clean water and believes achieving this goal will be greatly enhanced when permit requirements are carefully evaluated using a cost benefit analysis that will ensure that there will be reasonable benefits derived from the expenditures. In fact, the Coalition believes that this is one of the purposes of Water Quality Improvement Plans – to spend taxpayer money wisely and achieve the greatest benefit for the funds expended. As far as the Coalition can determine, the report, conducted by the Fermanian Business & Economic Institute at Point Loma Nazarene University and prepared by the City of San Diego in April 2011, is the only analysis that attempts to evaluate the relationship between the benefits and costs of implementing the 2011 Bacteria Total Maximum Daily Load ("TMDL"). The Revised Draft Permit expressly acknowledges that cost is a factor to be considered and evaluated under the MEP standard and is required under Porter Cologne, Water Code §13241, and a more robust analysis applying the newly added Cost Benefit Analysis is required here. Any large scale, impactful project or program would analyze the costs and benefits before development occurred or the program was implemented; a cost-benefit analysis should also be developed before increased regulations of this magnitude are considered, and has not occurred.

Thank you for the opportunity to review the Cost Benefit Analysis and the Errata Sheets and for considering the Coalition's comments. Please let us know if you have any questions or would like to discuss these issues further before the next hearing.

Very truly yours,

Lisabeth D. Rothman

LDR:mld

cc: Mike McSweeney
Borre Winckel

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To: SDRWQCB & Staff **Date:** April 19, 2013

Re: Cost Benefit Analysis (CBA) commissioned by the City of San Diego Transportation & Storm Water Department (CSDT&SWD) April 2011
Submitted & Allowed: Tentative Order R9-2013-0001

SDRWQCB:

Mark Twain wrote: **"Figures often beguile me, particularly when I have the arranging of them myself; in which case the remark attributed to Disraeli would often apply with justice and force: There are three kinds of lies: Lies, damned lies, and statistics."**

The Cost Benefit Analysis (CBA) in discussion fits this famous pithy quote almost perfectly. It should be seen with a jaundiced, cynical and skeptical eye because it's primary, pre-determined focus appears to be the past, present and future expenditures by the copermittees, not the actual or potential cumulative human health impacts. CWN contends that a CBA is the incorrect metric or analysis format (see preferred **Cost Effective Analysis** below).

Nor is there any addressing ***re*** the significant adverse ecological impacts, the impairments to the other biotic components, the indigenous plant and animal communities. How does one measure the worth in dollars of once healthy habitat turned into **"bacterial dead zones"**? Impaired, degraded ecosystems are incapable of even minor cleansing or anthropogenic pollutant loading abatement.

Several glaring challenges should be made as to the copermittee's chosen vendor and the motivation(s), the creation, conclusions and especially numerous flawed recommendations of the CBA. They purport to eschew unbiased objectivity, yet there is an implicit fiscal expectation to **"not bite the hand that feeds."**

If the generator, **Fernanian Business and Economic Institute (FBEI)**, produced documents and studies **not** supportive or **in concurrence** with their commissioning entities, their clients, they'd soon become **"Fermanian Out Of Business."**

Several notations reveal how specious the proffered strategy by FBEI of delay or gradual implementation of TMDLs ***et al*** really is. They have admitted that their projections are estimates, yet insist on measuring **THEIR** estimates against the guaranteed, known improvements of ***post haste***, legally mandated TMDLs. To quote Mr. Spock, this is illogical, in a courtroom it would be denied as vague and ambiguous testimony, open to multiple interpretations hence irrelevant.

Copermittees cheaply buying such prolonged periods of time will only worsen the conditions, introduce more persistent contaminants, hence the forbidden ***"backsliding"*** will occur, putting permit holders into an even deeper (and yes), more expensive hole. Irreversible impacts have no expenditure upper limitations because they become unachievable, unobtainable and mortal to the environs.

A literal **Expanding Universe of Water-Borne Pollution**, the receiving waters and habitats will degrade and remediation will not be able to catch up, hence irreversible non-compliance will dominate.

Costs now **might** be 6:1 as **"guestimated"** by the study group. By 2025 they could go up to 10:1 or greater. It's like a car. Either changed the oil now for $24.95 or pay $2,495.00 in a few years for a valve and head job.

"Yet, the sizable six-to-one gap between costs and benefits estimated in this study will be difficult to narrow substantially even with a significant boost to benefit estimates. At the same time, there is no guarantee that achieving certain TMDL standards will achieve the increased number of days for beach access or the projected reduction in incidence of various illnesses. San Diego residents who never or rarely visit the area's beaches may be unwilling to pay the expense of water quality improvement, especially if it is marginal."
Page 14-15 FBEI Final Bacteriological

Additionally, the majority of the supporting studies/docs cited are antiquated. Databases and conclusions cited by FBEI, reached over 7 years ago have superseded their shelf life, aren't necessarily relevant due to improved analysis methodology, better science, and last but most importantly, public education.

It's accepted in the industry that environmental review analyses and documents like

CEQA/NEPA require updated, current information to allow equitable peer review and encourage fair argument. This study by FBEI is therefore hopelessly derivative, it recycles and cannibalizes where more recent surveys, studies and polls are intuited.

FBEI emphasizes public education as a major BMP, but the argument can be made that polling of the public's desires 7 years or more ago has been surpassed, has changed significantly due to the public's increased awareness. And it's a known fact that many times those who answer polls are in fact already polarized about the subject or are disengaged but eager to give an uneducated opinion.

People respond ***in extremis*** to jeopardizing health and economic impacts upon themselves and to their families. Of course if a person polled (and their immediate loved ones) don't go to the beach it becomes an abstract topic, and if they're in dire economic straits as well, it's axiomatic that they won't want to fund improvements.

The FBEI study asserts that water quality improvements are significant this past decade, leading to far fewer beach closures. Isn't it tenable to propose, to estimate that this is directly attributable to the imposition of aggressive, strident NPDES Permits and the auspice, the specter and arrival of degradation-reversing TMDLs per federal law? The study ironically supports such a hypothesis or supposition.

Copermittee staffs are becoming **"encouraged and motivated"** to proactively and preemptively include the proposed orders in their calculations and projected budgets. Remove an assertive, mandated NPDES, take TMDLs either off the table or slow down their implementation and an insinuated, high-pollutant stasis will reign supreme.

(1) A **Cost Effectiveness Analysis** (CEA) might have been the more pertinent or appropriate format for assessment. Cost-effectiveness analysis is often used in the field of health services, where it may be inappropriate to monetize health effects in the same manner as a CBA.

Typically the CEA is expressed in terms of a ratio where the denominator is a gain in health from a measure (years of life, premature births averted, sight-years gained) and the numerator is the cost associated with the health gain. The most commonly used outcome measure is **Quality-Adjusted Life Years** (**QALY**).

(2) If the CBA had come to a different set of conclusions objectively, if it contradicted or countermanded, was contrary to the pre-disposed objectives, would the provider have even shared it with the stakeholders?

(3) Nowhere are the **CUMULATIVE** health impacts, the potential long term, synergistic, accumulation of impairments discussed. These should have been both **QUANTIFIED** and **QUALIFIED**, which lends credence to a CEA as the more appropriate methodology. Acute (single) **and** chronic toxicity impacts (multiple exposures) are not within the scope of this business and economic study, it was in fact drafted apparently without known, in-house expert medical discourse or input. There are no biologists or physicians within the FBEI team.

Unaddressed are the effects of multiple exposures resulting in complex ***symptomatologies*** (combined symptoms of each illness). The general medically accepted projected impacts of a series of singular exposure, single specific bacterial illness taking place sequentially over the course of decades of recreational (REC-1) immersion time are glaringly lacking.

Ex.: If, like myself, you've had all four (4) of the **"Beach related illnesses"** listed on Page 26 (Exhibit 19), especially been acutely symptomatic for more than one contemporaneously, nowhere in the study does it quantify that exponential potential. Different pathogenic bacteria have different impacts. There are no long term studies about this topic.

The singular epidemiology study is 15 years old. Emphasis on **OLD**:

"Fleisher, J., Kay, D., Wyer, M., & Godfree, A. (1998). Estimates of the severity of illness associated with bathing in marine recreational waters contaminated with domestic sewage. International Journal of Epidemiology , Vol. 27, 722-726."
Source: Page 31 of FBEI Study

(4) What of the toxicity-related illnesses from POPs, CECs, and other **known** mutagenic, teratogenic and carcinogenic substances usually found in urban runoff? This analysis ignores severe health impacts that a CEA might have included for stakeholder and/or Cal/EPA consideration.

The three (3) bacteria tested for under AB 411 are not life-threatening: Urban runoff can be, hence this narrowly focused CBA isn't fully describing or taking into account sound medical science, not to mention significant levels determined by USEPA that trigger TMDL-related activities.

Storm drain outfalls more than 12" in diameter with significant flow discharges, plus creek and river mouth Points of Discharge (PODs) constitute de facto, life-threatening attractive and public nuisances.

(5) CBA **"Recommendations and Action Steps"** CWN comments in **red**:

"1) A priority should be placed on solutions to improving water quality that will require relatively low amounts of expenditures."

Comments: This is a poker tell that reveals the intent, the real goals and mission statement, the predisposed agenda. It is a blatant admission that cost trumps everything, is paramount due to the sole arc of this CBA methodology.

"2) Scientific studies need to be conducted to more carefully document the correlation between TMDL standards and the incidence or risk of various illnesses."

Comments: There have been ample studies by highly reputable university medical clinics to facilitate direct correlations. USEPA has an easily accessible database. As noted earlier, a 15 year-old epidemiological study is nearly without value.

"3) Chambers of Commerce and other civic organizations in the beach areas (e.g., Ocean Beach Main Street Association) should be consulted on their recommendations and support for ways to reduce the flow of contaminants and pollutants."

Comments: Duh. Truly, a Homer Simpson no-brainer. The Permit watershed stakeholder process, the WQIP Panel mechanism, as well as the locale-specific Integrated Regional Watershed Management Plans (IRWMP) already include this iterative, **"novel"** strategy. Let the local, lead enforcement agency do it: **Lead**.

"4) A collaborative approach involving government, business, and

academic experts should be used to help develop some of the most <u>cost-effective</u> approaches to achieving the various water quality standards."

Comments: I underlined **"cost –effective"** because this CBA admits its critical deficiency, that a CEA is necessary but not provided by the submitter (CSDT&SWD).

"5) As suggested in the Strategic Plan, efforts to control pollution at its various sources need to be enhanced through greater monitoring and enforcement."

Comments: Isn't this why the NPDES Permits, TMDLs and the SDRWQCB exist, why storm water permits like the Proposed **Tentative Order R9-2013-0001** we're now considering are important?

"6) A more complete analysis of the relative importance of various causes of pollution in general runoff needs to be conducted (e.g., car washing, lawn pesticides, etc.) Aggressive public education needs to then be conducted, with possible restrictions implemented if necessary."

Comments: Once again, we have known the sources/causes for decades, they have been acknowledged, noted and reflected in the NPDES Permits themselves. So more studies==Buying more time while **<u>not</u>** in compliance. Public education is not only the least expensive activity, but is very difficult to measure.

"7) New parking lots should be required to have porous payments and follow other best management practices to reduce runoff and existing lots should be retrofitted in strategic areas.
8) As emphasized in the Strategic Plan, various programs and projects should be carefully evaluated as they are implemented to identify best management practices. Major expenditures or investments should first be piloted in one area before expanding them on a wider scope.
9) Public-private partnerships should be formed to implement the various projects entailing significant spending or investment."

Comments: The proposed NPDES 2013 prescribes, encourages, describes or alludes to these three (3), numbers 7—9 respectively, especially the pilot project as a potential analog.
LID (permeable filtration) has been part of the Permit process for at least 5 years. Ditto for CalGreen (effective as of 1/01/2012).
All of the watershed management plans (and their identified stakeholder groups) cite specific BMPs submissions/proposals plus BETs in their reports.
The proposed WQIP Panel will include public-private partnerships where applicable.

"10) Data on illnesses related to swimming in San Diego City waters needs to be collected from health care providers and analyzed to better understand the scope and severity of water pollution risk in the area."

Comments: Health care providers aren't always contacted, so the databases are inherently deficient. Medical care affordability wasn't factored in, but obviously many can't afford to seek the care they need for minor illnesses nor can they afford to take days off of work. Then too, because of the symptoms, many recreational users assume they have a cold, flu or in the case of gastroentiritis, ate some funky food somewhere.
Statistical analyses of this type that delay/stall might not be even close to accurate or reflect the depth of the problem. If you don't get cancer until 10 years later from an acute exposure, or from chronic conditions, how could you possibly link the causal factor(s) with the effect(s)? Answer: You can't, it can't be proven.

"11) San Diego City residents should be polled with respect to their opinions about the current quality of the City's beaches and their willingness to pay for additional enhancements. This data needs to be analyzed to ascertain the difference in response between frequent and infrequent beachgoers."

Comments: Q.: And if all the polled SD residents read was this study or those provided by chronic non-compliance parties? A.: Water quality improvement game over.
The second sentence borders on the absurd: Of course frequent beachgoers are different, we're the ones predominantly getting ill.

"12) Methods to pay for the cost of implementing the Strategic Plan need

to be considered that would be the most equitable and efficient. For example, beachgoers might be asked to pay a somewhat larger share of the total cost burden through parking fees, sales taxes, or hotel fees because of the special value they place on clean beaches. In addition, or alternatively, water pollutants could be taxed more heavily."

Comments: Costs associated with implementation, including specific revenue and/or funding mechanisms, are the responsibility of the copermittees, **not** Cal/EPA. **"Equitable and efficient"** are the sole proprietary domain and ultimately the fiduciary accountability standard-bearers for local lead agency copermittees, for the elected and appointed officials, **not** for the SDRWQCB.

"13) Given its budget pressures and this study's finding of the sizable gap between expected costs and benefits, the City of San Diego should consider requesting relief from the San Diego Water Board in achieving various TDMLs or in extending the period in which they are accomplished. This would allow a more thorough analysis of the potential effectiveness of such standards in San Diego. It also would allow more time to determine if solutions featuring lower costs with smaller impacts on established communities can produce significant improvements in water quality."
Comments: More time? The federal Clean Water Act is written, it is based upon a gradual ratcheting down of prescriptions and it has already allowed ample time. Such laws were intended to reverse acknowledged existing impairments.

As for the "**if**" part, that is speculative beyond comprehension. Waking up 5 years from now only to find out that lower costs with smaller impacts aren't possible contradicts the spirit and intent of both the CWA and California's Porter-Cologne.

Moreover, what if 5 years passed and the costs and impacts were not smaller but instead growing? If the both the costs and negative impacts increased exponentially or logarithmically, would the copermittees then use **that** to justify non-compliance or avoidance?
As our science gets better, as levels of significance reflected by USEPA data are in fact tracing the arc of our increasing detection and diagnostic abilities, then there will be attendant increasing abatement and remediation requisites. Allowing more time to pass within that algorithm equals fiscal **and** physical Russian Roulette.

Conclusion:

In what now appears to be **déjà vu all over again**, San Diego copermittees are revisiting that delay tactic realm, attempting to turn the clock back.

Over 10 years ago, while the NPDES for 2002 in South OC was being discussed and considered, then SDRWQCB Chair John (Jack) Minan travelled with staff to a Laguna Niguel City Council Chambers workshop.

Two Orange County Health Care officials, one a medical physician, abjectly in denial, challenged staff and Chair Minan to insert the word **"may"** or **"might"** into warning signs and policy reproductions. They alleged (like this CBA)) that there was no incontrovertible proof, that there weren't direct links or enough epidemiological proof to sustain the NGO and legitimate medical contentions about urban runoff.

In spite of emerging epidemiological studies, they requested warnings, postings, and literature be allowed to be intentionally non-committal, vague, to avoid litigation, to give them the sanctuary of that dreaded metaphor **"safe harbor."** Eventually, and sadly, they prevailed, and here's how the signs read today:

And here's a historical poster that for CWN sums up what's happening while local lead agencies, copermittees responsible for monitoring and enforcement, ones who request stays and delays, who obfuscate and stall state and federal law compliance with their own statistical analyses:

Commemorative Poster From Clean Water Now: November 9, 1999

Respectfully submitted,

Roger E. Bütow
Executive Director
Email: **roger@clean-water-now.org**

CLEAN WATER NOW is an innovative, science-based organization committed to solution-oriented collaboration as a means of developing safe, sustainable water supplies and preserving healthy ecosystems.

San Diego County Taxpayers Association
Taxpayers watchdog since 1945
707 Broadway, Suite 905, San Diego, CA 92101 • P: (619) 234-6423 • F: (619) 234-7403 • www.sdcta.org

April 26, 2013

Wayne Chiu, P.E.
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Dear Mr. Chiu:

The report conducted by the Fermanian Business & Economic Institute (FBEI) at Point Loma Nazarene University entitled "Meeting Water Quality Standards for San Diego's Recreational Waters: A Cost Benefit Analysis" quantifies a substantial concern. The benefit of Tentative Order No. R9-2013-0001 is far outweighed by the costs.

Limited available taxpayer dollars requires water quality regulations to be balanced with other public benefit programs such as healthcare, education, and ensuring fiscally stable government agencies. We need to develop a scientifically-based plan that will improve water quality by providing net benefit to the region before spending billions.

Please contact me at (619) 234-6423 or at felipe@sdcta.org should you have any questions.

Sincerely,

Felipe Monroig
President and CEO

FM/sdk

CC: Dave Gibson, Executive Officer, San Diego Regional Water Quality Control Board
Christine Witte, Executive Assistant, San Diego Regional Water Quality Control Board

SAN DIEGO™ REGIONAL CHAMBER OF COMMERCE

Emerald Plaza
402 West Broadway, Suite 1000
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April 26, 2013

Wayne Chiu, P.E.
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

RE: April 2011 Meeting Water Quality Standards for San Diego's Recreational Waters, a Cost Benefit Analysis

Dear Mr. Chiu,

As a coalition of business leaders the San Diego Regional Chamber of Commerce ("The Chamber") is writing to express the importance of the document labeled "April 2011 Meeting Water Quality Standards for San Diego's Recreational Waters, a Cost Benefit Analysis" admitted into the record for the San Diego Regional Water Quality Control Board's Tentative Order No. R9-2013-0001 on April 11, 2013. While the Chamber and its 3,000 business members are not directly regulated by the municipal stormwater permits, we are concerned that limited public funds will be required to be spent to implement unattainable requirements that lack scientific basis.

We all want to achieve the goal of clean water but the requirements must be carefully evaluated using a cost-benefit analysis to ensure that there will be reasonable benefits derived from the expenditures. Businesses in all sectors of the economy rely and need clean water; however, water quality regulations must be balanced with other public benefit programs. Any large-scale, impactful project or program would analyze the costs and benefits before development occurred or the program was implemented; a cost-benefit analysis should also be developed before increased regulations of this magnitude are considered.

To the best of our knowledge, the report conducted by the Fermanian Business & Economic Institute (FBEI) at Point Loma Nazarene University and prepared by the City of San Diego in April 2011, is the only analysis that attempts to evaluate the relationship between the benefits and costs of implementing the 2011 Bacteria Total Maximum Daily Load (TMDL).

The FBEI Report's concludes that the costs-to-benefit ratio to comply with regulations, including the Bacteria TMDL, is a factor of **six-to-one**. We need to develop scientifically sound processes that will provide a positive cost-benefit to the taxpayers of this region before spending billions to implement capital projects and design programs that may not achieve the water quality targets.

SAN DIEGO™ REGIONAL CHAMBER OF COMMERCE

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We urge your board to note the recommendations provided in the FBEI report, including the recommendations to:

- document carefully the correlation between water quality standards and regulations to the risk to human health,
- Ensure that local residents are polled as to their opinions about the current quality of beaches and their willingness it to pay for additional enhancements and identify the difference in responses between those who frequent the beach, and those who go infrequently.

The Chamber urges the San Diego Regional Water Quality Control Board to only adopt elements in Tentative Order No. R9-2013-0001 that are cost effective and will produce results that are economically, environmentally, and socially beneficial.

Please contact Leah Hemze lhemze@sdchamber.org, or Mike Nagy mnagy@sdchamber.org for comments.

Sincerely,

Jerry Sanders
President & CEO

CC:
- Dave Gibson, Executive Officer, San Diego Regional Water Quality Control Board
- Christine Witte, Executive Assistant, San Diego Regional Water Quality Control Board

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May 8, 2013
Item No. 9
Supporting Document No. 6

Regional Storm Water Program Expenditures FY 2011/2012

Copermittee	Administration	Development Planning	Construction (public & private)	Municipal	Industrial & Commercial	Residential, Education & Public Participation	IDDE	Watershed	Regional	Total
San Diego County										
City of San Diego	$536,961	$11,482,676	$9,372,038	$16,926,207	$1,142,811	$1,753,316	$4,872,827	$7,313,307	$675,703	$54,075,846
County of San Diego	$1,220,385	$6,633,794	$5,363,719	$13,716,276	$1,373,062	$1,127,502	$1,171,659	$1,341,806	$894,652	$32,842,855
City of Lemon Grove	$35,270	$2,100	$7,439	$67,340	$2,537	$10,663	$19,375	$50,866	$37,865	$233,455
City of National City	$25,478	$63,174	$40,492	$318,856	$61,566	$73,884	$53,360	$31,201	$62,813	$730,824
City of Santee	$99,431	$14,836	$13,335	$392,555	$16,182	$10,578	$144,624	$128,531	$62,677	$882,749
City of Poway	$289,490	$27,736	$20,628	$977,479	$54,449	$216,521	$48,500	$122,633	$97,260	$1,854,696
City of La Mesa	$101,781	$26,214	$13,273	$3,715	$51,298	$14,663	$53,182	$91,737	$64,258	$420,121
City of Solona Beach	$52,030	$17,200	$24,260	$144,100	$12,530	$21,530	$55,780	$28,440	$21,970	$377,840
City of Coronado	$11,269	$7,315	$53,305	$737,954	$1,703	$13,116	$22,233	$3,140	$30,921	$880,956
City of Carlsbad	$645,278	$126,997	$140,041	$1,360,839	$123,900	$35,299	$96,699	$40,327	$125,718	$2,695,098
City of Imperial Beach	$142,906	$80,295	$11,150	$386,676	$6,920	$42,562	$34,440	$577,247	$68,124	$1,350,320
City of San Marcos	$364,000	$162,000	$65,000	$739,000	$33,000	$43,000	$238,000	$4,000	$75,000	$1,723,000
City of Encinitas	$137,693	$490,005	$183,612	$1,651,958	$107,162	$66,975	$149,360	$2,519	$58,064	$2,847,348
City of Del Mar	$43,020	$50,093	$25,927	$148,733	$16,948	$42,150	$28,269	$77,915	$29,869	$462,924
City of Vista	$68,675	$65,885	$40,027	$2,033,161	$94,844	$71,998	$166,319	$108,433	$78,801	$2,728,143
City of Escondido	$352,350	$255,630	$77,850	$384,805	$88,000	$203,655	$47,730	$32,775	$107,330	$1,550,125
City of El Cajon *	NSR	NSR	NSR	NSR	NSR	$10,074	$35,675	$4,463	$57,943	$1,282,802
City of Chula Vista	$270,111	$78,916	$127,320	$1,061,810	$81,430	$64,820	$316,082	$35,441	$236,308	$2,272,238
San Diego Airport Authority	$97,800	$59,700	$86,100	$1,832,200	$260,900	$46,500	$132,700	$96,500	$16,800	$2,629,200
City of Oceanside	$112,351	$99,871	$24,815	$2,035,532	$218,995	$140,475	$302,421	$132,152	$201,662	$3,268,274
Port of San Diego	$0	$0	$226,648	$2,666,612	$29,233	$277,470	$614,208	$45,907	$20,225	$3,880,303
San Diego County Totals										$118,989,117
Orange County										
City of Laguna Niguel	$127,360	$35,689	$225,768	$787,165	$65,792	$69,744	$21,880	NSR	$233,674	$1,567,072
City of Mission Viejo	$211,112	$16,084	$16,084	$1,162,499	$4,980	$121,221	$45,930	NSR	$219,104	$1,797,014
City of Laguna Woods	$93,533	$8,279	$16,739	$244,930	$5,917	$53,470	$85,168	NSR	$35,474	$543,510
City of Lake Forest	$198,550	$37,223	$29,238	$1,173,911	$192,562	$54,360	$110,260	NSR	$116,661	$1,912,765
City of Dana Point	$503,767	NSR	NSR	$1,122,869	$10,260	$9,502	$14,093	NSR	$50,713	$1,711,204
City of Laguna Hills	$287,145	NSR	NSR	$330,312	NSR	NSR	NSR	NSR	$109,959	$727,418
County of Orange	$882,220	$151,458	$958,498	$28,193,926	$12,071	$78,473	$199,293	NSR	$1,296,832	$31,772,771
City of Rancho Santa Margarita	$13,997	$4,666	$16,998	$125,824	$6,998	$27,787	$6,291	NSR	$132,781	$335,342
City of San Clemente	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	$2,681,628
City of San Juan Capistrano	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	$2,000,000
City of Aliso Viejo	$163,726	$10,915	$35,604	$211,673	$13,644	$64,166	$13,644	NSR	$116,917	$630,289
Orange County Totals										$45,679,013
Riverside County										
City of Murrietta										DUE 10-13-2013
City of Temecula										DUE 10-13-2013
City of Wildomar										DUE 10-13-2013
County of Riverside										DUE 10-13-2013
Riverside County Flood Control										DUE 10-13-2013
Riverside County Totals										
NSR = Not Seperately Reported										**$164,668,130**

May 8, 2013
Item No. 9
Supporting Document No. 7

Comprehensive Load Reduction Plan Estimated Cost

Bacteria TMDL / Affected Copermittees	Regional Structural BMPs		Distributed Structural BMPs		Nonstructural BMPs		Stream Restoration Projects		Dry-Weather Diversion/ Treatment		Infrastructure Improvement		Private Property BMPs (optional strategy)		Special Studies		Monitoring		Total Lower Limit Costs ($M) / 20 years	Total Lower Limit Costs ($M) / year	Total Upper Limit Costs ($M) / 20 years	Total Upper Limit Costs ($M) / year
[1] Costs are additative to existing jurisdictional program costs.	Lower Limit	Upper Limit	Lower Limit	Upper Limit	Lower Limit	Upper Limit	Lower Limit	Upper Limit	Lower Limit	Upper Limit	Lower Limit	Upper Limit	Lower Limit	Upper Limit	Lower Limit	Upper Limit	Lower Limit	Upper Limit				
San Diego River[1]	$59	$141	$66	$219	$38	$104	$42	$42	$19	$43	$144	$423	$216	$360	$3	$7	$3	$3	$590	$30	$1,342	$67
County of San Diego																						
City of San Diego																						
CalTrans																						
City of Santee																						
City of El Cajon																						
Chollas Creek[1]	$52		$98		$248														$398	$20		
City of San Diego																						
City of La Mesa																						
City of Lemon Grove																						
County of San Diego																						
San Diego Unified Port District																						
Tecolote Creek[1]	$51		$52		$213														$316	$16		
City of San Diego																						
Caltrans																						
San Luis Rey River[1]	$53	$81	$17	$55	$50	$131			$1	$3					$3	$6	$1	$1	$125	$6	$276	$14
County of San Diego																						
Caltrans																						
City of Oceanside																						
City of Vista																						
Scripps Watershed[1]	$33		$12		$198														$243	$12		
City of San Diego																						
San Juan Creek																				$8		
City of Dana Point																			Estimated cumulative Aliso Creek watershed program expenditures for FY 10/11. Budget and funding for bacteria TMDL/CLRP efforts is ongoing and will be reevaluated annually as the program evolves. **San Juan CLRP 10/4/2012**			
City of Laguna Hills																						
City of Laguna Niguel																						
City of San Juan Capistrano																						
City of Mission Viejo																						
City of Rancho Santa Margarita																						
Aliso Creek																				$4		
City of Aliso Viejo																			Estimated cumulative San Juan Creek watershed program expenditures for FY 10/11. Budget and funding for bacteria TMDL/CLRP efforts is ongoing and will be reevaluated annually as the program evolves. **Aliso Creek CLRP 10/4/2012**			
City of Laguna Beach																						
City of Laguna Hills																						
City of Laguna Niguel																						
City of Laguna Woods																						
City of Lake Forest																						
City of Mission Viejo																						

Operation and Maintenance Costs

LIP Program Elements	Expenditures FY 2011-12	Projected Cost for FY 2012-13
Support of Program Administration (LIP Section 2.0)	$163,726	$168,000
Municipal Activities (LIP Section 5.0) Trash & Debris Control (formerly "Litter Control")	$13,644	$14,000
Municipal Activities (LIP Section 5.0) Drainage Facility Maintenance	$16,373	$16,800
Municipal Activities (LIP Section 5.0) Street Sweeping	$73,181	$80,000
Municipal Activities (LIP Section 5.0) Environmental Performance (BMP Implementation)	$8,186	$8,400
Municipal Activities (LIP Section 5.0) Pesticide & Fertilizer Management	$2,729	$2,800
Public Information (LIP Section 6.0) Nonpoint Source Pollution Awareness	$8,186	$8,400
Public Information (LIP Section 6.0) Household Hazardous Waste Collection	$8,186	$8,400
Requiring New Development BMPs (Supportive of Planning, etc) (LIP Section 7.0)	$10,915	$11,200
Requiring Construction BMPs (Supportive of Plan Check & Inspection) (LIP Section 8.0)	$13,644	$14,000
Existing Development (LIP Section 9.0) Industrial/Comm./HOA Inspections	$13,644	$14,000
Illicit Connections/Discharge Identification & Elimination (LIP Section10.0) Investigations	$13,644	$14,000
Agency Contribution to Regional Program	$116,917	$162,400
Other – Household Hazardous Waste	$47,794	$50,000
Other – Catch Basin Cleaning/Maintenance	$0	$10,000
Totals	**$510,769**	**$582,400**

Funding Source

LIP FUNDING SOURCES	Funding Sources FY 2011-12	Projected Funding Sources FY 2012-13
General Fund	85.3%	85.3%
Utility Tax/Charges	0.0%	0.0%
Separate Utility Billing Item	0.0%	0.0%
Gas Tax	14.7%	14.7%
Special Restricted Fund	0.0%	0.0%
- Sanitation Fee	0.0%	0.0%
- Benefit Assessment	0.0%	0.0%
- Fleet Maintenance Fund	0.0%	0.0%
- Community Services Fund	0.0%	0.0%
- Water Fund	0.0%	0.0%
- Sewer & Storm Drain Maintenance Fee	0.0%	0.0%
- Others	0.0%	0.0%
TOTALS	**100%**	**100%**

10.0 FISCAL ANALYSIS

10.1 Introduction

This section provides a Fiscal Analysis of the Storm Water Pollution Prevention activities in the City of Carlsbad. This methodology was developed by the Copermittees in January 2009 in accordance with sections, G, J.1 a(3)(k) and J.1.c(1)(d) of NPDES Order No. R9-2007-0001. The data provided in this section is based on actual expenditures for the period from July 1, 2011 through June 30, 2012.

10.2 General Budget Information

In FY 02-03 and 03-04, the City conducted a fee study to evaluate possible financing mechanisms for the Storm Water Protection Program. The new financing mechanism was detailed in the "*City of Carlsbad Storm Water Pollution Protection Program Regulatory Fee Study Report*", dated September 12, 2003. The report recommended funding the storm water program through an increase in the City's Solid Waste Service fees and new development processing fees. Nearly all of the pollutants discharged into the MS4 are classified as solid waste under state and local codes. Based on this information and other findings, the City implemented a *Solid Waste Service* fee increase for residential and commercial service users to fund certain Storm Water Protection Program activities. The amount of the fee increase is calculated based upon the apportioned costs to the business and residential service users and their contribution to the pollutant loading. This fee was last reviewed in June 2007, and updated to reflect current workloads. The current fee is $3.46 per month for residential customers, and 23.09% of the base trash rate for commercial customers.

The total operating costs to fund the storm water program activities related to existing development for FY 11-12 were budgeted at $3,357,402. This is a slight increase from FY 10-11, due to an increasein fees from the San Diego Regional Water Quality Board, as well as increases in estimated costs for outside contracted services. A summary of expenditures for the City of Carlsbad's Storm Water Program is included as Appendix 10.1.

10.3 Fiscal Analysis Methods

The data presented here was derived from the City of Carlsbad's financial reporting system, IFAS. Some estimates are made where specific activities are not clearly delineated in the budget.

10.4 Fiscal Analysis Results

10.4.1 Expenditures

For FY 11-12 ending June 30, 2012, a total of $2,695,098 was spent, with $2,529,052 spent on JURMP activities, $40,327 spent on WURMP activities, and $125,718 spent on RURMP activities. A breakdown of expenses is reported in Appendix 10.1.

10.4.2 Funding Sources

The Permit requires the City to secure the resources necessary to meet the requirements of the Permit and the JURMP, and to conduct an annual fiscal analysis. The analysis must evaluate the expenditures necessary to accomplish the activities identified in the JURMP and describe the sources of the funds

used to meet the expenditures. The Storm Water Protection Program is comprised of numerous program activities funded from a variety of sources. Table 10.1 summarizes the storm water protection program activities and identifies the current funding source:

Table 10.1 Summary of Program Activities and Current Funding Sources

Program/Activity	Funding Source(s)
Storm Water Facility Capital Improvement Program	Developer Impact Fees, Developer Exactions, General Fund, Gas Tax, TransNet Sales Tax, Federal and State Grants
Storm Water Facility Maintenance and Operation Program including Street Sweeping, Litter Removal and Storm Event Readiness and Patrolling	Solid Waste Service Fees, General Fund
Storm Water Program Administration	Solid Waste Service Fees
Illicit Detection and Illegal Discharge Enforcement Program	Solid Waste Service Fees
Commercial/Industrial SWPPP Inspection Program	Solid Waste Service Fees (charged to commercial service customers only)
Construction Related SWPPP Review and Inspection Program	Developer Fees

10.0 FISCAL ANALYSIS COMPONENT

MUNICIPAL PERMIT REQUIREMENTS:

Permit Section J.3.a.(3)(j).i - A fiscal analysis of the Copermittee's urban runoff management programs which meets all requirements of section G of this Order.

Permit Section G: Fiscal Analysis

1. *Each Copermittee shall secure the resources necessary to meet all requirement of this Order.*

2. *As part of the Regional Urban Runoff Management Program, the Copermittees shall collectively develop a standardized method and format for annually conducting and reporting fiscal analyses of their urban runoff management programs in their entirety (including jurisdictional, watershed, and regional activities). This standardized method shall:*

    a. *Identify the various categories of expenditures attributable to the urban runoff management programs, including a description of the specific items to be accounted for in each category of expenditures.*
    b. *Identify expenditures that contribute to multiple programs or were in existence prior to implementation of the urban runoff management program.*
    c. *Identify a metric or metrics to be used to report program component and total program expenditures.*

3. *Each Copermittee shall conduct an annual fiscal analysis. Starting January 31, 2010, the annual fiscal analysis shall be conducted consistent with the standardized fiscal analysis method included in the January 31, 2009 Regional Urban Runoff Management Program Annual Report. The annual fiscal analysis shall be conducted and reported on as part of each Copermittee's Jurisdictional Urban Runoff Management Program Annual Reports. For convenience, the fiscal analysis included in the Jurisdictional Urban Runoff Management Program Annual Reports shall address the Copermittee's urban runoff management programs in their entirety, including jurisdictional, watershed, and regional activities. The fiscal analysis shall provide the Copermittee's urban runoff management program budget for the current reporting period. The fiscal analysis shall include a description of the source(s) of the funds that are proposed to be used to meet the necessary expenditures, including legal restrictions on the use of such funds.*

10.1 INTRODUCTION

The Municipal Permit requires the Copermittees to develop a standardized method and format for annually conducting and reporting fiscal analysis of their urban runoff management programs. The Standardized Fiscal Analysis Method and Format (Fiscal Analysis Method) was collaboratively developed and adopted by the Copermittees in January 2009 in accordance with sections G, J.1.a(3)(k), and J.1.c(1)(d) of NPDES Order No. R9-2007-0001. The Fiscal Analysis

Method document was submitted to the San Diego Regional Water Quality Control Board by January 31, 2009, as Attachment 1 of the Regional Urban Runoff Management Plan (RURMP) Annual Report for 2008-2009. The Municipal Permit further requires the Copermittees to conduct their annual fiscal analysis consistent with the standardized method starting January 31, 2010. The fiscal analysis incorporated in this section is based on the standardized method. This is the third year that the standardized method is being used.

10.2 General Budget Information

The Standardized Fiscal Analysis Method includes a Standardized Fiscal Analysis Reporting Form, which consists of three tables separating jurisdictional, watershed, and regional expenditures. Jurisdictional expenditures are divided into components that mirror those included in the Municipal Permit as follows:

- Administration
- Development Planning
- Construction
- Municipal
- Industrial and Commercial
- Residential
- Illegal Discharge Detection and Elimination (IDDE)
- Education
- Public Participation
- Special Investigations
- Non-Emergency Firefighting

Further, each of the above categories may be broken down into sub-categories. Potential Sub-categories may include:

- Land Use Planning
- Environmental Review
- Development Project Approval and verification
- Public Construction Projects
- Private Construction Projects
- Public Reporting of Illicit Connection or Illegal Discharges (ICIDs)
- Jurisdictional Urban Runoff Monitoring Programs
- Other

Expenditure items to be considered for each category or sub-category may include:

- Administration
- Permitting and Licensing
- Project Planning and Engineering
- Maintenance Inspections
- Compliance Inspection and Enforcement

- BMP Implementation
- Educational Outreach
- Waste Collection and Recycling
- Jurisdictional Urban Runoff and Receiving Water Monitoring
- Other Expenditures

For reporting purposes, only the table incorporating major jurisdictional components will be used. Sub-categories and expenditure items are intended to provide standardization of expenditures and need not be shown in the final report.

City of Chula Vista staff from different departments and divisions contributes to the implementation of the storm water program and their contributions are as follow:

- The Storm Water Management Section is responsible for the development and implementation of storm water programs, participation in regional and watershed activities, oversight of storm water related contracts, data management, and report writing. It is also responsible for inspecting municipal, industrial, commercial, building construction, and residential land uses and responding to reported violations of the City's Storm Water Management and Discharge Control Ordinance. The Storm Water Management Section conducts enforcement action on violators of the City's Storm Water Ordinance.

- The Environmental Planning Division of the Development Services Department reviews development projects for compliance with the California Environmental Quality Act, assesses potential environmental impacts to sensitive areas and requires developers to provide mitigation plans before permits are issued.

- The Land Development Division of the Development Services Department is responsible for ensuring that grading and construction permit applications are in compliance with grading and other engineering ordinances, and that temporary and permanent Best Management Practices are incorporated in the grading plans, tentative maps, and final maps. Land Development Division staff reviews and approves Water Quality Technical Reports submitted to the City as part of development application packages for Priority Development Projects.

- The City Attorney's Office reviews all documents (such as manuals, forms, ordinances, etc.) developed by the Storm Water Management Section, to ensure that they are in compliance with current laws and regulations. The City Attorney's Office also assists the Storm Water Management Section in the enforcement of City's Municipal Code.

- The Environmental Services Section of the Public Works Department manages the Used Oil Recycling Program, the Household Hazardous Waste Collection Program, the Solid Waste Collection Program, the Conservation Program, and the Solid Waste Reduction and Recycling Program.

- The Geographic Information Systems (GIS) Section of the Information Technology Services Department is responsible for the City's GIS systems, and provides support to the Storm Water Management Section by mapping and updating the City's storm water conveyance systems and data management.

- The Operations Division of the Public Works Department is responsible for the maintenance of the City's storm drainage systems and the sanitary sewer collection systems; oversight of the street sweeping program, and oversight of the open space maintenance program. The Wastewater Management Section, in addition to its scheduled maintenance activities, is responsible for emergency responses to sanitary sewer overflows (SSO) and pollutant spills on public streets.

- The Inspection Services Section of the Public Works Department is responsible for the inspection of grading, improvement, and Capital Improvement Projects for compliance with the City's ordinances, including the Storm Water Management and Discharge Control Ordinance.

- Other City departments, divisions, and sections provide support to the Storm Water Management Section in the fulfillment of the City's JURMP and are instrumental in the implementation of that program. Although those departments, divisions, and sections provide important contributions, a detailed accounting of their roles is beyond the scope of this report.

10.3 FISCAL ANALYSIS METHODS

The fiscal analysis method used in this report is based on the standardized fiscal analysis method and format dated January 29, 2009, developed by the Copermittees of the San Diego County NPDES Municipal Permit, Order No. R9-2007-0001.

10.4 FISCAL ANALYSIS RESULTS

10.4.1 EXPENDITURES

10.4.1.1 JURISDICTIONAL

The City's jurisdictional expenditures for FY 2011-2012 related to compliance with the Municipal Permit are listed in Table 10-1 to 10-3.

Table 10-1 NPDES Jurisdictional Expenditures for FY 2011-2012

JURISDICTIONAL COMPONENT		MULTIPLE PROGRAMS	PRIOR PROGRAM
Administration	$270,111		
Development Planning	$78,916		
Construction	$127,320		
Municipal	$1,053,661		
Industrial and Commercial	$81,430		
Residential	$24,446		
IDDE	$311,231		
Education	$39,374		
Public Participation	$1,000		
Special Investigations	$4,851		
Non-Emergency Firefighting	$8,149		
Jurisdictional Total	**$2,000,489**		

Table 10-2 NPDES Jurisdictional Shared Program Expenditures for FY 2011-2012

JURISDICTIONAL COMPONENT SHARED PROGRAMS		MULTIPLE PROGRAMS	PRIOR PROGRAM
Used Oil Recycling	$10,582	x	x
Household hazardous Waste Management	$360,877		
Wastewater Collection Systems Maintenance	$4,597,347	x	x
Flood Management Projects and Flood Control Devices	$519,239	x	x
Jurisdictional Shared Programs Total	**$5,488,045**		

Table 10-3 Jurisdictional Shared Programs For Which Expenditures are Not Readily Available

JURISDICTIONAL COMPONENT SHARED PROGRAMS FOR WHICH COSTS ARE NOT READILY AVAILABLE	MULTIPLE PROGRAMS	PRIOR PROGRAM
Land Use Planning	x	x
Environmental Review	x	x
Development Project Approval and Verification	x	x
Management of Pesticides, Herbicides, and Fertilizers	x	x
Roads, Streets, Highways, and Parking Facilities	x	x
Parks and Recreational Facilities	x	x

10.4.1.2 WATERSHED

The standardized Fiscal Analysis method and format provides a form for total watershed expenditures, which is divided into various watersheds draining each Copermittee's jurisdictional boundaries. The City of Chula Vista is wholly located within the San Diego Bay watershed and, therefore, the sum total of all expenditures associated with watershed activities is shown as one number under Watershed Total.

Table 10-4 NPDES Watershed Expenditures for FY 2011-2012

WATERSHED COMPONENT		MULTIPLE PROGRAMS	PRIOR PROGRAMS
Chula Vista's Share of the Watershed Total	**$35,441**		

During FY 2011-2012, watershed activities in the San Diego Bay Watershed were developed at the watershed level, while each Copermittee implemented their respective watershed activities individually within their jurisdictions. During the current reporting period, the Copermittees of San Diego Bay Watershed decided to hire a consultant to develop their Watershed Urban Runoff Management Program annual report, and a cost share agreement was signed and each Copermittee contributed their share of the costs for this activity.

10.4.1.2 REGIONAL

Table 10-5 for total regional expenditures shows the City's share of total regional costs that are determined by using cost share formulae included in the Memorandum of Understanding dated November 16, 2007, and signed by all Copermittees.

The City participates in regional meetings and activities with other Copermittees of San Diego County. Each year, the Regional Management Committee approves a budget for the following Fiscal Year and each Copermittee pays their share of the regional costs to the Principal Copermittee. The Principal Copermittee, on behalf of all the Copermittees, manages an account and pays regional expenses from that account. During the current reporting period, costs associated with activities of the following workgroups were included in the regional expenditures and budgets:

- Program Planning Subcommittee
- Fiscal, Reporting, and Assessment Workgroup
- Education and Residential Sources Workgroup
- Monitoring Workgroup
- Land Development Workgroup
- Municipal Workgroup
- Industrial and Commercial Sources Workgroup
- Regional WURMP Workgroup

Additionally, City staff time for attending regional workgroup meetings has been included in regional expenditures for Fiscal Year 2011-2012. Finally, annual fees for membership in the

California Storm Water Quality Association is paid as a regional expenditure and the appropriate share of the City of Chula Vista has been included in the following regional expenditure analysis.

Table 10-5 NPDES Regional Expenditures for FY 2011-2012

REGIONAL COMPONENT		MULTIPLE PROGRAMS	PRIOR PROGRAMS
Chula Vista's Share of the Regional Total	**$236,308**		

As shown in Table 10-5, City's share of the above expenditures was $236,308 for FY 2011-2012.

10.4.2 FUNDING SOURCES

An analysis of the City's storm water program revenues and expenditures indicates that the program captures its revenues from General Funds, Capital Improvement Project funds, and Storm Drain Fees assessed on property owners or tenants of single family homes, multi-family buildings, and commercial/industrial facilities through the Sweetwater Authority, Otay Water District, and Cal-American Water District. Additional revenues are received from Building Permit Fees and from developer deposits; however, these vary significantly from year to year, depending on the level of development activities within the City. Building Permit Fees, which are used to cover staff time for inspections of construction sites during the building phase of the projects has been reduced drastically as a result of the recent slow down of development projects within the City.

Table 10-6 Funding Sources for FY 2011-2012

No.	FUNDING SOURCE	PROGRAM ELEMENT
1	General Fund	Storm Water Management Program
		Storm Drain Maintenance
2	Storm Drain Fee	Storm Water Management Program
3	Sewer Fee	Wastewater Collection System Maintenance
4	Special Assessment District Fees	Storm Drain Maintenance
		Wastewater Collection System Maintenance
5	Grant Funds	Used Oil Recycling
		Drainage Capital Improvement Projects
6	Solid Waste Fee	Household Hazardous Waste Management Waste Management Recycling
7	Developer Deposits and Fees	Environmental Reviews
8	Loans	Drainage Capital Improvement Projects
9	Transnet	Drainage Capital Improvement Projects

10 Fiscal Analysis

10.1 Program Implementation

Table 10-1 represents the City of San Diego's implementation of the Fiscal component as it relates to the Municipal Permit requirements during FY 2012. Further explanations and results are provided in Section 10.2. During FY 2012, the City was compliant with all elements of Section G of the Municipal Permit.

Table 10-1: Fiscal Analysis Program Implementation

Item No.	Program Implementation Description	Confirmation and/or result
1	A fiscal analysis of the Copermittee's urban runoff management programs which meets all requirements of section G of Order No. R9-2007-0001.	Completed – See Section 10.2 below.

10.2 Discussion Supporting Table 5-1

10.2.1 Table 10-1 Item No. 1

10.2.1.1 General Budget Information

The Storm Water Division is responsible for annually reporting on the JURMP, WURMP, and RURMP's fiscal analysis to the San Diego RWQCB in accordance with the Fiscal Analysis Method. The Storm Water Division collected and analyzed financial information from 23 City departments/divisions through its "Annual Report Form Questions", as well as financial information from within the Storm Water Division. A summary of the findings is included below.

10.2.1.2 Fiscal Analysis Methods

While the City utilized the format and guidelines included in the Fiscal Analysis Method for reporting purposes, a few modifications were necessary in order to address how the City tracks accounts internally. The modifications to the expenditure categories are described in the relevant sections below. In addition, since the City does not specifically track expenditures by municipal permit component for budgeting purposes, in many cases estimated percentages were utilized to allocate expenditures into the appropriate municipal permit component categories, including watershed and regional.

10.2.1.3 Fiscal Analysis Results

10.2.1.4 Expenditures

The City's FY 2012 jurisdictional (JURMP), watershed (WURMP), and regional (RURMP) expenditures for the implementation of the Municipal Permit requirements are summarized in Table 10-2.

Table 10-2: FY 2012 Jurisdictional, Watershed, Regional Expenditures Summary

Jurisdictional Component	
Administration	$536,961
Development Planning (includes public and private projects)	$11,482,676
Construction (includes public and private projects)	$9,372,038
Municipal (including Non-emergency Fire Fighting expenditures)	$16,926,207
Industrial and Commercial	$1,142,811
Residential, Education, and Public Participation	$1,753,316
IDDE	$4,872,827
Jurisdictional Total	**$46,086,836**
Watershed Component	
San Dieguito Watershed	$553,356
Los Peñasquitos Watershed	$1,000,185
Mission Bay Watershed	$2,699,743
San Diego River Watershed	$596,806
San Diego Bay Watershed	$2,167,387
Tijuana River Watershed	$295,830
Watershed Total	**$7,313,307**
Regional Component	
Total Copermittee Cost Share for the City of San Diego	$570,432
Additional Regional Costs for education efforts, monitoring, document reviews, regional meeting attendance, and special projects	$105,271
Regional Total	**$675,703**
Total Costs	**$54,082,449**

JURMP Expenditures

The City's FY 2012 City-wide expenditures for the implementation of the jurisdictional Municipal Permit requirements are depicted in Figure 10-1. In many cases expenditures were provided as actual costs and when the actual costs could not be determined estimates of actual costs were provided. The Storm Water Division utilized the expenditure categories detailed in the Fiscal Analysis Method for jurisdictional reporting. However, because of implementation overlap of the City's education, public participation, and residential Municipal Permit components, it is difficult to separate out individual component costs. Therefore, the expenditures for residential, education, and public participation are reported as one expenditure category.

A total of $46,086,836 was expended in FY 2012 for the implementation of City-wide JURMP activities. This amount includes costs paid by sewer and water rate payers (which are used for sewer and water-related services) and costs reimbursed by project applicants. An overview of the expenditures reflected in this component is described below.

Administration ($536,961)

Activities identified in this section represent personnel and non-personnel expenses for administration and contracts, grant management, city-wide management, reporting and assessment of the Municipal Permit.

Development Planning ($11,482,676)

Activities identified in this section represent personnel and non-personnel expenses for plan check reviews, project design and SUSMP implementation, and General Plan updates. This category includes expenses for private and public projects.

Construction ($9,372,038)

Activities identified in this section represent personnel and non-personnel expenses for plan check review services, field inspections related to grading permits, public improvements, and building activities. This category includes expenses for private and public projects.

Municipal ($16,926,207)

Activities identified in this section represent personnel and non-personnel expenses for street sweeping, storm drain and channel maintenance, BMP implementation, and municipal facility and activity inspections. Additionally, this section includes the expenditures for Fire Department activities that are not related to emergency fire- fighting such as facility inspections, storm water BMPs, etc.

Industrial and Commercial ($1,142,811)

Activities identified in this section represent personnel and non-personnel expenses for inspection of industrial and commercial facilities. This also includes personnel and non-personnel expenses for FEWD and IWCP inspections.

Residential, Education, and Public Participation ($1,753,316)

Activities identified in this section represent personnel and non-personnel expenses for educational materials, outreach efforts and events, PSAs, HHW and used oil outreach, and community events.

Illicit Discharge Detection and Elimination ($4,872,827)

Activities identified in this section represent personnel and non-personnel expenses for identification and elimination of illicit discharges, enforcing the City's storm water ordinance and implementation of the administrative civil penalties and citation process, and the urban runoff monitoring program.

WURMP Expenditures

The City's watershed expenditures during FY 2012 for the implementation of the watershed Municipal Permit requirements were provided as actual costs and when the actual costs could not be determined estimates of actual costs were provided. The Storm Water Division utilized the expenditure categories (administration, watershed activities, cost share contribution, and other) detailed in the Fiscal Analysis Method for watershed reporting. The watershed expenditures included in this report only capture City expenditures and do not account for any expenditure disbursed by other Copermittees within the watershed(s).

A total of $7,313,307 was expended in FY 2012 for the implementation of City-wide WURMP activities. This amount includes costs for the implementation of applicable TMDLs along with special studies.

RURMP Expenditures

The City's FY 2012 regional expenditures ($682,306) for the implementation of the regional Municipal Permit requirements were provided as actual costs and when the actual costs could not be determined estimates of actual costs were provided. The Storm Water Division utilized the expenditure categories (administration, cost share contribution, regional activities, and other) detailed in the Fiscal Analysis Method for regional reporting. The regional expenditures included in this report only capture City expenditures, and do not account for any expenditure disbursed by other Copermittees in the region.

10.2.1.5 Grant Funding for Special Studies

In addition to resources identified for Municipal Permit requirements, the City actively seeks grants, and other funding sources, for special studies and CIPs. For the most part, funding for these projects may be limited to the projects specified and which may restrict funding reallocation to other projects. Therefore, these resources are currently not incorporated in calculations for total Municipal Permit requirements expenditures detailed in Section 10.2.1.4 above. The following table lists projects that were initiated and/or in progress during FY 2012. It is important to note that the projects span multiple years and the amounts listed below are not just representative of FY 2012.

Table 10-3: Funding for Special Projects

Funding Source	Project	Amount	Matching Fund Amount	Total Amount[13]
United States Environmental Protection Agency	Kellog Park Infiltration	$873,000	$714,272	$1,587,272
California Department of Water Resources	Memorial Park Infiltration	$255,651	$295,904	$551,555
California Department of Water Resources	Bannock Avenue Streetscape Enhancement	$630,500	$125,000	$755,500
State Water Resources Control Board	Tijuana River Sediment and Trash Abatement	$700,000	N/A	$700,000
State Water Resource Control Board	Four ASBS Pollution Mitigation Projects	$2,500,000	$625,000	$3,125,000
California State Coastal Conservancy	Nelson Sloan Quarry Reclamation Studies and Plans	$250,000	N/A	$250,000
Total Grant Funding		**$5.21 million**	**$1.76 million**	**$6.97 million**

13 Amounts span multiple years and not just FY 2012

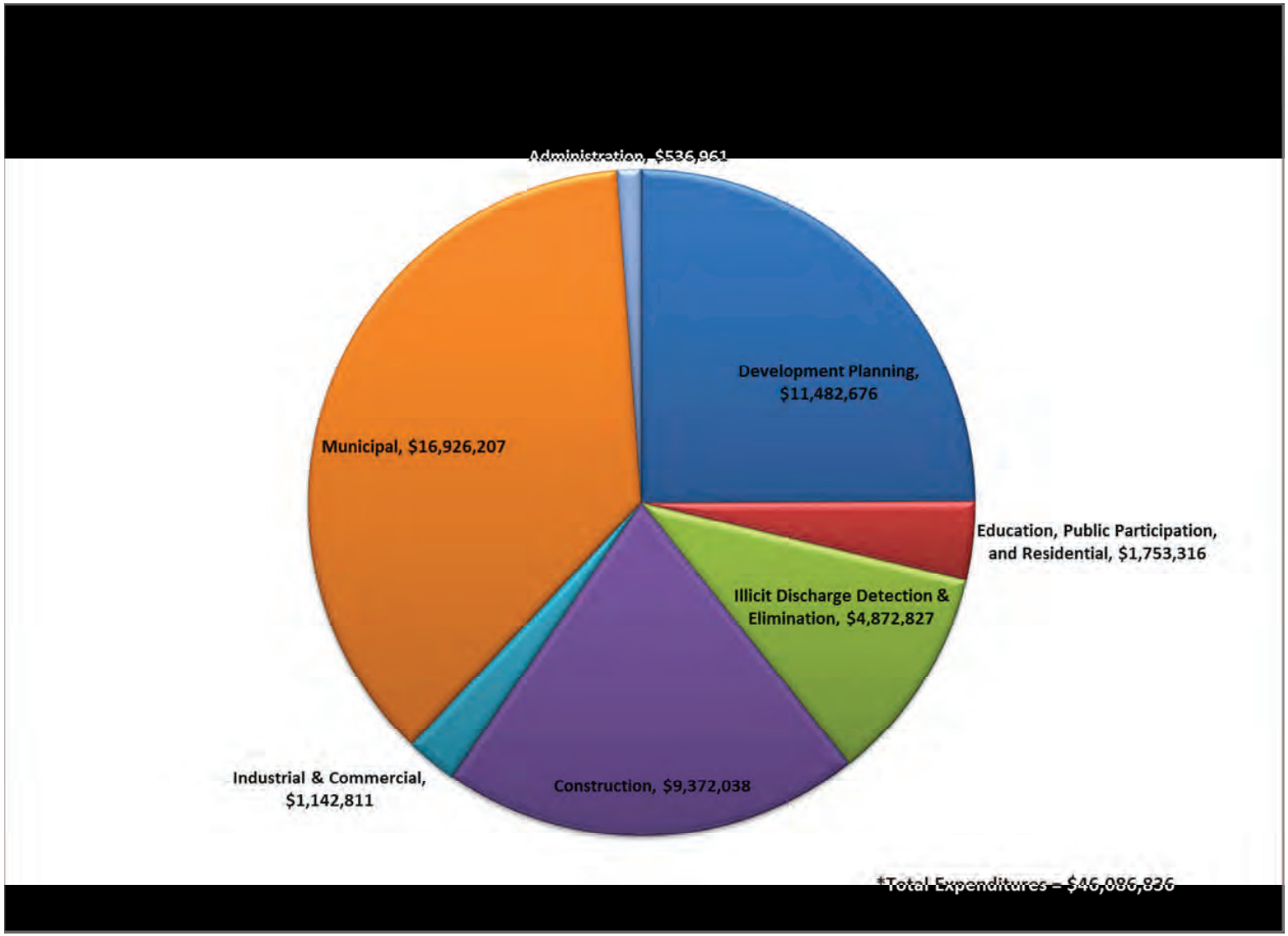

Figure 10-1: FY 2012 Citywide JURMP Expenditures by Permit Area

10.2.1.6 ***Funding Sources***

City-wide implementation of Municipal Permit requirements is funded through four main types of governmental funds: the General Fund, Special Revenue Funds, Enterprise Funds, and Internal Service Funds.

10.2.1.6.1 General Fund

The General Fund is the main fund for the City, and is supported by major revenue sources including property tax, sales tax, transient occupancy tax and franchise fees. Departments funded by the General Fund provide core community services.

10.2.1.6.2 Special Revenue Funds

Special Revenue Funds account for revenues received for specifically identified purposes. Some of the larger funds that fall under this category include Transnet, Gas Tax and Special Promotion programs.

10.2.1.6.3 Enterprise Funds

Enterprise Funds are initiated for specific purposes and funded through fees for services. This funding type is designated for the operations, management, maintenance, and development of the department providing the service. For implementation of City-wide JURMP activities, activities are funded through the following enterprise funds:

- Airports Fund
- Development Services Enterprise Fund
- Golf Course Enterprise Fund
- Recycling Fund
- Refuse Disposal Fund
- Sewer Revenue Funds
- Water Utility Fund

10.2.1.6.4 Internal Service Funds

Internal Service Funds are comprised of fees for services provided by one City department to another City department or division. For implementation of City-wide JURMP activities, activities are funded through the following internal service funds:

- Engineering and Capital Projects Fund
- Equipment Division Funds

12.0 FISCAL ANALYSIS COMPONENT

12.1 Introduction

The Standardized Fiscal Analysis Method and Format (Fiscal Analysis Method) was collaboratively developed and adopted by the Copermittees in January 2009 in accordance with sections G, J.1.a(3)(k), and J.1.c(1)(d) of NPDES Order No. R9-2007-0001. The Fiscal Analysis Method document was submitted to the San Diego RWQCB by January 31, 2009, as Attachment 1 of the Regional Urban Runoff Management Plan (RURMP) Annual Report for 2008-2009.

The City of Coronado has evaluated storm water-related expenditures for the various components of the program and has evaluated funding sources. The City of Coronado has determined that it has the resources necessary to meet all the requirements of the Permit.

12.2 General Budget Information

The City has numerous departments within its organization that implement the requirements of the Permit. As a part of the budgeting process, each department director is required to submit a draft budget to the City Manager to include in a comprehensive budget for City Council review and approval. The Departments involved in the JURMP's implementation include Community Development, Engineering, Public Services, and Fire.

12.3 Fiscal Analysis Methods

The City has again implemented the fiscal analysis model that was collaboratively developed by the Copermittees and submitted to the San Diego RWQCB by January 31, 2009.

Expenditures were estimated using two different methods: 1) percent of budget and 2) time and materials estimates.

Percent of budget was used to estimate expenses in the Community Development, Engineering, and Fire Departments. It was determined by the City that roughly 10% of the Community Development and Engineering Department's time was spent implementing requirements in the permit. Most of the expenses for these departments were personnel related. Therefore 10% of these departments' budgets were included in the report. Fire's expenses were related to training; therefore 10% of Fire's training budget was used to determine corresponding storm water expenses.

Public Services required a different approach; a percent of budget estimation was determined not to be a good estimator of actual expenses. The expenses in Public Services were distributed mainly in the Storm Water budget, but had significant expenses in both Waste Water Operations and Streets. In order to overcome these obstacles, material expenses and contract services were calculated from expenditure reports; personnel and labor cost were determined using estimated hours multiplied by fully loaded pay rates for each permit related task.

12.4 Fiscal Analysis Results

12.4.1 Expenditures

For the 2011-2012 reporting period $5,039,184 was budgeted for NPDES expenses. $846,895 were expenses related to implementing the JURMP portion of the permit, $3,140 for the WURMP and $30,921 for the RURMP.

Expenses have been further explained in Appendix A, Fiscal Worksheets, which includes the standardized forms created by the Copermittees to report expenditures. The forms are located at the end of this section.

Expenses in the JURMP components are summarized below.

Table 12.4.1

EXPENDITURE SUMMARY

JURISDICTIONAL COMPONENTS	
ADMINISTRATION	$11,269
DEVELOPMENT PLANNING	$7,315
CONSTRUCTION	$53,305
MUNICIPAL	$737,294
INDUSTRIAL AND COMMERCIAL	$1,703
RESIDENTIAL	$13,116
IDDE	$22,233
EDUCATION	$0
PUBLIC PARTICIPATION	$0
SPECIAL INVESTIGATIONS	$0
NON-EMERGENCY FIREFIGHTING	$660
Jurisdictional Total	$846,895

The Education and Public Participation components did incur expenses, but they were included in the administration and outreach subsections of the residential, commercial and municipal sections. There were no special investigations during this reporting period, so no expenses occurred.

The increase in expenses this period was primarily attributed to the repairs that were required on the Parker storm water and sewer pump station.

12.4.2 Funding Sources

As in previous reporting periods, the City of Coronado continues to asses a monthly storm water conveyance system fee of $3.80 for the Storm Drain Improvement Fund. The Storm Water Fee can fund the "costs of acquisition, construction, reconstruction, maintenance and operation of the storm drainage system and the payment of principal and interest on bonds issued for the construction or reconstruction of the storm drainage system." The total amount assessed for the reporting period was $536,858, all of which was used to fund permit related expenses.

The City of Coronado assesses residents and commercial entities an annual sewer fee to pay for the maintenance of the sanitary sewer system. The sewer fee can fund the "costs of acquisition, construction, reconstruction, maintenance, and operation of the sanitary sewer system and the payment of principal and interest on bonds or other debt instruments issued for the construction or reconstruction of the sanitation sewer system." The fee amount is determined by the type of dwelling that occurs on the property. Fees range from $303.72 for a multiple dwelling to $4,989.72 for a restaurant seating more than 150 people. The total amount assessed for the 2011-2012 fiscal year was $4,275,166.31.

$150,000 of funding came from issuance claims made in response to damages incurred at the Parker pump station. This money was used to repair and replace equipment damaged during the flooding.

All Funding is summarized in Appendix A, on the Page titled, "Fund Summary".

12.5 Update to Fiscal Analysis Methods

The Standardized Fiscal Analysis Method and Format (Fiscal Analysis Method) was collaboratively developed and adopted by the Copermittees in January 2009 in accordance with sections G, J.1.a(3)(k), and J.1.c(1)(d) of NPDES Order No. R9-2007-0001. The Fiscal Analysis Method document was submitted to the San Diego RWQCB by January 31, 2009, as Attachment 1 of the Regional Urban Runoff Management Plan (RURMP) Annual Report for 2008-2009.

APPENDIX A
Fiscal Worksheets

SAN DIEGO COUNTY COPERMITTEES FISCAL ANALYSIS REPORT FOR URBAN RUNOFF MANAGEMENT PROGRAMS

JURISDICTIONAL URBAN RUNOFF MANAGEMENT PROGRAM (JURMP)

	Copermittee Name:	City of Coronado	
	Date:	9/20/2012	
	Reporting Year:	2011-2012	
	Jurisdictional Worksheet Component		**Explanation/Notes**
1	**ADMINISTRATION**	$11,269	JURMP Preparation Costs
2	**DEVELOPMENT PLANNING**	$7,315	10% of Budget for Planning/Engineering's, 10% of Department Time Related to Storm Water
A	**Land Use Planning**	$7,315	10% of Budget for Planning/Engineering's, 10% of Department Time Related to Storm Water
B	**Environmental Review**	$10,972	10% of Budget for Planning/Engineering's, 10% of Department Time Related to Storm Water
C	**Development Project Approval and Verification**	$54,859	10% of Budget for Planning/Engineering's, 10% of Department Time Related to Storm Water
C1	**Public Projects (CIP)**	$28,984	10% of Budget for Planning/Engineering's, 10% of Department Time Related to Storm Water
	Administration	$9,550	
	Planning and Engineering	$10,155	
	Inspection and Enforcement	$5,077	
	Contract Services	$2,450	
	Other	$1,752	
C2	**Private Projects**	$22,186	10% of Budget for Planning/Engineering's, 10% of Department Time Related to Storm Water
	Administration	$4,726	
	Permitting and Plan Approval	$8,831	
	Inspection and Enforcement	$4,680	
	Contract Services	$2,199	
	Other	$1,750	
3	**CONSTRUCTION**	$53,305	
A	**Public Projects (CIP)**	$27,803	10% of Budget for Planning/Engineering's, 10% of Department Time Related to Storm Water
	Administration	$8,426	
	Planning and Engineering	$5,084	
	Inspection and Enforcement	$10,585	Includes Costs of Public Services 33 Municipal Construction Inspections
	Contract Services	$2,450	
	Other	$1,258	
B	**Private Projects**	$25,502	10% of Budget Planning/Engineering's, 10% of Department Time Related to Storm Water

	Administration	$6,179	
	Permitting and Plan Approval	$4,345	
	Inspection and Enforcement	$11,534	Includes Costs of Public Services 523 Construction Inspections
	Contract Services	$2,188	
	Other	$1,256	
4	**MUNICIPAL**	$737,294	
A	**Administration**	$2,680	Municipal Staff training which spanned multiple departments
B	**Operations & Maintenance of MS4 and Structure Contr**	$175,831	
	Administration	$115,750	Storm Water Equipment and Maintenance, Training, Services and Supplies, and Supervisors Time
	Inspections	$225	(17) Pump Station Inspections
	BMP Implementation	$26,154	Cleaning MS4 System and BMP Supplies
	Contract Services	$33,702	County Ocean Testing and Storm Water Consulting Services (not including RURMP costs)
	Other (5)	$0	
C	**Management of Pesticides, Herbicides, and Fertilizers**	$2,900	
	Administration	$980	Staff Training
	Inspections	$0	
	BMP Implementation	$0	
	Contract Services	$1,920	Olive Tree Fruit Surpression
	Other (5)	$0	
D	**Sweeping of Municipal Areas**	$120,344	
	Administration	$0	
	Inspections	$0	Driver Preforms Inspections as he Sweeps
	BMP Implementation	$120,344	Drivers Salary, Sweeper Maintenance, Hand Cleaning Cost
	Contract Services	$0	Included in BMP Implementation
	Other	$0	
E	**Infiltration Sanitary Sewer to MS4-Preventative Mainter**	$161,136	
	Administration	$132,883	Parker Pump Station Repairs , Equipment Maintenance, Supervisor Administrative Time
	Inspections	$7,632	Pump Station Inspections
	BMP Implementation	$4,240	Sanitary Sewer Line Cleaning
	Contract Services	$16,381	Maintenance for Parker Station
	Other	$0	
F	**Roads, Streets, Highways, and Parking Facilities**	$92,391	
	Administration	$40,553	Training and Supervisors Administrative Time
	Inspections	$0	Included in Sweeper Section
	BMP Implementation	$20,000	Minor Repairs to Sidewalk and Asphalt
	Contract Services	$31,838	Sidewalk Replacement

	Other (5)	$0	
G	**Flood Management Projects and Flood Control Devices**	$0	N/A
	Administration	$0	
	Inspections	$0	
	BMP Implementation	$0	
	Contract Services	$0	
	Other	$0	
H	**Areas & Activities - CWA Section 303(d) water bodies**	$0	Included in Sweeping of Municipal Areas and Enforcement of Municipal Areas and Activities sections
	Administration	$0	
	Other	$0	
I	**Active or Closed Municipal Landfills**	$0	N/A
	Administration	$0	
	Project Planning and Engineering	$0	
	Maintenance Inspections	$0	
	Compliance Inspection and Enforcement	$0	
	BMP Implementation	$0	
	Other	$0	
J	**POTWs and Sanitary Sewage Collection Systems**	$0	N/A
	Administration	$0	
	Maintenance Inspections	$0	
	Compliance Inspection and Enforcement	$0	
	BMP Implementation	$0	
	Other	$0	
K	**Solid Waste Transfer Facilities**	$0	N/A
	Administration	$0	
	Maintenance Inspections	$0	
	Compliance Inspection and Enforcement	$0	
	BMP Implementation	$0	
	Other	$0	
L	**Corporate Yards**	$1,461	
	Administration	$30	Training
	Maintenance Inspections	$1,378	(104) Daily Inspections
	Compliance Inspection and Enforcement	$53	(4) City Yard Inspection

	BMP Implementation	$0	
	Waste Collection and Recycling	$0	
	Other	$0	
M	**Household Hazardous Waste Collection Facilities**	$110,981	
	Administration	$10,512	Administrative Management of Contract
	Inspections	$27	(2) HazMat Inspections
	BMP Implementation	$0	
	Contract Services	$100,442	Hazardous Waste contract
	Other (5)	$0	
N	**Municipal Airfields**	$0	N/A
	Administration	$0	
	Project Planning and Engineering	$0	
	Maintenance Inspections	$0	
	Compliance Inspection and Enforcement	$0	
	BMP Implementation	$0	
	Waste Collection and Recycling	$0	
	Other	$0	
O	**Parks and Recreation Facilities**	$106	
	Administration	$0	
	Compliance Inspection and Enforcement	$106	(8) Park Restroom Inspections
	BMP Implementation	$0	
	Other	$0	
P	**Special Event Venues & Special Events**	$10,377	
	Administration	$3,360	Supervisor Time
	Project Planning and Engineering	$0	
	Inspections	$4,495	
	Contract Services	$2,522	Porta Pottie Rentals
	Other	$0	
Q	**Power Washing**	$58,928	
	Administration	$920	Management on Contract
	Inspections	$6,360	Inspection of Contract
	BMP Implementation	$0	
	Contract Services	$51,648	Power Washing Contract
	Other	$0	
R	**Other Municipal Areas and Activities- Contribute a Significant Pollutant Load to MS4**	$0	
	Administration	$0	

	Project Planning and Engineering	$0	
	Maintenance Inspections	$0	
	Compliance Inspection and Enforcement	$0	
	BMP Implementation	$0	
	Other	$0	
S	**Enforcement of Municipal Areas and Activities**	$159	
	Administration	$0	
	Compliance Inspection and Enforcement	$159	Inspections of Municipal Buildings not Included in other Sections (12)
	Other	$0	
5	**INDUSTRIAL and COMMERCIAL**	$1,703	
A	**Industrial Sites**	$0	N/A
	Administration	$0	
	Compliance Inspection and Enforcement	$0	
	Educational Outreach	$0	
	Other	$0	
B	**Commercial Sites**	$1,571	
	Administration (1)	$193	
	Inspections (12)	$1,378	104 Inspections
	Contract Services (4)	$0	
	Other (5)	$0	
	Outreach (3)	$0	
C	**Mobile Commercial Sites**	$132	
	Administration	$0	
	Permitting and Licensing	$0	Included in Development/Planning Section
	Compliance Inspection and Enforcement	$132	(5) Inspections
	Educational Outreach	$0	Included in Development/Planning Section
	Other	$0	
6	**RESIDENTIAL**	$13,116	
	Administration	$0	
	Compliance Inspection and Enforcement	$50	Non-Construction Inspections
	Educational Outreach	$6,322	
	Waste Collection and Recycling	$6,744	Dogi Pot Bags
	Other	$0	
7	**IDDE**	$22,233	
	Administration	$294	
	Public Reporting of ICIDs	$0	
	Dry Weather Monitoring	$21,939	

	Contract Services	$0	Included in Dry Weather
	Other (5)	$0	
8	**EDUCATION**	$0	Component is Included in Outreach and Administrative for previously Listed components
	Administration	$0	
	Other	$0	
9	**PUBLIC PARTICIPATION**	$0	Component is Included in Outreach and Administrative for previously Listed components
	Administration	$0	
	Other	$0	
10	**SPECIAL INVESTIGATIONS**	$0	No Special Investigations During the Reporting Period
	Administration	$0	
	Permitting and Licensing	$0	
	Project Planning and Engineering	$0	
	Maintenance Inspections	$0	
	Compliance Inspection and Enforcement	$0	
	BMP Implementation	$0	
	Educational Outreach	$0	
	Waste Collection and Recycling	$0	
	Jurisdictional Urban Runoff and Receiving Water Monitorir	$0	
	Other	$0	
11	**NON-EMERGENCY FIREFIGHTING**	$660	
	Administration	$600	
	Compliance Inspection and Enforcement	$60	
	BMP Implementation	$0	
	Waste Collection and Recycling	$0	
	Other	$0	
	TOTAL COSTS	**$846,895**	

Foot Notes:

1 - See Table 2-4 for detailed expenditure category explanations

SAN DIEGO COUNTY COPERMITTEES FISCAL ANALYSIS REPORT FOR URBAN RUNOFF MANAGEMENT PROGRAMS

WATERSHED URBAN RUNOFF MANAGEMENT PROGRAM (WURMP)

Copermittee Name:	City of Coronado
Date:	9/20/2012
Reporting Year:	2011-2012

	Otay	Watershed 2	Watershed 3	Watershed 4	Watershed 5	Watershed 6	Watershed 7	Watershed 8
Administration	$2,690							
Cost Share Contribution								
Watershed Activities	$450							
Other								
TOTAL	$3,140	$0	$0	$0	$0	$0	$0	$0

Foot Notes

1 - See Table 2-6 for detailed expenditure category explanations

SAN DIEGO COUNTY COPERMITTEES FISCAL ANALYSIS REPORT FOR URBAN RUNOFF MANAGEMENT PROGRAMS

REGIONAL URBAN RUNOFF MANAGEMENT PROGRAM (RURMP)

Copermittee Name:	City of Coronado
Date:	9/20/2012
Reporting Year:	2011-2012

Regional Programs	Jurisdictional Cost Share Amount
Administration	$3,512
Cost Share Contribution	$27,409
Regional Activities	
Other	
TOTAL	$30,921

Foot Notes

1- See Table 2-8 for detailed expenditure category explanations

SAN DIEGO COUNTY COPERMITTEES FISCAL ANALYSIS REPORT FOR URBAN RUNOFF MANAGEMENT PROGRAMS

Copermittee Name:	City of Coronado
Date:	9/20/2012
Reporting Year:	2011-2012

EXPENDITURE SUMMARY

JURISDICTIONAL COMPONENTS	
ADMINISTRATION	$11,269
DEVELOPMENT PLANNING	$7,315
CONSTRUCTION	$53,305
MUNICIPAL	$737,294
INDUSTRIAL AND COMMERCIAL	$1,703
RESIDENTIAL	$13,116
IDDE	$22,233
EDUCATION	$0
PUBLIC PARTICIPATION	$0
SPECIAL INVESTIGATIONS	$0
NON-EMERGENCY FIREFIGHTING	$660
Jurisdictional Total	$846,895

WATERSHED	
Otay	$3,140
Watershed 2	$0
Watershed 3	$0
Watershed 4	$0
Watershed 5	$0
Watershed 6	$0
Watershed 7	$0
Watershed 8	$0
Watershed Total	$3,140

REGIONAL	
Copermitttee Cost Share of Regional Budget	$30,921
Regional Total	$30,921

TOTAL COST	***$880,956***

SAN DIEGO COUNTY COPERMITTEES FISCAL ANALYSIS REPORT FOR URBAN RUNOFF MANAGEMENT PROGRAMS

Copermittee Name:	City of Coronado
Date:	9/20/2012
Reporting Year:	2011-2012

FUND SUMMARY (AS APPLICABLE)

FUNDING BY SOURCE	
GENERAL FUND	$13,116
STORMWATER FEE	$536,858
PERMIT FEES	$0
DEVELOPER DEPOSITS AND FEES	$10,000
REGISTRATION AND INSPECTION FEES	$12,969
FLOOD CONTROL FEES	$0
FRANCHISE FEES	$0
GAS TAX	$41,075
UTILITY TAX	$0
ROAD FUND	$0
ENTERPRISE FUNDS	$0
TRUST FUNDS	$0
SPECIAL ASSESSMENT DISTRICTS	$0
STATE APPROPRIATED FUNDS	$0
GRANT FUNDS	$0
OTHER	$0
WASTE WATER UTILITY FEE	$4,275,166
TOTAL	$4,889,184

ONE-TIME FUNDING	
GRANTS	$0
DONATIONS	$0
Insurance Payout (Parker Station)	$150,000
TOTAL	$150,000

TOTAL FUNDING	$5,039,184

Jurisdictional Urban Runoff Management Plan
Annual Report Fiscal Year 2011-2012

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10.0 FISCAL ANALYSIS COMPONENT

10.1 Introduction

JURMP Section 12.0 establishes the general approach employed by the County of San Diego to conduct annual fiscal analyses of its Urban Runoff Management Program (URMP). This section presents an estimated annual budget for the County's urban runoff management programs for FY 2011-12.

10.2 General Budget Information

Table 10.1 provides an overview of estimated program expenditures for fiscal year (FY) 2003-04 through the present. As shown the County estimated its total FY 2011-12 expenditures at $32,842,855. This is an increase of $5,963,515 over FY 2003-04 levels, or 22.2%. Despite this overall increase, caution is advised in comparing total values from year to year. Total costs represent the sum of a wide variety of activities and commitments (e.g., capital improvements), many of which are highly variable by year.

10.3 Fiscal Analysis Methods

This section utilizes the methodologies and standards established in *Fiscal Analysis Method* submitted by the Copermittees in January 2009.

10.4 Fiscal Analysis Results

Permit Section G.3 requires that the fiscal analysis address each of the County's Urban Runoff Management Program elements (jurisdictional, watershed, and regional activities). It also requires that the fiscal analysis provide the Copermittee's urban runoff management program budget for the current reporting period (FY 2011-12). For FY 2011-12, the County estimated a total budgeted expenditure of $32,842,855.

As required by ***Permit Section G.3***, expenditures are described by department and major program area. They represent an estimate of the expenditures that the County determined would be needed to meet its compliance obligations for FY 2011-12. However, they should not be interpreted as either budgeted or actual expenditures; first since they were developed prior to the finalization of FY 2011-12 budgets, and, secondly, because stormwater program expenditures are distributed throughout a considerable number of County programs, i.e., a single consolidated "budget" does not exist for the program as a whole. As such, they should be considered best estimates of stormwater-related expenditures.

Table 10. 1– Comparison of Projected Program Expenditures by Fiscal Year

	FY 2003-04	FY 2004-05	FY 2005-06	FY 6005-07	FY 2007-08	FY 2008-09	FY 2009-10	FY 2010-11	FY 2011-12
Total	**$26,879,340**	**$ 27,656,709**	**$ 28,204,830**	**$29,536,909**	**$31,517,738**	**$34,575,288**	**$34,605,056**	**$35,788,921**	**$32,842,855**

10.4.1 Expenditures

10.4.1.1 Jurisdictional

Table 10.2 presents the County's estimated jurisdictional expenditures for FY 2011-12.

Table 10.2 – Estimated Jurisdictional Expenditures for FY 2011-12

	Jurisdictional Worksheet Component		Explanation/Notes
1	**ADMINISTRATION**	**$1,220,385**	These costs correspond to the DPW WPP development, administrative oversight, and assessment of the County's stormwater programs. The WPP is responsible for the development of new and augmented County stormwater programs, regulatory reporting, and program assessment. Some administrative costs are associated with other specific functions shown below, but are included here because they could not be separated out.
2	**DEVELOPMENT PLANNING**	**$6,633,794**	
A	**Land Use Planning**	$0	Expenditures not reported for FY 2011-12.
B	**Environmental Review**	$0	Expenditures not reported for FY 2011-12.
C	**Development Project Approval and Verification**	**$6,633,794**	

Jurisdictional Urban Runoff Management Plan
Annual Report Fiscal Year 2011-2012

Table 10.2 – Estimated Jurisdictional Expenditures for FY 2011-12

	Jurisdictional Worksheet Component		Explanation/Notes
C1	**Public Projects (CIP)**	$6,415,794	
	Project Planning and Engineering	$3,202,794	Costs include: preparing and reviewing plans and specifications for stormwater BMPs, and SWPPP/WPCP review. These costs apply to DPW, DPR, and DGS.
	Compliance Inspection and Enforcement	$831,356	
	BMP Implementation	$2,381,644	
C2	**Private Projects**	$218,000	
	Permitting and Licensing	$218,000	This cost covers DPW and DPLU plan reviews at permitted sites. Total costs are estimated as fixed percentages of annual plan-checking fees.
3	**CONSTRUCTION**	**$5,363,719**	
A	**Public Projects (CIP)**	$4,481,719	Costs include: BMP compliance inspections during construction, and implementation of construction phase BMPs. These costs apply to DPW, DPR, and DGS.
	Compliance Inspection and Enforcement	$2,492,600	
	BMP Implementation	$1,989,129	
B	**Private Projects**	$882,000	
	Compliance Inspection and Enforcement	$882,000	This cost primarily covers DPW and DPLU construction inspections at permitted sites. Total costs are estimated as fixed percentages of inspection program fees.
4	**MUNICIPAL**	**$13,716,276**	
A	**Administration**	$152,534	Cost of DPW WPP municipal program oversight.
B	**Streets, Roads, and Highways Element**	$1,877,085	
	Administration	$170,644	Founded road operations activities include: culvert inspections and cleaning;

Jurisdictional Urban Runoff Management Plan
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Table 10.2 – Estimated Jurisdictional Expenditures for FY 2011-12

	Jurisdictional Worksheet Component		Explanation/Notes
	Maintenance Inspections	$1,621,968	increased culvert waste disposal costs, street sweeping, installation and maintenance of BMPs and road structures, and the placement of additional controls. 10% of the Maintenance and Inspections and BMP Implementation is reported as Administration cost.
	BMP Implementation	$84,473	
	Other	$0	
C	**MS4 Element**	$7,718,000	
	Administration	$7,360,000	The combined costs shown here apply across (1) DPW Flood Control -- conversion of existing concrete lined channels to natural bottom channels, updating flood control master plans, increased maintenance of flood control systems, and construction and maintenance of regional treatment BMPs; and (2) DPW Flood Control MS4 Operation & Maintenance -- maintenance on flood control facilities throughout the unincorporated areas of the County, exclusive of facilities within road rights-of-way (included in 4.B above).
	Maintenance Inspections	$40,000	
	BMP Implementation	$318,000	
	Other	$0	
D	**Solid Waste Facilities Element**	$830,000	
	Administration	$80,000	Costs include Regional Board stormwater permit fees, consultant costs associated with stormwater upgrade and repair projects, and office staff time.
	Maintenance Inspections	$135,000	Costs include staff time to perform site inspections and construction inspection/contract management during Bonsall Drainage Project.
	BMP Implementation	$140,000	Costs include stormwater consultant site inspections, sampling/testing and BMP materials.
	Other (construction)	$475,000	Drainage improvement projects and BMP site maintenance projects. $325K of the estimate is from the Bonsall Drainage Project.
E	**Wastewater Facilities Element**	$239,300	
	Administration	$7,000	This includes costs associated with JURMP report, the sanitary sewer system and facilities including: pump stations, sewage treatment plants and Spring Valley
	Maintenance Inspections	$226,600	

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Table 10.2 – Estimated Jurisdictional Expenditures for FY 2011-12

	Jurisdictional Worksheet Component		Explanation/Notes
	BMP Implementation	$6,300	Operations facility. Also includes the cost of BMP design, acquisition, maintenance and monitoring, for wastewater Capital Improvement Projects, and Major maintenance projects, and at various wastewater facilities.
	Other	$0	
F	**Road Stations Element**	$905,507	
	Administration	$82,319	This includes DPW road station operations related to Permit compliance. The Administration cost is determined as 10% of the total costs of maintenance and Inspections and BMP Implementation as reported by the DPW Roads Divisions.
	Maintenance Inspections	$803,040	
	BMP Implementation	$20,148	
	Other	$0	
G	**Fleet Maintenance Element**	$111,114	
	Administration	$53,617	This includes costs associated with operation of the County's fleet maintenance and fueling facilities.
	Maintenance Inspections	$50,560	
	BMP Implementation	$6,937	
	Other	$0	
H	**Municipal Airfields Element**	$166,269	These costs involve site inspections, annual reporting, and maintenance of BMPs at airports, including oversight of tenant operations. The BMP implementation item includes Palomar asphalt cap repairs.
	Administration	$5,000	
	Maintenance Inspections	$80,000	
	Compliance Inspection and Enforcement	$0	
	BMP Implementation	$81,269	
	Other (sampling and analysis)	$0	
I	**Parks & Recreational Facilities Element**	$1,221,692	

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Table 10.2 – Estimated Jurisdictional Expenditures for FY 2011-12

	Jurisdictional Worksheet Component		Explanation/Notes
	Administration	$205,485	This includes: coordinating all training requirements, preparing and reviewing reports, and overseeing the overall implementation of the stormwater program for DPR.
	BMP Implementation	$943,701	This includes costs associated with implementation of BMPs at County parks.
	Compliance Inspection and Enforcement	$72,506	Costs are for DPR enforcement of stormwater requirements at County parks.
	Other	$0	
J	**Office Buildings & Other Municipal Facilities Element**	$395,860	
	Administration	$25,500	DGS conducts a variety of storm water activities including: inspections and clean-up of County-owned, occupied, and leased facilities and vacant lands; maintenance and signage of storm drain inlet inserts and trash dumpsters; placement of inlet filters; maintenance of coverage and containment improvements for on-site supplies and materials; parking lot sweeping and controlled parking lot power washing; and application of erosion and sediment control measures. These costs are exclusive of fleet maintenance and fueling operations.
	Maintenance Inspections	$290,360	
	BMP Implementation	$80,000	
	Other		
	Management of Pesticides, Herbicides, & Fertilizers	$98,915	
	Administration	$98,915	Integrated Pest Control Program within the Department of Agriculture Weights and Measures performs eradication and control of invasive weeds. This program also provides weed control on roadsides, airports, flood control channels, sewage treatment plants and inactive landfills. It also provides structural pest control to facilities owned and operated by the county.
	Maintenance Inspections		
	BMP Implementation		
	Other		
5	**INDUSTRIAL and COMMERCIAL**	**$1,373,062**	

Jurisdictional Urban Runoff Management Plan
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Table 10.2 – Estimated Jurisdictional Expenditures for FY 2011-12

	Jurisdictional Worksheet Component		Explanation/Notes
	Administration	$0	DPW and AWM conduct inspections of a variety of businesses in the unincorporated County, provide regulatory oversight of mobile businesses, and conduct follow-up and enforcement of stormwater violations.
	Compliance Inspection and Enforcement	$1,423,062	
	Educational Outreach	$130,000	
	Other expenditures	$0	
6	**RESIDENTIAL**	**$1,127,502**	
	Compliance Inspection and Enforcement	$290,000	DPW conducts complaint investigations for residential sources in the unincorporated County, and conduct follow-up and enforcement of stormwater violations. DPW also operates a regional hotline.
	Educational Outreach	$837,502	Several County departments coordinate and provide outreach to the residential sector and schoolchildren in support of Permit Section D.5 requirements. Costs reported here correspond to DPW only. Funded activities include developing pollution prevention content and providing direct outreach to various target audiences within the general residential and schoolchildren target audiences.
7	**IDDE**	**$1,171,659**	
		$1,171,659	DPW conducts monitoring programs, assesses scientific data, and provides technical and scientific support to other County program staff. They also provide support for all technical and scientific aspects of URMP development and implementation. These costs are exclusive of the regional monitoring program which is addressed separately under regional costs.
8	**EDUCATION**	**$0**	Education costs are included in other sections as applicable.
9	**PUBLIC PARTICIPATION**	**$0**	Public participation costs are included in other sections as applicable.

Table 10.2 – Estimated Jurisdictional Expenditures for FY 2011-12

Jurisdictional Worksheet Component			Explanation/Notes
10	**SPECIAL INVESTIGATIONS**	**$0**	Expenditures not reported for FY 2011-12.
11	**NON-EMERGENCY FIREFIGHTING**	**$0**	Expenditures not reported for FY 2011-12.
	TOTAL COSTS	**$30,606,397**	

10.4.1.2 Watershed

Table 10. 3 presents the County's estimated watershed expenditures for FY 2011-12.

Table 10. 3 – Estimated Watershed Expenditures for FY 2011-12

	Santa Margarita WMA	San Luis Rey WMA	Carlsbad WMA	San Dieguito WMA	Peñasquitos WMA	San Diego River WMA	San Diego Bay WMA	Tijuana WMA
Administration	$60,000	$40,000	$80,000	$11,000	$11,000	$35,000	$30,000	$58,000
Cost Share Contribution	0	0	$7,000	$11,000	$1,000	$10,000	$3,820	$40,000
Watershed Activities	$271,320	$261,023	$63,422	$231,681	$48,896	$167,757	$45,137	$154,570
Other	---	---	---	---	---	---	---	---
Total Estimated Watershed Costs	$331,320	$301,023	$150,422	$253,681	$60,896	$212,757	$78,957	$252,570

10.4.1.3 Regional

Table 10. 4 presents the County's estimated regional expenditures for FY 2011-12. This includes only those expenditures associated with the Copermittees' adopted Regional Budget and Work Plan. Other costs associated with regional participation (meeting attendance, etc.) are included within the jurisdictional expenditures presented above.

Table 10. 4 – Estimated Regional Expenditures for FY 2011-12

Regional Programs	County Costs
Administration	$0
Cost Share Contribution	$894,652
Regional Activities	$0
Other	$0
Total Estimated Regional Costs	$894,652

10.4.1.4 Total Expenditures

Table 10.5 presents the County's total estimated expenditures for FY 2011-12 (jurisdictional, watershed, and regional).

Table 10. 5 – Total Estimated County Expenditures for FY 2011-12

Component / Sub-component	Estimated Expenditures
Jurisdictional	
Administration	$1,220,385
Development Planning	$6,633,794
Construction	$5,363,719
Municipal	$13,716,276
Industrial And Commercial	$1,373,062
Residential	$1,127,502
IDDE	$1,171,659
Education	$0
Public Participation	$0
Special Investigations	$0
Non-emergency Firefighting	$0
Jurisdictional Total	**$30,606,397**
Watershed	
Santa Margarita WMA	$271,320
San Luis Rey WMA	$261,023
Carlsbad WMA	$63,422
San Dieguito WMA	$231,681
Peñasquitos WMA	$48,896
San Diego River WMA	$167,757
San Diego Bay WMA	$45,137
Tijuana WMA	$252,570
Watershed Total	**$1,341,806**
Regional	**$894,652**
Total Estimated County Costs	***$32,842,855***

10.4.2 Funding Sources

Permit Section G.3 requires that the County's fiscal analysis include a description of the sources of funds that are proposed to be used to meet the expenditures estimated above, including legal restrictions on the use of such funds.

Table 10. 6 shows the major sources of funding for the County's urban runoff management programs in FY 2011-12, and described the legal restrictions applicable to the use of each.

Table 10. 6 – Legal Restrictions on the Use of Program Funding

Funding Source	Legal Restrictions
General Fund	There are no restrictions on the use of general fund for County water quality programs and activities except that they must be used only for the purposes for which they are budgeted and allocated by the County Board of Supervisors.
Flood Control District Fees	Revenue generated from these fees must be expended for activities related to flood and storm management.
Developer Deposits / Permit Fees	Deposits / fees may be used only to fund activities related to the work for which the permits are issued.
Gas Tax	Gas Tax is collected by the state and allocated to local government for transportation-related work including maintenance of existing transportation systems and construction of new transportation facilities. These funds may not be used for other purposes.
Sanitary District Fees	Sanitary District Fees are used for work related to the maintenance of sewer lines, pump stations, force mains, and several treatment plants that serve the unincorporated areas. They may be used only for such maintenance-related purposes within the respective sewer district for which they are collected.
Other Funding Sources	Other funding sources collectively account for a relatively small portion of ongoing expenditures. However, all funding for the County's stormwater compliance programs is expended within applicable legal restrictions and limitations.

10.5 Conclusions and Recommendations

Translating existing methods of cost estimation to the specific formats required by the Fiscal Analysis Method presents a number of challenges. It should be emphasized that the figures presented here are an estimate of the expenditures that the County determined would be needed to meet its compliance obligations for FY 2011-12. For the reasons explained above, they should be considered only best estimates of stormwater-related expenditures. Moreover, since a new permit is likely to be adopted during 2013, it makes little sense to pursue modifications or improvements to existing methodologies until these new requirements are solidified.

10.6 Program Review and Modification

In accordance with ***Permit Section 1.1.b***, the County has reviewed the results of its JURMP effectiveness assessment and other relevant information to identify modifications needed to maximize JURMP effectiveness and achieve compliance with ***Permit section A***. As shown in **Table 10. 7**, no modifications to the JURMP Fiscal Analysis Component are currently planned.

Table 10. 7 – Planned Modifications to the Fiscal Analysis Component

Target Date	JURMP Section(s)	Planned Modification(s)
N/A	10.0	No modifications are planned for FY 2012-13.

Fiscal Analysis - Dana Point, *(H.3., page 77)*

Capital Costs

LIP Program Elements	Preceding Period FY2010-11 Costs	Current Reporting Period FY 2011-12 Costs	Projected FY 2012-13 Costs - Draft	If there was a 25% change in annual costs, explain here.
Doheny Epidemiology Study	$0	$25,000	$0	SCCWRP saved these allocated funds to do some follow-up work in regards to Epi Study. No Dana Point funds used in FY10-11, but funds were used in FY11-12.
Other Capital Projects/Major Equipment Purchases	$0	$0	$110,000	Priscilla/Jeremiah Parkway Mitigation Project (OCTA M2 Grant)
Totals	**$0**			

Operation & Maintenance Costs

LIP Program Elements	Preceding Period FY2009-10 Costs	Current Reporting Period FY 2010-11 Costs	Projected FY 2011-12 Costs - Draft	
Supportive of Program Administration (LIP Section 2.0) – Please see details of Staff Costs in table below. Other administrative costs, include: memberships, conferences, training, cell phone, office supplies, mileage, SWRCB Permit Fee, Federal Lobbyist	$468,039	$503,767	$505,600	
Municipal Activities (LIP Section 5.0) Trash & Debris Control, include County, Park and Bus Stop litter control & mutt mitts, recycling	$135,132	$159,026	$209,750	
Municipal Activities (LIP Section 5.0) Drainage Facility Maintenance (includes Catch Basin Stenciling)	$607,325	$691,817	$780,900	
Municipal Activities (LIP Section 5.0) Street Sweeping	$243,358	$267,480	$274,480	
Municipal Activities (LIP Section 5.0) Environmental Performance (BMP Implementation)	Included in Program Administration	Included in Program Administration	Included in Program Administration	
Municipal Activities (LIP Section 5.0) Pesticide & Fertilizer Management	$5,272	$2,046	$5,650	Reduced fertilizer/pesticide management services used.
Public Information (LIP Section 6.0) Nonpoint Source Pollution Awareness	$6,676	$9,502	$9,000	existing stock of giveaways diminished; new giveaways purchased
Requiring New Development BMPs(Supportive of Planning, etc.) (LIP Section 7.0)	Included in Program Administration	Included in Program Administration	Included in Program Administration	
Requiring Construction BMPs(Supportive of Plan Check & Inspection) (LIP Section 8.0)	Included in Program Administration	Included in Program Administration	Included in Program Administration	
Existing Development (LIP Section 9.0) Industrial/Comm./HOA Inspections	$8,640	$10,260	$11,000	
Illicit Connections/Discharge Identification. & Elimination Facility Inspection, included Grease Interceptor Rebate Funds	$15,207	$14,093	$70,500	
Agency Contribution to Regional Program* , includes TMDL/Watershed Implementation	$65,592	$50,713	$65,000	
Other	$30,918	$36,380	$38,500	
Totals	**$1,586,159**	**$1,745,084**	**$1,970,380**	

Funding Sources

FUNDING SOURCES	Preceding Period FY2009-10 Costs	Current Reporting Period FY 2010-11 Costs	Projected FY 2011-12 Costs - Draft	
General Fund	100	100	98	
Grants: Clean Beaches Initiative				
Grants: OCTA			2	$72,000 awarded for OCTA M2 Tier 1 Grant for Jeremiah/Priscilla Parkway Improvement Project
Grants: Prop 84				
Other:				
TOTALS	**100%**	**100%**	**100%**	

10. FISCAL ANALYSIS

10.1 PROGRAM IMPLEMENTATION

During Fiscal Year 2012, the City was compliant with Section G of the Municipal Permit.

Section 12 of 2008 JURMP provided a strategy for effectively conducting a fiscal analysis of the Program in its entirety. The fiscal analysis strategy in the 2008 JURMP included the expenditures (such as capital, operation and maintenance, education, and administrative expenditures) necessary to accomplish the activities of the Program. No modifications in Section 12 of the 2008 JURMP were made during this reporting period.

On January 29, 2009, the San Diego Municipal Copermittees adopted the "Standardized Fiscal Method and Format" which provides a model for the City of Del Mar and other Copermittees to perform the review and annual reporting as required in Order R9-2007-0001, Section G. This methodology and reporting format became effective in January 31, 2010. The "Standardized Fiscal Analysis Method and Format" (Fiscal Analysis Method) was collaboratively developed and adopted by the Copermittees in January 2009 in accordance with sections G, J.1.a(3)(k) and J.1.c(1)(d) of the Permit. The Fiscal Analysis Method document was submitted to the San Diego RWQCB on January 31, 2009, as Attachment 1 of the "Regional Urban Runoff Management Plan (RURMP) Annual Report for 2008-2009."

As required, the City of Del Mar is utilizing the format and guidelines described in the Fiscal Analysis Method for this reporting period. This section of the Annual Report provides a fiscal analysis of the City's urban runoff management programs which meets all requirements of the Permit.

10.1.1 Clean Water Program Budget

The City of Del Mar Clean Water Program is a multi-departmental program, funded as an enterprise fund in the City's Annual Budget. Enterprise funds account for operations that are financed and operated in a manner similar to private businesses, with the costs of providing the services recovered largely through user fees. Fund 55 ("The Clean Water Fund"), is one of three (3) enterprise funds in the City's budget, and was added to the City's budget in Fiscal Year 2004 to account for the mandated costs of the City's responsibilities in order to comply with the Municipal Permit.

The City of Del Mar Operating and Capital Improvement Budgets for Fiscal Year 2012 and Fiscal Year 2013 were presented to the Del Mar City Council on June 4, 2012. The budget was formally adopted during the same meeting.

For the Fiscal Year 2011-2012 reporting period, the final amended budget for Fund 55 totaled $462,922. **Table 10-1** below provides a breakdown of program budget by major budget category for Fiscal Year 2012.

Table 10-1: Budget Summary – Clean Water Fund 55

Fund Account		Adopted Budget Fiscal Year 2012	Description/Comments
55-5220	Clean Water Engineering	-	Engineering contractual services including: Program management (Fiscal Year 2008) water quality testing, development and distribution of educational materials, fees to agencies (Fiscal Year 2008), and engineering services.
55-5530	Clean Water Planning	44,761	Active enforcement of Clean water regulations including project plan review, permitting, construction monitoring and plan review of BMPs.
55-5536	Clean Water Code Enforcement	23,068	Active in-field enforcement of clean water regulations, including response to resident complaints.
55-5539	Clean Water Program Management	237,975	Beginning mid-year Fiscal Year 2008, all program management and reporting activities, fees to agencies, and interaction with regional Copermittee groups.
55-5840	Public Works (General)	19,195	Provides for administration and general support for all clean water programs for property and facilities, including supervision of maintenance staff.
55-5841	Flood Control & Drainage	4,772	Provides for necessary monitoring, water quality testing, and labor associated with program requirements when Flood Control pumps are operated.
55-5845	Street Maintenance	99,718	Provides for a portion of sidewalk and street cleaning including street sweeping and storm drain maintenance within the City limits of Del Mar. Also covers costs with testing, recording contents, and recovering all deposited materials that otherwise would discharge to the beach, river, or lagoon.
55-5847	Street Landscaping	19,608	Provides for landscape supervision, documentation, and controls for the Clean Water aspects of the street landscaping for medians, islands, street ends, and other street related areas. The program also provides for improved litter control, pesticide and fertilization monitoring and reporting.
55-5848	Park Maintenance	13,825	Provides for park maintenance supervision, documentation, and controls for the Clean Water aspects of the landscaping for parks and open space areas. The program also provides for improved litter control, pesticide and fertilization monitoring and reporting.
Total Clean Water Program Budget – Fund 55		**$462,922**	

10.1.2 Fiscal Analysis Methods

The City of Del Mar utilized the format and guidelines included in the Fiscal Analysis Method for reporting purposes; however, given the City's financial accounting methods, a few modifications were necessary. These adjustments are described below.

10.1.3 Fiscal Analysis Results

The City's Fiscal Year 2012 jurisdictional (JURMP), watershed, (WURMP), and regional (RURMP) projected expenditures for the implementation of the Municipal Permit requirements are summarized in **Table 10-2** below.

10.1.4 JURMP Expenditures

The City of Del Mar utilized the expenditure categories detailed in the Fiscal Analysis Method for jurisdictional reporting. However, due to the implementation overlap of some of the City's municipal permit components; it is difficult to separate out individual component costs. As a result, the expenditures for residential, education, and public participation are reported as one expenditure category. Additionally, since the City does not explicitly track expenditures by permit component for its budgeting purposes, in many cases estimated percentages were utilized to allocate expenditures into the appropriate municipal permit component categories.

A total of $462,922 was projected to be expended in Fiscal Year 2012 for the implementation of JURMP activities. An overview of the expenditures reflected in JURMP activity components is described below.

Administration
Activities identified in this component represent labor and non-labor expenditures for materials, supplies, equipment, or tools that are not otherwise incorporated into other expenditure categories, general administrative functions (e.g., program planning, budgeting, staff supervision), and program assessment and reporting.

Development Planning
Activities identified in this component represent labor and non-labor expenditures related to issuance or oversight of permits or of plans (e.g., permit counter support, plan checks, permit or application processing), project planning and engineering (e.g. project design specifications, capital improvement projects).

Construction
Activities identified in this component represent labor and non-labor expenditures related to construction site inspections and enforcement.

Municipal
Activities identified in this component represent labor and non-labor expenditures related to maintenance inspections of streets, roads, catch basins and inlets, open channels, and the MS4, municipal facility inspections, street and parking lot sweeping, catch basins and inlets, open channels, and MS4 cleaning, and municipal BMP implementation. Since the City of Del Mar conducts all fire-fighting training outside of the City, and no non-emergency fire-fighting flows occurred during the reporting period, the City does not currently track expenditures relating to non-emergency fire-fighting flows. Any costs associated with preparing for these flows are included in the municipal component.

Table 10-2: Fiscal Year 2012 Expenditure Summary by Program Component

Component Description	Fiscal Year 2012 Projected Expenditures
Jurisdictional Component	
Administration	43,020
Development Planning	50,093
Construction	25,927
Municipal (Including Non-Emergency Fire Flows)	148,733
Industrial and Commercial	16,948
Residential, Education, and Public Participation	42,150
IDDE	28,269
Jurisdictional Total	**$355,138**
Watershed Component	
San Dieguito Watershed	42,900
Los Peñasquitos Watershed	35,015
Watershed Total	**$77,915**
Regional Component	
Total Copermittee Cost Share for Del Mar	19,065
Additional Regional Costs	10,804
Regional Total	**$29,869**
Total Costs	**$462,922**

Industrial and Commercial

Activities identified in this component represent labor and non-labor expenditures related to evaluation and enforcement of program requirements at industrial and commercial sites or sources (e.g. routine inspections and complaint investigations).

Residential, Education, and Public Participation

Activities identified in these components represent labor and non-labor expenditures related to investigation and enforcement of residential areas or activities, staffing outreach events, development and production of outreach materials, and any expenditures associated with waste collection and recycling (e.g. household hazardous waste, used oil).

Illicit Discharge Detection and Elimination

Activities identified in this component represent labor and non-labor expenditures related to the identification and elimination of illicit discharges or connections, enforcing the City of Del Mar's storm water ordinance, and any expenditures related to monitoring programs (e.g. dry weather monitoring, coastal storm drain monitoring, special investigations, field or sampling equipment, materials and supplies).

10.1.5 WURMP Expenditures

The City of Del Mar utilized the expenditure categories (administration, watershed activities, cost share contribution, and other) detailed in the Fiscal Analysis Method for watershed reporting. The watershed expenditures included in this report only capture City of Del Mar expenditures and do not account for any expenditure disbursed by other Copermittees included in the watershed(s).

A total of $77,915 was projected to be expended in Fiscal Year 2012 for the implementation of WURMP activities. This also includes costs for the implementation of applicable TMDLs (Los Peñasquitos Lagoon Sediment TMDL development and Bacteria TMDL Revised Project I Twenty Beaches and Creeks in San Diego Region), which are considered Special Studies.

10.1.6 RURMP Expenditures

The City of Del Mar utilized the expenditure categories (administration, cost share contribution, regional activities, and other) detailed in the Fiscal Analysis Method for regional reporting. The regional expenditures included in this report only capture City of Del Mar expenditures and do not account for any expenditure disbursed by other Copermittees in the region. A total of $29,869 was projected to be expended in Fiscal Year 2012 for the implementation of RURMP activities.

10.1.7 Funding Sources

To ensure adequate funding for the Clean Water Program, the City uses a combination of user fees and general fund monies.

10.1.8 Clean Water Service Charge

The City of Del Mar City Council created and adopted a user fee, called the Clean Water Service Charge to offset the costs of the program. Initially, the rate was adopted to collect $100,000 of the estimated $300,000 for the program, with an escalator to achieve full cost recovery by 2009. Mid-way through the five-year schedule, on July 24, 2006, the California Supreme Court published a decision in the case of Bighorn-Desert View Water Agency v. Verjil (2006) 39 Cal. 4th 205, which held that consumption-based rates such as water and sewer rates are subject to the notice and hearing requirements of California Constitution, Article XIIID, Section 6 (commonly known as "Proposition 218"). Therefore, on January 22, 2007, and February 5, 2007, the Del Mar City Council held public hearings to receive written protests to comply with Proposition 218. No majority protest was received, and the Council ratified the previously approved five-year rate schedule, including the City's Clean Water Service Charge. However, the adopted rate increases did not account for the actual increases in the costs associated program requirements.

As an additional measure to obtain voter approval of the five-year rate schedule for the City's Clean Water Service Charge, the Council directed staff on April 2, 2007, to start the process to perform a mail ballot election procedure. During the process of researching the mail ballot election procedures and the current rates, it became apparent that the process would

immediately need to be repeated to set the Fiscal Year 2010 rates and charges, since the current five-year rate schedule was due to expire in June of 2009. Due to the additional costs incurred in complying with the new requirements of the 2007 Permit, increases to the Clean Water Service Charge were proposed, including an annual rate escalator. All monies appropriated as part of the Clean Water Service Charge are directly identified for the Clean Water Program, and pursuant to law, may not be used by the City for any other purpose.

During the Fiscal Year 2009 reporting period, in compliance with Proposition 218, both the majority protest hearing and mail ballot process were conducted for the proposed increases. Both the ratification of the existing rate structure (required by Proposition 218), and the new rates, including the rate escalator, passed by more than 62%. As a result of the passage of the Clean Water Service Charge, the City will continue to have a secure funding source for the Clean Water Program, outside of general fund monies. Based on current water allocations for the City of Del Mar, the projected revenues from the Clean Water Service Fee will be $441,081 for Fiscal Year 2012.

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SECTION 10 FISCAL ANALYSIS

10.1 INTRODUCTION

A fiscal analysis of the JURMP provides a vital assessment of resources for the current and upcoming Permit Years. This section of the report will incorporate guidance and standards developed collaboratively by the Copermittees and in accordance with the Municipal Permit. The City is reporting expenditures using summary tables developed by the Standardized Fiscal Analysis Method and Format adopted in February 2009 (summary tables and forms are included in Appendix A.10). The analysis attempts to identify adequate support and how resources are divided to support and fortify the JURMP, WURMP, and RURMP efforts.

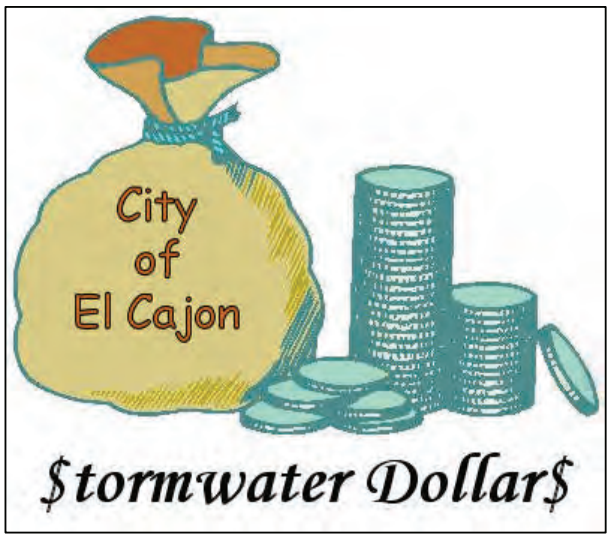

In PY 2003-04, the City Storm Water staff developed a separate budget from other Public Works activities and sufficient to run the Storm Water Program. The Program continues to be adequately funded through the City's Sewer Fund. This funding source has been used since PY 2004-05 and will continue to be used for PY 2012-13.

10.2 GENERAL BUDGET INFORMATION

The following table shows actual expenditures from permit year 2003-04 through 2010-11, estimated actual budget for 2011-12, and the proposed 2012-13 budget for the City's Urban Runoff Management Program.

Item	05-06	06-07	07-08	08-09	09-10	10-11	Estimated Actual 11-12	Proposed 12-13
Salaries (including benefits)	533,487	550,856	722,809	714,841	781,174	765,041	766,054	744,864
Materials, Services and Supplies	183,639	254,876	397,292	423,543	421,181	335,939	506,288	709,275
Capital Outlay	6,235	29,953	73,593			10,873	10,460	
TOTAL	**723,361**	**835,685**	**1,193,644**	**1,138,384**	**1,202,355**	**1,111,853**	**1,282,802**	**1,454,139**

Budgets increased steadily from 2003-04 through 2006-07 under Municipal Permit Order 2001-001. The increase in PY 2007-08 was a result of allocating resources in anticipation of fulfilling requirements for Municipal Permit R9-2007-001. The budget to maintain the Storm Water Program in compliance with the Permit dropped slightly in PY 2008-09 but increased again in PY 2009-10. Based on estimates for PY 2011-12 and the proposed budget for PY 2012-13, the over –all budgets for the Storm Water Program will continue to increase, especially with the anticipation of the renewal of the Municipal Permit. A copy of the budget is located in Appendix A.10.

The City's NPDES Urban Runoff Management Program funding was sufficient to meet the JURMP requirements in PY 2011-12 and is projected to be sufficient to meet requirements in PY 2012-13. The City met its projected goal of continuously executing plans, procedures, and processes to implement JURMP requirements and assess the effectiveness of its programs.

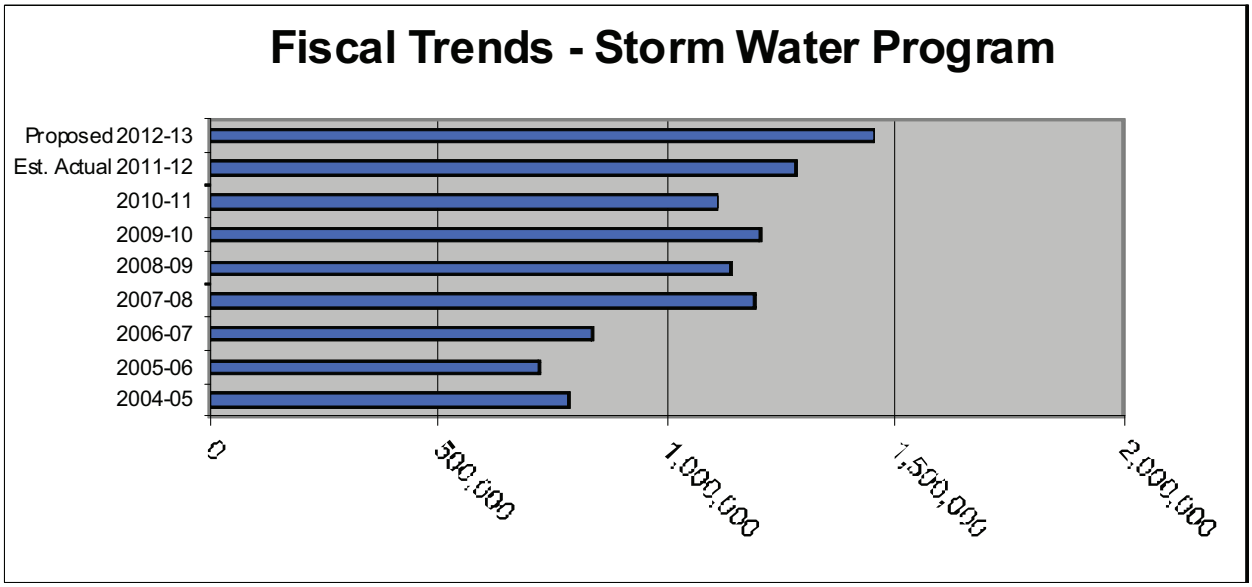

Modifications to the program were made that resulted in an increase in expenditures in PY 2004-05 and a slight decrease in PY 2005-06. The budget for PY 2004-05 contained some capital expenditures that were started in PY 2002-03 and PY 2003-04 such as a Geographical Information System dataset for map generation and a trash debris fence to collect trash and debris in Forrester Creek before discharging to Santee. From PY 2005-06 through PY 2011-12 there has been a steady increase in the budget to support the Storm Water Program. Overall, a general increasing trend of funds has been allocated from PY 2002-03 through the proposed PY 2012-13 to sustain a viable storm water program.

10.3 FISCAL ANALYSIS METHODS

The Standardized Fiscal Analysis Methods and Format (Fiscal Analysis Methods) were collaboratively developed and adopted by the Copermittees in January 2009 in accordance with sections G, J. 1 .a(3)(k), and J. 1 .c(1)(d) of NPDES Order No. R9-2007-0001. The Fiscal Analysis Methods document was submitted to the San Diego RWQCB by January 31, 2009, as Attachment 1 of the Regional Urban Runoff Management Plan (RURMP) Annual Report for 2008-2009.

10.4 FISCAL ANALYSIS RESULTS

10.4.1 EXPENDITURES

The budget for PY 2011-12 included a Storm Water Program Manager, 1 part-time senior engineering technician, 1 assistant engineer, 1 GIS technician, 1 compliance officer, and 2 part-time Engineering Intern. The personnel for PY2012-13 will remain unchanged with the same number and job classification as in the current reporting year. The City also has an open contract with two consultants to provide as-needed services to ensure the City meets its JURMP implementation requirements.

The City is using forms and tables developed by the new Fiscal Analysis Method for reporting (attached in Appendix A.10). It is important to note that while the Expenditure Summary table in Appendix A.10 shows jurisdictional expenditures for various permit components, it may not reflect all expenditures. Further modifications to the City's accounting and expenditure tracking will continue to be made in the future to better track expenditures for each jurisdictional component. Program components expenditures for development planning, construction, municipal, industrial/commercial, residential, and special investigations were difficult to dissect.

10.4.2 FUNDING SOURCES

In the long-term, funding for the Storm Water Program will continue to be even a bigger question with necessary increases required to maintain permit compliance related to permit renewals and up-coming new requirements. The City is constantly challenged with doing more with less after a continual decline in general fund budgets. For PY2011-12, the City completed all inspections, monitoring, and complaint investigations, as well as other requirements of permit R9-2007-0001, with existing staff complemented by consultants.

Working efficiently is the goal of the jurisdictional urban runoff management program. Completing onsite inspections, tracking enforcement actions, and complaint/referral information allows the City to reduce the amount of time and paper to complete significant portions of the Municipal, Industrial, Commercial, Construction, and Land Use Planning JURMP Components.

For WURMP activities, the City will continue to coordinate with the other San Diego River Watershed Copermittees to complete watershed water quality activities and education activities. Working together eliminates duplicative efforts and enhances the effect across a wider range of people and geographical area. The City manages a contract with a consultant to assist with the Watershed program and a share cost agreement has been in effect for a few years.

No regulatory comments were received for the Fiscal Analysis component of the JURMP Annual Report for 2010-11.

10.0 FISCAL ANALYSIS

10.1 INTRODUCTION

On January 29, 2009, the San Diego Region Stormwater Copermittees submitted the *Standardized Fiscal Analysis Method and Format* as required by municipal permit Sections G, J.1.a(3)(k), and J.1.c(1)(d). The defined reporting period of this report marks the third full application of the fiscal analysis methodologies developed in the document, and the information provided in this section has been prepared consistent with the standardized approach, using the best information available at the time of report preparation. The *Standardized Fiscal Analysis Method and Format* supports a greater scope of fiscal tracking, yielding a much more complete analysis of program related expenditures across a variety of City functions and departments and/or divisions that may not have been captured in previous reporting years. For consideration, using the standardized format to capture programmatic expenditures across multiple City departments that provide an array of interrelated stormwater management services has necessitated a considerable margin of approximation for various functional areas, particularly related to staff resources (labor costs). In compliment to approximated figures, actual programmatic expenditures have been used as much as possible to present a refined fiscal analysis overview specific to the City of Encinitas.

10.2 GENERAL BUDGET INFORMATION

The Clean Water Program and associated functions and activities in the City of Encinitas are organizationally shared by two primary departments: Engineering Services and Public Works. Engineering Services is responsible for the overall administration of the Clean Water Program and develops and implements core program components including water quality monitoring; development oversight (SUSMP & HMP implementation) inspection and enforcement; and education, outreach, and training related to stormwater and water quality. Public Works performs the operations and maintenance of the municipal separate storm sewer system (MS4) including channel maintenance, sewer maintenance, street sweeping, municipal facility inventories, and municipal facility inspections. Other City departments additionally support core program functions and needs including the Planning, Finance, Fire, and Parks & Recreation departments.

The FY 2011-2012 Clean Water Program and supporting Department Budgets have been prepared in consideration of Water Quality Order No. 2007-0001 as well as other regulatory mandates placed upon the City of Encinitas. Despite significant budget constraints due to widespread economic downturns, the FY 2011-2012 budgets support the historic level of service provided by the Clean Water Program in addressing water quality concerns specific to Encinitas through response to citizen complaints, education, inspection, enforcement, monitoring, and development oversight. FY 2012-2013

budgeting represents the City's ongoing commitment to this program and the community that it serves.

10.3 FISCAL ANALYSIS METHODS

As introduced above, the information presented in this section has been prepared based upon the *Standardized Fiscal Analysis Method and Format* document that was collaboratively developed by the San Diego County Stormwater Copermittees. This document provides the Copermittees, including the City of Encinitas, with guidance and standards to analyze and report on their respective urban runoff management program expenditures, and to identify the funding sources for their programs in a uniform format. While the regionally developed methodologies greatly support reporting consistencies such as expenditure categories and reporting metrics, the *Standardized Fiscal Analysis Method and Format* does not set up stringent or prescribed accounting practices.

In order to elucidate the information presented below, it is important to identify any assumptions used to calculate expenditures related to various program elements. The following points of consideration should be noted:

- Staff Resources have been calculated as a percentage of time and associated costs applied to a specific program area.
- Staff Resources have been captured for both Engineering Services and Public Works Operations personnel.
- In order to avoid cost "overlaps" in those areas implemented across multiple departments, supporting department staff costs have not been included in the accounting below.

10.4 FISCAL ANALYSIS RESULTS

10.4.1 EXPENDITURES

The City of Encinitas Clean Water Program FY 2011-2012 Jurisdictional expenditure summary is presented in Table 10-1. In FY 2011-2012, the City's Coastal Storm Drain Monitoring; Dry Weather Monitoring; IDDE; Construction, Education, Residential, and Commercial program elements; and overall program administration were accomplished through the use of five full time Clean Water Program staff. Land Development and Construction components utilized Engineering Services staff resources from various divisions, and Municipal activities utilized Public Works personnel. Labor related costs have been captured in the summary below based upon percentages of applicable staff resources. In addition, non-labor costs including materials, supplies, and equipment have also been included.

Table 10-2 presents the Watershed expenditure summary specific to Encinitas, and Table 10-3 presents the Regional expenditure summary capturing the City of Encinitas share of regionally distributed costs.

10.4.2 FUNDING SOURCES

In FY 2003-2004, the City Council attempted to pass a Clean Water Fee, which charged $5.00 per month per water meter to the residents and businesses in the City of Encinitas. The Howard Jarvis Taxpayers Associated challenged the fee based upon Proposition 218 requirements. The City was required to add this item to the ballot in March 2006 which was defeated. As a result, the City of Encinitas must and continues to completely subsidize the Clean Water Program through the General Fund.

Table 10-1 – Jurisdictional Expenditure Summary

JURISDICTIONAL COMPONENTS		
ADMINISTRATION	$	137,693
DEVELOPMENT PLANNING	$	490,005
CONSTRUCTION	$	183,612
MUNICIPAL	$	1,638,563
INDUSTRIAL AND COMMERCIAL	$	107,162
RESIDENTIAL	$	26,790
IDDE	$	147,955
EDUCATION	$	26,790
PUBLIC PARTICIPATION	$	13,395
SPECIAL INVESTIGATIONS	$	1,365
NON-EMERGENCY FIREFIGHTING	$	13,395
Jurisdictional Total	$	2,786,727

Table 10-2 – Watershed Expenditure Summary

WATERSHED		
CARLSBAD WATERSHED	$	2,519
Watershed Total	$	2,519

Table 10-3 – Regional Expenditure Summary

REGIONAL		
CITY OF ENCINITAS - REGIONAL COST SHARE	$	58,064
Regional Total	$	58,064

TOTAL EXPENDITURES: FY 11-12	***$***	***2,847,310***

10 FISCAL ANALYSIS COMPONENT

10.1 INTRODUCTION

The following fiscal analysis is based on the "Standardized Fiscal Method and Format" (Fiscal Analysis Method) that was collaboratively developed by the Copermittees in January 2009 in accordance with sections G,J.1.a(3)(k) and J.1.c(1)(d) of NPDES Order R9-2007-0001. The Fiscal Analysis Method document was submitted to the San Diego RWQCB in January 2009. The Fiscal Analysis Method provides Copermittees with guidance and standards to analyze and report their urban runoff management program (jurisdictional, watershed, and regional) expenditures, as well as with direction to identify the funding sources that support those costs. Because many stormwater-specific activities are co-mingled with other municipal responsibilities and tasks, some of the expenditures are best professional estimates of resources spent on a particular stormwater function or area. However, any estimates are documented by a rationale that will serve as a benchmark for future years' analyses.

10.2 GENERAL BUDGET INFORMATION

On an ongoing basis, the City reviews the revenue and expenditures associated with the Stormwater Management Fund to ensure that adequate support is available to implement jurisdictional, watershed, and regional urban runoff management program components (i.e., JURMP, WURMP, and RURMP). In doing so, the City annually tracks staff time, operations, maintenance, education, capital, and administrative expenditures, and makes allocation adjustments as necessary to accomplish the activities of this program. Since the majority of the stormwater program is supported by the Wastewater Fund, it is annually reviewed to determine whether adequate funding is available to sustain it.

Support from non-wastewater departments for stormwater services is largely represented by allocations to various General Fund departments involved in the planning and implementation of the program, e.g., Maintenance, Engineering, Information Systems, Planning, and Fire. However, because of budget constraints over the last couple of years, the City has focused on effectively delivering stormwater services that improve water quality and meet permit compliance targets while remaining within designated budget thresholds. To accomplish this in part, the City has relied less on outside contractors and more on existing staff resources to achieve program objectives and goals.

The following discussion of fiscal year 2011–2012 program expenditures and funding sources provides a more detailed analysis of how the balance between expenditures and available revenue has been achieved.

10.3 FISCAL ANALYSIS RESULTS

10.3.1 Expenditures

During fiscal year 2011–2012, the City spent $1.55 million to develop and deliver its stormwater program and services to its residents and businesses, as well as to its watershed and regional stakeholders. These expenditures are divided among the various categories of the permit-required components, which incorporate a wide range of jurisdictional, watershed, and regional services, including the following:

- administration;
- development project design review;
- residential complaint response and enforcement;
- education and outreach;
- commercial, industrial, and municipal facility inspections; and
- water quality monitoring.

It should be noted that an additional $15 million in wastewater funds is expended on programs that focus on removing, reducing, and preventing pollutants from entering and/or leaving city waterways and adjacent tributaries.

These programs and their costs are associated with the City's comprehensive sewer inspection and maintenance program, which incorporates a variety of methodologies to prevent sewer ruptures and overflows, including regular inspection and cleaning of its infrastructure; the operation and maintenance of its wastewater plant; and inspection of businesses such as restaurants, motive establishments, and significant industrial users that discharge to it. While not included in the stormwater budget, these services are integral to sustaining the health of the City's and the watershed's water quality.

Table 10-1 summarizes the required stormwater program components and their attendant expenditures for fiscal year 2011–2012, approximately 70 percent of which were devoted to program implementation. For more detail regarding fiscal year 2011–2012 expenditures, refer to the table, "San Diego County Copermittees' Fiscal Analysis Report," in Appendix E.

Table 10-1. Stormwater Program Expenditures, Fiscal Year 2011–2012

Program Components	Amount
Jurisdictional Programs	
Administration	$352,350
Development Planning	$255,630
Construction	$77,850
Municipal	$384,805
Industrial and Commercial	$88,000
Residential	$144,915
IDDE	$42,950
Education/Public Participation	$58,740
Special Investigations	$4,780
Non-Emergency Firefighting	$0
Jurisdictional Program Total	**$1,410,020**
Watershed Programs	
San Dieguito Watershed	$17,100
Carlsbad Watershed	$15,675
Watershed Programs Total	**$32,775**
Regional Programs	
Total Copermittee Cost Share	$95,330
Administration	$12,000
Regional Program Total	**$107,330**
TOTAL STORMWATER PROGRAM COSTS	**$1,550,125**

10.3.2 Funding Sources

A fee assessed through the City's Wastewater Fund provides fiscal support for all three urban runoff management plan components specified in the permit: (1) jurisdictional, (2) regional, and (3) watershed. The Wastewater Fee is included on the City's monthly utility bills, which is due and payable at the same time and on the same terms as other parts of the bill. The fee is based on each utility customer's contribution to the City's wastewater system. Both commercial and residential customers are charged a fixed fee of $16.37 and then are assessed additional fees based on customer class and volume. Although the fee generated $23.5 million in revenue during 2011–2012, the stormwater program was allocated $2.1 million of the total Wastewater Fund.

The Stormwater Program is supplemented by services provided by the City's General Fund departments and divisions. Although the stormwater services they provide represent functions that would occur irrespective of the stormwater-mandated functions, such as street sweeping and maintenance of the City's storm sewer infrastructure, these General Fund-supported services allocate a portion of their operational costs to the stormwater budget to address gaps in resources created by the expanded requirements of the 2007 stormwater permit.

In compliance with Proposition 218, any recommended wastewater increases are subject to a comprehensive public review process, including publicly noticed rate review workshops, proposed rate increase notifications sent to all residents and businesses, as well as publicly noticed City Council rate review hearings. In addition, under various debt issues, the City annually sets charges for wastewater services at rates sufficient to produce net revenues (after paying operating and maintenance expenses, excluding depreciation and interest) of at least 1.15 times the debt service on the Wastewater Fund bonds issued for that year. While this obligation is subject to the Proposition 218 public review process, the minimum funding requirement would legally supersede any rate restrictions proposed by the Proposition 218 public review process if the recommended rates did not meet the minimum debt service revenue requirement.

10.4 CONCLUSIONS AND RECOMMENDATIONS

The City will continue to participate with other Copermittees in the review and reporting of regional and local stormwater program funding and expenditures. Programs where shared costs and resources are beneficial to reduce jurisdictional expenses will be evaluated. City activities and staffing will continue to be analyzed for cost-effectiveness and fiscal responsibility relative to municipal stormwater permit compliance, water quality improvements, and pollution reduction. Annual modifications to the overall stormwater budget and/or City fees will be made in accordance with permit requirements, established public review processes, and minimum debt service funding levels.

10.0 Fiscal Analysis Component

10.1 Introduction

The Environmental Program Division of the Department of Public Works is responsible for the fiscal analysis of the storm water program. Implementation costs for the JURMP are approximately $773.075. Revenue source used by the City to fund the requirements of the Municipal Permit is the City general fund. The City also administered two grant projects in the approximate amount of $577,247 for the Tijuana River Bacteria Source Identification Study and the Los Laureles Trash Tracking Study

10.2 General Budget Information

The costs of implementing the JURMP are spread across the whole City. Each Department and associated Division has an established role in implementing the components of the JURMP. However, the primary responsibility of implementing the storm water program is split between the Department of Public Works and Community Development Department.

10.3 Fiscal Analysis Methods

The Standardized Fiscal Analysis Methods and Format (Fiscal Analysis Methods) were collaboratively developed and adopted by the Copermittees in January 2009 in accordance with sections G, J.1.a(3)(k), and J.1.c(1)(d) of NPDES Order No. R9-2007-0001. This section of the JURMP report follows the standardized Regional Fiscal Analysis Methods adopted by all Copermittees.

10.4 Fiscal Analysis Results

10.4.1 Expenditures

The expenditures for FY 2011-12 are provided in the tables below. The standardized fiscal analysis method does not exactly correspond to the line item budget maintained by the City. The values presented in Table 10.1 are therefore an extrapolation of the expenditures made that correspond best to the itemized categories. Table 10.2 also provides the expenditures related to City grant funded projects which included the Prop 50 Clean Beaches Initiative grant for the Tijuana River Bacteria Source Identification Study and the Cleanup and Abatement funding for the Los Laureles Trash Tacking Study.

The implementation of all JURMP Components involves every City Department and Division and the actual implementation costs for the program may exceed the amount posted below. The costs being reported only cover the expenditures tracked by the City of Imperial Beach Environmental Division budget.

Table 10.1 Expenditures on JURMP for FY 2011-12

Administration	$142,906
Development Planning	$80,295
Construction	$11,150
Municipal	$287,020
Industrial Commercial	$6,920
Residential	$16,695
IDDE	$34,440
Education	$16,447
Public Participation	$9,420
Special Investigations	$0
Non-Emergency Firefighting	$99,656
Regional Costs	$68,124
Total	**$773,075**

Table 10.2 Grant Funded City Projects FY 2011-12

Tijuana River Bacteria Study	$ 562,247
Los Laureles Trash Tacking	$15,000

10.4.2 Funding Source

Revenue source used by the City to fund the requirements of the Municipal Stormwater Permit is exclusively from the City's general fund.

10.0 Fiscal Analysis

10.1 Introduction

The City's Sanitation Fund provides almost all funding for the Storm Water Program. There have not been any changes to this funding mechanism during this reporting period. During 2009/2010, a fiscal analysis reporting template was developed collectively by the Copermittees. The City has used this template to report the 2011/2012 expenditures and funding sources in this JURMP Annual Report.

San Diego County Copermittees Fiscal Analysis Report
for Urban Runoff Management Programs

EXPENDITURE SUMMARY

JURISDICTIONAL COMPONENTS	
Administration	$101,780.98
Development Planning	$26,213.96
Construction	$13,272.63
Municipal	$3,715.00
Industrial and Commercial	$51,297.72
Residential	$1,316.00
IDDE	$42,967.08
Education	$7,215.00
Public Participation	$6,132.01
Special Investigations	$10,215.00
Non-Emergency Firefighting	$0.00
Jurisdictional Total	**$264,125.39**

WATERSHED	
Watershed 1 – San Diego River	$29,236.02
Watershed 2 – San Diego Bay	$62,501.06
Watershed Total	**$91,737.08**

REGIONAL	
Annual Permit Fee to Regional Board	$18,196.00
Copermittee Cost Share of Regional Budget	$46,062.00
Regional Total	**$64,258.00**

TOTAL COSTS	**$420,120.47**

FUND SUMMARY

FUNDING BY SOURCE	
General Fund	$10,016.73
Storm Water Fee	$0.00
Permit Fees	$0.00
Developer Deposits and Fees	$7,686.87
Registration and Inspection Fees	$22,185.00
Flood Control Fees	$0.00
Franchise Fees	$0.00
Gas Tax	$0.00
Utility Tax	$0.00
Road Fund	$0.00
Enterprise Funds	$0.00
Trust Funds	$0.00
Special Assessment Districts	$0.00
State Appropriated Funds	$0.00
Grant Funds	$0.00
Other – Sanitation Fund	$391,726.87
Total	**$431,615.47**

ONE-TIME FUNDING	
Grants	$0.00
Donations	$0.00
Total	**$0.00**

TOTAL FUNDING	$431,615.47

Watershed Urban Runoff Management Program (WURMP)

	Watershed 1 – San Diego River	Watershed 2 – San Diego Bay
Administration (1)	3,290.01	9,870.03
Cost Share	1,942.00	475.00
Watershed Activities	3,290.01	9,870.03
Other	$0.00	$0.00
TOTAL	**$8,522.02**	**$20,215.06**

(1) Administration – includes Watershed strategic planning, management, mapping, assessment, and reporting.

Regional Urban Runoff Management Program (RURMP)

Regional Programs	Jurisdictional Cost Share Amount
Administration (1)	$0.00
Cost Share Contribution	$0.00
Other (2)	$0.00
TOTAL	**$0.00**

(1) Administration – includes assessment, reporting, management, etc.
(2) Other – examples include regional and special studies.

CAPITAL COSTS
(Land, Large Equipment and Structures)

LIP Program Elements	2010-11 Expenditures	2011-12 Expenditures	2012-13 Projected Costs
Public Projects - BMPs		61,950.00	$70,350*
Construction BMPs for Public Construction Projects			
Other Capital Projects / Major Equipment Purchases	$1,853.20	$17,007.50	
Totals	$1,853.20	$78,957.50	$70,350*

*The City has applied for an additional $70,350 through the M2 Environmental Cleanup Program phase 2.

OPERATION AND MAINTENANCE COSTS

LIP Program Elements	***Preceding Period FY2010-11 Costs $***	***Current Period FY 2011-12 Costs $***	***Projected FY 2012-13 Costs $***
Supportive of Program Administration (LIP Section 2.0)*	270,302.12	287145.46	294669.8
Municipal Activities (LIP Section 5.0) Trash & Debris Control (formerly "Litter Control")***	19,488.69	55934.84	43627
Municipal Activities (LIP Section 5.0) Drainage Facility Maintenance	50,047.00	37609	28161
Municipal Activities (LIP Section 5.0) Street Sweeping	127,235.77	119914.12	120000
Municipal Activities (LIP Section 5.0) Environmental Performance (BMP Implementation)****	2,338.20	1691.82	1500
Municipal Activities (LIP Section 5.0) Pesticide & Fertilizer Management	31,839.00	36205	38016
Public Information (LIP Section 6.0) Nonpoint Source Pollution Awareness******	0	0	0
Public Information (LIP Section 6.0) Household Hazardous Waste Collection	0	0	0
Requiring New Development BMPs(Supportive of Planning, etc) (LIP Section 7.0)**	0	0	0

Requiring Construction BMPs (Supportive of Plan Check & Inspection) (LIP Section 8.0)**	0	0	0
Existing Development (LIP Section 9.0) Industrial/Comm./HOA Inspections**	0	0	0
Illicit Connections/Discharge Ident. & Elimination (LIP Section10.0) Investigations**	0	0	0
Agency Contribution to Regional Program*****	89,534.67	109959.89	100000
Totals	**590,785.45**	**648,460.13**	**625,973.80**

*Program Administration Costs include Program Admin Costs plus County pollution response costs
**All costs related to:
Public Information, Requiring New Development BMPs, Requiring Construction BMPs, Existing Development, and ID/IC Investigations, have been added into Program Administration Costs. See table on page C-2-6.
***Trash and Debris Control (Litter Control) Costs include County Costs + doggie walk bags cost.
****Environmental Performance Costs include pollution response costs
*****Agency Contribution to Regional Program includes total NPDES Shared Costs Budget, Aliso Creek Directive, Newport Bay (NSMP), and SWRCB annual fee.
****** Trails 4 All sponsorship.

	YES	NO
Are there any legal resitrictions on the use of any of the above funds? If yes, please explain		X
Was there a 25% or greater annual change for any of the budget line items? If yes, please explain		X

FUNDING SOURCES

LIP Funding Sources	FY 2010-11 Funding Sources	FY 2011-12 Funding Sources	FY 2012-13 Projected Funding Sources
General Fund	100%	22%	
Utility Tax/Charges			
Separate Utility Billing Item			
Gas Tax			
Special District Fund			
- Sanitation Fee			
- Benefit Assessment			

Fiscal Analysis - City of Laguna Niguel *(H.3., page 77)*

Capital Costs

LIP Program Elements	Preceding Period FY10-11-10 Costs	Current Reporting Period FY 2011-12 Costs	Projected FY 2012-13 Costs - Budgeted	Was there was a 25% annual change in this budget item? If yes, please explain.
Public Project BMPs relating to water quality	176,011	219,589	$2,742,485	yes; new grant funded projects in 11-12 and 12-13
Construction BMPs for Other Public Construction Projects	$268,100	125,936	$357,412	CIP expenses vary annually
Other Capital Projects/Major Equipment Purchases	3,799	5,092	5,436	no
Totals	**447,910**	**350,617**	**3,105,333**	

Operation & Maintenance Costs

LIP Program Elements	Prior Reporting Period FY10-11 Costs	Current Reporting Period FY 2011-12 Costs	Projected FY 2012-13 Costs - Budgeted	Was there was a 25% annual change in this budget item? If yes, please explain.
Supportive of Program Administration (LIP Section 2.0)	134,501	127,360	127,360	no
Municipal Activities (LIP Section 5.0) Trash & Debris Control	24,300	23,217	22,582	no
Municipal Activities (LIP Section 5.0) Drainage Facility Maintenance (includes Catch Basin Stenciling)	375,798	359,358	388,850	no
Municipal Activities (LIP Section 5.0) Street Sweeping	167,224	167,000	189,000	no
Municipal Activities (LIP Section 5.0) Environmental Performance (BMP Implementation)	7,256	7,470	7,470	no
Municipal Activities (LIP Section 5.0) Pesticide & Fertilizer Management	5,331	5,439	5,439	no
Public Information (LIP Section 6.0) Nonpoint Source Pollution Awareness	60,213	62,766	84,038	yes; increase in Countywide shared-program cost
Public Information (LIP Section 6.0) Household Hazardous Waste Collection	6,605	6,978	8,200	no
Requiring New Development BMPs(Supportive of Planning, etc) (LIP Section 7.0)	33770	35,689	35,689	no
Requiring Construction BMPs(Supportive of Plan Check & Inspection) (LIP Section 8.0)	94960	99,832	99,832	no
Existing Development (LIP Section 9.0) Industrial/Comm./HOA Inspections	66,995	65,792	65,792	no
Illicit Connections/Discharge Ident. & Elimination Facility Inspection,	20,353	21,880	31,650	yes; includes more investigative followup
Agency Contribution to Regional Programs	189,202	233,674	246,769	no
Totals	**1,186,508**	**1,216,455**	**1,312,671**	**no**

Funding Sources

FUNDING SOURCES	Preceding Reporting Period FY 2010-11	Current Reporting Period FY 2011-12 Costs	Projected FY 2012-13 Budgeted	
General Fund	100	95%	91%	
OCTA Measure M2 Tier 1 Grants	0	0	9%	
TOTALS	**100%**	**100%**	**100%**	

Are there any legal restrictions on the use of any of the above funds? If yes, please explain: no no no

located along a public right of way. City Hall is located in a facility in a commercial shopping center. The City contracts with a variety of service providers for landscaping, municipal storm drain maintenance, street sweeping, spill response and clean-up, and waste disposal. All contractors supply their own equipment.

Operations and Maintenance Costs

Operations and Maintenance costs refer to normal costs of operation including the cost of keeping equipment and facilities in working order. The City is a contract City and, therefore, has very little equipment that would result in Operations and Maintenance costs. The primary operational costs are service contracts and employee salaries associated with program management, enforcement, and inspection.

FUNDING SOURCES

LIP Funding Sources	FY 2010-11 Funding Sources	FY 2011-12 Funding Sources	FY 2012-13 Projected Funding Sources
General Fund	69.59%	73.88%	71.69%
Gas Tax	3.80%	15.55%	11.59%
Other	26.61%	10.57%	16.72%

CAPITAL COSTS
(Land, Large Equipment and Structures)

LIP Program Elements	2010-11 Expenditures	2011-12 Expenditures	2012-13 Projected Costs
Public Project BMPs	$30,951	$27,786	$35,989
Totals	$30,951	$27,786	$35,989

OPERATION AND MAINTENANCE COSTS

LIP Program Elements	2010-11 Expenditures	2011-12 Expenditures	2012-13 Projected Costs
Supportive of Program Administration	$102,459	$93,533	$101,188
Municipal Activities, Trash and Debris Control	$70,888	$24,869	$24,483
Municipal Activities, Drainage Facility Maintenance	$14,786	$13,030	$10,840
Municipal Activities, Street Sweeping	$30,293	$28,825	$29,989
Municipal Activities, Environmental Performance (BMP Implementation)	$134,882	$142,778	$101,730

Municipal Activities, Pesticide and Fertilizer Management	$9,172	$7,642	$8,105
Public Information, Nonpoint Source Pollution Awareness	$15,937	$12,909	$16,878
Public Information, Household Hazardous Waste Collection	$10,613	$9,367	$10,938
Requiring New Development BMPs (Supportive of Planning, etc.)	$9,208	$8,279	$8,682
Requiring Construction BMPs (Supportive of Plan Check and Inspection)	$12,995	$16,739	$15,155
Existing Development, Industrial/Commercial/HOA Inspections	$7,176	$5,917	$7,739
Illicit Connections/Discharge Identification and Elimination Investigations	$124,676	$85,168	$121,786
Agency Contribution to Regional Program	-	$35,474*	$48,500
Household Hazardous Waste	$1,834	$31,194**	$95,597
Totals	$544,919	$515,724	$601,610

* New category
** Accounting change

C-2.5 Program Management Modifications

The NPDES budget has been revised, as necessary, as a part of the City's normal budgeting process. Changes to the City's Operations and Maintenance costs include overhead adjustments and regional cost modifications. The following programs are among those considered in the City's NPDES budget: TMDLs and the Newport Bay Nitrogen and Selenium Working Group.

Capital Costs

Capital costs include any capital expended for each one of the DAMP elements. This would consist of any land, large equipment, and structures.

Operations and Maintenance Costs

Operations and Maintenance costs refer to normal costs of operation including the cost of keeping equipment and facilities in working order.

CAPITAL COSTS
(Land, Large Equipment and Structures)

LIP Program Elements	2010-11 Expenditures	2011-12 Expenditures	2012-13 Projected Costs
Public Projects - BMPs		$470,765	$60,000
Construction BMPs for Public Construction Projects		$97,100	$60,000
Totals	**$60,000**	**$567,865**	**$90,000**

OPERATION AND MAINTENANCE COSTS

LIP Program Elements	Costs FY 2010-2011	Costs FY 20011-12	Projected Costs FY 2012-12
Supportive of Program Administration (LIP Section 2.0)	$210,655	$198,550	$208,000
Municipal Activities (LIP Section 5.0) Trash & Debris Control	$62,318	$63,760	$66,629
Municipal Activities (LIP Section 5.0) Drainage Facility Maintenance	$65,789	$63,018	$66,000
Municipal Activities (LIP Section 5.0) Street Sweeping	$335,679	$315,867	$333,000
Municipal Activities (LIP Section 5.0) Environmental Performance/BMP Implementation	$79,424	$101,306	$106,000
Municipal Activities (LIP Section 5.0) Pesticide & Fertilizer Management	$56,314	$62,095	$65,000
Public Information (LIP Section 6.0) Nonpoint Source Pollution Awareness	$25,325	$24,360	$25,500
Public Information (LIP Section 6.0) Household Hazardous Waste Collection	$30,000	$30,000	$30,000
Requiring New Development BMPs (Supportive of Planning, etc.) (LIP Section 7.0)	$48,157	$37,223	$39,000
Requiring Construction BMPs (Supportive of Plan Check & Inspection (LIP Section 8.0)	$18,960	$29,238	$30,300

Existing Development (LIP Section 9.0) Industrial/Commercial Inspections	$118,972	$192,562	$201,000
Illicit Connections/Illegal Discharge (LIP Section 10.0) Investigations	$107,187	$110,260	$115,500
Agency Contribution to Regional Program	$112,888	$116,661	$122,000
Totals	**$1,209,205**	**$1,344,900**	**$1,407,929**

FUNDING SOURCES

LIP Funding Sources	FY 10-11 Funding Sources	FY 2011-12 Funding Sources	FY 2012-13 Projected Funding Sources
General Fund	100%	100%	100%
Utility Tax/Charges			
Separate Utility Billing Item			
Gas Tax			
Special District Fund			
- Sanitation Fee			
- Benefit Assessment			
- Fleet Maintenance Fund			
- Community Services Fund			
- Water Fund			
- Sewer & Storm Drain Maintenance Fee			
- Other			

A review of the costs for fiscal year 2010-11 and fiscal year 2011-12 indicate that there was 25 percent or greater change for program elements concerning municipal activities BMP implementation, requiring construction BMPs supportive of plan check and inspection, and existing development inspections. The municipal activities BMP implementation realized a reported cost increase during this reporting period. The increase was attributable to increased need for BMP deployment and implementation at numerous locations throughout the city. The costs reported this year match closely to prior reporting years; however, the previous reporting year (FY 2010-11) saw a decrease in expenditures associated with these activities. Therefore, the current reported expenditures appear to be more consistent with recent historical expenditures and do not reflect any significant programmatic changes. The change observed in expenditures related to requiring construction BMPs supportive of plan check and inspection reflect a change in reporting for the current reporting period. City staff worked with the Building and Safety Division to improve the assessment of costs associated with these activities. Therefore, the

10.0 Fiscal Analysis

10.1 Introduction

The City relies on several funding sources to support implementation of the Stormwater Program; however, the primary funding source is the City's General Fund. Other funding sources to assist offsetting the use of the General Fund include fees on building, residential and commercial pollutant sources. The City's Sanitation Fund and AB939 trash fee support multiple programs including implementation of the stormwater program.

During FY 2009-10, a fiscal analysis reporting template was developed collectively by the Copermittees. Fiscal information from FY 2011-12 is reported in the tables below, which follow the standard format adopted by the Copermittees.

Table 10-1
Expenditure Summary

JURISDICTIONAL COMPONENTS	
Administration	$35,270
Development Planning	$2,100
Construction	$7,439
Municipal	$67,340
Industrial and Commercial	$2,537
Residential	$6,755
IDDE	$19,375
Education	$2,250
Public Participation	$1,658
Special Investigations	$0
Non-Emergency Firefighting	$0
Jurisdictional Total	**$144,724**

WATERSHED And TMDL	
San Diego Bay Watershed	$895
Chollas Creek TMDLs	$49,991
Watershed And TMDL Total	**$50,886**

REGIONAL	**$37,865**

TOTAL COSTS	**$233,475**

Table 10-2
Fund Summary

FUNDING BY SOURCE	
General Fund	$162,012
Sanitation	$4,660
Commercial Fee	$44,929
Building Permit Cost Recovery	$8,370
Residential Fee	$2,841
AB 939 Fee	$10,663
Total	**$233,475**

Table 10-3
Watershed Urban Runoff Management Program (WURMP) Expenses

	San Diego Bay Watershed	Chollas Creek TMDL
Administration	$288	$900
Cost Share Contribution	$463	$48,947
Watershed Activities	$144	$144
SUBTOTAL	**$895**	**$49,991**
TOTAL		**$50,886**

Table 10-4
Regional Urban Runoff Management Program (RURMP) Expenses

Regional Programs	Jurisdictional Cost
Administration	$760
Cost Share Contribution	$28,305
RWQCB Annual Permit Fee	$8,800
TOTAL	**$37,865**

Fiscal Analysis - City of Mission Viejo, *(H.3., page 77)*
Capital Costs (Land, Large Equipment and Structures)

LIP Program Elements	Preceding Period FY2010-11 Costs	Current Reporting Period FY 2011-12 Costs	Projected FY 2012-13 Costs - Draft	If there was a 25% change in annual costs, explain here.
Public Projects - BMPs	$ 433,550	$ 301,250	$ 329,684	For FY 2011-2012, funds spent on various projects using a combination of grant funding as follows: $301,250 for the installation of a storm water treatment vault wihtin Oso Parkway at Country Club Drive to treat low water flows;obtained from the SWRCB through the American Recovery and Reinvestment Act of 2009 paid for the Oso Creek Restoration and Protection Project. For FY 2010-2011, funds were spent on three major construction projects associated with the Oso Creek Restoration and Protection Project: (1) a bio-swale at the Montanoso Recreation Center to treat parking lot runoff; (2) conversion of turf grass and above ground irrigation heads to low water use vegetation and drip irrigation; and (3) payment for the actual storm water treatment vault within Oso Parkway at Country Club Drive to treat low water flows. For FY 2012-13, $329,684 is projected to be spent on landscape and irrigation system median retrofits to prevent irrigation runoff from leaving arterial highway medians and picking up pollutants on streets and washing the pollutants to the storm drain system.
Construction BMPs for Public Projects	$ 20,000	$ -	$ 10,000	In reviewing the direction from the County for what this line item entails, City staff revised the previous funds spent and lumped them into the Public Projects - BMPs category. Now, we interpret this category to be exclusively for erosion control BMPs on public construction projects. The dollar amounts are arranged accordingly.
Other Capital Projects/Major Equipment Purchases	$ -	$ 142,638	$ -	In FY 2011-2012, the City using a grant from OC Waste & Recycling purchased food dehydration equipment and paid for the installation of the equipment at various restaurants to prevent fecal indicator bacteria from leeching from trash bin enclosures. In 2003, the City adopted a trash bin enclosure retrofit program by requiring the construction of a solid roof over and a sewer drain connected to the sanitary sewer within trash bin enclosures as tenant improvements and new construction occurs. Previous studies by Weston Solutions ratified this direction by providing statistical evidence the retrofit program is part of an integral part of preventing fecal indicator bacteria from reaching the MS4.
Totals	**$ 453,550**	**$ 443,888**	**$ 339,684**	

Operation & Maintenance Costs

LIP Program Elements	Preceding Period FY 2010-11 Costs	Current Reporting Period FY 2011-12 Costs	Projected FY 2012-13 Costs - Draft	If there was a 25% change in annual costs, explain here.
Supportive of Program Administration (LIP Section 2.0)	$216,007	$211,112	$218,101	
Municipal Activities Trash & Debris Control (LIP Section 5.0)	$56,608	$82,045	$78,507	Estimated budget.
Municipal Activities (LIP Section 5.0) Drainage Facility Maintenance (includes Catch Basin Stenciling)	$186,933	$147,057	$174,467	
Municipal Activities (LIP Section 5.0) Street Sweeping	$424,354	$399,918	$432,216	
Municipal Activities (LIP Section 5.0) Environmental Performance (BMP Implementation)	$10,600	$25,600	$15,600	Estimated budget.
Municipal Activities (LIP Section 5.0) Public Property & Street Chemical Spill Response	$0	$0	$0	
Municipal Activities (LIP Section 5.0) Pesticide & Fertilizer Management	$55,900	$63,991	$65,691	
Public Information (LIP Section 6.0) Nonpoint Source Pollution Awareness	$21,715	$47,957	$60,800	FY 2011-2012: Grant funding for the Oso Creek Restoration and Protection Project also included a public awareness campaign about Low Impact Development techniques that can be implemented in a cost-effective fashion at residential properties. This increase is attributable to the cost of printing and mailing the brochures. FY 2012-2013: Funding has been restored to fund sending all Mission Viejo sixth grade students to the Ocean Institute in Dana Point for environmental education.
Public Information (LIP Section 6.0) Household Hazardous Waste Collection	$72,685	$73,264	$75,744	
Requiring New Development BMPs(Supportive of Planning, etc) (LIP Section 7.0)	$8,020	$16,084	$5,000	Budget based upon estimated staff time.
Requiring Construction BMPs (Supportive of Plan Check & Inspection) (LIP Section 8.0)	$16,084	$16,084	$16,084	Budget based upon estimated staff time.
Existing Development (LIP Section 9.0) Industrial/Comm./HOA Inspections	$0	$4,980	$5,000	Improved tracking of staff time now allows for tracking of this metric.
Illicit Connections/Discharge Ident. & Elimination Facility Inspection (LIP Section 10.0) Other Efforts to Identify & Eliminate Illicit Connections	$47,794	$45,930	$45,930	Estimated budget.
Agency Contribution to Regional Program	$257,016	$219,104	$280,175	Estimated budgets vs. actual expenses.
Other	$0	$0	$0	
Totals	**$1,373,716**	**$1,353,126**	**$1,473,315**	

Funding Sources

FUNDING SOURCES	Preceding Period FY 2010-11 Costs	Current Reporting Period FY 2011-12 Costs	Projected FY 2012-13 Costs - Draft
General Fund	53.56%	65.09%	73.31%
Gas Tax	16.56%	2.52%	0.00%
Others	29.88%	32.40%	26.69%
TOTALS	**100%**	**100%**	**100%**

10.0 Fiscal Analysis

The sources of funding for this program listed in the City's JURMP have not been changed during this reporting period. During 2009/2010, a fiscal analysis reporting template was developed collectively by the Copermittees. The City has used this template to report the 2011/2012 expenditures in this JURMP Annual Report.

San Diego County Copermittees Fiscal Analysis Report for Urban Runoff Management Programs

EXPENDITURE SUMMARY

JURISDICTIONAL COMPONENTS	
Administration	$25,478
Development Planning	$63,174
Construction	$40,492
Municipal	$318,856
Industrial and Commercial	$61,566
Residential	$26,379
IDDE	$36,470
Education	$34,005
Public Participation	$13,504
Special Investigations	$17,890
Non-Emergency Firefighting	$0
Jurisdictional Total	**$637,814**

WATERSHED	
Watershed 1 – San Diego Bay	$31,201
Watershed Total	**$31,201**

REGIONAL	
Annual Permit Fee to Regional Board	$18,196
Copermittee Cost Share of Regional Budget	$44,617
Regional Total	**$62,813**

TOTAL COSTS	$731,828

Watershed Urban Runoff Management Program (WURMP)

	Watershed 1 – San Diego Bay
Administration (1)	$8,443
Cost Share Contribution	$0
Watershed Activities	$22,758
Other	$0
TOTAL	**$31,201**

(1) Administration – includes Watershed strategic planning, management, mapping, assessment, and reporting.

Regional Urban Runoff Management Program (RURMP)

Regional Programs	Jurisdictional Cost Share Amount
Administration (1)	$474
Cost Share Contribution	$44,143
Other (2)	$0
TOTAL	**$44,617**

(1) Administration – includes assessment, reporting, management, etc.
(2) Other – examples include regional and special studies.

10.0 FISCAL ANALYSIS COMPONENT

10.1 Introduction

The City of Oceanside acquires the funds necessary to facilitate the City's storm water program through four departments in the City: Water Utilities Department, Public Works Department, Development Services Department and Neighborhood Services Department. Much of City's storm water program falls under the responsibility of these four departments. Funds obtained for use in implementing the City's storm water program are utilized for a number of different programs, including jurisdictional, watershed, and regional programs. This section documents the activities conducted by the City of Oceanside during the 2011-2012 reporting period to meet the requirements of Section G of the Municipal Permit Order 2007-0001 (Table 10-1).

Table 10-1. Order 2007-0001 Fiscal Analysis Compliance Summary.

G.1: Each Copermittee shall secure the resources necessary to meet all requirements of the Municipal Permit.	See Section 10.1 of this Annual Report
G.2. Copermittees shall collectively develop a standardized method and format for annually conducting and reporting fiscal analyses of their urban runoff management programs in their entirety (including jurisdictional, watershed, and regional activities).	See Section 10.2 of this Annual Report
G.3. Each Copermittee shall conduct an annual fiscal analysis.	See Section 10.2.3 of this Annual Report
J.3.a.(3)(j).i Fiscal analysis of City urban runoff management program	See Entire Section 10 of this Annual Report

Effective programs require adequate funding to implement planned activities. The first step in securing adequate funding for the JURMP is to provide a strategy for effectively conducting a fiscal analysis of the JURMP in its entirety. This year's fiscal analysis included an evaluation of the expenditures (such as capital, operation and maintenance, education, enforcement, and administrative expenditures) necessary to accomplish the activities described in the JURMP and required under investigation orders and Total Maximum Daily Loads (TMDLs) mandates.

10.2 Fiscal Analysis Methods

The Municipal Permit requires the Copermittees to develop a standardized method and format for annually conducting and reporting fiscal analysis of their urban runoff management programs. The Standardized Fiscal Analysis Method and Format (Fiscal Analysis Method) was collaboratively developed and adopted by the Copermittees in January 2009 in accordance with sections G, J.1.a(3)(k), and J.1.c(1)(d) of NPDES Order No. R9-2007-0001. The Fiscal Analysis Method document was submitted to the San Diego Regional Water Quality Control Board by January 31, 2009, as Attachment 1 of the Regional Urban Runoff Management Plan (RURMP) Annual Report for 2008-2009. The Municipal Permit further requires the Copermittees to

conduct their annual fiscal analysis consistent with the standardized method starting January 31, 2010. The fiscal analysis incorporated in this section is based on the standardized method.

10.2.1 Program Funding

The City secures funding for the implementation of the storm water program through the Water Utilities, Public Works Departments, and Engineering Divisions in the City. To secure adequate funding, the Water Utilities Department collects a Clean Water Program surcharge. The surcharge is based on the customer's water consumption, so the surcharge is also designed as an incentive for individuals to conserve water. This amount is equal to $0.07 per unit of water used. Total revenue for fiscal year 2011-12 generated though the surcharge fee was $771,983.

The City Engineering Division as part of the Development Services Department secures funding from development-related programs. The Engineering Division receives funding through fees assessed on developers for grading plan checks and inspections. Funding for Public Works departments is obtained through general fund allocations to the department.

The Standardized Fiscal Analysis Method includes a Standardized Fiscal Analysis Reporting Form, which consists of three tables separating jurisdictional, watershed, and regional expenditures. Jurisdictional expenditures are divided into components that mirror those included in the Municipal Permit as follows:

Administration
Development Planning
Construction
Municipal
Industrial and Commercial
Residential
Illegal Discharge Detection and Elimination (IDDE)
Education
Public Participation
Special Investigations
Non-Emergency Firefighting

Further, each of the above categories may be broken down into sub-categories. Potential Sub-categories may include:

Land Use Planning
Environmental Review
Development Project Approval and verification
Public Construction Projects
Private Construction Projects
Public Reporting of Illicit Connection or Illegal Discharges (ICIDs)
Jurisdictional Urban Runoff Monitoring Programs
Other

Expenditure items to be considered for each category or sub-category may include:

Administration
Permitting and Licensing
Project Planning and Engineering
Maintenance Inspections
Compliance Inspection and Enforcement
BMP Implementation
Educational Outreach
Waste Collection and Recycling
Jurisdictional Urban Runoff and Receiving Water Monitoring
Other Expenditures

For reporting purposes, only the table incorporating major jurisdictional components will be used. Sub-categories and expenditure items are intended to provide standardization of expenditures and need not be shown in the final report.

10.2.2 Urban Runoff Management Programs

The City's storm water budget related to the following departments, divisions, and programs are:

- Water Utilities Department - Administration of the City's Clean Water Program
- Water Utilities Department – Clean Water Program Compliance Inspections
- Development Services Department, Engineering Division – Storm water plan review, SUSMP and HMP
- Development Services Department, Engineering Division - Capital Improvement Projects
- Public Works Department - Storm Drain Maintenance
- Public Works Department - Solid Waste Disposal
- Public Works Department - Street and Median Maintenance
- Neighborhood Services Department – Code Enforcement Division

In addition the following department/division dedicate employees to address storm water related tasks required by the municipal storm water permit:

- Public Works Department – Park Maintenance (Inspections and BMP installation/maintenance)
- Public Works Department – Harbor Maintenance (Inspections and BMP installation/maintenance)

Personnel from various City departments and divisions are involved in the implementation of the City's storm water program. Refer to Section 2 and the City's certification letter in Appendix A, pages 2 and 3, of the City's 2008 JURMP for further detail regarding the responsibilities of various departments. Other program expenditures include watershed and regional storm water activities.

10.2.3 Expenditure and Budget Reporting

This section provides information on the expenditures for fiscal year 2011-12 as well as a proposed budget for fiscal year 2012-13. The fiscal year expenditures are presented in tabular

format with separate rows for different expenditure categories and the proposed budget for the next FY. See Table 10-2.

The JURMP budgeting for the Water Clean Water Program which includes various departments is described in the following sections and summarized in Table 10-2 at the end of this section. During this reporting period there were eight staff people dedicated to the City's Clean Water Program.

- One full-time Environmental officer (note title change from Clean Water Program Coordinator)
- Three full-time Environmental Specialists (focusing on water quality monitoring, education outreach, and program administration)
- One full-time CWP compliance inspectors
- One full-time Engineering Assistant (focusing on SUSMP and HMP)
- One full-time Code Enforcement Officer

10.2.3.1 Water Utilities Department

The surcharge rate described above under Program Funding is listed as a separate line item on Oceanside customers' utility bills. This allows for the clear delineation of the revenue being secured for the Clean Water Program in the Water Utilities section of the utility bill. Total revenue for fiscal year 2011-12 generated though the surcharge fee was $771,983. The costs to administer the Clean Water Program during Fiscal Year 2011-12 totaled $1,131,274. It is anticipated that the Water Utilities Department will expend $1,379,891 during Fiscal Year 2012-13.

10.2.3.2 Public Works

The City calculated the curb miles swept for the reporting period totaling 32,500 miles. The overall cost of the City's street sweeping program during FY 2011-12 was $1,450,977. This included $677,505 for equipment costs and $773,472 for staff costs. With a total of 32,500 curb miles swept in the City at a cost of $1,450,977, this averages out to $44.65 per curb mile. The cost for inspection and maintenance of the MS4 was $330,000 during this reporting period and. Budgeted costs for FY 2012-13 for MS4 maintenance are $370,000.

During fiscal year 2011-12 the Public Works Department spent approximately $1,845,000. It is anticipated that the Public Works Department will expend $1,954,920 during Fiscal year 2012-13.

10.2.3.3 Engineering

Municipal Permit Order 2007-001 requires an increased focus and effort in development-related review and inspection, development of a Hydromodification Plan and revisions to the Standard Urban Storm Water Mitigation Plan. The approximate costs to implement this program during Fiscal Year 2011-12 totaled $100,000. It is anticipated that Engineering Department will expend $110,000 during Fiscal year 2012-13 for storm water plan check review and implementation of the HMP.

10.2.3.4 Overall Clean Water Program Costs

During Fiscal Year 2011-12 approximately $3,268,274 was expended amongst the departments for the implementation of and tasks that support the Clean Water Program. It is anticipated that the total program costs for Fiscal Year 2012-13 will total $3,344,811. See Table 10-2 below for a summary of expenditures and projected budgets.

Table 10-2. JURMP Budgeting for Water Utilities, Public Works and Engineering Departments/Divisions.

Department	Item	Fiscal Year 2010-2011	Fiscal Year 2011-2012	Projected Fiscal Year 2012-2013
Water Utilities	Personnel (including Code Enforcement)	$752,433	$675,958	$680,000
	Misc. office supplies, postage, uniforms	$303	$3,000	$3,000
	Print Materials	$18,270	$34,000	$15,000
	Monitoring Programs including lab materials, supplies and services	$21,183	$47,206	$30,500
	Outreach supplies; Other Misc – Cleanups and booths	$20,000	$20,500	$20,500
	Consultant Fees – Regional Monitoring, CLRP Development; Database Assistance	$156,689	$255,660	$346,000
	Independent Contractors – Teacher Training;	0	350	$350
	Permits, Licenses, Fees	$27,178	$36,635	$40,500
	Dues, Travel, Advertising	$2,099	$3,500	$3,000
	Equipment – UV	$1,673	$16,000	$16,000
	Regional Copermittee Cost-share; Monitoring, RURMP, WURMP	$131,902	$146,000	$146,000
	Vehicle Maintenance		$76,156	$79,041
Water Utilities	**Total**	**$1,131,730**	**$1,313,274**	**$1,379,891**
Public Works	Street Sweeping (Equipment)	$677,505	$675,000	$740,201
	Street Sweeping (staffing and /or contract costs)	$773,472	$775,000	$779,719
	Conveyance System Cleaning (Contracted Work and City Staff	$223,952	$330,000	$370,000
	Personnel for CWP Monitoring	$65,000	$65,000	$65,000
Public Works	**Total**	**$1,739,929**	**1,845,000**	**$1,954,920**
Engineering Division	Personnel	$95,849	$100,000	$110,000
	Hydromodification Plan	$0	$0	$0
Engineering Division	**Total**	**$95,849**	**$100,000**	**$110,000**
	Grand Total	**$2,967,508**	**$3,268,274**	**$3,344,811**

Capital Costs

Capital costs include any capital expenditure for each one of the LIP elements. This would consist of the purchase of any land, large equipment or structures; installation of public project BMPs; and construction BMPs for public projects (see table below). The County's capital costs totaled $176,609 for the 2011-2012 reporting period.

CAPITAL COSTS
(Land, Large Equipment and Structures)

LIP Program Elements		FY 2011-12 Costs	Projected FY 2012-13 Costs
Public Project - BMPs	BMPs, retrofits, facilities constructed as a component of some other facility	$109,719	$2,460,900
Construction BMPs for Public Construction Projects	Cost for water quality BMPs used during construction	$50,000	$975,900
Other Capital Projects/Major Equipment Purchases	Capital improvements related to the program that are not strictly BMPs and costs for purchase of major equipment	$16,890	$59,530
	Totals	**$176,609**	$3,496,330

Capital costs may vary greatly from year-to-year due to availability of funding and/or changes in project planning.

Operations and Maintenance Costs

Operations and maintenance costs refer to normal costs of operation to implement the County's stormwater program including the cost of keeping equipment and facilities in working order (see table below). The County's operations and maintenance costs totaled $31,596,161 for the 2011-12 reporting period.

OPERATION AND MAINTENANCE COSTS

LIP Program Elements			FY2011-12Costs	Projected FY 2012-2013 Costs
Supportive of Program Administration (LIP Section A-2.0)	Meetings/Committees/Training/Reporting		$882,219.73	$1,242,500.00
Plan Development (LIP Section A-3.0)	New Program Development/BMP Effectiveness Studies		$793,636.71	$817,445.81
Municipal Activities (LIP Section A- 5.0)	Trash & Debris Control(OC Public Works O&M) Litter Ordinance, Clean-up Programs, Specialty/bulky Pickups, Public Trash Receptacles		$15,565,551.00	$16,005,000.00
	Household Hazardous Waste Collection		$4,244,012.00	$5,600,000.00
	Drainage Facility Maintenance(OC Public Works O&M) Includes Catch basin Stenciling		$944,381.00	$945,000.00
	Street Sweeping(OC Public Works O&M)		$499,567.10	$500,000.00
	Environmental Performance Reporting Program	Litter/Trash Control	$3,578,502.08	$3,589,370.02
		Parking Lot Sweeping	$663,458.53	$679,335.00
		Facility Drain Maintenance	$520,765.27	$525,888.00
		Inspections	$185,933.25	$192,505.56
		BMP Maintenance	$707,446.44	$750,373.00
	Pesticide & Fertilizer Management		$364,064.00	$302,765.10
Public Information (LIP Section A-6.0)	Non-Point Source Pollution Awareness		$597.00	$597.00
	Household Hazardous Waste Collection		$77,876.00	$76,000.00
New Development/Significant Redevelopment (LIP Section A-7.0)	Requiring New Development BMPs (Supportive of Planning, etc.)		$151,457.58	$213,524.58
Construction (LIP Section A-8.0)	Requiring Construction BMPs (Supportive of Plan Check & Inspection) – Private Projects		$373,700.58	$392,380.58
	Requiring Construction BMPs (Supportive of Plan Check & Inspection) – Public Projects		$534,796.58	$586,496.58
Existing Development (LIP Section A-9.0)	Industrial/Commercial/HOA Facility Inspections		$12,070.88	$12,433.01
Illegal Discharge/Illicit	Illicit Connection Inspections		$2,138	$3,000

LIP Program Elements		FY2011-12Costs	Projected FY 2012-2013 Costs
Connection (LIP Section A-10.0)	Illegal Discharge Investigations, Spill Response	$197,155.28	$203,322.56
County Contribution to Countywide NPDES Program		$1,296,832.08	$1,335,737.04
	Totals	**$31,596,161.09**	**$33,973,673.85**

Funding Sources

The funding sources describe the origin of the combined capital and operations and maintenance expenditures.

1

FUNDING SOURCES

LIP FUNDING SOURCES	FY2011-12Costs	Projected FY 2012-13Costs
GENERAL FUND	0.80%	0.74%
UTILITY TAX/CHARGES	0.00%	0.00%
SEPARATE UTILITY BILLING ITEM	0.21%	0.19%
GAS TAX	10.71%	12.37%
SPECIAL DISTRICT FUND	12.9%	19.61%
• **Sanitation Fee**	0.18%	0.16%
• **Fleet Maintenance Fund**	0.04%	0.00%
• **Prop 172**	0.00%	0.00%
• **Grants**	1.55%	2.33%
• **Time & Materials**	0.00%	0.00%
• **Pollution Response Cost Recovery**	0.59%	0.55%
• **Service Fees & Fines**	24.54%	26.71%
• **Other**	50.65%	37.34%
TOTALS	100 %	100%

10.0 Fiscal Analysis

10.1 Introduction

The City's SWPP Program was largely funded by the City's General Fund in 2011/2012. Developer and inspection fees funded services tied to a specific permit. A Used Oil Block Grant funded portions of the Education and Public Participation Programs. AB939 trash fee funds supported the HHW Program. Due to legal issues, the City rescinded its Storm Water Program Fee during the 2011/2012 reporting period, so the actual fee amount collected was substantially less than budgeted. This shortfall was made up with General Fund.

Fiscal information from 2011/2012 is reported in the tables below, which indicate budgeted amounts following the standard format developed collectively by the Copermittees during 2009/2010.

Table 10-1
Expenditure Summary

JURISDICTIONAL COMPONENTS	
Administration	$289,490
Development Planning	$27,736
Construction	$20,628
Municipal	$977,479
Industrial and Commercial	$54,449
Residential	$213,371
IDDE	$48,500
Education	$3,150
Public Participation	$0
Special Investigations	$0
Non-Emergency Firefighting	$0
Jurisdictional Total	**$1,634,803**

WATERSHED	
Los Peñasquitos	$61,429
San Dieguito	$61,204
Watershed Total	**$122,633**

REGIONAL	**$97,260**

TOTAL COSTS	**$1,854,696**

Table 10-2
Fund Summary

FUNDING BY SOURCE	
General Fund	$178,017
Storm Water Fee	$1,398,300 (1)
Developer Deposits and Fees	$22,128
Registration and Inspection Fees	$2,180
Grant Funds	$22,549
Other	$231,522
Total	**$1,854,696**

(1) Per the standard format, amounts shown in the tables are budgeted amounts. The actual fee collected before it was eliminated was $484,190. The shortfall was made up with General Fund.

Table 10-3
Watershed Urban Runoff Management Program (WURMP) Expenses

	Los Peñasquitos	San Dieguito
Administration (1)	$9,704	$9,704
Cost Share Contribution	$7,500	$7,500
Watershed Activities	$44,225	$44,000
Other	$0	$0
TOTAL	**$61,429**	**$61,204**

(1) Administration – includes Watershed strategic planning, management, mapping, assessment, and reporting.

Table 10-4
Regional Urban Runoff Management Program (RURMP) Expenses

Regional Programs	Jurisdictional Cost
Administration (1)	$25,260
Cost Share Contribution	$72,000
Other (2)	$0
TOTAL	**$97,260**

(1) Administration – includes assessment, reporting, management, etc.
(2) Other – examples include regional and special studies.

C-2.5 Program Management Modifications

The modifications that were made to the Plan Management section of the City's LIP include the following:

- There were no updates to the Plan Management section of the City's LIP during this reporting period.

Capital Costs (Fiscal Analysis Summary)
(Land, Large Equipment and Structures)

LIP Program Elements	Expenditures FY 2010-2011	Projected Cost FY 2011-12
Public Projects - BMPs	$0	$0
Construction BMPs for Public Construction Projects	$6,400	$10,000
Other Capital Projects / Major Equipment Purchases	$0	$0
Totals	**$6,400**	**$10,000**

Operation and Maintenance Costs

LIP Program Elements	Expenditures FY 2010-11	Projected FY 2011-12
Supportive of Program Administration (LIP Section 2.0)	$13,818	$13,997
Municipal Activities (LIP Section 5.0) Trash & Debris Control (formerly "Litter Control")	$9,212	$9,331
Municipal Activities (LIP Section 5.0) Drainage Facility Maintenance	$9,212	$9,331
Municipal Activities (LIP Section 5.0) Street Sweeping	$93,096	$88,500
Municipal Activities (LIP Section 5.0) Environmental Performance (BMP Implementation)	$9,212	$9,331
Municipal Activities (LIP Section 5.0) Pesticide & Fertilizer Management	$9,212	$9,331
Public Information (LIP Section 6.0) Nonpoint Source Pollution Awareness	$12,436	$12,597

Public Information (LIP Section 6.0) Household Hazardous Waste Collection	$4,376	$4,432
Requiring New Development BMPs (Supportive of Planning, etc) (LIP Section 7.0)	$4,606	$4,666
Requiring Construction BMPs (Supportive of Plan Check & Inspection) (LIP Section 8.0)	$6,909	$6,998
Existing Development (LIP Section 9.0) Industrial/Comm./HOA Inspections	$6,909	$6,998
Illicit Connections/Discharge Identification & Elimination (LIP Section10.0) Investigations	$6,218	$6,291
Agency Contribution to Regional Program	$123,567	$132,781
Other – Household Hazardous Waste	$7,318	$10,758
Other	$40,000	$40,000
Totals	**$356,098**	**$365,343**

Funding Source

LIP FUNDING SOURCES	Funding Sources FY 2011-12	Projected Funding Sources FY 2012-13
General Fund	62%	65%
Utility Tax/Charges	0%	0%
Separate Utility Billing Item	0%	0%
Gas Tax	38%	35%
Special Restricted Fund	0%	0%
- Sanitation Fee	0%	0%
- Benefit Assessment	0%	0%
- Fleet Maintenance Fund	0%	0%
- Community Services Fund	0%	0%
- Water Fund	0%	0%
- Sewer & Storm Drain Maintenance Fee	0%	0%
- Others	0%	0%
TOTALS	**100%**	**100%**

CITY OF SAN CLEMENTE
SUMMARY OF CLEAN OCEAN FUND

	FY 2011	FY 2012	Projected FY 2013
Revenues			
Clean Ocean Fee	1,862,931.74	1,816,364.56	1,817,000.00
Grant revenues	-	-	-
Parking Violations	316,453.87	311,443.00	290,000.00
Administrative Fines	6,800.00	3,300.00	7,000.00
Investment Earnings	33,414.78	29,429.78	40,500.00
Other	-	-	-
Transfer in from Storm Drain Fund	-	-	-
Transfer in from Other Funds	103,420.00	242,400.00	540,000.00
	2,323,020.39	2,402,937.34	2,694,500.00
Costs:			
Water Quality			
Personnel	342,658.25	366,192.93	375,620.00
Supplies	18,597.26	79,520.44	83,250.00
Contractual	131,493.23	143,929.71	426,770.00
Other charges	152,743.70	138,085.57	201,140.00
Capital	-	-	-
Interdepartmental	354,083.74	352,920.72	108,740.00
Interfund transfers	695,790.00	755,110.00	1,121,110.00
Street Sweeping	520,134.35	399,999.84	450,220.00
Capital Improvement Projects (A)			
Seg/Des/Can MO2 Treatment	2,220.00	-	-
Poche Runoff Treatment	90,411.85	-	-
Other capital costs	46,420.00	-	-
Linda Lane Runoff Treatment Project	-	186,288.58	177,390.00
M02 Water Quality Treatment Backwash	-	-	150,000.00
Poche Beach M01 BacT Investigation	-	259,580.00	63,750.00
Total costs of program	2,354,552.38	2,681,627.79	3,157,990.00

10 Fiscal Analysis Component

10.1 INTRODUCTION

The fiscal analysis presented in this Chapter identifies the various categories of expenditures attributable to the urban runoff management program for FY11-12 and includes a description of the source(s) of the funds that are used to support the program and any legal restrictions on the use of the funds. In late 2008, the Copermittees collaboratively developed and adopted a standardized method of fiscal analysis in accordance with Permit Sections G, J.1.a(3)(k), and J.1.c(1)(d). This Standardized Fiscal Analysis Method and Format (Fiscal Analysis Method) was submitted to the RWQCB in January of 2009 as Attachment 1 of the Regional Urban Runoff Management Plan (RURMP) Annual Report for FY08-09. The Fiscal Analysis Method was prescribed for use by the Copermittees no later than January 31, 2010. The Authority first used the method in the FY10-11 Annual Report and now uses the method again here to frame the fiscal information presented below.

10.2 GENERAL BUDGET INFORMATION

The San Diego County Regional Airport Authority Act, the Authority's enabling legislation, outlines the financial parameters of the Authority. As a financially self-sufficient agency, the Airport Authority does not rely on

taxpayer dollars or any city or county funds to operate. The Authority operates on a fiscal year that runs from July 1 through June 30. The expense budget is comprised of costs for salaries, wages, benefits, operating equipment and systems, safety and security, maintenance, utilities, contractual services, business development costs (including advertising and promotional activities), various property lease payments, debt service, and capital improvements.

The bulk of expenditures related to the implementation of the SWMP pass through the Environmental Affairs Department and the Facilities Management Department. The Environmental Affairs Department is responsible for administrative functions within the Stormwater Management Program, including fiscal analysis. The Environmental Affairs Department staff carries out the administrative activities for the program, including: 1) general program budget analysis and planning; 2) inspections and enforcement; 3) monitoring and reporting; 4) coordination and involvement with the Municipal Permit Copermittees and agencies; 5) assistance to other groups outside the department; 6) internal and external training, workshops, and public events; and 7) helping to secure the materials and equipment necessary to perform required tasks. The Facilities Management Department is generally responsible for the operation and maintenance (O&M) aspects of the program, including: 1) inspection and maintenance of the storm drain system; 2) maintenance of facilities and grounds; 3) securing the materials, equipment and vehicles necessary to perform required tasks; and 4) supporting the management of the Authority's wastes.

The remaining expenditures flow through the Authority's Capital Improvement Program (CIP). The Capital Improvement Program is a rolling 3 to 5 year program that provides for critical improvements and asset preservation, including environmental pollution prevention needs.

10.3 FISCAL ANALYSIS METHODS

As noted above, this FY11-12 Annual Report uses the Copermittee Fiscal Analysis Method to conduct and present this review.

10.4 FISCAL YEAR 2011-2012 FISCAL ANALYSIS RESULTS

10.4.1 EXPENDITURES

Financial resources expended by the Authority to implement the SWMP are presented in the three categories outlined in the Fiscal Analysis Method, namely, Jurisdictional, Watershed, and Regional. The total expenditures for FY11-12 are presented in Table 10-1 and equal $2,629,200.

TABLE 10-1 STORM WATER MANAGEMENT PROGRAM EXPENDITURE SUMMARY FOR FY11-12

Description	Costs
A. Jurisdictional Components	
1. Administration	$97,800
2. Development Planning	$59,700
3. Construction	$86,100
4. Municipal	$1,803,200
5. Industrial	$260,900
6. Residential	$0
7. IDDE	$125,200
8. Education	$40,500
9. Public Participation	$6,000
10. Special Investigations	$7,500
11. Non-emergency Firefighting	$29,000
Jurisdictional Total	$2,515,900
B. Watershed - San Diego Bay Watershed	
1. Administration	$2,000
2. Watershed Activities	$94,500
WatershedTotal	$96,500

TABLE 10-1 STORM WATER MANAGEMENT PROGRAM EXPENDITURE SUMMARY FOR FY11-12

Description	Costs
C. Regional	
1. Administration	$6,000
2. Copermittee Cost Share	$10,800
Regional Total	$16,800
TOTAL COSTS	$2,629,200

A) Jurisdictional Expenditures

The annual costs to implement the Jurisdictional elements of the SWMP include the overall program administration and the costs incurred for staff, contract services, and materials and equipment for each of the program components listed in Table 10-1. The bulk of the Jurisdictional costs are associated with staff and contract services associated with the Municipal Component and represent the efforts expended by the Environmental Affairs and Facilities Management Departments. In addition to the expenditures required to ensure compliance with the Municipal Permit, the Industrial Component listed in Table 10-1 also includes contract services costs for sampling and monitoring required to ensure compliance with the General Industrial Permit. The IDDE Component costs presented in Table 10-1 also include contract services costs for the sampling and monitoring that is part of the dry weather monitoring program. All Capital Improvement Program costs, if any, associated with the Authority's stormwater management program are included in the Special Investigations Component presented in Table 10-1.

B) Watershed Expenditures

The annual costs to implement the Watershed elements of the San Diego Bay Watershed Urban Runoff Management Plan generally only fall into the categories of administration and watershed activities. Administration costs include Authority staff time at meetings, communication and coordination

with the Watershed Copermittees, and data compilation and reporting. The costs incurred for watershed activities include staff, contract services, and materials and equipment for those watershed activities implemented by the Authority.

C) Regional Expenditures

The annual costs to implement the Regional elements of the San Diego County Regional Urban Runoff Management Plan generally only fall into the categories of administration and the Authority's share of the cost for regional activities. Administration costs include Authority staff time at meetings, communication and coordination with the Copermittees, and data compilation and reporting. The shared costs represent the Authority's obligations to support Copermittee staff, contract services, and materials and equipment for regional activities such as regional workgroups, wet weather monitoring, and public education and outreach.

Funding Sources

The Authority has four sources of revenue: 1) airline revenue; 2) non-airline revenue; 3) non-operating revenue; and 4) investment earnings. Airline revenue is primarily from landing fees, terminal rents, and security related fees. Non-airline revenue is comprised of public parking fees, terminal and other concessions, rental car fees, and ground rents. Non-operating revenue is primarily passenger facility charges (PFCs) and federal grant receipts collected to fund capital improvement projects. To ensure that the budget is adequately funded, the Finance Division prepares a revenue budget that incorporates budget expenditure requests into a rate-setting formula to determine projected rates, fees and charges to the airlines and other tenants.

Funding sources for the Capital Improvement Program projects include Federal Aviation Administration (FAA) Airport Improvement Program (AIP) grants, PFCs, airport operating revenues, airport revenue bonds, and short-term borrowing using commercial paper.

10.5 PROGRAM REVIEW AND MODIFICATION

As noted in the FY09-10 Annual Report, with the adoption of the Fiscal Analysis Method by the Copermittees in January 2009, the fiscal analysis methodology presented in Chapter 12 (Fiscal Analysis Component) of the SWMP was updated to incorporate the standardized method. There have been no other revisions to the SWMP since that time.

Section 10: Fiscal Analysis Component

10.1 Introduction

In accordance with the requirements in Section G of the Permit, the Port JURMP Document describes the manner by which the Port secures the resources necessary to meet the requirements of the Permit. Chapter 12 of the Port JURMP Document outlines the Port's proposed strategy for conducting a fiscal analysis of the Urban Runoff Management Program in its entirety. In order to demonstrate sufficient financial resources to implement the Program, the Port's annual fiscal analysis is presented below.

10.2 General Budget Information

The Port has established an Urban Runoff Management Program that provides environmental benefits and is cost effective for the Port and its tenants. The Board of Port Commissioners adopted the 2011-2012 budget at their June 2011 board meeting. After public budget hearings, the Board of Port Commissioners filed the final budget with the San Diego County Board of Supervisors.

The 2011-2012 budget adequately funded the implementation of the Port JURMP, including monitoring, investigation, outreach, education, inspection, and enforcement programs. Funding for implementation of the Port JURMP was taken from the operating budget for the Environmental and Land Use Management, General Services and Marketing Departments. Funds were also expended for the maintenance of stormwater infrastructure and the additional structural BMPs that came on-line as a result of new development/redevelopment requirements and/or the results of the monitoring program.

The Port also continues to contribute to ongoing programs such as the Regional Harbor Monitoring Program, THINK BLUE, Project Clean Water, grants focused on San Diego Bay and the San Diego Bay Watershed, and other regionally focused water quality improvement programs to implement education and public participation components of the JURMP. Additionally, the Port is an active stakeholder in the various TMDLs that are in place throughout the bay. As such, funding for TMDL required monitoring and implementation activities overlap and become a part of the overall funding needed to address urban runoff and related costs.

10.3 Fiscal Analysis Methods

During 2009, the Regional Copermittees developed and submitted a Standardized Method and Format for Annually Conducting and Reporting Fiscal Analysis (Fiscal Analysis Method). This

document was developed in accordance with sections G, J.1.a(3)(k), and J.1.c(1)(d) of the Permit. The Fiscal Analysis Method provides Copermittees with guidance and standards to analyze and report their urban runoff management program (jurisdictional, watershed and regional) expenditures, and outline the funding sources for their programs in a uniform format. The Fiscal Analysis Method was prepared collaboratively by the Copermittees and submitted to the San Diego RWQCB by January 31, 2009 as required by the Permit. Beginning January 31, 2010, individual Copermittees were required to utilize the Fiscal Analysis Method in conducting future fiscal analysis for each reporting period.

The Port has added the regional fiscal standards into its current program. In doing so, the Port has incorporated the regional terminology and expenditure categories to the extent practical into its fiscal assessment. The Port also used the regional forms, tables and reporting outputs for this Annual Report.

Due to the limitations of the Port's financial system and internal tracking procedures, not all fiscal expenses are easily identifiable in the categories on the list. For example, the Port uses contracted services for construction and development related stormwater services and does not differentiate between capital and tenant project expenditures. As such, these expenditures are categorized together in the standard tables. Similarly, program administration is not easily broken out as a separate category because tracking for each JURMP component occurs within its own work order. As a result, expenditures related to program administration efforts are included into each JURMP component as a part of that component's overall fiscal effort.

10.4 Fiscal Analysis Results

The implementation of an adequate JURMP requires appropriate staffing relative to the managerial, administrative, and technical aspects of the program including field technicians for ICID, monitoring, and enforcement. Staffing needs are prioritized and the number of staff is contingent on the ultimate scope, complexity, and affordability of the final program as dictated by the results of the monitoring program and other discovery-related phases of the JURMP.

In general, the bulk of staff costs are borne by the Port's ELUM and General Services Departments. As identified in the Port JURMP Document, Port staff conducts most of the inspections, enforcement actions and monitoring efforts. ELUM staff was trained and assigned to conduct inspections and enforcement activities that help minimize and eliminate non-storm water discharges to the Port's storm drain system. General Services staff conduct most of the stormwater-related field operations, such as trash and debris collection and street sweeping. Performing the majority of the work in-house resulted in cost savings to the overall program.

The Port also expended stormwater-related costs for outside contracts and consultants, equipment and supplies, monitoring efforts, education events and project coordination. These costs were in addition to the funds needed for staffing. It should be noted that a large portion of

the non-staffing costs were allocated toward monitoring, construction site inspection, MS4 maintenance, and education, as these efforts generally go beyond what can be completed in-house. Reviewing the JURMP fiscal assessment annually allows the Port to appropriately budget for upcoming years.

10.4.1 Expenditures

This section provides the Port's fiscal analysis of its Stormwater program activities for the 2011-2012 reporting period. The fiscal analysis incorporates the Copermittee Standard Fiscal Methodology, as required by the Permit. The fiscal analysis presented herein identifies the expenses incurred by the Port to update, manage, and implement the Port's Stormwater program, conduct watershed efforts and participate in regional programs. The expenses include staffing expenses as well as those costs for service providers, consultants, and contractors to provide support. The data provided in this section is based on actual expenditures for the 2011-2012 reporting period. Table 10-1 shows the levels of effort, in terms of program costs, that were required to implement the JURMP program for the 2011-2012 reporting period. Additional supporting information is also included in Appendix E.

Table 10-1. 2011-2012 Port Stormwater Program Expenditures.

Jurisdictional Components		
Administration	$	-
Development Planning	$	-
Construction	$	226,648
Municipal	$	2,666,612
Industrial And Commercial	$	29,233
Residential	$	-
IDDE	$	-
Education	$	277,470
Public Participation	$	-
Special Investigations	$	614,208
Non-Emergency Firefighting	$	-
Jurisdictional Total	$	**3,814,170**

Watershed		
San Diego Bay Watershed	$	45,907
Watershed Total	$	**45,907**

Regional[1]		
Copermittee Cost Share of Regional Budget	$	20,225
Regional Total	$	**20,225**
TOTAL COST	***$***	***3,880,302***

10.4.2 Funding Sources

During 2011-2012, the Port generated revenue from three sources: (1) charges received by Marine Operations for wharfage, dockage, storage, passenger fees and other marine services subject to Port tariffs filed with the Federal Maritime Commission; (2) charges received by Real Estate Operations from flat-fee ground rentals and rental fees based on a fixed percentage of tenant revenues subject to certain minimum monthly fees for industrial, commercial and recreational facilities; and (3) reimbursement for services charged to the San Diego County Regional Airport Authority.

In addition to the above sources, the Port also received funding from an EPA Pollution Prevention grant for efforts related to the SIYB Copper TMDL, and from its Environmental Fund for the implementation of education efforts and BMP implementation. These activities generally go above and beyond the Permit obligations required by the Municipal Permit, but are an integral part of the JURMP program nonetheless. This reimbursement was for the entire amount expended on regional efforts. The Port also offset a portion of the costs associated with the Regional Harbor Monitoring Program by participating in a sharing of costs with other RHMP Agencies. The RHMP expenses were offset by approximately $28,575.25 in revenues received from these agencies during 2011-2012. Table 10-2 summarizes the program elements and activities and identifies their funding sources.

Table 10-2. 2011-2012 Stormwater Program Funding Sources.

Program/Activity	Funding Source(s)
Stormwater Maintenance & Operations (Incl street sweeping, trash collection, MS4 cleaning/maintenance	General Services Dept. Annual Budget ELUM Annual Budget
Commercial / Industrial Inspection Program	ELUM Annual Budget
Stormdrain & Receiving Water Monitoring	ELUM Annual Budget
Regional Workgroups (Industrial & Commercial, CSDM)	County of San Diego Copermittee Reimbursement for Regional Cost-Share
SIYB Copper TMDL Efforts and Special Copper Related Studies	ELUM Annual Budget; EPA Pollution Prevention Grant (NP-00946501-4) 319-h Grant (Project #10-437-559)
Regional Harbor Monitoring Program	ELUM Annual Budget; Cost-share funds from other RHMP Agencies
Environmental Education Program	ELUM Annual Budget; Port Environmental Fund

The Port has generally committed funds to the following issues: (1) the Capital Development Program for major capital improvements within the tidelands: (2) operating expenses, including most of the Port JURMP activities; (3) Municipal Service Contracts with the five member cities; and (4) various other commitments and contingencies related to the retirement fund, healthcare benefits, purchase agreements, environmental, and litigation matters. The revenues currently generated by the Port are sufficient to implement the Port's JURMP Program.

10.4.3 2011-2012 Expenditure Summary

The information below summarizes the Port's expenditure for this reporting period. Overall, municipal services, activities and operations comprised the bulk of the program, accounting for 69% of overall expenditures (Figure 10-1). TMDL and special investigation efforts accounted for another 16%, followed by education (7%) and construction (6%). Watershed and regional efforts consisted of leading workgroups and activities, and accounted for just over 1% of overall expenditures.

Figure 10-1. 2011-2012 JURMP Fiscal Expenditures.

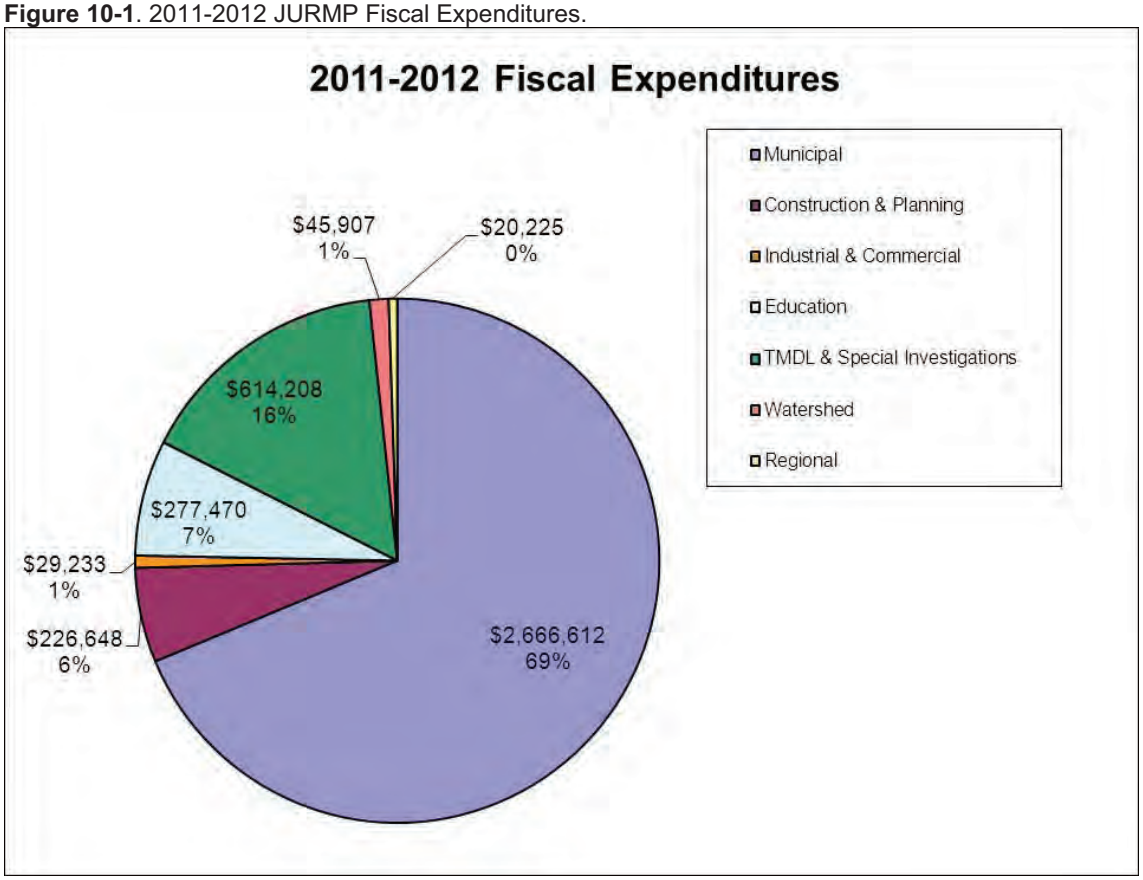

During this reporting period, the Port spent over half of the fiscal expenditures on staffing (70%), with the remaining 30% going to pay for external consultant or contracted services for program assistance (Table 10-3). Both staffing and external expenditures were greatest for municipal efforts and efforts towards TMDLs and special studies. Staffing comprised the bulk of the construction expenses, while external contracts and consultants accounted for much of the education expenses.

Table 10-3. 2011-2012 Expense Categories.

	Municipal	Construction & Planning	Industrial & Commercial	Education	TMDL & Special Inv	Watershed	Regional	Totals	%
Staffing	$2,416,984	$67,342	$29,233	$2,605	$158,970	$34,356	$0	$2,709,490	70%
External	$249,628	$159,306	$0	$274,864	$455,238	$11,551	$20,225	$1,170,812	30%
Total	**$2,666,612**	**$226,648**	**$29,233**	**$277,470**	**$614,208**	**$45,907**	**$20,225**	**$3,880,302**	

10.0 FISCAL ANALYSIS COMPONENT

10.1 Introduction

The Standardized Fiscal Analysis Method and Format (Fiscal Analysis Method) was collaboratively developed and adopted by the Copermittees in January 2009 in accordance with sections G, J.1.a(3)(k), and J.1.c(1)(d) of NPDES Order No. R9-2007-0001. The Fiscal Analysis Method document was submitted to the San Diego RWQCB by January 31, 2009, as Attachment 1 of the Regional Urban Runoff Management Plan (RURMP) Annual Report for 2008-2009.

Section G of NPDES Order No. R9-2007-0001 (Permit) establishes requirements for Copermittees to annually conduct a fiscal analysis of their urban runoff management programs. Under Section G, each Copermittee is responsible for the following:

a) Securing the resources necessary to meet all requirements of the Permit;

b) Collaborating with other Copermittees to develop a standardized method and format for annually conducting and reporting fiscal analysis of their urban runoff management programs in their entirety (including jurisdictional, watershed, and regional activities); and

c) Annually conducting a fiscal analysis consistent with the standardized fiscal analysis method.

The City utilizes the Fiscal Analysis Method in conducting its fiscal analysis for the current reporting period. The Fiscal Analysis Method provides Copermittees with guidance and standards to analyze and report their urban runoff management program (jurisdictional, watershed and regional) expenditures, and outline the funding sources for their programs in a uniform format.

10.2 General Budget Information

Expenses incurred by the City are currently allocated through the City's general fund (non-restricted) and the Stormwater Utility Fee, which is collected on trash bills by EDCO (expenditures limited to stormwater-related items).

10.3 Fiscal Analysis Methods

Each Copermittee performs the annual fiscal analysis with standard requirements that are applicable to all programs for which the City performs the fiscal analysis and then provides additional information for each of the following types of expenditures:

a) Jurisdictional Program Expenditures;

b) Watershed Shared Program Expenditures;

c) Regional Shared Program Expenditures; and

d) Total Program Expenditures.

The City's accounting system does not include cost-account budgets on a departmental level or for the categories. For FY 10 forward, the City has created a separate Stormwater Division with its own budget. Therefore the City must make approximations in the completion of the Fiscal Analysis (i.e. percent of total budget or other methodology).

10.4 Fiscal Analysis Results

The following is the City of San Marcos Expenditure Analysis for FY 12 as adopted by the City Council June 30, 2011 and June 30, 2012:

JURISDICTIONAL COMPONENTS	Total $	Funding Source
ADMINISTRATION (includes IT and City Clerk)	$364,000	General Fund
Administration: INFORMATION TECHNOLOGY[1]	*$189,000*	*General Fund*
Administration: CITY CLERK [2]	*$36,000*	*General Fund*
DEVELOPMENT SERVICES (Engineering,Planning, Building)	$162,000	General Fund
CONSTRUCTION	$65,000	General Fund
MUNICIPAL[3]	$534,000	General Fund
INDUSTRIAL AND COMMERCIAL	$33,000	General Fund
RESIDENTIAL	$16,000	General Fund
IDDE (Upper San Marcos Creek Watershed/Misc)	$238,000	General Fund
EDUCATION	$12,000	General Fund
PUBLIC PARTICIPATION	$15,000	General Fund
SPECIAL INVESTIGATIONS (Lake San Marcos TMDL /SWMM Modeling Parameters)	$200,000	General Fund
NON-EMERGENCY FIREFIGHTING	$5,000	General Fund
Jurisdictional Total	$1,644,000	

Source: City of San Marcos Operations and Maintenance Budgets for FY 2010-2013 and FY 2013-2015
Note[1]: Information Technology in support of Permit Compliance Tracking and Resources
Note[2]:Business License Tracking in Support of Permit Compliance
Note[3]: *Street Sweeping for FY 12: $282,000*; *MS4 Maintenance for FY 12: $113,000*

WATERSHED	Total $	Funding Source
Carlsbad WURMP MOU	$4,000	General Fund

Watershed Total	$4,000	

Source: City of San Marcos Operations and Maintenance Budget FY 2010-2013 #100-37

REGIONAL	Total $	Funding Source
Total Copermittee Cost Share	$75,000	General Fund
Regional Total	$75,000	

Source: City of San Marcos Operations and Maintenance Budget FY 2010-2013 #100-37

TOTAL COSTS	**$1,723,000**

10.4.1 Expenditures

- **Organization of Fiscal Analysis**

  The Fiscal Analysis Method will use the Permit's program components (Development Planning, Construction, Municipal, etc.) as the basis for reporting the jurisdiction's permit implementation costs. The organization by component will allow for future effectiveness assessment of each of the program components and ultimately cost-benefit evaluations. Analyzing the jurisdictional program components first also allows Copermittees to identify and separate any watershed and regional expenditures. The goal is to avoid overlapping expenditures between programs.

- **Exclusion of Overlapping Urban Runoff Management Program Expenditures**

  Each Copermittee must identify costs that are shared or partially attributed to the urban runoff program. It is imperative to avoid "double-counting" and also under estimating costs. To facilitate transparency and year-to-year consistency, Copermittees are encouraged to identify any assumptions made during the first year of fiscal reporting.

  The sum total of expenditures reported for Jurisdictional, Watershed, and Regional Programs should not exceed the Copermittee's total estimated expenditures. It is therefore imperative that Copermittees distinguish between costs allocated to each permit component within the provided expenditure categories and avoid "double-counting" expenditures where they overlap or crossover tasks or components.

Identification Of Multiple And Pre-Existing Program Expenditures

Permit section G.2.c requires that Copermittees identify expenditures that: (1) contribute to multiple programs, or (2) were in existence prior to implementation of the urban runoff management programs (jurisdictional, watershed, and regional). For most purposes, these two conditions are the same since expenditures would generally only have existed prior to the urban runoff management program if it already contributed to one or more other programs. While it is possible that expenditures were incurred as a result of implementing the urban runoff management program, and have subsequently been applied to other existing programs, no examples were identified during the development of the Fiscal Analysis Method.

Multiple Program Expenditures

Multiple programs are defined for the purposes of the Fiscal Analysis Method, as programs that include an urban runoff program activity that overlaps with a non-urban runoff related compliance program, activity or requirement. The expenditure is identified as covering multiple programs only if the expenditures for the urban runoff activities cannot be segregated from the non-urban runoff activities. Examples of such programs may include such as household hazardous waste programs which are conducted to comply with other state programs but are also included in the municipal stormwater permit. No watershed or regional program expenditures were determined to contribute to multiple programs.

Pre-existing Program Expenditures

As noted above, Permit section G.2.c also requires that Copermittees identify expenditures that contribute to multiple programs or were in existence prior to implementation of the urban runoff management program. This permit requirement is interpreted by the Copermittees to require that all three of the Permit programs (jurisdictional, watershed, and regional) be assessed.

As part of the Fiscal Analysis Method, fiscal year 2000-2001 was set by the Copermittees as a general baseline for the determination of the pre-existing urban runoff program expenditures. This corresponds to the issuance of NPDES Order No. 2001-01, which required significant program modifications be undertaken by the Copermittees and as a result redefined the urban runoff management programs as they had existed since 1990.

Copermittees identified which jurisdictional programs had pre-existing costs and to what degree by marking each 2008 Permit component as having a cost change that is:

a) A Partial or Significant Increase; or

b) New.

"Partial or Significant Increase" defines increases in expenditures or budget due to a partial or significant increase in effort or level of activity.

"New" would be identified as any new program activity that did not exist prior to the issuance of Order No. 2001-01, and that was added either subsequent to or in preparation for the implementation of that Permit.

None of the activities addressed in the Copermittees' Watershed Shared Costs Budgets and Work Plans existed prior to the implementation of the urban runoff management programs in 2000-2001 as a result of NPDES Order No. 2001-01; none can be considered applicable to multiple programs.

Only the Regional Monitoring Program existed as part of the Copermittees' Regional Shared Costs Budget prior to the implementation of the urban runoff management programs in 2000-2001 as a result of NPDES Order No. 2001-01.

Each watershed urban runoff management program shared costs budget is derived by the Copermittees participating in that watershed by projecting the cost to implement Permit requirements and activities for the year. Funding of the watershed budget is then allocated to each Copermittee based on the cost share formula. Annually, each Copermittee will report its share of the watershed costs in the spreadsheet form, and any other costs it incurred to implement additional watershed activities or requirements.

Standardized Reporting Metrics

Permit Section G.2.c requires that the Fiscal Analysis Method identify the metric or metrics to be used to report the expenditures for each program component. Copermittees should adhere to the following:

a) All expenditures should be reported in present day dollars rounded to the nearest ten dollars;

b) For consistency in reporting labor expenditures, the fully burdened, rather than direct, cost of staff positions should be used; and

c) All methods and assumptions used in performing calculations or making estimates should be documented for reference and to facilitate consistency in future years.

10.4.2 Funding Sources

Permit Section G.3 requires that Copermittee include a description of the source(s) of the funds that are proposed to be used to meet the necessary expenditures, including legal restrictions on the use of funds.
Permit Section G.3 requires that Copermittee fiscal analyses include a description of the source(s) of the funds that are proposed to be used to meet the necessary expenditures, including legal restrictions on the use of funds. This content will not be standardized since it is unique to each jurisdiction. However, to facilitate consistency between Copermittees, the following reporting guidelines are recommended:

a) Any funding source comprising greater than 5% of the total funding at the program level (jurisdictional, watershed, or regional) should be identified individually;

b) Other minor funding sources should be lumped together as "Other," with additional detail being provided as appropriate in the Annual Report (See standardized report outline in Section 10.9); and

c) The following standardized categories of funding sources are used by the City:

1) General Fund
2) Solid Waste Fee
4) Permit Fees
5) Developer Deposits and Fees
6) Registration and Inspection Fees
7) Flood Control Fees
8) Franchise Fees
9) Gas Tax
10) Utility Tax
11) Road Fund
12) Enterprise Funds (Solid, Wastewater/Sanitary Sewer, Water, etc.)
13) Special Assessment Districts
14) Grant Funds (State, Federal, or Other)

10.5 CONCLUSIONS AND RECOMMENDATIONS

The City adequately funds its stormwater program in accordance with the permit requirements.

10.0 FISCAL ANALYSIS

10.1 INTRODUCTION

During 2009/2010, a fiscal analysis reporting template was developed collectively by the Copermittees. Fiscal information for 2011/2012 is reported in the tables below, which follow the standard format adopted by the Copermittees.

Table 10-1
Expenditure Summary

JURISDICTIONAL COMPONENTS	
Administration	$99,431
Development Planning	$14,836
Construction	$13,335
Municipal	$392,555
Industrial and Commercial	$16,182
Residential	$5,863
IDDE	$58,242
Education	$4,215
Public Participation	$500
Special Investigations	$86,382
Non-Emergency Firefighting (incorporated into routine fire safety costs)	$0
Jurisdictional Total	**$691,541**

WATERSHED	
San Diego River	$128,531
Watershed Total	**$128,531**

REGIONAL	**$62,677**

TOTAL COSTS	**$882,749**

Table 10-2
Fund Summary

FUNDING BY SOURCE	
General Fund	$642,414
Storm Water Fee	$0
Developer Deposits and Fees	$19,935
Registration and Inspection Fees	$0
Grant Funds	$0
Zone 2 Flood Control	$220,400
Total	**$882,749**

Table 10-3
Watershed Urban Runoff Management Program (WURMP) Expenses

	San Diego River
Administration (1)	$5,349
Cost Share Contribution	$3,628
Watershed Activities	$119,554
Other	$0
TOTAL	**$128,531**

(1) Administration – includes Watershed strategic planning, management, mapping, assessment, and reporting.

Table 10-4
Regional Urban Runoff Management Program (RURMP) Expenses

Regional Programs	Jurisdictional Cost
Administration (1)	$9,225
Cost Share Contribution	$53,452
Other (2)	$0
TOTAL	**$62,677**

(1) Administration – includes assessment, reporting, management, etc.
(2) Other – examples include regional and special studies.

CHAPTER 10: FISCAL ANALYSIS

10.1 Introduction

In accordance with Permit Section J.1 (k), this section of the report describes the resources that the City utilizes to finance the various components of the storm water program. Effective programs require adequate funding to implement planned activities. The fiscal analysis will evaluate the expenditures necessary to accomplish the activities of the City's program.

The Standardized Fiscal Analysis Method and Format (Fiscal Analysis Method) was collaboratively developed and adopted by the Copermittees in January 2009 in accordance with sections G, J.1.a(3)(k) and J.1.c(1)(d) of NPDES Order No. R9-2007-0001. The Fiscal Analysis Method document was submitted to the San Diego RWQCB by January 31, 2009, as Attachment 1 of the Regional Urban Runoff Management Plan (RURMP) Annual Report for 2008-2009. As a result, the City of Solana Beach is utilizing the format and guidelines described in the Fiscal Analysis Method for this reporting period.

10.2 General Budget Information

The City's Budget for FY 11/12 was presented to the Solana Beach City Council and approved at a public hearing held on June 22, 2011. During FY 11/12, the City continued to face the challenge of maintaining and preserving its great community character while at the same time providing for long-term fiscal sustainability during the severe and prolonged economic downturn. Under the direction of City Council to cut expenditures as a result of reduced revenues, Departments enacted budget cuts in materials, supplies, and services in FY 11/12.

The City's NPDES program is primarily implemented by the Public Works Department's Environmental Services. Environmental Services is responsible for the coordination of all storm water related tasks. Therefore, the majority of the reported projected expenditures included in this section are part of the Environmental Services Program's FY 11/12 budget, which is approximately 7% of the total FY 11/12 Public Works Department budget.

10.3 Fiscal Analysis Methods

The City of Solana Beach utilized the format and guidelines included in the Fiscal Analysis Method for reporting purposes; however, there were a few adjustments made due to how the City of Solana Beach tracks expenditures. These adjustments are described in the relevant sections below.

10.4 Fiscal Analysis Results

The City's FY 11/12 jurisdictional (JURMP), watershed, (WURMP), and regional (RURMP) projected expenditures for the implementation of the Municipal Permit requirements are summarized in the table below.

FY 11/12 Projected Expenditures	
Jurisdictional Component	
Administration	52,030
Development Planning	17,200
Construction	24,260
Municipal (including Non-Fire Fighting Flows)	144,100
Industrial and Commercial	12,530
Residential, Education, and Public Participation	21,530
IDDE	55,780
Jurisdictional Total	**327,430**
Watershed Component	
Carlsbad Watershed	10,470
San Dieguito Watershed	17,970
Watershed Total	**28,440**
Regional Component	
Total Copermittee Cost Share for the City of Solana Beach (including regional and special investigations monitoring costs)	17,500
Additional Regional Costs	4,470
Regional Total	**21,970**
Total Costs	**$377,840**

10.4.1 JURMP Expenditures

The City utilized the expenditure categories detailed in the Fiscal Analysis Method for jurisdictional reporting. However, due to the implementation overlap of some of the City's municipal permit components; it is difficult to separate out individual component costs. As a result, the expenditures for residential, education, and public participation are reported as one expenditure category.

Additionally, since the City does not explicitly track expenditures by municipal permit component for its budgeting purposes, in many cases estimated percentages were utilized to allocate expenditures into the appropriate municipal permit component categories.

A total of $327,430 was projected to be expended in FY 11/12 for the implementation of JURMP activities. An overview of the expenditures reflected in JURMP activity components is described below.

10.4.1.1 Administration

Activities identified in this component represent labor and non-labor expenditures for materials, supplies, equipment, or tools that are not otherwise incorporated into other expenditure categories, general administrative functions (e.g., program planning, budgeting, staff supervision), and program assessment and reporting.

10.4.1.2 Development Planning

Activities identified in this component represent labor and non-labor expenditures related to issuance or oversight of permits or of plans (e.g., permit counter support, plan checks, permit or application processing), project planning and engineering (e.g. project design specifications, capital improvement projects).

10.4.1.3 Construction

Activities identified in this component represent labor and non-labor expenditures related to construction site inspections and enforcement.

10.4.1.4 Municipal

Activities identified in this component represent labor and non-labor expenditures related to maintenance inspections of streets, roads, catch basins and inlets, open channels, and the MS4, municipal facility inspections, street and parking lot sweeping, catch basins and inlets, open channels, and MS4 cleaning, and municipal BMP implementation. Additionally, this category includes the expenditures for non-emergency fire-fighting flows.

10.4.1.5 Industrial and Commercial

Activities identified in this component represent labor and non-labor expenditures related to evaluation and enforcement of program requirements at industrial and

commercial sites or sources (e.g. routine inspections and complaint investigations).

10.4.1.6 Residential, Education, and Public Participation

Activities identified in these components represent labor and non-labor expenditures related to investigation and enforcement of residential areas or activities, staffing outreach events, development and production of outreach materials, and any expenditures associated with waste collection and recycling (e.g. HHW, used oil).

10.4.1.7 Illicit Discharge Detection and Elimination

Activities identified in this component represent labor and non-labor expenditures related to the identification and elimination of illicit discharges or connections, enforcing the City's storm water ordinance, and any expenditures related to monitoring programs (e.g. Dry weather monitoring, coastal storm drain monitoring, field or sampling equipment, materials and supplies).

10.4.1.8 WURMP Expenditures

The City utilized the expenditure categories (administration, watershed activities, cost share contribution, and other) detailed in the Fiscal Analysis Method for watershed reporting. The watershed expenditures included in this report only capture City of Solana Beach expenditures and do not account for any expenditure disbursed by other Copermittees included in the watershed(s).
A total of $28,440 was projected to be expended in FY 11/12 for the implementation of WURMP activities. The amount also includes costs for the implementation of applicable TMDLs (Revised Project I – Twenty Beaches and Creeks in San Diego Region development and San Elijo Lagoon TMDL investigation).

10.4.1.9 RURMP Expenditures

The City utilized the expenditure categories (administration, cost share contribution, regional activities, and other) detailed in the Fiscal Analysis Method for regional reporting. The regional expenditures included in this report only capture City of Solana Beach expenditures and do not account for any expenditure disbursed by other Copermittees in the region.
A total of $21,970 was projected to be expended in FY 11/12 for the implementation of RURMP activities.

10.5 Funding Sources

The City primarily finances its Storm Water Management Department via revenues from an NPDES solid waste fee that was initiated in 2004. The City went through a long, arduous process to establish a long-term funding source to ensure the program would be sufficiently financed from 2004 through 2007. The City was sued by the Howard Jarvis Taxpayer's Association (HJTA), and the fee was put to a vote of the community. In September 2007, property owners in Solana Beach voted in favor of the fee which ultimately results in the City having a funding source to maintain, enhance, and ensure the long-term future of the NPDES program at the City. For more information on the City's NPDES Solid Waste Fee, please see the City's website at http://www.cityofsolanabeach.org

The City also utilizes the General Fund to assist in supporting some elements of the City's NPDES program. The General Fund is supported by major revenue sources that include property tax, the local portion of the sales tax and use tax, transient occupancy tax.

10.0 Fiscal Analysis Component

10.1 Introduction

The Standardized Fiscal Analysis Method and Format (Fiscal Analysis Method) was collaboratively developed and adopted by the Copermittees in January 2009 in accordance with Sections G, J.1.a(3)(k), and J.1.c(1)(d) of NPDES Order No. R9-2007-0001. The Fiscal Analysis Method document was submitted to the San Diego RWQCB by January 31, 2009, as Attachment 1 of the Regional Urban Runoff Management Plan (RURMP) Annual Report for FY 2007-08. In this Annual Report, the Standardized Method for reporting budgets is utilized. The Standardized Method allows for categorization of expenditures by permit component.

10.2 General Budget Information

The City's Jurisdictional Urban Runoff Management Program is funded through the City's Sewer Enterprise fund and is typically based on a two-year budgeting cycle. However, due to current economic conditions, the budgeting cycle has been revisited and is now performed annually. The City continues to pursue and utilize funding from grant sources. Some of the education activities are funded through Cal Recycle Grants such as the Beverage Recycling Grant and the Oil Payment Program. The City will also pursue other State Funds as part of watershed collaboration efforts as available.

10.3 Fiscal Analysis Methods

The City participated in the regional efforts to develop standards for Fiscal Reporting with other Copermittees. Currently, in conformance with the Regional Standards, the individual jurisdictional components are tracked, as well as watershed and regional expenditures. The City has performed the analysis according to the Standardized Fiscal Analysis Method for FY 2011-12. Table 10.1 below contains results of this analysis for FY 2011-12.

10.4 Fiscal Analysis Results – Standardized Fiscal Analysis Method

Table 10.1 Stormwater Budget Summary by Component FY 2011-12

EXPENDITURE SUMMARY

JURISDICTIONAL COMPONENTS		
ADMINISTRATION	$	68,675
DEVELOPMENT PLANNING	$	65,885
CONSTRUCTION	$	40,027
MUNICIPAL	$	2,033,161
INDUSTRIAL AND COMMERCIAL	$	94,844
RESIDENTIAL	$	10,832
IDDE	$	113,038
EDUCATION	$	61,113
PUBLIC PARTICIPATION	$	53
SPECIAL INVESTIGATIONS	$	53,281
NON-EMERGENCY FIREFIGHTING	$	-
Jurisdictional Total	$	2,540,909

WATERSHED		
Carlsbad	$	50,375
San Luis Rey	$	58,058
Watershed Total	$	108,433

REGIONAL		
Copermitttee Cost Share of Regional Budget	$	78,801
Regional Total	$	78,801

TOTAL COST	***$***	***2,728,143***

*Includes staff in Water Quality Protection Program, Planning, Development, Construction, Building, Parks, Public Works Maintenance, and Administrative staff implementing storm water requirements within their work units.

10.4.1 Funding Sources

The City's Water Quality Protection Program is funded primarily by enterprise funds. These funds are generated from sewer utilities within the City of Vista and the Buena Sanitation District. Approximately 80% of the Program is funded by the City of Vista sewer enterprise fund and the remaining 20% is funded by the Buena Sanitation District sewer enterprise fund. The program is supported by a Used Oil Block Grant and a Department of Conservation Recycling Grant as well. The City received approximately $53,233 during FY 2011-12, which was used to support the program's outreach and education activities, as well as the City's recycling program, and household hazardous waste collection programs.

Table 10.2 illustrates a summary of the Funding Sources for the program.

Table 10.2 Summary of Funding Sources

FUNDING BY SOURCE		
GENERAL FUND	$	82,846
STORMWATER FEE	$	-
PERMIT FEES	$	-
DEVELOPER DEPOSITS AND FEES	$	29,710
REGISTRATION AND INSPECTION FEES	$	-
FLOOD CONTROL FEES	$	-
FRANCHISE FEES	$	-
GAS TAX	$	2,009
UTILITY TAX	$	-
ROAD FUND	$	-
ENTERPRISE FUNDS	$	2,392,322
TRUST FUNDS	$	-
SPECIAL ASSESSMENT DISTRICTS	$	168,023
STATE APPROPRIATED FUNDS	$	-
GRANT FUNDS	$	53,233
OTHER	$	-
TOTAL	$	2,728,143

ONE-TIME FUNDING		
None	$	-
TOTAL	$	-

TOTAL FUNDING	$	2,728,143

Congress of the United States
Washington, DC 20515

April 2, 2013

Bob Perciasepe
Acting Administrator
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Jared Blumenfeld
Regional Administrator, EPA Region IX
75 Hawthorne Street
San Francisco, CA, 94105

Dear Administrator Perciasepe and Regional Administrator Blumenfeld:

As Members of Congress who represent San Diego County, California, we urge your immediate review of the San Diego region Municipal Separate Storm Sewer Systems Permit (Permit). The San Diego Regional Water Quality Control Board (RWQCB) has scheduled a Permit adoption hearing for April 10, 2013. Although this Permit will be issued by the State of California under its authority to regulate permit activity of the Clean Water Act (CWA), we request that the Environmental Protection Agency (EPA) review the Permit and its potential impact on local communities to ensure that compliance costs and schedules are sustainable and reasonable.

Achieving the common goal of clean water is dependent on cooperation with local governments, which bear the burden of implementing CWA obligations. Implementation costs and compliance schedules must be carefully reviewed and balanced with projected scientific benefits to ensure that the goals of the CWA are met. Specifically, stormwater regulations must to be reviewed with a cost-benefit analysis that adheres to the Maximum Extent Practicable (MEP) standard established by the CWA.[1]

In January 2013, EPA released a memorandum to regional authorities and local governments to clarify how the financial capability of permittees will be considered when developing compliance schedules for municipal projects to meet CWA obligations.[2] In the memorandum, EPA states that it is "essential that long-term approaches to meeting CWA objectives are sustainable and within a community's financial capability." However, we are concerned that EPA is adhering to unfinalized guidance still under review by the Office of Management and Budget would require the draft Permit to exceed the MEP standard intended by Congress, particularly regarding the bacteria Total Maximum Daily Load (TDML) numeric

[1] Clean Water Act Section 402(p)(3)(B)(iii)
[2] U.S. Environmental Protection Agency Memorandum, January 2013, "Assessing Financial Capability for Municipal Clean Water Act Requirements."

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limit.[3] Additionally, as the April 10 hearing approaches, numerous comments to the Permit from the last public review have yet to be released to ensure a fair and thorough process for the Permit adoption.

The County of San Diego has formed a coalition that includes representatives from six other southern California counties, businesses, and technical experts that have expressed concerns about the financial capability of the co-permittees and potential scientific deficiencies in the Permit's development. We are concerned that the high cost to the co-permitees, in the absence of a cost-benefit analysis, will strain public finances when the coalition is already facing difficult economic challenges. Together, the co-permitees for the Permit spend approximately $100 million annually to comply with existing stormwater permit requirements. The regional cost of compliance for the new Permit, including the TMDL for bacteria, could exceed $4.2 billion over the next 18 years, as projected by the RWQCB's TMDL documentation. We urge you to work with State and local government to use taxpayer dollars responsibly to achieve attainable water quality goals, including TMDL numeric limits, which should be based on sound science.

We would welcome a briefing on this issue from your staff before the Permit is adopted, and we appreciate your attention to this matter. As EPA reviews the Permit and continues to develop a financial capability framework for regions, we urge you to finalize guidance that does not exceed the MEP standard and will allow local, State, and Federal authorities to achieve mutually agreeable and scientifically based standards for clean water.

Sincerely,

Darrell Issa
Member of Congress

Juan Vargas
Member of Congress

Susan Davis
Member of Congress

Duncan Hunter
Member of Congress

Scott Peters
Member of Congress

[3] U.S. Environmental Protection Agency Memorandum, November 12, 2010, "Revisions to the November 22, 2002 Memorandum 'Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Watrer Sources and NPDES Permit Requirements Based on Those WLAs."

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TONI ATKINS
ASSEMBLYMEMBER, SEVENTY-EIGHTH DISTRICT
MAJORITY LEADER

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HEALTH
HOUSING AND COMMUNITY DEVELOPMENT
VETERANS AFFAIRS

SELECT COMMITTEES
CHAIR, HOMELESSNESS
BIOTECHNOLOGY
COASTAL PROTECTION
PORTS
SEA LEVEL RISE AND THE CALIFORNIA ECONOMY

JOINT COMMITTEES
RULES
JOINT LEGISLATIVE AUDIT

April 4, 2013

Chairman Tomas Morales
California Region Water Quality Control Board
San Diego – Region 9
9174 Sky Park Court, Suite 100
San Diego, CA 92123

Dear Chairman Morales:

On behalf of members of the California State Legislature who represent the San Diego Region, we are writing to encourage you and your colleagues on the San Diego Regional Water Quality Control Board to delay the hearing when you will consider adoption of Tentative Order No. R9-2013-0001, NPDES No. CAS0109266, *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (MS4 permit).

The adoption hearing is scheduled for April 10 and 11, 2013, but there are still important and outstanding issues that must be resolved. In particular, concerns have been raised about the receiving water limitations (RWL) language that was present in the most recent draft MS4 permit. A recent court decision has made the inclusion of this language highly problematic and will leave public entities under the permit vulnerable to excessive litigation. The State Water Resources Control Board (SWRCB) is reviewing the current situation and is considering whether to make changes to the RWL language, but has not yet come to any conclusions. It is expected that a decision on how to proceed with solving the problems with the current RWL language will be made in the next few months. Any adoption action should be postponed until this issue is settled.

Important concerns have also been raised by agencies that will be impacted by the prohibitive costs associated with the requirements imposed under the permit for the Bacteria TMDL, and your staff only released the new version of the draft MS4 permit language late in the day on March 27, 2013, which included the responses to the large volume of comment letters you received and concerns raised at previous hearings. This gives stakeholders less than two weeks to review the documents. Given the scope and impact of the new MS4 permit, it is important that your Board and the stakeholders covered by the permit all receive adequate time to review these documents.

A brief delay of your scheduled adoption hearing will allow the SWRCB to address the RWL language, while also allowing for complete and thoughtful review of the next draft version of the MS4 permit. Thank you for your consideration of this important issue.

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Sincerely,

ASSEMBLY MAJORITY LEADER
TONI ATKINS

ASSEMBLY MEMBER SHIRLEY WEBER

ASSEMBLY MEMBER ROCKY CHAVEZ

SENATOR JOEL ANDERSON

ASSEMBLY MEMBER BRIAN JONES

SENATOR MARTY BLOCK

ASSEMBLY MEMBER
BRIAN MAIENSCHEIN

SENATOR BEN HUESO

ASSEMBLY MEMBER MARIE WALDRON

SENATOR MARK WYLAND

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

APR 24 2013

OFFICE OF THE
REGIONAL ADMINISTRATOR

The Honorable Darrell Issa
U.S. House of Representatives
Attention: Ellen Dargie
2347 Rayburn House Office Building
Washington, DC 20515

Dear Congressman Issa:

Thank you for your letter of April 2, 2013 to Acting EPA Administrator Bob Perciasepe and me concerning the draft Municipal Separate Storm Sewer System (MS4) permit proposed for the San Diego Region by the San Diego Regional Water Quality Control Board (Regional Board).

We have been working closely with the Regional Board in developing the draft San Diego Regional MS4 permit over the past two years, and have carefully reviewed the draft MS4 permit to ensure it implements federal statutory and regulatory requirements and is sensitive to the challenges permittees face in funding and implementing stormwater controls. Stormwater management is a very high priority for us, as urban stormwater runoff is the principal cause of numerous water quality impairments that affect beaches, streams, lakes, and rivers throughout Southern California. (see http://waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml)

The draft MS4 permit represents the fifth iteration of MS4 permits developed by the Regional Board since 1990. Over the past 10 years, the Regional Board also developed six total maximum daily loads (TMDLs) which evaluate discharge sources causing pollution problems and identify needed pollutant load reductions. These TMDLs indicate that substantial reduction of pollutants from municipal stormwater sources is needed to restore the health of beaches and other waters in the San Diego Region. The draft MS4 permit incorporates specific requirements based on these TMDLs to reduce pollutants in stormwater discharges. We believe the draft MS4 permit appropriately reconciles the need for more effective action to restore our polluted waters with the practical realities municipalities face in controlling stormwater pollution.

Your letter expresses concern regarding the potential costs that complying with the draft MS4 permit requirements would entail, particularly those associated with TMDL implementation; similar concerns have been expressed by the permittees. Over the past few months, we have met several times with representatives of San Diego County and other municipal jurisdictions to discuss their concerns.

The TMDL that has generated the most concern among the permittees is the bacteria TMDL adopted by the Regional Board in 2010. Implementation of the TMDL will result in improved controls on stormwater and other sources that cause bacterial water quality impairment at San Diego area beaches and will address widespread concerns about beach closures and illnesses suffered by swimmers. We recognize stormwater controls are costly, but ineffective stormwater control already imposes high costs to the local economy when swimmers in polluted water get sick and beach visitation declines. The Regional Board recognized that TMDL implementation may require a considerable amount of time and provided for a 20-year timeframe, while indicating it would be willing to consider extending the timeframe, if new information supports those changes. TMDL implementation schedules were based on the best information at the time of adoption, but the State acknowledges the difficulty of accurately forecasting the time needed for implementation. For this reason, the draft MS4 permit recognizes that modification of the initial requirements in the permit implementing the TMDL may be necessary. As set forth in Provision B.5 of the permit, the Board is committed to an iterative, adaptive management process through which permit requirements will be periodically revised as new information becomes available. Provision II.H.4.c also provides a specific permit reopener to modify permit requirements related to TMDLs when appropriate.

The draft MS4 permit would also provide a new, innovative mechanism through which permittees can implement permit requirements through watershed-based implementation plans that allow for focusing first on highest priority, cost-effective pollution controls. Through the development and implementation of these Water Quality Improvement Plans, permittees can have substantial flexibility to determine how best to sequence implementation actions. This planning process would also afford permittees the ability to collect information needed to support potential revisions in permit schedules and requirements. While the draft MS4 permit and associated TMDLs provide several "reopener" opportunities, the permit needs to be renewed every five years, which provides another opportunity for the State, permittees, and other stakeholders to consider revisions in permit implementation requirements and timeframes. Thus, we believe the draft MS4 permit is sensitive to the concerns raised by San Diego County and that its implementation can be reasonably and practicably guided by the permittees' progress.

Your letter also noted that Permittees have raised concerns regarding the science and analysis underlying the TMDLs, in particular the bacteria TMDL. The Regional Board developed the bacteria TMDL through a multi-year process which provided numerous opportunities for input by stakeholders. That process included review of the science underlying the TMDL by third-party peer reviewers, and extensive analysis of TMDL implementation costs prior to State adoption of the TMDL. We also carefully reviewed the basis for the TMDL and believe the science and analysis are sound. Nevertheless, given the TMDL reopener provisions and draft MS4 permit's adaptive management process noted above, the State has clearly signaled its willingness to consider modifying the TMDLs and permit if new information supports changes.

Finally, in response to the request in your letter, EPA held a conference call with your staff on April 9, 2013. We discussed details of the draft MS4 permit and TMDLs and, more generally, opportunities to address the funding concerns raised by San Diego County. We noted

that to help address stormwater control costs, low cost loans are available through the California State Revolving Fund program. We also described EPA's new Clean Water Act integrated planning initiative started in 2012. This initiative provides the opportunity for municipalities to work with States and EPA to develop plans designed to reduce overall compliance costs by considering all wastewater and stormwater management obligations in an integrated fashion and sequencing implementation of control projects to address the most significant water quality issues first. While we have discussed this initiative with many municipalities in California, none have yet opted to pursue this opportunity. Lastly, as mentioned in your letter, EPA is currently working with municipalities to clarify how financial capabilities of local governments should be considered in determining Clean Water Act obligations. We welcome the opportunity to discuss these initiatives further with municipal governments.

We trust this information is helpful in addressing your concerns. If we can be of further assistance, please call me or our Congressional Liaison Officer, Brent Maier at (415) 947-4256.

Sincerely,

Jared Blumenfeld

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
San Diego Region

Errata Sheet
(OPTION 1)
CORRECTED
Tentative Order No. R9-2013-0001
NPDES No. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The following changes to the revised version of Tentative Order No. R9-2013-0001, released March 27, 2013, are based on the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) Public Hearing testimony presented during Agenda Item No. 8 at the April 10 and 11, 2013 San Diego Water Board Meeting. The changes to the Tentative Order listed below are shown in underline/strikeout format to indicate added and removed language, respectively.

GENERAL Errata

Correct typographical and grammatical errors.

FINDINGS Errata

1) Discharge Characteristics and Runoff Management Findings

Add the following finding after Finding 17, and renumber the subsequent findings appropriately:

18. Water Quality Improvements. Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges to the MS4s and control pollutants in storm water discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the Clean Water Act.

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Errata Sheet (OPTION 1) CORRECTED

PROVISION A Errata

1) Provision A.4.a.(4)

(4) Within 90 days of the San Diego Water Board determination that the ~~update~~ modifications to the Water Quality Improvement Plan required under Provision A.4.a.(3) meet~~s~~ the requirements of this Order, the applicable Copermittees must revise the jurisdictional runoff management program documents to incorporate the ~~updated~~ modified water quality improvement strategies that have been and will be implemented, the implementation schedule, and any additional monitoring required; and

PROVISION B Errata

1) Provision B Introductory Paragraph

The purpose of this provision is to develop Water Quality Improvement Plans that guide the Copermittees' jurisdictional runoff management programs towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plans is to further the Clean Water Act's objective to protect, preserve, ~~and~~ enhance, and restore the water quality and designated beneficial uses of waters of the state. This goal will be accomplished through an adaptive planning and management process that identifies the highest priority water quality conditions within a watershed and implements strategies through the jurisdictional runoff management programs to achieve improvements in the quality of discharges from the MS4s and receiving waters.

2) Provision B.3.b.(4)(b)

(b) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify and compile a list of candidate projects that could potentially be used as alternative compliance options for Priority Development Projects, to be implemented in lieu of onsite structural BMP performance requirements described in Provisions E.3.c.(1) and E.3.c.(2). Specifically, the Copermittees must identify opportunities to be included in the list for candidate projects in each Watershed Management Area, such as:

(i) ~~Opportunities for s~~Stream or riparian area rehabilitation;

(ii) ~~Opportunities for r~~Retrofitting existing infrastructure to incorporate storm water retention or treatment;

(iii) ~~Opportunities for r~~Regional BMPs;

(iv) ~~Opportunities for g~~Groundwater recharge projects;

(v) ~~Opportunities for w~~Water supply augmentation projects; and

(vi) ~~Opportunities for l~~Land purchases to preserve floodplain functions.

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Errata Sheet (OPTION 1) CORRECTED

3) Provision B.3.c

~~c. DISCHARGE PROHIBITIONS AND RECEIVING WATER LIMITATIONS COMPLIANCE OPTION~~

~~(1) The Copermittees may utilize implementation of the water quality improvement strategies in the Water Quality Improvement Plan to demonstrate compliance with the requirements of Provisions A.1.a, A.1.c and A.2.a. For each Copermittee in the Watershed Management Area that chooses to utilize this option, the Copermittee will be in compliance with Provisions A.1.a, A.1.c and A.2.a if:~~

~~(a) Numeric goals and schedules developed pursuant to Provision B.3.a include the following numeric goals:~~

~~(i) WQBELs expressed as concentration-based or load-based effluent limitations applicable to the Watershed Management Area established by the TMDLs in Attachment E to this Order; and~~

~~(ii) Numeric goals applicable to the Copermittee's MS4 discharges expressed as concentration-based or load-based effluent limitations for all other pollutants listed on the Clean Water Act Section 303(d) List of Water Quality Impaired Segments[1] for the receiving waters in the Watershed Management Area that do not have a TMDL developed; and~~

~~(iii) Numeric goals for receiving waters that will protect the conditions of the receiving waters and attain water quality standards.~~

~~(b) An analysis utilizing a watershed model or other watershed analytical tools is performed. The results must be included in the Water Quality Improvement Plan to quantitatively demonstrate that the implementation of the water quality improvement strategies required under Provision B.3.b will achieve the numeric goals within the established schedules required under Provision B.3.a. The analysis may be performed individually or jointly by the Copermittees choosing to utilize this option in the Watershed Management Area, and must be updated as part of the iterative approach and adaptive management process required under Provisions B.5.a-b.~~

~~(c) The Water Quality Improvement Plan specifies the monitoring and assessments (i.e. MS4 outfall discharge, receiving water, and/or special studies) that will be performed by the Copermittee to confirm the implementation of the water quality improvement strategies within its jurisdiction is making progress toward achieving the numeric goals in accordance with the established schedules developed pursuant to Provision B.3.c.(1)(a). The monitoring and assessments must be~~

~~[1] 2002 and subsequent 303(d) Lists~~

~~incorporated into the monitoring and assessment program required pursuant to Provision B.4. The monitoring and assessments must be updated as part of the iterative approach and adaptive management process required under Provision B.5.c.~~

~~(d) The numeric goals proposed pursuant to Provision B.3.c.(1)(a), the analysis performed pursuant to Provision B.3.c.(1)(b) and the specific monitoring and assessments proposed pursuant to Provision B.3.c.(1)(c) have been reviewed and receive concurrence by a majority of the Water Quality Improvement Consultation Panel (see Provision F.1.a.(1)(b)). Updates must also receive concurrence by a majority of the Water Quality Improvement Consultation Panel.~~

~~(2) Each Copermittee that chooses to utilize this option will, for the pollutant/water body combinations covered by the analysis, be in compliance with Provisions A.1.a, A.1.c and A.2.a when the Water Quality Improvement Plan, incorporating the requirements of Provision B.3.c.(1), is accepted by the San Diego Water Board.~~

~~(3) The Copermittee will, for the pollutant/water body combinations covered by the analysis, remain in compliance with Provisions A.1.a, A.1.c and A.2.a during the term of this Order as long as:~~

~~(a) The results of the analysis performed pursuant to Provision B.3.c.(1)(d) is accepted and continues to be accepted by the San Diego Water Board Executive Officer as part of the Water Quality Improvement Plan; AND~~

~~(b) The Copermittee continues to implement the water quality improvement strategies within its jurisdiction developed pursuant to Provision B.3.b.(1) in accordance with the schedules for implementing the strategies established pursuant to Provision B.3.b.(3)(a); AND~~

~~(c) The Copermittee continues to perform the monitoring and assessments specified in the Water Quality Improvement Plan, developed and implemented pursuant to Provision B.3.c.(1)(c), to demonstrate its progress toward achieving the numeric goals applicable to its MS4 discharges in accordance with the interim and final dates for achieving the numeric goals established pursuant to Provision B.3.a.(2); AND~~

~~(d) The Copermittees in the Watershed Management Area continue to implement the requirements of Provision A.4.a.~~

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Errata Sheet (OPTION 1) CORRECTED

PROVISION D Errata

1) Provision D.2.a.(3)(b)

(b) Transitional Wet Weather MS4 Outfall Discharge Monitoring Frequency

Each wet weather MS4 outfall discharge monitoring station selected pursuant to Provision D.2.a.(3)(a) must be monitored ~~twice~~ once during the wet season (October 1 – April 30). The wet weather monitoring events must be selected to be representative of the range of hydrological conditions experienced in the region. At least 10 percent of samples must be conducted during the first wet weather event of the wet season, to include at least one such sample in each Watershed Management Area.~~.~~

2) Provision D.3.d

(d) Special studies initiated prior to the effective date of this Order that meet the requirements of Provision D.3.b and are implemented during the term of this Order as part of the Water Quality Improvement Plan may be utilized to fulfill the special study requirements of Provision D.3.a. Special studies completed before the effective date of this Order ~~Water Quality Improvement Plan is accepted by the San Diego Water Board~~ cannot be utilized to fulfill the special study requirements of Provision D.3.a.

3) Provision D.4.b.(2)(b)(i)[d]

[d] The percent contribution of storm water volumes and pollutant loads discharged from each land use type within ~~the~~ each hydrologic subarea with a major MS4 outfall to receiving waters or within each major MS4 outfall to receiving waters ~~drainage basin to each of~~ in the Copermittee's ~~major MS4 outfalls in its~~ jurisdiction ~~to receiving waters~~ within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch.

PROVISION E Errata

1) Provision E.3.b.(1)

(1) Definition of Priority Development Project

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site)~~, or redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site)~~. This ~~category~~ includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

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Errata Sheet (OPTION 1) CORRECTED

(b) Redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site on an existing site of 10,000 square feet or more of impervious surfaces). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

~~(b)~~
(c) New or redevelopment projects that create 5,000 square feet or more of impervious surface (collectively over the entire project site), and support one or more of the following uses:

2) Provision ~~E.3.c.(3)(b)~~ E.3.b.(3)(b)

(b) Retrofitting or redevelopment of existing paved alleys, streets or roads that are designed and constructed in accordance with the USEPA Green Streets guidance.

3) Provision E.3.c.(1)

(a) Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite ~~100 percent of~~ the pollutants contained in the volume of storm water runoff produced from a 24-hour 85th percentile storm event (design capture volume)~~;~~.

~~(b)~~ (i) If a Copermittee determines that implementing BMPs to retain the full design capture volume onsite for a Priority Development Project is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize ~~flow-thru treatment control~~ biofiltration BMPs. Biofiltration BMPs must be sized and designed to: ~~achieve the equivalent pollutant load removal described in Provision E.3.c.(1)(a). Biofiltration LID BMPs must be considered as a first option before other types of flow-thru treatment control BMPs may be considered.~~

[a] Treat 1.5 times the design capture volume not reliably retained onsite; OR
[b] Treat the design capture volume not reliably retained onsite with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite.
[c] Have an appropriate loading rate to prevent erosion, scour, and channeling within the BMP.

(ii) If a Copermittee determines that biofiltration is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize flow-thru treatment control BMPs to treat runoff leaving the site, AND mitigate for

the design capture volume not reliably retained onsite pursuant to Provision E.3.(c)(1)(b). Flow thru treatment control BMPs must be sized and designed to:

[a] Remove pollutants from storm water to the MEP;
[b] Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;
[c] Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Flow-thru treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of flow-thru treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

~~(c)~~
(b) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1)(a). The Priority Development Project must mitigate for the portion of the pollutant load in the design capture volume not retained onsite if Provision E.3.~~(~~c.~~)~~(3) is utilized. If a Priority Development Project is allowed to utilize alternative compliance, flow-thru treatment control BMPs must be implemented to treat the portion of the design capture volume that is not reliably retained onsite. Flow-thru treatment control BMPs must be sized and designed in accordance with Provision E.3.c.(1)(a)(ii)[a]-[c].

~~(d) If a Priority Development project is allowed to utilize alternative compliance, flow-thru treatment control BMPs must be implemented to treat the portion of the design capture volume that is not retained onsite. Flow-thru treatment control BMPs must be sized and designed to:~~

~~(i) Remove pollutants from storm water to the MEP;~~

~~(ii) Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;~~

~~(iii) Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Flow-thru treatment control BMPs with a low removal efficiency ranking must only be~~

~~approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of flow-thru treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.~~

4) Provision E.3.c.(2)(b)

(b) Each Priority Development Project must avoid ~~known~~ critical sediment yield areas known to the Copermittee or identified by the Watershed Management Area Analysis pursuant to Provision B.3.b.(4), or implement measures that allow critical coarse sediment to be discharged to receiving waters, such that there is no net impact to the receiving water ~~sediment supply is unaffected by the project~~.

5) Provision E.3.c.(3)(a)(ix)

~~(ix) Receiving waters must not be utilized to convey untreated storm water runoff from the Priority Development Project to the candidate project;~~

6) Provision E.3.e.(1)(a)

(a) Each Copermittee must require and confirm that for all Priority Development Project applications that have not received prior lawful approval by the Copermittee by the time the BMP Design Manual is updated pursuant to Provision E.3.d ~~18 months after the commencement of coverage under this Order~~, the requirements of Provision E.3 are implemented. For project applications that have received prior lawful approval ~~by 18 months after~~ before the BMP Design Manual is updated pursuant to Provision E.3.d ~~commencement of coverage under this Order~~, the Copermittee may allow previous land development requirements to apply.

PROVISION F Errata

1) Provisions F.1 and F.2

Delete the terms "~~certification~~" and "~~notification of concurrence~~" and replace with "notification of acceptance" throughout Provisions F.1 and F.2.

2) Provision F.1.a.(1)(c)

(c) The Copermittees must coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public ~~as much~~ time and opportunity ~~as possible~~ to participate during the development of the Water Quality Improvement Plans.

Tentative Order No. R9-2013-0001
Errata Sheet (OPTION 1) CORRECTED

3) Provision F.1.b.(7)

(7) During implementation of the Water Quality Improvement Plan ~~after implementation~~ the Copermittees must correct any deficiencies in the Plan identified by the San Diego Water Board ~~no later than 90 days~~ in the updates submitted with the Water Quality Improvement Plan Annual Report following a request by the Board to do so.

4) Provision F.2.a.(2)

(2) Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E ~~no later than 3 months after San Diego Water Board notification of concurrence with~~ concurrent with the submittal of the Water Quality Improvement Plan. Each Copermittee must correct any deficiencies in the jurisdictional runoff management program document based on comments received from the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report.

5) Provision F.2.b.(1)

(1) Each Copermittee must update its BMP Design Manual to incorporate the requirements of Provisions E.3.a-d ~~no later than 3 months after San Diego Water Board notification of concurrence with~~ concurrent with the submittal of the Water Quality Improvement Plan ~~by the San Diego Water Board Executive Officer~~. Each Copermittee must correct any deficiencies in the BMP Design Manual based on comments received from the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report.

6) Provision F.3.b.(2)

(2) Transitional Monitoring and Assessment Program Annual Reports

The Copermittees for each Watershed Management Area must submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted under this Order. The Transitional Monitoring and Assessment Program Annual Reports must include:

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Errata Sheet (OPTION 1) CORRECTED

ATTACHMENT E Errata

1) Attachment E, Specific Provision 1.b.(3)(a)-(c)

Delete "~~Copermittees'~~" and replace with "Copermittee's"

2) Attachment E, Specific Provision 1.d

Add the following after Specific Provision 1.d.(2):

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 1.b.(2)(b), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

3) Attachment E, Specific Provision 2.b.(2)(b), Table 2.2

Table 2.2
Final Effluent Limitations as Expressed as Annual Loads in MS4 Discharges to Shelter Island Yacht Basin

Constituent	Effluent Limitation
Dissolved Copper	30 g/yr*

* If the water quality objectives for dissolved copper in Shelter Island Yacht Basin are changed in the future, then the margin of safety (MOS), TMDL and allocations will be recalculated using the *Method for Recalculation of the Total Maximum Daily Load for Dissolved Copper in the Shelter Island Yacht Basin, San Diego Bay* in the Basin Plan (p. 7-14).

4) Attachment E, Specific Provision 3.d

Add the following after Specific Provision 3.d.(2):

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 3.b.(2)(b)(i), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

5) Attachment E, Specific Provision 4.b.(3)(a)-(c)

Delete "~~Copermittees'~~" and replace with "Copermittee's"

6) Attachment E, Specific Provision 4.c.(2)(a)-(d)

Delete "~~Copermittees'~~" and replace with "Copermittee's"

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Errata Sheet (OPTION 1) CORRECTED

7) Attachment E, Specific Provision 4.d

Add the following after Specific Provision 4.d.(2):

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 4.b.(2)(b) or 4.c.(1), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

8) Attachment E, Specific Provision 5.b.(3)(a)-(c)

Delete "~~Copermittees'~~" and replace with "Copermittee's"

9) Attachment E, Specific Provision 5.c.(1)(b)(i)-(iii)

Delete "~~Copermittees'~~" and replace with "Copermittee's"

10) Attachment E, Specific Provision 5.d.(3)

Add the following after Specific Provision 5.d.(3)(a) and renumber subsequent provisions appropriately:

(b) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 5.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

11) Attachment E, Specific Provision 6.b.(2)(a), Table 6.2a

Table 6.2a
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Beaches

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform	10,000	22% ~~/ 0%~~	1,000	0%
Fecal Coliform	400	22% ~~/ 0%~~	200	0%
Enterococcus	104	22% ~~/ 0%~~	35	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. ~~The 0% single sample maximum allowable exceedance frequency applies to dry weather days.~~ For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan.

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Errata Sheet (OPTION 1) CORRECTED

12) Attachment E, Specific Provision 6.b.(2)(a), Table 6.2b

Table 6.2b
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Creeks

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Fecal Coliform	400	22% ~~/ 0%~~	200	0%
Enterococcus	61 (104)	22% ~~/ 0%~~	33	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. ~~The 0% single sample maximum allowable exceedance frequency applies to dry weather days.~~ For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Basin Plan.
d. A single sample maximum of 104 MPN/100ml for *Enterococcus* may be applied as a receiving water limitation for creeks, instead of 61~~0~~ MPN/100mL, if one or more of the creeks addressed by these TMDLs (San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek, San Diego River, and/or Chollas Creek) is designated with a "moderately to lightly used area" or less frequent usage frequency in the Basin Plan. Otherwise, the single sample max~~m~~imum of 61 MPN/100mL for *Enterococcus* must be used to assess compliance with the allowable exceedance frequency.

13) Attachment E, Specific Provision 6.b.(2)(b), Table 6.2

Table 6.2c
Final Effluent Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies in MS4 Discharges to the Water Body

Constituent	Concentration-Based Effluent Limitations			
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform[d]	10,000	22% ~~/ 0%~~	1,000	0%
Fecal Coliform	400	22% ~~/ 0%~~	200	0%
Enterococcus	104[e] / 61[f]	22% ~~/ 0%~~	35[e] / 33[f]	0%

Notes:
a. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. ~~The 0% single sample maximum allowable exceedance frequency applies to dry weather days.~~ For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan for discharges to beaches, and the Basin Plan for discharges to creeks and creek mouths.
d. Total coliform effluent limitations only apply to MS4 outfalls that discharge to the Pacific Ocean Shorelines and creek mouths listed in Table 6.0.
e. This *Enterococcus* effluent limitation applies to MS4 discharges to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
f. This *Enterococcus* effluent limitation applies to MS4 discharges to segments or areas of creeks or creek mouths listed in Table 6.0.

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Errata Sheet (OPTION 1) CORRECTED

14) Attachment E, Specific Provision 6.b.(3)(a)-(c)

Delete "~~Copermittees'~~" and replace with "Copermittee's"

15) Attachment E, Specific Provision 6.c.(3)(a)-(c)

Delete "~~Copermittees'~~" and replace with "Copermittee's"

16) Attachment E, Specific Provision 6.d.(1)(b)

Add the following after Specific Provision 6.d.(1)(b)(iii):

(iv) For Pacific Ocean Shoreline segments or areas listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

17) Attachment E, Specific Provision 6.d.(1)(c)

Add the following after Specific Provision 6.d.(1)(c)(iii) and renumber subsequent provisions appropriately:

(iv) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

18) Attachment E, Specific Provision 6.d.(1)(c)(iii)[c]

[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria density~~y~~ies ~~result~~ reported from ~~wet weather samples collected~~ each of the storm events sampled; and

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Errata Sheet (OPTION 1) CORRECTED

19) Attachment E, Specific Provision 6.d.(2)(b)

Add the following after Specific Provision 6.d.(2)(b)(iii):

(iv) For creeks or creek mouths listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

20) Attachment E, Specific Provision 6.d.(2)(c)

Add the following after Specific Provision 6.d.(2)(c)(iv) and renumber subsequent provisions appropriately:

(v) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

21) Attachment E, Specific Provision 6.d.(2)(c)(iii)[c]

[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria density~~y~~ies ~~result~~ reported from ~~wet weather samples collected~~ each of the storm events sampled; and

ATTACHMENT F Errata

1) Attachment F, Under the Fact Sheet discussion of Provision A.4

~~The San Diego Water Board recognizes that there is an apparent disparity between the Copermittees being able to demonstrate and be in compliance with the TMDLs in Attachment E and the discharge prohibitions and receiving water limitations in Provisions A.1.a, A.1.c, and A.2.a. Thus, similar to the TMDL requirements in Attachment E, the Order establishes a process under Provision B.3.c that the Copermittees may choose to utilize to demonstrate and be in compliance with the discharge prohibitions and receiving water limitations in Provisions A.1.a, A.1.c, and A.2.a. This process is described in more detail under the discussion for Provision B.3.~~

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Errata Sheet (OPTION 1) CORRECTED

2) Attachment F, Under the Fact Sheet discussion of Provision B

Purpose: Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges to the MS4s and control pollutants in storm water discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the Clean Water Act.

Provision B includes requirements for the Copermittees to develop and implement Water Quality Improvement Plans to ultimately comply with the prohibitions and limitations under Provision A. The Water Quality Improvement Plans will provide the Copermittees a comprehensive program that can achieve the requirements and further the objectives of the CWA. Implementation of the Water Quality Improvement Plans will also improve the quality of the receiving waters in the San Diego Region.

3) Attachment F, Under the Fact Sheet discussion of Provision B.3

~~Finally, Provision B.3.c has been included to provide the Copermittees an option to demonstrate and be in compliance with the requirements of Provisions A.1.a, A.1.c and A.2.a. One or more Copermittees within a Watershed Management Area can choose to implement this option. This option is only expected to be utilized by the Copermittees that wish to clearly demonstrate and be in compliance with the requirements of Provisions A.1.a, A.1.c and A.2.a.~~

~~In order for a Copermittee to utilize this option, the Copermittee is required to include three components in the Water Quality Improvement Plan. The first component is a comprehensive set of numeric goals that will demonstrate the requirements of Provisions A.1.a, A.1.c and A.2.a will be achieved. The criteria provided in the Order will require the Copermittee to demonstrate that the discharges from its MS4s will not cause or contribute to exceedances of water quality objectives in the receiving waters, and the receiving waters will be protected from the Copermittee's MS4 discharges.~~

~~The second component is an analysis utilizing a watershed model or other watershed analytical tools. The analysis must demonstrate that the implementation of the water quality improvement strategies required under Provision B.3.b will achieve the numeric goals within the established schedules required under Provision B.3.a. Because the development of the analysis may require significant resources, the Order allows the Copermittees in each Watershed Management Area that~~

~~choose to implement this option to perform the analysis individually, or pool their resources for the analysis collectively.~~

~~The San Diego Water Board does not expect the analysis to be a "guarantee" that the water quality improvement strategies will achieve the numeric goals within the established schedules. The analysis, however, must "reasonably" and "quantitatively" demonstrate that the implementation of the water quality improvement strategies can achieve the numeric goals within the established schedules. However, as more data and information are collected to demonstrate progress toward achieving the numeric goals, the numeric goals, water quality improvement strategies and schedules may need to be updated. When these updates occur, the Copermittees that choose to utilize this option must also update the analysis.~~

~~Thus, the third component is the key component that will allow a Copermittee to demonstrate the implementation of the water quality improvement strategies within its jurisdiction is making progress toward achieving the numeric goals. Each Copermittee must specify the monitoring and assessments that will be performed to confirm the implementation of the water quality improvement strategies are making progress toward achieving the numeric goals within the established schedules.~~

~~These three components must then be reviewed by the Water Quality Improvement Consultation Panel. The Water Quality Improvement Consultation Panel is required to be formed as part of the public participation process for the development of the Water Quality Improvement Plans. The Water Quality Improvement Consultation Panel is described under Provision F.1.a.(1)(b). Review by the Water Quality Improvement Consultation Panel has been included to provide an additional layer of input, support, and accountability for the implementation of this option.~~

~~Compliance with the requirements of Provisions A.1.a, A.1.c and A.2.a begins when the Water Quality Improvement Plan, incorporating the requirements of Provision B.3.c.(1), is accepted by the San Diego Water Board. Each Copermittee that chooses to implement and continues to implement this option will be in compliance with the requirements of Provisions A.1.a, A.1.c and A.2.a as long as the San Diego Water Board continues to accept the analysis, and subsequent updates, and the Copermittee continues to implement the strategies, monitoring and assessments as incorporated in the Water Quality Improvement Plan in accordance with Provision B.3.c.(1).~~

4) Attachment F, Under the Fact Sheet discussion of Provision D.2

Until the wet weather MS4 outfall discharge monitoring requirements of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board, the Copermittees must comply with the requirements of transitional wet weather MS4 outfall monitoring requirements pursuant to Provision D.2.a.(3). Provision D.2.a.(3) requires the Copermittees in each ~~Copermittee~~ Watershed Management Area to sample, at least five of the major MS4 outfalls inventoried pursuant to Provision D.2.a.(1) ~~twice~~ once per wet season for the monitoring data required to be collected pursuant to Provision D.2.a.(3)(c)-(e). Provision D.2.a.(3) further requires at least one major MS4 outfall monitoring station be located in each Copermittee's jurisdiction within the Watershed Management Area.

5) Attachment F, Under the Fact Sheet discussion of Provision E.3

The 85th percentile storm event is the event that has a precipitation total greater than or equal to 85 percent of all storm events over a given period of record in a specific area or location. For example, to determine what the 85th percentile storm event is in a specific location, all 24 hour storms that have recorded values over a 30 year period would be tabulated and a 85th percentile storm would be determined from this record (i.e., 15 percent of the storms would be greater than the number determined to be the 85th percentile storm). Most jurisdictions in the San Diego Region have already developed isopluvial maps that can provide this type of information. The 85th percentile storm might be determined to be a number such as 1.0 inch, and this would be multiplied by the total area of the project footprint producing runoff to calculate the design capture volume. The Priority Development Project designer would then select a system of BMPs that would retain (i.e. intercept, store, infiltrate, evaporate, or evapotranspire) ~~100 percent of~~ the pollutants contained in the design capture volume onsite.

Retention BMPs are necessary to capture and retain pollutants generated from a Priority Development Project. In a recent study performed by SCCWRP in the Los Angeles Region, they found "*that the magnitude of constituent load associated with storm water runoff depends, at least in part, on the amount of time available for pollutant build-up on land surfaces. The extended dry period that typically occurs in arid climates such as southern California maximizes the time for constituents to build-up on land surfaces, resulting in proportionally higher concentrations and loads during initial storms of the season*."[2] This implies that the "first flush" of a rainy season and the first storm events after long antecedent dry periods tend to have the highest pollutant loads. Capturing and retaining the pollutant loads of the "first flush" of a rainy season and the first storm events after long antecedent dry periods will

[2] Stein, E.D., Tiefenthaler, L.L., and Schiff, K.C., 2007. Technical Report 510, Sources, Patterns and Mechanisms of Storm Water Pollutant Loading from Watershed and Land Uses of the Greater Los Angeles Area, California, USA. March 20, 2007.

reduce a significant portion of the pollutants in storm water discharged to and from the MS4.

The San Diego Water Board, however, acknowledges that in some situations retention of the full design capture volume onsite may not be technically feasible. In this event, the Copermittee may allow the Priority Development Project to utilize biofiltration BMPs to treat 1.5 times the design capture volume not reliably retained onsite, or biofiltration BMPs with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite ~~flow-thru treatment control BMPs to achieve the equivalent pollutant load removal that would have been achieved if the design capture volume were fully retained onsite, pursuant to Provision E.3.c.(1)(b). Biofiltration LID BMPs must be considered as a first option before other types of flow-thru treatment control BMPs may be considered because of the ancillary benefits they provide, such as reduction in flow rates and creation of habitat. In any event, no matter what types of BMPs (or combination of BMPs) are chosen, 100 percent of the pollutants contained in the design capture volume must not be allowed to be discharged from the Priority Development Project~~.

The 1.5 multiplier is based on the finding in the Ventura County Technical Guidance Manual that biofiltration of 1.5 times the design capture volume not retained onsite will provide approximately the same pollutant removal as retention of the design capture volume on an annual basis.[3] This standard is consistent with the Los Angeles Water Board's Los Angeles and Ventura County municipal storm water permits (Order Nos. R4-2012-0175 and R4-2010-0108, respectively). The flow-thru design of 0.75 times the portion of the design capture volume not reliably retained onsite is consistent with the San Diego Water Board's Orange County and Riverside County municipal storm water permits (Order Nos. R9-2009-0002 and R9-2010-0016, respectively).

The San Diego Water Board further recognizes that, in addition to not being technically feasible, retention of the full design capture storm onsite may be cost prohibitive, or may not provide as much water quality benefit to the Watershed Management Area as would implementing BMPs elsewhere in the watershed. Thus, Provision ~~E.3.c.(1)(c)~~ E.3.c.(1)(b) allows for the use of a combination of onsite retention BMPs, and the implementation of an Alternative Compliance Program described in Provision E.3.c.(3). Provision E.3.c.(3) is discussed in more detail below.

If the full design capture volume is not retained onsite either because biofiltration is not technically feasible, or a Copermittee grants a Priority Development Project permission to utilize the Alternative Compliance Program, then the pollutants in the portion of the design capture volume that are not reliably retained onsite must still be reduced to the MEP. Thus, flow-thru treatment control BMPs are required to be implemented on Priority Development Projects in addition to the retention BMPs.

[3] Ventura Countywide Stormwater Management Program. 2011. Ventura Technical Guidance Manual, Manual Update, 2011.

The requirements of Provisions ~~E.3.c.(1)(d)~~ E.3.c.(1)(a)(ii)[a]-[c] include the performance standards for flow-thru treatment control BMPs, consistent with the Fourth Term Permits in the San Diego Region.

6) Attachment F, Under the Fact Sheet discussion of Provision F.1

The San Diego Water Board recognizes that the development of multiple Water Quality Improvement Plans concurrently may limit the ability of the public to review and provide comments to the Copermittees. Thus, Provision F.1.a.(1)(c) requires the Copermittees to coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public ~~as much~~ time and opportunity ~~as possible~~ to participate during the development of the Water Quality Improvement Plans.

7) Attachment F, Under the Fact Sheet discussion of Provision F.2

Each Copermittee is required to continue implementing a jurisdictional runoff management program, as required under Provision E. Implementation of each Copermittee's jurisdictional runoff management program is directed by its jurisdictional runoff management program document. Provision F.2.a requires each Copermittee to update its jurisdictional runoff management program document to be consistent with the requirements of Provision E ~~within 3 months after the acceptance~~ concurrent with the submittal of the Water Quality Improvement Plan.

Likewise, each Copermittee must continue to require new development and redevelopment projects to implement BMPs to control pollutants in storm water runoff. The control of pollutants in storm water runoff from development and redevelopment projects within each Copermittee's jurisdiction is guided and directed by its BMP Design Manual, formerly known as a Standard Storm Water Mitigation Plan (SSMP). Provision F.2.b requires each Copermittee to update its BMP Design Manual to be consistent with the requirements of Provision E.3 ~~within 3 months after the acceptance~~ concurrent with the submittal of the Water Quality Improvement Plan.

8) Attachment F, Under the Fact Sheet discussion of Provision F.3

Provision F.3.b.(2) includes the transitional annual reporting requirements for the transitional monitoring and assessment program for each Watershed Management Area. The Copermittees in the Watershed Management Area are required to submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted. The Transitional Monitoring and Assessment Program Annual Report is required to include the transitional period monitoring data collected pursuant to Provisions D.1.a and D.2.a, and the findings from the transitional period findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

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CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
San Diego Region

Errata Sheet
(OPTION 2)
CORRECTED
Tentative Order No. R9-2013-0001
NPDES No. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The following changes to the revised version of Tentative Order No. R9-2013-0001, released March 27, 2013, are based on the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) Public Hearing testimony presented during Agenda Item No. 8 at the April 10 and 11, 2013 San Diego Water Board Meeting. The changes to the Tentative Order listed below are shown in underline/strikeout format to indicate added and removed language, respectively.

GENERAL Errata

Correct typographical and grammatical errors.

FINDINGS Errata

1) Discharge Characteristics and Runoff Management Findings

Add the following finding after Finding 17, and renumber the subsequent findings appropriately:

18. Water Quality Improvements. Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges to the MS4s and control pollutants in storm water discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the Clean Water Act.

Tentative Order No. R9-2013-0001
Errata Sheet (OPTION 2) CORRECTED

PROVISION A Errata

1) Provision A.4.a.(4)

(4) Within 90 days of the San Diego Water Board determination that the ~~update~~ modifications to the Water Quality Improvement Plan required under Provision A.4.a.(3) meet~~s~~ the requirements of this Order, the applicable Copermittees must revise the jurisdictional runoff management program documents to incorporate the ~~updated~~ modified water quality improvement strategies that have been and will be implemented, the implementation schedule, and any additional monitoring required; and

PROVISION B Errata

1) Provision B Introductory Paragraph

The purpose of this provision is to develop Water Quality Improvement Plans that guide the Copermittees' jurisdictional runoff management programs towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plans is to further the Clean Water Act's objective to protect, preserve, ~~and~~ enhance, and restore the water quality and designated beneficial uses of waters of the state. This goal will be accomplished through an adaptive planning and management process that identifies the highest priority water quality conditions within a watershed and implements strategies through the jurisdictional runoff management programs to achieve improvements in the quality of discharges from the MS4s and receiving waters.

2) Provision B.3.b.(4)(b)

(b) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify and compile a list of candidate projects that could potentially be used as alternative compliance options for Priority Development Projects, to be implemented in lieu of onsite structural BMP performance requirements described in Provisions E.3.c.(1) and E.3.c.(2). Specifically, the Copermittees must identify opportunities to be included in the list for candidate projects in each Watershed Management Area, such as:

(i) ~~Opportunities for s~~Stream or riparian area rehabilitation;

(ii) ~~Opportunities for r~~Retrofitting existing infrastructure to incorporate storm water retention or treatment;

(iii) ~~Opportunities for r~~Regional BMPs;

(iv) ~~Opportunities for g~~Groundwater recharge projects;

(v) ~~Opportunities for w~~Water supply augmentation projects; and

(vi) ~~Opportunities for l~~Land purchases to preserve floodplain functions.

3) Provision B.3.c

Revise references to "Provisions A.1.a, A.1.c and A.2.a" to "Provisions A.1.a, A.1.c, A.1.d, A.2.a and A.2.b~~a~~" throughout the requirements of the Provision B.3.c.

4) Provision B.3.c.(1)(d)

(d) The numeric goals proposed pursuant to Provision B.3.c.(1)(a), the analysis performed pursuant to Provision B.3.c.(1)(b) and the specific monitoring and assessments proposed pursuant to Provision B.3.c.(1)(c) have been reviewed ~~and receive concurrence~~ by ~~a majority of~~ the Water Quality Improvement Consultation Panel (see Provision F.1.a.(1)(b)) for any recommendations. Updates must also ~~receive concurrence~~ be reviewed by ~~a majority of~~ the Water Quality Improvement Consultation Panel for any recommendations.

5) Provision B.3.c.(3)(a)

(a) The results of the analysis performed pursuant to Provision B.3.c.(1)(b~~d~~) is accepted ~~and continues to be accepted~~ by the San Diego Water Board Executive Officer as part of the Water Quality Improvement Plan and as part of subsequent updates to the Water Quality Improvement Plan; AND

6) Provision B.3.c.(3)(d)

(d) The Copermittee~~s in the Watershed Management Area~~ continues to implement the requirements of Provision A.4.a.

PROVISION D Errata

1) Provision D.2.a.(3)(b)

(b) Transitional Wet Weather MS4 Outfall Discharge Monitoring Frequency

Each wet weather MS4 outfall discharge monitoring station selected pursuant to Provision D.2.a.(3)(a) must be monitored ~~twice~~ once during the wet season (October 1 – April 30). The wet weather monitoring events must be selected to be representative of the range of hydrological conditions experienced in the region. At least 10 percent of samples must be conducted during the first wet weather event of the wet season, to include at least one such sample in each Watershed Management Area.~~.~~

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Errata Sheet (OPTION 2) CORRECTED

2) Provision D.3.d

(d) Special studies initiated prior to the effective date of this Order that meet the requirements of Provision D.3.b and are implemented during the term of this Order as part of the Water Quality Improvement Plan may be utilized to fulfill the special study requirements of Provision D.3.a. Special studies completed before the effective date of this Order ~~Water Quality Improvement Plan is accepted by the San Diego Water Board~~ cannot be utilized to fulfill the special study requirements of Provision D.3.a.

3) Provision D.4.b.(2)(b)(i)[d]

[d] The percent contribution of storm water volumes and pollutant loads discharged from each land use type within ~~the~~ each hydrologic subarea with a major MS4 outfall to receiving waters or within each major MS4 outfall to receiving waters ~~drainage basin to each of~~ in the Copermittee's ~~major MS4 outfalls in its~~ jurisdiction ~~to receiving waters~~ within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch.

PROVISION E Errata

1) Provision E.3.b.(1)

(1) Definition of Priority Development Project

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site)~~, or redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site)~~. This ~~category~~ includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(b) Redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site on an existing site of 10,000 square feet or more of impervious surfaces). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

~~(b)~~
(c) New or redevelopment projects that create 5,000 square feet or more of impervious surface (collectively over the entire project site), and support one or more of the following uses:

Tentative Order No. R9-2013-0001
Errata Sheet (OPTION 2) CORRECTED

2) Provision ~~E.3.c.(3)(b)~~ E.3.b.(3)(b)

(b) Retrofitting or redevelopment of existing paved alleys, streets or roads that are designed and constructed in accordance with the USEPA Green Streets guidance.

3) Provision E.3.c.(1)

(a) Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite ~~100 percent of~~ the pollutants contained in the volume of storm water runoff produced from a 24-hour 85th percentile storm event (design capture volume)~~;~~.

~~(b)~~ (i) If a Copermittee determines that implementing BMPs to retain the full design capture volume onsite for a Priority Development Project is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize ~~flow-thru treatment control~~ biofiltration BMPs. Biofiltration BMPs must be sized and designed to: ~~achieve the equivalent pollutant load removal described in Provision E.3.c.(1)(a). Biofiltration LID BMPs must be considered as a first option before other types of flow-thru treatment control BMPs may be considered.~~

[a] Treat 1.5 times the design capture volume not reliably retained onsite; OR
[b] Treat the design capture volume not reliably retained onsite with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite.
[c] Have an appropriate loading rate to prevent erosion, scour, and channeling within the BMP.

(ii) If a Copermittee determines that biofiltration is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize flow-thru treatment control BMPs to treat runoff leaving the site, AND mitigate for the design capture volume not reliably retained onsite pursuant to Provision E.3.(c)(1)(b). Flow thru treatment control BMPs must be sized and designed to:

[a] Remove pollutants from storm water to the MEP;
[b] Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;

[c] Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Flow-thru treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of flow-thru treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

~~(c)~~

(b) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1)(a). The Priority Development Project must mitigate for the portion of the pollutant load in the design capture volume not retained onsite if Provision E.3.~~(~~c.~~)~~(3) is utilized. If a Priority Development Project is allowed to utilize alternative compliance, flow-thru treatment control BMPs must be implemented to treat the portion of the design capture volume that is not reliably retained onsite. Flow-thru treatment control BMPs must be sized and designed in accordance with Provision E.3.c.(1)(a)(ii)[a]-[c].

~~(d) If a Priority Development project is allowed to utilize alternative compliance, flow-thru treatment control BMPs must be implemented to treat the portion of the design capture volume that is not retained onsite. Flow-thru treatment control BMPs must be sized and designed to:~~

~~(i) Remove pollutants from storm water to the MEP;~~

~~(ii) Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;~~

~~(iii) Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Flow-thru treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of flow-thru treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.~~

4) Provision E.3.c.(2)(b)

(b) Each Priority Development Project must avoid ~~known~~ critical sediment yield areas known to the Copermittee or identified by the Watershed Management Area Analysis pursuant to Provision B.3.b.(4), or implement measures that allow critical coarse sediment to be discharged to receiving waters, such that there is no net impact to the receiving water ~~sediment supply is unaffected by the project~~.

5) Provision E.3.c.(3)(a)(ix)

~~(ix) Receiving waters must not be utilized to convey untreated storm water runoff from the Priority Development Project to the candidate project;~~

6) Provision E.3.e.(1)(a)

(a) Each Copermittee must require and confirm that for all Priority Development Project applications that have not received prior lawful approval by the Copermittee by the time the BMP Design Manual is updated pursuant to Provision E.3.d ~~18 months after the commencement of coverage under this Order~~, the requirements of Provision E.3 are implemented. For project applications that have received prior lawful approval ~~by 18 months after~~ before the BMP Design Manual is updated pursuant to Provision E.3.d ~~commencement of coverage under this Order~~, the Copermittee may allow previous land development requirements to apply.

PROVISION F Errata

1) Provisions F.1 and F.2

Delete the terms "~~certification~~" and "~~notification of concurrence~~" and replace with "notification of acceptance" throughout Provisions F.1 and F.2.

2) Provision F.1.a.(1)(c)

(c) The Copermittees must coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public ~~as much~~ time and opportunity ~~as possible~~ to participate during the development of the Water Quality Improvement Plans.

3) Provision F.1.b.(7)

(7) During implementation of the Water Quality Improvement Plan ~~after implementation~~ the Copermittees must correct any deficiencies in the Plan identified by the San Diego Water Board ~~no later than 90 days~~ in the updates submitted with the Water Quality Improvement Plan Annual Report following a request by the Board to do so.

4) Provision F.2.a.(2)

(2) Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E ~~no later than 3 months after San Diego Water Board notification of concurrence with~~ concurrent with the submittal of the Water Quality Improvement Plan. Each Copermittee must correct any deficiencies in the jurisdictional runoff management program document based on comments received from the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report.

5) Provision F.2.b.(1)

(1) Each Copermittee must update its BMP Design Manual to incorporate the requirements of Provisions E.3.a-d ~~no later than 3 months after San Diego Water Board notification of concurrence with~~ concurrent with the submittal of the Water Quality Improvement Plan ~~by the San Diego Water Board Executive Officer~~. Each Copermittee must correct any deficiencies in the BMP Design Manual based on comments received from the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report.

6) Provision F.3.b.(2)

(2) Transitional Monitoring and Assessment Program Annual Reports

The Copermittees for each Watershed Management Area must submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted under this Order. The Transitional Monitoring and Assessment Program Annual Reports must include:

Tentative Order No. R9-2013-0001
Errata Sheet (OPTION 2) CORRECTED

ATTACHMENT E Errata

1) Attachment E, Specific Provision 1.b.(3)(a)-(c)

Delete "~~Copermittees'~~" and replace with "Copermittee's"

2) Attachment E, Specific Provision 1.d

Add the following after Specific Provision 1.d.(2):

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 1.b.(2)(b), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

3) Attachment E, Specific Provision 2.b.(2)(b), Table 2.2

Table 2.2
Final Effluent Limitations as Expressed as Annual Loads in MS4 Discharges to Shelter Island Yacht Basin

Constituent	Effluent Limitation
Dissolved Copper	30 g/yr*

* If the water quality objectives for dissolved copper in Shelter Island Yacht Basin are changed in the future, then the margin of safety (MOS), TMDL and allocations will be recalculated using the *Method for Recalculation of the Total Maximum Daily Load for Dissolved Copper in the Shelter Island Yacht Basin, San Diego Bay* in the Basin Plan (pp. 7-14).

4) Attachment E, Specific Provision 3.d

Add the following after Specific Provision 3.d.(2):

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 3.b.(2)(b)(i), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

5) Attachment E, Specific Provision 4.b.(3)(a)-(c)

Delete "~~Copermittees'~~" and replace with "Copermittee's"

6) Attachment E, Specific Provision 4.c.(2)(a)-(d)

Delete "~~Copermittees'~~" and replace with "Copermittee's"

Tentative Order No. R9-2013-0001
Errata Sheet (OPTION 2) CORRECTED

7) Attachment E, Specific Provision 4.d

Add the following after Specific Provision 4.d.(2):

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 4.b.(2)(b) or 4.c.(1), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

8) Attachment E, Specific Provision 5.b.(3)(a)-(c)

Delete "~~Copermittees'~~" and replace with "Copermittee's"

9) Attachment E, Specific Provision 5.c.(1)(b)(i)-(iii)

Delete "~~Copermittees'~~" and replace with "Copermittee's"

10) Attachment E, Specific Provision 5.d.(3)

Add the following after Specific Provision 5.d.(3)(a) and renumber subsequent provisions appropriately:

(b) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 5.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

11) Attachment E, Specific Provision 6.b.(2)(a), Table 6.2a

Table 6.2a
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Beaches

	Wet Weather Days		Dry Weather Days	
Constituent	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform	10,000	22% ~~/ 0%~~	1,000	0%
Fecal Coliform	400	22% ~~/ 0%~~	200	0%
Enterococcus	104	22% ~~/ 0%~~	35	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. ~~The 0% single sample maximum allowable exceedance frequency applies to dry weather days.~~ For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan.

Tentative Order No. R9-2013-0001
Errata Sheet (OPTION 2) CORRECTED

12) Attachment E, Specific Provision 6.b.(2)(a), Table 6.2b

Table 6.2b
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Creeks

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Fecal Coliform	400	22% ~~/ 0%~~	200	0%
Enterococcus	61 (104)	22% ~~/ 0%~~	33	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. ~~The 0% single sample maximum allowable exceedance frequency applies to dry weather days.~~ For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Basin Plan.
d. A single sample maximum of 104 MPN/100ml for *Enterococcus* may be applied as a receiving water limitation for creeks, instead of 61~~0~~ MPN/100mL, if one or more of the creeks addressed by these TMDLs (San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek, San Diego River, and/or Chollas Creek) is designated with a "moderately to lightly used area" or less frequent usage frequency in the Basin Plan. Otherwise, the single sample max~~m~~imum of 61 MPN/100mL for *Enterococcus* must be used to assess compliance with the allowable exceedance frequency.

13) Attachment E, Specific Provision 6.b.(2)(b), Table 6.2

Table 6.2c
Final Effluent Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies in MS4 Discharges to the Water Body

Constituent	Concentration-Based Effluent Limitations			
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform[d]	10,000	22% ~~/ 0%~~	1,000	0%
Fecal Coliform	400	22% ~~/ 0%~~	200	0%
Enterococcus	104[e] / 61[f]	22% ~~/ 0%~~	35[e] / 33[f]	0%

Notes:
a. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. ~~The 0% single sample maximum allowable exceedance frequency applies to dry weather days.~~ For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan for discharges to beaches, and the Basin Plan for discharges to creeks and creek mouths.
d. Total coliform effluent limitations only apply to MS4 outfalls that discharge to the Pacific Ocean Shorelines and creek mouths listed in Table 6.0.
e. This *Enterococcus* effluent limitation applies to MS4 discharges to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
f. This *Enterococcus* effluent limitation applies to MS4 discharges to segments or areas of creeks or creek mouths listed in Table 6.0.

Tentative Order No. R9-2013-0001
Errata Sheet (OPTION 2) CORRECTED

14) Attachment E, Specific Provision 6.b.(3)(a)-(c)

Delete "~~Copermittees'~~" and replace with "Copermittee's"

15) Attachment E, Specific Provision 6.c.(3)(a)-(c)

Delete "~~Copermittees'~~" and replace with "Copermittee's"

16) Attachment E, Specific Provision 6.d.(1)(b)

Add the following after Specific Provision 6.d.(1)(b)(iii):

(iv) For Pacific Ocean Shoreline segments or areas listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

17) Attachment E, Specific Provision 6.d.(1)(c)

Add the following after Specific Provision 6.d.(1)(c)(iii) and renumber subsequent provisions appropriately:

(iv) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

18) Attachment E, Specific Provision 6.d.(1)(c)(iii)[c]

[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria density~~y~~ies ~~result~~ reported from ~~wet weather samples collected~~ each of the storm events sampled; and

19) Attachment E, Specific Provision 6.d.(2)(b)

Add the following after Specific Provision 6.d.(2)(b)(iii):

(iv) For creeks or creek mouths listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

20) Attachment E, Specific Provision 6.d.(2)(c)

Add the following after Specific Provision 6.d.(2)(c)(iv) and renumber subsequent provisions appropriately:

(v) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

21) Attachment E, Specific Provision 6.d.(2)(c)(iii)[c]

[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria density~~y~~ies ~~result~~ reported from ~~wet weather samples collected~~ each of the storm events sampled; and

ATTACHMENT F Errata

1) Attachment F, Under the Fact Sheet discussion of Provision A.4

The San Diego Water Board recognizes that there is an apparent disparity between the Copermittees being able to demonstrate and be in compliance with the TMDLs in Attachment E and the discharge prohibitions and receiving water limitations in Provisions A.1.a, A.1.c, and A.2.a. Thus, similar to the TMDL requirements in Attachment E, the Order establishes a process under Provision B.3.c that the Copermittees may choose to utilize to demonstrate and be in compliance with the discharge prohibitions and receiving water limitations in Provisions A.1.a, A.1.c, and A.2.a, as well as Provisions A.1.d and A.2.b. This process is described in more detail under the discussion for Provision B.3.

2) Attachment F, Under the Fact Sheet discussion of Provision B

Purpose: Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges to the MS4s and control pollutants in storm water discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the Clean Water Act.

Provision B includes requirements for the Copermittees to develop and implement Water Quality Improvement Plans to ultimately comply with the prohibitions and limitations under Provision A. The Water Quality Improvement Plans will provide the Copermittees a comprehensive program that can achieve the requirements and further the objectives of the CWA. Implementation of the Water Quality Improvement Plans will also improve the quality of the receiving waters in the San Diego Region.

3) Attachment F, Under the Fact Sheet discussion of Provision B.3

Finally, Provision B.3.c has been included to provide the Copermittees an option to demonstrate and be in compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2.a and A.2.b~~a~~. One or more Copermittees within a Watershed Management Area can choose to implement this option. This option is only expected to be utilized by the Copermittees that wish to clearly demonstrate and be in compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2.a and A.2.b~~a~~.

In order for a Copermittee to utilize this option, the Copermittee is required to include three components in the Water Quality Improvement Plan. The first component is a comprehensive set of numeric goals that will demonstrate the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2.a and A.2.b~~a~~ will be achieved. The criteria provided in the Order will require the Copermittee to demonstrate that the discharges from its MS4s will not cause or contribute to exceedances of water quality objectives in the receiving waters, and the receiving waters will be protected from the Copermittee's MS4 discharges.

The second component is an analysis utilizing a watershed model or other watershed analytical tools. The analysis must demonstrate that the implementation of the water quality improvement strategies required under Provision B.3.b will achieve the numeric goals within the established schedules required under Provision B.3.a. Because the development of the analysis may require significant resources,

the Order allows the Copermittees in each Watershed Management Area that choose to implement this option to perform the analysis individually, or pool their resources for the analysis collectively.

The San Diego Water Board does not expect the analysis to be a "guarantee" that the water quality improvement strategies will achieve the numeric goals within the established schedules. The analysis, however, must "reasonably" and "quantitatively" demonstrate that the implementation of the water quality improvement strategies can achieve the numeric goals within the established schedules. However, as more data and information are collected to demonstrate progress toward achieving the numeric goals, the numeric goals, water quality improvement strategies and schedules may need to be updated. When these updates occur, the Copermittees that choose to utilize this option must also update the analysis.

Thus, the third component is the key component that will allow a Copermittee to demonstrate the implementation of the water quality improvement strategies within its jurisdiction is making progress toward achieving the numeric goals. Each Copermittee must specify the monitoring and assessments that will be performed to confirm the implementation of the water quality improvement strategies are making progress toward achieving the numeric goals within the established schedules.

These three components must then be reviewed by the Water Quality Improvement Consultation Panel. The Water Quality Improvement Consultation Panel is required to be formed as part of the public participation process for the development of the Water Quality Improvement Plans. The Water Quality Improvement Consultation Panel is described under Provision F.1.a.(1)(b). Review by the Water Quality Improvement Consultation Panel has been included to provide an additional layer of input, support, and accountability for the implementation of this option.

Compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2.a and A.2.b~~a~~ begins when the Water Quality Improvement Plan, incorporating the requirements of Provision B.3.c.(1), is accepted by the San Diego Water Board. Each Copermittee that chooses to implement and continues to implement this option will be in compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2.a and A.2.b~~a~~ as long as the San Diego Water Board ~~continues to~~ accepts the analysis as part of the Water Quality Improvement Plan, and subsequent updates, and the Copermittee continues to implement the strategies, monitoring and assessments as incorporated in the Water Quality Improvement Plan in accordance with Provision B.3.c.(1).

4) Attachment F, Under the Fact Sheet discussion of Provision D.2

Until the wet weather MS4 outfall discharge monitoring requirements of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board, the Copermittees must comply with the requirements of transitional wet weather MS4 outfall monitoring requirements pursuant to Provision D.2.a.(3). Provision D.2.a.(3) requires the Copermittees in each ~~Copermittee~~ Watershed Management Area to sample, at least five of the major MS4 outfalls inventoried pursuant to Provision D.2.a.(1) ~~twice~~ once per wet season for the monitoring data required to be collected pursuant to Provision D.2.a.(3)(c)-(e). Provision D.2.a.(3) further requires at least one major MS4 outfall monitoring station be located in each Copermittee's jurisdiction within the Watershed Management Area.

5) Attachment F, Under the Fact Sheet discussion of Provision E.3

The 85th percentile storm event is the event that has a precipitation total greater than or equal to 85 percent of all storm events over a given period of record in a specific area or location. For example, to determine what the 85th percentile storm event is in a specific location, all 24 hour storms that have recorded values over a 30 year period would be tabulated and a 85th percentile storm would be determined from this record (i.e., 15 percent of the storms would be greater than the number determined to be the 85th percentile storm). Most jurisdictions in the San Diego Region have already developed isopluvial maps that can provide this type of information. The 85th percentile storm might be determined to be a number such as 1.0 inch, and this would be multiplied by the total area of the project footprint producing runoff to calculate the design capture volume. The Priority Development Project designer would then select a system of BMPs that would retain (i.e. intercept, store, infiltrate, evaporate, or evapotranspire) ~~100 percent of~~ the pollutants contained in the design capture volume onsite.

Retention BMPs are necessary to capture and retain pollutants generated from a Priority Development Project. In a recent study performed by SCCWRP in the Los Angeles Region, they found "*that the magnitude of constituent load associated with storm water runoff depends, at least in part, on the amount of time available for pollutant build-up on land surfaces. The extended dry period that typically occurs in arid climates such as southern California maximizes the time for constituents to build-up on land surfaces, resulting in proportionally higher concentrations and loads during initial storms of the season*."[1] This implies that the "first flush" of a rainy season and the first storm events after long antecedent dry periods tend to have the highest pollutant loads. Capturing and retaining the pollutant loads of the "first flush" of a rainy season and the first storm events after long antecedent dry periods will

[1] Stein, E.D., Tiefenthaler, L.L., and Schiff, K.C., 2007. Technical Report 510, Sources, Patterns and Mechanisms of Storm Water Pollutant Loading from Watershed and Land Uses of the Greater Los Angeles Area, California, USA. March 20, 2007.

reduce a significant portion of the pollutants in storm water discharged to and from the MS4.

The San Diego Water Board, however, acknowledges that in some situations retention of the full design capture volume onsite may not be technically feasible. In this event, the Copermittee may allow the Priority Development Project to utilize biofiltration BMPs to treat 1.5 times the design capture volume not reliably retained onsite, or biofiltration BMPs with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite ~~flow-thru treatment control BMPs to achieve the equivalent pollutant load removal that would have been achieved if the design capture volume were fully retained onsite, pursuant to Provision E.3.c.(1)(b). Biofiltration LID BMPs must be considered as a first option before other types of flow-thru treatment control BMPs may be considered because of the ancillary benefits they provide, such as reduction in flow rates and creation of habitat. In any event, no matter what types of BMPs (or combination of BMPs) are chosen, 100 percent of the pollutants contained in the design capture volume must not be allowed to be discharged from the Priority Development Project~~.

The 1.5 multiplier is based on the finding in the Ventura County Technical Guidance Manual that biofiltration of 1.5 times the design capture volume not retained onsite will provide approximately the same pollutant removal as retention of the design capture volume on an annual basis.[2] This standard is consistent with the Los Angeles Water Board's Los Angeles and Ventura County municipal storm water permits (Order Nos. R4-2012-0175 and R4-2010-0108, respectively). The flow-thru design of 0.75 times the portion of the design capture volume not reliably retained onsite is consistent with the San Diego Water Board's Orange County and Riverside County municipal storm water permits (Order Nos. R9-2009-0002 and R9-2010-0016, respectively).

The San Diego Water Board further recognizes that, in addition to not being technically feasible, retention of the full design capture storm onsite may be cost prohibitive, or may not provide as much water quality benefit to the Watershed Management Area as would implementing BMPs elsewhere in the watershed. Thus, Provision ~~E.3.c.(1)(c)~~ E.3.c.(1)(b) allows for the use of a combination of onsite retention BMPs, and the implementation of an Alternative Compliance Program described in Provision E.3.c.(3). Provision E.3.c.(3) is discussed in more detail below.

If the full design capture volume is not retained onsite either because biofiltration is not technically feasible, or a Copermittee grants a Priority Development Project permission to utilize the Alternative Compliance Program, then the pollutants in the portion of the design capture volume that are not reliably retained onsite must still be reduced to the MEP. Thus, flow-thru treatment control BMPs are required to be implemented on Priority Development Projects in addition to the retention BMPs.

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2 Ventura Countywide Stormwater Management Program. 2011. Ventura Technical Guidance Manual, Manual Update, 2011.

The requirements of Provisions ~~E.3.c.(1)(d)~~ E.3.c.(1)(a)(ii)[a]-[c] include the performance standards for flow-thru treatment control BMPs, consistent with the Fourth Term Permits in the San Diego Region.

6) Attachment F, Under the Fact Sheet discussion of Provision F.1

The San Diego Water Board recognizes that the development of multiple Water Quality Improvement Plans concurrently may limit the ability of the public to review and provide comments to the Copermittees. Thus, Provision F.1.a.(1)(c) requires the Copermittees to coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public ~~as much~~ time and opportunity ~~as possible~~ to participate during the development of the Water Quality Improvement Plans.

7) Attachment F, Under the Fact Sheet discussion of Provision F.2

Each Copermittee is required to continue implementing a jurisdictional runoff management program, as required under Provision E. Implementation of each Copermittee's jurisdictional runoff management program is directed by its jurisdictional runoff management program document. Provision F.2.a requires each Copermittee to update its jurisdictional runoff management program document to be consistent with the requirements of Provision E ~~within 3 months after the acceptance~~ concurrent with the submittal of the Water Quality Improvement Plan.

Likewise, each Copermittee must continue to require new development and redevelopment projects to implement BMPs to control pollutants in storm water runoff. The control of pollutants in storm water runoff from development and redevelopment projects within each Copermittee's jurisdiction is guided and directed by its BMP Design Manual, formerly known as a Standard Storm Water Mitigation Plan (SSMP). Provision F.2.b requires each Copermittee to update its BMP Design Manual to be consistent with the requirements of Provision E.3 ~~within 3 months after the acceptance~~ concurrent with the submittal of the Water Quality Improvement Plan.

8) Attachment F, Under the Fact Sheet discussion of Provision F.3

Provision F.3.b.(2) includes the transitional annual reporting requirements for the transitional monitoring and assessment program for each Watershed Management Area. The Copermittees in the Watershed Management Area are required to submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted. The Transitional Monitoring and Assessment Program Annual Report is required to include the transitional period monitoring data collected pursuant to Provisions D.1.a and D.2.a, and the findings from the transitional period findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

012802

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

BOARD MEETING PARTICIPATION SIGN-IN SHEET

MAY 8, 2013 – 9:00 A.M. – SAN DIEGO

****PLEASE PRINT LEGIBLY****

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CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

BOARD MEETING PARTICIPATION SIGN-IN SHEET

MAY 8, 2013 – 9:00 A.M. – SAN DIEGO

****PLEASE PRINT LEGIBLY****

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Lisa Zawaski	Dana Point	949-248-3564	lzawaski@danapoint
Mo. Lahsaie	city of O/Side	760-435-5803	mlahsaie@ci.oceanside.ca.us
Annie Martin	Airport Authority	619 400 2793	Amartin@san.org
Paul Hartman	LWA	760 730-7446	phartman@lwa.com
Karen Cohen	LWA	310-394-1036	karenc@lwa.com
Karen Ashby	"	530 753 6400	karen@lwa.com
Noah Garrison	NRDC	310 434 2300	ngarrison@nrdc.org
Christine Sloan	County of San Diego	858-495-5757	christine.sloan@sdcounty.ca.gov
Nancy Richardson	" "	858-495-5294	nancy.richardson@sdcounty.ca.gov
Rosanna Lacarra	LaJolla Environmental	760-533-1875	rosanna@lajollaenvironmental.com
Wayne Rosenberg	Stoe Rives	858-481-9112	SWRosenberg@Stoel.com
Malik Tamimi	City of Lemon Grove	619 825-3827	mtamimi@lemongrove.ca.gov
WILLIE GATTER	SDG&E		
DAME CAMPOS	CITY OF EL CAJON	619-441-5554	scampos@cityofelcajon.us
Rachel Davenport	AMEC	858-278-3600	rachel.davenport@amec.com
Jo Ann Weber	County of San Diego	858-485-5312	joann.weber@sdcounty.ca.gov
Angeli Calinog	State Senator Joel Anderson	(619)596-3136	senator.anderson@sen.ca.gov
Kristiane Hill	CA State Parks	760-809-3277	kristiane.hill@parks.ca.gov
John Quenzer	City of National City	(858) 586.6600	jquenzer@dmaxinc.com
Cheryl Filar	City of Vista	760-683-4837	cfilar@ci.vista.ca.com
David Pohl	ESA	760 497 3318	dpohl@esassoc.com
Dave Renfrew	Weston Solutions	760-908-5779	dave.renfrew@westonsolutions.com
Ann Bechtel	Atkins	858 514 1026	Ann.Bechtel@atkinsglobal.com
DEVIN SLAVEN	CITY OF LAKE FOREST	949-461-3436	DSLAVEN@LAKEFOREST.CA.GOV
JOE AMES	CITY OF MISSION VIEJO	949 470-8419	james@cityofmissionviejo.org
James Wood	City of Carlsbad	760-602-2799	James.wood@carlsbad.ca.gov
Elaine Lukey	City of Carlsbad	760-602-2799	elaine.lukey@carlsbad.ca.gov
KEN SUSILO	GEOSYNTEC	310 957 6100	ksusilo@geosyntec.com
Claudia Steiding	RivCo Trans Dept.	951.955.1694	csteiding@rctlma.org
Tony Walker	SD BIA	760.414.9212	tony@tonywalkermarketing.com

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

BOARD MEETING PARTICIPATION SIGN-IN SHEET

MAY 8, 2013 – 9:00 A.M. – SAN DIEGO

****PLEASE PRINT LEGIBLY****

Name	Representing	Telephone No.	Email
Mikhail Ogawa	City of Del Mar	619 994 7074	mikhail@ogawaeng.com
Nancy Gardiner	Haley + Aldrich	619 285 7132	ngardiner@haleyaldrich.com
Joe Mann	City of La Mesa	619-667-1340	
Bryn Evans	VRS	858 812 9292	bryn.evans@vrs.com
Chris Helmer	Imperial Beach	619-628-1370	chelmer@imperialbeach.ca
Christian Brown	Geosyntec	858-2201367	cbrown@geosyntec.com
Lisa Skuterski	Brown + Caldwell	858 571 6739	lskuterski@brownandcaldwell.com
Helen Davies	City of Santee	619 258 4710 ext 177	hdavies@ci.santee
Sumer Hasenin	City of SD	858-541-4330	shasenin@sandiego.gov
Jennifer Peterson	Nolte (NVS)	619-807-6202	jennifer.peterson@nvs.com
Julia Chunn-Heer	Surfrider San Diego	(619-246-0001)	julia@surfridersd.org
ALDO LICITRA	CITY OF TEMECULA	951-308-6387	ALDO.LICITRA@CITYOFTEMECULA.ORG
James Lawson	California Strategies	619-546-7451	jlawson@calstrat.com
MARK WILLIAMS	AECOM	619 764 6847	mark.e.williams@aecom.com

NAME: Todd Snyder

AGENDA ITEM NO. 9

012805

Co-Recommender

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: County of San Diego / Watershed Planning Mgr.

ADDRESS: 5510 Overland Ave., Suite 410 TELEPHONE: 858 694 3482

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Todd Snyder hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 5/8/13

Signature: Todd Snyder

NAME: Ken Susilo AGENDA ITEM NO. 9

012806

Coffee-Pure

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: PRINCIPAL / GEOSYNTEC CONSULTANTS

ADDRESS: 3415. S. SEPULVEDA #500 90034 TELEPHONE: 310 957 6100

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Ken Susilo hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 5/8/13 Signature:

012807

NAME: RICHARD BOON

AGENDA ITEM NO. 1 ✓

NSF PERMIT

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: COUNTY OF ORANGE

ADDRESS: 2301 N. GLASSELL ST ORANGE TELEPHONE: 714 955 0670

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, RICHARD BOON hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 5/8/13 Signature: Richard Boon

012808

NAME: Jason Uhley

AGENDA ITEM NO. 9

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Jason Uhley Chief of Watershed Protection, Riverside County Flood Control and Water Conservation District

ADDRESS: 1995 Market Street 92507 TELEPHONE: 951 955 1273

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Jason Uhley hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 5/8/13

Signature: J Uhley

NAME: BILL BROWN AGENDA ITEM NO. 9

012809

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: ATTORNEY / PORT OF SAN DIEGO

ADDRESS: 120 BIRMINGHAM CARDIFF TELEPHONE: 760 633-4485

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, WILLIAM D. BROWN hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 5/8/2013 Signature: [illegible]

BIA

– Part of ORGANIZED PRESENTATION

012810

NAME: MICHAEL McSWEENEY **AGENDA ITEM NO.** 1

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Sr. Public Policy Advisor BIA

ADDRESS: 9201 SPECTRUM CTR BLVD TELEPHONE: 858 450 1221 x104

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Michael McSweeney hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 5/8/13 Signature: [signature]

BIA

NAME: DENNIS BOWLING **AGENDA ITEM NO.** 9

012811

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: RICK ENGINEERING

ADDRESS: 5620 FRIARS RD TELEPHONE: 619 688 1447

State your name and address (spell your last name) for the record prior to beginning your presentation. Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, DENNIS BOWLING hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 5/8/13 Signature:

I am part of an Organized Presentation

BIA **NAME:** Tony Walker **AGENDA ITEM NO.** 9

012812

organized presentation

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: President, TRWE; BIA storm water committee

ADDRESS: 122 Civic Ctr. Drive, #206, Vista TELEPHONE: 760.414.9212

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Tony Walker hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 5/8/13 Signature: Tony R Walker

NAME: Fred Jacobsen

AGENDA ITEM NO. 9

012813

BIA

I am part of an organized presentation

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Principal Environmental Specialist BIA/SDG&E

ADDRESS: 8315 Century Park Ct San Diego, CA 92123 TELEPHONE: 858-637-3723

State your name and address (spell your last name) for the record prior to beginning your presentation. Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Fredrik J. Jacobsen hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 5/8/13

Signature: Fred Jacobsen

NAME: VAIKKO ALLEN **AGENDA ITEM NO.** 9

012814

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: DIRECTOR OF STORMWATER REGULATORY MGMT. CONTECH

ADDRESS: 2550 BARMARK DR OJAI CA TELEPHONE: 310 850 1736

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, VAIKKO ALLEN hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: MAY 8/ 2013 Signature:

012815

NAME: Mary Anne Skorpanich

AGENDA ITEM NO. 9

↳ closing remarks for permittees

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: OC Watersheds, County of Orange

ADDRESS: 1301 N. Glassell St, Orange TELEPHONE: 714.955.0601

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, M.A. Skorpanich hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 5.8.2013 Signature: [signature]

did not speak

NAME: James O'Day

AGENDA ITEM NO. 9

012816

If Needed

Co-Petitioner

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Senior Deputy County Counsel/County of San Diego

ADDRESS: 1600 Pacific Hwy

TELEPHONE: (619) 531-4869

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, James O'Day hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 5/8/13

Signature: James O'Day

did not speak

012817

NAME: Ryan Baron

AGENDA ITEM NO. 7

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: County of Orange

ADDRESS: 333 W Santa Ana Blvd Santa Ana

TELEPHONE: 714-834-3300

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Ryan Baron hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 5/8/13

Signature:

did not speak

012818

NAME: Sean Kerafin

AGENDA ITEM NO. 9

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Economic Policy Analyst

ADDRESS: 707 Broadway, Ste 905 San Diego TELEPHONE: 619 234 7403

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Sean Kerafin hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 5.8.13

Signature: X

810

did not speak

012819

NAME: S. Wayne Rosenbaum

AGENDA ITEM NO. 7

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Attorney - San Diego Coalition -

ADDRESS: El Camino Real San Diego TELEPHONE: 858-794-9112

I am part of an Organized Presentation

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, S. Wayne Rosenbaum hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 5/8/13

Signature: S. Wayne Rosenbaum

did not speak

012820

NAME: Mark Grey - BIA/SC - CICWQ - BIA/SD AGENDA ITEM NO. 9

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Director of Environmental Affairs - CICWQ

ADDRESS: 3891 11th St. Riverside TELEPHONE: 909-525-0673

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Mark Grey hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 5-8-2013 Signature: [signature]

did not speak

NAME: Jesse Gipe

AGENDA ITEM NO. 9 012821

REQUEST TO ADDRESS REGIONAL BOARD

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

*****PLEASE PRINT LEGIBLY*****

MEETING DATE: 05/08/13

SUBJECT OF TESTIMONY: MS4 Permits

IS WRITTEN TESTIMONY BEING SUBMITTED? YES ☐ NO ☒

TITLE/AFFILIATION: District Representative w/ Senator Joel Anderson

ADDRESS: 500 Fesler st Suite 201 El Cajon CA 92020

TELEPHONE: 619 596-3136

☐ CHECK HERE IF YOU ARE REQUESTING A FORMAL HEARING TO SUBMIT SWORN TESTIMONY OR EVIDENCE FOR THE RECORD.

Please state your name and address for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE YOUR COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

did not speak

NAME: Angeli Calinog

AGENDA ITEM NO. 9 012822 ✓

REQUEST TO ADDRESS REGIONAL BOARD

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

*****PLEASE PRINT LEGIBLY*****

MEETING DATE: 5/8/13

SUBJECT OF TESTIMONY: MS4 Permits

IS WRITTEN TESTIMONY BEING SUBMITTED? YES ☐ NO ☑

TITLE/AFFILIATION: Office of State Senator Joel Anderson (District 36)

ADDRESS: 500 Fesler Street, #201, El Cajon, CA 92020

TELEPHONE: (619) 596-3136

☐ CHECK HERE IF YOU ARE REQUESTING A FORMAL HEARING TO SUBMIT SWORN TESTIMONY OR EVIDENCE FOR THE RECORD.

Please state your name and address for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE YOUR COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

NAME: John Kemmerer **AGENDA ITEM NO.** 9

012823

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Acting Water Director, USEPA, Region 9

ADDRESS: 600 Wilshire Blvd, LA, CA TELEPHONE: 213-244-1832

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, John Kemmerer hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 5/8/13 Signature:

NAME: Mikhail Ogawa **AGENDA ITEM NO.** 9 ✓

012824

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Clean Water Manager City of Del Mar

ADDRESS: 1050 Camino del Mar TELEPHONE: 6199947074

Del Mar CA 92014

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Mikhail Ogawa hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 5/8/13 Signature:

012825

NAME: Kris McFadden **AGENDA ITEM NO.** 9

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: City of San Diego

ADDRESS: 9370 Chesapeake Dr. TELEPHONE: 858 541 4320

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Kris McFadden hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 5/8/10 Signature: Kris McFadden

NAME: Noah Garrison **AGENDA ITEM NO.** 9 ✓

012826

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

↳ of option 1, with caveats mentioned in our written + oral comments

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: NRDC

ADDRESS: 1314 2nd St Santa Monica CA 90401 TELEPHONE: 310 434 2300

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Noah Garrison hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 5/8/13 Signature: [signature]

012827

NAME: Jill Witkowski **AGENDA ITEM NO.** 7

*REQUEST TO SPEAK **IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Waterkeeper San Diego Coastkeeper

ADDRESS: 2825 Dewey Rd 92106 TELEPHONE: 619.758.7743

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Jill Witkowski hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: May 8, 2013 Signature:

NAME: ROGER BUTOW

AGENDA ITEM NO. 7 ✓ 012828

NPDES

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: EXECUTIVE DIRECTOR CLEAN WATER NOW

ADDRESS: P.O. BOX 4711 LAGUNA BEACH 92652 TELEPHONE: 949-715-1973

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, _____ hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 5/08/2013 Signature: _____

NAME: Heather Strond

AGENDA ITEM NO. 9

012829

did not speak

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Deputy City Attorney / City of San Diego

ADDRESS: 1200 3rd Ave, Suite 1100, SD 92101 TELEPHONE: 619 533 5872

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Heather Strond hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: May 8, 2013 Signature: [illegible]

did not speak

012830

NAME: Colin Kelly

AGENDA ITEM NO. 9

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Staff Attorney / Orange Co. Coastkeeper, Inland Empire Waterkeeper

ADDRESS: 3151 airway AVE, Ste F-110, Costa mesa TELEPHONE: 714 850 1965

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Colin Kelly hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 5/8/13

Signature: [signature]

TMDL Compliance Language

- **Issue:**
  - The Errata corrected "Copermittees" to "Copermittee's" in *some* but not all places
    - If one (or more) Copermittee is not demonstrating compliance – it can be interpreted that all Responsible Copermittees are out of compliance
  - Will coordinate at watershed scale, but compliance for each Copermittee should be determined on an individual basis
- **Proposed Solution:**
  - Change language to Copermittee's in all instances.

TMDL Compliance Language

- **Requested changes to Errata Sheet (posted April 19, 2013) Attachment E Item #s:**

1. Specific Provision 1.b.(3)(a) - ~~(c)~~ **(d)**
5. Specific Provision 4.b.(3)(a) - ~~(c)~~ **(d)**
6. Specific Provision 4.c.(2)(a) - ~~(d)~~ **(e)**
8. Specific Provision 5.b.(3)(a) - ~~(c)~~ **(g)**
9. Specific Provision 5.c.(1)(b)(i) - ~~(iii)~~ **(viii)**
14. Specific Provision 6.b.(3)(a) - ~~(c)~~ **(f)**
15. Specific Provision 6.c.(3)(a) - ~~(c)~~ **(h)**

Attachment E (Multiple pages)

Pre-development Baseline

Issue:

○ Requires mitigation for hydromodification impacts that are not caused by redevelopment projects

○ There is no nexus to impacts of redevelopment projects – therefore exposes Copermittees to legal liability

○ "Pre-project" baseline would be more appropriate

Requested Language:

Post-project runoff conditions (flow rates and durations) must not exceed pre-development runoff conditions[FN] by more than 10 percent .

. . .

FN: The pre-development runoff condition standard shall be applied to the extent allowable under state and federal law. A Copermittee may modify the standard for a particular project where the Copermittee finds that application of the standard would exceed the Copermittee's authority under applicable state or federal law as applied to that project.

Provision E.3.c.(2)(a) page 89 (redline page 94)

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012834

May 8, 2013

Regional Permit Adoption Hearing

COUNTY OF ORANGE CALIFORNIA

Presentation

- MS4 Permits
- Need & Support for B.3.c. Compliance Option
- Questions

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MS4 Permits

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Need for B.3.c.

- Provision A requires instantaneous attainment of Water Quality Standards for "every pollutant, everywhere."
- B.3.c. is needed because it creates an achievable basis for compliance with the Order.

Support [With Clarifications] for B.3.c.

- Creates auditable compliance pathway
- Links “BMP Approach” to attainment of Water Quality Standards per State and Federal guidance
- Establishes outcome-based approach which will support watershed planning and the Draft San Diego RWQCB “Practical Vision” Document
- Is supported by 39 permittees

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Clarification #1 – Numeric Goals

B.3.a.(1) Footnote – Interim and Final Numeric Goals

Interim and final numeric goals may take a variety of forms such as TMDL established WQBELs, action levels, pollutant concentration, load reductions, number of impaired water bodies delisted from the List of Water Quality Impaired Segments, Index of Biotic Integrity (IBI) scores, or other appropriate metrics. Interim and final numeric goals are not necessarily limited to one criterion or indicator, but may include multiple criteria and/or indicators. Except for TMDL established WQBELs, interim and final numeric goals and corresponding schedules may be revised through the adaptive management process under Provision B.5.

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Clarification #1 – Resolution

B.3.c.(1).(a).(ii) Numeric Goals

Numeric goals applicable to the Copermittees MS4 discharges ~~expressed as concentration-based or load-based effluent limitations~~ for all other pollutants listed on the Clean Water Act Section 303(d) List of Water Quality Impaired

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Clarification #2 – Section A Compliance

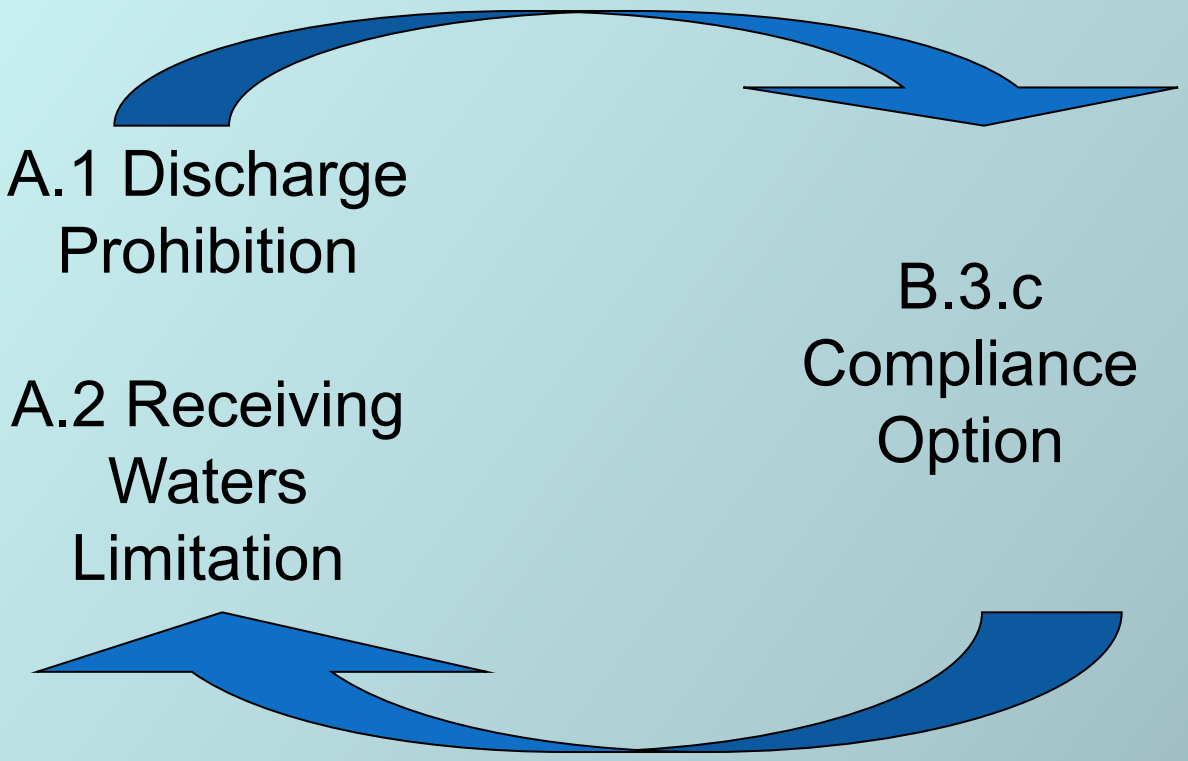

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Clarification #2 - Resolution

A. PROHIBITIONS AND LIMITATIONS

The purpose of this provision is to describe the conditions under which storm water from and non-storm water discharges into and from the MS4s are effectively prohibited or limited. The goal of the prohibitions and limitations is to protect the water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through the implementation of water quality improvement strategies and runoff management programs that effectively prohibit non-storm water discharges into the Copermittees' MS4s, and reduce pollutants in storm water discharges from the Copermittees' MS4s to the MEP. ***The process for determining compliance with the Discharge Prohibitions (A.1), Receiving Water Limitations (A.2), and Effluent Limitations (A.3, including effluent limitations derived from the TMDL requirements – Attachment E) is defined in Provision A.4.***

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Clarification # 2 - Resolution

A.1. Discharge Prohibitions

a. **Except as provided in Provision A.1.e, A.1.f, and A.4.d.,** discharges from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the state are prohibited.

e. **If a Permittee has complied with the procedures outlined in Part B.3.c, the Permittee shall not be considered in violation of Part A.1 of this Order.**

f. **For discharges associated with water body pollutant combinations addressed in a TMDL in Attachment E of this Order, the affected Copermittees shall achieve compliance as outlined in Attachment E.**

Clarification # 2 - Resolution

A.2.Receiving Water Limitations

a. Discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters, including but not limited to all applicable provisions contained in **the list below to the extent that they remain in effect and are operative, unless such discharges are being addressed by the Copermittee(s) through the processes set forth in this Order (Provision A.4, Provision B.3.c., and Attachment E). Where a TMDL has been developed and its terms have been incorporated into this Order (in a manner that is consistent with the waste load allocations set forth in the TMDL), a Permittee shall also be considered in compliance with such TMDL-related requirements provided in this Order, if it is timely and in good faith implementing the MEP-compliant control measures otherwise established by this Order:**

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Clarification # 2 - Resolution

A.2. Receiving Water Limitations

c. **If a Permittee has complied with the procedures outlined in Part B.3.c, the Permittee shall not be considered in violation of Part A.2 of this Order.**

d. **d. For receiving water limitations associated with a water body pollutant combination addressed in a TMDL in Attachment E of this Order, the affected Copermittees shall achieve compliance as outlined in Attachment E.**

Conclusion

- B.3.c. Compliance Option provides a necessary and auditable compliance pathway for permittees
- Clarify
  - “Numeric Goals” per Footnote
  - Nexus to Provision A
- Inclusion of B.3.c. Compliance Option (with Clarifications) is requested by San Diego, Riverside and Orange (39 permittees)

Questions

Urban Runoff - Conventional Urban Development

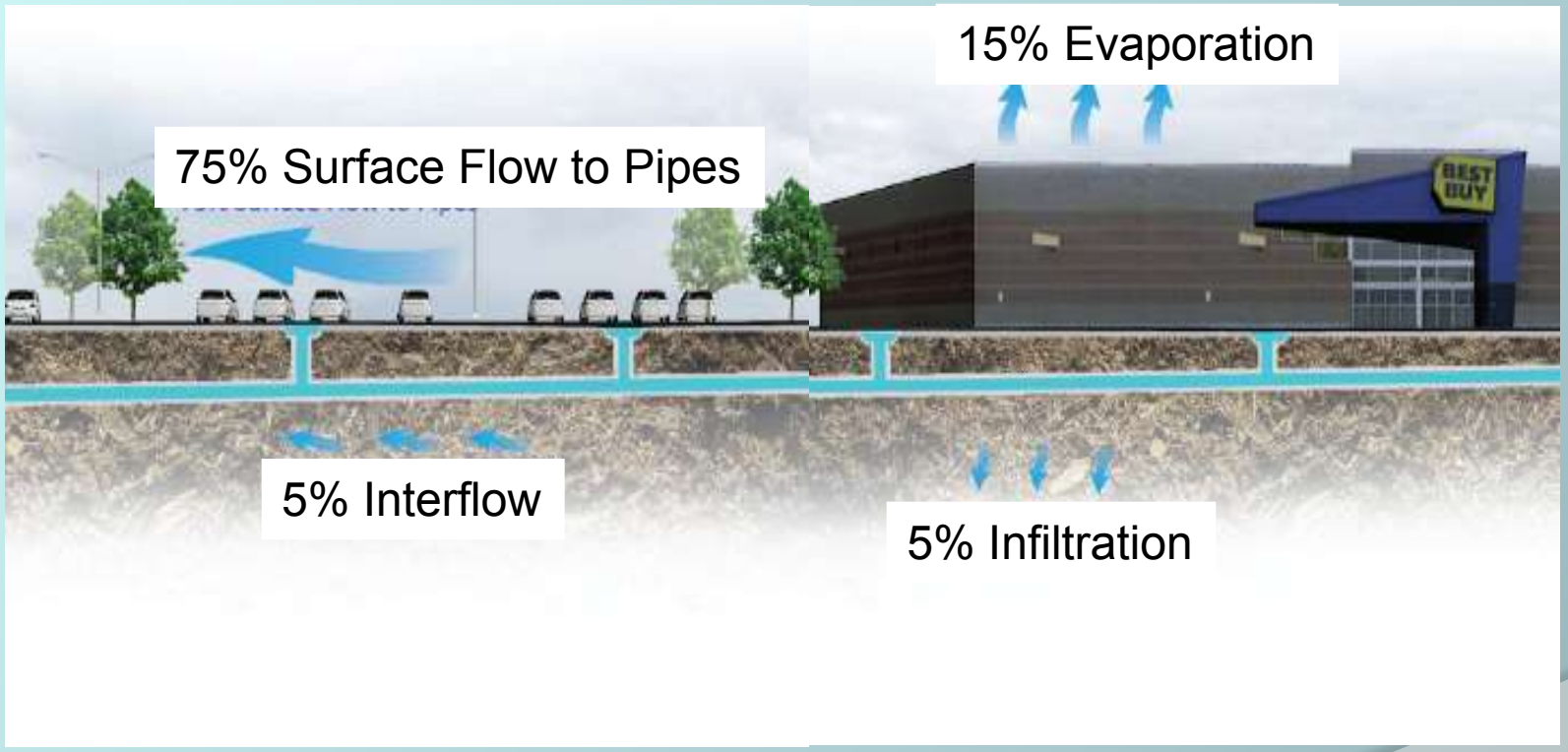

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Urban Runoff - Low Impact Development

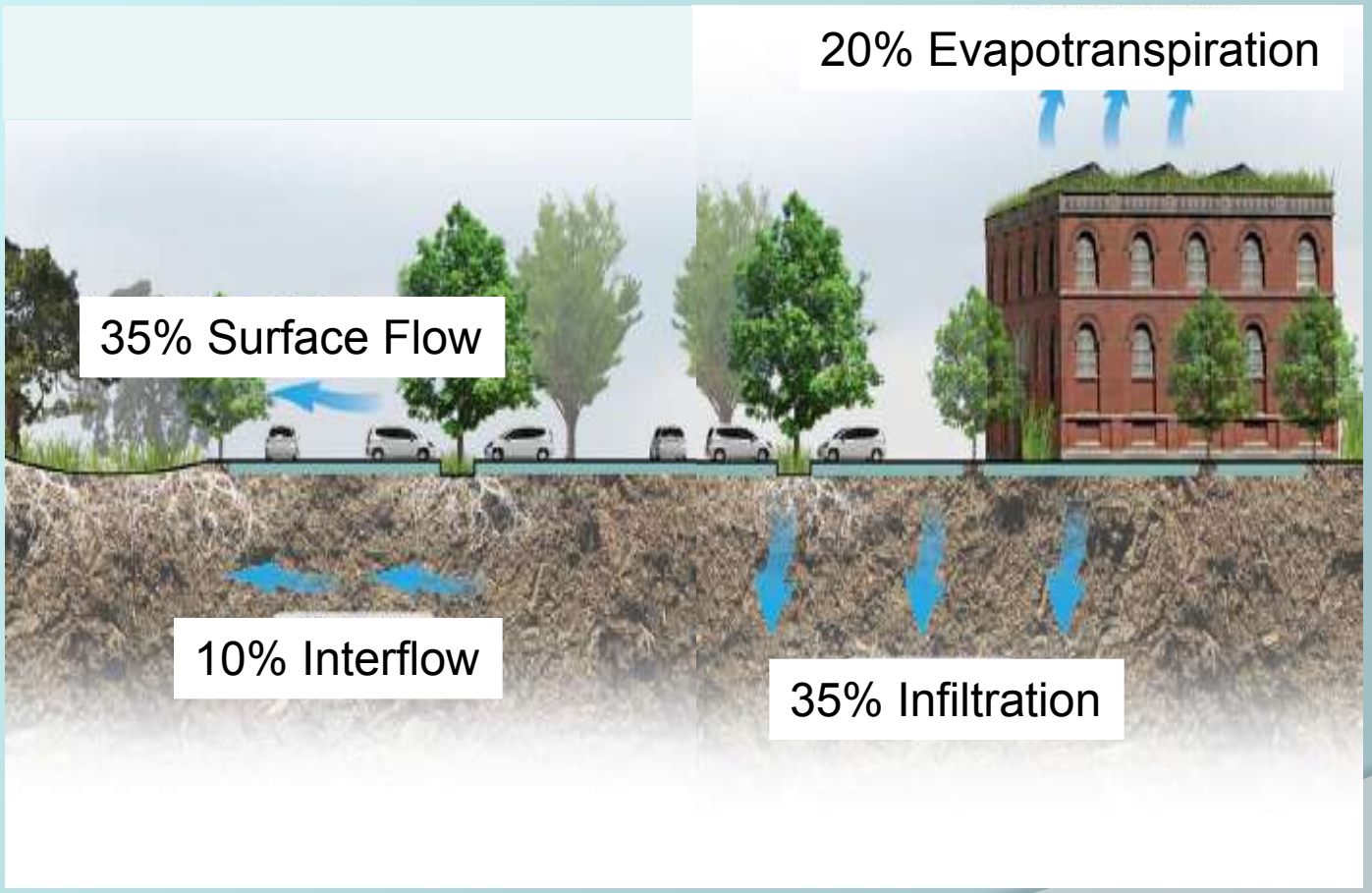

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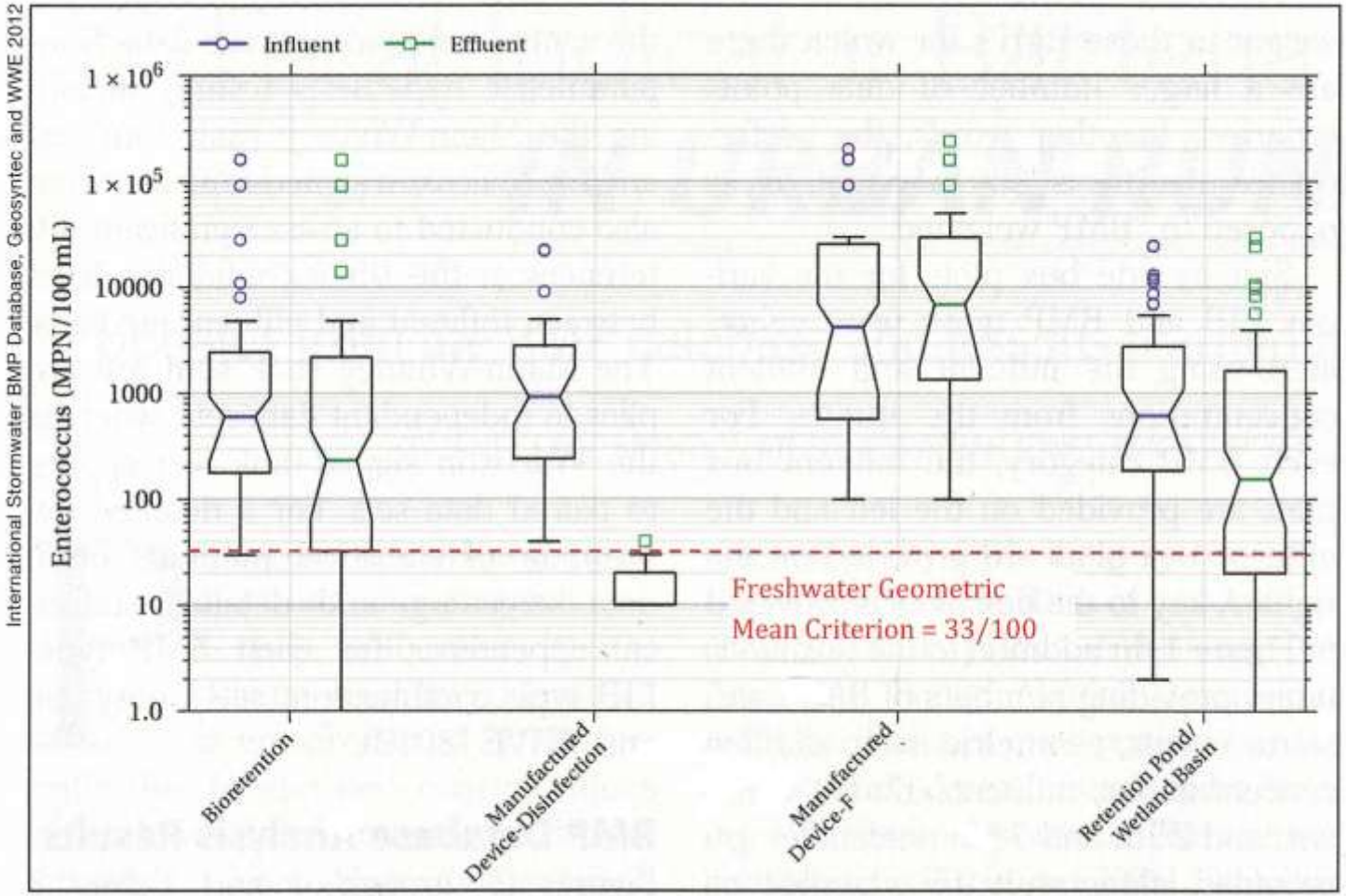

Figure 2. Box plots of influent/effluent enterococcus concentrations

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Presentation of the Riverside County Copermittees

Jason Uhley
Chief of Watershed Protection
Riverside County Flood Control and Water Conservation District

Riverside County

A partner in protecting water resources

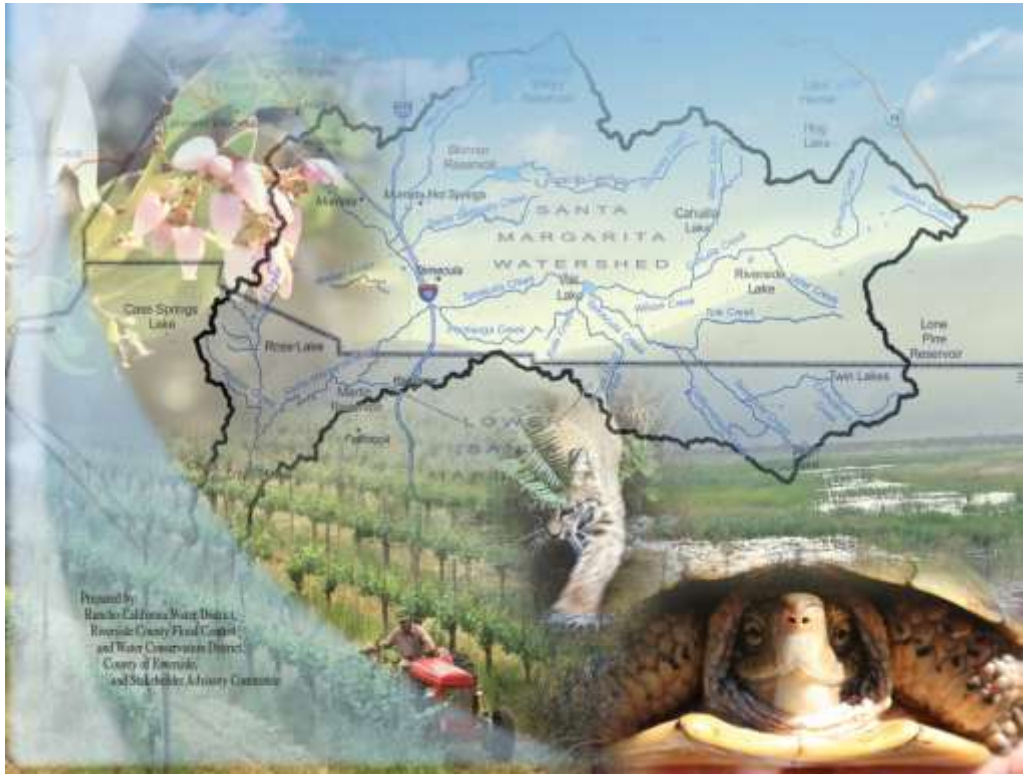

* Habitat Conservation
* Water Conservation
* Low Impact Development
* Flood Hazard Reduction

We Appreciate Revisions

* Provision b.3.c clarifications
  * WQIP Consultation Panel
  * RWL Compliance Option (B.3.c.(3)(a))
* Provision E errata
  * “Equivalent Pollutant Load” criteria
  * Maintaining existing DCV development requirements
  * Road standards clarification

Support Receiving Water Limitation Compliance Option 2

* Provides a necessary pathway to compliance for the Permittees
* Support recommended minor modifications raised by Orange County

RWL Compliance Not Safe Harbor

(iii) Numeric goals for receiving waters that will protect the conditions of the receiving waters and attain water quality standards.

* Significant and complicated studies required for each waterbody/pollutant combination
* Must commit to plan and schedule for action
* Costs could be prohibitive
* May recommend modifications in ROWD

Critical Sediment Yield Areas (E.3.c)

Permittee Recommendation from April

(b) Each Priority Development Project must avoid impacts to receiving waters from known critical sediment yield areas or implement measures that allow coarse sediment to be discharged to receiving waters, such that the ~~sediment supply~~receiving water is unaffected by the project to the MEP.

Board staff revisions in May errata

(b) Each Priority Development Project must avoid ~~known~~ critical sediment yield areas known to the Copermittee or identified by the Watershed Management Area Analysis pursuant to Provision B.3.b.(4), or implement measures that allow critical coarse sediment to be discharged to receiving waters, such that there is no net impact to the receiving water ~~sediment supply is unaffected by the project~~.

Concern 1: Sediment Transport Hydromod Management BMP Requirements E.3.c.(2)(b)

012857

Recommended Solution:

Each Priority Development Project must avoid critical sediment yield areas known to the Copermittee or identified by the Watershed Management Area Analysis pursuant to provision B.3.b.(4), or implement measures that allow critical coarse sediment to be discharged to receiving waters, such that there is no net impact to the receiving water. The Copermittees may propose an alternative program to assess and manage the impacts of changes in sediment supply on receiving waters as part of the Watershed Management Area Analysis incorporated into the Water Quality Improvement Plan pursuant to Provision B.3.b.(4) in lieu of this requirement.

Clarify Flood Control Projects are not Development Projects

Proposed E.3.b.(3)(c) – (Development exemptions)

~~(b)~~(c) Flood control and watershed management projects that have minimized the need for impervious surfaces to the MEP, consistent with requirements to protect public health and safety.

Clarify Flood Control Projects are not Development Projects

Add Language from LA Permit to the Attachment C: Definition of "Redevelopment":

Redevelopment - The creation and/or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include trenching and resurfacing associated with utility work; resurfacing existing roadways; new sidewalk construction, pedestrian ramps, or bike lane on existing roads; ~~and~~ routine replacement of damaged pavement, such as pothole repair; and routine maintenance to maintain original line and grade, hydraulic capacity or original purpose of facility; and emergency construction activities required to immediately protect public health and safety.

Other Issues

* "Must" provisions in Sections B.2.e and B.3.b
* Reduces flexibility (and increases cost) of WQIP development
* Simple fix: add "where applicable" language

B.2.E. IDENTIFICATION OF POTENTIAL WATER QUALITY IMPROVEMENT STRATEGIES

The Copermittees must evaluate the findings identified under Provisions B.2.a-d, and identify potential strategies that can result in improvements to water quality in MS4 discharges and/or receiving waters within the Watershed Management Area. Potential water quality improvement strategies that may be implemented within the Watershed Management Area must include the following where applicable to a Watershed Management Area:

B.3.b.(1) (b) Identify the optional jurisdictional strategies that each Copermittee will implement within its jurisdiction, as necessary, to effectively prohibit non-storm water discharges to its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. ~~Descriptions of the optional jurisdictional strategies must include~~Description of the optional jurisdictional strategies should include the following, as applicable:

B.3.b. (2) Watershed Management Area Strategies

The Copermittees must identify the optional regional or multi-jurisdictional strategies that will be implemented in the Watershed Management Area, as necessary, to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. Description of the optional jurisdictional strategies should include the following, as applicable:~~Descriptions of the optional regional or multi-jurisdictional strategies must include:~~

B.3.b.(4)(b) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify and compile a list of candidate projects that could potentially be used as alternative compliance options for Priority Development Projects, to be implemented in lieu of onsite structural BMP performance requirements described in Provisions E.3.c.(1) and E.3.c.(2). Specifically, the Copermittees must identify in each Watershed Management Area (where applicable to the Watershed Management Area):

012863

Hydraulic Loading Rates

* **Provision E.3.c.(1)(a)(i)**
*
* (i) If a Copermittee determines that implementing BMPs to retain the full design capture volume onsite for a Priority Development Project is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize biofiltration BMPs. Biofiltration BMPs must be designed to maximize pollutant removal and have an appropriate hydraulic loading rate to prevent erosion, scour, and channeling within the BMP [X], and must be sized to:
*
  * [a] Treat 1.5 times the design capture volume not reliably retained onsite; OR
  * [b] Treat the design capture volume not reliably retained onsite with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite.
  * ~~[c] Have an appropriate loading rate to prevent erosion, scout and channeling within the BMP.~~
*
* Insert Footnote X: As part of the copermittee's updates to their BMP Design Manuals, pursuant to Provision E.3.d, the copermittees must provide guidance for hydraulic loading rates and other biofiltration design criteria necessary to maximize pollutant removal.
*

Critical Sediment Yield Areas (E.3.c)

* Sediment is a challenge to assess and manage
* Board staff have proposed language to manage sources of critical sediment
* Recommend additional language that allows Permittees flexibility to develop alternative compliance options for the development community

ISSUE – Allow WQIP to work

All program elements should be "adaptable", including Provisions C, D and E

* Use limited resources to achieve highest priority outcomes
* Balance Santa Ana and San Diego MS4 Permit programs where appropriate to improve program performance

WQIP revisions still subject to stakeholder and Board review

012867

Technical Concerns with the Inclusion of Bacteria TMDL into the San Diego Region MS4 Permit

Todd Snyder, County of San Diego
Ken Susilo, PE, D.WRE, CPSWQ, Geosyntec Consultants

Technical Concerns with Inclusion of Bacterial TMDL for Beaches and Creeks

- **Science:** TMDL's bacteria limits do not reflect the current state of the science or recently collected data.
- **Attainability**: TMDL requirements are not consistently attainable.
- **Benefit-Cost:** No benefit-cost analysis has been performed.

- **County technical concerns were not adequately addressed in response to comments.**

Science

- Basis for Opinions
  - Review of Staff Reports
  - Review of Data in Reference Watersheds
  - Research by Nationally Recognized Experts
  - State of the Science Workshop (2012)

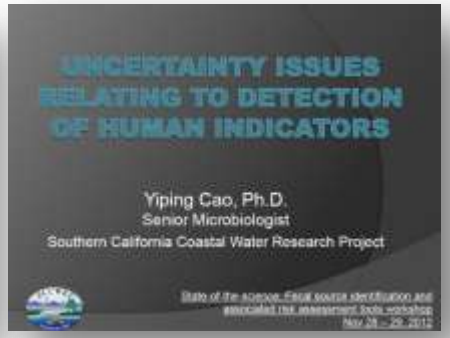

Science (Reference Approach)

- Permit Reference Approach is Inappropriately Applied to TMDL Compliance Sites
  - Large reference watersheds have higher AEF than medium size watersheds (Arroyo Sequit)
  - Wet weather AEFs should be higher (28%-30%)
  - Dry weather AEF should not be zero (winter-dry and perhaps summer-dry based on Arroyo Sequit)
  - Definition of wet weather day = 0.2 in. with 72 hr antecedent period:
    - Is inconsistent with that used for reference watershed and unsupported;
    - Makes zero dry-weather exceedances even more unreasonable.

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Science (Reference Approach)

- Reference Watershed Exceeds Wet Weather TMDL Standard about 50% of the Wet Time (Dry over 85%)

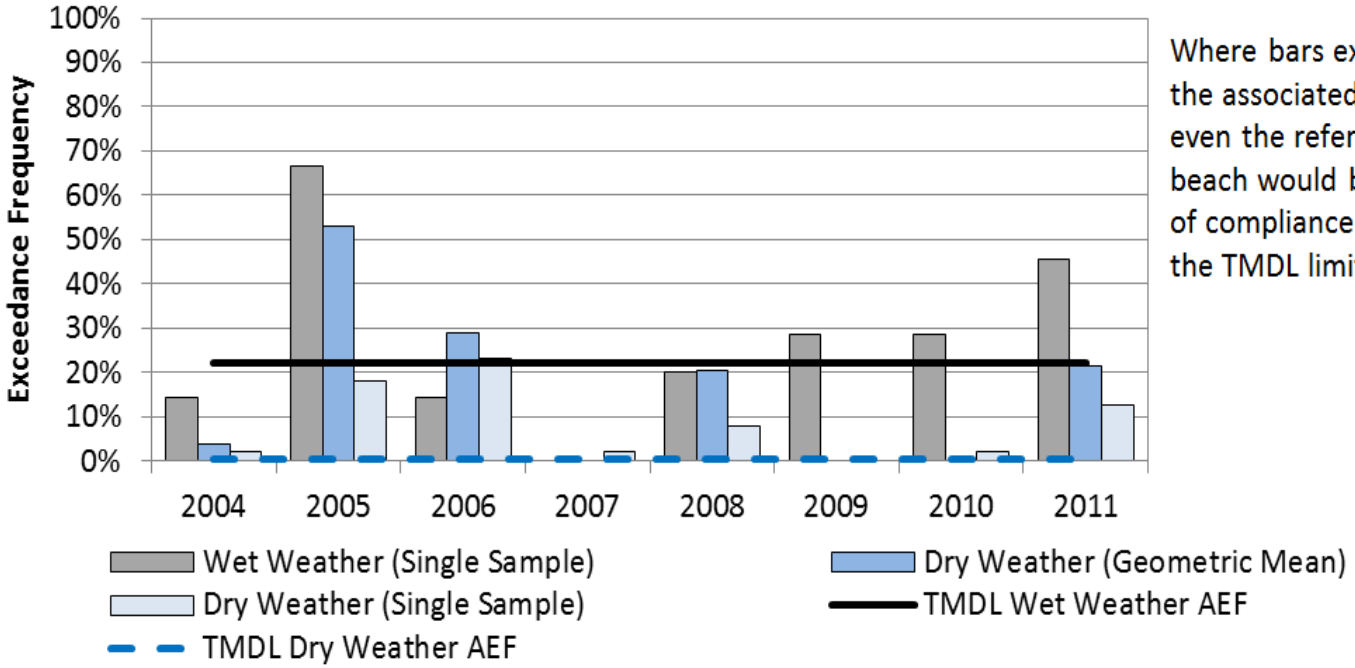

Where bars exceed the associated AEF, even the reference beach would be out of compliance with the TMDL limits.

Notes:

1. 30-day Rolling GM - Geometric mean calculation performed every week, on the dry weather samples within the previous 30-days period, if 5 or more samples have been taken in the 30-day period.

Science (Public Health)

- TMDL does not adequately reflect a protection of public health
  - TMDL FIB limits are inconsistent with recently published EPA 2012 REC Criteria
  - Need epidemiological data to specifically quantify the illness burden for swimmers and surfers during wet weather in stormwater dominated receiving waters.

Attainability

- Basis for Opinion on Attainability
  - Actual Monitored
    - Land Use Specific Data
    - BMP Performance Data
    - In-Stream Data
  - Predicted Performance of Non-Structural BMPs
  - Structural BMP Prioritization and Analysis Tool (SBPAT) Model runs that utilized actual land use and BMP performance data

SBPAT

- From the Los Angeles MS4 Permit

A Reasonable Assurance Analysis (RAA) shall be quantitative and performed using a peer-reviewed model in the public domain. Models to be considered for the RAA [include]… ***Structural BMP Prioritization and Analysis Tool (SBPAT).***

- Incorporates land use EMC data, BMP effluent data, SWMM modeling, and deterministic and stochastic analyses.

ORDER NO. R4-2012-0175, NPDES NO. CAS004001
Coastal Watersheds of Los Angeles County
Limitations and Discharge Requirements Page64

012874

Attainability (Uncertainty and Variability)

Many reasons to expect variability (and not one answer)

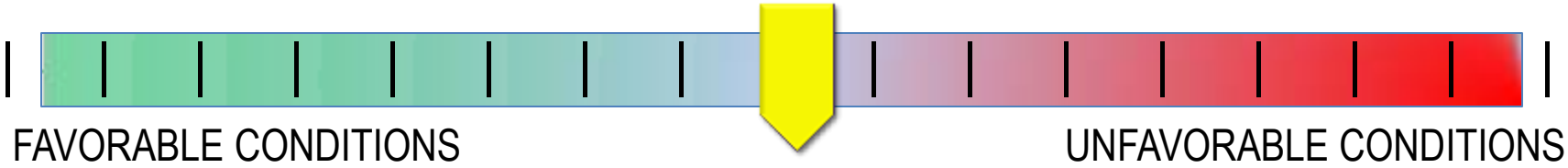

- Below Average Pollutant Inflow Concentrations
- Small storm events
- Mild Pre-Storm Conditions that
  - Decrease Runoff Volumes
  - Result in more capture BMPs
  - Are timed with maintenance
  - Vegetation Cover (seasonality)
- Good BMP Performance
- Multiple water (re)uses available
- No direct loading/sources in receiving waters or from non-anthropogenic sources

- Higher than Average Pollutant Concentrations (build up)
- Higher than Average Rainfall
- Extreme Pre-Storm Conditions that impact
  - Runoff (saturated conditions)
  - Capacity within BMPs (including groundwater levels)
  - Maintenance scheduling
  - Vegetation Cover (seasonality)
- Direct or In-system Loading, Non-Human Contributions, and Regrowth

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Attainability (BMP Performance vs WQBELs)

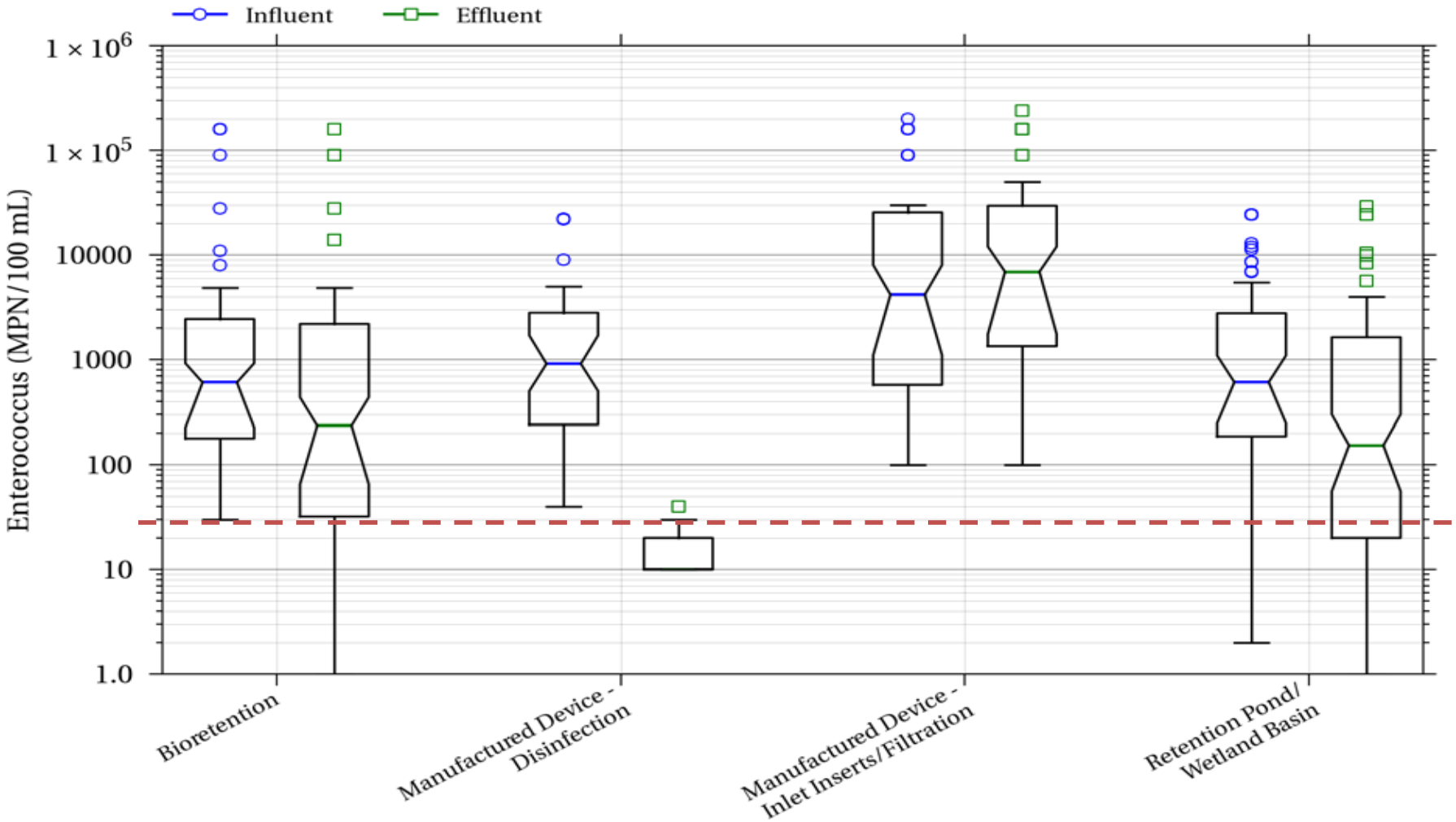

Clary, J., B. Steets, J. Jones, E. Strecker, M. Leisenring.
Fecal Indicator Bacteria Reduction in Urban Runoff. October 2012. <www.stormh20.com>.

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Attainability (Good Projects Not Achieving Attainment)

Non-structural: Santa Barbara - effective source control, still with noncompliance

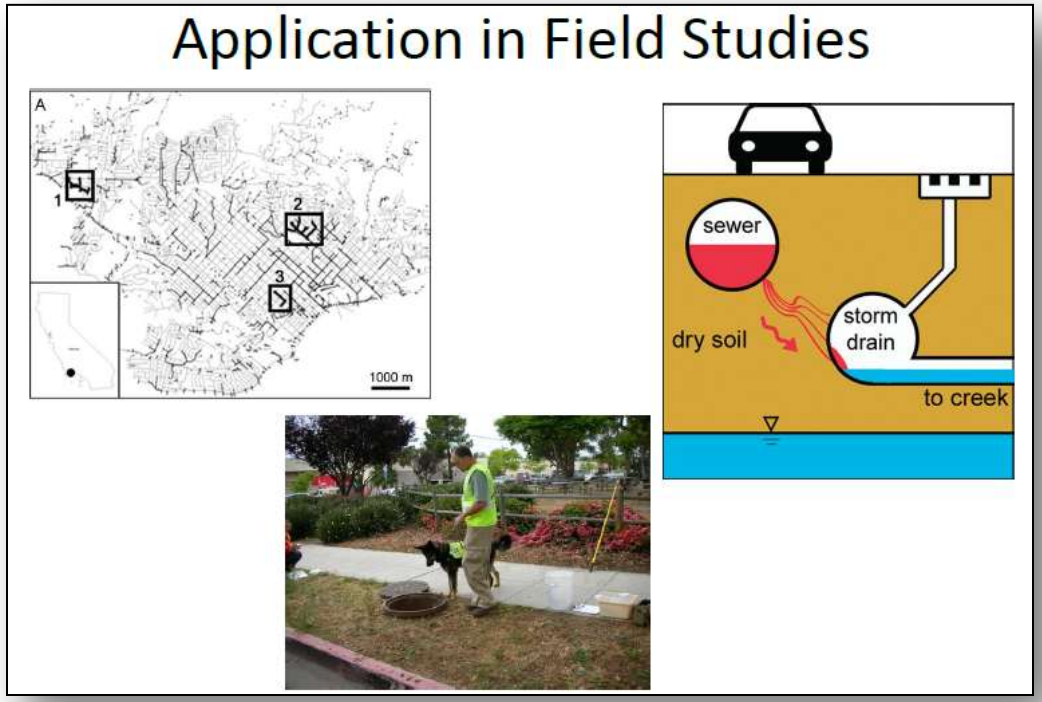

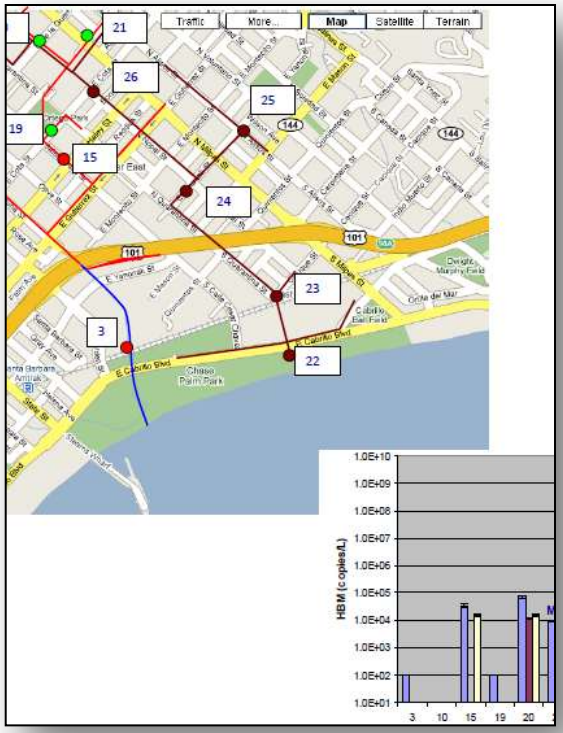

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Attainability (Good Projects Not Achieving Attainment)

- Example of structural + non-structural BMP implementation:
  - Santa Monica Pier
    - Full dry-weather capture - SMURRF
    - Bird trash control and exclusion
    - Sewer connections and rehabilitation
    - High levels of Enterococcus remain
- Direct sources in receiving waters
  - Natural sources (kelp wrack, sediments)
  - Regrowth in enclosed systems
  - Human sources (bather shedding, etc.)

Benefit-Cost (Basis)

- Basis for Cost Estimates
  - San Diego County Copermittees' Comprehensive Load Reduction Plans (submitted to RWQCB October 2012)

Cost Type	Annual Cost	Factor
Current Program	$119 million	---
Bacteria TMDL	$156 - 283 million	1.3x- 2.4x
Total	$275 – 402 million	2.3x– 3.4x

Benefit-Cost (Project Types from CLRPs*)

Wet-Weather Project List

- Non-Structural BMPs
  - Homelessness Waste Management Program Enhancements
  - New Residential/Small-Scale LID Incentive Program
  - Pet Waste Program Enhancements
  - Animal Facilities Management Enhancements
  - Street and Median Sweeping Enhancements
  - Drain Inlet and Conveyance System Cleaning
- Structural BMPs
  - 9 regional projects in SDR
  - 10 regional projects in SLR
  - Green Streets in High Priority Catchments
- Stream Restoration Projects

Dry-Weather Project List

- Non-Structural BMPs
  - Identification and Control of Sewer Discharges to MS4
  - Irrigation Runoff Reduction Enhancements
  - Commercial/Industrial Good Housekeeping Enhancements
- Infrastructure Improvements
  - Stormdrain and/or sewer repair and replacement in additions to existing budget
- Dry-weather Diversions/Treatment
  - 8 Low Flow Diversions
  - UV Treatment - 2175 acres

*San Diego River and San Luis Rey Watershed CLRPs

012880

Benefit-Cost (Example Costs from CLRPs)

- Wet-Weather vs Dry-Weather Cost Summaries (CLRP output from San Diego River and San Luis Rey)

	San Diego River Watershed	San Luis Rey Watershed	Combined	% of Total Cost
Wet-Weather	$394-820M	$79-157M	$473-977M	60-66%
Dry-Weather	$190-511M	$43-113M	$233-624M	33-39%
Studies	$3-6.5M	$3-6M	$6-13M	1%
Compliance Monitoring	$3M	$1M	$4M	<1%
Total	**$590-1340M**	**$126-277M**	**$716-1618M**	

012881

Benefit-Cost (Public Health Benefits)

Regional Public Health Cost Estimates from Los Angeles and Orange County (Given et al, 2006)

	Wet Season (Nov-Apr)		Dry Season (May-Oct)	Total
Health Costs[a]	$1.6M-$8.5M		$19.3M -$40.8	$20.9-$49.3
% of Total Cost	8-17%		80-92%	
Days	Wet Season Wet Weather	Wet Season Dry Weather	Dry Season Dry Weather	
Number of Days	40[b]	141	184	
Adjusted Health Costs	$360K-$1,883K	$20.5M - $47.4M		
Adjusted Percent of Total Health Cost	**2-4%**	**96-98%**		

[a] Given, et al., 2006.

[b] Estimate based on six month wet season (181 days). Costs assumed to be proportional to days within season.

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Benefit-Cost* (Comparative Public Health Basis)

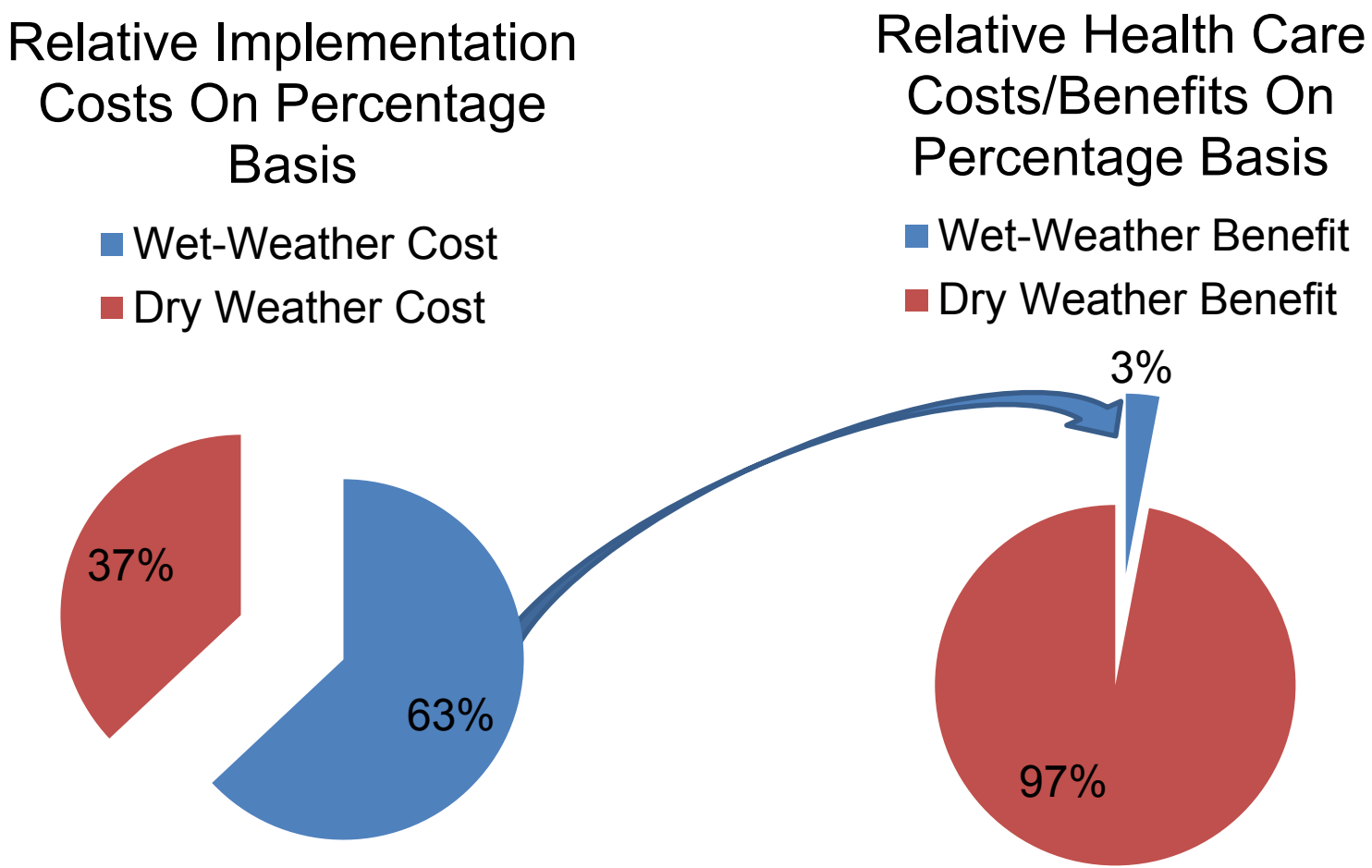

Costs estimated from the average of high and low estimates from the San Diego river and San Luis Rey Watershed CLRPs

Benefit-Cost (Uncertainties)

- RWQCB did not quantify the benefits of this particular TMDL.
- Uncertainties in Benefit Analysis of other cited studies(Given et al., 2006).
- Discussion from Given study:
  - *Generally speaking, it will be more difficult to reduce contaminant levels at cleaner beaches. At beaches with high attendance and generally good water quality… policy managers should continue dry weather source reduction efforts (e.g., education campaigns and watershed management), but should also recognize that <u>the cost of eliminating all beach contamination may outweigh the marginal public health benefits of doing so</u>. [emphasis added]*

Benefit-Cost (Composite Wet-Dry Study)

- City of San Diego-commissioned study performed by economists at Point Loma Nazarene University (April 2011)
  - Estimated costs to City of San Diego $3.7B
  - Estimated benefits $617M
    - Implicit Beach Value (off limit days from 40 to 8)
    - Economic Value (direct spending + multiplier)
    - Health Care Savings (GI, Acute Respiratory Disease, Ear Infection, Eye Infection)
  - Costs outweigh benefits by 6 to 1.

Preserve Compliance Option

- Compliance Option is highest priority issue for City of San Diego
- Clear compliance path critical for our program's water quality efforts

How did we get here?

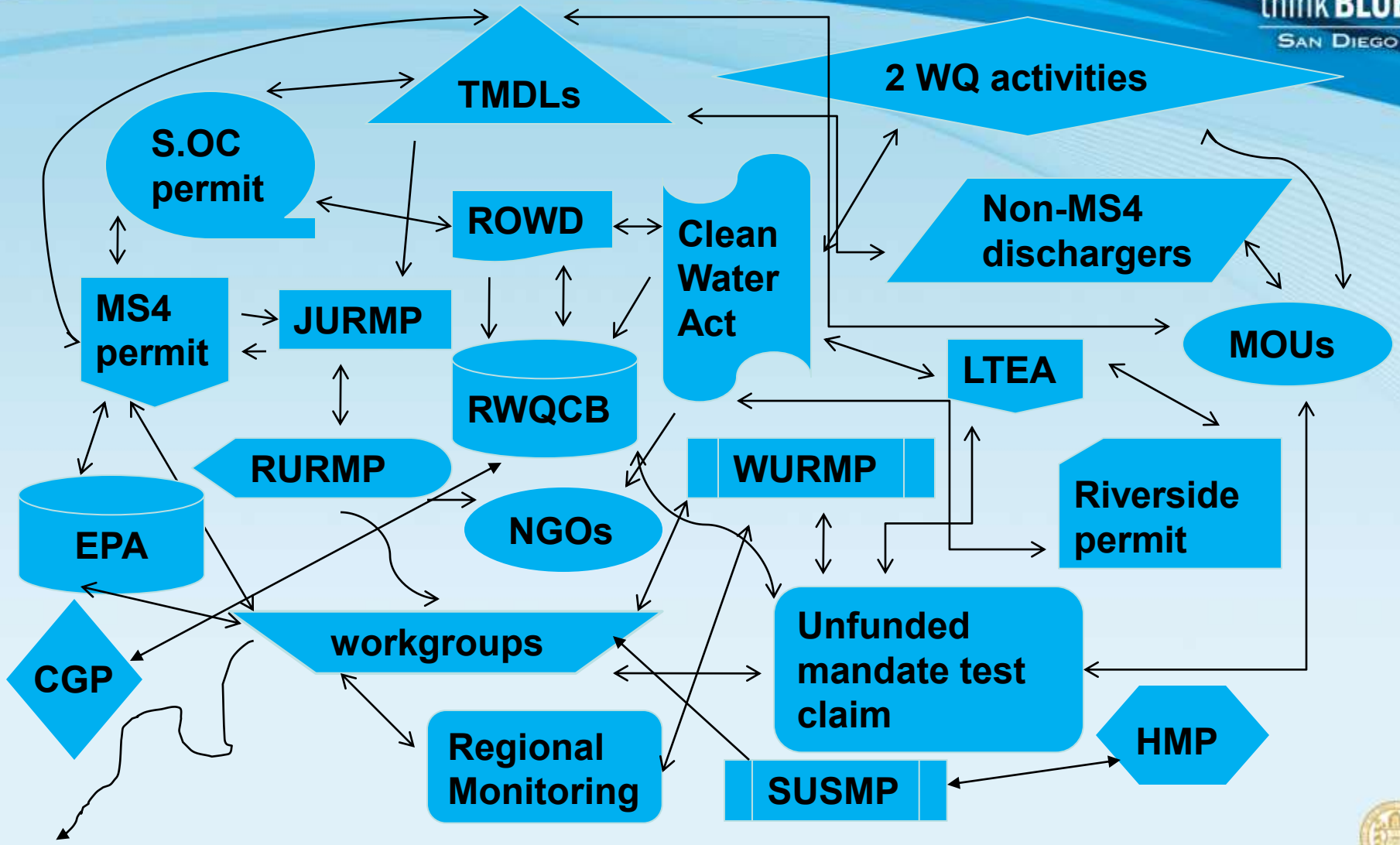

Compliance Option & Funding

- Provides clear linkage between funding requests and compliance
- Supports our budgeting for BMPs
- "Annualizes" funding needed for long-term efforts (TMDLs)

Adopt Permit with Option 2

- City of San Diego's single most important issue
- With Option 2, we <u>support</u> this Permit

San Diego Regional MS4 Permit

Environmental Group Testimony

May 8, 2013

Jill Witkowski, San Diego Coastkeeper
Noah Garrison, Natural Resources Defense Council
Colin Kelly, Orange County Coastkeeper and
Inland Empire Waterkeeper

Low Impact Development

Environmental Services, City of Portland, Oregon/Kevin Robert Perry

Provision E.3.c.(1)(a)(i)

If a Copermittee determines . . . then the Copermittee may allow the Priority Development Project to utilize biofiltration BMPs. Biofiltration BMPs must be ~~sized and~~ designed with an appropriate loading rate to maximize retention and pollution reduction, as well as prevent erosion, channeling and scour, and must be sized to:

[a] Treat 1.5 times the design capture volume not reliably retained onsite; OR

[b] Treat the design capture volume not reliably retained onsite with a flowthru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite.

~~[c] Have an appropriate loading rate to prevent erosion, scour, and channeling within the BMP.~~

Provision E.3.c.(3)(a)(ix)

~~(ix) Receiving waters must not be utilized to convey untreated storm water runoff from the Priority Development Project to the candidate project;~~

The Clean Water Act

(OC Register)

(LA Times)

Beach Closures

- San Diego County reported nearly 300 closing or advisory days in 2011 from all sources, and Orange County more than 750. Stormwater is the largest cause.
- Depending on the cost model used, for Orange County alone, excess cases of gastrointestinal illness from swimming in bacteria contaminated beachwater cost:
  - between $6 million and $16 million per year, or;
  - when willingness to pay *not* to get sick is included, between $56 million and $136 million per year.

Impaired Waters

Receiving Water Limitations

"we conclude the Permit's Water Quality Standards are proper under federal law."

Building Industry Assoc. of San Diego County v. State Water Resources Control Bd. (2004) 124 Cal.App.4th 866, 880

The Regional Board "included Parts 2.1 and 2.2 in the Permit without a 'safe harbor.'" These are independently enforceable requirements that prohibit discharges that cause or contribute to a violation of Water Quality Standards.

L.A. County Mun. Storm Water Permit Litigation, No. BS 080548 at 7 (L.A. Super. Ct. March 24, 2005)

Anti-backsliding

012897

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

AUG 0 8 2012

Mr. Jay Sakai, Director
Water Management Administration
Maryland Department of the Environment
1800 Washington Boulevard
Baltimore, Maryland 21230

"Backsliding is prohibited in NPDES permits. . . . Allowing additional time to complete a task that was required by the previous permit constitutes a less stringent condition and violates the prohibition against anti-backsliding."

MOA. As further explained herein, EPA believes that several substantive requirements for MS4 permits, as required by the federal Clean Water Act, 33 U.S.C. §§ 1251 *et seq.* (CWA), and its implementing regulations, have not been incorporated into the Prince George's County permit.

EPA's objection to the draft permit and identification of revisions needed before EPA can remove the objection, *see* 40 C.F.R. § 123.44(b)(2)(ii), are described below:

1. **Water Quality Standards**

Federal regulations require that all NPDES permits contain limitations to control discharges which may cause, have the reasonable potential to cause or contribute to an excursion above water quality standards. 40 C.F.R. §122.44(d)(1)(i). Part VI of the draft Prince George's County permit (Enforcement and Penalties) contains general language

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Antidegradation Policy

Protects existing uses and water quality necessary to support existing uses, or, for “high quality” waters, protects water quality better than necessary for “fishable/swimmable” uses.

Water quality may only be lowered in certain limited circumstances. In no case may water quality be lowered to a level which would interfere with existing or designated uses.

See, State Bd. Resolution 68-16,

40 CFR § 131.12

Area of Special Biological Significance

ASBS

Suggested Improvements to RWQCB Tentative Order No. R9-2013-0001

Coalition Members

THE ASSOCIATED GENERAL CONTRACTORS · SAN DIEGO CHAPTER

CICWQ

Alliance for Habitat Conservation

SDCAA SAN DIEGO COUNTY APARTMENT ASSOCIATION

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What we support

- The development of Water Quality Improvement Plans as the Core of the Permit
  - An open process involving all of the stakeholders
  - A stakeholder panel consisting of experts to assist in the development of the WQIPs
  - An outcome-based process that will achieve cleaner stormwater for the whole region, not just a small percentage of the built environment
  - Watershed/regional solutions— alternative compliance within the WQIPs will achieve cleaner stormwater faster
  - Incentivize & encourage regional cooperation

Suggested Improvements

- Adopt the US EPA's policy of incentivizing infill development by keeping urban infill Hydromodification Management Standard exemptions per the existing San Diego HMP process; modify, if necessary, as part of the stakeholder process to develop the WQIPs
- Allow more time to develop the WQIPs—give the Executive Officer the authority to extend the time to develop the WQIPs if needed
- Redefine Priority Development Projects for large area, low impervious projects (e.g., solar and wind renewable energy projects.)
- Strike sediment transport language and incorporate this as appropriate in the WQIPs (Section E.3.c.(2)(b) – page 95 of 144)
- Change the definition of Ground Water

Hydromodification Management Standards

012904

- The Coalition and RWQCB staff agree that the Tentative Order keeps current hydromodification management standards in place until such time as the WQIPs are approved by the RWQCB
- The Coalition believes that the current hydromodification management standards are based on good science. Given the limited resources available to the Co-permittees, the Coalition believes that the current hydromodification management standards should be presumed appropriate unless shown otherwise through the development of the WQIPs

Hydromodification Management Standards

012905

- **Request of the Board:**
  - Add the following finding to the Tentative Order:
    - The Regional Board finds that there is substantial evidence to support the use of the current hydromodification management standards in each WQIP unless there are unique characteristics in the watershed to the contrary.

Sediment Balance/Transport

- Concern:
  - This is an example of how a good idea applied to a specific situation becomes a bad idea when applied across the board.
  - This is an example of how overly prescriptive regulations often lead to unintended consequences, including overreaching an agency's authority.
  - The staff has stated it is not their intent to dictate land use decisions, yet they are opposed to removing this prescriptive and overreaching rule.
  - The rule is based on an incomplete understanding of fluvial geomorphic principles and stream rehabilitation.
  - As copermittees will likely continue to implement land development policies from the permit that require expensive studies, this will likely result in yet one more needless study to prove what is already intuitively obvious in the vast majority of development projects.
- Recommendation:
  - strike the requirement to avoid critical sediment yield areas found in Provision E.3.c.2) (b) and properly address the issue in the WQIPs.

Change the definition of Ground Water

- Concern:
  - The current definition of Ground Water in the permit remains vague.
  - Determining what constitutes ground water requires professional expertise.
- **Request of the Board:**
  - Revise the definition in the draft permit as follows:
- Groundwater –Subsurface water that occurs beneath the water table in soils and geologic formations that are fully saturated as determined by an appropriately licensed professional pursuant to California Business and Professions Code Section 7830 et seq.

Revise policy to adopt EPA standard for urban infill projects

012508

- Concerns:
  - Permit requires that urban infill projects use a “pre-development condition” standard conflicts with other land use policies and State laws such as AB-32 & SB-375
  - Recent EPA policy expressly encourages incentivizing infill development
- Recommendation:
  - Keep the urban infill project exemption as it reflects EPA’s policy direction to incentivize infill development projects; use the pre-project condition standard unless specific findings in the WQIPs require an alternative standard.

Change the definition of Priority Development Projects for large area, low impervious projects

012909

- Concern:
  - The current definition of PDP permits pulls in projects such as renewable energy and public parks that have more than 10,000 square feet of impervious area but are less than 3% total impervious area
- Request of the Board:
  - New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site), or redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site). This category includes commercial, industrial, residential, mixed-use, and public development projects on public or private land. This category does not include renewable energy solar or wind projects that do not create impervious surfaces collectively over the entire project site by more than 3% of the total surface area.

Provide more time to develop the WQIPs

- Concerns:
  - This will be the first attempt to develop WQIPs
  - This is an ambitious effort which will likely include issues that have not been anticipated
  - There is no assurance at this time that eight high quality WQIPs can be produced within 24 months.
- **Request of the Board:**
  - Modify the draft Order to grant the Executive Officer discretion to extend the deadline for Co-permittees to develop the WQIPs when good cause is shown

Alternative Compliance

- We need to ensure that Alternative Compliance methods and frameworks are included beyond the limited options included in the permit
- Need to ensure project applicants can actually use the option of Alternative Compliance
- Copermittees have a valid point of needing resources to maintain retrofit devices installed as result of Alternative Compliance

Conclusions

- We seek to build on the collaborative effort started by RWQCB, with co-permittees and NGOs
- Take the time needed to develop a consensus based permit
- The HMP deserves the time to see measurable results
- WQIPs are supported by all stakeholders-**Let's get it done right**

San Diego Regional Water Quality Control Board

SDG&E Presentation
May 8, 2013 Public Hearing
on Tentative Order R9-2013-0001
(San Diego Regional MS4 Permit)

Post-Construction BMPs

Linear Underground/Overhead Projects (LUPs)

- SDG&E's testimony on April 11: Permit's post-construction BMPs requirements:
  - Do not differentiate between concentrated impacts from traditional development (e.g., residential, commercial); and
  - Small disconnected impacts from linear projects such as utility power lines
- Purpose of post-construction BMPs:
  - Address large concentrated impacts from traditional footprint development projects (e.g., residential, commercial)
- Permit would also require small disconnected impervious surfaces spread over long distances (e.g., power lines) to implement these BMPs and management requirements
- This adds new design, construction, maintenance, and/ or reporting requirements on LUPs and co-permittees without commensurate water quality benefits

Relative Size

Minimum Threshold for
New Development
10,000 ft^2 Impervious Surface

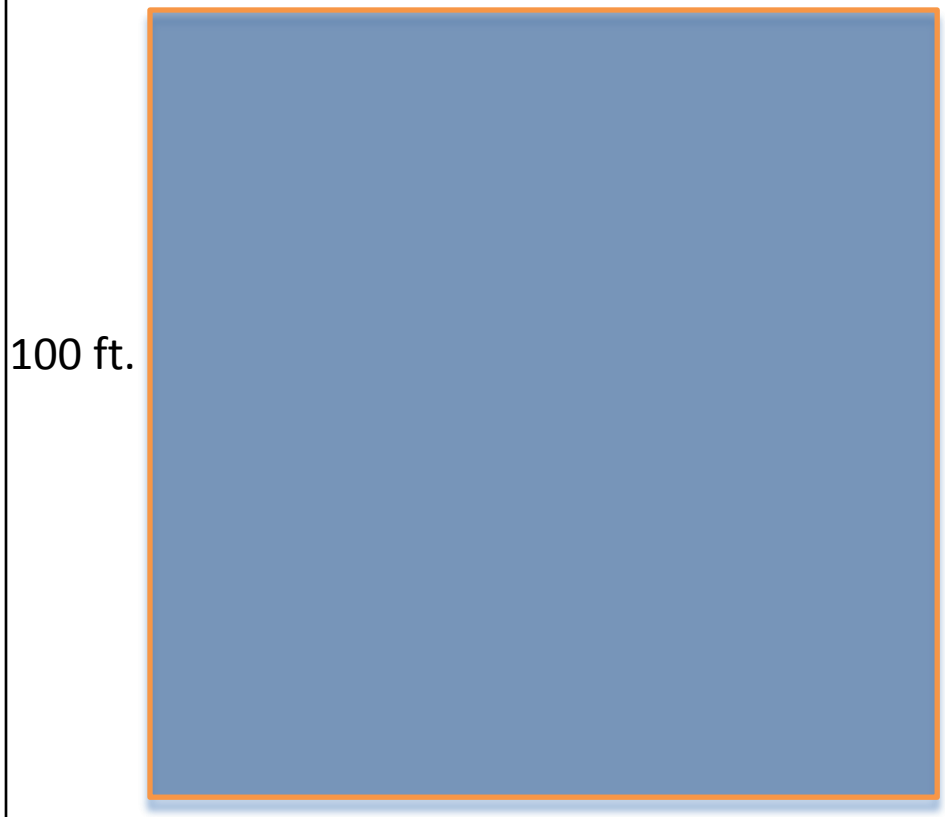

Transmission Pole Foundation
110 ft^2 Impervious Surface

12 ft.
diameter

Post-Construction BMPs – LUPs

- LUP facilities would not individually exceed thresholds, only collectively on long projects
- SWRCB has recognized LUP's dispersed facilities do not pose a water quality threat in their permits:
  - SWRCB Construction General Permit
  - SWRCB Small MS4 General Permit
- Regarding LUPs, this requirement needs to be corrected in this permit
- Staff position – Board would need to make this change
- We request that the Board incorporate permit language to clarify that:

  LUPs are not "Development Projects" and are not subject to the development planning requirements in Section E.3.
- We have previously provided language to the Board to make this clarification and have it available for you

Solution for LUPs
Option 1

General

- Insert language to clarify that LUPs are not "Development Projects" and are not subject to the development planning requirements in Section E.3.

Solution for LUPs
Option 1 (cont.)

- **Finding 10** - Add the following sentence and footnote to the end of the finding:

  "The nature of linear underground/ overhead projects (LUPs) is to return project sites to pre-construction conditions. Therefore, consistent with Finding 73 in the SWRCB's Storm Water Construction General Permit[FN], LUPs are not subject to the development planning requirements (i.e., Section E.3.).

  [FN]Order 2009-0009-DWQ, as amended by Orders 2010-0014-DWQ and 2012-0006-DWQ

Solution for LUPs
Option 1 (cont.)

- **Definition of "Development Project"** - Add the following sentence to the end of the definition:

"Development Projects do not include linear underground/ overhead projects (LUPs)."

Solution for LUPs
Option 1 (cont.)

Definition of "LUPs" - Add the definition from the SWRCB Construction General Permit to Attachment C:

> **"Linear Underground/Overhead Projects (LUPs) include, but are not limited to, any conveyance, pipe, or pipeline for the transportation of any gaseous, liquid (including water and wastewater for domestic municipal services), liquiescent, or slurry substance; any cable line or wire for the transmission of electrical energy; any cable line or wire for communications (e.g., telephone, telegraph, radio, or television messages); and associated ancillary facilities. Construction activities associated with LUPs include, but are not limited to, (a) those activities necessary for the installation of underground and overhead linear facilities (e.g., conduits, substructures, pipelines, towers, poles, cables, wires, connectors, switching, regulating and transforming equipment, and associated ancillary facilities); and include, but are not limited to, (b) underground utility mark-out, potholing, concrete and asphalt cutting and removal, trenching, excavation, boring and drilling, access road and pole/tower pad and cable/wire pull station, substation construction, substructure installation, construction of tower footings and/or foundations, pole and tower installations, pipeline installations, welding, concrete and/ or pavement repair or replacement, and stockpile/borrow locations."**

Solution for LUPs
Option 1 (cont.)

- **Fact Sheet (Redline Version p. F-91, Section Provision E.3-Development Planning)** - Insert the following language after the first sentence:

  "The requirements of Provision E.3.a include the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment*" applicable to all development projects, regardless of size or purpose of development." **"However, due to the nature of Linear Underground/Overhead Projects (LUPs) to return project sites to preconstruction conditions the definition of "Development Projects" excludes LUPs and LUPs are not subject to Section E.3."**

Solution for LUPs
Option 2

General

- Insert language that clarifies that:
  - LUPs are not subject to the ≥1 acre land disturbance threshold
  - LUPs are only subject to the impervious surface thresholds when a discrete location on a LUP has a newly constructed contiguous impervious surface exceeding a threshold
  - Where exceeded, the permit requirements only apply to that discrete location

Solution for LUPs
Option 2 (cont.)

- **Finding 10** - Add the following sentence and footnote to the end of the finding:

  "The nature of linear underground/ overhead projects (LUPs) is to return project sites to pre-construction conditions. Therefore, consistent with Finding 73 in the SWRCB's Storm Water Construction General Permit[FN], LUPs are not defined as a Priority Development Project based on the LUP's area of land disturbance (Section E.3.b.1.e.). Additionally, LUPs are not defined as a Priority Development Project based on the LUP's amount of new impervious surface unless a LUP has a discrete location with newly constructed contiguous impervious surface that exceeds one of the impervious surface thresholds in Section E.3.b. Further, when the LUP has a discrete location with newly constructed contiguous impervious surface that exceeds one of the impervious surface thresholds in Section E.3.b, only that specific discrete location is subject to the structural BMP performance requirements in Section E.3.c.

  [FN]Order 2009-0009-DWQ, as amended by Orders 2010-0014-DWQ and 2012-0006-DWQ"

Solution for LUPs
Option 2 (cont.)

Definition of "LUPs" - Add the definition from the SWRCB Construction General Permit to Attachment C:

> **"Linear Underground/Overhead Projects (LUPs) include, but are not limited to, any conveyance, pipe, or pipeline for the transportation of any gaseous, liquid (including water and wastewater for domestic municipal services), liquiescent, or slurry substance; any cable line or wire for the transmission of electrical energy; any cable line or wire for communications (e.g., telephone, telegraph, radio, or television messages); and associated ancillary facilities. Construction activities associated with LUPs include, but are not limited to, (a) those activities necessary for the installation of underground and overhead linear facilities (e.g., conduits, substructures, pipelines, towers, poles, cables, wires, connectors, switching, regulating and transforming equipment, and associated ancillary facilities); and include, but are not limited to, (b) underground utility mark-out, potholing, concrete and asphalt cutting and removal, trenching, excavation, boring and drilling, access road and pole/tower pad and cable/wire pull station, substation construction, substructure installation, construction of tower footings and/or foundations, pole and tower installations, pipeline installations, welding, concrete and/ or pavement repair or replacement, and stockpile/borrow locations."**

Solution for LUPs
Option 2 (cont.)

- **Section E.3.b.1.** – Add a footnote to the first sentence:

Priority Development Projects include the following"[FN]":

"[FN]LUPs are not defined as a Priority Development Project based on the LUP's amount of new impervious surface unless a LUP has a discrete location with newly constructed contiguous impervious surface that exceeds one of the impervious surface thresholds in Section E.3.b. Further, when a LUP has a discrete location with newly constructed contiguous impervious surface that exceeds one of the impervious surface thresholds in Section E.3.b., only that specific discrete location is subject to the structural BMP performance requirements in Section E.3.c."

Solution for LUPs
Option 2 (cont.)

- **Section E.3.b.1.e.** - Add a footnote to this section that states:

  New or redevelopment projects that result in the disturbance of one or more acre of land and are expected to generate pollutants post construction."[FN]":

  "[FN]This section does apply to LUPs, which are not defined as Priority Development Projects based upon the LUP's area of land disturbance."

Solution for LUPs
Option 2 (cont.)

- **Fact Sheet (Redline Version p. F-93, Section Provision E.3-Development Planning) –** In the second paragraph, insert the text below:

While all development projects are subject to the requirements of Provision **E.3.a**, Provision **E.3.b** identifies Priority Development Projects that exceed given size thresholds and/or fit under specific use categories.

"LUPs are not defined as a Priority Development Project based on the LUP's area of land disturbance. Additionally, LUPs are not defined as a Priority Development Project based on the LUP's amount of new impervious surface unless a LUP has a discrete location with newly constructed contiguous impervious surface that exceeds one of the impervious surface thresholds in Section E.3.b. Further, when the LUP has a discrete location with newly constructed contiguous impervious surface that exceeds one of the impervious surface thresholds in Section E.3.b., only that specific discrete location is subject to the structural BMP performance requirements in Section E.3.c."

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
9174 Sky Park Court, Suite 100
San Diego, California

MINUTES OF MEETING
MAY 8, 2013

At 9:00 a.m., Chairman Morales called to order the meeting of the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) at the Regional Water Quality Control Board, 9174, Sky Park Court, San Diego, California.

Item 1 – Roll Call and Introductions
Board Members present: Henry Abarbanel, Eric Anderson, Sharon Kalemkiarian, Tomas Morales, and Gary Strawn.

Staff Present: David Gibson, James Smith, Chris Witte, David Barker, Roger Mitchell, Julie Chan, Barry Pulver, Jeremy Haas, John Odermatt, Erik Becker, Tony Felix, Kelly Dorsey, Mike Porter, Chris Means, Brian Kelley, Alan Monji, Jody Ebsen, Sheila Christine McQuaid-Moran, Amy Grove, Bea Griffey, Craig Carlisle, Charles Cheng, Joann Lim, Michelle Mata, Chiara Clemente, Kristin Schwall, Ben Neill, Debbie Woodward, Deborah Jayne, Laurie Walsh, Wayne Chiu, Christina Arias, Rebecca Stewart, Frank Melbourn, Sean McClain, Fisayo Osibodu.

Others present on behalf of the San Diego Water Board: State Water Resources Control Board –Catherine Hagan, Julie Macedo. California Court Reporters – Bonnie Breen.

Public Attendance: Jan Scott; Jill Witkowski, San Diego Coastkeeper; Roy Hobbs, Shelter Island Boat Yard/San Diego Port Tenants' Association; Chris Stransky, AMEC; Al Masry; Chris Haynes, U.S. Navy; Howard Bailey, Nautilus Environmental; Cindy Lin, USEPA; Jack Monger, Industrial Environmental Association (IEA); Roger Bailey, San Diego Public Utilities; Adrian Kinnane, San Diego Coastkeeper; Travis Pritchard, San Diego Coastkeeper; Darren Smith, California State Parks; John Kemmerer, USEPA; Mikhail Ogawa, City of Del Mar; Kris McFadden, City of San Diego; Noah Garrison, Natural Resources Defense Council; Roger Butow, Clean Water Now; Todd Snyder, County of San Diego; Ken Susilo, Geosyntec Consultants; Richard Boon, County of Orange; Jason Uhley, Riverside County; Bill Brown, Port of San Diego; Michael McSweeney, Building Industries Association (BIA); Dennis Bowling, BIA; Tory Walker, BIA; Fred Jacobsen, SDG&E; Vaikko Allen, Contech; May Anne Skorpanich, County of Orange; Stan Griffiths, City of San Diego; Steve Meyer, City of San Diego; Ann Sasaki, City of San Diego; Jeremy Jung, City of San Diego; Heather Stroud, City of San Diego; Colin Kelly, Orange County Coastkeeper/Inland Empire Waterkeeper; James O'Day, County of San Diego; Ryan Baron, County of Orange; Sean Kerafin; S. Wayne Rosenbaum, Attorney, San Diego Coalition; Mark Grey, BIA; Jesse Gipe, Office of Senator Joel Anderson; Angeli Callinog, Office of Senator Joel Anderson; Ruth Kolb, City of San Diego; Brian Gordon, U.S. Navy; Marilyn O'Neill, Nautilus Environmental;

Steven E. Strapac, Poway; Sheri McPherson, County of San Diego; Stephanie Gaines, County of San Diego; Adrienne Ciber, Nautilus; Catherine Cope, Dana Point Shipyard; Julie Hampel, UC San Diego (UCSD); Kimberly O'Connell, UCSD; Chuck Kolz, U.S. Navy; Rita Fernandez, Office of Congressman Juan Vargas; Barry Snyder, AMEC; Trevor Alsop, Geosyntec; Jared Dunk, AMEC; Scott Norris, County of San Diego; Joe Parco, City of Rancho Santa Margarita; Jennifer Shook, County of Orange; Chris Crompton, County of Orange; Jenna Voss, County of Orange; Grant Sharp, County of Orange; Karen Holman, Port of San Diego; Eric Lonedi, Rancho California Flood Control and Water Control District (RCFCWCD); Steve Hon, County of Riverside; Les Kaminski, SDCRAA; Khosro Aminpour, City of Chula Vista; Jim Rasmus; Nancy Palmer, City of Laguna Niguel; Tracy Ingebretsen, City of Laguna Beach; Brad Fowler, City of Dana Point; Lisa Zawalski, City of Dana Point; Mo Lahsaie, City of Oceanside; Annie Martin, Airport Authority; Paul Hartman, Larry Walker Associates (LWA); Karen Conam, LWA; Karen Ashley, LWA; Christine Sloan, County of San Diego; Nancy Richardson, County of San Diego; Rosanne Laurence, Laruc Environmental; Malik Tamimi, City of Lemon Grove; Willie Gaters, SDG&E; Jaime Campos, City of El Cajon; Rachel Davenport, AMEC; Jo Ann Weber, County of San Diego; Kristiane Hill, California State Parks; John Quenzer, City of National City; Cheryl Filar, City of Vista; David Pohl, ESA; Dave Renfrew, Weston Solutions; Ann Bechtel, Atkins; Devin Slaven, City of Lake Forest; Joe Ames, City of Mission Viejo; James Wood, City of Carlsbad; Elaine Lukey, City of Carlsbad; Claudia Steiding, Riverside County Transportation Department; Nancy Gardiner, Haley & Aldrich; Joe Kohn, City of La Mesa; Bryn Evans, URS; Chris Helmer, City of Imperial Beach; Christian Brown, Geosyntec; Lisa Skutecki, Brown & Caldwell; Sumer Hasenin, City of San Diego; Jennifer Peterson, Nolte; Julia Chunn-Heer, Surfrider San Diego; Aldo Licitra, City of Temecula; James Lawson, California Strategies; Mark Williams, AECOM.

Item 2 – Public Forum

Jan Scott expressed concern about illegal dumping of agricultural waste mixed with trash into the Santa Margarita Watershed.

Jill Witkowski asked for an update on efforts to address the erosion in Los Peñasquitos Canyon. In addition, she commended the City of San Diego for their rapid response to a complaint about open dumpsters at Mission Bay during a rain event.

Item 3 – Minutes of Board Meeting: April 10-11, 2013

Approval of the minutes was postponed until the June meeting.

Item 4 – Chairman's, Board Members', State Water Board liaison's, and Executive Officer's Reports. These items are for Board discussion only. No public testimony will be allowed, and the Board will take no formal action.

Mr. Gibson responded to questions from the Board members regarding the written Executive Officer's report, and he noted that he would be attending the Tijuana Watershed Binational Vision meeting next week in Tijuana.

Ms. Kalemkiarian asked staff to arrange a tour of the agricultural areas that are monitored by the Board.

Item 5 – Information Item: Water Quality Management Training Requirements of the Agricultural and Nursery Operations Waiver and the University of California Cooperative Extension Irrigated Lands Education Program. The Board will take no formal action. (*Julie Chan*)

Ms. Chan made her presentation introducing and providing background information on the Ag Waiver.

Valerie Mellano, with the agricultural water quality program at the University of California Cooperative Extension (UCCE), provided background information about the development of UCCE's Irrigated Lands Education Program.

Loretta Bates, who teaches San Diego UCCE's water schools, provided an overview of the water school and the Irrigated Lands Education Program.

Scott Parker, who runs UCCE's Healthy Garden Healthy Home program, responded to Board member questions regarding home gardens as opposed to farms.

Item 6 – Information Item: University of California, San Diego's Phase II MS4 Permit. (*Tony Felix*)

Mr. Felix provided background information and an overview of the Phase II MS4 permit.

Julie Hampel, Environmental Manager for University of California San Diego (UCSD), and Kimberly O'Connell, UCSD's Storm Water Program Manager, presented information regarding UCSD's efforts to comply with the non-traditional, small Phase II MS4 permit and to protect an area of special biological significance with its own NPDES permit.

Mr. Morales called a recess at 10:40 a.m. and reconvened the meeting at 10:54 a.m.

Item 7 – General NPDES Permit Issuance: General Waste Discharge Requirements for Discharges from Boatyards and Boat Maintenance and Repair Facilities Adjacent to Surface Waters within the San Diego Region (Tentative Order No. R9-2013-0026, NPDES No. CAG719001). (*Kristin Schwall and Michelle Mata*)

Mr. Morales made opening remarks and administered the oath and Kristin Schwall made the staff presentation. After comments from the public, Ben Neill made closing statements for the staff.

Jack Monger, Executive Director of the Industrial Environmental Association, spoke about the proposed order.

The following people spoke about the proposed order:

- Roy Hobbs, Shelter Island Boat Yard/San Diego Port Tenants Association
- Chris Stransky, Aquatic Sciences Group Manager, AMEC
- Al Masry
- Chris Haynes, U.S. Navy
- Howard Bailey, Senior Scientist, Nautilus Environmental
- Dr. Cindy Lin, Liaison and Scientist, U.S. EPA Region 9
- Jill Witkowski, Waterkeeper, San Diego Coastkeeper

The Chair closed the public hearing, and Executive Officer Gibson provided his recommendation.

Mr. Anderson made a motion to adopt the Tentative Order with errata, and the motion was seconded by Mr. Strawn. Following discussion, the motion passed by unanimous vote.

Mr. Morales broke for lunch and Closed Session at 12:55 p.m. and reconvened the regular meeting at 1:45 p.m.

Item 8 – Administrative Civil Liability: Settlement Agreement and Stipulation for Order and Administrative Civil Liability Order, City of San Diego, Sanitary Sewer Overflow to Los Peñasquitos Creek, Peñasquitos Lagoon, and the Pacific Ocean. Settlement to resolve violations of Order Nos. 2006-0003-DWQ and R9-2007-0005 as set forth in Tentative Order No. R9-2013-0032. The Settlement would impose monetary liability of $1,245,414 against the City of San Diego, of which $622,707 in liability would be paid to the State Water Resources Control Board's Cleanup and Abatement Account and $622,707 in liability would be suspended upon successful completion of an Enhanced Compliance Action as described in Tentative Order No. R9-2013-0032. (*Barry Pulver*)

Barry Pulver introduced the item and provided background information.

Darren Smith, Senior Environmental Scientist for California State Parks, addressed the proposed order.

The following people spoke about the proposed order:

- Adrian Kinnane, San Diego Coastkeeper
- Travis Pritchard, Water Quality Lab Manager, San Diego Coastkeeper

- Jill Witkowski, Waterkeeper, San Diego Coastkeeper
- Roger Bailey, Director of Public Utilities for the City of San Diego, and Ruth Kolb, City of San Diego

The following people registered support for the proposed order, but did not speak:

- Stan Griffin, Assistant Director, City of San Diego
- Steve Meyer, Deputy Public Utilities Director, City of San Diego
- Ann Sasaki, Assistant Director, City of San Diego
- Jeremy Jung, Deputy City Attorney, City of San Diego

A motion to adopt the Tentative Order was made by Mr. Strawn and seconded by Dr. Abarbanel. After some discussion, the Board adopted the Order by a 3-2 vote.

Mr. Morales called a recess at 3:00 p.m. and reconvened the meeting at 3:15 p.m.

Item 9 – Public Hearing: Issuance of a NPDES Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region (Tentative Order No. R9-2013-0001, NPDES No. CAS0109266). Continued from April 11, 2013. (*Wayne Chiu, Laurie Walsh, Christina Arias*)

After Mr. Morales gave his opening remarks and administered the oath, Wayne Chiu made the staff presentation.

The following people commented on the proposed order:

- Todd Snyder, Watershed Planning Manager, County of San Diego
- Ken Susilo, Principal, Geosyntec Consultants
- Richard Boon, County of Orange
- Jason Uhley, Chief of Watershed Protection, RCFCWCD
- Bill Brown, Attorney, Port of San Diego
- Michael McSweeney, BIA
- Dennis Bowling, BIA
- Tory Walker, BIA
- Fred Jacobsen, BIA
- Vaikko Allen, Director of Storm Water Regulatory Management, Contech Engineering Solutions
- Mary Anne Skorpanich, Orange County Watersheds Manager, County of Orange
- John Kemmerer, Acting Water Director, USEPA Region 9
- Mikhail Ogawa, Clean Water Manager, City of Del Mar
- Kris McFadden, City of San Diego
- Noah Garrison, National Resource Defense Council

- Jill Witkowski, Waterkeeper, San Diego Coastkeeper
- Roger Butow, Executive Director, Clean Water Now
- Heather Stroud, Deputy City Attorney, City of San Diego
- Colin Kelly, Staff Attorney, Orange County Coastkeeper, Inland Empire Waterkeeper

The following people expressed opposition to the proposed order, but did not speak:

- James O'Day, Senior Deputy County Counsel, County of San Diego
- Ryan Baron, County of Orange
- Sean Kerafin, Economic Policy Analyst
- S. Wayne Rosenbaum, Attorney, BIA
- Mark Grey, Director of Environmental Affairs, BIA

The following people expressed support for the proposed order:

Mr. Morales called a recess at 4:53 p.m. and reconvened the meeting at 5:08 p.m.

Dr. Lynn Reaser, Chief Economist, Fermanian Business and Economic Institute, spoke regarding the City of San Diego Report, Meeting Water Quality Standards for San Diego's Recreational Waters: A Cost Benefit Analysis dated April 2011, which she authored.

The Chair closed the public hearing, and Executive Officer Gibson provided a recommendation.

Mr. Morales called a recess at 7:01 p.m. and reconvened the meeting at 7:10 p.m.

A motion to adopt the Tentative Order, Option 1 with the EPA's errata was made by Dr. Abarbanel, and the motion was seconded by Mr. Anderson. Following discussion, the Board adopted the Order by unanimous vote.

CLOSED SESSION

The Board may meet in closed session to consider personnel matters [Authority: Government Code Section 11126(a)]; to deliberate on a decision to be reached based upon evidence introduced in a hearing [Authority: Government Code Section 11126(c)(3)]; or to discuss matters in litigation, including discussion of initiated litigation, significant exposure to litigation, or decisions to initiate litigation [Authority: Government Code Section 11126(3)]. Litigation items that may be discussed are listed below by the type of item:

Civil Actions (Judicial and Administrative, other than Petitions for Review filed with the State Water Board)

a. *People of the State of California Ex Rel. the Regional Water Quality Control Board, San Diego Region v. Edward Drusina, an individual in his capacity as Commissioner of the International Boundary and Water Commission, United States Section, et al.,* Complaint for Violations of the Clean Water Act and Related State Law Claims. United States District Court, Southern District of California, Case No. 01-CV-027BTM(JFS) (filed February 2001). *(David Gibson)*

b. *In re: Test Claim on California Regional Water Quality Control Board, San Diego Region, Order No. R9-2007-001, (NPDES No. CAS0108758) Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego County, the San Diego Unified Port District, and the San Diego County Regional Airport Authority adopted on January 24, 2007. Test Claim filed by San Diego County, et al., with Commission on State Mandates, No. 07-TC-09* (filed June 2008). *(Catherine George Hagan)*

c. *California Regional Water Quality Control Board, San Diego Region v. Bill and Heidi Dickerson, Larry and Penelope Gunning and Perry & Papenhausen, Inc.* Complaint for Damages for Breach of Contract and for Specific Performance. San Diego County Superior Court, Case No. 37-2010-00096011-CU-CO-CTL (filed July 2010). *(Jeremy Haas)*

d. *State of California Department of Finance, State Water Resources Control Board, And California Regional Water Quality Control Board, San Diego Region v. Commission on State Mandates.* Petition for Writ of Administrative Mandamus. Sacramento County Superior Court, Case No. 34-2010-80000604 (filed July 2010). *(Catherine George Hagan)*

e. *In re: Citizens Development Corporation, Debtor and Debtor in Possession*, Case No. 10-15142-LT11. United States Bankruptcy Court, Southern District of California. (San Diego Water Board Claim in Bankruptcy) (filed June 2011). (*Catherine George Hagan*)

f. *Test Claim on California Regional Water Quality Control Board, San Diego Region, Order No. R9-2009-0002, (NPDES No. CAS0108740) Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of Orange, the Incorporated Cities of the County of Orange, and the Orange County Flood Control District adopted on December 16, 2009. Test Claim filed by County of Orange, et al., with Commission on State Mandates, No. 10-TC-11* (filed June 2011). *(Catherine George Hagan)*

g. *Test Claim on California Regional Water Quality Control Board, San Diego Region, Order No. R9-2010-0016 (NPDES No. CAS0108766) adopted November 10, 2010, County of Riverside, Riverside County Flood Control and Water Conservation District, and the Cities of Murrieta, Temecula and Wildomar, Co-Claimants, filed with Commission on State Mandates, No. 11-TC-03 (filed November 2011). (Catherine George Hagan)*

Petitions for Review Pending Before State Water Resources Control Board[1]

h. Petitions of the National Fireworks Association and Fireworks & Stage FX America Inc., Coastal Environmental Rights Foundation, and San Diego Coastkeeper (General National Pollutant Discharge Elimination System (NPDES) Permit Order No. R9-2011-0022 (NPDES No. CAG999002) for Residual Firework Pollutant Waste Discharges to Waters of the United States in the San Diego Region from the Public Display of Fireworks), SWRCB/OCC Files A-2164(a)-(c), filed June and July 2011. *(Michelle Mata)*

i. Petition of Citizens Development Corporation (Water Code Section 13267 Investigative Order No. R9-2011-0033 dated September 14, 2011, Requiring Submission of Technical Reports Pertaining to Investigation of Lake San Marcos Nutrient Impairment, San Diego County), SWRCB/OCC File A-2185, filed October 2011. (*Laurie Walsh*)

j. Petition of City of San Diego (Time Schedule Order No. R9-2011-0052 dated September 14, 2011, for the Kinder Morgan Energy Partners, Mission Valley Terminal Remediation Dewatering Discharge to Murphy Canyon Creek, San Diego County), SWRCB/OCC File A-2186, filed October 2011. (*Ben Neill*)

k. Petition of Jack Eitzen (Administrative Assessment of Civil Liability Order Nos. R9-2011-0048 and R9-2011-0049 against Jack Eitzen for 38175 and 38155 Via Vista Grande, Murrieta, Riverside County), issued October 12, 2011), SWRCB/OCC File A-2193, filed November 2011. (*Rebecca Stewart*)

l. Petitions for Review of San Diego Bay Shipyard Sediment Cleanup and Abatement Order No. R9-2012-0024 for National Steel and Shipbuilding Company (NASSCO), BAE Systems, San Diego Ship Repair (BAE Systems), Campbell Industries, City of San Diego, San Diego Gas & Electric (SDG&E) and San Diego Unified Port District (Port District) issued March 14, 2012. Petitions for Review and Requests for Stay filed by NASSCO, BAE Systems and City of San Diego. Petitions for Review w/o requests for stay

[1] Petitions for review of San Diego Water Board actions or inactions filed with the State Water Board being held in abeyance by the State Water Board are not listed in the agenda. The titles of these matters are available at the San Diego Water Board. Please contact Catherine George Hagan at chagan@waterboards.ca.gov or 858-467-2958 for more information.

filed by SDG&E, Star & Crescent Boat Company and Port District. SWRCB/OCC File A-2205(a) – (e), filed April 2012. (*Frank Melbourn)*

m. Petition of NASSCO for Review of Resolution No. R9-2012-0025 (Certifying Final Environmental Impact Report for San Diego Bay Shipyard Sediment Cleanup and Abatement Order No. R9-2012-0024), adopted March 14, 2012, SWRCB/OCC File A-XXXX, filed April 2012. (*Frank Melbourn)*

n. Petition of South Laguna Civic Association for Review of Order No. R9-2012-0013, NPDES No. CA0107611, NPDES Permit Reissuance: South Orange County Waste Authority, Discharges to the Pacific Ocean via Aliso Creek Ocean Outfall, adopted April 11, 2012, SWRCB/OCC File A-2211, filed May 2012. (*Joann Lim*)

o. Petition of City of San Diego for Review of Resolution No. R9-2012-0045, re NPDES Permit Notice of Enrollment Amendment for Kinder Morgan Energy Partners, June 13, 2012, SWRCB/OCC File A-XXXX, filed July 2012. (*Ben Neill*)

p. Petition of Fallbrook Public Utility District for Review of Order No. R9-2012-0004, NPDES Permit and Waste Discharge Requirements for Fallbrook Public Utility District Wastewater Treatment Plant No. 1 for Discharge to the Pacific Ocean via the Oceanside Ocean Outfall, adopted August 8, 2012, SWRCB/OCC File A-2226, filed September 2012. (*Joann Lim*)

The closed session was held, and the Board discussed item *a*.

There being no further business, the meeting was adjourned at 7:40 p.m.

These minutes were prepared by:

Christina A. Witte

Chris Witte
Executive Assistant

Signed by:

David W. Gibson

David Gibson
Executive Officer

Audio Recordings
May 8, 2013 Board Meeting
Item No. 9

07 Item 9 (1).WMA
08 Item 9 (2).WMA
09 Item 9 (3).WMA

Audio Recordings
May 8, 2013 Board Meeting
Item No. 9

10 Item 9 (4).WMA
11 Item 9 (5).WMA
12 Item 9 (6).WMA

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

ORDER NO. R9-2013-0001
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The San Diego County Copermittees in Table 1a are subject to waste discharge requirements set forth in this Order.

Table 1a. San Diego County Copermittees

City of Carlsbad	City of Oceanside
City of Chula Vista	City of Poway
City of Coronado	City of San Diego
City of Del Mar	City of San Marcos
City of El Cajon	City of Santee
City of Encinitas	City of Solana Beach
City of Escondido	City of Vista
City of Imperial Beach	County of San Diego
City of La Mesa	San Diego County Regional Airport Authority
City of Lemon Grove	San Diego Unified Port District
City of National City	

After the San Diego Water Board receives and considers the Orange County Copermittees' Report of Waste Discharge and makes any necessary changes to this Order, the Orange County Copermittees in Table 1b will become subject to waste discharge requirements set forth in this Order after expiration of Order No. R9-2009-0002, NPDES No. CAS0108740 on or after December 16, 2014.

Table 1b. Orange County Copermittees

City of Aliso Viejo	City of Rancho Santa Margarita
City of Dana Point	City of San Clemente
City of Laguna Beach	City of San Juan Capistrano
City of Laguna Hills	City of Laguna Woods
City of Laguna Niguel	County of Orange
City of Lake Forest	Orange County Flood Control District
City of Mission Viejo	

After the San Diego Water Board receives and considers the Riverside County Copermittees' Report of Waste Discharge and makes any necessary changes to this Order, the Riverside County Copermittees in Table 1c will become subject to waste discharge requirements set forth in this Order after expiration of Order No. R9-2010-0016, NPDES No. CAS0108766 on or after November 10, 2015.

Table 1c. Riverside County Copermittees

City of Murrieta	County of Riverside
City of Temecula	Riverside County Flood Control and Water Conservation District
City of Wildomar	

The Orange County Copermittees and Riverside County Copermittees may become subject to the requirements of this Order at a date earlier than the expiration date of their current Orders subject to the conditions described in Provision F.6 of this Order if the Copermittees in the respective county receive a notification of coverage from the San Diego Water Board.

The term Copermittee in this Order refers to any San Diego County, Orange County, or Riverside County Copermittee covered under this Order, unless specified otherwise.

This Order provides permit coverage for the Copermittee discharges described in Table 2.

Table 2. Discharge Locations and Receiving Waters

Discharge Points	Locations throughout San Diego Region
Discharge Description	Municipal Separate Storm Sewer System (MS4) Discharges
Receiving Waters	Inland Surface Waters, Enclosed Bays and Estuaries, and Coastal Ocean Waters of the San Diego Region

Table 3. Administrative Information

This Order was adopted by the San Diego Water Board on:	**May 8, 2013**
This Order will become effective on:	**June 27, 2013**
This Order will expire on:	**June 27, 2018**
The Copermittees must file a Report of Waste Discharge in accordance with Title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than 180 days in advance of the Order expiration date.	

I, David W. Gibson, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on May 8, 2013.

David W. Gibson
Executive Officer

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Attachment A - Discharge Prohibitions and Special Protections A-1
Attachment B - Standard Permit Provisions and General Provisions B-1
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Attachment F - Fact Sheet / Technical Report for Order No. R9-2013-0001 ..... F-1

I. FINDINGS

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), finds that:

JURISDICTION

1. **MS4 Ownership or Operation.** Each of the Copermittees owns or operates an MS4, through which it discharges storm water and non-storm water into waters of the U.S. within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the U.S.

2. **Legal and Regulatory Authority.** This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]) adopted by the United States Environmental Protection Agency (USEPA), and chapter 5.5, division 7 of the California Water Code (CWC) (commencing with section 13370). This Order serves as an NPDES permit for discharges from MS4s to surface waters. This Order also serves as waste discharge requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

   The San Diego Water Board has the legal authority to issue a regional MS4 permit pursuant to its authority under CWA section 402(p)(3)(B) and 40 CFR 122.26(a)(1)(v). The USEPA also made it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide permits (55 Federal Register [FR] 47990, 48039-48042). The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees and San Diego Water Board.

   The federal regulations make it clear that the Copermittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators (40 CFR 122.26(a)(3)(vi)). This Order does not require the Copermittees to manage storm water outside of their jurisdictional boundaries, but rather to work collectively to improve storm water management within watersheds.

3. **CWA NPDES Permit Conditions.** Pursuant to CWA section 402(p)(3)(B), NPDES permits for storm water discharges from MS4s must include requirements to effectively prohibit non-storm water discharges into MS4s, and require controls to reduce the discharge of pollutants in storm water to the maximum extent practicable (MEP), and to require other provisions as the San Diego Water Board determines are appropriate to control such pollutants. This Order prescribes conditions to assure compliance with the CWA requirements for owners and operators of MS4s to

effectively prohibit non-storm water discharges into the MS4s, and require controls to reduce the discharge of pollutants in storm water from the MS4s to the MEP.

4. **CWA and CWC Monitoring Requirements.** CWA section 308(a) and 40 CFR 122.41(h),(j)-(l) and 122.48 require that NPDES permits must specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s also specify additional monitoring and reporting requirements in 40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c). CWC section 13383 authorizes the San Diego Water Board to establish monitoring, inspection, entry, reporting and recordkeeping requirements. This Order establishes monitoring and reporting requirements to implement federal and State requirements.

5. **Total Maximum Daily Loads.** CWA section 303(d)(1)(A) requires that "[e]ach state shall identify those waters within its boundaries for which the effluent limitations…are not stringent enough to implement any water quality standard applicable to such waters." The CWA also requires states to establish a priority ranking of impaired water bodies known as Water Quality Limited Segments and to establish Total Maximum Daily Loads (TMDLs) for such waters. This priority list of impaired water bodies is called the Clean Water Act Section 303(d) List of Water Quality Limited Segments, commonly referred to as the 303(d) List. The CWA requires the 303(d) List to be updated every two years.

   TMDLs are numerical calculations of the maximum amount of a pollutant that a water body can assimilate and still meet water quality standards. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point sources (waste load allocations or WLAs) and non-point sources (load allocations or LAs), background contribution, plus a margin of safety. Discharges from MS4s are point source discharges. The federal regulations (40 CFR 122.44(d)(1)(vii)(B)) require that NPDES permits incorporate water quality based effluent limitations (WQBELs) developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, consistent with the assumptions and requirements of any available WLA for the discharge. Requirements of this Order implement the TMDLs adopted by the San Diego Water Board and approved by USEPA as of the time this Order is issued. This Order establishes WQBELs consistent with the assumptions and requirements of all available TMDL WLAs assigned to discharges from the Copermittees' MS4s.

6. **Non-Storm Water Discharges.** Pursuant to CWA section 402(p)(3)(B)(ii), this Order requires each Copermittee to effectively prohibit discharges of non-storm water into its MS4. Nevertheless, non-storm water discharges into and from the MS4s continue to be reported to the San Diego Water Board by the Copermittees and other persons. Monitoring conducted by the Copermittees, as well as the 303(d) List, have identified dry weather, non-storm water discharges from the MS4s as a source of pollutants causing or contributing to receiving water quality impairments in the San Diego Region. The federal regulations (40 CFR 122.26(d)(2)(iv)(B)(1)) require the Copermittees to have a program to prevent illicit discharges to the MS4.

The federal regulations, however, allow for specific categories of non-storm water discharges or flows to be addressed as illicit discharges only where such discharges are identified as sources of pollutants to waters of the U.S.

7. **In-Stream Treatment Systems.** Pursuant to federal regulations (40 CFR 131.10(a)), in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S. Authorizing the construction of a runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to accepting waste assimilation as an appropriate use for that water body. Runoff treatment must occur prior to the discharge of runoff into receiving waters. Treatment control best management practices (BMPs) must not be constructed in waters of the U.S. Construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body.

DISCHARGE CHARACTERISTICS AND RUNOFF MANAGEMENT

8. **Point Source Discharges of Pollutants.** Discharges from the MS4s contain waste, as defined in the CWC, and pollutants that adversely affect the quality of the waters of the state. A discharge from an MS4 is a “discharge of pollutants from a point source” into waters of the U.S. as defined in the CWA. Storm water and non-storm water discharges from the MS4s contain pollutants that cause or threaten to cause a violation of surface water quality standards, as outlined in the Water Quality Control Plan for the San Diego Basin (Basin Plan). Storm water and non-storm water discharges from the MS4s are subject to the conditions and requirements established in the Basin Plan for point source discharges.

9. **Potential Beneficial Use Impairment.** The discharge of pollutants and/or increased flows from MS4s may cause or threaten to cause the concentration of pollutants to exceed applicable receiving water quality objectives and impair or threaten to impair designated beneficial uses resulting in a condition of pollution, contamination, or nuisance.

10. **Pollutants Generated by Land Development.** Land development has created and continues to create new sources of non-storm water discharges and pollutants in storm water discharges as human population density increases. This brings higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash. Pollutants from these sources are dumped or washed off the surface by non-storm water or storm water flows into and from the MS4s. When development converts natural vegetated pervious ground cover to impervious surfaces such as paved highways, streets, rooftops, and parking lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving a developed area without BMPs that can maintain pre-development runoff conditions will contain greater pollutant loads and have significantly greater runoff volume, velocity, and peak flow rate than pre-development runoff conditions from the same area.

11. **Runoff Discharges to Receiving Waters.** The MS4s discharge runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within the eleven hydrologic units comprising the San Diego Region. Historic and current development makes use of natural drainage patterns and features as conveyances for runoff. Rivers, streams and creeks in developed areas used in this manner are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and receiving water. Numerous receiving water bodies and water body segments have been designated as impaired by the San Diego Water Board pursuant to CWA section 303(d).

12. **Pollutants in Runoff.** The most common pollutants in runoff discharged from the MS4s include total suspended solids, sediment, pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., cadmium, copper, lead, and zinc), petroleum products and polynuclear aromatic hydrocarbons, synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus), oxygen-demanding substances (e.g., decaying vegetation, animal waste), detergents, and trash. As operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not prohibit or otherwise control. These discharges may cause or contribute to a condition of pollution or a violation of water quality standards.

13. **Human Health and Aquatic Life Impairment.** Pollutants in runoff discharged from the MS4s can threaten and adversely affect human health and aquatic organisms. Adverse responses of organisms to chemicals or physical agents in runoff range from physiological responses such as impaired reproduction or growth anomalies to mortality. Increased volume, velocity, rate, and duration of storm water runoff greatly accelerate the erosion of downstream natural channels. This alters stream channels and habitats and can adversely affect aquatic and terrestrial organisms.

14. **Water Quality Effects.** The Copermittees' water quality monitoring data submitted to date documents persistent exceedances of Basin Plan water quality objectives for runoff-related pollutants at various watershed monitoring stations. Persistent toxicity has also been observed at several watershed monitoring stations. In addition, bioassessment data indicate that the majority of the monitored receiving waters have Poor to Very Poor Index of Biological Integrity (IBI) ratings. These findings indicate that runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in the San Diego Region. Non-storm water discharges from the MS4s have been shown to contribute significant levels of pollutants and flow in arid, developed Southern California watersheds, and contribute significantly to exceedances of applicable receiving water quality objectives.

15. **Non-Storm Water and Storm Water Discharges.** Non-storm water discharges from the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard of CWA section 402(p)(3)(B)(iii), which is explicitly for "Municipal … *Stormwater Discharges* (emphasis added)" from the MS4s. Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s must be effectively prohibited.

16. **Best Management Practices.** Waste and pollutants which are deposited and accumulate in MS4 drainage structures will be discharged from these structures to waters of the U.S. unless they are removed. These discharges may cause or contribute to, or threaten to cause or contribute to, a condition of pollution in receiving waters. For this reason, pollutants in storm water discharges from the MS4s can be and must be effectively reduced in runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Pollution prevention is the reduction or elimination of pollutant generation at its source and is the best "first line of defense". Source control BMPs (both structural and non-structural) minimize the contact between pollutants and runoff, therefore keeping pollutants onsite and out of receiving waters. Treatment control BMPs remove pollutants that have been mobilized by storm water or non-storm water flows.

17. **BMP Implementation.** Runoff needs to be addressed during the three major phases of development (planning, construction, and use) in order to reduce the discharge of storm water pollutants to the MEP, effectively prohibit non-storm water discharges, and protect receiving waters. Development which is not guided by water quality planning policies and principles can result in increased pollutant load discharges, flow rates, and flow durations which can negatively affect receiving water beneficial uses. Construction sites without adequate BMP implementation result in sediment runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. Existing development can generate substantial pollutant loads which are discharged in runoff to receiving waters. Retrofitting areas of existing development with storm water pollutant control and hydromodification management BMPs is necessary to address storm water discharges from existing development that may cause or contribute to a condition of pollution or a violation of water quality standards.

18. **Water Quality Improvements.** Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges to the MS4s and control pollutants in storm water discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the CWA.

19. **Long Term Planning and Implementation.** Federal regulations require municipal storm water permits to expire 5 years from adoption, after which the permit must be renewed and reissued. The San Diego Water Board recognizes that the degradation of water quality and impacts to beneficial uses of the waters in the San Diego Region occurred over several decades. The San Diego Water Board further recognizes that a decade or more may be necessary to realize demonstrable improvement to the quality of waters in the San Diego Region. This Order includes a long term planning and implementation approach that will require more than a single permit term to complete.

WATER QUALITY STANDARDS

20. **Basin Plan.** The San Diego Water Board adopted the Water Quality Control Plan for the San Diego Basin (Basin Plan) on September 8, 1994 that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for receiving waters addressed through the plan. The Basin Plan was subsequently approved by the State Water Resources Control Board (State Water Board) on December 13, 1994. Subsequent revisions to the Basin Plan have also been adopted by the San Diego Water Board and approved by the State Water Board. Requirements of this Order implement the Basin Plan.

    The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Process Supply (PROC), Industrial Service Supply (IND), Ground Water Recharge (GWR), Contact Water Recreation (REC1), Non-contact Water Recreation (REC2), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Freshwater Replenishment (FRSH), Hydropower Generation (POW), and Preservation of Biological Habitats of Special Significance (BIOL). The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region: Navigation (NAV), Commercial and Sport Fishing (COMM), Estuarine Habitat (EST), Marine Habitat (MAR), Aquaculture (AQUA), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN), and Shellfish Harvesting (SHELL).

21. **Ocean Plan.** The State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, and 2005. The State Water Board adopted the latest amendment on April 21, 2005 and it became effective on February 14, 2006. The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean. Requirements of this Order implement the Ocean Plan.

    The Ocean Plan identifies the following beneficial uses of ocean waters of the state to be protected: Industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture;

preservation and enhancement of designated Areas of Special Biological Significance; rare and endangered species; marine habitat; fish spawning and shellfish harvesting

22. **Sediment Quality Control Plan**. On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes: 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

23. **National Toxics Rule and California Toxics Rule.** USEPA adopted the National Toxics Rule (NTR) on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the NTR applied in California. On May 18, 2000, USEPA adopted the California Toxics Rule (CTR). The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants.

24. **Antidegradation Policy.** This Order is in conformance with the federal Antidegradation Policy described in 40 CFR 131.12, and State Water Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality Waters in California*. Federal regulations at 40 CFR 131.12 require that the State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. State Water Board Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies.

25. **Anti-Backsliding Requirements.** Section 402(o)(2) of the CWA and federal regulations at 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations may be relaxed. All effluent limitations in this Order are at least as stringent as effluent limitations in the previous permits.

CONSIDERATIONS UNDER FEDERAL AND STATE LAW

26. **Coastal Zone Act Reauthorization Amendments.** Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states with approved coastal zone management programs to address non-point source

pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point source pollution: agriculture, silviculture, urban, marinas, and hydromodification. This Order addresses the management measures required for the urban category, with the exception of septic systems. The runoff management programs developed pursuant to this Order fulfills the need for coastal cities to develop a runoff non-point source plan identified in the Non-Point Source Program Strategy and Implementation Plan. The San Diego Water Board addresses septic systems through the administration of other programs.

27. **Endangered Species Act.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 USC sections 1531 to 1544). This Order requires compliance with receiving water limits, and other requirements to protect the beneficial uses of waters of the State. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

28. **Report of Waste Discharge Process.** The waste discharge requirements set forth in this Order are based upon the Report of Waste Discharge submitted by the San Diego County Copermittees prior to the expiration of Order No. R9-2007-0001 (NPDES No. CAS0109266). The Orange County and Riverside County Copermittees are not immediately covered by the waste discharge requirements in this Order. The San Diego Water Board understands that each municipality is unique although the Counties share watersheds and/or geographical boundaries. The Order will continue to use the Report of Waste Discharge process prior to initially making Orange County or Riverside County Copermittees subject to the requirements of this Order.

    The federal regulations (40 CFR 122.21(d)(2)) and CWC section 13376 impose a duty on the Copermittees to reapply for continued coverage through submittal of a Report of Waste Discharge no later than 180 days prior to expiration of a currently effective permit. This requirement is set forth in the Orange County Copermittees' and Riverside County Copermittees' currently effective permits at Provisions K.2.b and K.2.c, respectively. The Orange County Permit, Order No. R9-2009-0002 (NPDES No. CAS0108740) expires on December 16, 2014 and the Riverside County MS4 Permit, Order No. R9-2010-0016 (NPDES No. CAS0108766) expires on November 10, 2015.

    Unless the Orange County or Riverside County Copermittees apply for and receive early coverage under this Order, the Orange County Copermittees' and the Riverside County Copermittees' respective permits will be superseded by this Order upon expiration of their respective permits, subject to any necessary revisions to the requirements of this Order made after the San Diego Water Board considers their respective Reports of Waste Discharge through the public process provided in 40 CFR Part 124.

29. **Integrated Report and Clean Water Act Section 303(d) List.** The San Diego Water Board and State Water Board submit an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. USEPA issued its *Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act* on July 29, 2005, which advocates the use of a five category approach for classifying the attainment status of water quality standards for water bodies in the Integrated Report. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 in the Integrated Report are placed on the 303(d) List.

    Water bodies with available data and/or information that indicate at least one beneficial use is not being supported or is threatened, but a TMDL is not required, are included in Category 4 in the Integrated Report. Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

    Implementation of the requirements of this Order may allow the San Diego Water Board to include surface waters impaired by discharges from the Copermittees' MS4s in Category 4 in the Integrated Report for consideration during the next 303(d) List submittal by the State to USEPA.

30. **Economic Considerations.** The California Supreme Court has ruled that although CWC section 13263 requires the State and Regional Water Boards (collectively Water Boards) to consider factors set forth in CWC section 13241 when issuing an NPDES permit, the Water Board may not consider the factors to justify imposing pollutant restrictions that are less stringent than the applicable federal regulations require. (*City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 618, 626-627.) However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

    As noted in the following finding, the San Diego Water Board finds that the requirements in this Order are not more stringent than the minimum federal requirements. Therefore, a CWC section 13241 analysis is not required for permit requirements that implement the effective prohibition on the discharge of non-storm water into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determined appropriate to control such pollutants, as those requirements are mandated by federal law. Notwithstanding the above, the San Diego Water Board has developed an economic analysis of the requirements in this Order. The economic analysis is provided in the Fact Sheet.

31. **Unfunded Mandates.** This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following:

    a. This Order implements federally mandated requirements under CWA section 402 (33 USC section 1342(p)(3)(B)).

    b. The local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental and new dischargers who are issued NPDES permits for storm water and non-storm water discharges.

    c. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order.

    d. The Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)) and in lieu of numeric restrictions on their MS4 discharges (i.e. effluent limitations).

    e. The local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under State law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

    f. The provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state develops a TMDL, federal law requires that permits must contain water quality based effluent limitations consistent with the assumptions and requirements of any applicable wasteload allocation (40 CFR 122.44(d)(1)(vii)(B)).

    See the Fact Sheet for further discussion of unfunded mandates.

32. **California Environmental Quality Act.** The issuance of waste discharge requirements and an NPDES permit for the discharge of runoff from MS4s to waters of the U.S. is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 et seq.) in accordance with CWC section 13389.

STATE WATER BOARD DECISIONS

33. **Compliance with Prohibitions and Limitations.** The receiving water limitation language specified in this Order is consistent with language recommended by the USEPA and established in State Water Board Order WQ 99-05, *Own Motion Review of the Petition of Environmental Health Coalition to Review Waste Discharge Requirements Order No. 96-03, NPDES Permit No. CAS0108740*, adopted by the

State Water Board on June 17, 1999. The receiving water limitation language in this Order requires storm water discharges from MS4s to not cause or contribute to a violation of water quality standards, which is to be achieved through an iterative approach requiring the implementation of improved and better-tailored BMPs over time. Implementation of the iterative approach to comply with receiving water limitations based on applicable water quality standards is necessary to ensure that storm water discharges from the MS4 will not ultimately cause or contribute to violations of water quality standards and will not create conditions of pollution, contamination, or nuisance.

34. **Special Conditions for Areas of Special Biological Significance.** On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving an exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges. State Water Board Resolution No. 2012-0012 requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject terms and conditions of State Water Board Resolution No. 2012-0012. The Special Protections contained in Attachment B to Resolution No. 2012-0012, applicable to these discharges, are hereby incorporated into this Order as if fully set forth herein.

ADMINISTRATIVE FINDINGS

35. **Executive Officer Delegation of Authority.** The San Diego Water Board by prior resolution has delegated all matters that may legally be delegated to its Executive Officer to act on its behalf pursuant to CWC section 13223. Therefore, the Executive Officer is authorized to act on the San Diego Water Board's behalf on any matter within this Order unless such delegation is unlawful under CWC section 13223 or this Order explicitly states otherwise.

36. **Standard Provisions.** Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR 122.42, are provided in Attachment B to this Order.

37. **Fact Sheet.** The Fact Sheet for this Order contains background information, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of this Order. The Fact Sheet is hereby incorporated into this Order and constitutes part of the Findings of this Order.

38. **Public Notice.** In accordance with State and federal laws and regulations, the San Diego Water Board notified the Copermittees, and interested agencies and persons of its intent to prescribe waste discharge requirements for the control of discharges into and from the MS4s to waters of the U.S. and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet.

39. **Public Hearing.** The San Diego Water Board held a public hearing on April 10 and 11, 2013, that was continued to May 8, 2013 and heard and considered all comments pertaining to the terms and conditions of this Order. Details of the public hearing are provided in the Fact Sheet.

40. **Effective Date.** This Order serves as an NPDES permit pursuant to CWA section 402 or amendments thereto, and becomes effective fifty (50) days after the date of its adoption, provided that the Regional Administrator, USEPA, Region IX, does not object to this Order.

41. **Review by the State Water Board.** Any person aggrieved by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with CWC section 13320 and California Code of Regulations, title 23, sections 2050, et seq. The State Water Board must receive the petition by 5:00 p.m., 30 days after the San Diego Water Board action, except that if the thirtieth day following the action falls on a Saturday, Sunday or State holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

THEREFORE, IT IS HEREBY ORDERED that the Copermittees, in order to meet the provisions contained in division 7 of the CWC (commencing with section 13000) and regulations adopted thereunder, and the provisions of the CWA and regulations adopted thereunder, must each comply with the requirements of this Order. This action in no way prevents the San Diego Water Board from taking enforcement action for past violations of the previous Order. If any part of this Order is subject to a temporary stay of enforcement, unless otherwise specified, the Copermittees must comply with the analogous portions of the previous Order, which will remain in effect for all purposes during the pendency of the stay.

II. PROVISIONS

A. PROHIBITIONS AND LIMITATIONS

The purpose of this provision is to describe the conditions under which storm water and non-storm water discharges into and from MS4s are prohibited or limited. The goal of the prohibitions and limitations is to protect the water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through the implementation of water quality improvement strategies and runoff management programs that effectively prohibit non-storm water discharges into the Copermittees' MS4s, and reduce pollutants in storm water discharges from the Copermittees' MS4s to the MEP.

1. Discharge Prohibitions

a. Discharges from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the state are prohibited.

b. Non-storm water discharges into MS4s are to be effectively prohibited, through the implementation of Provision E.2, unless such discharges are authorized by a separate NPDES permit.

c. Discharges from MS4s are subject to all waste discharge prohibitions in the Basin Plan, included in Attachment A to this Order.

d. Storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 applicable to these discharges, included in Attachment A to this Order. All other discharges from the Copermittees' MS4s to ASBS are prohibited.

2. Receiving Water Limitations

a. Discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters, including but not limited to all applicable provisions contained in:

(1) The San Diego Water Board's Basin Plan, including beneficial uses, water quality objectives, and implementation plans;

(2) State Water Board plans for water quality control including the following:

(a) Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries (Thermal Plan), and

(b) The Ocean Plan, including beneficial uses, water quality objectives, and implementation plans;

(3) State Water Board policies for water and sediment quality control including the following:

(a) Water Quality Control Policy for the Enclosed Bays and Estuaries of California,

(b) Sediment Quality Control Plan which includes the following narrative objectives for bays and estuaries:

(i) Pollutants in sediments shall not be present in quantities that, alone or in combination, are toxic to benthic communities, and

(ii) Pollutants shall not be present in sediments at levels that will bioaccumulate in aquatic life to levels that are harmful to human health,

(c) The Statement of Policy with Respect to Maintaining High Quality of Waters in California;[1]

(4) Priority pollutant criteria promulgated by the USEPA through the following:

(a) National Toxics Rule (NTR)[2] (promulgated on December 22, 1992 and amended on May 4, 1995), and

(b) California Toxics Rule (CTR).[3,4]

b. Discharges from MS4s composed of storm water runoff must not alter natural ocean water quality in an ASBS.

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[1] State Water Board Resolution No. 68-16
[2] 40 CFR 131.36
[3] 65 Federal Register 31682-31719 (May 18, 2000), adding Section 131.38 to 40 CFR
[4] If a water quality objective and a CTR criterion are in effect for the same priority pollutant, the more stringent of the two applies.

3. Effluent Limitations

a. Technology Based Effluent Limitations

Pollutants in storm water discharges from MS4s must be reduced to the MEP.[5]

b. Water Quality Based Effluent Limitations

Each Copermittee must comply with applicable WQBELs established for the TMDLs in Attachment E to this Order, pursuant to the applicable TMDL compliance schedules.

4. Compliance with Discharge Prohibitions and Receiving Water Limitations

Each Copermittee must achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order through timely implementation of control measures and other actions as specified in Provisions B and E of this Order, including any modifications. The Water Quality Improvement Plans required under Provision B must be designed and adapted to ultimately achieve compliance with Provisions A.1.a, A.1.c and A.2.a.

a. If exceedance(s) of water quality standards persist in receiving waters notwithstanding implementation of this Order, the Copermittees must comply with the following procedures:

(1) For exceedance(s) of a water quality standard in the process of being addressed by the Water Quality Improvement Plan, the Copermittee(s) must implement the Water Quality Improvement Plan as accepted by the San Diego Water Board, and update the Water Quality Improvement Plan, as necessary, pursuant to Provision F.2.c;

(2) Upon a determination by either the Copermittees or the San Diego Water Board that discharges from the MS4 are causing or contributing to a new exceedance of an applicable water quality standard not addressed by the Water Quality Improvement Plan, the Copermittees must submit the following updates to the Water Quality Improvement Plan pursuant to Provision F.2.c or as part of the Water Quality Improvement Plan Annual Report required under Provision F.3.b, unless the San Diego Water Board directs an earlier submittal:

(a) The water quality improvement strategies being implemented that are effective and will continue to be implemented,

[5] This does not apply to MS4 discharges which receive subsequent treatment to reduce pollutants in storm water discharges to the MEP prior to entering receiving waters (e.g., low flow diversions to the sanitary sewer). Runoff treatment must occur prior to the discharge of runoff into receiving waters per Finding 7.

(b) Water quality improvement strategies (i.e. BMPs, retrofitting projects, stream and/or habitat rehabilitation projects, adjustments to jurisdictional runoff management programs, etc.) that will be implemented to reduce or eliminate any pollutants or conditions that are causing or contributing to the exceedance of water quality standards,

(c) Updates to the schedule for implementation of the existing and additional water quality improvement strategies, and

(d) Updates to the monitoring and assessment program to track progress toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a of this Order;

(3) The San Diego Water Board may require the incorporation of additional modifications to the Water Quality Improvement Plan required under Provision B. The applicable Copermittees must submit any modifications to the update to the Water Quality Improvement Plan within 90 days of notification that additional modifications are required by the San Diego Water Board, or as otherwise directed;

(4) Within 90 days of the San Diego Water Board determination that the modifications to the Water Quality Improvement Plan required under Provision A.4.a.(3) meet the requirements of this Order, the applicable Copermittees must revise the jurisdictional runoff management program documents to incorporate the modified water quality improvement strategies that have been and will be implemented, the implementation schedule, and any additional monitoring required; and

(5) Each Copermittee must implement the updated Water Quality Improvement Plan.

b. The procedure set forth above to achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order do not have to be repeated for continuing or recurring exceedances of the same water quality standard(s) following implementation of scheduled actions unless directed to do otherwise by the San Diego Water Board.

c. Nothing in Provisions A.4.a and A.4.b prevents the San Diego Water Board from enforcing any provision of this Order while the applicable Copermittees prepare and implement the above update to the Water Quality Improvement Plan and jurisdictional runoff management programs.

B. WATER QUALITY IMPROVEMENT PLANS

The purpose of this provision is to develop Water Quality Improvement Plans that guide the Copermittees' jurisdictional runoff management programs towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plans is to further the Clean Water Act's objective to protect, preserve, enhance, and restore the water quality and designated beneficial uses of waters of the state. This goal will be accomplished through an adaptive planning and management process that identifies the highest priority water quality conditions within a watershed and implements strategies through the jurisdictional runoff management programs to achieve improvements in the quality of discharges from the MS4s and receiving waters.

1. Watershed Management Areas

The Copermittees must develop a Water Quality Improvement Plan for each of the Watershed Management Areas in Table B-1. A total of ten Water Quality Improvement Plans must be developed for the San Diego Region.

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
San Juan (901.00)	South Orange County	- Aliso Creek - San Juan Creek - San Mateo Creek - Pacific Ocean - Heisler Park ASBS	- City of Aliso Viejo[1] - City of Dana Point[1] - City of Laguna Beach[1] - City of Laguna Hills[1] - City of Laguna Niguel[1] - City of Laguna Woods[1] - City of Lake Forest[1] - City of Mission Viejo[1] - City of Rancho Santa Margarita[1] - City of San Clemente[1] - City of San Juan Capistrano[1] - County of Orange[1] - Orange County Flood Control District[1]
Santa Margarita (902.00)	Santa Margarita River	- Murrieta Creek - Temecula Creek - Santa Margarita River - Santa Margarita Lagoon - Pacific Ocean	- City of Murrieta[2] - City of Temecula[2] - City of Wildomar[2] - County of Riverside[2] - County of San Diego[3] - Riverside County Flood Control and Water Conservation District[2]
San Luis Rey (903.00)	San Luis Rey River	- San Luis Rey River - San Luis Rey Estuary - Pacific Ocean	- City of Oceanside - City of Vista - County of San Diego

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
Carlsbad (904.00)	Carlsbad	- Loma Alta Slough - Buena Vista Lagoon - Agua Hedionda Lagoon - Batiquitos Lagoon - San Elijo Lagoon - Pacific Ocean	- City of Carlsbad - City of Encinitas - City of Escondido - City of Oceanside - City of San Marcos - City of Solana Beach - City of Vista - County of San Diego
San Dieguito (905.00)	San Dieguito River	- San Dieguito River - San Dieguito Lagoon - Pacific Ocean	- City of Del Mar - City of Escondido - City of Poway - City of San Diego - City of Solana Beach - County of San Diego
Penasquitos (906.00)	Penasquitos	- Los Penasquitos Lagoon - Pacific Ocean	- City of Del Mar - City of Poway - City of San Diego - County of San Diego
	Mission Bay	- Mission Bay - Pacific Ocean - San Diego Marine Life Refuge ASBS	- City of San Diego
San Diego (907.00)	San Diego River	- San Diego River - Pacific Ocean	- City of El Cajon - City of La Mesa - City of San Diego - City of Santee - County of San Diego
Pueblo San Diego (908.00) Sweetwater (909.00) Otay (910.00)	San Diego Bay	- Sweetwater River - Otay River - San Diego Bay - Pacific Ocean	- City of Chula Vista - City of Coronado - City of Imperial Beach - City of La Mesa - City of Lemon Grove - City of National City - City of San Diego - County of San Diego - San Diego County Regional Airport Authority - San Diego Unified Port District
Tijuana (911.00)	Tijuana River	- Tijuana River - Tijuana Estuary - Pacific Ocean	- City of Imperial Beach - City of San Diego - County of San Diego

Notes:
1. The Orange County Copermittees will be covered under this Order after expiration of Order No. R9-2009-0002, or earlier if the Orange County Copermittees meet the conditions in Provision F.6.
2. The Riverside County Copermittees will be covered under this Order after expiration of Order No. R9-2010-0016, or earlier if the Riverside County Copermittees meet the conditions in Provision F.6.
3. The County of San Diego is not required to implement the requirements of Provision B for its jurisdiction within the Santa Margarita River Watershed Management Area until the Riverside County Copermittees have been notified of coverage under this Order. The County of San Diego is required to implement the requirements of Provisions D, F.3.b, and Attachment E until the Riverside County Copermittees have been notified of coverage under this Order.

2. Priority Water Quality Conditions

The Copermittees must identify the water quality priorities within each Watershed Management Area that will be addressed by the Water Quality Improvement Plan. Where appropriate, Watershed Management Areas may be separated into subwatersheds to focus water quality prioritization and jurisdictional runoff management program implementation efforts by receiving water.

a. Assessment of Receiving Water Conditions

The Copermittees must consider the following, at a minimum, to identify water quality priorities based on impacts of MS4 discharges on receiving water beneficial uses:

(1) Receiving waters listed as impaired on the CWA Section 303(d) List of Water Quality Limited Segments (303(d) List);

(2) TMDLs adopted and under development by the San Diego Water Board;

(3) Receiving waters recognized as sensitive or highly valued by the Copermittees, including estuaries designated under the National Estuary Program under CWA section 320, wetlands defined by the State or U.S. Fish and Wildlife Service's National Wetlands Inventory as wetlands, waters having the Preservation of Biological Habitats of Special Significance (BIOL) beneficial use designation, and receiving waters identified as ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(4) The receiving water limitations of Provision A.2;

(5) Known historical versus current physical, chemical, and biological water quality conditions;

(6) Available, relevant, and appropriately collected and analyzed physical, chemical, and biological receiving water monitoring data, including, but not limited to, data describing:

(a) Chemical constituents,

(b) Water quality parameters (i.e. pH, temperature, conductivity, etc.),

(c) Toxicity Identification Evaluations for both receiving water column and sediment,

(d) Trash impacts,

(e) Bioassessments, and

(f) Physical habitat;

(7) Available evidence of erosional impacts in receiving waters due to accelerated flows (i.e. hydromodification);

(8) Available evidence of adverse impacts to the chemical, physical, and biological integrity of receiving waters; and

(9) The potential improvements in the overall condition of the Watershed Management Area that can be achieved.

b. ASSESSMENT OF IMPACTS FROM MS4 DISCHARGES

The Copermittees must consider the following, at a minimum, to identify the potential impacts to receiving waters that may be caused or contributed to by discharges from the Copermittees' MS4s:

(1) The discharge prohibitions of Provision A.1 and effluent limitations of Provision A.3; and

(2) Available, relevant, and appropriately collected and analyzed storm water and non-storm water monitoring data from the Copermittees' MS4 outfalls;

(3) Locations of each Copermittee's MS4 outfalls that discharge to receiving waters;

(4) Locations of MS4 outfalls that are known to persistently discharge non-storm water to receiving waters likely causing or contributing to impacts on receiving water beneficial uses;

(5) Locations of MS4 outfalls that are known to discharge pollutants in storm water causing or contributing to impacts on receiving water beneficial uses; and

(6) The potential improvements in the quality of discharges from the MS4 that can be achieved.

c. IDENTIFICATION OF PRIORITY WATER QUALITY CONDITIONS

(1) The Copermittees must use the information gathered for Provisions B.2.a and B.2.b to develop a list of priority water quality conditions as pollutants, stressors and/or receiving water conditions that are the highest threat to receiving water quality or that most adversely affect the quality of receiving waters. The list must include the following information for each priority water quality condition:

(a) The beneficial use(s) associated with the priority water quality condition;

(b) The geographic extent of the priority water quality condition within the Watershed Management Area, if known;

(c) The temporal extent of the priority water quality condition (e.g., dry weather and/or wet weather);

(d) The Copermittees with MS4s discharges that may cause or contribute to the priority water quality condition; and

(e) An assessment of the adequacy of and data gaps in the monitoring data to characterize the conditions causing or contributing to the priority water quality condition, including a consideration of spatial and temporal variation.

(2) The Copermittees must identify the highest priority water quality conditions to be addressed by the Water Quality Improvement Plan, and provide a rationale for selecting a subset of the water quality conditions identified pursuant to Provision B.2.c.(1) as the highest priorities.

d. IDENTIFICATION OF MS4 SOURCES OF POLLUTANTS AND/OR STRESSORS

The Copermittees must identify and prioritize known and suspected sources of storm water and non-storm water pollutants and/or other stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c. The identification of known and suspected sources of pollutants and/or stressors that cause or contribute to the highest priority water quality conditions as identified for Provision B.2.c must consider the following:

(1) Pollutant generating facilities, areas, and/or activities within the Watershed Management Area, including:

(a) Each Copermittee's inventory of construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas,

(b) Publicly owned parks and/or recreational areas,

(c) Open space areas,

(d) All currently operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste, and

(e) Areas not within the Copermittees' jurisdictions (e.g., Phase II MS4s, tribal lands, state lands, federal lands) that are known or suspected to be discharging to the Copermittees' MS4s;

(2) Locations of the Copermittees' MS4s, including the following:

(a) All MS4 outfalls that discharge to receiving waters, and

(b) Locations of major structural controls for storm water and non-storm water (e.g., retention basins, detention basins, major infiltration devices, etc.);

(3) Other known and suspected sources of non-storm water or pollutants in storm water discharges to receiving waters within the Watershed Management Area, including the following:

(a) Other MS4 outfalls (e.g., Phase II Municipal and Caltrans),

(b) Other NPDES permitted discharges,

(c) Any other discharges that may be considered point sources (e.g., private outfalls), and

(d) Any other discharges that may be considered non-point sources (e.g., agriculture, wildlife or other natural sources);

(4) Review of available data, including but not limited to:

(a) Findings from the Copermittees' illicit discharge detection and elimination programs,

(b) Findings from the Copermittees' MS4 outfall discharge monitoring,

(c) Findings from the Copermittees' receiving water monitoring,

(d) Findings from the Copermittees' MS4 outfall discharge and receiving water assessments, and

(e) Other available, relevant, and appropriately collected data, information, or studies related to pollutant sources and/or stressors that contribute to the highest priority water quality conditions as identified for Provision B.2.c.

(5) The adequacy of the available data to identify and prioritize sources and/or stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c.

e. IDENTIFICATION OF POTENTIAL WATER QUALITY IMPROVEMENT STRATEGIES

The Copermittees must evaluate the findings identified under Provisions B.2.a-d, and identify potential strategies that can result in improvements to water quality

in MS4 discharges and/or receiving waters within the Watershed Management Area. Potential water quality improvement strategies that may be implemented within the Watershed Management Area must include the following:

(1) Structural BMPs, non-structural BMPs, incentives, or programs that can potentially be implemented to address the highest priority water quality conditions identified under Provision B.2.c, or MS4 sources of pollutants or stressors identified under Provision B.2.d,

(2) Retrofitting projects in areas of existing development within the Watershed Management Area that can potentially be implemented to reduce MS4 sources of pollutants or stressors identified under Provision B.2.d causing or contributing to the highest priority water quality conditions identified under Provision B.2.c, and

(3) Stream, channel, and/or habitat rehabilitation projects within the Watershed Management Area that can potentially be implemented to protect and/or improve conditions in receiving waters from MS4 pollutants and/or stressors identified under Provision B.2.d causing or contributing to the highest priority water quality conditions identified under Provision B.2.c.

3. Water Quality Improvement Goals, Strategies and Schedules

The Copermittees must identify and develop specific water quality improvement goals and strategies to address the highest priority water quality conditions identified within a Watershed Management Area. The water quality improvement goals and strategies must address the highest priority water quality conditions by effectively prohibiting non-storm water discharges to the MS4, reducing pollutants in storm water discharges from the MS4 to the MEP, and protecting the water quality standards of receiving waters.

a. WATER QUALITY IMPROVEMENT GOALS AND SCHEDULES

(1) Numeric Goals

The Copermittees must develop and incorporate numeric goals[6] into the Water Quality Improvement Plan. Numeric goals must be used to support Water Quality Improvement Plan implementation and measure reasonable progress towards addressing the highest priority water quality conditions identified under Provision B.2.c. The Copermittees must establish and

[6] Interim and final numeric goals may take a variety of forms such as TMDL established WQBELs, action levels, pollutant concentration, load reductions, number of impaired water bodies delisted from the List of Water Quality Impaired Segments, Index of Biotic Integrity (IBI) scores, or other appropriate metrics. Interim and final numeric goals are not necessarily limited to one criterion or indicator, but may include multiple criteria and/or indicators. Except for TMDL established WQBELs, interim and final numeric goals and corresponding schedules may be revised through the adaptive management process under Provision B.5.

incorporate the following numeric goals in the Water Quality Improvement Plan:

(a) Final numeric goals must be based on measureable criteria or indicators capable of demonstrating one or more of the following:

(i) Discharges from the Copermittees' MS4s will not cause or contribute to exceedances of water quality standards in receiving waters, AND/OR

(ii) The conditions of receiving waters and associated habitat are protected from MS4 discharges, AND/OR

(iii) Beneficial uses of receiving waters are protected from MS4 discharges and will be supported.

(b) Interim numeric goals must be based on measureable criteria or indicators capable of demonstrating reasonable incremental progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges as follows:

(i) One or more interim numeric goals may be established to demonstrate progress toward achieving each final numeric goal,

(ii) For each final numeric goal, at least one interim numeric goal must be expressed as a reasonable increment toward achievement of the final numeric goal,

(iii) For each final numeric goal, reasonable interim numeric goals must be established to be accomplished during each 5 year period between the acceptance of the Water Quality Improvement Plan and the achievement of the final numeric goals.

(2) Schedules for Achieving Numeric Goals

The Copermittees must develop and incorporate schedules for achieving the numeric goals into the Water Quality Improvement Plan. The schedules must demonstrate reasonable progress toward achieving the final numeric goals required for Provision B.3.a.(1). The Copermittees must incorporate the schedules for achieving the numeric goals into the Water Quality Improvement Plan based on the following considerations:

(a) Final dates for achieving all final numeric goals must be established considering the following:

(i) Final compliance dates for any applicable TMDLs in Attachment E to this Order;

(ii) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(iii) Achievement of the final numeric goals for the highest water quality priorities must be as soon as possible;

(iv) Final dates for achieving the final numeric goals must reflect a realistic assessment of the shortest practicable time required based on the temporal and spatial extent and factors associated with the highest priority water quality conditions identified under Provision B.2.c, and taking into account the time reasonably required to implement the water quality improvement strategies required pursuant to Provision B.3.b.

(b) Interim dates for achieving all interim numeric goals must be established considering the following:

(i) Interim compliance dates for any applicable TMDLs in Attachment E to this Order;

(ii) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(iii) Interim dates for achieving the interim numeric goals must reflect a realistic assessment of the shortest practicable time reasonably required, taking into account the time needed to implement new or significantly expanded programs and securing financing, if necessary; and

(iv) For each final numeric goal, at least one interim numeric goal must be established that the Copermittees will work toward achieving within the term of this Order.

b. WATER QUALITY IMPROVEMENT STRATEGIES AND SCHEDULES

Based on the likely effectiveness and efficiency of the potential water quality improvement strategies identified under Provision B.2.e to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a, the Copermittees must identify the strategies that will be implemented in each Watershed Management Area as follows:

(1) Jurisdictional Strategies

(a) Each Copermittee in the Watershed Management Area must identify the strategies that will be implemented within its jurisdiction as part of its jurisdictional runoff management program requirements under Provisions E.2 through E.7, including descriptions of the following:

(i) For each of the inventories developed for its jurisdiction, as required under Provisions D.2.a.(1), E.3.e.(2), E.4.b, and E.5.a, each Copermittee must identify the known and suspected areas or sources causing or contributing to the highest priority water quality conditions in the Watershed Management Area that the Copermittee will focus on in its efforts to effectively prohibit non-storm water discharges to its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, and achieve the interim and final numeric goals identified under Provision B.3.a;

(ii) BMPs that each Copermittee will implement, or require to be implemented, as applicable, for those areas or sources within its jurisdiction;

(iii) Education programs that each Copermittee will implement, as applicable, for those areas or sources within its jurisdiction;

(iv) Frequencies that each Copermittee will conduct inspections on those areas or sources within its jurisdiction;

(v) Incentive and enforcement programs that each Copermittee will implement, as applicable, for those areas or sources within its jurisdiction; and

(vi) Any other BMPs, incentives, or programs that each Copermittee will implement for those areas or sources within its jurisdiction.

(b) Identify the optional jurisdictional strategies that each Copermittee will implement within its jurisdiction, as necessary, to effectively prohibit non-storm water discharges to its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. Descriptions of the optional jurisdictional strategies must include:

(i) BMPs, incentives, or programs that may be implemented by the Copermittee within its jurisdiction in addition to the requirements of Provisions B.3.b.(1)(a);

(ii) Incentives or programs that may be implemented by the Copermittee to encourage or implement projects to retrofit areas of existing development within its jurisdiction;

(iii) Incentives or programs that may be implemented by the Copermittee to encourage or implement projects that will rehabilitate the conditions of channels or habitats within its jurisdiction;

(iv) The funds and/or resources that must be secured by the Copermittee to implement the optional strategies described for Provisions B.3.b.(1)(b)(i)-(iii) within its jurisdiction; and

(v) The circumstances necessary to trigger implementation of the optional jurisdictional strategies, in addition to the requirements of Provision B.3.b.(1)(a), to achieve the interim and final numeric goals within the schedules established under Provision B.3.a.

(c) Identify the strategies that will be implemented by the Copermittee in coordination with or with the cooperation of other agencies (e.g. Caltrans, water districts, school districts) and/or entities (e.g. non-governmental organizations) within its jurisdiction.

(2) Watershed Management Area Strategies

The Copermittees must identify the optional regional or multi-jurisdictional strategies that will be implemented in the Watershed Management Area, as necessary, to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. Descriptions of the optional regional or multi-jurisdictional strategies must include:

(a) Regional or multi-jurisdictional BMPs, incentives, or programs that may be implemented by the Copermittees in the Watershed Management Area;

(b) Incentives or programs that may be implemented by the Copermittees in the Watershed Management Area to encourage or implement regional or multi-jurisdictional projects to retrofit areas of existing development;

(c) Incentives or programs that may be implemented by the Copermittees to encourage or implement regional or multi-jurisdictional projects that will rehabilitate the conditions of channels, streams, or habitats within the Watershed Management Area;

(d) The funds and/or resources that must be secured by the Copermittees to implement the optional strategies described for Provisions B.3.b.(2)(a)-(c) within the Watershed Management Area; and

(e) The circumstances necessary to trigger implementation of the optional regional or multi-jurisdictional strategies to achieve the interim and final numeric goals within the schedules established under Provision B.3.a.

(3) Schedules for Implementing Strategies

The Copermittees must develop reasonable schedules for implementing the water quality improvement strategies identified under Provisions B.3.b.(1) and B.3.b.(2) to achieve the interim and final numeric goals identified and

schedules established under Provision B.3.a. The Copermittees must incorporate the schedules to implement the water quality improvement strategies into the Water Quality Improvement Plan as follows:

(a) Each Copermittee must develop schedules for the jurisdictional strategies identified pursuant to Provisions B.3.b.(1)(a)-(b). Each schedule must specify:

(i) If each jurisdictional strategy identified pursuant to Provision B.3.b.(1)(a) will or will not be initiated upon acceptance of the Water Quality Improvement Plan;

(ii) For each jurisdictional strategy identified pursuant to Provision B.3.b.(1)(a) that will not be initiated upon approval of the Water Quality Improvement Plan, the shortest practicable time in which each jurisdictional strategy will be initiated after acceptance of the Water Quality Improvement Plan;

(iii) For each optional jurisdictional strategy identified pursuant to Provision B.3.b.(1)(b), a realistic assessment of the shortest practicable time required to:

[a] Secure the resources needed to fund the optional jurisdictional strategy, and
[b] Procure the resources, materials, labor, and applicable permits necessary to initiate implementation of the optional jurisdictional strategy;

(iv) If each jurisdictional strategy identified pursuant to Provisions B.3.b.(1)(a)-(b) is expected to be continuously implemented (e.g. inspections) or completed within a schedule (e.g. construction of structural BMP); and

(v) If a jurisdictional strategy identified pursuant to Provisions B.3.b.(1)(a)-(b) is expected to be completed within a schedule, the anticipated time to complete based on a realistic assessment of the shortest practicable time required.

(b) The Copermittees in the Watershed Management Area must develop schedules for the regional or multi-jurisdictional strategies identified pursuant to Provision B.3.b.(2). Each schedule must specify:

(i) A realistic assessment of the shortest practicable time to:

[a] Secure the resources needed to fund the optional regional or multi-jurisdictional strategy, and
[b] Procure the resources, materials, labor, and permits necessary to initiate the implementation of the optional regional or multi-jurisdictional strategy;

(ii) If each regional or multi-jurisdictional strategy identified pursuant to Provision B.3.b.(2) is expected to be continuously implemented (e.g. inspections) or completed within a schedule (e.g. construction of structural BMP); and

(iii) If a regional or multi-jurisdictional strategy and/or activity identified pursuant to Provisions B.3.b.(2) is expected to be completed within a schedule, the anticipated time to complete based on a realistic assessment of the shortest practicable time required.

(4) Optional Watershed Management Area Analysis

(a) For each Watershed Management Area, the Copermittees have the option to perform a Watershed Management Area Analysis for the purpose of developing watershed-specific requirements for structural BMP implementation, as described in Provision E.3.c.(3). The Watershed Management Area Analysis must include GIS layers (maps) as output. The analysis must include the following information, to the extent it is available, in order to characterize the Watershed Management Areas:

(i) A description of dominant hydrologic processes, such as areas where infiltration or overland flow likely dominates;

(ii) A description of existing streams in the watershed, including bed material and composition, and if they are perennial or ephemeral;

(iii) Current and anticipated future land uses;

(iv) Potential coarse sediment yield areas; and

(v) Locations of existing flood control structures and channel structures, such as stream armoring, constrictions, grade control structures, and hydromodification or flood management basins.

(b) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify and compile a list of candidate projects that could potentially be used as alternative compliance options for Priority Development Projects, to be implemented in lieu of onsite structural BMP performance requirements described in Provisions E.3.c.(1) and E.3.c.(2). Specifically, the Copermittees must identify opportunities to be included in the list of candidate projects in each Watershed Management Area, such as:

(i) Stream or riparian area rehabilitation;

(ii) Retrofitting existing infrastructure to incorporate storm water retention or treatment;

(iii) Regional BMPs;

(iv) Groundwater recharge projects;

(v) Water supply augmentation projects; and

(vi) Land purchases to preserve floodplain functions.

(c) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify areas within the Watershed Management Area where it is appropriate to allow Priority Development Projects to be exempt from the hydromodification management BMP performance requirements described in Provision E.3.c.(2), including supporting rationale.

4. Water Quality Improvement Monitoring and Assessment Program

a. The Copermittees in each Watershed Management Area must develop and incorporate an integrated monitoring and assessment program into the Water Quality Improvement Plan that assesses: 1) the progress toward achieving the numeric goals and schedules, 2) the progress toward addressing the highest priority water quality conditions for each Watershed Management Area, and 3) each Copermittee's overall efforts to implement the Water Quality Improvement Plan.

b. The monitoring and assessment program must incorporate the monitoring and assessment requirements of Provision D, which may allow the Copermittees to modify the program to be consistent with and focus on the highest priority water quality conditions for each Watershed Management Area.

c. For Watershed Management Areas with applicable TMDLs, the monitoring and assessment program must incorporate the specific monitoring and assessment requirements of Attachment E.

d. For Watershed Management Areas with any ASBS, the water quality monitoring and assessment program must incorporate the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

5. Iterative Approach and Adaptive Management Process

The Copermittees in each Watershed Management Area must implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a, and must include the following:

a. Re-Evaluation of Priority Water Quality Conditions

The priority water quality conditions and potential water quality improvement strategies included in the Water Quality Improvement Plan pursuant to Provisions B.2.c and B.2.e may be re-evaluated by the Copermittees as needed during the term of this Order as part of the Water Quality Improvement Plan Annual Report. Re-evaluation and recommendations for modifications to the priority water quality conditions and potential water quality improvement strategies must be provided in the Report of Waste Discharge, and must consider the following:

(1) Achieving the outcome of improved water quality in MS4 discharges and receiving waters through implementation of the water quality improvement strategies identified in the Water Quality Improvement Plan;

(2) New information developed when the requirements of Provisions B.2.a-c have been re-evaluated;

(3) Spatial and temporal accuracy of monitoring data collected to inform prioritization of water quality conditions and implementation strategies to address the highest priority water quality conditions;

(4) Availability of new information and data from sources other than the jurisdictional runoff management programs within the Watershed Management Area that informs the effectiveness of the actions implemented by the Copermittees;

(5) San Diego Water Board recommendations; and

(6) Recommendations for modifications solicited through a public participation process.

b. Adaptation of Goals, Strategies and Schedules

The water quality improvement goals, strategies and schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.3, must be re-evaluated and adapted as new information becomes available to result in more effective and efficient measures to address the highest priority water quality conditions identified pursuant to Provision B.2.c. Re-evaluation of and modifications to the water quality improvement goals, strategies and schedules must be provided in the Water Quality Improvement Plan Annual Report, and must consider the following:

(1) Modifications to the priority water quality conditions based on Provision B.5.a;

(2) Progress toward achieving interim and final numeric goals in receiving waters and MS4 discharges for the highest priority water quality conditions in the Watershed Management Area,

(3) Progress toward achieving outcomes according to established schedules;

(4) New policies or regulations that may affect identified numeric goals;

(5) Measurable or demonstrable reductions of non-storm water discharges to and from each Copermittee's MS4;

(6) Measurable or demonstrable reductions of pollutants in storm water discharges from each Copermittee's MS4 to the MEP;

(7) New information developed when the requirements of Provisions B.2.b and B.2.d have been re-evaluated;

(8) Efficiency in implementing the Water Quality Improvement Plan;

(9) San Diego Water Board recommendations; and

(10) Recommendations for modifications solicited through a public participation process.

c. ADAPTATION OF MONITORING AND ASSESSMENT PROGRAM

The water quality improvement monitoring and assessment program, included in the Water Quality Improvement Plan pursuant to Provision B.4, must be re-evaluated and adapted when new information becomes available. Re-evaluation and recommendations for modifications to the monitoring and assessment program, pursuant to the requirements of Provision D, may be provided in the Water Quality Improvement Plan Annual Report, but must be provided in the Report of Waste Discharge.

6. Water Quality Improvement Plan Submittal, Updates, and Implementation

a. The Copermittees must submit and commence implementation of the Water Quality Improvement Plans in accordance with the requirements of Provision F.1.

b. The Copermittees must submit proposed updates to the Water Quality Improvement Plan for acceptance by the San Diego Water Board Executive Officer in accordance with the requirements of Provision F.2.c.

C. ACTION LEVELS

The purpose of this provision is for the Copermittees to incorporate numeric action levels in the Water Quality Improvement Plans. The goal of the action levels is to guide Water Quality Improvement Plan implementation efforts and measure progress towards the protection of water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through monitoring and assessing the quality of the MS4 discharges during the implementation of the Water Quality Improvement Plans.

1. Non-Storm Water Action Levels[7]

The Copermittees must develop and incorporate numeric non-storm water action levels (NALs) into the Water Quality Improvement Plan to: 1) support the development and prioritization of water quality improvement strategies for effectively prohibiting non-storm water discharges to the MS4s, 2) assess the effectiveness of the water quality improvement strategies toward addressing MS4 non-storm water discharges, required pursuant to Provision D.4.b.(1), and 3) support the detection and elimination of non-storm water and illicit discharges to the MS4, required pursuant to Provision E.2.[8]

a. The following NALs must be incorporated:

(1) Non-Storm Water Discharges from MS4s to Ocean Surf Zone

Table C-1. Non-Storm Water Action Levels for Discharges from MS4s to Ocean Surf Zone

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Total Coliform	MPN/100 ml	1,000	-	10,000/1,000[1]	OP
Fecal Coliform	MPN/100 ml	200[2]	-	400	OP
Enterococci	MPN/100 ml	35	-	104[3]	OP

Abbreviations/Acronyms
AMAL – average monthly action level
MDAL – maximum daily action level
OP – Ocean Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Total coliform density NAL is 1,000 MPN/100 ml when the fecal/total coliform ratio exceeds 0.1.
2. Fecal coliform density NAL is 200 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas."

[7] NALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, unless the NAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed.
[8] The Copermittees may utilize NALs or other benchmarks currently established by the Copermittees as interim NALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

(2) Non-Storm Water Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Table C-2. Non-Storm Water Action Levels for Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Turbidity	NTU	75	-	225	OP
pH	Units	Within limit of 6.0 to 9.0 at all times			OP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	35	-	104[3]	BP
Priority Pollutants	µg/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
OP – Ocean Plan water quality objective
NTU – Nephelometric Turbidity Units
µg/L – micrograms per liter
MDAL – maximum daily action level
BP – Basin Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas" and is not applicable to water bodies that are not designated with the water contact recreation (REC-1) beneficial use.

Table C-3. Non-Storm Water Action Levels for Priority Pollutants

Parameter	Units	Freshwater (CTR)		Saltwater (CTR)	
		MDAL	AMAL	MDAL	AMAL
Cadmium	µg/L	**	**	16	8
Copper	µg/L	*	*	5.8	2.9
Chromium III	µg/L	**	**	-	-
Chromium VI	µg/L	16	8.1	83	41
Lead	µg/L	*	*	14	2.9
Nickel	µg/L	**	**	14	6.8
Silver	µg/L	*	*	2.2	1.1
Zinc	µg/L	*	*	95	47

Abbreviations/Acronyms:
CTR – California Toxic Rule
AMAL – average monthly action level
µg/L – micrograms per liter
MDAL – maximum daily action level

Notes:
* Action levels developed on a case-by-case basis (see below)
** Action levels developed on a case-by-case basis (see below), but calculated criteria are not to exceed Maximum Contaminant Levels (MCLs) under the California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64431

The Cadmium, Copper, Chromium (III), Lead, Nickel, Silver and Zinc NALs for MS4 discharges to freshwater receiving waters will be developed on a case-by-case basis based on site-specific water quality data (receiving water hardness). For these priority pollutants, refer to 40 CFR 131.38(b)(2).

(3) Non-Storm Water Discharges from MS4s to Inland Surface Waters

Table C-4. Non-Storm Water Action Levels for Discharges from MS4s to Inland Surface Waters

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Dissolved Oxygen	mg/L	Not less than 5.0 in WARM waters and not less than 6.0 in COLD waters			BP
Turbidity	NTU	-	20	See MDAL	BP
pH	Units	Within limit of 6.5 to 8.5 at all times			BP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	33	-	61[3]	BP
Total Nitrogen	mg/L	-	1.0	See MDAL	BP
Total Phosphorus	mg/L	-	0.1	See MDAL	BP
MBAS	mg/L	-	0.5	See MDAL	BP
Iron	mg/L	-	0.3	See MDAL	BP
Manganese	mg/L	-	0.05	See MDAL	BP
Priority Pollutants	µg/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
BP – Basin Plan water quality objective
COLD – cold freshwater habitat beneficial use
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
MDAL – maximum daily action level
WARM – warm freshwater habitat beneficial use
MBAS – Methylene Blue Active Substances
MPN/100 ml – most probable number per 100 milliliters
µg/L – micrograms per liter

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for freshwater "designated beach areas" and is not applicable to water bodies that are not designated with the water contact recreation (REC-1) beneficial use.

b. If not identified in Provision C.1.a, NALs must be identified, developed and incorporated in the Water Quality Improvement Plan for any pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in receiving waters associated with the highest priority water quality conditions related to non-storm water discharges from the MS4s. NALs must be based on:

(1) Applicable water quality standards which may be dependent upon site-specific or receiving water-specific conditions or assumptions to be identified by the Copermittees; or

(2) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the NALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary NALs specific to the Watershed Management Area at levels greater than the NALs required by Provisions C.1.a and C.1.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for effectively prohibiting non-storm water discharges to the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and from the MS4. The

secondary NALs may be developed using an approach acceptable to the San Diego Water Board.

d. Dry weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.b may be utilized to develop or revise NALs based on watershed-specific data, subject to San Diego Water Board Executive Officer approval.

2. Storm Water Action Levels[9]

The Copermittees must develop and incorporate numeric storm water action levels (SALs) in the Water Quality Improvement Plans to: 1) support the development and prioritization of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s, and 2) assess the effectiveness of the water quality improvement strategies toward reducing pollutants in storm water discharges, required pursuant to Provision D.4.b.(2).[10]

a. The following SALs for discharges of storm water from the MS4 must be incorporated:

Table C-5. Storm Water Action Levels for Discharges from MS4s to Receiving Waters

Parameter	Units	Action Level
Turbidity	NTU	126
Nitrate & Nitrite (Total)	mg/L	2.6
Phosphorus (Total P)	mg/L	1.46
Cadmium (Total Cd)*	µg/L	3.0
Copper (Total Cu)*	µg/L	127
Lead (Total Pb)*	µg/L	250
Zinc (Total Zn)*	µg/L	976

Abbreviations/Acronyms:
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
µg/L – micrograms per liter

Notes:
* The sampling must include a measure of receiving water hardness at each MS4 outfall. If a total metal concentration exceeds the corresponding metals SAL in Table C-5, that concentration must be compared to the California Toxics Rule criteria and the USEPA 1-hour maximum concentration for the detected level of receiving water hardness associated with that sample. If it is determined that the sample's total metal concentration for that specific metal exceeds that SAL, but does not exceed the applicable USEPA 1-hour maximum concentration criterion for the measured level of hardness, then the sample result will not be considered above the SAL for that measurement.

[9] SALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, unless the SAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed.
[10] The Copermittees may utilize SALs or other benchmarks currently established by the Copermittees as interim SALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

b. If not identified in Provision C.2.a, SALs must be identified, developed and incorporated in the Water Quality Improvement Plan for pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in receiving waters associated with the highest priority water quality conditions related to storm water discharges from the MS4s. SALs must be based on:

(1) Federal and State water quality guidance and/or water quality standards; and

(2) Site-specific or receiving water-specific conditions; or

(3) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the SALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary SALs specific to the Watershed Management Area at levels greater than the SALs required by Provisions C.2.a and C.2.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s. The secondary SALs may be developed based on the approaches recommended by the State Water Board's Storm Water Panel[11] or using an approach acceptable to the San Diego Water Board.

d. Wet weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.c may be used to develop or revise SALs based upon watershed-specific data, subject to San Diego Water Board Executive Officer approval.

[11] Storm Water Panel Recommendations to the California State Water Resources Control Board: The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities (June 2006)

D. MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS

The purpose of this provision is for the Copermittees to monitor and assess the impact on the conditions of receiving waters caused by discharges from the Copermittees' MS4s under wet weather and dry weather conditions. The goal of the monitoring and assessment program is to inform the Copermittees about the nexus between the health of receiving waters and the water quality condition of the discharges from their MS4s. This goal will be accomplished through monitoring and assessing the conditions of the receiving waters, discharges from the MS4s, pollutant sources and/or stressors, and effectiveness of the water quality improvement strategies implemented as part of the Water Quality Improvement Plans.

1. Receiving Water Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the condition of the receiving waters in each Watershed Management Area during dry weather and wet weather. Following San Diego Water Board acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct long-term receiving water monitoring during implementation of the Water Quality Improvement Plan to assess the long term trends and determine if conditions in receiving waters are improving. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following receiving water monitoring procedures:

a. TRANSITIONAL RECEIVING WATER MONITORING

Until the monitoring requirements and schedules of Provisions D.1.b-e are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following receiving water monitoring in the Watershed Management Area:

(1) Continue the receiving water monitoring programs required in Order Nos. R9-2007-0001 (Monitoring and Reporting Program No. R9-2007-0001 Sections II.A.1-A.5), R9-2009-0002, and R9-2010-0016;

(2) Continue the monitoring in the Hydromodification Management Plans approved by the San Diego Water Board;

(3) Participate in the following regional receiving water monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring,

(b) Southern California Bight Regional Monitoring, and

(c) Sediment Quality Monitoring;

(4) Implement the monitoring programs developed as part of any implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) for the TMDLs in Attachment E to this Order; and

(5) For Watershed Management Areas with ASBS, implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

b. LONG-TERM RECEIVING WATER MONITORING STATIONS

The Copermittees must select at least one long-term receiving water monitoring station from among the existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees to be representative of the receiving water quality in the Watershed Management Area. Additional long-term receiving water monitoring stations must be selected where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

c. DRY WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three dry weather monitoring events at each of the long-term receiving water monitoring stations. At least one monitoring event must be conducted during the dry season (May 1 – September 30) and at least one monitoring event must be conducted during a dry weather period during the wet season (October 1 – April 30), after the first wet weather event of the season, with an antecedent dry period of at least 72 hours following a storm event producing measureable rainfall of greater than 0.1 inch.

(1) Dry Weather Receiving Water Field Observations

For each dry weather monitoring event, the Copermittees must record field observations consistent with Table D-1 at each long-term receiving water monitoring station.

Table D-1. Field Observations for Receiving Water Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) • Station description (i.e. deposits or stains, vegetation condition, structural condition, and observable biology) • Presence and assessment of trash in and around station

(2) Dry Weather Receiving Water Field Monitoring

For each dry weather monitoring event, if conditions allow the collection of the data, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

Table D-2. Field Monitoring Parameters for Receiving Water Monitoring Stations

Parameters
• pH • Temperature • Specific conductivity • Dissolved oxygen • Turbidity

(3) Dry Weather Receiving Water Analytical Monitoring

For each dry weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable NAL constituents, and

(v) Constituents listed in Table D-3.

Table D-3. Analytical Monitoring Constituents for Receiving Water Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Pesticides	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Mercury • Nickel • Selenium • Thallium • Zinc	• Organophosphate Pesticides • Pyrethroid Pesticides	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(4) Dry Weather Receiving Water Toxicity Monitoring

For each dry weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for aquatic toxicity in accordance with Table D-4. When the State Water Board's Policy for Toxicity Assessment and Control (Toxicity Policy) is approved and in effect, the San Diego Water Board Executive Officer may direct the Copermittees to replace current toxicity program elements with standardized procedures in the Toxicity Policy.

Table D-4. Dry Weather Chronic[1] Toxicity Testing for Receiving Water Monitoring Stations

Organism	Units	Test	USEPA Protocol
Freshwater			
Pimephales promelas (Fathead Minnow)	Pass / Fail	Larval Survival and Growth	EPA-821-R-02-013
Ceriodaphnia dubia (*Daphnid*)	Pass / Fail	Survival and Production	EPA-821-R-02-013
Selenastrum capricornutum (Green Algae)	Pass / Fail	Growth	EPA-821-R-02-013
Marine and Estuarine			
Strongylocentrotus purpuratus *(Purple Sea Urchin)*	Pass / Fail	Embryo-Larval Development	EPA-600-R-95-136

Notes:
1. Chronic toxicity testing is not required at receiving water monitoring stations located at mass loading stations if the channel flows are diverted year-round during dry weather conditions to the sanitary sewer for treatment.

(a) Freshwater Test Species and Methods: If samples are collected in receiving waters with salinity less than 1 ppt, the Copermittees must follow the methods for chronic toxicity tests as established in 40 CFR 136.3 using a single-concentration test design for routine monitoring, or a five-concentration test design for additional toxicity testing if the limitation is exceeded. The Copermittees must estimate the critical life stage chronic toxicity on undiluted samples in accordance with species and short term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms (EPA-821-R-02-013; Table IA, 40 CFR 136). Additional test species may be used by the Copermittees if approved by the San Diego Water Board Executive Officer. The Copermittees must conduct:

(i) A static renewal toxicity test with the fathead minnow, *Pimephales promelas* (Larval Survival and Growth Test Method 1000.0);

(ii) A static renewal toxicity test with the daphnid, *Ceriodaphnia dubia* (Survival and Reproduction Test Method 1002.0); and

(iii) A static renewal toxicity test with the green alga, *Selenastrum capricornutum* (also named *Raphidocelis subcapitata*) (Growth Test Method 1003.0).

(b) Marine and Estuarine Test Species and Methods: If samples are collected in receiving waters with salinity greater or equal to 1 ppt, the Copermittees must follow the methods for chronic toxicity tests as established in 40 CFR 136.3 using a single-concentration test design for routine monitoring, or a five-concentration test design for additional toxicity testing if the limitation is exceeded. The Copermittees must conduct the following critical life state chronic toxicity tests on undiluted samples in accordance with species and short term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms (EPA-600-R-95-136; 1995). Artificial sea salts must be used to increase sample salinity. The Copermittees must conduct a static non-renewal toxicity test with the purple sea urchin, *Strongylocentrotus purpuratus* (Embryo-larval Development Test Method). Additional species may be used by the Copermittees if approved by the San Diego Water Board Executive Officer.

(c) Holding Times: All toxicity tests must be conducted as soon as possible following sample collection. The 36-hour sample holding time for test initiation shall be targeted. However, no more than 72 hours shall elapse before the conclusion of sample collection and test initiation.

(d) Test Species Sensitivity Screening: To determine the most sensitive test species for freshwater, the Copermittees must screen 2 wet weather and 2 dry weather toxicity tests with a vertebrate, an invertebrate, and a plant species. After this screening period, subsequent monitoring must be conducted using the most sensitive test species. Alternatively, if a sensitive test species has already been determined, or if there is prior knowledge of potential toxicant(s) and a test species is sensitive to such toxicant(s), then monitoring must be conducted using only that test species. Sensitive test species determinations must also consider the most sensitive test species used for proximal receiving water monitoring. Rescreening must occur once each permit term.

(e) Chronic toxicity test biological endpoint data must be analyzed using the Test of Significant Toxicity t-test approach specified in *National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document* (USEPA, Office of Wastewater Management, Washington, D.C., EPA-833-R-10-003, 2010). For this monitoring program, the critical chronic instream waste concentration (IWC) is set at 100 percent receiving water (i.e. no dilution) for receiving water samples. A 100 percent receiving water and a control must be tested.

(f) Toxicity Identification Evaluation (TIE) / Toxicity Reduction Evaluation (TRE): If chronic toxicity is detected in receiving waters, the Copermittees must discuss the need for conducting a TIE/TRE in the assessments required under Provision D.4.a.(2), and develop a plan for implementing the TIE/TRE to be incorporated in the Water Quality Improvement Plan.

(5) Dry Weather Receiving Water Bioassessment Monitoring

Bioassessment monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must conduct bioassessment monitoring during at least one dry weather monitoring event at each long-term receiving water monitoring station as follows:

(a) The following bioassessment samples and measurements must be collected:

(i) Macroinvertebrate samples must be collected in accordance with the "Reachwide Benthos (Multihabitat) Procedure" in the most current Surface Water Ambient Monitoring Program (SWAMP) Bioassessment Standard Operating Procedures (SOP), and amendments, as applicable;[12]

(ii) The "Full" suite of physical habitat characterization measurements must be collected in accordance with the most current SWAMP Bioassessment SOP, and as summarized in the SWAMP Stream Habitat Characterization Form – Full Version;[13] and

(iii) Freshwater algae samples must be collected in accordance with the SWAMP Standard Operating Procedures for Collecting Algae Samples.[14] Analysis of samples must include algal taxonomic composition (diatoms and soft algae) and algal biomass.

(b) The bioassessment samples, measurements, and appropriate water chemistry data must be used to calculate the following:

(i) An Index of Biological Integrity (IBI) for macroinvertebrates for each monitoring station where bioassessment monitoring was conducted, based on the most current calculation method;[15] and

[12] Ode, P.R.. 2007. Standard operating procedures for collecting macroinvertebrate samples and associated physical and chemical data for ambient bioassessments in California. California State Water Resources Control Board Surface Water Ambient Monitoring Program (SWAMP) Bioassessment SOP 001. http://www.swrcb.ca.gov/water_issues/programs/swamp/tools.shtml#monitoring

[13] Available at: http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/reports/fieldforms_fullversion052908.pdf

[14] Fetscher et al. 2009. Standard Operating Procedures for Collecting Stream Algae Samples and Associated Physical Habitat and Chemical Data for Ambient Bioassessments in California.

[15] The most current calculation method at the time the Order was adopted is outlined in "A Quantitative Tool for Assessing the Integrity of Southern California Coastal Streams" (Ode, et al. 2005. Environmental Management. Vol. 35, No. 1, pp. 1-13). If an updated or new calculation method is developed, either both (i.e. current and updated/new) methods must be used, or historical IBIs must be recalculated with the updated or new calculation method.

(ii) An IBI for algae for each monitoring station where bioassessment monitoring was conducted, when a calculation method is developed.[16]

(c) In lieu of the requirements of Provision D.1.c.(5)(a), the Copermittees may conduct the bioassessment monitoring in accordance with the "Triad" assessment approach[17] to calculate the IBIs required for Provision D.1.c.(5)(b). The Copermittees must conduct sampling, analysis, and reporting of specified in-stream biological and habitat data according to the protocols specified in the SCCWRP Technical Report No. 539, or subsequent protocols, if developed.

(6) Dry Weather Receiving Water Hydromodification Monitoring

In addition to the hydromodification monitoring conducted as part of the Copermittees' Hydromodification Management Plans, hydromodification monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must collect the following hydromodification monitoring observations and measurements within an appropriate domain of analysis during at least one dry weather monitoring event for each long-term receiving water monitoring station:

(a) Channel conditions, including:

(i) Channel dimensions,

(ii) Hydrologic and geomorphic conditions, and

(iii) Presence and condition of vegetation and habitat;

(b) Location of discharge points;

(c) Habitat integrity;

(d) Photo documentation of existing erosion and habitat impacts, with location (i.e. latitude and longitude coordinates) where photos were taken;

(e) Measurement or estimate of dimensions of any existing channel bed or bank eroded areas, including length, width, and depth of any incisions; and

[16] When a calculation method is developed, IBIs must be calculated for all available and appropriate historical data.
[17] Stormwater Monitoring Coalition Model Monitoring Technical Committee, 2004. Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California. Technical Report #419. August 2004.

(f) Known or suspected cause(s) of existing downstream erosion or habitat impact, including flow, soil, slope, and vegetation conditions, as well as upstream land uses and contributing new and existing development.

d. WET WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three wet weather monitoring events at each long-term receiving water monitoring station. At least one wet weather monitoring event must be conducted during the first wet weather event of the wet season (October 1 – April 30), and at least one wet weather monitoring event during a wet weather event that occurs after February 1.

(1) Wet Weather Receiving Water Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each long-term receiving water monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event;

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(d) Presence and assessment of trash in and around station.

(2) Wet Weather Receiving Water Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

(3) Wet Weather Receiving Water Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) Constituents listed in Table D-3.

(4) Wet Weather Receiving Water Toxicity Monitoring

For each wet weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for chronic aquatic toxicity in accordance with Provisions D.1.c.(4)(a)-(f).

e. OTHER RECEIVING WATER MONITORING REQUIREMENTS

(1) Regional Monitoring

The Copermittees must participate in the following regional receiving waters monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring; and

(b) Southern California Bight Regional Monitoring.

(2) Sediment Quality Monitoring

The Copermittees must perform sediment monitoring to assess compliance with sediment quality receiving water limits applicable to MS4 discharges to enclosed bays and estuaries. The monitoring may be performed either by individual or multiple Copermittees to assess compliance with receiving water limits, or through participation in a water body monitoring coalition. A Sediment Monitoring Plan which satisfies the requirements of the State Water Board's Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part 1 Sediment Quality (Sediment Control Plan) must be submitted as part of the monitoring and assessment program in the Water Quality Improvement Plan.

(a) The Sediment Monitoring Plan design must include the following:

(i) The elements required under Section VII.D (Receiving Water Limits Monitoring Frequency) and Section VII.E (Sediment Monitoring) of the Sediment Control Plan;

(ii) A Quality Assurance Project Plan (QAPP) describing the project objectives and organization, functional activities, and quality assurance/quality control protocols for the water and sediment monitoring; and

(iii) A schedule for completion of all sample collection and analysis activities and submission of Sediment Monitoring Reports.

(b) The Copermittees must implement the Sediment Monitoring Plan in accordance with the schedule contained in the Sediment Monitoring Plan, unless otherwise directed in writing by the San Diego Water Board Executive Officer.

(c) The Copermittees must incorporate a Sediment Monitoring Report as part of the Water Quality Improvement Plan Annual Report in accordance with the schedule contained in the Sediment Monitoring Plan, unless otherwise directed in writing by the San Diego Water Board Executive Officer. The Sediment Monitoring Report must contain the following information:

(i) Analysis: An evaluation, interpretation and tabulation of the water and sediment monitoring data, including interpretations and conclusions as to whether applicable Receiving Water Limitations in this Order have been attained at each sample station;

(ii) Sample Location Map: The locations, type, and number of samples must be identified and shown on a site map; and

(iii) California Environmental Data Exchange Network: A statement certifying that the monitoring data and results have been uploaded into the California Environmental Data Exchange Network (CEDEN).

(d) Based on the Sediment Monitoring Report conclusions the San Diego Water Board may require a human health risk assessment to determine if the human health objective contained in Receiving Water Limitations in Provision A.2.a.(3)(b)(ii) has been attained at each sample station. In conducting a risk assessment, the Copermittees must consider any applicable and relevant information, including California Environmental Protection Agency's (Cal/EPA) Office of Environmental Health Hazard Assessment (OEHHA) policies for fish consumption and risk assessment, Cal/EPA's Department of Toxic Substances Control (DTSC) Risk Assessment, and USEPA Human Health Risk Assessment policies.

(3) ASBS Monitoring

For Watershed Management Areas with ASBS, the Copermittees must implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

f. ALTERNATIVE WATERSHED MONITORING REQUIREMENTS

The San Diego Water Board may direct the Copermittees to participate in an effort to develop alternative watershed monitoring with other regulated entities, other interested parties, and the San Diego Water Board to refine, coordinate, and implement regional monitoring and assessment programs to determine the status and trends of water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams.

2. MS4 Outfall Discharge Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the discharges from the MS4 outfalls in each Watershed Management Area during dry weather and wet weather. Following San Diego Water Board acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct MS4 outfall discharge monitoring during implementation of the Water Quality Improvement Plan to assess the effectiveness of their jurisdictional runoff

management programs toward effectively prohibiting non-storm water discharges into the MS4 and reducing pollutants in storm water discharges from their MS4s to the MEP. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following MS4 outfall monitoring procedures:

a. TRANSITIONAL MS4 OUTFALL DISCHARGE MONITORING

Until the monitoring requirements and schedules of Provisions D.2.b-c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following MS4 outfall discharge monitoring in the Watershed Management Area:

(1) MS4 Outfall Discharge Monitoring Station Inventory

Each Copermittee must identify all major MS4 outfalls that discharge directly to receiving waters within its jurisdiction and geo-locate those outfalls on a map of the MS4 pursuant to Provision E.2.b.(1). This information must be compiled into a MS4 outfall discharge monitoring station inventory, and must include the following information:

(a) Latitude and longitude of MS4 outfall point of discharge;

(b) Watershed Management Area;

(c) Hydrologic subarea;

(d) Outlet size;

(e) Accessibility (i.e. safety and without disturbance of critical habitat);

(f) Approximate drainage area; and

(g) Classification of whether the MS4 outfall is known to have persistent dry weather flows, transient dry weather flows, no dry weather flows, or unknown dry weather flows.

(2) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Until the monitoring requirements and schedules of Provision D.2.b are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, each Copermittee must perform dry weather MS4 outfall field screening monitoring to identify non-storm water and illicit discharges within its jurisdiction in accordance with

Provision E.2.c, to determine which discharges are transient flows and which are persistent flows, and prioritize the dry weather MS4 discharges that will be investigated and eliminated in accordance with Provision E.2.d.

(a) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Frequency

Each Copermittee must field screen the MS4 outfalls in its inventory developed pursuant to Provision D.2.a.(1) as follows:

(i) For Copermittees with less than 125 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 80 percent of the outfalls must be visually inspected two times per year during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv).

(ii) For Copermittees with 125 major MS4 outfalls or more, but less than or equal to 500 that discharge to receiving waters within a Watershed Management Area, all the outfalls must be visually inspected at least annually during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv).

(iii) For Copermittees with more than 500 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 500 outfalls must be visually inspected at least annually during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv). Copermittees with more than 500 major MS4 outfalls within a Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(iv) For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major MS4 outfalls within its jurisdiction, at least 500 major MS4 outfalls within its inventory must be visually inspected at least annually during dry

weather conditions. Copermittees with more than 500 major MS4 outfalls in more than one Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(v) Inspections of major MS4 outfalls conducted in response to public reports and staff or contractor reports and notifications may count toward the required visual inspections of MS4 outfall discharge monitoring stations.

(b) Transitional Dry Weather MS4 Outfall Discharge Field Screening Visual Observations

(i) An antecedent dry period of at least 72 hours following any storm event producing measurable rainfall greater than 0.1 inch is required prior to conducting field screening visual observations during a field screening monitoring event.

(ii) During the field screening monitoring event, each Copermittee must record visual observations consistent with Table D-5 at each MS4 outfall discharge monitoring station inspected.

Table D-5. Field Screening Visual Observations for MS4 Outfall Discharge Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) - Flow source(s) suspected or identified from non-storm water source investigation - Flow source(s) eliminated during non-storm water source identification • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) - Known or suspected source(s) of pooled or ponded water • Station description (i.e. deposits or stains, vegetation condition, structural condition, observable biology) • Presence and assessment of trash in and around station • Evidence or signs of illicit connections or illegal dumping

(iii) Each Copermittee must implement the requirements of Provisions E.2.d.(2)(c)-(e) based on the field observations required pursuant to Provision D.2.a.(2)(b)(ii).

(iv) Each Copermittee must evaluate field observations together with existing information available from prior reports, inspections and monitoring results to determine whether any observed flowing, pooled, or ponded waters are likely to be transient or persistent flow.[18]

(c) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Records

Based upon the results of the transitional dry weather MS4 outfall discharge field screening monitoring conducted pursuant to Provisions D.2.a.(2)(a)-(b), each Copermittee must update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow.

(3) Transitional Wet Weather MS4 Outfall Discharge Monitoring

Until the monitoring requirements and schedules of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(a) Transitional Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees must select wet weather MS4 outfall discharge monitoring stations from the inventories developed pursuant to Provision D.2.a.(1) for each Watershed Management Area as follows:

(i) At least five wet weather MS4 outfall discharge monitoring stations that are representative of storm water discharges from areas consisting primarily of residential, commercial, industrial, and typical mixed-use land uses present within the Watershed Management Area;

(ii) At least one wet weather MS4 outfall discharge monitoring station for each Copermittee within the Watershed Management Area; and

[18] Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

(iii) The County of San Diego may select at least two (2) wet weather MS4 outfall discharge monitoring stations for the portion of the Santa Margarita River Watershed Management Area within its jurisdiction to be monitored during the transitional period until the Riverside County Copermittees are notified of coverage under this Order. After the Riverside County Copermittees are notified of coverage under this Order, the Copermittees in the Watershed Management Area must select wet weather MS4 outfall discharge monitoring stations consistent with the requirements above.

(b) Transitional Wet Weather MS4 Outfall Discharge Monitoring Frequency

Each wet weather MS4 outfall discharge monitoring station selected pursuant to Provision D.2.a.(3)(a) must be monitored once during the wet season (October 1 – April 30). The wet weather monitoring events must be selected to be representative of the range of hydrological conditions experienced in the region. At least 10 percent of samples must be conducted during the first wet weather event of the wet season, to include at least one such sample in each Watershed Management Area..

(c) Transitional Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(i) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(ii) The flow rates and volumes measured or estimated from the MS4 outfall (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(d) Transitional Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(e) Transitional Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, and indicator bacteria;

(iv) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

[a] Time-weighted composites collected over the length of the storm event or the first 24 hour period whichever is shorter, composed of discrete samples, which may be collected through the use of automated equipment, or

[b] Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

[c] If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours;

(v) Only one analysis of the composite of aliquots is required;

(vi) The samples must be analyzed for the following constituents:

[a] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

[b] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and

[c] Constituents listed in in Table D-6.

Table D-6. Analytical Monitoring Constituents for Wet Weather MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Nickel • Selenium • Thallium • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(f) Other Transitional Wet Weather MS4 Outfall Discharge Monitoring

The San Diego County Copermittees must continue the wet weather MS4 outfall monitoring program developed under Order No. R9-2007-0001, as approved by the San Diego Water Board, through its planned completion.

b. DRY WEATHER MS4 OUTFALL DISCHARGE MONITORING

Each Copermittee must perform dry weather MS4 outfall monitoring to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. Each Copermittee must conduct the following dry weather MS4 outfall discharge monitoring within its jurisdiction:

(1) Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Each Copermittee must continue to perform the dry weather MS4 outfall discharge field screening monitoring in accordance with the requirements of Provision D.2.a.(2). The Copermittee may adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of persistent flow non-storm water discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of visual inspections performed is equivalent to the number of visual inspections required under Provision D.2.a.(2)(a).

(2) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring

Each Copermittee must perform non-storm water persistent flow MS4 outfall discharge monitoring to determine which persistent non-storm water discharges contain concentrations of pollutants below NALs, and which persistent non-storm water discharges impact receiving water quality during dry weather. Each Copermittee must conduct the following non-storm water persistent flow MS4 outfall discharge monitoring within its jurisdiction:

(a) Prioritization of Non-Storm Water Persistent Flow MS4 Outfalls

Based upon the dry weather MS4 outfall discharge field screening monitoring records developed pursuant to Provision D.2.a.(2)(c), each Copermittee must identify and prioritize the MS4 outfalls with persistent flows based on the highest priority water quality conditions identified in the Water Quality Improvement Plan and any additional criteria developed by the Copermittee, which may include historical data and data from sources other than what the Copermittee collects.

(b) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring Frequency

(i) Based on the prioritization of major MS4 outfalls developed under Provision D.2.b.(2)(a), each Copermittee must identify, at a minimum, the 5 highest priority major MS4 outfalls with non-storm water persistent flows that the Copermittee will monitor within its jurisdiction in each Watershed Management Area. For Responsible Copermittees identified by a TMDL in Attachment E to this Order, if the 5 chosen outfall locations are not sufficient to determine compliance with the TMDL(s), then each Responsible Copermittee must identify additional MS4 outfall monitoring locations within its jurisdiction sufficient to address compliance with the TMDL(s). If a Copermittee has less than 5 major outfalls within a Watershed Management Area, then the Copermittee must monitor all of its major MS4 outfalls with persistent flows within each Watershed Management Area. The location of the highest priority non-storm water persistent flow MS4 outfall monitoring stations must be identified on the map required pursuant to Provision E.2.b.(1). The map must specify which MS4 outfalls are being monitored for compliance with a TMDL.

(ii) Each of the highest priority non-storm water persistent flow MS4 outfall monitoring stations identified pursuant to Provision D.2.b.(2)(b)(i) must be monitored under dry weather conditions at least semi-annually until one of the following occurs:

[a] The non-storm water discharges have been effectively eliminated (i.e. no flowing, pooled, or ponded water) for three consecutive dry weather monitoring events; or

[b] The source(s) of the persistent flows has been identified as a category of non-storm water discharges that does not require an NPDES permit and does not have to be addressed as an illicit discharge because it was not identified as a source of pollutants (i.e. constituents in non-storm water discharge do not exceed NALs), and the persistent flow can be re-prioritized to a lower priority; or

[c] The constituents in the persistent flow non-storm water discharge do not exceed NALs, and the persistent flow can be re-prioritized to a lower priority; or

[d] The source(s) of the persistent flows has been identified as a non-storm water discharge authorized by a separate NPDES permit.

(iii) Where the criteria under Provision D.2.b.(2)(b)(ii) are not met, but the threat to water quality has been reduced by the Copermittee, the highest priority persistent flow MS4 outfall monitoring stations may be reprioritized accordingly for continued dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1).

(iv) Each Copermittee must document removal or re-prioritization of the highest priority persistent flow MS4 outfall monitoring stations identified under Provision D.2.b.(2)(a) in the Water Quality Improvement Plan Annual Report. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized major MS4 outfall in the Watershed Management Area within its jurisdiction, unless there are no remaining qualifying major MS4 outfalls within the Copermittee's jurisdiction in the Watershed Management Area.

(c) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Observations

During each semi-annual monitoring event, each Copermittee must record field observations consistent with Table D-5 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(d) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Monitoring

During each semi-annual monitoring event, if conditions allow the collection of the data, each Copermittee must monitor and record the parameters in Table D-2 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(e) Non-Storm Water Persistent Flow MS4 Outfall Discharge Analytical Monitoring

During each semi-annual monitoring event in which measurable flow is present, each Copermittee must collect and analyze samples from each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Collect grab or composite samples to be analyzed at a qualified laboratory for the following constituents:

[a] Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,
[b] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,
[c] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,
[d] Applicable NAL constituents, and
[e] Constituents listed in Table D-7. The Copermittees may adjust the list of constituents for the Watershed Management Area if historical data or supporting information can be provided that demonstrates or justifies the analysis of a constituent is not necessary.

Table D-7. Analytical Monitoring Constituents for Persistent Flow MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Total Hardness • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Cadmium • Copper • Lead • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(iv) If the Copermittee identifies and eliminates the source of the persistent flow non-storm water discharge, analysis of the sample is not required.

c. WET WEATHER MS4 OUTFALL DISCHARGE MONITORING

The Copermittees must perform wet weather MS4 outfall monitoring to identify pollutants in storm water discharges from the MS4s, to guide pollutant source identification efforts, and to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order. The Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(1) Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees may adjust the wet weather MS4 outfall discharge monitoring locations in the Watershed Management Area, as needed, to identify pollutants in storm water discharges from MS4s, to guide pollutant source identification efforts, and to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of stations is at least equivalent to the number of stations required under Provision D.2.a.(3)(a). Additional outfall monitoring locations, above the minimum per jurisdiction, may be required to demonstrate compliance with the WQBELs associated with the applicable TMDLs in Attachment E.

(2) Wet Weather MS4 Outfall Discharge Monitoring Frequency

The Copermittees must monitor the wet weather MS4 outfall discharge monitoring stations in the Watershed Management Area at least once (1) per year. The Copermittees may need to increase the frequency of monitoring in order to identify pollutants in storm water discharges from the MS4s causing or contributing to the highest priority water quality conditions, to guide pollutant source identification efforts, or to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order.

(3) Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm

event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(4) Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(5) Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites collected over the length of the storm event or the first 24 hour period, whichever is shorter , composed of discrete samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

(iii) If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours.

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) The Copermittees may adjust the analytical monitoring required for the Watershed Management Area, if the Copermittees have historical data or supporting information that can demonstrate or provide justification that the analysis of a constituent is not necessary.

3. Special Studies

a. Within the term of this Order, the Copermittees must initiate the following special studies:

(1) At least two special studies in each Watershed Management Area to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that cause or contribute to highest priority water quality conditions identified in the Water Quality Improvement Plan.

(2) At least one special study for the San Diego Region to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that are impacting receiving waters on a regional basis in the San Diego Region.

(3) One of the two special studies in each Watershed Management Area required pursuant to Provision D.3.a.(1) may be replaced by a special study implemented pursuant to Provision D.3.a.(2).

b. The special studies must, at a minimum, be in conformance with the following criteria:

(1) The special studies must be related to the highest priority water quality conditions identified by the Copermittees in the Watershed Management Area and/or for the entire San Diego Region;

(2) The special studies developed pursuant to Provision D.3.a.(1) must:

(a) Be implemented within the applicable Watershed Management Area, and

(b) Require some form of participation by all the Copermittees within the Watershed Management Area;

(3) The special studies developed pursuant to Provision D.3.a.(2) must:

(a) Be implemented within the San Diego Region, and

(b) Require some form of participation by all Copermittees covered under the requirements of this Order.

(4) The Copermittees are encouraged to partner with environmental groups or third parties knowledgeable of watershed conditions to complete the required special studies.

c. Special studies developed to identify sources of pollutants and/or stressors should be pollutant and/or stressor specific and based on historical monitoring data and monitoring performed pursuant to Provisions D.1 and D.2. Development of source identification special studies should include the following:

(1) A compilation of known information on the specific pollutant and/or stressor, including data on potential sources and movement of the pollutant and/or stressor within the watershed. Data generated by the Copermittees and others, as well as information available from a literature research on the pollutant and/or stressor should be compiled and analyzed as appropriate.

(2) An identification of data gaps, based on the compiled information generated on the specific pollutant and/or stressor identified in Provision D.3.c.(1). Source identification special studies should be developed to fill identified data gaps.

(3) A monitoring plan that will collect and provide data the Copermittees can utilize to do the following:

(a) Quantify the relative loading or impact of a pollutant and/or stressor from a particular source or pollutant generating activity;

(b) Improve understanding of the fate of a pollutant and/or stressor in the environment;

(c) Develop an inventory of known and suspected sources of a pollutant and/or stressor in the Watershed Management Area; and/or

(d) Prioritize known and suspected sources of a pollutant and/or stressor based on relative magnitude in discharges, geographical distribution (i.e., regional or localized), frequency of occurrence in discharges, human health risk, and controllability.

d. Special studies initiated prior to the effective date of this Order that meet the requirements of Provision D.3.b and are implemented during the term of this Order as part of the Water Quality Improvement Plan may be utilized to fulfill the special study requirements of Provision D.3.a. Special studies completed before the effective date of this Order cannot be utilized to fulfill the special study requirements of Provision D.3.a.

e. The Copermittees must submit the monitoring plans for the special studies in the Water Quality Improvement Plans required pursuant to Provision F.1.

f. The Copermittees are encouraged to share the results of the special studies regionally among the Copermittees to provide information useful in improving and adapting the management of non-storm water and storm water runoff through the implementation of the Water Quality Improvement Plans.

4. Assessment Requirements

Each Copermittee must evaluate the data collected pursuant to Provisions D.1, D.2 and D.3, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E, to assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a. Assessments must be performed as described in the following provisions:

a. Receiving Waters Assessments

(1) The Copermittees must assess and report the conditions of the receiving waters in the Watershed Management Area as follows:

(a) Based on data collected pursuant to Provision D.1.a, the assessments under Provision D.4.a.(2) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(b) Based on the data collected pursuant to Provisions D.1.a-e, the assessments required under Provision D.4.a.(2) must be included in the Report of Waste Discharge required pursuant to Provision F.5.b.

(2) The Copermittees must assess the status and trends of receiving water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under dry weather and wet weather conditions. For each of the three types of receiving waters in each Watershed Management Area the Copermittees must:

(a) Determine whether or not the conditions of the receiving waters are meeting the numeric goals established pursuant to Provision B.3.a;

(b) Identify the most critical beneficial uses that must be protected to ensure overall health of the receiving water;

(c) Determine whether or not those critical beneficial uses are being protected;

(d) Identify short-term and/or long-term improvements or degradation of those critical beneficial uses;

(e) Determine whether or not the strategies established in the Water Quality Improvement Plan contribute towards progress in achieving the interim and final numeric goals of the Water Quality Improvement Plan; and

(f) Identify data gaps in the monitoring data necessary to assess Provisions D.4.a.(2)(a)-(e).

b. MS4 OUTFALL DISCHARGES ASSESSMENTS

(1) Non-Storm Water Discharges Reduction Assessments

(a) Each Copermittee must assess and report the progress of its illicit discharge detection and elimination program, required to be implemented pursuant to Provision E.2, toward effectively prohibiting non-storm water and illicit discharges into the MS4 within its jurisdiction as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(2), the assessments under Provision D.4.b.(1)(b) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(ii) Based on the data collected pursuant to Provisions D.2.b, the assessments required under Provision D.4.b.(1)(c) must be included in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

(iii) Based on the data collected pursuant to Provisions D.2.b, the assessment required under Provision D.4.b.(1)(c) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.a.(2), each Copermittee must assess and report the following:

(i) Identify the known and suspected controllable sources (e.g. facilities, areas, land uses, pollutant generating activities) of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area;

(ii) Identify sources of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area that have been reduced or eliminated; and

(iii) Identify modifications to the field screening monitoring locations and frequencies for the MS4 outfalls in its inventory necessary to identify and eliminate sources of persistent flow non-storm water discharges pursuant to Provision D.2.b.

(c) Based on the dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1), each Copermittee must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(1)(b);

(ii) Based on the data collected and applicable NALs in the Water Quality Improvement Plan, rank the MS4 outfalls in the Copermittee's jurisdiction according to potential threat to receiving water quality, and produce a prioritized list of major MS4 outfalls for follow-up action to update the Water Quality Improvement Plan, with the goal of eliminating persistent flow non-storm water discharges and/or pollutant loads in order of the ranked priority list through targeted programmatic actions and source investigations;

(iii) For the highest priority major MS4 outfalls with persistent flows that are in exceedance of NALs, identify the known and suspected sources within the Copermittee's jurisdiction in the Watershed Management Area that may cause or contribute to the NAL exceedances;

(iv) Each Copermittee must analyze the data collected pursuant to Provision D.2.b, and utilize a model or other method, to calculate or estimate the non-storm water volumes and pollutant loads collectively discharged from all the major MS4s outfalls in its jurisdiction identified as having persistent dry weather flows during the monitoring year. These calculations or estimates must be updated annually.

[a] Each Copermittee must calculate or estimate the annual non-storm water volumes and pollutant loads collectively discharged

from the Copermittee's major MS4 outfalls to receiving waters within the Copermittee's jurisdiction, with an estimate of the percent contribution from each known source for each MS4 outfall;

[b] Each Copermittee must annually identify and quantify (i.e. volume and pollutant loads) sources of non-storm water not subject to the Copermittee's legal authority that are discharged from the Copermittee's major MS4 outfalls to downstream receiving waters.

(v) Each Copermittee must review the data collected pursuant to Provision D.2.b and findings from the assessments required pursuant to Provision D.4.b.(1)(c)(i)-(iv) at least once during the term of this Order to:

[a] Identify reductions and progress in achieving reductions in non-storm water and illicit discharges to the Copermittee's MS4 in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction, with an estimate, if possible, of the non-storm water volume and/or pollutant load reductions attributable to specific water quality strategies implemented by the Copermittee; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittee in the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction.

(vi) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(1)(c)(i)-(v).

(2) <u>Storm Water Pollutant Discharges Reduction Assessments</u>

(a) The Copermittees must assess and report the progress of the water quality improvement strategies, required to be implemented pursuant to Provisions B and E, toward reducing pollutants in storm water discharges from the MS4s within the Watershed Management Area as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(3), the assessments under Provision D.4.b.(2)(b) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(ii) Based on the data collected pursuant to Provisions D.2.c, the assessments required under Provision D.4.b.(2)(c) must be included

in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

(iii) Based on the data collected pursuant to Provisions D.2.c, the assessment required under Provisions D.4.b.(2)(c)-(d) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.a.(3) the Copermittees must assess and report the following:

(i) The Copermittees must analyze the monitoring data collected pursuant to Provision D.2.a.(3), and utilize a watershed model or other method, to calculate or estimate the following for each monitoring year:

[a] The average storm water runoff coefficient for each land use type within the Watershed Management Area;
[b] The volume of storm water and pollutant loads discharged from each of the Copermittee's monitored MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch;
[c] The total flow volume and pollutant loadings discharged from the Copermittee's jurisdiction within the Watershed Management Area over the course of the wet season, extrapolated from the data produced from the monitored MS4 outfalls; and
[d] The percent contribution of storm water volumes and pollutant loads discharged from each land use type within each hydrologic subarea with a major MS4 outfall to receiving waters or within each major MS4 outfall to receiving waters in the Copermittee's jurisdiction within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch.

(ii) Identify modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify pollutants in storm water discharges from the MS4s in the Watershed Management Area pursuant to Provision D.2.c.(1).

(c) Based on the wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.c the Copermittees must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(2)(b);

(ii) Based on the data collected and applicable SALs in the Water Quality Improvement Plan, analyze and compare the monitoring data to the analyses and assumptions used to develop the Water Quality

Improvement Plans, including strategies developed pursuant to Provision B.3, and evaluate whether those analyses and assumptions should be updated as a component of the adaptive management efforts pursuant to Provision B.5 for follow-up action to update the Water Quality Improvement Plan;

(iii) The Copermittees must review the data collected pursuant to Provision D.2.c and findings from the assessments required pursuant to Provisions D.4.b.(2)(c)(i)-(ii) at least once during the term of this Order to:

[a] Identify reductions or progress in achieving reductions in pollutant concentrations and/or pollutant loads from different land uses and/or drainage areas discharging from the Copermittees' MS4s in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters within the Watershed Management Area to the MEP, with an estimate, if possible, of the pollutant load reductions attributable to specific water quality strategies implemented by the Copermittees; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittees in the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters in the Watershed Management Area to the MEP.

(iv) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(iii).

(d) The Copermittees must evaluate all the data collected pursuant to Provision D.2.c, and incorporate new outfall monitoring data into time series plots for each long-term monitoring constituent for the Watershed Management Area, and perform statistical trends analysis on the cumulative long-term wet weather MS4 outfall discharge water quality data set.

c. Special Studies Assessments

The Copermittees must annually evaluate the results and findings from the special studies developed and implemented pursuant to Provision D.3, and assess their relevance to the Copermittees' efforts to characterize receiving water conditions, understand sources of pollutants and/or stressors, and control and reduce the discharges of pollutants from the MS4 outfalls to receiving waters in the Watershed Management Area. The Copermittees must report the results of the special studies assessments applicable to the Watershed Management Area, and identify any necessary modifications or updates to the Water Quality

Improvement Plan based on the results in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

d. INTEGRATED ASSESSMENT OF WATER QUALITY IMPROVEMENT PLAN

As part of the iterative approach and adaptive management process required for the Water Quality Improvement Plan pursuant to Provision B.5, the Copermittees in each Watershed Management Area must integrate the data collected pursuant to Provisions D.1-D.3, the findings from the assessments required pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to assess the effectiveness of, and identify necessary modifications to, the Water Quality Improvement Plan as follows:

(1) The Copermittees must re-evaluate the priority water quality conditions and numeric goals for the Watershed Management Area, as needed, during the term of this Order pursuant to Provision B.5.a. The re-evaluation and recommendations for modifications to the priority water quality conditions, and/or numeric goals and corresponding schedules may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The priority water quality conditions and numeric goals for the Watershed Management Area must be re-evaluated as follows:

(a) Re-evaluate the receiving water conditions in the Watershed Management Area in accordance with Provision B.2.a;

(b) Re-evaluate the impacts on receiving waters in the Watershed Management Area from MS4 discharges in accordance with Provision B.2.b;

(c) Re-evaluate the identification of MS4 sources of pollutants and/or stressors in accordance with Provision B.2.d;

(d) Identify beneficial uses of the receiving waters that are protected in accordance with Provision D.4.a;

(e) Evaluate the progress toward achieving the interim and final numeric goals for protecting impacted beneficial uses in the receiving waters.

(2) The Copermittees must re-evaluate the water quality improvement strategies for the Watershed Management Area during the term of this Order pursuant to Provision B.5.b. The re-evaluation and recommendations for modifications to the water quality improvement strategies and schedules may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The water quality improvement

strategies for the Watershed Management Area must be re-evaluated as follows:

(a) Identify the non-storm water and storm water pollutant loads from the Copermittees' MS4 outfalls in the Watershed Management Area, calculated or estimated pursuant to Provisions D.4.b;

(b) Identify the non-storm water and storm water pollutant load reductions, or other improvements to receiving water or water quality conditions, that are necessary to attain the interim and final numeric goals identified in the Water Quality Improvement Plan for protecting beneficial uses in the receiving waters;

(c) Identify the non-storm water and storm water pollutant load reductions, or other improvements to the quality of MS4 discharges, that are necessary for the Copermittees to demonstrate that non-storm water and storm water discharges from their MS4s are not causing or contributing to exceedances of receiving water limitations;

(d) Evaluate the progress of the water quality improvement strategies toward achieving the interim and final numeric goals identified in the Water Quality Improvement Plan for protecting beneficial uses in the receiving waters.

(3) The Copermittees must re-evaluate and adapt the water quality monitoring and assessment program for the Watershed Management Area when new information becomes available to improve the monitoring and assessment program pursuant to Provision B.5.c. The re-evaluation and recommendations for modifications to the monitoring and assessment program may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. Modifications to the water quality monitoring and assessment program must be consistent with the requirements of Provision D.1-D.3. The re-evaluation of the water quality monitoring and assessment program for the Watershed Management Area must consider the data gaps identified by the assessments required pursuant to Provisions D.4.a-b, and results of the special studies implemented pursuant to Provision D.4.c.

5. Monitoring Provisions

Each Copermittee must comply with all the monitoring, reporting, and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

E. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS

The purpose of this provision is for each Copermittee to implement a program to control the contribution of pollutants to and the discharges from the MS4 within its jurisdiction. The goal of the jurisdictional runoff management programs is to implement strategies that effectively prohibit non-storm water discharges to the MS4 and reduce the discharge of pollutants in storm water to the MEP. This goal will be accomplished through implementing the jurisdictional runoff management programs in accordance with the strategies identified in the Water Quality Improvement Plans.

Each Copermittee must update its jurisdictional runoff management program document, in accordance with Provision F.2.a, to incorporate all the requirements of Provision E. Until the Copermittee has updated its jurisdictional runoff management program document with the requirements of Provision E, the Copermittee must continue implementing its current jurisdictional runoff management program.

1. Legal Authority Establishment and Enforcement

a. Each Copermittee must establish, maintain, and enforce adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 through statute, ordinance, permit, contract, order, or similar means. This legal authority must, at a minimum, authorize the Copermittee to:

(1) Prohibit and eliminate all illicit discharges and illicit connections to its MS4;

(2) Control the contribution of pollutants in discharges of runoff associated with industrial and construction activity to its MS4 and control the quality of runoff from industrial and construction sites, including industrial and construction sites which have coverage under the statewide General Permit for Discharges of Storm Water Associated with Industrial Activities (Industrial General Permit) or General Permit for Discharges of Storm Water Associated with Construction Activities (Construction General Permit), as well as to those sites which do not;

(3) Control the discharge of spills, dumping, or disposal of materials other than storm water into its MS4;

(4) Control through interagency agreements among Copermittees the contribution of pollutants from one portion of the MS4 to another portion of the MS4;

(5) Control, by coordinating and cooperating with other owners of the MS4 such as Caltrans, the U.S. federal government, or sovereign Native American Tribes through interagency agreements, where possible, the contribution of pollutants from their portion of the MS4 to the portion of the MS4 within the Copermittee's jurisdiction;

(6) Require compliance with conditions in its statutes, ordinances, permits, contracts, orders, or similar means to hold dischargers to its MS4 accountable for their contributions of pollutants and flows;

(7) Require the use of BMPs to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(8) Require documentation on the effectiveness of BMPs implemented to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(9) Utilize enforcement mechanisms to require compliance with its statutes, ordinances, permits, contracts, orders, or similar means; and

(10) Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with its statutes, ordinances, permits, contracts, orders, or similar means and with the requirements of this Order, including the prohibition of illicit discharges and connections to its MS4; the Copermittee must also have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from industrial facilities, including construction sites, discharging into its MS4.

b. With the first Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3), each Copermittee must submit a statement certified by its Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative that the Copermittee has taken the necessary steps to obtain and maintain full legal authority within its jurisdiction to implement and enforce each of the requirements contained in this Order.

2. Illicit Discharge Detection and Elimination

Each Copermittee must implement a program to actively detect and eliminate illicit discharges and improper disposal into the MS4, or otherwise require the discharger to apply for and obtain a separate NPDES permit. The illicit discharge detection and elimination program must be implemented in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include, at a minimum, the following requirements:

a. Non-Storm Water Discharges

Each Copermittee must address all non-storm water discharges as illicit discharges unless a non-storm water discharge is either identified as a discharge authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to the following requirements:

(1) Discharges of non-storm water to the MS4 from the following categories must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG919001 (Order No. R9-2007-0034, or subsequent order) for discharges to San Diego Bay, or NPDES Permit No. CAG919002 (Order No. R9-2008-0002, or subsequent order) for discharges to surface waters other than San Diego Bay:

(1) Uncontaminated pumped ground water;

(2) Discharges from foundation drains;[19]

(3) Water from crawl space pumps; and

(4) Water from footing drains.[19]

(2) Discharges of non-storm water from water line flushing and water main breaks to the MS4 must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG 679001 (Order No. R9-2010-0003 or subsequent order). This category includes water line flushing and water main break discharges from water purveyors issued a water supply permit by the California Department of Public Health or federal military installations. Discharges from recycled or reclaimed water lines to the MS4 must be addressed as illicit discharges, unless the discharges have coverage under a separate NPDES permit.

(3) Discharges of non-storm water to the MS4 from the following categories must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a source of pollutants to receiving waters:

(a) Diverted stream flows;

(b) Rising ground waters;

(c) Uncontaminated ground water infiltration to MS4s;

(d) Springs;

(e) Flows from riparian habitats and wetlands;

(f) Discharges from potable water sources;

[19] Provision E.2.a.(1) only applies to this category of non-storm water if the system is designed to be located at or below the groundwater table to actively or passively extract groundwater during any part of the year.

(g) Discharges from foundation drains;[20] and

(h) Discharges from footing drains.[20]

(4) Discharges of non-storm water to the MS4 from the following categories must be controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means. Discharges of non-storm water to the MS4 from the following categories not controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means must be addressed by the Copermittee as illicit discharges.

(a) Air conditioning condensation

The discharge of air conditioning condensation should be directed to landscaped areas or other pervious surfaces, or to the sanitary sewer, where feasible.

(b) Individual residential vehicle washing

(i) The discharge of wash water should be directed to landscaped areas or other pervious surfaces where feasible; and

(ii) The minimization of water, washing detergent and other vehicle wash products used for residential vehicle washing, and the implementation of other practices or behaviors that will prevent the discharge of pollutants associated with individual residential vehicle washing from entering the MS4 must be encouraged.

(c) Dechlorinated swimming pool discharges

(i) Residual chlorine, algaecide, filter backwash, or other pollutants from swimming pools must be eliminated prior to discharging to the MS4; and

(ii) The discharge of saline swimming pool water must be directed to the sanitary sewer, landscaped areas, or other pervious surfaces that can accommodate the volume of water, unless the saline swimming pool water can be discharged via a pipe or concrete channel directly to a naturally saline water body (e.g. Pacific Ocean).

(5) Firefighting discharges to the MS4 must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a significant source of pollutants to receiving waters. Firefighting discharges to the MS4 not identified as a significant source of pollutants to receiving waters, must be addressed, at a minimum, as follows:

[20] Provision E.2.a.(3) only applies to this category of non-storm water discharge if the system is designed to be located above the groundwater table at all times of the year, and the system is only expected to discharge non-storm water under unusual circumstances.

(a) Non-emergency firefighting discharges

(i) Building fire suppression system maintenance discharges (e.g. sprinkler line flushing) to the MS4 must be addressed as illicit discharges unless BMPs are implemented to prevent pollutants associated with such discharges to the MS4.

(ii) Non-emergency firefighting discharges (i.e., discharges from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems) must be addressed by a program, to be developed and implemented by the Copermittee, to reduce or eliminate pollutants in such discharges from entering the MS4.

(b) Emergency firefighting discharges

Each Copermittee should develop and encourage implementation of BMPs to reduce or eliminate pollutants in emergency firefighting discharges to the MS4s and receiving waters within its jurisdiction. During emergency situations, priority of efforts should be directed toward life, property, and the environment (in descending order). BMPs should not interfere with immediate emergency response operations or impact public health and safety.

(6) If the Copermittee or San Diego Water Board identifies any category of non-storm water discharges listed under Provisions E.2.a.(1)-(4) as a source of pollutants to receiving waters, the category must be prohibited through ordinance, order, or similar means and addressed as an illicit discharge. Alternatively, the Copermittee may propose controls to be implemented for the category of non-storm water discharges as part of the Water Quality Improvement Plan instead of prohibiting the category of non-storm water discharges, and implement the controls if accepted by the San Diego Water Board as part of the Water Quality Improvement Plan.

(7) Each Copermittee must, where feasible and priorities and resources allow, reduce or eliminate non-storm water discharges listed under Provisions E.2.a.(1)-(4) into its MS4, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit.

b. PREVENT AND DETECT ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to prevent and detect illicit discharges to the MS4:

(1) Each Copermittee must maintain an updated map of its entire MS4 and the corresponding drainage areas. The accuracy of the MS4 map must be confirmed during the field screening required pursuant to Provision E.2.c.

The MS4 map must be included as part of the jurisdictional runoff management program document. Any geographic information system (GIS) layers or files used by the Copermittee to maintain the MS4 map must be made available to the San Diego Water Board upon request. The MS4 map must identify the following:

(a) All segments of the MS4 owned, operated, and maintained by the Copermittee;

(b) All known locations of inlets that discharge and/or collect runoff into the Copermittee's MS4;

(c) All known locations of connections with other MS4s not owned or operated by the Copermittee (e.g. Caltrans MS4s);

(d) All known locations of MS4 outfalls and private outfalls that discharge runoff collected from areas within the Copermittee's jurisdiction;

(e) All segments of receiving waters within the Copermittee's jurisdiction that receive and convey runoff discharged from the Copermittee's MS4 outfalls;

(f) Locations of the MS4 outfalls, identified pursuant to Provision D.2.a.(1), within its jurisdiction; and

(g) Locations of the non-storm water persistent flow MS4 outfall discharge monitoring stations, identified pursuant to Provision D.2.b.(2), within its jurisdiction.

(2) Each Copermittee must use Copermittee personnel and contractors to assist in identifying and reporting illicit discharges and connections during their daily employment activities.

(3) Each Copermittee must promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges to or from the MS4, including the following methods for public reporting:

(a) Operate a public hotline, which can be Copermittee-specific or shared by the Copermittees, and must be capable of receiving reports in both English and Spanish 24 hours per day and seven days per week; and

(b) Designate an e-mail address for receiving electronic reports from the public, which can be Copermittee-specific or shared by the Copermittees, and must be prominently displayed on the Copermittee's webpage and the Regional Clearinghouse required pursuant to Provision F.4.

(4) Each Copermittee must implement practices and procedures (including a notification mechanism) to prevent, respond to, contain, and clean up any spills that may discharge into the MS4 within its jurisdiction from any source. The Copermittee must coordinate, to the extent possible, with spill response teams to prevent entry of spills into the MS4, and prevent contamination of surface water, ground water, and soil. The Copermittee must coordinate spill prevention, containment, and response activities throughout all appropriate Copermittee departments, programs, and agencies.

(5) Each Copermittee must implement practices and procedures to prevent and limit infiltration of seepage from sanitary sewers (including private laterals and failing septic systems) to the MS4.

(6) Each Copermittee must coordinate, when necessary, with upstream Copermittees and/or entities to prevent illicit discharges from upstream sources into the MS4 within its jurisdiction.

c. FIELD SCREENING

Each Copermittee must conduct field screening (i.e. visual observations, field testing, and/or analytical testing) of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4 in accordance with the dry weather MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

d. INVESTIGATE AND ELIMINATE ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to investigate and eliminate illicit discharges to the MS4:

(1) Each Copermittee must prioritize and determine when follow-up investigations will be performed in response to visual observations and/or water quality monitoring data collected during an investigation of a detected non-storm water or illicit discharge to or from the MS4. The criteria for prioritizing investigations must consider the following:

(a) Pollutants identified as causing or contributing to the highest water quality priorities identified in the Water Quality Improvement Plan;

(b) Pollutants identified as causing or contributing, or threatening to cause or contribute to impairments in water bodies on the 303(d) List and/or in environmentally sensitive areas (ESAs), located within its jurisdiction;

(c) Pollutants identified from sources or land uses known to exist within the area, drainage basin, or watershed that discharges to the portion of the MS4 within its jurisdiction included in the investigation;

(d) Pollutants identified as causing or contributing to an exceedance of a NAL in the Water Quality Improvement Plan; and

(e) Pollutants identified as a threat to human health or the environment.

(2) Each Copermittee must implement procedures to investigate and inspect portions of its MS4 that, based on reports or notifications, field screening, or other appropriate information, indicate a reasonable potential of receiving, containing, or discharging pollutants due to illicit discharges, illicit connections, or other sources of non-storm water. The procedures must include the following:

(a) Each Copermittee must develop criteria to:

(i) Assess the validity of each report or notification received; and

(ii) Prioritize the response to each report or notification received.

(b) Each Copermittee must prioritize and respond to each valid report or notification (e.g., public reports, staff or contractor reports and notifications, etc.) of an incident in a timely manner.

(c) In accordance with the requirements of Provision E.2.d.(1), each Copermittee must investigate and seek to identify the source(s) of discharges of non-storm water where flows are observed in and from the MS4 during the field screening required pursuant to Provision D.2.b.(1) as follows:

(i) Obvious illicit discharges must be immediately investigated to identify the source(s) of non-storm water discharges;

(ii) The investigation must include field investigations to identify sources or potential sources for the discharge, unless the source or potential source has already been identified during previous investigations; and

(iii) The investigation may include follow-up field investigations and/or reviewing Copermittee inventories and other land use data to identify potential sources of the discharge.

(d) Each Copermittee must maintain records and a database of the following information:

(i) Location of incident, including hydrologic subarea, portion of MS4 receiving the non-storm water or illicit discharge, and point of discharge or potential discharge from MS4 to receiving water;

(ii) Source of information initiating the investigation (e.g., public reports, staff or contractor reports and notifications, field screening, etc.);

(iii) Date the information used to initiate the investigation was received;

(iv) Date the investigation was initiated;

(v) Dates of follow-up investigations;

(vi) Identified or suspected source of the illicit discharge or connection, if determined;

(vii) Known or suspected related incidents, if any;

(viii) Result of the investigation; and

(ix) If a source cannot be identified and the investigation is not continued, document the response pursuant to the requirements of Provision E.2.d.(4).

(e) Each Copermittee must maintain records and, in accordance with the priorities of the Water Quality Improvement Plan, seek to identify the source(s) of non-storm water discharges from the MS4 where there is evidence of non-storm water having been discharged into or from the MS4 (e.g., pooled water), in accordance with MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

(3) Each Copermittee must initiate the implementation of procedures, in a timely manner, to eliminate all detected and identified illicit discharges and connections within its jurisdiction. The procedures must include the following responses:

(a) Each Copermittee must enforce its legal authority, as required under Provision E.1, to eliminate illicit discharges and connections to the MS4.

(b) If the Copermittee identifies the source as a controllable source of non-storm water or illicit discharge or connection, the Copermittee must implement its Enforcement Response Plan pursuant to Provision E.6 and enforce its legal authority to prohibit and eliminate illicit discharges and connections to its MS4.

(c) If the Copermittee identifies the source of the discharge as a category of non-storm water discharges in Provision E.2.a, and the discharge is in exceedance of NALs in the Water Quality Improvement Plan, then the Copermittee must determine if: (1) this is an isolated incident or set of circumstances that will be addressed through its Enforcement Response Plan pursuant to Provision E.6, or (2) the category of discharge must be addressed through the prohibition of that category of discharge as an illicit discharge pursuant to Provision E.2.a.(6).

(d) If the Copermittee suspects the source of the non-storm water discharge as natural in origin (i.e. non-anthropogenically influenced) and in conveyance into the MS4, then the Copermittee must document and

provide the data and evidence necessary to demonstrate to the San Diego Water Board that it is natural in origin and does not require further investigation.

(e) If the Copermittee is unable to identify and document the source of a recurring non-storm water discharge to or from the MS4, then the Copermittee must address the discharge as an illicit discharge and update its jurisdictional runoff management program to address the common and suspected sources of the non-storm water discharge within its jurisdiction in accordance with the Copermittee's priorities.

(4) Each Copermittee must submit a summary of the non-storm water discharges and illicit discharges and connections investigated and eliminated within its jurisdiction with each Water Quality Improvement Plan Annual Report required under Provision F.3.b.(3) of this Order.

3. Development Planning

Each Copermittee must use their land use and planning authorities to implement a development planning program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. BMP Requirements for All Development Projects

Each Copermittee must prescribe the following BMP requirements during the planning process (i.e. prior to project approval and issuance of local permits) for all development projects (regardless of project type or size), where local permits are issued, including unpaved roads and flood management projects:

(1) General Requirements

(a) Onsite BMPs must be located so as to remove pollutants from runoff prior to its discharge to any receiving waters, and as close to the source as possible;

(b) Structural BMPs must not be constructed within waters of the U.S.

(c) Onsite BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors (e.g. mosquitos, rodents, or flies).

(2) Source Control BMP Requirements

The following source control BMPs must be implemented at all development projects where applicable and feasible:

(a) Prevention of illicit discharges into the MS4;

(b) Storm drain system stenciling or signage;

(c) Protect outdoor material storage areas from rainfall, run-on, runoff, and wind dispersal;

(d) Protect materials stored in outdoor work areas from rainfall, run-on, runoff, and wind dispersal;

(e) Protect trash storage areas from rainfall, run-on, runoff, and wind dispersal; and

(f) Any additional BMPs determined to be necessary by the Copermittee to minimize pollutant generation at each project.

(3) Low Impact Development (LID) BMP Requirements

The following LID BMPs must be implemented at all development projects where applicable and feasible:

(a) Maintenance or restoration of natural storage reservoirs and drainage corridors (including topographic depressions, areas of permeable soils, natural swales, and ephemeral and intermittent streams);[21]

(b) Buffer zones for natural water bodies (where buffer zones are technically infeasible, require project applicant to include other buffers such as trees, access restrictions, etc.);

(c) Conservation of natural areas within the project footprint including existing trees, other vegetation, and soils;

(d) Construction of streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided public safety is not compromised;

(e) Minimization of the impervious footprint of the project;

(f) Minimization of soil compaction to landscaped areas;

(g) Disconnection of impervious surfaces through distributed pervious areas;

[21] Development projects proposing to dredge or fill materials in waters of the U.S. must obtain a CWA Section 401 Water Quality Certification. Projects proposing to dredge or fill waters of the state must obtain waste discharge requirements.

(h) Landscaped or other pervious areas designed and constructed to effectively receive and infiltrate, retain and/or treat runoff from impervious areas, prior to discharging to the MS4;

(i) Small collection strategies located at, or as close as possible to, the source (i.e. the point where storm water initially meets the ground) to minimize the transport of runoff and pollutants to the MS4 and receiving waters;

(j) Use of permeable materials for projects with low traffic areas and appropriate soil conditions;

(k) Landscaping with native or drought tolerant species; and

(l) Harvesting and using precipitation.

b. PRIORITY DEVELOPMENT PROJECTS

Priority Development Projects are land development projects that fall under the planning and building authority of the Copermittee for which the Copermittee must impose specific requirements, in addition to those described in Provision E.3.a, including the implementation of structural BMPs to meet the performance requirements described in Provision E.3.c.

(1) Definition of Priority Development Project

Priority Development Projects include the following:

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(b) Redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site on an existing site of 10,000 square feet or more of impervious surfaces). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(c) New and redevelopment projects that create 5,000 square feet or more of impervious surface (collectively over the entire project site), and support one or more of the following uses:

(i) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812).

(ii) Hillside development projects. This category includes development on any natural slope that is twenty-five percent or greater.

(iii) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce.

(iv) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

(d) New or redevelopment projects that create or replace 2,500 square feet or more of impervious surface (collectively over the entire project site), and discharging directly to an Environmentally Sensitive Area (ESA). "Discharging directly to" includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands).

(e) New development projects that support one or more of the following uses:

(i) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

(ii) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

(f) New or redevelopment projects that result in the disturbance of one or more acres of land and are expected to generate pollutants post construction.

(2) <u>Special Considerations for Redevelopment Projects</u>

The structural BMP performance requirements of Provision E.3.c are applicable to redevelopment Priority Development Projects, as defined in E.3.b.(1), as follows:

(a) Where redevelopment results in the creation or replacement of impervious surface in an amount of less than fifty percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provision E.3.c apply only to the creation or replacement of impervious surface, and not the entire development; or

(b) Where redevelopment results in the creation or replacement of impervious surface in an amount of more than fifty percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provision E.3.c apply to the entire development.

(3) Priority Development Project Exemptions

Each Copermittee has the discretion to exempt the following projects from being defined as Priority Development Projects:

(a) New or retrofit paved sidewalks, bicycle lanes, or trails that meet the following criteria:

(i) Designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas; OR

(ii) Designed and constructed to be hydraulically disconnected from paved streets or roads; OR

(iii) Designed and constructed with permeable pavements or surfaces in accordance with USEPA Green Streets guidance.[22]

(b) Retrofitting or redevelopment of existing paved alleys, streets or roads that are designed and constructed in accordance with the USEPA Green Streets guidance.[23]

c. PRIORITY DEVELOPMENT PROJECT STRUCTURAL BMP PERFORMANCE REQUIREMENTS

In addition to the BMP requirements listed for all development projects under Provision E.3.a, Priority Development Projects must also implement structural BMPs that conform to performance requirements described below.

(1) Storm Water Pollutant Control BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite structural BMPs to control pollutants in storm water that may be discharged from a project as follows:

(a) Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite the pollutants contained in the volume of storm water runoff produced from a 24-hour 85th percentile storm event (design capture volume);[24]

[22] See "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).
[23] Ibid.
[24] This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are

(i) If a Copermittee determines that implementing BMPs to retain the full design capture volume onsite for a Priority Development Project is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize biofiltration BMPs. Biofiltration BMPs must be designed to have an appropriate hydraulic loading rate to maximize storm water retention and pollutant removal, as well as to prevent erosion, scour, and channeling within the BMP,[25] and must be sized to:

[a] Treat 1.5 times the design capture volume not reliably retained onsite, OR

[b] Treat the design capture volume not reliably retained onsite with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite.

(ii) If a Copermittee determines that biofiltration is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize flow-thru treatment control BMPs to treat runoff leaving the site, AND mitigate for the design capture volume not reliably retained onsite pursuant to Provision E.3.c.(1)(b). Flow thru treatment control BMPs must be sized and designed to:

[a] Remove pollutants from storm water to the MEP;

[b] Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;

[c] Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Flow-thru treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of flow-thru treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

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encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals.

[25] As part of the Copermittee's update to its BMP Design Manual, pursuant to Provision E.3.d, the Copermittee must provide guidance for hydraulic loading rates and other biofiltration design criteria necessary to maximize storm water retention and pollutant removal.

(b) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1)(a). The Priority Development Project must mitigate for the portion of the pollutant load in the design capture volume not retained onsite if Provision E.3.c.(3) is utilized. If a Priority Development Project is allowed to utilize alternative compliance, flow-thru treatment control BMPs must be implemented to treat the portion of the design capture volume that is not reliably retained onsite. Flow-thru treatment control BMPs must be sized and designed in accordance with Provisions E.3.c.(1)(a)(ii)[a]-[c].

(2) Hydromodification Management BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite BMPs to manage hydromodification that may be caused by storm water runoff discharged from a project as follows:

(a) Post-project runoff conditions (flow rates and durations) must not exceed pre-development runoff conditions by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat downstream of Priority Development Projects).

(i) In evaluating the range of flows that results in increased potential for erosion of natural (non-hardened) channels, the lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks.

(ii) The Copermittees may use monitoring results collected pursuant to Provision D.1.a.(2) to re-define the range of flows resulting in increased potential for erosion, or degraded instream habitat conditions, as warranted by the data.

(b) Each Priority Development Project must avoid critical sediment yield areas known to the Copermittee or identified by the optional Watershed Management Area Analysis pursuant to Provision B.3.b.(4), or implement measures that allow critical coarse sediment to be discharged to receiving waters, such that there is no net impact to the receiving water.

(c) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the performance requirements of Provision E.3.c.(2)(a). The Priority Development Project must mitigate for the post-project runoff conditions not fully managed onsite if Provision E.3.c.(3) is utilized.

(d) Exemptions

Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provisions E.3.c.(2) where the project discharges storm water runoff to:

(i) Existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;

(ii) Conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; or

(iii) An area identified by the Copermittees as appropriate for an exemption by the optional Watershed Management Area Analysis incorporated into the Water Quality Improvement Plan pursuant to Provision B.3.b.(4).

(3) Alternative Compliance Program to Onsite Structural BMP Implementation

At the discretion of each Copermittee, Priority Development Projects may be allowed to participate in an alternative compliance program in lieu of implementing the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2), provided that the Water Quality Improvement Plan includes the optional Watershed Management Area Analysis described in Provision B.3.b.(4). The alternative compliance program is available to a Priority Development Project only if the Priority Development Project applicant enters into a voluntary agreement with the Copermittee authorizing this arrangement. In addition to the voluntary agreement, relief from implementing structural BMPs onsite may be authorized by the Copermittee under the following conditions:

(a) Watershed Management Area Analysis Candidate Projects

The Priority Development Project applicant agrees to fund, contribute funds to, or implement a candidate project identified by the Copermittees in the Watershed Management Area Analysis included in the Water Quality Improvement Plan, pursuant to Provisions B.3.b.(4) subject to the following conditions:

(i) The Copermittee must determine that implementation of the candidate project will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite;

(ii) If the Priority Development Project applicant chooses to fully or partially fund a candidate project, then the in-lieu fee structure described in Provision E.3.c.(3)(c) must be followed;

(iii) If the Priority Development Project applicant chooses to fully or partially fund a candidate project, then the Copermittee must ensure that the funds to be obtained from the Priority Development Project applicant are sufficient to mitigate for impacts caused by not fully implementing structural BMPs onsite, pursuant to the performance requirements described in Provisions E.3.c.(1) and E.3.c.(2);

(iv) If the Priority Development Project applicant chooses to implement a candidate project, then the Copermittee must ensure that pollutant control and/or hydromodification management within the candidate project are sufficient to mitigate for impacts caused by not implementing structural BMPs fully onsite, pursuant to the performance requirements described in Provisions E.3.c.(1) and E.3.c.(2);

(v) The voluntary agreement to fund, partially fund, or implement a candidate project must include reliable sources of funding for operation and maintenance of the candidate project;

(vi) Design of the candidate project must be conducted under an appropriately qualified engineer, geologist, architect, landscape architect, or other professional, licenses where applicable, and competent and proficient in the fields pertinent to the candidate project design;

(vii) The candidate project must be constructed as soon as possible, but no later than 4 years after the certificate of occupancy is granted for the first Priority Development Project that contributed funds toward the construction of the candidate project, unless a longer period of time is authorized by the San Diego Water Board Executive Officer; and

(viii) If the candidate project is constructed after the Priority Development Project is constructed, the Copermittee must require temporal mitigation for pollutant loads and altered flows that are discharged from the Priority Development Project.

(b) Project Applicant Proposed Alternative Compliance Projects

The Copermittee may allow a Priority Development Project applicant to propose and fund, contribute funds to, or implement an alternative compliance project not identified by the Watershed Management Area Analysis included in the Water Quality Improvement Plan pursuant to Provisions B.3.b.(4). This option is allowed provided the Copermittee determines that implementation of the alternative compliance project will have a greater overall water quality benefit for the Watershed

Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite, and is subject to the requirements described in Provisions E.3.c.(3)(a)(ii)-(viii).

(c) Alternative Compliance In-Lieu Fee Structure

If a Copermittee chooses to allow a Priority Development Project applicant to fund, or partially fund a candidate project or an alternative compliance project, then the Copermittee must develop and implement an in-lieu fee structure. This may be developed individually or with other Copermittees and/or entities, as a means for designing, developing, constructing, operating and maintaining offsite alternative compliance projects. The in-lieu fee must be transferred to the Copermittee (for public projects) or an escrow account (for private projects) prior to the construction of the Priority Development Project.

(d) Alternative Compliance Water Quality Credit System Option

The Copermittee may develop and implement an alternative compliance water quality credit system option, individually or with other Copermittees and/or entities, provided that such a credit system clearly exhibits that it will not allow discharges from Priority Development Projects to cause or contribute to a net impact over and above the impact caused by projects meeting the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2). Any credit system that a Copermittee chooses to implement must be submitted to the San Diego Water Board Executive Officer for review and acceptance as part of the Water Quality Improvement Plan.

(4) Long-Term Structural BMP Maintenance

Each Copermittee must require the project applicant to submit proof of the mechanism under which ongoing long-term maintenance of all structural BMPs will be conducted.

(5) Infiltration and Groundwater Protection

(a) Structural BMPs designed to primarily function as large, centralized infiltration devices (such as large infiltration trenches and infiltration basins) must not cause or contribute to an exceedance of an applicable groundwater quality objective. At a minimum, such infiltration BMPs must be in conformance with the design criteria listed below, unless the development project applicant demonstrates to the Copermittee that one or more of the specific design criteria listed below are not necessary to protect groundwater quality. The design criteria listed below do not apply to small infiltration systems dispersed throughout a development project.

(i) Runoff must undergo pretreatment such as sedimentation or filtration prior to infiltration;

(ii) Pollution prevention and source control BMPs must be implemented at a level appropriate to protect groundwater quality at sites where infiltration BMPs are to be used;

(iii) Infiltration BMPs must be adequately maintained to remove pollutants in storm water to the MEP;

(iv) The vertical distance from the base of any infiltration BMP to the seasonal high groundwater mark must be at least 10 feet. Where groundwater basins do not support beneficial uses, this vertical distance criteria may be reduced, provided groundwater quality is maintained;

(v) The soil through which infiltration is to occur must have physical and chemical characteristics (e.g., appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses;

(vi) Infiltration BMPs must not be used for areas of industrial or light industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee, unless source control BMPs to prevent exposure of high threat activities are implemented, or runoff from such activities is first treated or filtered to remove pollutants prior to infiltration; and

(vii) Infiltration BMPs must be located a minimum of 100 feet horizontally from any water supply wells.

(b) The Copermittee may develop, individually or with other Copermittees, alternative mandatory design criteria to that listed above for infiltration BMPs which are designed to primarily function as centralized infiltration devices. Before implementing the alternative design criteria in the development planning process the Copermitee(s) must:

(i) Notify the San Diego Water Board of the intent to implement the alternative design criteria submitted; and

(ii) Comply with any conditions set by the San Diego Water Board.

d. BMP DESIGN MANUAL UPDATE

Each Copermittee must update its BMP Design Manual[26] pursuant to Provision F.2.b. Until the Copermittee has updated its BMP Design Manual with the

[26] The BMP Design Manual was formerly known as the Standard Storm Water Mitigation Plan under Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016.

requirements of Provisions E.3.a-c, the Copermittee must continue implementing its current BMP Design Manual. Unless directed otherwise by the San Diego Water Board, the Copermittee must implement the BMP Design Manual within 180 days of completing the update. The update of the BMP Design Manual must include the following:

(1) Updated procedures to determine the nature and extent of storm water requirements applicable to a potential development or redevelopment projects. These procedures must inform project applicants of the storm water management requirements applicable to their project including, but not limited to, general requirements for all development projects, structural BMP design procedures and requirements, hydromodification management requirements, requirements specific to phased projects, and procedures specific to private developments and public improvement projects;

(2) Updated procedures to identify pollutants and conditions of concern for selecting the most appropriate structural BMPs that consider, at a minimum, the following:

(a) Receiving water quality (including pollutants for which receiving waters are listed as impaired under the CWA section 303(d) List);

(b) Pollutants, stressors, and/or receiving water conditions that cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(c) Land use type of the project and pollutants associated with that land use type; and

(d) Pollutants expected to be present onsite.

(3) Updated procedures for designing structural BMPs, including any updated performance requirements to be consistent with the requirements of Provision E.3.c for all structural BMPs listed in the BMP Design Manual;

(4) Long-term maintenance criteria for each structural BMP listed in the BMP Design Manual; and

(5) Alternative compliance criteria, in accordance with the requirements under Provision E.3.c.(3), if the Copermittee elects to allow Priority Development Projects within its jurisdiction to utilize alternative compliance.

e. PRIORITY DEVELOPMENT PROJECT BMP IMPLEMENTATION AND OVERSIGHT

Each Copermittee must implement a program that requires and confirms structural BMPs on all Priority Development Projects are designed, constructed, and maintained to remove pollutants in storm water to the MEP.

(1) Structural BMP Approval and Verification Process

(a) Each Copermittee must require and confirm that for all Priority Development Project applications that have not received prior lawful approval by the Copermittee by the time the BMP Design Manual is updated pursuant to Provision E.3.d, the requirements of Provision E.3 are implemented. For project applications that have received prior lawful approval before the BMP Design Manual is updated pursuant to Provision E.3.d, the Copermittee may allow previous land development requirements to apply.

(b) Each Copermittee must identify the roles and responsibilities of its various municipal departments in implementing the structural BMP requirements, including each stage of a project from application review and approval through BMP maintenance and inspections.

(c) Each Copermittee must require and confirm that appropriate easements and ownerships are properly recorded in public records and the information is conveyed to all appropriate parties when there is a change in project or site ownership.

(d) Each Copermittee must require and confirm that prior to occupancy and/or intended use of any portion of the Priority Development Project, each structural BMP is inspected to verify that it has been constructed and is operating in compliance with all of its specifications, plans, permits, ordinances, and the requirements of this Order.

(2) Priority Development Project Inventory and Prioritization

(a) Each Copermittee must develop, maintain, and update at least annually, a watershed-based database to track and inventory all Priority Development Projects and associated structural BMPs within its jurisdiction. Inventories must be accurate and complete beginning from December 2002 for the San Diego County Copermittees, February 2003 for the Orange County Copermittees, and July 2005 for the Riverside County Copermittees. The use of an automated database system, such as GIS, is highly recommended. The database must include, at a minimum, the following information:

(i) Priority Development Project location (address and hydrologic subarea);

(ii) Descriptions of structural BMP type(s);

(iii) Date(s) of construction;

(iv) Party responsible for structural BMP maintenance;

(v) Dates and findings of structural BMP maintenance verifications; and

(vi) Corrective actions and/or resolutions, when applicable.

(b) Each Copermittee must prioritize the Priority Development Projects with structural BMPs within its jurisdiction. The designation of Priority Development Projects as high priority must consider the following:

(i) The highest water quality priorities identified in the Water Quality Improvement Plan;

(ii) Receiving water quality;

(iii) Number and sizes of structural BMPs;

(iv) Recommended maintenance frequency of structural BMPs;

(v) Likelihood of operation and maintenance issues of structural BMPs;

(vi) Land use and expected pollutants generated; and

(vii) Compliance record.

(3) Structural BMP Maintenance Verifications and Inspections

Each Copermittee is required to verify that structural BMPs on each Priority Development Project are adequately maintained, and continue to operate effectively to remove pollutants in storm water to the MEP through inspections, self-certifications, surveys, or other equally effective approaches.

(a) All (100 percent) of the structural BMPs at Priority Development Projects that are designated as high priority must be inspected directly by the Copermittee annually prior to each rainy season;

(b) For verifications performed through a means other than direct Copermittee inspection, adequate documentation must be required by the Copermittee to provide assurance that the required maintenance of structural BMPs at each Priority Development Project has been completed; and

(c) Appropriate follow-up measures (including re-inspections, enforcement, etc.) must be conducted to ensure that structural BMPs at each Priority Development Project continue to reduce pollutants in storm water to the MEP as originally designed.

f. DEVELOPMENT PROJECT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all development projects, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

4. Construction Management

Each Copermittee must implement a construction management program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. Project Approval Process

Prior to issuance of any local permit(s) that allows the commencement of construction projects that involve ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff, each Copermittee must:

(1) Require a pollution control plan, construction BMP plan, and/or an erosion and sediment control plan, to be submitted by the project applicant to the Copermittee;

(2) Confirm the pollution control plan, construction BMP plan, and/or erosion and sediment control plan, complies with the local grading ordinance, other applicable local ordinances, and the requirements of this Order;

(3) Confirm the pollution control, construction BMP, and/or erosion and sediment control plan, includes seasonally appropriate and effective BMPs and management measures described in Provision E.4.c, as applicable to the project; and

(4) Verify that the project applicant has obtained coverage under the statewide Construction General Permit (Order 2012-0006-DWQ or subsequent Order), if applicable.

b. Construction Site Inventory and Tracking

(1) Each Copermittee must maintain and update, at least quarterly, a watershed-based inventory of all construction projects issued a local permit that allows ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff. The use of an automated database system, such as GIS, is highly recommended. The inventory must include:

(a) Relevant contact information for each site (e.g., name, address, phone, and email for the owner and contractor);

(b) The basic site information including location (address and hydrologic subarea), Waste Discharge Identification (WDID) number (if applicable), size of the site, and approximate area of disturbance;

(c) Whether or not the site is considered a high threat to water quality, as defined in Provision E.4.b.(2) below;

(d) The project start and completion dates;

(e) The required inspection frequency, as defined in the Copermittee's jurisdictional runoff management program document;

(f) The date the Copermittee accepted or approved the pollution control plan, construction BMP plan, and/or erosion and sediment control plan; and

(g) Whether or not there are ongoing enforcement actions administered to the site.

(2) Each Copermittee must identify all construction sites within its jurisdiction that represent a high threat to downstream surface water quality. The designation of construction sites as high threat to water quality must consider the following:

(a) Sites located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Sites located within the same hydrologic subarea and tributary to a water body segment listed as impaired for sediment on the CWA section 303(d) List;

(c) Sites located within, directly adjacent to, or discharging directly to a receiving water within an ESA; and

(d) Other sites determined by the Copermittees or the San Diego Water Board as a high threat to water quality.

c. Construction Site BMP Implementation

Each Copermittee must implement, or require the implementation of effective BMPs to reduce discharges of pollutants in storm water from construction sites to the MEP, and effectively prohibit non-storm water discharges from construction sites into the MS4. These BMPs must be site specific, seasonally appropriate, and construction phase appropriate. BMPs must be implemented at each construction site year round. Dry season BMP implementation must plan for and address unseasonal rain events that may occur during the dry season (May 1 through September 30). Copermittees must implement, or require the implementation of, BMPs in the following categories:

(1) Project Planning;

(2) Good Site Management "Housekeeping", including waste management;

(3) Non-storm Water Management;

(4) Erosion Control;

(5) Sediment Control;

(6) Run-on and Run-off Control; and

(7) Active/Passive Sediment Treatment Systems, where applicable.

d. CONSTRUCTION SITE INSPECTIONS

Each Copermittee must conduct construction site inspections to require and confirm compliance with its local permits and applicable local ordinances, and the requirements of this Order. Priority for site inspections must consider threat to water quality pursuant to Provision E.4.b as well as the nature of the construction activity, topography, and the characteristics of soils and receiving water quality.

(1) Inspection Frequency

(a) Each Copermittee must conduct inspections at all inventoried sites, including high threat to water quality sites, at an appropriate frequency for each phase of construction to confirm the site reduces the discharge of pollutants in storm water from construction sites to the MEP, and effectively prohibits non-storm water discharges from entering the MS4.

(b) Each Copermittee must establish appropriate inspection frequencies for high threat to water quality sites, and all other sites, for each phase of construction. Inspection frequencies appropriate for addressing the highest water quality priorities identified in the Water Quality Improvement Plan, and for complying with the requirements of this Order must be identified in each Copermittee's jurisdictional runoff management program document.

(c) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e., re-inspection, enforcement) necessary to require and confirm site compliance with its local permits and applicable local ordinances, and the requirements of this Order.

(2) Inspection Content

Inspections of construction sites by the Copermittee must include, at a minimum:

(a) Verification of coverage under the Construction General Permit (Notice of Intent (NOI) and/or WDID number) during initial inspections, when applicable;

(b) Assessment of compliance with its local permits and applicable local ordinances related to pollution prevention, including the implementation and maintenance of applicable BMPs;

(c) Assessment of BMP adequacy and effectiveness;

(d) Visual observations of actual non-storm water discharges;

(e) Visual observations of actual or potential discharge of sediment and/or construction related materials from the site;

(f) Visual observations of actual or potential illicit connections; and

(g) If any violations are found and BMP corrections are needed, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried construction sites. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Site name, location (address and hydrologic subarea), and WDID number (if applicable);

(b) Inspection date;

(c) Approximate amount of rainfall since last inspection;

(d) Description of problems observed with BMPs and indication of need for BMP addition/repair/replacement and any scheduled re-inspection, and date of re-inspection;

(e) Descriptions of any other specific inspection comments which must, at a minimum, include rationales for longer compliance time;

(f) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(g) Resolution of problems noted and date problems fixed.

e. CONSTRUCTION SITE ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried construction sites, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

5. Existing Development Management

Each Copermittee must implement an existing development management program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. EXISTING DEVELOPMENT INVENTORY AND TRACKING

Each Copermittee must maintain, and update at least annually, a watershed-based inventory of the existing development within its jurisdiction that may discharge a pollutant load to and from the MS4. The use of an automated database system, such as GIS, is highly recommended. The inventory must, at a minimum, include:

(1) Name, location (hydrological subarea and address, if applicable) of the following types of existing development with its jurisdiction:

(a) Commercial facilities or areas;

(b) Industrial facilities;

(c) Municipal facilities, including:

(i) MS4 and related structures;[27]
(ii) Roads, streets, and highways;
(iii) Parking facilities;
(iv) Municipal airfields;
(v) Parks and recreation facilities;
(vi) Flood management facilities, flood control devices and structures;
(vii) Operating or closed municipal landfills;
(viii) Publicly owned treatment works (including water and wastewater treatment plants) and sanitary sewer collection systems;
(ix) Corporate yards, including maintenance and storage yards for materials, waste, equipment, and vehicles;

[27] The inventory may refer to the MS4 map required to be maintained pursuant to Provision E.2.b.(1).

(x) Hazardous waste collection facilities;

(xi) Other treatment, storage or disposal facilities for municipal waste; and

(xii) Other municipal facilities that the Copermittee determines may contribute a significant pollutant load to the MS4.

(d) Residential areas, which may be designated by one or more of the following:

(i) Residential management area;

(ii) Drainage basin or area;

(iii) Land use (e.g., single family, multi-family, rural);

(iv) Neighborhood;

(v) Common Interest Area;

(vi) Home Owner Association;

(vii) Mobile home park; and/or

(viii) Other designations accepted by the San Diego Water Board Executive Officer.

(2) A description of the facility or area, including the following information:

(a) Classification as commercial, industrial, municipal, or residential;

(b) Status of facility or area as active or inactive;

(c) Identification if a business is a mobile business;

(d) SIC Code or NAICS Code, if applicable;

(e) Industrial General Permit NOI and/or WDID number, if applicable;

(f) Identification if a residential area is or includes a Common Interest Area / Home Owner Association, or mobile home park;

(g) Identification of pollutants generated and potentially generated by the facility or area;

(h) Whether the facility or area is adjacent to an ESA;

(i) Whether the facility or area is tributary to and within the same hydrologic subarea as a water body segment listed as impaired on the CWA section 303(d) List and generates pollutants for which the water body segment is impaired; and

(3) An annually updated map showing the location of inventoried existing development, watershed boundaries, and water bodies.

b. EXISTING DEVELOPMENT BMP IMPLEMENTATION AND MAINTENANCE

Each Copermittee must designate a minimum set of BMPs required for all inventoried existing development, including special event venues. The designated minimum BMPs must be specific to facility or area types and pollutant generating activities, as appropriate.

(1) Commercial, Industrial, and Municipal Facilities and Areas

(a) Pollution Prevention

Each Copermittee must require the use of pollution prevention methods by the commercial, industrial, and municipal facilities and areas in its inventoried existing development to address the priorities and strategies in the Water Quality Improvement Plan.

(b) BMP Implementation

Each Copermittee must require the implementation of designated BMPs at commercial facilities and areas, industrial facilities, and implement designated BMPs at municipal facilities in its inventoried existing development.

(c) BMP Operation and Maintenance

(i) Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development.

(ii) Each Copermittee must implement a schedule of operation and maintenance activities for its MS4 and related structures (including but not limited to catch basins, storm drain inlets, detention basins, etc.), and verify proper operation of all its municipal structural treatment controls designed to reduce pollutants (including floatables) in storm water discharges to or from its MS4s and related drainage structures. Operation and maintenance activities may include, but is not limited to, the following:

[a] Inspections of the MS4 and related structures;
[b] Cleaning of the MS4 and related structures; and
[c] Proper disposal of materials removed from cleaning of the MS4 and related structures.

(iii) Each Copermittee must implement a schedule of operation and maintenance for public streets, unpaved roads, paved roads, and paved highways within its jurisdiction to minimize pollutants that can be discharged in storm water.

(iv) Each Copermittee must implement controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers. Copermittees that operate both a municipal sanitary sewer system and a MS4 must implement controls and measures to prevent and eliminate seeping sewage from infiltrating the MS4. Copermittees that do not operate both a municipal sanitary sewer system and a MS4 must coordinate with sewering agencies to keep themselves informed of relevant and appropriate maintenance activities and sanitary sewage projects in their jurisdiction that may cause or contribute to seepage of sewage into the MS4.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must require the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from commercial facilities and areas and industrial facilities, and implement BMPs at municipal facilities in its inventoried existing development. Such BMPs must include, as appropriate, educational activities, permits, certifications and other measures for applicators and distributors.

(2) <u>Residential Areas</u>

(a) Pollution Prevention

Each Copermittee must promote and encourage the use of pollution prevention methods, where appropriate, by the residential areas in its inventoried existing development.

(b) BMP Implementation

Each Copermittee must promote and encourage the implementation of designated BMPs at residential areas in its inventoried existing development.

(c) BMP Operation and Maintenance

Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at residential areas in its inventoried existing development.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must promote and encourage the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the

application, storage, and disposal of pesticides, herbicides and fertilizers from residential areas in its inventoried existing development.

c. EXISTING DEVELOPMENT INSPECTIONS

Each Copermittee must conduct inspections of inventoried existing development to ensure compliance with applicable local ordinances and permits, and the requirements of this Order.

(1) Inspection Frequency

(a) Each Copermittee must establish appropriate inspection frequencies for inventoried existing development in accordance with the following requirements:

(i) At a minimum, inventoried existing development must be inspected once every five years utilizing one or more of the following methods:

[a] Drive-by inspections by Copermittee municipal and contract staff;
[b] Onsite inspections by Copermittee municipal and contract staff; and/or
[c] Visual inspections of publicly accessible inventoried facilities or areas by volunteer monitoring or patrol programs that have been trained by the Copermittee;

(ii) The frequency of inspections must be appropriate to confirm that BMPs are being implemented to reduce the discharge of pollutants in storm water from the MS4 to the MEP and effectively prohibit non-storm water discharges to the MS4;

(iii) The frequency of inspections must be based on the potential for a facility or area to discharge non-storm water and pollutants in storm water, and should reflect the priorities set forth in the Water Quality Improvement Plan;

(iv) Each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development;[28] and

(v) Inventoried existing development must be inspected by the Copermittee, as needed, in response to valid public complaints.

(b) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e. education and outreach, re-inspection, enforcement)

[28] If any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspection may count toward the total annual inspection requirement. This requirement excludes linear municipal facilities (i.e., MS4 linear channels, sanitary sewer collection systems, streets, roads and highways).

necessary to require and confirm compliance with its applicable local ordinances and permits and the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

(2) Inspection Content

(a) Inspections of existing development must include, at a minimum:

(i) Visual inspections for the presence of actual non-storm water discharges;

(ii) Visual inspections for the presence of actual or potential discharge of pollutants;

(iii) Visual inspections for the presence of actual or potential illicit connections; and

(iv) Verification that the description of the facility or area in the inventory, required pursuant to Provision E.5.a.(2), has not changed.

(b) Onsite inspections of existing development by the Copermittee must include, at a minimum:

(i) Assessment of compliance with its applicable local ordinances and permits related to non-storm water and storm water discharges and runoff;

(ii) Assessment of the implementation of the designated BMPs;

(iii) Verification of coverage under the Industrial General Permit, when applicable; and

(iv) If any problems or violations are found, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried existing development. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Name and location of the facility or area (address and hydrologic subarea) consistent with the inventory name and location, pursuant to Provision E.5.a.(1);

(b) Inspection and re-inspection date(s);

(c) Inspection method(s) (i.e. drive-by, onsite);

(d) Observations and findings from the inspection(s);

(e) For onsite inspections of existing development by Copermittee municipal or contract staff, the records must also include, as applicable:

(i) Description of any problems or violations found during the inspection(s);

(ii) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(iii) The date problems or violations were resolved.

d. EXISTING DEVELOPMENT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried existing development, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

e. RETROFITTING AND REHABILITATING AREAS OF EXISTING DEVELOPMENT

(1) Retrofitting Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to retrofit areas of existing development within its jurisdiction to address identified sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify areas of existing development as candidates for retrofitting, focusing on areas where retrofitting will address pollutants and/or stressors that contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for retrofitting projects may be utilized to reduce pollutants that may be discharged in storm water from areas of existing development, and/or address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of retrofitting projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting projects; and

(e) Where retrofitting projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional retrofitting projects (i.e. projects that can receive and/or treat storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment) adjacent to and/or downstream of the areas of existing development.

(2) Stream, Channel and/or Habitat Rehabilitation in Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to rehabilitate streams, channels, and/or habitats in areas of existing development within its jurisdiction to address the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify streams, channels, and/or habitats in areas of existing development as candidates for rehabilitation, focusing on areas where stream, channel, and/or habitat rehabilitation projects will address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for stream, channel, and/or habitat rehabilitation projects may be utilized to address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters, rehabilitate channelized or hydromodified streams, restore wetland and riparian habitat, restore watershed functions, and/or restore beneficial uses of receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of stream, channel, and/or habitat rehabilitation projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance stream, channel, and/or habitat rehabilitation projects; and

(e) Where stream, channel, and/or habitat rehabilitation projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional stream, channel, and/or habitat rehabilitation projects (i.e. projects that can receive storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment).

6. Enforcement Response Plans

Each Copermittee must develop and implement an Enforcement Response Plan as part of its jurisdictional runoff management program document. The Enforcement Response Plan must describe the applicable approaches and options to enforce its legal authority established pursuant to Provision E.1, as necessary, to achieve compliance with the requirements of this Order. The Enforcement Response Plan must be in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include the following:

a. Enforcement Response Plan Components

The Enforcement Response Plan must include the following individual components:

(1) Illicit Discharge Detection and Elimination Enforcement Component;

(2) Development Planning Enforcement Component;

(3) Construction Management Enforcement Component; and

(4) Existing Development Enforcement Component.

b. Enforcement Response Approaches and Options

Each component of the Enforcement Response Plan must describe the enforcement response approaches that the Copermittee will implement to compel compliance with its statutes, ordinances, permits, contracts, orders, or similar means, and the requirements of this Order. The description must include the protocols for implementing progressively stricter enforcement responses. The enforcement response approaches must include appropriate sanctions to compel compliance, including, at a minimum, the following tools or their equivalent:

(1) Verbal and written notices of violation;

(2) Cleanup requirements;

(3) Fines;

(4) Bonding requirements;

(5) Administrative and criminal penalties;

(6) Liens;

(7) Stop work orders; and

(8) Permit and occupancy denials.

c. CORRECTION OF VIOLATIONS

(1) Violations must be corrected in a timely manner with the goal of correcting the violations within 30 calendar days after the violations are discovered, or prior to the next predicted rain event, whichever is sooner.

(2) If more than 30 calendar days are required to achieve compliance, then a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

d. ESCALATED ENFORCEMENT

(1) The Enforcement Response Plan must include a definition of "escalated enforcement." Escalated enforcement must include any enforcement scenario where a violation or other non-compliance is determined to cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan. Escalated enforcement may be defined differently for development planning, construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas.

(2) Where the Copermittee determines escalated enforcement is not required, a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

(3) Escalated enforcement actions must continue to increase in severity, as necessary, to compel compliance as soon as possible.

e. REPORTING OF NON-COMPLIANT SITES

(1) Each Copermittee must notify the San Diego Water Board in writing within five (5) calendar days of issuing escalated enforcement (as defined in the Copermittee's Enforcement Response Plan) to a construction site that poses a significant threat to water quality as a result of violations or other non-compliance with its permits and applicable local ordinances, and the

requirements of this Order. Written notification may be provided electronically by email to the appropriate San Diego Water Board staff.

(2) Each Copermittee must notify the San Diego Water Board any persons required to obtain coverage under the statewide Industrial General Permit and Construction General Permit and failing to do so, within five (5) calendar days from the time the Copermittee become aware of the circumstances. Written notification may be provided electronically by email to Nonfilers_R9@waterboards.ca.gov.

7. Public Education and Participation

Each Copermittee must implement, individually or with other Copermittees, a public education and participation program in accordance with the strategies identified in the Water Quality Improvement Plan to promote and encourage the development of programs, management practices, and behaviors that reduce the discharge of pollutants in storm water to the MEP, prevent controllable non-storm water discharges from entering the MS4, and protect water quality standards in receiving waters. The public education and participation program must be implemented in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include, at a minimum, the following requirements:

a. PUBLIC EDUCATION

The public education program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) Educational activities, public information activities, and other appropriate outreach activities intended to reduce pollutants associated with the application of pesticides, herbicides and fertilizer and other pollutants of concern in storm water discharges to and from its MS4 to the MEP, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed to address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(2) Educational activities, public information activities, and other appropriate outreach activities to facilitate the proper management and disposal of used oil and toxic materials; and

(3) Appropriate education and training measures for specific target audiences, such as construction site operators, residents, underserved target audiences and school-aged children, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed, based on high risk behaviors and pollutants of concern.

b. PUBLIC PARTICIPATION

The public participation program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) A process for members of the public to participate in updating the highest priority water quality conditions, numeric goals, and water quality improvement strategies in the Water Quality Improvement Plan;

(2) Opportunities for members of the public to participate in providing the Copermittee recommendations for improving the effectiveness of the water quality improvement strategies implemented within its jurisdiction; and

(3) Opportunities for members of the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or protection of the quality of receiving waters.

8. Fiscal Analysis

a. Each Copermittee must secure the resources necessary to meet all the requirements of this Order.

b. Each Copermittee must conduct an annual fiscal analysis of its jurisdictional runoff management program in its entirety. The fiscal analysis must include the following:

(1) Identification of the various categories of expenditures necessary to implement the requirements of this Order, including a description of the specific capital, operation and maintenance, and other expenditure items to be accounted for in each category of expenditures;

(2) The staff resources needed and allocated to meet the requirements of this Order, including any development, implementation, and enforcement activities required;

(3) The estimated expenditures for Provisions E.8.b.(1) and E.8.b.(2) for the current fiscal year; and

(4) The source(s) of funds that are proposed to meet the necessary expenditures described in Provisions E.8.b.(1) and E.8.b.(2), including legal restrictions on the use of such funds, for the current fiscal year and next fiscal year.

c. Each Copermittee must submit a summary of the annual fiscal analysis with each Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3).

d. Each Copermittee must provide the documentation used to develop the summary of the annual fiscal analysis upon request by the San Diego Water Board.

F. REPORTING

The purpose of this provision is to determine and document compliance with the requirements set forth in this Order. The goal of reporting is to communicate to the San Diego Water Board and the people of the State of California the implementation status of each jurisdictional runoff management program and compliance with the requirements of this Order. This goal is to be accomplished through the submittal of specific deliverables to the San Diego Water Board by the Copermittees.

1. Water Quality Improvement Plans

The Copermittees for each Watershed Management Area must develop and submit the Water Quality Improvement Plan in accordance with the following requirements:

a. WATER QUALITY IMPROVEMENT PLAN DEVELOPMENT

Each Water Quality Improvement Plan must be developed in accordance with the following process:

(1) Public Participation Process

The Copermittees must implement a public participation process to solicit data, information, and recommendations to be utilized in the development of the Water Quality Improvement Plan. The public participation process must include the following:

(a) The Copermittees must develop a publicly available and noticed schedule of the opportunities for the public to participate and provide comments during the development of the Water Quality Improvement Plan. The schedule may be adjusted as necessary by the Copermittees, provided the public is provided timely notification of the changes to the schedule.

(b) The Copermittees must form a Water Quality Improvement Consultation Panel to provide recommendations during the development of the Water Quality Improvement Plan. The Water Quality Improvement Consultation Panel must consist of at least the following members:

(i) A representative of the San Diego Water Board;

(ii) A representative of the environmental community familiar with the water quality conditions of concern of the receiving waters in the Watershed Management Area, preferably from an environmental interest group associated with a water body within the Watershed Management Area; and

(iii) A representative of the development community familiar with the opportunities and constraints for implementing structural BMPs, retrofitting projects, and stream, channel or habitat rehabilitation

projects in the Watershed Management Area, preferably with relevant engineering, hydrology, and/or geomorphology experience in the Watershed Management Area.

(c) The Copermittees must coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public time and opportunity to participate during the development of the Water Quality Improvement Plans.

(2) Priority Water Quality Conditions

(a) The Copermittees must solicit data, information and recommendations from the public to be utilized in the development and identification of the priority water quality conditions and potential water quality improvement strategies for the Watershed Management Area.

(b) The Copermittees must review the priority water quality conditions the Copermittees plan on including in the Water Quality Improvement Plan with the Water Quality Improvement Consultation Panel to receive recommendations or concurrence.

(c) The Copermittees must consider revisions to the priority water quality conditions based on recommendations from the Water Quality Improvement Consultation Panel.

(d) The Copermittees must include all the potential water quality improvement strategies identified by the public and the Water Quality Improvement Consultation Panel with the submittal of the priority water quality conditions to the San Diego Water Board.

(e) The Copermittees must submit the Water Quality Improvement Plan requirements of Provision B.2 to the San Diego Water Board as early as 6 months and no later than 12 months after the commencement of coverage under this Order. Upon receipt, the San Diego Water Board will issue a public notice and release the proposed priority water quality conditions and potential water quality improvement strategies for public review and comment for a minimum of 30 days.

(f) The Copermittees must consider revisions to the priority water quality conditions and potential water quality improvement strategies developed pursuant to Provision B.2 based on public comments received by the close of the comment period.

(3) Water Quality Improvement Goals, Strategies and Schedules

(a) The Copermittees must solicit recommendations from the public on potential numeric goals for the highest priority water quality conditions

identified for the Watershed Management Area, and recommendations on the strategies that should be implemented to achieve the potential numeric goals.

(b) The Copermittees must consult with the Water Quality Improvement Consultation Panel and consider revisions to the following items based on the Panel's recommendations:

(i) The numeric goals and schedules the Copermittees propose to include in the Water Quality Improvement Plan;

(ii) The water quality improvement strategies and schedules the Copermittees propose to implement in the Watershed Management Area and include in the Water Quality Improvement Plan; and

(iii) If the Copermittees choose to implement Provision B.3.b.(4), the results of the Watershed Management Area Analysis the Copermittees proposed to incorporate into the Water Quality Improvement Plan.

(c) The Copermittees must submit the Water Quality Improvement Plan requirements of Provision B.3 to the San Diego Water Board as early as 9 months and no later than 18 months after the commencement of coverage under this Order. Upon receipt, the San Diego Water Board will issue a public notice and release the proposed water quality improvement goals, strategies and schedules for public review and comment for a minimum of 30 days.

(d) The Copermittees must consider revisions to the water quality improvement goals, strategies and schedules developed pursuant to Provision B.3 based on public comments received by the close of the comment period.

b. WATER QUALITY IMPROVEMENT PLAN SUBMITTAL AND IMPLEMENTATION

(1) Within 24 months after the commencement of coverage under this Order, the Copermittees for each Watershed Management Area must submit a complete Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order to the San Diego Water Board. The San Diego Water Board will issue a public notice and release the Water Quality Improvement Plan for public review and comment for a minimum of 30 days.

(2) The Copermittees must consider revisions to the Water Quality Improvement Plan based on written comments received by the close of the public comment period.

(3) The Copermittees must promptly submit any revisions to the Water Quality Improvement Plan to the San Diego Water Board no later than 60 days after the close of the public comment period.

(4) If issues concerning the Water Quality Improvement Plan are resolved informally through discussions among the Copermittees, the San Diego Water Board and interested parties, the San Diego Water Board Executive Officer may provide written notification of acceptance to the Copermittees that the Water Quality Improvement Plan meets the requirements of Provision B. However, if the Executive Officer determines that significant issues with the Water Quality Improvement Plan remain, the matter will be scheduled for San Diego Water Board consideration at a public meeting.

(5) The Copermittees must commence with implementation of the Water Quality Improvement Plan, in accordance with the water quality improvement strategies and schedules therein, upon written notification of acceptance with the Water Quality Improvement Plan by the San Diego Water Board Executive Officer.

(6) During implementation of the Water Quality Improvement Plan the Copermittees must correct any deficiencies in the Plan identified by the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report following a request by the Board to do so.

(7) The Water Quality Improvement Plan must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of receiving notification of acceptance with the Water Quality Improvement Plan by the San Diego Water Board Executive Officer.

2. Updates

a. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATES

Each Copermittee must update its jurisdictional runoff management program document in accordance with the following requirements:

(1) Each Copermittee is encouraged to seek public and key stakeholder participation and comments, as early and often as possible during the process of developing updates to its jurisdictional runoff management program document;

(2) Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E concurrent with the submittal of the Water Quality Improvement Plan. Each Copermittee must correct any deficiencies in the jurisdictional runoff management program document based on comments received from the San Diego Water Board in

the updates submitted with the Water Quality Improvement Plan Annual Report;

(3) Each Copermittee must submit updates to its jurisdictional runoff management program, with the supporting rationale for the modifications, either in the Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b;

(4) The Copermittee must revise proposed modifications to its jurisdictional runoff management program as directed by the San Diego Water Board Executive Officer; and

(5) Updated jurisdictional runoff management program documents must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of submitting the Water Quality Improvement Plan Annual Report.

b. BMP DESIGN MANUAL UPDATES

Each Copermittee must update its BMP Design Manual in accordance with the following requirements:

(1) Each Copermittee must update its BMP Design Manual to incorporate the requirements of Provisions E.3.a-d concurrent with the submittal of the Water Quality Improvement Plan. Each Copermittee must correct any deficiencies in the BMP Design Manual based on comments received from the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report;

(2) Subsequent updates to the BMP Design Manual must be consistent with the requirements of Provisions E.3.a-d and must be submitted as part of the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b; and

(3) Updated BMP Design Manuals must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of completing the update.

c. WATER QUALITY IMPROVEMENT PLAN UPDATES

(1) The Water Quality Improvement Plans must be updated in accordance with the following process:

(a) The Copermittees must develop and implement a public participation process to obtain data, information and recommendations for updating the Water Quality Improvement Plan. The public participation process must provide for a publicly available and noticed schedule of opportunities for the public to participate and provide comments during the development of updates to the Water Quality Improvement Plan;

(b) The Copermittees must consult with the Water Quality Improvement Consultation Panel on proposed updates of the Water Quality Improvement Plan, and consider the Water Quality Improvement Consultation Panel's recommendations in finalizing the proposed updates;

(c) The Copermittees for each Watershed Management Area must submit 1) proposed updates to the Water Quality Improvement Plan and supporting rationale, and 2) recommendations received from the public and the Water Quality Improvement Consultation Panel and the rationale for the requested updates, either in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The updates submitted will be deemed accepted for inclusion in the Water Quality Improvement Plan ninety (90) days after submission unless otherwise directed in writing by the San Diego Water Board Executive Officer;

(d) The Copermittees must revise the requested updates as directed by the San Diego Water Board Executive Officer; and

(e) Updated Water Quality Improvement Plans must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance of the requested updates by the San Diego Water Board.

(2) No later than six months following Office of Administrative Law and USEPA approval of any TMDL Basin Plan amendment with wasteload allocations (WLAs) assigned to the Copermittees during the term of this Order, the Copermittees must initiate an update to the applicable Water Quality Improvement Plans in accordance with Provision F.1 or Provision F.2.c.(1) to incorporate the requirements of the TMDL WLAs.

3. Progress Reporting

a. Progress Report Presentations

The Copermittees for each Watershed Management Area must periodically appear before the San Diego Water Board, as requested by the Board, to provide progress reports on the implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs.

b. Annual Reports

(1) Transitional Jurisdictional Runoff Management Program Annual Reports

(a) Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) no later than October 31 of each year for each jurisdictional runoff management program reporting period (i.e. July 1 to June 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted.

(b) Each Copermittee must submit the information on the Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) specific to the area within its jurisdiction in each Watershed Management Area.

(c) In addition to submitting the Jurisdictional Runoff Management Program Annual Report Form during the transitional reporting period, each Copermittee may continue to utilize and submit the jurisdictional runoff management program annual reporting format of its previous NPDES permit until the first Water Quality Improvement Plan Annual Report is required to be submitted.

(2) Transitional Monitoring and Assessment Program Annual Reports

The Copermittees for each Watershed Management Area must submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted under this Order. The Transitional Monitoring and Assessment Program Annual Reports must include:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1.a and D.2.a, summarized and presented in tabular and graphical form; and

(b) The findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

(3) Water Quality Improvement Plan Annual Reports

The Copermittees for each Watershed Management Area must submit a Water Quality Improvement Plan Annual Report for each reporting period no later than January 31 of the following year. The annual reporting period consists of two different periods: 1) July 1 to June 30 of the following year for the jurisdictional runoff management programs, 2) October 1 to September 30 of the following year for the monitoring and assessment programs. The Water Quality Improvement Plan Annual Reports must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Each Annual Report must include the following:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, summarized and presented in tabular and graphical form;

(b) The progress of the special studies required pursuant to Provision D.3, and the findings, interpretations and conclusions of a special study, or each phase of a special study, upon its completion;

(c) The findings, interpretations and conclusions from the assessments required pursuant to Provision D.4;

(d) The progress of implementing the Water Quality Improvement Plan, including, but not limited to, the following:

(i) The progress toward achieving the interim and final numeric goals for the highest water quality priorities for the Watershed Management Area;

(ii) The water quality improvement strategies that were implemented and/or no longer implemented by each of the Copermittees during the reporting period and previous reporting periods;

(iii) The water quality improvement strategies planned for implementation during the next reporting period;

(iv) Proposed modifications to the water quality improvement strategies, the public comments received and the supporting rationale for the proposed modifications;

(v) Previous modifications or updates incorporated into the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document and implemented by the Copermittees in the Watershed Management Area; and

(vi) Proposed modifications or updates to the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document;

(e) A completed Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) for each Copermittee in the Watershed Management Area, certified by a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative; and

(f) Each Copermittee must provide any data or documentation utilized in developing the Water Quality Improvement Plan Annual Report upon request by the San Diego Water Board. Any Copermittee monitoring data utilized in developing the Water Quality Improvement Plan Annual Report must be uploaded to the California Environmental Data Exchange Network (CEDEN).[29] Any Copermittee monitoring and assessment data utilized in developing the Water Quality Improvement Plan Annual Report must be available for access on the Regional Clearinghouse required pursuant to Provision F.4.

c. Regional Monitoring and Assessment Report

(1) The Copermittees must submit a Regional Monitoring and Assessment Report no later than 180 days prior to the expiration date of this Order. The Regional Monitoring and Assessment Report may be submitted as part of the Report of Waste Discharge required pursuant to Provision F.5.b. In preparing the report the Copermittees must consider the receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, and the findings, interpretations, and conclusions from the assessments required pursuant to Provision D.4. Based on these considerations the report must assess the following:

(a) The beneficial uses of the receiving waters within the San Diego Region that are supported and not adversely affected by the Copermittees' MS4 discharges;

(b) The beneficial uses of the receiving waters within the San Diego Region that are adversely impacted by the Copermittees' MS4 discharges;

(c) The progress toward protecting the beneficial uses in the receiving waters within the San Diego Region from the Copermittees' discharges; and

[29] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

(d) Pollutants or conditions of emerging concern that may impact beneficial uses in the receiving waters within the San Diego Region.

(2) The Regional Monitoring and Assessment Report must include recommendations for improving the implementation and assessment of the Water Quality Improvement Plans and jurisdictional runoff management programs.

(3) Each Copermittee must provide any data or documentation utilized in developing the Regional Monitoring and Assessment Report upon request by the San Diego Water Board. Any Copermittee monitoring and assessment data utilized in developing the Regional Monitoring and Assessment Report must be available for access on the Regional Clearinghouse required pursuant to Provision F.4.

4. Regional Clearinghouse

The Copermittees must develop, update, and maintain an internet-based Regional Clearinghouse that is made available to the public no later than 18 months after the effective date of this Order.[30]

a. The Copermittees, through the Regional Clearinghouse, must make the following documents and data available for access, and organized by Watershed Management Area. The documents and data may be linked to other internet-based data portals and databases where the original documents are stored:

(1) Water Quality Improvement Plan for the Watershed Management Area, and all updated versions with date of update;

(2) Annual Reports for the Watershed Management Area;

(3) Jurisdictional Runoff Management Program document for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(4) BMP Design Manual for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(5) Reports from special studies (e.g. source identification, BMP effectiveness assessment) conducted in the Watershed Management Area;

[30] The Copermittees may develop, update and maintain the clearinghouse(s) of other Copermittees or agencies.

(6) Monitoring data collected pursuant to Provision D for each Watershed Management Area must be uploaded to CEDEN,[31] with links to the uploaded data; and

(7) Available GIS data, layers, and/or shapefiles used to develop the maps generated and maintained by the Copermittees for the Water Quality Improvement Plans, Annual Reports, and jurisdictional runoff management program documents.

b. The Copermittees, through the Regional Clearinghouse, must make the following information and documents available for access:

(1) Contact information (point of contact, phone number, email address, and mailing address) for each Copermittee;

(2) Public hotline number for reporting non-storm water and illicit discharges for each Copermittee;

(3) Email address for reporting non-storm water and illicit discharges for each Copermittee;

(4) Link to each Copermittee's website, if available, where the public may find additional information about the Copermittee's storm water management program and for requesting records for the implementation of its program;

(5) Information about opportunities for the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or protection of the quality of receiving waters; and

(6) Reports from regional monitoring programs in which the Copermittees participate (e.g. Southern California Monitoring Coalition, Southern California Coastal Water Research Project Bight Monitoring);

(7) Regional Monitoring and Assessment Reports; and

(8) Any other information, data, and documents the Copermittees determine as appropriate for making available to the public.

[31] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

5. Report of Waste Discharge

a. The Orange County Copermittees and the Riverside County Copermittees are required to submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders. The San Diego Water Board will review and consider the Reports of Waste Discharge to determine whether modification to this Order, pursuant to the requirements of Provision H, will be required prior to the Orange County Copermittees and/or Riverside County Copermittees obtaining coverage under this Order. The current Orders for the Orange County Copermittees and Riverside County Copermittees are rescinded upon the date of effective coverage under this Order except for enforcement purposes.

b. The Copermittees subject to the requirements of this Order must submit to the San Diego Water Board a complete Report of Waste Discharge as an application for the re-issuance of this Order and NPDES permit. The Report of Waste Discharge must be submitted no later than 180 days in advance of the expiration date of this Order. The Report of Waste Discharge must contain the following minimum information:

(1) Names and addresses of the Copermittees;

(2) Names and titles of the primary contacts of the Copermittees;

(3) Proposed changes to the Copermittees' Water Quality Improvement Plans and the supporting justification;

(4) Proposed changes to the Copermittees' jurisdictional runoff management programs and the supporting justification;

(5) Any other information necessary for the re-issuance of this Order;

(6) Any information to be included as part of the Report of Waste Discharge pursuant to the requirements of this Order; and

(7) Any other information required by federal regulations for NPDES permit reissuance.

6. Application for Early Coverage

a. The Orange County Copermittees, collectively, or Riverside County Copermittees, collectively, may apply for early coverage under this Order by submitting a Report of Waste Discharge Form 200, with a written request for early coverage under this Order.

b. The San Diego Water Board will review the application for early coverage. A notification of coverage under this Order will be issued to the Copermittees in the

respective county by the San Diego Water Board upon completion of the early coverage application requirements. The effective coverage date will be specified in the notification of coverage. The Copermittees in the respective county are authorized to have MS4 discharges pursuant to the requirements of this Order starting on the effective coverage date specified in the notification of coverage. The existing Order for the respective county is rescinded upon the effective coverage date specified in the notification of coverage except for enforcement purposes.

7. Reporting Provisions

Each Copermittee must comply with all the reporting and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

G. PRINCIPAL WATERSHED COPERMITTEE RESPONSIBILITIES

1. The Copermittees within each Watershed Management Area must designate a Principal Watershed Copermittee and notify the San Diego Water Board of the name of the Principal Watershed Copermittee. An individual Copermittee should not be designated a Principal Watershed Copermittee for more than two Watershed Management Areas. The notification may be submitted with the Water Quality Improvement Plan required pursuant to Provision F.1 of this Order.

2. The Principal Watershed Copermittee is responsible for, at a minimum, the following:

a. Serving as liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues, and when necessary and appropriate, representing the Copermittees in the Watershed Management Area before the San Diego Water Board;

b. Facilitating the development of the Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order;

c. Coordinating the submittal of the deliverables required by Provisions F.1, F.2, F.3.a, and F.3.b of this Order; and

d. Coordinating and developing, with the other Principal Watershed Copermittees, the requirements of Provisions F.3.c, F.4, and F.5.b of this Order.

3. The Principal Watershed Copermittee is not responsible for ensuring that the other Copermittees within the Watershed Management Area are in compliance with the requirements of this Order. Each Copermittee within the Watershed Management Area is responsible for complying with the requirements of this Order.

H. MODIFICATION OF ORDER

1. Modifications of the Order may be initiated by the San Diego Water Board or by the Copermittees. Requests by Copermittees must be made to the San Diego Water Board.

2. Minor modifications to the Order may be made by the San Diego Water Board where the proposed modification complies with all the prohibitions and limitations, and other requirements of this Order.

3. This Order may also be re-opened and modified, revoked and, reissued or terminated in accordance with the provisions of 40 CFR 122.44, 122.62 to 122.64, and 124.5. Causes for taking such actions include, but are not limited to, failure to comply with any condition of this Order and permit, and endangerment to human health or the environment resulting from the permitted activity.

4. This Order may be re-opened for modification for cause including but not limited to the following:

a. The State Water Board determines that revisions are warranted, and the San Diego Water Board concurs that revisions are necessary to those provisions of the Order addressing compliance with water quality standards in the receiving water and/or those provisions of the Order establishing an iterative process for implementation of management practices to assure compliance with water quality standards in the receiving water;

b. An application for early coverage under this Order is received pursuant to Provision F.6;

c. Any of the TMDLs in Attachment E to this Order are amended in the Basin Plan by San Diego Water Board, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA;

d. The Basin Plan is amended by the San Diego Water Board to incorporate a new TMDL, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA; or

e. Updating or revising the monitoring and reporting requirements is determined to be necessary, at the discretion of the San Diego Water Board. Such modification(s) may include, but is (are) not limited to, revision(s) to: (i) implement recommendations from Southern California Coastal Water Research Project (SCCWRP), (ii) develop, refine, implement, and/or coordinate a regional monitoring program, (iii) develop and implement improved monitoring and assessment programs in keeping with San Diego Water Board Resolution No. R9-2012-0069, Resolution in Support of a Regional Monitoring Framework, and/or (iv) add provisions to require the Copermittees to evaluate and provide information on cost and values of the monitoring and reporting program.

5. The San Diego Water Board, after opportunity for public comment and a public hearing, will re-open and consider modifications to this Order when the Orange County Copermittees or the Riverside County Copermittees submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders.

I. STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

Each Copermittee must comply with all the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

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ATTACHMENT A

DISCHARGE PROHIBITIONS AND SPECIAL PROTECTIONS

1. Basin Plan Waste Discharge Prohibitions

California Water Code Section 13243 provides that a Regional Water Board, in a water quality control plan, may specify certain conditions or areas where the discharge of waste or certain types of waste is not permitted. The following waste discharge prohibitions in the Water Quality Control Plan for the San Diego Basin (Basin Plan) are applicable to any person, as defined by Section 13050(c) of the California Water Code, who is a citizen, domiciliary, or political agency or entity of California whose activities in California could affect the quality of waters of the state within the boundaries of the San Diego Region.

1. The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in California Water Code Section 13050, is prohibited.

2. The discharge of waste to land, except as authorized by waste discharge requirements or the terms described in California Water Code Section 13264 is prohibited.

3. The discharge of pollutants or dredged or fill material to waters of the United States except as authorized by a National Pollutant Discharge Elimination System (NPDES) permit or a dredged or fill material permit (subject to the exemption described in California Water Code Section 13376) is prohibited.

4. Discharges of recycled water to lakes or reservoirs used for municipal water supply or to inland surface water tributaries thereto are prohibited, unless this San Diego Water Board issues a NPDES permit authorizing such a discharge; the proposed discharge has been approved by the State Department of Health Services (DHS) and the operating agency of the impacted reservoir; and the discharger has an approved fail-safe long-term disposal alternative.

5. The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the San Diego Water Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

6. The discharge of waste in a manner causing flow, ponding, or surfacing on lands not owned or under the control of the discharger is prohibited, unless the discharge is authorized by the San Diego Water Board.

7. The dumping, deposition, or discharge of waste directly into waters of the state, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the San Diego Water Board.

8. Any discharge to a storm water conveyance system that is not composed entirely of "*storm water*" is prohibited unless authorized by the San Diego Water Board. [The federal regulations, 40 CFR 122.26(b)(13), define storm water as storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from firefighting activities.] [§122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

9. The unauthorized discharge of treated or untreated sewage to waters of the state or to a storm water conveyance system is prohibited.

10. The discharge of industrial wastes to conventional septic tank/subsurface disposal systems, except as authorized by the terms described in California Water Code Section 13264, is prohibited.

11. The discharge of radioactive wastes amenable to alternative methods of disposal into the waters of the state is prohibited.

12. The discharge of any radiological, chemical, or biological warfare agent into waters of the state is prohibited.

13. The discharge of waste into a natural or excavated site below historic water levels is prohibited unless the discharge is authorized by the San Diego Water Board.

14. The discharge of sand, silt, clay, or other earthen materials from any activity, including land grading and construction, in quantities which cause deleterious bottom deposits, turbidity or discoloration in waters of the state or which unreasonably affect, or threaten to affect, beneficial uses of such waters is prohibited.

15. The discharge of treated or untreated sewage from vessels to Mission Bay, Oceanside Harbor, Dana Point Harbor, or other small boat harbors is prohibited.

16. The discharge of untreated sewage from vessels to San Diego Bay is prohibited.

17. The discharge of treated sewage from vessels to portions of San Diego Bay that are less than 30 feet deep at mean lower low water (MLLW) is prohibited.

18. The discharge of treated sewage from vessels, which do not have a properly functioning US Coast Guard certified Type I or Type II marine sanitation device, to portions of San Diego Bay that are greater than 30 feet deep at mean lower low water (MLLW) is prohibited.

2. Attachment B to State Water Board Resolution 2012-0012

Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges

I. PROVISIONS FOR POINT SOURCE DISCHARGES OF STORM WATER AND NONPOINT SOURCE WASTE DISCHARGES

The following terms, prohibitions, and special conditions (hereafter collectively referred to as special conditions) are established as limitations on point source storm water and nonpoint source discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in Areas of Special Biological Significance (ASBS), as required for State Water Quality Protection Areas pursuant to California Public Resources Code Sections 36700(f) and 36710(f). These Special Protections are adopted by the State Water Board as part of the California Ocean Plan (Ocean Plan) General Exception.

The special conditions are organized by category of discharge. The State Water Resources Control Board (State Water Board) and Regional Water Quality Control Boards (Regional Water Boards) will determine categories and the means of regulation for those categories [e.g., Point Source Storm Water National Pollutant Discharge Elimination System (NPDES) or Nonpoint Source].

A. PERMITTED POINT SOURCE DISCHARGES OF STORM WATER

1. General Provisions for Permitted Point Source Discharges of Storm Water

   a. Existing storm water discharges into an ASBS are allowed only under the following conditions:

      (1) The discharges are authorized by an NPDES permit issued by the State Water Board or Regional Water Board;

      (2) The discharges comply with all of the applicable terms, prohibitions, and special conditions contained in these Special Protections; and

      (3) The discharges:

         (i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

         (ii) Are designed to prevent soil erosion;

         (iii) Occur only during wet weather;

         (iv) Are composed of only storm water runoff.

   b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

   c. The discharge of trash is prohibited.

d. Only discharges from existing storm water outfalls are allowed. Any proposed or new storm water runoff discharge shall be routed to existing storm water discharge outfalls and shall not result in any new contribution of waste to an ASBS (i.e., no additional pollutant loading). “Existing storm water outfalls” are those that were constructed or under construction prior to January 1, 2005. “New contribution of waste” is defined as any addition of waste beyond what would have occurred as of January 1, 2005. A change to an existing storm water outfall, in terms of re-location or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges are prohibited except as provided below:

(1) The term “non-storm water discharges” means any waste discharges from a municipal separate storm sewer system (MS4) or other NPDES permitted storm drain system to an ASBS that are not composed entirely of storm water.

(2) (i) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability or occur naturally:

(a) Discharges associated with emergency firefighting operations.

(b) Foundation and footing drains.

(c) Water from crawl space or basement pumps.

(d) Hillside dewatering.

(e) Naturally occurring groundwater seepage via a storm drain.

(f) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(ii) An NPDES permitting authority may authorize non-storm water discharges to an MS4 with a direct discharge to an ASBS only to the extent the NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

2. Compliance Plans for Inclusion in Storm Water Management Plans (SWMP) and Storm Water Pollution Prevention Plans (SWPPP).

The discharger shall specifically address the prohibition of non-storm water runoff and the requirement to maintain natural water quality for storm water discharges to an ASBS in an ASBS Compliance Plan to be included in its SWMP or a SWPPP, as appropriate to permit type. If a statewide permit includes a SWMP, then the discharger shall prepare a stand-alone compliance plan for ASBS discharges. The ASBS Compliance Plan is subject to approval by the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (for permits issued by Regional Water Boards).

a. The Compliance Plan shall include a map of surface drainage of storm water runoff, showing areas of sheet runoff, prioritize discharges, and describe any structural Best Management Practices (BMPs) already employed and/or BMPs to be employed in the future. Priority discharges are those that pose the greatest water quality threat and which are identified to require installation of structural BMPs. The map shall also show the storm water conveyances in relation to other features such as service areas, sewage conveyances and treatment facilities, landslides, areas prone to erosion, and waste and hazardous material storage areas, if applicable. The SWMP or SWPPP shall also include a procedure for updating the map and plan when changes are made to the storm water conveyance facilities.

b. The ASBS Compliance Plan shall describe the measures by which all non-authorized non-storm water runoff (e.g., dry weather flows) has been eliminated, how these measures will be maintained over time, and how these measures are monitored and documented.

c. For Municipal Separate Storm Sewer System (MS4s), the ASBS Compliance Plan shall require minimum inspection frequencies as follows:

   (1) The minimum inspection frequency for construction sites shall be weekly during rainy season;

   (2) The minimum inspection frequency for industrial facilities shall be monthly during the rainy season;

   (3) The minimum inspection frequency for commercial facilities (e.g., restaurants) shall be twice during the rainy season; and

   (4) Storm water outfall drains equal to or greater than 18 inches (457 mm) in diameter or width shall be inspected once prior to the beginning of the rainy season and once during the rainy season and maintained to remove trash and other anthropogenic debris.

d. The ASBS Compliance Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff, that are necessary to comply with these special conditions, will be achieved through BMPs. Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that such installation would pose a threat to health or safety. BMPs to control storm water runoff discharges (at the end-of-pipe) during a design storm shall be designed to achieve on average the following target levels:

   (1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

   (2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges. The baseline for the reduction is the effective date of the Exception. The baseline for these determinations is the effective date of the Exception, and the

reductions must be achieved and documented within four (4) years of the effective date.

e. The ASBS Compliance Plan shall address erosion control and the prevention of anthropogenic sedimentation in ASBS. The natural habitat conditions in the ASBS shall not be altered as a result of anthropogenic sedimentation.

f. The ASBS Compliance Plan shall describe the non-structural BMPs currently employed and planned in the future (including those for construction activities), and include an implementation schedule. The ASBS Compliance Plan shall include non-structural BMPs that address public education and outreach. Education and outreach efforts must adequately inform the public that direct discharges of pollutants from private property not entering an MS4 are prohibited. The ASBS Compliance Plan shall also describe the structural BMPs, including any low impact development (LID) measures, currently employed and planned for higher threat discharges and include an implementation schedule. To control storm water runoff discharges (at the end-of-pipe) during a design storm, permittees must first consider using LID practices to infiltrate, use, or evapotranspirate storm water runoff on-site.

g. The BMPs and implementation schedule shall be designed to ensure that natural water quality conditions in the receiving water are achieved and maintained by either reducing flows from impervious surfaces or reducing pollutant loading, or some combination thereof.

h. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents in storm water runoff that alter natural ocean water quality and the sources of these constituents.

(2) The report shall describe BMPs that are currently being implemented, BMPs that are identified in the SWMP or SWPPP for future implementation, and any additional BMPs that may be added to the SWMP or SWPPP to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the BMPs.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits), the discharger shall revise its ASBS Compliance Plan to incorporate any new or modified BMPs that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised SWMP or SWPPP, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural ocean water quality conditions due to the same constituent.

(5) Compliance with this section does not excuse violations of any term, prohibition, or condition contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within one year from the effective date of the Exception, the discharger shall submit a written ASBS Compliance Plan to the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that describes its strategy to comply with these special conditions, including the requirement to maintain natural water quality in the affected ASBS. The ASBS Compliance Plan shall include a time schedule to implement appropriate non-structural and structural controls (implementation schedule) to comply with these special conditions for inclusion in the discharger's SWMP or SWPPP, as appropriate to permit type.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these special conditions shall be implemented.

d. Within four (4) years of the effective date of the Exception, any structural controls identified in the ASBS Compliance Plan that are necessary to comply with these special conditions shall be operational.

e. Within four (4) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water, pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data, and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

   If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

   The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

(1) for municipalities, a demonstration of significant hardship to discharger ratepayers, by showing the relationship of storm water fees to annual household income for residents within the discharger's jurisdictional area, and the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or
(2) for other governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process.

B. NONPOINT SOURCE DISCHARGES

[NOT INCLUDED]
[PROVISIONS FOR NONPOINT SOURCE DISCHARGES NOT APPLICABLE]

II. ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES

[NOT INCLUDED]
[ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES NOT APPLICABLE]

III. ADDITIONAL REQUIREMENTS – WATERFRONT AND MARINE OPERATIONS

[NOT INCLUDED]
[ADDITIONAL REQUIREMENTS FOR WATERFRONT AND MARINE OPERATIONS NOT APPLICABLE]

IV. MONITORING REQUIREMENTS

Monitoring is mandatory for all dischargers to assure compliance with the Ocean Plan. Monitoring requirements include both: (A) core discharge monitoring, and (B) ocean receiving water monitoring. The State and Regional Water Boards must approve sampling site locations and any adjustments to the monitoring programs. All ocean receiving water and reference area monitoring must be comparable with the Water Boards' Surface Water Ambient Monitoring Program (SWAMP).

Safety concerns: Sample locations and sampling periods must be determined considering safety issues. Sampling may be postponed upon notification to the State and Regional Water Boards if hazardous conditions prevail.

Analytical Chemistry Methods: All constituents must be analyzed using the lowest minimum detection limits comparable to the Ocean Plan water quality objectives. For metal analysis, all samples, including storm water effluent, reference samples, and ocean receiving water samples, must be analyzed by the approved analytical method with the lowest minimum detection limits (currently Inductively Coupled Plasma/Mass Spectrometry) described in the Ocean Plan.

A. CORE DISCHARGE MONITORING PROGRAM

1. General sampling requirements for timing and storm size:

   Runoff must be collected during a storm event that is greater than 0.1 inch and generates runoff, and at least 72 hours from the previously measurable storm event. Runoff samples shall be collected when post-storm receiving water is sampled, and analyzed for the same constituents as receiving water and reference site samples (see section IV B) as described below.

2. Runoff flow measurements

   a. For municipal/industrial storm water outfalls in existence as of December 31, 2007, 18 inches (457mm) or greater in diameter/width (including multiple outfall pipes in combination having a width of 18 inches, runoff flows must be measured or calculated, using a method acceptable to and approved by the State and Regional Water Boards.
   b. This will be reported annually for each precipitation season to the State and Regional Water Boards.

3. Runoff samples – storm events

   a. For outfalls equal to or greater than 18 inches (0.46m) in diameter or width:

      (1) Samples of storm water runoff shall be analyzed during the same storm as receiving water samples for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

      (2) Samples of storm water runoff shall be analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS

      (3) If an applicant has no outfall greater than 36 inches, then storm water runoff from the applicant's largest outfall shall be further analyzed during the same storm as receiving water samples for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates).

   b. For outfalls equal to or greater than 36 inches (0.91m) in diameter or width:

      (1) Samples of storm water runoff shall be analyzed during the same storm as receiving water samples for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

      (2) Samples of storm water runoff shall be further analyzed during the same storm as receiving water samples for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates) and

(3) Samples of storm water runoff shall be analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

c. For an applicant not participating in a regional monitoring program [see below in Section IV (B)] in addition to (a.) and (b.) above, a minimum of the two largest outfalls or 20 percent of the larger outfalls, whichever is greater, shall be sampled (flow weighted composite samples) at least three times annually during wet weather (storm event) and analyzed for all Ocean Plan Table A constituents, Table B constituents for marine aquatic life protection (except for toxicity, only chronic toxicity for three species shall be required), DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, and Ocean Plan indicator bacteria. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one (the largest) such discharge shall be sampled annually in each Region.

4. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may reduce or suspend core monitoring once the storm runoff is fully characterized. This determination may be made at any point after the discharge is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

B. OCEAN RECEIVING WATER AND REFERENCE AREA MONITORING PROGRAM

In addition to performing the Core Discharge Monitoring Program in Section II.A above, all applicants having authorized discharges must perform ocean receiving water monitoring. In order to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS, dischargers may choose either (1) an individual monitoring program, or (2) participation in a regional integrated monitoring program.

1. Individual Monitoring Program: The requirements listed below are for those dischargers who elect to perform an individual monitoring program to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within the affected ASBS. In addition to Core Discharge Monitoring, the following additional monitoring requirements shall be met:

   a. Three times annually, during wet weather (storm events), the receiving water at the point of discharge from the outfalls described in section (IV)(A)(3)(c) above shall be sampled and analyzed for Ocean Plan Table A constituents, Table B constituents for marine aquatic life, DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, salinity, chronic toxicity (three species), and Ocean Plan indicator bacteria.

      The sample location for the ocean receiving water shall be in the surf zone at the point of discharges; this must be at the same location where storm water runoff is sampled. Receiving water shall be sampled at approximately the same time prior to (pre-storm) and during (or immediately after) the same storm (post storm). Reference water quality shall also be sampled and analyzed for the same constituents pre-storm and post-storm, during the same storms when receiving water is sampled. Reference stations will be determined by the State Water Board's Division of Water Quality and the applicable Regional Water Board(s).

b. Sediment sampling shall occur at least three times during every five (5) year period. The subtidal sediment (sand or finer, if present) at the discharge shall be sampled and analyzed for Ocean Plan Table B constituents for marine aquatic life, DDT, PCBs, PAHs, pyrethroids, and OP pesticides. For sediment toxicity testing, only an acute toxicity test using the amphipod Eohaustorius estuarius must be performed.

c. A quantitative survey of intertidal benthic marine life shall be performed at the discharge and at a reference site. The survey shall be performed at least once every five (5) year period. The survey design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The results of the survey shall be completed and submitted to the State Water Board and Regional Water Board at least six months prior to the end of the permit cycle.

d. Once during each five (5) year period, a bioaccumulation study shall be conducted to determine the concentrations of metals and synthetic organic pollutants at representative discharge sites and at representative reference sites. The study design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The bioaccumulation study may include California mussels (Mytilus californianus) and/or sand crabs (Emerita analoga or Blepharipoda occidentalis). Based on the study results, the Regional Water Board and the State Water Board's Division of Water Quality, may adjust the study design in subsequent permits, or add or modify additional test organisms (such as shore crabs or fish), or modify the study design appropriate for the area and best available sensitive measures of contaminant exposure.

e. Marine Debris: Representative quantitative observations for trash by type and source shall be performed along the coast of the ASBS within the influence of the discharger's outfalls. The design, including locations and frequency, of the marine debris observations is subject to approval by the Regional Water Board and State Water Board's Division of Water Quality.

f. The monitoring requirements of the Individual Monitoring Program in this section are minimum requirements. After a minimum of one (1) year of continuous water quality monitoring of the discharges and ocean receiving waters, the Executive Director of the State Water Board (statewide permits) or Executive officer of the Regional Water Board (Regional Water Board permits) may require additional monitoring, or adjust, reduce or suspend receiving water and reference station monitoring. This determination may be made at any point after the discharge and receiving water is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

2. Regional Integrated Monitoring Program: Dischargers may elect to participate in a regional integrated monitoring program, in lieu of an individual monitoring program, to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS. This regional approach shall characterize natural water quality, pre- and post-storm, in ocean reference areas near the mouths of identified open space watersheds and the effects of the discharges on natural water quality (physical, chemical, and toxicity) in the ASBS receiving waters, and should include benthic marine aquatic life and bioaccumulation components. The design of the ASBS stratum of a regional integrated monitoring program may deviate from the otherwise prescribed individual monitoring approach (in Section IV.B.1) if approved by the State Water Board's Division of Water Quality and the Regional Water Boards.

a. Ocean reference areas shall be located at the drainages of flowing watersheds with minimal development (in no instance more than 10% development), and shall not be located in CWA Section 303(d) listed waterbodies or have tributaries that are 303(d) listed. Reference areas shall be free of wastewater discharges and anthropogenic non-storm water runoff. A minimum of low threat storm runoff discharges (e.g. stream highway overpasses and campgrounds) may be allowed on a case-by-case basis. Reference areas shall be located in the same region as the ASBS receiving water monitoring occurs. The reference areas for each Region are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean reference water samples must be collected from each station, each from a separate storm. A minimum of one reference location shall be sampled for each ASBS receiving water site sampled per responsible party. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

b. ASBS ocean receiving water must be sampled in the surf zone at the location where the runoff makes contact with ocean water (i.e. at "point zero"). Ocean receiving water stations must be representative of worst-case discharge conditions (i.e. co-located at a large drain greater than 36 inches, or if drains greater than 36 inches are not present in the ASBS then the largest drain greater than18 inches.) Ocean receiving water stations are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean receiving water samples must be collected during each storm season from each station, each from a separate storm. A minimum of one receiving water location shall be sampled in each ASBS per responsible party in that ASBS. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

c. Reference and receiving water sampling shall commence during the first full storm season following the adoption of these special conditions, and post-storm samples shall be collected when annual storm water runoff is sampled. Sampling shall occur in a minimum of two storm seasons. For those ASBS dischargers that have already participated in the Southern California Bight 2008 ASBS regional monitoring effort, sampling may be limited to only one storm season.

d. Receiving water and reference samples shall be analyzed for the same constituents as storm water runoff samples. At a minimum, constituents to be sampled and analyzed in reference and discharge receiving waters must include oil and grease, total suspended solids, Ocean Plan Table B metals for protection of marine life, Ocean Plan PAHs, pyrethroids, OP pesticides, ammonia, nitrate, phosphates, and critical life stage chronic toxicity for three species. In addition, within the range of the southern sea otter, indicator bacteria or some other measure of fecal contamination shall be analyzed.

3. Waterfront and Marine Operations: In addition to the above requirements for ocean receiving water monitoring, additional monitoring must be performed for marinas and boat launch and pier facilities:

a. For all marina or mooring field operators, in mooring fields with 10 or more occupied moorings, the ocean receiving water must be sampled for Ocean Plan indicator bacteria, residual chlorine, copper, zinc, grease and oil, methylene blue active substances (MBAS), and ammonia nitrogen.

   (1) For mooring field operators opting for an individual monitoring program (Section IV.B.1 above), this sampling must occur weekly (on the weekend) from May through October.

   (2) For mooring field operators opting to participate in a regional integrated monitoring program (Section IV.B.2 above), this sampling must occur monthly from May through October on a high use weekend in each month. The Water Boards may allow a reduction in the frequency of sampling, through the regional monitoring program, after the first year of monitoring.

b. For all mooring field operators, the subtidal sediment (sand or finer, if present) within mooring fields and below piers shall be sampled and analyzed for Ocean Plan Table B metals (for marine aquatic life beneficial use), acute toxicity, PAHs, and tributyltin. For sediment toxicity testing, only an acute toxicity test using the amphipod Eohaustorius estuarius must be performed. This sampling shall occur at least three times during a five (5) year period. For mooring field operators opting to participate in a regional integrated monitoring program, the Water Boards may allow a reduction in the frequency of sampling after the first sampling effort's results are assessed.

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ATTACHMENT B

STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

1. Standard Permit Provisions

Code of Federal Regulations Title 40 Section 122.41 (40 CFR 122.41) includes conditions, or provisions, that apply to all National Pollutant Discharge Elimination System (NPDES) permits. Additional provisions applicable to NPDES permits are in 40 CFR 122.42. All applicable provisions in 40 CFR 122.41 and 40 CFR 122.42 must be incorporated into this Order and NPDES permit. The applicable 40 CFR 122.41 and 40 CFR 122.42 provisions are as follows:

a. DUTY TO COMPLY [40 CFR 122.41(a)]

The Copermittee must comply with all of the provisions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

(1) The Copermittee must comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement. [40 CFR 122.41(a)(1)]

(2) The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to a civil penalty not to exceed $25,000 per day for each violation. The CWA provides that any person who *negligently* violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than 2 years, or both. Any person who *knowingly* violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both. Any person who knowingly violates Section 301, 302, 303, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, and who knows at that time that he thereby places another person in imminent danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of

not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.
[40 CFR 122.41(a)(2)]

(3) Any person may be assessed an administrative penalty by the San Diego Regional Water Quality Control Board (San Diego Water Board), State Water Resources Control Board (State Water Board), or United States Environmental Protection Agency (USEPA) for violating Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.
[40 CFR 122.41(a)(3)]

b. DUTY TO REAPPLY [40 CFR 122.41(b)]

If a Copermittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Copermittee must apply for and obtain a new permit.

c. NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE [40 CFR 122.41(c)]

It shall not be a defense for a Copermittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

d. DUTY TO MITIGATE [40 CFR 122.41(d)]

The Copermittee must take all reasonable steps to minimize or prevent any discharge or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

e. PROPER OPERATION AND MAINTENANCE [40 CFR 122.41(e)]

The Copermittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Copermittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by a Copermittee only when the operation is necessary to achieve compliance with the conditions of this permit.

f. PERMIT ACTIONS [40 CFR 122.41(f)]

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Copermittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

g. PROPERTY RIGHTS [40 CFR 122.41(g)]

This permit does not convey any property rights of any sort, or any exclusive privilege.

h. DUTY TO PROVIDE INFORMATION [40 CFR 122.41(h)]

The Copermittee must furnish to the San Diego Water Board, State Water Board, or USEPA within a reasonable time, any information which the San Diego Water Board, State Water Board, or USPEA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Copermittee must also furnish to the San Diego Water Board, State Water Board, or USPEA upon request, copies of records required to be kept by this permit.

i. INSPECTION AND ENTRY [40 CFR 122.41(i)]

The Copermittee must allow the San Diego Water Board, State Water Board, USEPA, and/or their authorized representative (including an authorized contractor acting as their representative), upon presentation of credentials and other documents as may be required by law, to:

(1) Enter upon the Copermittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit; [40 CFR 122.41(i)(1)]

(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit; [40 CFR 122.41(i)(2)]

(3) Inspect and photograph at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; [40 CFR 122.41(i)(3)] and

(4) Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location. [40 CFR 122.41(i)(4)]

j. MONITORING AND RECORDS [40 CFR 122.41(j)]

(1) Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity. [40 CFR 122.41(j)(1)]

(2) Except for records of monitoring information required by this permit related to the Copermittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five (5) years (or longer as required by 40 CFR Part 503), the

Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time. [40 CFR 122.41(j)(2)]

(3) Records for monitoring information must include: [40 CFR 122.41(j)(3)]

(a) The date, exact place, and time of sampling or measurements; [40 CFR 122.41(j)(3)(i)]
(b) The individual(s) who performed the sampling or measurements; [40 CFR 122.41(j)(3)(ii)]
(c) The date(s) analyses were performed; [40 CFR 122.41(j)(3)(iii)]
(d) The individual(s) who performed the analyses; [40 CFR 122.41(j)(3)(iv)]
(e) The analytical techniques or methods used; [40 CFR 122.41(j)(3)(v)] and
(f) The results of such analyses. [40 CFR 122.41(j)(3)(vi)]

(4) Monitoring must be conducted according to test procedures under 40 CFR Part 136 unless another method is required under 40 CFR Subchapters N or O. [40 CFR 122.41(j)(4)]

In the case of pollutants for which there are no approved methods under 40 CFR Part 136 or otherwise required under 40 CFR Subchapters N and O, monitoring must be conducted according to a test procedure specified in the permit for such pollutants. [40 CFR 122.44(i)(1)(iv)]

(5) The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. [40 CFR 122.41(j)(5)]

k. SIGNATORY REQUIREMENT [40 CFR 122.41(k)]

(1) All applications, reports, or information submitted to the San Diego Water Board, State Water Board, or USEPA must be signed and certified. (See 40 CFR 122.22) [40 CFR 122.41(k)(1)]

(a) *For a municipality, State, Federal, or other public agency.* [All applications must be signed] by either a principal executive officer or ranking elected official. [40 CFR 122.22(a)(3)]

(b) All reports required by permits, and other information requested by the San Diego Water Board, State Water Board, or USEPA must be signed by a person described in paragraph (a) of this section, or by a duly authorized representative of that person. A person is a duly authorized representative only if: [40 CFR 122.22(b)]

(i) The authorization is made in writing by a person described in paragraph (a) of this section; [40 CFR 122.22(b)(1)]

(ii) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company, (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) [40 CFR 122.22(b)(2)] and,

(iii) The written authorization is submitted to the San Diego Water Board and State Water Board. [40 CFR 122.22(b)(3)]

(c) *Changes to authorization.* If an authorization under paragraph (b) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (b) of this section must be submitted to the San Diego Water Board prior to or together with any reports, information, or applications to be signed by an authorized representative. [40 CFR 122.22(c)]

(d) *Certification.* Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." [40 CFR 122.22(d)]

(2) The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both. [40 CFR 122.41(k)(2)]

I. REPORTING REQUIREMENTS [40 CFR 122.41(l)]

(1) *Planned changes.* The Copermittee must give notice to the San Diego Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when: [40 CFR 122.41(l)(1)]

(a) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); [40 CFR 122.41(l)(1)(i)] or

(b) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which

are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1).
[40 CFR 122.41(l)(1)(ii)]

(c) The alteration or addition results in a significant change in the Copermittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. [40 CFR 122.41(l)(1)(iii)]

(2) *Anticipated noncompliance*. The Copermittee must give advance notice to the San Diego Water Board or State Water Board of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.
[40 CFR 122.41(l)(2)]

(3) *Transfers*. This permit is not transferable to any person except after notice to the San Diego Water Board. The San Diego Water Board may require modification or revocation and reissuance of the permit to change the name of the Copermittee and incorporate such other requirements as may be necessary under the CWA.
[40 CFR 122.41(l)(3)]

(4) *Monitoring reports.* Monitoring results must be reported at the intervals specified elsewhere in this permit. [40 CFR 122.41(l)(4)]

(a) Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the San Diego Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices. [40 CFR 122.41(l)(4)(i)]

(b) If the Copermittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or another method required for an industry-specific waste stream under 40 CFR Subchapters N or O, the results of this monitoring must be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the San Diego Water Board or State Water Board.
[40 CFR 122.41(l)(4)(ii)]

(c) Calculations for all limitations which require averaging of measurements must utilize an arithmetic mean unless otherwise specified in the permit.
[40 CFR 122.41(l)(4)(iii)]

(5) *Compliance schedules*. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date. [40 CFR 122.41(l)(5)]

(6) *Twenty-four hour reporting.*

(a) The Copermittee must report any noncompliance that may endanger health or the environment. Any information must be provided orally within 24 hours from the time the Copermittee becomes aware of the circumstances. A written submission must also be provided within five (5) days of the time the Copermittee becomes aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6)(i)]

(b) The following must be included as information which must be reported within 24 hours under this paragraph: [40 CFR 122.41(l)(6)(ii)]

(i) Any unanticipated bypass that exceeds any effluent limitation in the permit (See 40 CFR 122.41(g)). [40 CFR 122.41(l)(6)(ii)(A)]
(ii) Any upset which exceeds any effluent limitation in the permit. [40 CFR 122.41(l)(6)(ii)(B)] and,
(iii) Violation of a maximum daily discharge limitation for any of the pollutants listed by the San Diego Water Board in the permit to be reported within 24 hours. (See 40 CFR 122.44(g)) [40 CFR 122.41(l)(6)(ii)(C)]

(c) The San Diego Water Board may waive the above-required written report on a case-by-case basis if the oral report has been received within 24 hours. [40 CFR 122.41(l)(6)(iii)]

(7) *Other noncompliance.* The Copermittee must report all instances of noncompliance not reported in accordance with the standard provisions required under 40 CFR 122.41(l)(4), (5), and (6), at the time monitoring reports are submitted. The reports must contain the information listed in the standard provisions required under 40 CFR 122.41(l)(6). [40 CFR 122.41(l)(7))]

(8) *Other information.* When the Copermittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the San Diego Water Board, State Water Board, or USEPA, the Copermittee must promptly submit such facts or information. [40 CFR 122.41(l)(8)]

m. BYPASS [40 CFR 122.41(m)]

(1) *Definitions.*

(a) "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. [40 CFR 122.41(m)(1)(i)] or

(b) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be

expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
[40 CFR 122.41(m)(1)(ii)]

(2) *Bypass not exceeding limitations*. The Copermittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the standard provisions required under 40 CFR 122.41(m)(3) and (4).
[40 CFR 122.41(m)(2)]

(3) *Notice.*

(a) *Anticipated bypass*. If the Copermittee knows in advance of the need for a bypass, it must submit a notice, if possible at least ten days before the date of the bypass. [40 CFR 122.41(m)(3)(i)] or

(b) *Unanticipated bypass*. The Copermittee must submit notice of an unanticipated bypass in accordance with the standard provisions required under 40 CFR 122.41(l)(6) (24-hour notice).
[40 CFR 122.41(m)(3)(ii)]

(4) *Prohibition of Bypass.*

(a) Bypass is prohibited, and the San Diego Water Board may take enforcement action against a Copermittee for bypass, unless:
[40 CFR 122.41(m)(4)(i)]

(i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; [40 CFR 122.41(m)(4)(i)(A)]
(ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance;
[40 CFR 122.41(m)(4)(i)(B)] and,
(iii) The Copermittee submitted notice in accordance with the standard provisions required under 40 CFR 122.41(m)(3).
[40 CFR 122.41(m)(4)(i)(C)]

(b) The San Diego Water Board may approve an anticipated bypass, after considering its adverse effects, if the San Diego Water Board determines that it will meet the three conditions listed above.
[40 CFR 122.41(m)(4)(ii)]

n. UPSET [40 CFR 122.41(n)]

(1) *Definition.* "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Copermittee. An upset does not

include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. [40 CFR 122.41(n)(1)]

(2) *Effect of an upset*. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the standard provisions required under 40 CFR 122.41(n)(3) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. [40 CFR 122.41(n)(2)]

(3) *Conditions necessary for a demonstration of upset*. A Copermittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that: [40 CFR 122.41(n)(3)]

(a) An upset occurred and that the Copermittee can identify the cause(s) of the upset; [40 CFR 122.41(n)(3)(i)]
(b) The permitted facility was at the time being properly operated; [40 CFR 122.41(n)(3)(ii)] and
(c) The Copermittee submitted notice of the upset in accordance with the standard provisions required under 40 CFR 122.41(l)(6)(ii)(B) (24-hour notice). [40 CFR 122.41(n)(3)(iii)]
(d) The Copermittee complied with any remedial measures pursuant to the standard provisions required under 40 CFR 122.41(d). [40 CFR 122.41(n)(3)(iii)]

(4) *Burden of proof*. In any enforcement proceeding, the Copermittee seeking to establish the occurrence of an upset has the burden of proof. [40 CFR 122.41(n)(4)]

o. STANDARD PERMIT PROVISIONS FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS [40 CFR 122.42(c)]

The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the San Diego Water Board or State Water Board under 40 CFR 122.26(a)(1)(v) must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report must include:

(1) The status of implementing the components of the storm water management program that are established as permit conditions; [40 CFR 122.42(c)(1)]

(2) Proposed changes to the storm water management programs that are established as permit conditions. Such proposed changes must be consistent with 40 CFR 122.26(d)(2)(iii); [40 CFR 122.42(c)(2)] and

(3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under 40 CFR 122.26(d)(2)(iv) and (v); [40 CFR 122.42(c)(3)]

(4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; [40 CFR 122.42(c)(4)]

(5) Annual expenditures and budget for year following each annual report; [40 CFR 122.42(c)(5)]

(6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; [40 CFR 122.42(c)(6)]

(7) Identification of water quality improvements or degradation. [40 CFR 122.42(c)(7)]

p. STANDARD PERMIT PROVISIONS FOR STORM WATER DISCHARGES [40 CFR 122.42(d)]

The initial permits for discharges composed entirely of storm water issued pursuant to 40 CFR 122.26(e)(7) must require compliance with the conditions of the permit as expeditiously as practicable, but in no event later than three years after the date of issuance of the permit.

2. General Provisions

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. The general provisions applicable to this Order and NPDES permit are as follows:

a. DISCHARGE OF WASTE IS A PRIVILEGE

No discharge of waste into the waters of the State, whether or not such discharge is made pursuant to waste discharge requirements, shall create a vested right to continue such discharge. All discharges of waste into waters of the State are privileges, not rights. [CWC Section 13263(g)]

b. DURATION OF ORDER AND NPDES PERMIT

(1) *Effective date*. This Order and NPDES permit becomes effective on the 50th day after its adoption provided the USEPA has no objection. If the USEPA objects to its issuance, this Order shall not become effective until such objection is withdrawn. This Order supersedes Order No. R9-2007-0001 upon the effective date of this Order, and supersedes Order Nos. R9-2009-0002 and R9-2010-0016 upon their expiration or earlier notice of coverage.

(2) *Expiration*. This Order and NPDES permit expires five years after its effective date. [40 CFR 122.46(a)]

(3) *Continuation of expired order*. After this Order and NPDES permit expires, the terms and conditions of this Order and NPDES permit are automatically continued pending issuance of a new permit if all requirements of the federal NPDES regulations on the continuation of expired permits (40 CFR 122.6) are complied with.

c. AVAILABILITY

A copy of this Order must be kept at a readily accessible location and must be available to on-site personnel at all times.

d. CONFIDENTIALITY OF INFORMATION

Except as provided for in 40 CFR 122.7, no information or documents submitted in accordance with or in application for this Order will be considered confidential, and all such information and documents shall be available for review by the public at the San Diego Water Board office.

Claims of confidentiality for the following information will be denied:
[40 CFR 122.7(b)]

(1) The name and address of any permit applicant or Copermittee; [40 CFR 122.7(b)(1)] and

(2) Permit applications and attachments, permits, and effluent data. [40 CFR 122.7(b)(2)]

e. EFFLUENT LIMITATIONS

(1) *Interim effluent limitations*. The Copermittee must comply with any interim effluent limitations as established by addendum, enforcement action, or revised waste discharge requirements which have been, or may be, adopted by the San Diego Water Board.

(2) *Other effluent limitations and standards*. If any applicable toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant and that standard or prohibition is more stringent than any limitation on the pollutant in the permit, the San Diego Water Board shall institute proceedings under these regulations to modify or revoke and reissue the permit to conform to the toxic effluent standard or prohibition. [40 CFR 122.44(b)(1)]

f. DUTY TO MINIMIZE OR CORRECT ADVERSE IMPACTS

The Copermittee must take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this Order, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the noncompliance.

g. PERMIT ACTIONS

The filing of a request by the Copermittee for modification, revocation and reissuance, or termination of this Order, or a notification of planned change in or anticipated noncompliance with this Order does not stay any condition of this Order. (See 40 CFR 122.41(f)) In addition, the following provisions apply to this Order:

(1) Upon application by any affected person, or on its own motion, the San Diego Water Board may review and revise the requirements in this Order. All requirements must be reviewed periodically. [CWC Section 13263(e)]

(2) This Order may be terminated or modified for cause, including, but not limited to, all of the following: [CWC Section 13381]

(a) Violation of any condition contained in the requirements of this Order. [CWC Section 13381(a)]

(b) Obtaining the requirements in this Order by misrepresentation, or failure to disclose fully all relevant facts. [CWC Section 13381(b)]

(c) A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge. [CWC Section 13381(c)]

(3) When this Order is transferred to a new owner or operator, such requirements as may be necessary under the CWC may be incorporated into this Order.

h. NPDES Permitted Non-Storm Water Discharges

The San Diego Water Board has, in prior years, issued a limited number of individual NPDES permits for non-storm water discharges to MS4s. The San Diego Water Board or State Water Board may in the future, upon prior notice to the Copermittee(s), issue an NPDES permit for any non-storm water discharge (or class of non-storm water discharges) to an MS4.

i. Monitoring

In addition to the standard provisions required under 40 CFR 122.41(j) and (l)(4), the following general monitoring provisions apply to this Order:

(1) Where procedures are not otherwise specified in Order, sampling, analysis and quality assurance/quality control must be conducted in accordance with the Quality Assurance Management Plan (QAMP) for the State of California's Surface Water Ambient Monitoring Program (SWAMP), adopted by the State Water Resources Control Board (State Water Board).

(2) Pursuant to 40 CFR 122.41(j)(2) and CWC Section 13383(a), each Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five (5) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time.

(3) All chemical, bacteriological, and toxicity analyses must be conducted at a laboratory certified for such analyses by the California Department of Public Health or a laboratory approved by the San Diego Water Board.

(4) For priority toxic pollutants that are identified in the California Toxics Rule (CTR) (65 Fed. Reg. 31682), the Copermittees must instruct their laboratories to establish calibration standards that are equivalent to or lower than the Minimum Levels (MLs) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP). If a Copermittee can demonstrate that a particular ML is not attainable, in accordance with procedures set forth in 40 CFR Part 136, the lowest quantifiable concentration of the lowest calibration standard analyzed by a specific analytical procedure (assuming that all the method specified sample weights, volumes, and processing steps have been followed) may be used instead of the ML listed in Appendix 4 of the SIP. The Copermittee must submit documentation from the laboratory to the San Diego Water Board for approval prior to raising the ML for any priority toxic pollutant.

j. ENFORCEMENT

(1) The San Diego Water Board is authorized to enforce the terms of this Order under several provisions of the CWC, including, but not limited to, CWC Sections 13385, 13386, and 13387.

(2) Nothing in this Order shall be construed to protect the Copermittee from its liabilities under federal, state, or local laws.

(3) The CWC provides for civil and criminal penalties comparable to, and in some cases greater than, those provided for under the CWA.

(4) Except as provided in the standard conditions required under 40 CFR 122.41(m) and (n), nothing in this Order shall be construed to relieve the Copermittee from civil or criminal penalties for noncompliance.

(5) Nothing in this Order shall be construed to preclude the institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties to which the Copermittee is or may be subject to under Section 311 of the CWA.

(6) Nothing in this Order shall be construed to preclude institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authoring preserved by Section 510 of the CWA.

k. SEVERABILITY

The provisions of this Order are severable, and if any provision of this Order, or the application of any provisions of this Order to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this Order shall not be affected thereby.

l. APPLICATIONS

Any application submitted by a Copermittee for reissuance or modification of this Order must satisfy all applicable requirements specified in federal regulations as well as any additional requirements for submittal of a Report of Waste Discharge specified in the CWC and the California Code of Regulations.

m. IMPLEMENTATION

All plans, reports and subsequent amendments submitted in compliance with this Order must be implemented immediately (or as otherwise specified). All submittals by Copermittees must be adequate to implement the requirements of this Order.

n. REPORT SUBMITTALS

(1) All report submittals must include an executive summary, introduction, conclusion, recommendations, and signed certified statement.

(2) Each Copermittee must submit a signed certified statement covering its responsibilities for each applicable submittal.

(3) The Principal Watershed Copermittee(s) must submit a signed certified statement covering its responsibilities for each applicable submittal and the sections of the submittals for which it is responsible.

(4) Unless otherwise directed, the Copermittees must submit one hard copy and one electronic copy of each report required under this Order to the San Diego Water Board, and one electronic copy to the USEPA.

(5) The Copermittees must submit reports and provide notifications as required by this Order to the following:

EXECUTIVE OFFICER
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
9174 SKY PARK COURT, SUITE 100
SAN DIEGO CA 92123-4340
Telephone: (858) 467-2952 Fax: (858) 571-6972

EUGENE BROMLEY
US ENVIRONMENTAL PROTECTION AGENCY
REGION IX
PERMITS ISSUANCE SECTION (W-5-1)
75 HAWTHORNE STREET
SAN FRANCISCO CA 94105

ATTACHMENT C

ACRONYMS AND ABBREVIATIONS

AMAL	Average Monthly Action Level
ASBS	Area(s) of Special Biological Significance
BMP	Best Management Practice
Basin Plan	Water Quality Control Plan for the San Diego Basin
CEQA	California Environmental Quality Act
CCR	California Code of Regulations
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWC	California Water Code
CZARA	Coastal Zone Act Reauthorization Amendments of 1990
ESAs	Environmentally Sensitive Areas
GIS	Geographic Information System
IBI	Index of Biological Integrity
LID	Low Impact Development
MDAL	Maximum Daily Action Level
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
NAL	Non-Storm Water Action Level
NAICS	North American Industry Classification System
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
ROWD	Report of Waste Discharge (application for NPDES reissuance)
SAL	Storm Water Action Level
San Diego Water Board	California Regional Water Quality Control Board, San Diego Region
SIC	Standard Industrial Classification Code
State Water Board	State Water Resources Control Board
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
WDID	Waste Discharge Identification Number
WLA	Waste Load Allocation
WQBEL	Water Quality Based Effluent Limitation

DEFINITIONS

Active/Passive Sediment Treatment - Using mechanical, electrical or chemical means to flocculate or coagulate suspended sediment for removal from runoff from construction sites prior to discharge.

Anthropogenic Litter – Trash generated from human activities, not including sediment.

Average Monthly Action Level – The highest allowable average of daily discharges over a calendar month.

Beneficial Uses - The uses of water necessary for the survival or wellbeing of man, plants, and wildlife. These uses of water serve to promote tangible and intangible economic, social, and environmental goals. "Beneficial Uses" of the waters of the State that may be protected include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. Existing beneficial uses are uses that were attained in the surface or ground water on or after November 28, 1975; and potential beneficial uses are uses that would probably develop in future years through the implementation of various control measures. "Beneficial Uses" are equivalent to "Designated Uses" under federal law. [California Water Code Section 13050(f)].

Best Management Practices (BMPs) - Defined in 40 CFR 122.2 as schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Bioassessment - The use of biological community information to evaluate the biological integrity of a water body and its watershed. With respect to aquatic ecosystems, bioassessment is the collection and analysis of samples of the benthic macroinvertebrate community together with physical/habitat quality measurements associated with the sampling site and the watershed to evaluate the biological condition (i.e. biotic integrity) of a water body.

Biofiltration - Practices that use vegetation and amended soils to detain and treat runoff from impervious areas. Treatment is through filtration, infiltration, adsorption, ion exchange, and biological uptake of pollutants.

Biological Integrity - Defined in Karr J.R. and D.R. Dudley. 1981. Ecological perspective on water quality goals. *Environmental Management* 5:55-68 as: "A balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitat of the region." Also referred to as ecosystem health.

BMP Design Manual – A plan developed to eliminate, reduce, or mitigate the impacts of runoff from development projects, including Priority Development Projects.

Chronic Toxicity – A measurement of sublethal effect (e.g. reduced growth, reproduction) to experimental test organisms exposed to an effluent or receiving waters compared to that of the control organisms.

Clean Water Act Section 303(d) Water Body - An impaired water body in which water quality does not meet applicable water quality standards and/or is not expected to meet water quality standards, even after the application of technology based pollution controls required by the CWA. The discharge of runoff to these water bodies by the Copermittees is significant because these discharges can cause or contribute to violations of applicable water quality standards.

Construction Site – Any project, including projects requiring coverage under the Construction General Permit, that involves soil disturbing activities including, but not limited to, clearing, grading, disturbances to ground such as stockpiling, and excavation.

Contamination - As defined in the Porter-Cologne Water Quality Control Act, contamination is "an impairment of the quality of waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste whether or not waters of the State are affected."

Copermittee – A permittee to a NPDES permit that is only responsible for permit conditions relating to the discharge for which it is operator [40 CFR 122.26(b)(1)]. For the purposes of this Order, a Copermittee is one of the individual permittees identified in Tables 1a-1c of this Order.

Copermittees – All of the individual Copermittees, collectively.

Critical Channel Flow (Qc) – The channel flow that produces the critical shear stress that initiates bed movement or that erodes the toe of channel banks. When measuring Qc, it should be based on the weakest boundary material – either bed or bank.

Daily Discharge – Defined as either: (1) the total mass of the constituent discharged over the calendar day or any 24 hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g. concentration.)

The Daily Discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day, or other 24 hour period other than a day), or by the arithmetic mean of analytical results from one or more grab samples taken over the course of a day.

Development Projects - Construction, rehabilitation, redevelopment, or reconstruction of any public or private projects.

Dry Season –May 1 to September 30.

Dry Weather – Weather is considered dry if the preceding 72 hours has been without measurable precipitation (>0.1 inch).

Enclosed Bays – Enclosed bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost bay works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays do not include inland surface waters or ocean waters.

Erosion – When land is diminished or worn away due to wind, water, or glacial ice. Often the eroded debris (silt or sediment) becomes a pollutant via storm water runoff. Erosion occurs naturally but can be intensified by land clearing activities such as farming, development, road building, and timber harvesting.

Environmentally Sensitive Areas (ESAs) - Areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; areas designated as preserves or their equivalent under the Natural Communities Conservation Program within the Cities and County of Orange; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.

Estuaries – Waters, including coastal lagoons, located at the mouth of streams that serve as areas of mixing fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and ocean water. Estuaries do not include inland surface waters or ocean waters.

Existing Development – Any area that has been developed and exists for municipal, commercial, industrial, or residential purposes, uses, or activities. May include areas that are not actively used for its originally developed purpose, but may be re-purposed or redeveloped for another use or activity.

Flow Duration – The long-term period of time that flows occur above a threshold that causes significant sediment transport and may cause excessive erosion damage to creeks and streams (not a single storm event duration). The simplest way to visualize this is to consider a histogram of pre- and post-project flows using long-term records of hourly data. To maintain pre-development flow duration means that the total number of hours (counts) within each range of flows in a flow-duration histogram cannot increase between the pre- and post-development condition. Flow duration within the range of geomorphologically significant flows is important for managing erosion.

Grading - The cutting and/or filling of the land surface to a desired slope or elevation.

Groundwater – Subsurface water that occurs beneath the water table in soils and geologic formations that are fully saturated.

Hazardous Material – Any substance that poses a threat to human health or the environment due to its toxicity, corrosiveness, ignitability, explosive nature or chemical reactivity. These also include materials named by the USEPA in 40 CFR 116 to be reported if a designated quantity of the material is spilled into the waters of the U.S. or emitted into the environment.

Hazardous Waste - Hazardous waste is defined as “any waste which, under Section 600 of Title 22 of this code, is required to be managed according to Chapter 30 of Division 4.5 of Title 22 of this code” [CCR Title 22, Division 4.5, Chapter 11, Article 1].

Household Hazardous Waste – Paints, cleaning products, and other hazardous wastes generated during home improvement or maintenance activities.

Hydromodification – The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

Illicit Connection – Any man-made conveyance or drainage system through which a non-storm water discharge to the storm water drainage system occurs or may occur. Any connection to the MS4 that conveys an illicit discharge.

Illicit Discharge - Any discharge to the MS4 that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from firefighting activities [40 CFR 122.26(b)(2)].

Inactive Areas – Areas of construction activity that are not active and those that have been active and are not scheduled to be re-disturbed for at least 14 days.

Infiltration – In the context of low impact development, infiltration is defined as the percolation of water into the ground. Infiltration is often expressed as a rate (inches per hour), which is determined through an infiltration test. In the context of non-storm water, infiltration is water other than wastewater that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow [40 CFR 35.2005(20)].

Inland Surface Waters – Includes all surface waters of the State that do not include the ocean, enclosed bays, or estuaries.

Jurisdictional Runoff Management Program Document – A written description of the specific jurisdictional runoff management measures and programs that each Copermittee will implement to comply with this Order and ensure that storm water pollutant discharges in runoff are reduced to the MEP and do not cause or contribute to a violation of water quality standards.

Low Impact Development (LID) – A storm water management and land development strategy that emphasizes conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions.

Low Impact Development Best Management Practices (LID BMPs) – LID BMPs include schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States through storm water management and land development strategies that emphasize conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions. LID BMPs include retention practices that do not allow runoff, such as infiltration, rain water harvesting and reuse, and evapotranspiration. LID BMPs also include flow-through practices such as biofiltration that may have some discharge of storm water following pollutant reduction.

Major Outfall – As defined in the Code of Federal Regulations, a major outfall is a MS4 outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (i.e. discharge from a single conveyance other than a circular pipe which is associated with a drainage area of more than 50 acres); or, for MS4s that receive storm water from lands zoned for industrial activity (based on comprehensive zoning plans or equivalent), a MS4 outfall that discharges from a single pipe with an inside diameter of 12 inches or more or from its equivalent (i.e. discharge from other than a circular pipe associated with a drainage area of 2 acres or more).

Maximum Daily Action Level (MDAL) –The highest allowable daily discharge of a pollutant, over a calendar day (or 24 hour period). For pollutants with action levels expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with action levels expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

Maximum Extent Practicable (MEP) – The technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) for storm water that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) in combination with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than BAT. A definition for MEP is not provided either in the statute or in the regulations. Instead the definition of MEP is dynamic and will be defined by the following process over time: municipalities propose their definition of MEP by way of their runoff management programs. Their total collective and individual activities conducted pursuant to the runoff management programs becomes their proposal for MEP as it applies both to their overall effort, as well as to specific activities (e.g., MEP for street sweeping, or MEP for MS4 maintenance). In the absence of a proposal acceptable to the San Diego Water Board, the San Diego Water Board defines MEP.

In a memo dated February 11, 1993, entitled "Definition of Maximum Extent Practicable," Elizabeth Jennings, Senior Staff Counsel, SWRCB addressed the achievement of the MEP standard as follows:

> "*To achieve the MEP standard, municipalities must employ whatever Best Management Practices (BMPs) are technically feasible (i.e., are likely to be effective) and are not cost prohibitive. The major emphasis is on technical feasibility. Reducing pollutants to the MEP means choosing effective BMPs, and rejecting applicable BMPs only where other effective BMPs will serve the same purpose, or the BMPs would not be technically feasible, or the cost would be prohibitive. In selecting BMPs to achieve the MEP standard, the following factors may be useful to consider:*
>
> *a. Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?*
> *b. Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?*
> *c. Public Acceptance: Does the BMP have public support?*
> *d. Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?*
> *e. Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc.?*

The final determination regarding whether a municipality has reduced pollutants to the maximum extent practicable can only be made by the Regional or State Water Boards, and not by the municipal discharger. If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit derived, it would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs that would address a pollutant source, or to pick a BMP based solely on cost, which would be clearly less effective. In selecting BMPs the municipality must make a serious attempt to comply and practical solutions may not be lightly rejected. In any case, the burden would be on the municipal discharger to show compliance with its permit. After selecting a menu of BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented."

Monitoring Year – October 1 to September 30

Municipal Separate Storm Sewer System (MS4) – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designated or used for collecting or conveying storm water; (iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.26.

National Pollutant Discharge Elimination System (NPDES) - The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the CWA.

Non-Storm Water - All discharges to and from a MS4 that do not originate from precipitation events (i.e., all discharges from a MS4 other than storm water). Non-storm water includes illicit discharges and NPDES permitted discharges.

Nuisance - As defined in the Porter-Cologne Water Quality Control Act, a nuisance is "anything which meets all of the following requirements: 1) Is injurious to health, or is indecent, or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. 2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. 3) Occurs during, or as a result of, the treatment or disposal of wastes."

Ocean Waters – The territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the State Board's California Ocean Plan.

Order – Unless otherwise specified, refers to this Order, Order No. R9-2013-0001 (NPDES No. CAS0109266)

Outfall - Outfall means a point source as defined by 40 CFR 122.2 at the point where a municipal separate storm sewer discharges to waters of the US and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels or other conveyances which connect segments of the same stream or other waters of the US and are used to convey waters of the US.

Persistent Flow - Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

Person - A person is defined as an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof [40 CFR 122.2].

Point Source - Any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, landfill leachate collection systems, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

Pollutant - Any agent that may cause or contribute to the degradation of water quality such that a condition of pollution or contamination is created or aggravated.

Pollution - As defined in the Porter-Cologne Water Quality Control Act, pollution is "the alteration of the quality of the waters of the State by waste, to a degree which unreasonably affects either of the following: 1) The waters for beneficial uses; or 2) Facilities that serve these beneficial uses." Pollution may include contamination.

Pollution Prevention - Pollution prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control BMPs, treatment control BMPs, or disposal.

Pre-Development Runoff Conditions – Approximate flow rates and durations that exist or existed onsite before land development occurs. For new development projects, this equates to runoff conditions immediately before project construction. For redevelopment projects, this equates to runoff conditions from the project footprint assuming infiltration characteristics of the underlying soil, and existing grade. Runoff coefficients of concrete or asphalt must not be used. A redevelopment Priority Development Project must use available information pertaining to existing underlying soil type and onsite existing grade to estimate pre-development runoff conditions.

Priority Development Projects - New development and redevelopment projects defined under Provision E.3.b of Order No. R9-2013-0001.

Rainy Season (aka Wet Season) –October 1 to April 30

Receiving Waters – Waters of the United States.

Receiving Water Limitations - Waste discharge requirements issued by the San Diego Water Board typically include both: (1) "Effluent Limitations" (or "Discharge Limitations") that specify the technology-based or water-quality-based effluent limitations; and (2) "Receiving Water Limitations" that specify the water quality objectives in the Basin Plan as well as any other limitations necessary to attain those objectives. In summary, the "Receiving Water Limitations" provision is the provision used to implement the requirements of CWA section 402(p)(3)(B).

Redevelopment - The creation and/or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include trenching and resurfacing associated with utility work; resurfacing existing roadways; new sidewalk construction, pedestrian ramps, or bike lane on existing roads; and routine replacement of damaged pavement, such as pothole repair.

Regional Clearinghouse – A central location for the collection and distribution of information developed and maintained by the Copermittees including, but not limited to, plans, reports, manuals, data, contact information, and/or links to such documents and information.

Rehabilitation - Remedial measures or activities for the purpose of improving or restoring the beneficial uses of streams, channels or river systems. Techniques may vary from in-stream restoration techniques to off-line storm water management practices installed in the system corridor or upland areas, or a combination of in-stream and out of stream techniques. Rehabilitation techniques may include, but are not limited to the following: riparian zone restoration, constructed wetlands, channel modifications that improve habitat and stability, and daylighting of drainage systems.

Reporting Period – The period of information that is reported in the Water Quality Improvement Plan Annual Report. The reporting period consists of two components: 1) July 1 to June 30, consistent with the fiscal year, for the implementation of the jurisdictional runoff management programs, and 2) October 1 to September 30, consistent with the monitoring year for the monitoring and assessment programs. Together, these two time periods constitute the reporting year for the Water Quality Improvement Plan Annual Report due January 31 following the end of the monitoring year.

Retain – Keep or hold in a particular place, condition, or position without discharge to surface waters.

Retrofitting – Storm water management practice put into place after development has occurred in watersheds where the practices previously did not exist or are ineffective. Retrofitting of developed areas is intended to improve water quality, protect downstream channels, reduce flooding, or meet other specific objectives. Retrofitting developed areas may include, but is not limited to replacing roofs with green roofs, disconnecting downspouts or impervious surfaces to drain to pervious surfaces, replacing impervious surfaces with pervious surfaces, installing rain barrels, installing rain gardens, and trash area enclosures.

Runoff - All flows in a storm water conveyance system that consists of the following components: (1) storm water (wet weather flows) and (2) non-storm water including dry weather flows.

San Diego Water Board – As used in this document the term "San Diego Water Board" is synonymous with the term "Regional Board" as defined in Water Code section 13050(b) and is intended to refer to the California Regional Water Quality Control Board for the San Diego Region as specified in Water Code Section 13200.

Sediment - Soil, sand, and minerals washed from land into water. Sediment resulting from anthropogenic sources (i.e. human induced land disturbance activities) is considered a pollutant. This Order regulates only the discharges of sediment from anthropogenic sources and does not regulate naturally occurring sources of sediment. Sediment can destroy fish-nesting areas, clog animal habitats, and cloud waters so that sunlight does not reach aquatic plants.

Source Control BMP – Land use or site planning practices, or structural or nonstructural measures that aim to prevent runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between pollutants and runoff.

Storm Water – Per 40 CFR 122.26(b)(13), means storm water runoff, snowmelt runoff and surface runoff and drainage. Surface runoff and drainage pertains to runoff and drainage resulting from precipitation events.

Structural BMPs - A subset of BMPs which detains, retains, filters, removes, or prevents the release of pollutants to surface waters from development projects in perpetuity, after construction of a project is completed.

Test of Significant Toxicity (TST) - A statistical approach used to analyze toxicity test data. The TST incorporates a restated null hypothesis, Welch's t-test, and biological effect thresholds for chronic and acute toxicity.

Total Maximum Daily Load (TMDL) - The maximum amount of a pollutant that can be discharged into a water body from all sources (point and non-point) and still maintain water quality standards. Under CWA section 303(d), TMDLs must be developed for all water bodies that do not meet water quality standards after application of technology-based controls.

Toxicity - Adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies. The water quality objectives for toxicity provided in the Basin Plan, state in part…"All waters shall be free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life….The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge."

Toxicity Identification Evaluation (TIE) - A set of procedures for identifying the specific chemical(s) responsible for toxicity. These procedures are performed in three phases (characterization, identification, and confirmation) using aquatic organism toxicity tests.

Toxicity Reduction Evaluation (TRE) - A study conducted in a step-wise process designed to identify the causative agents of effluent or ambient toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in toxicity. The first steps of the TRE consist of the collection of data relevant to the toxicity, including additional toxicity testing, and an evaluation of facility operations and maintenance practices, and best management practices. A Toxicity Identification Evaluation (TIE) may be required as part of the TRE, if appropriate.

Treatment Control BMP – Any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media absorption or any other physical, biological, or chemical process.

Unpaved Road – Any long, narrow stretch without pavement used for traveling by motor passenger vehicles between two or more points. Unpaved roads are generally constructed of dirt, gravel, aggregate or macadam and may be improved or unimproved.

Waste - As defined in CWC Section 13050(d), "waste includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal."

Article 2 of CCR Title 23, Chapter 15 (Chapter 15) contains a waste classification system that applies to solid and semi-solid waste, which cannot be discharged directly or indirectly to water of the state and which therefore must be discharged to land for treatment, storage, or disposal in accordance with Chapter 15. There are four classifications of waste (listed in order of highest to lowest threat to water quality): hazardous waste, designated waste, non-hazardous solid waste, and inert waste.

Water Quality Objective - Numerical or narrative limits on constituents or characteristics of water designated to protect designated beneficial uses of the water. [California Water Code Section 13050 (h)]. California's water quality objectives are established by the State and Regional Water Boards in the Water Quality Control Plans. Numeric or narrative limits for pollutants or characteristics of water designed to protect the beneficial uses of the water. In other words, a water quality objective is the maximum concentration of a pollutant that can exist in a receiving water and still generally ensure that the beneficial uses of the receiving water remain protected (i.e., not impaired). Since water quality objectives are designed specifically to protect the beneficial uses, when the objectives are violated the beneficial uses are, by definition, no longer protected and become impaired. This is a fundamental concept under the Porter Cologne Act. Equally fundamental is Porter Cologne's definition of pollution. A condition of pollution exists when the water quality needed to support designated beneficial uses has become unreasonably affected or impaired; in other words, when the water quality objectives have been violated. These underlying definitions (regarding beneficial use protection) are the reason why all waste discharge requirements implementing the federal NPDES regulations require compliance with water quality objectives. (Water quality objectives are also called water quality criteria in the CWA.)

Water Quality Standards - Water quality standards, as defined in Clean Water Act section 303(c) consist of the beneficial uses (e.g., swimming, fishing, municipal drinking water supply, etc.,) of a water body and criteria (referred to as water quality objectives in the California Water Code) necessary to protect those uses. Under the Water Code, the water boards establish beneficial uses and water quality objectives in water quality control or basin plans. Together with an anti-degradation policy, these beneficial uses and water quality objectives serve as water quality standards under the Clean Water Act. In Clean Water Act parlance, state beneficial uses are called "designated uses" and state water quality objectives are called "criteria." Throughout this Order, the relevant term is used depending on the statutory scheme.

Waters of the State - Any water, surface or underground, including saline waters within the boundaries of the State [CWC section 13050 (e)]. The definition of the Waters of the State is broader than that for the Waters of the United States in that all water in the State is considered to be a Waters of the State regardless of circumstances or condition.

Waters of the United States - As defined in the 40 CFR 122.2, the Waters of the U.S. are defined as: "(a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate "wetlands;" (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters otherwise defined as waters of the United States under this definition: (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial seas; and (g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA."

Watershed - That geographical area which drains to a specified point on a water course, usually a confluence of streams or rivers (also known as drainage area, catchment, or river basin).

Wet Season (aka Rainy Season) – October 1 to April 30

Wet Weather – Weather is considered wet up to 72 hours after a storm event of 0.1 inches and greater, unless otherwise defined by another regulatory mechanism (e.g. a TMDL).

ATTACHMENT D

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

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JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

FY _____

I. COPERMITTEE INFORMATION

Copermittee Name:

Copermittee Primary Contact Name:

Copermittee Primary Contact Information:
Address:
City: County: State: Zip:
Telephone: Fax: Email:

II. LEGAL AUTHORITY

Has the Copermittee established adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐
A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority?	**YES**	☐
	NO	☐

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

Was an update of the jurisdictional runoff management program document required or recommended by the San Diego Water Board?	**YES**	☐
	NO	☐
If YES to the question above, did the Copermittee update its jurisdictional runoff management program document and make it available on the Regional Clearinghouse?	**YES**	☐
	NO	☐

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

Has the Copermittee implemented a program to actively detect and eliminate illicit discharges and connections to its MS4 that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

Number of non-storm water discharges reported by the public	
Number of non-storm water discharges detected by Copermittee staff or contractors	
Number of non-storm water discharges investigated by the Copermittee	
Number of sources of non-storm water discharges identified	
Number of non-storm water discharges eliminated	
Number of sources of illicit discharges or connections identified	
Number of illicit discharges or connections eliminated	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

V. DEVELOPMENT PLANNING PROGRAM

Has the Copermittee implemented a development planning program that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐
Was an update to the BMP Design Manual required or recommended by the San Diego Water Board?	**YES**	☐
	NO	☐
If YES to the question above, did the Copermittee update its BMP Design Manual and make it available on the Regional Clearinghouse?	**YES**	☐
	NO	☐

Number of proposed development projects in review	
Number of Priority Development Projects in review	
Number of Priority Development Projects approved	
Number of approved Priority Development Projects exempt from any BMP requirements	
Number of approved Priority Development Projects allowed alternative compliance	
Number of Priority Development Projects granted occupancy	

Number of completed Priority Development Projects in inventory	
Number of high priority Priority Development Project structural BMP inspections	
Number of Priority Development Project structural BMP violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM
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VI. CONSTRUCTION MANAGEMENT PROGRAM

Has the Copermittee implemented a construction management program that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

Number of construction sites in inventory	
Number of active construction sites in inventory	
Number of inactive construction sites in inventory	
Number of construction sites closed/completed during reporting period	
Number of construction site inspections	
Number of construction site violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

Has the Copermittee implemented an existing development management program that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

	Municipal	Commercial	Industrial	Residential
Number of facilities or areas in inventory				
Number of existing development inspections				
Number of follow-up inspections				
Number of violations				
Number of enforcement actions issued				
Number of escalated enforcement actions issued				

VIII. PUBLIC EDUCATION AND PARTICIPATION

Has the Copermittee implemented a public education program component that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐
Has the Copermittee implemented a public participation program component that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

IX. FISCAL ANALYSIS

Has the Copermittee attached to this form a summary of its fiscal analysis that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

X. CERTIFICATION

I [☐ Principal Executive Officer ☐ Ranking Elected Official ☐ Duly Authorized Representative] certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature	Date
Print Name	Title
Telephone Number	Email

ATTACHMENT E

SPECIFIC PROVISIONS FOR TOTAL MAXIMUM DAILY LOADS APPLICABLE TO ORDER NO. R9-2013-0001

These provisions implement load allocations (LAs) and wasteload allocations (WLAs) of the Total Maximum Daily Loads (TMDLs) adopted by the San Diego Water Board and approved by USEPA under Clean Water Act section 303(c), applicable to discharges regulated under this Order. The provisions and schedules for implementation of the TMDLs described below must be incorporated into the Water Quality Improvement Plans, required pursuant to Provision B of this Order, for the specified Watershed Management Areas.

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed
2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin
3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed
4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek
5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay
6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2002-0123

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	August 14, 2002
State Water Board Approval Date:	July 16, 2003
Office of Administrative Law Approval Date:	September 11, 2003
US EPA Approval Date:	November 3, 2003

(3) TMDL Effective Date: September 11, 2003

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final diazinon TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must be in compliance with the final TMDL compliance requirements as of December 31, 2010.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations:

Table 1.1
Final Receiving Water Limitations Expressed as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Diazinon	Acute	0.08 µg/L	1 hour
	Chronic	0.05 µg/L	4 days

(b) Final Effluent Limitations

Discharges from the MS4s containing concentrations that do not exceed the following effluent limitations will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 1.b.(2)(a):

Table 1.2
Final Effluent Limitations Expressed as Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation	Averaging Period
Diazinon	Acute	0.072 µg/L	1 hour
	Chronic	0.045 µg/L	4 days

(c) Best Management Practices

The following BMPs for Chollas Creek must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area and implemented by the Responsible Copermittees:

(i) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 1.b.(2)(a) and/or the effluent limitations under Specific Provision 1.b.(2)(b) for Chollas Creek.

(ii) The Responsible Copermittees must implement the Diazinon Toxicity Control Plan and Diazinon Public Outreach/Education Program as described in the report titled, *Technical Report for Total Maximum Daily Load for Diazinon in Chollas Creek Watershed, San Diego County*, dated August 14, 2002, including subsequent modifications, in order to achieve the receiving water limitations under Specific Provision 1.b.(2)(a) and/or the effluent limitations under Specific Provision 1.b.(2)(b).

(iii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 1.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 1.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 1.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 1.b.(2)(c) achieves compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 1.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 1.d, to demonstrate compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The Responsible Copermittees must be in compliance with the final diazinon TMDL compliance requirements as of December 31, 2010.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls for diazinon within the Chollas Creek watershed, and calculate or estimate the annual diazinon loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 1.b.(2)(b), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0019

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	September 22, 2005
Office of Administrative Law Approval Date:	December 2, 2005
US EPA Approval Date:	February 8, 2006

(3) TMDL Effective Date: December 2, 2005

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Shelter Island Yacht Basin

(6) Responsible Copermittee: City of San Diego

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final dissolved copper TMDL compliance requirements for Shelter Island Yacht Basin consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittee must be in compliance with the final TMDL compliance requirements as of December 2, 2005.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations:

Table 2.1
Final Receiving Water Limitations Expressed as Concentrations in Shelter Island Yacht Basin

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Dissolved Copper	Acute	4.8 µg/L x WER*	1 hour
	Chronic	3.1 µg/L x WER*	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 2.b.(3)(a):

Table 2.2
Final Effluent Limitations as Expressed as Annual Loads in MS4 Discharges to Shelter Island Yacht Basin

Constituent	Effluent Limitation
Dissolved Copper	30 kg/yr*

* If the water quality objectives for dissolved copper in Shelter Island Yacht Basin are changed in the future, then the margin of safety (MOS), TMDL and allocations will be recalculated using the *Method for Recalculation of the Total Maximum Daily Load for Dissolved Copper in the Shelter Island Yacht Basin, San Diego Bay* in the Basin Plan (p. 7-14).

(c) Best Management Practices

The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 2.b.(2)(a) and/or the effluent limitations under Specific Provision 2.b.(2)(b) for Shelter Island Yacht Basin. The BMPs must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 2.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 2.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittee develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 2.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate

that the implementation of the BMPs required under Provision 2.b.(2)(c) achieves compliance with Specific Provisions 2.b.(3)(a), 2.b.(3)(b) and/or 2.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 2.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 2.d, to demonstrate compliance with Specific Provisions 2.b.(3)(a), 2.b.(3)(b) and/or 2.b.(3)(c).

c. Interim TMDL Compliance Requirements

The Responsible Copermittees must be in compliance with the final dissolved copper TMDL compliance requirements as of December 2, 2005.

d. Specific Monitoring and Assessment Requirements

The Responsible Copermittee must monitor the effluent of its MS4 outfalls for dissolved copper, and calculate or estimate the monthly and annual dissolved copper loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.(b)(2)of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0036

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	November 16, 2005
Office of Administrative Law Approval Date:	February 1, 2006
US EPA Approval Date:	March 22, 2006

(3) TMDL Effective Date: February 1, 2006

(4) Watershed Management Area: Santa Margarita River

(5) Water Body: Rainbow Creek

(6) Responsible Copermittee: County of San Diego

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final total nitrogen and total phosphorus TMDL compliance requirements for Rainbow Creek consist of the following

(1) Final TMDL Compliance Date

The Responsible Copermittee must comply with final TMDL compliance requirements by December 31, 2021.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance date under Specific Provision 3.b.(1):

Table 3.1
Final Receiving Water Limitations Expressed as Concentrations in Rainbow Creek

Constituent	Receiving Water Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing concentrations that do not exceed the following effluent limitations by the compliance date under Specific Provision 3.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 3.b.(2)(a):

Table 3.2
Final Effluent Limitations Expressed as Concentrations in MS4 Discharges to Rainbow Creek

Constituent	Effluent Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(ii) Annual pollutant loads from given land uses discharging to and from the MS4s that do not exceed the following annual loads by the compliance date under Specific Provision 3.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 3.b.(2)(a):

Table 3.3
Final Effluent Limitations Expressed as Annual Loads in MS4 Discharges to Rainbow Creek

Land Use	Total N	Total P
Commercial nurseries	116 kg/yr	3 kg/yr
Park	3 kg/yr	0.1 kg/yr
Residential areas	149 kg/yr	12 kg/yr
Urban areas	27 kg/yr	6 kg/yr

(c) Best Management Practices

(i) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 3.b.(2)(a) and/or the effluent limitations under Specific Provision 3.b.(2)(b) for Rainbow Creek.

(ii) The Responsible Copermittee should coordinate any BMPs implemented to address this TMDL with Caltrans and other sources as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 3.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 3.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the final effluent limitations under Specific Provision 3.b.(2)(b)(ii); OR

(e) The Responsible Copermittee develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 3.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Specific Provision 3.b.(2)(c) achieves compliance with Specific Provisions 3.b.(3)(a), 3.b.(3)(b), 3.b.(3)(c) and/or 3.b.(3)(d),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 3.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 3.d, to demonstrate compliance with Specific Provisions 3.b.(3)(a), 3.b.(3)(b), 3.b.(3)(c) and/or 3.b.(3)(d).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim total nitrogen and total phosphorus TMDL compliance requirements for Rainbow Creek consist of the following:

(1) Interim Compliance Dates and WQBELs

The Responsible Copermittee must comply with the interim WQBELs, expressed as annual loads, by December 31 of the interim compliance year given in Table 3.4.

Table 3.4
Interim Water Quality Based Effluent Limitations Expressed as Annual Loads in MS4 Discharges from Specific Land Uses to Rainbow Creek

	Total N Interim Effluent Limitations (kg/yr)			Total P Interim Effluent Limitations (kg/yr)		
	Interim Compliance Date			Interim Compliance Date		
Land Use	**2009**	**2013**	**2017**	**2009**	**2013**	**2017**
Commercial nurseries	390	299	196	20	16	10
Park	5	3	3	0.15	0.10	0.10
Residential areas	507	390	260	99	74	47
Urban areas	40	27	27	9	6	6

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 3.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 3.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the final effluent limitations under Specific Provision 3.b.(2)(b)(ii); OR

(e) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the interim effluent limitations under Specific Provision 3.c.(1); OR

(f) The Responsible Copermittee has submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

d. Specific Monitoring and Assessment Requirements

(1) The Responsible Copermittee must incorporate into the Water Quality Improvement Plan and implement the Sampling and Analysis Plan for Rainbow Creek Nutrient Reduction TMDL Implementation Water Quality Monitoring, dated January 2010.

(2) The results of any monitoring conducted during the reporting period, and assessment of whether the interim and final TMDL compliance requirements have been achieved must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 3.b.(2)(b)(i), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2007-0043

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2007
State Water Board Approval Date:	July 15, 2008
Office of Administrative Law Approval Date:	October 22, 2008
US EPA Approval Date:	December 18, 2008

(3) TMDL Effective Date: October 22, 2008

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final dissolved copper, lead, and zinc TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must comply with the final TMDL compliance requirements by October 22, 2028.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance date under Specific Provision 4.b.(1):

Table 4.1
Final Receiving Water Limitations Expressed as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$(0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$(0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$(0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$(0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations by the compliance date under Specific Provision 4.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 4.b.(2)(a):

Table 4.2
Final Effluent Limitations as Expressed Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(c) Best Management Practices

(i) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 4.b.(2)(a) and/or the effluent limitations under Specific Provision 4.b.(2)(b) for Chollas Creek.

(ii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans and the U.S. Navy as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 4.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 4.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 4.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 4.b.(2)(c) achieves compliance with Specific Provisions 4.b.(3)(a), 4.b.(3)(b) and/or 4.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 4.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 4.d, to demonstrate compliance with Specific Provisions 4.b.(3)(a), 4.b.(3)(b) and/or 4.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim dissolved copper, lead, and zinc TMDL compliance requirements for Chollas Creek consist of the following:

(1) Interim Compliance Date and WQBELs

The Responsible Copermittee must comply with the interim WQBELs, expressed as concentrations, by the interim compliance date given in Table 4.3:

Table 4.3
Interim Water Quality Based Effluent Limitations Expressed as Concentrations in MS4 Discharges to Chollas Creek

Interim Compliance Date	Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
October 22, 2018	Dissolved Copper	Acute	$1.2 \times 90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
	Dissolved Lead	Acute	$1.2 \times 90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
	Dissolved Zinc	Acute	$1.2 \times 90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 4.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 4.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) There are no exceedances of the interim effluent limitations under Specific Provision 4.c.(1) at the Responsible Copermittee's MS4 outfalls; OR

(e) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance date.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*, when it is amended to include monitoring requirements for the Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls discharging to Chollas Creek for dissolved copper, lead, and zinc, and calculate or estimate the monthly and annual dissolved copper, lead, and zinc loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 4.b.(2)(b) or 4.c.(1), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2008-0027

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 11, 2008
State Water Board Approval Date:	June 16, 2009
Office of Administrative Law Approval Date:	September 15, 2009
US EPA Approval Date:	October 26, 2009

(3) TMDL Effective Date: September 15, 2009

(4) Watershed Management Areas: See Table 5.0

(5) Water Bodies: See Table 5.0

(6) Responsible Copermittees: See Table 5.0

Table 5.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County	Dana Point Harbor	Baby Beach	-City of Dana Point -County of Orange
San Diego Bay	San Diego Bay	Shelter Island Shoreline Park	- San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final indicator bacteria TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Final TMDL Compliance Dates

(a) Baby Beach in Dana Point Harbor

The Responsible Copermittees for MS4 discharges to Baby Beach must be in compliance with the final TMDL compliance requirements according to the following compliance dates:

Table 5.1
Compliance Dates to Achieve Final TMDL Compliance Requirements For Baby Beach in Dana Point Harbor

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform	September 15, 2014	September 15, 2009
Fecal Coliform		September 15, 2009
Enterococcus		September 15, 2019

(b) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park must be in compliance with the final TMDL compliance requirements as of December 31, 2012.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance dates under Specific Provision 5.b.(1):

Table 5.2
Final Receiving Water Limitations Expressed as Bacteria Densities in the Water Body

	Receiving Water Limitations	
Constituent	Single Sample Maximum[1,2]	30-Day Geometric Mean[2]
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing indicator bacteria densities that do not exceed the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.3a
Final Effluent Limitations as Expressed as Bacteria Densities in MS4 Discharges to the Water Body

	Effluent Limitations	
Constituent	**Single Sample Maximum[1,2]**	**30-Day Geometric Mean[2]**
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.

(ii) Discharges from the MS4s containing indicator bacteria loads that do not exceed the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.4a
Final Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to the Baby Beach in Dana Point Harbor

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0.86×10^9 MPN/day	$3{,}254 \times 10^9$ MPN/30days
Fecal Coliform	0.17×10^9 MPN/day	112×10^9 MPN/30days
Enterococcus	0.03×10^9 MPN/day	114×10^9 MPN/30days

Table 5.4b
Final Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to the Shelter Island Shoreline Park in San Diego Bay

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0 MPN/day	198×10^9 MPN/30days
Fecal Coliform	0 MPN/day	8×10^9 MPN/30days
Enterococcus	0 MPN/day	26×10^9 MPN/30days

(iii) Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.5a
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to Baby Beach in Dana Point Harbor*

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	90.4%	0%
Fecal Coliform	82.7%	0%
Enterococcus	96.2%	62.2%

Notes:
* The percent load reductions are relative to data collected between 1996-2002. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittees' MS4s must not exceed the loads in Table 5.4a, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the water body.

Table 5.5b
*Final Effluent Limitations Expressed as Percent Load Reductions** in MS4 Discharges to Shelter Island Shoreline Park in San Diego Bay*

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0%	0%
Fecal Coliform	0%	0%
Enterococcus	0%	0%

Notes:
* The percent load reductions are relative to data collected between 1999-2004. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittee's MS4s must not exceed the loads in Table 5.4b, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the water body.

(c) Best Management Practices

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 5.0 must incorporate the Bacteria Load Reduction Plan (BLRP) required to be developed pursuant to Resolution No. R9-2008-0027.

(ii) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 5.b.(2)(a) and/or the effluent limitations under Specific Provision 5.b.(2)(b) for the segments or areas of the water bodies listed in Table 5.0

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.b.(2)(b)(ii); OR

(e) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 5.b.(2)(b)(iii); OR

(f) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(g) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 5.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 5.b.(2)(c) achieves compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 5.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 5.d, to demonstrate compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim indicator bacteria TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Baby Beach in Dana Point Harbor

(a) Interim TMDL Compliance Dates and WQBELs

The Responsible Copermittees for MS4 discharges to Baby Beach must comply with the following interim WQBELs by the interim compliance dates given in Tables 5.6a and/or 5.6b:

Table 5.6a
Interim Water Quality Based Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to Baby Beach in Dana Point Harbor

Constituent	Interim Compliance Dates	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	4.93×10^9 MPN/day	$3{,}254 \times 10^9$ MPN/30days*
Fecal Coliform	September 15, 2012	0.59×10^9 MPN/day	112×10^9 MPN/30days*
Enterococcus	September 15, 2012	0.42×10^9 MPN/day	301×10^9 MPN/30days
	September 15, 2016	0.03×10^9 MPN/day *	207×10^9 MPN/30days

Notes:
* Same as the final effluent limitations in Table 5.4a.

Table 5.6b
Interim Water Quality Based Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to Baby Beach in Dana Point Harbor*

Constituent	Interim Compliance Dates	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	45.2%	0%**
Fecal Coliform	September 15, 2012	41.4%	0%**
Enterococcus	September 15, 2012	48.1%	0%
	September 15, 2016	96.2%**	31.1%

Notes:
* The percent load reductions are relative to data collected between 1996-2002. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittees' MS4s must not exceed the loads in Table 5.6a, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the waterbody.
** Same as the final effluent limitations in Table 5.5a.

(b) Interim Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(i) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(ii) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(iii) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(iv) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.b(2)(b)(ii); OR

(v) The Responsible Copermittees can demonstrate that exceedances of the applicable receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(vi) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the interim effluent limitations under Table 5.6a of Specific Provision 5.c.(1)(a); OR

(vii) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the interim effluent limitations under Table 5.6b of Specific Provision 5.c.(1)(a); OR

(viii) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

(2) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park must be in compliance with the final indicator bacteria TMDL requirements as of December 31, 2012.

d. Specific Monitoring and Assessment Requirements

(1) Monitoring Stations

Monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[32] If discharges of bacteria from the MS4 exceed the applicable interim or final WQBELs, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(2) Monitoring Procedures

(a) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) The Responsible Copermittees must collect wet weather monitoring samples within the first 24 hours of a storm event[33] of the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(c) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

[32] Commonly referred to as AB 411 monitoring

[33] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs have been achieved.

(b) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 5.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(c) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to correlate elevated bacteria levels with known or suspected sewage spills from wastewater collection systems and treatment plants or boats.

(d) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2010-0001

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 10, 2010
State Water Board Approval Date:	December 14, 2010
Office of Administrative Law Approval Date:	April 4, 2011
US EPA Approval Date:	June 22, 2011

(3) TMDL Effective Date: April 4, 2011

(4) Watershed Management Areas: See Table 6.0

(5) Water Bodies: See Table 6.0

(6) Responsible Copermittees: See Table 6.0

Table 6.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	-City of Laguna Beach -County of Orange -Orange County Flood Control District
		at Heisler Park - North	
	Pacific Ocean Shoreline	at Main Laguna Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Woods -County of Orange -Orange County Flood Control District
		Laguna Beach at Ocean Avenue	
		Laguna Beach at Cleo Street	
		Arch Cove at Bluebird Canyon Road	
		Laguna Beach at Dumond Drive	
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Hills -City of Laguna Niguel -City of Laguna Woods -City of Lake Forest -City of Mission Viejo -County of Orange -Orange County Flood Control District
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	
	Aliso Creek Mouth	at mouth	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	-City of Dana Point -City of Laguna Beach -City of Laguna Niguel -County of Orange -Orange County Flood Control District
		Aliso Beach at Table Rock Drive	
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)	
		at Salt Creek (large outlet)	
		Salt Creek Beach at Salt Creek service road	
		Salt Creek Beach at Strand Road	
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	-City of Dana Point -City of Laguna Hills -City of Laguna Niguel -City of Mission Viejo -City of Rancho Santa Margarita -City of San Juan Capistrano -County of Orange -Orange County Flood Control District
	San Juan Creek	lower 1 mile	
	San Juan Creek Mouth	at mouth	
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	-City of Dana Point -City of San Clemente -County of Orange -Orange County Flood Control District
		Ole Hanson Beach Club Beach at Pico Drain	
		San Clemente City Beach at El Portal Street Stairs	
		San Clemente City Beach at Mariposa Street	
		San Clemente City Beach at Linda Lane	
		San Clemente City Beach at South Linda Lane	
		San Clemente City Beach at Lifeguard Headquarters	
		under San Clemente Municipal Pier	
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	
		San Clemente State Beach at Riviera Beach	
		Can Clemente State Beach at Cypress Shores	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	-City of Oceanside -City of Vista -County of San Diego
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	-City of Carlsbad -City of Encinitas -City of Escondido -City of San Marcos -County of San Diego
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	-City of Del Mar -City of Escondido -City of Poway -City of San Diego -City of Solana Beach -County of San Diego
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	-City of Del Mar -City of Poway -City of San Diego -County of San Diego
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	-City of San Diego
		La Jolla Shores Beach at Caminito del Oro	
		La Jolla Shores Beach at Vallecitos	
		La Jolla Shores Beach at Avenida de la Playa	
		at Casa Beach, Children's Pool	
		South Casa Beach at Coast Boulevard	
		Whispering Sands Beach at Ravina Street	
		Windansea Beach at Vista de la Playa	
		Windansea Beach at Bonair Street	
		Windansea Beach at Playa del Norte	
		Windansea Beach at Palomar Avenue	
		at Tourmaline Surf Park	
		Pacific Beach at Grand Avenue	
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I- Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	-City of El Cajon -City of Santee -County of San Diego
	San Diego River	lower 6 miles	-City of El Cajon -City of La Mesa -City of San Diego -City of Santee -County of San Diego
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	-City of La Mesa -City of Lemon Grove -City of San Diego -County of San Diego - San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final indicator bacteria TMDL compliance requirements for the water bodies listed in Table 6.0 consist of the following:

(1) Final TMDL Compliance Dates

The Responsible Copermittees for MS4 discharges to the water bodies listed in Table 6.0 must be in compliance with the final TMDL compliance requirements according to the following compliance dates:

Table 6.1
Compliance Dates to Achieve Final TMDL Compliance Requirements

Constituent	Dry Weather TMDL Compliance Date	Wet Weather TMDL Compliance Date
Total Coliform	April 4, 2021	April 4, 2031
Fecal Coliform		
Enterococcus		

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance dates under Specific Provision 6.b.(1):

Table 6.2a
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Beaches

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform	10,000	22%	1,000	0%
Fecal Coliform	400	22%	200	0%
Enterococcus	104	22%	35	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan.

Table 6.2b
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Creeks

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Fecal Coliform	400	22%	200	0%
Enterococcus	61 (104)	22%	33	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Basin Plan.
d. A single sample maximum of 104 MPN/100ml for *Enterococcus* may be applied as a receiving water limitation for creeks, instead of 61 MPN/100mL, if one or more of the creeks addressed by these TMDLs (San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek, San Diego River, and/or Chollas Creek) is designated with a "moderately to lightly used area" or less frequent usage frequency in the Basin Plan. Otherwise, the single sample maximum of 61 MPN/100mL for *Enterococcus* must be used to assess compliance with the allowable exceedance frequency.

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing indicator bacteria densities that do not exceed the following effluent limitations by the compliance dates under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a):

Table 6.2c
Final Effluent Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies in MS4 Discharges to the Water Body

Constituent	Concentration-Based Effluent Limitations			
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform[d]	10,000	22%	1,000	0%
Fecal Coliform	400	22%	200	0%
Enterococcus	104[e] / 61[f]	22%	35[e] / 33[f]	0%

Notes:
a. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan for discharges to beaches, and the Basin Plan for discharges to creeks and creek mouths.
d. Total coliform effluent limitations only apply to MS4 outfalls that discharge to the Pacific Ocean Shorelines and creek mouths listed in Table 6.0.
e. This *Enterococcus* effluent limitation applies to MS4 discharges to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
f. This *Enterococcus* effluent limitation applies to MS4 discharges to segments or areas of creeks or creek mouths listed in Table 6.0.

(ii) Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the compliance dates under Specific Provision 6.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a):

Table 6.3
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watershed and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
South Orange County	**San Joaquin Hills HSA** (901.11) and **Laguna Hills HSA** (901.12) - Pacific Ocean Shoreline	91.78%	91.72%	98.28%	46.85%	52.07%	51.26%
	Aliso HSA (901.13) - Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	95.47%	95.58%	99.13%	25.29%	26.62%	27.52% (27.37%)**
	Dana Point HSA (901.14) - Pacific Ocean Shoreline	95.04%	95.03%	98.98%	13.15%	14.86%	15.16%
	Lower San Juan HSA (901.27) - Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	72.96%	74.21%	94.94%	19.21%	12.82%	27.12% (26.90%)**
	San Clemente HA (901.30) - Pacific Ocean Shoreline	94.28%	94.23%	98.83%	23.85%	24.58%	25.26%
San Luis Rey River	**San Luis Rey HU** (903.00) - Pacific Ocean Shoreline	38.13%	39.09%	87.38%	5.62%	3.12%	11.69%

Table 6.3 (Cont'd)

Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watershed and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
Carlsbad	**San Marcos HA** (904.50) - Pacific Ocean Shoreline	82.82%	82.55%	96.03%	18.47%	18.98%	20.19%
San Dieguito River	**San Dieguito HU** (905.00) - Pacific Ocean Shoreline	14.39%	20.72%	83.48%	4.29%	1.46%	7.72%
Penasquitos	**Miramar Reservoir HA** (906.10) - Pacific Ocean Shoreline	96.50%	96.59%	99.42%	1.61%	1.99%	1.93%
Mission Bay	**Scripps HA** (906.30) - Pacific Ocean Shoreline	96.44%	96.42%	99.25%	16.32%	21.14%	18.82%
	Tecolote HA (906.50) - Tecolote Creek	94.51%	94.59%	98.94%	16.51%	20.47%	18.15% (18.08%)**
San Diego River	**Mission San Diego HSA** (907.11) and **Santee HSA** (907.12) - Pacific Ocean Shoreline - Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles)	74.03%	69.44%	93.96%	38.14%	53.22%	42.74% (42.47%)**
San Diego Bay	**Chollas HSA** (908.22) - Chollas Creek	92.06%	92.15%	98.46%	17.82%	24.84%	21.46% (21.36%)**

Notes:

* The percent load reductions are based on reducing loads compared to pollutant loads from 2001 to 2002.

** The alternative *Enterococcus* percent load reduction was calculated based on a numeric target of 104 MPN/100mL instead of 61 MPN/100mL, protective of the REC-1 "moderately to lightly used area" usage frequency that is protective of freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative pollutant load reductions can be utilized.

(c) Best Management Practices

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 6.0 must incorporate the Comprehensive Load Reduction Plans (CLRPs) required to be developed pursuant to Resolution No. R9-2010-0001.

(ii) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 6.b.(2)(a) and/or the effluent limitations under Specific Provision 6.b.(2)(b) for the segments or areas of the water bodies listed in Table 6.0.

(iii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans, owners/operators of small MS4s, and agricultural dischargers as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(f) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 6.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 6.b.(2)(c) achieves compliance with Specific Provisions 6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), and/or 6.b.(3)(e),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 6.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 6.d, to demonstrate compliance with Specific Provisions 6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), 6.b.(3)(e) and/or 6.b.(3)(f).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim indicator bacteria TMDL compliance requirements for the water bodies listed in Table 6.0 consist of the following:

(1) Interim TMDL Compliance Dates

The Responsible Copermittees must achieve compliance with the interim TMDL compliance requirements, as determined in accordance with Specific Provision 6.c.(3), by the interim compliance dates given in Table 6.4, unless alternative interim compliance dates are accepted by the San Diego Water Board Executive Officer as part of the Water Quality Improvement Plan.

Table 6.4
Interim Compliance Dates to Achieve Interim TMDL Compliance Requirements

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	April 4, 2016	April 4, 2021
		at Heisler Park - North		
	Pacific Ocean Shoreline	at Main Laguna Beach	April 4, 2016	April 4, 2021
		Laguna Beach at Ocean Avenue		
		Laguna Beach at Cleo Street		
		Arch Cove at Bluebird Canyon Road		
		Laguna Beach at Dumond Drive		
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	April 4, 2016	April 4, 2021
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	April 4, 2018	April 4, 2021
	Aliso Creek Mouth	at mouth	April 4, 2018	April 4, 2021
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	April 4, 2016	April 4, 2021
		Aliso Beach at Table Rock Drive		
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)		
		at Salt Creek (large outlet)		
		Salt Creek Beach at Salt Creek service road	April 4, 2017	April 4, 2021
		Salt Creek Beach at Strand Road	April 4, 2017	April 4, 2021

Table 6.4 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates	
			Interim Dry Weather WQBELs	Interim Wet Weather WQBELs
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	April 4, 2016	April 4, 2021
	San Juan Creek	lower 1 mile	April 4, 2018	April 4, 2021
	San Juan Creek Mouth	at mouth	April 4, 2016	April 4, 2021
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	April 4, 2016	April 4, 2021
		Ole Hanson Beach Club Beach at Pico Drain	April 4, 2016	April 4, 2021
		San Clemente City Beach at El Portal Street Stairs	April 4, 2017	April 4, 2021
		San Clemente City Beach at Mariposa Street		
		San Clemente City Beach at Linda Lane	April 4, 2016	April 4, 2021
		San Clemente City Beach at South Linda Lane	April 4, 2018	April 4, 2021
		San Clemente City Beach at Lifeguard Headquarters	April 4, 2017	April 4, 2021
		under San Clemente Municipal Pier		
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	April 4, 2018	April 4, 2021
		San Clemente State Beach at Riviera Beach	April 4, 2016	April 4, 2021
		Can Clemente State Beach at Cypress Shores	April 4, 2017	April 4, 2021
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	April 4, 2017	April 4, 2021
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	April 4, 2016	April 4, 2021
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	April 4, 2016	April 4, 2021

Table 6.4 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates	
			Interim Dry Weather WQBELs	Interim Wet Weather WQBELs
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	April 4, 2016	April 4, 2021
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	April 4, 2016	April 4, 2021
		La Jolla Shores Beach at Caminito del Oro		
		La Jolla Shores Beach at Vallecitos		
		La Jolla Shores Beach at Avenida de la Playa		
		at Casa Beach, Children's Pool		
		South Casa Beach at Coast Boulevard		
		Whispering Sands Beach at Ravina Street		
		Windansea Beach at Vista de la Playa		
		Windansea Beach at Bonair Street		
		Windansea Beach at Playa del Norte		
		Windansea Beach at Palomar Avenue		
		at Tourmaline Surf Park		
		Pacific Beach at Grand Avenue		
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries		
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	April 4, 2018	April 4, 2021
	San Diego River	lower 6 miles		
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach		
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	April 4, 2018	April 4, 2021

(2) Interim Water Quality Based Effluent Limitations

The Responsible Copermittees for discharges to the water bodies in Table 6.0 must comply with the following interim WQBELs by the interim compliance dates given in Specific Provision 6.c.(1):

(a) Interim Receiving Water Limitations

(i) *Interim Dry Weather Receiving Water Limitations*

The Responsible Copermittee must calculate the "existing" exceedance frequencies of the 30-day geometric mean water quality objectives for each of the indicator bacteria by analyzing the available monitoring data collected between January 1, 1996 and December 31, 2002. "Existing" exceedance frequencies may be calculated by water body and/or by Watershed Management Area listed in Table 6.0. Separate "existing" exceedance frequencies must be calculated for beaches and creeks/creek mouths.

The Responsible Copermittees must achieve a 50 percent reduction in the "existing" exceedance frequency of the 30-day geometric mean WQBELs for the water bodies listed in Table 6.0 by the interim compliance dates given in Table 6.4. A 50 percent reduction in the "existing" exceedance frequency is equivalent to half of the "existing" exceedance frequency of the 30-day geometric mean WQBELs.

The "existing" exceedance frequencies and the interim dry weather allowable exceedance frequencies (i.e. interim dry weather receiving water limitations) calculated by the Responsible Copermittees must be included in the Water Quality Improvement Plans for the applicable Watershed Management Areas.

(ii) *Interim Wet Weather Receiving Water Limitations*

The Responsible Copermittees must achieve the interim wet weather receiving water limitations in Table 6.5, expressed as interim wet weather allowable exceedance frequencies, by the interim compliance dates given in Table 6.4.

Table 6.5
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	38%	37%	39%
		at Heisler Park - North			
	Pacific Ocean Shoreline	at Main Laguna Beach			
		Laguna Beach at Ocean Avenue			
		Laguna Beach at Cleo Street			
		Arch Cove at Bluebird Canyon Road			
		Laguna Beach at Dumond Drive			
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	41%	41%	42%
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	41%	41%	42%
	Aliso Creek Mouth	at mouth	41%	41%	42%
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	36%	36%	36%
		Aliso Beach at Table Rock Drive			
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)			
		at Salt Creek (large outlet)			
		Salt Creek Beach at Salt Creek service road			
		Salt Creek Beach at Strand Road			

Table 6.5 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	44%	44%	48%
	San Juan Creek	lower 1 mile	44%	44%	47%
	San Juan Creek Mouth	at mouth	44%	44%	47%
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	35%	35%	36%
		Ole Hanson Beach Club Beach at Pico Drain			
		San Clemente City Beach at El Portal Street Stairs			
		San Clemente City Beach at Mariposa Street			
		San Clemente City Beach at Linda Lane			
		San Clemente City Beach at South Linda Lane			
		San Clemente City Beach at Lifeguard Headquarters			
		under San Clemente Municipal Pier			
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)			
		San Clemente State Beach at Riviera Beach			
		Can Clemente State Beach at Cypress Shores			
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	45%	44%	47%
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	40%	40%	41%
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	33%	33%	36%

Table 6.5 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	26%	26%	26%
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	37%	37%	37%
		La Jolla Shores Beach at Caminito del Oro			
		La Jolla Shores Beach at Vallecitos			
		La Jolla Shores Beach at Avenida de la Playa			
		at Casa Beach, Children's Pool			
		South Casa Beach at Coast Boulevard			
		Whispering Sands Beach at Ravina Street			
		Windansea Beach at Vista de la Playa			
		Windansea Beach at Bonair Street			
		Windansea Beach at Playa del Norte			
		Windansea Beach at Palomar Avenue			
		at Tourmaline Surf Park			
		Pacific Beach at Grand Avenue			
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries	49%	49%	51%
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	46%	43%	49%
	San Diego River	lower 6 miles	46%	43%	49%
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	46%	43%	51%
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	41%	41%	43%

(b) Interim Effluent Limitations

Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the interim compliance dates under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.c.(2)(a):

Table 6.6
Interim Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watersheds and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
South Orange County	**San Joaquin Hills HSA** (901.11) and **Laguna Hills HSA** (901.12) - Pacific Ocean Shoreline	45.89%	45.86%	49.14%	23.43%	26.04%	25.63%
	Aliso HSA (901.13) - Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	47.74%	47.79%	49.57%	12.65%	13.31%	13.76% (13.69%)**
	Dana Point HSA (901.14) - Pacific Ocean Shoreline	47.52%	47.52%	49.49%	6.58%	7.43%	7.58%
	Lower San Juan HSA (901.27) - Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	36.48%	37.11%	47.47%	9.61%	6.41%	13.56% (13.45%)**
	San Clemente HA (901.30) - Pacific Ocean Shoreline	47.14%	47.12%	49.42%	11.93%	12.29%	12.63%
San Luis Rey River	**San Luis Rey HU** (903.00) - Pacific Ocean Shoreline	19.07%	19.55%	43.69%	2.81%	1.56%	5.85%
Carlsbad	**San Marcos HA** (904.50) - Pacific Ocean Shoreline	41.41%	41.28%	48.02%	9.24%	9.49%	10.10%

Table 6.6 (Cont'd)
Interim Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watersheds and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
San Dieguito River	**San Dieguito HU** (905.00) - Pacific Ocean Shoreline	7.20%	10.36%	41.74%	2.15%	0.73%	3.86%
Penasquitos	**Miramar Reservoir HA** (906.10) - Pacific Ocean Shoreline	48.25%	48.30%	49.71%	0.81%	1.00%	0.97%
Mission Bay	**Scripps HA** (906.30) - Pacific Ocean Shoreline	48.22%	48.21%	49.63%	8.16%	10.57%	9.41%
	Tecolote HA (906.50) - Tecolote Creek	47.26%	47.30%	49.47%	8.26%	10.24%	9.08% (9.04%)**
San Diego River	**Mission San Diego HSA** (907.11) and **Santee HSA** (907.12) - Pacific Ocean Shoreline - Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles)	37.02%	34.72%	46.98%	19.07%	26.61%	21.37% (21.24%)**
San Diego Bay	**Chollas HSA** (908.22) - Chollas Creek	46.03%	46.08%	49.23%	8.91%	12.42%	10.73% (10.68%)**

Notes:
* The percent load reductions are based on reducing loads compared to pollutant loads from 2001 to 2002.
** The alternative *Enterococcus* percent load reduction was calculated based on a numeric target of 104 MPN/100mL instead of 61 MPN/100mL, protective of the REC-1 "moderately to lightly used area" usage frequency that is protective of freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative pollutant load reductions can be utilized.

(3) Interim TMDL Compliance Determination

Compliance with the interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(f) There are no exceedances of the interim receiving water limitations under Specific Provision 6.c.(2)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(g) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the interim effluent limitations under Specific Provision 6.c.(2)(b); OR

(h) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

d. Specific Monitoring and Assessment Requirements

(1) Monitoring and Assessment Requirements for Beaches

(a) Monitoring Stations

For beaches addressed by the TMDL, monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[34] If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources

[34] Commonly referred to as AB 411 monitoring

causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations at least once within the first 24 hours of the end of a storm event[35] during the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer in exceedance of the allowable exceedance frequencies in the receiving waters.

(iii) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(iv) For Pacific Ocean Shoreline segments or areas listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final

[35] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

WQBELs for the Pacific Ocean Shoreline segments or areas listed in Table 6.0 have been achieved.

(ii) Dry weather exceedance frequencies must be calculated as follows:

[a] 30-day geometric means must be calculated from the results of any dry weather samples collected from the segments or areas for each water body listed in Table 6.0;
[b] The method and number of samples need for calculating the 30-day geometric means must be consistent with the number of samples required by the Ocean Plan;
[c] Where there are multiple segments or areas associated with a water body listed in Table 6.0, the Copermittees may calculate geometric means for each segment or area, or combine the dry weather monitoring data from all the segments or areas to calculate geometric means for the water body;
[d] The exceedance frequency must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the dry season.

(iii) Wet weather exceedance frequencies must be calculated as follows:

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;
[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;
[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria densities reported from each storm event sampled; and
[d] The single sample maximum exceedance frequency must be calculated by dividing the number of wet weather days that exceed the single sample maximum receiving water limitations in Table 6.2 by the total number of wet weather days during the rainy season.
[e] The data collected for dry weather must be used in addition to the data collected for wet weather to calculate the wet weather 30-day geometric means. The exceedance frequency of the wet weather 30-day geometric means must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of

geometric means calculated from samples collected during the wet season.

(iv) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(v) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) Monitoring and Assessment Requirements for Creeks and Creek Mouths

(a) Monitoring Stations

For creeks addressed by the TMDL, monitoring locations should consist of, at a minimum, a location at or near the mouth of the creek (e.g. Mass Loading Station or Mass Emission Station) and one or more locations upstream of the mouth (e.g. Watershed Assessment Station). If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations in accordance with the requirements of Provision D.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations within the first 24 hours of the end of a storm event[36] during the rainy season (i.e. October 1 through April 30).

(iii) Samples collected from receiving water monitoring stations must be analyzed for fecal coliform and *Enterococcus* indicator bacteria.

[36] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(iv) For creeks or creek mouths listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the receiving water monitoring data to assess whether the interim and final receiving water WQBELs for the creeks and creek mouths listed in Table 6.0 have been achieved.

(ii) Dry weather exceedance frequencies must be calculated as follows:

[a] 30-day geometric means must be calculated from the results of any dry weather samples collected from the segment or area for each water body listed in Table 6.0;
[b] The method and number of samples need for calculating the 30-day geometric means must be consistent with the number of samples required by the Basin Plan;
[c] The exceedance frequency must be calculated by dividing the number of 30-day geometric means that exceed the 30-day geometric mean receiving water limitations in Table 6.2 by the total number of 30-day geometric means calculated from samples collected during the dry season.

(iii) Wet weather exceedance frequencies must be calculated as follows:

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;
[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;
[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria densities reported from each of the storm events sampled; and

[d] The exceedance frequency must be calculated by dividing the number of wet weather days that exceed the single sample maximum receiving water limitations in Table 6.2 by the total number of wet weather days during the rainy season.

[e] The data collected for dry weather must be used in addition to the data collected for wet weather to calculate the wet weather 30-day geometric means. The exceedance frequency of the wet weather 30-day geometric means must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the wet season.

(iv) The Responsible Copermittee must identify and incorporate additional MS4 outfall and receiving water monitoring stations and/or adjust monitoring frequencies to identify sources causing exceedances of the receiving water WQBELs.

(v) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(vi) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

ATTACHMENT F

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

FACT SHEET / TECHNICAL REPORT

FOR

ORDER NO. R9-2013-0001
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

MAY 8, 2013

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I. FACT SHEET FORMAT

This Fact Sheet briefly sets forth the principal facts and the significant factual, legal, methodological, and policy questions that the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) considered in preparing Order No. R9-2013-0001 (Order). In accordance with the Code of Federal Regulations (CFR) Title 40 Parts 124.8 and 124.56 (40 CFR 124.8 and 40 CFR 124.56), this Fact Sheet includes, but is not limited to, the following information:

1. Contact information
2. Public process and notification procedures
3. Background of municipal storm water permits
4. Regional MS4 Permit approach
5. Economic considerations
6. Applicable statutes, regulations, plans and policies
7. Discussion of the provisions in the Order

Tentative Order No. R9-2013-0001 was distributed for public review on October 31, 2012. The San Diego Water Board accepted written comments on the Tentative Order until January 11, 2013. A public hearing was subsequently held on April 10 and 11, 2013, that was continued to May 8, 2013 to receive oral comments from interested persons.

The San Diego Water Board files applicable to the issuance of Order No. R9-2013-0001 are incorporated into the administrative record in support of the findings and requirements of the Order.

II. CONTACT INFORMATION

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The Order and other related documents can be downloaded from the San Diego Water Board website at

http://www.swrcb.ca.gov/rwqcb9/water_issues/programs/stormwater/index.shtml

The documents referenced in this Fact Sheet and in Order No. R9-2013-0001 are available for public review at the San Diego Water Board office, located at the address listed above. Public records are available for inspection during regular business hours, from 8:00 am to 5:00 pm Monday through Friday. To schedule an appointment to inspect public records, contact the San Diego Water Board Records Management Officer at 858-467-2952.

COPERMITTEES

Orange County Copermittees

- County of Orange
  - City of Aliso Viejo
  - City of Dana Point
  - City of Laguna Beach
  - City of Laguna Hills
  - City of Laguna Niguel
  - City of Laguna Woods
  - City of Lake Forest
  - City of Mission Viejo
  - City of Ranch Santa Margarita
  - City of San Clemente
  - City of San Juan Capistrano
  - Orange County Flood Control District

Riverside County Copermittees

- County of Riverside
  - City of Murrieta
  - City of Temecula
  - City of Wildomar
  - Riverside County Flood Control and Water Conservation District

San Diego County Copermittees

- County of San Diego
  - City of Carlsbad
  - City of Chula Vista
  - City of Coronado
  - City of Del Mar
  - City of El Cajon
  - City of Encinitas
  - City of Escondido
  - City of Imperial Beach
  - City of La Mesa
  - City of Lemon Grove
  - City of National City
  - City of Oceanside
  - City of Poway
  - City of San Diego
  - City of San Marcos
  - City of Santee
  - City of Solana Beach
  - City of Vista
  - San Diego County Regional Airport Authority
  - San Diego Unified Port District

III. PUBLIC PROCESS AND NOTIFICATION PROCEDURES

The San Diego Water Board followed the schedule listed below for the preparation of Order No. R9-2013-0001:

1. On February 8, 2011, the San Diego Water Board met with the San Diego County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No. R9-2007-0001.

2. Between February and May 2011, the San Diego Water Board met with select San Diego County, Orange County, and Riverside County Copermittees, as well as representatives of the environmental community to discuss concepts and receive recommendations for elements to be incorporated in a Regional Municipal Separate Storm Sewer System Permit (Regional MS4 Permit).

3. On June 27, 2011 the San Diego Water Board received the Report of Waste Discharge from the San Diego County Copermittees for the renewal of their NPDES permit, Order No. R9-2007-0001.

4. On April 9, 2012, the San Diego Water Board released an administrative draft of Tentative Order No. R9-2013-0001 for preliminary informal comments and feedback.

5. On April 25, 2012, the San Diego Water Board held an informal public workshop to present the administrative draft of Tentative Order No. R9-2013-0001 and receive verbal comments.

6. Between June and August 2012, the San Diego Water Board held four (4) focused meetings with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community, and USEPA) to discuss and receive preliminary comments and feedback about specific elements in the administrative draft of Tentative Order No. R9-2013-0001.

7. On September 5, 2012, the San Diego Water Board held an informal public workshop to present the modifications that were expected to be incorporated into the Tentative Order based on the preliminary comments and feedback received during the focused meetings held between June and August 2012.

8. Informal written comments on the administrative draft of Tentative Order No. R9-2013-0001 were accepted until September 14, 2012.

9. On October 12, 2012, the San Diego Water Board released a revised administrative draft of Tentative Order No. R9-2013-0001.

10. On October 24, 2012, the San Diego Water Board held a focused meeting with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community, and USEPA) to discuss modifications incorporated into the administrative draft of Tentative Order No. R9-2013-0001.

11. On October 31, 2012, the San Diego Water Board released Tentative Order No. R9-2013-0001 for formal public review and comment.

12. On November 13, 2012 and December 12, 2012, the San Diego Water Board held a formal public Board workshop to present the public draft of Tentative Order No. R9-2013-0001 and receive verbal comments.

13. Formal written comments on the public draft of Tentative Order No. R9-2013-0001 were accepted until January 11, 2013.

14. A public hearing of Tentative Order No. R9-2013-0001 was conducted on April 10 and 11, 2013, that was continued to May 8, 2013.

IV. BACKGROUND OF THE SAN DIEGO REGION MUNICIPAL STORM WATER PERMITS

In developed and developing areas, storm water runoff is commonly transported through municipal separate storm sewer systems (MS4s) and discharged into local receiving water bodies. As the storm water runs off and flows over the land or impervious surfaces (e.g., paved streets, parking lots, and building rooftops), it accumulates debris, chemicals, sediment, and other pollutants that can adversely affect receiving water quality if discharged untreated. The United States Environmental Protection Agency (USEPA) recognizes wet weather flows from urban areas as the number one source of estuarine pollution in coastal communities,[1] such as those within the San Diego Region.

The federal Clean Water Act (CWA) was amended in 1987 to address and regulate discharges of storm water associated with industrial activities and from municipal storm sewers. With the amendments, many municipalities throughout the United States were obligated for the first time to obtain National Pollutant Discharge Elimination System (NPDES) permits for discharges of storm water from their MS4s.

In response to the CWA 1987 amendment, as well as the pending federal NPDES regulations which would implement the amendment, the San Diego Water Board issued "early" MS4 permits. The San Diego Water Board adopted and issued Order Nos. 90-38, 90-42, and 90-46 to regulate storm water discharges from the MS4s in Orange County, San Diego County, and Riverside County, respectively, within the San Diego Region on July 16, 1990.

The "early" MS4 permits, or First Term Permits, were issued prior to the November 1990 promulgation of the final federal NPDES storm water regulations. By issuing these First Term Permits before the federal regulations took effect, the San Diego Water Board was able to provide the Copermittees additional flexibility in addressing and managing storm water discharges. The First Term Permits contained the essentials of the 1990 regulations, and required the Copermittees to develop and implement runoff management programs, but provided little specificity about what was required to be included in or actually achieved by those programs.

The flexibility provided in the First Term Permits was generally continued through the Second Term Permits. The combination of the lack of specificity in the First and Second Term Permits, a general lack of meaningful action by the Copermittees and a general lack of corresponding reaction (i.e. enforcement) by the San Diego Water Board during the first ten years of the storm water program, resulted in few substantive steps towards achieving improvements in the quality of receiving waters or storm water discharges from the MS4s.

[1] US EPA. 1999. 40 CFR Parts 9, 122, 123, and 124. National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. 64 FR 68727.

From 2001, the regulatory approach incorporated into Third Term Permits was a significant departure from the regulatory approach of the First and Second Term Permits. The Third Term Permits issued by the San Diego Water Board included more detailed requirements that outlined the minimum level of implementation required for the Copermittees' programs to meet the maximum extent practicable (MEP) standard for storm water. The Third Term Permits included more detail to emphasize and enhance the jurisdictional runoff management programs developed by the Copermittees and introduced requirements for developing and implementing watershed-based programs.

The Third Term Permits also incorporated two precedent setting decisions by the State Water Board. In Order WQ 99-05, the State Water Board established receiving water limitation language to be included in all MS4 permits. The State Water Board's precedential language clarified that municipal storm water permits must include provisions requiring discharges to be controlled to attain water quality standards in receiving waters. Unlike previously adopted versions of the receiving water limitation language in the First and Second Term Permits, the language no longer stated that "*violations of water quality standards are not violations of the municipal storm water permit under certain conditions*." In addition, the receiving water limitation language no longer indicated that the "*implementation of best management practices is the 'functional equivalent' of meeting water quality standards*." State Water Board Order WQ 99-05 specifically requires language in MS4 permits for the Copermittees to comply with water quality standards based discharge prohibitions and receiving water limitations through timely implementation of control measures and other actions to reduce pollutants in discharges. (See State Water Board Order WQ 99-05 (*Environmental Health Coalition*)).

In Order WQ 2000-11, also a precedential decision, the State Water Board addressed design standards for structural post-construction best management practices (BMPs) for new development and significant redevelopment. The State Water Board found that the design standards, which require that runoff generated by 85 percent of storm events from specific development categories be infiltrated or treated, reflect the MEP standard. State Water Board Order WQ 2000-11 also found that the post-construction BMP provisions, or Standard Storm Water Mitigation Plan (SSMP) provisions, constitute MEP for addressing storm water pollutant discharges resulting from specific development categories.

The Third Term San Diego County and Orange County Permits (Order Nos. 2001-01 and R9-2002-0001, respectively) were appealed to the State Water Board. Minor modifications were made by the State Water Board, but the requirements were largely upheld. In State Water Board Order WQ 2001-15, the State Water Board upheld the Third Term San Diego County Permit requirements with certain modifications. The State Water Board removed the prohibition of storm water discharges *into* the MS4 that cause or contribute to exceedances of water quality objectives. The revision allows for treatment of pollutants in storm water runoff after the pollutants have entered the MS4. State Water Board Order WQ 2001-15 otherwise upheld all the other requirements of the permit.

In addition to the modification to the discharge prohibition in Order WQ 2001-15, the State Water Board refined Order WQ 99-05 by making clear that the Copermittees may use an iterative approach to achieving compliance with water quality standards that involves ongoing assessments and revisions. Thus, the language for the discharge prohibitions and receiving water limitations was revised to explicitly require the Copermittees to implement an iterative process of assessments and revisions to comply with the discharge prohibitions and receiving water limitations. The San Diego Water Board retained the authority to enforce receiving water limitations and discharge prohibitions even if the Copermittee is engaged in the iterative process.

The Third Term San Diego County Permit was subsequently challenged in the Superior Court of the State of California and the Court of Appeal, Fourth Appellate District. The Court of Appeal, Fourth Appellate District, found that the approach of the Third Term San Diego County Permit to regulating discharges into the MS4 was appropriate (*Building Industry Ass'n. v. State Water Resources Control Bd., et al.,* 124 Cal.App.4th 866 (2004)). The State of California Supreme Court denied review sought by the Building Industry Association in March 2005.

The Fourth Term Permits, or current MS4 permits, began with the adoption of Order No. R9-2007-0001 issued to the Copermittees of San Diego County in January 2007. Order Nos. R9-2009-0002 and R9-2010-0016 were subsequently issued to the Copermittees of Orange County and Riverside County. The Fourth Term Permits continued to include more detailed requirements to be implemented by each Copermittee's jurisdictional runoff management program. The Fourth Term Permits also include requirements to further emphasize a watershed management approach and for more coordination among jurisdictional runoff management programs. In addition, the Fourth Term Permits included more requirements for assessing the effectiveness of the runoff management programs being implemented by the Copermittees. The intent of the inclusion of additional requirements was to enhance and better define elements of the permit that were expected to be incorporated into the iterative process for managing runoff from each Copermittee's jurisdiction and within the watersheds of the San Diego Region.

The Fourth Term Permits include several new and emerging approaches for managing storm water runoff and discharges. Low impact development (LID) requirements are included for development and significant redevelopment to reduce pollutants in storm water runoff from sites through more natural processes such as infiltration and biofiltration closer to the source, rather than utilizing conventional mechanical end-of-pipe treatment systems. Hydrograph modification (hydromodification) management requirements also are included to mitigate the potential for increased erosion in receiving waters due to increased runoff rates and durations often caused by development and increased impervious surfaces. The Fourth Term Orange County and Riverside County Permits introduced requirements to identify areas of existing development where retrofitting with LID projects would be feasible and could be implemented to reduce storm water runoff and pollutants in storm water discharges.

The Fourth Term Orange County and Riverside County Permits included a clearer distinction between storm water and non-storm water discharges. The term “urban runoff” was completely removed, and a distinction between storm water (wet weather) runoff and non-storm water (dry weather) runoff was emphasized. This clarification was made to prevent any potential misunderstanding that regulation under the MS4 permits is limited only to urbanized areas, and to prevent non-storm water runoff from being managed in the same manner as storm water runoff. The term “urban runoff” is not defined in the Code of Federal Regulations (CFR) or Federal Register (FR) in the regulation of MS4 discharges. According to the CWA 402(p)(3)(B)(ii), MS4 permits must include a requirement to effectively prohibit non-storm water discharges into the MS4s.

Finally, for the Fourth Term Orange County and Riverside County Permits the San Diego Water Board found that non-storm water discharges to the MS4 from over application of irrigation water are sources of pollutants. The San Diego Water Board found that non-storm water discharges resulting from over-irrigation must be prohibited from entering the MS4 in accordance with the requirements of the CWA and pursuant to 40 CFR 122.26(d)(2)(iv)(B)(1).

The requirements of the Fourth Term Permits issued to the Copermittees in each county within the San Diego Region now have substantively the same core requirements such as discharge prohibitions, receiving water limitations, jurisdictional runoff management program components, and monitoring program requirements. There are, however, several inconsistencies that exist among the three Fourth Term Permits which complicate oversight and implementation of the permits by the San Diego Water Board.

The Fourth Term San Diego County Permit expired in January 2012. The Fourth Term Orange County and Riverside County Permits will expire in December 2014 and November 2015, respectively. Issuing the Fifth Term Permits within five years for three counties under three different permits would require the San Diego Water Board to expend significant time and resources for the issuance of the permits through three separate public proceedings, thereby greatly reducing the time and resources available to oversee implementation and compliance. Multiple permits also create confusion for determining compliance among regulated entities, especially for the land development community.

The San Diego Water Board has acknowledged that issuing a single MS4 permit for all the Copermittees in the San Diego Region can and is expected to result in more consistent implementation, improve communication among agencies within watersheds crossing multiple jurisdictions, and minimize resources spent with each permit renewal process. Within the findings of the Fourth Term Riverside County Permit issued in November 2010, the San Diego Water Board notified the public of its intent to develop and issue a single Regional MS4 Permit.

V. REGIONAL MS4 PERMIT APPROACH

The Fifth Term Permit, or Regional MS4 Permit, shifts the focus of the permit requirements from a minimum level of actions to be implemented by the Copermittees to identifying outcomes to be achieved by those actions. Order No. R9-2013-0001 represents an important paradigm shift in the approach for MS4 permits within the San Diego Region.

Historical Permitting Approach

The First and Second Term Permits were very broad and provided little specificity about what was required to be developed and implemented by the Copermittees. The Third Term Permits began to become more specific about the minimum level of implementation required by the Copermittees. The Fourth Term Permits, or current permits, subsequently increased in specificity. The MS4 permits have progressively become more detailed and focused on specifying the minimum level of actions expected to be implemented by the Copermittees. As detailed and specific as the MS4 permits have become, however, they include very little detail about what the desired outcomes of the required actions are expected to achieve. Compliance with the permit requirements has essentially been tracking numbers of actions and reporting, not tracking progress or actual improvements in the quality of receiving waters or discharges from the MS4s. The result has been an increase in actions being implemented by the Copermittees with little or no ability or expectations to determine whether or not improvements in water quality are being achieved.

The Fourth Term Permits result in significant resource expenditure by the Copermittees to report permit compliance information to the San Diego Water Board in the form of annual jurisdictional runoff management program, watershed program, and monitoring program reports. The San Diego Water Board must then expend much of its limited resources on reviewing more than 50 voluminous reports submitted annually by the Copermittees. The information currently reported by the Copermittees is of limited value when trying to measure progress toward achieving improvements in the quality of receiving waters or discharges from the MS4s. Oversight of the MS4 permits is further complicated by the inconsistencies among the requirements issued to the Orange County, San Diego County, and Riverside County Copermittees under three separate MS4 permits.

Under the Fourth Term Permits, the Copermittees must expend a significant portion of their limited resources collecting data of limited value, and putting together reports to submit that information to the San Diego Water Board. Likewise, the San Diego Water Board must expend most of its limited resources reviewing reports, and developing permits instead of working directly with the Copermittees to identify solutions to problems causing impacts to water quality. This is an unsustainable course that will continue to demand more resources from the Copermittees and the San Diego Water Board, and would continue to result in unknown water quality benefits.

New Permitting Approach

The goal of the Regional MS4 Permit is twofold: 1) bring a consistent set of MS4 permit requirements to all of the Copermittees within the San Diego Region; and, 2) provide an MS4 permit with requirements that will allow the Copermittees to focus their efforts and resources on achieving goals and desired outcomes toward the improvement of water quality rather than completing specific actions.

The overall approach included in the Regional MS4 Permit with respect to the jurisdictional runoff management programs will not differ significantly from the current permits. The general requirements for the jurisdictional runoff management program components and compliance with those requirements will remain and be applied consistently throughout the San Diego Region under the Regional MS4 Permit.

The most significant difference in the new permitting approach is the specific manner of implementation for those jurisdictional runoff management programs. Implementation will be based on decisions made by the Copermittees in accordance with what they have identified as their highest priority water quality conditions. In other words, the Copermittees will have significant control in how to implement the jurisdictional runoff management programs to best utilize their available resources in addressing a specific set of priorities effectively, instead of trying to address all the water quality priorities ineffectively.

The Copermittees are given the responsibility of identifying their highest priority water quality conditions that they intend to address. The Copermittees will develop goals that can be used to measure and demonstrate progress or improvements toward addressing those priorities. In addition to the goals, the Copermittees will provide a schedule for achieving the goals for those highest priorities. The measurement of progress toward achieving the goals for those highest priorities requires a better defined and more focused program of monitoring and assessment than under the Fourth Term Permits.

The monitoring and assessment program must be designed to inform the Copermittees of their progress, and the need for modifications in their jurisdictional runoff management programs and schedules to achieve their goals to improve water quality. The monitoring and assessment program requirements will have a more central role in the Regional MS4 Permit than in earlier permits. The monitoring and assessment requirements must also be designed to enable the Copermittees to focus and direct their efforts in implementing their jurisdictional runoff management programs toward their stated desired outcomes to improve the quality of receiving waters and/or discharges from the MS4s.

By providing an MS4 permit that allows the Copermittees to make more decisions about how to utilize and focus their resources, along with a better defined monitoring and assessment program to inform their water quality management decisions, the Copermittees will have the opportunity to:

1) *Plan strategically*. The Copermittees must have the ability to identify their available resources and develop and implement long term plans that can organize, collect, and use those resources in the most strategically advantageous and efficient manner possible. This ability to develop long term plans will allow the Copermittees to focus and utilize their resources in a more concerted way over the short term and long term to address specific water quality priorities through stated desired outcomes.

2) *Manage adaptively*. The Copermittees must be given the ability to modify their plans as additional information and data are collected from the monitoring and assessment programs. The Copermittees' plans may require modifications to the programs, priorities, goals, strategies, and/or schedules in order for the Copermittees to achieve a stated desired outcome.

3) *Identify synergies*. The Copermittees must be given more flexibility to identify efficiencies within and among their jurisdictional runoff management programs as the strategies are developed and implemented to increase the Copermittees' collective effectiveness. The Copermittees must also be able to identify and utilize resources available from other agencies and entities to further augment and enhance their jurisdictional runoff management programs and/or to collectively work with those other agencies and entities toward achieving a stated desired outcome.

The Regional MS4 Permit requirements will provide the Copermittees the flexibility and responsibility to decide what actions will be necessary to achieve an outcome that is tailored and designed by the Copermittees to improve specific prioritized water quality conditions. The San Diego Water Board expects the approach of the Regional MS4 Permit to give the Copermittees a greater sense of ownership for restoring the quality of receiving waters in the San Diego Region by becoming an integral part of the decision making process in identifying water quality conditions to be addressed, as well as determining the best use of their resources.

VI. ECONOMIC CONSIDERATIONS

Statutory Considerations

California Water Code (CWC) section 13241 requires the San Diego Water Board to consider certain factors, including economic considerations, in the adoption of water quality objectives. CWC section 13263 requires the San Diego Water Board to take into consideration the provisions of CWC section 13241 in adopting waste discharge requirements.

In *City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, the California Supreme Court considered whether Regional Water Boards must comply with CWC section 13241 when issuing waste discharge requirements under CWC section 13263(a) by taking into account the costs a permittee will incur in complying with the permit requirements. The Court concluded that whether it is necessary to consider such cost information "*depends on whether those restrictions meet or exceed the requirements of the federal Clean Water Act.*" (*Id.* at p. 627.) The Court ruled that Regional Water Boards may not consider the factors in CWC section 13241, including economics, to justify imposing pollutant restrictions that are less stringent than applicable federal law requires. (*Id.* At pp. 618, 626-627 ["*[Water Code section 13377 specifies that [] discharge permits issued by California's regional boards must meet the federal standards set by federal law. In effect, section 13377 forbids a regional board's consideration of any economic hardship on the part of the permit holder if doing so would result in the dilution of the requirements set by Congress in the Clean Water Act...Because CWC section 13263 cannot authorize what federal law forbids, it cannot authorize a regional board, when issuing a [] discharge permit, to use compliance costs to justify pollutant restrictions that do not comply with federal clean water standards*."]). However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Regional Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

As discussed in Section VII.F, Unfunded State Mandates, the San Diego Water Board finds that the requirements in this Order are not more stringent than the minimum federal requirements. Among other requirements, federal law requires MS4 permits to include requirements to effectively prohibit non-storm water discharges into the MS4s, in addition to requiring controls to reduce the discharge of pollutants in storm water to the MEP, and other provisions as USEPA or the State determines are appropriate for the control of pollutants in MS4 discharges.

The requirements in this Order may be more specific or detailed than those enumerated in federal regulations under 40 CFR 122.26 or in the USEPA guidance. However, the requirements have been designed to be consistent with and within the federal statutory mandates described in CWA section 402(p)(3)(B)(ii) and (iii) and the related federal regulations and guidance. Consistent with federal law, all of the

conditions in this Order could have been included in a permit adopted by USEPA in the absence of the in lieu authority of California to issue NPDES permits.

Moreover, the inclusion of numeric WQBELs in this Order does not cause this Order to be more stringent than federal law. Federal law authorizes both narrative and numeric effluent limitations to meet state water quality standards. The inclusion of WQBELs as discharge specifications in an NPDES permit in order to achieve compliance with water quality standards is not a more stringent requirement than the inclusion of BMP based permit limitations to achieve water quality standards (State Water Board Order No. WQ 2006-0012 (*Boeing*)). Therefore, consideration of the factors set forth in CWC section 13241 is not required for permit requirements to implement the effective prohibition on the discharge of non-storm water discharges into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determine appropriate to control such pollutants, as those requirements are mandated by federal law.

Included in the provisions of the Order are monitoring and reporting requirements that are designed to demonstrate that the Copermittees are implementing programs to comply with the CWA municipal storm water requirements. CWA section 308(a) and 40 CFR 122.41(h), (j)-(l), 122.44(i) and 122.48 require that all NPDES permits specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s (40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c)) also specify additional monitoring and reporting requirements. In addition to the federal requirements of the CWA, the San Diego Water Board also has the authority in CWC 13383 to establish monitoring, reporting, and recordkeeping requirements that implement federal and state laws and regulations through NPDES permits. .

The monitoring and assessment information that will be reported to the San Diego Water Board is necessary to determine if the Copermittees are making progress toward achieving compliance with the discharge prohibitions, receiving water limitations, and effluent limitations under Provision A of the Order. The monitoring and assessment information that will be reported is also expected to be key to the iterative approach and adaptive management process that is required to be implemented by the Copermittees if they cannot meet the discharge prohibitions and receiving water limitations under the present conditions, which is also part of the requirements under Provision A of the Order.

Notwithstanding the above, the San Diego Water Board has considered cost information in issuing this Order, as discussed below. The San Diego Water Board has also considered all of the evidence that has been presented to the San Diego Water Board regarding the CWC section 13241 factors in adopting this Order. The San Diego Water Board finds that the requirements in this Order are reasonably necessary to protect beneficial uses identified in the Basin Plan and the economic information related to costs of compliance and other CWC section 13241 factors are not sufficient to justify failing to protect those beneficial uses. Where appropriate, the

San Diego Water Board has provided or will consider providing the Copermittees with additional time to implement control measures to achieve final WQBELs and/or water quality standards.

Cost Information

Discussions of the financial and economic ramifications of municipal storm water management programs tend to focus on the significant costs incurred by municipalities in developing and implementing the programs. When considering the cost of implementing the programs, however, it is also important to consider the alternative costs that are incurred when programs are not fully implemented, as well as the economic benefits which result from effective program implementation.

The recent financial and economic conditions have amplified the concerns about the costs incurred by the municipalities in developing and implementing their programs. The reduction in resources resulting from the recent financial and economic conditions has been cited by many of the Copermittees as a justification for reducing the requirements that must be met by their programs. While the recent conditions are a cause for concern in the short term, these programs also have an opportunity to identify and implement improvements and efficiencies before the next period of growth and development, resulting in more effective and sustainable programs over the long term.

In addition, it is very difficult to ascertain the true cost of implementation of the Copermittees' management programs because of inconsistencies in reporting by the Copermittees. Reported costs of compliance for the same program element can vary widely from city to city, often by a very wide margin that is not easily explained.[2] Despite these problems, efforts have been made to identify management program costs, which can be helpful in understanding the costs of program implementation.

The San Diego Water Board recognizes that the Copermittees will incur costs in implementing this Order, potentially above and beyond the costs from the Copermittees' prior permits. The San Diego Water Board also recognizes that, due to California's current economic condition, many Copermittees currently have limited staff and resources to implement actions to address its MS4 discharges. Based on the economic considerations below, the San Diego Water Board has provided the Copermittees a significant amount of flexibility to choose how to implement the requirements of the Order.

The Order also allows the Copermittees to customize their plans, programs, and monitoring requirements. In the end, it is up to the Copermittees to determine the effective BMPs and measures necessary to comply with this Order. The Copermittees can choose to implement the least expensive measures that are effective in meeting the requirements of this Order. This Order also does not require the Copermittees to

[2] LARWQCB, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.

fully implement all requirements within a single permit term. Where appropriate, the Board has provided the Copermittees with additional time outside of the permit term to implement control measures to achieve final WQBELs and/or water quality standards.

The San Diego Water Board has considered available cost information associated with compliance with this Order. It is not possible to predict accurately the cost impact of the requirements that involve an unknown level of implementation or that depend on environmental variables that are as yet undefined. Only general conclusions can be drawn from this information.

Estimated Municipal Storm Water Program Implementation Costs

The USEPA, the State Water Board, and the California Regional Water Quality Control Boards (Regional Water Boards) have attempted to evaluate the costs of implementing municipal storm water programs. The assessments have demonstrated that the true costs are difficult to ascertain and reported costs vary widely. In addition, reported fiscal analyses tend to neglect the costs incurred to municipalities when storm water and non-storm water runoff is not effectively managed, which are incurred as a result of pollution, contamination, nuisance, and damage to ecosystems, property, and human health. Nonetheless, they provide a useful context for considering the costs of requirements within Order No. R9-2013-0001.

In 1999, the USEPA reported on multiple studies it conducted to determine the cost of management programs. A study of Phase II municipalities determined that the annual cost of the Phase II program was expected to be $9.16 per household. The USEPA also studied 35 Phase I municipalities, finding costs to be $9.08 per household annually, similar to those anticipated for Phase II municipalities.[3]

The State Water Board commissioned a study by the California State University, Sacramento to assess costs of the Phase I MS4 program. This study includes an assessment of costs incurred by Phase I MS4s throughout the state to implement their programs. Annual cost per household in the study ranged from $18 to $46, with the Fresno-Clovis Metropolitan Area representing the lower end of the range, and the City of Encinitas (in San Diego County) representing the upper end of the range.[4]

A study on Phase I MS4 program costs was also conducted by the California Regional Water Quality Control Board, Los Angeles Region (Los Angeles Water Board), where program costs reported in the municipalities' annual reports were assessed. The Los Angeles Water Board estimated that average per household cost to implement the MS4 program in Los Angeles County was $12.50. [5]

[3] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791-68792.
[4] State Water Board, 2005. NPDES Stormwater Cost Survey. P. ii.
[5] Los Angeles Water Board, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.

It is important to note that reported program costs are not all attributable to solely complying with MS4 permits. Many program components, and their associated costs, existed before any MS4 permits were ever issued. For example, street sweeping and trash collection costs cannot be solely or even principally attributable to MS4 permit compliance, since these practices have long been expected from and implemented by municipalities.

Therefore, true program cost resulting from MS4 permit requirements is some fraction of reported costs. The California State University, Sacramento study found that only 38 percent of program costs are new costs fully attributable to MS4 permits. The remainder of the program costs was either pre-existing or resulted from enhancement of pre-existing programs.[6] In 2000, the County of Orange found that even lower amounts of program costs are solely attributable to MS4 permit compliance, reporting that the amount attributable to implement the County or Orange Drainage Area Management Plan (DAMP), was less than 20 percent of the total budget. The remaining 80 percent was attributable to pre-existing programs.[7] More current data from the County of Orange is not used in this discussion because the County of Orange no longer reports such information.

Estimated Value of Healthy Water Quality

Economic considerations of municipal storm water management programs cannot be limited only to program costs. Evaluation of programs must also consider information on the benefits derived from environmental protection and improvement.[8] Attention is often focused on municipal storm water management program costs, but the programs must also be viewed in terms of their value to the public.

Placing a value on healthy receiving waters is very difficult. Often the value of receiving waters with good water quality manifests in other forms, such as tourism, recreational opportunities, and/or increased property values. When surface water bodies are degraded, thereby degrading the habitat within and adjacent to the water bodies, the public loses the value and benefits associated with being able to use the area in and around the water bodies. Surface waters that are able to support the beneficial uses designated in the Basin Plan can sustain plants and wildlife that can attract visitors and residents, providing aesthetic, recreational, as well as monetary value to the public. At this time, however, there have been no studies for the San Diego Region to quantify the added value that surface waters with healthy water quality can provide.

[6] State Water Board, 2005. NPDES Stormwater Cost Survey. P. 58.
[7] County of Orange, 2000. A NPDES Annual Progress Report. P. 60.
[8] Ribaudo M.O. and D. Heelerstein. 1992, *Estimating Water Quality Benefits: Theoretical and Methodological Issues.* U.S. Department of Agriculture. Technical Bulletin No. 1808.

USEPA has estimated that household willingness to pay for improvements in fresh water quality for fishing and boating is approximately $158-$210.[9] This estimate can be considered conservative, since it does not include important considerations such as marine waters benefits, wildlife benefits, or flood control benefits. Another study conducted by California State University, Sacramento reported that the annual household willingness to pay for statewide clean water is approximately $180.[10]

A study conducted by the University of Southern California and University of California, Los Angeles assessed the costs and benefits of implementing various approaches for achieving compliance with the MS4 permits in the Los Angeles region. The study found that non-structural systems would cost $2.8 billion but provide $5.6 billion in benefit. If structural systems were determined to be needed, the study found that total costs would be $5.7 to $7.4 billion, while benefits could reach $18 billion.[11] Costs are anticipated to be borne over many years, probably at least ten years.

As can be seen, the benefits of the municipal storm water management programs are expected to considerably exceed their costs. Such findings are corroborated by USEPA, which found that the benefits of implementation of its Phase II storm water rule would also outweigh the costs.[12]

[9] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68793.
[10] State Water Board, 2005. NPDES Stormwater Cost Survey. P. iv.
[11] Los Angeles Water Board, 2004. Alternative Approaches to Stormwater Control.
[12] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791.

VII. APPLICABLE STATUTES, REGULATIONS, PLANS AND POLICIES

A. Legal Authorities – Federal Clean Water Act and California Water Code

This Order is issued pursuant to section 402 of the CWA and implementing regulations adopted by the USEPA and chapter 5.5, division 7 of the CWC (commencing with section 13370). This Order serves as an NPDES permit for point source discharges to surface waters. This Order also serves as waste discharge requirements pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

The objective of the CWA is "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*." To carry out this objective, the CWA requires the implementation of permit programs to regulate the discharge of pollutants and dredged or fill material to the navigable waters of the U.S. and to regulate the use and disposal of sewage sludge. CWA section 402 provides the legal authority to issue a permit for the discharge of pollutants to waters of the U.S. under the NPDES. The CWA provides that NPDES permits may be issued by states which are authorized to implement the provisions of that act. California became authorized to implement the NPDES permit program on May 14, 1973.

The Porter-Cologne Water Quality Control Act (Division 7, commencing with CWC section 13000) established the State Water Resources Control Board (State Water Board) and nine Regional Water Quality Control Boards (Regional Water Boards) as the principal state agencies with primary responsibility for the coordination and control of water quality. CWC section 13200(f) established the San Diego Water Board, which has the primary responsibility for the coordination and control of water quality in the San Diego Region, which includes all the basins draining into the Pacific Ocean between the southern boundary of the Santa Ana Region and the California-Mexico boundary. The San Diego Water Board implements the CWA through Chapter 5.5 of the CWC, commencing with section 13370. CWC section 13377 provides the San Diego Water Board the legal authority to issue waste discharge requirements to ensure compliance with all applicable provisions of the CWA and acts amendatory thereof or supplementary, thereto, to implement water quality control plans, or for the protection of beneficial uses, or to prevent nuisance.

CWA section 402(p) requires the USEPA or authorized state to issue NPDES permits for storm water discharges from municipal separate storm sewer systems (MS4s) to waters of the U.S. CWA section 402(p)(3)(B)(ii) requires that NPDES permits for storm water discharges from MS4s "*effectively prohibit non-storm water discharges*" into the MS4s. CWA section 402(p)(3)(B)(iii) requires that NPDES permits for storm water discharges from MS4s to "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable* [MEP], *including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*."

The USEPA published implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]), which prescribe permit application requirements for storm water discharges from MS4s pursuant to CWA 402(p), on November 16, 1990. The USEPA published an Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems, which provided guidance on permit application requirements for regulated MS4s, on May 17, 1996. The federal regulations in 40 CFR 122 and guidance issued by USEPA serve as the foundation for the provisions of Order No. R9-2013-0001. The legal authorities provided by the above statutes and regulations are included as part of the discussions in Section VIII of this Fact Sheet.

B. Legal Authority for the Permit Issued on a Region-wide Basis

CWA section 402(p)(3)(B) provides the San Diego Water Board the legal authority to issue an NPDES permit for the San Diego Region as compared to separate MS4 permits based upon County- and partial County-wide boundaries as they exist within the San Diego Region. CWA section 402(p)(3)(B) states that "*Permits for discharges from municipal storm sewers- (i) may be issued on a system- or jurisdiction-wide basis ....*" The federal regulations in 40 CFR 122.26(a)(1)(v) also state that the San Diego Water Board "*may designate dischargers from municipal separate storm sewers on a system-wide or jurisdiction-wide basis. In making this determination, the [San Diego Water Board] may consider the following factors: (A) the location of the discharge with respect to waters of the United States; (B) the size of the discharge; (C) the quantity and nature of the pollutants discharged to waters of the United States; and (D) other relevant factors*."

More specifically, the federal regulations provide that for large and medium MS4 systems, the San Diego Water Board may issue a regional permit. Specifically, the federal regulation in 40 CFR 122.26(a)(3) provide:

"*(ii) The Director may either issue one system-wide permit covering all discharges from municipal separate storm sewers within a large or medium municipal storm sewer system or issue distinct permits for appropriate categories of discharges within a large or municipal separate storm sewer system including, but not limited to: all discharges owned or operated by the same municipality; located within the same jurisdiction; all discharges within a system that discharge to the same watershed; discharges within a system that are similar in nature; or for individual discharges from municipal separate storm sewers within the system.*

(iii) The operator of a discharge from a municipal separate storm sewer which is part of a large or medium municipal separate storm sewer system must either: (A) Participate in a permit application (to be a permittee or a co-permittee) with one or more other operator of discharges from the large or medium municipal storm sewer system which covers all, or a portion of all, discharges from the municipal separate storm sewer system; (B) Submit a distinct permit application

which only covers discharges from the municipal separate storm sewers for which the operator is responsible; or (C) A regional authority may be responsible for submitting a permit application under the following guidelines....

(iv) One permit application may be submitted for all or a portion of all municipal separate storm sewers within adjacent or interconnected large or medium municipal separate storm sewer systems. The Director may issue one systemwide permit covering all, or a portion of all municipal separate storm sewers in adjacent or interconnected large or medium municipal separate storm sewer systems.

(v) Permits for all or a portion of all discharges from large or medium municipal separate storm sewer systems that are issued on a system-wide, jurisdiction-wide, watershed or other basis may specify different conditions relating to different discharges covered by the permit, including different management programs for different drainage areas which contribute storm water to the system."

Based on these regulations, the San Diego Water Board may issue a region-wide MS4 permit. The regulations also clarify that the permit may include different conditions for separate discharges covered by the permit. This allows the San Diego Water Board to ensure that suitable water quality conditions and provisions are identified for each watershed.

The USEPA's responses to comments in the Final Rule for the above-mentioned regulations also make it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide, permits. In the Final Rule published in the Federal Register and containing the responses to comments, USEPA notes that 40 CFR 122.26(a)(3)(iv) would allow an entire system in a geographical region under the purview of a State agency to be designated under a permit.[13] USEPA also states that many commenters wanted to allow the permitting authority broad discretion to establish system-wide permits, and that EPA believes that paragraphs 40 CFR 122.26 (a)(1)(v) and (a)(3)(ii) allow for such broad discretion.[14]

This Order creates watershed requirements that apply to multiple counties. The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees. Managing storm water on a regional and watershed basis is expected to result in improved water quality, as the Order focuses on monitoring and management practices necessary to improve each watershed rather than political boundaries. A single permit also allows the San Diego Water Board staff to expend fewer resources developing successive multiple permits and allows more resources to be devoted to working cooperatively with all three current groups of Copermittees to ensure implementation of this Order results in improved water quality.

[13] 55 Federal Register 47990-01, 48042
[14] Ibid

C. Federal and California Endangered Species Acts

This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2115.5) or the Federal Endangered Species Act (16 United States Code [USC] sections 1531 to 1544). This Order requires compliance with requirements to protect the beneficial uses of waters of the U.S. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

D. California Environmental Quality Act

The action to adopt an NPDES Permit is exempt from the provisions of Chapter 3 of the California Environmental Quality Act (CEQA) (Public Resources Code section 21100, et seq.) pursuant to CWC section 13389. (*County of Los Angeles v. Cal. Water Boards* (2006) 143 Cal.App.4th 985.)

E. State and Federal Regulations, Plans and Policies

The legal authority provided by the following regulations, plans, and policies are also included as part of the discussions in Section VIII of this Fact Sheet.

Water Quality Control Plan for the San Diego Basin

The CWA requires the San Diego Water Board to establish water quality standards for each water body in its region. Water quality standards include beneficial uses, water quality objectives and criteria that are established at levels sufficient to protect beneficial uses, and an antidegradation policy to prevent degrading of waters. On September 8, 1994, the San Diego Water Board adopted the *Water Quality Control Plan for the San Diego Basin (*Basin Plan). The Basin Plan designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters in the San Diego Region. The San Diego Water Board has amended the Basin Plan on multiple occasions since 1994. In addition, the Basin Plan implements State Water Board Resolution No. 88-63, which established state policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply. Beneficial uses applicable to the surface water bodies that receive discharges from the MS4s within the San Diego Region generally include those listed below:

The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region:

- Municipal and Domestic Supply (MUN)
- Agricultural Supply (AGR)

- Industrial Process Supply (PROC)
- Industrial Service Supply (IND)
- Ground Water Recharge (GWR)
- Contact Water Recreation (REC1)
- Non-contact Water Recreation (REC2)
- Warm Freshwater Habitat (WARM)
- Cold Freshwater Habitat (COLD)
- Wildlife Habitat (WILD)
- Rare, Threatened, or Endangered Species (RARE)
- Freshwater Replenishment (FRSH)
- Hydropower Generation (POW)
- Preservation of Biological Habitats of Special Significance (BIOL)

The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region:

- Navigation (NAV)
- Commercial and Sport Fishing (COMM)
- Estuarine Habitat (EST)
- Marine Habitat (MAR)
- Aquaculture (AQUA)
- Migration of Aquatic Organisms (MIGR)
- Spawning, Reproduction, and/or Early Development (SPWN)
- Shellfish Harvesting (SHELL)

Pursuant to Water Code sections 13263 and 13377, the requirements of this Order implement the Basin Plan.

Water Quality Control Plan for Ocean Waters of California, California Ocean Plan

In 1972, the State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan). The State Water Board adopted the most recent amended Ocean Plan on September 15, 2009. The Office of Administrative Law approved it on March 10, 2010. On October 8, 2010, USEPA approved the 2009 Ocean Plan. The Ocean Plan is applicable, in its entirety, to ocean waters of the State. In order to protect beneficial uses, the Ocean Plan establishes water quality objectives and a program of implementation. Pursuant to Water Code sections 13263 and 13377, the requirements of this Order implement the Ocean Plan. The Ocean Plan identifies the beneficial uses of ocean waters of the State to be protected as summarized below:

- Industrial water supply
- Water contact and non-contact recreation, including aesthetic enjoyment; navigation
- Commercial and sport fishing

- Mariculture
- Preservation and enhancement of designated Areas of Special Biological Significance
- Rare and endangered species
- Marine habitat
- Fish spawning and shellfish harvesting

On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving an exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges. The State Water Board Resolution No. 2012-0012 requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject terms and conditions of State Water Board Resolution No. 2012-0012. The Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 applicable to these discharges are hereby incorporated in this Order as if fully set forth herein. Requirements of this Order implement the Ocean Plan.

Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality

On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

Antidegradation Policy

Federal regulations (40 CFR 131.12) require that the state water quality standards include an antidegradation policy consistent with the federal antidegradation policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16 ("Statement of Policy with Respect to Maintaining the Quality of the Waters of the State"). State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law.

The San Diego Water Board's Basin Plan implements and incorporates by reference both the State and federal antidegradation policies. State Water Board Resolution No. 68-16 and 40 CFR 131.12 require the San Diego Water Board to maintain high quality

waters of the State until it is demonstrated that any change in quality will be consistent with maximum benefit to the people of the State, will not unreasonably affect beneficial uses, and will not result in water quality less than that described in the San Diego Water Boards' policies. State Water Board Resolution No. 68-16 requires that discharges of waste be regulated to meet best practicable treatment or control to assure that pollution or nuisance will not occur and the highest water quality consistent with the maximum benefit to the people of the State be maintained.

The discharges permitted in this Order are consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Board Resolution No. 68-16. Many of the water bodies within the area covered by this Order are of high quality. The Order requires the Copermittees to meet best practicable treatment or control to meet water quality standards. As required by 40 CFR 122.44(a), the Copermittees must comply with the "maximum extent practicable" technology-based standard set forth in CWA section 402(p) for discharges of pollutants in storm water from the MS4s.

Many of the waters within the area covered by this Order are impaired and listed on the State's CWA Section 303(d) List and the San Diego Water Board has established TMDLs to address the impairments. This Order requires the Copermittees to comply with permit provisions to implement the WLAs set forth in the TMDLs in order to restore the beneficial uses of the impaired water bodies consistent with the assumptions and requirements of the TMDLs. This Order includes requirements to develop and implement storm water management programs, achieve WQBELs, and effectively prohibit non-storm water discharges into the MS4. The issuance of this Order does not authorize an increase in the amount of discharge of waste.

Anti-Backsliding Requirements

CWA sections 402(o) and 303(d)(4) and 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations or conditions may be relaxed. All effluent limitations and other conditions in this Order are at least as stringent as the effluent limitations in the previous permits issued to the San Diego County Copermittees, the Orange County Copermittees and the Riverside County Copermittees.

Clean Water Act Section 303(d) List

CWA section 303(d)(1) requires each State to identify specific water bodies within its boundaries where water quality standards are not being met or are not expected to be met after implementation of technology-based effluent limitations on point sources. Water bodies that do not meet water quality standards are considered impaired and are placed on the state's "303(d) List." Periodically, USEPA approves the State's 303(d) List.

Most recently, USEPA approved the State's 2010 303(d) List of impaired water bodies on October 11, 2011, which includes certain receiving waters in the San Diego Region. For each listed water body, the state or USEPA is required to establish a TMDL of each pollutant impairing the water quality standards in that water body. A TMDL is a tool for implementing water quality standards and is based on the relationship between pollution sources and in-stream water quality conditions. The TMDL establishes the allowable pollutant loadings for a water body and thereby provides the basis to establish water quality-based controls. These controls should provide the pollution reduction necessary for a water body to meet water quality standards.

A TMDL is the sum of the allowable pollutant loads of a single pollutant from all contributing point sources (the waste load allocations or WLAs) and non-point sources (load allocations of LAs) plus the contribution from background sources and a margin of safety (40 CFR 130.2(i)). MS4 discharges are considered point source discharges. For 303(d)-listed water bodies and pollutants in the San Diego Region, the San Diego Water Board or USEPA develops and adopts TMDLs that specify these requirements.

Since 2002, the San Diego Water Board has established six (6) TMDLs to remedy water quality impairments in various water bodies within the San Diego Region (see Attachment E to the Order). These TMDLs identify MS4 discharges as a source of pollutants to these water bodies, and, as required, establish WLAs for MS4 discharges to reduce the amount of pollutant discharged to receiving waters. CWA section 402(p)(3)(B)(iii) requires the San Diego Water Board to impose permit conditions, including: "management practices, control techniques and system, design and engineering methods, and *such other provisions as the Administrator or the State determines appropriate for the control of such pollutants."* (Emphasis added.) CWA section 402(a)(1) also requires states to issue permits with conditions necessary to carry out the provisions of the CWA. Federal regulations also require that NDPES permits contain WQBELs consistent with the assumptions and requirements of all available WLAs (40 CFR 122.44(d)(1)(vii)(B)). CWC section 13377 also requires that NPDES permits include limitations necessary to implement water quality control plans. Therefore, this Order includes WQBELs and other provisions to implement the TMDL WLAs assigned to Copermittees regulated by this Order.

<u>Other Regulations, Plans and Policies</u>

This Order implements all other applicable federal regulations and State regulations, plans and policies, including the California Toxics Rule at 40 CFR 131.38 (Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California Rule [California Toxics Rule or CTR]), and State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP).

F. Unfunded State Mandates

Article XIII B, Section 6(a) of the California Constitution provides that whenever "*any state agency mandates a new program or higher level of service on any local government, the state shall provide a subvention of funds to reimburse that local government for the costs of the program or increased level of service*." The requirements of this Order do not constitute state mandates that are subject to a subvention of funds for several reasons, including, but not limited to, the following.

First, the requirements of this Order do not constitute a new program or a higher level of service as compared to the requirements contained in the previous Fourth Term Permits. The overarching requirement to impose controls to reduce the pollutants in discharges from MS4s is dictated by the CWA and is not new to this permit cycle (33 USC section 1342(p)(3)(B)). The inclusion of new and advanced measures as the MS4 programs evolve and mature over time is anticipated under the CWA (55 FR 47990, 48052 (Nov. 16, 1990)), and to the extent requirements in this Order are interpreted as new advanced measures, they do not constitute a new program or higher level of service.

Second, and more broadly, mandates imposed by federal law, rather than by a state agency, are exempt from the requirement that the local agency's expenditures be reimbursed (Cal. Const., art. XIII B, section 9, subd. (b)). This Order implements federally mandated requirements under the CWA and its requirements are therefore not subject to subvention of funds. This includes federal requirements to effectively prohibit non-storm water discharges, to reduce the discharge of pollutants in storm water to the MEP, and to include such other provisions as the Administrator or the State determines appropriate for the control of such pollutants (33 USC section 1342(p)(3)(B)). Federal cases have held these provisions require the development of permits and permit provisions on a case-by-case basis to satisfy federal requirements. (*Natural Resources Defense Council, Inc., v. USEPA* (9th Cir. 1992) 966 F.2d 1292, 1308, fn. 17.)

The authority exercised under this Order is not reserved state authority under the CWA's savings clause (cf. *Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 627-628 [relying on 33 USC section 1370, which allows a state to develop requirements which are not "less stringent" than federal requirements]), but instead is part of a federal mandate to develop pollutant reduction requirements for municipal separate storm sewer systems. To this extent, it is entirely federal authority that forms the legal basis to establish the permit provisions. (See, *City of Rancho Cucamonga v. Regional Water Quality Control Board, Santa Ana Region* (2006) 135 Cal.App.4th 1377, 1389; *Building Industry Ass'n of San Diego Co. v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 882-883.)

The MEP standard is a flexible standard that balances a number of considerations, including technical feasibility, cost, public acceptance, regulatory compliance, and effectiveness. (*Building Ind. Ass'n., supra,* 124 Cal.App.4th at pp. 873-874, 889.) Such considerations change over time with advances in technology and with experience

gained in storm water management (55 FR 47990, 48052 (Nov. 16, 1990)). Accordingly, a determination of whether the conditions contained in this Order exceed the requirements of federal law cannot be based on a point by point comparison of the permit conditions and the minimum control measures that are required "at a minimum" to reduce pollutants to the maximum extent practicable and to protect water quality (40 CFR 122.34). Rather, the appropriate focus is whether the permit conditions, as a whole, exceed the MEP standard.

In recent months, the County of Los Angeles and County of Sacramento Superior Courts have granted writs setting aside decisions of the Commission on State Mandates that held certain requirements in Phase I permits constituted unfunded mandates. In both cases, the courts have found that the correct analysis in determining whether an MS4 permit constituted a state mandate was to evaluate whether the permit as a whole exceeds the MEP standard. (*State of Cal. v. Comm. on State Mandates* (Super. Ct. Sacramento County, 2012, No. 34-2010-80000604), *State of California v. County of Los Angeles* (Super. Ct. Los Angeles County, 2011, No. BS130730.) Both cases are currently pending appeal.

The requirements of the Order, taken as a whole rather than individually, are necessary to reduce the discharge of pollutants to the MEP and to protect water quality. The San Diego Water Board finds that the requirements of the Order are practicable, do not exceed federal law, and thus do not constitute an unfunded mandate. These findings are the expert conclusions of the principal state agency charged with implementing the NPDES program in California (CWC sections 13001, 13370).

It should also be noted that the provisions in this Order to effectively prohibit non-storm water discharges are also mandated by the CWA (33 USC section 1342(p)(3)(B)(ii)). Likewise, the provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state establishes or adopts a TMDL, federal law requires that permits must contain effluent limitations consistent with the assumptions and requirements of any applicable waste load allocation in a TMDL (40 CFR 122.44(d)(1)(vii)(B)).

Third, the local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental dischargers who are issued NPDES permits for storm water discharges. With a few inapplicable exceptions, the CWA regulates the discharge of pollutants from point sources (33 USC section 1342) and the Porter-Cologne Act regulates the discharge of waste (CWC section 13263), both without regard to the source of the pollutant or waste. As a result, the "costs incurred by local agencies" to protect water quality reflect an overarching regulatory scheme that places similar requirements on governmental and non-governmental dischargers. (See *County of Los Angeles v. State of California* (1987) 43 Cal.3d 46, 57-58 [finding comprehensive workers' compensation scheme did not create a cost for local agencies that was subject to state subvention].)

The CWA and the Porter-Cologne Act largely regulate storm water with an even hand, but to the extent there is any relaxation of this even-handed regulation, it is in favor of the local agencies. Generally, the CWA requires point source dischargers, including dischargers of storm water associated with industrial or construction activity, to comply strictly with water quality standards (33 USC section 1311(b)(1)(C); *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159, 1164-1165 [noting that industrial discharges must strictly comply with water quality standards]). As discussed in prior State Water Board decisions, certain provisions of this Order do not require strict compliance with water quality standards (State Water Board Order No. WQ 2001-0015, p. 7). Those provisions of this Order regulate the discharge of waste in municipal storm water under the CWA's MEP standard, not the BAT/BCT standard that applies to other types of discharges. These provisions, therefore, regulate the discharge of waste in municipal storm water more leniently than the discharge of waste from non-governmental sources.

Fourth, the Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)). To the extent that the local agency Copermittees have voluntarily availed themselves of the permit, the program is not a state mandate. (Accord, *County of San Diego v. State of California* (1997) 15 Cal.4th 68, 107-108.)

Fifth, the local agency Copermittees' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under state law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

Finally, even if any of the permit provisions could be considered unfunded mandates, under Government Code section 17556, subdivision (d), a state mandate is not subject to reimbursement if the local agency has the authority to charge a fee. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order, subject to certain voting requirements contained in the California Constitution. (See Cal. Const., Art. XIII D, section 6, subd. (c); see also *Howard Jarvis Taxpayers Ass'n v. City of Salinas* (2002) 98 Cal.App.4th 1351, 1358-1359.) The Fact Sheet demonstrates that numerous activities contribute to the pollutant loading in the MS4. Local agencies can levy service charges, fees, or assessments on these activities, independent of real property ownership. (See, e.g., *Apartment Ass'n of Los Angeles County, Inc., v. City of Los Angeles* (2001(24 Cal.4th 830, 842 [upholding inspection fees associated with renting property].) The authority and ability of a local agency to defray the cost of a program without raising taxes indicates that a program does not entail a cost subject to subvention. (*Clovis Unified School Dist. V. Chiang* (2010) 188 Cal.App.4th 794, 812, citing *Connell v. Sup. Ct.* (1997) 59 Cal.App.4th 382, 401; *County of Fresno v. State of California* (1991) 53 Cal. 3d. 482, 487-488.)

VIII. PROVISIONS

The provisions (i.e. NPDES permit requirements) of the Order are discussed below.

A. Prohibitions and Limitations

Purpose: Provision A includes the prohibitions and limitations requirements that are the foundation of all the subsequent requirements included in the Order. Compliance with the prohibitions and limitations will restore and protect receiving waters from impacts that may be caused by discharges into and from the Copermittees' MS4s and ultimately achieve the objective of the CWA.

In meeting the requirements set forth in the Order, the Copermittees must be cognizant that the prohibitions and limitations exist and will be the standard by which the San Diego Water Board will be measuring the progress and success of their implementation of the NPDES permit requirements.

***Discussion*:** The objective of the CWA is to "*restore and maintain the chemical, physical, and biological integrity of the Nation's waters*." The CWA requires the implementation of NPDES permit programs to regulate discharges of pollutants and dredged or fill material to the navigable waters of the U.S. For discharges into and from MS4s, the CWA requires the NPDES permits to "*effectively prohibit non-stormwater discharges into the storm sewers*" and "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable.*"

Provision A includes limitations, consistent with the requirements of the CWA for discharges from MS4s. Provision A expresses these limitations as discharge prohibitions, receiving water limitations, and effluent limitations. Compliance with the discharge prohibitions and receiving water limitations is also explicitly described, in conformance with precedential State Water Board Orders.

More specific and detailed discussions of the requirements of Provision A are provided below.

Provision A.1 (Discharge Prohibitions) prohibits the discharge of specific types of waste into and/or from the Copermittees' MS4s.

Provision A.1.a restates and reiterates Basin Plan Waste Discharge Prohibition 1, by prohibiting discharges into and from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the

state. The terms pollution,[15] contamination,[16] and nuisance[17] are defined under CWC 13050. Provision A.1.c incorporates all the waste discharge prohibitions of the Basin Plan into the requirements of the Order. The waste discharge prohibitions from the Basin Plan have been reproduced and provided in Attachment A to the Order.

Provision A.1.b requires non-storm water discharges into the MS4s to be effectively prohibited, consistent with the requirements of the CWA for MS4 permits to "*effectively prohibit non-stormwater discharges into the storm sewers*." The effective prohibition is required to be implemented by each Copermittee within its jurisdiction through the illicit discharge detection and elimination requirements under Provision E.2. The prohibition does not apply to NPDES permitted discharges into the Copermittees' MS4s.

The CWA employs the strategy of prohibiting the discharge of any pollutant from a point source into waters of the United States unless the discharger of the pollutant(s) obtains an NPDES permit pursuant to CWA Section 402. The 1987 amendment to the CWA includes provision 402(p) that specifically addresses NPDES permitting requirements for storm water discharges from MS4s. CWA section 402(p) prohibits the discharge of pollutants from specified MS4s to waters of the U.S. except as authorized by an NPDES permit and identifies two substantive standards for MS4 storm water permits. MS4 permits (1) "*shall include a requirement to effectively prohibit nonstormwater discharges into the storm sewers*" and (2) "*shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or State determines appropriate for the control of such pollutants*." (CWA section 402(p)(3)(B)(ii-iii).)

In November 1990, the USEPA published regulations addressing storm water discharges from MS4s (55 FR 47990 and following (Nov. 16, 1990) (Phase I Final Rule)). The regulations establish minimum requirements for MS4 permits, and generally focus on the requirement that MS4s implement programs to reduce the amount of pollutants found in storm water discharges to the MEP. The CWA's municipal storm water MEP standard does not require storm water discharges to strictly meet water quality standards, as is required for other NPDES permitted discharges. Compliance is achieved through an iterative approach of continuous

[15] CWC 13050(l): "(1) 'Pollution' means an alteration of the quality of waters of the state by waste to a degree which unreasonably affects either of the following: (A) The water for beneficial uses. (B) Facilities which serve beneficial uses. (2) 'Pollution' may include "contamination.

[16] CWC 13050(k): "Contamination' means an impairment of the quality of waters of the state by waste to a degree which creates a hazard to public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste, whether or not waters of the state are affected."

[17] CWC 13050(m): "Nuisance' means anything which meets all of the following requirements: (1) Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. (2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. (3) Occurs during, or as a result of, the treatment or disposal of wastes."

implementation of improved BMPs. This distinction reflects Congress's recognition that variability in flow and intensity of storm events render difficult strict compliance with water quality standards by MS4 permittees. In describing the controls that permits must include to reduce pollutants in storm water discharges to the MEP, the statute (CWA section 402(p)(3)(B)(iii)) states that the controls shall include: "*management practices, control techniques and system, design and engineering methods, and such other provisions as the [permit writer] determines appropriate for the control of such pollutants*."

In contrast, non-storm water discharges from the MS4 that are not authorized by separate NPDES permits are subject to requirements under the NPDES program, including discharge prohibitions, technology based effluent limitations and water quality-based effluent limitations (40 CFR 122.44). The regulations also require the Copermittee's program to include an element to detect and remove illicit discharges and improper disposal into the storm sewer (40 CFR 122.26(d)(2)(iv)(B)).

While "non-storm water" is not defined in the CWA or federal regulations, the federal regulations (at 40 CFR 122.26(b)(2)) define "*illicit discharge*" as *"any discharge to a municipal separate storm sewer that is not composed entirely of storm water and that is not covered by an NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer and discharges resulting from fire fighting activities)*." This definition is the most closely applicable definition of "non-storm water" contained in federal law. As stated in the Phase I Final Rule, USEPA added the illicit discharge program requirement to begin implementation of the 'effective prohibition' requirement to detect and control non-storm water discharges to their municipal system.

Thus, federal law mandates that permits issued to MS4s must require management practices that will result in reducing storm water pollutants to the MEP yet at the same time requires that non-storm water discharges be effectively prohibited from entering the MS4. "Effectively" prohibit does not mean that non-storm water discharges are authorized to be discharged into and from the Copermittees' MS4s. The Phase I Final Rule clarifies what "effectively prohibit" means (55 FR 47995):

> "*Section 402(p)(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…<u>Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit</u> (other than the permit for the discharge from the municipal separate storm sewer)*" [Emphasis added].

Consistent with federal law, unless non-storm water discharges to the MS4 are authorized by a separate NPDES permit, non-storm water discharges are appropriately subject to the effective prohibition requirement in the CWA and Regional

Water Boards are not limited by the iterative MEP approach to storm water regulation in crafting appropriate regulations for non-storm water discharges.

The federal regulations (40CFR122.26(d)(2)(i)(B)) require the Copermittees to establish the legal authority which authorizes or enables the Copermittees to prohibit illicit discharges to the MS4s. The federal regulations (40 CFR 122.26(d)(2)(vi)(B)(1)) require the Copermittees to "*implement and enforce an ordinance, order or similar means*" to prevent non-storm water discharges to their MS4s. Thus, the Copermittees are required to "*effectively*" prohibit non-storm water discharges to their MS4s through enforcing their legal authority established under "*ordinance, order or similar means*" and either remove those discharges to their MS4s, or require those discharges to obtain coverage under a separate NPDES permit. More detail about the program that must be implemented to "*effectively*" prohibit non-storm water discharges to the Copermittees' MS4s is provided under the discussion for Provision E.2.

Provision A.1.d was included to be consistent Resolution No. 2012-0012, adopted by the State Water Board on March 20, 2012. Provision A.1.d prohibits discharges from MS4s to Areas of Special Biological Significance (ASBS), except for storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach to the Heisler Park ASBS subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012. The pertinent Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 are provided in Attachment A to the Order.

Provision A.2 (Receiving Water Limitations) specifies the condition of the receiving waters that must be achieved when there are discharges from the Copermittees' MS4s. Receiving water limitations are included in all NPDES permits issued pursuant to the CWA section 402. CWA section 402(p)(3)(B)(iii) authorizes the inclusion of "*such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." This requirement gives USEPA or the State permitting authority, in this case the San Diego Water Board, discretion to determine what permit conditions are necessary to control pollutants.

In its Phase I Final Rule (see 55 FR 47990, 47994 (Nov. 16, 1990)), USEPA elaborated on these requirements, stating that, "*permits for discharges from municipal separate storm sewer systems must require controls to reduce the discharge of pollutants to the maximum extent practicable, and where necessary water quality-based controls*." USEPA reiterated in its Phase II Final Rule (64 FR 68722, 68737), that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL*." CWC section 13377 also requires that NPDES permits include limitations necessary to implement water quality control plans. Both the State Water Board and the San Diego Water Board have previously concluded that discharges from the MS4 contain pollutants that have the reasonable potential to cause or contribute to excursions above water quality

standards. As such, inclusion of receiving water limitations is appropriate to control MS4 discharges.

The inclusion of receiving water limitations is also consistent with the Ninth Circuit Court of Appeals' ruling in *Defenders of Wildlife v. Browner* (191 F.3d 1159, 1166 (1999)) that the permitting authority has discretion regarding the nature and timing of requirements that it includes as MS4 permit conditions to attain water quality standards. The Ninth Circuit Court of Appeals recently explained that, "*[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*" (*Natural Resources Defense Council v. County of Los Angeles* (9th Cir. 2011) 673 F.3d 880, 886 (revd. On other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013)))

The receiving water limitations included in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan or in water quality control plans or policies adopted by the State Water Board, including State Water Board Resolution No. 68-16, or in federal regulations, including but not limited to 40 CFR 131.12 and 131.38. The water quality objectives in the Basin Plan and other State Water Board plans and policies have been approved by USEPA and combined with designated beneficial uses constitute the water quality standards required under federal law.

Provision A.2.a requires that discharges from the Copermittees' MS4s must not cause or contribute to the violation of water quality standards in receiving waters. The water quality standards of the receiving waters must be protected from the impacts that may be caused by the Copermittees' MS4 discharges. Water quality standards applicable to the surface waters in the San Diego Region must be achieved through meeting the technology based standard of MEP through an iterative process of improved management actions. Provision A.2.a is also consistent with State Water Board Order WQ 99-05 precedent-setting language requiring discharges from MS4s to attain receiving water quality standards. The water quality control plans and policies with water quality standards applicable to the waters in the San Diego Region are included under Provision A.2.a.

Provisions A.2.b was included to be consistent with the requirements of State Water Board Resolution No. 2012-0012, adopted on March 20, 2012.

<u>Provision A.3 (Effluent Limitations)</u> specifies the condition of the discharges from the Copermittees' MS4s that must be achieved if and when there are discharges.

Consistent with CWA section 301(b)(1)(A) and 40 CFR 122.44(a), Provision A.3.a includes the technology-based effluent limitations that must be included in the Order.

The technology-based effluent limits, representing the minimum level of control that must be imposed in a permit under CWA section 402, requires that pollutants in discharges of storm water from the Copermittees' MS4s be reduced to the MEP. This provision applies specifically to storm water discharges. Non-storm water discharges must be effectively prohibited, as required under Provision A.1.b. Non-storm water (dry weather) discharges from the MS4 are not considered storm water (wet weather) discharges and therefore are not subject to the MEP standard.

The technology-based MEP standard is an ever-evolving, flexible, and advancing concept. Neither Congress nor USEPA has specifically defined the term "maximum extent practicable." Congress established this flexible MEP standard so that the administrative bodies would have "*the tools to meet the fundamental goals of the Clean Water Act in the context of storm water pollution*." (*Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 884.) As knowledge about controlling storm water runoff and discharges continues to evolve, so does the knowledge which constitutes MEP. Reducing the discharge of pollutants in storm water from the MS4 to the MEP requires the Copermittees to assess each program component and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP.

The San Diego Water Board or the State Water Board ultimately define MEP, and may include requirements that provide specific guidance on what is expected to demonstrate MEP. It is the responsibility of the Copermittees to propose actions that implement BMPs to reduce storm water pollution to the MEP. In other words, the Copermittees' runoff management programs developed and implemented under the Order are the Copermittees' proposals for achieving MEP. Their total collective and individual activities conducted pursuant to their runoff management programs become their proposal for achieving MEP as it applies both to their overall effort, as well as to specific activities. Provisions B through E of the Order provides a minimum framework to guide the Copermittees in achieving the MEP standard for discharges of pollutants in storm water.

Provision A.3.b incorporates any water quality based effluent limitations (WQBELs) applicable to the MS4s established for TMDLs adopted and approved for the San Diego Region and requires the Copermittees to comply with those WQBELs. This is consistent with 40 CFR 122.44(d)(1)(vii)(B), which requires that NPDES permits to incorporate WQBELs "*developed to protect a narrative water quality criterion, a numeric water quality criterion, or both…consistent with the assumptions and requirements of any available wasteload allocation for the discharge...*"

Pursuant to CWA section 303(d), for surface water bodies identified as impaired by one or more pollutants, the San Diego Water Board is required to establish TMDLs "*at a level necessary to implement the applicable water quality standards with seasonal variations and a margin of safety which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality*." The

TMDLs identify sources of the pollutants causing the impairments and assign portions of the TMDL as WLAs to point sources, which include MS4s.

WLAs must be expressed in NPDES permits as WQBELs, which may include one or more numeric components such as numeric effluent limits, and/or receiving water limitations, and/or BMP requirements. Because numeric targets for TMDLs typically include a component that will be protective of water quality standards, a TMDL will likely include one or more numeric receiving water limitations and/or effluent limitations as part of the assumptions or requirements of the TMDL. Any numeric receiving water limitations and/or effluent limitations developed as part of the assumptions or requirements of a TMDL must be incorporated and included as part of WQBELs for the MS4s.

Because the development and approval of new TMDLs, or modification of existing TMDLs, may occur during the term of this Order, the specific provisions of those TMDLs, including effluent limitations applicable to MS4s are provided within Attachment E to the Order. Attachment E will be updated with new TMDLs and modifications to existing TMDLs in a timely manner as they occur.

Provision A.4 (Compliance with Discharge Prohibitions and Receiving Water Limitations) describes the process required to be implemented by the Copermittees if compliance with the discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a are not being achieved under current conditions.

In its Phase II Stormwater Regulations, Final Rule, USEPA states that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL.*"[18] In a series of comment letters on MS4 permits issued by various Regional Water Boards, USEPA has also reiterated that MS4 discharges must meet water quality standards.[19] In addition, the Ninth Circuit Court of Appeals explained in a recent ruling that, *"[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*"[20]

[18] Phase II Stormwater Regulations, Final Rule, 64 Fed. Reg. 68722, 68737.
[19] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.
[20] NRDC v. County of Los Angeles (9th Cir. 2011), 673 F.3d 880, 886 (revd. on other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013))). See also, *Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 884-886, citing *Defenders of Wildlife v. Browning,* (9th Cir. 1999) 191 F.3d 1159.)

Water quality standards for the San Diego Region are established in the Basin Plan. The water quality standards of the Basin Plan are incorporated into this Order as the discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a. The discharge prohibitions and receiving water limitations in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations or prohibitions to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan, water quality control plans or policies adopted by the State Water Board, including Resolution No. 68-16, or federal regulations, including but not limited to, 40 CFR 131.12 and 131.38. The waste discharge prohibitions and water quality objectives in the Basin Plan have been approved by USEPA and combined with the designated beneficial uses constitute the water quality standards required under federal law.

Under federal law (CWA section 402(p)(3)(B)(iii)), an MS4 permit must include "*controls to reduce the discharge of pollutants to the maximum extent practicable...and such other provision as...the State determines appropriate for control of such pollutants*." The State Water Board has previously determined that limitations necessary to meet water quality standards are appropriate for the control of pollutants discharged by MS4s and must be included in MS4 permits. (State Water Board Orders WQ 91-03, 98-01, 99-05, 2001-15; see also *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159.) This Order prohibits discharges that cause or contribute to violations of water quality standards.

The discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a are included in this Order to ensure that discharges from the MS4s do not cause or contribute to exceedances of water quality objectives necessary to protect the beneficial uses of the receiving waters.

Provision A.4 is consistent with the precedent-setting language in State Water Board Order WQ 99-05 required to be included in municipal storm water permits. State Water Board Order WQ 2001-15 refined Order WQ 99-05 by requiring an iterative approach to compliance with water quality standards involving ongoing assessments and revisions, as referred to as the "iterative process." The "iterative process" is a fundamental NPDES requirement for municipal storm water permits to achieve the objectives of the CWA.

The State Water Board and Regional Water Boards have stated that the provisions under Provisions A.1.a, A.1.c, A.2.a, and A.4 are independently applicable, meaning that compliance with one provision does not provide a "safe harbor" where there is non-compliance with another provision (i.e., compliance with the Provision A.4 does not shield a Copermittee who may have violated Provision A.1.a, A.1.c, or A.2.a from an enforcement action). The intent of Provision A.4 is to ensure that the Copermittees have the necessary storm water management programs and controls in place, and that they are modified by the Copermittees in a timely fashion when necessary, so that compliance with Provisions A.1.a, A.1.c, and/or A.2.a is achieved as soon as possible. USEPA expressed the importance of this independent applicability in a series of

comment letters on MS4 permits proposed by various Regional Water Boards. At that time, USEPA expressly objected to certain MS4 permits that included language stating, *"permittees will not be in violation of this [receiving water limitation] provision … [if certain steps are taken to evaluate and improve the effectiveness of the jurisdictional runoff management programs],"* concluding that this phrase would not comply with the CWA.[21]

The Ninth Circuit held in *Natural Resources Defense Council v. County of Los Angeles* (2011) 673 F3d. 880, 886 (revd. on other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013))) that engagement in the iterative process does not provide a safe harbor from liability for violations of permit terms prohibiting exceedances of water quality standards. The Ninth Circuit holding is consistent with the position of the State and Regional Water Boards that exceedances of water quality standards in an MS4 permit constitute violations of permit terms subject to enforcement by the Water Boards or through a citizen suit. While the Water Boards have generally directed dischargers to achieve compliance by improving control measures through the iterative process, the San Diego Water Board retains the discretion to take other appropriate enforcement and the iterative process does not shield dischargers from citizen suits under the CWA.

The requirements of Provision A.4, therefore, are required to be implemented until the water quality standards expressed under Provisions A.1.a, A.1.c, and A.2.a are achieved. The CWA requires MS4 permits to "*require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." The requirements of this Order have been deemed or determined to be "appropriate" to achieve water quality standards in receiving waters.

Part of the "*controls*" required by the Order is the process described in Provision A.4. Provision A.4 includes the process that is ultimately expected to achieve compliance with the requirement that discharges from the MS4 do not cause or contribute to violations of water quality standards in the receiving waters. The implementation of Provision A.4 is required when the Copermittees or the San Diego Water Board have determined that discharges from the MS4 are causing or contributing to violations of water quality standards in the receiving waters.

The Copermittees must effectively prohibit non-storm water discharges into the MS4s, reduce the discharge of pollutants in storm water from the MS4s to the MEP, and ensure that their MS4 discharges do not cause or contribute to violations of water quality standards. If the Copermittees have effectively prohibited non-storm water

[21] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.

discharges and reduced storm water pollutant discharges to the MEP, but their discharges are still causing or contributing to violations of water quality standards, Provision A.4 provides a clear "iterative process" for the Copermittees to follow.

Provision A.4 essentially requires the Copermittees to implement additional BMPs until MS4 discharges no longer cause or contribute to a violation of water quality standards.

In assessing compliance and potential enforcement actions, the San Diego Water Board looks at the Copermittees' efforts in total to meet the requirements of Provisions A.1.a, A.1.c, A.2.a and Provision A.4. The Copermittees need to demonstrate that they are making improvements to their programs and making progress toward achieving the discharge prohibitions and receiving water limitations in Provisions A.1.a, A.1.c, and A.2.a by implementing the requirements of Provision A.4. The San Diego Water Board would consider these efforts prior to strictly enforcing the requirements of Provisions A.1.a, A.1.c, and A.2.a. Causes of exceedances of the receiving water limitations can often be more difficult to identify and attribute solely to the Copermittees' MS4s. The intent of the Order is to provide the Copermittees more clarity and flexibility in addressing these exceedances through the iterative approach and adaptive management process until the requirements under Provisions A.1.a, A.1.c, and A.2.a are fully achieved.

An exception to the iterative approach and adaptive management process would be in receiving waters subject to adopted and approved TMDLs. For TMDLs that are incorporated into the Order, there is a specific date for compliance to be achieved, after which the iterative approach and adaptive management process required under Provision A.4 no longer provides the flexibility to achieve compliance. Where compliance dates for a TMDL have passed, compliance with the WQBELs incorporated into the Order established by a TMDL in Attachment E to protect water quality standards is required. Thus, after the interim or final compliance dates for a TMDL have passed, if the discharges from the Copermittees' MS4s are causing or contributing to a violation of WQBELs, exceedances of WQBELs must be strictly enforced by the San Diego Water Board. In the meantime, however, the Copermittees are in compliance with the interim or final TMDL requirements in Attachment E as long as the interim or final WQBELs are being achieved in accordance with the interim or final compliance dates.

B. Water Quality Improvement Plans

Purpose: Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges to the MS4s and control pollutants in storm water discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the Clean Water Act.

Provision B includes requirements for the Copermittees to develop and implement Water Quality Improvement Plans to ultimately comply with the prohibitions and limitations under Provision A. The Water Quality Improvement Plans will provide the Copermittees a comprehensive program that can achieve the requirements and further the objectives of the CWA. Implementation of the Water Quality Improvement Plans will also improve the quality of the receiving waters in the San Diego Region.

The Water Quality Improvement Plan is the backbone of the Regional MS4 Permit requirements. Provision B provides the guidance, criteria, and minimum expectations and requirements for the elements of the Water Quality Improvement Plan to be developed and implemented by the Copermittees. The Water Quality Improvement Plans will be implemented in the Watershed Management Area by the Copermittees within their jurisdictions through their jurisdictional runoff management programs.

The Water Quality Improvement Plan also incorporates a program to monitor and assess the progress of the Copermittees' jurisdictional runoff management programs toward improving the quality of discharges from the MS4s, as well as tracking improvements to the quality of receiving waters. A process to adapt and improve the effectiveness of the Water Quality Improvement Plans has also been incorporated into the requirements of Provision B to be consistent with the "iterative approach" required to achieve compliance with discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a, pursuant to the requirements of Provision A.4.

The Water Quality Improvement Plans have also been structured to incorporate the requirements of any TMDLs that have been adopted for the San Diego Region. Incorporating the requirements of the TMDLs into the requirements of Provision B allows the Copermittees to develop a single plan, instead of separate plans, to coordinate their non-storm water and storm water runoff management programs. The Water Quality Improvement Plans allow the Copermittees to meet the requirements of this Order, as well as fulfill the requirements of the TMDLs.

As an added benefit, if the Copermittees demonstrate that impaired water bodies within the Watershed Management Area listed on the 303(d) List will be addressed with their Water Quality Improvement Plans in a reasonable period of time, the San Diego Water Board may be able to remove the water bodies from the 303(d) List, which would greatly reduce the need for the San Diego Water Board to develop additional TMDLs that would have to be incorporated into the Order and implemented by the Copermittees.

***Discussion*:** The federal NPDES regulations require the Copermittees to develop a proposed management program (40 CFR 122.26(d)(2)(iv)). The proposed management program must include "*a comprehensive planning process*" and "*where necessary intergovernmental coordination*" for the "*duration of the permit.*" The Water Quality Improvement Plan is the Copermittees' "*comprehensive planning process*" document for the proposed management program that will be implemented within a Watershed Management Area. Implementation of the Water Quality Improvement Plan requires "*intergovernmental coordination*" among the Copermittees for at least the "*duration of the permit*," and likely into and beyond the next iteration of the permit.

Developing Water Quality Improvement Plans based upon watersheds is consistent with federal regulations that support the development of permit conditions, as well as implementation of storm water management programs, at a watershed scale (40 CFR 122.26(a)(3)(ii), 122.26(a)(3)(v), and 122.26(d)(2)(iv)). In 2003, USEPA issued a Watershed-Based NPDES Permitting Policy Statement (USEPA, 2003) that defines watershed-based permitting as an approach that produces NPDES permits that are issued to point sources on a geographic or watershed basis. In this policy statement, USEPA explains that "*[t]he utility of this tool relies heavily on a detailed, integrated, and inclusive watershed planning process*." USEPA identifies a number of important benefits of watershed permitting, including more environmentally effective results, the ability to emphasize measuring the effectiveness of targeted actions on improvements in water quality, reduced cost of improving the quality of the nation's waters and more effective implementation of watershed plans, including TMDLs, among others.

An emphasis on watersheds is appropriate at this stage in the San Diego Region's MS4 program to shift the focus to more targeted, water quality driven planning and implementation. Addressing discharges on a watershed scale focuses on water quality results by emphasizing the receiving waters in the watershed. The conditions of the receiving waters drive management actions, which in turn focus measures to address pollutant contributions from MS4 discharges.

The Water Quality Improvement Plan gives the Copermittees the responsibility of developing a comprehensive plan to coordinate the efforts of their jurisdictional runoff management programs for addressing the problems related to MS4 discharges causing impacts to water quality in the Watershed Management Area. The development of the plan provides the Copermittees the opportunity to provide significant input on how to implement their jurisdictional runoff management programs, and how to best utilize their available resources in addressing a focused set of

priorities that they believe will result in measureable improvements to water quality within the Watershed Management Area.

The Copermittees are encouraged to separate the Watershed Management Area into subwatersheds, as appropriate. This allows the Copermittees to identify priorities applicable to a subset of the Copermittees or specific water bodies or areas within the Watershed Management Area.

Included in the requirements for the elements to be included in the Water Quality Improvement Plan are monitoring and assessment requirements that are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order. In addition to the federal requirements of the CWA section 308(a) and 40 CFR 122.26(d), the San Diego Water Board has the authority to establish monitoring, reporting, and recordkeeping requirements for NPDES permits under CWC 13383.

More specific and detailed discussions of the requirements of Provision B are provided below.

Provision B.1 (Watershed Management Areas) requires the Copermittees to develop a Water Quality Improvement Plan for each of the Watershed Management Areas defined by the San Diego Water Board.

Pursuant to 40 CFR 122.26(d)(2)(iv), proposed management programs "*may impose controls on a…watershed basis…*" The Water Quality Improvement Plan is the Copermittees' proposed management program. A Water Quality Improvement Plan must be developed for each Watershed Management Area identified in the Order.

The Watershed Management Areas are identified in Table B-1. Table B-1 establishes ten (10) Watershed Management Areas, and identifies the Copermittees that are responsible for developing and implementing the Water Quality Improvement Plan for each Watershed Management Area.

The Copermittees from each of the three counties within the San Diego Region are expected to be phased in as their respective NPDES municipal storm water permits expire. Because Order No. R9-2007-0001 expired in January 2012, the San Diego County Copermittees are covered under the Regional MS4 Permit on the effective date of the Order.

After San Diego Water Board receives and considers the Reports of Waste Discharge required to be submitted by the Orange County Copermittees and Riverside County Copermittees pursuant to the requirements of their current permits, and make any necessary changes to the Order, the Orange County Copermittees and Riverside County Copermittees will be covered under the Regional MS4 Permit after Order No. R9-2009-0002 expires in November 2014, and Order No. R9-2010-0016 expires in December 2015, respectively.

The Orange County Copermittees and Riverside County Copermittees also have the option to obtain coverage under the Regional MS4 Permit earlier than their respective permit expiration dates. The process to apply for early coverage is described Provision F.6.

Because the Santa Margarita River Watershed Management Area includes Copermittees from both San Diego County and Riverside County, a footnote to Table B-1 has been included to specify that the requirements of Provision B are not required to be implemented by the County of San Diego until the Riverside County Copermittees have received a notice of coverage under the Order. Until the Riverside County Copermittees are notified of coverage under the Order, the County of San Diego is subject to the prohibitions and limitations under Provision A, responsible for continuing to implement its existing jurisdictional runoff management program, and responsible for implementing the transitional monitoring and assessment requirements of Provision D, the transitional annual reporting requirements of Provision F.3.b, and the TMDL requirements of Attachment E to the Order.

Provision B.2 (Priority Water Quality Conditions) requires the Copermittees in each Watershed Management Area to identify the highest priority water quality conditions which will be the focus of the Water Quality Improvement Plan implementation.

Provisions B.2.a and B.2.b provide the criteria that must be assessed when characterizing the receiving water quality and potential impacts from MS4 discharges of the receiving waters within the Watershed Management Area. The criteria are based primarily on the requirements in 40 CFR 122.26(d)(1)(iv)(C) and (C)(1)-(9). Characterizing the receiving water quality and identifying the potential impacts caused by MS4 discharges to receiving waters in the Watershed Management Area is necessary to identify the impacts to receiving waters associated with MS4 discharges that are of the most concern to the Copermittees.

Based on the information required to be considered under Provisions B.2.a and B.2.b, Provision B.2.c requires to Copermittees to identify the highest priority water quality conditions related to discharges from the MS4s that will be the primary focus of the Water Quality Improvement Plan in the Watershed Management Area. Addressing and improving these highest priority water quality conditions will become the focus of each Copermittee's jurisdictional runoff management program as the Water Quality Improvement Plan is implemented in the Watershed Management Area. The highest priority water quality conditions are expected to include source of pollutants and/or stressors, and/or receiving water conditions, that the Copermittees consider the highest threats or most likely to have adverse impacts on the physical, chemical, and biological integrity of receiving waters. Addressing these threats and/or adverse impacts should restore the physical, chemical, and biological integrity of receiving waters, and result in the restoration and protection of the beneficial uses of the receiving waters in the Watershed Management Area.

Provision B.2.d requires the Copermittees to identify known and suspected sources of pollutants and/or stressors contributing to the highest priority water quality conditions. The requirements of Provision B.2.d are based primarily on the requirements in 40 CFR 122.26(d)(1)(iii)(B)(1)-(6). The Copermittees are required to evaluate several factors in the identification of those sources. The Copermittees must consider and evaluate the following: (1) the land uses that may contribute toward impacts to receiving waters, (2) the locations of the Copermittees' MS4s that can convey and discharge runoff and pollutants to receiving waters, (3) other sources that discharge into the Copermittees' MS4s and receiving waters, and (4) other information and data that can help the Copermittees to evaluate the relative importance of or contribution from those sources toward the highest priority water quality conditions. Identifying the known and suspected sources, and their relative contribution toward the highest priority water quality conditions, will help the Copermittees to focus, direct, and prioritize their resources and implementation efforts within their jurisdictions.

Provision B.2.e requires the Copermittees to identify potential strategies that can result in improvements to water quality in MS4 discharges and/or receiving waters within the Watershed Management Area. Potential water quality improvement strategies will not necessarily be implemented by the Copermittees, but provide a "menu" of options that the Copermittees will consider for implementation. The public participation process that will be implemented during the development of the Water Quality Improvement Plan is where the potential water quality improvement strategies will be identified.

Provision B.3 (Water Quality Improvement Goals, Strategies and Schedules) requires the Copermittees in each Watershed Management Area to identify the goals that the Copermittees' jurisdictional runoff management programs will work toward achieving to address and improve the highest priority water quality conditions identified under Provision B.2.c; the strategies that will be implemented by the Copermittees within their jurisdictions and the Watershed Management Area to achieve the goals; and, the schedules for implementing the strategies and achieving the goals. The element of the Water Quality Improvement Plan required under Provision B.3 is where the "*comprehensive planning*" and "*intergovernmental coordination*" [40 CFR 122.26(d)(2)(iv)] of the Copermittees' actions for the proposed management programs within the Watershed Management Area is required to be described.

Provision B.3.a requires the Copermittees to identify interim and final numeric goals, and schedules to achieve those goals as part of the Water Quality Improvement Plans. Provision B.3.a.(1) requires the Copermittees to identify two types of numeric goals to be achieved:

(1) Final numeric goals in the receiving waters and/or MS4 discharges that will result in the protection of the water quality standards of the receiving waters for the highest priority water quality conditions identified by the Copermittees for Provision B.2.c. These final numeric goals are the ultimate goals for the Water Quality Improvement Plan, and the achievement and maintenance of these final numeric goals will indicate that one or more beneficial uses have been successfully restored and/or protected from MS4 discharges.

(2) Interim numeric goals that can be used by the Copermittees to demonstrate progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges for the highest priority water quality conditions in the Watershed Management Area. Achievement of the interim numeric goals will demonstrate to the San Diego Water Board that the Copermittees' implementation efforts are progressing toward achieving the final numeric goals.

Provision B.3.a.(1) does not specify what the interim and final numeric goals must be based on, but they essentially must be designed to achieve compliance with water quality standards in the receiving waters. To that end, the interim goals must be based on measureable criteria or indicators capable of demonstrating progress toward achieving the numeric goals."

The interim and final numeric goals can be based on the water quality objectives in the Basin Plan. The water quality objectives in the Basin Plan, however, consist of numeric and narrative water quality objectives. Numeric water quality objectives can be directly used as numeric goals. Narrative water quality objectives, on the other hand, will require some interpretation to identify numeric goals. The achievement of multiple numeric goals based on the water quality objectives, used in combination, may be necessary to demonstrate that beneficial uses have been restored and/or protected.

The Copermittees could also propose other numeric goals that are not necessarily water quality objectives from the Basin Plan. For example, the Copermittees could propose a numeric goal that consists of achieving some percent improvement of a measureable indicator, such as acreage of a specific habitat or increase in a specific plant or animal species population. Other examples may include pollutant load reductions, number of impaired waterbodies delisted from the List of Water Quality Impaired Segments, Index of Biological Integrity (IBI) scores, etc.

The Copermittees may choose to develop interim numeric goals based on the final numeric goals they develop, such as incremental steps toward ultimately achieving the final numeric goals. The Copermittees may also choose to develop interim numeric goals that are based on other measureable indicators that can indirectly indicate improvements and progress toward the final numeric goals.

There are no limits to the types of interim numeric goals that could be proposed by the Copermittees, other than the goals must be based on measureable criteria or indicators capable of demonstrating progress toward achieving the numeric goals. Likewise, there are no limits to the types of final numeric goals that could be proposed by the Copermittees, other than the goals must "*restore and protect the water quality standards of the receiving waters.*"

Finally, Provision B.3.a.(2) also requires the Copermittees to develop schedules for measuring progress and achieving the interim and final numeric goals. Several criteria

are included for the development of the schedules, but the Copermittees are required to achieve the numeric goals as soon as possible, consistent with federal NPDES regulations (40 CFR 122.47(a)(1)).

The Copermittees are also required to incorporate any compliance schedules for any applicable ASBS or TMDL requirements. Applicable ASBS and TMDL compliance schedules are set forth in Attachment A and Attachment E to the Order, respectively. The information provided by the Copermittees under Provision B.3.a.(2) will be used by the Copermittees and the San Diego Water Board to gauge and track the progress of the Copermittees' efforts in addressing the highest priority water quality conditions identified in the Water Quality Improvement Plan.

Provision B.3.b requires the Copermittees to identify the strategies and schedules to implement those strategies as part of the Water Quality Improvement Plans. Provision B.3.b requires the Copermittees to identify the water quality improvement strategies that will be and may be implemented within the Watershed Management Area to 1) reduce of pollutants in storm water discharged from the MS4 to the MEP, 2) effectively prohibit non-storm water discharges from entering the MS4, 3) protect water quality standards in receiving waters by controlling MS4 discharges so that they do not cause or contribute to exceedances of receiving water limitations, and 4) achieve applicable WQBELs that implement TMDLs. The Copermittees will select the strategies to be implemented based on the likely effectiveness and efficiency of the potential water quality improvement strategies identified under Provision B.2.e to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, and/or achieve the interim and final numeric goals identified under Provision B.3.a.

Provision B.3.b.(1) requires each Copermittee to identify the strategies that will be or may be implemented within its jurisdiction. Each Copermittee is required to describe the strategies it is committed to implementing as part of its jurisdictional runoff management requirements under Provisions E.2 through E.7, and the optional jurisdictional strategies that the Copermittee will implement, as necessary, to achieve the numeric goals.

Each Copermittee is expected to implement the optional jurisdictional strategies identified under Provisions B.3.b.(1)(b) when the jurisdictional strategies it has committed to implement under Provision B.3.b.(1)(a) are not making adequate progress toward the interim and final numeric goals in accordance with the schedules established under Provision B.3.a. Provision B.3.b.(1)(b)(v) requires each Copermittee to describe the circumstances necessary to trigger implementation of the optional jurisdictional strategies, in addition to the requirements of Provisions B.3.b.(1)(a).

The San Diego Water Board recognizes that there may be optional jurisdictional strategies that will likely require funding and/or resources for planning, permitting, procurement of labor and materials, and implementation. Thus, Provision

B.3.b.(1)(b)(iv) requires each Copermittee to describe the funding and/or resources that are necessary to implement these optional jurisdictional strategies. This information may provide interested groups and members of the public an understanding of the resources that they could provide or assist in obtaining to implement these optional jurisdictional strategies.

Provision B.3.b.(2) requires the Copermittees in the Watershed Management Area to identify the regional or multi-jurisdictional strategies that may be implemented, as necessary, to achieve the numeric goals. Similar to the requirements of Provision B.3.b.(1)(b), these regional or multi-jurisdictional strategies will likely require funding and/or resources for planning, permitting, procurement of labor and materials, and implementation, and San Diego Water Board recognizes that these strategies may be difficult to implement with only Copermittee resources. Thus, Provision B.3.b.(2)(d) requires the Copermittees to describe the funding and/or resources necessary to implement these optional regional or multi-jurisdictional strategies. This information may provide interested groups and members of the public an understanding of the resources that they could provide or assist in obtaining to implement these optional regional or multi-jurisdictional strategies.

Provision B.3.b.(3) requires the Copermittees to develop and include schedules in the Water Quality Improvement Plan for implementing the water quality improvement strategies identified under Provisions B.3.b.(1) and B.3.b.(2). The schedule for implementing the water quality improvement strategies will be used by the Copermittees and San Diego Water Board to measure and demonstrate the progress of the Copermittees' implementation efforts toward reducing pollutants in storm water discharged from the MS4 to the MEP, and eliminating illicit non-storm water discharges from entering the MS4.

Provision B.3.b.(4) provides the Copermittees in each Watershed Management Area the option of implementing watershed-specific structural BMP requirements for Priority Development Projects. Historically, storm water permits have included very specific performance standards for permanent, structural BMPs. These standards describe the expectation for the capture or treatment of pollutants and control of excessive flow before storm water is discharged from a site. The Copermittees were also allowed to develop waiver programs for Priority Development Projects to avoid implementing the structural BMPs; however, the waiver programs were not necessarily tied into any sort of holistic watershed strategy. The result is that implementation of BMP requirements is largely done on a site-by-site basis. This requires proper design on the part of the Priority Development Project and strict oversight on the part of the Copermittee.

Provision B.3.b.(4) promotes the evaluation of multiple strategies for water quality improvement, in addition to the implementation of permanent structural BMPs, on a watershed-scale versus the site-by-site approach. In a report issued by the Southern California Coastal Water Research Project (SCCWRP) and several other research institutions, the report emphasized that a successful hydromodification management program will involve watershed analysis as a first step, and that integrating multiple

watershed-based strategies is preferable over a site-by-site approach. Indeed, the report states that the watershed analysis "…*should lead to identification of existing opportunities and constraints that can be used to help prioritize areas of greater concern, areas of restoration potential, infrastructure constraints, and pathways for potential cumulative effects*."[22] Provision B.3.b.(4) promotes the findings and recommendations of the report by providing a pathway for Copermittees to develop an integrated approach to their land development programs.

Under Provision B.3.b.(4), the Copermittees in a Watershed Management Area must first perform an analysis by gathering as much information pertaining to the physical characteristics of the Watershed Management Area as possible. This includes, for example, identifying potential areas of coarse sediment supply, present and anticipated future land uses, and locations of physical structures within receiving streams and upland areas that affect the watershed hydrology (such as bridges, culverts, and flood management basins). Once this information is collected, the Copermittees must produce GIS layers (maps) that include this information.

From there, the Copermittees must use the results of the Watershed Management Area Analysis to identify and compile a list of candidate projects that could potentially be used as alternative compliance options for Priority Development Projects. Such projects include, for example, opportunities for stream or riparian area rehabilitation, opportunities for retrofitting existing infrastructure to incorporate storm water retention or treatment, and opportunities for regional BMPs, among others. Once these candidate projects are identified, Copermittees may allow Priority Development Projects to fund, partially fund, or completely implement these candidate projects. The Copermittees must first find that implementing such a candidate project would provide greater overall benefit to the watershed than requiring implementation of the structural BMPs onsite, and also enter into a voluntary agreement with the Priority Development Project that authorizes this arrangement. The Copermittees may use Provision B.3.b.(4) as both 1) a mechanism to reach their stated goals of the Water Quality Improvement Plan by using Priority Development Projects to either fund or implement projects that will provide water quality benefit, and 2) an alternative to requiring strict adherence to the structural BMP design standards.

Additionally, Provision B.3.b.(4) allows the Copermittees to use the results of the Watershed Management Area Analysis to identify areas within the Watershed Management Area where it is appropriate to allow Priority Development Projects to be exempt from the hydromodification management BMP performance requirements. Provision E.3.c.(2) already allows exemptions for Priority Development Projects that discharge to a conveyance channel whose bed and bank are concrete lined from the point of discharge to an enclosed embayment or the Pacific Ocean. However, there may be cases where further exemptions are warranted. The Copermittees may identify such cases on a watershed basis and include them in the Watershed

[22] 2012. ED Stein, F Federico, DB Booth, BP Bledsoe, C Bowles, Z Rubin, GM Kondolf, A Sengupta. Technical Report 667. Southern California Coastal Water Research Project. Costa Mesa, CA.

Management Area Analysis; however, they must provide the supporting rationale to support all claims for exemptions.

Provision B.3.b.(4) provides an innovative pathway for Copermittees to regulate their land development programs by allowing alternative compliance in lieu of implementing structural BMPs on each and every Priority Development Project. This approach facilitates the integration of watershed-scale solutions for improving overall water quality and assisting Copermittees to achieve their stated goals of the Water Quality Improvement Plan. The San Diego Water Board understands, however, that undertaking this approach, which involves extensive planning, could be resource intensive for the Copermittees. Therefore, the Watershed Management Area Analysis is optional and not a requirement. The Copermittees can choose not to perform the watershed planning and mapping exercise described in Provision B.3.b.(4), and instead choose to require strict implementation of the structural BMPs onsite, pursuant to Provision E.3.b.

Provision B.4 (Water Quality Improvement Monitoring and Assessment) requires the Copermittees to develop an integrated monitoring and assessment program to track the progress of the Water Quality Improvement Plan toward meeting the implementation goals and schedules, and improving the water quality of the Watershed Management Area. Provision B.4 is the part of the Water Quality Improvement Plan where the Copermittees describe the monitoring data that will be collected, which is not only necessary to implement the "iterative approach" required by Provision A.4, but inform the adaptive management and "*comprehensive planning process*" that allows the Copermittees to make adjustments and modifications to the Water Quality Improvement Plans and the jurisdictional runoff management programs.

Provision B.4 requires the Copermittees, at a minimum, to include the requirements of Provision D as part of the water quality improvement monitoring and assessment program for the Water Quality Improvement Plan. The Copermittees, however, are not limited to the requirements of Provision D and may include additional monitoring and assessment methods to track progress toward improving water quality in the Watershed Management Area.

In addition to incorporating the requirements of Provision D, the water quality improvement monitoring and assessment program must incorporate any monitoring and assessment requirements specified for any applicable TMDLs included in Attachment E to the Order, and the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 for Watershed Management Areas with ASBS.

The monitoring and assessments required to be incorporated into the Water Quality Improvement Plan are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order.

Provision B.5 (Iterative Approach and Adaptive Management Process) requires the Copermittees to implement the iterative approach pursuant to Provision A.4 to adapt

the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a.

Provision B.5 requires the Copermittees in each Watershed Management Area to re-evaluate the highest priority water quality conditions and potential water quality improvement strategies, the water quality improvement goals, strategies and schedules, and the water quality improvement monitoring and assessment program and provide recommendations for modifying those elements to improve the effectiveness of the Water Quality Improvement Plan. The re-evaluation of the Water Quality Improvement Plan is part of the assessment requirements of Provision D.

Provision B.6 (Water Quality Improvement Plan Submittal, Updates, and Implementation) requires to Copermittees to submit, update, and implement the Water Quality Improvement Plans.

The requirements for the process to develop and submit the Water Quality Improvement Plans is described in more detail under the discussion for Provision F.1. The process will include several opportunities for the public to provide input during the development of the Water Quality Improvement Plans. The process for updating the Water Quality Improvement Plans is described in more detail under the discussion for Provision F.3.c. Upon acceptance of the Water Quality Improvement Plan and updates, the Copermittees are required to immediately begin implementing the Water Quality Improvement Plan and subsequent updates.

The Water Quality Improvement Plan is expected to be a dynamic document that will evolve over time. The Water Quality Improvement Plan is also expected to be a long term plan that focuses the Copermittees' efforts and resources on a limited set of priority water quality conditions, with the ultimate goal of protecting all the beneficial uses of the receiving waters within the Watershed Management Area from impacts that may be caused or contributed to by MS4 discharges. As the Copermittees collect data, implement their jurisdictional runoff management programs, and review the results from their water quality improvement monitoring and assessment program, the Water Quality Improvement Plan is expected to be continually reviewed and updated until compliance with Provisions A.1.a, A.1.b, and A.2.a is achieved.

However, in specific cases supported by robust analytical documentation the implementation of the Water Quality Improvement Plans may demonstrate that TMDLs are not necessary for identified impaired water bodies within the Watershed Management Area if the analytical record demonstrates that technology-based effluent limitations required by the CWA, more stringent effluent limitations required by state, local, or federal authority, and/or other pollution control requirements (e.g., best management practices) required by local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time.[23]

[23] 40 CFR 130.7(b)(1)

The San Diego Water Board submits an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. According to USEPA guidance for the Integrated Report,[24] water bodies are placed in one of five categories. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 are placed on the 303(d) List.

Category 4 in the Integrated Report is for water bodies where available data and/or information indicate that at least one beneficial use is not being supported or is threatened, but a TMDL is not needed.[25] Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

Impaired water bodies can be included in Category 4a if a TMDL has been adopted and approved. The TMDLs in Attachment E to the Order implement the requirements of the TMDLs adopted by the San Diego Water Board, and approved by the State Water Board and USEPA. The water bodies in Attachment E will be included in Category 4a in the Integrated Report and removed from the 303(d) List.

Impaired water bodies can be included in Category 4b if there are *acceptable* "pollution control requirements" required by a local, state or federal authority stringent enough to implement applicable water quality standards within a reasonable period of time (e.g., a compliance date is set). When evaluating whether a particular set of pollution controls are "requirements," the USEPA considers a number of factors, including: (1) the authority (local, state, federal) under which the controls are required and will be implemented with respect to sources contributing to the water quality impairment (examples may include: self-executing state or local regulations, permits, and contracts and grant/funding agreements that require implementation of necessary controls), (2) existing commitments made by the sources and completion or soon to be completed implementation of the controls (including an analysis of the amount of actual implementation that has already occurred), (3) the certainty of dedicated funding for the implementation of the controls, and (4) other relevant factors as determined by USEPA depending on case-specific circumstances.[26]

[24] USEPA, 2005. Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act
[25] Ibid
[26] Ibid

Impaired water bodies can be included in Category 4c if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution. Pollution, as defined by the CWA is "the man-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of water."[27] In other cases, pollution does not result from a pollutant and a TMDL is not required. Examples of circumstances where an impaired segment may be placed in Category 4c include segments impaired solely due to lack of adequate flow, stream channelization, or hydromodification. In these situations, there may be water quality management actions that can address the cause(s) of the impairment, but a TMDL may not be required to implement the actions.

The Water Quality Improvement Plans will require the implementation of pollution controls and water quality management actions (i.e. water quality improvement strategies) which can result in the attainment of water quality standards in water bodies impaired by discharges from the Copermittees' MS4s. The Water Quality Improvement Plans also include requirements that are expected to attain water quality standards in a reasonable period of time. The San Diego Water Board considers the Water Quality Improvement Plans to be a commitment by the Copermittees to develop, plan, budget for, and implement pollution controls that will attain water quality standards in receiving waters in a reasonable period of time, or as soon as possible. The results of the Copermittees' efforts in implementing the Water Quality Improvement Plans can be used to re-evaluate the condition of the impaired water bodies during the next update to the 303(d) List.

After the Copermittees submit the Water Quality Improvement Plans and demonstrate that water quality standards are being attained or will be attained in a reasonable period of time, the San Diego Water Board may re-evaluate the water bodies on the 303(d) List. These water bodies on the 303(d) List may be re-evaluated and placed into Category 4b or Category 4c in the Integrated Report. The water bodies placed in Category 4b or Category 4c in the Integrated Report must show a record that the water bodies are attaining water quality standards or supporting the identified beneficial uses, or will attain water quality standards or support identified beneficial uses in a reasonable period of time, in order for the water bodies to be appropriately removed from the 303(d) List.

[27] CWA section 502(19)

C. Action Levels

Purpose: Provision C includes requirements for the Copermittees to identify and include numeric action levels in the Water Quality Improvement Plan to direct and focus the Copermittees' jurisdictional runoff management program implementation efforts for controlling MS4 discharges to receiving waters.

***Discussion*:** Under Provision C, the numeric action levels required are for non-storm water discharges and storm water discharges. The non-storm water action levels (NALs) are applicable to non-storm water discharges from the Copermittees' MS4s, which can occur year-round. The storm water action levels (SALs) are applicable to storm water discharges from the Copermittees' MS4s, which occur during the rainy season defined as the period between October 1 and April 30.

The action levels required by Provision C are based on the action level requirements that were developed and incorporated into Order Nos. R9-2009-0002 and R9-2010-0016, the Orange County and Riverside County MS4 Permits, respectively. The Fact Sheets for these Orders provide detailed discussions about the development of the numeric NALs and SALs included in this Order.

Order Nos. R9-2009-0002 and R9-2010-0016 required the Copermittees to perform prescribed actions if the NALs or SALs are exceeded. The actions required under Order Nos. R9-2009-0002 and R9-2010-0016 generally included conducting additional monitoring and source investigations when a discharge from the MS4 is observed to exceed one or more NALs and/or SALs.

For this Order, however, the action levels of Provision C are to be used by the Copermittees to prioritize the actions to be implemented as part of the Water Quality Improvement Plan. Monitoring data collected by the Copermittees from MS4 outfalls will be compared with the NALs and SALs. Exceedances of the NALs and SALs will not require the Copermittees to immediately identify sources causing exceedances, but will provide some numeric indicator levels that can give the Copermittees a way to measure the relative severity of a pollutant contributing to receiving water quality impacts.

NALs and SALs must be included in the Water Quality Improvement Plans to be used by the Copermittees in directing and focusing their water quality improvement strategies. The Copermittees are expected to utilize the NALs and SALs to help focus their implementation efforts on addressing pollutants that have the most significant potential or observed impacts to receiving waters. The NALs and SALs will be used as part of the MS4 discharges assessments required under Provision D.4.b. The NALs and SALs may also be used by the Copermittees as the numeric goals to be achieved in MS4 discharges and/or receiving waters as the Water Quality Improvement Plans are implemented.

More specific and detailed discussions of the requirements of Provision C are provided below.

Provision C.1 (Non-storm Water Action Levels) requires the Copermittees to incorporate NALs into the Water Quality Improvement Plan for pollutants and/or constituents that are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions identified in the Water Quality Improvement Plan related to non-storm water discharges from the MS4s. NALs generally must be consistent with the water quality objectives found within the Basin Plan.

The NALs have been included to ensure that the Copermittees are implementing and complying with several requirements of the MS4 permit. The federal CWA requires permits for municipal storm sewer systems to "*effectively prohibit non-storm water discharges into the storm sewers*." The federal NPDES regulations, which were promulgated to implement the CWA requirements for discharges from municipal storm sewers, require a program to address illicit discharges, which are non-storm water discharges. Provision A.1.b prohibits "*[n]on-storm water discharges into MS4s*" unless the non-storm water discharge authorized by a separate NPDES permit. The NALs will be used as part of the illicit discharge detection and elimination program required pursuant to Provision E.2, as well as part of the MS4 discharges assessments required pursuant to Provision D.4.b.

Provision A.1.a prohibits non-storm water discharges from the MS4 from "*causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state.*" In addition, pursuant to Provision A.2.a, non-storm water discharges "*must not cause or contribute to the violation of water quality standards in any receiving waters*."

Ideally, the Copermittees' jurisdictional runoff management programs will eliminate all non-storm water discharges entering the MS4s within their jurisdictions. The complete elimination of non-storm water discharges to the Copermittees' MS4s would be in compliance with the CWA requirements for non-storm water discharges, as well as the prohibitions and limitations of Provisions A.1.a and A.2.a.

The federal regulations, however, also refer to several non-storm water discharge categories that must be addressed as illicit discharges if they are found to be a source of pollutants. The federal regulations thus identify some non-storm water discharges that are not required to be addressed as illicit discharges if they are not a source of pollutants (e.g. non-storm water discharges specified in Provisions E.2.a.(1)-(5)). Thus, these regulations imply that some non-storm water discharges into and from the MS4 may occur even if non-storm water discharges are "effectively" prohibited by the Copermittees.

If the source of a non-storm water discharge is identified as a category of non-storm water specified in Provisions E.2.a.(1)-(5), the NALs can be used to determine the category of non-storm water discharges is a source of pollutants. For other non-storm

water discharges not specified in Provisions E.2.a.(1)-(5), the CWA requires those discharges to be "*effectively"* prohibited by removing the discharge to the MS4 through enforcement of the Copermittees' legal authority established under "*ordinance, order or similar means*" to prohibit illicit discharges to the MS4s.

If there are non-storm water discharges that are not required to be addressed as illicit discharges, those discharges must comply, at a minimum, with the discharge prohibitions and receiving water limitations of Provision A. Thus, the non-storm water discharges from the MS4 must be at levels that will not cause or contribute to a condition of pollution, contamination, or nuisance (Provision A.1.a), and must not cause or contribute to a violation of water quality standards in receiving waters (Provision A.2.a) to be consistent with the discharge prohibitions and receiving water limitations of Provisions A.1.a and A.2.a.

Furthermore, the San Diego Region has predominantly intermittent and ephemeral rivers and streams which vary in flow volume and duration at spatial and temporal scales. For most of these river and stream systems, non-storm water discharges from the MS4 are likely to be the most significant or the only source contributing to surface flows present within the receiving water, especially during the dry season.

Therefore, because of the prohibitions and limitations of Provision A.1.a and A.2.a, and the likelihood that non-storm water discharges from the MS4 are the most significant or only source contributing to surface flows present within the receiving water, NALs generally must be consistent with the water quality objectives found within the Basin Plan. Non-storm water discharges that are meeting the NALs would not be expected to cause or contribute to an exceedance of water quality objectives in receiving waters, which would be consistent with the discharge prohibitions and receiving water limitations of Provisions A.1.a and A.2.a.

Exceedances of the NALs would then provide an indication of the relative severity of a pollutant in non-storm water discharges from the MS4 contributing to potential or observed receiving water quality impacts. The relative severity or significance of a pollutant in non-storm water discharges from the MS4 will provide the Copermittees a valuable source of information that can be used to identify priority water quality conditions within a Watershed Management Area and within each Copermittee's jurisdiction.

Tables C-1 through C-4 under Provision C.1.a specify numeric NALs for several parameters or pollutant constituents for non-storm water discharges from the MS4 to several water body types. The NALs for MS4 discharges given under Provision C.1.a are based on the water quality objectives for inland surface waters in the Basin Plan, and the water quality objectives for ocean waters in the Ocean Plan. The NALs for most of the metals were calculated based on the State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP). The NALs provided in Tables C-1

through C-4 must be included in the Water Quality Improvement Plans required to be developed pursuant to Provision B.

Provision C.1.b requires the Copermittees to identify NALs for pollutants and/or constituents, not specified in Provision C.1.a, which are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions of the Watershed Management Area related to non-storm water discharges from the MS4s. The NALs must be based on the water quality objectives in the Basin Plan. The NALs identified under Provision C.1.b must be included in the Water Quality Improvement Plan.

The San Diego Water Board recognizes that some of the NALs required pursuant to Provisions C.1.a and C.1.b may be exceeded more frequently than not. Thus, Provision C.1.c has been included in the Order to provide the Copermittees the option to develop secondary NALs that are set at levels greater than the levels required pursuant to Provisions C.1.a and C.1.b to further refine the prioritization and assessment of water quality improvement strategies for addressing non-storm water discharges to and from the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and from the MS4.

Provision C.2 (Storm Water Action Levels) requires the Copermittees to incorporate SALs into the Water Quality Improvement Plan for pollutants and/or constituents causing or contributing, or may be causing or contributing, to the highest priority water quality conditions identified in the Water Quality Improvement Plan related to storm water discharges from the MS4s.

The SALs have been included to ensure that the Copermittees are implementing and complying with several requirements of the MS4 permit. Provision A.1.a prohibits storm water discharges from the MS4 from "*causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state.*" In addition, pursuant to Provision A.2.a, storm water discharges "*must not cause or contribute to the violation of water quality standards in any receiving waters*."

Provision A.3.a, however, implicitly acknowledges that compliance with Provisions A.1.a and A.2.a cannot be achieved immediately for discharges of storm water from the MS4 by applying the MEP standard. Thus, Provision A.4 requires the Copermittees to implement an iterative approach to demonstrate that MEP is being achieved. This approach is supported by USEPA.

The federal CWA requires permits for municipal storm sewer systems to "*require controls to reduce the discharge of pollutants [in storm water] to the maximum extent practicable*, *including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants.*" MEP is an ever-evolving, flexible, and advancing concept. As knowledge about controlling storm water runoff

and discharges evolves, so does the knowledge which constitutes MEP. Reducing the discharge of storm water pollutants from the MS4 to the MEP requires the Copermittees to assess their jurisdictional runoff management programs and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP. The SALs provide the Copermittees measureable goals that may be used to demonstrate the achievement of MEP for reducing pollutants in storm water discharges from the MS4. The SALs will be used as part of the MS4 discharges assessments required under Provision D.4.a.

In June of 2006, the State Water Board's Blue Ribbon Storm Water Panel released its report titled "*The Feasibility of Numerical Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities*." In the recommendations, the Blue Ribbon panel proposed storm water effluent limitations which are computed using statistical based population approaches. The SALs specified in Table C-5 under Provision C.2.a were developed from a regional subset of nationwide Phase I MS4 data by using USEPA Rain Zone 6 (arid west) data.[28] Additionally, utilization of regional data is appropriate due to the addition of data into the nationwide Phase I MS4 monitoring dataset in February 2008. This additional data increased the number of USEPA Rain Zone 6 samples to more than 400, and included additional monitoring events within Southern California.

Utilizing data from USEPA Rain Zone 6 resulted in SALs which closely reflect the environmental conditions experienced in the San Diego Region. The localized subset of data includes sampling events from multiple Southern California locations including Orange, San Diego, Riverside, Los Angeles, and San Bernardino Counties. The dataset includes samples taken from highly built-out impervious areas and from storm events representative of Southern California conditions.

The SALs for cadmium, copper, lead and zinc require the measurement of hardness and to provide more specificity in the assessment of samples with SALs for total metal concentrations. While USEPA Rain Zone 6 data include a large sample size for concentrations of total metals, the impact the concentration will have on receiving waters will vary with receiving water hardness. Since it is the goal of the SALs, through the iterative process and MEP standard, to have MS4 storm water discharges meet all applicable water quality objectives, the hardness of the receiving water should be used when assessing the total metal concentration of a sample.

Thus, when there is an exceedance of a SAL for a metal, the Copermittee must determine if that exceedance is above the existing applicable water quality objectives based upon the hardness of the receiving water. The water quality objectives Copermittees must use to assess total metal SAL exceedances are the California Toxic Rule (CTR) and USEPA National Recommended Water Quality Criteria for Freshwater Aquatic Life 1 hour maximum concentrations. The 1 hour maximum

[28] Data used to develop SAL were obtained from http://rpitt.eng.ua.edu/Research/ms4/mainms4.shtml

concentration is to be used for comparison since it is expected to most replicate the impacts to waters of the State from the first flush following a precipitation event.

The statistically calculated SALs given in Table C-5 are at levels greater than the water quality objectives in the Basin Plan or Ocean Plan. Because the objective of the CWA is to "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*", meaning eventually pollutants in storm water discharges must be reduced to a level that cannot cause or contribute to an exceedance of water quality objectives in receiving waters, over time the SALs are expected to be reduced to a level that is based on the water quality objectives rather than statistical calculations. The San Diego Water Board will review the SALs as more data for discharges of storm water from the MS4s are collected, and revise them as conditions improve and the MEP standard advances. For the Water Quality Improvement Plans required under this Order, the SALs identified under Provision C.2.a must be included.

Provision C.2.b requires the Copermittees to identify SALs for pollutants and/or constituents, not specified in Provision C.2.a, which are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions of the Watershed Management Area related to storm water discharges from the MS4s. The SALs identified under Provision C.2.b must be included in the Water Quality Improvement Plan.

The San Diego Water Board recognizes that some of the SALs required pursuant to Provisions C.2.a and C.2.b may be exceeded more frequently than not. Thus, Provision C.2.c has been included in the Order to provide the Copermittees the option to develop secondary SALs that are set at levels greater than the levels required pursuant to Provisions C.2.a and C.2.b to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s.

D. Monitoring and Assessment Program Requirements

Purpose: Provision D includes minimum monitoring and assessment requirements that must be developed and implemented by the Copermittees as part of the Water Quality Improvement Plans. Implementation of the monitoring and assessment requirements of Provision D will allow the Copermittees to demonstrate that the requirements of the CWA to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP are being achieved. Implementation of the monitoring and assessment requirements of Provision D will also allow the Copermittees and the San Diego Water Board to track improvements to the water quality in the San Diego Region. The monitoring and assessment program requirements are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order.

***Discussion*:** The San Diego Water Board recognized that changes to the monitoring and assessment requirements of the Fourth Term Permit were necessary to improve the usefulness and usability of monitoring data collected by the Copermittees to support their jurisdictional storm water programs more efficiently and with increased effectiveness. The data collected are needed to better inform the Copermittees' understanding of the physical, chemical, and biological condition of the receiving waters and the quality of the MS4 discharges. The monitoring program needs to provide opportunities for the Copermittees to integrate regional monitoring efforts into municipal storm water monitoring requirements to provide a cost-effective approach to monitoring and avoid duplication of efforts.

The requirements in Provision D were largely recommended by the Copermittees as an outcome of the San Diego Water Boards Focused Meeting process. The monitoring and assessment program requirements now require collection of more specific information necessary for each Copermittee to adapt its jurisdictional runoff management program in such a way that focuses resources on a watershed's highest priority water quality conditions. The monitoring and assessment program will require the Copermittees to collect data that can be utilized to answer both watershed level management questions (e.g. Are the chemical, physical, and biological conditions of a receiving water protective, or likely protective of beneficial uses?), and specific jurisdictional runoff management program activity questions (e.g. Are the water quality improvement strategies of the jurisdictional program effectively eliminating non-storm water discharges to the MS4?).

The monitoring data collected and assessment information that will be reported to the San Diego Water Board are necessary to determine if the Copermittees are complying with the prohibitions and limitations of Provision A. The required monitoring and assessments that must be reported to the San Diego Water Board will be utilized for three purposes:

(1) Inform the Copermittees, San Diego Water Board, and the public on the progress of the Copermittees' efforts to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP;

(2) Inform the Copermittees, San Diego Water Board, and the public on the condition of water bodies receiving discharges from the Copermittees' MS4, and the progress of the Copermittees' water quality improvement implementation efforts toward improving the receiving water quality; and

(3) Inform the Copermittees, the San Diego Water Board, and the public on the effectiveness of the Water Quality Improvement Plan toward achieving (1) and (2).

The monitoring and assessment information reported pursuant to Provision F is also expected to be key to the iterative approach and adaptive management process required under Provision A.4 and implemented through the Water Quality Improvement Plan required under Provision B. As required by Provision A.4, the iterative approach and adaptive management process is required if the Copermittees cannot meet the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c, and/or A.2.a under the present conditions.

Provision D provides the minimum monitoring and assessment requirements that must be included in each Water Quality Improvement Plan to be developed and implemented by the Copermittees. The Copermittees, however, are not limited to the requirements of Provision D and may include additional methods to track progress toward improving water quality in a Watershed Management Area.

More specific and detailed discussions of the requirements of Provision D are provided below.

<u>Provision D.1 (Receiving Water Monitoring Requirements)</u> specifies the minimum receiving water monitoring that the Copermittees must conduct within the Watershed Management Area and include as part of the Water Quality Improvement Plan.

Provision D.1 establishes minimum monitoring requirements that must be conducted by the Copermittees within each Watershed Management Area. Provision D.1 requires the Copermittees to collect and develop the data and information necessary to determine potential impacts to the beneficial uses in the receiving waters due to discharges from the MS4s. The monitoring required under Provision D.1 will also provide the data that will allow the Copermittees to gauge the effectiveness and progress of its Water Quality Improvement Plan implementation efforts toward improving the quality of receiving waters.

The receiving water monitoring requirements of Provision D.1 are focused primarily on monitoring the conditions and response of the receiving waters to the Copermittees'

collective implementation efforts to reduce receiving water impacts that may be caused by the discharges from the MS4s. The preference of the San Diego Water Board is for the Copermittees to spend their resources achieving tangible and observable improvements in receiving water conditions instead of collecting samples and analyzing data that has consistently indicated that receiving water conditions are degraded and require improvement. In general, the ability to measure potential improvements in receiving water conditions due to any actions implemented by the Copermittees as part of the Water Quality Improvement Plan may require several years before a response can be observed. Thus, the frequency of collecting receiving water monitoring data has been kept to a minimum.

During the transitional period between adoption of this Order and San Diego Water Board acceptance of a Water Quality Improvement Plan, the Copermittees must conduct receiving water monitoring in accordance with Provision D.1.a. This approach to collecting receiving water data is different from what was required in the Fourth Term Permits, but one that truly embraces the concept of an integrated, cost-effective, streamlined receiving water monitoring approach.

Provision D.1.a requires Copermittees to continue performing the receiving water monitoring programs required in Order Nos. R-2007-0001, R9-2009-002, and R9-2010-0016; plus participation in: hydromodification management plan monitoring approved by the San Diego Water Board, monitoring plans as part of load reduction plans (either Bacteria Load Reduction Plans or Comprehensive Load Reduction Plans) for TMDLs in Attachment E of the Order, Storm Water Monitoring Coalition Regional Monitoring, Southern California Bight Regional Monitoring, Sediment Quality Monitoring, and ASBS Monitoring as applicable to a Watershed Management Area.

Provision D.1.a also provides an opportunity for the Copermittees to use third party data to meet receiving water monitoring requirements where feasible. Allowing the Copermittees to use the data currently collected through its participation in existing regional receiving water programs and that of third parties provides an efficiency of resources in obtaining the data necessary to inform the Copermittees and the San Diego Water Board about the physical, chemical, and biological conditions of the receiving waters, which can also help to focus the receiving water monitoring during the implementation of the Water Quality Improvement Plan. Once a Water Quality Improvement Plan is developed for a Watershed Management Area in compliance with Provision B of this Order, the transitional period is over and Copermittees are required to conduct receiving water monitoring according to the requirements of Provisions D.1.b-e.

Provision D.1.b requires each Copermittee to identify at least one long term receiving water monitoring station to be representative of receiving water quality within each Watershed Management Area. Long term receiving water monitoring stations can be located at any existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees. The requirements under Provision D.1.b. are

consistent with 40 CFR 122.26(d)(2)(iii)(D), which specifies that a "*monitoring program for representative data collection for the term of the permit*" may include "*instream locations.*" For each Watershed Management Area, at least one long term watershed monitoring station is required to be established and monitored. The Copermittees may choose to establish additional long term monitoring stations where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

Provision D.1.b. requires the Copermittees to locate the long term receiving water monitoring station at one of these existing receiving water monitoring stations to provide the Copermittees an opportunity to experience monitoring cost savings while continuing to collect the necessary data to assess the status and trends of receiving water quality conditions in 1) coastal water, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under both dry weather and wet weather conditions. Ideally these stations will continue to be monitored as part of the receiving water monitoring for each Watershed Management Area to maintain a consistent set of locations and a period of data that can be built upon with the monitoring required under this Order.

The receiving water monitoring requirements are separated into monitoring required during dry weather conditions pursuant to Provision D.1.c, and wet weather conditions pursuant to Provision D.1.d.

At each long term monitoring station the Copermittees must conduct at least three dry weather monitoring events as required pursuant to Provision D.1.c and at least three wet weather monitoring events as required pursuant to Provision D.1.d per permit term. Provisions D.1.c and D.1.d require the Copermittees to monitor priority water quality conditions identified in the Water Quality Improvement Plan, constituents listed as causing impairment of receiving waters in the Watershed Management Area, applicable NALs, toxicity, constituents listed in Tables D-2 and D-3, and constituents for implementation plans (e.g. Bacteria Load Reduction Plans and Comprehensive Load Reduction Plans). Required toxicity monitoring was changed to reflect an updated understanding of the unique challenges associated with sampling storm water for toxicity. Copermittees are required to sample storm water for toxicity during each dry weather and each wet weather event pursuant to Provision D.1.c.(4) and D.1.d.(4). Required toxicity monitoring is now consistent with the State Water Resources Control Board Policy for Toxicity Assessment and Control (Draft June 2012) and recently adopted MS4 permits for Caltrans and Los Angeles Water Board. Receiving water monitoring efforts in this Order have been streamlined to redirect resources to monitoring efforts that better support pollutant reduction solutions with an increasing emphasis on MS4 outfall monitoring, source identification and source abatement activities.

In addition to the receiving water monitoring requirements under Provisions D.1.b-d, Provision D.1.e requires the Copermittees participate in and/or conduct other types of receiving water monitoring. As recommended and requested by the Copermittees, Provision D.1.e.(1) requires the Copermittees to participate in existing regional monitoring, as applicable to each Watershed Management Area. Existing regional

monitoring includes monitoring conducted by the Storm Water Monitoring Coalition and for the Southern California Bight. Participation in and use of monitoring data collected from these existing regional water quality monitoring programs provide the Copermittees a greater opportunity for efficiency in the use of their resources to manage their storm water programs and those controllable discharges under their authority.

The State Water Resources Control Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part 1 Sediment Quality which became effective August 25, 2009 (Sediment Quality Monitoring Policy). Provision D.1.e.(2) requires any Copermittees with MS4 discharges to an enclosed bay or estuary to monitoring the sediments in the enclosed bay or estuary receiving water in accordance with the sediment quality monitoring procedures as prescribed in the Sediment Quality Monitoring Policy.

The State Water Board adopted Resolution No. 2012-0012 which approved exceptions to the California Ocean Plan for selected discharges into Areas of Special Biological Significance (ASBS), including special protections for beneficial uses. State Board Resolution No. 2012-0012 became effective on March 20, 2012, and Attachment B to the Resolution established limitations on point source storm water discharges to ASBS. Copermittees with MS4s that discharge to an ASBS must monitor its discharge to assure compliance with State Board Resolution No. 2012-0012 as required pursuant to Provision D.1.e.(3).

The San Diego Water Board is currently developing a regional monitoring strategy to assess the conditions of receiving waters in the San Diego Region. The monitoring requirements of Provision D.1 are expected to be incorporated or serve as a foundation of this regional monitoring strategy, but may require some modifications. When the San Diego Water Board develops an alternative regional monitoring strategy, the Copermittees will be required to participate in the development and implementation of the alternative regional monitoring program pursuant to Provision D.1.f.

Provision D.2 (MS4 Outfall Discharge Monitoring Requirements) specifies the minimum MS4 outfall discharge monitoring requirements that the Copermittees must incorporate and implement as part of the Water Quality Improvement Plan.

The dry weather MS4 outfall discharge monitoring requirements are included under Provisions D.2.a.(2) and D.2.b. The dry weather MS4 outfall discharge monitoring requirements are part of the "*program, including a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer*" required by 40 CFR 122.26(d)(2)(iv)(B), which is expected to achieve compliance with the CWA section 402(p)(3)(B)(ii) statutory requirement for municipal storm water permits to require the Copermittees to "*effectively prohibit non-storm water discharges into the storm sewers*." The dry weather MS4 outfall discharge monitoring data

collection requirements are based on requirements under 40 CFR 122.26(d)(1)(iv)(D) and 122.26(d)(2)(iv)(B)(3).

The dry weather MS4 outfall discharge monitoring requirements are designed to provide wide spatial and temporal coverage of each jurisdiction to better understand the extent and magnitude of non-storm water discharges to receiving waters, and make a distinction between persistent and transient non-storm water flows. This information is expected to allow each Copermittee to focus its resources on eliminating and controlling the highest priority threats to receiving water quality, as well as integrating other elements of the storm water programs (e.g. complaint call response) and third party data to efficiently and effectively assist in efforts to eliminate non-storm water discharges.

The dry weather MS4 outfall discharge monitoring requirements of Provision D.2.a.(2) and D.2.b are separated into monitoring required before and after the San Diego Water Board accepts the Copermittees' Water Quality Improvement Plan. Outfall monitoring conducted prior to acceptance of the Water Quality Improvement Plan is referred to in the Order as Transitional MS4 Outfall Discharge Monitoring. Provision D.2.a.(2) includes the transitional dry weather MS4 outfall discharge monitoring requirements.

The requirements under Provision D.2.a.(2) are based on the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B), which include the requirements for a monitoring program to identify, detect, and eliminate illicit connections and illegal discharges to the MS4s. The federal regulations (40 CFR 122.26(d)(1)(iv)(D)) require the monitoring program to include "*a field screening analysis for illicit connections and illegal dumping [that]…[a]t a minimum, include[s] a narrative description, for either each field screening point or major outfall, of visual observations made during dry weather periods.*" The federal regulations (40 CFR 122.26(d)(1)(v)(B)) require the monitoring program to include "*inspection procedures and methods for detecting and preventing illicit discharges, and describe areas where this program has been implemented.*" Furthermore, the monitoring program is required by federal regulations (40 CFR 122.26(d)(2)(iv)(B)) to include "*a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer.*"

Dry weather transitional MS4 outfall discharge monitoring requires each Copermittee to field screen (inspect) its major MS4 outfalls to classify the MS4 outfall locations as having persistent dry weather flows, transient dry weather flows, or no dry weather flows. To account for the variance in size of the 39 jurisdictions covered under this Order, the Copermittees recommended a tiered approach to the number of major MS4 outfalls that must be inspected. Provision D.2.a.(2)(a) provides a tiered approach to the number of major MS4 outfalls that must be visually inspected per jurisdiction as well as a minimum frequency each Copermittee must inspect each major MS4 outfall per year. This tiered approach is based on the total number of major MS4 outfalls within a Copermittees jurisdiction within each Watershed Management Area.

Based on the field screening, each Copermittee is required to make a determination whether any observed flowing, pooled, or ponded waters are transient or persistent flows. Based on this field screening information, other jurisdictional program information, and third party information, each Copermittee is required to prioritize the MS4 outfalls within its jurisdiction for follow up investigation and elimination of the non-storm water discharge, as part of its illicit discharge detection and elimination program required pursuant to Provision E.2. In accordance with the requirements of Provision E.2, each Copermittee is required to immediately investigate obvious illicit discharges (e.g. outfall discharges with unusual color, unusual odor, or high flows).

This approach allows a Copermittee to use all of its resources, as well as leverage resources and information provided by third parties, to effectively eliminate non-storm water discharges from its MS4 outfalls. If the source of the non-storm water discharge cannot be immediately eliminated, the Copermittee uses the persistent flow or transient flow classification along with other programmatic implementation data to prioritize the MS4 outfalls for future investigation. In accordance with the adaptive management approach deployed throughout this Order, Provision D.2.a.(2)(c) requires each Copermittee to update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow. The requirement of Provision D.2.a.(2)(c) assures that each Copermittee is collecting data that can be used to demonstrate compliance with the CWA requirement that each Copermittee must implement a program to "*effectively prohibit non-storm water discharges into the [MS4]*" and with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

Provision D.2.b describes the dry weather MS4 outfall discharge monitoring required to be incorporated and implemented as part of the Water Quality Improvement Plan. Dry weather MS4 outfall discharge monitoring must be performed by each Copermittee to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. The emphasis of the dry weather MS4 outfall discharge monitoring required pursuant to Provision D.2.b is consistent with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

Provision D.2.b.(1) requires each Copermittee to continue field screening its major MS4 outfalls and identifying those with persistent flows and transient flows, as conducted during the transitional period (i.e. before the Water Quality Improvement Plan was developed). However, each Copermittee now has the flexibility to adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of non-storm water persistent flow discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan. In order to ensure a minimum number of outfalls are inspected, Provision D.2.b.(1) requires the number of visual

inspections be equal to the number of visual inspections required in the tiered inspection program pursuant to Provision D.2.a.(2)(a).

Provision D.2.b.(2)(b) requires each Copermittee to monitor a minimum of 5 major MS4 outfalls with persistent flows identified as the highest priorities within a Copermittee's jurisdiction, within each Watershed Management Area. In other words, Copermittees located in more than one Watershed Management Area must identify at least 5 major MS4 outfalls with persistent flows in its jurisdiction in each Watershed Management Area. If a Copermittee is located in more than one Watershed Management Area, and they have less than 5 major MS4 outfalls with persistent flows per jurisdictional area per Watershed Management Area, all of the major MS4 outfalls must be identified as high priority dry weather persistent flow MS4 outfalls. The Copermittees identified as Responsible Copermittees by a TMDL in Attachment E of the Order may need to monitor more than 5 dry weather major MS4 outfall locations to determine compliance with the requirements of the TMDL(s).

Monitoring must occur at the highest priority outfall locations at least semi-annually until the non-storm water discharges have been eliminated for three consecutive dry weather monitoring events; identified to be authorized by a separate NPDES Permit; or reprioritized to a lower priority. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized MS4 major outfall in the Copermittee's jurisdiction within the Watershed Management Area, unless there are no remaining qualifying major MS4 outfalls within the Copermittees jurisdiction. The Copermittees must continually update their dry weather persistent flow MS4 outfall discharge monitoring locations with the next highest priority non-storm water flow that have yet to be eliminated until all persistent and transient flows are eliminated or its threat reduced.

Non-storm water persistent flow MS4 outfall discharge monitoring data collected during each semi-annual monitoring event, must be collected and analyzed according to the requirements of Provision D.2.b.(2)(b)–(e). These monitoring requirements are consistent with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

The wet weather MS4 outfall discharge monitoring requirements are included under Provisions D.2.a.(3) and D.2.c. The wet weather MS4 outfall discharge monitoring requirements are necessary for the Copermittees to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable, using management practices, control techniques and system, design and engineering methods, and such other provisions which are appropriate*" required by 40CFR 122.26(d)(2)(iv), which is expected to achieve compliance with the CWA section 402(p)(3)(B)(iii) statutory requirement for municipal storm water permits to require "*controls to reduce the discharge of pollutants [in storm water] to the maximum extent practicable*." The wet weather MS4 outfall discharge monitoring data collection requirements are based on requirements under 40 CFR 122.26(d)(2)(iii), 122.26(d)(2)(iii)(A) and 122.26(d)(2)(iii)(A)(1)-(4), and 40 CFR 122.21(g)(7)(i)-(ii).

The wet weather MS4 outfall discharge monitoring requirements of Provision D.2.a.(3) and D.2.c are separated into monitoring required before and after the San Diego Water Board accepts the Copermittees' Water Quality Improvement Plan. Outfall monitoring conducted prior to acceptance of the Water Quality Improvement Plan is referred to in the Order as Transitional MS4 Outfall Discharge Monitoring. Provision D.2.a.(3) includes the transitional wet weather MS4 outfall discharge monitoring requirements.

Until the wet weather MS4 outfall discharge monitoring requirements of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board, the Copermittees must comply with the requirements of transitional wet weather MS4 outfall monitoring requirements pursuant to Provision D.2.a.(3). Provision D.2.a.(3) requires the Copermittees in each Watershed Management Area to sample, at least five of the major MS4 outfalls inventoried pursuant to Provision D.2.a.(1) once per wet season for the monitoring data required to be collected pursuant to Provision D.2.a.(3)(c)-(e). Provision D.2.a.(3) further requires at least one major MS4 outfall monitoring station be located in each Copermittee's jurisdiction within the Watershed Management Area.

At a minimum, the five sampling locations chosen must be representative of storm water discharges from residential, commercial, industrial, and typical mixed-use land uses present within a Watershed Management Area. The San Diego Water Board expects the Copermittees to extrapolate from these data to similar land uses throughout the Watershed Management Area to better inform the Water Quality Improvement Plan development process by prioritizing drainages for implementation of storm water control efforts required pursuant to Provision E.

Provision D.2.c describes the wet weather MS4 outfall discharge monitoring required to be included and implemented as part of the Water Quality Improvement Plan. Provision D.2.c provides the Copermittees the flexibility to adjust the wet weather MS4 outfall discharge monitoring locations and frequencies in the Watershed Management Area, as needed, to identify sources of pollutants in storm water discharges from MS4s in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan.

Although Provision D.2.c.(1) allows the Copermittees to adaptively manage the wet weather MS4 outfall discharge monitoring locations and frequencies, the provision requires a minimum of at least five wet weather outfall stations to be monitored. Provision D.2.c.(2) further allows the Copermittees to modify the monitoring frequency at each wet weather MS4 outfall station to meet the goals of the Water Quality Improvement Plan as long as the monitoring frequency occurs at least once per year and is at an appropriate frequency to identify sources of pollutants in storm water discharges, guide pollutant source identification efforts, or determine compliance with the requirements of the applicable TMDLs in Attachment E to the Order.

The wet weather MS4 outfall discharge monitoring requirements of Provisions D.2.c.(3) and D.2.c.(4) are the same as the transitional wet weather MS4 outfall discharge monitoring. In contrast, the requirements of Provision D.2.c.(5) are focused on collecting analytical data specific to the highest priority water quality conditions in the Watershed Management Area identified in the Water Quality Improvement Plan. The wet weather MS4 outfall discharge monitoring data collection requirements are consistent with the requirements under 40 CFR 122.26(d)(2)(iii), 122.26(d)(2)(iii)(A) and 122.26(d)(2)(iii)(A)(1)-(4), and 40 CFR 122.21(g)(7)(i)-(ii).

Provision D.3 (Special Studies) requires the Copermittees to develop special studies that will be conducted for each Watershed Management Area and the entire San Diego Region. Data collected pursuant to Provision D.3 is to be used by the Copermittees to improve the effectiveness of the strategies implemented by the jurisdictional runoff management programs toward achieving the numeric goals identified in the Water Quality Improvement Plans and ultimately achieve compliance with the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c, and A.2.a, which is consistent with the requirements of Provision A.4.

Special studies are often necessary to fill data gaps or provide more refined information that allow the Copermittees to better manage the generation or elimination of pollutants and discharges to and from the MS4. In the Fourth Term Permits, the Copermittees have been required to implement special studies as directed by the San Diego Water Board. The special studies required by this Order provide the Copermittees more flexibility to identify and implement special studies that will be most useful to improving the effectiveness of their jurisdictional runoff management programs.

Provision D.3.a.(1) requires the Copermittees to develop and conduct at least two special studies per Watershed Management Area, to be determined by the Copermittees. One of the two special studies may be accomplished through participation in a Regional Special Study required under Provision D.3.a.(2). The requirements provide the Copermittees great latitude in identifying and developing the special studies. Watershed Management Area special studies are required, at a minimum, to: (a) relate in some way to the highest water quality priorities identified by the Copermittees in the Water Quality Improvement Plan, (b) be conducted within the Watershed Management Area, and (c) include some form of participation (e.g. contribution of funds, personnel services, project management) by all the responsible Copermittees within the Watershed Management Area.

Examples of Watershed Management Area special studies might include, but are not limited to: (1) focused pollutant source identification studies, (2) BMP effectiveness and/or comparison studies, (3) pilot tests for new or emerging pollutant control methods, (4) receiving water pollutant or stressor source identification and/or mitigation studies, or (5) pollutant fate and transport studies. The Watershed Management Area special studies are expected to provide data that can be utilized by the Copermittees to improve the Water Quality Improvement Plan or implementation of

the Copermittees' jurisdictional runoff management programs to address the highest priority water quality conditions.

Provision D.3.a.(2) requires the Copermittees to develop at least one special study that will be conducted for the entire San Diego region. The regional special study is expected to provide data that can be utilized by the Copermittees to improve the Water Quality Improvement Plan or implementation of the Copermittees' jurisdictional runoff management programs to identify or address regional water quality concerns and priorities.

An example of a regional special study would be to develop and establish allowable exceedance frequencies of the bacteria water quality objectives for several types of water bodies, during different wet and dry weather conditions the San Diego region. The special study would be related to bacteria, which is a priority for the San Diego region due to the adoption of "*Bacteria TMDL Project I – Beaches and Creeks in the San Diego Region*." The study results could be used to inform the Copermittees and the San Diego Water Board about the indictor bacteria water quality objective exceedance frequencies that occur in natural or reference watersheds.

Provision D.4 (Assessment Requirements) specifies the assessments that the Copermittees are required to perform, based on the monitoring data collected, and will be reported as part of the Annual Report for the Water Quality Improvement Plan implementation. Provision D.4 requires the Copermittees assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c, and A.2.a.

Provision D.4 specifies the assessments that Copermittees must perform for each Watershed Management Area to assess the effectiveness of each Copermittee's jurisdictional runoff management program and the Water Quality Improvement Plan. The effectiveness of each Copermittee's jurisdictional runoff management program and Water Quality Improvement Plan is measured through these types of assessments: (a) Receiving Waters Assessments (b) MS4 Outfall Discharges Assessments, (c) Special Studies Assessments, and (d) Integrated Assessment of Water Quality Improvement Plan.

Provision D.4.a requires the Copermittees to assess the status of receiving water conditions annually during the transitional monitoring period (during development of the Water Quality Improvement Plan) and after acceptance of the Water Quality Improvement Plan. The monitoring data collected pursuant to Provision D.1 will be evaluated, among other information, to assess the condition of a Watershed Management Area's streams, coastal waters, enclosed bays, harbors, estuaries, and lagoons. The focus of the receiving waters assessments is to measure progress toward the objective of the CWA to "*restore and maintain the chemical, physical, and biological integrity of the Nation's waters*" as the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program are implemented within a Watershed Management Area. Provision D.4.a is consistent with 40 CFR

122.42(c)(7) which requires the Copermittees to annually report the *"[i]dentification of water quality improvements or degradation."*

Provision D.4.b includes the MS4 outfall discharges assessment requirements. The focus of MS4 outfall discharges assessments is to determine if the Copermittees' are implementing programs that comply with the requirements of the CWA for MS4 permits to "*effectively prohibit non-stormwater discharges into the storm sewers*" and "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable.*" The monitoring data collected pursuant to Provisions D.2 will be evaluated, among other information, to assess the effectiveness of the transitional MS4 outfall field screening monitoring, the implementation of the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program. The MS4 outfall discharge assessments consist of Non-Storm Water Discharges Reduction Assessments and Storm Water Pollutant Discharges Reduction Assessments.

The Non-Storm Water Discharges Reduction Assessments are how each Copermittee will demonstrate that its jurisdictional runoff management program implementation efforts are achieving the CWA requirement to "*effectively prohibit non-stormwater discharges into the storm sewers.*" Provision D.4.b.(1) requires each Copermittee to assess and report on its illicit discharge detection and elimination program required pursuant to Provision E.2 to reduce and effectively prohibit non-storm water and illicit discharges into the MS4 within its jurisdiction. The Non-Storm Water Discharges Reduction Assessments include specific assessment requirements applicable to each Copermittee.

As each Copermittee collects and analyzes the data collected pursuant to dry weather MS4 outfall discharges monitoring requirements of Provisions D.2.a.(2) and D.2.b, Provision D.4.b.(1) requires each Copermittee to assess the progress, assess the effectiveness of its current actions, and identify modifications necessary to increase the effectiveness of its actions toward reducing and eliminating non-storm water and illicit discharges to its MS4. The findings from these assessments are expected to be utilized by the Copermittee as part of its procedures to prioritize the non-storm water discharges that will be addressed by its Illicit Discharge Detection and Elimination program required pursuant to Provision E.2.

The assessment requirements of Provision D.4.a.(1) are consistent with 40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(3) which require "*procedures…to investigate portions of the separate storm sewer system that, <u>based on the results of the field screen, or other appropriate information</u> [emphasis added], indicate a reasonable potential of contain illicit discharges or other sources of non-storm water*" as part of a "*program…to detect and remove…illicit discharges and improper disposal into the storm sewer.*" The assessment requirements of Provision D.4.a.(1) are also consistent with 40 CFR122.42(c)(1) requires the Copermittees to annually report the "*status of implementing the components of the storm water management program that are established as permit conditions.*"

The Storm Water Pollutant Discharges Reduction Assessment is how the Copermittees in each Watershed Management Area will demonstrate that their jurisdictional runoff management program implementation efforts are achieving the CWA requirement to "*reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable*." Provision D.4.b.(2) requires the Copermittees in each Watershed Management Area to assess and report the progress of the Copermittees' efforts to reduce pollutants in storm water discharges from the MS4s to the MEP. The Storm Water Pollutant Discharges Reduction Assessments include specific assessment requirements during both the transitional monitoring period and after acceptance of the Water Quality Improvement Plan applicable to the Watershed Management Area and each Copermittee.

As the Copermittees collect and analyze the data collected pursuant to wet weather MS4 outfall discharges monitoring requirements of Provisions D.2.a.(3) and D.2.c, Provision D.4.b.(2) requires the Copermittees to assess runoff conditions during the transitional period, and the progress of the Water Quality Improvement Plan strategies toward reducing pollutants in storm water from the MS4 to the MEP. The findings from these assessments are expected to be utilized by the Copermittees to identify any modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify sources of pollutants in storm water discharges from the MS4s, as well as focus, modify, and improve the water quality improvement strategies implemented by each Copermittee within its jurisdiction to reduce pollutants in storm water discharges to the MEP.

The assessment requirements of Provision D.4.b.(2) are consistent with 40 CFR 122.26(d)(2)(iii)(B) which requires "*[e]stimates of the annual pollutant load of the cumulative discharges to waters of the United States from all identified municipal outfalls…during a storm event…accompanied by a description of the procedures for estimating constituent loads and concentrations, including any modeling, data analysis, and calculation methods.*" The assessment requirements of Provision D.4.a.(2) are consistent with 40 CFR 122.26(d)(2)(v) which requires that each Copermittee assesses the *"estimated reductions in loadings of pollutants from discharges of municipal storm sewer constituents from municipal storm sewer systems expected as the result of the municipal storm water quality management program."* The assessment requirements of Provision D.4.b.(2) are also consistent with 40 CFR122.42(c)(1) requires the Copermittees to annually report the "*status of implementing the components of the storm water management program that are established as permit conditions.*"

Provision D.4.c includes the special studies assessment requirements. Performing special studies are how the Copermittees will address data gaps identified during the development of and updates to the Water Quality Improvement Plan. The relevant findings from the special studies assessments are expected to be incorporated as part of the applicable receiving water assessments, MS4 outfall discharge assessments,

and integrated water quality improvement assessments required in Provision D.4.a, D.4.b, and D.4.d, respectively.

The assessment requirements in Provision D.4.d are part of the iterative approach and adaptive management process required by Provision A.4. The Copermittees are required to integrate the data collected pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to re-evaluate the Water Quality Improvement Plan.

The monitoring data collected pursuant to Provisions D.1 and D.2, and the results of the assessment required pursuant to Provisions D.4.a-c, will be used to determine whether the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program are effective, or require modifications or improvements to become more effective to achieve the requirements of the CWA. The assessments required by Provision D.4.d are consistent with 40 CFR 122.42(c)(1) which requires that the Copermittees to report the *"[t]he status of implementing the components of the storm water management program that are established as permit conditions."*

E. Jurisdictional Runoff Management Programs

Purpose: Provision E includes the requirements for the jurisdictional runoff management programs to be implemented by each of the Copermittees. Compliance with the requirements for the jurisdictional runoff management programs will allow the Copermittees to demonstrate that they are implementing programs to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP. The jurisdictional runoff management program document prepared by each Copermittee will also provide the details for implementing the water quality improvement strategies identified in the Water Quality Improvement Plan specifically within its jurisdiction.

***Discussion*:** Implementation of the jurisdictional runoff management program requirements under Provision E is how the Copermittees "*effectively prohibit non-stormwater discharges into the storm sewer,*" and outlines the "*controls to reduce the discharge of pollutants to the maximum extent practicable"* consistent with the federal regulations under 40 CFR 122.26. The jurisdictional runoff management program is part of the "*comprehensive planning process*" that is required pursuant to 40 CFR 122.26(d)(2)(iv). Where the Water Quality Improvement Plan is the "*comprehensive planning process*" on a Watershed Management Area scale, requiring "*intergovernmental coordination,*" the jurisdictional runoff management program document is the "*comprehensive planning process*" on a jurisdictional scale that should be coordinated with the other Copermittees in the Watershed Management Area to achieve the goals of the Water Quality Improvement Plan.

The jurisdictional runoff management program requirements are included to provide each Copermittee criteria that can be used to demonstrate that its storm water management program is implementing the "*comprehensive planning process*" within its jurisdiction to "*effectively prohibit non-stormwater discharges into the storm sewers,*" and to identify and implement the most effective "*controls to reduce the discharge of pollutants to the maximum extent practicable"* in accordance with the performance standards given in the CWA.

Provision E includes the requirements for each of the components that must be included in the Copermittee's jurisdictional runoff management program document that will be implemented by the Copermittee within its jurisdiction. Implementation of the components of each Copermittee's jurisdictional runoff management program must incorporate the water quality improvement strategies identified by each Copermittee in the Water Quality Improvement Plans, described pursuant to Provision B.3.b.(1)(a).

More specific and detailed discussions of the requirements of Provision E are provided below.

Provision E.1 (Legal Authority Establishment and Enforcement) requires each Copermittee to establish and enforce sufficient legal authority to control discharges to the MS4 within its jurisdiction.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system*" and be able to demonstrate that it can "*operate pursuant to legal authority established by statute, ordinance or series of contracts.*" Provision E.1.a describes the minimum legal authorities each Copermittee must establish for itself within its jurisdiction to control discharges to its MS4. The requirements of Provision E.1.a are consistent with the requirements set forth in 40 CFR 122.26(d)(2)(i)(A)-(F).

The certification statement required from each Copermittee by Provision E.1.b is included to provide the San Diego Water Board additional documentation that each Copermittee has established the legal authorities consistent with Provision E.1.a and 40 CFR 122.26(d)(2)(i)(A)-(F), and the Copermittee can "*operate pursuant to legal authority established by statute, ordinance or series of contracts.*"

Provision E.2 (Illicit Discharge Detection and Elimination) requires each Copermittee to implement an illicit discharge detection and elimination program to effectively prohibit non-storm water discharges to the MS4 by actively detecting and eliminating illicit discharges and disposal into its MS4.

Provision E.2 establishes the minimum requirements that each Copermittee must implement within its jurisdiction to effectively prohibit non-storm water discharges from entering its MS4. The federal CWA requires permits for municipal storm sewer systems to "*effectively prohibit non-storm water discharges into the storm sewers*." The federal regulations (40CFR122.26(d)(2)(i)(B)) require each Copermitee to establish the legal authority to prohibit illicit discharges to its MS4s. Under 40 CFR 122.26(d)(2)(iv)(B), each Copermittee must implement a "*program…to detect and remove…illicit discharges and improper disposal into the storm sewer.*" The federal NPDES regulations, under 40 CFR 122.26(b)(2), define illicit discharges as "*any discharge to a municipal separate storm sewer that is not composed entirely of storm water*." Thus, non-storm water discharges are not authorized to enter the MS4 and are considered to be illicit discharges, unless authorized by a separate NPDES permit.

The Phase I Final Rule clarifies that non-storm water discharges through an MS4 are not authorized under the CWA (55 FR 47995):

> "*Today's rule defines the term "illicit discharge" to describe any discharge through a municipal separate storm sewer system that is not composed entirely of storm water and that is not covered by an NPDES permit. Such illicit discharges are not authorized under the Clean Water Act. Section 402(p)(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…Ultimately, such non-storm water discharges through a municipal separate*

storm sewer must either be removed from the system or become subject to an NPDES permit."

The federal NPDES requirements for the program to address illicit discharges must include "*inspections, to implement and enforce an ordinance, orders, or other similar means to prevent illicit discharges to the MS4*." The federal NPDES regulations also reference several categories of "*non-storm water discharges or flows* [which] *shall be addressed where such discharges are identified…as sources of pollutants to waters of the United States*." The Phase I Final Rule (55 FR 48037) further clarified the requirements of 40 CFR 122.26(d)(2)(iv)(B)(1) as follows:

"*EPA is clarifying that section 402(p)(3)(B) of the CWA (which requires permits for municipal separate storm sewers to 'effectively' prohibit non-storm water discharges) does not require permits for municipalities to prohibit certain discharges or flows of nonstorm water to waters of the United States through municipal separate storm sewers in all cases*."

In previous iterations of the municipal storm water permits for the San Diego Region, these categories were simply listed and referred to as categories of non-storm water discharges "not prohibited" unless identified as a source of pollutants. The Copermittees have often referred to these categories as "exempt" discharges. In both cases, however, the language is inconsistent with the federal CWA and NPDES regulations. And, the clarification provided in the Phase I Final Rule does not specifically state that such discharges are "not prohibited" or "exempt" or in any way authorized. The federal NPDES regulations do, however, state that specific categories of non-storm water discharges must be "*addressed*" if identified as "*sources of pollutants to waters of the United States*."

The language of Provision E.2.a has been revised to be fully consistent with the language of the CWA and the requirements of the federal regulations under 40 CFR 122.26(d)(2)(iv)(B)(1). Provision E.2.a requires each Copermittee to address <u>all</u> types of non-storm water discharges into its MS4 as illicit discharges, <u>unless</u> the discharge is authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to Provisions E.2.a.(1) through E.2.a.(5). Only non-NPDES-permitted non-storm water discharges identified as a category of non-storm water discharges under Provisions E.2.a.(1) through E.2.a.(5) <u>and</u> *not identified as a source of pollutants* do not have to be addressed as illicit discharges. Categories of non-storm water discharges that meet the requirements of Provisions E.2.a.(1) through E.2.a.(5) do not have to be addressed by the Copermittee as illicit discharges.

Several of the non-storm water categories listed in 40 CFR 122.26(d)(2)(iv)(B)(1) have not been included in Provisions E.2.a.(1) through E.2.a.(5), including: street wash water, landscape irrigation, irrigation water, and lawn watering. Because these are no longer included within the categories listed under Provisions E.2.a.(1) through E.2.a.(5), the Copermittees must prohibit these types of non-storm water discharges

from entering the MS4. This is consistent with the clarification of 40 CFR 122.26(d)(2)(iv)(B)(1) in the Phase I Final Rule (55 FR 48037), which states:

> "*[T]he Director may include permit conditions that either require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*."

Street wash water is a category of non-storm water discharges that was removed when the Third Term Permits were issued. Street wash water is a source of several pollutants (e.g., metals, oil and grease, petroleum hydrocarbons, chlorinated solvents, sediment) which are generated during the street washing process. The removal of this category requires the Copermittees to prohibit this type of non-storm water discharge from entering the MS4.

The landscape irrigation, irrigation water, and lawn watering categories, collectively referred to hereafter as "over-irrigation" discharges, were removed from the list of non-storm water discharge categories in the Fourth Term Orange County and Riverside County Permits. Non-storm water discharges resulting from over-irrigation have been found to be a source of several types of pollutants (e.g., nutrients, bacteria, pesticides, sediment) in receiving waters. The San Diego Water Board and the Copermittees have identified categories of non-storm water discharges associated with over-irrigation as a source of pollutants and conveyance of pollutants to the MS4 and waters of the United States in the following documents:

- **SmartTimer/Edgescape Evaluation Program (SEEP) Grant Application**

  The State Water Board allocated grant funding to the SEEP project grant application submitted in 2006, which targeted irrigation runoff by retrofitting areas of existing development and documenting the conservation and runoff improvements. The basis of this grant project is that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 is a source and conveyance of pollutants. In addition, the grant application indicated that this alteration of natural flows is impacting the beneficial uses of waters of the state and U.S. Results from the study indicate that that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 *is* a source and conveyance of pollutants. The results of this study can be applied broadly to any area where over-irrigation takes place. The grant application included the following statements:

  > "*Irrigation runoff contributes flow & pollutant loads to creeks and beaches that are 303(d) listed for bacteria indicators.*"
  >
  > "*Regional program managers agree that the reduction and/or elimination of irrigation-related urban flows and associated pollutant loads may be key to successful attainment of water quality and beneficial use goals as outlined in the San Diego Basin Plan and Bacteria TMDL over the long term.*"

"*Elevated dry-weather storm drain flows, composed primarily … of landscape irrigation water wasted as runoff, carry pollutants that impair recreational use and aquatic habitats all along Southern California's urbanized coastline. Storm drain systems carry the wasted water, along with landscape derived pollutants such as bacteria, nutrients and pesticides, to local creeks and the ocean. Given the local Mediterranean climate, excessive perennial dry season stream flows are an unnatural hydrologic pattern, causing species shifts in local riparian communities and warm, unseasonal contaminated freshwater plumes in the near-shore marine environment.*"

- **2006-2007 Orange County Watershed Action Plan Annual Reports**

The Watershed Action Plan Annual Reports for the 2006-2007 reporting period were submitted by the County of Orange, Orange County Flood Control District and Copermittees within the San Juan Creek, Laguna Coastal Streams, Aliso Creek, and Dana Point Coastal Streams Watersheds. San Juan Creek, Laguna Coastal Streams, Aliso Creek and Dana Point Coastal Streams are all currently 303(d) listed as impaired for indicator bacteria within their watersheds and/or in the Pacific Ocean at the discharge points of their watersheds. The Orange County Copermittees, within their Watershed Action Strategy Table for fecal indicator bacteria included the following:

"*Support programs to reduce or eliminate the discharge of anthropogenic dry weather nuisance flow throughout the…watershed. Dry weather flow is the transport medium for bacteria and other 303(d) constituents of concern.*"

Additionally, they state that "*conditions in the MS4 contribute to high seasonal bacteria propagation in-pipe during warm weather. Landscape irrigation is a major contributor to dry weather flow, both as surface runoff due to over-irrigation and overspray onto pavements; and as subsurface seepage that finds its way into the MS4*."

- **Fiscal Year 2008 Carlsbad Watershed Urban Runoff Management Program Annual Report**

The Carlsbad Watershed Urban Runoff Management Program Annual Report for Fiscal Year 2008 was submitted by the Carlsbad Watershed Copermittees (Cities of Carlsbad, Encinitas, Escondido, Oceanside, San Marcos, Solana Beach, and Vista, and the County of San Diego). In the Annual Report, the Carlsbad Watershed Copermittees stated the following:

"The Carlsbad Watershed Management Area (WMA) collective watershed strategy identifies bacteria, sediment, and nutrients as high priority water quality pollutants in the Agua Hedionda (904.3 – bacteria and sediment), Buena Vista (904.2 – bacteria), and San Marcos Creek (904.5 – nutrients) Hydrologic Areas.

Bacteria, sediment, and nutrients have been identified as potential discharges from over-irrigation."

- **2007-2008 San Diego Bay Watershed Urban Runoff Management Program Annual Report**

  The San Diego Bay Watershed Urban Runoff Management Program 2007-2008 Annual Report was submitted by the San Diego Bay Watershed Copermittees (Cities of Chula Vista, Coronado, Imperial Beach, La Mesa, Lemon Grove, National City, and San Diego, the County of San Diego, the Port of San Diego, and the San Diego County Airport Authority). In Appendix D of the Annual Report, titled "Likely Sources of Pollutants," the San Diego Bay Watershed Copermittees identified over-irrigation of lawns as a pollutant generating activity from business and/or residential land uses for bacteria, pesticides, and sediment.

- **Copermittee Public Education Materials**

  The Orange County Public Works *Tips for Landscape & Gardening* public education brochure states: "*Fertilizers, pesticides and other chemicals that are left on yards or driveways can be blown or washed into storm drains that flow to the ocean. Overwatering lawns can also send materials into storm drains*."

  The Riverside County Flood Control and Water Conservation District *Landscape and Garden* public education brochure states: *"Soil, yard wastes, over-watering and garden chemicals become part of the urban runoff mix that winds its way through streets, gutters and storm drains before entering lakes, rivers, streams, etc. Urban runoff pollution contaminates water and harms aquatic life!"*

- **Los Penasquitos Lagoon Sedimentation/Siltation TMDL Technical Report**

  The Los Penasquitos Lagoon Sedimentation/Siltation TMDL technical report was prepared for the City of San Diego and USEPA in October 2010. The technical report was included as a technical supporting document attached to the Sediment TMDL for Los Penasquitos Lagoon staff report prepared by the San Diego Water Board, dated June 13, 2012. Under the Source Assessment section, the technical report states the following:

  "*Dry weather loading is dominated by nuisance flows from urban land use activities such as car washing, sidewalk washing, and lawn over-irrigation, which pick up and transport sediment into receiving waters.*"

These documents confirm that non-storm water discharges associated with over-irrigation are a source of pollutants and should be addressed as illicit discharges to the MS4. Prohibiting non-storm water discharges associated with over-irrigation, however,

is not a new requirement for the Copermittees because it is also consistent with and required by the Water Conservation in Landscaping Act (AB 1881, Laird).

The Water Conservation in Landscaping Act required the Department of Water Resources (DWR) to prepare a Model Water Efficient Landscape Ordinance for use by local agencies (e.g. the Copermittees). All local agencies were required to adopt a water efficient landscape ordinance by January 1, 2010. Local agencies could adopt the Water Efficient Landscape Ordinance developed by DWR, or an ordinance considered at least as effective as the Model Ordinance. The Water Efficient Landscape Ordinance includes a requirement that local agencies prohibit runoff from irrigation (§ 493.2):

> "*Local agencies shall prevent water waste resulting from inefficient landscape irrigation by* <u>*prohibiting runoff from leaving the target landscape*</u> *[emphasis added] due to low head drainage, overspray, or other similar conditions where water flows onto adjacent property, non-irrigated areas, walks, roadways, parking lots, or structures. Penalties for violation of these prohibitions shall be established locally*."

Furthermore, non-storm water discharges from over-irrigation not only transport and discharge pollutants to receiving waters, but are also a likely source of the dry weather flows causing changes to habitat within and along the receiving water bodies. Examples of habitat changes from the dry weather flows include perennialization of ephemeral streams, and conversion of saltwater and brackish water marsh habitats to freshwater marsh habitats (e.g. Los Penasquitos Lagoon). Both of these examples have resulted in the promotion of invasive species in several areas of the San Diego Region.

The removal of the over-irrigation discharges categories does not require the Copermittees to strictly prohibit lawn and landscape irrigation, but does require the prohibition of excessive irrigation water that results in non-storm water discharges to the MS4. Non-storm water discharges to the MS4 from over-irrigation must be addressed as illicit discharges by the Copermittees pursuant to the requirements of Provision E.2.

The remaining non-storm water categories listed in 40 CFR 122.26(d)(2)(iv)(B)(1) are listed under Provisions E.2.a.(1) through E.2.a.(5) and generally fall into four categories: (1) non-storm water discharges subject to existing San Diego Water Board waste discharge requirements and NPDES permits; (2) non-storm water discharges generally not expected to be a source of pollutants to receiving waters; (3) non-storm water discharges likely to contain pollutants requiring some form of control to address the pollutants prior to discharging to the MS4; and (4) non-storm water discharges or flows associated with firefighting.

Provisions E.2.a.(1) and E.2.a.(2) include several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) for which the San Diego Water Board already has developed general waste discharge requirements and NPDES

permits to address the discharges. The Copermittees are only required to address these types of non-storm water discharges as illicit discharges if the Copermittees or the San Diego Water Board identifies these non-storm water discharges not having coverage under the applicable NPDES permit.

Provision E.2.a.(3) includes several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) which are generally not expected to be a source of pollutants to receiving waters, many of which originate from what are typically natural, uncontrollable sources. The Copermittees are only required to address these types of non-storm water discharges as illicit discharges if the Copermittees or the San Diego Water Board identifies these non-storm water discharges as a source of pollutants to receiving waters. Because many of these sources are generally uncontrollable, enforcing a prohibition may not be a possibility for the Copermittees. The Copermittees would be able to address these non-storm water discharges by preventing these non-storm water discharges from entering the MS4. This could potentially be achieved by sealing their MS4 structures so the discharges cannot enter the MS4.

Provision E.2.a.(4) includes several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) that are likely to contain pollutants requiring some form of control to address the pollutants prior to discharging to the MS4. At this time, an outright prohibition of these types of non-storm water discharges does not yet appear to be warranted. Thus, Provision E.2.a.(4) includes several requirements for the Copermittees to control the pollutants from these types of non-storm water discharges. This is consistent with the clarification of the federal regulations in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board has the authority to require the Copermittees to "*control any of these types of discharges where appropriate*."

Unlike non-storm water discharges from over-irrigation, these types of non-storm water discharges are not expected to occur in close proximity to each other or very frequently. Provided these types of non-storm water discharges are controlled as required in Provision E.2.a.(4), the Copermittees would only be required to address these types of non-storm water discharges as illicit discharges if the Copermittee or the San Diego Water Board identifies these non-storm water discharges as a source of pollutants to receiving waters.

Provision E.2.a.(5) includes specific requirements for fire fighting discharges and flows. The requirements for non-storm water discharges and flows associated with fire fighting have been separated into requirements for: a) non-emergency fire fighting discharges and flows, and b) emergency fire fighting discharges and flows.

The San Diego Water Board has found that discharges from building fire suppression system maintenance (e.g. fire sprinklers) contain waste and potentially a significant source of pollutants to receiving waters. As such, the San Diego Water Board is requiring these discharges be addressed as illicit discharges by the Copermittees.

Thus, the discharges to the MS4 are to be prohibited via ordinance, order or similar means. For other non-emergency firefighting discharges and flows (i.e. flows from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems), the Copermittees are required to develop and implement a program to address pollutants in these non-storm water discharges and flows. This is consistent with the clarification of the federal regulations in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board has the authority to require the Copermittees to "*control any of these types of discharges where appropriate*."

For emergency firefighting discharges and flows, the Phase I Final Rule (55 FR 48037) has clarified the requirements of 40 CFR 122.26(d)(2)(iv)(B)(1) pertaining to emergency firefighting flows and discharges, which states:

> "*In the case of firefighting it is not the intention of these rules to prohibit in any circumstances the protection of life and public or private property through the use of water or other fire retardants that flow into separate storm sewers*."

Thus, the requirements have been made to be consistent with the guidance provided by the Phase I Final Rule. The Order recommends that the Copermittees develop and encourage implementation of BMPs to reduce or eliminate the discharge of pollutants from emergency firefighting flows to the MS4s and receiving waters. The Order does not include any requirements that should be interpreted as requiring the implementation of BMPs for emergency firefighting flows to the MS4s and receiving waters.

The Copermittees are expected to review the dry weather MS4 outfall discharge monitoring data they collect to determine if and when there are non-storm water discharges to or from their MS4s that are a source of pollutants to receiving waters. If the Copermittees identify one of the types of non-storm water discharges listed in Provisions E.2.a.(1) through E.2.a.(4) as a source of pollutants to receiving waters based on the review and evaluation of monitoring data, Provision E.2.a.(6) requires the Copermittees to prohibit those categories of discharges from entering the MS4 through ordinance, order or similar means. In addition, Provision E.2.a.(6) clarifies that the San Diego Water Board may identify categories of non-storm water discharges or flows listed under Provisions E.2.a.(1) through E.2.a.(4) that must be prohibited.

Provision E.2.a.(6) also provides the Copermittees an option to propose controls to be implemented for the category of non-storm water discharges as part of the Water Quality Improvement Plan instead of prohibiting the category of non-storm water discharges. If the Water Quality Improvement Plan is accepted by the San Diego Water Board with the proposed controls, the Copermittees will not be required to prohibit the category of non-storm water discharges to their MS4s as long as the controls are implemented. This is consistent with the clarification of 40 CFR 122.26(d)(2)(iv)(B)(1) in the Phase I Final Rule (55 FR 48037), which states the San

Diego Water Board may "*require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*."

Finally, Provision E.2.a.(7) has been included in the requirements for non-storm water discharges to clarify that any non-storm water discharges to the Copermittee's MS4, even those identified pursuant to Provisions E.2.a.(1) through E.2.a.(4), must be reduced or eliminated, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit. Provision E.2.a.(7) is consistent with the requirements of CWA section 402(p)(3)(B)(ii) and 40 CFR 122.26(d)(1)(v)(B), as clarified in the Phase I Final Rule (55 FR 47995) that "*[u]ltimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit*." However, the reduction or elimination of those non-storm water discharges are expected to be achieved as feasible, in accordance with the priorities in the Water Quality Improvement Plan and when the resources are available to the Copermittee.

Consistent with 40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(1), each Copermittee must implement a "*program…to prevent illicit discharges to the municipal storm sewer system*" and "*detect…illicit discharges and improper disposal into the storm sewer.*" Provision E.2.b requires each Copermittee to implement measures to prevent and detect illicit discharges and connections to its MS4 as part of its illicit discharge detection and elimination program.

As part of the program to prevent and detect illicit discharges to the MS4, 40 CFR 122.26(d)(2)(iv)(B)(2) requires "*procedures to conduct on-going field screening activities during the life of the permit, including areas or locations that will be evaluated by such field screens*." As part of the procedures, each Copermittee is required to maintain an updated map of its entire MS4 and the corresponding drainage areas within its jurisdiction. Having knowledge about where inlets, access points, connections with other MS4s, and outfalls are located is necessary for each Copermittee to track, identify, and eliminate illicit discharges and connections. Thus, Provision E.2.b.(1) of the Order specifies that the map must include the segments of the storm sewer system owned, operated, and maintained by the Copermittee, and include locations of all known inlets, connections with other MS4s, and outfalls to the Copermittee's MS4. The remaining requirements of Provision E.2.b are consistent with the requirements of 40 CFR 122.26(d)(2)(iv)(B)(3)-(7) related to implementing measures to prevent and detect illicit discharges and connections to the MS4.

Provision E.2.c requires each Copermittee to conduct field screening and monitoring of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4. Field screening is a required element of the program to detect and eliminate illicit discharges and connections to the MS4, pursuant to 40 CFR 122.26(d)(2)(iv)(B)(2). The field screening requirement will be implemented through the dry weather MS4 outfall discharge monitoring required under Provisions D.2.a.(2) and D.2.b.(1).

Provision E.2.d specifies the measures each Copermittee must implement to eliminate illicit discharges and connections to its MS4. Elimination of illicit discharges and connections to the MS4 is consistent with the requirement of 40 CFR 122.26(d)(2)(iv)(B) "*to detect and remove [emphasis added]…illicit discharges and improper disposal into the storm sewer*" and will achieve the CWA requirement for MS4 permits to "*effectively prohibit non-storm water discharges into the storm sewers*."

Generally, each Copermittee is responsible for prioritizing its efforts to eliminate non-storm water and illicit discharges or connections to its MS4 based on field screening and monitoring data, NALs, illicit discharge investigation records, and the known or suspected sources. Sources of non-storm water and illicit discharges or connections must be eliminated by enforcing the legal authority established by each Copermittee pursuant to Provision E.1.

Provision E.3 (Development Planning) requires each Copermittee to use its land use and planning authority to implement a development planning program to control and reduce the discharge of pollutants in storm water from new development and significant redevelopment to the MEP. Proper implementation of the development planning program will also contribute toward effectively prohibiting non-storm water discharges from development projects to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." As part of the management program, 40 CFR 122.26(d)(2)(iv)(A)(2) requires "*planning procedures including a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment*."

Land development generally alters the natural conditions of the land by removing vegetative cover, compacting soil, and/or placement of concrete, asphalt, or other impervious surfaces. These impervious surfaces concentrate urban pollutants (such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not found in high concentrations in the natural environment. Pollutants that accumulate on impervious surfaces are not easily biodegraded nor subject to natural treatment processes.

Impervious surfaces greatly affect the natural hydrology of the land because they do not allow natural infiltration and treatment of storm water runoff to take place. Instead, storm water runoff from impervious surfaces is typically directed through pipes, curbs, gutters, and other hardscape into receiving waters, with little treatment, at significantly increased volumes and accelerated flow rates over what would occur naturally. The increased pollutant loads, storm water volume, discharge rates and velocities, and discharge durations from the MS4 adversely impact stream habitat by causing accelerated, unnatural erosion and scouring within creek bed and banks. Placement

of impervious surfaces also encapsulates "good" sediment (such as sand, gravel, rocks and cobbles) that would normally replenish creek beds and banks to help stabilize them. Collectively, these changes to natural hydrologic processes are termed hydrograph modification, or hydromodification.

Hydromodification, which is caused by both altered storm water flow and altered sediment flow regimes, is largely responsible for degradation of creeks, streams, and associated habitats in the San Diego Region. In an ongoing study by the Stormwater Monitoring Coalition to assess the health of streams throughout Southern California, researchers found that three of the four highest risk stressors to creeks (percent sands and fines present, channel alteration, and riparian disturbance) were related to physical habitat.[29] Researchers studying flood frequencies in Riverside County have found that increases in watershed imperviousness of only 9-22 percent can result in increases in peak flow rates for the two-year storm event of up to 100 percent.[30] Such changes in runoff have significant impacts on channel morphology.

In addition, a technical report issued by the Southern California Coastal Water Research Project (SCCWRP) stated that "*[r]ecent studies indicate that California's intermittent and ephemeral streams are more susceptible to the effects of hydromodification than streams from other parts of the United States. Physical degradation of stream channels in the central and eastern United States can initially be detected when watershed impervious cover approaches 10 percent, although biological effects (which may be more difficult to detect) may occur at lower levels. In contrast, initial response of streams in the semi-arid portions of California appears to occur between 3 and 5 percent impervious cover*."[31] These studies highlight the extent to which impacts originating from impervious surfaces created by land development are responsible for the degradation of creek and stream habitat.

This is consistent with what USEPA has noted, that "*[m]ost stormwater runoff is the result of the man-made hydrologic modifications that normally accompany development. The addition of impervious surfaces, soil compaction, and tree and vegetation removal result in alterations to the movement of water through the environment. As interception, evapotranspiration, and infiltration are reduced and precipitation is converted to overland flow, these modifications affect not only the characteristics of the developed site but also the watershed in which the development is located. Stormwater has been identified as one of the leading sources of pollution for all waterbody types in the United States. Furthermore, the impacts of stormwater*

[29] Assessing the Health of Southern California Streams, Stormwater Monitoring Coalition, Fact Sheet
[30] Schueler and Holland, 2000. Storm Water Strategies for Arid and Semi-Arid Watersheds (Article 66). The Practice of Watershed Protection.
[31] Stein, E. and Zaleski, S., 2005. Technical Report 475, Managing Runoff to Protect Natural Streams: The Latest Development on Investigation and Management of Hydromodification in California. December 30, 2005.

pollution are not static; they usually increase with more development and urbanization."[32]

Reducing the impact from the increased pollutant loads and flows generated by impervious surfaces within a watershed is essential to protecting and restoring the integrity of the receiving waters. Provision E.3 includes the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment*." The requirements of Provision E.3 will 1) minimize the generation and discharge of pollutants in storm water from the MS4, and 2) minimize the potential of storm water discharges from the MS4 from causing altered flow regimes and excessive downstream erosion in receiving waters.

The requirements of Provision E.3.a include the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment*" applicable to all development projects, regardless of size or purpose of development. In general, all development projects must implement onsite BMPs to remove pollutants from runoff prior to its discharge to any receiving waters, as close to the pollutant generating source as possible, and structural BMPs must not be constructed within waters of the U.S.

Furthermore, the onsite BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors (e.g. mosquitos, rodents, and flies). If not properly designed or maintained, certain BMPs implemented or required by municipalities may create a habitat for vectors. Monitoring studies conducted by the California Department of Public Health (CDPH) have documented that mosquitoes opportunistically breed in structural storm water BMPs, particularly those that hold standing water for over 96 hours. Certain site design features that hold standing water may similarly produce mosquitoes.

Structural BMPs and site design features should incorporate design, construction, and maintenance principles to promote drainage within 96 hours to minimize standing water available to mosquitoes. Nuisances and public health impacts resulting from vector breeding can be prevented with close collaboration and cooperative effort between municipalities and local vector control agencies and the CDPH during the development and implementation of storm water runoff management programs. The CDPH also has issued guidance for BMP implementation that will minimize potential nuisances and public health impacts resulting from vector breeding.[33]

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[32] USEPA, 2007. Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices, December 2007.

[33] California Department of Public Health, 2012. Best Management Practices for Mosquito Control in California. (http://www.cdph.ca.gov/HealthInfo/discond/Documents/BMPforMosquitoControl07-12.pdf)

All development projects are required to implement source control BMPs that will minimize the generation of pollutants. Additionally, each development project must implement, where applicable and feasible, low impact development (LID) BMPs to mimic the natural hydrology of the site and retain and/or treat pollutants in storm water runoff prior to discharging to and from the MS4.

The LID Center defines LID as "*a comprehensive land planning and engineering design approach with a goal of maintaining and enhancing the pre-development hydrologic regime of urban and developing watersheds.*"[34] LID designs seek to control storm water at the source, using small-scale integrated site design and management practices to mimic the natural hydrology of a site, retain storm water runoff by minimizing soil compaction and impervious surfaces, and disconnect storm water runoff from conveyances to the storm drain system.

LID BMPs may utilize interception, storage, evaporation, evapotranspiration, infiltration, and filtration processes to retain and/or treat pollutants in storm water before it is discharged from a site. Because of these numerous options, the San Diego Water Board expects that every development project will be able to implement some form of LID BMPs. Examples of LID BMPs include using permeable pavements, rain gardens, rain barrels, grassy swales, soil amendments, and native plants.

Provision E.3.a also includes requirements for all development projects to, where feasible, landscape with native and/or low water use plants to minimize the discharge of non-storm water discharges associated with excessive irrigation, as well as harvest (i.e., storage) and use precipitation to promote the concept of utilizing storm water as a resource.

While all development projects are subject to the requirements of Provision E.3.a, Provision E.3.b identifies Priority Development Projects that exceed given size thresholds and/or fit under specific use categories. Priority Development Projects are required to incorporate specific performance criteria for structural BMPs into the project plan to reduce the generation of pollutants, and address potential impacts from hydromodification.

The Priority Development Project categories are based on the requirements of the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), and do not differ significantly from the Fourth Term Permit for San Diego County. Furthermore, the Priority Development Project categories are consistent with Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), and Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit).

[34] www.lowimpactdevelopment.org

Because of the impact of relatively small increases in watershed impervious surfaces to receiving waters, Provision E.3.b.(1)(c)(iv) has been updated to include large driveways that are 5,000 square feet or more. The San Diego Water Board finds that large driveways can exacerbate altered flow regimes if not properly controlled.

Provision E.3.b.(3) describes projects that are exempt from Priority Development Project status. These include new or retrofit paved sidewalks, bicycle lanes, or trails that are designed and constructed to direct runoff to vegetated areas or be hydraulically disconnected from paved areas. The exemptions have been provided to encourage these types of projects because they provide multiple environmental benefits, such as promoting walking rather than driving, which will in turn improve air quality. Additionally, retrofitting of existing alleys, streets, or roads are exempt from Priority Development Project status if they are constructed using USEPA Green Streets guidance.[35] By doing so, retrofitting of these types of projects is encouraged. The San Diego Water Board recognizes that there are spatial constraints associated with these projects, and implementation of structural BMPs are not always feasible.

For development projects identified as Priority Development Projects, the requirements of Provision E.3.c are the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment.*" Provisions E.3.c.(1)-(3) describe the performance criteria for the structural BMPs that must be implemented for each Priority Development Project defined by Provision E.3.b.

Provision E.3.c.(1) describes the storm water pollutant control BMP requirements that must be implemented by all Priority Development Projects. The purpose of Provision E.3.c.(1) is to reduce pollutants in storm water runoff to the MEP from Priority Development Projects before it is discharged to the MS4. Of all the available treatment processes available, retention of storm water, and therefore capture of the pollutants in the storm water, will achieve 100 percent pollutant removal efficiency for the volume of storm water retained. No other method of treatment can achieve 100 percent pollutant removal efficiency. Thus, retention of as much storm water onsite is the most effective way to reduce pollutants in storm water discharges to, and consequently from the MS4, and controls pollutants in storm water discharges from a site to the MEP.

Under Provision E.3.c.(1)(a), retention of the pollutants in the runoff produced from the 85th percentile storm event ("design capture volume") is the design standard to which Priority Development Projects must comply. Since the 85th percentile storm event has previously been used as the numeric design standard for treatment control BMPs, this same size storm event is used as the numeric design standard for storm water

[35] "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).

retention. This is the MEP standard recognized by the San Diego Water Board and is consistent with the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), as well as Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit), and Los Angeles Water Board Order No. R4-2012-0175 (Los Angeles County MS4 Permit).

The 85th percentile storm event is the event that has a precipitation total greater than or equal to 85 percent of all storm events over a given period of record in a specific area or location. For example, to determine what the 85th percentile storm event is in a specific location, all 24 hour storms that have recorded values over a 30 year period would be tabulated and a 85th percentile storm would be determined from this record (i.e. 15 percent of the storms would be greater than the number determined to be the 85th percentile storm). Most jurisdictions in the San Diego Region have already developed isopluvial maps that can provide this type of information. The 85th percentile storm might be determined to be a number such as 1.0 inch, and this would be multiplied by the total area of the project footprint producing runoff to calculate the design capture volume. The Priority Development Project designer would then select a system of BMPs that would retain (i.e. intercept, store, infiltrate, evaporate, or evapotranspire) the pollutants contained in the design capture volume onsite.

Retention BMPs are necessary to capture and retain pollutants generated from a Priority Development Project. In a recent study performed by SCCWRP in the Los Angeles Region, they found "*that the magnitude of constituent load associated with storm water runoff depends, at least in part, on the amount of time available for pollutant build-up on land surfaces. The extended dry period that typically occurs in arid climates such as southern California maximizes the time for constituents to build-up on land surfaces, resulting in proportionally higher concentrations and loads during initial storms of the season*."[36] This implies that the "first flush" of a rainy season and the first storm events after long antecedent dry periods tend to have the highest pollutant loads. Capturing and retaining the pollutant loads of the "first flush" of a rainy season and the first storm events after long antecedent dry periods will reduce a significant portion of the pollutants in storm water discharged to and from the MS4.

The San Diego Water Board, however, acknowledges that in some situations retention of the full design capture volume onsite may not be technically feasible. In this event, the Copermittee may allow the Priority Development Project to use biofiltration BMPs to treat 1.5 times the design capture volume not reliably retained onsite, or biofiltration BMPs with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite.

[36] Stein, E.D., Tiefenthaler, L.L., and Schiff, K.C., 2007. Technical Report 510, Sources, Patterns and Mechanisms of Storm Water Pollutant Loading from Watershed and Land Uses of the Greater Los Angeles Area, California, USA. March 20, 2007.

The 1.5 multiplier is based on the finding in the Ventura County Technical Guidance Manual that biofiltration of 1.5 times the design capture volume not retained onsite will provide approximately the same pollutant removal as retention of the design capture volume on an annual basis.[37] This standard is consistent with the Los Angeles Water Board's Los Angeles County and Ventura County municipal storm water permits (Order Nos. R4-2012-0175 and R4-2010-0108, respectively). The flow-thru design of 0.75 times the portion of the design capture volume not reliably retained onsite is consistent with the San Diego Water Board's Orange County and Riverside County municipal storm water permits (Order Nos. R9-2009-0002 and R9-2010-0016, respectively). In either case, the biofiltration BMPs must be designed with an appropriate hydraulic loading rate to maximize storm water retention and pollutant removal, as well as to prevent erosion, scour, and channeling within the BMP. Each Copermittee is required to update its BMP Design Manual to provide guidance for hydraulic loading rates and other biofiltration design criteria necessary to maximize storm water retention and pollutant removal.

The San Diego Water Board further recognizes that, in addition to not being technically feasible, retention of the full design capture storm onsite may be cost prohibitive, or may not provide as much water quality benefit to the Watershed Management Area as would implementing BMPs elsewhere in the watershed. Thus, Provision E.3.c.(1)(b) allows for the use of a combination of onsite retention BMPs, and the implementation of an Alternative Compliance Program described in Provision E.3.c.(3). Provision E.3.c.(3) is discussed in more detail below.

If the full design capture volume is not retained onsite either because biofiltration is not technically feasible, or a Copermittee grants a Priority Development Project permission to utilize the Alternative Compliance Program, then the pollutants in the portion of the design capture volume that are not reliably retained onsite must still be reduced to the MEP. Thus, flow-thru treatment control BMPs are required to be implemented on Priority Development Projects in addition to the retention BMPs. The requirements of Provisions E.3.c.(1)(a)(ii)[a]-[c] include the performance standards for flow-thru treatment control BMPs, consistent with the Fourth Term Permits in the San Diego Region.

Whereas the purpose of the requirements under Provision E.3.c.(1) is to reduce pollutants in storm water runoff to the MEP, the purpose of the requirements under Provision E.3.c.(2) is to maintain or restore more natural hydrologic flow regimes to prevent accelerated, unnatural erosion in downstream receiving waters, also to the MEP standard. Provision E.3.c.(2) describes hydromodification management BMP requirements that must be implemented by all Priority Development Projects.

[37] Ventura Countywide Stormwater Management Program. 2011. Ventura Technical Guidance Manual, Manual Update, 2011.

The performance criteria for the implementation of hydromodification management BMPs on Priority Development Projects are consistent with the requirements in the Fourth Term Permits for Orange and Riverside Counties (Order Nos. R9-2009-0002 and R9-2010-0016, respectively). Modifications to the Orange County and Riverside County Hydromodification Management Plans (HMPs) will likely be minor, or may not be necessary. The HMP for San Diego County will likely require some minor modifications to incorporate the requirements of Provision E.3.c.(2) and become consistent with the Orange County and Riverside County HMPs. The San Diego Water Board does not, however, expect that it will be necessary for the San Diego County Copermittees to develop a new approach or significantly re-write the San Diego County HMP. This is because the premise of the hydromodification management BMP requirements, which are to control storm water runoff conditions (flow rates and durations) for Copermittee-defined range of flows, is unchanged from all Fourth Term Permits in the San Diego Region.

Provision E.3.c.(2)(a) requires that post-project runoff conditions mimic the *pre-development* runoff conditions, and not the *pre-project* runoff conditions. Fundamentally, the San Diego Water Board believes that using a hydrology baseline that approximates that of an undeveloped, natural watershed is the only way to facilitate the return of more natural hydrological conditions to already built-out watersheds, and ultimately improved stream health. On the other hand, using the *pre-project* hydrology as a baseline for redevelopment projects results in propagating the unnatural hydrology of urbanized areas. Propagating the urbanized flow regime does not support conditions for restoring degraded or channelized stream segments, and would forever sentence such streams to the degraded state. Furthermore, reducing the volume of storm water runoff associated with the urbanized flow regime will also result in reducing the discharge of pollutants into receiving waters, since storm water runoff from impervious surfaces contains untreated pollutants.

The San Diego Water Board understands that approximating the pre-development runoff condition associated with a redevelopment site is not necessarily straightforward because factors such as natural grade and native vegetation for the site cannot be precisely known. Therefore, the San Diego Water Board does not expect project designers to estimate historical conditions associated with redevelopment sites. Rather, the San Diego Water Board expects project designers and the Copermittees to approximate pre-development runoff conditions using the parameters of a *pervious* area rather than an *impervious* area. This means that for redevelopment sites, approximating pre-development runoff conditions equates to using existing onsite grade and assuming the infiltration characteristics of the underlying soil. A redevelopment Priority Development Project must not use runoff coefficients of concrete or asphalt to estimate pre-development runoff conditions. Rather, redevelopment projects must use available information pertaining to existing underlying soil type (such as soil maps published by the National Resource Conservation Service), onsite existing grade, and any other readily available pertinent information to estimate pre-development runoff conditions.

The San Diego Water Board understands, indeed asserts, that the pre-development hydrology of an area in question can only be roughly estimated and cannot be precisely known. However, using the hydrology of a natural condition, even if not precisely known, will provide significant benefit to receiving waters over using the hydrology associated with pervious (developed) surfaces. Therefore in order to achieve the goals of the Clean Water Act, which are to "*restore and maintain the chemical, physical, and biological integrity of the nation's waters* [emphasis added]," the most appropriate standard to use for hydromodification management is the standard associated with the pre-development condition.

Provision E.3.c.(2)(b) requires Priority Development Projects to avoid known critical sediment yield areas or implement measures that would allow coarse sediment to be discharged to receiving waters, such that the natural sediment supply is unaffected by the project. This is necessary because coarse sediment supply is as much an issue for causing erosive conditions to receiving streams as are accelerated flows.

The San Diego Water Board recognizes that in some situations implementing the hydromodification management BMP requirements fully onsite may not be technically feasible, may be cost prohibitive, or may not provide any overall water quality benefits to the Watershed Management Area. Thus, Provision E.3.c.(2)(c) allows for the use of a combination of onsite hydromodification management BMPs and alternative compliance options described in Provision E.3.c.(3).

Provision E.3.c.(3) allows for alternative compliance in instances where the Copermittee determines that offsite measures will have a greater overall water quality benefit for the Watershed Management Area than if the Priority Development Project were to implement structural BMPs onsite. Consequently, watershed-specific structural BMP requirements are present in this Order in the form of allowable compliance offsite. The Alternative Compliance Program to Onsite Structural BMP Implementation Provision is intended to integrate with the Copermittees' planning efforts in the Water Quality Improvement Plans.

The Alternative Compliance Program is an option for Priority Development Projects where the governing Copermittee has participated in the development of a Watershed Management Area Analysis as part of the Water Quality Improvement Plan (described in Provision B.3.b.(4)). Such an approach is consistent with the latest findings in hydromodification management by the scientific community. In a Technical Report entitled *Hydromodification Assessment and Management in California,*[38] the report states:

> *"An effective [hydromodification] management program will likely include combinations of on-site measures (e.g., low-impact development techniques, flow-control basins), in-stream measures (e.g., stream habitat restoration), floodplain*

[38] 2012. ED Stein, F Federico, DB Booth, BP Bledsoe, C Bowles, Z Rubin, GM Kondolf, A Sengupta. Technical Report 667. Southern California Coastal Water Research Project. Costa Mesa, CA.

and riparian zone actions, and off-site measures. Off-site measures may include compensatory mitigation measures at upstream locations that are designed to help restore and manage flow and sediment yield in the watershed."

Consistent with the ideas brought forth in the report, in the Watershed Management Area Analysis of Provision B.3.b.(4), which is optional, the Copermittees will develop watershed maps that include as much detail about factors that affect the hydrology of the watershed as is available. Such factors included identification of areas suitable for infiltration, coarse sediment supply areas, and locating stream channel structures and constrictions. Once these factors are mapped and studied, the Copermittees can identify areas in the watershed where candidate projects may be implemented that are expected to improve water quality in the watershed by providing more opportunity for infiltration, slowing down storm water flows, or attenuation of pollutants naturally via healthy stream habitat. These candidate projects may be in the form of retrofitting existing development, rehabilitating degraded stream segments, identifying regional BMPs, purchasing land to preserve valuable floodplain functions, and any other project(s) that the Copermittees identify.

Under the Alternative Compliance Program, Priority Development Projects may be allowed to fund, partially fund, or implement a candidate project, in lieu of implementing structural BMPs onsite, if they enter into a voluntary agreement with the governing Copermittee permitting this arrangement. Project proponents may also propose an alternative project not previously identified by the Copermittees. In either case, whether a project proponent implements a candidate project identified by the Copermittees or a separate alternative compliance project, the governing Copermittee must determine that implementation of the project will have a greater overall water quality benefit for the Watershed Management Area than fully implementing structural BMPs onsite. If alternative compliance involves funding or implementing a project that is outside the jurisdiction of the governing Copermittee, then that Copermittee may enter into an inter-agency agreement with the appropriate jurisdiction.

Finally, Provision E.3.c.(2)(d) allows Priority Development Projects to be exempt from the hydromodification management BMP requirements if there is no threat of erosion to downstream receiving waters (i.e. the receiving stream is concrete lined from the point of discharge all the way to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean). If the Copermittees believe that more exemptions are warranted, then they must perform the optional Watershed Management Area Analysis of Provision B.3.b.(4). Additional exemptions other than those specified in this Order may be established on a watershed basis, provided the Copermittees perform the analysis, provide supporting rationale for the exemptions, and complete the Water Quality Improvement Plan approval process pursuant to Provision F.1.

Provisions E.3.c.(4) and E.3.c.(5) were included under the BMP requirements applicable to all development projects in the Fourth Term Permits for San Diego, Orange, and Riverside Counties (Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016, respectively). In this Order, the long-term BMP maintenance and

infiltration and groundwater protection requirements apply to structural BMPs implemented by Priority Development Projects only.

Provision E.3.d requires the Copermittees to update their BMP Design Manual as needed to incorporate the requirements of Provision E.3. The BMP Design Manual is formerly known as the Standard Storm Water Mitigation Plan, or SSMP, and was renamed so that the title has a more accurate description of the document content. The contents of the BMP Design Manual are largely unchanged from the previous Standard Storm Water Mitigation Plans required under the Fourth Term Permits. The BMP Design Manual fulfills the 40 CFR 122.26(d)(2)(iv)(A)(2) requirement that the Copermittee's development planning program includes "*a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment*."

As part of the "*planning procedures,*" 40 CFR 122.26(d)(2)(iv)(A)(2) requires the procedures to "*address controls to reduce pollutants in discharges from municipal separate storm sewers after construction is completed*." The requirements applicable to the implementation and oversight of structural BMPs at Priority Development Projects are provided under Provision E.3.e.

Proper installation of the structural BMPs approved for a Priority Development Project is necessary to ensure that pollutants in storm water discharges will be reduced to the MEP after the project is completed. In addition to the proper installation of structural BMPs, the maintenance of structural BMPs on Priority Development Projects is necessary to ensure that pollutants in storm water discharges will continue to be reduced to the MEP. Provision E.3.e.(1) includes the minimum requirements that each Copermittee must implement to ensure structural BMPs are properly installed and will be properly maintained.

The requirements under Provision E.3.e.(2)-(3) are necessary to demonstrate each Copermittee is implementing a program that complies with Provisions E.3.b-c and E.3.e.(1), and ensure structural BMPs at Priority Development Project will continue to be able to reduce pollutants in storm water discharges to the MEP.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary for any development projects to compel compliance with the requirements of Provision E.3 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.3.f requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

<u>Provision E.4 (Construction Management)</u> requires each Copermittee to implement a construction management program to control and reduce the discharge of pollutants in

storm water from construction sites to the MEP. Proper implementation of the construction management program will also contribute toward effectively prohibiting non-storm water discharges from construction sites to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." As part of the management program, 40 CFR 122.26(d)(2)(iv)(D) requires "*a program to implement and maintain structural and non-structural best management practices to reduce pollutants in storm water runoff from construction sites to the municipal storm sewer system.*"

Construction sites can be significant sources of sediment, trash, and other pollutants to receiving waters. Although sediment is naturally occurring in the natural environment, the discharge of sediment under unnatural conditions is problematic to receiving waters. Fine sediment in creeks causes high turbidity that interferes with the functionality of native flora and fauna in local creeks. For example, turbidity interferes with both photosynthesis of water-philic plants, as well as successful foraging and reproduction of benthic macroinvertebrates. Sediment can also make it difficult for fish to breathe because it clogs fish gills. Other pollutants such as heavy metals or pesticides can adhere to sediment and are transported to receiving waters during storm events, where they dissolve in the water column and become bioavailable to aquatic organisms. Sediment is recognized as a major stressor to surface waters and is responsible for the impairment of several lagoons and creeks in the San Diego Region.

Provision E.4 includes requirements that each Copermittee must implement to minimize the discharge of sediment and other pollutants from construction sites to the MS4 within its jurisdiction. The requirements under Provision E.4 are consistent with the Fourth Term Permits for San Diego, Orange, and Riverside Counties. Therefore, Copermittees are expected to implement the requirements seamlessly, with minimal changes to their existing construction management programs. The Copermittees, however, are given more flexibility to run their programs as needed to maximize efficiency, and also to be consistent with the Water Quality Improvement Plan for the Watershed Management Area.

As part of the construction management program, 40 CFR 122.26(d)(2)(iv)(D)(1) requires "*procedures for site planning which incorporate consideration of potential water quality impacts.*" Provision E.4.a describes the minimum elements each Copermittee is required to include as part of the construction site planning and project approval process. The construction site planning and approval process is based primarily on ensuring each project had an adequate site-specific pollution control, construction BMP, and/or erosion and sediment control plan that will be implemented to minimize the discharge of pollutants in storm water to the MEP, and minimize impacts to receiving waters.

The requirements under Provision E.4.b provide the data and information necessary to identify "*priorities for inspecting sites and enforcing control measures*" required pursuant to 40 CFR 122.26(d)(2)(iv)(D)(3). Under Provision E.4.b, each Copermittee must identify construction sites that are considered a high threat to downstream surface waters. Designation of "high threat to water quality" construction sites will necessitate the Copermittees to develop criteria to identify such sites. Provision E.4.b.(2) describes a list of factors that must be considered when the Copermittee considers threat to water quality. For example, a Copermittee must identify sites as "high threat to water quality" if it is located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions, according to the Water Quality Improvement Plan. This ensures that construction management program implementation is compatible with the Copermittee's identified highest priority water quality conditions.

Pursuant to 40 CFR 122.26(d)(2)(iv)(D)(2) each Copermittee is required describe "*requirements for nonstructural and structural best management practices*" at construction sites. Provision E.4.c includes the types of construction site BMPs that the Copermittees must implement, or require the implementation of, at each construction site to reduce pollutants in storm water discharges to the MEP.

Each Copermittee is expected to require the implementation of appropriate BMPs given specific site conditions, the season and likelihood of rain events, and construction phase (i.e. grading vs. vertical construction). This means that throughout the life of the project construction, the appropriate BMPs will vary, especially if the construction of the project spans multiple wet seasons. As opposed to describing specific minimum BMPs that must be implemented, the Order describes major BMP categories that should be considered for each site.

Each Copermittee is expected to use its 20 years of storm water experience and knowledge to require implementation of appropriate BMPs from the various categories at each construction site within its jurisdiction. For example, the San Diego Water Board expects that each site will be required to implement erosion control and sediment control. The San Diego Water Board also expects each Copermittee to require implementation of active/passive sediment treatment systems at sites where other BMPs have been tried and are known to be inadequate, and discharges of sediment are causing or contributing to water quality impairment downstream. Each Copermittee is granted flexibility in specifying the minimum level of BMP requirements at each site, but the San Diego Water Board expects each site to be capable of controlling pollutants in storm water discharges to the MEP and preventing illicit discharges.

The requirements under Provision E.4.d are necessary to demonstrate that each Copermittee is implementing a program that complies with Provisions E.4.a and E.4.c and ensure BMPs at construction sites will reduce pollutants in storm water discharges to the MEP.

Provision E.4.d does not include minimum required inspection frequencies for construction sites. Each Copermittee must use its experience and knowledge to specify an appropriate inspection frequency for both high priority and lower priority sites in their jurisdictional runoff management program documents, and in accordance with the Water Quality Improvement Plan. Appropriate inspection frequencies may vary by Copermittee, but the San Diego Water Board expects that the stated frequency will be adequate for each Copermittee to properly oversee the construction sites within its jurisdiction, confirm BMPs are implemented to reduce pollutants in storm water discharges from constructions sites to the MEP, and make needed changes to its program on an ongoing basis as necessary.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary for any development projects to compel compliance with the requirements of Provision E.4 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.4.e requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Provision E.5 (Existing Development Management) requires each Copermittee to implement an existing development management program to control and reduce the discharge of pollutants in storm water from areas of existing development to the MEP. Proper implementation of the existing development management program will also contribute toward effectively prohibiting non-storm water discharges from areas of existing development to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." Within 40 CFR 122.26(d)(2)(iv)(A) and (C), the management program is required to reduce impacts on receiving waters and reduce pollutants in storm water discharges to the MEP from commercial and residential areas, industrial facilities, and municipal facilities.

Commercial and residential areas, industrial facilities, and municipal facilities must be addressed by each Copermittee with the existing development management program required under Provision E.5. All other areas within each Copermittee's jurisdiction should be either undeveloped open space, or areas that are being developed or under construction. Areas being developed or under construction will be addressed by the Copermittee under the requirements of Provision E.3 (Development Planning) or Provision E.4 (Construction Management).

Areas of existing development typically include impervious surfaces such as sidewalks, driveways, roads, and rooftops, which generate and concentrate pollutants

(such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not found in high concentrations in the natural environment. Pollutants that accumulate on impervious surfaces are not easily biodegraded or not subject to natural treatment processes. When it rains, these pollutants are transported in storm water runoff from these impervious surfaces into receiving waters, resulting in poor water quality and degradation of beneficial uses.

In addition to the generation of pollutants, areas of existing development have generally altered the natural conditions of the land and removed vegetative cover, reduced the perviousness of the surface, and reduced the capacity of storm water that can be intercepted, captured, stored, infiltrated, evaporated, and/or evapotranspired. The alteration of the natural conditions and the impervious surfaces associated with areas of existing development causes water quality problems due to the alteration of natural flow regimes within the watersheds; resulting in hydromodification of channels, streams, and habitats that exist within or adjacent to the areas of existing development.

Thus, storm water discharges from areas of existing development are responsible for poor water quality, degraded habitats, and hydromodified channels throughout the developed portions of the watersheds in the San Diego Region. To improve the health and functionality of the receiving waters in a Watershed Management Area, land use practices and the amount of impervious surfaces in areas of existing development must change to reduce the various impacts caused by hydromodification and pollutants from storm water runoff generated in developed areas. Each Copermittee must be aggressive to address pollutant sources and runoff from areas of existing development to be able to reduce pollutants in storm water discharges from the MS4 to the MEP.

There is some overlap in the requirements under Provision E.5 with the requirements under Provisions E.2 (Illicit Discharge Detection and Elimination), E.3 (Development Planning), and E.4 (Construction Management). Illicit discharges frequently originate from areas of existing development. New development projects, when completed will become some type of residential, commercial, industrial or municipal existing development. Redevelopment projects are, by definition, redeveloping areas of existing development. And, redevelopment projects become construction sites located in areas of existing development. Much of the data and information collected, inspections performed, and enforcement actions taken for the requirements under Provisions E.2 to E.4 may also be utilized by the existing development management program. The requirements under Provision E.5, however, are focused primarily on reducing pollutants generated in areas of existing development that can be transported in storm water runoff and discharged to and from the MS4.

The requirements under Provision E.5 build upon existing program elements being implemented by the Copermittees. Provision E.5 is generally consistent with the existing development requirements of the Fourth Term Permits for Orange and Riverside Counties (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), but

modified to provide more flexibility to implement the programs so resources can be better focused toward addressing the highest priority water quality conditions identified in the Water Quality Improvement Plans.

For a Copermittee to properly manage areas of existing development, having knowledge of what development exists within its jurisdiction is essential. Provision E.5.a requires each Copermittee to maintain a watershed-based inventory of all the existing development within its jurisdiction. This requirement is necessary for each Copermittee to implement the requirements of Provision E.5.b-e.

As opposed to just maintaining separate inventories based on the type of site, each Copermittee must maintain a watershed-based inventory that includes all types of existing development within its jurisdiction. By utilizing a watershed-based inventory, the Copermittees within a Watershed Management Area can combine their inventories and review the inventories by watershed in addition to by jurisdiction. Pollutant sources and strategies for abatement can then be evaluated on a watershed level, as opposed to evaluating sources and strategies strictly by type of site.

Provision E.5.a includes the information that must be included in the inventory. Provision E.5.a.(1) specifies what facilities or areas must be included in the inventory. A commercial type of existing development may be identified in the inventory as a facility (e.g. individual building, individual business) or an area (e.g. shopping center, commercial zone). An industrial type of existing development must be identified in the inventory by facility (e.g. individual industrial entity). A municipal type of existing development must be identified in the inventory by facility, with a list of specific municipal facilities that must be included in the inventory. A residential type of existing development must be identified by areas to be designated by the Copermittee. For each of the facilities and areas identified in the Copermittee's inventory developed pursuant to Provision E.5.a.(1), Provision E.5.a.(2) specifies the information that must be included in the description for the facility or area.

Provision E.5.a.(3) requires each Copermittee to maintain an updated map showing the location of inventoried existing development, watershed boundaries, and water bodies. This requirement was included because this information is expected to help the Copermittees in a Watershed Management Area identify and prioritize sources of pollutants and/or stressors in areas of existing development that contribute toward the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Knowledge of the existing development that are likely to be sources of pollutants contributing to the highest priority water quality conditions is expected to be a key element in the Copermittees' development of the water quality improvement strategies that will be included in the Water Quality Improvement Plans. The strategies described in the Water Quality Improvement Plans will direct efforts within the existing development management programs implemented by each Copermittee.

Pursuant to 40 CFR 122.26(d)(2)(iv)(A) each Copermittee is required describe "*structural and source control measures to reduce pollutants*" in storm water runoff discharged from areas of existing development. Provision E.5.b includes the BMP implementation and maintenance requirements that the each Copermittee must require at areas of existing development to reduce pollutants in storm water discharges to the MEP. The San Diego Water Board, however, recognizes that BMP implementation and maintenance for residential areas will require much more education and encouragement through less authoritative measures than for commercial, industrial and municipal facilities and areas. Thus, the BMP implementation and maintenance requirements have been separated between requirements under Provision E.5.b.(1) for commercial, industrial and municipal facilities and areas, and Provision E.5.b.(2) for residential areas.

Most of the requirements in Provision E.5.b are consistent with the related requirements in the Fourth Term Permits. The level of specificity, however, has been changed to allow each Copermittee the flexibility to implement its program to achieve maximum efficiency, and to perform functions that will address the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Each Copermittee is expected to require the implementation of appropriate BMPs to address the expected pollutants from each facility or area. The Third and Fourth Term Permits described specific minimum BMPs that must be implemented at various sites. This Order, however, requires each Copermittee to designate minimum BMPs themselves and require implementation. Consistent with the Fourth Term Permits, each Copermittee is required to maintain, or require the maintenance of, all BMPs as needed.

The BMP implementation and maintenance requirements include a schedule of operation and maintenance activities for the MS4 and related structures (such as catch basins, storm drain inlets, and detention basins), as well as public streets and roads. Public streets and roads specifically include public unpaved roads. The San Diego Water Board identified, through investigations and complaints, sediment discharges from unpaved roads as a significant source of water quality problems in the San Diego Region. Inspection activities conducted by the San Diego Water Board since the Third Term Permits have found a lack of source control for many unpaved roads within the jurisdiction of the Copermittees.

Unpaved roads are a source of sediment that can be discharged in runoff to receiving waters, especially during storm events. Erosion of unpaved roadways occurs when soil particles are loosened and carried away from the roadway base, ditch, or road bank by water, wind, traffic, or other transport means. Exposed soils, high runoff velocities and volumes, sandy or silty soil types, and poor compaction increase the potential for erosion.

Road construction, culvert installation, and other maintenance activities can disturb the soil and drainage patterns to streams in undeveloped areas, causing excess runoff

and thereby erosion and the release of sediment. Poorly designed unpaved roads can act as preferential drainage pathways that carry runoff and sediment into natural streams, impacting water quality. In addition, other public works activities along unpaved roads have the potential to significantly affect sediment discharge and transport within streams and other waterways, which can degrade the beneficial uses of those waterways.

USEPA also recognizes that discharges from unpaved roads pose a significant potential threat to water quality. USEPA guidance[39] emphasizes the threat of unpaved roads to water quality:

> "*Dirt and gravel roads are a major potential source of these pollutants [sediment] and pollutants that bind to sediment such as oils, nutrients, pesticides, herbicides, and other toxic substances. Many roads have unstable surfaces and bases. Roads act like dams, concentrating flows that accelerate erosion of road materials and roadsides. Both unstable surfaces and accelerated erosion then lead to sediment and dust.*"

There are several guidance documents, developed by the USEPA,[40] the US Forest Service,[41] the University of California,[42] and others, that include design and construction specifications and BMPs that are readily available for implementation by public entities. Implementing design and other source control BMPs for unpaved roads in the region is necessary to reduce and minimize the impacts of sediment discharged during storm events from unpaved roads to the MS4s and receiving waters.

Provision E.5.c describes existing development site inspection frequency, content, and tracking that each Copermittee must incorporate into their existing development management programs. The requirements under Provision E.5.c are necessary to demonstrate each Copermittee is implementing a program that complies with Provision E.5.b and ensure BMPs implemented in areas of existing development will reduce pollutants in storm water discharges to the MEP. Provision E.5.c has been modified to include a minimum of once every 5 years for all inventoried facilities and areas of existing development, utilizing one or more methods of inspection.

In addition to onsite inspections, the methods of inspection have been expanded to include drive-by inspections. Inspections may be performed by the Copermittee's municipal and contract staff, or by volunteer monitoring or patrol programs. Volunteer monitoring or patrol programs are not expected to enforce the Copermittee's

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[39] USEPA, 2006. Environmentally Sensitive Maintenance for Dirt and Gravel Roads. Gesford and Anderson, USEPA-PA-2005.
[40] Ibid
[41] US Forest Service, 1996. Forest Service Specifications for Construction of Roads & Bridges. EM-7720-100. Revised August 1996.
[42] University of California Division of Agriculture and Natural Resources, 2007. Rural Roads: A Construction and Maintenance Guide of California Landowners. Publication 8262.

ordinances, or to inspect areas or facilities where members of the public are not allowed access. Volunteer monitoring or patrol programs must be trained by the Copermittee, and are only expected to collect visual observations. By utilizing drive-by inspections and volunteer monitoring or patrol programs, the Copermittees will be able to maximize and efficiently use their resources to identify and address sources of pollutants in areas of existing development.

The municipal and contract staff of each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial, industrial, and municipal facilities and areas in its inventoried existing development pursuant to Provision E.5.c.(1)(a)(iv). An "equivalent" of at least 20 percent means if any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspections may count toward the total annual inspection requirement. Linear municipal facilities (i.e. MS4 linear channels, sanitary sewer collection systems, streets, roads and highways) in the Copermittee's existing development inventory are not subject to the inspection frequency requirement of Provision E.5.c.(1)(a)(iv).

The inspection content specified in Provision E.5.c.(2)(a) includes the information required to be collected during an inspection by any method. The inspection content specified in Provision E.5.c.(2)(b) includes additional information that must be collected when a Copermittee's municipal or contract staff perform an onsite inspection. Provision E.5.c.(3) specifies the information that each Copermittee must maintain in its existing development inspection records.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary to compel compliance with the requirements of Provision E.5 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.5.d requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Provisions E.5.e.(1)-(2) specifically require the Copermittee to identify areas of existing development as candidates for retrofitting, and streams, channels, and/or habitats as candidates for rehabilitation. Provisions E.5.e.(1)-(2) are based on the retrofitting requirements of the Fourth Term Permits for Orange and Riverside Counties, but modified to also include identifying projects to rehabilitate channels within areas of existing development. The requirements have also been modified to be more focused on utilizing these types of projects for addressing the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Interest and opportunity to retrofit areas of existing development and rehabilitate channels located in areas of existing development has been observed in several programs the San Diego Water Board oversees (e.g., CWA Section 401 Water Quality

Certification program, supplemental environmental projects, and grant programs). Each jurisdiction has miles and miles of streets that could be retrofitted to become green streets. Reshaping landscaped areas from convex to concave configurations can detain storm water instead of directing runoff as quickly as possible to the MS4. Retrofit projects could also include simply replacing impervious surfaces with permeable surfaces.

Retrofitting projects do not necessarily have to be expensive. Retrofitting projects could be as simple as redirecting downspouts from roofs to pervious or landscaped areas instead of to hardscaped areas discharging directly to the MS4, providing rain barrels to harvest storm water from downspouts for use at a later time, or planting more trees in areas with little vegetation to provide canopy that can intercept storm water. The San Diego Water Board encourages the Copermittees to identify simple, low-cost retrofitting opportunities that can be easily implemented, in addition to other more expensive retrofitting and channel rehabilitation projects.

Rehabilitation of channels, streams, and/or habitat will require more significant planning and resources to implement. There are, however, also abundant opportunities to rehabilitate channels, streams and/or habitats in or adjacent to areas of existing development. Each Watershed Management Area likely has several creeks and stream reaches that have been undergrounded, artificially hardened, or hydromodified that could be rehabilitated to be more sustainably configured, which would slow down storm water flows and potentially have more assimilative capacity for pollutants while still being supportive of designated beneficial uses.

The San Diego Water Board recognizes that it may be infeasible to implement retrofitting or channel rehabilitation projects within certain areas of a Copermittee's jurisdictions. For such areas, the Copermittee must instead identify, develop, and implement regional retrofitting and channel rehabilitation projects (i.e. projects that can retain and/or treat storm water from one or more areas of existing development) adjacent to and/or downstream of the areas of existing development.

Provisions E.5.e.(1)-(2) do not require the implementation of retrofitting and rehabilitation projects, but do require the Copermittee to develop a program with strategies to facilitate the implementation of these types of projects in areas of existing development. The strategies are expected to include allowing and encouraging Priority Development Projects to implement retrofitting types of projects as a means of compliance with the structural BMP performance criteria requirements of Provisions E.3.c.(1) and E.3.c.(2).

Provision E.6 (Enforcement Response Plans) requires each Copermittee to develop an Enforcement Response Plan as part of its jurisdictional runoff management program document. Proper implementation of the Enforcement Response Plans is necessary to effectively prohibit non-storm water discharges to the MS4, and reduce the discharge of pollutants in storm water from the MS4 to the MEP.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system*" and be able to demonstrate that it can "*operate pursuant to legal authority established by statute, ordinance or series of contracts*" to control the discharge of non-storm water and pollutants in storm water to and from its MS4. Pursuant to 40 CFR 122.26(d)(2)(i)(E) each Copermittee is specifically required to have the legal authority to "*[r]equire compliance with conditions in ordinances, permits, contracts or order*s."

The requirements under Provision E.6 are necessary to demonstrate that each Copermittee can enforce its legal authority to *"effectively prohibit non-stormwater discharges"* and "*reduce the discharge of pollutants to the maximum extent practicable*" as well as "*[r]equire compliance with conditions in ordinances, permits, contracts or order*."

The Enforcement Response Plan required under Provision E.6 will serve as a reference for the Copermittee and the San Diego Water Board to determine if consistent enforcement actions are being implemented to achieve timely and effective compliance from all public and private entities that are not in compliance with the Copermittee's ordinances, permits, or other requirements. The Enforcement Response Plan must contain clear direction for the Copermittee to take immediate enforcement action, when appropriate and necessary, in their illicit discharge detection and elimination, development planning, construction management, and existing development management programs.

If the entities subject to the Copermittee's legal authority do not implement appropriate corrective actions in a timely manner, or if violations repeat, the Copermittee must take progressively stricter responses to enforce its legal authority and achieve compliance with its ordinances, permits, or other requirements to *"effectively prohibit non-stormwater discharges"* and "*reduce the discharge of pollutants to the maximum extent practicable.*"

<u>Provision E.7 (Public Education and Participation)</u> requires each Copermittee to implement a public education and participation program. Proper implementation of the public education and participation program as part of its jurisdictional runoff management program will contribute toward effectively prohibiting non-storm water discharges to the MS4, and toward the reduction of pollutants in storm water from the MS4 to the MEP.

Provision E.7 establishes the minimum requirements that each Copermittee must implement to engage members of the public as part of its jurisdictional runoff management program. In the Fourth Term Permits, the public education program requirements and the public participation requirements were included as separate jurisdictional runoff management program components. In this Order, the public education requirements have been consolidated with the public participation requirements, as both sets of requirements are related to the engagement of the public

by each Copermittee. Engagement of the public is critical for the success of each Copermittee's jurisdictional runoff management program.

The Copermittees have been implementing public education programs for the last 20 years, which are now well established. The specificity of expected public education program elements of the Fourth Term Permits has been removed. For the most part, the public education program requirements in Provision E.7.a have been reduced to a set of requirements that are specifically included in the federal regulations under 40 CFR 122.26(d)(2)(iv)(A)(6), 122.26(d)(2)(B)(6) and 122.26(d)(2)(D)(4), which should already be incorporated into each Copermittee's existing public education program. Each Copermittee is expected to utilize the information and data collected from the monitoring and assessments conducted within the Watershed Management Area, and from its inventories and inspections to best direct its public education program resources toward addressing the highest priority water quality conditions identified within the Water Quality Improvement Plan.

According to 40 CFR 122.26(d)(2)(iv), public participation is required to be included as part of the "*comprehensive planning process*", which includes the development and implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs. The requirements under Provision E.7.b specify the opportunities that the public must be provided to be involved in the "*comprehensive planning process*", as required by to 40 CFR 122.26(d)(2)(iv).

Provision E.8 (Fiscal Analysis) requires each Copermittee to secure the resources and provide an analysis of the resources that will be necessary to implement the requirements of the Order. Adequate fiscal resources are necessary for a jurisdictional runoff management program to effectively prohibit non-storm water discharges to the MS4, and reduce pollutants in storm water from the MS4 to the MEP.

According to 40 CFR 122.26(d)(2)(vi), each Copermittee is responsible for providing "*a fiscal analysis of the necessary capital and operation and maintenance expenditures necessary to accomplish the activities*" required by this Order, including "*a description of the source of funds that are proposed to meet the necessary expenditures, including legal restrictions on the use of such funds.*" The fiscal analysis requirements of Provision E.8 are consistent with 40 CFR 122.26(d)(2)(vi).

The San Diego Water Board has chosen not to require a description of fiscal benefits realized from implementation of the jurisdictional runoff management programs. This is a recommendation from the National Association of Flood and Stormwater Management Agencies.[43] For instance, the fiscal analysis requirements do not address city-wide fiscal benefits of protection (e.g., public health, tourism, property values, economic activity, beneficial uses, etc.), even though many costs currently

[43] National Association of Flood and Stormwater Management Agencies. 2006. *Guidance for Municipal Stormwater Funding.* Prepared under a grant provided by the USEPA.

reported to the San Diego Water Board are for related activities. This type of assessment may help Copermittees improve the allocation of resources and it may help the Copermittees secure adequate funding for the program. Qualitative assessments, however, could be overly subjective and most Copermittees likely lack the ability to provide accurate quantitative assessments. The San Diego Water Board encourages the Copermittees to consider means for conducting assessments of fiscal benefits derived from the programs. Such assessments could be conducted on a regional scale similar to studies of program costs conducted by the State Water Board.[44]

[44] State Water Board, 2005. NPDES Stormwater Cost Survey.

F. Reporting

Purpose: Provision F includes the requirements for the documents and reports that the Copermittees must prepare and provide to the San Diego Water Board. The documents prepared by the Copermittees and provided to the San Diego Water Board and made available to the public will provide the documentation that the Copermittees are complying with the requirements of the Order.

***Discussion*:** Provision F requires the Copermittees to prepare several documents and reports that must be provided to the San Diego Water Board and made available to the public. The reporting requirements have been significantly reduced compared to the Fourth Term Permit reporting requirements. The reduction in reporting requirements was recommended by the San Diego County Copermittees in the Report of Water Discharge submitted in June 2011.

More specific and detailed discussions of the requirements of Provision F are provided below.

Provision F.1 (Water Quality Improvement Plans) requires the Copermittees in each Watershed Management Area to develop and submit a Water Quality Improvement Plan in accordance with the requirements of Provision B.

Of all the requirements of Provision F, the Water Quality Improvement Plans will likely be the documents requiring the most significant effort to develop. The content of the Water Quality Improvement Plans, however, is expected to include content that should already have been developed for the Watershed Plans and several elements that are included in the Monitoring and Reporting Programs required under the Fourth Term Permits.

Because the Water Quality Improvement Plan is part of the "*comprehensive planning process which involves public participation*," Provision F.1 includes requirements to give multiple opportunities to the public to provide input on the content of the plans.

Provision F.1.a.(1) specifies the elements that the Copermittees must include in the public participation process for the development of the Water Quality Improvement Plans. In order for the public to be aware of the opportunities to provide input, Provision F.1.a.(1)(a) requires the Copermittees to develop a publicly available and noticed schedule of the opportunities for the public to participate and provide comments during the development of the Water Quality Improvement Plan. These opportunities are when the public can provide the data, information, and recommendations that the Copermittees can consider during the development of the Water Quality Improvement Plans.

The San Diego Water Board recognizes, however, that the Copermittees cannot be expected to incorporate all the data, information, and recommendations that the public

may provide into the Water Quality Improvement Plans. The Copermittees will have to review the data, information, and recommendations received and make some decisions on what to incorporate into the Water Quality Improvement Plans. Before the Copermittees finalize their decisions, members of the public should be allowed to review the Copermittees' decisions. Thus, Provision F.1.a.(1)(b) requires the Copermittees to form a Water Quality Improvement Consultation Panel (Panel).

The Panel will consist of a member from the environmental community and a member from the development community familiar with the Watershed Management Area. A representative from the San Diego Water Board staff will also be part of the Panel. The Copermittees may choose to include additional members, but the Panel is only required to include three panel members.

The Panel will serve as an additional public participation and input mechanism during the development of the Water Quality Improvement Plans. The knowledge and expertise from these Panel members are expected to provide the Copermittees valuable direction during their decision-making process. The Copermittees will review the content of their planned submittals with the Panel members to receive recommendations. If the Panel provides recommendations, the Copermittees must consider revisions to the Water Quality Improvement Plan submittals.

The San Diego Water Board recognizes that the development of multiple Water Quality Improvement Plans concurrently may limit the ability of the public to review and provide comments to the Copermittees. Thus, Provision F.1.a.(1)(c) requires the Copermittees to coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public time and opportunity to participate during the development of the Water Quality Improvement Plans.

Provision F.1.a.(2) requires the Copermittees to develop and submit the first Water Quality Improvement Plan component, in accordance with the requirements of Provision B.2, which includes the identification of the priority water quality conditions and potential water quality improvement strategies. The public must be provided an opportunity to provide data, information and recommendations to be utilized in the development and identification of the priority water quality conditions and potential water quality improvement strategies for the Watershed Management Area. The Copermittees must consult with the Panel and consider making revisions. The Copermittees may submit the requirements of Provision B.2 as early as 6 months and no later than 12 months after the commencement of coverage under this Order. After the requirements of Provision B.2 are submitted to the San Diego Water Board, the public will be provided another opportunity to provide comments.

Provision F.1.a.(3) requires the Copermittees to develop and submit the second Water Quality Improvement Plan component, in accordance with the requirements of Provision B.3, which includes the identification of the numeric goals for the highest priority water quality conditions identified for the Watershed Management Area, and the strategies that will be implemented to achieve the potential numeric goals. The

Copermittees may also develop the Optional Watershed Management Area Analysis, in accordance with the requirements of Provision B.3.b.(4), as part of this submittal. The public must be provided an opportunity to provide data, information and recommendations to be utilized in the development and identification of the numeric goals and water quality improvement strategies for the Watershed Management Area. The Copermittees must consult with the Panel and consider making revisions. The Copermittees may submit the requirements of Provision B.3 as early as 9 months and no later than 18 months after the commencement of coverage under this Order. After the requirements of Provision B.3 are submitted to the San Diego Water Board, the public will be provided another opportunity to provide comments.

Finally, Provision F.1.b describes the process for the submittal and implementation of the Water Quality Improvement Plans. The complete Water Quality Improvement Plans are required to be submitted by the Copermittees within 24 months after the commencement of coverage under this Order. The San Diego Water Board will provide the public an opportunity to provide comments on each complete Water Quality Improvement Plan.

The San Diego Water Board will review each Water Quality Improvement Plan and the public comments received to determine if the Copermittees have submitted a Water Quality Improvement Plan that meets the requirements of Provision B. If a Water Quality Improvement Plan does not meet the requirements of Provision B, the Copermittees will be considered out of compliance and directed in writing by the San Diego Water Board Executive Officer to correct the deficiencies.

When a Water Quality Improvement Plan meets the requirements of Provision B, the San Diego Water Board will determine whether to hold a public hearing or to limit public input to submittal of written comments before accepting the Water Quality Improvement Plan. Implementation of the Water Quality Improvement Plan must begin within 30 days of acceptance.

The San Diego Water Board expects that any deficiencies in the Water Quality Improvement Plan will be identified either in the public comments or during the review by the San Diego Water Board before implementation begins. In the event any deficiencies are identified after the implementation of the Water Quality Improvement Plan, Provision F.1.b.(7) clarifies that the San Diego Water Board maintains the right to require the Copermittees to correct any deficiencies that may be identified.

<u>Provision F.2 (Updates)</u> requires the Copermittees to update specific documents that the Copermittees will utilize to implement the requirements of this Order.

Each Copermittee is required to continue implementing a jurisdictional runoff management program, as required under Provision E. Implementation of each Copermittee's jurisdictional runoff management program is directed by its jurisdictional runoff management program document. Provision F.2.a requires each Copermittee to update its jurisdictional runoff management program document to be consistent with

the requirements of Provision E concurrent with the submittal of the Water Quality Improvement Plan.

Likewise, each Copermittee must continue to require new development and redevelopment projects to implement BMPs to control pollutants in storm water runoff. The control of pollutants in storm water runoff from development and redevelopment projects within each Copermittee's jurisdiction is guided and directed by its BMP Design Manual, formerly known as a Standard Storm Water Mitigation Plan (SSMP). Provision F.2.b requires each Copermittee to update its BMP Design Manual to be consistent with the requirements of Provision E.3 concurrent with the submittal of the Water Quality Improvement Plan.

In general, the requirements of the Order should not necessitate a complete rewrite of each Copermittee's jurisdictional runoff management program document or BMP Design Manual, as was required by the Third Term Permits. The jurisdictional runoff management program and BMP Design Manual requirements of this Order are not significantly different than the requirements of the Fourth Term Permits. Thus, only sections of the Order which are new or have been significantly changed should warrant revisions to specific sections of the Copermittee's jurisdictional runoff management program document and BMP Design Manual.

Finally, the Water Quality Improvement Plans are expected to require updates as the iterative approach and adaptive management process included in the Water Quality Improvement Plan, as required under Provision B.5, is implemented by the Copermittees. Provision F.2.c.(1) requires the Copermittees to implement a public participation process for the proposed updates, review the proposed updates with the Panel, and submit the updates to the Water Quality Improvement Plan as part of the Annual Reports required under Provision F.3.b.

Also, because TMDLs are likely to be developed, adopted and approved during the term of the Order, Provision F.2.c.(2) has been included to expedite the incorporation of TMDLs into the Copermittees' Water Quality Improvement Plans as part of the update process, potentially before the Order is re-opened to incorporated the requirements of the new TMDLs.

<u>Provision F.3 (Progress Reporting)</u> requires the Copermittees to report on the progress of implementing the Water Quality Improvement Plans.

The requirements of Provision F.3 are to report the progress toward improving water quality that the Copermittees are achieving with the implementation of the Water Quality Improvement Plans and each Copermittee's jurisdictional runoff management program. The Progress Report Presentations required under Provision F.3.a are included to provide the Copermittees an opportunity to communicate directly with the San Diego Water Board and the public. The Progress Report Presentations will also provide the members of the San Diego Water Board and members of the public an opportunity to become more acquainted with the Copermittees and their projects and

programs to address non-storm water and storm water discharges into and from their MS4s.

The Annual Report requirements of Provision F.3.b are a consolidation of several reporting requirements from the Fourth Term Permits, including the Jurisdictional Runoff Management Program Annual Reports, the Watershed Annual Reports, and the Monitoring and Reporting Program Annual Reports. Furthermore, the Annual Report requirements are consistent with the requirements under 40 CFR 122.42(c).

Pursuant to 40 CFR 122.42(c), "*[t]he operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the Director…must submit an annual report*", which must include the following:

(1) *The status of implementing the components of the storm water management program that are established as permit conditions* [40 CFR 122.42(c)(1)];

(2) *Proposed changes to the storm water management programs that are established as permit conditions* [40 CFR 122.42(c)(2)];

(3) *Revisions, if necessary, to the assessment of controls and fiscal analysis* [40 CFR 122.42(c)(3)];

(4) *A summary of data, including monitoring data, that is accumulated throughout the reporting year* [40 CFR 122.42(c)(4)];

(5) *Annual expenditures and budget for year following each annual report* [40 CFR 122.42(c)(5)];

(6) *A summary describing the number and nature of enforcement actions, inspections, and public education programs* [40 CFR 122.42(c)(6)];

(7) *Identification of water quality improvements or degradation* [40 CFR 122.42(c)(7)].

Under the Fourth Term Permits, each Copermittee is responsible for submitting a Jurisdictional Runoff Management Program Annual Report; the Copermittees in each designated watershed are responsible for submitting a Watershed Annual Report; and the Copermittees from each county are responsible for submitting a Monitoring and Reporting Program Annual Report.

There are 39 Copermittees in the San Diego Region, each required to prepare and submit a Jurisdictional Runoff Management Program Annual Report. There are 9 designated watersheds in San Diego County, 6 designated watersheds in Orange County, and 1 designated watershed in Riverside County for a total of 16 designated watersheds, each requiring a Watershed Annual Report. There are 3 sets of Copermittees in 3 counties in the San Diego Region, requiring Copermittees from each county to prepare and submit a Monitoring and Reporting Program Annual Report.

Thus each Copermittee is currently required to prepare, or participate in the preparation of at least 3 annual reports. In addition, the San Diego County Copermittees are required to prepare and submit a Regional Urban Runoff Management Plan Annual Report.

In total, there are 59 annual reports that are prepared by the Copermittees and submitted to the San Diego Water Board for the Fourth Term Permits. The preparation of these annual reports requires significant time and resources from each Copermittee, which could otherwise be expended on actions that could improve water quality within its jurisdiction. In turn, significant time and resources are required from the San Diego Water Board staff to review these reports, which could otherwise be expended on working directly with the Copermittees to improve their implementation efforts toward restoring and protecting water quality.

Until the Water Quality Improvement Plans are developed, there will be a transitional period during which the Copermittees will continue to implement their existing jurisdictional runoff management programs. There will also be a transitional period during which the Copermittees will implement the transitional monitoring and assessment requirements of Provision D. During the transitional period, the Copermittees will submit annual reports pursuant to the requirements of Provisions F.3.b.(1) and F.3.b.(2).

Provision F.3.b.(1) includes the transitional annual reporting requirements for each Copermittee's jurisdictional runoff management program. The reporting of the jurisdictional runoff management program implementation efforts have been reduced to a single 2-page form. Each Copermittee is required to complete and submit a Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D or a revised form accepted by the San Diego Water Board) no later than October 31 of each year for each jurisdictional runoff management program reporting period (i.e. July 1 to June 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted. The Jurisdictional Runoff Management Program Annual Report Form will certify that each Copermittee has implemented its jurisdictional runoff management program in accordance with the requirements of Provision E. Each Copermittee may choose to continue to utilize and submit the jurisdictional runoff management program annual reporting format of its current Order until the first Water Quality Improvement Plan Annual Report is required to be submitted.

Provision F.3.b.(2) includes the transitional annual reporting requirements for the transitional monitoring and assessment program for each Watershed Management Area. The Copermittees in the Watershed Management Area are required to submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted. The Transitional Monitoring and Assessment Program Annual Report is required to include

the transitional period monitoring data collected pursuant to Provisions D.1.a and D.2.a, and the findings from the transitional period findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

Provision F.3.b.(3) includes the Water Quality Improvement Plan Annual Report requirements. Only one Water Quality Improvement Plan Annual Report is required for each of the ten (10) Watershed Management Areas designated under Provision B.1, which is a significant reduction in the number of annual reports required to be prepared and submitted by the Copermittees. The Water Quality Improvement Plan Annual Report will document the Copermittees' efforts to implement the Water Quality Improvement Plan. Each Water Quality Improvement Plan Annual Report will be focused primarily on reporting the analysis of the monitoring data collected pursuant to Provisions D.1-D.3 during the reporting period, and the assessments that are required pursuant to Provision D.4 based on the data. The monitoring data analyses and the assessments that are provided in the Water Quality Improvement Plan Annual Report will be the core of the report. The reporting of the jurisdictional runoff management program implementation efforts have been reduced to a single 2-page form, and will no longer be the primary focus of the reporting requirements as in the Third and Fourth Term Permits.

Each Copermittee will continue to prepare and submit a Jurisdictional Runoff Management Program Annual Report Form as part of the Water Quality Improvement Plan Annual Report to certify that each Copermittee has implemented its jurisdictional runoff management program in accordance with the requirements of Provision E. Instead of reviewing a voluminous report from each Copermittee, as was required under the Third and Fourth Term Permits, the San Diego Water Board will conduct audits of each Copermittee's jurisdictional runoff management program to investigate and confirm the information provided by each Copermittee on its Jurisdictional Runoff Management Program Annual Report Form. The audits will allow the San Diego Water Board to become more familiar with the each Copermittee's jurisdictional runoff management program, and each Copermittee will become more informed about the expectations of the San Diego Water Board.

The reduction in the number and content of the Water Quality Improvement Plan Annual Reports should result in significant time, cost and resource savings for the Copermittees, as well as the San Diego Water Board. Those savings should offset a significant portion of any additional costs that may be incurred to develop the Water Quality Improvement Plans and to implement the monitoring and assessment program requirements of Provision D.

The reporting period for the Water Quality Improvement Plan Annual Reports consists of two periods. Because the jurisdictional runoff management programs are typically budgeted and implemented during a fiscal year, the information provided on the Jurisdictional Runoff Management Program Annual Report Forms will cover the period from July 1 to June 30 of the following year.

The Water Quality Improvement Plan Annual Reports, however, are focused primarily on the monitoring data and the assessments based on the monitoring data. The monitoring data is collected during the monitoring year, which begins October 1 and ends September 30 of the following year. The monitoring year begins after the beginning of the fiscal year and ends after the end of the fiscal year. Therefore, to accommodate and capture the information collected during the fiscal year and the monitoring year, the Annual Report reporting period incorporates both periods.

Finally, Provision F.3.c requires the Copermittees to develop and submit a Regional Monitoring and Assessment Report. The Regional Monitoring and Assessment Report is similar to the Long Term Effectiveness Assessment required under the Fourth Term San Diego County Permit. The Regional Monitoring and Assessment Report is expected to utilize the entire body of data and information collected by the Copermittees during the term of this Order to assess improvements to water quality on a regional scale.

Provision F.4 (Regional Clearinghouse) requires the Copermittees to develop, update, and maintain an internet-based Regional Clearinghouse that can be used to store, disseminate, and share the Copermittees' documents, monitoring data, special studies, and any other data or information.

Most of the documents and data that are generated by the Copermittees can be provided in electronic format, and made available to the San Diego Water Board and the public on the internet. The San Diego Water Board has been gradually transitioning its document submittal requirements to electronic submittals. Provision F.4 has been included to further these efforts.

Provision F.4 has also been included to improve the exchange and availability of information among the Copermittees, as well as between the Copermittees and the San Diego Water Board. Provision F.4 will also make the information generated during the implementation of the Order more accessible to the public.

Provision F.5 (Report of Waste Discharge) requires the Copermittees to submit a Report of Waste Discharge to reapply for renewal of the Order prior to its expiration, in accordance with 40 CFR 122.21(d)(2) and CWC section 13376.

Because the Orange County and Riverside County Copermittees will not be subject to the requirements of this Order until they are notified of coverage, Provision F.5.a describes the process of submitting their Reports of Waste Discharge pursuant to the requirements of their current permits to obtain coverage under this Order.

For the Copermittees subject to the requirements of this Order, Provision F.5.b requires the Copermittees to submit a Report of Waste Discharge 180 days in advance of the expiration of this Order Provision F.5.b also describes the minimum information to be included in the Report of Waste Discharge, based on USEPA

guidance “Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems,” dated May 17, 1996.

Provision F.6 (Application for Early Coverage) describes the process that would allow the Orange County and/or Riverside County Copermittees to obtain coverage under this Order earlier than the expiration of their current Orders.

If the Orange County and/or Riverside County Copermittees choose to obtain coverage under this Order earlier than the expiration of their current Orders, the preparation and submittal of a Report of Waste Discharge, as required by the Fourth Term Permits, will not be necessary. The existing Order for the respective county will be rescinded upon the effective coverage date under this Order, except for enforcement purposes.

G. Principal Watershed Copermittee Responsibilities

Purpose: Provision G includes the requirements for the Principal Watershed Copermittee designated by the Copermittees in each Watershed Management Area.

***Discussion*:** Unlike previous NPDES requirements, there will no longer be a single Principal Copermittee. Provision G.1 requires the Copermittees to designate a Principal Watershed Copermittee for each Watershed Management Area. There are ten (10) Watershed Management Areas in the San Diego Region, as defined in Table B-1 under Provision B.1 of the Order. An individual Copermittee should not be the Principal Watershed Copermittee for more than two (2) Watershed Management Areas. There could be up to ten (10) Principal Water Copermittees designated for the Watershed Management Areas in the San Diego Region.

Provision G.2 describes the minimum responsibilities of each Principal Watershed Copermittee. The primary responsibility of the Principal Watershed Copermittees is to serve as the liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues. Ideally, the Principal Watershed Copermittee can represent the interests of all the Copermittees within a Watershed Management Area during discussions or meetings to facilitate communication with the San Diego Water Board. The Principal Watershed Copermittees are also responsible for facilitating and coordinating the implementation efforts of the Copermittees and submittals of required documents and reports.

The Principal Watershed Copermittee is responsible for facilitating the efforts of the Copermittees within the Watershed Management Area to develop the Water Quality Improvement Plan required under Provision B, and submit it for approval in accordance with Provision F.1. The Principal Watershed Copermittee is also responsible for coordinating the submittal of the document updates, Progress Report Presentations, and Annual Reports required from the Copermittees within each Watershed Management Area under Provisions F.2, F.3.a, and F.3.b. The Principal Watershed Copermittees are responsible for coordinating with each other to develop and submit the Regional Clearinghouse, Regional Monitoring and Assessment Report, and the Report of Waste Discharge required under Provisions F.3.c, F.4, and F.5.

The designated Principal Watershed Copermittee for each Watershed Management Area does not necessarily have to serve as the Principal Watershed Copermittee for the entire term of the Order. If the Copermittees in a Watershed Management Area choose to designate a new Principal Watershed Copermittee, the change may be submitted as part of the Annual Report required under Provision F.3.b, with an update to the Water Quality Improvement Plan in accordance with Provision F.2.c.

Provision G.3 specifies that the Principal Watershed Copermittee is not responsible for ensuring that the other Copermittees within the Watershed Management Area are in compliance with the requirements of this Order

H. Modification of Order

Purpose: Provision H provides the conditions under which modifications to Order No. R9-2013-0001 may occur.

***Discussion*:** Provision H allows for modifications to Order No. R9-2013-0001. Minor modifications may be made by the San Diego Water Board Executive Officer without a public notice or public hearing. Minor modifications are defined under 40 CFR 122.63. Minor modifications under 40 CFR 122.63 potentially applicable to this Order are the following:

- Correcting typographical errors;
- Requiring more frequent monitoring or reporting by the Copermittees;
- Changing an interim compliance date in a schedule of compliance, provided the new date is not more than 120 days after the date specified in the existing permit and does not interfere with attainment of the final compliance date requirement.

Modifications that are not one of the above minor modifications will require re-opening the Order, subject to the requirements of 40 CFR 122.44, 122.62 to 122.64, and 124.5, but only for the specific provisions subject to the modification. Modifications of the Order that are not minor require a draft Order with the proposed modifications made available for public review, a public notice and comment period, and a public hearing. Comments on the provisions not subject to the proposed modifications are not required to be considered in the San Diego Water Board's responses to comments or during the public hearing.

Provision H.4 was included to specify that the Order will be re-opened for modifications if the State Water Board determines revisions to Provision A are warranted, an application for early coverage under the Order is received pursuant to Provision F.6, the Basin Plan is amended to modify an existing TMDL or incorporate a new TMDL, or the monitoring and assessment program requirements need to be updated or revised.

Provision H.5 was included to specify that the San Diego Water Board will re-open and consider modifications to this Order when the Orange County Copermittees or the Riverside County Copermittees submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders

I. Standard Permit Provisions and General Provisions

Purpose: Provision I incorporates the standard permit provisions required to be included in all NPDES permits, as well as several other general provisions.

***Discussion*:** Provision I refers to Attachment B to the Order. Attachment B expressly incorporates the conditions applicable to all NPDES permits as provided under 40 CFR 122.41(a)-(n), as well as the applicable conditions for MS4s and storm water discharges provided under 40 CFR 122.42(c) and 40 CFR 122.42(d), respectively. Attachment B also includes several general provisions that are typically included in or applicable to waste discharge requirements issued by the San Diego Water Board.

IX. ATTACHMENTS

The attachments to the Order are discussed below. The discussions describe the content of the attachments.

Attachment A – Discharge Prohibitions and Special Protections

Section 1 of Attachment A includes the Waste Discharge Prohibitions from the Basin Plan. They have been provided verbatim in their entirety.

Section 2 of Attachment A includes the "*Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges*" applicable to permitted point source discharges of storm water, adopted under State Water Board Resolution No. 2012-0012. The terms, prohibitions, and special conditions (collectively referred to as special conditions) are established as limitations on point source storm water discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in ASBS, as required for State Water Quality Protection Areas pursuant to California Public Resources Code sections 36700(f) and 36710(f). These Special Protections were adopted by the State Water Board as part of the Ocean Plan General Exception.

Attachment B – Standard Permit Provisions and General Provisions

Conditions applicable to all NPDES permits, as required under 40 CFR 122.41, and conditions applicable to MS4s and storm water discharges, as required under 40 CFR 122.42(c) and 122.42(d), respectively are provided in Attachment B to the Order. They have been provided expressly in their entirety.

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. These general provisions are typically included in or applicable to waste discharge requirements issued by the San Diego Water Board. Many of the general provisions were developed by the State Water Board. Where a general provision is derived from statute or regulation, a citation of the statute or regulation section is provided. General provisions that do not provide a citation are included under the authority provided CWC 13377.

Attachment C – Acronyms, Abbreviations and Definitions

The acronyms and abbreviations that are used in the Order are provided in Attachment C. Attachment C also includes definitions that may provide an explanation or description of the meaning or intent of specific terms or phrases included in the Order.

Attachment D – Jurisdictional Runoff Management Program Annual Report Form

An example of the Jurisdictional Runoff Management Program Annual Report Form required to be submitted by each Copermittee as part of the Annual Reports required under Provision F.3.b.(1)(e) is provided as Attachment D to the Order. An electronic version of the form will be available from the San Diego Water Board after the adoption of the Order.

The Jurisdictional Runoff Management Program Annual Report Form includes the minimum information necessary to demonstrate that the Copermittee is implementing and in compliance with the requirements of Provision E, and includes much of the information required to be reported pursuant to 40 CFR 122.42(c).

The information that must be provided on the Jurisdictional Runoff Management Program Annual Report Form is limited to the fiscal year, which begins July 1 and ends June 30 of the following year. The information expected to be provided by the Copermittees in each section of the Jurisdictional Runoff Management Program Annual Report Form is discussed below.

I. COPERMITTEE INFORMATION

The name of the Copermittee (e.g. name of city, county, or special district) and the contact information for the storm water program manager are provided under this section.

II. LEGAL AUTHORITY

The Copermittee must confirm whether or not the legal authorities under Provision E.1.a have been established for itself within its jurisdiction.

The Copermittee must also confirm whether or not a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority, as required under Provision E.1.b. The certification statement required by Provision E.1.b is only required to be submitted with the first Annual Report required under Provision F.3.b.

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

The Copermittee must inform the San Diego Water Board whether or not an update to its jurisdictional runoff management program document was required or recommended by the San Diego Water Board during the reporting period. An update to the jurisdictional runoff management program is required under Provision F.2.a. The San Diego Water Board may recommend modifications to the jurisdictional runoff management program as part of the iterative approach and adaptive management process required under Provision B.5, which may result in an update that is necessary for the Copermittee's jurisdictional runoff management document.

If an update was required or recommended, the Copermittee must confirm whether or not the update was completed and made available on the Regional Clearinghouse within the reporting period. If no update was required or recommended, an answer is not required. If the answer is NO, meaning the required or recommended update was not completed and/or made available on the Regional Clearinghouse, the Copermittee must attach a schedule for the completion of the update and/or posting of the updated document on the Regional Clearinghouse.

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

The Copermittee must confirm whether or not a program was implemented during the fiscal year to actively detect and eliminate illicit discharges and connections in accordance with the requirements under Provision E.2.

In addition to confirming that a program to detect and eliminate illicit discharges was implemented during the reporting period, the Copermittee is also required to report on several items related to the program. The information that must be reported is limited to the fiscal year for the Annual Report.

All non-storm water discharges are considered illicit discharges unless the source is identified as one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5). If a non-storm water discharge is identified as one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5), the discharge is a non-storm water discharge, but not an illicit discharge. If a non-storm water discharge is identified but not in one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5), the discharge is both a non-storm water discharge and an illicit discharge.

V. DEVELOPMENT PLANNING PROGRAM

The Copermittee must confirm whether or not a development planning program was implemented during the fiscal year in accordance with the requirements under Provision E.3.

The Copermittee must also inform the San Diego Water Board whether or not an update to its BMP Design Manual was required or recommended by the San Diego Water Board during the fiscal year. An update to the BMP Design Manual is required under Provision F.2.b. The San Diego Water Board may recommend modifications to the BMP Design Manual, which may result in an update that is necessary for Copermittee's the BMP Design Manual.

If an update was required or recommended, the Copermittee must confirm whether or not the update was completed and made available on the Regional Clearinghouse within the reporting period. If no update was required or recommended, an answer is not required. If the answer is NO, meaning the required or recommended update was not completed and/or made available on the Regional Clearinghouse, the Copermittee must attach a schedule for the completion of the update and/or posting of the updated document on the Regional Clearinghouse.

The Copermittee is also required to report on several items related to the program. For the development and redevelopment projects that are reviewed under the program, the Copermittee must report the total number projects submitted for review during the fiscal year. Of those projects, the Copermittee must report the number that are Priority Development Projects, as defined under Provision E.3.b.(1). The Copermittee must also report the number of Priority Development Projects that were approved and/or granted occupancy during the fiscal year, regardless of when the project was originally submitted for review. Any projects that were approved during the fiscal year and granted any exemptions from the BMP Design Manual requirements and/or allowed to implement alternative compliance options in accordance with Provision E.3.c.(3) must be reported.

Finally, the Copermittee must also report on several items related to its oversight of permanent BMPs on Priority Development Projects within its jurisdiction, as required under Provision E.3.e. The information that must be reported is limited to the fiscal year for the Annual Report.

VI. CONSTRUCTION MANAGEMENT PROGRAM

The Copermittee must confirm whether or not a construction management program was implemented during the fiscal year in accordance with the requirements under Provision E.4.

The Copermittee is also required to report on several items related to its oversight construction projects within its jurisdiction. The information that must be reported is limited to the fiscal year for the Annual Report.

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

The Copermittee must confirm whether or not an existing development management program was implemented during the fiscal year in accordance with the requirements under Provision E.5.

The Copermittee is also required to report on several items related to its oversight in areas of existing development within its jurisdiction. The information that must be reported is limited to the fiscal year for the Annual Report. The information must also be separated into four categories of existing development: municipal, commercial, industrial, and residential.

VIII. PUBLIC EDUCATION AND PARTICIPATION

The Copermittee must confirm whether or not a public education program component was implemented during the fiscal year in accordance with the requirements under Provision E.7.a.

The Copermittee must also confirm whether or not a public participation program component was implemented during the fiscal year in accordance with the requirements under Provision E.7.b.

IX. FISCAL ANALYSIS

The Copermittee must confirm a summary of its fiscal analysis, conducted in accordance with the requirements under Provision E.8, has been attached to the form.

X. CERTIFICATION

A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative must sign and certify the Jurisdictional Runoff Management Program Annual Report Form. The appropriate box must be checked to indicate the whether a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative is signing the form.

Attachment E – Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2013-0001

Attachment E provides specific provisions for implementing the load allocations (LAs) and wasteload allocations (WLAs) of Total Maximum Daily Loads (TMDLs) adopted by the San Diego Water Board and approved by USEPA in which the Copermittees are identified as responsible for discharges subject to the requirements of the TMDLs. Federal regulations require that NPDES requirements incorporate water quality based effluent limitations (WQBELs) that must be consistent with the requirements and assumptions of any available WLAs,[45] which may be expressed as numeric effluent limitations, when feasible, and/or as a best management practice (BMP) program of expanded or better-tailored BMPs.[46] Where the TMDL includes WLAs that provide numeric pollutant load or pollutant parameter objectives, the WLA has been, where feasible, translated into numeric WQBELs.[47]

For each TMDL in Attachment E, four sections are included:

a. Applicability: This section provides the resolution under which the TMDL Basin Plan amendment was adopted and approved, with the applicable adoption and approval dates. This section also gives the effective date of the TMDL and where the TMDL is applicable (i.e. Watershed Management Area and water body). The Copermittees that are responsible for implementing the specific provisions are also given in this section.

b. Final TMDL Compliance Requirements: For each TMDL, the final TMDL compliance requirements consist of the final TMDL compliance date(s), the final WQBELs, and the final TMDL compliance determination requirements. The final WQBELs are expressed in terms of receiving water limitations, effluent limitations, and/or best management practices (BMPs). The final WQBELs for the TMDLs are incorporated by reference into Provision A of the Order. The final WQBELs become enforceable when the final TMDL compliance dates have passed. Applicable BMPs within the final WQBELs must be incorporated into the Water Quality Improvement Plans. Compliance with the final WQBELs will be determined in accordance with the options provided under the final TMDL compliance determination requirements.

c. Interim TMDL Compliance Requirements: If the final TMDL compliance date has not passed and there are interim TMDL compliance requirements, they are included in this section. If there are interim WQBELs with interim compliance dates, the interim WQBELs become enforceable when the corresponding interim compliance dates have passed. Compliance with the interim WQBELs will be determined in accordance with the options provided under the interim TMDL compliance determination requirements.

d. Specific Monitoring and Assessment Requirements: If there are specific monitoring and assessment requirements that cannot be met with the monitoring and assessment program

[45] 40 CFR 122.44(d)(1)(vii)(B)
[46] 40 CFR 122.44(k)(2) and 40 CFR 122.44(k)(3)
[47] November 12, 2010 Memorandum from the USEPA, Revisions to the November 22, 2002 Memorandum "Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLA""

requirements under Provision D of the Order, the additional requirements are included in this section.

The requirements of the TMDLs are based on and consistent with the assumptions and requirements of any available adopted and approved TMDLs that have been incorporated into the Basin Plan. Modifications to the requirements for the TMDLs in Attachment E cannot be made unless the TMDLs are modified in the Basin Plan.

A modification to any aspect of a TMDL in the Basin Plan requires a Basin Plan amendment. A Basin Plan amendment to modify a TMDL will require the San Diego Water Board to adopt a resolution to amend the Basin Plan, which includes a separate public process. When the San Diego Water Board adopts a Basin Plan amendment, it subsequently requires approval from the State Water Board, the Office of Administrative Law, and the USEPA before it becomes effective.

If and when the TMDLs are a modified in the Basin Plan, the San Diego Water Board will revise the requirements of the TMDL in accordance with the Basin Plan amendment. When a Basin Plan amendment to modify a TMDL becomes effective, the San Diego Water Board will modify the requirements of the TMDL pursuant to the requirements of Provision H.4 of the Order as soon as possible.

Walsh, Laurie@Waterboards

From: Walsh, Laurie@Waterboards
Sent: Friday, May 24, 2013 10:28 AM
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Subject: Adopted Order No. R9-2013-0001 NPDES Regional MS4 Permit
Attachments: 2013-0523 Transmittal Letter.pdf; 2013-0523 Order No. R9-2013-0001 COMPLETE.pdf

Regional Phase I MS4 Copermittees,

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) is pleased to transmit to you a copy of Order No. R9-2013-0001, NPDES No. CAS0109266, *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Order), as adopted by the San Diego Water Board May 8, 2013.

The Order has been transmitted to you as an electronic copy. An electronic copy of the Order is also available to download on the San Diego Water Board website at:
http://www.waterboards.ca.gov/rwqcb9/water_issues/programs/stormwater/index.shtml

Laurie Walsh, PE
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CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD
www.waterboards.ca.gov/sandiego/

CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

May 23, 2013

San Diego County Copermittees
Orange County Copermittees
Riverside County Copermittees

In reply refer to / attn:
Place ID: 786088Wchiu

Subject: Order No. R9-2013-0001, NPDES No. CAS0109266 National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) is pleased to transmit to you a copy of Order No. R9-2013-0001, NPDES No. CAS0109266, *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Order), as adopted by the San Diego Water Board May 8, 2013.

The Order has been transmitted to you as an electronic copy. An electronic copy of the Order is also available to download on the San Diego Water Board website at: http://www.waterboards.ca.gov/rwqcb9/water_issues/programs/stormwater/index.shtml

If a Copermittee or interested persons who would like to receive a hard copy of the Order, please contact Wayne Chiu at (858) 637-5558 or wchiu@waterboards.ca.gov or visit the San Diego Water Board's office at 9174 Sky Park Court, Suite 100, San Diego, California 92123-4340, weekdays between 8:00 a.m. and 5:00 p.m., telephone 858-467-2952.

Respectfully,

David W. Gibson
Executive Officer
San Diego Regional Water Quality Control Board

DWG:dtb esb:wc

cc:

Distribution via US Mail and email: (see attached address list)	San Diego County Copermittees Orange County Copermittees Riverside County Copermittees
Distribution list via email:	San Diego County MS4 Permit Lyris List Riverside County MS4 Permit Lyris List Orange County MS4 Permit Lyris List

Tech Staff Info & Use	
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WDID	n/a
NPDES No.	CAS0109266
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Person ID	n/a
Inspection ID	n/a

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CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

ORDER NO. R9-2013-0001
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The San Diego County Copermittees in Table 1a are subject to waste discharge requirements set forth in this Order.

Table 1a. San Diego County Copermittees

City of Carlsbad	City of Oceanside
City of Chula Vista	City of Poway
City of Coronado	City of San Diego
City of Del Mar	City of San Marcos
City of El Cajon	City of Santee
City of Encinitas	City of Solana Beach
City of Escondido	City of Vista
City of Imperial Beach	County of San Diego
City of La Mesa	San Diego County Regional Airport Authority
City of Lemon Grove	San Diego Unified Port District
City of National City	

After the San Diego Water Board receives and considers the Orange County Copermittees' Report of Waste Discharge and makes any necessary changes to this Order, the Orange County Copermittees in Table 1b will become subject to waste discharge requirements set forth in this Order after expiration of Order No. R9-2009-0002, NPDES No. CAS0108740 on or after December 16, 2014.

Table 1b. Orange County Copermittees

City of Aliso Viejo	City of Rancho Santa Margarita
City of Dana Point	City of San Clemente
City of Laguna Beach	City of San Juan Capistrano
City of Laguna Hills	City of Laguna Woods
City of Laguna Niguel	County of Orange
City of Lake Forest	Orange County Flood Control District
City of Mission Viejo	

After the San Diego Water Board receives and considers the Riverside County Copermittees' Report of Waste Discharge and makes any necessary changes to this Order, the Riverside County Copermittees in Table 1c will become subject to waste discharge requirements set forth in this Order after expiration of Order No. R9-2010-0016, NPDES No. CAS0108766 on or after November 10, 2015.

Table 1c. Riverside County Copermittees

City of Murrieta	County of Riverside
City of Temecula	Riverside County Flood Control and Water Conservation District
City of Wildomar	

The Orange County Copermittees and Riverside County Copermittees may become subject to the requirements of this Order at a date earlier than the expiration date of their current Orders subject to the conditions described in Provision F.6 of this Order if the Copermittees in the respective county receive a notification of coverage from the San Diego Water Board.

The term Copermittee in this Order refers to any San Diego County, Orange County, or Riverside County Copermittee covered under this Order, unless specified otherwise.

This Order provides permit coverage for the Copermittee discharges described in Table 2.

Table 2. Discharge Locations and Receiving Waters

Discharge Points	Locations throughout San Diego Region
Discharge Description	Municipal Separate Storm Sewer System (MS4) Discharges
Receiving Waters	Inland Surface Waters, Enclosed Bays and Estuaries, and Coastal Ocean Waters of the San Diego Region

Table 3. Administrative Information

This Order was adopted by the San Diego Water Board on:	**May 8, 2013**
This Order will become effective on:	**June 27, 2013**
This Order will expire on:	**June 27, 2018**
The Copermittees must file a Report of Waste Discharge in accordance with Title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than 180 days in advance of the Order expiration date.	

I, David W. Gibson, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on May 8, 2013.

David W. Gibson
Executive Officer

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I. FINDINGS

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), finds that:

JURISDICTION

1. **MS4 Ownership or Operation.** Each of the Copermittees owns or operates an MS4, through which it discharges storm water and non-storm water into waters of the U.S. within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the U.S.

2. **Legal and Regulatory Authority.** This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]) adopted by the United States Environmental Protection Agency (USEPA), and chapter 5.5, division 7 of the California Water Code (CWC) (commencing with section 13370). This Order serves as an NPDES permit for discharges from MS4s to surface waters. This Order also serves as waste discharge requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

   The San Diego Water Board has the legal authority to issue a regional MS4 permit pursuant to its authority under CWA section 402(p)(3)(B) and 40 CFR 122.26(a)(1)(v). The USEPA also made it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide permits (55 Federal Register [FR] 47990, 48039-48042). The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees and San Diego Water Board.

   The federal regulations make it clear that the Copermittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators (40 CFR 122.26(a)(3)(vi)). This Order does not require the Copermittees to manage storm water outside of their jurisdictional boundaries, but rather to work collectively to improve storm water management within watersheds.

3. **CWA NPDES Permit Conditions.** Pursuant to CWA section 402(p)(3)(B), NPDES permits for storm water discharges from MS4s must include requirements to effectively prohibit non-storm water discharges into MS4s, and require controls to reduce the discharge of pollutants in storm water to the maximum extent practicable (MEP), and to require other provisions as the San Diego Water Board determines are appropriate to control such pollutants. This Order prescribes conditions to assure compliance with the CWA requirements for owners and operators of MS4s to

effectively prohibit non-storm water discharges into the MS4s, and require controls to reduce the discharge of pollutants in storm water from the MS4s to the MEP.

4. **CWA and CWC Monitoring Requirements.** CWA section 308(a) and 40 CFR 122.41(h),(j)-(l) and 122.48 require that NPDES permits must specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s also specify additional monitoring and reporting requirements in 40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c). CWC section 13383 authorizes the San Diego Water Board to establish monitoring, inspection, entry, reporting and recordkeeping requirements. This Order establishes monitoring and reporting requirements to implement federal and State requirements.

5. **Total Maximum Daily Loads.** CWA section 303(d)(1)(A) requires that "[e]ach state shall identify those waters within its boundaries for which the effluent limitations…are not stringent enough to implement any water quality standard applicable to such waters." The CWA also requires states to establish a priority ranking of impaired water bodies known as Water Quality Limited Segments and to establish Total Maximum Daily Loads (TMDLs) for such waters. This priority list of impaired water bodies is called the Clean Water Act Section 303(d) List of Water Quality Limited Segments, commonly referred to as the 303(d) List. The CWA requires the 303(d) List to be updated every two years.

   TMDLs are numerical calculations of the maximum amount of a pollutant that a water body can assimilate and still meet water quality standards. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point sources (waste load allocations or WLAs) and non-point sources (load allocations or LAs), background contribution, plus a margin of safety. Discharges from MS4s are point source discharges. The federal regulations (40 CFR 122.44(d)(1)(vii)(B)) require that NPDES permits incorporate water quality based effluent limitations (WQBELs) developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, consistent with the assumptions and requirements of any available WLA for the discharge. Requirements of this Order implement the TMDLs adopted by the San Diego Water Board and approved by USEPA as of the time this Order is issued. This Order establishes WQBELs consistent with the assumptions and requirements of all available TMDL WLAs assigned to discharges from the Copermittees' MS4s.

6. **Non-Storm Water Discharges.** Pursuant to CWA section 402(p)(3)(B)(ii), this Order requires each Copermittee to effectively prohibit discharges of non-storm water into its MS4. Nevertheless, non-storm water discharges into and from the MS4s continue to be reported to the San Diego Water Board by the Copermittees and other persons. Monitoring conducted by the Copermittees, as well as the 303(d) List, have identified dry weather, non-storm water discharges from the MS4s as a source of pollutants causing or contributing to receiving water quality impairments in the San Diego Region. The federal regulations (40 CFR 122.26(d)(2)(iv)(B)(1)) require the Copermittees to have a program to prevent illicit discharges to the MS4.

The federal regulations, however, allow for specific categories of non-storm water discharges or flows to be addressed as illicit discharges only where such discharges are identified as sources of pollutants to waters of the U.S.

7. **In-Stream Treatment Systems.** Pursuant to federal regulations (40 CFR 131.10(a)), in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S. Authorizing the construction of a runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to accepting waste assimilation as an appropriate use for that water body. Runoff treatment must occur prior to the discharge of runoff into receiving waters. Treatment control best management practices (BMPs) must not be constructed in waters of the U.S. Construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body.

DISCHARGE CHARACTERISTICS AND RUNOFF MANAGEMENT

8. **Point Source Discharges of Pollutants.** Discharges from the MS4s contain waste, as defined in the CWC, and pollutants that adversely affect the quality of the waters of the state. A discharge from an MS4 is a “discharge of pollutants from a point source” into waters of the U.S. as defined in the CWA. Storm water and non-storm water discharges from the MS4s contain pollutants that cause or threaten to cause a violation of surface water quality standards, as outlined in the Water Quality Control Plan for the San Diego Basin (Basin Plan). Storm water and non-storm water discharges from the MS4s are subject to the conditions and requirements established in the Basin Plan for point source discharges.

9. **Potential Beneficial Use Impairment.** The discharge of pollutants and/or increased flows from MS4s may cause or threaten to cause the concentration of pollutants to exceed applicable receiving water quality objectives and impair or threaten to impair designated beneficial uses resulting in a condition of pollution, contamination, or nuisance.

10. **Pollutants Generated by Land Development.** Land development has created and continues to create new sources of non-storm water discharges and pollutants in storm water discharges as human population density increases. This brings higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash. Pollutants from these sources are dumped or washed off the surface by non-storm water or storm water flows into and from the MS4s. When development converts natural vegetated pervious ground cover to impervious surfaces such as paved highways, streets, rooftops, and parking lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving a developed area without BMPs that can maintain pre-development runoff conditions will contain greater pollutant loads and have significantly greater runoff volume, velocity, and peak flow rate than pre-development runoff conditions from the same area.

11. **Runoff Discharges to Receiving Waters.** The MS4s discharge runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within the eleven hydrologic units comprising the San Diego Region. Historic and current development makes use of natural drainage patterns and features as conveyances for runoff. Rivers, streams and creeks in developed areas used in this manner are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and receiving water. Numerous receiving water bodies and water body segments have been designated as impaired by the San Diego Water Board pursuant to CWA section 303(d).

12. **Pollutants in Runoff.** The most common pollutants in runoff discharged from the MS4s include total suspended solids, sediment, pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., cadmium, copper, lead, and zinc), petroleum products and polynuclear aromatic hydrocarbons, synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus), oxygen-demanding substances (e.g., decaying vegetation, animal waste), detergents, and trash. As operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not prohibit or otherwise control. These discharges may cause or contribute to a condition of pollution or a violation of water quality standards.

13. **Human Health and Aquatic Life Impairment.** Pollutants in runoff discharged from the MS4s can threaten and adversely affect human health and aquatic organisms. Adverse responses of organisms to chemicals or physical agents in runoff range from physiological responses such as impaired reproduction or growth anomalies to mortality. Increased volume, velocity, rate, and duration of storm water runoff greatly accelerate the erosion of downstream natural channels. This alters stream channels and habitats and can adversely affect aquatic and terrestrial organisms.

14. **Water Quality Effects.** The Copermittees' water quality monitoring data submitted to date documents persistent exceedances of Basin Plan water quality objectives for runoff-related pollutants at various watershed monitoring stations. Persistent toxicity has also been observed at several watershed monitoring stations. In addition, bioassessment data indicate that the majority of the monitored receiving waters have Poor to Very Poor Index of Biological Integrity (IBI) ratings. These findings indicate that runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in the San Diego Region. Non-storm water discharges from the MS4s have been shown to contribute significant levels of pollutants and flow in arid, developed Southern California watersheds, and contribute significantly to exceedances of applicable receiving water quality objectives.

15. **Non-Storm Water and Storm Water Discharges.** Non-storm water discharges from the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard of CWA section 402(p)(3)(B)(iii), which is explicitly for "Municipal … *Stormwater Discharges* (emphasis added)" from the MS4s. Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s must be effectively prohibited.

16. **Best Management Practices.** Waste and pollutants which are deposited and accumulate in MS4 drainage structures will be discharged from these structures to waters of the U.S. unless they are removed. These discharges may cause or contribute to, or threaten to cause or contribute to, a condition of pollution in receiving waters. For this reason, pollutants in storm water discharges from the MS4s can be and must be effectively reduced in runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Pollution prevention is the reduction or elimination of pollutant generation at its source and is the best "first line of defense". Source control BMPs (both structural and non-structural) minimize the contact between pollutants and runoff, therefore keeping pollutants onsite and out of receiving waters. Treatment control BMPs remove pollutants that have been mobilized by storm water or non-storm water flows.

17. **BMP Implementation.** Runoff needs to be addressed during the three major phases of development (planning, construction, and use) in order to reduce the discharge of storm water pollutants to the MEP, effectively prohibit non-storm water discharges, and protect receiving waters. Development which is not guided by water quality planning policies and principles can result in increased pollutant load discharges, flow rates, and flow durations which can negatively affect receiving water beneficial uses. Construction sites without adequate BMP implementation result in sediment runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. Existing development can generate substantial pollutant loads which are discharged in runoff to receiving waters. Retrofitting areas of existing development with storm water pollutant control and hydromodification management BMPs is necessary to address storm water discharges from existing development that may cause or contribute to a condition of pollution or a violation of water quality standards.

18. **Water Quality Improvements.** Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges to the MS4s and control pollutants in storm water discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the CWA.

19. **Long Term Planning and Implementation.** Federal regulations require municipal storm water permits to expire 5 years from adoption, after which the permit must be renewed and reissued. The San Diego Water Board recognizes that the degradation of water quality and impacts to beneficial uses of the waters in the San Diego Region occurred over several decades. The San Diego Water Board further recognizes that a decade or more may be necessary to realize demonstrable improvement to the quality of waters in the San Diego Region. This Order includes a long term planning and implementation approach that will require more than a single permit term to complete.

WATER QUALITY STANDARDS

20. **Basin Plan.** The San Diego Water Board adopted the Water Quality Control Plan for the San Diego Basin (Basin Plan) on September 8, 1994 that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for receiving waters addressed through the plan. The Basin Plan was subsequently approved by the State Water Resources Control Board (State Water Board) on December 13, 1994. Subsequent revisions to the Basin Plan have also been adopted by the San Diego Water Board and approved by the State Water Board. Requirements of this Order implement the Basin Plan.

    The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Process Supply (PROC), Industrial Service Supply (IND), Ground Water Recharge (GWR), Contact Water Recreation (REC1), Non-contact Water Recreation (REC2), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Freshwater Replenishment (FRSH), Hydropower Generation (POW), and Preservation of Biological Habitats of Special Significance (BIOL). The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region: Navigation (NAV), Commercial and Sport Fishing (COMM), Estuarine Habitat (EST), Marine Habitat (MAR), Aquaculture (AQUA), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN), and Shellfish Harvesting (SHELL).

21. **Ocean Plan.** The State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, and 2005. The State Water Board adopted the latest amendment on April 21, 2005 and it became effective on February 14, 2006. The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean. Requirements of this Order implement the Ocean Plan.

    The Ocean Plan identifies the following beneficial uses of ocean waters of the state to be protected: Industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture;

preservation and enhancement of designated Areas of Special Biological Significance; rare and endangered species; marine habitat; fish spawning and shellfish harvesting

22. **Sediment Quality Control Plan**. On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes: 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

23. **National Toxics Rule and California Toxics Rule.** USEPA adopted the National Toxics Rule (NTR) on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the NTR applied in California. On May 18, 2000, USEPA adopted the California Toxics Rule (CTR). The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants.

24. **Antidegradation Policy.** This Order is in conformance with the federal Antidegradation Policy described in 40 CFR 131.12, and State Water Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality Waters in California*. Federal regulations at 40 CFR 131.12 require that the State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. State Water Board Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies.

25. **Anti-Backsliding Requirements.** Section 402(o)(2) of the CWA and federal regulations at 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations may be relaxed. All effluent limitations in this Order are at least as stringent as effluent limitations in the previous permits.

CONSIDERATIONS UNDER FEDERAL AND STATE LAW

26. **Coastal Zone Act Reauthorization Amendments.** Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states with approved coastal zone management programs to address non-point source

pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point source pollution: agriculture, silviculture, urban, marinas, and hydromodification. This Order addresses the management measures required for the urban category, with the exception of septic systems. The runoff management programs developed pursuant to this Order fulfills the need for coastal cities to develop a runoff non-point source plan identified in the Non-Point Source Program Strategy and Implementation Plan. The San Diego Water Board addresses septic systems through the administration of other programs.

27. **Endangered Species Act.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 USC sections 1531 to 1544). This Order requires compliance with receiving water limits, and other requirements to protect the beneficial uses of waters of the State. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

28. **Report of Waste Discharge Process.** The waste discharge requirements set forth in this Order are based upon the Report of Waste Discharge submitted by the San Diego County Copermittees prior to the expiration of Order No. R9-2007-0001 (NPDES No. CAS0109266). The Orange County and Riverside County Copermittees are not immediately covered by the waste discharge requirements in this Order. The San Diego Water Board understands that each municipality is unique although the Counties share watersheds and/or geographical boundaries. The Order will continue to use the Report of Waste Discharge process prior to initially making Orange County or Riverside County Copermittees subject to the requirements of this Order.

    The federal regulations (40 CFR 122.21(d)(2)) and CWC section 13376 impose a duty on the Copermittees to reapply for continued coverage through submittal of a Report of Waste Discharge no later than 180 days prior to expiration of a currently effective permit. This requirement is set forth in the Orange County Copermittees' and Riverside County Copermittees' currently effective permits at Provisions K.2.b and K.2.c, respectively. The Orange County Permit, Order No. R9-2009-0002 (NPDES No. CAS0108740) expires on December 16, 2014 and the Riverside County MS4 Permit, Order No. R9-2010-0016 (NPDES No. CAS0108766) expires on November 10, 2015.

    Unless the Orange County or Riverside County Copermittees apply for and receive early coverage under this Order, the Orange County Copermittees' and the Riverside County Copermittees' respective permits will be superseded by this Order upon expiration of their respective permits, subject to any necessary revisions to the requirements of this Order made after the San Diego Water Board considers their respective Reports of Waste Discharge through the public process provided in 40 CFR Part 124.

29. **Integrated Report and Clean Water Act Section 303(d) List.** The San Diego Water Board and State Water Board submit an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. USEPA issued its *Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act* on July 29, 2005, which advocates the use of a five category approach for classifying the attainment status of water quality standards for water bodies in the Integrated Report. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 in the Integrated Report are placed on the 303(d) List.

    Water bodies with available data and/or information that indicate at least one beneficial use is not being supported or is threatened, but a TMDL is not required, are included in Category 4 in the Integrated Report. Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

    Implementation of the requirements of this Order may allow the San Diego Water Board to include surface waters impaired by discharges from the Copermittees' MS4s in Category 4 in the Integrated Report for consideration during the next 303(d) List submittal by the State to USEPA.

30. **Economic Considerations.** The California Supreme Court has ruled that although CWC section 13263 requires the State and Regional Water Boards (collectively Water Boards) to consider factors set forth in CWC section 13241 when issuing an NPDES permit, the Water Board may not consider the factors to justify imposing pollutant restrictions that are less stringent than the applicable federal regulations require. (*City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 618, 626-627.) However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

    As noted in the following finding, the San Diego Water Board finds that the requirements in this Order are not more stringent than the minimum federal requirements. Therefore, a CWC section 13241 analysis is not required for permit requirements that implement the effective prohibition on the discharge of non-storm water into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determined appropriate to control such pollutants, as those requirements are mandated by federal law. Notwithstanding the above, the San Diego Water Board has developed an economic analysis of the requirements in this Order. The economic analysis is provided in the Fact Sheet.

31. **Unfunded Mandates.** This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following:

    a. This Order implements federally mandated requirements under CWA section 402 (33 USC section 1342(p)(3)(B)).

    b. The local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental and new dischargers who are issued NPDES permits for storm water and non-storm water discharges.

    c. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order.

    d. The Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)) and in lieu of numeric restrictions on their MS4 discharges (i.e. effluent limitations).

    e. The local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under State law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

    f. The provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state develops a TMDL, federal law requires that permits must contain water quality based effluent limitations consistent with the assumptions and requirements of any applicable wasteload allocation (40 CFR 122.44(d)(1)(vii)(B)).

    See the Fact Sheet for further discussion of unfunded mandates.

32. **California Environmental Quality Act.** The issuance of waste discharge requirements and an NPDES permit for the discharge of runoff from MS4s to waters of the U.S. is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 et seq.) in accordance with CWC section 13389.

STATE WATER BOARD DECISIONS

33. **Compliance with Prohibitions and Limitations.** The receiving water limitation language specified in this Order is consistent with language recommended by the USEPA and established in State Water Board Order WQ 99-05, *Own Motion Review of the Petition of Environmental Health Coalition to Review Waste Discharge Requirements Order No. 96-03, NPDES Permit No. CAS0108740*, adopted by the

State Water Board on June 17, 1999. The receiving water limitation language in this Order requires storm water discharges from MS4s to not cause or contribute to a violation of water quality standards, which is to be achieved through an iterative approach requiring the implementation of improved and better-tailored BMPs over time. Implementation of the iterative approach to comply with receiving water limitations based on applicable water quality standards is necessary to ensure that storm water discharges from the MS4 will not ultimately cause or contribute to violations of water quality standards and will not create conditions of pollution, contamination, or nuisance.

34. **Special Conditions for Areas of Special Biological Significance.** On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving an exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges. State Water Board Resolution No. 2012-0012 requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject terms and conditions of State Water Board Resolution No. 2012-0012. The Special Protections contained in Attachment B to Resolution No. 2012-0012, applicable to these discharges, are hereby incorporated into this Order as if fully set forth herein.

ADMINISTRATIVE FINDINGS

35. **Executive Officer Delegation of Authority.** The San Diego Water Board by prior resolution has delegated all matters that may legally be delegated to its Executive Officer to act on its behalf pursuant to CWC section 13223. Therefore, the Executive Officer is authorized to act on the San Diego Water Board's behalf on any matter within this Order unless such delegation is unlawful under CWC section 13223 or this Order explicitly states otherwise.

36. **Standard Provisions.** Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR 122.42, are provided in Attachment B to this Order.

37. **Fact Sheet.** The Fact Sheet for this Order contains background information, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of this Order. The Fact Sheet is hereby incorporated into this Order and constitutes part of the Findings of this Order.

38. **Public Notice.** In accordance with State and federal laws and regulations, the San Diego Water Board notified the Copermittees, and interested agencies and persons of its intent to prescribe waste discharge requirements for the control of discharges into and from the MS4s to waters of the U.S. and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet.

39. **Public Hearing.** The San Diego Water Board held a public hearing on April 10 and 11, 2013, that was continued to May 8, 2013 and heard and considered all comments pertaining to the terms and conditions of this Order. Details of the public hearing are provided in the Fact Sheet.

40. **Effective Date.** This Order serves as an NPDES permit pursuant to CWA section 402 or amendments thereto, and becomes effective fifty (50) days after the date of its adoption, provided that the Regional Administrator, USEPA, Region IX, does not object to this Order.

41. **Review by the State Water Board.** Any person aggrieved by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with CWC section 13320 and California Code of Regulations, title 23, sections 2050, et seq. The State Water Board must receive the petition by 5:00 p.m., 30 days after the San Diego Water Board action, except that if the thirtieth day following the action falls on a Saturday, Sunday or State holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

THEREFORE, IT IS HEREBY ORDERED that the Copermittees, in order to meet the provisions contained in division 7 of the CWC (commencing with section 13000) and regulations adopted thereunder, and the provisions of the CWA and regulations adopted thereunder, must each comply with the requirements of this Order. This action in no way prevents the San Diego Water Board from taking enforcement action for past violations of the previous Order. If any part of this Order is subject to a temporary stay of enforcement, unless otherwise specified, the Copermittees must comply with the analogous portions of the previous Order, which will remain in effect for all purposes during the pendency of the stay.

II. PROVISIONS

A. PROHIBITIONS AND LIMITATIONS

The purpose of this provision is to describe the conditions under which storm water and non-storm water discharges into and from MS4s are prohibited or limited. The goal of the prohibitions and limitations is to protect the water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through the implementation of water quality improvement strategies and runoff management programs that effectively prohibit non-storm water discharges into the Copermittees' MS4s, and reduce pollutants in storm water discharges from the Copermittees' MS4s to the MEP.

1. Discharge Prohibitions

a. Discharges from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the state are prohibited.

b. Non-storm water discharges into MS4s are to be effectively prohibited, through the implementation of Provision E.2, unless such discharges are authorized by a separate NPDES permit.

c. Discharges from MS4s are subject to all waste discharge prohibitions in the Basin Plan, included in Attachment A to this Order.

d. Storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 applicable to these discharges, included in Attachment A to this Order. All other discharges from the Copermittees' MS4s to ASBS are prohibited.

2. Receiving Water Limitations

a. Discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters, including but not limited to all applicable provisions contained in:

(1) The San Diego Water Board's Basin Plan, including beneficial uses, water quality objectives, and implementation plans;

(2) State Water Board plans for water quality control including the following:

(a) Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries (Thermal Plan), and

(b) The Ocean Plan, including beneficial uses, water quality objectives, and implementation plans;

(3) State Water Board policies for water and sediment quality control including the following:

(a) Water Quality Control Policy for the Enclosed Bays and Estuaries of California,

(b) Sediment Quality Control Plan which includes the following narrative objectives for bays and estuaries:

(i) Pollutants in sediments shall not be present in quantities that, alone or in combination, are toxic to benthic communities, and

(ii) Pollutants shall not be present in sediments at levels that will bioaccumulate in aquatic life to levels that are harmful to human health,

(c) The Statement of Policy with Respect to Maintaining High Quality of Waters in California;[1]

(4) Priority pollutant criteria promulgated by the USEPA through the following:

(a) National Toxics Rule (NTR)[2] (promulgated on December 22, 1992 and amended on May 4, 1995), and

(b) California Toxics Rule (CTR).[3,4]

b. Discharges from MS4s composed of storm water runoff must not alter natural ocean water quality in an ASBS.

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[1] State Water Board Resolution No. 68-16
[2] 40 CFR 131.36
[3] 65 Federal Register 31682-31719 (May 18, 2000), adding Section 131.38 to 40 CFR
[4] If a water quality objective and a CTR criterion are in effect for the same priority pollutant, the more stringent of the two applies.

3. Effluent Limitations

a. Technology Based Effluent Limitations

Pollutants in storm water discharges from MS4s must be reduced to the MEP.[5]

b. Water Quality Based Effluent Limitations

Each Copermittee must comply with applicable WQBELs established for the TMDLs in Attachment E to this Order, pursuant to the applicable TMDL compliance schedules.

4. Compliance with Discharge Prohibitions and Receiving Water Limitations

Each Copermittee must achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order through timely implementation of control measures and other actions as specified in Provisions B and E of this Order, including any modifications. The Water Quality Improvement Plans required under Provision B must be designed and adapted to ultimately achieve compliance with Provisions A.1.a, A.1.c and A.2.a.

a. If exceedance(s) of water quality standards persist in receiving waters notwithstanding implementation of this Order, the Copermittees must comply with the following procedures:

(1) For exceedance(s) of a water quality standard in the process of being addressed by the Water Quality Improvement Plan, the Copermittee(s) must implement the Water Quality Improvement Plan as accepted by the San Diego Water Board, and update the Water Quality Improvement Plan, as necessary, pursuant to Provision F.2.c;

(2) Upon a determination by either the Copermittees or the San Diego Water Board that discharges from the MS4 are causing or contributing to a new exceedance of an applicable water quality standard not addressed by the Water Quality Improvement Plan, the Copermittees must submit the following updates to the Water Quality Improvement Plan pursuant to Provision F.2.c or as part of the Water Quality Improvement Plan Annual Report required under Provision F.3.b, unless the San Diego Water Board directs an earlier submittal:

(a) The water quality improvement strategies being implemented that are effective and will continue to be implemented,

[5] This does not apply to MS4 discharges which receive subsequent treatment to reduce pollutants in storm water discharges to the MEP prior to entering receiving waters (e.g., low flow diversions to the sanitary sewer). Runoff treatment must occur prior to the discharge of runoff into receiving waters per Finding 7.

(b) Water quality improvement strategies (i.e. BMPs, retrofitting projects, stream and/or habitat rehabilitation projects, adjustments to jurisdictional runoff management programs, etc.) that will be implemented to reduce or eliminate any pollutants or conditions that are causing or contributing to the exceedance of water quality standards,

(c) Updates to the schedule for implementation of the existing and additional water quality improvement strategies, and

(d) Updates to the monitoring and assessment program to track progress toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a of this Order;

(3) The San Diego Water Board may require the incorporation of additional modifications to the Water Quality Improvement Plan required under Provision B. The applicable Copermittees must submit any modifications to the update to the Water Quality Improvement Plan within 90 days of notification that additional modifications are required by the San Diego Water Board, or as otherwise directed;

(4) Within 90 days of the San Diego Water Board determination that the modifications to the Water Quality Improvement Plan required under Provision A.4.a.(3) meet the requirements of this Order, the applicable Copermittees must revise the jurisdictional runoff management program documents to incorporate the modified water quality improvement strategies that have been and will be implemented, the implementation schedule, and any additional monitoring required; and

(5) Each Copermittee must implement the updated Water Quality Improvement Plan.

b. The procedure set forth above to achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order do not have to be repeated for continuing or recurring exceedances of the same water quality standard(s) following implementation of scheduled actions unless directed to do otherwise by the San Diego Water Board.

c. Nothing in Provisions A.4.a and A.4.b prevents the San Diego Water Board from enforcing any provision of this Order while the applicable Copermittees prepare and implement the above update to the Water Quality Improvement Plan and jurisdictional runoff management programs.

B. WATER QUALITY IMPROVEMENT PLANS

The purpose of this provision is to develop Water Quality Improvement Plans that guide the Copermittees' jurisdictional runoff management programs towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plans is to further the Clean Water Act's objective to protect, preserve, enhance, and restore the water quality and designated beneficial uses of waters of the state. This goal will be accomplished through an adaptive planning and management process that identifies the highest priority water quality conditions within a watershed and implements strategies through the jurisdictional runoff management programs to achieve improvements in the quality of discharges from the MS4s and receiving waters.

1. Watershed Management Areas

The Copermittees must develop a Water Quality Improvement Plan for each of the Watershed Management Areas in Table B-1. A total of ten Water Quality Improvement Plans must be developed for the San Diego Region.

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
San Juan (901.00)	South Orange County	- Aliso Creek - San Juan Creek - San Mateo Creek - Pacific Ocean - Heisler Park ASBS	- City of Aliso Viejo[1] - City of Dana Point[1] - City of Laguna Beach[1] - City of Laguna Hills[1] - City of Laguna Niguel[1] - City of Laguna Woods[1] - City of Lake Forest[1] - City of Mission Viejo[1] - City of Rancho Santa Margarita[1] - City of San Clemente[1] - City of San Juan Capistrano[1] - County of Orange[1] - Orange County Flood Control District[1]
Santa Margarita (902.00)	Santa Margarita River	- Murrieta Creek - Temecula Creek - Santa Margarita River - Santa Margarita Lagoon - Pacific Ocean	- City of Murrieta[2] - City of Temecula[2] - City of Wildomar[2] - County of Riverside[2] - County of San Diego[3] - Riverside County Flood Control and Water Conservation District[2]
San Luis Rey (903.00)	San Luis Rey River	- San Luis Rey River - San Luis Rey Estuary - Pacific Ocean	- City of Oceanside - City of Vista - County of San Diego

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
Carlsbad (904.00)	Carlsbad	- Loma Alta Slough - Buena Vista Lagoon - Agua Hedionda Lagoon - Batiquitos Lagoon - San Elijo Lagoon - Pacific Ocean	- City of Carlsbad - City of Encinitas - City of Escondido - City of Oceanside - City of San Marcos - City of Solana Beach - City of Vista - County of San Diego
San Dieguito (905.00)	San Dieguito River	- San Dieguito River - San Dieguito Lagoon - Pacific Ocean	- City of Del Mar - City of Escondido - City of Poway - City of San Diego - City of Solana Beach - County of San Diego
Penasquitos (906.00)	Penasquitos	- Los Penasquitos Lagoon - Pacific Ocean	- City of Del Mar - City of Poway - City of San Diego - County of San Diego
	Mission Bay	- Mission Bay - Pacific Ocean - San Diego Marine Life Refuge ASBS	- City of San Diego
San Diego (907.00)	San Diego River	- San Diego River - Pacific Ocean	- City of El Cajon - City of La Mesa - City of San Diego - City of Santee - County of San Diego
Pueblo San Diego (908.00) Sweetwater (909.00) Otay (910.00)	San Diego Bay	- Sweetwater River - Otay River - San Diego Bay - Pacific Ocean	- City of Chula Vista - City of Coronado - City of Imperial Beach - City of La Mesa - City of Lemon Grove - City of National City - City of San Diego - County of San Diego - San Diego County Regional Airport Authority - San Diego Unified Port District
Tijuana (911.00)	Tijuana River	- Tijuana River - Tijuana Estuary - Pacific Ocean	- City of Imperial Beach - City of San Diego - County of San Diego

Notes:
1. The Orange County Copermittees will be covered under this Order after expiration of Order No. R9-2009-0002, or earlier if the Orange County Copermittees meet the conditions in Provision F.6.
2. The Riverside County Copermittees will be covered under this Order after expiration of Order No. R9-2010-0016, or earlier if the Riverside County Copermittees meet the conditions in Provision F.6.
3. The County of San Diego is not required to implement the requirements of Provision B for its jurisdiction within the Santa Margarita River Watershed Management Area until the Riverside County Copermittees have been notified of coverage under this Order. The County of San Diego is required to implement the requirements of Provisions D, F.3.b, and Attachment E until the Riverside County Copermittees have been notified of coverage under this Order.

2. Priority Water Quality Conditions

The Copermittees must identify the water quality priorities within each Watershed Management Area that will be addressed by the Water Quality Improvement Plan. Where appropriate, Watershed Management Areas may be separated into subwatersheds to focus water quality prioritization and jurisdictional runoff management program implementation efforts by receiving water.

a. Assessment of Receiving Water Conditions

The Copermittees must consider the following, at a minimum, to identify water quality priorities based on impacts of MS4 discharges on receiving water beneficial uses:

(1) Receiving waters listed as impaired on the CWA Section 303(d) List of Water Quality Limited Segments (303(d) List);

(2) TMDLs adopted and under development by the San Diego Water Board;

(3) Receiving waters recognized as sensitive or highly valued by the Copermittees, including estuaries designated under the National Estuary Program under CWA section 320, wetlands defined by the State or U.S. Fish and Wildlife Service's National Wetlands Inventory as wetlands, waters having the Preservation of Biological Habitats of Special Significance (BIOL) beneficial use designation, and receiving waters identified as ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(4) The receiving water limitations of Provision A.2;

(5) Known historical versus current physical, chemical, and biological water quality conditions;

(6) Available, relevant, and appropriately collected and analyzed physical, chemical, and biological receiving water monitoring data, including, but not limited to, data describing:

(a) Chemical constituents,

(b) Water quality parameters (i.e. pH, temperature, conductivity, etc.),

(c) Toxicity Identification Evaluations for both receiving water column and sediment,

(d) Trash impacts,

(e) Bioassessments, and

(f) Physical habitat;

(7) Available evidence of erosional impacts in receiving waters due to accelerated flows (i.e. hydromodification);

(8) Available evidence of adverse impacts to the chemical, physical, and biological integrity of receiving waters; and

(9) The potential improvements in the overall condition of the Watershed Management Area that can be achieved.

b. ASSESSMENT OF IMPACTS FROM MS4 DISCHARGES

The Copermittees must consider the following, at a minimum, to identify the potential impacts to receiving waters that may be caused or contributed to by discharges from the Copermittees' MS4s:

(1) The discharge prohibitions of Provision A.1 and effluent limitations of Provision A.3; and

(2) Available, relevant, and appropriately collected and analyzed storm water and non-storm water monitoring data from the Copermittees' MS4 outfalls;

(3) Locations of each Copermittee's MS4 outfalls that discharge to receiving waters;

(4) Locations of MS4 outfalls that are known to persistently discharge non-storm water to receiving waters likely causing or contributing to impacts on receiving water beneficial uses;

(5) Locations of MS4 outfalls that are known to discharge pollutants in storm water causing or contributing to impacts on receiving water beneficial uses; and

(6) The potential improvements in the quality of discharges from the MS4 that can be achieved.

c. IDENTIFICATION OF PRIORITY WATER QUALITY CONDITIONS

(1) The Copermittees must use the information gathered for Provisions B.2.a and B.2.b to develop a list of priority water quality conditions as pollutants, stressors and/or receiving water conditions that are the highest threat to receiving water quality or that most adversely affect the quality of receiving waters. The list must include the following information for each priority water quality condition:

(a) The beneficial use(s) associated with the priority water quality condition;

(b) The geographic extent of the priority water quality condition within the Watershed Management Area, if known;

(c) The temporal extent of the priority water quality condition (e.g., dry weather and/or wet weather);

(d) The Copermittees with MS4s discharges that may cause or contribute to the priority water quality condition; and

(e) An assessment of the adequacy of and data gaps in the monitoring data to characterize the conditions causing or contributing to the priority water quality condition, including a consideration of spatial and temporal variation.

(2) The Copermittees must identify the highest priority water quality conditions to be addressed by the Water Quality Improvement Plan, and provide a rationale for selecting a subset of the water quality conditions identified pursuant to Provision B.2.c.(1) as the highest priorities.

d. IDENTIFICATION OF MS4 SOURCES OF POLLUTANTS AND/OR STRESSORS

The Copermittees must identify and prioritize known and suspected sources of storm water and non-storm water pollutants and/or other stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c. The identification of known and suspected sources of pollutants and/or stressors that cause or contribute to the highest priority water quality conditions as identified for Provision B.2.c must consider the following:

(1) Pollutant generating facilities, areas, and/or activities within the Watershed Management Area, including:

(a) Each Copermittee's inventory of construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas,

(b) Publicly owned parks and/or recreational areas,

(c) Open space areas,

(d) All currently operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste, and

(e) Areas not within the Copermittees' jurisdictions (e.g., Phase II MS4s, tribal lands, state lands, federal lands) that are known or suspected to be discharging to the Copermittees' MS4s;

(2) Locations of the Copermittees' MS4s, including the following:

(a) All MS4 outfalls that discharge to receiving waters, and

(b) Locations of major structural controls for storm water and non-storm water (e.g., retention basins, detention basins, major infiltration devices, etc.);

(3) Other known and suspected sources of non-storm water or pollutants in storm water discharges to receiving waters within the Watershed Management Area, including the following:

(a) Other MS4 outfalls (e.g., Phase II Municipal and Caltrans),

(b) Other NPDES permitted discharges,

(c) Any other discharges that may be considered point sources (e.g., private outfalls), and

(d) Any other discharges that may be considered non-point sources (e.g., agriculture, wildlife or other natural sources);

(4) Review of available data, including but not limited to:

(a) Findings from the Copermittees' illicit discharge detection and elimination programs,

(b) Findings from the Copermittees' MS4 outfall discharge monitoring,

(c) Findings from the Copermittees' receiving water monitoring,

(d) Findings from the Copermittees' MS4 outfall discharge and receiving water assessments, and

(e) Other available, relevant, and appropriately collected data, information, or studies related to pollutant sources and/or stressors that contribute to the highest priority water quality conditions as identified for Provision B.2.c.

(5) The adequacy of the available data to identify and prioritize sources and/or stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c.

e. IDENTIFICATION OF POTENTIAL WATER QUALITY IMPROVEMENT STRATEGIES

The Copermittees must evaluate the findings identified under Provisions B.2.a-d, and identify potential strategies that can result in improvements to water quality

in MS4 discharges and/or receiving waters within the Watershed Management Area. Potential water quality improvement strategies that may be implemented within the Watershed Management Area must include the following:

(1) Structural BMPs, non-structural BMPs, incentives, or programs that can potentially be implemented to address the highest priority water quality conditions identified under Provision B.2.c, or MS4 sources of pollutants or stressors identified under Provision B.2.d,

(2) Retrofitting projects in areas of existing development within the Watershed Management Area that can potentially be implemented to reduce MS4 sources of pollutants or stressors identified under Provision B.2.d causing or contributing to the highest priority water quality conditions identified under Provision B.2.c, and

(3) Stream, channel, and/or habitat rehabilitation projects within the Watershed Management Area that can potentially be implemented to protect and/or improve conditions in receiving waters from MS4 pollutants and/or stressors identified under Provision B.2.d causing or contributing to the highest priority water quality conditions identified under Provision B.2.c.

3. Water Quality Improvement Goals, Strategies and Schedules

The Copermittees must identify and develop specific water quality improvement goals and strategies to address the highest priority water quality conditions identified within a Watershed Management Area. The water quality improvement goals and strategies must address the highest priority water quality conditions by effectively prohibiting non-storm water discharges to the MS4, reducing pollutants in storm water discharges from the MS4 to the MEP, and protecting the water quality standards of receiving waters.

a. WATER QUALITY IMPROVEMENT GOALS AND SCHEDULES

(1) Numeric Goals

The Copermittees must develop and incorporate numeric goals[6] into the Water Quality Improvement Plan. Numeric goals must be used to support Water Quality Improvement Plan implementation and measure reasonable progress towards addressing the highest priority water quality conditions identified under Provision B.2.c. The Copermittees must establish and

[6] Interim and final numeric goals may take a variety of forms such as TMDL established WQBELs, action levels, pollutant concentration, load reductions, number of impaired water bodies delisted from the List of Water Quality Impaired Segments, Index of Biotic Integrity (IBI) scores, or other appropriate metrics. Interim and final numeric goals are not necessarily limited to one criterion or indicator, but may include multiple criteria and/or indicators. Except for TMDL established WQBELs, interim and final numeric goals and corresponding schedules may be revised through the adaptive management process under Provision B.5.

incorporate the following numeric goals in the Water Quality Improvement Plan:

(a) Final numeric goals must be based on measureable criteria or indicators capable of demonstrating one or more of the following:

(i) Discharges from the Copermittees' MS4s will not cause or contribute to exceedances of water quality standards in receiving waters, AND/OR

(ii) The conditions of receiving waters and associated habitat are protected from MS4 discharges, AND/OR

(iii) Beneficial uses of receiving waters are protected from MS4 discharges and will be supported.

(b) Interim numeric goals must be based on measureable criteria or indicators capable of demonstrating reasonable incremental progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges as follows:

(i) One or more interim numeric goals may be established to demonstrate progress toward achieving each final numeric goal,

(ii) For each final numeric goal, at least one interim numeric goal must be expressed as a reasonable increment toward achievement of the final numeric goal,

(iii) For each final numeric goal, reasonable interim numeric goals must be established to be accomplished during each 5 year period between the acceptance of the Water Quality Improvement Plan and the achievement of the final numeric goals.

(2) Schedules for Achieving Numeric Goals

The Copermittees must develop and incorporate schedules for achieving the numeric goals into the Water Quality Improvement Plan. The schedules must demonstrate reasonable progress toward achieving the final numeric goals required for Provision B.3.a.(1). The Copermittees must incorporate the schedules for achieving the numeric goals into the Water Quality Improvement Plan based on the following considerations:

(a) Final dates for achieving all final numeric goals must be established considering the following:

(i) Final compliance dates for any applicable TMDLs in Attachment E to this Order;

(ii) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(iii) Achievement of the final numeric goals for the highest water quality priorities must be as soon as possible;

(iv) Final dates for achieving the final numeric goals must reflect a realistic assessment of the shortest practicable time required based on the temporal and spatial extent and factors associated with the highest priority water quality conditions identified under Provision B.2.c, and taking into account the time reasonably required to implement the water quality improvement strategies required pursuant to Provision B.3.b.

(b) Interim dates for achieving all interim numeric goals must be established considering the following:

(i) Interim compliance dates for any applicable TMDLs in Attachment E to this Order;

(ii) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(iii) Interim dates for achieving the interim numeric goals must reflect a realistic assessment of the shortest practicable time reasonably required, taking into account the time needed to implement new or significantly expanded programs and securing financing, if necessary; and

(iv) For each final numeric goal, at least one interim numeric goal must be established that the Copermittees will work toward achieving within the term of this Order.

b. WATER QUALITY IMPROVEMENT STRATEGIES AND SCHEDULES

Based on the likely effectiveness and efficiency of the potential water quality improvement strategies identified under Provision B.2.e to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a, the Copermittees must identify the strategies that will be implemented in each Watershed Management Area as follows:

(1) Jurisdictional Strategies

(a) Each Copermittee in the Watershed Management Area must identify the strategies that will be implemented within its jurisdiction as part of its jurisdictional runoff management program requirements under Provisions E.2 through E.7, including descriptions of the following:

(i) For each of the inventories developed for its jurisdiction, as required under Provisions D.2.a.(1), E.3.e.(2), E.4.b, and E.5.a, each Copermittee must identify the known and suspected areas or sources causing or contributing to the highest priority water quality conditions in the Watershed Management Area that the Copermittee will focus on in its efforts to effectively prohibit non-storm water discharges to its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, and achieve the interim and final numeric goals identified under Provision B.3.a;

(ii) BMPs that each Copermittee will implement, or require to be implemented, as applicable, for those areas or sources within its jurisdiction;

(iii) Education programs that each Copermittee will implement, as applicable, for those areas or sources within its jurisdiction;

(iv) Frequencies that each Copermittee will conduct inspections on those areas or sources within its jurisdiction;

(v) Incentive and enforcement programs that each Copermittee will implement, as applicable, for those areas or sources within its jurisdiction; and

(vi) Any other BMPs, incentives, or programs that each Copermittee will implement for those areas or sources within its jurisdiction.

(b) Identify the optional jurisdictional strategies that each Copermittee will implement within its jurisdiction, as necessary, to effectively prohibit non-storm water discharges to its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. Descriptions of the optional jurisdictional strategies must include:

(i) BMPs, incentives, or programs that may be implemented by the Copermittee within its jurisdiction in addition to the requirements of Provisions B.3.b.(1)(a);

(ii) Incentives or programs that may be implemented by the Copermittee to encourage or implement projects to retrofit areas of existing development within its jurisdiction;

(iii) Incentives or programs that may be implemented by the Copermittee to encourage or implement projects that will rehabilitate the conditions of channels or habitats within its jurisdiction;

(iv) The funds and/or resources that must be secured by the Copermittee to implement the optional strategies described for Provisions B.3.b.(1)(b)(i)-(iii) within its jurisdiction; and

(v) The circumstances necessary to trigger implementation of the optional jurisdictional strategies, in addition to the requirements of Provision B.3.b.(1)(a), to achieve the interim and final numeric goals within the schedules established under Provision B.3.a.

(c) Identify the strategies that will be implemented by the Copermittee in coordination with or with the cooperation of other agencies (e.g. Caltrans, water districts, school districts) and/or entities (e.g. non-governmental organizations) within its jurisdiction.

(2) Watershed Management Area Strategies

The Copermittees must identify the optional regional or multi-jurisdictional strategies that will be implemented in the Watershed Management Area, as necessary, to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. Descriptions of the optional regional or multi-jurisdictional strategies must include:

(a) Regional or multi-jurisdictional BMPs, incentives, or programs that may be implemented by the Copermittees in the Watershed Management Area;

(b) Incentives or programs that may be implemented by the Copermittees in the Watershed Management Area to encourage or implement regional or multi-jurisdictional projects to retrofit areas of existing development;

(c) Incentives or programs that may be implemented by the Copermittees to encourage or implement regional or multi-jurisdictional projects that will rehabilitate the conditions of channels, streams, or habitats within the Watershed Management Area;

(d) The funds and/or resources that must be secured by the Copermittees to implement the optional strategies described for Provisions B.3.b.(2)(a)-(c) within the Watershed Management Area; and

(e) The circumstances necessary to trigger implementation of the optional regional or multi-jurisdictional strategies to achieve the interim and final numeric goals within the schedules established under Provision B.3.a.

(3) Schedules for Implementing Strategies

The Copermittees must develop reasonable schedules for implementing the water quality improvement strategies identified under Provisions B.3.b.(1) and B.3.b.(2) to achieve the interim and final numeric goals identified and

schedules established under Provision B.3.a. The Copermittees must incorporate the schedules to implement the water quality improvement strategies into the Water Quality Improvement Plan as follows:

(a) Each Copermittee must develop schedules for the jurisdictional strategies identified pursuant to Provisions B.3.b.(1)(a)-(b). Each schedule must specify:

(i) If each jurisdictional strategy identified pursuant to Provision B.3.b.(1)(a) will or will not be initiated upon acceptance of the Water Quality Improvement Plan;

(ii) For each jurisdictional strategy identified pursuant to Provision B.3.b.(1)(a) that will not be initiated upon approval of the Water Quality Improvement Plan, the shortest practicable time in which each jurisdictional strategy will be initiated after acceptance of the Water Quality Improvement Plan;

(iii) For each optional jurisdictional strategy identified pursuant to Provision B.3.b.(1)(b), a realistic assessment of the shortest practicable time required to:

[a] Secure the resources needed to fund the optional jurisdictional strategy, and
[b] Procure the resources, materials, labor, and applicable permits necessary to initiate implementation of the optional jurisdictional strategy;

(iv) If each jurisdictional strategy identified pursuant to Provisions B.3.b.(1)(a)-(b) is expected to be continuously implemented (e.g. inspections) or completed within a schedule (e.g. construction of structural BMP); and

(v) If a jurisdictional strategy identified pursuant to Provisions B.3.b.(1)(a)-(b) is expected to be completed within a schedule, the anticipated time to complete based on a realistic assessment of the shortest practicable time required.

(b) The Copermittees in the Watershed Management Area must develop schedules for the regional or multi-jurisdictional strategies identified pursuant to Provision B.3.b.(2). Each schedule must specify:

(i) A realistic assessment of the shortest practicable time to:

[a] Secure the resources needed to fund the optional regional or multi-jurisdictional strategy, and
[b] Procure the resources, materials, labor, and permits necessary to initiate the implementation of the optional regional or multi-jurisdictional strategy;

(ii) If each regional or multi-jurisdictional strategy identified pursuant to Provision B.3.b.(2) is expected to be continuously implemented (e.g. inspections) or completed within a schedule (e.g. construction of structural BMP); and

(iii) If a regional or multi-jurisdictional strategy and/or activity identified pursuant to Provisions B.3.b.(2) is expected to be completed within a schedule, the anticipated time to complete based on a realistic assessment of the shortest practicable time required.

(4) Optional Watershed Management Area Analysis

(a) For each Watershed Management Area, the Copermittees have the option to perform a Watershed Management Area Analysis for the purpose of developing watershed-specific requirements for structural BMP implementation, as described in Provision E.3.c.(3). The Watershed Management Area Analysis must include GIS layers (maps) as output. The analysis must include the following information, to the extent it is available, in order to characterize the Watershed Management Areas:

(i) A description of dominant hydrologic processes, such as areas where infiltration or overland flow likely dominates;

(ii) A description of existing streams in the watershed, including bed material and composition, and if they are perennial or ephemeral;

(iii) Current and anticipated future land uses;

(iv) Potential coarse sediment yield areas; and

(v) Locations of existing flood control structures and channel structures, such as stream armoring, constrictions, grade control structures, and hydromodification or flood management basins.

(b) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify and compile a list of candidate projects that could potentially be used as alternative compliance options for Priority Development Projects, to be implemented in lieu of onsite structural BMP performance requirements described in Provisions E.3.c.(1) and E.3.c.(2). Specifically, the Copermittees must identify opportunities to be included in the list of candidate projects in each Watershed Management Area, such as:

(i) Stream or riparian area rehabilitation;

(ii) Retrofitting existing infrastructure to incorporate storm water retention or treatment;

(iii) Regional BMPs;

(iv) Groundwater recharge projects;

(v) Water supply augmentation projects; and

(vi) Land purchases to preserve floodplain functions.

(c) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify areas within the Watershed Management Area where it is appropriate to allow Priority Development Projects to be exempt from the hydromodification management BMP performance requirements described in Provision E.3.c.(2), including supporting rationale.

4. Water Quality Improvement Monitoring and Assessment Program

a. The Copermittees in each Watershed Management Area must develop and incorporate an integrated monitoring and assessment program into the Water Quality Improvement Plan that assesses: 1) the progress toward achieving the numeric goals and schedules, 2) the progress toward addressing the highest priority water quality conditions for each Watershed Management Area, and 3) each Copermittee's overall efforts to implement the Water Quality Improvement Plan.

b. The monitoring and assessment program must incorporate the monitoring and assessment requirements of Provision D, which may allow the Copermittees to modify the program to be consistent with and focus on the highest priority water quality conditions for each Watershed Management Area.

c. For Watershed Management Areas with applicable TMDLs, the monitoring and assessment program must incorporate the specific monitoring and assessment requirements of Attachment E.

d. For Watershed Management Areas with any ASBS, the water quality monitoring and assessment program must incorporate the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

5. Iterative Approach and Adaptive Management Process

The Copermittees in each Watershed Management Area must implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a, and must include the following:

a. RE-EVALUATION OF PRIORITY WATER QUALITY CONDITIONS

The priority water quality conditions and potential water quality improvement strategies included in the Water Quality Improvement Plan pursuant to Provisions B.2.c and B.2.e may be re-evaluated by the Copermittees as needed during the term of this Order as part of the Water Quality Improvement Plan Annual Report. Re-evaluation and recommendations for modifications to the priority water quality conditions and potential water quality improvement strategies must be provided in the Report of Waste Discharge, and must consider the following:

(1) Achieving the outcome of improved water quality in MS4 discharges and receiving waters through implementation of the water quality improvement strategies identified in the Water Quality Improvement Plan;

(2) New information developed when the requirements of Provisions B.2.a-c have been re-evaluated;

(3) Spatial and temporal accuracy of monitoring data collected to inform prioritization of water quality conditions and implementation strategies to address the highest priority water quality conditions;

(4) Availability of new information and data from sources other than the jurisdictional runoff management programs within the Watershed Management Area that informs the effectiveness of the actions implemented by the Copermittees;

(5) San Diego Water Board recommendations; and

(6) Recommendations for modifications solicited through a public participation process.

b. ADAPTATION OF GOALS, STRATEGIES AND SCHEDULES

The water quality improvement goals, strategies and schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.3, must be re-evaluated and adapted as new information becomes available to result in more effective and efficient measures to address the highest priority water quality conditions identified pursuant to Provision B.2.c. Re-evaluation of and modifications to the water quality improvement goals, strategies and schedules must be provided in the Water Quality Improvement Plan Annual Report, and must consider the following:

(1) Modifications to the priority water quality conditions based on Provision B.5.a;

(2) Progress toward achieving interim and final numeric goals in receiving waters and MS4 discharges for the highest priority water quality conditions in the Watershed Management Area,

(3) Progress toward achieving outcomes according to established schedules;

(4) New policies or regulations that may affect identified numeric goals;

(5) Measurable or demonstrable reductions of non-storm water discharges to and from each Copermittee's MS4;

(6) Measurable or demonstrable reductions of pollutants in storm water discharges from each Copermittee's MS4 to the MEP;

(7) New information developed when the requirements of Provisions B.2.b and B.2.d have been re-evaluated;

(8) Efficiency in implementing the Water Quality Improvement Plan;

(9) San Diego Water Board recommendations; and

(10) Recommendations for modifications solicited through a public participation process.

c. ADAPTATION OF MONITORING AND ASSESSMENT PROGRAM

The water quality improvement monitoring and assessment program, included in the Water Quality Improvement Plan pursuant to Provision B.4, must be re-evaluated and adapted when new information becomes available. Re-evaluation and recommendations for modifications to the monitoring and assessment program, pursuant to the requirements of Provision D, may be provided in the Water Quality Improvement Plan Annual Report, but must be provided in the Report of Waste Discharge.

6. Water Quality Improvement Plan Submittal, Updates, and Implementation

a. The Copermittees must submit and commence implementation of the Water Quality Improvement Plans in accordance with the requirements of Provision F.1.

b. The Copermittees must submit proposed updates to the Water Quality Improvement Plan for acceptance by the San Diego Water Board Executive Officer in accordance with the requirements of Provision F.2.c.

C. ACTION LEVELS

The purpose of this provision is for the Copermittees to incorporate numeric action levels in the Water Quality Improvement Plans. The goal of the action levels is to guide Water Quality Improvement Plan implementation efforts and measure progress towards the protection of water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through monitoring and assessing the quality of the MS4 discharges during the implementation of the Water Quality Improvement Plans.

1. Non-Storm Water Action Levels[7]

The Copermittees must develop and incorporate numeric non-storm water action levels (NALs) into the Water Quality Improvement Plan to: 1) support the development and prioritization of water quality improvement strategies for effectively prohibiting non-storm water discharges to the MS4s, 2) assess the effectiveness of the water quality improvement strategies toward addressing MS4 non-storm water discharges, required pursuant to Provision D.4.b.(1), and 3) support the detection and elimination of non-storm water and illicit discharges to the MS4, required pursuant to Provision E.2.[8]

a. The following NALs must be incorporated:

(1) Non-Storm Water Discharges from MS4s to Ocean Surf Zone

Table C-1. Non-Storm Water Action Levels for Discharges from MS4s to Ocean Surf Zone

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Total Coliform	MPN/100 ml	1,000	-	10,000/1,000[1]	OP
Fecal Coliform	MPN/100 ml	200[2]	-	400	OP
Enterococci	MPN/100 ml	35	-	104[3]	OP

Abbreviations/Acronyms
AMAL – average monthly action level
MDAL – maximum daily action level
OP – Ocean Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Total coliform density NAL is 1,000 MPN/100 ml when the fecal/total coliform ratio exceeds 0.1.
2. Fecal coliform density NAL is 200 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas."

[7] NALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, unless the NAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed.
[8] The Copermittees may utilize NALs or other benchmarks currently established by the Copermittees as interim NALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

(2) Non-Storm Water Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Table C-2. Non-Storm Water Action Levels for Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Turbidity	NTU	75	-	225	OP
pH	Units	Within limit of 6.0 to 9.0 at all times			OP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	35	-	104[3]	BP
Priority Pollutants	µg/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
OP – Ocean Plan water quality objective
NTU – Nephelometric Turbidity Units
µg/L – micrograms per liter
MDAL – maximum daily action level
BP – Basin Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas" and is not applicable to water bodies that are not designated with the water contact recreation (REC-1) beneficial use.

Table C-3. Non-Storm Water Action Levels for Priority Pollutants

Parameter	Units	Freshwater (CTR)		Saltwater (CTR)	
		MDAL	AMAL	MDAL	AMAL
Cadmium	µg/L	**	**	16	8
Copper	µg/L	*	*	5.8	2.9
Chromium III	µg/L	**	**	-	-
Chromium VI	µg/L	16	8.1	83	41
Lead	µg/L	*	*	14	2.9
Nickel	µg/L	**	**	14	6.8
Silver	µg/L	*	*	2.2	1.1
Zinc	µg/L	*	*	95	47

Abbreviations/Acronyms:
CTR – California Toxic Rule
AMAL – average monthly action level
µg/L – micrograms per liter
MDAL – maximum daily action level

Notes:
* Action levels developed on a case-by-case basis (see below)
** Action levels developed on a case-by-case basis (see below), but calculated criteria are not to exceed Maximum Contaminant Levels (MCLs) under the California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64431

The Cadmium, Copper, Chromium (III), Lead, Nickel, Silver and Zinc NALs for MS4 discharges to freshwater receiving waters will be developed on a case-by-case basis based on site-specific water quality data (receiving water hardness). For these priority pollutants, refer to 40 CFR 131.38(b)(2).

(3) Non-Storm Water Discharges from MS4s to Inland Surface Waters

Table C-4. Non-Storm Water Action Levels for Discharges from MS4s to Inland Surface Waters

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Dissolved Oxygen	mg/L	Not less than 5.0 in WARM waters and not less than 6.0 in COLD waters			BP
Turbidity	NTU	-	20	See MDAL	BP
pH	Units	Within limit of 6.5 to 8.5 at all times			BP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	33	-	61[3]	BP
Total Nitrogen	mg/L	-	1.0	See MDAL	BP
Total Phosphorus	mg/L	-	0.1	See MDAL	BP
MBAS	mg/L	-	0.5	See MDAL	BP
Iron	mg/L	-	0.3	See MDAL	BP
Manganese	mg/L	-	0.05	See MDAL	BP
Priority Pollutants	µg/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
BP – Basin Plan water quality objective
COLD – cold freshwater habitat beneficial use
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
MDAL – maximum daily action level
WARM – warm freshwater habitat beneficial use
MBAS – Methylene Blue Active Substances
MPN/100 ml – most probable number per 100 milliliters
µg/L – micrograms per liter

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for freshwater "designated beach areas" and is not applicable to water bodies that are not designated with the water contact recreation (REC-1) beneficial use.

b. If not identified in Provision C.1.a, NALs must be identified, developed and incorporated in the Water Quality Improvement Plan for any pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in receiving waters associated with the highest priority water quality conditions related to non-storm water discharges from the MS4s. NALs must be based on:

(1) Applicable water quality standards which may be dependent upon site-specific or receiving water-specific conditions or assumptions to be identified by the Copermittees; or

(2) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the NALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary NALs specific to the Watershed Management Area at levels greater than the NALs required by Provisions C.1.a and C.1.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for effectively prohibiting non-storm water discharges to the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and from the MS4. The

secondary NALs may be developed using an approach acceptable to the San Diego Water Board.

d. Dry weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.b may be utilized to develop or revise NALs based on watershed-specific data, subject to San Diego Water Board Executive Officer approval.

2. Storm Water Action Levels[9]

The Copermittees must develop and incorporate numeric storm water action levels (SALs) in the Water Quality Improvement Plans to: 1) support the development and prioritization of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s, and 2) assess the effectiveness of the water quality improvement strategies toward reducing pollutants in storm water discharges, required pursuant to Provision D.4.b.(2).[10]

a. The following SALs for discharges of storm water from the MS4 must be incorporated:

Table C-5. Storm Water Action Levels for Discharges from MS4s to Receiving Waters

Parameter	Units	Action Level
Turbidity	NTU	126
Nitrate & Nitrite (Total)	mg/L	2.6
Phosphorus (Total P)	mg/L	1.46
Cadmium (Total Cd)*	µg/L	3.0
Copper (Total Cu)*	µg/L	127
Lead (Total Pb)*	µg/L	250
Zinc (Total Zn)*	µg/L	976

Abbreviations/Acronyms:
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
µg/L – micrograms per liter

Notes:
* The sampling must include a measure of receiving water hardness at each MS4 outfall. If a total metal concentration exceeds the corresponding metals SAL in Table C-5, that concentration must be compared to the California Toxics Rule criteria and the USEPA 1-hour maximum concentration for the detected level of receiving water hardness associated with that sample. If it is determined that the sample's total metal concentration for that specific metal exceeds that SAL, but does not exceed the applicable USEPA 1-hour maximum concentration criterion for the measured level of hardness, then the sample result will not be considered above the SAL for that measurement.

[9] SALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, unless the SAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed.
[10] The Copermittees may utilize SALs or other benchmarks currently established by the Copermittees as interim SALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

b. If not identified in Provision C.2.a, SALs must be identified, developed and incorporated in the Water Quality Improvement Plan for pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in receiving waters associated with the highest priority water quality conditions related to storm water discharges from the MS4s. SALs must be based on:

(1) Federal and State water quality guidance and/or water quality standards; and

(2) Site-specific or receiving water-specific conditions; or

(3) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the SALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary SALs specific to the Watershed Management Area at levels greater than the SALs required by Provisions C.2.a and C.2.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s. The secondary SALs may be developed based on the approaches recommended by the State Water Board's Storm Water Panel[11] or using an approach acceptable to the San Diego Water Board.

d. Wet weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.c may be used to develop or revise SALs based upon watershed-specific data, subject to San Diego Water Board Executive Officer approval.

[11] Storm Water Panel Recommendations to the California State Water Resources Control Board: The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities (June 2006)

D. MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS

The purpose of this provision is for the Copermittees to monitor and assess the impact on the conditions of receiving waters caused by discharges from the Copermittees' MS4s under wet weather and dry weather conditions. The goal of the monitoring and assessment program is to inform the Copermittees about the nexus between the health of receiving waters and the water quality condition of the discharges from their MS4s. This goal will be accomplished through monitoring and assessing the conditions of the receiving waters, discharges from the MS4s, pollutant sources and/or stressors, and effectiveness of the water quality improvement strategies implemented as part of the Water Quality Improvement Plans.

1. Receiving Water Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the condition of the receiving waters in each Watershed Management Area during dry weather and wet weather. Following San Diego Water Board acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct long-term receiving water monitoring during implementation of the Water Quality Improvement Plan to assess the long term trends and determine if conditions in receiving waters are improving. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following receiving water monitoring procedures:

a. TRANSITIONAL RECEIVING WATER MONITORING

Until the monitoring requirements and schedules of Provisions D.1.b-e are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following receiving water monitoring in the Watershed Management Area:

(1) Continue the receiving water monitoring programs required in Order Nos. R9-2007-0001 (Monitoring and Reporting Program No. R9-2007-0001 Sections II.A.1-A.5), R9-2009-0002, and R9-2010-0016;

(2) Continue the monitoring in the Hydromodification Management Plans approved by the San Diego Water Board;

(3) Participate in the following regional receiving water monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring,

(b) Southern California Bight Regional Monitoring, and

(c) Sediment Quality Monitoring;

(4) Implement the monitoring programs developed as part of any implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) for the TMDLs in Attachment E to this Order; and

(5) For Watershed Management Areas with ASBS, implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

b. LONG-TERM RECEIVING WATER MONITORING STATIONS

The Copermittees must select at least one long-term receiving water monitoring station from among the existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees to be representative of the receiving water quality in the Watershed Management Area. Additional long-term receiving water monitoring stations must be selected where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

c. DRY WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three dry weather monitoring events at each of the long-term receiving water monitoring stations. At least one monitoring event must be conducted during the dry season (May 1 – September 30) and at least one monitoring event must be conducted during a dry weather period during the wet season (October 1 – April 30), after the first wet weather event of the season, with an antecedent dry period of at least 72 hours following a storm event producing measureable rainfall of greater than 0.1 inch.

(1) Dry Weather Receiving Water Field Observations

For each dry weather monitoring event, the Copermittees must record field observations consistent with Table D-1 at each long-term receiving water monitoring station.

Table D-1. Field Observations for Receiving Water Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) • Station description (i.e. deposits or stains, vegetation condition, structural condition, and observable biology) • Presence and assessment of trash in and around station

(2) Dry Weather Receiving Water Field Monitoring

For each dry weather monitoring event, if conditions allow the collection of the data, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

Table D-2. Field Monitoring Parameters for Receiving Water Monitoring Stations

Parameters
• pH • Temperature • Specific conductivity • Dissolved oxygen • Turbidity

(3) Dry Weather Receiving Water Analytical Monitoring

For each dry weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable NAL constituents, and

(v) Constituents listed in Table D-3.

Table D-3. Analytical Monitoring Constituents for Receiving Water Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Pesticides	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Mercury • Nickel • Selenium • Thallium • Zinc	• Organophosphate Pesticides • Pyrethroid Pesticides	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(4) Dry Weather Receiving Water Toxicity Monitoring

For each dry weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for aquatic toxicity in accordance with Table D-4. When the State Water Board's Policy for Toxicity Assessment and Control (Toxicity Policy) is approved and in effect, the San Diego Water Board Executive Officer may direct the Copermittees to replace current toxicity program elements with standardized procedures in the Toxicity Policy.

Table D-4. Dry Weather Chronic[1] Toxicity Testing for Receiving Water Monitoring Stations

Organism	Units	Test	USEPA Protocol
Freshwater			
Pimephales promelas (Fathead Minnow)	Pass / Fail	Larval Survival and Growth	EPA-821-R-02-013
Ceriodaphnia dubia (*Daphnid*)	Pass / Fail	Survival and Production	EPA-821-R-02-013
Selenastrum capricornutum (Green Algae)	Pass / Fail	Growth	EPA-821-R-02-013
Marine and Estuarine			
Strongylocentrotus purpuratus *(Purple Sea Urchin)*	Pass / Fail	Embryo-Larval Development	EPA-600-R-95-136

Notes:
1. Chronic toxicity testing is not required at receiving water monitoring stations located at mass loading stations if the channel flows are diverted year-round during dry weather conditions to the sanitary sewer for treatment.

(a) Freshwater Test Species and Methods: If samples are collected in receiving waters with salinity less than 1 ppt, the Copermittees must follow the methods for chronic toxicity tests as established in 40 CFR 136.3 using a single-concentration test design for routine monitoring, or a five-concentration test design for additional toxicity testing if the limitation is exceeded. The Copermittees must estimate the critical life stage chronic toxicity on undiluted samples in accordance with species and short term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms (EPA-821-R-02-013; Table IA, 40 CFR 136). Additional test species may be used by the Copermittees if approved by the San Diego Water Board Executive Officer. The Copermittees must conduct:

(i) A static renewal toxicity test with the fathead minnow, *Pimephales promelas* (Larval Survival and Growth Test Method 1000.0);

(ii) A static renewal toxicity test with the daphnid, *Ceriodaphnia dubia* (Survival and Reproduction Test Method 1002.0); and

(iii) A static renewal toxicity test with the green alga, *Selenastrum capricornutum* (also named *Raphidocelis subcapitata*) (Growth Test Method 1003.0).

(b) Marine and Estuarine Test Species and Methods: If samples are collected in receiving waters with salinity greater or equal to 1 ppt, the Copermittees must follow the methods for chronic toxicity tests as established in 40 CFR 136.3 using a single-concentration test design for routine monitoring, or a five-concentration test design for additional toxicity testing if the limitation is exceeded. The Copermittees must conduct the following critical life state chronic toxicity tests on undiluted samples in accordance with species and short term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms (EPA-600-R-95-136; 1995). Artificial sea salts must be used to increase sample salinity. The Copermittees must conduct a static non-renewal toxicity test with the purple sea urchin, *Strongylocentrotus purpuratus* (Embryo-larval Development Test Method). Additional species may be used by the Copermittees if approved by the San Diego Water Board Executive Officer.

(c) Holding Times: All toxicity tests must be conducted as soon as possible following sample collection. The 36-hour sample holding time for test initiation shall be targeted. However, no more than 72 hours shall elapse before the conclusion of sample collection and test initiation.

(d) Test Species Sensitivity Screening: To determine the most sensitive test species for freshwater, the Copermittees must screen 2 wet weather and 2 dry weather toxicity tests with a vertebrate, an invertebrate, and a plant species. After this screening period, subsequent monitoring must be conducted using the most sensitive test species. Alternatively, if a sensitive test species has already been determined, or if there is prior knowledge of potential toxicant(s) and a test species is sensitive to such toxicant(s), then monitoring must be conducted using only that test species. Sensitive test species determinations must also consider the most sensitive test species used for proximal receiving water monitoring. Rescreening must occur once each permit term.

(e) Chronic toxicity test biological endpoint data must be analyzed using the Test of Significant Toxicity t-test approach specified in *National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document* (USEPA, Office of Wastewater Management, Washington, D.C., EPA-833-R-10-003, 2010). For this monitoring program, the critical chronic instream waste concentration (IWC) is set at 100 percent receiving water (i.e. no dilution) for receiving water samples. A 100 percent receiving water and a control must be tested.

(f) Toxicity Identification Evaluation (TIE) / Toxicity Reduction Evaluation (TRE): If chronic toxicity is detected in receiving waters, the Copermittees must discuss the need for conducting a TIE/TRE in the assessments required under Provision D.4.a.(2), and develop a plan for implementing the TIE/TRE to be incorporated in the Water Quality Improvement Plan.

(5) Dry Weather Receiving Water Bioassessment Monitoring

Bioassessment monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must conduct bioassessment monitoring during at least one dry weather monitoring event at each long-term receiving water monitoring station as follows:

(a) The following bioassessment samples and measurements must be collected:

(i) Macroinvertebrate samples must be collected in accordance with the "Reachwide Benthos (Multihabitat) Procedure" in the most current Surface Water Ambient Monitoring Program (SWAMP) Bioassessment Standard Operating Procedures (SOP), and amendments, as applicable;[12]

(ii) The "Full" suite of physical habitat characterization measurements must be collected in accordance with the most current SWAMP Bioassessment SOP, and as summarized in the SWAMP Stream Habitat Characterization Form – Full Version;[13] and

(iii) Freshwater algae samples must be collected in accordance with the SWAMP Standard Operating Procedures for Collecting Algae Samples.[14] Analysis of samples must include algal taxonomic composition (diatoms and soft algae) and algal biomass.

(b) The bioassessment samples, measurements, and appropriate water chemistry data must be used to calculate the following:

(i) An Index of Biological Integrity (IBI) for macroinvertebrates for each monitoring station where bioassessment monitoring was conducted, based on the most current calculation method;[15] and

[12] Ode, P.R.. 2007. Standard operating procedures for collecting macroinvertebrate samples and associated physical and chemical data for ambient bioassessments in California. California State Water Resources Control Board Surface Water Ambient Monitoring Program (SWAMP) Bioassessment SOP 001. http://www.swrcb.ca.gov/water_issues/programs/swamp/tools.shtml#monitoring

[13] Available at: http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/reports/fieldforms_fullversion052908.pdf

[14] Fetscher et al. 2009. Standard Operating Procedures for Collecting Stream Algae Samples and Associated Physical Habitat and Chemical Data for Ambient Bioassessments in California.

[15] The most current calculation method at the time the Order was adopted is outlined in "A Quantitative Tool for Assessing the Integrity of Southern California Coastal Streams" (Ode, et al. 2005. Environmental Management. Vol. 35, No. 1, pp. 1-13). If an updated or new calculation method is developed, either both (i.e. current and updated/new) methods must be used, or historical IBIs must be recalculated with the updated or new calculation method.

(ii) An IBI for algae for each monitoring station where bioassessment monitoring was conducted, when a calculation method is developed.[16]

(c) In lieu of the requirements of Provision D.1.c.(5)(a), the Copermittees may conduct the bioassessment monitoring in accordance with the "Triad" assessment approach[17] to calculate the IBIs required for Provision D.1.c.(5)(b). The Copermittees must conduct sampling, analysis, and reporting of specified in-stream biological and habitat data according to the protocols specified in the SCCWRP Technical Report No. 539, or subsequent protocols, if developed.

(6) Dry Weather Receiving Water Hydromodification Monitoring

In addition to the hydromodification monitoring conducted as part of the Copermittees' Hydromodification Management Plans, hydromodification monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must collect the following hydromodification monitoring observations and measurements within an appropriate domain of analysis during at least one dry weather monitoring event for each long-term receiving water monitoring station:

(a) Channel conditions, including:

(i) Channel dimensions,

(ii) Hydrologic and geomorphic conditions, and

(iii) Presence and condition of vegetation and habitat;

(b) Location of discharge points;

(c) Habitat integrity;

(d) Photo documentation of existing erosion and habitat impacts, with location (i.e. latitude and longitude coordinates) where photos were taken;

(e) Measurement or estimate of dimensions of any existing channel bed or bank eroded areas, including length, width, and depth of any incisions; and

[16] When a calculation method is developed, IBIs must be calculated for all available and appropriate historical data.
[17] Stormwater Monitoring Coalition Model Monitoring Technical Committee, 2004. Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California. Technical Report #419. August 2004.

(f) Known or suspected cause(s) of existing downstream erosion or habitat impact, including flow, soil, slope, and vegetation conditions, as well as upstream land uses and contributing new and existing development.

d. WET WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three wet weather monitoring events at each long-term receiving water monitoring station. At least one wet weather monitoring event must be conducted during the first wet weather event of the wet season (October 1 – April 30), and at least one wet weather monitoring event during a wet weather event that occurs after February 1.

(1) Wet Weather Receiving Water Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each long-term receiving water monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event;

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(d) Presence and assessment of trash in and around station.

(2) Wet Weather Receiving Water Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

(3) Wet Weather Receiving Water Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) Constituents listed in Table D-3.

(4) Wet Weather Receiving Water Toxicity Monitoring

For each wet weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for chronic aquatic toxicity in accordance with Provisions D.1.c.(4)(a)-(f).

e. OTHER RECEIVING WATER MONITORING REQUIREMENTS

(1) Regional Monitoring

The Copermittees must participate in the following regional receiving waters monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring; and

(b) Southern California Bight Regional Monitoring.

(2) Sediment Quality Monitoring

The Copermittees must perform sediment monitoring to assess compliance with sediment quality receiving water limits applicable to MS4 discharges to enclosed bays and estuaries. The monitoring may be performed either by individual or multiple Copermittees to assess compliance with receiving water limits, or through participation in a water body monitoring coalition. A Sediment Monitoring Plan which satisfies the requirements of the State Water Board's Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part 1 Sediment Quality (Sediment Control Plan) must be submitted as part of the monitoring and assessment program in the Water Quality Improvement Plan.

(a) The Sediment Monitoring Plan design must include the following:

(i) The elements required under Section VII.D (Receiving Water Limits Monitoring Frequency) and Section VII.E (Sediment Monitoring) of the Sediment Control Plan;

(ii) A Quality Assurance Project Plan (QAPP) describing the project objectives and organization, functional activities, and quality assurance/quality control protocols for the water and sediment monitoring; and

(iii) A schedule for completion of all sample collection and analysis activities and submission of Sediment Monitoring Reports.

(b) The Copermittees must implement the Sediment Monitoring Plan in accordance with the schedule contained in the Sediment Monitoring Plan, unless otherwise directed in writing by the San Diego Water Board Executive Officer.

(c) The Copermittees must incorporate a Sediment Monitoring Report as part of the Water Quality Improvement Plan Annual Report in accordance with the schedule contained in the Sediment Monitoring Plan, unless otherwise directed in writing by the San Diego Water Board Executive Officer. The Sediment Monitoring Report must contain the following information:

(i) Analysis: An evaluation, interpretation and tabulation of the water and sediment monitoring data, including interpretations and conclusions as to whether applicable Receiving Water Limitations in this Order have been attained at each sample station;

(ii) Sample Location Map: The locations, type, and number of samples must be identified and shown on a site map; and

(iii) California Environmental Data Exchange Network: A statement certifying that the monitoring data and results have been uploaded into the California Environmental Data Exchange Network (CEDEN).

(d) Based on the Sediment Monitoring Report conclusions the San Diego Water Board may require a human health risk assessment to determine if the human health objective contained in Receiving Water Limitations in Provision A.2.a.(3)(b)(ii) has been attained at each sample station. In conducting a risk assessment, the Copermittees must consider any applicable and relevant information, including California Environmental Protection Agency's (Cal/EPA) Office of Environmental Health Hazard Assessment (OEHHA) policies for fish consumption and risk assessment, Cal/EPA's Department of Toxic Substances Control (DTSC) Risk Assessment, and USEPA Human Health Risk Assessment policies.

(3) ASBS Monitoring

For Watershed Management Areas with ASBS, the Copermittees must implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

f. ALTERNATIVE WATERSHED MONITORING REQUIREMENTS

The San Diego Water Board may direct the Copermittees to participate in an effort to develop alternative watershed monitoring with other regulated entities, other interested parties, and the San Diego Water Board to refine, coordinate, and implement regional monitoring and assessment programs to determine the status and trends of water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams.

2. MS4 Outfall Discharge Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the discharges from the MS4 outfalls in each Watershed Management Area during dry weather and wet weather. Following San Diego Water Board acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct MS4 outfall discharge monitoring during implementation of the Water Quality Improvement Plan to assess the effectiveness of their jurisdictional runoff

management programs toward effectively prohibiting non-storm water discharges into the MS4 and reducing pollutants in storm water discharges from their MS4s to the MEP. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following MS4 outfall monitoring procedures:

a. TRANSITIONAL MS4 OUTFALL DISCHARGE MONITORING

Until the monitoring requirements and schedules of Provisions D.2.b-c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following MS4 outfall discharge monitoring in the Watershed Management Area:

(1) MS4 Outfall Discharge Monitoring Station Inventory

Each Copermittee must identify all major MS4 outfalls that discharge directly to receiving waters within its jurisdiction and geo-locate those outfalls on a map of the MS4 pursuant to Provision E.2.b.(1). This information must be compiled into a MS4 outfall discharge monitoring station inventory, and must include the following information:

(a) Latitude and longitude of MS4 outfall point of discharge;

(b) Watershed Management Area;

(c) Hydrologic subarea;

(d) Outlet size;

(e) Accessibility (i.e. safety and without disturbance of critical habitat);

(f) Approximate drainage area; and

(g) Classification of whether the MS4 outfall is known to have persistent dry weather flows, transient dry weather flows, no dry weather flows, or unknown dry weather flows.

(2) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Until the monitoring requirements and schedules of Provision D.2.b are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, each Copermittee must perform dry weather MS4 outfall field screening monitoring to identify non-storm water and illicit discharges within its jurisdiction in accordance with

Provision E.2.c, to determine which discharges are transient flows and which are persistent flows, and prioritize the dry weather MS4 discharges that will be investigated and eliminated in accordance with Provision E.2.d.

(a) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Frequency

Each Copermittee must field screen the MS4 outfalls in its inventory developed pursuant to Provision D.2.a.(1) as follows:

(i) For Copermittees with less than 125 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 80 percent of the outfalls must be visually inspected two times per year during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv).

(ii) For Copermittees with 125 major MS4 outfalls or more, but less than or equal to 500 that discharge to receiving waters within a Watershed Management Area, all the outfalls must be visually inspected at least annually during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv).

(iii) For Copermittees with more than 500 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 500 outfalls must be visually inspected at least annually during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv). Copermittees with more than 500 major MS4 outfalls within a Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(iv) For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major MS4 outfalls within its jurisdiction, at least 500 major MS4 outfalls within its inventory must be visually inspected at least annually during dry

weather conditions. Copermittees with more than 500 major MS4 outfalls in more than one Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(v) Inspections of major MS4 outfalls conducted in response to public reports and staff or contractor reports and notifications may count toward the required visual inspections of MS4 outfall discharge monitoring stations.

(b) Transitional Dry Weather MS4 Outfall Discharge Field Screening Visual Observations

(i) An antecedent dry period of at least 72 hours following any storm event producing measurable rainfall greater than 0.1 inch is required prior to conducting field screening visual observations during a field screening monitoring event.

(ii) During the field screening monitoring event, each Copermittee must record visual observations consistent with Table D-5 at each MS4 outfall discharge monitoring station inspected.

Table D-5. Field Screening Visual Observations for MS4 Outfall Discharge Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) - Flow source(s) suspected or identified from non-storm water source investigation - Flow source(s) eliminated during non-storm water source identification • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) - Known or suspected source(s) of pooled or ponded water • Station description (i.e. deposits or stains, vegetation condition, structural condition, observable biology) • Presence and assessment of trash in and around station • Evidence or signs of illicit connections or illegal dumping

(iii) Each Copermittee must implement the requirements of Provisions E.2.d.(2)(c)-(e) based on the field observations required pursuant to Provision D.2.a.(2)(b)(ii).

(iv) Each Copermittee must evaluate field observations together with existing information available from prior reports, inspections and monitoring results to determine whether any observed flowing, pooled, or ponded waters are likely to be transient or persistent flow.[18]

(c) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Records

Based upon the results of the transitional dry weather MS4 outfall discharge field screening monitoring conducted pursuant to Provisions D.2.a.(2)(a)-(b), each Copermittee must update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow.

(3) Transitional Wet Weather MS4 Outfall Discharge Monitoring

Until the monitoring requirements and schedules of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(a) Transitional Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees must select wet weather MS4 outfall discharge monitoring stations from the inventories developed pursuant to Provision D.2.a.(1) for each Watershed Management Area as follows:

(i) At least five wet weather MS4 outfall discharge monitoring stations that are representative of storm water discharges from areas consisting primarily of residential, commercial, industrial, and typical mixed-use land uses present within the Watershed Management Area;

(ii) At least one wet weather MS4 outfall discharge monitoring station for each Copermittee within the Watershed Management Area; and

[18] Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

(iii) The County of San Diego may select at least two (2) wet weather MS4 outfall discharge monitoring stations for the portion of the Santa Margarita River Watershed Management Area within its jurisdiction to be monitored during the transitional period until the Riverside County Copermittees are notified of coverage under this Order. After the Riverside County Copermittees are notified of coverage under this Order, the Copermittees in the Watershed Management Area must select wet weather MS4 outfall discharge monitoring stations consistent with the requirements above.

(b) Transitional Wet Weather MS4 Outfall Discharge Monitoring Frequency

Each wet weather MS4 outfall discharge monitoring station selected pursuant to Provision D.2.a.(3)(a) must be monitored once during the wet season (October 1 – April 30). The wet weather monitoring events must be selected to be representative of the range of hydrological conditions experienced in the region. At least 10 percent of samples must be conducted during the first wet weather event of the wet season, to include at least one such sample in each Watershed Management Area..

(c) Transitional Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(i) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(ii) The flow rates and volumes measured or estimated from the MS4 outfall (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(d) Transitional Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(e) Transitional Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, and indicator bacteria;

(iv) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

[a] Time-weighted composites collected over the length of the storm event or the first 24 hour period whichever is shorter, composed of discrete samples, which may be collected through the use of automated equipment, or

[b] Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

[c] If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours;

(v) Only one analysis of the composite of aliquots is required;

(vi) The samples must be analyzed for the following constituents:

[a] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

[b] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and

[c] Constituents listed in in Table D-6.

Table D-6. Analytical Monitoring Constituents for Wet Weather MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Nickel • Selenium • Thallium • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(f) Other Transitional Wet Weather MS4 Outfall Discharge Monitoring

The San Diego County Copermittees must continue the wet weather MS4 outfall monitoring program developed under Order No. R9-2007-0001, as approved by the San Diego Water Board, through its planned completion.

b. DRY WEATHER MS4 OUTFALL DISCHARGE MONITORING

Each Copermittee must perform dry weather MS4 outfall monitoring to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. Each Copermittee must conduct the following dry weather MS4 outfall discharge monitoring within its jurisdiction:

(1) Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Each Copermittee must continue to perform the dry weather MS4 outfall discharge field screening monitoring in accordance with the requirements of Provision D.2.a.(2). The Copermittee may adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of persistent flow non-storm water discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of visual inspections performed is equivalent to the number of visual inspections required under Provision D.2.a.(2)(a).

(2) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring

Each Copermittee must perform non-storm water persistent flow MS4 outfall discharge monitoring to determine which persistent non-storm water discharges contain concentrations of pollutants below NALs, and which persistent non-storm water discharges impact receiving water quality during dry weather. Each Copermittee must conduct the following non-storm water persistent flow MS4 outfall discharge monitoring within its jurisdiction:

(a) Prioritization of Non-Storm Water Persistent Flow MS4 Outfalls

Based upon the dry weather MS4 outfall discharge field screening monitoring records developed pursuant to Provision D.2.a.(2)(c), each Copermittee must identify and prioritize the MS4 outfalls with persistent flows based on the highest priority water quality conditions identified in the Water Quality Improvement Plan and any additional criteria developed by the Copermittee, which may include historical data and data from sources other than what the Copermittee collects.

(b) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring Frequency

(i) Based on the prioritization of major MS4 outfalls developed under Provision D.2.b.(2)(a), each Copermittee must identify, at a minimum, the 5 highest priority major MS4 outfalls with non-storm water persistent flows that the Copermittee will monitor within its jurisdiction in each Watershed Management Area. For Responsible Copermittees identified by a TMDL in Attachment E to this Order, if the 5 chosen outfall locations are not sufficient to determine compliance with the TMDL(s), then each Responsible Copermittee must identify additional MS4 outfall monitoring locations within its jurisdiction sufficient to address compliance with the TMDL(s). If a Copermittee has less than 5 major outfalls within a Watershed Management Area, then the Copermittee must monitor all of its major MS4 outfalls with persistent flows within each Watershed Management Area. The location of the highest priority non-storm water persistent flow MS4 outfall monitoring stations must be identified on the map required pursuant to Provision E.2.b.(1). The map must specify which MS4 outfalls are being monitored for compliance with a TMDL.

(ii) Each of the highest priority non-storm water persistent flow MS4 outfall monitoring stations identified pursuant to Provision D.2.b.(2)(b)(i) must be monitored under dry weather conditions at least semi-annually until one of the following occurs:

[a] The non-storm water discharges have been effectively eliminated (i.e. no flowing, pooled, or ponded water) for three consecutive dry weather monitoring events; or

[b] The source(s) of the persistent flows has been identified as a category of non-storm water discharges that does not require an NPDES permit and does not have to be addressed as an illicit discharge because it was not identified as a source of pollutants (i.e. constituents in non-storm water discharge do not exceed NALs), and the persistent flow can be re-prioritized to a lower priority; or

[c] The constituents in the persistent flow non-storm water discharge do not exceed NALs, and the persistent flow can be re-prioritized to a lower priority; or

[d] The source(s) of the persistent flows has been identified as a non-storm water discharge authorized by a separate NPDES permit.

(iii) Where the criteria under Provision D.2.b.(2)(b)(ii) are not met, but the threat to water quality has been reduced by the Copermittee, the highest priority persistent flow MS4 outfall monitoring stations may be reprioritized accordingly for continued dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1).

(iv) Each Copermittee must document removal or re-prioritization of the highest priority persistent flow MS4 outfall monitoring stations identified under Provision D.2.b.(2)(a) in the Water Quality Improvement Plan Annual Report. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized major MS4 outfall in the Watershed Management Area within its jurisdiction, unless there are no remaining qualifying major MS4 outfalls within the Copermittee's jurisdiction in the Watershed Management Area.

(c) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Observations

During each semi-annual monitoring event, each Copermittee must record field observations consistent with Table D-5 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(d) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Monitoring

During each semi-annual monitoring event, if conditions allow the collection of the data, each Copermittee must monitor and record the parameters in Table D-2 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(e) Non-Storm Water Persistent Flow MS4 Outfall Discharge Analytical Monitoring

During each semi-annual monitoring event in which measurable flow is present, each Copermittee must collect and analyze samples from each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Collect grab or composite samples to be analyzed at a qualified laboratory for the following constituents:

[a] Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,
[b] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,
[c] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,
[d] Applicable NAL constituents, and
[e] Constituents listed in Table D-7. The Copermittees may adjust the list of constituents for the Watershed Management Area if historical data or supporting information can be provided that demonstrates or justifies the analysis of a constituent is not necessary.

Table D-7. Analytical Monitoring Constituents for Persistent Flow MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Total Hardness • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Cadmium • Copper • Lead • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(iv) If the Copermittee identifies and eliminates the source of the persistent flow non-storm water discharge, analysis of the sample is not required.

c. WET WEATHER MS4 OUTFALL DISCHARGE MONITORING

The Copermittees must perform wet weather MS4 outfall monitoring to identify pollutants in storm water discharges from the MS4s, to guide pollutant source identification efforts, and to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order. The Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(1) Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees may adjust the wet weather MS4 outfall discharge monitoring locations in the Watershed Management Area, as needed, to identify pollutants in storm water discharges from MS4s, to guide pollutant source identification efforts, and to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of stations is at least equivalent to the number of stations required under Provision D.2.a.(3)(a). Additional outfall monitoring locations, above the minimum per jurisdiction, may be required to demonstrate compliance with the WQBELs associated with the applicable TMDLs in Attachment E.

(2) Wet Weather MS4 Outfall Discharge Monitoring Frequency

The Copermittees must monitor the wet weather MS4 outfall discharge monitoring stations in the Watershed Management Area at least once (1) per year. The Copermittees may need to increase the frequency of monitoring in order to identify pollutants in storm water discharges from the MS4s causing or contributing to the highest priority water quality conditions, to guide pollutant source identification efforts, or to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order.

(3) Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm

event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(4) Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(5) Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites collected over the length of the storm event or the first 24 hour period, whichever is shorter , composed of discrete samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

(iii) If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours.

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) The Copermittees may adjust the analytical monitoring required for the Watershed Management Area, if the Copermittees have historical data or supporting information that can demonstrate or provide justification that the analysis of a constituent is not necessary.

3. Special Studies

a. Within the term of this Order, the Copermittees must initiate the following special studies:

(1) At least two special studies in each Watershed Management Area to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that cause or contribute to highest priority water quality conditions identified in the Water Quality Improvement Plan.

(2) At least one special study for the San Diego Region to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that are impacting receiving waters on a regional basis in the San Diego Region.

(3) One of the two special studies in each Watershed Management Area required pursuant to Provision D.3.a.(1) may be replaced by a special study implemented pursuant to Provision D.3.a.(2).

b. The special studies must, at a minimum, be in conformance with the following criteria:

(1) The special studies must be related to the highest priority water quality conditions identified by the Copermittees in the Watershed Management Area and/or for the entire San Diego Region;

(2) The special studies developed pursuant to Provision D.3.a.(1) must:

(a) Be implemented within the applicable Watershed Management Area, and

(b) Require some form of participation by all the Copermittees within the Watershed Management Area;

(3) The special studies developed pursuant to Provision D.3.a.(2) must:

(a) Be implemented within the San Diego Region, and

(b) Require some form of participation by all Copermittees covered under the requirements of this Order.

(4) The Copermittees are encouraged to partner with environmental groups or third parties knowledgeable of watershed conditions to complete the required special studies.

c. Special studies developed to identify sources of pollutants and/or stressors should be pollutant and/or stressor specific and based on historical monitoring data and monitoring performed pursuant to Provisions D.1 and D.2. Development of source identification special studies should include the following:

(1) A compilation of known information on the specific pollutant and/or stressor, including data on potential sources and movement of the pollutant and/or stressor within the watershed. Data generated by the Copermittees and others, as well as information available from a literature research on the pollutant and/or stressor should be compiled and analyzed as appropriate.

(2) An identification of data gaps, based on the compiled information generated on the specific pollutant and/or stressor identified in Provision D.3.c.(1). Source identification special studies should be developed to fill identified data gaps.

(3) A monitoring plan that will collect and provide data the Copermittees can utilize to do the following:

(a) Quantify the relative loading or impact of a pollutant and/or stressor from a particular source or pollutant generating activity;

(b) Improve understanding of the fate of a pollutant and/or stressor in the environment;

(c) Develop an inventory of known and suspected sources of a pollutant and/or stressor in the Watershed Management Area; and/or

(d) Prioritize known and suspected sources of a pollutant and/or stressor based on relative magnitude in discharges, geographical distribution (i.e., regional or localized), frequency of occurrence in discharges, human health risk, and controllability.

d. Special studies initiated prior to the effective date of this Order that meet the requirements of Provision D.3.b and are implemented during the term of this Order as part of the Water Quality Improvement Plan may be utilized to fulfill the special study requirements of Provision D.3.a. Special studies completed before the effective date of this Order cannot be utilized to fulfill the special study requirements of Provision D.3.a.

e. The Copermittees must submit the monitoring plans for the special studies in the Water Quality Improvement Plans required pursuant to Provision F.1.

f. The Copermittees are encouraged to share the results of the special studies regionally among the Copermittees to provide information useful in improving and adapting the management of non-storm water and storm water runoff through the implementation of the Water Quality Improvement Plans.

4. Assessment Requirements

Each Copermittee must evaluate the data collected pursuant to Provisions D.1, D.2 and D.3, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E, to assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a. Assessments must be performed as described in the following provisions:

a. Receiving Waters Assessments

(1) The Copermittees must assess and report the conditions of the receiving waters in the Watershed Management Area as follows:

(a) Based on data collected pursuant to Provision D.1.a, the assessments under Provision D.4.a.(2) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(b) Based on the data collected pursuant to Provisions D.1.a-e, the assessments required under Provision D.4.a.(2) must be included in the Report of Waste Discharge required pursuant to Provision F.5.b.

(2) The Copermittees must assess the status and trends of receiving water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under dry weather and wet weather conditions. For each of the three types of receiving waters in each Watershed Management Area the Copermittees must:

(a) Determine whether or not the conditions of the receiving waters are meeting the numeric goals established pursuant to Provision B.3.a;

(b) Identify the most critical beneficial uses that must be protected to ensure overall health of the receiving water;

(c) Determine whether or not those critical beneficial uses are being protected;

(d) Identify short-term and/or long-term improvements or degradation of those critical beneficial uses;

(e) Determine whether or not the strategies established in the Water Quality Improvement Plan contribute towards progress in achieving the interim and final numeric goals of the Water Quality Improvement Plan; and

(f) Identify data gaps in the monitoring data necessary to assess Provisions D.4.a.(2)(a)-(e).

b. MS4 OUTFALL DISCHARGES ASSESSMENTS

(1) Non-Storm Water Discharges Reduction Assessments

(a) Each Copermittee must assess and report the progress of its illicit discharge detection and elimination program, required to be implemented pursuant to Provision E.2, toward effectively prohibiting non-storm water and illicit discharges into the MS4 within its jurisdiction as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(2), the assessments under Provision D.4.b.(1)(b) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(ii) Based on the data collected pursuant to Provisions D.2.b, the assessments required under Provision D.4.b.(1)(c) must be included in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

(iii) Based on the data collected pursuant to Provisions D.2.b, the assessment required under Provision D.4.b.(1)(c) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.a.(2), each Copermittee must assess and report the following:

(i) Identify the known and suspected controllable sources (e.g. facilities, areas, land uses, pollutant generating activities) of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area;

(ii) Identify sources of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area that have been reduced or eliminated; and

(iii) Identify modifications to the field screening monitoring locations and frequencies for the MS4 outfalls in its inventory necessary to identify and eliminate sources of persistent flow non-storm water discharges pursuant to Provision D.2.b.

(c) Based on the dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1), each Copermittee must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(1)(b);

(ii) Based on the data collected and applicable NALs in the Water Quality Improvement Plan, rank the MS4 outfalls in the Copermittee's jurisdiction according to potential threat to receiving water quality, and produce a prioritized list of major MS4 outfalls for follow-up action to update the Water Quality Improvement Plan, with the goal of eliminating persistent flow non-storm water discharges and/or pollutant loads in order of the ranked priority list through targeted programmatic actions and source investigations;

(iii) For the highest priority major MS4 outfalls with persistent flows that are in exceedance of NALs, identify the known and suspected sources within the Copermittee's jurisdiction in the Watershed Management Area that may cause or contribute to the NAL exceedances;

(iv) Each Copermittee must analyze the data collected pursuant to Provision D.2.b, and utilize a model or other method, to calculate or estimate the non-storm water volumes and pollutant loads collectively discharged from all the major MS4s outfalls in its jurisdiction identified as having persistent dry weather flows during the monitoring year. These calculations or estimates must be updated annually.

[a] Each Copermittee must calculate or estimate the annual non-storm water volumes and pollutant loads collectively discharged

from the Copermittee's major MS4 outfalls to receiving waters within the Copermittee's jurisdiction, with an estimate of the percent contribution from each known source for each MS4 outfall;

[b] Each Copermittee must annually identify and quantify (i.e. volume and pollutant loads) sources of non-storm water not subject to the Copermittee's legal authority that are discharged from the Copermittee's major MS4 outfalls to downstream receiving waters.

(v) Each Copermittee must review the data collected pursuant to Provision D.2.b and findings from the assessments required pursuant to Provision D.4.b.(1)(c)(i)-(iv) at least once during the term of this Order to:

[a] Identify reductions and progress in achieving reductions in non-storm water and illicit discharges to the Copermittee's MS4 in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction, with an estimate, if possible, of the non-storm water volume and/or pollutant load reductions attributable to specific water quality strategies implemented by the Copermittee; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittee in the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction.

(vi) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(1)(c)(i)-(v).

(2) <u>Storm Water Pollutant Discharges Reduction Assessments</u>

(a) The Copermittees must assess and report the progress of the water quality improvement strategies, required to be implemented pursuant to Provisions B and E, toward reducing pollutants in storm water discharges from the MS4s within the Watershed Management Area as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(3), the assessments under Provision D.4.b.(2)(b) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(ii) Based on the data collected pursuant to Provisions D.2.c, the assessments required under Provision D.4.b.(2)(c) must be included

in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

(iii) Based on the data collected pursuant to Provisions D.2.c, the assessment required under Provisions D.4.b.(2)(c)-(d) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.a.(3) the Copermittees must assess and report the following:

(i) The Copermittees must analyze the monitoring data collected pursuant to Provision D.2.a.(3), and utilize a watershed model or other method, to calculate or estimate the following for each monitoring year:

[a] The average storm water runoff coefficient for each land use type within the Watershed Management Area;
[b] The volume of storm water and pollutant loads discharged from each of the Copermittee's monitored MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch;
[c] The total flow volume and pollutant loadings discharged from the Copermittee's jurisdiction within the Watershed Management Area over the course of the wet season, extrapolated from the data produced from the monitored MS4 outfalls; and
[d] The percent contribution of storm water volumes and pollutant loads discharged from each land use type within each hydrologic subarea with a major MS4 outfall to receiving waters or within each major MS4 outfall to receiving waters in the Copermittee's jurisdiction within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch.

(ii) Identify modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify pollutants in storm water discharges from the MS4s in the Watershed Management Area pursuant to Provision D.2.c.(1).

(c) Based on the wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.c the Copermittees must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(2)(b);

(ii) Based on the data collected and applicable SALs in the Water Quality Improvement Plan, analyze and compare the monitoring data to the analyses and assumptions used to develop the Water Quality

Improvement Plans, including strategies developed pursuant to Provision B.3, and evaluate whether those analyses and assumptions should be updated as a component of the adaptive management efforts pursuant to Provision B.5 for follow-up action to update the Water Quality Improvement Plan;

(iii) The Copermittees must review the data collected pursuant to Provision D.2.c and findings from the assessments required pursuant to Provisions D.4.b.(2)(c)(i)-(ii) at least once during the term of this Order to:

[a] Identify reductions or progress in achieving reductions in pollutant concentrations and/or pollutant loads from different land uses and/or drainage areas discharging from the Copermittees' MS4s in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters within the Watershed Management Area to the MEP, with an estimate, if possible, of the pollutant load reductions attributable to specific water quality strategies implemented by the Copermittees; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittees in the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters in the Watershed Management Area to the MEP.

(iv) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(iii).

(d) The Copermittees must evaluate all the data collected pursuant to Provision D.2.c, and incorporate new outfall monitoring data into time series plots for each long-term monitoring constituent for the Watershed Management Area, and perform statistical trends analysis on the cumulative long-term wet weather MS4 outfall discharge water quality data set.

c. Special Studies Assessments

The Copermittees must annually evaluate the results and findings from the special studies developed and implemented pursuant to Provision D.3, and assess their relevance to the Copermittees' efforts to characterize receiving water conditions, understand sources of pollutants and/or stressors, and control and reduce the discharges of pollutants from the MS4 outfalls to receiving waters in the Watershed Management Area. The Copermittees must report the results of the special studies assessments applicable to the Watershed Management Area, and identify any necessary modifications or updates to the Water Quality

Improvement Plan based on the results in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

d. INTEGRATED ASSESSMENT OF WATER QUALITY IMPROVEMENT PLAN

As part of the iterative approach and adaptive management process required for the Water Quality Improvement Plan pursuant to Provision B.5, the Copermittees in each Watershed Management Area must integrate the data collected pursuant to Provisions D.1-D.3, the findings from the assessments required pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to assess the effectiveness of, and identify necessary modifications to, the Water Quality Improvement Plan as follows:

(1) The Copermittees must re-evaluate the priority water quality conditions and numeric goals for the Watershed Management Area, as needed, during the term of this Order pursuant to Provision B.5.a. The re-evaluation and recommendations for modifications to the priority water quality conditions, and/or numeric goals and corresponding schedules may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The priority water quality conditions and numeric goals for the Watershed Management Area must be re-evaluated as follows:

(a) Re-evaluate the receiving water conditions in the Watershed Management Area in accordance with Provision B.2.a;

(b) Re-evaluate the impacts on receiving waters in the Watershed Management Area from MS4 discharges in accordance with Provision B.2.b;

(c) Re-evaluate the identification of MS4 sources of pollutants and/or stressors in accordance with Provision B.2.d;

(d) Identify beneficial uses of the receiving waters that are protected in accordance with Provision D.4.a;

(e) Evaluate the progress toward achieving the interim and final numeric goals for protecting impacted beneficial uses in the receiving waters.

(2) The Copermittees must re-evaluate the water quality improvement strategies for the Watershed Management Area during the term of this Order pursuant to Provision B.5.b. The re-evaluation and recommendations for modifications to the water quality improvement strategies and schedules may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The water quality improvement

strategies for the Watershed Management Area must be re-evaluated as follows:

(a) Identify the non-storm water and storm water pollutant loads from the Copermittees' MS4 outfalls in the Watershed Management Area, calculated or estimated pursuant to Provisions D.4.b;

(b) Identify the non-storm water and storm water pollutant load reductions, or other improvements to receiving water or water quality conditions, that are necessary to attain the interim and final numeric goals identified in the Water Quality Improvement Plan for protecting beneficial uses in the receiving waters;

(c) Identify the non-storm water and storm water pollutant load reductions, or other improvements to the quality of MS4 discharges, that are necessary for the Copermittees to demonstrate that non-storm water and storm water discharges from their MS4s are not causing or contributing to exceedances of receiving water limitations;

(d) Evaluate the progress of the water quality improvement strategies toward achieving the interim and final numeric goals identified in the Water Quality Improvement Plan for protecting beneficial uses in the receiving waters.

(3) The Copermittees must re-evaluate and adapt the water quality monitoring and assessment program for the Watershed Management Area when new information becomes available to improve the monitoring and assessment program pursuant to Provision B.5.c. The re-evaluation and recommendations for modifications to the monitoring and assessment program may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. Modifications to the water quality monitoring and assessment program must be consistent with the requirements of Provision D.1-D.3. The re-evaluation of the water quality monitoring and assessment program for the Watershed Management Area must consider the data gaps identified by the assessments required pursuant to Provisions D.4.a-b, and results of the special studies implemented pursuant to Provision D.4.c.

5. Monitoring Provisions

Each Copermittee must comply with all the monitoring, reporting, and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

E. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS

The purpose of this provision is for each Copermittee to implement a program to control the contribution of pollutants to and the discharges from the MS4 within its jurisdiction. The goal of the jurisdictional runoff management programs is to implement strategies that effectively prohibit non-storm water discharges to the MS4 and reduce the discharge of pollutants in storm water to the MEP. This goal will be accomplished through implementing the jurisdictional runoff management programs in accordance with the strategies identified in the Water Quality Improvement Plans.

Each Copermittee must update its jurisdictional runoff management program document, in accordance with Provision F.2.a, to incorporate all the requirements of Provision E. Until the Copermittee has updated its jurisdictional runoff management program document with the requirements of Provision E, the Copermittee must continue implementing its current jurisdictional runoff management program.

1. Legal Authority Establishment and Enforcement

a. Each Copermittee must establish, maintain, and enforce adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 through statute, ordinance, permit, contract, order, or similar means. This legal authority must, at a minimum, authorize the Copermittee to:

(1) Prohibit and eliminate all illicit discharges and illicit connections to its MS4;

(2) Control the contribution of pollutants in discharges of runoff associated with industrial and construction activity to its MS4 and control the quality of runoff from industrial and construction sites, including industrial and construction sites which have coverage under the statewide General Permit for Discharges of Storm Water Associated with Industrial Activities (Industrial General Permit) or General Permit for Discharges of Storm Water Associated with Construction Activities (Construction General Permit), as well as to those sites which do not;

(3) Control the discharge of spills, dumping, or disposal of materials other than storm water into its MS4;

(4) Control through interagency agreements among Copermittees the contribution of pollutants from one portion of the MS4 to another portion of the MS4;

(5) Control, by coordinating and cooperating with other owners of the MS4 such as Caltrans, the U.S. federal government, or sovereign Native American Tribes through interagency agreements, where possible, the contribution of pollutants from their portion of the MS4 to the portion of the MS4 within the Copermittee's jurisdiction;

(6) Require compliance with conditions in its statutes, ordinances, permits, contracts, orders, or similar means to hold dischargers to its MS4 accountable for their contributions of pollutants and flows;

(7) Require the use of BMPs to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(8) Require documentation on the effectiveness of BMPs implemented to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(9) Utilize enforcement mechanisms to require compliance with its statutes, ordinances, permits, contracts, orders, or similar means; and

(10) Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with its statutes, ordinances, permits, contracts, orders, or similar means and with the requirements of this Order, including the prohibition of illicit discharges and connections to its MS4; the Copermittee must also have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from industrial facilities, including construction sites, discharging into its MS4.

b. With the first Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3), each Copermittee must submit a statement certified by its Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative that the Copermittee has taken the necessary steps to obtain and maintain full legal authority within its jurisdiction to implement and enforce each of the requirements contained in this Order.

2. Illicit Discharge Detection and Elimination

Each Copermittee must implement a program to actively detect and eliminate illicit discharges and improper disposal into the MS4, or otherwise require the discharger to apply for and obtain a separate NPDES permit. The illicit discharge detection and elimination program must be implemented in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include, at a minimum, the following requirements:

a. Non-Storm Water Discharges

Each Copermittee must address all non-storm water discharges as illicit discharges unless a non-storm water discharge is either identified as a discharge authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to the following requirements:

(1) Discharges of non-storm water to the MS4 from the following categories must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG919001 (Order No. R9-2007-0034, or subsequent order) for discharges to San Diego Bay, or NPDES Permit No. CAG919002 (Order No. R9-2008-0002, or subsequent order) for discharges to surface waters other than San Diego Bay:

(1) Uncontaminated pumped ground water;

(2) Discharges from foundation drains;[19]

(3) Water from crawl space pumps; and

(4) Water from footing drains.[19]

(2) Discharges of non-storm water from water line flushing and water main breaks to the MS4 must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG 679001 (Order No. R9-2010-0003 or subsequent order). This category includes water line flushing and water main break discharges from water purveyors issued a water supply permit by the California Department of Public Health or federal military installations. Discharges from recycled or reclaimed water lines to the MS4 must be addressed as illicit discharges, unless the discharges have coverage under a separate NPDES permit.

(3) Discharges of non-storm water to the MS4 from the following categories must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a source of pollutants to receiving waters:

(a) Diverted stream flows;

(b) Rising ground waters;

(c) Uncontaminated ground water infiltration to MS4s;

(d) Springs;

(e) Flows from riparian habitats and wetlands;

(f) Discharges from potable water sources;

[19] Provision E.2.a.(1) only applies to this category of non-storm water if the system is designed to be located at or below the groundwater table to actively or passively extract groundwater during any part of the year.

(g) Discharges from foundation drains;[20] and

(h) Discharges from footing drains.[20]

(4) Discharges of non-storm water to the MS4 from the following categories must be controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means. Discharges of non-storm water to the MS4 from the following categories not controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means must be addressed by the Copermittee as illicit discharges.

(a) Air conditioning condensation

The discharge of air conditioning condensation should be directed to landscaped areas or other pervious surfaces, or to the sanitary sewer, where feasible.

(b) Individual residential vehicle washing

(i) The discharge of wash water should be directed to landscaped areas or other pervious surfaces where feasible; and

(ii) The minimization of water, washing detergent and other vehicle wash products used for residential vehicle washing, and the implementation of other practices or behaviors that will prevent the discharge of pollutants associated with individual residential vehicle washing from entering the MS4 must be encouraged.

(c) Dechlorinated swimming pool discharges

(i) Residual chlorine, algaecide, filter backwash, or other pollutants from swimming pools must be eliminated prior to discharging to the MS4; and

(ii) The discharge of saline swimming pool water must be directed to the sanitary sewer, landscaped areas, or other pervious surfaces that can accommodate the volume of water, unless the saline swimming pool water can be discharged via a pipe or concrete channel directly to a naturally saline water body (e.g. Pacific Ocean).

(5) Firefighting discharges to the MS4 must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a significant source of pollutants to receiving waters. Firefighting discharges to the MS4 not identified as a significant source of pollutants to receiving waters, must be addressed, at a minimum, as follows:

[20] Provision E.2.a.(3) only applies to this category of non-storm water discharge if the system is designed to be located above the groundwater table at all times of the year, and the system is only expected to discharge non-storm water under unusual circumstances.

(a) Non-emergency firefighting discharges

(i) Building fire suppression system maintenance discharges (e.g. sprinkler line flushing) to the MS4 must be addressed as illicit discharges unless BMPs are implemented to prevent pollutants associated with such discharges to the MS4.

(ii) Non-emergency firefighting discharges (i.e., discharges from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems) must be addressed by a program, to be developed and implemented by the Copermittee, to reduce or eliminate pollutants in such discharges from entering the MS4.

(b) Emergency firefighting discharges

Each Copermittee should develop and encourage implementation of BMPs to reduce or eliminate pollutants in emergency firefighting discharges to the MS4s and receiving waters within its jurisdiction. During emergency situations, priority of efforts should be directed toward life, property, and the environment (in descending order). BMPs should not interfere with immediate emergency response operations or impact public health and safety.

(6) If the Copermittee or San Diego Water Board identifies any category of non-storm water discharges listed under Provisions E.2.a.(1)-(4) as a source of pollutants to receiving waters, the category must be prohibited through ordinance, order, or similar means and addressed as an illicit discharge. Alternatively, the Copermittee may propose controls to be implemented for the category of non-storm water discharges as part of the Water Quality Improvement Plan instead of prohibiting the category of non-storm water discharges, and implement the controls if accepted by the San Diego Water Board as part of the Water Quality Improvement Plan.

(7) Each Copermittee must, where feasible and priorities and resources allow, reduce or eliminate non-storm water discharges listed under Provisions E.2.a.(1)-(4) into its MS4, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit.

b. PREVENT AND DETECT ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to prevent and detect illicit discharges to the MS4:

(1) Each Copermittee must maintain an updated map of its entire MS4 and the corresponding drainage areas. The accuracy of the MS4 map must be confirmed during the field screening required pursuant to Provision E.2.c.

The MS4 map must be included as part of the jurisdictional runoff management program document. Any geographic information system (GIS) layers or files used by the Copermittee to maintain the MS4 map must be made available to the San Diego Water Board upon request. The MS4 map must identify the following:

(a) All segments of the MS4 owned, operated, and maintained by the Copermittee;

(b) All known locations of inlets that discharge and/or collect runoff into the Copermittee's MS4;

(c) All known locations of connections with other MS4s not owned or operated by the Copermittee (e.g. Caltrans MS4s);

(d) All known locations of MS4 outfalls and private outfalls that discharge runoff collected from areas within the Copermittee's jurisdiction;

(e) All segments of receiving waters within the Copermittee's jurisdiction that receive and convey runoff discharged from the Copermittee's MS4 outfalls;

(f) Locations of the MS4 outfalls, identified pursuant to Provision D.2.a.(1), within its jurisdiction; and

(g) Locations of the non-storm water persistent flow MS4 outfall discharge monitoring stations, identified pursuant to Provision D.2.b.(2), within its jurisdiction.

(2) Each Copermittee must use Copermittee personnel and contractors to assist in identifying and reporting illicit discharges and connections during their daily employment activities.

(3) Each Copermittee must promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges to or from the MS4, including the following methods for public reporting:

(a) Operate a public hotline, which can be Copermittee-specific or shared by the Copermittees, and must be capable of receiving reports in both English and Spanish 24 hours per day and seven days per week; and

(b) Designate an e-mail address for receiving electronic reports from the public, which can be Copermittee-specific or shared by the Copermittees, and must be prominently displayed on the Copermittee's webpage and the Regional Clearinghouse required pursuant to Provision F.4.

(4) Each Copermittee must implement practices and procedures (including a notification mechanism) to prevent, respond to, contain, and clean up any spills that may discharge into the MS4 within its jurisdiction from any source. The Copermittee must coordinate, to the extent possible, with spill response teams to prevent entry of spills into the MS4, and prevent contamination of surface water, ground water, and soil. The Copermittee must coordinate spill prevention, containment, and response activities throughout all appropriate Copermittee departments, programs, and agencies.

(5) Each Copermittee must implement practices and procedures to prevent and limit infiltration of seepage from sanitary sewers (including private laterals and failing septic systems) to the MS4.

(6) Each Copermittee must coordinate, when necessary, with upstream Copermittees and/or entities to prevent illicit discharges from upstream sources into the MS4 within its jurisdiction.

c. FIELD SCREENING

Each Copermittee must conduct field screening (i.e. visual observations, field testing, and/or analytical testing) of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4 in accordance with the dry weather MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

d. INVESTIGATE AND ELIMINATE ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to investigate and eliminate illicit discharges to the MS4:

(1) Each Copermittee must prioritize and determine when follow-up investigations will be performed in response to visual observations and/or water quality monitoring data collected during an investigation of a detected non-storm water or illicit discharge to or from the MS4. The criteria for prioritizing investigations must consider the following:

(a) Pollutants identified as causing or contributing to the highest water quality priorities identified in the Water Quality Improvement Plan;

(b) Pollutants identified as causing or contributing, or threatening to cause or contribute to impairments in water bodies on the 303(d) List and/or in environmentally sensitive areas (ESAs), located within its jurisdiction;

(c) Pollutants identified from sources or land uses known to exist within the area, drainage basin, or watershed that discharges to the portion of the MS4 within its jurisdiction included in the investigation;

(d) Pollutants identified as causing or contributing to an exceedance of a NAL in the Water Quality Improvement Plan; and

(e) Pollutants identified as a threat to human health or the environment.

(2) Each Copermittee must implement procedures to investigate and inspect portions of its MS4 that, based on reports or notifications, field screening, or other appropriate information, indicate a reasonable potential of receiving, containing, or discharging pollutants due to illicit discharges, illicit connections, or other sources of non-storm water. The procedures must include the following:

(a) Each Copermittee must develop criteria to:

(i) Assess the validity of each report or notification received; and

(ii) Prioritize the response to each report or notification received.

(b) Each Copermittee must prioritize and respond to each valid report or notification (e.g., public reports, staff or contractor reports and notifications, etc.) of an incident in a timely manner.

(c) In accordance with the requirements of Provision E.2.d.(1), each Copermittee must investigate and seek to identify the source(s) of discharges of non-storm water where flows are observed in and from the MS4 during the field screening required pursuant to Provision D.2.b.(1) as follows:

(i) Obvious illicit discharges must be immediately investigated to identify the source(s) of non-storm water discharges;

(ii) The investigation must include field investigations to identify sources or potential sources for the discharge, unless the source or potential source has already been identified during previous investigations; and

(iii) The investigation may include follow-up field investigations and/or reviewing Copermittee inventories and other land use data to identify potential sources of the discharge.

(d) Each Copermittee must maintain records and a database of the following information:

(i) Location of incident, including hydrologic subarea, portion of MS4 receiving the non-storm water or illicit discharge, and point of discharge or potential discharge from MS4 to receiving water;

(ii) Source of information initiating the investigation (e.g., public reports, staff or contractor reports and notifications, field screening, etc.);

(iii) Date the information used to initiate the investigation was received;

(iv) Date the investigation was initiated;

(v) Dates of follow-up investigations;

(vi) Identified or suspected source of the illicit discharge or connection, if determined;

(vii) Known or suspected related incidents, if any;

(viii) Result of the investigation; and

(ix) If a source cannot be identified and the investigation is not continued, document the response pursuant to the requirements of Provision E.2.d.(4).

(e) Each Copermittee must maintain records and, in accordance with the priorities of the Water Quality Improvement Plan, seek to identify the source(s) of non-storm water discharges from the MS4 where there is evidence of non-storm water having been discharged into or from the MS4 (e.g., pooled water), in accordance with MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

(3) Each Copermittee must initiate the implementation of procedures, in a timely manner, to eliminate all detected and identified illicit discharges and connections within its jurisdiction. The procedures must include the following responses:

(a) Each Copermittee must enforce its legal authority, as required under Provision E.1, to eliminate illicit discharges and connections to the MS4.

(b) If the Copermittee identifies the source as a controllable source of non-storm water or illicit discharge or connection, the Copermittee must implement its Enforcement Response Plan pursuant to Provision E.6 and enforce its legal authority to prohibit and eliminate illicit discharges and connections to its MS4.

(c) If the Copermittee identifies the source of the discharge as a category of non-storm water discharges in Provision E.2.a, and the discharge is in exceedance of NALs in the Water Quality Improvement Plan, then the Copermittee must determine if: (1) this is an isolated incident or set of circumstances that will be addressed through its Enforcement Response Plan pursuant to Provision E.6, or (2) the category of discharge must be addressed through the prohibition of that category of discharge as an illicit discharge pursuant to Provision E.2.a.(6).

(d) If the Copermittee suspects the source of the non-storm water discharge as natural in origin (i.e. non-anthropogenically influenced) and in conveyance into the MS4, then the Copermittee must document and

provide the data and evidence necessary to demonstrate to the San Diego Water Board that it is natural in origin and does not require further investigation.

(e) If the Copermittee is unable to identify and document the source of a recurring non-storm water discharge to or from the MS4, then the Copermittee must address the discharge as an illicit discharge and update its jurisdictional runoff management program to address the common and suspected sources of the non-storm water discharge within its jurisdiction in accordance with the Copermittee's priorities.

(4) Each Copermittee must submit a summary of the non-storm water discharges and illicit discharges and connections investigated and eliminated within its jurisdiction with each Water Quality Improvement Plan Annual Report required under Provision F.3.b.(3) of this Order.

3. Development Planning

Each Copermittee must use their land use and planning authorities to implement a development planning program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. BMP Requirements for All Development Projects

Each Copermittee must prescribe the following BMP requirements during the planning process (i.e. prior to project approval and issuance of local permits) for all development projects (regardless of project type or size), where local permits are issued, including unpaved roads and flood management projects:

(1) General Requirements

(a) Onsite BMPs must be located so as to remove pollutants from runoff prior to its discharge to any receiving waters, and as close to the source as possible;

(b) Structural BMPs must not be constructed within waters of the U.S.

(c) Onsite BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors (e.g. mosquitos, rodents, or flies).

(2) Source Control BMP Requirements

The following source control BMPs must be implemented at all development projects where applicable and feasible:

(a) Prevention of illicit discharges into the MS4;

(b) Storm drain system stenciling or signage;

(c) Protect outdoor material storage areas from rainfall, run-on, runoff, and wind dispersal;

(d) Protect materials stored in outdoor work areas from rainfall, run-on, runoff, and wind dispersal;

(e) Protect trash storage areas from rainfall, run-on, runoff, and wind dispersal; and

(f) Any additional BMPs determined to be necessary by the Copermittee to minimize pollutant generation at each project.

(3) Low Impact Development (LID) BMP Requirements

The following LID BMPs must be implemented at all development projects where applicable and feasible:

(a) Maintenance or restoration of natural storage reservoirs and drainage corridors (including topographic depressions, areas of permeable soils, natural swales, and ephemeral and intermittent streams);[21]

(b) Buffer zones for natural water bodies (where buffer zones are technically infeasible, require project applicant to include other buffers such as trees, access restrictions, etc.);

(c) Conservation of natural areas within the project footprint including existing trees, other vegetation, and soils;

(d) Construction of streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided public safety is not compromised;

(e) Minimization of the impervious footprint of the project;

(f) Minimization of soil compaction to landscaped areas;

(g) Disconnection of impervious surfaces through distributed pervious areas;

[21] Development projects proposing to dredge or fill materials in waters of the U.S. must obtain a CWA Section 401 Water Quality Certification. Projects proposing to dredge or fill waters of the state must obtain waste discharge requirements.

(h) Landscaped or other pervious areas designed and constructed to effectively receive and infiltrate, retain and/or treat runoff from impervious areas, prior to discharging to the MS4;

(i) Small collection strategies located at, or as close as possible to, the source (i.e. the point where storm water initially meets the ground) to minimize the transport of runoff and pollutants to the MS4 and receiving waters;

(j) Use of permeable materials for projects with low traffic areas and appropriate soil conditions;

(k) Landscaping with native or drought tolerant species; and

(l) Harvesting and using precipitation.

b. PRIORITY DEVELOPMENT PROJECTS

Priority Development Projects are land development projects that fall under the planning and building authority of the Copermittee for which the Copermittee must impose specific requirements, in addition to those described in Provision E.3.a, including the implementation of structural BMPs to meet the performance requirements described in Provision E.3.c.

(1) Definition of Priority Development Project

Priority Development Projects include the following:

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(b) Redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site on an existing site of 10,000 square feet or more of impervious surfaces). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(c) New and redevelopment projects that create 5,000 square feet or more of impervious surface (collectively over the entire project site), and support one or more of the following uses:

(i) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812).

(ii) Hillside development projects. This category includes development on any natural slope that is twenty-five percent or greater.

(iii) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce.

(iv) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

(d) New or redevelopment projects that create or replace 2,500 square feet or more of impervious surface (collectively over the entire project site), and discharging directly to an Environmentally Sensitive Area (ESA). "Discharging directly to" includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands).

(e) New development projects that support one or more of the following uses:

(i) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

(ii) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

(f) New or redevelopment projects that result in the disturbance of one or more acres of land and are expected to generate pollutants post construction.

(2) Special Considerations for Redevelopment Projects

The structural BMP performance requirements of Provision E.3.c are applicable to redevelopment Priority Development Projects, as defined in E.3.b.(1), as follows:

(a) Where redevelopment results in the creation or replacement of impervious surface in an amount of less than fifty percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provision E.3.c apply only to the creation or replacement of impervious surface, and not the entire development; or

(b) Where redevelopment results in the creation or replacement of impervious surface in an amount of more than fifty percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provision E.3.c apply to the entire development.

(3) Priority Development Project Exemptions

Each Copermittee has the discretion to exempt the following projects from being defined as Priority Development Projects:

(a) New or retrofit paved sidewalks, bicycle lanes, or trails that meet the following criteria:

(i) Designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas; OR

(ii) Designed and constructed to be hydraulically disconnected from paved streets or roads; OR

(iii) Designed and constructed with permeable pavements or surfaces in accordance with USEPA Green Streets guidance.[22]

(b) Retrofitting or redevelopment of existing paved alleys, streets or roads that are designed and constructed in accordance with the USEPA Green Streets guidance.[23]

c. Priority Development Project Structural BMP Performance Requirements

In addition to the BMP requirements listed for all development projects under Provision E.3.a, Priority Development Projects must also implement structural BMPs that conform to performance requirements described below.

(1) Storm Water Pollutant Control BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite structural BMPs to control pollutants in storm water that may be discharged from a project as follows:

(a) Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite the pollutants contained in the volume of storm water runoff produced from a 24-hour 85th percentile storm event (design capture volume);[24]

[22] See "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).
[23] Ibid.
[24] This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are

(i) If a Copermittee determines that implementing BMPs to retain the full design capture volume onsite for a Priority Development Project is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize biofiltration BMPs. Biofiltration BMPs must be designed to have an appropriate hydraulic loading rate to maximize storm water retention and pollutant removal, as well as to prevent erosion, scour, and channeling within the BMP,[25] and must be sized to:

[a] Treat 1.5 times the design capture volume not reliably retained onsite, OR

[b] Treat the design capture volume not reliably retained onsite with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite.

(ii) If a Copermittee determines that biofiltration is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize flow-thru treatment control BMPs to treat runoff leaving the site, AND mitigate for the design capture volume not reliably retained onsite pursuant to Provision E.3.c.(1)(b). Flow thru treatment control BMPs must be sized and designed to:

[a] Remove pollutants from storm water to the MEP;

[b] Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;

[c] Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Flow-thru treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of flow-thru treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

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encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals.

[25] As part of the Copermittee's update to its BMP Design Manual, pursuant to Provision E.3.d, the Copermittee must provide guidance for hydraulic loading rates and other biofiltration design criteria necessary to maximize storm water retention and pollutant removal.

(b) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1)(a). The Priority Development Project must mitigate for the portion of the pollutant load in the design capture volume not retained onsite if Provision E.3.c.(3) is utilized. If a Priority Development Project is allowed to utilize alternative compliance, flow-thru treatment control BMPs must be implemented to treat the portion of the design capture volume that is not reliably retained onsite. Flow-thru treatment control BMPs must be sized and designed in accordance with Provisions E.3.c.(1)(a)(ii)[a]-[c].

(2) Hydromodification Management BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite BMPs to manage hydromodification that may be caused by storm water runoff discharged from a project as follows:

(a) Post-project runoff conditions (flow rates and durations) must not exceed pre-development runoff conditions by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat downstream of Priority Development Projects).

(i) In evaluating the range of flows that results in increased potential for erosion of natural (non-hardened) channels, the lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks.

(ii) The Copermittees may use monitoring results collected pursuant to Provision D.1.a.(2) to re-define the range of flows resulting in increased potential for erosion, or degraded instream habitat conditions, as warranted by the data.

(b) Each Priority Development Project must avoid critical sediment yield areas known to the Copermittee or identified by the optional Watershed Management Area Analysis pursuant to Provision B.3.b.(4), or implement measures that allow critical coarse sediment to be discharged to receiving waters, such that there is no net impact to the receiving water.

(c) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the performance requirements of Provision E.3.c.(2)(a). The Priority Development Project must mitigate for the post-project runoff conditions not fully managed onsite if Provision E.3.c.(3) is utilized.

(d) Exemptions

Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provisions E.3.c.(2) where the project discharges storm water runoff to:

(i) Existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;

(ii) Conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; or

(iii) An area identified by the Copermittees as appropriate for an exemption by the optional Watershed Management Area Analysis incorporated into the Water Quality Improvement Plan pursuant to Provision B.3.b.(4).

(3) Alternative Compliance Program to Onsite Structural BMP Implementation

At the discretion of each Copermittee, Priority Development Projects may be allowed to participate in an alternative compliance program in lieu of implementing the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2), provided that the Water Quality Improvement Plan includes the optional Watershed Management Area Analysis described in Provision B.3.b.(4). The alternative compliance program is available to a Priority Development Project only if the Priority Development Project applicant enters into a voluntary agreement with the Copermittee authorizing this arrangement. In addition to the voluntary agreement, relief from implementing structural BMPs onsite may be authorized by the Copermittee under the following conditions:

(a) Watershed Management Area Analysis Candidate Projects

The Priority Development Project applicant agrees to fund, contribute funds to, or implement a candidate project identified by the Copermittees in the Watershed Management Area Analysis included in the Water Quality Improvement Plan, pursuant to Provisions B.3.b.(4) subject to the following conditions:

(i) The Copermittee must determine that implementation of the candidate project will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite;

(ii) If the Priority Development Project applicant chooses to fully or partially fund a candidate project, then the in-lieu fee structure described in Provision E.3.c.(3)(c) must be followed;

(iii) If the Priority Development Project applicant chooses to fully or partially fund a candidate project, then the Copermittee must ensure that the funds to be obtained from the Priority Development Project applicant are sufficient to mitigate for impacts caused by not fully implementing structural BMPs onsite, pursuant to the performance requirements described in Provisions E.3.c.(1) and E.3.c.(2);

(iv) If the Priority Development Project applicant chooses to implement a candidate project, then the Copermittee must ensure that pollutant control and/or hydromodification management within the candidate project are sufficient to mitigate for impacts caused by not implementing structural BMPs fully onsite, pursuant to the performance requirements described in Provisions E.3.c.(1) and E.3.c.(2);

(v) The voluntary agreement to fund, partially fund, or implement a candidate project must include reliable sources of funding for operation and maintenance of the candidate project;

(vi) Design of the candidate project must be conducted under an appropriately qualified engineer, geologist, architect, landscape architect, or other professional, licenses where applicable, and competent and proficient in the fields pertinent to the candidate project design;

(vii) The candidate project must be constructed as soon as possible, but no later than 4 years after the certificate of occupancy is granted for the first Priority Development Project that contributed funds toward the construction of the candidate project, unless a longer period of time is authorized by the San Diego Water Board Executive Officer; and

(viii) If the candidate project is constructed after the Priority Development Project is constructed, the Copermittee must require temporal mitigation for pollutant loads and altered flows that are discharged from the Priority Development Project.

(b) Project Applicant Proposed Alternative Compliance Projects

The Copermittee may allow a Priority Development Project applicant to propose and fund, contribute funds to, or implement an alternative compliance project not identified by the Watershed Management Area Analysis included in the Water Quality Improvement Plan pursuant to Provisions B.3.b.(4). This option is allowed provided the Copermittee determines that implementation of the alternative compliance project will have a greater overall water quality benefit for the Watershed

Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite, and is subject to the requirements described in Provisions E.3.c.(3)(a)(ii)-(viii).

(c) Alternative Compliance In-Lieu Fee Structure

If a Copermittee chooses to allow a Priority Development Project applicant to fund, or partially fund a candidate project or an alternative compliance project, then the Copermittee must develop and implement an in-lieu fee structure. This may be developed individually or with other Copermittees and/or entities, as a means for designing, developing, constructing, operating and maintaining offsite alternative compliance projects. The in-lieu fee must be transferred to the Copermittee (for public projects) or an escrow account (for private projects) prior to the construction of the Priority Development Project.

(d) Alternative Compliance Water Quality Credit System Option

The Copermittee may develop and implement an alternative compliance water quality credit system option, individually or with other Copermittees and/or entities, provided that such a credit system clearly exhibits that it will not allow discharges from Priority Development Projects to cause or contribute to a net impact over and above the impact caused by projects meeting the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2). Any credit system that a Copermittee chooses to implement must be submitted to the San Diego Water Board Executive Officer for review and acceptance as part of the Water Quality Improvement Plan.

(4) Long-Term Structural BMP Maintenance

Each Copermittee must require the project applicant to submit proof of the mechanism under which ongoing long-term maintenance of all structural BMPs will be conducted.

(5) Infiltration and Groundwater Protection

(a) Structural BMPs designed to primarily function as large, centralized infiltration devices (such as large infiltration trenches and infiltration basins) must not cause or contribute to an exceedance of an applicable groundwater quality objective. At a minimum, such infiltration BMPs must be in conformance with the design criteria listed below, unless the development project applicant demonstrates to the Copermittee that one or more of the specific design criteria listed below are not necessary to protect groundwater quality. The design criteria listed below do not apply to small infiltration systems dispersed throughout a development project.

(i) Runoff must undergo pretreatment such as sedimentation or filtration prior to infiltration;

(ii) Pollution prevention and source control BMPs must be implemented at a level appropriate to protect groundwater quality at sites where infiltration BMPs are to be used;

(iii) Infiltration BMPs must be adequately maintained to remove pollutants in storm water to the MEP;

(iv) The vertical distance from the base of any infiltration BMP to the seasonal high groundwater mark must be at least 10 feet. Where groundwater basins do not support beneficial uses, this vertical distance criteria may be reduced, provided groundwater quality is maintained;

(v) The soil through which infiltration is to occur must have physical and chemical characteristics (e.g., appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses;

(vi) Infiltration BMPs must not be used for areas of industrial or light industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee, unless source control BMPs to prevent exposure of high threat activities are implemented, or runoff from such activities is first treated or filtered to remove pollutants prior to infiltration; and

(vii) Infiltration BMPs must be located a minimum of 100 feet horizontally from any water supply wells.

(b) The Copermittee may develop, individually or with other Copermittees, alternative mandatory design criteria to that listed above for infiltration BMPs which are designed to primarily function as centralized infiltration devices. Before implementing the alternative design criteria in the development planning process the Copermitee(s) must:

(i) Notify the San Diego Water Board of the intent to implement the alternative design criteria submitted; and

(ii) Comply with any conditions set by the San Diego Water Board.

d. BMP DESIGN MANUAL UPDATE

Each Copermittee must update its BMP Design Manual[26] pursuant to Provision F.2.b. Until the Copermittee has updated its BMP Design Manual with the

[26] The BMP Design Manual was formerly known as the Standard Storm Water Mitigation Plan under Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016.

requirements of Provisions E.3.a-c, the Copermittee must continue implementing its current BMP Design Manual. Unless directed otherwise by the San Diego Water Board, the Copermittee must implement the BMP Design Manual within 180 days of completing the update. The update of the BMP Design Manual must include the following:

(1) Updated procedures to determine the nature and extent of storm water requirements applicable to a potential development or redevelopment projects. These procedures must inform project applicants of the storm water management requirements applicable to their project including, but not limited to, general requirements for all development projects, structural BMP design procedures and requirements, hydromodification management requirements, requirements specific to phased projects, and procedures specific to private developments and public improvement projects;

(2) Updated procedures to identify pollutants and conditions of concern for selecting the most appropriate structural BMPs that consider, at a minimum, the following:

(a) Receiving water quality (including pollutants for which receiving waters are listed as impaired under the CWA section 303(d) List);

(b) Pollutants, stressors, and/or receiving water conditions that cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(c) Land use type of the project and pollutants associated with that land use type; and

(d) Pollutants expected to be present onsite.

(3) Updated procedures for designing structural BMPs, including any updated performance requirements to be consistent with the requirements of Provision E.3.c for all structural BMPs listed in the BMP Design Manual;

(4) Long-term maintenance criteria for each structural BMP listed in the BMP Design Manual; and

(5) Alternative compliance criteria, in accordance with the requirements under Provision E.3.c.(3), if the Copermittee elects to allow Priority Development Projects within its jurisdiction to utilize alternative compliance.

e. PRIORITY DEVELOPMENT PROJECT BMP IMPLEMENTATION AND OVERSIGHT

Each Copermittee must implement a program that requires and confirms structural BMPs on all Priority Development Projects are designed, constructed, and maintained to remove pollutants in storm water to the MEP.

(1) Structural BMP Approval and Verification Process

(a) Each Copermittee must require and confirm that for all Priority Development Project applications that have not received prior lawful approval by the Copermittee by the time the BMP Design Manual is updated pursuant to Provision E.3.d, the requirements of Provision E.3 are implemented. For project applications that have received prior lawful approval before the BMP Design Manual is updated pursuant to Provision E.3.d, the Copermittee may allow previous land development requirements to apply.

(b) Each Copermittee must identify the roles and responsibilities of its various municipal departments in implementing the structural BMP requirements, including each stage of a project from application review and approval through BMP maintenance and inspections.

(c) Each Copermittee must require and confirm that appropriate easements and ownerships are properly recorded in public records and the information is conveyed to all appropriate parties when there is a change in project or site ownership.

(d) Each Copermittee must require and confirm that prior to occupancy and/or intended use of any portion of the Priority Development Project, each structural BMP is inspected to verify that it has been constructed and is operating in compliance with all of its specifications, plans, permits, ordinances, and the requirements of this Order.

(2) Priority Development Project Inventory and Prioritization

(a) Each Copermittee must develop, maintain, and update at least annually, a watershed-based database to track and inventory all Priority Development Projects and associated structural BMPs within its jurisdiction. Inventories must be accurate and complete beginning from December 2002 for the San Diego County Copermittees, February 2003 for the Orange County Copermittees, and July 2005 for the Riverside County Copermittees. The use of an automated database system, such as GIS, is highly recommended. The database must include, at a minimum, the following information:

(i) Priority Development Project location (address and hydrologic subarea);

(ii) Descriptions of structural BMP type(s);

(iii) Date(s) of construction;

(iv) Party responsible for structural BMP maintenance;

(v) Dates and findings of structural BMP maintenance verifications; and

(vi) Corrective actions and/or resolutions, when applicable.

(b) Each Copermittee must prioritize the Priority Development Projects with structural BMPs within its jurisdiction. The designation of Priority Development Projects as high priority must consider the following:

(i) The highest water quality priorities identified in the Water Quality Improvement Plan;

(ii) Receiving water quality;

(iii) Number and sizes of structural BMPs;

(iv) Recommended maintenance frequency of structural BMPs;

(v) Likelihood of operation and maintenance issues of structural BMPs;

(vi) Land use and expected pollutants generated; and

(vii) Compliance record.

(3) Structural BMP Maintenance Verifications and Inspections

Each Copermittee is required to verify that structural BMPs on each Priority Development Project are adequately maintained, and continue to operate effectively to remove pollutants in storm water to the MEP through inspections, self-certifications, surveys, or other equally effective approaches.

(a) All (100 percent) of the structural BMPs at Priority Development Projects that are designated as high priority must be inspected directly by the Copermittee annually prior to each rainy season;

(b) For verifications performed through a means other than direct Copermittee inspection, adequate documentation must be required by the Copermittee to provide assurance that the required maintenance of structural BMPs at each Priority Development Project has been completed; and

(c) Appropriate follow-up measures (including re-inspections, enforcement, etc.) must be conducted to ensure that structural BMPs at each Priority Development Project continue to reduce pollutants in storm water to the MEP as originally designed.

f. DEVELOPMENT PROJECT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all development projects, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

4. Construction Management

Each Copermittee must implement a construction management program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. Project Approval Process

Prior to issuance of any local permit(s) that allows the commencement of construction projects that involve ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff, each Copermittee must:

(1) Require a pollution control plan, construction BMP plan, and/or an erosion and sediment control plan, to be submitted by the project applicant to the Copermittee;

(2) Confirm the pollution control plan, construction BMP plan, and/or erosion and sediment control plan, complies with the local grading ordinance, other applicable local ordinances, and the requirements of this Order;

(3) Confirm the pollution control, construction BMP, and/or erosion and sediment control plan, includes seasonally appropriate and effective BMPs and management measures described in Provision E.4.c, as applicable to the project; and

(4) Verify that the project applicant has obtained coverage under the statewide Construction General Permit (Order 2012-0006-DWQ or subsequent Order), if applicable.

b. Construction Site Inventory and Tracking

(1) Each Copermittee must maintain and update, at least quarterly, a watershed-based inventory of all construction projects issued a local permit that allows ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff. The use of an automated database system, such as GIS, is highly recommended. The inventory must include:

(a) Relevant contact information for each site (e.g., name, address, phone, and email for the owner and contractor);

(b) The basic site information including location (address and hydrologic subarea), Waste Discharge Identification (WDID) number (if applicable), size of the site, and approximate area of disturbance;

(c) Whether or not the site is considered a high threat to water quality, as defined in Provision E.4.b.(2) below;

(d) The project start and completion dates;

(e) The required inspection frequency, as defined in the Copermittee's jurisdictional runoff management program document;

(f) The date the Copermittee accepted or approved the pollution control plan, construction BMP plan, and/or erosion and sediment control plan; and

(g) Whether or not there are ongoing enforcement actions administered to the site.

(2) Each Copermittee must identify all construction sites within its jurisdiction that represent a high threat to downstream surface water quality. The designation of construction sites as high threat to water quality must consider the following:

(a) Sites located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Sites located within the same hydrologic subarea and tributary to a water body segment listed as impaired for sediment on the CWA section 303(d) List;

(c) Sites located within, directly adjacent to, or discharging directly to a receiving water within an ESA; and

(d) Other sites determined by the Copermittees or the San Diego Water Board as a high threat to water quality.

c. CONSTRUCTION SITE BMP IMPLEMENTATION

Each Copermittee must implement, or require the implementation of effective BMPs to reduce discharges of pollutants in storm water from construction sites to the MEP, and effectively prohibit non-storm water discharges from construction sites into the MS4. These BMPs must be site specific, seasonally appropriate, and construction phase appropriate. BMPs must be implemented at each construction site year round. Dry season BMP implementation must plan for and address unseasonal rain events that may occur during the dry season (May 1 through September 30). Copermittees must implement, or require the implementation of, BMPs in the following categories:

(1) Project Planning;

(2) Good Site Management "Housekeeping", including waste management;

(3) Non-storm Water Management;

(4) Erosion Control;

(5) Sediment Control;

(6) Run-on and Run-off Control; and

(7) Active/Passive Sediment Treatment Systems, where applicable.

d. CONSTRUCTION SITE INSPECTIONS

Each Copermittee must conduct construction site inspections to require and confirm compliance with its local permits and applicable local ordinances, and the requirements of this Order. Priority for site inspections must consider threat to water quality pursuant to Provision E.4.b as well as the nature of the construction activity, topography, and the characteristics of soils and receiving water quality.

(1) Inspection Frequency

(a) Each Copermittee must conduct inspections at all inventoried sites, including high threat to water quality sites, at an appropriate frequency for each phase of construction to confirm the site reduces the discharge of pollutants in storm water from construction sites to the MEP, and effectively prohibits non-storm water discharges from entering the MS4.

(b) Each Copermittee must establish appropriate inspection frequencies for high threat to water quality sites, and all other sites, for each phase of construction. Inspection frequencies appropriate for addressing the highest water quality priorities identified in the Water Quality Improvement Plan, and for complying with the requirements of this Order must be identified in each Copermittee's jurisdictional runoff management program document.

(c) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e., re-inspection, enforcement) necessary to require and confirm site compliance with its local permits and applicable local ordinances, and the requirements of this Order.

(2) Inspection Content

Inspections of construction sites by the Copermittee must include, at a minimum:

(a) Verification of coverage under the Construction General Permit (Notice of Intent (NOI) and/or WDID number) during initial inspections, when applicable;

(b) Assessment of compliance with its local permits and applicable local ordinances related to pollution prevention, including the implementation and maintenance of applicable BMPs;

(c) Assessment of BMP adequacy and effectiveness;

(d) Visual observations of actual non-storm water discharges;

(e) Visual observations of actual or potential discharge of sediment and/or construction related materials from the site;

(f) Visual observations of actual or potential illicit connections; and

(g) If any violations are found and BMP corrections are needed, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried construction sites. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Site name, location (address and hydrologic subarea), and WDID number (if applicable);

(b) Inspection date;

(c) Approximate amount of rainfall since last inspection;

(d) Description of problems observed with BMPs and indication of need for BMP addition/repair/replacement and any scheduled re-inspection, and date of re-inspection;

(e) Descriptions of any other specific inspection comments which must, at a minimum, include rationales for longer compliance time;

(f) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(g) Resolution of problems noted and date problems fixed.

e. CONSTRUCTION SITE ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried construction sites, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

5. Existing Development Management

Each Copermittee must implement an existing development management program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. EXISTING DEVELOPMENT INVENTORY AND TRACKING

Each Copermittee must maintain, and update at least annually, a watershed-based inventory of the existing development within its jurisdiction that may discharge a pollutant load to and from the MS4. The use of an automated database system, such as GIS, is highly recommended. The inventory must, at a minimum, include:

(1) Name, location (hydrological subarea and address, if applicable) of the following types of existing development with its jurisdiction:

(a) Commercial facilities or areas;

(b) Industrial facilities;

(c) Municipal facilities, including:

(i) MS4 and related structures;[27]
(ii) Roads, streets, and highways;
(iii) Parking facilities;
(iv) Municipal airfields;
(v) Parks and recreation facilities;
(vi) Flood management facilities, flood control devices and structures;
(vii) Operating or closed municipal landfills;
(viii) Publicly owned treatment works (including water and wastewater treatment plants) and sanitary sewer collection systems;
(ix) Corporate yards, including maintenance and storage yards for materials, waste, equipment, and vehicles;

[27] The inventory may refer to the MS4 map required to be maintained pursuant to Provision E.2.b.(1).

(x) Hazardous waste collection facilities;

(xi) Other treatment, storage or disposal facilities for municipal waste; and

(xii) Other municipal facilities that the Copermittee determines may contribute a significant pollutant load to the MS4.

(d) Residential areas, which may be designated by one or more of the following:

(i) Residential management area;

(ii) Drainage basin or area;

(iii) Land use (e.g., single family, multi-family, rural);

(iv) Neighborhood;

(v) Common Interest Area;

(vi) Home Owner Association;

(vii) Mobile home park; and/or

(viii) Other designations accepted by the San Diego Water Board Executive Officer.

(2) A description of the facility or area, including the following information:

(a) Classification as commercial, industrial, municipal, or residential;

(b) Status of facility or area as active or inactive;

(c) Identification if a business is a mobile business;

(d) SIC Code or NAICS Code, if applicable;

(e) Industrial General Permit NOI and/or WDID number, if applicable;

(f) Identification if a residential area is or includes a Common Interest Area / Home Owner Association, or mobile home park;

(g) Identification of pollutants generated and potentially generated by the facility or area;

(h) Whether the facility or area is adjacent to an ESA;

(i) Whether the facility or area is tributary to and within the same hydrologic subarea as a water body segment listed as impaired on the CWA section 303(d) List and generates pollutants for which the water body segment is impaired; and

(3) An annually updated map showing the location of inventoried existing development, watershed boundaries, and water bodies.

b. EXISTING DEVELOPMENT BMP IMPLEMENTATION AND MAINTENANCE

Each Copermittee must designate a minimum set of BMPs required for all inventoried existing development, including special event venues. The designated minimum BMPs must be specific to facility or area types and pollutant generating activities, as appropriate.

(1) Commercial, Industrial, and Municipal Facilities and Areas

(a) Pollution Prevention

Each Copermittee must require the use of pollution prevention methods by the commercial, industrial, and municipal facilities and areas in its inventoried existing development to address the priorities and strategies in the Water Quality Improvement Plan.

(b) BMP Implementation

Each Copermittee must require the implementation of designated BMPs at commercial facilities and areas, industrial facilities, and implement designated BMPs at municipal facilities in its inventoried existing development.

(c) BMP Operation and Maintenance

(i) Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development.

(ii) Each Copermittee must implement a schedule of operation and maintenance activities for its MS4 and related structures (including but not limited to catch basins, storm drain inlets, detention basins, etc.), and verify proper operation of all its municipal structural treatment controls designed to reduce pollutants (including floatables) in storm water discharges to or from its MS4s and related drainage structures. Operation and maintenance activities may include, but is not limited to, the following:

[a] Inspections of the MS4 and related structures;
[b] Cleaning of the MS4 and related structures; and
[c] Proper disposal of materials removed from cleaning of the MS4 and related structures.

(iii) Each Copermittee must implement a schedule of operation and maintenance for public streets, unpaved roads, paved roads, and paved highways within its jurisdiction to minimize pollutants that can be discharged in storm water.

(iv) Each Copermittee must implement controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers. Copermittees that operate both a municipal sanitary sewer system and a MS4 must implement controls and measures to prevent and eliminate seeping sewage from infiltrating the MS4. Copermittees that do not operate both a municipal sanitary sewer system and a MS4 must coordinate with sewering agencies to keep themselves informed of relevant and appropriate maintenance activities and sanitary sewage projects in their jurisdiction that may cause or contribute to seepage of sewage into the MS4.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must require the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from commercial facilities and areas and industrial facilities, and implement BMPs at municipal facilities in its inventoried existing development. Such BMPs must include, as appropriate, educational activities, permits, certifications and other measures for applicators and distributors.

(2) <u>Residential Areas</u>

(a) Pollution Prevention

Each Copermittee must promote and encourage the use of pollution prevention methods, where appropriate, by the residential areas in its inventoried existing development.

(b) BMP Implementation

Each Copermittee must promote and encourage the implementation of designated BMPs at residential areas in its inventoried existing development.

(c) BMP Operation and Maintenance

Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at residential areas in its inventoried existing development.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must promote and encourage the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the

application, storage, and disposal of pesticides, herbicides and fertilizers from residential areas in its inventoried existing development.

c. EXISTING DEVELOPMENT INSPECTIONS

Each Copermittee must conduct inspections of inventoried existing development to ensure compliance with applicable local ordinances and permits, and the requirements of this Order.

(1) Inspection Frequency

(a) Each Copermittee must establish appropriate inspection frequencies for inventoried existing development in accordance with the following requirements:

(i) At a minimum, inventoried existing development must be inspected once every five years utilizing one or more of the following methods:

[a] Drive-by inspections by Copermittee municipal and contract staff;
[b] Onsite inspections by Copermittee municipal and contract staff; and/or
[c] Visual inspections of publicly accessible inventoried facilities or areas by volunteer monitoring or patrol programs that have been trained by the Copermittee;

(ii) The frequency of inspections must be appropriate to confirm that BMPs are being implemented to reduce the discharge of pollutants in storm water from the MS4 to the MEP and effectively prohibit non-storm water discharges to the MS4;

(iii) The frequency of inspections must be based on the potential for a facility or area to discharge non-storm water and pollutants in storm water, and should reflect the priorities set forth in the Water Quality Improvement Plan;

(iv) Each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development;[28] and

(v) Inventoried existing development must be inspected by the Copermittee, as needed, in response to valid public complaints.

(b) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e. education and outreach, re-inspection, enforcement)

[28] If any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspection may count toward the total annual inspection requirement. This requirement excludes linear municipal facilities (i.e., MS4 linear channels, sanitary sewer collection systems, streets, roads and highways).

necessary to require and confirm compliance with its applicable local ordinances and permits and the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

(2) Inspection Content

(a) Inspections of existing development must include, at a minimum:

(i) Visual inspections for the presence of actual non-storm water discharges;

(ii) Visual inspections for the presence of actual or potential discharge of pollutants;

(iii) Visual inspections for the presence of actual or potential illicit connections; and

(iv) Verification that the description of the facility or area in the inventory, required pursuant to Provision E.5.a.(2), has not changed.

(b) Onsite inspections of existing development by the Copermittee must include, at a minimum:

(i) Assessment of compliance with its applicable local ordinances and permits related to non-storm water and storm water discharges and runoff;

(ii) Assessment of the implementation of the designated BMPs;

(iii) Verification of coverage under the Industrial General Permit, when applicable; and

(iv) If any problems or violations are found, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried existing development. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Name and location of the facility or area (address and hydrologic subarea) consistent with the inventory name and location, pursuant to Provision E.5.a.(1);

(b) Inspection and re-inspection date(s);

(c) Inspection method(s) (i.e. drive-by, onsite);

(d) Observations and findings from the inspection(s);

(e) For onsite inspections of existing development by Copermittee municipal or contract staff, the records must also include, as applicable:

(i) Description of any problems or violations found during the inspection(s);

(ii) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(iii) The date problems or violations were resolved.

d. EXISTING DEVELOPMENT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried existing development, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

e. RETROFITTING AND REHABILITATING AREAS OF EXISTING DEVELOPMENT

(1) Retrofitting Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to retrofit areas of existing development within its jurisdiction to address identified sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify areas of existing development as candidates for retrofitting, focusing on areas where retrofitting will address pollutants and/or stressors that contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for retrofitting projects may be utilized to reduce pollutants that may be discharged in storm water from areas of existing development, and/or address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of retrofitting projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting projects; and

(e) Where retrofitting projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional retrofitting projects (i.e. projects that can receive and/or treat storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment) adjacent to and/or downstream of the areas of existing development.

(2) Stream, Channel and/or Habitat Rehabilitation in Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to rehabilitate streams, channels, and/or habitats in areas of existing development within its jurisdiction to address the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify streams, channels, and/or habitats in areas of existing development as candidates for rehabilitation, focusing on areas where stream, channel, and/or habitat rehabilitation projects will address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for stream, channel, and/or habitat rehabilitation projects may be utilized to address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters, rehabilitate channelized or hydromodified streams, restore wetland and riparian habitat, restore watershed functions, and/or restore beneficial uses of receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of stream, channel, and/or habitat rehabilitation projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance stream, channel, and/or habitat rehabilitation projects; and

(e) Where stream, channel, and/or habitat rehabilitation projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional stream, channel, and/or habitat rehabilitation projects (i.e. projects that can receive storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment).

6. Enforcement Response Plans

Each Copermittee must develop and implement an Enforcement Response Plan as part of its jurisdictional runoff management program document. The Enforcement Response Plan must describe the applicable approaches and options to enforce its legal authority established pursuant to Provision E.1, as necessary, to achieve compliance with the requirements of this Order. The Enforcement Response Plan must be in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include the following:

a. Enforcement Response Plan Components

The Enforcement Response Plan must include the following individual components:

(1) Illicit Discharge Detection and Elimination Enforcement Component;

(2) Development Planning Enforcement Component;

(3) Construction Management Enforcement Component; and

(4) Existing Development Enforcement Component.

b. Enforcement Response Approaches and Options

Each component of the Enforcement Response Plan must describe the enforcement response approaches that the Copermittee will implement to compel compliance with its statutes, ordinances, permits, contracts, orders, or similar means, and the requirements of this Order. The description must include the protocols for implementing progressively stricter enforcement responses. The enforcement response approaches must include appropriate sanctions to compel compliance, including, at a minimum, the following tools or their equivalent:

(1) Verbal and written notices of violation;

(2) Cleanup requirements;

(3) Fines;

(4) Bonding requirements;

(5) Administrative and criminal penalties;

(6) Liens;

(7) Stop work orders; and

(8) Permit and occupancy denials.

c. CORRECTION OF VIOLATIONS

(1) Violations must be corrected in a timely manner with the goal of correcting the violations within 30 calendar days after the violations are discovered, or prior to the next predicted rain event, whichever is sooner.

(2) If more than 30 calendar days are required to achieve compliance, then a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

d. ESCALATED ENFORCEMENT

(1) The Enforcement Response Plan must include a definition of "escalated enforcement." Escalated enforcement must include any enforcement scenario where a violation or other non-compliance is determined to cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan. Escalated enforcement may be defined differently for development planning, construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas.

(2) Where the Copermittee determines escalated enforcement is not required, a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

(3) Escalated enforcement actions must continue to increase in severity, as necessary, to compel compliance as soon as possible.

e. REPORTING OF NON-COMPLIANT SITES

(1) Each Copermittee must notify the San Diego Water Board in writing within five (5) calendar days of issuing escalated enforcement (as defined in the Copermittee's Enforcement Response Plan) to a construction site that poses a significant threat to water quality as a result of violations or other non-compliance with its permits and applicable local ordinances, and the

requirements of this Order. Written notification may be provided electronically by email to the appropriate San Diego Water Board staff.

(2) Each Copermittee must notify the San Diego Water Board any persons required to obtain coverage under the statewide Industrial General Permit and Construction General Permit and failing to do so, within five (5) calendar days from the time the Copermittee become aware of the circumstances. Written notification may be provided electronically by email to Nonfilers_R9@waterboards.ca.gov.

7. Public Education and Participation

Each Copermittee must implement, individually or with other Copermittees, a public education and participation program in accordance with the strategies identified in the Water Quality Improvement Plan to promote and encourage the development of programs, management practices, and behaviors that reduce the discharge of pollutants in storm water to the MEP, prevent controllable non-storm water discharges from entering the MS4, and protect water quality standards in receiving waters. The public education and participation program must be implemented in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include, at a minimum, the following requirements:

a. PUBLIC EDUCATION

The public education program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) Educational activities, public information activities, and other appropriate outreach activities intended to reduce pollutants associated with the application of pesticides, herbicides and fertilizer and other pollutants of concern in storm water discharges to and from its MS4 to the MEP, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed to address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(2) Educational activities, public information activities, and other appropriate outreach activities to facilitate the proper management and disposal of used oil and toxic materials; and

(3) Appropriate education and training measures for specific target audiences, such as construction site operators, residents, underserved target audiences and school-aged children, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed, based on high risk behaviors and pollutants of concern.

b. PUBLIC PARTICIPATION

The public participation program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) A process for members of the public to participate in updating the highest priority water quality conditions, numeric goals, and water quality improvement strategies in the Water Quality Improvement Plan;

(2) Opportunities for members of the public to participate in providing the Copermittee recommendations for improving the effectiveness of the water quality improvement strategies implemented within its jurisdiction; and

(3) Opportunities for members of the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or protection of the quality of receiving waters.

8. Fiscal Analysis

a. Each Copermittee must secure the resources necessary to meet all the requirements of this Order.

b. Each Copermittee must conduct an annual fiscal analysis of its jurisdictional runoff management program in its entirety. The fiscal analysis must include the following:

(1) Identification of the various categories of expenditures necessary to implement the requirements of this Order, including a description of the specific capital, operation and maintenance, and other expenditure items to be accounted for in each category of expenditures;

(2) The staff resources needed and allocated to meet the requirements of this Order, including any development, implementation, and enforcement activities required;

(3) The estimated expenditures for Provisions E.8.b.(1) and E.8.b.(2) for the current fiscal year; and

(4) The source(s) of funds that are proposed to meet the necessary expenditures described in Provisions E.8.b.(1) and E.8.b.(2), including legal restrictions on the use of such funds, for the current fiscal year and next fiscal year.

c. Each Copermittee must submit a summary of the annual fiscal analysis with each Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3).

d. Each Copermittee must provide the documentation used to develop the summary of the annual fiscal analysis upon request by the San Diego Water Board.

F. REPORTING

The purpose of this provision is to determine and document compliance with the requirements set forth in this Order. The goal of reporting is to communicate to the San Diego Water Board and the people of the State of California the implementation status of each jurisdictional runoff management program and compliance with the requirements of this Order. This goal is to be accomplished through the submittal of specific deliverables to the San Diego Water Board by the Copermittees.

1. Water Quality Improvement Plans

The Copermittees for each Watershed Management Area must develop and submit the Water Quality Improvement Plan in accordance with the following requirements:

a. WATER QUALITY IMPROVEMENT PLAN DEVELOPMENT

Each Water Quality Improvement Plan must be developed in accordance with the following process:

(1) Public Participation Process

The Copermittees must implement a public participation process to solicit data, information, and recommendations to be utilized in the development of the Water Quality Improvement Plan. The public participation process must include the following:

(a) The Copermittees must develop a publicly available and noticed schedule of the opportunities for the public to participate and provide comments during the development of the Water Quality Improvement Plan. The schedule may be adjusted as necessary by the Copermittees, provided the public is provided timely notification of the changes to the schedule.

(b) The Copermittees must form a Water Quality Improvement Consultation Panel to provide recommendations during the development of the Water Quality Improvement Plan. The Water Quality Improvement Consultation Panel must consist of at least the following members:

(i) A representative of the San Diego Water Board;

(ii) A representative of the environmental community familiar with the water quality conditions of concern of the receiving waters in the Watershed Management Area, preferably from an environmental interest group associated with a water body within the Watershed Management Area; and

(iii) A representative of the development community familiar with the opportunities and constraints for implementing structural BMPs, retrofitting projects, and stream, channel or habitat rehabilitation

projects in the Watershed Management Area, preferably with relevant engineering, hydrology, and/or geomorphology experience in the Watershed Management Area.

(c) The Copermittees must coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public time and opportunity to participate during the development of the Water Quality Improvement Plans.

(2) Priority Water Quality Conditions

(a) The Copermittees must solicit data, information and recommendations from the public to be utilized in the development and identification of the priority water quality conditions and potential water quality improvement strategies for the Watershed Management Area.

(b) The Copermittees must review the priority water quality conditions the Copermittees plan on including in the Water Quality Improvement Plan with the Water Quality Improvement Consultation Panel to receive recommendations or concurrence.

(c) The Copermittees must consider revisions to the priority water quality conditions based on recommendations from the Water Quality Improvement Consultation Panel.

(d) The Copermittees must include all the potential water quality improvement strategies identified by the public and the Water Quality Improvement Consultation Panel with the submittal of the priority water quality conditions to the San Diego Water Board.

(e) The Copermittees must submit the Water Quality Improvement Plan requirements of Provision B.2 to the San Diego Water Board as early as 6 months and no later than 12 months after the commencement of coverage under this Order. Upon receipt, the San Diego Water Board will issue a public notice and release the proposed priority water quality conditions and potential water quality improvement strategies for public review and comment for a minimum of 30 days.

(f) The Copermittees must consider revisions to the priority water quality conditions and potential water quality improvement strategies developed pursuant to Provision B.2 based on public comments received by the close of the comment period.

(3) Water Quality Improvement Goals, Strategies and Schedules

(a) The Copermittees must solicit recommendations from the public on potential numeric goals for the highest priority water quality conditions

identified for the Watershed Management Area, and recommendations on the strategies that should be implemented to achieve the potential numeric goals.

(b) The Copermittees must consult with the Water Quality Improvement Consultation Panel and consider revisions to the following items based on the Panel's recommendations:

(i) The numeric goals and schedules the Copermittees propose to include in the Water Quality Improvement Plan;

(ii) The water quality improvement strategies and schedules the Copermittees propose to implement in the Watershed Management Area and include in the Water Quality Improvement Plan; and

(iii) If the Copermittees choose to implement Provision B.3.b.(4), the results of the Watershed Management Area Analysis the Copermittees proposed to incorporate into the Water Quality Improvement Plan.

(c) The Copermittees must submit the Water Quality Improvement Plan requirements of Provision B.3 to the San Diego Water Board as early as 9 months and no later than 18 months after the commencement of coverage under this Order. Upon receipt, the San Diego Water Board will issue a public notice and release the proposed water quality improvement goals, strategies and schedules for public review and comment for a minimum of 30 days.

(d) The Copermittees must consider revisions to the water quality improvement goals, strategies and schedules developed pursuant to Provision B.3 based on public comments received by the close of the comment period.

b. WATER QUALITY IMPROVEMENT PLAN SUBMITTAL AND IMPLEMENTATION

(1) Within 24 months after the commencement of coverage under this Order, the Copermittees for each Watershed Management Area must submit a complete Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order to the San Diego Water Board. The San Diego Water Board will issue a public notice and release the Water Quality Improvement Plan for public review and comment for a minimum of 30 days.

(2) The Copermittees must consider revisions to the Water Quality Improvement Plan based on written comments received by the close of the public comment period.

(3) The Copermittees must promptly submit any revisions to the Water Quality Improvement Plan to the San Diego Water Board no later than 60 days after the close of the public comment period.

(4) If issues concerning the Water Quality Improvement Plan are resolved informally through discussions among the Copermittees, the San Diego Water Board and interested parties, the San Diego Water Board Executive Officer may provide written notification of acceptance to the Copermittees that the Water Quality Improvement Plan meets the requirements of Provision B. However, if the Executive Officer determines that significant issues with the Water Quality Improvement Plan remain, the matter will be scheduled for San Diego Water Board consideration at a public meeting.

(5) The Copermittees must commence with implementation of the Water Quality Improvement Plan, in accordance with the water quality improvement strategies and schedules therein, upon written notification of acceptance with the Water Quality Improvement Plan by the San Diego Water Board Executive Officer.

(6) During implementation of the Water Quality Improvement Plan the Copermittees must correct any deficiencies in the Plan identified by the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report following a request by the Board to do so.

(7) The Water Quality Improvement Plan must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of receiving notification of acceptance with the Water Quality Improvement Plan by the San Diego Water Board Executive Officer.

2. Updates

a. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATES

Each Copermittee must update its jurisdictional runoff management program document in accordance with the following requirements:

(1) Each Copermittee is encouraged to seek public and key stakeholder participation and comments, as early and often as possible during the process of developing updates to its jurisdictional runoff management program document;

(2) Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E concurrent with the submittal of the Water Quality Improvement Plan. Each Copermittee must correct any deficiencies in the jurisdictional runoff management program document based on comments received from the San Diego Water Board in

the updates submitted with the Water Quality Improvement Plan Annual Report;

(3) Each Copermittee must submit updates to its jurisdictional runoff management program, with the supporting rationale for the modifications, either in the Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b;

(4) The Copermittee must revise proposed modifications to its jurisdictional runoff management program as directed by the San Diego Water Board Executive Officer; and

(5) Updated jurisdictional runoff management program documents must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of submitting the Water Quality Improvement Plan Annual Report.

b. BMP DESIGN MANUAL UPDATES

Each Copermittee must update its BMP Design Manual in accordance with the following requirements:

(1) Each Copermittee must update its BMP Design Manual to incorporate the requirements of Provisions E.3.a-d concurrent with the submittal of the Water Quality Improvement Plan. Each Copermittee must correct any deficiencies in the BMP Design Manual based on comments received from the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report;

(2) Subsequent updates to the BMP Design Manual must be consistent with the requirements of Provisions E.3.a-d and must be submitted as part of the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b; and

(3) Updated BMP Design Manuals must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of completing the update.

c. WATER QUALITY IMPROVEMENT PLAN UPDATES

(1) The Water Quality Improvement Plans must be updated in accordance with the following process:

(a) The Copermittees must develop and implement a public participation process to obtain data, information and recommendations for updating the Water Quality Improvement Plan. The public participation process must provide for a publicly available and noticed schedule of opportunities for the public to participate and provide comments during the development of updates to the Water Quality Improvement Plan;

(b) The Copermittees must consult with the Water Quality Improvement Consultation Panel on proposed updates of the Water Quality Improvement Plan, and consider the Water Quality Improvement Consultation Panel's recommendations in finalizing the proposed updates;

(c) The Copermittees for each Watershed Management Area must submit 1) proposed updates to the Water Quality Improvement Plan and supporting rationale, and 2) recommendations received from the public and the Water Quality Improvement Consultation Panel and the rationale for the requested updates, either in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The updates submitted will be deemed accepted for inclusion in the Water Quality Improvement Plan ninety (90) days after submission unless otherwise directed in writing by the San Diego Water Board Executive Officer;

(d) The Copermittees must revise the requested updates as directed by the San Diego Water Board Executive Officer; and

(e) Updated Water Quality Improvement Plans must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance of the requested updates by the San Diego Water Board.

(2) No later than six months following Office of Administrative Law and USEPA approval of any TMDL Basin Plan amendment with wasteload allocations (WLAs) assigned to the Copermittees during the term of this Order, the Copermittees must initiate an update to the applicable Water Quality Improvement Plans in accordance with Provision F.1 or Provision F.2.c.(1) to incorporate the requirements of the TMDL WLAs.

3. Progress Reporting

a. Progress Report Presentations

The Copermittees for each Watershed Management Area must periodically appear before the San Diego Water Board, as requested by the Board, to provide progress reports on the implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs.

b. Annual Reports

(1) Transitional Jurisdictional Runoff Management Program Annual Reports

(a) Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) no later than October 31 of each year for each jurisdictional runoff management program reporting period (i.e. July 1 to June 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted.

(b) Each Copermittee must submit the information on the Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) specific to the area within its jurisdiction in each Watershed Management Area.

(c) In addition to submitting the Jurisdictional Runoff Management Program Annual Report Form during the transitional reporting period, each Copermittee may continue to utilize and submit the jurisdictional runoff management program annual reporting format of its previous NPDES permit until the first Water Quality Improvement Plan Annual Report is required to be submitted.

(2) Transitional Monitoring and Assessment Program Annual Reports

The Copermittees for each Watershed Management Area must submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted under this Order. The Transitional Monitoring and Assessment Program Annual Reports must include:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1.a and D.2.a, summarized and presented in tabular and graphical form; and

(b) The findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

(3) Water Quality Improvement Plan Annual Reports

The Copermittees for each Watershed Management Area must submit a Water Quality Improvement Plan Annual Report for each reporting period no later than January 31 of the following year. The annual reporting period consists of two different periods: 1) July 1 to June 30 of the following year for the jurisdictional runoff management programs, 2) October 1 to September 30 of the following year for the monitoring and assessment programs. The Water Quality Improvement Plan Annual Reports must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Each Annual Report must include the following:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, summarized and presented in tabular and graphical form;

(b) The progress of the special studies required pursuant to Provision D.3, and the findings, interpretations and conclusions of a special study, or each phase of a special study, upon its completion;

(c) The findings, interpretations and conclusions from the assessments required pursuant to Provision D.4;

(d) The progress of implementing the Water Quality Improvement Plan, including, but not limited to, the following:

(i) The progress toward achieving the interim and final numeric goals for the highest water quality priorities for the Watershed Management Area;

(ii) The water quality improvement strategies that were implemented and/or no longer implemented by each of the Copermittees during the reporting period and previous reporting periods;

(iii) The water quality improvement strategies planned for implementation during the next reporting period;

(iv) Proposed modifications to the water quality improvement strategies, the public comments received and the supporting rationale for the proposed modifications;

(v) Previous modifications or updates incorporated into the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document and implemented by the Copermittees in the Watershed Management Area; and

(vi) Proposed modifications or updates to the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document;

(e) A completed Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) for each Copermittee in the Watershed Management Area, certified by a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative; and

(f) Each Copermittee must provide any data or documentation utilized in developing the Water Quality Improvement Plan Annual Report upon request by the San Diego Water Board. Any Copermittee monitoring data utilized in developing the Water Quality Improvement Plan Annual Report must be uploaded to the California Environmental Data Exchange Network (CEDEN).[29] Any Copermittee monitoring and assessment data utilized in developing the Water Quality Improvement Plan Annual Report must be available for access on the Regional Clearinghouse required pursuant to Provision F.4.

c. Regional Monitoring and Assessment Report

(1) The Copermittees must submit a Regional Monitoring and Assessment Report no later than 180 days prior to the expiration date of this Order. The Regional Monitoring and Assessment Report may be submitted as part of the Report of Waste Discharge required pursuant to Provision F.5.b. In preparing the report the Copermittees must consider the receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, and the findings, interpretations, and conclusions from the assessments required pursuant to Provision D.4. Based on these considerations the report must assess the following:

(a) The beneficial uses of the receiving waters within the San Diego Region that are supported and not adversely affected by the Copermittees' MS4 discharges;

(b) The beneficial uses of the receiving waters within the San Diego Region that are adversely impacted by the Copermittees' MS4 discharges;

(c) The progress toward protecting the beneficial uses in the receiving waters within the San Diego Region from the Copermittees' discharges; and

[29] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

(d) Pollutants or conditions of emerging concern that may impact beneficial uses in the receiving waters within the San Diego Region.

(2) The Regional Monitoring and Assessment Report must include recommendations for improving the implementation and assessment of the Water Quality Improvement Plans and jurisdictional runoff management programs.

(3) Each Copermittee must provide any data or documentation utilized in developing the Regional Monitoring and Assessment Report upon request by the San Diego Water Board. Any Copermittee monitoring and assessment data utilized in developing the Regional Monitoring and Assessment Report must be available for access on the Regional Clearinghouse required pursuant to Provision F.4.

4. Regional Clearinghouse

The Copermittees must develop, update, and maintain an internet-based Regional Clearinghouse that is made available to the public no later than 18 months after the effective date of this Order.[30]

a. The Copermittees, through the Regional Clearinghouse, must make the following documents and data available for access, and organized by Watershed Management Area. The documents and data may be linked to other internet-based data portals and databases where the original documents are stored:

(1) Water Quality Improvement Plan for the Watershed Management Area, and all updated versions with date of update;

(2) Annual Reports for the Watershed Management Area;

(3) Jurisdictional Runoff Management Program document for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(4) BMP Design Manual for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(5) Reports from special studies (e.g. source identification, BMP effectiveness assessment) conducted in the Watershed Management Area;

[30] The Copermittees may develop, update and maintain the clearinghouse(s) of other Copermittees or agencies.

(6) Monitoring data collected pursuant to Provision D for each Watershed Management Area must be uploaded to CEDEN,[31] with links to the uploaded data; and

(7) Available GIS data, layers, and/or shapefiles used to develop the maps generated and maintained by the Copermittees for the Water Quality Improvement Plans, Annual Reports, and jurisdictional runoff management program documents.

b. The Copermittees, through the Regional Clearinghouse, must make the following information and documents available for access:

(1) Contact information (point of contact, phone number, email address, and mailing address) for each Copermittee;

(2) Public hotline number for reporting non-storm water and illicit discharges for each Copermittee;

(3) Email address for reporting non-storm water and illicit discharges for each Copermittee;

(4) Link to each Copermittee's website, if available, where the public may find additional information about the Copermittee's storm water management program and for requesting records for the implementation of its program;

(5) Information about opportunities for the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or protection of the quality of receiving waters; and

(6) Reports from regional monitoring programs in which the Copermittees participate (e.g. Southern California Monitoring Coalition, Southern California Coastal Water Research Project Bight Monitoring);

(7) Regional Monitoring and Assessment Reports; and

(8) Any other information, data, and documents the Copermittees determine as appropriate for making available to the public.

[31] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

5. Report of Waste Discharge

a. The Orange County Copermittees and the Riverside County Copermittees are required to submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders. The San Diego Water Board will review and consider the Reports of Waste Discharge to determine whether modification to this Order, pursuant to the requirements of Provision H, will be required prior to the Orange County Copermittees and/or Riverside County Copermittees obtaining coverage under this Order. The current Orders for the Orange County Copermittees and Riverside County Copermittees are rescinded upon the date of effective coverage under this Order except for enforcement purposes.

b. The Copermittees subject to the requirements of this Order must submit to the San Diego Water Board a complete Report of Waste Discharge as an application for the re-issuance of this Order and NPDES permit. The Report of Waste Discharge must be submitted no later than 180 days in advance of the expiration date of this Order. The Report of Waste Discharge must contain the following minimum information:

(1) Names and addresses of the Copermittees;

(2) Names and titles of the primary contacts of the Copermittees;

(3) Proposed changes to the Copermittees' Water Quality Improvement Plans and the supporting justification;

(4) Proposed changes to the Copermittees' jurisdictional runoff management programs and the supporting justification;

(5) Any other information necessary for the re-issuance of this Order;

(6) Any information to be included as part of the Report of Waste Discharge pursuant to the requirements of this Order; and

(7) Any other information required by federal regulations for NPDES permit reissuance.

6. Application for Early Coverage

a. The Orange County Copermittees, collectively, or Riverside County Copermittees, collectively, may apply for early coverage under this Order by submitting a Report of Waste Discharge Form 200, with a written request for early coverage under this Order.

b. The San Diego Water Board will review the application for early coverage. A notification of coverage under this Order will be issued to the Copermittees in the

respective county by the San Diego Water Board upon completion of the early coverage application requirements. The effective coverage date will be specified in the notification of coverage. The Copermittees in the respective county are authorized to have MS4 discharges pursuant to the requirements of this Order starting on the effective coverage date specified in the notification of coverage. The existing Order for the respective county is rescinded upon the effective coverage date specified in the notification of coverage except for enforcement purposes.

7. Reporting Provisions

Each Copermittee must comply with all the reporting and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

G. PRINCIPAL WATERSHED COPERMITTEE RESPONSIBILITIES

1. The Copermittees within each Watershed Management Area must designate a Principal Watershed Copermittee and notify the San Diego Water Board of the name of the Principal Watershed Copermittee. An individual Copermittee should not be designated a Principal Watershed Copermittee for more than two Watershed Management Areas. The notification may be submitted with the Water Quality Improvement Plan required pursuant to Provision F.1 of this Order.

2. The Principal Watershed Copermittee is responsible for, at a minimum, the following:

a. Serving as liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues, and when necessary and appropriate, representing the Copermittees in the Watershed Management Area before the San Diego Water Board;

b. Facilitating the development of the Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order;

c. Coordinating the submittal of the deliverables required by Provisions F.1, F.2, F.3.a, and F.3.b of this Order; and

d. Coordinating and developing, with the other Principal Watershed Copermittees, the requirements of Provisions F.3.c, F.4, and F.5.b of this Order.

3. The Principal Watershed Copermittee is not responsible for ensuring that the other Copermittees within the Watershed Management Area are in compliance with the requirements of this Order. Each Copermittee within the Watershed Management Area is responsible for complying with the requirements of this Order.

H. MODIFICATION OF ORDER

1. Modifications of the Order may be initiated by the San Diego Water Board or by the Copermittees. Requests by Copermittees must be made to the San Diego Water Board.

2. Minor modifications to the Order may be made by the San Diego Water Board where the proposed modification complies with all the prohibitions and limitations, and other requirements of this Order.

3. This Order may also be re-opened and modified, revoked and, reissued or terminated in accordance with the provisions of 40 CFR 122.44, 122.62 to 122.64, and 124.5. Causes for taking such actions include, but are not limited to, failure to comply with any condition of this Order and permit, and endangerment to human health or the environment resulting from the permitted activity.

4. This Order may be re-opened for modification for cause including but not limited to the following:

a. The State Water Board determines that revisions are warranted, and the San Diego Water Board concurs that revisions are necessary to those provisions of the Order addressing compliance with water quality standards in the receiving water and/or those provisions of the Order establishing an iterative process for implementation of management practices to assure compliance with water quality standards in the receiving water;

b. An application for early coverage under this Order is received pursuant to Provision F.6;

c. Any of the TMDLs in Attachment E to this Order are amended in the Basin Plan by San Diego Water Board, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA;

d. The Basin Plan is amended by the San Diego Water Board to incorporate a new TMDL, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA; or

e. Updating or revising the monitoring and reporting requirements is determined to be necessary, at the discretion of the San Diego Water Board. Such modification(s) may include, but is (are) not limited to, revision(s) to: (i) implement recommendations from Southern California Coastal Water Research Project (SCCWRP), (ii) develop, refine, implement, and/or coordinate a regional monitoring program, (iii) develop and implement improved monitoring and assessment programs in keeping with San Diego Water Board Resolution No. R9-2012-0069, Resolution in Support of a Regional Monitoring Framework, and/or (iv) add provisions to require the Copermittees to evaluate and provide information on cost and values of the monitoring and reporting program.

5. The San Diego Water Board, after opportunity for public comment and a public hearing, will re-open and consider modifications to this Order when the Orange County Copermittees or the Riverside County Copermittees submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders.

I. STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

Each Copermittee must comply with all the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

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ATTACHMENT A

DISCHARGE PROHIBITIONS AND SPECIAL PROTECTIONS

1. Basin Plan Waste Discharge Prohibitions

California Water Code Section 13243 provides that a Regional Water Board, in a water quality control plan, may specify certain conditions or areas where the discharge of waste or certain types of waste is not permitted. The following waste discharge prohibitions in the Water Quality Control Plan for the San Diego Basin (Basin Plan) are applicable to any person, as defined by Section 13050(c) of the California Water Code, who is a citizen, domiciliary, or political agency or entity of California whose activities in California could affect the quality of waters of the state within the boundaries of the San Diego Region.

1. The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in California Water Code Section 13050, is prohibited.

2. The discharge of waste to land, except as authorized by waste discharge requirements or the terms described in California Water Code Section 13264 is prohibited.

3. The discharge of pollutants or dredged or fill material to waters of the United States except as authorized by a National Pollutant Discharge Elimination System (NPDES) permit or a dredged or fill material permit (subject to the exemption described in California Water Code Section 13376) is prohibited.

4. Discharges of recycled water to lakes or reservoirs used for municipal water supply or to inland surface water tributaries thereto are prohibited, unless this San Diego Water Board issues a NPDES permit authorizing such a discharge; the proposed discharge has been approved by the State Department of Health Services (DHS) and the operating agency of the impacted reservoir; and the discharger has an approved fail-safe long-term disposal alternative.

5. The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the San Diego Water Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

6. The discharge of waste in a manner causing flow, ponding, or surfacing on lands not owned or under the control of the discharger is prohibited, unless the discharge is authorized by the San Diego Water Board.

7. The dumping, deposition, or discharge of waste directly into waters of the state, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the San Diego Water Board.

8. Any discharge to a storm water conveyance system that is not composed entirely of "*storm water*" is prohibited unless authorized by the San Diego Water Board. [The federal regulations, 40 CFR 122.26(b)(13), define storm water as storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from firefighting activities.] [§122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

9. The unauthorized discharge of treated or untreated sewage to waters of the state or to a storm water conveyance system is prohibited.

10. The discharge of industrial wastes to conventional septic tank/subsurface disposal systems, except as authorized by the terms described in California Water Code Section 13264, is prohibited.

11. The discharge of radioactive wastes amenable to alternative methods of disposal into the waters of the state is prohibited.

12. The discharge of any radiological, chemical, or biological warfare agent into waters of the state is prohibited.

13. The discharge of waste into a natural or excavated site below historic water levels is prohibited unless the discharge is authorized by the San Diego Water Board.

14. The discharge of sand, silt, clay, or other earthen materials from any activity, including land grading and construction, in quantities which cause deleterious bottom deposits, turbidity or discoloration in waters of the state or which unreasonably affect, or threaten to affect, beneficial uses of such waters is prohibited.

15. The discharge of treated or untreated sewage from vessels to Mission Bay, Oceanside Harbor, Dana Point Harbor, or other small boat harbors is prohibited.

16. The discharge of untreated sewage from vessels to San Diego Bay is prohibited.

17. The discharge of treated sewage from vessels to portions of San Diego Bay that are less than 30 feet deep at mean lower low water (MLLW) is prohibited.

18. The discharge of treated sewage from vessels, which do not have a properly functioning US Coast Guard certified Type I or Type II marine sanitation device, to portions of San Diego Bay that are greater than 30 feet deep at mean lower low water (MLLW) is prohibited.

2. Attachment B to State Water Board Resolution 2012-0012

Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges

I. PROVISIONS FOR POINT SOURCE DISCHARGES OF STORM WATER AND NONPOINT SOURCE WASTE DISCHARGES

The following terms, prohibitions, and special conditions (hereafter collectively referred to as special conditions) are established as limitations on point source storm water and nonpoint source discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in Areas of Special Biological Significance (ASBS), as required for State Water Quality Protection Areas pursuant to California Public Resources Code Sections 36700(f) and 36710(f). These Special Protections are adopted by the State Water Board as part of the California Ocean Plan (Ocean Plan) General Exception.

The special conditions are organized by category of discharge. The State Water Resources Control Board (State Water Board) and Regional Water Quality Control Boards (Regional Water Boards) will determine categories and the means of regulation for those categories [e.g., Point Source Storm Water National Pollutant Discharge Elimination System (NPDES) or Nonpoint Source].

A. PERMITTED POINT SOURCE DISCHARGES OF STORM WATER

1. General Provisions for Permitted Point Source Discharges of Storm Water

   a. Existing storm water discharges into an ASBS are allowed only under the following conditions:

      (1) The discharges are authorized by an NPDES permit issued by the State Water Board or Regional Water Board;

      (2) The discharges comply with all of the applicable terms, prohibitions, and special conditions contained in these Special Protections; and

      (3) The discharges:

         (i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

         (ii) Are designed to prevent soil erosion;

         (iii) Occur only during wet weather;

         (iv) Are composed of only storm water runoff.

   b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

   c. The discharge of trash is prohibited.

d. Only discharges from existing storm water outfalls are allowed. Any proposed or new storm water runoff discharge shall be routed to existing storm water discharge outfalls and shall not result in any new contribution of waste to an ASBS (i.e., no additional pollutant loading). “Existing storm water outfalls” are those that were constructed or under construction prior to January 1, 2005. “New contribution of waste” is defined as any addition of waste beyond what would have occurred as of January 1, 2005. A change to an existing storm water outfall, in terms of re-location or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges are prohibited except as provided below:

(1) The term “non-storm water discharges” means any waste discharges from a municipal separate storm sewer system (MS4) or other NPDES permitted storm drain system to an ASBS that are not composed entirely of storm water.

(2) (i) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability or occur naturally:

(a) Discharges associated with emergency firefighting operations.

(b) Foundation and footing drains.

(c) Water from crawl space or basement pumps.

(d) Hillside dewatering.

(e) Naturally occurring groundwater seepage via a storm drain.

(f) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(ii) An NPDES permitting authority may authorize non-storm water discharges to an MS4 with a direct discharge to an ASBS only to the extent the NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

2. Compliance Plans for Inclusion in Storm Water Management Plans (SWMP) and Storm Water Pollution Prevention Plans (SWPPP).

The discharger shall specifically address the prohibition of non-storm water runoff and the requirement to maintain natural water quality for storm water discharges to an ASBS in an ASBS Compliance Plan to be included in its SWMP or a SWPPP, as appropriate to permit type. If a statewide permit includes a SWMP, then the discharger shall prepare a stand-alone compliance plan for ASBS discharges. The ASBS Compliance Plan is subject to approval by the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (for permits issued by Regional Water Boards).

a. The Compliance Plan shall include a map of surface drainage of storm water runoff, showing areas of sheet runoff, prioritize discharges, and describe any structural Best Management Practices (BMPs) already employed and/or BMPs to be employed in the future. Priority discharges are those that pose the greatest water quality threat and which are identified to require installation of structural BMPs. The map shall also show the storm water conveyances in relation to other features such as service areas, sewage conveyances and treatment facilities, landslides, areas prone to erosion, and waste and hazardous material storage areas, if applicable. The SWMP or SWPPP shall also include a procedure for updating the map and plan when changes are made to the storm water conveyance facilities.

b. The ASBS Compliance Plan shall describe the measures by which all non-authorized non-storm water runoff (e.g., dry weather flows) has been eliminated, how these measures will be maintained over time, and how these measures are monitored and documented.

c. For Municipal Separate Storm Sewer System (MS4s), the ASBS Compliance Plan shall require minimum inspection frequencies as follows:

   (1) The minimum inspection frequency for construction sites shall be weekly during rainy season;

   (2) The minimum inspection frequency for industrial facilities shall be monthly during the rainy season;

   (3) The minimum inspection frequency for commercial facilities (e.g., restaurants) shall be twice during the rainy season; and

   (4) Storm water outfall drains equal to or greater than 18 inches (457 mm) in diameter or width shall be inspected once prior to the beginning of the rainy season and once during the rainy season and maintained to remove trash and other anthropogenic debris.

d. The ASBS Compliance Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff, that are necessary to comply with these special conditions, will be achieved through BMPs. Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that such installation would pose a threat to health or safety. BMPs to control storm water runoff discharges (at the end-of-pipe) during a design storm shall be designed to achieve on average the following target levels:

   (1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

   (2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges. The baseline for the reduction is the effective date of the Exception. The baseline for these determinations is the effective date of the Exception, and the

reductions must be achieved and documented within four (4) years of the effective date.

e. The ASBS Compliance Plan shall address erosion control and the prevention of anthropogenic sedimentation in ASBS. The natural habitat conditions in the ASBS shall not be altered as a result of anthropogenic sedimentation.

f. The ASBS Compliance Plan shall describe the non-structural BMPs currently employed and planned in the future (including those for construction activities), and include an implementation schedule. The ASBS Compliance Plan shall include non-structural BMPs that address public education and outreach. Education and outreach efforts must adequately inform the public that direct discharges of pollutants from private property not entering an MS4 are prohibited. The ASBS Compliance Plan shall also describe the structural BMPs, including any low impact development (LID) measures, currently employed and planned for higher threat discharges and include an implementation schedule. To control storm water runoff discharges (at the end-of-pipe) during a design storm, permittees must first consider using LID practices to infiltrate, use, or evapotranspirate storm water runoff on-site.

g. The BMPs and implementation schedule shall be designed to ensure that natural water quality conditions in the receiving water are achieved and maintained by either reducing flows from impervious surfaces or reducing pollutant loading, or some combination thereof.

h. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents in storm water runoff that alter natural ocean water quality and the sources of these constituents.

(2) The report shall describe BMPs that are currently being implemented, BMPs that are identified in the SWMP or SWPPP for future implementation, and any additional BMPs that may be added to the SWMP or SWPPP to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the BMPs.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits), the discharger shall revise its ASBS Compliance Plan to incorporate any new or modified BMPs that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised SWMP or SWPPP, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural ocean water quality conditions due to the same constituent.

(5) Compliance with this section does not excuse violations of any term, prohibition, or condition contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within one year from the effective date of the Exception, the discharger shall submit a written ASBS Compliance Plan to the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that describes its strategy to comply with these special conditions, including the requirement to maintain natural water quality in the affected ASBS. The ASBS Compliance Plan shall include a time schedule to implement appropriate non-structural and structural controls (implementation schedule) to comply with these special conditions for inclusion in the discharger's SWMP or SWPPP, as appropriate to permit type.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these special conditions shall be implemented.

d. Within four (4) years of the effective date of the Exception, any structural controls identified in the ASBS Compliance Plan that are necessary to comply with these special conditions shall be operational.

e. Within four (4) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water, pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data, and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

   If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

   The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

(1) for municipalities, a demonstration of significant hardship to discharger ratepayers, by showing the relationship of storm water fees to annual household income for residents within the discharger's jurisdictional area, and the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or
(2) for other governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process.

B. NONPOINT SOURCE DISCHARGES

[NOT INCLUDED]
[PROVISIONS FOR NONPOINT SOURCE DISCHARGES NOT APPLICABLE]

II. ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES

[NOT INCLUDED]
[ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES NOT APPLICABLE]

III. ADDITIONAL REQUIREMENTS – WATERFRONT AND MARINE OPERATIONS

[NOT INCLUDED]
[ADDITIONAL REQUIREMENTS FOR WATERFRONT AND MARINE OPERATIONS NOT APPLICABLE]

IV. MONITORING REQUIREMENTS

Monitoring is mandatory for all dischargers to assure compliance with the Ocean Plan. Monitoring requirements include both: (A) core discharge monitoring, and (B) ocean receiving water monitoring. The State and Regional Water Boards must approve sampling site locations and any adjustments to the monitoring programs. All ocean receiving water and reference area monitoring must be comparable with the Water Boards' Surface Water Ambient Monitoring Program (SWAMP).

Safety concerns: Sample locations and sampling periods must be determined considering safety issues. Sampling may be postponed upon notification to the State and Regional Water Boards if hazardous conditions prevail.

Analytical Chemistry Methods: All constituents must be analyzed using the lowest minimum detection limits comparable to the Ocean Plan water quality objectives. For metal analysis, all samples, including storm water effluent, reference samples, and ocean receiving water samples, must be analyzed by the approved analytical method with the lowest minimum detection limits (currently Inductively Coupled Plasma/Mass Spectrometry) described in the Ocean Plan.

A. CORE DISCHARGE MONITORING PROGRAM

1. General sampling requirements for timing and storm size:

   Runoff must be collected during a storm event that is greater than 0.1 inch and generates runoff, and at least 72 hours from the previously measurable storm event. Runoff samples shall be collected when post-storm receiving water is sampled, and analyzed for the same constituents as receiving water and reference site samples (see section IV B) as described below.

2. Runoff flow measurements

   a. For municipal/industrial storm water outfalls in existence as of December 31, 2007, 18 inches (457mm) or greater in diameter/width (including multiple outfall pipes in combination having a width of 18 inches, runoff flows must be measured or calculated, using a method acceptable to and approved by the State and Regional Water Boards.
   b. This will be reported annually for each precipitation season to the State and Regional Water Boards.

3. Runoff samples – storm events

   a. For outfalls equal to or greater than 18 inches (0.46m) in diameter or width:

      (1) Samples of storm water runoff shall be analyzed during the same storm as receiving water samples for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

      (2) Samples of storm water runoff shall be analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS

      (3) If an applicant has no outfall greater than 36 inches, then storm water runoff from the applicant's largest outfall shall be further analyzed during the same storm as receiving water samples for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates).

   b. For outfalls equal to or greater than 36 inches (0.91m) in diameter or width:

      (1) Samples of storm water runoff shall be analyzed during the same storm as receiving water samples for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

      (2) Samples of storm water runoff shall be further analyzed during the same storm as receiving water samples for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates) and

(3) Samples of storm water runoff shall be analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

c. For an applicant not participating in a regional monitoring program [see below in Section IV (B)] in addition to (a.) and (b.) above, a minimum of the two largest outfalls or 20 percent of the larger outfalls, whichever is greater, shall be sampled (flow weighted composite samples) at least three times annually during wet weather (storm event) and analyzed for all Ocean Plan Table A constituents, Table B constituents for marine aquatic life protection (except for toxicity, only chronic toxicity for three species shall be required), DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, and Ocean Plan indicator bacteria. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one (the largest) such discharge shall be sampled annually in each Region.

4. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may reduce or suspend core monitoring once the storm runoff is fully characterized. This determination may be made at any point after the discharge is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

B. OCEAN RECEIVING WATER AND REFERENCE AREA MONITORING PROGRAM

In addition to performing the Core Discharge Monitoring Program in Section II.A above, all applicants having authorized discharges must perform ocean receiving water monitoring. In order to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS, dischargers may choose either (1) an individual monitoring program, or (2) participation in a regional integrated monitoring program.

1. Individual Monitoring Program: The requirements listed below are for those dischargers who elect to perform an individual monitoring program to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within the affected ASBS. In addition to Core Discharge Monitoring, the following additional monitoring requirements shall be met:

   a. Three times annually, during wet weather (storm events), the receiving water at the point of discharge from the outfalls described in section (IV)(A)(3)(c) above shall be sampled and analyzed for Ocean Plan Table A constituents, Table B constituents for marine aquatic life, DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, salinity, chronic toxicity (three species), and Ocean Plan indicator bacteria.

      The sample location for the ocean receiving water shall be in the surf zone at the point of discharges; this must be at the same location where storm water runoff is sampled. Receiving water shall be sampled at approximately the same time prior to (pre-storm) and during (or immediately after) the same storm (post storm). Reference water quality shall also be sampled and analyzed for the same constituents pre-storm and post-storm, during the same storms when receiving water is sampled. Reference stations will be determined by the State Water Board's Division of Water Quality and the applicable Regional Water Board(s).

b. Sediment sampling shall occur at least three times during every five (5) year period. The subtidal sediment (sand or finer, if present) at the discharge shall be sampled and analyzed for Ocean Plan Table B constituents for marine aquatic life, DDT, PCBs, PAHs, pyrethroids, and OP pesticides. For sediment toxicity testing, only an acute toxicity test using the amphipod Eohaustorius estuarius must be performed.

c. A quantitative survey of intertidal benthic marine life shall be performed at the discharge and at a reference site. The survey shall be performed at least once every five (5) year period. The survey design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The results of the survey shall be completed and submitted to the State Water Board and Regional Water Board at least six months prior to the end of the permit cycle.

d. Once during each five (5) year period, a bioaccumulation study shall be conducted to determine the concentrations of metals and synthetic organic pollutants at representative discharge sites and at representative reference sites. The study design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The bioaccumulation study may include California mussels (Mytilus californianus) and/or sand crabs (Emerita analoga or Blepharipoda occidentalis). Based on the study results, the Regional Water Board and the State Water Board's Division of Water Quality, may adjust the study design in subsequent permits, or add or modify additional test organisms (such as shore crabs or fish), or modify the study design appropriate for the area and best available sensitive measures of contaminant exposure.

e. Marine Debris: Representative quantitative observations for trash by type and source shall be performed along the coast of the ASBS within the influence of the discharger's outfalls. The design, including locations and frequency, of the marine debris observations is subject to approval by the Regional Water Board and State Water Board's Division of Water Quality.

f. The monitoring requirements of the Individual Monitoring Program in this section are minimum requirements. After a minimum of one (1) year of continuous water quality monitoring of the discharges and ocean receiving waters, the Executive Director of the State Water Board (statewide permits) or Executive officer of the Regional Water Board (Regional Water Board permits) may require additional monitoring, or adjust, reduce or suspend receiving water and reference station monitoring. This determination may be made at any point after the discharge and receiving water is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

2. Regional Integrated Monitoring Program: Dischargers may elect to participate in a regional integrated monitoring program, in lieu of an individual monitoring program, to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS. This regional approach shall characterize natural water quality, pre- and post-storm, in ocean reference areas near the mouths of identified open space watersheds and the effects of the discharges on natural water quality (physical, chemical, and toxicity) in the ASBS receiving waters, and should include benthic marine aquatic life and bioaccumulation components. The design of the ASBS stratum of a regional integrated monitoring program may deviate from the otherwise prescribed individual monitoring approach (in Section IV.B.1) if approved by the State Water Board's Division of Water Quality and the Regional Water Boards.

a. Ocean reference areas shall be located at the drainages of flowing watersheds with minimal development (in no instance more than 10% development), and shall not be located in CWA Section 303(d) listed waterbodies or have tributaries that are 303(d) listed. Reference areas shall be free of wastewater discharges and anthropogenic non-storm water runoff. A minimum of low threat storm runoff discharges (e.g. stream highway overpasses and campgrounds) may be allowed on a case-by-case basis. Reference areas shall be located in the same region as the ASBS receiving water monitoring occurs. The reference areas for each Region are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean reference water samples must be collected from each station, each from a separate storm. A minimum of one reference location shall be sampled for each ASBS receiving water site sampled per responsible party. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

b. ASBS ocean receiving water must be sampled in the surf zone at the location where the runoff makes contact with ocean water (i.e. at "point zero"). Ocean receiving water stations must be representative of worst-case discharge conditions (i.e. co-located at a large drain greater than 36 inches, or if drains greater than 36 inches are not present in the ASBS then the largest drain greater than18 inches.) Ocean receiving water stations are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean receiving water samples must be collected during each storm season from each station, each from a separate storm. A minimum of one receiving water location shall be sampled in each ASBS per responsible party in that ASBS. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

c. Reference and receiving water sampling shall commence during the first full storm season following the adoption of these special conditions, and post-storm samples shall be collected when annual storm water runoff is sampled. Sampling shall occur in a minimum of two storm seasons. For those ASBS dischargers that have already participated in the Southern California Bight 2008 ASBS regional monitoring effort, sampling may be limited to only one storm season.

d. Receiving water and reference samples shall be analyzed for the same constituents as storm water runoff samples. At a minimum, constituents to be sampled and analyzed in reference and discharge receiving waters must include oil and grease, total suspended solids, Ocean Plan Table B metals for protection of marine life, Ocean Plan PAHs, pyrethroids, OP pesticides, ammonia, nitrate, phosphates, and critical life stage chronic toxicity for three species. In addition, within the range of the southern sea otter, indicator bacteria or some other measure of fecal contamination shall be analyzed.

3. Waterfront and Marine Operations: In addition to the above requirements for ocean receiving water monitoring, additional monitoring must be performed for marinas and boat launch and pier facilities:

a. For all marina or mooring field operators, in mooring fields with 10 or more occupied moorings, the ocean receiving water must be sampled for Ocean Plan indicator bacteria, residual chlorine, copper, zinc, grease and oil, methylene blue active substances (MBAS), and ammonia nitrogen.

   (1) For mooring field operators opting for an individual monitoring program (Section IV.B.1 above), this sampling must occur weekly (on the weekend) from May through October.

   (2) For mooring field operators opting to participate in a regional integrated monitoring program (Section IV.B.2 above), this sampling must occur monthly from May through October on a high use weekend in each month. The Water Boards may allow a reduction in the frequency of sampling, through the regional monitoring program, after the first year of monitoring.

b. For all mooring field operators, the subtidal sediment (sand or finer, if present) within mooring fields and below piers shall be sampled and analyzed for Ocean Plan Table B metals (for marine aquatic life beneficial use), acute toxicity, PAHs, and tributyltin. For sediment toxicity testing, only an acute toxicity test using the amphipod Eohaustorius estuarius must be performed. This sampling shall occur at least three times during a five (5) year period. For mooring field operators opting to participate in a regional integrated monitoring program, the Water Boards may allow a reduction in the frequency of sampling after the first sampling effort's results are assessed.

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ATTACHMENT B

STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

1. Standard Permit Provisions

Code of Federal Regulations Title 40 Section 122.41 (40 CFR 122.41) includes conditions, or provisions, that apply to all National Pollutant Discharge Elimination System (NPDES) permits. Additional provisions applicable to NPDES permits are in 40 CFR 122.42. All applicable provisions in 40 CFR 122.41 and 40 CFR 122.42 must be incorporated into this Order and NPDES permit. The applicable 40 CFR 122.41 and 40 CFR 122.42 provisions are as follows:

a. DUTY TO COMPLY [40 CFR 122.41(a)]

The Copermittee must comply with all of the provisions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

(1) The Copermittee must comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement. [40 CFR 122.41(a)(1)]

(2) The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to a civil penalty not to exceed $25,000 per day for each violation. The CWA provides that any person who *negligently* violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than 2 years, or both. Any person who *knowingly* violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both. Any person who knowingly violates Section 301, 302, 303, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, and who knows at that time that he thereby places another person in imminent danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of

not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.
[40 CFR 122.41(a)(2)]

(3) Any person may be assessed an administrative penalty by the San Diego Regional Water Quality Control Board (San Diego Water Board), State Water Resources Control Board (State Water Board), or United States Environmental Protection Agency (USEPA) for violating Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.
[40 CFR 122.41(a)(3)]

b. DUTY TO REAPPLY [40 CFR 122.41(b)]

If a Copermittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Copermittee must apply for and obtain a new permit.

c. NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE [40 CFR 122.41(c)]

It shall not be a defense for a Copermittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

d. DUTY TO MITIGATE [40 CFR 122.41(d)]

The Copermittee must take all reasonable steps to minimize or prevent any discharge or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

e. PROPER OPERATION AND MAINTENANCE [40 CFR 122.41(e)]

The Copermittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Copermittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by a Copermittee only when the operation is necessary to achieve compliance with the conditions of this permit.

f. PERMIT ACTIONS [40 CFR 122.41(f)]

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Copermittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

g. PROPERTY RIGHTS [40 CFR 122.41(g)]

This permit does not convey any property rights of any sort, or any exclusive privilege.

h. DUTY TO PROVIDE INFORMATION [40 CFR 122.41(h)]

The Copermittee must furnish to the San Diego Water Board, State Water Board, or USEPA within a reasonable time, any information which the San Diego Water Board, State Water Board, or USPEA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Copermittee must also furnish to the San Diego Water Board, State Water Board, or USPEA upon request, copies of records required to be kept by this permit.

i. INSPECTION AND ENTRY [40 CFR 122.41(i)]

The Copermittee must allow the San Diego Water Board, State Water Board, USEPA, and/or their authorized representative (including an authorized contractor acting as their representative), upon presentation of credentials and other documents as may be required by law, to:

(1) Enter upon the Copermittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit; [40 CFR 122.41(i)(1)]

(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit; [40 CFR 122.41(i)(2)]

(3) Inspect and photograph at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; [40 CFR 122.41(i)(3)] and

(4) Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location. [40 CFR 122.41(i)(4)]

j. MONITORING AND RECORDS [40 CFR 122.41(j)]

(1) Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity. [40 CFR 122.41(j)(1)]

(2) Except for records of monitoring information required by this permit related to the Copermittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five (5) years (or longer as required by 40 CFR Part 503), the

Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time. [40 CFR 122.41(j)(2)]

(3) Records for monitoring information must include: [40 CFR 122.41(j)(3)]

(a) The date, exact place, and time of sampling or measurements; [40 CFR 122.41(j)(3)(i)]
(b) The individual(s) who performed the sampling or measurements; [40 CFR 122.41(j)(3)(ii)]
(c) The date(s) analyses were performed; [40 CFR 122.41(j)(3)(iii)]
(d) The individual(s) who performed the analyses; [40 CFR 122.41(j)(3)(iv)]
(e) The analytical techniques or methods used; [40 CFR 122.41(j)(3)(v)] and
(f) The results of such analyses. [40 CFR 122.41(j)(3)(vi)]

(4) Monitoring must be conducted according to test procedures under 40 CFR Part 136 unless another method is required under 40 CFR Subchapters N or O. [40 CFR 122.41(j)(4)]

In the case of pollutants for which there are no approved methods under 40 CFR Part 136 or otherwise required under 40 CFR Subchapters N and O, monitoring must be conducted according to a test procedure specified in the permit for such pollutants. [40 CFR 122.44(i)(1)(iv)]

(5) The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. [40 CFR 122.41(j)(5)]

k. SIGNATORY REQUIREMENT [40 CFR 122.41(k)]

(1) All applications, reports, or information submitted to the San Diego Water Board, State Water Board, or USEPA must be signed and certified. (See 40 CFR 122.22) [40 CFR 122.41(k)(1)]

(a) *For a municipality, State, Federal, or other public agency.* [All applications must be signed] by either a principal executive officer or ranking elected official. [40 CFR 122.22(a)(3)]

(b) All reports required by permits, and other information requested by the San Diego Water Board, State Water Board, or USEPA must be signed by a person described in paragraph (a) of this section, or by a duly authorized representative of that person. A person is a duly authorized representative only if: [40 CFR 122.22(b)]

(i) The authorization is made in writing by a person described in paragraph (a) of this section; [40 CFR 122.22(b)(1)]

(ii) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company, (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) [40 CFR 122.22(b)(2)] and,

(iii) The written authorization is submitted to the San Diego Water Board and State Water Board. [40 CFR 122.22(b)(3)]

(c) *Changes to authorization.* If an authorization under paragraph (b) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (b) of this section must be submitted to the San Diego Water Board prior to or together with any reports, information, or applications to be signed by an authorized representative. [40 CFR 122.22(c)]

(d) *Certification.* Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." [40 CFR 122.22(d)]

(2) The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both. [40 CFR 122.41(k)(2)]

I. REPORTING REQUIREMENTS [40 CFR 122.41(l)]

(1) *Planned changes.* The Copermittee must give notice to the San Diego Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when: [40 CFR 122.41(l)(1)]

(a) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); [40 CFR 122.41(l)(1)(i)] or

(b) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which

are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1).
[40 CFR 122.41(l)(1)(ii)]

(c) The alteration or addition results in a significant change in the Copermittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. [40 CFR 122.41(l)(1)(iii)]

(2) *Anticipated noncompliance*. The Copermittee must give advance notice to the San Diego Water Board or State Water Board of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.
[40 CFR 122.41(l)(2)]

(3) *Transfers*. This permit is not transferable to any person except after notice to the San Diego Water Board. The San Diego Water Board may require modification or revocation and reissuance of the permit to change the name of the Copermittee and incorporate such other requirements as may be necessary under the CWA.
[40 CFR 122.41(l)(3)]

(4) *Monitoring reports.* Monitoring results must be reported at the intervals specified elsewhere in this permit. [40 CFR 122.41(l)(4)]

(a) Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the San Diego Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices. [40 CFR 122.41(l)(4)(i)]

(b) If the Copermittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or another method required for an industry-specific waste stream under 40 CFR Subchapters N or O, the results of this monitoring must be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the San Diego Water Board or State Water Board.
[40 CFR 122.41(l)(4)(ii)]

(c) Calculations for all limitations which require averaging of measurements must utilize an arithmetic mean unless otherwise specified in the permit.
[40 CFR 122.41(l)(4)(iii)]

(5) *Compliance schedules*. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date. [40 CFR 122.41(l)(5)]

(6) *Twenty-four hour reporting.*

(a) The Copermittee must report any noncompliance that may endanger health or the environment. Any information must be provided orally within 24 hours from the time the Copermittee becomes aware of the circumstances. A written submission must also be provided within five (5) days of the time the Copermittee becomes aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6)(i)]

(b) The following must be included as information which must be reported within 24 hours under this paragraph: [40 CFR 122.41(l)(6)(ii)]

(i) Any unanticipated bypass that exceeds any effluent limitation in the permit (See 40 CFR 122.41(g)). [40 CFR 122.41(l)(6)(ii)(A)]
(ii) Any upset which exceeds any effluent limitation in the permit. [40 CFR 122.41(l)(6)(ii)(B)] and,
(iii) Violation of a maximum daily discharge limitation for any of the pollutants listed by the San Diego Water Board in the permit to be reported within 24 hours. (See 40 CFR 122.44(g)) [40 CFR 122.41(l)(6)(ii)(C)]

(c) The San Diego Water Board may waive the above-required written report on a case-by-case basis if the oral report has been received within 24 hours. [40 CFR 122.41(l)(6)(iii)]

(7) *Other noncompliance.* The Copermittee must report all instances of noncompliance not reported in accordance with the standard provisions required under 40 CFR 122.41(l)(4), (5), and (6), at the time monitoring reports are submitted. The reports must contain the information listed in the standard provisions required under 40 CFR 122.41(l)(6). [40 CFR 122.41(l)(7))]

(8) *Other information.* When the Copermittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the San Diego Water Board, State Water Board, or USEPA, the Copermittee must promptly submit such facts or information. [40 CFR 122.41(l)(8)]

m. BYPASS [40 CFR 122.41(m)]

(1) *Definitions.*

(a) "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. [40 CFR 122.41(m)(1)(i)] or

(b) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be

expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
[40 CFR 122.41(m)(1)(ii)]

(2) *Bypass not exceeding limitations*. The Copermittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the standard provisions required under 40 CFR 122.41(m)(3) and (4).
[40 CFR 122.41(m)(2)]

(3) *Notice.*

(a) *Anticipated bypass*. If the Copermittee knows in advance of the need for a bypass, it must submit a notice, if possible at least ten days before the date of the bypass. [40 CFR 122.41(m)(3)(i)] or

(b) *Unanticipated bypass*. The Copermittee must submit notice of an unanticipated bypass in accordance with the standard provisions required under 40 CFR 122.41(l)(6) (24-hour notice).
[40 CFR 122.41(m)(3)(ii)]

(4) *Prohibition of Bypass.*

(a) Bypass is prohibited, and the San Diego Water Board may take enforcement action against a Copermittee for bypass, unless:
[40 CFR 122.41(m)(4)(i)]

(i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; [40 CFR 122.41(m)(4)(i)(A)]
(ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance;
[40 CFR 122.41(m)(4)(i)(B)] and,
(iii) The Copermittee submitted notice in accordance with the standard provisions required under 40 CFR 122.41(m)(3).
[40 CFR 122.41(m)(4)(i)(C)]

(b) The San Diego Water Board may approve an anticipated bypass, after considering its adverse effects, if the San Diego Water Board determines that it will meet the three conditions listed above.
[40 CFR 122.41(m)(4)(ii)]

n. UPSET [40 CFR 122.41(n)]

(1) *Definition.* "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Copermittee. An upset does not

include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. [40 CFR 122.41(n)(1)]

(2) *Effect of an upset*. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the standard provisions required under 40 CFR 122.41(n)(3) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. [40 CFR 122.41(n)(2)]

(3) *Conditions necessary for a demonstration of upset*. A Copermittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that: [40 CFR 122.41(n)(3)]

(a) An upset occurred and that the Copermittee can identify the cause(s) of the upset; [40 CFR 122.41(n)(3)(i)]
(b) The permitted facility was at the time being properly operated; [40 CFR 122.41(n)(3)(ii)] and
(c) The Copermittee submitted notice of the upset in accordance with the standard provisions required under 40 CFR 122.41(l)(6)(ii)(B) (24-hour notice). [40 CFR 122.41(n)(3)(iii)]
(d) The Copermittee complied with any remedial measures pursuant to the standard provisions required under 40 CFR 122.41(d). [40 CFR 122.41(n)(3)(iii)]

(4) *Burden of proof*. In any enforcement proceeding, the Copermittee seeking to establish the occurrence of an upset has the burden of proof. [40 CFR 122.41(n)(4)]

o. STANDARD PERMIT PROVISIONS FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS [40 CFR 122.42(c)]

The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the San Diego Water Board or State Water Board under 40 CFR 122.26(a)(1)(v) must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report must include:

(1) The status of implementing the components of the storm water management program that are established as permit conditions; [40 CFR 122.42(c)(1)]

(2) Proposed changes to the storm water management programs that are established as permit conditions. Such proposed changes must be consistent with 40 CFR 122.26(d)(2)(iii); [40 CFR 122.42(c)(2)] and

(3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under 40 CFR 122.26(d)(2)(iv) and (v); [40 CFR 122.42(c)(3)]

(4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; [40 CFR 122.42(c)(4)]

(5) Annual expenditures and budget for year following each annual report; [40 CFR 122.42(c)(5)]

(6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; [40 CFR 122.42(c)(6)]

(7) Identification of water quality improvements or degradation. [40 CFR 122.42(c)(7)]

p. STANDARD PERMIT PROVISIONS FOR STORM WATER DISCHARGES [40 CFR 122.42(d)]

The initial permits for discharges composed entirely of storm water issued pursuant to 40 CFR 122.26(e)(7) must require compliance with the conditions of the permit as expeditiously as practicable, but in no event later than three years after the date of issuance of the permit.

2. General Provisions

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. The general provisions applicable to this Order and NPDES permit are as follows:

a. DISCHARGE OF WASTE IS A PRIVILEGE

No discharge of waste into the waters of the State, whether or not such discharge is made pursuant to waste discharge requirements, shall create a vested right to continue such discharge. All discharges of waste into waters of the State are privileges, not rights. [CWC Section 13263(g)]

b. DURATION OF ORDER AND NPDES PERMIT

(1) *Effective date*. This Order and NPDES permit becomes effective on the 50th day after its adoption provided the USEPA has no objection. If the USEPA objects to its issuance, this Order shall not become effective until such objection is withdrawn. This Order supersedes Order No. R9-2007-0001 upon the effective date of this Order, and supersedes Order Nos. R9-2009-0002 and R9-2010-0016 upon their expiration or earlier notice of coverage.

(2) *Expiration*. This Order and NPDES permit expires five years after its effective date. [40 CFR 122.46(a)]

(3) *Continuation of expired order*. After this Order and NPDES permit expires, the terms and conditions of this Order and NPDES permit are automatically continued pending issuance of a new permit if all requirements of the federal NPDES regulations on the continuation of expired permits (40 CFR 122.6) are complied with.

c. AVAILABILITY

A copy of this Order must be kept at a readily accessible location and must be available to on-site personnel at all times.

d. CONFIDENTIALITY OF INFORMATION

Except as provided for in 40 CFR 122.7, no information or documents submitted in accordance with or in application for this Order will be considered confidential, and all such information and documents shall be available for review by the public at the San Diego Water Board office.

Claims of confidentiality for the following information will be denied:
[40 CFR 122.7(b)]

(1) The name and address of any permit applicant or Copermittee; [40 CFR 122.7(b)(1)] and

(2) Permit applications and attachments, permits, and effluent data. [40 CFR 122.7(b)(2)]

e. EFFLUENT LIMITATIONS

(1) *Interim effluent limitations*. The Copermittee must comply with any interim effluent limitations as established by addendum, enforcement action, or revised waste discharge requirements which have been, or may be, adopted by the San Diego Water Board.

(2) *Other effluent limitations and standards*. If any applicable toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant and that standard or prohibition is more stringent than any limitation on the pollutant in the permit, the San Diego Water Board shall institute proceedings under these regulations to modify or revoke and reissue the permit to conform to the toxic effluent standard or prohibition. [40 CFR 122.44(b)(1)]

f. DUTY TO MINIMIZE OR CORRECT ADVERSE IMPACTS

The Copermittee must take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this Order, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the noncompliance.

g. PERMIT ACTIONS

The filing of a request by the Copermittee for modification, revocation and reissuance, or termination of this Order, or a notification of planned change in or anticipated noncompliance with this Order does not stay any condition of this Order. (See 40 CFR 122.41(f)) In addition, the following provisions apply to this Order:

(1) Upon application by any affected person, or on its own motion, the San Diego Water Board may review and revise the requirements in this Order. All requirements must be reviewed periodically. [CWC Section 13263(e)]

(2) This Order may be terminated or modified for cause, including, but not limited to, all of the following: [CWC Section 13381]

(a) Violation of any condition contained in the requirements of this Order. [CWC Section 13381(a)]

(b) Obtaining the requirements in this Order by misrepresentation, or failure to disclose fully all relevant facts. [CWC Section 13381(b)]

(c) A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge. [CWC Section 13381(c)]

(3) When this Order is transferred to a new owner or operator, such requirements as may be necessary under the CWC may be incorporated into this Order.

h. NPDES Permitted Non-Storm Water Discharges

The San Diego Water Board has, in prior years, issued a limited number of individual NPDES permits for non-storm water discharges to MS4s. The San Diego Water Board or State Water Board may in the future, upon prior notice to the Copermittee(s), issue an NPDES permit for any non-storm water discharge (or class of non-storm water discharges) to an MS4.

i. Monitoring

In addition to the standard provisions required under 40 CFR 122.41(j) and (l)(4), the following general monitoring provisions apply to this Order:

(1) Where procedures are not otherwise specified in Order, sampling, analysis and quality assurance/quality control must be conducted in accordance with the Quality Assurance Management Plan (QAMP) for the State of California's Surface Water Ambient Monitoring Program (SWAMP), adopted by the State Water Resources Control Board (State Water Board).

(2) Pursuant to 40 CFR 122.41(j)(2) and CWC Section 13383(a), each Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five (5) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time.

(3) All chemical, bacteriological, and toxicity analyses must be conducted at a laboratory certified for such analyses by the California Department of Public Health or a laboratory approved by the San Diego Water Board.

(4) For priority toxic pollutants that are identified in the California Toxics Rule (CTR) (65 Fed. Reg. 31682), the Copermittees must instruct their laboratories to establish calibration standards that are equivalent to or lower than the Minimum Levels (MLs) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP). If a Copermittee can demonstrate that a particular ML is not attainable, in accordance with procedures set forth in 40 CFR Part 136, the lowest quantifiable concentration of the lowest calibration standard analyzed by a specific analytical procedure (assuming that all the method specified sample weights, volumes, and processing steps have been followed) may be used instead of the ML listed in Appendix 4 of the SIP. The Copermittee must submit documentation from the laboratory to the San Diego Water Board for approval prior to raising the ML for any priority toxic pollutant.

j. ENFORCEMENT

(1) The San Diego Water Board is authorized to enforce the terms of this Order under several provisions of the CWC, including, but not limited to, CWC Sections 13385, 13386, and 13387.

(2) Nothing in this Order shall be construed to protect the Copermittee from its liabilities under federal, state, or local laws.

(3) The CWC provides for civil and criminal penalties comparable to, and in some cases greater than, those provided for under the CWA.

(4) Except as provided in the standard conditions required under 40 CFR 122.41(m) and (n), nothing in this Order shall be construed to relieve the Copermittee from civil or criminal penalties for noncompliance.

(5) Nothing in this Order shall be construed to preclude the institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties to which the Copermittee is or may be subject to under Section 311 of the CWA.

(6) Nothing in this Order shall be construed to preclude institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authoring preserved by Section 510 of the CWA.

k. SEVERABILITY

The provisions of this Order are severable, and if any provision of this Order, or the application of any provisions of this Order to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this Order shall not be affected thereby.

l. APPLICATIONS

Any application submitted by a Copermittee for reissuance or modification of this Order must satisfy all applicable requirements specified in federal regulations as well as any additional requirements for submittal of a Report of Waste Discharge specified in the CWC and the California Code of Regulations.

m. IMPLEMENTATION

All plans, reports and subsequent amendments submitted in compliance with this Order must be implemented immediately (or as otherwise specified). All submittals by Copermittees must be adequate to implement the requirements of this Order.

n. REPORT SUBMITTALS

(1) All report submittals must include an executive summary, introduction, conclusion, recommendations, and signed certified statement.

(2) Each Copermittee must submit a signed certified statement covering its responsibilities for each applicable submittal.

(3) The Principal Watershed Copermittee(s) must submit a signed certified statement covering its responsibilities for each applicable submittal and the sections of the submittals for which it is responsible.

(4) Unless otherwise directed, the Copermittees must submit one hard copy and one electronic copy of each report required under this Order to the San Diego Water Board, and one electronic copy to the USEPA.

(5) The Copermittees must submit reports and provide notifications as required by this Order to the following:

EXECUTIVE OFFICER
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
9174 SKY PARK COURT, SUITE 100
SAN DIEGO CA 92123-4340
Telephone: (858) 467-2952 Fax: (858) 571-6972

EUGENE BROMLEY
US ENVIRONMENTAL PROTECTION AGENCY
REGION IX
PERMITS ISSUANCE SECTION (W-5-1)
75 HAWTHORNE STREET
SAN FRANCISCO CA 94105

ATTACHMENT C

ACRONYMS AND ABBREVIATIONS

AMAL	Average Monthly Action Level
ASBS	Area(s) of Special Biological Significance
BMP	Best Management Practice
Basin Plan	Water Quality Control Plan for the San Diego Basin
CEQA	California Environmental Quality Act
CCR	California Code of Regulations
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWC	California Water Code
CZARA	Coastal Zone Act Reauthorization Amendments of 1990
ESAs	Environmentally Sensitive Areas
GIS	Geographic Information System
IBI	Index of Biological Integrity
LID	Low Impact Development
MDAL	Maximum Daily Action Level
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
NAL	Non-Storm Water Action Level
NAICS	North American Industry Classification System
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
ROWD	Report of Waste Discharge (application for NPDES reissuance)
SAL	Storm Water Action Level
San Diego Water Board	California Regional Water Quality Control Board, San Diego Region
SIC	Standard Industrial Classification Code
State Water Board	State Water Resources Control Board
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
WDID	Waste Discharge Identification Number
WLA	Waste Load Allocation
WQBEL	Water Quality Based Effluent Limitation

DEFINITIONS

Active/Passive Sediment Treatment - Using mechanical, electrical or chemical means to flocculate or coagulate suspended sediment for removal from runoff from construction sites prior to discharge.

Anthropogenic Litter – Trash generated from human activities, not including sediment.

Average Monthly Action Level – The highest allowable average of daily discharges over a calendar month.

Beneficial Uses - The uses of water necessary for the survival or wellbeing of man, plants, and wildlife. These uses of water serve to promote tangible and intangible economic, social, and environmental goals. "Beneficial Uses" of the waters of the State that may be protected include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. Existing beneficial uses are uses that were attained in the surface or ground water on or after November 28, 1975; and potential beneficial uses are uses that would probably develop in future years through the implementation of various control measures. "Beneficial Uses" are equivalent to "Designated Uses" under federal law. [California Water Code Section 13050(f)].

Best Management Practices (BMPs) - Defined in 40 CFR 122.2 as schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Bioassessment - The use of biological community information to evaluate the biological integrity of a water body and its watershed. With respect to aquatic ecosystems, bioassessment is the collection and analysis of samples of the benthic macroinvertebrate community together with physical/habitat quality measurements associated with the sampling site and the watershed to evaluate the biological condition (i.e. biotic integrity) of a water body.

Biofiltration - Practices that use vegetation and amended soils to detain and treat runoff from impervious areas. Treatment is through filtration, infiltration, adsorption, ion exchange, and biological uptake of pollutants.

Biological Integrity - Defined in Karr J.R. and D.R. Dudley. 1981. Ecological perspective on water quality goals. *Environmental Management* 5:55-68 as: "A balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitat of the region." Also referred to as ecosystem health.

BMP Design Manual – A plan developed to eliminate, reduce, or mitigate the impacts of runoff from development projects, including Priority Development Projects.

Chronic Toxicity – A measurement of sublethal effect (e.g. reduced growth, reproduction) to experimental test organisms exposed to an effluent or receiving waters compared to that of the control organisms.

Clean Water Act Section 303(d) Water Body - An impaired water body in which water quality does not meet applicable water quality standards and/or is not expected to meet water quality standards, even after the application of technology based pollution controls required by the CWA. The discharge of runoff to these water bodies by the Copermittees is significant because these discharges can cause or contribute to violations of applicable water quality standards.

Construction Site – Any project, including projects requiring coverage under the Construction General Permit, that involves soil disturbing activities including, but not limited to, clearing, grading, disturbances to ground such as stockpiling, and excavation.

Contamination - As defined in the Porter-Cologne Water Quality Control Act, contamination is "an impairment of the quality of waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste whether or not waters of the State are affected."

Copermittee – A permittee to a NPDES permit that is only responsible for permit conditions relating to the discharge for which it is operator [40 CFR 122.26(b)(1)]. For the purposes of this Order, a Copermittee is one of the individual permittees identified in Tables 1a-1c of this Order.

Copermittees – All of the individual Copermittees, collectively.

Critical Channel Flow (Qc) – The channel flow that produces the critical shear stress that initiates bed movement or that erodes the toe of channel banks. When measuring Qc, it should be based on the weakest boundary material – either bed or bank.

Daily Discharge – Defined as either: (1) the total mass of the constituent discharged over the calendar day or any 24 hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g. concentration.)

The Daily Discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day, or other 24 hour period other than a day), or by the arithmetic mean of analytical results from one or more grab samples taken over the course of a day.

Development Projects - Construction, rehabilitation, redevelopment, or reconstruction of any public or private projects.

Dry Season –May 1 to September 30.

Dry Weather – Weather is considered dry if the preceding 72 hours has been without measurable precipitation (>0.1 inch).

Enclosed Bays – Enclosed bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost bay works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays do not include inland surface waters or ocean waters.

Erosion – When land is diminished or worn away due to wind, water, or glacial ice. Often the eroded debris (silt or sediment) becomes a pollutant via storm water runoff. Erosion occurs naturally but can be intensified by land clearing activities such as farming, development, road building, and timber harvesting.

Environmentally Sensitive Areas (ESAs) - Areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; areas designated as preserves or their equivalent under the Natural Communities Conservation Program within the Cities and County of Orange; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.

Estuaries – Waters, including coastal lagoons, located at the mouth of streams that serve as areas of mixing fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and ocean water. Estuaries do not include inland surface waters or ocean waters.

Existing Development – Any area that has been developed and exists for municipal, commercial, industrial, or residential purposes, uses, or activities. May include areas that are not actively used for its originally developed purpose, but may be re-purposed or redeveloped for another use or activity.

Flow Duration – The long-term period of time that flows occur above a threshold that causes significant sediment transport and may cause excessive erosion damage to creeks and streams (not a single storm event duration). The simplest way to visualize this is to consider a histogram of pre- and post-project flows using long-term records of hourly data. To maintain pre-development flow duration means that the total number of hours (counts) within each range of flows in a flow-duration histogram cannot increase between the pre- and post-development condition. Flow duration within the range of geomorphologically significant flows is important for managing erosion.

Grading - The cutting and/or filling of the land surface to a desired slope or elevation.

Groundwater – Subsurface water that occurs beneath the water table in soils and geologic formations that are fully saturated.

Hazardous Material – Any substance that poses a threat to human health or the environment due to its toxicity, corrosiveness, ignitability, explosive nature or chemical reactivity. These also include materials named by the USEPA in 40 CFR 116 to be reported if a designated quantity of the material is spilled into the waters of the U.S. or emitted into the environment.

Hazardous Waste - Hazardous waste is defined as “any waste which, under Section 600 of Title 22 of this code, is required to be managed according to Chapter 30 of Division 4.5 of Title 22 of this code” [CCR Title 22, Division 4.5, Chapter 11, Article 1].

Household Hazardous Waste – Paints, cleaning products, and other hazardous wastes generated during home improvement or maintenance activities.

Hydromodification – The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

Illicit Connection – Any man-made conveyance or drainage system through which a non-storm water discharge to the storm water drainage system occurs or may occur. Any connection to the MS4 that conveys an illicit discharge.

Illicit Discharge - Any discharge to the MS4 that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from firefighting activities [40 CFR 122.26(b)(2)].

Inactive Areas – Areas of construction activity that are not active and those that have been active and are not scheduled to be re-disturbed for at least 14 days.

Infiltration – In the context of low impact development, infiltration is defined as the percolation of water into the ground. Infiltration is often expressed as a rate (inches per hour), which is determined through an infiltration test. In the context of non-storm water, infiltration is water other than wastewater that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow [40 CFR 35.2005(20)].

Inland Surface Waters – Includes all surface waters of the State that do not include the ocean, enclosed bays, or estuaries.

Jurisdictional Runoff Management Program Document – A written description of the specific jurisdictional runoff management measures and programs that each Copermittee will implement to comply with this Order and ensure that storm water pollutant discharges in runoff are reduced to the MEP and do not cause or contribute to a violation of water quality standards.

Low Impact Development (LID) – A storm water management and land development strategy that emphasizes conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions.

Low Impact Development Best Management Practices (LID BMPs) – LID BMPs include schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States through storm water management and land development strategies that emphasize conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions. LID BMPs include retention practices that do not allow runoff, such as infiltration, rain water harvesting and reuse, and evapotranspiration. LID BMPs also include flow-through practices such as biofiltration that may have some discharge of storm water following pollutant reduction.

Major Outfall – As defined in the Code of Federal Regulations, a major outfall is a MS4 outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (i.e. discharge from a single conveyance other than a circular pipe which is associated with a drainage area of more than 50 acres); or, for MS4s that receive storm water from lands zoned for industrial activity (based on comprehensive zoning plans or equivalent), a MS4 outfall that discharges from a single pipe with an inside diameter of 12 inches or more or from its equivalent (i.e. discharge from other than a circular pipe associated with a drainage area of 2 acres or more).

Maximum Daily Action Level (MDAL) –The highest allowable daily discharge of a pollutant, over a calendar day (or 24 hour period). For pollutants with action levels expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with action levels expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

Maximum Extent Practicable (MEP) – The technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) for storm water that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) in combination with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than BAT. A definition for MEP is not provided either in the statute or in the regulations. Instead the definition of MEP is dynamic and will be defined by the following process over time: municipalities propose their definition of MEP by way of their runoff management programs. Their total collective and individual activities conducted pursuant to the runoff management programs becomes their proposal for MEP as it applies both to their overall effort, as well as to specific activities (e.g., MEP for street sweeping, or MEP for MS4 maintenance). In the absence of a proposal acceptable to the San Diego Water Board, the San Diego Water Board defines MEP.

In a memo dated February 11, 1993, entitled "Definition of Maximum Extent Practicable," Elizabeth Jennings, Senior Staff Counsel, SWRCB addressed the achievement of the MEP standard as follows:

> "*To achieve the MEP standard, municipalities must employ whatever Best Management Practices (BMPs) are technically feasible (i.e., are likely to be effective) and are not cost prohibitive. The major emphasis is on technical feasibility. Reducing pollutants to the MEP means choosing effective BMPs, and rejecting applicable BMPs only where other effective BMPs will serve the same purpose, or the BMPs would not be technically feasible, or the cost would be prohibitive. In selecting BMPs to achieve the MEP standard, the following factors may be useful to consider:*
>
> *a. Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?*
> *b. Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?*
> *c. Public Acceptance: Does the BMP have public support?*
> *d. Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?*
> *e. Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc.?*

The final determination regarding whether a municipality has reduced pollutants to the maximum extent practicable can only be made by the Regional or State Water Boards, and not by the municipal discharger. If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit derived, it would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs that would address a pollutant source, or to pick a BMP based solely on cost, which would be clearly less effective. In selecting BMPs the municipality must make a serious attempt to comply and practical solutions may not be lightly rejected. In any case, the burden would be on the municipal discharger to show compliance with its permit. After selecting a menu of BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented."

Monitoring Year – October 1 to September 30

Municipal Separate Storm Sewer System (MS4) – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designated or used for collecting or conveying storm water; (iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.26.

National Pollutant Discharge Elimination System (NPDES) - The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the CWA.

Non-Storm Water - All discharges to and from a MS4 that do not originate from precipitation events (i.e., all discharges from a MS4 other than storm water). Non-storm water includes illicit discharges and NPDES permitted discharges.

Nuisance - As defined in the Porter-Cologne Water Quality Control Act, a nuisance is "anything which meets all of the following requirements: 1) Is injurious to health, or is indecent, or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. 2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. 3) Occurs during, or as a result of, the treatment or disposal of wastes."

Ocean Waters – The territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the State Board's California Ocean Plan.

Order – Unless otherwise specified, refers to this Order, Order No. R9-2013-0001 (NPDES No. CAS0109266)

Outfall - Outfall means a point source as defined by 40 CFR 122.2 at the point where a municipal separate storm sewer discharges to waters of the US and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels or other conveyances which connect segments of the same stream or other waters of the US and are used to convey waters of the US.

Persistent Flow - Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

Person - A person is defined as an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof [40 CFR 122.2].

Point Source - Any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, landfill leachate collection systems, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

Pollutant - Any agent that may cause or contribute to the degradation of water quality such that a condition of pollution or contamination is created or aggravated.

Pollution - As defined in the Porter-Cologne Water Quality Control Act, pollution is "the alteration of the quality of the waters of the State by waste, to a degree which unreasonably affects either of the following: 1) The waters for beneficial uses; or 2) Facilities that serve these beneficial uses." Pollution may include contamination.

Pollution Prevention - Pollution prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control BMPs, treatment control BMPs, or disposal.

Pre-Development Runoff Conditions – Approximate flow rates and durations that exist or existed onsite before land development occurs. For new development projects, this equates to runoff conditions immediately before project construction. For redevelopment projects, this equates to runoff conditions from the project footprint assuming infiltration characteristics of the underlying soil, and existing grade. Runoff coefficients of concrete or asphalt must not be used. A redevelopment Priority Development Project must use available information pertaining to existing underlying soil type and onsite existing grade to estimate pre-development runoff conditions.

Priority Development Projects - New development and redevelopment projects defined under Provision E.3.b of Order No. R9-2013-0001.

Rainy Season (aka Wet Season) –October 1 to April 30

Receiving Waters – Waters of the United States.

Receiving Water Limitations - Waste discharge requirements issued by the San Diego Water Board typically include both: (1) "Effluent Limitations" (or "Discharge Limitations") that specify the technology-based or water-quality-based effluent limitations; and (2) "Receiving Water Limitations" that specify the water quality objectives in the Basin Plan as well as any other limitations necessary to attain those objectives. In summary, the "Receiving Water Limitations" provision is the provision used to implement the requirements of CWA section 402(p)(3)(B).

Redevelopment - The creation and/or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include trenching and resurfacing associated with utility work; resurfacing existing roadways; new sidewalk construction, pedestrian ramps, or bike lane on existing roads; and routine replacement of damaged pavement, such as pothole repair.

Regional Clearinghouse – A central location for the collection and distribution of information developed and maintained by the Copermittees including, but not limited to, plans, reports, manuals, data, contact information, and/or links to such documents and information.

Rehabilitation - Remedial measures or activities for the purpose of improving or restoring the beneficial uses of streams, channels or river systems. Techniques may vary from in-stream restoration techniques to off-line storm water management practices installed in the system corridor or upland areas, or a combination of in-stream and out of stream techniques. Rehabilitation techniques may include, but are not limited to the following: riparian zone restoration, constructed wetlands, channel modifications that improve habitat and stability, and daylighting of drainage systems.

Reporting Period – The period of information that is reported in the Water Quality Improvement Plan Annual Report. The reporting period consists of two components: 1) July 1 to June 30, consistent with the fiscal year, for the implementation of the jurisdictional runoff management programs, and 2) October 1 to September 30, consistent with the monitoring year for the monitoring and assessment programs. Together, these two time periods constitute the reporting year for the Water Quality Improvement Plan Annual Report due January 31 following the end of the monitoring year.

Retain – Keep or hold in a particular place, condition, or position without discharge to surface waters.

Retrofitting – Storm water management practice put into place after development has occurred in watersheds where the practices previously did not exist or are ineffective. Retrofitting of developed areas is intended to improve water quality, protect downstream channels, reduce flooding, or meet other specific objectives. Retrofitting developed areas may include, but is not limited to replacing roofs with green roofs, disconnecting downspouts or impervious surfaces to drain to pervious surfaces, replacing impervious surfaces with pervious surfaces, installing rain barrels, installing rain gardens, and trash area enclosures.

Runoff - All flows in a storm water conveyance system that consists of the following components: (1) storm water (wet weather flows) and (2) non-storm water including dry weather flows.

San Diego Water Board – As used in this document the term "San Diego Water Board" is synonymous with the term "Regional Board" as defined in Water Code section 13050(b) and is intended to refer to the California Regional Water Quality Control Board for the San Diego Region as specified in Water Code Section 13200.

Sediment - Soil, sand, and minerals washed from land into water. Sediment resulting from anthropogenic sources (i.e. human induced land disturbance activities) is considered a pollutant. This Order regulates only the discharges of sediment from anthropogenic sources and does not regulate naturally occurring sources of sediment. Sediment can destroy fish-nesting areas, clog animal habitats, and cloud waters so that sunlight does not reach aquatic plants.

Source Control BMP – Land use or site planning practices, or structural or nonstructural measures that aim to prevent runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between pollutants and runoff.

Storm Water – Per 40 CFR 122.26(b)(13), means storm water runoff, snowmelt runoff and surface runoff and drainage. Surface runoff and drainage pertains to runoff and drainage resulting from precipitation events.

Structural BMPs - A subset of BMPs which detains, retains, filters, removes, or prevents the release of pollutants to surface waters from development projects in perpetuity, after construction of a project is completed.

Test of Significant Toxicity (TST) - A statistical approach used to analyze toxicity test data. The TST incorporates a restated null hypothesis, Welch's t-test, and biological effect thresholds for chronic and acute toxicity.

Total Maximum Daily Load (TMDL) - The maximum amount of a pollutant that can be discharged into a water body from all sources (point and non-point) and still maintain water quality standards. Under CWA section 303(d), TMDLs must be developed for all water bodies that do not meet water quality standards after application of technology-based controls.

Toxicity - Adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies. The water quality objectives for toxicity provided in the Basin Plan, state in part…"All waters shall be free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life….The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge."

Toxicity Identification Evaluation (TIE) - A set of procedures for identifying the specific chemical(s) responsible for toxicity. These procedures are performed in three phases (characterization, identification, and confirmation) using aquatic organism toxicity tests.

Toxicity Reduction Evaluation (TRE) - A study conducted in a step-wise process designed to identify the causative agents of effluent or ambient toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in toxicity. The first steps of the TRE consist of the collection of data relevant to the toxicity, including additional toxicity testing, and an evaluation of facility operations and maintenance practices, and best management practices. A Toxicity Identification Evaluation (TIE) may be required as part of the TRE, if appropriate.

Treatment Control BMP – Any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media absorption or any other physical, biological, or chemical process.

Unpaved Road – Any long, narrow stretch without pavement used for traveling by motor passenger vehicles between two or more points. Unpaved roads are generally constructed of dirt, gravel, aggregate or macadam and may be improved or unimproved.

Waste - As defined in CWC Section 13050(d), "waste includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal."

Article 2 of CCR Title 23, Chapter 15 (Chapter 15) contains a waste classification system that applies to solid and semi-solid waste, which cannot be discharged directly or indirectly to water of the state and which therefore must be discharged to land for treatment, storage, or disposal in accordance with Chapter 15. There are four classifications of waste (listed in order of highest to lowest threat to water quality): hazardous waste, designated waste, non-hazardous solid waste, and inert waste.

Water Quality Objective - Numerical or narrative limits on constituents or characteristics of water designated to protect designated beneficial uses of the water. [California Water Code Section 13050 (h)]. California's water quality objectives are established by the State and Regional Water Boards in the Water Quality Control Plans. Numeric or narrative limits for pollutants or characteristics of water designed to protect the beneficial uses of the water. In other words, a water quality objective is the maximum concentration of a pollutant that can exist in a receiving water and still generally ensure that the beneficial uses of the receiving water remain protected (i.e., not impaired). Since water quality objectives are designed specifically to protect the beneficial uses, when the objectives are violated the beneficial uses are, by definition, no longer protected and become impaired. This is a fundamental concept under the Porter Cologne Act. Equally fundamental is Porter Cologne's definition of pollution. A condition of pollution exists when the water quality needed to support designated beneficial uses has become unreasonably affected or impaired; in other words, when the water quality objectives have been violated. These underlying definitions (regarding beneficial use protection) are the reason why all waste discharge requirements implementing the federal NPDES regulations require compliance with water quality objectives. (Water quality objectives are also called water quality criteria in the CWA.)

Water Quality Standards - Water quality standards, as defined in Clean Water Act section 303(c) consist of the beneficial uses (e.g., swimming, fishing, municipal drinking water supply, etc.,) of a water body and criteria (referred to as water quality objectives in the California Water Code) necessary to protect those uses. Under the Water Code, the water boards establish beneficial uses and water quality objectives in water quality control or basin plans. Together with an anti-degradation policy, these beneficial uses and water quality objectives serve as water quality standards under the Clean Water Act. In Clean Water Act parlance, state beneficial uses are called "designated uses" and state water quality objectives are called "criteria." Throughout this Order, the relevant term is used depending on the statutory scheme.

Waters of the State - Any water, surface or underground, including saline waters within the boundaries of the State [CWC section 13050 (e)]. The definition of the Waters of the State is broader than that for the Waters of the United States in that all water in the State is considered to be a Waters of the State regardless of circumstances or condition.

Waters of the United States - As defined in the 40 CFR 122.2, the Waters of the U.S. are defined as: "(a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate "wetlands;" (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters otherwise defined as waters of the United States under this definition: (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial seas; and (g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA."

Watershed - That geographical area which drains to a specified point on a water course, usually a confluence of streams or rivers (also known as drainage area, catchment, or river basin).

Wet Season (aka Rainy Season) – October 1 to April 30

Wet Weather – Weather is considered wet up to 72 hours after a storm event of 0.1 inches and greater, unless otherwise defined by another regulatory mechanism (e.g. a TMDL).

ATTACHMENT D

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

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JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

FY _____

I. COPERMITTEE INFORMATION

Copermittee Name:

Copermittee Primary Contact Name:

Copermittee Primary Contact Information:
Address:
City: County: State: Zip:
Telephone: Fax: Email:

II. LEGAL AUTHORITY

Has the Copermittee established adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐
A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority?	**YES**	☐
	NO	☐

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

Was an update of the jurisdictional runoff management program document required or recommended by the San Diego Water Board?	**YES**	☐
	NO	☐
If YES to the question above, did the Copermittee update its jurisdictional runoff management program document and make it available on the Regional Clearinghouse?	**YES**	☐
	NO	☐

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

Has the Copermittee implemented a program to actively detect and eliminate illicit discharges and connections to its MS4 that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

Number of non-storm water discharges reported by the public	
Number of non-storm water discharges detected by Copermittee staff or contractors	
Number of non-storm water discharges investigated by the Copermittee	
Number of sources of non-storm water discharges identified	
Number of non-storm water discharges eliminated	
Number of sources of illicit discharges or connections identified	
Number of illicit discharges or connections eliminated	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

V. DEVELOPMENT PLANNING PROGRAM

Has the Copermittee implemented a development planning program that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐
Was an update to the BMP Design Manual required or recommended by the San Diego Water Board?	**YES**	☐
	NO	☐
If YES to the question above, did the Copermittee update its BMP Design Manual and make it available on the Regional Clearinghouse?	**YES**	☐
	NO	☐

Number of proposed development projects in review	
Number of Priority Development Projects in review	
Number of Priority Development Projects approved	
Number of approved Priority Development Projects exempt from any BMP requirements	
Number of approved Priority Development Projects allowed alternative compliance	
Number of Priority Development Projects granted occupancy	

Number of completed Priority Development Projects in inventory	
Number of high priority Priority Development Project structural BMP inspections	
Number of Priority Development Project structural BMP violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM
FY _____

VI. CONSTRUCTION MANAGEMENT PROGRAM

Has the Copermittee implemented a construction management program that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

Number of construction sites in inventory	
Number of active construction sites in inventory	
Number of inactive construction sites in inventory	
Number of construction sites closed/completed during reporting period	
Number of construction site inspections	
Number of construction site violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

Has the Copermittee implemented an existing development management program that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

	Municipal	Commercial	Industrial	Residential
Number of facilities or areas in inventory				
Number of existing development inspections				
Number of follow-up inspections				
Number of violations				
Number of enforcement actions issued				
Number of escalated enforcement actions issued				

VIII. PUBLIC EDUCATION AND PARTICIPATION

Has the Copermittee implemented a public education program component that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐
Has the Copermittee implemented a public participation program component that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

IX. FISCAL ANALYSIS

Has the Copermittee attached to this form a summary of its fiscal analysis that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

X. CERTIFICATION

I [☐ Principal Executive Officer ☐ Ranking Elected Official ☐ Duly Authorized Representative] certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature	Date
Print Name	Title
Telephone Number	Email

ATTACHMENT E

SPECIFIC PROVISIONS FOR TOTAL MAXIMUM DAILY LOADS APPLICABLE TO ORDER NO. R9-2013-0001

These provisions implement load allocations (LAs) and wasteload allocations (WLAs) of the Total Maximum Daily Loads (TMDLs) adopted by the San Diego Water Board and approved by USEPA under Clean Water Act section 303(c), applicable to discharges regulated under this Order. The provisions and schedules for implementation of the TMDLs described below must be incorporated into the Water Quality Improvement Plans, required pursuant to Provision B of this Order, for the specified Watershed Management Areas.

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed
2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin
3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed
4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek
5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay
6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2002-0123

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	August 14, 2002
State Water Board Approval Date:	July 16, 2003
Office of Administrative Law Approval Date:	September 11, 2003
US EPA Approval Date:	November 3, 2003

(3) TMDL Effective Date: September 11, 2003

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final diazinon TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must be in compliance with the final TMDL compliance requirements as of December 31, 2010.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations:

Table 1.1
Final Receiving Water Limitations Expressed as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Diazinon	Acute	0.08 µg/L	1 hour
	Chronic	0.05 µg/L	4 days

(b) Final Effluent Limitations

Discharges from the MS4s containing concentrations that do not exceed the following effluent limitations will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 1.b.(2)(a):

Table 1.2
Final Effluent Limitations Expressed as Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation	Averaging Period
Diazinon	Acute	0.072 µg/L	1 hour
	Chronic	0.045 µg/L	4 days

(c) Best Management Practices

The following BMPs for Chollas Creek must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area and implemented by the Responsible Copermittees:

(i) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 1.b.(2)(a) and/or the effluent limitations under Specific Provision 1.b.(2)(b) for Chollas Creek.

(ii) The Responsible Copermittees must implement the Diazinon Toxicity Control Plan and Diazinon Public Outreach/Education Program as described in the report titled, *Technical Report for Total Maximum Daily Load for Diazinon in Chollas Creek Watershed, San Diego County*, dated August 14, 2002, including subsequent modifications, in order to achieve the receiving water limitations under Specific Provision 1.b.(2)(a) and/or the effluent limitations under Specific Provision 1.b.(2)(b).

(iii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 1.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 1.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 1.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 1.b.(2)(c) achieves compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 1.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 1.d, to demonstrate compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The Responsible Copermittees must be in compliance with the final diazinon TMDL compliance requirements as of December 31, 2010.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls for diazinon within the Chollas Creek watershed, and calculate or estimate the annual diazinon loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 1.b.(2)(b), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0019

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	September 22, 2005
Office of Administrative Law Approval Date:	December 2, 2005
US EPA Approval Date:	February 8, 2006

(3) TMDL Effective Date: December 2, 2005

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Shelter Island Yacht Basin

(6) Responsible Copermittee: City of San Diego

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final dissolved copper TMDL compliance requirements for Shelter Island Yacht Basin consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittee must be in compliance with the final TMDL compliance requirements as of December 2, 2005.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations:

Table 2.1
Final Receiving Water Limitations Expressed as Concentrations in Shelter Island Yacht Basin

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Dissolved Copper	Acute	4.8 µg/L x WER*	1 hour
	Chronic	3.1 µg/L x WER*	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 2.b.(3)(a):

Table 2.2
Final Effluent Limitations as Expressed as Annual Loads in MS4 Discharges to Shelter Island Yacht Basin

Constituent	Effluent Limitation
Dissolved Copper	30 kg/yr*

* If the water quality objectives for dissolved copper in Shelter Island Yacht Basin are changed in the future, then the margin of safety (MOS), TMDL and allocations will be recalculated using the *Method for Recalculation of the Total Maximum Daily Load for Dissolved Copper in the Shelter Island Yacht Basin, San Diego Bay* in the Basin Plan (p. 7-14).

(c) Best Management Practices

The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 2.b.(2)(a) and/or the effluent limitations under Specific Provision 2.b.(2)(b) for Shelter Island Yacht Basin. The BMPs must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 2.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 2.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittee develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 2.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate

that the implementation of the BMPs required under Provision 2.b.(2)(c) achieves compliance with Specific Provisions 2.b.(3)(a), 2.b.(3)(b) and/or 2.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 2.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 2.d, to demonstrate compliance with Specific Provisions 2.b.(3)(a), 2.b.(3)(b) and/or 2.b.(3)(c).

c. Interim TMDL Compliance Requirements

The Responsible Copermittees must be in compliance with the final dissolved copper TMDL compliance requirements as of December 2, 2005.

d. Specific Monitoring and Assessment Requirements

The Responsible Copermittee must monitor the effluent of its MS4 outfalls for dissolved copper, and calculate or estimate the monthly and annual dissolved copper loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.(b)(2)of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0036

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	November 16, 2005
Office of Administrative Law Approval Date:	February 1, 2006
US EPA Approval Date:	March 22, 2006

(3) TMDL Effective Date: February 1, 2006

(4) Watershed Management Area: Santa Margarita River

(5) Water Body: Rainbow Creek

(6) Responsible Copermittee: County of San Diego

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final total nitrogen and total phosphorus TMDL compliance requirements for Rainbow Creek consist of the following

(1) Final TMDL Compliance Date

The Responsible Copermittee must comply with final TMDL compliance requirements by December 31, 2021.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance date under Specific Provision 3.b.(1):

Table 3.1
Final Receiving Water Limitations Expressed as Concentrations in Rainbow Creek

Constituent	Receiving Water Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing concentrations that do not exceed the following effluent limitations by the compliance date under Specific Provision 3.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 3.b.(2)(a):

Table 3.2
Final Effluent Limitations Expressed as Concentrations in MS4 Discharges to Rainbow Creek

Constituent	Effluent Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(ii) Annual pollutant loads from given land uses discharging to and from the MS4s that do not exceed the following annual loads by the compliance date under Specific Provision 3.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 3.b.(2)(a):

Table 3.3
Final Effluent Limitations Expressed as Annual Loads in MS4 Discharges to Rainbow Creek

Land Use	Total N	Total P
Commercial nurseries	116 kg/yr	3 kg/yr
Park	3 kg/yr	0.1 kg/yr
Residential areas	149 kg/yr	12 kg/yr
Urban areas	27 kg/yr	6 kg/yr

(c) Best Management Practices

(i) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 3.b.(2)(a) and/or the effluent limitations under Specific Provision 3.b.(2)(b) for Rainbow Creek.

(ii) The Responsible Copermittee should coordinate any BMPs implemented to address this TMDL with Caltrans and other sources as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 3.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 3.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the final effluent limitations under Specific Provision 3.b.(2)(b)(ii); OR

(e) The Responsible Copermittee develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 3.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Specific Provision 3.b.(2)(c) achieves compliance with Specific Provisions 3.b.(3)(a), 3.b.(3)(b), 3.b.(3)(c) and/or 3.b.(3)(d),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 3.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 3.d, to demonstrate compliance with Specific Provisions 3.b.(3)(a), 3.b.(3)(b), 3.b.(3)(c) and/or 3.b.(3)(d).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim total nitrogen and total phosphorus TMDL compliance requirements for Rainbow Creek consist of the following:

(1) Interim Compliance Dates and WQBELs

The Responsible Copermittee must comply with the interim WQBELs, expressed as annual loads, by December 31 of the interim compliance year given in Table 3.4.

Table 3.4
Interim Water Quality Based Effluent Limitations Expressed as Annual Loads in MS4 Discharges from Specific Land Uses to Rainbow Creek

	Total N Interim Effluent Limitations (kg/yr)			Total P Interim Effluent Limitations (kg/yr)		
	Interim Compliance Date			Interim Compliance Date		
Land Use	**2009**	**2013**	**2017**	**2009**	**2013**	**2017**
Commercial nurseries	390	299	196	20	16	10
Park	5	3	3	0.15	0.10	0.10
Residential areas	507	390	260	99	74	47
Urban areas	40	27	27	9	6	6

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 3.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 3.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the final effluent limitations under Specific Provision 3.b.(2)(b)(ii); OR

(e) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the interim effluent limitations under Specific Provision 3.c.(1); OR

(f) The Responsible Copermittee has submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

d. Specific Monitoring and Assessment Requirements

(1) The Responsible Copermittee must incorporate into the Water Quality Improvement Plan and implement the Sampling and Analysis Plan for Rainbow Creek Nutrient Reduction TMDL Implementation Water Quality Monitoring, dated January 2010.

(2) The results of any monitoring conducted during the reporting period, and assessment of whether the interim and final TMDL compliance requirements have been achieved must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 3.b.(2)(b)(i), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2007-0043

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2007
State Water Board Approval Date:	July 15, 2008
Office of Administrative Law Approval Date:	October 22, 2008
US EPA Approval Date:	December 18, 2008

(3) TMDL Effective Date: October 22, 2008

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final dissolved copper, lead, and zinc TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must comply with the final TMDL compliance requirements by October 22, 2028.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance date under Specific Provision 4.b.(1):

Table 4.1
Final Receiving Water Limitations Expressed as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$(0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$(0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$(0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$(0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations by the compliance date under Specific Provision 4.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 4.b.(2)(a):

Table 4.2
Final Effluent Limitations as Expressed Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(c) Best Management Practices

(i) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 4.b.(2)(a) and/or the effluent limitations under Specific Provision 4.b.(2)(b) for Chollas Creek.

(ii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans and the U.S. Navy as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 4.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 4.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 4.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 4.b.(2)(c) achieves compliance with Specific Provisions 4.b.(3)(a), 4.b.(3)(b) and/or 4.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 4.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 4.d, to demonstrate compliance with Specific Provisions 4.b.(3)(a), 4.b.(3)(b) and/or 4.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim dissolved copper, lead, and zinc TMDL compliance requirements for Chollas Creek consist of the following:

(1) Interim Compliance Date and WQBELs

The Responsible Copermittee must comply with the interim WQBELs, expressed as concentrations, by the interim compliance date given in Table 4.3:

Table 4.3
Interim Water Quality Based Effluent Limitations Expressed as Concentrations in MS4 Discharges to Chollas Creek

Interim Compliance Date	Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
October 22, 2018	Dissolved Copper	Acute	$1.2 \times 90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
	Dissolved Lead	Acute	$1.2 \times 90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
	Dissolved Zinc	Acute	$1.2 \times 90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 4.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 4.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) There are no exceedances of the interim effluent limitations under Specific Provision 4.c.(1) at the Responsible Copermittee's MS4 outfalls; OR

(e) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance date.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*, when it is amended to include monitoring requirements for the Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls discharging to Chollas Creek for dissolved copper, lead, and zinc, and calculate or estimate the monthly and annual dissolved copper, lead, and zinc loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 4.b.(2)(b) or 4.c.(1), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2008-0027

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 11, 2008
State Water Board Approval Date:	June 16, 2009
Office of Administrative Law Approval Date:	September 15, 2009
US EPA Approval Date:	October 26, 2009

(3) TMDL Effective Date: September 15, 2009

(4) Watershed Management Areas: See Table 5.0

(5) Water Bodies: See Table 5.0

(6) Responsible Copermittees: See Table 5.0

Table 5.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County	Dana Point Harbor	Baby Beach	-City of Dana Point -County of Orange
San Diego Bay	San Diego Bay	Shelter Island Shoreline Park	- San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final indicator bacteria TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Final TMDL Compliance Dates

(a) Baby Beach in Dana Point Harbor

The Responsible Copermittees for MS4 discharges to Baby Beach must be in compliance with the final TMDL compliance requirements according to the following compliance dates:

Table 5.1
Compliance Dates to Achieve Final TMDL Compliance Requirements For Baby Beach in Dana Point Harbor

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform	September 15, 2014	September 15, 2009
Fecal Coliform		September 15, 2009
Enterococcus		September 15, 2019

(b) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park must be in compliance with the final TMDL compliance requirements as of December 31, 2012.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance dates under Specific Provision 5.b.(1):

Table 5.2
Final Receiving Water Limitations Expressed as Bacteria Densities in the Water Body

	Receiving Water Limitations	
Constituent	Single Sample Maximum[1,2]	30-Day Geometric Mean[2]
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing indicator bacteria densities that do not exceed the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.3a
Final Effluent Limitations as Expressed as Bacteria Densities in MS4 Discharges to the Water Body

	Effluent Limitations	
Constituent	**Single Sample Maximum[1,2]**	**30-Day Geometric Mean[2]**
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.

(ii) Discharges from the MS4s containing indicator bacteria loads that do not exceed the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.4a
Final Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to the Baby Beach in Dana Point Harbor

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0.86×10^9 MPN/day	$3{,}254 \times 10^9$ MPN/30days
Fecal Coliform	0.17×10^9 MPN/day	112×10^9 MPN/30days
Enterococcus	0.03×10^9 MPN/day	114×10^9 MPN/30days

Table 5.4b
Final Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to the Shelter Island Shoreline Park in San Diego Bay

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0 MPN/day	198×10^9 MPN/30days
Fecal Coliform	0 MPN/day	8×10^9 MPN/30days
Enterococcus	0 MPN/day	26×10^9 MPN/30days

(iii) Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.5a
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to Baby Beach in Dana Point Harbor*

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	90.4%	0%
Fecal Coliform	82.7%	0%
Enterococcus	96.2%	62.2%

Notes:
* The percent load reductions are relative to data collected between 1996-2002. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittees' MS4s must not exceed the loads in Table 5.4a, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the water body.

Table 5.5b
*Final Effluent Limitations Expressed as Percent Load Reductions** in MS4 Discharges to Shelter Island Shoreline Park in San Diego Bay*

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0%	0%
Fecal Coliform	0%	0%
Enterococcus	0%	0%

Notes:
* The percent load reductions are relative to data collected between 1999-2004. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittee's MS4s must not exceed the loads in Table 5.4b, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the water body.

(c) Best Management Practices

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 5.0 must incorporate the Bacteria Load Reduction Plan (BLRP) required to be developed pursuant to Resolution No. R9-2008-0027.

(ii) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 5.b.(2)(a) and/or the effluent limitations under Specific Provision 5.b.(2)(b) for the segments or areas of the water bodies listed in Table 5.0

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.b.(2)(b)(ii); OR

(e) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 5.b.(2)(b)(iii); OR

(f) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(g) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 5.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 5.b.(2)(c) achieves compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 5.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 5.d, to demonstrate compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim indicator bacteria TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Baby Beach in Dana Point Harbor

(a) Interim TMDL Compliance Dates and WQBELs

The Responsible Copermittees for MS4 discharges to Baby Beach must comply with the following interim WQBELs by the interim compliance dates given in Tables 5.6a and/or 5.6b:

Table 5.6a
Interim Water Quality Based Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to Baby Beach in Dana Point Harbor

Constituent	Interim Compliance Dates	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	4.93×10^9 MPN/day	$3{,}254 \times 10^9$ MPN/30days*
Fecal Coliform	September 15, 2012	0.59×10^9 MPN/day	112×10^9 MPN/30days*
Enterococcus	September 15, 2012	0.42×10^9 MPN/day	301×10^9 MPN/30days
	September 15, 2016	0.03×10^9 MPN/day *	207×10^9 MPN/30days

Notes:
* Same as the final effluent limitations in Table 5.4a.

Table 5.6b
Interim Water Quality Based Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to Baby Beach in Dana Point Harbor*

Constituent	Interim Compliance Dates	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	45.2%	0%**
Fecal Coliform	September 15, 2012	41.4%	0%**
Enterococcus	September 15, 2012	48.1%	0%
	September 15, 2016	96.2%**	31.1%

Notes:
* The percent load reductions are relative to data collected between 1996-2002. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittees' MS4s must not exceed the loads in Table 5.6a, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the waterbody.
** Same as the final effluent limitations in Table 5.5a.

(b) Interim Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(i) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(ii) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(iii) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(iv) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.b(2)(b)(ii); OR

(v) The Responsible Copermittees can demonstrate that exceedances of the applicable receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(vi) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the interim effluent limitations under Table 5.6a of Specific Provision 5.c.(1)(a); OR

(vii) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the interim effluent limitations under Table 5.6b of Specific Provision 5.c.(1)(a); OR

(viii) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

(2) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park must be in compliance with the final indicator bacteria TMDL requirements as of December 31, 2012.

d. Specific Monitoring and Assessment Requirements

(1) Monitoring Stations

Monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[32] If discharges of bacteria from the MS4 exceed the applicable interim or final WQBELs, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(2) Monitoring Procedures

(a) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) The Responsible Copermittees must collect wet weather monitoring samples within the first 24 hours of a storm event[33] of the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(c) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

[32] Commonly referred to as AB 411 monitoring

[33] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs have been achieved.

(b) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 5.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(c) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to correlate elevated bacteria levels with known or suspected sewage spills from wastewater collection systems and treatment plants or boats.

(d) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2010-0001

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 10, 2010
State Water Board Approval Date:	December 14, 2010
Office of Administrative Law Approval Date:	April 4, 2011
US EPA Approval Date:	June 22, 2011

(3) TMDL Effective Date: April 4, 2011

(4) Watershed Management Areas: See Table 6.0

(5) Water Bodies: See Table 6.0

(6) Responsible Copermittees: See Table 6.0

Table 6.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	-City of Laguna Beach -County of Orange -Orange County Flood Control District
		at Heisler Park - North	
	Pacific Ocean Shoreline	at Main Laguna Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Woods -County of Orange -Orange County Flood Control District
		Laguna Beach at Ocean Avenue	
		Laguna Beach at Cleo Street	
		Arch Cove at Bluebird Canyon Road	
		Laguna Beach at Dumond Drive	
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Hills -City of Laguna Niguel -City of Laguna Woods -City of Lake Forest -City of Mission Viejo -County of Orange -Orange County Flood Control District
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	
	Aliso Creek Mouth	at mouth	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	-City of Dana Point -City of Laguna Beach -City of Laguna Niguel -County of Orange -Orange County Flood Control District
		Aliso Beach at Table Rock Drive	
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)	
		at Salt Creek (large outlet)	
		Salt Creek Beach at Salt Creek service road	
		Salt Creek Beach at Strand Road	
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	-City of Dana Point -City of Laguna Hills -City of Laguna Niguel -City of Mission Viejo -City of Rancho Santa Margarita -City of San Juan Capistrano -County of Orange -Orange County Flood Control District
	San Juan Creek	lower 1 mile	
	San Juan Creek Mouth	at mouth	
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	-City of Dana Point -City of San Clemente -County of Orange -Orange County Flood Control District
		Ole Hanson Beach Club Beach at Pico Drain	
		San Clemente City Beach at El Portal Street Stairs	
		San Clemente City Beach at Mariposa Street	
		San Clemente City Beach at Linda Lane	
		San Clemente City Beach at South Linda Lane	
		San Clemente City Beach at Lifeguard Headquarters	
		under San Clemente Municipal Pier	
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	
		San Clemente State Beach at Riviera Beach	
		Can Clemente State Beach at Cypress Shores	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	-City of Oceanside -City of Vista -County of San Diego
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	-City of Carlsbad -City of Encinitas -City of Escondido -City of San Marcos -County of San Diego
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	-City of Del Mar -City of Escondido -City of Poway -City of San Diego -City of Solana Beach -County of San Diego
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	-City of Del Mar -City of Poway -City of San Diego -County of San Diego
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	-City of San Diego
		La Jolla Shores Beach at Caminito del Oro	
		La Jolla Shores Beach at Vallecitos	
		La Jolla Shores Beach at Avenida de la Playa	
		at Casa Beach, Children's Pool	
		South Casa Beach at Coast Boulevard	
		Whispering Sands Beach at Ravina Street	
		Windansea Beach at Vista de la Playa	
		Windansea Beach at Bonair Street	
		Windansea Beach at Playa del Norte	
		Windansea Beach at Palomar Avenue	
		at Tourmaline Surf Park	
		Pacific Beach at Grand Avenue	
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I- Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	-City of El Cajon -City of Santee -County of San Diego
	San Diego River	lower 6 miles	-City of El Cajon -City of La Mesa -City of San Diego -City of Santee -County of San Diego
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	-City of La Mesa -City of Lemon Grove -City of San Diego -County of San Diego - San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final indicator bacteria TMDL compliance requirements for the water bodies listed in Table 6.0 consist of the following:

(1) Final TMDL Compliance Dates

The Responsible Copermittees for MS4 discharges to the water bodies listed in Table 6.0 must be in compliance with the final TMDL compliance requirements according to the following compliance dates:

Table 6.1
Compliance Dates to Achieve Final TMDL Compliance Requirements

Constituent	Dry Weather TMDL Compliance Date	Wet Weather TMDL Compliance Date
Total Coliform	April 4, 2021	April 4, 2031
Fecal Coliform		
Enterococcus		

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance dates under Specific Provision 6.b.(1):

Table 6.2a
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Beaches

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform	10,000	22%	1,000	0%
Fecal Coliform	400	22%	200	0%
Enterococcus	104	22%	35	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan.

Table 6.2b
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Creeks

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Fecal Coliform	400	22%	200	0%
Enterococcus	61 (104)	22%	33	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Basin Plan.
d. A single sample maximum of 104 MPN/100ml for *Enterococcus* may be applied as a receiving water limitation for creeks, instead of 61 MPN/100mL, if one or more of the creeks addressed by these TMDLs (San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek, San Diego River, and/or Chollas Creek) is designated with a "moderately to lightly used area" or less frequent usage frequency in the Basin Plan. Otherwise, the single sample maximum of 61 MPN/100mL for *Enterococcus* must be used to assess compliance with the allowable exceedance frequency.

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing indicator bacteria densities that do not exceed the following effluent limitations by the compliance dates under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a):

Table 6.2c

Final Effluent Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies in MS4 Discharges to the Water Body

Constituent	Concentration-Based Effluent Limitations			
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform[d]	10,000	22%	1,000	0%
Fecal Coliform	400	22%	200	0%
Enterococcus	104[e] / 61[f]	22%	35[e] / 33[f]	0%

Notes:

a. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan for discharges to beaches, and the Basin Plan for discharges to creeks and creek mouths.
d. Total coliform effluent limitations only apply to MS4 outfalls that discharge to the Pacific Ocean Shorelines and creek mouths listed in Table 6.0.
e. This *Enterococcus* effluent limitation applies to MS4 discharges to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
f. This *Enterococcus* effluent limitation applies to MS4 discharges to segments or areas of creeks or creek mouths listed in Table 6.0.

(ii) Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the compliance dates under Specific Provision 6.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a):

Table 6.3
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watershed and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
South Orange County	**San Joaquin Hills HSA** (901.11) and **Laguna Hills HSA** (901.12) - Pacific Ocean Shoreline	91.78%	91.72%	98.28%	46.85%	52.07%	51.26%
	Aliso HSA (901.13) - Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	95.47%	95.58%	99.13%	25.29%	26.62%	27.52% (27.37%)**
	Dana Point HSA (901.14) - Pacific Ocean Shoreline	95.04%	95.03%	98.98%	13.15%	14.86%	15.16%
	Lower San Juan HSA (901.27) - Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	72.96%	74.21%	94.94%	19.21%	12.82%	27.12% (26.90%)**
	San Clemente HA (901.30) - Pacific Ocean Shoreline	94.28%	94.23%	98.83%	23.85%	24.58%	25.26%
San Luis Rey River	**San Luis Rey HU** (903.00) - Pacific Ocean Shoreline	38.13%	39.09%	87.38%	5.62%	3.12%	11.69%

Table 6.3 (Cont'd)
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watershed and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
Carlsbad	**San Marcos HA** (904.50) - Pacific Ocean Shoreline	82.82%	82.55%	96.03%	18.47%	18.98%	20.19%
San Dieguito River	**San Dieguito HU** (905.00) - Pacific Ocean Shoreline	14.39%	20.72%	83.48%	4.29%	1.46%	7.72%
Penasquitos	**Miramar Reservoir HA** (906.10) - Pacific Ocean Shoreline	96.50%	96.59%	99.42%	1.61%	1.99%	1.93%
Mission Bay	**Scripps HA** (906.30) - Pacific Ocean Shoreline	96.44%	96.42%	99.25%	16.32%	21.14%	18.82%
	Tecolote HA (906.50) - Tecolote Creek	94.51%	94.59%	98.94%	16.51%	20.47%	18.15% (18.08%)**
San Diego River	**Mission San Diego HSA** (907.11) and **Santee HSA** (907.12) - Pacific Ocean Shoreline - Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles)	74.03%	69.44%	93.96%	38.14%	53.22%	42.74% (42.47%)**
San Diego Bay	**Chollas HSA** (908.22) - Chollas Creek	92.06%	92.15%	98.46%	17.82%	24.84%	21.46% (21.36%)**

Notes:
* The percent load reductions are based on reducing loads compared to pollutant loads from 2001 to 2002.
** The alternative *Enterococcus* percent load reduction was calculated based on a numeric target of 104 MPN/100mL instead of 61 MPN/100mL, protective of the REC-1 "moderately to lightly used area" usage frequency that is protective of freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative pollutant load reductions can be utilized.

(c) Best Management Practices

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 6.0 must incorporate the Comprehensive Load Reduction Plans (CLRPs) required to be developed pursuant to Resolution No. R9-2010-0001.

(ii) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 6.b.(2)(a) and/or the effluent limitations under Specific Provision 6.b.(2)(b) for the segments or areas of the water bodies listed in Table 6.0.

(iii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans, owners/operators of small MS4s, and agricultural dischargers as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(f) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 6.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 6.b.(2)(c) achieves compliance with Specific Provisions 6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), and/or 6.b.(3)(e),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 6.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 6.d, to demonstrate compliance with Specific Provisions 6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), 6.b.(3)(e) and/or 6.b.(3)(f).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim indicator bacteria TMDL compliance requirements for the water bodies listed in Table 6.0 consist of the following:

(1) Interim TMDL Compliance Dates

The Responsible Copermittees must achieve compliance with the interim TMDL compliance requirements, as determined in accordance with Specific Provision 6.c.(3), by the interim compliance dates given in Table 6.4, unless alternative interim compliance dates are accepted by the San Diego Water Board Executive Officer as part of the Water Quality Improvement Plan.

Table 6.4
Interim Compliance Dates to Achieve Interim TMDL Compliance Requirements

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	April 4, 2016	April 4, 2021
		at Heisler Park - North		
	Pacific Ocean Shoreline	at Main Laguna Beach	April 4, 2016	April 4, 2021
		Laguna Beach at Ocean Avenue		
		Laguna Beach at Cleo Street		
		Arch Cove at Bluebird Canyon Road		
		Laguna Beach at Dumond Drive		
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	April 4, 2016	April 4, 2021
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	April 4, 2018	April 4, 2021
	Aliso Creek Mouth	at mouth	April 4, 2018	April 4, 2021
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	April 4, 2016	April 4, 2021
		Aliso Beach at Table Rock Drive		
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)		
		at Salt Creek (large outlet)		
		Salt Creek Beach at Salt Creek service road	April 4, 2017	April 4, 2021
		Salt Creek Beach at Strand Road	April 4, 2017	April 4, 2021

Table 6.4 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates	
			Interim Dry Weather WQBELs	Interim Wet Weather WQBELs
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	April 4, 2016	April 4, 2021
	San Juan Creek	lower 1 mile	April 4, 2018	April 4, 2021
	San Juan Creek Mouth	at mouth	April 4, 2016	April 4, 2021
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	April 4, 2016	April 4, 2021
		Ole Hanson Beach Club Beach at Pico Drain	April 4, 2016	April 4, 2021
		San Clemente City Beach at El Portal Street Stairs	April 4, 2017	April 4, 2021
		San Clemente City Beach at Mariposa Street		
		San Clemente City Beach at Linda Lane	April 4, 2016	April 4, 2021
		San Clemente City Beach at South Linda Lane	April 4, 2018	April 4, 2021
		San Clemente City Beach at Lifeguard Headquarters	April 4, 2017	April 4, 2021
		under San Clemente Municipal Pier		
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	April 4, 2018	April 4, 2021
		San Clemente State Beach at Riviera Beach	April 4, 2016	April 4, 2021
		Can Clemente State Beach at Cypress Shores	April 4, 2017	April 4, 2021
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	April 4, 2017	April 4, 2021
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	April 4, 2016	April 4, 2021
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	April 4, 2016	April 4, 2021

Table 6.4 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates	
			Interim Dry Weather WQBELs	Interim Wet Weather WQBELs
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	April 4, 2016	April 4, 2021
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	April 4, 2016	April 4, 2021
		La Jolla Shores Beach at Caminito del Oro		
		La Jolla Shores Beach at Vallecitos		
		La Jolla Shores Beach at Avenida de la Playa		
		at Casa Beach, Children's Pool		
		South Casa Beach at Coast Boulevard		
		Whispering Sands Beach at Ravina Street		
		Windansea Beach at Vista de la Playa		
		Windansea Beach at Bonair Street		
		Windansea Beach at Playa del Norte		
		Windansea Beach at Palomar Avenue		
		at Tourmaline Surf Park		
		Pacific Beach at Grand Avenue		
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries		
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	April 4, 2018	April 4, 2021
	San Diego River	lower 6 miles		
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach		
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	April 4, 2018	April 4, 2021

(2) Interim Water Quality Based Effluent Limitations

The Responsible Copermittees for discharges to the water bodies in Table 6.0 must comply with the following interim WQBELs by the interim compliance dates given in Specific Provision 6.c.(1):

(a) Interim Receiving Water Limitations

(i) *Interim Dry Weather Receiving Water Limitations*

The Responsible Copermittee must calculate the "existing" exceedance frequencies of the 30-day geometric mean water quality objectives for each of the indicator bacteria by analyzing the available monitoring data collected between January 1, 1996 and December 31, 2002. "Existing" exceedance frequencies may be calculated by water body and/or by Watershed Management Area listed in Table 6.0. Separate "existing" exceedance frequencies must be calculated for beaches and creeks/creek mouths.

The Responsible Copermittees must achieve a 50 percent reduction in the "existing" exceedance frequency of the 30-day geometric mean WQBELs for the water bodies listed in Table 6.0 by the interim compliance dates given in Table 6.4. A 50 percent reduction in the "existing" exceedance frequency is equivalent to half of the "existing" exceedance frequency of the 30-day geometric mean WQBELs.

The "existing" exceedance frequencies and the interim dry weather allowable exceedance frequencies (i.e. interim dry weather receiving water limitations) calculated by the Responsible Copermittees must be included in the Water Quality Improvement Plans for the applicable Watershed Management Areas.

(ii) *Interim Wet Weather Receiving Water Limitations*

The Responsible Copermittees must achieve the interim wet weather receiving water limitations in Table 6.5, expressed as interim wet weather allowable exceedance frequencies, by the interim compliance dates given in Table 6.4.

Table 6.5
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	38%	37%	39%
		at Heisler Park - North			
	Pacific Ocean Shoreline	at Main Laguna Beach			
		Laguna Beach at Ocean Avenue			
		Laguna Beach at Cleo Street			
		Arch Cove at Bluebird Canyon Road			
		Laguna Beach at Dumond Drive			
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	41%	41%	42%
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	41%	41%	42%
	Aliso Creek Mouth	at mouth	41%	41%	42%
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	36%	36%	36%
		Aliso Beach at Table Rock Drive			
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)			
		at Salt Creek (large outlet)			
		Salt Creek Beach at Salt Creek service road			
		Salt Creek Beach at Strand Road			

Table 6.5 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	44%	44%	48%
	San Juan Creek	lower 1 mile	44%	44%	47%
	San Juan Creek Mouth	at mouth	44%	44%	47%
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	35%	35%	36%
		Ole Hanson Beach Club Beach at Pico Drain			
		San Clemente City Beach at El Portal Street Stairs			
		San Clemente City Beach at Mariposa Street			
		San Clemente City Beach at Linda Lane			
		San Clemente City Beach at South Linda Lane			
		San Clemente City Beach at Lifeguard Headquarters			
		under San Clemente Municipal Pier			
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)			
		San Clemente State Beach at Riviera Beach			
		Can Clemente State Beach at Cypress Shores			
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	45%	44%	47%
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	40%	40%	41%
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	33%	33%	36%

Table 6.5 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	26%	26%	26%
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	37%	37%	37%
		La Jolla Shores Beach at Caminito del Oro			
		La Jolla Shores Beach at Vallecitos			
		La Jolla Shores Beach at Avenida de la Playa			
		at Casa Beach, Children's Pool			
		South Casa Beach at Coast Boulevard			
		Whispering Sands Beach at Ravina Street			
		Windansea Beach at Vista de la Playa			
		Windansea Beach at Bonair Street			
		Windansea Beach at Playa del Norte			
		Windansea Beach at Palomar Avenue			
		at Tourmaline Surf Park			
		Pacific Beach at Grand Avenue			
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries	49%	49%	51%
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	46%	43%	49%
	San Diego River	lower 6 miles	46%	43%	49%
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	46%	43%	51%
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	41%	41%	43%

(b) Interim Effluent Limitations

Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the interim compliance dates under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.c.(2)(a):

Table 6.6
Interim Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watersheds and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
South Orange County	**San Joaquin Hills HSA** (901.11) and **Laguna Hills HSA** (901.12) - Pacific Ocean Shoreline	45.89%	45.86%	49.14%	23.43%	26.04%	25.63%
	Aliso HSA (901.13) - Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	47.74%	47.79%	49.57%	12.65%	13.31%	13.76% (13.69%)**
	Dana Point HSA (901.14) - Pacific Ocean Shoreline	47.52%	47.52%	49.49%	6.58%	7.43%	7.58%
	Lower San Juan HSA (901.27) - Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	36.48%	37.11%	47.47%	9.61%	6.41%	13.56% (13.45%)**
	San Clemente HA (901.30) - Pacific Ocean Shoreline	47.14%	47.12%	49.42%	11.93%	12.29%	12.63%
San Luis Rey River	**San Luis Rey HU** (903.00) - Pacific Ocean Shoreline	19.07%	19.55%	43.69%	2.81%	1.56%	5.85%
Carlsbad	**San Marcos HA** (904.50) - Pacific Ocean Shoreline	41.41%	41.28%	48.02%	9.24%	9.49%	10.10%

Table 6.6 (Cont'd)
Interim Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watersheds and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
San Dieguito River	**San Dieguito HU** (905.00) - Pacific Ocean Shoreline	7.20%	10.36%	41.74%	2.15%	0.73%	3.86%
Penasquitos	**Miramar Reservoir HA** (906.10) - Pacific Ocean Shoreline	48.25%	48.30%	49.71%	0.81%	1.00%	0.97%
Mission Bay	**Scripps HA** (906.30) - Pacific Ocean Shoreline	48.22%	48.21%	49.63%	8.16%	10.57%	9.41%
	Tecolote HA (906.50) - Tecolote Creek	47.26%	47.30%	49.47%	8.26%	10.24%	9.08% (9.04%)**
San Diego River	**Mission San Diego HSA** (907.11) and **Santee HSA** (907.12) - Pacific Ocean Shoreline - Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles)	37.02%	34.72%	46.98%	19.07%	26.61%	21.37% (21.24%)**
San Diego Bay	**Chollas HSA** (908.22) - Chollas Creek	46.03%	46.08%	49.23%	8.91%	12.42%	10.73% (10.68%)**

Notes:
* The percent load reductions are based on reducing loads compared to pollutant loads from 2001 to 2002.
** The alternative *Enterococcus* percent load reduction was calculated based on a numeric target of 104 MPN/100mL instead of 61 MPN/100mL, protective of the REC-1 "moderately to lightly used area" usage frequency that is protective of freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative pollutant load reductions can be utilized.

(3) Interim TMDL Compliance Determination

Compliance with the interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(f) There are no exceedances of the interim receiving water limitations under Specific Provision 6.c.(2)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(g) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the interim effluent limitations under Specific Provision 6.c.(2)(b); OR

(h) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

d. Specific Monitoring and Assessment Requirements

(1) Monitoring and Assessment Requirements for Beaches

(a) Monitoring Stations

For beaches addressed by the TMDL, monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[34] If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources

[34] Commonly referred to as AB 411 monitoring

causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations at least once within the first 24 hours of the end of a storm event[35] during the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer in exceedance of the allowable exceedance frequencies in the receiving waters.

(iii) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(iv) For Pacific Ocean Shoreline segments or areas listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final

[35] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

WQBELs for the Pacific Ocean Shoreline segments or areas listed in Table 6.0 have been achieved.

(ii) Dry weather exceedance frequencies must be calculated as follows:

[a] 30-day geometric means must be calculated from the results of any dry weather samples collected from the segments or areas for each water body listed in Table 6.0;
[b] The method and number of samples need for calculating the 30-day geometric means must be consistent with the number of samples required by the Ocean Plan;
[c] Where there are multiple segments or areas associated with a water body listed in Table 6.0, the Copermittees may calculate geometric means for each segment or area, or combine the dry weather monitoring data from all the segments or areas to calculate geometric means for the water body;
[d] The exceedance frequency must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the dry season.

(iii) Wet weather exceedance frequencies must be calculated as follows:

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;
[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;
[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria densities reported from each storm event sampled; and
[d] The single sample maximum exceedance frequency must be calculated by dividing the number of wet weather days that exceed the single sample maximum receiving water limitations in Table 6.2 by the total number of wet weather days during the rainy season.
[e] The data collected for dry weather must be used in addition to the data collected for wet weather to calculate the wet weather 30-day geometric means. The exceedance frequency of the wet weather 30-day geometric means must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of

geometric means calculated from samples collected during the wet season.

(iv) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(v) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) Monitoring and Assessment Requirements for Creeks and Creek Mouths

(a) Monitoring Stations

For creeks addressed by the TMDL, monitoring locations should consist of, at a minimum, a location at or near the mouth of the creek (e.g. Mass Loading Station or Mass Emission Station) and one or more locations upstream of the mouth (e.g. Watershed Assessment Station). If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations in accordance with the requirements of Provision D.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations within the first 24 hours of the end of a storm event[36] during the rainy season (i.e. October 1 through April 30).

(iii) Samples collected from receiving water monitoring stations must be analyzed for fecal coliform and *Enterococcus* indicator bacteria.

[36] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(iv) For creeks or creek mouths listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the receiving water monitoring data to assess whether the interim and final receiving water WQBELs for the creeks and creek mouths listed in Table 6.0 have been achieved.

(ii) Dry weather exceedance frequencies must be calculated as follows:

[a] 30-day geometric means must be calculated from the results of any dry weather samples collected from the segment or area for each water body listed in Table 6.0;
[b] The method and number of samples need for calculating the 30-day geometric means must be consistent with the number of samples required by the Basin Plan;
[c] The exceedance frequency must be calculated by dividing the number of 30-day geometric means that exceed the 30-day geometric mean receiving water limitations in Table 6.2 by the total number of 30-day geometric means calculated from samples collected during the dry season.

(iii) Wet weather exceedance frequencies must be calculated as follows:

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;
[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;
[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria densities reported from each of the storm events sampled; and

[d] The exceedance frequency must be calculated by dividing the number of wet weather days that exceed the single sample maximum receiving water limitations in Table 6.2 by the total number of wet weather days during the rainy season.

[e] The data collected for dry weather must be used in addition to the data collected for wet weather to calculate the wet weather 30-day geometric means. The exceedance frequency of the wet weather 30-day geometric means must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the wet season.

(iv) The Responsible Copermittee must identify and incorporate additional MS4 outfall and receiving water monitoring stations and/or adjust monitoring frequencies to identify sources causing exceedances of the receiving water WQBELs.

(v) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(vi) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

ATTACHMENT F

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

FACT SHEET / TECHNICAL REPORT

FOR

ORDER NO. R9-2013-0001
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

MAY 8, 2013

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I. FACT SHEET FORMAT

This Fact Sheet briefly sets forth the principal facts and the significant factual, legal, methodological, and policy questions that the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) considered in preparing Order No. R9-2013-0001 (Order). In accordance with the Code of Federal Regulations (CFR) Title 40 Parts 124.8 and 124.56 (40 CFR 124.8 and 40 CFR 124.56), this Fact Sheet includes, but is not limited to, the following information:

1. Contact information
2. Public process and notification procedures
3. Background of municipal storm water permits
4. Regional MS4 Permit approach
5. Economic considerations
6. Applicable statutes, regulations, plans and policies
7. Discussion of the provisions in the Order

Tentative Order No. R9-2013-0001 was distributed for public review on October 31, 2012. The San Diego Water Board accepted written comments on the Tentative Order until January 11, 2013. A public hearing was subsequently held on April 10 and 11, 2013, that was continued to May 8, 2013 to receive oral comments from interested persons.

The San Diego Water Board files applicable to the issuance of Order No. R9-2013-0001 are incorporated into the administrative record in support of the findings and requirements of the Order.

II. CONTACT INFORMATION

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The Order and other related documents can be downloaded from the San Diego Water Board website at

http://www.swrcb.ca.gov/rwqcb9/water_issues/programs/stormwater/index.shtml

The documents referenced in this Fact Sheet and in Order No. R9-2013-0001 are available for public review at the San Diego Water Board office, located at the address listed above. Public records are available for inspection during regular business hours, from 8:00 am to 5:00 pm Monday through Friday. To schedule an appointment to inspect public records, contact the San Diego Water Board Records Management Officer at 858-467-2952.

COPERMITTEES

Orange County Copermittees

- County of Orange
  - City of Aliso Viejo
  - City of Dana Point
  - City of Laguna Beach
  - City of Laguna Hills
  - City of Laguna Niguel
  - City of Laguna Woods
  - City of Lake Forest
  - City of Mission Viejo
  - City of Ranch Santa Margarita
  - City of San Clemente
  - City of San Juan Capistrano
  - Orange County Flood Control District

Riverside County Copermittees

- County of Riverside
  - City of Murrieta
  - City of Temecula
  - City of Wildomar
  - Riverside County Flood Control and Water Conservation District

San Diego County Copermittees

- County of San Diego
  - City of Carlsbad
  - City of Chula Vista
  - City of Coronado
  - City of Del Mar
  - City of El Cajon
  - City of Encinitas
  - City of Escondido
  - City of Imperial Beach
  - City of La Mesa
  - City of Lemon Grove
  - City of National City
  - City of Oceanside
  - City of Poway
  - City of San Diego
  - City of San Marcos
  - City of Santee
  - City of Solana Beach
  - City of Vista
  - San Diego County Regional Airport Authority
  - San Diego Unified Port District

III. PUBLIC PROCESS AND NOTIFICATION PROCEDURES

The San Diego Water Board followed the schedule listed below for the preparation of Order No. R9-2013-0001:

1. On February 8, 2011, the San Diego Water Board met with the San Diego County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No. R9-2007-0001.

2. Between February and May 2011, the San Diego Water Board met with select San Diego County, Orange County, and Riverside County Copermittees, as well as representatives of the environmental community to discuss concepts and receive recommendations for elements to be incorporated in a Regional Municipal Separate Storm Sewer System Permit (Regional MS4 Permit).

3. On June 27, 2011 the San Diego Water Board received the Report of Waste Discharge from the San Diego County Copermittees for the renewal of their NPDES permit, Order No. R9-2007-0001.

4. On April 9, 2012, the San Diego Water Board released an administrative draft of Tentative Order No. R9-2013-0001 for preliminary informal comments and feedback.

5. On April 25, 2012, the San Diego Water Board held an informal public workshop to present the administrative draft of Tentative Order No. R9-2013-0001 and receive verbal comments.

6. Between June and August 2012, the San Diego Water Board held four (4) focused meetings with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community, and USEPA) to discuss and receive preliminary comments and feedback about specific elements in the administrative draft of Tentative Order No. R9-2013-0001.

7. On September 5, 2012, the San Diego Water Board held an informal public workshop to present the modifications that were expected to be incorporated into the Tentative Order based on the preliminary comments and feedback received during the focused meetings held between June and August 2012.

8. Informal written comments on the administrative draft of Tentative Order No. R9-2013-0001 were accepted until September 14, 2012.

9. On October 12, 2012, the San Diego Water Board released a revised administrative draft of Tentative Order No. R9-2013-0001.

10. On October 24, 2012, the San Diego Water Board held a focused meeting with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community, and USEPA) to discuss modifications incorporated into the administrative draft of Tentative Order No. R9-2013-0001.

11. On October 31, 2012, the San Diego Water Board released Tentative Order No. R9-2013-0001 for formal public review and comment.

12. On November 13, 2012 and December 12, 2012, the San Diego Water Board held a formal public Board workshop to present the public draft of Tentative Order No. R9-2013-0001 and receive verbal comments.

13. Formal written comments on the public draft of Tentative Order No. R9-2013-0001 were accepted until January 11, 2013.

14. A public hearing of Tentative Order No. R9-2013-0001 was conducted on April 10 and 11, 2013, that was continued to May 8, 2013.

IV. BACKGROUND OF THE SAN DIEGO REGION MUNICIPAL STORM WATER PERMITS

In developed and developing areas, storm water runoff is commonly transported through municipal separate storm sewer systems (MS4s) and discharged into local receiving water bodies. As the storm water runs off and flows over the land or impervious surfaces (e.g., paved streets, parking lots, and building rooftops), it accumulates debris, chemicals, sediment, and other pollutants that can adversely affect receiving water quality if discharged untreated. The United States Environmental Protection Agency (USEPA) recognizes wet weather flows from urban areas as the number one source of estuarine pollution in coastal communities,[1] such as those within the San Diego Region.

The federal Clean Water Act (CWA) was amended in 1987 to address and regulate discharges of storm water associated with industrial activities and from municipal storm sewers. With the amendments, many municipalities throughout the United States were obligated for the first time to obtain National Pollutant Discharge Elimination System (NPDES) permits for discharges of storm water from their MS4s.

In response to the CWA 1987 amendment, as well as the pending federal NPDES regulations which would implement the amendment, the San Diego Water Board issued "early" MS4 permits. The San Diego Water Board adopted and issued Order Nos. 90-38, 90-42, and 90-46 to regulate storm water discharges from the MS4s in Orange County, San Diego County, and Riverside County, respectively, within the San Diego Region on July 16, 1990.

The "early" MS4 permits, or First Term Permits, were issued prior to the November 1990 promulgation of the final federal NPDES storm water regulations. By issuing these First Term Permits before the federal regulations took effect, the San Diego Water Board was able to provide the Copermittees additional flexibility in addressing and managing storm water discharges. The First Term Permits contained the essentials of the 1990 regulations, and required the Copermittees to develop and implement runoff management programs, but provided little specificity about what was required to be included in or actually achieved by those programs.

The flexibility provided in the First Term Permits was generally continued through the Second Term Permits. The combination of the lack of specificity in the First and Second Term Permits, a general lack of meaningful action by the Copermittees and a general lack of corresponding reaction (i.e. enforcement) by the San Diego Water Board during the first ten years of the storm water program, resulted in few substantive steps towards achieving improvements in the quality of receiving waters or storm water discharges from the MS4s.

[1] US EPA. 1999. 40 CFR Parts 9, 122, 123, and 124. National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. 64 FR 68727.

From 2001, the regulatory approach incorporated into Third Term Permits was a significant departure from the regulatory approach of the First and Second Term Permits. The Third Term Permits issued by the San Diego Water Board included more detailed requirements that outlined the minimum level of implementation required for the Copermittees' programs to meet the maximum extent practicable (MEP) standard for storm water. The Third Term Permits included more detail to emphasize and enhance the jurisdictional runoff management programs developed by the Copermittees and introduced requirements for developing and implementing watershed-based programs.

The Third Term Permits also incorporated two precedent setting decisions by the State Water Board. In Order WQ 99-05, the State Water Board established receiving water limitation language to be included in all MS4 permits. The State Water Board's precedential language clarified that municipal storm water permits must include provisions requiring discharges to be controlled to attain water quality standards in receiving waters. Unlike previously adopted versions of the receiving water limitation language in the First and Second Term Permits, the language no longer stated that "*violations of water quality standards are not violations of the municipal storm water permit under certain conditions*." In addition, the receiving water limitation language no longer indicated that the "*implementation of best management practices is the 'functional equivalent' of meeting water quality standards*." State Water Board Order WQ 99-05 specifically requires language in MS4 permits for the Copermittees to comply with water quality standards based discharge prohibitions and receiving water limitations through timely implementation of control measures and other actions to reduce pollutants in discharges. (See State Water Board Order WQ 99-05 (*Environmental Health Coalition*)).

In Order WQ 2000-11, also a precedential decision, the State Water Board addressed design standards for structural post-construction best management practices (BMPs) for new development and significant redevelopment. The State Water Board found that the design standards, which require that runoff generated by 85 percent of storm events from specific development categories be infiltrated or treated, reflect the MEP standard. State Water Board Order WQ 2000-11 also found that the post-construction BMP provisions, or Standard Storm Water Mitigation Plan (SSMP) provisions, constitute MEP for addressing storm water pollutant discharges resulting from specific development categories.

The Third Term San Diego County and Orange County Permits (Order Nos. 2001-01 and R9-2002-0001, respectively) were appealed to the State Water Board. Minor modifications were made by the State Water Board, but the requirements were largely upheld. In State Water Board Order WQ 2001-15, the State Water Board upheld the Third Term San Diego County Permit requirements with certain modifications. The State Water Board removed the prohibition of storm water discharges *into* the MS4 that cause or contribute to exceedances of water quality objectives. The revision allows for treatment of pollutants in storm water runoff after the pollutants have entered the MS4. State Water Board Order WQ 2001-15 otherwise upheld all the other requirements of the permit.

In addition to the modification to the discharge prohibition in Order WQ 2001-15, the State Water Board refined Order WQ 99-05 by making clear that the Copermittees may use an iterative approach to achieving compliance with water quality standards that involves ongoing assessments and revisions. Thus, the language for the discharge prohibitions and receiving water limitations was revised to explicitly require the Copermittees to implement an iterative process of assessments and revisions to comply with the discharge prohibitions and receiving water limitations. The San Diego Water Board retained the authority to enforce receiving water limitations and discharge prohibitions even if the Copermittee is engaged in the iterative process.

The Third Term San Diego County Permit was subsequently challenged in the Superior Court of the State of California and the Court of Appeal, Fourth Appellate District. The Court of Appeal, Fourth Appellate District, found that the approach of the Third Term San Diego County Permit to regulating discharges into the MS4 was appropriate (*Building Industry Ass'n. v. State Water Resources Control Bd., et al.,* 124 Cal.App.4th 866 (2004)). The State of California Supreme Court denied review sought by the Building Industry Association in March 2005.

The Fourth Term Permits, or current MS4 permits, began with the adoption of Order No. R9-2007-0001 issued to the Copermittees of San Diego County in January 2007. Order Nos. R9-2009-0002 and R9-2010-0016 were subsequently issued to the Copermittees of Orange County and Riverside County. The Fourth Term Permits continued to include more detailed requirements to be implemented by each Copermittee's jurisdictional runoff management program. The Fourth Term Permits also include requirements to further emphasize a watershed management approach and for more coordination among jurisdictional runoff management programs. In addition, the Fourth Term Permits included more requirements for assessing the effectiveness of the runoff management programs being implemented by the Copermittees. The intent of the inclusion of additional requirements was to enhance and better define elements of the permit that were expected to be incorporated into the iterative process for managing runoff from each Copermittee's jurisdiction and within the watersheds of the San Diego Region.

The Fourth Term Permits include several new and emerging approaches for managing storm water runoff and discharges. Low impact development (LID) requirements are included for development and significant redevelopment to reduce pollutants in storm water runoff from sites through more natural processes such as infiltration and biofiltration closer to the source, rather than utilizing conventional mechanical end-of-pipe treatment systems. Hydrograph modification (hydromodification) management requirements also are included to mitigate the potential for increased erosion in receiving waters due to increased runoff rates and durations often caused by development and increased impervious surfaces. The Fourth Term Orange County and Riverside County Permits introduced requirements to identify areas of existing development where retrofitting with LID projects would be feasible and could be implemented to reduce storm water runoff and pollutants in storm water discharges.

The Fourth Term Orange County and Riverside County Permits included a clearer distinction between storm water and non-storm water discharges. The term “urban runoff” was completely removed, and a distinction between storm water (wet weather) runoff and non-storm water (dry weather) runoff was emphasized. This clarification was made to prevent any potential misunderstanding that regulation under the MS4 permits is limited only to urbanized areas, and to prevent non-storm water runoff from being managed in the same manner as storm water runoff. The term “urban runoff” is not defined in the Code of Federal Regulations (CFR) or Federal Register (FR) in the regulation of MS4 discharges. According to the CWA 402(p)(3)(B)(ii), MS4 permits must include a requirement to effectively prohibit non-storm water discharges into the MS4s.

Finally, for the Fourth Term Orange County and Riverside County Permits the San Diego Water Board found that non-storm water discharges to the MS4 from over application of irrigation water are sources of pollutants. The San Diego Water Board found that non-storm water discharges resulting from over-irrigation must be prohibited from entering the MS4 in accordance with the requirements of the CWA and pursuant to 40 CFR 122.26(d)(2)(iv)(B)(1).

The requirements of the Fourth Term Permits issued to the Copermittees in each county within the San Diego Region now have substantively the same core requirements such as discharge prohibitions, receiving water limitations, jurisdictional runoff management program components, and monitoring program requirements. There are, however, several inconsistencies that exist among the three Fourth Term Permits which complicate oversight and implementation of the permits by the San Diego Water Board.

The Fourth Term San Diego County Permit expired in January 2012. The Fourth Term Orange County and Riverside County Permits will expire in December 2014 and November 2015, respectively. Issuing the Fifth Term Permits within five years for three counties under three different permits would require the San Diego Water Board to expend significant time and resources for the issuance of the permits through three separate public proceedings, thereby greatly reducing the time and resources available to oversee implementation and compliance. Multiple permits also create confusion for determining compliance among regulated entities, especially for the land development community.

The San Diego Water Board has acknowledged that issuing a single MS4 permit for all the Copermittees in the San Diego Region can and is expected to result in more consistent implementation, improve communication among agencies within watersheds crossing multiple jurisdictions, and minimize resources spent with each permit renewal process. Within the findings of the Fourth Term Riverside County Permit issued in November 2010, the San Diego Water Board notified the public of its intent to develop and issue a single Regional MS4 Permit.

V. REGIONAL MS4 PERMIT APPROACH

The Fifth Term Permit, or Regional MS4 Permit, shifts the focus of the permit requirements from a minimum level of actions to be implemented by the Copermittees to identifying outcomes to be achieved by those actions. Order No. R9-2013-0001 represents an important paradigm shift in the approach for MS4 permits within the San Diego Region.

Historical Permitting Approach

The First and Second Term Permits were very broad and provided little specificity about what was required to be developed and implemented by the Copermittees. The Third Term Permits began to become more specific about the minimum level of implementation required by the Copermittees. The Fourth Term Permits, or current permits, subsequently increased in specificity. The MS4 permits have progressively become more detailed and focused on specifying the minimum level of actions expected to be implemented by the Copermittees. As detailed and specific as the MS4 permits have become, however, they include very little detail about what the desired outcomes of the required actions are expected to achieve. Compliance with the permit requirements has essentially been tracking numbers of actions and reporting, not tracking progress or actual improvements in the quality of receiving waters or discharges from the MS4s. The result has been an increase in actions being implemented by the Copermittees with little or no ability or expectations to determine whether or not improvements in water quality are being achieved.

The Fourth Term Permits result in significant resource expenditure by the Copermittees to report permit compliance information to the San Diego Water Board in the form of annual jurisdictional runoff management program, watershed program, and monitoring program reports. The San Diego Water Board must then expend much of its limited resources on reviewing more than 50 voluminous reports submitted annually by the Copermittees. The information currently reported by the Copermittees is of limited value when trying to measure progress toward achieving improvements in the quality of receiving waters or discharges from the MS4s. Oversight of the MS4 permits is further complicated by the inconsistencies among the requirements issued to the Orange County, San Diego County, and Riverside County Copermittees under three separate MS4 permits.

Under the Fourth Term Permits, the Copermittees must expend a significant portion of their limited resources collecting data of limited value, and putting together reports to submit that information to the San Diego Water Board. Likewise, the San Diego Water Board must expend most of its limited resources reviewing reports, and developing permits instead of working directly with the Copermittees to identify solutions to problems causing impacts to water quality. This is an unsustainable course that will continue to demand more resources from the Copermittees and the San Diego Water Board, and would continue to result in unknown water quality benefits.

New Permitting Approach

The goal of the Regional MS4 Permit is twofold: 1) bring a consistent set of MS4 permit requirements to all of the Copermittees within the San Diego Region; and, 2) provide an MS4 permit with requirements that will allow the Copermittees to focus their efforts and resources on achieving goals and desired outcomes toward the improvement of water quality rather than completing specific actions.

The overall approach included in the Regional MS4 Permit with respect to the jurisdictional runoff management programs will not differ significantly from the current permits. The general requirements for the jurisdictional runoff management program components and compliance with those requirements will remain and be applied consistently throughout the San Diego Region under the Regional MS4 Permit.

The most significant difference in the new permitting approach is the specific manner of implementation for those jurisdictional runoff management programs. Implementation will be based on decisions made by the Copermittees in accordance with what they have identified as their highest priority water quality conditions. In other words, the Copermittees will have significant control in how to implement the jurisdictional runoff management programs to best utilize their available resources in addressing a specific set of priorities effectively, instead of trying to address all the water quality priorities ineffectively.

The Copermittees are given the responsibility of identifying their highest priority water quality conditions that they intend to address. The Copermittees will develop goals that can be used to measure and demonstrate progress or improvements toward addressing those priorities. In addition to the goals, the Copermittees will provide a schedule for achieving the goals for those highest priorities. The measurement of progress toward achieving the goals for those highest priorities requires a better defined and more focused program of monitoring and assessment than under the Fourth Term Permits.

The monitoring and assessment program must be designed to inform the Copermittees of their progress, and the need for modifications in their jurisdictional runoff management programs and schedules to achieve their goals to improve water quality. The monitoring and assessment program requirements will have a more central role in the Regional MS4 Permit than in earlier permits. The monitoring and assessment requirements must also be designed to enable the Copermittees to focus and direct their efforts in implementing their jurisdictional runoff management programs toward their stated desired outcomes to improve the quality of receiving waters and/or discharges from the MS4s.

By providing an MS4 permit that allows the Copermittees to make more decisions about how to utilize and focus their resources, along with a better defined monitoring and assessment program to inform their water quality management decisions, the Copermittees will have the opportunity to:

1) *Plan strategically*. The Copermittees must have the ability to identify their available resources and develop and implement long term plans that can organize, collect, and use those resources in the most strategically advantageous and efficient manner possible. This ability to develop long term plans will allow the Copermittees to focus and utilize their resources in a more concerted way over the short term and long term to address specific water quality priorities through stated desired outcomes.

2) *Manage adaptively*. The Copermittees must be given the ability to modify their plans as additional information and data are collected from the monitoring and assessment programs. The Copermittees' plans may require modifications to the programs, priorities, goals, strategies, and/or schedules in order for the Copermittees to achieve a stated desired outcome.

3) *Identify synergies*. The Copermittees must be given more flexibility to identify efficiencies within and among their jurisdictional runoff management programs as the strategies are developed and implemented to increase the Copermittees' collective effectiveness. The Copermittees must also be able to identify and utilize resources available from other agencies and entities to further augment and enhance their jurisdictional runoff management programs and/or to collectively work with those other agencies and entities toward achieving a stated desired outcome.

The Regional MS4 Permit requirements will provide the Copermittees the flexibility and responsibility to decide what actions will be necessary to achieve an outcome that is tailored and designed by the Copermittees to improve specific prioritized water quality conditions. The San Diego Water Board expects the approach of the Regional MS4 Permit to give the Copermittees a greater sense of ownership for restoring the quality of receiving waters in the San Diego Region by becoming an integral part of the decision making process in identifying water quality conditions to be addressed, as well as determining the best use of their resources.

VI. ECONOMIC CONSIDERATIONS

Statutory Considerations

California Water Code (CWC) section 13241 requires the San Diego Water Board to consider certain factors, including economic considerations, in the adoption of water quality objectives. CWC section 13263 requires the San Diego Water Board to take into consideration the provisions of CWC section 13241 in adopting waste discharge requirements.

In *City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, the California Supreme Court considered whether Regional Water Boards must comply with CWC section 13241 when issuing waste discharge requirements under CWC section 13263(a) by taking into account the costs a permittee will incur in complying with the permit requirements. The Court concluded that whether it is necessary to consider such cost information "*depends on whether those restrictions meet or exceed the requirements of the federal Clean Water Act.*" (*Id.* at p. 627.) The Court ruled that Regional Water Boards may not consider the factors in CWC section 13241, including economics, to justify imposing pollutant restrictions that are less stringent than applicable federal law requires. (*Id.* At pp. 618, 626-627 ["*[Water Code section 13377 specifies that [] discharge permits issued by California's regional boards must meet the federal standards set by federal law. In effect, section 13377 forbids a regional board's consideration of any economic hardship on the part of the permit holder if doing so would result in the dilution of the requirements set by Congress in the Clean Water Act...Because CWC section 13263 cannot authorize what federal law forbids, it cannot authorize a regional board, when issuing a [] discharge permit, to use compliance costs to justify pollutant restrictions that do not comply with federal clean water standards*."]). However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Regional Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

As discussed in Section VII.F, Unfunded State Mandates, the San Diego Water Board finds that the requirements in this Order are not more stringent than the minimum federal requirements. Among other requirements, federal law requires MS4 permits to include requirements to effectively prohibit non-storm water discharges into the MS4s, in addition to requiring controls to reduce the discharge of pollutants in storm water to the MEP, and other provisions as USEPA or the State determines are appropriate for the control of pollutants in MS4 discharges.

The requirements in this Order may be more specific or detailed than those enumerated in federal regulations under 40 CFR 122.26 or in the USEPA guidance. However, the requirements have been designed to be consistent with and within the federal statutory mandates described in CWA section 402(p)(3)(B)(ii) and (iii) and the related federal regulations and guidance. Consistent with federal law, all of the

conditions in this Order could have been included in a permit adopted by USEPA in the absence of the in lieu authority of California to issue NPDES permits.

Moreover, the inclusion of numeric WQBELs in this Order does not cause this Order to be more stringent than federal law. Federal law authorizes both narrative and numeric effluent limitations to meet state water quality standards. The inclusion of WQBELs as discharge specifications in an NPDES permit in order to achieve compliance with water quality standards is not a more stringent requirement than the inclusion of BMP based permit limitations to achieve water quality standards (State Water Board Order No. WQ 2006-0012 (*Boeing*)). Therefore, consideration of the factors set forth in CWC section 13241 is not required for permit requirements to implement the effective prohibition on the discharge of non-storm water discharges into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determine appropriate to control such pollutants, as those requirements are mandated by federal law.

Included in the provisions of the Order are monitoring and reporting requirements that are designed to demonstrate that the Copermittees are implementing programs to comply with the CWA municipal storm water requirements. CWA section 308(a) and 40 CFR 122.41(h), (j)-(l), 122.44(i) and 122.48 require that all NPDES permits specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s (40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c)) also specify additional monitoring and reporting requirements. In addition to the federal requirements of the CWA, the San Diego Water Board also has the authority in CWC 13383 to establish monitoring, reporting, and recordkeeping requirements that implement federal and state laws and regulations through NPDES permits. .

The monitoring and assessment information that will be reported to the San Diego Water Board is necessary to determine if the Copermittees are making progress toward achieving compliance with the discharge prohibitions, receiving water limitations, and effluent limitations under Provision A of the Order. The monitoring and assessment information that will be reported is also expected to be key to the iterative approach and adaptive management process that is required to be implemented by the Copermittees if they cannot meet the discharge prohibitions and receiving water limitations under the present conditions, which is also part of the requirements under Provision A of the Order.

Notwithstanding the above, the San Diego Water Board has considered cost information in issuing this Order, as discussed below. The San Diego Water Board has also considered all of the evidence that has been presented to the San Diego Water Board regarding the CWC section 13241 factors in adopting this Order. The San Diego Water Board finds that the requirements in this Order are reasonably necessary to protect beneficial uses identified in the Basin Plan and the economic information related to costs of compliance and other CWC section 13241 factors are not sufficient to justify failing to protect those beneficial uses. Where appropriate, the

San Diego Water Board has provided or will consider providing the Copermittees with additional time to implement control measures to achieve final WQBELs and/or water quality standards.

Cost Information

Discussions of the financial and economic ramifications of municipal storm water management programs tend to focus on the significant costs incurred by municipalities in developing and implementing the programs. When considering the cost of implementing the programs, however, it is also important to consider the alternative costs that are incurred when programs are not fully implemented, as well as the economic benefits which result from effective program implementation.

The recent financial and economic conditions have amplified the concerns about the costs incurred by the municipalities in developing and implementing their programs. The reduction in resources resulting from the recent financial and economic conditions has been cited by many of the Copermittees as a justification for reducing the requirements that must be met by their programs. While the recent conditions are a cause for concern in the short term, these programs also have an opportunity to identify and implement improvements and efficiencies before the next period of growth and development, resulting in more effective and sustainable programs over the long term.

In addition, it is very difficult to ascertain the true cost of implementation of the Copermittees' management programs because of inconsistencies in reporting by the Copermittees. Reported costs of compliance for the same program element can vary widely from city to city, often by a very wide margin that is not easily explained.[2] Despite these problems, efforts have been made to identify management program costs, which can be helpful in understanding the costs of program implementation.

The San Diego Water Board recognizes that the Copermittees will incur costs in implementing this Order, potentially above and beyond the costs from the Copermittees' prior permits. The San Diego Water Board also recognizes that, due to California's current economic condition, many Copermittees currently have limited staff and resources to implement actions to address its MS4 discharges. Based on the economic considerations below, the San Diego Water Board has provided the Copermittees a significant amount of flexibility to choose how to implement the requirements of the Order.

The Order also allows the Copermittees to customize their plans, programs, and monitoring requirements. In the end, it is up to the Copermittees to determine the effective BMPs and measures necessary to comply with this Order. The Copermittees can choose to implement the least expensive measures that are effective in meeting the requirements of this Order. This Order also does not require the Copermittees to

[2] LARWQCB, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.

fully implement all requirements within a single permit term. Where appropriate, the Board has provided the Copermittees with additional time outside of the permit term to implement control measures to achieve final WQBELs and/or water quality standards.

The San Diego Water Board has considered available cost information associated with compliance with this Order. It is not possible to predict accurately the cost impact of the requirements that involve an unknown level of implementation or that depend on environmental variables that are as yet undefined. Only general conclusions can be drawn from this information.

Estimated Municipal Storm Water Program Implementation Costs

The USEPA, the State Water Board, and the California Regional Water Quality Control Boards (Regional Water Boards) have attempted to evaluate the costs of implementing municipal storm water programs. The assessments have demonstrated that the true costs are difficult to ascertain and reported costs vary widely. In addition, reported fiscal analyses tend to neglect the costs incurred to municipalities when storm water and non-storm water runoff is not effectively managed, which are incurred as a result of pollution, contamination, nuisance, and damage to ecosystems, property, and human health. Nonetheless, they provide a useful context for considering the costs of requirements within Order No. R9-2013-0001.

In 1999, the USEPA reported on multiple studies it conducted to determine the cost of management programs. A study of Phase II municipalities determined that the annual cost of the Phase II program was expected to be $9.16 per household. The USEPA also studied 35 Phase I municipalities, finding costs to be $9.08 per household annually, similar to those anticipated for Phase II municipalities.[3]

The State Water Board commissioned a study by the California State University, Sacramento to assess costs of the Phase I MS4 program. This study includes an assessment of costs incurred by Phase I MS4s throughout the state to implement their programs. Annual cost per household in the study ranged from $18 to $46, with the Fresno-Clovis Metropolitan Area representing the lower end of the range, and the City of Encinitas (in San Diego County) representing the upper end of the range.[4]

A study on Phase I MS4 program costs was also conducted by the California Regional Water Quality Control Board, Los Angeles Region (Los Angeles Water Board), where program costs reported in the municipalities' annual reports were assessed. The Los Angeles Water Board estimated that average per household cost to implement the MS4 program in Los Angeles County was $12.50. [5]

[3] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791-68792.
[4] State Water Board, 2005. NPDES Stormwater Cost Survey. P. ii.
[5] Los Angeles Water Board, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.

It is important to note that reported program costs are not all attributable to solely complying with MS4 permits. Many program components, and their associated costs, existed before any MS4 permits were ever issued. For example, street sweeping and trash collection costs cannot be solely or even principally attributable to MS4 permit compliance, since these practices have long been expected from and implemented by municipalities.

Therefore, true program cost resulting from MS4 permit requirements is some fraction of reported costs. The California State University, Sacramento study found that only 38 percent of program costs are new costs fully attributable to MS4 permits. The remainder of the program costs was either pre-existing or resulted from enhancement of pre-existing programs.[6] In 2000, the County of Orange found that even lower amounts of program costs are solely attributable to MS4 permit compliance, reporting that the amount attributable to implement the County or Orange Drainage Area Management Plan (DAMP), was less than 20 percent of the total budget. The remaining 80 percent was attributable to pre-existing programs.[7] More current data from the County of Orange is not used in this discussion because the County of Orange no longer reports such information.

Estimated Value of Healthy Water Quality

Economic considerations of municipal storm water management programs cannot be limited only to program costs. Evaluation of programs must also consider information on the benefits derived from environmental protection and improvement.[8] Attention is often focused on municipal storm water management program costs, but the programs must also be viewed in terms of their value to the public.

Placing a value on healthy receiving waters is very difficult. Often the value of receiving waters with good water quality manifests in other forms, such as tourism, recreational opportunities, and/or increased property values. When surface water bodies are degraded, thereby degrading the habitat within and adjacent to the water bodies, the public loses the value and benefits associated with being able to use the area in and around the water bodies. Surface waters that are able to support the beneficial uses designated in the Basin Plan can sustain plants and wildlife that can attract visitors and residents, providing aesthetic, recreational, as well as monetary value to the public. At this time, however, there have been no studies for the San Diego Region to quantify the added value that surface waters with healthy water quality can provide.

[6] State Water Board, 2005. NPDES Stormwater Cost Survey. P. 58.
[7] County of Orange, 2000. A NPDES Annual Progress Report. P. 60.
[8] Ribaudo M.O. and D. Heelerstein. 1992, *Estimating Water Quality Benefits: Theoretical and Methodological Issues.* U.S. Department of Agriculture. Technical Bulletin No. 1808.

USEPA has estimated that household willingness to pay for improvements in fresh water quality for fishing and boating is approximately $158-$210.[9] This estimate can be considered conservative, since it does not include important considerations such as marine waters benefits, wildlife benefits, or flood control benefits. Another study conducted by California State University, Sacramento reported that the annual household willingness to pay for statewide clean water is approximately $180.[10]

A study conducted by the University of Southern California and University of California, Los Angeles assessed the costs and benefits of implementing various approaches for achieving compliance with the MS4 permits in the Los Angeles region. The study found that non-structural systems would cost $2.8 billion but provide $5.6 billion in benefit. If structural systems were determined to be needed, the study found that total costs would be $5.7 to $7.4 billion, while benefits could reach $18 billion.[11] Costs are anticipated to be borne over many years, probably at least ten years.

As can be seen, the benefits of the municipal storm water management programs are expected to considerably exceed their costs. Such findings are corroborated by USEPA, which found that the benefits of implementation of its Phase II storm water rule would also outweigh the costs.[12]

[9] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68793.
[10] State Water Board, 2005. NPDES Stormwater Cost Survey. P. iv.
[11] Los Angeles Water Board, 2004. Alternative Approaches to Stormwater Control.
[12] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791.

VII. APPLICABLE STATUTES, REGULATIONS, PLANS AND POLICIES

A. Legal Authorities – Federal Clean Water Act and California Water Code

This Order is issued pursuant to section 402 of the CWA and implementing regulations adopted by the USEPA and chapter 5.5, division 7 of the CWC (commencing with section 13370). This Order serves as an NPDES permit for point source discharges to surface waters. This Order also serves as waste discharge requirements pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

The objective of the CWA is "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*." To carry out this objective, the CWA requires the implementation of permit programs to regulate the discharge of pollutants and dredged or fill material to the navigable waters of the U.S. and to regulate the use and disposal of sewage sludge. CWA section 402 provides the legal authority to issue a permit for the discharge of pollutants to waters of the U.S. under the NPDES. The CWA provides that NPDES permits may be issued by states which are authorized to implement the provisions of that act. California became authorized to implement the NPDES permit program on May 14, 1973.

The Porter-Cologne Water Quality Control Act (Division 7, commencing with CWC section 13000) established the State Water Resources Control Board (State Water Board) and nine Regional Water Quality Control Boards (Regional Water Boards) as the principal state agencies with primary responsibility for the coordination and control of water quality. CWC section 13200(f) established the San Diego Water Board, which has the primary responsibility for the coordination and control of water quality in the San Diego Region, which includes all the basins draining into the Pacific Ocean between the southern boundary of the Santa Ana Region and the California-Mexico boundary. The San Diego Water Board implements the CWA through Chapter 5.5 of the CWC, commencing with section 13370. CWC section 13377 provides the San Diego Water Board the legal authority to issue waste discharge requirements to ensure compliance with all applicable provisions of the CWA and acts amendatory thereof or supplementary, thereto, to implement water quality control plans, or for the protection of beneficial uses, or to prevent nuisance.

CWA section 402(p) requires the USEPA or authorized state to issue NPDES permits for storm water discharges from municipal separate storm sewer systems (MS4s) to waters of the U.S. CWA section 402(p)(3)(B)(ii) requires that NPDES permits for storm water discharges from MS4s "*effectively prohibit non-storm water discharges*" into the MS4s. CWA section 402(p)(3)(B)(iii) requires that NPDES permits for storm water discharges from MS4s to "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable* [MEP], *including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*."

The USEPA published implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]), which prescribe permit application requirements for storm water discharges from MS4s pursuant to CWA 402(p), on November 16, 1990. The USEPA published an Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems, which provided guidance on permit application requirements for regulated MS4s, on May 17, 1996. The federal regulations in 40 CFR 122 and guidance issued by USEPA serve as the foundation for the provisions of Order No. R9-2013-0001. The legal authorities provided by the above statutes and regulations are included as part of the discussions in Section VIII of this Fact Sheet.

B. Legal Authority for the Permit Issued on a Region-wide Basis

CWA section 402(p)(3)(B) provides the San Diego Water Board the legal authority to issue an NPDES permit for the San Diego Region as compared to separate MS4 permits based upon County- and partial County-wide boundaries as they exist within the San Diego Region. CWA section 402(p)(3)(B) states that "*Permits for discharges from municipal storm sewers- (i) may be issued on a system- or jurisdiction-wide basis ....*" The federal regulations in 40 CFR 122.26(a)(1)(v) also state that the San Diego Water Board "*may designate dischargers from municipal separate storm sewers on a system-wide or jurisdiction-wide basis. In making this determination, the [San Diego Water Board] may consider the following factors: (A) the location of the discharge with respect to waters of the United States; (B) the size of the discharge; (C) the quantity and nature of the pollutants discharged to waters of the United States; and (D) other relevant factors*."

More specifically, the federal regulations provide that for large and medium MS4 systems, the San Diego Water Board may issue a regional permit. Specifically, the federal regulation in 40 CFR 122.26(a)(3) provide:

"*(ii) The Director may either issue one system-wide permit covering all discharges from municipal separate storm sewers within a large or medium municipal storm sewer system or issue distinct permits for appropriate categories of discharges within a large or municipal separate storm sewer system including, but not limited to: all discharges owned or operated by the same municipality; located within the same jurisdiction; all discharges within a system that discharge to the same watershed; discharges within a system that are similar in nature; or for individual discharges from municipal separate storm sewers within the system.*

(iii) The operator of a discharge from a municipal separate storm sewer which is part of a large or medium municipal separate storm sewer system must either: (A) Participate in a permit application (to be a permittee or a co-permittee) with one or more other operator of discharges from the large or medium municipal storm sewer system which covers all, or a portion of all, discharges from the municipal separate storm sewer system; (B) Submit a distinct permit application

which only covers discharges from the municipal separate storm sewers for which the operator is responsible; or (C) A regional authority may be responsible for submitting a permit application under the following guidelines....

(iv) One permit application may be submitted for all or a portion of all municipal separate storm sewers within adjacent or interconnected large or medium municipal separate storm sewer systems. The Director may issue one systemwide permit covering all, or a portion of all municipal separate storm sewers in adjacent or interconnected large or medium municipal separate storm sewer systems.

(v) Permits for all or a portion of all discharges from large or medium municipal separate storm sewer systems that are issued on a system-wide, jurisdiction-wide, watershed or other basis may specify different conditions relating to different discharges covered by the permit, including different management programs for different drainage areas which contribute storm water to the system."

Based on these regulations, the San Diego Water Board may issue a region-wide MS4 permit. The regulations also clarify that the permit may include different conditions for separate discharges covered by the permit. This allows the San Diego Water Board to ensure that suitable water quality conditions and provisions are identified for each watershed.

The USEPA's responses to comments in the Final Rule for the above-mentioned regulations also make it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide, permits. In the Final Rule published in the Federal Register and containing the responses to comments, USEPA notes that 40 CFR 122.26(a)(3)(iv) would allow an entire system in a geographical region under the purview of a State agency to be designated under a permit.[13] USEPA also states that many commenters wanted to allow the permitting authority broad discretion to establish system-wide permits, and that EPA believes that paragraphs 40 CFR 122.26 (a)(1)(v) and (a)(3)(ii) allow for such broad discretion.[14]

This Order creates watershed requirements that apply to multiple counties. The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees. Managing storm water on a regional and watershed basis is expected to result in improved water quality, as the Order focuses on monitoring and management practices necessary to improve each watershed rather than political boundaries. A single permit also allows the San Diego Water Board staff to expend fewer resources developing successive multiple permits and allows more resources to be devoted to working cooperatively with all three current groups of Copermittees to ensure implementation of this Order results in improved water quality.

[13] 55 Federal Register 47990-01, 48042
[14] Ibid

C. Federal and California Endangered Species Acts

This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2115.5) or the Federal Endangered Species Act (16 United States Code [USC] sections 1531 to 1544). This Order requires compliance with requirements to protect the beneficial uses of waters of the U.S. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

D. California Environmental Quality Act

The action to adopt an NPDES Permit is exempt from the provisions of Chapter 3 of the California Environmental Quality Act (CEQA) (Public Resources Code section 21100, et seq.) pursuant to CWC section 13389. (*County of Los Angeles v. Cal. Water Boards* (2006) 143 Cal.App.4th 985.)

E. State and Federal Regulations, Plans and Policies

The legal authority provided by the following regulations, plans, and policies are also included as part of the discussions in Section VIII of this Fact Sheet.

Water Quality Control Plan for the San Diego Basin

The CWA requires the San Diego Water Board to establish water quality standards for each water body in its region. Water quality standards include beneficial uses, water quality objectives and criteria that are established at levels sufficient to protect beneficial uses, and an antidegradation policy to prevent degrading of waters. On September 8, 1994, the San Diego Water Board adopted the *Water Quality Control Plan for the San Diego Basin (*Basin Plan). The Basin Plan designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters in the San Diego Region. The San Diego Water Board has amended the Basin Plan on multiple occasions since 1994. In addition, the Basin Plan implements State Water Board Resolution No. 88-63, which established state policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply. Beneficial uses applicable to the surface water bodies that receive discharges from the MS4s within the San Diego Region generally include those listed below:

The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region:

- Municipal and Domestic Supply (MUN)
- Agricultural Supply (AGR)

- Industrial Process Supply (PROC)
- Industrial Service Supply (IND)
- Ground Water Recharge (GWR)
- Contact Water Recreation (REC1)
- Non-contact Water Recreation (REC2)
- Warm Freshwater Habitat (WARM)
- Cold Freshwater Habitat (COLD)
- Wildlife Habitat (WILD)
- Rare, Threatened, or Endangered Species (RARE)
- Freshwater Replenishment (FRSH)
- Hydropower Generation (POW)
- Preservation of Biological Habitats of Special Significance (BIOL)

The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region:

- Navigation (NAV)
- Commercial and Sport Fishing (COMM)
- Estuarine Habitat (EST)
- Marine Habitat (MAR)
- Aquaculture (AQUA)
- Migration of Aquatic Organisms (MIGR)
- Spawning, Reproduction, and/or Early Development (SPWN)
- Shellfish Harvesting (SHELL)

Pursuant to Water Code sections 13263 and 13377, the requirements of this Order implement the Basin Plan.

Water Quality Control Plan for Ocean Waters of California, California Ocean Plan

In 1972, the State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan). The State Water Board adopted the most recent amended Ocean Plan on September 15, 2009. The Office of Administrative Law approved it on March 10, 2010. On October 8, 2010, USEPA approved the 2009 Ocean Plan. The Ocean Plan is applicable, in its entirety, to ocean waters of the State. In order to protect beneficial uses, the Ocean Plan establishes water quality objectives and a program of implementation. Pursuant to Water Code sections 13263 and 13377, the requirements of this Order implement the Ocean Plan. The Ocean Plan identifies the beneficial uses of ocean waters of the State to be protected as summarized below:

- Industrial water supply
- Water contact and non-contact recreation, including aesthetic enjoyment; navigation
- Commercial and sport fishing

- Mariculture
- Preservation and enhancement of designated Areas of Special Biological Significance
- Rare and endangered species
- Marine habitat
- Fish spawning and shellfish harvesting

On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving an exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges. The State Water Board Resolution No. 2012-0012 requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject terms and conditions of State Water Board Resolution No. 2012-0012. The Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 applicable to these discharges are hereby incorporated in this Order as if fully set forth herein. Requirements of this Order implement the Ocean Plan.

Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality

On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

Antidegradation Policy

Federal regulations (40 CFR 131.12) require that the state water quality standards include an antidegradation policy consistent with the federal antidegradation policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16 ("Statement of Policy with Respect to Maintaining the Quality of the Waters of the State"). State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law.

The San Diego Water Board's Basin Plan implements and incorporates by reference both the State and federal antidegradation policies. State Water Board Resolution No. 68-16 and 40 CFR 131.12 require the San Diego Water Board to maintain high quality

waters of the State until it is demonstrated that any change in quality will be consistent with maximum benefit to the people of the State, will not unreasonably affect beneficial uses, and will not result in water quality less than that described in the San Diego Water Boards' policies. State Water Board Resolution No. 68-16 requires that discharges of waste be regulated to meet best practicable treatment or control to assure that pollution or nuisance will not occur and the highest water quality consistent with the maximum benefit to the people of the State be maintained.

The discharges permitted in this Order are consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Board Resolution No. 68-16. Many of the water bodies within the area covered by this Order are of high quality. The Order requires the Copermittees to meet best practicable treatment or control to meet water quality standards. As required by 40 CFR 122.44(a), the Copermittees must comply with the "maximum extent practicable" technology-based standard set forth in CWA section 402(p) for discharges of pollutants in storm water from the MS4s.

Many of the waters within the area covered by this Order are impaired and listed on the State's CWA Section 303(d) List and the San Diego Water Board has established TMDLs to address the impairments. This Order requires the Copermittees to comply with permit provisions to implement the WLAs set forth in the TMDLs in order to restore the beneficial uses of the impaired water bodies consistent with the assumptions and requirements of the TMDLs. This Order includes requirements to develop and implement storm water management programs, achieve WQBELs, and effectively prohibit non-storm water discharges into the MS4. The issuance of this Order does not authorize an increase in the amount of discharge of waste.

Anti-Backsliding Requirements

CWA sections 402(o) and 303(d)(4) and 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations or conditions may be relaxed. All effluent limitations and other conditions in this Order are at least as stringent as the effluent limitations in the previous permits issued to the San Diego County Copermittees, the Orange County Copermittees and the Riverside County Copermittees.

Clean Water Act Section 303(d) List

CWA section 303(d)(1) requires each State to identify specific water bodies within its boundaries where water quality standards are not being met or are not expected to be met after implementation of technology-based effluent limitations on point sources. Water bodies that do not meet water quality standards are considered impaired and are placed on the state's "303(d) List." Periodically, USEPA approves the State's 303(d) List.

Most recently, USEPA approved the State's 2010 303(d) List of impaired water bodies on October 11, 2011, which includes certain receiving waters in the San Diego Region. For each listed water body, the state or USEPA is required to establish a TMDL of each pollutant impairing the water quality standards in that water body. A TMDL is a tool for implementing water quality standards and is based on the relationship between pollution sources and in-stream water quality conditions. The TMDL establishes the allowable pollutant loadings for a water body and thereby provides the basis to establish water quality-based controls. These controls should provide the pollution reduction necessary for a water body to meet water quality standards.

A TMDL is the sum of the allowable pollutant loads of a single pollutant from all contributing point sources (the waste load allocations or WLAs) and non-point sources (load allocations of LAs) plus the contribution from background sources and a margin of safety (40 CFR 130.2(i)). MS4 discharges are considered point source discharges. For 303(d)-listed water bodies and pollutants in the San Diego Region, the San Diego Water Board or USEPA develops and adopts TMDLs that specify these requirements.

Since 2002, the San Diego Water Board has established six (6) TMDLs to remedy water quality impairments in various water bodies within the San Diego Region (see Attachment E to the Order). These TMDLs identify MS4 discharges as a source of pollutants to these water bodies, and, as required, establish WLAs for MS4 discharges to reduce the amount of pollutant discharged to receiving waters. CWA section 402(p)(3)(B)(iii) requires the San Diego Water Board to impose permit conditions, including: "management practices, control techniques and system, design and engineering methods, and *such other provisions as the Administrator or the State determines appropriate for the control of such pollutants."* (Emphasis added.) CWA section 402(a)(1) also requires states to issue permits with conditions necessary to carry out the provisions of the CWA. Federal regulations also require that NDPES permits contain WQBELs consistent with the assumptions and requirements of all available WLAs (40 CFR 122.44(d)(1)(vii)(B)). CWC section 13377 also requires that NPDES permits include limitations necessary to implement water quality control plans. Therefore, this Order includes WQBELs and other provisions to implement the TMDL WLAs assigned to Copermittees regulated by this Order.

<u>Other Regulations, Plans and Policies</u>

This Order implements all other applicable federal regulations and State regulations, plans and policies, including the California Toxics Rule at 40 CFR 131.38 (Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California Rule [California Toxics Rule or CTR]), and State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP).

F. Unfunded State Mandates

Article XIII B, Section 6(a) of the California Constitution provides that whenever "*any state agency mandates a new program or higher level of service on any local government, the state shall provide a subvention of funds to reimburse that local government for the costs of the program or increased level of service*." The requirements of this Order do not constitute state mandates that are subject to a subvention of funds for several reasons, including, but not limited to, the following.

First, the requirements of this Order do not constitute a new program or a higher level of service as compared to the requirements contained in the previous Fourth Term Permits. The overarching requirement to impose controls to reduce the pollutants in discharges from MS4s is dictated by the CWA and is not new to this permit cycle (33 USC section 1342(p)(3)(B)). The inclusion of new and advanced measures as the MS4 programs evolve and mature over time is anticipated under the CWA (55 FR 47990, 48052 (Nov. 16, 1990)), and to the extent requirements in this Order are interpreted as new advanced measures, they do not constitute a new program or higher level of service.

Second, and more broadly, mandates imposed by federal law, rather than by a state agency, are exempt from the requirement that the local agency's expenditures be reimbursed (Cal. Const., art. XIII B, section 9, subd. (b)). This Order implements federally mandated requirements under the CWA and its requirements are therefore not subject to subvention of funds. This includes federal requirements to effectively prohibit non-storm water discharges, to reduce the discharge of pollutants in storm water to the MEP, and to include such other provisions as the Administrator or the State determines appropriate for the control of such pollutants (33 USC section 1342(p)(3)(B)). Federal cases have held these provisions require the development of permits and permit provisions on a case-by-case basis to satisfy federal requirements. (*Natural Resources Defense Council, Inc., v. USEPA* (9th Cir. 1992) 966 F.2d 1292, 1308, fn. 17.)

The authority exercised under this Order is not reserved state authority under the CWA's savings clause (cf. *Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 627-628 [relying on 33 USC section 1370, which allows a state to develop requirements which are not "less stringent" than federal requirements]), but instead is part of a federal mandate to develop pollutant reduction requirements for municipal separate storm sewer systems. To this extent, it is entirely federal authority that forms the legal basis to establish the permit provisions. (See, *City of Rancho Cucamonga v. Regional Water Quality Control Board, Santa Ana Region* (2006) 135 Cal.App.4th 1377, 1389; *Building Industry Ass'n of San Diego Co. v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 882-883.)

The MEP standard is a flexible standard that balances a number of considerations, including technical feasibility, cost, public acceptance, regulatory compliance, and effectiveness. (*Building Ind. Ass'n., supra,* 124 Cal.App.4th at pp. 873-874, 889.) Such considerations change over time with advances in technology and with experience

gained in storm water management (55 FR 47990, 48052 (Nov. 16, 1990)). Accordingly, a determination of whether the conditions contained in this Order exceed the requirements of federal law cannot be based on a point by point comparison of the permit conditions and the minimum control measures that are required "at a minimum" to reduce pollutants to the maximum extent practicable and to protect water quality (40 CFR 122.34). Rather, the appropriate focus is whether the permit conditions, as a whole, exceed the MEP standard.

In recent months, the County of Los Angeles and County of Sacramento Superior Courts have granted writs setting aside decisions of the Commission on State Mandates that held certain requirements in Phase I permits constituted unfunded mandates. In both cases, the courts have found that the correct analysis in determining whether an MS4 permit constituted a state mandate was to evaluate whether the permit as a whole exceeds the MEP standard. (*State of Cal. v. Comm. on State Mandates* (Super. Ct. Sacramento County, 2012, No. 34-2010-80000604), *State of California v. County of Los Angeles* (Super. Ct. Los Angeles County, 2011, No. BS130730.) Both cases are currently pending appeal.

The requirements of the Order, taken as a whole rather than individually, are necessary to reduce the discharge of pollutants to the MEP and to protect water quality. The San Diego Water Board finds that the requirements of the Order are practicable, do not exceed federal law, and thus do not constitute an unfunded mandate. These findings are the expert conclusions of the principal state agency charged with implementing the NPDES program in California (CWC sections 13001, 13370).

It should also be noted that the provisions in this Order to effectively prohibit non-storm water discharges are also mandated by the CWA (33 USC section 1342(p)(3)(B)(ii)). Likewise, the provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state establishes or adopts a TMDL, federal law requires that permits must contain effluent limitations consistent with the assumptions and requirements of any applicable waste load allocation in a TMDL (40 CFR 122.44(d)(1)(vii)(B)).

Third, the local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental dischargers who are issued NPDES permits for storm water discharges. With a few inapplicable exceptions, the CWA regulates the discharge of pollutants from point sources (33 USC section 1342) and the Porter-Cologne Act regulates the discharge of waste (CWC section 13263), both without regard to the source of the pollutant or waste. As a result, the "costs incurred by local agencies" to protect water quality reflect an overarching regulatory scheme that places similar requirements on governmental and non-governmental dischargers. (See *County of Los Angeles v. State of California* (1987) 43 Cal.3d 46, 57-58 [finding comprehensive workers' compensation scheme did not create a cost for local agencies that was subject to state subvention].)

The CWA and the Porter-Cologne Act largely regulate storm water with an even hand, but to the extent there is any relaxation of this even-handed regulation, it is in favor of the local agencies. Generally, the CWA requires point source dischargers, including dischargers of storm water associated with industrial or construction activity, to comply strictly with water quality standards (33 USC section 1311(b)(1)(C); *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159, 1164-1165 [noting that industrial discharges must strictly comply with water quality standards]). As discussed in prior State Water Board decisions, certain provisions of this Order do not require strict compliance with water quality standards (State Water Board Order No. WQ 2001-0015, p. 7). Those provisions of this Order regulate the discharge of waste in municipal storm water under the CWA's MEP standard, not the BAT/BCT standard that applies to other types of discharges. These provisions, therefore, regulate the discharge of waste in municipal storm water more leniently than the discharge of waste from non-governmental sources.

Fourth, the Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)). To the extent that the local agency Copermittees have voluntarily availed themselves of the permit, the program is not a state mandate. (Accord, *County of San Diego v. State of California* (1997) 15 Cal.4th 68, 107-108.)

Fifth, the local agency Copermittees' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under state law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

Finally, even if any of the permit provisions could be considered unfunded mandates, under Government Code section 17556, subdivision (d), a state mandate is not subject to reimbursement if the local agency has the authority to charge a fee. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order, subject to certain voting requirements contained in the California Constitution. (See Cal. Const., Art. XIII D, section 6, subd. (c); see also *Howard Jarvis Taxpayers Ass'n v. City of Salinas* (2002) 98 Cal.App.4th 1351, 1358-1359.) The Fact Sheet demonstrates that numerous activities contribute to the pollutant loading in the MS4. Local agencies can levy service charges, fees, or assessments on these activities, independent of real property ownership. (See, e.g., *Apartment Ass'n of Los Angeles County, Inc., v. City of Los Angeles* (2001(24 Cal.4th 830, 842 [upholding inspection fees associated with renting property].) The authority and ability of a local agency to defray the cost of a program without raising taxes indicates that a program does not entail a cost subject to subvention. (*Clovis Unified School Dist. V. Chiang* (2010) 188 Cal.App.4th 794, 812, citing *Connell v. Sup. Ct.* (1997) 59 Cal.App.4th 382, 401; *County of Fresno v. State of California* (1991) 53 Cal. 3d. 482, 487-488.)

VIII. PROVISIONS

The provisions (i.e. NPDES permit requirements) of the Order are discussed below.

A. Prohibitions and Limitations

Purpose: Provision A includes the prohibitions and limitations requirements that are the foundation of all the subsequent requirements included in the Order. Compliance with the prohibitions and limitations will restore and protect receiving waters from impacts that may be caused by discharges into and from the Copermittees' MS4s and ultimately achieve the objective of the CWA.

In meeting the requirements set forth in the Order, the Copermittees must be cognizant that the prohibitions and limitations exist and will be the standard by which the San Diego Water Board will be measuring the progress and success of their implementation of the NPDES permit requirements.

***Discussion*:** The objective of the CWA is to "*restore and maintain the chemical, physical, and biological integrity of the Nation's waters*." The CWA requires the implementation of NPDES permit programs to regulate discharges of pollutants and dredged or fill material to the navigable waters of the U.S. For discharges into and from MS4s, the CWA requires the NPDES permits to "*effectively prohibit non-stormwater discharges into the storm sewers*" and "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable.*"

Provision A includes limitations, consistent with the requirements of the CWA for discharges from MS4s. Provision A expresses these limitations as discharge prohibitions, receiving water limitations, and effluent limitations. Compliance with the discharge prohibitions and receiving water limitations is also explicitly described, in conformance with precedential State Water Board Orders.

More specific and detailed discussions of the requirements of Provision A are provided below.

Provision A.1 (Discharge Prohibitions) prohibits the discharge of specific types of waste into and/or from the Copermittees' MS4s.

Provision A.1.a restates and reiterates Basin Plan Waste Discharge Prohibition 1, by prohibiting discharges into and from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the

state. The terms pollution,[15] contamination,[16] and nuisance[17] are defined under CWC 13050. Provision A.1.c incorporates all the waste discharge prohibitions of the Basin Plan into the requirements of the Order. The waste discharge prohibitions from the Basin Plan have been reproduced and provided in Attachment A to the Order.

Provision A.1.b requires non-storm water discharges into the MS4s to be effectively prohibited, consistent with the requirements of the CWA for MS4 permits to "*effectively prohibit non-stormwater discharges into the storm sewers*." The effective prohibition is required to be implemented by each Copermittee within its jurisdiction through the illicit discharge detection and elimination requirements under Provision E.2. The prohibition does not apply to NPDES permitted discharges into the Copermittees' MS4s.

The CWA employs the strategy of prohibiting the discharge of any pollutant from a point source into waters of the United States unless the discharger of the pollutant(s) obtains an NPDES permit pursuant to CWA Section 402. The 1987 amendment to the CWA includes provision 402(p) that specifically addresses NPDES permitting requirements for storm water discharges from MS4s. CWA section 402(p) prohibits the discharge of pollutants from specified MS4s to waters of the U.S. except as authorized by an NPDES permit and identifies two substantive standards for MS4 storm water permits. MS4 permits (1) "*shall include a requirement to effectively prohibit nonstormwater discharges into the storm sewers*" and (2) "*shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or State determines appropriate for the control of such pollutants*." (CWA section 402(p)(3)(B)(ii-iii).)

In November 1990, the USEPA published regulations addressing storm water discharges from MS4s (55 FR 47990 and following (Nov. 16, 1990) (Phase I Final Rule)). The regulations establish minimum requirements for MS4 permits, and generally focus on the requirement that MS4s implement programs to reduce the amount of pollutants found in storm water discharges to the MEP. The CWA's municipal storm water MEP standard does not require storm water discharges to strictly meet water quality standards, as is required for other NPDES permitted discharges. Compliance is achieved through an iterative approach of continuous

[15] CWC 13050(l): "(1) 'Pollution' means an alteration of the quality of waters of the state by waste to a degree which unreasonably affects either of the following: (A) The water for beneficial uses. (B) Facilities which serve beneficial uses. (2) 'Pollution' may include "contamination.

[16] CWC 13050(k): "Contamination' means an impairment of the quality of waters of the state by waste to a degree which creates a hazard to public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste, whether or not waters of the state are affected."

[17] CWC 13050(m): "Nuisance' means anything which meets all of the following requirements: (1) Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. (2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. (3) Occurs during, or as a result of, the treatment or disposal of wastes."

implementation of improved BMPs. This distinction reflects Congress's recognition that variability in flow and intensity of storm events render difficult strict compliance with water quality standards by MS4 permittees. In describing the controls that permits must include to reduce pollutants in storm water discharges to the MEP, the statute (CWA section 402(p)(3)(B)(iii)) states that the controls shall include: "*management practices, control techniques and system, design and engineering methods, and such other provisions as the [permit writer] determines appropriate for the control of such pollutants*."

In contrast, non-storm water discharges from the MS4 that are not authorized by separate NPDES permits are subject to requirements under the NPDES program, including discharge prohibitions, technology based effluent limitations and water quality-based effluent limitations (40 CFR 122.44). The regulations also require the Copermittee's program to include an element to detect and remove illicit discharges and improper disposal into the storm sewer (40 CFR 122.26(d)(2)(iv)(B)).

While "non-storm water" is not defined in the CWA or federal regulations, the federal regulations (at 40 CFR 122.26(b)(2)) define "*illicit discharge*" as *"any discharge to a municipal separate storm sewer that is not composed entirely of storm water and that is not covered by an NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer and discharges resulting from fire fighting activities)*." This definition is the most closely applicable definition of "non-storm water" contained in federal law. As stated in the Phase I Final Rule, USEPA added the illicit discharge program requirement to begin implementation of the 'effective prohibition' requirement to detect and control non-storm water discharges to their municipal system.

Thus, federal law mandates that permits issued to MS4s must require management practices that will result in reducing storm water pollutants to the MEP yet at the same time requires that non-storm water discharges be effectively prohibited from entering the MS4. "Effectively" prohibit does not mean that non-storm water discharges are authorized to be discharged into and from the Copermittees' MS4s. The Phase I Final Rule clarifies what "effectively prohibit" means (55 FR 47995):

> "*Section 402(p)(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…<u>Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit</u> (other than the permit for the discharge from the municipal separate storm sewer)*" [Emphasis added].

Consistent with federal law, unless non-storm water discharges to the MS4 are authorized by a separate NPDES permit, non-storm water discharges are appropriately subject to the effective prohibition requirement in the CWA and Regional

Water Boards are not limited by the iterative MEP approach to storm water regulation in crafting appropriate regulations for non-storm water discharges.

The federal regulations (40CFR122.26(d)(2)(i)(B)) require the Copermittees to establish the legal authority which authorizes or enables the Copermittees to prohibit illicit discharges to the MS4s. The federal regulations (40 CFR 122.26(d)(2)(vi)(B)(1)) require the Copermittees to "*implement and enforce an ordinance, order or similar means*" to prevent non-storm water discharges to their MS4s. Thus, the Copermittees are required to "*effectively*" prohibit non-storm water discharges to their MS4s through enforcing their legal authority established under "*ordinance, order or similar means*" and either remove those discharges to their MS4s, or require those discharges to obtain coverage under a separate NPDES permit. More detail about the program that must be implemented to "*effectively*" prohibit non-storm water discharges to the Copermittees' MS4s is provided under the discussion for Provision E.2.

Provision A.1.d was included to be consistent Resolution No. 2012-0012, adopted by the State Water Board on March 20, 2012. Provision A.1.d prohibits discharges from MS4s to Areas of Special Biological Significance (ASBS), except for storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach to the Heisler Park ASBS subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012. The pertinent Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 are provided in Attachment A to the Order.

Provision A.2 (Receiving Water Limitations) specifies the condition of the receiving waters that must be achieved when there are discharges from the Copermittees' MS4s. Receiving water limitations are included in all NPDES permits issued pursuant to the CWA section 402. CWA section 402(p)(3)(B)(iii) authorizes the inclusion of "*such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." This requirement gives USEPA or the State permitting authority, in this case the San Diego Water Board, discretion to determine what permit conditions are necessary to control pollutants.

In its Phase I Final Rule (see 55 FR 47990, 47994 (Nov. 16, 1990)), USEPA elaborated on these requirements, stating that, "*permits for discharges from municipal separate storm sewer systems must require controls to reduce the discharge of pollutants to the maximum extent practicable, and where necessary water quality-based controls*." USEPA reiterated in its Phase II Final Rule (64 FR 68722, 68737), that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL*." CWC section 13377 also requires that NPDES permits include limitations necessary to implement water quality control plans. Both the State Water Board and the San Diego Water Board have previously concluded that discharges from the MS4 contain pollutants that have the reasonable potential to cause or contribute to excursions above water quality

standards. As such, inclusion of receiving water limitations is appropriate to control MS4 discharges.

The inclusion of receiving water limitations is also consistent with the Ninth Circuit Court of Appeals' ruling in *Defenders of Wildlife v. Browner* (191 F.3d 1159, 1166 (1999)) that the permitting authority has discretion regarding the nature and timing of requirements that it includes as MS4 permit conditions to attain water quality standards. The Ninth Circuit Court of Appeals recently explained that, "*[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*" (*Natural Resources Defense Council v. County of Los Angeles* (9th Cir. 2011) 673 F.3d 880, 886 (revd. On other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013)))

The receiving water limitations included in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan or in water quality control plans or policies adopted by the State Water Board, including State Water Board Resolution No. 68-16, or in federal regulations, including but not limited to 40 CFR 131.12 and 131.38. The water quality objectives in the Basin Plan and other State Water Board plans and policies have been approved by USEPA and combined with designated beneficial uses constitute the water quality standards required under federal law.

Provision A.2.a requires that discharges from the Copermittees' MS4s must not cause or contribute to the violation of water quality standards in receiving waters. The water quality standards of the receiving waters must be protected from the impacts that may be caused by the Copermittees' MS4 discharges. Water quality standards applicable to the surface waters in the San Diego Region must be achieved through meeting the technology based standard of MEP through an iterative process of improved management actions. Provision A.2.a is also consistent with State Water Board Order WQ 99-05 precedent-setting language requiring discharges from MS4s to attain receiving water quality standards. The water quality control plans and policies with water quality standards applicable to the waters in the San Diego Region are included under Provision A.2.a.

Provisions A.2.b was included to be consistent with the requirements of State Water Board Resolution No. 2012-0012, adopted on March 20, 2012.

<u>Provision A.3 (Effluent Limitations)</u> specifies the condition of the discharges from the Copermittees' MS4s that must be achieved if and when there are discharges.

Consistent with CWA section 301(b)(1)(A) and 40 CFR 122.44(a), Provision A.3.a includes the technology-based effluent limitations that must be included in the Order.

The technology-based effluent limits, representing the minimum level of control that must be imposed in a permit under CWA section 402, requires that pollutants in discharges of storm water from the Copermittees' MS4s be reduced to the MEP. This provision applies specifically to storm water discharges. Non-storm water discharges must be effectively prohibited, as required under Provision A.1.b. Non-storm water (dry weather) discharges from the MS4 are not considered storm water (wet weather) discharges and therefore are not subject to the MEP standard.

The technology-based MEP standard is an ever-evolving, flexible, and advancing concept. Neither Congress nor USEPA has specifically defined the term "maximum extent practicable." Congress established this flexible MEP standard so that the administrative bodies would have "*the tools to meet the fundamental goals of the Clean Water Act in the context of storm water pollution*." (*Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 884.) As knowledge about controlling storm water runoff and discharges continues to evolve, so does the knowledge which constitutes MEP. Reducing the discharge of pollutants in storm water from the MS4 to the MEP requires the Copermittees to assess each program component and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP.

The San Diego Water Board or the State Water Board ultimately define MEP, and may include requirements that provide specific guidance on what is expected to demonstrate MEP. It is the responsibility of the Copermittees to propose actions that implement BMPs to reduce storm water pollution to the MEP. In other words, the Copermittees' runoff management programs developed and implemented under the Order are the Copermittees' proposals for achieving MEP. Their total collective and individual activities conducted pursuant to their runoff management programs become their proposal for achieving MEP as it applies both to their overall effort, as well as to specific activities. Provisions B through E of the Order provides a minimum framework to guide the Copermittees in achieving the MEP standard for discharges of pollutants in storm water.

Provision A.3.b incorporates any water quality based effluent limitations (WQBELs) applicable to the MS4s established for TMDLs adopted and approved for the San Diego Region and requires the Copermittees to comply with those WQBELs. This is consistent with 40 CFR 122.44(d)(1)(vii)(B), which requires that NPDES permits to incorporate WQBELs "*developed to protect a narrative water quality criterion, a numeric water quality criterion, or both…consistent with the assumptions and requirements of any available wasteload allocation for the discharge...*"

Pursuant to CWA section 303(d), for surface water bodies identified as impaired by one or more pollutants, the San Diego Water Board is required to establish TMDLs "*at a level necessary to implement the applicable water quality standards with seasonal variations and a margin of safety which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality*." The

TMDLs identify sources of the pollutants causing the impairments and assign portions of the TMDL as WLAs to point sources, which include MS4s.

WLAs must be expressed in NPDES permits as WQBELs, which may include one or more numeric components such as numeric effluent limits, and/or receiving water limitations, and/or BMP requirements. Because numeric targets for TMDLs typically include a component that will be protective of water quality standards, a TMDL will likely include one or more numeric receiving water limitations and/or effluent limitations as part of the assumptions or requirements of the TMDL. Any numeric receiving water limitations and/or effluent limitations developed as part of the assumptions or requirements of a TMDL must be incorporated and included as part of WQBELs for the MS4s.

Because the development and approval of new TMDLs, or modification of existing TMDLs, may occur during the term of this Order, the specific provisions of those TMDLs, including effluent limitations applicable to MS4s are provided within Attachment E to the Order. Attachment E will be updated with new TMDLs and modifications to existing TMDLs in a timely manner as they occur.

Provision A.4 (Compliance with Discharge Prohibitions and Receiving Water Limitations) describes the process required to be implemented by the Copermittees if compliance with the discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a are not being achieved under current conditions.

In its Phase II Stormwater Regulations, Final Rule, USEPA states that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL.*"[18] In a series of comment letters on MS4 permits issued by various Regional Water Boards, USEPA has also reiterated that MS4 discharges must meet water quality standards.[19] In addition, the Ninth Circuit Court of Appeals explained in a recent ruling that, *"[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*"[20]

[18] Phase II Stormwater Regulations, Final Rule, 64 Fed. Reg. 68722, 68737.
[19] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.
[20] NRDC v. County of Los Angeles (9th Cir. 2011), 673 F.3d 880, 886 (revd. on other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013))). See also, *Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 884-886, citing *Defenders of Wildlife v. Browning,* (9th Cir. 1999) 191 F.3d 1159.)

Water quality standards for the San Diego Region are established in the Basin Plan. The water quality standards of the Basin Plan are incorporated into this Order as the discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a. The discharge prohibitions and receiving water limitations in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations or prohibitions to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan, water quality control plans or policies adopted by the State Water Board, including Resolution No. 68-16, or federal regulations, including but not limited to, 40 CFR 131.12 and 131.38. The waste discharge prohibitions and water quality objectives in the Basin Plan have been approved by USEPA and combined with the designated beneficial uses constitute the water quality standards required under federal law.

Under federal law (CWA section 402(p)(3)(B)(iii)), an MS4 permit must include "*controls to reduce the discharge of pollutants to the maximum extent practicable...and such other provision as...the State determines appropriate for control of such pollutants*." The State Water Board has previously determined that limitations necessary to meet water quality standards are appropriate for the control of pollutants discharged by MS4s and must be included in MS4 permits. (State Water Board Orders WQ 91-03, 98-01, 99-05, 2001-15; see also *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159.) This Order prohibits discharges that cause or contribute to violations of water quality standards.

The discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a are included in this Order to ensure that discharges from the MS4s do not cause or contribute to exceedances of water quality objectives necessary to protect the beneficial uses of the receiving waters.

Provision A.4 is consistent with the precedent-setting language in State Water Board Order WQ 99-05 required to be included in municipal storm water permits. State Water Board Order WQ 2001-15 refined Order WQ 99-05 by requiring an iterative approach to compliance with water quality standards involving ongoing assessments and revisions, as referred to as the "iterative process." The "iterative process" is a fundamental NPDES requirement for municipal storm water permits to achieve the objectives of the CWA.

The State Water Board and Regional Water Boards have stated that the provisions under Provisions A.1.a, A.1.c, A.2.a, and A.4 are independently applicable, meaning that compliance with one provision does not provide a "safe harbor" where there is non-compliance with another provision (i.e., compliance with the Provision A.4 does not shield a Copermittee who may have violated Provision A.1.a, A.1.c, or A.2.a from an enforcement action). The intent of Provision A.4 is to ensure that the Copermittees have the necessary storm water management programs and controls in place, and that they are modified by the Copermittees in a timely fashion when necessary, so that compliance with Provisions A.1.a, A.1.c, and/or A.2.a is achieved as soon as possible. USEPA expressed the importance of this independent applicability in a series of

comment letters on MS4 permits proposed by various Regional Water Boards. At that time, USEPA expressly objected to certain MS4 permits that included language stating, *"permittees will not be in violation of this [receiving water limitation] provision … [if certain steps are taken to evaluate and improve the effectiveness of the jurisdictional runoff management programs],"* concluding that this phrase would not comply with the CWA.[21]

The Ninth Circuit held in *Natural Resources Defense Council v. County of Los Angeles* (2011) 673 F3d. 880, 886 (revd. on other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013))) that engagement in the iterative process does not provide a safe harbor from liability for violations of permit terms prohibiting exceedances of water quality standards. The Ninth Circuit holding is consistent with the position of the State and Regional Water Boards that exceedances of water quality standards in an MS4 permit constitute violations of permit terms subject to enforcement by the Water Boards or through a citizen suit. While the Water Boards have generally directed dischargers to achieve compliance by improving control measures through the iterative process, the San Diego Water Board retains the discretion to take other appropriate enforcement and the iterative process does not shield dischargers from citizen suits under the CWA.

The requirements of Provision A.4, therefore, are required to be implemented until the water quality standards expressed under Provisions A.1.a, A.1.c, and A.2.a are achieved. The CWA requires MS4 permits to "*require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." The requirements of this Order have been deemed or determined to be "appropriate" to achieve water quality standards in receiving waters.

Part of the "*controls*" required by the Order is the process described in Provision A.4. Provision A.4 includes the process that is ultimately expected to achieve compliance with the requirement that discharges from the MS4 do not cause or contribute to violations of water quality standards in the receiving waters. The implementation of Provision A.4 is required when the Copermittees or the San Diego Water Board have determined that discharges from the MS4 are causing or contributing to violations of water quality standards in the receiving waters.

The Copermittees must effectively prohibit non-storm water discharges into the MS4s, reduce the discharge of pollutants in storm water from the MS4s to the MEP, and ensure that their MS4 discharges do not cause or contribute to violations of water quality standards. If the Copermittees have effectively prohibited non-storm water

[21] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.

discharges and reduced storm water pollutant discharges to the MEP, but their discharges are still causing or contributing to violations of water quality standards, Provision A.4 provides a clear "iterative process" for the Copermittees to follow.

Provision A.4 essentially requires the Copermittees to implement additional BMPs until MS4 discharges no longer cause or contribute to a violation of water quality standards.

In assessing compliance and potential enforcement actions, the San Diego Water Board looks at the Copermittees' efforts in total to meet the requirements of Provisions A.1.a, A.1.c, A.2.a and Provision A.4. The Copermittees need to demonstrate that they are making improvements to their programs and making progress toward achieving the discharge prohibitions and receiving water limitations in Provisions A.1.a, A.1.c, and A.2.a by implementing the requirements of Provision A.4. The San Diego Water Board would consider these efforts prior to strictly enforcing the requirements of Provisions A.1.a, A.1.c, and A.2.a. Causes of exceedances of the receiving water limitations can often be more difficult to identify and attribute solely to the Copermittees' MS4s. The intent of the Order is to provide the Copermittees more clarity and flexibility in addressing these exceedances through the iterative approach and adaptive management process until the requirements under Provisions A.1.a, A.1.c, and A.2.a are fully achieved.

An exception to the iterative approach and adaptive management process would be in receiving waters subject to adopted and approved TMDLs. For TMDLs that are incorporated into the Order, there is a specific date for compliance to be achieved, after which the iterative approach and adaptive management process required under Provision A.4 no longer provides the flexibility to achieve compliance. Where compliance dates for a TMDL have passed, compliance with the WQBELs incorporated into the Order established by a TMDL in Attachment E to protect water quality standards is required. Thus, after the interim or final compliance dates for a TMDL have passed, if the discharges from the Copermittees' MS4s are causing or contributing to a violation of WQBELs, exceedances of WQBELs must be strictly enforced by the San Diego Water Board. In the meantime, however, the Copermittees are in compliance with the interim or final TMDL requirements in Attachment E as long as the interim or final WQBELs are being achieved in accordance with the interim or final compliance dates.

B. Water Quality Improvement Plans

Purpose: Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges to the MS4s and control pollutants in storm water discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the Clean Water Act.

Provision B includes requirements for the Copermittees to develop and implement Water Quality Improvement Plans to ultimately comply with the prohibitions and limitations under Provision A. The Water Quality Improvement Plans will provide the Copermittees a comprehensive program that can achieve the requirements and further the objectives of the CWA. Implementation of the Water Quality Improvement Plans will also improve the quality of the receiving waters in the San Diego Region.

The Water Quality Improvement Plan is the backbone of the Regional MS4 Permit requirements. Provision B provides the guidance, criteria, and minimum expectations and requirements for the elements of the Water Quality Improvement Plan to be developed and implemented by the Copermittees. The Water Quality Improvement Plans will be implemented in the Watershed Management Area by the Copermittees within their jurisdictions through their jurisdictional runoff management programs.

The Water Quality Improvement Plan also incorporates a program to monitor and assess the progress of the Copermittees' jurisdictional runoff management programs toward improving the quality of discharges from the MS4s, as well as tracking improvements to the quality of receiving waters. A process to adapt and improve the effectiveness of the Water Quality Improvement Plans has also been incorporated into the requirements of Provision B to be consistent with the "iterative approach" required to achieve compliance with discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a, pursuant to the requirements of Provision A.4.

The Water Quality Improvement Plans have also been structured to incorporate the requirements of any TMDLs that have been adopted for the San Diego Region. Incorporating the requirements of the TMDLs into the requirements of Provision B allows the Copermittees to develop a single plan, instead of separate plans, to coordinate their non-storm water and storm water runoff management programs. The Water Quality Improvement Plans allow the Copermittees to meet the requirements of this Order, as well as fulfill the requirements of the TMDLs.

As an added benefit, if the Copermittees demonstrate that impaired water bodies within the Watershed Management Area listed on the 303(d) List will be addressed with their Water Quality Improvement Plans in a reasonable period of time, the San Diego Water Board may be able to remove the water bodies from the 303(d) List, which would greatly reduce the need for the San Diego Water Board to develop additional TMDLs that would have to be incorporated into the Order and implemented by the Copermittees.

***Discussion*:** The federal NPDES regulations require the Copermittees to develop a proposed management program (40 CFR 122.26(d)(2)(iv)). The proposed management program must include "*a comprehensive planning process*" and "*where necessary intergovernmental coordination*" for the "*duration of the permit.*" The Water Quality Improvement Plan is the Copermittees' "*comprehensive planning process*" document for the proposed management program that will be implemented within a Watershed Management Area. Implementation of the Water Quality Improvement Plan requires "*intergovernmental coordination*" among the Copermittees for at least the "*duration of the permit*," and likely into and beyond the next iteration of the permit.

Developing Water Quality Improvement Plans based upon watersheds is consistent with federal regulations that support the development of permit conditions, as well as implementation of storm water management programs, at a watershed scale (40 CFR 122.26(a)(3)(ii), 122.26(a)(3)(v), and 122.26(d)(2)(iv)). In 2003, USEPA issued a Watershed-Based NPDES Permitting Policy Statement (USEPA, 2003) that defines watershed-based permitting as an approach that produces NPDES permits that are issued to point sources on a geographic or watershed basis. In this policy statement, USEPA explains that "*[t]he utility of this tool relies heavily on a detailed, integrated, and inclusive watershed planning process*." USEPA identifies a number of important benefits of watershed permitting, including more environmentally effective results, the ability to emphasize measuring the effectiveness of targeted actions on improvements in water quality, reduced cost of improving the quality of the nation's waters and more effective implementation of watershed plans, including TMDLs, among others.

An emphasis on watersheds is appropriate at this stage in the San Diego Region's MS4 program to shift the focus to more targeted, water quality driven planning and implementation. Addressing discharges on a watershed scale focuses on water quality results by emphasizing the receiving waters in the watershed. The conditions of the receiving waters drive management actions, which in turn focus measures to address pollutant contributions from MS4 discharges.

The Water Quality Improvement Plan gives the Copermittees the responsibility of developing a comprehensive plan to coordinate the efforts of their jurisdictional runoff management programs for addressing the problems related to MS4 discharges causing impacts to water quality in the Watershed Management Area. The development of the plan provides the Copermittees the opportunity to provide significant input on how to implement their jurisdictional runoff management programs, and how to best utilize their available resources in addressing a focused set of

priorities that they believe will result in measureable improvements to water quality within the Watershed Management Area.

The Copermittees are encouraged to separate the Watershed Management Area into subwatersheds, as appropriate. This allows the Copermittees to identify priorities applicable to a subset of the Copermittees or specific water bodies or areas within the Watershed Management Area.

Included in the requirements for the elements to be included in the Water Quality Improvement Plan are monitoring and assessment requirements that are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order. In addition to the federal requirements of the CWA section 308(a) and 40 CFR 122.26(d), the San Diego Water Board has the authority to establish monitoring, reporting, and recordkeeping requirements for NPDES permits under CWC 13383.

More specific and detailed discussions of the requirements of Provision B are provided below.

Provision B.1 (Watershed Management Areas) requires the Copermittees to develop a Water Quality Improvement Plan for each of the Watershed Management Areas defined by the San Diego Water Board.

Pursuant to 40 CFR 122.26(d)(2)(iv), proposed management programs "*may impose controls on a…watershed basis…*" The Water Quality Improvement Plan is the Copermittees' proposed management program. A Water Quality Improvement Plan must be developed for each Watershed Management Area identified in the Order.

The Watershed Management Areas are identified in Table B-1. Table B-1 establishes ten (10) Watershed Management Areas, and identifies the Copermittees that are responsible for developing and implementing the Water Quality Improvement Plan for each Watershed Management Area.

The Copermittees from each of the three counties within the San Diego Region are expected to be phased in as their respective NPDES municipal storm water permits expire. Because Order No. R9-2007-0001 expired in January 2012, the San Diego County Copermittees are covered under the Regional MS4 Permit on the effective date of the Order.

After San Diego Water Board receives and considers the Reports of Waste Discharge required to be submitted by the Orange County Copermittees and Riverside County Copermittees pursuant to the requirements of their current permits, and make any necessary changes to the Order, the Orange County Copermittees and Riverside County Copermittees will be covered under the Regional MS4 Permit after Order No. R9-2009-0002 expires in November 2014, and Order No. R9-2010-0016 expires in December 2015, respectively.

The Orange County Copermittees and Riverside County Copermittees also have the option to obtain coverage under the Regional MS4 Permit earlier than their respective permit expiration dates. The process to apply for early coverage is described Provision F.6.

Because the Santa Margarita River Watershed Management Area includes Copermittees from both San Diego County and Riverside County, a footnote to Table B-1 has been included to specify that the requirements of Provision B are not required to be implemented by the County of San Diego until the Riverside County Copermittees have received a notice of coverage under the Order. Until the Riverside County Copermittees are notified of coverage under the Order, the County of San Diego is subject to the prohibitions and limitations under Provision A, responsible for continuing to implement its existing jurisdictional runoff management program, and responsible for implementing the transitional monitoring and assessment requirements of Provision D, the transitional annual reporting requirements of Provision F.3.b, and the TMDL requirements of Attachment E to the Order.

Provision B.2 (Priority Water Quality Conditions) requires the Copermittees in each Watershed Management Area to identify the highest priority water quality conditions which will be the focus of the Water Quality Improvement Plan implementation.

Provisions B.2.a and B.2.b provide the criteria that must be assessed when characterizing the receiving water quality and potential impacts from MS4 discharges of the receiving waters within the Watershed Management Area. The criteria are based primarily on the requirements in 40 CFR 122.26(d)(1)(iv)(C) and (C)(1)-(9). Characterizing the receiving water quality and identifying the potential impacts caused by MS4 discharges to receiving waters in the Watershed Management Area is necessary to identify the impacts to receiving waters associated with MS4 discharges that are of the most concern to the Copermittees.

Based on the information required to be considered under Provisions B.2.a and B.2.b, Provision B.2.c requires to Copermittees to identify the highest priority water quality conditions related to discharges from the MS4s that will be the primary focus of the Water Quality Improvement Plan in the Watershed Management Area. Addressing and improving these highest priority water quality conditions will become the focus of each Copermittee's jurisdictional runoff management program as the Water Quality Improvement Plan is implemented in the Watershed Management Area. The highest priority water quality conditions are expected to include source of pollutants and/or stressors, and/or receiving water conditions, that the Copermittees consider the highest threats or most likely to have adverse impacts on the physical, chemical, and biological integrity of receiving waters. Addressing these threats and/or adverse impacts should restore the physical, chemical, and biological integrity of receiving waters, and result in the restoration and protection of the beneficial uses of the receiving waters in the Watershed Management Area.

Provision B.2.d requires the Copermittees to identify known and suspected sources of pollutants and/or stressors contributing to the highest priority water quality conditions. The requirements of Provision B.2.d are based primarily on the requirements in 40 CFR 122.26(d)(1)(iii)(B)(1)-(6). The Copermittees are required to evaluate several factors in the identification of those sources. The Copermittees must consider and evaluate the following: (1) the land uses that may contribute toward impacts to receiving waters, (2) the locations of the Copermittees' MS4s that can convey and discharge runoff and pollutants to receiving waters, (3) other sources that discharge into the Copermittees' MS4s and receiving waters, and (4) other information and data that can help the Copermittees to evaluate the relative importance of or contribution from those sources toward the highest priority water quality conditions. Identifying the known and suspected sources, and their relative contribution toward the highest priority water quality conditions, will help the Copermittees to focus, direct, and prioritize their resources and implementation efforts within their jurisdictions.

Provision B.2.e requires the Copermittees to identify potential strategies that can result in improvements to water quality in MS4 discharges and/or receiving waters within the Watershed Management Area. Potential water quality improvement strategies will not necessarily be implemented by the Copermittees, but provide a "menu" of options that the Copermittees will consider for implementation. The public participation process that will be implemented during the development of the Water Quality Improvement Plan is where the potential water quality improvement strategies will be identified.

Provision B.3 (Water Quality Improvement Goals, Strategies and Schedules) requires the Copermittees in each Watershed Management Area to identify the goals that the Copermittees' jurisdictional runoff management programs will work toward achieving to address and improve the highest priority water quality conditions identified under Provision B.2.c; the strategies that will be implemented by the Copermittees within their jurisdictions and the Watershed Management Area to achieve the goals; and, the schedules for implementing the strategies and achieving the goals. The element of the Water Quality Improvement Plan required under Provision B.3 is where the "*comprehensive planning*" and "*intergovernmental coordination*" [40 CFR 122.26(d)(2)(iv)] of the Copermittees' actions for the proposed management programs within the Watershed Management Area is required to be described.

Provision B.3.a requires the Copermittees to identify interim and final numeric goals, and schedules to achieve those goals as part of the Water Quality Improvement Plans. Provision B.3.a.(1) requires the Copermittees to identify two types of numeric goals to be achieved:

(1) Final numeric goals in the receiving waters and/or MS4 discharges that will result in the protection of the water quality standards of the receiving waters for the highest priority water quality conditions identified by the Copermittees for Provision B.2.c. These final numeric goals are the ultimate goals for the Water Quality Improvement Plan, and the achievement and maintenance of these final numeric goals will indicate that one or more beneficial uses have been successfully restored and/or protected from MS4 discharges.

(2) Interim numeric goals that can be used by the Copermittees to demonstrate progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges for the highest priority water quality conditions in the Watershed Management Area. Achievement of the interim numeric goals will demonstrate to the San Diego Water Board that the Copermittees' implementation efforts are progressing toward achieving the final numeric goals.

Provision B.3.a.(1) does not specify what the interim and final numeric goals must be based on, but they essentially must be designed to achieve compliance with water quality standards in the receiving waters. To that end, the interim goals must be based on measureable criteria or indicators capable of demonstrating progress toward achieving the numeric goals."

The interim and final numeric goals can be based on the water quality objectives in the Basin Plan. The water quality objectives in the Basin Plan, however, consist of numeric and narrative water quality objectives. Numeric water quality objectives can be directly used as numeric goals. Narrative water quality objectives, on the other hand, will require some interpretation to identify numeric goals. The achievement of multiple numeric goals based on the water quality objectives, used in combination, may be necessary to demonstrate that beneficial uses have been restored and/or protected.

The Copermittees could also propose other numeric goals that are not necessarily water quality objectives from the Basin Plan. For example, the Copermittees could propose a numeric goal that consists of achieving some percent improvement of a measureable indicator, such as acreage of a specific habitat or increase in a specific plant or animal species population. Other examples may include pollutant load reductions, number of impaired waterbodies delisted from the List of Water Quality Impaired Segments, Index of Biological Integrity (IBI) scores, etc.

The Copermittees may choose to develop interim numeric goals based on the final numeric goals they develop, such as incremental steps toward ultimately achieving the final numeric goals. The Copermittees may also choose to develop interim numeric goals that are based on other measureable indicators that can indirectly indicate improvements and progress toward the final numeric goals.

There are no limits to the types of interim numeric goals that could be proposed by the Copermittees, other than the goals must be based on measureable criteria or indicators capable of demonstrating progress toward achieving the numeric goals. Likewise, there are no limits to the types of final numeric goals that could be proposed by the Copermittees, other than the goals must "*restore and protect the water quality standards of the receiving waters.*"

Finally, Provision B.3.a.(2) also requires the Copermittees to develop schedules for measuring progress and achieving the interim and final numeric goals. Several criteria

are included for the development of the schedules, but the Copermittees are required to achieve the numeric goals as soon as possible, consistent with federal NPDES regulations (40 CFR 122.47(a)(1)).

The Copermittees are also required to incorporate any compliance schedules for any applicable ASBS or TMDL requirements. Applicable ASBS and TMDL compliance schedules are set forth in Attachment A and Attachment E to the Order, respectively. The information provided by the Copermittees under Provision B.3.a.(2) will be used by the Copermittees and the San Diego Water Board to gauge and track the progress of the Copermittees' efforts in addressing the highest priority water quality conditions identified in the Water Quality Improvement Plan.

Provision B.3.b requires the Copermittees to identify the strategies and schedules to implement those strategies as part of the Water Quality Improvement Plans. Provision B.3.b requires the Copermittees to identify the water quality improvement strategies that will be and may be implemented within the Watershed Management Area to 1) reduce of pollutants in storm water discharged from the MS4 to the MEP, 2) effectively prohibit non-storm water discharges from entering the MS4, 3) protect water quality standards in receiving waters by controlling MS4 discharges so that they do not cause or contribute to exceedances of receiving water limitations, and 4) achieve applicable WQBELs that implement TMDLs. The Copermittees will select the strategies to be implemented based on the likely effectiveness and efficiency of the potential water quality improvement strategies identified under Provision B.2.e to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, and/or achieve the interim and final numeric goals identified under Provision B.3.a.

Provision B.3.b.(1) requires each Copermittee to identify the strategies that will be or may be implemented within its jurisdiction. Each Copermittee is required to describe the strategies it is committed to implementing as part of its jurisdictional runoff management requirements under Provisions E.2 through E.7, and the optional jurisdictional strategies that the Copermittee will implement, as necessary, to achieve the numeric goals.

Each Copermittee is expected to implement the optional jurisdictional strategies identified under Provisions B.3.b.(1)(b) when the jurisdictional strategies it has committed to implement under Provision B.3.b.(1)(a) are not making adequate progress toward the interim and final numeric goals in accordance with the schedules established under Provision B.3.a. Provision B.3.b.(1)(b)(v) requires each Copermittee to describe the circumstances necessary to trigger implementation of the optional jurisdictional strategies, in addition to the requirements of Provisions B.3.b.(1)(a).

The San Diego Water Board recognizes that there may be optional jurisdictional strategies that will likely require funding and/or resources for planning, permitting, procurement of labor and materials, and implementation. Thus, Provision

B.3.b.(1)(b)(iv) requires each Copermittee to describe the funding and/or resources that are necessary to implement these optional jurisdictional strategies. This information may provide interested groups and members of the public an understanding of the resources that they could provide or assist in obtaining to implement these optional jurisdictional strategies.

Provision B.3.b.(2) requires the Copermittees in the Watershed Management Area to identify the regional or multi-jurisdictional strategies that may be implemented, as necessary, to achieve the numeric goals. Similar to the requirements of Provision B.3.b.(1)(b), these regional or multi-jurisdictional strategies will likely require funding and/or resources for planning, permitting, procurement of labor and materials, and implementation, and San Diego Water Board recognizes that these strategies may be difficult to implement with only Copermittee resources. Thus, Provision B.3.b.(2)(d) requires the Copermittees to describe the funding and/or resources necessary to implement these optional regional or multi-jurisdictional strategies. This information may provide interested groups and members of the public an understanding of the resources that they could provide or assist in obtaining to implement these optional regional or multi-jurisdictional strategies.

Provision B.3.b.(3) requires the Copermittees to develop and include schedules in the Water Quality Improvement Plan for implementing the water quality improvement strategies identified under Provisions B.3.b.(1) and B.3.b.(2). The schedule for implementing the water quality improvement strategies will be used by the Copermittees and San Diego Water Board to measure and demonstrate the progress of the Copermittees' implementation efforts toward reducing pollutants in storm water discharged from the MS4 to the MEP, and eliminating illicit non-storm water discharges from entering the MS4.

Provision B.3.b.(4) provides the Copermittees in each Watershed Management Area the option of implementing watershed-specific structural BMP requirements for Priority Development Projects. Historically, storm water permits have included very specific performance standards for permanent, structural BMPs. These standards describe the expectation for the capture or treatment of pollutants and control of excessive flow before storm water is discharged from a site. The Copermittees were also allowed to develop waiver programs for Priority Development Projects to avoid implementing the structural BMPs; however, the waiver programs were not necessarily tied into any sort of holistic watershed strategy. The result is that implementation of BMP requirements is largely done on a site-by-site basis. This requires proper design on the part of the Priority Development Project and strict oversight on the part of the Copermittee.

Provision B.3.b.(4) promotes the evaluation of multiple strategies for water quality improvement, in addition to the implementation of permanent structural BMPs, on a watershed-scale versus the site-by-site approach. In a report issued by the Southern California Coastal Water Research Project (SCCWRP) and several other research institutions, the report emphasized that a successful hydromodification management program will involve watershed analysis as a first step, and that integrating multiple

watershed-based strategies is preferable over a site-by-site approach. Indeed, the report states that the watershed analysis "…*should lead to identification of existing opportunities and constraints that can be used to help prioritize areas of greater concern, areas of restoration potential, infrastructure constraints, and pathways for potential cumulative effects*."[22] Provision B.3.b.(4) promotes the findings and recommendations of the report by providing a pathway for Copermittees to develop an integrated approach to their land development programs.

Under Provision B.3.b.(4), the Copermittees in a Watershed Management Area must first perform an analysis by gathering as much information pertaining to the physical characteristics of the Watershed Management Area as possible. This includes, for example, identifying potential areas of coarse sediment supply, present and anticipated future land uses, and locations of physical structures within receiving streams and upland areas that affect the watershed hydrology (such as bridges, culverts, and flood management basins). Once this information is collected, the Copermittees must produce GIS layers (maps) that include this information.

From there, the Copermittees must use the results of the Watershed Management Area Analysis to identify and compile a list of candidate projects that could potentially be used as alternative compliance options for Priority Development Projects. Such projects include, for example, opportunities for stream or riparian area rehabilitation, opportunities for retrofitting existing infrastructure to incorporate storm water retention or treatment, and opportunities for regional BMPs, among others. Once these candidate projects are identified, Copermittees may allow Priority Development Projects to fund, partially fund, or completely implement these candidate projects. The Copermittees must first find that implementing such a candidate project would provide greater overall benefit to the watershed than requiring implementation of the structural BMPs onsite, and also enter into a voluntary agreement with the Priority Development Project that authorizes this arrangement. The Copermittees may use Provision B.3.b.(4) as both 1) a mechanism to reach their stated goals of the Water Quality Improvement Plan by using Priority Development Projects to either fund or implement projects that will provide water quality benefit, and 2) an alternative to requiring strict adherence to the structural BMP design standards.

Additionally, Provision B.3.b.(4) allows the Copermittees to use the results of the Watershed Management Area Analysis to identify areas within the Watershed Management Area where it is appropriate to allow Priority Development Projects to be exempt from the hydromodification management BMP performance requirements. Provision E.3.c.(2) already allows exemptions for Priority Development Projects that discharge to a conveyance channel whose bed and bank are concrete lined from the point of discharge to an enclosed embayment or the Pacific Ocean. However, there may be cases where further exemptions are warranted. The Copermittees may identify such cases on a watershed basis and include them in the Watershed

[22] 2012. ED Stein, F Federico, DB Booth, BP Bledsoe, C Bowles, Z Rubin, GM Kondolf, A Sengupta. Technical Report 667. Southern California Coastal Water Research Project. Costa Mesa, CA.

Management Area Analysis; however, they must provide the supporting rationale to support all claims for exemptions.

Provision B.3.b.(4) provides an innovative pathway for Copermittees to regulate their land development programs by allowing alternative compliance in lieu of implementing structural BMPs on each and every Priority Development Project. This approach facilitates the integration of watershed-scale solutions for improving overall water quality and assisting Copermittees to achieve their stated goals of the Water Quality Improvement Plan. The San Diego Water Board understands, however, that undertaking this approach, which involves extensive planning, could be resource intensive for the Copermittees. Therefore, the Watershed Management Area Analysis is optional and not a requirement. The Copermittees can choose not to perform the watershed planning and mapping exercise described in Provision B.3.b.(4), and instead choose to require strict implementation of the structural BMPs onsite, pursuant to Provision E.3.b.

Provision B.4 (Water Quality Improvement Monitoring and Assessment) requires the Copermittees to develop an integrated monitoring and assessment program to track the progress of the Water Quality Improvement Plan toward meeting the implementation goals and schedules, and improving the water quality of the Watershed Management Area. Provision B.4 is the part of the Water Quality Improvement Plan where the Copermittees describe the monitoring data that will be collected, which is not only necessary to implement the "iterative approach" required by Provision A.4, but inform the adaptive management and "*comprehensive planning process*" that allows the Copermittees to make adjustments and modifications to the Water Quality Improvement Plans and the jurisdictional runoff management programs.

Provision B.4 requires the Copermittees, at a minimum, to include the requirements of Provision D as part of the water quality improvement monitoring and assessment program for the Water Quality Improvement Plan. The Copermittees, however, are not limited to the requirements of Provision D and may include additional monitoring and assessment methods to track progress toward improving water quality in the Watershed Management Area.

In addition to incorporating the requirements of Provision D, the water quality improvement monitoring and assessment program must incorporate any monitoring and assessment requirements specified for any applicable TMDLs included in Attachment E to the Order, and the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 for Watershed Management Areas with ASBS.

The monitoring and assessments required to be incorporated into the Water Quality Improvement Plan are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order.

Provision B.5 (Iterative Approach and Adaptive Management Process) requires the Copermittees to implement the iterative approach pursuant to Provision A.4 to adapt

the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a.

Provision B.5 requires the Copermittees in each Watershed Management Area to re-evaluate the highest priority water quality conditions and potential water quality improvement strategies, the water quality improvement goals, strategies and schedules, and the water quality improvement monitoring and assessment program and provide recommendations for modifying those elements to improve the effectiveness of the Water Quality Improvement Plan. The re-evaluation of the Water Quality Improvement Plan is part of the assessment requirements of Provision D.

Provision B.6 (Water Quality Improvement Plan Submittal, Updates, and Implementation) requires to Copermittees to submit, update, and implement the Water Quality Improvement Plans.

The requirements for the process to develop and submit the Water Quality Improvement Plans is described in more detail under the discussion for Provision F.1. The process will include several opportunities for the public to provide input during the development of the Water Quality Improvement Plans. The process for updating the Water Quality Improvement Plans is described in more detail under the discussion for Provision F.3.c. Upon acceptance of the Water Quality Improvement Plan and updates, the Copermittees are required to immediately begin implementing the Water Quality Improvement Plan and subsequent updates.

The Water Quality Improvement Plan is expected to be a dynamic document that will evolve over time. The Water Quality Improvement Plan is also expected to be a long term plan that focuses the Copermittees' efforts and resources on a limited set of priority water quality conditions, with the ultimate goal of protecting all the beneficial uses of the receiving waters within the Watershed Management Area from impacts that may be caused or contributed to by MS4 discharges. As the Copermittees collect data, implement their jurisdictional runoff management programs, and review the results from their water quality improvement monitoring and assessment program, the Water Quality Improvement Plan is expected to be continually reviewed and updated until compliance with Provisions A.1.a, A.1.b, and A.2.a is achieved.

However, in specific cases supported by robust analytical documentation the implementation of the Water Quality Improvement Plans may demonstrate that TMDLs are not necessary for identified impaired water bodies within the Watershed Management Area if the analytical record demonstrates that technology-based effluent limitations required by the CWA, more stringent effluent limitations required by state, local, or federal authority, and/or other pollution control requirements (e.g., best management practices) required by local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time.[23]

[23] 40 CFR 130.7(b)(1)

The San Diego Water Board submits an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. According to USEPA guidance for the Integrated Report,[24] water bodies are placed in one of five categories. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 are placed on the 303(d) List.

Category 4 in the Integrated Report is for water bodies where available data and/or information indicate that at least one beneficial use is not being supported or is threatened, but a TMDL is not needed.[25] Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

Impaired water bodies can be included in Category 4a if a TMDL has been adopted and approved. The TMDLs in Attachment E to the Order implement the requirements of the TMDLs adopted by the San Diego Water Board, and approved by the State Water Board and USEPA. The water bodies in Attachment E will be included in Category 4a in the Integrated Report and removed from the 303(d) List.

Impaired water bodies can be included in Category 4b if there are *acceptable* "pollution control requirements" required by a local, state or federal authority stringent enough to implement applicable water quality standards within a reasonable period of time (e.g., a compliance date is set). When evaluating whether a particular set of pollution controls are "requirements," the USEPA considers a number of factors, including: (1) the authority (local, state, federal) under which the controls are required and will be implemented with respect to sources contributing to the water quality impairment (examples may include: self-executing state or local regulations, permits, and contracts and grant/funding agreements that require implementation of necessary controls), (2) existing commitments made by the sources and completion or soon to be completed implementation of the controls (including an analysis of the amount of actual implementation that has already occurred), (3) the certainty of dedicated funding for the implementation of the controls, and (4) other relevant factors as determined by USEPA depending on case-specific circumstances.[26]

[24] USEPA, 2005. Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act
[25] Ibid
[26] Ibid

Impaired water bodies can be included in Category 4c if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution. Pollution, as defined by the CWA is "the man-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of water."[27] In other cases, pollution does not result from a pollutant and a TMDL is not required. Examples of circumstances where an impaired segment may be placed in Category 4c include segments impaired solely due to lack of adequate flow, stream channelization, or hydromodification. In these situations, there may be water quality management actions that can address the cause(s) of the impairment, but a TMDL may not be required to implement the actions.

The Water Quality Improvement Plans will require the implementation of pollution controls and water quality management actions (i.e. water quality improvement strategies) which can result in the attainment of water quality standards in water bodies impaired by discharges from the Copermittees' MS4s. The Water Quality Improvement Plans also include requirements that are expected to attain water quality standards in a reasonable period of time. The San Diego Water Board considers the Water Quality Improvement Plans to be a commitment by the Copermittees to develop, plan, budget for, and implement pollution controls that will attain water quality standards in receiving waters in a reasonable period of time, or as soon as possible. The results of the Copermittees' efforts in implementing the Water Quality Improvement Plans can be used to re-evaluate the condition of the impaired water bodies during the next update to the 303(d) List.

After the Copermittees submit the Water Quality Improvement Plans and demonstrate that water quality standards are being attained or will be attained in a reasonable period of time, the San Diego Water Board may re-evaluate the water bodies on the 303(d) List. These water bodies on the 303(d) List may be re-evaluated and placed into Category 4b or Category 4c in the Integrated Report. The water bodies placed in Category 4b or Category 4c in the Integrated Report must show a record that the water bodies are attaining water quality standards or supporting the identified beneficial uses, or will attain water quality standards or support identified beneficial uses in a reasonable period of time, in order for the water bodies to be appropriately removed from the 303(d) List.

[27] CWA section 502(19)

C. Action Levels

Purpose: Provision C includes requirements for the Copermittees to identify and include numeric action levels in the Water Quality Improvement Plan to direct and focus the Copermittees' jurisdictional runoff management program implementation efforts for controlling MS4 discharges to receiving waters.

***Discussion*:** Under Provision C, the numeric action levels required are for non-storm water discharges and storm water discharges. The non-storm water action levels (NALs) are applicable to non-storm water discharges from the Copermittees' MS4s, which can occur year-round. The storm water action levels (SALs) are applicable to storm water discharges from the Copermittees' MS4s, which occur during the rainy season defined as the period between October 1 and April 30.

The action levels required by Provision C are based on the action level requirements that were developed and incorporated into Order Nos. R9-2009-0002 and R9-2010-0016, the Orange County and Riverside County MS4 Permits, respectively. The Fact Sheets for these Orders provide detailed discussions about the development of the numeric NALs and SALs included in this Order.

Order Nos. R9-2009-0002 and R9-2010-0016 required the Copermittees to perform prescribed actions if the NALs or SALs are exceeded. The actions required under Order Nos. R9-2009-0002 and R9-2010-0016 generally included conducting additional monitoring and source investigations when a discharge from the MS4 is observed to exceed one or more NALs and/or SALs.

For this Order, however, the action levels of Provision C are to be used by the Copermittees to prioritize the actions to be implemented as part of the Water Quality Improvement Plan. Monitoring data collected by the Copermittees from MS4 outfalls will be compared with the NALs and SALs. Exceedances of the NALs and SALs will not require the Copermittees to immediately identify sources causing exceedances, but will provide some numeric indicator levels that can give the Copermittees a way to measure the relative severity of a pollutant contributing to receiving water quality impacts.

NALs and SALs must be included in the Water Quality Improvement Plans to be used by the Copermittees in directing and focusing their water quality improvement strategies. The Copermittees are expected to utilize the NALs and SALs to help focus their implementation efforts on addressing pollutants that have the most significant potential or observed impacts to receiving waters. The NALs and SALs will be used as part of the MS4 discharges assessments required under Provision D.4.b. The NALs and SALs may also be used by the Copermittees as the numeric goals to be achieved in MS4 discharges and/or receiving waters as the Water Quality Improvement Plans are implemented.

More specific and detailed discussions of the requirements of Provision C are provided below.

Provision C.1 (Non-storm Water Action Levels) requires the Copermittees to incorporate NALs into the Water Quality Improvement Plan for pollutants and/or constituents that are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions identified in the Water Quality Improvement Plan related to non-storm water discharges from the MS4s. NALs generally must be consistent with the water quality objectives found within the Basin Plan.

The NALs have been included to ensure that the Copermittees are implementing and complying with several requirements of the MS4 permit. The federal CWA requires permits for municipal storm sewer systems to "*effectively prohibit non-storm water discharges into the storm sewers*." The federal NPDES regulations, which were promulgated to implement the CWA requirements for discharges from municipal storm sewers, require a program to address illicit discharges, which are non-storm water discharges. Provision A.1.b prohibits "*[n]on-storm water discharges into MS4s*" unless the non-storm water discharge authorized by a separate NPDES permit. The NALs will be used as part of the illicit discharge detection and elimination program required pursuant to Provision E.2, as well as part of the MS4 discharges assessments required pursuant to Provision D.4.b.

Provision A.1.a prohibits non-storm water discharges from the MS4 from "*causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state.*" In addition, pursuant to Provision A.2.a, non-storm water discharges "*must not cause or contribute to the violation of water quality standards in any receiving waters*."

Ideally, the Copermittees' jurisdictional runoff management programs will eliminate all non-storm water discharges entering the MS4s within their jurisdictions. The complete elimination of non-storm water discharges to the Copermittees' MS4s would be in compliance with the CWA requirements for non-storm water discharges, as well as the prohibitions and limitations of Provisions A.1.a and A.2.a.

The federal regulations, however, also refer to several non-storm water discharge categories that must be addressed as illicit discharges if they are found to be a source of pollutants. The federal regulations thus identify some non-storm water discharges that are not required to be addressed as illicit discharges if they are not a source of pollutants (e.g. non-storm water discharges specified in Provisions E.2.a.(1)-(5)). Thus, these regulations imply that some non-storm water discharges into and from the MS4 may occur even if non-storm water discharges are "effectively" prohibited by the Copermittees.

If the source of a non-storm water discharge is identified as a category of non-storm water specified in Provisions E.2.a.(1)-(5), the NALs can be used to determine the category of non-storm water discharges is a source of pollutants. For other non-storm

water discharges not specified in Provisions E.2.a.(1)-(5), the CWA requires those discharges to be "*effectively"* prohibited by removing the discharge to the MS4 through enforcement of the Copermittees' legal authority established under "*ordinance, order or similar means*" to prohibit illicit discharges to the MS4s.

If there are non-storm water discharges that are not required to be addressed as illicit discharges, those discharges must comply, at a minimum, with the discharge prohibitions and receiving water limitations of Provision A. Thus, the non-storm water discharges from the MS4 must be at levels that will not cause or contribute to a condition of pollution, contamination, or nuisance (Provision A.1.a), and must not cause or contribute to a violation of water quality standards in receiving waters (Provision A.2.a) to be consistent with the discharge prohibitions and receiving water limitations of Provisions A.1.a and A.2.a.

Furthermore, the San Diego Region has predominantly intermittent and ephemeral rivers and streams which vary in flow volume and duration at spatial and temporal scales. For most of these river and stream systems, non-storm water discharges from the MS4 are likely to be the most significant or the only source contributing to surface flows present within the receiving water, especially during the dry season.

Therefore, because of the prohibitions and limitations of Provision A.1.a and A.2.a, and the likelihood that non-storm water discharges from the MS4 are the most significant or only source contributing to surface flows present within the receiving water, NALs generally must be consistent with the water quality objectives found within the Basin Plan. Non-storm water discharges that are meeting the NALs would not be expected to cause or contribute to an exceedance of water quality objectives in receiving waters, which would be consistent with the discharge prohibitions and receiving water limitations of Provisions A.1.a and A.2.a.

Exceedances of the NALs would then provide an indication of the relative severity of a pollutant in non-storm water discharges from the MS4 contributing to potential or observed receiving water quality impacts. The relative severity or significance of a pollutant in non-storm water discharges from the MS4 will provide the Copermittees a valuable source of information that can be used to identify priority water quality conditions within a Watershed Management Area and within each Copermittee's jurisdiction.

Tables C-1 through C-4 under Provision C.1.a specify numeric NALs for several parameters or pollutant constituents for non-storm water discharges from the MS4 to several water body types. The NALs for MS4 discharges given under Provision C.1.a are based on the water quality objectives for inland surface waters in the Basin Plan, and the water quality objectives for ocean waters in the Ocean Plan. The NALs for most of the metals were calculated based on the State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP). The NALs provided in Tables C-1

through C-4 must be included in the Water Quality Improvement Plans required to be developed pursuant to Provision B.

Provision C.1.b requires the Copermittees to identify NALs for pollutants and/or constituents, not specified in Provision C.1.a, which are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions of the Watershed Management Area related to non-storm water discharges from the MS4s. The NALs must be based on the water quality objectives in the Basin Plan. The NALs identified under Provision C.1.b must be included in the Water Quality Improvement Plan.

The San Diego Water Board recognizes that some of the NALs required pursuant to Provisions C.1.a and C.1.b may be exceeded more frequently than not. Thus, Provision C.1.c has been included in the Order to provide the Copermittees the option to develop secondary NALs that are set at levels greater than the levels required pursuant to Provisions C.1.a and C.1.b to further refine the prioritization and assessment of water quality improvement strategies for addressing non-storm water discharges to and from the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and from the MS4.

Provision C.2 (Storm Water Action Levels) requires the Copermittees to incorporate SALs into the Water Quality Improvement Plan for pollutants and/or constituents causing or contributing, or may be causing or contributing, to the highest priority water quality conditions identified in the Water Quality Improvement Plan related to storm water discharges from the MS4s.

The SALs have been included to ensure that the Copermittees are implementing and complying with several requirements of the MS4 permit. Provision A.1.a prohibits storm water discharges from the MS4 from "*causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state.*" In addition, pursuant to Provision A.2.a, storm water discharges "*must not cause or contribute to the violation of water quality standards in any receiving waters*."

Provision A.3.a, however, implicitly acknowledges that compliance with Provisions A.1.a and A.2.a cannot be achieved immediately for discharges of storm water from the MS4 by applying the MEP standard. Thus, Provision A.4 requires the Copermittees to implement an iterative approach to demonstrate that MEP is being achieved. This approach is supported by USEPA.

The federal CWA requires permits for municipal storm sewer systems to "*require controls to reduce the discharge of pollutants [in storm water] to the maximum extent practicable*, *including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants.*" MEP is an ever-evolving, flexible, and advancing concept. As knowledge about controlling storm water runoff

and discharges evolves, so does the knowledge which constitutes MEP. Reducing the discharge of storm water pollutants from the MS4 to the MEP requires the Copermittees to assess their jurisdictional runoff management programs and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP. The SALs provide the Copermittees measureable goals that may be used to demonstrate the achievement of MEP for reducing pollutants in storm water discharges from the MS4. The SALs will be used as part of the MS4 discharges assessments required under Provision D.4.a.

In June of 2006, the State Water Board's Blue Ribbon Storm Water Panel released its report titled "*The Feasibility of Numerical Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities*." In the recommendations, the Blue Ribbon panel proposed storm water effluent limitations which are computed using statistical based population approaches. The SALs specified in Table C-5 under Provision C.2.a were developed from a regional subset of nationwide Phase I MS4 data by using USEPA Rain Zone 6 (arid west) data.[28] Additionally, utilization of regional data is appropriate due to the addition of data into the nationwide Phase I MS4 monitoring dataset in February 2008. This additional data increased the number of USEPA Rain Zone 6 samples to more than 400, and included additional monitoring events within Southern California.

Utilizing data from USEPA Rain Zone 6 resulted in SALs which closely reflect the environmental conditions experienced in the San Diego Region. The localized subset of data includes sampling events from multiple Southern California locations including Orange, San Diego, Riverside, Los Angeles, and San Bernardino Counties. The dataset includes samples taken from highly built-out impervious areas and from storm events representative of Southern California conditions.

The SALs for cadmium, copper, lead and zinc require the measurement of hardness and to provide more specificity in the assessment of samples with SALs for total metal concentrations. While USEPA Rain Zone 6 data include a large sample size for concentrations of total metals, the impact the concentration will have on receiving waters will vary with receiving water hardness. Since it is the goal of the SALs, through the iterative process and MEP standard, to have MS4 storm water discharges meet all applicable water quality objectives, the hardness of the receiving water should be used when assessing the total metal concentration of a sample.

Thus, when there is an exceedance of a SAL for a metal, the Copermittee must determine if that exceedance is above the existing applicable water quality objectives based upon the hardness of the receiving water. The water quality objectives Copermittees must use to assess total metal SAL exceedances are the California Toxic Rule (CTR) and USEPA National Recommended Water Quality Criteria for Freshwater Aquatic Life 1 hour maximum concentrations. The 1 hour maximum

[28] Data used to develop SAL were obtained from http://rpitt.eng.ua.edu/Research/ms4/mainms4.shtml

concentration is to be used for comparison since it is expected to most replicate the impacts to waters of the State from the first flush following a precipitation event.

The statistically calculated SALs given in Table C-5 are at levels greater than the water quality objectives in the Basin Plan or Ocean Plan. Because the objective of the CWA is to "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*", meaning eventually pollutants in storm water discharges must be reduced to a level that cannot cause or contribute to an exceedance of water quality objectives in receiving waters, over time the SALs are expected to be reduced to a level that is based on the water quality objectives rather than statistical calculations. The San Diego Water Board will review the SALs as more data for discharges of storm water from the MS4s are collected, and revise them as conditions improve and the MEP standard advances. For the Water Quality Improvement Plans required under this Order, the SALs identified under Provision C.2.a must be included.

Provision C.2.b requires the Copermittees to identify SALs for pollutants and/or constituents, not specified in Provision C.2.a, which are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions of the Watershed Management Area related to storm water discharges from the MS4s. The SALs identified under Provision C.2.b must be included in the Water Quality Improvement Plan.

The San Diego Water Board recognizes that some of the SALs required pursuant to Provisions C.2.a and C.2.b may be exceeded more frequently than not. Thus, Provision C.2.c has been included in the Order to provide the Copermittees the option to develop secondary SALs that are set at levels greater than the levels required pursuant to Provisions C.2.a and C.2.b to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s.

D. Monitoring and Assessment Program Requirements

Purpose: Provision D includes minimum monitoring and assessment requirements that must be developed and implemented by the Copermittees as part of the Water Quality Improvement Plans. Implementation of the monitoring and assessment requirements of Provision D will allow the Copermittees to demonstrate that the requirements of the CWA to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP are being achieved. Implementation of the monitoring and assessment requirements of Provision D will also allow the Copermittees and the San Diego Water Board to track improvements to the water quality in the San Diego Region. The monitoring and assessment program requirements are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order.

***Discussion*:** The San Diego Water Board recognized that changes to the monitoring and assessment requirements of the Fourth Term Permit were necessary to improve the usefulness and usability of monitoring data collected by the Copermittees to support their jurisdictional storm water programs more efficiently and with increased effectiveness. The data collected are needed to better inform the Copermittees' understanding of the physical, chemical, and biological condition of the receiving waters and the quality of the MS4 discharges. The monitoring program needs to provide opportunities for the Copermittees to integrate regional monitoring efforts into municipal storm water monitoring requirements to provide a cost-effective approach to monitoring and avoid duplication of efforts.

The requirements in Provision D were largely recommended by the Copermittees as an outcome of the San Diego Water Boards Focused Meeting process. The monitoring and assessment program requirements now require collection of more specific information necessary for each Copermittee to adapt its jurisdictional runoff management program in such a way that focuses resources on a watershed's highest priority water quality conditions. The monitoring and assessment program will require the Copermittees to collect data that can be utilized to answer both watershed level management questions (e.g. Are the chemical, physical, and biological conditions of a receiving water protective, or likely protective of beneficial uses?), and specific jurisdictional runoff management program activity questions (e.g. Are the water quality improvement strategies of the jurisdictional program effectively eliminating non-storm water discharges to the MS4?).

The monitoring data collected and assessment information that will be reported to the San Diego Water Board are necessary to determine if the Copermittees are complying with the prohibitions and limitations of Provision A. The required monitoring and assessments that must be reported to the San Diego Water Board will be utilized for three purposes:

(1) Inform the Copermittees, San Diego Water Board, and the public on the progress of the Copermittees' efforts to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP;

(2) Inform the Copermittees, San Diego Water Board, and the public on the condition of water bodies receiving discharges from the Copermittees' MS4, and the progress of the Copermittees' water quality improvement implementation efforts toward improving the receiving water quality; and

(3) Inform the Copermittees, the San Diego Water Board, and the public on the effectiveness of the Water Quality Improvement Plan toward achieving (1) and (2).

The monitoring and assessment information reported pursuant to Provision F is also expected to be key to the iterative approach and adaptive management process required under Provision A.4 and implemented through the Water Quality Improvement Plan required under Provision B. As required by Provision A.4, the iterative approach and adaptive management process is required if the Copermittees cannot meet the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c, and/or A.2.a under the present conditions.

Provision D provides the minimum monitoring and assessment requirements that must be included in each Water Quality Improvement Plan to be developed and implemented by the Copermittees. The Copermittees, however, are not limited to the requirements of Provision D and may include additional methods to track progress toward improving water quality in a Watershed Management Area.

More specific and detailed discussions of the requirements of Provision D are provided below.

<u>Provision D.1 (Receiving Water Monitoring Requirements)</u> specifies the minimum receiving water monitoring that the Copermittees must conduct within the Watershed Management Area and include as part of the Water Quality Improvement Plan.

Provision D.1 establishes minimum monitoring requirements that must be conducted by the Copermittees within each Watershed Management Area. Provision D.1 requires the Copermittees to collect and develop the data and information necessary to determine potential impacts to the beneficial uses in the receiving waters due to discharges from the MS4s. The monitoring required under Provision D.1 will also provide the data that will allow the Copermittees to gauge the effectiveness and progress of its Water Quality Improvement Plan implementation efforts toward improving the quality of receiving waters.

The receiving water monitoring requirements of Provision D.1 are focused primarily on monitoring the conditions and response of the receiving waters to the Copermittees'

collective implementation efforts to reduce receiving water impacts that may be caused by the discharges from the MS4s. The preference of the San Diego Water Board is for the Copermittees to spend their resources achieving tangible and observable improvements in receiving water conditions instead of collecting samples and analyzing data that has consistently indicated that receiving water conditions are degraded and require improvement. In general, the ability to measure potential improvements in receiving water conditions due to any actions implemented by the Copermittees as part of the Water Quality Improvement Plan may require several years before a response can be observed. Thus, the frequency of collecting receiving water monitoring data has been kept to a minimum.

During the transitional period between adoption of this Order and San Diego Water Board acceptance of a Water Quality Improvement Plan, the Copermittees must conduct receiving water monitoring in accordance with Provision D.1.a. This approach to collecting receiving water data is different from what was required in the Fourth Term Permits, but one that truly embraces the concept of an integrated, cost-effective, streamlined receiving water monitoring approach.

Provision D.1.a requires Copermittees to continue performing the receiving water monitoring programs required in Order Nos. R-2007-0001, R9-2009-002, and R9-2010-0016; plus participation in: hydromodification management plan monitoring approved by the San Diego Water Board, monitoring plans as part of load reduction plans (either Bacteria Load Reduction Plans or Comprehensive Load Reduction Plans) for TMDLs in Attachment E of the Order, Storm Water Monitoring Coalition Regional Monitoring, Southern California Bight Regional Monitoring, Sediment Quality Monitoring, and ASBS Monitoring as applicable to a Watershed Management Area.

Provision D.1.a also provides an opportunity for the Copermittees to use third party data to meet receiving water monitoring requirements where feasible. Allowing the Copermittees to use the data currently collected through its participation in existing regional receiving water programs and that of third parties provides an efficiency of resources in obtaining the data necessary to inform the Copermittees and the San Diego Water Board about the physical, chemical, and biological conditions of the receiving waters, which can also help to focus the receiving water monitoring during the implementation of the Water Quality Improvement Plan. Once a Water Quality Improvement Plan is developed for a Watershed Management Area in compliance with Provision B of this Order, the transitional period is over and Copermittees are required to conduct receiving water monitoring according to the requirements of Provisions D.1.b-e.

Provision D.1.b requires each Copermittee to identify at least one long term receiving water monitoring station to be representative of receiving water quality within each Watershed Management Area. Long term receiving water monitoring stations can be located at any existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees. The requirements under Provision D.1.b. are

consistent with 40 CFR 122.26(d)(2)(iii)(D), which specifies that a "*monitoring program for representative data collection for the term of the permit*" may include "*instream locations.*" For each Watershed Management Area, at least one long term watershed monitoring station is required to be established and monitored. The Copermittees may choose to establish additional long term monitoring stations where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

Provision D.1.b. requires the Copermittees to locate the long term receiving water monitoring station at one of these existing receiving water monitoring stations to provide the Copermittees an opportunity to experience monitoring cost savings while continuing to collect the necessary data to assess the status and trends of receiving water quality conditions in 1) coastal water, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under both dry weather and wet weather conditions. Ideally these stations will continue to be monitored as part of the receiving water monitoring for each Watershed Management Area to maintain a consistent set of locations and a period of data that can be built upon with the monitoring required under this Order.

The receiving water monitoring requirements are separated into monitoring required during dry weather conditions pursuant to Provision D.1.c, and wet weather conditions pursuant to Provision D.1.d.

At each long term monitoring station the Copermittees must conduct at least three dry weather monitoring events as required pursuant to Provision D.1.c and at least three wet weather monitoring events as required pursuant to Provision D.1.d per permit term. Provisions D.1.c and D.1.d require the Copermittees to monitor priority water quality conditions identified in the Water Quality Improvement Plan, constituents listed as causing impairment of receiving waters in the Watershed Management Area, applicable NALs, toxicity, constituents listed in Tables D-2 and D-3, and constituents for implementation plans (e.g. Bacteria Load Reduction Plans and Comprehensive Load Reduction Plans). Required toxicity monitoring was changed to reflect an updated understanding of the unique challenges associated with sampling storm water for toxicity. Copermittees are required to sample storm water for toxicity during each dry weather and each wet weather event pursuant to Provision D.1.c.(4) and D.1.d.(4). Required toxicity monitoring is now consistent with the State Water Resources Control Board Policy for Toxicity Assessment and Control (Draft June 2012) and recently adopted MS4 permits for Caltrans and Los Angeles Water Board. Receiving water monitoring efforts in this Order have been streamlined to redirect resources to monitoring efforts that better support pollutant reduction solutions with an increasing emphasis on MS4 outfall monitoring, source identification and source abatement activities.

In addition to the receiving water monitoring requirements under Provisions D.1.b-d, Provision D.1.e requires the Copermittees participate in and/or conduct other types of receiving water monitoring. As recommended and requested by the Copermittees, Provision D.1.e.(1) requires the Copermittees to participate in existing regional monitoring, as applicable to each Watershed Management Area. Existing regional

monitoring includes monitoring conducted by the Storm Water Monitoring Coalition and for the Southern California Bight. Participation in and use of monitoring data collected from these existing regional water quality monitoring programs provide the Copermittees a greater opportunity for efficiency in the use of their resources to manage their storm water programs and those controllable discharges under their authority.

The State Water Resources Control Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part 1 Sediment Quality which became effective August 25, 2009 (Sediment Quality Monitoring Policy). Provision D.1.e.(2) requires any Copermittees with MS4 discharges to an enclosed bay or estuary to monitoring the sediments in the enclosed bay or estuary receiving water in accordance with the sediment quality monitoring procedures as prescribed in the Sediment Quality Monitoring Policy.

The State Water Board adopted Resolution No. 2012-0012 which approved exceptions to the California Ocean Plan for selected discharges into Areas of Special Biological Significance (ASBS), including special protections for beneficial uses. State Board Resolution No. 2012-0012 became effective on March 20, 2012, and Attachment B to the Resolution established limitations on point source storm water discharges to ASBS. Copermittees with MS4s that discharge to an ASBS must monitor its discharge to assure compliance with State Board Resolution No. 2012-0012 as required pursuant to Provision D.1.e.(3).

The San Diego Water Board is currently developing a regional monitoring strategy to assess the conditions of receiving waters in the San Diego Region. The monitoring requirements of Provision D.1 are expected to be incorporated or serve as a foundation of this regional monitoring strategy, but may require some modifications. When the San Diego Water Board develops an alternative regional monitoring strategy, the Copermittees will be required to participate in the development and implementation of the alternative regional monitoring program pursuant to Provision D.1.f.

Provision D.2 (MS4 Outfall Discharge Monitoring Requirements) specifies the minimum MS4 outfall discharge monitoring requirements that the Copermittees must incorporate and implement as part of the Water Quality Improvement Plan.

The dry weather MS4 outfall discharge monitoring requirements are included under Provisions D.2.a.(2) and D.2.b. The dry weather MS4 outfall discharge monitoring requirements are part of the "*program, including a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer*" required by 40 CFR 122.26(d)(2)(iv)(B), which is expected to achieve compliance with the CWA section 402(p)(3)(B)(ii) statutory requirement for municipal storm water permits to require the Copermittees to "*effectively prohibit non-storm water discharges into the storm sewers*." The dry weather MS4 outfall discharge monitoring data

collection requirements are based on requirements under 40 CFR 122.26(d)(1)(iv)(D) and 122.26(d)(2)(iv)(B)(3).

The dry weather MS4 outfall discharge monitoring requirements are designed to provide wide spatial and temporal coverage of each jurisdiction to better understand the extent and magnitude of non-storm water discharges to receiving waters, and make a distinction between persistent and transient non-storm water flows. This information is expected to allow each Copermittee to focus its resources on eliminating and controlling the highest priority threats to receiving water quality, as well as integrating other elements of the storm water programs (e.g. complaint call response) and third party data to efficiently and effectively assist in efforts to eliminate non-storm water discharges.

The dry weather MS4 outfall discharge monitoring requirements of Provision D.2.a.(2) and D.2.b are separated into monitoring required before and after the San Diego Water Board accepts the Copermittees' Water Quality Improvement Plan. Outfall monitoring conducted prior to acceptance of the Water Quality Improvement Plan is referred to in the Order as Transitional MS4 Outfall Discharge Monitoring. Provision D.2.a.(2) includes the transitional dry weather MS4 outfall discharge monitoring requirements.

The requirements under Provision D.2.a.(2) are based on the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B), which include the requirements for a monitoring program to identify, detect, and eliminate illicit connections and illegal discharges to the MS4s. The federal regulations (40 CFR 122.26(d)(1)(iv)(D)) require the monitoring program to include "*a field screening analysis for illicit connections and illegal dumping [that]…[a]t a minimum, include[s] a narrative description, for either each field screening point or major outfall, of visual observations made during dry weather periods.*" The federal regulations (40 CFR 122.26(d)(1)(v)(B)) require the monitoring program to include "*inspection procedures and methods for detecting and preventing illicit discharges, and describe areas where this program has been implemented.*" Furthermore, the monitoring program is required by federal regulations (40 CFR 122.26(d)(2)(iv)(B)) to include "*a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer.*"

Dry weather transitional MS4 outfall discharge monitoring requires each Copermittee to field screen (inspect) its major MS4 outfalls to classify the MS4 outfall locations as having persistent dry weather flows, transient dry weather flows, or no dry weather flows. To account for the variance in size of the 39 jurisdictions covered under this Order, the Copermittees recommended a tiered approach to the number of major MS4 outfalls that must be inspected. Provision D.2.a.(2)(a) provides a tiered approach to the number of major MS4 outfalls that must be visually inspected per jurisdiction as well as a minimum frequency each Copermittee must inspect each major MS4 outfall per year. This tiered approach is based on the total number of major MS4 outfalls within a Copermittees jurisdiction within each Watershed Management Area.

Based on the field screening, each Copermittee is required to make a determination whether any observed flowing, pooled, or ponded waters are transient or persistent flows. Based on this field screening information, other jurisdictional program information, and third party information, each Copermittee is required to prioritize the MS4 outfalls within its jurisdiction for follow up investigation and elimination of the non-storm water discharge, as part of its illicit discharge detection and elimination program required pursuant to Provision E.2. In accordance with the requirements of Provision E.2, each Copermittee is required to immediately investigate obvious illicit discharges (e.g. outfall discharges with unusual color, unusual odor, or high flows).

This approach allows a Copermittee to use all of its resources, as well as leverage resources and information provided by third parties, to effectively eliminate non-storm water discharges from its MS4 outfalls. If the source of the non-storm water discharge cannot be immediately eliminated, the Copermittee uses the persistent flow or transient flow classification along with other programmatic implementation data to prioritize the MS4 outfalls for future investigation. In accordance with the adaptive management approach deployed throughout this Order, Provision D.2.a.(2)(c) requires each Copermittee to update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow. The requirement of Provision D.2.a.(2)(c) assures that each Copermittee is collecting data that can be used to demonstrate compliance with the CWA requirement that each Copermittee must implement a program to "*effectively prohibit non-storm water discharges into the [MS4]*" and with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

Provision D.2.b describes the dry weather MS4 outfall discharge monitoring required to be incorporated and implemented as part of the Water Quality Improvement Plan. Dry weather MS4 outfall discharge monitoring must be performed by each Copermittee to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. The emphasis of the dry weather MS4 outfall discharge monitoring required pursuant to Provision D.2.b is consistent with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

Provision D.2.b.(1) requires each Copermittee to continue field screening its major MS4 outfalls and identifying those with persistent flows and transient flows, as conducted during the transitional period (i.e. before the Water Quality Improvement Plan was developed). However, each Copermittee now has the flexibility to adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of non-storm water persistent flow discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan. In order to ensure a minimum number of outfalls are inspected, Provision D.2.b.(1) requires the number of visual

inspections be equal to the number of visual inspections required in the tiered inspection program pursuant to Provision D.2.a.(2)(a).

Provision D.2.b.(2)(b) requires each Copermittee to monitor a minimum of 5 major MS4 outfalls with persistent flows identified as the highest priorities within a Copermittee's jurisdiction, within each Watershed Management Area. In other words, Copermittees located in more than one Watershed Management Area must identify at least 5 major MS4 outfalls with persistent flows in its jurisdiction in each Watershed Management Area. If a Copermittee is located in more than one Watershed Management Area, and they have less than 5 major MS4 outfalls with persistent flows per jurisdictional area per Watershed Management Area, all of the major MS4 outfalls must be identified as high priority dry weather persistent flow MS4 outfalls. The Copermittees identified as Responsible Copermittees by a TMDL in Attachment E of the Order may need to monitor more than 5 dry weather major MS4 outfall locations to determine compliance with the requirements of the TMDL(s).

Monitoring must occur at the highest priority outfall locations at least semi-annually until the non-storm water discharges have been eliminated for three consecutive dry weather monitoring events; identified to be authorized by a separate NPDES Permit; or reprioritized to a lower priority. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized MS4 major outfall in the Copermittee's jurisdiction within the Watershed Management Area, unless there are no remaining qualifying major MS4 outfalls within the Copermittees jurisdiction. The Copermittees must continually update their dry weather persistent flow MS4 outfall discharge monitoring locations with the next highest priority non-storm water flow that have yet to be eliminated until all persistent and transient flows are eliminated or its threat reduced.

Non-storm water persistent flow MS4 outfall discharge monitoring data collected during each semi-annual monitoring event, must be collected and analyzed according to the requirements of Provision D.2.b.(2)(b)–(e). These monitoring requirements are consistent with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

The wet weather MS4 outfall discharge monitoring requirements are included under Provisions D.2.a.(3) and D.2.c. The wet weather MS4 outfall discharge monitoring requirements are necessary for the Copermittees to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable, using management practices, control techniques and system, design and engineering methods, and such other provisions which are appropriate*" required by 40CFR 122.26(d)(2)(iv), which is expected to achieve compliance with the CWA section 402(p)(3)(B)(iii) statutory requirement for municipal storm water permits to require "*controls to reduce the discharge of pollutants [in storm water] to the maximum extent practicable*." The wet weather MS4 outfall discharge monitoring data collection requirements are based on requirements under 40 CFR 122.26(d)(2)(iii), 122.26(d)(2)(iii)(A) and 122.26(d)(2)(iii)(A)(1)-(4), and 40 CFR 122.21(g)(7)(i)-(ii).

The wet weather MS4 outfall discharge monitoring requirements of Provision D.2.a.(3) and D.2.c are separated into monitoring required before and after the San Diego Water Board accepts the Copermittees' Water Quality Improvement Plan. Outfall monitoring conducted prior to acceptance of the Water Quality Improvement Plan is referred to in the Order as Transitional MS4 Outfall Discharge Monitoring. Provision D.2.a.(3) includes the transitional wet weather MS4 outfall discharge monitoring requirements.

Until the wet weather MS4 outfall discharge monitoring requirements of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board, the Copermittees must comply with the requirements of transitional wet weather MS4 outfall monitoring requirements pursuant to Provision D.2.a.(3). Provision D.2.a.(3) requires the Copermittees in each Watershed Management Area to sample, at least five of the major MS4 outfalls inventoried pursuant to Provision D.2.a.(1) once per wet season for the monitoring data required to be collected pursuant to Provision D.2.a.(3)(c)-(e). Provision D.2.a.(3) further requires at least one major MS4 outfall monitoring station be located in each Copermittee's jurisdiction within the Watershed Management Area.

At a minimum, the five sampling locations chosen must be representative of storm water discharges from residential, commercial, industrial, and typical mixed-use land uses present within a Watershed Management Area. The San Diego Water Board expects the Copermittees to extrapolate from these data to similar land uses throughout the Watershed Management Area to better inform the Water Quality Improvement Plan development process by prioritizing drainages for implementation of storm water control efforts required pursuant to Provision E.

Provision D.2.c describes the wet weather MS4 outfall discharge monitoring required to be included and implemented as part of the Water Quality Improvement Plan. Provision D.2.c provides the Copermittees the flexibility to adjust the wet weather MS4 outfall discharge monitoring locations and frequencies in the Watershed Management Area, as needed, to identify sources of pollutants in storm water discharges from MS4s in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan.

Although Provision D.2.c.(1) allows the Copermittees to adaptively manage the wet weather MS4 outfall discharge monitoring locations and frequencies, the provision requires a minimum of at least five wet weather outfall stations to be monitored. Provision D.2.c.(2) further allows the Copermittees to modify the monitoring frequency at each wet weather MS4 outfall station to meet the goals of the Water Quality Improvement Plan as long as the monitoring frequency occurs at least once per year and is at an appropriate frequency to identify sources of pollutants in storm water discharges, guide pollutant source identification efforts, or determine compliance with the requirements of the applicable TMDLs in Attachment E to the Order.

The wet weather MS4 outfall discharge monitoring requirements of Provisions D.2.c.(3) and D.2.c.(4) are the same as the transitional wet weather MS4 outfall discharge monitoring. In contrast, the requirements of Provision D.2.c.(5) are focused on collecting analytical data specific to the highest priority water quality conditions in the Watershed Management Area identified in the Water Quality Improvement Plan. The wet weather MS4 outfall discharge monitoring data collection requirements are consistent with the requirements under 40 CFR 122.26(d)(2)(iii), 122.26(d)(2)(iii)(A) and 122.26(d)(2)(iii)(A)(1)-(4), and 40 CFR 122.21(g)(7)(i)-(ii).

Provision D.3 (Special Studies) requires the Copermittees to develop special studies that will be conducted for each Watershed Management Area and the entire San Diego Region. Data collected pursuant to Provision D.3 is to be used by the Copermittees to improve the effectiveness of the strategies implemented by the jurisdictional runoff management programs toward achieving the numeric goals identified in the Water Quality Improvement Plans and ultimately achieve compliance with the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c, and A.2.a, which is consistent with the requirements of Provision A.4.

Special studies are often necessary to fill data gaps or provide more refined information that allow the Copermittees to better manage the generation or elimination of pollutants and discharges to and from the MS4. In the Fourth Term Permits, the Copermittees have been required to implement special studies as directed by the San Diego Water Board. The special studies required by this Order provide the Copermittees more flexibility to identify and implement special studies that will be most useful to improving the effectiveness of their jurisdictional runoff management programs.

Provision D.3.a.(1) requires the Copermittees to develop and conduct at least two special studies per Watershed Management Area, to be determined by the Copermittees. One of the two special studies may be accomplished through participation in a Regional Special Study required under Provision D.3.a.(2). The requirements provide the Copermittees great latitude in identifying and developing the special studies. Watershed Management Area special studies are required, at a minimum, to: (a) relate in some way to the highest water quality priorities identified by the Copermittees in the Water Quality Improvement Plan, (b) be conducted within the Watershed Management Area, and (c) include some form of participation (e.g. contribution of funds, personnel services, project management) by all the responsible Copermittees within the Watershed Management Area.

Examples of Watershed Management Area special studies might include, but are not limited to: (1) focused pollutant source identification studies, (2) BMP effectiveness and/or comparison studies, (3) pilot tests for new or emerging pollutant control methods, (4) receiving water pollutant or stressor source identification and/or mitigation studies, or (5) pollutant fate and transport studies. The Watershed Management Area special studies are expected to provide data that can be utilized by the Copermittees to improve the Water Quality Improvement Plan or implementation of

the Copermittees' jurisdictional runoff management programs to address the highest priority water quality conditions.

Provision D.3.a.(2) requires the Copermittees to develop at least one special study that will be conducted for the entire San Diego region. The regional special study is expected to provide data that can be utilized by the Copermittees to improve the Water Quality Improvement Plan or implementation of the Copermittees' jurisdictional runoff management programs to identify or address regional water quality concerns and priorities.

An example of a regional special study would be to develop and establish allowable exceedance frequencies of the bacteria water quality objectives for several types of water bodies, during different wet and dry weather conditions the San Diego region. The special study would be related to bacteria, which is a priority for the San Diego region due to the adoption of "*Bacteria TMDL Project I – Beaches and Creeks in the San Diego Region*." The study results could be used to inform the Copermittees and the San Diego Water Board about the indictor bacteria water quality objective exceedance frequencies that occur in natural or reference watersheds.

Provision D.4 (Assessment Requirements) specifies the assessments that the Copermittees are required to perform, based on the monitoring data collected, and will be reported as part of the Annual Report for the Water Quality Improvement Plan implementation. Provision D.4 requires the Copermittees assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c, and A.2.a.

Provision D.4 specifies the assessments that Copermittees must perform for each Watershed Management Area to assess the effectiveness of each Copermittee's jurisdictional runoff management program and the Water Quality Improvement Plan. The effectiveness of each Copermittee's jurisdictional runoff management program and Water Quality Improvement Plan is measured through these types of assessments: (a) Receiving Waters Assessments (b) MS4 Outfall Discharges Assessments, (c) Special Studies Assessments, and (d) Integrated Assessment of Water Quality Improvement Plan.

Provision D.4.a requires the Copermittees to assess the status of receiving water conditions annually during the transitional monitoring period (during development of the Water Quality Improvement Plan) and after acceptance of the Water Quality Improvement Plan. The monitoring data collected pursuant to Provision D.1 will be evaluated, among other information, to assess the condition of a Watershed Management Area's streams, coastal waters, enclosed bays, harbors, estuaries, and lagoons. The focus of the receiving waters assessments is to measure progress toward the objective of the CWA to "*restore and maintain the chemical, physical, and biological integrity of the Nation's waters*" as the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program are implemented within a Watershed Management Area. Provision D.4.a is consistent with 40 CFR

122.42(c)(7) which requires the Copermittees to annually report the *"[i]dentification of water quality improvements or degradation."*

Provision D.4.b includes the MS4 outfall discharges assessment requirements. The focus of MS4 outfall discharges assessments is to determine if the Copermittees' are implementing programs that comply with the requirements of the CWA for MS4 permits to "*effectively prohibit non-stormwater discharges into the storm sewers*" and "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable.*" The monitoring data collected pursuant to Provisions D.2 will be evaluated, among other information, to assess the effectiveness of the transitional MS4 outfall field screening monitoring, the implementation of the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program. The MS4 outfall discharge assessments consist of Non-Storm Water Discharges Reduction Assessments and Storm Water Pollutant Discharges Reduction Assessments.

The Non-Storm Water Discharges Reduction Assessments are how each Copermittee will demonstrate that its jurisdictional runoff management program implementation efforts are achieving the CWA requirement to "*effectively prohibit non-stormwater discharges into the storm sewers.*" Provision D.4.b.(1) requires each Copermittee to assess and report on its illicit discharge detection and elimination program required pursuant to Provision E.2 to reduce and effectively prohibit non-storm water and illicit discharges into the MS4 within its jurisdiction. The Non-Storm Water Discharges Reduction Assessments include specific assessment requirements applicable to each Copermittee.

As each Copermittee collects and analyzes the data collected pursuant to dry weather MS4 outfall discharges monitoring requirements of Provisions D.2.a.(2) and D.2.b, Provision D.4.b.(1) requires each Copermittee to assess the progress, assess the effectiveness of its current actions, and identify modifications necessary to increase the effectiveness of its actions toward reducing and eliminating non-storm water and illicit discharges to its MS4. The findings from these assessments are expected to be utilized by the Copermittee as part of its procedures to prioritize the non-storm water discharges that will be addressed by its Illicit Discharge Detection and Elimination program required pursuant to Provision E.2.

The assessment requirements of Provision D.4.a.(1) are consistent with 40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(3) which require "*procedures…to investigate portions of the separate storm sewer system that, <u>based on the results of the field screen, or other appropriate information</u> [emphasis added], indicate a reasonable potential of contain illicit discharges or other sources of non-storm water*" as part of a "*program…to detect and remove…illicit discharges and improper disposal into the storm sewer.*" The assessment requirements of Provision D.4.a.(1) are also consistent with 40 CFR122.42(c)(1) requires the Copermittees to annually report the "*status of implementing the components of the storm water management program that are established as permit conditions.*"

The Storm Water Pollutant Discharges Reduction Assessment is how the Copermittees in each Watershed Management Area will demonstrate that their jurisdictional runoff management program implementation efforts are achieving the CWA requirement to "*reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable*." Provision D.4.b.(2) requires the Copermittees in each Watershed Management Area to assess and report the progress of the Copermittees' efforts to reduce pollutants in storm water discharges from the MS4s to the MEP. The Storm Water Pollutant Discharges Reduction Assessments include specific assessment requirements during both the transitional monitoring period and after acceptance of the Water Quality Improvement Plan applicable to the Watershed Management Area and each Copermittee.

As the Copermittees collect and analyze the data collected pursuant to wet weather MS4 outfall discharges monitoring requirements of Provisions D.2.a.(3) and D.2.c, Provision D.4.b.(2) requires the Copermittees to assess runoff conditions during the transitional period, and the progress of the Water Quality Improvement Plan strategies toward reducing pollutants in storm water from the MS4 to the MEP. The findings from these assessments are expected to be utilized by the Copermittees to identify any modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify sources of pollutants in storm water discharges from the MS4s, as well as focus, modify, and improve the water quality improvement strategies implemented by each Copermittee within its jurisdiction to reduce pollutants in storm water discharges to the MEP.

The assessment requirements of Provision D.4.b.(2) are consistent with 40 CFR 122.26(d)(2)(iii)(B) which requires "*[e]stimates of the annual pollutant load of the cumulative discharges to waters of the United States from all identified municipal outfalls…during a storm event…accompanied by a description of the procedures for estimating constituent loads and concentrations, including any modeling, data analysis, and calculation methods.*" The assessment requirements of Provision D.4.a.(2) are consistent with 40 CFR 122.26(d)(2)(v) which requires that each Copermittee assesses the *"estimated reductions in loadings of pollutants from discharges of municipal storm sewer constituents from municipal storm sewer systems expected as the result of the municipal storm water quality management program."* The assessment requirements of Provision D.4.b.(2) are also consistent with 40 CFR122.42(c)(1) requires the Copermittees to annually report the "*status of implementing the components of the storm water management program that are established as permit conditions.*"

Provision D.4.c includes the special studies assessment requirements. Performing special studies are how the Copermittees will address data gaps identified during the development of and updates to the Water Quality Improvement Plan. The relevant findings from the special studies assessments are expected to be incorporated as part of the applicable receiving water assessments, MS4 outfall discharge assessments,

and integrated water quality improvement assessments required in Provision D.4.a, D.4.b, and D.4.d, respectively.

The assessment requirements in Provision D.4.d are part of the iterative approach and adaptive management process required by Provision A.4. The Copermittees are required to integrate the data collected pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to re-evaluate the Water Quality Improvement Plan.

The monitoring data collected pursuant to Provisions D.1 and D.2, and the results of the assessment required pursuant to Provisions D.4.a-c, will be used to determine whether the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program are effective, or require modifications or improvements to become more effective to achieve the requirements of the CWA. The assessments required by Provision D.4.d are consistent with 40 CFR 122.42(c)(1) which requires that the Copermittees to report the *"[t]he status of implementing the components of the storm water management program that are established as permit conditions."*

E. Jurisdictional Runoff Management Programs

Purpose: Provision E includes the requirements for the jurisdictional runoff management programs to be implemented by each of the Copermittees. Compliance with the requirements for the jurisdictional runoff management programs will allow the Copermittees to demonstrate that they are implementing programs to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP. The jurisdictional runoff management program document prepared by each Copermittee will also provide the details for implementing the water quality improvement strategies identified in the Water Quality Improvement Plan specifically within its jurisdiction.

***Discussion*:** Implementation of the jurisdictional runoff management program requirements under Provision E is how the Copermittees "*effectively prohibit non-stormwater discharges into the storm sewer,*" and outlines the "*controls to reduce the discharge of pollutants to the maximum extent practicable"* consistent with the federal regulations under 40 CFR 122.26. The jurisdictional runoff management program is part of the "*comprehensive planning process*" that is required pursuant to 40 CFR 122.26(d)(2)(iv). Where the Water Quality Improvement Plan is the "*comprehensive planning process*" on a Watershed Management Area scale, requiring "*intergovernmental coordination,*" the jurisdictional runoff management program document is the "*comprehensive planning process*" on a jurisdictional scale that should be coordinated with the other Copermittees in the Watershed Management Area to achieve the goals of the Water Quality Improvement Plan.

The jurisdictional runoff management program requirements are included to provide each Copermittee criteria that can be used to demonstrate that its storm water management program is implementing the "*comprehensive planning process*" within its jurisdiction to "*effectively prohibit non-stormwater discharges into the storm sewers,*" and to identify and implement the most effective "*controls to reduce the discharge of pollutants to the maximum extent practicable"* in accordance with the performance standards given in the CWA.

Provision E includes the requirements for each of the components that must be included in the Copermittee's jurisdictional runoff management program document that will be implemented by the Copermittee within its jurisdiction. Implementation of the components of each Copermittee's jurisdictional runoff management program must incorporate the water quality improvement strategies identified by each Copermittee in the Water Quality Improvement Plans, described pursuant to Provision B.3.b.(1)(a).

More specific and detailed discussions of the requirements of Provision E are provided below.

Provision E.1 (Legal Authority Establishment and Enforcement) requires each Copermittee to establish and enforce sufficient legal authority to control discharges to the MS4 within its jurisdiction.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system*" and be able to demonstrate that it can "*operate pursuant to legal authority established by statute, ordinance or series of contracts.*" Provision E.1.a describes the minimum legal authorities each Copermittee must establish for itself within its jurisdiction to control discharges to its MS4. The requirements of Provision E.1.a are consistent with the requirements set forth in 40 CFR 122.26(d)(2)(i)(A)-(F).

The certification statement required from each Copermittee by Provision E.1.b is included to provide the San Diego Water Board additional documentation that each Copermittee has established the legal authorities consistent with Provision E.1.a and 40 CFR 122.26(d)(2)(i)(A)-(F), and the Copermittee can "*operate pursuant to legal authority established by statute, ordinance or series of contracts.*"

Provision E.2 (Illicit Discharge Detection and Elimination) requires each Copermittee to implement an illicit discharge detection and elimination program to effectively prohibit non-storm water discharges to the MS4 by actively detecting and eliminating illicit discharges and disposal into its MS4.

Provision E.2 establishes the minimum requirements that each Copermittee must implement within its jurisdiction to effectively prohibit non-storm water discharges from entering its MS4. The federal CWA requires permits for municipal storm sewer systems to "*effectively prohibit non-storm water discharges into the storm sewers*." The federal regulations (40CFR122.26(d)(2)(i)(B)) require each Copermitee to establish the legal authority to prohibit illicit discharges to its MS4s. Under 40 CFR 122.26(d)(2)(iv)(B), each Copermittee must implement a "*program…to detect and remove…illicit discharges and improper disposal into the storm sewer.*" The federal NPDES regulations, under 40 CFR 122.26(b)(2), define illicit discharges as "*any discharge to a municipal separate storm sewer that is not composed entirely of storm water*." Thus, non-storm water discharges are not authorized to enter the MS4 and are considered to be illicit discharges, unless authorized by a separate NPDES permit.

The Phase I Final Rule clarifies that non-storm water discharges through an MS4 are not authorized under the CWA (55 FR 47995):

> "*Today's rule defines the term "illicit discharge" to describe any discharge through a municipal separate storm sewer system that is not composed entirely of storm water and that is not covered by an NPDES permit. Such illicit discharges are not authorized under the Clean Water Act. Section 402(p)(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…Ultimately, such non-storm water discharges through a municipal separate*

storm sewer must either be removed from the system or become subject to an NPDES permit."

The federal NPDES requirements for the program to address illicit discharges must include "*inspections, to implement and enforce an ordinance, orders, or other similar means to prevent illicit discharges to the MS4*." The federal NPDES regulations also reference several categories of "*non-storm water discharges or flows* [which] *shall be addressed where such discharges are identified…as sources of pollutants to waters of the United States*." The Phase I Final Rule (55 FR 48037) further clarified the requirements of 40 CFR 122.26(d)(2)(iv)(B)(1) as follows:

"*EPA is clarifying that section 402(p)(3)(B) of the CWA (which requires permits for municipal separate storm sewers to 'effectively' prohibit non-storm water discharges) does not require permits for municipalities to prohibit certain discharges or flows of nonstorm water to waters of the United States through municipal separate storm sewers in all cases*."

In previous iterations of the municipal storm water permits for the San Diego Region, these categories were simply listed and referred to as categories of non-storm water discharges "not prohibited" unless identified as a source of pollutants. The Copermittees have often referred to these categories as "exempt" discharges. In both cases, however, the language is inconsistent with the federal CWA and NPDES regulations. And, the clarification provided in the Phase I Final Rule does not specifically state that such discharges are "not prohibited" or "exempt" or in any way authorized. The federal NPDES regulations do, however, state that specific categories of non-storm water discharges must be "*addressed*" if identified as "*sources of pollutants to waters of the United States*."

The language of Provision E.2.a has been revised to be fully consistent with the language of the CWA and the requirements of the federal regulations under 40 CFR 122.26(d)(2)(iv)(B)(1). Provision E.2.a requires each Copermittee to address <u>all</u> types of non-storm water discharges into its MS4 as illicit discharges, <u>unless</u> the discharge is authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to Provisions E.2.a.(1) through E.2.a.(5). Only non-NPDES-permitted non-storm water discharges identified as a category of non-storm water discharges under Provisions E.2.a.(1) through E.2.a.(5) <u>and</u> *not identified as a source of pollutants* do not have to be addressed as illicit discharges. Categories of non-storm water discharges that meet the requirements of Provisions E.2.a.(1) through E.2.a.(5) do not have to be addressed by the Copermittee as illicit discharges.

Several of the non-storm water categories listed in 40 CFR 122.26(d)(2)(iv)(B)(1) have not been included in Provisions E.2.a.(1) through E.2.a.(5), including: street wash water, landscape irrigation, irrigation water, and lawn watering. Because these are no longer included within the categories listed under Provisions E.2.a.(1) through E.2.a.(5), the Copermittees must prohibit these types of non-storm water discharges

from entering the MS4. This is consistent with the clarification of 40 CFR 122.26(d)(2)(iv)(B)(1) in the Phase I Final Rule (55 FR 48037), which states:

> "*[T]he Director may include permit conditions that either require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*."

Street wash water is a category of non-storm water discharges that was removed when the Third Term Permits were issued. Street wash water is a source of several pollutants (e.g., metals, oil and grease, petroleum hydrocarbons, chlorinated solvents, sediment) which are generated during the street washing process. The removal of this category requires the Copermittees to prohibit this type of non-storm water discharge from entering the MS4.

The landscape irrigation, irrigation water, and lawn watering categories, collectively referred to hereafter as "over-irrigation" discharges, were removed from the list of non-storm water discharge categories in the Fourth Term Orange County and Riverside County Permits. Non-storm water discharges resulting from over-irrigation have been found to be a source of several types of pollutants (e.g., nutrients, bacteria, pesticides, sediment) in receiving waters. The San Diego Water Board and the Copermittees have identified categories of non-storm water discharges associated with over-irrigation as a source of pollutants and conveyance of pollutants to the MS4 and waters of the United States in the following documents:

- **SmartTimer/Edgescape Evaluation Program (SEEP) Grant Application**

  The State Water Board allocated grant funding to the SEEP project grant application submitted in 2006, which targeted irrigation runoff by retrofitting areas of existing development and documenting the conservation and runoff improvements. The basis of this grant project is that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 is a source and conveyance of pollutants. In addition, the grant application indicated that this alteration of natural flows is impacting the beneficial uses of waters of the state and U.S. Results from the study indicate that that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 *is* a source and conveyance of pollutants. The results of this study can be applied broadly to any area where over-irrigation takes place. The grant application included the following statements:

  > "*Irrigation runoff contributes flow & pollutant loads to creeks and beaches that are 303(d) listed for bacteria indicators.*"
  >
  > "*Regional program managers agree that the reduction and/or elimination of irrigation-related urban flows and associated pollutant loads may be key to successful attainment of water quality and beneficial use goals as outlined in the San Diego Basin Plan and Bacteria TMDL over the long term.*"

"*Elevated dry-weather storm drain flows, composed primarily … of landscape irrigation water wasted as runoff, carry pollutants that impair recreational use and aquatic habitats all along Southern California's urbanized coastline. Storm drain systems carry the wasted water, along with landscape derived pollutants such as bacteria, nutrients and pesticides, to local creeks and the ocean. Given the local Mediterranean climate, excessive perennial dry season stream flows are an unnatural hydrologic pattern, causing species shifts in local riparian communities and warm, unseasonal contaminated freshwater plumes in the near-shore marine environment.*"

- **2006-2007 Orange County Watershed Action Plan Annual Reports**

The Watershed Action Plan Annual Reports for the 2006-2007 reporting period were submitted by the County of Orange, Orange County Flood Control District and Copermittees within the San Juan Creek, Laguna Coastal Streams, Aliso Creek, and Dana Point Coastal Streams Watersheds. San Juan Creek, Laguna Coastal Streams, Aliso Creek and Dana Point Coastal Streams are all currently 303(d) listed as impaired for indicator bacteria within their watersheds and/or in the Pacific Ocean at the discharge points of their watersheds. The Orange County Copermittees, within their Watershed Action Strategy Table for fecal indicator bacteria included the following:

"*Support programs to reduce or eliminate the discharge of anthropogenic dry weather nuisance flow throughout the…watershed. Dry weather flow is the transport medium for bacteria and other 303(d) constituents of concern.*"

Additionally, they state that "*conditions in the MS4 contribute to high seasonal bacteria propagation in-pipe during warm weather. Landscape irrigation is a major contributor to dry weather flow, both as surface runoff due to over-irrigation and overspray onto pavements; and as subsurface seepage that finds its way into the MS4*."

- **Fiscal Year 2008 Carlsbad Watershed Urban Runoff Management Program Annual Report**

The Carlsbad Watershed Urban Runoff Management Program Annual Report for Fiscal Year 2008 was submitted by the Carlsbad Watershed Copermittees (Cities of Carlsbad, Encinitas, Escondido, Oceanside, San Marcos, Solana Beach, and Vista, and the County of San Diego). In the Annual Report, the Carlsbad Watershed Copermittees stated the following:

"The Carlsbad Watershed Management Area (WMA) collective watershed strategy identifies bacteria, sediment, and nutrients as high priority water quality pollutants in the Agua Hedionda (904.3 – bacteria and sediment), Buena Vista (904.2 – bacteria), and San Marcos Creek (904.5 – nutrients) Hydrologic Areas.

Bacteria, sediment, and nutrients have been identified as potential discharges from over-irrigation."

- **2007-2008 San Diego Bay Watershed Urban Runoff Management Program Annual Report**

  The San Diego Bay Watershed Urban Runoff Management Program 2007-2008 Annual Report was submitted by the San Diego Bay Watershed Copermittees (Cities of Chula Vista, Coronado, Imperial Beach, La Mesa, Lemon Grove, National City, and San Diego, the County of San Diego, the Port of San Diego, and the San Diego County Airport Authority). In Appendix D of the Annual Report, titled "Likely Sources of Pollutants," the San Diego Bay Watershed Copermittees identified over-irrigation of lawns as a pollutant generating activity from business and/or residential land uses for bacteria, pesticides, and sediment.

- **Copermittee Public Education Materials**

  The Orange County Public Works *Tips for Landscape & Gardening* public education brochure states: "*Fertilizers, pesticides and other chemicals that are left on yards or driveways can be blown or washed into storm drains that flow to the ocean. Overwatering lawns can also send materials into storm drains*."

  The Riverside County Flood Control and Water Conservation District *Landscape and Garden* public education brochure states: *"Soil, yard wastes, over-watering and garden chemicals become part of the urban runoff mix that winds its way through streets, gutters and storm drains before entering lakes, rivers, streams, etc. Urban runoff pollution contaminates water and harms aquatic life!"*

- **Los Penasquitos Lagoon Sedimentation/Siltation TMDL Technical Report**

  The Los Penasquitos Lagoon Sedimentation/Siltation TMDL technical report was prepared for the City of San Diego and USEPA in October 2010. The technical report was included as a technical supporting document attached to the Sediment TMDL for Los Penasquitos Lagoon staff report prepared by the San Diego Water Board, dated June 13, 2012. Under the Source Assessment section, the technical report states the following:

  "*Dry weather loading is dominated by nuisance flows from urban land use activities such as car washing, sidewalk washing, and lawn over-irrigation, which pick up and transport sediment into receiving waters.*"

These documents confirm that non-storm water discharges associated with over-irrigation are a source of pollutants and should be addressed as illicit discharges to the MS4. Prohibiting non-storm water discharges associated with over-irrigation, however,

is not a new requirement for the Copermittees because it is also consistent with and required by the Water Conservation in Landscaping Act (AB 1881, Laird).

The Water Conservation in Landscaping Act required the Department of Water Resources (DWR) to prepare a Model Water Efficient Landscape Ordinance for use by local agencies (e.g. the Copermittees). All local agencies were required to adopt a water efficient landscape ordinance by January 1, 2010. Local agencies could adopt the Water Efficient Landscape Ordinance developed by DWR, or an ordinance considered at least as effective as the Model Ordinance. The Water Efficient Landscape Ordinance includes a requirement that local agencies prohibit runoff from irrigation (§ 493.2):

> "*Local agencies shall prevent water waste resulting from inefficient landscape irrigation by* <u>*prohibiting runoff from leaving the target landscape*</u> *[emphasis added] due to low head drainage, overspray, or other similar conditions where water flows onto adjacent property, non-irrigated areas, walks, roadways, parking lots, or structures. Penalties for violation of these prohibitions shall be established locally*."

Furthermore, non-storm water discharges from over-irrigation not only transport and discharge pollutants to receiving waters, but are also a likely source of the dry weather flows causing changes to habitat within and along the receiving water bodies. Examples of habitat changes from the dry weather flows include perennialization of ephemeral streams, and conversion of saltwater and brackish water marsh habitats to freshwater marsh habitats (e.g. Los Penasquitos Lagoon). Both of these examples have resulted in the promotion of invasive species in several areas of the San Diego Region.

The removal of the over-irrigation discharges categories does not require the Copermittees to strictly prohibit lawn and landscape irrigation, but does require the prohibition of excessive irrigation water that results in non-storm water discharges to the MS4. Non-storm water discharges to the MS4 from over-irrigation must be addressed as illicit discharges by the Copermittees pursuant to the requirements of Provision E.2.

The remaining non-storm water categories listed in 40 CFR 122.26(d)(2)(iv)(B)(1) are listed under Provisions E.2.a.(1) through E.2.a.(5) and generally fall into four categories: (1) non-storm water discharges subject to existing San Diego Water Board waste discharge requirements and NPDES permits; (2) non-storm water discharges generally not expected to be a source of pollutants to receiving waters; (3) non-storm water discharges likely to contain pollutants requiring some form of control to address the pollutants prior to discharging to the MS4; and (4) non-storm water discharges or flows associated with firefighting.

Provisions E.2.a.(1) and E.2.a.(2) include several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) for which the San Diego Water Board already has developed general waste discharge requirements and NPDES

permits to address the discharges. The Copermittees are only required to address these types of non-storm water discharges as illicit discharges if the Copermittees or the San Diego Water Board identifies these non-storm water discharges not having coverage under the applicable NPDES permit.

Provision E.2.a.(3) includes several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) which are generally not expected to be a source of pollutants to receiving waters, many of which originate from what are typically natural, uncontrollable sources. The Copermittees are only required to address these types of non-storm water discharges as illicit discharges if the Copermittees or the San Diego Water Board identifies these non-storm water discharges as a source of pollutants to receiving waters. Because many of these sources are generally uncontrollable, enforcing a prohibition may not be a possibility for the Copermittees. The Copermittees would be able to address these non-storm water discharges by preventing these non-storm water discharges from entering the MS4. This could potentially be achieved by sealing their MS4 structures so the discharges cannot enter the MS4.

Provision E.2.a.(4) includes several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) that are likely to contain pollutants requiring some form of control to address the pollutants prior to discharging to the MS4. At this time, an outright prohibition of these types of non-storm water discharges does not yet appear to be warranted. Thus, Provision E.2.a.(4) includes several requirements for the Copermittees to control the pollutants from these types of non-storm water discharges. This is consistent with the clarification of the federal regulations in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board has the authority to require the Copermittees to "*control any of these types of discharges where appropriate*."

Unlike non-storm water discharges from over-irrigation, these types of non-storm water discharges are not expected to occur in close proximity to each other or very frequently. Provided these types of non-storm water discharges are controlled as required in Provision E.2.a.(4), the Copermittees would only be required to address these types of non-storm water discharges as illicit discharges if the Copermittee or the San Diego Water Board identifies these non-storm water discharges as a source of pollutants to receiving waters.

Provision E.2.a.(5) includes specific requirements for fire fighting discharges and flows. The requirements for non-storm water discharges and flows associated with fire fighting have been separated into requirements for: a) non-emergency fire fighting discharges and flows, and b) emergency fire fighting discharges and flows.

The San Diego Water Board has found that discharges from building fire suppression system maintenance (e.g. fire sprinklers) contain waste and potentially a significant source of pollutants to receiving waters. As such, the San Diego Water Board is requiring these discharges be addressed as illicit discharges by the Copermittees.

Thus, the discharges to the MS4 are to be prohibited via ordinance, order or similar means. For other non-emergency firefighting discharges and flows (i.e. flows from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems), the Copermittees are required to develop and implement a program to address pollutants in these non-storm water discharges and flows. This is consistent with the clarification of the federal regulations in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board has the authority to require the Copermittees to "*control any of these types of discharges where appropriate*."

For emergency firefighting discharges and flows, the Phase I Final Rule (55 FR 48037) has clarified the requirements of 40 CFR 122.26(d)(2)(iv)(B)(1) pertaining to emergency firefighting flows and discharges, which states:

> "*In the case of firefighting it is not the intention of these rules to prohibit in any circumstances the protection of life and public or private property through the use of water or other fire retardants that flow into separate storm sewers*."

Thus, the requirements have been made to be consistent with the guidance provided by the Phase I Final Rule. The Order recommends that the Copermittees develop and encourage implementation of BMPs to reduce or eliminate the discharge of pollutants from emergency firefighting flows to the MS4s and receiving waters. The Order does not include any requirements that should be interpreted as requiring the implementation of BMPs for emergency firefighting flows to the MS4s and receiving waters.

The Copermittees are expected to review the dry weather MS4 outfall discharge monitoring data they collect to determine if and when there are non-storm water discharges to or from their MS4s that are a source of pollutants to receiving waters. If the Copermittees identify one of the types of non-storm water discharges listed in Provisions E.2.a.(1) through E.2.a.(4) as a source of pollutants to receiving waters based on the review and evaluation of monitoring data, Provision E.2.a.(6) requires the Copermittees to prohibit those categories of discharges from entering the MS4 through ordinance, order or similar means. In addition, Provision E.2.a.(6) clarifies that the San Diego Water Board may identify categories of non-storm water discharges or flows listed under Provisions E.2.a.(1) through E.2.a.(4) that must be prohibited.

Provision E.2.a.(6) also provides the Copermittees an option to propose controls to be implemented for the category of non-storm water discharges as part of the Water Quality Improvement Plan instead of prohibiting the category of non-storm water discharges. If the Water Quality Improvement Plan is accepted by the San Diego Water Board with the proposed controls, the Copermittees will not be required to prohibit the category of non-storm water discharges to their MS4s as long as the controls are implemented. This is consistent with the clarification of 40 CFR 122.26(d)(2)(iv)(B)(1) in the Phase I Final Rule (55 FR 48037), which states the San

Diego Water Board may "*require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*."

Finally, Provision E.2.a.(7) has been included in the requirements for non-storm water discharges to clarify that any non-storm water discharges to the Copermittee's MS4, even those identified pursuant to Provisions E.2.a.(1) through E.2.a.(4), must be reduced or eliminated, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit. Provision E.2.a.(7) is consistent with the requirements of CWA section 402(p)(3)(B)(ii) and 40 CFR 122.26(d)(1)(v)(B), as clarified in the Phase I Final Rule (55 FR 47995) that "*[u]ltimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit*." However, the reduction or elimination of those non-storm water discharges are expected to be achieved as feasible, in accordance with the priorities in the Water Quality Improvement Plan and when the resources are available to the Copermittee.

Consistent with 40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(1), each Copermittee must implement a "*program…to prevent illicit discharges to the municipal storm sewer system*" and "*detect…illicit discharges and improper disposal into the storm sewer.*" Provision E.2.b requires each Copermittee to implement measures to prevent and detect illicit discharges and connections to its MS4 as part of its illicit discharge detection and elimination program.

As part of the program to prevent and detect illicit discharges to the MS4, 40 CFR 122.26(d)(2)(iv)(B)(2) requires "*procedures to conduct on-going field screening activities during the life of the permit, including areas or locations that will be evaluated by such field screens*." As part of the procedures, each Copermittee is required to maintain an updated map of its entire MS4 and the corresponding drainage areas within its jurisdiction. Having knowledge about where inlets, access points, connections with other MS4s, and outfalls are located is necessary for each Copermittee to track, identify, and eliminate illicit discharges and connections. Thus, Provision E.2.b.(1) of the Order specifies that the map must include the segments of the storm sewer system owned, operated, and maintained by the Copermittee, and include locations of all known inlets, connections with other MS4s, and outfalls to the Copermittee's MS4. The remaining requirements of Provision E.2.b are consistent with the requirements of 40 CFR 122.26(d)(2)(iv)(B)(3)-(7) related to implementing measures to prevent and detect illicit discharges and connections to the MS4.

Provision E.2.c requires each Copermittee to conduct field screening and monitoring of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4. Field screening is a required element of the program to detect and eliminate illicit discharges and connections to the MS4, pursuant to 40 CFR 122.26(d)(2)(iv)(B)(2). The field screening requirement will be implemented through the dry weather MS4 outfall discharge monitoring required under Provisions D.2.a.(2) and D.2.b.(1).

Provision E.2.d specifies the measures each Copermittee must implement to eliminate illicit discharges and connections to its MS4. Elimination of illicit discharges and connections to the MS4 is consistent with the requirement of 40 CFR 122.26(d)(2)(iv)(B) "*to detect and remove [emphasis added]…illicit discharges and improper disposal into the storm sewer*" and will achieve the CWA requirement for MS4 permits to "*effectively prohibit non-storm water discharges into the storm sewers*."

Generally, each Copermittee is responsible for prioritizing its efforts to eliminate non-storm water and illicit discharges or connections to its MS4 based on field screening and monitoring data, NALs, illicit discharge investigation records, and the known or suspected sources. Sources of non-storm water and illicit discharges or connections must be eliminated by enforcing the legal authority established by each Copermittee pursuant to Provision E.1.

Provision E.3 (Development Planning) requires each Copermittee to use its land use and planning authority to implement a development planning program to control and reduce the discharge of pollutants in storm water from new development and significant redevelopment to the MEP. Proper implementation of the development planning program will also contribute toward effectively prohibiting non-storm water discharges from development projects to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." As part of the management program, 40 CFR 122.26(d)(2)(iv)(A)(2) requires "*planning procedures including a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment*."

Land development generally alters the natural conditions of the land by removing vegetative cover, compacting soil, and/or placement of concrete, asphalt, or other impervious surfaces. These impervious surfaces concentrate urban pollutants (such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not found in high concentrations in the natural environment. Pollutants that accumulate on impervious surfaces are not easily biodegraded nor subject to natural treatment processes.

Impervious surfaces greatly affect the natural hydrology of the land because they do not allow natural infiltration and treatment of storm water runoff to take place. Instead, storm water runoff from impervious surfaces is typically directed through pipes, curbs, gutters, and other hardscape into receiving waters, with little treatment, at significantly increased volumes and accelerated flow rates over what would occur naturally. The increased pollutant loads, storm water volume, discharge rates and velocities, and discharge durations from the MS4 adversely impact stream habitat by causing accelerated, unnatural erosion and scouring within creek bed and banks. Placement

of impervious surfaces also encapsulates "good" sediment (such as sand, gravel, rocks and cobbles) that would normally replenish creek beds and banks to help stabilize them. Collectively, these changes to natural hydrologic processes are termed hydrograph modification, or hydromodification.

Hydromodification, which is caused by both altered storm water flow and altered sediment flow regimes, is largely responsible for degradation of creeks, streams, and associated habitats in the San Diego Region. In an ongoing study by the Stormwater Monitoring Coalition to assess the health of streams throughout Southern California, researchers found that three of the four highest risk stressors to creeks (percent sands and fines present, channel alteration, and riparian disturbance) were related to physical habitat.[29] Researchers studying flood frequencies in Riverside County have found that increases in watershed imperviousness of only 9-22 percent can result in increases in peak flow rates for the two-year storm event of up to 100 percent.[30] Such changes in runoff have significant impacts on channel morphology.

In addition, a technical report issued by the Southern California Coastal Water Research Project (SCCWRP) stated that "*[r]ecent studies indicate that California's intermittent and ephemeral streams are more susceptible to the effects of hydromodification than streams from other parts of the United States. Physical degradation of stream channels in the central and eastern United States can initially be detected when watershed impervious cover approaches 10 percent, although biological effects (which may be more difficult to detect) may occur at lower levels. In contrast, initial response of streams in the semi-arid portions of California appears to occur between 3 and 5 percent impervious cover*."[31] These studies highlight the extent to which impacts originating from impervious surfaces created by land development are responsible for the degradation of creek and stream habitat.

This is consistent with what USEPA has noted, that "*[m]ost stormwater runoff is the result of the man-made hydrologic modifications that normally accompany development. The addition of impervious surfaces, soil compaction, and tree and vegetation removal result in alterations to the movement of water through the environment. As interception, evapotranspiration, and infiltration are reduced and precipitation is converted to overland flow, these modifications affect not only the characteristics of the developed site but also the watershed in which the development is located. Stormwater has been identified as one of the leading sources of pollution for all waterbody types in the United States. Furthermore, the impacts of stormwater*

[29] Assessing the Health of Southern California Streams, Stormwater Monitoring Coalition, Fact Sheet
[30] Schueler and Holland, 2000. Storm Water Strategies for Arid and Semi-Arid Watersheds (Article 66). The Practice of Watershed Protection.
[31] Stein, E. and Zaleski, S., 2005. Technical Report 475, Managing Runoff to Protect Natural Streams: The Latest Development on Investigation and Management of Hydromodification in California. December 30, 2005.

pollution are not static; they usually increase with more development and urbanization."[32]

Reducing the impact from the increased pollutant loads and flows generated by impervious surfaces within a watershed is essential to protecting and restoring the integrity of the receiving waters. Provision E.3 includes the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment*." The requirements of Provision E.3 will 1) minimize the generation and discharge of pollutants in storm water from the MS4, and 2) minimize the potential of storm water discharges from the MS4 from causing altered flow regimes and excessive downstream erosion in receiving waters.

The requirements of Provision E.3.a include the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment*" applicable to all development projects, regardless of size or purpose of development. In general, all development projects must implement onsite BMPs to remove pollutants from runoff prior to its discharge to any receiving waters, as close to the pollutant generating source as possible, and structural BMPs must not be constructed within waters of the U.S.

Furthermore, the onsite BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors (e.g. mosquitos, rodents, and flies). If not properly designed or maintained, certain BMPs implemented or required by municipalities may create a habitat for vectors. Monitoring studies conducted by the California Department of Public Health (CDPH) have documented that mosquitoes opportunistically breed in structural storm water BMPs, particularly those that hold standing water for over 96 hours. Certain site design features that hold standing water may similarly produce mosquitoes.

Structural BMPs and site design features should incorporate design, construction, and maintenance principles to promote drainage within 96 hours to minimize standing water available to mosquitoes. Nuisances and public health impacts resulting from vector breeding can be prevented with close collaboration and cooperative effort between municipalities and local vector control agencies and the CDPH during the development and implementation of storm water runoff management programs. The CDPH also has issued guidance for BMP implementation that will minimize potential nuisances and public health impacts resulting from vector breeding.[33]

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[32] USEPA, 2007. Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices, December 2007.

[33] California Department of Public Health, 2012. Best Management Practices for Mosquito Control in California. (http://www.cdph.ca.gov/HealthInfo/discond/Documents/BMPforMosquitoControl07-12.pdf)

All development projects are required to implement source control BMPs that will minimize the generation of pollutants. Additionally, each development project must implement, where applicable and feasible, low impact development (LID) BMPs to mimic the natural hydrology of the site and retain and/or treat pollutants in storm water runoff prior to discharging to and from the MS4.

The LID Center defines LID as "*a comprehensive land planning and engineering design approach with a goal of maintaining and enhancing the pre-development hydrologic regime of urban and developing watersheds.*"[34] LID designs seek to control storm water at the source, using small-scale integrated site design and management practices to mimic the natural hydrology of a site, retain storm water runoff by minimizing soil compaction and impervious surfaces, and disconnect storm water runoff from conveyances to the storm drain system.

LID BMPs may utilize interception, storage, evaporation, evapotranspiration, infiltration, and filtration processes to retain and/or treat pollutants in storm water before it is discharged from a site. Because of these numerous options, the San Diego Water Board expects that every development project will be able to implement some form of LID BMPs. Examples of LID BMPs include using permeable pavements, rain gardens, rain barrels, grassy swales, soil amendments, and native plants.

Provision E.3.a also includes requirements for all development projects to, where feasible, landscape with native and/or low water use plants to minimize the discharge of non-storm water discharges associated with excessive irrigation, as well as harvest (i.e., storage) and use precipitation to promote the concept of utilizing storm water as a resource.

While all development projects are subject to the requirements of Provision E.3.a, Provision E.3.b identifies Priority Development Projects that exceed given size thresholds and/or fit under specific use categories. Priority Development Projects are required to incorporate specific performance criteria for structural BMPs into the project plan to reduce the generation of pollutants, and address potential impacts from hydromodification.

The Priority Development Project categories are based on the requirements of the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), and do not differ significantly from the Fourth Term Permit for San Diego County. Furthermore, the Priority Development Project categories are consistent with Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), and Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit).

[34] www.lowimpactdevelopment.org

Because of the impact of relatively small increases in watershed impervious surfaces to receiving waters, Provision E.3.b.(1)(c)(iv) has been updated to include large driveways that are 5,000 square feet or more. The San Diego Water Board finds that large driveways can exacerbate altered flow regimes if not properly controlled.

Provision E.3.b.(3) describes projects that are exempt from Priority Development Project status. These include new or retrofit paved sidewalks, bicycle lanes, or trails that are designed and constructed to direct runoff to vegetated areas or be hydraulically disconnected from paved areas. The exemptions have been provided to encourage these types of projects because they provide multiple environmental benefits, such as promoting walking rather than driving, which will in turn improve air quality. Additionally, retrofitting of existing alleys, streets, or roads are exempt from Priority Development Project status if they are constructed using USEPA Green Streets guidance.[35] By doing so, retrofitting of these types of projects is encouraged. The San Diego Water Board recognizes that there are spatial constraints associated with these projects, and implementation of structural BMPs are not always feasible.

For development projects identified as Priority Development Projects, the requirements of Provision E.3.c are the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment.*" Provisions E.3.c.(1)-(3) describe the performance criteria for the structural BMPs that must be implemented for each Priority Development Project defined by Provision E.3.b.

Provision E.3.c.(1) describes the storm water pollutant control BMP requirements that must be implemented by all Priority Development Projects. The purpose of Provision E.3.c.(1) is to reduce pollutants in storm water runoff to the MEP from Priority Development Projects before it is discharged to the MS4. Of all the available treatment processes available, retention of storm water, and therefore capture of the pollutants in the storm water, will achieve 100 percent pollutant removal efficiency for the volume of storm water retained. No other method of treatment can achieve 100 percent pollutant removal efficiency. Thus, retention of as much storm water onsite is the most effective way to reduce pollutants in storm water discharges to, and consequently from the MS4, and controls pollutants in storm water discharges from a site to the MEP.

Under Provision E.3.c.(1)(a), retention of the pollutants in the runoff produced from the 85th percentile storm event ("design capture volume") is the design standard to which Priority Development Projects must comply. Since the 85th percentile storm event has previously been used as the numeric design standard for treatment control BMPs, this same size storm event is used as the numeric design standard for storm water

[35] "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).

retention. This is the MEP standard recognized by the San Diego Water Board and is consistent with the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), as well as Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit), and Los Angeles Water Board Order No. R4-2012-0175 (Los Angeles County MS4 Permit).

The 85th percentile storm event is the event that has a precipitation total greater than or equal to 85 percent of all storm events over a given period of record in a specific area or location. For example, to determine what the 85th percentile storm event is in a specific location, all 24 hour storms that have recorded values over a 30 year period would be tabulated and a 85th percentile storm would be determined from this record (i.e. 15 percent of the storms would be greater than the number determined to be the 85th percentile storm). Most jurisdictions in the San Diego Region have already developed isopluvial maps that can provide this type of information. The 85th percentile storm might be determined to be a number such as 1.0 inch, and this would be multiplied by the total area of the project footprint producing runoff to calculate the design capture volume. The Priority Development Project designer would then select a system of BMPs that would retain (i.e. intercept, store, infiltrate, evaporate, or evapotranspire) the pollutants contained in the design capture volume onsite.

Retention BMPs are necessary to capture and retain pollutants generated from a Priority Development Project. In a recent study performed by SCCWRP in the Los Angeles Region, they found "*that the magnitude of constituent load associated with storm water runoff depends, at least in part, on the amount of time available for pollutant build-up on land surfaces. The extended dry period that typically occurs in arid climates such as southern California maximizes the time for constituents to build-up on land surfaces, resulting in proportionally higher concentrations and loads during initial storms of the season*."[36] This implies that the "first flush" of a rainy season and the first storm events after long antecedent dry periods tend to have the highest pollutant loads. Capturing and retaining the pollutant loads of the "first flush" of a rainy season and the first storm events after long antecedent dry periods will reduce a significant portion of the pollutants in storm water discharged to and from the MS4.

The San Diego Water Board, however, acknowledges that in some situations retention of the full design capture volume onsite may not be technically feasible. In this event, the Copermittee may allow the Priority Development Project to use biofiltration BMPs to treat 1.5 times the design capture volume not reliably retained onsite, or biofiltration BMPs with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite.

[36] Stein, E.D., Tiefenthaler, L.L., and Schiff, K.C., 2007. Technical Report 510, Sources, Patterns and Mechanisms of Storm Water Pollutant Loading from Watershed and Land Uses of the Greater Los Angeles Area, California, USA. March 20, 2007.

The 1.5 multiplier is based on the finding in the Ventura County Technical Guidance Manual that biofiltration of 1.5 times the design capture volume not retained onsite will provide approximately the same pollutant removal as retention of the design capture volume on an annual basis.[37] This standard is consistent with the Los Angeles Water Board's Los Angeles County and Ventura County municipal storm water permits (Order Nos. R4-2012-0175 and R4-2010-0108, respectively). The flow-thru design of 0.75 times the portion of the design capture volume not reliably retained onsite is consistent with the San Diego Water Board's Orange County and Riverside County municipal storm water permits (Order Nos. R9-2009-0002 and R9-2010-0016, respectively). In either case, the biofiltration BMPs must be designed with an appropriate hydraulic loading rate to maximize storm water retention and pollutant removal, as well as to prevent erosion, scour, and channeling within the BMP. Each Copermittee is required to update its BMP Design Manual to provide guidance for hydraulic loading rates and other biofiltration design criteria necessary to maximize storm water retention and pollutant removal.

The San Diego Water Board further recognizes that, in addition to not being technically feasible, retention of the full design capture storm onsite may be cost prohibitive, or may not provide as much water quality benefit to the Watershed Management Area as would implementing BMPs elsewhere in the watershed. Thus, Provision E.3.c.(1)(b) allows for the use of a combination of onsite retention BMPs, and the implementation of an Alternative Compliance Program described in Provision E.3.c.(3). Provision E.3.c.(3) is discussed in more detail below.

If the full design capture volume is not retained onsite either because biofiltration is not technically feasible, or a Copermittee grants a Priority Development Project permission to utilize the Alternative Compliance Program, then the pollutants in the portion of the design capture volume that are not reliably retained onsite must still be reduced to the MEP. Thus, flow-thru treatment control BMPs are required to be implemented on Priority Development Projects in addition to the retention BMPs. The requirements of Provisions E.3.c.(1)(a)(ii)[a]-[c] include the performance standards for flow-thru treatment control BMPs, consistent with the Fourth Term Permits in the San Diego Region.

Whereas the purpose of the requirements under Provision E.3.c.(1) is to reduce pollutants in storm water runoff to the MEP, the purpose of the requirements under Provision E.3.c.(2) is to maintain or restore more natural hydrologic flow regimes to prevent accelerated, unnatural erosion in downstream receiving waters, also to the MEP standard. Provision E.3.c.(2) describes hydromodification management BMP requirements that must be implemented by all Priority Development Projects.

[37] Ventura Countywide Stormwater Management Program. 2011. Ventura Technical Guidance Manual, Manual Update, 2011.

The performance criteria for the implementation of hydromodification management BMPs on Priority Development Projects are consistent with the requirements in the Fourth Term Permits for Orange and Riverside Counties (Order Nos. R9-2009-0002 and R9-2010-0016, respectively). Modifications to the Orange County and Riverside County Hydromodification Management Plans (HMPs) will likely be minor, or may not be necessary. The HMP for San Diego County will likely require some minor modifications to incorporate the requirements of Provision E.3.c.(2) and become consistent with the Orange County and Riverside County HMPs. The San Diego Water Board does not, however, expect that it will be necessary for the San Diego County Copermittees to develop a new approach or significantly re-write the San Diego County HMP. This is because the premise of the hydromodification management BMP requirements, which are to control storm water runoff conditions (flow rates and durations) for Copermittee-defined range of flows, is unchanged from all Fourth Term Permits in the San Diego Region.

Provision E.3.c.(2)(a) requires that post-project runoff conditions mimic the *pre-development* runoff conditions, and not the *pre-project* runoff conditions. Fundamentally, the San Diego Water Board believes that using a hydrology baseline that approximates that of an undeveloped, natural watershed is the only way to facilitate the return of more natural hydrological conditions to already built-out watersheds, and ultimately improved stream health. On the other hand, using the *pre-project* hydrology as a baseline for redevelopment projects results in propagating the unnatural hydrology of urbanized areas. Propagating the urbanized flow regime does not support conditions for restoring degraded or channelized stream segments, and would forever sentence such streams to the degraded state. Furthermore, reducing the volume of storm water runoff associated with the urbanized flow regime will also result in reducing the discharge of pollutants into receiving waters, since storm water runoff from impervious surfaces contains untreated pollutants.

The San Diego Water Board understands that approximating the pre-development runoff condition associated with a redevelopment site is not necessarily straightforward because factors such as natural grade and native vegetation for the site cannot be precisely known. Therefore, the San Diego Water Board does not expect project designers to estimate historical conditions associated with redevelopment sites. Rather, the San Diego Water Board expects project designers and the Copermittees to approximate pre-development runoff conditions using the parameters of a *pervious* area rather than an *impervious* area. This means that for redevelopment sites, approximating pre-development runoff conditions equates to using existing onsite grade and assuming the infiltration characteristics of the underlying soil. A redevelopment Priority Development Project must not use runoff coefficients of concrete or asphalt to estimate pre-development runoff conditions. Rather, redevelopment projects must use available information pertaining to existing underlying soil type (such as soil maps published by the National Resource Conservation Service), onsite existing grade, and any other readily available pertinent information to estimate pre-development runoff conditions.

The San Diego Water Board understands, indeed asserts, that the pre-development hydrology of an area in question can only be roughly estimated and cannot be precisely known. However, using the hydrology of a natural condition, even if not precisely known, will provide significant benefit to receiving waters over using the hydrology associated with pervious (developed) surfaces. Therefore in order to achieve the goals of the Clean Water Act, which are to "*restore and maintain the chemical, physical, and biological integrity of the nation's waters* [emphasis added]," the most appropriate standard to use for hydromodification management is the standard associated with the pre-development condition.

Provision E.3.c.(2)(b) requires Priority Development Projects to avoid known critical sediment yield areas or implement measures that would allow coarse sediment to be discharged to receiving waters, such that the natural sediment supply is unaffected by the project. This is necessary because coarse sediment supply is as much an issue for causing erosive conditions to receiving streams as are accelerated flows.

The San Diego Water Board recognizes that in some situations implementing the hydromodification management BMP requirements fully onsite may not be technically feasible, may be cost prohibitive, or may not provide any overall water quality benefits to the Watershed Management Area. Thus, Provision E.3.c.(2)(c) allows for the use of a combination of onsite hydromodification management BMPs and alternative compliance options described in Provision E.3.c.(3).

Provision E.3.c.(3) allows for alternative compliance in instances where the Copermittee determines that offsite measures will have a greater overall water quality benefit for the Watershed Management Area than if the Priority Development Project were to implement structural BMPs onsite. Consequently, watershed-specific structural BMP requirements are present in this Order in the form of allowable compliance offsite. The Alternative Compliance Program to Onsite Structural BMP Implementation Provision is intended to integrate with the Copermittees' planning efforts in the Water Quality Improvement Plans.

The Alternative Compliance Program is an option for Priority Development Projects where the governing Copermittee has participated in the development of a Watershed Management Area Analysis as part of the Water Quality Improvement Plan (described in Provision B.3.b.(4)). Such an approach is consistent with the latest findings in hydromodification management by the scientific community. In a Technical Report entitled *Hydromodification Assessment and Management in California,*[38] the report states:

> *"An effective [hydromodification] management program will likely include combinations of on-site measures (e.g., low-impact development techniques, flow-control basins), in-stream measures (e.g., stream habitat restoration), floodplain*

[38] 2012. ED Stein, F Federico, DB Booth, BP Bledsoe, C Bowles, Z Rubin, GM Kondolf, A Sengupta. Technical Report 667. Southern California Coastal Water Research Project. Costa Mesa, CA.

and riparian zone actions, and off-site measures. Off-site measures may include compensatory mitigation measures at upstream locations that are designed to help restore and manage flow and sediment yield in the watershed."

Consistent with the ideas brought forth in the report, in the Watershed Management Area Analysis of Provision B.3.b.(4), which is optional, the Copermittees will develop watershed maps that include as much detail about factors that affect the hydrology of the watershed as is available. Such factors included identification of areas suitable for infiltration, coarse sediment supply areas, and locating stream channel structures and constrictions. Once these factors are mapped and studied, the Copermittees can identify areas in the watershed where candidate projects may be implemented that are expected to improve water quality in the watershed by providing more opportunity for infiltration, slowing down storm water flows, or attenuation of pollutants naturally via healthy stream habitat. These candidate projects may be in the form of retrofitting existing development, rehabilitating degraded stream segments, identifying regional BMPs, purchasing land to preserve valuable floodplain functions, and any other project(s) that the Copermittees identify.

Under the Alternative Compliance Program, Priority Development Projects may be allowed to fund, partially fund, or implement a candidate project, in lieu of implementing structural BMPs onsite, if they enter into a voluntary agreement with the governing Copermittee permitting this arrangement. Project proponents may also propose an alternative project not previously identified by the Copermittees. In either case, whether a project proponent implements a candidate project identified by the Copermittees or a separate alternative compliance project, the governing Copermittee must determine that implementation of the project will have a greater overall water quality benefit for the Watershed Management Area than fully implementing structural BMPs onsite. If alternative compliance involves funding or implementing a project that is outside the jurisdiction of the governing Copermittee, then that Copermittee may enter into an inter-agency agreement with the appropriate jurisdiction.

Finally, Provision E.3.c.(2)(d) allows Priority Development Projects to be exempt from the hydromodification management BMP requirements if there is no threat of erosion to downstream receiving waters (i.e. the receiving stream is concrete lined from the point of discharge all the way to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean). If the Copermittees believe that more exemptions are warranted, then they must perform the optional Watershed Management Area Analysis of Provision B.3.b.(4). Additional exemptions other than those specified in this Order may be established on a watershed basis, provided the Copermittees perform the analysis, provide supporting rationale for the exemptions, and complete the Water Quality Improvement Plan approval process pursuant to Provision F.1.

Provisions E.3.c.(4) and E.3.c.(5) were included under the BMP requirements applicable to all development projects in the Fourth Term Permits for San Diego, Orange, and Riverside Counties (Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016, respectively). In this Order, the long-term BMP maintenance and

infiltration and groundwater protection requirements apply to structural BMPs implemented by Priority Development Projects only.

Provision E.3.d requires the Copermittees to update their BMP Design Manual as needed to incorporate the requirements of Provision E.3. The BMP Design Manual is formerly known as the Standard Storm Water Mitigation Plan, or SSMP, and was renamed so that the title has a more accurate description of the document content. The contents of the BMP Design Manual are largely unchanged from the previous Standard Storm Water Mitigation Plans required under the Fourth Term Permits. The BMP Design Manual fulfills the 40 CFR 122.26(d)(2)(iv)(A)(2) requirement that the Copermittee's development planning program includes "*a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment*."

As part of the "*planning procedures,*" 40 CFR 122.26(d)(2)(iv)(A)(2) requires the procedures to "*address controls to reduce pollutants in discharges from municipal separate storm sewers after construction is completed*." The requirements applicable to the implementation and oversight of structural BMPs at Priority Development Projects are provided under Provision E.3.e.

Proper installation of the structural BMPs approved for a Priority Development Project is necessary to ensure that pollutants in storm water discharges will be reduced to the MEP after the project is completed. In addition to the proper installation of structural BMPs, the maintenance of structural BMPs on Priority Development Projects is necessary to ensure that pollutants in storm water discharges will continue to be reduced to the MEP. Provision E.3.e.(1) includes the minimum requirements that each Copermittee must implement to ensure structural BMPs are properly installed and will be properly maintained.

The requirements under Provision E.3.e.(2)-(3) are necessary to demonstrate each Copermittee is implementing a program that complies with Provisions E.3.b-c and E.3.e.(1), and ensure structural BMPs at Priority Development Project will continue to be able to reduce pollutants in storm water discharges to the MEP.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary for any development projects to compel compliance with the requirements of Provision E.3 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.3.f requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

<u>Provision E.4 (Construction Management)</u> requires each Copermittee to implement a construction management program to control and reduce the discharge of pollutants in

storm water from construction sites to the MEP. Proper implementation of the construction management program will also contribute toward effectively prohibiting non-storm water discharges from construction sites to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." As part of the management program, 40 CFR 122.26(d)(2)(iv)(D) requires "*a program to implement and maintain structural and non-structural best management practices to reduce pollutants in storm water runoff from construction sites to the municipal storm sewer system.*"

Construction sites can be significant sources of sediment, trash, and other pollutants to receiving waters. Although sediment is naturally occurring in the natural environment, the discharge of sediment under unnatural conditions is problematic to receiving waters. Fine sediment in creeks causes high turbidity that interferes with the functionality of native flora and fauna in local creeks. For example, turbidity interferes with both photosynthesis of water-philic plants, as well as successful foraging and reproduction of benthic macroinvertebrates. Sediment can also make it difficult for fish to breathe because it clogs fish gills. Other pollutants such as heavy metals or pesticides can adhere to sediment and are transported to receiving waters during storm events, where they dissolve in the water column and become bioavailable to aquatic organisms. Sediment is recognized as a major stressor to surface waters and is responsible for the impairment of several lagoons and creeks in the San Diego Region.

Provision E.4 includes requirements that each Copermittee must implement to minimize the discharge of sediment and other pollutants from construction sites to the MS4 within its jurisdiction. The requirements under Provision E.4 are consistent with the Fourth Term Permits for San Diego, Orange, and Riverside Counties. Therefore, Copermittees are expected to implement the requirements seamlessly, with minimal changes to their existing construction management programs. The Copermittees, however, are given more flexibility to run their programs as needed to maximize efficiency, and also to be consistent with the Water Quality Improvement Plan for the Watershed Management Area.

As part of the construction management program, 40 CFR 122.26(d)(2)(iv)(D)(1) requires "*procedures for site planning which incorporate consideration of potential water quality impacts.*" Provision E.4.a describes the minimum elements each Copermittee is required to include as part of the construction site planning and project approval process. The construction site planning and approval process is based primarily on ensuring each project had an adequate site-specific pollution control, construction BMP, and/or erosion and sediment control plan that will be implemented to minimize the discharge of pollutants in storm water to the MEP, and minimize impacts to receiving waters.

The requirements under Provision E.4.b provide the data and information necessary to identify "*priorities for inspecting sites and enforcing control measures*" required pursuant to 40 CFR 122.26(d)(2)(iv)(D)(3). Under Provision E.4.b, each Copermittee must identify construction sites that are considered a high threat to downstream surface waters. Designation of "high threat to water quality" construction sites will necessitate the Copermittees to develop criteria to identify such sites. Provision E.4.b.(2) describes a list of factors that must be considered when the Copermittee considers threat to water quality. For example, a Copermittee must identify sites as "high threat to water quality" if it is located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions, according to the Water Quality Improvement Plan. This ensures that construction management program implementation is compatible with the Copermittee's identified highest priority water quality conditions.

Pursuant to 40 CFR 122.26(d)(2)(iv)(D)(2) each Copermittee is required describe "*requirements for nonstructural and structural best management practices*" at construction sites. Provision E.4.c includes the types of construction site BMPs that the Copermittees must implement, or require the implementation of, at each construction site to reduce pollutants in storm water discharges to the MEP.

Each Copermittee is expected to require the implementation of appropriate BMPs given specific site conditions, the season and likelihood of rain events, and construction phase (i.e. grading vs. vertical construction). This means that throughout the life of the project construction, the appropriate BMPs will vary, especially if the construction of the project spans multiple wet seasons. As opposed to describing specific minimum BMPs that must be implemented, the Order describes major BMP categories that should be considered for each site.

Each Copermittee is expected to use its 20 years of storm water experience and knowledge to require implementation of appropriate BMPs from the various categories at each construction site within its jurisdiction. For example, the San Diego Water Board expects that each site will be required to implement erosion control and sediment control. The San Diego Water Board also expects each Copermittee to require implementation of active/passive sediment treatment systems at sites where other BMPs have been tried and are known to be inadequate, and discharges of sediment are causing or contributing to water quality impairment downstream. Each Copermittee is granted flexibility in specifying the minimum level of BMP requirements at each site, but the San Diego Water Board expects each site to be capable of controlling pollutants in storm water discharges to the MEP and preventing illicit discharges.

The requirements under Provision E.4.d are necessary to demonstrate that each Copermittee is implementing a program that complies with Provisions E.4.a and E.4.c and ensure BMPs at construction sites will reduce pollutants in storm water discharges to the MEP.

Provision E.4.d does not include minimum required inspection frequencies for construction sites. Each Copermittee must use its experience and knowledge to specify an appropriate inspection frequency for both high priority and lower priority sites in their jurisdictional runoff management program documents, and in accordance with the Water Quality Improvement Plan. Appropriate inspection frequencies may vary by Copermittee, but the San Diego Water Board expects that the stated frequency will be adequate for each Copermittee to properly oversee the construction sites within its jurisdiction, confirm BMPs are implemented to reduce pollutants in storm water discharges from constructions sites to the MEP, and make needed changes to its program on an ongoing basis as necessary.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary for any development projects to compel compliance with the requirements of Provision E.4 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.4.e requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

<u>Provision E.5 (Existing Development Management)</u> requires each Copermittee to implement an existing development management program to control and reduce the discharge of pollutants in storm water from areas of existing development to the MEP. Proper implementation of the existing development management program will also contribute toward effectively prohibiting non-storm water discharges from areas of existing development to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." Within 40 CFR 122.26(d)(2)(iv)(A) and (C), the management program is required to reduce impacts on receiving waters and reduce pollutants in storm water discharges to the MEP from commercial and residential areas, industrial facilities, and municipal facilities.

Commercial and residential areas, industrial facilities, and municipal facilities must be addressed by each Copermittee with the existing development management program required under Provision E.5. All other areas within each Copermittee's jurisdiction should be either undeveloped open space, or areas that are being developed or under construction. Areas being developed or under construction will be addressed by the Copermittee under the requirements of Provision E.3 (Development Planning) or Provision E.4 (Construction Management).

Areas of existing development typically include impervious surfaces such as sidewalks, driveways, roads, and rooftops, which generate and concentrate pollutants

(such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not found in high concentrations in the natural environment. Pollutants that accumulate on impervious surfaces are not easily biodegraded or not subject to natural treatment processes. When it rains, these pollutants are transported in storm water runoff from these impervious surfaces into receiving waters, resulting in poor water quality and degradation of beneficial uses.

In addition to the generation of pollutants, areas of existing development have generally altered the natural conditions of the land and removed vegetative cover, reduced the perviousness of the surface, and reduced the capacity of storm water that can be intercepted, captured, stored, infiltrated, evaporated, and/or evapotranspired. The alteration of the natural conditions and the impervious surfaces associated with areas of existing development causes water quality problems due to the alteration of natural flow regimes within the watersheds; resulting in hydromodification of channels, streams, and habitats that exist within or adjacent to the areas of existing development.

Thus, storm water discharges from areas of existing development are responsible for poor water quality, degraded habitats, and hydromodified channels throughout the developed portions of the watersheds in the San Diego Region. To improve the health and functionality of the receiving waters in a Watershed Management Area, land use practices and the amount of impervious surfaces in areas of existing development must change to reduce the various impacts caused by hydromodification and pollutants from storm water runoff generated in developed areas. Each Copermittee must be aggressive to address pollutant sources and runoff from areas of existing development to be able to reduce pollutants in storm water discharges from the MS4 to the MEP.

There is some overlap in the requirements under Provision E.5 with the requirements under Provisions E.2 (Illicit Discharge Detection and Elimination), E.3 (Development Planning), and E.4 (Construction Management). Illicit discharges frequently originate from areas of existing development. New development projects, when completed will become some type of residential, commercial, industrial or municipal existing development. Redevelopment projects are, by definition, redeveloping areas of existing development. And, redevelopment projects become construction sites located in areas of existing development. Much of the data and information collected, inspections performed, and enforcement actions taken for the requirements under Provisions E.2 to E.4 may also be utilized by the existing development management program. The requirements under Provision E.5, however, are focused primarily on reducing pollutants generated in areas of existing development that can be transported in storm water runoff and discharged to and from the MS4.

The requirements under Provision E.5 build upon existing program elements being implemented by the Copermittees. Provision E.5 is generally consistent with the existing development requirements of the Fourth Term Permits for Orange and Riverside Counties (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), but

modified to provide more flexibility to implement the programs so resources can be better focused toward addressing the highest priority water quality conditions identified in the Water Quality Improvement Plans.

For a Copermittee to properly manage areas of existing development, having knowledge of what development exists within its jurisdiction is essential. Provision E.5.a requires each Copermittee to maintain a watershed-based inventory of all the existing development within its jurisdiction. This requirement is necessary for each Copermittee to implement the requirements of Provision E.5.b-e.

As opposed to just maintaining separate inventories based on the type of site, each Copermittee must maintain a watershed-based inventory that includes all types of existing development within its jurisdiction. By utilizing a watershed-based inventory, the Copermittees within a Watershed Management Area can combine their inventories and review the inventories by watershed in addition to by jurisdiction. Pollutant sources and strategies for abatement can then be evaluated on a watershed level, as opposed to evaluating sources and strategies strictly by type of site.

Provision E.5.a includes the information that must be included in the inventory. Provision E.5.a.(1) specifies what facilities or areas must be included in the inventory. A commercial type of existing development may be identified in the inventory as a facility (e.g. individual building, individual business) or an area (e.g. shopping center, commercial zone). An industrial type of existing development must be identified in the inventory by facility (e.g. individual industrial entity). A municipal type of existing development must be identified in the inventory by facility, with a list of specific municipal facilities that must be included in the inventory. A residential type of existing development must be identified by areas to be designated by the Copermittee. For each of the facilities and areas identified in the Copermittee's inventory developed pursuant to Provision E.5.a.(1), Provision E.5.a.(2) specifies the information that must be included in the description for the facility or area.

Provision E.5.a.(3) requires each Copermittee to maintain an updated map showing the location of inventoried existing development, watershed boundaries, and water bodies. This requirement was included because this information is expected to help the Copermittees in a Watershed Management Area identify and prioritize sources of pollutants and/or stressors in areas of existing development that contribute toward the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Knowledge of the existing development that are likely to be sources of pollutants contributing to the highest priority water quality conditions is expected to be a key element in the Copermittees' development of the water quality improvement strategies that will be included in the Water Quality Improvement Plans. The strategies described in the Water Quality Improvement Plans will direct efforts within the existing development management programs implemented by each Copermittee.

Pursuant to 40 CFR 122.26(d)(2)(iv)(A) each Copermittee is required describe "*structural and source control measures to reduce pollutants*" in storm water runoff discharged from areas of existing development. Provision E.5.b includes the BMP implementation and maintenance requirements that the each Copermittee must require at areas of existing development to reduce pollutants in storm water discharges to the MEP. The San Diego Water Board, however, recognizes that BMP implementation and maintenance for residential areas will require much more education and encouragement through less authoritative measures than for commercial, industrial and municipal facilities and areas. Thus, the BMP implementation and maintenance requirements have been separated between requirements under Provision E.5.b.(1) for commercial, industrial and municipal facilities and areas, and Provision E.5.b.(2) for residential areas.

Most of the requirements in Provision E.5.b are consistent with the related requirements in the Fourth Term Permits. The level of specificity, however, has been changed to allow each Copermittee the flexibility to implement its program to achieve maximum efficiency, and to perform functions that will address the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Each Copermittee is expected to require the implementation of appropriate BMPs to address the expected pollutants from each facility or area. The Third and Fourth Term Permits described specific minimum BMPs that must be implemented at various sites. This Order, however, requires each Copermittee to designate minimum BMPs themselves and require implementation. Consistent with the Fourth Term Permits, each Copermittee is required to maintain, or require the maintenance of, all BMPs as needed.

The BMP implementation and maintenance requirements include a schedule of operation and maintenance activities for the MS4 and related structures (such as catch basins, storm drain inlets, and detention basins), as well as public streets and roads. Public streets and roads specifically include public unpaved roads. The San Diego Water Board identified, through investigations and complaints, sediment discharges from unpaved roads as a significant source of water quality problems in the San Diego Region. Inspection activities conducted by the San Diego Water Board since the Third Term Permits have found a lack of source control for many unpaved roads within the jurisdiction of the Copermittees.

Unpaved roads are a source of sediment that can be discharged in runoff to receiving waters, especially during storm events. Erosion of unpaved roadways occurs when soil particles are loosened and carried away from the roadway base, ditch, or road bank by water, wind, traffic, or other transport means. Exposed soils, high runoff velocities and volumes, sandy or silty soil types, and poor compaction increase the potential for erosion.

Road construction, culvert installation, and other maintenance activities can disturb the soil and drainage patterns to streams in undeveloped areas, causing excess runoff

and thereby erosion and the release of sediment. Poorly designed unpaved roads can act as preferential drainage pathways that carry runoff and sediment into natural streams, impacting water quality. In addition, other public works activities along unpaved roads have the potential to significantly affect sediment discharge and transport within streams and other waterways, which can degrade the beneficial uses of those waterways.

USEPA also recognizes that discharges from unpaved roads pose a significant potential threat to water quality. USEPA guidance[39] emphasizes the threat of unpaved roads to water quality:

> "*Dirt and gravel roads are a major potential source of these pollutants [sediment] and pollutants that bind to sediment such as oils, nutrients, pesticides, herbicides, and other toxic substances. Many roads have unstable surfaces and bases. Roads act like dams, concentrating flows that accelerate erosion of road materials and roadsides. Both unstable surfaces and accelerated erosion then lead to sediment and dust.*"

There are several guidance documents, developed by the USEPA,[40] the US Forest Service,[41] the University of California,[42] and others, that include design and construction specifications and BMPs that are readily available for implementation by public entities. Implementing design and other source control BMPs for unpaved roads in the region is necessary to reduce and minimize the impacts of sediment discharged during storm events from unpaved roads to the MS4s and receiving waters.

Provision E.5.c describes existing development site inspection frequency, content, and tracking that each Copermittee must incorporate into their existing development management programs. The requirements under Provision E.5.c are necessary to demonstrate each Copermittee is implementing a program that complies with Provision E.5.b and ensure BMPs implemented in areas of existing development will reduce pollutants in storm water discharges to the MEP. Provision E.5.c has been modified to include a minimum of once every 5 years for all inventoried facilities and areas of existing development, utilizing one or more methods of inspection.

In addition to onsite inspections, the methods of inspection have been expanded to include drive-by inspections. Inspections may be performed by the Copermittee's municipal and contract staff, or by volunteer monitoring or patrol programs. Volunteer monitoring or patrol programs are not expected to enforce the Copermittee's

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[39] USEPA, 2006. Environmentally Sensitive Maintenance for Dirt and Gravel Roads. Gesford and Anderson, USEPA-PA-2005.
[40] Ibid
[41] US Forest Service, 1996. Forest Service Specifications for Construction of Roads & Bridges. EM-7720-100. Revised August 1996.
[42] University of California Division of Agriculture and Natural Resources, 2007. Rural Roads: A Construction and Maintenance Guide of California Landowners. Publication 8262.

ordinances, or to inspect areas or facilities where members of the public are not allowed access. Volunteer monitoring or patrol programs must be trained by the Copermittee, and are only expected to collect visual observations. By utilizing drive-by inspections and volunteer monitoring or patrol programs, the Copermittees will be able to maximize and efficiently use their resources to identify and address sources of pollutants in areas of existing development.

The municipal and contract staff of each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial, industrial, and municipal facilities and areas in its inventoried existing development pursuant to Provision E.5.c.(1)(a)(iv). An "equivalent" of at least 20 percent means if any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspections may count toward the total annual inspection requirement. Linear municipal facilities (i.e. MS4 linear channels, sanitary sewer collection systems, streets, roads and highways) in the Copermittee's existing development inventory are not subject to the inspection frequency requirement of Provision E.5.c.(1)(a)(iv).

The inspection content specified in Provision E.5.c.(2)(a) includes the information required to be collected during an inspection by any method. The inspection content specified in Provision E.5.c.(2)(b) includes additional information that must be collected when a Copermittee's municipal or contract staff perform an onsite inspection. Provision E.5.c.(3) specifies the information that each Copermittee must maintain in its existing development inspection records.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary to compel compliance with the requirements of Provision E.5 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.5.d requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Provisions E.5.e.(1)-(2) specifically require the Copermittee to identify areas of existing development as candidates for retrofitting, and streams, channels, and/or habitats as candidates for rehabilitation. Provisions E.5.e.(1)-(2) are based on the retrofitting requirements of the Fourth Term Permits for Orange and Riverside Counties, but modified to also include identifying projects to rehabilitate channels within areas of existing development. The requirements have also been modified to be more focused on utilizing these types of projects for addressing the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Interest and opportunity to retrofit areas of existing development and rehabilitate channels located in areas of existing development has been observed in several programs the San Diego Water Board oversees (e.g., CWA Section 401 Water Quality

Certification program, supplemental environmental projects, and grant programs). Each jurisdiction has miles and miles of streets that could be retrofitted to become green streets. Reshaping landscaped areas from convex to concave configurations can detain storm water instead of directing runoff as quickly as possible to the MS4. Retrofit projects could also include simply replacing impervious surfaces with permeable surfaces.

Retrofitting projects do not necessarily have to be expensive. Retrofitting projects could be as simple as redirecting downspouts from roofs to pervious or landscaped areas instead of to hardscaped areas discharging directly to the MS4, providing rain barrels to harvest storm water from downspouts for use at a later time, or planting more trees in areas with little vegetation to provide canopy that can intercept storm water. The San Diego Water Board encourages the Copermittees to identify simple, low-cost retrofitting opportunities that can be easily implemented, in addition to other more expensive retrofitting and channel rehabilitation projects.

Rehabilitation of channels, streams, and/or habitat will require more significant planning and resources to implement. There are, however, also abundant opportunities to rehabilitate channels, streams and/or habitats in or adjacent to areas of existing development. Each Watershed Management Area likely has several creeks and stream reaches that have been undergrounded, artificially hardened, or hydromodified that could be rehabilitated to be more sustainably configured, which would slow down storm water flows and potentially have more assimilative capacity for pollutants while still being supportive of designated beneficial uses.

The San Diego Water Board recognizes that it may be infeasible to implement retrofitting or channel rehabilitation projects within certain areas of a Copermittee's jurisdictions. For such areas, the Copermittee must instead identify, develop, and implement regional retrofitting and channel rehabilitation projects (i.e. projects that can retain and/or treat storm water from one or more areas of existing development) adjacent to and/or downstream of the areas of existing development.

Provisions E.5.e.(1)-(2) do not require the implementation of retrofitting and rehabilitation projects, but do require the Copermittee to develop a program with strategies to facilitate the implementation of these types of projects in areas of existing development. The strategies are expected to include allowing and encouraging Priority Development Projects to implement retrofitting types of projects as a means of compliance with the structural BMP performance criteria requirements of Provisions E.3.c.(1) and E.3.c.(2).

Provision E.6 (Enforcement Response Plans) requires each Copermittee to develop an Enforcement Response Plan as part of its jurisdictional runoff management program document. Proper implementation of the Enforcement Response Plans is necessary to effectively prohibit non-storm water discharges to the MS4, and reduce the discharge of pollutants in storm water from the MS4 to the MEP.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system*" and be able to demonstrate that it can "*operate pursuant to legal authority established by statute, ordinance or series of contracts*" to control the discharge of non-storm water and pollutants in storm water to and from its MS4. Pursuant to 40 CFR 122.26(d)(2)(i)(E) each Copermittee is specifically required to have the legal authority to "*[r]equire compliance with conditions in ordinances, permits, contracts or order*s."

The requirements under Provision E.6 are necessary to demonstrate that each Copermittee can enforce its legal authority to *"effectively prohibit non-stormwater discharges"* and "*reduce the discharge of pollutants to the maximum extent practicable*" as well as "*[r]equire compliance with conditions in ordinances, permits, contracts or order*."

The Enforcement Response Plan required under Provision E.6 will serve as a reference for the Copermittee and the San Diego Water Board to determine if consistent enforcement actions are being implemented to achieve timely and effective compliance from all public and private entities that are not in compliance with the Copermittee's ordinances, permits, or other requirements. The Enforcement Response Plan must contain clear direction for the Copermittee to take immediate enforcement action, when appropriate and necessary, in their illicit discharge detection and elimination, development planning, construction management, and existing development management programs.

If the entities subject to the Copermittee's legal authority do not implement appropriate corrective actions in a timely manner, or if violations repeat, the Copermittee must take progressively stricter responses to enforce its legal authority and achieve compliance with its ordinances, permits, or other requirements to *"effectively prohibit non-stormwater discharges"* and "*reduce the discharge of pollutants to the maximum extent practicable.*"

<u>Provision E.7 (Public Education and Participation)</u> requires each Copermittee to implement a public education and participation program. Proper implementation of the public education and participation program as part of its jurisdictional runoff management program will contribute toward effectively prohibiting non-storm water discharges to the MS4, and toward the reduction of pollutants in storm water from the MS4 to the MEP.

Provision E.7 establishes the minimum requirements that each Copermittee must implement to engage members of the public as part of its jurisdictional runoff management program. In the Fourth Term Permits, the public education program requirements and the public participation requirements were included as separate jurisdictional runoff management program components. In this Order, the public education requirements have been consolidated with the public participation requirements, as both sets of requirements are related to the engagement of the public

by each Copermittee. Engagement of the public is critical for the success of each Copermittee's jurisdictional runoff management program.

The Copermittees have been implementing public education programs for the last 20 years, which are now well established. The specificity of expected public education program elements of the Fourth Term Permits has been removed. For the most part, the public education program requirements in Provision E.7.a have been reduced to a set of requirements that are specifically included in the federal regulations under 40 CFR 122.26(d)(2)(iv)(A)(6), 122.26(d)(2)(B)(6) and 122.26(d)(2)(D)(4), which should already be incorporated into each Copermittee's existing public education program. Each Copermittee is expected to utilize the information and data collected from the monitoring and assessments conducted within the Watershed Management Area, and from its inventories and inspections to best direct its public education program resources toward addressing the highest priority water quality conditions identified within the Water Quality Improvement Plan.

According to 40 CFR 122.26(d)(2)(iv), public participation is required to be included as part of the "*comprehensive planning process*", which includes the development and implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs. The requirements under Provision E.7.b specify the opportunities that the public must be provided to be involved in the "*comprehensive planning process*", as required by to 40 CFR 122.26(d)(2)(iv).

Provision E.8 (Fiscal Analysis) requires each Copermittee to secure the resources and provide an analysis of the resources that will be necessary to implement the requirements of the Order. Adequate fiscal resources are necessary for a jurisdictional runoff management program to effectively prohibit non-storm water discharges to the MS4, and reduce pollutants in storm water from the MS4 to the MEP.

According to 40 CFR 122.26(d)(2)(vi), each Copermittee is responsible for providing "*a fiscal analysis of the necessary capital and operation and maintenance expenditures necessary to accomplish the activities*" required by this Order, including "*a description of the source of funds that are proposed to meet the necessary expenditures, including legal restrictions on the use of such funds.*" The fiscal analysis requirements of Provision E.8 are consistent with 40 CFR 122.26(d)(2)(vi).

The San Diego Water Board has chosen not to require a description of fiscal benefits realized from implementation of the jurisdictional runoff management programs. This is a recommendation from the National Association of Flood and Stormwater Management Agencies.[43] For instance, the fiscal analysis requirements do not address city-wide fiscal benefits of protection (e.g., public health, tourism, property values, economic activity, beneficial uses, etc.), even though many costs currently

[43] National Association of Flood and Stormwater Management Agencies. 2006. *Guidance for Municipal Stormwater Funding.* Prepared under a grant provided by the USEPA.

reported to the San Diego Water Board are for related activities. This type of assessment may help Copermittees improve the allocation of resources and it may help the Copermittees secure adequate funding for the program. Qualitative assessments, however, could be overly subjective and most Copermittees likely lack the ability to provide accurate quantitative assessments. The San Diego Water Board encourages the Copermittees to consider means for conducting assessments of fiscal benefits derived from the programs. Such assessments could be conducted on a regional scale similar to studies of program costs conducted by the State Water Board.[44]

[44] State Water Board, 2005. NPDES Stormwater Cost Survey.

F. Reporting

Purpose: Provision F includes the requirements for the documents and reports that the Copermittees must prepare and provide to the San Diego Water Board. The documents prepared by the Copermittees and provided to the San Diego Water Board and made available to the public will provide the documentation that the Copermittees are complying with the requirements of the Order.

***Discussion*:** Provision F requires the Copermittees to prepare several documents and reports that must be provided to the San Diego Water Board and made available to the public. The reporting requirements have been significantly reduced compared to the Fourth Term Permit reporting requirements. The reduction in reporting requirements was recommended by the San Diego County Copermittees in the Report of Water Discharge submitted in June 2011.

More specific and detailed discussions of the requirements of Provision F are provided below.

Provision F.1 (Water Quality Improvement Plans) requires the Copermittees in each Watershed Management Area to develop and submit a Water Quality Improvement Plan in accordance with the requirements of Provision B.

Of all the requirements of Provision F, the Water Quality Improvement Plans will likely be the documents requiring the most significant effort to develop. The content of the Water Quality Improvement Plans, however, is expected to include content that should already have been developed for the Watershed Plans and several elements that are included in the Monitoring and Reporting Programs required under the Fourth Term Permits.

Because the Water Quality Improvement Plan is part of the "*comprehensive planning process which involves public participation*," Provision F.1 includes requirements to give multiple opportunities to the public to provide input on the content of the plans.

Provision F.1.a.(1) specifies the elements that the Copermittees must include in the public participation process for the development of the Water Quality Improvement Plans. In order for the public to be aware of the opportunities to provide input, Provision F.1.a.(1)(a) requires the Copermittees to develop a publicly available and noticed schedule of the opportunities for the public to participate and provide comments during the development of the Water Quality Improvement Plan. These opportunities are when the public can provide the data, information, and recommendations that the Copermittees can consider during the development of the Water Quality Improvement Plans.

The San Diego Water Board recognizes, however, that the Copermittees cannot be expected to incorporate all the data, information, and recommendations that the public

may provide into the Water Quality Improvement Plans. The Copermittees will have to review the data, information, and recommendations received and make some decisions on what to incorporate into the Water Quality Improvement Plans. Before the Copermittees finalize their decisions, members of the public should be allowed to review the Copermittees' decisions. Thus, Provision F.1.a.(1)(b) requires the Copermittees to form a Water Quality Improvement Consultation Panel (Panel).

The Panel will consist of a member from the environmental community and a member from the development community familiar with the Watershed Management Area. A representative from the San Diego Water Board staff will also be part of the Panel. The Copermittees may choose to include additional members, but the Panel is only required to include three panel members.

The Panel will serve as an additional public participation and input mechanism during the development of the Water Quality Improvement Plans. The knowledge and expertise from these Panel members are expected to provide the Copermittees valuable direction during their decision-making process. The Copermittees will review the content of their planned submittals with the Panel members to receive recommendations. If the Panel provides recommendations, the Copermittees must consider revisions to the Water Quality Improvement Plan submittals.

The San Diego Water Board recognizes that the development of multiple Water Quality Improvement Plans concurrently may limit the ability of the public to review and provide comments to the Copermittees. Thus, Provision F.1.a.(1)(c) requires the Copermittees to coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public time and opportunity to participate during the development of the Water Quality Improvement Plans.

Provision F.1.a.(2) requires the Copermittees to develop and submit the first Water Quality Improvement Plan component, in accordance with the requirements of Provision B.2, which includes the identification of the priority water quality conditions and potential water quality improvement strategies. The public must be provided an opportunity to provide data, information and recommendations to be utilized in the development and identification of the priority water quality conditions and potential water quality improvement strategies for the Watershed Management Area. The Copermittees must consult with the Panel and consider making revisions. The Copermittees may submit the requirements of Provision B.2 as early as 6 months and no later than 12 months after the commencement of coverage under this Order. After the requirements of Provision B.2 are submitted to the San Diego Water Board, the public will be provided another opportunity to provide comments.

Provision F.1.a.(3) requires the Copermittees to develop and submit the second Water Quality Improvement Plan component, in accordance with the requirements of Provision B.3, which includes the identification of the numeric goals for the highest priority water quality conditions identified for the Watershed Management Area, and the strategies that will be implemented to achieve the potential numeric goals. The

Copermittees may also develop the Optional Watershed Management Area Analysis, in accordance with the requirements of Provision B.3.b.(4), as part of this submittal. The public must be provided an opportunity to provide data, information and recommendations to be utilized in the development and identification of the numeric goals and water quality improvement strategies for the Watershed Management Area. The Copermittees must consult with the Panel and consider making revisions. The Copermittees may submit the requirements of Provision B.3 as early as 9 months and no later than 18 months after the commencement of coverage under this Order. After the requirements of Provision B.3 are submitted to the San Diego Water Board, the public will be provided another opportunity to provide comments.

Finally, Provision F.1.b describes the process for the submittal and implementation of the Water Quality Improvement Plans. The complete Water Quality Improvement Plans are required to be submitted by the Copermittees within 24 months after the commencement of coverage under this Order. The San Diego Water Board will provide the public an opportunity to provide comments on each complete Water Quality Improvement Plan.

The San Diego Water Board will review each Water Quality Improvement Plan and the public comments received to determine if the Copermittees have submitted a Water Quality Improvement Plan that meets the requirements of Provision B. If a Water Quality Improvement Plan does not meet the requirements of Provision B, the Copermittees will be considered out of compliance and directed in writing by the San Diego Water Board Executive Officer to correct the deficiencies.

When a Water Quality Improvement Plan meets the requirements of Provision B, the San Diego Water Board will determine whether to hold a public hearing or to limit public input to submittal of written comments before accepting the Water Quality Improvement Plan. Implementation of the Water Quality Improvement Plan must begin within 30 days of acceptance.

The San Diego Water Board expects that any deficiencies in the Water Quality Improvement Plan will be identified either in the public comments or during the review by the San Diego Water Board before implementation begins. In the event any deficiencies are identified after the implementation of the Water Quality Improvement Plan, Provision F.1.b.(7) clarifies that the San Diego Water Board maintains the right to require the Copermittees to correct any deficiencies that may be identified.

<u>Provision F.2 (Updates)</u> requires the Copermittees to update specific documents that the Copermittees will utilize to implement the requirements of this Order.

Each Copermittee is required to continue implementing a jurisdictional runoff management program, as required under Provision E. Implementation of each Copermittee's jurisdictional runoff management program is directed by its jurisdictional runoff management program document. Provision F.2.a requires each Copermittee to update its jurisdictional runoff management program document to be consistent with

the requirements of Provision E concurrent with the submittal of the Water Quality Improvement Plan.

Likewise, each Copermittee must continue to require new development and redevelopment projects to implement BMPs to control pollutants in storm water runoff. The control of pollutants in storm water runoff from development and redevelopment projects within each Copermittee's jurisdiction is guided and directed by its BMP Design Manual, formerly known as a Standard Storm Water Mitigation Plan (SSMP). Provision F.2.b requires each Copermittee to update its BMP Design Manual to be consistent with the requirements of Provision E.3 concurrent with the submittal of the Water Quality Improvement Plan.

In general, the requirements of the Order should not necessitate a complete rewrite of each Copermittee's jurisdictional runoff management program document or BMP Design Manual, as was required by the Third Term Permits. The jurisdictional runoff management program and BMP Design Manual requirements of this Order are not significantly different than the requirements of the Fourth Term Permits. Thus, only sections of the Order which are new or have been significantly changed should warrant revisions to specific sections of the Copermittee's jurisdictional runoff management program document and BMP Design Manual.

Finally, the Water Quality Improvement Plans are expected to require updates as the iterative approach and adaptive management process included in the Water Quality Improvement Plan, as required under Provision B.5, is implemented by the Copermittees. Provision F.2.c.(1) requires the Copermittees to implement a public participation process for the proposed updates, review the proposed updates with the Panel, and submit the updates to the Water Quality Improvement Plan as part of the Annual Reports required under Provision F.3.b.

Also, because TMDLs are likely to be developed, adopted and approved during the term of the Order, Provision F.2.c.(2) has been included to expedite the incorporation of TMDLs into the Copermittees' Water Quality Improvement Plans as part of the update process, potentially before the Order is re-opened to incorporated the requirements of the new TMDLs.

Provision F.3 (Progress Reporting) requires the Copermittees to report on the progress of implementing the Water Quality Improvement Plans.

The requirements of Provision F.3 are to report the progress toward improving water quality that the Copermittees are achieving with the implementation of the Water Quality Improvement Plans and each Copermittee's jurisdictional runoff management program. The Progress Report Presentations required under Provision F.3.a are included to provide the Copermittees an opportunity to communicate directly with the San Diego Water Board and the public. The Progress Report Presentations will also provide the members of the San Diego Water Board and members of the public an opportunity to become more acquainted with the Copermittees and their projects and

programs to address non-storm water and storm water discharges into and from their MS4s.

The Annual Report requirements of Provision F.3.b are a consolidation of several reporting requirements from the Fourth Term Permits, including the Jurisdictional Runoff Management Program Annual Reports, the Watershed Annual Reports, and the Monitoring and Reporting Program Annual Reports. Furthermore, the Annual Report requirements are consistent with the requirements under 40 CFR 122.42(c).

Pursuant to 40 CFR 122.42(c), "*[t]he operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the Director…must submit an annual report*", which must include the following:

(1) *The status of implementing the components of the storm water management program that are established as permit conditions* [40 CFR 122.42(c)(1)];

(2) *Proposed changes to the storm water management programs that are established as permit conditions* [40 CFR 122.42(c)(2)];

(3) *Revisions, if necessary, to the assessment of controls and fiscal analysis* [40 CFR 122.42(c)(3)];

(4) *A summary of data, including monitoring data, that is accumulated throughout the reporting year* [40 CFR 122.42(c)(4)];

(5) *Annual expenditures and budget for year following each annual report* [40 CFR 122.42(c)(5)];

(6) *A summary describing the number and nature of enforcement actions, inspections, and public education programs* [40 CFR 122.42(c)(6)];

(7) *Identification of water quality improvements or degradation* [40 CFR 122.42(c)(7)].

Under the Fourth Term Permits, each Copermittee is responsible for submitting a Jurisdictional Runoff Management Program Annual Report; the Copermittees in each designated watershed are responsible for submitting a Watershed Annual Report; and the Copermittees from each county are responsible for submitting a Monitoring and Reporting Program Annual Report.

There are 39 Copermittees in the San Diego Region, each required to prepare and submit a Jurisdictional Runoff Management Program Annual Report. There are 9 designated watersheds in San Diego County, 6 designated watersheds in Orange County, and 1 designated watershed in Riverside County for a total of 16 designated watersheds, each requiring a Watershed Annual Report. There are 3 sets of Copermittees in 3 counties in the San Diego Region, requiring Copermittees from each county to prepare and submit a Monitoring and Reporting Program Annual Report.

Thus each Copermittee is currently required to prepare, or participate in the preparation of at least 3 annual reports. In addition, the San Diego County Copermittees are required to prepare and submit a Regional Urban Runoff Management Plan Annual Report.

In total, there are 59 annual reports that are prepared by the Copermittees and submitted to the San Diego Water Board for the Fourth Term Permits. The preparation of these annual reports requires significant time and resources from each Copermittee, which could otherwise be expended on actions that could improve water quality within its jurisdiction. In turn, significant time and resources are required from the San Diego Water Board staff to review these reports, which could otherwise be expended on working directly with the Copermittees to improve their implementation efforts toward restoring and protecting water quality.

Until the Water Quality Improvement Plans are developed, there will be a transitional period during which the Copermittees will continue to implement their existing jurisdictional runoff management programs. There will also be a transitional period during which the Copermittees will implement the transitional monitoring and assessment requirements of Provision D. During the transitional period, the Copermittees will submit annual reports pursuant to the requirements of Provisions F.3.b.(1) and F.3.b.(2).

Provision F.3.b.(1) includes the transitional annual reporting requirements for each Copermittee's jurisdictional runoff management program. The reporting of the jurisdictional runoff management program implementation efforts have been reduced to a single 2-page form. Each Copermittee is required to complete and submit a Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D or a revised form accepted by the San Diego Water Board) no later than October 31 of each year for each jurisdictional runoff management program reporting period (i.e. July 1 to June 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted. The Jurisdictional Runoff Management Program Annual Report Form will certify that each Copermittee has implemented its jurisdictional runoff management program in accordance with the requirements of Provision E. Each Copermittee may choose to continue to utilize and submit the jurisdictional runoff management program annual reporting format of its current Order until the first Water Quality Improvement Plan Annual Report is required to be submitted.

Provision F.3.b.(2) includes the transitional annual reporting requirements for the transitional monitoring and assessment program for each Watershed Management Area. The Copermittees in the Watershed Management Area are required to submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted. The Transitional Monitoring and Assessment Program Annual Report is required to include

the transitional period monitoring data collected pursuant to Provisions D.1.a and D.2.a, and the findings from the transitional period findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

Provision F.3.b.(3) includes the Water Quality Improvement Plan Annual Report requirements. Only one Water Quality Improvement Plan Annual Report is required for each of the ten (10) Watershed Management Areas designated under Provision B.1, which is a significant reduction in the number of annual reports required to be prepared and submitted by the Copermittees. The Water Quality Improvement Plan Annual Report will document the Copermittees' efforts to implement the Water Quality Improvement Plan. Each Water Quality Improvement Plan Annual Report will be focused primarily on reporting the analysis of the monitoring data collected pursuant to Provisions D.1-D.3 during the reporting period, and the assessments that are required pursuant to Provision D.4 based on the data. The monitoring data analyses and the assessments that are provided in the Water Quality Improvement Plan Annual Report will be the core of the report. The reporting of the jurisdictional runoff management program implementation efforts have been reduced to a single 2-page form, and will no longer be the primary focus of the reporting requirements as in the Third and Fourth Term Permits.

Each Copermittee will continue to prepare and submit a Jurisdictional Runoff Management Program Annual Report Form as part of the Water Quality Improvement Plan Annual Report to certify that each Copermittee has implemented its jurisdictional runoff management program in accordance with the requirements of Provision E. Instead of reviewing a voluminous report from each Copermittee, as was required under the Third and Fourth Term Permits, the San Diego Water Board will conduct audits of each Copermittee's jurisdictional runoff management program to investigate and confirm the information provided by each Copermittee on its Jurisdictional Runoff Management Program Annual Report Form. The audits will allow the San Diego Water Board to become more familiar with the each Copermittee's jurisdictional runoff management program, and each Copermittee will become more informed about the expectations of the San Diego Water Board.

The reduction in the number and content of the Water Quality Improvement Plan Annual Reports should result in significant time, cost and resource savings for the Copermittees, as well as the San Diego Water Board. Those savings should offset a significant portion of any additional costs that may be incurred to develop the Water Quality Improvement Plans and to implement the monitoring and assessment program requirements of Provision D.

The reporting period for the Water Quality Improvement Plan Annual Reports consists of two periods. Because the jurisdictional runoff management programs are typically budgeted and implemented during a fiscal year, the information provided on the Jurisdictional Runoff Management Program Annual Report Forms will cover the period from July 1 to June 30 of the following year.

The Water Quality Improvement Plan Annual Reports, however, are focused primarily on the monitoring data and the assessments based on the monitoring data. The monitoring data is collected during the monitoring year, which begins October 1 and ends September 30 of the following year. The monitoring year begins after the beginning of the fiscal year and ends after the end of the fiscal year. Therefore, to accommodate and capture the information collected during the fiscal year and the monitoring year, the Annual Report reporting period incorporates both periods.

Finally, Provision F.3.c requires the Copermittees to develop and submit a Regional Monitoring and Assessment Report. The Regional Monitoring and Assessment Report is similar to the Long Term Effectiveness Assessment required under the Fourth Term San Diego County Permit. The Regional Monitoring and Assessment Report is expected to utilize the entire body of data and information collected by the Copermittees during the term of this Order to assess improvements to water quality on a regional scale.

Provision F.4 (Regional Clearinghouse) requires the Copermittees to develop, update, and maintain an internet-based Regional Clearinghouse that can be used to store, disseminate, and share the Copermittees' documents, monitoring data, special studies, and any other data or information.

Most of the documents and data that are generated by the Copermittees can be provided in electronic format, and made available to the San Diego Water Board and the public on the internet. The San Diego Water Board has been gradually transitioning its document submittal requirements to electronic submittals. Provision F.4 has been included to further these efforts.

Provision F.4 has also been included to improve the exchange and availability of information among the Copermittees, as well as between the Copermittees and the San Diego Water Board. Provision F.4 will also make the information generated during the implementation of the Order more accessible to the public.

Provision F.5 (Report of Waste Discharge) requires the Copermittees to submit a Report of Waste Discharge to reapply for renewal of the Order prior to its expiration, in accordance with 40 CFR 122.21(d)(2) and CWC section 13376.

Because the Orange County and Riverside County Copermittees will not be subject to the requirements of this Order until they are notified of coverage, Provision F.5.a describes the process of submitting their Reports of Waste Discharge pursuant to the requirements of their current permits to obtain coverage under this Order.

For the Copermittees subject to the requirements of this Order, Provision F.5.b requires the Copermittees to submit a Report of Waste Discharge 180 days in advance of the expiration of this Order Provision F.5.b also describes the minimum information to be included in the Report of Waste Discharge, based on USEPA

guidance “Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems,” dated May 17, 1996.

Provision F.6 (Application for Early Coverage) describes the process that would allow the Orange County and/or Riverside County Copermittees to obtain coverage under this Order earlier than the expiration of their current Orders.

If the Orange County and/or Riverside County Copermittees choose to obtain coverage under this Order earlier than the expiration of their current Orders, the preparation and submittal of a Report of Waste Discharge, as required by the Fourth Term Permits, will not be necessary. The existing Order for the respective county will be rescinded upon the effective coverage date under this Order, except for enforcement purposes.

G. Principal Watershed Copermittee Responsibilities

Purpose: Provision G includes the requirements for the Principal Watershed Copermittee designated by the Copermittees in each Watershed Management Area.

***Discussion*:** Unlike previous NPDES requirements, there will no longer be a single Principal Copermittee. Provision G.1 requires the Copermittees to designate a Principal Watershed Copermittee for each Watershed Management Area. There are ten (10) Watershed Management Areas in the San Diego Region, as defined in Table B-1 under Provision B.1 of the Order. An individual Copermittee should not be the Principal Watershed Copermittee for more than two (2) Watershed Management Areas. There could be up to ten (10) Principal Water Copermittees designated for the Watershed Management Areas in the San Diego Region.

Provision G.2 describes the minimum responsibilities of each Principal Watershed Copermittee. The primary responsibility of the Principal Watershed Copermittees is to serve as the liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues. Ideally, the Principal Watershed Copermittee can represent the interests of all the Copermittees within a Watershed Management Area during discussions or meetings to facilitate communication with the San Diego Water Board. The Principal Watershed Copermittees are also responsible for facilitating and coordinating the implementation efforts of the Copermittees and submittals of required documents and reports.

The Principal Watershed Copermittee is responsible for facilitating the efforts of the Copermittees within the Watershed Management Area to develop the Water Quality Improvement Plan required under Provision B, and submit it for approval in accordance with Provision F.1. The Principal Watershed Copermittee is also responsible for coordinating the submittal of the document updates, Progress Report Presentations, and Annual Reports required from the Copermittees within each Watershed Management Area under Provisions F.2, F.3.a, and F.3.b. The Principal Watershed Copermittees are responsible for coordinating with each other to develop and submit the Regional Clearinghouse, Regional Monitoring and Assessment Report, and the Report of Waste Discharge required under Provisions F.3.c, F.4, and F.5.

The designated Principal Watershed Copermittee for each Watershed Management Area does not necessarily have to serve as the Principal Watershed Copermittee for the entire term of the Order. If the Copermittees in a Watershed Management Area choose to designate a new Principal Watershed Copermittee, the change may be submitted as part of the Annual Report required under Provision F.3.b, with an update to the Water Quality Improvement Plan in accordance with Provision F.2.c.

Provision G.3 specifies that the Principal Watershed Copermittee is not responsible for ensuring that the other Copermittees within the Watershed Management Area are in compliance with the requirements of this Order

H. Modification of Order

Purpose: Provision H provides the conditions under which modifications to Order No. R9-2013-0001 may occur.

***Discussion*:** Provision H allows for modifications to Order No. R9-2013-0001. Minor modifications may be made by the San Diego Water Board Executive Officer without a public notice or public hearing. Minor modifications are defined under 40 CFR 122.63. Minor modifications under 40 CFR 122.63 potentially applicable to this Order are the following:

- Correcting typographical errors;
- Requiring more frequent monitoring or reporting by the Copermittees;
- Changing an interim compliance date in a schedule of compliance, provided the new date is not more than 120 days after the date specified in the existing permit and does not interfere with attainment of the final compliance date requirement.

Modifications that are not one of the above minor modifications will require re-opening the Order, subject to the requirements of 40 CFR 122.44, 122.62 to 122.64, and 124.5, but only for the specific provisions subject to the modification. Modifications of the Order that are not minor require a draft Order with the proposed modifications made available for public review, a public notice and comment period, and a public hearing. Comments on the provisions not subject to the proposed modifications are not required to be considered in the San Diego Water Board's responses to comments or during the public hearing.

Provision H.4 was included to specify that the Order will be re-opened for modifications if the State Water Board determines revisions to Provision A are warranted, an application for early coverage under the Order is received pursuant to Provision F.6, the Basin Plan is amended to modify an existing TMDL or incorporate a new TMDL, or the monitoring and assessment program requirements need to be updated or revised.

Provision H.5 was included to specify that the San Diego Water Board will re-open and consider modifications to this Order when the Orange County Copermittees or the Riverside County Copermittees submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders

I. Standard Permit Provisions and General Provisions

Purpose: Provision I incorporates the standard permit provisions required to be included in all NPDES permits, as well as several other general provisions.

***Discussion*:** Provision I refers to Attachment B to the Order. Attachment B expressly incorporates the conditions applicable to all NPDES permits as provided under 40 CFR 122.41(a)-(n), as well as the applicable conditions for MS4s and storm water discharges provided under 40 CFR 122.42(c) and 40 CFR 122.42(d), respectively. Attachment B also includes several general provisions that are typically included in or applicable to waste discharge requirements issued by the San Diego Water Board.

IX. ATTACHMENTS

The attachments to the Order are discussed below. The discussions describe the content of the attachments.

Attachment A – Discharge Prohibitions and Special Protections

Section 1 of Attachment A includes the Waste Discharge Prohibitions from the Basin Plan. They have been provided verbatim in their entirety.

Section 2 of Attachment A includes the "*Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges*" applicable to permitted point source discharges of storm water, adopted under State Water Board Resolution No. 2012-0012. The terms, prohibitions, and special conditions (collectively referred to as special conditions) are established as limitations on point source storm water discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in ASBS, as required for State Water Quality Protection Areas pursuant to California Public Resources Code sections 36700(f) and 36710(f). These Special Protections were adopted by the State Water Board as part of the Ocean Plan General Exception.

Attachment B – Standard Permit Provisions and General Provisions

Conditions applicable to all NPDES permits, as required under 40 CFR 122.41, and conditions applicable to MS4s and storm water discharges, as required under 40 CFR 122.42(c) and 122.42(d), respectively are provided in Attachment B to the Order. They have been provided expressly in their entirety.

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. These general provisions are typically included in or applicable to waste discharge requirements issued by the San Diego Water Board. Many of the general provisions were developed by the State Water Board. Where a general provision is derived from statute or regulation, a citation of the statute or regulation section is provided. General provisions that do not provide a citation are included under the authority provided CWC 13377.

Attachment C – Acronyms, Abbreviations and Definitions

The acronyms and abbreviations that are used in the Order are provided in Attachment C. Attachment C also includes definitions that may provide an explanation or description of the meaning or intent of specific terms or phrases included in the Order.

Attachment D – Jurisdictional Runoff Management Program Annual Report Form

An example of the Jurisdictional Runoff Management Program Annual Report Form required to be submitted by each Copermittee as part of the Annual Reports required under Provision F.3.b.(1)(e) is provided as Attachment D to the Order. An electronic version of the form will be available from the San Diego Water Board after the adoption of the Order.

The Jurisdictional Runoff Management Program Annual Report Form includes the minimum information necessary to demonstrate that the Copermittee is implementing and in compliance with the requirements of Provision E, and includes much of the information required to be reported pursuant to 40 CFR 122.42(c).

The information that must be provided on the Jurisdictional Runoff Management Program Annual Report Form is limited to the fiscal year, which begins July 1 and ends June 30 of the following year. The information expected to be provided by the Copermittees in each section of the Jurisdictional Runoff Management Program Annual Report Form is discussed below.

I. COPERMITTEE INFORMATION

The name of the Copermittee (e.g. name of city, county, or special district) and the contact information for the storm water program manager are provided under this section.

II. LEGAL AUTHORITY

The Copermittee must confirm whether or not the legal authorities under Provision E.1.a have been established for itself within its jurisdiction.

The Copermittee must also confirm whether or not a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority, as required under Provision E.1.b. The certification statement required by Provision E.1.b is only required to be submitted with the first Annual Report required under Provision F.3.b.

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

The Copermittee must inform the San Diego Water Board whether or not an update to its jurisdictional runoff management program document was required or recommended by the San Diego Water Board during the reporting period. An update to the jurisdictional runoff management program is required under Provision F.2.a. The San Diego Water Board may recommend modifications to the jurisdictional runoff management program as part of the iterative approach and adaptive management process required under Provision B.5, which may result in an update that is necessary for the Copermittee's jurisdictional runoff management document.

If an update was required or recommended, the Copermittee must confirm whether or not the update was completed and made available on the Regional Clearinghouse within the reporting period. If no update was required or recommended, an answer is not required. If the answer is NO, meaning the required or recommended update was not completed and/or made available on the Regional Clearinghouse, the Copermittee must attach a schedule for the completion of the update and/or posting of the updated document on the Regional Clearinghouse.

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

The Copermittee must confirm whether or not a program was implemented during the fiscal year to actively detect and eliminate illicit discharges and connections in accordance with the requirements under Provision E.2.

In addition to confirming that a program to detect and eliminate illicit discharges was implemented during the reporting period, the Copermittee is also required to report on several items related to the program. The information that must be reported is limited to the fiscal year for the Annual Report.

All non-storm water discharges are considered illicit discharges unless the source is identified as one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5). If a non-storm water discharge is identified as one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5), the discharge is a non-storm water discharge, but not an illicit discharge. If a non-storm water discharge is identified but not in one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5), the discharge is both a non-storm water discharge and an illicit discharge.

V. DEVELOPMENT PLANNING PROGRAM

The Copermittee must confirm whether or not a development planning program was implemented during the fiscal year in accordance with the requirements under Provision E.3.

The Copermittee must also inform the San Diego Water Board whether or not an update to its BMP Design Manual was required or recommended by the San Diego Water Board during the fiscal year. An update to the BMP Design Manual is required under Provision F.2.b. The San Diego Water Board may recommend modifications to the BMP Design Manual, which may result in an update that is necessary for Copermittee's the BMP Design Manual.

If an update was required or recommended, the Copermittee must confirm whether or not the update was completed and made available on the Regional Clearinghouse within the reporting period. If no update was required or recommended, an answer is not required. If the answer is NO, meaning the required or recommended update was not completed and/or made available on the Regional Clearinghouse, the Copermittee must attach a schedule for the completion of the update and/or posting of the updated document on the Regional Clearinghouse.

The Copermittee is also required to report on several items related to the program. For the development and redevelopment projects that are reviewed under the program, the Copermittee must report the total number projects submitted for review during the fiscal year. Of those projects, the Copermittee must report the number that are Priority Development Projects, as defined under Provision E.3.b.(1). The Copermittee must also report the number of Priority Development Projects that were approved and/or granted occupancy during the fiscal year, regardless of when the project was originally submitted for review. Any projects that were approved during the fiscal year and granted any exemptions from the BMP Design Manual requirements and/or allowed to implement alternative compliance options in accordance with Provision E.3.c.(3) must be reported.

Finally, the Copermittee must also report on several items related to its oversight of permanent BMPs on Priority Development Projects within its jurisdiction, as required under Provision E.3.e. The information that must be reported is limited to the fiscal year for the Annual Report.

VI. CONSTRUCTION MANAGEMENT PROGRAM

The Copermittee must confirm whether or not a construction management program was implemented during the fiscal year in accordance with the requirements under Provision E.4.

The Copermittee is also required to report on several items related to its oversight construction projects within its jurisdiction. The information that must be reported is limited to the fiscal year for the Annual Report.

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

The Copermittee must confirm whether or not an existing development management program was implemented during the fiscal year in accordance with the requirements under Provision E.5.

The Copermittee is also required to report on several items related to its oversight in areas of existing development within its jurisdiction. The information that must be reported is limited to the fiscal year for the Annual Report. The information must also be separated into four categories of existing development: municipal, commercial, industrial, and residential.

VIII. PUBLIC EDUCATION AND PARTICIPATION

The Copermittee must confirm whether or not a public education program component was implemented during the fiscal year in accordance with the requirements under Provision E.7.a.

The Copermittee must also confirm whether or not a public participation program component was implemented during the fiscal year in accordance with the requirements under Provision E.7.b.

IX. FISCAL ANALYSIS

The Copermittee must confirm a summary of its fiscal analysis, conducted in accordance with the requirements under Provision E.8, has been attached to the form.

X. CERTIFICATION

A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative must sign and certify the Jurisdictional Runoff Management Program Annual Report Form. The appropriate box must be checked to indicate the whether a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative is signing the form.

Attachment E – Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2013-0001

Attachment E provides specific provisions for implementing the load allocations (LAs) and wasteload allocations (WLAs) of Total Maximum Daily Loads (TMDLs) adopted by the San Diego Water Board and approved by USEPA in which the Copermittees are identified as responsible for discharges subject to the requirements of the TMDLs. Federal regulations require that NPDES requirements incorporate water quality based effluent limitations (WQBELs) that must be consistent with the requirements and assumptions of any available WLAs,[45] which may be expressed as numeric effluent limitations, when feasible, and/or as a best management practice (BMP) program of expanded or better-tailored BMPs.[46] Where the TMDL includes WLAs that provide numeric pollutant load or pollutant parameter objectives, the WLA has been, where feasible, translated into numeric WQBELs.[47]

For each TMDL in Attachment E, four sections are included:

a. Applicability: This section provides the resolution under which the TMDL Basin Plan amendment was adopted and approved, with the applicable adoption and approval dates. This section also gives the effective date of the TMDL and where the TMDL is applicable (i.e. Watershed Management Area and water body). The Copermittees that are responsible for implementing the specific provisions are also given in this section.

b. Final TMDL Compliance Requirements: For each TMDL, the final TMDL compliance requirements consist of the final TMDL compliance date(s), the final WQBELs, and the final TMDL compliance determination requirements. The final WQBELs are expressed in terms of receiving water limitations, effluent limitations, and/or best management practices (BMPs). The final WQBELs for the TMDLs are incorporated by reference into Provision A of the Order. The final WQBELs become enforceable when the final TMDL compliance dates have passed. Applicable BMPs within the final WQBELs must be incorporated into the Water Quality Improvement Plans. Compliance with the final WQBELs will be determined in accordance with the options provided under the final TMDL compliance determination requirements.

c. Interim TMDL Compliance Requirements: If the final TMDL compliance date has not passed and there are interim TMDL compliance requirements, they are included in this section. If there are interim WQBELs with interim compliance dates, the interim WQBELs become enforceable when the corresponding interim compliance dates have passed. Compliance with the interim WQBELs will be determined in accordance with the options provided under the interim TMDL compliance determination requirements.

d. Specific Monitoring and Assessment Requirements: If there are specific monitoring and assessment requirements that cannot be met with the monitoring and assessment program

[45] 40 CFR 122.44(d)(1)(vii)(B)
[46] 40 CFR 122.44(k)(2) and 40 CFR 122.44(k)(3)
[47] November 12, 2010 Memorandum from the USEPA, Revisions to the November 22, 2002 Memorandum "Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLA""

requirements under Provision D of the Order, the additional requirements are included in this section.

The requirements of the TMDLs are based on and consistent with the assumptions and requirements of any available adopted and approved TMDLs that have been incorporated into the Basin Plan. Modifications to the requirements for the TMDLs in Attachment E cannot be made unless the TMDLs are modified in the Basin Plan.

A modification to any aspect of a TMDL in the Basin Plan requires a Basin Plan amendment. A Basin Plan amendment to modify a TMDL will require the San Diego Water Board to adopt a resolution to amend the Basin Plan, which includes a separate public process. When the San Diego Water Board adopts a Basin Plan amendment, it subsequently requires approval from the State Water Board, the Office of Administrative Law, and the USEPA before it becomes effective.

If and when the TMDLs are a modified in the Basin Plan, the San Diego Water Board will revise the requirements of the TMDL in accordance with the Basin Plan amendment. When a Basin Plan amendment to modify a TMDL becomes effective, the San Diego Water Board will modify the requirements of the TMDL pursuant to the requirements of Provision H.4 of the Order as soon as possible.

013659

Orange County Permit Renewal Process July 1, 2014 Meeting Notice

lyris@swrcb18.waterboards.ca.gov

Sent: Thursday, June 05, 2014 3:37 PM
To: Chiu, Wayne@Waterboards
Cc: Arias, Christina@Waterboards; Becker, Eric@Waterboards; Chiu, Wayne@Waterboards
Attachments: OC MS4 2014-0401 Meeting N~1.pdf (2 MB)

Water Boards This is a message from the California Regional Water Quality Control Board, San Diego Region (9).

Interested Persons,

The San Diego Water Board is initiating the permit renewal process for the Orange County Copermittees. We would like to invite you to a meeting to discuss topic-specific recommended permit changes described in the Report of Waste Discharge (ROWD) and enrollment of the Orange County Copermittees into the Regional MS4 Permit.

Representatives of Orange County, Riverside County, and San Diego County Copermittees, Non-government Environmental Organizations, and the Business/Construction/Development Community are invited to attend the meeting with the San Diego Water Board staff on July 1, 2014 from 9:30 a.m. to 3:30 p.m. at the City of San Juan Capistrano Community Center.

See the attached notice for more information. The notice and all information regarding the Orange County Permit Renewal Process can be found on our website at http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/oc_stormwater.shtml

If you have any questions please contact me.

Laurie Walsh, PE
San Diego Water Board

2375 Northside Drive, Suite 100
San Diego, CA 92108
Direct Phone: 619-521-3373
Main Line: 619-516-1990
Fax No. (619) 516-1994
lwalsh@waterboards.ca.gov

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD
www.waterboards.ca.gov/sandiego/

You are currently subscribed to reg9_sandiegoco_ms4permit as: wchiu@waterboards.ca.gov.
To unsubscribe click here: leave-1945907-508208.cee2a373662e566393e62f0af18d11cf@swrcb18.waterboards.ca.gov

CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

June 5, 2014

To: Municipal Storm Water Interested Persons

Subject: Invitation to Meeting to Discuss Report of Waste Discharge and Enrollment of Orange County Copermittees In the Regional Municipal Separate Storm Sewer System (MS4) Permit

Storm water and non-storm water discharges from southern Orange County are regulated by Municipal Separate Storm Sewer Systems (MS4s) permit Order No. R9-2009-0002. Municipalities regulated by Order No. R9-2009-0002 include the County of Orange, Orange County Flood Control District and the cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Lake Forest, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano (Orange County Copermittees). Order No. R9-2009-0002 will expire on December 16, 2014, and the Orange County Copermittees have submitted a Report of Waste Discharge (ROWD) in application for NPDES permit reissuance that summarizes their existing storm water programs and makes recommendations for updates and other modifications to the MS4 permit coverage.

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) is reviewing the information in the ROWD and considering enrollment of Orange County Copermittees into the Regional NPDES Permit for MS4s Draining the Watersheds within the San Diego Region, Order No. R9-2013-0001(Regional MS4 Permit). As discussed below the San Diego Water Board staff will be holding a meeting on **July 1, 2014** with interested stakeholders to discuss the ROWD and enrollment process details.

The Regional MS4 Permit is available on the following webpage:
http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

The Regional MS4 Permit was adopted by the San Diego Water Board in May 2013 and is an area-wide permit based on the boundaries of the San Diego Region, instead of county political boundaries. Under this approach, the Regional MS4 Permit provides a basis for uniformly regulating all Copermittees in San Diego, Riverside, and southern Orange Counties within the San Diego Water Board's jurisdiction. The Regional MS4 Permit also provides opportunities for a comprehensive monitoring framework, regional collaborative approaches, and regional cost efficiencies among the Copermittees region-wide.

The San Diego County Copermittees are currently regulated by the Regional MS4 Permit. Orange and Riverside County Copermittees will be enrolled in a phased manner as their current MS4 permits expire or upon request for earlier coverage prior to permit expiration. However, as provided in the Regional MS4 Permit, the San Diego Water Board, after opportunity for public comment and a public hearing, will re-open and consider any necessary changes to the Regional MS4 Permit prior to enrollment of the Orange and Riverside County Copermittees. The San Diego Water Board has tentatively scheduled the Orange County Copermitees enrollment in the Regional MS4 Permit for San Diego Water Board consideration at a regularly scheduled public meeting in early 2015.

Representatives of Orange County, Riverside County, and San Diego County Copermittees, Non-government Environmental Organizations, and the Business/Construction/Development Community are invited to attend a meeting with the San Diego Water Board staff on July 1, 2014, to discuss the ROWD and planned enrollment process for the Orange County Copermitees in greater detail.

Details on the meeting time, location and issues to be discussed are provided below.

Meeting Time and Location
Tuesday, July 1, 2014
9:30 a.m. to 3:30 p.m.
City of San Juan Capistrano Community Center
25925 Camino Del Avion
San Juan Capistrano, CA 92675

Meeting Objective and Agenda
The objective of the July 1, 2014 meeting is for the San Diego Water Board to facilitate discussion on topic-specific recommended changes to the Regional MS4 Permit described in the ROWD and enrollment of the Orange County Copermittees. The San Diego Water Board is seeking input from the Copermittees, Non-governmental Environmental Organizations, and the Building Business/Construction/Development Community on the following specific topics:

1. **Report of Waste Discharge.** Information and recommendations contained in the ROWD.

2. **Enrollment Process**. The San Diego Water Board's proposed process and schedule for enrollment of the Orange County Copermittees into the Regional MS4 Permit.

3. **Future Stakeholder Meetings.** The San Diego Water Board's proposed schedule of focused meetings, workshops, and public hearings.

Stakeholder Participation at Meeting

Similar to the process used during the development of the Regional MS4 Permit, participation at this meeting will be structured to provide for an appropriate level of participation by key stakeholder groups, while preserving staff's ability to ensure a collaborative discussion on the agenda topics. Meeting participants will be divided into two groups: a limited group to be seated at the meeting table and an audience group. The total number of participants at the meeting table will be limited to twenty-five (25) persons subdivided into representative stakeholder groups as described in the table below. Groups of stakeholders can share their seats at the table and rotate particular topic experts from the audience to the table depending on the topic being discussed.

Stakeholder Group	Participants at the Table
Orange County Copermittees	8
San Diego County Copermittees	3
Riverside County Copermittees	3
Environmental Community	3
Business/Construction/Development Community	3
USEPA	1
San Diego Water Board	4

Ample audience seating will be provided so that interested persons can attend the meeting. Audience members will be allowed to ask questions and make comments at the end of each meeting.

For questions or comments, please contact Laurie Walsh by phone at (619) 521-3373, or by email at laurie.walsh@waterboards.ca.gov.

Respectfully,

David W. Gibson
Executive Officer
San Diego Regional Water Quality Control Board

DWG:jgs:dtb esb

Distribution list via email:

San Diego County MS4 Permit Lyris List
Riverside County MS4 Permit Lyris List
Orange County MS4 Permit Lyris List

Tech Staff Info & Use	
Order No.	R9-2009-0002
Party (GT/CIWQS) ID	525473
NPDES No.	CAS0108740
Reg. Measure ID	332672
PIN	658018

MEETING AGENDA

Meeting to Discuss Report of Waste Discharge and Enrollment of Orange County Copermittees In the Regional Municipal Separate Storm Sewer System (MS4) Permit Order R9-2013-0001

Tuesday, July 1, 2014

City of San Juan Capistrano Community Center
25925 Camino Del Avion
San Juan Capistrano, CA 92675

9:30 a.m. - 3:30 p.m.

9:30 a.m.	Introductions Proposed Orange County Reissuance Process Schedule Presentation of Orange County ROWD Land Development Discussion	Table Participants Laurie Walsh Richard Boon Christina Arias Table Participants
11:30 a.m. - 12:45 p.m.	Lunch	
12:45 p.m.	Water Quality Improvement Plan Development, San Diego County Copermittees Progress Potential Regional Permit Modifications to address Orange County ROWD Recommendations Discussion	Jon VanRhyn, San Diego County Laurie Walsh Table Participants
3:00 p.m.	Closing Comments	Laurie Walsh

ELECTRONIC MAIL LIST SUBSCRIPTION

The San Diego Water Board has established an electronic mail list for information and notices on the reissuance of the Municipal Storm Water Permit through enrollment into the Regional MS4 Permit Order R9-2013-0001 for the County of Orange, the Incorporated Cities of Orange, and the Orange County Flood Control District within the San Diego Region. The San Diego Water Board will use the email lists to notify interested persons of upcoming important events and the availability of on-line documents. Persons interested in receiving future notices and information on this specific project can subscribe to one (1) of the electronic mail lists titled “Orange County MS4 Permit, “ Riverside County MS4 Permit, or “San Diego MS4 Permit ”, located on the San Diego Water Board website at:

http://www.waterboards.ca.gov/resources/email_subscriptions/reg9_subscribe.shtml

Orange County MS4 ROWD and Regional Permit Meeting

Sign in Sheet **July 1, 2014**

Name	Agency/Company Affiliation	Telephone	E-mail Address
Lisa Zawaski	Dana Point	949.248.3584	lzawaski@danapoint.org
Rich Schlesinger	Mission Viejo	949-470 3079	rschlesinger@cityofmissionviejo.org
Mary Vondrak	San Clemente	949-361-8204	VondrakM@san-clemente.org
Tim Klein	Balfour Beatty Const	858 997 4939	tklein@balfourbeattyus.com
W GATERS	SDG&E	(619) 805-5023	WGATERS@SEMPRAUTILITIES.com
Erik Steenblock	City of Encinitas	(858) 943-2108	
Nancy Palmer	Laguna Niguel	949 362 4384	npalmer@cityoflagunaniguel.org

0143664

Orange County MS4 ROWD and Regional Permit Meeting

Sign in Sheet **July 1, 2014**

Name	Agency/Company Affiliation	Telephone	E-mail Address
JAMES O'DAY	Co. of San Diego	(619) 531-4869	James.oday@sdcounty.ca.gov
James Fortuna	County of Orange	714-955-0680	James.Fortuna@ocpw.ocgov.com
LUISA ANDRADE	COUNTY OF ORANGE	714 378 7858	LUISA.ANDRADE@OCPW.OCGOV.COM
Rae Beimer	City of RSM	7147886936	rbeimer@cityofrsm.org
Dave Burhenn	Burhenn & Gest	213-629-8788	dburhenn@burhenngest.com
David Garcia	RCFC & WCD	951 955-1330	dhgarcia@rcflood.org
KATHLEEN McGOWAN	GEOSYNTEC	714 465-1255	KMCGOWAN@GEOSYNTEC.COM
Mikhail Ogawa	City of Del Mar	6199847024	mikhail@mogawaeng.com
Grant Sharp	OC Public Works	714-[illegible] 955-0633	grant.sharp@ocpw.ocgov.com
Alicia Appel	City of Escondido	760-839-4528	aappel@escondido.org
Paul Hartman	Larry Walker Assoc	760 730-9446	paulh@lwa.com
TED VONSTRACK	AMEC	858-514-7741	THEODORE.VONSTRACK@AMEC.COM
ZIAD MAZBOUDI	CSJC	949-234-4413	zmazboudi@sanjuancapistrano.o
HUMZA JAVED	City of Laguna Hills	949-707-2657	hjaved@ci.laguna-hills.ca.us
Rebecca Andrews	Best Best & Krieger	619-525-1392	rebecca.andrews@bbklaw.com

013665

Orange County MS4 ROWD and Regional Permit Meeting

Sign in Sheet **July 1, 2014**

Name	Agency/Company Affiliation	Telephone	E-mail Address
Deborah Carson	City of Mission Viejo	949 470-8458	dcarson@cityofmissionviejo.org
MICHAEL M CSWEENEY	BIA SAN DIEGO	858 450 1221	MMCSWEENEY@BIASANDIEGO.ORG
Moy Yahya	Cities of Aliso Viejo/Laguna Woods	949 2794285	myahya@cityofalisoviejo.com
Jon Van Rhyn	County of San Diego	858-495-5133	jon.vanrhyn@sdcounty.ca.s-
Daniel Apt	RBF	949-390-417	dapt@rbf.com
MIKE PHILLIPS	CITY OF LAGUNA BCH	(949)497-0390	mphillips@lagunabeachcity.net
DEVIN SLAVEN	CITY OF LAKE FOREST	949-461-3436	DSLAVEN@LAKEFOREST.CA.GOV
CHRIS CROMPTON	COUNTY OF ORANGE	714 955-0630	CHRIS.CROMPTON@OCPW.OCGOV.COM

013666

Orange County MS4 ROWD and Regional Permit Meeting

Sign in Sheet **July 1, 2014**

Name	Agency/Company Affiliation	Telephone	E-mail Address
Bryn Evans	Dudek	760 479 4193	bevans@dudek.com
RICHARD BOON	County of Orange	714 955 0670	
Jennifer Shook	County of Orange	714 955-0671	
Christy Suppes	County of Orange	714 955-0673	
Taryn Kjolsing	City of Solana Beach	858-720-2487	tkjolsing@cosb.org
ROGER BUTOW	CLEAN WATER NOW	949-715-1912	ROGERBUTOW@ME.COM
Susan Harden	RBF		sharden@mbakorinth.com
Colin Kelly	OC COASTKEEPER	714 850 1965	COLIN@COASTKEEPER.ORG
Dave Renfrew	Alta Environmental	760-908-5749	david.renfrew@altaenviron.com
MIKE FENNESSY	OC PUBLIC WORKS	(714) 955-0660	MICHAEL.FENNESSY@OCPW.OCGOV.COM
Lisa Kay	Alta Environmental	760 497 6287	lisa.kay@altaenviron.com
MIKE BEANAN	SLCA / LAGUNA BIKEBELT	949.887.7914	MIKE@SOUTHLAGUNA.ORG
Mark Corey	BIA SC-CCWQ	909-525-0623	mycorey@basc.org
Bob Callaghan	Riverside Co		
Jim Meller	Tetra tech	949-809-5113	jimmedkn@hotmail.com
Ryan Burn	County of Orange	714-834 3300	
Tracy Ingebrigtsen	Laguna Beach	949.497.0781	tingebrigtsen@lagunabeachcity.net
Ruth Kolb	City San Diego	858-541-4328	rkolb@sandiego.gov
JOE AMES	CITY OF MISSION VIEJO	949-470-8419	james@cityofmissionviejo.org

0439667

Orange County Phase I Municipal Storm Water Permit Reissuance

Tentative Schedule

- Orange County Submit ROWD- **May 2014**
- Meeting Orange County Copermittees Discuss ROWD- **June 24, 2014**
- Focused Meeting Orange County Stakeholders- **July, August 2014**
- Release Draft Permit Amendment – **September/October 2014**
- Board Workshop- **October 2014**
- End Comment Period **October 2014**
- Orange County Permit Expires –**December 2014**
- Responses to Comments- **December 2014 to January 2015**
- Adoption Hearing-**February 2015**

OC Public Works
Integrity, Accountability, Service, Trust

013669

Orange County – Report of Waste Discharge

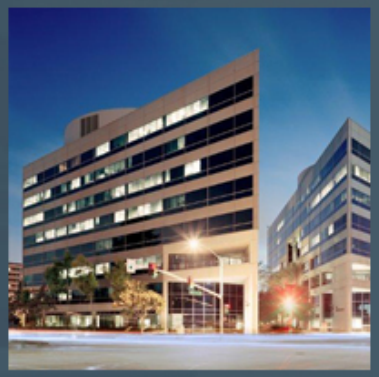

July 1, 2014

Landscape Change

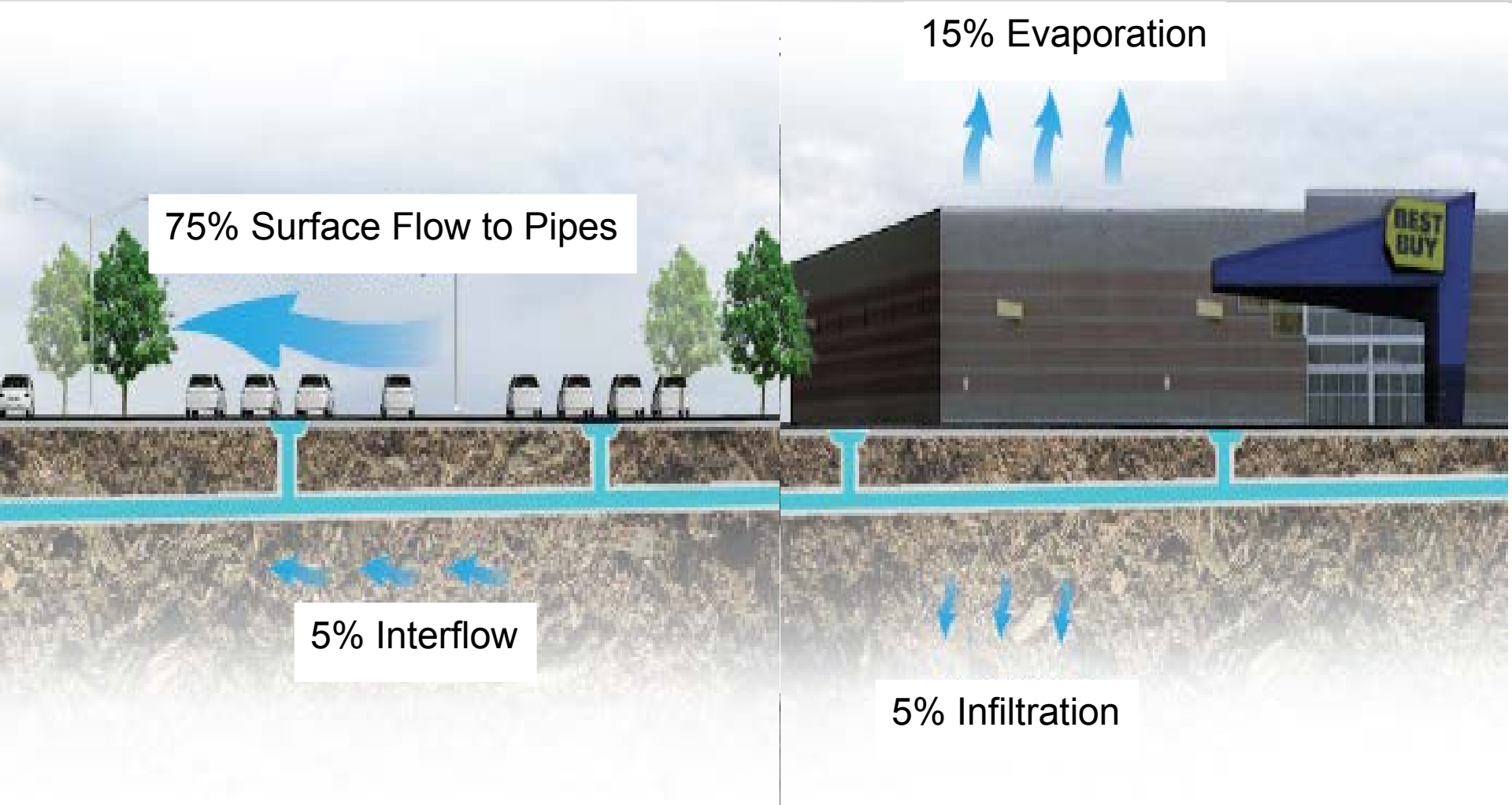

Stormwater and Land Use Change

There are four interrelated but separable effects of land-use changes on the hydrology of an area: changes in peak flow characteristics, changes in total runoff, changes in quality of water, and changes in the hydrologic amenities.

Luna Leopold, 1968

Municipal Stormwater Permits

The federal Clean Water Act requires that stormwater permits for discharges from municipal storm sewers:

- may be issued on a system- or jurisdiction-wide basis;
- shall include a requirement to effectively prohibit non-stormwater discharges into the storm sewers; and
- shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, <u>and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants.</u>

1990

1996

2003

2009

2014

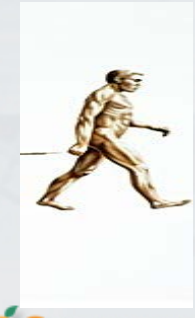

Report of Waste Discharge

013673

Report of Waste Discharge

Submitted by

The County of Orange, Orange County Flood Control District and Cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Lake Forest, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano

May 20, 2014

State of the Environment

- Four key questions:
  - Is our water safe to drink?
  - Is it safe to swim in our waters?
  - Is it safe to eat fish and shellfish from our waters?
  - Are our aquatic ecosystems healthy?

Prioritization

- Raw exceedance frequencies provide only partial information
- CCME water quality index[1] integrates
  - Percent of indicators with exceedances
  - Percent of measurements/tests with exceedances
  - Magnitudes of exceedances
- Index produces a score from 0 – 1 (or 0 – 100) with higher scores reflecting lower overall exceedances
- Used widely (e.g., Central Coast Regional Board)

[1] Canadian Council of Ministers of the Environment . 2001. Canadian water quality guidelines for the protection of aquatic life: CCME Water Quality Index 1.0, Technical Report. In: Canadian environmental quality guidelines, 1999, Canadian Council of Ministers of the Environment, Winnipeg.

CCME Index

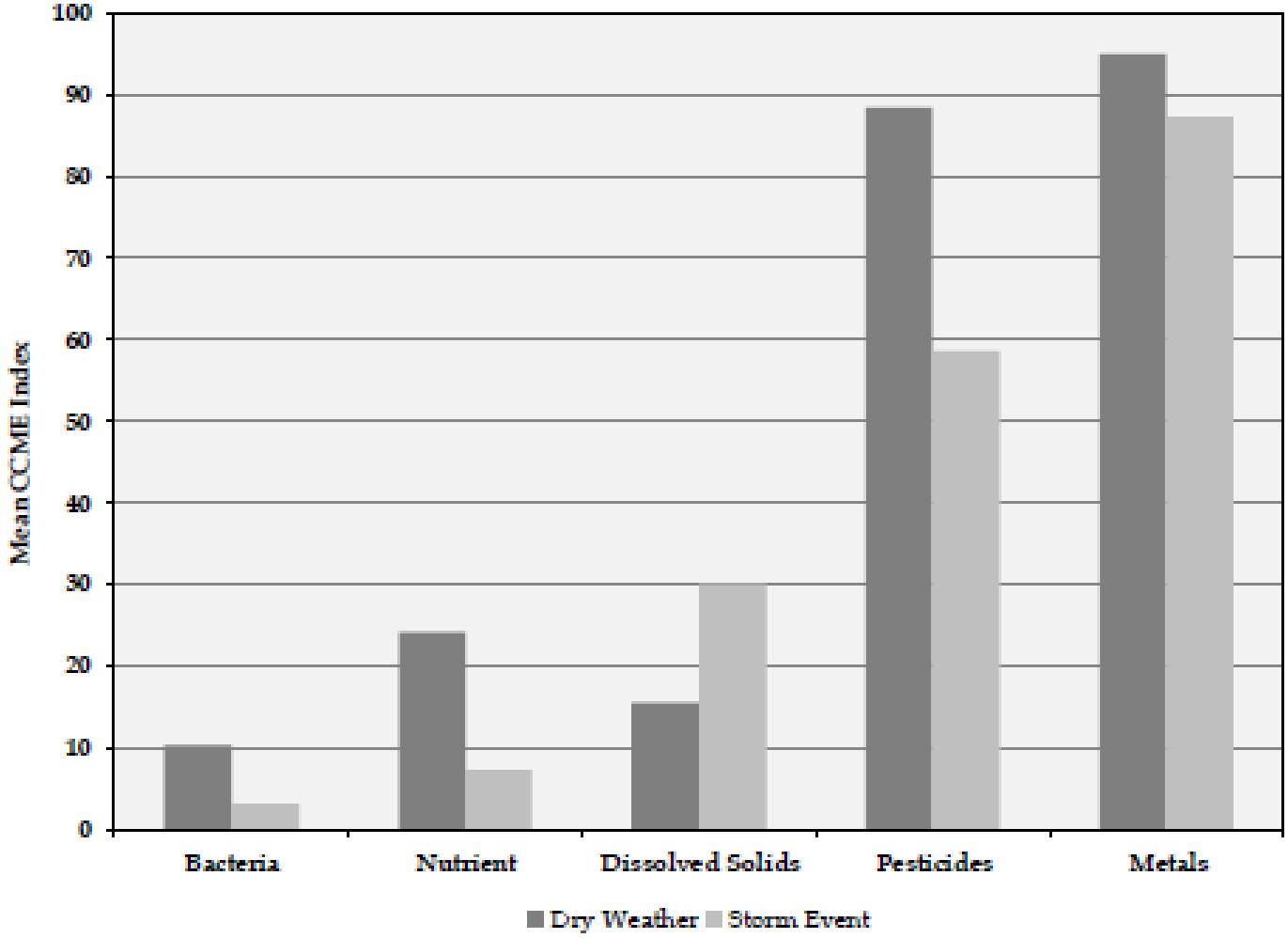
100
90
80
70
60
50
40
30
20
10
0
Mean CCME Index
Bacteria
Nutrient
Dissolved Solids
Pesticides
Metals
Dry Weather
Storm Event

BACTERIA

Bacteria: Report Card Grades

013678

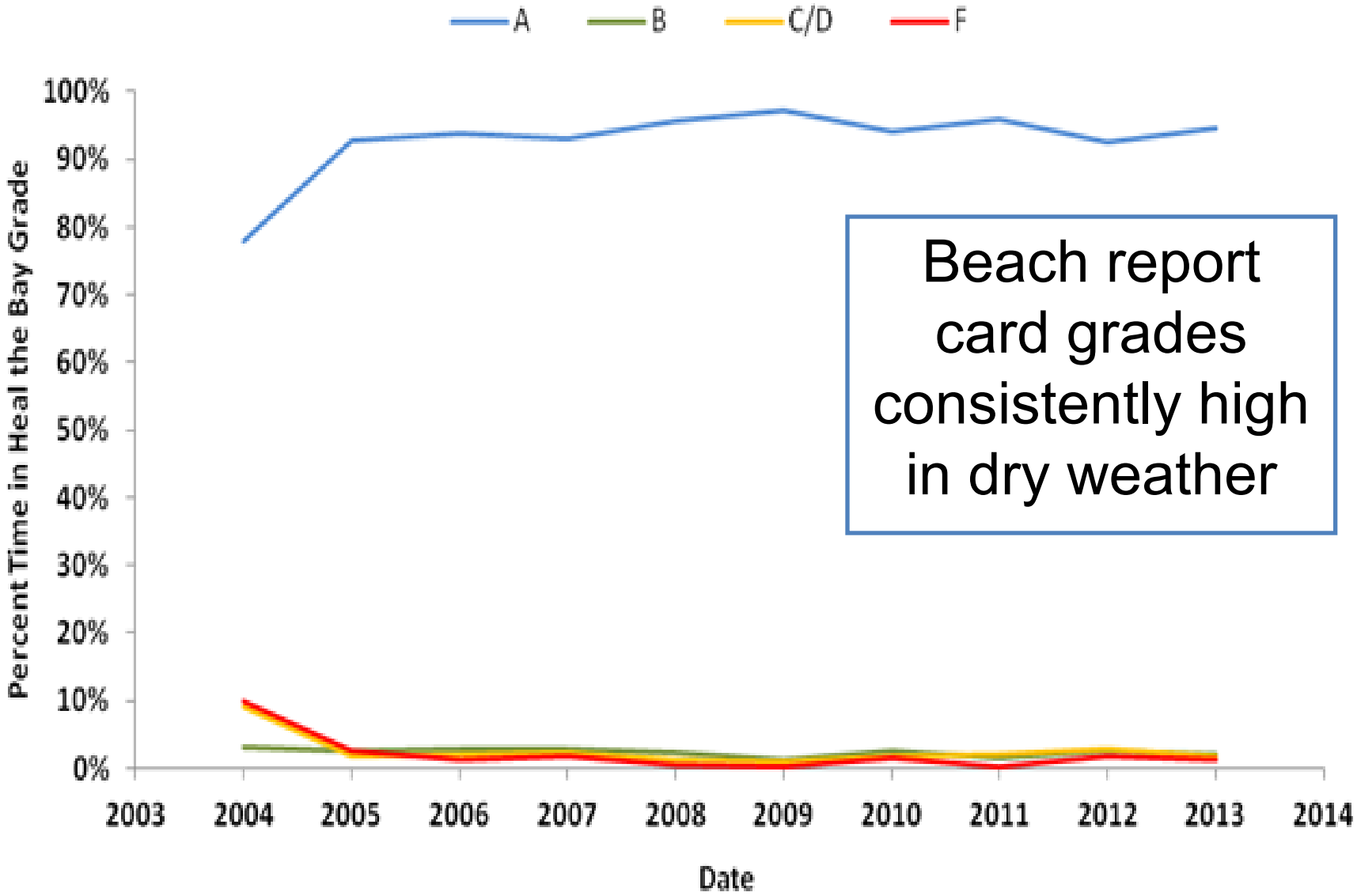

Beach report card grades consistently high in dry weather

Bacteria: Beach Closures

013679

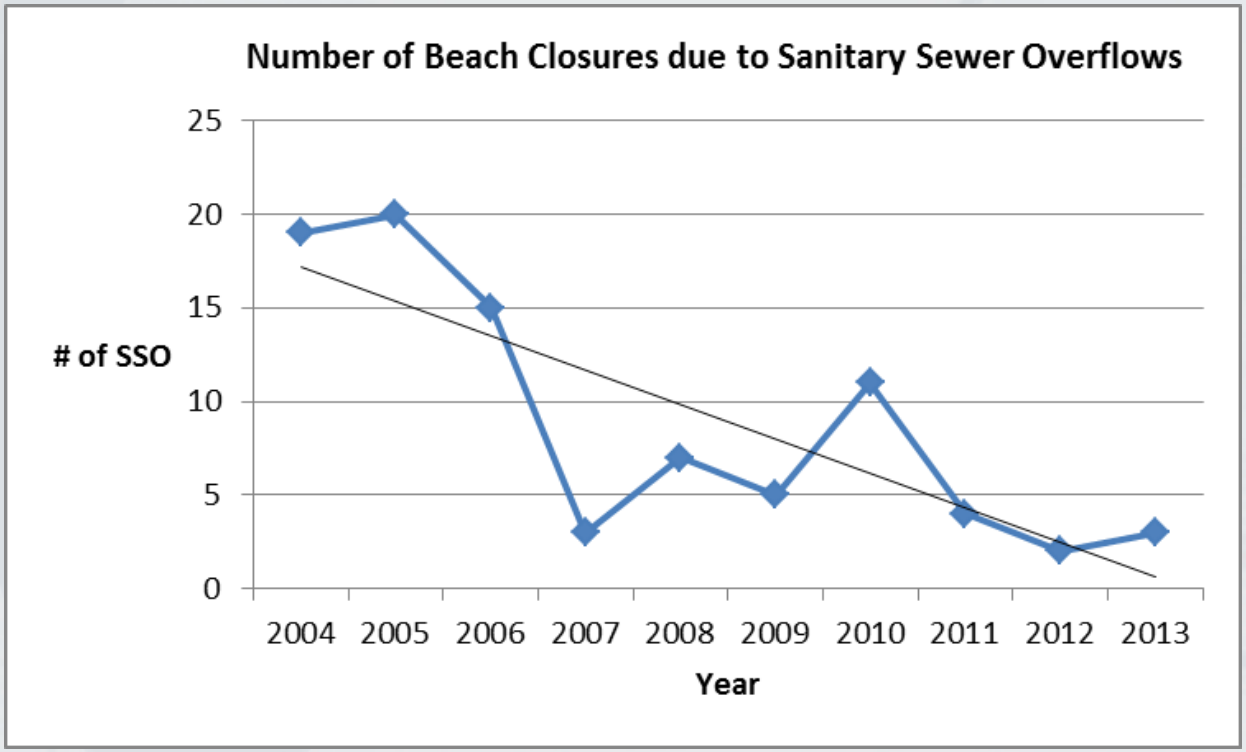

Bacteria: Beach Advisories

013680

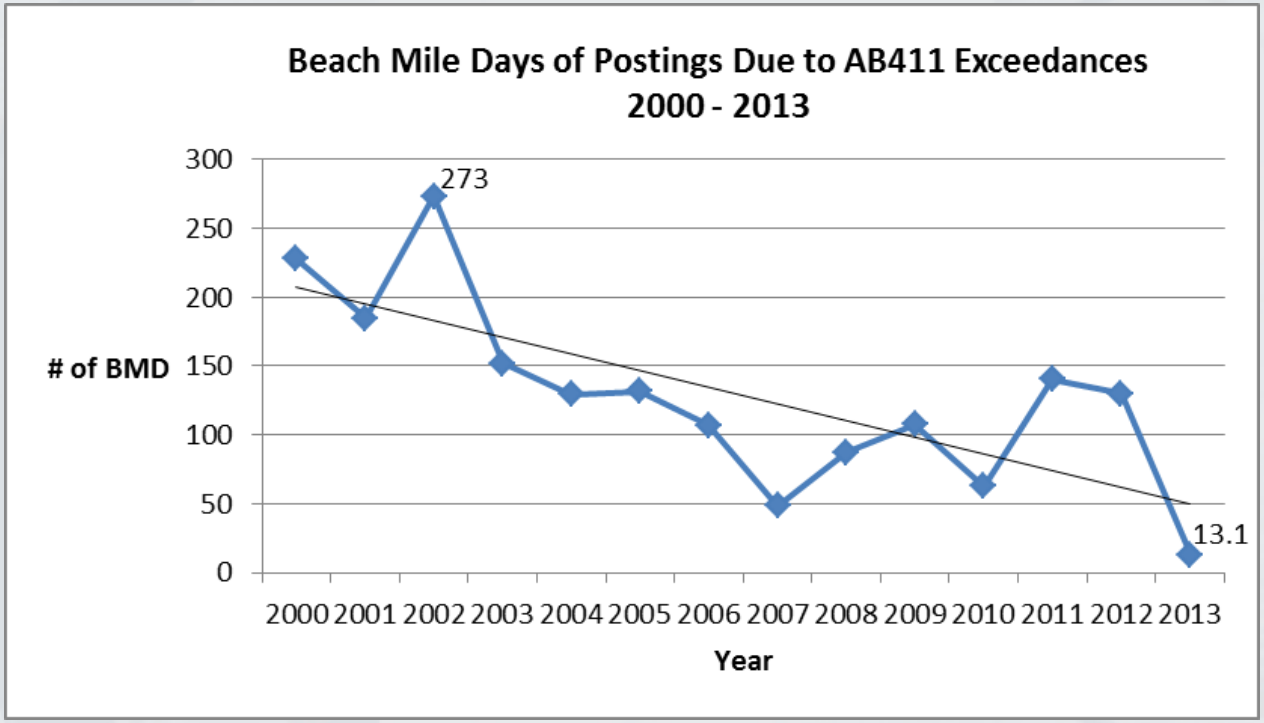

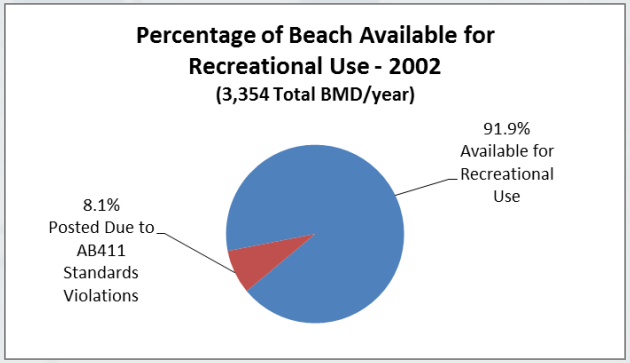

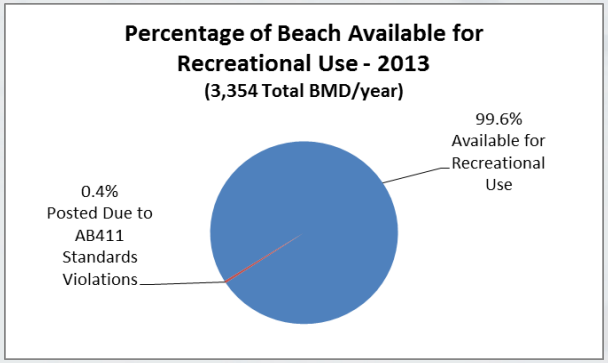

OC Public Works

Bacteria: Sanitary Sewer Overflows

013681

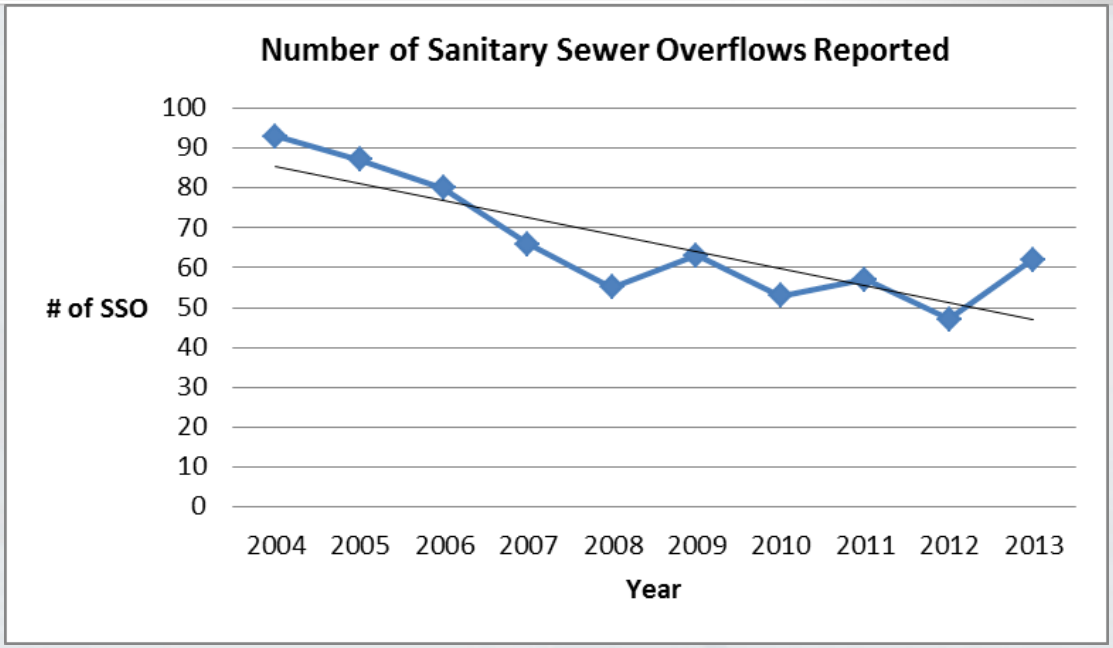

OC Public Works

Bacteria: CASC

013682

Incident Triggering CASC Activation	Receiving Waters	Date	Type	Volume Diverted to Sanitary Sewer (Gallons)
Sanitary sewer force main rupture	Tijeras Creek/San Juan Creek/Doheny Beach	March 23, 2010	SSO (public)	2,500,000
Mobile home community, Lake Forest	Aliso Creek	June 25, 2010	SSO (private)	2,400
Sanitary sewer force main rupture	Buck Gully Creek/Little Corona Beach	July 2 , 2010	SSO (public)	710,000
Manufacturer corporate HQ, Irvine	Peters Canyon Channel	January 13, 2011	Other (fountain discharge)	100,000
Residential apartment complex, Anaheim	Santa Ana River	April 12, 2012	SSO (private)	1,900
Residential apartment complex, Anaheim	Santa Ana River	April 18, 2012	SSO (private)	77,500
Packaging products manufacturer, Buena Park	Fullerton Creek/Coyote Creek/San Gabriel River	July 25, 2012	Other (clarifier discharge)	355,000
Ammonia refrigeration leak, Santa Ana	Santa Ana Delhi Channel	February 4, 2013	Other (ammonia discharge)	200
Industrial chemical facility fire, Santa Ana	Greenville-Banning Channel	August 28, 2013	Other (fire suppression runoff)	~3,000,000
Sanitary sewer pump station failure, Newport Beach	Santa Ana-Delhi Channel/Upper Newport Bay	August 31, 2013	SSO (public, mixed with channel water)	45,000
Hotel facility HVAC system discharge	Lane Channel	December 16, 2013	Other (HVAC discharge w/ dye)	140,000
			Total:	6,932,000

Bacteria: Dry Weather Diversions

013683

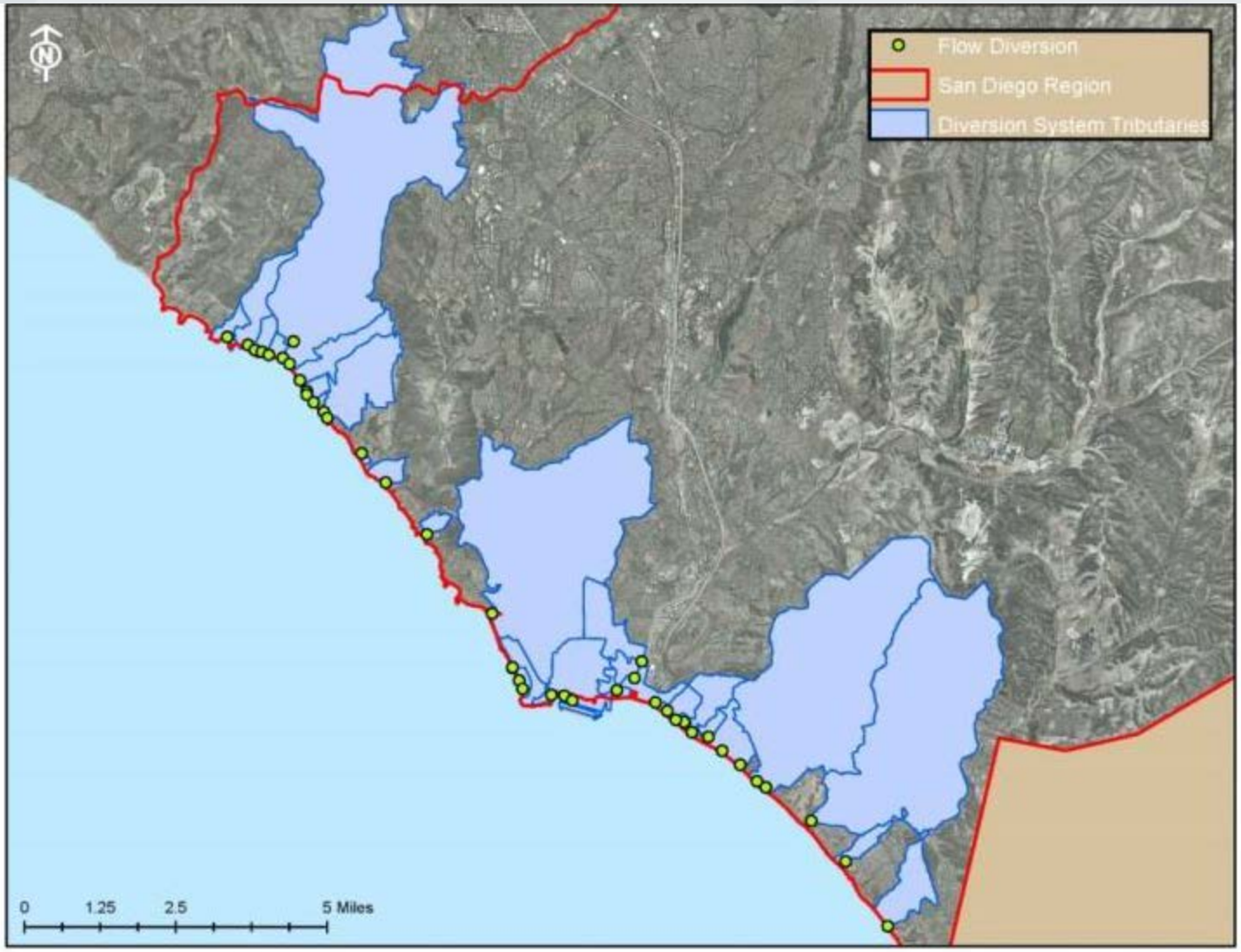

OC Public Works

Bacteria: Wet Weather Challenges

013684

- Poorer conditions
- Larger flows
- Potential for new methods
  - Wet weather epidemiology study
  - Source tracking tools, including for in situ virus detection

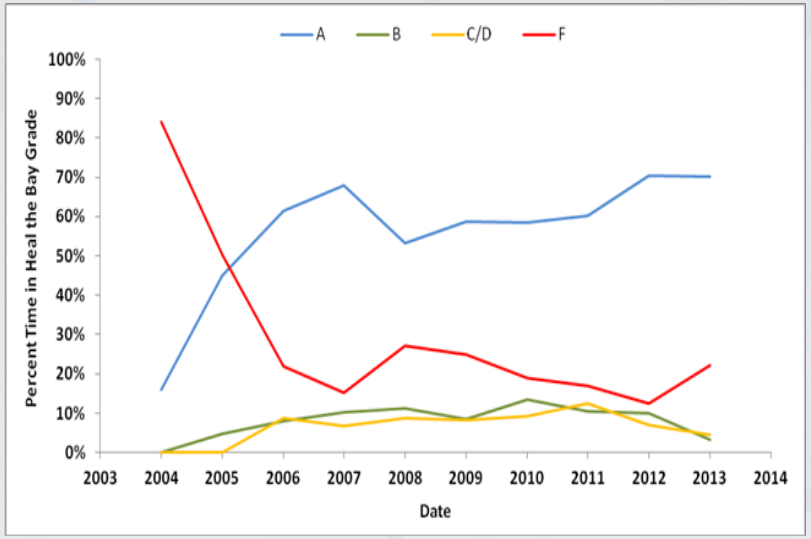

OC Public Works

Bacteria: TMDL Programs

Bacteria TMDL Programs

- Seeing significant dry weather progress through BMPs and water conservation/flow reduction efforts

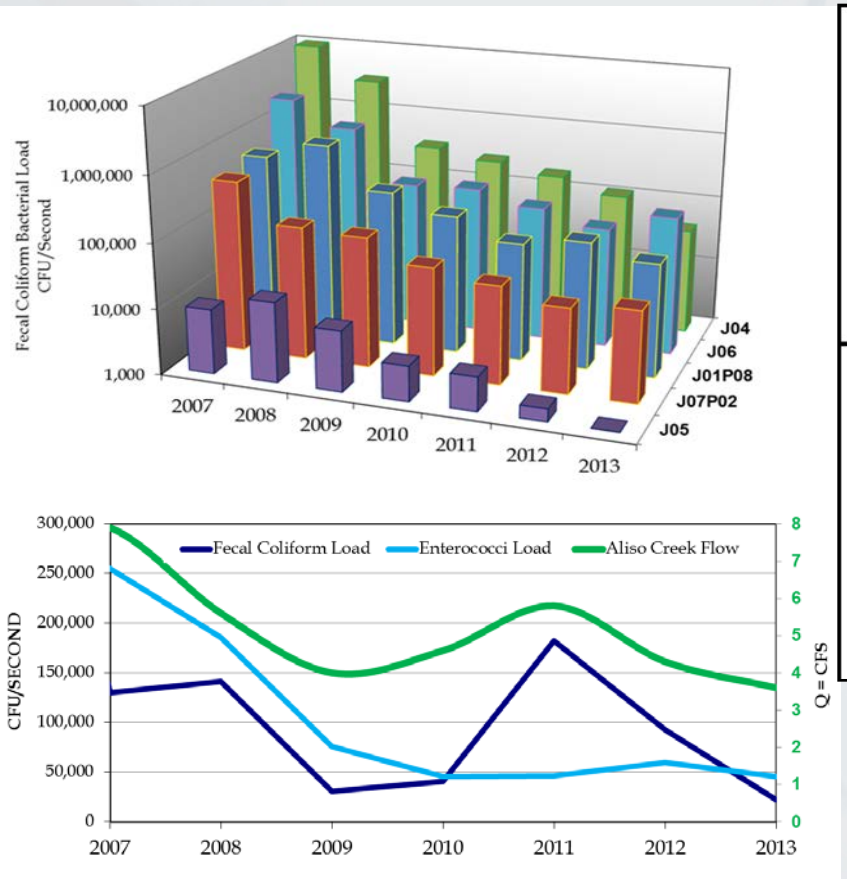

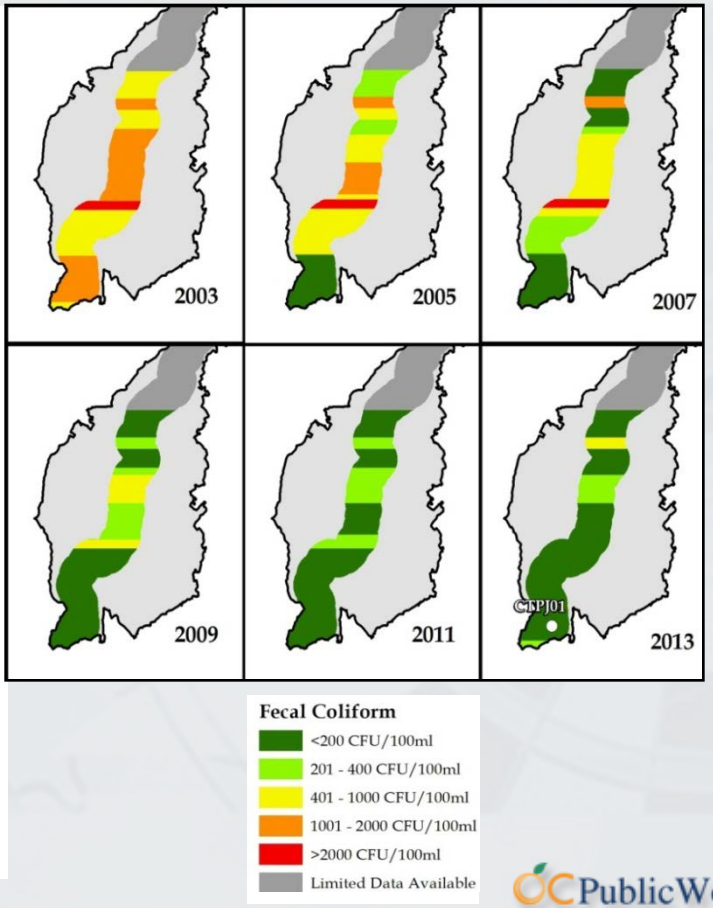

Bacteria: CLRP BMP Effectiveness Study

013686

- Horno Retarding Basin (2003)
  - Designed to reduce peak flows from ~1,800 acres of the Ladera Ranch Planned Community
  - Includes Water Quality Detention Basin (~8 acres) to treat dry weather and first-flush flows (up to 265 cfs)

- Narco Channel Restoration (2005)

- 1000ft of existing rock/earthen channel dredged and widened and revegetated with native plants

Bacteria: CLRP BMP Effectiveness Study

013687

➔ BMP Effectiveness - Bacteria Reductions (Enterococci)

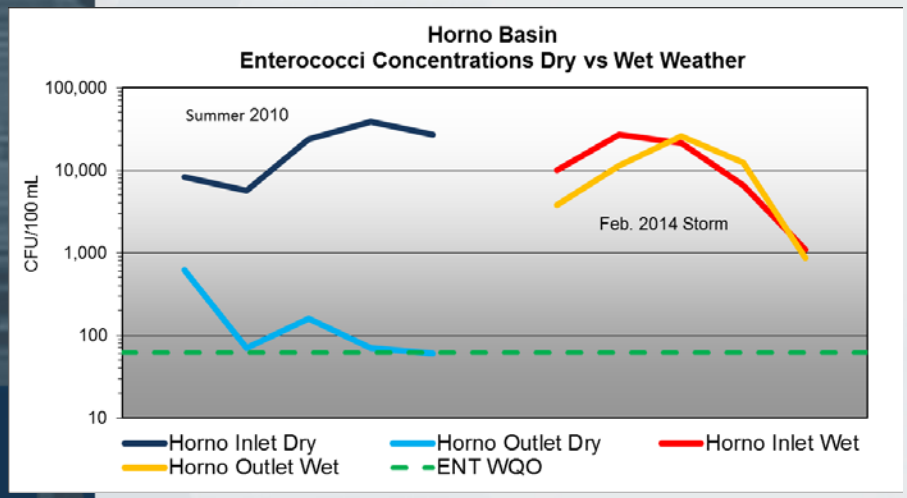

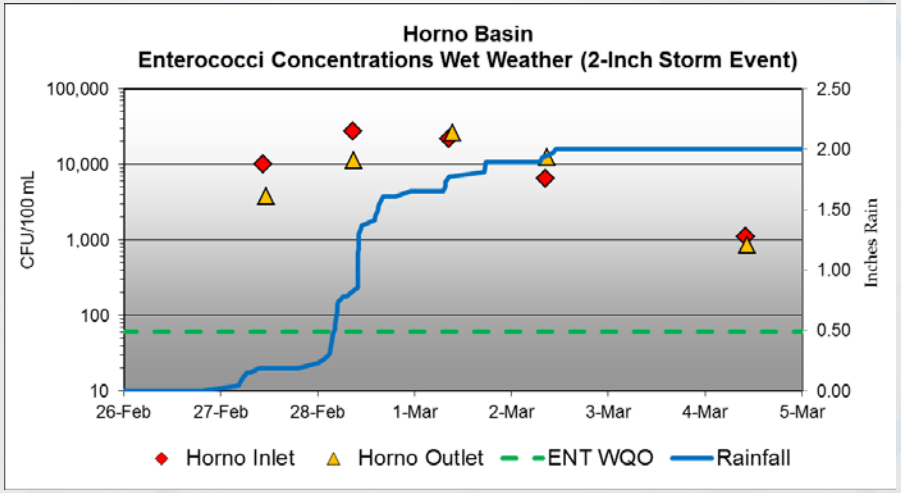

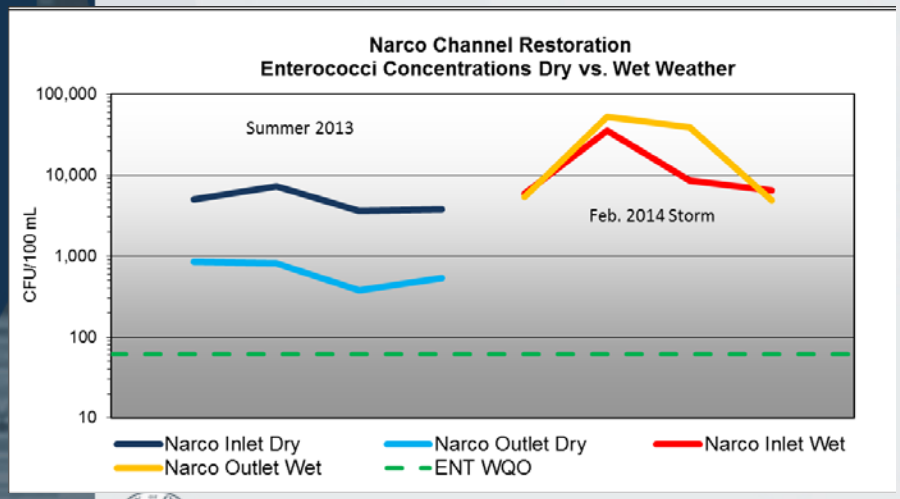

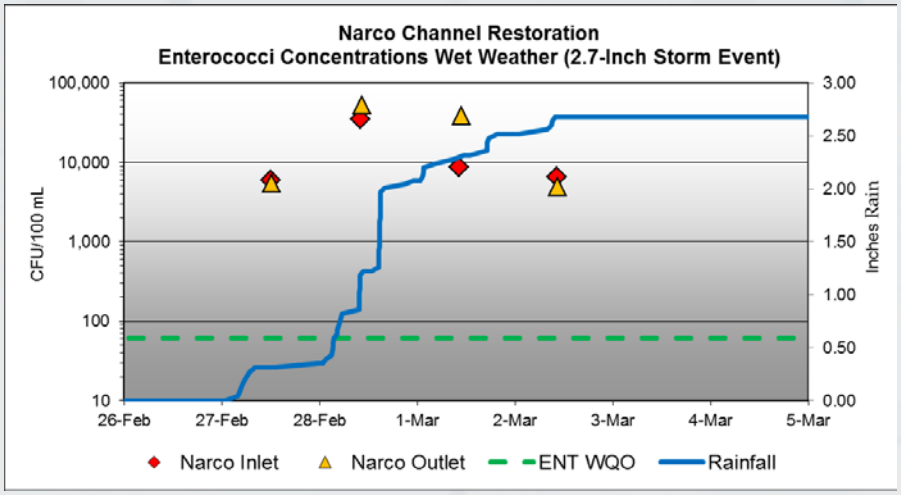

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Bacteria: Summary

- BMPs and overall flow reductions resulting in significant reductions in dry weather
- Successful dry weather bacteria BMPs appear ineffective in providing meaningful wet weather reductions
- Microbial source tracking may be useful tool assist with isolating remaining bacteria sources causing exceedances
- Overall reduction in the number of sewage spills correlates with lower number of beach closures and increased recreational water use. (Countywide Area Spill Control Program – CASC)
- Decrease in the total number of beach mile days posted due to AB411 standards violations has increased beneficial use. Example: Doheny

NUTRIENTS

Nutrients: A Regional Problem

013690

- Exceedances widespread
- Algal overgrowth less so but occurs in undeveloped areas as well
- May contribute to harmful algal blooms

Nutrients: Summary

- Nonpoint and diffuse sources such as leaching from upland soils and intrusions from shallow groundwater are increasingly important.
- Nutrients can be readily transported in and out of various reservoirs (e.g., sediments, groundwater) and undergo complex biological transformation and cycling, making traditional pollutant control strategies less effective for nutrients.
- Improved management strategies may contribute to further progress, particularly in streams and channels, by accounting for site-specific conditions, promoting Low Impact Development, and accounting for broader regional sources.

TOXICITY

Regional Toxicity Patterns

013693

- Toxicity widespread but sporadic and at low levels
- No apparent trends over time

	% Stream Miles	
Ceriodaphnia Reproduction	Open	Urban
Toxic	63.0	37.4
Nontoxic	37.0	62.6

Pesticides Most Likely Cause

013694

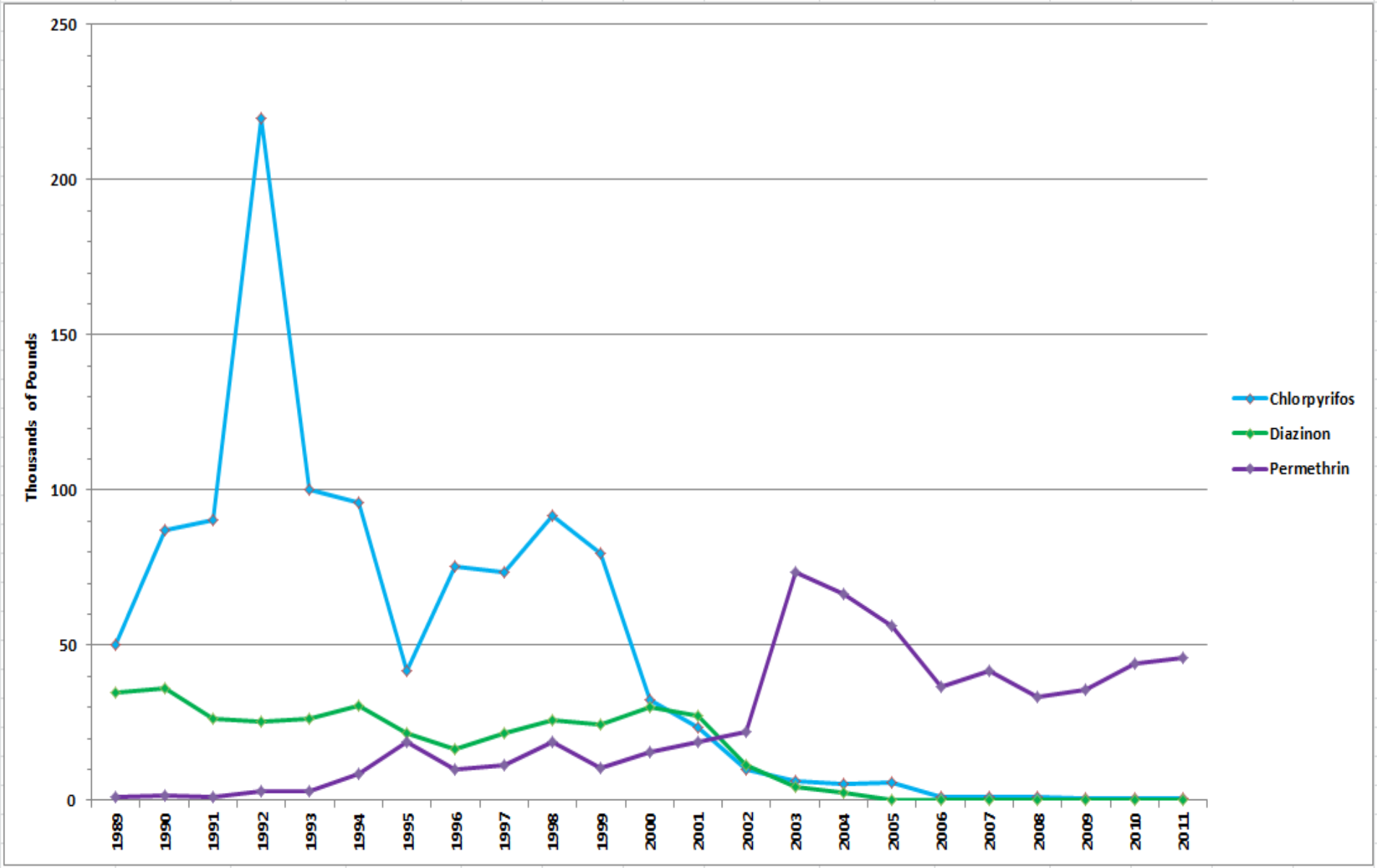

Source Control: Pesticides

Summary of Toxicity - California Watersheds – SWRCB – 2010

- Of the 992 sites,48% had at least 1 sample which exhibited toxicity
- With the exception of ammonia, all evaluations implicated pesticides, primarily OPs and more recently pyrethroids.

Analysis by U.C. Davis of new DPR rule making suggests that the regulations will largely--but not completely--end widespread water and sediment toxicity from pyrethroids in California's urban watersheds (Kelly Moran pers.comm.).

Toxicity: Summary

- Pesticides are contributing to chronic toxicity;
- Need to improve information on pesticide use.
- Support source control approaches.
- Metals are not an issue.
- Geochemistry.

DISSOLVED SOLIDS

DISSOLVED SOLIDS: PRIMARY ISSUES

013698

- Persistent and widespread exceedances of total dissolved solids occur in channels and at discharge outfalls.

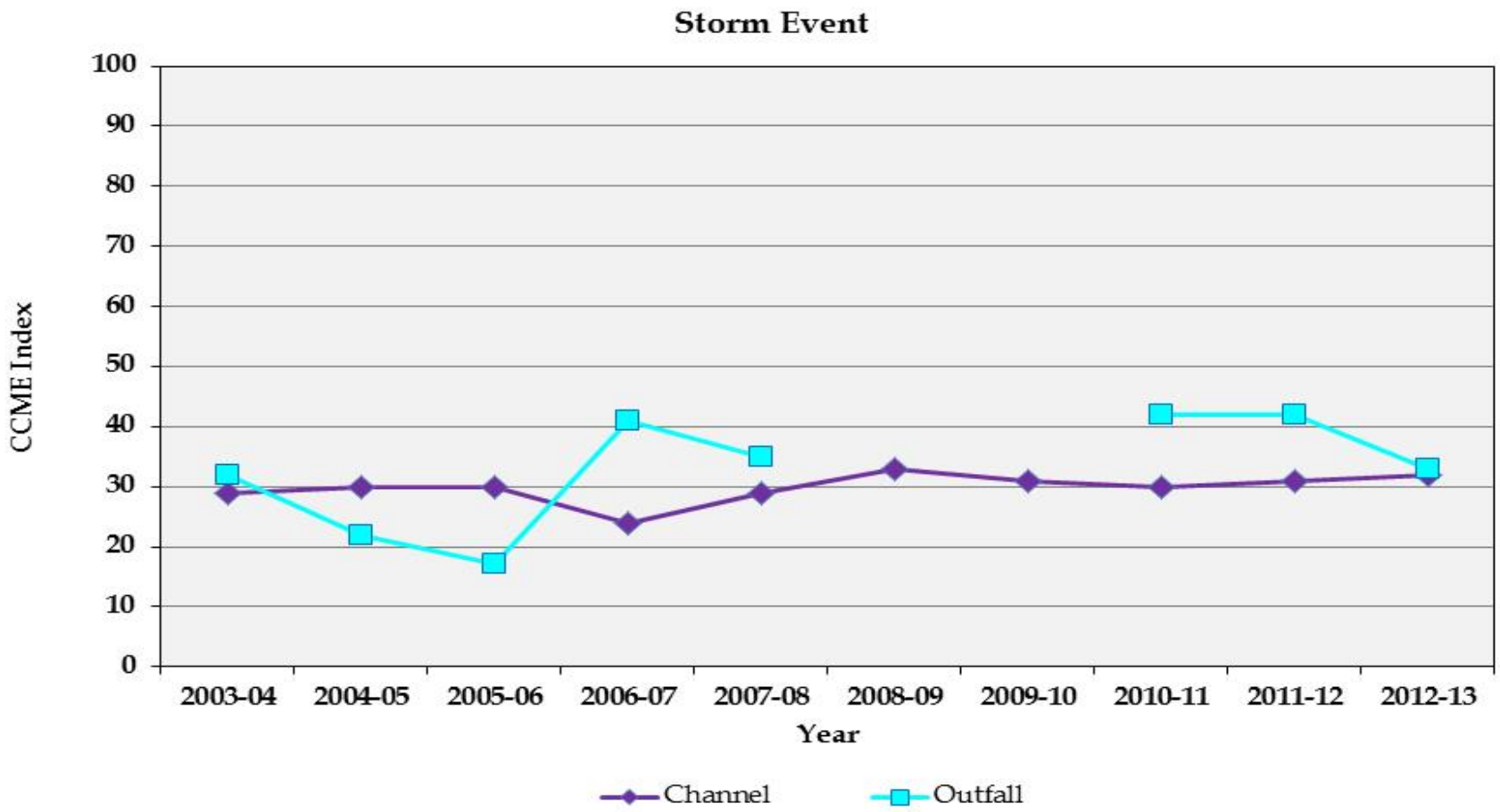

DISSOLVED SOLIDS: SUMMARY

013699

- Natural sources in regional groundwater represent a large portion of elevated dissolved solids.
- Understanding local geology is key to understanding sources of dissolved solids and the pathways they travel in the watershed.
- While the flood control system provides one pathway for dissolved solids in groundwater to reach the surface, other natural pathways (such as artesian springs) exist and there is evidence of historically elevated dissolved solids levels in surface water in the region.
- Determine significance of TDS as a stressor.
- Investigate feasibility of mass balance study.

DRY WEATHER RECONNAISSANCE & ID/IC

ID/IC Complaints & Enforcement

013701

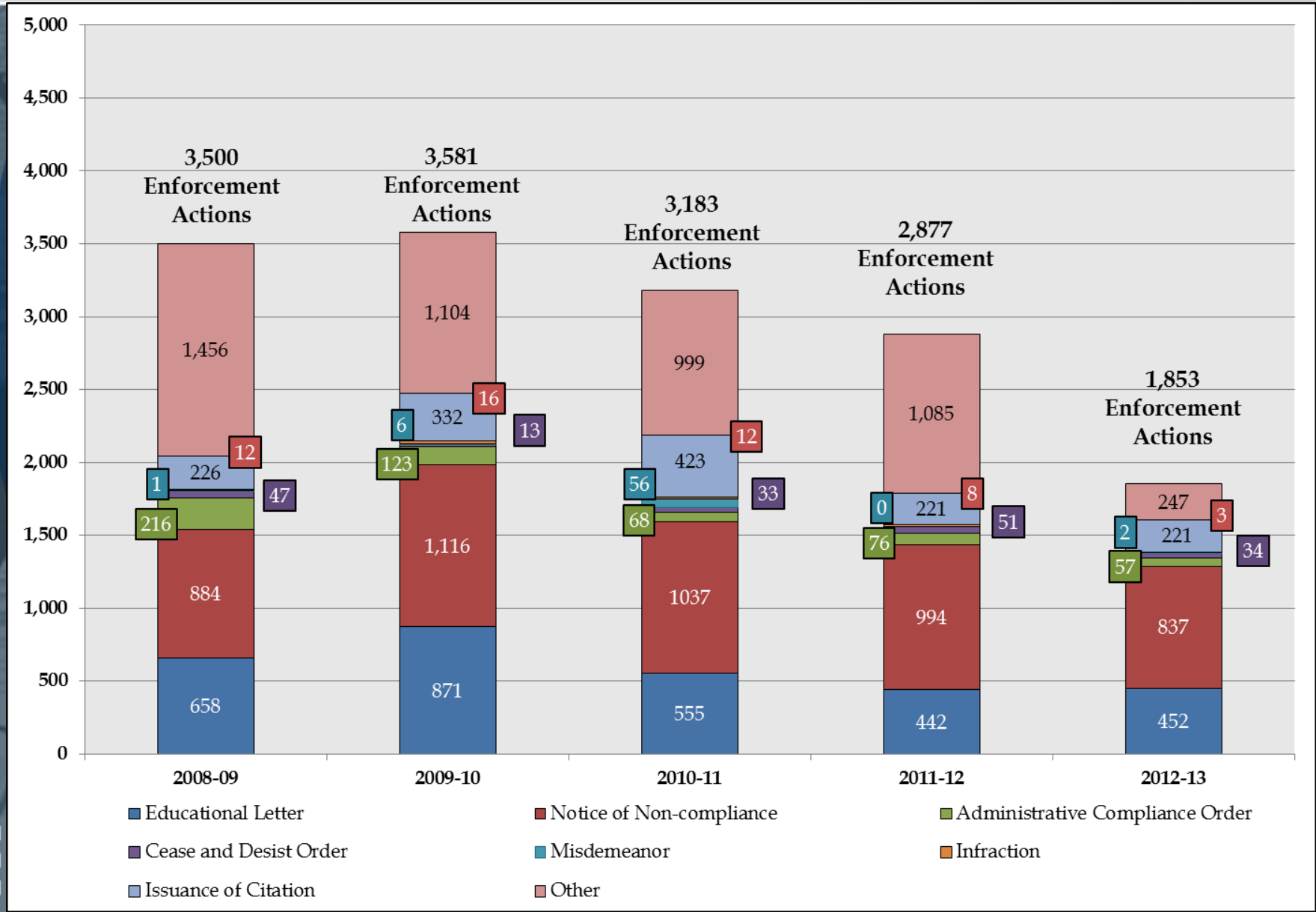

Dry Weather Reconnaissance: NALs

013702

NALs vs. Als (Dry Weather)

Constituent	# of NAL Exceedances	% of NAL Exceedances	# of Reconnaissance Action Level Exceeedances	% of Reconnaissance Action Level Exceeedances
	2011-2012		2009-2010	
pH	1	2	0	0
TDS	42	93	0	0
Dissolved Oxygen	2	4	0	0
Turbidity	3	7	3	1
Surfactants	3	7	14	5
Total Coliforms	24	53	0	0
Fecal Coliforms	19	42	0	0
Enterococcus	42	93	0	0
Unionized Ammonia	3	7	8	3
Total Nitrogen	41	91	0	0
Total Phosphate	38	84	11	4
Cadmium	13	28	0	0
Copper	1	2	0	0
Nickel	7	15	0	0
Zinc	1	2	0	0
Total # of Site Visits	**45**		**274**	

Table 3.7.1. Comparison of the 2011-12 NALs Data with the Weather Hybrid Reconnaissance Monitoring Program Data for the 2009-10 Reporting Period

OC Public Works

Dry Weather Reconnaissance: Summary

NALs Program Summary:

- The current NALs program has made achievements in reducing anthropogenic sources of NALs constituents, but lacks the flexibility to re-prioritize sites or reach definitive endpoints.
- Source investigation resources are therefore confined to a limited number of outfall sites Countywide.
- Groundwater, geologic conditions, and other related discharge sources are an ongoing challenge to meeting the NALs utilizing the current Basin Plan Objectives.
- The current NALs program does not account for evaluating impacts to receiving waters, which could be utilized in a potential site prioritization program.

Dry Weather: Recommendation

013704

- NALs Program Summary:
  - Reinstate Dry Weather Reconnaissance Program

Hydromodification

013705

Prima Deshecha Watershed - 1947 vs. 2012 Alignment
San Diego Regional Water Quality Control Board

Hydromodification

013706

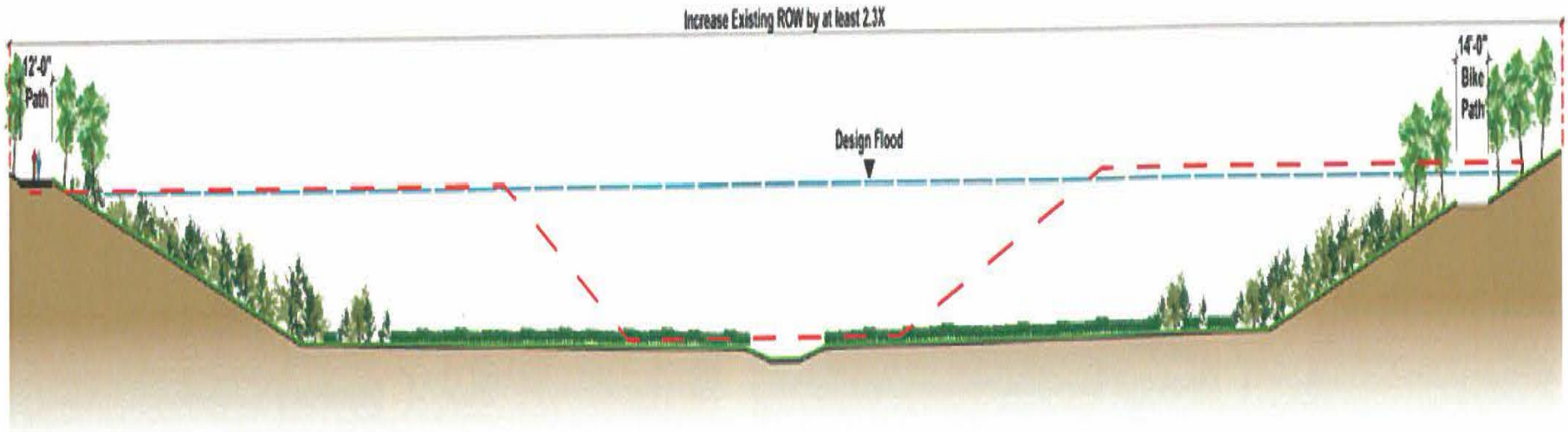

70% GREEN
APPROX. 5 X EXISTING CAPACITY

Expansion in channel capacity needed to make the River's surface area 70-percent green.
The approximately "5 times the current width" illustration is meant to illustrate the width that could be necessary if only the channel were widened

Hydromodification: Recommendation

- Implement an approach to hydromodification that is (pre)informed by a watershed analysis and channel-specific protection goals.
- Pending completion of the analysis, land development projects discharging to engineered channels are exempted from requirements.

LID Hierarchy

Figure 7.II-5: WQMP Development Process Flow Chart for South Orange County

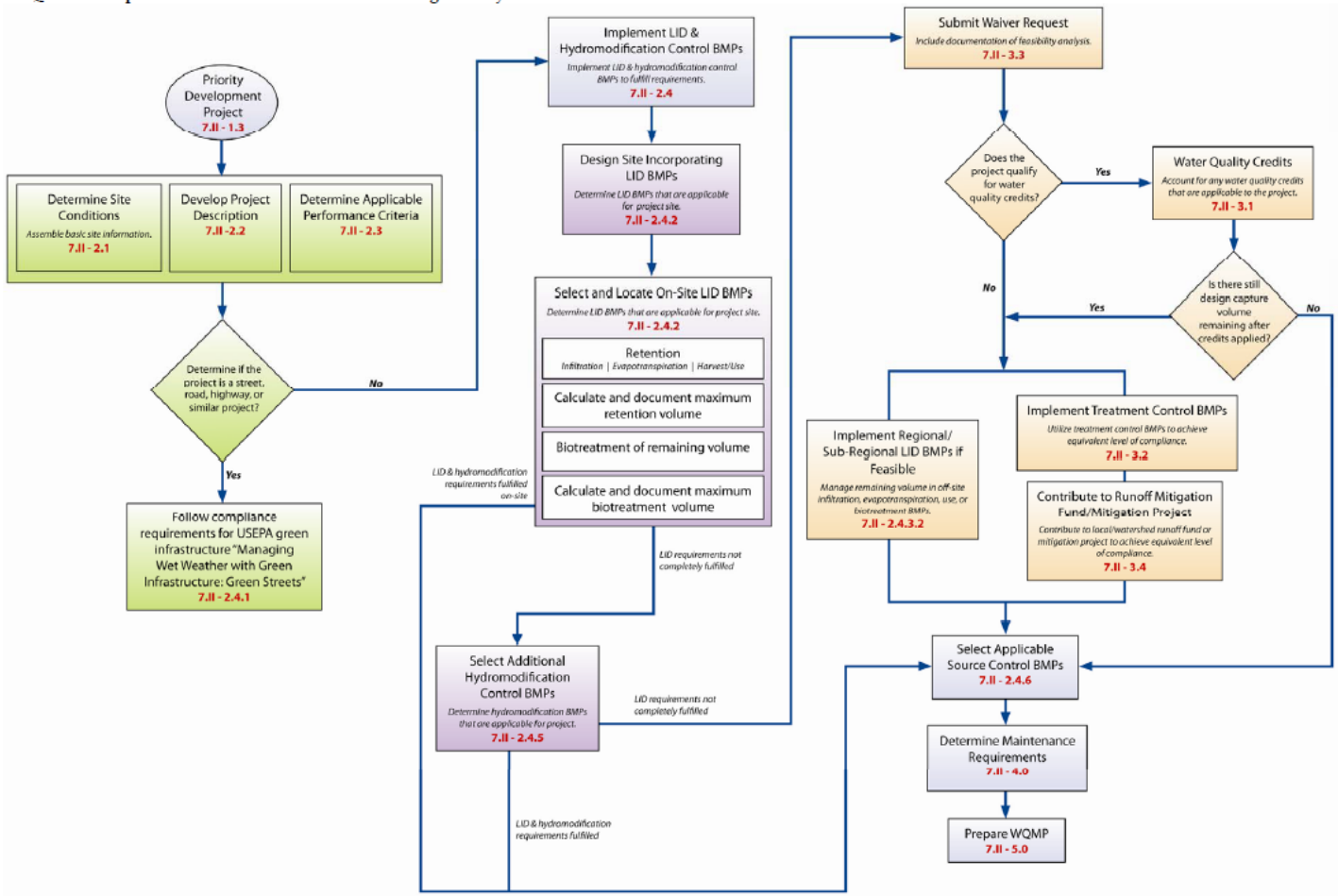

Note: Model WQMP sections shown in red

Runoff Retention - Soils

013709

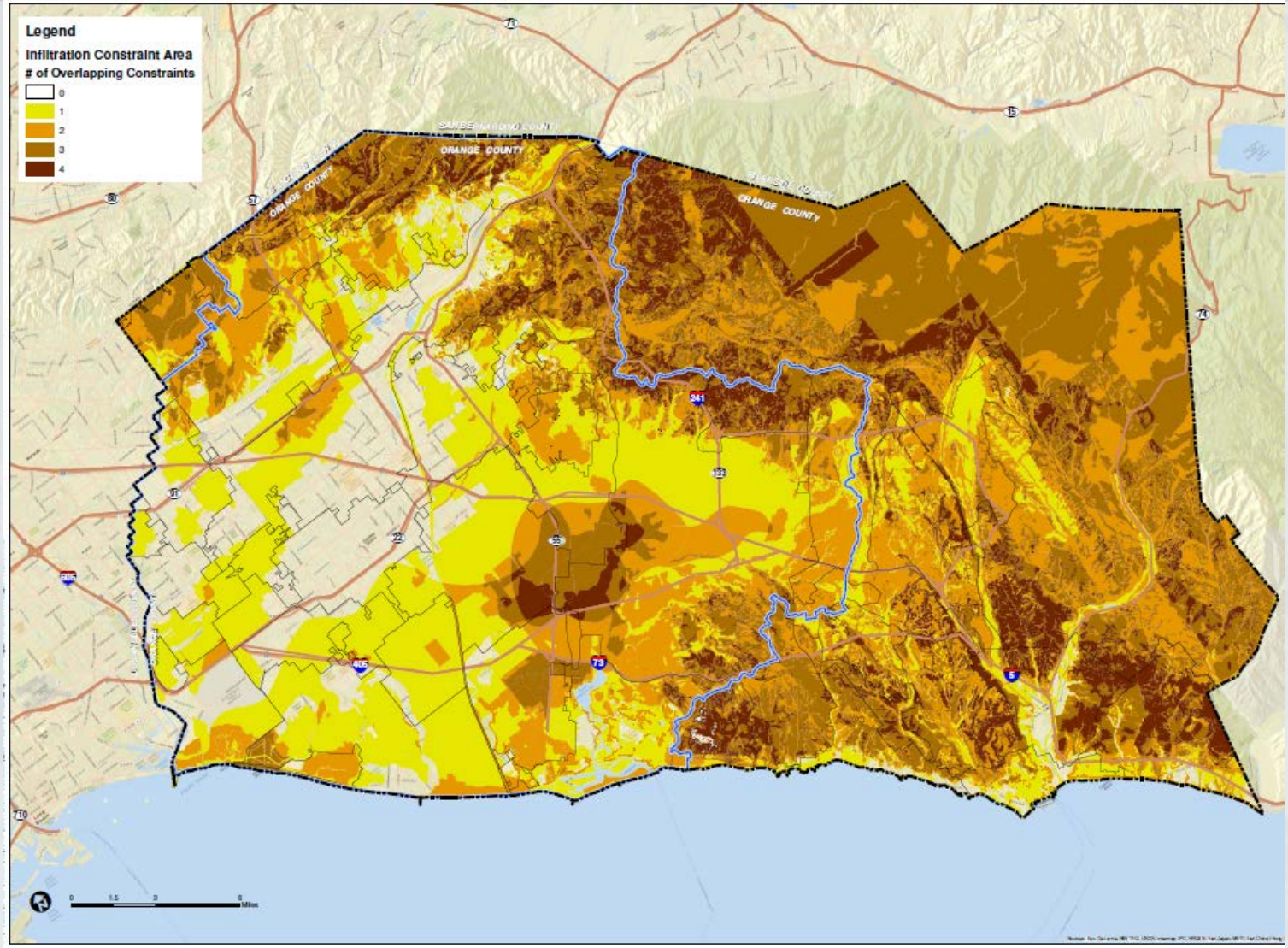

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LID Hierarchy: Recommendation

013710

- Incorporate Integrated Water Resource Management (IRWM) element into land planning.
- Modify LID Hierarchy to establish equivalency of “On-Site BMP” and “Off-Site BMP” solutions.

Receiving Water Limitations (RWL)

013711

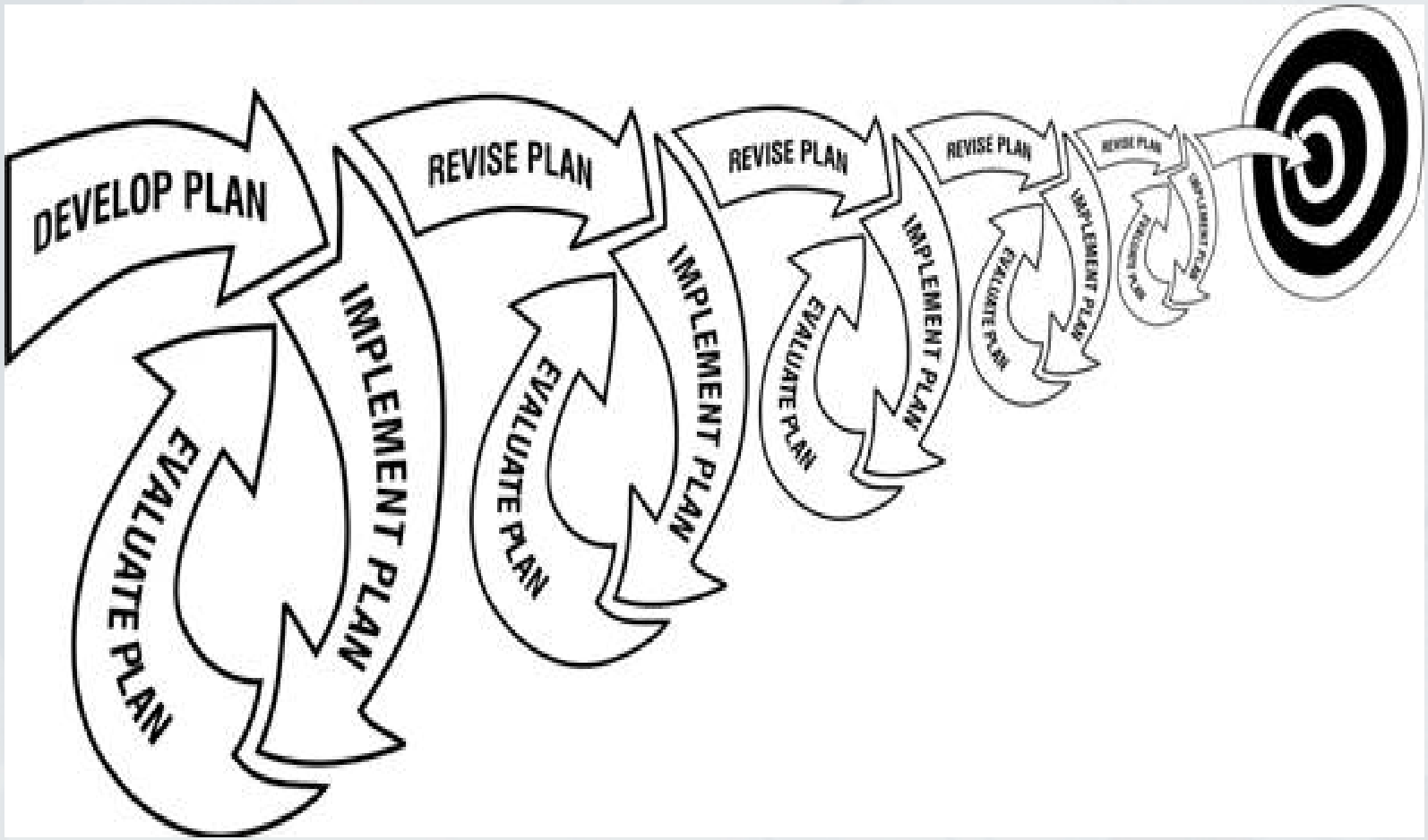

RWL: Recommendation

A.1 Discharge Prohibition

A.2 Receiving Waters Limitation

B.3.c Compliance Option

Questions (?)

013714

Land Development Planning Requirements R9-2013-0001

Christina Arias, P.E.
Water Resource Control Engineer
San Diego Water Board

Goal of Provision

Implement strategies to reduce the discharge of pollutants in storm water caused by land development to the maximum extent practicable (MEP)

Requirements for…

- ALL Projects
- Priority Development Projects (PDPs)

Example Requirements, ALL Projects(where applicable)

- Source Control
  - Storm drain signage
  - Cover trash storage areas
- Low Impact Development (LID)
  - Conservation of natural areas
  - Minimization of impervious footprint
  - Use of permeable materials

Priority Development Projects

- Exceeds square footage threshold and/or supports specific uses
- Exemptions:
  - **Sidewalks, bike lanes, trails** that are hydraulically disconnected from paved streets, drain to vegetated areas, or use permeable surfaces
  - Retrofitting of **streets** designed and constructed in accordance to Green Streets guidance

PDP Sizing Requirements

- Storm Water Pollutant Control BMP Requirements
- Hydromodification Management BMP Requirements (Flow Control)

Pollutant Control

- Retain onsite 85th percentile runoff (infiltrate, evaporate, evapotranspirate, harvest and use)
- Biofiltration if infeasible to retain runoff
- Flow-thru treatment control BMPs AND mitigate offsite for the volume not retained onsite, if infeasible to retain or biofiltrate

Pollutant Control BMP Hierarchy

Retain 85 percentile runoff

Biofiltrate (oversized)

Flow-thru treatment control AND offsite mitigation

Hydromodification Management

- BMPs for flow control where there is potential for erosion of creek bed and bank
- Post-project runoff condition must not exceed pre-development runoff condition
- Avoid critical sediment yield areas

Hydromodification Management

- Exemptions:
  - Underground drain to lake, bay, Pacific Ocean
  - Concrete lined channel from point of discharge to lake, bay, Pacific Ocean
  - Other areas identified in Optional Watershed Management Area Analysis

Watershed Management Area Analysis

- Characterization of watershed
  - Description of dominant hydrologic processes, current and future land uses
  - Locations of streams, channel structures
- List of "Candidate Projects" to be used for Alternative Compliance (offsite mitigation)
  - Can be used ***in lieu of*** implementing BMPs onsite

Candidate Projects

- Stream rehabilitation
- Retrofitting existing infrastructure
- Regional BMPs
- Groundwater or water supply augmentation
- Land purchases to retain floodplain functions

How To Utilize Alternative Compliance?

- Copermittees must perform Watershed Management Area Analysis
- Voluntary agreement between PDP and Copermittee
- “Greater” water quality benefit by mitigating for impacts offsite than implementing BMPs onsite

Pollutant Control BMP Hierarchy

Retain 85 percentile runoff

Biofiltrate (oversized)

Flow-thru treatment control AND offsite mitigation

Hydromodification Management BMP Requirements

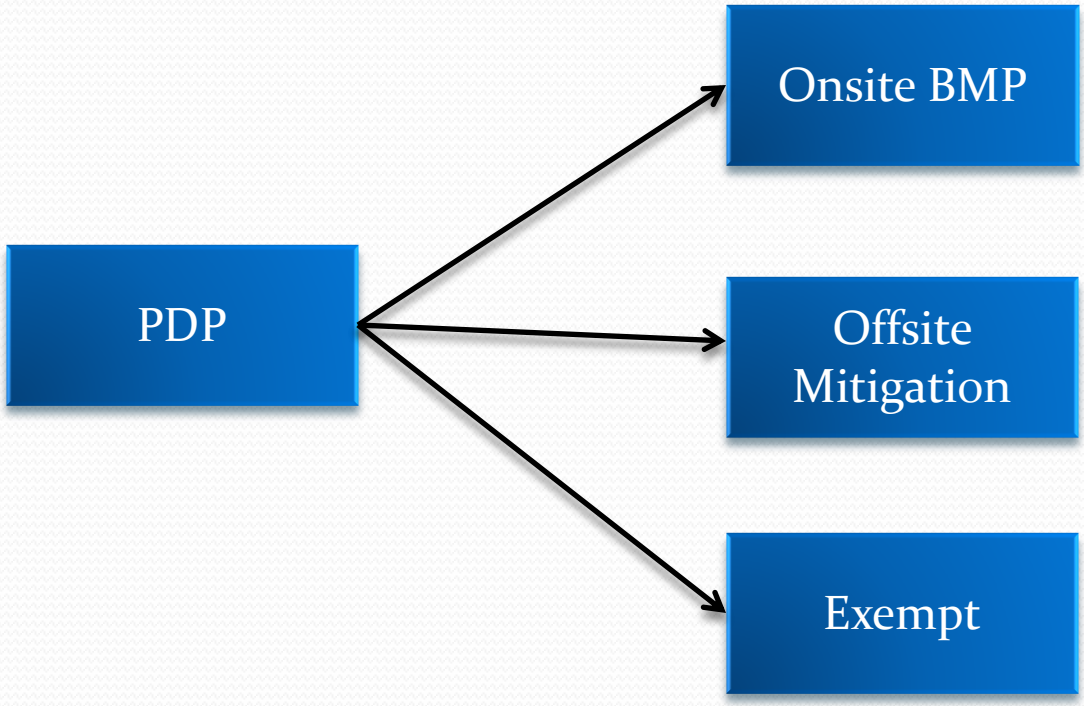

(if available)

Proposed Change to Permit in Response to RoWD

- Add Provision allowing use of **interim hydromodification management requirements** until Water Quality Improvement Plan is developed

Potential Modifications Regional MS4 Permit based on Orange County Copermittees ROWD

Laurie Walsh P.E.
Water Resource Control Engineer
San Diego Water Board

Regional MS4 Permit

Shifted Focus of Requirements

* From Actions to Outcomes of Actions
* Emphasize Planning and Adaptive Management
* Allows for Custom Jurisdictional / Watershed Monitoring
* Allows Copermittees to be More Strategic

Water Quality Improvement Plan

Goal –

To further the Clean Water Act's objective to protect, preserve, enhance, and restore the water quality and designated beneficial uses of waters of the state

Water Quality Improvement Plan

Accomplish the Goal –

* Adaptive planning and management process
* Prioritization within a watershed
* Implement strategies through the JRMP
* Achieve improvement in the quality of discharges from the MS4s and receiving waters

013734

Report of Waste Discharge

Submitted by

The County of Orange, Orange County Flood Control District and Cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Lake Forest, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano

May 20, 2014

Plan Development

Recommendation: "Develop comprehensive Watershed Plan to prioritize implementation efforts and resources"

Proposed Permit Modification: Not Needed

Illegal Discharges / Illicit Connections

Recommendation: "Reinstate an approach such as the Dry Weather Reconnaissance Program"

Proposed Permit Modification: Not Needed

Construction

Recommendation: "Reduce inspection frequency for "high" priority sites from bi-weekly to twice during the wet season and for "medium" priority sites from monthly to once during the season"

Proposed Permit Modification: Not Needed

Land Development

Recommendation : "Incorporate integrated water resources management element into land planning and land development processes…. which will require equivalency of on-site BMPs"

Proposed Permit Modification: Not Needed

Land Development

Recommendation : "Implement an approach to hydromodification management that is informed by a watershed analysis and channel-specific protection and restoration goals."

Proposed Permit Modification: Add Provision allowing use of Interim Hydromodification Management requirements until Water Quality Improvement Plan is developed

Land Development

Recommendation: "Develop model water retention credit program(s) to facilitate off-site BMP implementation where appropriate and to address existing developed areas"

Proposed Permit Modification: Not Needed

Land Development

Recommendation : "Create exemption from Project WQMP criteria for stream and watershed restoration projects "

Proposed Permit Modification: Not Supported

Land Development

Recommendation : "Create exemption from Project WQMP criteria for emergency public safety projects where delay would compromise public safety, health, and the environment "

Proposed Permit Modification: Not Supported

Regional MS4 Permit does not include strict exemption

Aliso Creek Watershed Monitoring

Recommendation :

"(1) Reduce quarterly reporting to annual

(2) Continue Program implementation to Dec 2015,

(3) Reevaluate Program relative to bacteria TMDLs, Comprehensive Load Reduction Plan, and related NPDES programs."

Proposed Permit Modification: Not Needed

Monitoring

Recommendations : Many Recommendations

Proposed Permit Modification: Generally Not Needed

Further Consultation - Monitoring Assessment Research Unit (MARU)

Potential Modifications to Regional MS4 Permit based on Orange County Copermittees ROWD

Questions & Discussion

Meeting to Discuss Orange County MS4 ROWD And Regional MS4 Permit

Closing Comments

Laurie Walsh, PE
Christina Arias, PE
Eric Becker, PE

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

2375 Northside Drive, Suite 100, San Diego, CA 92108
Phone (619) 516-1990 Fax (619) 516-1994
http://www.waterboards.ca.gov/sandiego

TENTATIVE ORDER NO. R9-2015-0001

AN ORDER AMENDING ORDER NO. R9-2013-0001, NPDES NO. CAS010266 NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The California Regional Water Quality Control Board, San Diego Region (hereinafter San Diego Water Board), finds that:

ENROLLMENT OF ORANGE COUNTY COPERMITTEES

1. **Enrollment Process.** On May 8, 2013, the San Diego Water Board adopted Order No. R9-2013-0001, NPDES No. CAS019266, *National Pollutant Discharge Elimination System Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Order No. R9-2013-0001, Order or Regional MS4 Permit). Provision F.5 of that Order outlines a process to designate (enroll) the County of Orange, the Orange County Flood Control District and the south Orange County Cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Lake Forest, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano (collectively Orange County) as Copermittees under Order No. R9-2013-0001, responsible for compliance with the terms and the conditions of the Order. Provision F.5 provides that prior to such enrollment the San Diego Water Board must first review and consider a Report of Waste Discharge (RoWD), submitted by the Orange County Copermittees under their current MS4 NPDES Order No. R9-2009-0002, to determine whether the Copermittees should be enrolled under Order No. R9-2013-0001 and what changes to the Order proposed in the RoWD are appropriate.

2. **Report Of Waste Discharge.** By letter dated May 20, 2014, the Orange County Copermittees jointly submitted a RoWD in application for the reissuance of waste discharge requirements, pursuant to the requirements of section K.2.b of Order No. R9-2009-0002, for MS4 discharges draining the San Juan Hydraulic Unit within the San Diego Region. The RoWD discusses the MS4 Permit compliance activities and accomplishments of the Orange County Copermittees over the period June 2009 through June 2013. The RoWD also identifies all of the activities, research, and pilot studies the Copermittees propose to undertake during the next permit term based

upon consideration of the effectiveness of the Orange County Storm Water Program and the need for additional pollutant control initiatives. Development of a watershed-based planning approach is portrayed in the RoWD as the most important next step to take in the development of the storm water programs in Orange County. The RoWD concludes that such a comprehensive approach offers the opportunity to identify the environmental and recreational benefits that can be realized in each watershed and the management strategies that will most effectively ensure their realization. Among several recommendations, the RoWD included a request that permit requirements be amended to provide an initial or time limited exemption from hydromodification control best management practices (BMPs) for conveyance channels that are engineered and regularly maintained with the capacity to convey peak flows generated from the 10-year or greater storm event from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean. The County of Orange also separately requested a second exemption for discharges to “large river” low gradient reaches with a very wide flood plain by letter dated November 22, 2013. The San Diego Water Board has reviewed the RoWD and determined it is complete.

3. **Permit Hydromodification Control Requirement Modifications.** The hydromodification control BMP requirements in Provision E.3.c.(2) of Order No. R9-2013-0001 require modification to address the hydromodification exemption issues identified in the Orange County Copermittees’ RoWD application and November 22, 2013 letter. To facilitate the transition of the Orange County Copermittees (and eventually the Riverside County Copermittees) to the Regional MS4 Permit from the current Phase I MS4 NPDES permit (Order No. R9-2009-0002), two temporary exemptions from hydromodification control BMP requirements should be provided. The first temporary exemption would allow relief from hydromodification control BMP requirements for Priority Development Projects discharging directly to an engineered channel conveyance system with a capacity to convey peak flows generate by the 10-year storm event all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean. The second temporary exemption would allow relief from hydromodification control BMP requirements for Priority Development Projects discharging directly to large river reaches with drainage areas larger than 100 square miles and a 100-year flow capacity in excess of 20,000 cubic feet per second.

4. **Orange County Copermittees Enrollment.** After consideration of the Orange County RoWD and changes needed to Order No. R9-2013-0001, the San Diego Water Board has determined that the County of Orange, the Orange County Flood Control District and the south Orange County Cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano should be enrolled as Copermittees under Order No. R9-2013-0001 (Order) and responsible for compliance with the terms and the conditions of the Order. Enrolling the Orange County Copermittees into Order No. R9-2013-0001 (and the eventual enrollment of Riverside County Copermittees upon expiration of their current MS4 permit) will

provide regulatory consistency in the implementation of MS4 permit requirements throughout the San Diego Region, improve communication and coordination among Copermittees within watersheds crossing multiple jurisdictions, and maximize efficiency and economy of resources for the San Diego Water Board achieved through the redirection of staff permitting resources to better advance the storm water program. The enrollment of the Cities of Laguna Hills, Laguna Woods and Lake Forest is subject to a California Water Code (Water Code) section 13228 agreement as set forth in the findings of this Order.

DESIGNATION OF A REGIONAL WATER BOARD

5. **Regional Water Board Designation.** The Cities of Laguna Woods, Laguna Hills and Lake Forest (Cities) are located partially within the jurisdictions of both the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board) and the San Diego Water Board. Written requests for designation of a single Regional Water Board to regulate matters pertaining to permitting of Phase I MS4 discharges were submitted to the San Diego Water Board by the City of Laguna Woods by letter dated September 8, 2014, the City of Laguna Hills by letter dated March 12, 2014, and the City of Lake Forest by letter dated April 4, 2014. The Cities of Laguna Hills and Laguna Woods requested designation of the San Diego Water Board, and the City of Lake Forest requested designation of the Santa Ana Water Board. Water Code section 13228 specifies the circumstances that allow, and the process for, designation of a Regional Water Board.

6. **Factual Considerations**. The Santa Ana Water Board and San Diego Water Board establish generally consistent requirements for MS4 discharges to meet the technology-based standard of reducing pollutants in the discharge to the maximum extent practicable (MEP), a related iterative process to ensure MS4 discharges meet receiving water quality standards, and non-storm water discharges to be effectively prohibited from entering the MS4. However due to the unique nature of watersheds and water quality issues in the San Diego Region and Santa Ana Region, MS4 permit requirements between the two Regional Water Boards may also vary to address region specific pollutant discharges and watershed conditions. The Cities of Laguna Woods, Laguna Hills, and Lake Forest report that management and implementation of municipal programs to comply with two different MS4 permits creates a significant administrative and financial burden that is not contributing to greater overall water quality improvements in either region.

7. **Regional Water Board Agreement**. In an effort to address the concerns of the Cities, the San Diego Water Board and the Santa Ana Water Board have entered into an agreement whereby the San Diego Water Board is designated to regulate Phase I MS4 discharges within the jurisdiction of the Cities of Laguna Woods and Laguna Hills and the Santa Ana Water Board is designated to regulate Phase I MS4 discharges within the jurisdiction of the City of Lake Forest. Under the terms of the agreement the City of Lake Forest will be required to retain and continue implementing the prohibition of over-irrigation discharges identified in Title 15,

Chapter 15, Section 14.030 of the City Municipal Code for regulating storm water quality throughout its jurisdiction, which was established during the permit term of Order No. R9-2009-0002. The City of Lake Forest will also be required to actively participate in the development and implementation of the Aliso Creek Watershed Management Area Water Quality Improvement Plan required pursuant to the San Diego Water Board's Regional MS4 Permit, Order No. R9-2013-0001. Under the terms of the agreement, any Total Maximum Daily Load (TMDL) and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Laguna Woods, Laguna Hills or Lake Forest as a responsible party, will be incorporated into the appropriate MS4 permit by reference. Enforcement of the applicable TMDL would remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's San Diego Creek/Newport Bay TMDL and the San Diego Water Board's Indicator Bacteria Project I Beaches and Creeks TMDL.

8. **Periodic Review of Regional Water Board Agreement.** The basis supporting the Cities of Laguna Woods, Laguna Hills, and Lake Forest requests to designate a specific Regional Water Board for regulatory oversight of MS4 discharges may change under future conditions and circumstances. Therefore the San Diego Water Board will periodically review the effectiveness of the agreement during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate the agreement with the Santa Ana Water Board or otherwise modify the agreement subject to the approval of the Santa Ana Water Board.

WATER QUALITY CONTROL PLANS AND POLICIES

9. **Cause for Modification.** Federal NPDES regulations at 40 CFR 122.62(a)(3) provide that NPDES permits may be modified when the standards or regulations on which the permit was based have been changed by promulgation of amended standards or regulations or by judicial decision after the permit was issued. Standard Permit Provision 1.f of Attachment B to Order No. R9-2013-0001 provides in relevant part that the Order may be modified for cause. Section II.H.4.d. of the Order provides that the Order may be reopened during its term for cause including when the *Water Quality Control Plan for the San Diego Basin (9)* (Basin Plan) is amended by the San Diego Water Board to incorporate a new TMDL, and the amendment is approved by the State Water Resources Control Board (State Water Board), Office of Administrative Law, and the United State Environmental Protection Agency (USEPA). The amended changes to water quality control plans and policies set forth in the findings below represent changes to standards on which Order No. R9-2013-0001 was based.

10. **Special Conditions for Areas of Special Biological Significance**. On March 20, 2012, in Resolution No. 2012-0012, the State Water Board adopted a General Exception to the Ocean Plan Areas of Special Biological Significance (ASBS) waste discharge prohibition for storm water and nonpoint source discharges, including Special Protections for Beneficial Uses. On June 19, 2012, in Resolution No. 2012-0031, the State Water Board amended the General Exception to require pollutant load reductions to be achieved over a six year term. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject to the terms and conditions of State Water Board General Exception, as amended.

11. **Total Maximum Daily Loads (TMDLs)**. On June 13 2012 the San Diego Water Board in Resolution No. R9-2012-0033 amended the Basin Plan to incorporate the Los Penasquitos Lagoon Sediment TMDL. This TMDL Basin Plan amendment was approved by the State Water Board on January 21, 2014, by the Office of Administrative Law (OAL) on July 14, 2014, and USEPA on Month XX, Year. The County of San Diego, City of San Diego, City of Del Mar, and the City of Poway are among the responsible parties collectively assigned a single wasteload allocation applicable to MS4 discharges under the terms and conditions of the TMDL.

BEACH WATER QUALITY MONITORING AND ASSESSMENT PROGRAM

12. **Unified Approach Beach Water Quality Monitoring.** In November 2010, the State Water Board adopted Resolution No. 2010-0053, directing regional water boards to work with dischargers to modify beach water quality monitoring programs required by regional water board-issued permits in order to eliminate redundancies and incorporate beach water quality monitoring required by applicable statutes, where appropriate. Beginning in 2012, the San Diego Water Board reviewed the various beach water quality monitoring programs conducted in south Orange County and convened a stakeholder workgroup to develop a unified regional beach water quality monitoring and assessment program (Unified Program). The Unified Program is outlined in the San Diego Water Board report entitled "*Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County,*" dated September 2014. The Unified Program is consistent with and will meet or exceed the minimum requirements for beach water quality monitoring and related public notification and reporting established by State law, including the California Ocean Plan. The Unified Program will help protect the health of swimmers, surfers, and others who use south Orange County beach waters for water contact recreational activities.

13. **Monitoring Framework Consistency**. The Unified Program is consistent with and will help implement "*A Framework for Monitoring and Assessment in the San Diego Region*," which emphasizes the need for question-driven, beneficial use-oriented monitoring and assessment. The primary purpose of the Unified Program will be to answer the question "Does beach water quality meet standards for the beneficial use of water contact recreation?"

14. **Unified Program Implementation**. The San Diego Water Board Executive Officer has issued a written directive, pursuant to California Water Code sections 13225, 13267, and 13383, for the South Orange County Wastewater Authority (SOCWA) and the south Orange County Copermittees to implement the Unified Program, in cooperation with the Orange County Health Care Agency (OCHCA). After appropriate opportunity for public input, the Executive Officer may make revisions to the Unified Program, provided that the Unified Program, as revised, continues to be consistent with and meet the requirements of State law, including the California Ocean Plan, for beach water quality monitoring and related public notification and reporting. The Unified Program will supersede the existing routine, ongoing, beach water quality monitoring programs in south Orange County that are conducted in accordance with the existing requirements of the NPDES permits for discharges from SOCWA ocean outfalls and the south Orange County Copermittees' MS4s. The requirement for the Orange County Copermittees to participate in "regional monitoring" of beach water quality replaces requirements to conduct "core monitoring" of beach water quality, as provided for in Appendix III of the 2012 California Ocean Plan.

ADMINISTRATIVE FINDINGS

15. **Effect of this Order.** This Order amends Order No. R9-2013-0001 to:

    a. Enroll the County of Orange, the Orange County Flood Control District and the south Orange County Cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano as Copermittees responsible for compliance with the terms and conditions of Order No. R9-2013-0001,as amended by this Order;

    b. Designate the San Diego Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the Cities of Laguna Woods and Laguna Hills and the Santa Ana Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the City of Lake Forest, subject to the terms of the agreement between San Diego Water Board and the Santa Ana Water Board described in Finding 7 of this Order;

c. Establish interim exceptions to land development requirements for those Priority Development Projects that discharge to engineered channels and large river reaches described in Finding 3 of this Order;

d. Incorporate the amended requirements of the State Water Board's General Exception to require that pollutant reductions be achieved within 6 years for storm water and nonpoint source discharges to ASBS;

e. Incorporate applicable requirements of the Los Penasquitos Lagoon Sediment TMDL; *and*

f. Require the Orange County Copermittees to implement the "*Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County,*" dated September 2014, made effective in the Monitoring and Reporting Program/Order issued pursuant to California Water Code sections 13225, 13267, and 13383 and subject to future revisions by the Executive Officer after appropriate public input.

16. **Effect of this Order.** Order No. R9-2013-0001 is not being reopened for any other purpose than the revisions contained herein. Except as contradicted or superseded by the findings and directives set forth in this Order, all of the previous findings and directives of Order No. R9-2013-0001 shall remain in full force and effect.

17. **California Environmental Quality Act**. This action is exempt from the requirement of preparation of environmental documents under the California Environmental Quality Act [Public Resources Code, Division 13, Chapter 3, Section 21000 et seq.] in accordance with California Water Code section 13389.

18. **Public Notice.** In accordance with State and federal laws and regulations, the San Diego Water Board has notified San Diego County, Orange County and Riverside County Copermittees, and all known interested agencies and persons of its intent to adopt this Order and has provided them with an opportunity to submit their written comments and recommendations.

19. **Public Hearing.** The San Diego Water Board held a public hearing on February 11, 2015 and heard and considered all comments pertaining to the adoption of this Order.

20. **Notification.** Any person aggrieved by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with California Water Code section 13320 and California Code of Regulations, title 23, sections 2050 et seq. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date of this Order. Copies of the law and regulations applicable to filing petitions may be found on the Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

THEREFORE, IT IS HEREBY ORDERED,

1. This Order amends the Regional MS4 Permit, Order No. R9-2013-0001 and the Fact Sheet (Attachment F of the Order) as described in the revised versions of Order No. R9-2013-0001 and Fact Sheet included as Attachments 1 and 2 to this Order. Added text to Order No. R9-2013-0001 and the Fact Sheet is displayed in blue-underline text and deleted text is displayed as red-strikeout text.

2. The amended version of Order No. 2013-0001 and Fact Sheet included as Attachments 1 and 2 to this Order shall become effective on April 1, 2015.

3. Amended Order No. R9-2013-0001 shall supersede Order No. R9-2009-0002 for the Orange County Copermittees except for enforcement purposes.

4. San Diego Water Board staff is directed to prepare and post a conformed copy of Order No. R9-2013-0001 and the Fact Sheet incorporating the revisions made by this Order.

I, David W. Gibson, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on February 11, 2015.

_____
David W. Gibson
Executive Officer

ATTACHMENT F

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

FACT SHEET / TECHNICAL REPORT

FOR

ORDER NO. R9-2013-0001
As amended by Order No. R9-2015-0001
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

MAY 8, 2013
Amended on February 11, 2015

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I. FACT SHEET FORMAT

This Fact Sheet briefly sets forth the principal facts and the significant factual, legal, methodological, and policy questions that the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) considered in preparing Order No. R9-2013-0001 (Order) as amended by Order No. R9-2015-0001. In accordance with the Code of Federal Regulations (CFR) Title 40 Parts 124.8 and 124.56 (40 CFR 124.8 and 40 CFR 124.56), this Fact Sheet includes, but is not limited to, the following information:

1. Contact information
2. Public process and notification procedures
3. Background of municipal storm water permits
4. Regional MS4 Permit approach
5. Economic considerations
6. Applicable statutes, regulations, plans and policies
7. Discussion of the provisions in the Order

Tentative Order No. R9-2013-0001 was distributed for public review on October 31, 2012. The San Diego Water Board accepted written comments on the Tentative Order until January 11, 2013. A public hearing was subsequently held on April 10 and 11, 2013, that was continued to May 8, 2013 to receive oral comments from interested persons. The San Diego Water Board adopted Order No. R9-2013-0001 on May 8, 2013.

Order No. R9-2015-0001 an Order amending Order No. R9-2013-0001 was distributed for public review on September 19, 2014. Order No. R9-2015-0001 amended the findings and provisions of Order No. R9-2013-0001 to:

a. Enroll the County of Orange, the Orange County Flood Control District and the south Orange County Cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano as Copermittees responsible for compliance with the terms and conditions of Order No. R9-2013-0001, as amended by Order No. R9-2015-0001;

b. Designate the San Diego Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the Cities of Laguna Woods and Laguna Hills and the Santa Ana Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the City of Lake Forest, subject to the terms of the agreement between San Diego Water Board and the Santa Ana Water Board described in Finding 29 of this Order;

c. Establish interim exceptions to land development requirements for those priority development projects that discharge to engineered channels and large river reaches as described in Provision E.3.c(2)(e) of this Order;

d. Incorporate the amended requirements of the State Water Board's General Exception to require that pollutant reductions be achieved within 6 years for storm water and nonpoint source discharges to ASBS within the Region;

e. Incorporate applicable requirements of the Los Penasquitos Lagoon Sediment TMDL;

f. Require the Orange County Copermittees to implement the "*Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County*," dated September 2014 made effective in the Monitoring and Reporting Program/Order issued pursuant to California Water Code sections 13225, 13267, and 13383 and subject to future revisions by the Executive Officer after appropriate public input.

A public hearing was held on February 11, 2015 to receive oral comments from Copermittees and interested persons. The San Diego Water Board adopted Order No. R9-2015-0001 amending Order No. R9-2013-0001 on February 11, 2015.

The San Diego Water Board files applicable to the issuance of Order No. R9-2013-0001 and amendments thereto are incorporated into the administrative record in support of the findings and requirements of the Order.

II. CONTACT INFORMATION

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The Order and other related documents can be downloaded from the San Diego Water Board website at

~~http://www.swrcb.ca.gov/rwqcb9/water_issues/programs/stormwater/index.shtml~~
http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/oc_stormwater.shtml

The documents referenced in this Fact Sheet and in Order No. R9-2013-0001 are available for public review at the San Diego Water Board office, located at the address listed above. Public records are available for inspection during regular business hours, from 8:00 am to 5:00 pm Monday through Friday. To schedule an appointment to inspect public records, contact the San Diego Water Board Records Management Officer at ~~858-467-2952~~619-516-1990.

COPERMITTEES

Orange County Copermittees

- County of Orange
  - City of Aliso Viejo
  - City of Dana Point
  - City of Laguna Beach
  - City of Laguna Hills
  - City of Laguna Niguel
  - City of Laguna Woods
  - City of Lake Forest
  - City of Mission Viejo
  - City of Ranch Santa Margarita
  - City of San Clemente
  - City of San Juan Capistrano
  - Orange County Flood Control District

Riverside County Copermittees

- County of Riverside
  - City of Murrieta
  - City of Temecula
  - City of Wildomar
  - Riverside County Flood Control and Water Conservation District

San Diego County Copermittees

- County of San Diego
  - City of Carlsbad
  - City of Chula Vista
  - City of Coronado
  - City of Del Mar
  - City of El Cajon
  - City of Encinitas
  - City of Escondido
  - City of Imperial Beach
  - City of La Mesa
  - City of Lemon Grove
  - City of National City
  - City of Oceanside
  - City of Poway
  - City of San Diego
  - City of San Marcos
  - City of Santee
  - City of Solana Beach
  - City of Vista
  - San Diego County Regional Airport Authority
  - San Diego Unified Port District

III. PUBLIC PROCESS AND NOTIFICATION PROCEDURES

The San Diego Water Board followed the schedule listed below for the preparation of Order No. R9-2013-0001:

San Diego County Copermittee Permit Reissuance Process

1. On February 8, 2011, the San Diego Water Board met with the San Diego County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No. R9-2007-0001.

2. Between February and May 2011, the San Diego Water Board met with select San Diego County, Orange County, and Riverside County Copermittees, as well as representatives of the environmental community to discuss concepts and receive recommendations for elements to be incorporated in a Regional Municipal Separate Storm Sewer System Permit (Regional MS4 Permit).

3. On June 27, 2011 the San Diego Water Board received the Report of Waste Discharge from the San Diego County Copermittees for the renewal of their NPDES permit, Order No. R9-2007-0001.

4. On April 9, 2012, the San Diego Water Board released an administrative draft of Tentative Order No. R9-2013-0001 for preliminary informal comments and feedback.

5. On April 25, 2012, the San Diego Water Board held an informal public workshop to present the administrative draft of Tentative Order No. R9-2013-0001 and receive verbal comments.

6. Between June and August 2012, the San Diego Water Board held four (4) focused meetings with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community, and USEPA) to discuss and receive preliminary comments and feedback about specific elements in the administrative draft of Tentative Order No. R9-2013-0001.

7. On September 5, 2012, the San Diego Water Board held an informal public workshop to present the modifications that were expected to be incorporated into the Tentative Order based on the preliminary comments and feedback received during the focused meetings held between June and August 2012.

8. Informal written comments on the administrative draft of Tentative Order No. R9-2013-0001 were accepted until September 14, 2012.

9. On October 12, 2012, the San Diego Water Board released a revised administrative draft of Tentative Order No. R9-2013-0001.

10. On October 24, 2012, the San Diego Water Board held a focused meeting with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community, and USEPA) to discuss modifications incorporated into the administrative draft of Tentative Order No. R9-2013-0001.

11. On October 31, 2012, the San Diego Water Board released Tentative Order No. R9-2013-0001 for formal public review and comment.

12. On November 13, 2012 and December 12, 2012, the San Diego Water Board held a formal public Board workshop to present the public draft of Tentative Order No. R9-2013-0001 and receive verbal comments.

13. Formal written comments on the public draft of Tentative Order No. R9-2013-0001 were accepted until January 11, 2013.

14. A public hearing of Tentative Order No. R9-2013-0001 was conducted on April 10 and 11, 2013, that was continued to May 8, 2013.

Orange County Copermittee Permit Reissuance Process

15. On May 20, 2014 the San Diego Water Board received the Report of Waste Discharge from the Orange County Copermittees for the renewal of their MS4 NPDES permit, Order No. R9-2009-0002.

16. On June 24, 2014, the San Diego Water Board met with the Orange County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No.R9-2009-0002 and the process for enrollment as Copermittees under Regional MS4 Permit Order No. R9-2013-0001.

17. On July 1, 2014, the San Diego Water Board held a public meeting to discuss the Orange County Report of Waste Discharge (RoWD) and receive comments on potential modifications to Order No. R9-2013-0001. Based on comments received from the Orange County Copermittees and other interested persons at this meeting, the San Diego Water Board determined that additional public meetings were not needed prior to release of Tentative Order No. R9-2015-0001, amending Order No. R9-2013-0001 in redlined – strikeout format for public review and comment.

18. On September 19, 2014, the San Diego Water Board released Tentative Order No. R9-2015-0001 for a 60 day public review and comment period.

19. On October 8, 2014, the San Diego Water Board held a formal public workshop at a regular board meeting to receive information and discuss the proposed amendments to Order No. R9-2013-0001 described in Tentative Order No. R9-2015-0001.

20. In accordance with State and federal laws and regulations, the San Diego Water Board notified San Diego County, Orange County and Riverside County Copermittees, and all known interested agencies and persons of its intent to adopt Tentative Order No. R9-2015-0001 and provided them with an opportunity to submit their written comments and recommendations. Written comments and recommendations on Tentative Order No. R9-2015-0001 were accepted until November 19, 2014.

21. The San Diego Water Board held a public hearing on February 11, 2015 and heard and considered all comments pertaining to the adoption of Tentative Order No. R9-2015-0001 on February 11, 2015.

IV. BACKGROUND OF THE SAN DIEGO REGION MUNICIPAL STORM WATER PERMITS

In developed and developing areas, storm water runoff is commonly transported through municipal separate storm sewer systems (MS4s) and discharged into local receiving water bodies. As the storm water runs off and flows over the land or impervious surfaces (e.g., paved streets, parking lots, and building rooftops), it accumulates debris, chemicals, sediment, and other pollutants that can adversely affect receiving water quality if discharged untreated. The United States Environmental Protection Agency (USEPA) recognizes wet weather flows from urban areas as the number one source of estuarine pollution in coastal communities,[1] such as those within the San Diego Region.

The federal Clean Water Act (CWA) was amended in 1987 to address and regulate discharges of storm water associated with industrial activities and from municipal storm sewers. With the amendments, many municipalities throughout the United States were obligated for the first time to obtain National Pollutant Discharge Elimination System (NPDES) permits for discharges of storm water from their MS4s.

In response to the CWA 1987 amendment, as well as the pending federal NPDES regulations which would implement the amendment, the San Diego Water Board issued "early" MS4 permits. The San Diego Water Board adopted and issued Order Nos. 90-38, 90-42, and 90-46 to regulate storm water discharges from the MS4s in Orange County, San Diego County, and Riverside County, respectively, within the San Diego Region on July 16, 1990.

The "early" MS4 permits, or First Term Permits, were issued prior to the November 1990 promulgation of the final federal NPDES storm water regulations. By issuing these First Term Permits before the federal regulations took effect, the San Diego Water Board was able to provide the Copermittees additional flexibility in addressing and managing storm water discharges. The First Term Permits contained the essentials of the 1990 regulations, and required the Copermittees to develop and implement runoff management programs, but provided little specificity about what was required to be included in or actually achieved by those programs.

The flexibility provided in the First Term Permits was generally continued through the Second Term Permits. The combination of the lack of specificity in the First and Second Term Permits, a general lack of meaningful action by the Copermittees and a general lack of corresponding reaction (i.e. enforcement) by the San Diego Water Board during the first ten years of the storm water program, resulted in few substantive steps

[1] US EPA. 1999. 40 CFR Parts 9, 122, 123, and 124. National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. 64 FR 68727.

towards achieving improvements in the quality of receiving waters or storm water discharges from the MS4s.

From 2001, the regulatory approach incorporated into Third Term Permits was a significant departure from the regulatory approach of the First and Second Term Permits. The Third Term Permits issued by the San Diego Water Board included more detailed requirements that outlined the minimum level of implementation required for the Copermittees' programs to meet the maximum extent practicable (MEP) standard for storm water. The Third Term Permits included more detail to emphasize and enhance the jurisdictional runoff management programs developed by the Copermittees and introduced requirements for developing and implementing watershed-based programs.

The Third Term Permits also incorporated two precedent setting decisions by the State Water Board. In Order WQ 99-05, the State Water Board established receiving water limitation language to be included in all MS4 permits. The State Water Board's precedential language clarified that municipal storm water permits must include provisions requiring discharges to be controlled to attain water quality standards in receiving waters. Unlike previously adopted versions of the receiving water limitation language in the First and Second Term Permits, the language no longer stated that "*violations of water quality standards are not violations of the municipal storm water permit under certain conditions*." In addition, the receiving water limitation language no longer indicated that the "*implementation of best management practices is the 'functional equivalent' of meeting water quality standards*." State Water Board Order WQ 99-05 specifically requires language in MS4 permits for the Copermittees to comply with water quality standards based discharge prohibitions and receiving water limitations through timely implementation of control measures and other actions to reduce pollutants in discharges. (See State Water Board Order WQ 99-05 (*Environmental Health Coalition*)).

In Order WQ 2000-11, also a precedential decision, the State Water Board addressed design standards for structural post-construction best management practices (BMPs) for new development and significant redevelopment. The State Water Board found that the design standards, which require that runoff generated by 85 percent of storm events from specific development categories be infiltrated or treated, reflect the MEP standard. State Water Board Order WQ 2000-11 also found that the post-construction BMP provisions, or Standard Storm Water Mitigation Plan (SSMP) provisions, constitute MEP for addressing storm water pollutant discharges resulting from specific development categories.

The Third Term San Diego County and Orange County Permits (Order Nos. 2001-01 and R9-2002-0001, respectively) were appealed to the State Water Board. Minor modifications were made by the State Water Board, but the requirements were largely upheld. In State Water Board Order WQ 2001-15, the State Water Board upheld the Third Term San Diego County Permit requirements with certain modifications. The State Water Board removed the prohibition of storm water discharges *into* the MS4 that cause or contribute to exceedances of water quality objectives. The revision allows for

treatment of pollutants in storm water runoff after the pollutants have entered the MS4. State Water Board Order WQ 2001-15 otherwise upheld all the other requirements of the permit.

In addition to the modification to the discharge prohibition in Order WQ 2001-15, the State Water Board refined Order WQ 99-05 by making clear that the Copermittees may use an iterative approach to achieving compliance with water quality standards that involves ongoing assessments and revisions. Thus, the language for the discharge prohibitions and receiving water limitations was revised to explicitly require the Copermittees to implement an iterative process of assessments and revisions to comply with the discharge prohibitions and receiving water limitations. The San Diego Water Board retained the authority to enforce receiving water limitations and discharge prohibitions even if the Copermittee is engaged in the iterative process.

The Third Term San Diego County Permit was subsequently challenged in the Superior Court of the State of California and the Court of Appeal, Fourth Appellate District. The Court of Appeal, Fourth Appellate District, found that the approach of the Third Term San Diego County Permit to regulating discharges into the MS4 was appropriate (*Building Industry Ass'n. v. State Water Resources Control Bd., et al.,* 124 Cal.App.4th 866 (2004)). The State of California Supreme Court denied review sought by the Building Industry Association in March 2005.

The Fourth Term Permits, or current MS4 permits, began with the adoption of Order No. R9-2007-0001 issued to the Copermittees of San Diego County in January 2007. Order Nos. R9-2009-0002 and R9-2010-0016 were subsequently issued to the Copermittees of Orange County and Riverside County. The Fourth Term Permits continued to include more detailed requirements to be implemented by each Copermittee's jurisdictional runoff management program. The Fourth Term Permits also include requirements to further emphasize a watershed management approach and for more coordination among jurisdictional runoff management programs. In addition, the Fourth Term Permits included more requirements for assessing the effectiveness of the runoff management programs being implemented by the Copermittees. The intent of the inclusion of additional requirements was to enhance and better define elements of the permit that were expected to be incorporated into the iterative process for managing runoff from each Copermittee's jurisdiction and within the watersheds of the San Diego Region.

The Fourth Term Permits include several new and emerging approaches for managing storm water runoff and discharges. Low impact development (LID) requirements are included for development and significant redevelopment to reduce pollutants in storm water runoff from sites through more natural processes such as infiltration and biofiltration closer to the source, rather than utilizing conventional mechanical end-of-pipe treatment systems. Hydrograph modification (hydromodification) management requirements also are included to mitigate the potential for increased erosion in receiving waters due to increased runoff rates and durations often caused by development and increased impervious surfaces. The Fourth Term Orange County and

Riverside County Permits introduced requirements to identify areas of existing development where retrofitting with LID projects would be feasible and could be implemented to reduce storm water runoff and pollutants in storm water discharges.

The Fourth Term Orange County and Riverside County Permits included a clearer distinction between storm water and non-storm water discharges. The term "urban runoff" was completely removed, and a distinction between storm water (wet weather) runoff and non-storm water (dry weather) runoff was emphasized. This clarification was made to prevent any potential misunderstanding that regulation under the MS4 permits is limited only to urbanized areas, and to prevent non-storm water runoff from being managed in the same manner as storm water runoff. The term "urban runoff" is not defined in the Code of Federal Regulations (CFR) or Federal Register (FR) in the regulation of MS4 discharges. According to the CWA 402(p)(3)(B)(ii), MS4 permits must include a requirement to effectively prohibit non-storm water discharges into the MS4s.

Finally, for the Fourth Term Orange County and Riverside County Permits the San Diego Water Board found that non-storm water discharges to the MS4 from over application of irrigation water are sources of pollutants. The San Diego Water Board found that non-storm water discharges resulting from over-irrigation must be prohibited from entering the MS4 in accordance with the requirements of the CWA and pursuant to 40 CFR 122.26(d)(2)(iv)(B)(1).

The requirements of the Fourth Term Permits issued to the Copermittees in each county within the San Diego Region now have substantively the same core requirements such as discharge prohibitions, receiving water limitations, jurisdictional runoff management program components, and monitoring program requirements. There are, however, several inconsistencies that exist among the three Fourth Term Permits which complicate oversight and implementation of the permits by the San Diego Water Board.

The Fourth Term San Diego County Permit expired in January 2012. The Fourth Term Orange County permit ~~and Riverside County Permits will~~ expired in December 2014 and the Fourth Term Riverside County Permit will expire in November 2015. ~~, respectively.~~ Issuing the Fifth Term Permits within five years for three counties under three different permits would require the San Diego Water Board to expend significant time and resources for the issuance of the permits through three separate public proceedings, thereby greatly reducing the time and resources available to oversee implementation and compliance. Multiple permits also create confusion for determining compliance among regulated entities, especially for the land development community.

The San Diego Water Board has acknowledged that issuing a single MS4 permit for all the Copermittees in the San Diego Region can and is expected to result in more consistent implementation, improve communication among agencies within watersheds crossing multiple jurisdictions, and minimize resources spent with each permit renewal process. Within the findings of the Fourth Term Riverside County Permit issued in

November 2010, the San Diego Water Board notified the public of its intent to develop and issue a single Regional MS4 Permit.

V. REGIONAL MS4 PERMIT APPROACH

The Fifth Term Permit, or Regional MS4 Permit, shifts the focus of the permit requirements from a minimum level of actions to be implemented by the Copermittees to identifying outcomes to be achieved by those actions. Order No. R9-2013-0001 represents an important paradigm shift in the approach for MS4 permits within the San Diego Region.

Historical Permitting Approach

The First and Second Term Permits were very broad and provided little specificity about what was required to be developed and implemented by the Copermittees. The Third Term Permits began to become more specific about the minimum level of implementation required by the Copermittees. The Fourth Term Permits, or current permits, subsequently increased in specificity. The MS4 permits have progressively become more detailed and focused on specifying the minimum level of actions expected to be implemented by the Copermittees. As detailed and specific as the MS4 permits have become, however, they include very little detail about what the desired outcomes of the required actions are expected to achieve. Compliance with the permit requirements has essentially been tracking numbers of actions and reporting, not tracking progress or actual improvements in the quality of receiving waters or discharges from the MS4s. The result has been an increase in actions being implemented by the Copermittees with little or no ability or expectations to determine whether or not improvements in water quality are being achieved.

The Fourth Term Permits result in significant resource expenditure by the Copermittees to report permit compliance information to the San Diego Water Board in the form of annual jurisdictional runoff management program, watershed program, and monitoring program reports. The San Diego Water Board must then expend much of its limited resources on reviewing more than 50 voluminous reports submitted annually by the Copermittees. The information currently reported by the Copermittees is of limited value when trying to measure progress toward achieving improvements in the quality of receiving waters or discharges from the MS4s. Oversight of the MS4 permits is further complicated by the inconsistencies among the requirements issued to the Orange County, San Diego County, and Riverside County Copermittees under three separate MS4 permits.

Under the Fourth Term Permits, the Copermittees must expend a significant portion of their limited resources collecting data of limited value, and putting together reports to submit that information to the San Diego Water Board. Likewise, the San Diego Water Board must expend most of its limited resources reviewing reports, and developing permits instead of working directly with the Copermittees to identify solutions to problems causing impacts to water quality. This is an unsustainable course that will continue to demand more resources from the Copermittees and the San Diego Water Board, and would continue to result in unknown water quality benefits.

New Permitting Approach

The goal of the Regional MS4 Permit is twofold: 1) bring a consistent set of MS4 permit requirements to all of the Copermittees within the San Diego Region; and, 2) provide an MS4 permit with requirements that will allow the Copermittees to focus their efforts and resources on achieving goals and desired outcomes toward the improvement of water quality rather than completing specific actions.

The overall approach included in the Regional MS4 Permit with respect to the jurisdictional runoff management programs will not differ significantly from the current permits. The general requirements for the jurisdictional runoff management program components and compliance with those requirements will remain and be applied consistently throughout the San Diego Region under the Regional MS4 Permit.

The most significant difference in the new permitting approach is the specific manner of implementation for those jurisdictional runoff management programs. Implementation will be based on decisions made by the Copermittees in accordance with what they have identified as their highest priority water quality conditions. In other words, the Copermittees will have significant control in how to implement the jurisdictional runoff management programs to best utilize their available resources in addressing a specific set of priorities effectively, instead of trying to address all the water quality priorities ineffectively.

The Copermittees are given the responsibility of identifying their highest priority water quality conditions that they intend to address. The Copermittees will develop goals that can be used to measure and demonstrate progress or improvements toward addressing those priorities. In addition to the goals, the Copermittees will provide a schedule for achieving the goals for those highest priorities. The measurement of progress toward achieving the goals for those highest priorities requires a better defined and more focused program of monitoring and assessment than under the Fourth Term Permits.

The monitoring and assessment program must be designed to inform the Copermittees of their progress, and the need for modifications in their jurisdictional runoff management programs and schedules to achieve their goals to improve water quality. The monitoring and assessment program requirements will have a more central role in the Regional MS4 Permit than in earlier permits. The monitoring and assessment requirements must also be designed to enable the Copermittees to focus and direct their efforts in implementing their jurisdictional runoff management programs toward their stated desired outcomes to improve the quality of receiving waters and/or discharges from the MS4s.

By providing an MS4 permit that allows the Copermittees to make more decisions about how to utilize and focus their resources, along with a better defined monitoring and assessment program to inform their water quality management decisions, the Copermittees will have the opportunity to:

1) *Plan strategically*. The Copermittees must have the ability to identify their available resources and develop and implement long term plans that can organize, collect, and use those resources in the most strategically advantageous and efficient manner possible. This ability to develop long term plans will allow the Copermittees to focus and utilize their resources in a more concerted way over the short term and long term to address specific water quality priorities through stated desired outcomes.

2) *Manage adaptively*. The Copermittees must be given the ability to modify their plans as additional information and data are collected from the monitoring and assessment programs. The Copermittees' plans may require modifications to the programs, priorities, goals, strategies, and/or schedules in order for the Copermittees to achieve a stated desired outcome.

3) *Identify synergies*. The Copermittees must be given more flexibility to identify efficiencies within and among their jurisdictional runoff management programs as the strategies are developed and implemented to increase the Copermittees' collective effectiveness. The Copermittees must also be able to identify and utilize resources available from other agencies and entities to further augment and enhance their jurisdictional runoff management programs and/or to collectively work with those other agencies and entities toward achieving a stated desired outcome.

The Regional MS4 Permit requirements will provide the Copermittees the flexibility and responsibility to decide what actions will be necessary to achieve an outcome that is tailored and designed by the Copermittees to improve specific prioritized water quality conditions. The San Diego Water Board expects the approach of the Regional MS4 Permit to give the Copermittees a greater sense of ownership for restoring the quality of receiving waters in the San Diego Region by becoming an integral part of the decision making process in identifying water quality conditions to be addressed, as well as determining the best use of their resources.

VI. ECONOMIC CONSIDERATIONS

Statutory Considerations

California Water Code (CWC) section 13241 requires the San Diego Water Board to consider certain factors, including economic considerations, in the adoption of water quality objectives. CWC section 13263 requires the San Diego Water Board to take into consideration the provisions of CWC section 13241 in adopting waste discharge requirements.

In *City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, the California Supreme Court considered whether Regional Water Boards must comply with CWC section 13241 when issuing waste discharge requirements under CWC section 13263(a) by taking into account the costs a permittee will incur in complying with the permit requirements. The Court concluded that whether it is necessary to consider such cost information "*depends on whether those restrictions meet or exceed the requirements of the federal Clean Water Act.*" (*Id.* at p. 627.) The Court ruled that Regional Water Boards may not consider the factors in CWC section 13241, including economics, to justify imposing pollutant restrictions that are less stringent than applicable federal law requires. (*Id.* At pp. 618, 626-627 ["*[Water Code section 13377 specifies that [] discharge permits issued by California's regional boards must meet the federal standards set by federal law. In effect, section 13377 forbids a regional board's consideration of any economic hardship on the part of the permit holder if doing so would result in the dilution of the requirements set by Congress in the Clean Water Act...Because CWC section 13263 cannot authorize what federal law forbids, it cannot authorize a regional board, when issuing a [] discharge permit, to use compliance costs to justify pollutant restrictions that do not comply with federal clean water standards*."]). However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Regional Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

As discussed in Section VII.F, Unfunded State Mandates, the San Diego Water Board finds that the requirements in this Order are not more stringent than the minimum federal requirements. Among other requirements, federal law requires MS4 permits to include requirements to effectively prohibit non-storm water discharges into the MS4s, in addition to requiring controls to reduce the discharge of pollutants in storm water to the MEP, and other provisions as USEPA or the State determines are appropriate for the control of pollutants in MS4 discharges.

The requirements in this Order may be more specific or detailed than those enumerated in federal regulations under 40 CFR 122.26 or in the USEPA guidance. However, the requirements have been designed to be consistent with and within the federal statutory mandates described in CWA section 402(p)(3)(B)(ii) and (iii) and the related federal regulations and guidance. Consistent with federal law, all of the

conditions in this Order could have been included in a permit adopted by USEPA in the absence of the in lieu authority of California to issue NPDES permits.

Moreover, the inclusion of numeric WQBELs in this Order does not cause this Order to be more stringent than federal law. Federal law authorizes both narrative and numeric effluent limitations to meet state water quality standards. The inclusion of WQBELs as discharge specifications in an NPDES permit in order to achieve compliance with water quality standards is not a more stringent requirement than the inclusion of BMP based permit limitations to achieve water quality standards (State Water Board Order No. WQ 2006-0012 (*Boeing*)). Therefore, consideration of the factors set forth in CWC section 13241 is not required for permit requirements to implement the effective prohibition on the discharge of non-storm water discharges into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determine appropriate to control such pollutants, as those requirements are mandated by federal law.

Included in the provisions of the Order are monitoring and reporting requirements that are designed to demonstrate that the Copermittees are implementing programs to comply with the CWA municipal storm water requirements. CWA section 308(a) and 40 CFR 122.41(h), (j)-(l), 122.44(i) and 122.48 require that all NPDES permits specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s (40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c)) also specify additional monitoring and reporting requirements. In addition to the federal requirements of the CWA, the San Diego Water Board also has the authority in CWC 13383 to establish monitoring, reporting, and recordkeeping requirements that implement federal and state laws and regulations through NPDES permits. .

The monitoring and assessment information that will be reported to the San Diego Water Board is necessary to determine if the Copermittees are making progress toward achieving compliance with the discharge prohibitions, receiving water limitations, and effluent limitations under Provision A of the Order. The monitoring and assessment information that will be reported is also expected to be key to the iterative approach and adaptive management process that is required to be implemented by the Copermittees if they cannot meet the discharge prohibitions and receiving water limitations under the present conditions, which is also part of the requirements under Provision A of the Order.

Notwithstanding the above, the San Diego Water Board has considered cost information in issuing this Order, as discussed below. The San Diego Water Board has also considered all of the evidence that has been presented to the San Diego Water Board regarding the CWC section 13241 factors in adopting this Order. The San Diego Water Board finds that the requirements in this Order are reasonably necessary to protect beneficial uses identified in the Basin Plan and the economic information related to costs of compliance and other CWC section 13241 factors are not sufficient to justify failing to protect those beneficial uses. Where appropriate, the

San Diego Water Board has provided or will consider providing the Copermittees with additional time to implement control measures to achieve final WQBELs and/or water quality standards.

Cost Information

Discussions of the financial and economic ramifications of municipal storm water management programs tend to focus on the significant costs incurred by municipalities in developing and implementing the programs. When considering the cost of implementing the programs, however, it is also important to consider the alternative costs that are incurred when programs are not fully implemented, as well as the economic benefits which result from effective program implementation.

The recent financial and economic conditions have amplified the concerns about the costs incurred by the municipalities in developing and implementing their programs. The reduction in resources resulting from the recent financial and economic conditions has been cited by many of the Copermittees as a justification for reducing the requirements that must be met by their programs. While the recent conditions are a cause for concern in the short term, these programs also have an opportunity to identify and implement improvements and efficiencies before the next period of growth and development, resulting in more effective and sustainable programs over the long term.

In addition, it is very difficult to ascertain the true cost of implementation of the Copermittees' management programs because of inconsistencies in reporting by the Copermittees. Reported costs of compliance for the same program element can vary widely from city to city, often by a very wide margin that is not easily explained.[2] Despite these problems, efforts have been made to identify management program costs, which can be helpful in understanding the costs of program implementation.

The San Diego Water Board recognizes that the Copermittees will incur costs in implementing this Order, potentially above and beyond the costs from the Copermittees' prior permits. The San Diego Water Board also recognizes that, due to California's current economic condition, many Copermittees currently have limited staff and resources to implement actions to address its MS4 discharges. Based on the economic considerations below, the San Diego Water Board has provided the Copermittees a significant amount of flexibility to choose how to implement the requirements of the Order.

The Order also allows the Copermittees to customize their plans, programs, and monitoring requirements. In the end, it is up to the Copermittees to determine the effective BMPs and measures necessary to comply with this Order. The Copermittees can choose to implement the least expensive measures that are effective in meeting

[2] LARWQCB, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.

the requirements of this Order. This Order also does not require the Copermittees to fully implement all requirements within a single permit term. Where appropriate, the Board has provided the Copermittees with additional time outside of the permit term to implement control measures to achieve final WQBELs and/or water quality standards.

The San Diego Water Board has considered available cost information associated with compliance with this Order. It is not possible to predict accurately the cost impact of the requirements that involve an unknown level of implementation or that depend on environmental variables that are as yet undefined. Only general conclusions can be drawn from this information.

Estimated Municipal Storm Water Program Implementation Costs

The USEPA, the State Water Board, and the California Regional Water Quality Control Boards (Regional Water Boards) have attempted to evaluate the costs of implementing municipal storm water programs. The assessments have demonstrated that the true costs are difficult to ascertain and reported costs vary widely. In addition, reported fiscal analyses tend to neglect the costs incurred to municipalities when storm water and non-storm water runoff is not effectively managed, which are incurred as a result of pollution, contamination, nuisance, and damage to ecosystems, property, and human health. Nonetheless, they provide a useful context for considering the costs of requirements within Order No. R9-2013-0001.

In 1999, the USEPA reported on multiple studies it conducted to determine the cost of management programs. A study of Phase II municipalities determined that the annual cost of the Phase II program was expected to be $9.16 per household. The USEPA also studied 35 Phase I municipalities, finding costs to be $9.08 per household annually, similar to those anticipated for Phase II municipalities.[3]

The State Water Board commissioned a study by the California State University, Sacramento to assess costs of the Phase I MS4 program. This study includes an assessment of costs incurred by Phase I MS4s throughout the state to implement their programs. Annual cost per household in the study ranged from $18 to $46, with the Fresno-Clovis Metropolitan Area representing the lower end of the range, and the City of Encinitas (in San Diego County) representing the upper end of the range.[4]

A study on Phase I MS4 program costs was also conducted by the California Regional Water Quality Control Board, Los Angeles Region (Los Angeles Water Board), where program costs reported in the municipalities' annual reports were assessed. The Los

[3] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791-68792.
[4] State Water Board, 2005. NPDES Stormwater Cost Survey. P. ii.

Angeles Water Board estimated that average per household cost to implement the MS4 program in Los Angeles County was $12.50. [5]

It is important to note that reported program costs are not all attributable to solely complying with MS4 permits. Many program components, and their associated costs, existed before any MS4 permits were ever issued. For example, street sweeping and trash collection costs cannot be solely or even principally attributable to MS4 permit compliance, since these practices have long been expected from and implemented by municipalities.

Therefore, true program cost resulting from MS4 permit requirements is some fraction of reported costs. The California State University, Sacramento study found that only 38 percent of program costs are new costs fully attributable to MS4 permits. The remainder of the program costs was either pre-existing or resulted from enhancement of pre-existing programs.[6] In 2000, the County of Orange found that even lower amounts of program costs are solely attributable to MS4 permit compliance, reporting that the amount attributable to implement the County or Orange Drainage Area Management Plan (DAMP), was less than 20 percent of the total budget. The remaining 80 percent was attributable to pre-existing programs.[7] More current data from the County of Orange is not used in this discussion because the County of Orange no longer reports such information.

Estimated Value of Healthy Water Quality

Economic considerations of municipal storm water management programs cannot be limited only to program costs. Evaluation of programs must also consider information on the benefits derived from environmental protection and improvement.[8] Attention is often focused on municipal storm water management program costs, but the programs must also be viewed in terms of their value to the public.

Placing a value on healthy receiving waters is very difficult. Often the value of receiving waters with good water quality manifests in other forms, such as tourism, recreational opportunities, and/or increased property values. When surface water bodies are degraded, thereby degrading the habitat within and adjacent to the water bodies, the public loses the value and benefits associated with being able to use the area in and around the water bodies. Surface waters that are able to support the beneficial uses designated in the Basin Plan can sustain plants and wildlife that can attract visitors and residents, providing aesthetic, recreational, as well as monetary value to the public. At this time, however, there have been no studies for the San

[5] Los Angeles Water Board, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.
[6] State Water Board, 2005. NPDES Stormwater Cost Survey. P. 58.
[7] County of Orange, 2000. A NPDES Annual Progress Report. P. 60.
[8] Ribaudo M.O. and D. Heelerstein. 1992, *Estimating Water Quality Benefits: Theoretical and Methodological Issues.* U.S. Department of Agriculture. Technical Bulletin No. 1808.

Diego Region to quantify the added value that surface waters with healthy water quality can provide.

USEPA has estimated that household willingness to pay for improvements in fresh water quality for fishing and boating is approximately $158-$210.[9] This estimate can be considered conservative, since it does not include important considerations such as marine waters benefits, wildlife benefits, or flood control benefits. Another study conducted by California State University, Sacramento reported that the annual household willingness to pay for statewide clean water is approximately $180.[10]

A study conducted by the University of Southern California and University of California, Los Angeles assessed the costs and benefits of implementing various approaches for achieving compliance with the MS4 permits in the Los Angeles region. The study found that non-structural systems would cost $2.8 billion but provide $5.6 billion in benefit. If structural systems were determined to be needed, the study found that total costs would be $5.7 to $7.4 billion, while benefits could reach $18 billion.[11] Costs are anticipated to be borne over many years, probably at least ten years.

As can be seen, the benefits of the municipal storm water management programs are expected to considerably exceed their costs. Such findings are corroborated by USEPA, which found that the benefits of implementation of its Phase II storm water rule would also outweigh the costs.[12]

[9] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68793.
[10] State Water Board, 2005. NPDES Stormwater Cost Survey. P. iv.
[11] Los Angeles Water Board, 2004. Alternative Approaches to Stormwater Control.
[12] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791.

VII. APPLICABLE STATUTES, REGULATIONS, PLANS AND POLICIES

A. Legal Authorities – Federal Clean Water Act and California Water Code

This Order is issued pursuant to section 402 of the CWA and implementing regulations adopted by the USEPA and chapter 5.5, division 7 of the CWC (commencing with section 13370). This Order serves as an NPDES permit for point source discharges to surface waters. This Order also serves as waste discharge requirements pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

The objective of the CWA is "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*." To carry out this objective, the CWA requires the implementation of permit programs to regulate the discharge of pollutants and dredged or fill material to the navigable waters of the U.S. and to regulate the use and disposal of sewage sludge. CWA section 402 provides the legal authority to issue a permit for the discharge of pollutants to waters of the U.S. under the NPDES. The CWA provides that NPDES permits may be issued by states which are authorized to implement the provisions of that act. California became authorized to implement the NPDES permit program on May 14, 1973.

The Porter-Cologne Water Quality Control Act (Division 7, commencing with CWC section 13000) established the State Water Resources Control Board (State Water Board) and nine Regional Water Quality Control Boards (Regional Water Boards) as the principal state agencies with primary responsibility for the coordination and control of water quality. CWC section 13200(f) established the San Diego Water Board, which has the primary responsibility for the coordination and control of water quality in the San Diego Region, which includes all the basins draining into the Pacific Ocean between the southern boundary of the Santa Ana Region and the California-Mexico boundary. The San Diego Water Board implements the CWA through Chapter 5.5 of the CWC, commencing with section 13370. CWC section 13377 provides the San Diego Water Board the legal authority to issue waste discharge requirements to ensure compliance with all applicable provisions of the CWA and acts amendatory thereof or supplementary, thereto, to implement water quality control plans, or for the protection of beneficial uses, or to prevent nuisance.

CWA section 402(p) requires the USEPA or authorized state to issue NPDES permits for storm water discharges from municipal separate storm sewer systems (MS4s) to waters of the U.S. CWA section 402(p)(3)(B)(ii) requires that NPDES permits for storm water discharges from MS4s "*effectively prohibit non-storm water discharges*" into the MS4s. CWA section 402(p)(3)(B)(iii) requires that NPDES permits for storm water discharges from MS4s to "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable* [MEP], *including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control*

of such pollutants."

The USEPA published implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]), which prescribe permit application requirements for storm water discharges from MS4s pursuant to CWA 402(p), on November 16, 1990. The USEPA published an Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems, which provided guidance on permit application requirements for regulated MS4s, on May 17, 1996. The federal regulations in 40 CFR 122 and guidance issued by USEPA serve as the foundation for the provisions of Order No. R9-2013-0001. The legal authorities provided by the above statutes and regulations are included as part of the discussions in Section VIII of this Fact Sheet.

B. Legal Authority for the Permit Issued on a Region-wide Basis

CWA section 402(p)(3)(B) provides the San Diego Water Board the legal authority to issue an NPDES permit for the San Diego Region as compared to separate MS4 permits based upon County- and partial County-wide boundaries as they exist within the San Diego Region. CWA section 402(p)(3)(B) states that "*Permits for discharges from municipal storm sewers- (i) may be issued on a system- or jurisdiction-wide basis ....*" The federal regulations in 40 CFR 122.26(a)(1)(v) also state that the San Diego Water Board "*may designate dischargers from municipal separate storm sewers on a system-wide or jurisdiction-wide basis. In making this determination, the [San Diego Water Board] may consider the following factors: (A) the location of the discharge with respect to waters of the United States; (B) the size of the discharge; (C) the quantity and nature of the pollutants discharged to waters of the United States; and (D) other relevant factors*."

More specifically, the federal regulations provide that for large and medium MS4 systems, the San Diego Water Board may issue a regional permit. Specifically, the federal regulation in 40 CFR 122.26(a)(3) provide:

"*(ii) The Director may either issue one system-wide permit covering all discharges from municipal separate storm sewers within a large or medium municipal storm sewer system or issue distinct permits for appropriate categories of discharges within a large or municipal separate storm sewer system including, but not limited to: all discharges owned or operated by the same municipality; located within the same jurisdiction; all discharges within a system that discharge to the same watershed; discharges within a system that are similar in nature; or for individual discharges from municipal separate storm sewers within the system.*

(iii) The operator of a discharge from a municipal separate storm sewer which is part of a large or medium municipal separate storm sewer system must either: (A) Participate in a permit application (to be a permittee or a co-permittee) with one or more other operator of discharges from the large or medium municipal

storm sewer system which covers all, or a portion of all, discharges from the municipal separate storm sewer system; (B) Submit a distinct permit application which only covers discharges from the municipal separate storm sewers for which the operator is responsible; or (C) A regional authority may be responsible for submitting a permit application under the following guidelines....

(iv) One permit application may be submitted for all or a portion of all municipal separate storm sewers within adjacent or interconnected large or medium municipal separate storm sewer systems. The Director may issue one systemwide permit covering all, or a portion of all municipal separate storm sewers in adjacent or interconnected large or medium municipal separate storm sewer systems.

(v) Permits for all or a portion of all discharges from large or medium municipal separate storm sewer systems that are issued on a system-wide, jurisdiction-wide, watershed or other basis may specify different conditions relating to different discharges covered by the permit, including different management programs for different drainage areas which contribute storm water to the system."

Based on these regulations, the San Diego Water Board may issue a region-wide MS4 permit. The regulations also clarify that the permit may include different conditions for separate discharges covered by the permit. This allows the San Diego Water Board to ensure that suitable water quality conditions and provisions are identified for each watershed.

The USEPA's responses to comments in the Final Rule for the above-mentioned regulations also make it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide, permits. In the Final Rule published in the Federal Register and containing the responses to comments, USEPA notes that 40 CFR 122.26(a)(3)(iv) would allow an entire system in a geographical region under the purview of a State agency to be designated under a permit.[13] USEPA also states that many commenters wanted to allow the permitting authority broad discretion to establish system-wide permits, and that EPA believes that paragraphs 40 CFR 122.26 (a)(1)(v) and (a)(3)(ii) allow for such broad discretion.[14]

This Order creates watershed requirements that apply to multiple counties. The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees. Managing storm water on a regional and watershed basis is expected to result in improved water quality, as the Order focuses on monitoring and management practices necessary to improve each watershed rather than political boundaries. A single permit also allows the San Diego Water Board staff to expend fewer resources developing successive multiple permits and allows more resources to be devoted to working cooperatively with all three

[13] 55 Federal Register 47990-01, 48042
[14] Ibid

current groups of Copermittees to ensure implementation of this Order results in improved water quality.

C. Federal and California Endangered Species Acts

This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2115.5) or the Federal Endangered Species Act (16 United States Code [USC] sections 1531 to 1544). This Order requires compliance with requirements to protect the beneficial uses of waters of the U.S. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

D. California Environmental Quality Act

The action to adopt an NPDES Permit is exempt from the provisions of Chapter 3 of the California Environmental Quality Act (CEQA) (Public Resources Code section 21100, et seq.) pursuant to CWC section 13389. (*County of Los Angeles v. Cal. Water Boards* (2006) 143 Cal.App.4th 985.)

E. State and Federal Regulations, Plans and Policies

The legal authority provided by the following regulations, plans, and policies are also included as part of the discussions in Section VIII of this Fact Sheet.

Water Quality Control Plan for the San Diego Basin

The CWA requires the San Diego Water Board to establish water quality standards for each water body in its region. Water quality standards include beneficial uses, water quality objectives and criteria that are established at levels sufficient to protect beneficial uses, and an antidegradation policy to prevent degrading of waters. On September 8, 1994, the San Diego Water Board adopted the *Water Quality Control Plan for the San Diego Basin (*Basin Plan). The Basin Plan designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters in the San Diego Region. The San Diego Water Board has amended the Basin Plan on multiple occasions since 1994. In addition, the Basin Plan implements State Water Board Resolution No. 88-63, which established state policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply. Beneficial uses applicable to the surface water bodies that receive discharges from the MS4s within the San Diego Region generally include those listed below:

The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region:

- Municipal and Domestic Supply (MUN)
- Agricultural Supply (AGR)
- Industrial Process Supply (PROC)
- Industrial Service Supply (IND)
- Ground Water Recharge (GWR)
- Contact Water Recreation (REC1)
- Non-contact Water Recreation (REC2)
- Warm Freshwater Habitat (WARM)
- Cold Freshwater Habitat (COLD)
- Wildlife Habitat (WILD)
- Rare, Threatened, or Endangered Species (RARE)
- Freshwater Replenishment (FRSH)
- Hydropower Generation (POW)
- Preservation of Biological Habitats of Special Significance (BIOL)

The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region:

- Navigation (NAV)
- Commercial and Sport Fishing (COMM)
- Estuarine Habitat (EST)
- Marine Habitat (MAR)
- Aquaculture (AQUA)
- Migration of Aquatic Organisms (MIGR)
- Spawning, Reproduction, and/or Early Development (SPWN)
- Shellfish Harvesting (SHELL)

Pursuant to Water Code sections 13263 and 13377, the requirements of this Order implement the Basin Plan.

Water Quality Control Plan for Ocean Waters of California, California Ocean Plan

In 1972, the State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan). The State Water Board adopted the most recent amended Ocean Plan on September 15, 2009. The Office of Administrative Law approved it on March 10, 2010. On October 8, 2010, USEPA approved the 2009 Ocean Plan. The Ocean Plan is applicable, in its entirety, to ocean waters of the State. In order to protect beneficial uses, the Ocean Plan establishes water quality objectives and a program of implementation. Pursuant to Water Code sections 13263 and 13377, the requirements of this Order implement the Ocean Plan. The Ocean Plan identifies the beneficial uses of ocean waters of the State to be

protected as summarized below:

- Industrial water supply
- Water contact and non-contact recreation, including aesthetic enjoyment; navigation
- Commercial and sport fishing
- Mariculture
- Preservation and enhancement of designated Areas of Special Biological Significance
- Rare and endangered species
- Marine habitat
- Fish spawning and shellfish harvesting

On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving an exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges. On June 19, 2012, the State Water Board adopted Order No. 2012-0031, amending Order No. 2012-0012 to require pollutant load reductions to be achieved within six years for the ASBS Compliance Plans, section A.2.d(2) and ASBS Pollution Prevention Plans, section B.2.b(2). The State Water Board Resolution No. 2012-0012, as amended requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject terms and conditions of State Water Board Resolution No. 2012-0012, as amended. The Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012, as amended, applicable to these discharges, are ~~hereby~~ incorporated in Attachment A of this Order ~~as if fully set forth herein~~. Requirements of this Order implement the Ocean Plan.

Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality

On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

Antidegradation Policy

Federal regulations (40 CFR 131.12) require that the state water quality standards include an antidegradation policy consistent with the federal antidegradation policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16 ("Statement of Policy with Respect to Maintaining the Quality of the Waters of the State"). State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law.

The San Diego Water Board's Basin Plan implements and incorporates by reference both the State and federal antidegradation policies. State Water Board Resolution No. 68-16 and 40 CFR 131.12 require the San Diego Water Board to maintain high quality waters of the State until it is demonstrated that any change in quality will be consistent with maximum benefit to the people of the State, will not unreasonably affect beneficial uses, and will not result in water quality less than that described in the San Diego Water Boards' policies. State Water Board Resolution No. 68-16 requires that discharges of waste be regulated to meet best practicable treatment or control to assure that pollution or nuisance will not occur and the highest water quality consistent with the maximum benefit to the people of the State be maintained.

The discharges permitted in this Order are consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Board Resolution No. 68-16. Many of the water bodies within the area covered by this Order are of high quality. The Order requires the Copermittees to meet best practicable treatment or control to meet water quality standards. As required by 40 CFR 122.44(a), the Copermittees must comply with the "maximum extent practicable" technology-based standard set forth in CWA section 402(p) for discharges of pollutants in storm water from the MS4s.

Many of the waters within the area covered by this Order are impaired and listed on the State's CWA Section 303(d) List and the San Diego Water Board has established TMDLs to address the impairments. This Order requires the Copermittees to comply with permit provisions to implement the WLAs set forth in the TMDLs in order to restore the beneficial uses of the impaired water bodies consistent with the assumptions and requirements of the TMDLs. This Order includes requirements to develop and implement storm water management programs, achieve WQBELs, and effectively prohibit non-storm water discharges into the MS4. The issuance of this Order does not authorize an increase in the amount of discharge of waste.

Anti-Backsliding Requirements

CWA sections 402(o) and 303(d)(4) and 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations or conditions may be relaxed. All effluent limitations and other conditions in this Order are at least as stringent as the effluent limitations in the previous permits issued to the San Diego County Copermittees, the Orange County Copermittees and the Riverside County Copermittees.

Clean Water Act Section 303(d) List

CWA section 303(d)(1) requires each State to identify specific water bodies within its boundaries where water quality standards are not being met or are not expected to be met after implementation of technology-based effluent limitations on point sources. Water bodies that do not meet water quality standards are considered impaired and are placed on the state's "303(d) List." Periodically, USEPA approves the State's 303(d) List.

Most recently, USEPA approved the State's 2010 303(d) List of impaired water bodies on October 11, 2011, which includes certain receiving waters in the San Diego Region. For each listed water body, the state or USEPA is required to establish a TMDL of each pollutant impairing the water quality standards in that water body. A TMDL is a tool for implementing water quality standards and is based on the relationship between pollution sources and in-stream water quality conditions. The TMDL establishes the allowable pollutant loadings for a water body and thereby provides the basis to establish water quality-based controls. These controls should provide the pollution reduction necessary for a water body to meet water quality standards.

A TMDL is the sum of the allowable pollutant loads of a single pollutant from all contributing point sources (the waste load allocations or WLAs) and non-point sources (load allocations of LAs) plus the contribution from background sources and a margin of safety (40 CFR 130.2(i)). MS4 discharges are considered point source discharges. For 303(d)-listed water bodies and pollutants in the San Diego Region, the San Diego Water Board or USEPA develops and adopts TMDLs that specify these requirements.

Since 2002, the San Diego Water Board has established ~~six (6)~~ seven (7) TMDLs to remedy water quality impairments in various water bodies within the San Diego Region (see Attachment E to the Order). These TMDLs identify MS4 discharges as a source of pollutants to these water bodies, and, as required, establish WLAs for MS4 discharges to reduce the amount of pollutant discharged to receiving waters. CWA section 402(p)(3)(B)(iii) requires the San Diego Water Board to impose permit conditions, including: "management practices, control techniques and system, design and engineering methods, and *such other provisions as the Administrator or the State determines appropriate for the control of such pollutants."* (Emphasis added.) CWA section 402(a)(1) also requires states to issue permits with conditions necessary to carry out the provisions of the CWA. Federal regulations also require that NDPES permits contain WQBELs consistent with the assumptions and requirements of all available WLAs (40 CFR 122.44(d)(1)(vii)(B)). CWC section 13377 also requires that NPDES permits include limitations necessary to implement water quality control plans. Therefore, this Order includes WQBELs and other provisions to implement the TMDL WLAs assigned to Copermittees regulated by this Order.

Other Regulations, Plans and Policies

This Order implements all other applicable federal regulations and State regulations, plans and policies, including the California Toxics Rule at 40 CFR 131.38 (Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California Rule [California Toxics Rule or CTR]), and State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP).

F. Unfunded State Mandates

Article XIII B, Section 6(a) of the California Constitution provides that whenever "*any state agency mandates a new program or higher level of service on any local government, the state shall provide a subvention of funds to reimburse that local government for the costs of the program or increased level of service*." The requirements of this Order do not constitute state mandates that are subject to a subvention of funds for several reasons, including, but not limited to, the following.

First, the requirements of this Order do not constitute a new program or a higher level of service as compared to the requirements contained in the previous Fourth Term Permits. The overarching requirement to impose controls to reduce the pollutants in discharges from MS4s is dictated by the CWA and is not new to this permit cycle (33 USC section 1342(p)(3)(B)). The inclusion of new and advanced measures as the MS4 programs evolve and mature over time is anticipated under the CWA (55 FR 47990, 48052 (Nov. 16, 1990)), and to the extent requirements in this Order are interpreted as new advanced measures, they do not constitute a new program or higher level of service.

Second, and more broadly, mandates imposed by federal law, rather than by a state agency, are exempt from the requirement that the local agency's expenditures be reimbursed (Cal. Const., art. XIII B, section 9, subd. (b)). This Order implements federally mandated requirements under the CWA and its requirements are therefore not subject to subvention of funds. This includes federal requirements to effectively prohibit non-storm water discharges, to reduce the discharge of pollutants in storm water to the MEP, and to include such other provisions as the Administrator or the State determines appropriate for the control of such pollutants (33 USC section 1342(p)(3)(B)). Federal cases have held these provisions require the development of permits and permit provisions on a case-by-case basis to satisfy federal requirements. (*Natural Resources Defense Council, Inc., v. USEPA* (9th Cir. 1992) 966 F.2d 1292, 1308, fn. 17.)

The authority exercised under this Order is not reserved state authority under the CWA's savings clause (cf. *Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 627-628 [relying on 33 USC section 1370, which allows a state to develop requirements which are not "less stringent" than federal requirements]), but instead is part of a federal mandate to develop pollutant reduction requirements for municipal separate storm sewer systems. To this extent, it is entirely federal authority that forms the legal basis to establish the permit provisions. (See, *City of Rancho Cucamonga v. Regional Water Quality Control Board, Santa Ana Region* (2006) 135 Cal.App.4th 1377, 1389; *Building Industry Ass'n of San Diego Co. v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 882-883.)

The MEP standard is a flexible standard that balances a number of considerations, including technical feasibility, cost, public acceptance, regulatory compliance, and effectiveness. (*Building Ind. Ass'n., supra,* 124 Cal.App.4th at pp. 873-874, 889.) Such

considerations change over time with advances in technology and with experience gained in storm water management (55 FR 47990, 48052 (Nov. 16, 1990)). Accordingly, a determination of whether the conditions contained in this Order exceed the requirements of federal law cannot be based on a point by point comparison of the permit conditions and the minimum control measures that are required "at a minimum" to reduce pollutants to the maximum extent practicable and to protect water quality (40 CFR 122.34). Rather, the appropriate focus is whether the permit conditions, as a whole, exceed the MEP standard.

In recent months, the County of Los Angeles and County of Sacramento Superior Courts have granted writs setting aside decisions of the Commission on State Mandates that held certain requirements in Phase I permits constituted unfunded mandates. In both cases, the courts have found that the correct analysis in determining whether an MS4 permit constituted a state mandate was to evaluate whether the permit as a whole exceeds the MEP standard. (*State of Cal. v. Comm. on State Mandates* (Super. Ct. Sacramento County, 2012, No. 34-2010-80000604), *State of California v. County of Los Angeles* (Super. Ct. Los Angeles County, 2011, No. BS130730.) Both cases are currently pending appeal.

The requirements of the Order, taken as a whole rather than individually, are necessary to reduce the discharge of pollutants to the MEP and to protect water quality. The San Diego Water Board finds that the requirements of the Order are practicable, do not exceed federal law, and thus do not constitute an unfunded mandate. These findings are the expert conclusions of the principal state agency charged with implementing the NPDES program in California (CWC sections 13001, 13370).

It should also be noted that the provisions in this Order to effectively prohibit non-storm water discharges are also mandated by the CWA (33 USC section 1342(p)(3)(B)(ii)). Likewise, the provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state establishes or adopts a TMDL, federal law requires that permits must contain effluent limitations consistent with the assumptions and requirements of any applicable waste load allocation in a TMDL (40 CFR 122.44(d)(1)(vii)(B)).

Third, the local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental dischargers who are issued NPDES permits for storm water discharges. With a few inapplicable exceptions, the CWA regulates the discharge of pollutants from point sources (33 USC section 1342) and the Porter-Cologne Act regulates the discharge of waste (CWC section 13263), both without regard to the source of the pollutant or waste. As a result, the "costs incurred by local agencies" to protect water quality reflect an overarching regulatory scheme that places similar requirements on governmental and non-governmental dischargers. (See *County of Los Angeles v. State of California* (1987) 43 Cal.3d 46, 57-58 [finding comprehensive workers' compensation scheme did not create a cost for local agencies that was subject to state subvention].)

The CWA and the Porter-Cologne Act largely regulate storm water with an even hand, but to the extent there is any relaxation of this even-handed regulation, it is in favor of the local agencies. Generally, the CWA requires point source dischargers, including dischargers of storm water associated with industrial or construction activity, to comply strictly with water quality standards (33 USC section 1311(b)(1)(C); *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159, 1164-1165 [noting that industrial discharges must strictly comply with water quality standards]). As discussed in prior State Water Board decisions, certain provisions of this Order do not require strict compliance with water quality standards (State Water Board Order No. WQ 2001-0015, p. 7). Those provisions of this Order regulate the discharge of waste in municipal storm water under the CWA's MEP standard, not the BAT/BCT standard that applies to other types of discharges. These provisions, therefore, regulate the discharge of waste in municipal storm water more leniently than the discharge of waste from non-governmental sources.

Fourth, the Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)). To the extent that the local agency Copermittees have voluntarily availed themselves of the permit, the program is not a state mandate. (Accord, *County of San Diego v. State of California* (1997) 15 Cal.4th 68, 107-108.)

Fifth, the local agency Copermittees' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under state law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

Finally, even if any of the permit provisions could be considered unfunded mandates, under Government Code section 17556, subdivision (d), a state mandate is not subject to reimbursement if the local agency has the authority to charge a fee. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order, subject to certain voting requirements contained in the California Constitution. (See Cal. Const., Art. XIII D, section 6, subd. (c); see also *Howard Jarvis Taxpayers Ass'n v. City of Salinas* (2002) 98 Cal.App.4th 1351, 1358-1359.) The Fact Sheet demonstrates that numerous activities contribute to the pollutant loading in the MS4. Local agencies can levy service charges, fees, or assessments on these activities, independent of real property ownership. (See, e.g., *Apartment Ass'n of Los Angeles County, Inc., v. City of Los Angeles* (2001(24 Cal.4th 830, 842 [upholding inspection fees associated with renting property].) The authority and ability of a local agency to defray the cost of a program without raising taxes indicates that a program does not entail a cost subject to subvention. (*Clovis Unified School Dist. V. Chiang* (2010) 188 Cal.App.4th 794, 812, citing *Connell v. Sup. Ct.* (1997) 59 Cal.App.4th 382, 401; *County of Fresno v. State of California* (1991) 53 Cal. 3d. 482, 487-488.)

VIII. PROVISIONS

The provisions (i.e. NPDES permit requirements) of the Order are discussed below.

A. Prohibitions and Limitations

Purpose: Provision A includes the prohibitions and limitations requirements that are the foundation of all the subsequent requirements included in the Order. Compliance with the prohibitions and limitations will restore and protect receiving waters from impacts that may be caused by discharges into and from the Copermittees' MS4s and ultimately achieve the objective of the CWA.

In meeting the requirements set forth in the Order, the Copermittees must be cognizant that the prohibitions and limitations exist and will be the standard by which the San Diego Water Board will be measuring the progress and success of their implementation of the NPDES permit requirements.

***Discussion*:** The objective of the CWA is to "*restore and maintain the chemical, physical, and biological integrity of the Nation's waters*." The CWA requires the implementation of NPDES permit programs to regulate discharges of pollutants and dredged or fill material to the navigable waters of the U.S. For discharges into and from MS4s, the CWA requires the NPDES permits to "*effectively prohibit non-stormwater discharges into the storm sewers*" and "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable.*"

Provision A includes limitations, consistent with the requirements of the CWA for discharges from MS4s. Provision A expresses these limitations as discharge prohibitions, receiving water limitations, and effluent limitations. Compliance with the discharge prohibitions and receiving water limitations is also explicitly described, in conformance with precedential State Water Board Orders.

More specific and detailed discussions of the requirements of Provision A are provided below.

Provision A.1 (Discharge Prohibitions) prohibits the discharge of specific types of waste into and/or from the Copermittees' MS4s.

Provision A.1.a restates and reiterates Basin Plan Waste Discharge Prohibition 1, by prohibiting discharges into and from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the

state. The terms pollution,[15] contamination,[16] and nuisance[17] are defined under CWC 13050. Provision A.1.c incorporates all the waste discharge prohibitions of the Basin Plan into the requirements of the Order. The waste discharge prohibitions from the Basin Plan have been reproduced and provided in Attachment A to the Order.

Provision A.1.b requires non-storm water discharges into the MS4s to be effectively prohibited, consistent with the requirements of the CWA for MS4 permits to "*effectively prohibit non-stormwater discharges into the storm sewers*." The effective prohibition is required to be implemented by each Copermittee within its jurisdiction through the illicit discharge detection and elimination requirements under Provision E.2. The prohibition does not apply to NPDES permitted discharges into the Copermittees' MS4s.

The CWA employs the strategy of prohibiting the discharge of any pollutant from a point source into waters of the United States unless the discharger of the pollutant(s) obtains an NPDES permit pursuant to CWA Section 402. The 1987 amendment to the CWA includes provision 402(p) that specifically addresses NPDES permitting requirements for storm water discharges from MS4s. CWA section 402(p) prohibits the discharge of pollutants from specified MS4s to waters of the U.S. except as authorized by an NPDES permit and identifies two substantive standards for MS4 storm water permits. MS4 permits (1) "*shall include a requirement to effectively prohibit nonstormwater discharges into the storm sewers*" and (2) "*shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or State determines appropriate for the control of such pollutants*." (CWA section 402(p)(3)(B)(ii-iii).)

In November 1990, the USEPA published regulations addressing storm water discharges from MS4s (55 FR 47990 and following (Nov. 16, 1990) (Phase I Final Rule)). The regulations establish minimum requirements for MS4 permits, and generally focus on the requirement that MS4s implement programs to reduce the amount of pollutants found in storm water discharges to the MEP. The CWA's municipal storm water MEP standard does not require storm water discharges to strictly meet water quality standards, as is required for other NPDES permitted

[15] CWC 13050(l): "(1) 'Pollution' means an alteration of the quality of waters of the state by waste to a degree which unreasonably affects either of the following: (A) The water for beneficial uses. (B) Facilities which serve beneficial uses. (2) 'Pollution' may include "contamination.

[16] CWC 13050(k): "Contamination' means an impairment of the quality of waters of the state by waste to a degree which creates a hazard to public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste, whether or not waters of the state are affected."

[17] CWC 13050(m): "Nuisance' means anything which meets all of the following requirements: (1) Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. (2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. (3) Occurs during, or as a result of, the treatment or disposal of wastes."

discharges. Compliance is achieved through an iterative approach of continuous implementation of improved BMPs. This distinction reflects Congress's recognition that variability in flow and intensity of storm events render difficult strict compliance with water quality standards by MS4 permittees. In describing the controls that permits must include to reduce pollutants in storm water discharges to the MEP, the statute (CWA section 402(p)(3)(B)(iii)) states that the controls shall include: "*management practices, control techniques and system, design and engineering methods, and such other provisions as the [permit writer] determines appropriate for the control of such pollutants*."

In contrast, non-storm water discharges from the MS4 that are not authorized by separate NPDES permits are subject to requirements under the NPDES program, including discharge prohibitions, technology based effluent limitations and water quality-based effluent limitations (40 CFR 122.44). The regulations also require the Copermittee's program to include an element to detect and remove illicit discharges and improper disposal into the storm sewer (40 CFR 122.26(d)(2)(iv)(B)).

While "non-storm water" is not defined in the CWA or federal regulations, the federal regulations (at 40 CFR 122.26(b)(2)) define "*illicit discharge*" as *"any discharge to a municipal separate storm sewer that is not composed entirely of storm water and that is not covered by an NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer and discharges resulting from fire fighting activities)*." This definition is the most closely applicable definition of "non-storm water" contained in federal law. As stated in the Phase I Final Rule, USEPA added the illicit discharge program requirement to begin implementation of the 'effective prohibition' requirement to detect and control non-storm water discharges to their municipal system.

Thus, federal law mandates that permits issued to MS4s must require management practices that will result in reducing storm water pollutants to the MEP yet at the same time requires that non-storm water discharges be effectively prohibited from entering the MS4. "Effectively" prohibit does not mean that non-storm water discharges are authorized to be discharged into and from the Copermittees' MS4s. The Phase I Final Rule clarifies what "effectively prohibit" means (55 FR 47995):

> "*Section 402(p)(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…<u>Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit</u> (other than the permit for the discharge from the municipal separate storm sewer)*" [Emphasis added].

Consistent with federal law, unless non-storm water discharges to the MS4 are authorized by a separate NPDES permit, non-storm water discharges are

appropriately subject to the effective prohibition requirement in the CWA and Regional Water Boards are not limited by the iterative MEP approach to storm water regulation in crafting appropriate regulations for non-storm water discharges.

The federal regulations (40CFR122.26(d)(2)(i)(B)) require the Copermittees to establish the legal authority which authorizes or enables the Copermittees to prohibit illicit discharges to the MS4s. The federal regulations (40 CFR 122.26(d)(2)(vi)(B)(1)) require the Copermittees to "*implement and enforce an ordinance, order or similar means*" to prevent non-storm water discharges to their MS4s. Thus, the Copermittees are required to "*effectively*" prohibit non-storm water discharges to their MS4s through enforcing their legal authority established under "*ordinance, order or similar means*" and either remove those discharges to their MS4s, or require those discharges to obtain coverage under a separate NPDES permit. More detail about the program that must be implemented to "*effectively*" prohibit non-storm water discharges to the Copermittees' MS4s is provided under the discussion for Provision E.2.

Provision A.1.d was included to be consistent Resolution No. 2012-0012, adopted by the State Water Board on March 20, 2012. Provision A.1.d prohibits discharges from MS4s to Areas of Special Biological Significance (ASBS), except for storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach to the Heisler Park ASBS subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012. The pertinent Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 are provided in Attachment A to the Order.

Provision A.2 (Receiving Water Limitations) specifies the condition of the receiving waters that must be achieved when there are discharges from the Copermittees' MS4s. Receiving water limitations are included in all NPDES permits issued pursuant to the CWA section 402. CWA section 402(p)(3)(B)(iii) authorizes the inclusion of "*such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." This requirement gives USEPA or the State permitting authority, in this case the San Diego Water Board, discretion to determine what permit conditions are necessary to control pollutants.

In its Phase I Final Rule (see 55 FR 47990, 47994 (Nov. 16, 1990)), USEPA elaborated on these requirements, stating that, "*permits for discharges from municipal separate storm sewer systems must require controls to reduce the discharge of pollutants to the maximum extent practicable, and where necessary water quality-based controls*." USEPA reiterated in its Phase II Final Rule (64 FR 68722, 68737), that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL*." CWC section 13377 also requires that NPDES permits include limitations necessary to implement water quality control plans. Both the State Water Board and the San Diego Water Board have previously concluded that discharges from the MS4 contain pollutants that have

the reasonable potential to cause or contribute to excursions above water quality standards. As such, inclusion of receiving water limitations is appropriate to control MS4 discharges.

The inclusion of receiving water limitations is also consistent with the Ninth Circuit Court of Appeals' ruling in *Defenders of Wildlife v. Browner* (191 F.3d 1159, 1166 (1999)) that the permitting authority has discretion regarding the nature and timing of requirements that it includes as MS4 permit conditions to attain water quality standards. The Ninth Circuit Court of Appeals recently explained that, "*[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*" (*Natural Resources Defense Council v. County of Los Angeles* (9th Cir. 2011) 673 F.3d 880, 886 (revd. On other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013)))

The receiving water limitations included in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan or in water quality control plans or policies adopted by the State Water Board, including State Water Board Resolution No. 68-16, or in federal regulations, including but not limited to 40 CFR 131.12 and 131.38. The water quality objectives in the Basin Plan and other State Water Board plans and policies have been approved by USEPA and combined with designated beneficial uses constitute the water quality standards required under federal law.

Provision A.2.a requires that discharges from the Copermittees' MS4s must not cause or contribute to the violation of water quality standards in receiving waters. The water quality standards of the receiving waters must be protected from the impacts that may be caused by the Copermittees' MS4 discharges. Water quality standards applicable to the surface waters in the San Diego Region must be achieved through meeting the technology based standard of MEP through an iterative process of improved management actions. Provision A.2.a is also consistent with State Water Board Order WQ 99-05 precedent-setting language requiring discharges from MS4s to attain receiving water quality standards. The water quality control plans and policies with water quality standards applicable to the waters in the San Diego Region are included under Provision A.2.a.

Provisions A.2.b was included to be consistent with the requirements of State Water Board Resolution No. 2012-0012, adopted on March 20, 2012.

Provision A.3 (Effluent Limitations) specifies the condition of the discharges from the Copermittees' MS4s that must be achieved if and when there are discharges.

Consistent with CWA section 301(b)(1)(A) and 40 CFR 122.44(a), Provision A.3.a includes the technology-based effluent limitations that must be included in the Order. The technology-based effluent limits, representing the minimum level of control that must be imposed in a permit under CWA section 402, requires that pollutants in discharges of storm water from the Copermittees' MS4s be reduced to the MEP. This provision applies specifically to storm water discharges. Non-storm water discharges must be effectively prohibited, as required under Provision A.1.b. Non-storm water (dry weather) discharges from the MS4 are not considered storm water (wet weather) discharges and therefore are not subject to the MEP standard.

The technology-based MEP standard is an ever-evolving, flexible, and advancing concept. Neither Congress nor USEPA has specifically defined the term "maximum extent practicable." Congress established this flexible MEP standard so that the administrative bodies would have "*the tools to meet the fundamental goals of the Clean Water Act in the context of storm water pollution*." (*Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 884.) As knowledge about controlling storm water runoff and discharges continues to evolve, so does the knowledge which constitutes MEP. Reducing the discharge of pollutants in storm water from the MS4 to the MEP requires the Copermittees to assess each program component and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP.

The San Diego Water Board or the State Water Board ultimately define MEP, and may include requirements that provide specific guidance on what is expected to demonstrate MEP. It is the responsibility of the Copermittees to propose actions that implement BMPs to reduce storm water pollution to the MEP. In other words, the Copermittees' runoff management programs developed and implemented under the Order are the Copermittees' proposals for achieving MEP. Their total collective and individual activities conducted pursuant to their runoff management programs become their proposal for achieving MEP as it applies both to their overall effort, as well as to specific activities. Provisions B through E of the Order provides a minimum framework to guide the Copermittees in achieving the MEP standard for discharges of pollutants in storm water.

Provision A.3.b incorporates any water quality based effluent limitations (WQBELs) applicable to the MS4s established for TMDLs adopted and approved for the San Diego Region and requires the Copermittees to comply with those WQBELs. This is consistent with 40 CFR 122.44(d)(1)(vii)(B), which requires that NPDES permits to incorporate WQBELs "*developed to protect a narrative water quality criterion, a numeric water quality criterion, or both…consistent with the assumptions and requirements of any available wasteload allocation for the discharge...*"

Pursuant to CWA section 303(d), for surface water bodies identified as impaired by one or more pollutants, the San Diego Water Board is required to establish TMDLs "*at a level necessary to implement the applicable water quality standards with seasonal*

variations and a margin of safety which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality." The TMDLs identify sources of the pollutants causing the impairments and assign portions of the TMDL as WLAs to point sources, which include MS4s.

WLAs must be expressed in NPDES permits as WQBELs, which may include one or more numeric components such as numeric effluent limits, and/or receiving water limitations, and/or BMP requirements. Because numeric targets for TMDLs typically include a component that will be protective of water quality standards, a TMDL will likely include one or more numeric receiving water limitations and/or effluent limitations as part of the assumptions or requirements of the TMDL. Any numeric receiving water limitations and/or effluent limitations developed as part of the assumptions or requirements of a TMDL must be incorporated and included as part of WQBELs for the MS4s.

Because the development and approval of new TMDLs, or modification of existing TMDLs, may occur during the term of this Order, the specific provisions of those TMDLs, including effluent limitations applicable to MS4s are provided within Attachment E to the Order. Attachment E will be updated with new TMDLs and modifications to existing TMDLs in a timely manner as they occur.

Provision A.4 (Compliance with Discharge Prohibitions and Receiving Water Limitations) describes the process required to be implemented by the Copermittees if compliance with the discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a are not being achieved under current conditions.

In its Phase II Stormwater Regulations, Final Rule, USEPA states that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL.*"[18] In a series of comment letters on MS4 permits issued by various Regional Water Boards, USEPA has also reiterated that MS4 discharges must meet water quality standards.[19] In addition, the Ninth Circuit Court of Appeals explained in a recent ruling that, *"[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*"[20]

[18] Phase II Stormwater Regulations, Final Rule, 64 Fed. Reg. 68722, 68737.
[19] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.
[20] NRDC v. County of Los Angeles (9th Cir. 2011), 673 F.3d 880, 886 (revd. on other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013))). See also, *Building Industry Ass'n of San Diego County v. State Water Resources*

Water quality standards for the San Diego Region are established in the Basin Plan. The water quality standards of the Basin Plan are incorporated into this Order as the discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a. The discharge prohibitions and receiving water limitations in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations or prohibitions to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan, water quality control plans or policies adopted by the State Water Board, including Resolution No. 68-16, or federal regulations, including but not limited to, 40 CFR 131.12 and 131.38. The waste discharge prohibitions and water quality objectives in the Basin Plan have been approved by USEPA and combined with the designated beneficial uses constitute the water quality standards required under federal law.

Under federal law (CWA section 402(p)(3)(B)(iii)), an MS4 permit must include "*controls to reduce the discharge of pollutants to the maximum extent practicable...and such other provision as...the State determines appropriate for control of such pollutants*." The State Water Board has previously determined that limitations necessary to meet water quality standards are appropriate for the control of pollutants discharged by MS4s and must be included in MS4 permits. (State Water Board Orders WQ 91-03, 98-01, 99-05, 2001-15; see also *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159.) This Order prohibits discharges that cause or contribute to violations of water quality standards.

The discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a are included in this Order to ensure that discharges from the MS4s do not cause or contribute to exceedances of water quality objectives necessary to protect the beneficial uses of the receiving waters.

Provision A.4 is consistent with the precedent-setting language in State Water Board Order WQ 99-05 required to be included in municipal storm water permits. State Water Board Order WQ 2001-15 refined Order WQ 99-05 by requiring an iterative approach to compliance with water quality standards involving ongoing assessments and revisions, as referred to as the "iterative process." The "iterative process" is a fundamental NPDES requirement for municipal storm water permits to achieve the objectives of the CWA.

The State Water Board and Regional Water Boards have stated that the provisions under Provisions A.1.a, A.1.c, A.2.a, and A.4 are independently applicable, meaning that compliance with one provision does not provide a "safe harbor" where there is non-compliance with another provision (i.e., compliance with the Provision A.4 does not shield a Copermittee who may have violated Provision A.1.a, A.1.c, or A.2.a from

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Control Bd. (2004) 124 Cal.App.4th 866, 884-886, citing *Defenders of Wildlife v. Browning,* (9th Cir. 1999) 191 F.3d 1159.)

an enforcement action). The intent of Provision A.4 is to ensure that the Copermittees have the necessary storm water management programs and controls in place, and that they are modified by the Copermittees in a timely fashion when necessary, so that compliance with Provisions A.1.a, A.1.c, and/or A.2.a is achieved as soon as possible. USEPA expressed the importance of this independent applicability in a series of comment letters on MS4 permits proposed by various Regional Water Boards. At that time, USEPA expressly objected to certain MS4 permits that included language stating, *"permittees will not be in violation of this [receiving water limitation] provision … [if certain steps are taken to evaluate and improve the effectiveness of the jurisdictional runoff management programs],"* concluding that this phrase would not comply with the CWA.[21]

The Ninth Circuit held in *Natural Resources Defense Council v. County of Los Angeles* (2011) 673 F3d. 880, 886 (revd. on other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013))) that engagement in the iterative process does not provide a safe harbor from liability for violations of permit terms prohibiting exceedances of water quality standards. The Ninth Circuit holding is consistent with the position of the State and Regional Water Boards that exceedances of water quality standards in an MS4 permit constitute violations of permit terms subject to enforcement by the Water Boards or through a citizen suit. While the Water Boards have generally directed dischargers to achieve compliance by improving control measures through the iterative process, the San Diego Water Board retains the discretion to take other appropriate enforcement and the iterative process does not shield dischargers from citizen suits under the CWA.

The requirements of Provision A.4, therefore, are required to be implemented until the water quality standards expressed under Provisions A.1.a, A.1.c, and A.2.a are achieved. The CWA requires MS4 permits to "*require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." The requirements of this Order have been deemed or determined to be "appropriate" to achieve water quality standards in receiving waters.

Part of the "*controls*" required by the Order is the process described in Provision A.4. Provision A.4 includes the process that is ultimately expected to achieve compliance with the requirement that discharges from the MS4 do not cause or contribute to violations of water quality standards in the receiving waters. The implementation of Provision A.4 is required when the Copermittees or the San Diego Water Board have

[21] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.

determined that discharges from the MS4 are causing or contributing to violations of water quality standards in the receiving waters.

The Copermittees must effectively prohibit non-storm water discharges into the MS4s, reduce the discharge of pollutants in storm water from the MS4s to the MEP, and ensure that their MS4 discharges do not cause or contribute to violations of water quality standards. If the Copermittees have effectively prohibited non-storm water discharges and reduced storm water pollutant discharges to the MEP, but their discharges are still causing or contributing to violations of water quality standards, Provision A.4 provides a clear "iterative process" for the Copermittees to follow.

Provision A.4 essentially requires the Copermittees to implement additional BMPs until MS4 discharges no longer cause or contribute to a violation of water quality standards.

In assessing compliance and potential enforcement actions, the San Diego Water Board looks at the Copermittees' efforts in total to meet the requirements of Provisions A.1.a, A.1.c, A.2.a and Provision A.4. The Copermittees need to demonstrate that they are making improvements to their programs and making progress toward achieving the discharge prohibitions and receiving water limitations in Provisions A.1.a, A.1.c, and A.2.a by implementing the requirements of Provision A.4. The San Diego Water Board would consider these efforts prior to strictly enforcing the requirements of Provisions A.1.a, A.1.c, and A.2.a. Causes of exceedances of the receiving water limitations can often be more difficult to identify and attribute solely to the Copermittees' MS4s. The intent of the Order is to provide the Copermittees more clarity and flexibility in addressing these exceedances through the iterative approach and adaptive management process until the requirements under Provisions A.1.a, A.1.c, and A.2.a are fully achieved.

An exception to the iterative approach and adaptive management process would be in receiving waters subject to adopted and approved TMDLs. For TMDLs that are incorporated into the Order, there is a specific date for compliance to be achieved, after which the iterative approach and adaptive management process required under Provision A.4 no longer provides the flexibility to achieve compliance. Where compliance dates for a TMDL have passed, compliance with the WQBELs incorporated into the Order established by a TMDL in Attachment E to protect water quality standards is required. Thus, after the interim or final compliance dates for a TMDL have passed, if the discharges from the Copermittees' MS4s are causing or contributing to a violation of WQBELs, exceedances of WQBELs must be strictly enforced by the San Diego Water Board. In the meantime, however, the Copermittees are in compliance with the interim or final TMDL requirements in Attachment E as long as the interim or final WQBELs are being achieved in accordance with the interim or final compliance dates.

B. Water Quality Improvement Plans

Purpose: Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges to the MS4s and control pollutants in storm water discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the Clean Water Act.

Provision B includes requirements for the Copermittees to develop and implement Water Quality Improvement Plans to ultimately comply with the prohibitions and limitations under Provision A. The Water Quality Improvement Plans will provide the Copermittees a comprehensive program that can achieve the requirements and further the objectives of the CWA. Implementation of the Water Quality Improvement Plans will also improve the quality of the receiving waters in the San Diego Region.

The Water Quality Improvement Plan is the backbone of the Regional MS4 Permit requirements. Provision B provides the guidance, criteria, and minimum expectations and requirements for the elements of the Water Quality Improvement Plan to be developed and implemented by the Copermittees. The Water Quality Improvement Plans will be implemented in the Watershed Management Area by the Copermittees within their jurisdictions through their jurisdictional runoff management programs.

The Water Quality Improvement Plan also incorporates a program to monitor and assess the progress of the Copermittees' jurisdictional runoff management programs toward improving the quality of discharges from the MS4s, as well as tracking improvements to the quality of receiving waters. A process to adapt and improve the effectiveness of the Water Quality Improvement Plans has also been incorporated into the requirements of Provision B to be consistent with the "iterative approach" required to achieve compliance with discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a, pursuant to the requirements of Provision A.4.

The Water Quality Improvement Plans have also been structured to incorporate the requirements of any TMDLs that have been adopted for the San Diego Region. Incorporating the requirements of the TMDLs into the requirements of Provision B allows the Copermittees to develop a single plan, instead of separate plans, to coordinate their non-storm water and storm water runoff management programs. The Water Quality Improvement Plans allow the Copermittees to meet the requirements of this Order, as well as fulfill the requirements of the TMDLs.

As an added benefit, if the Copermittees demonstrate that impaired water bodies within the Watershed Management Area listed on the 303(d) List will be addressed with their Water Quality Improvement Plans in a reasonable period of time, the San Diego Water Board may be able to remove the water bodies from the 303(d) List, which would greatly reduce the need for the San Diego Water Board to develop additional TMDLs that would have to be incorporated into the Order and implemented by the Copermittees.

***Discussion*:** The federal NPDES regulations require the Copermittees to develop a proposed management program (40 CFR 122.26(d)(2)(iv)). The proposed management program must include "*a comprehensive planning process*" and "*where necessary intergovernmental coordination*" for the "*duration of the permit.*" The Water Quality Improvement Plan is the Copermittees' "*comprehensive planning process*" document for the proposed management program that will be implemented within a Watershed Management Area. Implementation of the Water Quality Improvement Plan requires "*intergovernmental coordination*" among the Copermittees for at least the "*duration of the permit*," and likely into and beyond the next iteration of the permit.

Developing Water Quality Improvement Plans based upon watersheds is consistent with federal regulations that support the development of permit conditions, as well as implementation of storm water management programs, at a watershed scale (40 CFR 122.26(a)(3)(ii), 122.26(a)(3)(v), and 122.26(d)(2)(iv)). In 2003, USEPA issued a Watershed-Based NPDES Permitting Policy Statement (USEPA, 2003) that defines watershed-based permitting as an approach that produces NPDES permits that are issued to point sources on a geographic or watershed basis. In this policy statement, USEPA explains that "*[t]he utility of this tool relies heavily on a detailed, integrated, and inclusive watershed planning process*." USEPA identifies a number of important benefits of watershed permitting, including more environmentally effective results, the ability to emphasize measuring the effectiveness of targeted actions on improvements in water quality, reduced cost of improving the quality of the nation's waters and more effective implementation of watershed plans, including TMDLs, among others.

An emphasis on watersheds is appropriate at this stage in the San Diego Region's MS4 program to shift the focus to more targeted, water quality driven planning and implementation. Addressing discharges on a watershed scale focuses on water quality results by emphasizing the receiving waters in the watershed. The conditions of the receiving waters drive management actions, which in turn focus measures to address pollutant contributions from MS4 discharges.

The Water Quality Improvement Plan gives the Copermittees the responsibility of developing a comprehensive plan to coordinate the efforts of their jurisdictional runoff management programs for addressing the problems related to MS4 discharges causing impacts to water quality in the Watershed Management Area. The development of the plan provides the Copermittees the opportunity to provide

significant input on how to implement their jurisdictional runoff management programs, and how to best utilize their available resources in addressing a focused set of priorities that they believe will result in measureable improvements to water quality within the Watershed Management Area.

The Copermittees are encouraged to separate the Watershed Management Area into subwatersheds, as appropriate. This allows the Copermittees to identify priorities applicable to a subset of the Copermittees or specific water bodies or areas within the Watershed Management Area.

Included in the requirements for the elements to be included in the Water Quality Improvement Plan are monitoring and assessment requirements that are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order. In addition to the federal requirements of the CWA section 308(a) and 40 CFR 122.26(d), the San Diego Water Board has the authority to establish monitoring, reporting, and recordkeeping requirements for NPDES permits under CWC 13383.

More specific and detailed discussions of the requirements of Provision B are provided below.

Provision B.1 (Watershed Management Areas) requires the Copermittees to develop a Water Quality Improvement Plan for each of the Watershed Management Areas defined by the San Diego Water Board.

Pursuant to 40 CFR 122.26(d)(2)(iv), proposed management programs "*may impose controls on a…watershed basis…*" The Water Quality Improvement Plan is the Copermittees' proposed management program. A Water Quality Improvement Plan must be developed for each Watershed Management Area identified in the Order.

The Watershed Management Areas are identified in Table B-1. Table B-1 establishes ten (10) Watershed Management Areas, and identifies the Copermittees that are responsible for developing and implementing the Water Quality Improvement Plan for each Watershed Management Area.

The Copermittees from each of the three counties within the San Diego Region are expected to be phased in as their respective NPDES municipal storm water permits expire. Because Order No. R9-2007-0001 expired in January 2012, the San Diego County Copermittees ~~are~~were covered under the Regional MS4 Permit on June 27, 2013, the effective date of the Order. Because Order No. R9-2009-0002 expired in December 2014, the Orange County Copermittees are covered under the Regional MS4 Permit on April 1, 2015, the effective date of Order No. R9-2013-0001 as amended by Order No. R9-2015-0001.

After the San Diego Water Board receives and considers the Report~~s~~ of Waste

Discharge required to be submitted by the ~~Orange County Copermittees and~~ Riverside County Copermittees pursuant to the requirements of their current permit~~s~~, and makes any necessary changes to the Order, the ~~Orange County Copermittees and~~ Riverside County Copermittees will be covered under the Regional MS4 Permit after ~~Order No. R9-2009-0002 expires in November 2014, and~~ Order No. R9-2010-0016 expires in December 2015~~, respectively~~.

The ~~Orange County Copermittees and~~ Riverside County Copermittees also have the option to obtain coverage under the Regional MS4 Permit earlier than their respective permit expiration dates. The process to apply for early coverage is described Provision F.6.

Because the Santa Margarita River Watershed Management Area includes Copermittees from both San Diego County and Riverside County, a footnote to Table B-1 has been included to specify that the requirements of Provision B are not required to be implemented by the County of San Diego until the Riverside County Copermittees have received a notice of coverage under the Order. Until the Riverside County Copermittees are notified of coverage under the Order, the County of San Diego is subject to the prohibitions and limitations under Provision A, responsible for continuing to implement its existing jurisdictional runoff management program, and responsible for implementing the transitional monitoring and assessment requirements of Provision D, the transitional annual reporting requirements of Provision F.3.b, and the TMDL requirements of Attachment E to the Order.

The City of Laguna Woods and Laguna Hills are located partially within the jurisdictions of both the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board) and the San Diego Water Board. Written requests for designation of a single Regional Water Board to regulate matters pertaining to permitting of Phase I MS4 discharges were submitted to the San Diego Water Board and the Santa Ana Water Board by the City of Laguna Woods by letter dated September 8, 2014, and the City of Laguna Hills by letter dated March 12, 2014. The Cities of Laguna Woods and Laguna Hills requested designation of the San Diego Water Board pursuant to CWC section 13228. The Cities of Laguna Woods and Laguna Hills reported that management and implementation of municipal programs to comply with two different Phase I MS4 permits creates a significant administrative and financial burden and inhibits their ability to contribute to greater overall water quality improvements in either Region. In an effort to address these concerns, the San Diego Water Board and the Santa Ana Water Board have entered into an agreement whereby the San Diego Water Board is designated to regulate Phase I MS4 discharges within the jurisdiction of the Cities of Laguna Woods and Laguna Hills. Under the terms of the agreement, each Regional Water Board retains the authority to enforce provisions of the Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee (Water Code section 13228 (b)). Also under the terms of the agreement, any TMDL and associated MS4 permit requirements issued by the San

Diego Water Board or the Santa Ana Water Board which include the Cities of Laguna Woods or Laguna Hills as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement of the applicable TMDL would remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Boards' San Diego Creek/Newport Bay TMDL and the San Diego Water Boards indicator Bacteria Project I Beaches and Creeks TMDL. In conformance with this agreement, a footnote to Table B-1 has been included to specify coverage under Order No. R9-2013-0001 for those Phase I MS4 discharges within the jurisdictional boundaries of the Cities of Laguna Woods and Laguna Hills. The footnote specifies that the City of Laguna Woods and Laguna Hills are identified as responsible Copermittees in the San Diego Creek/Newport Bay TMDL in the Santa Ana Region and remain obligated to comply with the San Diego Creek/Newport Bay TMDL pursuant to section XVIII of Order No. R8-2014-0002 (NPDES No. CAS618030) and any reissuance thereto.

The City of Lake Forest is located partially within the jurisdictions of both the Santa Ana Water Board and the San Diego Water Board. By letter dated April 4, 2014 the City of Lake Forest submitted a written request, pursuant to CWC section 13228, to the San Diego Water Board and the Santa Ana Water Board requesting the Santa Ana Water Board be designated to regulate matters within the City of Lake Forest pertaining to permitting of their Phase I MS4 discharges. The City of Lake Forest reported that management and implementation of municipal programs to comply with two different Phase I MS4 permits creates a significant administrative and financial burden and inhibits their ability to contribute to greater overall water quality improvements in either Region. In an effort to address these concerns, the San Diego Water Board and the Santa Ana Water Board have entered into an agreement whereby the Santa Ana Water Board is designated to regulate Phase I MS4 discharges within the jurisdiction of the City of Lake Forest. Under the terms of the agreement, each Regional Water Board retains the authority to enforce provisions of the Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee (Water Code section 13228 (b)). Also under the terms of the agreement, any TMDL and associated Phase I MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the City of Lake Forest as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement authority for the applicable TMDL would remain with the Regional Water Board which has the jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Boards' San Diego Creek/Newport Bay TMDL and the San Diego Water Boards' indicator Bacteria Project I Beaches and Creeks TMDL. In conformance with this agreement, , a footnote to Table B-1 has been included to specify that Phase I MS4 discharges within the jurisdictional boundaries of the City of Lake Forest will be regulated under Santa Ana Water Board Order No. R8-2014-0002 (NPDES No. CAS618030) and any reissuance thereto. The footnote specifies that the

City of Lake Forest is an identified responsible Copermittee in the Indicator Bacteria Project I Beaches and Creeks TMDL (Bacteria TMDL) in the San Diego Region and remains obligated to comply with the Bacteria TMDL pursuant to Attachment E of Order No. R9-2013-0001 and any reissuance thereto. The City is also identified as a responsible Copermittee in the San Diego Creek/Newport Bay TMDL established by the Santa Ana Water Board. The City remains obligated to comply with the San Diego Creek/New Port Bay TMDL pursuant to section XVIII of Order No. R8-2014-0002 (NPDES No. CAS618030) and any reissuance thereto. The footnote also provides that the City of Lake Forest must retain and continue implementation of the over irrigation prohibition in Title 15, Chapter 15, Section 14.030, List (b) of the City Municipal Code throughout its jurisdiction. The footnote further provides that the City of Lake Forest must actively participate in the development and implementation of the Aliso Creek Watershed Management Area Water Quality Improvement Plan required pursuant to Order No. R9-2013-0001, and any reissuance thereto.

The basis supporting the Cities of Laguna Woods, Laguna Hills, and Lake Forest requests to designate a specific Regional Water Board for regulatory oversight of Phase I MS4 discharges may change under future conditions and circumstances, therefore the San Diego Water Board will periodically review the effectiveness of the agreement during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate the agreement with the Santa Ana Water Board or otherwise modify the agreement subject to the approval of the Santa Ana Water Board.

Provision B.2 (Priority Water Quality Conditions) requires the Copermittees in each Watershed Management Area to identify the highest priority water quality conditions which will be the focus of the Water Quality Improvement Plan implementation.

Provisions B.2.a and B.2.b provide the criteria that must be assessed when characterizing the receiving water quality and potential impacts from MS4 discharges of the receiving waters within the Watershed Management Area. The criteria are based primarily on the requirements in 40 CFR 122.26(d)(1)(iv)(C) and (C)(1)-(9). Characterizing the receiving water quality and identifying the potential impacts caused by MS4 discharges to receiving waters in the Watershed Management Area is necessary to identify the impacts to receiving waters associated with MS4 discharges that are of the most concern to the Copermittees.

Based on the information required to be considered under Provisions B.2.a and B.2.b, Provision B.2.c requires to Copermittees to identify the highest priority water quality conditions related to discharges from the MS4s that will be the primary focus of the Water Quality Improvement Plan in the Watershed Management Area. Addressing and improving these highest priority water quality conditions will become the focus of each Copermittee's jurisdictional runoff management program as the Water Quality Improvement Plan is implemented in the Watershed Management Area. The highest priority water quality conditions are expected to include source of pollutants and/or

stressors, and/or receiving water conditions, that the Copermittees consider the highest threats or most likely to have adverse impacts on the physical, chemical, and biological integrity of receiving waters. Addressing these threats and/or adverse impacts should restore the physical, chemical, and biological integrity of receiving waters, and result in the restoration and protection of the beneficial uses of the receiving waters in the Watershed Management Area.

Provision B.2.d requires the Copermittees to identify known and suspected sources of pollutants and/or stressors contributing to the highest priority water quality conditions. The requirements of Provision B.2.d are based primarily on the requirements in 40 CFR 122.26(d)(1)(iii)(B)(1)-(6). The Copermittees are required to evaluate several factors in the identification of those sources. The Copermittees must consider and evaluate the following: (1) the land uses that may contribute toward impacts to receiving waters, (2) the locations of the Copermittees' MS4s that can convey and discharge runoff and pollutants to receiving waters, (3) other sources that discharge into the Copermittees' MS4s and receiving waters, and (4) other information and data that can help the Copermittees to evaluate the relative importance of or contribution from those sources toward the highest priority water quality conditions. Identifying the known and suspected sources, and their relative contribution toward the highest priority water quality conditions, will help the Copermittees to focus, direct, and prioritize their resources and implementation efforts within their jurisdictions.

Provision B.2.e requires the Copermittees to identify potential strategies that can result in improvements to water quality in MS4 discharges and/or receiving waters within the Watershed Management Area. Potential water quality improvement strategies will not necessarily be implemented by the Copermittees, but provide a "menu" of options that the Copermittees will consider for implementation. The public participation process that will be implemented during the development of the Water Quality Improvement Plan is where the potential water quality improvement strategies will be identified.

Provision B.3 (Water Quality Improvement Goals, Strategies and Schedules) requires the Copermittees in each Watershed Management Area to identify the goals that the Copermittees' jurisdictional runoff management programs will work toward achieving to address and improve the highest priority water quality conditions identified under Provision B.2.c; the strategies that will be implemented by the Copermittees within their jurisdictions and the Watershed Management Area to achieve the goals; and, the schedules for implementing the strategies and achieving the goals. The element of the Water Quality Improvement Plan required under Provision B.3 is where the "*comprehensive planning*" and "*intergovernmental coordination*" [40 CFR 122.26(d)(2)(iv)] of the Copermittees' actions for the proposed management programs within the Watershed Management Area is required to be described.

Provision B.3.a requires the Copermittees to identify interim and final numeric goals, and schedules to achieve those goals as part of the Water Quality Improvement Plans. Provision B.3.a.(1) requires the Copermittees to identify two types of numeric goals to be achieved:

(1) Final numeric goals in the receiving waters and/or MS4 discharges that will result in the protection of the water quality standards of the receiving waters for the highest priority water quality conditions identified by the Copermittees for Provision B.2.c. These final numeric goals are the ultimate goals for the Water Quality Improvement Plan, and the achievement and maintenance of these final numeric goals will indicate that one or more beneficial uses have been successfully restored and/or protected from MS4 discharges.

(2) Interim numeric goals that can be used by the Copermittees to demonstrate progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges for the highest priority water quality conditions in the Watershed Management Area. Achievement of the interim numeric goals will demonstrate to the San Diego Water Board that the Copermittees' implementation efforts are progressing toward achieving the final numeric goals.

Provision B.3.a.(1) does not specify what the interim and final numeric goals must be based on, but they essentially must be designed to achieve compliance with water quality standards in the receiving waters. To that end, the interim goals must be based on measureable criteria or indicators capable of demonstrating progress toward achieving the numeric goals."

The interim and final numeric goals can be based on the water quality objectives in the Basin Plan. The water quality objectives in the Basin Plan, however, consist of numeric and narrative water quality objectives. Numeric water quality objectives can be directly used as numeric goals. Narrative water quality objectives, on the other hand, will require some interpretation to identify numeric goals. The achievement of multiple numeric goals based on the water quality objectives, used in combination, may be necessary to demonstrate that beneficial uses have been restored and/or protected.

The Copermittees could also propose other numeric goals that are not necessarily water quality objectives from the Basin Plan. For example, the Copermittees could propose a numeric goal that consists of achieving some percent improvement of a measureable indicator, such as acreage of a specific habitat or increase in a specific plant or animal species population. Other examples may include pollutant load reductions, number of impaired waterbodies delisted from the List of Water Quality Impaired Segments, Index of Biological Integrity (IBI) scores, etc.

The Copermittees may choose to develop interim numeric goals based on the final numeric goals they develop, such as incremental steps toward ultimately achieving the final numeric goals. The Copermittees may also choose to develop interim numeric goals that are based on other measureable indicators that can indirectly indicate improvements and progress toward the final numeric goals.

There are no limits to the types of interim numeric goals that could be proposed by the Copermittees, other than the goals must be based on measureable criteria or indicators capable of demonstrating progress toward achieving the numeric goals. Likewise, there are no limits to the types of final numeric goals that could be proposed by the Copermittees, other than the goals must "*restore and protect the water quality standards of the receiving waters.*"

Finally, Provision B.3.a.(2) also requires the Copermittees to develop schedules for measuring progress and achieving the interim and final numeric goals. Several criteria are included for the development of the schedules, but the Copermittees are required to achieve the numeric goals as soon as possible, consistent with federal NPDES regulations (40 CFR 122.47(a)(1)).

The Copermittees are also required to incorporate any compliance schedules for any applicable ASBS or TMDL requirements. Applicable ASBS and TMDL compliance schedules are set forth in Attachment A and Attachment E to the Order, respectively. The information provided by the Copermittees under Provision B.3.a.(2) will be used by the Copermittees and the San Diego Water Board to gauge and track the progress of the Copermittees' efforts in addressing the highest priority water quality conditions identified in the Water Quality Improvement Plan.

Provision B.3.b requires the Copermittees to identify the strategies and schedules to implement those strategies as part of the Water Quality Improvement Plans. Provision B.3.b requires the Copermittees to identify the water quality improvement strategies that will be and may be implemented within the Watershed Management Area to 1) reduce of pollutants in storm water discharged from the MS4 to the MEP, 2) effectively prohibit non-storm water discharges from entering the MS4, 3) protect water quality standards in receiving waters by controlling MS4 discharges so that they do not cause or contribute to exceedances of receiving water limitations, and 4) achieve applicable WQBELs that implement TMDLs. The Copermittees will select the strategies to be implemented based on the likely effectiveness and efficiency of the potential water quality improvement strategies identified under Provision B.2.e to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, and/or achieve the interim and final numeric goals identified under Provision B.3.a.

Provision B.3.b.(1) requires each Copermittee to identify the strategies that will be or may be implemented within its jurisdiction. Each Copermittee is required to describe the strategies it is committed to implementing as part of its jurisdictional runoff management requirements under Provisions E.2 through E.7, and the optional jurisdictional strategies that the Copermittee will implement, as necessary, to achieve the numeric goals.

Each Copermittee is expected to implement the optional jurisdictional strategies identified under Provisions B.3.b.(1)(b) when the jurisdictional strategies it has

committed to implement under Provision B.3.b.(1)(a) are not making adequate progress toward the interim and final numeric goals in accordance with the schedules established under Provision B.3.a. Provision B.3.b.(1)(b)(v) requires each Copermittee to describe the circumstances necessary to trigger implementation of the optional jurisdictional strategies, in addition to the requirements of Provisions B.3.b.(1)(a).

The San Diego Water Board recognizes that there may be optional jurisdictional strategies that will likely require funding and/or resources for planning, permitting, procurement of labor and materials, and implementation. Thus, Provision B.3.b.(1)(b)(iv) requires each Copermittee to describe the funding and/or resources that are necessary to implement these optional jurisdictional strategies. This information may provide interested groups and members of the public an understanding of the resources that they could provide or assist in obtaining to implement these optional jurisdictional strategies.

Provision B.3.b.(2) requires the Copermittees in the Watershed Management Area to identify the regional or multi-jurisdictional strategies that may be implemented, as necessary, to achieve the numeric goals. Similar to the requirements of Provision B.3.b.(1)(b), these regional or multi-jurisdictional strategies will likely require funding and/or resources for planning, permitting, procurement of labor and materials, and implementation, and San Diego Water Board recognizes that these strategies may be difficult to implement with only Copermittee resources. Thus, Provision B.3.b.(2)(d) requires the Copermittees to describe the funding and/or resources necessary to implement these optional regional or multi-jurisdictional strategies. This information may provide interested groups and members of the public an understanding of the resources that they could provide or assist in obtaining to implement these optional regional or multi-jurisdictional strategies.

Provision B.3.b.(3) requires the Copermittees to develop and include schedules in the Water Quality Improvement Plan for implementing the water quality improvement strategies identified under Provisions B.3.b.(1) and B.3.b.(2). The schedule for implementing the water quality improvement strategies will be used by the Copermittees and San Diego Water Board to measure and demonstrate the progress of the Copermittees' implementation efforts toward reducing pollutants in storm water discharged from the MS4 to the MEP, and eliminating illicit non-storm water discharges from entering the MS4.

Provision B.3.b.(4) provides the Copermittees in each Watershed Management Area the option of implementing watershed-specific structural BMP requirements for Priority Development Projects. Historically, storm water permits have included very specific performance standards for permanent, structural BMPs. These standards describe the expectation for the capture or treatment of pollutants and control of excessive flow before storm water is discharged from a site. The Copermittees were also allowed to develop waiver programs for Priority Development Projects to avoid implementing the

structural BMPs; however, the waiver programs were not necessarily tied into any sort of holistic watershed strategy. The result is that implementation of BMP requirements is largely done on a site-by-site basis. This requires proper design on the part of the Priority Development Project and strict oversight on the part of the Copermittee.

Provision B.3.b.(4) promotes the evaluation of multiple strategies for water quality improvement, in addition to the implementation of permanent structural BMPs, on a watershed-scale versus the site-by-site approach. In a report issued by the Southern California Coastal Water Research Project (SCCWRP) and several other research institutions, the report emphasized that a successful hydromodification management program will involve watershed analysis as a first step, and that integrating multiple watershed-based strategies is preferable over a site-by-site approach. Indeed, the report states that the watershed analysis "…*should lead to identification of existing opportunities and constraints that can be used to help prioritize areas of greater concern, areas of restoration potential, infrastructure constraints, and pathways for potential cumulative effects*."[22] Provision B.3.b.(4) promotes the findings and recommendations of the report by providing a pathway for Copermittees to develop an integrated approach to their land development programs.

Under Provision B.3.b.(4), the Copermittees in a Watershed Management Area must first perform an analysis by gathering as much information pertaining to the physical characteristics of the Watershed Management Area as possible. This includes, for example, identifying potential areas of coarse sediment supply, present and anticipated future land uses, and locations of physical structures within receiving streams and upland areas that affect the watershed hydrology (such as bridges, culverts, and flood management basins). Once this information is collected, the Copermittees must produce GIS layers (maps) that include this information.

From there, the Copermittees must use the results of the Watershed Management Area Analysis to identify and compile a list of candidate projects that could potentially be used as alternative compliance options for Priority Development Projects. Such projects include, for example, opportunities for stream or riparian area rehabilitation, opportunities for retrofitting existing infrastructure to incorporate storm water retention or treatment, and opportunities for regional BMPs, among others. Once these candidate projects are identified, Copermittees may allow Priority Development Projects to fund, partially fund, or completely implement these candidate projects. The Copermittees must first find that implementing such a candidate project would provide greater overall benefit to the watershed than requiring implementation of the structural BMPs onsite, and also enter into a voluntary agreement with the Priority Development Project that authorizes this arrangement. The Copermittees may use Provision B.3.b.(4) as both 1) a mechanism to reach their stated goals of the Water Quality Improvement Plan by using Priority Development Projects to either fund or implement

[22] 2012. ED Stein, F Federico, DB Booth, BP Bledsoe, C Bowles, Z Rubin, GM Kondolf, A Sengupta. Technical Report 667. Southern California Coastal Water Research Project. Costa Mesa, CA.

projects that will provide water quality benefit, and 2) an alternative to requiring strict adherence to the structural BMP design standards.

Additionally, Provision B.3.b.(4) allows the Copermittees to use the results of the Watershed Management Area Analysis to identify areas within the Watershed Management Area where it is appropriate to allow Priority Development Projects to be exempt from the hydromodification management BMP performance requirements. Provision E.3.c.(2) already allows exemptions for Priority Development Projects that discharge to a conveyance channel whose bed and bank are concrete lined from the point of discharge to an enclosed embayment or the Pacific Ocean. However, there may be cases where further exemptions are warranted. The Copermittees may identify such cases on a watershed basis and include them in the Watershed Management Area Analysis; however, they must provide the supporting rationale to support all claims for exemptions.

Provision B.3.b.(4) provides an innovative pathway for Copermittees to regulate their land development programs by allowing alternative compliance in lieu of implementing structural BMPs on each and every Priority Development Project. This approach facilitates the integration of watershed-scale solutions for improving overall water quality and assisting Copermittees to achieve their stated goals of the Water Quality Improvement Plan. The San Diego Water Board understands, however, that undertaking this approach, which involves extensive planning, could be resource intensive for the Copermittees. Therefore, the Watershed Management Area Analysis is optional and not a requirement. The Copermittees can choose not to perform the watershed planning and mapping exercise described in Provision B.3.b.(4), and instead choose to require strict implementation of the structural BMPs onsite, pursuant to Provision E.3.b.

Provision B.4 (Water Quality Improvement Monitoring and Assessment) requires the Copermittees to develop an integrated monitoring and assessment program to track the progress of the Water Quality Improvement Plan toward meeting the implementation goals and schedules, and improving the water quality of the Watershed Management Area. Provision B.4 is the part of the Water Quality Improvement Plan where the Copermittees describe the monitoring data that will be collected, which is not only necessary to implement the "iterative approach" required by Provision A.4, but inform the adaptive management and "*comprehensive planning process*" that allows the Copermittees to make adjustments and modifications to the Water Quality Improvement Plans and the jurisdictional runoff management programs.

Provision B.4 requires the Copermittees, at a minimum, to include the requirements of Provision D as part of the water quality improvement monitoring and assessment program for the Water Quality Improvement Plan. The Copermittees, however, are not limited to the requirements of Provision D and may include additional monitoring and assessment methods to track progress toward improving water quality in the Watershed Management Area.

In addition to incorporating the requirements of Provision D, the water quality improvement monitoring and assessment program must incorporate any monitoring and assessment requirements specified for any applicable TMDLs included in Attachment E to the Order, and the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 for Watershed Management Areas with ASBS.

The monitoring and assessments required to be incorporated into the Water Quality Improvement Plan are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order.

Provision B.5 (Iterative Approach and Adaptive Management Process) requires the Copermittees to implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a.

Provision B.5 requires the Copermittees in each Watershed Management Area to re-evaluate the highest priority water quality conditions and potential water quality improvement strategies, the water quality improvement goals, strategies and schedules, and the water quality improvement monitoring and assessment program and provide recommendations for modifying those elements to improve the effectiveness of the Water Quality Improvement Plan. The re-evaluation of the Water Quality Improvement Plan is part of the assessment requirements of Provision D.

Provision B.6 (Water Quality Improvement Plan Submittal, Updates, and Implementation) requires to Copermittees to submit, update, and implement the Water Quality Improvement Plans.

The requirements for the process to develop and submit the Water Quality Improvement Plans is described in more detail under the discussion for Provision F.1. The process will include several opportunities for the public to provide input during the development of the Water Quality Improvement Plans. The process for updating the Water Quality Improvement Plans is described in more detail under the discussion for Provision F.3.c. Upon acceptance of the Water Quality Improvement Plan and updates, the Copermittees are required to immediately begin implementing the Water Quality Improvement Plan and subsequent updates.

The Water Quality Improvement Plan is expected to be a dynamic document that will evolve over time. The Water Quality Improvement Plan is also expected to be a long term plan that focuses the Copermittees' efforts and resources on a limited set of priority water quality conditions, with the ultimate goal of protecting all the beneficial uses of the receiving waters within the Watershed Management Area from impacts that may be caused or contributed to by MS4 discharges. As the Copermittees collect data, implement their jurisdictional runoff management programs, and review the results from their water quality improvement monitoring and assessment program, the

Water Quality Improvement Plan is expected to be continually reviewed and updated until compliance with Provisions A.1.a, A.1.b, and A.2.a is achieved.

However, in specific cases supported by robust analytical documentation the implementation of the Water Quality Improvement Plans may demonstrate that TMDLs are not necessary for identified impaired water bodies within the Watershed Management Area if the analytical record demonstrates that technology-based effluent limitations required by the CWA, more stringent effluent limitations required by state, local, or federal authority, and/or other pollution control requirements (e.g., best management practices) required by local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time.[23]

The San Diego Water Board submits an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. According to USEPA guidance for the Integrated Report,[24] water bodies are placed in one of five categories. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 are placed on the 303(d) List.

Category 4 in the Integrated Report is for water bodies where available data and/or information indicate that at least one beneficial use is not being supported or is threatened, but a TMDL is not needed. [25] Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

Impaired water bodies can be included in Category 4a if a TMDL has been adopted and approved. The TMDLs in Attachment E to the Order implement the requirements of the TMDLs adopted by the San Diego Water Board, and approved by the State Water Board and USEPA. The water bodies in Attachment E will be included in Category 4a in the Integrated Report and removed from the 303(d) List.

Impaired water bodies can be included in Category 4b if there are *acceptable* "pollution control requirements" required by a local, state or federal authority stringent enough to implement applicable water quality standards within a reasonable period of time (e.g., a compliance date is set). When evaluating whether a particular set of

[23] 40 CFR 130.7(b)(1)
[24] USEPA, 2005. Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act
[25] Ibid

pollution controls are "requirements," the USEPA considers a number of factors, including: (1) the authority (local, state, federal) under which the controls are required and will be implemented with respect to sources contributing to the water quality impairment (examples may include: self-executing state or local regulations, permits, and contracts and grant/funding agreements that require implementation of necessary controls), (2) existing commitments made by the sources and completion or soon to be completed implementation of the controls (including an analysis of the amount of actual implementation that has already occurred), (3) the certainty of dedicated funding for the implementation of the controls, and (4) other relevant factors as determined by USEPA depending on case-specific circumstances.[26]

Impaired water bodies can be included in Category 4c if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution. Pollution, as defined by the CWA is "the man-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of water."[27] In other cases, pollution does not result from a pollutant and a TMDL is not required. Examples of circumstances where an impaired segment may be placed in Category 4c include segments impaired solely due to lack of adequate flow, stream channelization, or hydromodification. In these situations, there may be water quality management actions that can address the cause(s) of the impairment, but a TMDL may not be required to implement the actions.

The Water Quality Improvement Plans will require the implementation of pollution controls and water quality management actions (i.e. water quality improvement strategies) which can result in the attainment of water quality standards in water bodies impaired by discharges from the Copermittees' MS4s. The Water Quality Improvement Plans also include requirements that are expected to attain water quality standards in a reasonable period of time. The San Diego Water Board considers the Water Quality Improvement Plans to be a commitment by the Copermittees to develop, plan, budget for, and implement pollution controls that will attain water quality standards in receiving waters in a reasonable period of time, or as soon as possible. The results of the Copermittees' efforts in implementing the Water Quality Improvement Plans can be used to re-evaluate the condition of the impaired water bodies during the next update to the 303(d) List.

After the Copermittees submit the Water Quality Improvement Plans and demonstrate that water quality standards are being attained or will be attained in a reasonable period of time, the San Diego Water Board may re-evaluate the water bodies on the 303(d) List. These water bodies on the 303(d) List may be re-evaluated and placed into Category 4b or Category 4c in the Integrated Report. The water bodies placed in Category 4b or Category 4c in the Integrated Report must show a record that the

[26] Ibid
[27] CWA section 502(19)

water bodies are attaining water quality standards or supporting the identified beneficial uses, or will attain water quality standards or support identified beneficial uses in a reasonable period of time, in order for the water bodies to be appropriately removed from the 303(d) List.

C. Action Levels

Purpose: Provision C includes requirements for the Copermittees to identify and include numeric action levels in the Water Quality Improvement Plan to direct and focus the Copermittees' jurisdictional runoff management program implementation efforts for controlling MS4 discharges to receiving waters.

***Discussion*:** Under Provision C, the numeric action levels required are for non-storm water discharges and storm water discharges. The non-storm water action levels (NALs) are applicable to non-storm water discharges from the Copermittees' MS4s, which can occur year-round. The storm water action levels (SALs) are applicable to storm water discharges from the Copermittees' MS4s, which occur during the rainy season defined as the period between October 1 and April 30.

The action levels required by Provision C are based on the action level requirements that were developed and incorporated into Order Nos. R9-2009-0002 and R9-2010-0016, the Orange County and Riverside County MS4 Permits, respectively. The Fact Sheets for these Orders provide detailed discussions about the development of the numeric NALs and SALs included in this Order.

Order Nos. R9-2009-0002 and R9-2010-0016 required the Copermittees to perform prescribed actions if the NALs or SALs are exceeded. The actions required under Order Nos. R9-2009-0002 and R9-2010-0016 generally included conducting additional monitoring and source investigations when a discharge from the MS4 is observed to exceed one or more NALs and/or SALs.

For this Order, however, the action levels of Provision C are to be used by the Copermittees to prioritize the actions to be implemented as part of the Water Quality Improvement Plan. Monitoring data collected by the Copermittees from MS4 outfalls will be compared with the NALs and SALs. Exceedances of the NALs and SALs will not require the Copermittees to immediately identify sources causing exceedances, but will provide some numeric indicator levels that can give the Copermittees a way to measure the relative severity of a pollutant contributing to receiving water quality impacts.

NALs and SALs must be included in the Water Quality Improvement Plans to be used by the Copermittees in directing and focusing their water quality improvement strategies. The Copermittees are expected to utilize the NALs and SALs to help focus their implementation efforts on addressing pollutants that have the most significant potential or observed impacts to receiving waters. The NALs and SALs will be used as part of the MS4 discharges assessments required under Provision D.4.b. The NALs and SALs may also be used by the Copermittees as the numeric goals to be achieved in MS4 discharges and/or receiving waters as the Water Quality Improvement Plans are implemented.

More specific and detailed discussions of the requirements of Provision C are provided below.

Provision C.1 (Non-storm Water Action Levels) requires the Copermittees to incorporate NALs into the Water Quality Improvement Plan for pollutants and/or constituents that are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions identified in the Water Quality Improvement Plan related to non-storm water discharges from the MS4s. NALs generally must be consistent with the water quality objectives found within the Basin Plan.

The NALs have been included to ensure that the Copermittees are implementing and complying with several requirements of the MS4 permit. The federal CWA requires permits for municipal storm sewer systems to "*effectively prohibit non-storm water discharges into the storm sewers*." The federal NPDES regulations, which were promulgated to implement the CWA requirements for discharges from municipal storm sewers, require a program to address illicit discharges, which are non-storm water discharges. Provision A.1.b prohibits "*[n]on-storm water discharges into MS4s*" unless the non-storm water discharge authorized by a separate NPDES permit. The NALs will be used as part of the illicit discharge detection and elimination program required pursuant to Provision E.2, as well as part of the MS4 discharges assessments required pursuant to Provision D.4.b.

Provision A.1.a prohibits non-storm water discharges from the MS4 from "*causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state.*" In addition, pursuant to Provision A.2.a, non-storm water discharges "*must not cause or contribute to the violation of water quality standards in any receiving waters*."

Ideally, the Copermittees' jurisdictional runoff management programs will eliminate all non-storm water discharges entering the MS4s within their jurisdictions. The complete elimination of non-storm water discharges to the Copermittees' MS4s would be in compliance with the CWA requirements for non-storm water discharges, as well as the prohibitions and limitations of Provisions A.1.a and A.2.a.

The federal regulations, however, also refer to several non-storm water discharge categories that must be addressed as illicit discharges if they are found to be a source of pollutants. The federal regulations thus identify some non-storm water discharges that are not required to be addressed as illicit discharges if they are not a source of pollutants (e.g. non-storm water discharges specified in Provisions E.2.a.(1)-(5)). Thus, these regulations imply that some non-storm water discharges into and from the MS4 may occur even if non-storm water discharges are "effectively" prohibited by the Copermittees.

If the source of a non-storm water discharge is identified as a category of non-storm water specified in Provisions E.2.a.(1)-(5), the NALs can be used to determine the category of non-storm water discharges is a source of pollutants. For other non-storm water discharges not specified in Provisions E.2.a.(1)-(5), the CWA requires those discharges to be "*effectively"* prohibited by removing the discharge to the MS4 through enforcement of the Copermittees' legal authority established under "*ordinance, order or similar means*" to prohibit illicit discharges to the MS4s.

If there are non-storm water discharges that are not required to be addressed as illicit discharges, those discharges must comply, at a minimum, with the discharge prohibitions and receiving water limitations of Provision A. Thus, the non-storm water discharges from the MS4 must be at levels that will not cause or contribute to a condition of pollution, contamination, or nuisance (Provision A.1.a), and must not cause or contribute to a violation of water quality standards in receiving waters (Provision A.2.a) to be consistent with the discharge prohibitions and receiving water limitations of Provisions A.1.a and A.2.a.

Furthermore, the San Diego Region has predominantly intermittent and ephemeral rivers and streams which vary in flow volume and duration at spatial and temporal scales. For most of these river and stream systems, non-storm water discharges from the MS4 are likely to be the most significant or the only source contributing to surface flows present within the receiving water, especially during the dry season.

Therefore, because of the prohibitions and limitations of Provision A.1.a and A.2.a, and the likelihood that non-storm water discharges from the MS4 are the most significant or only source contributing to surface flows present within the receiving water, NALs generally must be consistent with the water quality objectives found within the Basin Plan. Non-storm water discharges that are meeting the NALs would not be expected to cause or contribute to an exceedance of water quality objectives in receiving waters, which would be consistent with the discharge prohibitions and receiving water limitations of Provisions A.1.a and A.2.a.

Exceedances of the NALs would then provide an indication of the relative severity of a pollutant in non-storm water discharges from the MS4 contributing to potential or observed receiving water quality impacts. The relative severity or significance of a pollutant in non-storm water discharges from the MS4 will provide the Copermittees a valuable source of information that can be used to identify priority water quality conditions within a Watershed Management Area and within each Copermittee's jurisdiction.

Tables C-1 through C-4 under Provision C.1.a specify numeric NALs for several parameters or pollutant constituents for non-storm water discharges from the MS4 to several water body types. The NALs for MS4 discharges given under Provision C.1.a are based on the water quality objectives for inland surface waters in the Basin Plan, and the water quality objectives for ocean waters in the Ocean Plan. The NALs for

most of the metals were calculated based on the State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP). The NALs provided in Tables C-1 through C-4 must be included in the Water Quality Improvement Plans required to be developed pursuant to Provision B.

Provision C.1.b requires the Copermittees to identify NALs for pollutants and/or constituents, not specified in Provision C.1.a, which are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions of the Watershed Management Area related to non-storm water discharges from the MS4s. The NALs must be based on the water quality objectives in the Basin Plan. The NALs identified under Provision C.1.b must be included in the Water Quality Improvement Plan.

The San Diego Water Board recognizes that some of the NALs required pursuant to Provisions C.1.a and C.1.b may be exceeded more frequently than not. Thus, Provision C.1.c has been included in the Order to provide the Copermittees the option to develop secondary NALs that are set at levels greater than the levels required pursuant to Provisions C.1.a and C.1.b to further refine the prioritization and assessment of water quality improvement strategies for addressing non-storm water discharges to and from the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and from the MS4.

Provision C.2 (Storm Water Action Levels) requires the Copermittees to incorporate SALs into the Water Quality Improvement Plan for pollutants and/or constituents causing or contributing, or may be causing or contributing, to the highest priority water quality conditions identified in the Water Quality Improvement Plan related to storm water discharges from the MS4s.

The SALs have been included to ensure that the Copermittees are implementing and complying with several requirements of the MS4 permit. Provision A.1.a prohibits storm water discharges from the MS4 from "*causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state.*" In addition, pursuant to Provision A.2.a, storm water discharges "*must not cause or contribute to the violation of water quality standards in any receiving waters*."

Provision A.3.a, however, implicitly acknowledges that compliance with Provisions A.1.a and A.2.a cannot be achieved immediately for discharges of storm water from the MS4 by applying the MEP standard. Thus, Provision A.4 requires the Copermittees to implement an iterative approach to demonstrate that MEP is being achieved. This approach is supported by USEPA.

The federal CWA requires permits for municipal storm sewer systems to "*require controls to reduce the discharge of pollutants [in storm water] to the maximum extent*

practicable, *including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants.*" MEP is an ever-evolving, flexible, and advancing concept. As knowledge about controlling storm water runoff and discharges evolves, so does the knowledge which constitutes MEP. Reducing the discharge of storm water pollutants from the MS4 to the MEP requires the Copermittees to assess their jurisdictional runoff management programs and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP. The SALs provide the Copermittees measureable goals that may be used to demonstrate the achievement of MEP for reducing pollutants in storm water discharges from the MS4. The SALs will be used as part of the MS4 discharges assessments required under Provision D.4.a.

In June of 2006, the State Water Board's Blue Ribbon Storm Water Panel released its report titled "*The Feasibility of Numerical Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities*." In the recommendations, the Blue Ribbon panel proposed storm water effluent limitations which are computed using statistical based population approaches. The SALs specified in Table C-5 under Provision C.2.a were developed from a regional subset of nationwide Phase I MS4 data by using USEPA Rain Zone 6 (arid west) data.[28] Additionally, utilization of regional data is appropriate due to the addition of data into the nationwide Phase I MS4 monitoring dataset in February 2008. This additional data increased the number of USEPA Rain Zone 6 samples to more than 400, and included additional monitoring events within Southern California.

Utilizing data from USEPA Rain Zone 6 resulted in SALs which closely reflect the environmental conditions experienced in the San Diego Region. The localized subset of data includes sampling events from multiple Southern California locations including Orange, San Diego, Riverside, Los Angeles, and San Bernardino Counties. The dataset includes samples taken from highly built-out impervious areas and from storm events representative of Southern California conditions.

The SALs for cadmium, copper, lead and zinc require the measurement of hardness and to provide more specificity in the assessment of samples with SALs for total metal concentrations. While USEPA Rain Zone 6 data include a large sample size for concentrations of total metals, the impact the concentration will have on receiving waters will vary with receiving water hardness. Since it is the goal of the SALs, through the iterative process and MEP standard, to have MS4 storm water discharges meet all applicable water quality objectives, the hardness of the receiving water should be used when assessing the total metal concentration of a sample.

Thus, when there is an exceedance of a SAL for a metal, the Copermittee must determine if that exceedance is above the existing applicable water quality objectives

[28] Data used to develop SAL were obtained from http://rpitt.eng.ua.edu/Research/ms4/mainms4.shtml

based upon the hardness of the receiving water. The water quality objectives Copermittees must use to assess total metal SAL exceedances are the California Toxic Rule (CTR) and USEPA National Recommended Water Quality Criteria for Freshwater Aquatic Life 1 hour maximum concentrations. The 1 hour maximum concentration is to be used for comparison since it is expected to most replicate the impacts to waters of the State from the first flush following a precipitation event.

The statistically calculated SALs given in Table C-5 are at levels greater than the water quality objectives in the Basin Plan or Ocean Plan. Because the objective of the CWA is to "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*", meaning eventually pollutants in storm water discharges must be reduced to a level that cannot cause or contribute to an exceedance of water quality objectives in receiving waters, over time the SALs are expected to be reduced to a level that is based on the water quality objectives rather than statistical calculations. The San Diego Water Board will review the SALs as more data for discharges of storm water from the MS4s are collected, and revise them as conditions improve and the MEP standard advances. For the Water Quality Improvement Plans required under this Order, the SALs identified under Provision C.2.a must be included.

Provision C.2.b requires the Copermittees to identify SALs for pollutants and/or constituents, not specified in Provision C.2.a, which are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions of the Watershed Management Area related to storm water discharges from the MS4s. The SALs identified under Provision C.2.b must be included in the Water Quality Improvement Plan.

The San Diego Water Board recognizes that some of the SALs required pursuant to Provisions C.2.a and C.2.b may be exceeded more frequently than not. Thus, Provision C.2.c has been included in the Order to provide the Copermittees the option to develop secondary SALs that are set at levels greater than the levels required pursuant to Provisions C.2.a and C.2.b to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s.

D. Monitoring and Assessment Program Requirements

Purpose: Provision D includes minimum monitoring and assessment requirements that must be developed and implemented by the Copermittees as part of the Water Quality Improvement Plans. Implementation of the monitoring and assessment requirements of Provision D will allow the Copermittees to demonstrate that the requirements of the CWA to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP are being achieved. Implementation of the monitoring and assessment requirements of Provision D will also allow the Copermittees and the San Diego Water Board to track improvements to the water quality in the San Diego Region. The monitoring and assessment program requirements are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order.

***Discussion*:** The San Diego Water Board recognized that changes to the monitoring and assessment requirements of the Fourth Term Permit were necessary to improve the usefulness and usability of monitoring data collected by the Copermittees to support their jurisdictional storm water programs more efficiently and with increased effectiveness. The data collected are needed to better inform the Copermittees' understanding of the physical, chemical, and biological condition of the receiving waters and the quality of the MS4 discharges. The monitoring program needs to provide opportunities for the Copermittees to integrate regional monitoring efforts into municipal storm water monitoring requirements to provide a cost-effective approach to monitoring and avoid duplication of efforts.

The requirements in Provision D were largely recommended by the Copermittees as an outcome of the San Diego Water Boards Focused Meeting process. The monitoring and assessment program requirements now require collection of more specific information necessary for each Copermittee to adapt its jurisdictional runoff management program in such a way that focuses resources on a watershed's highest priority water quality conditions. The monitoring and assessment program will require the Copermittees to collect data that can be utilized to answer both watershed level management questions (e.g. Are the chemical, physical, and biological conditions of a receiving water protective, or likely protective of beneficial uses?), and specific jurisdictional runoff management program activity questions (e.g. Are the water quality improvement strategies of the jurisdictional program effectively eliminating non-storm water discharges to the MS4?).

The monitoring data collected and assessment information that will be reported to the San Diego Water Board are necessary to determine if the Copermittees are complying with the prohibitions and limitations of Provision A. The required monitoring and assessments that must be reported to the San Diego Water Board will be utilized for three purposes:

(1) Inform the Copermittees, San Diego Water Board, and the public on the progress of the Copermittees' efforts to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP;

(2) Inform the Copermittees, San Diego Water Board, and the public on the condition of water bodies receiving discharges from the Copermittees' MS4, and the progress of the Copermittees' water quality improvement implementation efforts toward improving the receiving water quality; and

(3) Inform the Copermittees, the San Diego Water Board, and the public on the effectiveness of the Water Quality Improvement Plan toward achieving (1) and (2).

The monitoring and assessment information reported pursuant to Provision F is also expected to be key to the iterative approach and adaptive management process required under Provision A.4 and implemented through the Water Quality Improvement Plan required under Provision B. As required by Provision A.4, the iterative approach and adaptive management process is required if the Copermittees cannot meet the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c, and/or A.2.a under the present conditions.

Provision D provides the minimum monitoring and assessment requirements that must be included in each Water Quality Improvement Plan to be developed and implemented by the Copermittees. The Copermittees, however, are not limited to the requirements of Provision D and may include additional methods to track progress toward improving water quality in a Watershed Management Area.

More specific and detailed discussions of the requirements of Provision D are provided below.

Provision D.1 (Receiving Water Monitoring Requirements) specifies the minimum receiving water monitoring that the Copermittees must conduct within the Watershed Management Area and include as part of the Water Quality Improvement Plan.

Provision D.1 establishes minimum monitoring requirements that must be conducted by the Copermittees within each Watershed Management Area. Provision D.1 requires the Copermittees to collect and develop the data and information necessary to determine potential impacts to the beneficial uses in the receiving waters due to discharges from the MS4s. The monitoring required under Provision D.1 will also provide the data that will allow the Copermittees to gauge the effectiveness and progress of its Water Quality Improvement Plan implementation efforts toward improving the quality of receiving waters.

The receiving water monitoring requirements of Provision D.1 are focused primarily on monitoring the conditions and response of the receiving waters to the Copermittees' collective implementation efforts to reduce receiving water impacts that may be caused by the discharges from the MS4s. The preference of the San Diego Water Board is for the Copermittees to spend their resources achieving tangible and observable improvements in receiving water conditions instead of collecting samples and analyzing data that has consistently indicated that receiving water conditions are degraded and require improvement. In general, the ability to measure potential improvements in receiving water conditions due to any actions implemented by the Copermittees as part of the Water Quality Improvement Plan may require several years before a response can be observed. Thus, the frequency of collecting receiving water monitoring data has been kept to a minimum.

During the transitional period between adoption of this Order and San Diego Water Board acceptance of a Water Quality Improvement Plan, the Copermittees must conduct receiving water monitoring in accordance with Provision D.1.a. This approach to collecting receiving water data is different from what was required in the Fourth Term Permits, but one that truly embraces the concept of an integrated, cost-effective, streamlined receiving water monitoring approach.

Provision D.1.a requires Copermittees to continue performing the receiving water monitoring programs required in Order Nos. R-2007-0001, R9-2009-002, and R9-2010-0016; plus participation in: hydromodification management plan monitoring approved by the San Diego Water Board, monitoring plans as part of load reduction plans (either Bacteria Load Reduction Plans or Comprehensive Load Reduction Plans) for TMDLs in Attachment E of the Order, Storm Water Monitoring Coalition Regional Monitoring, Southern California Bight Regional Monitoring, Sediment Quality Monitoring, and ASBS Monitoring as applicable to a Watershed Management Area.

Provision D.1.a also provides an opportunity for the Copermittees to use third party data to meet receiving water monitoring requirements where feasible. Allowing the Copermittees to use the data currently collected through its participation in existing regional receiving water programs and that of third parties provides an efficiency of resources in obtaining the data necessary to inform the Copermittees and the San Diego Water Board about the physical, chemical, and biological conditions of the receiving waters, which can also help to focus the receiving water monitoring during the implementation of the Water Quality Improvement Plan. Once a Water Quality Improvement Plan is developed for a Watershed Management Area in compliance with Provision B of this Order, the transitional period is over and Copermittees are required to conduct receiving water monitoring according to the requirements of Provisions D.1.b-e.

Provision D.1.b requires each Copermittee to identify at least one long term receiving water monitoring station to be representative of receiving water quality within each Watershed Management Area. Long term receiving water monitoring stations can be

located at any existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees. The requirements under Provision D.1.b. are consistent with 40 CFR 122.26(d)(2)(iii)(D), which specifies that a "*monitoring program for representative data collection for the term of the permit*" may include "*instream locations.*" For each Watershed Management Area, at least one long term watershed monitoring station is required to be established and monitored. The Copermittees may choose to establish additional long term monitoring stations where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

Provision D.1.b. requires the Copermittees to locate the long term receiving water monitoring station at one of these existing receiving water monitoring stations to provide the Copermittees an opportunity to experience monitoring cost savings while continuing to collect the necessary data to assess the status and trends of receiving water quality conditions in 1) coastal water, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under both dry weather and wet weather conditions. Ideally these stations will continue to be monitored as part of the receiving water monitoring for each Watershed Management Area to maintain a consistent set of locations and a period of data that can be built upon with the monitoring required under this Order.

The receiving water monitoring requirements are separated into monitoring required during dry weather conditions pursuant to Provision D.1.c, and wet weather conditions pursuant to Provision D.1.d.

At each long term monitoring station the Copermittees must conduct at least three dry weather monitoring events as required pursuant to Provision D.1.c and at least three wet weather monitoring events as required pursuant to Provision D.1.d per permit term. Provisions D.1.c and D.1.d require the Copermittees to monitor priority water quality conditions identified in the Water Quality Improvement Plan, constituents listed as causing impairment of receiving waters in the Watershed Management Area, applicable NALs, toxicity, constituents listed in Tables D-2 and D-3, and constituents for implementation plans (e.g. Bacteria Load Reduction Plans and Comprehensive Load Reduction Plans). Required toxicity monitoring was changed to reflect an updated understanding of the unique challenges associated with sampling storm water for toxicity. Copermittees are required to sample storm water for toxicity during each dry weather and each wet weather event pursuant to Provision D.1.c.(4) and D.1.d.(4). Required toxicity monitoring is now consistent with the State Water Resources Control Board Policy for Toxicity Assessment and Control (Draft June 2012) and recently adopted MS4 permits for Caltrans and Los Angeles Water Board. Receiving water monitoring efforts in this Order have been streamlined to redirect resources to monitoring efforts that better support pollutant reduction solutions with an increasing emphasis on MS4 outfall monitoring, source identification and source abatement activities.

In addition to the receiving water monitoring requirements under Provisions D.1.b-d, Provision D.1.e requires the Copermittees participate in and/or conduct other types of receiving water monitoring. As recommended and requested by the Copermittees, Provision D.1.e.(1) requires the Copermittees to participate in existing regional monitoring, as applicable to each Watershed Management Area. Existing regional monitoring includes monitoring conducted by the Storm Water Monitoring Coalition and for the Southern California Bight. Participation in and use of monitoring data collected from these existing regional water quality monitoring programs provide the Copermittees a greater opportunity for efficiency in the use of their resources to manage their storm water programs and those controllable discharges under their authority. Provision D.1.e.(1)(c) requires the south Orange County MS4 Copermittees to participate in "unified regional beach water quality monitoring." This monitoring replaces requirements to conduct "core monitoring" of beach water quality, as provided for in Appendix III of the 2012 California Ocean Plan.

Several different public agencies currently conduct routine, ongoing beach water quality monitoring in south Orange County in accordance with several different sets of requirements. The monitoring programs implemented to meet those requirements overlap temporally and spatially. These monitoring programs are partially but not fully integrated. In November 2010, the State Water Board adopted Resolution No. 2010-0053, which directed regional water boards to work with dischargers to modify beach water quality monitoring programs required by regional board-issued permits in order to eliminate redundancies and incorporate beach water quality monitoring required by beach water quality statutes, where appropriate.

In April 2012, the San Diego Water Board requested that its staff review beach water quality monitoring conducted in south Orange County. To assist in responding to that request, staff of the Board convened a workgroup that included representatives of the three public agencies that currently conduct almost all of the routine, ongoing beach water quality monitoring in south Orange County, i.e., South Orange County Wastewater Authority (SOCWA), Orange County Public Works, and Orange County Health Care Agency (OCHCA). The workgroup also included other interested parties, including representatives of the Sierra Club and Surfrider Foundation. In December 2012, the San Diego Water Board adopted Resolution No. R9-2012-0069, which endorsed the San Diego Water Board staff report entitled "A Framework for Monitoring and Assessment in the San Diego Region," dated November 2012.

The unified program is consistent with and will meet or exceed the minimum requirements for beach water quality monitoring and related public notification and reporting established by State law, including the California Ocean Plan. The unified program is consistent with State Water Board Resolution No. 2010-0053. The unified program is also consistent with and will help implement, "A Framework for Monitoring and Assessment in the San Diego Region," which emphasizes the need for question-driven, beneficial use-oriented monitoring and assessment. The primary purpose of

the unified program will be to answer the question "Does beach water quality meet standards for the beneficial use of water contact recreation?"

The unified program is intended to be protective; it will help protect the health of swimmers, surfers, and others who use south Orange County beach waters for water contact recreational activities. The unified program is also intended to be reasonable; it will eliminate duplicative monitoring and will include triggers for public notification and additional sampling at all sampling stations year-round. The unified program is intended to be equitable; responsibility for implementation of the unified program will be shared and the responsible agencies will jointly make arrangements to implement the program and will have the flexibility to jointly make short and/or long term changes in those arrangements.

The San Diego Water Board Executive Officer has issued a written directive, pursuant to California Water Code sections 13225, 13267, and 13383, for SOCWA and the south Orange County MS4 Copermittees to implement the unified program in cooperation with OCHCA. The Executive Officer may make revisions to the unified program, provided that the unified program, as revised, continues to be consistent with and meet the requirements of State law, including the California Ocean Plan, for beach water quality monitoring and related public notification and reporting. Following a thirty day public comment period, and subject to a request for a hearing before the San Diego Water Board, any such revision shall take effect as specified in a written directive issued by the Executive Officer pursuant to California Water Code sections 13225, 13267, and/or 13383. The program and any Executive Officer issued revisions to the program are subject to California Water Code section 13320 right of review from the date of issuance.

The unified program will supersede the existing routine, ongoing, beach water quality monitoring programs in south Orange County that are conducted in accordance with the existing requirements of the NPDES permits for discharges from the SOCWA ocean outfalls and the south Orange County MS4s. The requirement to participate in "regional monitoring" of beach water quality replaces requirements to conduct "core monitoring" of beach water quality, as provided for in Appendix III of the 2012 California Ocean Plan.

The State Water Resources Control Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part 1 Sediment Quality which became effective August 25, 2009 (Sediment Quality Monitoring Policy). Provision D.1.e.(2) requires any Copermittees with MS4 discharges to an enclosed bay or estuary to monitoring the sediments in the enclosed bay or estuary receiving water in accordance with the sediment quality monitoring procedures as prescribed in the Sediment Quality Monitoring Policy.

The State Water Board adopted Resolution No. 2012-0012 which approved exceptions to the California Ocean Plan for selected discharges into Areas of Special Biological

Significance (ASBS), including special protections for beneficial uses. State Board Resolution No. 2012-0012 became effective on March 20, 2012, and Attachment B to the Resolution established limitations on point source storm water discharges to ASBS. Copermittees with MS4s that discharge to an ASBS must monitor its discharge to assure compliance with State Board Resolution No. 2012-0012 as required pursuant to Provision D.1.e.(3).

The San Diego Water Board is currently developing a regional monitoring strategy to assess the conditions of receiving waters in the San Diego Region. The monitoring requirements of Provision D.1 are expected to be incorporated or serve as a foundation of this regional monitoring strategy, but may require some modifications. When the San Diego Water Board develops an alternative regional monitoring strategy, the Copermittees will be required to participate in the development and implementation of the alternative regional monitoring program pursuant to Provision D.1.f.

Provision D.2 (MS4 Outfall Discharge Monitoring Requirements) specifies the minimum MS4 outfall discharge monitoring requirements that the Copermittees must incorporate and implement as part of the Water Quality Improvement Plan.

The dry weather MS4 outfall discharge monitoring requirements are included under Provisions D.2.a.(2) and D.2.b. The dry weather MS4 outfall discharge monitoring requirements are part of the "*program, including a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer*" required by 40 CFR 122.26(d)(2)(iv)(B), which is expected to achieve compliance with the CWA section 402(p)(3)(B)(ii) statutory requirement for municipal storm water permits to require the Copermittees to "*effectively prohibit non-storm water discharges into the storm sewers*." The dry weather MS4 outfall discharge monitoring data collection requirements are based on requirements under 40 CFR 122.26(d)(1)(iv)(D) and 122.26(d)(2)(iv)(B)(3).

The dry weather MS4 outfall discharge monitoring requirements are designed to provide wide spatial and temporal coverage of each jurisdiction to better understand the extent and magnitude of non-storm water discharges to receiving waters, and make a distinction between persistent and transient non-storm water flows. This information is expected to allow each Copermittee to focus its resources on eliminating and controlling the highest priority threats to receiving water quality, as well as integrating other elements of the storm water programs (e.g. complaint call response) and third party data to efficiently and effectively assist in efforts to eliminate non-storm water discharges.

The dry weather MS4 outfall discharge monitoring requirements of Provision D.2.a.(2) and D.2.b are separated into monitoring required before and after the San Diego Water Board accepts the Copermittees' Water Quality Improvement Plan. Outfall

monitoring conducted prior to acceptance of the Water Quality Improvement Plan is referred to in the Order as Transitional MS4 Outfall Discharge Monitoring. Provision D.2.a.(2) includes the transitional dry weather MS4 outfall discharge monitoring requirements.

The requirements under Provision D.2.a.(2) are based on the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B), which include the requirements for a monitoring program to identify, detect, and eliminate illicit connections and illegal discharges to the MS4s. The federal regulations (40 CFR 122.26(d)(1)(iv)(D)) require the monitoring program to include "*a field screening analysis for illicit connections and illegal dumping [that]…[a]t a minimum, include[s] a narrative description, for either each field screening point or major outfall, of visual observations made during dry weather periods.*" The federal regulations (40 CFR 122.26(d)(1)(v)(B)) require the monitoring program to include "*inspection procedures and methods for detecting and preventing illicit discharges, and describe areas where this program has been implemented.*" Furthermore, the monitoring program is required by federal regulations (40 CFR 122.26(d)(2)(iv)(B)) to include "*a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer.*"

Dry weather transitional MS4 outfall discharge monitoring requires each Copermittee to field screen (inspect) its major MS4 outfalls to classify the MS4 outfall locations as having persistent dry weather flows, transient dry weather flows, or no dry weather flows. To account for the variance in size of the 39 jurisdictions covered under this Order, the Copermittees recommended a tiered approach to the number of major MS4 outfalls that must be inspected. Provision D.2.a.(2)(a) provides a tiered approach to the number of major MS4 outfalls that must be visually inspected per jurisdiction as well as a minimum frequency each Copermittee must inspect each major MS4 outfall per year. This tiered approach is based on the total number of major MS4 outfalls within a Copermittees jurisdiction within each Watershed Management Area.

Based on the field screening, each Copermittee is required to make a determination whether any observed flowing, pooled, or ponded waters are transient or persistent flows. Based on this field screening information, other jurisdictional program information, and third party information, each Copermittee is required to prioritize the MS4 outfalls within its jurisdiction for follow up investigation and elimination of the non-storm water discharge, as part of its illicit discharge detection and elimination program required pursuant to Provision E.2. In accordance with the requirements of Provision E.2, each Copermittee is required to immediately investigate obvious illicit discharges (e.g. outfall discharges with unusual color, unusual odor, or high flows).

This approach allows a Copermittee to use all of its resources, as well as leverage resources and information provided by third parties, to effectively eliminate non-storm water discharges from its MS4 outfalls. If the source of the non-storm water discharge cannot be immediately eliminated, the Copermittee uses the persistent flow or

transient flow classification along with other programmatic implementation data to prioritize the MS4 outfalls for future investigation. In accordance with the adaptive management approach deployed throughout this Order, Provision D.2.a.(2)(c) requires each Copermittee to update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow. The requirement of Provision D.2.a.(2)(c) assures that each Copermittee is collecting data that can be used to demonstrate compliance with the CWA requirement that each Copermittee must implement a program to "*effectively prohibit non-storm water discharges into the [MS4]*" and with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

Provision D.2.b describes the dry weather MS4 outfall discharge monitoring required to be incorporated and implemented as part of the Water Quality Improvement Plan. Dry weather MS4 outfall discharge monitoring must be performed by each Copermittee to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. The emphasis of the dry weather MS4 outfall discharge monitoring required pursuant to Provision D.2.b is consistent with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

Provision D.2.b.(1) requires each Copermittee to continue field screening its major MS4 outfalls and identifying those with persistent flows and transient flows, as conducted during the transitional period (i.e. before the Water Quality Improvement Plan was developed). However, each Copermittee now has the flexibility to adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of non-storm water persistent flow discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan. In order to ensure a minimum number of outfalls are inspected, Provision D.2.b.(1) requires the number of visual inspections be equal to the number of visual inspections required in the tiered inspection program pursuant to Provision D.2.a.(2)(a).

Provision D.2.b.(2)(b) requires each Copermittee to monitor a minimum of 5 major MS4 outfalls with persistent flows identified as the highest priorities within a Copermittee's jurisdiction, within each Watershed Management Area. In other words, Copermittees located in more than one Watershed Management Area must identify at least 5 major MS4 outfalls with persistent flows in its jurisdiction in each Watershed Management Area. If a Copermittee is located in more than one Watershed Management Area, and they have less than 5 major MS4 outfalls with persistent flows per jurisdictional area per Watershed Management Area, all of the major MS4 outfalls must be identified as high priority dry weather persistent flow MS4 outfalls. The Copermittees identified as Responsible Copermittees by a TMDL in Attachment E of

the Order may need to monitor more than 5 dry weather major MS4 outfall locations to determine compliance with the requirements of the TMDL(s).

Monitoring must occur at the highest priority outfall locations at least semi-annually until the non-storm water discharges have been eliminated for three consecutive dry weather monitoring events; identified to be authorized by a separate NPDES Permit; or reprioritized to a lower priority. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized MS4 major outfall in the Copermittee's jurisdiction within the Watershed Management Area, unless there are no remaining qualifying major MS4 outfalls within the Copermittees jurisdiction. The Copermittees must continually update their dry weather persistent flow MS4 outfall discharge monitoring locations with the next highest priority non-storm water flow that have yet to be eliminated until all persistent and transient flows are eliminated or its threat reduced.

Non-storm water persistent flow MS4 outfall discharge monitoring data collected during each semi-annual monitoring event, must be collected and analyzed according to the requirements of Provision D.2.b.(2)(b)–(e). These monitoring requirements are consistent with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

The wet weather MS4 outfall discharge monitoring requirements are included under Provisions D.2.a.(3) and D.2.c. The wet weather MS4 outfall discharge monitoring requirements are necessary for the Copermittees to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable, using management practices, control techniques and system, design and engineering methods, and such other provisions which are appropriate*" required by 40CFR 122.26(d)(2)(iv), which is expected to achieve compliance with the CWA section 402(p)(3)(B)(iii) statutory requirement for municipal storm water permits to require "*controls to reduce the discharge of pollutants [in storm water] to the maximum extent practicable*." The wet weather MS4 outfall discharge monitoring data collection requirements are based on requirements under 40 CFR 122.26(d)(2)(iii), 122.26(d)(2)(iii)(A) and 122.26(d)(2)(iii)(A)(1)-(4), and 40 CFR 122.21(g)(7)(i)-(ii).

The wet weather MS4 outfall discharge monitoring requirements of Provision D.2.a.(3) and D.2.c are separated into monitoring required before and after the San Diego Water Board accepts the Copermittees' Water Quality Improvement Plan. Outfall monitoring conducted prior to acceptance of the Water Quality Improvement Plan is referred to in the Order as Transitional MS4 Outfall Discharge Monitoring. Provision D.2.a.(3) includes the transitional wet weather MS4 outfall discharge monitoring requirements.

Until the wet weather MS4 outfall discharge monitoring requirements of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board, the Copermittees must comply with the requirements of

transitional wet weather MS4 outfall monitoring requirements pursuant to Provision D.2.a.(3). Provision D.2.a.(3) requires the Copermittees in each Watershed Management Area to sample, at least five of the major MS4 outfalls inventoried pursuant to Provision D.2.a.(1) once per wet season for the monitoring data required to be collected pursuant to Provision D.2.a.(3)(c)-(e). Provision D.2.a.(3) further requires at least one major MS4 outfall monitoring station be located in each Copermittee's jurisdiction within the Watershed Management Area.

At a minimum, the five sampling locations chosen must be representative of storm water discharges from residential, commercial, industrial, and typical mixed-use land uses present within a Watershed Management Area. The San Diego Water Board expects the Copermittees to extrapolate from these data to similar land uses throughout the Watershed Management Area to better inform the Water Quality Improvement Plan development process by prioritizing drainages for implementation of storm water control efforts required pursuant to Provision E.

Provision D.2.c describes the wet weather MS4 outfall discharge monitoring required to be included and implemented as part of the Water Quality Improvement Plan. Provision D.2.c provides the Copermittees the flexibility to adjust the wet weather MS4 outfall discharge monitoring locations and frequencies in the Watershed Management Area, as needed, to identify sources of pollutants in storm water discharges from MS4s in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan.

Although Provision D.2.c.(1) allows the Copermittees to adaptively manage the wet weather MS4 outfall discharge monitoring locations and frequencies, the provision requires a minimum of at least five wet weather outfall stations to be monitored. Provision D.2.c.(2) further allows the Copermittees to modify the monitoring frequency at each wet weather MS4 outfall station to meet the goals of the Water Quality Improvement Plan as long as the monitoring frequency occurs at least once per year and is at an appropriate frequency to identify sources of pollutants in storm water discharges, guide pollutant source identification efforts, or determine compliance with the requirements of the applicable TMDLs in Attachment E to the Order.

The wet weather MS4 outfall discharge monitoring requirements of Provisions D.2.c.(3) and D.2.c.(4) are the same as the transitional wet weather MS4 outfall discharge monitoring. In contrast, the requirements of Provision D.2.c.(5) are focused on collecting analytical data specific to the highest priority water quality conditions in the Watershed Management Area identified in the Water Quality Improvement Plan. The wet weather MS4 outfall discharge monitoring data collection requirements are consistent with the requirements under 40 CFR 122.26(d)(2)(iii), 122.26(d)(2)(iii)(A) and 122.26(d)(2)(iii)(A)(1)-(4), and 40 CFR 122.21(g)(7)(i)-(ii).

Provision D.3 (Special Studies) requires the Copermittees to develop special studies that will be conducted for each Watershed Management Area and the entire San

Diego Region. Data collected pursuant to Provision D.3 is to be used by the Copermittees to improve the effectiveness of the strategies implemented by the jurisdictional runoff management programs toward achieving the numeric goals identified in the Water Quality Improvement Plans and ultimately achieve compliance with the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c, and A.2.a, which is consistent with the requirements of Provision A.4.

Special studies are often necessary to fill data gaps or provide more refined information that allow the Copermittees to better manage the generation or elimination of pollutants and discharges to and from the MS4. In the Fourth Term Permits, the Copermittees have been required to implement special studies as directed by the San Diego Water Board. The special studies required by this Order provide the Copermittees more flexibility to identify and implement special studies that will be most useful to improving the effectiveness of their jurisdictional runoff management programs.

Provision D.3.a.(1) requires the Copermittees to develop and conduct at least two special studies per Watershed Management Area, to be determined by the Copermittees. One of the two special studies may be accomplished through participation in a Regional Special Study required under Provision D.3.a.(2). The requirements provide the Copermittees great latitude in identifying and developing the special studies. Watershed Management Area special studies are required, at a minimum, to: (a) relate in some way to the highest water quality priorities identified by the Copermittees in the Water Quality Improvement Plan, (b) be conducted within the Watershed Management Area, and (c) include some form of participation (e.g. contribution of funds, personnel services, project management) by all the responsible Copermittees within the Watershed Management Area.

Examples of Watershed Management Area special studies might include, but are not limited to: (1) focused pollutant source identification studies, (2) BMP effectiveness and/or comparison studies, (3) pilot tests for new or emerging pollutant control methods, (4) receiving water pollutant or stressor source identification and/or mitigation studies, or (5) pollutant fate and transport studies. The Watershed Management Area special studies are expected to provide data that can be utilized by the Copermittees to improve the Water Quality Improvement Plan or implementation of the Copermittees' jurisdictional runoff management programs to address the highest priority water quality conditions.

Provision D.3.a.(2) requires the Copermittees to develop at least one special study that will be conducted for the entire San Diego region. The regional special study is expected to provide data that can be utilized by the Copermittees to improve the Water Quality Improvement Plan or implementation of the Copermittees' jurisdictional runoff management programs to identify or address regional water quality concerns and priorities.

An example of a regional special study would be to develop and establish allowable exceedance frequencies of the bacteria water quality objectives for several types of water bodies, during different wet and dry weather conditions the San Diego region. The special study would be related to bacteria, which is a priority for the San Diego region due to the adoption of "*Bacteria TMDL Project I – Beaches and Creeks in the San Diego Region*." The study results could be used to inform the Copermittees and the San Diego Water Board about the indictor bacteria water quality objective exceedance frequencies that occur in natural or reference watersheds.

Provision D.4 (Assessment Requirements) specifies the assessments that the Copermittees are required to perform, based on the monitoring data collected, and will be reported as part of the Annual Report for the Water Quality Improvement Plan implementation. Provision D.4 requires the Copermittees assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c, and A.2.a.

Provision D.4 specifies the assessments that Copermittees must perform for each Watershed Management Area to assess the effectiveness of each Copermittee's jurisdictional runoff management program and the Water Quality Improvement Plan. The effectiveness of each Copermittee's jurisdictional runoff management program and Water Quality Improvement Plan is measured through these types of assessments: (a) Receiving Waters Assessments (b) MS4 Outfall Discharges Assessments, (c) Special Studies Assessments, and (d) Integrated Assessment of Water Quality Improvement Plan.

Provision D.4.a requires the Copermittees to assess the status of receiving water conditions annually during the transitional monitoring period (during development of the Water Quality Improvement Plan) and after acceptance of the Water Quality Improvement Plan. The monitoring data collected pursuant to Provision D.1 will be evaluated, among other information, to assess the condition of a Watershed Management Area's streams, coastal waters, enclosed bays, harbors, estuaries, and lagoons. The focus of the receiving waters assessments is to measure progress toward the objective of the CWA to "*restore and maintain the chemical, physical, and biological integrity of the Nation's waters*" as the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program are implemented within a Watershed Management Area. Provision D.4.a is consistent with 40 CFR 122.42(c)(7) which requires the Copermittees to annually report the *"[i]dentification of water quality improvements or degradation."*

Provision D.4.b includes the MS4 outfall discharges assessment requirements. The focus of MS4 outfall discharges assessments is to determine if the Copermittees' are implementing programs that comply with the requirements of the CWA for MS4 permits to "*effectively prohibit non-stormwater discharges into the storm sewers*" and "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable.*" The monitoring data collected pursuant to Provisions D.2 will be

evaluated, among other information, to assess the effectiveness of the transitional MS4 outfall field screening monitoring, the implementation of the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program. The MS4 outfall discharge assessments consist of Non-Storm Water Discharges Reduction Assessments and Storm Water Pollutant Discharges Reduction Assessments.

The Non-Storm Water Discharges Reduction Assessments are how each Copermittee will demonstrate that its jurisdictional runoff management program implementation efforts are achieving the CWA requirement to "*effectively prohibit non-stormwater discharges into the storm sewers.*" Provision D.4.b.(1) requires each Copermittee to assess and report on its illicit discharge detection and elimination program required pursuant to Provision E.2 to reduce and effectively prohibit non-storm water and illicit discharges into the MS4 within its jurisdiction. The Non-Storm Water Discharges Reduction Assessments include specific assessment requirements applicable to each Copermittee.

As each Copermittee collects and analyzes the data collected pursuant to dry weather MS4 outfall discharges monitoring requirements of Provisions D.2.a.(2) and D.2.b, Provision D.4.b.(1) requires each Copermittee to assess the progress, assess the effectiveness of its current actions, and identify modifications necessary to increase the effectiveness of its actions toward reducing and eliminating non-storm water and illicit discharges to its MS4. The findings from these assessments are expected to be utilized by the Copermittee as part of its procedures to prioritize the non-storm water discharges that will be addressed by its Illicit Discharge Detection and Elimination program required pursuant to Provision E.2.

The assessment requirements of Provision D.4.a.(1) are consistent with 40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(3) which require "*procedures…to investigate portions of the separate storm sewer system that, <u>based on the results of the field screen, or other appropriate information</u> [emphasis added], indicate a reasonable potential of contain illicit discharges or other sources of non-storm water*" as part of a "*program…to detect and remove…illicit discharges and improper disposal into the storm sewer.*" The assessment requirements of Provision D.4.a.(1) are also consistent with 40 CFR122.42(c)(1) requires the Copermittees to annually report the "*status of implementing the components of the storm water management program that are established as permit conditions.*"

The Storm Water Pollutant Discharges Reduction Assessment is how the Copermittees in each Watershed Management Area will demonstrate that their jurisdictional runoff management program implementation efforts are achieving the CWA requirement to "*reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable*." Provision D.4.b.(2) requires the Copermittees in each Watershed Management Area to assess and report the progress of the Copermittees' efforts to reduce pollutants in storm water discharges from the MS4s to the MEP. The

Storm Water Pollutant Discharges Reduction Assessments include specific assessment requirements during both the transitional monitoring period and after acceptance of the Water Quality Improvement Plan applicable to the Watershed Management Area and each Copermittee.

As the Copermittees collect and analyze the data collected pursuant to wet weather MS4 outfall discharges monitoring requirements of Provisions D.2.a.(3) and D.2.c, Provision D.4.b.(2) requires the Copermittees to assess runoff conditions during the transitional period, and the progress of the Water Quality Improvement Plan strategies toward reducing pollutants in storm water from the MS4 to the MEP. The findings from these assessments are expected to be utilized by the Copermittees to identify any modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify sources of pollutants in storm water discharges from the MS4s, as well as focus, modify, and improve the water quality improvement strategies implemented by each Copermittee within its jurisdiction to reduce pollutants in storm water discharges to the MEP.

The assessment requirements of Provision D.4.b.(2) are consistent with 40 CFR 122.26(d)(2)(iii)(B) which requires "*[e]stimates of the annual pollutant load of the cumulative discharges to waters of the United States from all identified municipal outfalls…during a storm event…accompanied by a description of the procedures for estimating constituent loads and concentrations, including any modeling, data analysis, and calculation methods.*" The assessment requirements of Provision D.4.a.(2) are consistent with 40 CFR 122.26(d)(2)(v) which requires that each Copermittee assesses the *"estimated reductions in loadings of pollutants from discharges of municipal storm sewer constituents from municipal storm sewer systems expected as the result of the municipal storm water quality management program."* The assessment requirements of Provision D.4.b.(2) are also consistent with 40 CFR122.42(c)(1) requires the Copermittees to annually report the "*status of implementing the components of the storm water management program that are established as permit conditions.*"

Provision D.4.c includes the special studies assessment requirements. Performing special studies are how the Copermittees will address data gaps identified during the development of and updates to the Water Quality Improvement Plan. The relevant findings from the special studies assessments are expected to be incorporated as part of the applicable receiving water assessments, MS4 outfall discharge assessments, and integrated water quality improvement assessments required in Provision D.4.a, D.4.b, and D.4.d, respectively.

The assessment requirements in Provision D.4.d are part of the iterative approach and adaptive management process required by Provision A.4. The Copermittees are required to integrate the data collected pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to re-evaluate the Water Quality Improvement Plan.

The monitoring data collected pursuant to Provisions D.1 and D.2, and the results of the assessment required pursuant to Provisions D.4.a-c, will be used to determine whether the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program are effective, or require modifications or improvements to become more effective to achieve the requirements of the CWA. The assessments required by Provision D.4.d are consistent with 40 CFR 122.42(c)(1) which requires that the Copermittees to report the *"[t]he status of implementing the components of the storm water management program that are established as permit conditions."*

E. Jurisdictional Runoff Management Programs

Purpose: Provision E includes the requirements for the jurisdictional runoff management programs to be implemented by each of the Copermittees. Compliance with the requirements for the jurisdictional runoff management programs will allow the Copermittees to demonstrate that they are implementing programs to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP. The jurisdictional runoff management program document prepared by each Copermittee will also provide the details for implementing the water quality improvement strategies identified in the Water Quality Improvement Plan specifically within its jurisdiction.

***Discussion*:** Implementation of the jurisdictional runoff management program requirements under Provision E is how the Copermittees "*effectively prohibit non-stormwater discharges into the storm sewer,*" and outlines the "*controls to reduce the discharge of pollutants to the maximum extent practicable"* consistent with the federal regulations under 40 CFR 122.26. The jurisdictional runoff management program is part of the "*comprehensive planning process*" that is required pursuant to 40 CFR 122.26(d)(2)(iv). Where the Water Quality Improvement Plan is the "*comprehensive planning process*" on a Watershed Management Area scale, requiring "*intergovernmental coordination,*" the jurisdictional runoff management program document is the "*comprehensive planning process*" on a jurisdictional scale that should be coordinated with the other Copermittees in the Watershed Management Area to achieve the goals of the Water Quality Improvement Plan.

The jurisdictional runoff management program requirements are included to provide each Copermittee criteria that can be used to demonstrate that its storm water management program is implementing the "*comprehensive planning process*" within its jurisdiction to "*effectively prohibit non-stormwater discharges into the storm sewers,*" and to identify and implement the most effective "*controls to reduce the discharge of pollutants to the maximum extent practicable"* in accordance with the performance standards given in the CWA.

Provision E includes the requirements for each of the components that must be included in the Copermittee's jurisdictional runoff management program document that will be implemented by the Copermittee within its jurisdiction. Implementation of the components of each Copermittee's jurisdictional runoff management program must incorporate the water quality improvement strategies identified by each Copermittee in the Water Quality Improvement Plans, described pursuant to Provision B.3.b.(1)(a).

More specific and detailed discussions of the requirements of Provision E are provided below.

Provision E.1 (Legal Authority Establishment and Enforcement) requires each Copermittee to establish and enforce sufficient legal authority to control discharges to the MS4 within its jurisdiction.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system*" and be able to demonstrate that it can "*operate pursuant to legal authority established by statute, ordinance or series of contracts.*" Provision E.1.a describes the minimum legal authorities each Copermittee must establish for itself within its jurisdiction to control discharges to its MS4. The requirements of Provision E.1.a are consistent with the requirements set forth in 40 CFR 122.26(d)(2)(i)(A)-(F).

The certification statement required from each Copermittee by Provision E.1.b is included to provide the San Diego Water Board additional documentation that each Copermittee has established the legal authorities consistent with Provision E.1.a and 40 CFR 122.26(d)(2)(i)(A)-(F), and the Copermittee can "*operate pursuant to legal authority established by statute, ordinance or series of contracts.*"

Provision E.2 (Illicit Discharge Detection and Elimination) requires each Copermittee to implement an illicit discharge detection and elimination program to effectively prohibit non-storm water discharges to the MS4 by actively detecting and eliminating illicit discharges and disposal into its MS4.

Provision E.2 establishes the minimum requirements that each Copermittee must implement within its jurisdiction to effectively prohibit non-storm water discharges from entering its MS4. The federal CWA requires permits for municipal storm sewer systems to "*effectively prohibit non-storm water discharges into the storm sewers*." The federal regulations (40CFR122.26(d)(2)(i)(B)) require each Copermitee to establish the legal authority to prohibit illicit discharges to its MS4s. Under 40 CFR 122.26(d)(2)(iv)(B), each Copermittee must implement a "*program…to detect and remove…illicit discharges and improper disposal into the storm sewer.*" The federal NPDES regulations, under 40 CFR 122.26(b)(2), define illicit discharges as "*any discharge to a municipal separate storm sewer that is not composed entirely of storm water*." Thus, non-storm water discharges are not authorized to enter the MS4 and are considered to be illicit discharges, unless authorized by a separate NPDES permit.

The Phase I Final Rule clarifies that non-storm water discharges through an MS4 are not authorized under the CWA (55 FR 47995):

> "*Today's rule defines the term "illicit discharge" to describe any discharge through a municipal separate storm sewer system that is not composed entirely of storm water and that is not covered by an NPDES permit. Such illicit discharges are not authorized under the Clean Water Act. Section 402(p)(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm*

sewer…Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit."

The federal NPDES requirements for the program to address illicit discharges must include "*inspections, to implement and enforce an ordinance, orders, or other similar means to prevent illicit discharges to the MS4*." The federal NPDES regulations also reference several categories of "*non-storm water discharges or flows* [which] *shall be addressed where such discharges are identified…as sources of pollutants to waters of the United States*." The Phase I Final Rule (55 FR 48037) further clarified the requirements of 40 CFR 122.26(d)(2)(iv)(B)(1) as follows:

"*EPA is clarifying that section 402(p)(3)(B) of the CWA (which requires permits for municipal separate storm sewers to 'effectively' prohibit non-storm water discharges) does not require permits for municipalities to prohibit certain discharges or flows of nonstorm water to waters of the United States through municipal separate storm sewers in all cases*."

In previous iterations of the municipal storm water permits for the San Diego Region, these categories were simply listed and referred to as categories of non-storm water discharges "not prohibited" unless identified as a source of pollutants. The Copermittees have often referred to these categories as "exempt" discharges. In both cases, however, the language is inconsistent with the federal CWA and NPDES regulations. And, the clarification provided in the Phase I Final Rule does not specifically state that such discharges are "not prohibited" or "exempt" or in any way authorized. The federal NPDES regulations do, however, state that specific categories of non-storm water discharges must be "*addressed*" if identified as "*sources of pollutants to waters of the United States*."

The language of Provision E.2.a has been revised to be fully consistent with the language of the CWA and the requirements of the federal regulations under 40 CFR 122.26(d)(2)(iv)(B)(1). Provision E.2.a requires each Copermittee to address <u>all</u> types of non-storm water discharges into its MS4 as illicit discharges, <u>unless</u> the discharge is authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to Provisions E.2.a.(1) through E.2.a.(5). Only non-NPDES-permitted non-storm water discharges identified as a category of non-storm water discharges under Provisions E.2.a.(1) through E.2.a.(5) <u>and</u> *not identified as a source of pollutants* do not have to be addressed as illicit discharges. Categories of non-storm water discharges that meet the requirements of Provisions E.2.a.(1) through E.2.a.(5) do not have to be addressed by the Copermittee as illicit discharges.

Several of the non-storm water categories listed in 40 CFR 122.26(d)(2)(iv)(B)(1) have not been included in Provisions E.2.a.(1) through E.2.a.(5), including: street wash water, landscape irrigation, irrigation water, and lawn watering. Because these are no

longer included within the categories listed under Provisions E.2.a.(1) through E.2.a.(5), the Copermittees must prohibit these types of non-storm water discharges from entering the MS4. This is consistent with the clarification of 40 CFR 122.26(d)(2)(iv)(B)(1) in the Phase I Final Rule (55 FR 48037), which states:

> "*[T]he Director may include permit conditions that either require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*."

Street wash water is a category of non-storm water discharges that was removed when the Third Term Permits were issued. Street wash water is a source of several pollutants (e.g., metals, oil and grease, petroleum hydrocarbons, chlorinated solvents, sediment) which are generated during the street washing process. The removal of this category requires the Copermittees to prohibit this type of non-storm water discharge from entering the MS4.

The landscape irrigation, irrigation water, and lawn watering categories, collectively referred to hereafter as "over-irrigation" discharges, were removed from the list of non-storm water discharge categories in the Fourth Term Orange County and Riverside County Permits. Non-storm water discharges resulting from over-irrigation have been found to be a source of several types of pollutants (e.g., nutrients, bacteria, pesticides, sediment) in receiving waters. The San Diego Water Board and the Copermittees have identified categories of non-storm water discharges associated with over-irrigation as a source of pollutants and conveyance of pollutants to the MS4 and waters of the United States in the following documents:

- **SmartTimer/Edgescape Evaluation Program (SEEP) Grant Application**

  The State Water Board allocated grant funding to the SEEP project grant application submitted in 2006, which targeted irrigation runoff by retrofitting areas of existing development and documenting the conservation and runoff improvements. The basis of this grant project is that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 is a source and conveyance of pollutants. In addition, the grant application indicated that this alteration of natural flows is impacting the beneficial uses of waters of the state and U.S. Results from the study indicate that that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 *is* a source and conveyance of pollutants. The results of this study can be applied broadly to any area where over-irrigation takes place. The grant application included the following statements:

  > "*Irrigation runoff contributes flow & pollutant loads to creeks and beaches that are 303(d) listed for bacteria indicators.*"
  >
  > "*Regional program managers agree that the reduction and/or elimination of irrigation-related urban flows and associated pollutant loads may be key to successful attainment of water quality and beneficial use goals as outlined in*

the San Diego Basin Plan and Bacteria TMDL over the long term."

"*Elevated dry-weather storm drain flows, composed primarily … of landscape irrigation water wasted as runoff, carry pollutants that impair recreational use and aquatic habitats all along Southern California's urbanized coastline. Storm drain systems carry the wasted water, along with landscape derived pollutants such as bacteria, nutrients and pesticides, to local creeks and the ocean. Given the local Mediterranean climate, excessive perennial dry season stream flows are an unnatural hydrologic pattern, causing species shifts in local riparian communities and warm, unseasonal contaminated freshwater plumes in the near-shore marine environment.*"

- **2006-2007 Orange County Watershed Action Plan Annual Reports**

The Watershed Action Plan Annual Reports for the 2006-2007 reporting period were submitted by the County of Orange, Orange County Flood Control District and Copermittees within the San Juan Creek, Laguna Coastal Streams, Aliso Creek, and Dana Point Coastal Streams Watersheds. San Juan Creek, Laguna Coastal Streams, Aliso Creek and Dana Point Coastal Streams are all currently 303(d) listed as impaired for indicator bacteria within their watersheds and/or in the Pacific Ocean at the discharge points of their watersheds. The Orange County Copermittees, within their Watershed Action Strategy Table for fecal indicator bacteria included the following:

"*Support programs to reduce or eliminate the discharge of anthropogenic dry weather nuisance flow throughout the…watershed. Dry weather flow is the transport medium for bacteria and other 303(d) constituents of concern.*"

Additionally, they state that "*conditions in the MS4 contribute to high seasonal bacteria propagation in-pipe during warm weather. Landscape irrigation is a major contributor to dry weather flow, both as surface runoff due to over-irrigation and overspray onto pavements; and as subsurface seepage that finds its way into the MS4*."

- **Fiscal Year 2008 Carlsbad Watershed Urban Runoff Management Program Annual Report**

The Carlsbad Watershed Urban Runoff Management Program Annual Report for Fiscal Year 2008 was submitted by the Carlsbad Watershed Copermittees (Cities of Carlsbad, Encinitas, Escondido, Oceanside, San Marcos, Solana Beach, and Vista, and the County of San Diego). In the Annual Report, the Carlsbad Watershed Copermittees stated the following:

"The Carlsbad Watershed Management Area (WMA) collective watershed

strategy identifies bacteria, sediment, and nutrients as high priority water quality pollutants in the Agua Hedionda (904.3 – bacteria and sediment), Buena Vista (904.2 – bacteria), and San Marcos Creek (904.5 – nutrients) Hydrologic Areas. Bacteria, sediment, and nutrients have been identified as potential discharges from over-irrigation."

- **2007-2008 San Diego Bay Watershed Urban Runoff Management Program Annual Report**

  The San Diego Bay Watershed Urban Runoff Management Program 2007-2008 Annual Report was submitted by the San Diego Bay Watershed Copermittees (Cities of Chula Vista, Coronado, Imperial Beach, La Mesa, Lemon Grove, National City, and San Diego, the County of San Diego, the Port of San Diego, and the San Diego County Airport Authority). In Appendix D of the Annual Report, titled "Likely Sources of Pollutants," the San Diego Bay Watershed Copermittees identified over-irrigation of lawns as a pollutant generating activity from business and/or residential land uses for bacteria, pesticides, and sediment.

- **Copermittee Public Education Materials**

  The Orange County Public Works *Tips for Landscape & Gardening* public education brochure states: "*Fertilizers, pesticides and other chemicals that are left on yards or driveways can be blown or washed into storm drains that flow to the ocean. Overwatering lawns can also send materials into storm drains*."

  The Riverside County Flood Control and Water Conservation District *Landscape and Garden* public education brochure states: *"Soil, yard wastes, over-watering and garden chemicals become part of the urban runoff mix that winds its way through streets, gutters and storm drains before entering lakes, rivers, streams, etc. Urban runoff pollution contaminates water and harms aquatic life!"*

- **Los Penasquitos Lagoon Sedimentation/Siltation TMDL Technical Report**

  The Los Penasquitos Lagoon Sedimentation/Siltation TMDL technical report was prepared for the City of San Diego and USEPA in October 2010. The technical report was included as a technical supporting document attached to the Sediment TMDL for Los Penasquitos Lagoon staff report prepared by the San Diego Water Board, dated June 13, 2012. Under the Source Assessment section, the technical report states the following:

  "*Dry weather loading is dominated by nuisance flows from urban land use activities such as car washing, sidewalk washing, and lawn over-irrigation, which pick up and transport sediment into receiving waters.*"

These documents confirm that non-storm water discharges associated with over-irrigation are a source of pollutants and should be addressed as illicit discharges to the MS4. Prohibiting non-storm water discharges associated with over-irrigation, however, is not a new requirement for the Copermittees because it is also consistent with and required by the Water Conservation in Landscaping Act (AB 1881, Laird).

The Water Conservation in Landscaping Act required the Department of Water Resources (DWR) to prepare a Model Water Efficient Landscape Ordinance for use by local agencies (e.g. the Copermittees). All local agencies were required to adopt a water efficient landscape ordinance by January 1, 2010. Local agencies could adopt the Water Efficient Landscape Ordinance developed by DWR, or an ordinance considered at least as effective as the Model Ordinance. The Water Efficient Landscape Ordinance includes a requirement that local agencies prohibit runoff from irrigation (§ 493.2):

> "*Local agencies shall prevent water waste resulting from inefficient landscape irrigation by* <u>*prohibiting runoff from leaving the target landscape*</u> *[emphasis added] due to low head drainage, overspray, or other similar conditions where water flows onto adjacent property, non-irrigated areas, walks, roadways, parking lots, or structures. Penalties for violation of these prohibitions shall be established locally*."

Furthermore, non-storm water discharges from over-irrigation not only transport and discharge pollutants to receiving waters, but are also a likely source of the dry weather flows causing changes to habitat within and along the receiving water bodies. Examples of habitat changes from the dry weather flows include perennialization of ephemeral streams, and conversion of saltwater and brackish water marsh habitats to freshwater marsh habitats (e.g. Los Penasquitos Lagoon). Both of these examples have resulted in the promotion of invasive species in several areas of the San Diego Region.

The removal of the over-irrigation discharges categories does not require the Copermittees to strictly prohibit lawn and landscape irrigation, but does require the prohibition of excessive irrigation water that results in non-storm water discharges to the MS4. Non-storm water discharges to the MS4 from over-irrigation must be addressed as illicit discharges by the Copermittees pursuant to the requirements of Provision E.2.

The remaining non-storm water categories listed in 40 CFR 122.26(d)(2)(iv)(B)(1) are listed under Provisions E.2.a.(1) through E.2.a.(5) and generally fall into four categories: (1) non-storm water discharges subject to existing San Diego Water Board waste discharge requirements and NPDES permits; (2) non-storm water discharges generally not expected to be a source of pollutants to receiving waters; (3) non-storm water discharges likely to contain pollutants requiring some form of control to address the pollutants prior to discharging to the MS4; and (4) non-storm water discharges or flows associated with firefighting.

Provisions E.2.a.(1) and E.2.a.(2) include several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) for which the San Diego Water Board already has developed general waste discharge requirements and NPDES permits to address the discharges. The Copermittees are only required to address these types of non-storm water discharges as illicit discharges if the Copermittees or the San Diego Water Board identifies these non-storm water discharges not having coverage under the applicable NPDES permit.

Provision E.2.a.(3) includes several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) which are generally not expected to be a source of pollutants to receiving waters, many of which originate from what are typically natural, uncontrollable sources. The Copermittees are only required to address these types of non-storm water discharges as illicit discharges if the Copermittees or the San Diego Water Board identifies these non-storm water discharges as a source of pollutants to receiving waters. Because many of these sources are generally uncontrollable, enforcing a prohibition may not be a possibility for the Copermittees. The Copermittees would be able to address these non-storm water discharges by preventing these non-storm water discharges from entering the MS4. This could potentially be achieved by sealing their MS4 structures so the discharges cannot enter the MS4.

Provision E.2.a.(4) includes several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) that are likely to contain pollutants requiring some form of control to address the pollutants prior to discharging to the MS4. At this time, an outright prohibition of these types of non-storm water discharges does not yet appear to be warranted. Thus, Provision E.2.a.(4) includes several requirements for the Copermittees to control the pollutants from these types of non-storm water discharges. This is consistent with the clarification of the federal regulations in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board has the authority to require the Copermittees to "*control any of these types of discharges where appropriate*."

Unlike non-storm water discharges from over-irrigation, these types of non-storm water discharges are not expected to occur in close proximity to each other or very frequently. Provided these types of non-storm water discharges are controlled as required in Provision E.2.a.(4), the Copermittees would only be required to address these types of non-storm water discharges as illicit discharges if the Copermittee or the San Diego Water Board identifies these non-storm water discharges as a source of pollutants to receiving waters.

Provision E.2.a.(5) includes specific requirements for fire fighting discharges and flows. The requirements for non-storm water discharges and flows associated with fire fighting have been separated into requirements for: a) non-emergency fire fighting discharges and flows, and b) emergency fire fighting discharges and flows.

The San Diego Water Board has found that discharges from building fire suppression system maintenance (e.g. fire sprinklers) contain waste and potentially a significant source of pollutants to receiving waters. As such, the San Diego Water Board is requiring these discharges be addressed as illicit discharges by the Copermittees. Thus, the discharges to the MS4 are to be prohibited via ordinance, order or similar means. For other non-emergency firefighting discharges and flows (i.e. flows from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems), the Copermittees are required to develop and implement a program to address pollutants in these non-storm water discharges and flows. This is consistent with the clarification of the federal regulations in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board has the authority to require the Copermittees to "*control any of these types of discharges where appropriate*."

For emergency firefighting discharges and flows, the Phase I Final Rule (55 FR 48037) has clarified the requirements of 40 CFR 122.26(d)(2)(iv)(B)(1) pertaining to emergency firefighting flows and discharges, which states:

> "*In the case of firefighting it is not the intention of these rules to prohibit in any circumstances the protection of life and public or private property through the use of water or other fire retardants that flow into separate storm sewers*."

Thus, the requirements have been made to be consistent with the guidance provided by the Phase I Final Rule. The Order recommends that the Copermittees develop and encourage implementation of BMPs to reduce or eliminate the discharge of pollutants from emergency firefighting flows to the MS4s and receiving waters. The Order does not include any requirements that should be interpreted as requiring the implementation of BMPs for emergency firefighting flows to the MS4s and receiving waters.

The Copermittees are expected to review the dry weather MS4 outfall discharge monitoring data they collect to determine if and when there are non-storm water discharges to or from their MS4s that are a source of pollutants to receiving waters. If the Copermittees identify one of the types of non-storm water discharges listed in Provisions E.2.a.(1) through E.2.a.(4) as a source of pollutants to receiving waters based on the review and evaluation of monitoring data, Provision E.2.a.(6) requires the Copermittees to prohibit those categories of discharges from entering the MS4 through ordinance, order or similar means. In addition, Provision E.2.a.(6) clarifies that the San Diego Water Board may identify categories of non-storm water discharges or flows listed under Provisions E.2.a.(1) through E.2.a.(4) that must be prohibited.

Provision E.2.a.(6) also provides the Copermittees an option to propose controls to be implemented for the category of non-storm water discharges as part of the Water Quality Improvement Plan instead of prohibiting the category of non-storm water

discharges. If the Water Quality Improvement Plan is accepted by the San Diego Water Board with the proposed controls, the Copermittees will not be required to prohibit the category of non-storm water discharges to their MS4s as long as the controls are implemented. This is consistent with the clarification of 40 CFR 122.26(d)(2)(iv)(B)(1) in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board may "*require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*."

Finally, Provision E.2.a.(7) has been included in the requirements for non-storm water discharges to clarify that any non-storm water discharges to the Copermittee's MS4, even those identified pursuant to Provisions E.2.a.(1) through E.2.a.(4), must be reduced or eliminated, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit. Provision E.2.a.(7) is consistent with the requirements of CWA section 402(p)(3)(B)(ii) and 40 CFR 122.26(d)(1)(v)(B), as clarified in the Phase I Final Rule (55 FR 47995) that "*[u]ltimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit*." However, the reduction or elimination of those non-storm water discharges are expected to be achieved as feasible, in accordance with the priorities in the Water Quality Improvement Plan and when the resources are available to the Copermittee.

Consistent with 40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(1), each Copermittee must implement a "*program…to prevent illicit discharges to the municipal storm sewer system*" and "*detect…illicit discharges and improper disposal into the storm sewer.*" Provision E.2.b requires each Copermittee to implement measures to prevent and detect illicit discharges and connections to its MS4 as part of its illicit discharge detection and elimination program.

As part of the program to prevent and detect illicit discharges to the MS4, 40 CFR 122.26(d)(2)(iv)(B)(2) requires "*procedures to conduct on-going field screening activities during the life of the permit, including areas or locations that will be evaluated by such field screens*." As part of the procedures, each Copermittee is required to maintain an updated map of its entire MS4 and the corresponding drainage areas within its jurisdiction. Having knowledge about where inlets, access points, connections with other MS4s, and outfalls are located is necessary for each Copermittee to track, identify, and eliminate illicit discharges and connections. Thus, Provision E.2.b.(1) of the Order specifies that the map must include the segments of the storm sewer system owned, operated, and maintained by the Copermittee, and include locations of all known inlets, connections with other MS4s, and outfalls to the Copermittee's MS4. The remaining requirements of Provision E.2.b are consistent with the requirements of 40 CFR 122.26(d)(2)(iv)(B)(3)-(7) related to implementing measures to prevent and detect illicit discharges and connections to the MS4.

Provision E.2.c requires each Copermittee to conduct field screening and monitoring of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm

water and illicit discharges and connections to the MS4. Field screening is a required element of the program to detect and eliminate illicit discharges and connections to the MS4, pursuant to 40 CFR 122.26(d)(2)(iv)(B)(2). The field screening requirement will be implemented through the dry weather MS4 outfall discharge monitoring required under Provisions D.2.a.(2) and D.2.b.(1).

Provision E.2.d specifies the measures each Copermittee must implement to eliminate illicit discharges and connections to its MS4. Elimination of illicit discharges and connections to the MS4 is consistent with the requirement of 40 CFR 122.26(d)(2)(iv)(B) "*to detect and remove [emphasis added]…illicit discharges and improper disposal into the storm sewer*" and will achieve the CWA requirement for MS4 permits to "*effectively prohibit non-storm water discharges into the storm sewers*."

Generally, each Copermittee is responsible for prioritizing its efforts to eliminate non-storm water and illicit discharges or connections to its MS4 based on field screening and monitoring data, NALs, illicit discharge investigation records, and the known or suspected sources. Sources of non-storm water and illicit discharges or connections must be eliminated by enforcing the legal authority established by each Copermittee pursuant to Provision E.1.

Provision E.3 (Development Planning) requires each Copermittee to use its land use and planning authority to implement a development planning program to control and reduce the discharge of pollutants in storm water from new development and significant redevelopment to the MEP. Proper implementation of the development planning program will also contribute toward effectively prohibiting non-storm water discharges from development projects to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." As part of the management program, 40 CFR 122.26(d)(2)(iv)(A)(2) requires "*planning procedures including a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment*."

Land development generally alters the natural conditions of the land by removing vegetative cover, compacting soil, and/or placement of concrete, asphalt, or other impervious surfaces. These impervious surfaces concentrate urban pollutants (such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not found in high concentrations in the natural environment. Pollutants that accumulate on impervious surfaces are not easily biodegraded nor subject to natural treatment processes.

Impervious surfaces greatly affect the natural hydrology of the land because they do not allow natural infiltration and treatment of storm water runoff to take place. Instead, storm water runoff from impervious surfaces is typically directed through pipes, curbs, gutters, and other hardscape into receiving waters, with little treatment, at significantly increased volumes and accelerated flow rates over what would occur naturally. The increased pollutant loads, storm water volume, discharge rates and velocities, and discharge durations from the MS4 adversely impact stream habitat by causing accelerated, unnatural erosion and scouring within creek bed and banks. Placement of impervious surfaces also encapsulates "good" sediment (such as sand, gravel, rocks and cobbles) that would normally replenish creek beds and banks to help stabilize them. Collectively, these changes to natural hydrologic processes are termed hydrograph modification, or hydromodification.

Hydromodification, which is caused by both altered storm water flow and altered sediment flow regimes, is largely responsible for degradation of creeks, streams, and associated habitats in the San Diego Region. In an ongoing study by the Stormwater Monitoring Coalition to assess the health of streams throughout Southern California, researchers found that three of the four highest risk stressors to creeks (percent sands and fines present, channel alteration, and riparian disturbance) were related to physical habitat.[29] Researchers studying flood frequencies in Riverside County have found that increases in watershed imperviousness of only 9-22 percent can result in increases in peak flow rates for the two-year storm event of up to 100 percent.[30] Such changes in runoff have significant impacts on channel morphology.

In addition, a technical report issued by the Southern California Coastal Water Research Project (SCCWRP) stated that "*[r]ecent studies indicate that California's intermittent and ephemeral streams are more susceptible to the effects of hydromodification than streams from other parts of the United States. Physical degradation of stream channels in the central and eastern United States can initially be detected when watershed impervious cover approaches 10 percent, although biological effects (which may be more difficult to detect) may occur at lower levels. In contrast, initial response of streams in the semi-arid portions of California appears to occur between 3 and 5 percent impervious cover*."[31] These studies highlight the extent to which impacts originating from impervious surfaces created by land development are responsible for the degradation of creek and stream habitat.

This is consistent with what USEPA has noted, that "*[m]ost stormwater runoff is the result of the man-made hydrologic modifications that normally accompany development. The addition of impervious surfaces, soil compaction, and tree and*

[29] Assessing the Health of Southern California Streams, Stormwater Monitoring Coalition, Fact Sheet
[30] Schueler and Holland, 2000. Storm Water Strategies for Arid and Semi-Arid Watersheds (Article 66). The Practice of Watershed Protection.
[31] Stein, E. and Zaleski, S., 2005. Technical Report 475, Managing Runoff to Protect Natural Streams: The Latest Development on Investigation and Management of Hydromodification in California. December 30, 2005.

vegetation removal result in alterations to the movement of water through the environment. As interception, evapotranspiration, and infiltration are reduced and precipitation is converted to overland flow, these modifications affect not only the characteristics of the developed site but also the watershed in which the development is located. Stormwater has been identified as one of the leading sources of pollution for all waterbody types in the United States. Furthermore, the impacts of stormwater pollution are not static; they usually increase with more development and urbanization."[32]

Reducing the impact from the increased pollutant loads and flows generated by impervious surfaces within a watershed is essential to protecting and restoring the integrity of the receiving waters. Provision E.3 includes the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment*." The requirements of Provision E.3 will 1) minimize the generation and discharge of pollutants in storm water from the MS4, and 2) minimize the potential of storm water discharges from the MS4 from causing altered flow regimes and excessive downstream erosion in receiving waters.

The requirements of Provision E.3.a include the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment*" applicable to all development projects, regardless of size or purpose of development. In general, all development projects must implement onsite BMPs to remove pollutants from runoff prior to its discharge to any receiving waters, as close to the pollutant generating source as possible, and structural BMPs must not be constructed within waters of the U.S.

Furthermore, the onsite BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors (e.g. mosquitos, rodents, and flies). If not properly designed or maintained, certain BMPs implemented or required by municipalities may create a habitat for vectors. Monitoring studies conducted by the California Department of Public Health (CDPH) have documented that mosquitoes opportunistically breed in structural storm water BMPs, particularly those that hold standing water for over 96 hours. Certain site design features that hold standing water may similarly produce mosquitoes.

Structural BMPs and site design features should incorporate design, construction, and maintenance principles to promote drainage within 96 hours to minimize standing water available to mosquitoes. Nuisances and public health impacts resulting from

[32] USEPA, 2007. Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices, December 2007.

vector breeding can be prevented with close collaboration and cooperative effort between municipalities and local vector control agencies and the CDPH during the development and implementation of storm water runoff management programs. The CDPH also has issued guidance for BMP implementation that will minimize potential nuisances and public health impacts resulting from vector breeding.[33]

All development projects are required to implement source control BMPs that will minimize the generation of pollutants. Additionally, each development project must implement, where applicable and feasible, low impact development (LID) BMPs to mimic the natural hydrology of the site and retain and/or treat pollutants in storm water runoff prior to discharging to and from the MS4.

The LID Center defines LID as "*a comprehensive land planning and engineering design approach with a goal of maintaining and enhancing the pre-development hydrologic regime of urban and developing watersheds.*"[34] LID designs seek to control storm water at the source, using small-scale integrated site design and management practices to mimic the natural hydrology of a site, retain storm water runoff by minimizing soil compaction and impervious surfaces, and disconnect storm water runoff from conveyances to the storm drain system.

LID BMPs may utilize interception, storage, evaporation, evapotranspiration, infiltration, and filtration processes to retain and/or treat pollutants in storm water before it is discharged from a site. Because of these numerous options, the San Diego Water Board expects that every development project will be able to implement some form of LID BMPs. Examples of LID BMPs include using permeable pavements, rain gardens, rain barrels, grassy swales, soil amendments, and native plants.

Provision E.3.a also includes requirements for all development projects to, where feasible, landscape with native and/or low water use plants to minimize the discharge of non-storm water discharges associated with excessive irrigation, as well as harvest (i.e., storage) and use precipitation to promote the concept of utilizing storm water as a resource.

While all development projects are subject to the requirements of Provision E.3.a, Provision E.3.b identifies Priority Development Projects that exceed given size thresholds and/or fit under specific use categories. Priority Development Projects are required to incorporate specific performance criteria for structural BMPs into the project plan to reduce the generation of pollutants, and address potential impacts from hydromodification.

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[33] California Department of Public Health, 2012. Best Management Practices for Mosquito Control in California. (http://www.cdph.ca.gov/HealthInfo/discond/Documents/BMPforMosquitoControl07-12.pdf)
[34] www.lowimpactdevelopment.org

The Priority Development Project categories are based on the requirements of the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), and do not differ significantly from the Fourth Term Permit for San Diego County. Furthermore, the Priority Development Project categories are consistent with Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), and Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit).

Because of the impact of relatively small increases in watershed impervious surfaces to receiving waters, Provision E.3.b.(1)(c)(iv) has been updated to include large driveways that are 5,000 square feet or more. The San Diego Water Board finds that large driveways can exacerbate altered flow regimes if not properly controlled.

Provision E.3.b.(3) describes projects that are exempt from Priority Development Project status. These include new or retrofit paved sidewalks, bicycle lanes, or trails that are designed and constructed to direct runoff to vegetated areas or be hydraulically disconnected from paved areas. The exemptions have been provided to encourage these types of projects because they provide multiple environmental benefits, such as promoting walking rather than driving, which will in turn improve air quality. Additionally, retrofitting of existing alleys, streets, or roads are exempt from Priority Development Project status if they are constructed using USEPA Green Streets guidance.[35] By doing so, retrofitting of these types of projects is encouraged. The San Diego Water Board recognizes that there are spatial constraints associated with these projects, and implementation of structural BMPs are not always feasible.

For development projects identified as Priority Development Projects, the requirements of Provision E.3.c are the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment.*" Provisions E.3.c.(1)-(3) describe the performance criteria for the structural BMPs that must be implemented for each Priority Development Project defined by Provision E.3.b.

Provision E.3.c.(1) describes the storm water pollutant control BMP requirements that must be implemented by all Priority Development Projects. The purpose of Provision E.3.c.(1) is to reduce pollutants in storm water runoff to the MEP from Priority Development Projects before it is discharged to the MS4. Of all the available treatment processes available, retention of storm water, and therefore capture of the pollutants in the storm water, will achieve 100 percent pollutant removal efficiency for the volume of storm water retained. No other method of treatment can achieve 100 percent pollutant removal efficiency. Thus, retention of as much storm water onsite is

[35] "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).

the most effective way to reduce pollutants in storm water discharges to, and consequently from the MS4, and controls pollutants in storm water discharges from a site to the MEP.

Under Provision E.3.c.(1)(a), retention of the pollutants in the runoff produced from the 85th percentile storm event ("design capture volume") is the design standard to which Priority Development Projects must comply. Since the 85th percentile storm event has previously been used as the numeric design standard for treatment control BMPs, this same size storm event is used as the numeric design standard for storm water retention. This is the MEP standard recognized by the San Diego Water Board and is consistent with the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), as well as Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit), and Los Angeles Water Board Order No. R4-2012-0175 (Los Angeles County MS4 Permit).

The 85th percentile storm event is the event that has a precipitation total greater than or equal to 85 percent of all storm events over a given period of record in a specific area or location. For example, to determine what the 85th percentile storm event is in a specific location, all 24 hour storms that have recorded values over a 30 year period would be tabulated and a 85th percentile storm would be determined from this record (i.e. 15 percent of the storms would be greater than the number determined to be the 85th percentile storm). Most jurisdictions in the San Diego Region have already developed isopluvial maps that can provide this type of information. The 85th percentile storm might be determined to be a number such as 1.0 inch, and this would be multiplied by the total area of the project footprint producing runoff to calculate the design capture volume. The Priority Development Project designer would then select a system of BMPs that would retain (i.e. intercept, store, infiltrate, evaporate, or evapotranspire) the pollutants contained in the design capture volume onsite.

Retention BMPs are necessary to capture and retain pollutants generated from a Priority Development Project. In a recent study performed by SCCWRP in the Los Angeles Region, they found "*that the magnitude of constituent load associated with storm water runoff depends, at least in part, on the amount of time available for pollutant build-up on land surfaces. The extended dry period that typically occurs in arid climates such as southern California maximizes the time for constituents to build-up on land surfaces, resulting in proportionally higher concentrations and loads during initial storms of the season*."[36] This implies that the "first flush" of a rainy season and the first storm events after long antecedent dry periods tend to have the highest pollutant loads. Capturing and retaining the pollutant loads of the "first flush" of a rainy

[36] Stein, E.D., Tiefenthaler, L.L., and Schiff, K.C., 2007. Technical Report 510, Sources, Patterns and Mechanisms of Storm Water Pollutant Loading from Watershed and Land Uses of the Greater Los Angeles Area, California, USA. March 20, 2007.

season and the first storm events after long antecedent dry periods will reduce a significant portion of the pollutants in storm water discharged to and from the MS4.

The San Diego Water Board, however, acknowledges that in some situations retention of the full design capture volume onsite may not be technically feasible. In this event, the Copermittee may allow the Priority Development Project to use biofiltration BMPs to treat 1.5 times the design capture volume not reliably retained onsite, or biofiltration BMPs with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite.

The 1.5 multiplier is based on the finding in the Ventura County Technical Guidance Manual that biofiltration of 1.5 times the design capture volume not retained onsite will provide approximately the same pollutant removal as retention of the design capture volume on an annual basis.[37] This standard is consistent with the Los Angeles Water Board's Los Angeles County and Ventura County municipal storm water permits (Order Nos. R4-2012-0175 and R4-2010-0108, respectively). The flow-thru design of 0.75 times the portion of the design capture volume not reliably retained onsite is consistent with the San Diego Water Board's Fourth Term Permits for Orange County and Riverside County ~~municipal storm water permits~~ (Order Nos. R9-2009-0002 and R9-2010-0016, respectively). In either case, the biofiltration BMPs must be designed with an appropriate hydraulic loading rate to maximize storm water retention and pollutant removal, as well as to prevent erosion, scour, and channeling within the BMP. Each Copermittee is required to update its BMP Design Manual to provide guidance for hydraulic loading rates and other biofiltration design criteria necessary to maximize storm water retention and pollutant removal.

The San Diego Water Board further recognizes that, in addition to not being technically feasible, retention of the full design capture storm onsite may be cost prohibitive, or may not provide as much water quality benefit to the Watershed Management Area as would implementing BMPs elsewhere in the watershed. Thus, Provision E.3.c.(1)(b) allows for the use of a combination of onsite retention BMPs, and the implementation of an Alternative Compliance Program described in Provision E.3.c.(3). Provision E.3.c.(3) is discussed in more detail below.

If the full design capture volume is not retained onsite either because biofiltration is not technically feasible, or a Copermittee grants a Priority Development Project permission to utilize the Alternative Compliance Program, then the pollutants in the portion of the design capture volume that are not reliably retained onsite must still be reduced to the MEP. Thus, flow-thru treatment control BMPs are required to be implemented on Priority Development Projects in addition to the retention BMPs. The requirements of Provisions E.3.c.(1)(a)(ii)[a]-[c] include the performance standards for flow-thru

[37] Ventura Countywide Stormwater Management Program. 2011. Ventura Technical Guidance Manual, Manual Update, 2011.

treatment control BMPs, consistent with the Fourth Term Permits in the San Diego Region.

Whereas the purpose of the requirements under Provision E.3.c.(1) is to reduce pollutants in storm water runoff to the MEP, the purpose of the requirements under Provision E.3.c.(2) is to maintain or restore more natural hydrologic flow regimes to prevent accelerated, unnatural erosion in downstream receiving waters, also to the MEP standard. Provision E.3.c.(2) describes hydromodification management BMP requirements that must be implemented by all Priority Development Projects.

The performance criteria for the implementation of hydromodification management BMPs on Priority Development Projects are consistent with the requirements in the Fourth Term Permits for Orange and Riverside Counties (Order Nos. R9-2009-0002 and R9-2010-0016, respectively). Modifications to the Orange County and Riverside County Hydromodification Management Plans (HMPs) will likely be minor, or may not be necessary. The HMP for San Diego County will likely require some minor modifications to incorporate the requirements of Provision E.3.c.(2) and become consistent with the Orange County and Riverside County HMPs. The San Diego Water Board does not, however, expect that it will be necessary for the San Diego County Copermittees to develop a new approach or significantly re-write the San Diego County HMP. This is because the premise of the hydromodification management BMP requirements, which are to control storm water runoff conditions (flow rates and durations) for Copermittee-defined range of flows, is unchanged from all Fourth Term Permits in the San Diego Region.

Provision E.3.c.(2)(a) requires that post-project runoff conditions mimic the *pre-development* runoff conditions, and not the *pre-project* runoff conditions. Fundamentally, the San Diego Water Board believes that using a hydrology baseline that approximates that of an undeveloped, natural watershed is the only way to facilitate the return of more natural hydrological conditions to already built-out watersheds, and ultimately improved stream health. On the other hand, using the *pre-project* hydrology as a baseline for redevelopment projects results in propagating the unnatural hydrology of urbanized areas. Propagating the urbanized flow regime does not support conditions for restoring degraded or channelized stream segments, and would forever sentence such streams to the degraded state. Furthermore, reducing the volume of storm water runoff associated with the urbanized flow regime will also result in reducing the discharge of pollutants into receiving waters, since storm water runoff from impervious surfaces contains untreated pollutants.

The San Diego Water Board understands that approximating the pre-development runoff condition associated with a redevelopment site is not necessarily straightforward because factors such as natural grade and native vegetation for the site cannot be precisely known. Therefore, the San Diego Water Board does not expect project designers to estimate historical conditions associated with redevelopment sites. Rather, the San Diego Water Board expects project designers and the Copermittees to

approximate pre-development runoff conditions using the parameters of a *pervious* area rather than an *impervious* area. This means that for redevelopment sites, approximating pre-development runoff conditions equates to using existing onsite grade and assuming the infiltration characteristics of the underlying soil. A redevelopment Priority Development Project must not use runoff coefficients of concrete or asphalt to estimate pre-development runoff conditions. Rather, redevelopment projects must use available information pertaining to existing underlying soil type (such as soil maps published by the National Resource Conservation Service), onsite existing grade, and any other readily available pertinent information to estimate pre-development runoff conditions.

The San Diego Water Board understands, indeed asserts, that the pre-development hydrology of an area in question can only be roughly estimated and cannot be precisely known. However, using the hydrology of a natural condition, even if not precisely known, will provide significant benefit to receiving waters over using the hydrology associated with impervious (developed) surfaces. Therefore in order to achieve the goals of the Clean Water Act, which are to "*restore and maintain the chemical, physical, and biological integrity of the nation's waters* [emphasis added]," the most appropriate standard to use for hydromodification management is the standard associated with the pre-development condition.

Provision E.3.c.(2)(b) requires Priority Development Projects to avoid known critical sediment yield areas or implement measures that would allow coarse sediment to be discharged to receiving waters, such that the natural sediment supply is unaffected by the project. This is necessary because the availability of coarse sediment supply is as much an issue for causing erosive conditions to receiving streams as are accelerated flows.

The San Diego Water Board recognizes that in some situations implementing the hydromodification management BMP requirements for flow control fully onsite may not be technically feasible, may be cost prohibitive, or may not provide any overall water quality benefits to the Watershed Management Area. Thus, Provision E.3.c.(2)(c) allows for the use of a combination of onsite hydromodification management BMPs for flow control and alternative compliance options described in Provision E.3.c.(3).

Provision E.3.c.(3) allows for alternative compliance in instances where the Copermittee determines that offsite measures will have a greater overall water quality benefit for the Watershed Management Area than if the Priority Development Project were to implement structural BMPs onsite. Consequently, watershed-specific structural BMP requirements are present in this Order in the form of allowable compliance offsite. The Alternative Compliance Program to Onsite Structural BMP Implementation Provision is intended to integrate with the Copermittees' planning efforts in the Water Quality Improvement Plans.

The Alternative Compliance Program is an option for Priority Development Projects where the governing Copermittee has participated in the development of a Watershed Management Area Analysis as part of the Water Quality Improvement Plan (described in Provision B.3.b.(4)). Such an approach is consistent with the latest findings in hydromodification management by the scientific community. In a Technical Report entitled *Hydromodification Assessment and Management in California,*[38] the report states:

> *"An effective [hydromodification] management program will likely include combinations of on-site measures (e.g., low-impact development techniques, flow-control basins), in-stream measures (e.g., stream habitat restoration), floodplain and riparian zone actions, and off-site measures. Off-site measures may include compensatory mitigation measures at upstream locations that are designed to help restore and manage flow and sediment yield in the watershed."*

Consistent with the ideas brought forth in the report, in the Watershed Management Area Analysis of Provision B.3.b.(4), which is optional, the Copermittees will develop watershed maps that include as much detail about factors that affect the hydrology of the watershed as is available. Such factors included identification of areas suitable for infiltration, coarse sediment supply areas, and locating stream channel structures and constrictions. Once these factors are mapped and studied, the Copermittees can identify areas in the watershed where candidate projects may be implemented that are expected to improve water quality in the watershed by providing more opportunity for infiltration, slowing down storm water flows, or attenuation of pollutants naturally via healthy stream habitat. These candidate projects may be in the form of retrofitting existing development, rehabilitating degraded stream segments, identifying regional BMPs, purchasing land to preserve valuable floodplain functions, and any other project(s) that the Copermittees identify.

Under the Alternative Compliance Program, Priority Development Projects may be allowed to fund, partially fund, or implement a candidate project, in lieu of implementing structural BMPs onsite, if they enter into a voluntary agreement with the governing Copermittee permitting this arrangement. Project proponents may also propose an alternative project not previously identified by the Copermittees. In either case, whether a project proponent implements a candidate project identified by the Copermittees or a separate alternative compliance project, the governing Copermittee must determine that implementation of the project will have a greater overall water quality benefit for the Watershed Management Area than fully implementing structural BMPs onsite. If alternative compliance involves funding or implementing a project that is outside the jurisdiction of the governing Copermittee, then that Copermittee may enter into an inter-agency agreement with the appropriate jurisdiction.

[38] 2012. ED Stein, F Federico, DB Booth, BP Bledsoe, C Bowles, Z Rubin, GM Kondolf, A Sengupta. Technical Report 667. Southern California Coastal Water Research Project. Costa Mesa, CA.

Finally, Provision E.3.c.(2)(d) allows Priority Development Projects to be exempt from the hydromodification management BMP requirements if there is no threat of erosion to downstream receiving waters (i.e. the receiving stream is concrete lined from the point of discharge all the way to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean). If the Copermittees believe that more exemptions are warranted, then they must perform the optional Watershed Management Area Analysis of Provision B.3.b.(4). Additional exemptions other than those specified in this Order may be established on a watershed basis, provided the Copermittees perform the analysis, provide supporting rationale for the exemptions, and complete the Water Quality Improvement Plan approval process pursuant to Provision F.1.

To facilitate the transition to this Order from the Fourth Term Permits for Orange and Riverside County Copermittees, Provision E.3.c.(2)(e) allows two additional temporary exemptions from hydromodification management BMP implementation. The first temporary exemption allows relief from hydromodification management BMP implementation for Priority Development Projects discharging directly to an engineered channel conveyance system with a capacity to convey peak flows generated by the 10-year storm event all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean. Similar to the exemption allowed for concrete-lined channels, this exemption is premised on the concept that there is little threat of erosion to these types of engineered channel systems.

The second temporary exemption allows relief from hydromodification management BMP implementation for Priority Development Projects discharging directly to large river reaches with drainage areas larger than 100 square miles and a 100-year flow capacity in excess of 20,000 cubic feet per second. If this exemption is claimed, then properly sized energy dissipation is required at all discharge points associated with the Priority Development Project. This exemption is premised on the concept that large river reaches can essentially assimilate the accelerated flow rates associated with individual Priority Development Projects because they are inconsequential compared to the flow rate in the large river reach. Both of these exemptions are included in the Hydromodification Management Plan for San Diego County[39].

These temporary exemptions are allowed as a means to facilitate Orange and Riverside County Copermittees' transition to this Order from the Fourth Term Permits and are not meant to reside as permanent exemptions without additional rigorous technical analyses specific to each County. Therefore, these exemptions will no longer apply once the Copermittees' land development programs are fully updated to reflect the requirements of this Order, i.e., upon implementation of the BMP Design Manual pursuant to Provision F.2.b. If the Copermittees believe that these or other exemptions are warranted in the context of water quality improvement and stream restoration opportunities, then the Copermittees must perform the optional Watershed

[39] Final Hydromodification Management Plan Prepared for County of San Diego, March 2011

Management Area Analysis of Provision B.3.b.(4) and provide supporting rationale for the exemptions. The San Diego County Copermittees are also required to perform the optional Watershed Management Area Analysis to provide supporting rationale to justify use of these and other exemptions. Updated BMP Design Manuals including rationale to justify use of exemptions will be reviewed by the San Diego Water Board pursuant to Provision F.2.b.

Provisions E.3.c.(4) and E.3.c.(5) were included under the BMP requirements applicable to all development projects in the Fourth Term Permits for San Diego, Orange, and Riverside Counties (Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016, respectively). In this Order, the long-term BMP maintenance and infiltration and groundwater protection requirements apply to structural BMPs implemented by Priority Development Projects only.

Provision E.3.d requires the Copermittees to update their BMP Design Manual as needed to incorporate the requirements of Provision E.3. The BMP Design Manual is formerly known as the Standard Storm Water Mitigation Plan, or SSMP, and was renamed so that the title has a more accurate description of the document content. The contents of the BMP Design Manual are largely unchanged from the previous Standard Storm Water Mitigation Plans required under the Fourth Term Permits. The BMP Design Manual fulfills the 40 CFR 122.26(d)(2)(iv)(A)(2) requirement that the Copermittee's development planning program includes "*a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment*."

As part of the "*planning procedures,*" 40 CFR 122.26(d)(2)(iv)(A)(2) requires the procedures to "*address controls to reduce pollutants in discharges from municipal separate storm sewers after construction is completed*." The requirements applicable to the implementation and oversight of structural BMPs at Priority Development Projects are provided under Provision E.3.e.

Proper installation of the structural BMPs approved for a Priority Development Project is necessary to ensure that pollutants in storm water discharges will be reduced to the MEP after the project is completed. In addition to the proper installation of structural BMPs, the maintenance of structural BMPs on Priority Development Projects is necessary to ensure that pollutants in storm water discharges will continue to be reduced to the MEP. Provision E.3.e.(1) includes the minimum requirements that each Copermittee must implement to ensure structural BMPs are properly installed and will be properly maintained.

The requirements under Provision E.3.e.(2)-(3) are necessary to demonstrate each Copermittee is implementing a program that complies with Provisions E.3.b-c and E.3.e.(1), and ensure structural BMPs at Priority Development Project will continue to be able to reduce pollutants in storm water discharges to the MEP.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary for any development projects to compel compliance with the requirements of Provision E.3 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.3.f requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Provision E.4 (Construction Management) requires each Copermittee to implement a construction management program to control and reduce the discharge of pollutants in storm water from construction sites to the MEP. Proper implementation of the construction management program will also contribute toward effectively prohibiting non-storm water discharges from construction sites to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." As part of the management program, 40 CFR 122.26(d)(2)(iv)(D) requires "*a program to implement and maintain structural and non-structural best management practices to reduce pollutants in storm water runoff from construction sites to the municipal storm sewer system.*"

Construction sites can be significant sources of sediment, trash, and other pollutants to receiving waters. Although sediment is naturally occurring in the natural environment, the discharge of sediment under unnatural conditions is problematic to receiving waters. Fine sediment in creeks causes high turbidity that interferes with the functionality of native flora and fauna in local creeks. For example, turbidity interferes with both photosynthesis of water-philic plants, as well as successful foraging and reproduction of benthic macroinvertebrates. Sediment can also make it difficult for fish to breathe because it clogs fish gills. Other pollutants such as heavy metals or pesticides can adhere to sediment and are transported to receiving waters during storm events, where they dissolve in the water column and become bioavailable to aquatic organisms. Sediment is recognized as a major stressor to surface waters and is responsible for the impairment of several lagoons and creeks in the San Diego Region.

Provision E.4 includes requirements that each Copermittee must implement to minimize the discharge of sediment and other pollutants from construction sites to the MS4 within its jurisdiction. The requirements under Provision E.4 are consistent with the Fourth Term Permits for San Diego, Orange, and Riverside Counties. Therefore, Copermittees are expected to implement the requirements seamlessly, with minimal changes to their existing construction management programs. The Copermittees,

however, are given more flexibility to run their programs as needed to maximize efficiency, and also to be consistent with the Water Quality Improvement Plan for the Watershed Management Area.

As part of the construction management program, 40 CFR 122.26(d)(2)(iv)(D)(1) requires "*procedures for site planning which incorporate consideration of potential water quality impacts.*" Provision E.4.a describes the minimum elements each Copermittee is required to include as part of the construction site planning and project approval process. The construction site planning and approval process is based primarily on ensuring each project had an adequate site-specific pollution control, construction BMP, and/or erosion and sediment control plan that will be implemented to minimize the discharge of pollutants in storm water to the MEP, and minimize impacts to receiving waters.

The requirements under Provision E.4.b provide the data and information necessary to identify "*priorities for inspecting sites and enforcing control measures*" required pursuant to 40 CFR 122.26(d)(2)(iv)(D)(3). Under Provision E.4.b, each Copermittee must identify construction sites that are considered a high threat to downstream surface waters. Designation of "high threat to water quality" construction sites will necessitate the Copermittees to develop criteria to identify such sites. Provision E.4.b.(2) describes a list of factors that must be considered when the Copermittee considers threat to water quality. For example, a Copermittee must identify sites as "high threat to water quality" if it is located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions, according to the Water Quality Improvement Plan. This ensures that construction management program implementation is compatible with the Copermittee's identified highest priority water quality conditions.

Pursuant to 40 CFR 122.26(d)(2)(iv)(D)(2) each Copermittee is required describe "*requirements for nonstructural and structural best management practices*" at construction sites. Provision E.4.c includes the types of construction site BMPs that the Copermittees must implement, or require the implementation of, at each construction site to reduce pollutants in storm water discharges to the MEP.

Each Copermittee is expected to require the implementation of appropriate BMPs given specific site conditions, the season and likelihood of rain events, and construction phase (i.e. grading vs. vertical construction). This means that throughout the life of the project construction, the appropriate BMPs will vary, especially if the construction of the project spans multiple wet seasons. As opposed to describing specific minimum BMPs that must be implemented, the Order describes major BMP categories that should be considered for each site.

Each Copermittee is expected to use its 20 years of storm water experience and knowledge to require implementation of appropriate BMPs from the various categories at each construction site within its jurisdiction. For example, the San Diego Water

Board expects that each site will be required to implement erosion control and sediment control. The San Diego Water Board also expects each Copermittee to require implementation of active/passive sediment treatment systems at sites where other BMPs have been tried and are known to be inadequate, and discharges of sediment are causing or contributing to water quality impairment downstream. Each Copermittee is granted flexibility in specifying the minimum level of BMP requirements at each site, but the San Diego Water Board expects each site to be capable of controlling pollutants in storm water discharges to the MEP and preventing illicit discharges.

The requirements under Provision E.4.d are necessary to demonstrate that each Copermittee is implementing a program that complies with Provisions E.4.a and E.4.c and ensure BMPs at construction sites will reduce pollutants in storm water discharges to the MEP.

Provision E.4.d does not include minimum required inspection frequencies for construction sites. Each Copermittee must use its experience and knowledge to specify an appropriate inspection frequency for both high priority and lower priority sites in their jurisdictional runoff management program documents, and in accordance with the Water Quality Improvement Plan. Appropriate inspection frequencies may vary by Copermittee, but the San Diego Water Board expects that the stated frequency will be adequate for each Copermittee to properly oversee the construction sites within its jurisdiction, confirm BMPs are implemented to reduce pollutants in storm water discharges from constructions sites to the MEP, and make needed changes to its program on an ongoing basis as necessary.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary for any development projects to compel compliance with the requirements of Provision E.4 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.4.e requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

<u>Provision E.5 (Existing Development Management)</u> requires each Copermittee to implement an existing development management program to control and reduce the discharge of pollutants in storm water from areas of existing development to the MEP. Proper implementation of the existing development management program will also contribute toward effectively prohibiting non-storm water discharges from areas of existing development to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and*

engineering methods, and other such provisions where applicable." Within 40 CFR 122.26(d)(2)(iv)(A) and (C), the management program is required to reduce impacts on receiving waters and reduce pollutants in storm water discharges to the MEP from commercial and residential areas, industrial facilities, and municipal facilities.

Commercial and residential areas, industrial facilities, and municipal facilities must be addressed by each Copermittee with the existing development management program required under Provision E.5. All other areas within each Copermittee's jurisdiction should be either undeveloped open space, or areas that are being developed or under construction. Areas being developed or under construction will be addressed by the Copermittee under the requirements of Provision E.3 (Development Planning) or Provision E.4 (Construction Management).

Areas of existing development typically include impervious surfaces such as sidewalks, driveways, roads, and rooftops, which generate and concentrate pollutants (such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not found in high concentrations in the natural environment. Pollutants that accumulate on impervious surfaces are not easily biodegraded or not subject to natural treatment processes. When it rains, these pollutants are transported in storm water runoff from these impervious surfaces into receiving waters, resulting in poor water quality and degradation of beneficial uses.

In addition to the generation of pollutants, areas of existing development have generally altered the natural conditions of the land and removed vegetative cover, reduced the perviousness of the surface, and reduced the capacity of storm water that can be intercepted, captured, stored, infiltrated, evaporated, and/or evapotranspired. The alteration of the natural conditions and the impervious surfaces associated with areas of existing development causes water quality problems due to the alteration of natural flow regimes within the watersheds; resulting in hydromodification of channels, streams, and habitats that exist within or adjacent to the areas of existing development.

Thus, storm water discharges from areas of existing development are responsible for poor water quality, degraded habitats, and hydromodified channels throughout the developed portions of the watersheds in the San Diego Region. To improve the health and functionality of the receiving waters in a Watershed Management Area, land use practices and the amount of impervious surfaces in areas of existing development must change to reduce the various impacts caused by hydromodification and pollutants from storm water runoff generated in developed areas. Each Copermittee must be aggressive to address pollutant sources and runoff from areas of existing development to be able to reduce pollutants in storm water discharges from the MS4 to the MEP.

There is some overlap in the requirements under Provision E.5 with the requirements under Provisions E.2 (Illicit Discharge Detection and Elimination), E.3 (Development

Planning), and E.4 (Construction Management). Illicit discharges frequently originate from areas of existing development. New development projects, when completed will become some type of residential, commercial, industrial or municipal existing development. Redevelopment projects are, by definition, redeveloping areas of existing development. And, redevelopment projects become construction sites located in areas of existing development. Much of the data and information collected, inspections performed, and enforcement actions taken for the requirements under Provisions E.2 to E.4 may also be utilized by the existing development management program. The requirements under Provision E.5, however, are focused primarily on reducing pollutants generated in areas of existing development that can be transported in storm water runoff and discharged to and from the MS4.

The requirements under Provision E.5 build upon existing program elements being implemented by the Copermittees. Provision E.5 is generally consistent with the existing development requirements of the Fourth Term Permits for Orange and Riverside Counties (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), but modified to provide more flexibility to implement the programs so resources can be better focused toward addressing the highest priority water quality conditions identified in the Water Quality Improvement Plans.

For a Copermittee to properly manage areas of existing development, having knowledge of what development exists within its jurisdiction is essential. Provision E.5.a requires each Copermittee to maintain a watershed-based inventory of all the existing development within its jurisdiction. This requirement is necessary for each Copermittee to implement the requirements of Provision E.5.b-e.

As opposed to just maintaining separate inventories based on the type of site, each Copermittee must maintain a watershed-based inventory that includes all types of existing development within its jurisdiction. By utilizing a watershed-based inventory, the Copermittees within a Watershed Management Area can combine their inventories and review the inventories by watershed in addition to by jurisdiction. Pollutant sources and strategies for abatement can then be evaluated on a watershed level, as opposed to evaluating sources and strategies strictly by type of site.

Provision E.5.a includes the information that must be included in the inventory. Provision E.5.a.(1) specifies what facilities or areas must be included in the inventory. A commercial type of existing development may be identified in the inventory as a facility (e.g. individual building, individual business) or an area (e.g. shopping center, commercial zone). An industrial type of existing development must be identified in the inventory by facility (e.g. individual industrial entity). A municipal type of existing development must be identified in the inventory by facility, with a list of specific municipal facilities that must be included in the inventory. A residential type of existing development must be identified by areas to be designated by the Copermittee. For each of the facilities and areas identified in the Copermittee's inventory developed

pursuant to Provision E.5.a.(1), Provision E.5.a.(2) specifies the information that must be included in the description for the facility or area.

Provision E.5.a.(3) requires each Copermittee to maintain an updated map showing the location of inventoried existing development, watershed boundaries, and water bodies. This requirement was included because this information is expected to help the Copermittees in a Watershed Management Area identify and prioritize sources of pollutants and/or stressors in areas of existing development that contribute toward the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Knowledge of the existing development that are likely to be sources of pollutants contributing to the highest priority water quality conditions is expected to be a key element in the Copermittees' development of the water quality improvement strategies that will be included in the Water Quality Improvement Plans. The strategies described in the Water Quality Improvement Plans will direct efforts within the existing development management programs implemented by each Copermittee.

Pursuant to 40 CFR 122.26(d)(2)(iv)(A) each Copermittee is required describe "*structural and source control measures to reduce pollutants*" in storm water runoff discharged from areas of existing development. Provision E.5.b includes the BMP implementation and maintenance requirements that the each Copermittee must require at areas of existing development to reduce pollutants in storm water discharges to the MEP. The San Diego Water Board, however, recognizes that BMP implementation and maintenance for residential areas will require much more education and encouragement through less authoritative measures than for commercial, industrial and municipal facilities and areas. Thus, the BMP implementation and maintenance requirements have been separated between requirements under Provision E.5.b.(1) for commercial, industrial and municipal facilities and areas, and Provision E.5.b.(2) for residential areas.

Most of the requirements in Provision E.5.b are consistent with the related requirements in the Fourth Term Permits. The level of specificity, however, has been changed to allow each Copermittee the flexibility to implement its program to achieve maximum efficiency, and to perform functions that will address the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Each Copermittee is expected to require the implementation of appropriate BMPs to address the expected pollutants from each facility or area. The Third and Fourth Term Permits described specific minimum BMPs that must be implemented at various sites. This Order, however, requires each Copermittee to designate minimum BMPs themselves and require implementation. Consistent with the Fourth Term Permits, each Copermittee is required to maintain, or require the maintenance of, all BMPs as needed.

The BMP implementation and maintenance requirements include a schedule of operation and maintenance activities for the MS4 and related structures (such as catch basins, storm drain inlets, and detention basins), as well as public streets and roads. Public streets and roads specifically include public unpaved roads. The San Diego Water Board identified, through investigations and complaints, sediment discharges from unpaved roads as a significant source of water quality problems in the San Diego Region. Inspection activities conducted by the San Diego Water Board since the Third Term Permits have found a lack of source control for many unpaved roads within the jurisdiction of the Copermittees.

Unpaved roads are a source of sediment that can be discharged in runoff to receiving waters, especially during storm events. Erosion of unpaved roadways occurs when soil particles are loosened and carried away from the roadway base, ditch, or road bank by water, wind, traffic, or other transport means. Exposed soils, high runoff velocities and volumes, sandy or silty soil types, and poor compaction increase the potential for erosion.

Road construction, culvert installation, and other maintenance activities can disturb the soil and drainage patterns to streams in undeveloped areas, causing excess runoff and thereby erosion and the release of sediment. Poorly designed unpaved roads can act as preferential drainage pathways that carry runoff and sediment into natural streams, impacting water quality. In addition, other public works activities along unpaved roads have the potential to significantly affect sediment discharge and transport within streams and other waterways, which can degrade the beneficial uses of those waterways.

USEPA also recognizes that discharges from unpaved roads pose a significant potential threat to water quality. USEPA guidance[40] emphasizes the threat of unpaved roads to water quality:

> "*Dirt and gravel roads are a major potential source of these pollutants [sediment] and pollutants that bind to sediment such as oils, nutrients, pesticides, herbicides, and other toxic substances. Many roads have unstable surfaces and bases. Roads act like dams, concentrating flows that accelerate erosion of road materials and roadsides. Both unstable surfaces and accelerated erosion then lead to sediment and dust.*"

There are several guidance documents, developed by the USEPA,[41] the US Forest Service,[42] the University of California,[43] and others, that include design and

[40] USEPA, 2006. Environmentally Sensitive Maintenance for Dirt and Gravel Roads. Gesford and Anderson, USEPA-PA-2005.
[41] Ibid
[42] US Forest Service, 1996. Forest Service Specifications for Construction of Roads & Bridges. EM-7720-100. Revised August 1996.

construction specifications and BMPs that are readily available for implementation by public entities. Implementing design and other source control BMPs for unpaved roads in the region is necessary to reduce and minimize the impacts of sediment discharged during storm events from unpaved roads to the MS4s and receiving waters.

Provision E.5.c describes existing development site inspection frequency, content, and tracking that each Copermittee must incorporate into their existing development management programs. The requirements under Provision E.5.c are necessary to demonstrate each Copermittee is implementing a program that complies with Provision E.5.b and ensure BMPs implemented in areas of existing development will reduce pollutants in storm water discharges to the MEP. Provision E.5.c has been modified to include a minimum of once every 5 years for all inventoried facilities and areas of existing development, utilizing one or more methods of inspection.

In addition to onsite inspections, the methods of inspection have been expanded to include drive-by inspections. Inspections may be performed by the Copermittee's municipal and contract staff, or by volunteer monitoring or patrol programs. Volunteer monitoring or patrol programs are not expected to enforce the Copermittee's ordinances, or to inspect areas or facilities where members of the public are not allowed access. Volunteer monitoring or patrol programs must be trained by the Copermittee, and are only expected to collect visual observations. By utilizing drive-by inspections and volunteer monitoring or patrol programs, the Copermittees will be able to maximize and efficiently use their resources to identify and address sources of pollutants in areas of existing development.

The municipal and contract staff of each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial, industrial, and municipal facilities and areas in its inventoried existing development pursuant to Provision E.5.c.(1)(a)(iv). An "equivalent" of at least 20 percent means if any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspections may count toward the total annual inspection requirement. Linear municipal facilities (i.e. MS4 linear channels, sanitary sewer collection systems, streets, roads and highways) in the Copermittee's existing development inventory are not subject to the inspection frequency requirement of Provision E.5.c.(1)(a)(iv).

The inspection content specified in Provision E.5.c.(2)(a) includes the information required to be collected during an inspection by any method. The inspection content specified in Provision E.5.c.(2)(b) includes additional information that must be collected when a Copermittee's municipal or contract staff perform an onsite

[43] University of California Division of Agriculture and Natural Resources, 2007. Rural Roads: A Construction and Maintenance Guide of California Landowners. Publication 8262.

inspection. Provision E.5.c.(3) specifies the information that each Copermittee must maintain in its existing development inspection records.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary to compel compliance with the requirements of Provision E.5 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.5.d requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Provisions E.5.e.(1)-(2) specifically require the Copermittee to identify areas of existing development as candidates for retrofitting, and streams, channels, and/or habitats as candidates for rehabilitation. Provisions E.5.e.(1)-(2) are based on the retrofitting requirements of the Fourth Term Permits for Orange and Riverside Counties, but modified to also include identifying projects to rehabilitate channels within areas of existing development. The requirements have also been modified to be more focused on utilizing these types of projects for addressing the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Interest and opportunity to retrofit areas of existing development and rehabilitate channels located in areas of existing development has been observed in several programs the San Diego Water Board oversees (e.g., CWA Section 401 Water Quality Certification program, supplemental environmental projects, and grant programs). Each jurisdiction has miles and miles of streets that could be retrofitted to become green streets. Reshaping landscaped areas from convex to concave configurations can detain storm water instead of directing runoff as quickly as possible to the MS4. Retrofit projects could also include simply replacing impervious surfaces with permeable surfaces.

Retrofitting projects do not necessarily have to be expensive. Retrofitting projects could be as simple as redirecting downspouts from roofs to pervious or landscaped areas instead of to hardscaped areas discharging directly to the MS4, providing rain barrels to harvest storm water from downspouts for use at a later time, or planting more trees in areas with little vegetation to provide canopy that can intercept storm water. The San Diego Water Board encourages the Copermittees to identify simple, low-cost retrofitting opportunities that can be easily implemented, in addition to other more expensive retrofitting and channel rehabilitation projects.

Rehabilitation of channels, streams, and/or habitat will require more significant planning and resources to implement. There are, however, also abundant opportunities to rehabilitate channels, streams and/or habitats in or adjacent to areas of existing development. Each Watershed Management Area likely has several creeks and stream reaches that have been undergrounded, artificially hardened, or

hydromodified that could be rehabilitated to be more sustainably configured, which would slow down storm water flows and potentially have more assimilative capacity for pollutants while still being supportive of designated beneficial uses.

The San Diego Water Board recognizes that it may be infeasible to implement retrofitting or channel rehabilitation projects within certain areas of a Copermittee's jurisdictions. For such areas, the Copermittee must instead identify, develop, and implement regional retrofitting and channel rehabilitation projects (i.e. projects that can retain and/or treat storm water from one or more areas of existing development) adjacent to and/or downstream of the areas of existing development.

Provisions E.5.e.(1)-(2) do not require the implementation of retrofitting and rehabilitation projects, but do require the Copermittee to develop a program with strategies to facilitate the implementation of these types of projects in areas of existing development. The strategies are expected to include allowing and encouraging Priority Development Projects to implement retrofitting types of projects as a means of compliance with the structural BMP performance criteria requirements of Provisions E.3.c.(1) and E.3.c.(2).

Provision E.6 (Enforcement Response Plans) requires each Copermittee to develop an Enforcement Response Plan as part of its jurisdictional runoff management program document. Proper implementation of the Enforcement Response Plans is necessary to effectively prohibit non-storm water discharges to the MS4, and reduce the discharge of pollutants in storm water from the MS4 to the MEP.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system*" and be able to demonstrate that it can "*operate pursuant to legal authority established by statute, ordinance or series of contracts*" to control the discharge of non-storm water and pollutants in storm water to and from its MS4. Pursuant to 40 CFR 122.26(d)(2)(i)(E) each Copermittee is specifically required to have the legal authority to "*[r]equire compliance with conditions in ordinances, permits, contracts or order*s."

The requirements under Provision E.6 are necessary to demonstrate that each Copermittee can enforce its legal authority to *"effectively prohibit non-stormwater discharges"* and "*reduce the discharge of pollutants to the maximum extent practicable*" as well as "*[r]equire compliance with conditions in ordinances, permits, contracts or order*."

The Enforcement Response Plan required under Provision E.6 will serve as a reference for the Copermittee and the San Diego Water Board to determine if consistent enforcement actions are being implemented to achieve timely and effective compliance from all public and private entities that are not in compliance with the Copermittee's ordinances, permits, or other requirements. The Enforcement

Response Plan must contain clear direction for the Copermittee to take immediate enforcement action, when appropriate and necessary, in their illicit discharge detection and elimination, development planning, construction management, and existing development management programs.

If the entities subject to the Copermittee's legal authority do not implement appropriate corrective actions in a timely manner, or if violations repeat, the Copermittee must take progressively stricter responses to enforce its legal authority and achieve compliance with its ordinances, permits, or other requirements to *"effectively prohibit non-stormwater discharges"* and "*reduce the discharge of pollutants to the maximum extent practicable.*"

Provision E.7 (Public Education and Participation) requires each Copermittee to implement a public education and participation program. Proper implementation of the public education and participation program as part of its jurisdictional runoff management program will contribute toward effectively prohibiting non-storm water discharges to the MS4, and toward the reduction of pollutants in storm water from the MS4 to the MEP.

Provision E.7 establishes the minimum requirements that each Copermittee must implement to engage members of the public as part of its jurisdictional runoff management program. In the Fourth Term Permits, the public education program requirements and the public participation requirements were included as separate jurisdictional runoff management program components. In this Order, the public education requirements have been consolidated with the public participation requirements, as both sets of requirements are related to the engagement of the public by each Copermittee. Engagement of the public is critical for the success of each Copermittee's jurisdictional runoff management program.

The Copermittees have been implementing public education programs for the last 20 years, which are now well established. The specificity of expected public education program elements of the Fourth Term Permits has been removed. For the most part, the public education program requirements in Provision E.7.a have been reduced to a set of requirements that are specifically included in the federal regulations under 40 CFR 122.26(d)(2)(iv)(A)(6), 122.26(d)(2)(B)(6) and 122.26(d)(2)(D)(4), which should already be incorporated into each Copermittee's existing public education program. Each Copermittee is expected to utilize the information and data collected from the monitoring and assessments conducted within the Watershed Management Area, and from its inventories and inspections to best direct its public education program resources toward addressing the highest priority water quality conditions identified within the Water Quality Improvement Plan.

According to 40 CFR 122.26(d)(2)(iv), public participation is required to be included as part of the "*comprehensive planning process*", which includes the development and implementation of the Water Quality Improvement Plan and jurisdictional runoff

management programs. The requirements under Provision E.7.b specify the opportunities that the public must be provided to be involved in the "*comprehensive planning process*", as required by to 40 CFR 122.26(d)(2)(iv).

Provision E.8 (Fiscal Analysis) requires each Copermittee to secure the resources and provide an analysis of the resources that will be necessary to implement the requirements of the Order. Adequate fiscal resources are necessary for a jurisdictional runoff management program to effectively prohibit non-storm water discharges to the MS4, and reduce pollutants in storm water from the MS4 to the MEP.

According to 40 CFR 122.26(d)(2)(vi), each Copermittee is responsible for providing "*a fiscal analysis of the necessary capital and operation and maintenance expenditures necessary to accomplish the activities*" required by this Order, including "*a description of the source of funds that are proposed to meet the necessary expenditures, including legal restrictions on the use of such funds.*" The fiscal analysis requirements of Provision E.8 are consistent with 40 CFR 122.26(d)(2)(vi).

The San Diego Water Board has chosen not to require a description of fiscal benefits realized from implementation of the jurisdictional runoff management programs. This is a recommendation from the National Association of Flood and Stormwater Management Agencies.[44] For instance, the fiscal analysis requirements do not address city-wide fiscal benefits of protection (e.g., public health, tourism, property values, economic activity, beneficial uses, etc.), even though many costs currently reported to the San Diego Water Board are for related activities. This type of assessment may help Copermittees improve the allocation of resources and it may help the Copermittees secure adequate funding for the program. Qualitative assessments, however, could be overly subjective and most Copermittees likely lack the ability to provide accurate quantitative assessments. The San Diego Water Board encourages the Copermittees to consider means for conducting assessments of fiscal benefits derived from the programs. Such assessments could be conducted on a regional scale similar to studies of program costs conducted by the State Water Board.[45]

[44] National Association of Flood and Stormwater Management Agencies. 2006. *Guidance for Municipal Stormwater Funding.* Prepared under a grant provided by the USEPA.
[45] State Water Board, 2005. NPDES Stormwater Cost Survey.

F. Reporting

Purpose: Provision F includes the requirements for the documents and reports that the Copermittees must prepare and provide to the San Diego Water Board. The documents prepared by the Copermittees and provided to the San Diego Water Board and made available to the public will provide the documentation that the Copermittees are complying with the requirements of the Order.

***Discussion*:** Provision F requires the Copermittees to prepare several documents and reports that must be provided to the San Diego Water Board and made available to the public. The reporting requirements have been significantly reduced compared to the Fourth Term Permit reporting requirements. The reduction in reporting requirements was recommended by the San Diego County Copermittees in the Report of Water Discharge submitted in June 2011.

More specific and detailed discussions of the requirements of Provision F are provided below.

Provision F.1 (Water Quality Improvement Plans) requires the Copermittees in each Watershed Management Area to develop and submit a Water Quality Improvement Plan in accordance with the requirements of Provision B.

Of all the requirements of Provision F, the Water Quality Improvement Plans will likely be the documents requiring the most significant effort to develop. The content of the Water Quality Improvement Plans, however, is expected to include content that should already have been developed for the Watershed Plans and several elements that are included in the Monitoring and Reporting Programs required under the Fourth Term Permits.

Because the Water Quality Improvement Plan is part of the "*comprehensive planning process which involves public participation*," Provision F.1 includes requirements to give multiple opportunities to the public to provide input on the content of the plans.

Provision F.1.a.(1) specifies the elements that the Copermittees must include in the public participation process for the development of the Water Quality Improvement Plans. In order for the public to be aware of the opportunities to provide input, Provision F.1.a.(1)(a) requires the Copermittees to develop a publicly available and noticed schedule of the opportunities for the public to participate and provide comments during the development of the Water Quality Improvement Plan. These opportunities are when the public can provide the data, information, and recommendations that the Copermittees can consider during the development of the Water Quality Improvement Plans.

The San Diego Water Board recognizes, however, that the Copermittees cannot be expected to incorporate all the data, information, and recommendations that the public may provide into the Water Quality Improvement Plans. The Copermittees will have to review the data, information, and recommendations received and make some decisions on what to incorporate into the Water Quality Improvement Plans. Before the Copermittees finalize their decisions, members of the public should be allowed to review the Copermittees' decisions. Thus, Provision F.1.a.(1)(b) requires the Copermittees to form a Water Quality Improvement Consultation Panel (Panel).

The Panel will consist of a member from the environmental community and a member from the development community familiar with the Watershed Management Area. A representative from the San Diego Water Board staff will also be part of the Panel. The Copermittees may choose to include additional members, but the Panel is only required to include three panel members.

The Panel will serve as an additional public participation and input mechanism during the development of the Water Quality Improvement Plans. The knowledge and expertise from these Panel members are expected to provide the Copermittees valuable direction during their decision-making process. The Copermittees will review the content of their planned submittals with the Panel members to receive recommendations. If the Panel provides recommendations, the Copermittees must consider revisions to the Water Quality Improvement Plan submittals.

The San Diego Water Board recognizes that the development of multiple Water Quality Improvement Plans concurrently may limit the ability of the public to review and provide comments to the Copermittees. Thus, Provision F.1.a.(1)(c) requires the Copermittees to coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public time and opportunity to participate during the development of the Water Quality Improvement Plans.

Provision F.1.a.(2) requires the Copermittees to develop and submit the first Water Quality Improvement Plan component, in accordance with the requirements of Provision B.2, which includes the identification of the priority water quality conditions and potential water quality improvement strategies. The public must be provided an opportunity to provide data, information and recommendations to be utilized in the development and identification of the priority water quality conditions and potential water quality improvement strategies for the Watershed Management Area. The Copermittees must consult with the Panel and consider making revisions. The Copermittees may submit the requirements of Provision B.2 as early as 6 months and no later than 12 months after the commencement of coverage under this Order. After the requirements of Provision B.2 are submitted to the San Diego Water Board, the public will be provided another opportunity to provide comments.

Provision F.1.a.(3) requires the Copermittees to develop and submit the second Water Quality Improvement Plan component, in accordance with the requirements of

Provision B.3, which includes the identification of the numeric goals for the highest priority water quality conditions identified for the Watershed Management Area, and the strategies that will be implemented to achieve the potential numeric goals. The Copermittees may also develop the Optional Watershed Management Area Analysis, in accordance with the requirements of Provision B.3.b.(4), as part of this submittal. The public must be provided an opportunity to provide data, information and recommendations to be utilized in the development and identification of the numeric goals and water quality improvement strategies for the Watershed Management Area. The Copermittees must consult with the Panel and consider making revisions. The Copermittees may submit the requirements of Provision B.3 as early as 9 months and no later than 18 months after the commencement of coverage under this Order. After the requirements of Provision B.3 are submitted to the San Diego Water Board, the public will be provided another opportunity to provide comments.

Finally, Provision F.1.b describes the process for the submittal and implementation of the Water Quality Improvement Plans. The complete Water Quality Improvement Plans are required to be submitted by the Copermittees within 24 months after the commencement of coverage under this Order. The San Diego Water Board will provide the public an opportunity to provide comments on each complete Water Quality Improvement Plan.

The San Diego Water Board will review each Water Quality Improvement Plan and the public comments received to determine if the Copermittees have submitted a Water Quality Improvement Plan that meets the requirements of Provision B. If a Water Quality Improvement Plan does not meet the requirements of Provision B, the Copermittees will be considered out of compliance and directed in writing by the San Diego Water Board Executive Officer to correct the deficiencies.

When a Water Quality Improvement Plan meets the requirements of Provision B, the San Diego Water Board will determine whether to hold a public hearing or to limit public input to submittal of written comments before accepting the Water Quality Improvement Plan. Implementation of the Water Quality Improvement Plan must begin within 30 days of acceptance.

The San Diego Water Board expects that any deficiencies in the Water Quality Improvement Plan will be identified either in the public comments or during the review by the San Diego Water Board before implementation begins. In the event any deficiencies are identified after the implementation of the Water Quality Improvement Plan, Provision F.1.b.(7) clarifies that the San Diego Water Board maintains the right to require the Copermittees to correct any deficiencies that may be identified.

Provision F.2 (Updates) requires the Copermittees to update specific documents that the Copermittees will utilize to implement the requirements of this Order.

Each Copermittee is required to continue implementing a jurisdictional runoff management program, as required under Provision E. Implementation of each Copermittee's jurisdictional runoff management program is directed by its jurisdictional runoff management program document. Provision F.2.a requires each Copermittee to update its jurisdictional runoff management program document to be consistent with the requirements of Provision E concurrent with the submittal of the Water Quality Improvement Plan.

Likewise, each Copermittee must continue to require new development and redevelopment projects to implement BMPs to control pollutants in storm water runoff. The control of pollutants in storm water runoff from development and redevelopment projects within each Copermittee's jurisdiction is guided and directed by its BMP Design Manual, formerly known as a Standard Storm Water Mitigation Plan (SSMP). Provision F.2.b requires each Copermittee to update its BMP Design Manual to be consistent with the requirements of Provision E.3 concurrent with the submittal of the Water Quality Improvement Plan.

In general, the requirements of the Order should not necessitate a complete rewrite of each Copermittee's jurisdictional runoff management program document or BMP Design Manual, as was required by the Third Term Permits. The jurisdictional runoff management program and BMP Design Manual requirements of this Order are not significantly different than the requirements of the Fourth Term Permits. Thus, only sections of the Order which are new or have been significantly changed should warrant revisions to specific sections of the Copermittee's jurisdictional runoff management program document and BMP Design Manual.

Finally, the Water Quality Improvement Plans are expected to require updates as the iterative approach and adaptive management process included in the Water Quality Improvement Plan, as required under Provision B.5, is implemented by the Copermittees. Provision F.2.c.(1) requires the Copermittees to implement a public participation process for the proposed updates, review the proposed updates with the Panel, and submit the updates to the Water Quality Improvement Plan as part of the Annual Reports required under Provision F.3.b.

Also, because TMDLs are likely to be developed, adopted and approved during the term of the Order, Provision F.2.c.(2) has been included to expedite the incorporation of TMDLs into the Copermittees' Water Quality Improvement Plans as part of the update process, potentially before the Order is re-opened to incorporated the requirements of the new TMDLs.

Provision F.3 (Progress Reporting) requires the Copermittees to report on the progress of implementing the Water Quality Improvement Plans.

The requirements of Provision F.3 are to report the progress toward improving water quality that the Copermittees are achieving with the implementation of the Water

Quality Improvement Plans and each Copermittee's jurisdictional runoff management program. The Progress Report Presentations required under Provision F.3.a are included to provide the Copermittees an opportunity to communicate directly with the San Diego Water Board and the public. The Progress Report Presentations will also provide the members of the San Diego Water Board and members of the public an opportunity to become more acquainted with the Copermittees and their projects and programs to address non-storm water and storm water discharges into and from their MS4s.

The Annual Report requirements of Provision F.3.b are a consolidation of several reporting requirements from the Fourth Term Permits, including the Jurisdictional Runoff Management Program Annual Reports, the Watershed Annual Reports, and the Monitoring and Reporting Program Annual Reports. Furthermore, the Annual Report requirements are consistent with the requirements under 40 CFR 122.42(c).

Pursuant to 40 CFR 122.42(c), "*[t]he operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the Director…must submit an annual report*", which must include the following:

(1) *The status of implementing the components of the storm water management program that are established as permit conditions* [40 CFR 122.42(c)(1)];

(2) *Proposed changes to the storm water management programs that are established as permit conditions* [40 CFR 122.42(c)(2)];

(3) *Revisions, if necessary, to the assessment of controls and fiscal analysis* [40 CFR 122.42(c)(3)];

(4) *A summary of data, including monitoring data, that is accumulated throughout the reporting year* [40 CFR 122.42(c)(4)];

(5) *Annual expenditures and budget for year following each annual report* [40 CFR 122.42(c)(5)];

(6) *A summary describing the number and nature of enforcement actions, inspections, and public education programs* [40 CFR 122.42(c)(6)];

(7) *Identification of water quality improvements or degradation* [40 CFR 122.42(c)(7)].

Under the Fourth Term Permits, each Copermittee is responsible for submitting a Jurisdictional Runoff Management Program Annual Report; the Copermittees in each designated watershed are responsible for submitting a Watershed Annual Report; and the Copermittees from each county are responsible for submitting a Monitoring and Reporting Program Annual Report.

There are 39 Copermittees in the San Diego Region, each required to prepare and submit a Jurisdictional Runoff Management Program Annual Report. There are 9 designated watersheds in San Diego County, 6 designated watersheds in Orange County, and 1 designated watershed in Riverside County for a total of 16 designated watersheds, each requiring a Watershed Annual Report. There are 3 sets of Copermittees in 3 counties in the San Diego Region, requiring Copermittees from each county to prepare and submit a Monitoring and Reporting Program Annual Report. Thus each Copermittee is currently required to prepare, or participate in the preparation of at least 3 annual reports. In addition, the San Diego County Copermittees are required to prepare and submit a Regional Urban Runoff Management Plan Annual Report.

In total, there are 59 annual reports that are prepared by the Copermittees and submitted to the San Diego Water Board for the Fourth Term Permits. The preparation of these annual reports requires significant time and resources from each Copermittee, which could otherwise be expended on actions that could improve water quality within its jurisdiction. In turn, significant time and resources are required from the San Diego Water Board staff to review these reports, which could otherwise be expended on working directly with the Copermittees to improve their implementation efforts toward restoring and protecting water quality.

Until the Water Quality Improvement Plans are developed, there will be a transitional period during which the Copermittees will continue to implement their existing jurisdictional runoff management programs. There will also be a transitional period during which the Copermittees will implement the transitional monitoring and assessment requirements of Provision D. During the transitional period, the Copermittees will submit annual reports pursuant to the requirements of Provisions F.3.b.(1) and F.3.b.(2).

Provision F.3.b.(1) includes the transitional annual reporting requirements for each Copermittee's jurisdictional runoff management program. The reporting of the jurisdictional runoff management program implementation efforts have been reduced to a single 2-page form. Each Copermittee is required to complete and submit a Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D or a revised form accepted by the San Diego Water Board) no later than October 31 of each year for each jurisdictional runoff management program reporting period (i.e. July 1 to June 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted. The Jurisdictional Runoff Management Program Annual Report Form will certify that each Copermittee has implemented its jurisdictional runoff management program in accordance with the requirements of Provision E. Each Copermittee may choose to continue to utilize and submit the jurisdictional runoff management program annual reporting format of its current Order until the first Water Quality Improvement Plan Annual Report is required to be submitted.

Provision F.3.b.(2) includes the transitional annual reporting requirements for the transitional monitoring and assessment program for each Watershed Management Area. The Copermittees in the Watershed Management Area are required to submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted. The Transitional Monitoring and Assessment Program Annual Report is required to include the transitional period monitoring data collected pursuant to Provisions D.1.a and D.2.a, and the findings from the transitional period findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

Provision F.3.b.(3) includes the Water Quality Improvement Plan Annual Report requirements. Only one Water Quality Improvement Plan Annual Report is required for each of the ten (10) Watershed Management Areas designated under Provision B.1, which is a significant reduction in the number of annual reports required to be prepared and submitted by the Copermittees. The Water Quality Improvement Plan Annual Report will document the Copermittees' efforts to implement the Water Quality Improvement Plan. Each Water Quality Improvement Plan Annual Report will be focused primarily on reporting the analysis of the monitoring data collected pursuant to Provisions D.1-D.3 during the reporting period, and the assessments that are required pursuant to Provision D.4 based on the data. The monitoring data analyses and the assessments that are provided in the Water Quality Improvement Plan Annual Report will be the core of the report. The reporting of the jurisdictional runoff management program implementation efforts have been reduced to a single 2-page form, and will no longer be the primary focus of the reporting requirements as in the Third and Fourth Term Permits.

Each Copermittee will continue to prepare and submit a Jurisdictional Runoff Management Program Annual Report Form as part of the Water Quality Improvement Plan Annual Report to certify that each Copermittee has implemented its jurisdictional runoff management program in accordance with the requirements of Provision E. Instead of reviewing a voluminous report from each Copermittee, as was required under the Third and Fourth Term Permits, the San Diego Water Board will conduct audits of each Copermittee's jurisdictional runoff management program to investigate and confirm the information provided by each Copermittee on its Jurisdictional Runoff Management Program Annual Report Form. The audits will allow the San Diego Water Board to become more familiar with the each Copermittee's jurisdictional runoff management program, and each Copermittee will become more informed about the expectations of the San Diego Water Board.

The reduction in the number and content of the Water Quality Improvement Plan Annual Reports should result in significant time, cost and resource savings for the Copermittees, as well as the San Diego Water Board. Those savings should offset a significant portion of any additional costs that may be incurred to develop the Water

Quality Improvement Plans and to implement the monitoring and assessment program requirements of Provision D.

The reporting period for the Water Quality Improvement Plan Annual Reports consists of two periods. Because the jurisdictional runoff management programs are typically budgeted and implemented during a fiscal year, the information provided on the Jurisdictional Runoff Management Program Annual Report Forms will cover the period from July 1 to June 30 of the following year.

The Water Quality Improvement Plan Annual Reports, however, are focused primarily on the monitoring data and the assessments based on the monitoring data. The monitoring data is collected during the monitoring year, which begins October 1 and ends September 30 of the following year. The monitoring year begins after the beginning of the fiscal year and ends after the end of the fiscal year. Therefore, to accommodate and capture the information collected during the fiscal year and the monitoring year, the Annual Report reporting period incorporates both periods.

Finally, Provision F.3.c requires the Copermittees to develop and submit a Regional Monitoring and Assessment Report. The Regional Monitoring and Assessment Report is similar to the Long Term Effectiveness Assessment required under the Fourth Term San Diego County Permit. The Regional Monitoring and Assessment Report is expected to utilize the entire body of data and information collected by the Copermittees during the term of this Order to assess improvements to water quality on a regional scale.

Provision F.4 (Regional Clearinghouse) requires the Copermittees to develop, update, and maintain an internet-based Regional Clearinghouse that can be used to store, disseminate, and share the Copermittees' documents, monitoring data, special studies, and any other data or information.

Most of the documents and data that are generated by the Copermittees can be provided in electronic format, and made available to the San Diego Water Board and the public on the internet. The San Diego Water Board has been gradually transitioning its document submittal requirements to electronic submittals. Provision F.4 has been included to further these efforts.

Provision F.4 has also been included to improve the exchange and availability of information among the Copermittees, as well as between the Copermittees and the San Diego Water Board. Provision F.4 will also make the information generated during the implementation of the Order more accessible to the public.

Provision F.5 (Report of Waste Discharge) requires the Copermittees to submit a Report of Waste Discharge to reapply for renewal of the Order prior to its expiration, in accordance with 40 CFR 122.21(d)(2) and CWC section 13376.

Because the ~~Orange County and~~ Riverside County Copermittees will not be subject to the requirements of this Order until they are notified of coverage, Provision F.5.a describes the process of submitting a ~~their~~ Report~~s~~ of Waste Discharge pursuant to the requirements of their current permit~~s~~ to obtain coverage under this Order.

For the Copermittees subject to the requirements of this Order, Provision F.5.b requires the Copermittees to submit a Report of Waste Discharge 180 days in advance of the expiration of this Order. Provision F.5.b also describes the minimum information to be included in the Report of Waste Discharge, based on USEPA guidance "Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems," dated May 17, 1996.

Provision F.6 (Application for Early Coverage) describes the process that would allow the Orange County and/or Riverside County Copermittees to obtain coverage under this Order earlier than the expiration of their current Orders.

If the Orange County and/or Riverside County Copermittees choose to obtain coverage under this Order earlier than the expiration of their current Orders, the preparation and submittal of a Report of Waste Discharge, as required by the Fourth Term Permits, will not be necessary. The existing Order for the respective county will be rescinded upon the effective coverage date under this Order, except for enforcement purposes.

G. Principal Watershed Copermittee Responsibilities

Purpose: Provision G includes the requirements for the Principal Watershed Copermittee designated by the Copermittees in each Watershed Management Area.

***Discussion*:** Unlike previous NPDES requirements, there will no longer be a single Principal Copermittee. Provision G.1 requires the Copermittees to designate a Principal Watershed Copermittee for each Watershed Management Area. There are ten (10) Watershed Management Areas in the San Diego Region, as defined in Table B-1 under Provision B.1 of the Order. An individual Copermittee should not be the Principal Watershed Copermittee for more than two (2) Watershed Management Areas. There could be up to ten (10) Principal Water Copermittees designated for the Watershed Management Areas in the San Diego Region.

Provision G.2 describes the minimum responsibilities of each Principal Watershed Copermittee. The primary responsibility of the Principal Watershed Copermittees is to serve as the liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues. Ideally, the Principal Watershed Copermittee can represent the interests of all the Copermittees within a Watershed Management Area during discussions or meetings to facilitate communication with the San Diego Water Board. The Principal Watershed Copermittees are also responsible for facilitating and coordinating the implementation efforts of the Copermittees and submittals of required documents and reports.

The Principal Watershed Copermittee is responsible for facilitating the efforts of the Copermittees within the Watershed Management Area to develop the Water Quality Improvement Plan required under Provision B, and submit it for approval in accordance with Provision F.1. The Principal Watershed Copermittee is also responsible for coordinating the submittal of the document updates, Progress Report Presentations, and Annual Reports required from the Copermittees within each Watershed Management Area under Provisions F.2, F.3.a, and F.3.b. The Principal Watershed Copermittees are responsible for coordinating with each other to develop and submit the Regional Clearinghouse, Regional Monitoring and Assessment Report, and the Report of Waste Discharge required under Provisions F.3.c, F.4, and F.5.

The designated Principal Watershed Copermittee for each Watershed Management Area does not necessarily have to serve as the Principal Watershed Copermittee for the entire term of the Order. If the Copermittees in a Watershed Management Area choose to designate a new Principal Watershed Copermittee, the change may be submitted as part of the Annual Report required under Provision F.3.b, with an update to the Water Quality Improvement Plan in accordance with Provision F.2.c.

Provision G.3 specifies that the Principal Watershed Copermittee is not responsible for ensuring that the other Copermittees within the Watershed Management Area are in compliance with the requirements of this Order

H. Modification of Order

Purpose: Provision H provides the conditions under which modifications to Order No. R9-2013-0001 may occur.

***Discussion*:** Provision H allows for modifications to Order No. R9-2013-0001. Minor modifications may be made by the San Diego Water Board Executive Officer without a public notice or public hearing. Minor modifications are defined under 40 CFR 122.63. Minor modifications under 40 CFR 122.63 potentially applicable to this Order are the following:

- Correcting typographical errors;
- Requiring more frequent monitoring or reporting by the Copermittees;
- Changing an interim compliance date in a schedule of compliance, provided the new date is not more than 120 days after the date specified in the existing permit and does not interfere with attainment of the final compliance date requirement.

Modifications that are not one of the above minor modifications will require re-opening the Order, subject to the requirements of 40 CFR 122.44, 122.62 to 122.64, and 124.5, but only for the specific provisions subject to the modification. Modifications of the Order that are not minor require a draft Order with the proposed modifications made available for public review, a public notice and comment period, and a public hearing. Comments on the provisions not subject to the proposed modifications are not required to be considered in the San Diego Water Board's responses to comments or during the public hearing.

Provision H.4 was included to specify that the Order will be re-opened for modifications if the State Water Board determines revisions to Provision A are warranted, an application for early coverage under the Order is received pursuant to Provision F.6, the Basin Plan is amended to modify an existing TMDL or incorporate a new TMDL, or the monitoring and assessment program requirements need to be updated or revised.

Provision H.5 was included to specify that the San Diego Water Board will re-open and consider modifications to this Order when the Orange County Copermittees or the Riverside County Copermittees submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders

I. Standard Permit Provisions and General Provisions

Purpose: Provision I incorporates the standard permit provisions required to be included in all NPDES permits, as well as several other general provisions.

***Discussion*:** Provision I refers to Attachment B to the Order. Attachment B expressly incorporates the conditions applicable to all NPDES permits as provided under 40 CFR 122.41(a)-(n), as well as the applicable conditions for MS4s and storm water discharges provided under 40 CFR 122.42(c) and 40 CFR 122.42(d), respectively. Attachment B also includes several general provisions that are typically included in or applicable to waste discharge requirements issued by the San Diego Water Board.

IX. ATTACHMENTS

The attachments to the Order are discussed below. The discussions describe the content of the attachments.

Attachment A – Discharge Prohibitions and Special Protections

Section 1 of Attachment A includes the Waste Discharge Prohibitions from the Basin Plan. They have been provided verbatim in their entirety.

Section 2 of Attachment A includes the "*Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges*" applicable to permitted point source discharges of storm water, adopted under State Water Board Resolution No. 2012-0012, as amended by Resolution No. 2012-0031. The terms, prohibitions, and special conditions (collectively referred to as special conditions) are established as limitations on point source storm water discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in ASBS, as required for State Water Quality Protection Areas pursuant to California Public Resources Code sections 36700(f) and 36710(f). These Special Protections were adopted by the State Water Board as part of the Ocean Plan General Exception.

Attachment B – Standard Permit Provisions and General Provisions

Conditions applicable to all NPDES permits, as required under 40 CFR 122.41, and conditions applicable to MS4s and storm water discharges, as required under 40 CFR 122.42(c) and 122.42(d), respectively are provided in Attachment B to the Order. They have been provided expressly in their entirety.

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. These general provisions are typically included in or applicable to waste discharge requirements issued by the San Diego Water Board. Many of the general provisions were developed by the State Water Board. Where a general provision is derived from statute or regulation, a citation of the statute or regulation section is provided. General provisions that do not provide a citation are included under the authority provided CWC 13377.

Attachment C – Acronyms, Abbreviations and Definitions

The acronyms and abbreviations that are used in the Order are provided in Attachment C. Attachment C also includes definitions that may provide an explanation or description of the meaning or intent of specific terms or phrases included in the Order.

Attachment D – Jurisdictional Runoff Management Program Annual Report Form

An example of the Jurisdictional Runoff Management Program Annual Report Form required to be submitted by each Copermittee as part of the Annual Reports required under Provision F.3.b.(1)(e) is provided as Attachment D to the Order. An electronic version of the form will be available from the San Diego Water Board after the adoption of the Order.

The Jurisdictional Runoff Management Program Annual Report Form includes the minimum information necessary to demonstrate that the Copermittee is implementing and in compliance with the requirements of Provision E, and includes much of the information required to be reported pursuant to 40 CFR 122.42(c).

The information that must be provided on the Jurisdictional Runoff Management Program Annual Report Form is limited to the fiscal year, which begins July 1 and ends June 30 of the following year. The information expected to be provided by the Copermittees in each section of the Jurisdictional Runoff Management Program Annual Report Form is discussed below.

I. COPERMITTEE INFORMATION

The name of the Copermittee (e.g. name of city, county, or special district) and the contact information for the storm water program manager are provided under this section.

II. LEGAL AUTHORITY

The Copermittee must confirm whether or not the legal authorities under Provision E.1.a have been established for itself within its jurisdiction.

The Copermittee must also confirm whether or not a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority, as required under Provision E.1.b. The certification statement required by Provision E.1.b is only required to be submitted with the first Annual Report required under Provision F.3.b.

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

The Copermittee must inform the San Diego Water Board whether or not an update to its jurisdictional runoff management program document was required or recommended by the San Diego Water Board during the reporting period. An update to the jurisdictional runoff management program is required under Provision F.2.a. The San Diego Water Board may recommend modifications to the jurisdictional runoff management program as part of the iterative approach and adaptive management process required under Provision B.5, which may result in an update that is necessary for the Copermittee's jurisdictional runoff management document.

If an update was required or recommended, the Copermittee must confirm whether or not the update was completed and made available on the Regional Clearinghouse within the reporting period. If no update was required or recommended, an answer is not required. If the answer is NO, meaning the required or recommended update was not completed and/or made available on the Regional Clearinghouse, the Copermittee must attach a

schedule for the completion of the update and/or posting of the updated document on the Regional Clearinghouse.

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

The Copermittee must confirm whether or not a program was implemented during the fiscal year to actively detect and eliminate illicit discharges and connections in accordance with the requirements under Provision E.2.

In addition to confirming that a program to detect and eliminate illicit discharges was implemented during the reporting period, the Copermittee is also required to report on several items related to the program. The information that must be reported is limited to the fiscal year for the Annual Report.

All non-storm water discharges are considered illicit discharges unless the source is identified as one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5). If a non-storm water discharge is identified as one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5), the discharge is a non-storm water discharge, but not an illicit discharge. If a non-storm water discharge is identified but not in one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5), the discharge is both a non-storm water discharge and an illicit discharge.

V. DEVELOPMENT PLANNING PROGRAM

The Copermittee must confirm whether or not a development planning program was implemented during the fiscal year in accordance with the requirements under Provision E.3.

The Copermittee must also inform the San Diego Water Board whether or not an update to its BMP Design Manual was required or recommended by the San Diego Water Board during the fiscal year. An update to the BMP Design Manual is required under Provision F.2.b. The San Diego Water Board may recommend modifications to the BMP Design Manual, which may result in an update that is necessary for Copermittee's the BMP Design Manual.

If an update was required or recommended, the Copermittee must confirm whether or not the update was completed and made available on the Regional Clearinghouse within the reporting period. If no update was required or recommended, an answer is not required. If the answer is NO, meaning the required or recommended update was not completed and/or made available on the Regional Clearinghouse, the Copermittee must attach a schedule for the completion of the update and/or posting of the updated document on the Regional Clearinghouse.

The Copermittee is also required to report on several items related to the program. For the development and redevelopment projects that are reviewed under the program, the Copermittee must report the total number projects submitted for review during the fiscal year. Of those projects, the Copermittee must report the number that are Priority Development Projects, as defined under Provision E.3.b.(1). The Copermittee must also report the number of Priority Development Projects that were approved and/or granted occupancy during the fiscal year, regardless of when the project was originally submitted for review. Any projects that were approved during the fiscal year and granted any

exemptions from the BMP Design Manual requirements and/or allowed to implement alternative compliance options in accordance with Provision E.3.c.(3) must be reported.

Finally, the Copermittee must also report on several items related to its oversight of permanent BMPs on Priority Development Projects within its jurisdiction, as required under Provision E.3.e. The information that must be reported is limited to the fiscal year for the Annual Report.

VI. CONSTRUCTION MANAGEMENT PROGRAM

The Copermittee must confirm whether or not a construction management program was implemented during the fiscal year in accordance with the requirements under Provision E.4.

The Copermittee is also required to report on several items related to its oversight construction projects within its jurisdiction. The information that must be reported is limited to the fiscal year for the Annual Report.

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

The Copermittee must confirm whether or not an existing development management program was implemented during the fiscal year in accordance with the requirements under Provision E.5.

The Copermittee is also required to report on several items related to its oversight in areas of existing development within its jurisdiction. The information that must be reported is limited to the fiscal year for the Annual Report. The information must also be separated into four categories of existing development: municipal, commercial, industrial, and residential.

VIII. PUBLIC EDUCATION AND PARTICIPATION

The Copermittee must confirm whether or not a public education program component was implemented during the fiscal year in accordance with the requirements under Provision E.7.a.

The Copermittee must also confirm whether or not a public participation program component was implemented during the fiscal year in accordance with the requirements under Provision E.7.b.

IX. FISCAL ANALYSIS

The Copermittee must confirm a summary of its fiscal analysis, conducted in accordance with the requirements under Provision E.8, has been attached to the form.

X. CERTIFICATION

A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative must sign and certify the Jurisdictional Runoff Management Program Annual Report Form. The appropriate box must be checked to indicate the whether a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative is signing the form.

Attachment E – Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2013-0001

Attachment E provides specific provisions for implementing the load allocations (LAs) and wasteload allocations (WLAs) of Total Maximum Daily Loads (TMDLs) adopted by the San Diego Water Board and approved by USEPA in which the Copermittees are identified as responsible for discharges subject to the requirements of the TMDLs. Federal regulations require that NPDES requirements incorporate water quality based effluent limitations (WQBELs) that must be consistent with the requirements and assumptions of any available WLAs,[46] which may be expressed as numeric effluent limitations, when feasible, and/or as a best management practice (BMP) program of expanded or better-tailored BMPs.[47] Where the TMDL includes WLAs that provide numeric pollutant load or pollutant parameter objectives, the WLA has been, where feasible, translated into numeric WQBELs.[48]

For each TMDL in Attachment E, four sections are included:

a. Applicability: This section provides the resolution under which the TMDL Basin Plan amendment was adopted and approved, with the applicable adoption and approval dates. This section also gives the effective date of the TMDL and where the TMDL is applicable (i.e. Watershed Management Area and water body). The Copermittees that are responsible for implementing the specific provisions are also given in this section.

b. Final TMDL Compliance Requirements: For each TMDL, the final TMDL compliance requirements consist of the final TMDL compliance date(s), the final WQBELs, and the final TMDL compliance determination requirements. The final WQBELs are expressed in terms of receiving water limitations, effluent limitations, and/or best management practices (BMPs). The final WQBELs for the TMDLs are incorporated by reference into Provision A of the Order. The final WQBELs become enforceable when the final TMDL compliance dates have passed. Applicable BMPs within the final WQBELs must be incorporated into the Water Quality Improvement Plans. Compliance with the final WQBELs will be determined in accordance with the options provided under the final TMDL compliance determination requirements.

c. Interim TMDL Compliance Requirements: If the final TMDL compliance date has not passed and there are interim TMDL compliance requirements, they are included in this section. If there are interim WQBELs with interim compliance dates, the interim WQBELs become enforceable when the corresponding interim compliance dates have passed. Compliance with the interim WQBELs will be determined in accordance with the options provided under the interim TMDL compliance determination requirements.

d. Specific Monitoring and Assessment Requirements: If there are specific monitoring and assessment requirements that cannot be met with the monitoring and assessment program

[46] 40 CFR 122.44(d)(1)(vii)(B)
[47] 40 CFR 122.44(k)(2) and 40 CFR 122.44(k)(3)
[48] November 12, 2010 Memorandum from the USEPA, Revisions to the November 22, 2002 Memorandum "Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLA""

requirements under Provision D of the Order, the additional requirements are included in this section.

The requirements of the TMDLs are based on and consistent with the assumptions and requirements of any available adopted and approved TMDLs that have been incorporated into the Basin Plan. Modifications to the requirements for the TMDLs in Attachment E cannot be made unless the TMDLs are modified in the Basin Plan.

A modification to any aspect of a TMDL in the Basin Plan requires a Basin Plan amendment. A Basin Plan amendment to modify a TMDL will require the San Diego Water Board to adopt a resolution to amend the Basin Plan, which includes a separate public process. When the San Diego Water Board adopts a Basin Plan amendment, it subsequently requires approval from the State Water Board, the Office of Administrative Law, and the USEPA before it becomes effective.

If and when the TMDLs are a modified in the Basin Plan, the San Diego Water Board will revise the requirements of the Order ~~TMDL~~ in accordance with the Basin Plan amendment. When a Basin Plan amendment to modify a TMDL becomes effective, the San Diego Water Board will modify the requirements of the Order~~TMDL~~ pursuant to the requirements of Provision H.4 of the Order as soon as possible.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

ORDER NO. R9-2013-0001
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The San Diego County Copermittees in Table 1a are subject to waste discharge requirements set forth in this Order.

Table 1a. San Diego County Copermittees

City of Carlsbad	City of Oceanside
City of Chula Vista	City of Poway
City of Coronado	City of San Diego
City of Del Mar	City of San Marcos
City of El Cajon	City of Santee
City of Encinitas	City of Solana Beach
City of Escondido	City of Vista
City of Imperial Beach	County of San Diego
City of La Mesa	San Diego County Regional Airport Authority
City of Lemon Grove	San Diego Unified Port District
City of National City	

~~After the San Diego Water Board receives and considers~~ T~~t~~he Orange County Copermittees~~' Report of Waste Discharge and makes any necessary changes to this Order, the Orange County Copermittees~~ in Table 1b are ~~will become~~ subject to waste discharge requirements set forth in this Order. ~~after expiration of Order No. R9-2009-0002, NPDES No. CAS0108740 on or after December 16, 2014.~~

Table 1b. Orange County Copermittees

City of Aliso Viejo	City of Rancho Santa Margarita
City of Dana Point	City of San Clemente
City of Laguna Beach	City of San Juan Capistrano
City of Laguna Hills	City of Laguna Woods
City of Laguna Niguel	County of Orange
City of Lake Forest[1]	Orange County Flood Control District
City of Mission Viejo	

[1] The MS4 discharges within the jurisdiction of the City of Lake Forest located in the San Diego Region will be regulated by the Santa Ana Water Board Order No. R8-2014-0002 (NPDES No. CAS618030) and any reissuance thereto subject to the terms of the agreement between San Diego Water Board and Santa Ana Water Board.

After the San Diego Water Board receives and considers the Riverside County Copermittees' Report of Waste Discharge and makes any necessary changes to this Order, the Riverside County Copermittees in Table 1c will become subject to waste discharge requirements set forth in this Order after expiration of Order No.R9-2010-0016, NPDES No. CAS0108766 on or after November 10, 2015.

Table 1c. Riverside County Copermittees

City of Murrieta	County of Riverside
City of Temecula	Riverside County Flood Control and Water Conservation District
City of Wildomar	

The ~~Orange County Copermittees and~~ Riverside County Copermittees may become subject to the requirements of this Order at a date earlier than the expiration date of their current Order~~s~~ subject to the conditions described in Provision F.6 of this Order if the Riverside County Copermittees ~~in the respective county~~ receive ~~a~~ notification of coverage from the San Diego Water Board.

The term Copermittee in this Order refers to any San Diego County, Orange County, or Riverside County Copermittee covered under this Order, unless specified otherwise.

This Order provides permit coverage for the Copermittee discharges described in Table 2.

Table 2. Discharge Locations and Receiving Waters

Discharge Points	Locations throughout San Diego Region
Discharge Description	Municipal Separate Storm Sewer System (MS4) Discharges
Receiving Waters	Inland Surface Waters, Enclosed Bays and Estuaries, and Coastal Ocean Waters of the San Diego Region

Table 3. Administrative Information

This Order was adopted by the San Diego Water Board on:	**May 8, 2013**
~~This~~ Order R9-2013-0001 ~~will become~~ became effective on:	**June 27, 2013**
This Order as amended by R9-2015-0001 became effective on:	**April 1, 2015**
This Order will expire on:	**June 27, 2018**
The Copermittees must file a Report of Waste Discharge in accordance with Title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than 180 days in advance of the Order expiration date.	

I, David W. Gibson, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on May 8, 2013, as amended by adoption of Order No. R9-2015-0001 on February 11, 2015.

David W. Gibson
Executive Officer

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I. FINDINGS

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), finds that:

JURISDICTION

1. **MS4 Ownership or Operation.** Each of the Copermittees owns or operates an MS4, through which it discharges storm water and non-storm water into waters of the U.S. within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the U.S.

2. **Legal and Regulatory Authority.** This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]) adopted by the United States Environmental Protection Agency (USEPA), and chapter 5.5, division 7 of the California Water Code (CWC) (commencing with section 13370). This Order serves as an NPDES permit for discharges from MS4s to surface waters. This Order also serves as waste discharge requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

   The San Diego Water Board has the legal authority to issue a regional MS4 permit pursuant to its authority under CWA section 402(p)(3)(B) and 40 CFR 122.26(a)(1)(v). The USEPA also made it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide permits (55 Federal Register [FR] 47990, 48039-48042). The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees and San Diego Water Board.

   The federal regulations make it clear that the Copermittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators (40 CFR 122.26(a)(3)(vi)). This Order does not require the Copermittees to manage storm water outside of their jurisdictional boundaries, but rather to work collectively to improve storm water management within watersheds.

3. **CWA NPDES Permit Conditions.** Pursuant to CWA section 402(p)(3)(B), NPDES permits for storm water discharges from MS4s must include requirements to effectively prohibit non-storm water discharges into MS4s, and require controls to reduce the discharge of pollutants in storm water to the maximum extent practicable (MEP), and to require other provisions as the San Diego Water Board determines are appropriate to control such pollutants. This Order prescribes conditions to assure

compliance with the CWA requirements for owners and operators of MS4s to effectively prohibit non-storm water discharges into the MS4s, and require controls to reduce the discharge of pollutants in storm water from the MS4s to the MEP.

4. **CWA and CWC Monitoring Requirements.** CWA section 308(a) and 40 CFR 122.41(h),(j)-(l) and 122.48 require that NPDES permits must specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s also specify additional monitoring and reporting requirements in 40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c). CWC section 13383 authorizes the San Diego Water Board to establish monitoring, inspection, entry, reporting and recordkeeping requirements. This Order establishes monitoring and reporting requirements to implement federal and State requirements. This Order also includes requirements for the Orange County Copermittees to implement a unified approach to beach water quality monitoring and assessment as set forth in Monitoring and Reporting Program No. XX, issued pursuant to CWC sections 13225, 13267, and 13383.

5. **Total Maximum Daily Loads.** CWA section 303(d)(1)(A) requires that "[e]ach state shall identify those waters within its boundaries for which the effluent limitations are not stringent enough to implement any water quality standard applicable to such waters." The CWA also requires states to establish a priority ranking of impaired water bodies known as Water Quality Limited Segments and to establish Total Maximum Daily Loads (TMDLs) for such waters. This priority list of impaired water bodies is called the Clean Water Act Section 303(d) List of Water Quality Limited Segments, commonly referred to as the 303(d) List. The CWA requires the 303(d) List to be updated every two years.

   TMDLs are numerical calculations of the maximum amount of a pollutant that a water body can assimilate and still meet water quality standards. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point sources (waste load allocations or WLAs) and non-point sources (load allocations or LAs), background contribution, plus a margin of safety. Discharges from MS4s are point source discharges. The federal regulations (40 CFR 122.44(d)(1)(vii)(B)) require that NPDES permits incorporate water quality based effluent limitations (WQBELs) developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, consistent with the assumptions and requirements of any available WLA for the discharge. Requirements of this Order implement the TMDLs established ~~adopted~~ by the San Diego Water Board or ~~and approved by~~ USEPA as of the time this Order was ~~is issued~~ amended in 2015. This Order establishes WQBELs consistent with the assumptions and requirements of all available TMDL WLAs assigned to discharges from the Copermittees' MS4s.

6. **Non-Storm Water Discharges.** Pursuant to CWA section 402(p)(3)(B)(ii), this Order requires each Copermittee to effectively prohibit discharges of non-storm water into its MS4. Nevertheless, non-storm water discharges into and from the MS4s continue to be reported to the San Diego Water Board by the Copermittees

and other persons. Monitoring conducted by the Copermittees, as well as the 303(d) List, have identified dry weather, non-storm water discharges from the MS4s as a source of pollutants causing or contributing to receiving water quality impairments in the San Diego Region. The federal regulations (40 CFR 122.26(d)(2)(iv)(B)(1)) require the Copermittees to have a program to prevent illicit discharges to the MS4. The federal regulations, however, allow for specific categories of non-storm water discharges or flows to be addressed as illicit discharges only where such discharges are identified as sources of pollutants to waters of the U.S.

7. **In-Stream Treatment Systems.** Pursuant to federal regulations (40 CFR 131.10(a)), in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S. Authorizing the construction of a runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to accepting waste assimilation as an appropriate use for that water body. Runoff treatment must occur prior to the discharge of runoff into receiving waters. Treatment control best management practices (BMPs) must not be constructed in waters of the U.S. Construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body.

DISCHARGE CHARACTERISTICS AND RUNOFF MANAGEMENT

8. **Point Source Discharges of Pollutants.** Discharges from the MS4s contain waste, as defined in the CWC, and pollutants that adversely affect the quality of the waters of the state. A discharge from an MS4 is a “discharge of pollutants from a point source” into waters of the U.S. as defined in the CWA. Storm water and non-storm water discharges from the MS4s contain pollutants that cause or threaten to cause a violation of surface water quality standards, as outlined in the Water Quality Control Plan for the San Diego Basin (Basin Plan). Storm water and non-storm water discharges from the MS4s are subject to the conditions and requirements established in the Basin Plan for point source discharges.

9. **Potential Beneficial Use Impairment.** The discharge of pollutants and/or increased flows from MS4s may cause or threaten to cause the concentration of pollutants to exceed applicable receiving water quality objectives and impair or threaten to impair designated beneficial uses resulting in a condition of pollution, contamination, or nuisance.

10. **Pollutants Generated by Land Development.** Land development has created and continues to create new sources of non-storm water discharges and pollutants in storm water discharges as human population density increases. This brings higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash. Pollutants from these sources are dumped or washed off the surface by non-storm water or storm water flows into and from the MS4s. When development converts natural vegetated pervious ground

cover to impervious surfaces such as paved highways, streets, rooftops, and parking lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving a developed area without BMPs that can maintain pre-development runoff conditions will contain greater pollutant loads and have significantly greater runoff volume, velocity, and peak flow rate than pre-development runoff conditions from the same area.

11. **Runoff Discharges to Receiving Waters.** The MS4s discharge runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within the eleven hydrologic units comprising the San Diego Region. Historic and current development makes use of natural drainage patterns and features as conveyances for runoff. Rivers, streams and creeks in developed areas used in this manner are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and receiving water. Numerous receiving water bodies and water body segments have been designated as impaired by the San Diego Water Board pursuant to CWA section 303(d).

12. **Pollutants in Runoff.** The most common pollutants in runoff discharged from the MS4s include total suspended solids, sediment, pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., cadmium, copper, lead, and zinc), petroleum products and polynuclear aromatic hydrocarbons, synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus), oxygen-demanding substances (e.g., decaying vegetation, animal waste), detergents, and trash. As operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not prohibit or otherwise control. These discharges may cause or contribute to a condition of pollution or a violation of water quality standards.

13. **Human Health and Aquatic Life Impairment.** Pollutants in runoff discharged from the MS4s can threaten and adversely affect human health and aquatic organisms. Adverse responses of organisms to chemicals or physical agents in runoff range from physiological responses such as impaired reproduction or growth anomalies to mortality. Increased volume, velocity, rate, and duration of storm water runoff greatly accelerate the erosion of downstream natural channels. This alters stream channels and habitats and can adversely affect aquatic and terrestrial organisms.

14. **Water Quality Effects.** The Copermittees' water quality monitoring data submitted to date documents persistent exceedances of Basin Plan water quality objectives for runoff-related pollutants at various watershed monitoring stations. Persistent toxicity has also been observed at several watershed monitoring stations. In addition, bioassessment data indicate that the majority of the monitored receiving waters have Poor to Very Poor Index of Biological Integrity (IBI) ratings. These findings indicate

that runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in the San Diego Region. Non-storm water discharges from the MS4s have been shown to contribute significant levels of pollutants and flow in arid, developed Southern California watersheds, and contribute significantly to exceedances of applicable receiving water quality objectives.

15. **Non-Storm Water and Storm Water Discharges.** Non-storm water discharges from the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard of CWA section 402(p)(3)(B)(iii), which is explicitly for "Municipal … *Stormwater Discharges* (emphasis added)" from the MS4s. Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s must be effectively prohibited.

16. **Best Management Practices.** Waste and pollutants which are deposited and accumulate in MS4 drainage structures will be discharged from these structures to waters of the U.S. unless they are removed. These discharges may cause or contribute to, or threaten to cause or contribute to, a condition of pollution in receiving waters. For this reason, pollutants in storm water discharges from the MS4s can be and must be effectively reduced in runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Pollution prevention is the reduction or elimination of pollutant generation at its source and is the best "first line of defense." Source control BMPs (both structural and non-structural) minimize the contact between pollutants and runoff, therefore keeping pollutants onsite and out of receiving waters. Treatment control BMPs remove pollutants that have been mobilized by storm water or non-storm water flows.

17. **BMP Implementation.** Runoff needs to be addressed during the three major phases of development (planning, construction, and use) in order to reduce the discharge of storm water pollutants to the MEP, effectively prohibit non-storm water discharges, and protect receiving waters. Development which is not guided by water quality planning policies and principles can result in increased pollutant load discharges, flow rates, and flow durations which can negatively affect receiving water beneficial uses. Construction sites without adequate BMP implementation result in sediment runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. Existing development can generate substantial pollutant loads which are discharged in runoff to receiving waters. Retrofitting areas of existing development with storm water pollutant control and hydromodification management BMPs is necessary to address storm water discharges from existing development that may cause or contribute to a condition of pollution or a violation of water quality standards.

18. **Water Quality Improvements.** Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges to the MS4s and control pollutants in storm water

discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the CWA.

19. **Long Term Planning and Implementation.** Federal regulations require municipal storm water permits to expire 5 years from adoption, after which the permit must be renewed and reissued. The San Diego Water Board recognizes that the degradation of water quality and impacts to beneficial uses of the waters in the San Diego Region occurred over several decades. The San Diego Water Board further recognizes that a decade or more may be necessary to realize demonstrable improvement to the quality of waters in the San Diego Region. This Order includes a long term planning and implementation approach that will require more than a single permit term to complete.

WATER QUALITY STANDARDS

20. **Basin Plan.** The San Diego Water Board adopted the Water Quality Control Plan for the San Diego Basin (Basin Plan) on September 8, 1994, that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for receiving waters addressed through the plan. The Basin Plan was subsequently approved by the State Water Resources Control Board (State Water Board) on December 13, 1994. Subsequent revisions to the Basin Plan have also been adopted by the San Diego Water Board and approved by the State Water Board. Requirements of this Order implement the Basin Plan.

    The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Process Supply (PROC), Industrial Service Supply (IND), Ground Water Recharge (GWR), Contact Water Recreation (REC1), Non-contact Water Recreation (REC2), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Freshwater Replenishment (FRSH), Hydropower Generation (POW), and Preservation of Biological Habitats of Special Significance (BIOL). The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region: Navigation (NAV), Commercial and Sport Fishing (COMM), Estuarine Habitat (EST), Marine Habitat (MAR), Aquaculture (AQUA), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN), and Shellfish Harvesting (SHELL).

21. **Ocean Plan.** The State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, and 2005. The State Water Board adopted the latest amendment on April 21, 2005 and it became effective on February 14, 2006. The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean. Requirements of this Order implement the Ocean Plan.

    The Ocean Plan identifies the following beneficial uses of ocean waters of the state to be protected: Industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture; preservation and enhancement of designated Areas of Special Biological Significance; rare and endangered species; marine habitat; fish spawning and shellfish harvesting.

22. **Sediment Quality Control Plan**. On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes: 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

23. **National Toxics Rule and California Toxics Rule.** USEPA adopted the National Toxics Rule (NTR) on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the NTR applied in California. On May 18, 2000, USEPA adopted the California Toxics Rule (CTR). The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants.

24. **Antidegradation Policy.** This Order is in conformance with the federal Antidegradation Policy described in 40 CFR 131.12, and State Water Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality Waters in California*. Federal regulations at 40 CFR 131.12 require that the State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. State Water Board Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies.

25. **Anti-Backsliding Requirements.** Section 402(o)(2) of the CWA and federal regulations at 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-

backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations may be relaxed. All effluent limitations in this Order are at least as stringent as effluent limitations in the previous permits.

CONSIDERATIONS UNDER FEDERAL AND STATE LAW

26. **Coastal Zone Act Reauthorization Amendments.** Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states with approved coastal zone management programs to address non-point source pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point source pollution: agriculture, silviculture, urban, marinas, and hydromodification. This Order addresses the management measures required for the urban category, with the exception of septic systems. The runoff management programs developed pursuant to this Order fulfills the need for coastal cities to develop a runoff non-point source plan identified in the Non-Point Source Program Strategy and Implementation Plan. The San Diego Water Board addresses septic systems through the administration of other programs.

27. **Endangered Species Act.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 USC sections 1531 to 1544). This Order requires compliance with receiving water limits, and other requirements to protect the beneficial uses of waters of the State. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

28. **Report of Waste Discharge Process.** The waste discharge requirements set forth in this Order are based upon the Report of Waste Discharge submitted by the San Diego County Copermittees prior to the expiration of Order No. R9-2007-0001 (NPDES No. CAS0109266) and the Report of Waste Discharge submitted by the Orange County Copermittees prior to the expiration of Order No. R9-2009-0002 (CAS0108740). The ~~Orange County and~~ Riverside County Copermittees are not immediately covered by the waste discharge requirements in this Order. The San Diego Water Board understands that each municipality is unique although the Counties share watersheds and/or geographical boundaries. The Order will continue to use the Report of Waste Discharge process prior to initially making ~~Orange County or~~ Riverside County Copermittees subject to the requirements of this Order.

The federal regulations (40 CFR 122.21(d)(2)) and CWC section 13376 impose a duty on the Copermittees to reapply for continued coverage through submittal of a Report of Waste Discharge no later than 180 days prior to expiration of a currently effective permit. This requirement is set forth in the ~~Orange County Copermittees' and~~ Riverside County Copermittees' currently effective permit~~s~~ at Provision~~s K.2.b~~

~~and~~ K.2.c~~, respectively~~. The ~~Orange County Permit, Order No. R9-2009-0002 (NPDES No. CAS0108740) expires on December 16, 2014 and the~~ Riverside County MS4 Permit, Order No. R9-2010-0016 (NPDES No. CAS0108766) expires on November 10, 2015.

Unless the ~~Orange County or~~ Riverside County Copermittees apply for and receive early coverage under this Order, ~~the Orange County Copermittees' and~~ the Riverside County Copermittees' ~~respective~~ permit~~s~~ will be superseded by this Order upon expiration of their ~~respective~~ permit~~s~~, subject to any necessary revisions to the requirements of this Order made after the San Diego Water Board considers their ~~respective~~ Report~~s~~ of Waste Discharge through the public process provided in 40 CFR Part 124.

29. Regional Water Board Designation. The Cities of Laguna Hills, Laguna Woods, and Lake Forest are located partially within the jurisdictions of the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board) and the San Diego Water Board and their dischargers are subject to regulation by both Regional Water Boards. Pursuant to CWC section13228, the Cities of Laguna Hills, Laguna Woods, and Lake Forest submitted written requests that one Regional Water Board be designated to regulate Phase I MS4 discharges for each of the Cities. The Santa Ana Water Board and the San Diego Water Board have entered into an agreement whereby the San Diego Water Board is designated to regulate Phase I MS4 discharges within the jurisdiction of the Cities of Laguna Woods and Laguna Hills and the Santa Ana Water Board is designated to regulate Phase I MS4 discharges within the jurisdiction of the City of Lake Forest pursuant to MS4 permits administered by each Regional Water Board. The agreement provides that the City of Lake Forest will be required to retain, and continue implementation of, its over-irrigation discharge prohibition in Title 15, Chapter 14.030, List (b) of the City Municipal Code for regulating storm water quality throughout its jurisdiction. The City of Lake Forest will also be required to actively participate during development and implementation of the Aliso Creek Watershed Management Area Water Quality Improvement Plan required pursuant to this Order. Each Regional Water Board retains the authority to enforce provisions of the Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee (Water Code section 13228 (b)). Under the terms of the agreement, any TMDL and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Laguna Woods, Laguna Hills or Lake Forest as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement of the applicable TMDL will remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's San Diego Creek/Newport Bay TMDL and the San Diego Water Board's Indicator Bacteria Project I Beaches and Creeks TMDL. The San Diego Water Board will periodically review the effectiveness of the agreement during each MS4 permit reissuance. Based on this periodic review the San Diego Water

Board may terminate the agreement with Santa Ana Water Board or otherwise modify the agreement subject to the approval of the Santa Ana Water Board.

~~29.~~30. **Integrated Report and Clean Water Act Section 303(d) List.** The San Diego Water Board and State Water Board submit an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. USEPA issued its *Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act* on July 29, 2005, which advocates the use of a five category approach for classifying the attainment status of water quality standards for water bodies in the Integrated Report. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 in the Integrated Report are placed on the 303(d) List.

Water bodies with available data and/or information that indicate at least one beneficial use is not being supported or is threatened, but a TMDL is not required, are included in Category 4 in the Integrated Report. Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

Implementation of the requirements of this Order may allow the San Diego Water Board to include surface waters impaired by discharges from the Copermittees' MS4s in Category 4 in the Integrated Report for consideration during the next 303(d) List submittal by the State to USEPA.

~~30.~~31. **Economic Considerations.** The California Supreme Court has ruled that although CWC section 13263 requires the State and Regional Water Boards (collectively Water Boards) to consider factors set forth in CWC section 13241 when issuing an NPDES permit, the Water Board may not consider the factors to justify imposing pollutant restrictions that are less stringent than the applicable federal regulations require. (*City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 618, 626-627.) However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

As noted in the following finding, the San Diego Water Board finds that the requirements in this Order are not more stringent than the minimum federal requirements. Therefore, a CWC section 13241 analysis is not required for permit requirements that implement the effective prohibition on the discharge of non-storm water into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has

determined appropriate to control such pollutants, as those requirements are mandated by federal law. Notwithstanding the above, the San Diego Water Board has developed an economic analysis of the requirements in this Order. The economic analysis is provided in the Fact Sheet.

~~31.~~32. **Unfunded Mandates.** This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following:

a. This Order implements federally mandated requirements under CWA section 402 (33 USC section 1342(p)(3)(B)).

b. The local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental and new dischargers who are issued NPDES permits for storm water and non-storm water discharges.

c. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order.

d. The Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)) and in lieu of numeric restrictions on their MS4 discharges (i.e. effluent limitations).

e. The local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under State law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

f. The provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state develops a TMDL, federal law requires that permits must contain water quality based effluent limitations consistent with the assumptions and requirements of any applicable wasteload allocation (40 CFR 122.44(d)(1)(vii)(B)).

See the Fact Sheet for further discussion of unfunded mandates.

~~32.~~33. **California Environmental Quality Act.** The issuance of waste discharge requirements and an NPDES permit for the discharge of runoff from MS4s to waters of the U.S. is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 et seq.) in accordance with CWC section 13389.

STATE WATER BOARD DECISIONS

~~33.~~34. **Compliance with Prohibitions and Limitations.** The receiving water limitation language specified in this Order is consistent with language recommended by the USEPA and established in State Water Board Order WQ 99-05, *Own Motion Review of the Petition of Environmental Health Coalition to Review Waste Discharge Requirements Order No. 96-03, NPDES Permit No. CAS0108740*, adopted by the State Water Board on June 17, 1999. The receiving water limitation language in this Order requires storm water discharges from MS4s to not cause or contribute to a violation of water quality standards, which is to be achieved through an iterative approach requiring the implementation of improved and better-tailored BMPs over time. Implementation of the iterative approach to comply with receiving water limitations based on applicable water quality standards is necessary to ensure that storm water discharges from the MS4 will not ultimately cause or contribute to violations of water quality standards and will not create conditions of pollution, contamination, or nuisance.

~~34.~~35. **Special Conditions for Areas of Special Biological Significance.** On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving a~~n~~ general exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges (General Exception). On June 19, 2012, the State Water Board adopted Order No. 2012-0031, amending the General Exception to require pollutant reductions to be achieved within six years in accordance with ASBS Compliance Plans and ASBS Pollution Prevention Plans. The General Exception ~~State Water Board Resolution No. 2012-0012~~ requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject to the terms and conditions of the General Exception as amended ~~State Water Board Resolution No. 2012-0012~~. The Special Protections contained in Attachment B to the General Exception as amended~~Resolution No. 2012-0012,~~ are applicable to these discharges, and are hereby incorporated into Attachment A of this Order. ~~as if fully set forth herein.~~

ADMINISTRATIVE FINDINGS

~~35.~~36. **Executive Officer Delegation of Authority.** The San Diego Water Board by prior resolution has delegated all matters that may legally be delegated to its Executive Officer to act on its behalf pursuant to CWC section 13223. Therefore, the Executive Officer is authorized to act on the San Diego Water Board's behalf on any matter within this Order unless such delegation is unlawful under CWC section 13223 or this Order explicitly states otherwise.

36.37. **Standard Provisions.** Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR 122.42, are provided in Attachment B to this Order.

37.38. **Fact Sheet.** The Fact Sheet for this Order contains background information, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of this Order. The Fact Sheet is hereby incorporated into this Order and constitutes part of the Findings of this Order.

38.39. **Public Notice.** In accordance with State and federal laws and regulations, the San Diego Water Board notified the Copermittees, and interested agencies and persons of its intent to prescribe waste discharge requirements for the control of discharges into and from the MS4s to waters of the U.S. and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet.

39.40. **Public Hearings.** The San Diego Water Board held a public hearing on April 10 and 11, 2013, that was continued to May 8, 2013 and heard and considered all comments pertaining to the terms and conditions of this Order. The San Diego Water Board also held a public hearing on February 11, 2015, and heard and considered all comments pertaining to the amendment of this Order through Order No. R9-2015-0001. Details of these public hearing are provided in the Fact Sheet.

40.41. **Effective Date.** This Order serves as an NPDES permit pursuant to CWA section 402 or amendments thereto, and as to the San Diego County Copermittees listed in Table 2.a., became becomes effective fifty (50) days after the date of its adoption, and as to the Orange County Copermittees listed in Table 2.b., becomes effective on April 1, 2015 after the date Order R9-2015-0001 is adopted, provided that the Regional Administrator, USEPA, Region IX, does not object to this Order.

41.42. **Review by the State Water Board.** Any person aggrieved by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with CWC section 13320 and California Code of Regulations, title 23, sections 2050, et seq and following. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date of this Order San Diego Water Board action, except that if the thirtieth day following the actiondate of this Order falls on a Saturday, Sunday or State holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

THEREFORE, IT IS HEREBY ORDERED that the Copermittees, in order to meet the provisions contained in division 7 of the CWC (commencing with section 13000) and regulations adopted thereunder, and the provisions of the CWA and regulations adopted thereunder, must each comply with the requirements of this Order. This action in no way prevents the San Diego Water Board from taking enforcement action for past violations of the previous Order. If any part of this Order is subject to a temporary stay of enforcement, unless otherwise specified, the Copermittees must comply with the analogous portions of the previous Order, which will remain in effect for all purposes during the pendency of the stay.

II. PROVISIONS

A. PROHIBITIONS AND LIMITATIONS

The purpose of this provision is to describe the conditions under which storm water and non-storm water discharges into and from MS4s are prohibited or limited. The goal of the prohibitions and limitations is to protect the water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through the implementation of water quality improvement strategies and runoff management programs that effectively prohibit non-storm water discharges into the Copermittees' MS4s, and reduce pollutants in storm water discharges from the Copermittees' MS4s to the MEP.

1. Discharge Prohibitions

a. Discharges from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the state are prohibited.

b. Non-storm water discharges into MS4s are to be effectively prohibited, through the implementation of Provision E.2, unless such discharges are authorized by a separate NPDES permit.

c. Discharges from MS4s are subject to all waste discharge prohibitions in the Basin Plan, included in Attachment A to this Order.

d. Storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 applicable to these discharges, included in Attachment A to this Order. All other discharges from the Copermittees' MS4s to ASBS are prohibited.

2. Receiving Water Limitations

a. Discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters, including but not limited to all applicable provisions contained in:

(1) The San Diego Water Board's Basin Plan, including beneficial uses, water quality objectives, and implementation plans;

(2) State Water Board plans for water quality control including the following:

(a) Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries (Thermal Plan), and

(b) The Ocean Plan, including beneficial uses, water quality objectives, and implementation plans;

(3) State Water Board policies for water and sediment quality control including the following:

(a) Water Quality Control Policy for the Enclosed Bays and Estuaries of California,

(b) Sediment Quality Control Plan which includes the following narrative objectives for bays and estuaries:

(i) Pollutants in sediments shall not be present in quantities that, alone or in combination, are toxic to benthic communities, and

(ii) Pollutants shall not be present in sediments at levels that will bioaccumulate in aquatic life to levels that are harmful to human health,

(c) The Statement of Policy with Respect to Maintaining High Quality of Waters in California;[2]

(4) Priority pollutant criteria promulgated by the USEPA through the following:

(a) National Toxics Rule (NTR)[3] (promulgated on December 22, 1992 and amended on May 4, 1995), and

(b) California Toxics Rule (CTR).[4,5]

b. Discharges from MS4s composed of storm water runoff must not alter natural ocean water quality in an ASBS.

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[2] State Water Board Resolution No. 68-16
[3] 40 CFR 131.36
[4] 65 Federal Register 31682-31719 (May 18, 2000), adding Section 131.38 to 40 CFR
[5] If a water quality objective and a CTR criterion are in effect for the same priority pollutant, the more stringent of the two applies.

3. Effluent Limitations

a. Technology Based Effluent Limitations

Pollutants in storm water discharges from MS4s must be reduced to the MEP.[6]

b. Water Quality Based Effluent Limitations

Each Copermittee must comply with applicable WQBELs established for the TMDLs in Attachment E to this Order, pursuant to the applicable TMDL compliance schedules.

4. Compliance with Discharge Prohibitions and Receiving Water Limitations

Each Copermittee must achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order through timely implementation of control measures and other actions as specified in Provisions B and E of this Order, including any modifications. The Water Quality Improvement Plans required under Provision B must be designed and adapted to ultimately achieve compliance with Provisions A.1.a, A.1.c and A.2.a.

a. If exceedance(s) of water quality standards persist in receiving waters notwithstanding implementation of this Order, the Copermittees must comply with the following procedures:

(1) For exceedance(s) of a water quality standard in the process of being addressed by the Water Quality Improvement Plan, the Copermittee(s) must implement the Water Quality Improvement Plan as accepted by the San Diego Water Board, and update the Water Quality Improvement Plan, as necessary, pursuant to Provision F.2.c;

(2) Upon a determination by either the Copermittees or the San Diego Water Board that discharges from the MS4 are causing or contributing to a new exceedance of an applicable water quality standard not addressed by the Water Quality Improvement Plan, the Copermittees must submit the following updates to the Water Quality Improvement Plan pursuant to Provision F.2.c or as part of the Water Quality Improvement Plan Annual Report required under Provision F.3.b, unless the San Diego Water Board directs an earlier submittal:

(a) The water quality improvement strategies being implemented that are effective and will continue to be implemented,

[6] This does not apply to MS4 discharges which receive subsequent treatment to reduce pollutants in storm water discharges to the MEP prior to entering receiving waters (e.g., low flow diversions to the sanitary sewer). Runoff treatment must occur prior to the discharge of runoff into receiving waters per Finding 7.

(b) Water quality improvement strategies (i.e. BMPs, retrofitting projects, stream and/or habitat rehabilitation projects, adjustments to jurisdictional runoff management programs, etc.) that will be implemented to reduce or eliminate any pollutants or conditions that are causing or contributing to the exceedance of water quality standards,

(c) Updates to the schedule for implementation of the existing and additional water quality improvement strategies, and

(d) Updates to the monitoring and assessment program to track progress toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a of this Order;

(3) The San Diego Water Board may require the incorporation of additional modifications to the Water Quality Improvement Plan required under Provision B. The applicable Copermittees must submit any modifications to the update to the Water Quality Improvement Plan within 90 days of notification that additional modifications are required by the San Diego Water Board, or as otherwise directed;

(4) Within 90 days of the San Diego Water Board determination that the modifications to the Water Quality Improvement Plan required under Provision A.4.a.(3) meet the requirements of this Order, the applicable Copermittees must revise the jurisdictional runoff management program documents to incorporate the modified water quality improvement strategies that have been and will be implemented, the implementation schedule, and any additional monitoring required; and

(5) Each Copermittee must implement the updated Water Quality Improvement Plan.

b. The procedure set forth above to achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order do not have to be repeated for continuing or recurring exceedances of the same water quality standard(s) following implementation of scheduled actions unless directed to do otherwise by the San Diego Water Board.

c. Nothing in Provisions A.4.a and A.4.b prevents the San Diego Water Board from enforcing any provision of this Order while the applicable Copermittees prepare and implement the above update to the Water Quality Improvement Plan and jurisdictional runoff management programs.

B. WATER QUALITY IMPROVEMENT PLANS

The purpose of this provision is to develop Water Quality Improvement Plans that guide the Copermittees' jurisdictional runoff management programs towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plans is to further the Clean Water Act's objective to protect, preserve, enhance, and restore the water quality and designated beneficial uses of waters of the state. This goal will be accomplished through an adaptive planning and management process that identifies the highest priority water quality conditions within a watershed and implements strategies through the jurisdictional runoff management programs to achieve improvements in the quality of discharges from the MS4s and receiving waters.

1. Watershed Management Areas

The Copermittees must develop a Water Quality Improvement Plan for each of the Watershed Management Areas in Table B-1. A total of ten Water Quality Improvement Plans must be developed for the San Diego Region.

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
San Juan (901.00)	South Orange County	- Aliso Creek - San Juan Creek - San Mateo Creek - Pacific Ocean - Heisler Park ASBS	- City of Aliso Viejo[~~1~~] - City of Dana Point[~~1~~] - City of Laguna Beach[~~1~~] - City of Laguna Hills[1] - City of Laguna Niguel[~~1~~] - City of Laguna Woods[1] - City of Lake Forest[~~1~~2] - City of Mission Viejo[~~1~~] - City of Rancho Santa Margarita[~~1~~] - City of San Clemente[1] - City of San Juan Capistrano[~~1~~] - County of Orange[~~1~~] - Orange County Flood Control District[~~1~~]
Santa Margarita (902.00)	Santa Margarita River	- Murrieta Creek - Temecula Creek - Santa Margarita River - Santa Margarita Lagoon - Pacific Ocean	- City of Murrieta[~~2~~3] - City of Temecula[~~2~~3] - City of Wildomar[~~2~~3] - County of Riverside[~~2~~3] - County of San Diego[~~3~~4] - Riverside County Flood Control and Water Conservation District[~~2~~3]
San Luis Rey (903.00)	San Luis Rey River	- San Luis Rey River - San Luis Rey Estuary - Pacific Ocean	- City of Oceanside - City of Vista - County of San Diego

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
Carlsbad (904.00)	Carlsbad	- Loma Alta Slough - Buena Vista Lagoon - Agua Hedionda Lagoon - Batiquitos Lagoon - San Elijo Lagoon - Pacific Ocean	- City of Carlsbad - City of Encinitas - City of Escondido - City of Oceanside - City of San Marcos - City of Solana Beach - City of Vista - County of San Diego
San Dieguito (905.00)	San Dieguito River	- San Dieguito River - San Dieguito Lagoon - Pacific Ocean	- City of Del Mar - City of Escondido - City of Poway - City of San Diego - City of Solana Beach - County of San Diego
Penasquitos (906.00)	Penasquitos	- Los Penasquitos Lagoon - Pacific Ocean	- City of Del Mar - City of Poway - City of San Diego - County of San Diego
	Mission Bay	- Mission Bay - Pacific Ocean - San Diego Marine Life Refuge ASBS	- City of San Diego
San Diego (907.00)	San Diego River	- San Diego River - Pacific Ocean	- City of El Cajon - City of La Mesa - City of San Diego - City of Santee - County of San Diego
Pueblo San Diego (908.00) Sweetwater (909.00) Otay (910.00)	San Diego Bay	- Sweetwater River - Otay River - San Diego Bay - Pacific Ocean	- City of Chula Vista - City of Coronado - City of Imperial Beach - City of La Mesa - City of Lemon Grove - City of National City - City of San Diego - County of San Diego - San Diego County Regional Airport Authority - San Diego Unified Port District
Tijuana (911.00)	Tijuana River	- Tijuana River - Tijuana Estuary - Pacific Ocean	- City of Imperial Beach - City of San Diego - County of San Diego

Notes:

1. The MS4 discharges within the jurisdiction of the City of Laguna Hills and the City of Laguna Woods located in the Santa Ana Region will be regulated by San Diego Water Board Order No. R9-2013-0001. The City of Laguna Hills and Laguna Woods must also comply with the requirements of the San Diego Creek/Newport Bay TMDL in section XVIII of Santa Ana Water Board Order No. R8-2014-0002 and any reissuance thereto.
2. ~~The Orange County Copermittees will be covered under this Order after expiration of Order No. R9-2009-0002, or earlier if the Orange County Copermittees meet the conditions in Provision F.6.~~The MS4 discharges within the jurisdiction of the City of Lake Forest located in the San Diego Region will be regulated by the Santa Ana Water Board Order No. R8-2014-0002 (NPDES No. CAS618030) and any reissuance thereto. The City of Lake Forest must also comply with the requirements of the Bacteria TMDL in Attachment E of this Order, participate in preparation and implementation of the Water Quality Improvement Plan for the Aliso Creek Watershed Management Area as described in Provision B of this Order and continue implementation of its over-irrigation discharge prohibition in Title 15, Chapter 15, section 14.030, List (b).

~~2.~~3. The Riverside County Copermittees will be covered under this Order after expiration of Order No. R9-2010-0016, or earlier if the Riverside County Copermittees meet the conditions in Provision F.6.

~~3~~4.. The County of San Diego is not required to implement the requirements of Provision B for its jurisdiction within the Santa Margarita River Watershed Management Area until the Riverside County Copermittees have been notified of coverage under this Order. The County of San Diego is required to implement the requirements of Provisions D, F.3.b, and Attachment E until the Riverside County Copermittees have been notified of coverage under this Order.

2. Priority Water Quality Conditions

The Copermittees must identify the water quality priorities within each Watershed Management Area that will be addressed by the Water Quality Improvement Plan. Where appropriate, Watershed Management Areas may be separated into subwatersheds to focus water quality prioritization and jurisdictional runoff management program implementation efforts by receiving water.

a. Assessment of Receiving Water Conditions

The Copermittees must consider the following, at a minimum, to identify water quality priorities based on impacts of MS4 discharges on receiving water beneficial uses:

(1) Receiving waters listed as impaired on the CWA Section 303(d) List of Water Quality Limited Segments (303(d) List);

(2) TMDLs adopted and under development by the San Diego Water Board;

(3) Receiving waters recognized as sensitive or highly valued by the Copermittees, including estuaries designated under the National Estuary Program under CWA section 320, wetlands defined by the State or U.S. Fish and Wildlife Service's National Wetlands Inventory as wetlands, waters having the Preservation of Biological Habitats of Special Significance (BIOL) beneficial use designation, and receiving waters identified as ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(4) The receiving water limitations of Provision A.2;

(5) Known historical versus current physical, chemical, and biological water quality conditions;

(6) Available, relevant, and appropriately collected and analyzed physical, chemical, and biological receiving water monitoring data, including, but not limited to, data describing:

(a) Chemical constituents,

(b) Water quality parameters (i.e. pH, temperature, conductivity, etc.),

(c) Toxicity Identification Evaluations for both receiving water column and sediment,

(d) Trash impacts,

(e) Bioassessments, and

(f) Physical habitat;

(7) Available evidence of erosional impacts in receiving waters due to accelerated flows (i.e. hydromodification);

(8) Available evidence of adverse impacts to the chemical, physical, and biological integrity of receiving waters; and

(9) The potential improvements in the overall condition of the Watershed Management Area that can be achieved.

b. ASSESSMENT OF IMPACTS FROM MS4 DISCHARGES

The Copermittees must consider the following, at a minimum, to identify the potential impacts to receiving waters that may be caused or contributed to by discharges from the Copermittees' MS4s:

(1) The discharge prohibitions of Provision A.1 and effluent limitations of Provision A.3; and

(2) Available, relevant, and appropriately collected and analyzed storm water and non-storm water monitoring data from the Copermittees' MS4 outfalls;

(3) Locations of each Copermittee's MS4 outfalls that discharge to receiving waters;

(4) Locations of MS4 outfalls that are known to persistently discharge non-storm water to receiving waters likely causing or contributing to impacts on receiving water beneficial uses;

(5) Locations of MS4 outfalls that are known to discharge pollutants in storm water causing or contributing to impacts on receiving water beneficial uses; and

(6) The potential improvements in the quality of discharges from the MS4 that can be achieved.

c. IDENTIFICATION OF PRIORITY WATER QUALITY CONDITIONS

(1) The Copermittees must use the information gathered for Provisions B.2.a and B.2.b to develop a list of priority water quality conditions as pollutants, stressors and/or receiving water conditions that are the highest threat to receiving water quality or that most adversely affect the quality of receiving waters. The list must include the following information for each priority water

quality condition:

(a) The beneficial use(s) associated with the priority water quality condition;

(b) The geographic extent of the priority water quality condition within the Watershed Management Area, if known;

(c) The temporal extent of the priority water quality condition (e.g., dry weather and/or wet weather);

(d) The Copermittees with MS4s discharges that may cause or contribute to the priority water quality condition; and

(e) An assessment of the adequacy of and data gaps in the monitoring data to characterize the conditions causing or contributing to the priority water quality condition, including a consideration of spatial and temporal variation.

(2) The Copermittees must identify the highest priority water quality conditions to be addressed by the Water Quality Improvement Plan, and provide a rationale for selecting a subset of the water quality conditions identified pursuant to Provision B.2.c.(1) as the highest priorities.

d. IDENTIFICATION OF MS4 SOURCES OF POLLUTANTS AND/OR STRESSORS

The Copermittees must identify and prioritize known and suspected sources of storm water and non-storm water pollutants and/or other stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c. The identification of known and suspected sources of pollutants and/or stressors that cause or contribute to the highest priority water quality conditions as identified for Provision B.2.c must consider the following:

(1) Pollutant generating facilities, areas, and/or activities within the Watershed Management Area, including:

(a) Each Copermittee's inventory of construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas,

(b) Publicly owned parks and/or recreational areas,

(c) Open space areas,

(d) All currently operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste, and

(e) Areas not within the Copermittees' jurisdictions (e.g., Phase II MS4s, tribal

lands, state lands, federal lands) that are known or suspected to be discharging to the Copermittees' MS4s;

(2) Locations of the Copermittees' MS4s, including the following:

(a) All MS4 outfalls that discharge to receiving waters, and

(b) Locations of major structural controls for storm water and non-storm water (e.g., retention basins, detention basins, major infiltration devices, etc.);

(3) Other known and suspected sources of non-storm water or pollutants in storm water discharges to receiving waters within the Watershed Management Area, including the following:

(a) Other MS4 outfalls (e.g., Phase II Municipal and Caltrans),

(b) Other NPDES permitted discharges,

(c) Any other discharges that may be considered point sources (e.g., private outfalls), and

(d) Any other discharges that may be considered non-point sources (e.g., agriculture, wildlife or other natural sources);

(4) Review of available data, including but not limited to:

(a) Findings from the Copermittees' illicit discharge detection and elimination programs,

(b) Findings from the Copermittees' MS4 outfall discharge monitoring,

(c) Findings from the Copermittees' receiving water monitoring,

(d) Findings from the Copermittees' MS4 outfall discharge and receiving water assessments, and

(e) Other available, relevant, and appropriately collected data, information, or studies related to pollutant sources and/or stressors that contribute to the highest priority water quality conditions as identified for Provision B.2.c.

(5) The adequacy of the available data to identify and prioritize sources and/or stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c.

e. IDENTIFICATION OF POTENTIAL WATER QUALITY IMPROVEMENT STRATEGIES

The Copermittees must evaluate the findings identified under Provisions B.2.a-d, and identify potential strategies that can result in improvements to water quality in MS4 discharges and/or receiving waters within the Watershed Management

Area. Potential water quality improvement strategies that may be implemented within the Watershed Management Area must include the following:

(1) Structural BMPs, non-structural BMPs, incentives, or programs that can potentially be implemented to address the highest priority water quality conditions identified under Provision B.2.c, or MS4 sources of pollutants or stressors identified under Provision B.2.d,

(2) Retrofitting projects in areas of existing development within the Watershed Management Area that can potentially be implemented to reduce MS4 sources of pollutants or stressors identified under Provision B.2.d causing or contributing to the highest priority water quality conditions identified under Provision B.2.c, and

(3) Stream, channel, and/or habitat rehabilitation projects within the Watershed Management Area that can potentially be implemented to protect and/or improve conditions in receiving waters from MS4 pollutants and/or stressors identified under Provision B.2.d causing or contributing to the highest priority water quality conditions identified under Provision B.2.c.

3. Water Quality Improvement Goals, Strategies and Schedules

The Copermittees must identify and develop specific water quality improvement goals and strategies to address the highest priority water quality conditions identified within a Watershed Management Area. The water quality improvement goals and strategies must address the highest priority water quality conditions by effectively prohibiting non-storm water discharges to the MS4, reducing pollutants in storm water discharges from the MS4 to the MEP, and protecting the water quality standards of receiving waters.

a. WATER QUALITY IMPROVEMENT GOALS AND SCHEDULES

(1) Numeric Goals

The Copermittees must develop and incorporate numeric goals[7] into the Water Quality Improvement Plan. Numeric goals must be used to support Water Quality Improvement Plan implementation and measure reasonable progress towards addressing the highest priority water quality conditions identified under Provision B.2.c. The Copermittees must establish and incorporate the following numeric goals in the Water Quality Improvement

[7] Interim and final numeric goals may take a variety of forms such as TMDL established WQBELs, action levels, pollutant concentration, load reductions, number of impaired water bodies delisted from the List of Water Quality Impaired Segments, Index of Biotic Integrity (IBI) scores, or other appropriate metrics. Interim and final numeric goals are not necessarily limited to one criterion or indicator, but may include multiple criteria and/or indicators. Except for TMDL established WQBELs, interim and final numeric goals and corresponding schedules may be revised through the adaptive management process under Provision B.5.

Plan:

(a) Final numeric goals must be based on measureable criteria or indicators capable of demonstrating one or more of the following:

(i) Discharges from the Copermittees' MS4s will not cause or contribute to exceedances of water quality standards in receiving waters, AND/OR

(ii) The conditions of receiving waters and associated habitat are protected from MS4 discharges, AND/OR

(iii) Beneficial uses of receiving waters are protected from MS4 discharges and will be supported.

(b) Interim numeric goals must be based on measureable criteria or indicators capable of demonstrating reasonable incremental progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges as follows:

(i) One or more interim numeric goals may be established to demonstrate progress toward achieving each final numeric goal,

(ii) For each final numeric goal, at least one interim numeric goal must be expressed as a reasonable increment toward achievement of the final numeric goal,

(iii) For each final numeric goal, reasonable interim numeric goals must be established to be accomplished during each 5 year period between the acceptance of the Water Quality Improvement Plan and the achievement of the final numeric goals.

(2) Schedules for Achieving Numeric Goals

The Copermittees must develop and incorporate schedules for achieving the numeric goals into the Water Quality Improvement Plan. The schedules must demonstrate reasonable progress toward achieving the final numeric goals required for Provision B.3.a.(1). The Copermittees must incorporate the schedules for achieving the numeric goals into the Water Quality Improvement Plan based on the following considerations:

(a) Final dates for achieving all final numeric goals must be established considering the following:

(i) Final compliance dates for any applicable TMDLs in Attachment E to this Order;

(ii) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(iii) Achievement of the final numeric goals for the highest water quality priorities must be as soon as possible;

(iv) Final dates for achieving the final numeric goals must reflect a realistic assessment of the shortest practicable time required based on the temporal and spatial extent and factors associated with the highest priority water quality conditions identified under Provision B.2.c, and taking into account the time reasonably required to implement the water quality improvement strategies required pursuant to Provision B.3.b.

(b) Interim dates for achieving all interim numeric goals must be established considering the following:

(i) Interim compliance dates for any applicable TMDLs in Attachment E to this Order;

(ii) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(iii) Interim dates for achieving the interim numeric goals must reflect a realistic assessment of the shortest practicable time reasonably required, taking into account the time needed to implement new or significantly expanded programs and securing financing, if necessary; and

(iv) For each final numeric goal, at least one interim numeric goal must be established that the Copermittees will work toward achieving within the term of this Order.

b. WATER QUALITY IMPROVEMENT STRATEGIES AND SCHEDULES

Based on the likely effectiveness and efficiency of the potential water quality improvement strategies identified under Provision B.2.e to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a, the Copermittees must identify the strategies that will be implemented in each Watershed Management Area as follows:

(1) Jurisdictional Strategies

(a) Each Copermittee in the Watershed Management Area must identify the strategies that will be implemented within its jurisdiction as part of its jurisdictional runoff management program requirements under Provisions E.2 through E.7, including descriptions of the following:

(i) For each of the inventories developed for its jurisdiction, as required

under Provisions D.2.a.(1), E.3.e.(2), E.4.b, and E.5.a, each Copermittee must identify the known and suspected areas or sources causing or contributing to the highest priority water quality conditions in the Watershed Management Area that the Copermittee will focus on in its efforts to effectively prohibit non-storm water discharges to its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, and achieve the interim and final numeric goals identified under Provision B.3.a;

(ii) BMPs that each Copermittee will implement, or require to be implemented, as applicable, for those areas or sources within its jurisdiction;

(iii) Education programs that each Copermittee will implement, as applicable, for those areas or sources within its jurisdiction;

(iv) Frequencies that each Copermittee will conduct inspections on those areas or sources within its jurisdiction;

(v) Incentive and enforcement programs that each Copermittee will implement, as applicable, for those areas or sources within its jurisdiction; and

(vi) Any other BMPs, incentives, or programs that each Copermittee will implement for those areas or sources within its jurisdiction.

(b) Identify the optional jurisdictional strategies that each Copermittee will implement within its jurisdiction, as necessary, to effectively prohibit non-storm water discharges to its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. Descriptions of the optional jurisdictional strategies must include:

(i) BMPs, incentives, or programs that may be implemented by the Copermittee within its jurisdiction in addition to the requirements of Provisions B.3.b.(1)(a);

(ii) Incentives or programs that may be implemented by the Copermittee to encourage or implement projects to retrofit areas of existing development within its jurisdiction;

(iii) Incentives or programs that may be implemented by the Copermittee to encourage or implement projects that will rehabilitate the conditions of channels or habitats within its jurisdiction;

(iv) The funds and/or resources that must be secured by the Copermittee to implement the optional strategies described for Provisions B.3.b.(1)(b)(i)-(iii) within its jurisdiction; and

(v) The circumstances necessary to trigger implementation of the optional jurisdictional strategies, in addition to the requirements of Provision B.3.b.(1)(a), to achieve the interim and final numeric goals within the schedules established under Provision B.3.a.

(c) Identify the strategies that will be implemented by the Copermittee in coordination with or with the cooperation of other agencies (e.g. Caltrans, water districts, school districts) and/or entities (e.g. non-governmental organizations) within its jurisdiction.

(2) Watershed Management Area Strategies

The Copermittees must identify the optional regional or multi-jurisdictional strategies that will be implemented in the Watershed Management Area, as necessary, to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. Descriptions of the optional regional or multi-jurisdictional strategies must include:

(a) Regional or multi-jurisdictional BMPs, incentives, or programs that may be implemented by the Copermittees in the Watershed Management Area;

(b) Incentives or programs that may be implemented by the Copermittees in the Watershed Management Area to encourage or implement regional or multi-jurisdictional projects to retrofit areas of existing development;

(c) Incentives or programs that may be implemented by the Copermittees to encourage or implement regional or multi-jurisdictional projects that will rehabilitate the conditions of channels, streams, or habitats within the Watershed Management Area;

(d) The funds and/or resources that must be secured by the Copermittees to implement the optional strategies described for Provisions B.3.b.(2)(a)-(c) within the Watershed Management Area; and

(e) The circumstances necessary to trigger implementation of the optional regional or multi-jurisdictional strategies to achieve the interim and final numeric goals within the schedules established under Provision B.3.a.

(3) Schedules for Implementing Strategies

The Copermittees must develop reasonable schedules for implementing the water quality improvement strategies identified under Provisions B.3.b.(1) and B.3.b.(2) to achieve the interim and final numeric goals identified and

schedules established under Provision B.3.a. The Copermittees must incorporate the schedules to implement the water quality improvement strategies into the Water Quality Improvement Plan as follows:

(a) Each Copermittee must develop schedules for the jurisdictional strategies identified pursuant to Provisions B.3.b.(1)(a)-(b). Each schedule must specify:

(i) If each jurisdictional strategy identified pursuant to Provision B.3.b.(1)(a) will or will not be initiated upon acceptance of the Water Quality Improvement Plan;

(ii) For each jurisdictional strategy identified pursuant to Provision B.3.b.(1)(a) that will not be initiated upon acceptance~~approval~~ of the Water Quality Improvement Plan, the shortest practicable time in which each jurisdictional strategy will be initiated after acceptance of the Water Quality Improvement Plan;

(iii) For each optional jurisdictional strategy identified pursuant to Provision B.3.b.(1)(b), a realistic assessment of the shortest practicable time required to:

[a] Secure the resources needed to fund the optional jurisdictional strategy, and
[b] Procure the resources, materials, labor, and applicable permits necessary to initiate implementation of the optional jurisdictional strategy;

(iv) If each jurisdictional strategy identified pursuant to Provisions B.3.b.(1)(a)-(b) is expected to be continuously implemented (e.g. inspections) or completed within a schedule (e.g. construction of structural BMP); and

(v) If a jurisdictional strategy identified pursuant to Provisions B.3.b.(1)(a)-(b) is expected to be completed within a schedule, the anticipated time to complete based on a realistic assessment of the shortest practicable time required.

(b) The Copermittees in the Watershed Management Area must develop schedules for the regional or multi-jurisdictional strategies identified pursuant to Provision B.3.b.(2). Each schedule must specify:

(i) A realistic assessment of the shortest practicable time to:

[a] Secure the resources needed to fund the optional regional or multi-jurisdictional strategy, and
[b] Procure the resources, materials, labor, and permits necessary to initiate the implementation of the optional regional or multi-jurisdictional strategy;

(ii) If each regional or multi-jurisdictional strategy identified pursuant to Provision B.3.b.(2) is expected to be continuously implemented (e.g. inspections) or completed within a schedule (e.g. construction of structural BMP); and

(iii) If a regional or multi-jurisdictional strategy and/or activity identified pursuant to Provisions B.3.b.(2) is expected to be completed within a schedule, the anticipated time to complete based on a realistic assessment of the shortest practicable time required.

(4) Optional Watershed Management Area Analysis

(a) For each Watershed Management Area, the Copermittees have the option to perform a Watershed Management Area Analysis for the purpose of developing watershed-specific requirements for structural BMP implementation, as described in Provision E.3.c.(3). The Watershed Management Area Analysis must include GIS layers (maps) as output. The analysis must include the following information, to the extent it is available, in order to characterize the Watershed Management Areas:

(i) A description of dominant hydrologic processes, such as areas where infiltration or overland flow likely dominates;

(ii) A description of existing streams in the watershed, including bed material and composition, and if they are perennial or ephemeral;

(iii) Current and anticipated future land uses;

(iv) Potential coarse sediment yield areas; and

(v) Locations of existing flood control structures and channel structures, such as stream armoring, constrictions, grade control structures, and hydromodification or flood management basins.

(b) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify and compile a list of candidate projects that could potentially be used as alternative compliance options for Priority Development Projects, to be implemented in lieu of onsite structural BMP performance requirements described in Provisions E.3.c.(1) and E.3.c.(2). Specifically, the Copermittees must identify opportunities to be included in the list of candidate projects in each Watershed Management Area, such as:

(i) Stream or riparian area rehabilitation;

(ii) Retrofitting existing infrastructure to incorporate storm water retention or treatment;

(iii) Regional BMPs;

(iv) Groundwater recharge projects;

(v) Water supply augmentation projects; and

(vi) Land purchases to preserve floodplain functions.

(c) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify areas within the Watershed Management Area where it is appropriate to allow Priority Development Projects to be exempt from the hydromodification management BMP performance requirements described in Provision E.3.c.(2), including supporting rationale.

4. Water Quality Improvement Monitoring and Assessment Program

a. The Copermittees in each Watershed Management Area must develop and incorporate an integrated monitoring and assessment program into the Water Quality Improvement Plan that assesses: 1) the progress toward achieving the numeric goals and schedules, 2) the progress toward addressing the highest priority water quality conditions for each Watershed Management Area, and 3) each Copermittee's overall efforts to implement the Water Quality Improvement Plan.

b. The monitoring and assessment program must incorporate the monitoring and assessment requirements of Provision D, which may allow the Copermittees to modify the program to be consistent with and focus on the highest priority water quality conditions for each Watershed Management Area.

c. For Watershed Management Areas with applicable TMDLs, the monitoring and assessment program must incorporate the specific monitoring and assessment requirements of Attachment E.

d. For Watershed Management Areas with any ASBS, the water quality monitoring and assessment program must incorporate the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

5. Iterative Approach and Adaptive Management Process

The Copermittees in each Watershed Management Area must implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a, and must include the following:

a. RE-EVALUATION OF PRIORITY WATER QUALITY CONDITIONS

The priority water quality conditions and potential water quality improvement strategies included in the Water Quality Improvement Plan pursuant to Provisions B.2.c and B.2.e may be re-evaluated by the Copermittees as needed during the term of this Order as part of the Water Quality Improvement Plan Annual Report. Re-evaluation and recommendations for modifications to the priority water quality conditions and potential water quality improvement strategies must be provided in the Report of Waste Discharge, and must consider the following:

(1) Achieving the outcome of improved water quality in MS4 discharges and receiving waters through implementation of the water quality improvement strategies identified in the Water Quality Improvement Plan;

(2) New information developed when the requirements of Provisions B.2.a-c have been re-evaluated;

(3) Spatial and temporal accuracy of monitoring data collected to inform prioritization of water quality conditions and implementation strategies to address the highest priority water quality conditions;

(4) Availability of new information and data from sources other than the jurisdictional runoff management programs within the Watershed Management Area that informs the effectiveness of the actions implemented by the Copermittees;

(5) San Diego Water Board recommendations; and

(6) Recommendations for modifications solicited through a public participation process.

b. ADAPTATION OF GOALS, STRATEGIES AND SCHEDULES

The water quality improvement goals, strategies and schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.3, must be re-evaluated and adapted as new information becomes available to result in more effective and efficient measures to address the highest priority water quality conditions identified pursuant to Provision B.2.c. Re-evaluation of and modifications to the water quality improvement goals, strategies and schedules must be provided in the Water Quality Improvement Plan Annual Report, and must consider the following:

(1) Modifications to the priority water quality conditions based on Provision B.5.a;

(2) Progress toward achieving interim and final numeric goals in receiving waters and MS4 discharges for the highest priority water quality conditions in the Watershed Management Area,

(3) Progress toward achieving outcomes according to established schedules;

(4) New policies or regulations that may affect identified numeric goals;

(5) Measurable or demonstrable reductions of non-storm water discharges to and from each Copermittee's MS4;

(6) Measurable or demonstrable reductions of pollutants in storm water discharges from each Copermittee's MS4 to the MEP;

(7) New information developed when the requirements of Provisions B.2.b and B.2.d have been re-evaluated;

(8) Efficiency in implementing the Water Quality Improvement Plan;

(9) San Diego Water Board recommendations; and

(10) Recommendations for modifications solicited through a public participation process.

c. ADAPTATION OF MONITORING AND ASSESSMENT PROGRAM

The water quality improvement monitoring and assessment program, included in the Water Quality Improvement Plan pursuant to Provision B.4, must be re-evaluated and adapted when new information becomes available. Re-evaluation and recommendations for modifications to the monitoring and assessment program, pursuant to the requirements of Provision D, may be provided in the Water Quality Improvement Plan Annual Report, but must be provided in the Report of Waste Discharge.

6. Water Quality Improvement Plan Submittal, Updates, and Implementation

a. The Copermittees must submit and commence implementation of the Water Quality Improvement Plans in accordance with the requirements of Provision F.1.

b. The Copermittees must submit proposed updates to the Water Quality Improvement Plan for acceptance by the San Diego Water Board Executive Officer in accordance with the requirements of Provision F.2.c.

C. ACTION LEVELS

The purpose of this provision is for the Copermittees to incorporate numeric action levels in the Water Quality Improvement Plans. The goal of the action levels is to guide Water Quality Improvement Plan implementation efforts and measure progress towards the protection of water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through monitoring and assessing the quality of the MS4 discharges during the implementation of the Water Quality Improvement Plans.

1. Non-Storm Water Action Levels[8]

The Copermittees must develop and incorporate numeric non-storm water action levels (NALs) into the Water Quality Improvement Plan to: 1) support the development and prioritization of water quality improvement strategies for effectively prohibiting non-storm water discharges to the MS4s, 2) assess the effectiveness of the water quality improvement strategies toward addressing MS4 non-storm water discharges, required pursuant to Provision D.4.b.(1), and 3) support the detection and elimination of non-storm water and illicit discharges to the MS4, required pursuant to Provision E.2.[9]

a. The following NALs must be incorporated:

(1) Non-Storm Water Discharges from MS4s to Ocean Surf Zone

Table C-1. Non-Storm Water Action Levels for Discharges from MS4s to Ocean Surf Zone

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Total Coliform	MPN/100 ml	1,000	-	10,000/1,000[1]	OP
Fecal Coliform	MPN/100 ml	200[2]	-	400	OP
Enterococci	MPN/100 ml	35	-	104[3]	OP

Abbreviations/Acronyms
AMAL – average monthly action level
MDAL – maximum daily action level
OP – Ocean Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Total coliform density NAL is 1,000 MPN/100 ml when the fecal/total coliform ratio exceeds 0.1.
2. Fecal coliform density NAL is 200 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas."

[8] NALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, unless the NAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed.
[9] The Copermittees may utilize NALs or other benchmarks currently established by the Copermittees as interim NALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

(2) Non-Storm Water Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Table C-2. Non-Storm Water Action Levels for Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Turbidity	NTU	75	-	225	OP
pH	Units	Within limit of 6.0 to 9.0 at all times			OP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	35	-	104[3]	BP
Priority Pollutants	µg/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
OP – Ocean Plan water quality objective
NTU – Nephelometric Turbidity Units
µg/L – micrograms per liter
MDAL – maximum daily action level
BP – Basin Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas" and is not applicable to water bodies that are not designated with the water contact recreation (REC-1) beneficial use.

Table C-3. Non-Storm Water Action Levels for Priority Pollutants

Parameter	Units	Freshwater (CTR)		Saltwater (CTR)	
		MDAL	AMAL	MDAL	AMAL
Cadmium	µg/L	**	**	16	8
Copper	µg/L	*	*	5.8	2.9
Chromium III	µg/L	**	**	-	-
Chromium VI	µg/L	16	8.1	83	41
Lead	µg/L	*	*	14	2.9
Nickel	µg/L	**	**	14	6.8
Silver	µg/L	*	*	2.2	1.1
Zinc	µg/L	*	*	95	47

Abbreviations/Acronyms:
CTR – California Toxic Rule
AMAL – average monthly action level
µg/L – micrograms per liter
MDAL – maximum daily action level

Notes:
* Action levels developed on a case-by-case basis (see below)
** Action levels developed on a case-by-case basis (see below), but calculated criteria are not to exceed Maximum Contaminant Levels (MCLs) under the California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64431

The Cadmium, Copper, Chromium (III), Lead, Nickel, Silver and Zinc NALs for MS4 discharges to freshwater receiving waters will be developed on a case-by-case basis based on site-specific water quality data (receiving water hardness). For these priority pollutants, refer to 40 CFR 131.38(b)(2).

(3) Non-Storm Water Discharges from MS4s to Inland Surface Waters

Table C-4. Non-Storm Water Action Levels for Discharges from MS4s to Inland Surface Waters

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Dissolved Oxygen	mg/L	Not less than 5.0 in WARM waters and not less than 6.0 in COLD waters			BP
Turbidity	NTU	-	20	See MDAL	BP
pH	Units	Within limit of 6.5 to 8.5 at all times			BP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	33	-	61[3]	BP
Total Nitrogen	mg/L	-	1.0	See MDAL	BP
Total Phosphorus	mg/L	-	0.1	See MDAL	BP
MBAS	mg/L	-	0.5	See MDAL	BP
Iron	mg/L	-	0.3	See MDAL	BP
Manganese	mg/L	-	0.05	See MDAL	BP
Priority Pollutants	µg/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
BP – Basin Plan water quality objective
COLD – cold freshwater habitat beneficial use
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
MDAL – maximum daily action level
WARM – warm freshwater habitat beneficial use
MBAS – Methylene Blue Active Substances
MPN/100 ml – most probable number per 100 milliliters
µg/L – micrograms per liter

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for freshwater "designated beach areas" and is not applicable to water bodies that are not designated with the water contact recreation (REC-1) beneficial use.

b. If not identified in Provision C.1.a, NALs must be identified, developed and incorporated in the Water Quality Improvement Plan for any pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in receiving waters associated with the highest priority water quality conditions related to non-storm water discharges from the MS4s. NALs must be based on:

(1) Applicable water quality standards which may be dependent upon site-specific or receiving water-specific conditions or assumptions to be identified by the Copermittees; or

(2) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the NALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary NALs specific to the Watershed Management Area at levels greater than the NALs required by Provisions C.1.a and C.1.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for effectively prohibiting non-storm water discharges to the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and from the MS4. The

secondary NALs may be developed using an approach acceptable to the San Diego Water Board.

d. Dry weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.b may be utilized to develop or revise NALs based on watershed-specific data, subject to San Diego Water Board Executive Officer approval.

2. Storm Water Action Levels[10]

The Copermittees must develop and incorporate numeric storm water action levels (SALs) in the Water Quality Improvement Plans to: 1) support the development and prioritization of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s, and 2) assess the effectiveness of the water quality improvement strategies toward reducing pollutants in storm water discharges, required pursuant to Provision D.4.b.(2).[11]

a. The following SALs for discharges of storm water from the MS4 must be incorporated:

Table C-5. Storm Water Action Levels for Discharges from MS4s to Receiving Waters

Parameter	Units	Action Level
Turbidity	NTU	126
Nitrate & Nitrite (Total)	mg/L	2.6
Phosphorus (Total P)	mg/L	1.46
Cadmium (Total Cd)*	µg/L	3.0
Copper (Total Cu)*	µg/L	127
Lead (Total Pb)*	µg/L	250
Zinc (Total Zn)*	µg/L	976

Abbreviations/Acronyms:
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
µg/L – micrograms per liter

Notes:
* The sampling must include a measure of receiving water hardness at each MS4 outfall. If a total metal concentration exceeds the corresponding metals SAL in Table C-5, that concentration must be compared to the California Toxics Rule criteria and the USEPA 1-hour maximum concentration for the detected level of receiving water hardness associated with that sample. If it is determined that the sample's total metal concentration for that specific metal exceeds that SAL, but does not exceed the applicable USEPA 1-hour maximum concentration criterion for the measured level of hardness, then the sample result will not be considered above the SAL for that measurement.

[10] SALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, unless the SAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed.

[11] The Copermittees may utilize SALs or other benchmarks currently established by the Copermittees as interim SALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

b. If not identified in Provision C.2.a, SALs must be identified, developed and incorporated in the Water Quality Improvement Plan for pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in receiving waters associated with the highest priority water quality conditions related to storm water discharges from the MS4s. SALs must be based on:

(1) Federal and State water quality guidance and/or water quality standards; and

(2) Site-specific or receiving water-specific conditions; or

(3) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the SALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary SALs specific to the Watershed Management Area at levels greater than the SALs required by Provisions C.2.a and C.2.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s. The secondary SALs may be developed based on the approaches recommended by the State Water Board's Storm Water Panel[12] or using an approach acceptable to the San Diego Water Board.

d. Wet weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.c may be used to develop or revise SALs based upon watershed-specific data, subject to San Diego Water Board Executive Officer approval.

[12] Storm Water Panel Recommendations to the California State Water Resources Control Board: The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities (June 2006)

D. MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS

The purpose of this provision is for the Copermittees to monitor and assess the impact on the conditions of receiving waters caused by discharges from the Copermittees' MS4s under wet weather and dry weather conditions. The goal of the monitoring and assessment program is to inform the Copermittees about the nexus between the health of receiving waters and the water quality condition of the discharges from their MS4s. This goal will be accomplished through monitoring and assessing the conditions of the receiving waters, discharges from the MS4s, pollutant sources and/or stressors, and effectiveness of the water quality improvement strategies implemented as part of the Water Quality Improvement Plans.

1. Receiving Water Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the condition of the receiving waters in each Watershed Management Area during dry weather and wet weather. Following San Diego Water Board acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct long-term receiving water monitoring during implementation of the Water Quality Improvement Plan to assess the long term trends and determine if conditions in receiving waters are improving. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following receiving water monitoring procedures:

a. TRANSITIONAL RECEIVING WATER MONITORING

Until the monitoring requirements and schedules of Provisions D.1.b-e are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following receiving water monitoring in the Watershed Management Area:

(1) Continue the receiving water monitoring programs required in Order Nos. R9-2007-0001 (Monitoring and Reporting Program No. R9-2007-0001 Sections II.A.1-A.5), R9-2009-0002, and R9-2010-0016;

(2) Continue the monitoring in the Hydromodification Management Plans approved by the San Diego Water Board;

(3) Participate in the following regional receiving water monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring,

(b) Southern California Bight Regional Monitoring, and

(c) Sediment Quality Monitoring;

(4) Implement the monitoring programs developed as part of any implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) for the TMDLs in Attachment E to this Order; and

(5) For Watershed Management Areas with ASBS, implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

b. LONG-TERM RECEIVING WATER MONITORING STATIONS

The Copermittees must select at least one long-term receiving water monitoring station from among the existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees to be representative of the receiving water quality in the Watershed Management Area. Additional long-term receiving water monitoring stations must be selected where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

c. DRY WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three dry weather monitoring events at each of the long-term receiving water monitoring stations. At least one monitoring event must be conducted during the dry season (May 1 – September 30) and at least one monitoring event must be conducted during a dry weather period during the wet season (October 1 – April 30), after the first wet weather event of the season, with an antecedent dry period of at least 72 hours following a storm event producing measureable rainfall of greater than 0.1 inch.

(1) Dry Weather Receiving Water Field Observations

For each dry weather monitoring event, the Copermittees must record field observations consistent with Table D-1 at each long-term receiving water monitoring station.

Table D-1. Field Observations for Receiving Water Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) • Station description (i.e. deposits or stains, vegetation condition, structural condition, and observable biology) • Presence and assessment of trash in and around station

(2) Dry Weather Receiving Water Field Monitoring

For each dry weather monitoring event, if conditions allow the collection of the data, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

Table D-2. Field Monitoring Parameters for Receiving Water Monitoring Stations

Parameters
• pH • Temperature • Specific conductivity • Dissolved oxygen • Turbidity

(3) Dry Weather Receiving Water Analytical Monitoring

For each dry weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable NAL constituents, and

(v) Constituents listed in Table D-3.

Table D-3. Analytical Monitoring Constituents for Receiving Water Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Pesticides	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Mercury • Nickel • Selenium • Thallium • Zinc	• Organophosphate Pesticides • Pyrethroid Pesticides	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(4) Dry Weather Receiving Water Toxicity Monitoring

For each dry weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for aquatic toxicity in accordance with Table D-4. When the State Water Board's Policy for Toxicity Assessment and Control (Toxicity Policy) is approved and in effect, the San Diego Water Board Executive Officer may direct the Copermittees to replace current toxicity program elements with standardized procedures in the Toxicity Policy.

Table D-4. Dry Weather Chronic[1] Toxicity Testing for Receiving Water Monitoring Stations

Organism	Units	Test	USEPA Protocol
Freshwater			
Pimephales promelas (Fathead Minnow)	Pass / Fail	Larval Survival and Growth	EPA-821-R-02-013
Ceriodaphnia dubia (*Daphnid*)	Pass / Fail	Survival and Production	EPA-821-R-02-013
Selenastrum capricornutum (Green Algae)	Pass / Fail	Growth	EPA-821-R-02-013
Marine and Estuarine			
Strongylocentrotus purpuratus *(Purple Sea Urchin)*	Pass / Fail	Embryo-Larval Development	EPA-600-R-95-136

Notes:
1. Chronic toxicity testing is not required at receiving water monitoring stations located at mass loading stations if the channel flows are diverted year-round during dry weather conditions to the sanitary sewer for treatment.

(a) Freshwater Test Species and Methods: If samples are collected in receiving waters with salinity less than 1 ppt, the Copermittees must follow the methods for chronic toxicity tests as established in 40 CFR 136.3 using a single-concentration test design for routine monitoring, or a five-concentration test design for additional toxicity testing if the limitation is exceeded. The Copermittees must estimate the critical life stage chronic toxicity on undiluted samples in accordance with species and short term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms (EPA-821-R-02-013; Table IA, 40 CFR 136). Additional test species may be used by the Copermittees if approved by the San Diego Water Board Executive Officer. The Copermittees must conduct:

(i) A static renewal toxicity test with the fathead minnow, *Pimephales promelas* (Larval Survival and Growth Test Method 1000.0);

(ii) A static renewal toxicity test with the daphnid, *Ceriodaphnia dubia* (Survival and Reproduction Test Method 1002.0); and

(iii) A static renewal toxicity test with the green alga, *Selenastrum capricornutum* (also named *Raphidocelis subcapitata*) (Growth Test Method 1003.0).

(b) Marine and Estuarine Test Species and Methods: If samples are collected in receiving waters with salinity greater or equal to 1 ppt, the Copermittees must follow the methods for chronic toxicity tests as established in 40 CFR 136.3 using a single-concentration test design for routine monitoring, or a five-concentration test design for additional toxicity testing if the limitation is exceeded. The Copermittees must conduct the following critical life state chronic toxicity tests on undiluted samples in accordance with species and short term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms (EPA-600-R-95-136; 1995). Artificial sea salts must be used to increase sample salinity. The Copermittees must conduct a static non-renewal toxicity test with the purple sea urchin, *Strongylocentrotus purpuratus* (Embryo-larval Development Test Method). Additional species may be used by the Copermittees if approved by the San Diego Water Board Executive Officer.

(c) Holding Times: All toxicity tests must be conducted as soon as possible following sample collection. The 36-hour sample holding time for test initiation shall be targeted. However, no more than 72 hours shall elapse before the conclusion of sample collection and test initiation.

(d) Test Species Sensitivity Screening: To determine the most sensitive test species for freshwater, the Copermittees must screen 2 wet weather and 2 dry weather toxicity tests with a vertebrate, an invertebrate, and a plant species. After this screening period, subsequent monitoring must be conducted using the most sensitive test species. Alternatively, if a sensitive test species has already been determined, or if there is prior knowledge of potential toxicant(s) and a test species is sensitive to such toxicant(s), then monitoring must be conducted using only that test species. Sensitive test species determinations must also consider the most sensitive test species used for proximal receiving water monitoring. Rescreening must occur once each permit term.

(e) Chronic toxicity test biological endpoint data must be analyzed using the Test of Significant Toxicity t-test approach specified in *National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document* (USEPA, Office of Wastewater Management, Washington, D.C., EPA-833-R-10-003, 2010). For this monitoring program, the critical chronic instream waste concentration (IWC) is set at 100 percent receiving water (i.e. no dilution) for receiving water samples. A 100 percent receiving water and a control must be tested.

(f) Toxicity Identification Evaluation (TIE) / Toxicity Reduction Evaluation (TRE): If chronic toxicity is detected in receiving waters, the Copermittees must discuss the need for conducting a TIE/TRE in the assessments required under Provision D.4.a.(2), and develop a plan for implementing the TIE/TRE to be incorporated in the Water Quality Improvement Plan.

(5) Dry Weather Receiving Water Bioassessment Monitoring

Bioassessment monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must conduct bioassessment monitoring during at least one dry weather monitoring event at each long-term receiving water monitoring station as follows:

(a) The following bioassessment samples and measurements must be collected:

(i) Macroinvertebrate samples must be collected in accordance with the "Reachwide Benthos (Multihabitat) Procedure" in the most current Surface Water Ambient Monitoring Program (SWAMP) Bioassessment Standard Operating Procedures (SOP), and amendments, as applicable;[13]

(ii) The "Full" suite of physical habitat characterization measurements must be collected in accordance with the most current SWAMP Bioassessment SOP, and as summarized in the SWAMP Stream Habitat Characterization Form – Full Version;[14] and

(iii) Freshwater algae samples must be collected in accordance with the SWAMP Standard Operating Procedures for Collecting Algae Samples.[15] Analysis of samples must include algal taxonomic composition (diatoms and soft algae) and algal biomass.

(b) The bioassessment samples, measurements, and appropriate water chemistry data must be used to calculate the following:

(i) An Index of Biological Integrity (IBI) for macroinvertebrates for each monitoring station where bioassessment monitoring was conducted, based on the most current calculation method;[16] and

[13] Ode, P.R.. 2007. Standard operating procedures for collecting macroinvertebrate samples and associated physical and chemical data for ambient bioassessments in California. California State Water Resources Control Board Surface Water Ambient Monitoring Program (SWAMP) Bioassessment SOP 001. http://www.swrcb.ca.gov/water_issues/programs/swamp/tools.shtml#monitoring

[14] Available at: http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/reports/fieldforms_fullversion052908.pdf

[15] Fetscher et al. 2009. Standard Operating Procedures for Collecting Stream Algae Samples and Associated Physical Habitat and Chemical Data for Ambient Bioassessments in California.

[16] The most current calculation method at the time the Order was adopted is outlined in "A Quantitative Tool for Assessing the Integrity of Southern California Coastal Streams" (Ode, et al. 2005. Environmental Management. Vol. 35, No. 1, pp. 1-13). If an updated or new calculation method is developed, either both (i.e. current and updated/new) methods must be used, or historical IBIs must be recalculated with the updated or new calculation method.

(ii) An IBI for algae for each monitoring station where bioassessment monitoring was conducted, when a calculation method is developed.[17]

(c) In lieu of the requirements of Provision D.1.c.(5)(a), the Copermittees may conduct the bioassessment monitoring in accordance with the "Triad" assessment approach[18] to calculate the IBIs required for Provision D.1.c.(5)(b). The Copermittees must conduct sampling, analysis, and reporting of specified in-stream biological and habitat data according to the protocols specified in the SCCWRP Technical Report No. 539, or subsequent protocols, if developed.

(6) Dry Weather Receiving Water Hydromodification Monitoring

In addition to the hydromodification monitoring conducted as part of the Copermittees' Hydromodification Management Plans, hydromodification monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must collect the following hydromodification monitoring observations and measurements within an appropriate domain of analysis during at least one dry weather monitoring event for each long-term receiving water monitoring station:

(a) Channel conditions, including:

(i) Channel dimensions,

(ii) Hydrologic and geomorphic conditions, and

(iii) Presence and condition of vegetation and habitat;

(b) Location of discharge points;

(c) Habitat integrity;

(d) Photo documentation of existing erosion and habitat impacts, with location (i.e. latitude and longitude coordinates) where photos were taken;

(e) Measurement or estimate of dimensions of any existing channel bed or bank eroded areas, including length, width, and depth of any incisions; and

[17] When a calculation method is developed, IBIs must be calculated for all available and appropriate historical data.
[18] Stormwater Monitoring Coalition Model Monitoring Technical Committee, 2004. Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California. Technical Report #419. August 2004.

(f) Known or suspected cause(s) of existing downstream erosion or habitat impact, including flow, soil, slope, and vegetation conditions, as well as upstream land uses and contributing new and existing development.

d. WET WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three wet weather monitoring events at each long-term receiving water monitoring station. At least one wet weather monitoring event must be conducted during the first wet weather event of the wet season (October 1 – April 30), and at least one wet weather monitoring event during a wet weather event that occurs after February 1.

(1) Wet Weather Receiving Water Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each long-term receiving water monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event;

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(d) Presence and assessment of trash in and around station.

(2) Wet Weather Receiving Water Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

(3) Wet Weather Receiving Water Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) Constituents listed in Table D-3.

(4) Wet Weather Receiving Water Toxicity Monitoring

For each wet weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for chronic aquatic toxicity in accordance with Provisions D.1.c.(4)(a)-(f).

e. OTHER RECEIVING WATER MONITORING REQUIREMENTS

(1) Regional Monitoring

The Copermittees must participate in the following regional receiving waters monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring; and

(b) Southern California Bight Regional Monitoring~~.~~ and

(c) Unified Beach Water Quality Monitoring and Assessment Program
The Orange County Copermittees shall participate in and, together with South Orange County Wastewater Authority and Orange County Health Care Agency, shall share responsibility for implementation of a unified regional beach water quality monitoring and assessment program in south Orange County, as set forth in Monitoring and Reporting Program No. XXX, issued pursuant to CWC sections 13225, 13267, and 13383 and subject to future revision.

(2) Sediment Quality Monitoring

The Copermittees must perform sediment monitoring to assess compliance with sediment quality receiving water limits applicable to MS4 discharges to enclosed bays and estuaries. The monitoring may be performed either by individual or multiple Copermittees to assess compliance with receiving water limits, or through participation in a water body monitoring coalition. A Sediment Monitoring Plan which satisfies the requirements of the State Water Board's Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part 1 Sediment Quality (Sediment Control Plan) must be submitted as part of the monitoring and assessment program in the Water Quality Improvement Plan.

(a) The Sediment Monitoring Plan design must include the following:

(i) The elements required under Section VII.D (Receiving Water Limits Monitoring Frequency) and Section VII.E (Sediment Monitoring) of the Sediment Control Plan;

(ii) A Quality Assurance Project Plan (QAPP) describing the project objectives and organization, functional activities, and quality assurance/quality control protocols for the water and sediment monitoring; and

(iii) A schedule for completion of all sample collection and analysis activities and submission of Sediment Monitoring Reports.

(b) The Copermittees must implement the Sediment Monitoring Plan in accordance with the schedule contained in the Sediment Monitoring Plan, unless otherwise directed in writing by the San Diego Water Board Executive Officer.

(c) The Copermittees must incorporate a Sediment Monitoring Report as part of the Water Quality Improvement Plan Annual Report in accordance with the schedule contained in the Sediment Monitoring Plan, unless otherwise directed in writing by the San Diego Water Board Executive Officer. The Sediment Monitoring Report must contain the following information:

(i) Analysis: An evaluation, interpretation and tabulation of the water and sediment monitoring data, including interpretations and conclusions as to whether applicable Receiving Water Limitations in this Order have been attained at each sample station;

(ii) Sample Location Map: The locations, type, and number of samples must be identified and shown on a site map; and

(iii) California Environmental Data Exchange Network: A statement certifying that the monitoring data and results have been uploaded into the California Environmental Data Exchange Network (CEDEN).

(d) Based on the Sediment Monitoring Report conclusions the San Diego Water Board may require a human health risk assessment to determine if the human health objective contained in Receiving Water Limitations in Provision A.2.a.(3)(b)(ii) has been attained at each sample station. In conducting a risk assessment, the Copermittees must consider any applicable and relevant information, including California Environmental Protection Agency's (Cal/EPA) Office of Environmental Health Hazard Assessment (OEHHA) policies for fish consumption and risk assessment, Cal/EPA's Department of Toxic Substances Control (DTSC) Risk Assessment, and USEPA Human Health Risk Assessment policies.

(3) ASBS Monitoring

For Watershed Management Areas with ASBS, the Copermittees must implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

f. ALTERNATIVE WATERSHED MONITORING REQUIREMENTS

The San Diego Water Board may direct the Copermittees to participate in an effort to develop alternative watershed monitoring with other regulated entities, other interested parties, and the San Diego Water Board to refine, coordinate, and implement regional monitoring and assessment programs to determine the status and trends of water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams.

2. MS4 Outfall Discharge Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the discharges from the MS4 outfalls in each Watershed Management Area during dry weather and wet weather. Following San Diego Water Board acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct MS4 outfall discharge monitoring during implementation of the Water Quality Improvement Plan to assess the effectiveness of their jurisdictional runoff management programs toward effectively prohibiting non-storm water discharges into the MS4 and reducing pollutants in storm water discharges from their MS4s to the MEP. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following MS4 outfall monitoring procedures:

a. TRANSITIONAL MS4 OUTFALL DISCHARGE MONITORING

Until the monitoring requirements and schedules of Provisions D.2.b-c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following MS4 outfall discharge monitoring in the Watershed Management Area:

(1) MS4 Outfall Discharge Monitoring Station Inventory

Each Copermittee must identify all major MS4 outfalls that discharge directly to receiving waters within its jurisdiction and geo-locate those outfalls on a map of the MS4 pursuant to Provision E.2.b.(1). This information must be compiled into a MS4 outfall discharge monitoring station inventory, and must include the following information:

(a) Latitude and longitude of MS4 outfall point of discharge;

(b) Watershed Management Area;

(c) Hydrologic subarea;

(d) Outlet size;

(e) Accessibility (i.e. safety and without disturbance of critical habitat);

(f) Approximate drainage area; and

(g) Classification of whether the MS4 outfall is known to have persistent dry weather flows, transient dry weather flows, no dry weather flows, or unknown dry weather flows.

(2) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Until the monitoring requirements and schedules of Provision D.2.b are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, each Copermittee must perform dry weather MS4 outfall field screening monitoring to identify non-storm water and illicit discharges within its jurisdiction in accordance with Provision E.2.c, to determine which discharges are transient flows and which are persistent flows, and prioritize the dry weather MS4 discharges that will be investigated and eliminated in accordance with Provision E.2.d.

(a) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Frequency

Each Copermittee must field screen the MS4 outfalls in its inventory developed pursuant to Provision D.2.a.(1) as follows:

(i) For Copermittees with less than 125 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 80 percent of the outfalls must be visually inspected two times per year during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv).

(ii) For Copermittees with 125 major MS4 outfalls or more, but less than or equal to 500 that discharge to receiving waters within a Watershed Management Area, all the outfalls must be visually inspected at least annually during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv).

(iii) For Copermittees with more than 500 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 500 outfalls must be visually inspected at least annually during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv). Copermittees with more than 500 major MS4 outfalls within a Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;

[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(iv) For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major MS4 outfalls within its jurisdiction, at least 500 major MS4 outfalls within its inventory must be visually inspected at least annually during dry weather conditions. Copermittees with more than 500 major MS4 outfalls in more than one Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(v) Inspections of major MS4 outfalls conducted in response to public reports and staff or contractor reports and notifications may count toward the required visual inspections of MS4 outfall discharge monitoring stations.

(b) Transitional Dry Weather MS4 Outfall Discharge Field Screening Visual Observations

(i) An antecedent dry period of at least 72 hours following any storm event producing measurable rainfall greater than 0.1 inch is required prior to conducting field screening visual observations during a field screening monitoring event.

(ii) During the field screening monitoring event, each Copermittee must record visual observations consistent with Table D-5 at each MS4 outfall discharge monitoring station inspected.

Table D-5. Field Screening Visual Observations for MS4 Outfall Discharge Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) - Flow source(s) suspected or identified from non-storm water source investigation - Flow source(s) eliminated during non-storm water source identification • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) - Known or suspected source(s) of pooled or ponded water • Station description (i.e. deposits or stains, vegetation condition, structural condition, observable biology) • Presence and assessment of trash in and around station • Evidence or signs of illicit connections or illegal dumping

(iii) Each Copermittee must implement the requirements of Provisions E.2.d.(2)(c)-(e) based on the field observations required pursuant to Provision D.2.a.(2)(b)(ii).

(iv) Each Copermittee must evaluate field observations together with existing information available from prior reports, inspections and monitoring results to determine whether any observed flowing, pooled, or ponded waters are likely to be transient or persistent flow.[19]

(c) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Records

Based upon the results of the transitional dry weather MS4 outfall discharge field screening monitoring conducted pursuant to Provisions D.2.a.(2)(a)-(b), each Copermittee must update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow.

(3) Transitional Wet Weather MS4 Outfall Discharge Monitoring

Until the monitoring requirements and schedules of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the

[19] Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(a) Transitional Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees must select wet weather MS4 outfall discharge monitoring stations from the inventories developed pursuant to Provision D.2.a.(1) for each Watershed Management Area as follows:

(i) At least five wet weather MS4 outfall discharge monitoring stations that are representative of storm water discharges from areas consisting primarily of residential, commercial, industrial, and typical mixed-use land uses present within the Watershed Management Area;

(ii) At least one wet weather MS4 outfall discharge monitoring station for each Copermittee within the Watershed Management Area; and

(iii) The County of San Diego may select at least two (2) wet weather MS4 outfall discharge monitoring stations for the portion of the Santa Margarita River Watershed Management Area within its jurisdiction to be monitored during the transitional period until the Riverside County Copermittees are notified of coverage under this Order. After the Riverside County Copermittees are notified of coverage under this Order, the Copermittees in the Watershed Management Area must select wet weather MS4 outfall discharge monitoring stations consistent with the requirements above.

(b) Transitional Wet Weather MS4 Outfall Discharge Monitoring Frequency

Each wet weather MS4 outfall discharge monitoring station selected pursuant to Provision D.2.a.(3)(a) must be monitored once during the wet season (October 1 – April 30). The wet weather monitoring events must be selected to be representative of the range of hydrological conditions experienced in the region. At least 10 percent of samples must be conducted during the first wet weather event of the wet season, to include at least one such sample in each Watershed Management Area..

(c) Transitional Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(i) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the

storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(ii) The flow rates and volumes measured or estimated from the MS4 outfall (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(d) Transitional Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(e) Transitional Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, and indicator bacteria;

(iv) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

[a] Time-weighted composites collected over the length of the storm event or the first 24 hour period whichever is shorter, composed of discrete samples, which may be collected through the use of automated equipment, or

[b] Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

[c] If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours;

(v) Only one analysis of the composite of aliquots is required;

(vi) The samples must be analyzed for the following constituents:

[a] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

[b] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and

[c] Constituents listed in Table D-6.

Table D-6. Analytical Monitoring Constituents for Wet Weather MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Nickel • Selenium • Thallium • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(f) Other Transitional Wet Weather MS4 Outfall Discharge Monitoring

The San Diego County Copermittees must continue the wet weather MS4 outfall monitoring program developed under Order No. R9-2007-0001, as approved by the San Diego Water Board, through its planned completion.

b. Dry Weather MS4 Outfall Discharge Monitoring

Each Copermittee must perform dry weather MS4 outfall monitoring to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. Each Copermittee must conduct the following dry weather MS4 outfall discharge monitoring within its jurisdiction:

(1) Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Each Copermittee must continue to perform the dry weather MS4 outfall discharge field screening monitoring in accordance with the requirements of Provision D.2.a.(2). The Copermittee may adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of persistent flow non-storm water discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of visual inspections performed is equivalent to the number of visual inspections required under Provision D.2.a.(2)(a).

(2) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring

Each Copermittee must perform non-storm water persistent flow MS4 outfall discharge monitoring to determine which persistent non-storm water discharges contain concentrations of pollutants below NALs, and which persistent non-storm water discharges impact receiving water quality during dry weather. Each Copermittee must conduct the following non-storm water persistent flow MS4 outfall discharge monitoring within its jurisdiction:

(a) Prioritization of Non-Storm Water Persistent Flow MS4 Outfalls

Based upon the dry weather MS4 outfall discharge field screening monitoring records developed pursuant to Provision D.2.a.(2)(c), each Copermittee must identify and prioritize the MS4 outfalls with persistent flows based on the highest priority water quality conditions identified in the Water Quality Improvement Plan and any additional criteria developed by the Copermittee, which may include historical data and data from sources other than what the Copermittee collects.

(b) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring Frequency

(i) Based on the prioritization of major MS4 outfalls developed under Provision D.2.b.(2)(a), each Copermittee must identify, at a minimum, the 5 highest priority major MS4 outfalls with non-storm water persistent flows that the Copermittee will monitor within its jurisdiction in each Watershed Management Area. For Responsible Copermittees identified by a TMDL in Attachment E to this Order, if the 5 chosen outfall locations are not sufficient to determine compliance with the TMDL(s), then each Responsible Copermittee must identify additional MS4 outfall monitoring locations within its jurisdiction sufficient to address compliance with the TMDL(s). If a Copermittee has less than 5 major outfalls within a Watershed

Management Area, then the Copermittee must monitor all of its major MS4 outfalls with persistent flows within each Watershed Management Area. The location of the highest priority non-storm water persistent flow MS4 outfall monitoring stations must be identified on the map required pursuant to Provision E.2.b.(1). The map must specify which MS4 outfalls are being monitored for compliance with a TMDL.

(ii) Each of the highest priority non-storm water persistent flow MS4 outfall monitoring stations identified pursuant to Provision D.2.b.(2)(b)(i) must be monitored under dry weather conditions at least semi-annually until one of the following occurs:

[a] The non-storm water discharges have been effectively eliminated (i.e. no flowing, pooled, or ponded water) for three consecutive dry weather monitoring events; or

[b] The source(s) of the persistent flows has been identified as a category of non-storm water discharges that does not require an NPDES permit and does not have to be addressed as an illicit discharge because it was not identified as a source of pollutants (i.e. constituents in non-storm water discharge do not exceed NALs), and the persistent flow can be re-prioritized to a lower priority; or

[c] The constituents in the persistent flow non-storm water discharge do not exceed NALs, and the persistent flow can be re-prioritized to a lower priority; or

[d] The source(s) of the persistent flows has been identified as a non-storm water discharge authorized by a separate NPDES permit.

(iii) Where the criteria under Provision D.2.b.(2)(b)(ii) are not met, but the threat to water quality has been reduced by the Copermittee, the highest priority persistent flow MS4 outfall monitoring stations may be reprioritized accordingly for continued dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1).

(iv) Each Copermittee must document removal or re-prioritization of the highest priority persistent flow MS4 outfall monitoring stations identified under Provision D.2.b.(2)(a) in the Water Quality Improvement Plan Annual Report. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized major MS4 outfall in the Watershed Management Area within its jurisdiction, unless there are no remaining qualifying major MS4 outfalls within the Copermittee's jurisdiction in the Watershed Management Area.

(c) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Observations

During each semi-annual monitoring event, each Copermittee must record field observations consistent with Table D-5 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(d) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Monitoring

During each semi-annual monitoring event, if conditions allow the collection of the data, each Copermittee must monitor and record the parameters in Table D-2 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(e) Non-Storm Water Persistent Flow MS4 Outfall Discharge Analytical Monitoring

During each semi-annual monitoring event in which measurable flow is present, each Copermittee must collect and analyze samples from each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Collect grab or composite samples to be analyzed at a qualified laboratory for the following constituents:

[a] Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,
[b] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,
[c] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,
[d] Applicable NAL constituents, and
[e] Constituents listed in Table D-7. The Copermittees may adjust the list of constituents for the Watershed Management Area if historical data or supporting information can be provided that demonstrates or justifies the analysis of a constituent is not necessary.

Table D-7. Analytical Monitoring Constituents for Persistent Flow MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Total Hardness • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Cadmium • Copper • Lead • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(iv) If the Copermittee identifies and eliminates the source of the persistent flow non-storm water discharge, analysis of the sample is not required.

c. WET WEATHER MS4 OUTFALL DISCHARGE MONITORING

The Copermittees must perform wet weather MS4 outfall monitoring to identify pollutants in storm water discharges from the MS4s, to guide pollutant source identification efforts, and to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order. The Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(1) Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees may adjust the wet weather MS4 outfall discharge monitoring locations in the Watershed Management Area, as needed, to identify pollutants in storm water discharges from MS4s, to guide pollutant source identification efforts, and to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of stations is at least equivalent to the number of stations required under Provision D.2.a.(3)(a). Additional outfall monitoring locations, above the minimum per jurisdiction, may be required to demonstrate compliance with the WQBELs associated with the applicable TMDLs in Attachment E.

(2) Wet Weather MS4 Outfall Discharge Monitoring Frequency

The Copermittees must monitor the wet weather MS4 outfall discharge monitoring stations in the Watershed Management Area at least once (1) per year. The Copermittees may need to increase the frequency of monitoring in order to identify pollutants in storm water discharges from the MS4s causing or contributing to the highest priority water quality conditions, to guide pollutant source identification efforts, or to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order.

(3) Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(4) Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(5) Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate

the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites collected over the length of the storm event or the first 24 hour period, whichever is shorter , composed of discrete samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

(iii) If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours.

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) The Copermittees may adjust the analytical monitoring required for the Watershed Management Area, if the Copermittees have historical data or supporting information that can demonstrate or provide justification that the analysis of a constituent is not necessary.

3. Special Studies

a. Within the term of this Order, the Copermittees must initiate the following special studies:

(1) At least two special studies in each Watershed Management Area to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that cause or contribute to highest priority water quality conditions identified in the Water Quality Improvement Plan.

(2) At least one special study for the San Diego Region to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that are impacting receiving waters on a regional basis in the San Diego Region.

(3) One of the two special studies in each Watershed Management Area required pursuant to Provision D.3.a.(1) may be replaced by a special study implemented pursuant to Provision D.3.a.(2).

b. The special studies must, at a minimum, be in conformance with the following criteria:

(1) The special studies must be related to the highest priority water quality conditions identified by the Copermittees in the Watershed Management Area and/or for the entire San Diego Region;

(2) The special studies developed pursuant to Provision D.3.a.(1) must:

(a) Be implemented within the applicable Watershed Management Area, and

(b) Require some form of participation by all the Copermittees within the Watershed Management Area;

(3) The special studies developed pursuant to Provision D.3.a.(2) must:

(a) Be implemented within the San Diego Region, and

(b) Require some form of participation by all Copermittees covered under the requirements of this Order.

(4) The Copermittees are encouraged to partner with environmental groups or third parties knowledgeable of watershed conditions to complete the required special studies.

c. Special studies developed to identify sources of pollutants and/or stressors should be pollutant and/or stressor specific and based on historical monitoring data and monitoring performed pursuant to Provisions D.1 and D.2. Development of source identification special studies should include the following:

(1) A compilation of known information on the specific pollutant and/or stressor,

including data on potential sources and movement of the pollutant and/or stressor within the watershed. Data generated by the Copermittees and others, as well as information available from a literature research on the pollutant and/or stressor should be compiled and analyzed as appropriate.

(2) An identification of data gaps, based on the compiled information generated on the specific pollutant and/or stressor identified in Provision D.3.c.(1). Source identification special studies should be developed to fill identified data gaps.

(3) A monitoring plan that will collect and provide data the Copermittees can utilize to do the following:

(a) Quantify the relative loading or impact of a pollutant and/or stressor from a particular source or pollutant generating activity;

(b) Improve understanding of the fate of a pollutant and/or stressor in the environment;

(c) Develop an inventory of known and suspected sources of a pollutant and/or stressor in the Watershed Management Area; and/or

(d) Prioritize known and suspected sources of a pollutant and/or stressor based on relative magnitude in discharges, geographical distribution (i.e., regional or localized), frequency of occurrence in discharges, human health risk, and controllability.

d. Special studies initiated prior to the effective date of this Order that meet the requirements of Provision D.3.b and are implemented during the term of this Order as part of the Water Quality Improvement Plan may be utilized to fulfill the special study requirements of Provision D.3.a. Special studies completed before the effective date of this Order cannot be utilized to fulfill the special study requirements of Provision D.3.a.

e. The Copermittees must submit the monitoring plans for the special studies in the Water Quality Improvement Plans required pursuant to Provision F.1.

f. The Copermittees are encouraged to share the results of the special studies regionally among the Copermittees to provide information useful in improving and adapting the management of non-storm water and storm water runoff through the implementation of the Water Quality Improvement Plans.

4. Assessment Requirements

Each Copermittee must evaluate the data collected pursuant to Provisions D.1, D.2 and D.3, and information collected during the implementation of the jurisdictional

runoff management programs required pursuant to Provision E, to assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a. Assessments must be performed as described in the following provisions:

a. RECEIVING WATERS ASSESSMENTS

(1) The Copermittees must assess and report the conditions of the receiving waters in the Watershed Management Area as follows:

(a) Based on data collected pursuant to Provision D.1.a, the assessments under Provision D.4.a.(2) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(b) Based on the data collected pursuant to Provisions D.1.a-e, the assessments required under Provision D.4.a.(2) must be included in the Report of Waste Discharge required pursuant to Provision F.5.b.

(2) The Copermittees must assess the status and trends of receiving water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under dry weather and wet weather conditions. For each of the three types of receiving waters in each Watershed Management Area the Copermittees must:

(a) Determine whether or not the conditions of the receiving waters are meeting the numeric goals established pursuant to Provision B.3.a;

(b) Identify the most critical beneficial uses that must be protected to ensure overall health of the receiving water;

(c) Determine whether or not those critical beneficial uses are being protected;

(d) Identify short-term and/or long-term improvements or degradation of those critical beneficial uses;

(e) Determine whether or not the strategies established in the Water Quality Improvement Plan contribute towards progress in achieving the interim and final numeric goals of the Water Quality Improvement Plan; and

(f) Identify data gaps in the monitoring data necessary to assess Provisions D.4.a.(2)(a)-(e).

b. MS4 OUTFALL DISCHARGES ASSESSMENTS

(1) Non-Storm Water Discharges Reduction Assessments

(a) Each Copermittee must assess and report the progress of its illicit discharge detection and elimination program, required to be implemented pursuant to Provision E.2, toward effectively prohibiting non-storm water and illicit discharges into the MS4 within its jurisdiction as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(2), the assessments under Provision D.4.b.(1)(b) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(ii) Based on the data collected pursuant to Provisions D.2.b, the assessments required under Provision D.4.b.(1)(c) must be included in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

(iii) Based on the data collected pursuant to Provisions D.2.b, the assessment required under Provision D.4.b.(1)(c) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.a.(2), each Copermittee must assess and report the following:

(i) Identify the known and suspected controllable sources (e.g. facilities, areas, land uses, pollutant generating activities) of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area;

(ii) Identify sources of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area that have been reduced or eliminated; and

(iii) Identify modifications to the field screening monitoring locations and frequencies for the MS4 outfalls in its inventory necessary to identify and eliminate sources of persistent flow non-storm water discharges pursuant to Provision D.2.b.

(c) Based on the dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1), each Copermittee must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(1)(b);

(ii) Based on the data collected and applicable NALs in the Water Quality Improvement Plan, rank the MS4 outfalls in the Copermittee's jurisdiction according to potential threat to receiving water quality, and produce a prioritized list of major MS4 outfalls for follow-up action to update the Water Quality Improvement Plan, with the goal of eliminating persistent flow non-storm water discharges and/or pollutant loads in order of the ranked priority list through targeted programmatic actions and source investigations;

(iii) For the highest priority major MS4 outfalls with persistent flows that are in exceedance of NALs, identify the known and suspected sources within the Copermittee's jurisdiction in the Watershed Management Area that may cause or contribute to the NAL exceedances;

(iv) Each Copermittee must analyze the data collected pursuant to Provision D.2.b, and utilize a model or other method, to calculate or estimate the non-storm water volumes and pollutant loads collectively discharged from all the major MS4s outfalls in its jurisdiction identified as having persistent dry weather flows during the monitoring year. These calculations or estimates must be updated annually.

[a] Each Copermittee must calculate or estimate the annual non-storm water volumes and pollutant loads collectively discharged from the Copermittee's major MS4 outfalls to receiving waters within the Copermittee's jurisdiction, with an estimate of the percent contribution from each known source for each MS4 outfall;

[b] Each Copermittee must annually identify and quantify (i.e. volume and pollutant loads) sources of non-storm water not subject to the Copermittee's legal authority that are discharged from the Copermittee's major MS4 outfalls to downstream receiving waters.

(v) Each Copermittee must review the data collected pursuant to Provision D.2.b and findings from the assessments required pursuant to Provision D.4.b.(1)(c)(i)-(iv) at least once during the term of this Order to:

[a] Identify reductions and progress in achieving reductions in non-storm water and illicit discharges to the Copermittee's MS4 in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction, with an estimate, if possible, of the non-storm water volume and/or pollutant load reductions

attributable to specific water quality strategies implemented by the Copermittee; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittee in the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction.

(vi) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(1)(c)(i)-(v).

(2) Storm Water Pollutant Discharges Reduction Assessments

(a) The Copermittees must assess and report the progress of the water quality improvement strategies, required to be implemented pursuant to Provisions B and E, toward reducing pollutants in storm water discharges from the MS4s within the Watershed Management Area as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(3), the assessments under Provision D.4.b.(2)(b) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(ii) Based on the data collected pursuant to Provisions D.2.c, the assessments required under Provision D.4.b.(2)(c) must be included in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

(iii) Based on the data collected pursuant to Provisions D.2.c, the assessment required under Provisions D.4.b.(2)(c)-(d) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.a.(3) the Copermittees must assess and report the following:

(i) The Copermittees must analyze the monitoring data collected pursuant to Provision D.2.a.(3), and utilize a watershed model or other method, to calculate or estimate the following for each monitoring year:

[a] The average storm water runoff coefficient for each land use type within the Watershed Management Area;

[b] The volume of storm water and pollutant loads discharged from each of the Copermittee's monitored MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch;

[c] The total flow volume and pollutant loadings discharged from the Copermittee's jurisdiction within the Watershed Management Area over the course of the wet season, extrapolated from the data produced from the monitored MS4 outfalls; and

[d] The percent contribution of storm water volumes and pollutant loads discharged from each land use type within each hydrologic subarea with a major MS4 outfall to receiving waters or within each major MS4 outfall to receiving waters in the Copermittee's jurisdiction within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch.

(ii) Identify modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify pollutants in storm water discharges from the MS4s in the Watershed Management Area pursuant to Provision D.2.c.(1).

(c) Based on the wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.c the Copermittees must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(2)(b);

(ii) Based on the data collected and applicable SALs in the Water Quality Improvement Plan, analyze and compare the monitoring data to the analyses and assumptions used to develop the Water Quality Improvement Plans, including strategies developed pursuant to Provision B.3, and evaluate whether those analyses and assumptions should be updated as a component of the adaptive management efforts pursuant to Provision B.5 for follow-up action to update the Water Quality Improvement Plan;

(iii) The Copermittees must review the data collected pursuant to Provision D.2.c and findings from the assessments required pursuant to Provisions D.4.b.(2)(c)(i)-(ii) at least once during the term of this Order to:

[a] Identify reductions or progress in achieving reductions in pollutant concentrations and/or pollutant loads from different land uses and/or drainage areas discharging from the Copermittees' MS4s in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters within the Watershed Management Area to the MEP, with an estimate, if possible, of the pollutant load reductions attributable to specific water quality strategies implemented by the Copermittees; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittees in the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters in the Watershed Management Area to the MEP.

(iv) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(iii).

(d) The Copermittees must evaluate all the data collected pursuant to Provision D.2.c, and incorporate new outfall monitoring data into time series plots for each long-term monitoring constituent for the Watershed Management Area, and perform statistical trends analysis on the cumulative long-term wet weather MS4 outfall discharge water quality data set.

c. Special Studies Assessments

The Copermittees must annually evaluate the results and findings from the special studies developed and implemented pursuant to Provision D.3, and assess their relevance to the Copermittees' efforts to characterize receiving water conditions, understand sources of pollutants and/or stressors, and control and reduce the discharges of pollutants from the MS4 outfalls to receiving waters in the Watershed Management Area. The Copermittees must report the results of the special studies assessments applicable to the Watershed Management Area, and identify any necessary modifications or updates to the Water Quality Improvement Plan based on the results in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

d. Integrated Assessment of Water Quality Improvement Plan

As part of the iterative approach and adaptive management process required for the Water Quality Improvement Plan pursuant to Provision B.5, the Copermittees in each Watershed Management Area must integrate the data collected pursuant to Provisions D.1-D.3, the findings from the assessments required pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to assess the effectiveness of, and identify necessary modifications to, the Water Quality Improvement Plan as follows:

(1) The Copermittees must re-evaluate the priority water quality conditions and numeric goals for the Watershed Management Area, as needed, during the term of this Order pursuant to Provision B.5.a. The re-evaluation and recommendations for modifications to the priority water quality conditions, and/or numeric goals and corresponding schedules may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to

Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The priority water quality conditions and numeric goals for the Watershed Management Area must be re-evaluated as follows:

(a) Re-evaluate the receiving water conditions in the Watershed Management Area in accordance with Provision B.2.a;

(b) Re-evaluate the impacts on receiving waters in the Watershed Management Area from MS4 discharges in accordance with Provision B.2.b;

(c) Re-evaluate the identification of MS4 sources of pollutants and/or stressors in accordance with Provision B.2.d;

(d) Identify beneficial uses of the receiving waters that are protected in accordance with Provision D.4.a;

(e) Evaluate the progress toward achieving the interim and final numeric goals for protecting impacted beneficial uses in the receiving waters.

(2) The Copermittees must re-evaluate the water quality improvement strategies for the Watershed Management Area during the term of this Order pursuant to Provision B.5.b. The re-evaluation and recommendations for modifications to the water quality improvement strategies and schedules may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The water quality improvement strategies for the Watershed Management Area must be re-evaluated as follows:

(a) Identify the non-storm water and storm water pollutant loads from the Copermittees' MS4 outfalls in the Watershed Management Area, calculated or estimated pursuant to Provisions D.4.b;

(b) Identify the non-storm water and storm water pollutant load reductions, or other improvements to receiving water or water quality conditions, that are necessary to attain the interim and final numeric goals identified in the Water Quality Improvement Plan for protecting beneficial uses in the receiving waters;

(c) Identify the non-storm water and storm water pollutant load reductions, or other improvements to the quality of MS4 discharges, that are necessary for the Copermittees to demonstrate that non-storm water and storm water discharges from their MS4s are not causing or contributing to exceedances of receiving water limitations;

(d) Evaluate the progress of the water quality improvement strategies toward

achieving the interim and final numeric goals identified in the Water Quality Improvement Plan for protecting beneficial uses in the receiving waters.

(3) The Copermittees must re-evaluate and adapt the water quality monitoring and assessment program for the Watershed Management Area when new information becomes available to improve the monitoring and assessment program pursuant to Provision B.5.c. The re-evaluation and recommendations for modifications to the monitoring and assessment program may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. Modifications to the water quality monitoring and assessment program must be consistent with the requirements of Provision D.1-D.3. The re-evaluation of the water quality monitoring and assessment program for the Watershed Management Area must consider the data gaps identified by the assessments required pursuant to Provisions D.4.a-b, and results of the special studies implemented pursuant to Provision D.4.c.

5. Monitoring Provisions

Each Copermittee must comply with all the monitoring, reporting, and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

E. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS

The purpose of this provision is for each Copermittee to implement a program to control the contribution of pollutants to and the discharges from the MS4 within its jurisdiction. The goal of the jurisdictional runoff management programs is to implement strategies that effectively prohibit non-storm water discharges to the MS4 and reduce the discharge of pollutants in storm water to the MEP. This goal will be accomplished through implementing the jurisdictional runoff management programs in accordance with the strategies identified in the Water Quality Improvement Plans.

Each Copermittee must update its jurisdictional runoff management program document, in accordance with Provision F.2.a, to incorporate all the requirements of Provision E. Until the Copermittee has updated its jurisdictional runoff management program document with the requirements of Provision E, the Copermittee must continue implementing its current jurisdictional runoff management program.

1. Legal Authority Establishment and Enforcement

a. Each Copermittee must establish, maintain, and enforce adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 through statute, ordinance, permit, contract, order, or similar means. This legal authority must, at a minimum, authorize the Copermittee to:

(1) Prohibit and eliminate all illicit discharges and illicit connections to its MS4;

(2) Control the contribution of pollutants in discharges of runoff associated with industrial and construction activity to its MS4 and control the quality of runoff from industrial and construction sites, including industrial and construction sites which have coverage under the statewide General Permit for Discharges of Storm Water Associated with Industrial Activities (Industrial General Permit) or General Permit for Discharges of Storm Water Associated with Construction Activities (Construction General Permit), as well as to those sites which do not;

(3) Control the discharge of spills, dumping, or disposal of materials other than storm water into its MS4;

(4) Control through interagency agreements among Copermittees the contribution of pollutants from one portion of the MS4 to another portion of the MS4;

(5) Control, by coordinating and cooperating with other owners of the MS4 such as Caltrans, the U.S. federal government, or sovereign Native American Tribes through interagency agreements, where possible, the contribution of pollutants from their portion of the MS4 to the portion of the MS4 within the Copermittee's jurisdiction;

(6) Require compliance with conditions in its statutes, ordinances, permits, contracts, orders, or similar means to hold dischargers to its MS4 accountable for their contributions of pollutants and flows;

(7) Require the use of BMPs to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(8) Require documentation on the effectiveness of BMPs implemented to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(9) Utilize enforcement mechanisms to require compliance with its statutes, ordinances, permits, contracts, orders, or similar means; and

(10) Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with its statutes, ordinances, permits, contracts, orders, or similar means and with the requirements of this Order, including the prohibition of illicit discharges and connections to its MS4; the Copermittee must also have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from industrial facilities, including construction sites, discharging into its MS4.

b. With the first Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3), each Copermittee must submit a statement certified by its Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative that the Copermittee has taken the necessary steps to obtain and maintain full legal authority within its jurisdiction to implement and enforce each of the requirements contained in this Order.

2. Illicit Discharge Detection and Elimination

Each Copermittee must implement a program to actively detect and eliminate illicit discharges and improper disposal into the MS4, or otherwise require the discharger to apply for and obtain a separate NPDES permit. The illicit discharge detection and elimination program must be implemented in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include, at a minimum, the following requirements:

e. NON-STORM WATER DISCHARGES

Each Copermittee must address all non-storm water discharges as illicit discharges unless a non-storm water discharge is either identified as a discharge authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to the following requirements:

(1) Discharges of non-storm water to the MS4 from the following categories must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG919001 (Order No. R9-2007-0034, or subsequent order) for discharges to San Diego Bay, or NPDES Permit No. CAG919002 (Order No. R9-2008-0002, or subsequent order) for discharges to surface waters other than San Diego Bay:

(1) Uncontaminated pumped ground water;

(2) Discharges from foundation drains;[20]

(3) Water from crawl space pumps; and

(4) Water from footing drains.[20]

(2) Discharges of non-storm water from water line flushing and water main breaks to the MS4 must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG 679001 (Order No. R9-2010-0003 or subsequent order). This category includes water line flushing and water main break discharges from water purveyors issued a water supply permit by the California Department of Public Health or federal military installations. Discharges from recycled or reclaimed water lines to the MS4 must be addressed as illicit discharges, unless the discharges have coverage under a separate NPDES permit.

(3) Discharges of non-storm water to the MS4 from the following categories must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a source of pollutants to receiving waters:

(a) Diverted stream flows;

(b) Rising ground waters;

(c) Uncontaminated ground water infiltration to MS4s;

(d) Springs;

(e) Flows from riparian habitats and wetlands;

(f) Discharges from potable water sources;

[20] Provision E.2.a.(1) only applies to this category of non-storm water if the system is designed to be located at or below the groundwater table to actively or passively extract groundwater during any part of the year.

(g) Discharges from foundation drains;[21] and

(h) Discharges from footing drains.[21]

(4) Discharges of non-storm water to the MS4 from the following categories must be controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means. Discharges of non-storm water to the MS4 from the following categories not controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means must be addressed by the Copermittee as illicit discharges.

(a) Air conditioning condensation

The discharge of air conditioning condensation should be directed to landscaped areas or other pervious surfaces, or to the sanitary sewer, where feasible.

(b) Individual residential vehicle washing

(i) The discharge of wash water should be directed to landscaped areas or other pervious surfaces where feasible; and

(ii) The minimization of water, washing detergent and other vehicle wash products used for residential vehicle washing, and the implementation of other practices or behaviors that will prevent the discharge of pollutants associated with individual residential vehicle washing from entering the MS4 must be encouraged.

(c) Dechlorinated swimming pool discharges

(i) Residual chlorine, algaecide, filter backwash, or other pollutants from swimming pools must be eliminated prior to discharging to the MS4; and

(ii) The discharge of saline swimming pool water must be directed to the sanitary sewer, landscaped areas, or other pervious surfaces that can accommodate the volume of water, unless the saline swimming pool water can be discharged via a pipe or concrete channel directly to a naturally saline water body (e.g. Pacific Ocean).

(5) Firefighting discharges to the MS4 must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a significant source of pollutants to receiving waters. Firefighting discharges to the MS4 not identified as a significant source of pollutants to receiving waters, must be addressed, at a minimum, as follows:

[21] Provision E.2.a.(3) only applies to this category of non-storm water discharge if the system is designed to be located above the groundwater table at all times of the year, and the system is only expected to discharge non-storm water under unusual circumstances.

(a) Non-emergency firefighting discharges

(i) Building fire suppression system maintenance discharges (e.g. sprinkler line flushing) to the MS4 must be addressed as illicit discharges unless BMPs are implemented to prevent pollutants associated with such discharges to the MS4.

(ii) Non-emergency firefighting discharges (i.e., discharges from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems) must be addressed by a program, to be developed and implemented by the Copermittee, to reduce or eliminate pollutants in such discharges from entering the MS4.

(b) Emergency firefighting discharges

Each Copermittee should develop and encourage implementation of BMPs to reduce or eliminate pollutants in emergency firefighting discharges to the MS4s and receiving waters within its jurisdiction. During emergency situations, priority of efforts should be directed toward life, property, and the environment (in descending order). BMPs should not interfere with immediate emergency response operations or impact public health and safety.

(6) If the Copermittee or San Diego Water Board identifies any category of non-storm water discharges listed under Provisions E.2.a.(1)-(4) as a source of pollutants to receiving waters, the category must be prohibited through ordinance, order, or similar means and addressed as an illicit discharge. Alternatively, the Copermittee may propose controls to be implemented for the category of non-storm water discharges as part of the Water Quality Improvement Plan instead of prohibiting the category of non-storm water discharges, and implement the controls if accepted by the San Diego Water Board as part of the Water Quality Improvement Plan.

(7) Each Copermittee must, where feasible and priorities and resources allow, reduce or eliminate non-storm water discharges listed under Provisions E.2.a.(1)-(4) into its MS4, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit.

f. Prevent And Detect Illicit Discharges And Connections

Each Copermittee must include the following measures within its program to prevent and detect illicit discharges to the MS4:

(1) Each Copermittee must maintain an updated map of its entire MS4 and the corresponding drainage areas. The accuracy of the MS4 map must be confirmed during the field screening required pursuant to Provision E.2.c.

The MS4 map must be included as part of the jurisdictional runoff management program document. Any geographic information system (GIS) layers or files used by the Copermittee to maintain the MS4 map must be made available to the San Diego Water Board upon request. The MS4 map must identify the following:

(a) All segments of the MS4 owned, operated, and maintained by the Copermittee;

(b) All known locations of inlets that discharge and/or collect runoff into the Copermittee's MS4;

(c) All known locations of connections with other MS4s not owned or operated by the Copermittee (e.g. Caltrans MS4s);

(d) All known locations of MS4 outfalls and private outfalls that discharge runoff collected from areas within the Copermittee's jurisdiction;

(e) All segments of receiving waters within the Copermittee's jurisdiction that receive and convey runoff discharged from the Copermittee's MS4 outfalls;

(f) Locations of the MS4 outfalls, identified pursuant to Provision D.2.a.(1), within its jurisdiction; and

(g) Locations of the non-storm water persistent flow MS4 outfall discharge monitoring stations, identified pursuant to Provision D.2.b.(2), within its jurisdiction.

(2) Each Copermittee must use Copermittee personnel and contractors to assist in identifying and reporting illicit discharges and connections during their daily employment activities.

(3) Each Copermittee must promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges to or from the MS4, including the following methods for public reporting:

(a) Operate a public hotline, which can be Copermittee-specific or shared by the Copermittees, and must be capable of receiving reports in both English and Spanish 24 hours per day and seven days per week; and

(b) Designate an e-mail address for receiving electronic reports from the public, which can be Copermittee-specific or shared by the Copermittees, and must be prominently displayed on the Copermittee's webpage and the Regional Clearinghouse required pursuant to Provision F.4.

(4) Each Copermittee must implement practices and procedures (including a notification mechanism) to prevent, respond to, contain, and clean up any spills that may discharge into the MS4 within its jurisdiction from any source. The Copermittee must coordinate, to the extent possible, with spill response teams to prevent entry of spills into the MS4, and prevent contamination of surface water, ground water, and soil. The Copermittee must coordinate spill prevention, containment, and response activities throughout all appropriate Copermittee departments, programs, and agencies.

(5) Each Copermittee must implement practices and procedures to prevent and limit infiltration of seepage from sanitary sewers (including private laterals and failing septic systems) to the MS4.

(6) Each Copermittee must coordinate, when necessary, with upstream Copermittees and/or entities to prevent illicit discharges from upstream sources into the MS4 within its jurisdiction.

g. FIELD SCREENING

Each Copermittee must conduct field screening (i.e. visual observations, field testing, and/or analytical testing) of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4 in accordance with the dry weather MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

h. INVESTIGATE AND ELIMINATE ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to investigate and eliminate illicit discharges to the MS4:

(1) Each Copermittee must prioritize and determine when follow-up investigations will be performed in response to visual observations and/or water quality monitoring data collected during an investigation of a detected non-storm water or illicit discharge to or from the MS4. The criteria for prioritizing investigations must consider the following:

(a) Pollutants identified as causing or contributing to the highest water quality priorities identified in the Water Quality Improvement Plan;

(b) Pollutants identified as causing or contributing, or threatening to cause or contribute to impairments in water bodies on the 303(d) List and/or in environmentally sensitive areas (ESAs), located within its jurisdiction;

(c) Pollutants identified from sources or land uses known to exist within the area, drainage basin, or watershed that discharges to the portion of the MS4 within its jurisdiction included in the investigation;

(d) Pollutants identified as causing or contributing to an exceedance of a NAL in the Water Quality Improvement Plan; and

(e) Pollutants identified as a threat to human health or the environment.

(2) Each Copermittee must implement procedures to investigate and inspect portions of its MS4 that, based on reports or notifications, field screening, or other appropriate information, indicate a reasonable potential of receiving, containing, or discharging pollutants due to illicit discharges, illicit connections, or other sources of non-storm water. The procedures must include the following:

(a) Each Copermittee must develop criteria to:

(i) Assess the validity of each report or notification received; and

(ii) Prioritize the response to each report or notification received.

(b) Each Copermittee must prioritize and respond to each valid report or notification (e.g., public reports, staff or contractor reports and notifications, etc.) of an incident in a timely manner.

(c) In accordance with the requirements of Provision E.2.d.(1), each Copermittee must investigate and seek to identify the source(s) of discharges of non-storm water where flows are observed in and from the MS4 during the field screening required pursuant to Provision D.2.b.(1) as follows:

(i) Obvious illicit discharges must be immediately investigated to identify the source(s) of non-storm water discharges;

(ii) The investigation must include field investigations to identify sources or potential sources for the discharge, unless the source or potential source has already been identified during previous investigations; and

(iii) The investigation may include follow-up field investigations and/or reviewing Copermittee inventories and other land use data to identify potential sources of the discharge.

(d) Each Copermittee must maintain records and a database of the following information:

(i) Location of incident, including hydrologic subarea, portion of MS4 receiving the non-storm water or illicit discharge, and point of discharge or potential discharge from MS4 to receiving water;

(ii) Source of information initiating the investigation (e.g., public reports, staff or contractor reports and notifications, field screening, etc.);

(iii) Date the information used to initiate the investigation was received;

(iv) Date the investigation was initiated;

(v) Dates of follow-up investigations;

(vi) Identified or suspected source of the illicit discharge or connection, if determined;

(vii) Known or suspected related incidents, if any;

(viii) Result of the investigation; and

(ix) If a source cannot be identified and the investigation is not continued, document the response pursuant to the requirements of Provision E.2.d.(4).

(e) Each Copermittee must maintain records and, in accordance with the priorities of the Water Quality Improvement Plan, seek to identify the source(s) of non-storm water discharges from the MS4 where there is evidence of non-storm water having been discharged into or from the MS4 (e.g., pooled water), in accordance with MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

(3) Each Copermittee must initiate the implementation of procedures, in a timely manner, to eliminate all detected and identified illicit discharges and connections within its jurisdiction. The procedures must include the following responses:

(a) Each Copermittee must enforce its legal authority, as required under Provision E.1, to eliminate illicit discharges and connections to the MS4.

(b) If the Copermittee identifies the source as a controllable source of non-storm water or illicit discharge or connection, the Copermittee must implement its Enforcement Response Plan pursuant to Provision E.6 and enforce its legal authority to prohibit and eliminate illicit discharges and connections to its MS4.

(c) If the Copermittee identifies the source of the discharge as a category of non-storm water discharges in Provision E.2.a, and the discharge is in exceedance of NALs in the Water Quality Improvement Plan, then the Copermittee must determine if: (1) this is an isolated incident or set of circumstances that will be addressed through its Enforcement Response Plan pursuant to Provision E.6, or (2) the category of discharge must be addressed through the prohibition of that category of discharge as an illicit discharge pursuant to Provision E.2.a.(6).

(d) If the Copermittee suspects the source of the non-storm water discharge as natural in origin (i.e. non-anthropogenically influenced) and in conveyance into the MS4, then the Copermittee must document and

provide the data and evidence necessary to demonstrate to the San Diego Water Board that it is natural in origin and does not require further investigation.

(e) If the Copermittee is unable to identify and document the source of a recurring non-storm water discharge to or from the MS4, then the Copermittee must address the discharge as an illicit discharge and update its jurisdictional runoff management program to address the common and suspected sources of the non-storm water discharge within its jurisdiction in accordance with the Copermittee's priorities.

(4) Each Copermittee must submit a summary of the non-storm water discharges and illicit discharges and connections investigated and eliminated within its jurisdiction with each Water Quality Improvement Plan Annual Report required under Provision F.3.b.(3) of this Order.

3. Development Planning

Each Copermittee must use their land use and planning authorities to implement a development planning program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. BMP Requirements for All Development Projects

Each Copermittee must prescribe the following BMP requirements during the planning process (i.e. prior to project approval and issuance of local permits) for all development projects (regardless of project type or size), where local permits are issued, including unpaved roads and flood management projects:

(3) General Requirements

(a) Onsite BMPs must be located so as to remove pollutants from runoff prior to its discharge to any receiving waters, and as close to the source as possible;

(b) Structural BMPs must not be constructed within waters of the U.S.

(c) Onsite BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors (e.g. mosquitos, rodents, or flies).

(4) Source Control BMP Requirements

The following source control BMPs must be implemented at all development projects where applicable and feasible:

(a) Prevention of illicit discharges into the MS4;

(b) Storm drain system stenciling or signage;

(c) Protect outdoor material storage areas from rainfall, run-on, runoff, and wind dispersal;

(d) Protect materials stored in outdoor work areas from rainfall, run-on, runoff, and wind dispersal;

(e) Protect trash storage areas from rainfall, run-on, runoff, and wind dispersal; and

(f) Any additional BMPs determined to be necessary by the Copermittee to minimize pollutant generation at each project.

(5) Low Impact Development (LID) BMP Requirements

The following LID BMPs must be implemented at all development projects where applicable and feasible:

(a) Maintenance or restoration of natural storage reservoirs and drainage corridors (including topographic depressions, areas of permeable soils, natural swales, and ephemeral and intermittent streams);[22]

(b) Buffer zones for natural water bodies (where buffer zones are technically infeasible, require project applicant to include other buffers such as trees, access restrictions, etc.);

(c) Conservation of natural areas within the project footprint including existing trees, other vegetation, and soils;

(d) Construction of streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided public safety is not compromised;

(e) Minimization of the impervious footprint of the project;

(f) Minimization of soil compaction to landscaped areas;

(g) Disconnection of impervious surfaces through distributed pervious areas;

[22] Development projects proposing to dredge or fill materials in waters of the U.S. must obtain a CWA Section 401 Water Quality Certification. Projects proposing to dredge or fill waters of the state must obtain waste discharge requirements.

(h) Landscaped or other pervious areas designed and constructed to effectively receive and infiltrate, retain and/or treat runoff from impervious areas, prior to discharging to the MS4;

(i) Small collection strategies located at, or as close as possible to, the source (i.e. the point where storm water initially meets the ground) to minimize the transport of runoff and pollutants to the MS4 and receiving waters;

(j) Use of permeable materials for projects with low traffic areas and appropriate soil conditions;

(k) Landscaping with native or drought tolerant species; and

(l) Harvesting and using precipitation.

b. PRIORITY DEVELOPMENT PROJECTS

Priority Development Projects are land development projects that fall under the planning and building authority of the Copermittee for which the Copermittee must impose specific requirements, in addition to those described in Provision E.3.a, including the implementation of structural BMPs to meet the performance requirements described in Provision E.3.c.

(1) Definition of Priority Development Project

Priority Development Projects include the following:

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(b) Redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site on an existing site of 10,000 square feet or more of impervious surfaces). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(c) New and redevelopment projects that create 5,000 square feet or more of impervious surface (collectively over the entire project site), and support one or more of the following uses:

(i) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812).

(ii) Hillside development projects. This category includes development on any natural slope that is twenty-five percent or greater.

(iii) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce.

(iv) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

(d) New or redevelopment projects that create or replace 2,500 square feet or more of impervious surface (collectively over the entire project site), and discharging directly to an Environmentally Sensitive Area (ESA). "Discharging directly to" includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands).

(e) New development projects that support one or more of the following uses:

(i) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

(ii) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

(f) New or redevelopment projects that result in the disturbance of one or more acres of land and are expected to generate pollutants post construction.

(2) <u>Special Considerations for Redevelopment Projects</u>

The structural BMP performance requirements of Provision E.3.c are applicable to redevelopment Priority Development Projects, as defined in E.3.b.(1), as follows:

(a) Where redevelopment results in the creation or replacement of impervious surface in an amount of less than fifty percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provision E.3.c apply only to the creation or replacement of impervious surface, and not the entire development; or

(b) Where redevelopment results in the creation or replacement of impervious surface in an amount of more than fifty percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provision E.3.c apply to the entire development.

(3) Priority Development Project Exemptions

Each Copermittee has the discretion to exempt the following projects from being defined as Priority Development Projects:

(a) New or retrofit paved sidewalks, bicycle lanes, or trails that meet the following criteria:

(i) Designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas; OR

(ii) Designed and constructed to be hydraulically disconnected from paved streets or roads; OR

(iii) Designed and constructed with permeable pavements or surfaces in accordance with USEPA Green Streets guidance.[23]

(b) Retrofitting or redevelopment of existing paved alleys, streets or roads that are designed and constructed in accordance with the USEPA Green Streets guidance.[24]

c. Priority Development Project Structural BMP Performance Requirements

In addition to the BMP requirements listed for all development projects under Provision E.3.a, Priority Development Projects must also implement structural BMPs that conform to performance requirements described below.

(1) Storm Water Pollutant Control BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite structural BMPs to control pollutants in storm water that may be discharged from a project as follows:

(a) Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite the pollutants contained in the volume of storm water runoff produced from a 24-hour 85th percentile storm event (design capture volume);[25]

[23] See "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).
[24] Ibid.
[25] This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are

(i) If a Copermittee determines that implementing BMPs to retain the full design capture volume onsite for a Priority Development Project is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize biofiltration BMPs. Biofiltration BMPs must be designed to have an appropriate hydraulic loading rate to maximize storm water retention and pollutant removal, as well as to prevent erosion, scour, and channeling within the BMP,[26] and must be sized to:

[a] Treat 1.5 times the design capture volume not reliably retained onsite, OR

[b] Treat the design capture volume not reliably retained onsite with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite.

(ii) If a Copermittee determines that biofiltration is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize flow-thru treatment control BMPs to treat runoff leaving the site, AND mitigate for the design capture volume not reliably retained onsite pursuant to Provision E.3.c.(1)(b). Flow thru treatment control BMPs must be sized and designed to:

[a] Remove pollutants from storm water to the MEP;

[b] Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;

[c] Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Flow-thru treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of flow-thru treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

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encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals.

[26] As part of the Copermittee's update to its BMP Design Manual, pursuant to Provision E.3.d, the Copermittee must provide guidance for hydraulic loading rates and other biofiltration design criteria necessary to maximize storm water retention and pollutant removal.

(b) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1)(a). The Priority Development Project must mitigate for the portion of the pollutant load in the design capture volume not retained onsite if Provision E.3.c.(3) is utilized. If a Priority Development Project is allowed to utilize alternative compliance, flow-thru treatment control BMPs must be implemented to treat the portion of the design capture volume that is not reliably retained onsite. Flow-thru treatment control BMPs must be sized and designed in accordance with Provisions E.3.c.(1)(a)(ii)[a]-[c].

(2) Hydromodification Management BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite BMPs to manage hydromodification that may be caused by storm water runoff discharged from a project as follows:

(a) Post-project runoff conditions (flow rates and durations) must not exceed pre-development runoff conditions by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat downstream of Priority Development Projects).

(i) In evaluating the range of flows that results in increased potential for erosion of natural (non-hardened) channels, the lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks.

(ii) The Copermittees may use monitoring results collected pursuant to Provision D.1.a.(2) to re-define the range of flows resulting in increased potential for erosion, or degraded instream habitat conditions, as warranted by the data.

(b) Each Priority Development Project must avoid critical sediment yield areas known to the Copermittee or identified by the optional Watershed Management Area Analysis pursuant to Provision B.3.b.(4), or implement measures that allow critical coarse sediment to be discharged to receiving waters, such that there is no net impact to the receiving water.

(c) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the performance requirements of Provision E.3.c.(2)(a). The Priority Development Project must mitigate for the post-project runoff conditions not fully managed onsite if Provision E.3.c.(3) is utilized.

(d) Exemptions

Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provisions E.3.c.(2) where the project discharges storm water runoff to:

(i) Existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;

(ii) Conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; or

(iii) An area identified by the Copermittees as appropriate for an exemption by the optional Watershed Management Area Analysis incorporated into the Water Quality Improvement Plan pursuant to Provision B.3.b.(4).

(e) Interim Timeframe Exemptions

Until the Copermittees have updated their BMP Design Manual in accordance with Provision F.2.b with the requirements of Provision E, the Copermittees have the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provision E.3.c.(2) where the project discharges storm water runoff directly to:

(i) An engineered channel conveyance system with a capacity to convey peak flows generated by the 10-year storm event all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; and

(ii) Large river reaches with a drainage area larger than 100 square miles and a 100-year flow capacity in excess of 20,000 cubic feet per second, provided that properly sized energy dissipation is included at all Priority Development Project discharge points.

(3) Alternative Compliance Program to Onsite Structural BMP Implementation

At the discretion of each Copermittee, Priority Development Projects may be allowed to participate in an alternative compliance program in lieu of implementing the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a), provided that the Water Quality Improvement Plan includes the optional Watershed Management Area Analysis described in Provision B.3.b.(4). The alternative compliance

program is available to a Priority Development Project only if the Priority Development Project applicant enters into a voluntary agreement with the Copermittee authorizing this arrangement. In addition to the voluntary agreement, relief from implementing structural BMPs onsite may be authorized by the Copermittee under the following conditions:

(a) Watershed Management Area Analysis Candidate Projects

The Priority Development Project applicant agrees to fund, contribute funds to, or implement a candidate project identified by the Copermittees in the Watershed Management Area Analysis included in the Water Quality Improvement Plan, pursuant to Provisions B.3.b.(4) subject to the following conditions:

(i) The Copermittee must determine that implementation of the candidate project will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a) onsite;

(ii) If the Priority Development Project applicant chooses to fully or partially fund a candidate project, then the in-lieu fee structure described in Provision E.3.c.(3)(c) must be followed;

(iii) If the Priority Development Project applicant chooses to fully or partially fund a candidate project, then the Copermittee must ensure that the funds to be obtained from the Priority Development Project applicant are sufficient to mitigate for impacts caused by not fully implementing structural BMPs onsite, pursuant to the performance requirements described in Provisions E.3.c.(1) and E.3.c.(2)(a);

(iv) If the Priority Development Project applicant chooses to implement a candidate project, then the Copermittee must ensure that pollutant control and/or hydromodification management within the candidate project are sufficient to mitigate for impacts caused by not implementing structural BMPs fully onsite, pursuant to the performance requirements described in Provisions E.3.c.(1) and E.3.c.(2)(a);

(v) The voluntary agreement to fund, partially fund, or implement a candidate project must include reliable sources of funding for operation and maintenance of the candidate project;

(vi) Design of the candidate project must be conducted under an appropriately qualified engineer, geologist, architect, landscape architect, or other professional, licenses where applicable, and competent and proficient in the fields pertinent to the candidate project design;

(vii) The candidate project must be constructed as soon as possible, but no later than 4 years after the certificate of occupancy is granted for

the first Priority Development Project that contributed funds toward the construction of the candidate project, unless a longer period of time is authorized by the San Diego Water Board Executive Officer; and

(viii) If the candidate project is constructed after the Priority Development Project is constructed, the Copermittee must require temporal mitigation for pollutant loads and altered flows that are discharged from the Priority Development Project.

(b) Project Applicant Proposed Alternative Compliance Projects

The Copermittee may allow a Priority Development Project applicant to propose and fund, contribute funds to, or implement an alternative compliance project not identified by the Watershed Management Area Analysis included in the Water Quality Improvement Plan pursuant to Provisions B.3.b.(4). This option is allowed provided the Copermittee determines that implementation of the alternative compliance project will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a) onsite, and is subject to the requirements described in Provisions E.3.c.(3)(a)(ii)-(viii).

(c) Alternative Compliance In-Lieu Fee Structure

If a Copermittee chooses to allow a Priority Development Project applicant to fund, or partially fund a candidate project or an alternative compliance project, then the Copermittee must develop and implement an in-lieu fee structure. This may be developed individually or with other Copermittees and/or entities, as a means for designing, developing, constructing, operating and maintaining offsite alternative compliance projects. The in-lieu fee must be transferred to the Copermittee (for public projects) or an escrow account (for private projects) prior to the construction of the Priority Development Project.

(d) Alternative Compliance Water Quality Credit System Option

The Copermittee may develop and implement an alternative compliance water quality credit system option, individually or with other Copermittees and/or entities, provided that such a credit system clearly exhibits that it will not allow discharges from Priority Development Projects to cause or contribute to a net impact over and above the impact caused by projects meeting the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a). Any credit system that a Copermittee chooses to implement must be submitted to the San Diego Water Board Executive Officer for review and acceptance as part of the Water Quality Improvement Plan.

(4) Long-Term Structural BMP Maintenance

Each Copermittee must require the project applicant to submit proof of the mechanism under which ongoing long-term maintenance of all structural BMPs will be conducted.

(5) Infiltration and Groundwater Protection

(a) Structural BMPs designed to primarily function as large, centralized infiltration devices (such as large infiltration trenches and infiltration basins) must not cause or contribute to an exceedance of an applicable groundwater quality objective. At a minimum, such infiltration BMPs must be in conformance with the design criteria listed below, unless the development project applicant demonstrates to the Copermittee that one or more of the specific design criteria listed below are not necessary to protect groundwater quality. The design criteria listed below do not apply to small infiltration systems dispersed throughout a development project.

(i) Runoff must undergo pretreatment such as sedimentation or filtration prior to infiltration;

(ii) Pollution prevention and source control BMPs must be implemented at a level appropriate to protect groundwater quality at sites where infiltration BMPs are to be used;

(iii) Infiltration BMPs must be adequately maintained to remove pollutants in storm water to the MEP;

(iv) The vertical distance from the base of any infiltration BMP to the seasonal high groundwater mark must be at least 10 feet. Where groundwater basins do not support beneficial uses, this vertical distance criteria may be reduced, provided groundwater quality is maintained;

(v) The soil through which infiltration is to occur must have physical and chemical characteristics (e.g., appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses;

(vi) Infiltration BMPs must not be used for areas of industrial or light industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee, unless source control BMPs to prevent exposure of high threat activities are implemented, or runoff from such activities is first treated or filtered to remove pollutants prior to infiltration; and

(vii) Infiltration BMPs must be located a minimum of 100 feet horizontally from any water supply wells.

(b) The Copermittee may develop, individually or with other Copermittees, alternative mandatory design criteria to that listed above for infiltration BMPs which are designed to primarily function as centralized infiltration devices. Before implementing the alternative design criteria in the development planning process the Copermitee(s) must:

(i) Notify the San Diego Water Board of the intent to implement the alternative design criteria submitted; and

(ii) Comply with any conditions set by the San Diego Water Board.

d. BMP DESIGN MANUAL UPDATE

Each Copermittee must update its BMP Design Manual[27] pursuant to Provision F.2.b. Until the Copermittee has updated its BMP Design Manual with the requirements of Provisions E.3.a-c, the Copermittee must continue implementing its current BMP Design Manual. Unless directed otherwise by the San Diego Water Board, the Copermittee must implement the BMP Design Manual within 180 days of completing the update. The update of the BMP Design Manual must include the following:

(1) Updated procedures to determine the nature and extent of storm water requirements applicable to a potential development or redevelopment projects. These procedures must inform project applicants of the storm water management requirements applicable to their project including, but not limited to, general requirements for all development projects, structural BMP design procedures and requirements, hydromodification management requirements, requirements specific to phased projects, and procedures specific to private developments and public improvement projects;

(2) Updated procedures to identify pollutants and conditions of concern for selecting the most appropriate structural BMPs that consider, at a minimum, the following:

(a) Receiving water quality (including pollutants for which receiving waters are listed as impaired under the CWA section 303(d) List);

(b) Pollutants, stressors, and/or receiving water conditions that cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(c) Land use type of the project and pollutants associated with that land use type; and

[27] The BMP Design Manual was formerly known as the Standard Storm Water Mitigation Plan under Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016.

(d) Pollutants expected to be present onsite.

(3) Updated procedures for designing structural BMPs, including any updated performance requirements to be consistent with the requirements of Provision E.3.c for all structural BMPs listed in the BMP Design Manual;

(4) Long-term maintenance criteria for each structural BMP listed in the BMP Design Manual; and

(5) Alternative compliance criteria, in accordance with the requirements under Provision E.3.c.(3), if the Copermittee elects to allow Priority Development Projects within its jurisdiction to utilize alternative compliance.

e. PRIORITY DEVELOPMENT PROJECT BMP IMPLEMENTATION AND OVERSIGHT

Each Copermittee must implement a program that requires and confirms structural BMPs on all Priority Development Projects are designed, constructed, and maintained to remove pollutants in storm water to the MEP.

(1) Structural BMP Approval and Verification Process

(a) Each Copermittee must require and confirm that for all Priority Development Project applications that have not received prior lawful approval by the Copermittee by the time the BMP Design Manual is implemented~~updated~~ pursuant to Provision E.3.d, the requirements of Provision E.3 are implemented. For project applications that have received prior lawful approval before the BMP Design Manual is implemented~~updated~~ pursuant to Provision E.3.d, the Copermittee may allow previous land development requirements to apply.

(b) Each Copermittee must identify the roles and responsibilities of its various municipal departments in implementing the structural BMP requirements, including each stage of a project from application review and approval through BMP maintenance and inspections.

(c) Each Copermittee must require and confirm that appropriate easements and ownerships are properly recorded in public records and the information is conveyed to all appropriate parties when there is a change in project or site ownership.

(d) Each Copermittee must require and confirm that prior to occupancy and/or intended use of any portion of the Priority Development Project, each structural BMP is inspected to verify that it has been constructed and is operating in compliance with all of its specifications, plans, permits, ordinances, and the requirements of this Order.

(2) Priority Development Project Inventory and Prioritization

(a) Each Copermittee must develop, maintain, and update at least annually, a watershed-based database to track and inventory all Priority Development Projects and associated structural BMPs within its jurisdiction. Inventories must be accurate and complete beginning from December 2002 for the San Diego County Copermittees, February 2003 for the Orange County Copermittees, and July 2005 for the Riverside County Copermittees. The use of an automated database system, such as GIS, is highly recommended. The database must include, at a minimum, the following information:

(i) Priority Development Project location (address and hydrologic subarea);

(ii) Descriptions of structural BMP type(s);

(iii) Date(s) of construction;

(iv) Party responsible for structural BMP maintenance;

(v) Dates and findings of structural BMP maintenance verifications; and

(vi) Corrective actions and/or resolutions, when applicable.

(b) Each Copermittee must prioritize the Priority Development Projects with structural BMPs within its jurisdiction. The designation of Priority Development Projects as high priority must consider the following:

(i) The highest water quality priorities identified in the Water Quality Improvement Plan;

(ii) Receiving water quality;

(iii) Number and sizes of structural BMPs;

(iv) Recommended maintenance frequency of structural BMPs;

(v) Likelihood of operation and maintenance issues of structural BMPs;

(vi) Land use and expected pollutants generated; and

(vii) Compliance record.

(3) Structural BMP Maintenance Verifications and Inspections

Each Copermittee is required to verify that structural BMPs on each Priority Development Project are adequately maintained, and continue to operate effectively to remove pollutants in storm water to the MEP through inspections, self-certifications, surveys, or other equally effective approaches.

(a) All (100 percent) of the structural BMPs at Priority Development Projects that are designated as high priority must be inspected directly by the

Copermittee annually prior to each rainy season;

(b) For verifications performed through a means other than direct Copermittee inspection, adequate documentation must be required by the Copermittee to provide assurance that the required maintenance of structural BMPs at each Priority Development Project has been completed; and

(c) Appropriate follow-up measures (including re-inspections, enforcement, etc.) must be conducted to ensure that structural BMPs at each Priority Development Project continue to reduce pollutants in storm water to the MEP as originally designed.

f. DEVELOPMENT PROJECT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all development projects, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

4. Construction Management

Each Copermittee must implement a construction management program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. PROJECT APPROVAL PROCESS

Prior to issuance of any local permit(s) that allows the commencement of construction projects that involve ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff, each Copermittee must:

(1) Require a pollution control plan, construction BMP plan, and/or an erosion and sediment control plan, to be submitted by the project applicant to the Copermittee;

(2) Confirm the pollution control plan, construction BMP plan, and/or erosion and sediment control plan, complies with the local grading ordinance, other applicable local ordinances, and the requirements of this Order;

(3) Confirm the pollution control, construction BMP, and/or erosion and sediment control plan, includes seasonally appropriate and effective BMPs and management measures described in Provision E.4.c, as applicable to the project; and

(4) Verify that the project applicant has obtained coverage under the statewide

Construction General Permit (Order ~~2012-0006~~2009-0009-DWQ or subsequent Order), if applicable.

b. CONSTRUCTION SITE INVENTORY AND TRACKING

(1) Each Copermittee must maintain and update, at least quarterly, a watershed-based inventory of all construction projects issued a local permit that allows ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff. The use of an automated database system, such as GIS, is highly recommended. The inventory must include:

(a) Relevant contact information for each site (e.g., name, address, phone, and email for the owner and contractor);

(b) The basic site information including location (address and hydrologic subarea), Waste Discharge Identification (WDID) number (if applicable), size of the site, and approximate area of disturbance;

(c) Whether or not the site is considered a high threat to water quality, as defined in Provision E.4.b.(2) below;

(d) The project start and completion dates;

(e) The required inspection frequency, as defined in the Copermittee's jurisdictional runoff management program document;

(f) The date the Copermittee accepted or approved the pollution control plan, construction BMP plan, and/or erosion and sediment control plan; and

(g) Whether or not there are ongoing enforcement actions administered to the site.

(2) Each Copermittee must identify all construction sites within its jurisdiction that represent a high threat to downstream surface water quality. The designation of construction sites as high threat to water quality must consider the following:

(a) Sites located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Sites located within the same hydrologic subarea and tributary to a water body segment listed as impaired for sediment on the CWA section 303(d) List;

(c) Sites located within, directly adjacent to, or discharging directly to a receiving water within an ESA; and

(d) Other sites determined by the Copermittees or the San Diego Water Board as a high threat to water quality.

c. CONSTRUCTION SITE BMP IMPLEMENTATION

Each Copermittee must implement, or require the implementation of effective BMPs to reduce discharges of pollutants in storm water from construction sites to the MEP, and effectively prohibit non-storm water discharges from construction sites into the MS4. These BMPs must be site specific, seasonally appropriate, and construction phase appropriate. BMPs must be implemented at each construction site year round. Dry season BMP implementation must plan for and address unseasonal rain events that may occur during the dry season (May 1 through September 30). Copermittees must implement, or require the implementation of, BMPs in the following categories:

(1) Project Planning;

(2) Good Site Management "Housekeeping", including waste management;

(3) Non-storm Water Management;

(4) Erosion Control;

(5) Sediment Control;

(6) Run-on and Run-off Control; and

(7) Active/Passive Sediment Treatment Systems, where applicable.

d. CONSTRUCTION SITE INSPECTIONS

Each Copermittee must conduct construction site inspections to require and confirm compliance with its local permits and applicable local ordinances, and the requirements of this Order. Priority for site inspections must consider threat to water quality pursuant to Provision E.4.b as well as the nature of the construction activity, topography, and the characteristics of soils and receiving water quality.

(1) <u>Inspection Frequency</u>

(a) Each Copermittee must conduct inspections at all inventoried sites, including high threat to water quality sites, at an appropriate frequency for each phase of construction to confirm the site reduces the discharge of pollutants in storm water from construction sites to the MEP, and effectively prohibits non-storm water discharges from entering the MS4.

(b) Each Copermittee must establish appropriate inspection frequencies for

high threat to water quality sites, and all other sites, for each phase of construction. Inspection frequencies appropriate for addressing the highest water quality priorities identified in the Water Quality Improvement Plan, and for complying with the requirements of this Order must be identified in each Copermittee's jurisdictional runoff management program document.

(c) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e., re-inspection, enforcement) necessary to require and confirm site compliance with its local permits and applicable local ordinances, and the requirements of this Order.

(2) Inspection Content

Inspections of construction sites by the Copermittee must include, at a minimum:

(a) Verification of coverage under the Construction General Permit (Notice of Intent (NOI) and/or WDID number) during initial inspections, when applicable;

(b) Assessment of compliance with its local permits and applicable local ordinances related to pollution prevention, including the implementation and maintenance of applicable BMPs;

(c) Assessment of BMP adequacy and effectiveness;

(d) Visual observations of actual non-storm water discharges;

(e) Visual observations of actual or potential discharge of sediment and/or construction related materials from the site;

(f) Visual observations of actual or potential illicit connections; and

(g) If any violations are found and BMP corrections are needed, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried construction sites. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Site name, location (address and hydrologic subarea), and WDID number

(if applicable);

(b) Inspection date;

(c) Approximate amount of rainfall since last inspection;

(d) Description of problems observed with BMPs and indication of need for BMP addition/repair/replacement and any scheduled re-inspection, and date of re-inspection;

(e) Descriptions of any other specific inspection comments which must, at a minimum, include rationales for longer compliance time;

(f) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(g) Resolution of problems noted and date problems fixed.

e. CONSTRUCTION SITE ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried construction sites, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

5. Existing Development Management

Each Copermittee must implement an existing development management program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. EXISTING DEVELOPMENT INVENTORY AND TRACKING

Each Copermittee must maintain, and update at least annually, a watershed-based inventory of the existing development within its jurisdiction that may discharge a pollutant load to and from the MS4. The use of an automated database system, such as GIS, is highly recommended. The inventory must, at a minimum, include:

(1) Name, location (hydrological subarea and address, if applicable) of the following types of existing development with its jurisdiction:

(a) Commercial facilities or areas;

(b) Industrial facilities;

(c) Municipal facilities, including:

(i) MS4 and related structures;[28]

(ii) Roads, streets, and highways;

(iii) Parking facilities;

(iv) Municipal airfields;

(v) Parks and recreation facilities;

(vi) Flood management facilities, flood control devices and structures;

(vii) Operating or closed municipal landfills;

(viii) Publicly owned treatment works (including water and wastewater treatment plants) and sanitary sewer collection systems;

(ix) Corporate yards, including maintenance and storage yards for materials, waste, equipment, and vehicles;

(x) Hazardous waste collection facilities;

(xi) Other treatment, storage or disposal facilities for municipal waste; and

(xii) Other municipal facilities that the Copermittee determines may contribute a significant pollutant load to the MS4.

(d) Residential areas, which may be designated by one or more of the following:

(i) Residential management area;

(ii) Drainage basin or area;

(iii) Land use (e.g., single family, multi-family, rural);

(iv) Neighborhood;

(v) Common Interest Area;

(vi) Home Owner Association;

(vii) Mobile home park; and/or

(viii) Other designations accepted by the San Diego Water Board Executive Officer.

(2) A description of the facility or area, including the following information:

(a) Classification as commercial, industrial, municipal, or residential;

(b) Status of facility or area as active or inactive;

(c) Identification if a business is a mobile business;

[28] The inventory may refer to the MS4 map required to be maintained pursuant to Provision E.2.b.(1).

(d) SIC Code or NAICS Code, if applicable;

(e) Industrial General Permit NOI and/or WDID number, if applicable;

(f) Identification if a residential area is or includes a Common Interest Area / Home Owner Association, or mobile home park;

(g) Identification of pollutants generated and potentially generated by the facility or area;

(h) Whether the facility or area is adjacent to an ESA;

(i) Whether the facility or area is tributary to and within the same hydrologic subarea as a water body segment listed as impaired on the CWA section 303(d) List and generates pollutants for which the water body segment is impaired; and

(3) An annually updated map showing the location of inventoried existing development, watershed boundaries, and water bodies.

b. EXISTING DEVELOPMENT BMP IMPLEMENTATION AND MAINTENANCE

Each Copermittee must designate a minimum set of BMPs required for all inventoried existing development, including special event venues. The designated minimum BMPs must be specific to facility or area types and pollutant generating activities, as appropriate.

(1) Commercial, Industrial, and Municipal Facilities and Areas

(a) Pollution Prevention

Each Copermittee must require the use of pollution prevention methods by the commercial, industrial, and municipal facilities and areas in its inventoried existing development to address the priorities and strategies in the Water Quality Improvement Plan.

(b) BMP Implementation

Each Copermittee must require the implementation of designated BMPs at commercial facilities and areas, industrial facilities, and implement designated BMPs at municipal facilities in its inventoried existing development.

(c) BMP Operation and Maintenance

(i) Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at commercial facilities and areas, industrial facilities, and municipal

facilities in its inventoried existing development.

(ii) Each Copermittee must implement a schedule of operation and maintenance activities for its MS4 and related structures (including but not limited to catch basins, storm drain inlets, detention basins, etc.), and verify proper operation of all its municipal structural treatment controls designed to reduce pollutants (including floatables) in storm water discharges to or from its MS4s and related drainage structures. Operation and maintenance activities may include, but is not limited to, the following:

[a] Inspections of the MS4 and related structures;
[b] Cleaning of the MS4 and related structures; and
[c] Proper disposal of materials removed from cleaning of the MS4 and related structures.

(iii) Each Copermittee must implement a schedule of operation and maintenance for public streets, unpaved roads, paved roads, and paved highways within its jurisdiction to minimize pollutants that can be discharged in storm water.

(iv) Each Copermittee must implement controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers. Copermittees that operate both a municipal sanitary sewer system and a MS4 must implement controls and measures to prevent and eliminate seeping sewage from infiltrating the MS4. Copermittees that do not operate both a municipal sanitary sewer system and a MS4 must coordinate with sewering agencies to keep themselves informed of relevant and appropriate maintenance activities and sanitary sewage projects in their jurisdiction that may cause or contribute to seepage of sewage into the MS4.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must require the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from commercial facilities and areas and industrial facilities, and implement BMPs at municipal facilities in its inventoried existing development. Such BMPs must include, as appropriate, educational activities, permits, certifications and other measures for applicators and distributors.

(2) <u>Residential Areas</u>

(a) Pollution Prevention

Each Copermittee must promote and encourage the use of pollution prevention methods, where appropriate, by the residential areas in its

inventoried existing development.

(b) BMP Implementation

Each Copermittee must promote and encourage the implementation of designated BMPs at residential areas in its inventoried existing development.

(c) BMP Operation and Maintenance

Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at residential areas in its inventoried existing development.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must promote and encourage the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from residential areas in its inventoried existing development.

c. EXISTING DEVELOPMENT INSPECTIONS

Each Copermittee must conduct inspections of inventoried existing development to ensure compliance with applicable local ordinances and permits, and the requirements of this Order.

(1) Inspection Frequency

(a) Each Copermittee must establish appropriate inspection frequencies for inventoried existing development in accordance with the following requirements:

(i) At a minimum, inventoried existing development must be inspected once every five years utilizing one or more of the following methods:

[a] Drive-by inspections by Copermittee municipal and contract staff;
[b] Onsite inspections by Copermittee municipal and contract staff; and/or
[c] Visual inspections of publicly accessible inventoried facilities or areas by volunteer monitoring or patrol programs that have been trained by the Copermittee;

(ii) The frequency of inspections must be appropriate to confirm that BMPs are being implemented to reduce the discharge of pollutants in storm water from the MS4 to the MEP and effectively prohibit non-storm water discharges to the MS4;

(iii) The frequency of inspections must be based on the potential for a facility or area to discharge non-storm water and pollutants in storm water, and should reflect the priorities set forth in the Water Quality Improvement Plan;

(iv) Each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development;[29] and

(v) Inventoried existing development must be inspected by the Copermittee, as needed, in response to valid public complaints.

(b) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e. education and outreach, re-inspection, enforcement) necessary to require and confirm compliance with its applicable local ordinances and permits and the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

(2) Inspection Content

(a) Inspections of existing development must include, at a minimum:

(i) Visual inspections for the presence of actual non-storm water discharges;

(ii) Visual inspections for the presence of actual or potential discharge of pollutants;

(iii) Visual inspections for the presence of actual or potential illicit connections; and

(iv) Verification that the description of the facility or area in the inventory, required pursuant to Provision E.5.a.(2), has not changed.

(b) Onsite inspections of existing development by the Copermittee must include, at a minimum:

(i) Assessment of compliance with its applicable local ordinances and permits related to non-storm water and storm water discharges and runoff;

(ii) Assessment of the implementation of the designated BMPs;

(iii) Verification of coverage under the Industrial General Permit, when

[29] If any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspection may count toward the total annual inspection requirement. This requirement excludes linear municipal facilities (i.e., MS4 linear channels, sanitary sewer collection systems, streets, roads and highways).

applicable; and

(iv) If any problems or violations are found, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried existing development. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Name and location of the facility or area (address and hydrologic subarea) consistent with the inventory name and location, pursuant to Provision E.5.a.(1);

(b) Inspection and re-inspection date(s);

(c) Inspection method(s) (i.e. drive-by, onsite);

(d) Observations and findings from the inspection(s);

(e) For onsite inspections of existing development by Copermittee municipal or contract staff, the records must also include, as applicable:

(i) Description of any problems or violations found during the inspection(s);

(ii) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(iii) The date problems or violations were resolved.

d. EXISTING DEVELOPMENT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried existing development, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

e. RETROFITTING AND REHABILITATING AREAS OF EXISTING DEVELOPMENT

(1) Retrofitting Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to retrofit areas of existing development within

its jurisdiction to address identified sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify areas of existing development as candidates for retrofitting, focusing on areas where retrofitting will address pollutants and/or stressors that contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for retrofitting projects may be utilized to reduce pollutants that may be discharged in storm water from areas of existing development, and/or address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of retrofitting projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting projects; and

(e) Where retrofitting projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional retrofitting projects (i.e. projects that can receive and/or treat storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment) adjacent to and/or downstream of the areas of existing development.

(2) Stream, Channel and/or Habitat Rehabilitation in Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to rehabilitate streams, channels, and/or habitats in areas of existing development within its jurisdiction to address the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify streams, channels, and/or habitats in areas of existing development as candidates for rehabilitation, focusing on areas where stream, channel, and/or habitat rehabilitation projects will address the highest priority water quality conditions identified in the Water

Quality Improvement Plan;

(b) Candidates for stream, channel, and/or habitat rehabilitation projects may be utilized to address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters, rehabilitate channelized or hydromodified streams, restore wetland and riparian habitat, restore watershed functions, and/or restore beneficial uses of receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of stream, channel, and/or habitat rehabilitation projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance stream, channel, and/or habitat rehabilitation projects; and

(e) Where stream, channel, and/or habitat rehabilitation projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional stream, channel, and/or habitat rehabilitation projects (i.e. projects that can receive storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment).

6. Enforcement Response Plans

Each Copermittee must develop and implement an Enforcement Response Plan as part of its jurisdictional runoff management program document. The Enforcement Response Plan must describe the applicable approaches and options to enforce its legal authority established pursuant to Provision E.1, as necessary, to achieve compliance with the requirements of this Order. The Enforcement Response Plan must be in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include the following:

a. ENFORCEMENT RESPONSE PLAN COMPONENTS

The Enforcement Response Plan must include the following individual components:

(1) Illicit Discharge Detection and Elimination Enforcement Component;

(2) Development Planning Enforcement Component;

(3) Construction Management Enforcement Component; and

(4) Existing Development Enforcement Component.

b. ENFORCEMENT RESPONSE APPROACHES AND OPTIONS

Each component of the Enforcement Response Plan must describe the enforcement response approaches that the Copermittee will implement to compel compliance with its statutes, ordinances, permits, contracts, orders, or similar means, and the requirements of this Order. The description must include the protocols for implementing progressively stricter enforcement responses. The enforcement response approaches must include appropriate sanctions to compel compliance, including, at a minimum, the following tools or their equivalent:

(1) Verbal and written notices of violation;

(2) Cleanup requirements;

(3) Fines;

(4) Bonding requirements;

(5) Administrative and criminal penalties;

(6) Liens;

(7) Stop work orders; and

(8) Permit and occupancy denials.

c. CORRECTION OF VIOLATIONS

(1) Violations must be corrected in a timely manner with the goal of correcting the violations within 30 calendar days after the violations are discovered, or prior to the next predicted rain event, whichever is sooner.

(2) If more than 30 calendar days are required to achieve compliance, then a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

d. ESCALATED ENFORCEMENT

(1) The Enforcement Response Plan must include a definition of "escalated enforcement." Escalated enforcement must include any enforcement scenario where a violation or other non-compliance is determined to cause or contribute to the highest priority water quality conditions identified in the

Water Quality Improvement Plan. Escalated enforcement may be defined differently for development planning, construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas.

(2) Where the Copermittee determines escalated enforcement is not required, a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

(3) Escalated enforcement actions must continue to increase in severity, as necessary, to compel compliance as soon as possible.

e. REPORTING OF NON-COMPLIANT SITES

(1) Each Copermittee must notify the San Diego Water Board in writing within five (5) calendar days of issuing escalated enforcement (as defined in the Copermittee's Enforcement Response Plan) to a construction site that poses a significant threat to water quality as a result of violations or other non-compliance with its permits and applicable local ordinances, and the requirements of this Order. Written notification may be provided electronically by email to the appropriate San Diego Water Board staff.

(2) Each Copermittee must notify the San Diego Water Board of any persons required to obtain coverage under the statewide Industrial General Permit and Construction General Permit and failing to do so, within five (5) calendar days from the time the Copermittee become aware of the circumstances. Written notification may be provided electronically by email to R9_Nonfilers@waterboards.ca.gov ~~Nonfilers_R9@waterboards.ca.gov~~.

7. Public Education and Participation

Each Copermittee must implement, individually or with other Copermittees, a public education and participation program in accordance with the strategies identified in the Water Quality Improvement Plan to promote and encourage the development of programs, management practices, and behaviors that reduce the discharge of pollutants in storm water to the MEP, prevent controllable non-storm water discharges from entering the MS4, and protect water quality standards in receiving waters. The public education and participation program must be implemented in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include, at a minimum, the following requirements:

a. PUBLIC EDUCATION

The public education program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) Educational activities, public information activities, and other appropriate outreach activities intended to reduce pollutants associated with the application of pesticides, herbicides and fertilizer and other pollutants of concern in storm water discharges to and from its MS4 to the MEP, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed to address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(2) Educational activities, public information activities, and other appropriate outreach activities to facilitate the proper management and disposal of used oil and toxic materials; and

(3) Appropriate education and training measures for specific target audiences, such as construction site operators, residents, underserved target audiences and school-aged children, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed, based on high risk behaviors and pollutants of concern.

b. PUBLIC PARTICIPATION

The public participation program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) A process for members of the public to participate in updating the highest priority water quality conditions, numeric goals, and water quality improvement strategies in the Water Quality Improvement Plan;

(2) Opportunities for members of the public to participate in providing the Copermittee recommendations for improving the effectiveness of the water quality improvement strategies implemented within its jurisdiction; and

(3) Opportunities for members of the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or protection of the quality of receiving waters.

8. Fiscal Analysis

a. Each Copermittee must secure the resources necessary to meet all the requirements of this Order.

b. Each Copermittee must conduct an annual fiscal analysis of its jurisdictional runoff management program in its entirety. The fiscal analysis must include the following:

(1) Identification of the various categories of expenditures necessary to implement the requirements of this Order, including a description of the specific capital, operation and maintenance, and other expenditure items to

be accounted for in each category of expenditures;

(2) The staff resources needed and allocated to meet the requirements of this Order, including any development, implementation, and enforcement activities required;

(3) The estimated expenditures for Provisions E.8.b.(1) and E.8.b.(2) for the current fiscal year; and

(4) The source(s) of funds that are proposed to meet the necessary expenditures described in Provisions E.8.b.(1) and E.8.b.(2), including legal restrictions on the use of such funds, for the current fiscal year and next fiscal year.

c. Each Copermittee must submit a summary of the annual fiscal analysis with each Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3).

d. Each Copermittee must provide the documentation used to develop the summary of the annual fiscal analysis upon request by the San Diego Water Board.

F. REPORTING

The purpose of this provision is to determine and document compliance with the requirements set forth in this Order. The goal of reporting is to communicate to the San Diego Water Board and the people of the State of California the implementation status of each jurisdictional runoff management program and compliance with the requirements of this Order. This goal is to be accomplished through the submittal of specific deliverables to the San Diego Water Board by the Copermittees.

1. Water Quality Improvement Plans

The Copermittees for each Watershed Management Area must develop and submit the Water Quality Improvement Plan in accordance with the following requirements:

a. WATER QUALITY IMPROVEMENT PLAN DEVELOPMENT

Each Water Quality Improvement Plan must be developed in accordance with the following process:

(1) Public Participation Process

The Copermittees must implement a public participation process to solicit data, information, and recommendations to be utilized in the development of the Water Quality Improvement Plan. The public participation process must include the following:

(a) The Copermittees must develop a publicly available and noticed schedule of the opportunities for the public to participate and provide comments during the development of the Water Quality Improvement Plan. The schedule may be adjusted as necessary by the Copermittees, provided the public is provided timely notification of the changes to the schedule.

(b) The Copermittees must form a Water Quality Improvement Consultation Panel to provide recommendations during the development of the Water Quality Improvement Plan. The Water Quality Improvement Consultation Panel must consist of at least the following members:

(i) A representative of the San Diego Water Board;

(ii) A representative of the environmental community familiar with the water quality conditions of concern of the receiving waters in the Watershed Management Area, preferably from an environmental interest group associated with a water body within the Watershed Management Area; and

(iii) A representative of the development community familiar with the opportunities and constraints for implementing structural BMPs, retrofitting projects, and stream, channel or habitat rehabilitation

projects in the Watershed Management Area, preferably with relevant engineering, hydrology, and/or geomorphology experience in the Watershed Management Area.

(c) The Copermittees must coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public time and opportunity to participate during the development of the Water Quality Improvement Plans.

(2) Priority Water Quality Conditions

(a) The Copermittees must solicit data, information and recommendations from the public to be utilized in the development and identification of the priority water quality conditions and potential water quality improvement strategies for the Watershed Management Area.

(b) The Copermittees must review the priority water quality conditions the Copermittees plan on including in the Water Quality Improvement Plan with the Water Quality Improvement Consultation Panel to receive recommendations or concurrence.

(c) The Copermittees must consider revisions to the priority water quality conditions based on recommendations from the Water Quality Improvement Consultation Panel.

(d) The Copermittees must include all the potential water quality improvement strategies identified by the public and the Water Quality Improvement Consultation Panel with the submittal of the priority water quality conditions to the San Diego Water Board.

(e) The Copermittees must submit the Water Quality Improvement Plan requirements of Provision B.2 to the San Diego Water Board as early as 6 months and no later than 12 months after the commencement of coverage under this Order. Upon receipt, the San Diego Water Board will issue a public notice and release the proposed priority water quality conditions and potential water quality improvement strategies for public review and comment for a minimum of 30 days.

(f) The Copermittees must consider revisions to the priority water quality conditions and potential water quality improvement strategies developed pursuant to Provision B.2 based on public comments received by the close of the comment period.

(3) Water Quality Improvement Goals, Strategies and Schedules

(a) The Copermittees must solicit recommendations from the public on potential numeric goals for the highest priority water quality conditions

identified for the Watershed Management Area, and recommendations on the strategies that should be implemented to achieve the potential numeric goals.

(b) The Copermittees must consult with the Water Quality Improvement Consultation Panel and consider revisions to the following items based on the Panel's recommendations:

(i) The numeric goals and schedules the Copermittees propose to include in the Water Quality Improvement Plan;

(ii) The water quality improvement strategies and schedules the Copermittees propose to implement in the Watershed Management Area and include in the Water Quality Improvement Plan; and

(iii) If the Copermittees choose to implement Provision B.3.b.(4), the results of the Watershed Management Area Analysis the Copermittees proposed to incorporate into the Water Quality Improvement Plan.

(c) The Copermittees must submit the Water Quality Improvement Plan requirements of Provision B.3 to the San Diego Water Board as early as 9 months and no later than 18 months after the commencement of coverage under this Order. Upon receipt, the San Diego Water Board will issue a public notice and release the proposed water quality improvement goals, strategies and schedules for public review and comment for a minimum of 30 days.

(d) The Copermittees must consider revisions to the water quality improvement goals, strategies and schedules developed pursuant to Provision B.3 based on public comments received by the close of the comment period.

b. WATER QUALITY IMPROVEMENT PLAN SUBMITTAL AND IMPLEMENTATION

(1) Within 24 months after the commencement of coverage under this Order, the Copermittees for each Watershed Management Area must submit a complete Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order to the San Diego Water Board. The San Diego Water Board will issue a public notice and release the Water Quality Improvement Plan for public review and comment for a minimum of 30 days.

(2) The Copermittees must consider revisions to the Water Quality Improvement Plan based on written comments received by the close of the public comment period.

(3) The Copermittees must promptly submit any revisions to the Water Quality Improvement Plan to the San Diego Water Board no later than 60 days after the close of the public comment period.

(4) If issues concerning the Water Quality Improvement Plan are resolved informally through discussions among the Copermittees, the San Diego Water Board and interested parties, the San Diego Water Board Executive Officer may provide written notification of acceptance to the Copermittees that the Water Quality Improvement Plan meets the requirements of Provision B. However, if the Executive Officer determines that significant issues with the Water Quality Improvement Plan remain, the matter will be scheduled for San Diego Water Board consideration at a public meeting.

(5) The Copermittees must commence with implementation of the Water Quality Improvement Plan, in accordance with the water quality improvement strategies and schedules therein, upon written notification of acceptance with the Water Quality Improvement Plan by the San Diego Water Board Executive Officer.

(6) During implementation of the Water Quality Improvement Plan the Copermittees must correct any deficiencies in the Plan identified by the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report following a request by the Board to do so.

(7) The Water Quality Improvement Plan must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of receiving notification of acceptance with the Water Quality Improvement Plan by the San Diego Water Board Executive Officer.

2. Updates

a. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATES

Each Copermittee must update its jurisdictional runoff management program document in accordance with the following requirements:

(1) Each Copermittee is encouraged to seek public and key stakeholder participation and comments, as early and often as possible during the process of developing updates to its jurisdictional runoff management program document;

(2) Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E concurrent with the submittal of the Water Quality Improvement Plan. Each Copermittee must correct any deficiencies in the jurisdictional runoff management program document based on comments received from the San Diego Water Board in

the updates submitted with the Water Quality Improvement Plan Annual Report;

(3) Each Copermittee must submit updates to its jurisdictional runoff management program, with the supporting rationale for the modifications, either in the Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b;

(4) The Copermittee must revise proposed modifications to its jurisdictional runoff management program as directed by the San Diego Water Board Executive Officer; and

(5) Updated jurisdictional runoff management program documents must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of submitting the Water Quality Improvement Plan Annual Report.

b. BMP DESIGN MANUAL UPDATES

Each Copermittee must update its BMP Design Manual in accordance with the following requirements:

(1) Each Copermittee must update its BMP Design Manual to incorporate the requirements of Provisions E.3.a-d concurrent with the submittal of the Water Quality Improvement Plan. Each Copermittee must correct any deficiencies in the BMP Design Manual based on comments received from the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report;

(2) Subsequent updates to the BMP Design Manual must be consistent with the requirements of Provisions E.3.a-d and must be submitted as part of the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b; and

(3) Updated BMP Design Manuals must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of completing the update.

c. WATER QUALITY IMPROVEMENT PLAN UPDATES

(1) The Water Quality Improvement Plans must be updated in accordance with the following process:

(a) The Copermittees must develop and implement a public participation process to obtain data, information and recommendations for updating the Water Quality Improvement Plan. The public participation process must provide for a publicly available and noticed schedule of opportunities for the public to participate and provide comments during the development of updates to the Water Quality Improvement Plan;

(b) The Copermittees must consult with the Water Quality Improvement Consultation Panel on proposed updates of the Water Quality Improvement Plan, and consider the Water Quality Improvement Consultation Panel's recommendations in finalizing the proposed updates;

(c) The Copermittees for each Watershed Management Area must submit 1) proposed updates to the Water Quality Improvement Plan and supporting rationale, and 2) recommendations received from the public and the Water Quality Improvement Consultation Panel and the rationale for the requested updates, either in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The updates submitted will be deemed accepted for inclusion in the Water Quality Improvement Plan ninety (90) days after submission unless otherwise directed in writing by the San Diego Water Board Executive Officer;

(d) The Copermittees must revise the requested updates as directed by the San Diego Water Board Executive Officer; and

(e) Updated Water Quality Improvement Plans must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance of the requested updates by the San Diego Water Board.

(2) No later than six months following Office of Administrative Law and USEPA approval of any TMDL Basin Plan amendment with wasteload allocations (WLAs) assigned to the Copermittees during the term of this Order, the Copermittees must initiate an update to the applicable Water Quality Improvement Plans in accordance with Provision F.1 or Provision F.2.c.(1) to incorporate the requirements of the TMDL WLAs.

3. Progress Reporting

a. Progress Report Presentations

The Copermittees for each Watershed Management Area must periodically appear before the San Diego Water Board, as requested by the Board, to provide progress reports on the implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs.

b. Annual Reports

(1) Transitional Jurisdictional Runoff Management Program Annual Reports

(a) Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) no later than October 31 of each year for each jurisdictional runoff management program reporting period (i.e. July 1 to June 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted.

(b) Each Copermittee must submit the information on the Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) specific to the area within its jurisdiction in each Watershed Management Area.

(c) In addition to submitting the Jurisdictional Runoff Management Program Annual Report Form during the transitional reporting period, each Copermittee may continue to utilize and submit the jurisdictional runoff management program annual reporting format of its previous NPDES permit until the first Water Quality Improvement Plan Annual Report is required to be submitted.

(2) Transitional Monitoring and Assessment Program Annual Reports

The Copermittees for each Watershed Management Area must submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted under this Order. The Transitional Monitoring and Assessment Program Annual Reports must include:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1.a and D.2.a, summarized and presented in tabular and graphical form; and

(b) The findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

(3) Water Quality Improvement Plan Annual Reports

The Copermittees for each Watershed Management Area must submit a Water Quality Improvement Plan Annual Report for each reporting period no later than January 31 of the following year. The annual reporting period consists of two different periods: 1) July 1 to June 30 of the following year for the jurisdictional runoff management programs, 2) October 1 to September 30 of the following year for the monitoring and assessment programs. The Water Quality Improvement Plan Annual Reports must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Each Annual Report must include the following:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, summarized and presented in tabular and graphical form;

(b) The progress of the special studies required pursuant to Provision D.3, and the findings, interpretations and conclusions of a special study, or each phase of a special study, upon its completion;

(c) The findings, interpretations and conclusions from the assessments required pursuant to Provision D.4;

(d) The progress of implementing the Water Quality Improvement Plan, including, but not limited to, the following:

(i) The progress toward achieving the interim and final numeric goals for the highest water quality priorities for the Watershed Management Area;

(ii) The water quality improvement strategies that were implemented and/or no longer implemented by each of the Copermittees during the reporting period and previous reporting periods;

(iii) The water quality improvement strategies planned for implementation during the next reporting period;

(iv) Proposed modifications to the water quality improvement strategies, the public comments received and the supporting rationale for the proposed modifications;

(v) Previous modifications or updates incorporated into the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document and implemented by the Copermittees in the Watershed Management Area; and

(vi) Proposed modifications or updates to the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document;

(e) A completed Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) for each Copermittee in the Watershed Management Area, certified by a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative; and

(f) Each Copermittee must provide any data or documentation utilized in developing the Water Quality Improvement Plan Annual Report upon request by the San Diego Water Board. Any Copermittee monitoring data utilized in developing the Water Quality Improvement Plan Annual Report must be uploaded to the California Environmental Data Exchange Network (CEDEN).[30] Any Copermittee monitoring and assessment data utilized in developing the Water Quality Improvement Plan Annual Report must be available for access on the Regional Clearinghouse required pursuant to Provision F.4.

C. REGIONAL MONITORING AND ASSESSMENT REPORT

(1) The Copermittees must submit a Regional Monitoring and Assessment Report no later than 180 days prior to the expiration date of this Order. The Regional Monitoring and Assessment Report may be submitted as part of the Report of Waste Discharge required pursuant to Provision F.5.b. In preparing the report the Copermittees must consider the receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, and the findings, interpretations, and conclusions from the assessments required pursuant to Provision D.4. Based on these considerations the report must assess the following:

(a) The beneficial uses of the receiving waters within the San Diego Region that are supported and not adversely affected by the Copermittees' MS4 discharges;

(b) The beneficial uses of the receiving waters within the San Diego Region that are adversely impacted by the Copermittees' MS4 discharges;

(c) The progress toward protecting the beneficial uses in the receiving waters within the San Diego Region from the Copermittees' discharges; and

[30] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

(d) Pollutants or conditions of emerging concern that may impact beneficial uses in the receiving waters within the San Diego Region.

(2) The Regional Monitoring and Assessment Report must include recommendations for improving the implementation and assessment of the Water Quality Improvement Plans and jurisdictional runoff management programs.

(3) Each Copermittee must provide any data or documentation utilized in developing the Regional Monitoring and Assessment Report upon request by the San Diego Water Board. Any Copermittee monitoring and assessment data utilized in developing the Regional Monitoring and Assessment Report must be available for access on the Regional Clearinghouse required pursuant to Provision F.4.

4. Regional Clearinghouse

The Copermittees must develop, update, and maintain an internet-based Regional Clearinghouse that is made available to the public no later than 18 months after the effective date of this Order.[31]

a. The Copermittees, through the Regional Clearinghouse, must make the following documents and data available for access, and organized by Watershed Management Area. The documents and data may be linked to other internet-based data portals and databases where the original documents are stored:

(1) Water Quality Improvement Plan for the Watershed Management Area, and all updated versions with date of update;

(2) Annual Reports for the Watershed Management Area;

(3) Jurisdictional Runoff Management Program document for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(4) BMP Design Manual for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(5) Reports from special studies (e.g. source identification, BMP effectiveness assessment) conducted in the Watershed Management Area;

[31] The Copermittees may develop, update and maintain the clearinghouse(s) of other Copermittees or agencies.

(6) Monitoring data collected pursuant to Provision D for each Watershed Management Area must be uploaded to CEDEN,[32] with links to the uploaded data; and

(7) Available GIS data, layers, and/or shapefiles used to develop the maps generated and maintained by the Copermittees for the Water Quality Improvement Plans, Annual Reports, and jurisdictional runoff management program documents.

b. The Copermittees, through the Regional Clearinghouse, must make the following information and documents available for access:

(1) Contact information (point of contact, phone number, email address, and mailing address) for each Copermittee;

(2) Public hotline number for reporting non-storm water and illicit discharges for each Copermittee;

(3) Email address for reporting non-storm water and illicit discharges for each Copermittee;

(4) Link to each Copermittee's website, if available, where the public may find additional information about the Copermittee's storm water management program and for requesting records for the implementation of its program;

(5) Information about opportunities for the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or protection of the quality of receiving waters; and

(6) Reports from regional monitoring programs in which the Copermittees participate (e.g. Southern California Monitoring Coalition, Southern California Coastal Water Research Project Bight Monitoring);

(7) Regional Monitoring and Assessment Reports; and

(8) Any other information, data, and documents the Copermittees determine as appropriate for making available to the public.

[32] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

5. Report of Waste Discharge

a. The ~~Orange County Copermittees and the~~ Riverside County Copermittees are required to submit a complete Report of Waste Discharge pursuant to the requirements of their current Order~~s~~. The San Diego Water Board will review and consider the Report~~s~~ of Waste Discharge to determine whether modification to this Order, pursuant to the requirements of Provision H, will be required prior to the ~~Orange County Copermittees and/or~~ Riverside County Copermittees obtaining coverage under this Order. The current Order ~~s~~ for ~~the Orange County Copermittees and~~ Riverside County Copermittees is ~~are~~ rescinded upon the date of effective coverage under this Order except for enforcement purposes.

b. The Copermittees subject to the requirements of this Order must submit to the San Diego Water Board a complete Report of Waste Discharge as an application for the re-issuance of this Order and NPDES permit. The Report of Waste Discharge must be submitted no later than 180 days in advance of the expiration date of this Order. The Report of Waste Discharge must contain the following minimum information:

(1) Names and addresses of the Copermittees;

(2) Names and titles of the primary contacts of the Copermittees;

(3) Proposed changes to the Copermittees' Water Quality Improvement Plans and the supporting justification;

(4) Proposed changes to the Copermittees' jurisdictional runoff management programs and the supporting justification;

(5) Any other information necessary for the re-issuance of this Order;

(6) Any information to be included as part of the Report of Waste Discharge pursuant to the requirements of this Order; and

(7) Any other information required by federal regulations for NPDES permit reissuance.

6. Application for Early Coverage

a. The ~~Orange County Copermittees, collectively, or~~ Riverside County Copermittees~~, collectively,~~ may apply for early coverage under this Order by submitting a Report of Waste Discharge Form 200, with a written request for early coverage under this Order.

b. The San Diego Water Board will review the application for early coverage. A notification of coverage under this Order will be issued to the Copermittees in the

respective county by the San Diego Water Board upon completion of the early coverage application requirements. The effective coverage date will be specified in the notification of coverage. The Copermittees in the respective county are authorized to have MS4 discharges pursuant to the requirements of this Order starting on the effective coverage date specified in the notification of coverage. The existing Order for the respective county is rescinded upon the effective coverage date specified in the notification of coverage except for enforcement purposes.

7. Reporting Provisions

Each Copermittee must comply with all the reporting and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

G. PRINCIPAL WATERSHED COPERMITTEE RESPONSIBILITIES

1. The Copermittees within each Watershed Management Area must designate a Principal Watershed Copermittee and notify the San Diego Water Board of the name of the Principal Watershed Copermittee. An individual Copermittee should not be designated a Principal Watershed Copermittee for more than two Watershed Management Areas. The notification may be submitted with the Water Quality Improvement Plan required pursuant to Provision F.1 of this Order.

2. The Principal Watershed Copermittee is responsible for, at a minimum, the following:

a. Serving as liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues, and when necessary and appropriate, representing the Copermittees in the Watershed Management Area before the San Diego Water Board;

b. Facilitating the development of the Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order;

c. Coordinating the submittal of the deliverables required by Provisions F.1, F.2, F.3.a, and F.3.b of this Order; and

d. Coordinating and developing, with the other Principal Watershed Copermittees, the requirements of Provisions F.3.c, F.4, and F.5.b of this Order.

3. The Principal Watershed Copermittee is not responsible for ensuring that the other Copermittees within the Watershed Management Area are in compliance with the requirements of this Order. Each Copermittee within the Watershed Management Area is responsible for complying with the requirements of this Order.

H. MODIFICATION OF ORDER

1. Modifications of the Order may be initiated by the San Diego Water Board or by the Copermittees. Requests by Copermittees must be made to the San Diego Water Board.

2. Minor modifications to the Order may be made by the San Diego Water Board where the proposed modification complies with all the prohibitions and limitations, and other requirements of this Order.

3. This Order may also be re-opened and modified, revoked and, reissued or terminated in accordance with the provisions of 40 CFR 122.44, 122.62 to 122.64, and 124.5. Causes for taking such actions include, but are not limited to, failure to comply with any condition of this Order and permit, and endangerment to human health or the environment resulting from the permitted activity.

4. This Order may be re-opened for modification for cause including but not limited to the following:

   a. The State Water Board determines that revisions are warranted, and the San Diego Water Board concurs that revisions are necessary to those provisions of the Order addressing compliance with water quality standards in the receiving water and/or those provisions of the Order establishing an iterative process for implementation of management practices to assure compliance with water quality standards in the receiving water;

   b. An application for early coverage under this Order is received pursuant to Provision F.6;

   c. Any of the TMDLs in Attachment E to this Order are amended in the Basin Plan by San Diego Water Board, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA;

   d. The Basin Plan is amended by the San Diego Water Board to incorporate a new TMDL, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA; or

   e. Updating or revising the monitoring and reporting requirements is determined to be necessary, at the discretion of the San Diego Water Board. Such modification(s) may include, but is (are) not limited to, revision(s) to: (i) implement recommendations from Southern California Coastal Water Research Project (SCCWRP), (ii) develop, refine, implement, and/or coordinate a regional monitoring program, (iii) develop and implement improved monitoring and assessment programs in keeping with San Diego Water Board Resolution No. R9-2012-0069, Resolution in Support of a Regional Monitoring Framework, and/or (iv) add provisions to require the Copermittees to evaluate and provide information on cost and values of the monitoring and reporting program.

5. The San Diego Water Board, after opportunity for public comment and a public hearing, will re-open and consider modifications to this Order when the Orange County Copermittees or the Riverside County Copermittees submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders.

I. STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

Each Copermittee must comply with all the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

ATTACHMENT A

DISCHARGE PROHIBITIONS AND SPECIAL PROTECTIONS

1. Basin Plan Waste Discharge Prohibitions

California Water Code Section 13243 provides that a Regional Water Board, in a water quality control plan, may specify certain conditions or areas where the discharge of waste or certain types of waste is not permitted. The following waste discharge prohibitions in the Water Quality Control Plan for the San Diego Basin (Basin Plan) are applicable to any person, as defined by Section 13050(c) of the California Water Code, who is a citizen, domiciliary, or political agency or entity of California whose activities in California could affect the quality of waters of the state within the boundaries of the San Diego Region.

1. The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in California Water Code Section 13050, is prohibited.

2. The discharge of waste to land, except as authorized by waste discharge requirements or the terms described in California Water Code Section 13264 is prohibited.

3. The discharge of pollutants or dredged or fill material to waters of the United States except as authorized by a National Pollutant Discharge Elimination System (NPDES) permit or a dredged or fill material permit (subject to the exemption described in California Water Code Section 13376) is prohibited.

4. Discharges of recycled water to lakes or reservoirs used for municipal water supply or to inland surface water tributaries thereto are prohibited, unless this San Diego Water Board issues a NPDES permit authorizing such a discharge; the proposed discharge has been approved by the State Department of Health Services (DHS) and the operating agency of the impacted reservoir; and the discharger has an approved fail-safe long-term disposal alternative.

5. The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the San Diego Water Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

6. The discharge of waste in a manner causing flow, ponding, or surfacing on lands not owned or under the control of the discharger is prohibited, unless the discharge is authorized by the San Diego Water Board.

7. The dumping, deposition, or discharge of waste directly into waters of the state, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the San Diego Water Board.

8. Any discharge to a storm water conveyance system that is not composed entirely of "*storm water*" is prohibited unless authorized by the San Diego Water Board. [The federal regulations, 40 CFR 122.26(b)(13), define storm water as storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from firefighting activities.] [§122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

9. The unauthorized discharge of treated or untreated sewage to waters of the state or to a storm water conveyance system is prohibited.

10. The discharge of industrial wastes to conventional septic tank/subsurface disposal systems, except as authorized by the terms described in California Water Code Section 13264, is prohibited.

11. The discharge of radioactive wastes amenable to alternative methods of disposal into the waters of the state is prohibited.

12. The discharge of any radiological, chemical, or biological warfare agent into waters of the state is prohibited.

13. The discharge of waste into a natural or excavated site below historic water levels is prohibited unless the discharge is authorized by the San Diego Water Board.

14. The discharge of sand, silt, clay, or other earthen materials from any activity, including land grading and construction, in quantities which cause deleterious bottom deposits, turbidity or discoloration in waters of the state or which unreasonably affect, or threaten to affect, beneficial uses of such waters is prohibited.

15. The discharge of treated or untreated sewage from vessels to Mission Bay, Oceanside Harbor, Dana Point Harbor, or other small boat harbors is prohibited.

16. The discharge of untreated sewage from vessels to San Diego Bay is prohibited.

17. The discharge of treated sewage from vessels to portions of San Diego Bay that are less than 30 feet deep at mean lower low water (MLLW) is prohibited.

18. The discharge of treated sewage from vessels, which do not have a properly functioning US Coast Guard certified Type I or Type II marine sanitation device, to portions of San Diego Bay that are greater than 30 feet deep at mean lower low water (MLLW) is prohibited.

2. Attachment B to State Water Board Resolution 2012-0012, as amended by State Water Board Resolution No. 2012-0031.

Special Protections for Areas of Special Biological Significance (ASBS), Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges

I. PROVISIONS FOR POINT SOURCE DISCHARGES OF STORM WATER AND NONPOINT SOURCE WASTE DISCHARGES

The following terms, prohibitions, and special conditions (hereafter collectively referred to as special conditions) are established as limitations on point source storm water and nonpoint source discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in Areas of Special Biological Significance (ASBS), as required for State Water Quality Protection Areas pursuant to California Public Resources Code Sections 36700(f) and 36710(f). These Special Protections are adopted by the State Water Board as part of the California Ocean Plan (Ocean Plan) General Exception.

The special conditions are organized by category of discharge. The State Water Resources Control Board (State Water Board) and Regional Water Quality Control Boards (Regional Water Boards) will determine categories and the means of regulation for those categories [e.g., Point Source Storm Water National Pollutant Discharge Elimination System (NPDES) or Nonpoint Source].

A. PERMITTED POINT SOURCE DISCHARGES OF STORM WATER

1. General Provisions for Permitted Point Source Discharges of Storm Water

a. Existing storm water discharges into an ASBS are allowed only under the following conditions:

(1) The discharges are authorized by an NPDES permit issued by the State Water Board or Regional Water Board;

(2) The discharges comply with all of the applicable terms, prohibitions, and special conditions contained in these Special Protections; and

(3) The discharges:

(i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

(ii) Are designed to prevent soil erosion;

(iii) Occur only during wet weather;

(iv) Are composed of only storm water runoff.

b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

c. The discharge of trash is prohibited.

d. Only discharges from existing storm water outfalls are allowed. Any proposed or new storm water runoff discharge shall be routed to existing storm water discharge outfalls and shall not result in any new contribution of waste to an ASBS (i.e., no additional pollutant loading). "Existing storm water outfalls" are those that were constructed or under construction prior to January 1, 2005. "New contribution of waste" is defined as any addition of waste beyond what would have occurred as of January 1, 2005. A change to an existing storm water outfall, in terms of re-location or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges are prohibited except as provided below:

(1) The term "non-storm water discharges" means any waste discharges from a municipal separate storm sewer system (MS4) or other NPDES permitted storm drain system to an ASBS that are not composed entirely of storm water.

(2) (i) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability or occur naturally:

(a) Discharges associated with emergency fire fighting operations.

(b) Foundation and footing drains.

(c) Water from crawl space or basement pumps.

(d) Hillside dewatering.

(e) Naturally occurring groundwater seepage via a storm drain.

(f) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(ii) An NPDES permitting authority may authorize non-storm water discharges to an MS4 with a direct discharge to an ASBS only to the extent the NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

2. Compliance Plans for Inclusion in Storm Water Management Plans (SWMP) and Storm Water Pollution Prevention Plans (SWPPP).

The discharger shall specifically address the prohibition of non-storm water runoff and the requirement to maintain natural water quality for storm water discharges to an ASBS in an ASBS Compliance Plan to be included in its SWMP or a SWPPP, as appropriate to permit

type. If a statewide permit includes a SWMP, then the discharger shall prepare a stand-alone compliance plan for ASBS discharges. The ASBS Compliance Plan is subject to approval by the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (for permits issued by Regional Water Boards).

a. The Compliance Plan shall include a map of surface drainage of storm water runoff, showing areas of sheet runoff, prioritize discharges, and describe any structural Best Management Practices (BMPs) already employed and/or BMPs to be employed in the future. Priority discharges are those that pose the greatest water quality threat and which are identified to require installation of structural BMPs. The map shall also show the storm water conveyances in relation to other features such as service areas, sewage conveyances and treatment facilities, landslides, areas prone to erosion, and waste and hazardous material storage areas, if applicable. The SWMP or SWPPP shall also include a procedure for updating the map and plan when changes are made to the storm water conveyance facilities.

b. The ASBS Compliance Plan shall describe the measures by which all non-authorized non-storm water runoff (e.g., dry weather flows) has been eliminated, how these measures will be maintained over time, and how these measures are monitored and documented.

c. For Municipal Separate Storm Sewer System (MS4s), the ASBS Compliance Plan shall require minimum inspection frequencies as follows:

(1) The minimum inspection frequency for construction sites shall be weekly during rainy season;

(2) The minimum inspection frequency for industrial facilities shall be monthly during the rainy season;

(3) The minimum inspection frequency for commercial facilities (e.g., restaurants) shall be twice during the rainy season; and

(4) Storm water outfall drains equal to or greater than 18 inches (457 mm) in diameter or width shall be inspected once prior to the beginning of the rainy season and once during the rainy season and maintained to remove trash and other anthropogenic debris.

d. The ASBS Compliance Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff, that are necessary to comply with these special conditions, will be achieved through BMPs. Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that such installation would pose a threat to health or safety. BMPs to control storm water runoff discharges (at the end-of-pipe) during a design storm shall be designed to achieve on average the following target levels:

(1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

(2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges.

The baseline for these determinations is the effective date of the Exception, except for those structural BMPs installed between January 1, 2005 and adoption of these Special Protections, and the reductions must be achieved and documented within six (6) years of the effective date.

e. The ASBS Compliance Plan shall address erosion control and the prevention of anthropogenic sedimentation in ASBS. The natural habitat conditions in the ASBS shall not be altered as a result of anthropogenic sedimentation.

f. The ASBS Compliance Plan shall describe the non-structural BMPs currently employed and planned in the future (including those for construction activities), and include an implementation schedule. The ASBS Compliance Plan shall include non-structural BMPs that address public education and outreach. Education and outreach efforts must adequately inform the public that direct discharges of pollutants from private property not entering an MS4 are prohibited. The ASBS Compliance Plan shall also describe the structural BMPs, including any low impact development (LID) measures, currently employed and planned for higher threat discharges and include an implementation schedule. To control storm water runoff discharges (at the end-of-pipe) during a design storm, permittees must first consider, and use where feasible, LID practices to infiltrate, use, or evapotranspirate storm water runoff on-site, if LID practices would be the most effective at reducing pollutants from entering the ASBS.

g. The BMPs and implementation schedule shall be designed to ensure that natural water quality conditions in the receiving water are achieved and maintained by either reducing flows from impervious surfaces or reducing pollutant loading, or some combination thereof.

h. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents in storm water runoff that alter natural ocean water quality and the sources of these constituents.

(2) The report shall describe BMPs that are currently being implemented, BMPs that are identified in the SWMP or SWPPP for future implementation, and any additional BMPs that may be added to the SWMP or SWPPP to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the BMPs.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits), the discharger shall revise its ASBS Compliance Plan to incorporate any new or modified BMPs that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised SWMP or SWPPP, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural ocean water quality conditions due to the same constituent.

(5) The requirements of this section are in addition to the terms, prohibitions, and conditions contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within eighteen (18) months from the effective date of the Exception, the discharger shall submit a draft written ASBS Compliance Plan to the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that describes its strategy to comply with these special conditions, including the requirement to maintain natural water quality in the affected ASBS. The ASBS Compliance Plan shall include a description of appropriate non-structural controls and a time schedule to implement structural controls (implementation schedule) to comply with these special conditions for inclusion in the discharger's SWMP or SWPPP, as appropriate to permit type. The final ASBS Compliance Plan, including a description and final schedule for structural controls based on the results of runoff and receiving water monitoring, must be submitted within thirty (30) months from the effective date of the Exception.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these special conditions shall be implemented.

d. Within six (6) years of the effective date of the Exception, any structural controls identified in the ASBS Compliance Plan that are necessary to comply with these special conditions shall be operational.

e. Within six (6) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water, pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data, and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe

the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. for municipalities, a demonstration of significant hardship to discharger ratepayers, by showing the relationship of storm water fees to annual household income for residents within the discharger's jurisdictional area, and the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or

2. for other governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

B. NONPOINT SOURCE DISCHARGES

1. General Provisions for Nonpoint Sources

a. Existing nonpoint source waste discharges are allowed into an ASBS only under the following conditions:

(1) The discharges are authorized under waste discharge requirements, a conditional waiver of waste discharge requirements, or a conditional prohibition issued by the State Water Board or a Regional Water Board.

(2) The discharges are in compliance with the applicable terms, prohibitions, and special conditions contained in these Special Protections.

(3) The discharges:

(i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

(ii) Are designed to prevent soil erosion;

(iii) Occur only during wet weather;

(iv) Are composed of only storm water runoff.

b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

c. The discharge of trash is prohibited.

d. Only existing nonpoint source waste discharges are allowed. "Existing nonpoint source waste discharges" are discharges that were ongoing prior to January 1, 2005. "New nonpoint source discharges" are defined as those that commenced on or after January 1, 2005. A change to an existing nonpoint source discharge, in terms of relocation or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges from nonpoint sources (those not subject to an NPDES Permit) are prohibited except as provided below:

(1) The term "non-storm water discharges" means any waste discharges that are not composed entirely of storm water.

(2) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability, or occur naturally:

(i) Discharges associated with emergency fire fighting operations.

(ii) Foundation and footing drains.

(iii) Water from crawl space or basement pumps.

(iv) Hillside dewatering.

(v) Naturally occurring groundwater seepage via a storm drain.

(vi) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

f. At the San Clemente Island ASBS, discharges incidental to military training and research, development, test, and evaluation operations are allowed. Discharges incidental to underwater demolition and other in-water explosions are not allowed in the two military closure areas in the vicinity of Wilson Cove and Castle Rock. Discharges must not result in a violation of the water quality objectives, including the protection of the marine aquatic life beneficial use, anywhere in the ASBS.

g. At the San Nicolas Island and Begg Rock ASBS, discharges incidental to military research, development, testing, and evaluation of, and training with, guided missile and other weapons systems, fleet training exercises, small-scale amphibious warfare training, and special warfare training are allowed. Discharges incidental to underwater demolition and other in-water explosions are not allowed. Discharges must not result in a violation of the water quality objectives, including the protection of the marine aquatic life beneficial use, anywhere in the ASBS.

h. All other nonpoint source discharges not specifically authorized above are prohibited.

2. Planning and Reporting

a. The nonpoint source discharger shall develop an ASBS Pollution Prevention ~~P~~lan, including an implementation schedule, to address storm water runoff and any other nonpoint source discharges from its facilities. The ASBS Pollution Prevention Plan must be equivalent in contents to an ASBS Compliance Plan as described in I (A)(2) in this document. The ASBS Pollution Prevention Plan is subject to approval by the Executive Director of the State Water Board (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements).

b. The ASBS Pollution Prevention Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff that are necessary to comply with these special conditions, will be achieved through Management Measures and associated Management Practices (Management Measures/Practices). Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director or Regional Water Board Executive Officer that such installation would pose a threat to health or safety. Management Measures to control storm water runoff during a design storm shall achieve on average the following target levels:

(1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

(2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges.

The baseline for these determinations is the effective date of the Exception, except for those structural BMPs installed between January 1, 2005 and adoption of these Special Protections, and the reductions must be achieved and documented within six (6) years of the effective date.

c. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff or other nonpoint source pollution is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and the Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents that alter natural water quality and the sources of these constituents.

(2) The report shall describe Management Measures/Practices that are currently being implemented, Management Measures/Practices that are identified in the ASBS Pollution Prevention Plan for future implementation, and any additional Management Measures/Practices that may be added to the Pollution Prevention Plan to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the Management Measures/Practices.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of

the Regional Water Board (Regional Water Board waivers or waste discharge requirements), the discharger shall revise its ASBS Pollution Prevention Plan to incorporate any new or modified Management Measures/Practices that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised ASBS Pollution Prevention Plan, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural water quality conditions due to the same constituent.

(5) The requirements of this section are in addition to the terms, prohibitions, and conditions contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within eighteen (18) months from the effective date of the Exception, the discharger~~s~~ shall submit a draft written ASBS Pollution Prevention Plan to the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) that describes its strategy to comply with these special conditions, including the requirement to maintain natural ocean water quality in the affected ASBS. The Pollution Prevention Plan shall include a description of appropriate non-structural controls and a time schedule to implement structural controls to comply with these special conditions for inclusion in the discharger's Pollution Prevention Plan. The final ASBS Pollution Prevention Plan, including a description and final schedule for structural controls based on the results of runoff and receiving water monitoring, must be submitted within thirty (30) months from the effective date of the Exception.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these Special Protections shall be implemented.

d. Within six (6) years of the effective date of the Exception, any structural controls identified in the ASBS Pollution Prevention Plan that are necessary to comply with these special conditions shall be operational.

e. Within six (6) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board

waivers or waste discharge requirements) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. a demonstration that the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or

2. for governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

II. ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES

In addition to the provisions in Section I (A) or I (B), respectively, a discharger with parks and recreation facilities shall comply with the following:

A. The discharger shall include a section in an ASBS Compliance Plan (for NPDES dischargers) or an ASBS Pollution Prevention Plan (for nonpoint source dischargers) to address storm water runoff from parks and recreation facilities.

1. The plan shall identify all pollutant sources, including sediment sources, which may result in waste entering storm water runoff. Pollutant sources include, but are not limited to, roadside rest areas and vistas, picnic areas, campgrounds, trash receptacles, maintenance facilities, park personnel housing, portable toilets, leach fields, fuel tanks, roads, piers, and boat launch facilities.

2. The plan shall describe BMPs or Management Measures/Practices that will be implemented to control soil erosion (both temporary and permanent erosion controls) and reduce or eliminate pollutants in storm water runoff in order to achieve and maintain natural water quality conditions in the affected ASBS. The plan shall include BMPs or Management Measures/Practices to ensure that trails and culverts are maintained to prevent erosion and minimize waste discharges to ASBS.

3. The plan shall include BMPs or Management Measures/Practices to prevent the discharge of pesticides or other chemicals, including agricultural chemicals, in storm water runoff to the affected ASBS.

4. The plan shall include BMPs or Management Measures/Practices that address public education and outreach. The goal of these BMPs or Management Measures/Practices is to ensure that the public is adequately informed that waste discharges to the affected ASBS are prohibited or limited by special conditions in these Special Protections. The BMPs or Management Measures/Practices shall include signage at camping, picnicking, beach and roadside parking areas, and visitor centers, or other appropriate measures, which notify the public of any applicable requirements of these Special Protections and identify the ASBS boundaries.

5. The plan shall include BMPs or Management Measures/Practices that address the prohibition against the discharge of trash to ASBS. The BMPs or Management Measures/Practices shall include measures to ensure that adequate trash receptacles are available for public use at visitor facilities, including parking areas, and that the receptacles are adequately maintained to prevent trash discharges into the ASBS. Appropriate measures include covering trash receptacles to prevent trash from being wind blown and periodically emptying the receptacles to prevent overflows.

6. The plan shall include BMPs or Management Measures/Practices to address runoff from parking areas and other developed features to ensure that the runoff does not alter natural water quality in the affected ASBS. BMPs or Management Measures/Practices shall include measures to reduce pollutant loading in runoff to the ASBS through installation of natural area buffers (LID), treatment, or other appropriate measures.

B. Maintenance and repair of park and recreation facilities must not result in waste discharges to the ASBS. The practice of road oiling must be minimized or eliminated, and must not result in waste discharges to the ASBS.

III. ADDITIONAL REQUIREMENTS – WATERFRONT AND MARINE OPERATIONS

In addition to the provisions in Section I (A) or I (B), respectively, a discharger with waterfront and marine operations shall comply with the following:

A. For discharges related to waterfront and marine operations, the discharger shall develop a Waterfront and Marine Operations Management Plan (Waterfront Plan). This plan shall contain appropriate Management Measures/Practices to address nonpoint source pollutant discharges to the affected ASBS.

1. The Waterfront Plan shall contain appropriate Management Measures/Practices for any waste discharges associated with the operation and maintenance of vessels, moorings, piers, launch ramps, and cleaning stations in order to ensure that beneficial uses are protected and natural water quality is maintained in the affected ASBS.

2. For discharges from marinas and recreational boating activities, the Waterfront Plan shall include appropriate Management Measures, described in The Plan for California's Nonpoint Source Pollution Control Program, for marinas and recreational boating, or equivalent practices, to ensure that nonpoint source pollutant discharges do not alter natural water quality in the affected ASBS.

3. The Waterfront Plan shall include Management Practices to address public education and outreach to ensure that the public is adequately informed that waste discharges to the affected ASBS are prohibited or limited by special conditions in these Special Protections. The management practices shall include appropriate signage, or similar measures, to inform the public of the ASBS restrictions and to identify the ASBS boundaries.

4. The Waterfront Plan shall include Management Practices to address the prohibition against trash discharges to ASBS. The Management Practices shall include the provision of adequate trash receptacles for marine recreation areas, including parking areas, launch ramps, and docks. The plan shall also include appropriate Management Practices to ensure that the receptacles are adequately maintained and secured in order to prevent trash discharges into the ASBS. Appropriate Management Practices include covering the trash receptacles to prevent trash from being windblown, staking or
securing the trash receptacles so they don't tip over, and periodically emptying the receptacles to prevent overflow.

5. The discharger shall submit its Waterfront Plan to the by the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) within six months of the effective date of these special conditions. The Waterfront Plan is subject to approval by the State Water Board Executive Director or the Regional Water Board Executive Officer, as appropriate. The plan must be fully implemented within 18 months of the effective date of the Exception.

B. The discharge of chlorine, soaps, petroleum, other chemical contaminants, trash, fish offal, or human sewage to ASBS is prohibited. Sinks and fish cleaning stations are point source discharges of wastes and are prohibited from discharging into ASBS. Anthropogenic accumulations of discarded fouling organisms on the sea floor must be minimized.

C. Limited-term activities, such as the repair, renovation, or maintenance of waterfront facilities, including, but not limited to, piers, docks, moorings, and breakwaters, are authorized only in accordance with Chapter III.E.2 of the Ocean Plan.

D. If the discharger anticipates that the discharger will fail to fully implement the approved Waterfront Plan within the 18 month deadline, the discharger shall submit a technical report as soon as practicable to the State Water Board Executive Director or the Regional Water Board Executive Officer, as appropriate. The technical report shall contain reasons for failing to meet the deadline and propose a revised schedule to fully implement the plan.

E. The State Water Board or the Regional Water Board may, for good cause, authorize additional time to comply with the Waterfront Plan. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that

caused or would cause it to fail to meet the deadline in Section III.A.5. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality. The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. a demonstration of significant hardship by showing that the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate.

2. for governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

IV. MONITORING REQUIREMENTS

Monitoring is mandatory for all dischargers to assure compliance with the Ocean Plan. Monitoring requirements include both: (A) core discharge monitoring, and (B) ocean receiving water monitoring. The State and Regional Water Boards must approve sampling site locations and any adjustments to the monitoring programs. All ocean receiving water and reference area monitoring must be comparable with the Water Boards' Surface Water Ambient Monitoring Program (SWAMP).

Safety concerns: Sample locations and sampling periods must be determined considering safety issues. Sampling may be postponed upon notification to the State and Regional Water Boards if hazardous conditions prevail.

Analytical Chemistry Methods: All constituents must be analyzed using the lowest minimum detection limits comparable to the Ocean Plan water quality objectives. For metal analysis, all samples, including storm water effluent, reference samples, and ocean receiving water samples, must be analyzed by the approved analytical method with the lowest minimum detection limits (currently Inductively Coupled Plasma/Mass Spectrometry) described in the Ocean Plan.

A. CORE DISCHARGE MONITORING PROGRAM

1. General sampling requirements for timing and storm size:

Runoff must be collected during a storm event that is greater than 0.1 inch and generates runoff, and at least 72 hours from the previously measurable storm event. Runoff samples shall be collected during the same storm and at approximately the same time when post-storm receiving water is sampled, and analyzed for the same constituents as receiving water and reference site samples (see section IV B) as described below.

2. Runoff flow measurements

a. For municipal/industrial storm water outfalls in existence as of December 31, 2007, 18 inches (457mm) or greater in diameter/width (including multiple outfall pipes in combination having a width of 18 inches, runoff flows must be measured or calculated, using a method acceptable to and approved by the State and Regional Water Boards.

b. This will be reported annually for each precipitation season to the State and Regional Water Boards.

3. Runoff samples – storm events

a. For outfalls equal to or greater than 18 inches (0.46m) in diameter or width:

(1) samples of storm water runoff shall be collected during the same storm as receiving water samples and analyzed for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

(2) samples of storm water runoff shall be collected and analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

(3) If an applicant has no outfall greater than 36 inches, then storm water runoff from the applicant's largest outfall shall be further collected during the same storm as receiving water samples and analyzed for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates).

b. For outfalls equal to or greater than 36 inches (0.91m) in diameter or width:

(1) samples of storm water runoff shall be collected during the same storm as receiving water samples and analyzed for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

(2) samples of storm water runoff shall be further collected during the same storm as receiving water samples and analyzed for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates); and

(3) samples of storm water runoff shall be collected and analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

c. For an applicant not participating in a regional monitoring program [see below in Section IV (B)] in addition to (a.) and (b.) above, a minimum of the two largest outfalls or 20 percent of the larger outfalls, whichever is greater, shall be sampled (flow weighted composite samples) at least three times annually during wet weather (storm event)

and analyzed for all Ocean Plan Table A constituents, Table B constituents for marine aquatic life protection (except for toxicity, only chronic toxicity for three species shall be required), DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, and Ocean Plan indicator bacteria. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one (the largest) such discharge shall be sampled annually in each Region.

4. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may reduce or suspend core monitoring once the storm runoff is fully characterized. This determination may be made at any point after the discharge is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

B. Ocean Receiving Water and Reference Area Monitoring Program

In addition to performing the Core Discharge Monitoring Program in Section II.A above, all applicants having authorized discharges must perform ocean receiving water monitoring. In order to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS, dischargers may choose either (1) an individual monitoring program, or (2) participation in a regional integrated monitoring program.

1. Individual Monitoring Program: The requirements listed below are for those dischargers who elect to perform an individual monitoring program to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within the affected ASBS. In addition to Core Discharge Monitoring, the following additional monitoring requirements shall be met:

   a. Three times annually, during wet weather (storm events), the receiving water at the point of discharge from the outfalls described in section (IV)(A)(3)(c) above shall be sampled and analyzed for Ocean Plan Table A constituents, Table B constituents for marine aquatic life, DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, salinity, chronic toxicity (three species), and Ocean Plan indicator bacteria.

      The sample location for the ocean receiving water shall be in the surf zone at the point of discharges; this must be at the same location where storm water runoff is sampled. Receiving water shall be sampled prior to (pre-storm) and during (or immediately after) the same storm (post storm). Post storm sampling shall be during the same storm and at approximately the same time as when the runoff is sampled. Reference water quality shall also be sampled three times annually and analyzed for the same constituents pre-storm and post-storm, during the same storm seasons when receiving water is sampled. Reference stations will be determined by the State Water Board's Division of Water Quality and the applicable Regional Water Board(s).

   b. Sediment sampling shall occur at least three times during every five (5) year period. The subtidal sediment (sand or finer, if present) at the discharge shall be sampled and analyzed for Ocean Plan Table B constituents for marine aquatic life, DDT, PCBs, PAHs, pyrethroids, and OP pesticides. For sediment toxicity testing, only an acute toxicity test using the amphipod *Eohaustorius estuarius* must be performed.

c. A quantitative survey of intertidal benthic marine life shall be performed at the discharge and at a reference site. The survey shall be performed at least once every five (5) year period. The survey design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The results of the survey shall be completed and submitted to the State Water Board and Regional Water Board at least six months prior to the end of the permit cycle.

d. Once during each five (5) year period, a bioaccumulation study shall be conducted to determine the concentrations of metals and synthetic organic pollutants at representative discharge sites and at representative reference sites. The study design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The bioaccumulation study may include California mussels (*Mytilus californianus*) and/or sand crabs (*Emerita analoga* or *Blepharipoda occidentalis*). Based on the study results, the Regional Water Board and the State Water Board's Division of Water Quality, may adjust the study design in subsequent permits, or add or modify additional test organisms (such as shore crabs or fish), or modify the study design appropriate for the area and best available sensitive measures of contaminant exposure.

e. Marine Debris: Representative quantitative observations for trash by type and source shall be performed along the coast of the ASBS within the influence of the discharger's outfalls. The design, including locations and frequency, of the marine debris observations is subject to approval by the Regional Water Board and State Water Board's Division of Water Quality.

f. The monitoring requirements of the Individual Monitoring Program in this section are minimum requirements. After a minimum of one (1) year of continuous water quality monitoring of the discharges and ocean receiving waters, the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may require additional monitoring, or adjust, reduce or suspend receiving water and reference station monitoring. This determination may be made at any point after the discharge and receiving water is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

2. Regional Integrated Monitoring Program: Dischargers may elect to participate in a regional integrated monitoring program, in lieu of an individual monitoring program, to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS. This regional approach shall characterize natural water quality, pre- and post-storm, in ocean reference areas near the mouths of identified open space watersheds and the effects of the discharges on natural water quality (physical, chemical, and toxicity) in the ASBS receiving waters, and should include benthic marine aquatic life and bioaccumulation components. The design of the ASBS stratum of a regional integrated monitoring program may deviate from the otherwise prescribed individual monitoring approach (in Section IV.B.1) if approved by the State Water Board's Division of Water Quality and the Regional Water Boards.

a. Ocean reference areas shall be located at the drainages of flowing watersheds with minimal development (in no instance more than 10% development), and shall not be located in CWA Section 303(d) listed waterbodies or have tributaries that are 303(d) listed. Reference areas shall be free of wastewater discharges and anthropogenic non- storm water runoff. A minimum of low threat storm runoff discharges (e.g.

stream highway overpasses and campgrounds) may be allowed on a case-by-case basis. Reference areas shall be located in the same region as the ASBS receiving water monitoring occurs. The reference areas for each Region are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean reference water samples must be collected from each station, each from a separate storm during the same storm season that receiving water is sampled. A minimum of one reference location shall be sampled for each ASBS receiving water site sampled per responsible party. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

b. ASBS ocean receiving water must be sampled in the surf zone at the location where the runoff makes contact with ocean water (i.e. at "point zero"). Ocean receiving water stations must be representative of worst-case discharge conditions (i.e. co-located at a large drain greater than 36 inches, or if drains greater than 36 inches are not present in the ASBS then the largest drain greater than18 inches.) Ocean receiving water stations are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean receiving water samples must be collected during each storm season from each station, each from a separate storm. A minimum of one receiving water location shall be sampled in each ASBS per responsible party in that ASBS. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

c. Reference and receiving water sampling shall commence during the first full storm season following the adoption of these special conditions, and post-storm samples shall be collected during the same storm event when storm water runoff is sampled. Sampling shall occur in a minimum of two storm seasons. For those ASBS dischargers that have already participated in the Southern California Bight 2008 ASBS regional monitoring effort, sampling may be limited to only one storm season.

d. Receiving water and reference samples shall be analyzed for the same constituents as storm water runoff samples. At a minimum, constituents to be sampled and analyzed in reference and discharge receiving waters must include oil and grease, total suspended solids, Ocean Plan Table B metals for protection of marine life, Ocean Plan PAHs, pyrethroids, OP pesticides, ammonia, nitrate, phosphates, and critical life stage chronic toxicity for three species. In addition, within the range of the southern sea otter, indicator bacteria or some other measure of fecal contamination shall be analyzed.

3. Waterfront and Marine Operations: In addition to the above requirements for ocean receiving water monitoring, additional monitoring must be performed for marinas and boat launch and pier facilities:

a. For all marina or mooring field operators, in mooring fields with 10 or more occupied moorings, the ocean receiving water must be sampled for Ocean Plan indicator bacteria, residual chlorine, copper, zinc, grease and oil, methylene blue active substances (MBAS), and ammonia nitrogen.

(1) For mooring field operators opting for an individual monitoring program (Section IV.B.1 above), this sampling must occur weekly (on the weekend) from May through October.

(2) For mooring field operators opting to participate in a regional integrated monitoring program (Section IV.B.2 above), this sampling must occur monthly from May through October on a high use weekend in each month. The Water Boards may allow a reduction in the frequency of sampling, through the regional monitoring program, after the first year of monitoring.

b. For all mooring field operators, the subtidal sediment (sand or finer, if present) within mooring fields and below piers shall be sampled and analyzed for Ocean Plan Table B metals (for marine aquatic life beneficial use), acute toxicity, PAHs, and tributyltin. For sediment toxicity testing, only an acute toxicity test using the amphipod *Eohaustorius estuarius* must be performed. This sampling shall occur at least three times during a five (5) year period. For mooring field operators opting to participate in a regional integrated monitoring program, the Water Boards may allow a reduction in the frequency of sampling after the first sampling effort's results are assessed.

Glossary

At the point of discharge(s) – Means in the surf zone immediately where runoff from an outfall meets the ocean water (a.k.a., at point zero).

Areas of Special Biological Significance (ASBS) – Those areas designated by the State Water Board as ocean areas requiring protection of species or biological communities to the extent that alteration of natural water quality is undesirable. All Areas of Special Biological Significance are also classified as a subset of State Water Quality Protection Areas.

Design storm – For purposes of these Special Protections, a design storm is defined as the volume of runoff produced from one inch of precipitation per day or, if this definition is inconsistent with the discharger's applicable storm water permit, then the design storm shall be the definition included in the discharger's applicable storm water permit.

Development – Relevant to reference monitoring sites, means urban, industrial, agricultural, grazing, mining, and timber harvesting land uses.

Higher threat discharges - Permitted storm drains discharging equal to or greater than 18 inches, industrial storm drains, agricultural runoff discharged through an MS4, discharges associated with waterfront and marina operations (e.g., piers, launch ramps, mooring fields, and associated vessel support activities, except for passive discharges defined below), and direct discharges associated with commercial or industrial activities to ASBS.

Low Impact Development (LID) – A sustainable practice that benefits water supply and contributes to water quality protection. Unlike traditional storm water management, which entails collecting and conveying storm water runoff through storm drains, pipes, or other conveyances to a centralized storm water facility, LID focuses on using site design and storm water management to maintain the site's pre-development runoff rates and volumes. The goal of LID is to mimic a site's predevelopment hydrology by using design techniques that infiltrate, filter, store, evaporate, and detain runoff close to the source of rainfall.

Marine Operations – Marinas or mooring fields that contain slips or mooring locations for 10 or more vessels.

Management Measure (MM) - Economically achievable measures for the control of the addition of pollutants from various classes of nonpoint sources of pollution, which reflect the greatest degree of pollutant reduction achievable through the application of the best available nonpoint pollution control practices, technologies, processes, siting criteria, operating methods, or other alternatives. For example, in the "marinas and recreational boating" land- use category specified in the Plan for California's Nonpoint Source Pollution Control Program (NPS Program Plan) (SWRCB, 1999), "boat cleaning and maintenance" is considered a MM or the source of a specific class or type of NPS pollution.

Management Practice (MP) - The practices (e.g., structural, non-structural, operational, or other alternatives) that can be used either individually or in combination to address a specific MM class or classes of NPS pollution. For example, for the "boat cleaning and maintenance" MM, specific MPs can include, but are not limited to, methods for the selection of environmentally sensitive hull paints or methods for cleaning/removal of hull copper anti- fouling paints.

Municipal Separate Storm Sewer System (MS4) – A municipally-owned storm sewer system regulated under the Phase I or Phase II storm water program implemented in compliance with Clean Water Act section 402(p). Note that an MS4 program's boundaries are not necessarily congruent with the permittee's political boundaries.

Natural Ocean Water Quality - The water quality (based on selected physical, chemical and biological characteristics) that is required to sustain marine ecosystems, and which is without apparent human influence, *i.e.*, an absence of significant amounts of: (a) man-made constituents (*e.g.,* DDT); (b) other chemical (*e.g.,* trace metals), physical (temperature/thermal pollution, sediment burial), and biological (*e.g.*, bacteria) constituents at concentrations that have been elevated due to man's activities above those resulting from the naturally occurring processes that affect the area in question; and (c) non-indigenous biota (*e.g.,* invasive algal bloom species) that have been introduced either deliberately or accidentally by man. Discharges "*shall not alter natural ocean water quality*" as determined by a comparison to the range of constituent concentrations in reference areas agreed upon via the regional monitoring program(s). If monitoring information indicates that *natural ocean water quality* is not maintained, but there is sufficient evidence that a discharge is not contributing to the alteration of natural water quality, then the Regional Water Board may make that determination. In this case, sufficient information must include runoff sample data that has equal or lower concentrations for the range of constituents at the applicable reference area(s).

Nonpoint source – Nonpoint pollution sources generally are sources that do not meet the definition of a point source. Nonpoint source pollution typically results from land runoff, precipitation, atmospheric deposition, agricultural drainage, marine/boating operations or hydrologic modification. Nonpoint sources, for purposes of these Special Protections, include discharges that are not required to be regulated under an NPDES permit.

Non-storm water discharge – Any runoff that is not the result of a precipitation event. This is often referred to as "dry weather flow."

Non-structural control – A Best Management Practice that involves operational, maintenance, regulatory (e.g., ordinances) or educational activities designed to reduce or eliminate pollutants in runoff, and that are not structural controls (i.e. there are no physical structures involved).

Physical impossibility - Means any act of God, war, fire, earthquake, windstorm, flood or natural catastrophe; unexpected and unintended accidents not caused by discharger or its employees' negligence; civil disturbance, vandalism, sabotage or terrorism; restrain by court order or public authority or agency; or action or non-action by, or inability to

obtain the necessary authorizations or approvals from any governmental agency other than the permittee.

Representative sites and monitoring procedures – Are to be proposed by the discharger, with appropriate rationale, and subject to approval by Water Board staff.

Sheet-flow – Runoff that flows across land surfaces at a shallow depth relative to the cross- sectional width of the flow. These types of flow may or may not enter a storm drain system before discharge to receiving waters.

Storm Season – Also referred to as rainy season, means the months of the year from the onset of rainfall during autumn until the cessation of rainfall in the spring.

Structural control – A Best Management Practice that involves the installation of engineering solutions to the physical treatment or infiltration of runoff.

Surf Zone - The surf zone is defined as the submerged area between the breaking waves and the shoreline at any one time.

Surface Water Ambient Monitoring Program (SWAMP) comparable – Means that the monitoring program must 1) meet or exceed 2008 SWAMP Quality Assurance Program Management Plan (QAPP) Measurement Quality Objectives, or 2) have a Quality Assurance Project Plan that has been approved by SWAMP; in addition data must be formatted to match the database requirements of the SWAMP Information Management System. Adherence to the measurement quality objectives in the Southern California Bight 2008 ASBS Regional Monitoring Program QAPP and data base management comprises being SWAMP comparable.

Waterfront Operations - Piers, launch ramps, and cleaning stations in the water or on the adjacent shoreline.

Attachment 1
Special Protections Sections I(A)(3)(e) and I(B)(3)(e)
Flowchart to Deteremine Compliance with natural Water Quality

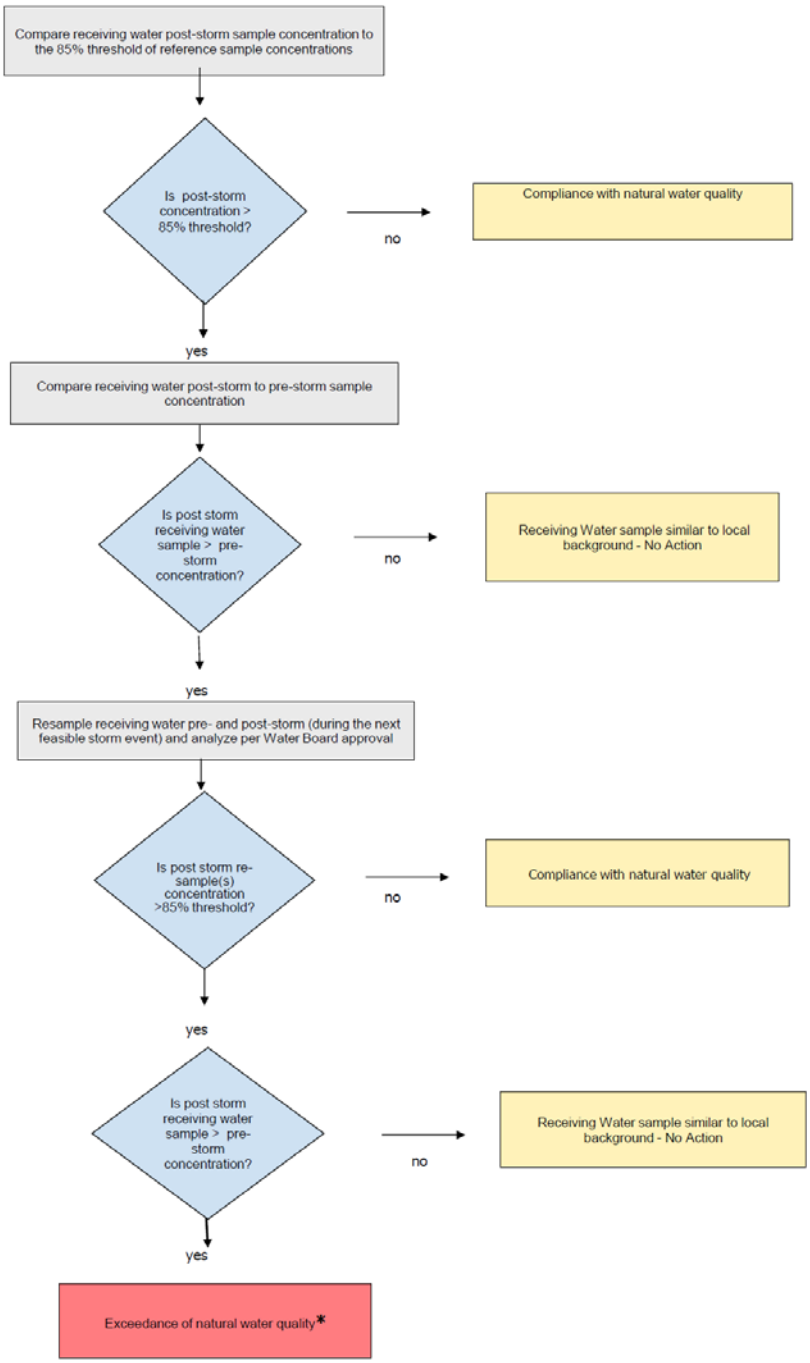

*** When an exceedance of natural water quality occurs, the discharger must comply with section I.A.2.h (for permitted storm water) or section I.B.2.c (for nonpoint sources). Note, when sampling data is available, end-of-pipe effluent concentrations will be considered by the Water Boards in making this determination.**

ATTACHMENT B

STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

1. Standard Permit Provisions

Code of Federal Regulations Title 40 Section 122.41 (40 CFR 122.41) includes conditions, or provisions, that apply to all National Pollutant Discharge Elimination System (NPDES) permits. Additional provisions applicable to NPDES permits are in 40 CFR 122.42. All applicable provisions in 40 CFR 122.41 and 40 CFR 122.42 must be incorporated into this Order and NPDES permit. The applicable 40 CFR 122.41 and 40 CFR 122.42 provisions are as follows:

a. DUTY TO COMPLY [40 CFR 122.41(a)]

The Copermittee must comply with all of the provisions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

(1) The Copermittee must comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement. [40 CFR 122.41(a)(1)]

(2) The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to a civil penalty not to exceed $25,000 per day for each violation. The CWA provides that any person who *negligently* violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than 2 years, or both. Any person who *knowingly* violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both. Any person who knowingly violates Section 301, 302, 303, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, and who knows at that time that he thereby places another person in imminent

danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.
[40 CFR 122.41(a)(2)]

(3) Any person may be assessed an administrative penalty by the San Diego Regional Water Quality Control Board (San Diego Water Board), State Water Resources Control Board (State Water Board), or United States Environmental Protection Agency (USEPA) for violating Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.
[40 CFR 122.41(a)(3)]

b. DUTY TO REAPPLY [40 CFR 122.41(b)]

If a Copermittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Copermittee must apply for and obtain a new permit.

c. NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE [40 CFR 122.41(c)]

It shall not be a defense for a Copermittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

d. DUTY TO MITIGATE [40 CFR 122.41(d)]

The Copermittee must take all reasonable steps to minimize or prevent any discharge or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

e. PROPER OPERATION AND MAINTENANCE [40 CFR 122.41(e)]

The Copermittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Copermittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by a Copermittee only when the operation is necessary to achieve compliance with the conditions of this permit.

f. PERMIT ACTIONS [40 CFR 122.41(f)]

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Copermittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

g. PROPERTY RIGHTS [40 CFR 122.41(g)]

This permit does not convey any property rights of any sort, or any exclusive privilege.

h. DUTY TO PROVIDE INFORMATION [40 CFR 122.41(h)]

The Copermittee must furnish to the San Diego Water Board, State Water Board, or USEPA within a reasonable time, any information which the San Diego Water Board, State Water Board, or USPEA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Copermittee must also furnish to the San Diego Water Board, State Water Board, or USPEA upon request, copies of records required to be kept by this permit.

i. INSPECTION AND ENTRY [40 CFR 122.41(i)]

The Copermittee must allow the San Diego Water Board, State Water Board, USEPA, and/or their authorized representative (including an authorized contractor acting as their representative), upon presentation of credentials and other documents as may be required by law, to:

(1) Enter upon the Copermittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit; [40 CFR 122.41(i)(1)]

(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit; [40 CFR 122.41(i)(2)]

(3) Inspect and photograph at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; [40 CFR 122.41(i)(3)] and

(4) Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location. [40 CFR 122.41(i)(4)]

j. MONITORING AND RECORDS [40 CFR 122.41(j)]

(1) Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity. [40 CFR 122.41(j)(1)]

(2) Except for records of monitoring information required by this permit related to the Copermittee's sewage sludge use and disposal activities, which shall be retained for

a period of at least five (5) years (or longer as required by 40 CFR Part 503), the Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time. [40 CFR 122.41(j)(2)]

(3) Records for monitoring information must include: [40 CFR 122.41(j)(3)]

(a) The date, exact place, and time of sampling or measurements; [40 CFR 122.41(j)(3)(i)]
(b) The individual(s) who performed the sampling or measurements; [40 CFR 122.41(j)(3)(ii)]
(c) The date(s) analyses were performed; [40 CFR 122.41(j)(3)(iii)]
(d) The individual(s) who performed the analyses; [40 CFR 122.41(j)(3)(iv)]
(e) The analytical techniques or methods used; [40 CFR 122.41(j)(3)(v)] and
(f) The results of such analyses. [40 CFR 122.41(j)(3)(vi)]

(4) Monitoring must be conducted according to test procedures under 40 CFR Part 136 unless another method is required under 40 CFR Subchapters N or O. [40 CFR 122.41(j)(4)]

In the case of pollutants for which there are no approved methods under 40 CFR Part 136 or otherwise required under 40 CFR Subchapters N and O, monitoring must be conducted according to a test procedure specified in the permit for such pollutants. [40 CFR 122.44(i)(1)(iv)]

(5) The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. [40 CFR 122.41(j)(5)]

k. SIGNATORY REQUIREMENT [40 CFR 122.41(k)]

(1) All applications, reports, or information submitted to the San Diego Water Board, State Water Board, or USEPA must be signed and certified. (See 40 CFR 122.22) [40 CFR 122.41(k)(1)]

(a) *For a municipality, State, Federal, or other public agency.* [All applications must be signed] by either a principal executive officer or ranking elected official. [40 CFR 122.22(a)(3)]

(b) All reports required by permits, and other information requested by the San Diego Water Board, State Water Board, or USEPA must be signed by a person described in paragraph (a) of this section, or by a duly authorized

representative of that person. A person is a duly authorized representative only if: [40 CFR 122.22(b)]

(i) The authorization is made in writing by a person described in paragraph (a) of this section; [40 CFR 122.22(b)(1)]

(ii) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company, (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) [40 CFR 122.22(b)(2)] and,

(iii) The written authorization is submitted to the San Diego Water Board and State Water Board. [40 CFR 122.22(b)(3)]

(c) *Changes to authorization.* If an authorization under paragraph (b) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (b) of this section must be submitted to the San Diego Water Board prior to or together with any reports, information, or applications to be signed by an authorized representative. [40 CFR 122.22(c)]

(d) *Certification.* Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." [40 CFR 122.22(d)]

(2) The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both. [40 CFR 122.41(k)(2)]

I. REPORTING REQUIREMENTS [40 CFR 122.41(l)]

(1) *Planned changes.* The Copermittee must give notice to the San Diego Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when: [40 CFR 122.41(l)(1)]

(a) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); [40 CFR 122.41(l)(1)(i)] or

(b) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1). [40 CFR 122.41(l)(1)(ii)]

(c) The alteration or addition results in a significant change in the Copermittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. [40 CFR 122.41(l)(1)(iii)]

(2) *Anticipated noncompliance*. The Copermittee must give advance notice to the San Diego Water Board or State Water Board of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements. [40 CFR 122.41(l)(2)]

(3) *Transfers*. This permit is not transferable to any person except after notice to the San Diego Water Board. The San Diego Water Board may require modification or revocation and reissuance of the permit to change the name of the Copermittee and incorporate such other requirements as may be necessary under the CWA. [40 CFR 122.41(l)(3)]

(4) *Monitoring reports.* Monitoring results must be reported at the intervals specified elsewhere in this permit. [40 CFR 122.41(l)(4)]

(a) Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the San Diego Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices. [40 CFR 122.41(l)(4)(i)]

(b) If the Copermittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or another method required for an industry-specific waste stream under 40 CFR Subchapters N or O, the results of this monitoring must be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the San Diego Water Board or State Water Board. [40 CFR 122.41(l)(4)(ii)]

(c) Calculations for all limitations which require averaging of measurements must utilize an arithmetic mean unless otherwise specified in the permit. [40 CFR 122.41(l)(4)(iii)]

(5) *Compliance schedules*. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date. [40 CFR 122.41(l)(5)]

(6) *Twenty-four hour reporting.*

(a) The Copermittee must report any noncompliance that may endanger health or the environment. Any information must be provided orally within 24 hours from the time the Copermittee becomes aware of the circumstances. A written submission must also be provided within five (5) days of the time the Copermittee becomes aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6)(i)]

(b) The following must be included as information which must be reported within 24 hours under this paragraph: [40 CFR 122.41(l)(6)(ii)]

(i) Any unanticipated bypass that exceeds any effluent limitation in the permit (See 40 CFR 122.41(g)). [40 CFR 122.41(l)(6)(ii)(A)]
(ii) Any upset which exceeds any effluent limitation in the permit. [40 CFR 122.41(l)(6)(ii)(B)] and,
(iii) Violation of a maximum daily discharge limitation for any of the pollutants listed by the San Diego Water Board in the permit to be reported within 24 hours. (See 40 CFR 122.44(g)) [40 CFR 122.41(l)(6)(ii)(C)]

(c) The San Diego Water Board may waive the above-required written report on a case-by-case basis if the oral report has been received within 24 hours. [40 CFR 122.41(l)(6)(iii)]

(7) *Other noncompliance.* The Copermittee must report all instances of noncompliance not reported in accordance with the standard provisions required under 40 CFR 122.41(l)(4), (5), and (6), at the time monitoring reports are submitted. The reports must contain the information listed in the standard provisions required under 40 CFR 122.41(l)(6). [40 CFR 122.41(l)(7))]

(8) *Other information.* When the Copermittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the San Diego Water Board, State Water Board, or USEPA, the Copermittee must promptly submit such facts or information. [40 CFR 122.41(l)(8)]

m. BYPASS [40 CFR 122.41(m)]

(1) *Definitions.*

(a) "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. [40 CFR 122.41(m)(1)(i)] or

(b) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or

substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
[40 CFR 122.41(m)(1)(ii)]

(2) *Bypass not exceeding limitations*. The Copermittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the standard provisions required under 40 CFR 122.41(m)(3) and (4).
[40 CFR 122.41(m)(2)]

(3) *Notice.*

(a) *Anticipated bypass*. If the Copermittee knows in advance of the need for a bypass, it must submit a notice, if possible at least ten days before the date of the bypass. [40 CFR 122.41(m)(3)(i)] or

(b) *Unanticipated bypass*. The Copermittee must submit notice of an unanticipated bypass in accordance with the standard provisions required under 40 CFR 122.41(l)(6) (24-hour notice).
[40 CFR 122.41(m)(3)(ii)]

(4) *Prohibition of Bypass.*

(a) Bypass is prohibited, and the San Diego Water Board may take enforcement action against a Copermittee for bypass, unless:
[40 CFR 122.41(m)(4)(i)]

(i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; [40 CFR 122.41(m)(4)(i)(A)]
(ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance;
[40 CFR 122.41(m)(4)(i)(B)] and,
(iii) The Copermittee submitted notice in accordance with the standard provisions required under 40 CFR 122.41(m)(3).
[40 CFR 122.41(m)(4)(i)(C)]

(b) The San Diego Water Board may approve an anticipated bypass, after considering its adverse effects, if the San Diego Water Board determines that it will meet the three conditions listed above.
[40 CFR 122.41(m)(4)(ii)]

n. UPSET [40 CFR 122.41(n)]

(1) *Definition.* "Upset" means an exceptional incident in which there is unintentional and

temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Copermittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. [40 CFR 122.41(n)(1)]

(2) *Effect of an upset*. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the standard provisions required under 40 CFR 122.41(n)(3) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. [40 CFR 122.41(n)(2)]

(3) *Conditions necessary for a demonstration of upset*. A Copermittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that: [40 CFR 122.41(n)(3)]

(a) An upset occurred and that the Copermittee can identify the cause(s) of the upset; [40 CFR 122.41(n)(3)(i)]
(b) The permitted facility was at the time being properly operated; [40 CFR 122.41(n)(3)(ii)] and
(c) The Copermittee submitted notice of the upset in accordance with the standard provisions required under 40 CFR 122.41(l)(6)(ii)(B) (24-hour notice). [40 CFR 122.41(n)(3)(iii)]
(d) The Copermittee complied with any remedial measures pursuant to the standard provisions required under 40 CFR 122.41(d). [40 CFR 122.41(n)(3)(iii)]

(4) *Burden of proof*. In any enforcement proceeding, the Copermittee seeking to establish the occurrence of an upset has the burden of proof. [40 CFR 122.41(n)(4)]

o. STANDARD PERMIT PROVISIONS FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS [40 CFR 122.42(c)]

The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the San Diego Water Board or State Water Board under 40 CFR 122.26(a)(1)(v) must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report must include:

(1) The status of implementing the components of the storm water management program that are established as permit conditions; [40 CFR 122.42(c)(1)]

(2) Proposed changes to the storm water management programs that are established as permit conditions. Such proposed changes must be consistent with 40 CFR 122.26(d)(2)(iii); [40 CFR 122.42(c)(2)] and

(3) Revisions, if necessary, to the assessment of controls and the fiscal analysis

reported in the permit application under 40 CFR 122.26(d)(2)(iv) and (v); [40 CFR 122.42(c)(3)]

(4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; [40 CFR 122.42(c)(4)]

(5) Annual expenditures and budget for year following each annual report; [40 CFR 122.42(c)(5)]

(6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; [40 CFR 122.42(c)(6)]

(7) Identification of water quality improvements or degradation. [40 CFR 122.42(c)(7)]

p. STANDARD PERMIT PROVISIONS FOR STORM WATER DISCHARGES [40 CFR 122.42(d)]

The initial permits for discharges composed entirely of storm water issued pursuant to 40 CFR 122.26(e)(7) must require compliance with the conditions of the permit as expeditiously as practicable, but in no event later than three years after the date of issuance of the permit.

2. General Provisions

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. The general provisions applicable to this Order and NPDES permit are as follows:

a. DISCHARGE OF WASTE IS A PRIVILEGE

No discharge of waste into the waters of the State, whether or not such discharge is made pursuant to waste discharge requirements, shall create a vested right to continue such discharge. All discharges of waste into waters of the State are privileges, not rights. [CWC Section 13263(g)]

b. DURATION OF ORDER AND NPDES PERMIT

(1) *Effective date*. This Order and NPDES permit becomes effective on April 1st, 2015 ~~the 50th day~~ after its adoption provided the USEPA has no objection. If the USEPA objects to its issuance, this Order shall not become effective until such objection is withdrawn. This Order supersedes Order No. R9-2007-0001 for the San Diego County Copermittees listed in Table 2.a and became effective on June 27, 2014.~~upon the effective date of this Order~~. This Order as amended by Order R9-2015-0001~~, and~~ supersedes Order No~~s~~. R9-2009-0002 and becomes effective ~~fifty (50) days~~ April 1, 2015 after the date Order No. R9-2015-0001 is adopted. This Order supersedes Order No. R9-2010-0016 upon its ~~their~~ expiration or earlier notice of coverage.

(2) *Expiration*. This Order and NPDES permit expires five years after its effective date.

[40 CFR 122.46(a)]

(3) *Continuation of expired order*. After this Order and NPDES permit expires, the terms and conditions of this Order and NPDES permit are automatically continued pending issuance of a new permit if all requirements of the federal NPDES regulations on the continuation of expired permits (40 CFR 122.6) are complied with.

c. AVAILABILITY

A copy of this Order must be kept at a readily accessible location and must be available to on-site personnel at all times.

d. CONFIDENTIALITY OF INFORMATION

Except as provided for in 40 CFR 122.7, no information or documents submitted in accordance with or in application for this Order will be considered confidential, and all such information and documents shall be available for review by the public at the San Diego Water Board office.

Claims of confidentiality for the following information will be denied:
[40 CFR 122.7(b)]

(1) The name and address of any permit applicant or Copermittee;
[40 CFR 122.7(b)(1)] and

(2) Permit applications and attachments, permits, and effluent data.
[40 CFR 122.7(b)(2)]

e. EFFLUENT LIMITATIONS

(1) *Interim effluent limitations*. The Copermittee must comply with any interim effluent limitations as established by addendum, enforcement action, or revised waste discharge requirements which have been, or may be, adopted by the San Diego Water Board.

(2) *Other effluent limitations and standards*. If any applicable toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant and that standard or prohibition is more stringent than any limitation on the pollutant in the permit, the San Diego Water Board shall institute proceedings under these regulations to modify or revoke and reissue the permit to conform to the toxic effluent standard or prohibition. [40 CFR 122.44(b)(1)]

f. DUTY TO MINIMIZE OR CORRECT ADVERSE IMPACTS

The Copermittee must take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this Order, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the noncompliance.

g. PERMIT ACTIONS

The filing of a request by the Copermittee for modification, revocation and reissuance, or termination of this Order, or a notification of planned change in or anticipated noncompliance with this Order does not stay any condition of this Order. (See 40 CFR 122.41(f)) In addition, the following provisions apply to this Order:

(1) Upon application by any affected person, or on its own motion, the San Diego Water Board may review and revise the requirements in this Order. All requirements must be reviewed periodically. [CWC Section 13263(e)]

(2) This Order may be terminated or modified for cause, including, but not limited to, all of the following: [CWC Section 13381]

(a) Violation of any condition contained in the requirements of this Order. [CWC Section 13381(a)]

(b) Obtaining the requirements in this Order by misrepresentation, or failure to disclose fully all relevant facts. [CWC Section 13381(b)]

(c) A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge. [CWC Section 13381(c)]

(3) When this Order is transferred to a new owner or operator, such requirements as may be necessary under the CWC may be incorporated into this Order.

h. NPDES PERMITTED NON-STORM WATER DISCHARGES

The San Diego Water Board has, in prior years, issued a limited number of individual NPDES permits for non-storm water discharges to MS4s. The San Diego Water Board or State Water Board may in the future, upon prior notice to the Copermittee(s), issue an NPDES permit for any non-storm water discharge (or class of non-storm water discharges) to an MS4.

i. MONITORING

In addition to the standard provisions required under 40 CFR 122.41(j) and (l)(4), the following general monitoring provisions apply to this Order:

(1) Where procedures are not otherwise specified in Order, sampling, analysis and quality assurance/quality control must be conducted in accordance with the Quality Assurance Management Plan (QAMP) for the State of California's Surface Water Ambient Monitoring Program (SWAMP), adopted by the State Water Resources Control Board (State Water Board).

(2) Pursuant to 40 CFR 122.41(j)(2) and CWC Section 13383(a), each Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring

instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five (5) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time.

(3) All chemical, bacteriological, and toxicity analyses must be conducted at a laboratory certified for such analyses by the California Department of Public Health or a laboratory approved by the San Diego Water Board.

(4) For priority toxic pollutants that are identified in the California Toxics Rule (CTR) (65 Fed. Reg. 31682), the Copermittees must instruct their laboratories to establish calibration standards that are equivalent to or lower than the Minimum Levels (MLs) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP). If a Copermittee can demonstrate that a particular ML is not attainable, in accordance with procedures set forth in 40 CFR Part 136, the lowest quantifiable concentration of the lowest calibration standard analyzed by a specific analytical procedure (assuming that all the method specified sample weights, volumes, and processing steps have been followed) may be used instead of the ML listed in Appendix 4 of the SIP. The Copermittee must submit documentation from the laboratory to the San Diego Water Board for approval prior to raising the ML for any priority toxic pollutant.

j. ENFORCEMENT

(1) The San Diego Water Board is authorized to enforce the terms of this Order under several provisions of the CWC, including, but not limited to, CWC Sections 13385, 13386, and 13387.

(2) Nothing in this Order shall be construed to protect the Copermittee from its liabilities under federal, state, or local laws.

(3) The CWC provides for civil and criminal penalties comparable to, and in some cases greater than, those provided for under the CWA.

(4) Except as provided in the standard conditions required under 40 CFR 122.41(m) and (n), nothing in this Order shall be construed to relieve the Copermittee from civil or criminal penalties for noncompliance.

(5) Nothing in this Order shall be construed to preclude the institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties to which the Copermittee is or may be subject to under Section 311 of the CWA.

(6) Nothing in this Order shall be construed to preclude institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authoring preserved by Section 510 of the CWA.

k. SEVERABILITY

The provisions of this Order are severable, and if any provision of this Order, or the

application of any provisions of this Order to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this Order shall not be affected thereby.

l. APPLICATIONS

Any application submitted by a Copermittee for reissuance or modification of this Order must satisfy all applicable requirements specified in federal regulations as well as any additional requirements for submittal of a Report of Waste Discharge specified in the CWC and the California Code of Regulations.

m. IMPLEMENTATION

All plans, reports and subsequent amendments submitted in compliance with this Order must be implemented immediately (or as otherwise specified). All submittals by Copermittees must be adequate to implement the requirements of this Order.

n. REPORT SUBMITTALS

(1) All report submittals must include an executive summary, introduction, conclusion, recommendations, and signed certified statement.

(2) Each Copermittee must submit a signed certified statement covering its responsibilities for each applicable submittal.

(3) The Principal Watershed Copermittee(s) must submit a signed certified statement covering its responsibilities for each applicable submittal and the sections of the submittals for which it is responsible.

(4) Unless otherwise directed, the Copermittees must submit one hard copy and one electronic copy of each report required under this Order to the San Diego Water Board, and one electronic copy to the USEPA.

(5) The Copermittees must submit reports and provide notifications as required by this Order to the following:

EXECUTIVE OFFICER
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
2375 NORTHSIDE DRIVE~~9174 SKY PARK COURT~~, SUITE 100
SAN DIEGO CA 92108~~23-4340~~
Telephone: ~~(858) 467-2952~~(619) 516-1990~~-~~ Fax: ~~(858) 571-6972~~(619) 516-1994

EUGENE BROMLEY
US ENVIRONMENTAL PROTECTION AGENCY
REGION IX
PERMITS ISSUANCE SECTION (W-5-1)
75 HAWTHORNE STREET
SAN FRANCISCO CA 94105

ATTACHMENT C

ACRONYMS AND ABBREVIATIONS

AMAL	Average Monthly Action Level
ASBS	Area(s) of Special Biological Significance
BMP	Best Management Practice
Basin Plan	Water Quality Control Plan for the San Diego Basin
CEQA	California Environmental Quality Act
CCR	California Code of Regulations
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWC	California Water Code
CZARA	Coastal Zone Act Reauthorization Amendments of 1990
ESAs	Environmentally Sensitive Areas
GIS	Geographic Information System
IBI	Index of Biological Integrity
LID	Low Impact Development
MDAL	Maximum Daily Action Level
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
NAL	Non-Storm Water Action Level
NAICS	North American Industry Classification System
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
ROWD	Report of Waste Discharge (application for NPDES reissuance)
SAL	Storm Water Action Level
San Diego Water Board	California Regional Water Quality Control Board, San Diego Region
SIC	Standard Industrial Classification Code
State Water Board	State Water Resources Control Board
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
WDID	Waste Discharge Identification Number
WLA	Waste Load Allocation
WQBEL	Water Quality Based Effluent Limitation

DEFINITIONS

Active/Passive Sediment Treatment - Using mechanical, electrical or chemical means to flocculate or coagulate suspended sediment for removal from runoff from construction sites prior to discharge.

Anthropogenic Litter – Trash generated from human activities, not including sediment.

Average Monthly Action Level – The highest allowable average of daily discharges over a calendar month.

Beneficial Uses - The uses of water necessary for the survival or wellbeing of man, plants, and wildlife. These uses of water serve to promote tangible and intangible economic, social, and environmental goals. "Beneficial Uses" of the waters of the State that may be protected include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. Existing beneficial uses are uses that were attained in the surface or ground water on or after November 28, 1975; and potential beneficial uses are uses that would probably develop in future years through the implementation of various control measures. "Beneficial Uses" are equivalent to "Designated Uses" under federal law. [California Water Code Section 13050(f)].

Best Management Practices (BMPs) - Defined in 40 CFR 122.2 as schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Bioassessment - The use of biological community information to evaluate the biological integrity of a water body and its watershed. With respect to aquatic ecosystems, bioassessment is the collection and analysis of samples of the benthic macroinvertebrate community together with physical/habitat quality measurements associated with the sampling site and the watershed to evaluate the biological condition (i.e. biotic integrity) of a water body.

Biofiltration - Practices that use vegetation and amended soils to detain and treat runoff from impervious areas. Treatment is through filtration, infiltration, adsorption, ion exchange, and biological uptake of pollutants.

Biological Integrity - Defined in Karr J.R. and D.R. Dudley. 1981. Ecological perspective on water quality goals. *Environmental Management* 5:55-68 as: "A balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitat of the region." Also referred to as ecosystem health.

BMP Design Manual – A plan developed to eliminate, reduce, or mitigate the impacts of runoff from development projects, including Priority Development Projects.

Chronic Toxicity – A measurement of sublethal effect (e.g. reduced growth, reproduction) to experimental test organisms exposed to an effluent or receiving waters compared to that of the

control organisms.

Clean Water Act Section 303(d) Water Body - An impaired water body in which water quality does not meet applicable water quality standards and/or is not expected to meet water quality standards, even after the application of technology based pollution controls required by the CWA. The discharge of runoff to these water bodies by the Copermittees is significant because these discharges can cause or contribute to violations of applicable water quality standards.

Construction Site – Any project, including projects requiring coverage under the Construction General Permit, that involves soil disturbing activities including, but not limited to, clearing, grading, disturbances to ground such as stockpiling, and excavation.

Contamination - As defined in the Porter-Cologne Water Quality Control Act, contamination is "an impairment of the quality of waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste whether or not waters of the State are affected."

Copermittee – A permittee to a NPDES permit that is only responsible for permit conditions relating to the discharge for which it is operator [40 CFR 122.26(b)(1)]. For the purposes of this Order, a Copermittee is one of the individual permittees identified in Tables 1a-1c of this Order.

Copermittees – All of the individual Copermittees, collectively.

Critical Channel Flow (Qc) – The channel flow that produces the critical shear stress that initiates bed movement or that erodes the toe of channel banks. When measuring Qc, it should be based on the weakest boundary material – either bed or bank.

Daily Discharge – Defined as either: (1) the total mass of the constituent discharged over the calendar day or any 24 hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g. concentration.)

The Daily Discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day, or other 24 hour period other than a day), or by the arithmetic mean of analytical results from one or more grab samples taken over the course of a day.

Development Projects - Construction, rehabilitation, redevelopment, or reconstruction of any public or private projects.

Dry Season –May 1 to September 30.

Dry Weather – Weather is considered dry if the preceding 72 hours has been without measurable precipitation (>0.1 inch).

Enclosed Bays – Enclosed bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost bay works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays do not include

inland surface waters or ocean waters.

Erosion – When land is diminished or worn away due to wind, water, or glacial ice. Often the eroded debris (silt or sediment) becomes a pollutant via storm water runoff. Erosion occurs naturally but can be intensified by land clearing activities such as farming, development, road building, and timber harvesting.

Environmentally Sensitive Areas (ESAs) - Areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; areas designated as preserves or their equivalent under the Natural Communities Conservation Program within the Cities and County of Orange; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.

Estuaries – Waters, including coastal lagoons, located at the mouth of streams that serve as areas of mixing fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and ocean water. Estuaries do not include inland surface waters or ocean waters.

Existing Development – Any area that has been developed and exists for municipal, commercial, industrial, or residential purposes, uses, or activities. May include areas that are not actively used for its originally developed purpose, but may be re-purposed or redeveloped for another use or activity.

Flow Duration – The long-term period of time that flows occur above a threshold that causes significant sediment transport and may cause excessive erosion damage to creeks and streams (not a single storm event duration). The simplest way to visualize this is to consider a histogram of pre- and post-project flows using long-term records of hourly data. To maintain pre-development flow duration means that the total number of hours (counts) within each range of flows in a flow-duration histogram cannot increase between the pre- and post-development condition. Flow duration within the range of geomorphologically significant flows is important for managing erosion.

Grading - The cutting and/or filling of the land surface to a desired slope or elevation.

Groundwater – Subsurface water that occurs beneath the water table in soils and geologic formations that are fully saturated.

Hazardous Material – Any substance that poses a threat to human health or the environment due to its toxicity, corrosiveness, ignitability, explosive nature or chemical reactivity. These also include materials named by the USEPA in 40 CFR 116 to be reported if a designated quantity of the material is spilled into the waters of the U.S. or emitted into the environment.

Hazardous Waste - Hazardous waste is defined as “any waste which, under Section 600 of Title 22 of this code, is required to be managed according to Chapter 30 of Division 4.5 of Title 22 of this code” [CCR Title 22, Division 4.5, Chapter 11, Article 1].

Household Hazardous Waste – Paints, cleaning products, and other hazardous wastes generated during home improvement or maintenance activities.

Hydromodification – The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

Illicit Connection – Any man-made conveyance or drainage system through which a non-storm water discharge to the storm water drainage system occurs or may occur. Any connection to the MS4 that conveys an illicit discharge.

Illicit Discharge - Any discharge to the MS4 that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from firefighting activities [40 CFR 122.26(b)(2)].

Inactive Areas – Areas of construction activity that are not active and those that have been active and are not scheduled to be re-disturbed for at least 14 days.

Infiltration – In the context of low impact development, infiltration is defined as the percolation of water into the ground. Infiltration is often expressed as a rate (inches per hour), which is determined through an infiltration test. In the context of non-storm water, infiltration is water other than wastewater that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow [40 CFR 35.2005(20)].

Inland Surface Waters – Includes all surface waters of the State that do not include the ocean, enclosed bays, or estuaries.

Jurisdictional Runoff Management Program Document – A written description of the specific jurisdictional runoff management measures and programs that each Copermittee will implement to comply with this Order and ensure that storm water pollutant discharges in runoff are reduced to the MEP and do not cause or contribute to a violation of water quality standards.

Low Impact Development (LID) – A storm water management and land development strategy that emphasizes conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions.

Low Impact Development Best Management Practices (LID BMPs) – LID BMPs include schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States through storm water management and land development strategies that emphasize conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions. LID BMPs include retention

practices that do not allow runoff, such as infiltration, rain water harvesting and reuse, and evapotranspiration. LID BMPs also include flow-through practices such as biofiltration that may have some discharge of storm water following pollutant reduction.

Major Outfall – As defined in the Code of Federal Regulations, a major outfall is a MS4 outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (i.e. discharge from a single conveyance other than a circular pipe which is associated with a drainage area of more than 50 acres); or, for MS4s that receive storm water from lands zoned for industrial activity (based on comprehensive zoning plans or equivalent), a MS4 outfall that discharges from a single pipe with an inside diameter of 12 inches or more or from its equivalent (i.e. discharge from other than a circular pipe associated with a drainage area of 2 acres or more).

Maximum Daily Action Level (MDAL) –The highest allowable daily discharge of a pollutant, over a calendar day (or 24 hour period). For pollutants with action levels expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with action levels expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

Maximum Extent Practicable (MEP) – The technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) for storm water that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) in combination with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than BAT. A definition for MEP is not provided either in the statute or in the regulations. Instead the definition of MEP is dynamic and will be defined by the following process over time: municipalities propose their definition of MEP by way of their runoff management programs. Their total collective and individual activities conducted pursuant to the runoff management programs becomes their proposal for MEP as it applies both to their overall effort, as well as to specific activities (e.g., MEP for street sweeping, or MEP for MS4 maintenance). In the absence of a proposal acceptable to the San Diego Water Board, the San Diego Water Board defines MEP.

In a memo dated February 11, 1993, entitled "Definition of Maximum Extent Practicable," Elizabeth Jennings, Senior Staff Counsel, SWRCB addressed the achievement of the MEP standard as follows:

> "*To achieve the MEP standard, municipalities must employ whatever Best Management Practices (BMPs) are technically feasible (i.e., are likely to be effective) and are not cost prohibitive. The major emphasis is on technical feasibility. Reducing pollutants to the MEP means choosing effective BMPs, and rejecting applicable BMPs only where other effective BMPs will serve the same purpose, or the BMPs would not be technically feasible, or the cost would be prohibitive. In selecting BMPs to achieve the MEP standard, the following factors may be useful to consider:*
>
> *a. Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?*
> *b. Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?*
> *c. Public Acceptance: Does the BMP have public support?*

d. Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?
e. Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc.?

The final determination regarding whether a municipality has reduced pollutants to the maximum extent practicable can only be made by the Regional or State Water Boards, and not by the municipal discharger. If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit derived, it would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs that would address a pollutant source, or to pick a BMP based solely on cost, which would be clearly less effective. In selecting BMPs the municipality must make a serious attempt to comply and practical solutions may not be lightly rejected. In any case, the burden would be on the municipal discharger to show compliance with its permit. After selecting a menu of BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented."

Monitoring Year – October 1 to September 30

Municipal Separate Storm Sewer System (MS4) – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designated or used for collecting or conveying storm water; (iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.26.

National Pollutant Discharge Elimination System (NPDES) - The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the CWA.

Non-Storm Water - All discharges to and from a MS4 that do not originate from precipitation events (i.e., all discharges from a MS4 other than storm water). Non-storm water includes illicit discharges and NPDES permitted discharges.

Nuisance - As defined in the Porter-Cologne Water Quality Control Act, a nuisance is "anything which meets all of the following requirements: 1) Is injurious to health, or is indecent, or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. 2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or

damage inflicted upon individuals may be unequal. 3) Occurs during, or as a result of, the treatment or disposal of wastes."

Ocean Waters – The territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the State Board's California Ocean Plan.

Order – Unless otherwise specified, refers to this Order, Order No. R9-2013-0001 (NPDES No. CAS0109266)

Outfall - Outfall means a point source as defined by 40 CFR 122.2 at the point where a municipal separate storm sewer discharges to waters of the US and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels or other conveyances which connect segments of the same stream or other waters of the US and are used to convey waters of the US.

Persistent Flow - Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

Person - A person is defined as an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof [40 CFR 122.2].

Point Source - Any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, landfill leachate collection systems, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

Pollutant - Any agent that may cause or contribute to the degradation of water quality such that a condition of pollution or contamination is created or aggravated.

Pollution - As defined in the Porter-Cologne Water Quality Control Act, pollution is "the alteration of the quality of the waters of the State by waste, to a degree which unreasonably affects either of the following: 1) The waters for beneficial uses; or 2) Facilities that serve these beneficial uses." Pollution may include contamination.

Pollution Prevention - Pollution prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control BMPs, treatment control BMPs, or disposal.

Pre-Development Runoff Conditions – Approximate flow rates and durations that exist or existed onsite before land development occurs. For new development projects, this equates to runoff conditions immediately before project construction. For redevelopment projects, this equates to runoff conditions from the project footprint assuming infiltration characteristics of the underlying soil, and existing grade. Runoff coefficients of concrete or asphalt must not be used. A redevelopment Priority Development Project must use available information pertaining to existing underlying soil type and onsite existing grade to estimate pre-development runoff conditions.

Priority Development Projects - New development and redevelopment projects defined under Provision E.3.b of Order No. R9-2013-0001.

Rainy Season (aka Wet Season) –October 1 to April 30

Receiving Waters – Waters of the United States.

Receiving Water Limitations - Waste discharge requirements issued by the San Diego Water Board typically include both: (1) "Effluent Limitations" (or "Discharge Limitations") that specify the technology-based or water-quality-based effluent limitations; and (2) "Receiving Water Limitations" that specify the water quality objectives in the Basin Plan as well as any other limitations necessary to attain those objectives. In summary, the "Receiving Water Limitations" provision is the provision used to implement the requirements of CWA section 402(p)(3)(B).

Redevelopment - The creation and/or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include trenching and resurfacing associated with utility work; resurfacing existing roadways; new sidewalk construction, pedestrian ramps, or bike lane on existing roads; and routine replacement of damaged pavement, such as pothole repair.

Regional Clearinghouse – A central location for the collection and distribution of information developed and maintained by the Copermittees including, but not limited to, plans, reports, manuals, data, contact information, and/or links to such documents and information.

Rehabilitation - Remedial measures or activities for the purpose of improving or restoring the beneficial uses of streams, channels or river systems. Techniques may vary from in-stream restoration techniques to off-line storm water management practices installed in the system corridor or upland areas, or a combination of in-stream and out of stream techniques. Rehabilitation techniques may include, but are not limited to the following: riparian zone restoration, constructed wetlands, channel modifications that improve habitat and stability, and daylighting of drainage systems.

Reporting Period – The period of information that is reported in the Water Quality Improvement Plan Annual Report. The reporting period consists of two components: 1) July 1 to June 30, consistent with the fiscal year, for the implementation of the jurisdictional runoff management programs, and 2) October 1 to September 30, consistent with the monitoring year for the monitoring and assessment programs. Together, these two time periods constitute the reporting year for the Water Quality Improvement Plan Annual Report due January 31 following the end of the monitoring year.

Retain – Keep or hold in a particular place, condition, or position without discharge to surface waters.

Retrofitting – Storm water management practice put into place after development has occurred in watersheds where the practices previously did not exist or are ineffective. Retrofitting of developed areas is intended to improve water quality, protect downstream channels, reduce

flooding, or meet other specific objectives. Retrofitting developed areas may include, but is not limited to replacing roofs with green roofs, disconnecting downspouts or impervious surfaces to drain to pervious surfaces, replacing impervious surfaces with pervious surfaces, installing rain barrels, installing rain gardens, and trash area enclosures.

Runoff - All flows in a storm water conveyance system that consists of the following components: (1) storm water (wet weather flows) and (2) non-storm water including dry weather flows.

San Diego Water Board – As used in this document the term "San Diego Water Board" is synonymous with the term "Regional Board" as defined in Water Code section 13050(b) and is intended to refer to the California Regional Water Quality Control Board for the San Diego Region as specified in Water Code Section 13200.

Sediment - Soil, sand, and minerals washed from land into water. Sediment resulting from anthropogenic sources (i.e. human induced land disturbance activities) is considered a pollutant. This Order regulates only the discharges of sediment from anthropogenic sources and does not regulate naturally occurring sources of sediment. Sediment can destroy fish-nesting areas, clog animal habitats, and cloud waters so that sunlight does not reach aquatic plants.

Source Control BMP – Land use or site planning practices, or structural or nonstructural measures that aim to prevent runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between pollutants and runoff.

Storm Water – Per 40 CFR 122.26(b)(13), means storm water runoff, snowmelt runoff and surface runoff and drainage. Surface runoff and drainage pertains to runoff and drainage resulting from precipitation events.

Structural BMPs - A subset of BMPs which detains, retains, filters, removes, or prevents the release of pollutants to surface waters from development projects in perpetuity, after construction of a project is completed.

Test of Significant Toxicity (TST) - A statistical approach used to analyze toxicity test data. The TST incorporates a restated null hypothesis, Welch's t-test, and biological effect thresholds for chronic and acute toxicity.

Total Maximum Daily Load (TMDL) - The maximum amount of a pollutant that can be discharged into a water body from all sources (point and non-point) and still maintain water quality standards. Under CWA section 303(d), TMDLs must be developed for all water bodies that do not meet water quality standards after application of technology-based controls.

Toxicity - Adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies. The water quality objectives for toxicity provided in the Basin Plan, state in part…"All waters shall be free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life….The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge."

Toxicity Identification Evaluation (TIE) - A set of procedures for identifying the specific

chemical(s) responsible for toxicity. These procedures are performed in three phases (characterization, identification, and confirmation) using aquatic organism toxicity tests.

Toxicity Reduction Evaluation (TRE) - A study conducted in a step-wise process designed to identify the causative agents of effluent or ambient toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in toxicity. The first steps of the TRE consist of the collection of data relevant to the toxicity, including additional toxicity testing, and an evaluation of facility operations and maintenance practices, and best management practices. A Toxicity Identification Evaluation (TIE) may be required as part of the TRE, if appropriate.

Treatment Control BMP – Any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media absorption or any other physical, biological, or chemical process.

Unpaved Road – Any long, narrow stretch without pavement used for traveling by motor passenger vehicles between two or more points. Unpaved roads are generally constructed of dirt, gravel, aggregate or macadam and may be improved or unimproved.

Waste - As defined in CWC Section 13050(d), "waste includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal."

Article 2 of CCR Title 23, Chapter 15 (Chapter 15) contains a waste classification system that applies to solid and semi-solid waste, which cannot be discharged directly or indirectly to water of the state and which therefore must be discharged to land for treatment, storage, or disposal in accordance with Chapter 15. There are four classifications of waste (listed in order of highest to lowest threat to water quality): hazardous waste, designated waste, non-hazardous solid waste, and inert waste.

Water Quality Objective - Numerical or narrative limits on constituents or characteristics of water designated to protect designated beneficial uses of the water. [California Water Code Section 13050 (h)]. California's water quality objectives are established by the State and Regional Water Boards in the Water Quality Control Plans. Numeric or narrative limits for pollutants or characteristics of water designed to protect the beneficial uses of the water. In other words, a water quality objective is the maximum concentration of a pollutant that can exist in a receiving water and still generally ensure that the beneficial uses of the receiving water remain protected (i.e., not impaired). Since water quality objectives are designed specifically to protect the beneficial uses, when the objectives are violated the beneficial uses are, by definition, no longer protected and become impaired. This is a fundamental concept under the Porter Cologne Act. Equally fundamental is Porter Cologne's definition of pollution. A condition of pollution exists when the water quality needed to support designated beneficial uses has become unreasonably affected or impaired; in other words, when the water quality objectives have been violated. These underlying definitions (regarding beneficial use protection) are the reason why all waste discharge requirements implementing the federal NPDES regulations require compliance with water quality objectives. (Water quality objectives are also called water quality criteria in the CWA.)

Water Quality Standards - Water quality standards, as defined in Clean Water Act section 303(c) consist of the beneficial uses (e.g., swimming, fishing, municipal drinking water supply, etc.,) of a water body and criteria (referred to as water quality objectives in the California Water Code) necessary to protect those uses. Under the Water Code, the water boards establish beneficial uses and water quality objectives in water quality control or basin plans. Together with an anti-degradation policy, these beneficial uses and water quality objectives serve as water quality standards under the Clean Water Act. In Clean Water Act parlance, state beneficial uses are called "designated uses" and state water quality objectives are called "criteria." Throughout this Order, the relevant term is used depending on the statutory scheme.

Waters of the State - Any water, surface or underground, including saline waters within the boundaries of the State [CWC section 13050 (e)]. The definition of the Waters of the State is broader than that for the Waters of the United States in that all water in the State is considered to be a Waters of the State regardless of circumstances or condition.

Waters of the United States - As defined in the 40 CFR 122.2, the Waters of the U.S. are defined as: "(a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate "wetlands;" (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters otherwise defined as waters of the United States under this definition: (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial seas; and (g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA."

Watershed - That geographical area which drains to a specified point on a water course, usually a confluence of streams or rivers (also known as drainage area, catchment, or river basin).

Wet Season (aka Rainy Season) – October 1 to April 30

Wet Weather – Weather is considered wet up to 72 hours after a storm event of 0.1 inches and greater, unless otherwise defined by another regulatory mechanism (e.g. a TMDL).

ATTACHMENT D

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM

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JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM
FY _____

I. COPERMITTEE INFORMATION			
Copermittee Name:			
Copermittee Primary Contact Name:			
Copermittee Primary Contact Information: Address: City:	County:	State:	Zip:
Telephone:	Fax:	Email:	

II. LEGAL AUTHORITY		
Has the Copermittee established adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 that complies with Order No. R9-2013-0001?	YES NO	☐ ☐
A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority?	YES NO	☐ ☐

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE		
Was an update of the jurisdictional runoff management program document required or recommended by the San Diego Water Board?	YES NO	☐ ☐
If YES to the question above, did the Copermittee update its jurisdictional runoff management program document and make it available on the Regional Clearinghouse?	YES NO	☐ ☐

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM		
Has the Copermittee implemented a program to actively detect and eliminate illicit discharges and connections to its MS4 that complies with Order No. R9-2013-0001?	YES NO	☐ ☐

Number of non-storm water discharges reported by the public	
Number of non-storm water discharges detected by Copermittee staff or contractors	
Number of non-storm water discharges investigated by the Copermittee	
Number of sources of non-storm water discharges identified	
Number of non-storm water discharges eliminated	
Number of sources of illicit discharges or connections identified	
Number of illicit discharges or connections eliminated	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

V. DEVELOPMENT PLANNING PROGRAM		
Has the Copermittee implemented a development planning program that complies with Order No. R9-2013-0001?	YES NO	☐ ☐
Was an update to the BMP Design Manual required or recommended by the San Diego Water Board?	YES NO	☐ ☐
If YES to the question above, did the Copermittee update its BMP Design Manual and make it available on the Regional Clearinghouse?	YES NO	☐ ☐

Number of proposed development projects in review	
Number of Priority Development Projects in review	
Number of Priority Development Projects approved	
Number of approved Priority Development Projects exempt from any BMP requirements	
Number of approved Priority Development Projects allowed alternative compliance	
Number of Priority Development Projects granted occupancy	

Number of completed Priority Development Projects in inventory	
Number of high priority Priority Development Project structural BMP inspections	
Number of Priority Development Project structural BMP violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM

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VI. CONSTRUCTION MANAGEMENT PROGRAM

Has the Copermittee implemented a construction management program that complies with Order No. R9-2013-0001?	YES	☐
	NO	☐

Number of construction sites in inventory	
Number of active construction sites in inventory	
Number of inactive construction sites in inventory	
Number of construction sites closed/completed during reporting period	
Number of construction site inspections	
Number of construction site violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

Has the Copermittee implemented an existing development management program that complies with Order No. R9-2013-0001?	YES	☐
	NO	☐

	Municipal	Commercial	Industrial	Residential
Number of facilities or areas in inventory				
Number of existing development inspections				
Number of follow-up inspections				
Number of violations				
Number of enforcement actions issued				
Number of escalated enforcement actions issued				

VIII. PUBLIC EDUCATION AND PARTICIPATION

Has the Copermittee implemented a public education program component that complies with Order No. R9-2013-0001?	YES	☐
	NO	☐
Has the Copermittee implemented a public participation program component that complies with Order No. R9-2013-0001?	YES	☐
	NO	☐

IX. FISCAL ANALYSIS

Has the Copermittee attached to this form a summary of its fiscal analysis that complies with Order No. R9-2013-0001?	YES	☐
	NO	☐

X. CERTIFICATION

I [☐ Principal Executive Officer ☐ Ranking Elected Official ☐ Duly Authorized Representative] certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature	Date
Print Name	Title
Telephone Number	Email

ATTACHMENT E

SPECIFIC PROVISIONS FOR TOTAL MAXIMUM DAILY LOADS APPLICABLE TO ORDER NO. R9-2013-0001

These provisions implement load allocations (LAs) and wasteload allocations (WLAs) of the Total Maximum Daily Loads (TMDLs) ~~adopted~~ established by the San Diego Water Board or ~~and approved by~~ USEPA under Clean Water Act section 303(c), applicable to discharges regulated under this Order. The provisions and schedules for implementation of the TMDLs described below must be incorporated into the Water Quality Improvement Plans, required pursuant to Provision B of this Order, for the specified Watershed Management Areas.

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed
2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin
3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed
4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek
5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay
6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)
7. Total Maximum Daily Load for Sediment in Los Peñasquitos Lagoon

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2002-0123

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	August 14, 2002
State Water Board Approval Date:	July 16, 2003
Office of Administrative Law Approval Date:	September 11, 2003
US EPA Approval Date:	November 3, 2003

(3) TMDL Effective Date: September 11, 2003

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final diazinon TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must be in compliance with the final TMDL compliance requirements as of December 31, 2010.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations:

Table 1.1
Final Receiving Water Limitations Expressed as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Diazinon	Acute	0.08 µg/L	1 hour
	Chronic	0.05 µg/L	4 days

(b) Final Effluent Limitations

Discharges from the MS4s containing concentrations that do not exceed the following effluent limitations will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 1.b.(2)(a):

Table 1.2
Final Effluent Limitations Expressed as Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation	Averaging Period
Diazinon	Acute	0.072 µg/L	1 hour
	Chronic	0.045 µg/L	4 days

(c) Best Management Practices

The following BMPs for Chollas Creek must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area and implemented by the Responsible Copermittees:

(i) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 1.b.(2)(a) and/or the effluent limitations under Specific Provision 1.b.(2)(b) for Chollas Creek.

(ii) The Responsible Copermittees must implement the Diazinon Toxicity Control Plan and Diazinon Public Outreach/Education Program as described in the report titled, *Technical Report for Total Maximum Daily Load for Diazinon in Chollas Creek Watershed, San Diego County*, dated August 14, 2002, including subsequent modifications, in order to achieve the receiving water limitations under Specific Provision 1.b.(2)(a) and/or the effluent limitations under Specific Provision 1.b.(2)(b).

(iii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 1.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 1.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 1.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 1.b.(2)(c) achieves compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 1.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 1.d, to demonstrate compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The Responsible Copermittees must be in compliance with the final diazinon TMDL compliance requirements as of December 31, 2010.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls for diazinon within the Chollas Creek watershed, and calculate or estimate the annual diazinon loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment

Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 1.b.(2)(b), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0019

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	September 22, 2005
Office of Administrative Law Approval Date:	December 2, 2005
US EPA Approval Date:	February 8, 2006

(3) TMDL Effective Date: December 2, 2005

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Shelter Island Yacht Basin

(6) Responsible Copermittee: City of San Diego

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final dissolved copper TMDL compliance requirements for Shelter Island Yacht Basin consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittee must be in compliance with the final TMDL compliance requirements as of December 2, 2005.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations:

Table 2.1
Final Receiving Water Limitations Expressed as Concentrations in Shelter Island Yacht Basin

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Dissolved Copper	Acute	4.8 µg/L x WER*	1 hour
	Chronic	3.1 µg/L x WER*	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 2.b.(3)(a):

Table 2.2
Final Effluent Limitations as Expressed as Annual Loads in MS4 Discharges to Shelter Island Yacht Basin

Constituent	Effluent Limitation
Dissolved Copper	30 kg/yr*

* If the water quality objectives for dissolved copper in Shelter Island Yacht Basin are changed in the future, then the margin of safety (MOS), TMDL and allocations will be recalculated using the *Method for Recalculation of the Total Maximum Daily Load for Dissolved Copper in the Shelter Island Yacht Basin, San Diego Bay* in the Basin Plan (p. 7-14).

(c) Best Management Practices

The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 2.b.(2)(a) and/or the effluent limitations under Specific Provision 2.b.(2)(b) for Shelter Island Yacht Basin. The BMPs must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 2.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 2.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittee develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 2.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 2.b.(2)(c) achieves compliance with Specific Provisions 2.b.(3)(a), 2.b.(3)(b) and/or 2.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 2.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 2.d, to demonstrate compliance with Specific Provisions 2.b.(3)(a), 2.b.(3)(b) and/or 2.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The Responsible Copermittees must be in compliance with the final dissolved copper TMDL compliance requirements as of December 2, 2005.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

The Responsible Copermittee must monitor the effluent of its MS4 outfalls for dissolved copper, and calculate or estimate the monthly and annual dissolved copper loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.(b)(2)of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0036

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	November 16, 2005
Office of Administrative Law Approval Date:	February 1, 2006
US EPA Approval Date:	March 22, 2006

(3) TMDL Effective Date: February 1, 2006

(4) Watershed Management Area: Santa Margarita River

(5) Water Body: Rainbow Creek

(6) Responsible Copermittee: County of San Diego

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final total nitrogen and total phosphorus TMDL compliance requirements for Rainbow Creek consist of the following

(1) Final TMDL Compliance Date

The Responsible Copermittee must comply with final TMDL compliance requirements by December 31, 2021.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance date under Specific Provision 3.b.(1):

Table 3.1
Final Receiving Water Limitations Expressed as Concentrations in Rainbow Creek

Constituent	Receiving Water Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing concentrations that do not exceed the following effluent limitations by the compliance date under Specific Provision 3.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 3.b.(2)(a):

Table 3.2
Final Effluent Limitations Expressed as Concentrations in MS4 Discharges to Rainbow Creek

Constituent	Effluent Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(ii) Annual pollutant loads from given land uses discharging to and from the MS4s that do not exceed the following annual loads by the compliance date under Specific Provision 3.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 3.b.(2)(a):

Table 3.3
Final Effluent Limitations Expressed as Annual Loads in MS4 Discharges to Rainbow Creek

Land Use	Total N	Total P
Commercial nurseries	116 kg/yr	3 kg/yr
Park	3 kg/yr	0.1 kg/yr
Residential areas	149 kg/yr	12 kg/yr
Urban areas	27 kg/yr	6 kg/yr

(c) Best Management Practices

(i) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 3.b.(2)(a) and/or the effluent limitations under Specific Provision 3.b.(2)(b) for Rainbow Creek.

(ii) The Responsible Copermittee should coordinate any BMPs implemented to address this TMDL with Caltrans and other sources as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under

Specific Provision 3.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 3.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the final effluent limitations under Specific Provision 3.b.(2)(b)(ii); OR

(e) The Responsible Copermittee develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 3.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Specific Provision 3.b.(2)(c) achieves compliance with Specific Provisions 3.b.(3)(a), 3.b.(3)(b), 3.b.(3)(c) and/or 3.b.(3)(d),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 3.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 3.d, to demonstrate compliance with Specific Provisions 3.b.(3)(a), 3.b.(3)(b), 3.b.(3)(c) and/or 3.b.(3)(d).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim total nitrogen and total phosphorus TMDL compliance requirements for Rainbow Creek consist of the following:

(1) Interim Compliance Dates and WQBELs

The Responsible Copermittee must comply with the interim WQBELs, expressed as annual loads, by December 31 of the interim compliance year given in Table 3.4.

Table 3.4
Interim Water Quality Based Effluent Limitations Expressed as Annual Loads in MS4 Discharges from Specific Land Uses to Rainbow Creek

	Total N Interim Effluent Limitations (kg/yr)			Total P Interim Effluent Limitations (kg/yr)		
	Interim Compliance Date			Interim Compliance Date		
Land Use	**2009**	**2013**	**2017**	**2009**	**2013**	**2017**
Commercial nurseries	390	299	196	20	16	10
Park	5	3	3	0.15	0.10	0.10
Residential areas	507	390	260	99	74	47
Urban areas	40	27	27	9	6	6

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 3.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 3.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the final effluent limitations under Specific Provision 3.b.(2)(b)(ii); OR

(e) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the interim effluent limitations under Specific Provision 3.c.(1); OR

(f) The Responsible Copermittee has submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittee must incorporate into the Water Quality Improvement Plan and implement the Sampling and Analysis Plan for Rainbow Creek Nutrient Reduction TMDL Implementation Water Quality Monitoring, dated January 2010.

(2) The results of any monitoring conducted during the reporting period, and assessment of whether the interim and final TMDL compliance requirements have been achieved must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 3.b.(2)(b)(i), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2007-0043

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2007
State Water Board Approval Date:	July 15, 2008
Office of Administrative Law Approval Date:	October 22, 2008
US EPA Approval Date:	December 18, 2008

(3) TMDL Effective Date: October 22, 2008

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final dissolved copper, lead, and zinc TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must comply with the final TMDL compliance requirements by October 22, 2028.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance date under Specific Provision 4.b.(1):

Table 4.1
Final Receiving Water Limitations Expressed as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$(0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$(0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$(0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$(0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations by the compliance date under Specific Provision 4.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 4.b.(2)(a):

Table 4.2
Final Effluent Limitations as Expressed Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(c) Best Management Practices

(i) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 4.b.(2)(a) and/or the effluent limitations under Specific Provision 4.b.(2)(b) for Chollas Creek.

(ii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans and the U.S. Navy as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 4.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 4.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 4.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 4.b.(2)(c) achieves compliance with Specific Provisions 4.b.(3)(a), 4.b.(3)(b) and/or 4.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 4.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 4.d, to demonstrate compliance with Specific Provisions 4.b.(3)(a), 4.b.(3)(b) and/or 4.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim dissolved copper, lead, and zinc TMDL compliance requirements for Chollas Creek consist of the following:

(1) Interim Compliance Date and WQBELs

The Responsible Copermittee must comply with the interim WQBELs, expressed as concentrations, by the interim compliance date given in Table 4.3:

Table 4.3
Interim Water Quality Based Effluent Limitations Expressed as Concentrations in MS4 Discharges to Chollas Creek

Interim Compliance Date	Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
October 22, 2018	Dissolved Copper	Acute	$1.2 \times 90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
	Dissolved Lead	Acute	$1.2 \times 90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
	Dissolved Zinc	Acute	$1.2 \times 90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 4.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 4.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) There are no exceedances of the interim effluent limitations under Specific

Provision 4.c.(1) at the Responsible Copermittee's MS4 outfalls; OR

(e) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance date.

d. Specific Monitoring and Assessment Requirements

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*, when it is amended to include monitoring requirements for the Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls discharging to Chollas Creek for dissolved copper, lead, and zinc, and calculate or estimate the monthly and annual dissolved copper, lead, and zinc loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 4.b.(2)(b) or 4.c.(1), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2008-0027

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 11, 2008
State Water Board Approval Date:	June 16, 2009
Office of Administrative Law Approval Date:	September 15, 2009
US EPA Approval Date:	October 26, 2009

(3) TMDL Effective Date: September 15, 2009

(4) Watershed Management Areas: See Table 5.0

(5) Water Bodies: See Table 5.0

(6) Responsible Copermittees: See Table 5.0

Table 5.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County	Dana Point Harbor	Baby Beach	-City of Dana Point -County of Orange
San Diego Bay	San Diego Bay	Shelter Island Shoreline Park	- San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final indicator bacteria TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Final TMDL Compliance Dates

(a) Baby Beach in Dana Point Harbor

The Responsible Copermittees for MS4 discharges to Baby Beach must be in compliance with the final TMDL compliance requirements according to the following compliance dates:

Table 5.1
Compliance Dates to Achieve Final TMDL Compliance Requirements For Baby Beach in Dana Point Harbor

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform	September 15, 2014	September 15, 2009
Fecal Coliform		September 15, 2009
Enterococcus		September 15, 2019

(b) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park must be in compliance with the final TMDL compliance requirements as of December 31, 2012.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance dates under Specific Provision 5.b.(1):

Table 5.2
Final Receiving Water Limitations Expressed as Bacteria Densities in the Water Body

	Receiving Water Limitations	
Constituent	Single Sample Maximum[1,2]	30-Day Geometric Mean[2]
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing indicator bacteria densities that do not exceed the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.3a
Final Effluent Limitations as Expressed as Bacteria Densities in MS4 Discharges to the Water Body

	Effluent Limitations	
Constituent	**Single Sample Maximum[1,2]**	**30-Day Geometric Mean[2]**
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.

(ii) Discharges from the MS4s containing indicator bacteria loads that do not exceed the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.4a
Final Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to the Baby Beach in Dana Point Harbor

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0.86×10^9 MPN/day	$3{,}254 \times 10^9$ MPN/30days
Fecal Coliform	0.17×10^9 MPN/day	112×10^9 MPN/30days
Enterococcus	0.03×10^9 MPN/day	114×10^9 MPN/30days

Table 5.4b
Final Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to the Shelter Island Shoreline Park in San Diego Bay

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0 MPN/day	198×10^9 MPN/30days
Fecal Coliform	0 MPN/day	8×10^9 MPN/30days
Enterococcus	0 MPN/day	26×10^9 MPN/30days

(iii) Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.5a
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to Baby Beach in Dana Point Harbor*

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	90.4%	0%
Fecal Coliform	82.7%	0%
Enterococcus	96.2%	62.2%

Notes:
* The percent load reductions are relative to data collected between 1996-2002. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittees' MS4s must not exceed the loads in Table 5.4a, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the water body.

Table 5.5b
*Final Effluent Limitations Expressed as Percent Load Reductions** in MS4 Discharges to Shelter Island Shoreline Park in San Diego Bay*

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0%	0%
Fecal Coliform	0%	0%
Enterococcus	0%	0%

Notes:
* The percent load reductions are relative to data collected between 1999-2004. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittee's MS4s must not exceed the loads in Table 5.4b, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the water body.

(c) Best Management Practices

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 5.0 must incorporate the Bacteria Load Reduction Plan (BLRP) required to be developed pursuant to Resolution No. R9-2008-0027.

(ii) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 5.b.(2)(a) and/or the effluent limitations under Specific Provision 5.b.(2)(b) for the segments or areas of the water bodies listed in Table 5.0

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.b.(2)(b)(ii); OR

(e) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 5.b.(2)(b)(iii); OR

(f) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(g) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 5.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 5.b.(2)(c) achieves compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 5.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 5.d, to demonstrate compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim indicator bacteria TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Baby Beach in Dana Point Harbor

(a) Interim TMDL Compliance Dates and WQBELs

The Responsible Copermittees for MS4 discharges to Baby Beach must comply with the following interim WQBELs by the interim compliance dates given in Tables 5.6a and/or 5.6b:

Table 5.6a
Interim Water Quality Based Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to Baby Beach in Dana Point Harbor

Constituent	Interim Compliance Dates	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	4.93×10^9 MPN/day	$3{,}254 \times 10^9$ MPN/30days*
Fecal Coliform	September 15, 2012	0.59×10^9 MPN/day	112×10^9 MPN/30days*
Enterococcus	September 15, 2012	0.42×10^9 MPN/day	301×10^9 MPN/30days
	September 15, 2016	0.03×10^9 MPN/day *	207×10^9 MPN/30days

Notes:
* Same as the final effluent limitations in Table 5.4a.

Table 5.6b
Interim Water Quality Based Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to Baby Beach in Dana Point Harbor*

Constituent	Interim Compliance Dates	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	45.2%	0%**
Fecal Coliform	September 15, 2012	41.4%	0%**
Enterococcus	September 15, 2012	48.1%	0%
	September 15, 2016	96.2%**	31.1%

Notes:
* The percent load reductions are relative to data collected between 1996-2002. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittees' MS4s must not exceed the loads in Table 5.6a, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the waterbody.
** Same as the final effluent limitations in Table 5.5a.

(b) Interim Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(i) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(ii) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(iii) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(iv) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.b(2)(b)(ii); OR

(v) The Responsible Copermittees can demonstrate that exceedances of the applicable receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(vi) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the interim effluent limitations under Table 5.6a of Specific Provision 5.c.(1)(a); OR

(vii) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the interim effluent limitations under Table 5.6b of Specific Provision 5.c.(1)(a); OR

(viii) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

(2) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park must be in compliance with the final indicator bacteria TMDL requirements as of December 31, 2012.

d. Specific Monitoring and Assessment Requirements

(1) Monitoring Stations

Monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[33] If discharges of bacteria from the MS4 exceed the applicable interim or final WQBELs, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(2) Monitoring Procedures

(a) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) The Responsible Copermittees must collect wet weather monitoring samples within the first 24 hours of a storm event[34] of the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(c) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

[33] Commonly referred to as AB 411 monitoring
[34] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs have been achieved.

(b) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 5.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(c) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to correlate elevated bacteria levels with known or suspected sewage spills from wastewater collection systems and treatment plants or boats.

(d) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2010-0001

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 10, 2010
State Water Board Approval Date:	December 14, 2010
Office of Administrative Law Approval Date:	April 4, 2011
US EPA Approval Date:	June 22, 2011

(3) TMDL Effective Date: April 4, 2011

(4) Watershed Management Areas: See Table 6.0

(5) Water Bodies: See Table 6.0

(6) Responsible Copermittees: See Table 6.0

Table 6.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	-City of Laguna Beach -County of Orange -Orange County Flood Control District
		at Heisler Park - North	
	Pacific Ocean Shoreline	at Main Laguna Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Woods -County of Orange -Orange County Flood Control District
		Laguna Beach at Ocean Avenue	
		Laguna Beach at Cleo Street	
		Arch Cove at Bluebird Canyon Road	
		Laguna Beach at Dumond Drive	
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Hills -City of Laguna Niguel -City of Laguna Woods -City of Lake Forest -City of Mission Viejo -County of Orange -Orange County Flood Control District
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	
	Aliso Creek Mouth	at mouth	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	-City of Dana Point -City of Laguna Beach -City of Laguna Niguel -County of Orange -Orange County Flood Control District
		Aliso Beach at Table Rock Drive	
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)	
		at Salt Creek (large outlet)	
		Salt Creek Beach at Salt Creek service road	
		Salt Creek Beach at Strand Road	
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	-City of Dana Point -City of Laguna Hills -City of Laguna Niguel -City of Mission Viejo -City of Rancho Santa Margarita -City of San Juan Capistrano -County of Orange -Orange County Flood Control District
	San Juan Creek	lower 1 mile	
	San Juan Creek Mouth	at mouth	
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	-City of Dana Point -City of San Clemente -County of Orange -Orange County Flood Control District
		Ole Hanson Beach Club Beach at Pico Drain	
		San Clemente City Beach at El Portal Street Stairs	
		San Clemente City Beach at Mariposa Street	
		San Clemente City Beach at Linda Lane	
		San Clemente City Beach at South Linda Lane	
		San Clemente City Beach at Lifeguard Headquarters	
		under San Clemente Municipal Pier	
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	
		San Clemente State Beach at Riviera Beach	
		Can Clemente State Beach at Cypress Shores	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	-City of Oceanside -City of Vista -County of San Diego
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	-City of Carlsbad -City of Encinitas -City of Escondido -City of San Marcos -County of San Diego
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	-City of Del Mar -City of Escondido -City of Poway -City of San Diego -City of Solana Beach -County of San Diego
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	-City of Del Mar -City of Poway -City of San Diego -County of San Diego
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	-City of San Diego
		La Jolla Shores Beach at Caminito del Oro	
		La Jolla Shores Beach at Vallecitos	
		La Jolla Shores Beach at Avenida de la Playa	
		at Casa Beach, Children's Pool	
		South Casa Beach at Coast Boulevard	
		Whispering Sands Beach at Ravina Street	
		Windansea Beach at Vista de la Playa	
		Windansea Beach at Bonair Street	
		Windansea Beach at Playa del Norte	
		Windansea Beach at Palomar Avenue	
		at Tourmaline Surf Park	
		Pacific Beach at Grand Avenue	
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I- Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	-City of El Cajon -City of Santee -County of San Diego
	San Diego River	lower 6 miles	-City of El Cajon -City of La Mesa -City of San Diego -City of Santee -County of San Diego
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	-City of La Mesa -City of Lemon Grove -City of San Diego -County of San Diego - San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final indicator bacteria TMDL compliance requirements for the water bodies listed in Table 6.0 consist of the following:

(1) Final TMDL Compliance Dates

The Responsible Copermittees for MS4 discharges to the water bodies listed in Table 6.0 must be in compliance with the final TMDL compliance requirements according to the following compliance dates:

Table 6.1
Compliance Dates to Achieve Final TMDL Compliance Requirements

Constituent	Dry Weather TMDL Compliance Date	Wet Weather TMDL Compliance Date
Total Coliform	April 4, 2021	April 4, 2031
Fecal Coliform		
Enterococcus		

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance dates under Specific Provision 6.b.(1):

Table 6.2a
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Beaches

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform	10,000	22%	1,000	0%
Fecal Coliform	400	22%	200	0%
Enterococcus	104	22%	35	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan.

Table 6.2b
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Creeks

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Fecal Coliform	400	22%	200	0%
Enterococcus	61 (104)	22%	33	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Basin Plan.
d. A single sample maximum of 104 MPN/100ml for *Enterococcus* may be applied as a receiving water limitation for creeks, instead of 61 MPN/100mL, if one or more of the creeks addressed by these TMDLs (San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek, San Diego River, and/or Chollas Creek) is designated with a "moderately to lightly used area" or less frequent usage frequency in the Basin Plan. Otherwise, the single sample maximum of 61 MPN/100mL for *Enterococcus* must be used to assess compliance with the allowable exceedance frequency.

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing indicator bacteria densities that do not exceed the following effluent limitations by the compliance dates under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a):

Table 6.2c
Final Effluent Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies in MS4 Discharges to the Water Body

Constituent	Concentration-Based Effluent Limitations			
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform[d]	10,000	22%	1,000	0%
Fecal Coliform	400	22%	200	0%
Enterococcus	104[e] / 61[f]	22%	35[e] / 33[f]	0%

Notes:
a. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan for discharges to beaches, and the Basin Plan for discharges to creeks and creek mouths.
d. Total coliform effluent limitations only apply to MS4 outfalls that discharge to the Pacific Ocean Shorelines and creek mouths listed in Table 6.0.
e. This *Enterococcus* effluent limitation applies to MS4 discharges to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
f. This *Enterococcus* effluent limitation applies to MS4 discharges to segments or areas of creeks or creek mouths listed in Table 6.0.

(ii) Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the compliance dates under Specific Provision 6.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a):

Table 6.3
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	*Watershed and Water Bodies*	*Load-Based Effluent Limitations*					
		Dry Weather			*Wet Weather*		
		Total Coliform	*Fecal Coliform*	*Entero-coccus*	*Total Coliform*	*Fecal Coliform*	*Entero-coccus*
South Orange County	San Joaquin Hills HSA (901.11) and Laguna Hills HSA (901.12) - Pacific Ocean Shoreline	91.78%	91.72%	98.28%	46.85%	52.07%	51.26%
	Aliso HSA (901.13) - Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	95.47%	95.58%	99.13%	25.29%	26.62%	27.52% (27.37%)**
	Dana Point HSA (901.14) - Pacific Ocean Shoreline	95.04%	95.03%	98.98%	13.15%	14.86%	15.16%
	Lower San Juan HSA (901.27) - Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	72.96%	74.21%	94.94%	19.21%	12.82%	27.12% (26.90%)**
	San Clemente HA (901.30) - Pacific Ocean Shoreline	94.28%	94.23%	98.83%	23.85%	24.58%	25.26%
San Luis Rey River	San Luis Rey HU (903.00) - Pacific Ocean Shoreline	38.13%	39.09%	87.38%	5.62%	3.12%	11.69%

Table 6.3 (Cont'd)
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watershed and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
Carlsbad	San Marcos HA (904.50) - Pacific Ocean Shoreline	82.82%	82.55%	96.03%	18.47%	18.98%	20.19%
San Dieguito River	San Dieguito HU (905.00) - Pacific Ocean Shoreline	14.39%	20.72%	83.48%	4.29%	1.46%	7.72%
Penasquitos	Miramar Reservoir HA (906.10) - Pacific Ocean Shoreline	96.50%	96.59%	99.42%	1.61%	1.99%	1.93%
Mission Bay	Scripps HA (906.30) - Pacific Ocean Shoreline	96.44%	96.42%	99.25%	16.32%	21.14%	18.82%
	Tecolote HA (906.50) - Tecolote Creek	94.51%	94.59%	98.94%	16.51%	20.47%	18.15% (18.08%)**
San Diego River	Mission San Diego HSA (907.11) and Santee HSA (907.12) - Pacific Ocean Shoreline - Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles)	74.03%	69.44%	93.96%	38.14%	53.22%	42.74% (42.47%)**
San Diego Bay	Chollas HSA (908.22) - Chollas Creek	92.06%	92.15%	98.46%	17.82%	24.84%	21.46% (21.36%)**

Notes:
* The percent load reductions are based on reducing loads compared to pollutant loads from 2001 to 2002.
** The alternative *Enterococcus* percent load reduction was calculated based on a numeric target of 104 MPN/100mL instead of 61 MPN/100mL, protective of the REC-1 "moderately to lightly used area" usage frequency that is protective of freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative pollutant load reductions can be utilized.

(c) Best Management Practices

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 6.0 must incorporate the Comprehensive Load Reduction Plans (CLRPs) required to be developed pursuant to Resolution No. R9-2010-0001.

(ii) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 6.b.(2)(a) and/or the effluent limitations under Specific Provision 6.b.(2)(b) for the segments or areas of the water bodies listed in Table 6.0.

(iii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans, owners/operators of small MS4s, and agricultural dischargers as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(f) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 6.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 6.b.(2)(c) achieves compliance with Specific Provisions 6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), and/or 6.b.(3)(e),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 6.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 6.d, to demonstrate compliance with Specific Provisions 6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), 6.b.(3)(e) and/or 6.b.(3)(f).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim indicator bacteria TMDL compliance requirements for the water bodies listed in Table 6.0 consist of the following:

(1) Interim TMDL Compliance Dates

The Responsible Copermittees must achieve compliance with the interim TMDL compliance requirements, as determined in accordance with Specific Provision 6.c.(3), by the interim compliance dates given in Table 6.4, unless alternative interim compliance dates are accepted by the San Diego Water Board Executive Officer as part of the Water Quality Improvement Plan.

Table 6.4
Interim Compliance Dates to Achieve Interim TMDL Compliance Requirements

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	April 4, 2016	April 4, 2021
		at Heisler Park - North		
	Pacific Ocean Shoreline	at Main Laguna Beach	April 4, 2016	April 4, 2021
		Laguna Beach at Ocean Avenue		
		Laguna Beach at Cleo Street		
		Arch Cove at Bluebird Canyon Road		
		Laguna Beach at Dumond Drive		
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	April 4, 2016	April 4, 2021
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	April 4, 2018	April 4, 2021
	Aliso Creek Mouth	at mouth	April 4, 2018	April 4, 2021
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	April 4, 2016	April 4, 2021
		Aliso Beach at Table Rock Drive		
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)		
		at Salt Creek (large outlet)		
		Salt Creek Beach at Salt Creek service road	April 4, 2017	April 4, 2021
		Salt Creek Beach at Strand Road	April 4, 2017	April 4, 2021

Table 6.4 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates	
			Interim Dry Weather WQBELs	Interim Wet Weather WQBELs
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	April 4, 2016	April 4, 2021
	San Juan Creek	lower 1 mile	April 4, 2018	April 4, 2021
	San Juan Creek Mouth	at mouth	April 4, 2016	April 4, 2021
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	April 4, 2016	April 4, 2021
		Ole Hanson Beach Club Beach at Pico Drain	April 4, 2016	April 4, 2021
		San Clemente City Beach at El Portal Street Stairs	April 4, 2017	April 4, 2021
		San Clemente City Beach at Mariposa Street		
		San Clemente City Beach at Linda Lane	April 4, 2016	April 4, 2021
		San Clemente City Beach at South Linda Lane	April 4, 2018	April 4, 2021
		San Clemente City Beach at Lifeguard Headquarters	April 4, 2017	April 4, 2021
		under San Clemente Municipal Pier		
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	April 4, 2018	April 4, 2021
		San Clemente State Beach at Riviera Beach	April 4, 2016	April 4, 2021
		Can Clemente State Beach at Cypress Shores	April 4, 2017	April 4, 2021
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	April 4, 2017	April 4, 2021
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	April 4, 2016	April 4, 2021
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	April 4, 2016	April 4, 2021

Table 6.4 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates	
			Interim Dry Weather WQBELs	Interim Wet Weather WQBELs
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	April 4, 2016	April 4, 2021
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	April 4, 2016	April 4, 2021
		La Jolla Shores Beach at Caminito del Oro		
		La Jolla Shores Beach at Vallecitos		
		La Jolla Shores Beach at Avenida de la Playa		
		at Casa Beach, Children's Pool		
		South Casa Beach at Coast Boulevard		
		Whispering Sands Beach at Ravina Street		
		Windansea Beach at Vista de la Playa		
		Windansea Beach at Bonair Street		
		Windansea Beach at Playa del Norte		
		Windansea Beach at Palomar Avenue		
		at Tourmaline Surf Park		
		Pacific Beach at Grand Avenue		
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries		
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	April 4, 2018	April 4, 2021
	San Diego River	lower 6 miles		
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach		
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	April 4, 2018	April 4, 2021

(2) Interim Water Quality Based Effluent Limitations

The Responsible Copermittees for discharges to the water bodies in Table 6.0 must comply with the following interim WQBELs by the interim compliance dates given in Specific Provision 6.c.(1):

(a) Interim Receiving Water Limitations

(i) *Interim Dry Weather Receiving Water Limitations*

The Responsible Copermittee must calculate the "existing" exceedance frequencies of the 30-day geometric mean water quality objectives for each of the indicator bacteria by analyzing the available monitoring data collected between January 1, 1996 and December 31, 2002. "Existing" exceedance frequencies may be calculated by water body and/or by Watershed Management Area listed in Table 6.0. Separate "existing" exceedance frequencies must be calculated for beaches and creeks/creek mouths.

The Responsible Copermittees must achieve a 50 percent reduction in the "existing" exceedance frequency of the 30-day geometric mean WQBELs for the water bodies listed in Table 6.0 by the interim compliance dates given in Table 6.4. A 50 percent reduction in the "existing" exceedance frequency is equivalent to half of the "existing" exceedance frequency of the 30-day geometric mean WQBELs.

The "existing" exceedance frequencies and the interim dry weather allowable exceedance frequencies (i.e. interim dry weather receiving water limitations) calculated by the Responsible Copermittees must be included in the Water Quality Improvement Plans for the applicable Watershed Management Areas.

(ii) *Interim Wet Weather Receiving Water Limitations*

The Responsible Copermittees must achieve the interim wet weather receiving water limitations in Table 6.5, expressed as interim wet weather allowable exceedance frequencies, by the interim compliance dates given in Table 6.4.

Table 6.5
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	38%	37%	39%
		at Heisler Park - North			
	Pacific Ocean Shoreline	at Main Laguna Beach			
		Laguna Beach at Ocean Avenue			
		Laguna Beach at Cleo Street			
		Arch Cove at Bluebird Canyon Road			
		Laguna Beach at Dumond Drive			
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	41%	41%	42%
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	41%	41%	42%
	Aliso Creek Mouth	at mouth	41%	41%	42%
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	36%	36%	36%
		Aliso Beach at Table Rock Drive			
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)			
		at Salt Creek (large outlet)			
		Salt Creek Beach at Salt Creek service road			
		Salt Creek Beach at Strand Road			

Table 6.5 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	44%	44%	48%
	San Juan Creek	lower 1 mile	44%	44%	47%
	San Juan Creek Mouth	at mouth	44%	44%	47%
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	35%	35%	36%
		Ole Hanson Beach Club Beach at Pico Drain			
		San Clemente City Beach at El Portal Street Stairs			
		San Clemente City Beach at Mariposa Street			
		San Clemente City Beach at Linda Lane			
		San Clemente City Beach at South Linda Lane			
		San Clemente City Beach at Lifeguard Headquarters			
		under San Clemente Municipal Pier			
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)			
		San Clemente State Beach at Riviera Beach			
		Can Clemente State Beach at Cypress Shores			
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	45%	44%	47%
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	40%	40%	41%
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	33%	33%	36%

Table 6.5 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	26%	26%	26%
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	37%	37%	37%
		La Jolla Shores Beach at Caminito del Oro			
		La Jolla Shores Beach at Vallecitos			
		La Jolla Shores Beach at Avenida de la Playa			
		at Casa Beach, Children's Pool			
		South Casa Beach at Coast Boulevard			
		Whispering Sands Beach at Ravina Street			
		Windansea Beach at Vista de la Playa			
		Windansea Beach at Bonair Street			
		Windansea Beach at Playa del Norte			
		Windansea Beach at Palomar Avenue			
		at Tourmaline Surf Park			
		Pacific Beach at Grand Avenue			
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries	49%	49%	51%
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	46%	43%	49%
	San Diego River	lower 6 miles	46%	43%	49%
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	46%	43%	51%
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	41%	41%	43%

(b) Interim Effluent Limitations

Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the interim compliance dates under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.c.(2)(a):

Table 6.6
Interim Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	*Watersheds and Water Bodies*	*Load-Based Effluent Limitations*					
		Dry Weather			*Wet Weather*		
		Total Coliform	*Fecal Coliform*	*Entero-coccus*	*Total Coliform*	*Fecal Coliform*	*Entero-coccus*
South Orange County	San Joaquin Hills HSA (901.11) and Laguna Hills HSA (901.12) - Pacific Ocean Shoreline	45.89%	45.86%	49.14%	23.43%	26.04%	25.63%
	Aliso HSA (901.13) - Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	47.74%	47.79%	49.57%	12.65%	13.31%	13.76% (13.69%)**
	Dana Point HSA (901.14) - Pacific Ocean Shoreline	47.52%	47.52%	49.49%	6.58%	7.43%	7.58%
	Lower San Juan HSA (901.27) - Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	36.48%	37.11%	47.47%	9.61%	6.41%	13.56% (13.45%)**
	San Clemente HA (901.30) - Pacific Ocean Shoreline	47.14%	47.12%	49.42%	11.93%	12.29%	12.63%
San Luis Rey River	San Luis Rey HU (903.00) - Pacific Ocean Shoreline	19.07%	19.55%	43.69%	2.81%	1.56%	5.85%
Carlsbad	San Marcos HA (904.50) - Pacific Ocean Shoreline	41.41%	41.28%	48.02%	9.24%	9.49%	10.10%

Table 6.6 (Cont'd)
Interim Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watersheds and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
San Dieguito River	San Dieguito HU (905.00) - Pacific Ocean Shoreline	7.20%	10.36%	41.74%	2.15%	0.73%	3.86%
Penasquitos	Miramar Reservoir HA (906.10) - Pacific Ocean Shoreline	48.25%	48.30%	49.71%	0.81%	1.00%	0.97%
Mission Bay	Scripps HA (906.30) - Pacific Ocean Shoreline	48.22%	48.21%	49.63%	8.16%	10.57%	9.41%
	Tecolote HA (906.50) - Tecolote Creek	47.26%	47.30%	49.47%	8.26%	10.24%	9.08% (9.04%)**
San Diego River	Mission San Diego HSA (907.11) and Santee HSA (907.12) - Pacific Ocean Shoreline - Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles)	37.02%	34.72%	46.98%	19.07%	26.61%	21.37% (21.24%)**
San Diego Bay	Chollas HSA (908.22) - Chollas Creek	46.03%	46.08%	49.23%	8.91%	12.42%	10.73% (10.68%)**

Notes:
* The percent load reductions are based on reducing loads compared to pollutant loads from 2001 to 2002.
** The alternative *Enterococcus* percent load reduction was calculated based on a numeric target of 104 MPN/100mL instead of 61 MPN/100mL, protective of the REC-1 "moderately to lightly used area" usage frequency that is protective of freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative pollutant load reductions can be utilized.

(3) Interim TMDL Compliance Determination

Compliance with the interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(f) There are no exceedances of the interim receiving water limitations under Specific Provision 6.c.(2)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(g) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the interim effluent limitations under Specific Provision 6.c.(2)(b); OR

(h) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

d. Specific Monitoring and Assessment Requirements

(1) Monitoring and Assessment Requirements for Beaches

(a) Monitoring Stations

For beaches addressed by the TMDL, monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[35] If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source

[35] Commonly referred to as AB 411 monitoring

identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations at least once within the first 24 hours of the end of a storm event[36] during the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer in exceedance of the allowable exceedance frequencies in the receiving waters.

(iii) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(iv) For Pacific Ocean Shoreline segments or areas listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the dry weather and

[36] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

wet weather monitoring data to assess whether the interim and final WQBELs for the Pacific Ocean Shoreline segments or areas listed in Table 6.0 have been achieved.

(ii) Dry weather exceedance frequencies must be calculated as follows:

[a] 30-day geometric means must be calculated from the results of any dry weather samples collected from the segments or areas for each water body listed in Table 6.0;
[b] The method and number of samples need for calculating the 30-day geometric means must be consistent with the number of samples required by the Ocean Plan;
[c] Where there are multiple segments or areas associated with a water body listed in Table 6.0, the Copermittees may calculate geometric means for each segment or area, or combine the dry weather monitoring data from all the segments or areas to calculate geometric means for the water body;
[d] The exceedance frequency must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the dry season.

(iii) Wet weather exceedance frequencies must be calculated as follows:

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;
[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;
[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria densities reported from each storm event sampled; and
[d] The single sample maximum exceedance frequency must be calculated by dividing the number of wet weather days that exceed the single sample maximum receiving water limitations in Table 6.2 by the total number of wet weather days during the rainy season.
[e] The data collected for dry weather must be used in addition to the data collected for wet weather to calculate the wet weather 30-day geometric means. The exceedance frequency of the wet weather 30-day geometric means must be calculated by dividing the number of geometric means that exceed the geometric mean

receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the wet season.

(iv) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(v) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) Monitoring and Assessment Requirements for Creeks and Creek Mouths

(a) Monitoring Stations

For creeks addressed by the TMDL, monitoring locations should consist of, at a minimum, a location at or near the mouth of the creek (e.g. Mass Loading Station or Mass Emission Station) and one or more locations upstream of the mouth (e.g. Watershed Assessment Station). If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations in accordance with the requirements of Provision D.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations within the first 24 hours of the end of a storm event[37] during the rainy season (i.e. October 1 through April 30).

[37] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(iii) Samples collected from receiving water monitoring stations must be analyzed for fecal coliform and *Enterococcus* indicator bacteria.

(iv) For creeks or creek mouths listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the receiving water monitoring data to assess whether the interim and final receiving water WQBELs for the creeks and creek mouths listed in Table 6.0 have been achieved.

(ii) Dry weather exceedance frequencies must be calculated as follows:

[a] 30-day geometric means must be calculated from the results of any dry weather samples collected from the segment or area for each water body listed in Table 6.0;
[b] The method and number of samples need for calculating the 30-day geometric means must be consistent with the number of samples required by the Basin Plan;
[c] The exceedance frequency must be calculated by dividing the number of 30-day geometric means that exceed the 30-day geometric mean receiving water limitations in Table 6.2 by the total number of 30-day geometric means calculated from samples collected during the dry season.

(iii) Wet weather exceedance frequencies must be calculated as follows:

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;
[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;
[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria densities reported from each of the storm events sampled; and

[d] The exceedance frequency must be calculated by dividing the number of wet weather days that exceed the single sample maximum receiving water limitations in Table 6.2 by the total number of wet weather days during the rainy season.

[e] The data collected for dry weather must be used in addition to the data collected for wet weather to calculate the wet weather 30-day geometric means. The exceedance frequency of the wet weather 30-day geometric means must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the wet season.

(iv) The Responsible Copermittee must identify and incorporate additional MS4 outfall and receiving water monitoring stations and/or adjust monitoring frequencies to identify sources causing exceedances of the receiving water WQBELs.

(v) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(vi) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

7. Total Maximum Daily Loads for Sediment in Los Peñasquitos Lagoon

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2012-0033

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2012
State Water Board Approval Date:	January 21, 2014
Office of Administrative Law Approval Date:	July 14, 2014
US EPA Approval Date:	Month XX, Year

(3) TMDL Effective Date: July 14, 2014

(4) Watershed Management Area: Los Peñasquitos

(5) Water Body: Los Peñasquitos Lagoon

(6) Responsible Copermittees: County of San Diego, City of San Diego, City of Del Mar, and City of Poway

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final sediment TMDL compliance requirements for Los Peñasquitos Lagoon consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must be in compliance with the final TMDL compliance requirements by December 31, 2034.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not prohibit the sustainable restoration of tidal and non-tidal saltmarsh vegetation of at least 346 acres.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations by the compliance date under Provision 7.b(1) will not cause or contribute to a failure of the receiving water condition specified under Specific Provision 7.b.(2)(a):

Table 7.1
Final Effluent Limitations as Expressed as Annual Loads in MS4 Discharges to Los Peñasquitos Lagoon

Constituent	Effluent Limitation
Sediment	2,580 tons/yr

(c) Best Management Practices

(i) The Water Quality Improvement Plan for the Los Peñasquitos Watershed Management Area must incorporate the Sediment Load Reduction Plan required to be developed pursuant to Resolution No. R9-2012-0033.

(ii) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 7.b.(2)(a) and the effluent limitations under Specific Provision 7.b.(2)(b) for Los Peñasquitos Lagoon.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) Successful restoration of 346 total acres of tidal and non-tidal saltmarsh vegetation in Los Peñasquitos Lagoon; OR

(b) The Responsible Copermittees must develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 7.b.(2)(c)(ii) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 7.b.(2)(c)(ii) achieves compliance with Specific Provision 7.b.(3)(a),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees must continue to implement the BMPs required under Specific Provision 7.b.(2)(c)(ii), AND

(v) The Responsible Copermittees must continue to perform the specific monitoring and assessments specified in Specific Provision 7.d to demonstrate compliance with Specific Provision 2.b.(3)(a).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The Responsible Copermittees must comply with the interim WQBELs, expressed as annual loads, by December 31 of the interim compliance year set forth in Table 7.2.

Table 7.2
Interim Water Quality Based Effluent Limitations Expressed as Annual Loads in MS4 Discharges

Interim Compliance Date	Interim Effluent Limitations (tons/yr)	Associated Percentage of Reduction
December 31, 2019	6,691	20%
December 31, 2023	5,663	40%
December 31, 2027	4,636	60%
December 31, 2029	3,608	80%

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) Watershed Monitoring

The Responsible Copermittees must conduct suspended sediment, bed load, and flow monitoring to calculate total sediment loading to the Los Peñasquitos Lagoon for each wet season (October 1 thru April 30) as set forth below:

(a) The Responsible Copermittees must monitor enough storm events throughout the season to quantify sediment loading over each wet season, and

(b) The Responsible Copermittees must monitor at least 3 stations to quantify cumulative sediment loading into Los Peñasquitos Lagoon. Stations must be located within the Los Peñasquitos, Carroll Canyon, and Carmel Creek tributaries prior to discharging into Los Peñasquitos Lagoon.

(2) Lagoon Monitoring

The Responsible Copermittees must monitor Los Peñasquitos Lagoon each Fall for changes in the extent of the vegetation types as set forth below:

(a) The Responsible Copermittees must acquire aerial photos of Los Peñasquitos Lagoon and digitize them at an approximate scale of 1:2,500,

(b) The Responsible Copermittees must appropriately interpret the vegetation and classify the various types as saltmarsh, non-tidal saltmarsh, freshwater marsh, non-tidal saltmarsh –*Lolium perrene* infested, southern willow scrub/mulefat scrub, herbaceous wetland, or upland land cover.

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the monitoring data collected under Specific Provision 7.d(1) and 7.d(2) to assess whether the interim and final WQBELs have been achieved.

(b) For assessing and determining compliance with the final receiving water limitations under Specific Provision 7.b.(2)(a), the Responsible Copermittees must use the data acquired under Specific Provision 7.d.(2) to estimate the acreage of tidal and non-tidal saltmarsh actually restored.

(c) For assessing and determining compliance with the final effluent limitations under Specific Provision 7.b.(2)(b), the Responsible Copermittees must use the data acquired under Specific Provision 7.d.(1) to estimate sediment loading into Los Peñasquitos Lagoon. Sediment loading must be evaluated using a 3-year, weighted rolling average. The first reported average shall be calculated using data collected in the year 2014-2015, 2015-2016, and 2016-2017 wet seasons.

(d) The monitoring and assessment results must be submitted as part of the Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

CALIFORNIA Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

September 18, 2014

Sent via E-mail

San Diego County Copermittees
Orange County Copermittees
Riverside County Copermittees

In reply refer to / attn:
Place ID: 658018Lwalsh

Subject: NOTICE OF OPPORTUNITY TO COMMENT
Tentative Order No. R9-2015-0001, An Order Amending the Regional Municipal Separate Storm Sewer (MS4) Permit for the San Diego Region (Order No. R9-2013-0001)

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) is releasing for public review and comment Tentative Order No. R9-2015-0001 (Tentative Order). The Tentative Order proposes to amend the National Pollutant Discharge Elimination System (NPDES) Permit for *Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region*, Order No. R9-2013-0001 (Regional MS4 Permit). Notice is hereby given that the San Diego Water Board will receive written comments on the Tentative Order and proposed changes to the Regional MS4 Permit in accordance with title 40 Code of Federal Regulations (CFR) section 124.10 and Water Code section 13167.5.

The Tentative Order proposes to amend the Regional MS4 Permit in response to the Orange County Copermittees' Report of Waste Discharge (RoWD) submitted by letter dated May 20, 2014, and designate the Orange County Copermittees as MS4 dischargers responsible for compliance with the terms and the conditions of the Permit. The Tentative Order also proposes to amend the Regional MS4 Permit to address a variety of other issues including 1) Regional Water Board designation to consolidate regulation of Phase I MS4 discharges for the Cities of Laguna Hills, Laguna Woods, and Lake Forest pursuant to Water Code section 13228, 2) incorporation of the Los Peñasquitos Lagoon Sediment Total Maximum Daily Load requirements, 3) the extension of a pollutant reduction deadline for MS4 discharges to Areas of Special Biological Significance, 4) incorporation of interim exemptions for hydromodification management, and 5) implementation of a uniform approach for monitoring beach water quality in south Orange County. The uniform monitoring approach referenced in the Tentative Order is contained in a San Diego Water Board report entitled "*Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County,*" dated September 2014. This report will be available for public review during the public review and comment period on the Tentative Order.

The Tentative Order amends the Regional MS4 Permit and the Fact Sheet (Attachment F of the Permit) as described in Attachments 1 and 2 of the Tentative Order. Changes to the Regional MS4 Permit and its Fact Sheet based upon the Tentative Order are displayed in blue-underline text and red-strikeout text in the attachments to the Tentative Order.

If the San Diego Water Board adopts Tentative Order No. R9-2015-0001, the Orange County Copermittees will be the second group of Copermittees to obtain coverage under the Regional MS4 Permit. San Diego County Copermittees obtained coverage upon the effective date of the Regional MS4 Permit following its adoption on May 8, 2013. The last remaining group, the Riverside County Copermittees, will be considered for coverage under the Regional MS4 Permit in a future action following the expiration of their current MS4 Permit in November 2015, and after consideration of their RoWD submittal for MS4 Permit reissuance. Thus the intent of the Regional MS4 Permit is to ultimately cover multiple MS4 discharge points to receiving waters throughout areas of San Diego, Orange, and Riverside Counties that fall within the San Diego Water Board's jurisdiction. Therefore, the Copermittees currently covered by Order No. R9-2013-0001 (i.e. the Copermittees in San Diego County) and Orange County Copermittees have an opportunity to submit any written comments on the Tentative Order and proposed changes to the Regional MS4 Permit during the comment period described below. Copermittees covered by the current Riverside County MS4 permit (Order No. R9-2010-0016), for which a RoWD NPDES reissuance application has not yet been filed, are strongly encouraged to submit written comments during the comment period described below.

Document Availability

The Tentative Order and attachments thereto, are available on the San Diego Water Board website at:

http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/oc_stormwater.shtml.

Interested persons may also receive a copy of the Tentative Order and its attachments by contacting Laurie Walsh at (619) 521-3373, email Laurie.Walsh@waterboards.ca.gov or by visiting the San Diego Water Board's office at 2375 Northside Drive, Suite 100, San Diego, California 92108, weekdays between 8:00 a.m. and 5:00 p.m., telephone (619) 516-1990. San Diego, Orange, and Riverside County Copermittees are requested to confirm by e-mail to Laurie Walsh that they *do not* wish to receive a copy of the Tentative Order and its attachments in paper form.

Submission of Written Comments

The submission of written comments is the opportunity for the Copermittees and interested persons to raise and comment on issues pertaining to the terms and conditions of the Tentative Order. All written comments pertaining to the terms and conditions of the Tentative Order to be considered by the San Diego Water Board at the as-yet unscheduled public hearing must be received no later than **12:00 noon on Wednesday November 19, 2014.**

Written comments must be sent to the San Diego Water Board's office at 2375 Northside Drive, Suite 100, San Diego, CA 92108, faxed to (619) 516-1994, or e-mailed to Laurie Walsh at Laurie.Walsh@waterboards.ca.gov. Please indicate in the subject line of all written comments "Comment - Tentative Order No. R9-2015-0001, Place ID:658018LWalsh". The early submission of written comments on the Tentative Order is encouraged.

Written comments received by **12:00 noon on Wednesday, November 19, 2014** will be provided to the San Diego Water Board members for their review in advance of a public hearing to consider adoption of the Tentative Order. All timely written comments will also be posted as they are received on the San Diego Water Board website at: http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/oc_stormwater.shtml.

Consistent with State Water Board regulations that apply to this proceeding, written comments received after the close of the comment period will not be accepted and will not be incorporated into the administrative record if doing so would prejudice any party. Written comments received by the close of the comment period will be provided to the San Diego Water Board members for their review in advance of a public hearing to consider adoption of the Tentative Order. The San Diego Water Board will prepare written responses to significant comments that are timely received.

Public Hearing for Consideration of Tentative Order Adoption
The San Diego Water Board will issue a separate notice announcing a public hearing to receive oral comments and consider adoption of the Tentative Order at a later date. Notice of the public hearing will be provided to the Copermittees and interested persons at least thirty (30) days in advance of the hearing. Participants will have an opportunity to address the San Diego Water Board members subject to reasonable limitations prior to the Board taking action on the Tentative Order. The public notice providing the specific date for the San Diego Water Board adoption meeting and any other public notices related to the Tentative Order will be distributed through the e-mail list service specified below and posted on the San Diego Water Board website at:
http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/oc_stormwater.shtml

Public Workshop on Tentative Order
The San Diego Water Board will hold a public workshop to receive information and discuss requirements of the Tentative Order as part of the Board's regularly scheduled public meeting on October 8, 2014 in the City of Mission Viejo, Council Chambers, Mission Viejo, California. Additional information on the public workshop is contained in the Notice of Public Workshop which is available on the San Diego Water Board website at:
http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/oc_stormwater.shtml

E-Mail List Service
Interested persons desiring to receive future public notices regarding the Tentative Order and potential future modifications to the Regional MS4 Permit can subscribe to one of the electronic e-mail service lists titled "Orange County MS4 Permit," "Riverside County MS4 Permit," or "San Diego MS4 Permit" located on the San Diego Water Board website at:
http://www.waterboards.ca.gov/resources/email_subscriptions/reg9_subscribe.shtml

Persons without access to email may request paper copies of future notices and other documents by contacting Laurie Walsh as specified in the Document Availability section of this notice.

Contact for further Information
For questions or comments concerning this notice, please contact Laurie Walsh by phone at (619) 521-3373, or by email at Laurie.Walsh@waterboards.ca.gov .

Respectfully,

David Barker, P.E.
Supervising Engineer
San Diego Regional Water Quality Control Board

DWG:dtb esb:law

Cc (via email):

San Diego County Copermittees
Orange County Copermittees
Riverside County Copermittees
Natural Resource Agencies
San Diego County MS4 Permit E-mail Service List
Riverside County MS4 Permit E-mail Service List
Orange County MS4 Permit E-mail Service List
San Diego Water Board Agenda E-mail Service List

Tech Staff Info & Use	
Tentative Order No.	R9-2015-0001
NPDES No.	CAS0109266
Place ID	658018

San Diego County Copermittees

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Orange County Copermittees

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Riverside County Copermittees

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mbennett@interwestgrp.com

Walsh, Laurie@Waterboards

From: lyris@swrcb18.waterboards.ca.gov
Sent: Thursday, September 18, 2014 12:11 PM
To: Walsh, Laurie@Waterboards
Subject: Availability of Tentative Order R9-2015-0001 revising the San Diego Regional MS4 Permit Order No. R9-2013-0001 and Fact Sheet
Attachments: Public Workshop Notice.pdf

Water Boards This is a message from the California Regional Water Quality Control Board, San Diego Region (9).

Stakeholders,

The Tentative Order R9-2015-0001 which seeks to revise the Regional MS4 Permit Order No. R9-2013-0001 and Fact Sheet will be available on the San Diego Water Boards' website on or before COB Friday, September 19, 2014. The Tentative Order includes proposed revisions to the San Diego Water Board Regional MS4 Permit Order R9-2013-0001 and Fact Sheet. Proposed revisions are indicated in redline –strikeout format. Information on document availability, submission of written comments, e-mail lists to receive additional information, and additional contact information will be available on the San Diego Water Boards' website:

http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/oc_stormwater.shtml

Attached is the Notice of Public Workshop to be held during the next regularly scheduled San Diego Water Board meeting on October 8, 2014 at 9 am.

Public Workshop
Wednesday, October 8, 2014 – 9:00 a.m.
City of Mission Viejo
Council Chambers
200 Civic Center
Mission Viejo, California

If you have any questions please contact me or Christina Arias at (619) 521-3361 or Christina.arias@waterboards.ca.gov

Laurie Walsh, PE
San Diego Water Board

2375 Northside Drive, Suite 100
San Diego, CA 92108
Direct Phone: 619-521-3373
Main Line: 619-516-1990
Fax No. (619) 516-1994
lwalsh@waterboards.ca.gov

THE REGISTER

625 N GRAND AVE, SANTA ANA, CA 92701
Telephone (714) 796-7000 / Fax (714) 796-6059

This space for filing stamp only

PROOF OF PUBLICATION

(2015.5 C.C.P.)

State of California)
County of ORANGE) ss

Notice Type: GPN - GOVT PUBLIC NOTICE

Ad Description:

Public Notice-MS4 Permit Release, Orange County

I am a citizen of the United States and a resident of the State of California; I am over the age of eighteen years, and not a party to or interested in the above entitled matter. I am the principal clerk of the printer and publisher of the THE REGISTER, a newspaper published in the English language in the city of SANTA ANA, county of ORANGE, and adjudged a newspaper of general circulation as defined by the laws of the State of California by the Superior Court of the County of ORANGE, State of California, under date 11/19/1905, Case No. A21046. That the notice, of which the annexed is a printed copy, has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to-wit:

09/19/2014

Executed on: 09/19/2014
At SANTA ANA, California

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Signature

CNS#: 2666863

NOTICE OF OPPORTUNITY TO COMMENT

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) is releasing for public review *and comment Tentative* Order No. R9-2015-0001 (Tentative Order). The Tentative Order proposes to amend the National Pollutant Discharge Elimination System (NPDES) Permit for Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region, Order No. R9-2013-0001 (Regional MS4 Permit). Notice is hereby given that the San Diego Water Board will receive written comments on the Tentative Order in accordance with this notice pursuant to title 40 Code of Federal Regulations (CFR) section 124.10 (40 CFR 124.10) and Water Code section 13167.5.

Orange County Copermittees consist of the County of Orange, Orange County Flood Control District and the cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Lake Forest, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano. The Tentative Order proposes to amend the Regional MS4 Permit to designate the Orange County Copermittees as MS4 dischargers responsible for compliance with the terms and the conditions of the Permit. The Tentative Order also proposes to amend the Regional MS4 Permit to address other issues including 1) Regional Water Board designation to consolidate regulation of MS4 discharges for the Cities of Laguna Hills, Laguna Woods, and Lake Forest, 2) incorporation of the Los Peñasquitos Lagoon Sediment Total Maximum Daily Load (TMDL) requirements, 3) the extension of a pollutant reduction deadline for MS4 discharges to Areas of Special Biological Significance, 4) incorporation of interim exemptions for hydromodification management, and 5) implementation of a uniform approach for monitoring beach water quality in south Orange County.

Document Availability

The names and addresses of the Copermittees, the Tentative Order and attachments thereto, and other related documents are available on the San Diego Water Board website at: http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/oc_stormwater.shtml

Interested persons may also receive a copy of the Tentative Order by contacting Laurie Walsh at (619) 521-3373, e-mail Laurie.Walsh@waterboards.ca.gov or by visiting the San Diego Water Board's office at 2375 Northside Drive, Suite 100, San Diego, California 92108-2700, weekdays between 8:00 a.m. and 5:00 p.m.

Submission of Written Comments

The submission of written comments is the opportunity for the Copermittees and interested persons to raise and comment on issues pertaining to the Tentative Order. All written comments pertaining to the Tentative Order to be considered by the San Diego Water Board at the as yet unscheduled public hearing must be received no later than **12:00 noon on Wednesday, November 19, 2014.**

Written comments must be sent to the San Diego Water Board's office or e-mailed to Laurie Walsh. Please indicate in the subject line of all written comments "Comment - Tentative Order No. R9-2015-0001, Place ID:332672, LWalsh". The early submission of written comments on the Tentative Order is encouraged.

Written comments received by **12:00 noon on Wednesday, November 19, 2014** will be provided to the San Diego Water Board members for their review in advance of the as yet unscheduled public hearing to consider adoption of the Tentative Order. All timely written comments will also be posted as they are received on the San Diego Water Board website. The San Diego Water Board will prepare written responses to significant comments that are timely received.

Consistent with State Water Resources Control Board regulations that apply to this proceeding, written comments received after 12:00 noon on Wednesday, November 19, 2014 will not be accepted and will not be incorporated into the

A0000035402 52

administrative record if doing so would prejudice any party.

Public Hearing for Consideration of Tentative Order Adoption
The San Diego Water Board will issue a separate notice announcing a public hearing to receive oral comments and consider adoption of the Tentative Order at a later date. Notice of the public hearing will be provided to the Copermittees and interested persons at least thirty (30) days in advance of the hearing. The public notice providing the specific date for the San Diego Water Board adoption meeting and any other public notices related to the Tentative Order will be distributed through the e-mail list service specified below and posted on the San Diego Water Board website.

E-Mail List Service
Interested persons desiring to receive future public notices regarding the Tentative Order and potential modifications to the Regional MS4 Permit can subscribe to one of the electronic e-mail service lists titled "Orange County MS4 Permit," "Riverside County MS4 Permit," or "San Diego MS4 Permit" located on the San Diego Water Board website at:
http://www.waterboards.ca.gov/resources/email_subscriptions/reg9_subscribe.shtml
Persons without access to email may request paper copies of future notices and other documents by contacting Laurie Walsh as specified in the Document Availability section of this notice.

Contact for Further Information
Please contact Laurie Walsh at (619) 521-3373 or by email at Laurie.Walsh@waterboards.ca.gov for information regarding the above listed proposed permit action. Please bring the foregoing to the attention of any person known to you who would be interested in these matters.
9/19/14
CNS-2666863#
THE REGISTER

THE PRESS-ENTERPRISE

1825 Chicago Ave, Suite 100
Riverside, CA 92507
951-684-1200
951-368-9018 FAX

PROOF OF PUBLICATION
(2010, 2015.5 C.C.P)

Publication(s): The Press-Enterprise

PROOF OF PUBLICATION OF

Ad Desc.: / 2666861

I am a citizen of the United States. I am over the age of eighteen years and not a party to or interested in the above entitled matter. I am an authorized representative of THE PRESS-ENTERPRISE, a newspaper in general circulation, printed and published daily in the County of Riverside, and which newspaper has been adjudicated a newspaper of general circulation by the Superior Court of the County of Riverside, State of California, under date of April 25, 1952, Case Number 54446, under date of March 29, 1957, Case Number 65673, under date of August 25, 1995, Case Number 267864, under date of February 4, 2013, Case Number RIC 1215735, under date of July 25, 2013, Case Number RIC 1305730, and under date of September 16, 2013, Case Number RIC 1309013; that the notice, of which the annexed is a printed copy, has been published in said newspaper in accordance with the instructions of the person(s) requesting publication, and not in any supplement thereof on the following dates, to wit:

09/19/2014

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Date: September 19, 2014
At: Riverside, California

CALIF NEWSPAPER SERV BUREAU
PO BOX 60460
LOS ANGELES, CA 90060

Ad Number: 0009967770-01

P.O. Number: 2666861

A0000035544 4 4

Ad Copy:

014147

NOTICE OF OPPORTUNITY TO COMMENT

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Document Availability

The names and addresses of the Copermittees, the Tentative Order and attachments thereto, and other related documents are available on the San Diego Water Board website at:
http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/oc_stormwater.shtml

Interested persons may also receive a copy of the Tentative Order by contacting Laurie Walsh at (619) 521-3373, e-mail Laurie.Walsh@waterboards.ca.gov or by visiting the San Diego Water Board's office at 2375 Northside Drive, Suite 100, San Diego, California 92108-2700, weekdays between 8:00 a.m. and 5:00 p.m.

Submission of Written Comments

The submission of written comments is the opportunity for the Copermittees and interested persons to raise and comment on issues pertaining to the Tentative Order. All written comments pertaining to the Tentative Order to be considered by the San Diego Water Board at the as yet unscheduled public hearing must be received no later than **12:00 noon on Wednesday, November 19, 2014.** Written comments must be sent to the San Diego Water Board's office or e-mailed to Laurie Walsh. Please indicate in the subject line of all written comments "Comment - Tentative Order No. R9-2015-0001, Place ID:332672, LWalsh". The early submission of written comments on the Tentative Order is encouraged.

Written comments received by **12:00 noon on Wednesday, November 19, 2014** will be provided to the San Diego Water Board members for their review in advance of the as yet unscheduled public hearing to consider adoption of the Tentative Order. All timely written comments will also be posted as they are received on the San Diego Water Board website. The San Diego Water Board will prepare written responses to significant comments that are timely received.

Consistent with State Water Resources Control Board regulations that apply to this proceeding, written comments received after 12:00 noon on Wednesday, November 19, 2014 will not be accepted and will not be incorporated into the administrative record if doing so would prejudice any party.

Public Hearing for Consideration of Tentative Order Adoption

The San Diego Water Board will issue a separate notice announcing a public hearing to receive oral comments and consider adoption of the Tentative Order at a later date. Notice of the public hearing will be provided to the Copermittees and interested persons at least thirty (30) days in advance of the hearing. The public notice providing the specific date for the San Diego Water Board adoption meeting and any other public notices related to the Tentative Order will be distributed through the e-mail list service specified below and posted on the San Diego Water Board website.

E-Mail List Service

Interested persons desiring to receive future public notices regarding the Tentative Order and potential modifications to the Regional MS4 Permit can subscribe to one of the electronic e-mail service lists titled "Orange County MS4 Permit," "Riverside County MS4 Permit," or "San Diego MS4 Permit" located on the San Diego Water Board website at:
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Persons without access to email may request paper copies of future notices and other documents by contacting Laurie Walsh as specified in the Document Availability section of this notice.

Contact for Further Information

Please contact Laurie Walsh at (619) 521-3373 or by email at Laurie.Walsh@waterboards.ca.gov for information regarding the above listed proposed permit action. Please bring the foregoing to the attention of any person known to you who would be interested in these matters.

9/19/14

CNS-2666861#
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DECLARATION

I am a resident of San Diego County, over the age of eighteen years and not a party to any or interested in the matter noticed.

The notice, of which the annexed is a printed copy appeared in the:

UT-SAN DIEGO

On the following dates:

Sep 19, 2014

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Dated at San Diego, California, this

25th day of **September** 2014

YOLANDA CÓRDOVA

Cns#2666862

"The only Public Notice which is justifiable from the standpoint of true economy and the public interest, is that which reaches those who are affected by it"

Rev. 05/04 Daily Journal Corporation, 915 East First Street, Los Angeles, CA 90012

* A 0 0 0 0 0 3 5 5 2 9 9 9 *

NOTICE OF OPPORTUNITY TO COMMENT

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) is releasing for public review and comment Tentative Order No. R9-2015-0001 (Tentative Order). The Tentative Order proposes to amend the National Pollutant Discharge Elimination System (NPDES) Permit for Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region, Order No. R9-2013-0001 (Regional MS4 Permit). Notice is hereby given that the San Diego Water Board will receive written comments on the Tentative Order in accordance with this notice pursuant to title 40 Code of Federal Regulations (CFR) section 124.10 (40 CFR 124.10) and Water Code section 13167.5.

Orange County Copermittees consist of the County of Orange, Orange County Flood Control District and the cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Lake Forest, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano. The Tentative Order proposes to amend the Regional MS4 Permit to designate the Orange County Copemrittees as MS4 dischargers responsible for compliance with the terms and the conditions of the Permit. The Tentative Order also proposes to amend the Regional MS4 Permit to address other issues including 1) Regional Water Board designation to consolidate regulation of MS4 discharges for the Cities of Laguna Hills, Laguna Woods, and Lake Forest, 2) incorporation of the Los Peñasquitos Lagoon Sediment Total Maximum Daily Load (TMDL) requirements, 3) the extension of a pollutant reduction deadline for MS4 discharges to Areas of Special Biological Significance, 4) incorporation of interim exemptions for hydromodification management, and 5) implementation of a uniform approach for monitoring beach water quality in south Orange County.

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Please contact Laurie Walsh at (619) 521-3373 or by email at Laurie.Walsh@waterboards.ca.gov for information regarding the above listed proposed permit action. Please bring the foregoing to the attention of any person known to you who would be interested in these matters.
9/19/14
CNS-2666862#

Walsh, Laurie@Waterboards

From: lyris@swrcb18.waterboards.ca.gov
Sent: Friday, September 05, 2014 1:45 PM
To: Walsh, Laurie@Waterboards
Subject: Public Workshop Notice on Tentative Order No. R9-2015-0001 proposing modifications to the Regional MS4 Permit
Attachments: 2014-1008_WorkshopNotice.pdf

This is a message from the California Regional Water Quality Control Board, San Diego Region (9).

Interested Persons,

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) will hold an informational public workshop to receive information and discuss requirements in a public draft of Tentative Order No. R9-2015-0001. Tentative Order No. R9-2015-0001 proposes to amend the National Pollutant Discharge Elimination System (NPDES) Permit for Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region, Order No. R9-2013-0001 (Regional MS4 Permit).

The Public Workshop is scheduled during the San Diego Water Boards' regular Board Meeting on:

Wednesday, October 8, 2014 – 9:00 a.m.

City of Mission Viejo
Council Chambers
200 Civic Center
Mission Viejo, California

Attached is the Public Workshop Notice. You can also access this notice on our website at:
http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/oc_stormwater.shtml

If you have any questions please feel free to contact me.

Laurie Walsh P.E.

San Diego Water Board

619-521-3373

lwalsh@waterboards.ca.gov

You are currently subscribed to reg9_sandiegoco_ms4permit as: Laurie.Walsh@waterboards.ca.gov.

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California Water Boards

Edmund G. Brown Jr.
Governor

Matthew Rodriquez
Secretary for
Environmental Protection

California Regional Water Quality Control Board, San Diego Region

NOTICE OF PUBLIC WORKSHOP

A Workshop Will Be Held To Discuss

Tentative Order No. R9-2015-0001
An Order Amending the Regional Municipal Separate Storm Sewer (MS4) NPDES Permit for the San Diego Region

The Location and Time Are Specified Below.

Wednesday, October 8, 2014 – 9:00 a.m.
City of Mission Viejo
Council Chambers
200 Civic Center
Mission Viejo, California

NOTICE IS HEREBY GIVEN that the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) will hold an informational public workshop to receive information and discuss requirements in a public draft of Tentative Order No. R9-2015-0001. Tentative Order No. R9-2015-0001 proposes to amend the National Pollutant Discharge Elimination System (NPDES) Permit for Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region, Order No. R9-2013-0001 (Regional MS4 Permit). Tentative Order No. R9-2015-0001 will be available on or about September 12, 2014 and will be accessible electronically at:

http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/oc_stormwater.shtml.

The workshop will be held at the San Diego Water Board's regularly scheduled public meeting on October 8, 2014. To view the meeting agenda in advance of the meeting, please visit the San Diego Water Board's website at:

http://www.waterboards.ca.gov/sandiego/board_info/agendas/.

Except for items designated as time certain, there are no set times for agenda items. Items including the workshop may be taken out of order at the discretion of the Chairman.

BACKGROUND INFORMATION

The San Diego Water Board adopted the Regional MS4 Permit on May 8, 2013 in response to a Report of Waste Discharge (RoWD) application from the municipal Copermittees in San Diego County for reissuance of an MS4 NPDES permit. The Copermittees in San Diego County are currently enrolled under the Regional MS4 Permit. The San Diego Water Board is considering enrollment of Copermittees in Orange County and Riverside County under the Regional MS4 Permit in a phased manner as their current MS4 permits expire and after consideration of their RoWD submittal.

Copermittees in Orange County consisting of the County of Orange, Orange County Flood Control District and the cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Lake Forest, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano are currently regulated by MS4 Permit Order No. R9-2009-0002. This MS4 permit will expire on December 16, 2014, and the Orange County Copermittees have jointly submitted a RoWD in application for MS4 NPDES permit reissuance. Tentative Order No. R9-2015-0001 proposes to amend the Regional MS4 Permit in response to the RoWD and enroll the Orange County Copermittees under the Permit as MS4 dischargers responsible for compliance with the terms and the conditions of the Permit. The Tentative Order also proposes to amend the Regional MS4 Permit to address a variety of other issues including 1) Regional Water Board designation to consolidate regulation of MS4 discharges for the Cities of Laguna Hills, Laguna Woods, and Lake Forest, 2) incorporation of the Los Peñasquitos Lagoon Sediment Total Maximum Daily Load (TMDL) requirements, 3) incorporation of interim exemptions for hydromodification management, 4) the extension of a pollutant reduction deadline for MS4 discharges to Areas of Special Biological Significance (ASBS) and 5) implementation of a unified approach for monitoring beach water quality in south Orange County.

PROCEDURAL MATTERS

The October 8, 2014 public workshop will be informal and conducted to provide San Diego Water Board members with information about the Tentative Order and to facilitate discussion. There will be no sworn testimony or cross-examination of participants. San Diego Water Board staff will explain the Regional MS4 Permit amendment process and summarize significant elements of the Tentative Order for the San Diego Water Board and the public. Orange County Copermittees, other Copermittees within the San Diego Region, and any interested persons will also have an opportunity to provide oral comments as set forth below. The San Diego Water Board may provide general feedback to staff on proposed modifications of the Regional MS4 Permit; however, no action or voting will take place at this workshop.

To ensure a productive and efficient public workshop, and to ensure that all attending have an opportunity to participate, oral presentations may be limited at the discretion of the Chair. This item has significant interest to the public and regulated community, and in order to provide enough time for all interested parties to participate, participants with similar comments are requested to make joint presentations. San Diego Water Board staff may, but will not necessarily, respond to comments made at the workshop.

The San Diego Water Board will issue a separate public hearing and comment period notice announcing the release of the Tentative Order for public review and comment on or about September 12, 2014. The public hearing notice will establish the deadline for submission of written comments, the time, date and location of the public hearing, and the procedures that the San Diego Water Board will follow at the public hearing to consider adoption of the Tentative Order. Once released, the Tentative Order will serve as the public comment draft permit amendment for purposes of applicable public notice requirements under the Code of Federal Regulations (40 C.F.R. § 124.10) and Water Code section 13167.5, subdivision (b).

DOCUMENT AVAILABILITY

The Tentative Order will be available on or about September 12, 2014 and will be accessible electronically at:

http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/oc_stormwater.shtml.

ELECTRONIC MAIL LIST SUBSCRIPTION

The San Diego Water Board has established an electronic mail list specifically for information and notices on the development of the Regional MS4 Permit. The San Diego Water Board will use the email list to notify interested persons of upcoming important events and the availability of on-line documents. Persons interested in receiving future notices and information on this specific project can subscribe to one (1) of the electronic mail lists titled “Orange County MS4 Permit, “ Riverside County MS4 Permit, or “San Diego MS4 Permit ”, located on the San Diego Water Board website at:

http://www.waterboards.ca.gov/resources/email_subscriptions/reg9_subscribe.shtml.

PARKING AND ACCESSIBILITY

For directions to the City of Mission Viejo, please refer to:
http://cityofmissionviejo.org/CityDirectory/.

A parking lot is available for your convenience; however, please refrain from using the area between the library and City Hall. The facility is accessible to persons with disabilities. Persons requiring additional accommodations should contact Chris Blank at Chris.Blank@waterboards.ca.gov or 619-521-3382 at least five (5) days prior to the workshop.

INFORMATION REGARDING WORKSHOP

If you have any questions or wish to receive a hard copy of the Tentative Order, please contact Laurie Walsh at (619) 521-3373 or via e-mail at Laurie.Walsh@waterboards.ca.gov.

Walsh, Laurie@Waterboards

From: Walsh, Laurie@Waterboards
Sent: Tuesday, September 30, 2014 3:59 PM
To: 'ptsunoda@cityofalisoviejo.com'
Cc: Moy Yahya
Subject: Invitation to attend San Diego Water Board Public Workshop - Orange County Storm Water Permit Renewal
Attachments: 2014-0930 Aliso Viejo.pdf

Mayor Tsunoda,

You are invited to attend the San Diego Water Boards' Public Workshop to discuss proposed amendments to the Regional Storm Water Permit to include several incorporated cities in south Orange County and the County of Orange as Copermittees. The San Diego Water Board values your perspective and input on how the Regional Permit affect your municipality.

Please see the attached invitation from the San Diego Water Board.

Laurie Walsh, PE
San Diego Water Board

2375 Northside Drive, Suite 100
San Diego, CA 92108
Direct Phone: 619-521-3373
Main Line: 619-516-1990
Fax No. (619) 516-1994
lwalsh@waterboards.ca.gov

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD
www.waterboards.ca.gov/sandiego/

CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

September 30, 2014

Mayor Phillip Tsunoda
City of Aliso Viejo
12 Journey, Suite 100
Aliso Viejo, CA 92656-5335
ptsunoda@cityofalisoviejo.com

In reply refer to / attn:
Place ID: 658018Lwalsh

Subject: INVITATION TO SAN DIEGO WATER BOARD PUBLIC WORKSHOP REGIONAL MUNICIPAL STORM WATER PERMIT REISSUANCE

I, on behalf of the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), invite you to attend our public workshop on October 8, 2014, in the City of Mission Viejos' Council Chambers. A workshop notice with detailed meeting information is attached. At the workshop, the San Diego Water Board will discuss Tentative Order No. R9-2015-0001, proposed amendments to Order No. R9-2013-0001, *Regional NPDES Permit for Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Regional MS4 Permit), including the incorporation of the County of Orange, several incorporated cities in south Orange County, and the Orange County Flood Control District as Copermittees. The intent of the proposed amendments to the Regional MS4 Permit is to advance the storm water program and achieve regulatory consistency throughout the San Diego Water Boards' jurisdiction.

The Copermittees currently covered by Order No. R9-2013-0001 (i.e. the Copermittees in San Diego County), the proposed Orange County Copermittees, and other interested stakeholders will have an opportunity at the workshop to provide comments and other information regarding Tentative Order No. R9-2015-0001 to the San Diego Water Board. No action will be taken by the Board. Elected officials intending to speak during the workshop will be given an opportunity to address the San Diego Water Board immediately following presentations by Board staff and the representatives of the south Orange County Copermittees. I encourage you to also invite other elected officials from your municipality to attend.

The San Diego Water Board values your perspective and input on how the Regional MS4 Permit affects your municipality. If you have any questions concerning this invitation please contact me at (619) 521-3005, or by email at David.Gibson@waterboards.ca.gov.

Respectfully,

David W. Gibson
Executive Officer
San Diego Regional Water Quality Control Board

DWG:js:bb:esb:law

Cc: Moy Yahya, myahya@cityofalisoviejo.com

CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

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An Order Amending the Regional Municipal Separate Storm Sewer (MS4) NPDES Permit for the San Diego Region

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Walsh, Laurie@Waterboards

From: Walsh, Laurie@Waterboards
Sent: Tuesday, September 30, 2014 4:02 PM
To: 'lbartlett@danapoint.org'
Cc: Lisa Zawaski
Subject: Invitation to attend San Diego Water Board Public Workshop - Orange County Storm Water Permit Renewal
Attachments: 2014-0930 Dana Point.pdf

Mayor Bartlett,

You are invited to attend the San Diego Water Boards' Public Workshop to discuss proposed amendments to the Regional Storm Water Permit to include several incorporated cities in south Orange County and the County of Orange as Copermittees. The San Diego Water Board values your perspective and input on how the Regional Permit affect your municipality.

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Laurie Walsh, PE
San Diego Water Board

2375 Northside Drive, Suite 100
San Diego, CA 92108
Direct Phone: 619-521-3373
Main Line: 619-516-1990
Fax No. (619) 516-1994
lwalsh@waterboards.ca.gov

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD
www.waterboards.ca.gov/sandiego/

014160

CALIFORNIA
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EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

September 30, 2014

Mayor Lisa Bartlett
City of Dana Point
33282 Golden Lantern
Dana Point, CA 92629
lbartlett@danapoint.org

In reply refer to / attn:
Place ID: 658018Lwalsh

Subject: INVITATION TO SAN DIEGO WATER BOARD PUBLIC WORKSHOP REGIONAL MUNICIPAL STORM WATER PERMIT REISSUANCE

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The San Diego Water Board values your perspective and input on how the Regional MS4 Permit affects your municipality. If you have any questions concerning this invitation please contact me at (619) 521-3005, or by email at David.Gibson@waterboards.ca.gov.

Respectfully,

David W. Gibson
Executive Officer
San Diego Regional Water Quality Control Board

DWG:js:bb:esb:law

Cc: Lisa Zawaski, lzawaski@danapoint.org

CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

NOTICE OF PUBLIC WORKSHOP

A Workshop Will Be Held To Discuss

Tentative Order No. R9-2015-0001
An Order Amending the Regional Municipal Separate Storm Sewer (MS4) NPDES Permit for the San Diego Region

The Location and Time Are Specified Below.

Wednesday, October 8, 2014 – 9:00 a.m.
City of Mission Viejo
Council Chambers
200 Civic Center
Mission Viejo, California

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PROCEDURAL MATTERS

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INFORMATION REGARDING WORKSHOP

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Walsh, Laurie@Waterboards

From: Walsh, Laurie@Waterboards
Sent: Tuesday, September 30, 2014 4:06 PM
To: 'elizabethpearson2@cox.net'
Cc: Tracy Ingebrigtsen
Subject: Invitation to attend San Diego Water Board Public Workshop - Orange County Storm Water Permit Renewal
Attachments: 2014-0930 Laguna Beach.pdf

Mayor Pearson,

You are invited to attend the San Diego Water Boards' Public Workshop to discuss proposed amendments to the Regional Storm Water Permit to include several incorporated cities in south Orange County and the County of Orange as Copermittees. The San Diego Water Board values your perspective and input on how the Regional Permit affects your municipality.

Please see the attached invitation from the San Diego Water Board.

Laurie Walsh, PE
San Diego Water Board

2375 Northside Drive, Suite 100
San Diego, CA 92108
Direct Phone: 619-521-3373
Main Line: 619-516-1990
Fax No. (619) 516-1994
lwalsh@waterboards.ca.gov

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD
www.waterboards.ca.gov/sandiego/

014165

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EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

September 30, 2014

Mayor Elizabeth Pearson
City of Laguna Beach
505 Forest Avenue
Laguna Beach, CA 92651
elizabethpearson2@cox.net

In reply refer to / attn:
Place ID: 658018Lwalsh

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San Diego Regional Water Quality Control Board

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Cc: Tracy Ingebrigtsen, tingebrigtsen@lagunabeachcity.net

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Walsh, Laurie@Waterboards

From: Walsh, Laurie@Waterboards
Sent: Tuesday, September 30, 2014 4:35 PM
To: 'ccouncil@ci.laguna-hills.ca.us'
Cc: Humza Javed
Subject: Invitation to attend San Diego Water Board Public Workshop - Orange County Storm Water Permit Renewal
Attachments: 2014-0930 Laguna Hills.pdf

Mayor Blount,

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Laurie Walsh, PE
San Diego Water Board

2375 Northside Drive, Suite 100
San Diego, CA 92108
Direct Phone: 619-521-3373
Main Line: 619-516-1990
Fax No. (619) 516-1994
lwalsh@waterboards.ca.gov

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MATTHEW RODRIQUEZ
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California Regional Water Quality Control Board, San Diego Region

September 30, 2014

Mayor Andrew Blount
City of Laguna Hills
24035 El Toro Rd
Laguna Hills, CA 92653
ccouncil@ci.laguna-hills.ca.us

In reply refer to / attn:
Place ID: 658018Lwalsh

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Executive Officer
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DWG:js:bb:esb:law

Cc: Humza Javed, hjaved@ci.laguna-hills.ca.us

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Walsh, Laurie@Waterboards

From: Walsh, Laurie@Waterboards
Sent: Tuesday, September 30, 2014 4:10 PM
To: 'llindholm@cityoflagunaniguel.org'
Cc: Nancy Palmer
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California Regional Water Quality Control Board, San Diego Region

September 30, 2014

Mayor Linda Lindholm
City of Laguna Niguel
30111 Crown Valley Parkway
Laguna Niguel, CA 92677
llindholm@cityoflagunaniguel.org

In reply refer to / attn:
Place ID: 658018Lwalsh

Subject: INVITATION TO SAN DIEGO WATER BOARD PUBLIC WORKSHOP REGIONAL MUNICIPAL STORM WATER PERMIT REISSUANCE

I, on behalf of the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), invite you to attend our public workshop on October 8, 2014, in the City of Mission Viejos' Council Chambers. A workshop notice with detailed meeting information is attached. At the workshop, the San Diego Water Board will discuss Tentative Order No. R9-2015-0001, proposed amendments to Order No. R9-2013-0001, *Regional NPDES Permit for Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Regional MS4 Permit), including the incorporation of the County of Orange, several incorporated cities in south Orange County, and the Orange County Flood Control District as Copermittees. The intent of the proposed amendments to the Regional MS4 Permit is to advance the storm water program and achieve regulatory consistency throughout the San Diego Water Boards' jurisdiction.

The Copermittees currently covered by Order No. R9-2013-0001 (i.e. the Copermittees in San Diego County), the proposed Orange County Copermittees, and other interested stakeholders will have an opportunity at the workshop to provide comments and other information regarding Tentative Order No. R9-2015-0001 to the San Diego Water Board. No action will be taken by the Board. Elected officials intending to speak during the workshop will be given an opportunity to address the San Diego Water Board immediately following presentations by Board staff and the representatives of the south Orange County Copermittees. I encourage you to also invite other elected officials from your municipality to attend.

The San Diego Water Board values your perspective and input on how the Regional MS4 Permit affects your municipality. If you have any questions concerning this invitation please contact me at (619) 521-3005, or by email at David.Gibson@waterboards.ca.gov.

Respectfully,

David W. Gibson
Executive Officer
San Diego Regional Water Quality Control Board

DWG:js:bb:esb:law

Cc: Nancy Palmer, npalmer@cityoflagunaniguel.org

CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

NOTICE OF PUBLIC WORKSHOP

A Workshop Will Be Held To Discuss

Tentative Order No. R9-2015-0001
An Order Amending the Regional Municipal Separate Storm Sewer (MS4) NPDES Permit for the San Diego Region

The Location and Time Are Specified Below.

Wednesday, October 8, 2014 – 9:00 a.m.
City of Mission Viejo
Council Chambers
200 Civic Center
Mission Viejo, California

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BACKGROUND INFORMATION

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If you have any questions or wish to receive a hard copy of the Tentative Order, please contact Laurie Walsh at (619) 521-3373 or via e-mail at Laurie.Walsh@waterboards.ca.gov.

Walsh, Laurie@Waterboards

From: Walsh, Laurie@Waterboards
Sent: Tuesday, September 30, 2014 4:17 PM
To: 'cityhall@lagunawoodscity.org'
Cc: Moy Yahya (moyyahya@caaprofessionals.com)
Subject: Invitation to attend San Diego Water Board Public Workshop - Orange County Storm Water Permit Renewal
Attachments: 2014-0930 Laguna Woods.pdf

Mayor Hack,

You are invited to attend the San Diego Water Boards' Public Workshop to discuss proposed amendments to the Regional Storm Water Permit to include several incorporated cities in south Orange County and the County of Orange as Copermittees. The San Diego Water Board values your perspective and input on how the Regional Permit affects your municipality.

Please see the attached invitation from the San Diego Water Board.

Laurie Walsh, PE
San Diego Water Board

2375 Northside Drive, Suite 100
San Diego, CA 92108
Direct Phone: 619-521-3373
Main Line: 619-516-1990
Fax No. (619) 516-1994
lwalsh@waterboards.ca.gov

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD
www.waterboards.ca.gov/sandiego/

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GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

September 30, 2014

Mayor Bert Hack
City of Laguna Woods
24264 El Toro Rd
Laguna Woods, CA 92637
cityhall@lagunawoodscity.org

In reply refer to / attn:
Place ID: 658018Lwalsh

Subject: INVITATION TO SAN DIEGO WATER BOARD PUBLIC WORKSHOP REGIONAL MUNICIPAL STORM WATER PERMIT REISSUANCE

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Respectfully,

David W. Gibson
Executive Officer
San Diego Regional Water Quality Control Board

DWG:js:bb:esb:law

Cc: Moy Yahya, moyyahya@caaprofessionals.com

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Walsh, Laurie@Waterboards

From: Walsh, Laurie@Waterboards
Sent: Tuesday, September 30, 2014 4:21 PM
To: 'drobinson@lakeforestca.gov'
Cc: Devin Slaven
Subject: Invitation to attend San Diego Water Board Public Workshop - Orange County Storm Water Permit Renewal
Attachments: 2014-0930 Lake Forest.pdf

Mayor Robinson,

You are invited to attend the San Diego Water Boards' Public Workshop to discuss proposed amendments to the Regional Storm Water Permit to include several incorporated cities in south Orange County and the County of Orange as Copermittees. The San Diego Water Board values your perspective and input on how the Regional Permit affects your municipality.

Please see the attached invitation from the San Diego Water Board.

Laurie Walsh, PE
San Diego Water Board

2375 Northside Drive, Suite 100
San Diego, CA 92108
Direct Phone: 619-521-3373
Main Line: 619-516-1990
Fax No. (619) 516-1994
lwalsh@waterboards.ca.gov

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MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

September 30, 2014

Mayor Dwight Robinson
City of Lake Forest
25550 Commercentre Drive, Suite 100
Lake Forest, CA 92630
drobinson@lakeforestca.gov

In reply refer to / attn:
Place ID: 658018Lwalsh

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Respectfully,

David W. Gibson
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DWG:js:bb:esb:law

Cc: Devin Slaven, dslaven@lakeforestca.gov

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Walsh, Laurie@Waterboards

From: Walsh, Laurie@Waterboards
Sent: Tuesday, September 30, 2014 4:23 PM
To: 'tkelly@cityofmissionviejo.org'
Cc: Joe Ames
Subject: Invitation to attend San Diego Water Board Public Workshop - Orange County Storm Water Permit Renewal
Attachments: 2014-0930 Mission Viejo.pdf

Mayor Kelly,

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Laurie Walsh, PE
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ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

September 30, 2014

Mayor Patricia Kelley
City of Mission Viejo
200 Civic Center
Mission Viejo, CA 92691
tkelley@cityofmissionviejo.org

In reply refer to / attn:
Place ID: 658018Lwalsh

Subject: INVITATION TO SAN DIEGO WATER BOARD PUBLIC WORKSHOP REGIONAL MUNICIPAL STORM WATER PERMIT REISSUANCE

I, on behalf of the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), invite you to attend our public workshop on October 8, 2014, in the City of Mission Viejos' Council Chambers. A workshop notice with detailed meeting information is attached. At the workshop, the San Diego Water Board will discuss Tentative Order No. R9-2015-0001, proposed amendments to Order No. R9-2013-0001, *Regional NPDES Permit for Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Regional MS4 Permit), including the incorporation of the County of Orange, several incorporated cities in south Orange County, and the Orange County Flood Control District as Copermittees. The intent of the proposed amendments to the Regional MS4 Permit is to advance the storm water program and achieve regulatory consistency throughout the San Diego Water Boards' jurisdiction.

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The San Diego Water Board values your perspective and input on how the Regional MS4 Permit affects your municipality. If you have any questions concerning this invitation please contact me at (619) 521-3005, or by email at David.Gibson@waterboards.ca.gov.

Respectfully,

David W. Gibson
Executive Officer
San Diego Regional Water Quality Control Board

DWG:js:bb:esb:law

Cc: Joe Ames, james@cityofmissionviejo.org

CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

NOTICE OF PUBLIC WORKSHOP

A Workshop Will Be Held To Discuss

Tentative Order No. R9-2015-0001
An Order Amending the Regional Municipal Separate Storm Sewer (MS4) NPDES Permit for the San Diego Region

The Location and Time Are Specified Below.

Wednesday, October 8, 2014 – 9:00 a.m.
City of Mission Viejo
Council Chambers
200 Civic Center
Mission Viejo, California

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If you have any questions or wish to receive a hard copy of the Tentative Order, please contact Laurie Walsh at (619) 521-3373 or via e-mail at Laurie.Walsh@waterboards.ca.gov.

Walsh, Laurie@Waterboards

From: Walsh, Laurie@Waterboards
Sent: Tuesday, September 30, 2014 4:32 PM
To: 'PatBates@ocgov.com'
Cc: Richard Boon; Greg Yi
Subject: Invitation to attend San Diego Water Board Public Workshop - Orange County Storm Water Permit Renewal
Attachments: 2014-0930 County of Orange-OC Flood.pdf

Supervisor Bates,

You are invited to attend the San Diego Water Boards' Public Workshop to discuss proposed amendments to the Regional Storm Water Permit to include several incorporated cities in south Orange County and the County of Orange as Copermittees. The San Diego Water Board values your perspective and input on how the Regional Permit affects your municipality.

Please see the attached invitation from the San Diego Water Board.

Laurie Walsh, PE
San Diego Water Board

2375 Northside Drive, Suite 100
San Diego, CA 92108
Direct Phone: 619-521-3373
Main Line: 619-516-1990
Fax No. (619) 516-1994
lwalsh@waterboards.ca.gov

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD
www.waterboards.ca.gov/sandiego/

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MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

September 30, 2014

Supervisor Patricia Bates
County of Orange
333 W. Santa Ana Blvd
Santa Ana, CA 92701
PatBates@ocgov.com

In reply refer to / attn:
Place ID: 658018Lwalsh

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Respectfully,

David W. Gibson
Executive Officer
San Diego Regional Water Quality Control Board

DWG:js:bb:esb:law

Cc: Richard Boon, Richard.boon@ocpw.ocgov.com
Greg Yi, greg.yi@ocpw.ocgov.com

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Walsh, Laurie@Waterboards

From: Walsh, Laurie@Waterboards
Sent: Tuesday, September 30, 2014 4:40 PM
To: 'cgamble@cityofrsm.org'
Cc: Rae Beimer
Subject: Invitation to attend San Diego Water Board Public Workshop - Orange County Storm Water Permit Renewal
Attachments: 2014-0930 Rancho Santa Margarita.pdf

Mayor Gamble,

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Laurie Walsh, PE
San Diego Water Board

2375 Northside Drive, Suite 100
San Diego, CA 92108
Direct Phone: 619-521-3373
Main Line: 619-516-1990
Fax No. (619) 516-1994
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www.waterboards.ca.gov/sandiego/

014200

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MATTHEW RODRIQUEZ
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ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

September 30, 2014

Mayor Carol Gamble
City of Rancho Santa Margarita
22112 El Paseo
Rancho Santa Margarita, CA 92688
cgamble@cityofrsm.org

In reply refer to / attn:
Place ID: 658018Lwalsh

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DWG:js:bb:esb:law

Cc: Rae Beimer, rbeimer@cityofrsm.org

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Walsh, Laurie@Waterboards

From: Walsh, Laurie@Waterboards
Sent: Tuesday, September 30, 2014 4:26 PM
To: 'brownt@san-clemente.org'
Cc: Mary Vondrak
Subject: Invitation to attend San Diego Water Board Public Workshop - Orange County Storm Water Permit Renewal
Attachments: 2014-0930 San Clemente.pdf

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California Regional Water Quality Control Board, San Diego Region

September 30, 2014

Mayor Tim Brown
City of San Clemente
100 Avenida Presidio
San Clemente, CA 92672
Brownt@san-clemente.org

In reply refer to / attn:
Place ID: 658018Lwalsh

Subject: INVITATION TO SAN DIEGO WATER BOARD PUBLIC WORKSHOP REGIONAL MUNICIPAL STORM WATER PERMIT REISSUANCE

I, on behalf of the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), invite you to attend our public workshop on October 8, 2014, in the City of Mission Viejos' Council Chambers. A workshop notice with detailed meeting information is attached. At the workshop, the San Diego Water Board will discuss Tentative Order No. R9-2015-0001, proposed amendments to Order No. R9-2013-0001, *Regional NPDES Permit for Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Regional MS4 Permit), including the incorporation of the County of Orange, several incorporated cities in south Orange County, and the Orange County Flood Control District as Copermittees. The intent of the proposed amendments to the Regional MS4 Permit is to advance the storm water program and achieve regulatory consistency throughout the San Diego Water Boards' jurisdiction.

The Copermittees currently covered by Order No. R9-2013-0001 (i.e. the Copermittees in San Diego County), the proposed Orange County Copermittees, and other interested stakeholders will have an opportunity at the workshop to provide comments and other information regarding Tentative Order No. R9-2015-0001 to the San Diego Water Board. No action will be taken by the Board. Elected officials intending to speak during the workshop will be given an opportunity to address the San Diego Water Board immediately following presentations by Board staff and the representatives of the south Orange County Copermittees. I encourage you to also invite other elected officials from your municipality to attend.

The San Diego Water Board values your perspective and input on how the Regional MS4 Permit affects your municipality. If you have any questions concerning this invitation please contact me at (619) 521-3005, or by email at David.Gibson@waterboards.ca.gov.

Respectfully,

David W. Gibson
Executive Officer
San Diego Regional Water Quality Control Board

DWG:js:bb:esb:law

Cc: Mary Vondrak, vondrakM@san-clemente.org

CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

NOTICE OF PUBLIC WORKSHOP

A Workshop Will Be Held To Discuss

Tentative Order No. R9-2015-0001
An Order Amending the Regional Municipal Separate Storm Sewer (MS4) NPDES Permit for the San Diego Region

The Location and Time Are Specified Below.

Wednesday, October 8, 2014 – 9:00 a.m.
City of Mission Viejo
Council Chambers
200 Civic Center
Mission Viejo, California

NOTICE IS HEREBY GIVEN that the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) will hold an informational public workshop to receive information and discuss requirements in a public draft of Tentative Order No. R9-2015-0001. Tentative Order No. R9-2015-0001 proposes to amend the National Pollutant Discharge Elimination System (NPDES) Permit for Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region, Order No. R9-2013-0001 (Regional MS4 Permit). Tentative Order No. R9-2015-0001 will be available on or about September 12, 2014 and will be accessible electronically at:

http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/oc_stormwater.shtml.

The workshop will be held at the San Diego Water Board's regularly scheduled public meeting on October 8, 2014. To view the meeting agenda in advance of the meeting, please visit the San Diego Water Board's website at:

http://www.waterboards.ca.gov/sandiego/board_info/agendas/.

Except for items designated as time certain, there are no set times for agenda items. Items including the workshop may be taken out of order at the discretion of the Chairman.

BACKGROUND INFORMATION

The San Diego Water Board adopted the Regional MS4 Permit on May 8, 2013 in response to a Report of Waste Discharge (RoWD) application from the municipal Copermittees in San Diego County for reissuance of an MS4 NPDES permit. The Copermittees in San Diego County are currently enrolled under the Regional MS4 Permit. The San Diego Water Board is considering enrollment of Copermittees in Orange County and Riverside County under the Regional MS4 Permit in a phased manner as their current MS4 permits expire and after consideration of their RoWD submittal.

Copermittees in Orange County consisting of the County of Orange, Orange County Flood Control District and the cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Lake Forest, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano are currently regulated by MS4 Permit Order No. R9-2009-0002. This MS4 permit will expire on December 16, 2014, and the Orange County Copermittees have jointly submitted a RoWD in application for MS4 NPDES permit reissuance. Tentative Order No. R9-2015-0001 proposes to amend the Regional MS4 Permit in response to the RoWD and enroll the Orange County Copermittees under the Permit as MS4 dischargers responsible for compliance with the terms and the conditions of the Permit. The Tentative Order also proposes to amend the Regional MS4 Permit to address a variety of other issues including 1) Regional Water Board designation to consolidate regulation of MS4 discharges for the Cities of Laguna Hills, Laguna Woods, and Lake Forest, 2) incorporation of the Los Peñasquitos Lagoon Sediment Total Maximum Daily Load (TMDL) requirements, 3) incorporation of interim exemptions for hydromodification management, 4) the extension of a pollutant reduction deadline for MS4 discharges to Areas of Special Biological Significance (ASBS) and 5) implementation of a unified approach for monitoring beach water quality in south Orange County.

PROCEDURAL MATTERS

The October 8, 2014 public workshop will be informal and conducted to provide San Diego Water Board members with information about the Tentative Order and to facilitate discussion. There will be no sworn testimony or cross-examination of participants. San Diego Water Board staff will explain the Regional MS4 Permit amendment process and summarize significant elements of the Tentative Order for the San Diego Water Board and the public. Orange County Copermittees, other Copermittees within the San Diego Region, and any interested persons will also have an opportunity to provide oral comments as set forth below. The San Diego Water Board may provide general feedback to staff on proposed modifications of the Regional MS4 Permit; however, no action or voting will take place at this workshop.

To ensure a productive and efficient public workshop, and to ensure that all attending have an opportunity to participate, oral presentations may be limited at the discretion of the Chair. This item has significant interest to the public and regulated community, and in order to provide enough time for all interested parties to participate, participants with similar comments are requested to make joint presentations. San Diego Water Board staff may, but will not necessarily, respond to comments made at the workshop.

The San Diego Water Board will issue a separate public hearing and comment period notice announcing the release of the Tentative Order for public review and comment on or about September 12, 2014. The public hearing notice will establish the deadline for submission of written comments, the time, date and location of the public hearing, and the procedures that the San Diego Water Board will follow at the public hearing to consider adoption of the Tentative Order. Once released, the Tentative Order will serve as the public comment draft permit amendment for purposes of applicable public notice requirements under the Code of Federal Regulations (40 C.F.R. § 124.10) and Water Code section 13167.5, subdivision (b).

DOCUMENT AVAILABILITY

The Tentative Order will be available on or about September 12, 2014 and will be accessible electronically at:

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ELECTRONIC MAIL LIST SUBSCRIPTION

The San Diego Water Board has established an electronic mail list specifically for information and notices on the development of the Regional MS4 Permit. The San Diego Water Board will use the email list to notify interested persons of upcoming important events and the availability of on-line documents. Persons interested in receiving future notices and information on this specific project can subscribe to one (1) of the electronic mail lists titled "Orange County MS4 Permit, " Riverside County MS4 Permit, or "San Diego MS4 Permit ", located on the San Diego Water Board website at:

http://www.waterboards.ca.gov/resources/email_subscriptions/reg9_subscribe.shtml.

PARKING AND ACCESSIBILITY

For directions to the City of Mission Viejo, please refer to:
http://cityofmissionviejo.org/CityDirectory/.

A parking lot is available for your convenience; however, please refrain from using the area between the library and City Hall. The facility is accessible to persons with disabilities. Persons requiring additional accommodations should contact Chris Blank at Chris.Blank@waterboards.ca.gov or 619-521-3382 at least five (5) days prior to the workshop.

INFORMATION REGARDING WORKSHOP

If you have any questions or wish to receive a hard copy of the Tentative Order, please contact Laurie Walsh at (619) 521-3373 or via e-mail at Laurie.Walsh@waterboards.ca.gov.

Walsh, Laurie@Waterboards

From: Walsh, Laurie@Waterboards
Sent: Tuesday, September 30, 2014 4:29 PM
To: 'sallevato@sanjuancapistrano.org'
Cc: 'zmazboudi@sanjuancapistrano.org'
Subject: Invitation to attend San Diego Water Board Public Workshop - Orange County Storm Water Permit Renewal
Attachments: 2014-0930 San Juan Capistrano.pdf

Mayor Allevato,

You are invited to attend the San Diego Water Boards' Public Workshop to discuss proposed amendments to the Regional Storm Water Permit to include several incorporated cities in south Orange County and the County of Orange as Copermittees. The San Diego Water Board values your perspective and input on how the Regional Permit affects your municipality.

Please see the attached invitation from the San Diego Water Board.

Laurie Walsh, PE
San Diego Water Board

2375 Northside Drive, Suite 100
San Diego, CA 92108
Direct Phone: 619-521-3373
Main Line: 619-516-1990
Fax No. (619) 516-1994
lwalsh@waterboards.ca.gov

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD
www.waterboards.ca.gov/sandiego/

014210

CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

September 30, 2014

Mayor Sam Allevato
City of San Juan Capistrano
32400 Paseo Adelanto
San Juan Capistrano, CA 92675
sallevato@sanjuancapistrano.org

In reply refer to / attn:
Place ID: 658018Lwalsh

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The San Diego Water Board values your perspective and input on how the Regional MS4 Permit affects your municipality. If you have any questions concerning this invitation please contact me at (619) 521-3005, or by email at David.Gibson@waterboards.ca.gov.

Respectfully,

David W. Gibson
Executive Officer
San Diego Regional Water Quality Control Board

DWG:js:bb:esb:law

Cc:Ziad Mazboudi, zmazboudi@sanjuancapistrano.org

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INFORMATION REGARDING WORKSHOP

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STATE OF CALIFORNIA
REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

MEETING NOTICE AND AGENDA[1]

Wednesday, October 8, 2014
9:00 a.m.

City of Mission Viejo
Council Chambers
200 Civic Center
Mission Viejo, California

The purpose of this meeting is for the San Diego Water Board to obtain testimony and information from concerned and affected persons and to make decisions based on the information received. Persons who want to submit written comments or evidence on any agenda item must comply with the procedures described in the agenda and agenda notes. Persons wishing to speak at the meeting should complete an attendance card (see Note F, attached to this Notice). The San Diego Water Board requests that all lengthy comments be submitted in writing in advance of the meeting date. To ensure that the San Diego Water Board members and staff have the opportunity to review and consider written material, comments should be received in the San Diego Water Board's office no later than noon on Tuesday, September 23, 2014* and should indicate the agenda item to which it is applicable. If the submitted written material is more than 5 pages or contains foldouts, color graphics, maps, two copies must be submitted. Written material submitted after 5:00 P.M. on Tuesday, September 30, 2014, will not be provided to the Board members and may not be considered by the San Diego Water Board (See Note D, attached to this Notice).

****PLEASE NOTE THAT SOME ITEMS ON THE AGENDA MAY HAVE BEEN PREVIOUSLY NOTICED WITH EARLIER DEADLINES FOR SUBMITTING WRITTEN COMMENTS OR MAY HAVE A SEPARATE HEARING PROCEDURES DOCUMENT THAT ESTABLISHES DIFFERENT DEADLINES OR PROCEDURES FOR SUBMITTING WRITTEN MATERIALS. IN THOSE CASES THE DIFFERENT DEADLINES OR PROCEDURES APPLY.***

Comments on agenda items will be accepted by E-mail subject to the same conditions set forth for other written submissions as long as the total submittal (including attachments) does not exceed five printed pages in length. E-mail must be submitted to: rb9agenda@waterboards.ca.gov. Type the word “Agenda” in the subject line.

[1] Versión en español disponible también en:
http://www.waterboards.ca.gov/sandiego/board_info/agendas/index.shtml

Pursuant to Title 23, California Code of Regulations, section 648.4, the San Diego Water Board may refuse to admit written testimony or evidence into the record if it is not submitted to the San Diego Water Board in a timely manner and shall refuse to do so if admitting it would prejudice any party or the board, unless the proponent demonstrates that compliance with the deadline would create an unreasonable hardship.

NOTE D, attached to this Notice, refers to the procedures that will be followed by the San Diego Water Board in contested adjudicatory matters if a separate Hearing Procedures Document has not been issued for a particular agenda item. Parties requesting an alternate hearing process must do so in accord with the directions in NOTE D. Any such request, together with supporting material, must be received in the San Diego Water Board's office no later than noon on Tuesday, September 30, 2014 (unless an earlier deadline is established in a separate hearing procedures document).

Copies of the agenda items to be considered by the San Diego Water Board as they are available are posted on the San Diego Water Board's website at http://www.waterboards.ca.gov/sandiego/board_info/agendas

Except for items designated as time certain, there are no set times for agenda items. Items may be taken out of order at the discretion of the Chairman.

1. Roll Call and Introductions.

2. PUBLIC FORUM: Any person may address the Board regarding a matter within the Board's jurisdiction that is not related to an item on this meeting agenda and is not scheduled for a future meeting. **Comments will generally be limited to three minutes, unless otherwise directed by the Board Chairperson**. Any person wishing to make a longer presentation should contact the Executive Officer at least ten days prior to the meeting.

3. Minutes of Board Meetings:

   - September 10, 2014
   - September 24, 2014

4. Chairman's, Board Members', State Board liaison's and Executive Officer's Reports: These items are for Board discussion only. No public testimony will be allowed, and the Board will take no formal action.

5. Future Agenda Items: Board members may discuss items for possible inclusion on future agendas. (*David Gibson*)

Consent Calendar: Item 6 is considered a non-controversial issue. (NOTE: If there is public interest, concern, or discussion regarding any consent calendar item or a request for a public hearing, then the item(s) will be removed from the consent calendar and considered after all other agenda items have been completed.)

6. Rescission of Cease and Desist Order: An Order rescinding Cease and Desist Order No. 96-52 for the International Boundary and Water Commission, U.S. Section, South Bay International Wastewater Treatment Plant, South Bay Ocean Outfall, San Diego County (Tentative Order No. R9-2014-0081). (*Joann Lim*)

Remainder of the Agenda (Non-Consent Items):

7. Public Workshop: The San Diego Water Board will hold a public workshop to receive and discuss information on proposed amendments to the Regional NPDES Permit for Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region (Order No. R9-2013-0001 or Regional MS4 Permit), including but not limited to the incorporation of the County of Orange, several Incorporated Cities of Orange County, and the Orange County Flood Control District as Copermittees (Tentative Order No. R9-2015-0001). The San Diego Water Board will not take any action on this item at the workshop. (*Laurie Walsh and Christina Arias*)

8. *Closed Session*-Discussion of Ongoing Litigation [Authorized under Government Code Section 11126, subd. (e)]. The San Diego Water Board may meet in closed session to discuss ongoing litigation for the following cases:

   Civil Actions (Judicial and Administrative, other than Petitions for Review filed with the State Water Board)

   a. *In re: Test Claim on California Regional Water Quality Control Board, San Diego Region, Order No. R9-2007-001, (NPDES No. CAS0108758) Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego County, the San Diego Unified Port District, and the San Diego County Regional Airport Authority adopted on January 24, 2007. Test Claim filed by San Diego County, et al., with Commission on State Mandates, No. 07-TC-09* (filed June 2008). *(Catherine George Hagan)*

   b. *State of California Department of Finance, State Water Resources Control Board, And California Regional Water Quality Control Board, San Diego Region v. Commission on State Mandates.* Petition for Writ of Administrative Mandamus. Sacramento County Superior Court, Case No. 34-2010-80000604 (filed July 2010). *(Catherine George Hagan)*

   c. *In re: Citizens Development Corporation, Debtor and Debtor in Possession*, Case No. 10-15142-LT11. United States Bankruptcy Court, Southern District of California. (San Diego Water Board Claim in Bankruptcy) (filed June 2011). (*Catherine George Hagan*)

   d. *Test Claim on California Regional Water Quality Control Board, San Diego Region, Order No. R9-2009-0002, (NPDES No. CAS0108740) Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal*

Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of Orange, the Incorporated Cities of the County of Orange, and the Orange County Flood Control District adopted on December 16, 2009. Test Claim filed by County of Orange, et al., with Commission on State Mandates, No. 10-TC-11 (filed June 2011). *(Catherine George Hagan)*

e. *Test Claim on California Regional Water Quality Control Board, San Diego Region, Order No. R9-2010-0016 (NPDES No. CAS0108766) adopted November 10, 2010, County of Riverside, Riverside County Flood Control and Water Conservation District, and the Cities of Murrieta, Temecula and Wildomar, Co-Claimants, filed with Commission on State Mandates, No. 11-TC-03 (filed November 2011). (Catherine George Hagan)*

f. *City of San Diego v. California Regional Water Quality Control Board, San Diego Division, SFPP, L.P., A Delaware Limited Partnership, and Kinder Morgan Energy Partners, L.P., A Delaware Limited Partnership, Real Parties-in-Interest.* Petition for Writ of Administrative Mandamus. San Diego County Superior Court, Case No. 37-2013-00047614-CU-WM-CTL (filed May 2013). (*Ben Neill*)

Petitions for Review Pending Before State Water Resources Control Board[2]

g. Petitions of the National Fireworks Association and Fireworks & Stage FX America Inc., Coastal Environmental Rights Foundation, and San Diego Coastkeeper (General National Pollutant Discharge Elimination System (NPDES) Permit Order No. R9-2011-0022 (NPDES No. CAG999002) for Residual Firework Pollutant Waste Discharges to Waters of the United States in the San Diego Region from the Public Display of Fireworks), SWRCB/OCC Files A-2164(a)-(c), filed June and July 2011. *(Michelle Mata)*

h. Petition of Citizens Development Corporation (Water Code Section 13267 Investigative Order No. R9-2011-0033 dated September 14, 2011, Requiring Submission of Technical Reports Pertaining to Investigation of Lake San Marcos Nutrient Impairment, San Diego County), SWRCB/OCC File A-2185, filed October 2011. (*Laurie Walsh*)

i. Petition of City of San Diego (Time Schedule Order No. R9-2011-0052 dated September 14, 2011, for the Kinder Morgan Energy Partners, Mission Valley Terminal Remediation Dewatering Discharge to Murphy Canyon Creek, San Diego County), SWRCB/OCC File A-2186, filed October 2011. (*Ben Neill*)

j. Petition of Jack Eitzen (Administrative Assessment of Civil Liability Order Nos. R9-2011-0048 and R9-2011-0049 against Jack Eitzen for 38175 and

[2] Petitions for review of San Diego Water Board actions or inactions filed with the State Water Board being held in abeyance by the State Water Board are generally not listed in the agenda. The titles of these matters are available at the San Diego Water Board. Please contact Catherine George Hagan at catherine.hagan@waterboards.ca.gov or 619-521-3012 for more information.

38155 Via Vista Grande, Murrieta, Riverside County), issued October 12, 2011), SWRCB/OCC File A-2193, filed November 2011. (*Rebecca Stewart*)

k. Petitions for Review of San Diego Bay Shipyard Sediment Cleanup and Abatement Order No. R9-2012-0024 for National Steel and Shipbuilding Company (NASSCO), Campbell Industries, City of San Diego, San Diego Gas & Electric (SDG&E) and San Diego Unified Port District (Port District) issued March 14, 2012. Petitions for Review and Requests for Stay filed by NASSCO, and City of San Diego. Petitions for Review w/o requests for stay filed by SDG&E, Star & Crescent Boat Company and Port District. SWRCB/OCC File A-2205(a), (c), (d), and (e), filed April 2012. (*Frank Melbourn)*

l. Petition of NASSCO for Review of Resolution No. R9-2012-0025 (Certifying Final Environmental Impact Report for San Diego Bay Shipyard Sediment Cleanup and Abatement Order No. R9-2012-0024), adopted March 14, 2012, SWRCB/OCC File A-2205(a), filed April 2012. (*Frank Melbourn)*

m. Petition of South Laguna Civic Association for Review of Order No. R9-2012-0013, NPDES No. CA0107611, NPDES Permit Reissuance: South Orange County Waste Authority, Discharges to the Pacific Ocean via Aliso Creek Ocean Outfall, adopted April 11, 2012, SWRCB/OCC File A-2211, filed May 2012. (*Joann Lim*)

n. Petition of City of San Diego for Review of Resolution No. R9-2012-0045, re Authorizing Executive Officer to Increase Daily Average Discharge Flow Rate Limitation under Order No. R9-2008-0002 [NPDES No. CAG919002] for the Kinder Morgan Energy Partner's Mission Valley Terminal Remediation Dewatering Discharge to Murphy Canyon Creek, June 13, 2012, SWRCB/OCC File A-2222, filed July 2012. (*Ben Neill*)

o. Petitions for Review of Regional Municipal Separate Storm Sewer System Order No. R9-2013-0001 (NPDES No. CAS0109266), adopted May 8, 2013, filed by (1) San Diego County Regional Airport Authority (stay requested), (2) City of Lake Forest (abeyance request), (3) City of Aliso Viejo (abeyance request), (4) City of Laguna Hills (abeyance request), (5) City of Rancho Santa Margarita (abeyance request), (6) City of Chula Vista, (7) City of National City, (8) Riverside County Flood Control and Water Conservation District, the County of Riverside, and the Cities of Murrieta, Temecula, and Wildomar (abeyance request), (9) City of Dana Point (abeyance request), (10) City of Mission Viejo (abeyance request), (11) City of San Clemente (abeyance request), (12) County of Orange and Orange County Flood Control District (abeyance request), (13) San Diego Unified Port District, (14) City of San Diego (abeyance request), (15) County of San Diego, and (16) City of Laguna Niguel. SWRCB/OCC File A-2254(a)-(p), filed June 2013. (*Wayne Chiu*)

p. Petition of Foothill/Eastern Transportation Corridor Agency for Review of Action and Failure to Act, in Connection with Waste Discharge Requirements

(Tentative Order No. R9-2013-0007) for the Tesoro Extension Project, Orange County, June 19, 2013, SWRCB/OCC File A-2259, filed July 2013. (*Darren Bradford*)

q. Petition of San Diego United Port District, Waste Discharge Requirements Order No. R9-2013-0093 for San Diego Shipyard Sediment Remediation Project, San Diego Bay, San Diego County, July 10, 2013, SWRCB/OCC File A-2263, filed August 2013 (stay requested). (*Alan Monji*)

r. Petition of Donan Environmental Services, Inc., Cleanup and Abatement Order No. R9-2013-0022 at the Site of the Former Santa Ysabel Chevron Station, 30350 Highway 78, Santa Ysabel, San Diego County, September 18, 2013, SWRCB/OCC File A-2277, filed October 2013. (*Sean McClain*)

9. *Closed Session*-Consideration of Initiation of Litigation or Discussion of Significant Exposure to Litigation. The San Diego Water Board may meet in closed session to initiate or consider initiating litigation concerning matters within its jurisdiction or to discuss significant exposure to litigation [Authorized under Government Code Section 11126(e)]. *(David Gibson)*

10. *Closed Session*-Deliberation on a Decision to be Reached Based on Evidence Introduced in a Hearing. The San Diego Water Board may meet in closed session to consider evidence received in an adjudicative hearing and to deliberate on a decision to be reached based upon that evidence [Authorized under Government Code Section 11126(c)(3)].

11. *Closed Session*-Personnel. The San Diego Water Board may meet in closed session to consider the appointment, employment, evaluation of performance, or dismissal of a public employee or to hear complaints or charges brought against that employee by another person or employee unless the employee requests a public hearing [Authorized under Government Code Section 11126(a)].

12. Arrangements for Next Meeting and Adjournment:

    Wednesday, November 12, 2014-9:00 a.m.
    Rancho California Water District
    District Board Room
    42135 Winchester Road
    Temecula, California

NOTIFICATIONS

A. **Follow the Board Meeting on Twitter**: Updates on the progress of the San Diego Water Board meeting will be posted on Twitter at www.twitter.com/SDWaterBoard. The San Diego Water Board's use of Twitter is a courtesy and is for informational purposes only. It is not always reliable, and is not a substitute for personal attendance at a Board meeting.

DIRECTIONS TO MEETING

From San Diego: I-5 North to Oso Parkway exit. Right on Oso Parkway to Marguerite Parkway. Left on Marguerite Parkway to Civic Center. Turn left onto Civic Center. Destination will be on the right. Please park in the paved parking lot, not the cobblestones in front of the building.

From the North: I-5 South to La Paz Road exit. Left on La Paz Road to Marguerite Parkway. Right on Marguerite Parkway to Civic Center. Turn right to Civic Center. Destination will be on the right. Please park in the paved parking lot, not the cobblestones in front of the building.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
Summary of Board Actions and Proceedings
At the September 10, 2014, Board Meeting

MINUTES	REGIONAL BOARD ACTIONS
Minutes of the August 13, 2014 Board Meeting.	Approved Minutes.
NON-CONSENT ITEMS	
Information Item: Update on Current and Planned Research by the Southern California Coastal Water Research Project (SCCWRP). (*David Gibson*)	Information item only; no action taken.
Information Item: Preview of the USEPA Border 2020 Conference. (*David Gibson*)	Information item only; no action taken.
Information Item: Public Workshop on the State of Wetlands in the San Diego Region: Protection and Restoration Potential. (*Kelly Dorsey*)	Information item only; no action taken.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
Summary of Board Actions and Proceedings
At the September 24, 2014, Board Meeting

MINUTES	REGIONAL BOARD ACTIONS
Minutes of the August 18, 2014 Board Meeting.	Approved minutes.
NON-CONSENT ITEMS	
Information Item: Discussion of Upcoming Water Quality Coordinating Committee Meeting. (*David Gibson*)	Information item only; no action taken.

NOTES:

A. GENERAL STATEMENT. The primary duty of the San Diego Water Board is to protect the quality of the waters within the region for all beneficial uses. This duty is implemented by formulation and adoption of water quality plans for specific ground or surface water basins and by prescribing and enforcing requirements on all domestic and industrial waste discharges. Responsibilities and procedures of the Regional Water Quality Control Board come from the State's Porter-Cologne Water Quality Act and the Nation's Clean Water Act.

   The purpose of the meeting is for the Board to obtain testimony and information from concerned and affected parties and make decisions after considering the recommendations made by the Executive Officer.

   All interested persons may speak at the San Diego Water Board meeting and are expected to orally summarize their written submittals. Testimony should be presented in writing prior to the meeting and only a summary of pertinent points presented orally. Oral testimony (i.e., direct testimony or comment) will be limited in time by the Board Chair (typically 3 minutes for interested persons and no more than 10 minutes for designated parties). A timer may be used and speakers are expected to honor the time limits.

B. PROCEDURE FOR CONSENT (UNCONTESTED) CALENDAR (see also 23 C.C.R. § 647.2) Consent or uncontested agenda items are items for which there appears to be no controversy and which can be acted upon by the San Diego Water Board with no discussion. Such items have been properly noticed and all interested parties consent to the staff recommendation. The San Diego Water Board Chair will recognize late revisions submitted by staff and will then call for a motion and vote on all of the consent calendar items by the San Diego Water Board.

   If any San Diego Water Board member or member of the public raises a question or issue regarding an item that requires San Diego Water Board discussion, the item may be removed from the consent calendar and considered separately in an order determined by the Chair. Anyone wishing to contest a consent item on the agenda is expected to appear in person at the San Diego Water Board meeting and explain to the San Diego Water Board the reason that it is contested.

C. PROCEDURE FOR INFORMATION ITEMS (see also 23 C.C.R. 649, et. seq.). Information items are items presented to the San Diego Water Board for discussion only and for which no San Diego Water Board action or vote is normally taken. The San Diego Water Board usually will hear a presentation by staff, but may hear presentations by others. Comments by interested persons shall also be allowed. Members of the public wishing to address the San Diego Water Board on the topic under discussion should submit an attendance card beforehand indicating their request to speak to the San Diego Water Board. Comment from the public should be for clarification or to add to the San Diego

Water Board's understanding of the item; such comment must not be testimonial in nature or argumentative, as speakers are not under oath and the proceeding is not adversarial. Time limits may be imposed on interested persons.

D. PROCEDURES FOR NON-CONSENT (CONTESTED) AGENDA ITEMS. Non-consent or contested agenda items are items to which the parties involved have not consented and the staff recommendation is in dispute. The procedure that applies to such items depends on the nature of the matter. Matters before the San Diego Water Board may be quasi-legislative or quasi-judicial (adjudicative proceedings). Such items may require a public hearing and all interested persons will be provided an opportunity to make comments.

Contested Adjudicative Matters

Contested agenda items that are adjudicative, not quasi-legislative, are governed by the rules for adjudicative proceedings. State Water Resources Control Board (State Water Board) regulations setting forth the procedures for adjudicative proceedings before the State and Regional Water Boards are codified in Title 23, California Code of Regulations, Division 3. Adjudicative proceedings before the State and Regional Water Boards are governed by State Water Board regulations as authorized by Chapter 4.5 of the Administrative Procedures Act (commencing with section 11400 of the Government Code). State Water Board regulations further provide that, with certain exceptions, adjudicative proceedings will be conducted in accordance with sections 800-805 of the Evidence Code and section 11513 of Chapter 5 of the Government Code. (Other provisions of Chapter 5 of the Government Code do not apply to adjudicative proceedings before the State and Regional Water Boards). A copy of those regulations and Chapter 4.5 of the Administrative Procedures Act, section 11513 of the Government Code and sections 801-805 of the Evidence Code can be found at http://www.waterboards.ca.gov/laws_regulations/.

An adjudicative proceeding is a hearing to receive evidence for determination of facts pursuant to which the State or Regional Water Board formulates and issues a decision. A decision determines a legal right, duty, privilege, immunity or other legal interest of a particular person or persons. Examples of adjudicative proceedings include hearings to receive evidence concerning the issuance of waste discharge requirements or National Pollutant Discharge Elimination System (NPDES) permits, concerning cease and desist orders, and concerning orders imposing administrative civil liability. Adjudicative proceedings are not conducted according to the technical rules of evidence, and the San Diego Water Board will accept testimony and comments that are reasonably relevant to the issues before the Board. Testimony or comments that are not reasonably relevant, or that are repetitious, will be excluded.

In some adjudicative matters, most frequently administrative civil liability matters, a separate Hearing Procedures Document has been issued. In those cases, the procedures set forth in that Document will apply, subject to discretionary modification by the Chairman. For other adjudicatory matters, the

Chair may establish specific procedures for each item, and consistent with section 648, subdivision (d) of title 23 of the California Code of Regulations may waive nonstatutory provisions of the regulations. Generally, all witnesses testifying before the San Diego Water Board must affirm the truth of their testimony and are subject to questioning by the Board Members.

Absent a separate Hearing Procedures Document, the Board normally conducts adjudicative proceedings in an informal manner. That is, the Board does not, generally, require the designation of parties, the prior identification of witnesses, prior submission of written testimony, or the cross examination of witnesses. Any requests for an alternate hearing process should be directed to the Executive Officer and must be received by the San Diego Water Board by the deadline set forth on pages 1-2 of the Agenda.

When the San Diego Water Board determines that a hearing will be formal (as opposed to informal, as described above), participants in a contested agenda item are either “designated parties” or “interested persons.” Only designated parties will have the right to cross-examination, and may be subject to cross-examination. Interested persons (i.e., nondesignated parties) do not have a right to cross-examination, but may ask the San Diego Water Board to clarify testimony. Interested persons may also be asked to clarify their statements at the discretion of the San Diego Water Board.

Designated parties include:

-Discharger or Responsible Party
-Persons directly affected by the discharge
-Staff of the San Diego Water Board (if specified in the applicable hearing procedures)

All other persons wishing to testify or provide comments for a formal hearing are “interested persons” and not “designated parties.” Such interested persons may request status as a designated party for purposes of the formal hearing by submitting such request in writing to the San Diego Water Board no later than the date specified at the beginning of the Agenda Notice or in the applicable Notice of Public Hearing or Hearing Procedures Document. The request must explain the basis for status as a designated party and, in particular, how the person is directly affected by the discharge.

All persons testifying must state their name, address, affiliation, and whether they have taken the oath before testifying. The order of testimony for formal hearings generally will be as follows, unless modified by the San Diego Water Board Chair:

-Testimony and cross-examination of San Diego Water Board staff
-Testimony and cross-examination of discharger
-Testimony and cross-examination of other designated parties
-Testimony by interested persons

-Closing statement by designated parties other than discharger
-Closing statement by discharger
-Closing statement by staff
-Recommendation by Executive Officer (as appropriate)
-Close hearing
-Deliberation and voting by San Diego Water Board

Closing statements shall be for the purpose of summarization and rebuttal and are not to be used to introduce new evidence or testimony. After considering evidence, testimony, and comments, the San Diego Water Board may choose to adopt an order regarding a proposed agenda item.

Quasi-legislative Matters

Quasi-legislative matters include rulemaking and some informational proceedings. These matters may include hearings for the adoption or amendment of regulations, water quality control plans, and hearings to gather information to assist the State and Regional Water Boards in formulating policy for future action. They are not adjudicative proceedings and are subject to different procedures. (See PROCEDURE FOR INFORMATION ITEMS, above, and Cal. Code Regs. Tit. 23, § 649, et seq.)

E. CONTRIBUTIONS TO SAN DIEGO WATER BOARD MEMBERS. Persons applying for or actively supporting or opposing waste discharge requirements or other San Diego Water Board orders must comply with legal requirements if they or their agents have contributed or proposed to contribute $250 or more to the campaign of a San Diego Water Board member for elected office. Contact the San Diego Water Board for details if you fall into this category.

F. PROCEDURAL INFORMATION. The San Diego Water Board may meet in closed session to discuss matters in litigation, including discussion of initiated litigation, significant exposure to litigation, or decisions to initiate litigation [Authority: Government Code § 11126(e)]; deliberate on a decision to be reached based upon evidence introduced in an adjudicatory hearing [Authority: Government Code § 11126(d)]; or to consider the appointment, employment or dismissal of a public employee to hear complaints or charges brought against a public employee [Authority: Government Code §11126(a)].

The San Diego Water Board may break for lunch at approximately noon at the discretion of the Chairman. During the lunch break San Diego Water Board members may have lunch together. Other than properly noticed closed session items, San Diego Water Board business will not be discussed.

Agenda items are subject to postponement. A listing of postponed items will be posted in the meeting room. You may contact the designated staff contact person in advance of the meeting day for information on the status of any agenda item.

Speaker Cards. All persons desiring to address the San Diego Water Board are required to fill out a speaker card. Cards are normally provided near the entrance to the meeting room. San Diego Water Board staff can assist you in locating the cards.

Please fill out a separate card for each item you plan to speak on. All relevant sections, including the oath, must be completed. Please use the appropriate color card, as indicated below:

Blue: Public Comments (for items requiring no San Diego Water Board action - Public Forum, status reports, etc.).
Green: Public Testimony, in support of the tentative action.
Pink: Public Testimony, opposed to the tentative action.

G. AVAILABILITY OF EXECUTIVE OFFICER'S REPORT AND AGENDA MATERIAL. Visit our website at www.waterboards.ca.gov/sandiego to view the Executive Officer's Report over the internet two days prior to the San Diego Water Board meeting. A copy can also be obtained by contacting the staff office. A limited number of copies are available at the meeting.

Copies of most agenda items to be considered by the San Diego Water Board are posted as available on the San Diego Water Board's website at http://www.waterboards.ca.gov/sandiego/board_info/agendas.

Details concerning other agenda items are available for public reference during normal working hours at the San Diego Water Board's office. The appropriate staff contact person, indicated with the specific agenda item, can answer questions and provide additional information. For additional information about the Board, please see the attached sheet.

H. PETITION OF SAN DIEGO WATER BOARD ACTION. In accordance with California Water Code section 13320 and California Code of Regulations, title 23, section 2050 et seq., any person affected adversely by most decisions of the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) may petition the State Water Resources Control Board (State Board) to review the decision. The petition must be received by the State Board within 30 days of the San Diego Water Board's meeting at which the adverse action was taken. Copies of the law and regulations applicable to filing petitions will be provided upon request.

I. HEARING RECORD. Material presented to the Board as part of testimony (e.g. photographs, slides, charts, diagrams etc.) that is to be made part of the record must be left with the Board. Photographs or slides of large exhibits are acceptable.

All Board files, exhibits, and agenda material pertaining to items on this agenda are hereby made a part of the record.

J. ACCESSIBILITY. The facility is accessible to people with disabilities. Individuals who have special accommodation or language needs, please contact Ms. Chris Blank at (619) 521-3382 or cblank@waterboards.ca.gov at least 5 working days prior to the meeting. TTY/TDD/Speech-to-Speech users may dial 7-1-1 for the California Relay Service.

K. PRESENTATION EQUIPMENT. Providing and operating projectors and other presentation aids are the responsibilities of the speakers. Some equipment may be available at the Board Meeting; however, the type of equipment available will vary dependent on the meeting location. Because of compatibility issues, provision and operation of laptop computers and projectors for Power Point presentations will generally be the responsibility of the individual speakers. To ascertain the availability of presentation equipment please contact Ms. Chris Blank at (619) 521-3382 or cblank@waterboards.ca.gov at least 5 working days prior to the meeting.

State of California
Regional Water Quality Control Board
San Diego Region

EXECUTIVE OFFICER SUMMARY REPORT
October 8, 2014

ITEM: 7

SUBJECT: Public Workshop: The San Diego Water Board will hold a public workshop to receive and discuss information on proposed amendments to the *Regional NPDES Permit for Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Order No. R9-2013-0001 or Regional MS4 Permit), including but not limited to, the incorporation of the County of Orange, several Incorporated Cities of South Orange County, and the Orange County Flood Control District as Copermittees (Tentative Order No. R9-2015-0001). (*Laurie Walsh and Christina Arias*)

PURPOSE: The San Diego Water Board is now in the process of considering amendments to the Regional MS4 Permit as described in Tentative Order No. R9-2015-0001 to incorporate the Orange County Copermittees and address other issues summarized below. The workshop is intended to provide information to San Diego Water Board members and address questions the Board members, the Copermittees, or the public may have regarding the Tentative Order. The Tentative Order was released for public review and comment on September 18, 2014 (**Supporting Document 1**).

RECOMMENDATION: There is no recommendation as this is a public workshop and the San Diego Water Board will take no action.

KEY ISSUES:

1. On May 20, 2014, the County of Orange, Orange County Flood Control District and the cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Lake Forest, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano (collectively referred to as Orange County Copermittees) jointly submitted a Report of Waste Discharge (RoWD) in application for the reissuance of their MS4 permit. The recommendations set forth in the RoWD for revised permit requirements are largely

consistent with the requirements of the Regional MS4 Permit adopted by the San Diego Water Board on May 8, 2013.

2. The Tentative Order proposes to amend the Regional MS4 Permit to designate the Orange County Copermittees as MS4 dischargers responsible for compliance with the terms and the conditions of the Permit.

PRACTICAL VISION: The Regional MS4 Permit directly implements several chapters of the San Diego Water Board's Practical Vision entitled *Healthy Waters, Healthy People.* Multiple provisions of the Permit pertain to the development and implementation of strategies to achieve healthy waters and recovery of stream, wetlands, and riparian ecosystems. These strategies implement an outcome-based approach, with a focus on achieving measureable reductions in MS4 pollutant discharges and improvements in receiving water quality. The Regional MS4 Permit also includes requirements for monitoring and assessment in order for the Copermittees to evaluate the success of their jurisdictional storm water management programs in a robust and meaningful way.

DISCUSSION: From the inception of the storm water permitting program in 1990 until 2013, the San Diego Water Board issued MS4 permits to Copermittees within its jurisdiction based on San Diego County, Orange County, and Riverside County political boundaries. Under this approach, regulation of MS4 discharges in San Diego, Riverside, and Orange Counties by the San Diego Water Board was accomplished under three separate municipal storm water permits which placed a significant permit administration burden on the Board. In an effort to better advance the storm water program and achieve regulatory consistency and economy of resources, the San Diego Water Board adopted the Regional MS4 Permit on May 8, 2013 to jointly cover municipal Copermittees in San Diego, Riverside, and Orange Counties. The Regional MS4 Permit was issued to Copermittees in San Diego County initially, as their Fourth Term MS4 permit expired.

Provision F.5 of the Regional MS4 Permit outlines a public hearing process to incorporate Copermittees in Orange and Riverside Counties following expiration of their current MS4 permits. Under this process the San Diego Water Board

must first review and consider a RoWD to determine whether the Copermittees should be enrolled under the Regional MS4 Permit and what changes to the Permit (as proposed in the RoWD) are appropriate.

The Orange County Copermittees are currently regulated by MS4 Permit Order No. R9-2009-0002, which will expire on December 16, 2014. The Orange County Copermittees jointly submitted a RoWD in application for MS4 permit reissuance on May 20, 2014. The Tentative Order proposes to amend the Regional MS4 Permit and enroll the Orange County Copermittees under the Permit. If the San Diego Water Board adopts the Tentative Order, the Orange County Copermittees will be the second group of Copermittees to obtain coverage under the Regional MS4 Permit. The last remaining group, the Riverside County Copermittees, will be considered for coverage under the Regional MS4 Permit in a future action following the expiration of their current MS4 Permit in November 2015, and after consideration of their RoWD submittal for MS4 Permit reissuance.

The San Diego Water Board has reviewed the Orange County Copermittees' RoWD, including its recommendations, and finds it to be consistent with the framework and intent of the Regional MS4 Permit. For example, the RoWD recommends a watershed approach to focus Copermittees' limited resources to more effectively improve conditions in receiving waters. This is consistent with the Regional MS4 Permit's emphasis on the implementation of Water Quality Improvement Plans, jointly developed by the Copermittees and stakeholders, to achieve watershed-specific priorities that will yield the greatest water quality improvements. Additionally, the Regional MS4 Permit requirements will provide considerably more flexibility for the Orange County Copermittees to manage their storm water programs to achieve watershed-specific priorities than their current MS4 permit. Based on consideration of the RoWD, the Orange County Copermittees should be incorporated in the Regional MS4 Permit as amended by the modifications described below.

In addition to incorporating the Orange County Copermittees, the Tentative Order also proposes to amend the Regional MS4 Permit to address a variety of other issues including: 1) Regional Water Board designation to consolidate regulation of Phase I MS4 discharges for the

Cities of Laguna Hills, Laguna Woods, and Lake Forest pursuant to Water Code section 13228, 2) incorporation of the Los Peñasquitos Lagoon Sediment Total Maximum Daily Load (TMDL) requirements, 3) the extension of a pollutant reduction deadline for MS4 discharges to Areas of Special Biological Significance, 4) incorporation of interim exemptions for hydromodification management, and 5) implementation of a uniform approach for monitoring beach water quality in south Orange County. All of these amendments are described in the Tentative Order and Attachments 1 and 2 thereto. The specific Permit and Fact Sheet language changes are highlighted in blue underline and red-strikeout text. A summary of each of these amendments is provided below:

Designation of a Regional Water Board

The Tentative Order proposes to amend the Regional MS4 Permit in Provision B.1 to consolidate regulation of MS4 discharges in the Cities of Laguna Hills, Laguna Woods, and Lake Forest under a single Regional Water Board. The political boundaries of these cities are split between the jurisdictions of both the Santa Ana Water Board and the San Diego Water Board, and their MS4 discharges have historically been regulated by both Boards. The map in **Supporting Document 4** shows these cities political boundaries in comparison to the Santa Ana Water Board and the San Diego Water Board regional boundaries. These cities have reported that management and implementation of municipal programs to comply with different MS4 permits administered by two Regional Water Boards presents an excessive administrative and financial burden. In an effort to address these concerns the San Diego Water Board and the Santa Ana Water Board are in the process of entering into an agreement whereby the San Diego Water Board is designated to regulate MS4 discharges within the jurisdiction of the Cities of Laguna Woods and Laguna Hills and the Santa Ana Water Board is designated to regulate MS4 discharges within the jurisdiction of the City of Lake Forest. As the basis for this agreement may change under future conditions, the Tentative Order provides that the San Diego Water Board will periodically review the effectiveness of the agreement during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate the agreement with the Santa Ana Water Board or otherwise modify the agreement subject to the approval of the Santa Ana Water Board.

Los Peñasquitos Sediment TMDL

The Tentative Order proposes to amend the Regional MS4 Permit in Attachment E to add the Los Peñasquitos Sediment TMDL to the Regional MS4 Permit. The Los Peñasquitos Sediment TMDL was adopted by the San Diego Water Board on June 13, 2012, and subsequently approved by the State Water Resources Control Board (State Water Board) on January 21, 2014, and the Office of Administrative Law on July 14, 2014, thereby making it effective. Although the TMDL is now effective, it is not self-implementing and requires incorporation into an NPDES permit in order to be implemented. Therefore the Tentative Order proposes amending the Regional MS4 Permit to include implementation provisions for this TMDL.

Special Conditions for Areas of Special Biological Significance (ASBS)

The Tentative Order also proposes to amend the Regional MS4 Permit in Attachment A.2 to include an extension of a pollutant reduction deadline for MS4 discharges to ASBS from four to six years as provided for by State Water Board Resolution No. 2012-0031. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject to the terms and conditions of State Water Board Resolution No. 2012-0031.

Hydromodification Control Requirement Modifications

In order to facilitate the Orange County Copermittees' transition to the Regional MS4 Permit, the Tentative Order proposes amending the Regional MS4 Permit in Provision E.3.c.(2) to allow two temporary exemptions from hydromodification management BMP implementation. The first exemption is for Priority Development Projects that discharge storm water runoff directly into an engineered channel conveyance system with a capacity to convey peak flows generated by the 10-year storm event from the point of discharge to a reservoir, lake, embayment, or the Pacific Ocean. The second exemption is for Priority Development Projects that discharge storm water runoff directly to a "large" river reach with a drainage area larger than 100 square miles and a 100-year flow capacity in excess of 20,000 cubic feet per second. The exemptions are short-term and will expire upon San Diego Water Board

acceptance of the San Juan Watershed Management Area Water Quality Improvement Plan (there is a mechanism for extending the exemptions based on rigorous, technical, and site specific analysis). The proposed approach is consistent with the approach to hydromodification management currently utilized by the San Diego County Copermittees.

Unified Approach for Beach Water Quality Monitoring
The Tentative Order incorporates a unified approach for beach water quality monitoring to eliminate duplicative monitoring, enable sharing of technical resources, trained personnel, and associated costs and consolidate beach water quality monitoring for fecal indicator bacteria required by various statutes. In 2012 the San Diego Water Board reviewed the various beach water quality monitoring programs conducted in south Orange County and convened a stakeholder workgroup to develop a unified regional beach water quality monitoring and assessment program. The program is outlined in the San Diego Water Board report entitled "*Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County,*" dated September 2014. The unified program is intended to be protective of the health of swimmers, surfers, and others who use south Orange County beach waters for water contact recreational activities. The Tentative Order amends the Regional MS4 permit at Provision D.1.e to require the Orange County Copermittees to participate in implementation of a unified regional beach water quality monitoring and assessment program, along with the South Orange County Wastewater Authority and Orange County Health Care Agency.

Activities to Date
On June 24, 2014, the San Diego Water Board staff met with the Orange County Copermittees to discuss the RoWD and the proposal to incorporate the Orange County Copermittees under the Regional MS4 Permit. On July 1, 2014, the San Diego Water Board held a public stakeholder meeting in the City of San Juan Capistrano to further discuss incorporation of the Orange County Copermittees under the Regional MS4 Permit, potential amendments to the Regional MS4 permit based on the RoWD, and the public review process. On September 18, 2014, the San Diego Water Board released the Tentative Order and Attachments thereto, for public review and comment. The transmittal letter is included as **Supporting Document 2**.

LEGAL CONCERNS: None.

SUPPORTING DOCUMENTS:

1. Tentative Order No. R9-2015-0001 with Attachments:
   Attachment 1 -- Revised Order No. R9-2013-0001
   Attachment 2 -- Revised Fact Sheet to Order No. R9-2013-0001
2. Transmittal Letter Announcing Availability of Tentative Order, dated September 18, 2014
3. Notice of Public Workshop
4. Map – San Juan Hydrologic Unit

PUBLIC NOTICE: Notice of this item was provided to interested persons via e-mail on September 5, 2014 (**Supporting Document 3**). Notice was also provided in the Meeting Notice and Agenda for the October 8, 2014 Board meeting, which is posted on the San Diego Water Board's website.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

2375 Northside Drive, Suite 100, San Diego, CA 92108
Phone (619) 516-1990 Fax (619) 516-1994
http://www.waterboards.ca.gov/sandiego

TENTATIVE ORDER NO. R9-2015-0001

AN ORDER AMENDING ORDER NO. R9-2013-0001, NPDES NO. CAS010266 NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The California Regional Water Quality Control Board, San Diego Region (hereinafter San Diego Water Board), finds that:

ENROLLMENT OF ORANGE COUNTY COPERMITTEES

1. **Enrollment Process.** On May 8, 2013, the San Diego Water Board adopted Order No. R9-2013-0001, NPDES No. CAS019266, *National Pollutant Discharge Elimination System Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Order No. R9-2013-0001, Order or Regional MS4 Permit). Provision F.5 of that Order outlines a process to designate (enroll) the County of Orange, the Orange County Flood Control District and the south Orange County Cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Lake Forest, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano (collectively Orange County) as Copermittees under Order No. R9-2013-0001, responsible for compliance with the terms and the conditions of the Order. Provision F.5 provides that prior to such enrollment the San Diego Water Board must first review and consider a Report of Waste Discharge (RoWD), submitted by the Orange County Copermittees under their current MS4 NPDES Order No. R9-2009-0002, to determine whether the Copermittees should be enrolled under Order No. R9-2013-0001 and what changes to the Order proposed in the RoWD are appropriate.

2. **Report Of Waste Discharge.** By letter dated May 20, 2014, the Orange County Copermittees jointly submitted a RoWD in application for the reissuance of waste discharge requirements, pursuant to the requirements of section K.2.b of Order No. R9-2009-0002, for MS4 discharges draining the San Juan Hydraulic Unit within the San Diego Region. The RoWD discusses the MS4 Permit compliance activities and accomplishments of the Orange County Copermittees over the period June 2009 through June 2013. The RoWD also identifies all of the activities, research, and pilot studies the Copermittees propose to undertake during the next permit term based

upon consideration of the effectiveness of the Orange County Storm Water Program and the need for additional pollutant control initiatives. Development of a watershed-based planning approach is portrayed in the RoWD as the most important next step to take in the development of the storm water programs in Orange County. The RoWD concludes that such a comprehensive approach offers the opportunity to identify the environmental and recreational benefits that can be realized in each watershed and the management strategies that will most effectively ensure their realization. Among several recommendations, the RoWD included a request that permit requirements be amended to provide an initial or time limited exemption from hydromodification control best management practices (BMPs) for conveyance channels that are engineered and regularly maintained with the capacity to convey peak flows generated from the 10-year or greater storm event from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean. The County of Orange also separately requested a second exemption for discharges to "large river" low gradient reaches with a very wide flood plain by letter dated November 22, 2013. The San Diego Water Board has reviewed the RoWD and determined it is complete.

3. **Permit Hydromodification Control Requirement Modifications.** The hydromodification control BMP requirements in Provision E.3.c.(2) of Order No. R9-2013-0001 require modification to address the hydromodification exemption issues identified in the Orange County Copermittees' RoWD application and November 22, 2013 letter. To facilitate the transition of the Orange County Copermittees (and eventually the Riverside County Copermittees) to the Regional MS4 Permit from the current Phase I MS4 NPDES permit (Order No. R9-2009-0002), two temporary exemptions from hydromodification control BMP requirements should be provided. The first temporary exemption would allow relief from hydromodification control BMP requirements for Priority Development Projects discharging directly to an engineered channel conveyance system with a capacity to convey peak flows generate by the 10-year storm event all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean. The second temporary exemption would allow relief from hydromodification control BMP requirements for Priority Development Projects discharging directly to large river reaches with drainage areas larger than 100 square miles and a 100-year flow capacity in excess of 20,000 cubic feet per second.

4. **Orange County Copermittees Enrollment.** After consideration of the Orange County RoWD and changes needed to Order No. R9-2013-0001, the San Diego Water Board has determined that the County of Orange, the Orange County Flood Control District and the south Orange County Cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano should be enrolled as Copermittees under Order No. R9-2013-0001 (Order) and responsible for compliance with the terms and the conditions of the Order. Enrolling the Orange County Copermittees into Order No. R9-2013-0001 (and the eventual enrollment of Riverside County Copermittees upon expiration of their current MS4 permit) will

provide regulatory consistency in the implementation of MS4 permit requirements throughout the San Diego Region, improve communication and coordination among Copermittees within watersheds crossing multiple jurisdictions, and maximize efficiency and economy of resources for the San Diego Water Board achieved through the redirection of staff permitting resources to better advance the storm water program. The enrollment of the Cities of Laguna Hills, Laguna Woods and Lake Forest is subject to a California Water Code (Water Code) section 13228 agreement as set forth in the findings of this Order.

DESIGNATION OF A REGIONAL WATER BOARD

5. **Regional Water Board Designation.** The Cities of Laguna Woods, Laguna Hills and Lake Forest (Cities) are located partially within the jurisdictions of both the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board) and the San Diego Water Board. Written requests for designation of a single Regional Water Board to regulate matters pertaining to permitting of Phase I MS4 discharges were submitted to the San Diego Water Board by the City of Laguna Woods by letter dated September 8, 2014, the City of Laguna Hills by letter dated March 12, 2014, and the City of Lake Forest by letter dated April 4, 2014. The Cities of Laguna Hills and Laguna Woods requested designation of the San Diego Water Board, and the City of Lake Forest requested designation of the Santa Ana Water Board. Water Code section 13228 specifies the circumstances that allow, and the process for, designation of a Regional Water Board.

6. **Factual Considerations**. The Santa Ana Water Board and San Diego Water Board establish generally consistent requirements for MS4 discharges to meet the technology-based standard of reducing pollutants in the discharge to the maximum extent practicable (MEP), a related iterative process to ensure MS4 discharges meet receiving water quality standards, and non-storm water discharges to be effectively prohibited from entering the MS4. However due to the unique nature of watersheds and water quality issues in the San Diego Region and Santa Ana Region, MS4 permit requirements between the two Regional Water Boards may also vary to address region specific pollutant discharges and watershed conditions. The Cities of Laguna Woods, Laguna Hills, and Lake Forest report that management and implementation of municipal programs to comply with two different MS4 permits creates a significant administrative and financial burden that is not contributing to greater overall water quality improvements in either region.

7. **Regional Water Board Agreement**. In an effort to address the concerns of the Cities, the San Diego Water Board and the Santa Ana Water Board have entered into an agreement whereby the San Diego Water Board is designated to regulate Phase I MS4 discharges within the jurisdiction of the Cities of Laguna Woods and Laguna Hills and the Santa Ana Water Board is designated to regulate Phase I MS4 discharges within the jurisdiction of the City of Lake Forest. Under the terms of the agreement the City of Lake Forest will be required to retain and continue implementing the prohibition of over-irrigation discharges identified in Title 15,

Chapter 15, Section 14.030 of the City Municipal Code for regulating storm water quality throughout its jurisdiction, which was established during the permit term of Order No. R9-2009-0002. The City of Lake Forest will also be required to actively participate in the development and implementation of the Aliso Creek Watershed Management Area Water Quality Improvement Plan required pursuant to the San Diego Water Board's Regional MS4 Permit, Order No. R9-2013-0001. Under the terms of the agreement, any Total Maximum Daily Load (TMDL) and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Laguna Woods, Laguna Hills or Lake Forest as a responsible party, will be incorporated into the appropriate MS4 permit by reference. Enforcement of the applicable TMDL would remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's San Diego Creek/Newport Bay TMDL and the San Diego Water Board's Indicator Bacteria Project I Beaches and Creeks TMDL.

8. **Periodic Review of Regional Water Board Agreement.** The basis supporting the Cities of Laguna Woods, Laguna Hills, and Lake Forest requests to designate a specific Regional Water Board for regulatory oversight of MS4 discharges may change under future conditions and circumstances. Therefore the San Diego Water Board will periodically review the effectiveness of the agreement during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate the agreement with the Santa Ana Water Board or otherwise modify the agreement subject to the approval of the Santa Ana Water Board.

WATER QUALITY CONTROL PLANS AND POLICIES

9. **Cause for Modification.** Federal NPDES regulations at 40 CFR 122.62(a)(3) provide that NPDES permits may be modified when the standards or regulations on which the permit was based have been changed by promulgation of amended standards or regulations or by judicial decision after the permit was issued. Standard Permit Provision 1.f of Attachment B to Order No. R9-2013-0001 provides in relevant part that the Order may be modified for cause. Section II.H.4.d. of the Order provides that the Order may be reopened during its term for cause including when the *Water Quality Control Plan for the San Diego Basin (9)* (Basin Plan) is amended by the San Diego Water Board to incorporate a new TMDL, and the amendment is approved by the State Water Resources Control Board (State Water Board), Office of Administrative Law, and the United State Environmental Protection Agency (USEPA). The amended changes to water quality control plans and policies set forth in the findings below represent changes to standards on which Order No. R9-2013-0001 was based.

10. **Special Conditions for Areas of Special Biological Significance**. On March 20, 2012, in Resolution No. 2012-0012, the State Water Board adopted a General Exception to the Ocean Plan Areas of Special Biological Significance (ASBS) waste discharge prohibition for storm water and nonpoint source discharges, including Special Protections for Beneficial Uses. On June 19, 2012, in Resolution No. 2012-0031, the State Water Board amended the General Exception to require pollutant load reductions to be achieved over a six year term. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject to the terms and conditions of State Water Board General Exception, as amended.

11. **Total Maximum Daily Loads (TMDLs)**. On June 13 2012 the San Diego Water Board in Resolution No. R9-2012-0033 amended the Basin Plan to incorporate the Los Penasquitos Lagoon Sediment TMDL. This TMDL Basin Plan amendment was approved by the State Water Board on January 21, 2014, by the Office of Administrative Law (OAL) on July 14, 2014, and USEPA on Month XX, Year. The County of San Diego, City of San Diego, City of Del Mar, and the City of Poway are among the responsible parties collectively assigned a single wasteload allocation applicable to MS4 discharges under the terms and conditions of the TMDL.

BEACH WATER QUALITY MONITORING AND ASSESSMENT PROGRAM

12. **Unified Approach Beach Water Quality Monitoring.** In November 2010, the State Water Board adopted Resolution No. 2010-0053, directing regional water boards to work with dischargers to modify beach water quality monitoring programs required by regional water board-issued permits in order to eliminate redundancies and incorporate beach water quality monitoring required by applicable statutes, where appropriate. Beginning in 2012, the San Diego Water Board reviewed the various beach water quality monitoring programs conducted in south Orange County and convened a stakeholder workgroup to develop a unified regional beach water quality monitoring and assessment program (Unified Program). The Unified Program is outlined in the San Diego Water Board report entitled "*Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County,*" dated September 2014. The Unified Program is consistent with and will meet or exceed the minimum requirements for beach water quality monitoring and related public notification and reporting established by State law, including the California Ocean Plan. The Unified Program will help protect the health of swimmers, surfers, and others who use south Orange County beach waters for water contact recreational activities.

13. **Monitoring Framework Consistency**. The Unified Program is consistent with and will help implement "*A Framework for Monitoring and Assessment in the San Diego Region*," which emphasizes the need for question-driven, beneficial use-oriented monitoring and assessment. The primary purpose of the Unified Program will be to answer the question "Does beach water quality meet standards for the beneficial use of water contact recreation?"

14. **Unified Program Implementation**. The San Diego Water Board Executive Officer has issued a written directive, pursuant to California Water Code sections 13225, 13267, and 13383, for the South Orange County Wastewater Authority (SOCWA) and the south Orange County Copermittees to implement the Unified Program, in cooperation with the Orange County Health Care Agency (OCHCA). After appropriate opportunity for public input, the Executive Officer may make revisions to the Unified Program, provided that the Unified Program, as revised, continues to be consistent with and meet the requirements of State law, including the California Ocean Plan, for beach water quality monitoring and related public notification and reporting. The Unified Program will supersede the existing routine, ongoing, beach water quality monitoring programs in south Orange County that are conducted in accordance with the existing requirements of the NPDES permits for discharges from SOCWA ocean outfalls and the south Orange County Copermittees' MS4s. The requirement for the Orange County Copermittees to participate in "regional monitoring" of beach water quality replaces requirements to conduct "core monitoring" of beach water quality, as provided for in Appendix III of the 2012 California Ocean Plan.

ADMINISTRATIVE FINDINGS

15. **Effect of this Order.** This Order amends Order No. R9-2013-0001 to:

    a. Enroll the County of Orange, the Orange County Flood Control District and the south Orange County Cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano as Copermittees responsible for compliance with the terms and conditions of Order No. R9-2013-0001,as amended by this Order;

    b. Designate the San Diego Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the Cities of Laguna Woods and Laguna Hills and the Santa Ana Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the City of Lake Forest, subject to the terms of the agreement between San Diego Water Board and the Santa Ana Water Board described in Finding 7 of this Order;

c. Establish interim exceptions to land development requirements for those Priority Development Projects that discharge to engineered channels and large river reaches described in Finding 3 of this Order;

d. Incorporate the amended requirements of the State Water Board's General Exception to require that pollutant reductions be achieved within 6 years for storm water and nonpoint source discharges to ASBS;

e. Incorporate applicable requirements of the Los Penasquitos Lagoon Sediment TMDL; *and*

f. Require the Orange County Copermittees to implement the "*Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County,*" dated September 2014, made effective in the Monitoring and Reporting Program/Order issued pursuant to California Water Code sections 13225, 13267, and 13383 and subject to future revisions by the Executive Officer after appropriate public input.

16. **Effect of this Order.** Order No. R9-2013-0001 is not being reopened for any other purpose than the revisions contained herein. Except as contradicted or superseded by the findings and directives set forth in this Order, all of the previous findings and directives of Order No. R9-2013-0001 shall remain in full force and effect.

17. **California Environmental Quality Act**. This action is exempt from the requirement of preparation of environmental documents under the California Environmental Quality Act [Public Resources Code, Division 13, Chapter 3, Section 21000 et seq.] in accordance with California Water Code section 13389.

18. **Public Notice.** In accordance with State and federal laws and regulations, the San Diego Water Board has notified San Diego County, Orange County and Riverside County Copermittees, and all known interested agencies and persons of its intent to adopt this Order and has provided them with an opportunity to submit their written comments and recommendations.

19. **Public Hearing.** The San Diego Water Board held a public hearing on February 11, 2015 and heard and considered all comments pertaining to the adoption of this Order.

20. **Notification.** Any person aggrieved by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with California Water Code section 13320 and California Code of Regulations, title 23, sections 2050 et seq. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date of this Order. Copies of the law and regulations applicable to filing petitions may be found on the Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

THEREFORE, IT IS HEREBY ORDERED,

1. This Order amends the Regional MS4 Permit, Order No. R9-2013-0001 and the Fact Sheet (Attachment F of the Order) as described in the revised versions of Order No. R9-2013-0001 and Fact Sheet included as Attachments 1 and 2 to this Order. Added text to Order No. R9-2013-0001 and the Fact Sheet is displayed in blue-underline text and deleted text is displayed as ~~red-strikeout~~ text.

2. The amended version of Order No. 2013-0001 and Fact Sheet included as Attachments 1 and 2 to this Order shall become effective on April 1, 2015.

3. Amended Order No. R9-2013-0001 shall supersede Order No. R9-2009-0002 for the Orange County Copermittees except for enforcement purposes.

4. San Diego Water Board staff is directed to prepare and post a conformed copy of Order No. R9-2013-0001 and the Fact Sheet incorporating the revisions made by this Order.

I, David W. Gibson, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on February 11, 2015.

_____
David W. Gibson
Executive Officer

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

ORDER NO. R9-2013-0001
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The San Diego County Copermittees in Table 1a are subject to waste discharge requirements set forth in this Order.

Table 1a. San Diego County Copermittees

City of Carlsbad	City of Oceanside
City of Chula Vista	City of Poway
City of Coronado	City of San Diego
City of Del Mar	City of San Marcos
City of El Cajon	City of Santee
City of Encinitas	City of Solana Beach
City of Escondido	City of Vista
City of Imperial Beach	County of San Diego
City of La Mesa	San Diego County Regional Airport Authority
City of Lemon Grove	San Diego Unified Port District
City of National City	

~~After the San Diego Water Board receives and considers~~ T~~t~~he Orange County Copermittees~~' Report of Waste Discharge and makes any necessary changes to this Order, the Orange County Copermittees~~ in Table 1b are ~~will become~~ subject to waste discharge requirements set forth in this Order. ~~after expiration of Order No. R9-2009-0002, NPDES No. CAS0108740 on or after December 16, 2014.~~

Table 1b. Orange County Copermittees

City of Aliso Viejo	City of Rancho Santa Margarita
City of Dana Point	City of San Clemente
City of Laguna Beach	City of San Juan Capistrano
City of Laguna Hills	City of Laguna Woods
City of Laguna Niguel	County of Orange
City of Lake Forest[1]	Orange County Flood Control District
City of Mission Viejo	

[1] The MS4 discharges within the jurisdiction of the City of Lake Forest located in the San Diego Region will be regulated by the Santa Ana Water Board Order No. R8-2014-0002 (NPDES No. CAS618030) and any reissuance thereto subject to the terms of the agreement between San Diego Water Board and Santa Ana Water Board.

After the San Diego Water Board receives and considers the Riverside County Copermittees' Report of Waste Discharge and makes any necessary changes to this Order, the Riverside County Copermittees in Table 1c will become subject to waste discharge requirements set forth in this Order after expiration of Order No.R9-2010-0016, NPDES No. CAS0108766 on or after November 10, 2015.

Table 1c. Riverside County Copermittees

City of Murrieta	County of Riverside
City of Temecula	Riverside County Flood Control and Water Conservation District
City of Wildomar	

The ~~Orange County Copermittees and~~ Riverside County Copermittees may become subject to the requirements of this Order at a date earlier than the expiration date of their current Order~~s~~ subject to the conditions described in Provision F.6 of this Order if the Riverside County Copermittees ~~in the respective county~~ receive ~~a~~ notification of coverage from the San Diego Water Board.

The term Copermittee in this Order refers to any San Diego County, Orange County, or Riverside County Copermittee covered under this Order, unless specified otherwise.

This Order provides permit coverage for the Copermittee discharges described in Table 2.

Table 2. Discharge Locations and Receiving Waters

Discharge Points	Locations throughout San Diego Region
Discharge Description	Municipal Separate Storm Sewer System (MS4) Discharges
Receiving Waters	Inland Surface Waters, Enclosed Bays and Estuaries, and Coastal Ocean Waters of the San Diego Region

Table 3. Administrative Information

This Order was adopted by the San Diego Water Board on:	**May 8, 2013**
~~This~~ Order R9-2013-0001 ~~will become~~ became effective on:	**June 27, 2013**
This Order as amended by R9-2015-0001 became effective on:	**April 1, 2015**
This Order will expire on:	**June 27, 2018**
The Copermittees must file a Report of Waste Discharge in accordance with Title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than 180 days in advance of the Order expiration date.	

I, David W. Gibson, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on May 8, 2013, as amended by adoption of Order No. R9-2015-0001 on February 11, 2015.

David W. Gibson
Executive Officer

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I. FINDINGS

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), finds that:

JURISDICTION

1. **MS4 Ownership or Operation.** Each of the Copermittees owns or operates an MS4, through which it discharges storm water and non-storm water into waters of the U.S. within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the U.S.

2. **Legal and Regulatory Authority.** This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]) adopted by the United States Environmental Protection Agency (USEPA), and chapter 5.5, division 7 of the California Water Code (CWC) (commencing with section 13370). This Order serves as an NPDES permit for discharges from MS4s to surface waters. This Order also serves as waste discharge requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

   The San Diego Water Board has the legal authority to issue a regional MS4 permit pursuant to its authority under CWA section 402(p)(3)(B) and 40 CFR 122.26(a)(1)(v). The USEPA also made it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide permits (55 Federal Register [FR] 47990, 48039-48042). The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees and San Diego Water Board.

   The federal regulations make it clear that the Copermittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators (40 CFR 122.26(a)(3)(vi)). This Order does not require the Copermittees to manage storm water outside of their jurisdictional boundaries, but rather to work collectively to improve storm water management within watersheds.

3. **CWA NPDES Permit Conditions.** Pursuant to CWA section 402(p)(3)(B), NPDES permits for storm water discharges from MS4s must include requirements to effectively prohibit non-storm water discharges into MS4s, and require controls to reduce the discharge of pollutants in storm water to the maximum extent practicable (MEP), and to require other provisions as the San Diego Water Board determines are appropriate to control such pollutants. This Order prescribes conditions to assure

compliance with the CWA requirements for owners and operators of MS4s to effectively prohibit non-storm water discharges into the MS4s, and require controls to reduce the discharge of pollutants in storm water from the MS4s to the MEP.

4. **CWA and CWC Monitoring Requirements.** CWA section 308(a) and 40 CFR 122.41(h),(j)-(l) and 122.48 require that NPDES permits must specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s also specify additional monitoring and reporting requirements in 40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c). CWC section 13383 authorizes the San Diego Water Board to establish monitoring, inspection, entry, reporting and recordkeeping requirements. This Order establishes monitoring and reporting requirements to implement federal and State requirements. This Order also includes requirements for the Orange County Copermittees to implement a unified approach to beach water quality monitoring and assessment as set forth in Monitoring and Reporting Program No. XX, issued pursuant to CWC sections 13225, 13267, and 13383.

5. **Total Maximum Daily Loads.** CWA section 303(d)(1)(A) requires that "[e]ach state shall identify those waters within its boundaries for which the effluent limitations are not stringent enough to implement any water quality standard applicable to such waters." The CWA also requires states to establish a priority ranking of impaired water bodies known as Water Quality Limited Segments and to establish Total Maximum Daily Loads (TMDLs) for such waters. This priority list of impaired water bodies is called the Clean Water Act Section 303(d) List of Water Quality Limited Segments, commonly referred to as the 303(d) List. The CWA requires the 303(d) List to be updated every two years.

   TMDLs are numerical calculations of the maximum amount of a pollutant that a water body can assimilate and still meet water quality standards. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point sources (waste load allocations or WLAs) and non-point sources (load allocations or LAs), background contribution, plus a margin of safety. Discharges from MS4s are point source discharges. The federal regulations (40 CFR 122.44(d)(1)(vii)(B)) require that NPDES permits incorporate water quality based effluent limitations (WQBELs) developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, consistent with the assumptions and requirements of any available WLA for the discharge. Requirements of this Order implement the TMDLs established ~~adopted~~ by the San Diego Water Board or ~~and approved by~~ USEPA as of the time this Order was ~~is issued~~ amended in 2015. This Order establishes WQBELs consistent with the assumptions and requirements of all available TMDL WLAs assigned to discharges from the Copermittees' MS4s.

6. **Non-Storm Water Discharges.** Pursuant to CWA section 402(p)(3)(B)(ii), this Order requires each Copermittee to effectively prohibit discharges of non-storm water into its MS4. Nevertheless, non-storm water discharges into and from the MS4s continue to be reported to the San Diego Water Board by the Copermittees

and other persons. Monitoring conducted by the Copermittees, as well as the 303(d) List, have identified dry weather, non-storm water discharges from the MS4s as a source of pollutants causing or contributing to receiving water quality impairments in the San Diego Region. The federal regulations (40 CFR 122.26(d)(2)(iv)(B)(1)) require the Copermittees to have a program to prevent illicit discharges to the MS4. The federal regulations, however, allow for specific categories of non-storm water discharges or flows to be addressed as illicit discharges only where such discharges are identified as sources of pollutants to waters of the U.S.

7. **In-Stream Treatment Systems.** Pursuant to federal regulations (40 CFR 131.10(a)), in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S. Authorizing the construction of a runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to accepting waste assimilation as an appropriate use for that water body. Runoff treatment must occur prior to the discharge of runoff into receiving waters. Treatment control best management practices (BMPs) must not be constructed in waters of the U.S. Construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body.

DISCHARGE CHARACTERISTICS AND RUNOFF MANAGEMENT

8. **Point Source Discharges of Pollutants.** Discharges from the MS4s contain waste, as defined in the CWC, and pollutants that adversely affect the quality of the waters of the state. A discharge from an MS4 is a “discharge of pollutants from a point source” into waters of the U.S. as defined in the CWA. Storm water and non-storm water discharges from the MS4s contain pollutants that cause or threaten to cause a violation of surface water quality standards, as outlined in the Water Quality Control Plan for the San Diego Basin (Basin Plan). Storm water and non-storm water discharges from the MS4s are subject to the conditions and requirements established in the Basin Plan for point source discharges.

9. **Potential Beneficial Use Impairment.** The discharge of pollutants and/or increased flows from MS4s may cause or threaten to cause the concentration of pollutants to exceed applicable receiving water quality objectives and impair or threaten to impair designated beneficial uses resulting in a condition of pollution, contamination, or nuisance.

10. **Pollutants Generated by Land Development.** Land development has created and continues to create new sources of non-storm water discharges and pollutants in storm water discharges as human population density increases. This brings higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash. Pollutants from these sources are dumped or washed off the surface by non-storm water or storm water flows into and from the MS4s. When development converts natural vegetated pervious ground

cover to impervious surfaces such as paved highways, streets, rooftops, and parking lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving a developed area without BMPs that can maintain pre-development runoff conditions will contain greater pollutant loads and have significantly greater runoff volume, velocity, and peak flow rate than pre-development runoff conditions from the same area.

11. **Runoff Discharges to Receiving Waters.** The MS4s discharge runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within the eleven hydrologic units comprising the San Diego Region. Historic and current development makes use of natural drainage patterns and features as conveyances for runoff. Rivers, streams and creeks in developed areas used in this manner are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and receiving water. Numerous receiving water bodies and water body segments have been designated as impaired by the San Diego Water Board pursuant to CWA section 303(d).

12. **Pollutants in Runoff.** The most common pollutants in runoff discharged from the MS4s include total suspended solids, sediment, pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., cadmium, copper, lead, and zinc), petroleum products and polynuclear aromatic hydrocarbons, synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus), oxygen-demanding substances (e.g., decaying vegetation, animal waste), detergents, and trash. As operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not prohibit or otherwise control. These discharges may cause or contribute to a condition of pollution or a violation of water quality standards.

13. **Human Health and Aquatic Life Impairment.** Pollutants in runoff discharged from the MS4s can threaten and adversely affect human health and aquatic organisms. Adverse responses of organisms to chemicals or physical agents in runoff range from physiological responses such as impaired reproduction or growth anomalies to mortality. Increased volume, velocity, rate, and duration of storm water runoff greatly accelerate the erosion of downstream natural channels. This alters stream channels and habitats and can adversely affect aquatic and terrestrial organisms.

14. **Water Quality Effects.** The Copermittees' water quality monitoring data submitted to date documents persistent exceedances of Basin Plan water quality objectives for runoff-related pollutants at various watershed monitoring stations. Persistent toxicity has also been observed at several watershed monitoring stations. In addition, bioassessment data indicate that the majority of the monitored receiving waters have Poor to Very Poor Index of Biological Integrity (IBI) ratings. These findings indicate

that runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in the San Diego Region. Non-storm water discharges from the MS4s have been shown to contribute significant levels of pollutants and flow in arid, developed Southern California watersheds, and contribute significantly to exceedances of applicable receiving water quality objectives.

15. **Non-Storm Water and Storm Water Discharges.** Non-storm water discharges from the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard of CWA section 402(p)(3)(B)(iii), which is explicitly for "Municipal … *Stormwater Discharges* (emphasis added)" from the MS4s. Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s must be effectively prohibited.

16. **Best Management Practices.** Waste and pollutants which are deposited and accumulate in MS4 drainage structures will be discharged from these structures to waters of the U.S. unless they are removed. These discharges may cause or contribute to, or threaten to cause or contribute to, a condition of pollution in receiving waters. For this reason, pollutants in storm water discharges from the MS4s can be and must be effectively reduced in runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Pollution prevention is the reduction or elimination of pollutant generation at its source and is the best "first line of defense." Source control BMPs (both structural and non-structural) minimize the contact between pollutants and runoff, therefore keeping pollutants onsite and out of receiving waters. Treatment control BMPs remove pollutants that have been mobilized by storm water or non-storm water flows.

17. **BMP Implementation.** Runoff needs to be addressed during the three major phases of development (planning, construction, and use) in order to reduce the discharge of storm water pollutants to the MEP, effectively prohibit non-storm water discharges, and protect receiving waters. Development which is not guided by water quality planning policies and principles can result in increased pollutant load discharges, flow rates, and flow durations which can negatively affect receiving water beneficial uses. Construction sites without adequate BMP implementation result in sediment runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. Existing development can generate substantial pollutant loads which are discharged in runoff to receiving waters. Retrofitting areas of existing development with storm water pollutant control and hydromodification management BMPs is necessary to address storm water discharges from existing development that may cause or contribute to a condition of pollution or a violation of water quality standards.

18. **Water Quality Improvements.** Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges to the MS4s and control pollutants in storm water

discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the CWA.

19. **Long Term Planning and Implementation.** Federal regulations require municipal storm water permits to expire 5 years from adoption, after which the permit must be renewed and reissued. The San Diego Water Board recognizes that the degradation of water quality and impacts to beneficial uses of the waters in the San Diego Region occurred over several decades. The San Diego Water Board further recognizes that a decade or more may be necessary to realize demonstrable improvement to the quality of waters in the San Diego Region. This Order includes a long term planning and implementation approach that will require more than a single permit term to complete.

WATER QUALITY STANDARDS

20. **Basin Plan.** The San Diego Water Board adopted the Water Quality Control Plan for the San Diego Basin (Basin Plan) on September 8, 1994, that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for receiving waters addressed through the plan. The Basin Plan was subsequently approved by the State Water Resources Control Board (State Water Board) on December 13, 1994. Subsequent revisions to the Basin Plan have also been adopted by the San Diego Water Board and approved by the State Water Board. Requirements of this Order implement the Basin Plan.

    The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Process Supply (PROC), Industrial Service Supply (IND), Ground Water Recharge (GWR), Contact Water Recreation (REC1), Non-contact Water Recreation (REC2), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Freshwater Replenishment (FRSH), Hydropower Generation (POW), and Preservation of Biological Habitats of Special Significance (BIOL). The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region: Navigation (NAV), Commercial and Sport Fishing (COMM), Estuarine Habitat (EST), Marine Habitat (MAR), Aquaculture (AQUA), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN), and Shellfish Harvesting (SHELL).

21. **Ocean Plan.** The State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, and 2005. The State Water Board adopted the latest amendment on April 21, 2005 and it became effective on February 14, 2006. The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean. Requirements of this Order implement the Ocean Plan.

    The Ocean Plan identifies the following beneficial uses of ocean waters of the state to be protected: Industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture; preservation and enhancement of designated Areas of Special Biological Significance; rare and endangered species; marine habitat; fish spawning and shellfish harvesting.

22. **Sediment Quality Control Plan**. On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes: 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

23. **National Toxics Rule and California Toxics Rule.** USEPA adopted the National Toxics Rule (NTR) on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the NTR applied in California. On May 18, 2000, USEPA adopted the California Toxics Rule (CTR). The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants.

24. **Antidegradation Policy.** This Order is in conformance with the federal Antidegradation Policy described in 40 CFR 131.12, and State Water Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality Waters in California*. Federal regulations at 40 CFR 131.12 require that the State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. State Water Board Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies.

25. **Anti-Backsliding Requirements.** Section 402(o)(2) of the CWA and federal regulations at 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-

backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations may be relaxed. All effluent limitations in this Order are at least as stringent as effluent limitations in the previous permits.

CONSIDERATIONS UNDER FEDERAL AND STATE LAW

26. **Coastal Zone Act Reauthorization Amendments.** Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states with approved coastal zone management programs to address non-point source pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point source pollution: agriculture, silviculture, urban, marinas, and hydromodification. This Order addresses the management measures required for the urban category, with the exception of septic systems. The runoff management programs developed pursuant to this Order fulfills the need for coastal cities to develop a runoff non-point source plan identified in the Non-Point Source Program Strategy and Implementation Plan. The San Diego Water Board addresses septic systems through the administration of other programs.

27. **Endangered Species Act.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 USC sections 1531 to 1544). This Order requires compliance with receiving water limits, and other requirements to protect the beneficial uses of waters of the State. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

28. **Report of Waste Discharge Process.** The waste discharge requirements set forth in this Order are based upon the Report of Waste Discharge submitted by the San Diego County Copermittees prior to the expiration of Order No. R9-2007-0001 (NPDES No. CAS0109266) and the Report of Waste Discharge submitted by the Orange County Copermittees prior to the expiration of Order No. R9-2009-0002 (CAS0108740). The ~~Orange County and~~ Riverside County Copermittees are not immediately covered by the waste discharge requirements in this Order. The San Diego Water Board understands that each municipality is unique although the Counties share watersheds and/or geographical boundaries. The Order will continue to use the Report of Waste Discharge process prior to initially making ~~Orange County or~~ Riverside County Copermittees subject to the requirements of this Order.

The federal regulations (40 CFR 122.21(d)(2)) and CWC section 13376 impose a duty on the Copermittees to reapply for continued coverage through submittal of a Report of Waste Discharge no later than 180 days prior to expiration of a currently effective permit. This requirement is set forth in the ~~Orange County Copermittees' and~~ Riverside County Copermittees' currently effective permit~~s~~ at Provision~~s K.2.b~~

~~and~~ K.2.c~~, respectively~~. The ~~Orange County Permit, Order No. R9-2009-0002 (NPDES No. CAS0108740) expires on December 16, 2014 and the~~ Riverside County MS4 Permit, Order No. R9-2010-0016 (NPDES No. CAS0108766) expires on November 10, 2015.

Unless the ~~Orange County or~~ Riverside County Copermittees apply for and receive early coverage under this Order, ~~the Orange County Copermittees' and~~ the Riverside County Copermittees' ~~respective~~ permit~~s~~ will be superseded by this Order upon expiration of their ~~respective~~ permit~~s~~, subject to any necessary revisions to the requirements of this Order made after the San Diego Water Board considers their ~~respective~~ Report~~s~~ of Waste Discharge through the public process provided in 40 CFR Part 124.

29. **Regional Water Board Designation.** The Cities of Laguna Hills, Laguna Woods, and Lake Forest are located partially within the jurisdictions of the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board) and the San Diego Water Board and their dischargers are subject to regulation by both Regional Water Boards. Pursuant to CWC section13228, the Cities of Laguna Hills, Laguna Woods, and Lake Forest submitted written requests that one Regional Water Board be designated to regulate Phase I MS4 discharges for each of the Cities. The Santa Ana Water Board and the San Diego Water Board have entered into an agreement whereby the San Diego Water Board is designated to regulate Phase I MS4 discharges within the jurisdiction of the Cities of Laguna Woods and Laguna Hills and the Santa Ana Water Board is designated to regulate Phase I MS4 discharges within the jurisdiction of the City of Lake Forest pursuant to MS4 permits administered by each Regional Water Board. The agreement provides that the City of Lake Forest will be required to retain, and continue implementation of, its over-irrigation discharge prohibition in Title 15, Chapter 14.030, List (b) of the City Municipal Code for regulating storm water quality throughout its jurisdiction. The City of Lake Forest will also be required to actively participate during development and implementation of the Aliso Creek Watershed Management Area Water Quality Improvement Plan required pursuant to this Order. Each Regional Water Board retains the authority to enforce provisions of the Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee (Water Code section 13228 (b)). Under the terms of the agreement, any TMDL and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Laguna Woods, Laguna Hills or Lake Forest as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement of the applicable TMDL will remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's San Diego Creek/Newport Bay TMDL and the San Diego Water Board's Indicator Bacteria Project I Beaches and Creeks TMDL. The San Diego Water Board will periodically review the effectiveness of the agreement during each MS4 permit reissuance. Based on this periodic review the San Diego Water

Board may terminate the agreement with Santa Ana Water Board or otherwise modify the agreement subject to the approval of the Santa Ana Water Board.

~~29.~~30. **Integrated Report and Clean Water Act Section 303(d) List.** The San Diego Water Board and State Water Board submit an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. USEPA issued its *Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act* on July 29, 2005, which advocates the use of a five category approach for classifying the attainment status of water quality standards for water bodies in the Integrated Report. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 in the Integrated Report are placed on the 303(d) List.

Water bodies with available data and/or information that indicate at least one beneficial use is not being supported or is threatened, but a TMDL is not required, are included in Category 4 in the Integrated Report. Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

Implementation of the requirements of this Order may allow the San Diego Water Board to include surface waters impaired by discharges from the Copermittees' MS4s in Category 4 in the Integrated Report for consideration during the next 303(d) List submittal by the State to USEPA.

~~30.~~31. **Economic Considerations.** The California Supreme Court has ruled that although CWC section 13263 requires the State and Regional Water Boards (collectively Water Boards) to consider factors set forth in CWC section 13241 when issuing an NPDES permit, the Water Board may not consider the factors to justify imposing pollutant restrictions that are less stringent than the applicable federal regulations require. (*City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 618, 626-627.) However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

As noted in the following finding, the San Diego Water Board finds that the requirements in this Order are not more stringent than the minimum federal requirements. Therefore, a CWC section 13241 analysis is not required for permit requirements that implement the effective prohibition on the discharge of non-storm water into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has

determined appropriate to control such pollutants, as those requirements are mandated by federal law. Notwithstanding the above, the San Diego Water Board has developed an economic analysis of the requirements in this Order. The economic analysis is provided in the Fact Sheet.

31.32. **Unfunded Mandates.** This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following:

a. This Order implements federally mandated requirements under CWA section 402 (33 USC section 1342(p)(3)(B)).

b. The local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental and new dischargers who are issued NPDES permits for storm water and non-storm water discharges.

c. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order.

d. The Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)) and in lieu of numeric restrictions on their MS4 discharges (i.e. effluent limitations).

e. The local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under State law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

f. The provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state develops a TMDL, federal law requires that permits must contain water quality based effluent limitations consistent with the assumptions and requirements of any applicable wasteload allocation (40 CFR 122.44(d)(1)(vii)(B)).

See the Fact Sheet for further discussion of unfunded mandates.

32.33. **California Environmental Quality Act.** The issuance of waste discharge requirements and an NPDES permit for the discharge of runoff from MS4s to waters of the U.S. is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 et seq.) in accordance with CWC section 13389.

STATE WATER BOARD DECISIONS

33.34. Compliance with Prohibitions and Limitations. The receiving water limitation language specified in this Order is consistent with language recommended by the USEPA and established in State Water Board Order WQ 99-05, *Own Motion Review of the Petition of Environmental Health Coalition to Review Waste Discharge Requirements Order No. 96-03, NPDES Permit No. CAS0108740*, adopted by the State Water Board on June 17, 1999. The receiving water limitation language in this Order requires storm water discharges from MS4s to not cause or contribute to a violation of water quality standards, which is to be achieved through an iterative approach requiring the implementation of improved and better-tailored BMPs over time. Implementation of the iterative approach to comply with receiving water limitations based on applicable water quality standards is necessary to ensure that storm water discharges from the MS4 will not ultimately cause or contribute to violations of water quality standards and will not create conditions of pollution, contamination, or nuisance.

34.35. Special Conditions for Areas of Special Biological Significance. On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving an general exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges (General Exception). On June 19, 2012, the State Water Board adopted Order No. 2012-0031, amending the General Exception to require pollutant reductions to be achieved within six years in accordance with ASBS Compliance Plans and ASBS Pollution Prevention Plans. The General Exception State Water Board Resolution No. 2012-0012 requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject to the terms and conditions of the General Exception as amended State Water Board Resolution No. 2012-0012. The Special Protections contained in Attachment B to the General Exception as amendedResolution No. 2012-0012, are applicable to these discharges, and are hereby incorporated into Attachment A of this Order. as if fully set forth herein.

ADMINISTRATIVE FINDINGS

35.36. Executive Officer Delegation of Authority. The San Diego Water Board by prior resolution has delegated all matters that may legally be delegated to its Executive Officer to act on its behalf pursuant to CWC section 13223. Therefore, the Executive Officer is authorized to act on the San Diego Water Board's behalf on any matter within this Order unless such delegation is unlawful under CWC section 13223 or this Order explicitly states otherwise.

36.37. Standard Provisions. Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR 122.42, are provided in Attachment B to this Order.

37.38. Fact Sheet. The Fact Sheet for this Order contains background information, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of this Order. The Fact Sheet is hereby incorporated into this Order and constitutes part of the Findings of this Order.

38.39. Public Notice. In accordance with State and federal laws and regulations, the San Diego Water Board notified the Copermittees, and interested agencies and persons of its intent to prescribe waste discharge requirements for the control of discharges into and from the MS4s to waters of the U.S. and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet.

39.40. Public Hearings. The San Diego Water Board held a public hearing on April 10 and 11, 2013, that was continued to May 8, 2013 and heard and considered all comments pertaining to the terms and conditions of this Order. The San Diego Water Board also held a public hearing on February 11, 2015, and heard and considered all comments pertaining to the amendment of this Order through Order No. R9-2015-0001. Details of these public hearing are provided in the Fact Sheet.

40.41. Effective Date. This Order serves as an NPDES permit pursuant to CWA section 402 or amendments thereto, and as to the San Diego County Copermittees listed in Table 2.a., became becomes effective fifty (50) days after the date of its adoption, and as to the Orange County Copermittees listed in Table 2.b., becomes effective on April 1, 2015 after the date Order R9-2015-0001 is adopted, provided that the Regional Administrator, USEPA, Region IX, does not object to this Order.

41.42. Review by the State Water Board. Any person aggrieved by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with CWC section 13320 and California Code of Regulations, title 23, sections 2050, et seq and following. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date of this Order San Diego Water Board action, except that if the thirtieth day following the actiondate of this Order falls on a Saturday, Sunday or State holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

THEREFORE, IT IS HEREBY ORDERED that the Copermittees, in order to meet the provisions contained in division 7 of the CWC (commencing with section 13000) and regulations adopted thereunder, and the provisions of the CWA and regulations adopted thereunder, must each comply with the requirements of this Order. This action in no way prevents the San Diego Water Board from taking enforcement action for past violations of the previous Order. If any part of this Order is subject to a temporary stay of enforcement, unless otherwise specified, the Copermittees must comply with the analogous portions of the previous Order, which will remain in effect for all purposes during the pendency of the stay.

II. PROVISIONS

A. PROHIBITIONS AND LIMITATIONS

The purpose of this provision is to describe the conditions under which storm water and non-storm water discharges into and from MS4s are prohibited or limited. The goal of the prohibitions and limitations is to protect the water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through the implementation of water quality improvement strategies and runoff management programs that effectively prohibit non-storm water discharges into the Copermittees' MS4s, and reduce pollutants in storm water discharges from the Copermittees' MS4s to the MEP.

1. Discharge Prohibitions

a. Discharges from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the state are prohibited.

b. Non-storm water discharges into MS4s are to be effectively prohibited, through the implementation of Provision E.2, unless such discharges are authorized by a separate NPDES permit.

c. Discharges from MS4s are subject to all waste discharge prohibitions in the Basin Plan, included in Attachment A to this Order.

d. Storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 applicable to these discharges, included in Attachment A to this Order. All other discharges from the Copermittees' MS4s to ASBS are prohibited.

2. Receiving Water Limitations

a. Discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters, including but not limited to all applicable provisions contained in:

(1) The San Diego Water Board's Basin Plan, including beneficial uses, water quality objectives, and implementation plans;

(2) State Water Board plans for water quality control including the following:

(a) Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries (Thermal Plan), and

(b) The Ocean Plan, including beneficial uses, water quality objectives, and implementation plans;

(3) State Water Board policies for water and sediment quality control including the following:

(a) Water Quality Control Policy for the Enclosed Bays and Estuaries of California,

(b) Sediment Quality Control Plan which includes the following narrative objectives for bays and estuaries:

(i) Pollutants in sediments shall not be present in quantities that, alone or in combination, are toxic to benthic communities, and

(ii) Pollutants shall not be present in sediments at levels that will bioaccumulate in aquatic life to levels that are harmful to human health,

(c) The Statement of Policy with Respect to Maintaining High Quality of Waters in California;[2]

(4) Priority pollutant criteria promulgated by the USEPA through the following:

(a) National Toxics Rule (NTR)[3] (promulgated on December 22, 1992 and amended on May 4, 1995), and

(b) California Toxics Rule (CTR).[4,5]

b. Discharges from MS4s composed of storm water runoff must not alter natural ocean water quality in an ASBS.

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[2] State Water Board Resolution No. 68-16
[3] 40 CFR 131.36
[4] 65 Federal Register 31682-31719 (May 18, 2000), adding Section 131.38 to 40 CFR
[5] If a water quality objective and a CTR criterion are in effect for the same priority pollutant, the more stringent of the two applies.

3. Effluent Limitations

a. Technology Based Effluent Limitations

Pollutants in storm water discharges from MS4s must be reduced to the MEP.[6]

b. Water Quality Based Effluent Limitations

Each Copermittee must comply with applicable WQBELs established for the TMDLs in Attachment E to this Order, pursuant to the applicable TMDL compliance schedules.

4. Compliance with Discharge Prohibitions and Receiving Water Limitations

Each Copermittee must achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order through timely implementation of control measures and other actions as specified in Provisions B and E of this Order, including any modifications. The Water Quality Improvement Plans required under Provision B must be designed and adapted to ultimately achieve compliance with Provisions A.1.a, A.1.c and A.2.a.

a. If exceedance(s) of water quality standards persist in receiving waters notwithstanding implementation of this Order, the Copermittees must comply with the following procedures:

(1) For exceedance(s) of a water quality standard in the process of being addressed by the Water Quality Improvement Plan, the Copermittee(s) must implement the Water Quality Improvement Plan as accepted by the San Diego Water Board, and update the Water Quality Improvement Plan, as necessary, pursuant to Provision F.2.c;

(2) Upon a determination by either the Copermittees or the San Diego Water Board that discharges from the MS4 are causing or contributing to a new exceedance of an applicable water quality standard not addressed by the Water Quality Improvement Plan, the Copermittees must submit the following updates to the Water Quality Improvement Plan pursuant to Provision F.2.c or as part of the Water Quality Improvement Plan Annual Report required under Provision F.3.b, unless the San Diego Water Board directs an earlier submittal:

(a) The water quality improvement strategies being implemented that are effective and will continue to be implemented,

[6] This does not apply to MS4 discharges which receive subsequent treatment to reduce pollutants in storm water discharges to the MEP prior to entering receiving waters (e.g., low flow diversions to the sanitary sewer). Runoff treatment must occur prior to the discharge of runoff into receiving waters per Finding 7.

(b) Water quality improvement strategies (i.e. BMPs, retrofitting projects, stream and/or habitat rehabilitation projects, adjustments to jurisdictional runoff management programs, etc.) that will be implemented to reduce or eliminate any pollutants or conditions that are causing or contributing to the exceedance of water quality standards,

(c) Updates to the schedule for implementation of the existing and additional water quality improvement strategies, and

(d) Updates to the monitoring and assessment program to track progress toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a of this Order;

(3) The San Diego Water Board may require the incorporation of additional modifications to the Water Quality Improvement Plan required under Provision B. The applicable Copermittees must submit any modifications to the update to the Water Quality Improvement Plan within 90 days of notification that additional modifications are required by the San Diego Water Board, or as otherwise directed;

(4) Within 90 days of the San Diego Water Board determination that the modifications to the Water Quality Improvement Plan required under Provision A.4.a.(3) meet the requirements of this Order, the applicable Copermittees must revise the jurisdictional runoff management program documents to incorporate the modified water quality improvement strategies that have been and will be implemented, the implementation schedule, and any additional monitoring required; and

(5) Each Copermittee must implement the updated Water Quality Improvement Plan.

b. The procedure set forth above to achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order do not have to be repeated for continuing or recurring exceedances of the same water quality standard(s) following implementation of scheduled actions unless directed to do otherwise by the San Diego Water Board.

c. Nothing in Provisions A.4.a and A.4.b prevents the San Diego Water Board from enforcing any provision of this Order while the applicable Copermittees prepare and implement the above update to the Water Quality Improvement Plan and jurisdictional runoff management programs.

B. WATER QUALITY IMPROVEMENT PLANS

The purpose of this provision is to develop Water Quality Improvement Plans that guide the Copermittees' jurisdictional runoff management programs towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plans is to further the Clean Water Act's objective to protect, preserve, enhance, and restore the water quality and designated beneficial uses of waters of the state. This goal will be accomplished through an adaptive planning and management process that identifies the highest priority water quality conditions within a watershed and implements strategies through the jurisdictional runoff management programs to achieve improvements in the quality of discharges from the MS4s and receiving waters.

1. Watershed Management Areas

The Copermittees must develop a Water Quality Improvement Plan for each of the Watershed Management Areas in Table B-1. A total of ten Water Quality Improvement Plans must be developed for the San Diego Region.

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
San Juan (901.00)	South Orange County	- Aliso Creek - San Juan Creek - San Mateo Creek - Pacific Ocean - Heisler Park ASBS	- City of Aliso Viejo[~~1~~] - City of Dana Point[~~1~~] - City of Laguna Beach[~~1~~] - City of Laguna Hills[1] - City of Laguna Niguel[~~1~~] - City of Laguna Woods[1] - City of Lake Forest[~~1~~2] - City of Mission Viejo[~~1~~] - City of Rancho Santa Margarita[~~1~~] - City of San Clemente[1] - City of San Juan Capistrano[~~1~~] - County of Orange[~~1~~] - Orange County Flood Control District[~~1~~]
Santa Margarita (902.00)	Santa Margarita River	- Murrieta Creek - Temecula Creek - Santa Margarita River - Santa Margarita Lagoon - Pacific Ocean	- City of Murrieta[~~2~~3] - City of Temecula[~~2~~3] - City of Wildomar[~~2~~3] - County of Riverside[~~2~~3] - County of San Diego[~~3~~4] - Riverside County Flood Control and Water Conservation District[~~2~~3]
San Luis Rey (903.00)	San Luis Rey River	- San Luis Rey River - San Luis Rey Estuary - Pacific Ocean	- City of Oceanside - City of Vista - County of San Diego

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
Carlsbad (904.00)	Carlsbad	- Loma Alta Slough - Buena Vista Lagoon - Agua Hedionda Lagoon - Batiquitos Lagoon - San Elijo Lagoon - Pacific Ocean	- City of Carlsbad - City of Encinitas - City of Escondido - City of Oceanside - City of San Marcos - City of Solana Beach - City of Vista - County of San Diego
San Dieguito (905.00)	San Dieguito River	- San Dieguito River - San Dieguito Lagoon - Pacific Ocean	- City of Del Mar - City of Escondido - City of Poway - City of San Diego - City of Solana Beach - County of San Diego
Penasquitos (906.00)	Penasquitos	- Los Penasquitos Lagoon - Pacific Ocean	- City of Del Mar - City of Poway - City of San Diego - County of San Diego
	Mission Bay	- Mission Bay - Pacific Ocean - San Diego Marine Life Refuge ASBS	- City of San Diego
San Diego (907.00)	San Diego River	- San Diego River - Pacific Ocean	- City of El Cajon - City of La Mesa - City of San Diego - City of Santee - County of San Diego
Pueblo San Diego (908.00) Sweetwater (909.00) Otay (910.00)	San Diego Bay	- Sweetwater River - Otay River - San Diego Bay - Pacific Ocean	- City of Chula Vista - City of Coronado - City of Imperial Beach - City of La Mesa - City of Lemon Grove - City of National City - City of San Diego - County of San Diego - San Diego County Regional Airport Authority - San Diego Unified Port District
Tijuana (911.00)	Tijuana River	- Tijuana River - Tijuana Estuary - Pacific Ocean	- City of Imperial Beach - City of San Diego - County of San Diego

Notes:

1. The MS4 discharges within the jurisdiction of the City of Laguna Hills and the City of Laguna Woods located in the Santa Ana Region will be regulated by San Diego Water Board Order No. R9-2013-0001. The City of Laguna Hills and Laguna Woods must also comply with the requirements of the San Diego Creek/Newport Bay TMDL in section XVIII of Santa Ana Water Board Order No. R8-2014-0002 and any reissuance thereto.
2. ~~The Orange County Copermittees will be covered under this Order after expiration of Order No. R9-2009-0002, or earlier if the Orange County Copermittees meet the conditions in Provision F.6.~~The MS4 discharges within the jurisdiction of the City of Lake Forest located in the San Diego Region will be regulated by the Santa Ana Water Board Order No. R8-2014-0002 (NPDES No. CAS618030) and any reissuance thereto. The City of Lake Forest must also comply with the requirements of the Bacteria TMDL in Attachment E of this Order, participate in preparation and implementation of the Water Quality Improvement Plan for the Aliso Creek Watershed Management Area as described in Provision B of this Order and continue implementation of its over-irrigation discharge prohibition in Title 15, Chapter 15, section 14.030, List (b).

~~2.~~3. The Riverside County Copermittees will be covered under this Order after expiration of Order No. R9-2010-0016, or earlier if the Riverside County Copermittees meet the conditions in Provision F.6.

~~3~~4.. The County of San Diego is not required to implement the requirements of Provision B for its jurisdiction within the Santa Margarita River Watershed Management Area until the Riverside County Copermittees have been notified of coverage under this Order. The County of San Diego is required to implement the requirements of Provisions D, F.3.b, and Attachment E until the Riverside County Copermittees have been notified of coverage under this Order.

2. Priority Water Quality Conditions

The Copermittees must identify the water quality priorities within each Watershed Management Area that will be addressed by the Water Quality Improvement Plan. Where appropriate, Watershed Management Areas may be separated into subwatersheds to focus water quality prioritization and jurisdictional runoff management program implementation efforts by receiving water.

a. Assessment of Receiving Water Conditions

The Copermittees must consider the following, at a minimum, to identify water quality priorities based on impacts of MS4 discharges on receiving water beneficial uses:

(1) Receiving waters listed as impaired on the CWA Section 303(d) List of Water Quality Limited Segments (303(d) List);

(2) TMDLs adopted and under development by the San Diego Water Board;

(3) Receiving waters recognized as sensitive or highly valued by the Copermittees, including estuaries designated under the National Estuary Program under CWA section 320, wetlands defined by the State or U.S. Fish and Wildlife Service's National Wetlands Inventory as wetlands, waters having the Preservation of Biological Habitats of Special Significance (BIOL) beneficial use designation, and receiving waters identified as ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(4) The receiving water limitations of Provision A.2;

(5) Known historical versus current physical, chemical, and biological water quality conditions;

(6) Available, relevant, and appropriately collected and analyzed physical, chemical, and biological receiving water monitoring data, including, but not limited to, data describing:

(a) Chemical constituents,

(b) Water quality parameters (i.e. pH, temperature, conductivity, etc.),

(c) Toxicity Identification Evaluations for both receiving water column and sediment,

(d) Trash impacts,

(e) Bioassessments, and

(f) Physical habitat;

(7) Available evidence of erosional impacts in receiving waters due to accelerated flows (i.e. hydromodification);

(8) Available evidence of adverse impacts to the chemical, physical, and biological integrity of receiving waters; and

(9) The potential improvements in the overall condition of the Watershed Management Area that can be achieved.

b. ASSESSMENT OF IMPACTS FROM MS4 DISCHARGES

The Copermittees must consider the following, at a minimum, to identify the potential impacts to receiving waters that may be caused or contributed to by discharges from the Copermittees' MS4s:

(1) The discharge prohibitions of Provision A.1 and effluent limitations of Provision A.3; and

(2) Available, relevant, and appropriately collected and analyzed storm water and non-storm water monitoring data from the Copermittees' MS4 outfalls;

(3) Locations of each Copermittee's MS4 outfalls that discharge to receiving waters;

(4) Locations of MS4 outfalls that are known to persistently discharge non-storm water to receiving waters likely causing or contributing to impacts on receiving water beneficial uses;

(5) Locations of MS4 outfalls that are known to discharge pollutants in storm water causing or contributing to impacts on receiving water beneficial uses; and

(6) The potential improvements in the quality of discharges from the MS4 that can be achieved.

c. IDENTIFICATION OF PRIORITY WATER QUALITY CONDITIONS

(1) The Copermittees must use the information gathered for Provisions B.2.a and B.2.b to develop a list of priority water quality conditions as pollutants, stressors and/or receiving water conditions that are the highest threat to receiving water quality or that most adversely affect the quality of receiving waters. The list must include the following information for each priority water

quality condition:

(a) The beneficial use(s) associated with the priority water quality condition;

(b) The geographic extent of the priority water quality condition within the Watershed Management Area, if known;

(c) The temporal extent of the priority water quality condition (e.g., dry weather and/or wet weather);

(d) The Copermittees with MS4s discharges that may cause or contribute to the priority water quality condition; and

(e) An assessment of the adequacy of and data gaps in the monitoring data to characterize the conditions causing or contributing to the priority water quality condition, including a consideration of spatial and temporal variation.

(2) The Copermittees must identify the highest priority water quality conditions to be addressed by the Water Quality Improvement Plan, and provide a rationale for selecting a subset of the water quality conditions identified pursuant to Provision B.2.c.(1) as the highest priorities.

d. IDENTIFICATION OF MS4 SOURCES OF POLLUTANTS AND/OR STRESSORS

The Copermittees must identify and prioritize known and suspected sources of storm water and non-storm water pollutants and/or other stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c. The identification of known and suspected sources of pollutants and/or stressors that cause or contribute to the highest priority water quality conditions as identified for Provision B.2.c must consider the following:

(1) Pollutant generating facilities, areas, and/or activities within the Watershed Management Area, including:

(a) Each Copermittee's inventory of construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas,

(b) Publicly owned parks and/or recreational areas,

(c) Open space areas,

(d) All currently operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste, and

(e) Areas not within the Copermittees' jurisdictions (e.g., Phase II MS4s, tribal

lands, state lands, federal lands) that are known or suspected to be discharging to the Copermittees' MS4s;

(2) Locations of the Copermittees' MS4s, including the following:

(a) All MS4 outfalls that discharge to receiving waters, and

(b) Locations of major structural controls for storm water and non-storm water (e.g., retention basins, detention basins, major infiltration devices, etc.);

(3) Other known and suspected sources of non-storm water or pollutants in storm water discharges to receiving waters within the Watershed Management Area, including the following:

(a) Other MS4 outfalls (e.g., Phase II Municipal and Caltrans),

(b) Other NPDES permitted discharges,

(c) Any other discharges that may be considered point sources (e.g., private outfalls), and

(d) Any other discharges that may be considered non-point sources (e.g., agriculture, wildlife or other natural sources);

(4) Review of available data, including but not limited to:

(a) Findings from the Copermittees' illicit discharge detection and elimination programs,

(b) Findings from the Copermittees' MS4 outfall discharge monitoring,

(c) Findings from the Copermittees' receiving water monitoring,

(d) Findings from the Copermittees' MS4 outfall discharge and receiving water assessments, and

(e) Other available, relevant, and appropriately collected data, information, or studies related to pollutant sources and/or stressors that contribute to the highest priority water quality conditions as identified for Provision B.2.c.

(5) The adequacy of the available data to identify and prioritize sources and/or stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c.

e. IDENTIFICATION OF POTENTIAL WATER QUALITY IMPROVEMENT STRATEGIES

The Copermittees must evaluate the findings identified under Provisions B.2.a-d, and identify potential strategies that can result in improvements to water quality in MS4 discharges and/or receiving waters within the Watershed Management

Area. Potential water quality improvement strategies that may be implemented within the Watershed Management Area must include the following:

(1) Structural BMPs, non-structural BMPs, incentives, or programs that can potentially be implemented to address the highest priority water quality conditions identified under Provision B.2.c, or MS4 sources of pollutants or stressors identified under Provision B.2.d,

(2) Retrofitting projects in areas of existing development within the Watershed Management Area that can potentially be implemented to reduce MS4 sources of pollutants or stressors identified under Provision B.2.d causing or contributing to the highest priority water quality conditions identified under Provision B.2.c, and

(3) Stream, channel, and/or habitat rehabilitation projects within the Watershed Management Area that can potentially be implemented to protect and/or improve conditions in receiving waters from MS4 pollutants and/or stressors identified under Provision B.2.d causing or contributing to the highest priority water quality conditions identified under Provision B.2.c.

3. Water Quality Improvement Goals, Strategies and Schedules

The Copermittees must identify and develop specific water quality improvement goals and strategies to address the highest priority water quality conditions identified within a Watershed Management Area. The water quality improvement goals and strategies must address the highest priority water quality conditions by effectively prohibiting non-storm water discharges to the MS4, reducing pollutants in storm water discharges from the MS4 to the MEP, and protecting the water quality standards of receiving waters.

a. Water Quality Improvement Goals and Schedules

(1) Numeric Goals

The Copermittees must develop and incorporate numeric goals[7] into the Water Quality Improvement Plan. Numeric goals must be used to support Water Quality Improvement Plan implementation and measure reasonable progress towards addressing the highest priority water quality conditions identified under Provision B.2.c. The Copermittees must establish and incorporate the following numeric goals in the Water Quality Improvement

[7] Interim and final numeric goals may take a variety of forms such as TMDL established WQBELs, action levels, pollutant concentration, load reductions, number of impaired water bodies delisted from the List of Water Quality Impaired Segments, Index of Biotic Integrity (IBI) scores, or other appropriate metrics. Interim and final numeric goals are not necessarily limited to one criterion or indicator, but may include multiple criteria and/or indicators. Except for TMDL established WQBELs, interim and final numeric goals and corresponding schedules may be revised through the adaptive management process under Provision B.5.

Plan:

(a) Final numeric goals must be based on measureable criteria or indicators capable of demonstrating one or more of the following:

(i) Discharges from the Copermittees' MS4s will not cause or contribute to exceedances of water quality standards in receiving waters, AND/OR

(ii) The conditions of receiving waters and associated habitat are protected from MS4 discharges, AND/OR

(iii) Beneficial uses of receiving waters are protected from MS4 discharges and will be supported.

(b) Interim numeric goals must be based on measureable criteria or indicators capable of demonstrating reasonable incremental progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges as follows:

(i) One or more interim numeric goals may be established to demonstrate progress toward achieving each final numeric goal,

(ii) For each final numeric goal, at least one interim numeric goal must be expressed as a reasonable increment toward achievement of the final numeric goal,

(iii) For each final numeric goal, reasonable interim numeric goals must be established to be accomplished during each 5 year period between the acceptance of the Water Quality Improvement Plan and the achievement of the final numeric goals.

(2) Schedules for Achieving Numeric Goals

The Copermittees must develop and incorporate schedules for achieving the numeric goals into the Water Quality Improvement Plan. The schedules must demonstrate reasonable progress toward achieving the final numeric goals required for Provision B.3.a.(1). The Copermittees must incorporate the schedules for achieving the numeric goals into the Water Quality Improvement Plan based on the following considerations:

(a) Final dates for achieving all final numeric goals must be established considering the following:

(i) Final compliance dates for any applicable TMDLs in Attachment E to this Order;

(ii) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(iii) Achievement of the final numeric goals for the highest water quality priorities must be as soon as possible;

(iv) Final dates for achieving the final numeric goals must reflect a realistic assessment of the shortest practicable time required based on the temporal and spatial extent and factors associated with the highest priority water quality conditions identified under Provision B.2.c, and taking into account the time reasonably required to implement the water quality improvement strategies required pursuant to Provision B.3.b.

(b) Interim dates for achieving all interim numeric goals must be established considering the following:

(i) Interim compliance dates for any applicable TMDLs in Attachment E to this Order;

(ii) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(iii) Interim dates for achieving the interim numeric goals must reflect a realistic assessment of the shortest practicable time reasonably required, taking into account the time needed to implement new or significantly expanded programs and securing financing, if necessary; and

(iv) For each final numeric goal, at least one interim numeric goal must be established that the Copermittees will work toward achieving within the term of this Order.

b. WATER QUALITY IMPROVEMENT STRATEGIES AND SCHEDULES

Based on the likely effectiveness and efficiency of the potential water quality improvement strategies identified under Provision B.2.e to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a, the Copermittees must identify the strategies that will be implemented in each Watershed Management Area as follows:

(1) Jurisdictional Strategies

(a) Each Copermittee in the Watershed Management Area must identify the strategies that will be implemented within its jurisdiction as part of its jurisdictional runoff management program requirements under Provisions E.2 through E.7, including descriptions of the following:

(i) For each of the inventories developed for its jurisdiction, as required

under Provisions D.2.a.(1), E.3.e.(2), E.4.b, and E.5.a, each Copermittee must identify the known and suspected areas or sources causing or contributing to the highest priority water quality conditions in the Watershed Management Area that the Copermittee will focus on in its efforts to effectively prohibit non-storm water discharges to its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, and achieve the interim and final numeric goals identified under Provision B.3.a;

(ii) BMPs that each Copermittee will implement, or require to be implemented, as applicable, for those areas or sources within its jurisdiction;

(iii) Education programs that each Copermittee will implement, as applicable, for those areas or sources within its jurisdiction;

(iv) Frequencies that each Copermittee will conduct inspections on those areas or sources within its jurisdiction;

(v) Incentive and enforcement programs that each Copermittee will implement, as applicable, for those areas or sources within its jurisdiction; and

(vi) Any other BMPs, incentives, or programs that each Copermittee will implement for those areas or sources within its jurisdiction.

(b) Identify the optional jurisdictional strategies that each Copermittee will implement within its jurisdiction, as necessary, to effectively prohibit non-storm water discharges to its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. Descriptions of the optional jurisdictional strategies must include:

(i) BMPs, incentives, or programs that may be implemented by the Copermittee within its jurisdiction in addition to the requirements of Provisions B.3.b.(1)(a);

(ii) Incentives or programs that may be implemented by the Copermittee to encourage or implement projects to retrofit areas of existing development within its jurisdiction;

(iii) Incentives or programs that may be implemented by the Copermittee to encourage or implement projects that will rehabilitate the conditions of channels or habitats within its jurisdiction;

(iv) The funds and/or resources that must be secured by the Copermittee to implement the optional strategies described for Provisions B.3.b.(1)(b)(i)-(iii) within its jurisdiction; and

(v) The circumstances necessary to trigger implementation of the optional jurisdictional strategies, in addition to the requirements of Provision B.3.b.(1)(a), to achieve the interim and final numeric goals within the schedules established under Provision B.3.a.

(c) Identify the strategies that will be implemented by the Copermittee in coordination with or with the cooperation of other agencies (e.g. Caltrans, water districts, school districts) and/or entities (e.g. non-governmental organizations) within its jurisdiction.

(2) Watershed Management Area Strategies

The Copermittees must identify the optional regional or multi-jurisdictional strategies that will be implemented in the Watershed Management Area, as necessary, to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. Descriptions of the optional regional or multi-jurisdictional strategies must include:

(a) Regional or multi-jurisdictional BMPs, incentives, or programs that may be implemented by the Copermittees in the Watershed Management Area;

(b) Incentives or programs that may be implemented by the Copermittees in the Watershed Management Area to encourage or implement regional or multi-jurisdictional projects to retrofit areas of existing development;

(c) Incentives or programs that may be implemented by the Copermittees to encourage or implement regional or multi-jurisdictional projects that will rehabilitate the conditions of channels, streams, or habitats within the Watershed Management Area;

(d) The funds and/or resources that must be secured by the Copermittees to implement the optional strategies described for Provisions B.3.b.(2)(a)-(c) within the Watershed Management Area; and

(e) The circumstances necessary to trigger implementation of the optional regional or multi-jurisdictional strategies to achieve the interim and final numeric goals within the schedules established under Provision B.3.a.

(3) Schedules for Implementing Strategies

The Copermittees must develop reasonable schedules for implementing the water quality improvement strategies identified under Provisions B.3.b.(1) and B.3.b.(2) to achieve the interim and final numeric goals identified and

schedules established under Provision B.3.a. The Copermittees must incorporate the schedules to implement the water quality improvement strategies into the Water Quality Improvement Plan as follows:

(a) Each Copermittee must develop schedules for the jurisdictional strategies identified pursuant to Provisions B.3.b.(1)(a)-(b). Each schedule must specify:

(i) If each jurisdictional strategy identified pursuant to Provision B.3.b.(1)(a) will or will not be initiated upon acceptance of the Water Quality Improvement Plan;

(ii) For each jurisdictional strategy identified pursuant to Provision B.3.b.(1)(a) that will not be initiated upon acceptance~~approval~~ of the Water Quality Improvement Plan, the shortest practicable time in which each jurisdictional strategy will be initiated after acceptance of the Water Quality Improvement Plan;

(iii) For each optional jurisdictional strategy identified pursuant to Provision B.3.b.(1)(b), a realistic assessment of the shortest practicable time required to:

[a] Secure the resources needed to fund the optional jurisdictional strategy, and
[b] Procure the resources, materials, labor, and applicable permits necessary to initiate implementation of the optional jurisdictional strategy;

(iv) If each jurisdictional strategy identified pursuant to Provisions B.3.b.(1)(a)-(b) is expected to be continuously implemented (e.g. inspections) or completed within a schedule (e.g. construction of structural BMP); and

(v) If a jurisdictional strategy identified pursuant to Provisions B.3.b.(1)(a)-(b) is expected to be completed within a schedule, the anticipated time to complete based on a realistic assessment of the shortest practicable time required.

(b) The Copermittees in the Watershed Management Area must develop schedules for the regional or multi-jurisdictional strategies identified pursuant to Provision B.3.b.(2). Each schedule must specify:

(i) A realistic assessment of the shortest practicable time to:

[a] Secure the resources needed to fund the optional regional or multi-jurisdictional strategy, and
[b] Procure the resources, materials, labor, and permits necessary to initiate the implementation of the optional regional or multi-jurisdictional strategy;

(ii) If each regional or multi-jurisdictional strategy identified pursuant to Provision B.3.b.(2) is expected to be continuously implemented (e.g. inspections) or completed within a schedule (e.g. construction of structural BMP); and

(iii) If a regional or multi-jurisdictional strategy and/or activity identified pursuant to Provisions B.3.b.(2) is expected to be completed within a schedule, the anticipated time to complete based on a realistic assessment of the shortest practicable time required.

(4) Optional Watershed Management Area Analysis

(a) For each Watershed Management Area, the Copermittees have the option to perform a Watershed Management Area Analysis for the purpose of developing watershed-specific requirements for structural BMP implementation, as described in Provision E.3.c.(3). The Watershed Management Area Analysis must include GIS layers (maps) as output. The analysis must include the following information, to the extent it is available, in order to characterize the Watershed Management Areas:

(i) A description of dominant hydrologic processes, such as areas where infiltration or overland flow likely dominates;

(ii) A description of existing streams in the watershed, including bed material and composition, and if they are perennial or ephemeral;

(iii) Current and anticipated future land uses;

(iv) Potential coarse sediment yield areas; and

(v) Locations of existing flood control structures and channel structures, such as stream armoring, constrictions, grade control structures, and hydromodification or flood management basins.

(b) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify and compile a list of candidate projects that could potentially be used as alternative compliance options for Priority Development Projects, to be implemented in lieu of onsite structural BMP performance requirements described in Provisions E.3.c.(1) and E.3.c.(2). Specifically, the Copermittees must identify opportunities to be included in the list of candidate projects in each Watershed Management Area, such as:

(i) Stream or riparian area rehabilitation;

(ii) Retrofitting existing infrastructure to incorporate storm water retention or treatment;

(iii) Regional BMPs;

(iv) Groundwater recharge projects;

(v) Water supply augmentation projects; and

(vi) Land purchases to preserve floodplain functions.

(c) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify areas within the Watershed Management Area where it is appropriate to allow Priority Development Projects to be exempt from the hydromodification management BMP performance requirements described in Provision E.3.c.(2), including supporting rationale.

4. Water Quality Improvement Monitoring and Assessment Program

a. The Copermittees in each Watershed Management Area must develop and incorporate an integrated monitoring and assessment program into the Water Quality Improvement Plan that assesses: 1) the progress toward achieving the numeric goals and schedules, 2) the progress toward addressing the highest priority water quality conditions for each Watershed Management Area, and 3) each Copermittee's overall efforts to implement the Water Quality Improvement Plan.

b. The monitoring and assessment program must incorporate the monitoring and assessment requirements of Provision D, which may allow the Copermittees to modify the program to be consistent with and focus on the highest priority water quality conditions for each Watershed Management Area.

c. For Watershed Management Areas with applicable TMDLs, the monitoring and assessment program must incorporate the specific monitoring and assessment requirements of Attachment E.

d. For Watershed Management Areas with any ASBS, the water quality monitoring and assessment program must incorporate the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

5. Iterative Approach and Adaptive Management Process

The Copermittees in each Watershed Management Area must implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a, and must include the following:

a. RE-EVALUATION OF PRIORITY WATER QUALITY CONDITIONS

The priority water quality conditions and potential water quality improvement strategies included in the Water Quality Improvement Plan pursuant to Provisions B.2.c and B.2.e may be re-evaluated by the Copermittees as needed during the term of this Order as part of the Water Quality Improvement Plan Annual Report. Re-evaluation and recommendations for modifications to the priority water quality conditions and potential water quality improvement strategies must be provided in the Report of Waste Discharge, and must consider the following:

(1) Achieving the outcome of improved water quality in MS4 discharges and receiving waters through implementation of the water quality improvement strategies identified in the Water Quality Improvement Plan;

(2) New information developed when the requirements of Provisions B.2.a-c have been re-evaluated;

(3) Spatial and temporal accuracy of monitoring data collected to inform prioritization of water quality conditions and implementation strategies to address the highest priority water quality conditions;

(4) Availability of new information and data from sources other than the jurisdictional runoff management programs within the Watershed Management Area that informs the effectiveness of the actions implemented by the Copermittees;

(5) San Diego Water Board recommendations; and

(6) Recommendations for modifications solicited through a public participation process.

b. ADAPTATION OF GOALS, STRATEGIES AND SCHEDULES

The water quality improvement goals, strategies and schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.3, must be re-evaluated and adapted as new information becomes available to result in more effective and efficient measures to address the highest priority water quality conditions identified pursuant to Provision B.2.c. Re-evaluation of and modifications to the water quality improvement goals, strategies and schedules must be provided in the Water Quality Improvement Plan Annual Report, and must consider the following:

(1) Modifications to the priority water quality conditions based on Provision B.5.a;

(2) Progress toward achieving interim and final numeric goals in receiving waters and MS4 discharges for the highest priority water quality conditions in the Watershed Management Area,

(3) Progress toward achieving outcomes according to established schedules;

(4) New policies or regulations that may affect identified numeric goals;

(5) Measurable or demonstrable reductions of non-storm water discharges to and from each Copermittee's MS4;

(6) Measurable or demonstrable reductions of pollutants in storm water discharges from each Copermittee's MS4 to the MEP;

(7) New information developed when the requirements of Provisions B.2.b and B.2.d have been re-evaluated;

(8) Efficiency in implementing the Water Quality Improvement Plan;

(9) San Diego Water Board recommendations; and

(10) Recommendations for modifications solicited through a public participation process.

c. ADAPTATION OF MONITORING AND ASSESSMENT PROGRAM

The water quality improvement monitoring and assessment program, included in the Water Quality Improvement Plan pursuant to Provision B.4, must be re-evaluated and adapted when new information becomes available. Re-evaluation and recommendations for modifications to the monitoring and assessment program, pursuant to the requirements of Provision D, may be provided in the Water Quality Improvement Plan Annual Report, but must be provided in the Report of Waste Discharge.

6. Water Quality Improvement Plan Submittal, Updates, and Implementation

a. The Copermittees must submit and commence implementation of the Water Quality Improvement Plans in accordance with the requirements of Provision F.1.

b. The Copermittees must submit proposed updates to the Water Quality Improvement Plan for acceptance by the San Diego Water Board Executive Officer in accordance with the requirements of Provision F.2.c.

C. ACTION LEVELS

The purpose of this provision is for the Copermittees to incorporate numeric action levels in the Water Quality Improvement Plans. The goal of the action levels is to guide Water Quality Improvement Plan implementation efforts and measure progress towards the protection of water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through monitoring and assessing the quality of the MS4 discharges during the implementation of the Water Quality Improvement Plans.

1. Non-Storm Water Action Levels[8]

The Copermittees must develop and incorporate numeric non-storm water action levels (NALs) into the Water Quality Improvement Plan to: 1) support the development and prioritization of water quality improvement strategies for effectively prohibiting non-storm water discharges to the MS4s, 2) assess the effectiveness of the water quality improvement strategies toward addressing MS4 non-storm water discharges, required pursuant to Provision D.4.b.(1), and 3) support the detection and elimination of non-storm water and illicit discharges to the MS4, required pursuant to Provision E.2.[9]

a. The following NALs must be incorporated:

(1) Non-Storm Water Discharges from MS4s to Ocean Surf Zone

Table C-1. Non-Storm Water Action Levels for Discharges from MS4s to Ocean Surf Zone

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Total Coliform	MPN/100 ml	1,000	-	10,000/1,000[1]	OP
Fecal Coliform	MPN/100 ml	200[2]	-	400	OP
Enterococci	MPN/100 ml	35	-	104[3]	OP

Abbreviations/Acronyms
AMAL – average monthly action level
MDAL – maximum daily action level
OP – Ocean Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Total coliform density NAL is 1,000 MPN/100 ml when the fecal/total coliform ratio exceeds 0.1.
2. Fecal coliform density NAL is 200 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas."

[8] NALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, unless the NAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed.
[9] The Copermittees may utilize NALs or other benchmarks currently established by the Copermittees as interim NALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

(2) Non-Storm Water Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Table C-2. Non-Storm Water Action Levels for Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Turbidity	NTU	75	-	225	OP
pH	Units	Within limit of 6.0 to 9.0 at all times			OP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	35	-	104[3]	BP
Priority Pollutants	µg/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
OP – Ocean Plan water quality objective
NTU – Nephelometric Turbidity Units
µg/L – micrograms per liter
MDAL – maximum daily action level
BP – Basin Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas" and is not applicable to water bodies that are not designated with the water contact recreation (REC-1) beneficial use.

Table C-3. Non-Storm Water Action Levels for Priority Pollutants

Parameter	Units	Freshwater (CTR)		Saltwater (CTR)	
		MDAL	AMAL	MDAL	AMAL
Cadmium	µg/L	**	**	16	8
Copper	µg/L	*	*	5.8	2.9
Chromium III	µg/L	**	**	-	-
Chromium VI	µg/L	16	8.1	83	41
Lead	µg/L	*	*	14	2.9
Nickel	µg/L	**	**	14	6.8
Silver	µg/L	*	*	2.2	1.1
Zinc	µg/L	*	*	95	47

Abbreviations/Acronyms:
CTR – California Toxic Rule
AMAL – average monthly action level
µg/L – micrograms per liter
MDAL – maximum daily action level

Notes:
* Action levels developed on a case-by-case basis (see below)
** Action levels developed on a case-by-case basis (see below), but calculated criteria are not to exceed Maximum Contaminant Levels (MCLs) under the California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64431

The Cadmium, Copper, Chromium (III), Lead, Nickel, Silver and Zinc NALs for MS4 discharges to freshwater receiving waters will be developed on a case-by-case basis based on site-specific water quality data (receiving water hardness). For these priority pollutants, refer to 40 CFR 131.38(b)(2).

(3) Non-Storm Water Discharges from MS4s to Inland Surface Waters

Table C-4. Non-Storm Water Action Levels for Discharges from MS4s to Inland Surface Waters

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Dissolved Oxygen	mg/L	Not less than 5.0 in WARM waters and not less than 6.0 in COLD waters			BP
Turbidity	NTU	-	20	See MDAL	BP
pH	Units	Within limit of 6.5 to 8.5 at all times			BP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	33	-	61[3]	BP
Total Nitrogen	mg/L	-	1.0	See MDAL	BP
Total Phosphorus	mg/L	-	0.1	See MDAL	BP
MBAS	mg/L	-	0.5	See MDAL	BP
Iron	mg/L	-	0.3	See MDAL	BP
Manganese	mg/L	-	0.05	See MDAL	BP
Priority Pollutants	µg/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
BP – Basin Plan water quality objective
COLD – cold freshwater habitat beneficial use
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
MDAL – maximum daily action level
WARM – warm freshwater habitat beneficial use
MBAS – Methylene Blue Active Substances
MPN/100 ml – most probable number per 100 milliliters
µg/L – micrograms per liter

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for freshwater "designated beach areas" and is not applicable to water bodies that are not designated with the water contact recreation (REC-1) beneficial use.

b. If not identified in Provision C.1.a, NALs must be identified, developed and incorporated in the Water Quality Improvement Plan for any pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in receiving waters associated with the highest priority water quality conditions related to non-storm water discharges from the MS4s. NALs must be based on:

(1) Applicable water quality standards which may be dependent upon site-specific or receiving water-specific conditions or assumptions to be identified by the Copermittees; or

(2) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the NALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary NALs specific to the Watershed Management Area at levels greater than the NALs required by Provisions C.1.a and C.1.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for effectively prohibiting non-storm water discharges to the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and from the MS4. The

secondary NALs may be developed using an approach acceptable to the San Diego Water Board.

d. Dry weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.b may be utilized to develop or revise NALs based on watershed-specific data, subject to San Diego Water Board Executive Officer approval.

2. Storm Water Action Levels[10]

The Copermittees must develop and incorporate numeric storm water action levels (SALs) in the Water Quality Improvement Plans to: 1) support the development and prioritization of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s, and 2) assess the effectiveness of the water quality improvement strategies toward reducing pollutants in storm water discharges, required pursuant to Provision D.4.b.(2).[11]

a. The following SALs for discharges of storm water from the MS4 must be incorporated:

Table C-5. Storm Water Action Levels for Discharges from MS4s to Receiving Waters

Parameter	Units	Action Level
Turbidity	NTU	126
Nitrate & Nitrite (Total)	mg/L	2.6
Phosphorus (Total P)	mg/L	1.46
Cadmium (Total Cd)*	µg/L	3.0
Copper (Total Cu)*	µg/L	127
Lead (Total Pb)*	µg/L	250
Zinc (Total Zn)*	µg/L	976

Abbreviations/Acronyms:
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
µg/L – micrograms per liter

Notes:
* The sampling must include a measure of receiving water hardness at each MS4 outfall. If a total metal concentration exceeds the corresponding metals SAL in Table C-5, that concentration must be compared to the California Toxics Rule criteria and the USEPA 1-hour maximum concentration for the detected level of receiving water hardness associated with that sample. If it is determined that the sample's total metal concentration for that specific metal exceeds that SAL, but does not exceed the applicable USEPA 1-hour maximum concentration criterion for the measured level of hardness, then the sample result will not be considered above the SAL for that measurement.

[10] SALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, unless the SAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed.

[11] The Copermittees may utilize SALs or other benchmarks currently established by the Copermittees as interim SALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

b. If not identified in Provision C.2.a, SALs must be identified, developed and incorporated in the Water Quality Improvement Plan for pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in receiving waters associated with the highest priority water quality conditions related to storm water discharges from the MS4s. SALs must be based on:

(1) Federal and State water quality guidance and/or water quality standards; and

(2) Site-specific or receiving water-specific conditions; or

(3) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the SALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary SALs specific to the Watershed Management Area at levels greater than the SALs required by Provisions C.2.a and C.2.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s. The secondary SALs may be developed based on the approaches recommended by the State Water Board's Storm Water Panel[12] or using an approach acceptable to the San Diego Water Board.

d. Wet weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.c may be used to develop or revise SALs based upon watershed-specific data, subject to San Diego Water Board Executive Officer approval.

[12] Storm Water Panel Recommendations to the California State Water Resources Control Board: The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities (June 2006)

D. MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS

The purpose of this provision is for the Copermittees to monitor and assess the impact on the conditions of receiving waters caused by discharges from the Copermittees' MS4s under wet weather and dry weather conditions. The goal of the monitoring and assessment program is to inform the Copermittees about the nexus between the health of receiving waters and the water quality condition of the discharges from their MS4s. This goal will be accomplished through monitoring and assessing the conditions of the receiving waters, discharges from the MS4s, pollutant sources and/or stressors, and effectiveness of the water quality improvement strategies implemented as part of the Water Quality Improvement Plans.

1. Receiving Water Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the condition of the receiving waters in each Watershed Management Area during dry weather and wet weather. Following San Diego Water Board acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct long-term receiving water monitoring during implementation of the Water Quality Improvement Plan to assess the long term trends and determine if conditions in receiving waters are improving. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following receiving water monitoring procedures:

a. TRANSITIONAL RECEIVING WATER MONITORING

Until the monitoring requirements and schedules of Provisions D.1.b-e are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following receiving water monitoring in the Watershed Management Area:

(1) Continue the receiving water monitoring programs required in Order Nos. R9-2007-0001 (Monitoring and Reporting Program No. R9-2007-0001 Sections II.A.1-A.5), R9-2009-0002, and R9-2010-0016;

(2) Continue the monitoring in the Hydromodification Management Plans approved by the San Diego Water Board;

(3) Participate in the following regional receiving water monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring,

(b) Southern California Bight Regional Monitoring, and

(c) Sediment Quality Monitoring;

(4) Implement the monitoring programs developed as part of any implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) for the TMDLs in Attachment E to this Order; and

(5) For Watershed Management Areas with ASBS, implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

b. LONG-TERM RECEIVING WATER MONITORING STATIONS

The Copermittees must select at least one long-term receiving water monitoring station from among the existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees to be representative of the receiving water quality in the Watershed Management Area. Additional long-term receiving water monitoring stations must be selected where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

c. DRY WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three dry weather monitoring events at each of the long-term receiving water monitoring stations. At least one monitoring event must be conducted during the dry season (May 1 – September 30) and at least one monitoring event must be conducted during a dry weather period during the wet season (October 1 – April 30), after the first wet weather event of the season, with an antecedent dry period of at least 72 hours following a storm event producing measureable rainfall of greater than 0.1 inch.

(1) Dry Weather Receiving Water Field Observations

For each dry weather monitoring event, the Copermittees must record field observations consistent with Table D-1 at each long-term receiving water monitoring station.

Table D-1. Field Observations for Receiving Water Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) • Station description (i.e. deposits or stains, vegetation condition, structural condition, and observable biology) • Presence and assessment of trash in and around station

(2) Dry Weather Receiving Water Field Monitoring

For each dry weather monitoring event, if conditions allow the collection of the data, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

Table D-2. Field Monitoring Parameters for Receiving Water Monitoring Stations

Parameters
• pH • Temperature • Specific conductivity • Dissolved oxygen • Turbidity

(3) Dry Weather Receiving Water Analytical Monitoring

For each dry weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable NAL constituents, and

(v) Constituents listed in Table D-3.

Table D-3. Analytical Monitoring Constituents for Receiving Water Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Pesticides	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Mercury • Nickel • Selenium • Thallium • Zinc	• Organophosphate Pesticides • Pyrethroid Pesticides	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(4) Dry Weather Receiving Water Toxicity Monitoring

For each dry weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for aquatic toxicity in accordance with Table D-4. When the State Water Board's Policy for Toxicity Assessment and Control (Toxicity Policy) is approved and in effect, the San Diego Water Board Executive Officer may direct the Copermittees to replace current toxicity program elements with standardized procedures in the Toxicity Policy.

Table D-4. Dry Weather Chronic[1] Toxicity Testing for Receiving Water Monitoring Stations

Organism	Units	Test	USEPA Protocol
Freshwater			
Pimephales promelas (Fathead Minnow)	Pass / Fail	Larval Survival and Growth	EPA-821-R-02-013
Ceriodaphnia dubia (*Daphnid*)	Pass / Fail	Survival and Production	EPA-821-R-02-013
Selenastrum capricornutum (Green Algae)	Pass / Fail	Growth	EPA-821-R-02-013
Marine and Estuarine			
Strongylocentrotus purpuratus *(Purple Sea Urchin)*	Pass / Fail	Embryo-Larval Development	EPA-600-R-95-136

Notes:
1. Chronic toxicity testing is not required at receiving water monitoring stations located at mass loading stations if the channel flows are diverted year-round during dry weather conditions to the sanitary sewer for treatment.

(a) Freshwater Test Species and Methods: If samples are collected in receiving waters with salinity less than 1 ppt, the Copermittees must follow the methods for chronic toxicity tests as established in 40 CFR 136.3 using a single-concentration test design for routine monitoring, or a five-concentration test design for additional toxicity testing if the limitation is exceeded. The Copermittees must estimate the critical life stage chronic toxicity on undiluted samples in accordance with species and short term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms (EPA-821-R-02-013; Table IA, 40 CFR 136). Additional test species may be used by the Copermittees if approved by the San Diego Water Board Executive Officer. The Copermittees must conduct:

(i) A static renewal toxicity test with the fathead minnow, *Pimephales promelas* (Larval Survival and Growth Test Method 1000.0);

(ii) A static renewal toxicity test with the daphnid, *Ceriodaphnia dubia* (Survival and Reproduction Test Method 1002.0); and

(iii) A static renewal toxicity test with the green alga, *Selenastrum capricornutum* (also named *Raphidocelis subcapitata*) (Growth Test Method 1003.0).

(b) Marine and Estuarine Test Species and Methods: If samples are collected in receiving waters with salinity greater or equal to 1 ppt, the Copermittees must follow the methods for chronic toxicity tests as established in 40 CFR 136.3 using a single-concentration test design for routine monitoring, or a five-concentration test design for additional toxicity testing if the limitation is exceeded. The Copermittees must conduct the following critical life state chronic toxicity tests on undiluted samples in accordance with species and short term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms (EPA-600-R-95-136; 1995). Artificial sea salts must be used to increase sample salinity. The Copermittees must conduct a static non-renewal toxicity test with the purple sea urchin, *Strongylocentrotus purpuratus* (Embryo-larval Development Test Method). Additional species may be used by the Copermittees if approved by the San Diego Water Board Executive Officer.

(c) Holding Times: All toxicity tests must be conducted as soon as possible following sample collection. The 36-hour sample holding time for test initiation shall be targeted. However, no more than 72 hours shall elapse before the conclusion of sample collection and test initiation.

(d) Test Species Sensitivity Screening: To determine the most sensitive test species for freshwater, the Copermittees must screen 2 wet weather and 2 dry weather toxicity tests with a vertebrate, an invertebrate, and a plant species. After this screening period, subsequent monitoring must be conducted using the most sensitive test species. Alternatively, if a sensitive test species has already been determined, or if there is prior knowledge of potential toxicant(s) and a test species is sensitive to such toxicant(s), then monitoring must be conducted using only that test species. Sensitive test species determinations must also consider the most sensitive test species used for proximal receiving water monitoring. Rescreening must occur once each permit term.

(e) Chronic toxicity test biological endpoint data must be analyzed using the Test of Significant Toxicity t-test approach specified in *National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document* (USEPA, Office of Wastewater Management, Washington, D.C., EPA-833-R-10-003, 2010). For this monitoring program, the critical chronic instream waste concentration (IWC) is set at 100 percent receiving water (i.e. no dilution) for receiving water samples. A 100 percent receiving water and a control must be tested.

(f) Toxicity Identification Evaluation (TIE) / Toxicity Reduction Evaluation (TRE): If chronic toxicity is detected in receiving waters, the Copermittees must discuss the need for conducting a TIE/TRE in the assessments required under Provision D.4.a.(2), and develop a plan for implementing the TIE/TRE to be incorporated in the Water Quality Improvement Plan.

(5) Dry Weather Receiving Water Bioassessment Monitoring

Bioassessment monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must conduct bioassessment monitoring during at least one dry weather monitoring event at each long-term receiving water monitoring station as follows:

(a) The following bioassessment samples and measurements must be collected:

(i) Macroinvertebrate samples must be collected in accordance with the "Reachwide Benthos (Multihabitat) Procedure" in the most current Surface Water Ambient Monitoring Program (SWAMP) Bioassessment Standard Operating Procedures (SOP), and amendments, as applicable;[13]

(ii) The "Full" suite of physical habitat characterization measurements must be collected in accordance with the most current SWAMP Bioassessment SOP, and as summarized in the SWAMP Stream Habitat Characterization Form – Full Version;[14] and

(iii) Freshwater algae samples must be collected in accordance with the SWAMP Standard Operating Procedures for Collecting Algae Samples.[15] Analysis of samples must include algal taxonomic composition (diatoms and soft algae) and algal biomass.

(b) The bioassessment samples, measurements, and appropriate water chemistry data must be used to calculate the following:

(i) An Index of Biological Integrity (IBI) for macroinvertebrates for each monitoring station where bioassessment monitoring was conducted, based on the most current calculation method;[16] and

[13] Ode, P.R.. 2007. Standard operating procedures for collecting macroinvertebrate samples and associated physical and chemical data for ambient bioassessments in California. California State Water Resources Control Board Surface Water Ambient Monitoring Program (SWAMP) Bioassessment SOP 001. http://www.swrcb.ca.gov/water_issues/programs/swamp/tools.shtml#monitoring

[14] Available at: http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/reports/fieldforms_fullversion052908.pdf

[15] Fetscher et al. 2009. Standard Operating Procedures for Collecting Stream Algae Samples and Associated Physical Habitat and Chemical Data for Ambient Bioassessments in California.

[16] The most current calculation method at the time the Order was adopted is outlined in "A Quantitative Tool for Assessing the Integrity of Southern California Coastal Streams" (Ode, et al. 2005. Environmental Management. Vol. 35, No. 1, pp. 1-13). If an updated or new calculation method is developed, either both (i.e. current and updated/new) methods must be used, or historical IBIs must be recalculated with the updated or new calculation method.

(ii) An IBI for algae for each monitoring station where bioassessment monitoring was conducted, when a calculation method is developed.[17]

(c) In lieu of the requirements of Provision D.1.c.(5)(a), the Copermittees may conduct the bioassessment monitoring in accordance with the "Triad" assessment approach[18] to calculate the IBIs required for Provision D.1.c.(5)(b). The Copermittees must conduct sampling, analysis, and reporting of specified in-stream biological and habitat data according to the protocols specified in the SCCWRP Technical Report No. 539, or subsequent protocols, if developed.

(6) Dry Weather Receiving Water Hydromodification Monitoring

In addition to the hydromodification monitoring conducted as part of the Copermittees' Hydromodification Management Plans, hydromodification monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must collect the following hydromodification monitoring observations and measurements within an appropriate domain of analysis during at least one dry weather monitoring event for each long-term receiving water monitoring station:

(a) Channel conditions, including:

(i) Channel dimensions,

(ii) Hydrologic and geomorphic conditions, and

(iii) Presence and condition of vegetation and habitat;

(b) Location of discharge points;

(c) Habitat integrity;

(d) Photo documentation of existing erosion and habitat impacts, with location (i.e. latitude and longitude coordinates) where photos were taken;

(e) Measurement or estimate of dimensions of any existing channel bed or bank eroded areas, including length, width, and depth of any incisions; and

[17] When a calculation method is developed, IBIs must be calculated for all available and appropriate historical data.
[18] Stormwater Monitoring Coalition Model Monitoring Technical Committee, 2004. Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California. Technical Report #419. August 2004.

(f) Known or suspected cause(s) of existing downstream erosion or habitat impact, including flow, soil, slope, and vegetation conditions, as well as upstream land uses and contributing new and existing development.

d. WET WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three wet weather monitoring events at each long-term receiving water monitoring station. At least one wet weather monitoring event must be conducted during the first wet weather event of the wet season (October 1 – April 30), and at least one wet weather monitoring event during a wet weather event that occurs after February 1.

(1) Wet Weather Receiving Water Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each long-term receiving water monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event;

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(d) Presence and assessment of trash in and around station.

(2) Wet Weather Receiving Water Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

(3) Wet Weather Receiving Water Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) Constituents listed in Table D-3.

(4) Wet Weather Receiving Water Toxicity Monitoring

For each wet weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for chronic aquatic toxicity in accordance with Provisions D.1.c.(4)(a)-(f).

e. OTHER RECEIVING WATER MONITORING REQUIREMENTS

(1) Regional Monitoring

The Copermittees must participate in the following regional receiving waters monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring; and

(b) Southern California Bight Regional Monitoring~~.~~ and

(c) Unified Beach Water Quality Monitoring and Assessment Program
The Orange County Copermittees shall participate in and, together with South Orange County Wastewater Authority and Orange County Health Care Agency, shall share responsibility for implementation of a unified regional beach water quality monitoring and assessment program in south Orange County, as set forth in Monitoring and Reporting Program No. XXX, issued pursuant to CWC sections 13225, 13267, and 13383 and subject to future revision.

(2) Sediment Quality Monitoring

The Copermittees must perform sediment monitoring to assess compliance with sediment quality receiving water limits applicable to MS4 discharges to enclosed bays and estuaries. The monitoring may be performed either by individual or multiple Copermittees to assess compliance with receiving water limits, or through participation in a water body monitoring coalition. A Sediment Monitoring Plan which satisfies the requirements of the State Water Board's Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part 1 Sediment Quality (Sediment Control Plan) must be submitted as part of the monitoring and assessment program in the Water Quality Improvement Plan.

(a) The Sediment Monitoring Plan design must include the following:

(i) The elements required under Section VII.D (Receiving Water Limits Monitoring Frequency) and Section VII.E (Sediment Monitoring) of the Sediment Control Plan;

(ii) A Quality Assurance Project Plan (QAPP) describing the project objectives and organization, functional activities, and quality assurance/quality control protocols for the water and sediment monitoring; and

(iii) A schedule for completion of all sample collection and analysis activities and submission of Sediment Monitoring Reports.

(b) The Copermittees must implement the Sediment Monitoring Plan in accordance with the schedule contained in the Sediment Monitoring Plan, unless otherwise directed in writing by the San Diego Water Board Executive Officer.

(c) The Copermittees must incorporate a Sediment Monitoring Report as part of the Water Quality Improvement Plan Annual Report in accordance with the schedule contained in the Sediment Monitoring Plan, unless otherwise directed in writing by the San Diego Water Board Executive Officer. The Sediment Monitoring Report must contain the following information:

(i) Analysis: An evaluation, interpretation and tabulation of the water and sediment monitoring data, including interpretations and conclusions as to whether applicable Receiving Water Limitations in this Order have been attained at each sample station;

(ii) Sample Location Map: The locations, type, and number of samples must be identified and shown on a site map; and

(iii) California Environmental Data Exchange Network: A statement certifying that the monitoring data and results have been uploaded into the California Environmental Data Exchange Network (CEDEN).

(d) Based on the Sediment Monitoring Report conclusions the San Diego Water Board may require a human health risk assessment to determine if the human health objective contained in Receiving Water Limitations in Provision A.2.a.(3)(b)(ii) has been attained at each sample station. In conducting a risk assessment, the Copermittees must consider any applicable and relevant information, including California Environmental Protection Agency's (Cal/EPA) Office of Environmental Health Hazard Assessment (OEHHA) policies for fish consumption and risk assessment, Cal/EPA's Department of Toxic Substances Control (DTSC) Risk Assessment, and USEPA Human Health Risk Assessment policies.

(3) ASBS Monitoring

For Watershed Management Areas with ASBS, the Copermittees must implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

f. ALTERNATIVE WATERSHED MONITORING REQUIREMENTS

The San Diego Water Board may direct the Copermittees to participate in an effort to develop alternative watershed monitoring with other regulated entities, other interested parties, and the San Diego Water Board to refine, coordinate, and implement regional monitoring and assessment programs to determine the status and trends of water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams.

2. MS4 Outfall Discharge Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the discharges from the MS4 outfalls in each Watershed Management Area during dry weather and wet weather. Following San Diego Water Board acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct MS4 outfall discharge monitoring during implementation of the Water Quality Improvement Plan to assess the effectiveness of their jurisdictional runoff management programs toward effectively prohibiting non-storm water discharges into the MS4 and reducing pollutants in storm water discharges from their MS4s to the MEP. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following MS4 outfall monitoring procedures:

a. TRANSITIONAL MS4 OUTFALL DISCHARGE MONITORING

Until the monitoring requirements and schedules of Provisions D.2.b-c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following MS4 outfall discharge monitoring in the Watershed Management Area:

(1) MS4 Outfall Discharge Monitoring Station Inventory

Each Copermittee must identify all major MS4 outfalls that discharge directly to receiving waters within its jurisdiction and geo-locate those outfalls on a map of the MS4 pursuant to Provision E.2.b.(1). This information must be compiled into a MS4 outfall discharge monitoring station inventory, and must include the following information:

(a) Latitude and longitude of MS4 outfall point of discharge;

(b) Watershed Management Area;

(c) Hydrologic subarea;

(d) Outlet size;

(e) Accessibility (i.e. safety and without disturbance of critical habitat);

(f) Approximate drainage area; and

(g) Classification of whether the MS4 outfall is known to have persistent dry weather flows, transient dry weather flows, no dry weather flows, or unknown dry weather flows.

(2) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Until the monitoring requirements and schedules of Provision D.2.b are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, each Copermittee must perform dry weather MS4 outfall field screening monitoring to identify non-storm water and illicit discharges within its jurisdiction in accordance with Provision E.2.c, to determine which discharges are transient flows and which are persistent flows, and prioritize the dry weather MS4 discharges that will be investigated and eliminated in accordance with Provision E.2.d.

(a) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Frequency

Each Copermittee must field screen the MS4 outfalls in its inventory developed pursuant to Provision D.2.a.(1) as follows:

(i) For Copermittees with less than 125 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 80 percent of the outfalls must be visually inspected two times per year during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv).

(ii) For Copermittees with 125 major MS4 outfalls or more, but less than or equal to 500 that discharge to receiving waters within a Watershed Management Area, all the outfalls must be visually inspected at least annually during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv).

(iii) For Copermittees with more than 500 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 500 outfalls must be visually inspected at least annually during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv). Copermittees with more than 500 major MS4 outfalls within a Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;

[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(iv) For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major MS4 outfalls within its jurisdiction, at least 500 major MS4 outfalls within its inventory must be visually inspected at least annually during dry weather conditions. Copermittees with more than 500 major MS4 outfalls in more than one Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(v) Inspections of major MS4 outfalls conducted in response to public reports and staff or contractor reports and notifications may count toward the required visual inspections of MS4 outfall discharge monitoring stations.

(b) Transitional Dry Weather MS4 Outfall Discharge Field Screening Visual Observations

(i) An antecedent dry period of at least 72 hours following any storm event producing measurable rainfall greater than 0.1 inch is required prior to conducting field screening visual observations during a field screening monitoring event.

(ii) During the field screening monitoring event, each Copermittee must record visual observations consistent with Table D-5 at each MS4 outfall discharge monitoring station inspected.

Table D-5. Field Screening Visual Observations for MS4 Outfall Discharge Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) - Flow source(s) suspected or identified from non-storm water source investigation - Flow source(s) eliminated during non-storm water source identification • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) - Known or suspected source(s) of pooled or ponded water • Station description (i.e. deposits or stains, vegetation condition, structural condition, observable biology) • Presence and assessment of trash in and around station • Evidence or signs of illicit connections or illegal dumping

(iii) Each Copermittee must implement the requirements of Provisions E.2.d.(2)(c)-(e) based on the field observations required pursuant to Provision D.2.a.(2)(b)(ii).

(iv) Each Copermittee must evaluate field observations together with existing information available from prior reports, inspections and monitoring results to determine whether any observed flowing, pooled, or ponded waters are likely to be transient or persistent flow.[19]

(c) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Records

Based upon the results of the transitional dry weather MS4 outfall discharge field screening monitoring conducted pursuant to Provisions D.2.a.(2)(a)-(b), each Copermittee must update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow.

(3) Transitional Wet Weather MS4 Outfall Discharge Monitoring

Until the monitoring requirements and schedules of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the

[19] Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(a) Transitional Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees must select wet weather MS4 outfall discharge monitoring stations from the inventories developed pursuant to Provision D.2.a.(1) for each Watershed Management Area as follows:

(i) At least five wet weather MS4 outfall discharge monitoring stations that are representative of storm water discharges from areas consisting primarily of residential, commercial, industrial, and typical mixed-use land uses present within the Watershed Management Area;

(ii) At least one wet weather MS4 outfall discharge monitoring station for each Copermittee within the Watershed Management Area; and

(iii) The County of San Diego may select at least two (2) wet weather MS4 outfall discharge monitoring stations for the portion of the Santa Margarita River Watershed Management Area within its jurisdiction to be monitored during the transitional period until the Riverside County Copermittees are notified of coverage under this Order. After the Riverside County Copermittees are notified of coverage under this Order, the Copermittees in the Watershed Management Area must select wet weather MS4 outfall discharge monitoring stations consistent with the requirements above.

(b) Transitional Wet Weather MS4 Outfall Discharge Monitoring Frequency

Each wet weather MS4 outfall discharge monitoring station selected pursuant to Provision D.2.a.(3)(a) must be monitored once during the wet season (October 1 – April 30). The wet weather monitoring events must be selected to be representative of the range of hydrological conditions experienced in the region. At least 10 percent of samples must be conducted during the first wet weather event of the wet season, to include at least one such sample in each Watershed Management Area..

(c) Transitional Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(i) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the

storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(ii) The flow rates and volumes measured or estimated from the MS4 outfall (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(d) Transitional Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(e) Transitional Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, and indicator bacteria;

(iv) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

[a] Time-weighted composites collected over the length of the storm event or the first 24 hour period whichever is shorter, composed of discrete samples, which may be collected through the use of automated equipment, or

[b] Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

[c] If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours;

(v) Only one analysis of the composite of aliquots is required;

(vi) The samples must be analyzed for the following constituents:

[a] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

[b] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and

[c] Constituents listed in Table D-6.

Table D-6. Analytical Monitoring Constituents for Wet Weather MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Nickel • Selenium • Thallium • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(f) Other Transitional Wet Weather MS4 Outfall Discharge Monitoring

The San Diego County Copermittees must continue the wet weather MS4 outfall monitoring program developed under Order No. R9-2007-0001, as approved by the San Diego Water Board, through its planned completion.

b. DRY WEATHER MS4 OUTFALL DISCHARGE MONITORING

Each Copermittee must perform dry weather MS4 outfall monitoring to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. Each Copermittee must conduct the following dry weather MS4 outfall discharge monitoring within its jurisdiction:

(1) Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Each Copermittee must continue to perform the dry weather MS4 outfall discharge field screening monitoring in accordance with the requirements of Provision D.2.a.(2). The Copermittee may adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of persistent flow non-storm water discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of visual inspections performed is equivalent to the number of visual inspections required under Provision D.2.a.(2)(a).

(2) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring

Each Copermittee must perform non-storm water persistent flow MS4 outfall discharge monitoring to determine which persistent non-storm water discharges contain concentrations of pollutants below NALs, and which persistent non-storm water discharges impact receiving water quality during dry weather. Each Copermittee must conduct the following non-storm water persistent flow MS4 outfall discharge monitoring within its jurisdiction:

(a) Prioritization of Non-Storm Water Persistent Flow MS4 Outfalls

Based upon the dry weather MS4 outfall discharge field screening monitoring records developed pursuant to Provision D.2.a.(2)(c), each Copermittee must identify and prioritize the MS4 outfalls with persistent flows based on the highest priority water quality conditions identified in the Water Quality Improvement Plan and any additional criteria developed by the Copermittee, which may include historical data and data from sources other than what the Copermittee collects.

(b) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring Frequency

(i) Based on the prioritization of major MS4 outfalls developed under Provision D.2.b.(2)(a), each Copermittee must identify, at a minimum, the 5 highest priority major MS4 outfalls with non-storm water persistent flows that the Copermittee will monitor within its jurisdiction in each Watershed Management Area. For Responsible Copermittees identified by a TMDL in Attachment E to this Order, if the 5 chosen outfall locations are not sufficient to determine compliance with the TMDL(s), then each Responsible Copermittee must identify additional MS4 outfall monitoring locations within its jurisdiction sufficient to address compliance with the TMDL(s). If a Copermittee has less than 5 major outfalls within a Watershed

Management Area, then the Copermittee must monitor all of its major MS4 outfalls with persistent flows within each Watershed Management Area. The location of the highest priority non-storm water persistent flow MS4 outfall monitoring stations must be identified on the map required pursuant to Provision E.2.b.(1). The map must specify which MS4 outfalls are being monitored for compliance with a TMDL.

(ii) Each of the highest priority non-storm water persistent flow MS4 outfall monitoring stations identified pursuant to Provision D.2.b.(2)(b)(i) must be monitored under dry weather conditions at least semi-annually until one of the following occurs:

[a] The non-storm water discharges have been effectively eliminated (i.e. no flowing, pooled, or ponded water) for three consecutive dry weather monitoring events; or

[b] The source(s) of the persistent flows has been identified as a category of non-storm water discharges that does not require an NPDES permit and does not have to be addressed as an illicit discharge because it was not identified as a source of pollutants (i.e. constituents in non-storm water discharge do not exceed NALs), and the persistent flow can be re-prioritized to a lower priority; or

[c] The constituents in the persistent flow non-storm water discharge do not exceed NALs, and the persistent flow can be re-prioritized to a lower priority; or

[d] The source(s) of the persistent flows has been identified as a non-storm water discharge authorized by a separate NPDES permit.

(iii) Where the criteria under Provision D.2.b.(2)(b)(ii) are not met, but the threat to water quality has been reduced by the Copermittee, the highest priority persistent flow MS4 outfall monitoring stations may be reprioritized accordingly for continued dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1).

(iv) Each Copermittee must document removal or re-prioritization of the highest priority persistent flow MS4 outfall monitoring stations identified under Provision D.2.b.(2)(a) in the Water Quality Improvement Plan Annual Report. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized major MS4 outfall in the Watershed Management Area within its jurisdiction, unless there are no remaining qualifying major MS4 outfalls within the Copermittee's jurisdiction in the Watershed Management Area.

(c) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Observations

During each semi-annual monitoring event, each Copermittee must record field observations consistent with Table D-5 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(d) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Monitoring

During each semi-annual monitoring event, if conditions allow the collection of the data, each Copermittee must monitor and record the parameters in Table D-2 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(e) Non-Storm Water Persistent Flow MS4 Outfall Discharge Analytical Monitoring

During each semi-annual monitoring event in which measurable flow is present, each Copermittee must collect and analyze samples from each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Collect grab or composite samples to be analyzed at a qualified laboratory for the following constituents:

[a] Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,
[b] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,
[c] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,
[d] Applicable NAL constituents, and
[e] Constituents listed in Table D-7. The Copermittees may adjust the list of constituents for the Watershed Management Area if historical data or supporting information can be provided that demonstrates or justifies the analysis of a constituent is not necessary.

Table D-7. Analytical Monitoring Constituents for Persistent Flow MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Total Hardness • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Cadmium • Copper • Lead • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(iv) If the Copermittee identifies and eliminates the source of the persistent flow non-storm water discharge, analysis of the sample is not required.

c. WET WEATHER MS4 OUTFALL DISCHARGE MONITORING

The Copermittees must perform wet weather MS4 outfall monitoring to identify pollutants in storm water discharges from the MS4s, to guide pollutant source identification efforts, and to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order. The Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(1) Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees may adjust the wet weather MS4 outfall discharge monitoring locations in the Watershed Management Area, as needed, to identify pollutants in storm water discharges from MS4s, to guide pollutant source identification efforts, and to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of stations is at least equivalent to the number of stations required under Provision D.2.a.(3)(a). Additional outfall monitoring locations, above the minimum per jurisdiction, may be required to demonstrate compliance with the WQBELs associated with the applicable TMDLs in Attachment E.

(2) Wet Weather MS4 Outfall Discharge Monitoring Frequency

The Copermittees must monitor the wet weather MS4 outfall discharge monitoring stations in the Watershed Management Area at least once (1) per year. The Copermittees may need to increase the frequency of monitoring in order to identify pollutants in storm water discharges from the MS4s causing or contributing to the highest priority water quality conditions, to guide pollutant source identification efforts, or to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order.

(3) Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(4) Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(5) Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate

the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites collected over the length of the storm event or the first 24 hour period, whichever is shorter , composed of discrete samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

(iii) If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours.

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) The Copermittees may adjust the analytical monitoring required for the Watershed Management Area, if the Copermittees have historical data or supporting information that can demonstrate or provide justification that the analysis of a constituent is not necessary.

3. Special Studies

a. Within the term of this Order, the Copermittees must initiate the following special studies:

(1) At least two special studies in each Watershed Management Area to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that cause or contribute to highest priority water quality conditions identified in the Water Quality Improvement Plan.

(2) At least one special study for the San Diego Region to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that are impacting receiving waters on a regional basis in the San Diego Region.

(3) One of the two special studies in each Watershed Management Area required pursuant to Provision D.3.a.(1) may be replaced by a special study implemented pursuant to Provision D.3.a.(2).

b. The special studies must, at a minimum, be in conformance with the following criteria:

(1) The special studies must be related to the highest priority water quality conditions identified by the Copermittees in the Watershed Management Area and/or for the entire San Diego Region;

(2) The special studies developed pursuant to Provision D.3.a.(1) must:

(a) Be implemented within the applicable Watershed Management Area, and

(b) Require some form of participation by all the Copermittees within the Watershed Management Area;

(3) The special studies developed pursuant to Provision D.3.a.(2) must:

(a) Be implemented within the San Diego Region, and

(b) Require some form of participation by all Copermittees covered under the requirements of this Order.

(4) The Copermittees are encouraged to partner with environmental groups or third parties knowledgeable of watershed conditions to complete the required special studies.

c. Special studies developed to identify sources of pollutants and/or stressors should be pollutant and/or stressor specific and based on historical monitoring data and monitoring performed pursuant to Provisions D.1 and D.2. Development of source identification special studies should include the following:

(1) A compilation of known information on the specific pollutant and/or stressor,

including data on potential sources and movement of the pollutant and/or stressor within the watershed. Data generated by the Copermittees and others, as well as information available from a literature research on the pollutant and/or stressor should be compiled and analyzed as appropriate.

(2) An identification of data gaps, based on the compiled information generated on the specific pollutant and/or stressor identified in Provision D.3.c.(1). Source identification special studies should be developed to fill identified data gaps.

(3) A monitoring plan that will collect and provide data the Copermittees can utilize to do the following:

(a) Quantify the relative loading or impact of a pollutant and/or stressor from a particular source or pollutant generating activity;

(b) Improve understanding of the fate of a pollutant and/or stressor in the environment;

(c) Develop an inventory of known and suspected sources of a pollutant and/or stressor in the Watershed Management Area; and/or

(d) Prioritize known and suspected sources of a pollutant and/or stressor based on relative magnitude in discharges, geographical distribution (i.e., regional or localized), frequency of occurrence in discharges, human health risk, and controllability.

d. Special studies initiated prior to the effective date of this Order that meet the requirements of Provision D.3.b and are implemented during the term of this Order as part of the Water Quality Improvement Plan may be utilized to fulfill the special study requirements of Provision D.3.a. Special studies completed before the effective date of this Order cannot be utilized to fulfill the special study requirements of Provision D.3.a.

e. The Copermittees must submit the monitoring plans for the special studies in the Water Quality Improvement Plans required pursuant to Provision F.1.

f. The Copermittees are encouraged to share the results of the special studies regionally among the Copermittees to provide information useful in improving and adapting the management of non-storm water and storm water runoff through the implementation of the Water Quality Improvement Plans.

4. Assessment Requirements

Each Copermittee must evaluate the data collected pursuant to Provisions D.1, D.2 and D.3, and information collected during the implementation of the jurisdictional

runoff management programs required pursuant to Provision E, to assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a. Assessments must be performed as described in the following provisions:

a. RECEIVING WATERS ASSESSMENTS

(1) The Copermittees must assess and report the conditions of the receiving waters in the Watershed Management Area as follows:

(a) Based on data collected pursuant to Provision D.1.a, the assessments under Provision D.4.a.(2) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(b) Based on the data collected pursuant to Provisions D.1.a-e, the assessments required under Provision D.4.a.(2) must be included in the Report of Waste Discharge required pursuant to Provision F.5.b.

(2) The Copermittees must assess the status and trends of receiving water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under dry weather and wet weather conditions. For each of the three types of receiving waters in each Watershed Management Area the Copermittees must:

(a) Determine whether or not the conditions of the receiving waters are meeting the numeric goals established pursuant to Provision B.3.a;

(b) Identify the most critical beneficial uses that must be protected to ensure overall health of the receiving water;

(c) Determine whether or not those critical beneficial uses are being protected;

(d) Identify short-term and/or long-term improvements or degradation of those critical beneficial uses;

(e) Determine whether or not the strategies established in the Water Quality Improvement Plan contribute towards progress in achieving the interim and final numeric goals of the Water Quality Improvement Plan; and

(f) Identify data gaps in the monitoring data necessary to assess Provisions D.4.a.(2)(a)-(e).

b. MS4 OUTFALL DISCHARGES ASSESSMENTS

(1) Non-Storm Water Discharges Reduction Assessments

(a) Each Copermittee must assess and report the progress of its illicit discharge detection and elimination program, required to be implemented pursuant to Provision E.2, toward effectively prohibiting non-storm water and illicit discharges into the MS4 within its jurisdiction as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(2), the assessments under Provision D.4.b.(1)(b) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(ii) Based on the data collected pursuant to Provisions D.2.b, the assessments required under Provision D.4.b.(1)(c) must be included in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

(iii) Based on the data collected pursuant to Provisions D.2.b, the assessment required under Provision D.4.b.(1)(c) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.a.(2), each Copermittee must assess and report the following:

(i) Identify the known and suspected controllable sources (e.g. facilities, areas, land uses, pollutant generating activities) of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area;

(ii) Identify sources of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area that have been reduced or eliminated; and

(iii) Identify modifications to the field screening monitoring locations and frequencies for the MS4 outfalls in its inventory necessary to identify and eliminate sources of persistent flow non-storm water discharges pursuant to Provision D.2.b.

(c) Based on the dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1), each Copermittee must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(1)(b);

(ii) Based on the data collected and applicable NALs in the Water Quality Improvement Plan, rank the MS4 outfalls in the Copermittee's jurisdiction according to potential threat to receiving water quality, and produce a prioritized list of major MS4 outfalls for follow-up action to update the Water Quality Improvement Plan, with the goal of eliminating persistent flow non-storm water discharges and/or pollutant loads in order of the ranked priority list through targeted programmatic actions and source investigations;

(iii) For the highest priority major MS4 outfalls with persistent flows that are in exceedance of NALs, identify the known and suspected sources within the Copermittee's jurisdiction in the Watershed Management Area that may cause or contribute to the NAL exceedances;

(iv) Each Copermittee must analyze the data collected pursuant to Provision D.2.b, and utilize a model or other method, to calculate or estimate the non-storm water volumes and pollutant loads collectively discharged from all the major MS4s outfalls in its jurisdiction identified as having persistent dry weather flows during the monitoring year. These calculations or estimates must be updated annually.

[a] Each Copermittee must calculate or estimate the annual non-storm water volumes and pollutant loads collectively discharged from the Copermittee's major MS4 outfalls to receiving waters within the Copermittee's jurisdiction, with an estimate of the percent contribution from each known source for each MS4 outfall;

[b] Each Copermittee must annually identify and quantify (i.e. volume and pollutant loads) sources of non-storm water not subject to the Copermittee's legal authority that are discharged from the Copermittee's major MS4 outfalls to downstream receiving waters.

(v) Each Copermittee must review the data collected pursuant to Provision D.2.b and findings from the assessments required pursuant to Provision D.4.b.(1)(c)(i)-(iv) at least once during the term of this Order to:

[a] Identify reductions and progress in achieving reductions in non-storm water and illicit discharges to the Copermittee's MS4 in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction, with an estimate, if possible, of the non-storm water volume and/or pollutant load reductions

attributable to specific water quality strategies implemented by the Copermittee; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittee in the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction.

(vi) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(1)(c)(i)-(v).

(2) Storm Water Pollutant Discharges Reduction Assessments

(a) The Copermittees must assess and report the progress of the water quality improvement strategies, required to be implemented pursuant to Provisions B and E, toward reducing pollutants in storm water discharges from the MS4s within the Watershed Management Area as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(3), the assessments under Provision D.4.b.(2)(b) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(ii) Based on the data collected pursuant to Provisions D.2.c, the assessments required under Provision D.4.b.(2)(c) must be included in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

(iii) Based on the data collected pursuant to Provisions D.2.c, the assessment required under Provisions D.4.b.(2)(c)-(d) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.a.(3) the Copermittees must assess and report the following:

(i) The Copermittees must analyze the monitoring data collected pursuant to Provision D.2.a.(3), and utilize a watershed model or other method, to calculate or estimate the following for each monitoring year:

[a] The average storm water runoff coefficient for each land use type within the Watershed Management Area;

[b] The volume of storm water and pollutant loads discharged from each of the Copermittee's monitored MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch;

[c] The total flow volume and pollutant loadings discharged from the Copermittee's jurisdiction within the Watershed Management Area over the course of the wet season, extrapolated from the data produced from the monitored MS4 outfalls; and

[d] The percent contribution of storm water volumes and pollutant loads discharged from each land use type within each hydrologic subarea with a major MS4 outfall to receiving waters or within each major MS4 outfall to receiving waters in the Copermittee's jurisdiction within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch.

(ii) Identify modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify pollutants in storm water discharges from the MS4s in the Watershed Management Area pursuant to Provision D.2.c.(1).

(c) Based on the wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.c the Copermittees must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(2)(b);

(ii) Based on the data collected and applicable SALs in the Water Quality Improvement Plan, analyze and compare the monitoring data to the analyses and assumptions used to develop the Water Quality Improvement Plans, including strategies developed pursuant to Provision B.3, and evaluate whether those analyses and assumptions should be updated as a component of the adaptive management efforts pursuant to Provision B.5 for follow-up action to update the Water Quality Improvement Plan;

(iii) The Copermittees must review the data collected pursuant to Provision D.2.c and findings from the assessments required pursuant to Provisions D.4.b.(2)(c)(i)-(ii) at least once during the term of this Order to:

[a] Identify reductions or progress in achieving reductions in pollutant concentrations and/or pollutant loads from different land uses and/or drainage areas discharging from the Copermittees' MS4s in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters within the Watershed Management Area to the MEP, with an estimate, if possible, of the pollutant load reductions attributable to specific water quality strategies implemented by the Copermittees; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittees in the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters in the Watershed Management Area to the MEP.

(iv) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(iii).

(d) The Copermittees must evaluate all the data collected pursuant to Provision D.2.c, and incorporate new outfall monitoring data into time series plots for each long-term monitoring constituent for the Watershed Management Area, and perform statistical trends analysis on the cumulative long-term wet weather MS4 outfall discharge water quality data set.

c. Special Studies Assessments

The Copermittees must annually evaluate the results and findings from the special studies developed and implemented pursuant to Provision D.3, and assess their relevance to the Copermittees' efforts to characterize receiving water conditions, understand sources of pollutants and/or stressors, and control and reduce the discharges of pollutants from the MS4 outfalls to receiving waters in the Watershed Management Area. The Copermittees must report the results of the special studies assessments applicable to the Watershed Management Area, and identify any necessary modifications or updates to the Water Quality Improvement Plan based on the results in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

d. Integrated Assessment of Water Quality Improvement Plan

As part of the iterative approach and adaptive management process required for the Water Quality Improvement Plan pursuant to Provision B.5, the Copermittees in each Watershed Management Area must integrate the data collected pursuant to Provisions D.1-D.3, the findings from the assessments required pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to assess the effectiveness of, and identify necessary modifications to, the Water Quality Improvement Plan as follows:

(1) The Copermittees must re-evaluate the priority water quality conditions and numeric goals for the Watershed Management Area, as needed, during the term of this Order pursuant to Provision B.5.a. The re-evaluation and recommendations for modifications to the priority water quality conditions, and/or numeric goals and corresponding schedules may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to

Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The priority water quality conditions and numeric goals for the Watershed Management Area must be re-evaluated as follows:

(a) Re-evaluate the receiving water conditions in the Watershed Management Area in accordance with Provision B.2.a;

(b) Re-evaluate the impacts on receiving waters in the Watershed Management Area from MS4 discharges in accordance with Provision B.2.b;

(c) Re-evaluate the identification of MS4 sources of pollutants and/or stressors in accordance with Provision B.2.d;

(d) Identify beneficial uses of the receiving waters that are protected in accordance with Provision D.4.a;

(e) Evaluate the progress toward achieving the interim and final numeric goals for protecting impacted beneficial uses in the receiving waters.

(2) The Copermittees must re-evaluate the water quality improvement strategies for the Watershed Management Area during the term of this Order pursuant to Provision B.5.b. The re-evaluation and recommendations for modifications to the water quality improvement strategies and schedules may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The water quality improvement strategies for the Watershed Management Area must be re-evaluated as follows:

(a) Identify the non-storm water and storm water pollutant loads from the Copermittees' MS4 outfalls in the Watershed Management Area, calculated or estimated pursuant to Provisions D.4.b;

(b) Identify the non-storm water and storm water pollutant load reductions, or other improvements to receiving water or water quality conditions, that are necessary to attain the interim and final numeric goals identified in the Water Quality Improvement Plan for protecting beneficial uses in the receiving waters;

(c) Identify the non-storm water and storm water pollutant load reductions, or other improvements to the quality of MS4 discharges, that are necessary for the Copermittees to demonstrate that non-storm water and storm water discharges from their MS4s are not causing or contributing to exceedances of receiving water limitations;

(d) Evaluate the progress of the water quality improvement strategies toward

achieving the interim and final numeric goals identified in the Water Quality Improvement Plan for protecting beneficial uses in the receiving waters.

(3) The Copermittees must re-evaluate and adapt the water quality monitoring and assessment program for the Watershed Management Area when new information becomes available to improve the monitoring and assessment program pursuant to Provision B.5.c. The re-evaluation and recommendations for modifications to the monitoring and assessment program may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. Modifications to the water quality monitoring and assessment program must be consistent with the requirements of Provision D.1-D.3. The re-evaluation of the water quality monitoring and assessment program for the Watershed Management Area must consider the data gaps identified by the assessments required pursuant to Provisions D.4.a-b, and results of the special studies implemented pursuant to Provision D.4.c.

5. Monitoring Provisions

Each Copermittee must comply with all the monitoring, reporting, and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

E. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS

The purpose of this provision is for each Copermittee to implement a program to control the contribution of pollutants to and the discharges from the MS4 within its jurisdiction. The goal of the jurisdictional runoff management programs is to implement strategies that effectively prohibit non-storm water discharges to the MS4 and reduce the discharge of pollutants in storm water to the MEP. This goal will be accomplished through implementing the jurisdictional runoff management programs in accordance with the strategies identified in the Water Quality Improvement Plans.

Each Copermittee must update its jurisdictional runoff management program document, in accordance with Provision F.2.a, to incorporate all the requirements of Provision E. Until the Copermittee has updated its jurisdictional runoff management program document with the requirements of Provision E, the Copermittee must continue implementing its current jurisdictional runoff management program.

1. Legal Authority Establishment and Enforcement

a. Each Copermittee must establish, maintain, and enforce adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 through statute, ordinance, permit, contract, order, or similar means. This legal authority must, at a minimum, authorize the Copermittee to:

(1) Prohibit and eliminate all illicit discharges and illicit connections to its MS4;

(2) Control the contribution of pollutants in discharges of runoff associated with industrial and construction activity to its MS4 and control the quality of runoff from industrial and construction sites, including industrial and construction sites which have coverage under the statewide General Permit for Discharges of Storm Water Associated with Industrial Activities (Industrial General Permit) or General Permit for Discharges of Storm Water Associated with Construction Activities (Construction General Permit), as well as to those sites which do not;

(3) Control the discharge of spills, dumping, or disposal of materials other than storm water into its MS4;

(4) Control through interagency agreements among Copermittees the contribution of pollutants from one portion of the MS4 to another portion of the MS4;

(5) Control, by coordinating and cooperating with other owners of the MS4 such as Caltrans, the U.S. federal government, or sovereign Native American Tribes through interagency agreements, where possible, the contribution of pollutants from their portion of the MS4 to the portion of the MS4 within the Copermittee's jurisdiction;

(6) Require compliance with conditions in its statutes, ordinances, permits, contracts, orders, or similar means to hold dischargers to its MS4 accountable for their contributions of pollutants and flows;

(7) Require the use of BMPs to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(8) Require documentation on the effectiveness of BMPs implemented to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(9) Utilize enforcement mechanisms to require compliance with its statutes, ordinances, permits, contracts, orders, or similar means; and

(10) Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with its statutes, ordinances, permits, contracts, orders, or similar means and with the requirements of this Order, including the prohibition of illicit discharges and connections to its MS4; the Copermittee must also have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from industrial facilities, including construction sites, discharging into its MS4.

b. With the first Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3), each Copermittee must submit a statement certified by its Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative that the Copermittee has taken the necessary steps to obtain and maintain full legal authority within its jurisdiction to implement and enforce each of the requirements contained in this Order.

2. Illicit Discharge Detection and Elimination

Each Copermittee must implement a program to actively detect and eliminate illicit discharges and improper disposal into the MS4, or otherwise require the discharger to apply for and obtain a separate NPDES permit. The illicit discharge detection and elimination program must be implemented in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include, at a minimum, the following requirements:

e. Non-Storm Water Discharges

Each Copermittee must address all non-storm water discharges as illicit discharges unless a non-storm water discharge is either identified as a discharge authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to the following requirements:

(1) Discharges of non-storm water to the MS4 from the following categories must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG919001 (Order No. R9-2007-0034, or subsequent order) for discharges to San Diego Bay, or NPDES Permit No. CAG919002 (Order No. R9-2008-0002, or subsequent order) for discharges to surface waters other than San Diego Bay:

(1) Uncontaminated pumped ground water;

(2) Discharges from foundation drains;[20]

(3) Water from crawl space pumps; and

(4) Water from footing drains.[20]

(2) Discharges of non-storm water from water line flushing and water main breaks to the MS4 must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG 679001 (Order No. R9-2010-0003 or subsequent order). This category includes water line flushing and water main break discharges from water purveyors issued a water supply permit by the California Department of Public Health or federal military installations. Discharges from recycled or reclaimed water lines to the MS4 must be addressed as illicit discharges, unless the discharges have coverage under a separate NPDES permit.

(3) Discharges of non-storm water to the MS4 from the following categories must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a source of pollutants to receiving waters:

(a) Diverted stream flows;

(b) Rising ground waters;

(c) Uncontaminated ground water infiltration to MS4s;

(d) Springs;

(e) Flows from riparian habitats and wetlands;

(f) Discharges from potable water sources;

[20] Provision E.2.a.(1) only applies to this category of non-storm water if the system is designed to be located at or below the groundwater table to actively or passively extract groundwater during any part of the year.

(g) Discharges from foundation drains;[21] and

(h) Discharges from footing drains.[21]

(4) Discharges of non-storm water to the MS4 from the following categories must be controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means. Discharges of non-storm water to the MS4 from the following categories not controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means must be addressed by the Copermittee as illicit discharges.

(a) Air conditioning condensation

The discharge of air conditioning condensation should be directed to landscaped areas or other pervious surfaces, or to the sanitary sewer, where feasible.

(b) Individual residential vehicle washing

(i) The discharge of wash water should be directed to landscaped areas or other pervious surfaces where feasible; and

(ii) The minimization of water, washing detergent and other vehicle wash products used for residential vehicle washing, and the implementation of other practices or behaviors that will prevent the discharge of pollutants associated with individual residential vehicle washing from entering the MS4 must be encouraged.

(c) Dechlorinated swimming pool discharges

(i) Residual chlorine, algaecide, filter backwash, or other pollutants from swimming pools must be eliminated prior to discharging to the MS4; and

(ii) The discharge of saline swimming pool water must be directed to the sanitary sewer, landscaped areas, or other pervious surfaces that can accommodate the volume of water, unless the saline swimming pool water can be discharged via a pipe or concrete channel directly to a naturally saline water body (e.g. Pacific Ocean).

(5) Firefighting discharges to the MS4 must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a significant source of pollutants to receiving waters. Firefighting discharges to the MS4 not identified as a significant source of pollutants to receiving waters, must be addressed, at a minimum, as follows:

[21] Provision E.2.a.(3) only applies to this category of non-storm water discharge if the system is designed to be located above the groundwater table at all times of the year, and the system is only expected to discharge non-storm water under unusual circumstances.

(a) Non-emergency firefighting discharges

(i) Building fire suppression system maintenance discharges (e.g. sprinkler line flushing) to the MS4 must be addressed as illicit discharges unless BMPs are implemented to prevent pollutants associated with such discharges to the MS4.

(ii) Non-emergency firefighting discharges (i.e., discharges from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems) must be addressed by a program, to be developed and implemented by the Copermittee, to reduce or eliminate pollutants in such discharges from entering the MS4.

(b) Emergency firefighting discharges

Each Copermittee should develop and encourage implementation of BMPs to reduce or eliminate pollutants in emergency firefighting discharges to the MS4s and receiving waters within its jurisdiction. During emergency situations, priority of efforts should be directed toward life, property, and the environment (in descending order). BMPs should not interfere with immediate emergency response operations or impact public health and safety.

(6) If the Copermittee or San Diego Water Board identifies any category of non-storm water discharges listed under Provisions E.2.a.(1)-(4) as a source of pollutants to receiving waters, the category must be prohibited through ordinance, order, or similar means and addressed as an illicit discharge. Alternatively, the Copermittee may propose controls to be implemented for the category of non-storm water discharges as part of the Water Quality Improvement Plan instead of prohibiting the category of non-storm water discharges, and implement the controls if accepted by the San Diego Water Board as part of the Water Quality Improvement Plan.

(7) Each Copermittee must, where feasible and priorities and resources allow, reduce or eliminate non-storm water discharges listed under Provisions E.2.a.(1)-(4) into its MS4, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit.

f. Prevent And Detect Illicit Discharges And Connections

Each Copermittee must include the following measures within its program to prevent and detect illicit discharges to the MS4:

(1) Each Copermittee must maintain an updated map of its entire MS4 and the corresponding drainage areas. The accuracy of the MS4 map must be confirmed during the field screening required pursuant to Provision E.2.c.

The MS4 map must be included as part of the jurisdictional runoff management program document. Any geographic information system (GIS) layers or files used by the Copermittee to maintain the MS4 map must be made available to the San Diego Water Board upon request. The MS4 map must identify the following:

(a) All segments of the MS4 owned, operated, and maintained by the Copermittee;

(b) All known locations of inlets that discharge and/or collect runoff into the Copermittee's MS4;

(c) All known locations of connections with other MS4s not owned or operated by the Copermittee (e.g. Caltrans MS4s);

(d) All known locations of MS4 outfalls and private outfalls that discharge runoff collected from areas within the Copermittee's jurisdiction;

(e) All segments of receiving waters within the Copermittee's jurisdiction that receive and convey runoff discharged from the Copermittee's MS4 outfalls;

(f) Locations of the MS4 outfalls, identified pursuant to Provision D.2.a.(1), within its jurisdiction; and

(g) Locations of the non-storm water persistent flow MS4 outfall discharge monitoring stations, identified pursuant to Provision D.2.b.(2), within its jurisdiction.

(2) Each Copermittee must use Copermittee personnel and contractors to assist in identifying and reporting illicit discharges and connections during their daily employment activities.

(3) Each Copermittee must promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges to or from the MS4, including the following methods for public reporting:

(a) Operate a public hotline, which can be Copermittee-specific or shared by the Copermittees, and must be capable of receiving reports in both English and Spanish 24 hours per day and seven days per week; and

(b) Designate an e-mail address for receiving electronic reports from the public, which can be Copermittee-specific or shared by the Copermittees, and must be prominently displayed on the Copermittee's webpage and the Regional Clearinghouse required pursuant to Provision F.4.

(4) Each Copermittee must implement practices and procedures (including a notification mechanism) to prevent, respond to, contain, and clean up any spills that may discharge into the MS4 within its jurisdiction from any source. The Copermittee must coordinate, to the extent possible, with spill response teams to prevent entry of spills into the MS4, and prevent contamination of surface water, ground water, and soil. The Copermittee must coordinate spill prevention, containment, and response activities throughout all appropriate Copermittee departments, programs, and agencies.

(5) Each Copermittee must implement practices and procedures to prevent and limit infiltration of seepage from sanitary sewers (including private laterals and failing septic systems) to the MS4.

(6) Each Copermittee must coordinate, when necessary, with upstream Copermittees and/or entities to prevent illicit discharges from upstream sources into the MS4 within its jurisdiction.

g. FIELD SCREENING

Each Copermittee must conduct field screening (i.e. visual observations, field testing, and/or analytical testing) of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4 in accordance with the dry weather MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

h. INVESTIGATE AND ELIMINATE ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to investigate and eliminate illicit discharges to the MS4:

(1) Each Copermittee must prioritize and determine when follow-up investigations will be performed in response to visual observations and/or water quality monitoring data collected during an investigation of a detected non-storm water or illicit discharge to or from the MS4. The criteria for prioritizing investigations must consider the following:

(a) Pollutants identified as causing or contributing to the highest water quality priorities identified in the Water Quality Improvement Plan;

(b) Pollutants identified as causing or contributing, or threatening to cause or contribute to impairments in water bodies on the 303(d) List and/or in environmentally sensitive areas (ESAs), located within its jurisdiction;

(c) Pollutants identified from sources or land uses known to exist within the area, drainage basin, or watershed that discharges to the portion of the MS4 within its jurisdiction included in the investigation;

(d) Pollutants identified as causing or contributing to an exceedance of a NAL in the Water Quality Improvement Plan; and

(e) Pollutants identified as a threat to human health or the environment.

(2) Each Copermittee must implement procedures to investigate and inspect portions of its MS4 that, based on reports or notifications, field screening, or other appropriate information, indicate a reasonable potential of receiving, containing, or discharging pollutants due to illicit discharges, illicit connections, or other sources of non-storm water. The procedures must include the following:

(a) Each Copermittee must develop criteria to:

(i) Assess the validity of each report or notification received; and

(ii) Prioritize the response to each report or notification received.

(b) Each Copermittee must prioritize and respond to each valid report or notification (e.g., public reports, staff or contractor reports and notifications, etc.) of an incident in a timely manner.

(c) In accordance with the requirements of Provision E.2.d.(1), each Copermittee must investigate and seek to identify the source(s) of discharges of non-storm water where flows are observed in and from the MS4 during the field screening required pursuant to Provision D.2.b.(1) as follows:

(i) Obvious illicit discharges must be immediately investigated to identify the source(s) of non-storm water discharges;

(ii) The investigation must include field investigations to identify sources or potential sources for the discharge, unless the source or potential source has already been identified during previous investigations; and

(iii) The investigation may include follow-up field investigations and/or reviewing Copermittee inventories and other land use data to identify potential sources of the discharge.

(d) Each Copermittee must maintain records and a database of the following information:

(i) Location of incident, including hydrologic subarea, portion of MS4 receiving the non-storm water or illicit discharge, and point of discharge or potential discharge from MS4 to receiving water;

(ii) Source of information initiating the investigation (e.g., public reports, staff or contractor reports and notifications, field screening, etc.);

(iii) Date the information used to initiate the investigation was received;

(iv) Date the investigation was initiated;

(v) Dates of follow-up investigations;

(vi) Identified or suspected source of the illicit discharge or connection, if determined;

(vii) Known or suspected related incidents, if any;

(viii) Result of the investigation; and

(ix) If a source cannot be identified and the investigation is not continued, document the response pursuant to the requirements of Provision E.2.d.(4).

(e) Each Copermittee must maintain records and, in accordance with the priorities of the Water Quality Improvement Plan, seek to identify the source(s) of non-storm water discharges from the MS4 where there is evidence of non-storm water having been discharged into or from the MS4 (e.g., pooled water), in accordance with MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

(3) Each Copermittee must initiate the implementation of procedures, in a timely manner, to eliminate all detected and identified illicit discharges and connections within its jurisdiction. The procedures must include the following responses:

(a) Each Copermittee must enforce its legal authority, as required under Provision E.1, to eliminate illicit discharges and connections to the MS4.

(b) If the Copermittee identifies the source as a controllable source of non-storm water or illicit discharge or connection, the Copermittee must implement its Enforcement Response Plan pursuant to Provision E.6 and enforce its legal authority to prohibit and eliminate illicit discharges and connections to its MS4.

(c) If the Copermittee identifies the source of the discharge as a category of non-storm water discharges in Provision E.2.a, and the discharge is in exceedance of NALs in the Water Quality Improvement Plan, then the Copermittee must determine if: (1) this is an isolated incident or set of circumstances that will be addressed through its Enforcement Response Plan pursuant to Provision E.6, or (2) the category of discharge must be addressed through the prohibition of that category of discharge as an illicit discharge pursuant to Provision E.2.a.(6).

(d) If the Copermittee suspects the source of the non-storm water discharge as natural in origin (i.e. non-anthropogenically influenced) and in conveyance into the MS4, then the Copermittee must document and

provide the data and evidence necessary to demonstrate to the San Diego Water Board that it is natural in origin and does not require further investigation.

(e) If the Copermittee is unable to identify and document the source of a recurring non-storm water discharge to or from the MS4, then the Copermittee must address the discharge as an illicit discharge and update its jurisdictional runoff management program to address the common and suspected sources of the non-storm water discharge within its jurisdiction in accordance with the Copermittee's priorities.

(4) Each Copermittee must submit a summary of the non-storm water discharges and illicit discharges and connections investigated and eliminated within its jurisdiction with each Water Quality Improvement Plan Annual Report required under Provision F.3.b.(3) of this Order.

3. Development Planning

Each Copermittee must use their land use and planning authorities to implement a development planning program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. BMP Requirements for All Development Projects

Each Copermittee must prescribe the following BMP requirements during the planning process (i.e. prior to project approval and issuance of local permits) for all development projects (regardless of project type or size), where local permits are issued, including unpaved roads and flood management projects:

(3) General Requirements

(a) Onsite BMPs must be located so as to remove pollutants from runoff prior to its discharge to any receiving waters, and as close to the source as possible;

(b) Structural BMPs must not be constructed within waters of the U.S.

(c) Onsite BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors (e.g. mosquitos, rodents, or flies).

(4) Source Control BMP Requirements

The following source control BMPs must be implemented at all development projects where applicable and feasible:

(a) Prevention of illicit discharges into the MS4;

(b) Storm drain system stenciling or signage;

(c) Protect outdoor material storage areas from rainfall, run-on, runoff, and wind dispersal;

(d) Protect materials stored in outdoor work areas from rainfall, run-on, runoff, and wind dispersal;

(e) Protect trash storage areas from rainfall, run-on, runoff, and wind dispersal; and

(f) Any additional BMPs determined to be necessary by the Copermittee to minimize pollutant generation at each project.

(5) Low Impact Development (LID) BMP Requirements

The following LID BMPs must be implemented at all development projects where applicable and feasible:

(a) Maintenance or restoration of natural storage reservoirs and drainage corridors (including topographic depressions, areas of permeable soils, natural swales, and ephemeral and intermittent streams);[22]

(b) Buffer zones for natural water bodies (where buffer zones are technically infeasible, require project applicant to include other buffers such as trees, access restrictions, etc.);

(c) Conservation of natural areas within the project footprint including existing trees, other vegetation, and soils;

(d) Construction of streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided public safety is not compromised;

(e) Minimization of the impervious footprint of the project;

(f) Minimization of soil compaction to landscaped areas;

(g) Disconnection of impervious surfaces through distributed pervious areas;

[22] Development projects proposing to dredge or fill materials in waters of the U.S. must obtain a CWA Section 401 Water Quality Certification. Projects proposing to dredge or fill waters of the state must obtain waste discharge requirements.

(h) Landscaped or other pervious areas designed and constructed to effectively receive and infiltrate, retain and/or treat runoff from impervious areas, prior to discharging to the MS4;

(i) Small collection strategies located at, or as close as possible to, the source (i.e. the point where storm water initially meets the ground) to minimize the transport of runoff and pollutants to the MS4 and receiving waters;

(j) Use of permeable materials for projects with low traffic areas and appropriate soil conditions;

(k) Landscaping with native or drought tolerant species; and

(l) Harvesting and using precipitation.

b. PRIORITY DEVELOPMENT PROJECTS

Priority Development Projects are land development projects that fall under the planning and building authority of the Copermittee for which the Copermittee must impose specific requirements, in addition to those described in Provision E.3.a, including the implementation of structural BMPs to meet the performance requirements described in Provision E.3.c.

(1) Definition of Priority Development Project

Priority Development Projects include the following:

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(b) Redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site on an existing site of 10,000 square feet or more of impervious surfaces). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(c) New and redevelopment projects that create 5,000 square feet or more of impervious surface (collectively over the entire project site), and support one or more of the following uses:

(i) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812).

(ii) Hillside development projects. This category includes development on any natural slope that is twenty-five percent or greater.

(iii) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce.

(iv) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

(d) New or redevelopment projects that create or replace 2,500 square feet or more of impervious surface (collectively over the entire project site), and discharging directly to an Environmentally Sensitive Area (ESA). "Discharging directly to" includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands).

(e) New development projects that support one or more of the following uses:

(i) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

(ii) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

(f) New or redevelopment projects that result in the disturbance of one or more acres of land and are expected to generate pollutants post construction.

(2) <u>Special Considerations for Redevelopment Projects</u>

The structural BMP performance requirements of Provision E.3.c are applicable to redevelopment Priority Development Projects, as defined in E.3.b.(1), as follows:

(a) Where redevelopment results in the creation or replacement of impervious surface in an amount of less than fifty percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provision E.3.c apply only to the creation or replacement of impervious surface, and not the entire development; or

(b) Where redevelopment results in the creation or replacement of impervious surface in an amount of more than fifty percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provision E.3.c apply to the entire development.

(3) Priority Development Project Exemptions

Each Copermittee has the discretion to exempt the following projects from being defined as Priority Development Projects:

(a) New or retrofit paved sidewalks, bicycle lanes, or trails that meet the following criteria:

(i) Designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas; OR

(ii) Designed and constructed to be hydraulically disconnected from paved streets or roads; OR

(iii) Designed and constructed with permeable pavements or surfaces in accordance with USEPA Green Streets guidance.[23]

(b) Retrofitting or redevelopment of existing paved alleys, streets or roads that are designed and constructed in accordance with the USEPA Green Streets guidance.[24]

c. Priority Development Project Structural BMP Performance Requirements

In addition to the BMP requirements listed for all development projects under Provision E.3.a, Priority Development Projects must also implement structural BMPs that conform to performance requirements described below.

(1) Storm Water Pollutant Control BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite structural BMPs to control pollutants in storm water that may be discharged from a project as follows:

(a) Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite the pollutants contained in the volume of storm water runoff produced from a 24-hour 85th percentile storm event (design capture volume);[25]

[23] See "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).
[24] Ibid.
[25] This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are

(i) If a Copermittee determines that implementing BMPs to retain the full design capture volume onsite for a Priority Development Project is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize biofiltration BMPs. Biofiltration BMPs must be designed to have an appropriate hydraulic loading rate to maximize storm water retention and pollutant removal, as well as to prevent erosion, scour, and channeling within the BMP,[26] and must be sized to:

[a] Treat 1.5 times the design capture volume not reliably retained onsite, OR

[b] Treat the design capture volume not reliably retained onsite with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite.

(ii) If a Copermittee determines that biofiltration is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize flow-thru treatment control BMPs to treat runoff leaving the site, AND mitigate for the design capture volume not reliably retained onsite pursuant to Provision E.3.c.(1)(b). Flow thru treatment control BMPs must be sized and designed to:

[a] Remove pollutants from storm water to the MEP;

[b] Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;

[c] Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Flow-thru treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of flow-thru treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

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encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals.

[26] As part of the Copermittee's update to its BMP Design Manual, pursuant to Provision E.3.d, the Copermittee must provide guidance for hydraulic loading rates and other biofiltration design criteria necessary to maximize storm water retention and pollutant removal.

(b) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1)(a). The Priority Development Project must mitigate for the portion of the pollutant load in the design capture volume not retained onsite if Provision E.3.c.(3) is utilized. If a Priority Development Project is allowed to utilize alternative compliance, flow-thru treatment control BMPs must be implemented to treat the portion of the design capture volume that is not reliably retained onsite. Flow-thru treatment control BMPs must be sized and designed in accordance with Provisions E.3.c.(1)(a)(ii)[a]-[c].

(2) Hydromodification Management BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite BMPs to manage hydromodification that may be caused by storm water runoff discharged from a project as follows:

(a) Post-project runoff conditions (flow rates and durations) must not exceed pre-development runoff conditions by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat downstream of Priority Development Projects).

(i) In evaluating the range of flows that results in increased potential for erosion of natural (non-hardened) channels, the lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks.

(ii) The Copermittees may use monitoring results collected pursuant to Provision D.1.a.(2) to re-define the range of flows resulting in increased potential for erosion, or degraded instream habitat conditions, as warranted by the data.

(b) Each Priority Development Project must avoid critical sediment yield areas known to the Copermittee or identified by the optional Watershed Management Area Analysis pursuant to Provision B.3.b.(4), or implement measures that allow critical coarse sediment to be discharged to receiving waters, such that there is no net impact to the receiving water.

(c) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the performance requirements of Provision E.3.c.(2)(a). The Priority Development Project must mitigate for the post-project runoff conditions not fully managed onsite if Provision E.3.c.(3) is utilized.

(d) Exemptions

Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provisions E.3.c.(2) where the project discharges storm water runoff to:

(i) Existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;

(ii) Conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; or

(iii) An area identified by the Copermittees as appropriate for an exemption by the optional Watershed Management Area Analysis incorporated into the Water Quality Improvement Plan pursuant to Provision B.3.b.(4).

(e) Interim Timeframe Exemptions

Until the Copermittees have updated their BMP Design Manual in accordance with Provision F.2.b with the requirements of Provision E, the Copermittees have the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provision E.3.c.(2) where the project discharges storm water runoff directly to:

(i) An engineered channel conveyance system with a capacity to convey peak flows generated by the 10-year storm event all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; and

(ii) Large river reaches with a drainage area larger than 100 square miles and a 100-year flow capacity in excess of 20,000 cubic feet per second, provided that properly sized energy dissipation is included at all Priority Development Project discharge points.

(3) Alternative Compliance Program to Onsite Structural BMP Implementation

At the discretion of each Copermittee, Priority Development Projects may be allowed to participate in an alternative compliance program in lieu of implementing the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a), provided that the Water Quality Improvement Plan includes the optional Watershed Management Area Analysis described in Provision B.3.b.(4). The alternative compliance

program is available to a Priority Development Project only if the Priority Development Project applicant enters into a voluntary agreement with the Copermittee authorizing this arrangement. In addition to the voluntary agreement, relief from implementing structural BMPs onsite may be authorized by the Copermittee under the following conditions:

(a) Watershed Management Area Analysis Candidate Projects

The Priority Development Project applicant agrees to fund, contribute funds to, or implement a candidate project identified by the Copermittees in the Watershed Management Area Analysis included in the Water Quality Improvement Plan, pursuant to Provisions B.3.b.(4) subject to the following conditions:

(i) The Copermittee must determine that implementation of the candidate project will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a) onsite;

(ii) If the Priority Development Project applicant chooses to fully or partially fund a candidate project, then the in-lieu fee structure described in Provision E.3.c.(3)(c) must be followed;

(iii) If the Priority Development Project applicant chooses to fully or partially fund a candidate project, then the Copermittee must ensure that the funds to be obtained from the Priority Development Project applicant are sufficient to mitigate for impacts caused by not fully implementing structural BMPs onsite, pursuant to the performance requirements described in Provisions E.3.c.(1) and E.3.c.(2)(a);

(iv) If the Priority Development Project applicant chooses to implement a candidate project, then the Copermittee must ensure that pollutant control and/or hydromodification management within the candidate project are sufficient to mitigate for impacts caused by not implementing structural BMPs fully onsite, pursuant to the performance requirements described in Provisions E.3.c.(1) and E.3.c.(2)(a);

(v) The voluntary agreement to fund, partially fund, or implement a candidate project must include reliable sources of funding for operation and maintenance of the candidate project;

(vi) Design of the candidate project must be conducted under an appropriately qualified engineer, geologist, architect, landscape architect, or other professional, licenses where applicable, and competent and proficient in the fields pertinent to the candidate project design;

(vii) The candidate project must be constructed as soon as possible, but no later than 4 years after the certificate of occupancy is granted for

the first Priority Development Project that contributed funds toward the construction of the candidate project, unless a longer period of time is authorized by the San Diego Water Board Executive Officer; and

(viii) If the candidate project is constructed after the Priority Development Project is constructed, the Copermittee must require temporal mitigation for pollutant loads and altered flows that are discharged from the Priority Development Project.

(b) Project Applicant Proposed Alternative Compliance Projects

The Copermittee may allow a Priority Development Project applicant to propose and fund, contribute funds to, or implement an alternative compliance project not identified by the Watershed Management Area Analysis included in the Water Quality Improvement Plan pursuant to Provisions B.3.b.(4). This option is allowed provided the Copermittee determines that implementation of the alternative compliance project will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a) onsite, and is subject to the requirements described in Provisions E.3.c.(3)(a)(ii)-(viii).

(c) Alternative Compliance In-Lieu Fee Structure

If a Copermittee chooses to allow a Priority Development Project applicant to fund, or partially fund a candidate project or an alternative compliance project, then the Copermittee must develop and implement an in-lieu fee structure. This may be developed individually or with other Copermittees and/or entities, as a means for designing, developing, constructing, operating and maintaining offsite alternative compliance projects. The in-lieu fee must be transferred to the Copermittee (for public projects) or an escrow account (for private projects) prior to the construction of the Priority Development Project.

(d) Alternative Compliance Water Quality Credit System Option

The Copermittee may develop and implement an alternative compliance water quality credit system option, individually or with other Copermittees and/or entities, provided that such a credit system clearly exhibits that it will not allow discharges from Priority Development Projects to cause or contribute to a net impact over and above the impact caused by projects meeting the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a). Any credit system that a Copermittee chooses to implement must be submitted to the San Diego Water Board Executive Officer for review and acceptance as part of the Water Quality Improvement Plan.

(4) Long-Term Structural BMP Maintenance

Each Copermittee must require the project applicant to submit proof of the mechanism under which ongoing long-term maintenance of all structural BMPs will be conducted.

(5) Infiltration and Groundwater Protection

(a) Structural BMPs designed to primarily function as large, centralized infiltration devices (such as large infiltration trenches and infiltration basins) must not cause or contribute to an exceedance of an applicable groundwater quality objective. At a minimum, such infiltration BMPs must be in conformance with the design criteria listed below, unless the development project applicant demonstrates to the Copermittee that one or more of the specific design criteria listed below are not necessary to protect groundwater quality. The design criteria listed below do not apply to small infiltration systems dispersed throughout a development project.

(i) Runoff must undergo pretreatment such as sedimentation or filtration prior to infiltration;

(ii) Pollution prevention and source control BMPs must be implemented at a level appropriate to protect groundwater quality at sites where infiltration BMPs are to be used;

(iii) Infiltration BMPs must be adequately maintained to remove pollutants in storm water to the MEP;

(iv) The vertical distance from the base of any infiltration BMP to the seasonal high groundwater mark must be at least 10 feet. Where groundwater basins do not support beneficial uses, this vertical distance criteria may be reduced, provided groundwater quality is maintained;

(v) The soil through which infiltration is to occur must have physical and chemical characteristics (e.g., appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses;

(vi) Infiltration BMPs must not be used for areas of industrial or light industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee, unless source control BMPs to prevent exposure of high threat activities are implemented, or runoff from such activities is first treated or filtered to remove pollutants prior to infiltration; and

(vii) Infiltration BMPs must be located a minimum of 100 feet horizontally from any water supply wells.

(b) The Copermittee may develop, individually or with other Copermittees, alternative mandatory design criteria to that listed above for infiltration BMPs which are designed to primarily function as centralized infiltration devices. Before implementing the alternative design criteria in the development planning process the Copermitee(s) must:

(i) Notify the San Diego Water Board of the intent to implement the alternative design criteria submitted; and

(ii) Comply with any conditions set by the San Diego Water Board.

d. BMP DESIGN MANUAL UPDATE

Each Copermittee must update its BMP Design Manual[27] pursuant to Provision F.2.b. Until the Copermittee has updated its BMP Design Manual with the requirements of Provisions E.3.a-c, the Copermittee must continue implementing its current BMP Design Manual. Unless directed otherwise by the San Diego Water Board, the Copermittee must implement the BMP Design Manual within 180 days of completing the update. The update of the BMP Design Manual must include the following:

(1) Updated procedures to determine the nature and extent of storm water requirements applicable to a potential development or redevelopment projects. These procedures must inform project applicants of the storm water management requirements applicable to their project including, but not limited to, general requirements for all development projects, structural BMP design procedures and requirements, hydromodification management requirements, requirements specific to phased projects, and procedures specific to private developments and public improvement projects;

(2) Updated procedures to identify pollutants and conditions of concern for selecting the most appropriate structural BMPs that consider, at a minimum, the following:

(a) Receiving water quality (including pollutants for which receiving waters are listed as impaired under the CWA section 303(d) List);

(b) Pollutants, stressors, and/or receiving water conditions that cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(c) Land use type of the project and pollutants associated with that land use type; and

[27] The BMP Design Manual was formerly known as the Standard Storm Water Mitigation Plan under Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016.

(d) Pollutants expected to be present onsite.

(3) Updated procedures for designing structural BMPs, including any updated performance requirements to be consistent with the requirements of Provision E.3.c for all structural BMPs listed in the BMP Design Manual;

(4) Long-term maintenance criteria for each structural BMP listed in the BMP Design Manual; and

(5) Alternative compliance criteria, in accordance with the requirements under Provision E.3.c.(3), if the Copermittee elects to allow Priority Development Projects within its jurisdiction to utilize alternative compliance.

e. PRIORITY DEVELOPMENT PROJECT BMP IMPLEMENTATION AND OVERSIGHT

Each Copermittee must implement a program that requires and confirms structural BMPs on all Priority Development Projects are designed, constructed, and maintained to remove pollutants in storm water to the MEP.

(1) Structural BMP Approval and Verification Process

(a) Each Copermittee must require and confirm that for all Priority Development Project applications that have not received prior lawful approval by the Copermittee by the time the BMP Design Manual is implemented~~updated~~ pursuant to Provision E.3.d, the requirements of Provision E.3 are implemented. For project applications that have received prior lawful approval before the BMP Design Manual is implemented~~updated~~ pursuant to Provision E.3.d, the Copermittee may allow previous land development requirements to apply.

(b) Each Copermittee must identify the roles and responsibilities of its various municipal departments in implementing the structural BMP requirements, including each stage of a project from application review and approval through BMP maintenance and inspections.

(c) Each Copermittee must require and confirm that appropriate easements and ownerships are properly recorded in public records and the information is conveyed to all appropriate parties when there is a change in project or site ownership.

(d) Each Copermittee must require and confirm that prior to occupancy and/or intended use of any portion of the Priority Development Project, each structural BMP is inspected to verify that it has been constructed and is operating in compliance with all of its specifications, plans, permits, ordinances, and the requirements of this Order.

(2) Priority Development Project Inventory and Prioritization

(a) Each Copermittee must develop, maintain, and update at least annually, a watershed-based database to track and inventory all Priority Development Projects and associated structural BMPs within its jurisdiction. Inventories must be accurate and complete beginning from December 2002 for the San Diego County Copermittees, February 2003 for the Orange County Copermittees, and July 2005 for the Riverside County Copermittees. The use of an automated database system, such as GIS, is highly recommended. The database must include, at a minimum, the following information:

(i) Priority Development Project location (address and hydrologic subarea);

(ii) Descriptions of structural BMP type(s);

(iii) Date(s) of construction;

(iv) Party responsible for structural BMP maintenance;

(v) Dates and findings of structural BMP maintenance verifications; and

(vi) Corrective actions and/or resolutions, when applicable.

(b) Each Copermittee must prioritize the Priority Development Projects with structural BMPs within its jurisdiction. The designation of Priority Development Projects as high priority must consider the following:

(i) The highest water quality priorities identified in the Water Quality Improvement Plan;

(ii) Receiving water quality;

(iii) Number and sizes of structural BMPs;

(iv) Recommended maintenance frequency of structural BMPs;

(v) Likelihood of operation and maintenance issues of structural BMPs;

(vi) Land use and expected pollutants generated; and

(vii) Compliance record.

(3) Structural BMP Maintenance Verifications and Inspections

Each Copermittee is required to verify that structural BMPs on each Priority Development Project are adequately maintained, and continue to operate effectively to remove pollutants in storm water to the MEP through inspections, self-certifications, surveys, or other equally effective approaches.

(a) All (100 percent) of the structural BMPs at Priority Development Projects that are designated as high priority must be inspected directly by the

Copermittee annually prior to each rainy season;

(b) For verifications performed through a means other than direct Copermittee inspection, adequate documentation must be required by the Copermittee to provide assurance that the required maintenance of structural BMPs at each Priority Development Project has been completed; and

(c) Appropriate follow-up measures (including re-inspections, enforcement, etc.) must be conducted to ensure that structural BMPs at each Priority Development Project continue to reduce pollutants in storm water to the MEP as originally designed.

f. Development Project Enforcement

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all development projects, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

4. Construction Management

Each Copermittee must implement a construction management program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. Project Approval Process

Prior to issuance of any local permit(s) that allows the commencement of construction projects that involve ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff, each Copermittee must:

(1) Require a pollution control plan, construction BMP plan, and/or an erosion and sediment control plan, to be submitted by the project applicant to the Copermittee;

(2) Confirm the pollution control plan, construction BMP plan, and/or erosion and sediment control plan, complies with the local grading ordinance, other applicable local ordinances, and the requirements of this Order;

(3) Confirm the pollution control, construction BMP, and/or erosion and sediment control plan, includes seasonally appropriate and effective BMPs and management measures described in Provision E.4.c, as applicable to the project; and

(4) Verify that the project applicant has obtained coverage under the statewide

Construction General Permit (Order ~~2012-0006~~2009-0009-DWQ or subsequent Order), if applicable.

b. CONSTRUCTION SITE INVENTORY AND TRACKING

(1) Each Copermittee must maintain and update, at least quarterly, a watershed-based inventory of all construction projects issued a local permit that allows ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff. The use of an automated database system, such as GIS, is highly recommended. The inventory must include:

(a) Relevant contact information for each site (e.g., name, address, phone, and email for the owner and contractor);

(b) The basic site information including location (address and hydrologic subarea), Waste Discharge Identification (WDID) number (if applicable), size of the site, and approximate area of disturbance;

(c) Whether or not the site is considered a high threat to water quality, as defined in Provision E.4.b.(2) below;

(d) The project start and completion dates;

(e) The required inspection frequency, as defined in the Copermittee's jurisdictional runoff management program document;

(f) The date the Copermittee accepted or approved the pollution control plan, construction BMP plan, and/or erosion and sediment control plan; and

(g) Whether or not there are ongoing enforcement actions administered to the site.

(2) Each Copermittee must identify all construction sites within its jurisdiction that represent a high threat to downstream surface water quality. The designation of construction sites as high threat to water quality must consider the following:

(a) Sites located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Sites located within the same hydrologic subarea and tributary to a water body segment listed as impaired for sediment on the CWA section 303(d) List;

(c) Sites located within, directly adjacent to, or discharging directly to a receiving water within an ESA; and

(d) Other sites determined by the Copermittees or the San Diego Water Board as a high threat to water quality.

c. CONSTRUCTION SITE BMP IMPLEMENTATION

Each Copermittee must implement, or require the implementation of effective BMPs to reduce discharges of pollutants in storm water from construction sites to the MEP, and effectively prohibit non-storm water discharges from construction sites into the MS4. These BMPs must be site specific, seasonally appropriate, and construction phase appropriate. BMPs must be implemented at each construction site year round. Dry season BMP implementation must plan for and address unseasonal rain events that may occur during the dry season (May 1 through September 30). Copermittees must implement, or require the implementation of, BMPs in the following categories:

(1) Project Planning;

(2) Good Site Management "Housekeeping", including waste management;

(3) Non-storm Water Management;

(4) Erosion Control;

(5) Sediment Control;

(6) Run-on and Run-off Control; and

(7) Active/Passive Sediment Treatment Systems, where applicable.

d. CONSTRUCTION SITE INSPECTIONS

Each Copermittee must conduct construction site inspections to require and confirm compliance with its local permits and applicable local ordinances, and the requirements of this Order. Priority for site inspections must consider threat to water quality pursuant to Provision E.4.b as well as the nature of the construction activity, topography, and the characteristics of soils and receiving water quality.

(1) <u>Inspection Frequency</u>

(a) Each Copermittee must conduct inspections at all inventoried sites, including high threat to water quality sites, at an appropriate frequency for each phase of construction to confirm the site reduces the discharge of pollutants in storm water from construction sites to the MEP, and effectively prohibits non-storm water discharges from entering the MS4.

(b) Each Copermittee must establish appropriate inspection frequencies for

high threat to water quality sites, and all other sites, for each phase of construction. Inspection frequencies appropriate for addressing the highest water quality priorities identified in the Water Quality Improvement Plan, and for complying with the requirements of this Order must be identified in each Copermittee's jurisdictional runoff management program document.

(c) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e., re-inspection, enforcement) necessary to require and confirm site compliance with its local permits and applicable local ordinances, and the requirements of this Order.

(2) Inspection Content

Inspections of construction sites by the Copermittee must include, at a minimum:

(a) Verification of coverage under the Construction General Permit (Notice of Intent (NOI) and/or WDID number) during initial inspections, when applicable;

(b) Assessment of compliance with its local permits and applicable local ordinances related to pollution prevention, including the implementation and maintenance of applicable BMPs;

(c) Assessment of BMP adequacy and effectiveness;

(d) Visual observations of actual non-storm water discharges;

(e) Visual observations of actual or potential discharge of sediment and/or construction related materials from the site;

(f) Visual observations of actual or potential illicit connections; and

(g) If any violations are found and BMP corrections are needed, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried construction sites. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Site name, location (address and hydrologic subarea), and WDID number

(if applicable);

(b) Inspection date;

(c) Approximate amount of rainfall since last inspection;

(d) Description of problems observed with BMPs and indication of need for BMP addition/repair/replacement and any scheduled re-inspection, and date of re-inspection;

(e) Descriptions of any other specific inspection comments which must, at a minimum, include rationales for longer compliance time;

(f) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(g) Resolution of problems noted and date problems fixed.

e. CONSTRUCTION SITE ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried construction sites, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

5. Existing Development Management

Each Copermittee must implement an existing development management program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. EXISTING DEVELOPMENT INVENTORY AND TRACKING

Each Copermittee must maintain, and update at least annually, a watershed-based inventory of the existing development within its jurisdiction that may discharge a pollutant load to and from the MS4. The use of an automated database system, such as GIS, is highly recommended. The inventory must, at a minimum, include:

(1) Name, location (hydrological subarea and address, if applicable) of the following types of existing development with its jurisdiction:

(a) Commercial facilities or areas;

(b) Industrial facilities;

(c) Municipal facilities, including:

(i) MS4 and related structures;[28]

(ii) Roads, streets, and highways;

(iii) Parking facilities;

(iv) Municipal airfields;

(v) Parks and recreation facilities;

(vi) Flood management facilities, flood control devices and structures;

(vii) Operating or closed municipal landfills;

(viii) Publicly owned treatment works (including water and wastewater treatment plants) and sanitary sewer collection systems;

(ix) Corporate yards, including maintenance and storage yards for materials, waste, equipment, and vehicles;

(x) Hazardous waste collection facilities;

(xi) Other treatment, storage or disposal facilities for municipal waste; and

(xii) Other municipal facilities that the Copermittee determines may contribute a significant pollutant load to the MS4.

(d) Residential areas, which may be designated by one or more of the following:

(i) Residential management area;

(ii) Drainage basin or area;

(iii) Land use (e.g., single family, multi-family, rural);

(iv) Neighborhood;

(v) Common Interest Area;

(vi) Home Owner Association;

(vii) Mobile home park; and/or

(viii) Other designations accepted by the San Diego Water Board Executive Officer.

(2) A description of the facility or area, including the following information:

(a) Classification as commercial, industrial, municipal, or residential;

(b) Status of facility or area as active or inactive;

(c) Identification if a business is a mobile business;

[28] The inventory may refer to the MS4 map required to be maintained pursuant to Provision E.2.b.(1).

(d) SIC Code or NAICS Code, if applicable;

(e) Industrial General Permit NOI and/or WDID number, if applicable;

(f) Identification if a residential area is or includes a Common Interest Area / Home Owner Association, or mobile home park;

(g) Identification of pollutants generated and potentially generated by the facility or area;

(h) Whether the facility or area is adjacent to an ESA;

(i) Whether the facility or area is tributary to and within the same hydrologic subarea as a water body segment listed as impaired on the CWA section 303(d) List and generates pollutants for which the water body segment is impaired; and

(3) An annually updated map showing the location of inventoried existing development, watershed boundaries, and water bodies.

b. EXISTING DEVELOPMENT BMP IMPLEMENTATION AND MAINTENANCE

Each Copermittee must designate a minimum set of BMPs required for all inventoried existing development, including special event venues. The designated minimum BMPs must be specific to facility or area types and pollutant generating activities, as appropriate.

(1) Commercial, Industrial, and Municipal Facilities and Areas

(a) Pollution Prevention

Each Copermittee must require the use of pollution prevention methods by the commercial, industrial, and municipal facilities and areas in its inventoried existing development to address the priorities and strategies in the Water Quality Improvement Plan.

(b) BMP Implementation

Each Copermittee must require the implementation of designated BMPs at commercial facilities and areas, industrial facilities, and implement designated BMPs at municipal facilities in its inventoried existing development.

(c) BMP Operation and Maintenance

(i) Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at commercial facilities and areas, industrial facilities, and municipal

facilities in its inventoried existing development.

(ii) Each Copermittee must implement a schedule of operation and maintenance activities for its MS4 and related structures (including but not limited to catch basins, storm drain inlets, detention basins, etc.), and verify proper operation of all its municipal structural treatment controls designed to reduce pollutants (including floatables) in storm water discharges to or from its MS4s and related drainage structures. Operation and maintenance activities may include, but is not limited to, the following:

[a] Inspections of the MS4 and related structures;
[b] Cleaning of the MS4 and related structures; and
[c] Proper disposal of materials removed from cleaning of the MS4 and related structures.

(iii) Each Copermittee must implement a schedule of operation and maintenance for public streets, unpaved roads, paved roads, and paved highways within its jurisdiction to minimize pollutants that can be discharged in storm water.

(iv) Each Copermittee must implement controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers. Copermittees that operate both a municipal sanitary sewer system and a MS4 must implement controls and measures to prevent and eliminate seeping sewage from infiltrating the MS4. Copermittees that do not operate both a municipal sanitary sewer system and a MS4 must coordinate with sewering agencies to keep themselves informed of relevant and appropriate maintenance activities and sanitary sewage projects in their jurisdiction that may cause or contribute to seepage of sewage into the MS4.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must require the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from commercial facilities and areas and industrial facilities, and implement BMPs at municipal facilities in its inventoried existing development. Such BMPs must include, as appropriate, educational activities, permits, certifications and other measures for applicators and distributors.

(2) <u>Residential Areas</u>

(a) Pollution Prevention

Each Copermittee must promote and encourage the use of pollution prevention methods, where appropriate, by the residential areas in its

inventoried existing development.

(b) BMP Implementation

Each Copermittee must promote and encourage the implementation of designated BMPs at residential areas in its inventoried existing development.

(c) BMP Operation and Maintenance

Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at residential areas in its inventoried existing development.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must promote and encourage the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from residential areas in its inventoried existing development.

c. EXISTING DEVELOPMENT INSPECTIONS

Each Copermittee must conduct inspections of inventoried existing development to ensure compliance with applicable local ordinances and permits, and the requirements of this Order.

(1) Inspection Frequency

(a) Each Copermittee must establish appropriate inspection frequencies for inventoried existing development in accordance with the following requirements:

(i) At a minimum, inventoried existing development must be inspected once every five years utilizing one or more of the following methods:

[a] Drive-by inspections by Copermittee municipal and contract staff;
[b] Onsite inspections by Copermittee municipal and contract staff; and/or
[c] Visual inspections of publicly accessible inventoried facilities or areas by volunteer monitoring or patrol programs that have been trained by the Copermittee;

(ii) The frequency of inspections must be appropriate to confirm that BMPs are being implemented to reduce the discharge of pollutants in storm water from the MS4 to the MEP and effectively prohibit non-storm water discharges to the MS4;

(iii) The frequency of inspections must be based on the potential for a facility or area to discharge non-storm water and pollutants in storm water, and should reflect the priorities set forth in the Water Quality Improvement Plan;

(iv) Each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development;[29] and

(v) Inventoried existing development must be inspected by the Copermittee, as needed, in response to valid public complaints.

(b) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e. education and outreach, re-inspection, enforcement) necessary to require and confirm compliance with its applicable local ordinances and permits and the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

(2) Inspection Content

(a) Inspections of existing development must include, at a minimum:

(i) Visual inspections for the presence of actual non-storm water discharges;

(ii) Visual inspections for the presence of actual or potential discharge of pollutants;

(iii) Visual inspections for the presence of actual or potential illicit connections; and

(iv) Verification that the description of the facility or area in the inventory, required pursuant to Provision E.5.a.(2), has not changed.

(b) Onsite inspections of existing development by the Copermittee must include, at a minimum:

(i) Assessment of compliance with its applicable local ordinances and permits related to non-storm water and storm water discharges and runoff;

(ii) Assessment of the implementation of the designated BMPs;

(iii) Verification of coverage under the Industrial General Permit, when

[29] If any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspection may count toward the total annual inspection requirement. This requirement excludes linear municipal facilities (i.e., MS4 linear channels, sanitary sewer collection systems, streets, roads and highways).

applicable; and

(iv) If any problems or violations are found, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried existing development. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Name and location of the facility or area (address and hydrologic subarea) consistent with the inventory name and location, pursuant to Provision E.5.a.(1);

(b) Inspection and re-inspection date(s);

(c) Inspection method(s) (i.e. drive-by, onsite);

(d) Observations and findings from the inspection(s);

(e) For onsite inspections of existing development by Copermittee municipal or contract staff, the records must also include, as applicable:

(i) Description of any problems or violations found during the inspection(s);

(ii) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(iii) The date problems or violations were resolved.

d. EXISTING DEVELOPMENT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried existing development, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

e. RETROFITTING AND REHABILITATING AREAS OF EXISTING DEVELOPMENT

(1) Retrofitting Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to retrofit areas of existing development within

its jurisdiction to address identified sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify areas of existing development as candidates for retrofitting, focusing on areas where retrofitting will address pollutants and/or stressors that contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for retrofitting projects may be utilized to reduce pollutants that may be discharged in storm water from areas of existing development, and/or address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of retrofitting projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting projects; and

(e) Where retrofitting projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional retrofitting projects (i.e. projects that can receive and/or treat storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment) adjacent to and/or downstream of the areas of existing development.

(2) Stream, Channel and/or Habitat Rehabilitation in Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to rehabilitate streams, channels, and/or habitats in areas of existing development within its jurisdiction to address the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify streams, channels, and/or habitats in areas of existing development as candidates for rehabilitation, focusing on areas where stream, channel, and/or habitat rehabilitation projects will address the highest priority water quality conditions identified in the Water

Quality Improvement Plan;

(b) Candidates for stream, channel, and/or habitat rehabilitation projects may be utilized to address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters, rehabilitate channelized or hydromodified streams, restore wetland and riparian habitat, restore watershed functions, and/or restore beneficial uses of receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of stream, channel, and/or habitat rehabilitation projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance stream, channel, and/or habitat rehabilitation projects; and

(e) Where stream, channel, and/or habitat rehabilitation projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional stream, channel, and/or habitat rehabilitation projects (i.e. projects that can receive storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment).

6. Enforcement Response Plans

Each Copermittee must develop and implement an Enforcement Response Plan as part of its jurisdictional runoff management program document. The Enforcement Response Plan must describe the applicable approaches and options to enforce its legal authority established pursuant to Provision E.1, as necessary, to achieve compliance with the requirements of this Order. The Enforcement Response Plan must be in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include the following:

a. Enforcement Response Plan Components

The Enforcement Response Plan must include the following individual components:

(1) Illicit Discharge Detection and Elimination Enforcement Component;

(2) Development Planning Enforcement Component;

(3) Construction Management Enforcement Component; and

(4) Existing Development Enforcement Component.

b. ENFORCEMENT RESPONSE APPROACHES AND OPTIONS

Each component of the Enforcement Response Plan must describe the enforcement response approaches that the Copermittee will implement to compel compliance with its statutes, ordinances, permits, contracts, orders, or similar means, and the requirements of this Order. The description must include the protocols for implementing progressively stricter enforcement responses. The enforcement response approaches must include appropriate sanctions to compel compliance, including, at a minimum, the following tools or their equivalent:

(1) Verbal and written notices of violation;

(2) Cleanup requirements;

(3) Fines;

(4) Bonding requirements;

(5) Administrative and criminal penalties;

(6) Liens;

(7) Stop work orders; and

(8) Permit and occupancy denials.

c. CORRECTION OF VIOLATIONS

(1) Violations must be corrected in a timely manner with the goal of correcting the violations within 30 calendar days after the violations are discovered, or prior to the next predicted rain event, whichever is sooner.

(2) If more than 30 calendar days are required to achieve compliance, then a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

d. ESCALATED ENFORCEMENT

(1) The Enforcement Response Plan must include a definition of "escalated enforcement." Escalated enforcement must include any enforcement scenario where a violation or other non-compliance is determined to cause or contribute to the highest priority water quality conditions identified in the

Water Quality Improvement Plan. Escalated enforcement may be defined differently for development planning, construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas.

(2) Where the Copermittee determines escalated enforcement is not required, a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

(3) Escalated enforcement actions must continue to increase in severity, as necessary, to compel compliance as soon as possible.

e. REPORTING OF NON-COMPLIANT SITES

(1) Each Copermittee must notify the San Diego Water Board in writing within five (5) calendar days of issuing escalated enforcement (as defined in the Copermittee's Enforcement Response Plan) to a construction site that poses a significant threat to water quality as a result of violations or other non-compliance with its permits and applicable local ordinances, and the requirements of this Order. Written notification may be provided electronically by email to the appropriate San Diego Water Board staff.

(2) Each Copermittee must notify the San Diego Water Board of any persons required to obtain coverage under the statewide Industrial General Permit and Construction General Permit and failing to do so, within five (5) calendar days from the time the Copermittee become aware of the circumstances. Written notification may be provided electronically by email to R9_Nonfilers@waterboards.ca.gov ~~Nonfilers_R9@waterboards.ca.gov~~.

7. Public Education and Participation

Each Copermittee must implement, individually or with other Copermittees, a public education and participation program in accordance with the strategies identified in the Water Quality Improvement Plan to promote and encourage the development of programs, management practices, and behaviors that reduce the discharge of pollutants in storm water to the MEP, prevent controllable non-storm water discharges from entering the MS4, and protect water quality standards in receiving waters. The public education and participation program must be implemented in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include, at a minimum, the following requirements:

a. PUBLIC EDUCATION

The public education program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) Educational activities, public information activities, and other appropriate outreach activities intended to reduce pollutants associated with the application of pesticides, herbicides and fertilizer and other pollutants of concern in storm water discharges to and from its MS4 to the MEP, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed to address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(2) Educational activities, public information activities, and other appropriate outreach activities to facilitate the proper management and disposal of used oil and toxic materials; and

(3) Appropriate education and training measures for specific target audiences, such as construction site operators, residents, underserved target audiences and school-aged children, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed, based on high risk behaviors and pollutants of concern.

b. PUBLIC PARTICIPATION

The public participation program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) A process for members of the public to participate in updating the highest priority water quality conditions, numeric goals, and water quality improvement strategies in the Water Quality Improvement Plan;

(2) Opportunities for members of the public to participate in providing the Copermittee recommendations for improving the effectiveness of the water quality improvement strategies implemented within its jurisdiction; and

(3) Opportunities for members of the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or protection of the quality of receiving waters.

8. Fiscal Analysis

a. Each Copermittee must secure the resources necessary to meet all the requirements of this Order.

b. Each Copermittee must conduct an annual fiscal analysis of its jurisdictional runoff management program in its entirety. The fiscal analysis must include the following:

(1) Identification of the various categories of expenditures necessary to implement the requirements of this Order, including a description of the specific capital, operation and maintenance, and other expenditure items to

be accounted for in each category of expenditures;

(2) The staff resources needed and allocated to meet the requirements of this Order, including any development, implementation, and enforcement activities required;

(3) The estimated expenditures for Provisions E.8.b.(1) and E.8.b.(2) for the current fiscal year; and

(4) The source(s) of funds that are proposed to meet the necessary expenditures described in Provisions E.8.b.(1) and E.8.b.(2), including legal restrictions on the use of such funds, for the current fiscal year and next fiscal year.

c. Each Copermittee must submit a summary of the annual fiscal analysis with each Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3).

d. Each Copermittee must provide the documentation used to develop the summary of the annual fiscal analysis upon request by the San Diego Water Board.

F. REPORTING

The purpose of this provision is to determine and document compliance with the requirements set forth in this Order. The goal of reporting is to communicate to the San Diego Water Board and the people of the State of California the implementation status of each jurisdictional runoff management program and compliance with the requirements of this Order. This goal is to be accomplished through the submittal of specific deliverables to the San Diego Water Board by the Copermittees.

1. Water Quality Improvement Plans

The Copermittees for each Watershed Management Area must develop and submit the Water Quality Improvement Plan in accordance with the following requirements:

a. WATER QUALITY IMPROVEMENT PLAN DEVELOPMENT

Each Water Quality Improvement Plan must be developed in accordance with the following process:

(1) Public Participation Process

The Copermittees must implement a public participation process to solicit data, information, and recommendations to be utilized in the development of the Water Quality Improvement Plan. The public participation process must include the following:

(a) The Copermittees must develop a publicly available and noticed schedule of the opportunities for the public to participate and provide comments during the development of the Water Quality Improvement Plan. The schedule may be adjusted as necessary by the Copermittees, provided the public is provided timely notification of the changes to the schedule.

(b) The Copermittees must form a Water Quality Improvement Consultation Panel to provide recommendations during the development of the Water Quality Improvement Plan. The Water Quality Improvement Consultation Panel must consist of at least the following members:

(i) A representative of the San Diego Water Board;

(ii) A representative of the environmental community familiar with the water quality conditions of concern of the receiving waters in the Watershed Management Area, preferably from an environmental interest group associated with a water body within the Watershed Management Area; and

(iii) A representative of the development community familiar with the opportunities and constraints for implementing structural BMPs, retrofitting projects, and stream, channel or habitat rehabilitation

projects in the Watershed Management Area, preferably with relevant engineering, hydrology, and/or geomorphology experience in the Watershed Management Area.

(c) The Copermittees must coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public time and opportunity to participate during the development of the Water Quality Improvement Plans.

(2) Priority Water Quality Conditions

(a) The Copermittees must solicit data, information and recommendations from the public to be utilized in the development and identification of the priority water quality conditions and potential water quality improvement strategies for the Watershed Management Area.

(b) The Copermittees must review the priority water quality conditions the Copermittees plan on including in the Water Quality Improvement Plan with the Water Quality Improvement Consultation Panel to receive recommendations or concurrence.

(c) The Copermittees must consider revisions to the priority water quality conditions based on recommendations from the Water Quality Improvement Consultation Panel.

(d) The Copermittees must include all the potential water quality improvement strategies identified by the public and the Water Quality Improvement Consultation Panel with the submittal of the priority water quality conditions to the San Diego Water Board.

(e) The Copermittees must submit the Water Quality Improvement Plan requirements of Provision B.2 to the San Diego Water Board as early as 6 months and no later than 12 months after the commencement of coverage under this Order. Upon receipt, the San Diego Water Board will issue a public notice and release the proposed priority water quality conditions and potential water quality improvement strategies for public review and comment for a minimum of 30 days.

(f) The Copermittees must consider revisions to the priority water quality conditions and potential water quality improvement strategies developed pursuant to Provision B.2 based on public comments received by the close of the comment period.

(3) Water Quality Improvement Goals, Strategies and Schedules

(a) The Copermittees must solicit recommendations from the public on potential numeric goals for the highest priority water quality conditions

identified for the Watershed Management Area, and recommendations on the strategies that should be implemented to achieve the potential numeric goals.

(b) The Copermittees must consult with the Water Quality Improvement Consultation Panel and consider revisions to the following items based on the Panel's recommendations:

(i) The numeric goals and schedules the Copermittees propose to include in the Water Quality Improvement Plan;

(ii) The water quality improvement strategies and schedules the Copermittees propose to implement in the Watershed Management Area and include in the Water Quality Improvement Plan; and

(iii) If the Copermittees choose to implement Provision B.3.b.(4), the results of the Watershed Management Area Analysis the Copermittees proposed to incorporate into the Water Quality Improvement Plan.

(c) The Copermittees must submit the Water Quality Improvement Plan requirements of Provision B.3 to the San Diego Water Board as early as 9 months and no later than 18 months after the commencement of coverage under this Order. Upon receipt, the San Diego Water Board will issue a public notice and release the proposed water quality improvement goals, strategies and schedules for public review and comment for a minimum of 30 days.

(d) The Copermittees must consider revisions to the water quality improvement goals, strategies and schedules developed pursuant to Provision B.3 based on public comments received by the close of the comment period.

b. WATER QUALITY IMPROVEMENT PLAN SUBMITTAL AND IMPLEMENTATION

(1) Within 24 months after the commencement of coverage under this Order, the Copermittees for each Watershed Management Area must submit a complete Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order to the San Diego Water Board. The San Diego Water Board will issue a public notice and release the Water Quality Improvement Plan for public review and comment for a minimum of 30 days.

(2) The Copermittees must consider revisions to the Water Quality Improvement Plan based on written comments received by the close of the public comment period.

(3) The Copermittees must promptly submit any revisions to the Water Quality Improvement Plan to the San Diego Water Board no later than 60 days after the close of the public comment period.

(4) If issues concerning the Water Quality Improvement Plan are resolved informally through discussions among the Copermittees, the San Diego Water Board and interested parties, the San Diego Water Board Executive Officer may provide written notification of acceptance to the Copermittees that the Water Quality Improvement Plan meets the requirements of Provision B. However, if the Executive Officer determines that significant issues with the Water Quality Improvement Plan remain, the matter will be scheduled for San Diego Water Board consideration at a public meeting.

(5) The Copermittees must commence with implementation of the Water Quality Improvement Plan, in accordance with the water quality improvement strategies and schedules therein, upon written notification of acceptance with the Water Quality Improvement Plan by the San Diego Water Board Executive Officer.

(6) During implementation of the Water Quality Improvement Plan the Copermittees must correct any deficiencies in the Plan identified by the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report following a request by the Board to do so.

(7) The Water Quality Improvement Plan must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of receiving notification of acceptance with the Water Quality Improvement Plan by the San Diego Water Board Executive Officer.

2. Updates

a. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATES

Each Copermittee must update its jurisdictional runoff management program document in accordance with the following requirements:

(1) Each Copermittee is encouraged to seek public and key stakeholder participation and comments, as early and often as possible during the process of developing updates to its jurisdictional runoff management program document;

(2) Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E concurrent with the submittal of the Water Quality Improvement Plan. Each Copermittee must correct any deficiencies in the jurisdictional runoff management program document based on comments received from the San Diego Water Board in

the updates submitted with the Water Quality Improvement Plan Annual Report;

(3) Each Copermittee must submit updates to its jurisdictional runoff management program, with the supporting rationale for the modifications, either in the Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b;

(4) The Copermittee must revise proposed modifications to its jurisdictional runoff management program as directed by the San Diego Water Board Executive Officer; and

(5) Updated jurisdictional runoff management program documents must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of submitting the Water Quality Improvement Plan Annual Report.

b. BMP DESIGN MANUAL UPDATES

Each Copermittee must update its BMP Design Manual in accordance with the following requirements:

(1) Each Copermittee must update its BMP Design Manual to incorporate the requirements of Provisions E.3.a-d concurrent with the submittal of the Water Quality Improvement Plan. Each Copermittee must correct any deficiencies in the BMP Design Manual based on comments received from the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report;

(2) Subsequent updates to the BMP Design Manual must be consistent with the requirements of Provisions E.3.a-d and must be submitted as part of the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b; and

(3) Updated BMP Design Manuals must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of completing the update.

c. WATER QUALITY IMPROVEMENT PLAN UPDATES

(1) The Water Quality Improvement Plans must be updated in accordance with the following process:

(a) The Copermittees must develop and implement a public participation process to obtain data, information and recommendations for updating the Water Quality Improvement Plan. The public participation process must provide for a publicly available and noticed schedule of opportunities for the public to participate and provide comments during the development of updates to the Water Quality Improvement Plan;

(b) The Copermittees must consult with the Water Quality Improvement Consultation Panel on proposed updates of the Water Quality Improvement Plan, and consider the Water Quality Improvement Consultation Panel's recommendations in finalizing the proposed updates;

(c) The Copermittees for each Watershed Management Area must submit 1) proposed updates to the Water Quality Improvement Plan and supporting rationale, and 2) recommendations received from the public and the Water Quality Improvement Consultation Panel and the rationale for the requested updates, either in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The updates submitted will be deemed accepted for inclusion in the Water Quality Improvement Plan ninety (90) days after submission unless otherwise directed in writing by the San Diego Water Board Executive Officer;

(d) The Copermittees must revise the requested updates as directed by the San Diego Water Board Executive Officer; and

(e) Updated Water Quality Improvement Plans must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance of the requested updates by the San Diego Water Board.

(2) No later than six months following Office of Administrative Law and USEPA approval of any TMDL Basin Plan amendment with wasteload allocations (WLAs) assigned to the Copermittees during the term of this Order, the Copermittees must initiate an update to the applicable Water Quality Improvement Plans in accordance with Provision F.1 or Provision F.2.c.(1) to incorporate the requirements of the TMDL WLAs.

3. Progress Reporting

a. Progress Report Presentations

The Copermittees for each Watershed Management Area must periodically appear before the San Diego Water Board, as requested by the Board, to provide progress reports on the implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs.

b. Annual Reports

(1) Transitional Jurisdictional Runoff Management Program Annual Reports

(a) Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) no later than October 31 of each year for each jurisdictional runoff management program reporting period (i.e. July 1 to June 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted.

(b) Each Copermittee must submit the information on the Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) specific to the area within its jurisdiction in each Watershed Management Area.

(c) In addition to submitting the Jurisdictional Runoff Management Program Annual Report Form during the transitional reporting period, each Copermittee may continue to utilize and submit the jurisdictional runoff management program annual reporting format of its previous NPDES permit until the first Water Quality Improvement Plan Annual Report is required to be submitted.

(2) Transitional Monitoring and Assessment Program Annual Reports

The Copermittees for each Watershed Management Area must submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted under this Order. The Transitional Monitoring and Assessment Program Annual Reports must include:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1.a and D.2.a, summarized and presented in tabular and graphical form; and

(b) The findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

(3) Water Quality Improvement Plan Annual Reports

The Copermittees for each Watershed Management Area must submit a Water Quality Improvement Plan Annual Report for each reporting period no later than January 31 of the following year. The annual reporting period consists of two different periods: 1) July 1 to June 30 of the following year for the jurisdictional runoff management programs, 2) October 1 to September 30 of the following year for the monitoring and assessment programs. The Water Quality Improvement Plan Annual Reports must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Each Annual Report must include the following:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, summarized and presented in tabular and graphical form;

(b) The progress of the special studies required pursuant to Provision D.3, and the findings, interpretations and conclusions of a special study, or each phase of a special study, upon its completion;

(c) The findings, interpretations and conclusions from the assessments required pursuant to Provision D.4;

(d) The progress of implementing the Water Quality Improvement Plan, including, but not limited to, the following:

(i) The progress toward achieving the interim and final numeric goals for the highest water quality priorities for the Watershed Management Area;

(ii) The water quality improvement strategies that were implemented and/or no longer implemented by each of the Copermittees during the reporting period and previous reporting periods;

(iii) The water quality improvement strategies planned for implementation during the next reporting period;

(iv) Proposed modifications to the water quality improvement strategies, the public comments received and the supporting rationale for the proposed modifications;

(v) Previous modifications or updates incorporated into the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document and implemented by the Copermittees in the Watershed Management Area; and

(vi) Proposed modifications or updates to the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document;

(e) A completed Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) for each Copermittee in the Watershed Management Area, certified by a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative; and

(f) Each Copermittee must provide any data or documentation utilized in developing the Water Quality Improvement Plan Annual Report upon request by the San Diego Water Board. Any Copermittee monitoring data utilized in developing the Water Quality Improvement Plan Annual Report must be uploaded to the California Environmental Data Exchange Network (CEDEN).[30] Any Copermittee monitoring and assessment data utilized in developing the Water Quality Improvement Plan Annual Report must be available for access on the Regional Clearinghouse required pursuant to Provision F.4.

c. Regional Monitoring and Assessment Report

(1) The Copermittees must submit a Regional Monitoring and Assessment Report no later than 180 days prior to the expiration date of this Order. The Regional Monitoring and Assessment Report may be submitted as part of the Report of Waste Discharge required pursuant to Provision F.5.b. In preparing the report the Copermittees must consider the receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, and the findings, interpretations, and conclusions from the assessments required pursuant to Provision D.4. Based on these considerations the report must assess the following:

(a) The beneficial uses of the receiving waters within the San Diego Region that are supported and not adversely affected by the Copermittees' MS4 discharges;

(b) The beneficial uses of the receiving waters within the San Diego Region that are adversely impacted by the Copermittees' MS4 discharges;

(c) The progress toward protecting the beneficial uses in the receiving waters within the San Diego Region from the Copermittees' discharges; and

[30] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

(d) Pollutants or conditions of emerging concern that may impact beneficial uses in the receiving waters within the San Diego Region.

(2) The Regional Monitoring and Assessment Report must include recommendations for improving the implementation and assessment of the Water Quality Improvement Plans and jurisdictional runoff management programs.

(3) Each Copermittee must provide any data or documentation utilized in developing the Regional Monitoring and Assessment Report upon request by the San Diego Water Board. Any Copermittee monitoring and assessment data utilized in developing the Regional Monitoring and Assessment Report must be available for access on the Regional Clearinghouse required pursuant to Provision F.4.

4. Regional Clearinghouse

The Copermittees must develop, update, and maintain an internet-based Regional Clearinghouse that is made available to the public no later than 18 months after the effective date of this Order.[31]

a. The Copermittees, through the Regional Clearinghouse, must make the following documents and data available for access, and organized by Watershed Management Area. The documents and data may be linked to other internet-based data portals and databases where the original documents are stored:

(1) Water Quality Improvement Plan for the Watershed Management Area, and all updated versions with date of update;

(2) Annual Reports for the Watershed Management Area;

(3) Jurisdictional Runoff Management Program document for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(4) BMP Design Manual for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(5) Reports from special studies (e.g. source identification, BMP effectiveness assessment) conducted in the Watershed Management Area;

[31] The Copermittees may develop, update and maintain the clearinghouse(s) of other Copermittees or agencies.

(6) Monitoring data collected pursuant to Provision D for each Watershed Management Area must be uploaded to CEDEN,[32] with links to the uploaded data; and

(7) Available GIS data, layers, and/or shapefiles used to develop the maps generated and maintained by the Copermittees for the Water Quality Improvement Plans, Annual Reports, and jurisdictional runoff management program documents.

b. The Copermittees, through the Regional Clearinghouse, must make the following information and documents available for access:

(1) Contact information (point of contact, phone number, email address, and mailing address) for each Copermittee;

(2) Public hotline number for reporting non-storm water and illicit discharges for each Copermittee;

(3) Email address for reporting non-storm water and illicit discharges for each Copermittee;

(4) Link to each Copermittee's website, if available, where the public may find additional information about the Copermittee's storm water management program and for requesting records for the implementation of its program;

(5) Information about opportunities for the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or protection of the quality of receiving waters; and

(6) Reports from regional monitoring programs in which the Copermittees participate (e.g. Southern California Monitoring Coalition, Southern California Coastal Water Research Project Bight Monitoring);

(7) Regional Monitoring and Assessment Reports; and

(8) Any other information, data, and documents the Copermittees determine as appropriate for making available to the public.

[32] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

5. Report of Waste Discharge

a. The ~~Orange County Copermittees and the~~ Riverside County Copermittees are required to submit a complete Report of Waste Discharge pursuant to the requirements of their current Order~~s~~. The San Diego Water Board will review and consider the Report~~s~~ of Waste Discharge to determine whether modification to this Order, pursuant to the requirements of Provision H, will be required prior to the ~~Orange County Copermittees and/or~~ Riverside County Copermittees obtaining coverage under this Order. The current Order ~~s~~ for ~~the Orange County Copermittees and~~ Riverside County Copermittees is ~~are~~ rescinded upon the date of effective coverage under this Order except for enforcement purposes.

b. The Copermittees subject to the requirements of this Order must submit to the San Diego Water Board a complete Report of Waste Discharge as an application for the re-issuance of this Order and NPDES permit. The Report of Waste Discharge must be submitted no later than 180 days in advance of the expiration date of this Order. The Report of Waste Discharge must contain the following minimum information:

(1) Names and addresses of the Copermittees;

(2) Names and titles of the primary contacts of the Copermittees;

(3) Proposed changes to the Copermittees' Water Quality Improvement Plans and the supporting justification;

(4) Proposed changes to the Copermittees' jurisdictional runoff management programs and the supporting justification;

(5) Any other information necessary for the re-issuance of this Order;

(6) Any information to be included as part of the Report of Waste Discharge pursuant to the requirements of this Order; and

(7) Any other information required by federal regulations for NPDES permit reissuance.

6. Application for Early Coverage

a. The ~~Orange County Copermittees, collectively, or~~ Riverside County Copermittees~~, collectively,~~ may apply for early coverage under this Order by submitting a Report of Waste Discharge Form 200, with a written request for early coverage under this Order.

b. The San Diego Water Board will review the application for early coverage. A notification of coverage under this Order will be issued to the Copermittees in the

respective county by the San Diego Water Board upon completion of the early coverage application requirements. The effective coverage date will be specified in the notification of coverage. The Copermittees in the respective county are authorized to have MS4 discharges pursuant to the requirements of this Order starting on the effective coverage date specified in the notification of coverage. The existing Order for the respective county is rescinded upon the effective coverage date specified in the notification of coverage except for enforcement purposes.

7. Reporting Provisions

Each Copermittee must comply with all the reporting and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

G. PRINCIPAL WATERSHED COPERMITTEE RESPONSIBILITIES

1. The Copermittees within each Watershed Management Area must designate a Principal Watershed Copermittee and notify the San Diego Water Board of the name of the Principal Watershed Copermittee. An individual Copermittee should not be designated a Principal Watershed Copermittee for more than two Watershed Management Areas. The notification may be submitted with the Water Quality Improvement Plan required pursuant to Provision F.1 of this Order.

2. The Principal Watershed Copermittee is responsible for, at a minimum, the following:

a. Serving as liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues, and when necessary and appropriate, representing the Copermittees in the Watershed Management Area before the San Diego Water Board;

b. Facilitating the development of the Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order;

c. Coordinating the submittal of the deliverables required by Provisions F.1, F.2, F.3.a, and F.3.b of this Order; and

d. Coordinating and developing, with the other Principal Watershed Copermittees, the requirements of Provisions F.3.c, F.4, and F.5.b of this Order.

3. The Principal Watershed Copermittee is not responsible for ensuring that the other Copermittees within the Watershed Management Area are in compliance with the requirements of this Order. Each Copermittee within the Watershed Management Area is responsible for complying with the requirements of this Order.

H. MODIFICATION OF ORDER

1. Modifications of the Order may be initiated by the San Diego Water Board or by the Copermittees. Requests by Copermittees must be made to the San Diego Water Board.

2. Minor modifications to the Order may be made by the San Diego Water Board where the proposed modification complies with all the prohibitions and limitations, and other requirements of this Order.

3. This Order may also be re-opened and modified, revoked and, reissued or terminated in accordance with the provisions of 40 CFR 122.44, 122.62 to 122.64, and 124.5. Causes for taking such actions include, but are not limited to, failure to comply with any condition of this Order and permit, and endangerment to human health or the environment resulting from the permitted activity.

4. This Order may be re-opened for modification for cause including but not limited to the following:

   a. The State Water Board determines that revisions are warranted, and the San Diego Water Board concurs that revisions are necessary to those provisions of the Order addressing compliance with water quality standards in the receiving water and/or those provisions of the Order establishing an iterative process for implementation of management practices to assure compliance with water quality standards in the receiving water;

   b. An application for early coverage under this Order is received pursuant to Provision F.6;

   c. Any of the TMDLs in Attachment E to this Order are amended in the Basin Plan by San Diego Water Board, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA;

   d. The Basin Plan is amended by the San Diego Water Board to incorporate a new TMDL, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA; or

   e. Updating or revising the monitoring and reporting requirements is determined to be necessary, at the discretion of the San Diego Water Board. Such modification(s) may include, but is (are) not limited to, revision(s) to: (i) implement recommendations from Southern California Coastal Water Research Project (SCCWRP), (ii) develop, refine, implement, and/or coordinate a regional monitoring program, (iii) develop and implement improved monitoring and assessment programs in keeping with San Diego Water Board Resolution No. R9-2012-0069, Resolution in Support of a Regional Monitoring Framework, and/or (iv) add provisions to require the Copermittees to evaluate and provide information on cost and values of the monitoring and reporting program.

5. The San Diego Water Board, after opportunity for public comment and a public hearing, will re-open and consider modifications to this Order when the Orange County Copermittees or the Riverside County Copermittees submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders.

I. STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

Each Copermittee must comply with all the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

ATTACHMENT A

DISCHARGE PROHIBITIONS AND SPECIAL PROTECTIONS

1. Basin Plan Waste Discharge Prohibitions

California Water Code Section 13243 provides that a Regional Water Board, in a water quality control plan, may specify certain conditions or areas where the discharge of waste or certain types of waste is not permitted. The following waste discharge prohibitions in the Water Quality Control Plan for the San Diego Basin (Basin Plan) are applicable to any person, as defined by Section 13050(c) of the California Water Code, who is a citizen, domiciliary, or political agency or entity of California whose activities in California could affect the quality of waters of the state within the boundaries of the San Diego Region.

1. The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in California Water Code Section 13050, is prohibited.

2. The discharge of waste to land, except as authorized by waste discharge requirements or the terms described in California Water Code Section 13264 is prohibited.

3. The discharge of pollutants or dredged or fill material to waters of the United States except as authorized by a National Pollutant Discharge Elimination System (NPDES) permit or a dredged or fill material permit (subject to the exemption described in California Water Code Section 13376) is prohibited.

4. Discharges of recycled water to lakes or reservoirs used for municipal water supply or to inland surface water tributaries thereto are prohibited, unless this San Diego Water Board issues a NPDES permit authorizing such a discharge; the proposed discharge has been approved by the State Department of Health Services (DHS) and the operating agency of the impacted reservoir; and the discharger has an approved fail-safe long-term disposal alternative.

5. The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the San Diego Water Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

6. The discharge of waste in a manner causing flow, ponding, or surfacing on lands not owned or under the control of the discharger is prohibited, unless the discharge is authorized by the San Diego Water Board.

7. The dumping, deposition, or discharge of waste directly into waters of the state, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the San Diego Water Board.

8. Any discharge to a storm water conveyance system that is not composed entirely of "*storm water*" is prohibited unless authorized by the San Diego Water Board. [The federal regulations, 40 CFR 122.26(b)(13), define storm water as storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from firefighting activities.] [§122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

9. The unauthorized discharge of treated or untreated sewage to waters of the state or to a storm water conveyance system is prohibited.

10. The discharge of industrial wastes to conventional septic tank/subsurface disposal systems, except as authorized by the terms described in California Water Code Section 13264, is prohibited.

11. The discharge of radioactive wastes amenable to alternative methods of disposal into the waters of the state is prohibited.

12. The discharge of any radiological, chemical, or biological warfare agent into waters of the state is prohibited.

13. The discharge of waste into a natural or excavated site below historic water levels is prohibited unless the discharge is authorized by the San Diego Water Board.

14. The discharge of sand, silt, clay, or other earthen materials from any activity, including land grading and construction, in quantities which cause deleterious bottom deposits, turbidity or discoloration in waters of the state or which unreasonably affect, or threaten to affect, beneficial uses of such waters is prohibited.

15. The discharge of treated or untreated sewage from vessels to Mission Bay, Oceanside Harbor, Dana Point Harbor, or other small boat harbors is prohibited.

16. The discharge of untreated sewage from vessels to San Diego Bay is prohibited.

17. The discharge of treated sewage from vessels to portions of San Diego Bay that are less than 30 feet deep at mean lower low water (MLLW) is prohibited.

18. The discharge of treated sewage from vessels, which do not have a properly functioning US Coast Guard certified Type I or Type II marine sanitation device, to portions of San Diego Bay that are greater than 30 feet deep at mean lower low water (MLLW) is prohibited.

2. Attachment B to State Water Board Resolution 2012-0012, as amended by State Water Board Resolution No. 2012-0031.

Special Protections for Areas of Special Biological Significance (ASBS), Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges

I. PROVISIONS FOR POINT SOURCE DISCHARGES OF STORM WATER AND NONPOINT SOURCE WASTE DISCHARGES

The following terms, prohibitions, and special conditions (hereafter collectively referred to as special conditions) are established as limitations on point source storm water and nonpoint source discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in Areas of Special Biological Significance (ASBS), as required for State Water Quality Protection Areas pursuant to California Public Resources Code Sections 36700(f) and 36710(f). These Special Protections are adopted by the State Water Board as part of the California Ocean Plan (Ocean Plan) General Exception.

The special conditions are organized by category of discharge. The State Water Resources Control Board (State Water Board) and Regional Water Quality Control Boards (Regional Water Boards) will determine categories and the means of regulation for those categories [e.g., Point Source Storm Water National Pollutant Discharge Elimination System (NPDES) or Nonpoint Source].

A. PERMITTED POINT SOURCE DISCHARGES OF STORM WATER

1. General Provisions for Permitted Point Source Discharges of Storm Water

a. Existing storm water discharges into an ASBS are allowed only under the following conditions:

(1) The discharges are authorized by an NPDES permit issued by the State Water Board or Regional Water Board;

(2) The discharges comply with all of the applicable terms, prohibitions, and special conditions contained in these Special Protections; and

(3) The discharges:

(i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

(ii) Are designed to prevent soil erosion;

(iii) Occur only during wet weather;

(iv) Are composed of only storm water runoff.

b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

c. The discharge of trash is prohibited.

d. Only discharges from existing storm water outfalls are allowed. Any proposed or new storm water runoff discharge shall be routed to existing storm water discharge outfalls and shall not result in any new contribution of waste to an ASBS (i.e., no additional pollutant loading). "Existing storm water outfalls" are those that were constructed or under construction prior to January 1, 2005. "New contribution of waste" is defined as any addition of waste beyond what would have occurred as of January 1, 2005. A change to an existing storm water outfall, in terms of re-location or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges are prohibited except as provided below:

(1) The term "non-storm water discharges" means any waste discharges from a municipal separate storm sewer system (MS4) or other NPDES permitted storm drain system to an ASBS that are not composed entirely of storm water.

(2) (i) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability or occur naturally:

(a) Discharges associated with emergency fire fighting operations.

(b) Foundation and footing drains.

(c) Water from crawl space or basement pumps.

(d) Hillside dewatering.

(e) Naturally occurring groundwater seepage via a storm drain.

(f) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(ii) An NPDES permitting authority may authorize non-storm water discharges to an MS4 with a direct discharge to an ASBS only to the extent the NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

2. Compliance Plans for Inclusion in Storm Water Management Plans (SWMP) and Storm Water Pollution Prevention Plans (SWPPP).

The discharger shall specifically address the prohibition of non-storm water runoff and the requirement to maintain natural water quality for storm water discharges to an ASBS in an ASBS Compliance Plan to be included in its SWMP or a SWPPP, as appropriate to permit

type. If a statewide permit includes a SWMP, then the discharger shall prepare a stand-alone compliance plan for ASBS discharges. The ASBS Compliance Plan is subject to approval by the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (for permits issued by Regional Water Boards).

a. The Compliance Plan shall include a map of surface drainage of storm water runoff, showing areas of sheet runoff, prioritize discharges, and describe any structural Best Management Practices (BMPs) already employed and/or BMPs to be employed in the future. Priority discharges are those that pose the greatest water quality threat and which are identified to require installation of structural BMPs. The map shall also show the storm water conveyances in relation to other features such as service areas, sewage conveyances and treatment facilities, landslides, areas prone to erosion, and waste and hazardous material storage areas, if applicable. The SWMP or SWPPP shall also include a procedure for updating the map and plan when changes are made to the storm water conveyance facilities.

b. The ASBS Compliance Plan shall describe the measures by which all non-authorized non-storm water runoff (e.g., dry weather flows) has been eliminated, how these measures will be maintained over time, and how these measures are monitored and documented.

c. For Municipal Separate Storm Sewer System (MS4s), the ASBS Compliance Plan shall require minimum inspection frequencies as follows:

(1) The minimum inspection frequency for construction sites shall be weekly during rainy season;

(2) The minimum inspection frequency for industrial facilities shall be monthly during the rainy season;

(3) The minimum inspection frequency for commercial facilities (e.g., restaurants) shall be twice during the rainy season; and

(4) Storm water outfall drains equal to or greater than 18 inches (457 mm) in diameter or width shall be inspected once prior to the beginning of the rainy season and once during the rainy season and maintained to remove trash and other anthropogenic debris.

d. The ASBS Compliance Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff, that are necessary to comply with these special conditions, will be achieved through BMPs. Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that such installation would pose a threat to health or safety. BMPs to control storm water runoff discharges (at the end-of-pipe) during a design storm shall be designed to achieve on average the following target levels:

(1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

(2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges.

The baseline for these determinations is the effective date of the Exception, except for those structural BMPs installed between January 1, 2005 and adoption of these Special Protections, and the reductions must be achieved and documented within six (6) years of the effective date.

e. The ASBS Compliance Plan shall address erosion control and the prevention of anthropogenic sedimentation in ASBS. The natural habitat conditions in the ASBS shall not be altered as a result of anthropogenic sedimentation.

f. The ASBS Compliance Plan shall describe the non-structural BMPs currently employed and planned in the future (including those for construction activities), and include an implementation schedule. The ASBS Compliance Plan shall include non-structural BMPs that address public education and outreach. Education and outreach efforts must adequately inform the public that direct discharges of pollutants from private property not entering an MS4 are prohibited. The ASBS Compliance Plan shall also describe the structural BMPs, including any low impact development (LID) measures, currently employed and planned for higher threat discharges and include an implementation schedule. To control storm water runoff discharges (at the end-of-pipe) during a design storm, permittees must first consider, and use where feasible, LID practices to infiltrate, use, or evapotranspirate storm water runoff on-site, if LID practices would be the most effective at reducing pollutants from entering the ASBS.

g. The BMPs and implementation schedule shall be designed to ensure that natural water quality conditions in the receiving water are achieved and maintained by either reducing flows from impervious surfaces or reducing pollutant loading, or some combination thereof.

h. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents in storm water runoff that alter natural ocean water quality and the sources of these constituents.

(2) The report shall describe BMPs that are currently being implemented, BMPs that are identified in the SWMP or SWPPP for future implementation, and any additional BMPs that may be added to the SWMP or SWPPP to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the BMPs.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits), the discharger shall revise its ASBS Compliance Plan to incorporate any new or modified BMPs that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised SWMP or SWPPP, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural ocean water quality conditions due to the same constituent.

(5) The requirements of this section are in addition to the terms, prohibitions, and conditions contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within eighteen (18) months from the effective date of the Exception, the discharger shall submit a draft written ASBS Compliance Plan to the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that describes its strategy to comply with these special conditions, including the requirement to maintain natural water quality in the affected ASBS. The ASBS Compliance Plan shall include a description of appropriate non-structural controls and a time schedule to implement structural controls (implementation schedule) to comply with these special conditions for inclusion in the discharger's SWMP or SWPPP, as appropriate to permit type. The final ASBS Compliance Plan, including a description and final schedule for structural controls based on the results of runoff and receiving water monitoring, must be submitted within thirty (30) months from the effective date of the Exception.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these special conditions shall be implemented.

d. Within six (6) years of the effective date of the Exception, any structural controls identified in the ASBS Compliance Plan that are necessary to comply with these special conditions shall be operational.

e. Within six (6) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water, pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data, and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe

the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. for municipalities, a demonstration of significant hardship to discharger ratepayers, by showing the relationship of storm water fees to annual household income for residents within the discharger's jurisdictional area, and the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or

2. for other governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

B. NONPOINT SOURCE DISCHARGES

1. General Provisions for Nonpoint Sources

a. Existing nonpoint source waste discharges are allowed into an ASBS only under the following conditions:

(1) The discharges are authorized under waste discharge requirements, a conditional waiver of waste discharge requirements, or a conditional prohibition issued by the State Water Board or a Regional Water Board.

(2) The discharges are in compliance with the applicable terms, prohibitions, and special conditions contained in these Special Protections.

(3) The discharges:

(i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

(ii) Are designed to prevent soil erosion;

(iii) Occur only during wet weather;

(iv) Are composed of only storm water runoff.

b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

c. The discharge of trash is prohibited.

d. Only existing nonpoint source waste discharges are allowed. "Existing nonpoint source waste discharges" are discharges that were ongoing prior to January 1, 2005. "New nonpoint source discharges" are defined as those that commenced on or after January 1, 2005. A change to an existing nonpoint source discharge, in terms of relocation or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges from nonpoint sources (those not subject to an NPDES Permit) are prohibited except as provided below:

(1) The term "non-storm water discharges" means any waste discharges that are not composed entirely of storm water.

(2) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability, or occur naturally:

(i) Discharges associated with emergency fire fighting operations.

(ii) Foundation and footing drains.

(iii) Water from crawl space or basement pumps.

(iv) Hillside dewatering.

(v) Naturally occurring groundwater seepage via a storm drain.

(vi) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

f. At the San Clemente Island ASBS, discharges incidental to military training and research, development, test, and evaluation operations are allowed. Discharges incidental to underwater demolition and other in-water explosions are not allowed in the two military closure areas in the vicinity of Wilson Cove and Castle Rock. Discharges must not result in a violation of the water quality objectives, including the protection of the marine aquatic life beneficial use, anywhere in the ASBS.

g. At the San Nicolas Island and Begg Rock ASBS, discharges incidental to military research, development, testing, and evaluation of, and training with, guided missile and other weapons systems, fleet training exercises, small-scale amphibious warfare training, and special warfare training are allowed. Discharges incidental to underwater demolition and other in-water explosions are not allowed. Discharges must not result in a violation of the water quality objectives, including the protection of the marine aquatic life beneficial use, anywhere in the ASBS.

h. All other nonpoint source discharges not specifically authorized above are prohibited.

2. Planning and Reporting

a. The nonpoint source discharger shall develop an ASBS Pollution Prevention Plan, including an implementation schedule, to address storm water runoff and any other nonpoint source discharges from its facilities. The ASBS Pollution Prevention Plan must be equivalent in contents to an ASBS Compliance Plan as described in I (A)(2) in this document. The ASBS Pollution Prevention Plan is subject to approval by the Executive Director of the State Water Board (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements).

b. The ASBS Pollution Prevention Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff that are necessary to comply with these special conditions, will be achieved through Management Measures and associated Management Practices (Management Measures/Practices). Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director or Regional Water Board Executive Officer that such installation would pose a threat to health or safety. Management Measures to control storm water runoff during a design storm shall achieve on average the following target levels:

(1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

(2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges.

The baseline for these determinations is the effective date of the Exception, except for those structural BMPs installed between January 1, 2005 and adoption of these Special Protections, and the reductions must be achieved and documented within six (6) years of the effective date.

c. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff or other nonpoint source pollution is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and the Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents that alter natural water quality and the sources of these constituents.

(2) The report shall describe Management Measures/Practices that are currently being implemented, Management Measures/Practices that are identified in the ASBS Pollution Prevention Plan for future implementation, and any additional Management Measures/Practices that may be added to the Pollution Prevention Plan to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the Management Measures/Practices.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of

the Regional Water Board (Regional Water Board waivers or waste discharge requirements), the discharger shall revise its ASBS Pollution Prevention Plan to incorporate any new or modified Management Measures/Practices that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised ASBS Pollution Prevention Plan, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural water quality conditions due to the same constituent.

(5) The requirements of this section are in addition to the terms, prohibitions, and conditions contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within eighteen (18) months from the effective date of the Exception, the dischargers shall submit a draft written ASBS Pollution Prevention Plan to the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) that describes its strategy to comply with these special conditions, including the requirement to maintain natural ocean water quality in the affected ASBS. The Pollution Prevention Plan shall include a description of appropriate non-structural controls and a time schedule to implement structural controls to comply with these special conditions for inclusion in the discharger's Pollution Prevention Plan. The final ASBS Pollution Prevention Plan, including a description and final schedule for structural controls based on the results of runoff and receiving water monitoring, must be submitted within thirty (30) months from the effective date of the Exception.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these Special Protections shall be implemented.

d. Within six (6) years of the effective date of the Exception, any structural controls identified in the ASBS Pollution Prevention Plan that are necessary to comply with these special conditions shall be operational.

e. Within six (6) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board

waivers or waste discharge requirements) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. a demonstration that the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or

2. for governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

II. ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES

In addition to the provisions in Section I (A) or I (B), respectively, a discharger with parks and recreation facilities shall comply with the following:

A. The discharger shall include a section in an ASBS Compliance Plan (for NPDES dischargers) or an ASBS Pollution Prevention Plan (for nonpoint source dischargers) to address storm water runoff from parks and recreation facilities.

1. The plan shall identify all pollutant sources, including sediment sources, which may result in waste entering storm water runoff. Pollutant sources include, but are not limited to, roadside rest areas and vistas, picnic areas, campgrounds, trash receptacles, maintenance facilities, park personnel housing, portable toilets, leach fields, fuel tanks, roads, piers, and boat launch facilities.

2. The plan shall describe BMPs or Management Measures/Practices that will be implemented to control soil erosion (both temporary and permanent erosion controls) and reduce or eliminate pollutants in storm water runoff in order to achieve and maintain natural water quality conditions in the affected ASBS. The plan shall include BMPs or Management Measures/Practices to ensure that trails and culverts are maintained to prevent erosion and minimize waste discharges to ASBS.

3. The plan shall include BMPs or Management Measures/Practices to prevent the discharge of pesticides or other chemicals, including agricultural chemicals, in storm water runoff to the affected ASBS.

4. The plan shall include BMPs or Management Measures/Practices that address public education and outreach. The goal of these BMPs or Management Measures/Practices is to ensure that the public is adequately informed that waste discharges to the affected ASBS are prohibited or limited by special conditions in these Special Protections. The BMPs or Management Measures/Practices shall include signage at camping, picnicking, beach and roadside parking areas, and visitor centers, or other appropriate measures, which notify the public of any applicable requirements of these Special Protections and identify the ASBS boundaries.

5. The plan shall include BMPs or Management Measures/Practices that address the prohibition against the discharge of trash to ASBS. The BMPs or Management Measures/Practices shall include measures to ensure that adequate trash receptacles are available for public use at visitor facilities, including parking areas, and that the receptacles are adequately maintained to prevent trash discharges into the ASBS. Appropriate measures include covering trash receptacles to prevent trash from being wind blown and periodically emptying the receptacles to prevent overflows.

6. The plan shall include BMPs or Management Measures/Practices to address runoff from parking areas and other developed features to ensure that the runoff does not alter natural water quality in the affected ASBS. BMPs or Management Measures/Practices shall include measures to reduce pollutant loading in runoff to the ASBS through installation of natural area buffers (LID), treatment, or other appropriate measures.

B. Maintenance and repair of park and recreation facilities must not result in waste discharges to the ASBS. The practice of road oiling must be minimized or eliminated, and must not result in waste discharges to the ASBS.

III. ADDITIONAL REQUIREMENTS – WATERFRONT AND MARINE OPERATIONS

In addition to the provisions in Section I (A) or I (B), respectively, a discharger with waterfront and marine operations shall comply with the following:

A. For discharges related to waterfront and marine operations, the discharger shall develop a Waterfront and Marine Operations Management Plan (Waterfront Plan). This plan shall contain appropriate Management Measures/Practices to address nonpoint source pollutant discharges to the affected ASBS.

1. The Waterfront Plan shall contain appropriate Management Measures/Practices for any waste discharges associated with the operation and maintenance of vessels, moorings, piers, launch ramps, and cleaning stations in order to ensure that beneficial uses are protected and natural water quality is maintained in the affected ASBS.

2. For discharges from marinas and recreational boating activities, the Waterfront Plan shall include appropriate Management Measures, described in The Plan for California's Nonpoint Source Pollution Control Program, for marinas and recreational boating, or equivalent practices, to ensure that nonpoint source pollutant discharges do not alter natural water quality in the affected ASBS.

3. The Waterfront Plan shall include Management Practices to address public education and outreach to ensure that the public is adequately informed that waste discharges to the affected ASBS are prohibited or limited by special conditions in these Special Protections. The management practices shall include appropriate signage, or similar measures, to inform the public of the ASBS restrictions and to identify the ASBS boundaries.

4. The Waterfront Plan shall include Management Practices to address the prohibition against trash discharges to ASBS. The Management Practices shall include the provision of adequate trash receptacles for marine recreation areas, including parking areas, launch ramps, and docks. The plan shall also include appropriate Management Practices to ensure that the receptacles are adequately maintained and secured in order to prevent trash discharges into the ASBS. Appropriate Management Practices include covering the trash receptacles to prevent trash from being windblown, staking or
securing the trash receptacles so they don't tip over, and periodically emptying the receptacles to prevent overflow.

5. The discharger shall submit its Waterfront Plan to the by the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) within six months of the effective date of these special conditions. The Waterfront Plan is subject to approval by the State Water Board Executive Director or the Regional Water Board Executive Officer, as appropriate. The plan must be fully implemented within 18 months of the effective date of the Exception.

B. The discharge of chlorine, soaps, petroleum, other chemical contaminants, trash, fish offal, or human sewage to ASBS is prohibited. Sinks and fish cleaning stations are point source discharges of wastes and are prohibited from discharging into ASBS. Anthropogenic accumulations of discarded fouling organisms on the sea floor must be minimized.

C. Limited-term activities, such as the repair, renovation, or maintenance of waterfront facilities, including, but not limited to, piers, docks, moorings, and breakwaters, are authorized only in accordance with Chapter III.E.2 of the Ocean Plan.

D. If the discharger anticipates that the discharger will fail to fully implement the approved Waterfront Plan within the 18 month deadline, the discharger shall submit a technical report as soon as practicable to the State Water Board Executive Director or the Regional Water Board Executive Officer, as appropriate. The technical report shall contain reasons for failing to meet the deadline and propose a revised schedule to fully implement the plan.

E. The State Water Board or the Regional Water Board may, for good cause, authorize additional time to comply with the Waterfront Plan. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that

caused or would cause it to fail to meet the deadline in Section III.A.5. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality. The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. a demonstration of significant hardship by showing that the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate.

2. for governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

IV. MONITORING REQUIREMENTS

Monitoring is mandatory for all dischargers to assure compliance with the Ocean Plan. Monitoring requirements include both: (A) core discharge monitoring, and (B) ocean receiving water monitoring. The State and Regional Water Boards must approve sampling site locations and any adjustments to the monitoring programs. All ocean receiving water and reference area monitoring must be comparable with the Water Boards' Surface Water Ambient Monitoring Program (SWAMP).

Safety concerns: Sample locations and sampling periods must be determined considering safety issues. Sampling may be postponed upon notification to the State and Regional Water Boards if hazardous conditions prevail.

Analytical Chemistry Methods: All constituents must be analyzed using the lowest minimum detection limits comparable to the Ocean Plan water quality objectives. For metal analysis, all samples, including storm water effluent, reference samples, and ocean receiving water samples, must be analyzed by the approved analytical method with the lowest minimum detection limits (currently Inductively Coupled Plasma/Mass Spectrometry) described in the Ocean Plan.

A. CORE DISCHARGE MONITORING PROGRAM

1. General sampling requirements for timing and storm size:

   Runoff must be collected during a storm event that is greater than 0.1 inch and generates runoff, and at least 72 hours from the previously measurable storm event. Runoff samples shall be collected during the same storm and at approximately the same time when post-storm receiving water is sampled, and analyzed for the same constituents as receiving water and reference site samples (see section IV B) as described below.

2. Runoff flow measurements

a. For municipal/industrial storm water outfalls in existence as of December 31, 2007, 18 inches (457mm) or greater in diameter/width (including multiple outfall pipes in combination having a width of 18 inches, runoff flows must be measured or calculated, using a method acceptable to and approved by the State and Regional Water Boards.

b. This will be reported annually for each precipitation season to the State and Regional Water Boards.

3. Runoff samples – storm events

a. For outfalls equal to or greater than 18 inches (0.46m) in diameter or width:

(1) samples of storm water runoff shall be collected during the same storm as receiving water samples and analyzed for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

(2) samples of storm water runoff shall be collected and analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

(3) If an applicant has no outfall greater than 36 inches, then storm water runoff from the applicant's largest outfall shall be further collected during the same storm as receiving water samples and analyzed for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates).

b. For outfalls equal to or greater than 36 inches (0.91m) in diameter or width:

(1) samples of storm water runoff shall be collected during the same storm as receiving water samples and analyzed for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

(2) samples of storm water runoff shall be further collected during the same storm as receiving water samples and analyzed for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates); and

(3) samples of storm water runoff shall be collected and analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

c. For an applicant not participating in a regional monitoring program [see below in Section IV (B)] in addition to (a.) and (b.) above, a minimum of the two largest outfalls or 20 percent of the larger outfalls, whichever is greater, shall be sampled (flow weighted composite samples) at least three times annually during wet weather (storm event)

and analyzed for all Ocean Plan Table A constituents, Table B constituents for marine aquatic life protection (except for toxicity, only chronic toxicity for three species shall be required), DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, and Ocean Plan indicator bacteria. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one (the largest) such discharge shall be sampled annually in each Region.

4. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may reduce or suspend core monitoring once the storm runoff is fully characterized. This determination may be made at any point after the discharge is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

B. Ocean Receiving Water and Reference Area Monitoring Program

In addition to performing the Core Discharge Monitoring Program in Section II.A above, all applicants having authorized discharges must perform ocean receiving water monitoring. In order to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS, dischargers may choose either (1) an individual monitoring program, or (2) participation in a regional integrated monitoring program.

1. Individual Monitoring Program: The requirements listed below are for those dischargers who elect to perform an individual monitoring program to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within the affected ASBS. In addition to Core Discharge Monitoring, the following additional monitoring requirements shall be met:

   a. Three times annually, during wet weather (storm events), the receiving water at the point of discharge from the outfalls described in section (IV)(A)(3)(c) above shall be sampled and analyzed for Ocean Plan Table A constituents, Table B constituents for marine aquatic life, DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, salinity, chronic toxicity (three species), and Ocean Plan indicator bacteria.

      The sample location for the ocean receiving water shall be in the surf zone at the point of discharges; this must be at the same location where storm water runoff is sampled. Receiving water shall be sampled prior to (pre-storm) and during (or immediately after) the same storm (post storm). Post storm sampling shall be during the same storm and at approximately the same time as when the runoff is sampled. Reference water quality shall also be sampled three times annually and analyzed for the same constituents pre-storm and post-storm, during the same storm seasons when receiving water is sampled. Reference stations will be determined by the State Water Board's Division of Water Quality and the applicable Regional Water Board(s).

   b. Sediment sampling shall occur at least three times during every five (5) year period. The subtidal sediment (sand or finer, if present) at the discharge shall be sampled and analyzed for Ocean Plan Table B constituents for marine aquatic life, DDT, PCBs, PAHs, pyrethroids, and OP pesticides. For sediment toxicity testing, only an acute toxicity test using the amphipod *Eohaustorius estuarius* must be performed.

c. A quantitative survey of intertidal benthic marine life shall be performed at the discharge and at a reference site. The survey shall be performed at least once every five (5) year period. The survey design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The results of the survey shall be completed and submitted to the State Water Board and Regional Water Board at least six months prior to the end of the permit cycle.

d. Once during each five (5) year period, a bioaccumulation study shall be conducted to determine the concentrations of metals and synthetic organic pollutants at representative discharge sites and at representative reference sites. The study design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The bioaccumulation study may include California mussels (*Mytilus californianus*) and/or sand crabs (*Emerita analoga* or *Blepharipoda occidentalis*). Based on the study results, the Regional Water Board and the State Water Board's Division of Water Quality, may adjust the study design in subsequent permits, or add or modify additional test organisms (such as shore crabs or fish), or modify the study design appropriate for the area and best available sensitive measures of contaminant exposure.

e. Marine Debris: Representative quantitative observations for trash by type and source shall be performed along the coast of the ASBS within the influence of the discharger's outfalls. The design, including locations and frequency, of the marine debris observations is subject to approval by the Regional Water Board and State Water Board's Division of Water Quality.

f. The monitoring requirements of the Individual Monitoring Program in this section are minimum requirements. After a minimum of one (1) year of continuous water quality monitoring of the discharges and ocean receiving waters, the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may require additional monitoring, or adjust, reduce or suspend receiving water and reference station monitoring. This determination may be made at any point after the discharge and receiving water is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

2. Regional Integrated Monitoring Program: Dischargers may elect to participate in a regional integrated monitoring program, in lieu of an individual monitoring program, to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS. This regional approach shall characterize natural water quality, pre- and post-storm, in ocean reference areas near the mouths of identified open space watersheds and the effects of the discharges on natural water quality (physical, chemical, and toxicity) in the ASBS receiving waters, and should include benthic marine aquatic life and bioaccumulation components. The design of the ASBS stratum of a regional integrated monitoring program may deviate from the otherwise prescribed individual monitoring approach (in Section IV.B.1) if approved by the State Water Board's Division of Water Quality and the Regional Water Boards.

a. Ocean reference areas shall be located at the drainages of flowing watersheds with minimal development (in no instance more than 10% development), and shall not be located in CWA Section 303(d) listed waterbodies or have tributaries that are 303(d) listed. Reference areas shall be free of wastewater discharges and anthropogenic non- storm water runoff. A minimum of low threat storm runoff discharges (e.g.

stream highway overpasses and campgrounds) may be allowed on a case-by-case basis. Reference areas shall be located in the same region as the ASBS receiving water monitoring occurs. The reference areas for each Region are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean reference water samples must be collected from each station, each from a separate storm during the same storm season that receiving water is sampled. A minimum of one reference location shall be sampled for each ASBS receiving water site sampled per responsible party. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

b. ASBS ocean receiving water must be sampled in the surf zone at the location where the runoff makes contact with ocean water (i.e. at "point zero"). Ocean receiving water stations must be representative of worst-case discharge conditions (i.e. co-located at a large drain greater than 36 inches, or if drains greater than 36 inches are not present in the ASBS then the largest drain greater than18 inches.) Ocean receiving water stations are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean receiving water samples must be collected during each storm season from each station, each from a separate storm. A minimum of one receiving water location shall be sampled in each ASBS per responsible party in that ASBS. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

c. Reference and receiving water sampling shall commence during the first full storm season following the adoption of these special conditions, and post-storm samples shall be collected during the same storm event when storm water runoff is sampled. Sampling shall occur in a minimum of two storm seasons. For those ASBS dischargers that have already participated in the Southern California Bight 2008 ASBS regional monitoring effort, sampling may be limited to only one storm season.

d. Receiving water and reference samples shall be analyzed for the same constituents as storm water runoff samples. At a minimum, constituents to be sampled and analyzed in reference and discharge receiving waters must include oil and grease, total suspended solids, Ocean Plan Table B metals for protection of marine life, Ocean Plan PAHs, pyrethroids, OP pesticides, ammonia, nitrate, phosphates, and critical life stage chronic toxicity for three species. In addition, within the range of the southern sea otter, indicator bacteria or some other measure of fecal contamination shall be analyzed.

3. Waterfront and Marine Operations: In addition to the above requirements for ocean receiving water monitoring, additional monitoring must be performed for marinas and boat launch and pier facilities:

a. For all marina or mooring field operators, in mooring fields with 10 or more occupied moorings, the ocean receiving water must be sampled for Ocean Plan indicator bacteria, residual chlorine, copper, zinc, grease and oil, methylene blue active substances (MBAS), and ammonia nitrogen.

(1) For mooring field operators opting for an individual monitoring program (Section IV.B.1 above), this sampling must occur weekly (on the weekend) from May through October.

(2) For mooring field operators opting to participate in a regional integrated monitoring program (Section IV.B.2 above), this sampling must occur monthly from May through October on a high use weekend in each month. The Water Boards may allow a reduction in the frequency of sampling, through the regional monitoring program, after the first year of monitoring.

b. For all mooring field operators, the subtidal sediment (sand or finer, if present) within mooring fields and below piers shall be sampled and analyzed for Ocean Plan Table B metals (for marine aquatic life beneficial use), acute toxicity, PAHs, and tributyltin. For sediment toxicity testing, only an acute toxicity test using the amphipod *Eohaustorius estuarius* must be performed. This sampling shall occur at least three times during a five (5) year period. For mooring field operators opting to participate in a regional integrated monitoring program, the Water Boards may allow a reduction in the frequency of sampling after the first sampling effort's results are assessed.

Glossary

At the point of discharge(s) – Means in the surf zone immediately where runoff from an outfall meets the ocean water (a.k.a., at point zero).

Areas of Special Biological Significance (ASBS) – Those areas designated by the State Water Board as ocean areas requiring protection of species or biological communities to the extent that alteration of natural water quality is undesirable. All Areas of Special Biological Significance are also classified as a subset of State Water Quality Protection Areas.

Design storm – For purposes of these Special Protections, a design storm is defined as the volume of runoff produced from one inch of precipitation per day or, if this definition is inconsistent with the discharger's applicable storm water permit, then the design storm shall be the definition included in the discharger's applicable storm water permit.

Development – Relevant to reference monitoring sites, means urban, industrial, agricultural, grazing, mining, and timber harvesting land uses.

Higher threat discharges - Permitted storm drains discharging equal to or greater than 18 inches, industrial storm drains, agricultural runoff discharged through an MS4, discharges associated with waterfront and marina operations (e.g., piers, launch ramps, mooring fields, and associated vessel support activities, except for passive discharges defined below), and direct discharges associated with commercial or industrial activities to ASBS.

Low Impact Development (LID) – A sustainable practice that benefits water supply and contributes to water quality protection. Unlike traditional storm water management, which entails collecting and conveying storm water runoff through storm drains, pipes, or other conveyances to a centralized storm water facility, LID focuses on using site design and storm water management to maintain the site's pre-development runoff rates and volumes. The goal of LID is to mimic a site's predevelopment hydrology by using design techniques that infiltrate, filter, store, evaporate, and detain runoff close to the source of rainfall.

Marine Operations – Marinas or mooring fields that contain slips or mooring locations for 10 or more vessels.

Management Measure (MM) - Economically achievable measures for the control of the addition of pollutants from various classes of nonpoint sources of pollution, which reflect the greatest degree of pollutant reduction achievable through the application of the best available nonpoint pollution control practices, technologies, processes, siting criteria, operating methods, or other alternatives. For example, in the "marinas and recreational boating" land- use category specified in the Plan for California's Nonpoint Source Pollution Control Program (NPS Program Plan) (SWRCB, 1999), "boat cleaning and maintenance" is considered a MM or the source of a specific class or type of NPS pollution.

Management Practice (MP) - The practices (e.g., structural, non-structural, operational, or other alternatives) that can be used either individually or in combination to address a specific MM class or classes of NPS pollution. For example, for the "boat cleaning and maintenance" MM, specific MPs can include, but are not limited to, methods for the selection of environmentally sensitive hull paints or methods for cleaning/removal of hull copper anti- fouling paints.

Municipal Separate Storm Sewer System (MS4) – A municipally-owned storm sewer system regulated under the Phase I or Phase II storm water program implemented in compliance with Clean Water Act section 402(p). Note that an MS4 program's boundaries are not necessarily congruent with the permittee's political boundaries.

Natural Ocean Water Quality - The water quality (based on selected physical, chemical and biological characteristics) that is required to sustain marine ecosystems, and which is without apparent human influence, *i.e.*, an absence of significant amounts of: (a) man-made constituents (*e.g.,* DDT); (b) other chemical (*e.g.,* trace metals), physical (temperature/thermal pollution, sediment burial), and biological (*e.g.*, bacteria) constituents at concentrations that have been elevated due to man's activities above those resulting from the naturally occurring processes that affect the area in question; and (c) non-indigenous biota (*e.g.,* invasive algal bloom species) that have been introduced either deliberately or accidentally by man. Discharges "*shall not alter natural ocean water quality*" as determined by a comparison to the range of constituent concentrations in reference areas agreed upon via the regional monitoring program(s). If monitoring information indicates that *natural ocean water quality* is not maintained, but there is sufficient evidence that a discharge is not contributing to the alteration of natural water quality, then the Regional Water Board may make that determination. In this case, sufficient information must include runoff sample data that has equal or lower concentrations for the range of constituents at the applicable reference area(s).

Nonpoint source – Nonpoint pollution sources generally are sources that do not meet the definition of a point source. Nonpoint source pollution typically results from land runoff, precipitation, atmospheric deposition, agricultural drainage, marine/boating operations or hydrologic modification. Nonpoint sources, for purposes of these Special Protections, include discharges that are not required to be regulated under an NPDES permit.

Non-storm water discharge – Any runoff that is not the result of a precipitation event. This is often referred to as "dry weather flow."

Non-structural control – A Best Management Practice that involves operational, maintenance, regulatory (e.g., ordinances) or educational activities designed to reduce or eliminate pollutants in runoff, and that are not structural controls (i.e. there are no physical structures involved).

Physical impossibility - Means any act of God, war, fire, earthquake, windstorm, flood or natural catastrophe; unexpected and unintended accidents not caused by discharger or its employees' negligence; civil disturbance, vandalism, sabotage or terrorism; restrain by court order or public authority or agency; or action or non-action by, or inability to

obtain the necessary authorizations or approvals from any governmental agency other than the permittee.

Representative sites and monitoring procedures – Are to be proposed by the discharger, with appropriate rationale, and subject to approval by Water Board staff.

Sheet-flow – Runoff that flows across land surfaces at a shallow depth relative to the cross- sectional width of the flow. These types of flow may or may not enter a storm drain system before discharge to receiving waters.

Storm Season – Also referred to as rainy season, means the months of the year from the onset of rainfall during autumn until the cessation of rainfall in the spring.

Structural control – A Best Management Practice that involves the installation of engineering solutions to the physical treatment or infiltration of runoff.

Surf Zone - The surf zone is defined as the submerged area between the breaking waves and the shoreline at any one time.

Surface Water Ambient Monitoring Program (SWAMP) comparable – Means that the monitoring program must 1) meet or exceed 2008 SWAMP Quality Assurance Program Management Plan (QAPP) Measurement Quality Objectives, or 2) have a Quality Assurance Project Plan that has been approved by SWAMP; in addition data must be formatted to match the database requirements of the SWAMP Information Management System. Adherence to the measurement quality objectives in the Southern California Bight 2008 ASBS Regional Monitoring Program QAPP and data base management comprises being SWAMP comparable.

Waterfront Operations - Piers, launch ramps, and cleaning stations in the water or on the adjacent shoreline.

Attachment 1
Special Protections Sections I(A)(3)(e) and I(B)(3)(e)
Flowchart to Deteremine Compliance with natural Water Quality

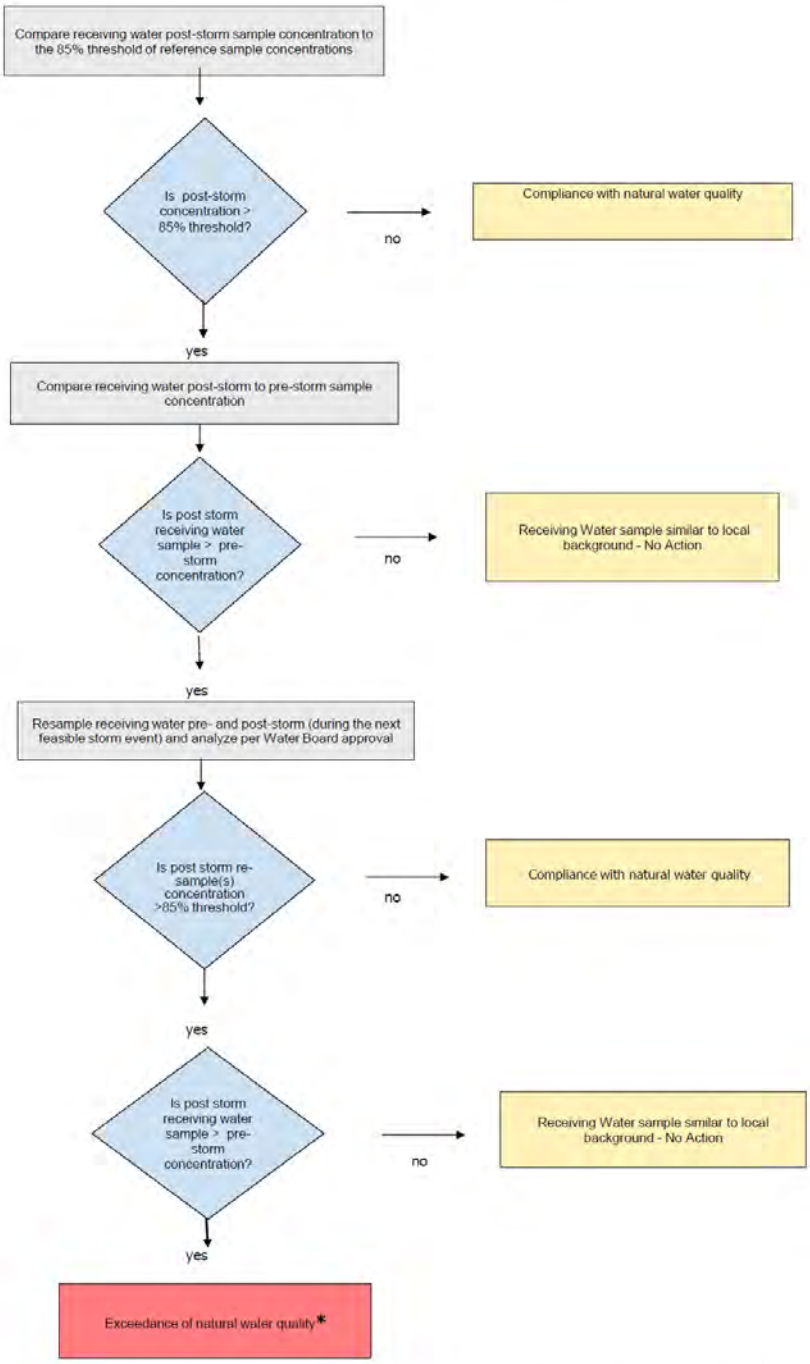

*** When an exceedance of natural water quality occurs, the discharger must comply with section I.A.2.h (for permitted storm water) or section I.B.2.c (for nonpoint sources). Note, when sampling data is available, end-of-pipe effluent concentrations will be considered by the Water Boards in making this determination.**

ATTACHMENT B

STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

1. Standard Permit Provisions

Code of Federal Regulations Title 40 Section 122.41 (40 CFR 122.41) includes conditions, or provisions, that apply to all National Pollutant Discharge Elimination System (NPDES) permits. Additional provisions applicable to NPDES permits are in 40 CFR 122.42. All applicable provisions in 40 CFR 122.41 and 40 CFR 122.42 must be incorporated into this Order and NPDES permit. The applicable 40 CFR 122.41 and 40 CFR 122.42 provisions are as follows:

a. DUTY TO COMPLY [40 CFR 122.41(a)]

The Copermittee must comply with all of the provisions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

(1) The Copermittee must comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement. [40 CFR 122.41(a)(1)]

(2) The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to a civil penalty not to exceed $25,000 per day for each violation. The CWA provides that any person who *negligently* violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than 2 years, or both. Any person who *knowingly* violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both. Any person who knowingly violates Section 301, 302, 303, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, and who knows at that time that he thereby places another person in imminent

danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.
[40 CFR 122.41(a)(2)]

(3) Any person may be assessed an administrative penalty by the San Diego Regional Water Quality Control Board (San Diego Water Board), State Water Resources Control Board (State Water Board), or United States Environmental Protection Agency (USEPA) for violating Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.
[40 CFR 122.41(a)(3)]

b. DUTY TO REAPPLY [40 CFR 122.41(b)]

If a Copermittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Copermittee must apply for and obtain a new permit.

c. NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE [40 CFR 122.41(c)]

It shall not be a defense for a Copermittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

d. DUTY TO MITIGATE [40 CFR 122.41(d)]

The Copermittee must take all reasonable steps to minimize or prevent any discharge or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

e. PROPER OPERATION AND MAINTENANCE [40 CFR 122.41(e)]

The Copermittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Copermittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by a Copermittee only when the operation is necessary to achieve compliance with the conditions of this permit.

f. PERMIT ACTIONS [40 CFR 122.41(f)]

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Copermittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

g. PROPERTY RIGHTS [40 CFR 122.41(g)]

This permit does not convey any property rights of any sort, or any exclusive privilege.

h. DUTY TO PROVIDE INFORMATION [40 CFR 122.41(h)]

The Copermittee must furnish to the San Diego Water Board, State Water Board, or USEPA within a reasonable time, any information which the San Diego Water Board, State Water Board, or USPEA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Copermittee must also furnish to the San Diego Water Board, State Water Board, or USPEA upon request, copies of records required to be kept by this permit.

i. INSPECTION AND ENTRY [40 CFR 122.41(i)]

The Copermittee must allow the San Diego Water Board, State Water Board, USEPA, and/or their authorized representative (including an authorized contractor acting as their representative), upon presentation of credentials and other documents as may be required by law, to:

(1) Enter upon the Copermittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit; [40 CFR 122.41(i)(1)]

(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit; [40 CFR 122.41(i)(2)]

(3) Inspect and photograph at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; [40 CFR 122.41(i)(3)] and

(4) Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location. [40 CFR 122.41(i)(4)]

j. MONITORING AND RECORDS [40 CFR 122.41(j)]

(1) Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity. [40 CFR 122.41(j)(1)]

(2) Except for records of monitoring information required by this permit related to the Copermittee's sewage sludge use and disposal activities, which shall be retained for

a period of at least five (5) years (or longer as required by 40 CFR Part 503), the Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time. [40 CFR 122.41(j)(2)]

(3) Records for monitoring information must include: [40 CFR 122.41(j)(3)]

(a) The date, exact place, and time of sampling or measurements; [40 CFR 122.41(j)(3)(i)]
(b) The individual(s) who performed the sampling or measurements; [40 CFR 122.41(j)(3)(ii)]
(c) The date(s) analyses were performed; [40 CFR 122.41(j)(3)(iii)]
(d) The individual(s) who performed the analyses; [40 CFR 122.41(j)(3)(iv)]
(e) The analytical techniques or methods used; [40 CFR 122.41(j)(3)(v)] and
(f) The results of such analyses. [40 CFR 122.41(j)(3)(vi)]

(4) Monitoring must be conducted according to test procedures under 40 CFR Part 136 unless another method is required under 40 CFR Subchapters N or O. [40 CFR 122.41(j)(4)]

In the case of pollutants for which there are no approved methods under 40 CFR Part 136 or otherwise required under 40 CFR Subchapters N and O, monitoring must be conducted according to a test procedure specified in the permit for such pollutants. [40 CFR 122.44(i)(1)(iv)]

(5) The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. [40 CFR 122.41(j)(5)]

k. SIGNATORY REQUIREMENT [40 CFR 122.41(k)]

(1) All applications, reports, or information submitted to the San Diego Water Board, State Water Board, or USEPA must be signed and certified. (See 40 CFR 122.22) [40 CFR 122.41(k)(1)]

(a) *For a municipality, State, Federal, or other public agency.* [All applications must be signed] by either a principal executive officer or ranking elected official. [40 CFR 122.22(a)(3)]

(b) All reports required by permits, and other information requested by the San Diego Water Board, State Water Board, or USEPA must be signed by a person described in paragraph (a) of this section, or by a duly authorized

representative of that person. A person is a duly authorized representative only if: [40 CFR 122.22(b)]

(i) The authorization is made in writing by a person described in paragraph (a) of this section; [40 CFR 122.22(b)(1)]

(ii) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company, (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) [40 CFR 122.22(b)(2)] and,

(iii) The written authorization is submitted to the San Diego Water Board and State Water Board. [40 CFR 122.22(b)(3)]

(c) *Changes to authorization.* If an authorization under paragraph (b) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (b) of this section must be submitted to the San Diego Water Board prior to or together with any reports, information, or applications to be signed by an authorized representative. [40 CFR 122.22(c)]

(d) *Certification.* Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." [40 CFR 122.22(d)]

(2) The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both. [40 CFR 122.41(k)(2)]

I. REPORTING REQUIREMENTS [40 CFR 122.41(l)]

(1) *Planned changes.* The Copermittee must give notice to the San Diego Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when: [40 CFR 122.41(l)(1)]

(a) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); [40 CFR 122.41(l)(1)(i)] or

(b) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1). [40 CFR 122.41(l)(1)(ii)]

(c) The alteration or addition results in a significant change in the Copermittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. [40 CFR 122.41(l)(1)(iii)]

(2) *Anticipated noncompliance*. The Copermittee must give advance notice to the San Diego Water Board or State Water Board of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements. [40 CFR 122.41(l)(2)]

(3) *Transfers*. This permit is not transferable to any person except after notice to the San Diego Water Board. The San Diego Water Board may require modification or revocation and reissuance of the permit to change the name of the Copermittee and incorporate such other requirements as may be necessary under the CWA. [40 CFR 122.41(l)(3)]

(4) *Monitoring reports.* Monitoring results must be reported at the intervals specified elsewhere in this permit. [40 CFR 122.41(l)(4)]

(a) Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the San Diego Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices. [40 CFR 122.41(l)(4)(i)]

(b) If the Copermittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or another method required for an industry-specific waste stream under 40 CFR Subchapters N or O, the results of this monitoring must be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the San Diego Water Board or State Water Board. [40 CFR 122.41(l)(4)(ii)]

(c) Calculations for all limitations which require averaging of measurements must utilize an arithmetic mean unless otherwise specified in the permit. [40 CFR 122.41(l)(4)(iii)]

(5) *Compliance schedules*. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date. [40 CFR 122.41(l)(5)]

(6) *Twenty-four hour reporting.*

(a) The Copermittee must report any noncompliance that may endanger health or the environment. Any information must be provided orally within 24 hours from the time the Copermittee becomes aware of the circumstances. A written submission must also be provided within five (5) days of the time the Copermittee becomes aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6)(i)]

(b) The following must be included as information which must be reported within 24 hours under this paragraph: [40 CFR 122.41(l)(6)(ii)]

(i) Any unanticipated bypass that exceeds any effluent limitation in the permit (See 40 CFR 122.41(g)). [40 CFR 122.41(l)(6)(ii)(A)]
(ii) Any upset which exceeds any effluent limitation in the permit. [40 CFR 122.41(l)(6)(ii)(B)] and,
(iii) Violation of a maximum daily discharge limitation for any of the pollutants listed by the San Diego Water Board in the permit to be reported within 24 hours. (See 40 CFR 122.44(g)) [40 CFR 122.41(l)(6)(ii)(C)]

(c) The San Diego Water Board may waive the above-required written report on a case-by-case basis if the oral report has been received within 24 hours. [40 CFR 122.41(l)(6)(iii)]

(7) *Other noncompliance.* The Copermittee must report all instances of noncompliance not reported in accordance with the standard provisions required under 40 CFR 122.41(l)(4), (5), and (6), at the time monitoring reports are submitted. The reports must contain the information listed in the standard provisions required under 40 CFR 122.41(l)(6). [40 CFR 122.41(l)(7))]

(8) *Other information.* When the Copermittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the San Diego Water Board, State Water Board, or USEPA, the Copermittee must promptly submit such facts or information. [40 CFR 122.41(l)(8)]

m. BYPASS [40 CFR 122.41(m)]

(1) *Definitions.*

(a) "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. [40 CFR 122.41(m)(1)(i)] or

(b) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or

substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
[40 CFR 122.41(m)(1)(ii)]

(2) *Bypass not exceeding limitations*. The Copermittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the standard provisions required under 40 CFR 122.41(m)(3) and (4).
[40 CFR 122.41(m)(2)]

(3) *Notice.*

(a) *Anticipated bypass*. If the Copermittee knows in advance of the need for a bypass, it must submit a notice, if possible at least ten days before the date of the bypass. [40 CFR 122.41(m)(3)(i)] or

(b) *Unanticipated bypass*. The Copermittee must submit notice of an unanticipated bypass in accordance with the standard provisions required under 40 CFR 122.41(l)(6) (24-hour notice).
[40 CFR 122.41(m)(3)(ii)]

(4) *Prohibition of Bypass.*

(a) Bypass is prohibited, and the San Diego Water Board may take enforcement action against a Copermittee for bypass, unless:
[40 CFR 122.41(m)(4)(i)]

(i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; [40 CFR 122.41(m)(4)(i)(A)]

(ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance;
[40 CFR 122.41(m)(4)(i)(B)] and,

(iii) The Copermittee submitted notice in accordance with the standard provisions required under 40 CFR 122.41(m)(3).
[40 CFR 122.41(m)(4)(i)(C)]

(b) The San Diego Water Board may approve an anticipated bypass, after considering its adverse effects, if the San Diego Water Board determines that it will meet the three conditions listed above.
[40 CFR 122.41(m)(4)(ii)]

n. UPSET [40 CFR 122.41(n)]

(1) *Definition.* "Upset" means an exceptional incident in which there is unintentional and

temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Copermittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. [40 CFR 122.41(n)(1)]

(2) *Effect of an upset*. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the standard provisions required under 40 CFR 122.41(n)(3) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. [40 CFR 122.41(n)(2)]

(3) *Conditions necessary for a demonstration of upset*. A Copermittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that: [40 CFR 122.41(n)(3)]

(a) An upset occurred and that the Copermittee can identify the cause(s) of the upset; [40 CFR 122.41(n)(3)(i)]
(b) The permitted facility was at the time being properly operated; [40 CFR 122.41(n)(3)(ii)] and
(c) The Copermittee submitted notice of the upset in accordance with the standard provisions required under 40 CFR 122.41(l)(6)(ii)(B) (24-hour notice). [40 CFR 122.41(n)(3)(iii)]
(d) The Copermittee complied with any remedial measures pursuant to the standard provisions required under 40 CFR 122.41(d). [40 CFR 122.41(n)(3)(iii)]

(4) *Burden of proof*. In any enforcement proceeding, the Copermittee seeking to establish the occurrence of an upset has the burden of proof. [40 CFR 122.41(n)(4)]

o. STANDARD PERMIT PROVISIONS FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS [40 CFR 122.42(c)]

The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the San Diego Water Board or State Water Board under 40 CFR 122.26(a)(1)(v) must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report must include:

(1) The status of implementing the components of the storm water management program that are established as permit conditions; [40 CFR 122.42(c)(1)]

(2) Proposed changes to the storm water management programs that are established as permit conditions. Such proposed changes must be consistent with 40 CFR 122.26(d)(2)(iii); [40 CFR 122.42(c)(2)] and

(3) Revisions, if necessary, to the assessment of controls and the fiscal analysis

reported in the permit application under 40 CFR 122.26(d)(2)(iv) and (v); [40 CFR 122.42(c)(3)]

(4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; [40 CFR 122.42(c)(4)]

(5) Annual expenditures and budget for year following each annual report; [40 CFR 122.42(c)(5)]

(6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; [40 CFR 122.42(c)(6)]

(7) Identification of water quality improvements or degradation. [40 CFR 122.42(c)(7)]

p. STANDARD PERMIT PROVISIONS FOR STORM WATER DISCHARGES [40 CFR 122.42(d)]

The initial permits for discharges composed entirely of storm water issued pursuant to 40 CFR 122.26(e)(7) must require compliance with the conditions of the permit as expeditiously as practicable, but in no event later than three years after the date of issuance of the permit.

2. General Provisions

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. The general provisions applicable to this Order and NPDES permit are as follows:

a. DISCHARGE OF WASTE IS A PRIVILEGE

No discharge of waste into the waters of the State, whether or not such discharge is made pursuant to waste discharge requirements, shall create a vested right to continue such discharge. All discharges of waste into waters of the State are privileges, not rights. [CWC Section 13263(g)]

b. DURATION OF ORDER AND NPDES PERMIT

(1) *Effective date*. This Order and NPDES permit becomes effective on April 1st, 2015 ~~the 50th day~~ after its adoption provided the USEPA has no objection. If the USEPA objects to its issuance, this Order shall not become effective until such objection is withdrawn. This Order supersedes Order No. R9-2007-0001 for the San Diego County Copermittees listed in Table 2.a and became effective on June 27, 2014.~~upon the effective date of this Order~~. This Order as amended by Order R9-2015-0001~~, and~~ supersedes Order No~~s~~. R9-2009-0002 and becomes effective ~~fifty (50) days~~ April 1, 2015 after the date Order No. R9-2015-0001 is adopted. This Order supersedes Order No. R9-2010-0016 upon its ~~their~~ expiration or earlier notice of coverage.

(2) *Expiration*. This Order and NPDES permit expires five years after its effective date.

[40 CFR 122.46(a)]

(3) *Continuation of expired order*. After this Order and NPDES permit expires, the terms and conditions of this Order and NPDES permit are automatically continued pending issuance of a new permit if all requirements of the federal NPDES regulations on the continuation of expired permits (40 CFR 122.6) are complied with.

c. AVAILABILITY

A copy of this Order must be kept at a readily accessible location and must be available to on-site personnel at all times.

d. CONFIDENTIALITY OF INFORMATION

Except as provided for in 40 CFR 122.7, no information or documents submitted in accordance with or in application for this Order will be considered confidential, and all such information and documents shall be available for review by the public at the San Diego Water Board office.

Claims of confidentiality for the following information will be denied:
[40 CFR 122.7(b)]

(1) The name and address of any permit applicant or Copermittee; [40 CFR 122.7(b)(1)] and

(2) Permit applications and attachments, permits, and effluent data. [40 CFR 122.7(b)(2)]

e. EFFLUENT LIMITATIONS

(1) *Interim effluent limitations*. The Copermittee must comply with any interim effluent limitations as established by addendum, enforcement action, or revised waste discharge requirements which have been, or may be, adopted by the San Diego Water Board.

(2) *Other effluent limitations and standards*. If any applicable toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant and that standard or prohibition is more stringent than any limitation on the pollutant in the permit, the San Diego Water Board shall institute proceedings under these regulations to modify or revoke and reissue the permit to conform to the toxic effluent standard or prohibition. [40 CFR 122.44(b)(1)]

f. DUTY TO MINIMIZE OR CORRECT ADVERSE IMPACTS

The Copermittee must take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this Order, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the noncompliance.

g. PERMIT ACTIONS

The filing of a request by the Copermittee for modification, revocation and reissuance, or termination of this Order, or a notification of planned change in or anticipated noncompliance with this Order does not stay any condition of this Order. (See 40 CFR 122.41(f)) In addition, the following provisions apply to this Order:

(1) Upon application by any affected person, or on its own motion, the San Diego Water Board may review and revise the requirements in this Order. All requirements must be reviewed periodically. [CWC Section 13263(e)]

(2) This Order may be terminated or modified for cause, including, but not limited to, all of the following: [CWC Section 13381]

(a) Violation of any condition contained in the requirements of this Order. [CWC Section 13381(a)]

(b) Obtaining the requirements in this Order by misrepresentation, or failure to disclose fully all relevant facts. [CWC Section 13381(b)]

(c) A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge. [CWC Section 13381(c)]

(3) When this Order is transferred to a new owner or operator, such requirements as may be necessary under the CWC may be incorporated into this Order.

h. NPDES PERMITTED NON-STORM WATER DISCHARGES

The San Diego Water Board has, in prior years, issued a limited number of individual NPDES permits for non-storm water discharges to MS4s. The San Diego Water Board or State Water Board may in the future, upon prior notice to the Copermittee(s), issue an NPDES permit for any non-storm water discharge (or class of non-storm water discharges) to an MS4.

i. MONITORING

In addition to the standard provisions required under 40 CFR 122.41(j) and (l)(4), the following general monitoring provisions apply to this Order:

(1) Where procedures are not otherwise specified in Order, sampling, analysis and quality assurance/quality control must be conducted in accordance with the Quality Assurance Management Plan (QAMP) for the State of California's Surface Water Ambient Monitoring Program (SWAMP), adopted by the State Water Resources Control Board (State Water Board).

(2) Pursuant to 40 CFR 122.41(j)(2) and CWC Section 13383(a), each Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring

instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five (5) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time.

(3) All chemical, bacteriological, and toxicity analyses must be conducted at a laboratory certified for such analyses by the California Department of Public Health or a laboratory approved by the San Diego Water Board.

(4) For priority toxic pollutants that are identified in the California Toxics Rule (CTR) (65 Fed. Reg. 31682), the Copermittees must instruct their laboratories to establish calibration standards that are equivalent to or lower than the Minimum Levels (MLs) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP). If a Copermittee can demonstrate that a particular ML is not attainable, in accordance with procedures set forth in 40 CFR Part 136, the lowest quantifiable concentration of the lowest calibration standard analyzed by a specific analytical procedure (assuming that all the method specified sample weights, volumes, and processing steps have been followed) may be used instead of the ML listed in Appendix 4 of the SIP. The Copermittee must submit documentation from the laboratory to the San Diego Water Board for approval prior to raising the ML for any priority toxic pollutant.

j. ENFORCEMENT

(1) The San Diego Water Board is authorized to enforce the terms of this Order under several provisions of the CWC, including, but not limited to, CWC Sections 13385, 13386, and 13387.

(2) Nothing in this Order shall be construed to protect the Copermittee from its liabilities under federal, state, or local laws.

(3) The CWC provides for civil and criminal penalties comparable to, and in some cases greater than, those provided for under the CWA.

(4) Except as provided in the standard conditions required under 40 CFR 122.41(m) and (n), nothing in this Order shall be construed to relieve the Copermittee from civil or criminal penalties for noncompliance.

(5) Nothing in this Order shall be construed to preclude the institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties to which the Copermittee is or may be subject to under Section 311 of the CWA.

(6) Nothing in this Order shall be construed to preclude institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authoring preserved by Section 510 of the CWA.

k. SEVERABILITY

The provisions of this Order are severable, and if any provision of this Order, or the

application of any provisions of this Order to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this Order shall not be affected thereby.

l. APPLICATIONS

Any application submitted by a Copermittee for reissuance or modification of this Order must satisfy all applicable requirements specified in federal regulations as well as any additional requirements for submittal of a Report of Waste Discharge specified in the CWC and the California Code of Regulations.

m. IMPLEMENTATION

All plans, reports and subsequent amendments submitted in compliance with this Order must be implemented immediately (or as otherwise specified). All submittals by Copermittees must be adequate to implement the requirements of this Order.

n. REPORT SUBMITTALS

(1) All report submittals must include an executive summary, introduction, conclusion, recommendations, and signed certified statement.

(2) Each Copermittee must submit a signed certified statement covering its responsibilities for each applicable submittal.

(3) The Principal Watershed Copermittee(s) must submit a signed certified statement covering its responsibilities for each applicable submittal and the sections of the submittals for which it is responsible.

(4) Unless otherwise directed, the Copermittees must submit one hard copy and one electronic copy of each report required under this Order to the San Diego Water Board, and one electronic copy to the USEPA.

(5) The Copermittees must submit reports and provide notifications as required by this Order to the following:

EXECUTIVE OFFICER
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
2375 NORTHSIDE DRIVE~~9174 SKY PARK COURT~~, SUITE 100
SAN DIEGO CA 92108~~23-4340~~
Telephone: ~~(858) 467-2952~~(619) 516-1990~~-~~ Fax: ~~(858) 571-6972~~(619) 516-1994

EUGENE BROMLEY
US ENVIRONMENTAL PROTECTION AGENCY
REGION IX
PERMITS ISSUANCE SECTION (W-5-1)
75 HAWTHORNE STREET
SAN FRANCISCO CA 94105

ATTACHMENT C

ACRONYMS AND ABBREVIATIONS

AMAL	Average Monthly Action Level
ASBS	Area(s) of Special Biological Significance
BMP	Best Management Practice
Basin Plan	Water Quality Control Plan for the San Diego Basin
CEQA	California Environmental Quality Act
CCR	California Code of Regulations
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWC	California Water Code
CZARA	Coastal Zone Act Reauthorization Amendments of 1990
ESAs	Environmentally Sensitive Areas
GIS	Geographic Information System
IBI	Index of Biological Integrity
LID	Low Impact Development
MDAL	Maximum Daily Action Level
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
NAL	Non-Storm Water Action Level
NAICS	North American Industry Classification System
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
ROWD	Report of Waste Discharge (application for NPDES reissuance)
SAL	Storm Water Action Level
San Diego Water Board	California Regional Water Quality Control Board, San Diego Region
SIC	Standard Industrial Classification Code
State Water Board	State Water Resources Control Board
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
WDID	Waste Discharge Identification Number
WLA	Waste Load Allocation
WQBEL	Water Quality Based Effluent Limitation

DEFINITIONS

Active/Passive Sediment Treatment - Using mechanical, electrical or chemical means to flocculate or coagulate suspended sediment for removal from runoff from construction sites prior to discharge.

Anthropogenic Litter – Trash generated from human activities, not including sediment.

Average Monthly Action Level – The highest allowable average of daily discharges over a calendar month.

Beneficial Uses - The uses of water necessary for the survival or wellbeing of man, plants, and wildlife. These uses of water serve to promote tangible and intangible economic, social, and environmental goals. "Beneficial Uses" of the waters of the State that may be protected include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. Existing beneficial uses are uses that were attained in the surface or ground water on or after November 28, 1975; and potential beneficial uses are uses that would probably develop in future years through the implementation of various control measures. "Beneficial Uses" are equivalent to "Designated Uses" under federal law. [California Water Code Section 13050(f)].

Best Management Practices (BMPs) - Defined in 40 CFR 122.2 as schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Bioassessment - The use of biological community information to evaluate the biological integrity of a water body and its watershed. With respect to aquatic ecosystems, bioassessment is the collection and analysis of samples of the benthic macroinvertebrate community together with physical/habitat quality measurements associated with the sampling site and the watershed to evaluate the biological condition (i.e. biotic integrity) of a water body.

Biofiltration - Practices that use vegetation and amended soils to detain and treat runoff from impervious areas. Treatment is through filtration, infiltration, adsorption, ion exchange, and biological uptake of pollutants.

Biological Integrity - Defined in Karr J.R. and D.R. Dudley. 1981. Ecological perspective on water quality goals. *Environmental Management* 5:55-68 as: "A balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitat of the region." Also referred to as ecosystem health.

BMP Design Manual – A plan developed to eliminate, reduce, or mitigate the impacts of runoff from development projects, including Priority Development Projects.

Chronic Toxicity – A measurement of sublethal effect (e.g. reduced growth, reproduction) to experimental test organisms exposed to an effluent or receiving waters compared to that of the

control organisms.

Clean Water Act Section 303(d) Water Body - An impaired water body in which water quality does not meet applicable water quality standards and/or is not expected to meet water quality standards, even after the application of technology based pollution controls required by the CWA. The discharge of runoff to these water bodies by the Copermittees is significant because these discharges can cause or contribute to violations of applicable water quality standards.

Construction Site – Any project, including projects requiring coverage under the Construction General Permit, that involves soil disturbing activities including, but not limited to, clearing, grading, disturbances to ground such as stockpiling, and excavation.

Contamination - As defined in the Porter-Cologne Water Quality Control Act, contamination is "an impairment of the quality of waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste whether or not waters of the State are affected."

Copermittee – A permittee to a NPDES permit that is only responsible for permit conditions relating to the discharge for which it is operator [40 CFR 122.26(b)(1)]. For the purposes of this Order, a Copermittee is one of the individual permittees identified in Tables 1a-1c of this Order.

Copermittees – All of the individual Copermittees, collectively.

Critical Channel Flow (Qc) – The channel flow that produces the critical shear stress that initiates bed movement or that erodes the toe of channel banks. When measuring Qc, it should be based on the weakest boundary material – either bed or bank.

Daily Discharge – Defined as either: (1) the total mass of the constituent discharged over the calendar day or any 24 hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g. concentration.)

The Daily Discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day, or other 24 hour period other than a day), or by the arithmetic mean of analytical results from one or more grab samples taken over the course of a day.

Development Projects - Construction, rehabilitation, redevelopment, or reconstruction of any public or private projects.

Dry Season –May 1 to September 30.

Dry Weather – Weather is considered dry if the preceding 72 hours has been without measurable precipitation (>0.1 inch).

Enclosed Bays – Enclosed bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost bay works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays do not include

inland surface waters or ocean waters.

Erosion – When land is diminished or worn away due to wind, water, or glacial ice. Often the eroded debris (silt or sediment) becomes a pollutant via storm water runoff. Erosion occurs naturally but can be intensified by land clearing activities such as farming, development, road building, and timber harvesting.

Environmentally Sensitive Areas (ESAs) - Areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; areas designated as preserves or their equivalent under the Natural Communities Conservation Program within the Cities and County of Orange; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.

Estuaries – Waters, including coastal lagoons, located at the mouth of streams that serve as areas of mixing fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and ocean water. Estuaries do not include inland surface waters or ocean waters.

Existing Development – Any area that has been developed and exists for municipal, commercial, industrial, or residential purposes, uses, or activities. May include areas that are not actively used for its originally developed purpose, but may be re-purposed or redeveloped for another use or activity.

Flow Duration – The long-term period of time that flows occur above a threshold that causes significant sediment transport and may cause excessive erosion damage to creeks and streams (not a single storm event duration). The simplest way to visualize this is to consider a histogram of pre- and post-project flows using long-term records of hourly data. To maintain pre-development flow duration means that the total number of hours (counts) within each range of flows in a flow-duration histogram cannot increase between the pre- and post-development condition. Flow duration within the range of geomorphologically significant flows is important for managing erosion.

Grading - The cutting and/or filling of the land surface to a desired slope or elevation.

Groundwater – Subsurface water that occurs beneath the water table in soils and geologic formations that are fully saturated.

Hazardous Material – Any substance that poses a threat to human health or the environment due to its toxicity, corrosiveness, ignitability, explosive nature or chemical reactivity. These also include materials named by the USEPA in 40 CFR 116 to be reported if a designated quantity of the material is spilled into the waters of the U.S. or emitted into the environment.

Hazardous Waste - Hazardous waste is defined as “any waste which, under Section 600 of Title 22 of this code, is required to be managed according to Chapter 30 of Division 4.5 of Title 22 of this code” [CCR Title 22, Division 4.5, Chapter 11, Article 1].

Household Hazardous Waste – Paints, cleaning products, and other hazardous wastes generated during home improvement or maintenance activities.

Hydromodification – The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

Illicit Connection – Any man-made conveyance or drainage system through which a non-storm water discharge to the storm water drainage system occurs or may occur. Any connection to the MS4 that conveys an illicit discharge.

Illicit Discharge - Any discharge to the MS4 that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from firefighting activities [40 CFR 122.26(b)(2)].

Inactive Areas – Areas of construction activity that are not active and those that have been active and are not scheduled to be re-disturbed for at least 14 days.

Infiltration – In the context of low impact development, infiltration is defined as the percolation of water into the ground. Infiltration is often expressed as a rate (inches per hour), which is determined through an infiltration test. In the context of non-storm water, infiltration is water other than wastewater that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow [40 CFR 35.2005(20)].

Inland Surface Waters – Includes all surface waters of the State that do not include the ocean, enclosed bays, or estuaries.

Jurisdictional Runoff Management Program Document – A written description of the specific jurisdictional runoff management measures and programs that each Copermittee will implement to comply with this Order and ensure that storm water pollutant discharges in runoff are reduced to the MEP and do not cause or contribute to a violation of water quality standards.

Low Impact Development (LID) – A storm water management and land development strategy that emphasizes conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions.

Low Impact Development Best Management Practices (LID BMPs) – LID BMPs include schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States through storm water management and land development strategies that emphasize conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions. LID BMPs include retention

practices that do not allow runoff, such as infiltration, rain water harvesting and reuse, and evapotranspiration. LID BMPs also include flow-through practices such as biofiltration that may have some discharge of storm water following pollutant reduction.

Major Outfall – As defined in the Code of Federal Regulations, a major outfall is a MS4 outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (i.e. discharge from a single conveyance other than a circular pipe which is associated with a drainage area of more than 50 acres); or, for MS4s that receive storm water from lands zoned for industrial activity (based on comprehensive zoning plans or equivalent), a MS4 outfall that discharges from a single pipe with an inside diameter of 12 inches or more or from its equivalent (i.e. discharge from other than a circular pipe associated with a drainage area of 2 acres or more).

Maximum Daily Action Level (MDAL) –The highest allowable daily discharge of a pollutant, over a calendar day (or 24 hour period). For pollutants with action levels expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with action levels expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

Maximum Extent Practicable (MEP) – The technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) for storm water that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) in combination with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than BAT. A definition for MEP is not provided either in the statute or in the regulations. Instead the definition of MEP is dynamic and will be defined by the following process over time: municipalities propose their definition of MEP by way of their runoff management programs. Their total collective and individual activities conducted pursuant to the runoff management programs becomes their proposal for MEP as it applies both to their overall effort, as well as to specific activities (e.g., MEP for street sweeping, or MEP for MS4 maintenance). In the absence of a proposal acceptable to the San Diego Water Board, the San Diego Water Board defines MEP.

In a memo dated February 11, 1993, entitled "Definition of Maximum Extent Practicable," Elizabeth Jennings, Senior Staff Counsel, SWRCB addressed the achievement of the MEP standard as follows:

> "*To achieve the MEP standard, municipalities must employ whatever Best Management Practices (BMPs) are technically feasible (i.e., are likely to be effective) and are not cost prohibitive. The major emphasis is on technical feasibility. Reducing pollutants to the MEP means choosing effective BMPs, and rejecting applicable BMPs only where other effective BMPs will serve the same purpose, or the BMPs would not be technically feasible, or the cost would be prohibitive. In selecting BMPs to achieve the MEP standard, the following factors may be useful to consider:*
>
> *a. Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?*
> *b. Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?*
> *c. Public Acceptance: Does the BMP have public support?*

d. Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?
e. Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc.?

The final determination regarding whether a municipality has reduced pollutants to the maximum extent practicable can only be made by the Regional or State Water Boards, and not by the municipal discharger. If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit derived, it would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs that would address a pollutant source, or to pick a BMP based solely on cost, which would be clearly less effective. In selecting BMPs the municipality must make a serious attempt to comply and practical solutions may not be lightly rejected. In any case, the burden would be on the municipal discharger to show compliance with its permit. After selecting a menu of BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented."

Monitoring Year – October 1 to September 30

Municipal Separate Storm Sewer System (MS4) – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designated or used for collecting or conveying storm water; (iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.26.

National Pollutant Discharge Elimination System (NPDES) - The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the CWA.

Non-Storm Water - All discharges to and from a MS4 that do not originate from precipitation events (i.e., all discharges from a MS4 other than storm water). Non-storm water includes illicit discharges and NPDES permitted discharges.

Nuisance - As defined in the Porter-Cologne Water Quality Control Act, a nuisance is "anything which meets all of the following requirements: 1) Is injurious to health, or is indecent, or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. 2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or

damage inflicted upon individuals may be unequal. 3) Occurs during, or as a result of, the treatment or disposal of wastes."

Ocean Waters – The territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the State Board's California Ocean Plan.

Order – Unless otherwise specified, refers to this Order, Order No. R9-2013-0001 (NPDES No. CAS0109266)

Outfall - Outfall means a point source as defined by 40 CFR 122.2 at the point where a municipal separate storm sewer discharges to waters of the US and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels or other conveyances which connect segments of the same stream or other waters of the US and are used to convey waters of the US.

Persistent Flow - Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

Person - A person is defined as an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof [40 CFR 122.2].

Point Source - Any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, landfill leachate collection systems, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

Pollutant - Any agent that may cause or contribute to the degradation of water quality such that a condition of pollution or contamination is created or aggravated.

Pollution - As defined in the Porter-Cologne Water Quality Control Act, pollution is "the alteration of the quality of the waters of the State by waste, to a degree which unreasonably affects either of the following: 1) The waters for beneficial uses; or 2) Facilities that serve these beneficial uses." Pollution may include contamination.

Pollution Prevention - Pollution prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control BMPs, treatment control BMPs, or disposal.

Pre-Development Runoff Conditions – Approximate flow rates and durations that exist or existed onsite before land development occurs. For new development projects, this equates to runoff conditions immediately before project construction. For redevelopment projects, this equates to runoff conditions from the project footprint assuming infiltration characteristics of the underlying soil, and existing grade. Runoff coefficients of concrete or asphalt must not be used. A redevelopment Priority Development Project must use available information pertaining to existing underlying soil type and onsite existing grade to estimate pre-development runoff conditions.

Priority Development Projects - New development and redevelopment projects defined under Provision E.3.b of Order No. R9-2013-0001.

Rainy Season (aka Wet Season) –October 1 to April 30

Receiving Waters – Waters of the United States.

Receiving Water Limitations - Waste discharge requirements issued by the San Diego Water Board typically include both: (1) "Effluent Limitations" (or "Discharge Limitations") that specify the technology-based or water-quality-based effluent limitations; and (2) "Receiving Water Limitations" that specify the water quality objectives in the Basin Plan as well as any other limitations necessary to attain those objectives. In summary, the "Receiving Water Limitations" provision is the provision used to implement the requirements of CWA section 402(p)(3)(B).

Redevelopment - The creation and/or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include trenching and resurfacing associated with utility work; resurfacing existing roadways; new sidewalk construction, pedestrian ramps, or bike lane on existing roads; and routine replacement of damaged pavement, such as pothole repair.

Regional Clearinghouse – A central location for the collection and distribution of information developed and maintained by the Copermittees including, but not limited to, plans, reports, manuals, data, contact information, and/or links to such documents and information.

Rehabilitation - Remedial measures or activities for the purpose of improving or restoring the beneficial uses of streams, channels or river systems. Techniques may vary from in-stream restoration techniques to off-line storm water management practices installed in the system corridor or upland areas, or a combination of in-stream and out of stream techniques. Rehabilitation techniques may include, but are not limited to the following: riparian zone restoration, constructed wetlands, channel modifications that improve habitat and stability, and daylighting of drainage systems.

Reporting Period – The period of information that is reported in the Water Quality Improvement Plan Annual Report. The reporting period consists of two components: 1) July 1 to June 30, consistent with the fiscal year, for the implementation of the jurisdictional runoff management programs, and 2) October 1 to September 30, consistent with the monitoring year for the monitoring and assessment programs. Together, these two time periods constitute the reporting year for the Water Quality Improvement Plan Annual Report due January 31 following the end of the monitoring year.

Retain – Keep or hold in a particular place, condition, or position without discharge to surface waters.

Retrofitting – Storm water management practice put into place after development has occurred in watersheds where the practices previously did not exist or are ineffective. Retrofitting of developed areas is intended to improve water quality, protect downstream channels, reduce

flooding, or meet other specific objectives. Retrofitting developed areas may include, but is not limited to replacing roofs with green roofs, disconnecting downspouts or impervious surfaces to drain to pervious surfaces, replacing impervious surfaces with pervious surfaces, installing rain barrels, installing rain gardens, and trash area enclosures.

Runoff - All flows in a storm water conveyance system that consists of the following components: (1) storm water (wet weather flows) and (2) non-storm water including dry weather flows.

San Diego Water Board – As used in this document the term "San Diego Water Board" is synonymous with the term "Regional Board" as defined in Water Code section 13050(b) and is intended to refer to the California Regional Water Quality Control Board for the San Diego Region as specified in Water Code Section 13200.

Sediment - Soil, sand, and minerals washed from land into water. Sediment resulting from anthropogenic sources (i.e. human induced land disturbance activities) is considered a pollutant. This Order regulates only the discharges of sediment from anthropogenic sources and does not regulate naturally occurring sources of sediment. Sediment can destroy fish-nesting areas, clog animal habitats, and cloud waters so that sunlight does not reach aquatic plants.

Source Control BMP – Land use or site planning practices, or structural or nonstructural measures that aim to prevent runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between pollutants and runoff.

Storm Water – Per 40 CFR 122.26(b)(13), means storm water runoff, snowmelt runoff and surface runoff and drainage. Surface runoff and drainage pertains to runoff and drainage resulting from precipitation events.

Structural BMPs - A subset of BMPs which detains, retains, filters, removes, or prevents the release of pollutants to surface waters from development projects in perpetuity, after construction of a project is completed.

Test of Significant Toxicity (TST) - A statistical approach used to analyze toxicity test data. The TST incorporates a restated null hypothesis, Welch's t-test, and biological effect thresholds for chronic and acute toxicity.

Total Maximum Daily Load (TMDL) - The maximum amount of a pollutant that can be discharged into a water body from all sources (point and non-point) and still maintain water quality standards. Under CWA section 303(d), TMDLs must be developed for all water bodies that do not meet water quality standards after application of technology-based controls.

Toxicity - Adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies. The water quality objectives for toxicity provided in the Basin Plan, state in part…"All waters shall be free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life….The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge."

Toxicity Identification Evaluation (TIE) - A set of procedures for identifying the specific

chemical(s) responsible for toxicity. These procedures are performed in three phases (characterization, identification, and confirmation) using aquatic organism toxicity tests.

Toxicity Reduction Evaluation (TRE) - A study conducted in a step-wise process designed to identify the causative agents of effluent or ambient toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in toxicity. The first steps of the TRE consist of the collection of data relevant to the toxicity, including additional toxicity testing, and an evaluation of facility operations and maintenance practices, and best management practices. A Toxicity Identification Evaluation (TIE) may be required as part of the TRE, if appropriate.

Treatment Control BMP – Any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media absorption or any other physical, biological, or chemical process.

Unpaved Road – Any long, narrow stretch without pavement used for traveling by motor passenger vehicles between two or more points. Unpaved roads are generally constructed of dirt, gravel, aggregate or macadam and may be improved or unimproved.

Waste - As defined in CWC Section 13050(d), "waste includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal."

Article 2 of CCR Title 23, Chapter 15 (Chapter 15) contains a waste classification system that applies to solid and semi-solid waste, which cannot be discharged directly or indirectly to water of the state and which therefore must be discharged to land for treatment, storage, or disposal in accordance with Chapter 15. There are four classifications of waste (listed in order of highest to lowest threat to water quality): hazardous waste, designated waste, non-hazardous solid waste, and inert waste.

Water Quality Objective - Numerical or narrative limits on constituents or characteristics of water designated to protect designated beneficial uses of the water. [California Water Code Section 13050 (h)]. California's water quality objectives are established by the State and Regional Water Boards in the Water Quality Control Plans. Numeric or narrative limits for pollutants or characteristics of water designed to protect the beneficial uses of the water. In other words, a water quality objective is the maximum concentration of a pollutant that can exist in a receiving water and still generally ensure that the beneficial uses of the receiving water remain protected (i.e., not impaired). Since water quality objectives are designed specifically to protect the beneficial uses, when the objectives are violated the beneficial uses are, by definition, no longer protected and become impaired. This is a fundamental concept under the Porter Cologne Act. Equally fundamental is Porter Cologne's definition of pollution. A condition of pollution exists when the water quality needed to support designated beneficial uses has become unreasonably affected or impaired; in other words, when the water quality objectives have been violated. These underlying definitions (regarding beneficial use protection) are the reason why all waste discharge requirements implementing the federal NPDES regulations require compliance with water quality objectives. (Water quality objectives are also called water quality criteria in the CWA.)

Water Quality Standards - Water quality standards, as defined in Clean Water Act section 303(c) consist of the beneficial uses (e.g., swimming, fishing, municipal drinking water supply, etc.,) of a water body and criteria (referred to as water quality objectives in the California Water Code) necessary to protect those uses. Under the Water Code, the water boards establish beneficial uses and water quality objectives in water quality control or basin plans. Together with an anti-degradation policy, these beneficial uses and water quality objectives serve as water quality standards under the Clean Water Act. In Clean Water Act parlance, state beneficial uses are called "designated uses" and state water quality objectives are called "criteria." Throughout this Order, the relevant term is used depending on the statutory scheme.

Waters of the State - Any water, surface or underground, including saline waters within the boundaries of the State [CWC section 13050 (e)]. The definition of the Waters of the State is broader than that for the Waters of the United States in that all water in the State is considered to be a Waters of the State regardless of circumstances or condition.

Waters of the United States - As defined in the 40 CFR 122.2, the Waters of the U.S. are defined as: "(a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate "wetlands;" (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters otherwise defined as waters of the United States under this definition: (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial seas; and (g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA."

Watershed - That geographical area which drains to a specified point on a water course, usually a confluence of streams or rivers (also known as drainage area, catchment, or river basin).

Wet Season (aka Rainy Season) – October 1 to April 30

Wet Weather – Weather is considered wet up to 72 hours after a storm event of 0.1 inches and greater, unless otherwise defined by another regulatory mechanism (e.g. a TMDL).

ATTACHMENT D

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM

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JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

FY _____

I. COPERMITTEE INFORMATION

Copermittee Name:

Copermittee Primary Contact Name:

Copermittee Primary Contact Information:
Address:
City: County: State: Zip:
Telephone: Fax: Email:

II. LEGAL AUTHORITY

Has the Copermittee established adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 that complies with Order No. R9-2013-0001?	YES NO	☐ ☐
A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority?	YES NO	☐ ☐

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

Was an update of the jurisdictional runoff management program document required or recommended by the San Diego Water Board?	YES NO	☐ ☐
If YES to the question above, did the Copermittee update its jurisdictional runoff management program document and make it available on the Regional Clearinghouse?	YES NO	☐ ☐

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

Has the Copermittee implemented a program to actively detect and eliminate illicit discharges and connections to its MS4 that complies with Order No. R9-2013-0001?	YES NO	☐ ☐

Number of non-storm water discharges reported by the public	
Number of non-storm water discharges detected by Copermittee staff or contractors	
Number of non-storm water discharges investigated by the Copermittee	
Number of sources of non-storm water discharges identified	
Number of non-storm water discharges eliminated	
Number of sources of illicit discharges or connections identified	
Number of illicit discharges or connections eliminated	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

V. DEVELOPMENT PLANNING PROGRAM

Has the Copermittee implemented a development planning program that complies with Order No. R9-2013-0001?	YES NO	☐ ☐
Was an update to the BMP Design Manual required or recommended by the San Diego Water Board?	YES NO	☐ ☐
If YES to the question above, did the Copermittee update its BMP Design Manual and make it available on the Regional Clearinghouse?	YES NO	☐ ☐

Number of proposed development projects in review	
Number of Priority Development Projects in review	
Number of Priority Development Projects approved	
Number of approved Priority Development Projects exempt from any BMP requirements	
Number of approved Priority Development Projects allowed alternative compliance	
Number of Priority Development Projects granted occupancy	

Number of completed Priority Development Projects in inventory	
Number of high priority Priority Development Project structural BMP inspections	
Number of Priority Development Project structural BMP violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

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VI. CONSTRUCTION MANAGEMENT PROGRAM

Has the Copermittee implemented a construction management program that complies with Order No. R9-2013-0001?	YES ☐ NO ☐

Number of construction sites in inventory	
Number of active construction sites in inventory	
Number of inactive construction sites in inventory	
Number of construction sites closed/completed during reporting period	
Number of construction site inspections	
Number of construction site violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

Has the Copermittee implemented an existing development management program that complies with Order No. R9-2013-0001?	YES ☐ NO ☐

	Municipal	Commercial	Industrial	Residential
Number of facilities or areas in inventory				
Number of existing development inspections				
Number of follow-up inspections				
Number of violations				
Number of enforcement actions issued				
Number of escalated enforcement actions issued				

VIII. PUBLIC EDUCATION AND PARTICIPATION

Has the Copermittee implemented a public education program component that complies with Order No. R9-2013-0001?	YES ☐ NO ☐
Has the Copermittee implemented a public participation program component that complies with Order No. R9-2013-0001?	YES ☐ NO ☐

IX. FISCAL ANALYSIS

Has the Copermittee attached to this form a summary of its fiscal analysis that complies with Order No. R9-2013-0001?	YES ☐ NO ☐

X. CERTIFICATION

I [☐ Principal Executive Officer ☐ Ranking Elected Official ☐ Duly Authorized Representative] certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature	Date
Print Name	Title
Telephone Number	Email

ATTACHMENT E

SPECIFIC PROVISIONS FOR TOTAL MAXIMUM DAILY LOADS APPLICABLE TO ORDER NO. R9-2013-0001

These provisions implement load allocations (LAs) and wasteload allocations (WLAs) of the Total Maximum Daily Loads (TMDLs) ~~adopted~~ established by the San Diego Water Board or ~~and approved by~~ USEPA under Clean Water Act section 303(c), applicable to discharges regulated under this Order. The provisions and schedules for implementation of the TMDLs described below must be incorporated into the Water Quality Improvement Plans, required pursuant to Provision B of this Order, for the specified Watershed Management Areas.

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed
2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin
3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed
4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek
5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay
6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)
7. Total Maximum Daily Load for Sediment in Los Peñasquitos Lagoon

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2002-0123

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	August 14, 2002
State Water Board Approval Date:	July 16, 2003
Office of Administrative Law Approval Date:	September 11, 2003
US EPA Approval Date:	November 3, 2003

(3) TMDL Effective Date: September 11, 2003

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final diazinon TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must be in compliance with the final TMDL compliance requirements as of December 31, 2010.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations:

Table 1.1
Final Receiving Water Limitations Expressed as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Diazinon	Acute	0.08 µg/L	1 hour
	Chronic	0.05 µg/L	4 days

(b) Final Effluent Limitations

Discharges from the MS4s containing concentrations that do not exceed the following effluent limitations will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 1.b.(2)(a):

Table 1.2
Final Effluent Limitations Expressed as Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation	Averaging Period
Diazinon	Acute	0.072 µg/L	1 hour
	Chronic	0.045 µg/L	4 days

(c) Best Management Practices

The following BMPs for Chollas Creek must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area and implemented by the Responsible Copermittees:

(i) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 1.b.(2)(a) and/or the effluent limitations under Specific Provision 1.b.(2)(b) for Chollas Creek.

(ii) The Responsible Copermittees must implement the Diazinon Toxicity Control Plan and Diazinon Public Outreach/Education Program as described in the report titled, *Technical Report for Total Maximum Daily Load for Diazinon in Chollas Creek Watershed, San Diego County*, dated August 14, 2002, including subsequent modifications, in order to achieve the receiving water limitations under Specific Provision 1.b.(2)(a) and/or the effluent limitations under Specific Provision 1.b.(2)(b).

(iii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 1.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 1.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 1.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 1.b.(2)(c) achieves compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 1.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 1.d, to demonstrate compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The Responsible Copermittees must be in compliance with the final diazinon TMDL compliance requirements as of December 31, 2010.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls for diazinon within the Chollas Creek watershed, and calculate or estimate the annual diazinon loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment

Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 1.b.(2)(b), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0019

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	September 22, 2005
Office of Administrative Law Approval Date:	December 2, 2005
US EPA Approval Date:	February 8, 2006

(3) TMDL Effective Date: December 2, 2005

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Shelter Island Yacht Basin

(6) Responsible Copermittee: City of San Diego

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final dissolved copper TMDL compliance requirements for Shelter Island Yacht Basin consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittee must be in compliance with the final TMDL compliance requirements as of December 2, 2005.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations:

Table 2.1
Final Receiving Water Limitations Expressed as Concentrations in Shelter Island Yacht Basin

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Dissolved Copper	Acute	4.8 µg/L x WER*	1 hour
	Chronic	3.1 µg/L x WER*	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 2.b.(3)(a):

Table 2.2
Final Effluent Limitations as Expressed as Annual Loads in MS4 Discharges to Shelter Island Yacht Basin

Constituent	Effluent Limitation
Dissolved Copper	30 kg/yr*

* If the water quality objectives for dissolved copper in Shelter Island Yacht Basin are changed in the future, then the margin of safety (MOS), TMDL and allocations will be recalculated using the *Method for Recalculation of the Total Maximum Daily Load for Dissolved Copper in the Shelter Island Yacht Basin, San Diego Bay* in the Basin Plan (p. 7-14).

(c) Best Management Practices

The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 2.b.(2)(a) and/or the effluent limitations under Specific Provision 2.b.(2)(b) for Shelter Island Yacht Basin. The BMPs must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 2.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 2.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittee develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 2.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 2.b.(2)(c) achieves compliance with Specific Provisions 2.b.(3)(a), 2.b.(3)(b) and/or 2.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 2.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 2.d, to demonstrate compliance with Specific Provisions 2.b.(3)(a), 2.b.(3)(b) and/or 2.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The Responsible Copermittees must be in compliance with the final dissolved copper TMDL compliance requirements as of December 2, 2005.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

The Responsible Copermittee must monitor the effluent of its MS4 outfalls for dissolved copper, and calculate or estimate the monthly and annual dissolved copper loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.(b)(2)of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0036

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	November 16, 2005
Office of Administrative Law Approval Date:	February 1, 2006
US EPA Approval Date:	March 22, 2006

(3) TMDL Effective Date: February 1, 2006

(4) Watershed Management Area: Santa Margarita River

(5) Water Body: Rainbow Creek

(6) Responsible Copermittee: County of San Diego

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final total nitrogen and total phosphorus TMDL compliance requirements for Rainbow Creek consist of the following

(1) Final TMDL Compliance Date

The Responsible Copermittee must comply with final TMDL compliance requirements by December 31, 2021.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance date under Specific Provision 3.b.(1):

Table 3.1
Final Receiving Water Limitations Expressed as Concentrations in Rainbow Creek

Constituent	Receiving Water Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing concentrations that do not exceed the following effluent limitations by the compliance date under Specific Provision 3.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 3.b.(2)(a):

Table 3.2
Final Effluent Limitations Expressed as Concentrations in MS4 Discharges to Rainbow Creek

Constituent	Effluent Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(ii) Annual pollutant loads from given land uses discharging to and from the MS4s that do not exceed the following annual loads by the compliance date under Specific Provision 3.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 3.b.(2)(a):

Table 3.3
Final Effluent Limitations Expressed as Annual Loads in MS4 Discharges to Rainbow Creek

Land Use	Total N	Total P
Commercial nurseries	116 kg/yr	3 kg/yr
Park	3 kg/yr	0.1 kg/yr
Residential areas	149 kg/yr	12 kg/yr
Urban areas	27 kg/yr	6 kg/yr

(c) Best Management Practices

(i) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 3.b.(2)(a) and/or the effluent limitations under Specific Provision 3.b.(2)(b) for Rainbow Creek.

(ii) The Responsible Copermittee should coordinate any BMPs implemented to address this TMDL with Caltrans and other sources as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under

Specific Provision 3.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 3.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the final effluent limitations under Specific Provision 3.b.(2)(b)(ii); OR

(e) The Responsible Copermittee develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 3.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Specific Provision 3.b.(2)(c) achieves compliance with Specific Provisions 3.b.(3)(a), 3.b.(3)(b), 3.b.(3)(c) and/or 3.b.(3)(d),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 3.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 3.d, to demonstrate compliance with Specific Provisions 3.b.(3)(a), 3.b.(3)(b), 3.b.(3)(c) and/or 3.b.(3)(d).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim total nitrogen and total phosphorus TMDL compliance requirements for Rainbow Creek consist of the following:

(1) Interim Compliance Dates and WQBELs

The Responsible Copermittee must comply with the interim WQBELs, expressed as annual loads, by December 31 of the interim compliance year given in Table 3.4.

Table 3.4
Interim Water Quality Based Effluent Limitations Expressed as Annual Loads in MS4 Discharges from Specific Land Uses to Rainbow Creek

	Total N Interim Effluent Limitations (kg/yr)			Total P Interim Effluent Limitations (kg/yr)		
	Interim Compliance Date			Interim Compliance Date		
Land Use	**2009**	**2013**	**2017**	**2009**	**2013**	**2017**
Commercial nurseries	390	299	196	20	16	10
Park	5	3	3	0.15	0.10	0.10
Residential areas	507	390	260	99	74	47
Urban areas	40	27	27	9	6	6

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 3.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 3.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the final effluent limitations under Specific Provision 3.b.(2)(b)(ii); OR

(e) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the interim effluent limitations under Specific Provision 3.c.(1); OR

(f) The Responsible Copermittee has submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

d. Specific Monitoring and Assessment Requirements

(1) The Responsible Copermittee must incorporate into the Water Quality Improvement Plan and implement the Sampling and Analysis Plan for Rainbow Creek Nutrient Reduction TMDL Implementation Water Quality Monitoring, dated January 2010.

(2) The results of any monitoring conducted during the reporting period, and assessment of whether the interim and final TMDL compliance requirements have been achieved must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 3.b.(2)(b)(i), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2007-0043

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2007
State Water Board Approval Date:	July 15, 2008
Office of Administrative Law Approval Date:	October 22, 2008
US EPA Approval Date:	December 18, 2008

(3) TMDL Effective Date: October 22, 2008

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final dissolved copper, lead, and zinc TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must comply with the final TMDL compliance requirements by October 22, 2028.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance date under Specific Provision 4.b.(1):

Table 4.1
Final Receiving Water Limitations Expressed as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$(0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$(0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$(0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$(0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations by the compliance date under Specific Provision 4.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 4.b.(2)(a):

Table 4.2
Final Effluent Limitations as Expressed Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(c) Best Management Practices

(i) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 4.b.(2)(a) and/or the effluent limitations under Specific Provision 4.b.(2)(b) for Chollas Creek.

(ii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans and the U.S. Navy as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 4.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 4.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 4.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 4.b.(2)(c) achieves compliance with Specific Provisions 4.b.(3)(a), 4.b.(3)(b) and/or 4.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 4.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 4.d, to demonstrate compliance with Specific Provisions 4.b.(3)(a), 4.b.(3)(b) and/or 4.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim dissolved copper, lead, and zinc TMDL compliance requirements for Chollas Creek consist of the following:

(1) Interim Compliance Date and WQBELs

The Responsible Copermittee must comply with the interim WQBELs, expressed as concentrations, by the interim compliance date given in Table 4.3:

Table 4.3
Interim Water Quality Based Effluent Limitations Expressed as Concentrations in MS4 Discharges to Chollas Creek

Interim Compliance Date	Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
October 22, 2018	Dissolved Copper	Acute	1.2 x 90% x (0.96) x $e^{[0.9422 \times \ln(\text{hardness}) - 1.700]}$ x WER*	1 hour
		Chronic	1.2 x 90% x (0.96) x $e^{[0.8545 \times \ln(\text{hardness}) - 1.702]}$ x WER*	4 days
	Dissolved Lead	Acute	1.2 x 90% x [1.46203 – 0.145712 x ln(hardness)] x $e^{[1.273 \times \ln(\text{hardness}) - 1.460]}$ x WER*	1 hour
		Chronic	1.2 x 90% x [1.46203 – 0.145712 x ln(hardness)] x $e^{[1.273 \times \ln(\text{hardness}) - 4.705]}$ x WER*	4 days
	Dissolved Zinc	Acute	1.2 x 90% x (0.978) x $e^{[0.8473 \times \ln(\text{hardness}) + 0.884]}$ x WER*	1 hour
		Chronic	1.2 x 90% x (0.986) x $e^{[0.8473 \times \ln(\text{hardness}) + 0.884]}$ x WER*	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 4.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 4.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) There are no exceedances of the interim effluent limitations under Specific

Provision 4.c.(1) at the Responsible Copermittee's MS4 outfalls; OR

(e) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance date.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*, when it is amended to include monitoring requirements for the Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls discharging to Chollas Creek for dissolved copper, lead, and zinc, and calculate or estimate the monthly and annual dissolved copper, lead, and zinc loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 4.b.(2)(b) or 4.c.(1), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2008-0027

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 11, 2008
State Water Board Approval Date:	June 16, 2009
Office of Administrative Law Approval Date:	September 15, 2009
US EPA Approval Date:	October 26, 2009

(3) TMDL Effective Date: September 15, 2009

(4) Watershed Management Areas: See Table 5.0

(5) Water Bodies: See Table 5.0

(6) Responsible Copermittees: See Table 5.0

Table 5.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County	Dana Point Harbor	Baby Beach	-City of Dana Point -County of Orange
San Diego Bay	San Diego Bay	Shelter Island Shoreline Park	- San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final indicator bacteria TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Final TMDL Compliance Dates

(a) Baby Beach in Dana Point Harbor

The Responsible Copermittees for MS4 discharges to Baby Beach must be in compliance with the final TMDL compliance requirements according to the following compliance dates:

Table 5.1
Compliance Dates to Achieve Final TMDL Compliance Requirements For Baby Beach in Dana Point Harbor

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform	September 15, 2014	September 15, 2009
Fecal Coliform		September 15, 2009
Enterococcus		September 15, 2019

(b) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park must be in compliance with the final TMDL compliance requirements as of December 31, 2012.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance dates under Specific Provision 5.b.(1):

Table 5.2
Final Receiving Water Limitations Expressed as Bacteria Densities in the Water Body

	Receiving Water Limitations	
Constituent	Single Sample Maximum[1,2]	30-Day Geometric Mean[2]
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing indicator bacteria densities that do not exceed the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.3a
Final Effluent Limitations as Expressed as Bacteria Densities in MS4 Discharges to the Water Body

	Effluent Limitations	
Constituent	**Single Sample Maximum[1,2]**	**30-Day Geometric Mean[2]**
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.

(ii) Discharges from the MS4s containing indicator bacteria loads that do not exceed the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.4a
Final Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to the Baby Beach in Dana Point Harbor

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0.86×10^9 MPN/day	$3{,}254 \times 10^9$ MPN/30days
Fecal Coliform	0.17×10^9 MPN/day	112×10^9 MPN/30days
Enterococcus	0.03×10^9 MPN/day	114×10^9 MPN/30days

Table 5.4b
Final Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to the Shelter Island Shoreline Park in San Diego Bay

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0 MPN/day	198×10^9 MPN/30days
Fecal Coliform	0 MPN/day	8×10^9 MPN/30days
Enterococcus	0 MPN/day	26×10^9 MPN/30days

(iii) Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.5a
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to Baby Beach in Dana Point Harbor*

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	90.4%	0%
Fecal Coliform	82.7%	0%
Enterococcus	96.2%	62.2%

Notes:
* The percent load reductions are relative to data collected between 1996-2002. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittees' MS4s must not exceed the loads in Table 5.4a, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the water body.

Table 5.5b
*Final Effluent Limitations Expressed as Percent Load Reductions** in MS4 Discharges to Shelter Island Shoreline Park in San Diego Bay*

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0%	0%
Fecal Coliform	0%	0%
Enterococcus	0%	0%

Notes:
* The percent load reductions are relative to data collected between 1999-2004. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittee's MS4s must not exceed the loads in Table 5.4b, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the water body.

(c) Best Management Practices

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 5.0 must incorporate the Bacteria Load Reduction Plan (BLRP) required to be developed pursuant to Resolution No. R9-2008-0027.

(ii) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 5.b.(2)(a) and/or the effluent limitations under Specific Provision 5.b.(2)(b) for the segments or areas of the water bodies listed in Table 5.0

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.b.(2)(b)(ii); OR

(e) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 5.b.(2)(b)(iii); OR

(f) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(g) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 5.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 5.b.(2)(c) achieves compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 5.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 5.d, to demonstrate compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim indicator bacteria TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Baby Beach in Dana Point Harbor

(a) Interim TMDL Compliance Dates and WQBELs

The Responsible Copermittees for MS4 discharges to Baby Beach must comply with the following interim WQBELs by the interim compliance dates given in Tables 5.6a and/or 5.6b:

Table 5.6a
Interim Water Quality Based Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to Baby Beach in Dana Point Harbor

Constituent	Interim Compliance Dates	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	4.93×10^9 MPN/day	$3{,}254 \times 10^9$ MPN/30days*
Fecal Coliform	September 15, 2012	0.59×10^9 MPN/day	112×10^9 MPN/30days*
Enterococcus	September 15, 2012	0.42×10^9 MPN/day	301×10^9 MPN/30days
	September 15, 2016	0.03×10^9 MPN/day *	207×10^9 MPN/30days

Notes:
* Same as the final effluent limitations in Table 5.4a.

Table 5.6b
Interim Water Quality Based Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to Baby Beach in Dana Point Harbor*

Constituent	Interim Compliance Dates	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	45.2%	0%**
Fecal Coliform	September 15, 2012	41.4%	0%**
Enterococcus	September 15, 2012	48.1%	0%
	September 15, 2016	96.2%**	31.1%

Notes:
* The percent load reductions are relative to data collected between 1996-2002. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittees' MS4s must not exceed the loads in Table 5.6a, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the waterbody.
** Same as the final effluent limitations in Table 5.5a.

(b) Interim Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(i) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(ii) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(iii) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(iv) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.b(2)(b)(ii); OR

(v) The Responsible Copermittees can demonstrate that exceedances of the applicable receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(vi) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the interim effluent limitations under Table 5.6a of Specific Provision 5.c.(1)(a); OR

(vii) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the interim effluent limitations under Table 5.6b of Specific Provision 5.c.(1)(a); OR

(viii) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

(2) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park must be in compliance with the final indicator bacteria TMDL requirements as of December 31, 2012.

d. Specific Monitoring and Assessment Requirements

(1) Monitoring Stations

Monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[33] If discharges of bacteria from the MS4 exceed the applicable interim or final WQBELs, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(2) Monitoring Procedures

(a) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) The Responsible Copermittees must collect wet weather monitoring samples within the first 24 hours of a storm event[34] of the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(c) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

[33] Commonly referred to as AB 411 monitoring
[34] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs have been achieved.

(b) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 5.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(c) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to correlate elevated bacteria levels with known or suspected sewage spills from wastewater collection systems and treatment plants or boats.

(d) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2010-0001

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 10, 2010
State Water Board Approval Date:	December 14, 2010
Office of Administrative Law Approval Date:	April 4, 2011
US EPA Approval Date:	June 22, 2011

(3) TMDL Effective Date: April 4, 2011

(4) Watershed Management Areas: See Table 6.0

(5) Water Bodies: See Table 6.0

(6) Responsible Copermittees: See Table 6.0

Table 6.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	-City of Laguna Beach -County of Orange -Orange County Flood Control District
		at Heisler Park - North	
	Pacific Ocean Shoreline	at Main Laguna Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Woods -County of Orange -Orange County Flood Control District
		Laguna Beach at Ocean Avenue	
		Laguna Beach at Cleo Street	
		Arch Cove at Bluebird Canyon Road	
		Laguna Beach at Dumond Drive	
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Hills -City of Laguna Niguel -City of Laguna Woods -City of Lake Forest -City of Mission Viejo -County of Orange -Orange County Flood Control District
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	
	Aliso Creek Mouth	at mouth	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	-City of Dana Point -City of Laguna Beach -City of Laguna Niguel -County of Orange -Orange County Flood Control District
		Aliso Beach at Table Rock Drive	
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)	
		at Salt Creek (large outlet)	
		Salt Creek Beach at Salt Creek service road	
		Salt Creek Beach at Strand Road	
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	-City of Dana Point -City of Laguna Hills -City of Laguna Niguel -City of Mission Viejo -City of Rancho Santa Margarita -City of San Juan Capistrano -County of Orange -Orange County Flood Control District
	San Juan Creek	lower 1 mile	
	San Juan Creek Mouth	at mouth	
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	-City of Dana Point -City of San Clemente -County of Orange -Orange County Flood Control District
		Ole Hanson Beach Club Beach at Pico Drain	
		San Clemente City Beach at El Portal Street Stairs	
		San Clemente City Beach at Mariposa Street	
		San Clemente City Beach at Linda Lane	
		San Clemente City Beach at South Linda Lane	
		San Clemente City Beach at Lifeguard Headquarters	
		under San Clemente Municipal Pier	
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	
		San Clemente State Beach at Riviera Beach	
		Can Clemente State Beach at Cypress Shores	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	-City of Oceanside -City of Vista -County of San Diego
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	-City of Carlsbad -City of Encinitas -City of Escondido -City of San Marcos -County of San Diego
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	-City of Del Mar -City of Escondido -City of Poway -City of San Diego -City of Solana Beach -County of San Diego
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	-City of Del Mar -City of Poway -City of San Diego -County of San Diego
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	-City of San Diego
		La Jolla Shores Beach at Caminito del Oro	
		La Jolla Shores Beach at Vallecitos	
		La Jolla Shores Beach at Avenida de la Playa	
		at Casa Beach, Children's Pool	
		South Casa Beach at Coast Boulevard	
		Whispering Sands Beach at Ravina Street	
		Windansea Beach at Vista de la Playa	
		Windansea Beach at Bonair Street	
		Windansea Beach at Playa del Norte	
		Windansea Beach at Palomar Avenue	
		at Tourmaline Surf Park	
		Pacific Beach at Grand Avenue	
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I- Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	-City of El Cajon -City of Santee -County of San Diego
	San Diego River	lower 6 miles	-City of El Cajon -City of La Mesa -City of San Diego -City of Santee -County of San Diego
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	-City of La Mesa -City of Lemon Grove -City of San Diego -County of San Diego - San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final indicator bacteria TMDL compliance requirements for the water bodies listed in Table 6.0 consist of the following:

(1) Final TMDL Compliance Dates

The Responsible Copermittees for MS4 discharges to the water bodies listed in Table 6.0 must be in compliance with the final TMDL compliance requirements according to the following compliance dates:

Table 6.1
Compliance Dates to Achieve Final TMDL Compliance Requirements

Constituent	Dry Weather TMDL Compliance Date	Wet Weather TMDL Compliance Date
Total Coliform	April 4, 2021	April 4, 2031
Fecal Coliform		
Enterococcus		

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance dates under Specific Provision 6.b.(1):

Table 6.2a
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Beaches

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform	10,000	22%	1,000	0%
Fecal Coliform	400	22%	200	0%
Enterococcus	104	22%	35	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan.

Table 6.2b
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Creeks

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Fecal Coliform	400	22%	200	0%
Enterococcus	61 (104)	22%	33	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Basin Plan.
d. A single sample maximum of 104 MPN/100ml for *Enterococcus* may be applied as a receiving water limitation for creeks, instead of 61 MPN/100mL, if one or more of the creeks addressed by these TMDLs (San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek, San Diego River, and/or Chollas Creek) is designated with a "moderately to lightly used area" or less frequent usage frequency in the Basin Plan. Otherwise, the single sample maximum of 61 MPN/100mL for *Enterococcus* must be used to assess compliance with the allowable exceedance frequency.

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing indicator bacteria densities that do not exceed the following effluent limitations by the compliance dates under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a):

Table 6.2c
Final Effluent Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies in MS4 Discharges to the Water Body

Constituent	Concentration-Based Effluent Limitations			
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform[d]	10,000	22%	1,000	0%
Fecal Coliform	400	22%	200	0%
Enterococcus	104[e] / 61[f]	22%	35[e] / 33[f]	0%

Notes:
a. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan for discharges to beaches, and the Basin Plan for discharges to creeks and creek mouths.
d. Total coliform effluent limitations only apply to MS4 outfalls that discharge to the Pacific Ocean Shorelines and creek mouths listed in Table 6.0.
e. This *Enterococcus* effluent limitation applies to MS4 discharges to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
f. This *Enterococcus* effluent limitation applies to MS4 discharges to segments or areas of creeks or creek mouths listed in Table 6.0.

(ii) Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the compliance dates under Specific Provision 6.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a):

Table 6.3
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	*Watershed and Water Bodies*	*Load-Based Effluent Limitations*					
		Dry Weather			*Wet Weather*		
		Total Coliform	*Fecal Coliform*	*Entero-coccus*	*Total Coliform*	*Fecal Coliform*	*Entero-coccus*
South Orange County	San Joaquin Hills HSA (901.11) and Laguna Hills HSA (901.12) - Pacific Ocean Shoreline	91.78%	91.72%	98.28%	46.85%	52.07%	51.26%
	Aliso HSA (901.13) - Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	95.47%	95.58%	99.13%	25.29%	26.62%	27.52% (27.37%)**
	Dana Point HSA (901.14) - Pacific Ocean Shoreline	95.04%	95.03%	98.98%	13.15%	14.86%	15.16%
	Lower San Juan HSA (901.27) - Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	72.96%	74.21%	94.94%	19.21%	12.82%	27.12% (26.90%)**
	San Clemente HA (901.30) - Pacific Ocean Shoreline	94.28%	94.23%	98.83%	23.85%	24.58%	25.26%
San Luis Rey River	San Luis Rey HU (903.00) - Pacific Ocean Shoreline	38.13%	39.09%	87.38%	5.62%	3.12%	11.69%

Table 6.3 (Cont'd)
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watershed and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
Carlsbad	San Marcos HA (904.50) - Pacific Ocean Shoreline	82.82%	82.55%	96.03%	18.47%	18.98%	20.19%
San Dieguito River	San Dieguito HU (905.00) - Pacific Ocean Shoreline	14.39%	20.72%	83.48%	4.29%	1.46%	7.72%
Penasquitos	Miramar Reservoir HA (906.10) - Pacific Ocean Shoreline	96.50%	96.59%	99.42%	1.61%	1.99%	1.93%
Mission Bay	Scripps HA (906.30) - Pacific Ocean Shoreline	96.44%	96.42%	99.25%	16.32%	21.14%	18.82%
	Tecolote HA (906.50) - Tecolote Creek	94.51%	94.59%	98.94%	16.51%	20.47%	18.15% (18.08%)**
San Diego River	Mission San Diego HSA (907.11) and Santee HSA (907.12) - Pacific Ocean Shoreline - Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles)	74.03%	69.44%	93.96%	38.14%	53.22%	42.74% (42.47%)**
San Diego Bay	Chollas HSA (908.22) - Chollas Creek	92.06%	92.15%	98.46%	17.82%	24.84%	21.46% (21.36%)**

Notes:
* The percent load reductions are based on reducing loads compared to pollutant loads from 2001 to 2002.
** The alternative *Enterococcus* percent load reduction was calculated based on a numeric target of 104 MPN/100mL instead of 61 MPN/100mL, protective of the REC-1 "moderately to lightly used area" usage frequency that is protective of freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative pollutant load reductions can be utilized.

(c) Best Management Practices

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 6.0 must incorporate the Comprehensive Load Reduction Plans (CLRPs) required to be developed pursuant to Resolution No. R9-2010-0001.

(ii) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 6.b.(2)(a) and/or the effluent limitations under Specific Provision 6.b.(2)(b) for the segments or areas of the water bodies listed in Table 6.0.

(iii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans, owners/operators of small MS4s, and agricultural dischargers as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(f) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 6.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 6.b.(2)(c) achieves compliance with Specific Provisions 6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), and/or 6.b.(3)(e),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 6.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 6.d, to demonstrate compliance with Specific Provisions 6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), 6.b.(3)(e) and/or 6.b.(3)(f).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim indicator bacteria TMDL compliance requirements for the water bodies listed in Table 6.0 consist of the following:

(1) Interim TMDL Compliance Dates

The Responsible Copermittees must achieve compliance with the interim TMDL compliance requirements, as determined in accordance with Specific Provision 6.c.(3), by the interim compliance dates given in Table 6.4, unless alternative interim compliance dates are accepted by the San Diego Water Board Executive Officer as part of the Water Quality Improvement Plan.

Table 6.4
Interim Compliance Dates to Achieve Interim TMDL Compliance Requirements

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	April 4, 2016	April 4, 2021
		at Heisler Park - North		
	Pacific Ocean Shoreline	at Main Laguna Beach	April 4, 2016	April 4, 2021
		Laguna Beach at Ocean Avenue		
		Laguna Beach at Cleo Street		
		Arch Cove at Bluebird Canyon Road		
		Laguna Beach at Dumond Drive		
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	April 4, 2016	April 4, 2021
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	April 4, 2018	April 4, 2021
	Aliso Creek Mouth	at mouth	April 4, 2018	April 4, 2021
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	April 4, 2016	April 4, 2021
		Aliso Beach at Table Rock Drive		
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)		
		at Salt Creek (large outlet)		
		Salt Creek Beach at Salt Creek service road	April 4, 2017	April 4, 2021
		Salt Creek Beach at Strand Road	April 4, 2017	April 4, 2021

Table 6.4 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	April 4, 2016	April 4, 2021
	San Juan Creek	lower 1 mile	April 4, 2018	April 4, 2021
	San Juan Creek Mouth	at mouth	April 4, 2016	April 4, 2021
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	April 4, 2016	April 4, 2021
		Ole Hanson Beach Club Beach at Pico Drain	April 4, 2016	April 4, 2021
		San Clemente City Beach at El Portal Street Stairs	April 4, 2017	April 4, 2021
		San Clemente City Beach at Mariposa Street		
		San Clemente City Beach at Linda Lane	April 4, 2016	April 4, 2021
		San Clemente City Beach at South Linda Lane	April 4, 2018	April 4, 2021
		San Clemente City Beach at Lifeguard Headquarters	April 4, 2017	April 4, 2021
		under San Clemente Municipal Pier		
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	April 4, 2018	April 4, 2021
		San Clemente State Beach at Riviera Beach	April 4, 2016	April 4, 2021
		Can Clemente State Beach at Cypress Shores	April 4, 2017	April 4, 2021
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	April 4, 2017	April 4, 2021
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	April 4, 2016	April 4, 2021
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	April 4, 2016	April 4, 2021

Table 6.4 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	April 4, 2016	April 4, 2021
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	April 4, 2016	April 4, 2021
		La Jolla Shores Beach at Caminito del Oro		
		La Jolla Shores Beach at Vallecitos		
		La Jolla Shores Beach at Avenida de la Playa		
		at Casa Beach, Children's Pool		
		South Casa Beach at Coast Boulevard		
		Whispering Sands Beach at Ravina Street		
		Windansea Beach at Vista de la Playa		
		Windansea Beach at Bonair Street		
		Windansea Beach at Playa del Norte		
		Windansea Beach at Palomar Avenue		
		at Tourmaline Surf Park		
		Pacific Beach at Grand Avenue		
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries		
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	April 4, 2018	April 4, 2021
	San Diego River	lower 6 miles		
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach		
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	April 4, 2018	April 4, 2021

(2) Interim Water Quality Based Effluent Limitations

The Responsible Copermittees for discharges to the water bodies in Table 6.0 must comply with the following interim WQBELs by the interim compliance dates given in Specific Provision 6.c.(1):

(a) Interim Receiving Water Limitations

(i) *Interim Dry Weather Receiving Water Limitations*

The Responsible Copermittee must calculate the "existing" exceedance frequencies of the 30-day geometric mean water quality objectives for each of the indicator bacteria by analyzing the available monitoring data collected between January 1, 1996 and December 31, 2002. "Existing" exceedance frequencies may be calculated by water body and/or by Watershed Management Area listed in Table 6.0. Separate "existing" exceedance frequencies must be calculated for beaches and creeks/creek mouths.

The Responsible Copermittees must achieve a 50 percent reduction in the "existing" exceedance frequency of the 30-day geometric mean WQBELs for the water bodies listed in Table 6.0 by the interim compliance dates given in Table 6.4. A 50 percent reduction in the "existing" exceedance frequency is equivalent to half of the "existing" exceedance frequency of the 30-day geometric mean WQBELs.

The "existing" exceedance frequencies and the interim dry weather allowable exceedance frequencies (i.e. interim dry weather receiving water limitations) calculated by the Responsible Copermittees must be included in the Water Quality Improvement Plans for the applicable Watershed Management Areas.

(ii) *Interim Wet Weather Receiving Water Limitations*

The Responsible Copermittees must achieve the interim wet weather receiving water limitations in Table 6.5, expressed as interim wet weather allowable exceedance frequencies, by the interim compliance dates given in Table 6.4.

Table 6.5
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	38%	37%	39%
		at Heisler Park - North			
	Pacific Ocean Shoreline	at Main Laguna Beach			
		Laguna Beach at Ocean Avenue			
		Laguna Beach at Cleo Street			
		Arch Cove at Bluebird Canyon Road			
		Laguna Beach at Dumond Drive			
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	41%	41%	42%
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	41%	41%	42%
	Aliso Creek Mouth	at mouth	41%	41%	42%
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	36%	36%	36%
		Aliso Beach at Table Rock Drive			
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)			
		at Salt Creek (large outlet)			
		Salt Creek Beach at Salt Creek service road			
		Salt Creek Beach at Strand Road			

Table 6.5 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	44%	44%	48%
	San Juan Creek	lower 1 mile	44%	44%	47%
	San Juan Creek Mouth	at mouth	44%	44%	47%
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	35%	35%	36%
		Ole Hanson Beach Club Beach at Pico Drain			
		San Clemente City Beach at El Portal Street Stairs			
		San Clemente City Beach at Mariposa Street			
		San Clemente City Beach at Linda Lane			
		San Clemente City Beach at South Linda Lane			
		San Clemente City Beach at Lifeguard Headquarters			
		under San Clemente Municipal Pier			
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)			
		San Clemente State Beach at Riviera Beach			
		Can Clemente State Beach at Cypress Shores			
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	45%	44%	47%
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	40%	40%	41%
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	33%	33%	36%

Table 6.5 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	26%	26%	26%
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	37%	37%	37%
		La Jolla Shores Beach at Caminito del Oro			
		La Jolla Shores Beach at Vallecitos			
		La Jolla Shores Beach at Avenida de la Playa			
		at Casa Beach, Children's Pool			
		South Casa Beach at Coast Boulevard			
		Whispering Sands Beach at Ravina Street			
		Windansea Beach at Vista de la Playa			
		Windansea Beach at Bonair Street			
		Windansea Beach at Playa del Norte			
		Windansea Beach at Palomar Avenue			
		at Tourmaline Surf Park			
		Pacific Beach at Grand Avenue			
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries	49%	49%	51%
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	46%	43%	49%
	San Diego River	lower 6 miles	46%	43%	49%
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	46%	43%	51%
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	41%	41%	43%

(b) Interim Effluent Limitations

Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the interim compliance dates under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.c.(2)(a):

Table 6.6
Interim Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	*Watersheds and Water Bodies*	*Load-Based Effluent Limitations*					
		Dry Weather			*Wet Weather*		
		Total Coliform	*Fecal Coliform*	*Entero-coccus*	*Total Coliform*	*Fecal Coliform*	*Entero-coccus*
South Orange County	San Joaquin Hills HSA (901.11) and Laguna Hills HSA (901.12) - Pacific Ocean Shoreline	45.89%	45.86%	49.14%	23.43%	26.04%	25.63%
	Aliso HSA (901.13) - Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	47.74%	47.79%	49.57%	12.65%	13.31%	13.76% (13.69%)**
	Dana Point HSA (901.14) - Pacific Ocean Shoreline	47.52%	47.52%	49.49%	6.58%	7.43%	7.58%
	Lower San Juan HSA (901.27) - Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	36.48%	37.11%	47.47%	9.61%	6.41%	13.56% (13.45%)**
	San Clemente HA (901.30) - Pacific Ocean Shoreline	47.14%	47.12%	49.42%	11.93%	12.29%	12.63%
San Luis Rey River	San Luis Rey HU (903.00) - Pacific Ocean Shoreline	19.07%	19.55%	43.69%	2.81%	1.56%	5.85%
Carlsbad	San Marcos HA (904.50) - Pacific Ocean Shoreline	41.41%	41.28%	48.02%	9.24%	9.49%	10.10%

Table 6.6 (Cont'd)
Interim Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watersheds and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
San Dieguito River	San Dieguito HU (905.00) - Pacific Ocean Shoreline	7.20%	10.36%	41.74%	2.15%	0.73%	3.86%
Penasquitos	Miramar Reservoir HA (906.10) - Pacific Ocean Shoreline	48.25%	48.30%	49.71%	0.81%	1.00%	0.97%
Mission Bay	Scripps HA (906.30) - Pacific Ocean Shoreline	48.22%	48.21%	49.63%	8.16%	10.57%	9.41%
	Tecolote HA (906.50) - Tecolote Creek	47.26%	47.30%	49.47%	8.26%	10.24%	9.08% (9.04%)**
San Diego River	Mission San Diego HSA (907.11) and Santee HSA (907.12) - Pacific Ocean Shoreline - Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles)	37.02%	34.72%	46.98%	19.07%	26.61%	21.37% (21.24%)**
San Diego Bay	Chollas HSA (908.22) - Chollas Creek	46.03%	46.08%	49.23%	8.91%	12.42%	10.73% (10.68%)**

Notes:
* The percent load reductions are based on reducing loads compared to pollutant loads from 2001 to 2002.
** The alternative *Enterococcus* percent load reduction was calculated based on a numeric target of 104 MPN/100mL instead of 61 MPN/100mL, protective of the REC-1 "moderately to lightly used area" usage frequency that is protective of freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative pollutant load reductions can be utilized.

(3) Interim TMDL Compliance Determination

Compliance with the interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(f) There are no exceedances of the interim receiving water limitations under Specific Provision 6.c.(2)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(g) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the interim effluent limitations under Specific Provision 6.c.(2)(b); OR

(h) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

d. Specific Monitoring and Assessment Requirements

(1) Monitoring and Assessment Requirements for Beaches

(a) Monitoring Stations

For beaches addressed by the TMDL, monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[35] If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source

[35] Commonly referred to as AB 411 monitoring

identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations at least once within the first 24 hours of the end of a storm event[36] during the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer in exceedance of the allowable exceedance frequencies in the receiving waters.

(iii) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(iv) For Pacific Ocean Shoreline segments or areas listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the dry weather and

[36] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

wet weather monitoring data to assess whether the interim and final WQBELs for the Pacific Ocean Shoreline segments or areas listed in Table 6.0 have been achieved.

(ii) Dry weather exceedance frequencies must be calculated as follows:

[a] 30-day geometric means must be calculated from the results of any dry weather samples collected from the segments or areas for each water body listed in Table 6.0;
[b] The method and number of samples need for calculating the 30-day geometric means must be consistent with the number of samples required by the Ocean Plan;
[c] Where there are multiple segments or areas associated with a water body listed in Table 6.0, the Copermittees may calculate geometric means for each segment or area, or combine the dry weather monitoring data from all the segments or areas to calculate geometric means for the water body;
[d] The exceedance frequency must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the dry season.

(iii) Wet weather exceedance frequencies must be calculated as follows:

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;
[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;
[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria densities reported from each storm event sampled; and
[d] The single sample maximum exceedance frequency must be calculated by dividing the number of wet weather days that exceed the single sample maximum receiving water limitations in Table 6.2 by the total number of wet weather days during the rainy season.
[e] The data collected for dry weather must be used in addition to the data collected for wet weather to calculate the wet weather 30-day geometric means. The exceedance frequency of the wet weather 30-day geometric means must be calculated by dividing the number of geometric means that exceed the geometric mean

receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the wet season.

(iv) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(v) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) Monitoring and Assessment Requirements for Creeks and Creek Mouths

(a) Monitoring Stations

For creeks addressed by the TMDL, monitoring locations should consist of, at a minimum, a location at or near the mouth of the creek (e.g. Mass Loading Station or Mass Emission Station) and one or more locations upstream of the mouth (e.g. Watershed Assessment Station). If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations in accordance with the requirements of Provision D.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations within the first 24 hours of the end of a storm event[37] during the rainy season (i.e. October 1 through April 30).

[37] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(iii) Samples collected from receiving water monitoring stations must be analyzed for fecal coliform and *Enterococcus* indicator bacteria.

(iv) For creeks or creek mouths listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the receiving water monitoring data to assess whether the interim and final receiving water WQBELs for the creeks and creek mouths listed in Table 6.0 have been achieved.

(ii) Dry weather exceedance frequencies must be calculated as follows:

[a] 30-day geometric means must be calculated from the results of any dry weather samples collected from the segment or area for each water body listed in Table 6.0;
[b] The method and number of samples need for calculating the 30-day geometric means must be consistent with the number of samples required by the Basin Plan;
[c] The exceedance frequency must be calculated by dividing the number of 30-day geometric means that exceed the 30-day geometric mean receiving water limitations in Table 6.2 by the total number of 30-day geometric means calculated from samples collected during the dry season.

(iii) Wet weather exceedance frequencies must be calculated as follows:

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;
[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;
[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria densities reported from each of the storm events sampled; and

[d] The exceedance frequency must be calculated by dividing the number of wet weather days that exceed the single sample maximum receiving water limitations in Table 6.2 by the total number of wet weather days during the rainy season.

[e] The data collected for dry weather must be used in addition to the data collected for wet weather to calculate the wet weather 30-day geometric means. The exceedance frequency of the wet weather 30-day geometric means must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the wet season.

(iv) The Responsible Copermittee must identify and incorporate additional MS4 outfall and receiving water monitoring stations and/or adjust monitoring frequencies to identify sources causing exceedances of the receiving water WQBELs.

(v) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(vi) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

7. Total Maximum Daily Loads for Sediment in Los Peñasquitos Lagoon

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2012-0033

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2012
State Water Board Approval Date:	January 21, 2014
Office of Administrative Law Approval Date:	July 14, 2014
US EPA Approval Date:	Month XX, Year

(3) TMDL Effective Date: July 14, 2014

(4) Watershed Management Area: Los Peñasquitos

(5) Water Body: Los Peñasquitos Lagoon

(6) Responsible Copermittees: County of San Diego, City of San Diego, City of Del Mar, and City of Poway

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final sediment TMDL compliance requirements for Los Peñasquitos Lagoon consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must be in compliance with the final TMDL compliance requirements by December 31, 2034.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not prohibit the sustainable restoration of tidal and non-tidal saltmarsh vegetation of at least 346 acres.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations by the compliance date under Provision 7.b(1) will not cause or contribute to a failure of the receiving water condition specified under Specific Provision 7.b.(2)(a):

Table 7.1
Final Effluent Limitations as Expressed as Annual Loads in MS4 Discharges to Los Peñasquitos Lagoon

Constituent	Effluent Limitation
Sediment	2,580 tons/yr

(c) Best Management Practices

(i) The Water Quality Improvement Plan for the Los Peñasquitos Watershed Management Area must incorporate the Sediment Load Reduction Plan required to be developed pursuant to Resolution No. R9-2012-0033.

(ii) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 7.b.(2)(a) and the effluent limitations under Specific Provision 7.b.(2)(b) for Los Peñasquitos Lagoon.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) Successful restoration of 346 total acres of tidal and non-tidal saltmarsh vegetation in Los Peñasquitos Lagoon; OR

(b) The Responsible Copermittees must develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 7.b.(2)(c)(ii) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 7.b.(2)(c)(ii) achieves compliance with Specific Provision 7.b.(3)(a),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees must continue to implement the BMPs required under Specific Provision 7.b.(2)(c)(ii), AND

(v) The Responsible Copermittees must continue to perform the specific monitoring and assessments specified in Specific Provision 7.d to demonstrate compliance with Specific Provision 2.b.(3)(a).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The Responsible Copermittees must comply with the interim WQBELs, expressed as annual loads, by December 31 of the interim compliance year set forth in Table 7.2.

Table 7.2
Interim Water Quality Based Effluent Limitations Expressed as Annual Loads in MS4 Discharges

Interim Compliance Date	Interim Effluent Limitations (tons/yr)	Associated Percentage of Reduction
December 31, 2019	6,691	20%
December 31, 2023	5,663	40%
December 31, 2027	4,636	60%
December 31, 2029	3,608	80%

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) Watershed Monitoring

The Responsible Copermittees must conduct suspended sediment, bed load, and flow monitoring to calculate total sediment loading to the Los Peñasquitos Lagoon for each wet season (October 1 thru April 30) as set forth below:

(a) The Responsible Copermittees must monitor enough storm events throughout the season to quantify sediment loading over each wet season, and

(b) The Responsible Copermittees must monitor at least 3 stations to quantify cumulative sediment loading into Los Peñasquitos Lagoon. Stations must be located within the Los Peñasquitos, Carroll Canyon, and Carmel Creek tributaries prior to discharging into Los Peñasquitos Lagoon.

(2) Lagoon Monitoring

The Responsible Copermittees must monitor Los Peñasquitos Lagoon each Fall for changes in the extent of the vegetation types as set forth below:

(a) The Responsible Copermittees must acquire aerial photos of Los Peñasquitos Lagoon and digitize them at an approximate scale of 1:2,500,

(b) The Responsible Copermittees must appropriately interpret the vegetation and classify the various types as saltmarsh, non-tidal saltmarsh, freshwater marsh, non-tidal saltmarsh –*Lolium perrene* infested, southern willow scrub/mulefat scrub, herbaceous wetland, or upland land cover.

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the monitoring data collected under Specific Provision 7.d(1) and 7.d(2) to assess whether the interim and final WQBELs have been achieved.

(b) For assessing and determining compliance with the final receiving water limitations under Specific Provision 7.b.(2)(a), the Responsible Copermittees must use the data acquired under Specific Provision 7.d.(2) to estimate the acreage of tidal and non-tidal saltmarsh actually restored.

(c) For assessing and determining compliance with the final effluent limitations under Specific Provision 7.b.(2)(b), the Responsible Copermittees must use the data acquired under Specific Provision 7.d.(1) to estimate sediment loading into Los Peñasquitos Lagoon. Sediment loading must be evaluated using a 3-year, weighted rolling average. The first reported average shall be calculated using data collected in the year 2014-2015, 2015-2016, and 2016-2017 wet seasons.

(d) The monitoring and assessment results must be submitted as part of the Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

ATTACHMENT F

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

FACT SHEET / TECHNICAL REPORT

FOR

ORDER NO. R9-2013-0001
As amended by Order No. R9-2015-0001
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

MAY 8, 2013
Amended on February 11, 2015

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I. FACT SHEET FORMAT

This Fact Sheet briefly sets forth the principal facts and the significant factual, legal, methodological, and policy questions that the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) considered in preparing Order No. R9-2013-0001 (Order) as amended by Order No. R9-2015-0001. In accordance with the Code of Federal Regulations (CFR) Title 40 Parts 124.8 and 124.56 (40 CFR 124.8 and 40 CFR 124.56), this Fact Sheet includes, but is not limited to, the following information:

1. Contact information
2. Public process and notification procedures
3. Background of municipal storm water permits
4. Regional MS4 Permit approach
5. Economic considerations
6. Applicable statutes, regulations, plans and policies
7. Discussion of the provisions in the Order

Tentative Order No. R9-2013-0001 was distributed for public review on October 31, 2012. The San Diego Water Board accepted written comments on the Tentative Order until January 11, 2013. A public hearing was subsequently held on April 10 and 11, 2013, that was continued to May 8, 2013 to receive oral comments from interested persons. The San Diego Water Board adopted Order No. R9-2013-0001 on May 8, 2013.

Order No. R9-2015-0001 an Order amending Order No. R9-2013-0001 was distributed for public review on September 19, 2014. Order No. R9-2015-0001 amended the findings and provisions of Order No. R9-2013-0001 to:

a. Enroll the County of Orange, the Orange County Flood Control District and the south Orange County Cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano as Copermittees responsible for compliance with the terms and conditions of Order No. R9-2013-0001, as amended by Order No. R9-2015-0001;

b. Designate the San Diego Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the Cities of Laguna Woods and Laguna Hills and the Santa Ana Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the City of Lake Forest, subject to the terms of the agreement between San Diego Water Board and the Santa Ana Water Board described in Finding 29 of this Order;

c. Establish interim exceptions to land development requirements for those priority development projects that discharge to engineered channels and large river reaches as described in Provision E.3.c(2)(e) of this Order;

d. Incorporate the amended requirements of the State Water Board's General Exception to require that pollutant reductions be achieved within 6 years for storm water and nonpoint source discharges to ASBS within the Region;

e. Incorporate applicable requirements of the Los Penasquitos Lagoon Sediment TMDL;

f. Require the Orange County Copermittees to implement the "*Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County*," dated September 2014 made effective in the Monitoring and Reporting Program/Order issued pursuant to California Water Code sections 13225, 13267, and 13383 and subject to future revisions by the Executive Officer after appropriate public input.

A public hearing was held on February 11, 2015 to receive oral comments from Copermittees and interested persons. The San Diego Water Board adopted Order No. R9-2015-0001 amending Order No. R9-2013-0001 on February 11, 2015.

The San Diego Water Board files applicable to the issuance of Order No. R9-2013-0001 and amendments thereto are incorporated into the administrative record in support of the findings and requirements of the Order.

II. CONTACT INFORMATION

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The Order and other related documents can be downloaded from the San Diego Water Board website at

http://www.swrcb.ca.gov/rwqcb9/water_issues/programs/stormwater/index.shtml
http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/oc_stormwater.shtml

The documents referenced in this Fact Sheet and in Order No. R9-2013-0001 are available for public review at the San Diego Water Board office, located at the address listed above. Public records are available for inspection during regular business hours, from 8:00 am to 5:00 pm Monday through Friday. To schedule an appointment to inspect public records, contact the San Diego Water Board Records Management Officer at 858-467-2952619-516-1990.

COPERMITTEES

Orange County Copermittees

- County of Orange
  - City of Aliso Viejo
  - City of Dana Point
  - City of Laguna Beach
  - City of Laguna Hills
  - City of Laguna Niguel
  - City of Laguna Woods
  - City of Lake Forest
  - City of Mission Viejo
  - City of Ranch Santa Margarita
  - City of San Clemente
  - City of San Juan Capistrano
  - Orange County Flood Control District

Riverside County Copermittees

- County of Riverside
  - City of Murrieta
  - City of Temecula
  - City of Wildomar
  - Riverside County Flood Control and Water Conservation District

San Diego County Copermittees

- County of San Diego
  - City of Carlsbad
  - City of Chula Vista
  - City of Coronado
  - City of Del Mar
  - City of El Cajon
  - City of Encinitas
  - City of Escondido
  - City of Imperial Beach
  - City of La Mesa
  - City of Lemon Grove
  - City of National City
  - City of Oceanside
  - City of Poway
  - City of San Diego
  - City of San Marcos
  - City of Santee
  - City of Solana Beach
  - City of Vista
  - San Diego County Regional Airport Authority
  - San Diego Unified Port District

III. PUBLIC PROCESS AND NOTIFICATION PROCEDURES

The San Diego Water Board followed the schedule listed below for the preparation of Order No. R9-2013-0001:

San Diego County Copermittee Permit Reissuance Process

1. On February 8, 2011, the San Diego Water Board met with the San Diego County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No. R9-2007-0001.

2. Between February and May 2011, the San Diego Water Board met with select San Diego County, Orange County, and Riverside County Copermittees, as well as representatives of the environmental community to discuss concepts and receive recommendations for elements to be incorporated in a Regional Municipal Separate Storm Sewer System Permit (Regional MS4 Permit).

3. On June 27, 2011 the San Diego Water Board received the Report of Waste Discharge from the San Diego County Copermittees for the renewal of their NPDES permit, Order No. R9-2007-0001.

4. On April 9, 2012, the San Diego Water Board released an administrative draft of Tentative Order No. R9-2013-0001 for preliminary informal comments and feedback.

5. On April 25, 2012, the San Diego Water Board held an informal public workshop to present the administrative draft of Tentative Order No. R9-2013-0001 and receive verbal comments.

6. Between June and August 2012, the San Diego Water Board held four (4) focused meetings with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community, and USEPA) to discuss and receive preliminary comments and feedback about specific elements in the administrative draft of Tentative Order No. R9-2013-0001.

7. On September 5, 2012, the San Diego Water Board held an informal public workshop to present the modifications that were expected to be incorporated into the Tentative Order based on the preliminary comments and feedback received during the focused meetings held between June and August 2012.

8. Informal written comments on the administrative draft of Tentative Order No. R9-2013-0001 were accepted until September 14, 2012.

9. On October 12, 2012, the San Diego Water Board released a revised administrative draft of Tentative Order No. R9-2013-0001.

10. On October 24, 2012, the San Diego Water Board held a focused meeting with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community, and USEPA) to discuss modifications incorporated into the administrative draft of Tentative Order No. R9-2013-0001.

11. On October 31, 2012, the San Diego Water Board released Tentative Order No. R9-2013-0001 for formal public review and comment.

12. On November 13, 2012 and December 12, 2012, the San Diego Water Board held a formal public Board workshop to present the public draft of Tentative Order No. R9-2013-0001 and receive verbal comments.

13. Formal written comments on the public draft of Tentative Order No. R9-2013-0001 were accepted until January 11, 2013.

14. A public hearing of Tentative Order No. R9-2013-0001 was conducted on April 10 and 11, 2013, that was continued to May 8, 2013.

Orange County Copermittee Permit Reissuance Process

15. On May 20, 2014 the San Diego Water Board received the Report of Waste Discharge from the Orange County Copermittees for the renewal of their MS4 NPDES permit, Order No. R9-2009-0002.

16. On June 24, 2014, the San Diego Water Board met with the Orange County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No.R9-2009-0002 and the process for enrollment as Copermittees under Regional MS4 Permit Order No. R9-2013-0001.

17. On July 1, 2014, the San Diego Water Board held a public meeting to discuss the Orange County Report of Waste Discharge (RoWD) and receive comments on potential modifications to Order No. R9-2013-0001. Based on comments received from the Orange County Copermittees and other interested persons at this meeting, the San Diego Water Board determined that additional public meetings were not needed prior to release of Tentative Order No. R9-2015-0001, amending Order No. R9-2013-0001 in redlined – strikeout format for public review and comment.

18. On September 19, 2014, the San Diego Water Board released Tentative Order No. R9-2015-0001 for a 60 day public review and comment period.

19. On October 8, 2014, the San Diego Water Board held a formal public workshop at a regular board meeting to receive information and discuss the proposed amendments to Order No. R9-2013-0001 described in Tentative Order No. R9-2015-0001.

20. In accordance with State and federal laws and regulations, the San Diego Water Board notified San Diego County, Orange County and Riverside County Copermittees, and all known interested agencies and persons of its intent to adopt Tentative Order No. R9-2015-0001 and provided them with an opportunity to submit their written comments and recommendations. Written comments and recommendations on Tentative Order No. R9-2015-0001 were accepted until November 19, 2014.

21. The San Diego Water Board held a public hearing on February 11, 2015 and heard and considered all comments pertaining to the adoption of Tentative Order No. R9-2015-0001 on February 11, 2015.

IV. BACKGROUND OF THE SAN DIEGO REGION MUNICIPAL STORM WATER PERMITS

In developed and developing areas, storm water runoff is commonly transported through municipal separate storm sewer systems (MS4s) and discharged into local receiving water bodies. As the storm water runs off and flows over the land or impervious surfaces (e.g., paved streets, parking lots, and building rooftops), it accumulates debris, chemicals, sediment, and other pollutants that can adversely affect receiving water quality if discharged untreated. The United States Environmental Protection Agency (USEPA) recognizes wet weather flows from urban areas as the number one source of estuarine pollution in coastal communities,[1] such as those within the San Diego Region.

The federal Clean Water Act (CWA) was amended in 1987 to address and regulate discharges of storm water associated with industrial activities and from municipal storm sewers. With the amendments, many municipalities throughout the United States were obligated for the first time to obtain National Pollutant Discharge Elimination System (NPDES) permits for discharges of storm water from their MS4s.

In response to the CWA 1987 amendment, as well as the pending federal NPDES regulations which would implement the amendment, the San Diego Water Board issued "early" MS4 permits. The San Diego Water Board adopted and issued Order Nos. 90-38, 90-42, and 90-46 to regulate storm water discharges from the MS4s in Orange County, San Diego County, and Riverside County, respectively, within the San Diego Region on July 16, 1990.

The "early" MS4 permits, or First Term Permits, were issued prior to the November 1990 promulgation of the final federal NPDES storm water regulations. By issuing these First Term Permits before the federal regulations took effect, the San Diego Water Board was able to provide the Copermittees additional flexibility in addressing and managing storm water discharges. The First Term Permits contained the essentials of the 1990 regulations, and required the Copermittees to develop and implement runoff management programs, but provided little specificity about what was required to be included in or actually achieved by those programs.

The flexibility provided in the First Term Permits was generally continued through the Second Term Permits. The combination of the lack of specificity in the First and Second Term Permits, a general lack of meaningful action by the Copermittees and a general lack of corresponding reaction (i.e. enforcement) by the San Diego Water Board during the first ten years of the storm water program, resulted in few substantive steps

[1] US EPA. 1999. 40 CFR Parts 9, 122, 123, and 124. National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. 64 FR 68727.

towards achieving improvements in the quality of receiving waters or storm water discharges from the MS4s.

From 2001, the regulatory approach incorporated into Third Term Permits was a significant departure from the regulatory approach of the First and Second Term Permits. The Third Term Permits issued by the San Diego Water Board included more detailed requirements that outlined the minimum level of implementation required for the Copermittees' programs to meet the maximum extent practicable (MEP) standard for storm water. The Third Term Permits included more detail to emphasize and enhance the jurisdictional runoff management programs developed by the Copermittees and introduced requirements for developing and implementing watershed-based programs.

The Third Term Permits also incorporated two precedent setting decisions by the State Water Board. In Order WQ 99-05, the State Water Board established receiving water limitation language to be included in all MS4 permits. The State Water Board's precedential language clarified that municipal storm water permits must include provisions requiring discharges to be controlled to attain water quality standards in receiving waters. Unlike previously adopted versions of the receiving water limitation language in the First and Second Term Permits, the language no longer stated that "*violations of water quality standards are not violations of the municipal storm water permit under certain conditions*." In addition, the receiving water limitation language no longer indicated that the "*implementation of best management practices is the 'functional equivalent' of meeting water quality standards*." State Water Board Order WQ 99-05 specifically requires language in MS4 permits for the Copermittees to comply with water quality standards based discharge prohibitions and receiving water limitations through timely implementation of control measures and other actions to reduce pollutants in discharges. (See State Water Board Order WQ 99-05 (*Environmental Health Coalition*)).

In Order WQ 2000-11, also a precedential decision, the State Water Board addressed design standards for structural post-construction best management practices (BMPs) for new development and significant redevelopment. The State Water Board found that the design standards, which require that runoff generated by 85 percent of storm events from specific development categories be infiltrated or treated, reflect the MEP standard. State Water Board Order WQ 2000-11 also found that the post-construction BMP provisions, or Standard Storm Water Mitigation Plan (SSMP) provisions, constitute MEP for addressing storm water pollutant discharges resulting from specific development categories.

The Third Term San Diego County and Orange County Permits (Order Nos. 2001-01 and R9-2002-0001, respectively) were appealed to the State Water Board. Minor modifications were made by the State Water Board, but the requirements were largely upheld. In State Water Board Order WQ 2001-15, the State Water Board upheld the Third Term San Diego County Permit requirements with certain modifications. The State Water Board removed the prohibition of storm water discharges *into* the MS4 that cause or contribute to exceedances of water quality objectives. The revision allows for

treatment of pollutants in storm water runoff after the pollutants have entered the MS4. State Water Board Order WQ 2001-15 otherwise upheld all the other requirements of the permit.

In addition to the modification to the discharge prohibition in Order WQ 2001-15, the State Water Board refined Order WQ 99-05 by making clear that the Copermittees may use an iterative approach to achieving compliance with water quality standards that involves ongoing assessments and revisions. Thus, the language for the discharge prohibitions and receiving water limitations was revised to explicitly require the Copermittees to implement an iterative process of assessments and revisions to comply with the discharge prohibitions and receiving water limitations. The San Diego Water Board retained the authority to enforce receiving water limitations and discharge prohibitions even if the Copermittee is engaged in the iterative process.

The Third Term San Diego County Permit was subsequently challenged in the Superior Court of the State of California and the Court of Appeal, Fourth Appellate District. The Court of Appeal, Fourth Appellate District, found that the approach of the Third Term San Diego County Permit to regulating discharges into the MS4 was appropriate (*Building Industry Ass'n. v. State Water Resources Control Bd., et al.,* 124 Cal.App.4th 866 (2004)). The State of California Supreme Court denied review sought by the Building Industry Association in March 2005.

The Fourth Term Permits, or current MS4 permits, began with the adoption of Order No. R9-2007-0001 issued to the Copermittees of San Diego County in January 2007. Order Nos. R9-2009-0002 and R9-2010-0016 were subsequently issued to the Copermittees of Orange County and Riverside County. The Fourth Term Permits continued to include more detailed requirements to be implemented by each Copermittee's jurisdictional runoff management program. The Fourth Term Permits also include requirements to further emphasize a watershed management approach and for more coordination among jurisdictional runoff management programs. In addition, the Fourth Term Permits included more requirements for assessing the effectiveness of the runoff management programs being implemented by the Copermittees. The intent of the inclusion of additional requirements was to enhance and better define elements of the permit that were expected to be incorporated into the iterative process for managing runoff from each Copermittee's jurisdiction and within the watersheds of the San Diego Region.

The Fourth Term Permits include several new and emerging approaches for managing storm water runoff and discharges. Low impact development (LID) requirements are included for development and significant redevelopment to reduce pollutants in storm water runoff from sites through more natural processes such as infiltration and biofiltration closer to the source, rather than utilizing conventional mechanical end-of-pipe treatment systems. Hydrograph modification (hydromodification) management requirements also are included to mitigate the potential for increased erosion in receiving waters due to increased runoff rates and durations often caused by development and increased impervious surfaces. The Fourth Term Orange County and

Riverside County Permits introduced requirements to identify areas of existing development where retrofitting with LID projects would be feasible and could be implemented to reduce storm water runoff and pollutants in storm water discharges.

The Fourth Term Orange County and Riverside County Permits included a clearer distinction between storm water and non-storm water discharges. The term "urban runoff" was completely removed, and a distinction between storm water (wet weather) runoff and non-storm water (dry weather) runoff was emphasized. This clarification was made to prevent any potential misunderstanding that regulation under the MS4 permits is limited only to urbanized areas, and to prevent non-storm water runoff from being managed in the same manner as storm water runoff. The term "urban runoff" is not defined in the Code of Federal Regulations (CFR) or Federal Register (FR) in the regulation of MS4 discharges. According to the CWA 402(p)(3)(B)(ii), MS4 permits must include a requirement to effectively prohibit non-storm water discharges into the MS4s.

Finally, for the Fourth Term Orange County and Riverside County Permits the San Diego Water Board found that non-storm water discharges to the MS4 from over application of irrigation water are sources of pollutants. The San Diego Water Board found that non-storm water discharges resulting from over-irrigation must be prohibited from entering the MS4 in accordance with the requirements of the CWA and pursuant to 40 CFR 122.26(d)(2)(iv)(B)(1).

The requirements of the Fourth Term Permits issued to the Copermittees in each county within the San Diego Region now have substantively the same core requirements such as discharge prohibitions, receiving water limitations, jurisdictional runoff management program components, and monitoring program requirements. There are, however, several inconsistencies that exist among the three Fourth Term Permits which complicate oversight and implementation of the permits by the San Diego Water Board.

The Fourth Term San Diego County Permit expired in January 2012. The Fourth Term Orange County permit ~~and Riverside County Permits will~~ expired in December 2014 and the Fourth Term Riverside County Permit will expire in November 2015. ~~, respectively.~~ Issuing the Fifth Term Permits within five years for three counties under three different permits would require the San Diego Water Board to expend significant time and resources for the issuance of the permits through three separate public proceedings, thereby greatly reducing the time and resources available to oversee implementation and compliance. Multiple permits also create confusion for determining compliance among regulated entities, especially for the land development community.

The San Diego Water Board has acknowledged that issuing a single MS4 permit for all the Copermittees in the San Diego Region can and is expected to result in more consistent implementation, improve communication among agencies within watersheds crossing multiple jurisdictions, and minimize resources spent with each permit renewal process. Within the findings of the Fourth Term Riverside County Permit issued in

November 2010, the San Diego Water Board notified the public of its intent to develop and issue a single Regional MS4 Permit.

V. REGIONAL MS4 PERMIT APPROACH

The Fifth Term Permit, or Regional MS4 Permit, shifts the focus of the permit requirements from a minimum level of actions to be implemented by the Copermittees to identifying outcomes to be achieved by those actions. Order No. R9-2013-0001 represents an important paradigm shift in the approach for MS4 permits within the San Diego Region.

Historical Permitting Approach

The First and Second Term Permits were very broad and provided little specificity about what was required to be developed and implemented by the Copermittees. The Third Term Permits began to become more specific about the minimum level of implementation required by the Copermittees. The Fourth Term Permits, or current permits, subsequently increased in specificity. The MS4 permits have progressively become more detailed and focused on specifying the minimum level of actions expected to be implemented by the Copermittees. As detailed and specific as the MS4 permits have become, however, they include very little detail about what the desired outcomes of the required actions are expected to achieve. Compliance with the permit requirements has essentially been tracking numbers of actions and reporting, not tracking progress or actual improvements in the quality of receiving waters or discharges from the MS4s. The result has been an increase in actions being implemented by the Copermittees with little or no ability or expectations to determine whether or not improvements in water quality are being achieved.

The Fourth Term Permits result in significant resource expenditure by the Copermittees to report permit compliance information to the San Diego Water Board in the form of annual jurisdictional runoff management program, watershed program, and monitoring program reports. The San Diego Water Board must then expend much of its limited resources on reviewing more than 50 voluminous reports submitted annually by the Copermittees. The information currently reported by the Copermittees is of limited value when trying to measure progress toward achieving improvements in the quality of receiving waters or discharges from the MS4s. Oversight of the MS4 permits is further complicated by the inconsistencies among the requirements issued to the Orange County, San Diego County, and Riverside County Copermittees under three separate MS4 permits.

Under the Fourth Term Permits, the Copermittees must expend a significant portion of their limited resources collecting data of limited value, and putting together reports to submit that information to the San Diego Water Board. Likewise, the San Diego Water Board must expend most of its limited resources reviewing reports, and developing permits instead of working directly with the Copermittees to identify solutions to problems causing impacts to water quality. This is an unsustainable course that will continue to demand more resources from the Copermittees and the San Diego Water Board, and would continue to result in unknown water quality benefits.

New Permitting Approach

The goal of the Regional MS4 Permit is twofold: 1) bring a consistent set of MS4 permit requirements to all of the Copermittees within the San Diego Region; and, 2) provide an MS4 permit with requirements that will allow the Copermittees to focus their efforts and resources on achieving goals and desired outcomes toward the improvement of water quality rather than completing specific actions.

The overall approach included in the Regional MS4 Permit with respect to the jurisdictional runoff management programs will not differ significantly from the current permits. The general requirements for the jurisdictional runoff management program components and compliance with those requirements will remain and be applied consistently throughout the San Diego Region under the Regional MS4 Permit.

The most significant difference in the new permitting approach is the specific manner of implementation for those jurisdictional runoff management programs. Implementation will be based on decisions made by the Copermittees in accordance with what they have identified as their highest priority water quality conditions. In other words, the Copermittees will have significant control in how to implement the jurisdictional runoff management programs to best utilize their available resources in addressing a specific set of priorities effectively, instead of trying to address all the water quality priorities ineffectively.

The Copermittees are given the responsibility of identifying their highest priority water quality conditions that they intend to address. The Copermittees will develop goals that can be used to measure and demonstrate progress or improvements toward addressing those priorities. In addition to the goals, the Copermittees will provide a schedule for achieving the goals for those highest priorities. The measurement of progress toward achieving the goals for those highest priorities requires a better defined and more focused program of monitoring and assessment than under the Fourth Term Permits.

The monitoring and assessment program must be designed to inform the Copermittees of their progress, and the need for modifications in their jurisdictional runoff management programs and schedules to achieve their goals to improve water quality. The monitoring and assessment program requirements will have a more central role in the Regional MS4 Permit than in earlier permits. The monitoring and assessment requirements must also be designed to enable the Copermittees to focus and direct their efforts in implementing their jurisdictional runoff management programs toward their stated desired outcomes to improve the quality of receiving waters and/or discharges from the MS4s.

By providing an MS4 permit that allows the Copermittees to make more decisions about how to utilize and focus their resources, along with a better defined monitoring and assessment program to inform their water quality management decisions, the Copermittees will have the opportunity to:

1) *Plan strategically*. The Copermittees must have the ability to identify their available resources and develop and implement long term plans that can organize, collect, and use those resources in the most strategically advantageous and efficient manner possible. This ability to develop long term plans will allow the Copermittees to focus and utilize their resources in a more concerted way over the short term and long term to address specific water quality priorities through stated desired outcomes.

2) *Manage adaptively*. The Copermittees must be given the ability to modify their plans as additional information and data are collected from the monitoring and assessment programs. The Copermittees' plans may require modifications to the programs, priorities, goals, strategies, and/or schedules in order for the Copermittees to achieve a stated desired outcome.

3) *Identify synergies*. The Copermittees must be given more flexibility to identify efficiencies within and among their jurisdictional runoff management programs as the strategies are developed and implemented to increase the Copermittees' collective effectiveness. The Copermittees must also be able to identify and utilize resources available from other agencies and entities to further augment and enhance their jurisdictional runoff management programs and/or to collectively work with those other agencies and entities toward achieving a stated desired outcome.

The Regional MS4 Permit requirements will provide the Copermittees the flexibility and responsibility to decide what actions will be necessary to achieve an outcome that is tailored and designed by the Copermittees to improve specific prioritized water quality conditions. The San Diego Water Board expects the approach of the Regional MS4 Permit to give the Copermittees a greater sense of ownership for restoring the quality of receiving waters in the San Diego Region by becoming an integral part of the decision making process in identifying water quality conditions to be addressed, as well as determining the best use of their resources.

VI. ECONOMIC CONSIDERATIONS

Statutory Considerations

California Water Code (CWC) section 13241 requires the San Diego Water Board to consider certain factors, including economic considerations, in the adoption of water quality objectives. CWC section 13263 requires the San Diego Water Board to take into consideration the provisions of CWC section 13241 in adopting waste discharge requirements.

In *City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, the California Supreme Court considered whether Regional Water Boards must comply with CWC section 13241 when issuing waste discharge requirements under CWC section 13263(a) by taking into account the costs a permittee will incur in complying with the permit requirements. The Court concluded that whether it is necessary to consider such cost information "*depends on whether those restrictions meet or exceed the requirements of the federal Clean Water Act.*" (*Id.* at p. 627.) The Court ruled that Regional Water Boards may not consider the factors in CWC section 13241, including economics, to justify imposing pollutant restrictions that are less stringent than applicable federal law requires. (*Id.* At pp. 618, 626-627 ["*[Water Code section 13377 specifies that [] discharge permits issued by California's regional boards must meet the federal standards set by federal law. In effect, section 13377 forbids a regional board's consideration of any economic hardship on the part of the permit holder if doing so would result in the dilution of the requirements set by Congress in the Clean Water Act...Because CWC section 13263 cannot authorize what federal law forbids, it cannot authorize a regional board, when issuing a [] discharge permit, to use compliance costs to justify pollutant restrictions that do not comply with federal clean water standards*."]). However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Regional Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

As discussed in Section VII.F, Unfunded State Mandates, the San Diego Water Board finds that the requirements in this Order are not more stringent than the minimum federal requirements. Among other requirements, federal law requires MS4 permits to include requirements to effectively prohibit non-storm water discharges into the MS4s, in addition to requiring controls to reduce the discharge of pollutants in storm water to the MEP, and other provisions as USEPA or the State determines are appropriate for the control of pollutants in MS4 discharges.

The requirements in this Order may be more specific or detailed than those enumerated in federal regulations under 40 CFR 122.26 or in the USEPA guidance. However, the requirements have been designed to be consistent with and within the federal statutory mandates described in CWA section 402(p)(3)(B)(ii) and (iii) and the related federal regulations and guidance. Consistent with federal law, all of the

conditions in this Order could have been included in a permit adopted by USEPA in the absence of the in lieu authority of California to issue NPDES permits.

Moreover, the inclusion of numeric WQBELs in this Order does not cause this Order to be more stringent than federal law. Federal law authorizes both narrative and numeric effluent limitations to meet state water quality standards. The inclusion of WQBELs as discharge specifications in an NPDES permit in order to achieve compliance with water quality standards is not a more stringent requirement than the inclusion of BMP based permit limitations to achieve water quality standards (State Water Board Order No. WQ 2006-0012 (*Boeing*)). Therefore, consideration of the factors set forth in CWC section 13241 is not required for permit requirements to implement the effective prohibition on the discharge of non-storm water discharges into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determine appropriate to control such pollutants, as those requirements are mandated by federal law.

Included in the provisions of the Order are monitoring and reporting requirements that are designed to demonstrate that the Copermittees are implementing programs to comply with the CWA municipal storm water requirements. CWA section 308(a) and 40 CFR 122.41(h), (j)-(l), 122.44(i) and 122.48 require that all NPDES permits specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s (40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c)) also specify additional monitoring and reporting requirements. In addition to the federal requirements of the CWA, the San Diego Water Board also has the authority in CWC 13383 to establish monitoring, reporting, and recordkeeping requirements that implement federal and state laws and regulations through NPDES permits. .

The monitoring and assessment information that will be reported to the San Diego Water Board is necessary to determine if the Copermittees are making progress toward achieving compliance with the discharge prohibitions, receiving water limitations, and effluent limitations under Provision A of the Order. The monitoring and assessment information that will be reported is also expected to be key to the iterative approach and adaptive management process that is required to be implemented by the Copermittees if they cannot meet the discharge prohibitions and receiving water limitations under the present conditions, which is also part of the requirements under Provision A of the Order.

Notwithstanding the above, the San Diego Water Board has considered cost information in issuing this Order, as discussed below. The San Diego Water Board has also considered all of the evidence that has been presented to the San Diego Water Board regarding the CWC section 13241 factors in adopting this Order. The San Diego Water Board finds that the requirements in this Order are reasonably necessary to protect beneficial uses identified in the Basin Plan and the economic information related to costs of compliance and other CWC section 13241 factors are not sufficient to justify failing to protect those beneficial uses. Where appropriate, the

San Diego Water Board has provided or will consider providing the Copermittees with additional time to implement control measures to achieve final WQBELs and/or water quality standards.

Cost Information

Discussions of the financial and economic ramifications of municipal storm water management programs tend to focus on the significant costs incurred by municipalities in developing and implementing the programs. When considering the cost of implementing the programs, however, it is also important to consider the alternative costs that are incurred when programs are not fully implemented, as well as the economic benefits which result from effective program implementation.

The recent financial and economic conditions have amplified the concerns about the costs incurred by the municipalities in developing and implementing their programs. The reduction in resources resulting from the recent financial and economic conditions has been cited by many of the Copermittees as a justification for reducing the requirements that must be met by their programs. While the recent conditions are a cause for concern in the short term, these programs also have an opportunity to identify and implement improvements and efficiencies before the next period of growth and development, resulting in more effective and sustainable programs over the long term.

In addition, it is very difficult to ascertain the true cost of implementation of the Copermittees' management programs because of inconsistencies in reporting by the Copermittees. Reported costs of compliance for the same program element can vary widely from city to city, often by a very wide margin that is not easily explained.[2] Despite these problems, efforts have been made to identify management program costs, which can be helpful in understanding the costs of program implementation.

The San Diego Water Board recognizes that the Copermittees will incur costs in implementing this Order, potentially above and beyond the costs from the Copermittees' prior permits. The San Diego Water Board also recognizes that, due to California's current economic condition, many Copermittees currently have limited staff and resources to implement actions to address its MS4 discharges. Based on the economic considerations below, the San Diego Water Board has provided the Copermittees a significant amount of flexibility to choose how to implement the requirements of the Order.

The Order also allows the Copermittees to customize their plans, programs, and monitoring requirements. In the end, it is up to the Copermittees to determine the effective BMPs and measures necessary to comply with this Order. The Copermittees can choose to implement the least expensive measures that are effective in meeting

[2] LARWQCB, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.

the requirements of this Order. This Order also does not require the Copermittees to fully implement all requirements within a single permit term. Where appropriate, the Board has provided the Copermittees with additional time outside of the permit term to implement control measures to achieve final WQBELs and/or water quality standards.

The San Diego Water Board has considered available cost information associated with compliance with this Order. It is not possible to predict accurately the cost impact of the requirements that involve an unknown level of implementation or that depend on environmental variables that are as yet undefined. Only general conclusions can be drawn from this information.

Estimated Municipal Storm Water Program Implementation Costs

The USEPA, the State Water Board, and the California Regional Water Quality Control Boards (Regional Water Boards) have attempted to evaluate the costs of implementing municipal storm water programs. The assessments have demonstrated that the true costs are difficult to ascertain and reported costs vary widely. In addition, reported fiscal analyses tend to neglect the costs incurred to municipalities when storm water and non-storm water runoff is not effectively managed, which are incurred as a result of pollution, contamination, nuisance, and damage to ecosystems, property, and human health. Nonetheless, they provide a useful context for considering the costs of requirements within Order No. R9-2013-0001.

In 1999, the USEPA reported on multiple studies it conducted to determine the cost of management programs. A study of Phase II municipalities determined that the annual cost of the Phase II program was expected to be $9.16 per household. The USEPA also studied 35 Phase I municipalities, finding costs to be $9.08 per household annually, similar to those anticipated for Phase II municipalities.[3]

The State Water Board commissioned a study by the California State University, Sacramento to assess costs of the Phase I MS4 program. This study includes an assessment of costs incurred by Phase I MS4s throughout the state to implement their programs. Annual cost per household in the study ranged from $18 to $46, with the Fresno-Clovis Metropolitan Area representing the lower end of the range, and the City of Encinitas (in San Diego County) representing the upper end of the range.[4]

A study on Phase I MS4 program costs was also conducted by the California Regional Water Quality Control Board, Los Angeles Region (Los Angeles Water Board), where program costs reported in the municipalities' annual reports were assessed. The Los

[3] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791-68792.
[4] State Water Board, 2005. NPDES Stormwater Cost Survey. P. ii.

Angeles Water Board estimated that average per household cost to implement the MS4 program in Los Angeles County was $12.50. [5]

It is important to note that reported program costs are not all attributable to solely complying with MS4 permits. Many program components, and their associated costs, existed before any MS4 permits were ever issued. For example, street sweeping and trash collection costs cannot be solely or even principally attributable to MS4 permit compliance, since these practices have long been expected from and implemented by municipalities.

Therefore, true program cost resulting from MS4 permit requirements is some fraction of reported costs. The California State University, Sacramento study found that only 38 percent of program costs are new costs fully attributable to MS4 permits. The remainder of the program costs was either pre-existing or resulted from enhancement of pre-existing programs.[6] In 2000, the County of Orange found that even lower amounts of program costs are solely attributable to MS4 permit compliance, reporting that the amount attributable to implement the County or Orange Drainage Area Management Plan (DAMP), was less than 20 percent of the total budget. The remaining 80 percent was attributable to pre-existing programs.[7] More current data from the County of Orange is not used in this discussion because the County of Orange no longer reports such information.

Estimated Value of Healthy Water Quality

Economic considerations of municipal storm water management programs cannot be limited only to program costs. Evaluation of programs must also consider information on the benefits derived from environmental protection and improvement.[8] Attention is often focused on municipal storm water management program costs, but the programs must also be viewed in terms of their value to the public.

Placing a value on healthy receiving waters is very difficult. Often the value of receiving waters with good water quality manifests in other forms, such as tourism, recreational opportunities, and/or increased property values. When surface water bodies are degraded, thereby degrading the habitat within and adjacent to the water bodies, the public loses the value and benefits associated with being able to use the area in and around the water bodies. Surface waters that are able to support the beneficial uses designated in the Basin Plan can sustain plants and wildlife that can attract visitors and residents, providing aesthetic, recreational, as well as monetary value to the public. At this time, however, there have been no studies for the San

[5] Los Angeles Water Board, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.
[6] State Water Board, 2005. NPDES Stormwater Cost Survey. P. 58.
[7] County of Orange, 2000. A NPDES Annual Progress Report. P. 60.
[8] Ribaudo M.O. and D. Heelerstein. 1992, *Estimating Water Quality Benefits: Theoretical and Methodological Issues.* U.S. Department of Agriculture. Technical Bulletin No. 1808.

Diego Region to quantify the added value that surface waters with healthy water quality can provide.

USEPA has estimated that household willingness to pay for improvements in fresh water quality for fishing and boating is approximately $158-$210.[9] This estimate can be considered conservative, since it does not include important considerations such as marine waters benefits, wildlife benefits, or flood control benefits. Another study conducted by California State University, Sacramento reported that the annual household willingness to pay for statewide clean water is approximately $180.[10]

A study conducted by the University of Southern California and University of California, Los Angeles assessed the costs and benefits of implementing various approaches for achieving compliance with the MS4 permits in the Los Angeles region. The study found that non-structural systems would cost $2.8 billion but provide $5.6 billion in benefit. If structural systems were determined to be needed, the study found that total costs would be $5.7 to $7.4 billion, while benefits could reach $18 billion.[11] Costs are anticipated to be borne over many years, probably at least ten years.

As can be seen, the benefits of the municipal storm water management programs are expected to considerably exceed their costs. Such findings are corroborated by USEPA, which found that the benefits of implementation of its Phase II storm water rule would also outweigh the costs.[12]

[9] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68793.
[10] State Water Board, 2005. NPDES Stormwater Cost Survey. P. iv.
[11] Los Angeles Water Board, 2004. Alternative Approaches to Stormwater Control.
[12] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791.

VII. APPLICABLE STATUTES, REGULATIONS, PLANS AND POLICIES

A. Legal Authorities – Federal Clean Water Act and California Water Code

This Order is issued pursuant to section 402 of the CWA and implementing regulations adopted by the USEPA and chapter 5.5, division 7 of the CWC (commencing with section 13370). This Order serves as an NPDES permit for point source discharges to surface waters. This Order also serves as waste discharge requirements pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

The objective of the CWA is "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*." To carry out this objective, the CWA requires the implementation of permit programs to regulate the discharge of pollutants and dredged or fill material to the navigable waters of the U.S. and to regulate the use and disposal of sewage sludge. CWA section 402 provides the legal authority to issue a permit for the discharge of pollutants to waters of the U.S. under the NPDES. The CWA provides that NPDES permits may be issued by states which are authorized to implement the provisions of that act. California became authorized to implement the NPDES permit program on May 14, 1973.

The Porter-Cologne Water Quality Control Act (Division 7, commencing with CWC section 13000) established the State Water Resources Control Board (State Water Board) and nine Regional Water Quality Control Boards (Regional Water Boards) as the principal state agencies with primary responsibility for the coordination and control of water quality. CWC section 13200(f) established the San Diego Water Board, which has the primary responsibility for the coordination and control of water quality in the San Diego Region, which includes all the basins draining into the Pacific Ocean between the southern boundary of the Santa Ana Region and the California-Mexico boundary. The San Diego Water Board implements the CWA through Chapter 5.5 of the CWC, commencing with section 13370. CWC section 13377 provides the San Diego Water Board the legal authority to issue waste discharge requirements to ensure compliance with all applicable provisions of the CWA and acts amendatory thereof or supplementary, thereto, to implement water quality control plans, or for the protection of beneficial uses, or to prevent nuisance.

CWA section 402(p) requires the USEPA or authorized state to issue NPDES permits for storm water discharges from municipal separate storm sewer systems (MS4s) to waters of the U.S. CWA section 402(p)(3)(B)(ii) requires that NPDES permits for storm water discharges from MS4s "*effectively prohibit non-storm water discharges*" into the MS4s. CWA section 402(p)(3)(B)(iii) requires that NPDES permits for storm water discharges from MS4s to "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable* [MEP], *including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control*

of such pollutants."

The USEPA published implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]), which prescribe permit application requirements for storm water discharges from MS4s pursuant to CWA 402(p), on November 16, 1990. The USEPA published an Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems, which provided guidance on permit application requirements for regulated MS4s, on May 17, 1996. The federal regulations in 40 CFR 122 and guidance issued by USEPA serve as the foundation for the provisions of Order No. R9-2013-0001. The legal authorities provided by the above statutes and regulations are included as part of the discussions in Section VIII of this Fact Sheet.

B. Legal Authority for the Permit Issued on a Region-wide Basis

CWA section 402(p)(3)(B) provides the San Diego Water Board the legal authority to issue an NPDES permit for the San Diego Region as compared to separate MS4 permits based upon County- and partial County-wide boundaries as they exist within the San Diego Region. CWA section 402(p)(3)(B) states that "*Permits for discharges from municipal storm sewers- (i) may be issued on a system- or jurisdiction-wide basis ....*" The federal regulations in 40 CFR 122.26(a)(1)(v) also state that the San Diego Water Board "*may designate dischargers from municipal separate storm sewers on a system-wide or jurisdiction-wide basis. In making this determination, the [San Diego Water Board] may consider the following factors: (A) the location of the discharge with respect to waters of the United States; (B) the size of the discharge; (C) the quantity and nature of the pollutants discharged to waters of the United States; and (D) other relevant factors*."

More specifically, the federal regulations provide that for large and medium MS4 systems, the San Diego Water Board may issue a regional permit. Specifically, the federal regulation in 40 CFR 122.26(a)(3) provide:

"*(ii) The Director may either issue one system-wide permit covering all discharges from municipal separate storm sewers within a large or medium municipal storm sewer system or issue distinct permits for appropriate categories of discharges within a large or municipal separate storm sewer system including, but not limited to: all discharges owned or operated by the same municipality; located within the same jurisdiction; all discharges within a system that discharge to the same watershed; discharges within a system that are similar in nature; or for individual discharges from municipal separate storm sewers within the system.*

(iii) The operator of a discharge from a municipal separate storm sewer which is part of a large or medium municipal separate storm sewer system must either: (A) Participate in a permit application (to be a permittee or a co-permittee) with one or more other operator of discharges from the large or medium municipal

storm sewer system which covers all, or a portion of all, discharges from the municipal separate storm sewer system; (B) Submit a distinct permit application which only covers discharges from the municipal separate storm sewers for which the operator is responsible; or (C) A regional authority may be responsible for submitting a permit application under the following guidelines....

(iv) One permit application may be submitted for all or a portion of all municipal separate storm sewers within adjacent or interconnected large or medium municipal separate storm sewer systems. The Director may issue one systemwide permit covering all, or a portion of all municipal separate storm sewers in adjacent or interconnected large or medium municipal separate storm sewer systems.

(v) Permits for all or a portion of all discharges from large or medium municipal separate storm sewer systems that are issued on a system-wide, jurisdiction-wide, watershed or other basis may specify different conditions relating to different discharges covered by the permit, including different management programs for different drainage areas which contribute storm water to the system."

Based on these regulations, the San Diego Water Board may issue a region-wide MS4 permit. The regulations also clarify that the permit may include different conditions for separate discharges covered by the permit. This allows the San Diego Water Board to ensure that suitable water quality conditions and provisions are identified for each watershed.

The USEPA's responses to comments in the Final Rule for the above-mentioned regulations also make it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide, permits. In the Final Rule published in the Federal Register and containing the responses to comments, USEPA notes that 40 CFR 122.26(a)(3)(iv) would allow an entire system in a geographical region under the purview of a State agency to be designated under a permit.[13] USEPA also states that many commenters wanted to allow the permitting authority broad discretion to establish system-wide permits, and that EPA believes that paragraphs 40 CFR 122.26 (a)(1)(v) and (a)(3)(ii) allow for such broad discretion.[14]

This Order creates watershed requirements that apply to multiple counties. The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees. Managing storm water on a regional and watershed basis is expected to result in improved water quality, as the Order focuses on monitoring and management practices necessary to improve each watershed rather than political boundaries. A single permit also allows the San Diego Water Board staff to expend fewer resources developing successive multiple permits and allows more resources to be devoted to working cooperatively with all three

[13] 55 Federal Register 47990-01, 48042
[14] Ibid

current groups of Copermittees to ensure implementation of this Order results in improved water quality.

C. Federal and California Endangered Species Acts

This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2115.5) or the Federal Endangered Species Act (16 United States Code [USC] sections 1531 to 1544). This Order requires compliance with requirements to protect the beneficial uses of waters of the U.S. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

D. California Environmental Quality Act

The action to adopt an NPDES Permit is exempt from the provisions of Chapter 3 of the California Environmental Quality Act (CEQA) (Public Resources Code section 21100, et seq.) pursuant to CWC section 13389. (*County of Los Angeles v. Cal. Water Boards* (2006) 143 Cal.App.4th 985.)

E. State and Federal Regulations, Plans and Policies

The legal authority provided by the following regulations, plans, and policies are also included as part of the discussions in Section VIII of this Fact Sheet.

Water Quality Control Plan for the San Diego Basin

The CWA requires the San Diego Water Board to establish water quality standards for each water body in its region. Water quality standards include beneficial uses, water quality objectives and criteria that are established at levels sufficient to protect beneficial uses, and an antidegradation policy to prevent degrading of waters. On September 8, 1994, the San Diego Water Board adopted the *Water Quality Control Plan for the San Diego Basin (*Basin Plan). The Basin Plan designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters in the San Diego Region. The San Diego Water Board has amended the Basin Plan on multiple occasions since 1994. In addition, the Basin Plan implements State Water Board Resolution No. 88-63, which established state policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply. Beneficial uses applicable to the surface water bodies that receive discharges from the MS4s within the San Diego Region generally include those listed below:

The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region:

- Municipal and Domestic Supply (MUN)
- Agricultural Supply (AGR)
- Industrial Process Supply (PROC)
- Industrial Service Supply (IND)
- Ground Water Recharge (GWR)
- Contact Water Recreation (REC1)
- Non-contact Water Recreation (REC2)
- Warm Freshwater Habitat (WARM)
- Cold Freshwater Habitat (COLD)
- Wildlife Habitat (WILD)
- Rare, Threatened, or Endangered Species (RARE)
- Freshwater Replenishment (FRSH)
- Hydropower Generation (POW)
- Preservation of Biological Habitats of Special Significance (BIOL)

The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region:

- Navigation (NAV)
- Commercial and Sport Fishing (COMM)
- Estuarine Habitat (EST)
- Marine Habitat (MAR)
- Aquaculture (AQUA)
- Migration of Aquatic Organisms (MIGR)
- Spawning, Reproduction, and/or Early Development (SPWN)
- Shellfish Harvesting (SHELL)

Pursuant to Water Code sections 13263 and 13377, the requirements of this Order implement the Basin Plan.

Water Quality Control Plan for Ocean Waters of California, California Ocean Plan

In 1972, the State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan). The State Water Board adopted the most recent amended Ocean Plan on September 15, 2009. The Office of Administrative Law approved it on March 10, 2010. On October 8, 2010, USEPA approved the 2009 Ocean Plan. The Ocean Plan is applicable, in its entirety, to ocean waters of the State. In order to protect beneficial uses, the Ocean Plan establishes water quality objectives and a program of implementation. Pursuant to Water Code sections 13263 and 13377, the requirements of this Order implement the Ocean Plan. The Ocean Plan identifies the beneficial uses of ocean waters of the State to be

protected as summarized below:

- Industrial water supply
- Water contact and non-contact recreation, including aesthetic enjoyment; navigation
- Commercial and sport fishing
- Mariculture
- Preservation and enhancement of designated Areas of Special Biological Significance
- Rare and endangered species
- Marine habitat
- Fish spawning and shellfish harvesting

On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving an exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges. On June 19, 2012, the State Water Board adopted Order No. 2012-0031, amending Order No. 2012-0012 to require pollutant load reductions to be achieved within six years for the ASBS Compliance Plans, section A.2.d(2) and ASBS Pollution Prevention Plans, section B.2.b(2). The State Water Board Resolution No. 2012-0012, as amended requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject terms and conditions of State Water Board Resolution No. 2012-0012, as amended. The Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012, as amended, applicable to these discharges, are ~~hereby~~ incorporated in Attachment A of this Order ~~as if fully set forth herein~~. Requirements of this Order implement the Ocean Plan.

Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality

On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

Antidegradation Policy

Federal regulations (40 CFR 131.12) require that the state water quality standards include an antidegradation policy consistent with the federal antidegradation policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16 ("Statement of Policy with Respect to Maintaining the Quality of the Waters of the State"). State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law.

The San Diego Water Board's Basin Plan implements and incorporates by reference both the State and federal antidegradation policies. State Water Board Resolution No. 68-16 and 40 CFR 131.12 require the San Diego Water Board to maintain high quality waters of the State until it is demonstrated that any change in quality will be consistent with maximum benefit to the people of the State, will not unreasonably affect beneficial uses, and will not result in water quality less than that described in the San Diego Water Boards' policies. State Water Board Resolution No. 68-16 requires that discharges of waste be regulated to meet best practicable treatment or control to assure that pollution or nuisance will not occur and the highest water quality consistent with the maximum benefit to the people of the State be maintained.

The discharges permitted in this Order are consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Board Resolution No. 68-16. Many of the water bodies within the area covered by this Order are of high quality. The Order requires the Copermittees to meet best practicable treatment or control to meet water quality standards. As required by 40 CFR 122.44(a), the Copermittees must comply with the "maximum extent practicable" technology-based standard set forth in CWA section 402(p) for discharges of pollutants in storm water from the MS4s.

Many of the waters within the area covered by this Order are impaired and listed on the State's CWA Section 303(d) List and the San Diego Water Board has established TMDLs to address the impairments. This Order requires the Copermittees to comply with permit provisions to implement the WLAs set forth in the TMDLs in order to restore the beneficial uses of the impaired water bodies consistent with the assumptions and requirements of the TMDLs. This Order includes requirements to develop and implement storm water management programs, achieve WQBELs, and effectively prohibit non-storm water discharges into the MS4. The issuance of this Order does not authorize an increase in the amount of discharge of waste.

Anti-Backsliding Requirements

CWA sections 402(o) and 303(d)(4) and 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations or conditions may be relaxed. All effluent limitations and other conditions in this Order are at least as stringent as the effluent limitations in the previous permits issued to the San Diego County Copermittees, the Orange County Copermittees and the Riverside County Copermittees.

Clean Water Act Section 303(d) List

CWA section 303(d)(1) requires each State to identify specific water bodies within its boundaries where water quality standards are not being met or are not expected to be met after implementation of technology-based effluent limitations on point sources. Water bodies that do not meet water quality standards are considered impaired and are placed on the state's "303(d) List." Periodically, USEPA approves the State's 303(d) List.

Most recently, USEPA approved the State's 2010 303(d) List of impaired water bodies on October 11, 2011, which includes certain receiving waters in the San Diego Region. For each listed water body, the state or USEPA is required to establish a TMDL of each pollutant impairing the water quality standards in that water body. A TMDL is a tool for implementing water quality standards and is based on the relationship between pollution sources and in-stream water quality conditions. The TMDL establishes the allowable pollutant loadings for a water body and thereby provides the basis to establish water quality-based controls. These controls should provide the pollution reduction necessary for a water body to meet water quality standards.

A TMDL is the sum of the allowable pollutant loads of a single pollutant from all contributing point sources (the waste load allocations or WLAs) and non-point sources (load allocations of LAs) plus the contribution from background sources and a margin of safety (40 CFR 130.2(i)). MS4 discharges are considered point source discharges. For 303(d)-listed water bodies and pollutants in the San Diego Region, the San Diego Water Board or USEPA develops and adopts TMDLs that specify these requirements.

Since 2002, the San Diego Water Board has established ~~six (6)~~ seven (7) TMDLs to remedy water quality impairments in various water bodies within the San Diego Region (see Attachment E to the Order). These TMDLs identify MS4 discharges as a source of pollutants to these water bodies, and, as required, establish WLAs for MS4 discharges to reduce the amount of pollutant discharged to receiving waters. CWA section 402(p)(3)(B)(iii) requires the San Diego Water Board to impose permit conditions, including: "management practices, control techniques and system, design and engineering methods, and *such other provisions as the Administrator or the State determines appropriate for the control of such pollutants.*" (Emphasis added.) CWA section 402(a)(1) also requires states to issue permits with conditions necessary to carry out the provisions of the CWA. Federal regulations also require that NDPES permits contain WQBELs consistent with the assumptions and requirements of all available WLAs (40 CFR 122.44(d)(1)(vii)(B)). CWC section 13377 also requires that NPDES permits include limitations necessary to implement water quality control plans. Therefore, this Order includes WQBELs and other provisions to implement the TMDL WLAs assigned to Copermittees regulated by this Order.

Other Regulations, Plans and Policies

This Order implements all other applicable federal regulations and State regulations, plans and policies, including the California Toxics Rule at 40 CFR 131.38 (Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California Rule [California Toxics Rule or CTR]), and State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP).

F. Unfunded State Mandates

Article XIII B, Section 6(a) of the California Constitution provides that whenever "*any state agency mandates a new program or higher level of service on any local government, the state shall provide a subvention of funds to reimburse that local government for the costs of the program or increased level of service*." The requirements of this Order do not constitute state mandates that are subject to a subvention of funds for several reasons, including, but not limited to, the following.

First, the requirements of this Order do not constitute a new program or a higher level of service as compared to the requirements contained in the previous Fourth Term Permits. The overarching requirement to impose controls to reduce the pollutants in discharges from MS4s is dictated by the CWA and is not new to this permit cycle (33 USC section 1342(p)(3)(B)). The inclusion of new and advanced measures as the MS4 programs evolve and mature over time is anticipated under the CWA (55 FR 47990, 48052 (Nov. 16, 1990)), and to the extent requirements in this Order are interpreted as new advanced measures, they do not constitute a new program or higher level of service.

Second, and more broadly, mandates imposed by federal law, rather than by a state agency, are exempt from the requirement that the local agency's expenditures be reimbursed (Cal. Const., art. XIII B, section 9, subd. (b)). This Order implements federally mandated requirements under the CWA and its requirements are therefore not subject to subvention of funds. This includes federal requirements to effectively prohibit non-storm water discharges, to reduce the discharge of pollutants in storm water to the MEP, and to include such other provisions as the Administrator or the State determines appropriate for the control of such pollutants (33 USC section 1342(p)(3)(B)). Federal cases have held these provisions require the development of permits and permit provisions on a case-by-case basis to satisfy federal requirements. (*Natural Resources Defense Council, Inc., v. USEPA* (9th Cir. 1992) 966 F.2d 1292, 1308, fn. 17.)

The authority exercised under this Order is not reserved state authority under the CWA's savings clause (cf. *Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 627-628 [relying on 33 USC section 1370, which allows a state to develop requirements which are not "less stringent" than federal requirements]), but instead is part of a federal mandate to develop pollutant reduction requirements for municipal separate storm sewer systems. To this extent, it is entirely federal authority that forms the legal basis to establish the permit provisions. (See, *City of Rancho Cucamonga v. Regional Water Quality Control Board, Santa Ana Region* (2006) 135 Cal.App.4th 1377, 1389; *Building Industry Ass'n of San Diego Co. v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 882-883.)

The MEP standard is a flexible standard that balances a number of considerations, including technical feasibility, cost, public acceptance, regulatory compliance, and effectiveness. (*Building Ind. Ass'n., supra,* 124 Cal.App.4th at pp. 873-874, 889.) Such

considerations change over time with advances in technology and with experience gained in storm water management (55 FR 47990, 48052 (Nov. 16, 1990)). Accordingly, a determination of whether the conditions contained in this Order exceed the requirements of federal law cannot be based on a point by point comparison of the permit conditions and the minimum control measures that are required "at a minimum" to reduce pollutants to the maximum extent practicable and to protect water quality (40 CFR 122.34). Rather, the appropriate focus is whether the permit conditions, as a whole, exceed the MEP standard.

In recent months, the County of Los Angeles and County of Sacramento Superior Courts have granted writs setting aside decisions of the Commission on State Mandates that held certain requirements in Phase I permits constituted unfunded mandates. In both cases, the courts have found that the correct analysis in determining whether an MS4 permit constituted a state mandate was to evaluate whether the permit as a whole exceeds the MEP standard. (*State of Cal. v. Comm. on State Mandates* (Super. Ct. Sacramento County, 2012, No. 34-2010-80000604), *State of California v. County of Los Angeles* (Super. Ct. Los Angeles County, 2011, No. BS130730.) Both cases are currently pending appeal.

The requirements of the Order, taken as a whole rather than individually, are necessary to reduce the discharge of pollutants to the MEP and to protect water quality. The San Diego Water Board finds that the requirements of the Order are practicable, do not exceed federal law, and thus do not constitute an unfunded mandate. These findings are the expert conclusions of the principal state agency charged with implementing the NPDES program in California (CWC sections 13001, 13370).

It should also be noted that the provisions in this Order to effectively prohibit non-storm water discharges are also mandated by the CWA (33 USC section 1342(p)(3)(B)(ii)). Likewise, the provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state establishes or adopts a TMDL, federal law requires that permits must contain effluent limitations consistent with the assumptions and requirements of any applicable waste load allocation in a TMDL (40 CFR 122.44(d)(1)(vii)(B)).

Third, the local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental dischargers who are issued NPDES permits for storm water discharges. With a few inapplicable exceptions, the CWA regulates the discharge of pollutants from point sources (33 USC section 1342) and the Porter-Cologne Act regulates the discharge of waste (CWC section 13263), both without regard to the source of the pollutant or waste. As a result, the "costs incurred by local agencies" to protect water quality reflect an overarching regulatory scheme that places similar requirements on governmental and non-governmental dischargers. (See *County of Los Angeles v. State of California* (1987) 43 Cal.3d 46, 57-58 [finding comprehensive workers' compensation scheme did not create a cost for local agencies that was subject to state subvention].)

The CWA and the Porter-Cologne Act largely regulate storm water with an even hand, but to the extent there is any relaxation of this even-handed regulation, it is in favor of the local agencies. Generally, the CWA requires point source dischargers, including dischargers of storm water associated with industrial or construction activity, to comply strictly with water quality standards (33 USC section 1311(b)(1)(C); *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159, 1164-1165 [noting that industrial discharges must strictly comply with water quality standards]). As discussed in prior State Water Board decisions, certain provisions of this Order do not require strict compliance with water quality standards (State Water Board Order No. WQ 2001-0015, p. 7). Those provisions of this Order regulate the discharge of waste in municipal storm water under the CWA's MEP standard, not the BAT/BCT standard that applies to other types of discharges. These provisions, therefore, regulate the discharge of waste in municipal storm water more leniently than the discharge of waste from non-governmental sources.

Fourth, the Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)). To the extent that the local agency Copermittees have voluntarily availed themselves of the permit, the program is not a state mandate. (Accord, *County of San Diego v. State of California* (1997) 15 Cal.4th 68, 107-108.)

Fifth, the local agency Copermittees' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under state law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

Finally, even if any of the permit provisions could be considered unfunded mandates, under Government Code section 17556, subdivision (d), a state mandate is not subject to reimbursement if the local agency has the authority to charge a fee. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order, subject to certain voting requirements contained in the California Constitution. (See Cal. Const., Art. XIII D, section 6, subd. (c); see also *Howard Jarvis Taxpayers Ass'n v. City of Salinas* (2002) 98 Cal.App.4th 1351, 1358-1359.) The Fact Sheet demonstrates that numerous activities contribute to the pollutant loading in the MS4. Local agencies can levy service charges, fees, or assessments on these activities, independent of real property ownership. (See, e.g., *Apartment Ass'n of Los Angeles County, Inc., v. City of Los Angeles* (2001(24 Cal.4th 830, 842 [upholding inspection fees associated with renting property].) The authority and ability of a local agency to defray the cost of a program without raising taxes indicates that a program does not entail a cost subject to subvention. (*Clovis Unified School Dist. V. Chiang* (2010) 188 Cal.App.4th 794, 812, citing *Connell v. Sup. Ct.* (1997) 59 Cal.App.4th 382, 401; *County of Fresno v. State of California* (1991) 53 Cal. 3d. 482, 487-488.)

VIII. PROVISIONS

The provisions (i.e. NPDES permit requirements) of the Order are discussed below.

A. Prohibitions and Limitations

Purpose: Provision A includes the prohibitions and limitations requirements that are the foundation of all the subsequent requirements included in the Order. Compliance with the prohibitions and limitations will restore and protect receiving waters from impacts that may be caused by discharges into and from the Copermittees' MS4s and ultimately achieve the objective of the CWA.

In meeting the requirements set forth in the Order, the Copermittees must be cognizant that the prohibitions and limitations exist and will be the standard by which the San Diego Water Board will be measuring the progress and success of their implementation of the NPDES permit requirements.

***Discussion*:** The objective of the CWA is to "*restore and maintain the chemical, physical, and biological integrity of the Nation's waters*." The CWA requires the implementation of NPDES permit programs to regulate discharges of pollutants and dredged or fill material to the navigable waters of the U.S. For discharges into and from MS4s, the CWA requires the NPDES permits to "*effectively prohibit non-stormwater discharges into the storm sewers*" and "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable.*"

Provision A includes limitations, consistent with the requirements of the CWA for discharges from MS4s. Provision A expresses these limitations as discharge prohibitions, receiving water limitations, and effluent limitations. Compliance with the discharge prohibitions and receiving water limitations is also explicitly described, in conformance with precedential State Water Board Orders.

More specific and detailed discussions of the requirements of Provision A are provided below.

Provision A.1 (Discharge Prohibitions) prohibits the discharge of specific types of waste into and/or from the Copermittees' MS4s.

Provision A.1.a restates and reiterates Basin Plan Waste Discharge Prohibition 1, by prohibiting discharges into and from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the

state. The terms pollution,[15] contamination,[16] and nuisance[17] are defined under CWC 13050. Provision A.1.c incorporates all the waste discharge prohibitions of the Basin Plan into the requirements of the Order. The waste discharge prohibitions from the Basin Plan have been reproduced and provided in Attachment A to the Order.

Provision A.1.b requires non-storm water discharges into the MS4s to be effectively prohibited, consistent with the requirements of the CWA for MS4 permits to "*effectively prohibit non-stormwater discharges into the storm sewers*." The effective prohibition is required to be implemented by each Copermittee within its jurisdiction through the illicit discharge detection and elimination requirements under Provision E.2. The prohibition does not apply to NPDES permitted discharges into the Copermittees' MS4s.

The CWA employs the strategy of prohibiting the discharge of any pollutant from a point source into waters of the United States unless the discharger of the pollutant(s) obtains an NPDES permit pursuant to CWA Section 402. The 1987 amendment to the CWA includes provision 402(p) that specifically addresses NPDES permitting requirements for storm water discharges from MS4s. CWA section 402(p) prohibits the discharge of pollutants from specified MS4s to waters of the U.S. except as authorized by an NPDES permit and identifies two substantive standards for MS4 storm water permits. MS4 permits (1) "*shall include a requirement to effectively prohibit nonstormwater discharges into the storm sewers*" and (2) "*shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or State determines appropriate for the control of such pollutants*." (CWA section 402(p)(3)(B)(ii-iii).)

In November 1990, the USEPA published regulations addressing storm water discharges from MS4s (55 FR 47990 and following (Nov. 16, 1990) (Phase I Final Rule)). The regulations establish minimum requirements for MS4 permits, and generally focus on the requirement that MS4s implement programs to reduce the amount of pollutants found in storm water discharges to the MEP. The CWA's municipal storm water MEP standard does not require storm water discharges to strictly meet water quality standards, as is required for other NPDES permitted

[15] CWC 13050(l): "(1) 'Pollution' means an alteration of the quality of waters of the state by waste to a degree which unreasonably affects either of the following: (A) The water for beneficial uses. (B) Facilities which serve beneficial uses. (2) 'Pollution' may include "contamination.
[16] CWC 13050(k): "Contamination' means an impairment of the quality of waters of the state by waste to a degree which creates a hazard to public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste, whether or not waters of the state are affected."
[17] CWC 13050(m): "Nuisance' means anything which meets all of the following requirements: (1) Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. (2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. (3) Occurs during, or as a result of, the treatment or disposal of wastes."

discharges. Compliance is achieved through an iterative approach of continuous implementation of improved BMPs. This distinction reflects Congress's recognition that variability in flow and intensity of storm events render difficult strict compliance with water quality standards by MS4 permittees. In describing the controls that permits must include to reduce pollutants in storm water discharges to the MEP, the statute (CWA section 402(p)(3)(B)(iii)) states that the controls shall include: "*management practices, control techniques and system, design and engineering methods, and such other provisions as the [permit writer] determines appropriate for the control of such pollutants*."

In contrast, non-storm water discharges from the MS4 that are not authorized by separate NPDES permits are subject to requirements under the NPDES program, including discharge prohibitions, technology based effluent limitations and water quality-based effluent limitations (40 CFR 122.44). The regulations also require the Copermittee's program to include an element to detect and remove illicit discharges and improper disposal into the storm sewer (40 CFR 122.26(d)(2)(iv)(B)).

While "non-storm water" is not defined in the CWA or federal regulations, the federal regulations (at 40 CFR 122.26(b)(2)) define "*illicit discharge*" as *"any discharge to a municipal separate storm sewer that is not composed entirely of storm water and that is not covered by an NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer and discharges resulting from fire fighting activities)*." This definition is the most closely applicable definition of "non-storm water" contained in federal law. As stated in the Phase I Final Rule, USEPA added the illicit discharge program requirement to begin implementation of the 'effective prohibition' requirement to detect and control non-storm water discharges to their municipal system.

Thus, federal law mandates that permits issued to MS4s must require management practices that will result in reducing storm water pollutants to the MEP yet at the same time requires that non-storm water discharges be effectively prohibited from entering the MS4. "Effectively" prohibit does not mean that non-storm water discharges are authorized to be discharged into and from the Copermittees' MS4s. The Phase I Final Rule clarifies what "effectively prohibit" means (55 FR 47995):

> "*Section 402(p)(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…<u>Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit</u> (other than the permit for the discharge from the municipal separate storm sewer)*" [Emphasis added].

Consistent with federal law, unless non-storm water discharges to the MS4 are authorized by a separate NPDES permit, non-storm water discharges are

appropriately subject to the effective prohibition requirement in the CWA and Regional Water Boards are not limited by the iterative MEP approach to storm water regulation in crafting appropriate regulations for non-storm water discharges.

The federal regulations (40CFR122.26(d)(2)(i)(B)) require the Copermittees to establish the legal authority which authorizes or enables the Copermittees to prohibit illicit discharges to the MS4s. The federal regulations (40 CFR 122.26(d)(2)(vi)(B)(1)) require the Copermittees to "*implement and enforce an ordinance, order or similar means*" to prevent non-storm water discharges to their MS4s. Thus, the Copermittees are required to "*effectively*" prohibit non-storm water discharges to their MS4s through enforcing their legal authority established under "*ordinance, order or similar means*" and either remove those discharges to their MS4s, or require those discharges to obtain coverage under a separate NPDES permit. More detail about the program that must be implemented to "*effectively*" prohibit non-storm water discharges to the Copermittees' MS4s is provided under the discussion for Provision E.2.

Provision A.1.d was included to be consistent Resolution No. 2012-0012, adopted by the State Water Board on March 20, 2012. Provision A.1.d prohibits discharges from MS4s to Areas of Special Biological Significance (ASBS), except for storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach to the Heisler Park ASBS subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012. The pertinent Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 are provided in Attachment A to the Order.

Provision A.2 (Receiving Water Limitations) specifies the condition of the receiving waters that must be achieved when there are discharges from the Copermittees' MS4s. Receiving water limitations are included in all NPDES permits issued pursuant to the CWA section 402. CWA section 402(p)(3)(B)(iii) authorizes the inclusion of "*such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." This requirement gives USEPA or the State permitting authority, in this case the San Diego Water Board, discretion to determine what permit conditions are necessary to control pollutants.

In its Phase I Final Rule (see 55 FR 47990, 47994 (Nov. 16, 1990)), USEPA elaborated on these requirements, stating that, "*permits for discharges from municipal separate storm sewer systems must require controls to reduce the discharge of pollutants to the maximum extent practicable, and where necessary water quality-based controls*." USEPA reiterated in its Phase II Final Rule (64 FR 68722, 68737), that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL*." CWC section 13377 also requires that NPDES permits include limitations necessary to implement water quality control plans. Both the State Water Board and the San Diego Water Board have previously concluded that discharges from the MS4 contain pollutants that have

the reasonable potential to cause or contribute to excursions above water quality standards. As such, inclusion of receiving water limitations is appropriate to control MS4 discharges.

The inclusion of receiving water limitations is also consistent with the Ninth Circuit Court of Appeals' ruling in *Defenders of Wildlife v. Browner* (191 F.3d 1159, 1166 (1999)) that the permitting authority has discretion regarding the nature and timing of requirements that it includes as MS4 permit conditions to attain water quality standards. The Ninth Circuit Court of Appeals recently explained that, "*[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*" (*Natural Resources Defense Council v. County of Los Angeles* (9th Cir. 2011) 673 F.3d 880, 886 (revd. On other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013)))

The receiving water limitations included in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan or in water quality control plans or policies adopted by the State Water Board, including State Water Board Resolution No. 68-16, or in federal regulations, including but not limited to 40 CFR 131.12 and 131.38. The water quality objectives in the Basin Plan and other State Water Board plans and policies have been approved by USEPA and combined with designated beneficial uses constitute the water quality standards required under federal law.

Provision A.2.a requires that discharges from the Copermittees' MS4s must not cause or contribute to the violation of water quality standards in receiving waters. The water quality standards of the receiving waters must be protected from the impacts that may be caused by the Copermittees' MS4 discharges. Water quality standards applicable to the surface waters in the San Diego Region must be achieved through meeting the technology based standard of MEP through an iterative process of improved management actions. Provision A.2.a is also consistent with State Water Board Order WQ 99-05 precedent-setting language requiring discharges from MS4s to attain receiving water quality standards. The water quality control plans and policies with water quality standards applicable to the waters in the San Diego Region are included under Provision A.2.a.

Provisions A.2.b was included to be consistent with the requirements of State Water Board Resolution No. 2012-0012, adopted on March 20, 2012.

Provision A.3 (Effluent Limitations) specifies the condition of the discharges from the Copermittees' MS4s that must be achieved if and when there are discharges.

Consistent with CWA section 301(b)(1)(A) and 40 CFR 122.44(a), Provision A.3.a includes the technology-based effluent limitations that must be included in the Order. The technology-based effluent limits, representing the minimum level of control that must be imposed in a permit under CWA section 402, requires that pollutants in discharges of storm water from the Copermittees' MS4s be reduced to the MEP. This provision applies specifically to storm water discharges. Non-storm water discharges must be effectively prohibited, as required under Provision A.1.b. Non-storm water (dry weather) discharges from the MS4 are not considered storm water (wet weather) discharges and therefore are not subject to the MEP standard.

The technology-based MEP standard is an ever-evolving, flexible, and advancing concept. Neither Congress nor USEPA has specifically defined the term "maximum extent practicable." Congress established this flexible MEP standard so that the administrative bodies would have "*the tools to meet the fundamental goals of the Clean Water Act in the context of storm water pollution*." (*Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 884.) As knowledge about controlling storm water runoff and discharges continues to evolve, so does the knowledge which constitutes MEP. Reducing the discharge of pollutants in storm water from the MS4 to the MEP requires the Copermittees to assess each program component and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP.

The San Diego Water Board or the State Water Board ultimately define MEP, and may include requirements that provide specific guidance on what is expected to demonstrate MEP. It is the responsibility of the Copermittees to propose actions that implement BMPs to reduce storm water pollution to the MEP. In other words, the Copermittees' runoff management programs developed and implemented under the Order are the Copermittees' proposals for achieving MEP. Their total collective and individual activities conducted pursuant to their runoff management programs become their proposal for achieving MEP as it applies both to their overall effort, as well as to specific activities. Provisions B through E of the Order provides a minimum framework to guide the Copermittees in achieving the MEP standard for discharges of pollutants in storm water.

Provision A.3.b incorporates any water quality based effluent limitations (WQBELs) applicable to the MS4s established for TMDLs adopted and approved for the San Diego Region and requires the Copermittees to comply with those WQBELs. This is consistent with 40 CFR 122.44(d)(1)(vii)(B), which requires that NPDES permits to incorporate WQBELs "*developed to protect a narrative water quality criterion, a numeric water quality criterion, or both…consistent with the assumptions and requirements of any available wasteload allocation for the discharge...*"

Pursuant to CWA section 303(d), for surface water bodies identified as impaired by one or more pollutants, the San Diego Water Board is required to establish TMDLs "*at a level necessary to implement the applicable water quality standards with seasonal*

variations and a margin of safety which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality." The TMDLs identify sources of the pollutants causing the impairments and assign portions of the TMDL as WLAs to point sources, which include MS4s.

WLAs must be expressed in NPDES permits as WQBELs, which may include one or more numeric components such as numeric effluent limits, and/or receiving water limitations, and/or BMP requirements. Because numeric targets for TMDLs typically include a component that will be protective of water quality standards, a TMDL will likely include one or more numeric receiving water limitations and/or effluent limitations as part of the assumptions or requirements of the TMDL. Any numeric receiving water limitations and/or effluent limitations developed as part of the assumptions or requirements of a TMDL must be incorporated and included as part of WQBELs for the MS4s.

Because the development and approval of new TMDLs, or modification of existing TMDLs, may occur during the term of this Order, the specific provisions of those TMDLs, including effluent limitations applicable to MS4s are provided within Attachment E to the Order. Attachment E will be updated with new TMDLs and modifications to existing TMDLs in a timely manner as they occur.

Provision A.4 (Compliance with Discharge Prohibitions and Receiving Water Limitations) describes the process required to be implemented by the Copermittees if compliance with the discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a are not being achieved under current conditions.

In its Phase II Stormwater Regulations, Final Rule, USEPA states that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL.*"[18] In a series of comment letters on MS4 permits issued by various Regional Water Boards, USEPA has also reiterated that MS4 discharges must meet water quality standards.[19] In addition, the Ninth Circuit Court of Appeals explained in a recent ruling that, *"[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*"[20]

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[18] Phase II Stormwater Regulations, Final Rule, 64 Fed. Reg. 68722, 68737.
[19] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.
[20] NRDC v. County of Los Angeles (9th Cir. 2011), 673 F.3d 880, 886 (revd. on other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013))). See also, *Building Industry Ass'n of San Diego County v. State Water Resources*

Water quality standards for the San Diego Region are established in the Basin Plan. The water quality standards of the Basin Plan are incorporated into this Order as the discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a. The discharge prohibitions and receiving water limitations in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations or prohibitions to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan, water quality control plans or policies adopted by the State Water Board, including Resolution No. 68-16, or federal regulations, including but not limited to, 40 CFR 131.12 and 131.38. The waste discharge prohibitions and water quality objectives in the Basin Plan have been approved by USEPA and combined with the designated beneficial uses constitute the water quality standards required under federal law.

Under federal law (CWA section 402(p)(3)(B)(iii)), an MS4 permit must include "*controls to reduce the discharge of pollutants to the maximum extent practicable...and such other provision as...the State determines appropriate for control of such pollutants*." The State Water Board has previously determined that limitations necessary to meet water quality standards are appropriate for the control of pollutants discharged by MS4s and must be included in MS4 permits. (State Water Board Orders WQ 91-03, 98-01, 99-05, 2001-15; see also *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159.) This Order prohibits discharges that cause or contribute to violations of water quality standards.

The discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a are included in this Order to ensure that discharges from the MS4s do not cause or contribute to exceedances of water quality objectives necessary to protect the beneficial uses of the receiving waters.

Provision A.4 is consistent with the precedent-setting language in State Water Board Order WQ 99-05 required to be included in municipal storm water permits. State Water Board Order WQ 2001-15 refined Order WQ 99-05 by requiring an iterative approach to compliance with water quality standards involving ongoing assessments and revisions, as referred to as the "iterative process." The "iterative process" is a fundamental NPDES requirement for municipal storm water permits to achieve the objectives of the CWA.

The State Water Board and Regional Water Boards have stated that the provisions under Provisions A.1.a, A.1.c, A.2.a, and A.4 are independently applicable, meaning that compliance with one provision does not provide a "safe harbor" where there is non-compliance with another provision (i.e., compliance with the Provision A.4 does not shield a Copermittee who may have violated Provision A.1.a, A.1.c, or A.2.a from

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Control Bd. (2004) 124 Cal.App.4th 866, 884-886, citing *Defenders of Wildlife v. Browning,* (9th Cir. 1999) 191 F.3d 1159.)

an enforcement action). The intent of Provision A.4 is to ensure that the Copermittees have the necessary storm water management programs and controls in place, and that they are modified by the Copermittees in a timely fashion when necessary, so that compliance with Provisions A.1.a, A.1.c, and/or A.2.a is achieved as soon as possible. USEPA expressed the importance of this independent applicability in a series of comment letters on MS4 permits proposed by various Regional Water Boards. At that time, USEPA expressly objected to certain MS4 permits that included language stating, *"permittees will not be in violation of this [receiving water limitation] provision … [if certain steps are taken to evaluate and improve the effectiveness of the jurisdictional runoff management programs],"* concluding that this phrase would not comply with the CWA.[21]

The Ninth Circuit held in *Natural Resources Defense Council v. County of Los Angeles* (2011) 673 F3d. 880, 886 (revd. on other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013))) that engagement in the iterative process does not provide a safe harbor from liability for violations of permit terms prohibiting exceedances of water quality standards. The Ninth Circuit holding is consistent with the position of the State and Regional Water Boards that exceedances of water quality standards in an MS4 permit constitute violations of permit terms subject to enforcement by the Water Boards or through a citizen suit. While the Water Boards have generally directed dischargers to achieve compliance by improving control measures through the iterative process, the San Diego Water Board retains the discretion to take other appropriate enforcement and the iterative process does not shield dischargers from citizen suits under the CWA.

The requirements of Provision A.4, therefore, are required to be implemented until the water quality standards expressed under Provisions A.1.a, A.1.c, and A.2.a are achieved. The CWA requires MS4 permits to "*require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." The requirements of this Order have been deemed or determined to be "appropriate" to achieve water quality standards in receiving waters.

Part of the "*controls*" required by the Order is the process described in Provision A.4. Provision A.4 includes the process that is ultimately expected to achieve compliance with the requirement that discharges from the MS4 do not cause or contribute to violations of water quality standards in the receiving waters. The implementation of Provision A.4 is required when the Copermittees or the San Diego Water Board have

[21] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.

determined that discharges from the MS4 are causing or contributing to violations of water quality standards in the receiving waters.

The Copermittees must effectively prohibit non-storm water discharges into the MS4s, reduce the discharge of pollutants in storm water from the MS4s to the MEP, and ensure that their MS4 discharges do not cause or contribute to violations of water quality standards. If the Copermittees have effectively prohibited non-storm water discharges and reduced storm water pollutant discharges to the MEP, but their discharges are still causing or contributing to violations of water quality standards, Provision A.4 provides a clear "iterative process" for the Copermittees to follow.

Provision A.4 essentially requires the Copermittees to implement additional BMPs until MS4 discharges no longer cause or contribute to a violation of water quality standards.

In assessing compliance and potential enforcement actions, the San Diego Water Board looks at the Copermittees' efforts in total to meet the requirements of Provisions A.1.a, A.1.c, A.2.a and Provision A.4. The Copermittees need to demonstrate that they are making improvements to their programs and making progress toward achieving the discharge prohibitions and receiving water limitations in Provisions A.1.a, A.1.c, and A.2.a by implementing the requirements of Provision A.4. The San Diego Water Board would consider these efforts prior to strictly enforcing the requirements of Provisions A.1.a, A.1.c, and A.2.a. Causes of exceedances of the receiving water limitations can often be more difficult to identify and attribute solely to the Copermittees' MS4s. The intent of the Order is to provide the Copermittees more clarity and flexibility in addressing these exceedances through the iterative approach and adaptive management process until the requirements under Provisions A.1.a, A.1.c, and A.2.a are fully achieved.

An exception to the iterative approach and adaptive management process would be in receiving waters subject to adopted and approved TMDLs. For TMDLs that are incorporated into the Order, there is a specific date for compliance to be achieved, after which the iterative approach and adaptive management process required under Provision A.4 no longer provides the flexibility to achieve compliance. Where compliance dates for a TMDL have passed, compliance with the WQBELs incorporated into the Order established by a TMDL in Attachment E to protect water quality standards is required. Thus, after the interim or final compliance dates for a TMDL have passed, if the discharges from the Copermittees' MS4s are causing or contributing to a violation of WQBELs, exceedances of WQBELs must be strictly enforced by the San Diego Water Board. In the meantime, however, the Copermittees are in compliance with the interim or final TMDL requirements in Attachment E as long as the interim or final WQBELs are being achieved in accordance with the interim or final compliance dates.

B. Water Quality Improvement Plans

Purpose: Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges to the MS4s and control pollutants in storm water discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the Clean Water Act.

Provision B includes requirements for the Copermittees to develop and implement Water Quality Improvement Plans to ultimately comply with the prohibitions and limitations under Provision A. The Water Quality Improvement Plans will provide the Copermittees a comprehensive program that can achieve the requirements and further the objectives of the CWA. Implementation of the Water Quality Improvement Plans will also improve the quality of the receiving waters in the San Diego Region.

The Water Quality Improvement Plan is the backbone of the Regional MS4 Permit requirements. Provision B provides the guidance, criteria, and minimum expectations and requirements for the elements of the Water Quality Improvement Plan to be developed and implemented by the Copermittees. The Water Quality Improvement Plans will be implemented in the Watershed Management Area by the Copermittees within their jurisdictions through their jurisdictional runoff management programs.

The Water Quality Improvement Plan also incorporates a program to monitor and assess the progress of the Copermittees' jurisdictional runoff management programs toward improving the quality of discharges from the MS4s, as well as tracking improvements to the quality of receiving waters. A process to adapt and improve the effectiveness of the Water Quality Improvement Plans has also been incorporated into the requirements of Provision B to be consistent with the "iterative approach" required to achieve compliance with discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a, pursuant to the requirements of Provision A.4.

The Water Quality Improvement Plans have also been structured to incorporate the requirements of any TMDLs that have been adopted for the San Diego Region. Incorporating the requirements of the TMDLs into the requirements of Provision B allows the Copermittees to develop a single plan, instead of separate plans, to coordinate their non-storm water and storm water runoff management programs. The Water Quality Improvement Plans allow the Copermittees to meet the requirements of this Order, as well as fulfill the requirements of the TMDLs.

As an added benefit, if the Copermittees demonstrate that impaired water bodies within the Watershed Management Area listed on the 303(d) List will be addressed with their Water Quality Improvement Plans in a reasonable period of time, the San Diego Water Board may be able to remove the water bodies from the 303(d) List, which would greatly reduce the need for the San Diego Water Board to develop additional TMDLs that would have to be incorporated into the Order and implemented by the Copermittees.

***Discussion*:** The federal NPDES regulations require the Copermittees to develop a proposed management program (40 CFR 122.26(d)(2)(iv)). The proposed management program must include "*a comprehensive planning process*" and "*where necessary intergovernmental coordination*" for the "*duration of the permit.*" The Water Quality Improvement Plan is the Copermittees' "*comprehensive planning process*" document for the proposed management program that will be implemented within a Watershed Management Area. Implementation of the Water Quality Improvement Plan requires "*intergovernmental coordination*" among the Copermittees for at least the "*duration of the permit*," and likely into and beyond the next iteration of the permit.

Developing Water Quality Improvement Plans based upon watersheds is consistent with federal regulations that support the development of permit conditions, as well as implementation of storm water management programs, at a watershed scale (40 CFR 122.26(a)(3)(ii), 122.26(a)(3)(v), and 122.26(d)(2)(iv)). In 2003, USEPA issued a Watershed-Based NPDES Permitting Policy Statement (USEPA, 2003) that defines watershed-based permitting as an approach that produces NPDES permits that are issued to point sources on a geographic or watershed basis. In this policy statement, USEPA explains that "*[t]he utility of this tool relies heavily on a detailed, integrated, and inclusive watershed planning process*." USEPA identifies a number of important benefits of watershed permitting, including more environmentally effective results, the ability to emphasize measuring the effectiveness of targeted actions on improvements in water quality, reduced cost of improving the quality of the nation's waters and more effective implementation of watershed plans, including TMDLs, among others.

An emphasis on watersheds is appropriate at this stage in the San Diego Region's MS4 program to shift the focus to more targeted, water quality driven planning and implementation. Addressing discharges on a watershed scale focuses on water quality results by emphasizing the receiving waters in the watershed. The conditions of the receiving waters drive management actions, which in turn focus measures to address pollutant contributions from MS4 discharges.

The Water Quality Improvement Plan gives the Copermittees the responsibility of developing a comprehensive plan to coordinate the efforts of their jurisdictional runoff management programs for addressing the problems related to MS4 discharges causing impacts to water quality in the Watershed Management Area. The development of the plan provides the Copermittees the opportunity to provide

significant input on how to implement their jurisdictional runoff management programs, and how to best utilize their available resources in addressing a focused set of priorities that they believe will result in measureable improvements to water quality within the Watershed Management Area.

The Copermittees are encouraged to separate the Watershed Management Area into subwatersheds, as appropriate. This allows the Copermittees to identify priorities applicable to a subset of the Copermittees or specific water bodies or areas within the Watershed Management Area.

Included in the requirements for the elements to be included in the Water Quality Improvement Plan are monitoring and assessment requirements that are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order. In addition to the federal requirements of the CWA section 308(a) and 40 CFR 122.26(d), the San Diego Water Board has the authority to establish monitoring, reporting, and recordkeeping requirements for NPDES permits under CWC 13383.

More specific and detailed discussions of the requirements of Provision B are provided below.

Provision B.1 (Watershed Management Areas) requires the Copermittees to develop a Water Quality Improvement Plan for each of the Watershed Management Areas defined by the San Diego Water Board.

Pursuant to 40 CFR 122.26(d)(2)(iv), proposed management programs "*may impose controls on a…watershed basis…*" The Water Quality Improvement Plan is the Copermittees' proposed management program. A Water Quality Improvement Plan must be developed for each Watershed Management Area identified in the Order.

The Watershed Management Areas are identified in Table B-1. Table B-1 establishes ten (10) Watershed Management Areas, and identifies the Copermittees that are responsible for developing and implementing the Water Quality Improvement Plan for each Watershed Management Area.

The Copermittees from each of the three counties within the San Diego Region are expected to be phased in as their respective NPDES municipal storm water permits expire. Because Order No. R9-2007-0001 expired in January 2012, the San Diego County Copermittees ~~are~~were covered under the Regional MS4 Permit on June 27, 2013, the effective date of the Order. Because Order No. R9-2009-0002 expired in December 2014, the Orange County Copermittees are covered under the Regional MS4 Permit on April 1, 2015, the effective date of Order No. R9-2013-0001 as amended by Order No. R9-2015-0001.

After the San Diego Water Board receives and considers the Report~~s~~ of Waste

Discharge required to be submitted by the ~~Orange County Copermittees and~~ Riverside County Copermittees pursuant to the requirements of their current permit~~s~~, and makes any necessary changes to the Order, the ~~Orange County Copermittees and~~ Riverside County Copermittees will be covered under the Regional MS4 Permit after ~~Order No. R9-2009-0002 expires in November 2014, and~~ Order No. R9-2010-0016 expires in December 2015~~, respectively~~.

The ~~Orange County Copermittees and~~ Riverside County Copermittees also have the option to obtain coverage under the Regional MS4 Permit earlier than their respective permit expiration dates. The process to apply for early coverage is described Provision F.6.

Because the Santa Margarita River Watershed Management Area includes Copermittees from both San Diego County and Riverside County, a footnote to Table B-1 has been included to specify that the requirements of Provision B are not required to be implemented by the County of San Diego until the Riverside County Copermittees have received a notice of coverage under the Order. Until the Riverside County Copermittees are notified of coverage under the Order, the County of San Diego is subject to the prohibitions and limitations under Provision A, responsible for continuing to implement its existing jurisdictional runoff management program, and responsible for implementing the transitional monitoring and assessment requirements of Provision D, the transitional annual reporting requirements of Provision F.3.b, and the TMDL requirements of Attachment E to the Order.

The City of Laguna Woods and Laguna Hills are located partially within the jurisdictions of both the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board) and the San Diego Water Board. Written requests for designation of a single Regional Water Board to regulate matters pertaining to permitting of Phase I MS4 discharges were submitted to the San Diego Water Board and the Santa Ana Water Board by the City of Laguna Woods by letter dated September 8, 2014, and the City of Laguna Hills by letter dated March 12, 2014. The Cities of Laguna Woods and Laguna Hills requested designation of the San Diego Water Board pursuant to CWC section 13228. The Cities of Laguna Woods and Laguna Hills reported that management and implementation of municipal programs to comply with two different Phase I MS4 permits creates a significant administrative and financial burden and inhibits their ability to contribute to greater overall water quality improvements in either Region. In an effort to address these concerns, the San Diego Water Board and the Santa Ana Water Board have entered into an agreement whereby the San Diego Water Board is designated to regulate Phase I MS4 discharges within the jurisdiction of the Cities of Laguna Woods and Laguna Hills. Under the terms of the agreement, each Regional Water Board retains the authority to enforce provisions of the Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee (Water Code section 13228 (b)). Also under the terms of the agreement, any TMDL and associated MS4 permit requirements issued by the San

Diego Water Board or the Santa Ana Water Board which include the Cities of Laguna Woods or Laguna Hills as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement of the applicable TMDL would remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Boards' San Diego Creek/Newport Bay TMDL and the San Diego Water Boards indicator Bacteria Project I Beaches and Creeks TMDL. In conformance with this agreement, a footnote to Table B-1 has been included to specify coverage under Order No. R9-2013-0001 for those Phase I MS4 discharges within the jurisdictional boundaries of the Cities of Laguna Woods and Laguna Hills. The footnote specifies that the City of Laguna Woods and Laguna Hills are identified as responsible Copermittees in the San Diego Creek/Newport Bay TMDL in the Santa Ana Region and remain obligated to comply with the San Diego Creek/Newport Bay TMDL pursuant to section XVIII of Order No. R8-2014-0002 (NPDES No. CAS618030) and any reissuance thereto.

The City of Lake Forest is located partially within the jurisdictions of both the Santa Ana Water Board and the San Diego Water Board. By letter dated April 4, 2014 the City of Lake Forest submitted a written request, pursuant to CWC section 13228, to the San Diego Water Board and the Santa Ana Water Board requesting the Santa Ana Water Board be designated to regulate matters within the City of Lake Forest pertaining to permitting of their Phase I MS4 discharges. The City of Lake Forest reported that management and implementation of municipal programs to comply with two different Phase I MS4 permits creates a significant administrative and financial burden and inhibits their ability to contribute to greater overall water quality improvements in either Region. In an effort to address these concerns, the San Diego Water Board and the Santa Ana Water Board have entered into an agreement whereby the Santa Ana Water Board is designated to regulate Phase I MS4 discharges within the jurisdiction of the City of Lake Forest. Under the terms of the agreement, each Regional Water Board retains the authority to enforce provisions of the Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee (Water Code section 13228 (b)). Also under the terms of the agreement, any TMDL and associated Phase I MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the City of Lake Forest as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement authority for the applicable TMDL would remain with the Regional Water Board which has the jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Boards' San Diego Creek/Newport Bay TMDL and the San Diego Water Boards' indicator Bacteria Project I Beaches and Creeks TMDL. In conformance with this agreement, , a footnote to Table B-1 has been included to specify that Phase I MS4 discharges within the jurisdictional boundaries of the City of Lake Forest will be regulated under Santa Ana Water Board Order No. R8-2014-0002 (NPDES No. CAS618030) and any reissuance thereto. The footnote specifies that the

City of Lake Forest is an identified responsible Copermittee in the Indicator Bacteria Project I Beaches and Creeks TMDL (Bacteria TMDL) in the San Diego Region and remains obligated to comply with the Bacteria TMDL pursuant to Attachment E of Order No. R9-2013-0001 and any reissuance thereto. The City is also identified as a responsible Copermittee in the San Diego Creek/Newport Bay TMDL established by the Santa Ana Water Board. The City remains obligated to comply with the San Diego Creek/New Port Bay TMDL pursuant to section XVIII of Order No. R8-2014-0002 (NPDES No. CAS618030) and any reissuance thereto. The footnote also provides that the City of Lake Forest must retain and continue implementation of the over irrigation prohibition in Title 15, Chapter 15, Section 14.030, List (b) of the City Municipal Code throughout its jurisdiction. The footnote further provides that the City of Lake Forest must actively participate in the development and implementation of the Aliso Creek Watershed Management Area Water Quality Improvement Plan required pursuant to Order No. R9-2013-0001, and any reissuance thereto.

The basis supporting the Cities of Laguna Woods, Laguna Hills, and Lake Forest requests to designate a specific Regional Water Board for regulatory oversight of Phase I MS4 discharges may change under future conditions and circumstances, therefore the San Diego Water Board will periodically review the effectiveness of the agreement during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate the agreement with the Santa Ana Water Board or otherwise modify the agreement subject to the approval of the Santa Ana Water Board.

Provision B.2 (Priority Water Quality Conditions) requires the Copermittees in each Watershed Management Area to identify the highest priority water quality conditions which will be the focus of the Water Quality Improvement Plan implementation.

Provisions B.2.a and B.2.b provide the criteria that must be assessed when characterizing the receiving water quality and potential impacts from MS4 discharges of the receiving waters within the Watershed Management Area. The criteria are based primarily on the requirements in 40 CFR 122.26(d)(1)(iv)(C) and (C)(1)-(9). Characterizing the receiving water quality and identifying the potential impacts caused by MS4 discharges to receiving waters in the Watershed Management Area is necessary to identify the impacts to receiving waters associated with MS4 discharges that are of the most concern to the Copermittees.

Based on the information required to be considered under Provisions B.2.a and B.2.b, Provision B.2.c requires to Copermittees to identify the highest priority water quality conditions related to discharges from the MS4s that will be the primary focus of the Water Quality Improvement Plan in the Watershed Management Area. Addressing and improving these highest priority water quality conditions will become the focus of each Copermittee's jurisdictional runoff management program as the Water Quality Improvement Plan is implemented in the Watershed Management Area. The highest priority water quality conditions are expected to include source of pollutants and/or

stressors, and/or receiving water conditions, that the Copermittees consider the highest threats or most likely to have adverse impacts on the physical, chemical, and biological integrity of receiving waters. Addressing these threats and/or adverse impacts should restore the physical, chemical, and biological integrity of receiving waters, and result in the restoration and protection of the beneficial uses of the receiving waters in the Watershed Management Area.

Provision B.2.d requires the Copermittees to identify known and suspected sources of pollutants and/or stressors contributing to the highest priority water quality conditions. The requirements of Provision B.2.d are based primarily on the requirements in 40 CFR 122.26(d)(1)(iii)(B)(1)-(6). The Copermittees are required to evaluate several factors in the identification of those sources. The Copermittees must consider and evaluate the following: (1) the land uses that may contribute toward impacts to receiving waters, (2) the locations of the Copermittees' MS4s that can convey and discharge runoff and pollutants to receiving waters, (3) other sources that discharge into the Copermittees' MS4s and receiving waters, and (4) other information and data that can help the Copermittees to evaluate the relative importance of or contribution from those sources toward the highest priority water quality conditions. Identifying the known and suspected sources, and their relative contribution toward the highest priority water quality conditions, will help the Copermittees to focus, direct, and prioritize their resources and implementation efforts within their jurisdictions.

Provision B.2.e requires the Copermittees to identify potential strategies that can result in improvements to water quality in MS4 discharges and/or receiving waters within the Watershed Management Area. Potential water quality improvement strategies will not necessarily be implemented by the Copermittees, but provide a "menu" of options that the Copermittees will consider for implementation. The public participation process that will be implemented during the development of the Water Quality Improvement Plan is where the potential water quality improvement strategies will be identified.

Provision B.3 (Water Quality Improvement Goals, Strategies and Schedules) requires the Copermittees in each Watershed Management Area to identify the goals that the Copermittees' jurisdictional runoff management programs will work toward achieving to address and improve the highest priority water quality conditions identified under Provision B.2.c; the strategies that will be implemented by the Copermittees within their jurisdictions and the Watershed Management Area to achieve the goals; and, the schedules for implementing the strategies and achieving the goals. The element of the Water Quality Improvement Plan required under Provision B.3 is where the "*comprehensive planning*" and "*intergovernmental coordination*" [40 CFR 122.26(d)(2)(iv)] of the Copermittees' actions for the proposed management programs within the Watershed Management Area is required to be described.

Provision B.3.a requires the Copermittees to identify interim and final numeric goals, and schedules to achieve those goals as part of the Water Quality Improvement Plans. Provision B.3.a.(1) requires the Copermittees to identify two types of numeric goals to be achieved:

(1) Final numeric goals in the receiving waters and/or MS4 discharges that will result in the protection of the water quality standards of the receiving waters for the highest priority water quality conditions identified by the Copermittees for Provision B.2.c. These final numeric goals are the ultimate goals for the Water Quality Improvement Plan, and the achievement and maintenance of these final numeric goals will indicate that one or more beneficial uses have been successfully restored and/or protected from MS4 discharges.

(2) Interim numeric goals that can be used by the Copermittees to demonstrate progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges for the highest priority water quality conditions in the Watershed Management Area. Achievement of the interim numeric goals will demonstrate to the San Diego Water Board that the Copermittees' implementation efforts are progressing toward achieving the final numeric goals.

Provision B.3.a.(1) does not specify what the interim and final numeric goals must be based on, but they essentially must be designed to achieve compliance with water quality standards in the receiving waters. To that end, the interim goals must be based on measureable criteria or indicators capable of demonstrating progress toward achieving the numeric goals."

The interim and final numeric goals can be based on the water quality objectives in the Basin Plan. The water quality objectives in the Basin Plan, however, consist of numeric and narrative water quality objectives. Numeric water quality objectives can be directly used as numeric goals. Narrative water quality objectives, on the other hand, will require some interpretation to identify numeric goals. The achievement of multiple numeric goals based on the water quality objectives, used in combination, may be necessary to demonstrate that beneficial uses have been restored and/or protected.

The Copermittees could also propose other numeric goals that are not necessarily water quality objectives from the Basin Plan. For example, the Copermittees could propose a numeric goal that consists of achieving some percent improvement of a measureable indicator, such as acreage of a specific habitat or increase in a specific plant or animal species population. Other examples may include pollutant load reductions, number of impaired waterbodies delisted from the List of Water Quality Impaired Segments, Index of Biological Integrity (IBI) scores, etc.

The Copermittees may choose to develop interim numeric goals based on the final numeric goals they develop, such as incremental steps toward ultimately achieving the final numeric goals. The Copermittees may also choose to develop interim numeric goals that are based on other measureable indicators that can indirectly indicate improvements and progress toward the final numeric goals.

There are no limits to the types of interim numeric goals that could be proposed by the Copermittees, other than the goals must be based on measureable criteria or indicators capable of demonstrating progress toward achieving the numeric goals. Likewise, there are no limits to the types of final numeric goals that could be proposed by the Copermittees, other than the goals must "*restore and protect the water quality standards of the receiving waters.*"

Finally, Provision B.3.a.(2) also requires the Copermittees to develop schedules for measuring progress and achieving the interim and final numeric goals. Several criteria are included for the development of the schedules, but the Copermittees are required to achieve the numeric goals as soon as possible, consistent with federal NPDES regulations (40 CFR 122.47(a)(1)).

The Copermittees are also required to incorporate any compliance schedules for any applicable ASBS or TMDL requirements. Applicable ASBS and TMDL compliance schedules are set forth in Attachment A and Attachment E to the Order, respectively. The information provided by the Copermittees under Provision B.3.a.(2) will be used by the Copermittees and the San Diego Water Board to gauge and track the progress of the Copermittees' efforts in addressing the highest priority water quality conditions identified in the Water Quality Improvement Plan.

Provision B.3.b requires the Copermittees to identify the strategies and schedules to implement those strategies as part of the Water Quality Improvement Plans. Provision B.3.b requires the Copermittees to identify the water quality improvement strategies that will be and may be implemented within the Watershed Management Area to 1) reduce of pollutants in storm water discharged from the MS4 to the MEP, 2) effectively prohibit non-storm water discharges from entering the MS4, 3) protect water quality standards in receiving waters by controlling MS4 discharges so that they do not cause or contribute to exceedances of receiving water limitations, and 4) achieve applicable WQBELs that implement TMDLs. The Copermittees will select the strategies to be implemented based on the likely effectiveness and efficiency of the potential water quality improvement strategies identified under Provision B.2.e to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, and/or achieve the interim and final numeric goals identified under Provision B.3.a.

Provision B.3.b.(1) requires each Copermittee to identify the strategies that will be or may be implemented within its jurisdiction. Each Copermittee is required to describe the strategies it is committed to implementing as part of its jurisdictional runoff management requirements under Provisions E.2 through E.7, and the optional jurisdictional strategies that the Copermittee will implement, as necessary, to achieve the numeric goals.

Each Copermittee is expected to implement the optional jurisdictional strategies identified under Provisions B.3.b.(1)(b) when the jurisdictional strategies it has

committed to implement under Provision B.3.b.(1)(a) are not making adequate progress toward the interim and final numeric goals in accordance with the schedules established under Provision B.3.a. Provision B.3.b.(1)(b)(v) requires each Copermittee to describe the circumstances necessary to trigger implementation of the optional jurisdictional strategies, in addition to the requirements of Provisions B.3.b.(1)(a).

The San Diego Water Board recognizes that there may be optional jurisdictional strategies that will likely require funding and/or resources for planning, permitting, procurement of labor and materials, and implementation. Thus, Provision B.3.b.(1)(b)(iv) requires each Copermittee to describe the funding and/or resources that are necessary to implement these optional jurisdictional strategies. This information may provide interested groups and members of the public an understanding of the resources that they could provide or assist in obtaining to implement these optional jurisdictional strategies.

Provision B.3.b.(2) requires the Copermittees in the Watershed Management Area to identify the regional or multi-jurisdictional strategies that may be implemented, as necessary, to achieve the numeric goals. Similar to the requirements of Provision B.3.b.(1)(b), these regional or multi-jurisdictional strategies will likely require funding and/or resources for planning, permitting, procurement of labor and materials, and implementation, and San Diego Water Board recognizes that these strategies may be difficult to implement with only Copermittee resources. Thus, Provision B.3.b.(2)(d) requires the Copermittees to describe the funding and/or resources necessary to implement these optional regional or multi-jurisdictional strategies. This information may provide interested groups and members of the public an understanding of the resources that they could provide or assist in obtaining to implement these optional regional or multi-jurisdictional strategies.

Provision B.3.b.(3) requires the Copermittees to develop and include schedules in the Water Quality Improvement Plan for implementing the water quality improvement strategies identified under Provisions B.3.b.(1) and B.3.b.(2). The schedule for implementing the water quality improvement strategies will be used by the Copermittees and San Diego Water Board to measure and demonstrate the progress of the Copermittees' implementation efforts toward reducing pollutants in storm water discharged from the MS4 to the MEP, and eliminating illicit non-storm water discharges from entering the MS4.

Provision B.3.b.(4) provides the Copermittees in each Watershed Management Area the option of implementing watershed-specific structural BMP requirements for Priority Development Projects. Historically, storm water permits have included very specific performance standards for permanent, structural BMPs. These standards describe the expectation for the capture or treatment of pollutants and control of excessive flow before storm water is discharged from a site. The Copermittees were also allowed to develop waiver programs for Priority Development Projects to avoid implementing the

structural BMPs; however, the waiver programs were not necessarily tied into any sort of holistic watershed strategy. The result is that implementation of BMP requirements is largely done on a site-by-site basis. This requires proper design on the part of the Priority Development Project and strict oversight on the part of the Copermittee.

Provision B.3.b.(4) promotes the evaluation of multiple strategies for water quality improvement, in addition to the implementation of permanent structural BMPs, on a watershed-scale versus the site-by-site approach. In a report issued by the Southern California Coastal Water Research Project (SCCWRP) and several other research institutions, the report emphasized that a successful hydromodification management program will involve watershed analysis as a first step, and that integrating multiple watershed-based strategies is preferable over a site-by-site approach. Indeed, the report states that the watershed analysis "…*should lead to identification of existing opportunities and constraints that can be used to help prioritize areas of greater concern, areas of restoration potential, infrastructure constraints, and pathways for potential cumulative effects*."[22] Provision B.3.b.(4) promotes the findings and recommendations of the report by providing a pathway for Copermittees to develop an integrated approach to their land development programs.

Under Provision B.3.b.(4), the Copermittees in a Watershed Management Area must first perform an analysis by gathering as much information pertaining to the physical characteristics of the Watershed Management Area as possible. This includes, for example, identifying potential areas of coarse sediment supply, present and anticipated future land uses, and locations of physical structures within receiving streams and upland areas that affect the watershed hydrology (such as bridges, culverts, and flood management basins). Once this information is collected, the Copermittees must produce GIS layers (maps) that include this information.

From there, the Copermittees must use the results of the Watershed Management Area Analysis to identify and compile a list of candidate projects that could potentially be used as alternative compliance options for Priority Development Projects. Such projects include, for example, opportunities for stream or riparian area rehabilitation, opportunities for retrofitting existing infrastructure to incorporate storm water retention or treatment, and opportunities for regional BMPs, among others. Once these candidate projects are identified, Copermittees may allow Priority Development Projects to fund, partially fund, or completely implement these candidate projects. The Copermittees must first find that implementing such a candidate project would provide greater overall benefit to the watershed than requiring implementation of the structural BMPs onsite, and also enter into a voluntary agreement with the Priority Development Project that authorizes this arrangement. The Copermittees may use Provision B.3.b.(4) as both 1) a mechanism to reach their stated goals of the Water Quality Improvement Plan by using Priority Development Projects to either fund or implement

[22] 2012. ED Stein, F Federico, DB Booth, BP Bledsoe, C Bowles, Z Rubin, GM Kondolf, A Sengupta. Technical Report 667. Southern California Coastal Water Research Project. Costa Mesa, CA.

projects that will provide water quality benefit, and 2) an alternative to requiring strict adherence to the structural BMP design standards.

Additionally, Provision B.3.b.(4) allows the Copermittees to use the results of the Watershed Management Area Analysis to identify areas within the Watershed Management Area where it is appropriate to allow Priority Development Projects to be exempt from the hydromodification management BMP performance requirements. Provision E.3.c.(2) already allows exemptions for Priority Development Projects that discharge to a conveyance channel whose bed and bank are concrete lined from the point of discharge to an enclosed embayment or the Pacific Ocean. However, there may be cases where further exemptions are warranted. The Copermittees may identify such cases on a watershed basis and include them in the Watershed Management Area Analysis; however, they must provide the supporting rationale to support all claims for exemptions.

Provision B.3.b.(4) provides an innovative pathway for Copermittees to regulate their land development programs by allowing alternative compliance in lieu of implementing structural BMPs on each and every Priority Development Project. This approach facilitates the integration of watershed-scale solutions for improving overall water quality and assisting Copermittees to achieve their stated goals of the Water Quality Improvement Plan. The San Diego Water Board understands, however, that undertaking this approach, which involves extensive planning, could be resource intensive for the Copermittees. Therefore, the Watershed Management Area Analysis is optional and not a requirement. The Copermittees can choose not to perform the watershed planning and mapping exercise described in Provision B.3.b.(4), and instead choose to require strict implementation of the structural BMPs onsite, pursuant to Provision E.3.b.

Provision B.4 (Water Quality Improvement Monitoring and Assessment) requires the Copermittees to develop an integrated monitoring and assessment program to track the progress of the Water Quality Improvement Plan toward meeting the implementation goals and schedules, and improving the water quality of the Watershed Management Area. Provision B.4 is the part of the Water Quality Improvement Plan where the Copermittees describe the monitoring data that will be collected, which is not only necessary to implement the "iterative approach" required by Provision A.4, but inform the adaptive management and "*comprehensive planning process*" that allows the Copermittees to make adjustments and modifications to the Water Quality Improvement Plans and the jurisdictional runoff management programs.

Provision B.4 requires the Copermittees, at a minimum, to include the requirements of Provision D as part of the water quality improvement monitoring and assessment program for the Water Quality Improvement Plan. The Copermittees, however, are not limited to the requirements of Provision D and may include additional monitoring and assessment methods to track progress toward improving water quality in the Watershed Management Area.

In addition to incorporating the requirements of Provision D, the water quality improvement monitoring and assessment program must incorporate any monitoring and assessment requirements specified for any applicable TMDLs included in Attachment E to the Order, and the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 for Watershed Management Areas with ASBS.

The monitoring and assessments required to be incorporated into the Water Quality Improvement Plan are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order.

Provision B.5 (Iterative Approach and Adaptive Management Process) requires the Copermittees to implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a.

Provision B.5 requires the Copermittees in each Watershed Management Area to re-evaluate the highest priority water quality conditions and potential water quality improvement strategies, the water quality improvement goals, strategies and schedules, and the water quality improvement monitoring and assessment program and provide recommendations for modifying those elements to improve the effectiveness of the Water Quality Improvement Plan. The re-evaluation of the Water Quality Improvement Plan is part of the assessment requirements of Provision D.

Provision B.6 (Water Quality Improvement Plan Submittal, Updates, and Implementation) requires to Copermittees to submit, update, and implement the Water Quality Improvement Plans.

The requirements for the process to develop and submit the Water Quality Improvement Plans is described in more detail under the discussion for Provision F.1. The process will include several opportunities for the public to provide input during the development of the Water Quality Improvement Plans. The process for updating the Water Quality Improvement Plans is described in more detail under the discussion for Provision F.3.c. Upon acceptance of the Water Quality Improvement Plan and updates, the Copermittees are required to immediately begin implementing the Water Quality Improvement Plan and subsequent updates.

The Water Quality Improvement Plan is expected to be a dynamic document that will evolve over time. The Water Quality Improvement Plan is also expected to be a long term plan that focuses the Copermittees' efforts and resources on a limited set of priority water quality conditions, with the ultimate goal of protecting all the beneficial uses of the receiving waters within the Watershed Management Area from impacts that may be caused or contributed to by MS4 discharges. As the Copermittees collect data, implement their jurisdictional runoff management programs, and review the results from their water quality improvement monitoring and assessment program, the

Water Quality Improvement Plan is expected to be continually reviewed and updated until compliance with Provisions A.1.a, A.1.b, and A.2.a is achieved.

However, in specific cases supported by robust analytical documentation the implementation of the Water Quality Improvement Plans may demonstrate that TMDLs are not necessary for identified impaired water bodies within the Watershed Management Area if the analytical record demonstrates that technology-based effluent limitations required by the CWA, more stringent effluent limitations required by state, local, or federal authority, and/or other pollution control requirements (e.g., best management practices) required by local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time.[23]

The San Diego Water Board submits an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. According to USEPA guidance for the Integrated Report,[24] water bodies are placed in one of five categories. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 are placed on the 303(d) List.

Category 4 in the Integrated Report is for water bodies where available data and/or information indicate that at least one beneficial use is not being supported or is threatened, but a TMDL is not needed. [25] Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

Impaired water bodies can be included in Category 4a if a TMDL has been adopted and approved. The TMDLs in Attachment E to the Order implement the requirements of the TMDLs adopted by the San Diego Water Board, and approved by the State Water Board and USEPA. The water bodies in Attachment E will be included in Category 4a in the Integrated Report and removed from the 303(d) List.

Impaired water bodies can be included in Category 4b if there are *acceptable* "pollution control requirements" required by a local, state or federal authority stringent enough to implement applicable water quality standards within a reasonable period of time (e.g., a compliance date is set). When evaluating whether a particular set of

[23] 40 CFR 130.7(b)(1)
[24] USEPA, 2005. Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act
[25] Ibid

pollution controls are "requirements," the USEPA considers a number of factors, including: (1) the authority (local, state, federal) under which the controls are required and will be implemented with respect to sources contributing to the water quality impairment (examples may include: self-executing state or local regulations, permits, and contracts and grant/funding agreements that require implementation of necessary controls), (2) existing commitments made by the sources and completion or soon to be completed implementation of the controls (including an analysis of the amount of actual implementation that has already occurred), (3) the certainty of dedicated funding for the implementation of the controls, and (4) other relevant factors as determined by USEPA depending on case-specific circumstances.[26]

Impaired water bodies can be included in Category 4c if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution. Pollution, as defined by the CWA is "the man-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of water."[27] In other cases, pollution does not result from a pollutant and a TMDL is not required. Examples of circumstances where an impaired segment may be placed in Category 4c include segments impaired solely due to lack of adequate flow, stream channelization, or hydromodification. In these situations, there may be water quality management actions that can address the cause(s) of the impairment, but a TMDL may not be required to implement the actions.

The Water Quality Improvement Plans will require the implementation of pollution controls and water quality management actions (i.e. water quality improvement strategies) which can result in the attainment of water quality standards in water bodies impaired by discharges from the Copermittees' MS4s. The Water Quality Improvement Plans also include requirements that are expected to attain water quality standards in a reasonable period of time. The San Diego Water Board considers the Water Quality Improvement Plans to be a commitment by the Copermittees to develop, plan, budget for, and implement pollution controls that will attain water quality standards in receiving waters in a reasonable period of time, or as soon as possible. The results of the Copermittees' efforts in implementing the Water Quality Improvement Plans can be used to re-evaluate the condition of the impaired water bodies during the next update to the 303(d) List.

After the Copermittees submit the Water Quality Improvement Plans and demonstrate that water quality standards are being attained or will be attained in a reasonable period of time, the San Diego Water Board may re-evaluate the water bodies on the 303(d) List. These water bodies on the 303(d) List may be re-evaluated and placed into Category 4b or Category 4c in the Integrated Report. The water bodies placed in Category 4b or Category 4c in the Integrated Report must show a record that the

[26] Ibid
[27] CWA section 502(19)

water bodies are attaining water quality standards or supporting the identified beneficial uses, or will attain water quality standards or support identified beneficial uses in a reasonable period of time, in order for the water bodies to be appropriately removed from the 303(d) List.

C. Action Levels

Purpose: Provision C includes requirements for the Copermittees to identify and include numeric action levels in the Water Quality Improvement Plan to direct and focus the Copermittees' jurisdictional runoff management program implementation efforts for controlling MS4 discharges to receiving waters.

***Discussion*:** Under Provision C, the numeric action levels required are for non-storm water discharges and storm water discharges. The non-storm water action levels (NALs) are applicable to non-storm water discharges from the Copermittees' MS4s, which can occur year-round. The storm water action levels (SALs) are applicable to storm water discharges from the Copermittees' MS4s, which occur during the rainy season defined as the period between October 1 and April 30.

The action levels required by Provision C are based on the action level requirements that were developed and incorporated into Order Nos. R9-2009-0002 and R9-2010-0016, the Orange County and Riverside County MS4 Permits, respectively. The Fact Sheets for these Orders provide detailed discussions about the development of the numeric NALs and SALs included in this Order.

Order Nos. R9-2009-0002 and R9-2010-0016 required the Copermittees to perform prescribed actions if the NALs or SALs are exceeded. The actions required under Order Nos. R9-2009-0002 and R9-2010-0016 generally included conducting additional monitoring and source investigations when a discharge from the MS4 is observed to exceed one or more NALs and/or SALs.

For this Order, however, the action levels of Provision C are to be used by the Copermittees to prioritize the actions to be implemented as part of the Water Quality Improvement Plan. Monitoring data collected by the Copermittees from MS4 outfalls will be compared with the NALs and SALs. Exceedances of the NALs and SALs will not require the Copermittees to immediately identify sources causing exceedances, but will provide some numeric indicator levels that can give the Copermittees a way to measure the relative severity of a pollutant contributing to receiving water quality impacts.

NALs and SALs must be included in the Water Quality Improvement Plans to be used by the Copermittees in directing and focusing their water quality improvement strategies. The Copermittees are expected to utilize the NALs and SALs to help focus their implementation efforts on addressing pollutants that have the most significant potential or observed impacts to receiving waters. The NALs and SALs will be used as part of the MS4 discharges assessments required under Provision D.4.b. The NALs and SALs may also be used by the Copermittees as the numeric goals to be achieved in MS4 discharges and/or receiving waters as the Water Quality Improvement Plans are implemented.

More specific and detailed discussions of the requirements of Provision C are provided below.

Provision C.1 (Non-storm Water Action Levels) requires the Copermittees to incorporate NALs into the Water Quality Improvement Plan for pollutants and/or constituents that are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions identified in the Water Quality Improvement Plan related to non-storm water discharges from the MS4s. NALs generally must be consistent with the water quality objectives found within the Basin Plan.

The NALs have been included to ensure that the Copermittees are implementing and complying with several requirements of the MS4 permit. The federal CWA requires permits for municipal storm sewer systems to "*effectively prohibit non-storm water discharges into the storm sewers*." The federal NPDES regulations, which were promulgated to implement the CWA requirements for discharges from municipal storm sewers, require a program to address illicit discharges, which are non-storm water discharges. Provision A.1.b prohibits "*[n]on-storm water discharges into MS4s*" unless the non-storm water discharge authorized by a separate NPDES permit. The NALs will be used as part of the illicit discharge detection and elimination program required pursuant to Provision E.2, as well as part of the MS4 discharges assessments required pursuant to Provision D.4.b.

Provision A.1.a prohibits non-storm water discharges from the MS4 from "*causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state.*" In addition, pursuant to Provision A.2.a, non-storm water discharges "*must not cause or contribute to the violation of water quality standards in any receiving waters*."

Ideally, the Copermittees' jurisdictional runoff management programs will eliminate all non-storm water discharges entering the MS4s within their jurisdictions. The complete elimination of non-storm water discharges to the Copermittees' MS4s would be in compliance with the CWA requirements for non-storm water discharges, as well as the prohibitions and limitations of Provisions A.1.a and A.2.a.

The federal regulations, however, also refer to several non-storm water discharge categories that must be addressed as illicit discharges if they are found to be a source of pollutants. The federal regulations thus identify some non-storm water discharges that are not required to be addressed as illicit discharges if they are not a source of pollutants (e.g. non-storm water discharges specified in Provisions E.2.a.(1)-(5)). Thus, these regulations imply that some non-storm water discharges into and from the MS4 may occur even if non-storm water discharges are "effectively" prohibited by the Copermittees.

If the source of a non-storm water discharge is identified as a category of non-storm water specified in Provisions E.2.a.(1)-(5), the NALs can be used to determine the category of non-storm water discharges is a source of pollutants. For other non-storm water discharges not specified in Provisions E.2.a.(1)-(5), the CWA requires those discharges to be "*effectively"* prohibited by removing the discharge to the MS4 through enforcement of the Copermittees' legal authority established under "*ordinance, order or similar means*" to prohibit illicit discharges to the MS4s.

If there are non-storm water discharges that are not required to be addressed as illicit discharges, those discharges must comply, at a minimum, with the discharge prohibitions and receiving water limitations of Provision A. Thus, the non-storm water discharges from the MS4 must be at levels that will not cause or contribute to a condition of pollution, contamination, or nuisance (Provision A.1.a), and must not cause or contribute to a violation of water quality standards in receiving waters (Provision A.2.a) to be consistent with the discharge prohibitions and receiving water limitations of Provisions A.1.a and A.2.a.

Furthermore, the San Diego Region has predominantly intermittent and ephemeral rivers and streams which vary in flow volume and duration at spatial and temporal scales. For most of these river and stream systems, non-storm water discharges from the MS4 are likely to be the most significant or the only source contributing to surface flows present within the receiving water, especially during the dry season.

Therefore, because of the prohibitions and limitations of Provision A.1.a and A.2.a, and the likelihood that non-storm water discharges from the MS4 are the most significant or only source contributing to surface flows present within the receiving water, NALs generally must be consistent with the water quality objectives found within the Basin Plan. Non-storm water discharges that are meeting the NALs would not be expected to cause or contribute to an exceedance of water quality objectives in receiving waters, which would be consistent with the discharge prohibitions and receiving water limitations of Provisions A.1.a and A.2.a.

Exceedances of the NALs would then provide an indication of the relative severity of a pollutant in non-storm water discharges from the MS4 contributing to potential or observed receiving water quality impacts. The relative severity or significance of a pollutant in non-storm water discharges from the MS4 will provide the Copermittees a valuable source of information that can be used to identify priority water quality conditions within a Watershed Management Area and within each Copermittee's jurisdiction.

Tables C-1 through C-4 under Provision C.1.a specify numeric NALs for several parameters or pollutant constituents for non-storm water discharges from the MS4 to several water body types. The NALs for MS4 discharges given under Provision C.1.a are based on the water quality objectives for inland surface waters in the Basin Plan, and the water quality objectives for ocean waters in the Ocean Plan. The NALs for

most of the metals were calculated based on the State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP). The NALs provided in Tables C-1 through C-4 must be included in the Water Quality Improvement Plans required to be developed pursuant to Provision B.

Provision C.1.b requires the Copermittees to identify NALs for pollutants and/or constituents, not specified in Provision C.1.a, which are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions of the Watershed Management Area related to non-storm water discharges from the MS4s. The NALs must be based on the water quality objectives in the Basin Plan. The NALs identified under Provision C.1.b must be included in the Water Quality Improvement Plan.

The San Diego Water Board recognizes that some of the NALs required pursuant to Provisions C.1.a and C.1.b may be exceeded more frequently than not. Thus, Provision C.1.c has been included in the Order to provide the Copermittees the option to develop secondary NALs that are set at levels greater than the levels required pursuant to Provisions C.1.a and C.1.b to further refine the prioritization and assessment of water quality improvement strategies for addressing non-storm water discharges to and from the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and from the MS4.

Provision C.2 (Storm Water Action Levels) requires the Copermittees to incorporate SALs into the Water Quality Improvement Plan for pollutants and/or constituents causing or contributing, or may be causing or contributing, to the highest priority water quality conditions identified in the Water Quality Improvement Plan related to storm water discharges from the MS4s.

The SALs have been included to ensure that the Copermittees are implementing and complying with several requirements of the MS4 permit. Provision A.1.a prohibits storm water discharges from the MS4 from "*causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state.*" In addition, pursuant to Provision A.2.a, storm water discharges "*must not cause or contribute to the violation of water quality standards in any receiving waters*."

Provision A.3.a, however, implicitly acknowledges that compliance with Provisions A.1.a and A.2.a cannot be achieved immediately for discharges of storm water from the MS4 by applying the MEP standard. Thus, Provision A.4 requires the Copermittees to implement an iterative approach to demonstrate that MEP is being achieved. This approach is supported by USEPA.

The federal CWA requires permits for municipal storm sewer systems to "*require controls to reduce the discharge of pollutants [in storm water] to the maximum extent*

practicable, *including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants.*" MEP is an ever-evolving, flexible, and advancing concept. As knowledge about controlling storm water runoff and discharges evolves, so does the knowledge which constitutes MEP. Reducing the discharge of storm water pollutants from the MS4 to the MEP requires the Copermittees to assess their jurisdictional runoff management programs and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP. The SALs provide the Copermittees measureable goals that may be used to demonstrate the achievement of MEP for reducing pollutants in storm water discharges from the MS4. The SALs will be used as part of the MS4 discharges assessments required under Provision D.4.a.

In June of 2006, the State Water Board's Blue Ribbon Storm Water Panel released its report titled "*The Feasibility of Numerical Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities*." In the recommendations, the Blue Ribbon panel proposed storm water effluent limitations which are computed using statistical based population approaches. The SALs specified in Table C-5 under Provision C.2.a were developed from a regional subset of nationwide Phase I MS4 data by using USEPA Rain Zone 6 (arid west) data.[28] Additionally, utilization of regional data is appropriate due to the addition of data into the nationwide Phase I MS4 monitoring dataset in February 2008. This additional data increased the number of USEPA Rain Zone 6 samples to more than 400, and included additional monitoring events within Southern California.

Utilizing data from USEPA Rain Zone 6 resulted in SALs which closely reflect the environmental conditions experienced in the San Diego Region. The localized subset of data includes sampling events from multiple Southern California locations including Orange, San Diego, Riverside, Los Angeles, and San Bernardino Counties. The dataset includes samples taken from highly built-out impervious areas and from storm events representative of Southern California conditions.

The SALs for cadmium, copper, lead and zinc require the measurement of hardness and to provide more specificity in the assessment of samples with SALs for total metal concentrations. While USEPA Rain Zone 6 data include a large sample size for concentrations of total metals, the impact the concentration will have on receiving waters will vary with receiving water hardness. Since it is the goal of the SALs, through the iterative process and MEP standard, to have MS4 storm water discharges meet all applicable water quality objectives, the hardness of the receiving water should be used when assessing the total metal concentration of a sample.

Thus, when there is an exceedance of a SAL for a metal, the Copermittee must determine if that exceedance is above the existing applicable water quality objectives

[28] Data used to develop SAL were obtained from http://rpitt.eng.ua.edu/Research/ms4/mainms4.shtml

based upon the hardness of the receiving water. The water quality objectives Copermittees must use to assess total metal SAL exceedances are the California Toxic Rule (CTR) and USEPA National Recommended Water Quality Criteria for Freshwater Aquatic Life 1 hour maximum concentrations. The 1 hour maximum concentration is to be used for comparison since it is expected to most replicate the impacts to waters of the State from the first flush following a precipitation event.

The statistically calculated SALs given in Table C-5 are at levels greater than the water quality objectives in the Basin Plan or Ocean Plan. Because the objective of the CWA is to "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*", meaning eventually pollutants in storm water discharges must be reduced to a level that cannot cause or contribute to an exceedance of water quality objectives in receiving waters, over time the SALs are expected to be reduced to a level that is based on the water quality objectives rather than statistical calculations. The San Diego Water Board will review the SALs as more data for discharges of storm water from the MS4s are collected, and revise them as conditions improve and the MEP standard advances. For the Water Quality Improvement Plans required under this Order, the SALs identified under Provision C.2.a must be included.

Provision C.2.b requires the Copermittees to identify SALs for pollutants and/or constituents, not specified in Provision C.2.a, which are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions of the Watershed Management Area related to storm water discharges from the MS4s. The SALs identified under Provision C.2.b must be included in the Water Quality Improvement Plan.

The San Diego Water Board recognizes that some of the SALs required pursuant to Provisions C.2.a and C.2.b may be exceeded more frequently than not. Thus, Provision C.2.c has been included in the Order to provide the Copermittees the option to develop secondary SALs that are set at levels greater than the levels required pursuant to Provisions C.2.a and C.2.b to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s.

D. Monitoring and Assessment Program Requirements

Purpose: Provision D includes minimum monitoring and assessment requirements that must be developed and implemented by the Copermittees as part of the Water Quality Improvement Plans. Implementation of the monitoring and assessment requirements of Provision D will allow the Copermittees to demonstrate that the requirements of the CWA to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP are being achieved. Implementation of the monitoring and assessment requirements of Provision D will also allow the Copermittees and the San Diego Water Board to track improvements to the water quality in the San Diego Region. The monitoring and assessment program requirements are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order.

***Discussion*:** The San Diego Water Board recognized that changes to the monitoring and assessment requirements of the Fourth Term Permit were necessary to improve the usefulness and usability of monitoring data collected by the Copermittees to support their jurisdictional storm water programs more efficiently and with increased effectiveness. The data collected are needed to better inform the Copermittees' understanding of the physical, chemical, and biological condition of the receiving waters and the quality of the MS4 discharges. The monitoring program needs to provide opportunities for the Copermittees to integrate regional monitoring efforts into municipal storm water monitoring requirements to provide a cost-effective approach to monitoring and avoid duplication of efforts.

The requirements in Provision D were largely recommended by the Copermittees as an outcome of the San Diego Water Boards Focused Meeting process. The monitoring and assessment program requirements now require collection of more specific information necessary for each Copermittee to adapt its jurisdictional runoff management program in such a way that focuses resources on a watershed's highest priority water quality conditions. The monitoring and assessment program will require the Copermittees to collect data that can be utilized to answer both watershed level management questions (e.g. Are the chemical, physical, and biological conditions of a receiving water protective, or likely protective of beneficial uses?), and specific jurisdictional runoff management program activity questions (e.g. Are the water quality improvement strategies of the jurisdictional program effectively eliminating non-storm water discharges to the MS4?).

The monitoring data collected and assessment information that will be reported to the San Diego Water Board are necessary to determine if the Copermittees are complying with the prohibitions and limitations of Provision A. The required monitoring and assessments that must be reported to the San Diego Water Board will be utilized for three purposes:

(1) Inform the Copermittees, San Diego Water Board, and the public on the progress of the Copermittees' efforts to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP;

(2) Inform the Copermittees, San Diego Water Board, and the public on the condition of water bodies receiving discharges from the Copermittees' MS4, and the progress of the Copermittees' water quality improvement implementation efforts toward improving the receiving water quality; and

(3) Inform the Copermittees, the San Diego Water Board, and the public on the effectiveness of the Water Quality Improvement Plan toward achieving (1) and (2).

The monitoring and assessment information reported pursuant to Provision F is also expected to be key to the iterative approach and adaptive management process required under Provision A.4 and implemented through the Water Quality Improvement Plan required under Provision B. As required by Provision A.4, the iterative approach and adaptive management process is required if the Copermittees cannot meet the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c, and/or A.2.a under the present conditions.

Provision D provides the minimum monitoring and assessment requirements that must be included in each Water Quality Improvement Plan to be developed and implemented by the Copermittees. The Copermittees, however, are not limited to the requirements of Provision D and may include additional methods to track progress toward improving water quality in a Watershed Management Area.

More specific and detailed discussions of the requirements of Provision D are provided below.

Provision D.1 (Receiving Water Monitoring Requirements) specifies the minimum receiving water monitoring that the Copermittees must conduct within the Watershed Management Area and include as part of the Water Quality Improvement Plan.

Provision D.1 establishes minimum monitoring requirements that must be conducted by the Copermittees within each Watershed Management Area. Provision D.1 requires the Copermittees to collect and develop the data and information necessary to determine potential impacts to the beneficial uses in the receiving waters due to discharges from the MS4s. The monitoring required under Provision D.1 will also provide the data that will allow the Copermittees to gauge the effectiveness and progress of its Water Quality Improvement Plan implementation efforts toward improving the quality of receiving waters.

The receiving water monitoring requirements of Provision D.1 are focused primarily on monitoring the conditions and response of the receiving waters to the Copermittees' collective implementation efforts to reduce receiving water impacts that may be caused by the discharges from the MS4s. The preference of the San Diego Water Board is for the Copermittees to spend their resources achieving tangible and observable improvements in receiving water conditions instead of collecting samples and analyzing data that has consistently indicated that receiving water conditions are degraded and require improvement. In general, the ability to measure potential improvements in receiving water conditions due to any actions implemented by the Copermittees as part of the Water Quality Improvement Plan may require several years before a response can be observed. Thus, the frequency of collecting receiving water monitoring data has been kept to a minimum.

During the transitional period between adoption of this Order and San Diego Water Board acceptance of a Water Quality Improvement Plan, the Copermittees must conduct receiving water monitoring in accordance with Provision D.1.a. This approach to collecting receiving water data is different from what was required in the Fourth Term Permits, but one that truly embraces the concept of an integrated, cost-effective, streamlined receiving water monitoring approach.

Provision D.1.a requires Copermittees to continue performing the receiving water monitoring programs required in Order Nos. R-2007-0001, R9-2009-002, and R9-2010-0016; plus participation in: hydromodification management plan monitoring approved by the San Diego Water Board, monitoring plans as part of load reduction plans (either Bacteria Load Reduction Plans or Comprehensive Load Reduction Plans) for TMDLs in Attachment E of the Order, Storm Water Monitoring Coalition Regional Monitoring, Southern California Bight Regional Monitoring, Sediment Quality Monitoring, and ASBS Monitoring as applicable to a Watershed Management Area.

Provision D.1.a also provides an opportunity for the Copermittees to use third party data to meet receiving water monitoring requirements where feasible. Allowing the Copermittees to use the data currently collected through its participation in existing regional receiving water programs and that of third parties provides an efficiency of resources in obtaining the data necessary to inform the Copermittees and the San Diego Water Board about the physical, chemical, and biological conditions of the receiving waters, which can also help to focus the receiving water monitoring during the implementation of the Water Quality Improvement Plan. Once a Water Quality Improvement Plan is developed for a Watershed Management Area in compliance with Provision B of this Order, the transitional period is over and Copermittees are required to conduct receiving water monitoring according to the requirements of Provisions D.1.b-e.

Provision D.1.b requires each Copermittee to identify at least one long term receiving water monitoring station to be representative of receiving water quality within each Watershed Management Area. Long term receiving water monitoring stations can be

located at any existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees. The requirements under Provision D.1.b. are consistent with 40 CFR 122.26(d)(2)(iii)(D), which specifies that a "*monitoring program for representative data collection for the term of the permit*" may include "*instream locations.*" For each Watershed Management Area, at least one long term watershed monitoring station is required to be established and monitored. The Copermittees may choose to establish additional long term monitoring stations where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

Provision D.1.b. requires the Copermittees to locate the long term receiving water monitoring station at one of these existing receiving water monitoring stations to provide the Copermittees an opportunity to experience monitoring cost savings while continuing to collect the necessary data to assess the status and trends of receiving water quality conditions in 1) coastal water, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under both dry weather and wet weather conditions. Ideally these stations will continue to be monitored as part of the receiving water monitoring for each Watershed Management Area to maintain a consistent set of locations and a period of data that can be built upon with the monitoring required under this Order.

The receiving water monitoring requirements are separated into monitoring required during dry weather conditions pursuant to Provision D.1.c, and wet weather conditions pursuant to Provision D.1.d.

At each long term monitoring station the Copermittees must conduct at least three dry weather monitoring events as required pursuant to Provision D.1.c and at least three wet weather monitoring events as required pursuant to Provision D.1.d per permit term. Provisions D.1.c and D.1.d require the Copermittees to monitor priority water quality conditions identified in the Water Quality Improvement Plan, constituents listed as causing impairment of receiving waters in the Watershed Management Area, applicable NALs, toxicity, constituents listed in Tables D-2 and D-3, and constituents for implementation plans (e.g. Bacteria Load Reduction Plans and Comprehensive Load Reduction Plans). Required toxicity monitoring was changed to reflect an updated understanding of the unique challenges associated with sampling storm water for toxicity. Copermittees are required to sample storm water for toxicity during each dry weather and each wet weather event pursuant to Provision D.1.c.(4) and D.1.d.(4). Required toxicity monitoring is now consistent with the State Water Resources Control Board Policy for Toxicity Assessment and Control (Draft June 2012) and recently adopted MS4 permits for Caltrans and Los Angeles Water Board. Receiving water monitoring efforts in this Order have been streamlined to redirect resources to monitoring efforts that better support pollutant reduction solutions with an increasing emphasis on MS4 outfall monitoring, source identification and source abatement activities.

In addition to the receiving water monitoring requirements under Provisions D.1.b-d, Provision D.1.e requires the Copermittees participate in and/or conduct other types of receiving water monitoring. As recommended and requested by the Copermittees, Provision D.1.e.(1) requires the Copermittees to participate in existing regional monitoring, as applicable to each Watershed Management Area. Existing regional monitoring includes monitoring conducted by the Storm Water Monitoring Coalition and for the Southern California Bight. Participation in and use of monitoring data collected from these existing regional water quality monitoring programs provide the Copermittees a greater opportunity for efficiency in the use of their resources to manage their storm water programs and those controllable discharges under their authority. Provision D.1.e.(1)(c) requires the south Orange County MS4 Copermittees to participate in "unified regional beach water quality monitoring." This monitoring replaces requirements to conduct "core monitoring" of beach water quality, as provided for in Appendix III of the 2012 California Ocean Plan.

Several different public agencies currently conduct routine, ongoing beach water quality monitoring in south Orange County in accordance with several different sets of requirements. The monitoring programs implemented to meet those requirements overlap temporally and spatially. These monitoring programs are partially but not fully integrated. In November 2010, the State Water Board adopted Resolution No. 2010-0053, which directed regional water boards to work with dischargers to modify beach water quality monitoring programs required by regional board-issued permits in order to eliminate redundancies and incorporate beach water quality monitoring required by beach water quality statutes, where appropriate.

In April 2012, the San Diego Water Board requested that its staff review beach water quality monitoring conducted in south Orange County. To assist in responding to that request, staff of the Board convened a workgroup that included representatives of the three public agencies that currently conduct almost all of the routine, ongoing beach water quality monitoring in south Orange County, i.e., South Orange County Wastewater Authority (SOCWA), Orange County Public Works, and Orange County Health Care Agency (OCHCA). The workgroup also included other interested parties, including representatives of the Sierra Club and Surfrider Foundation. In December 2012, the San Diego Water Board adopted Resolution No. R9-2012-0069, which endorsed the San Diego Water Board staff report entitled "A Framework for Monitoring and Assessment in the San Diego Region," dated November 2012.

The unified program is consistent with and will meet or exceed the minimum requirements for beach water quality monitoring and related public notification and reporting established by State law, including the California Ocean Plan. The unified program is consistent with State Water Board Resolution No. 2010-0053. The unified program is also consistent with and will help implement, "A Framework for Monitoring and Assessment in the San Diego Region," which emphasizes the need for question-driven, beneficial use-oriented monitoring and assessment. The primary purpose of

the unified program will be to answer the question "Does beach water quality meet standards for the beneficial use of water contact recreation?"

The unified program is intended to be protective; it will help protect the health of swimmers, surfers, and others who use south Orange County beach waters for water contact recreational activities. The unified program is also intended to be reasonable; it will eliminate duplicative monitoring and will include triggers for public notification and additional sampling at all sampling stations year-round. The unified program is intended to be equitable; responsibility for implementation of the unified program will be shared and the responsible agencies will jointly make arrangements to implement the program and will have the flexibility to jointly make short and/or long term changes in those arrangements.

The San Diego Water Board Executive Officer has issued a written directive, pursuant to California Water Code sections 13225, 13267, and 13383, for SOCWA and the south Orange County MS4 Copermittees to implement the unified program in cooperation with OCHCA. The Executive Officer may make revisions to the unified program, provided that the unified program, as revised, continues to be consistent with and meet the requirements of State law, including the California Ocean Plan, for beach water quality monitoring and related public notification and reporting. Following a thirty day public comment period, and subject to a request for a hearing before the San Diego Water Board, any such revision shall take effect as specified in a written directive issued by the Executive Officer pursuant to California Water Code sections 13225, 13267, and/or 13383. The program and any Executive Officer issued revisions to the program are subject to California Water Code section 13320 right of review from the date of issuance.

The unified program will supersede the existing routine, ongoing, beach water quality monitoring programs in south Orange County that are conducted in accordance with the existing requirements of the NPDES permits for discharges from the SOCWA ocean outfalls and the south Orange County MS4s. The requirement to participate in "regional monitoring" of beach water quality replaces requirements to conduct "core monitoring" of beach water quality, as provided for in Appendix III of the 2012 California Ocean Plan.

The State Water Resources Control Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part 1 Sediment Quality which became effective August 25, 2009 (Sediment Quality Monitoring Policy). Provision D.1.e.(2) requires any Copermittees with MS4 discharges to an enclosed bay or estuary to monitoring the sediments in the enclosed bay or estuary receiving water in accordance with the sediment quality monitoring procedures as prescribed in the Sediment Quality Monitoring Policy.

The State Water Board adopted Resolution No. 2012-0012 which approved exceptions to the California Ocean Plan for selected discharges into Areas of Special Biological

Significance (ASBS), including special protections for beneficial uses. State Board Resolution No. 2012-0012 became effective on March 20, 2012, and Attachment B to the Resolution established limitations on point source storm water discharges to ASBS. Copermittees with MS4s that discharge to an ASBS must monitor its discharge to assure compliance with State Board Resolution No. 2012-0012 as required pursuant to Provision D.1.e.(3).

The San Diego Water Board is currently developing a regional monitoring strategy to assess the conditions of receiving waters in the San Diego Region. The monitoring requirements of Provision D.1 are expected to be incorporated or serve as a foundation of this regional monitoring strategy, but may require some modifications. When the San Diego Water Board develops an alternative regional monitoring strategy, the Copermittees will be required to participate in the development and implementation of the alternative regional monitoring program pursuant to Provision D.1.f.

Provision D.2 (MS4 Outfall Discharge Monitoring Requirements) specifies the minimum MS4 outfall discharge monitoring requirements that the Copermittees must incorporate and implement as part of the Water Quality Improvement Plan.

The dry weather MS4 outfall discharge monitoring requirements are included under Provisions D.2.a.(2) and D.2.b. The dry weather MS4 outfall discharge monitoring requirements are part of the "*program, including a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer*" required by 40 CFR 122.26(d)(2)(iv)(B), which is expected to achieve compliance with the CWA section 402(p)(3)(B)(ii) statutory requirement for municipal storm water permits to require the Copermittees to "*effectively prohibit non-storm water discharges into the storm sewers*." The dry weather MS4 outfall discharge monitoring data collection requirements are based on requirements under 40 CFR 122.26(d)(1)(iv)(D) and 122.26(d)(2)(iv)(B)(3).

The dry weather MS4 outfall discharge monitoring requirements are designed to provide wide spatial and temporal coverage of each jurisdiction to better understand the extent and magnitude of non-storm water discharges to receiving waters, and make a distinction between persistent and transient non-storm water flows. This information is expected to allow each Copermittee to focus its resources on eliminating and controlling the highest priority threats to receiving water quality, as well as integrating other elements of the storm water programs (e.g. complaint call response) and third party data to efficiently and effectively assist in efforts to eliminate non-storm water discharges.

The dry weather MS4 outfall discharge monitoring requirements of Provision D.2.a.(2) and D.2.b are separated into monitoring required before and after the San Diego Water Board accepts the Copermittees' Water Quality Improvement Plan. Outfall

monitoring conducted prior to acceptance of the Water Quality Improvement Plan is referred to in the Order as Transitional MS4 Outfall Discharge Monitoring. Provision D.2.a.(2) includes the transitional dry weather MS4 outfall discharge monitoring requirements.

The requirements under Provision D.2.a.(2) are based on the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B), which include the requirements for a monitoring program to identify, detect, and eliminate illicit connections and illegal discharges to the MS4s. The federal regulations (40 CFR 122.26(d)(1)(iv)(D)) require the monitoring program to include "*a field screening analysis for illicit connections and illegal dumping [that]…[a]t a minimum, include[s] a narrative description, for either each field screening point or major outfall, of visual observations made during dry weather periods.*" The federal regulations (40 CFR 122.26(d)(1)(v)(B)) require the monitoring program to include "*inspection procedures and methods for detecting and preventing illicit discharges, and describe areas where this program has been implemented.*" Furthermore, the monitoring program is required by federal regulations (40 CFR 122.26(d)(2)(iv)(B)) to include "*a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer.*"

Dry weather transitional MS4 outfall discharge monitoring requires each Copermittee to field screen (inspect) its major MS4 outfalls to classify the MS4 outfall locations as having persistent dry weather flows, transient dry weather flows, or no dry weather flows. To account for the variance in size of the 39 jurisdictions covered under this Order, the Copermittees recommended a tiered approach to the number of major MS4 outfalls that must be inspected. Provision D.2.a.(2)(a) provides a tiered approach to the number of major MS4 outfalls that must be visually inspected per jurisdiction as well as a minimum frequency each Copermittee must inspect each major MS4 outfall per year. This tiered approach is based on the total number of major MS4 outfalls within a Copermittees jurisdiction within each Watershed Management Area.

Based on the field screening, each Copermittee is required to make a determination whether any observed flowing, pooled, or ponded waters are transient or persistent flows. Based on this field screening information, other jurisdictional program information, and third party information, each Copermittee is required to prioritize the MS4 outfalls within its jurisdiction for follow up investigation and elimination of the non-storm water discharge, as part of its illicit discharge detection and elimination program required pursuant to Provision E.2. In accordance with the requirements of Provision E.2, each Copermittee is required to immediately investigate obvious illicit discharges (e.g. outfall discharges with unusual color, unusual odor, or high flows).

This approach allows a Copermittee to use all of its resources, as well as leverage resources and information provided by third parties, to effectively eliminate non-storm water discharges from its MS4 outfalls. If the source of the non-storm water discharge cannot be immediately eliminated, the Copermittee uses the persistent flow or

transient flow classification along with other programmatic implementation data to prioritize the MS4 outfalls for future investigation. In accordance with the adaptive management approach deployed throughout this Order, Provision D.2.a.(2)(c) requires each Copermittee to update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow. The requirement of Provision D.2.a.(2)(c) assures that each Copermittee is collecting data that can be used to demonstrate compliance with the CWA requirement that each Copermittee must implement a program to "*effectively prohibit non-storm water discharges into the [MS4]*" and with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

Provision D.2.b describes the dry weather MS4 outfall discharge monitoring required to be incorporated and implemented as part of the Water Quality Improvement Plan. Dry weather MS4 outfall discharge monitoring must be performed by each Copermittee to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. The emphasis of the dry weather MS4 outfall discharge monitoring required pursuant to Provision D.2.b is consistent with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

Provision D.2.b.(1) requires each Copermittee to continue field screening its major MS4 outfalls and identifying those with persistent flows and transient flows, as conducted during the transitional period (i.e. before the Water Quality Improvement Plan was developed). However, each Copermittee now has the flexibility to adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of non-storm water persistent flow discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan. In order to ensure a minimum number of outfalls are inspected, Provision D.2.b.(1) requires the number of visual inspections be equal to the number of visual inspections required in the tiered inspection program pursuant to Provision D.2.a.(2)(a).

Provision D.2.b.(2)(b) requires each Copermittee to monitor a minimum of 5 major MS4 outfalls with persistent flows identified as the highest priorities within a Copermittee's jurisdiction, within each Watershed Management Area. In other words, Copermittees located in more than one Watershed Management Area must identify at least 5 major MS4 outfalls with persistent flows in its jurisdiction in each Watershed Management Area. If a Copermittee is located in more than one Watershed Management Area, and they have less than 5 major MS4 outfalls with persistent flows per jurisdictional area per Watershed Management Area, all of the major MS4 outfalls must be identified as high priority dry weather persistent flow MS4 outfalls. The Copermittees identified as Responsible Copermittees by a TMDL in Attachment E of

the Order may need to monitor more than 5 dry weather major MS4 outfall locations to determine compliance with the requirements of the TMDL(s).

Monitoring must occur at the highest priority outfall locations at least semi-annually until the non-storm water discharges have been eliminated for three consecutive dry weather monitoring events; identified to be authorized by a separate NPDES Permit; or reprioritized to a lower priority. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized MS4 major outfall in the Copermittee's jurisdiction within the Watershed Management Area, unless there are no remaining qualifying major MS4 outfalls within the Copermittees jurisdiction. The Copermittees must continually update their dry weather persistent flow MS4 outfall discharge monitoring locations with the next highest priority non-storm water flow that have yet to be eliminated until all persistent and transient flows are eliminated or its threat reduced.

Non-storm water persistent flow MS4 outfall discharge monitoring data collected during each semi-annual monitoring event, must be collected and analyzed according to the requirements of Provision D.2.b.(2)(b)–(e). These monitoring requirements are consistent with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

The wet weather MS4 outfall discharge monitoring requirements are included under Provisions D.2.a.(3) and D.2.c. The wet weather MS4 outfall discharge monitoring requirements are necessary for the Copermittees to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable, using management practices, control techniques and system, design and engineering methods, and such other provisions which are appropriate*" required by 40CFR 122.26(d)(2)(iv), which is expected to achieve compliance with the CWA section 402(p)(3)(B)(iii) statutory requirement for municipal storm water permits to require "*controls to reduce the discharge of pollutants [in storm water] to the maximum extent practicable*." The wet weather MS4 outfall discharge monitoring data collection requirements are based on requirements under 40 CFR 122.26(d)(2)(iii), 122.26(d)(2)(iii)(A) and 122.26(d)(2)(iii)(A)(1)-(4), and 40 CFR 122.21(g)(7)(i)-(ii).

The wet weather MS4 outfall discharge monitoring requirements of Provision D.2.a.(3) and D.2.c are separated into monitoring required before and after the San Diego Water Board accepts the Copermittees' Water Quality Improvement Plan. Outfall monitoring conducted prior to acceptance of the Water Quality Improvement Plan is referred to in the Order as Transitional MS4 Outfall Discharge Monitoring. Provision D.2.a.(3) includes the transitional wet weather MS4 outfall discharge monitoring requirements.

Until the wet weather MS4 outfall discharge monitoring requirements of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board, the Copermittees must comply with the requirements of

transitional wet weather MS4 outfall monitoring requirements pursuant to Provision D.2.a.(3). Provision D.2.a.(3) requires the Copermittees in each Watershed Management Area to sample, at least five of the major MS4 outfalls inventoried pursuant to Provision D.2.a.(1) once per wet season for the monitoring data required to be collected pursuant to Provision D.2.a.(3)(c)-(e). Provision D.2.a.(3) further requires at least one major MS4 outfall monitoring station be located in each Copermittee's jurisdiction within the Watershed Management Area.

At a minimum, the five sampling locations chosen must be representative of storm water discharges from residential, commercial, industrial, and typical mixed-use land uses present within a Watershed Management Area. The San Diego Water Board expects the Copermittees to extrapolate from these data to similar land uses throughout the Watershed Management Area to better inform the Water Quality Improvement Plan development process by prioritizing drainages for implementation of storm water control efforts required pursuant to Provision E.

Provision D.2.c describes the wet weather MS4 outfall discharge monitoring required to be included and implemented as part of the Water Quality Improvement Plan. Provision D.2.c provides the Copermittees the flexibility to adjust the wet weather MS4 outfall discharge monitoring locations and frequencies in the Watershed Management Area, as needed, to identify sources of pollutants in storm water discharges from MS4s in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan.

Although Provision D.2.c.(1) allows the Copermittees to adaptively manage the wet weather MS4 outfall discharge monitoring locations and frequencies, the provision requires a minimum of at least five wet weather outfall stations to be monitored. Provision D.2.c.(2) further allows the Copermittees to modify the monitoring frequency at each wet weather MS4 outfall station to meet the goals of the Water Quality Improvement Plan as long as the monitoring frequency occurs at least once per year and is at an appropriate frequency to identify sources of pollutants in storm water discharges, guide pollutant source identification efforts, or determine compliance with the requirements of the applicable TMDLs in Attachment E to the Order.

The wet weather MS4 outfall discharge monitoring requirements of Provisions D.2.c.(3) and D.2.c.(4) are the same as the transitional wet weather MS4 outfall discharge monitoring. In contrast, the requirements of Provision D.2.c.(5) are focused on collecting analytical data specific to the highest priority water quality conditions in the Watershed Management Area identified in the Water Quality Improvement Plan. The wet weather MS4 outfall discharge monitoring data collection requirements are consistent with the requirements under 40 CFR 122.26(d)(2)(iii), 122.26(d)(2)(iii)(A) and 122.26(d)(2)(iii)(A)(1)-(4), and 40 CFR 122.21(g)(7)(i)-(ii).

Provision D.3 (Special Studies) requires the Copermittees to develop special studies that will be conducted for each Watershed Management Area and the entire San

Diego Region. Data collected pursuant to Provision D.3 is to be used by the Copermittees to improve the effectiveness of the strategies implemented by the jurisdictional runoff management programs toward achieving the numeric goals identified in the Water Quality Improvement Plans and ultimately achieve compliance with the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c, and A.2.a, which is consistent with the requirements of Provision A.4.

Special studies are often necessary to fill data gaps or provide more refined information that allow the Copermittees to better manage the generation or elimination of pollutants and discharges to and from the MS4. In the Fourth Term Permits, the Copermittees have been required to implement special studies as directed by the San Diego Water Board. The special studies required by this Order provide the Copermittees more flexibility to identify and implement special studies that will be most useful to improving the effectiveness of their jurisdictional runoff management programs.

Provision D.3.a.(1) requires the Copermittees to develop and conduct at least two special studies per Watershed Management Area, to be determined by the Copermittees. One of the two special studies may be accomplished through participation in a Regional Special Study required under Provision D.3.a.(2). The requirements provide the Copermittees great latitude in identifying and developing the special studies. Watershed Management Area special studies are required, at a minimum, to: (a) relate in some way to the highest water quality priorities identified by the Copermittees in the Water Quality Improvement Plan, (b) be conducted within the Watershed Management Area, and (c) include some form of participation (e.g. contribution of funds, personnel services, project management) by all the responsible Copermittees within the Watershed Management Area.

Examples of Watershed Management Area special studies might include, but are not limited to: (1) focused pollutant source identification studies, (2) BMP effectiveness and/or comparison studies, (3) pilot tests for new or emerging pollutant control methods, (4) receiving water pollutant or stressor source identification and/or mitigation studies, or (5) pollutant fate and transport studies. The Watershed Management Area special studies are expected to provide data that can be utilized by the Copermittees to improve the Water Quality Improvement Plan or implementation of the Copermittees' jurisdictional runoff management programs to address the highest priority water quality conditions.

Provision D.3.a.(2) requires the Copermittees to develop at least one special study that will be conducted for the entire San Diego region. The regional special study is expected to provide data that can be utilized by the Copermittees to improve the Water Quality Improvement Plan or implementation of the Copermittees' jurisdictional runoff management programs to identify or address regional water quality concerns and priorities.

An example of a regional special study would be to develop and establish allowable exceedance frequencies of the bacteria water quality objectives for several types of water bodies, during different wet and dry weather conditions the San Diego region. The special study would be related to bacteria, which is a priority for the San Diego region due to the adoption of "*Bacteria TMDL Project I – Beaches and Creeks in the San Diego Region*." The study results could be used to inform the Copermittees and the San Diego Water Board about the indictor bacteria water quality objective exceedance frequencies that occur in natural or reference watersheds.

Provision D.4 (Assessment Requirements) specifies the assessments that the Copermittees are required to perform, based on the monitoring data collected, and will be reported as part of the Annual Report for the Water Quality Improvement Plan implementation. Provision D.4 requires the Copermittees assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c, and A.2.a.

Provision D.4 specifies the assessments that Copermittees must perform for each Watershed Management Area to assess the effectiveness of each Copermittee's jurisdictional runoff management program and the Water Quality Improvement Plan. The effectiveness of each Copermittee's jurisdictional runoff management program and Water Quality Improvement Plan is measured through these types of assessments: (a) Receiving Waters Assessments (b) MS4 Outfall Discharges Assessments, (c) Special Studies Assessments, and (d) Integrated Assessment of Water Quality Improvement Plan.

Provision D.4.a requires the Copermittees to assess the status of receiving water conditions annually during the transitional monitoring period (during development of the Water Quality Improvement Plan) and after acceptance of the Water Quality Improvement Plan. The monitoring data collected pursuant to Provision D.1 will be evaluated, among other information, to assess the condition of a Watershed Management Area's streams, coastal waters, enclosed bays, harbors, estuaries, and lagoons. The focus of the receiving waters assessments is to measure progress toward the objective of the CWA to "*restore and maintain the chemical, physical, and biological integrity of the Nation's waters*" as the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program are implemented within a Watershed Management Area. Provision D.4.a is consistent with 40 CFR 122.42(c)(7) which requires the Copermittees to annually report the *"[i]dentification of water quality improvements or degradation."*

Provision D.4.b includes the MS4 outfall discharges assessment requirements. The focus of MS4 outfall discharges assessments is to determine if the Copermittees' are implementing programs that comply with the requirements of the CWA for MS4 permits to "*effectively prohibit non-stormwater discharges into the storm sewers*" and "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable.*" The monitoring data collected pursuant to Provisions D.2 will be

evaluated, among other information, to assess the effectiveness of the transitional MS4 outfall field screening monitoring, the implementation of the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program. The MS4 outfall discharge assessments consist of Non-Storm Water Discharges Reduction Assessments and Storm Water Pollutant Discharges Reduction Assessments.

The Non-Storm Water Discharges Reduction Assessments are how each Copermittee will demonstrate that its jurisdictional runoff management program implementation efforts are achieving the CWA requirement to "*effectively prohibit non-stormwater discharges into the storm sewers.*" Provision D.4.b.(1) requires each Copermittee to assess and report on its illicit discharge detection and elimination program required pursuant to Provision E.2 to reduce and effectively prohibit non-storm water and illicit discharges into the MS4 within its jurisdiction. The Non-Storm Water Discharges Reduction Assessments include specific assessment requirements applicable to each Copermittee.

As each Copermittee collects and analyzes the data collected pursuant to dry weather MS4 outfall discharges monitoring requirements of Provisions D.2.a.(2) and D.2.b, Provision D.4.b.(1) requires each Copermittee to assess the progress, assess the effectiveness of its current actions, and identify modifications necessary to increase the effectiveness of its actions toward reducing and eliminating non-storm water and illicit discharges to its MS4. The findings from these assessments are expected to be utilized by the Copermittee as part of its procedures to prioritize the non-storm water discharges that will be addressed by its Illicit Discharge Detection and Elimination program required pursuant to Provision E.2.

The assessment requirements of Provision D.4.a.(1) are consistent with 40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(3) which require "*procedures…to investigate portions of the separate storm sewer system that, <u>based on the results of the field screen, or other appropriate information</u> [emphasis added], indicate a reasonable potential of contain illicit discharges or other sources of non-storm water*" as part of a "*program…to detect and remove…illicit discharges and improper disposal into the storm sewer.*" The assessment requirements of Provision D.4.a.(1) are also consistent with 40 CFR122.42(c)(1) requires the Copermittees to annually report the "*status of implementing the components of the storm water management program that are established as permit conditions.*"

The Storm Water Pollutant Discharges Reduction Assessment is how the Copermittees in each Watershed Management Area will demonstrate that their jurisdictional runoff management program implementation efforts are achieving the CWA requirement to "*reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable*." Provision D.4.b.(2) requires the Copermittees in each Watershed Management Area to assess and report the progress of the Copermittees' efforts to reduce pollutants in storm water discharges from the MS4s to the MEP. The

Storm Water Pollutant Discharges Reduction Assessments include specific assessment requirements during both the transitional monitoring period and after acceptance of the Water Quality Improvement Plan applicable to the Watershed Management Area and each Copermittee.

As the Copermittees collect and analyze the data collected pursuant to wet weather MS4 outfall discharges monitoring requirements of Provisions D.2.a.(3) and D.2.c, Provision D.4.b.(2) requires the Copermittees to assess runoff conditions during the transitional period, and the progress of the Water Quality Improvement Plan strategies toward reducing pollutants in storm water from the MS4 to the MEP. The findings from these assessments are expected to be utilized by the Copermittees to identify any modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify sources of pollutants in storm water discharges from the MS4s, as well as focus, modify, and improve the water quality improvement strategies implemented by each Copermittee within its jurisdiction to reduce pollutants in storm water discharges to the MEP.

The assessment requirements of Provision D.4.b.(2) are consistent with 40 CFR 122.26(d)(2)(iii)(B) which requires "*[e]stimates of the annual pollutant load of the cumulative discharges to waters of the United States from all identified municipal outfalls…during a storm event…accompanied by a description of the procedures for estimating constituent loads and concentrations, including any modeling, data analysis, and calculation methods.*" The assessment requirements of Provision D.4.a.(2) are consistent with 40 CFR 122.26(d)(2)(v) which requires that each Copermittee assesses the *"estimated reductions in loadings of pollutants from discharges of municipal storm sewer constituents from municipal storm sewer systems expected as the result of the municipal storm water quality management program."* The assessment requirements of Provision D.4.b.(2) are also consistent with 40 CFR122.42(c)(1) requires the Copermittees to annually report the "*status of implementing the components of the storm water management program that are established as permit conditions.*"

Provision D.4.c includes the special studies assessment requirements. Performing special studies are how the Copermittees will address data gaps identified during the development of and updates to the Water Quality Improvement Plan. The relevant findings from the special studies assessments are expected to be incorporated as part of the applicable receiving water assessments, MS4 outfall discharge assessments, and integrated water quality improvement assessments required in Provision D.4.a, D.4.b, and D.4.d, respectively.

The assessment requirements in Provision D.4.d are part of the iterative approach and adaptive management process required by Provision A.4. The Copermittees are required to integrate the data collected pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to re-evaluate the Water Quality Improvement Plan.

The monitoring data collected pursuant to Provisions D.1 and D.2, and the results of the assessment required pursuant to Provisions D.4.a-c, will be used to determine whether the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program are effective, or require modifications or improvements to become more effective to achieve the requirements of the CWA. The assessments required by Provision D.4.d are consistent with 40 CFR 122.42(c)(1) which requires that the Copermittees to report the *"[t]he status of implementing the components of the storm water management program that are established as permit conditions."*

E. Jurisdictional Runoff Management Programs

Purpose: Provision E includes the requirements for the jurisdictional runoff management programs to be implemented by each of the Copermittees. Compliance with the requirements for the jurisdictional runoff management programs will allow the Copermittees to demonstrate that they are implementing programs to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP. The jurisdictional runoff management program document prepared by each Copermittee will also provide the details for implementing the water quality improvement strategies identified in the Water Quality Improvement Plan specifically within its jurisdiction.

***Discussion*:** Implementation of the jurisdictional runoff management program requirements under Provision E is how the Copermittees "*effectively prohibit non-stormwater discharges into the storm sewer,*" and outlines the "*controls to reduce the discharge of pollutants to the maximum extent practicable"* consistent with the federal regulations under 40 CFR 122.26. The jurisdictional runoff management program is part of the "*comprehensive planning process*" that is required pursuant to 40 CFR 122.26(d)(2)(iv). Where the Water Quality Improvement Plan is the "*comprehensive planning process*" on a Watershed Management Area scale, requiring "*intergovernmental coordination,*" the jurisdictional runoff management program document is the "*comprehensive planning process*" on a jurisdictional scale that should be coordinated with the other Copermittees in the Watershed Management Area to achieve the goals of the Water Quality Improvement Plan.

The jurisdictional runoff management program requirements are included to provide each Copermittee criteria that can be used to demonstrate that its storm water management program is implementing the "*comprehensive planning process*" within its jurisdiction to "*effectively prohibit non-stormwater discharges into the storm sewers,*" and to identify and implement the most effective "*controls to reduce the discharge of pollutants to the maximum extent practicable"* in accordance with the performance standards given in the CWA.

Provision E includes the requirements for each of the components that must be included in the Copermittee's jurisdictional runoff management program document that will be implemented by the Copermittee within its jurisdiction. Implementation of the components of each Copermittee's jurisdictional runoff management program must incorporate the water quality improvement strategies identified by each Copermittee in the Water Quality Improvement Plans, described pursuant to Provision B.3.b.(1)(a).

More specific and detailed discussions of the requirements of Provision E are provided below.

Provision E.1 (Legal Authority Establishment and Enforcement) requires each Copermittee to establish and enforce sufficient legal authority to control discharges to the MS4 within its jurisdiction.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system*" and be able to demonstrate that it can "*operate pursuant to legal authority established by statute, ordinance or series of contracts.*" Provision E.1.a describes the minimum legal authorities each Copermittee must establish for itself within its jurisdiction to control discharges to its MS4. The requirements of Provision E.1.a are consistent with the requirements set forth in 40 CFR 122.26(d)(2)(i)(A)-(F).

The certification statement required from each Copermittee by Provision E.1.b is included to provide the San Diego Water Board additional documentation that each Copermittee has established the legal authorities consistent with Provision E.1.a and 40 CFR 122.26(d)(2)(i)(A)-(F), and the Copermittee can "*operate pursuant to legal authority established by statute, ordinance or series of contracts.*"

Provision E.2 (Illicit Discharge Detection and Elimination) requires each Copermittee to implement an illicit discharge detection and elimination program to effectively prohibit non-storm water discharges to the MS4 by actively detecting and eliminating illicit discharges and disposal into its MS4.

Provision E.2 establishes the minimum requirements that each Copermittee must implement within its jurisdiction to effectively prohibit non-storm water discharges from entering its MS4. The federal CWA requires permits for municipal storm sewer systems to "*effectively prohibit non-storm water discharges into the storm sewers*." The federal regulations (40CFR122.26(d)(2)(i)(B)) require each Copermitee to establish the legal authority to prohibit illicit discharges to its MS4s. Under 40 CFR 122.26(d)(2)(iv)(B), each Copermittee must implement a "*program…to detect and remove…illicit discharges and improper disposal into the storm sewer.*" The federal NPDES regulations, under 40 CFR 122.26(b)(2), define illicit discharges as "*any discharge to a municipal separate storm sewer that is not composed entirely of storm water*." Thus, non-storm water discharges are not authorized to enter the MS4 and are considered to be illicit discharges, unless authorized by a separate NPDES permit.

The Phase I Final Rule clarifies that non-storm water discharges through an MS4 are not authorized under the CWA (55 FR 47995):

> "*Today's rule defines the term "illicit discharge" to describe any discharge through a municipal separate storm sewer system that is not composed entirely of storm water and that is not covered by an NPDES permit. Such illicit discharges are not authorized under the Clean Water Act. Section 402(p)(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm*

sewer…Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit."

The federal NPDES requirements for the program to address illicit discharges must include "*inspections, to implement and enforce an ordinance, orders, or other similar means to prevent illicit discharges to the MS4*." The federal NPDES regulations also reference several categories of "*non-storm water discharges or flows* [which] *shall be addressed where such discharges are identified…as sources of pollutants to waters of the United States*." The Phase I Final Rule (55 FR 48037) further clarified the requirements of 40 CFR 122.26(d)(2)(iv)(B)(1) as follows:

"*EPA is clarifying that section 402(p)(3)(B) of the CWA (which requires permits for municipal separate storm sewers to 'effectively' prohibit non-storm water discharges) does not require permits for municipalities to prohibit certain discharges or flows of nonstorm water to waters of the United States through municipal separate storm sewers in all cases*."

In previous iterations of the municipal storm water permits for the San Diego Region, these categories were simply listed and referred to as categories of non-storm water discharges "not prohibited" unless identified as a source of pollutants. The Copermittees have often referred to these categories as "exempt" discharges. In both cases, however, the language is inconsistent with the federal CWA and NPDES regulations. And, the clarification provided in the Phase I Final Rule does not specifically state that such discharges are "not prohibited" or "exempt" or in any way authorized. The federal NPDES regulations do, however, state that specific categories of non-storm water discharges must be "*addressed*" if identified as "*sources of pollutants to waters of the United States*."

The language of Provision E.2.a has been revised to be fully consistent with the language of the CWA and the requirements of the federal regulations under 40 CFR 122.26(d)(2)(iv)(B)(1). Provision E.2.a requires each Copermittee to address <u>all</u> types of non-storm water discharges into its MS4 as illicit discharges, <u>unless</u> the discharge is authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to Provisions E.2.a.(1) through E.2.a.(5). Only non-NPDES-permitted non-storm water discharges identified as a category of non-storm water discharges under Provisions E.2.a.(1) through E.2.a.(5) <u>and</u> *not identified as a source of pollutants* do not have to be addressed as illicit discharges. Categories of non-storm water discharges that meet the requirements of Provisions E.2.a.(1) through E.2.a.(5) do not have to be addressed by the Copermittee as illicit discharges.

Several of the non-storm water categories listed in 40 CFR 122.26(d)(2)(iv)(B)(1) have not been included in Provisions E.2.a.(1) through E.2.a.(5), including: street wash water, landscape irrigation, irrigation water, and lawn watering. Because these are no

longer included within the categories listed under Provisions E.2.a.(1) through E.2.a.(5), the Copermittees must prohibit these types of non-storm water discharges from entering the MS4. This is consistent with the clarification of 40 CFR 122.26(d)(2)(iv)(B)(1) in the Phase I Final Rule (55 FR 48037), which states:

> "*[T]he Director may include permit conditions that either require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*."

Street wash water is a category of non-storm water discharges that was removed when the Third Term Permits were issued. Street wash water is a source of several pollutants (e.g., metals, oil and grease, petroleum hydrocarbons, chlorinated solvents, sediment) which are generated during the street washing process. The removal of this category requires the Copermittees to prohibit this type of non-storm water discharge from entering the MS4.

The landscape irrigation, irrigation water, and lawn watering categories, collectively referred to hereafter as "over-irrigation" discharges, were removed from the list of non-storm water discharge categories in the Fourth Term Orange County and Riverside County Permits. Non-storm water discharges resulting from over-irrigation have been found to be a source of several types of pollutants (e.g., nutrients, bacteria, pesticides, sediment) in receiving waters. The San Diego Water Board and the Copermittees have identified categories of non-storm water discharges associated with over-irrigation as a source of pollutants and conveyance of pollutants to the MS4 and waters of the United States in the following documents:

- **SmartTimer/Edgescape Evaluation Program (SEEP) Grant Application**

  The State Water Board allocated grant funding to the SEEP project grant application submitted in 2006, which targeted irrigation runoff by retrofitting areas of existing development and documenting the conservation and runoff improvements. The basis of this grant project is that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 is a source and conveyance of pollutants. In addition, the grant application indicated that this alteration of natural flows is impacting the beneficial uses of waters of the state and U.S. Results from the study indicate that that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 *is* a source and conveyance of pollutants. The results of this study can be applied broadly to any area where over-irrigation takes place. The grant application included the following statements:

  > "*Irrigation runoff contributes flow & pollutant loads to creeks and beaches that are 303(d) listed for bacteria indicators.*"
  >
  > "*Regional program managers agree that the reduction and/or elimination of irrigation-related urban flows and associated pollutant loads may be key to successful attainment of water quality and beneficial use goals as outlined in*

the San Diego Basin Plan and Bacteria TMDL over the long term."

"*Elevated dry-weather storm drain flows, composed primarily … of landscape irrigation water wasted as runoff, carry pollutants that impair recreational use and aquatic habitats all along Southern California's urbanized coastline. Storm drain systems carry the wasted water, along with landscape derived pollutants such as bacteria, nutrients and pesticides, to local creeks and the ocean. Given the local Mediterranean climate, excessive perennial dry season stream flows are an unnatural hydrologic pattern, causing species shifts in local riparian communities and warm, unseasonal contaminated freshwater plumes in the near-shore marine environment.*"

- **2006-2007 Orange County Watershed Action Plan Annual Reports**

The Watershed Action Plan Annual Reports for the 2006-2007 reporting period were submitted by the County of Orange, Orange County Flood Control District and Copermittees within the San Juan Creek, Laguna Coastal Streams, Aliso Creek, and Dana Point Coastal Streams Watersheds. San Juan Creek, Laguna Coastal Streams, Aliso Creek and Dana Point Coastal Streams are all currently 303(d) listed as impaired for indicator bacteria within their watersheds and/or in the Pacific Ocean at the discharge points of their watersheds. The Orange County Copermittees, within their Watershed Action Strategy Table for fecal indicator bacteria included the following:

"*Support programs to reduce or eliminate the discharge of anthropogenic dry weather nuisance flow throughout the…watershed. Dry weather flow is the transport medium for bacteria and other 303(d) constituents of concern.*"

Additionally, they state that "*conditions in the MS4 contribute to high seasonal bacteria propagation in-pipe during warm weather. Landscape irrigation is a major contributor to dry weather flow, both as surface runoff due to over-irrigation and overspray onto pavements; and as subsurface seepage that finds its way into the MS4*."

- **Fiscal Year 2008 Carlsbad Watershed Urban Runoff Management Program Annual Report**

The Carlsbad Watershed Urban Runoff Management Program Annual Report for Fiscal Year 2008 was submitted by the Carlsbad Watershed Copermittees (Cities of Carlsbad, Encinitas, Escondido, Oceanside, San Marcos, Solana Beach, and Vista, and the County of San Diego). In the Annual Report, the Carlsbad Watershed Copermittees stated the following:

"The Carlsbad Watershed Management Area (WMA) collective watershed

strategy identifies bacteria, sediment, and nutrients as high priority water quality pollutants in the Agua Hedionda (904.3 – bacteria and sediment), Buena Vista (904.2 – bacteria), and San Marcos Creek (904.5 – nutrients) Hydrologic Areas. Bacteria, sediment, and nutrients have been identified as potential discharges from over-irrigation."

- **2007-2008 San Diego Bay Watershed Urban Runoff Management Program Annual Report**

  The San Diego Bay Watershed Urban Runoff Management Program 2007-2008 Annual Report was submitted by the San Diego Bay Watershed Copermittees (Cities of Chula Vista, Coronado, Imperial Beach, La Mesa, Lemon Grove, National City, and San Diego, the County of San Diego, the Port of San Diego, and the San Diego County Airport Authority). In Appendix D of the Annual Report, titled "Likely Sources of Pollutants," the San Diego Bay Watershed Copermittees identified over-irrigation of lawns as a pollutant generating activity from business and/or residential land uses for bacteria, pesticides, and sediment.

- **Copermittee Public Education Materials**

  The Orange County Public Works *Tips for Landscape & Gardening* public education brochure states: "*Fertilizers, pesticides and other chemicals that are left on yards or driveways can be blown or washed into storm drains that flow to the ocean. Overwatering lawns can also send materials into storm drains*."

  The Riverside County Flood Control and Water Conservation District *Landscape and Garden* public education brochure states: *"Soil, yard wastes, over-watering and garden chemicals become part of the urban runoff mix that winds its way through streets, gutters and storm drains before entering lakes, rivers, streams, etc. Urban runoff pollution contaminates water and harms aquatic life!"*

- **Los Penasquitos Lagoon Sedimentation/Siltation TMDL Technical Report**

  The Los Penasquitos Lagoon Sedimentation/Siltation TMDL technical report was prepared for the City of San Diego and USEPA in October 2010. The technical report was included as a technical supporting document attached to the Sediment TMDL for Los Penasquitos Lagoon staff report prepared by the San Diego Water Board, dated June 13, 2012. Under the Source Assessment section, the technical report states the following:

  "*Dry weather loading is dominated by nuisance flows from urban land use activities such as car washing, sidewalk washing, and lawn over-irrigation, which pick up and transport sediment into receiving waters.*"

These documents confirm that non-storm water discharges associated with over-irrigation are a source of pollutants and should be addressed as illicit discharges to the MS4. Prohibiting non-storm water discharges associated with over-irrigation, however, is not a new requirement for the Copermittees because it is also consistent with and required by the Water Conservation in Landscaping Act (AB 1881, Laird).

The Water Conservation in Landscaping Act required the Department of Water Resources (DWR) to prepare a Model Water Efficient Landscape Ordinance for use by local agencies (e.g. the Copermittees). All local agencies were required to adopt a water efficient landscape ordinance by January 1, 2010. Local agencies could adopt the Water Efficient Landscape Ordinance developed by DWR, or an ordinance considered at least as effective as the Model Ordinance. The Water Efficient Landscape Ordinance includes a requirement that local agencies prohibit runoff from irrigation (§ 493.2):

> "*Local agencies shall prevent water waste resulting from inefficient landscape irrigation by* <u>*prohibiting runoff from leaving the target landscape*</u> *[emphasis added] due to low head drainage, overspray, or other similar conditions where water flows onto adjacent property, non-irrigated areas, walks, roadways, parking lots, or structures. Penalties for violation of these prohibitions shall be established locally*."

Furthermore, non-storm water discharges from over-irrigation not only transport and discharge pollutants to receiving waters, but are also a likely source of the dry weather flows causing changes to habitat within and along the receiving water bodies. Examples of habitat changes from the dry weather flows include perennialization of ephemeral streams, and conversion of saltwater and brackish water marsh habitats to freshwater marsh habitats (e.g. Los Penasquitos Lagoon). Both of these examples have resulted in the promotion of invasive species in several areas of the San Diego Region.

The removal of the over-irrigation discharges categories does not require the Copermittees to strictly prohibit lawn and landscape irrigation, but does require the prohibition of excessive irrigation water that results in non-storm water discharges to the MS4. Non-storm water discharges to the MS4 from over-irrigation must be addressed as illicit discharges by the Copermittees pursuant to the requirements of Provision E.2.

The remaining non-storm water categories listed in 40 CFR 122.26(d)(2)(iv)(B)(1) are listed under Provisions E.2.a.(1) through E.2.a.(5) and generally fall into four categories: (1) non-storm water discharges subject to existing San Diego Water Board waste discharge requirements and NPDES permits; (2) non-storm water discharges generally not expected to be a source of pollutants to receiving waters; (3) non-storm water discharges likely to contain pollutants requiring some form of control to address the pollutants prior to discharging to the MS4; and (4) non-storm water discharges or flows associated with firefighting.

Provisions E.2.a.(1) and E.2.a.(2) include several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) for which the San Diego Water Board already has developed general waste discharge requirements and NPDES permits to address the discharges. The Copermittees are only required to address these types of non-storm water discharges as illicit discharges if the Copermittees or the San Diego Water Board identifies these non-storm water discharges not having coverage under the applicable NPDES permit.

Provision E.2.a.(3) includes several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) which are generally not expected to be a source of pollutants to receiving waters, many of which originate from what are typically natural, uncontrollable sources. The Copermittees are only required to address these types of non-storm water discharges as illicit discharges if the Copermittees or the San Diego Water Board identifies these non-storm water discharges as a source of pollutants to receiving waters. Because many of these sources are generally uncontrollable, enforcing a prohibition may not be a possibility for the Copermittees. The Copermittees would be able to address these non-storm water discharges by preventing these non-storm water discharges from entering the MS4. This could potentially be achieved by sealing their MS4 structures so the discharges cannot enter the MS4.

Provision E.2.a.(4) includes several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) that are likely to contain pollutants requiring some form of control to address the pollutants prior to discharging to the MS4. At this time, an outright prohibition of these types of non-storm water discharges does not yet appear to be warranted. Thus, Provision E.2.a.(4) includes several requirements for the Copermittees to control the pollutants from these types of non-storm water discharges. This is consistent with the clarification of the federal regulations in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board has the authority to require the Copermittees to "*control any of these types of discharges where appropriate*."

Unlike non-storm water discharges from over-irrigation, these types of non-storm water discharges are not expected to occur in close proximity to each other or very frequently. Provided these types of non-storm water discharges are controlled as required in Provision E.2.a.(4), the Copermittees would only be required to address these types of non-storm water discharges as illicit discharges if the Copermittee or the San Diego Water Board identifies these non-storm water discharges as a source of pollutants to receiving waters.

Provision E.2.a.(5) includes specific requirements for fire fighting discharges and flows. The requirements for non-storm water discharges and flows associated with fire fighting have been separated into requirements for: a) non-emergency fire fighting discharges and flows, and b) emergency fire fighting discharges and flows.

The San Diego Water Board has found that discharges from building fire suppression system maintenance (e.g. fire sprinklers) contain waste and potentially a significant source of pollutants to receiving waters. As such, the San Diego Water Board is requiring these discharges be addressed as illicit discharges by the Copermittees. Thus, the discharges to the MS4 are to be prohibited via ordinance, order or similar means. For other non-emergency firefighting discharges and flows (i.e. flows from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems), the Copermittees are required to develop and implement a program to address pollutants in these non-storm water discharges and flows. This is consistent with the clarification of the federal regulations in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board has the authority to require the Copermittees to "*control any of these types of discharges where appropriate*."

For emergency firefighting discharges and flows, the Phase I Final Rule (55 FR 48037) has clarified the requirements of 40 CFR 122.26(d)(2)(iv)(B)(1) pertaining to emergency firefighting flows and discharges, which states:

> "*In the case of firefighting it is not the intention of these rules to prohibit in any circumstances the protection of life and public or private property through the use of water or other fire retardants that flow into separate storm sewers*."

Thus, the requirements have been made to be consistent with the guidance provided by the Phase I Final Rule. The Order recommends that the Copermittees develop and encourage implementation of BMPs to reduce or eliminate the discharge of pollutants from emergency firefighting flows to the MS4s and receiving waters. The Order does not include any requirements that should be interpreted as requiring the implementation of BMPs for emergency firefighting flows to the MS4s and receiving waters.

The Copermittees are expected to review the dry weather MS4 outfall discharge monitoring data they collect to determine if and when there are non-storm water discharges to or from their MS4s that are a source of pollutants to receiving waters. If the Copermittees identify one of the types of non-storm water discharges listed in Provisions E.2.a.(1) through E.2.a.(4) as a source of pollutants to receiving waters based on the review and evaluation of monitoring data, Provision E.2.a.(6) requires the Copermittees to prohibit those categories of discharges from entering the MS4 through ordinance, order or similar means. In addition, Provision E.2.a.(6) clarifies that the San Diego Water Board may identify categories of non-storm water discharges or flows listed under Provisions E.2.a.(1) through E.2.a.(4) that must be prohibited.

Provision E.2.a.(6) also provides the Copermittees an option to propose controls to be implemented for the category of non-storm water discharges as part of the Water Quality Improvement Plan instead of prohibiting the category of non-storm water

discharges. If the Water Quality Improvement Plan is accepted by the San Diego Water Board with the proposed controls, the Copermittees will not be required to prohibit the category of non-storm water discharges to their MS4s as long as the controls are implemented. This is consistent with the clarification of 40 CFR 122.26(d)(2)(iv)(B)(1) in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board may "*require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*."

Finally, Provision E.2.a.(7) has been included in the requirements for non-storm water discharges to clarify that any non-storm water discharges to the Copermittee's MS4, even those identified pursuant to Provisions E.2.a.(1) through E.2.a.(4), must be reduced or eliminated, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit. Provision E.2.a.(7) is consistent with the requirements of CWA section 402(p)(3)(B)(ii) and 40 CFR 122.26(d)(1)(v)(B), as clarified in the Phase I Final Rule (55 FR 47995) that "*[u]ltimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit*." However, the reduction or elimination of those non-storm water discharges are expected to be achieved as feasible, in accordance with the priorities in the Water Quality Improvement Plan and when the resources are available to the Copermittee.

Consistent with 40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(1), each Copermittee must implement a "*program…to prevent illicit discharges to the municipal storm sewer system*" and "*detect…illicit discharges and improper disposal into the storm sewer.*" Provision E.2.b requires each Copermittee to implement measures to prevent and detect illicit discharges and connections to its MS4 as part of its illicit discharge detection and elimination program.

As part of the program to prevent and detect illicit discharges to the MS4, 40 CFR 122.26(d)(2)(iv)(B)(2) requires "*procedures to conduct on-going field screening activities during the life of the permit, including areas or locations that will be evaluated by such field screens*." As part of the procedures, each Copermittee is required to maintain an updated map of its entire MS4 and the corresponding drainage areas within its jurisdiction. Having knowledge about where inlets, access points, connections with other MS4s, and outfalls are located is necessary for each Copermittee to track, identify, and eliminate illicit discharges and connections. Thus, Provision E.2.b.(1) of the Order specifies that the map must include the segments of the storm sewer system owned, operated, and maintained by the Copermittee, and include locations of all known inlets, connections with other MS4s, and outfalls to the Copermittee's MS4. The remaining requirements of Provision E.2.b are consistent with the requirements of 40 CFR 122.26(d)(2)(iv)(B)(3)-(7) related to implementing measures to prevent and detect illicit discharges and connections to the MS4.

Provision E.2.c requires each Copermittee to conduct field screening and monitoring of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm

water and illicit discharges and connections to the MS4. Field screening is a required element of the program to detect and eliminate illicit discharges and connections to the MS4, pursuant to 40 CFR 122.26(d)(2)(iv)(B)(2). The field screening requirement will be implemented through the dry weather MS4 outfall discharge monitoring required under Provisions D.2.a.(2) and D.2.b.(1).

Provision E.2.d specifies the measures each Copermittee must implement to eliminate illicit discharges and connections to its MS4. Elimination of illicit discharges and connections to the MS4 is consistent with the requirement of 40 CFR 122.26(d)(2)(iv)(B) "*to detect and remove [emphasis added]…illicit discharges and improper disposal into the storm sewer*" and will achieve the CWA requirement for MS4 permits to "*effectively prohibit non-storm water discharges into the storm sewers*."

Generally, each Copermittee is responsible for prioritizing its efforts to eliminate non-storm water and illicit discharges or connections to its MS4 based on field screening and monitoring data, NALs, illicit discharge investigation records, and the known or suspected sources. Sources of non-storm water and illicit discharges or connections must be eliminated by enforcing the legal authority established by each Copermittee pursuant to Provision E.1.

Provision E.3 (Development Planning) requires each Copermittee to use its land use and planning authority to implement a development planning program to control and reduce the discharge of pollutants in storm water from new development and significant redevelopment to the MEP. Proper implementation of the development planning program will also contribute toward effectively prohibiting non-storm water discharges from development projects to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." As part of the management program, 40 CFR 122.26(d)(2)(iv)(A)(2) requires "*planning procedures including a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment*."

Land development generally alters the natural conditions of the land by removing vegetative cover, compacting soil, and/or placement of concrete, asphalt, or other impervious surfaces. These impervious surfaces concentrate urban pollutants (such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not found in high concentrations in the natural environment. Pollutants that accumulate on impervious surfaces are not easily biodegraded nor subject to natural treatment processes.

Impervious surfaces greatly affect the natural hydrology of the land because they do not allow natural infiltration and treatment of storm water runoff to take place. Instead, storm water runoff from impervious surfaces is typically directed through pipes, curbs, gutters, and other hardscape into receiving waters, with little treatment, at significantly increased volumes and accelerated flow rates over what would occur naturally. The increased pollutant loads, storm water volume, discharge rates and velocities, and discharge durations from the MS4 adversely impact stream habitat by causing accelerated, unnatural erosion and scouring within creek bed and banks. Placement of impervious surfaces also encapsulates "good" sediment (such as sand, gravel, rocks and cobbles) that would normally replenish creek beds and banks to help stabilize them. Collectively, these changes to natural hydrologic processes are termed hydrograph modification, or hydromodification.

Hydromodification, which is caused by both altered storm water flow and altered sediment flow regimes, is largely responsible for degradation of creeks, streams, and associated habitats in the San Diego Region. In an ongoing study by the Stormwater Monitoring Coalition to assess the health of streams throughout Southern California, researchers found that three of the four highest risk stressors to creeks (percent sands and fines present, channel alteration, and riparian disturbance) were related to physical habitat.[29] Researchers studying flood frequencies in Riverside County have found that increases in watershed imperviousness of only 9-22 percent can result in increases in peak flow rates for the two-year storm event of up to 100 percent.[30] Such changes in runoff have significant impacts on channel morphology.

In addition, a technical report issued by the Southern California Coastal Water Research Project (SCCWRP) stated that "*[r]ecent studies indicate that California's intermittent and ephemeral streams are more susceptible to the effects of hydromodification than streams from other parts of the United States. Physical degradation of stream channels in the central and eastern United States can initially be detected when watershed impervious cover approaches 10 percent, although biological effects (which may be more difficult to detect) may occur at lower levels. In contrast, initial response of streams in the semi-arid portions of California appears to occur between 3 and 5 percent impervious cover*."[31] These studies highlight the extent to which impacts originating from impervious surfaces created by land development are responsible for the degradation of creek and stream habitat.

This is consistent with what USEPA has noted, that "*[m]ost stormwater runoff is the result of the man-made hydrologic modifications that normally accompany development. The addition of impervious surfaces, soil compaction, and tree and*

[29] Assessing the Health of Southern California Streams, Stormwater Monitoring Coalition, Fact Sheet
[30] Schueler and Holland, 2000. Storm Water Strategies for Arid and Semi-Arid Watersheds (Article 66). The Practice of Watershed Protection.
[31] Stein, E. and Zaleski, S., 2005. Technical Report 475, Managing Runoff to Protect Natural Streams: The Latest Development on Investigation and Management of Hydromodification in California. December 30, 2005.

vegetation removal result in alterations to the movement of water through the environment. As interception, evapotranspiration, and infiltration are reduced and precipitation is converted to overland flow, these modifications affect not only the characteristics of the developed site but also the watershed in which the development is located. Stormwater has been identified as one of the leading sources of pollution for all waterbody types in the United States. Furthermore, the impacts of stormwater pollution are not static; they usually increase with more development and urbanization."[32]

Reducing the impact from the increased pollutant loads and flows generated by impervious surfaces within a watershed is essential to protecting and restoring the integrity of the receiving waters. Provision E.3 includes the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment*." The requirements of Provision E.3 will 1) minimize the generation and discharge of pollutants in storm water from the MS4, and 2) minimize the potential of storm water discharges from the MS4 from causing altered flow regimes and excessive downstream erosion in receiving waters.

The requirements of Provision E.3.a include the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment*" applicable to all development projects, regardless of size or purpose of development. In general, all development projects must implement onsite BMPs to remove pollutants from runoff prior to its discharge to any receiving waters, as close to the pollutant generating source as possible, and structural BMPs must not be constructed within waters of the U.S.

Furthermore, the onsite BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors (e.g. mosquitos, rodents, and flies). If not properly designed or maintained, certain BMPs implemented or required by municipalities may create a habitat for vectors. Monitoring studies conducted by the California Department of Public Health (CDPH) have documented that mosquitoes opportunistically breed in structural storm water BMPs, particularly those that hold standing water for over 96 hours. Certain site design features that hold standing water may similarly produce mosquitoes.

Structural BMPs and site design features should incorporate design, construction, and maintenance principles to promote drainage within 96 hours to minimize standing water available to mosquitoes. Nuisances and public health impacts resulting from

[32] USEPA, 2007. Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices, December 2007.

vector breeding can be prevented with close collaboration and cooperative effort between municipalities and local vector control agencies and the CDPH during the development and implementation of storm water runoff management programs. The CDPH also has issued guidance for BMP implementation that will minimize potential nuisances and public health impacts resulting from vector breeding.[33]

All development projects are required to implement source control BMPs that will minimize the generation of pollutants. Additionally, each development project must implement, where applicable and feasible, low impact development (LID) BMPs to mimic the natural hydrology of the site and retain and/or treat pollutants in storm water runoff prior to discharging to and from the MS4.

The LID Center defines LID as "*a comprehensive land planning and engineering design approach with a goal of maintaining and enhancing the pre-development hydrologic regime of urban and developing watersheds.*"[34] LID designs seek to control storm water at the source, using small-scale integrated site design and management practices to mimic the natural hydrology of a site, retain storm water runoff by minimizing soil compaction and impervious surfaces, and disconnect storm water runoff from conveyances to the storm drain system.

LID BMPs may utilize interception, storage, evaporation, evapotranspiration, infiltration, and filtration processes to retain and/or treat pollutants in storm water before it is discharged from a site. Because of these numerous options, the San Diego Water Board expects that every development project will be able to implement some form of LID BMPs. Examples of LID BMPs include using permeable pavements, rain gardens, rain barrels, grassy swales, soil amendments, and native plants.

Provision E.3.a also includes requirements for all development projects to, where feasible, landscape with native and/or low water use plants to minimize the discharge of non-storm water discharges associated with excessive irrigation, as well as harvest (i.e., storage) and use precipitation to promote the concept of utilizing storm water as a resource.

While all development projects are subject to the requirements of Provision E.3.a, Provision E.3.b identifies Priority Development Projects that exceed given size thresholds and/or fit under specific use categories. Priority Development Projects are required to incorporate specific performance criteria for structural BMPs into the project plan to reduce the generation of pollutants, and address potential impacts from hydromodification.

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[33] California Department of Public Health, 2012. Best Management Practices for Mosquito Control in California. (http://www.cdph.ca.gov/HealthInfo/discond/Documents/BMPforMosquitoControl07-12.pdf)
[34] www.lowimpactdevelopment.org

The Priority Development Project categories are based on the requirements of the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), and do not differ significantly from the Fourth Term Permit for San Diego County. Furthermore, the Priority Development Project categories are consistent with Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), and Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit).

Because of the impact of relatively small increases in watershed impervious surfaces to receiving waters, Provision E.3.b.(1)(c)(iv) has been updated to include large driveways that are 5,000 square feet or more. The San Diego Water Board finds that large driveways can exacerbate altered flow regimes if not properly controlled.

Provision E.3.b.(3) describes projects that are exempt from Priority Development Project status. These include new or retrofit paved sidewalks, bicycle lanes, or trails that are designed and constructed to direct runoff to vegetated areas or be hydraulically disconnected from paved areas. The exemptions have been provided to encourage these types of projects because they provide multiple environmental benefits, such as promoting walking rather than driving, which will in turn improve air quality. Additionally, retrofitting of existing alleys, streets, or roads are exempt from Priority Development Project status if they are constructed using USEPA Green Streets guidance.[35] By doing so, retrofitting of these types of projects is encouraged. The San Diego Water Board recognizes that there are spatial constraints associated with these projects, and implementation of structural BMPs are not always feasible.

For development projects identified as Priority Development Projects, the requirements of Provision E.3.c are the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment.*" Provisions E.3.c.(1)-(3) describe the performance criteria for the structural BMPs that must be implemented for each Priority Development Project defined by Provision E.3.b.

Provision E.3.c.(1) describes the storm water pollutant control BMP requirements that must be implemented by all Priority Development Projects. The purpose of Provision E.3.c.(1) is to reduce pollutants in storm water runoff to the MEP from Priority Development Projects before it is discharged to the MS4. Of all the available treatment processes available, retention of storm water, and therefore capture of the pollutants in the storm water, will achieve 100 percent pollutant removal efficiency for the volume of storm water retained. No other method of treatment can achieve 100 percent pollutant removal efficiency. Thus, retention of as much storm water onsite is

[35] "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).

the most effective way to reduce pollutants in storm water discharges to, and consequently from the MS4, and controls pollutants in storm water discharges from a site to the MEP.

Under Provision E.3.c.(1)(a), retention of the pollutants in the runoff produced from the 85th percentile storm event ("design capture volume") is the design standard to which Priority Development Projects must comply. Since the 85th percentile storm event has previously been used as the numeric design standard for treatment control BMPs, this same size storm event is used as the numeric design standard for storm water retention. This is the MEP standard recognized by the San Diego Water Board and is consistent with the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), as well as Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit), and Los Angeles Water Board Order No. R4-2012-0175 (Los Angeles County MS4 Permit).

The 85th percentile storm event is the event that has a precipitation total greater than or equal to 85 percent of all storm events over a given period of record in a specific area or location. For example, to determine what the 85th percentile storm event is in a specific location, all 24 hour storms that have recorded values over a 30 year period would be tabulated and a 85th percentile storm would be determined from this record (i.e. 15 percent of the storms would be greater than the number determined to be the 85th percentile storm). Most jurisdictions in the San Diego Region have already developed isopluvial maps that can provide this type of information. The 85th percentile storm might be determined to be a number such as 1.0 inch, and this would be multiplied by the total area of the project footprint producing runoff to calculate the design capture volume. The Priority Development Project designer would then select a system of BMPs that would retain (i.e. intercept, store, infiltrate, evaporate, or evapotranspire) the pollutants contained in the design capture volume onsite.

Retention BMPs are necessary to capture and retain pollutants generated from a Priority Development Project. In a recent study performed by SCCWRP in the Los Angeles Region, they found "*that the magnitude of constituent load associated with storm water runoff depends, at least in part, on the amount of time available for pollutant build-up on land surfaces. The extended dry period that typically occurs in arid climates such as southern California maximizes the time for constituents to build-up on land surfaces, resulting in proportionally higher concentrations and loads during initial storms of the season*."[36] This implies that the "first flush" of a rainy season and the first storm events after long antecedent dry periods tend to have the highest pollutant loads. Capturing and retaining the pollutant loads of the "first flush" of a rainy

[36] Stein, E.D., Tiefenthaler, L.L., and Schiff, K.C., 2007. Technical Report 510, Sources, Patterns and Mechanisms of Storm Water Pollutant Loading from Watershed and Land Uses of the Greater Los Angeles Area, California, USA. March 20, 2007.

season and the first storm events after long antecedent dry periods will reduce a significant portion of the pollutants in storm water discharged to and from the MS4.

The San Diego Water Board, however, acknowledges that in some situations retention of the full design capture volume onsite may not be technically feasible. In this event, the Copermittee may allow the Priority Development Project to use biofiltration BMPs to treat 1.5 times the design capture volume not reliably retained onsite, or biofiltration BMPs with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite.

The 1.5 multiplier is based on the finding in the Ventura County Technical Guidance Manual that biofiltration of 1.5 times the design capture volume not retained onsite will provide approximately the same pollutant removal as retention of the design capture volume on an annual basis.[37] This standard is consistent with the Los Angeles Water Board's Los Angeles County and Ventura County municipal storm water permits (Order Nos. R4-2012-0175 and R4-2010-0108, respectively). The flow-thru design of 0.75 times the portion of the design capture volume not reliably retained onsite is consistent with the San Diego Water Board's Fourth Term Permits for Orange County and Riverside County ~~municipal storm water permits~~ (Order Nos. R9-2009-0002 and R9-2010-0016, respectively). In either case, the biofiltration BMPs must be designed with an appropriate hydraulic loading rate to maximize storm water retention and pollutant removal, as well as to prevent erosion, scour, and channeling within the BMP. Each Copermittee is required to update its BMP Design Manual to provide guidance for hydraulic loading rates and other biofiltration design criteria necessary to maximize storm water retention and pollutant removal.

The San Diego Water Board further recognizes that, in addition to not being technically feasible, retention of the full design capture storm onsite may be cost prohibitive, or may not provide as much water quality benefit to the Watershed Management Area as would implementing BMPs elsewhere in the watershed. Thus, Provision E.3.c.(1)(b) allows for the use of a combination of onsite retention BMPs, and the implementation of an Alternative Compliance Program described in Provision E.3.c.(3). Provision E.3.c.(3) is discussed in more detail below.

If the full design capture volume is not retained onsite either because biofiltration is not technically feasible, or a Copermittee grants a Priority Development Project permission to utilize the Alternative Compliance Program, then the pollutants in the portion of the design capture volume that are not reliably retained onsite must still be reduced to the MEP. Thus, flow-thru treatment control BMPs are required to be implemented on Priority Development Projects in addition to the retention BMPs. The requirements of Provisions E.3.c.(1)(a)(ii)[a]-[c] include the performance standards for flow-thru

[37] Ventura Countywide Stormwater Management Program. 2011. Ventura Technical Guidance Manual, Manual Update, 2011.

treatment control BMPs, consistent with the Fourth Term Permits in the San Diego Region.

Whereas the purpose of the requirements under Provision E.3.c.(1) is to reduce pollutants in storm water runoff to the MEP, the purpose of the requirements under Provision E.3.c.(2) is to maintain or restore more natural hydrologic flow regimes to prevent accelerated, unnatural erosion in downstream receiving waters, also to the MEP standard. Provision E.3.c.(2) describes hydromodification management BMP requirements that must be implemented by all Priority Development Projects.

The performance criteria for the implementation of hydromodification management BMPs on Priority Development Projects are consistent with the requirements in the Fourth Term Permits for Orange and Riverside Counties (Order Nos. R9-2009-0002 and R9-2010-0016, respectively). Modifications to the Orange County and Riverside County Hydromodification Management Plans (HMPs) will likely be minor, or may not be necessary. The HMP for San Diego County will likely require some minor modifications to incorporate the requirements of Provision E.3.c.(2) and become consistent with the Orange County and Riverside County HMPs. The San Diego Water Board does not, however, expect that it will be necessary for the San Diego County Copermittees to develop a new approach or significantly re-write the San Diego County HMP. This is because the premise of the hydromodification management BMP requirements, which are to control storm water runoff conditions (flow rates and durations) for Copermittee-defined range of flows, is unchanged from all Fourth Term Permits in the San Diego Region.

Provision E.3.c.(2)(a) requires that post-project runoff conditions mimic the *pre-development* runoff conditions, and not the *pre-project* runoff conditions. Fundamentally, the San Diego Water Board believes that using a hydrology baseline that approximates that of an undeveloped, natural watershed is the only way to facilitate the return of more natural hydrological conditions to already built-out watersheds, and ultimately improved stream health. On the other hand, using the *pre-project* hydrology as a baseline for redevelopment projects results in propagating the unnatural hydrology of urbanized areas. Propagating the urbanized flow regime does not support conditions for restoring degraded or channelized stream segments, and would forever sentence such streams to the degraded state. Furthermore, reducing the volume of storm water runoff associated with the urbanized flow regime will also result in reducing the discharge of pollutants into receiving waters, since storm water runoff from impervious surfaces contains untreated pollutants.

The San Diego Water Board understands that approximating the pre-development runoff condition associated with a redevelopment site is not necessarily straightforward because factors such as natural grade and native vegetation for the site cannot be precisely known. Therefore, the San Diego Water Board does not expect project designers to estimate historical conditions associated with redevelopment sites. Rather, the San Diego Water Board expects project designers and the Copermittees to

approximate pre-development runoff conditions using the parameters of a *pervious* area rather than an *impervious* area. This means that for redevelopment sites, approximating pre-development runoff conditions equates to using existing onsite grade and assuming the infiltration characteristics of the underlying soil. A redevelopment Priority Development Project must not use runoff coefficients of concrete or asphalt to estimate pre-development runoff conditions. Rather, redevelopment projects must use available information pertaining to existing underlying soil type (such as soil maps published by the National Resource Conservation Service), onsite existing grade, and any other readily available pertinent information to estimate pre-development runoff conditions.

The San Diego Water Board understands, indeed asserts, that the pre-development hydrology of an area in question can only be roughly estimated and cannot be precisely known. However, using the hydrology of a natural condition, even if not precisely known, will provide significant benefit to receiving waters over using the hydrology associated with impervious (developed) surfaces. Therefore in order to achieve the goals of the Clean Water Act, which are to "*restore and maintain the chemical, physical, and biological integrity of the nation's waters* [emphasis added]," the most appropriate standard to use for hydromodification management is the standard associated with the pre-development condition.

Provision E.3.c.(2)(b) requires Priority Development Projects to avoid known critical sediment yield areas or implement measures that would allow coarse sediment to be discharged to receiving waters, such that the natural sediment supply is unaffected by the project. This is necessary because the availability of coarse sediment supply is as much an issue for causing erosive conditions to receiving streams as are accelerated flows.

The San Diego Water Board recognizes that in some situations implementing the hydromodification management BMP requirements for flow control fully onsite may not be technically feasible, may be cost prohibitive, or may not provide any overall water quality benefits to the Watershed Management Area. Thus, Provision E.3.c.(2)(c) allows for the use of a combination of onsite hydromodification management BMPs for flow control and alternative compliance options described in Provision E.3.c.(3).

Provision E.3.c.(3) allows for alternative compliance in instances where the Copermittee determines that offsite measures will have a greater overall water quality benefit for the Watershed Management Area than if the Priority Development Project were to implement structural BMPs onsite. Consequently, watershed-specific structural BMP requirements are present in this Order in the form of allowable compliance offsite. The Alternative Compliance Program to Onsite Structural BMP Implementation Provision is intended to integrate with the Copermittees' planning efforts in the Water Quality Improvement Plans.

The Alternative Compliance Program is an option for Priority Development Projects where the governing Copermittee has participated in the development of a Watershed Management Area Analysis as part of the Water Quality Improvement Plan (described in Provision B.3.b.(4)). Such an approach is consistent with the latest findings in hydromodification management by the scientific community. In a Technical Report entitled *Hydromodification Assessment and Management in California,*[38] the report states:

> *"An effective [hydromodification] management program will likely include combinations of on-site measures (e.g., low-impact development techniques, flow-control basins), in-stream measures (e.g., stream habitat restoration), floodplain and riparian zone actions, and off-site measures. Off-site measures may include compensatory mitigation measures at upstream locations that are designed to help restore and manage flow and sediment yield in the watershed."*

Consistent with the ideas brought forth in the report, in the Watershed Management Area Analysis of Provision B.3.b.(4), which is optional, the Copermittees will develop watershed maps that include as much detail about factors that affect the hydrology of the watershed as is available. Such factors included identification of areas suitable for infiltration, coarse sediment supply areas, and locating stream channel structures and constrictions. Once these factors are mapped and studied, the Copermittees can identify areas in the watershed where candidate projects may be implemented that are expected to improve water quality in the watershed by providing more opportunity for infiltration, slowing down storm water flows, or attenuation of pollutants naturally via healthy stream habitat. These candidate projects may be in the form of retrofitting existing development, rehabilitating degraded stream segments, identifying regional BMPs, purchasing land to preserve valuable floodplain functions, and any other project(s) that the Copermittees identify.

Under the Alternative Compliance Program, Priority Development Projects may be allowed to fund, partially fund, or implement a candidate project, in lieu of implementing structural BMPs onsite, if they enter into a voluntary agreement with the governing Copermittee permitting this arrangement. Project proponents may also propose an alternative project not previously identified by the Copermittees. In either case, whether a project proponent implements a candidate project identified by the Copermittees or a separate alternative compliance project, the governing Copermittee must determine that implementation of the project will have a greater overall water quality benefit for the Watershed Management Area than fully implementing structural BMPs onsite. If alternative compliance involves funding or implementing a project that is outside the jurisdiction of the governing Copermittee, then that Copermittee may enter into an inter-agency agreement with the appropriate jurisdiction.

[38] 2012. ED Stein, F Federico, DB Booth, BP Bledsoe, C Bowles, Z Rubin, GM Kondolf, A Sengupta. Technical Report 667. Southern California Coastal Water Research Project. Costa Mesa, CA.

Finally, Provision E.3.c.(2)(d) allows Priority Development Projects to be exempt from the hydromodification management BMP requirements if there is no threat of erosion to downstream receiving waters (i.e. the receiving stream is concrete lined from the point of discharge all the way to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean). If the Copermittees believe that more exemptions are warranted, then they must perform the optional Watershed Management Area Analysis of Provision B.3.b.(4). Additional exemptions other than those specified in this Order may be established on a watershed basis, provided the Copermittees perform the analysis, provide supporting rationale for the exemptions, and complete the Water Quality Improvement Plan approval process pursuant to Provision F.1.

To facilitate the transition to this Order from the Fourth Term Permits for Orange and Riverside County Copermittees, Provision E.3.c.(2)(e) allows two additional temporary exemptions from hydromodification management BMP implementation. The first temporary exemption allows relief from hydromodification management BMP implementation for Priority Development Projects discharging directly to an engineered channel conveyance system with a capacity to convey peak flows generated by the 10-year storm event all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean. Similar to the exemption allowed for concrete-lined channels, this exemption is premised on the concept that there is little threat of erosion to these types of engineered channel systems.

The second temporary exemption allows relief from hydromodification management BMP implementation for Priority Development Projects discharging directly to large river reaches with drainage areas larger than 100 square miles and a 100-year flow capacity in excess of 20,000 cubic feet per second. If this exemption is claimed, then properly sized energy dissipation is required at all discharge points associated with the Priority Development Project. This exemption is premised on the concept that large river reaches can essentially assimilate the accelerated flow rates associated with individual Priority Development Projects because they are inconsequential compared to the flow rate in the large river reach. Both of these exemptions are included in the Hydromodification Management Plan for San Diego County[39].

These temporary exemptions are allowed as a means to facilitate Orange and Riverside County Copermittees' transition to this Order from the Fourth Term Permits and are not meant to reside as permanent exemptions without additional rigorous technical analyses specific to each County. Therefore, these exemptions will no longer apply once the Copermittees' land development programs are fully updated to reflect the requirements of this Order, i.e., upon implementation of the BMP Design Manual pursuant to Provision F.2.b. If the Copermittees believe that these or other exemptions are warranted in the context of water quality improvement and stream restoration opportunities, then the Copermittees must perform the optional Watershed

[39] Final Hydromodification Management Plan Prepared for County of San Diego, March 2011

Management Area Analysis of Provision B.3.b.(4) and provide supporting rationale for the exemptions. The San Diego County Copermittees are also required to perform the optional Watershed Management Area Analysis to provide supporting rationale to justify use of these and other exemptions. Updated BMP Design Manuals including rationale to justify use of exemptions will be reviewed by the San Diego Water Board pursuant to Provision F.2.b.

Provisions E.3.c.(4) and E.3.c.(5) were included under the BMP requirements applicable to all development projects in the Fourth Term Permits for San Diego, Orange, and Riverside Counties (Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016, respectively). In this Order, the long-term BMP maintenance and infiltration and groundwater protection requirements apply to structural BMPs implemented by Priority Development Projects only.

Provision E.3.d requires the Copermittees to update their BMP Design Manual as needed to incorporate the requirements of Provision E.3. The BMP Design Manual is formerly known as the Standard Storm Water Mitigation Plan, or SSMP, and was renamed so that the title has a more accurate description of the document content. The contents of the BMP Design Manual are largely unchanged from the previous Standard Storm Water Mitigation Plans required under the Fourth Term Permits. The BMP Design Manual fulfills the 40 CFR 122.26(d)(2)(iv)(A)(2) requirement that the Copermittee's development planning program includes "*a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment*."

As part of the "*planning procedures,*" 40 CFR 122.26(d)(2)(iv)(A)(2) requires the procedures to "*address controls to reduce pollutants in discharges from municipal separate storm sewers after construction is completed*." The requirements applicable to the implementation and oversight of structural BMPs at Priority Development Projects are provided under Provision E.3.e.

Proper installation of the structural BMPs approved for a Priority Development Project is necessary to ensure that pollutants in storm water discharges will be reduced to the MEP after the project is completed. In addition to the proper installation of structural BMPs, the maintenance of structural BMPs on Priority Development Projects is necessary to ensure that pollutants in storm water discharges will continue to be reduced to the MEP. Provision E.3.e.(1) includes the minimum requirements that each Copermittee must implement to ensure structural BMPs are properly installed and will be properly maintained.

The requirements under Provision E.3.e.(2)-(3) are necessary to demonstrate each Copermittee is implementing a program that complies with Provisions E.3.b-c and E.3.e.(1), and ensure structural BMPs at Priority Development Project will continue to be able to reduce pollutants in storm water discharges to the MEP.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary for any development projects to compel compliance with the requirements of Provision E.3 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.3.f requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Provision E.4 (Construction Management) requires each Copermittee to implement a construction management program to control and reduce the discharge of pollutants in storm water from construction sites to the MEP. Proper implementation of the construction management program will also contribute toward effectively prohibiting non-storm water discharges from construction sites to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." As part of the management program, 40 CFR 122.26(d)(2)(iv)(D) requires "*a program to implement and maintain structural and non-structural best management practices to reduce pollutants in storm water runoff from construction sites to the municipal storm sewer system.*"

Construction sites can be significant sources of sediment, trash, and other pollutants to receiving waters. Although sediment is naturally occurring in the natural environment, the discharge of sediment under unnatural conditions is problematic to receiving waters. Fine sediment in creeks causes high turbidity that interferes with the functionality of native flora and fauna in local creeks. For example, turbidity interferes with both photosynthesis of water-philic plants, as well as successful foraging and reproduction of benthic macroinvertebrates. Sediment can also make it difficult for fish to breathe because it clogs fish gills. Other pollutants such as heavy metals or pesticides can adhere to sediment and are transported to receiving waters during storm events, where they dissolve in the water column and become bioavailable to aquatic organisms. Sediment is recognized as a major stressor to surface waters and is responsible for the impairment of several lagoons and creeks in the San Diego Region.

Provision E.4 includes requirements that each Copermittee must implement to minimize the discharge of sediment and other pollutants from construction sites to the MS4 within its jurisdiction. The requirements under Provision E.4 are consistent with the Fourth Term Permits for San Diego, Orange, and Riverside Counties. Therefore, Copermittees are expected to implement the requirements seamlessly, with minimal changes to their existing construction management programs. The Copermittees,

however, are given more flexibility to run their programs as needed to maximize efficiency, and also to be consistent with the Water Quality Improvement Plan for the Watershed Management Area.

As part of the construction management program, 40 CFR 122.26(d)(2)(iv)(D)(1) requires "*procedures for site planning which incorporate consideration of potential water quality impacts.*" Provision E.4.a describes the minimum elements each Copermittee is required to include as part of the construction site planning and project approval process. The construction site planning and approval process is based primarily on ensuring each project had an adequate site-specific pollution control, construction BMP, and/or erosion and sediment control plan that will be implemented to minimize the discharge of pollutants in storm water to the MEP, and minimize impacts to receiving waters.

The requirements under Provision E.4.b provide the data and information necessary to identify "*priorities for inspecting sites and enforcing control measures*" required pursuant to 40 CFR 122.26(d)(2)(iv)(D)(3). Under Provision E.4.b, each Copermittee must identify construction sites that are considered a high threat to downstream surface waters. Designation of "high threat to water quality" construction sites will necessitate the Copermittees to develop criteria to identify such sites. Provision E.4.b.(2) describes a list of factors that must be considered when the Copermittee considers threat to water quality. For example, a Copermittee must identify sites as "high threat to water quality" if it is located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions, according to the Water Quality Improvement Plan. This ensures that construction management program implementation is compatible with the Copermittee's identified highest priority water quality conditions.

Pursuant to 40 CFR 122.26(d)(2)(iv)(D)(2) each Copermittee is required describe "*requirements for nonstructural and structural best management practices*" at construction sites. Provision E.4.c includes the types of construction site BMPs that the Copermittees must implement, or require the implementation of, at each construction site to reduce pollutants in storm water discharges to the MEP.

Each Copermittee is expected to require the implementation of appropriate BMPs given specific site conditions, the season and likelihood of rain events, and construction phase (i.e. grading vs. vertical construction). This means that throughout the life of the project construction, the appropriate BMPs will vary, especially if the construction of the project spans multiple wet seasons. As opposed to describing specific minimum BMPs that must be implemented, the Order describes major BMP categories that should be considered for each site.

Each Copermittee is expected to use its 20 years of storm water experience and knowledge to require implementation of appropriate BMPs from the various categories at each construction site within its jurisdiction. For example, the San Diego Water

Board expects that each site will be required to implement erosion control and sediment control. The San Diego Water Board also expects each Copermittee to require implementation of active/passive sediment treatment systems at sites where other BMPs have been tried and are known to be inadequate, and discharges of sediment are causing or contributing to water quality impairment downstream. Each Copermittee is granted flexibility in specifying the minimum level of BMP requirements at each site, but the San Diego Water Board expects each site to be capable of controlling pollutants in storm water discharges to the MEP and preventing illicit discharges.

The requirements under Provision E.4.d are necessary to demonstrate that each Copermittee is implementing a program that complies with Provisions E.4.a and E.4.c and ensure BMPs at construction sites will reduce pollutants in storm water discharges to the MEP.

Provision E.4.d does not include minimum required inspection frequencies for construction sites. Each Copermittee must use its experience and knowledge to specify an appropriate inspection frequency for both high priority and lower priority sites in their jurisdictional runoff management program documents, and in accordance with the Water Quality Improvement Plan. Appropriate inspection frequencies may vary by Copermittee, but the San Diego Water Board expects that the stated frequency will be adequate for each Copermittee to properly oversee the construction sites within its jurisdiction, confirm BMPs are implemented to reduce pollutants in storm water discharges from constructions sites to the MEP, and make needed changes to its program on an ongoing basis as necessary.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary for any development projects to compel compliance with the requirements of Provision E.4 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.4.e requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

<u>Provision E.5 (Existing Development Management)</u> requires each Copermittee to implement an existing development management program to control and reduce the discharge of pollutants in storm water from areas of existing development to the MEP. Proper implementation of the existing development management program will also contribute toward effectively prohibiting non-storm water discharges from areas of existing development to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and*

engineering methods, and other such provisions where applicable." Within 40 CFR 122.26(d)(2)(iv)(A) and (C), the management program is required to reduce impacts on receiving waters and reduce pollutants in storm water discharges to the MEP from commercial and residential areas, industrial facilities, and municipal facilities.

Commercial and residential areas, industrial facilities, and municipal facilities must be addressed by each Copermittee with the existing development management program required under Provision E.5. All other areas within each Copermittee's jurisdiction should be either undeveloped open space, or areas that are being developed or under construction. Areas being developed or under construction will be addressed by the Copermittee under the requirements of Provision E.3 (Development Planning) or Provision E.4 (Construction Management).

Areas of existing development typically include impervious surfaces such as sidewalks, driveways, roads, and rooftops, which generate and concentrate pollutants (such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not found in high concentrations in the natural environment. Pollutants that accumulate on impervious surfaces are not easily biodegraded or not subject to natural treatment processes. When it rains, these pollutants are transported in storm water runoff from these impervious surfaces into receiving waters, resulting in poor water quality and degradation of beneficial uses.

In addition to the generation of pollutants, areas of existing development have generally altered the natural conditions of the land and removed vegetative cover, reduced the perviousness of the surface, and reduced the capacity of storm water that can be intercepted, captured, stored, infiltrated, evaporated, and/or evapotranspired. The alteration of the natural conditions and the impervious surfaces associated with areas of existing development causes water quality problems due to the alteration of natural flow regimes within the watersheds; resulting in hydromodification of channels, streams, and habitats that exist within or adjacent to the areas of existing development.

Thus, storm water discharges from areas of existing development are responsible for poor water quality, degraded habitats, and hydromodified channels throughout the developed portions of the watersheds in the San Diego Region. To improve the health and functionality of the receiving waters in a Watershed Management Area, land use practices and the amount of impervious surfaces in areas of existing development must change to reduce the various impacts caused by hydromodification and pollutants from storm water runoff generated in developed areas. Each Copermittee must be aggressive to address pollutant sources and runoff from areas of existing development to be able to reduce pollutants in storm water discharges from the MS4 to the MEP.

There is some overlap in the requirements under Provision E.5 with the requirements under Provisions E.2 (Illicit Discharge Detection and Elimination), E.3 (Development

Planning), and E.4 (Construction Management). Illicit discharges frequently originate from areas of existing development. New development projects, when completed will become some type of residential, commercial, industrial or municipal existing development. Redevelopment projects are, by definition, redeveloping areas of existing development. And, redevelopment projects become construction sites located in areas of existing development. Much of the data and information collected, inspections performed, and enforcement actions taken for the requirements under Provisions E.2 to E.4 may also be utilized by the existing development management program. The requirements under Provision E.5, however, are focused primarily on reducing pollutants generated in areas of existing development that can be transported in storm water runoff and discharged to and from the MS4.

The requirements under Provision E.5 build upon existing program elements being implemented by the Copermittees. Provision E.5 is generally consistent with the existing development requirements of the Fourth Term Permits for Orange and Riverside Counties (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), but modified to provide more flexibility to implement the programs so resources can be better focused toward addressing the highest priority water quality conditions identified in the Water Quality Improvement Plans.

For a Copermittee to properly manage areas of existing development, having knowledge of what development exists within its jurisdiction is essential. Provision E.5.a requires each Copermittee to maintain a watershed-based inventory of all the existing development within its jurisdiction. This requirement is necessary for each Copermittee to implement the requirements of Provision E.5.b-e.

As opposed to just maintaining separate inventories based on the type of site, each Copermittee must maintain a watershed-based inventory that includes all types of existing development within its jurisdiction. By utilizing a watershed-based inventory, the Copermittees within a Watershed Management Area can combine their inventories and review the inventories by watershed in addition to by jurisdiction. Pollutant sources and strategies for abatement can then be evaluated on a watershed level, as opposed to evaluating sources and strategies strictly by type of site.

Provision E.5.a includes the information that must be included in the inventory. Provision E.5.a.(1) specifies what facilities or areas must be included in the inventory. A commercial type of existing development may be identified in the inventory as a facility (e.g. individual building, individual business) or an area (e.g. shopping center, commercial zone). An industrial type of existing development must be identified in the inventory by facility (e.g. individual industrial entity). A municipal type of existing development must be identified in the inventory by facility, with a list of specific municipal facilities that must be included in the inventory. A residential type of existing development must be identified by areas to be designated by the Copermittee. For each of the facilities and areas identified in the Copermittee's inventory developed

pursuant to Provision E.5.a.(1), Provision E.5.a.(2) specifies the information that must be included in the description for the facility or area.

Provision E.5.a.(3) requires each Copermittee to maintain an updated map showing the location of inventoried existing development, watershed boundaries, and water bodies. This requirement was included because this information is expected to help the Copermittees in a Watershed Management Area identify and prioritize sources of pollutants and/or stressors in areas of existing development that contribute toward the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Knowledge of the existing development that are likely to be sources of pollutants contributing to the highest priority water quality conditions is expected to be a key element in the Copermittees' development of the water quality improvement strategies that will be included in the Water Quality Improvement Plans. The strategies described in the Water Quality Improvement Plans will direct efforts within the existing development management programs implemented by each Copermittee.

Pursuant to 40 CFR 122.26(d)(2)(iv)(A) each Copermittee is required describe "*structural and source control measures to reduce pollutants*" in storm water runoff discharged from areas of existing development. Provision E.5.b includes the BMP implementation and maintenance requirements that the each Copermittee must require at areas of existing development to reduce pollutants in storm water discharges to the MEP. The San Diego Water Board, however, recognizes that BMP implementation and maintenance for residential areas will require much more education and encouragement through less authoritative measures than for commercial, industrial and municipal facilities and areas. Thus, the BMP implementation and maintenance requirements have been separated between requirements under Provision E.5.b.(1) for commercial, industrial and municipal facilities and areas, and Provision E.5.b.(2) for residential areas.

Most of the requirements in Provision E.5.b are consistent with the related requirements in the Fourth Term Permits. The level of specificity, however, has been changed to allow each Copermittee the flexibility to implement its program to achieve maximum efficiency, and to perform functions that will address the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Each Copermittee is expected to require the implementation of appropriate BMPs to address the expected pollutants from each facility or area. The Third and Fourth Term Permits described specific minimum BMPs that must be implemented at various sites. This Order, however, requires each Copermittee to designate minimum BMPs themselves and require implementation. Consistent with the Fourth Term Permits, each Copermittee is required to maintain, or require the maintenance of, all BMPs as needed.

The BMP implementation and maintenance requirements include a schedule of operation and maintenance activities for the MS4 and related structures (such as catch basins, storm drain inlets, and detention basins), as well as public streets and roads. Public streets and roads specifically include public unpaved roads. The San Diego Water Board identified, through investigations and complaints, sediment discharges from unpaved roads as a significant source of water quality problems in the San Diego Region. Inspection activities conducted by the San Diego Water Board since the Third Term Permits have found a lack of source control for many unpaved roads within the jurisdiction of the Copermittees.

Unpaved roads are a source of sediment that can be discharged in runoff to receiving waters, especially during storm events. Erosion of unpaved roadways occurs when soil particles are loosened and carried away from the roadway base, ditch, or road bank by water, wind, traffic, or other transport means. Exposed soils, high runoff velocities and volumes, sandy or silty soil types, and poor compaction increase the potential for erosion.

Road construction, culvert installation, and other maintenance activities can disturb the soil and drainage patterns to streams in undeveloped areas, causing excess runoff and thereby erosion and the release of sediment. Poorly designed unpaved roads can act as preferential drainage pathways that carry runoff and sediment into natural streams, impacting water quality. In addition, other public works activities along unpaved roads have the potential to significantly affect sediment discharge and transport within streams and other waterways, which can degrade the beneficial uses of those waterways.

USEPA also recognizes that discharges from unpaved roads pose a significant potential threat to water quality. USEPA guidance[40] emphasizes the threat of unpaved roads to water quality:

> "*Dirt and gravel roads are a major potential source of these pollutants [sediment] and pollutants that bind to sediment such as oils, nutrients, pesticides, herbicides, and other toxic substances. Many roads have unstable surfaces and bases. Roads act like dams, concentrating flows that accelerate erosion of road materials and roadsides. Both unstable surfaces and accelerated erosion then lead to sediment and dust.*"

There are several guidance documents, developed by the USEPA,[41] the US Forest Service,[42] the University of California,[43] and others, that include design and

[40] USEPA, 2006. Environmentally Sensitive Maintenance for Dirt and Gravel Roads. Gesford and Anderson, USEPA-PA-2005.
[41] Ibid
[42] US Forest Service, 1996. Forest Service Specifications for Construction of Roads & Bridges. EM-7720-100. Revised August 1996.

construction specifications and BMPs that are readily available for implementation by public entities. Implementing design and other source control BMPs for unpaved roads in the region is necessary to reduce and minimize the impacts of sediment discharged during storm events from unpaved roads to the MS4s and receiving waters.

Provision E.5.c describes existing development site inspection frequency, content, and tracking that each Copermittee must incorporate into their existing development management programs. The requirements under Provision E.5.c are necessary to demonstrate each Copermittee is implementing a program that complies with Provision E.5.b and ensure BMPs implemented in areas of existing development will reduce pollutants in storm water discharges to the MEP. Provision E.5.c has been modified to include a minimum of once every 5 years for all inventoried facilities and areas of existing development, utilizing one or more methods of inspection.

In addition to onsite inspections, the methods of inspection have been expanded to include drive-by inspections. Inspections may be performed by the Copermittee's municipal and contract staff, or by volunteer monitoring or patrol programs. Volunteer monitoring or patrol programs are not expected to enforce the Copermittee's ordinances, or to inspect areas or facilities where members of the public are not allowed access. Volunteer monitoring or patrol programs must be trained by the Copermittee, and are only expected to collect visual observations. By utilizing drive-by inspections and volunteer monitoring or patrol programs, the Copermittees will be able to maximize and efficiently use their resources to identify and address sources of pollutants in areas of existing development.

The municipal and contract staff of each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial, industrial, and municipal facilities and areas in its inventoried existing development pursuant to Provision E.5.c.(1)(a)(iv). An "equivalent" of at least 20 percent means if any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspections may count toward the total annual inspection requirement. Linear municipal facilities (i.e. MS4 linear channels, sanitary sewer collection systems, streets, roads and highways) in the Copermittee's existing development inventory are not subject to the inspection frequency requirement of Provision E.5.c.(1)(a)(iv).

The inspection content specified in Provision E.5.c.(2)(a) includes the information required to be collected during an inspection by any method. The inspection content specified in Provision E.5.c.(2)(b) includes additional information that must be collected when a Copermittee's municipal or contract staff perform an onsite

[43] University of California Division of Agriculture and Natural Resources, 2007. Rural Roads: A Construction and Maintenance Guide of California Landowners. Publication 8262.

inspection. Provision E.5.c.(3) specifies the information that each Copermittee must maintain in its existing development inspection records.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary to compel compliance with the requirements of Provision E.5 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.5.d requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Provisions E.5.e.(1)-(2) specifically require the Copermittee to identify areas of existing development as candidates for retrofitting, and streams, channels, and/or habitats as candidates for rehabilitation. Provisions E.5.e.(1)-(2) are based on the retrofitting requirements of the Fourth Term Permits for Orange and Riverside Counties, but modified to also include identifying projects to rehabilitate channels within areas of existing development. The requirements have also been modified to be more focused on utilizing these types of projects for addressing the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Interest and opportunity to retrofit areas of existing development and rehabilitate channels located in areas of existing development has been observed in several programs the San Diego Water Board oversees (e.g., CWA Section 401 Water Quality Certification program, supplemental environmental projects, and grant programs). Each jurisdiction has miles and miles of streets that could be retrofitted to become green streets. Reshaping landscaped areas from convex to concave configurations can detain storm water instead of directing runoff as quickly as possible to the MS4. Retrofit projects could also include simply replacing impervious surfaces with permeable surfaces.

Retrofitting projects do not necessarily have to be expensive. Retrofitting projects could be as simple as redirecting downspouts from roofs to pervious or landscaped areas instead of to hardscaped areas discharging directly to the MS4, providing rain barrels to harvest storm water from downspouts for use at a later time, or planting more trees in areas with little vegetation to provide canopy that can intercept storm water. The San Diego Water Board encourages the Copermittees to identify simple, low-cost retrofitting opportunities that can be easily implemented, in addition to other more expensive retrofitting and channel rehabilitation projects.

Rehabilitation of channels, streams, and/or habitat will require more significant planning and resources to implement. There are, however, also abundant opportunities to rehabilitate channels, streams and/or habitats in or adjacent to areas of existing development. Each Watershed Management Area likely has several creeks and stream reaches that have been undergrounded, artificially hardened, or

hydromodified that could be rehabilitated to be more sustainably configured, which would slow down storm water flows and potentially have more assimilative capacity for pollutants while still being supportive of designated beneficial uses.

The San Diego Water Board recognizes that it may be infeasible to implement retrofitting or channel rehabilitation projects within certain areas of a Copermittee's jurisdictions. For such areas, the Copermittee must instead identify, develop, and implement regional retrofitting and channel rehabilitation projects (i.e. projects that can retain and/or treat storm water from one or more areas of existing development) adjacent to and/or downstream of the areas of existing development.

Provisions E.5.e.(1)-(2) do not require the implementation of retrofitting and rehabilitation projects, but do require the Copermittee to develop a program with strategies to facilitate the implementation of these types of projects in areas of existing development. The strategies are expected to include allowing and encouraging Priority Development Projects to implement retrofitting types of projects as a means of compliance with the structural BMP performance criteria requirements of Provisions E.3.c.(1) and E.3.c.(2).

Provision E.6 (Enforcement Response Plans) requires each Copermittee to develop an Enforcement Response Plan as part of its jurisdictional runoff management program document. Proper implementation of the Enforcement Response Plans is necessary to effectively prohibit non-storm water discharges to the MS4, and reduce the discharge of pollutants in storm water from the MS4 to the MEP.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system*" and be able to demonstrate that it can "*operate pursuant to legal authority established by statute, ordinance or series of contracts*" to control the discharge of non-storm water and pollutants in storm water to and from its MS4. Pursuant to 40 CFR 122.26(d)(2)(i)(E) each Copermittee is specifically required to have the legal authority to "*[r]equire compliance with conditions in ordinances, permits, contracts or order*s."

The requirements under Provision E.6 are necessary to demonstrate that each Copermittee can enforce its legal authority to *"effectively prohibit non-stormwater discharges"* and "*reduce the discharge of pollutants to the maximum extent practicable*" as well as "*[r]equire compliance with conditions in ordinances, permits, contracts or order*."

The Enforcement Response Plan required under Provision E.6 will serve as a reference for the Copermittee and the San Diego Water Board to determine if consistent enforcement actions are being implemented to achieve timely and effective compliance from all public and private entities that are not in compliance with the Copermittee's ordinances, permits, or other requirements. The Enforcement

Response Plan must contain clear direction for the Copermittee to take immediate enforcement action, when appropriate and necessary, in their illicit discharge detection and elimination, development planning, construction management, and existing development management programs.

If the entities subject to the Copermittee's legal authority do not implement appropriate corrective actions in a timely manner, or if violations repeat, the Copermittee must take progressively stricter responses to enforce its legal authority and achieve compliance with its ordinances, permits, or other requirements to *"effectively prohibit non-stormwater discharges"* and "*reduce the discharge of pollutants to the maximum extent practicable.*"

Provision E.7 (Public Education and Participation) requires each Copermittee to implement a public education and participation program. Proper implementation of the public education and participation program as part of its jurisdictional runoff management program will contribute toward effectively prohibiting non-storm water discharges to the MS4, and toward the reduction of pollutants in storm water from the MS4 to the MEP.

Provision E.7 establishes the minimum requirements that each Copermittee must implement to engage members of the public as part of its jurisdictional runoff management program. In the Fourth Term Permits, the public education program requirements and the public participation requirements were included as separate jurisdictional runoff management program components. In this Order, the public education requirements have been consolidated with the public participation requirements, as both sets of requirements are related to the engagement of the public by each Copermittee. Engagement of the public is critical for the success of each Copermittee's jurisdictional runoff management program.

The Copermittees have been implementing public education programs for the last 20 years, which are now well established. The specificity of expected public education program elements of the Fourth Term Permits has been removed. For the most part, the public education program requirements in Provision E.7.a have been reduced to a set of requirements that are specifically included in the federal regulations under 40 CFR 122.26(d)(2)(iv)(A)(6), 122.26(d)(2)(B)(6) and 122.26(d)(2)(D)(4), which should already be incorporated into each Copermittee's existing public education program. Each Copermittee is expected to utilize the information and data collected from the monitoring and assessments conducted within the Watershed Management Area, and from its inventories and inspections to best direct its public education program resources toward addressing the highest priority water quality conditions identified within the Water Quality Improvement Plan.

According to 40 CFR 122.26(d)(2)(iv), public participation is required to be included as part of the "*comprehensive planning process*", which includes the development and implementation of the Water Quality Improvement Plan and jurisdictional runoff

management programs. The requirements under Provision E.7.b specify the opportunities that the public must be provided to be involved in the "*comprehensive planning process*", as required by to 40 CFR 122.26(d)(2)(iv).

Provision E.8 (Fiscal Analysis) requires each Copermittee to secure the resources and provide an analysis of the resources that will be necessary to implement the requirements of the Order. Adequate fiscal resources are necessary for a jurisdictional runoff management program to effectively prohibit non-storm water discharges to the MS4, and reduce pollutants in storm water from the MS4 to the MEP.

According to 40 CFR 122.26(d)(2)(vi), each Copermittee is responsible for providing "*a fiscal analysis of the necessary capital and operation and maintenance expenditures necessary to accomplish the activities*" required by this Order, including "*a description of the source of funds that are proposed to meet the necessary expenditures, including legal restrictions on the use of such funds.*" The fiscal analysis requirements of Provision E.8 are consistent with 40 CFR 122.26(d)(2)(vi).

The San Diego Water Board has chosen not to require a description of fiscal benefits realized from implementation of the jurisdictional runoff management programs. This is a recommendation from the National Association of Flood and Stormwater Management Agencies.[44] For instance, the fiscal analysis requirements do not address city-wide fiscal benefits of protection (e.g., public health, tourism, property values, economic activity, beneficial uses, etc.), even though many costs currently reported to the San Diego Water Board are for related activities. This type of assessment may help Copermittees improve the allocation of resources and it may help the Copermittees secure adequate funding for the program. Qualitative assessments, however, could be overly subjective and most Copermittees likely lack the ability to provide accurate quantitative assessments. The San Diego Water Board encourages the Copermittees to consider means for conducting assessments of fiscal benefits derived from the programs. Such assessments could be conducted on a regional scale similar to studies of program costs conducted by the State Water Board.[45]

[44] National Association of Flood and Stormwater Management Agencies. 2006. *Guidance for Municipal Stormwater Funding.* Prepared under a grant provided by the USEPA.
[45] State Water Board, 2005. NPDES Stormwater Cost Survey.

F. Reporting

Purpose: Provision F includes the requirements for the documents and reports that the Copermittees must prepare and provide to the San Diego Water Board. The documents prepared by the Copermittees and provided to the San Diego Water Board and made available to the public will provide the documentation that the Copermittees are complying with the requirements of the Order.

***Discussion*:** Provision F requires the Copermittees to prepare several documents and reports that must be provided to the San Diego Water Board and made available to the public. The reporting requirements have been significantly reduced compared to the Fourth Term Permit reporting requirements. The reduction in reporting requirements was recommended by the San Diego County Copermittees in the Report of Water Discharge submitted in June 2011.

More specific and detailed discussions of the requirements of Provision F are provided below.

Provision F.1 (Water Quality Improvement Plans) requires the Copermittees in each Watershed Management Area to develop and submit a Water Quality Improvement Plan in accordance with the requirements of Provision B.

Of all the requirements of Provision F, the Water Quality Improvement Plans will likely be the documents requiring the most significant effort to develop. The content of the Water Quality Improvement Plans, however, is expected to include content that should already have been developed for the Watershed Plans and several elements that are included in the Monitoring and Reporting Programs required under the Fourth Term Permits.

Because the Water Quality Improvement Plan is part of the "*comprehensive planning process which involves public participation*," Provision F.1 includes requirements to give multiple opportunities to the public to provide input on the content of the plans.

Provision F.1.a.(1) specifies the elements that the Copermittees must include in the public participation process for the development of the Water Quality Improvement Plans. In order for the public to be aware of the opportunities to provide input, Provision F.1.a.(1)(a) requires the Copermittees to develop a publicly available and noticed schedule of the opportunities for the public to participate and provide comments during the development of the Water Quality Improvement Plan. These opportunities are when the public can provide the data, information, and recommendations that the Copermittees can consider during the development of the Water Quality Improvement Plans.

The San Diego Water Board recognizes, however, that the Copermittees cannot be expected to incorporate all the data, information, and recommendations that the public may provide into the Water Quality Improvement Plans. The Copermittees will have to review the data, information, and recommendations received and make some decisions on what to incorporate into the Water Quality Improvement Plans. Before the Copermittees finalize their decisions, members of the public should be allowed to review the Copermittees' decisions. Thus, Provision F.1.a.(1)(b) requires the Copermittees to form a Water Quality Improvement Consultation Panel (Panel).

The Panel will consist of a member from the environmental community and a member from the development community familiar with the Watershed Management Area. A representative from the San Diego Water Board staff will also be part of the Panel. The Copermittees may choose to include additional members, but the Panel is only required to include three panel members.

The Panel will serve as an additional public participation and input mechanism during the development of the Water Quality Improvement Plans. The knowledge and expertise from these Panel members are expected to provide the Copermittees valuable direction during their decision-making process. The Copermittees will review the content of their planned submittals with the Panel members to receive recommendations. If the Panel provides recommendations, the Copermittees must consider revisions to the Water Quality Improvement Plan submittals.

The San Diego Water Board recognizes that the development of multiple Water Quality Improvement Plans concurrently may limit the ability of the public to review and provide comments to the Copermittees. Thus, Provision F.1.a.(1)(c) requires the Copermittees to coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public time and opportunity to participate during the development of the Water Quality Improvement Plans.

Provision F.1.a.(2) requires the Copermittees to develop and submit the first Water Quality Improvement Plan component, in accordance with the requirements of Provision B.2, which includes the identification of the priority water quality conditions and potential water quality improvement strategies. The public must be provided an opportunity to provide data, information and recommendations to be utilized in the development and identification of the priority water quality conditions and potential water quality improvement strategies for the Watershed Management Area. The Copermittees must consult with the Panel and consider making revisions. The Copermittees may submit the requirements of Provision B.2 as early as 6 months and no later than 12 months after the commencement of coverage under this Order. After the requirements of Provision B.2 are submitted to the San Diego Water Board, the public will be provided another opportunity to provide comments.

Provision F.1.a.(3) requires the Copermittees to develop and submit the second Water Quality Improvement Plan component, in accordance with the requirements of

Provision B.3, which includes the identification of the numeric goals for the highest priority water quality conditions identified for the Watershed Management Area, and the strategies that will be implemented to achieve the potential numeric goals. The Copermittees may also develop the Optional Watershed Management Area Analysis, in accordance with the requirements of Provision B.3.b.(4), as part of this submittal. The public must be provided an opportunity to provide data, information and recommendations to be utilized in the development and identification of the numeric goals and water quality improvement strategies for the Watershed Management Area. The Copermittees must consult with the Panel and consider making revisions. The Copermittees may submit the requirements of Provision B.3 as early as 9 months and no later than 18 months after the commencement of coverage under this Order. After the requirements of Provision B.3 are submitted to the San Diego Water Board, the public will be provided another opportunity to provide comments.

Finally, Provision F.1.b describes the process for the submittal and implementation of the Water Quality Improvement Plans. The complete Water Quality Improvement Plans are required to be submitted by the Copermittees within 24 months after the commencement of coverage under this Order. The San Diego Water Board will provide the public an opportunity to provide comments on each complete Water Quality Improvement Plan.

The San Diego Water Board will review each Water Quality Improvement Plan and the public comments received to determine if the Copermittees have submitted a Water Quality Improvement Plan that meets the requirements of Provision B. If a Water Quality Improvement Plan does not meet the requirements of Provision B, the Copermittees will be considered out of compliance and directed in writing by the San Diego Water Board Executive Officer to correct the deficiencies.

When a Water Quality Improvement Plan meets the requirements of Provision B, the San Diego Water Board will determine whether to hold a public hearing or to limit public input to submittal of written comments before accepting the Water Quality Improvement Plan. Implementation of the Water Quality Improvement Plan must begin within 30 days of acceptance.

The San Diego Water Board expects that any deficiencies in the Water Quality Improvement Plan will be identified either in the public comments or during the review by the San Diego Water Board before implementation begins. In the event any deficiencies are identified after the implementation of the Water Quality Improvement Plan, Provision F.1.b.(7) clarifies that the San Diego Water Board maintains the right to require the Copermittees to correct any deficiencies that may be identified.

Provision F.2 (Updates) requires the Copermittees to update specific documents that the Copermittees will utilize to implement the requirements of this Order.

Each Copermittee is required to continue implementing a jurisdictional runoff management program, as required under Provision E. Implementation of each Copermittee's jurisdictional runoff management program is directed by its jurisdictional runoff management program document. Provision F.2.a requires each Copermittee to update its jurisdictional runoff management program document to be consistent with the requirements of Provision E concurrent with the submittal of the Water Quality Improvement Plan.

Likewise, each Copermittee must continue to require new development and redevelopment projects to implement BMPs to control pollutants in storm water runoff. The control of pollutants in storm water runoff from development and redevelopment projects within each Copermittee's jurisdiction is guided and directed by its BMP Design Manual, formerly known as a Standard Storm Water Mitigation Plan (SSMP). Provision F.2.b requires each Copermittee to update its BMP Design Manual to be consistent with the requirements of Provision E.3 concurrent with the submittal of the Water Quality Improvement Plan.

In general, the requirements of the Order should not necessitate a complete rewrite of each Copermittee's jurisdictional runoff management program document or BMP Design Manual, as was required by the Third Term Permits. The jurisdictional runoff management program and BMP Design Manual requirements of this Order are not significantly different than the requirements of the Fourth Term Permits. Thus, only sections of the Order which are new or have been significantly changed should warrant revisions to specific sections of the Copermittee's jurisdictional runoff management program document and BMP Design Manual.

Finally, the Water Quality Improvement Plans are expected to require updates as the iterative approach and adaptive management process included in the Water Quality Improvement Plan, as required under Provision B.5, is implemented by the Copermittees. Provision F.2.c.(1) requires the Copermittees to implement a public participation process for the proposed updates, review the proposed updates with the Panel, and submit the updates to the Water Quality Improvement Plan as part of the Annual Reports required under Provision F.3.b.

Also, because TMDLs are likely to be developed, adopted and approved during the term of the Order, Provision F.2.c.(2) has been included to expedite the incorporation of TMDLs into the Copermittees' Water Quality Improvement Plans as part of the update process, potentially before the Order is re-opened to incorporated the requirements of the new TMDLs.

Provision F.3 (Progress Reporting) requires the Copermittees to report on the progress of implementing the Water Quality Improvement Plans.

The requirements of Provision F.3 are to report the progress toward improving water quality that the Copermittees are achieving with the implementation of the Water

Quality Improvement Plans and each Copermittee's jurisdictional runoff management program. The Progress Report Presentations required under Provision F.3.a are included to provide the Copermittees an opportunity to communicate directly with the San Diego Water Board and the public. The Progress Report Presentations will also provide the members of the San Diego Water Board and members of the public an opportunity to become more acquainted with the Copermittees and their projects and programs to address non-storm water and storm water discharges into and from their MS4s.

The Annual Report requirements of Provision F.3.b are a consolidation of several reporting requirements from the Fourth Term Permits, including the Jurisdictional Runoff Management Program Annual Reports, the Watershed Annual Reports, and the Monitoring and Reporting Program Annual Reports. Furthermore, the Annual Report requirements are consistent with the requirements under 40 CFR 122.42(c).

Pursuant to 40 CFR 122.42(c), "*[t]he operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the Director…must submit an annual report*", which must include the following:

(1) *The status of implementing the components of the storm water management program that are established as permit conditions* [40 CFR 122.42(c)(1)];

(2) *Proposed changes to the storm water management programs that are established as permit conditions* [40 CFR 122.42(c)(2)];

(3) *Revisions, if necessary, to the assessment of controls and fiscal analysis* [40 CFR 122.42(c)(3)];

(4) *A summary of data, including monitoring data, that is accumulated throughout the reporting year* [40 CFR 122.42(c)(4)];

(5) *Annual expenditures and budget for year following each annual report* [40 CFR 122.42(c)(5)];

(6) *A summary describing the number and nature of enforcement actions, inspections, and public education programs* [40 CFR 122.42(c)(6)];

(7) *Identification of water quality improvements or degradation* [40 CFR 122.42(c)(7)].

Under the Fourth Term Permits, each Copermittee is responsible for submitting a Jurisdictional Runoff Management Program Annual Report; the Copermittees in each designated watershed are responsible for submitting a Watershed Annual Report; and the Copermittees from each county are responsible for submitting a Monitoring and Reporting Program Annual Report.

There are 39 Copermittees in the San Diego Region, each required to prepare and submit a Jurisdictional Runoff Management Program Annual Report. There are 9 designated watersheds in San Diego County, 6 designated watersheds in Orange County, and 1 designated watershed in Riverside County for a total of 16 designated watersheds, each requiring a Watershed Annual Report. There are 3 sets of Copermittees in 3 counties in the San Diego Region, requiring Copermittees from each county to prepare and submit a Monitoring and Reporting Program Annual Report. Thus each Copermittee is currently required to prepare, or participate in the preparation of at least 3 annual reports. In addition, the San Diego County Copermittees are required to prepare and submit a Regional Urban Runoff Management Plan Annual Report.

In total, there are 59 annual reports that are prepared by the Copermittees and submitted to the San Diego Water Board for the Fourth Term Permits. The preparation of these annual reports requires significant time and resources from each Copermittee, which could otherwise be expended on actions that could improve water quality within its jurisdiction. In turn, significant time and resources are required from the San Diego Water Board staff to review these reports, which could otherwise be expended on working directly with the Copermittees to improve their implementation efforts toward restoring and protecting water quality.

Until the Water Quality Improvement Plans are developed, there will be a transitional period during which the Copermittees will continue to implement their existing jurisdictional runoff management programs. There will also be a transitional period during which the Copermittees will implement the transitional monitoring and assessment requirements of Provision D. During the transitional period, the Copermittees will submit annual reports pursuant to the requirements of Provisions F.3.b.(1) and F.3.b.(2).

Provision F.3.b.(1) includes the transitional annual reporting requirements for each Copermittee's jurisdictional runoff management program. The reporting of the jurisdictional runoff management program implementation efforts have been reduced to a single 2-page form. Each Copermittee is required to complete and submit a Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D or a revised form accepted by the San Diego Water Board) no later than October 31 of each year for each jurisdictional runoff management program reporting period (i.e. July 1 to June 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted. The Jurisdictional Runoff Management Program Annual Report Form will certify that each Copermittee has implemented its jurisdictional runoff management program in accordance with the requirements of Provision E. Each Copermittee may choose to continue to utilize and submit the jurisdictional runoff management program annual reporting format of its current Order until the first Water Quality Improvement Plan Annual Report is required to be submitted.

Provision F.3.b.(2) includes the transitional annual reporting requirements for the transitional monitoring and assessment program for each Watershed Management Area. The Copermittees in the Watershed Management Area are required to submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted. The Transitional Monitoring and Assessment Program Annual Report is required to include the transitional period monitoring data collected pursuant to Provisions D.1.a and D.2.a, and the findings from the transitional period findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

Provision F.3.b.(3) includes the Water Quality Improvement Plan Annual Report requirements. Only one Water Quality Improvement Plan Annual Report is required for each of the ten (10) Watershed Management Areas designated under Provision B.1, which is a significant reduction in the number of annual reports required to be prepared and submitted by the Copermittees. The Water Quality Improvement Plan Annual Report will document the Copermittees' efforts to implement the Water Quality Improvement Plan. Each Water Quality Improvement Plan Annual Report will be focused primarily on reporting the analysis of the monitoring data collected pursuant to Provisions D.1-D.3 during the reporting period, and the assessments that are required pursuant to Provision D.4 based on the data. The monitoring data analyses and the assessments that are provided in the Water Quality Improvement Plan Annual Report will be the core of the report. The reporting of the jurisdictional runoff management program implementation efforts have been reduced to a single 2-page form, and will no longer be the primary focus of the reporting requirements as in the Third and Fourth Term Permits.

Each Copermittee will continue to prepare and submit a Jurisdictional Runoff Management Program Annual Report Form as part of the Water Quality Improvement Plan Annual Report to certify that each Copermittee has implemented its jurisdictional runoff management program in accordance with the requirements of Provision E. Instead of reviewing a voluminous report from each Copermittee, as was required under the Third and Fourth Term Permits, the San Diego Water Board will conduct audits of each Copermittee's jurisdictional runoff management program to investigate and confirm the information provided by each Copermittee on its Jurisdictional Runoff Management Program Annual Report Form. The audits will allow the San Diego Water Board to become more familiar with the each Copermittee's jurisdictional runoff management program, and each Copermittee will become more informed about the expectations of the San Diego Water Board.

The reduction in the number and content of the Water Quality Improvement Plan Annual Reports should result in significant time, cost and resource savings for the Copermittees, as well as the San Diego Water Board. Those savings should offset a significant portion of any additional costs that may be incurred to develop the Water

Quality Improvement Plans and to implement the monitoring and assessment program requirements of Provision D.

The reporting period for the Water Quality Improvement Plan Annual Reports consists of two periods. Because the jurisdictional runoff management programs are typically budgeted and implemented during a fiscal year, the information provided on the Jurisdictional Runoff Management Program Annual Report Forms will cover the period from July 1 to June 30 of the following year.

The Water Quality Improvement Plan Annual Reports, however, are focused primarily on the monitoring data and the assessments based on the monitoring data. The monitoring data is collected during the monitoring year, which begins October 1 and ends September 30 of the following year. The monitoring year begins after the beginning of the fiscal year and ends after the end of the fiscal year. Therefore, to accommodate and capture the information collected during the fiscal year and the monitoring year, the Annual Report reporting period incorporates both periods.

Finally, Provision F.3.c requires the Copermittees to develop and submit a Regional Monitoring and Assessment Report. The Regional Monitoring and Assessment Report is similar to the Long Term Effectiveness Assessment required under the Fourth Term San Diego County Permit. The Regional Monitoring and Assessment Report is expected to utilize the entire body of data and information collected by the Copermittees during the term of this Order to assess improvements to water quality on a regional scale.

Provision F.4 (Regional Clearinghouse) requires the Copermittees to develop, update, and maintain an internet-based Regional Clearinghouse that can be used to store, disseminate, and share the Copermittees' documents, monitoring data, special studies, and any other data or information.

Most of the documents and data that are generated by the Copermittees can be provided in electronic format, and made available to the San Diego Water Board and the public on the internet. The San Diego Water Board has been gradually transitioning its document submittal requirements to electronic submittals. Provision F.4 has been included to further these efforts.

Provision F.4 has also been included to improve the exchange and availability of information among the Copermittees, as well as between the Copermittees and the San Diego Water Board. Provision F.4 will also make the information generated during the implementation of the Order more accessible to the public.

Provision F.5 (Report of Waste Discharge) requires the Copermittees to submit a Report of Waste Discharge to reapply for renewal of the Order prior to its expiration, in accordance with 40 CFR 122.21(d)(2) and CWC section 13376.

Because the ~~Orange County and~~ Riverside County Copermittees will not be subject to the requirements of this Order until they are notified of coverage, Provision F.5.a describes the process of submitting a ~~their~~ Report~~s~~ of Waste Discharge pursuant to the requirements of their current permit~~s~~ to obtain coverage under this Order.

For the Copermittees subject to the requirements of this Order, Provision F.5.b requires the Copermittees to submit a Report of Waste Discharge 180 days in advance of the expiration of this Order. Provision F.5.b also describes the minimum information to be included in the Report of Waste Discharge, based on USEPA guidance "Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems," dated May 17, 1996.

Provision F.6 (Application for Early Coverage) describes the process that would allow the Orange County and/or Riverside County Copermittees to obtain coverage under this Order earlier than the expiration of their current Orders.

If the Orange County and/or Riverside County Copermittees choose to obtain coverage under this Order earlier than the expiration of their current Orders, the preparation and submittal of a Report of Waste Discharge, as required by the Fourth Term Permits, will not be necessary. The existing Order for the respective county will be rescinded upon the effective coverage date under this Order, except for enforcement purposes.

G. Principal Watershed Copermittee Responsibilities

Purpose: Provision G includes the requirements for the Principal Watershed Copermittee designated by the Copermittees in each Watershed Management Area.

***Discussion*:** Unlike previous NPDES requirements, there will no longer be a single Principal Copermittee. Provision G.1 requires the Copermittees to designate a Principal Watershed Copermittee for each Watershed Management Area. There are ten (10) Watershed Management Areas in the San Diego Region, as defined in Table B-1 under Provision B.1 of the Order. An individual Copermittee should not be the Principal Watershed Copermittee for more than two (2) Watershed Management Areas. There could be up to ten (10) Principal Water Copermittees designated for the Watershed Management Areas in the San Diego Region.

Provision G.2 describes the minimum responsibilities of each Principal Watershed Copermittee. The primary responsibility of the Principal Watershed Copermittees is to serve as the liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues. Ideally, the Principal Watershed Copermittee can represent the interests of all the Copermittees within a Watershed Management Area during discussions or meetings to facilitate communication with the San Diego Water Board. The Principal Watershed Copermittees are also responsible for facilitating and coordinating the implementation efforts of the Copermittees and submittals of required documents and reports.

The Principal Watershed Copermittee is responsible for facilitating the efforts of the Copermittees within the Watershed Management Area to develop the Water Quality Improvement Plan required under Provision B, and submit it for approval in accordance with Provision F.1. The Principal Watershed Copermittee is also responsible for coordinating the submittal of the document updates, Progress Report Presentations, and Annual Reports required from the Copermittees within each Watershed Management Area under Provisions F.2, F.3.a, and F.3.b. The Principal Watershed Copermittees are responsible for coordinating with each other to develop and submit the Regional Clearinghouse, Regional Monitoring and Assessment Report, and the Report of Waste Discharge required under Provisions F.3.c, F.4, and F.5.

The designated Principal Watershed Copermittee for each Watershed Management Area does not necessarily have to serve as the Principal Watershed Copermittee for the entire term of the Order. If the Copermittees in a Watershed Management Area choose to designate a new Principal Watershed Copermittee, the change may be submitted as part of the Annual Report required under Provision F.3.b, with an update to the Water Quality Improvement Plan in accordance with Provision F.2.c.

Provision G.3 specifies that the Principal Watershed Copermittee is not responsible for ensuring that the other Copermittees within the Watershed Management Area are in compliance with the requirements of this Order

H. Modification of Order

Purpose: Provision H provides the conditions under which modifications to Order No. R9-2013-0001 may occur.

***Discussion*:** Provision H allows for modifications to Order No. R9-2013-0001. Minor modifications may be made by the San Diego Water Board Executive Officer without a public notice or public hearing. Minor modifications are defined under 40 CFR 122.63. Minor modifications under 40 CFR 122.63 potentially applicable to this Order are the following:

- Correcting typographical errors;
- Requiring more frequent monitoring or reporting by the Copermittees;
- Changing an interim compliance date in a schedule of compliance, provided the new date is not more than 120 days after the date specified in the existing permit and does not interfere with attainment of the final compliance date requirement.

Modifications that are not one of the above minor modifications will require re-opening the Order, subject to the requirements of 40 CFR 122.44, 122.62 to 122.64, and 124.5, but only for the specific provisions subject to the modification. Modifications of the Order that are not minor require a draft Order with the proposed modifications made available for public review, a public notice and comment period, and a public hearing. Comments on the provisions not subject to the proposed modifications are not required to be considered in the San Diego Water Board's responses to comments or during the public hearing.

Provision H.4 was included to specify that the Order will be re-opened for modifications if the State Water Board determines revisions to Provision A are warranted, an application for early coverage under the Order is received pursuant to Provision F.6, the Basin Plan is amended to modify an existing TMDL or incorporate a new TMDL, or the monitoring and assessment program requirements need to be updated or revised.

Provision H.5 was included to specify that the San Diego Water Board will re-open and consider modifications to this Order when the Orange County Copermittees or the Riverside County Copermittees submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders

I. Standard Permit Provisions and General Provisions

Purpose: Provision I incorporates the standard permit provisions required to be included in all NPDES permits, as well as several other general provisions.

***Discussion*:** Provision I refers to Attachment B to the Order. Attachment B expressly incorporates the conditions applicable to all NPDES permits as provided under 40 CFR 122.41(a)-(n), as well as the applicable conditions for MS4s and storm water discharges provided under 40 CFR 122.42(c) and 40 CFR 122.42(d), respectively. Attachment B also includes several general provisions that are typically included in or applicable to waste discharge requirements issued by the San Diego Water Board.

IX. ATTACHMENTS

The attachments to the Order are discussed below. The discussions describe the content of the attachments.

Attachment A – Discharge Prohibitions and Special Protections

Section 1 of Attachment A includes the Waste Discharge Prohibitions from the Basin Plan. They have been provided verbatim in their entirety.

Section 2 of Attachment A includes the "*Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges*" applicable to permitted point source discharges of storm water, adopted under State Water Board Resolution No. 2012-0012, as amended by Resolution No. 2012-0031. The terms, prohibitions, and special conditions (collectively referred to as special conditions) are established as limitations on point source storm water discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in ASBS, as required for State Water Quality Protection Areas pursuant to California Public Resources Code sections 36700(f) and 36710(f). These Special Protections were adopted by the State Water Board as part of the Ocean Plan General Exception.

Attachment B – Standard Permit Provisions and General Provisions

Conditions applicable to all NPDES permits, as required under 40 CFR 122.41, and conditions applicable to MS4s and storm water discharges, as required under 40 CFR 122.42(c) and 122.42(d), respectively are provided in Attachment B to the Order. They have been provided expressly in their entirety.

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. These general provisions are typically included in or applicable to waste discharge requirements issued by the San Diego Water Board. Many of the general provisions were developed by the State Water Board. Where a general provision is derived from statute or regulation, a citation of the statute or regulation section is provided. General provisions that do not provide a citation are included under the authority provided CWC 13377.

Attachment C – Acronyms, Abbreviations and Definitions

The acronyms and abbreviations that are used in the Order are provided in Attachment C. Attachment C also includes definitions that may provide an explanation or description of the meaning or intent of specific terms or phrases included in the Order.

Attachment D – Jurisdictional Runoff Management Program Annual Report Form

An example of the Jurisdictional Runoff Management Program Annual Report Form required to be submitted by each Copermittee as part of the Annual Reports required under Provision F.3.b.(1)(e) is provided as Attachment D to the Order. An electronic version of the form will be available from the San Diego Water Board after the adoption of the Order.

The Jurisdictional Runoff Management Program Annual Report Form includes the minimum information necessary to demonstrate that the Copermittee is implementing and in compliance with the requirements of Provision E, and includes much of the information required to be reported pursuant to 40 CFR 122.42(c).

The information that must be provided on the Jurisdictional Runoff Management Program Annual Report Form is limited to the fiscal year, which begins July 1 and ends June 30 of the following year. The information expected to be provided by the Copermittees in each section of the Jurisdictional Runoff Management Program Annual Report Form is discussed below.

I. COPERMITTEE INFORMATION

The name of the Copermittee (e.g. name of city, county, or special district) and the contact information for the storm water program manager are provided under this section.

II. LEGAL AUTHORITY

The Copermittee must confirm whether or not the legal authorities under Provision E.1.a have been established for itself within its jurisdiction.

The Copermittee must also confirm whether or not a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority, as required under Provision E.1.b. The certification statement required by Provision E.1.b is only required to be submitted with the first Annual Report required under Provision F.3.b.

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

The Copermittee must inform the San Diego Water Board whether or not an update to its jurisdictional runoff management program document was required or recommended by the San Diego Water Board during the reporting period. An update to the jurisdictional runoff management program is required under Provision F.2.a. The San Diego Water Board may recommend modifications to the jurisdictional runoff management program as part of the iterative approach and adaptive management process required under Provision B.5, which may result in an update that is necessary for the Copermittee's jurisdictional runoff management document.

If an update was required or recommended, the Copermittee must confirm whether or not the update was completed and made available on the Regional Clearinghouse within the reporting period. If no update was required or recommended, an answer is not required. If the answer is NO, meaning the required or recommended update was not completed and/or made available on the Regional Clearinghouse, the Copermittee must attach a

schedule for the completion of the update and/or posting of the updated document on the Regional Clearinghouse.

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

The Copermittee must confirm whether or not a program was implemented during the fiscal year to actively detect and eliminate illicit discharges and connections in accordance with the requirements under Provision E.2.

In addition to confirming that a program to detect and eliminate illicit discharges was implemented during the reporting period, the Copermittee is also required to report on several items related to the program. The information that must be reported is limited to the fiscal year for the Annual Report.

All non-storm water discharges are considered illicit discharges unless the source is identified as one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5). If a non-storm water discharge is identified as one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5), the discharge is a non-storm water discharge, but not an illicit discharge. If a non-storm water discharge is identified but not in one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5), the discharge is both a non-storm water discharge and an illicit discharge.

V. DEVELOPMENT PLANNING PROGRAM

The Copermittee must confirm whether or not a development planning program was implemented during the fiscal year in accordance with the requirements under Provision E.3.

The Copermittee must also inform the San Diego Water Board whether or not an update to its BMP Design Manual was required or recommended by the San Diego Water Board during the fiscal year. An update to the BMP Design Manual is required under Provision F.2.b. The San Diego Water Board may recommend modifications to the BMP Design Manual, which may result in an update that is necessary for Copermittee's the BMP Design Manual.

If an update was required or recommended, the Copermittee must confirm whether or not the update was completed and made available on the Regional Clearinghouse within the reporting period. If no update was required or recommended, an answer is not required. If the answer is NO, meaning the required or recommended update was not completed and/or made available on the Regional Clearinghouse, the Copermittee must attach a schedule for the completion of the update and/or posting of the updated document on the Regional Clearinghouse.

The Copermittee is also required to report on several items related to the program. For the development and redevelopment projects that are reviewed under the program, the Copermittee must report the total number projects submitted for review during the fiscal year. Of those projects, the Copermittee must report the number that are Priority Development Projects, as defined under Provision E.3.b.(1). The Copermittee must also report the number of Priority Development Projects that were approved and/or granted occupancy during the fiscal year, regardless of when the project was originally submitted for review. Any projects that were approved during the fiscal year and granted any

exemptions from the BMP Design Manual requirements and/or allowed to implement alternative compliance options in accordance with Provision E.3.c.(3) must be reported.

Finally, the Copermittee must also report on several items related to its oversight of permanent BMPs on Priority Development Projects within its jurisdiction, as required under Provision E.3.e. The information that must be reported is limited to the fiscal year for the Annual Report.

VI. CONSTRUCTION MANAGEMENT PROGRAM

The Copermittee must confirm whether or not a construction management program was implemented during the fiscal year in accordance with the requirements under Provision E.4.

The Copermittee is also required to report on several items related to its oversight construction projects within its jurisdiction. The information that must be reported is limited to the fiscal year for the Annual Report.

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

The Copermittee must confirm whether or not an existing development management program was implemented during the fiscal year in accordance with the requirements under Provision E.5.

The Copermittee is also required to report on several items related to its oversight in areas of existing development within its jurisdiction. The information that must be reported is limited to the fiscal year for the Annual Report. The information must also be separated into four categories of existing development: municipal, commercial, industrial, and residential.

VIII. PUBLIC EDUCATION AND PARTICIPATION

The Copermittee must confirm whether or not a public education program component was implemented during the fiscal year in accordance with the requirements under Provision E.7.a.

The Copermittee must also confirm whether or not a public participation program component was implemented during the fiscal year in accordance with the requirements under Provision E.7.b.

IX. FISCAL ANALYSIS

The Copermittee must confirm a summary of its fiscal analysis, conducted in accordance with the requirements under Provision E.8, has been attached to the form.

X. CERTIFICATION

A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative must sign and certify the Jurisdictional Runoff Management Program Annual Report Form. The appropriate box must be checked to indicate the whether a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative is signing the form.

Attachment E – Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2013-0001

Attachment E provides specific provisions for implementing the load allocations (LAs) and wasteload allocations (WLAs) of Total Maximum Daily Loads (TMDLs) adopted by the San Diego Water Board and approved by USEPA in which the Copermittees are identified as responsible for discharges subject to the requirements of the TMDLs. Federal regulations require that NPDES requirements incorporate water quality based effluent limitations (WQBELs) that must be consistent with the requirements and assumptions of any available WLAs,[46] which may be expressed as numeric effluent limitations, when feasible, and/or as a best management practice (BMP) program of expanded or better-tailored BMPs.[47] Where the TMDL includes WLAs that provide numeric pollutant load or pollutant parameter objectives, the WLA has been, where feasible, translated into numeric WQBELs.[48]

For each TMDL in Attachment E, four sections are included:

a. Applicability: This section provides the resolution under which the TMDL Basin Plan amendment was adopted and approved, with the applicable adoption and approval dates. This section also gives the effective date of the TMDL and where the TMDL is applicable (i.e. Watershed Management Area and water body). The Copermittees that are responsible for implementing the specific provisions are also given in this section.

b. Final TMDL Compliance Requirements: For each TMDL, the final TMDL compliance requirements consist of the final TMDL compliance date(s), the final WQBELs, and the final TMDL compliance determination requirements. The final WQBELs are expressed in terms of receiving water limitations, effluent limitations, and/or best management practices (BMPs). The final WQBELs for the TMDLs are incorporated by reference into Provision A of the Order. The final WQBELs become enforceable when the final TMDL compliance dates have passed. Applicable BMPs within the final WQBELs must be incorporated into the Water Quality Improvement Plans. Compliance with the final WQBELs will be determined in accordance with the options provided under the final TMDL compliance determination requirements.

c. Interim TMDL Compliance Requirements: If the final TMDL compliance date has not passed and there are interim TMDL compliance requirements, they are included in this section. If there are interim WQBELs with interim compliance dates, the interim WQBELs become enforceable when the corresponding interim compliance dates have passed. Compliance with the interim WQBELs will be determined in accordance with the options provided under the interim TMDL compliance determination requirements.

d. Specific Monitoring and Assessment Requirements: If there are specific monitoring and assessment requirements that cannot be met with the monitoring and assessment program

[46] 40 CFR 122.44(d)(1)(vii)(B)
[47] 40 CFR 122.44(k)(2) and 40 CFR 122.44(k)(3)
[48] November 12, 2010 Memorandum from the USEPA, Revisions to the November 22, 2002 Memorandum "Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLA""

requirements under Provision D of the Order, the additional requirements are included in this section.

The requirements of the TMDLs are based on and consistent with the assumptions and requirements of any available adopted and approved TMDLs that have been incorporated into the Basin Plan. Modifications to the requirements for the TMDLs in Attachment E cannot be made unless the TMDLs are modified in the Basin Plan.

A modification to any aspect of a TMDL in the Basin Plan requires a Basin Plan amendment. A Basin Plan amendment to modify a TMDL will require the San Diego Water Board to adopt a resolution to amend the Basin Plan, which includes a separate public process. When the San Diego Water Board adopts a Basin Plan amendment, it subsequently requires approval from the State Water Board, the Office of Administrative Law, and the USEPA before it becomes effective.

If and when the TMDLs are a modified in the Basin Plan, the San Diego Water Board will revise the requirements of the Order ~~TMDL~~ in accordance with the Basin Plan amendment. When a Basin Plan amendment to modify a TMDL becomes effective, the San Diego Water Board will modify the requirements of the Order~~TMDL~~ pursuant to the requirements of Provision H.4 of the Order as soon as possible.

CALIFORNIA Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

September 18, 2014

Sent via E-mail

San Diego County Copermittees
Orange County Copermittees
Riverside County Copermittees

In reply refer to / attn:
Place ID: 658018Lwalsh

Subject: NOTICE OF OPPORTUNITY TO COMMENT
Tentative Order No. R9-2015-0001, An Order Amending the Regional Municipal Separate Storm Sewer (MS4) Permit for the San Diego Region (Order No. R9-2013-0001)

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) is releasing for public review and comment Tentative Order No. R9-2015-0001 (Tentative Order). The Tentative Order proposes to amend the National Pollutant Discharge Elimination System (NPDES) Permit for *Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region*, Order No. R9-2013-0001 (Regional MS4 Permit). Notice is hereby given that the San Diego Water Board will receive written comments on the Tentative Order and proposed changes to the Regional MS4 Permit in accordance with title 40 Code of Federal Regulations (CFR) section 124.10 and Water Code section 13167.5.

The Tentative Order proposes to amend the Regional MS4 Permit in response to the Orange County Copermittees' Report of Waste Discharge (RoWD) submitted by letter dated May 20, 2014, and designate the Orange County Copermittees as MS4 dischargers responsible for compliance with the terms and the conditions of the Permit. The Tentative Order also proposes to amend the Regional MS4 Permit to address a variety of other issues including 1) Regional Water Board designation to consolidate regulation of Phase I MS4 discharges for the Cities of Laguna Hills, Laguna Woods, and Lake Forest pursuant to Water Code section 13228, 2) incorporation of the Los Peñasquitos Lagoon Sediment Total Maximum Daily Load requirements, 3) the extension of a pollutant reduction deadline for MS4 discharges to Areas of Special Biological Significance, 4) incorporation of interim exemptions for hydromodification management, and 5) implementation of a uniform approach for monitoring beach water quality in south Orange County. The uniform monitoring approach referenced in the Tentative Order is contained in a San Diego Water Board report entitled "*Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County,*" dated September 2014. This report will be available for public review during the public review and comment period on the Tentative Order.

The Tentative Order amends the Regional MS4 Permit and the Fact Sheet (Attachment F of the Permit) as described in Attachments 1 and 2 of the Tentative Order. Changes to the Regional MS4 Permit and its Fact Sheet based upon the Tentative Order are displayed in blue-underline text and red-strikeout text in the attachments to the Tentative Order.

If the San Diego Water Board adopts Tentative Order No. R9-2015-0001, the Orange County Copermittees will be the second group of Copermittees to obtain coverage under the Regional MS4 Permit. San Diego County Copermittees obtained coverage upon the effective date of the Regional MS4 Permit following its adoption on May 8, 2013. The last remaining group, the Riverside County Copermittees, will be considered for coverage under the Regional MS4 Permit in a future action following the expiration of their current MS4 Permit in November 2015, and after consideration of their RoWD submittal for MS4 Permit reissuance. Thus the intent of the Regional MS4 Permit is to ultimately cover multiple MS4 discharge points to receiving waters throughout areas of San Diego, Orange, and Riverside Counties that fall within the San Diego Water Board's jurisdiction. Therefore, the Copermittees currently covered by Order No. R9-2013-0001 (i.e. the Copermittees in San Diego County) and Orange County Copermittees have an opportunity to submit any written comments on the Tentative Order and proposed changes to the Regional MS4 Permit during the comment period described below. Copermittees covered by the current Riverside County MS4 permit (Order No. R9-2010-0016), for which a RoWD NPDES reissuance application has not yet been filed, are strongly encouraged to submit written comments during the comment period described below.

Document Availability
The Tentative Order and attachments thereto, are available on the San Diego Water Board website at:

http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/oc_stormwater.shtml.

Interested persons may also receive a copy of the Tentative Order and its attachments by contacting Laurie Walsh at (619) 521-3373, email Laurie.Walsh@waterboards.ca.gov or by visiting the San Diego Water Board's office at 2375 Northside Drive, Suite 100, San Diego, California 92108, weekdays between 8:00 a.m. and 5:00 p.m., telephone (619) 516-1990. San Diego, Orange, and Riverside County Copermittees are requested to confirm by e-mail to Laurie Walsh that they *do not* wish to receive a copy of the Tentative Order and its attachments in paper form.

Submission of Written Comments
The submission of written comments is the opportunity for the Copermittees and interested persons to raise and comment on issues pertaining to the terms and conditions of the Tentative Order. All written comments pertaining to the terms and conditions of the Tentative Order to be considered by the San Diego Water Board at the as-yet unscheduled public hearing must be received no later than **12:00 noon on Wednesday November 19, 2014.**

Written comments must be sent to the San Diego Water Board's office at 2375 Northside Drive, Suite 100, San Diego, CA 92108, faxed to (619) 516-1994, or e-mailed to Laurie Walsh at Laurie.Walsh@waterboards.ca.gov. Please indicate in the subject line of all written comments "Comment - Tentative Order No. R9-2015-0001, Place ID:658018LWalsh". The early submission of written comments on the Tentative Order is encouraged.

Written comments received by **12:00 noon on Wednesday, November 19, 2014** will be provided to the San Diego Water Board members for their review in advance of a public hearing to consider adoption of the Tentative Order. All timely written comments will also be posted as they are received on the San Diego Water Board website at: http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/oc_stormwater.shtml.

Consistent with State Water Board regulations that apply to this proceeding, written comments received after the close of the comment period will not be accepted and will not be incorporated into the administrative record if doing so would prejudice any party. Written comments received by the close of the comment period will be provided to the San Diego Water Board members for their review in advance of a public hearing to consider adoption of the Tentative Order. The San Diego Water Board will prepare written responses to significant comments that are timely received.

Public Hearing for Consideration of Tentative Order Adoption
The San Diego Water Board will issue a separate notice announcing a public hearing to receive oral comments and consider adoption of the Tentative Order at a later date. Notice of the public hearing will be provided to the Copermittees and interested persons at least thirty (30) days in advance of the hearing. Participants will have an opportunity to address the San Diego Water Board members subject to reasonable limitations prior to the Board taking action on the Tentative Order. The public notice providing the specific date for the San Diego Water Board adoption meeting and any other public notices related to the Tentative Order will be distributed through the e-mail list service specified below and posted on the San Diego Water Board website at:
http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/oc_stormwater.shtml

Public Workshop on Tentative Order
The San Diego Water Board will hold a public workshop to receive information and discuss requirements of the Tentative Order as part of the Board's regularly scheduled public meeting on October 8, 2014 in the City of Mission Viejo, Council Chambers, Mission Viejo, California. Additional information on the public workshop is contained in the Notice of Public Workshop which is available on the San Diego Water Board website at:
http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/oc_stormwater.shtml

E-Mail List Service
Interested persons desiring to receive future public notices regarding the Tentative Order and potential future modifications to the Regional MS4 Permit can subscribe to one of the electronic e-mail service lists titled "Orange County MS4 Permit," "Riverside County MS4 Permit," or "San Diego MS4 Permit" located on the San Diego Water Board website at:
http://www.waterboards.ca.gov/resources/email_subscriptions/reg9_subscribe.shtml

Persons without access to email may request paper copies of future notices and other documents by contacting Laurie Walsh as specified in the Document Availability section of this notice.

Contact for further Information
For questions or comments concerning this notice, please contact Laurie Walsh by phone at (619) 521-3373, or by email at Laurie.Walsh@waterboards.ca.gov .

Respectfully,

David Barker, P.E.
Supervising Engineer
San Diego Regional Water Quality Control Board

DWG:dtb esb:law

Cc (via email):

San Diego County Copermittees
Orange County Copermittees
Riverside County Copermittees
Natural Resource Agencies
San Diego County MS4 Permit E-mail Service List
Riverside County MS4 Permit E-mail Service List
Orange County MS4 Permit E-mail Service List
San Diego Water Board Agenda E-mail Service List

Tech Staff Info & Use	
Tentative Order No.	R9-2015-0001
NPDES No.	CAS0109266
Place ID	658018

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CALIFORNIA Water Boards

EDMUND G. BROWN JR. GOVERNOR

MATTHEW RODRIQUEZ SECRETARY FOR ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

NOTICE OF PUBLIC WORKSHOP

A Workshop Will Be Held To Discuss

Tentative Order No. R9-2015-0001
An Order Amending the Regional Municipal Separate Storm Sewer (MS4) NPDES Permit for the San Diego Region

The Location and Time Are Specified Below.

Wednesday, October 8, 2014 – 9:00 a.m.
City of Mission Viejo
Council Chambers
200 Civic Center
Mission Viejo, California

NOTICE IS HEREBY GIVEN that the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) will hold an informational public workshop to receive information and discuss requirements in a public draft of Tentative Order No. R9-2015-0001. Tentative Order No. R9-2015-0001 proposes to amend the National Pollutant Discharge Elimination System (NPDES) Permit for Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region, Order No. R9-2013-0001 (Regional MS4 Permit). Tentative Order No. R9-2015-0001 will be available on or about September 12, 2014 and will be accessible electronically at:

http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/oc_stormwater.shtml.

The workshop will be held at the San Diego Water Board's regularly scheduled public meeting on October 8, 2014. To view the meeting agenda in advance of the meeting, please visit the San Diego Water Board's website at:

http://www.waterboards.ca.gov/sandiego/board_info/agendas/.

Except for items designated as time certain, there are no set times for agenda items. Items including the workshop may be taken out of order at the discretion of the Chairman.

BACKGROUND INFORMATION

The San Diego Water Board adopted the Regional MS4 Permit on May 8, 2013 in response to a Report of Waste Discharge (RoWD) application from the municipal Copermittees in San Diego County for reissuance of an MS4 NPDES permit. The Copermittees in San Diego County are currently enrolled under the Regional MS4 Permit. The San Diego Water Board is considering enrollment of Copermittees in Orange County and Riverside County under the Regional MS4 Permit in a phased manner as their current MS4 permits expire and after consideration of their RoWD submittal.

Copermittees in Orange County consisting of the County of Orange, Orange County Flood Control District and the cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Lake Forest, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano are currently regulated by MS4 Permit Order No. R9-2009-0002. This MS4 permit will expire on December 16, 2014, and the Orange County Copermittees have jointly submitted a RoWD in application for MS4 NPDES permit reissuance. Tentative Order No. R9-2015-0001 proposes to amend the Regional MS4 Permit in response to the RoWD and enroll the Orange County Copermittees under the Permit as MS4 dischargers responsible for compliance with the terms and the conditions of the Permit. The Tentative Order also proposes to amend the Regional MS4 Permit to address a variety of other issues including 1) Regional Water Board designation to consolidate regulation of MS4 discharges for the Cities of Laguna Hills, Laguna Woods, and Lake Forest, 2) incorporation of the Los Peñasquitos Lagoon Sediment Total Maximum Daily Load (TMDL) requirements, 3) incorporation of interim exemptions for hydromodification management, 4) the extension of a pollutant reduction deadline for MS4 discharges to Areas of Special Biological Significance (ASBS) and 5) implementation of a unified approach for monitoring beach water quality in south Orange County.

PROCEDURAL MATTERS

The October 8, 2014 public workshop will be informal and conducted to provide San Diego Water Board members with information about the Tentative Order and to facilitate discussion. There will be no sworn testimony or cross-examination of participants. San Diego Water Board staff will explain the Regional MS4 Permit amendment process and summarize significant elements of the Tentative Order for the San Diego Water Board and the public. Orange County Copermittees, other Copermittees within the San Diego Region, and any interested persons will also have an opportunity to provide oral comments as set forth below. The San Diego Water Board may provide general feedback to staff on proposed modifications of the Regional MS4 Permit; however, no action or voting will take place at this workshop.

To ensure a productive and efficient public workshop, and to ensure that all attending have an opportunity to participate, oral presentations may be limited at the discretion of the Chair. This item has significant interest to the public and regulated community, and in order to provide enough time for all interested parties to participate, participants with similar comments are requested to make joint presentations. San Diego Water Board staff may, but will not necessarily, respond to comments made at the workshop.

The San Diego Water Board will issue a separate public hearing and comment period notice announcing the release of the Tentative Order for public review and comment on or about September 12, 2014. The public hearing notice will establish the deadline for submission of written comments, the time, date and location of the public hearing, and the procedures that the San Diego Water Board will follow at the public hearing to consider adoption of the Tentative Order. Once released, the Tentative Order will serve as the public comment draft permit amendment for purposes of applicable public notice requirements under the Code of Federal Regulations (40 C.F.R. § 124.10) and Water Code section 13167.5, subdivision (b).

DOCUMENT AVAILABILITY

The Tentative Order will be available on or about September 12, 2014 and will be accessible electronically at:

http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/oc_stormwater.shtml.

ELECTRONIC MAIL LIST SUBSCRIPTION

The San Diego Water Board has established an electronic mail list specifically for information and notices on the development of the Regional MS4 Permit. The San Diego Water Board will use the email list to notify interested persons of upcoming important events and the availability of on-line documents. Persons interested in receiving future notices and information on this specific project can subscribe to one (1) of the electronic mail lists titled “Orange County MS4 Permit, “ Riverside County MS4 Permit, or “San Diego MS4 Permit ”, located on the San Diego Water Board website at:

http://www.waterboards.ca.gov/resources/email_subscriptions/reg9_subscribe.shtml.

PARKING AND ACCESSIBILITY

For directions to the City of Mission Viejo, please refer to:
http://cityofmissionviejo.org/CityDirectory/.

A parking lot is available for your convenience; however, please refrain from using the area between the library and City Hall. The facility is accessible to persons with disabilities. Persons requiring additional accommodations should contact Chris Blank at Chris.Blank@waterboards.ca.gov or 619-521-3382 at least five (5) days prior to the workshop.

INFORMATION REGARDING WORKSHOP

If you have any questions or wish to receive a hard copy of the Tentative Order, please contact Laurie Walsh at (619) 521-3373 or via e-mail at Laurie.Walsh@waterboards.ca.gov.

San Juan HU (901)

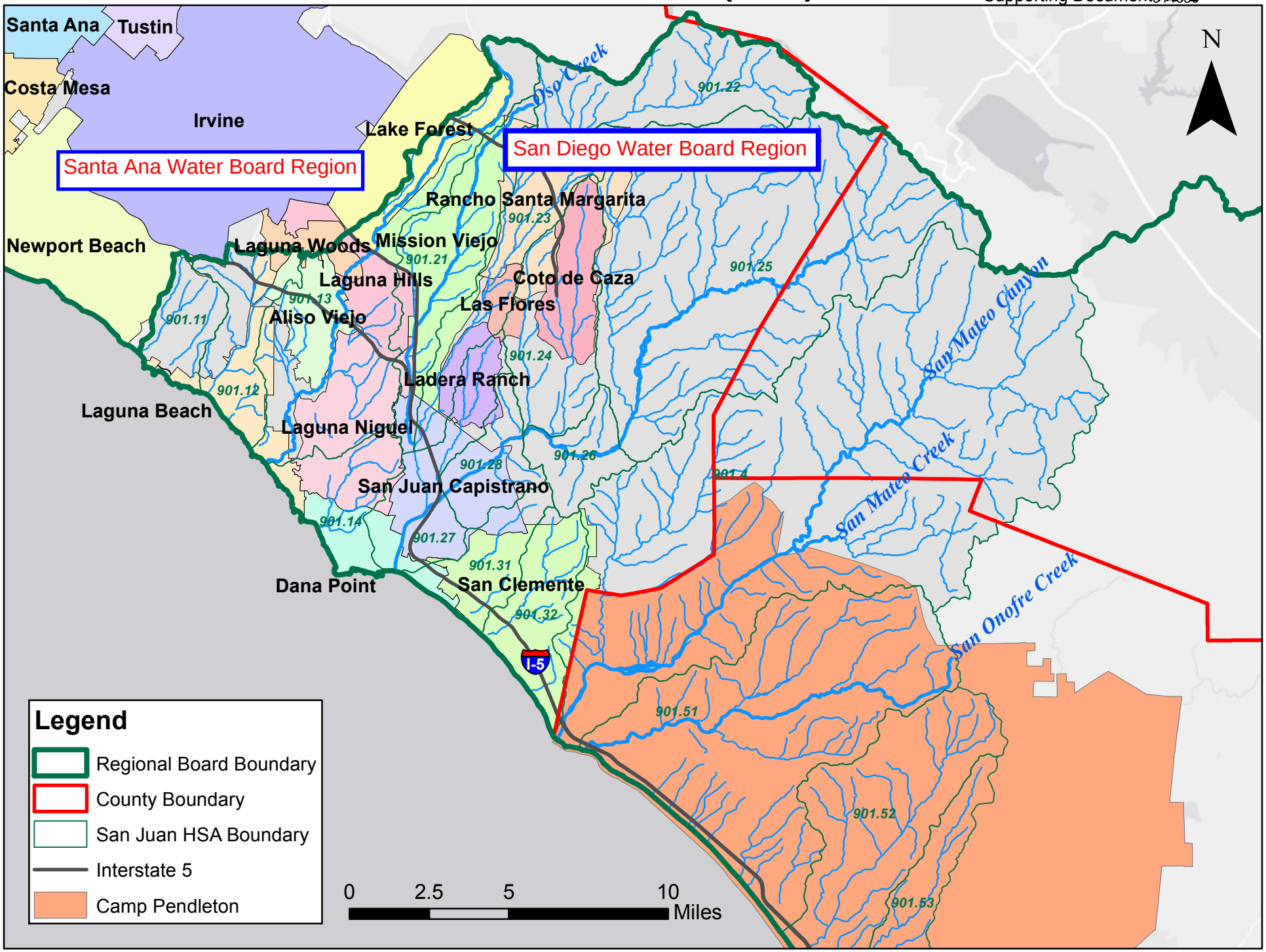

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

BOARD MEETING PARTICIPATION SIGN IN SHEET

OCTOBER 8, 2014 - 9:00 A.M. - MISSION VIEJO

PLEASE PRINT CLEARLY, AS THIS WILL BECOME PART OF THE BOARD'S OFFICIAL RECORD

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014637

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

BOARD MEETING PARTICIPATION SIGN IN SHEET

OCTOBER 8, 2014 - 9:00 A.M. - MISSION VIEJO

PLEASE PRINT CLEARLY, AS THIS WILL BECOME PART OF THE BOARD'S OFFICIAL RECORD

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014638

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

BOARD MEETING PARTICIPATION SIGN IN SHEET

OCTOBER 8, 2014 - 9:00 A.M. - MISSION VIEJO

PLEASE PRINT CLEARLY, AS THIS WILL BECOME PART OF THE BOARD'S OFFICIAL RECORD

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014639

✓ **NAME:** Dr. CINDY LIN **AGENDA ITEM NO.** 7

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: USEPA R9 liaison to RB9

ADDRESS: 600 Wilshire Blvd, Suite 1460 L.A., CA 90017 TELEPHONE: 213.244.1803

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Cindy LIN hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 10/8/2014 Signature:

NAME: RICHARD BOON **AGENDA ITEM NO.** #7

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: COUNTY OF ORANGE

ADDRESS: 2301 N. GLASSELL ORANGE TELEPHONE: 714 955 0670

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, RICHARD BOON hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 10/8/14 Signature: Richard Boon

NAME: Mary Anne Skorpanich **AGENDA ITEM NO.** 7

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Deputy Director, OC Public Works

ADDRESS: 2301 N. Glassell, Orange TELEPHONE: 714 955 0601

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, _____ hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 10/8 Signature: _____

✓

NAME: DAVID GARCIA

AGENDA ITEM NO. 7

REQUEST TO ADDRESS REGIONAL BOARD

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

*****PLEASE PRINT LEGIBLY*****

MEETING DATE: 10/8/14

SUBJECT OF TESTIMONY: Riverside County Copermitees

IS WRITTEN TESTIMONY BEING SUBMITTED? YES ☐ NO ☒

TITLE/AFFILIATION: Engineering Project Manager Riverside Co. Flood Control and Water Conservation District

ADDRESS: 1995 Market St. Riverside Ca. 92501

TELEPHONE: ~~951-955-1330~~ 951-955-1330

☐ CHECK HERE IF YOU ARE REQUESTING A FORMAL HEARING TO SUBMIT SWORN TESTIMONY OR EVIDENCE FOR THE RECORD.

Please state your name and address for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE YOUR COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

✓

NAME: Ruth Kolb

AGENDA ITEM NO. 7

REQUEST TO ADDRESS REGIONAL BOARD

DURING PUBLIC FORUMS, STATUS REPORTS, WORKSHOPS AND OTHER NON-ACTION ITEMS

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: City of San Diego, Storm Water

ADDRESS: 9370 Chesapeake Dr SD 92123

TELEPHONE: 858.541.4338

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

Meeting Date: 10/8/14

Signature:

✓ NAME: Heather Stroud

AGENDA ITEM NO. 7

REQUEST TO ADDRESS REGIONAL BOARD

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

*****PLEASE PRINT LEGIBLY*****

MEETING DATE: 10/8/14

SUBJECT OF TESTIMONY: MS4 permit amendment

IS WRITTEN TESTIMONY BEING SUBMITTED? YES ☐ NO ☑

TITLE/AFFILIATION: Deputy City Attorney

ADDRESS: 1200 3rd Ave, Suite 1100, San Diego CA

TELEPHONE: 619-533-5872

☐ CHECK HERE IF YOU ARE REQUESTING A FORMAL HEARING TO SUBMIT SWORN TESTIMONY OR EVIDENCE FOR THE RECORD.

Please state your name and address for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE YOUR COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

✓ **NAME:** Nancy Palmer **AGENDA ITEM NO.** 7

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: City of Laguna Niguel

ADDRESS: 30111 Crown Valley Parkway TELEPHONE: 949-362-4384

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Nancy Palmer hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 10/8/14 Signature: Nancy R Palmer

✓

NAME: MICHAEL BEANAN

AGENDA ITEM NO. 7

N60

REQUEST TO ADDRESS REGIONAL BOARD
DURING PUBLIC FORUMS, STATUS REPORTS, WORKSHOPS, AND OTHER NON-ACTION ITEMS

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: SOUTH LAGUNA CIVIC ASSOCIATION

ADDRESS: P.O. 9668, S° LAGUNA, CA TELEPHONE: _____

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

Meeting Date: _____ Signature: M BEANAN

✓

NAME: Colin Kelly **AGENDA ITEM NO.** 7

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Staff Attorney Orange County Coastkeeper

ADDRESS: 3151 Airway Ave, Ste F-110 Costa Mesa, CA 92626 TELEPHONE: (714) 850-1965

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Colin Kelly hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: Oct 8, 2014 Signature: [signature]

NAME: ROGER W. BUTOW

AGENDA ITEM NO. 7

REQUEST TO ADDRESS REGIONAL BOARD

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

*****PLEASE PRINT LEGIBLY*****

MEETING DATE: 10/08/2014

SUBJECT OF TESTIMONY: WORKSHOP — VPDES 2015-001

IS WRITTEN TESTIMONY BEING SUBMITTED? YES ☐ NO ☒

TITLE/AFFILIATION: CLEAN WATER NOW

ADDRESS: P.O. BOX 4711 LAGUNA BEACH CA

TELEPHONE: (949) 715-1912

☐ CHECK HERE IF YOU ARE REQUESTING A FORMAL HEARING TO SUBMIT SWORN TESTIMONY OR EVIDENCE FOR THE RECORD.

Please state your name and address for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE YOUR COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

✓ NAME: Jon Van Rhyn

AGENDA ITEM NO. 7

REQUEST TO ADDRESS REGIONAL BOARD

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

*****PLEASE PRINT LEGIBLY*****

MEETING DATE: 10/8/14

SUBJECT OF TESTIMONY: Prior lawful approval

IS WRITTEN TESTIMONY BEING SUBMITTED? YES ☐ NO ☑

TITLE/AFFILIATION: water Quality Prog. Mgr / County of San Diego

ADDRESS: 5510 overland Ave San Diego 92123

TELEPHONE: 858-495-5133

☐ CHECK HERE IF YOU ARE REQUESTING A FORMAL HEARING TO SUBMIT SWORN TESTIMONY OR EVIDENCE FOR THE RECORD.

Please state your name and address for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE YOUR COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

NAME: S. Wayne Rosenbaum

AGENDA ITEM NO. 7

REQUEST TO ADDRESS REGIONAL BOARD

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

*****PLEASE PRINT LEGIBLY*****

MEETING DATE: 10/8/14

SUBJECT OF TESTIMONY: BIA/Coalition Presentation on Prior Lawful Approval

IS WRITTEN TESTIMONY BEING SUBMITTED? YES ☑ NO ☐

TITLE/AFFILIATION: Partner Cooper & Vargo

ADDRESS: 225 Broadway Suite 1900 San Diego 92101

TELEPHONE: 619-231-5858

☐ CHECK HERE IF YOU ARE REQUESTING A FORMAL HEARING TO SUBMIT SWORN TESTIMONY OR EVIDENCE FOR THE RECORD.

Please state your name and address for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE YOUR COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

NAME: MICHAEL McSWEENEY

AGENDA ITEM NO. 7

REQUEST TO ADDRESS REGIONAL BOARD

DURING PUBLIC FORUMS, STATUS REPORTS, WORKSHOPS AND OTHER NON-ACTION ITEMS

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: SR. Public Policy ADVISOR – BIA SAN DIEGO

ADDRESS: 9201 SPECTRUM CTR BLVD # 110 SD 92123 TELEPHONE: 858-450-1221 x104

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT.

Meeting Date: OCT 8 2014

Signature: Michael McSweeney

Tentative Order No. R9-2015-0001

Modification of the Regional MS4 Permit to include the Orange County Copermittees

California Regional Water Quality Control Board
San Diego Region

San Diego Water Board Practical Vision

Healthy Waters, Healthy People

014655

014656

A sustainable future for future generations

San Juan HU (901)

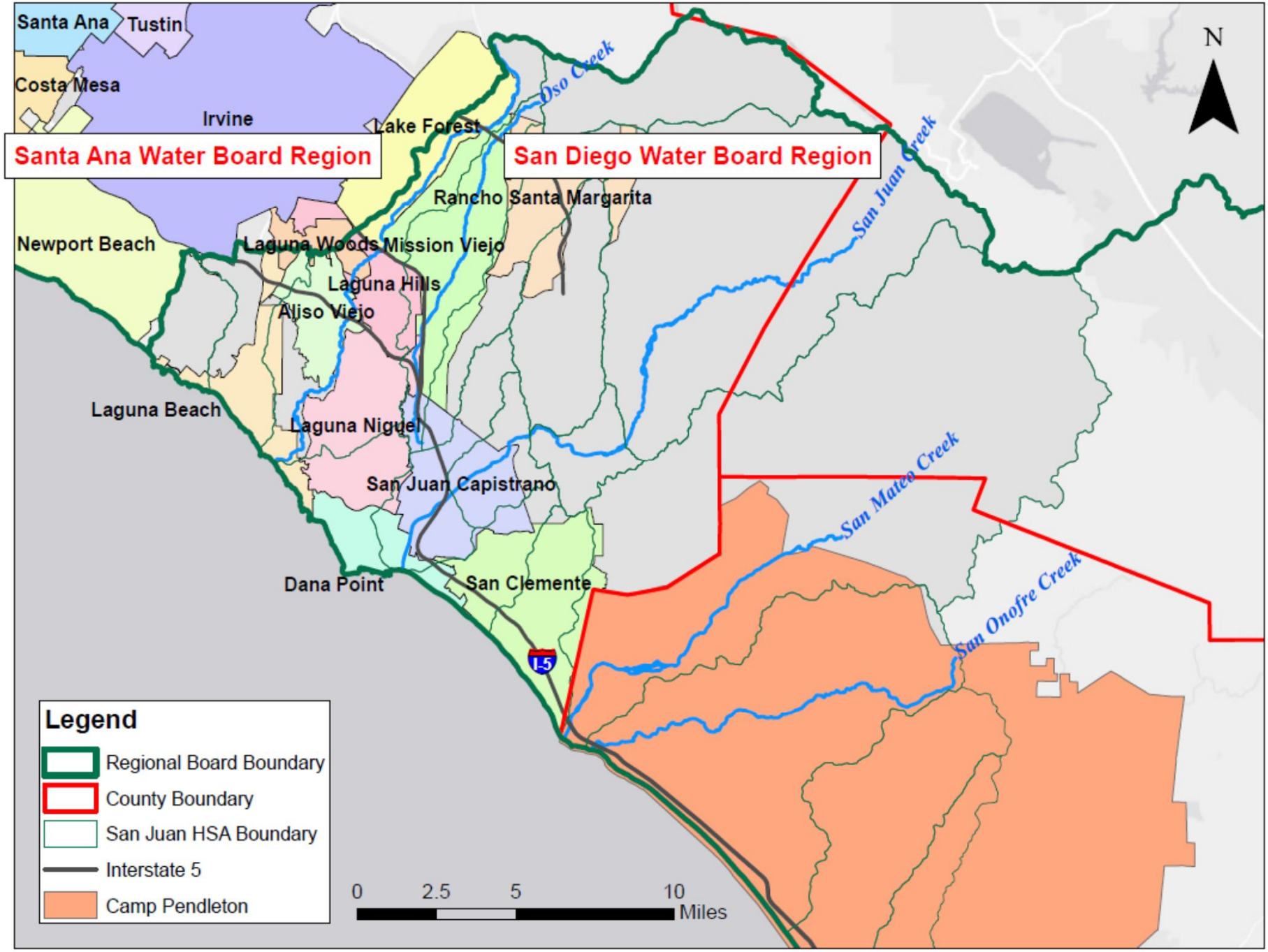

Tentative Order R9-2015-0001
Proposed Modifications to the Regional MS4 Permit

3. Include the Unified Approach for Beach Water Quality Monitoring
   - Consolidates and replaces fecal indicator bacteria monitoring
4. Add Los Peñasquitos Lagoon Sediment TMDL
   - TMDL became effective July 14, 2014
5. Correct typographical error
   - State Water Board Order - Exception to the Ocean Plan for MS4 Discharges to ASBS's
6. Land Development Requirements
   - Interim hydromodification exemptions

Hydromodification Management

Changes in natural flow regime caused by land development

Water Quality Improvement Plan

- 2-Year Development Process
- Consultation Panel and Stakeholder Input
- Accepted by San Diego Water Board
- Evaluate Retrofit/Restoration Opportunities

Exemptions

Apply to projects where risk of erosion is minimal

- Concrete-lined channels
- Underground storm drains

Interim Exemption -- Engineered Channel

Channel engineered and maintained to convey the flow generated by 10-year storm, from point of discharge to lake, bay, or Pacific Ocean

Interim Exemption -- Large River

- Floodplain > 100 sq mi
- 100-year storm flow > 20,000 cubic ft/sec

Tentative Order R9-2015-0001
Proposed Modifications to the Regional MS4 Permit

Schedule

Public Meeting	July 1, 2013
Release Tentative Order	September 19, 2014
Comment Period Start	September 19, 2014
San Diego Water Board Workshop	October 8, 2014
Comment Period End	November 19, 2014
Responding to Comments / Amending Tentative Order	November 19 through December 2014
San Diego Water Board Public Hearing – Adoption of Tentative Order	February 11, 2015

Wood Canyon Creek Wetland Habitat Project

California Stormwater Quality Association

2014 Outstanding Local Stormwater BMP Implementation Project

California Regional Water Quality Control Board
San Diego Region

Tentative Order No. R9-2015-0001

Questions

Laurie Walsh, PE
Christina Arias, PE
San Diego Water Board

Regional Permit 2013

Mary Anne Skorpanich, County of Orange
Richard Boon, County of Orange

Overview

- Introduction
- State of the Environment
- Summary
- Conclusion

Introduction

Facts are stubborn things; and whatever may be our wishes, our inclinations, or the dictates of our passions, they cannot alter the state of facts and evidence.

John Adams, 1770

State of the Environment

FECAL INDICATOR BACTERIA (FIB)

TMDLs – FIB

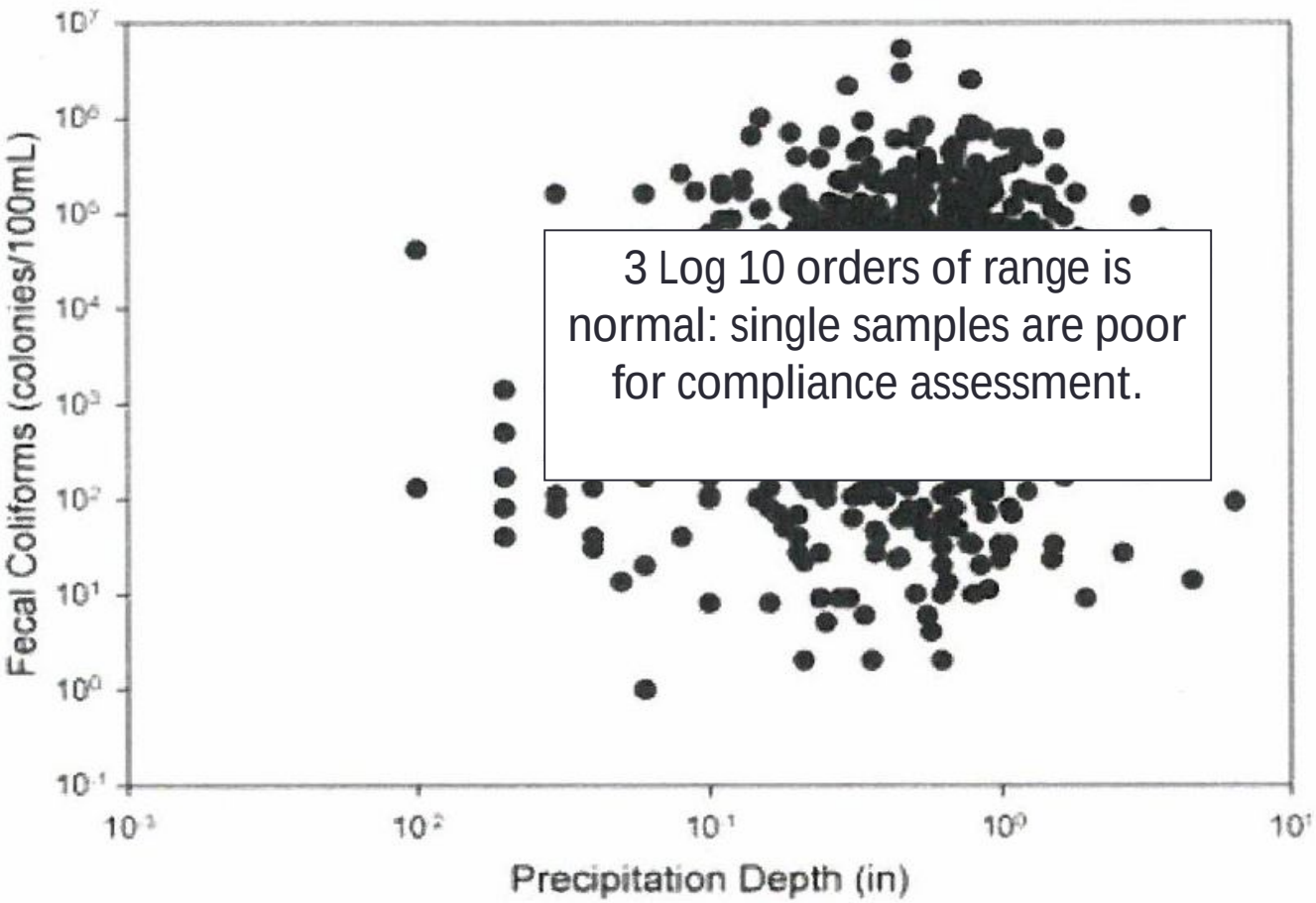

Data (Outfall samples) from National Stormwater Quality Database presented in ASCE, 2014.

FIB: Report Card Grades

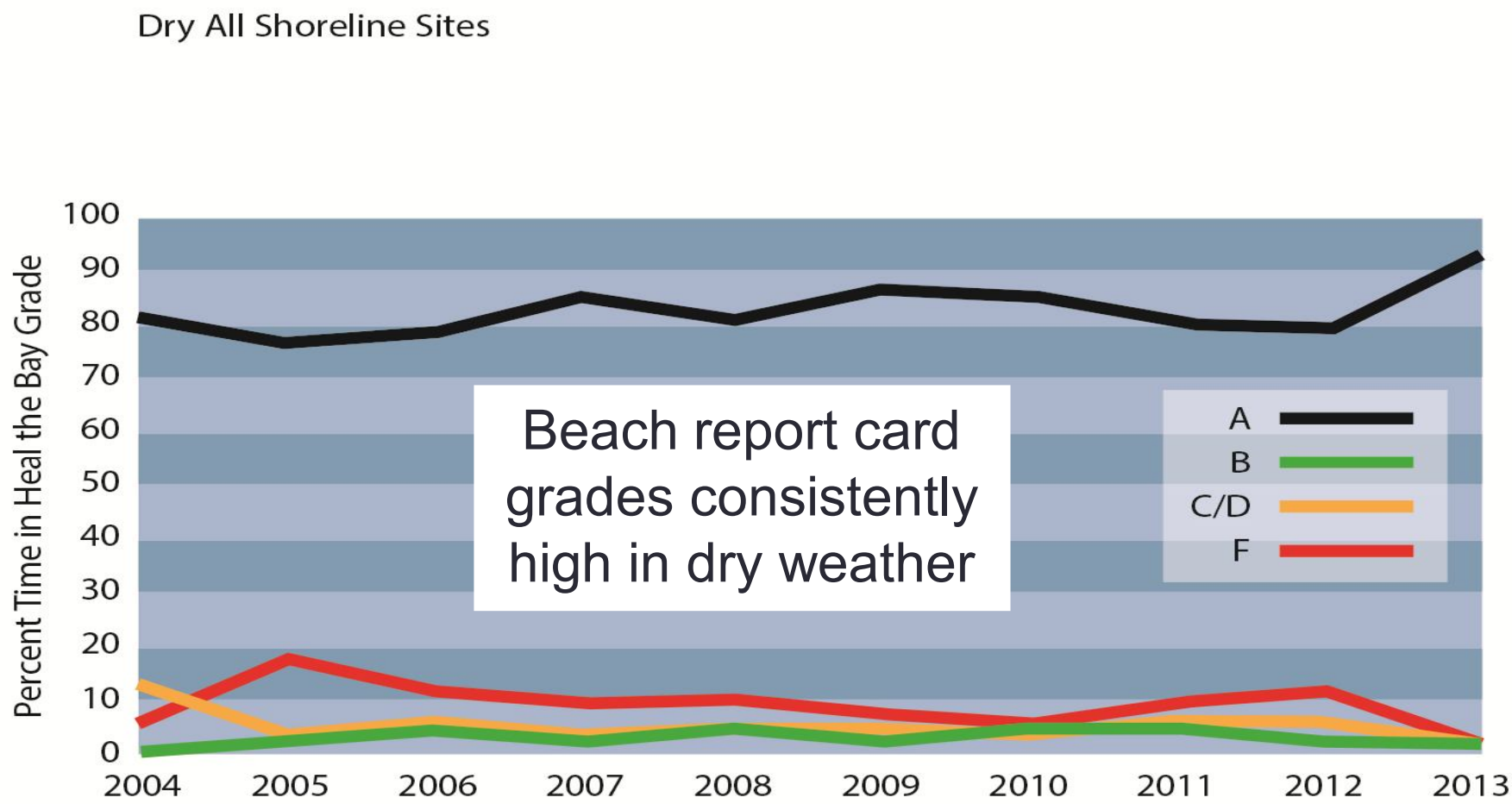

Source: Heal The Bay

FIB: Dry Weather – Aliso Creek

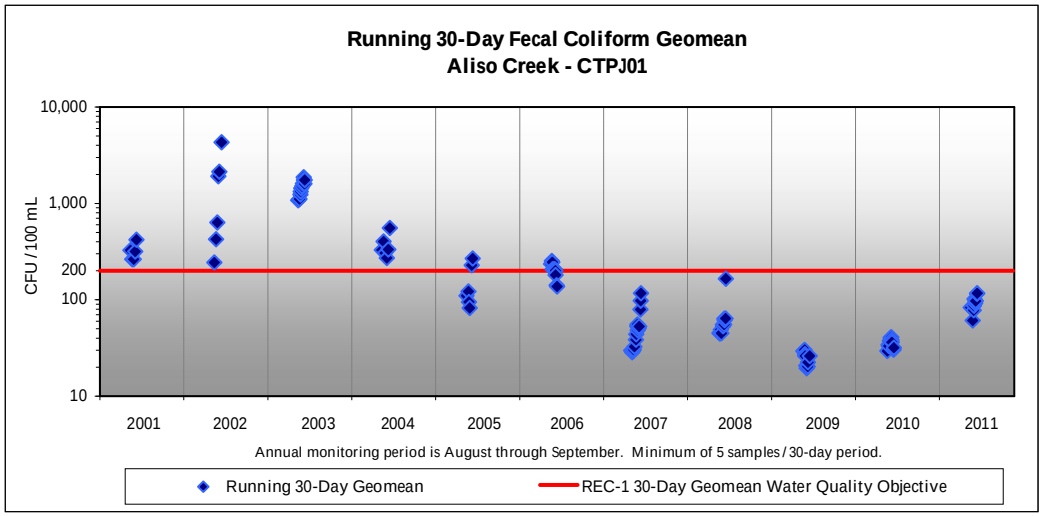

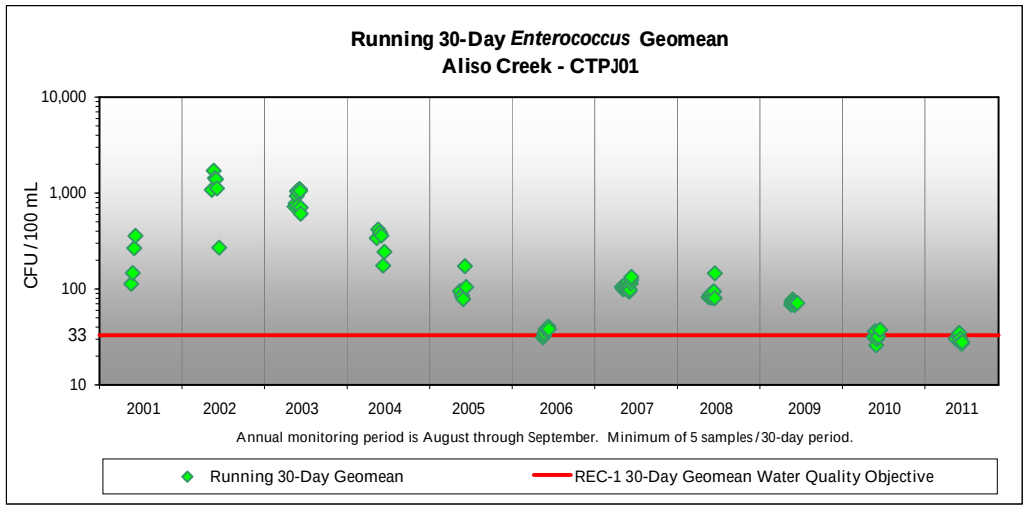

Credit: K. Clapper, OCPW

FIB: Model Control Program

Sources

- SSOs
- Sanitary Infrastructure
- Pet Waste
- ID/IC
- Homeless
- Trash Receptacles
- Equine Facilities
- Wildlife
- Vegetation
- Channel substrates

Pathways

- Irrigation
- Dry weather Flow
- Wet weather flows

FIB: SSO Reduction

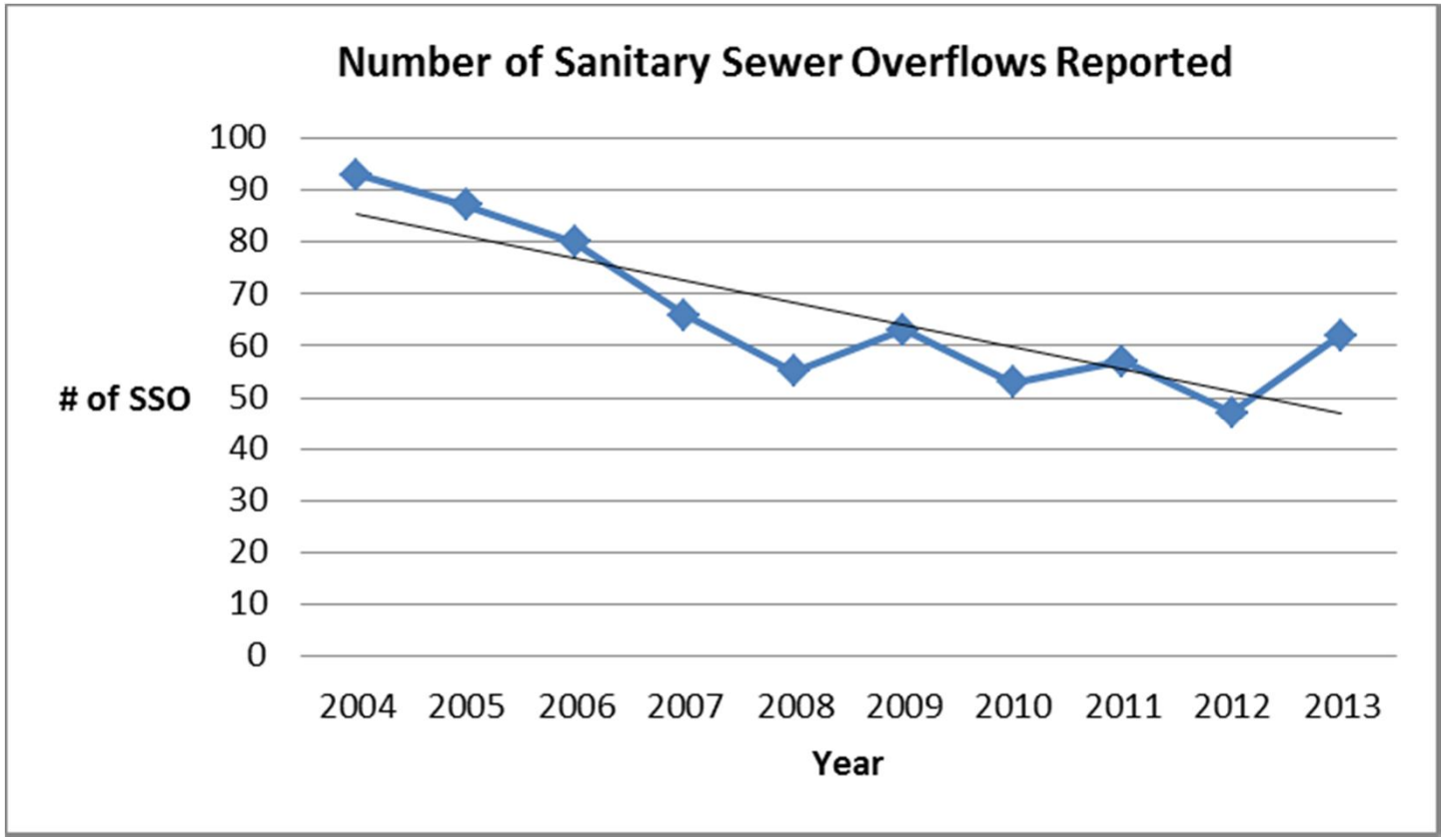

FIB: SSO Recovery

Incident Triggering CASC Activation	Receiving Waters	Date	Type	Volume Diverted to Sanitary Sewer (Gallons)
Sanitary sewer force main rupture	Tijeras Creek/San Juan Creek/Doheny Beach	March 23, 2010	SSO (public)	2,500,000
Mobile home community, Lake Forest	Aliso Creek	June 25, 2010	SSO (private)	2,400
Sanitary sewer force main rupture	Buck Gully Creek/Little Corona Beach	July 2 , 2010	SSO (public)	710,000
Manufacturer corporate HQ, Irvine	Peters Canyon Channel	January 13, 2011	Other (fountain discharge)	100,000
Residential apartment complex, Anaheim	Santa Ana River	April 12, 2012	SSO (private)	1,900
Residential apartment complex, Anaheim	Santa Ana River	April 18, 2012	SSO (private)	77,500
Packaging products manufacturer, Buena Park	Fullerton Creek/Coyote Creek/San Gabriel River	July 25, 2012	Other (clarifier discharge)	355,000
Ammonia refrigeration leak, Santa Ana	Santa Ana Delhi Channel	February 4, 2013	Other (ammonia discharge)	200
Industrial chemical facility fire, Santa Ana	Greenville-Banning Channel	August 28, 2013	Other (fire suppression runoff)	~3,000,000
Sanitary sewer pump station failure, Newport Beach	Santa Ana-Delhi Channel/Upper Newport Bay	August 31, 2013	SSO (public, mixed with channel water)	45,000
Hotel facility HVAC system discharge	Lane Channel	December 16, 2013	Other (HVAC discharge w/ dye)	140,000
			Total:	6,932,000

FIB: ID/IC Investigation & Enforcement

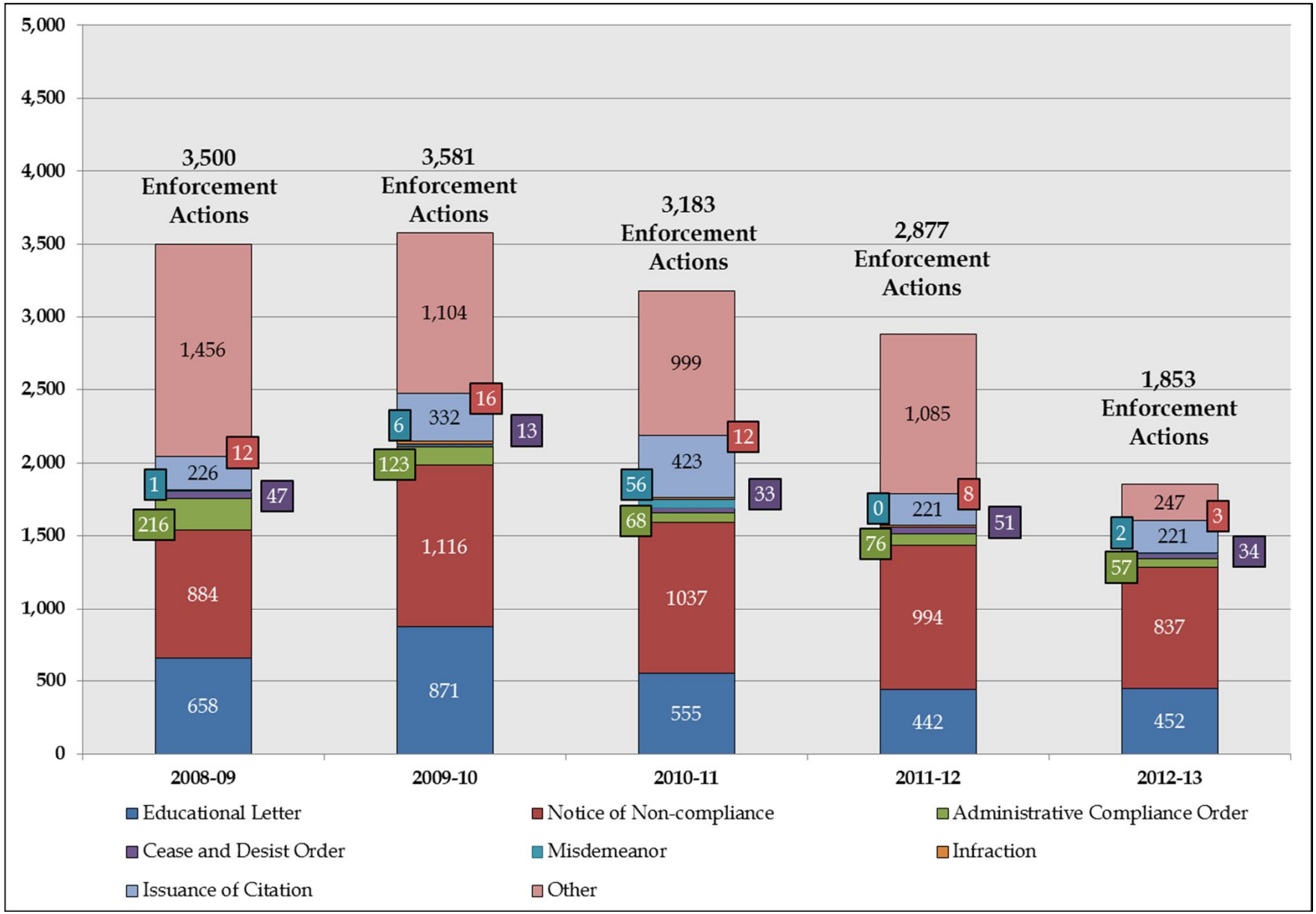

FIB: Wildlife Control

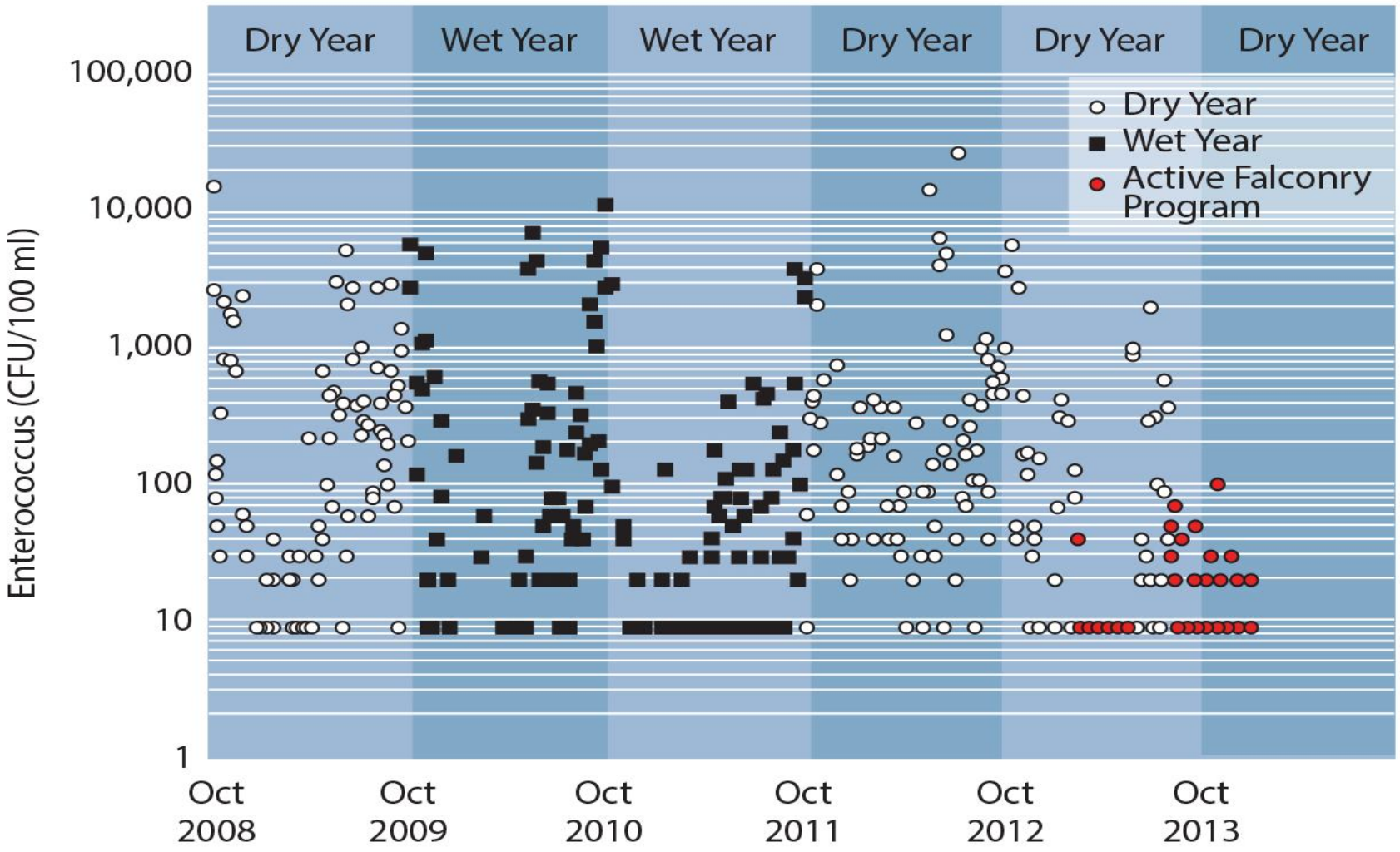

FIB: Overwatering Is Out

H2OC.org is a stormwater initiative of the County of Orange and its 34 cities.

Overwatering Is OUT. Efficient Watering Is IN.

Overwatering is OUT. *When we give our landscape more water than it needs, it not only wastes our precious drinking water supplies, it also pollutes the environment. That's because the runoff from your sprinkler system carries fertilizers, pesticides, and pet waste out into our waterways and the ocean.*

Efficient watering is IN. *You can help preserve our drinking water supplies and protect the environment by giving your plants the correct amount of water. The devices below can help you water your landscape efficiently and effectively. Plus, the rebate levels often cover most or all of the cost of the device.*

SMART IRRIGATION TIMERS

Take control of your sprinkler system with a weather-based irrigation controller. These "smart" timers use information about your plants, soil, and weather conditions to give your landscape the right amount of water year-round.

REBATE LEVEL: Up to $380 per controller for properties < 1 acre, or $25 per station for properties > 1 acre.

ROTATING SPRINKLER NOZZLES

Rotating nozzles can help you reduce harmful water runoff that flows off your landscape and eventually enters the ocean. Rotating nozzles water more uniformly than traditional sprinkler heads, and they can reduce your outdoor water use by up to 30%.

REBATE LEVEL: $4 (or more) per nozzle

SOIL MOISTURE SENSOR CONTROLLERS

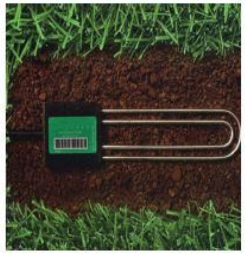

Soil moisture sensors are placed below ground in the root zones of lawns and landscapes to determine if and how long to water. Sensor-based products are available as stand-alone controllers or add-on devices to existing controllers. They have been shown to reduce outdoor water use by up to 70% without sacrificing the quality or health of your landscape.

REBATE LEVEL: Up to $380 per controller for properties < 1 acre, or $25 per station for properties > 1 acre.

The Family of Orange County Water Agencies

Visit mwdoc.com/rebates or call (888) 376-3314 for more information.

FIB: Dry Weather Flow Diversions

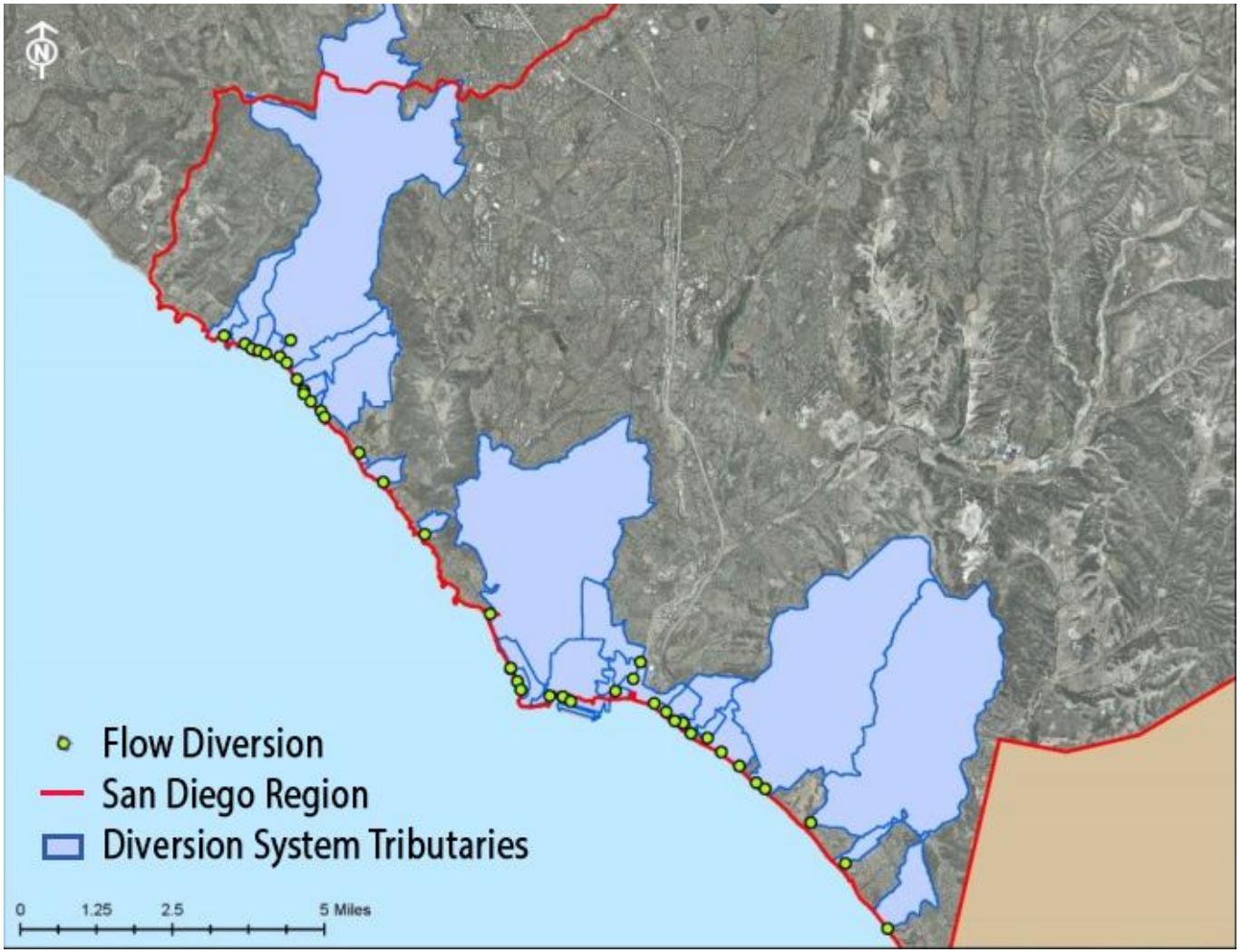

FIB: Wet Weather Flows

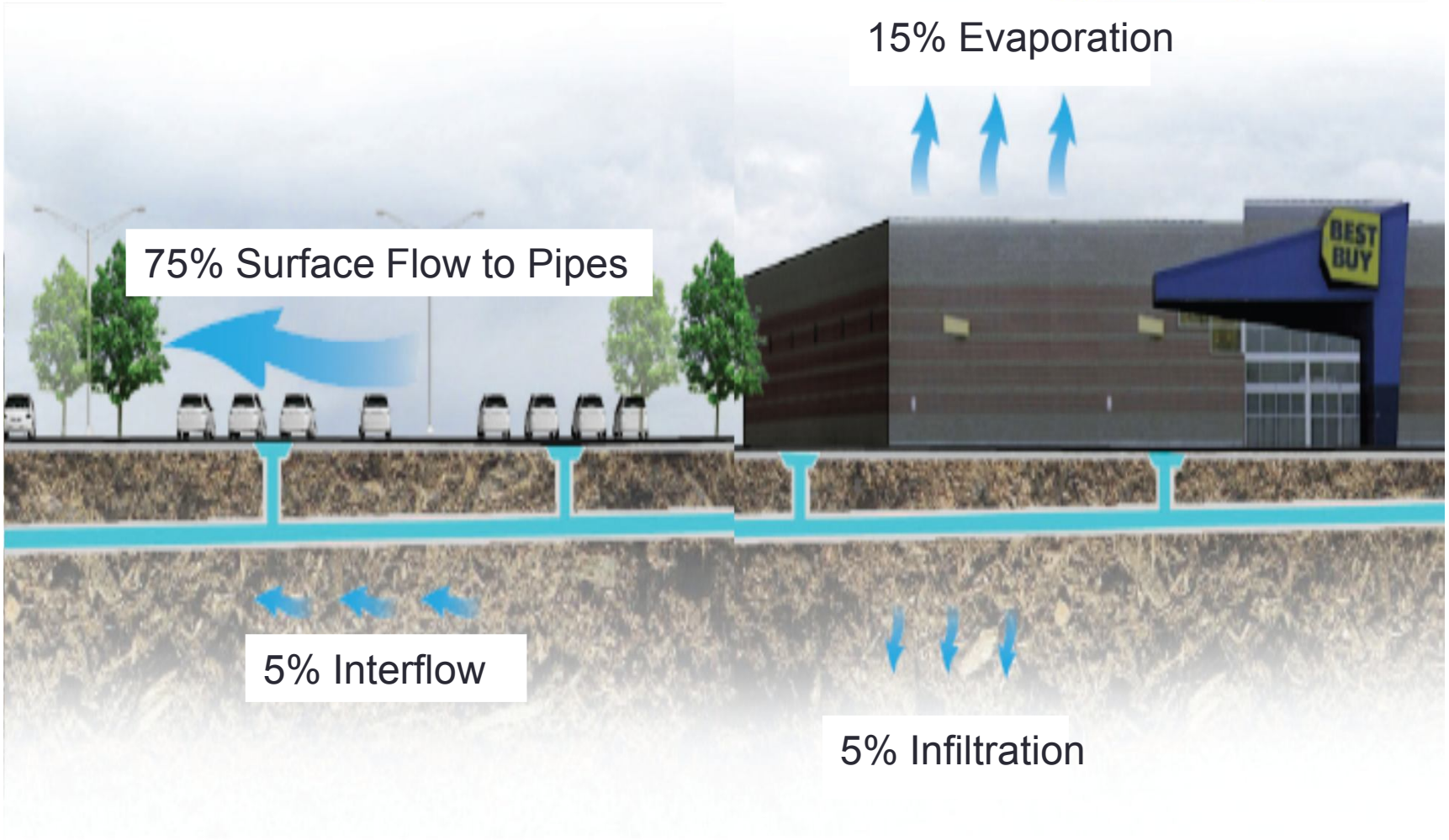

Credit: Illustrations from San Mateo County

FIB: BMP Effectiveness Study

BMP Effectiveness - Enterococci

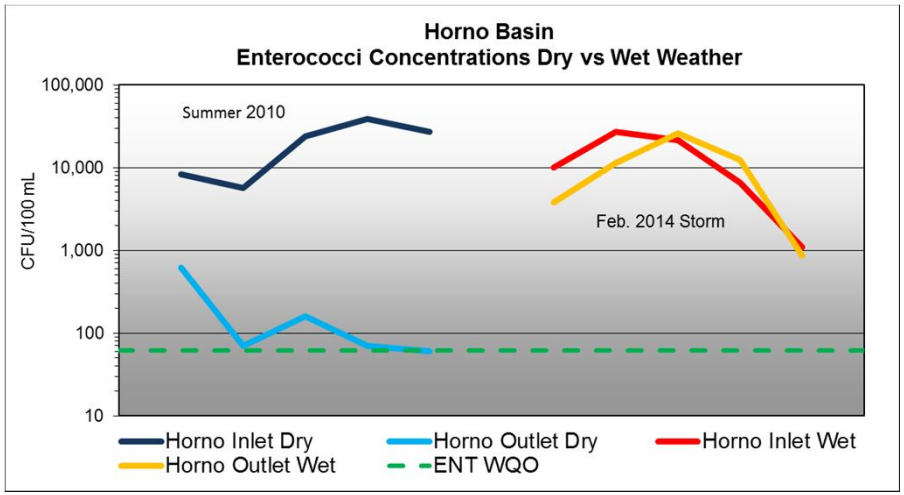

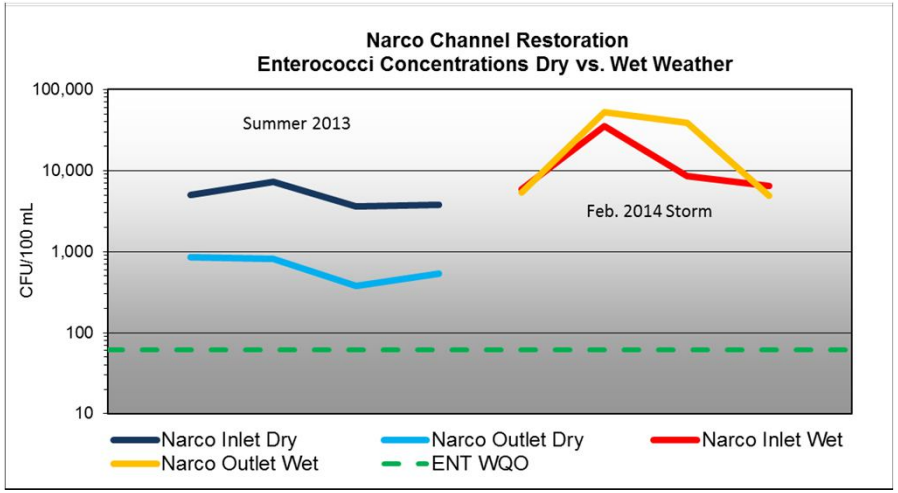

Credit: K. Clapper, OCPW

FIB: Wet Weather Challenges

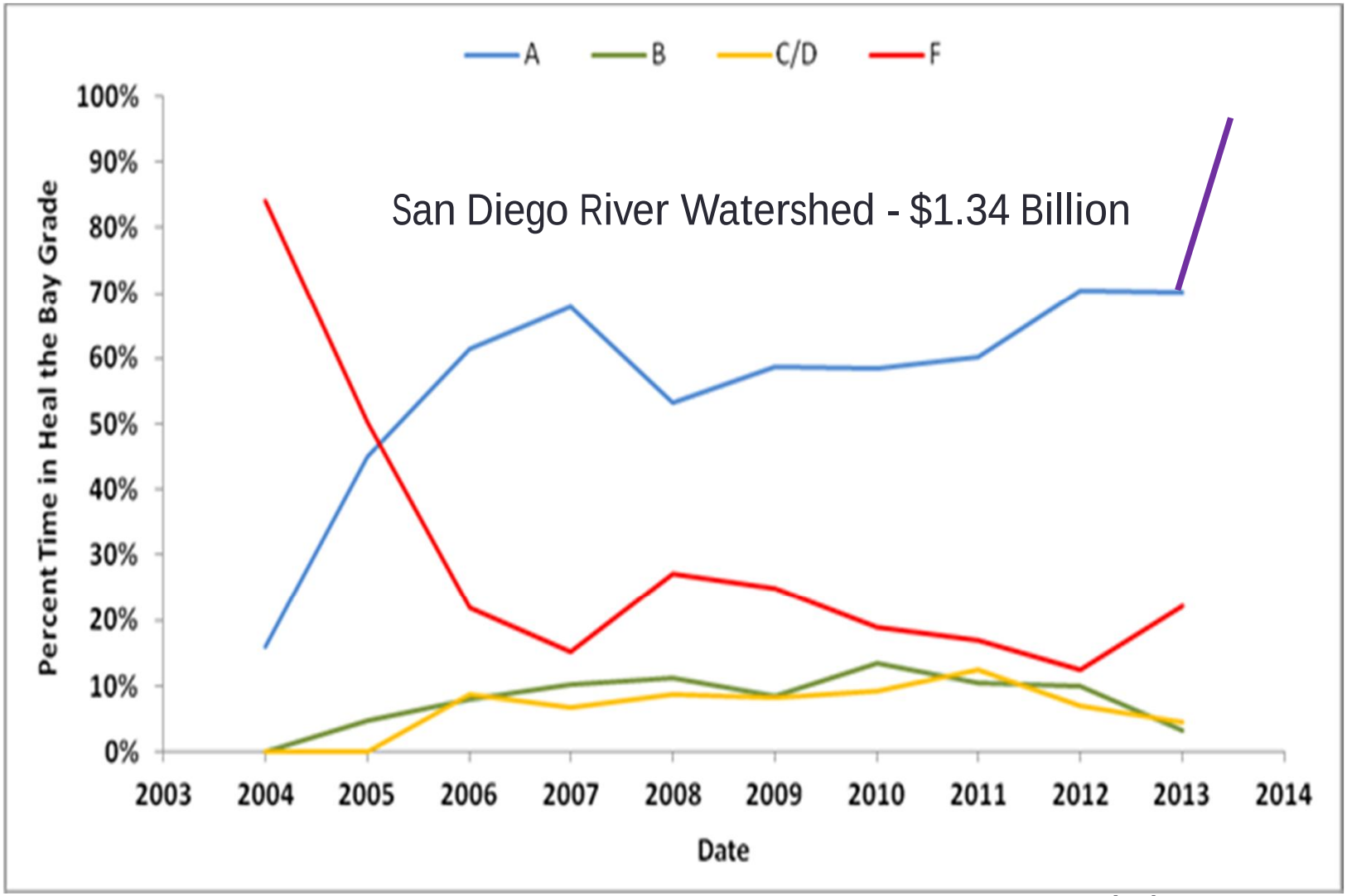

Source: Heal The Bay

FIB: Summary (ROWD)

- BMPs and overall flow reductions resulting in significant reductions in dry weather
- Successful dry weather bacteria BMPs appear ineffective in providing meaningful wet weather reductions
- Overall reduction in the number of sewage spills correlates with lower number of beach closures and increased recreational water use.
- Decrease in the total number of beach mile days posted due to AB411 standards violations has increased beneficial use. Example: Doheny

The FIB Dilemma

E. Coli and enterococci emanating from naturalized of non-fecal sources may result in the waterbody being incorrectly classified as impaired…. The development of BMPs and treatment technologies for removing FIB from waters where there are no obvious fecal inputs could be costly, destructive to natural ecosystems, and not substantially reduce the health risk.

(Boehm et al. 2009, in ASCE, 2014)

TOTAL DISSOLVED SOLIDS (TDS)

Total amount of mobile charged ions, including minerals, salts or metals dissolved in a given volume of water, expressed in units of mg per unit volume of water (mg/L).

TDS

- Persistent and widespread exceedances of total dissolved solids occur in channels and at discharge outfalls.

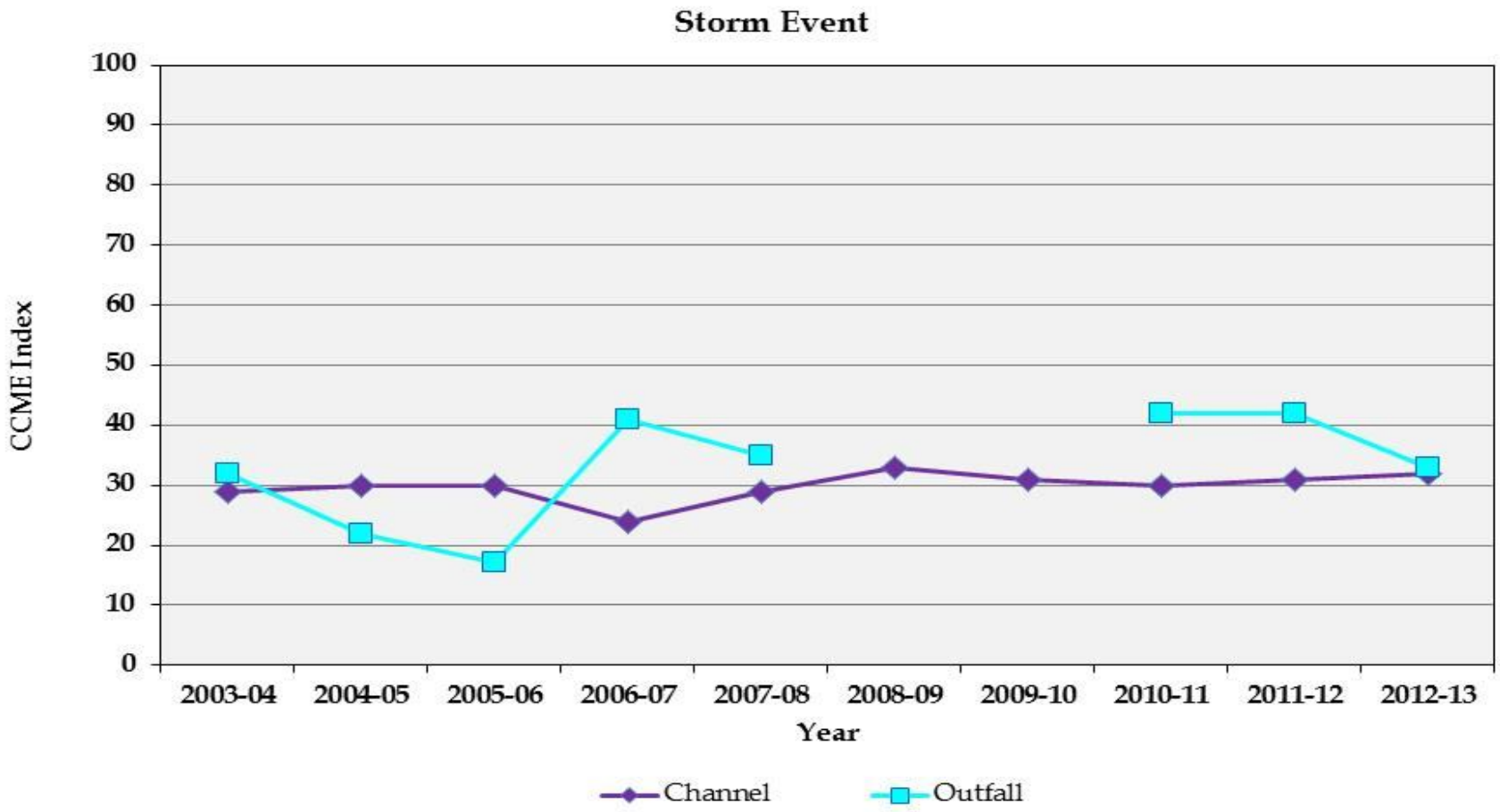

TDS

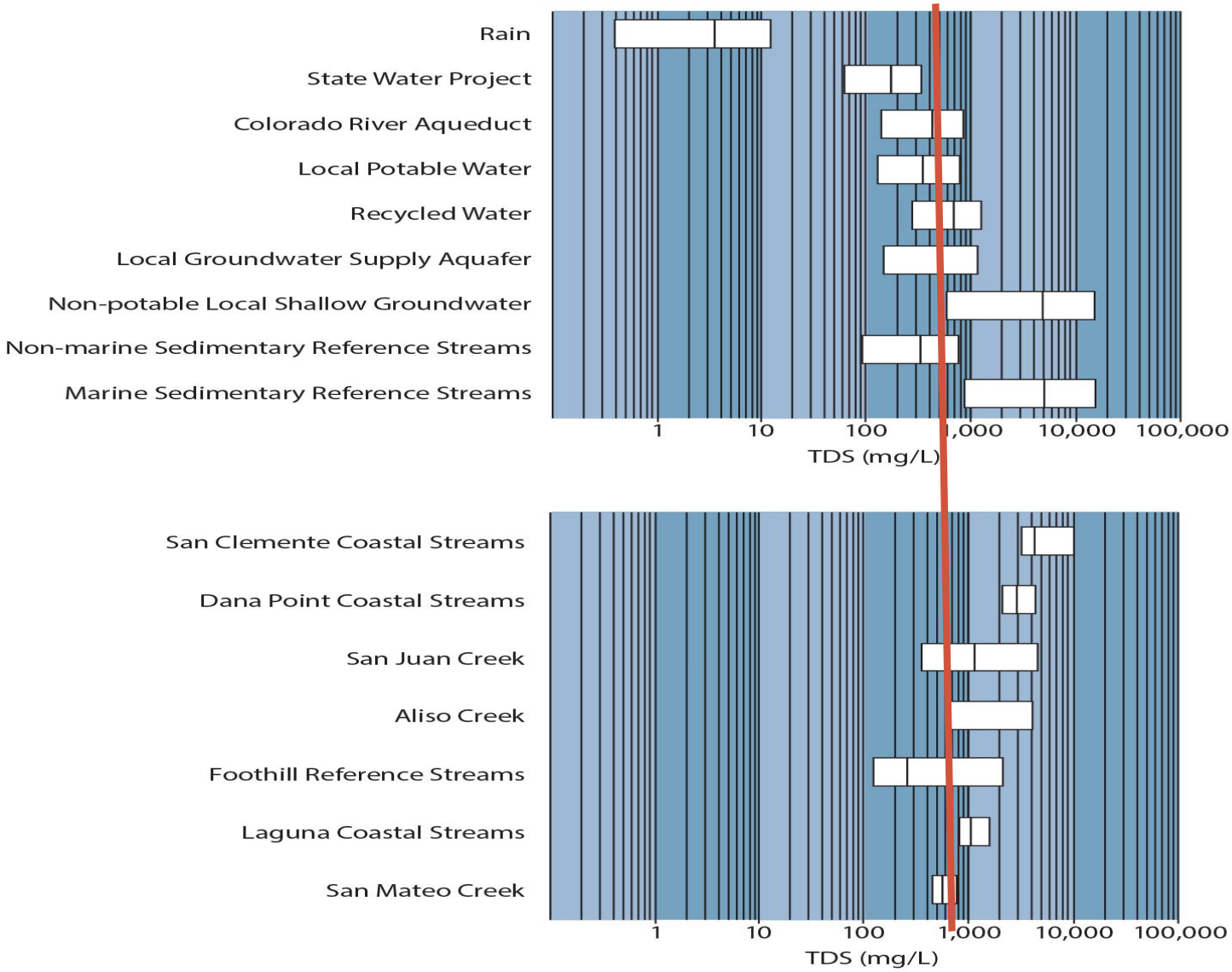

Credit: Ted Von Bitner, AMEC

TDS: SOURCE IDENTIFICATION

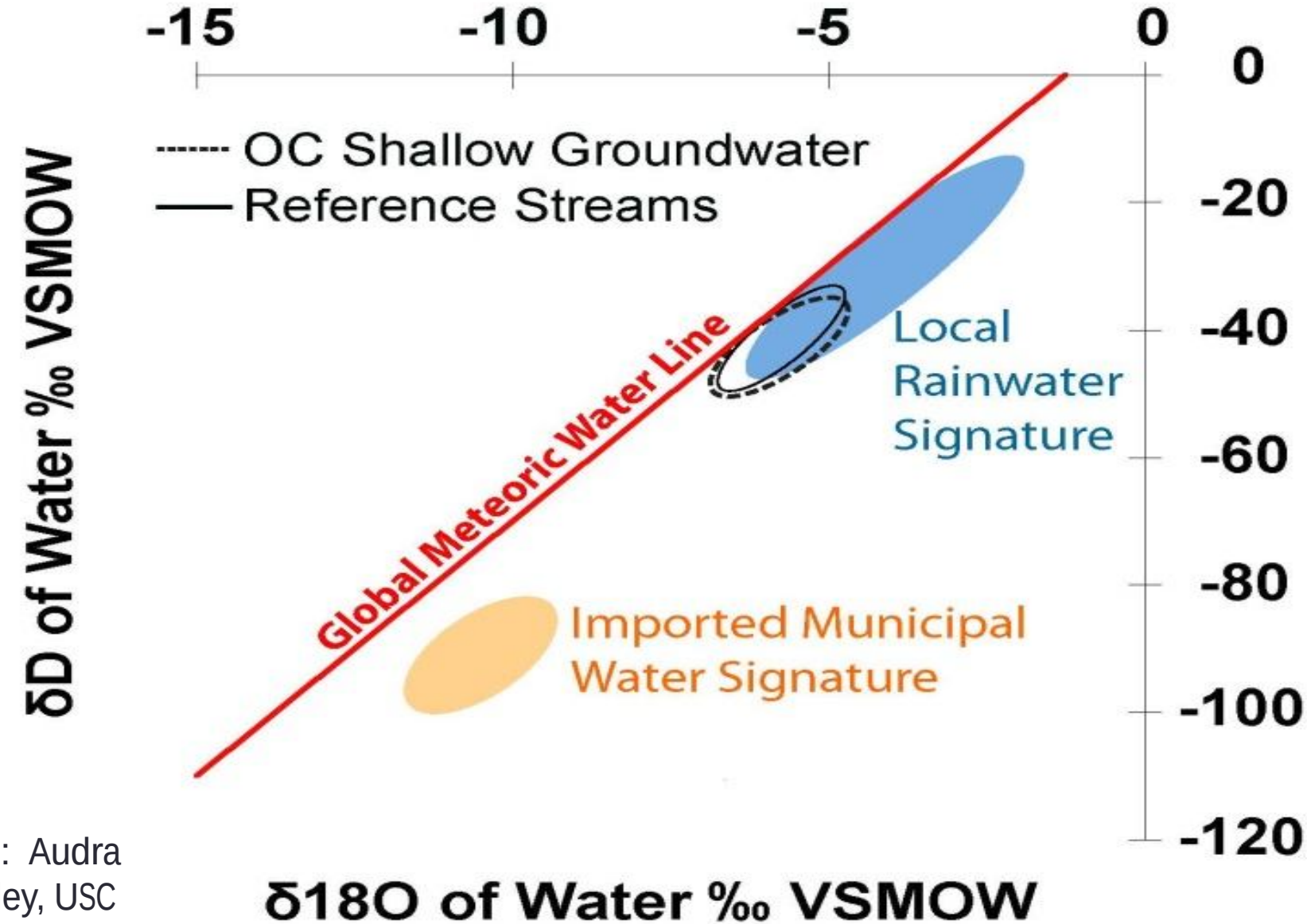

Credit: Audra Bardsley, USC

DISSOLVED SOLIDS: SUMMARY

- Natural sources in regional groundwater represent a large portion of elevated dissolved solids.
- Understanding local geology is key to understanding sources of dissolved solids and the pathways they travel in the watershed.
- While the flood control system provides one pathway for dissolved solids in groundwater to reach the surface, other natural pathways (such as artesian springs) exist and there is evidence of historically elevated dissolved solids levels in surface water in the region.
- Determine significance of TDS as a stressor.

NUTRIENTS

Nutrients Are a Regional Problem

- Exceedances widespread
- Algal overgrowth less so but occurs in undeveloped areas as well
- May contribute to harmful algal blooms
- Continue to reduce dry weather flows

Toxicity

- Toxicity widespread but sporadic & at low levels
- No apparent trends over time

	% Stream Miles	
Ceriodaphnia Reproduction	Open	Urban
Toxic	63.0	37.4
Nontoxic	37.0	62.6

Toxicity: Summary

- Reassess management concerns about metals
- Improve information on the use of pesticides in the County;
- Expand and focus cooperative outreach efforts about proper pesticide aplication;
- Continue productive relationships with Univeristy of California Cooperative Extension and CASQA

In Summary

The central questions that elected officials, regulators, NGOs, and regulated parties must somehow reach agreement on are:

What level of control for FIB is practical and attainable and reflects “acceptable” levels of public health protection?

How can measureable water quality compliance metrics be expressed so that practical constraints are recognized, while still promoting meaningful water quality improvement?

ASCE, 2014 (paraphrased)

In Conclusion

- South Orange County is a model stormwater program
- The environment is responding
- The WQIP is a necessary framework for answering key questions and ensuring that science informs the attainment of further positive environmental outcomes

Questions (?)

County of San Diego Comments on Prior Lawful Approval (PLA)

San Diego Regional Water Quality Control Board

Public Workshop on Tentative Order No. R9-2015-0001

An Order Amending the Regional Municipal Separate Storm Sewer (MS4) NPDES Permit for the San Diego Region

Wednesday, October 8, 2014

City of Mission Viejo

Council Chambers

200 Civic Center

Mission Viejo, California

Prior Lawful Approval (PLA)

- Prior Lawful Approval determines when and if a development or public works project will be required to comply with updated stormwater regulations
- Often referred to as “grandfathering”
- 2013 MS4 Permit requirements are effective on December 24, 2015

PLA under the 2007 Permit (p. 17 footnote)

[3] Updated SUSMP and hydromodification requirements shall apply to all priority projects or phases of priority projects which have not yet begun grading or construction activities at the time any updated SUSMP or hydromodification requirement commences. If a Copermittee determines that lawful prior approval of a project exists, whereby application of an updated SUSMP or hydromodification requirement to the project is infeasible, the updated SUSMP or hydromodification requirement need not apply to the project. Where feasible, the Copermittees shall utilize the SUSMP and hydromodification update periods to ensure that projects undergoing approval processes include application of the updated SUSMP and hydromodification requirements in their plans.

Discretionary approvals (examples)			Ministerial approvals (examples)	
Specific Plan Amendments	Tentative Maps	Final Maps	Grading Permits	Building Permits
Major Use Permits	Vesting Tentative Maps			
	Development Agreements			

Time →

Ongoing Coordination

- 2013 MS4 Permit does not include a PLA definition
- County requested clarification from RWQCB staff in April 2014
- Continued meetings with other Copermittees
- Additional concerns with the 2007 PLA approach identified

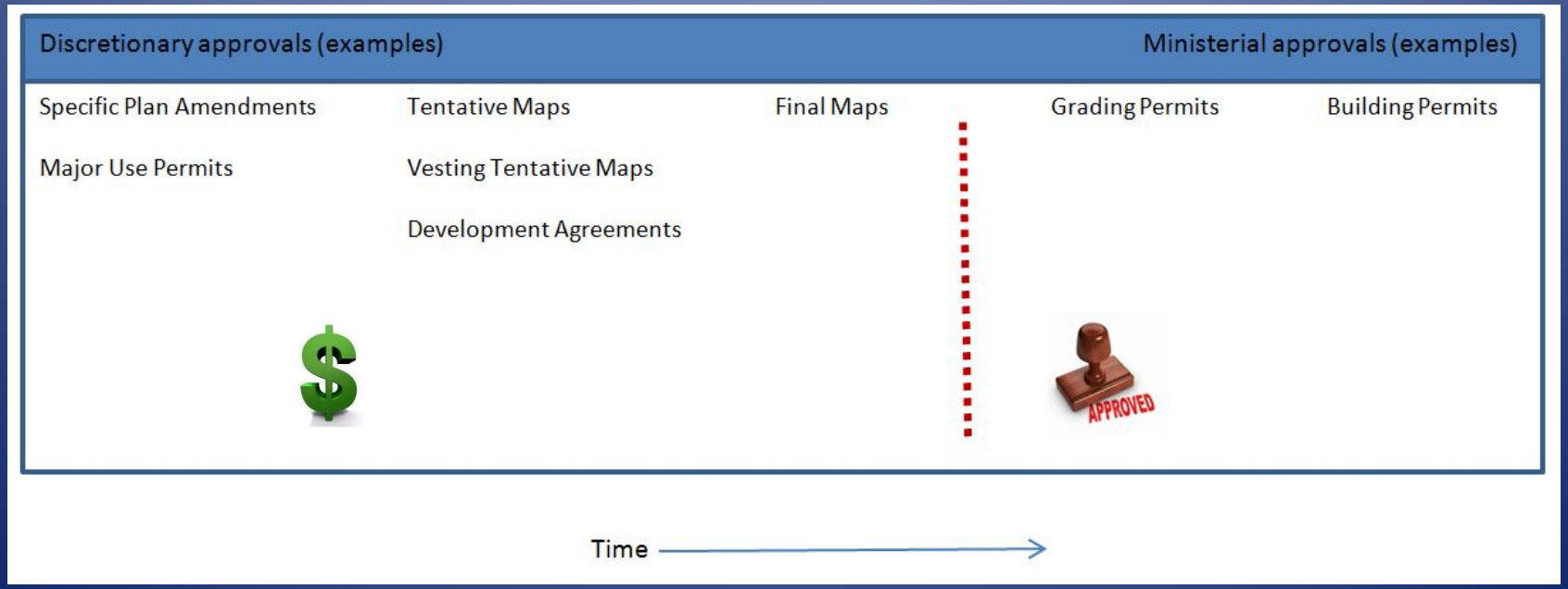

Balancing Potential Risks

Risks to Private & Public Projects

- Unpredictability of process
- Project redesign
- Schedule impacts
- Cost increases

Risks for Local Jurisdictions

- Water quality impacts
- MS4 permit non-compliance
- Transfer of costs or liability to jurisdictions
- Loss of jurisdictional discretion

Regional Water Quality Control Board MS4 Permit Workshop

Prior Lawful Approval (PLA) Policy

Wednesday, October 8, 2014
200 Civic Center
Mission Viejo, California

Introductions

- The Coalition
  - San Diego Building Industry Association
  - Building Industry Association of Southern California
  - Associated General Contractors
  - Associated Builders and Contractors
  - San Diego Regional Chamber of Commerce
  - Business Leadership Alliance
  - San Diego Association of Realtors
  - San Diego Apartment Association
  - NAIOP (National Association of Industrial & Office Properties)
  - BOMA (Building Office & Management Association
  - San Diego Chapter of the American Society of Landscape Architects.

Background

- Worked with Copermittees re: meaning of permit section E.3.e.(1)(a)
  - City of San Diego, County, Chula Vista, Carlsbad, San Marcos, Escondido, El Cajon, and Santee
  - Regional Board staff
  - Coast Keeper
- General agreement: the section requires clarification. But no consensus on specific language.
- Time for the Regional Board to weigh in.

Current Permit Language in E.3.e.(1)(a)

Applications **with** lawful approval before the BMP Design Manual is updated…

[redacted] may [redacted]

Applications **without** lawful approval by the Copermittee by the time the BMP Design Manual is updated…

[redacted]

Language Revisions Proposed by Staff

Applications **with** prior lawful approval before the BMP Design Manual is ~~updated~~ implemented...

[redacted]

Applications **without** prior lawful approval by the Copermittee by the time the BMP Design Manual is ~~updated~~ implemented...

[redacted]

Issues Requiring Clarification by the Board

- What is the purpose of Section E.3.e.(1)(a)?
- What is a “Prior Lawful Approval”?
- When may a Copermittee use its discretion to allow previous land development requirements to apply?

The Purpose of Section E.3.e.(1)(a)

- Address the disconnect between permit cycles and entitlement cycles
  - Permits are revised every 5 years.
  - Project approvals from inception to building permits are much longer (7 to 10 years)
- Provide predictability for design and financing
- Avoid takings claims against Copermittees over statutory and common-law vested rights

Permit Cycle Disconnect Example: Redevelopment of Brown Field Airport

- 2006: RFP by City of San Diego
- 2009: Development Department approval of site design including WQTR in conformity with 2007 permit
- 2013: Certification of EIR and approval of Site Development Permit including WQTR
- 2014: Challenge to certified EIR
- 2016: Grading permits and commencement of construction

But, if required to comply w/ 2013 permit…

And if investors walk away, back to Square 1!

- Public is denied:
  - 6,000 new jobs, most at prevailing wage
  - A critical piece of public infrastructure
  - An economic engine in a depressed area
  - Tax revenue
  - Loss of water quality improvements for existing development on airport.

Defining a "Prior Lawful Approval"

- Currently an undefined term in the permit
  - Creates uncertainty and fear for Copermittees
  - Creates uncertainty for the development of both public and private projects whose entitlement cycles are much longer than permit cycles.
  - Creates funding uncertainties for both public and private projects.
- Other regional boards have addressed this issue.

Examples of PLA Policies in Other MS4 Permit Regions (see handout)

	Los Angeles County	Central Coast Region	Sacramento	Ventura County
Source	Order # R4-2012-0175	Post Construction Storm Water Management Requirements	Stormwater Quality Partnership Hydromodification Management Plan	Ventura Technical Guidance Manual
Date	November, 2012	July, 2013	February, 2013	July, 2011
• **Development Agreements**	Silent	Silent	Silent	Exempt
• **Vesting Tentative Maps**	Exempt	Silent	Silent	Exempt
• **Tentative Maps**	Silent	Silent	Exempt	Exempt
• **Other Discretionary Permit**	Exempt (1st permit)	Exempt	Exempt	Exempt
• **Other Ministerial Permit**	Silent	Exempt	Exempt	Silent
• **Commencement of Work**	Silent	Silent	Silent	Exempt

When may a Copermittee allow previous land development requirements to apply?

- Project complies with requirements in previous permit cycle
- The project has a vested right
- Special circumstances requiring Copermittee discretion
  - Health and Safety
  - Other

Clarity and Consistency Benefit Everyone

- Project applicants
- Copermittees
- Regional Board
- Non-governmental organizations
- Public

Objectives of Clear PLA Language

- Provide a clear minimum standard that each Copermittee can rely on as a basis for MS4 permit compliance.
- Recognize and honor vested rights in order to protect Copermittees from takings claims and to avoid budgetary crisis for CIP, FPPF and assessment district financing.
- Protect Copermittee land use authority by allowing them to impose higher standards required to protect health and safety or to prevent a nuisance.
- Reflect statewide trends in addressing the meaning and implementation of Prior Lawful Approval provisions, which are not unique to this permit.

Proposed Permit Language
(Replaces Section E.3.e.(1)(a); does not alter (b) through (d))

(a) Each Copermittee must require and confirm that for all Priority Development Project applications that have not received prior lawful approval by the Copermittee by the time the BMP Design Manual is implemented pursuant to Provision E.3.d, the requirements of Provision E.3 are implemented. For project applications that have received prior lawful approval before the BMP Design Manual is implemented pursuant to Provision E.3.d, the Copermittee may allow previous land development requirements to apply.

i. For private development projects, "Prior Lawful Approval" means projects that have entered into a development agreement as defined by the California Government Code or have received a first discretionary approval or ministerial permit prior to the time the BMP Design Manual is implemented. A Prior Lawful Approval shall include any subsequent discretionary or ministerial entitlement necessary to implement the initial Prior Lawful Approval.

ii. For public projects, the Copermittee shall develop and adopt an equivalent approach to that for private projects.

iii. For project applications that have obtained a Prior Lawful Approval before the BMP Design Manual is implemented pursuant to Provision E.3.d, the Copermittee may use its discretion to allow previous land development requirements to apply.

iv. Projects with Prior Lawful Approvals as defined above that predate Order No.R9-2007-0001 for San Diego County Copermittees, Oder No. R9-2009-0002 for Orange County Copermittees, and Order No. R9-2010-0016 for Riverside County, Copermittees shall be required to incorporate Treatment Control BMPs necessary to achieve the water quality standards set forth in the applicable Orders identified above to the Maximum Extent Practicable, as determined by the Copermittee on a case by case basis.

The Coalition's Request

- Direct staff to incorporate the Coalition's proposed language for E.3.e.(1)(a) into Tentative Order No. R9-2015-0001 for review and comment by all stakeholders prior to consideration for adoption by the Regional Board.

Questions

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SAN DIEGO COASTKEEPER

COASTAL ENVIRONMENTAL RIGHTS FOUNDATION

September 26, 2014

Board Chair Henry Abarbanel
San Diego Regional Water Quality Control Board
2375 Northside Drive, Suite 100
San Diego, CA 92108

VIA EMAIL
Laurie.Walsh@waterboards.ca.gov

Re: Proposed Prior Lawful Approval Language for Regional MS4 Permit
San Diego Water Board Public Workshop - October 8, 2014

Dear Chair Abarbanel:

Please accept these comments on behalf of Coastal Environmental Rights Foundation (CERF) and San Diego Coastkeeper (Coastkeeper) regarding the upcoming public workshop to consider amendments to the Regional MS4 Permit for the San Diego Region. Unfortunately, representatives from CERF and Coastkeeper are unable to attend the forthcoming workshop, but offer these comments to register our opposition to any proposed weakening of the Regional MS4 Permit. Specifically, though it would be inappropriate for the Board to take any action on un-agendized matters at the workshop, CERF and Coastkeeper believe interested parties may urge the Board to consider amendments to the MS4 Permit to redefine "prior lawful approval".

Should interested parties (developers subject to the new MS4 Permit requirements) suggest a proposed amendment regarding "prior lawful approval" Permit language, we urge the Regional Board to adhere to its prior language and avoid potential backsliding.[1]

If the Regional Board is interested in specifically defining prior lawful approval, a reconsideration should focus on traditional vested rights doctrines. Under the *Avco* line of cases, mere acquisition of a building permit affords a builder no protection against a change in the laws adopted after its issuance. In order to continue the construction of a project initiated prior to a change in the law, a builder must have obtained a vested right by performing substantial work and incurring substantial liabilities in good faith reliance on the permit prior to the effective date of the new law. (*Avco Community Developers, Inc. v. South Coast Reg'l Comm'n*, 17 Cal. 3d. 785, 791 (1976)).

CERF and Coastkeeper therefore urge the Board not to consider such proposed amendments at the forthcoming hearing. However, we understand the upcoming hearing is a workshop – should any such discussions lead to action items for a future hearing, we look forward to working with Board staff to ensure the new MS4 Permit is not weakened.

Sincerely,

Matt O'Malley, Waterkeeper
San Diego Coastkeeper

Livia Borak, Legal Advisor
Coastal Environmental Rights Foundation

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[1] Specifically, Footnote 3 on page 17 of Order No. R9-2007-0001 states: "Updated SUSMP and hydromodification requirements shall apply to all priority projects or phases of priority projects which have not yet begun grading or construction activities at the time any updated SUSMP or hydromodification requirement commences. If a Copermittee determines that lawful prior approval of a project exists, whereby application of an updated SUSMP or hydromodification requirement to the project is infeasible, the updated SUSMP or hydromodification requirement need not apply to the project. Where feasible, the Copermittees shall utilize the SUSMP and hydromodification update periods to ensure that projects undergoing approval processes include application of the updated SUSMP and hydromodification requirements in their plans."

City of SD

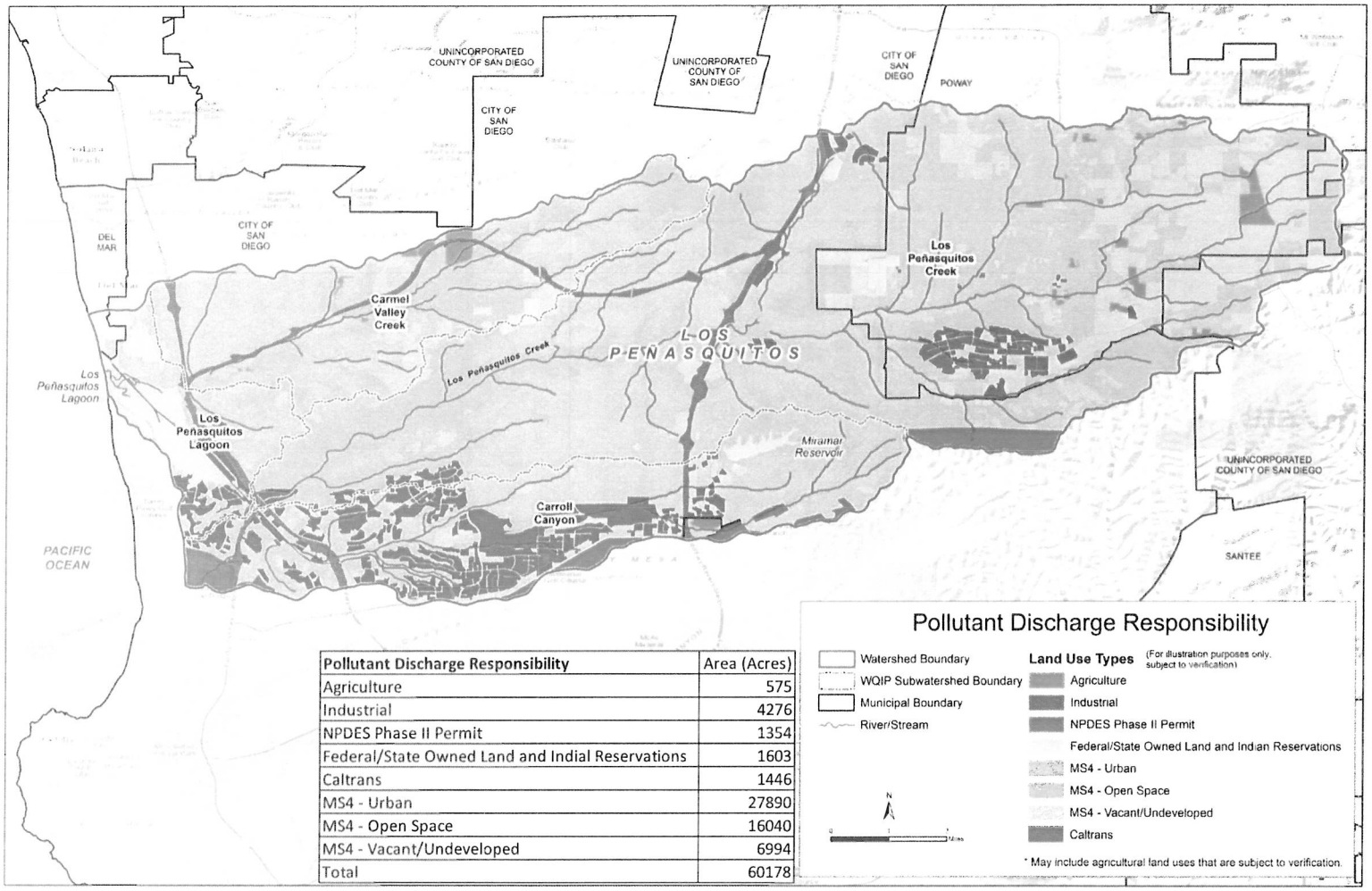

Pollutant Discharge Responsibility	Area (Acres)
Agriculture	575
Industrial	4276
NPDES Phase II Permit	1354
Federal/State Owned Land and Indial Reservations	1603
Caltrans	1446
MS4 - Urban	27890
MS4 - Open Space	16040
MS4 - Vacant/Undeveloped	6994
Total	60178

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BPA TMDL-

Table 7-48. Receiving Water Limitations for Beaches

Indicator Bacteria	Wet Weather Days [a]		Dry Weather Days [b]	
	Wet Weather Numeric Objective [c] (MPN/100mL)	Wet Weather Allowable Exceedance [d] Frequency	Dry Weather Numeric Objective [e] (MPN/100mL)	Dry Weather Allowable Exceedance Frequency
Fecal Coliform	400	22%	200	0%
Total Coliform	10,000	22%	1,000	0%
Enterococcus	104	22%	35	0%

a. Wet weather days defined as days with rainfall events of 0.2 inches or greater and the following 72 hours.
b. Dry weather days defined as days with less than 0.2 inch of rainfall observed on each of the previous 3 days.
c. Wet weather numeric objectives based on the single sample maximum water quality objectives in the California Ocean Plan (2005). Compliance with the wet weather TMDLs in the receiving water is based on the frequency that the wet weather days in any given year exceed the wet weather numeric objective, but 30-day geometric mean must also be met.
d. The wet weather allowable exceedance frequency is set at 22%. In the calculation of the wet weather TMDLs, the San Diego Regional Board chose to apply the 22 percent allowable exceedance frequency as determined for Leo Carillo Beach in Los Angeles County. At the time the wet weather watershed model was developed, the 22 percent exceedance frequency from Los Angeles County was the only reference beach exceedance frequency available. The 22 percent allowable exceedance frequency used to calculate the wet weather TMDLs is justified because the San Diego Region watersheds' exceedance frequencies will likely be close to the value calculated for Leo Carillo Beach, and is consistent with the exceedance frequency that was applied by the Los Angeles Regional Board.
e Dry weather numeric objectives based on the 30-day geometric mean water quality objectives in the California Ocean Plan (2005). Compliance with the dry weather TMDLs in the receiving water is based on the frequency that the dry weather days in any given year exceed the dry weather numeric objective.

Table 7-49. Receiving Water Limitations for Creeks

Indicator Bacteria	Wet Weather Days [a]		Dry Weather Days [b]	
	Wet Weather Numeric Objective [c] (MPN/100mL)	Wet Weather Allowable Exceedance [d] Frequency	Dry Weather Numeric Objective [e] (MPN/100mL)	Dry Weather Allowable Exceedance Frequency
Fecal Coliform	400	22%	200	0%
Enterococcus	61 (104) [f]	22%	33	0%

a. Wet weather days defined as days with rainfall events of 0.2 inches or greater and the following 72 hours.
b. Dry weather days defined as days with less than 0.2 inch of rainfall observed on each of the previous 3 days.
c. Wet weather numeric objectives based on the single sample maximum (or equivalent) water quality objectives in the Water Quality Control Plan for the San Diego Basin (1994). Compliance with the wet weather TMDLs in the receiving water is based on the frequency that the wet weather days in any given year exceed the wet weather numeric objective, but 30-day geometric mean must also be met.
d. The wet weather allowable exceedance frequency is set at 22%. In the calculation of the wet weather TMDLs, the San Diego Regional Board chose to apply the 22 percent allowable exceedance frequency as determined for Leo Carillo Beach in Los Angeles County. At the time the wet weather watershed model was developed, the 22 percent exceedance frequency from Los Angeles County was the only reference beach exceedance frequency available. The 22 percent allowable exceedance frequency used to calculate the wet weather TMDLs is justified because the San Diego Region watersheds' exceedance frequencies will likely be close to the value calculated for Leo Carillo Beach, and is consistent with the exceedance frequency that was applied by the Los Angeles Regional Board.
e. Dry weather numeric objectives based on the 30-day geometric mean (or equivalent) water quality objectives in Water Quality Control Plan for the San Diego Basin (1994). Compliance with the dry weather TMDLs in the receiving water is based on the frequency that the dry weather days in any given year exceed the dry weather numeric objective.
f. A wet weather numeric objective for *Enterococcus* of 104 MPN/100mL may be applied as a receiving water limitation for creeks, instead of 61 MPN/100mL, if one or more of the creeks addressed by these TMDLs (San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek, San Diego River, and/or Chollas Creek) is designated with a "moderately to lightly used area" or less frequent usage frequency in the Basin Plan. Otherwise, the wet weather numeric objective of 61 MPN/100mL for Enterococcus will be used to assess compliance with the wet weather allowable exceedance frequency.

EX. REGIONAL PERMIT

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance dates under Specific Provision 6.b.(1):

Table 6.2a
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Beaches

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform	10,000	22%	1,000	0%
Fecal Coliform	400	22%	200	0%
Enterococcus	104	22%	35	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan.

Table 6.2b
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Creeks

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Fecal Coliform	400	22%	200	0%
Enterococcus	61 (104)	22%	33	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Basin Plan.
d. A single sample maximum of 104 MPN/100ml for *Enterococcus* may be applied as a receiving water limitation for creeks, instead of 61 MPN/100mL, if one or more of the creeks addressed by these TMDLs (San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek, San Diego River, and/or Chollas Creek) is designated with a "moderately to lightly used area" or less frequent usage frequency in the Basin Plan. Otherwise, the single sample maximum of 61 MPN/100mL for *Enterococcus* must be used to assess compliance with the allowable exceedance frequency.

EX. REGIONAL PERMIT

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing indicator bacteria densities that do not exceed the following effluent limitations by the compliance dates under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a):

Table 6.2c
Final Effluent Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies in MS4 Discharges to the Water Body

Constituent	Concentration-Based Effluent Limitations			
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform[d]	10,000	22%	1,000	0%
Fecal Coliform	400	22%	200	0%
Enterococcus	104[e] / 61[f]	22%	35[e] / 33[f]	0%

Notes:

a. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan for discharges to beaches, and the Basin Plan for discharges to creeks and creek mouths.
d. Total coliform effluent limitations only apply to MS4 outfalls that discharge to the Pacific Ocean Shorelines and creek mouths listed in Table 6.0.
e. This *Enterococcus* effluent limitation applies to MS4 discharges to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
f. This *Enterococcus* effluent limitation applies to MS4 discharges to segments or areas of creeks or creek mouths listed in Table 6.0.

B|A

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10/8/2014

Regional Water Quality Control Board MS4 Permit Workshop

Prior Lawful Approval (PLA) Policy

Wednesday, October 8, 2014
200 Civic Center
Mission Viejo, California

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Introductions

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  - City of San Diego, County, Chula Vista, Carlsbad, San Marcos, Escondido, El Cajon, and Santee
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- General agreement: the section requires clarification. But no consensus on specific language.
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Current Permit Language in E.3.e.(1)(a)

Applications **with** lawful approval before the BMP Design Manual is updated...

Copermittee **may** allow previous land development requirements to apply. [Emphasis added.]

Applications **without** lawful approval by the Copermittee by the time the BMP Design Manual is updated...

Copermittee must require and confirm the requirements of E.3 are implemented.

4

Language Revisions Proposed by Staff

Applications **with** prior lawful approval before the BMP Design Manual is ~~updated~~ implemented...

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- What is a "Prior Lawful Approval"?
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Examples of PLA Policies in Other MS4 Permit Regions (see handout)

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- Special circumstances requiring Copermittee discretion
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  - Other

11

Clarity and Consistency Benefit Everyone

- Project applicants
- Copermittees
- Regional Board
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Objectives of Clear PLA Language

- Provide a clear minimum standard that each Copermittee can rely on as a basis for MS4 permit compliance.
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- Protect Copermittee land use authority by allowing them to impose higher standards required to protect health and safety or to prevent a nuisance.
- Reflect statewide trends in addressing the meaning and implementation of Prior Lawful Approval provisions, which are not unique to this permit.

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Proposed Permit Language
(Replaces Section E.3.e.(1)(a); does not alter (b) through (d))

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ii. For public projects, the Copermittee shall develop and adopt an equivalent approach to that for private projects.

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The Coalition's Request

- Direct staff to incorporate the Coalition's proposed language for E.3.e.(1)(a) into Tentative Order No. R9-2015-0001 for review and comment by all stakeholders prior to consideration for adoption by the Regional Board.

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Questions

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Excerpts from California MS4 Permits and Related Documents describing Prior Lawful Approval (PLA) Policy Requirements: July 16, 2014

(1) ORDER NO. R4-2012-0175 LOS ANGELES COUNTY (Nov. 2012; p. 97)

(d) In this section, Existing Development or Redevelopment projects shall mean all discretionary permit projects or project phases that have not been deemed complete for processing, or discretionary permit projects without vesting tentative maps that have not requested and received an extension of previously granted approvals within 90 days of adoption of the Order. Projects that have been deemed complete within 90 days of adoption of the Order are not subject to the requirements Section 7.c. For Permittee's projects the effective date shall be the date the governing body or their designee approves initiation of the project design.

(2) POST-CONSTRUCTION STORMWATER MANAGEMENT REQUIREMENTS FOR DEVELOPMENT PROJECTS IN THE CENTRAL COAST REGION (July 2013; p.2)

c) The Permittee shall apply the Post-Construction Requirements by March 6, 2014[1], to all applicable Regulated Projects that require approvals and/or permits issued under the Permittee's planning, building, or other comparable authority. Applicable Regulated Projects include both private development requiring permits, and public projects:

i) Private Development Projects

(1) Discretionary Projects – The Permittee shall apply the Post-Construction Requirements to those projects that have not received the first discretionary approval of project design.

(2) Ministerial Projects – If the project is only subject to ministerial approval, the Permittee shall apply the Post-Construction Requirements to those projects that have not received any ministerial approvals. If the ministerial project receives multiple ministerial approvals, the Permittee shall apply the Post-Construction Requirements to the first ministerial approval. Ministerial approvals include, but are not limited to, building permits, site engineering improvements, and grading permits.

ii) Public Development Projects

(1) The Permittee shall develop and implement an equivalent approach, to the above approach used for private development projects, to apply the Post-Construction Requirements to applicable public development projects, including applicable university development projects

iii) Exemptions – The Permittee may propose, to the Central Coast Water Board Executive Officer, a lesser application of the Post-Construction Requirements for projects with completed project applications dated prior to September 6, 2012. The Permittee must demonstrate that the application of the Post-Construction Requirements would pose financial infeasibility for the project. The Permittee shall not grant any exemptions without prior approval from the Central Coast Water Board Executive Officer.

(3) SACRAMENTO STORMWATER QUALITY PARTNERSHIP HYDROMODIFICATION MANAGEMENT PLAN (rev. Feb. 2013; p. 48)

3.2.5 Approved Projects

Approved projects will not be subject to hydromodification management requirements because the design plans and specifications (including drainage design) have already been completed and it will be unreasonable and cost prohibitive to require a project applicant to re-design the project.

A project with previous conditions requiring hydromodification management will not be eligible for the following "approved project" exemption.

A project shall meet one of the following criteria to be considered an "approved project" for the purposes of this document:

1. A project will be exempt from HMP requirements if the project's site design is approved or established by one of the following methods no later than twelve months after approval of the HMP by the Regional Water Board:

    a. The site has an approved tentative map to construct a single family subdivision[8]; or
    b. The site has an approved Plan Review, Special Permit or Conditional Use Permit, Design Review/Preservation Review entitlement; or
    c. The project has a complete building permit application submitted; or
    d. The project has a valid building permit issued (or approved off-site improvement plan); or
    e. A project being issued a new building permit to complete work commenced under a prior permit may be considered exempt from HMP requirements at the discretion of the local Permitting Agency.
2. A project discharging directly to a segment of a channel or creek with permitted improvements under a 404 permit or 401 certification from the relevant Federal or State regulatory agencies. The applicant's 404 and 401 certification must be currently valid or obtained no later than twelve months after approval of the HMP by the Regional Water Board. This exemption does not apply for projects with 404 permits or 401 certification which require hydromodification management.
3. A public agency project for which design has been completed and/or a contract has been awarded no later than twelve months after approval of the HMP by the Regional Water Board.

(4) VENTURA COUNTY TECHNICAL GUIDANCE MANUAL FOR STORMWATER QUALITY CONTROL MEASURES MANUAL (July 2011 update; p. 1-8)

The new development and redevelopment requirements contained in Part 4, Section E of the Order shall not apply to the projects described in paragraphs 1 through 5 below. Projects meeting the criteria listed in paragraphs 1 through 5 below shall instead continue to comply with the performance criteria set forth in the 2002 Technical Guidance Manual for Stormwater Quality Control Measures under Board Order 00-108:

1) Projects or phases of projects where the project's applications have been "deemed complete for processing" (or words of equivalent meaning), including projects with ministerial approval, by the applicable local permitting agency in accordance with the local permitting agency's applicable rules prior to the Effective Date; or

2) Projects that are the subject of an approved Development Agreement and/or an adopted Specific Plan; or an application for a Development Agreement and/or Specific Plan where the application for the Development Agreement and/or Specific Plan has been "deemed complete for processing" (or words of equivalent meaning), by the applicable local permitting agency in accordance with the local permitting agency's applicable rules, and thereafter during the term of such Development Agreement and/or Specific Plan unless earlier cancelled or terminated; or

3) All private projects in which, prior to the Effective Date, the private party has completed public improvements; commenced design, obtained financing, and/or participated in the financing of the public improvements; or which requires the private party to reimburse the local agency for public improvements upon the development of such private project; or

4) Local agency projects for which the governing body or their designee has approved initiation of the project design prior to the Effective Date; or

5) A Tentative Map or Vesting Tentative Map deemed complete or approved by the local permitting agency prior to the Effective Date, and subsequently a Revised Map is submitted, the project would be exempt from the 2011 TGM provisions if the revisions substantially conform to original map design, consistent with Subdivision Map Act requirements. Changes must also comply with local and state law.

The intent of these guidelines is to ensure that projects for which the applications have been deemed "complete" or the applicants have worked with local permitting agency staff to develop a final, or substantially final, drainage concept and site layout that includes water quality treatment based upon the performance criteria set forth in the 2002 Technical Guidance Manual for Stormwater Quality Control Measures prior to the Effective Date, are not required to redesign their proposed projects for purposes of complying with the new development and redevelopment requirements contained in Part 4, Section E of Board Order R4-2010-0108.

In addition, any project, phase of a project, or individual lot within a larger previously-approved project, where the application for such project has been "deemed complete for processing" (or words of equivalent meaning) that does not have a final or substantially final drainage concept as determined by the local permitting agency or a site layout that includes water quality treatment must comply with the performance standards set forth in the 2011 TGM.

014734

Example – Central Coast Region "excerpts of Applicability of New Requirements"

Resolution No. R3-2013-0032

ATTACHMENT 1

POST-CONSTRUCTION STORMWATER MANAGEMENT REQUIREMENTS FOR DEVELOPMENT PROJECTS IN THE CENTRAL COAST REGION

July 12, 2013

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL COAST REGION
895 Aerovista Place, Suite 101, San Luis Obispo, California 93401
Phone • (805) 549-3147
http://www.waterboards.ca.gov/centralcoast/

To request copies of this report please contact Dominic Roques at (805) 542-4780, or by email at: droques@waterboards.ca.gov

Documents also are available at:
http://www.waterboards.ca.gov/centralcoast/water_issues/programs/stormwater/docs/lid/lid_hydromod_charette_index.shtml

projects with completed project applications dated prior to September 6, 2012. The Permittee must demonstrate that the application of the Post-Construction Requirements would pose financial infeasibility for the project. The Permittee shall not grant any exemptions without prior approval from the Central Coast Water Board Executive Officer.

If project seeks grandfathering based on "application" rather than an "approval", then an infeasibility analysis is req'd.

2) Performance Requirement No. 1: Site Design and Runoff Reduction
   a) The Permittee shall require all Regulated Projects that create and/or replace ≥ 2,500 square feet of impervious surface (collectively over the entire project site), including detached single-family home projects, to implement at least the following design strategies throughout the Regulated Project site:
      i) Limit disturbance of creeks and natural drainage features
      ii) Minimize compaction of highly permeable soils
      iii) Limit clearing and grading of native vegetation at the site to the minimum area needed to build the project, allow access, and provide fire protection
      iv) Minimize impervious surfaces by concentrating improvements on the least-sensitive portions of the site, while leaving the remaining land in a natural undisturbed state
      v) Minimize stormwater runoff by implementing one or more of the following site design measures:
         (1) Direct roof runoff into cisterns or rain barrels for reuse
         (2) Direct roof runoff onto vegetated areas safely away from building foundations and footings, consistent with California building code
         (3) Direct runoff from sidewalks, walkways, and/or patios onto vegetated areas safely away from building foundations and footings, consistent with California building code
         (4) Direct runoff from driveways and/or uncovered parking lots onto vegetated areas safely away from building foundations and footings, consistent with California building code
         (5) Construct bike lanes, driveways, uncovered parking lots, sidewalks, walkways, and patios with permeable surfaces
   b) The Permittee shall confirm that projects comply with Site Design and Runoff Reduction Performance Requirements by means of appropriate documentation (e.g., check lists) accompanying applications for project approval.

3) Performance Requirement No. 2: Water Quality Treatment
   a) The Permittee shall require Regulated Projects, except detached single-family homes, ≥ 5,000 square feet of Net Impervious Area, and detached single-family homes ≥ 15,000 square feet of Net Impervious Area, to treat stormwater runoff as required in the Water Quality Treatment Performance Requirements in Section B.3.b. to reduce pollutant loads and concentrations using physical, biological, and chemical removal.
      i) Net Impervious Area is the total (including new and replaced) post-project impervious areas, minus any reduction in total imperviousness from the pre-project to post-project condition: *Net Impervious Area = (New and Replaced Impervious Area) - (Reduced Impervious Area Credit)*, where *Reduced Impervious Area Credit* is the total pre-project to post-project reduction in impervious area, if any.
   b) The Permittee shall require each Regulated Project subject to Water Quality Treatment Performance Requirements to treat runoff generated by the Regulated Project site using the onsite measures below, listed in the order of preference (highest to lowest). Water Quality Treatment Performance Requirements shall apply to the runoff from existing, new, and replaced impervious surfaces on sites where runoff from existing impervious surfaces cannot be separated from runoff from new and replaced impervious surfaces.

(5) Crack sealing
(6) Resurfacing with in-kind material without expanding the road or parking lot
(7) Practices to maintain original line and grade, hydraulic capacity, and overall footprint of the road or parking lot
(8) Repair or reconstruction of the road because of slope failures, natural disasters, acts of God or other man-made disaster

ii) Sidewalk and bicycle path or lane projects, where no other impervious surfaces are created or replaced, built to direct stormwater runoff to adjacent vegetated areas
iii) Trails and pathways, where no other impervious surfaces are replaced or created, and built to direct stormwater runoff to adjacent vegetated areas
iv) Underground utility projects that replace the ground surface with in-kind material or materials with similar runoff characteristics
v) Curb and gutter improvement or replacement projects that are not part of any additional creation or replacement of impervious surface area (e.g., sidewalks, roadway)
vi) Second-story additions that do not increase the building footprint
vii) Raised (not built directly on the ground) decks, stairs, or walkways designed with spaces to allow for water drainage
viii) Photovoltaic systems installed on/over existing roof or other impervious surfaces, and panels located over pervious surfaces with well-maintained grass or vegetated groundcover, or panel arrays with a buffer strip at the most down gradient row of panels
ix) Temporary structures (in place for less than six months)
x) Electrical and utility vaults, sewer and water lift stations, backflows and other utility devices
xi) Above-ground fuel storage tanks and fuel farms with spill containment system

c) The Permittee shall apply the Post-Construction Requirements by March 6, 2014[1], to all applicable Regulated Projects that require approvals and/or permits issued under the Permittee's planning, building, or other comparable authority. Applicable Regulated Projects include both private development requiring permits, and public projects:

i) Private Development Projects
(1) Discretionary Projects – The Permittee shall apply the Post-Construction Requirements to those projects that have not received the first discretionary approval of project design.
(2) Ministerial Projects – If the project is only subject to ministerial approval, the Permittee shall apply the Post-Construction Requirements to those projects that have not received any ministerial approvals. If the ministerial project receives multiple ministerial approvals, the Permittee shall apply the Post-Construction Requirements to the first ministerial approval. Ministerial approvals include, but are not limited to, building permits, site engineering improvements, and grading permits.

ii) Public Development Projects
(1) The Permittee shall develop and implement an equivalent approach, to the above approach used for private development projects, to apply the Post-Construction Requirements to applicable public development projects, including applicable university development projects

iii) Exemptions – The Permittee may propose, to the Central Coast Water Board Executive Officer, a lesser application of the Post-Construction Requirements for

Grandfathered per 1st Discretionary Approval.

If project didn't have a Discretionary Approval, then its 1st Ministerial approval defines date of grandfathering.

[1] Newly enrolled Permittees Gonzales, Greenfield, and Guadalupe shall apply the Post-Construction Requirements by July 1, 2014.

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Example – Ventura Region
"Excerpts of Applicability on Revised Requirements"

Ventura County Technical Guidance Manual for Stormwater Quality Control Measures

Manual Update 2011

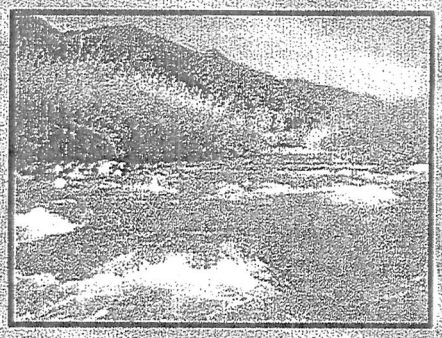

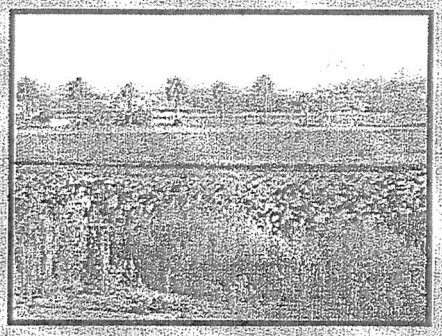

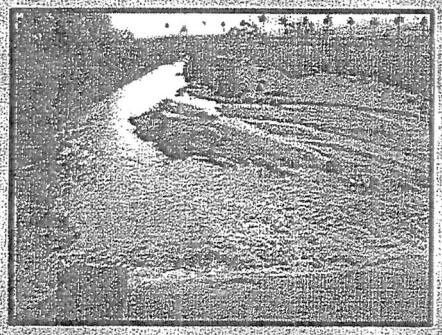

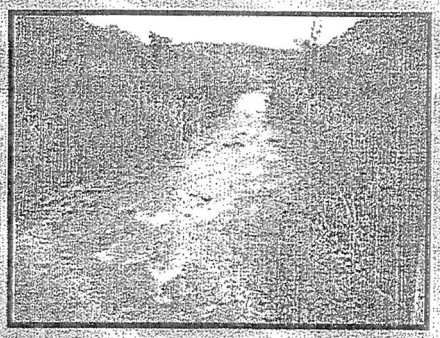

Ventura Countywide Stormwater Quality Management Program

Geosyntec consultants

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July 13, 2011

Existing single-family dwelling and accessory structure projects are exempt from the redevelopment requirements unless the project creates, adds, or replaces 10,000 square feet of impervious surface area.

Effective Date

The new development and redevelopment requirements contained in Part 4, Section E of Board Order R4-2010-0108 (the "Order") shall become effective 90 calendar days after the Regional Water Quality Control Board Executive Officer approves the 2011 TGM (the "Effective Date"). After the Effective Date, all applicable projects, except those identified below, must comply with the new development and redevelopment requirements contained in Part 4, Section E of the Order.

The new development and redevelopment requirements contained in Part 4, Section E of the Order shall not apply to the projects described in paragraphs 1 through 5 below. Projects meeting the criteria listed in paragraphs 1 through 5 below shall instead continue to comply with the performance criteria set forth in the 2002 Technical Guidance Manual for Stormwater Quality Control Measures under Board Order 00-108:

1) Projects or phases of projects where the project's applications have been "deemed complete for processing" (or words of equivalent meaning), including projects with ministerial approval, by the applicable local permitting agency in accordance with the local permitting agency's applicable rules prior to the Effective Date; or

2) Projects that are the subject of an approved Development Agreement and/or an adopted Specific Plan; or an application for a Development Agreement and/or Specific Plan where the application for the Development Agreement and/or Specific Plan has been "deemed complete for processing" (or words of equivalent meaning), by the applicable local permitting agency in accordance with the local permitting agency's applicable rules, and thereafter during the term of such Development Agreement and/or Specific Plan unless earlier cancelled or terminated; or

3) All private projects in which, prior to the Effective Date, the private party has completed public improvements; commenced design, obtained financing, and/or participated in the financing of the public improvements; or which requires the private party to reimburse the local agency for public improvements upon the development of such private project; or

4) Local agency projects for which the governing body or their designee has approved initiation of the project design prior to the Effective Date; or

5) A Tentative Map or Vesting Tentative Map deemed complete or approved by the local permitting agency prior to the Effective Date, and subsequently a Revised Map is submitted, the project would be exempt from the 2011 TGM provisions if the revisions substantially conform to original map design, consistent with

Subdivision Map Act requirements. Changes must also comply with local and state law.

The intent of these guidelines is to ensure that projects for which the applications have been deemed "complete" or the applicants have worked with local permitting agency staff to develop a final, or substantially final, drainage concept and site layout that includes water quality treatment based upon the performance criteria set forth in the 2002 Technical Guidance Manual for Stormwater Quality Control Measures prior to the Effective Date, are not required to redesign their proposed projects for purposes of complying with the new development and redevelopment requirements contained in Part 4, Section E of Board Order R4-2010-0108.

INTENT OF GRANDFATH -ERING

In addition, any project, phase of a project, or individual lot within a larger previously-approved project, where the application for such project has been "deemed complete for processing" (or words of equivalent meaning) that does not have a final or substantially final drainage concept as determined by the local permitting agency or a site layout that includes water quality treatment must comply with the performance standards set forth in the 2011 TGM.

1.6 Organization of the 2011 TGM

The 2011 TGM is divided into seven sections and nine appendices:

Section 1	Introduction
Section 2	Stormwater Management Standards
Section 3	Site Assessment and BMP Selection
Section 4	Site Design Principles & Techniques
Section 5	Source Control Measures
Section 6	Retention BMPs, Biofiltration BMPs, and Treatment Control Measure Design
Section 7	Operation and Maintenance Planning
Appendix A	Glossary of Terms
Appendix B	Maps: Watersheds Delineation, Existing Urban Areas, Environmentally Sensitive Areas, and 85th Percentile Rainfall Depth
Appendix C	Site Soil Type and Infiltration Testing

014740

Document	Ventura County	LA County	Sacramento	Central Coast Region	SD Region Proposal
Source	Ventura Technical Guidance Manual	Order # R4-2012-0175	Stormwater Quality Partnership Hydromodification Management Plan	Post Construction Storm Water Management Requirements	Copermittees and Private Parties
Date	July, 2011	November, 2012	February, 2013	July, 2013	August, 2014
Development Agreements	Exempt	Silent	Silent	Silent	Exempt
Vesting Tentative Maps	Exempt	Exempt	Silent	Silent	Silent
Tentative Maps	Exempt	Silent	Exempt	Silent	Silent
Other Discretionary Permit	Exempt	Exempt (1st permit)	Exempt	Exempt	Exempt
Other Ministerial Permit	Silent	Silent	Exempt	Exempt	Exempt
Commencement of Work	Exempt	Silent	Silent	Silent	Silent

2014 REPORT OF WASTE DISCHARGE
SAN DIEGO REGION
STATE OF THE ENVIRONMENT

ORANGE COUNTY STORMWATER PROGRAM

014743

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FOREWORD

I am pleased to present the Orange County Stormwater Program's first State of the Environment Report. This report represents our commitment to periodically present a comprehensive picture of the quality of Orange County's creeks, rivers, bays and coastal waters and the actions being taken by the Orange County Stormwater Program (the Program) to protect and restore them.

The Program is a partnership of the cities of Orange County, the County of Orange and the Orange County Flood Control District. The Program's partners own and operate inter-connected storm drain systems and have been working together since 1990 to mitigate the water quality impacts that can arise from the imprint of urban development on the landscape.

This report is intended to provide a basis for broadening participation and creating common purpose in the actions we need to take to protect and enhance Orange County's highly significant ecological and recreational water resources. With this objective always in mind, we will continue to improve future reports with a focus always on fostering understanding and collaboration.

I hope that you will use this report as a resource for understanding and participating in the progress we are making on protecting water quality in Orange County.

Mary Anne Skorpanich, Director

OC Environmental Resources

STATE OF THE ENVIRONMENT

OVERVIEW

The Orange County Stormwater Program's monitoring, assessment, and environmental research efforts are intended to track progress toward solving existing problems, identify emerging issues that could become concerns in the future, and support research and development that improves our understanding of key processes and advances the efficiency and effectiveness of monitoring methods.

Monitoring is most often seen as a response to regulatory requirements, which it is, but it also provides information that guides the use of important resources and answers a set of fundamental questions of keen interest to both managers and the public. The State Water Resources Control Board has articulated the following four questions (based on the intent of the federal Clean Water Act) that provide a broad context for water quality monitoring in the state:

- Is our water safe to drink?
- Is it safe to swim in our waters?
- Is it safe to eat fish and shellfish from our waters?
- Are our aquatic ecosystems healthy?

This current assessment of the state of the environment for south Orange County (Figure 1) summarizes the results of long-term monitoring and related special studies that address the second and fourth of these questions (related to swimming safety and aquatic ecosystem health). These two issues are directly related to stormwater management priorities. The safety of drinking water is addressed by other agencies and programs that produce independent reports on drinking water quality. The safety of consuming local fish and shellfish is directly managed by the California Office of Environmental Health Hazard Assessment (OEHHA), supported by data and assessments conducted by the California Surface Water Ambient Monitoring Program (SWAMP) and others (the Beaches and Creeks TMDL for bacteria did not address the shellfish recreational use standard). In addition, the State Water Resources Control Board is in the process of conducting a statewide assessment of the potential contribution of contaminated sediments in enclosed bays and estuaries to the levels of contaminants in seafood tissue as well as shellfish beneficial use (SWRCB 2011).

This Report therefore focuses on the two core management questions that are within the Program's area of responsibility and that are not currently being assessed by other agencies. For each major question (e.g., Is it safe to swim in our waters?), monitoring and assessment should, over time, answer the following assessment questions:

- Is there a problem?
- If so, what is its magnitude and extent?
- What are the sources of the problem?
- Are conditions getting better or worse?
- Are management actions working as intended?

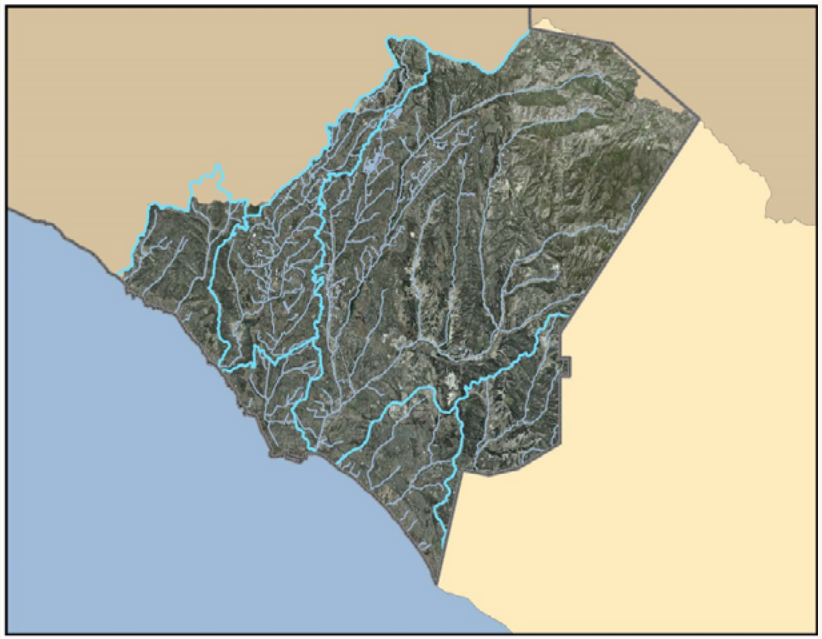

FIGURE 1: The portion of south Orange County that is under the jurisdiction of the San Diego Regional Water Quality Control Board and is the focus of this Report. Blue lines represent watershed boundaries.

Monitoring, assessment, and research efforts should be tightly focused on one or more of these questions and be managed to ensure that resources are reallocated when questions are answered and new ones arise (Figure 2). Monitoring, assessment, and research should therefore be managed as a portfolio of resources invested in creating the information needed to meet the Program's goals, with the allocation of resources adjusted as needed. Assessment and research are included as a package with monitoring for two reasons. First, the information produced by ongoing monitoring programs is most useful when it is carefully analyzed, evaluated in the context of other related information, and applied to the basic questions motivating monitoring (i.e., assessed). Second, not all questions can be answered by routine monitoring and targeted special studies (i.e., research) are often needed to fill critical data gaps, develop more effective monitoring tools, and/or lay the groundwork for new management approaches. This approach follows the guidance contained in the Regional Board's recently adopted Framework for Monitoring and Assessment (RWQCB 2012), which emphasizes the importance of a sequential, question-driven approach supported by appropriate monitoring and assessment efforts that are adapted over time as knowledge improves and priorities shift.

FIGURE 2: Monitoring, assessment, and research provide the data and information required to answer the five key assessment questions. *Attention should shift among questions as information improves and priorities change, and the mix of monitoring, assessment, and research activities should be adjusted to correspond.*

The Program has identified three themes that help structure the assessment of the status and trends of environmental conditions in south Orange County and the accompanying recommendations for restructuring current monitoring programs:

- Theme 1: Focus on priority areas and constituents rather than trying to monitor all constituents, potential issues, and locations.
- Theme 2: Increase the integration of data from a wider range of sources in order to leverage the value and impact of the Program's efforts to address the five assessment questions.
- Theme 3: Continue evolving from a strictly discharge-specific approach to a risk prioritization approach that can highlight problem areas and support more flexible monitoring designs that include data driven adaptive triggers.

These three Report themes inform efforts toward meeting management goals for the four critical areas of concern (bacteria, dissolved solids, nutrients and toxicity). In these areas, there is a substantial amount of data available to support conclusions about progress, highlight remaining problem areas, and reexamine current monitoring designs to improve efficiency and effectiveness.

This Report begins with an evaluation of available data from the past ten years of monitoring in the region's water bodies in order to identify constituents whose concentrations and impacts have been successfully reduced, as well as those that remain of concern. This initial prioritization is then expanded and examined in greater detail in subsequent sections of this Report.

Subsequent sections examine these constituents in greater depth, the progress made and factors that contribute to continuing issues. Each section ends with recommendations for improving monitoring's effectiveness. A final section evaluates the study designs for the Dry Weath-

er and the Coastal Ambient monitoring efforts, to assess whether their goals could be better met with different approaches.

THE STORY: PRIORITIZATION

- Prioritization is a valuable tool for the Program to use its resources wisely to focus on the most important issues.
- Initial prioritization is based on the overall frequency and magnitude of exceedances of compliance standards and other measures of problem severity.
- In inland channels, bacteria, dissolved solids, and nutrients are persistent issues over time, particularly in wet weather.
- For coastal discharges, there are no persistent issues in wet weather, while bacteria and nutrients are issues in dry weather.
- Some elevated toxicity is present in inland channels during wet weather, but overall toxicity is not different from that described for background conditions by the Stormwater Monitoring Coalition (SMC).
- There are no persistent issues in the coastal surfzone due to discharges, other than localized bacteria contamination at a handful of problem beaches and localized and moderate nutrient exceedances in wet weather.

PRIORITIZATION

The Program has measured a broad suite of contaminants and other measures of condition (i.e., toxicity, bioassessment) and the accumulated data from many years of monitoring provides a valuable opportunity to compare the severity of impacts and adjust their relative priority (Table 1). In order to provide a consistent basis of comparison across indicators (with the exceptions of toxicity and bioassessment), an overall index of the extent to which indicators meet regulatory standards is used.

The index, developed by the Canadian Council of Ministers of the Environment (CCME) was used in the Report of Waste Discharge (ROWD) for the northern portion of the County and such frequency-based indices are widely used in water quality assessment (e.g., by the Central Coast Regional Water Quality Control Board and the Ventura Countywide Stormwater Quality Management Program). It provides a measure, scored from 0 – 100, of the frequency and magnitude of exceedances that can be tracked over time, with lower scores representing worse conditions and higher scores better conditions. This index, which is a more effective means of communicating water quality results, accounts for the number of indicators within each category (e.g., bacteria, metals) that exceed standards in each year, the percentage of individual samples that exceed standards, and the average magnitude of any such exceedances (CCME 2001).

	BACTERIA	DISSOLVED SOLIDS	NUTRIENTS	TOXICITY	PESTICIDES	METALS	BIOASSESSMENT
CHANNELS							
DRY							
WET							NA
COASTAL							
DRY		NA					NA
WET		NA					NA

TABLE 1: Overall summary of results of prioritization analysis. *Red represents persistent and widespread exceedances of regulatory and/or widely used thresholds, yellow occasional exceedances, and green few if any exceedances. Measures of exceedance used in this analysis accounted for both the frequency and the magnitude of exceedance. Note: Bacteria, dissolved solids, and nutrients may be problem constituents in channels, and bioassessment scores in urban areas are generally low.*

014749

Inland Channels

For inland channels, bacteria, dissolved solids, and nutrients are persistent issues over time. The prevalence of toxicity is somewhat higher in wet than in dry weather, but is not substantially above background conditions described in SMC studies (see Tables 2 and 3). High toxicity occurs in only isolated instances in wet and dry weather. Biological condition (i.e., bioassessment) is generally poor and is in the lower 50% of the distribution compared to other urban areas in southern California. The following figures present results of the prioritization analysis for these core constituents, beginning with Figure 3's overall summary ranking of constituents based on monitoring data from receiving waters in inland channels.

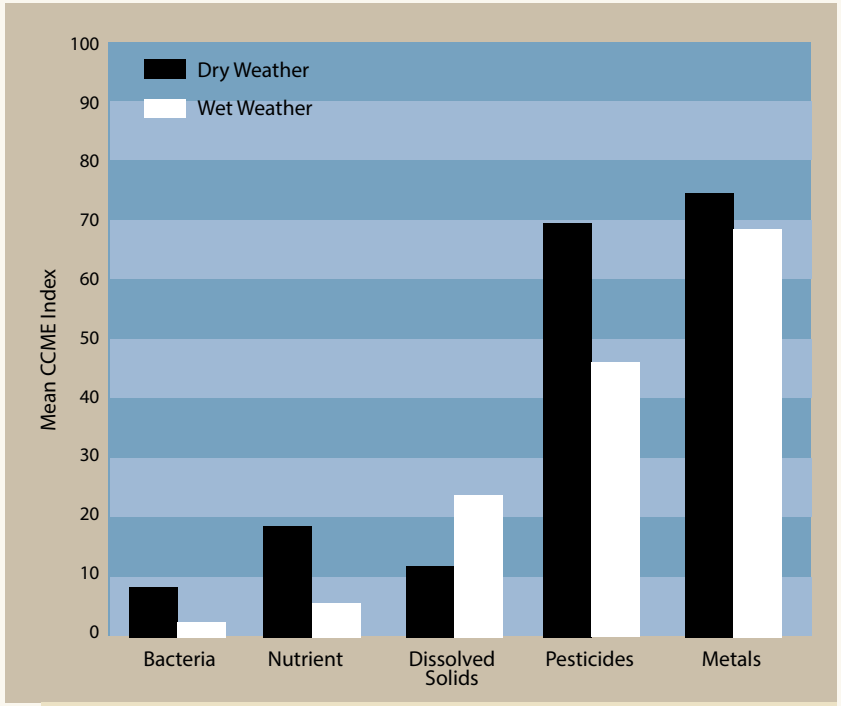

FIGURE 3: Overall exceedance index for core monitoring constituents in inland channels, summarized over the 2003 – 2013 monitoring period. *The bar charts rank constituents based on their respective CCME exceedance indices in both dry and wet weather, with higher values indicating fewer and smaller exceedances. Note: pesticides and metals had considerably lower exceedance rates and magnitudes of exceedance than bacteria, dissolved solids, and nutrients.*

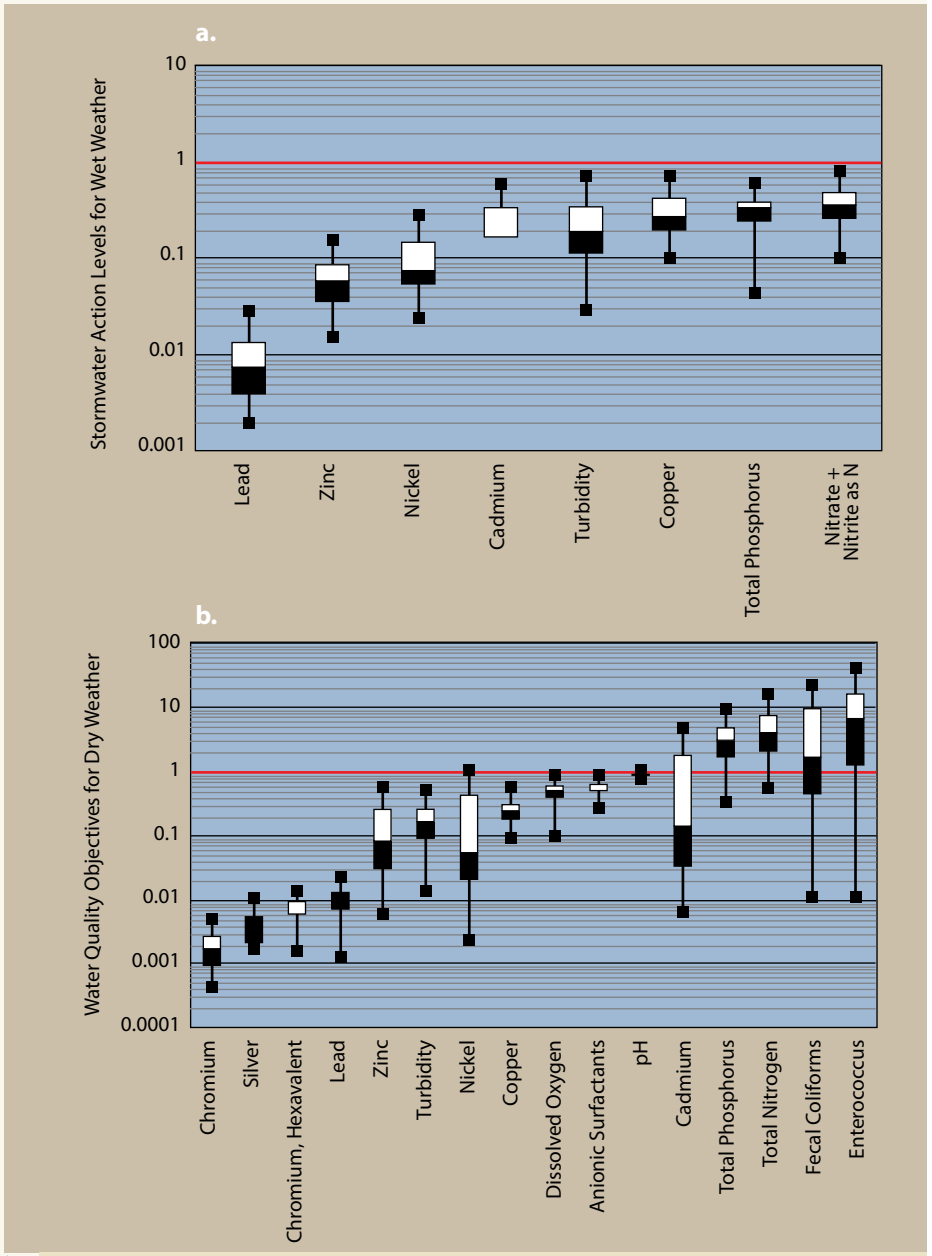

FIGURE 4: Comparison of individual constituent concentrations with a) Stormwater Action Levels (SALs) for wet weather and b) water quality objectives (WQOs) for dry weather. *In the box and whiskers plot, the horizontal bar represents the median, with the upper and lower edge of the box the 75th and 25th percentiles of the distribution, respectively, and the whiskers the maximum and minimum values. Note: All constituents are below SALs in wet weather and only nutrients and bacteria are above WQOs in dry weather.*

TEST SPECIES	DRY WEATHER			WET WEATHER			SEDIMENT		
	n	TOXIC	NON-TOXIC	n	TOXIC	NON-TOXIC	n	TOXIC	NON-TOXIC
Americamysis bahia	391	34%	66%	573	45%	55%			
Strongylocentrotus purpuratus	179	5%	95%	293	24%	76%			
Ceriodaphnia dubia	569	20%	80%	51	12%	88%			
Pimephales promelas	64	9%	91%	1	0%	100%			
Hyalella azteca	224	11%	89%	17	53%	47%	9	0%	100%
OVERALL	**1593**	**18%**	**82%**	**946**	**36%**	**64%**	**9**	**0%**	**100%**

TABLE 2: Summary of the Program's toxicity testing in south Orange County from 2003 – 2012, an effort that includes 2548 tests on multiple species from a range of times, locations, and conditions. *Note: Toxicity levels are generally low except for one organism in wet weather that is susceptible to pesticides.*

Figure 4 presents a slightly different perspective with data collected from stormwater discharge points into inland channels prior to mixing with receiving water. No constituents in wet weather exceeded Stormwater Action Levels (SALs) (Figure 4a) which are higher than the Water Quality Objectives (WQO) that apply to dry weather discharges (Figure 4b) and receiving waters in channels (Figure 3). Nutrients and bacteria are persistent issues for dry weather discharges.

While toxicity is present in urban channels (Table 2), it is not higher, overall, in dry weather than the toxicity documented in the open (undeveloped) landuse by the SMC's regional monitoring program. Wet weather toxicity in the County's channels is higher in wet than in dry weather, and is somewhat higher in wet weather for *Americamysis bahia* than seen in the northern portion of the County, patterns discussed further in the subsequent section on toxicity.

Biological condition, as measured by macroinvertebrate bioassessment results, is uniformly poor at targeted monitoring sites in south Orange County channels (Figure 5). Studies conducted as part of the State Water Resources Control Board's effort to develop a statewide Biological Integrity policy indicate that alterations to physical habitat are a major cause of degraded biological conditions. The somewhat elevated toxicity in wet weather

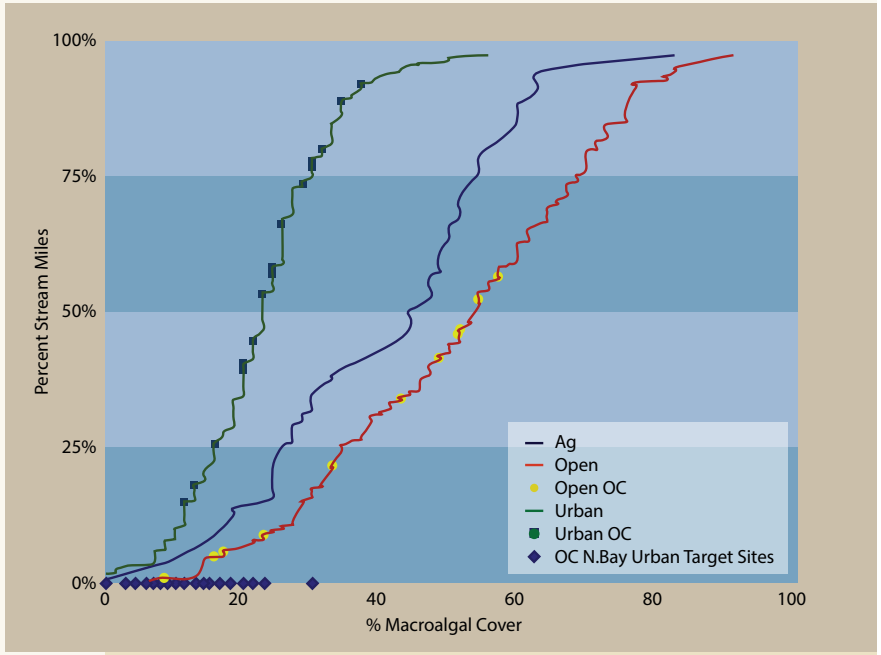

FIGURE 5: Cumulative frequency distribution of SMC bioassessment monitoring results across southern California in three distinct landuses. *The random sites within Orange County sampled as part of the SMC program are indicated on the curves for urban and open landuses. Targeted channel sites are shown along the X axis and Index of Biotic Integrity (IBI) scores for these sites, with one exception, fall in the lower 50% of the distribution compared to all urban landuse sites sampled as part of the SMC regional study. Note: Bioassessment IBI scores in urban areas are in the lower half of scores for urban areas in southern California.*

014751

	% STREAM MILES	
	OPEN	URBAN
***Ceriodaphnia* survival**		
Toxic	2.1	2.4
Nontoxic	97.9	97.6
***Ceriodaphnia* reproduction**		
Toxic	63.0	37.4
Nontoxic	37.0	62.6

TABLE 3: Summary of aquatic toxicity results from the past five years of Stormwater Monitoring Coalition (SMC) samples from random sites across the southern California region. *Sites were located in both open (i.e., undeveloped) and urban landuse types. The large majority of stream miles were nontoxic for acute toxicity (i.e., survival), with an equivalent amount of sporadic background toxicity, in both open and urban landuses. The majority of stream miles were toxic for chronic toxicity (i.e., reproduction) in the open landuse, a strikingly different pattern than seen in the urban landuse. Note: Acute toxicity patterns in open undeveloped areas are not substantially from those in urban areas.*

(Table 3) might be another contributing factor. Because the Biological Integrity policy, with its new scoring protocol, is still under development, and its technical background studies have not been completed and released, the Program will defer a more detailed consideration of biological condition for now. At that point, however, a causal assessment, using the approach recommended by the SWRCB, would be appropriate and informative.

Coastal Surfzone

For the coastal surfzone, nutrients and bacteria are mild to moderate issues in wet weather, with most bacteria issues due to a small number of persistent problem beaches (Figure 6). Elevated nutrient concentrations in wet weather are a concern because they may contribute to regional eutrophication in coastal estuaries and to harmful algal blooms along the coast.

While Figure 6 suggests that bacteria contamination is a moderate problem, particularly in wet weather, two other datasets present a different perspective. The data in Figure 6 are drawn from the Program's monitoring at large coastal discharges, all of which are more likely to have elevated bacteria levels and thus represent a worst case estimate. In contrast, Heal the Bay beach report grades for a much larger set of south Orange County swimming beaches (Figure 7) show that the large majority of grades are in the A condition, even in wet weather and a more detailed examination of individual beaches (Figure 8) shows that bacteria shows continued improvement at some beaches over the past five years. However, Figure 8 does not reflect recent dramatic improvements at these beaches because it summarizes data over the entire 2005 –

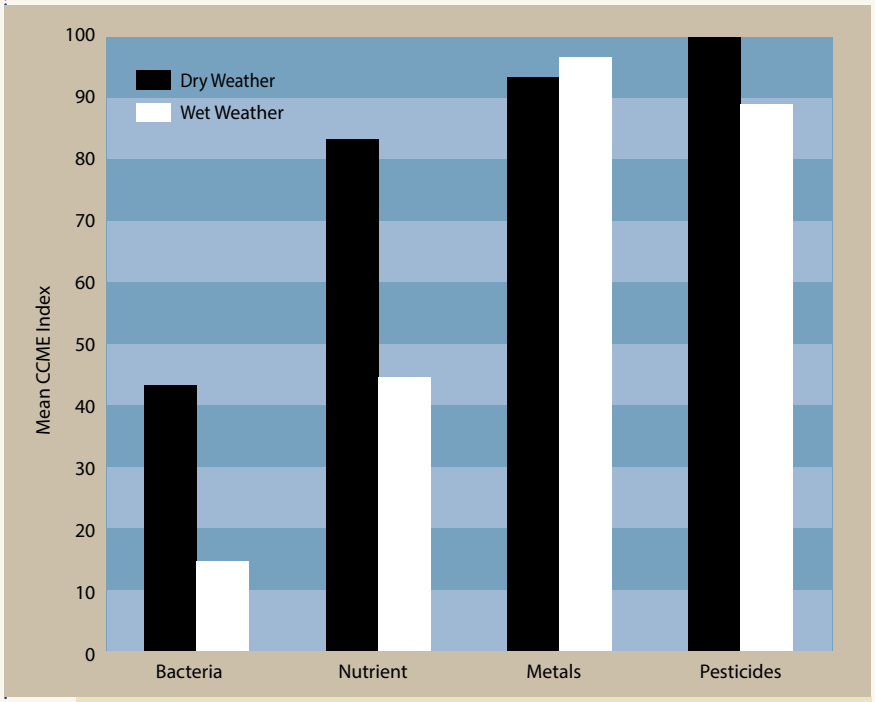

FIGURE 6: Overall exceedance index for core monitoring constituents in the coastal surfzone, summarized over the 2003 – 2013 monitoring period. *Note: Constituents measured at coastal discharge points rarely exceed standards, except occasionally for bacteria and nutrients in wet weather.*

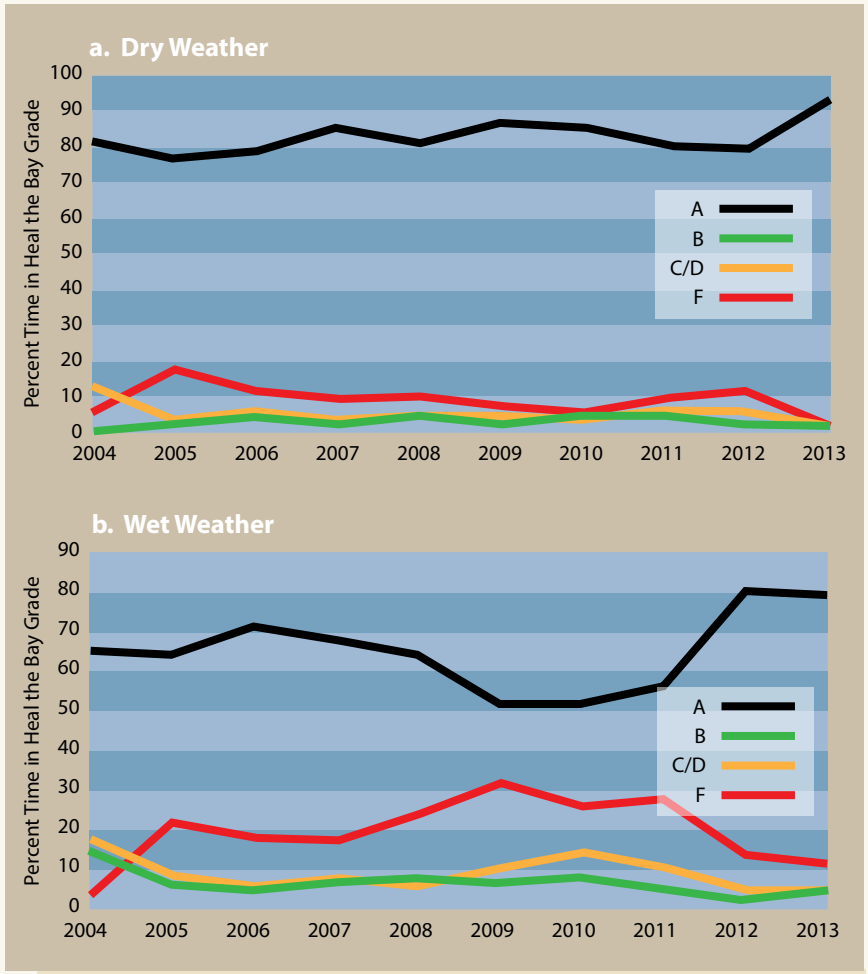

FIGURE 7: Percentage of the time that swimming beaches are in each Heal the Bay report card category, averaged across all monitored beaches. *During (a.) dry weather beaches are in the A grade between 80 and 90% of the time. During (b.) wet weather the percentage of A grades drops, but has remained at about 80% for the past two years.*

2013 period (see Bacteria section which reflects on the recent changes and provides a perspective of trends over time). The issues that do exist are localized to a few persistent problem beaches. For example, Heal the Bay has recently removed both Poche and Doheny beaches from its Beach Bummer list of the top 10 problem beaches in southern California. Thus, the data summarized for Figure 6 do not provide the entire context for evaluating bacterial contamination at coastal beaches.

Figure 6 shows that nutrients may be a moderate issue in wet weather. However, unlike bacteria which cause relatively localized issues because they die off in seawater, nutrients can be a more regional concern due to their potential to contribute to plankton blooms and eutrophication both in local estuaries and the larger coastal ocean. A fuller assessment of potential nutrient impacts will depend on the developing state policy on Nutrient Numeric Endpoints (NNE) for coastal estuaries and Bight Program assessments of nutrients' potential contribution to plankton blooms in the coastal ocean.

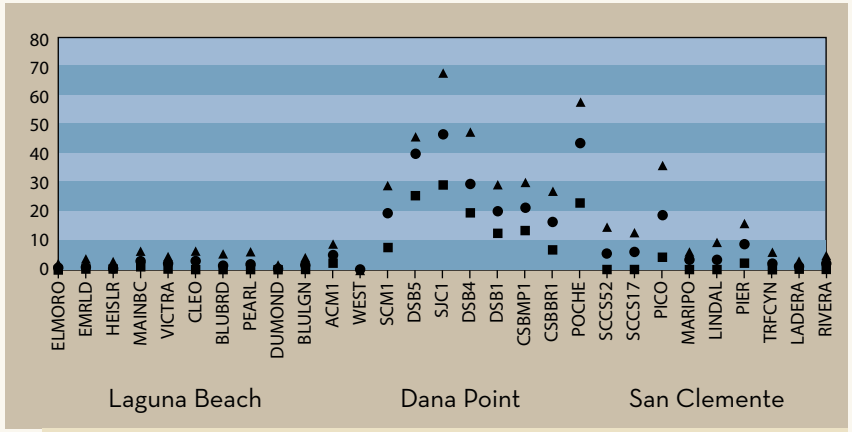

FIGURE 8: The overall percent exceedance of the AB411 Enterococcus standard over the time period 2005 - 2013. *Poche and Doheny, and to a lesser extent Pico, are the only persistent problem beaches and this summary figure overstates the problem because it does not clearly reflect significant recent improvements. This figure focuses on Enterococcus because it is the only one of the three AB411 indicators with any meaningful level of exceedance. Note: Exceedances of the Enterococcus standard occur at only a few problem beaches, which have improved dramatically in recent years.*

014753

BACTERIA

THE STORY: BACTERIA

- The County's beaches support concentrated recreational activities for both residents and visitors and are important contributors to the local and regional economy.
- Concern about swimming safety is consistently high and epidemiology studies in dry weather show that some illness (for example, gastroenteritis) is associated with full immersion swimming in contaminated water.
- Contamination is very low during dry weather and has dropped steadily over time; beach report card grades are consistently high.
- Sources of contamination have been reduced through targeted actions; remaining issues during dry weather are localized and may have natural components.
- Contamination is more widespread during wet weather; wet weather flows are larger and qualitatively different.
- Health risks associated with wet weather flows are uncertain, but ongoing research and development focuses on improved monitoring tools and wet weather epidemiology studies.
- Progress on managing dry weather contamination demonstrates the efficacy of targeted BMPs appropriate to specific situations that may include natural sources (e.g., birds).

FIGURE 9: The beach is a popular recreational destination across the region.

A Valued Resource

South Orange County's beaches (Figure 9) have been used for recreation at least as far back as the early 20th Century, and the local population as well as visitors from outside the region have enjoyed the opportunities they provide for sightseeing, picnicking, sunbathing, swimming, and surfing. The acceleration of urbanization and population growth in the last century increased beach usage at the same time as growing environmental awareness intensified concerns about contamination and its potential health impacts. The nexus of these two trends was illustrated dramatically in 1999 when persistent closures of Huntington State Beach due to contamination resulted in substantial economic impacts, anxiety about potential health effects, and concerted efforts to find and control the sources of contamination. While this event occurred in the north County, it affected perceptions among managers and the public throughout southern California. With over 100 million visits annually to southern California's beaches (nearly 40 million of which occur in Orange County) (Dwight et al. 2007) that contribute billions of dollars to the regional economy, the stakes related to contamination and public health are higher than ever.

The intensity of recreational use at beaches has stimulated a large amount of research, monitoring, and regulation at the federal, state, and local levels. These efforts have identified bacterial, protozoan, and viral pathogens that could be present when contaminated runoff and untreated sewage are released into the ocean (HCA 2012). Epidemiology studies in Santa Monica Bay (1995 & 2007/08) and at Doheny Beach (Colford et al. 2012) documented higher illness rates (e.g., *gastroenteritis*) among swimmers, especially near flowing stormdrains.

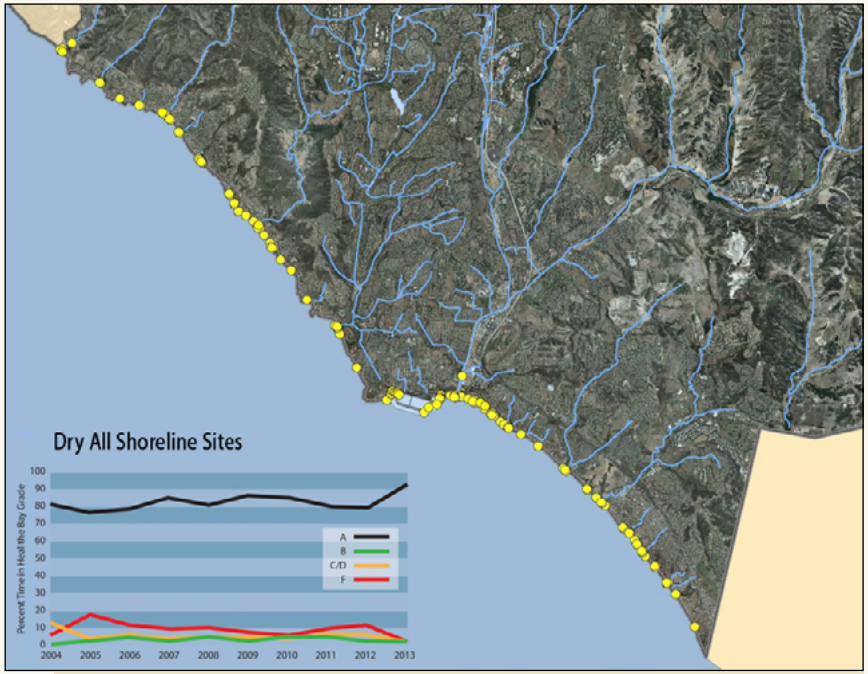

FIGURE 10: A Coordinated beach monitoring program conducted by the County Health Care Agency, the Program, and wastewater treatment agencies regularly monitors a large number of swimming sites. *Heal the Bay prepares weekly beach report card grades (inset figure and expanded Figure 7) that are made available on their website (www.healthebay.org).*

These illnesses are not life threatening. However, the past history of beach contamination due to untreated sewage discharges (prior to passage of the federal Clean Water Act), along with current concerns about sewage spills and untreated storm-drain discharges, has led to constant vigilance and one of the preeminent beach water quality monitoring and improvement programs in the state (Figure 10). A unified monitoring program that improves coordination among monitoring efforts conducted by the Program, the County Health Care Agency, and the water treatment agencies has been approved by the Regional Water Board and will be implemented shortly.

Progress during Dry Weather

Beach use and body contact recreation occur predominantly during the summer and in dry weather, although there is some use, mainly by surfers, during wet weather in the winter storm season. As a result, most regulation and monitoring focuses on dry weather conditions, using three bacterial indicators that indicate the presence of fecal pollution. These indicators are only indirect indicators of illness risk and not themselves pathogens, or disease agents. Thus, they do not provide a direct measure of potential health risk. However, they have been correlated with illness rates in dry weather when sewage contamination is present. They are more easily sampled and analyzed than the larger number of pathogens themselves. Long-term monitoring based on these indicators shows that exceedances of regulatory standards are also low and have been dropping over time and that the percentage of Heal the Bay report card grades of A has been at or above 80% in dry weather since 2004 (Figure 10).

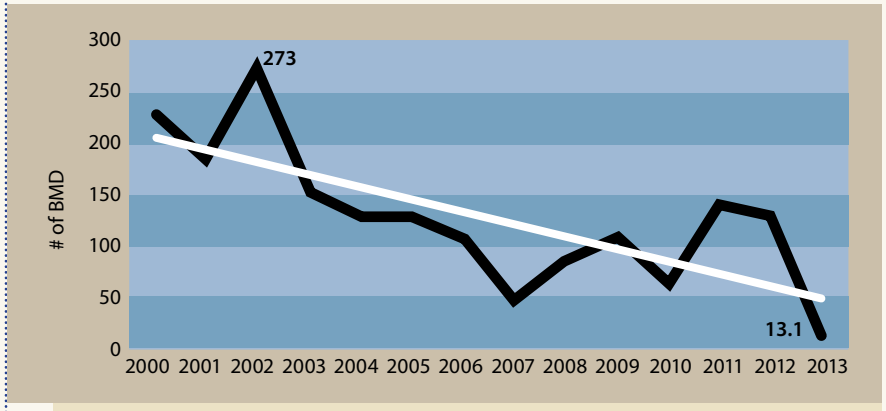

FIGURE 11: The total number of Beach Mile Days (the product of the length of beach posted times the length of beach posted) posted due to exceedances of standards during the April 1 – October 31 summer swimming season. *Beach Mile Days have declined substantially since 2000 and reached an all-time low in 2013. Adapted from HCA (2012).*

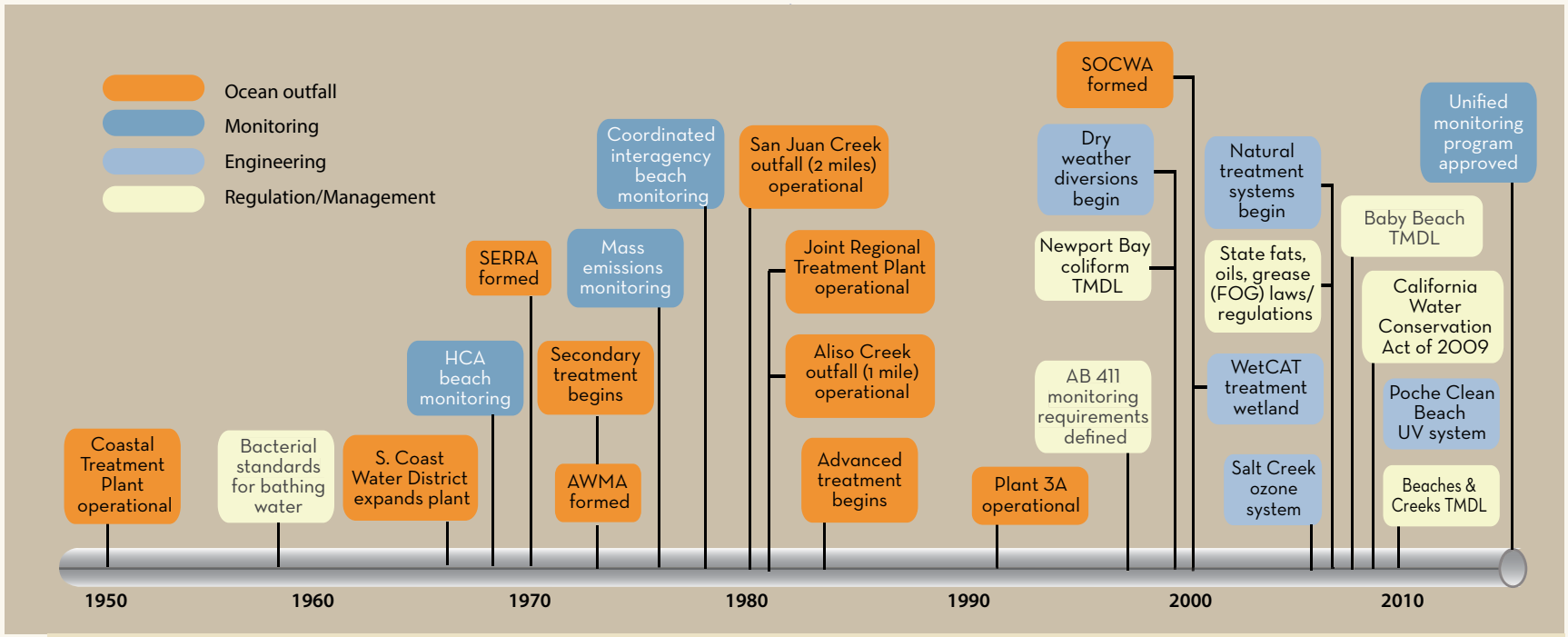

FIGURE 12: Timeline of significant actions in several categories that have contributed significantly to improved beach water quality.

This improvement in conditions during dry weather has been mirrored by a decrease over the past several years in beach postings due to the exceedances of bacteriological standards, as measured by Beach Mile Days (Figure 11). This metric is calculated by multiplying the length in days of each closure by the length (in miles) of beach affected and is a more accurate measure of the impact on beach users than the simple number of closures.

The improvement over time in these several measures of beach condition has resulted from a better understanding of contamination sources and targeted efforts to address the most severe of these sources. These efforts (Figure 12) initially focused on wastewater treatment plant improvements and treatment upgrades and have more recently expanded to include a wide range of localized BMPs (Figure 13) that have dramatically reduced the level of contamination at beaches and in the streams that discharge to the coastline. For example, the percent of Enterococcus exceedances at Salt Creek in Dana Point and the Pico stormdrain in San Clemente have dropped from 23 to 10% and from 22 to 4%, respectively, since 2005.

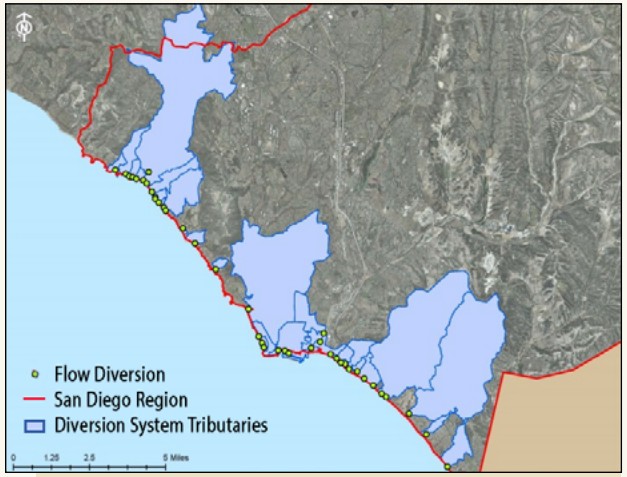

FIGURE 13: Coastal flow diversions that reroute dry weather flow to treatment plants that affect flow and/or bacterial loads.

Beginning around 2000, County agencies and individual cities began improving their spill response and prevention capability, supported by a number of state laws and policies targeted at the discharge of FOG (fats, oils and grease, which can clog sewer lines), with the result that the numbers of spills and beach closures due to spills have declined dramatically (Figure 14). Attention also focused on urban runoff from rivers, creeks, and stormdrains, which can contain high levels of bacterial indicators. A notable regional example is the long-term effort to document and reduce levels of bacterial contamination in Aliso Creek which has been ongoing since the late 1990s.

Problem Beaches and Creeks

In response to persistent bacterial contamination issues at a number of creeks and beaches in the San Diego Region, the San Diego Regional Water Board in 2007 adopted a Total Maximum Daily Loads for Indicator Bacteria, Project I - Beaches and Creeks in the San Diego Region, commonly referred to as the Beaches and Creeks TMDL. In the southern portion of the County, the primary focus of the TMDL was on a handful of persistent problem beaches (Figure 8). The TMDL was preceded by other individual actions, such as the Aliso Creek Directive issued by the Regional Water Board in 2001, also in response to elevated bacteria concentrations in the Aliso Creek watershed. These regulatory actions, combined with increased public and management attention to bacterial contamination (e.g., reduced sewage spills (Figure 14)), have resulted in significant improvements to beach water quality. For example, both Poche and Doheny Beaches were recently removed from Heal the Bay's Beach Bummer list of the ten worst beaches in the region.

While actions to reduce bacterial inputs and improve water quality span the region (Figure 13), Aliso Creek and Poche and Doheny Beaches provide representative examples of the diversity

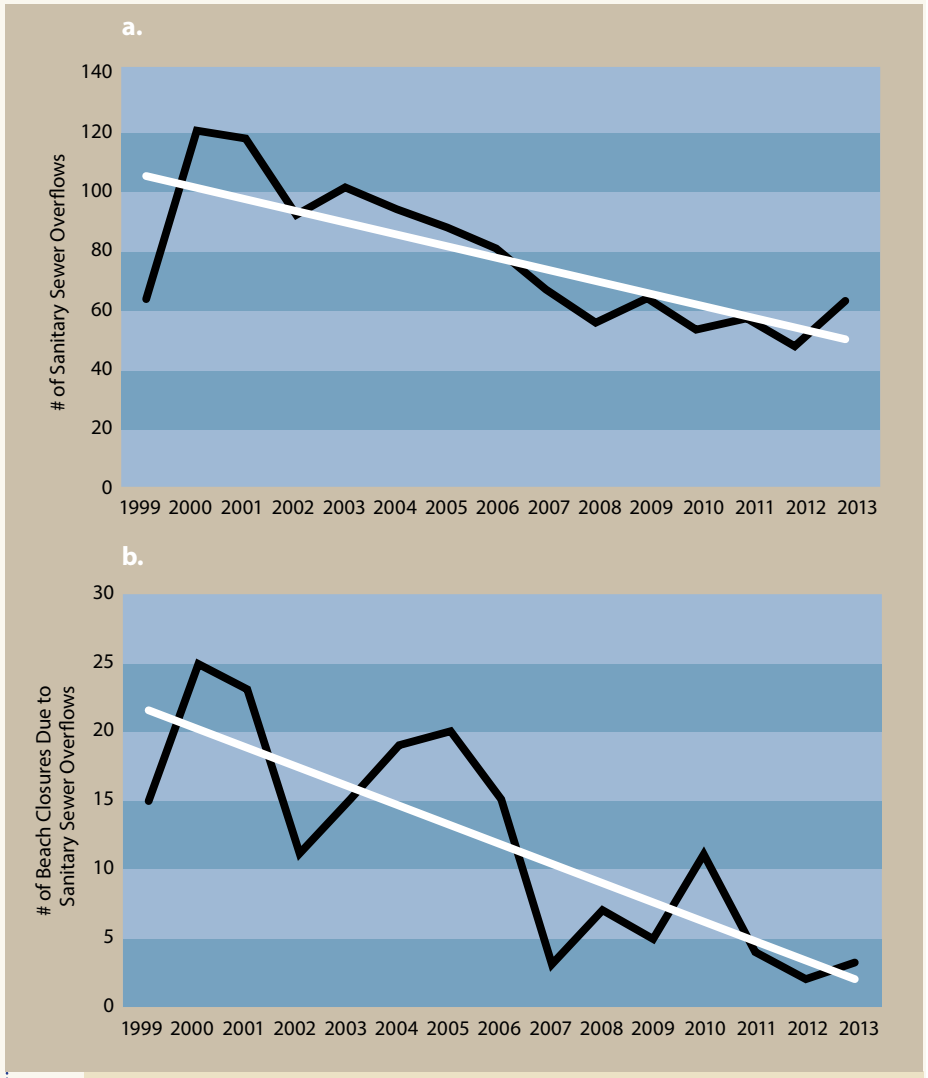

FIGURE 14: Two key metrics track the decreasing impact of sewage spills on beach condition in south Orange County over time. *a) The number of reported sewage spills from 1999 through 2013. The number of spills peaked in 2000 and has declined steadily since then (regression significant at p = 0 .001), reflecting increased attention to the causes of spills (primarily line blockages); b) the number of beach closures from 1999 through 2011 resulting from sewage spills. After peaking in 2000, the number of closures has declined steadily (regression significant at p <0.001), reflecting the reduction in the number of sewage spills and in the percentage of spills reaching the beach. Peaks in 2005 and 2010 are due to an unusual number of larger spills over 1000 gallons. Adapted from HCA (2012).*

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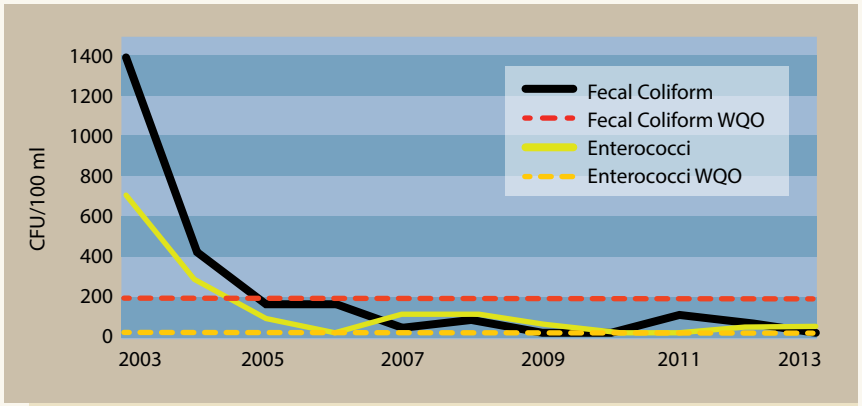

FIGURE 15: Fecal indicator bacteria concentrations at Aliso Creek monitoring site CTPJO1 have significantly declined and now meet recreational water quality objectives (WQOs) for fecal coliform.

of monitoring, assessment, prevention, and treatment efforts that combine to produce improvements over the past several years.

In addition to water conservation efforts that include the entire urbanized portion of the Aliso Creek watershed, four specific types of Best Management Practices (BMPs) have been implemented, including:

- **Treatment systems** such as sand filters, cartridge media filters, disinfection (ozone or Ultraviolet (UV)) light, and dry weather diversions that send stormdrain flow to the sanitary sewer for treatment.
- **Wetlands/channel restoration** that enhances a stream's natural capacity to absorb pollutant loads and restores riparian habitat.
- **Landscape retrofits** such as weather-based irrigation controllers, edgescaping that replaces irrigated lawn area along the edge of a sidewalk, street curb, driveway, etc. with lower impact landscaping and permeable ground covering, and other irrigation improvements to improve water efficiency and reduce runoff.
- **Catch basin retrofits** such as debris gates and in line baskets or filters that reduce the potential for bacterial growth by keeping trash out of catch basins.

These actions have had noticeable effects, reducing fecal coliform levels below the regulatory standard at a key monitoring station in the lower watershed and reducing *Enterococcus* levels to near the standard (Figure 15).

Bacterial indicator levels in the Aliso Creek watershed have declined over the past several years in concert with a decline in the average flowrate from urban discharges to the creek (Figure 16). While correlation of course does not necessarily equal causality, in this instance there is a strong case that the reduced flow of water contaminated with urban pollutants (including bacteria) has contributed to the reduced levels seen in the creek monitoring program.

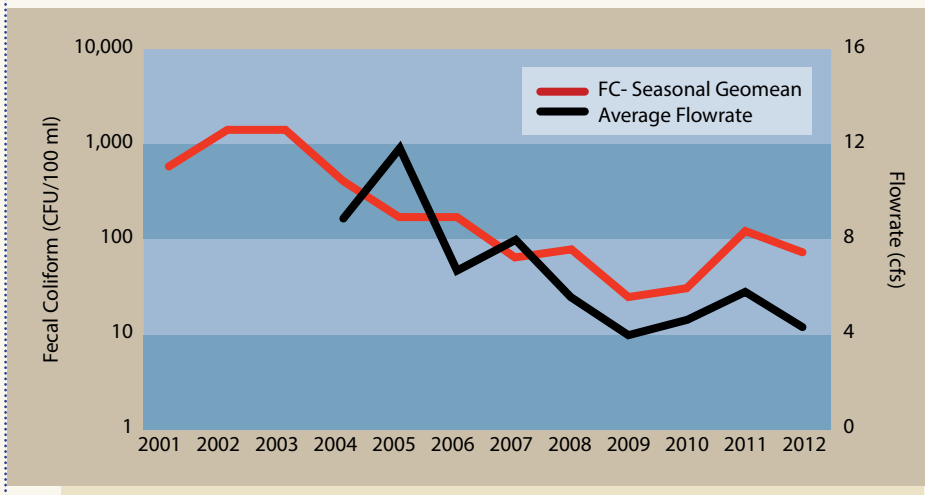

FIGURE 16: The fecal coliform seasonal geomean in the Aliso Creek watershed plotted in comparison to the average dry weather flow rate in the creek. *Note: Fecal coliforms have declined in concert with reductions in flow of urban runoff to Aliso Creek.*

The story of success at Poche and Doheny Beaches is equally dramatice but involves a different set of studies and BMPs. In concert with the epidemiology study at Doheny Beach in 2007-08, a source identification pilot project (or SIPP) identified leaking sanitary sewer infrastructure as a source of human fecal markers

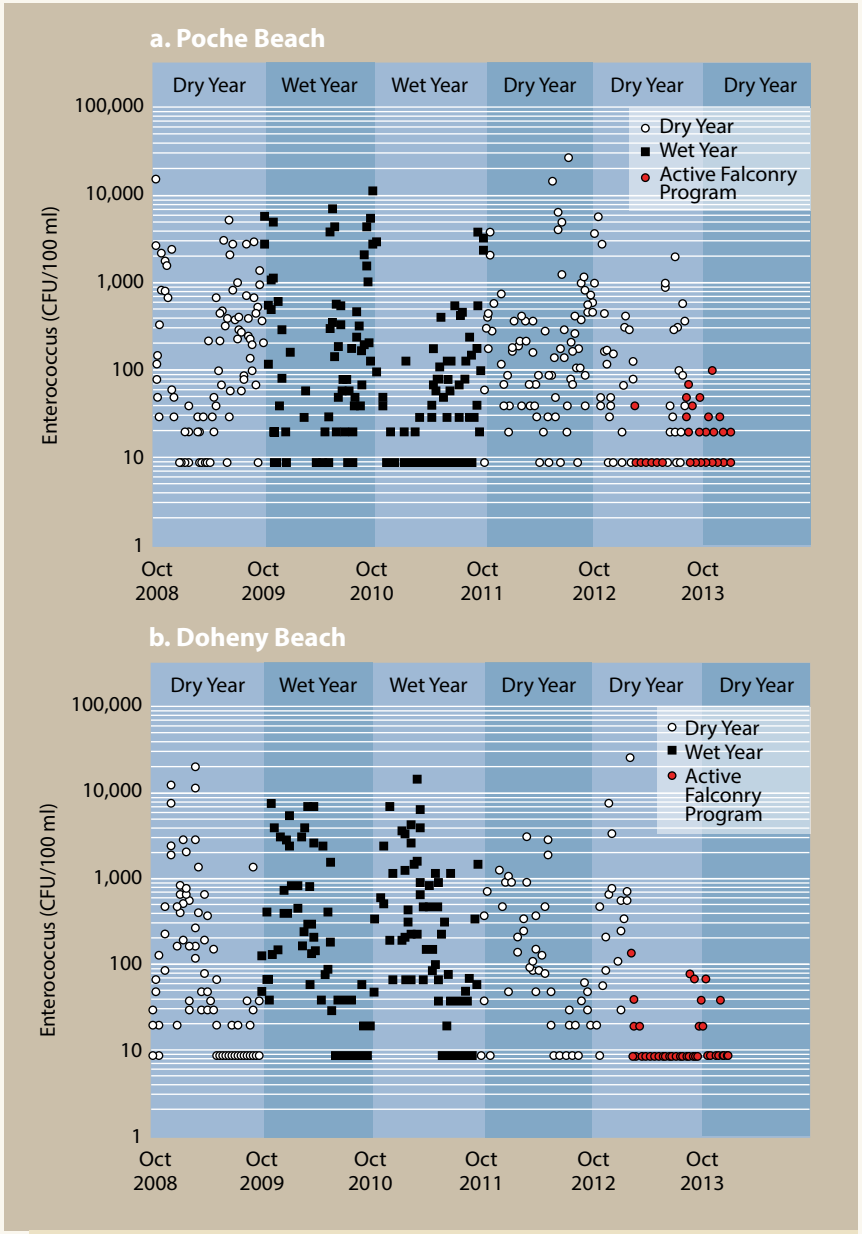

FIGURE 17: The presence of an active falconry program to deter seagulls is associated with significant declines in bacterial contamination levels at both Poche (a) and Doheny (b) beaches. *Note: Falconry programs help reduce contaminant inputs from seagulls.*

seen in the surfzone. Targeted repair efforts essentially removed this source. A parallel program at Poche Beach, the Poche Clean Beach Project, used state grant funds to construct a filtration and UV treatment system that reduced input of bacterial contamination from the the channel discharging to the beach.

Additional studies identified another source of human fecal makers, this one airborne. Projects that involved genetic characerization as well as behavioral studies of seagulls found that seagulls feeding at the Prima Deshecha landfill in the upper watershed constituted a separate pathway for contamination. Better landfill maintenance, combined with falconry programs at both the landfill and the beach significantly reduce this source of contaminant input (Figure 17). Thus, the combination of modern genetics methods and the ancient practice of falconry provided an effective solution at Poche and Doheny Beaches.

Ongoing efforts by cities to improve water conservation and reduce nuisance runoff have begun to ameliorate this problem. While concentrations of indicator bacteria in channels in both wet and dry weather combined continue to be elevated, the diversion of dry weather stormdrain and stream flows to treatment plants and other actions (Figure 13) has significantly reduced the volume of contaminated flows to beaches. Such efforts, along with the targeted identification and removal of specific problem sources, have also helped the County and watershed permittees make substantial progress toward improving conditions at the few problem beaches in the region. As a result of the effectiveness of these complementary actions, Orange County's beaches meet regulatory standards for the large majority of the time in dry weather and the health risks of swimming during dry weather conditions are very low, well understood, and well managed.

014759

FIGURE 18: Photographs showing examples of the changes in flows during dry and wet weather and the subsequent changes in ocean water quality. *a) Dry weather flows are much smaller than b) wet weather flows; c) wet weather flows from stormdrains and channels typically reach the ocean in wet weather, in contrast to dry weather flows which rarely reach the ocean; d) surfers often take advantage of the large waves caused by winter storms, despite the increased exposure to contamination this may involve.*

Continued Challenges in Wet Weather

In contrast to the progress achieved in maintaining clean beaches during dry weather conditions, significant challenges remain during wet weather. Channel flows during and immediately after wet weather storms are substantially higher than during dry weather (Figure 18a vs. 18b) which makes it infeasible to apply the management practices (e.g., diversion to treatment plants) that have been so successful in dry weather. In addition, these flows reach the beach more frequently (Figure 18c), which means that their loads of bacteria and other pathogens are delivered directly to the coastal ocean, with the result that beach grades worsen and exceedances of standards increase during wet weather (Figure 19). Nevertheless, the annual percentage of A grades for wet weather on the Heal the Bay report card has reached 70% in recent years (Figure 19). As a result of these characteristics of wet weather flow, the Orange County Health Care Agency issues routine health advisories recommending that the public stay out of the ocean during and for 72 hours after storms in order to avoid contact with potentially contaminated discharge. Despite this, there is significant recreational use during storms (Figure 18d), primarily by surfers taking advantage of the larger surf that often accompanies winter storms.

In addition to the higher flows in wet weather, there are two other aspects of this issue that complicate efforts to reduce wet weather contamination and its resultant potential health risks:

- Bacterial contamination in wet weather flows stems from a much wider range of sources than in dry weather.
- Limitations in existing monitoring tools make it difficult to know when there is actually human fecal contamination and a resultant health problem.

Rainfall and the resulting runoff from land surfaces mobilizes indicator bacteria from a wide range of sources, including humans

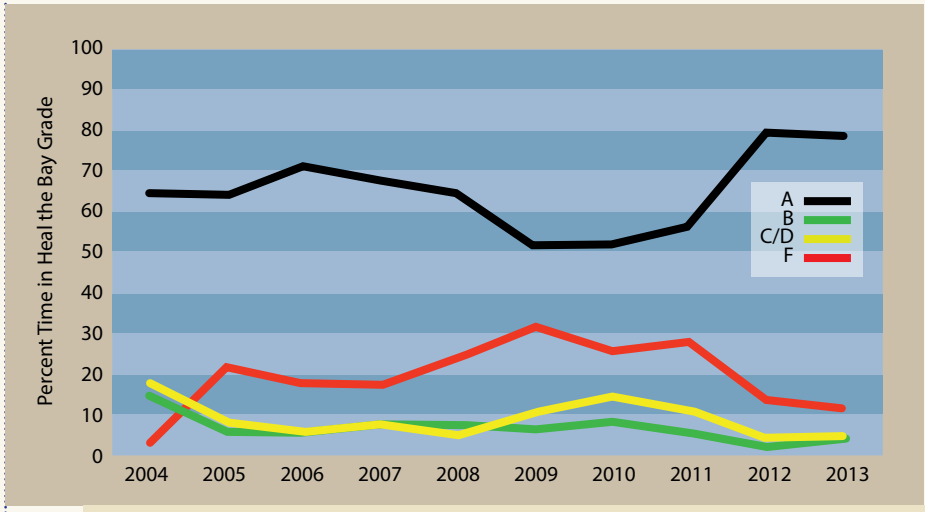

FIGURE 19: The percentage of poor Heal the Bay report card grades at swimming beaches is much higher in wet weather than in dry weather (see insert in Figure 10), although the annual percentage of A grades in wet weather has increased gradually in recent years to 80% and the percentage of F grades has dropped to 10% in the most recent monitoring year (2013). *Note: Heal the Bay beach grades in wet weather have improved recently and are mostly A.*

and animals, soils, vegetation debris, and persistent bacterial films in gutters and stormdrains. These loads stem from sources in both urban and open areas, as documented in a number of studies that have correlated bacterial loading with rainfall and measured loading from both urban and natural landscapes. Controlling this large range of sources and the very large volumes of wet weather flow would present a daunting engineering problem. For example, the long-term (1986 – 2013) mean monthly flow of San Juan Creek in January, February, and March is approximately 6175, 9201, and 5095 acre feet, respectively. Because treating these runoff volumes is infeasible, approaches such as Low Impact Development (which reduces runoff) and amendments to the Basin Plan that include changing bacteria objectives, delisting of some concrete channels, and suspending objectives in highly modified flood control channels during periods of high flow may be called for.

Because of the different nature of wet weather flows and the indirect nature of monitoring indicators, it is impossible to draw firm conclusions about health risk in wet weather. Wet weather flows may actually include a large proportion of true pathogens or they may simply be mobilizing non-pathogenic indicator bacteria from multiple sources across the landscape and diluting a stable pool of human fecal pathogens. Epidemiological studies in dry weather, including in Santa Monica Bay in 1995 and 2007-08, and at Doheny Beach (Colford et al. (2012)) have established a relationship between levels of indicator bacteria and health risk, as well as documenting that full immersion swimming closer to flowing stormdrains increases risk. In contrast, there are no epidemiological studies in wet weather that can help resolve the fundamental uncertainties that have so far precluded significant management actions.

New studies planned and underway should, over the next few years, provide significant insight into the nature and magnitude of health risks in wet weather as well as more powerful and targeted monitoring tools to support improved regulation and decision making.

Monitoring Methods

Current indicators do not measure pathogens directly and do not separate human vs. animal and other sources. This is problematic, especially in wet weather when higher flows mobilize indicator bacteria from a multitude of sources distributed widely across the landscape. The current bacterial indicators are present in soils, leaf litter, other forms of rotting biomass, biofilms in gutters and stormdrains, as well as in both domesticated animals and wildlife, and often recover and grow in the environment even after disinfection. In contrast, the pathogens responsible for human illness (about 90% of which are viruses) all derive from human fecal contamination. These shortcomings of traditional indicators make it difficult to reliably separate human from nonhuman sources, estimate health risk, and accurately track the sources of actual pathogens.

Recent research has led to new tools that resolve some of these handicaps, although further development remains to be done over the next few years. Ongoing research falls into three categories:

- Development of genetic markers that more reliably identify the presence of human fecal material.
- Monitoring methods that directly measure the presence and abundance of pathogens, particularly viruses.
- Wet weather epidemiology studies that will improve estimates of health risk from exposure to ocean waters during wet weather conditions.

We now have the technology to reliably determine if there is a human fecal component to bacterial contamination, using the HF183 genetic marker from a *Bacteriodes* species that is present in large quantities in humans but not in other species. This marker is not itself a pathogen but does enable relatively accurate estimates of the percentage of time human fecal material is present. At present, it is most useful as a means of confirming/eliminating the presence of human sources, a key first step in microbial source

tracking studies. However, it is not yet a suitable basis for revised regulatory standards because its persistence in the environment and its behavior compared to that of actual pathogens is poorly understood. A component of the Bight '13 large-scale regional monitoring program aims to improve our understanding of HF183's utility by measuring it, along with traditional indicators, in a number of coastal drainages across southern California in both wet and dry weather.

New monitoring methods that utilize digital polymerase chain reaction (dPCR) technology enable quantification of pathogenic viruses at very low detection limits. Researchers can now test for the presence of adenoviruses, noroviruses, and rotaviruses in environmental samples, although substantial further development is needed before these methods are available for routine application. Rotaviruses are related predominantly to gastrointestinal illness and some adenoviruses affect a broader range of membranes, including those in the nose and bronchia. Some noroviruses cause intense but shortlived (24 – 48 hour) illnesses that are not life threatening but are extremely unpleasant. With funding from the state of CA, the Southern California Coastal Water Research Project is working with the Monterey Bay Aquarium Research Institute (MBARI) and researchers at Arizona State University to develop mobile digital PCR equipment that could enable new approaches to beach water quality monitoring, such as in situ sensors that provide a stream of real-time data. There are technical complications related to sample processing but once these are resolved, the digital PCR methods could provide the basis for updated standards.

The third area of research is the investigation of health effects associated with swimming and surfing in the ocean during wet weather conditions. SCCWRP is cooperating with the City and County of San Diego and USEPA this winter on a pilot wet weather epidemiology study that will follow a large sample of surfers to estimate the relationship between illness rates and the levels in ocean water of a number of indicator bacteria and pathogens. Plans are in place for a full epidemiology study at more locations during the winter of 2014/15. The results of these studies, in combination with quantitative microbial risk assessment methods, could show that health risk is either lower or higher than the assumptions built into current regulations. In either case, the epidemiology studies, in combination with new monitoring methods, will provide the basis for improved regulations and more informed management decisions.

Recommendations

Past progress in identifying and controlling sources of contamination, the availability of a long time series of monitoring data, and the development of new monitoring and assessment tools provide the basis for this review of existing bacteria monitoring programs with the goal of improving their utility and efficiency. The following recommendations stem from a data-driven, risk prioritization approach that views monitoring, assessment, research, and management actions as a portfolio of related actions.

- Continue targeted data analyses of monitoring data to prioritize problem areas.
- Conduct additional source tracking studies as needed, using new monitoring methods based on genetic markers to identify potential sources of these issues such as infiltration into the MS4 from sewage lines. This effort should build on results of the Bight '13 Microbiology Study.
- Continue identifying opportunities to reduce and prevent flows in dry weather, where monitoring and source tracking data suggest the presence of human fecal contamination.
- Conduct statistical power analysis and optimization studies to improve existing monitoring program designs to improve efficiency and take advantage of available information about patterns and trends of contamination. Figure 20 illustrates how statistical power analysis can provide information that can reduce and/or better target monitoring resources.
- Shift resources from routine monitoring to targeted source tracking and adaptive response, using new tools such as genetic markers of human fecal contamination as these become available.
- Continue supporting regional and collaborative research into better monitoring and source tracking tools.
- Improve understanding of health risk related to high wet weather flows, for example, through the Bight '13 Microbiology Study; follow results of the pilot wet weather epidemiology study planned for San Diego and consider supporting the larger, follow-on study planned for 2014/2015.

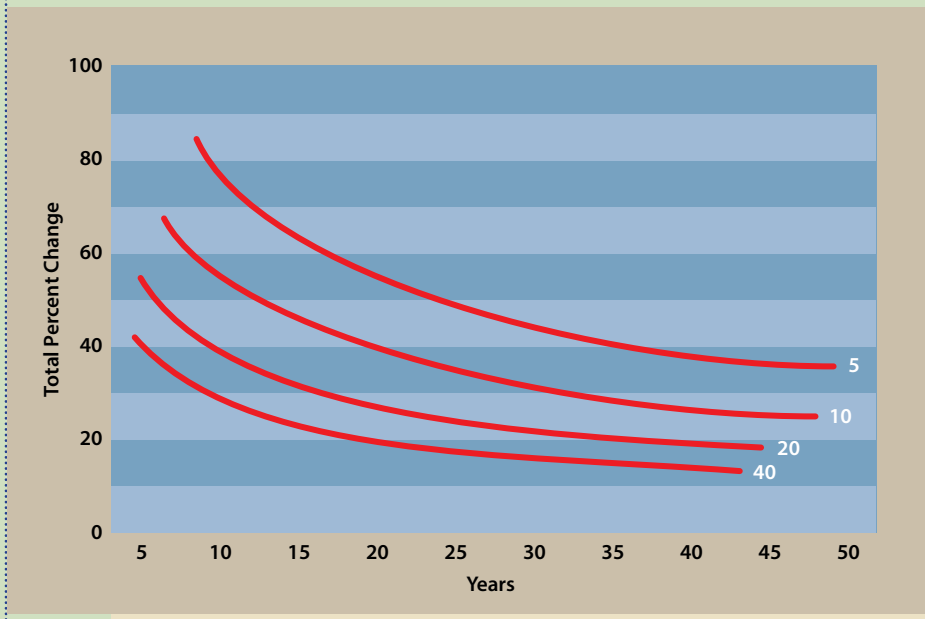

FIGURE 20: Example analysis run with pesticide data to demonstrate statistical power analysis for a trend monitoring program. *The number of years of data required to detect varying amounts of change with different numbers of samples per year (5, 10, 20, 40) next to respective curves). This figure illustrates that increased sampling intensity often produces diminishing returns and that such analyses can inform tradeoffs among different types of sampling effort and the amount of change managers with to detect and/or the amount of time they can wait to detect a change. The figure also shows that the inherent variability in a system may make it impossible to detect small amounts of change with even large amounts of sampling effort.*

014763

THE STORY: DISSOLVED SOLIDS

- Persistent and widespread exceedances of total dissolved solids objective occur in channels and at discharge outfalls.
- Dissolved solids are challenging to address because a large portion of these elevated levels derive from natural sources in regional groundwater.
- Understanding local geology is key to understanding sources of dissolved solids and the pathways they travel in the watershed.
- While the flood control system provides one pathway for dissolved solids in groundwater to reach the surface, other natural pathways (such as artesian springs) exist and there is evidence of historically elevated dissolved solids levels in surface water in the region.

DISSOLVED SOLIDS

Natural Geology is Key

Dissolved solids refers to the amount of salt in water and can be a difficult water quality problem to address when concentrations are elevated. They can be toxic to fish and plants and require expensive processing in water reclamation systems to make the water drinkable or usable for irrigation. Dissolved solids is a general description of the amount of salt in water and the most common chemical constituents are chloride, sulfate, nitrate, phosphate, calcium, magnesium, sodium, potassium, and sometimes a few trace metals such as cadmium, nickel, selenium, and zinc.

Total dissolved solids (TDS) consistently exceed the Basin Plan Objective (Figure 21) and these levels create the potential for detrimental impacts on the aquatic ecosystem; for example, TDS has been suspected as a causal factor in poor benthic macroinvertebrate community condition.

The key issue in deciding whether elevated dissolved solids represent a water quality problem, and thus a priority for management, depends directly on the source of these solids and the appropriate benchmark for comparison (Figure 22). Many creeks in south Orange County have elevated levels of dissolved solids that do not appear to be related to the urban sources. For example, the dissolved solids from common urban potable sources such as imported water from the Colorado River or northern California, or

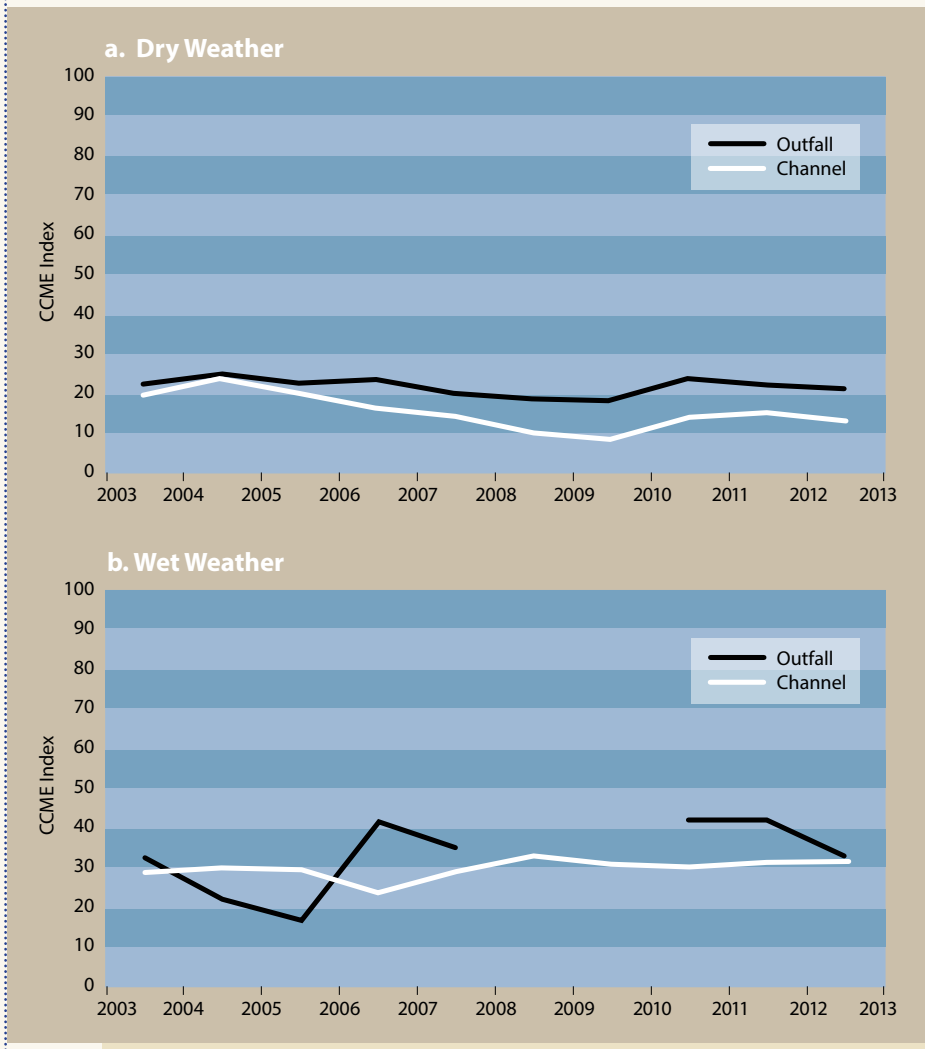

FIGURE 21: An overall exceedance index *of the extent to which total dissolved solids meet regulatory standards in both a) wet and b) wet conditions is low (which means poor conditions) and has remained fairly steady since 2004.*

locally generated drinking water from deep groundwater supplies or from recycled water, are often at levels much lower than those measured in south Orange County creeks. Conversely, the shallow groundwater tables that provide most of the water to these streams are often much higher in dissolved solids than water from urban sources.

Local geology is the primary reason south Orange County creeks have dissolved solids higher than those in common urban sources of water. The coastal areas of south Orange County have salt-rich native soils, as a consequence of the area's marine sedimentary geology. Further, the creeks with elevated dissolved solids are not limited only to water bodies within urbanized areas. Natural reference creeks in coastal areas with this type of unique geology and little to no urban influence have levels of dissolved solids substantially above those in urban water sources (Figure 22a).

In contrast, the parts of south Orange County with geology more closely related to bedrock (i.e., igneous geology) and those soils found in the upland higher elevations closer to the Santa Ana mountains exhibit an entirely different geochemistry and impart lower levels of dissolved solids (Figure 22b).

The Program has conducted several special studies to improve understanding of the relationships between natural and urban sources of dissolved solids in creeks. Studies in Oso Creek, which has elevated dissolved solids levels showed that dissolved solids concentrations in this Creek were comparable to those in three reference streams (Figure 23a), although loads of dissolved solids to Oso Creek were higher than those in natural streams (Figure 23b).

The Program has also conducted collaborative studies with researchers in the Geochemistry Group at University of Southern California's Department of Earth Sciences, using specialized testing of stable isotopes of hydrogen and oxygen. Physiographic conditions under which rain falls in the Sierra Nevada or Colorado

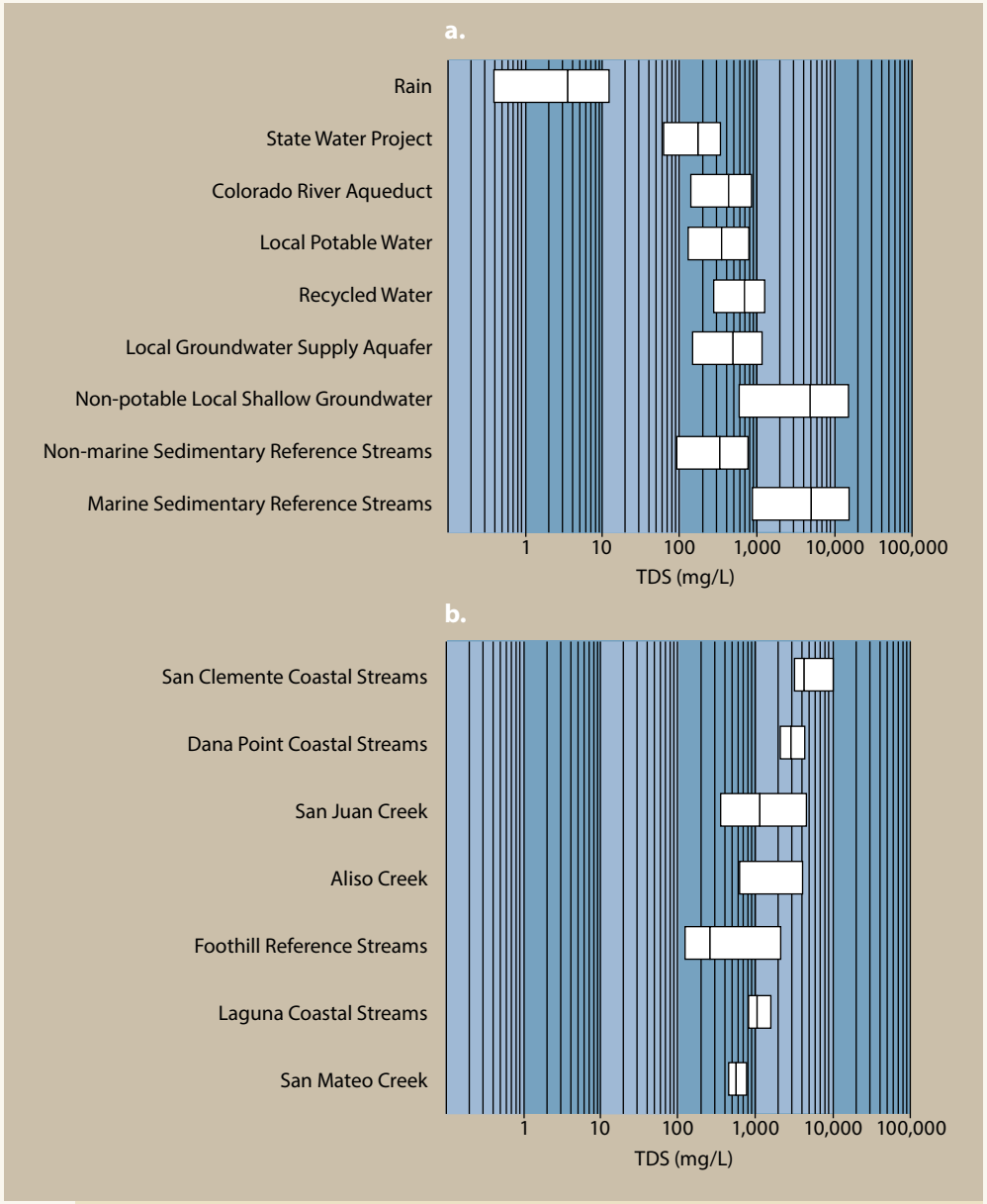

FIGURE 22: Means and ranges of dissolved solids concentration *in a) various water sources including rainwater, local potable, Colorado River potable, recycled, groundwater, and b) streams. Data from these sources provide context as to which water source(s) most closely resemble surface waters with elevated dissolved solids.*

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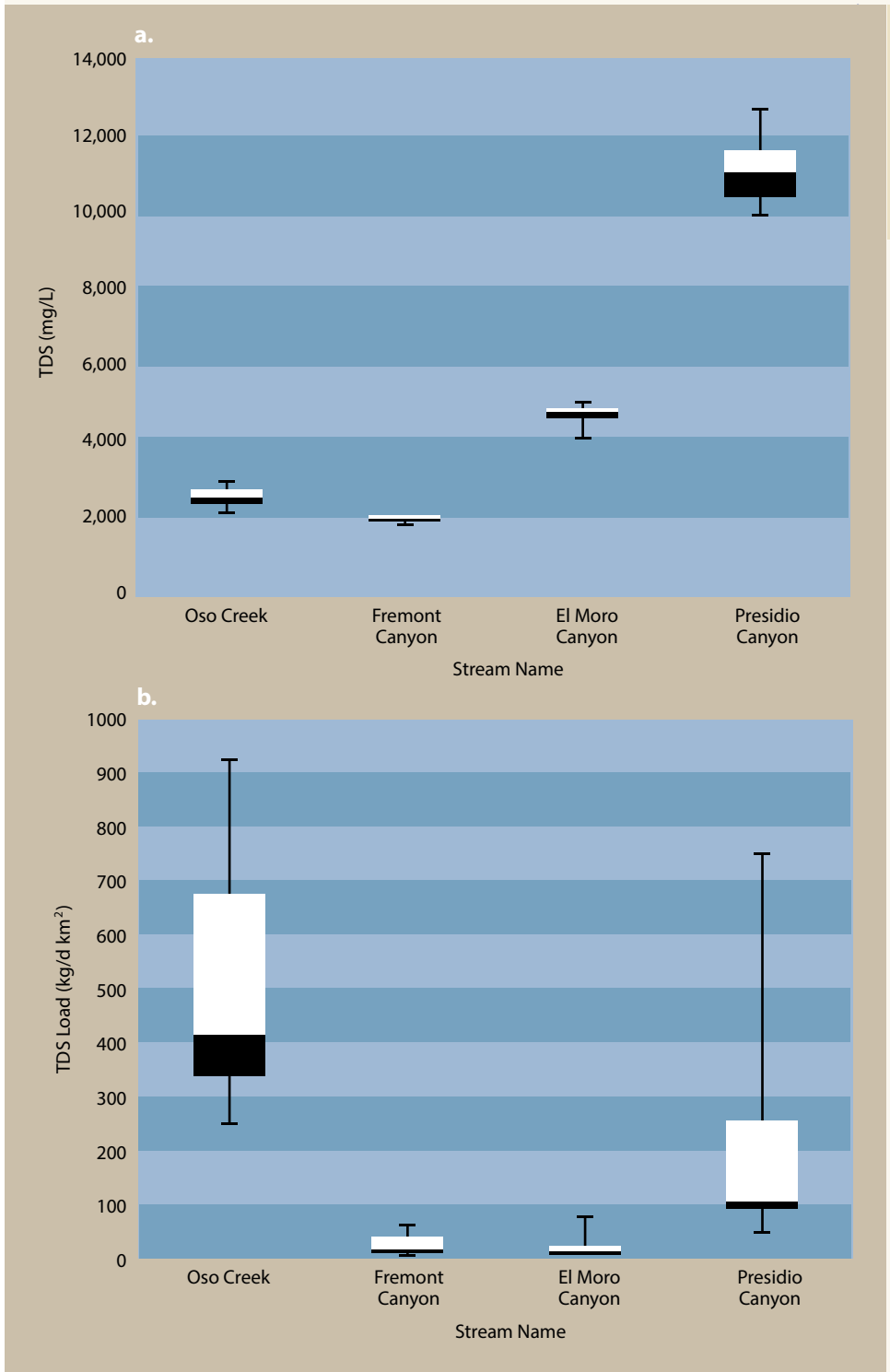

FIGURE 23: Ranges of dissolved solid concentrations *(a) and loads (b) in Oso Creek in comparison to three reference streams of similar geology.*

River watershed are very different from those in the County's low elevation coastal watersheds. These differences impart unique isotopic signatures that can help to uniquely identify the contribution from various sources. This study compared the isotopic signatures of groundwater emerging from weeps and springs in the urbanized areas of south Orange County to those from a range of potential sources including rain, natural groundwater, and urban sources (e.g., potable or recycled water). The stable isotopic signature for shallow groundwater from weeps and springs in urban areas is more similar to that of local rain water and natural reference streams and much less similar to the imported water that is the primary source of potable water in south Orange County.

This study also compared shallow groundwater to the global meteoric water line, which describes the mean relationship between hydrogen and oxygen isotopes in water which has not been exposed to evaporation (Figure 24). The shallow groundwater in urban areas reflects conditions more similar to rainwater and reference streams than to an imported source of water.

These three pieces of information have important implications for the Program's efforts to

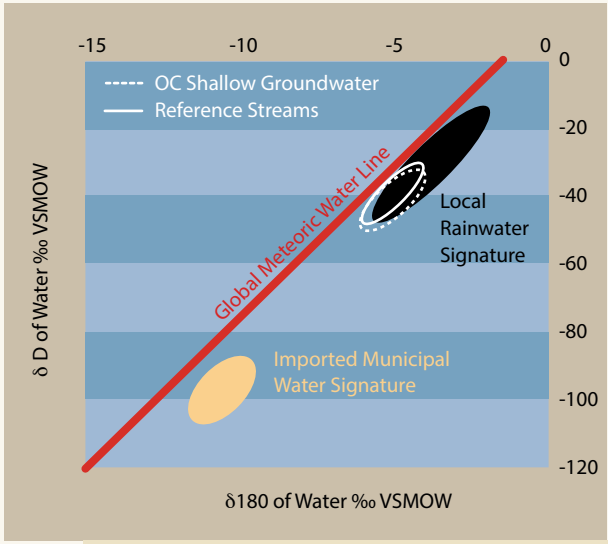

FIGURE 24: Hydrogen and oxygen stable isotope compositions of shallow groundwater *in urban creeks across south Orange County in comparison to rain, water from reference streams in undeveloped watersheds, and imported municipal water from Colorado River and the Sierra Nevada mountains.*

identify sources of dry weather flow, understand the underlying natural conditions in streams in the urbanized portions of south Orange County, and to then determine whether elevated dissolved solids in a particular watershed are an important management priority for the future.

014766

Recommendations

- Conduct a mass balance study, even if at a crude level, to determine the extent to which the MS4 contributes to dissolved solid levels in the creeks.
- Prepare a summary report on historic and contemporary conditions of dissolved solids across south Orange County
- Invest effort into understanding whether dissolved solids are an important stressor on macroinvertebrate communities in the creeks to evaluate the environmental significance of elevated dissolved solid concentrations.
- Continue evaluating changes in dissolved solids at key locations such as Oso Creek in concert with water conservation efforts to track changes in dissolved solids over time.

014767

NUTRIENTS

THE STORY: NUTRIENTS

- Nutrient levels in south Orange County streams and channels are frequently above commonly used thresholds that suggest increased likelihood of nutrient impacts. In contrast, there are much less frequent occurrences of impacts, such as macroalgal overgrowth, due to excessive nutrient levels.
- Nutrient issues are not limited to the urban portion of the County; regional monitoring data show nutrient enrichment and impacts such as increased macroalgal cover and/or lower dissolved oxygen in streams and estuaries in undeveloped regions.
- The major point sources of nutrients have been controlled. Therefore, nonpoint and diffuse sources such as leaching from upland soils and intrusions from shallow groundwater are increasingly important.
- Nutrients can be readily transported in and out of various reservoirs (e.g., sediments, groundwater) and undergo complex biological transformation and cycling. This makes traditional pollutant control strategies less effective for nutrients.
- Improved management strategies may contribute to further progress, particularly in streams and channels, by accounting for site-specific conditions, promoting Low Impact Development, and accounting for broader regional sources.

A Complex Regional Problem

Elevated levels of nutrients have become an increasing national and regional concern in recent years because of their impacts on lakes, streams and estuaries. Nutrient enrichment leads to the overgrowth of algae in streams, (Figure 25) and estuaries (Figure 26) that can reduce dissolved oxygen, sometimes to the point of causing mortality to fish and other aquatic organisms. Dense algal mats can also cause aesthetic (visual and odor) impacts and impair beneficial uses such as boating and swimming. There is also concern that nutrient runoff has contributed to the observed increased incidence and severity of harmful algal blooms (HABs) in California and their toxic effects in the coastal ocean (Figure 27). For example, the Bight '08 Program found that anthropogenic nutrient inputs are co-located with algal bloom hotspots at subregional and seasonal / daily scales and onging regional studies are further investigating this potential connection. Finally, nutrients are involved in geochemical processes that can amplify ocean acidification impacts in estuaries.

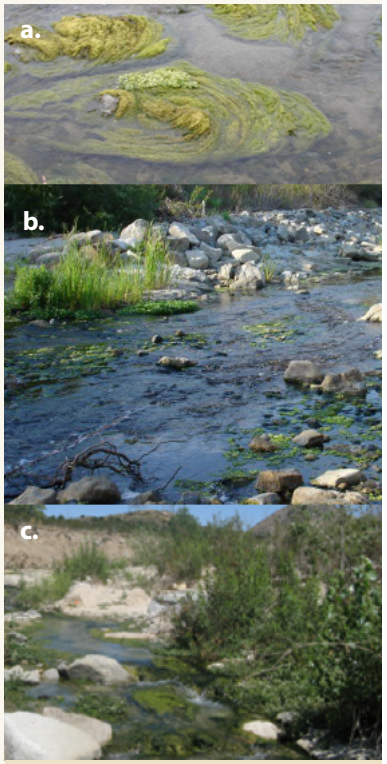

FIGURE 25: Nutrient enrichment causes overgrowth of algae in streams, particularly in warmer, low flow conditions. *a) algal mats in a slow moving stream. Urban and natural watershed areas can supply excessive nutrients, so algal overgrowth and its secondary impacts (e.g., low dissolved oxygen) occur in both urban channels (b) and streams in undeveloped open space (c).*

Unlike most other pollutants, nutrients are involved in complex biological transformation and cycling processes (Figure 28) and storage in a variety of reservoirs. This complicates nutrient assessment and management in two important ways. First, nutrient impacts can persist even after inputs have been reduced or ended because nutrients stored in sediments, groundwater, and plants can move in and out of these reservoirs on a range of time scales. For example, studies conducted by the Southern California Coastal Water Research Project and others have shown that nutrients cycle in and out of the sediments in bays and estuaries on a seasonal basis and Fenn et al. (2010) showed that large portions of several

vegetation types in California (e.g., chaparral, oak woodlands, coastal sage scrub, annual grassland) exceed the "critical load" for nitrogen deposition. Excess loading of nitrogen from aerial deposition can cause shifts in the plant community by, for example, changing conditions to favor invasive grasses and other nutrient sensitive species. Where loadings exceed the amount that can be assimilated by plants, rainfall can more easily wash excess nutrients out of soils and into streams.

The second way in which nutrients differ from most other pollutants is that complex bio- and geochemical dynamics can cause very different effects at different locations or times in response to the same nutrient concentration or load. As a result, there is no consistent functional relationship between the exceedance of a single, numeric regulatory standard for nitrogen or phosphorus and the presence or severity of impacts from nutrient overenrichment.

FIGURE 27: Bloom of the alga Lingulodinium polyhedrum in the coastal ocean off southern California. *This alga can be toxic to marine organisms.*

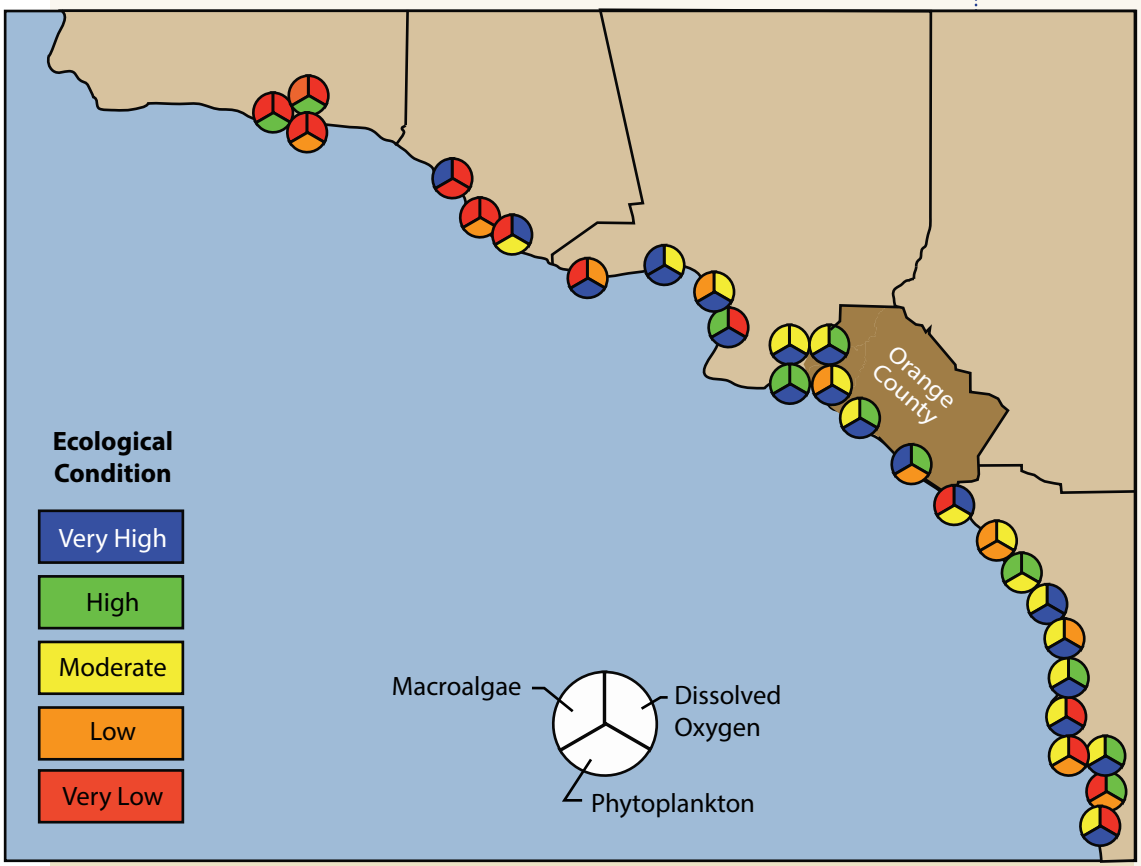

FIGURE 26: Almost all estuarine segments in the Southern California Bight show some degradation *on at least one of the three response indicators of eutrophication: macroalgal cover, phytoplankton, and dissolved oxygen concentration. Adapted from Bight '08 program data.*

Nutrient Patterns in South Orange County

The Program collects three types of data that help document the extent, severity, and changes over time in nutrient issues:

- Concentrations of nutrients and comparison of these data to commonly used thresholds(1mg/l for total Nitrogen; 0.1mg/L for total Phosphorus) that indicate likelihood of impacts
- The percent cover of algae, a measure of nutrient impacts on biological conditions in waterbodies
- Mass loads of nutrients at key mass emission stations

Figure 29a and 29b shows that nutrients (total nitrogen and total phosphorus) commonly exceed thresholds in channels and that a frequency-based

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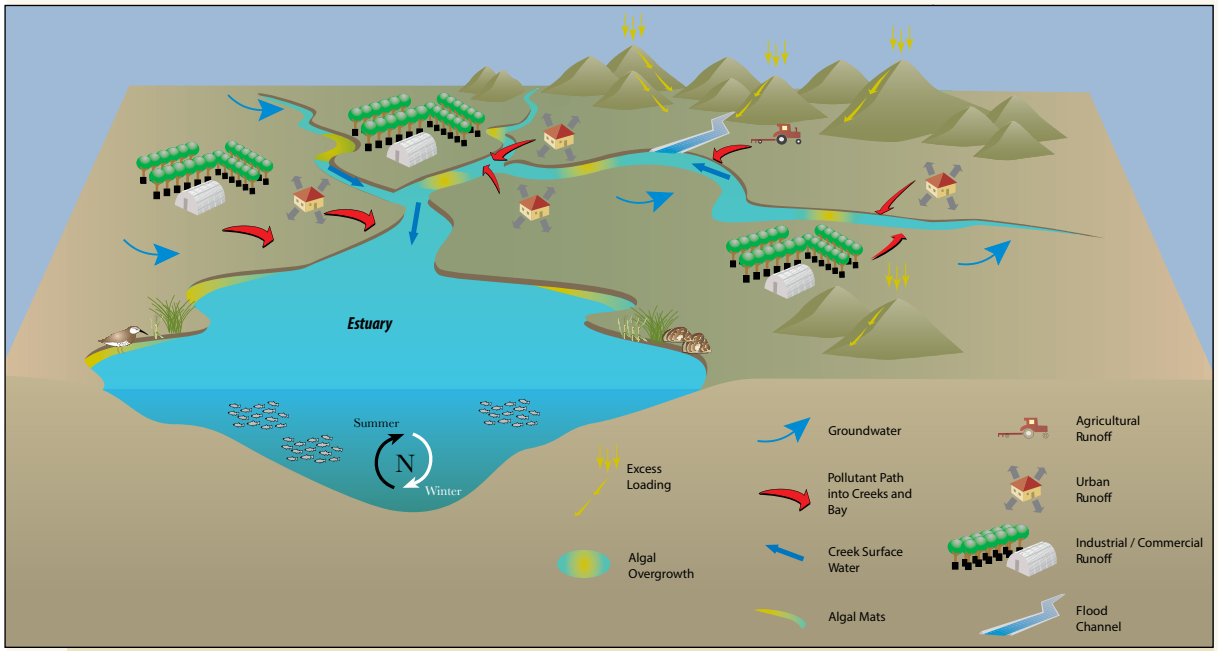

FIGURE 28: A graphical conceptual model of nutrient dynamics in a generalized estuarine system. *Nutrients derive from multiple sources, both natural and anthropogenic, spread across the watershed. Atmospheric deposition can exceed the carrying capacity of upland soils, leading to nutrient loading to streams during storm events. Nutrient loadings are higher in wet weather and they can be stored in and move through sediments, groundwater, and riparian and aquatic plants on different timescales. Because of these reservoirs, nutrients can require a lengthy period to move through the system and their impacts can continue long after inputs have been shut off. Note: Nutrients enter coastal systems through a variety of sources and pathways.*

water quality index widely used in a number of monitoring and assessment programs has improved only slightly since 2000. While conditions are slightly better in dry weather in most years, the index values are consistently low (i.e., poor condition) in all years in both dry and wet weather.

However, this is not strictly an urban problem (see Figures 25c and 30). The Stormwater Monitoring Coalition (SMC) has for the past five years collected data from sites across southern California in urban, agricultural, and open (undeveloped) natural areas. The locations of SMC sites are selected randomly each year so that they can provide a statistically valid picture of regional conditions, which forms a valuable context for interpreting data from north County. Figure 30 shows that targeted monitoring sites in south Orange County channels clustered in the lower end of the distribution (less than about 30% macroalgal cover) for the urban landuse. In other words, about half of the stream miles in southern California in the urban land use had a greater degree of macroalgal cover than did sites in channels in south Orange County. Figure 30 also shows about half of the stream miles in southern California in the open (undeveloped) landuse had up to 20% macroalgal cover. Thus, while macroalgal cover is greater in the urban landscape, this problem also occurs in undeveloped streams in the region.

Figure 29 shows that elevated nutrient levels are pervasive in south County channels but Figure 30 documents that the primary nutrient impact monitored in these channels, percent macroalgal cover, is at the lower end of the cumulative frequency distribution for the urban landuse in the region. Thus, nuisance algal growth is not always evident in streams when nutrients are above thresholds, which reflects the lack of a one-to-one correspondence between nutrient levels and impacts such as macroalgal cover and dissolved oxygen. Recognition of this issue is at the heart of the State Water Resources Control Board's attempt to develop a new approach to setting nutrient thresholds (see Section *New Management Approaches*).

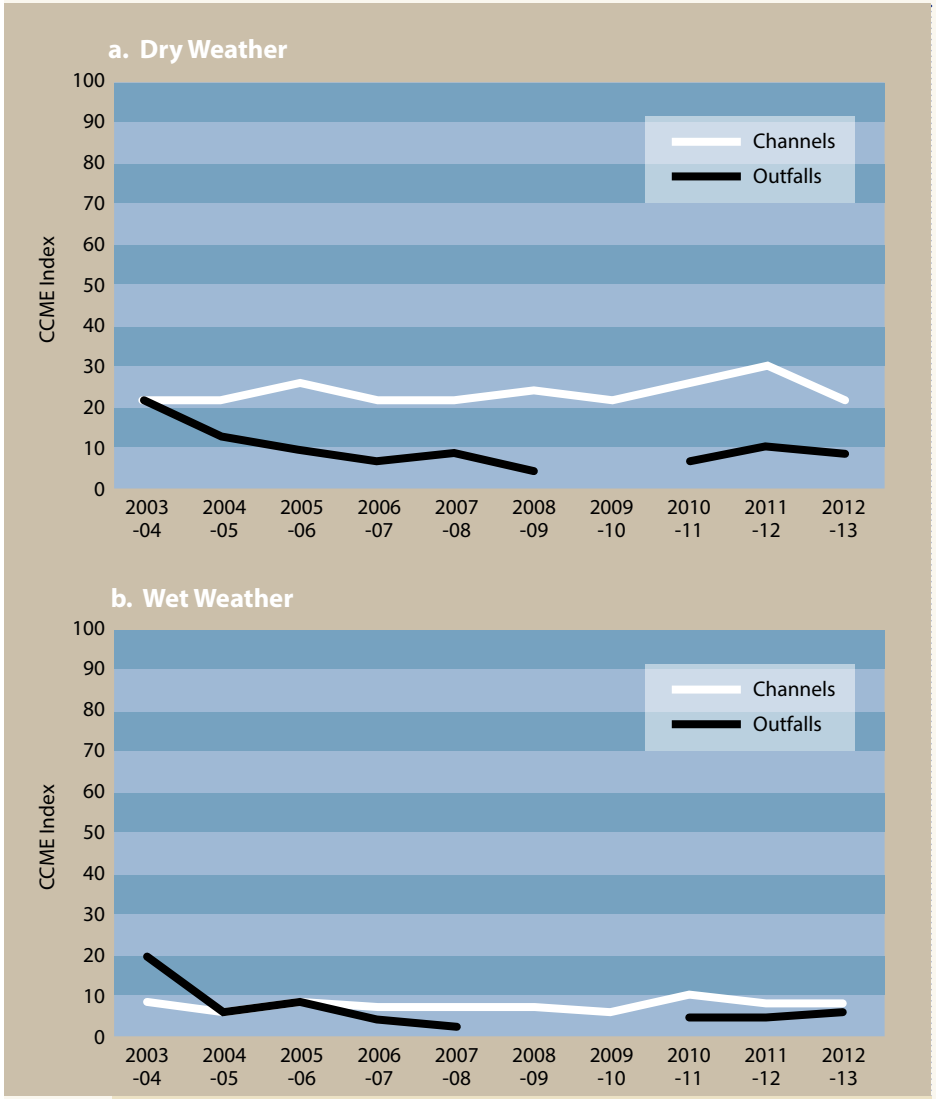

FIGURE 29: An overall index of the extent to which nutrients (total nitrogen and total phosphorus) meet thresholds in channels and outfalls, *in both dry (a) and wet (b) weather is low (which means poor conditions) and has remained low over the monitoring period. The index integrates the number of indicators and the percentage of samples higher than thresholds in each year, and the average magnitude of such excursions (CCME 2001). It provides a score, scaled from 0 - 100, that can readily be tracked over time. Note: Nutrients regularly exceed standards in channels in both wet and dry weather.*

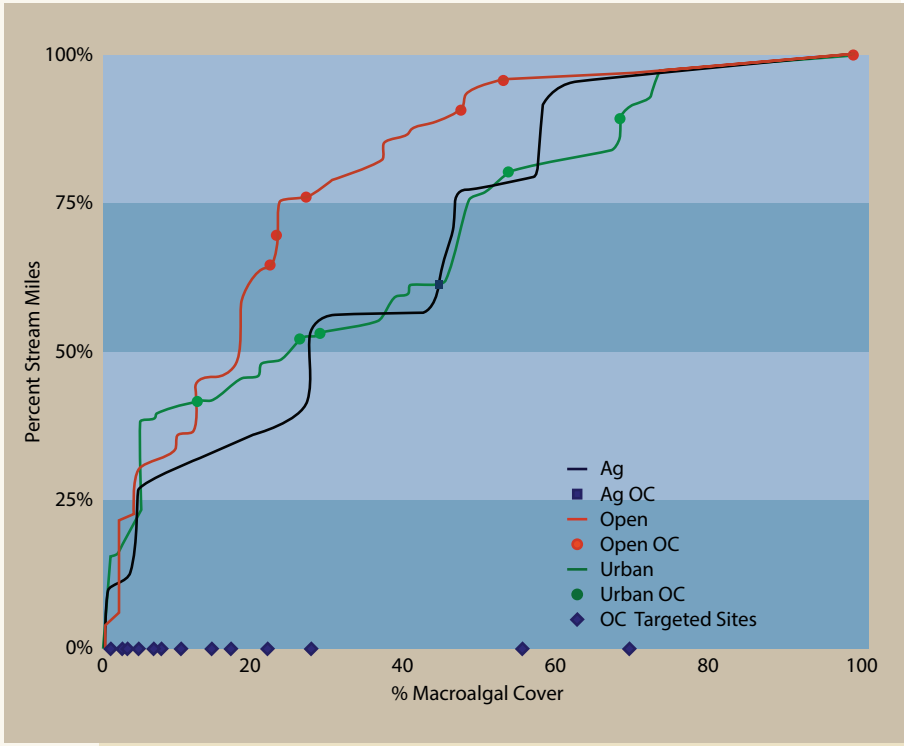

FIGURE 30: The cumulative frequency distribution function of macroalgal cover in the three landuse types *sampled by the Stormwater Monitoring Coalition's (SMC) regional program. Fifty percent of the stream miles in the open landuse had about 20% or less macroalgal cover, while about 50% of the stream miles in the urban landuse had about 30% or less macroalgal cover. The majority of the County's targeted sites (situated along the X axis) had less than 30% macroalgal cover.*

Nutrient Sources

As with many pollutants, the focus on sources of nutrient inputs has gradually shifted from distinct point sources to more widespread and diffuse sources as point sources have been identified, targeted for management action, and removed or reduced. Natural areas such as chaparral, oak woodlands, coastal sage scrub, and

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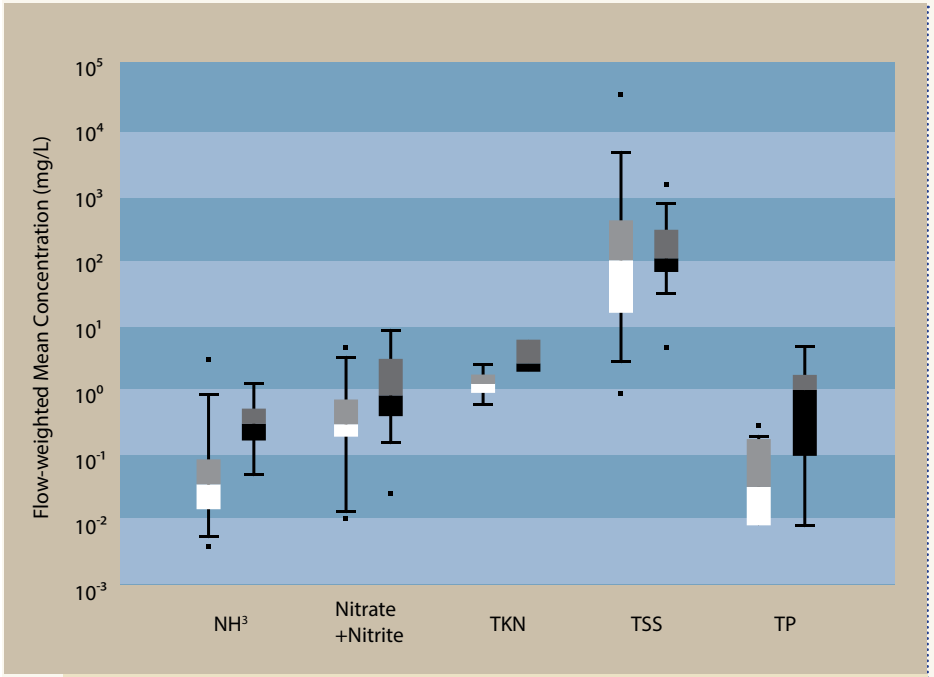

FIGURE 31: Wet weather flow-weighted mean concentrations of several forms of nutrients *at urban (shaded boxes) and undeveloped open space (clear boxes) sites, as measured in the SCCWRP Natural Loadings Study. These data document that natural areas are sources of nutrients at concentrations that are similar in some cases to those in runoff from urban sites. Boxes indicate the 25th and 75th percentiles and error bars indicate the 10th and 89th percentiles. From Stein and Yoon (2007). NH+ refers to ammonia, TKN to total Kjeldahl nitrogen, TSS to total suspended solids, and TP to total phosphorus.*

annual grassland can also be important sources of nutrient loading, particularly in wet weather. These areas have accumulated excess nutrients from aerial deposition (e.g., nitrogen oxides in smog) which can leach from soils during rain events. Figure 31 shows that concentrations of nutrients in wet weather runoff from undeveloped open space are similar to those in runoff from urban sites. As a result, a narrow focus on urban sources of nutrients will miss an important category of inputs.

New Management Approaches

Improved knowledge about the lack of a tight correlation between nutrient levels and nutrient impacts, and about the importance of diffuse sources in open areas and in groundwater, has prompted the development of new management approaches at both the statewide and regional / local levels that more accurately measure and address the risk of impairment. For example, the State Water Resources Control Board's Nutrient Numeric Endpoint (NNE) project is developing methods (Figure 32) to derive a maximum allowable nutrient concentration in a particular stream reach, reservoir, or estuary based on local factors such as temperature, irradiance, and flow. The NNE's goal is to ensure that the key ecological indicators of macroalgae and dissolved oxygen remain within acceptable bounds.

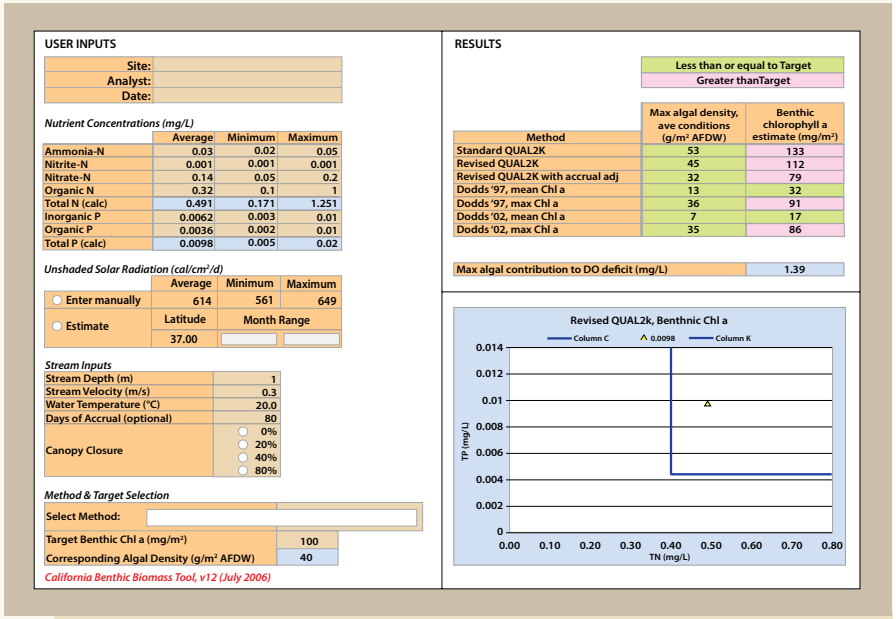

FIGURE 32: The main user interface for the current version of the freshwater Nutrient Numeric Endpoint (NNE) *biomass estimation spreadsheet tool. In this figure, data fields are loaded with example data for illustrative purposes.*

Recommendations

Past progress in identifying and controlling sources of contamination, the availability of a long time series of monitoring data, and the development of new monitoring and assessment tools provide the basis for this review of existing nutrient programs with the goal of improving their utility and efficiency. The following recommendations stem from a data-driven, risk prioritization approach that views monitoring, assessment, research, and management actions as a portfolio of related actions.

- Conduct an assessment of sources and practices that input to the MS4, to assess the significance of each to downstream issues.
- Continue identifying opportunities to reduce and prevent flows in dry weather.
- Pilot a regional mass balance nutrient model, even if elementary, to help prioritize monitoring and management attention; the Newport Bay watershed and SCCWRP coastal ocean nutrient mass balance models provide useful examples.
- Use available time series of data to streamline monitoring to improve its statistical and economic efficiency. Sampling effort could be reduced by identifying stations that essentially mimic each other and/or by reducing the spatial and/or temporal intensity of sampling. Monitoring could shift to a sentinel program with a lower frequency of monitoring intended to ensure conditions do not worsen.

014773

TOXICITY

THE STORY: TOXICITY

- Toxicity in freshwater channels in all conditions (aquatic, sediment, wet and dry weather) occurs at low levels and is sporadic, occurring at different locations at different times and varying unpredictably across test species.
- Aquatic toxicity in dry weather occurs in open (undeveloped) areas at levels equivalent to those in urban areas; suggesting that dry weather toxicity is not driven predominantly by urban pollutants.
- There are no apparent trends in toxicity over time.
- Metals, except for some instances of elevated copper, are at low levels and do not appear to contribute to aquatic toxicity in freshwater.
- The primary source of toxicity appears to be pesticides, with evidence that pyrethroids contribute to sediment toxicity.
- Use of organophosphate pesticides has declined virtually to zero but use of pyrethroid pesticides has increased and exceedances of thresholds for pyrethroid pesticides are high.
- Reported pesticide use in the County has declined from just over 2 million pounds a year in 1998 to just under 1 million pounds in 2011, due primarily to reduced use of indoor fumigants.
- There is a large data gap in our knowledge of retail pesticide sales and use.
- Pesticide use (which is regulated directly at the state and federal levels) presents a moving target for management because of the continued introduction of new products; the most effective management strategies are to continue to reduce dry weather runoff/flows and support education and outreach efforts to reduce pesticide use and runoff.

Low But Puzzling Patterns in Toxicity

Since the publication of Rachel Carson's Silent Spring in 1962, concerns about the potentially destructive impacts of chemicals released into the environment have expanded, supported by an increasingly sophisticated understanding of their impacts and modes of action. Environmental monitoring now provides a range of tools, including sensitive sampling for specific chemicals at very low levels and toxicity tests (Figure 33) that integrate the effects on organisms of multiple chemicals in ambient water and sediments. These tools can indicate the potential for toxic effects before they become major events and provide the means for tracking and managing the distribution and impacts of anthropogenic chemicals.

FIGURE 33: The water flea Ceriodaphnia *which is commonly used as a laboratory test organism in both acute and chronic aquatic toxicity tests*

The Program's monitoring efforts to assess aquatic ecosystem health include a range of toxicity tests (Table 2) including aquatic tests in both dry and wet weather as well as toxicity tests on sediment collected from streams and channels. These tests use a variety of test organisms sensitive to different types of chemicals include and assess both acute (i.e., survival / death) and chronic (i.e., reproduction / growth) endpoints to document a range of potential toxic effects. Table 2 summarizes the results of 2548 separate toxicity tests performed since 2003. The overall prevalence of toxicity is low but is highest in wet weather. Winter storms wash accumulated contaminants off land surfaces and the first flush of storms is known to have higher levels of contamination. In addition, some contaminants, particularly synthetic pyrethroids, which are an increasingly common pesticide, bind to

TEST SPECIES	DRY WEATHER			WET WEATHER			SEDIMENT		
	n	TOXIC	NON-TOXIC	n	TOXIC	NON-TOXIC	n	TOXIC	NON-TOXIC
Americamysis bahia	391	34%	66%	573	45%	55%			
Strongylocentrotus purpuratus	179	5%	95%	293	24%	76%			
Ceriodaphnia dubia	569	20%	80%	51	12%	88%			
Pimephales promelas	64	9%	91%	1	0%	100%			
Hyalella azteca	224	11%	89%	17	53%	47%	9%	0%	100%
OVERALL	**1593**	**18%**	**82%**	**946**	**36%**	**64%**	**9%**	**0%**	**100%**

TABLE 2: Summary of the Program's toxicity testing in south Orange County from 2003 – 2012, an effort that includes 2548 tests on multiple species from a range of times, locations, and conditions. *Note: Toxicity is generally low except for one organism in wet weather that is susceptible to pesticides.*

sediments where, depending on their solubility, they may be a primary cause of aquatic and/or sediment toxicity in urban streams (Holmes et al. 2008). However, the occurrence of toxicity is highly variable, shifting from site to site at times, with high toxicity occurring in only isolated instances; a careful examination of the Program's data shows no consistent spatial patterns or trends over time. The relatively low level of toxicity, combined with the fact it appears sporadically, makes it difficult to control.

The Program also has the benefit of comparing data from its sites in south Orange County to a collection of sites from across southern California sampled by the regional Stormwater Monitoring Coalition (SMC). The locations of SMC sites are selected randomly each year so that they can provide a statistically valid picture of regional background conditions, which forms a valuable context for interpreting data from south Orange County.

A summary of the past five years of SMC aquatic toxicity testing data (Table 3, repeated below for convenience) shows puzzling patterns. Acute toxicity (i.e., mortality) occurs in only a small fraction of stream miles in both open and urban landuses. In contrast, chronic toxicity (i.e., reduced reproduction) is more prevalent in the open landuse than the urban landuse. There is chronic toxicity present in the urban landuse, but in a much smaller portion of stream miles than in undeveloped open space. These results suggest that there are sources of toxicity that are more widely spread throughout the region and may not necessarily be directly associated with urban runoff. Speculation has focused on aerial deposition of airborne contaminants or natural factors such as high conductivity or turbidity. For example, a special study conducted by the Program in the Oso Creek watershed found

	% STREAM MILES	
	OPEN	URBAN
***Ceriodaphnia* survival**		
Toxic	2.1	2.4
Nontoxic	97.9	97.6
***Ceriodaphnia* reproduction**		
Toxic	63.0	37.4
Nontoxic	37.0	62.6

TABLE 3: Summary of aquatic toxicity results from the past five years of Stormwater Monitoring Coalition (SMC) samples from random sites across the southern California region. *Sites were located in both open (i.e., undeveloped) and urban landuse types. The large majority of stream miles were nontoxic for acute toxicity (i.e., survival) in both landuse categories, with an equivalent amount of sporadic background toxicity in both open and urban landuses. The majority of stream miles were toxic for chronic toxicity (i.e., reproduction) in the open landuse, a strikingly different pattern than seen in the urban landuse.*

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that high levels of dissolved solids (see Dissolved Solids section), which can be toxic to aquatic species, derived from natural geologic formations and had increased in recent decades as development patterns caused the groundwater table to rise. However, no region-wide followup studies on the SMC's findings have to date been planned or conducted.

In addition to the generally low toxicity found in inland channels, the Program's toxicity testing in the surfzone up- and downcoast of stormwater discharge points has found virtually no toxicity in the nearshore marine environment.

Metals not a Source of Toxicity

Toxicity is a useful indicator of ecological impacts but toxicity test results by themselves do not identify the specific pollutants or other stressors responsible for toxicity. Instead they can indicate the general category of pollutants, such as metals or organic pesticides, contributing to toxicity. The Program therefore combines three complementary lines of evidence to attempt to isolate the cause(s) of toxicity:

- Correlation between toxicity test results and chemical concentrations in the waters and sediments collected for toxicity tests
- Comparison of these chemical concentrations to regulatory standards in the California Toxics Rule (CTR) which are based on laboratory studies of test organisms' sensitivity to specific chemicals
- More detailed analyses of ambient water and sediments, called Toxicity Identification Evaluations (TIEs), that sequentially remove classes of chemicals to determine whether toxicity drops in concert

Unfortunately, these studies have not succeeded in clearly identifying the sources of toxicity in the County's streams and channels.

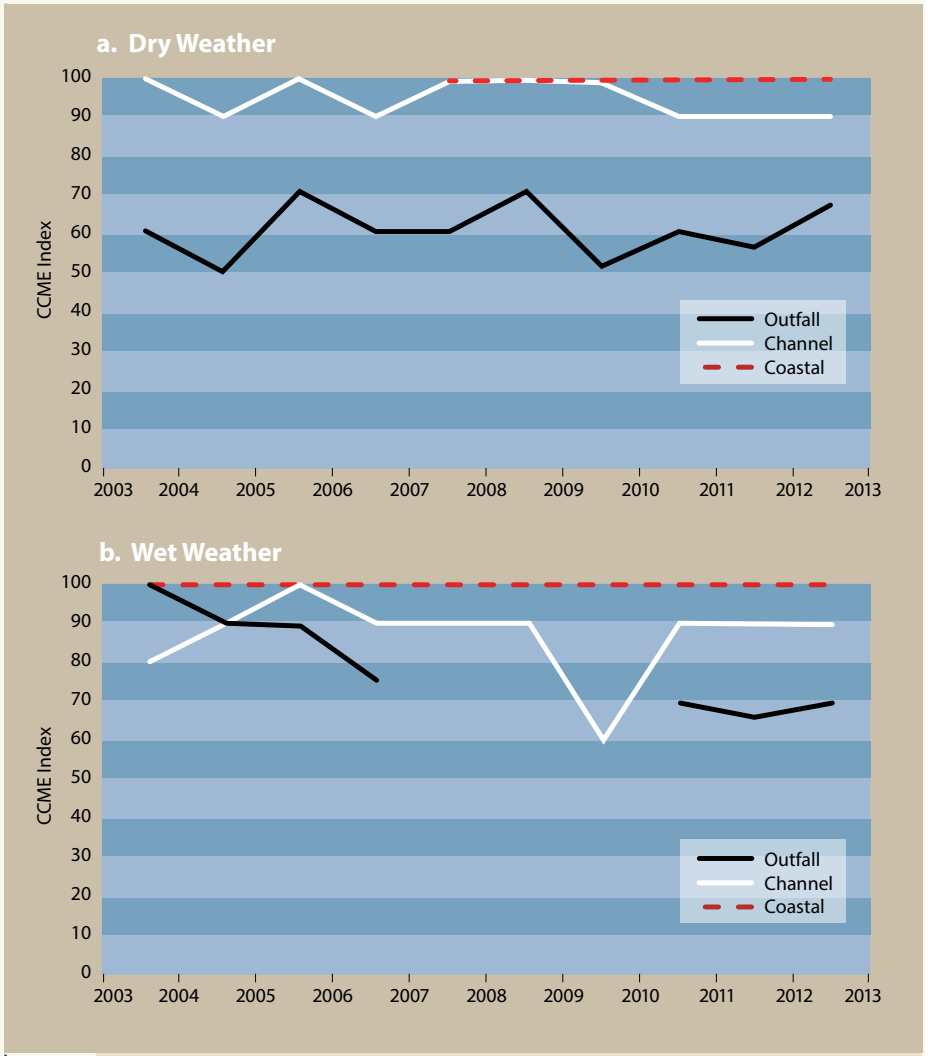

FIGURE 34: An overall index of the extent to which metals meet regulatory standards in channels and embayments is high (meaning few exceedances) and has remained steady since 2003, in all samples for both dry (a) and wet (b) weather. *This index accounts for the number of metals that exceed standards in each year, the percentage of individual samples that exceed standards, and the average magnitude of any such exceedances (CCME 2001). It provides a score, scaled from 0 - 100, that can readily be tracked over time.*

The sporadic nature of the toxicity signal makes it difficult to follow up on, correlations are inconsistent, and TIE methods have technical limitations that make their results less specific than desired. However, these methods have succeeded in ruling out metals as a source of toxicity and suggest that the observed persistent toxicity patterns in the test species evaluated in urban streams and channels is due to organic compounds, likely pesticides.

Exceedances of CTR standards for metals are consistently low in both dry and wet weather (Figure 34) and there is no apparent trend over time. While copper and cadmium account for the large majority of these limited exceedances, neither metal is correlated with the occurrence of toxicity in streams and channels and has not been identified as a cause of freshwater toxicity in TIEs. This conclusion matches findings from the SMC's regional program (see Table 3), a regional study of loadings from natural areas (Figure 35), as well as from watershed monitoring programs in the San Gabriel River and Los Angeles River watersheds.

While copper is a concern in harbors, the 2002 TMDL for Toxic Pollutants in San Diego Creek and Newport Bay estimated that antifouling paint on boat hulls represents nearly 90% of the loading of copper to the Bay. In addition, a Bight '08 study of discharges to Areas of Special Biological Significance (ASBS) (Schiff et al. 2011) found no significant differences between post storm metals concentration at ASBS discharge sites and at reference drainages. There was some evidence for a slight increase in copper at ASBS discharge sites but this may be due to particular coastal sources such as harbors and coastal developments with copper architectural features.

A Localized Source of Copper

A history of persistent exceedances of regulatory thresholds for copper in the Irvine Cove community triggered a detailed, two-year special study to identify and prioritize sources of copper for future source control efforts. This cooperative effort between the County and the City of Laguna Beach included additional sampling of stormwater runoff at multiple locations along with field reconnaissance to identify potential sources of copper. This information helped focus targeted sampling at specific potential sources to rule them in or out and characterize their contribution to copper levels in runoff. The study showed that copper was concentrated in runoff from Irvine Cove below the Pacific Coast Highway, a spatial pattern that ruled out brake pad dust as a major source. Further reconnaissance focused attention on residential architectural copper uses such as roofs, rain gutters, and flashing (Figure 36). Sampling during a storm event of runoff from homes with and without architectural copper features showed that the

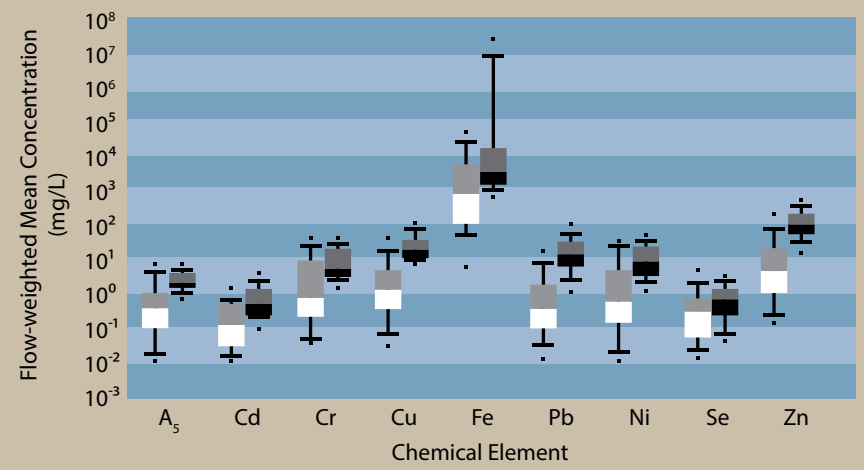

FIGURE 35: Wet weather flow-weighted mean concentrations of metals at urban (shaded boxes) and undeveloped open space (clear boxes) sites, as measured in the regional study of runoff characteristics from natural drainages *(Stein and Yoon 2007). These data document that natural areas are sources of metals, although concentrations in runoff from natural drainages are somewhat lower than those at urban sites. Boxes indicate the 25th and 75th percentiles and error bars indicate the 10th and 89th percentiles. Dots represent extreme values.*

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average level of copper in runoff from homes with copper features was nearly ten times higher than copper in runoff from homes without copper, and nearly six times the regulatory action level. Maximum levels of copper were more than 1000 times higher. This information is useful in ruling out other sources and highlights the difficulty of controlling all sources of contaminants from urbanized watersheds.

FIGURE 36: Aerial photograph of a portion of the Irvine Cove drainage area *identifying various types of structural architectural copper uses.*

Trends in Pesticide Use

While pesticides have been implicated as a cause of both aquatic and sediment toxicity, it has been extremely difficult to confirm their role largely because of technical challenges associated with TIEs (Anderson et al. 2010). There are hundreds of pesticides in current use, neither certified laboratory methods nor toxic thresholds exist for many of these, and legacy pesticides such as DDT are still present in the environment. In addition, the population of pesticides in use changes continually over time in response to new regulatory requirements and increasing knowledge of their targets' physiology (Figure 37). Organochlorine pesticides (e.g., DDT, chlordane) were banned and replaced by organophosphate pesticides (e.g., diazinon and chlorpyrifos), whose use was tightly restricted and were in turn replaced by the synthetic pyrethroids (e.g., permethrin). Most recently, policies have tightened the use of pyrethroids, opening a door for increased use of fipronil. Newer pesticides are often toxic at much lower levels than older pesticides (e.g., pyrethroids exhibit toxic effects at the parts per trillion level), requiring the development of increasingly

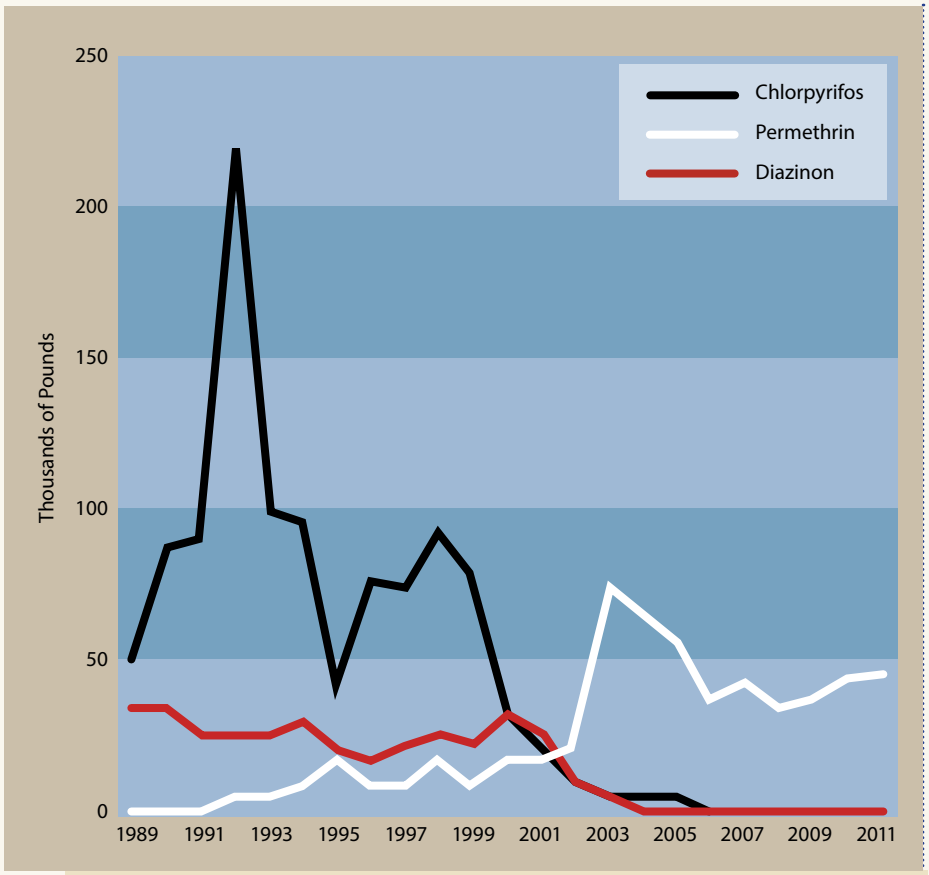

FIGURE 37: Trends in the use of the two most widely used organophosphate pesticides, diazinon and chlorpyrifos, and permethrin, the most widely used of the newer synthetic pyrethroids. *The organophosphates have virtually disappeared from the County after their residential use was banned by the USEPA, in 2001 for chlorpyrifos and 2004 for diazinon. Trends for all three pesticides are significant at the p <0.001 level.*

sensitive methods with lower detection limits. In addition, new pesticides often change the nature of toxicity and the types of organisms affected. This ever-changing cast of characters poses a constant challenge to monitoring methods and the understanding of toxic processes. Figure 37 shows that the use of organophosphate pesticides (chlorpyrifos and diazinon) has declined substantially since the early 1990s, even before their use in residential applications was banned in 2001 and 2004, respectively. Available data from the Program's monitoring efforts shows that, as a result, the exceedance index for organophosphate pesticides has increased (i.e., improved conditions) significantly in dry weather and to a lesser degree in wet weather (Figure 38). The slower rate of improvement in wet weather suggests that there may be reservoirs of these pesticides still present. Because agricultural uses must be reported and the reported use of these pesticides has declined to virtually zero (Figure 37), it is unlikely that still-permitted uses of these two pesticides are the source of the remaining wet weather exceedances. In contrast, the exceedance index for pyrethroid pesticides in wet weather is quite low (i.e., poor conditions), reflecting their increased use.

Despite the challenges of assessing pesticides' impacts in waterbodies, we do know that total reported pesticide use in Orange County has declined dramatically since 1998 (Figure 39). Inspection of detailed annual reports on the California Department of Pesticide Regulation's (CDPR) website shows this is due to declines in the use of glyphosate (i.e., Roundup) and a set of indoor fumigants used, for example, in termite treatment of homes and other structures. Glyphosate is an herbicide that is applied in the environment and there are some concerns about its potential water quality impacts. Indoor fumigants, in contrast, are not applied outdoors, degrade relatively quickly, and vent to the atmosphere. Because it has extended over nearly 15 years, this decline is likely due to a combination of causes, including changes in the real estate market (fumigation is required as a condition of sale), growing concern about health effects of toxic compounds, the greater use of spot applications of pesticides, and the increased availability of alternative non-pesticide treatments for indoor and structural pests.

The CDPR data show that large declines in pesticide use are possible, and provide promise that continued education and improved policy can contribute to environmental improvement.

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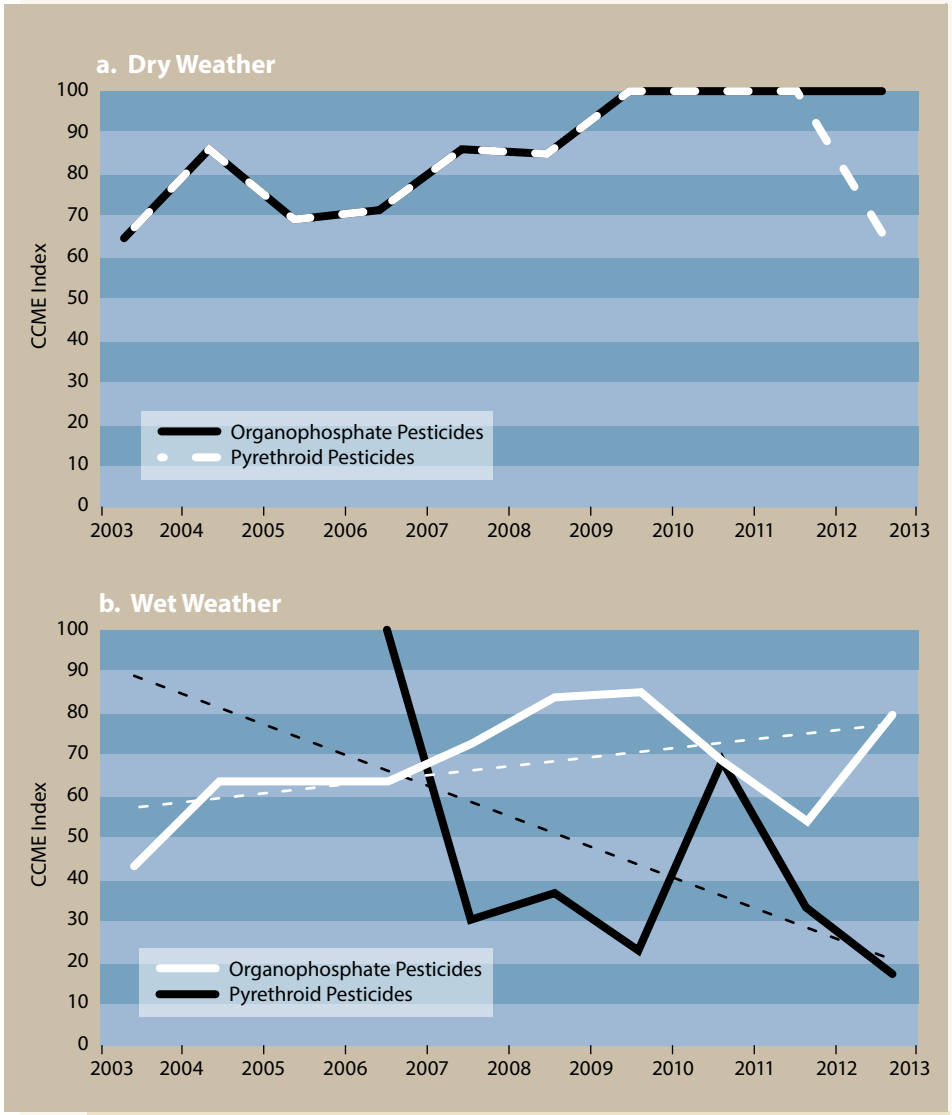

FIGURE 38: Trends over time in the exceedance index for a) organophosphate pesticides in dry weather and b) both organophosphate and pyrethroid pesticides in wet weather. Higher values of the index indicate better conditions. *Organophosphate pesticides reach an index value of 100 (no exceedances) in dry weather (a) and remain there, a trend significant at the p <0.001 level; pyrethroid exceedances appear in 2010 and increase quickly. While there are remaining exceedances for organophosphate pesticides in wet weather (b), trends for these pesticides in both wet and dry weather are improving.*

However, the chemicals that contributed most to the decline shown in Figure 39 are not those (e.g., pyrethroids, fipronil) most often implicated in environmental toxicity. Further examination of the CDPR database would be needed to determine whether the aggregate amount of reported environmentally toxic pesticide applications has also declined in recent years. More importantly, there is a large and significant data gap related to retail purchases at hardware, gardening, and home improvement stores. Sales at these outlets are not reported to the CDPR and methods to reliably capture these data have not yet been developed. Continued efforts to expand the scope of pesticide sales / use reporting and to improve education on proper application and the use of effective alternatives (e.g., botanical oils) could reduce the loading of pesticides to the County's water bodies. For example, CDPR has developed new regulations for pyrethroid application that should substantially reduce pyrethroids in urban runoff.

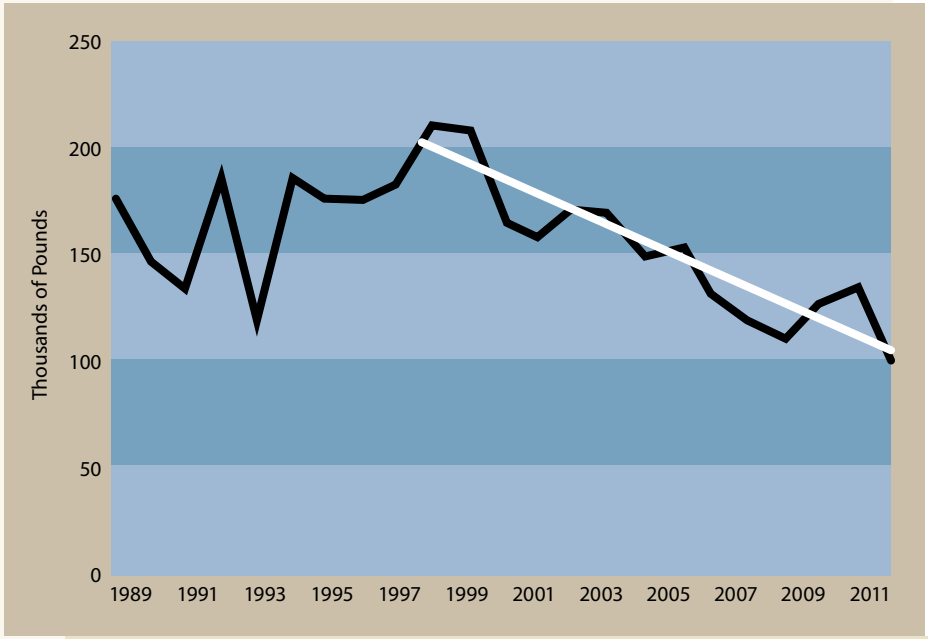

FIGURE 39: Total reported pesticide use in Orange County, drawn from the California Department of Pesticide Regulation's website (www.cdpr. ca.gov). *The amount applied annually has declined by over 50% since 1998 (regression significant at p <0.001). Note: Overall pesticide use appears to be declining.*

Such efforts will be amplified by the continuing focus on water conservation to reduce dry weather runoff (e.g., through Low Impact Development practices) and on reducing overuse to minimize or prevent toxicity in wet weather runoff, which are the two delivery pathways for moving pesticides from the landscape to water bodies.

Recommendations

Past progress in identifying and controlling sources of contamination, the availability of a long time series of monitoring data, and the development of new monitoring and assessment tools provide the basis for this review of existing toxicity monitoring programs with the goal of improving their utility and efficiency. The following recommendations stem from a data-driven, risk prioritization approach that views monitoring, assessment, research, and management actions as a portfolio of related actions.

- Reassess management concerns and priorities about metals impacts in freshwater channels, bays and estuaries, and the nearshore coastal zone.
- To the extent that metals, particularly copper, remain a concern because of potential impacts in bays and harbors, recognize that inputs from antifouling paint, which are not an urban runoff issue, are likely a more important source than watershed input.
- Improve information on the use of pesticides in the County, particularly by the largest applicators
- Work with other interested parties to fill the data gap related to retail sales of pesticides.
- Examine the CDPR database to develop a more thorough picture of trends in reported pesticide use.
- Use this information to expand and focus cooperate outreach efforts about proper pesticide application and the use of alternatives such as botanical oils that are effective, but nonlethal, insect deterrents.
- Use available data to streamline monitoring and improve its statistical and economic efficiency. Consider reducing the current focus on metals monitoring and targeting pesticide monitoring on less expensive representative constituents or surrogates. Consider reducing the frequency of sampling for sediment associated constituents to the Bight Program's sampling frequency.
- Given the overall low level of observed toxicity, consider increasing the use of adaptive responses (e.g., TIEs and other types of causal assessment) in place of intensive routine monitoring.
- Continue taking advantage of opportunities to reduce dry weather runoff to channels.
- Continue the productive relationship the University of California's South Coast Research and Extension Center and take advantage of opportunities for its Director to communicate the stormwater management perspective to CDPR.

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RECONSIDERATION OF MONITORING PROGRAM ELEMENTS

THE STORY: REVISITING PROGRAM DESIGNS

- The designs of two program elements deserve reconsideration because of increased knowledge, improved monitoring and assessment tools, and shifting management priorities.
- Such reconsideration and adaptation is fully in the spirit of the Regional Board's recently adopted Framework for Monitoring and Assessment.
- The Coastal Ambient Program has served its purpose and documented that coastal stormwater discharges are not causing any meaningful exceedances or impacts in the very nearshore coastal zone.
- The Bight Program's regional assessment of the effects of stormwater discharges on protected areas at larger spatial scales is a more effective approach to answering questions about the potential impacts of stormwater discharges.
- Efforts to reduce dry weather flow, in part through water conservation and reclamation efforts have produced substantial declines in the amount of dry weather stormwater discharge.
- These reductions have resulted in concomitant reductions in the loads of a range of problematic constituents and represent an effective means of controlling pollution from urban runoff.

Coastal Ambient Monitoring Has Served Its Purpose

The potential impacts of coastal stormwater discharges on the marine ecosystem have long been a concern because of the pollutants they carry to the ocean. Impacts could occur at the point of initial discharge where they are most concentrated and/or at larger distances as discharge plumes mix into the coastal ocean.

The Program's Coastal Ambient monitoring effort samples directly in front of and at a short distance up- and downcoast of key discharge points. It is designed to determine whether stormwater pollutants are reaching the surfzone in concentrations that exceed water quality objectives and are causing measurable toxicity. However, the prioritization analysis shows that this is not the case, with only minor exceedances and virtually no toxicity detected. The length of time this monitoring has continued and its consistent results in both wet and dry years suggests these findings are robust and reliable.

While the Coastal Ambient monitoring has confirmed that near-field effects in the immediate vicinity of coastal discharges are not occurring (Schiff et al. 2011), questions about the possibility of farfield effects, particularly on protected areas (ASBSs and MPAs), have not yet been resolved. This requires a more substantial effort and is being addressed by a Bight Program study that integrated several types of information on a regional scale. The Bight study included three main parts:

- A pollution index of the likely intensity of stormwater pollution at specific protected areas
- A fishing pressure index of the effects of commercial and recreational fishing on key species
- A new assessment tool for measuring the condition of biological communities on rocky reefs

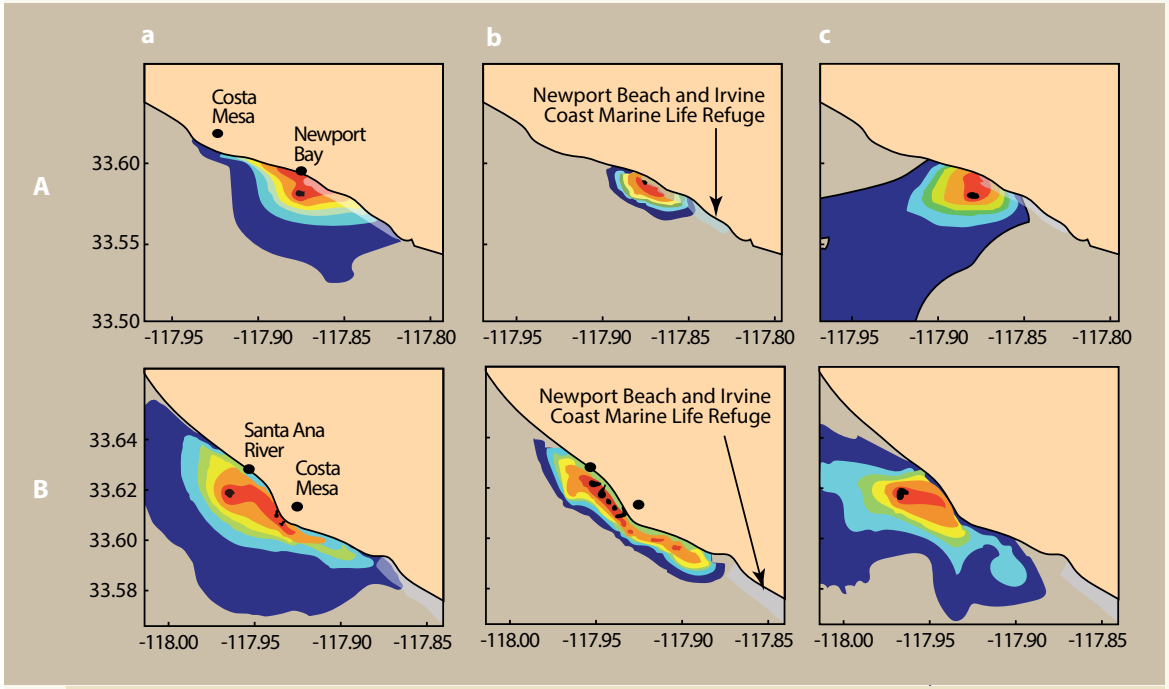

FIGURE 40: Illustration of the use of coastal discharge flow and coastal current data to produce probability exposure maps for a series of discharges and nearby protected areas in southern California. *The figure is organized by rows for (A) Newport Bay, and (B) Santa Ana River. Additionally, each column represents a different temporal model run including (a) annual, (b) the February 22, 2008 storm event, and (c) the December 15, 2008 storm event. Local ASBS are also displayed in all figures and defined in column (b). The X-axis is longitude and the Y-axis latitude. Colors represent probability of plume exposure as indicated at the bottom of the the figure. These probability exposure maps are then combined with estimates of pollutant loads for each discharge to derive a pollutant index for each protected area. From Figure 3, Rogowski et al. (2014).*

The pollution index was based on a plume dispersion model (Figure 40) (Rogowski et al. 2014) that estimated the probability that stormwater discharge plumes would overlap with specific protected areas. This was combined with a measure of pollutant loads to develop an estimated index of pollution intensity. The regional assessment will then compare the relative effects of fishing pressure (Figure 41) and pollution on the status of biological communities.

The integrated regional approach includes a more much more powerful and relevant set of questions and methods to address the potential impacts of coastal stormwater discharges on marine ecosystems. The Program's future efforts to assess the potential impacts of coastal discharges should therefore focus on contributing to this regional effort rather than continuing to monitor at extremely local scales in the vicinity of each discharge point.

Runoff Reduction, a Powerful All-Around Tool

Evidence from a number of the Program's monitoring efforts documents the value of water conservation and reduced urban runoff (i.e., discharge flow into streams and channels) in reducing pollutant inputs and their impacts. Water conservation and related efforts to reduce urban runoff therefore represent a potentially powerful all-around tool for addressing impacts of urban runoff. While water conservation efforts motivated by state and local policies provide the underlying impetus, pollutant control could add another important rationale for pursuing such policies as part of a larger, coordinated strategy. The effectiveness of such programs is dramatically illustrated by the declining trend of dry weather discharge flow to channels and streams from urban outfall (Figure 42).

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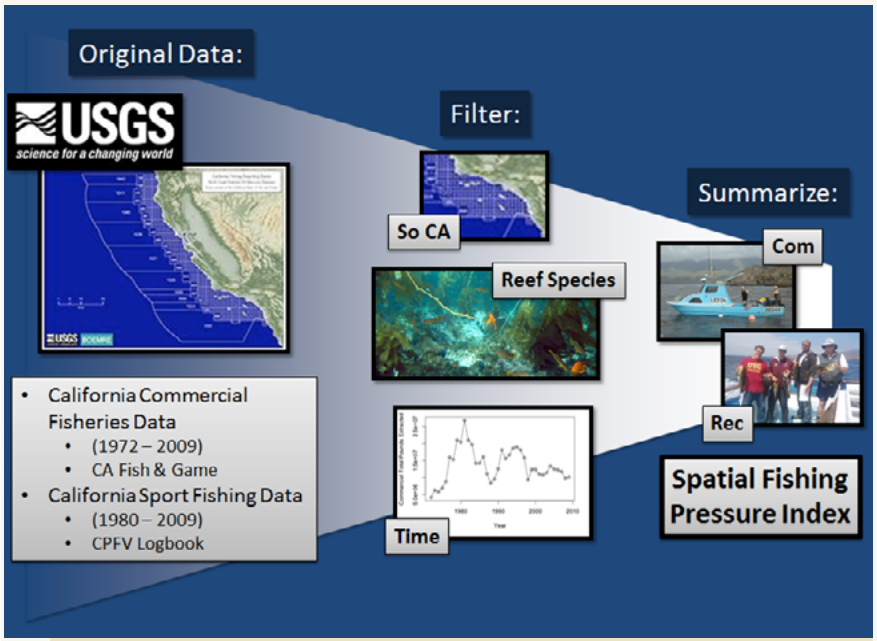

FIGURE 41: Schematic of the data integration and synthesis steps involved in producing an index of fishing pressure on protected areas in southern California. *This project illustrates the need to integrate data from multiple sources into more complex assessments in order to answer questions about the relative impacts of stormwater discharges. From Update on Fishing Pressure Index presentation by SCCWRP, Ocean Science Trust, and Occidental College Vantuna Research Group, March 2, 2014.*

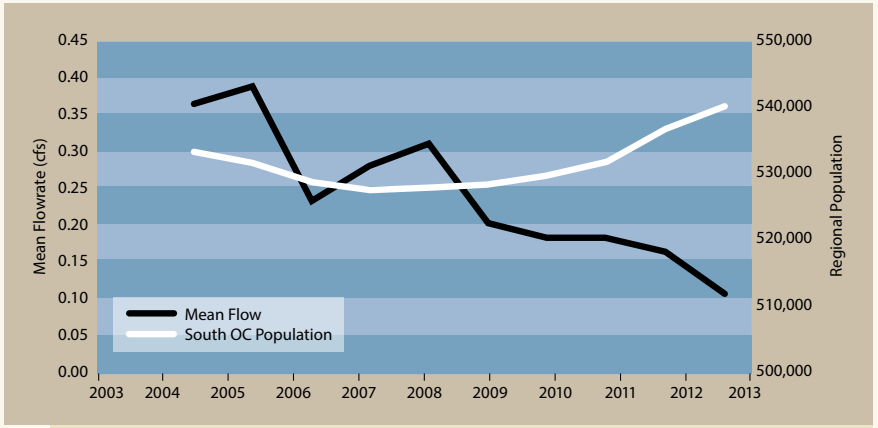

FIGURE 42: Discharge of dry weather flow to channels and creeks from urban outfalls has declined dramatically despite an increase in regional population. *The decline spans both wet and dry years and is therefore not simply a result of drought conditions.*

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Figure 33, Accessed online; no credit available

Figure 36, from the Program's Irvine Cove Source Investigation report, September 2012

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
City of Mission Viejo
Council Chambers
200 Civic Center
Mission Viejo, California

MINUTES OF MEETING
OCTOBER 8, 2014

At 9:00 a.m., Chairman Abarbanel called to order the meeting of the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) at the City of Mission Viejo City Council Chambers, 200 Civic Center, Mission Viejo, California.

Item 1 – Roll Call and Introductions

Board Members present: Henry Abarbanel, Eric Anderson, Tomás Morales, Gary Strawn, and Stefanie Warren. Sharon Kalemkiarian was absent.

Staff Present: David Gibson, James Smith, Chris Blank, Jeremy Haas, Eric Becker, Laurie Walsh, Christina Arias, Wayne Chiu, Julie Chan, Brandi Outwin-Beals, Alex Smith.

Others present on behalf of the San Diego Water Board: State Water Resources Control Board –Catherine Hagan. California Court Reporting – Jaqueline Denlinger.

Public Attendance: Roger Butow, Clean Water Now; Todd Glen, Voices of Monarch Beach (VOMB); Patricia McCarroll, VOMB; Ted Von Bitner, AMEC Consulting; Heather Stroud, City of San Diego; Edward Modiano, Chatham Site PRP Group; Michael McSweeney, BIA San Diego; David Garcia, Riverside County Flood & Water Control District; Todd Snyder, County of San Diego; Jon Van Rhyn, County of San Diego; Mikkail Ogawa, City of Del Mar; Wayne Rosenbaum, Opper & Varco; Josette Hatter, VOMB; Sam Allevato, City of San Juan Capistrano; Eric Lomeli, Riverside County Flood Control; J.C. Herrera, City of Laguna Niguel; James O'Day, County of San Diego; Rich Schlesinger, City of Mission Viejo; Tracy Ingebrigtsen, City of Laguna Beach; Fred Jacobsen, SDG&E; Ruth Kolb, City of San Diego; Robert Stone, Quantum Ozone, Inc.; Sarah Montrowl, Quantum Ozone, Inc.; Lisa Kay, Alta Environmental; Bryn Evans, Dudek; Moy Yahyk, Cities of Alisa Viejo/Laguna Woods; Joe Ames, City of Mission Viejo; Mark Corey, CICW2/BIA; Paul Hartman, Larry Walker Associates; Keith Van Der Maaten, City of San Juan Capistrano; Ken Floom, County of Orange, OCWR; Nancy Palmer, City of Laguna Niguel; Carlos Castellanos, City of Rancho Santa Margarita; Deborah Carson, City of Mission Viejo; Rhonda Reardon, City of Mission Viejo; Jenna Voss, County of Orange; Jennifer Shook, County of Orange; Julie Riggo, County of Orange; Lisa Zawahi, Dana Point; W. Gaters, SDG&E; Dave Renfrew, Alta Environmental; Peter Meier, City of Lake Forest; Ziad Mazboudi, City of San Juan Capistrano; Patric DeBoer, Omega Engineering; Mary Vondrak, City of San Clemente; James Fortuna, County of Orange; Colin Kelly, Orange County Coastkeeper; Mike

Beanan, SLCA; Humza Javed, City of Laguna Hills; Cindy Lin, USEPA; Ryan Baron, County of Orange; Devin Slaven, City of Lake Forest; Rececca Andrews, Best, Best & Krieger; Brad Fowler, City of Dana Point; Grant Sharp, County of Orange; Chris Crompton, County of Orange; Wayne Brown, South Orange County Economic Coalition; Mary Anne Skorpanich, Orange County Public Works; Richard Boon, County of Orange;

Item 2 – Public Forum

Sam Allevato, Mayor of the City of San Juan Capistrano, welcomed the Board to Orange County.

Wayne Brown, South Orange County Economic Coalition, spoke about the importance of building an infrastructure that meets the highest water quality standards while also accommodating the needs of a growing population.

Rhonda Reardon, Council Member of Mission Viejo, welcomed the Board to Mission Viejo.

Edward Modiano, Project Coordinator of the Chatham Site for the PRP Group, provided an update on the Chatham Brothers Barrel Yard plume in Escondido. Ms. Warren recused herself and stepped away from the dais during this time.

Ziad Mazboudi, City of San Juan Capistrano, stated that he was leaving the City of San Juan Capistrano to take another position in the Middle East. He praised the Regional Water Board staff for their dedication, hard work, and willingness to work with stakeholders to improve water quality.

Mary Anne Skorpanich, Deputy Director, Orange County Public Works, presented an award to Mr. Mazboudi for his work in Orange County.

Michael Beanan, Laguna Beach Wastewater Task Force, provided an update on the task force's activities toward the use of wastewater, and he spoke about the importance of mapping of coastal receiving waters and urban runoff plumes.

The following people addressed the Board regarding proposed development of the South Shores Church site in Dana Point:

- Todd Glen, VOMB
- Josette Hatter, VOMB
- Patricia McCarroll, VOMB
- Roger Butow, Clean Water Now
- Brad Fowler, Director of Public Works, City of Dana Point

Item 3 – Minutes of Board Meeting:

Dr. Abarbanel moved to adopt the minutes for August 18, September 10, and September 24. Aside from the abstentions noted below, the minutes were approved by unanimous vote.

- August 18, 2014: Mr. Anderson abstained, as he did not attend the meeting.
- September 10, 2014: There were no abstentions.
- September 24, 2014: Mr. Morales and Mr. Strawn abstained, as they did not attend the meeting.

Item 4 – Chairman's, Board Members', State Water Board Liaison's, and Executive Officer's Reports. These items are for Board discussion only. No public testimony will be allowed, and the Board will take no formal action.

Ms. Fran Spivy-Weber, the State Board liaison, was unable to attend the meeting.

The Board Members provided summaries of the Water Quality Coordinating Committee (WQCC) meeting that took place in Sacramento on October 1-3. Mr. Strawn suggested sending a thank-you note to Ms. Fran Spivy-Weber for her efforts in organizing the WQCC.

Mr. Gibson also provided a summary of the WQCC. He also thanked staff for their attendance at a public meeting on September 30 regarding the Chatham Brothers site and for the multi-page summary of the history of the site in the Executive Officer's Report. In addition, Mr. Gibson summarized the visit of EPA Administrator Gina McCarthy at Border Field State Park on October 7.

Item 5 – Future Agenda Items: Board Members may discuss items for possible inclusion on future agendas. No action will be taken. (*David Gibson*)

Ms. Warren requested that the Board have an information item regarding California water law and water rights at a future Board meeting.

Mr. Gibson relayed a request from Board Member Kalemkiarian for information items from some of the community groups with which she and other Board members have been conducting outreach meetings.

Dr. Abarbanel asked that Rob Egel, Chief of the State Board's Legislative Affairs Office, be invited to join the Board at the June meeting to discuss legislative priorities.

Consent Calendar: Item 6 is considered a non-controversial issue. (NOTE: If there is public interest or discussion regarding any consent calendar item or a request for a public hearing, then the item(s) will be removed from the consent calendar and considered after all other agenda items have been completed.)

Item 6 – Rescission of Cease and Desist Order: An Order rescinding Cease and Desist Order No. 96-52 for the International Boundary and Water Commission, U.S. Section, South Bay International Wastewater Treatment Plant, South Bay Ocean Outfall, San Diego County (Tentative Order No. R9-2014-0081). (*Joann Lim*)

Mr. Anderson moved to approve the Consent Calendar, and Mr. Strawn seconded the motion. A roll call vote was taken, and all Board members present voted "aye." The motion passed.

Remainder of the Agenda (Non-Consent Items):

Item 7 – Public Workshop: The San Diego Water Board will hold a public workshop to receive and discuss information on proposed amendments to the Regional NPDES Permit for Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region (Order No. R9-2013-0001 or Regional MS4 Permit), including but not limited to the incorporation of the County of Orange, several Incorporated Cities of Orange County, and the Orange County Flood Control District as Copermittees (Tentative Order No. R9-2015-0001). The San Diego Water Board will not take any action on this item at the workshop. (*Laurie Walsh and Christina Arias*)

Mr. Gibson introduced the item.

The Chairman called a recess at 10:03 a.m. and reconvened at 10:11 a.m.

Laurie Walsh and Christina Arias gave the staff presentation regarding the Tentative Order and answered Board members' questions.

The following stakeholders spoke about the Tentative Order and responded to Board member questions:

- Dr. Cindy Lin, USEPA
- Richard Boon, County of Orange
- Mary Anne Skorpanich, Deputy Director, Orange County Public Works
- David Garcia, Riverside County Copermittees
- Ruth Kolb, City of San Diego, Storm Water
- Heather Stroud, Deputy City Attorney, City of San Diego
- Nancy Palmer, City of Laguna Niguel
- Michael Beanan, South Laguna Civic Association
- Colin Kelly, Staff Attorney, Orange County Coastkeeper
- Roger Butow, Clean Water Now
- Jon Van Rhyn, Water Quality Property Manager, County of San Diego

- Wayne Rosenbaum, BIA San Diego
- Michael McSweeney, Senior Public Policy Advisor, BIA San Diego
- Brendan Hesty

The Chairman called a recess at 12:03 p.m. and reconvened the meeting at 12:07 p.m.

Discussion of Item 7 continued.

The Chairman then adjourned for lunch and Closed Session at 1:10 p.m.

Item 8 – *Closed Session* - Discussion of Ongoing Litigation [Authorized under Government Code Section 11126, subd. (e)]. The San Diego Water Board may meet in closed session to discuss ongoing litigation for the following cases:

Civil Actions (Judicial and Administrative, other than Petitions for Review filed with the State Water Board)

a. *In re: Test Claim on California Regional Water Quality Control Board, San Diego Region, Order No. R9-2007-001, (NPDES No. CAS0108758) Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego County, the San Diego Unified Port District, and the San Diego County Regional Airport Authority adopted on January 24, 2007. Test Claim filed by San Diego County, et al., with Commission on State Mandates, No. 07-TC-09* (filed June 2008). *(Catherine George Hagan)*

b. *State of California Department of Finance, State Water Resources Control Board, And California Regional Water Quality Control Board, San Diego Region v. Commission on State Mandates.* Petition for Writ of Administrative Mandamus. Sacramento County Superior Court, Case No. 34-2010-80000604 (filed July 2010). *(Catherine George Hagan)*

c. *In re: Citizens Development Corporation, Debtor and Debtor in Possession*, Case No. 10-15142-LT11. United States Bankruptcy Court, Southern District of California. (San Diego Water Board Claim in Bankruptcy) (filed June 2011). (*Catherine George Hagan*)

d. *Test Claim on California Regional Water Quality Control Board, San Diego Region, Order No. R9-2009-0002, (NPDES No. CAS0108740) Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of Orange, the Incorporated Cities of the County of Orange, and the Orange County Flood Control District adopted on December 16, 2009. Test Claim filed by County of Orange, et al., with Commission on State Mandates, No. 10-TC-11* (filed June 2011). *(Catherine George Hagan)*

e. *Test Claim on California Regional Water Quality Control Board, San Diego Region, Order No. R9-2010-0016 (NPDES No. CAS0108766) adopted November 10, 2010, County of Riverside, Riverside County Flood Control and Water Conservation District, and the Cities of Murrieta, Temecula and Wildomar, Co-Claimants, filed with Commission on State Mandates, No. 11-TC-03 (filed November 2011).* (*Catherine George Hagan*)

f. *City of San Diego v. California Regional Water Quality Control Board, San Diego Division, SFPP, L.P., A Delaware Limited Partnership, and Kinder Morgan Energy Partners, L.P., A Delaware Limited Partnership, Real Parties-in-Interest.* Petition for Writ of Administrative Mandamus. San Diego County Superior Court, Case No. 37-2013-00047614-CU-WM-CTL (filed May 2013). (*Ben Neill*)

Petitions for Review Pending Before State Water Resources Control Board[1]

g. Petitions of the National Fireworks Association and Fireworks & Stage FX America Inc., Coastal Environmental Rights Foundation, and San Diego Coastkeeper (General National Pollutant Discharge Elimination System (NPDES) Permit Order No. R9-2011-0022 (NPDES No. CAG999002) for Residual Firework Pollutant Waste Discharges to Waters of the United States in the San Diego Region from the Public Display of Fireworks), SWRCB/OCC Files A-2164(a)-(c), filed June and July 2011. *(Michelle Mata)*

h. Petition of Citizens Development Corporation (Water Code Section 13267 Investigative Order No. R9-2011-0033 dated September 14, 2011, Requiring Submission of Technical Reports Pertaining to Investigation of Lake San Marcos Nutrient Impairment, San Diego County), SWRCB/OCC File A-2185, filed October 2011. (*Laurie Walsh*)

i. Petition of City of San Diego (Time Schedule Order No. R9-2011-0052 dated September 14, 2011, for the Kinder Morgan Energy Partners, Mission Valley Terminal Remediation Dewatering Discharge to Murphy Canyon Creek, San Diego County), SWRCB/OCC File A-2186, filed October 2011. (*Ben Neill*)

j. Petition of Jack Eitzen (Administrative Assessment of Civil Liability Order Nos. R9-2011-0048 and R9-2011-0049 against Jack Eitzen for 38175 and 38155 Via Vista Grande, Murrieta, Riverside County), issued October 12, 2011), SWRCB/OCC File A-2193, filed November 2011. (*Rebecca Stewart*)

k. Petitions for Review of San Diego Bay Shipyard Sediment Cleanup and Abatement Order No. R9-2012-0024 for National Steel and Shipbuilding Company (NASSCO), Campbell Industries, City of San Diego, San Diego

[1] Petitions for review of San Diego Water Board actions or inactions filed with the State Water Board being held in abeyance by the State Water Board are generally not listed in the agenda. The titles of these matters are available at the San Diego Water Board. Please contact Catherine George Hagan at catherine.hagan@waterboards.ca.gov or 619-521-3012 for more information.

Gas & Electric (SDG&E) and San Diego Unified Port District (Port District) issued March 14, 2012. Petitions for Review and Requests for Stay filed by NASSCO, and City of San Diego. Petitions for Review w/o requests for stay filed by SDG&E, Star & Crescent Boat Company and Port District. SWRCB/OCC File A-2205(a), (c), (d), and (e), filed April 2012. (*Frank Melbourn*)

l. Petition of NASSCO for Review of Resolution No. R9-2012-0025 (Certifying Final Environmental Impact Report for San Diego Bay Shipyard Sediment Cleanup and Abatement Order No. R9-2012-0024), adopted March 14, 2012, SWRCB/OCC File A-2205(a), filed April 2012. (*Frank Melbourn*)

m. Petition of South Laguna Civic Association for Review of Order No. R9-2012-0013, NPDES No. CA0107611, NPDES Permit Reissuance: South Orange County Waste Authority, Discharges to the Pacific Ocean via Aliso Creek Ocean Outfall, adopted April 11, 2012, SWRCB/OCC File A-2211, filed May 2012. (*Joann Lim*)

n. Petition of City of San Diego for Review of Resolution No. R9-2012-0045, re Authorizing Executive Officer to Increase Daily Average Discharge Flow Rate Limitation under Order No. R9-2008-0002 [NPDES No. CAG919002] for the Kinder Morgan Energy Partner's Mission Valley Terminal Remediation Dewatering Discharge to Murphy Canyon Creek, June 13, 2012, SWRCB/OCC File A-2222, filed July 2012. (*Ben Neill*)

o. Petitions for Review of Regional Municipal Separate Storm Sewer System Order No. R9-2013-0001 (NPDES No. CAS0109266), adopted May 8, 2013, filed by (1) San Diego County Regional Airport Authority (stay requested), (2) City of Lake Forest (abeyance request), (3) City of Aliso Viejo (abeyance request), (4) City of Laguna Hills (abeyance request), (5) City of Rancho Santa Margarita (abeyance request), (6) City of Chula Vista, (7) City of National City, (8) Riverside County Flood Control and Water Conservation District, the County of Riverside, and the Cities of Murrieta, Temecula, and Wildomar (abeyance request), (9) City of Dana Point (abeyance request), (10) City of Mission Viejo (abeyance request), (11) City of San Clemente (abeyance request), (12) County of Orange and Orange County Flood Control District (abeyance request), (13) San Diego Unified Port District, (14) City of San Diego (abeyance request), (15) County of San Diego, and (16) City of Laguna Niguel. SWRCB/OCC File A-2254(a)-(p), filed June 2013. (*Wayne Chiu*)

p. Petition of Foothill/Eastern Transportation Corridor Agency for Review of Action and Failure to Act, in Connection with Waste Discharge Requirements (Tentative Order No. R9-2013-0007) for the Tesoro Extension Project, Orange County, June 19, 2013, SWRCB/OCC File A-2259, filed July 2013. (*Darren Bradford*)

q. Petition of San Diego United Port District, Waste Discharge Requirements Order No. R9-2013-0093 for San Diego Shipyard Sediment Remediation Project, San Diego Bay, San Diego County, July 10, 2013, SWRCB/OCC File A-2263, filed August 2013 (stay requested). (*Alan Monji*)

r. Petition of Donan Environmental Services, Inc., Cleanup and Abatement Order No. R9-2013-0022 at the Site of the Former Santa Ysabel Chevron Station, 30350 Highway 78, Santa Ysabel, San Diego County, September 18, 2013, SWRCB/OCC File A-2277, filed October 2013. (*Sean McClain*)

This Closed Session was held, and the Board members discussed item 8(*f*).

Item 9 – *Closed Session* - Consideration of Initiation of Litigation or Discussion of Significant Exposure to Litigation. The San Diego Water Board may meet in closed session to initiate or consider initiating litigation concerning matters within its jurisdiction or to discuss significant exposure to litigation [Authorized under Government Code Section 11126(e)].

This Closed Session was not held.

Item 10 – *Closed Session* - Deliberation on a Decision to be Reached Based on Evidence Introduced in a Hearing. The San Diego Water Board may meet in closed session to consider evidence received in an adjudicative hearing and to deliberate on a decision to be reached based upon that evidence [Authorized under Government Code Section 11126(c)(3)].

This Closed Session was not held.

Item 11 – *Closed Session* – Personnel. The San Diego Water Board may meet in closed session to consider the appointment, employment, evaluation of performance, or dismissal of a public employee or to hear complaints or charges brought against that employee by another person or employee unless the employee requests a public hearing [Authorized under Government Code Section 11126(a)].

This Closed Session was not held.

There being no further business, the meeting was adjourned at 1:37p.m.

These minutes were prepared by:

Christina A. Blank

Chris Blank
Executive Assistant

Signed by:

David W. G

David Gibson
Executive Officer

Audio Recordings
October 8, 2014 Permit Workshop

E032 2014-1008 MS4 Permit Workshop (1).WMA
E032 2014-1008 MS4 Permit Workshop (2).WMA
E032 2014-1008 MS4 Permit Workshop (3).WMA

County of San Diego

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November 10, 2014

Laurie Walsh
San Diego Regional Water Quality Control Board
2375 Northside Drive, Suite 100
San Diego, California 92108

Via Email
Laurie.Walsh@waterboards.ca.gov

Re: Tentative Order R9-2015-0001, Place ID:658019LWalsh

Dear Ms. Walsh:

Please accept this correspondence as the County of San Diego's legal comments on the above Tentative Order. County Public Works staff will also be submitting technical comments on aspects of the Tentative Order prior to the comment deadline.

Because it is not clear at this point what legal impact the anticipated adoption of Order R9-2015-0001 will have upon the pending appeals with the State Water Resources Control Board of the order being amended (R9-2013-0001), the County renews all of its objections to various aspects of the Tentative Order as described in the County's Petition to the SWRCB in that proceeding (State Water Resources Control Board Petition and Request for Stay of County of San Diego designated A-2254 (h)), incorporated by reference to this objection letter.

Further, because the Tentative Order does not incorporate the changes requested by the County of San Diego or other petitioners in proceeding A-2254, the County renews all objections from all petitioners to R9-2013-0001 as applicable to the provisions of R9-2015-0001 when adopted by the RWQCB.

Very truly yours,

THOMAS E. MONTGOMERY, County Counsel

By James R. O'Day, Senior Deputy

JRO/tlm
13-90386

Response to Coastkeeper Letter Regarding Prior Lawful Approval dated October 8, 2014

On October 8, 2014 the San Diego Regional Water Quality Control Board ("RWQCB") conducted a workshop to accept public testimony regarding possible amendments to the Regional MS4 Permit ("Permit"). During the workshop testimony was presented by the County of San Diego and the Coalition[1] regarding Permit section E.3.e.(1)(a). Coastkeeper and the Coastal Environmental Rights Foundation submitted a comment letter ("Coastkeeper Letter').

After the presentations and questions by various board members, Chairman Abarbanel requested that the Coalition prepare further briefing concerning its views on the Coastkeeper letter and specifically on what issues it agrees with the Coastkeeper Letter. This briefing paper constitutes both that response as well as the Coalition's comments on suggested revisions to the Permit.

Purpose of Workshop

The Coastkeeper Letter states "it would be inappropriate for the Board to take any action on un-agenized matters at the workshop, CERF and Coastkeeper believe interested parties may urge the Board to consider amendments to the MS4 Permit to redefine "prior lawful approval"". The Coalition agrees.

The Coalition understands that the purpose of the workshop was to take testimony from interested parties and, while it failed to do so, direct RWQCB staff to draft revised language where appropriate for insertion into the Draft MS4 permit. The Coalition further understands that any amendments to the current permit would be subject to public review and comment prior to the RWQCB taking any formal action.

[1] The Coalition consists of environmental groups and associations representing various private stakeholders who have a keen interest in achieving water quality objectives within the San Diego region in the most efficient and cost effective manner. Coalition members include: San Diego Building Industry Association, Building Industry Association of Southern California; Associated General Contractors; Associated Builders and Contractors; San Diego Regional Chamber of Commerce; Business Leadership Alliance; San Diego Association of Realtors; San Diego Apartment Association; NAIOP (National Association of Industrial & Office Properties); BOMA (Building Office & Management Association; San Diego Chapter of the American Society of Landscape Architects.

Purpose of the Prior Lawful Approval Provision

Both the MS4 Permit and its associated fact sheet are silent on the rationale behind Permit section E.3.e.(1)(a). The Coastkeeper Letter states "If the Regional Board is interested in specifically defining prior lawful approval, a reconsideration should focus on traditional vested rights doctrines". The Coalition agrees that this is part of the rationale behind the PLA provision but disagrees that this is its entire purpose.

While the provisions that constitute Permit section E.3.e.(1)(a) has been modified over the last several permit cycles, the Coalition believes the purpose of the provision has always remained the same. That is, to allow Copermittees to use their land use authority to appropriately balance their obligation to achieve water quality objectives to the Maximum Extent Practical ("MEP") while honoring the property rights associated with public and private development projects whose entitlement cycles do not coincide with the MS4 permit cycles. The Coalition further believes that section E.3.e.(1)(a) is also intended to recognize that MEP is not a fixed standard but will vary based on the circumstances. The Coalition believes that by clarifying the intent of the Permit section E.3.e.(1)(a) the RWQCB will assist all of the interested parties in understanding the factors that the Copermittees need to balance in applying this provision of the Permit.

Maximum Extent Practical

The Permit explains the concept of Maximum Extent Practical ("MEP") as follows:

> The technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) for storm water that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) in combination with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than BAT. A definition for MEP is not provided either in the statute or in the regulations. Instead the definition of MEP is dynamic and will be defined by the following process over time: municipalities propose their definition of MEP by way of their runoff management programs. Their total collective and individual activities conducted pursuant to the runoff management programs becomes their proposal for MEP as it applies both to their overall effort, as well as to specific activities (e.g., MEP for street sweeping, or MEP for MS4 maintenance). In the absence of a proposal acceptable to the San Diego Water Board, the San Diego Water Board defines MEP.

As described above, the concept of MEP includes consideration of:

- Economic feasibility;
- Technically feasibility of various source controls and treatment controls; and
- The impact that any single project may have on the collective and individual activities to address water quality objectives.

As applied to sectionE.3.e.(1)(a), the Coalition believes that MEP provides an overarching standard of review when considering when and how a Copermittee should use its discretion when allowing previous land development requirements to apply where the project has a recognized PLA. While the Coalition believes that it is the intent of the RWQCB to allow Copermittees to apply these factors on a case by case basis, the Coalition also believes that some additional guidance would be helpful for all parties concerned in two areas. These are:

- What constitutes a PLA?
- How should a Copermittee apply its discretion to projects that have a PLA?

The Coalition does not believe that providing such a clarification is antithetical to the position taken by the Coastkeeper Letter.

What constitutes a PLA

On May 8, 2013 the RWQCB, adopted the Permit. Section E.3.e.(1)(a) of the New MS4 Permit states:

> Each Copermittee must require and confirm that for all Priority Development Project applications **that have not received prior lawful approval** by the Copermittee by the time the BMP Design Manual is updated pursuant to Provision E.3.d, the requirements of Provision E.3 are implemented. For **project applications that have received prior lawful approval** before the BMP Design Manual is updated pursuant to Provision E.3.d, the Copermittee **may** allow previous land development requirements to apply. [Emphasis added.]

The Coalition interprets the intent of section E.3.e.(1)(a) to ensure that projects which have been granted a PLA that incorporates a final, or substantially final, drainage concept and site layout that includes water quality treatment based on the performance criteria set forth in the Copermittee' s storm water ordinances, regulations and manuals at the time the PLA was granted, are not required to redesign their proposed projects for the purposes of complying with the Permit unless doing so is necessary for the Copermittee to remain in compliance with the Maximum Extent Practicable standard as described in the Permit.

The Permit does not define the term "Prior Lawful Approval". Therefore, the Coalition relies on the plain meaning rule of statutory and regulatory interpretation. The plain meaning rule dictates that permit language is to be interpreted using the ordinary meaning of the language. In other words, Section E.3.e.(1)(a) is to be read word for word and is to be interpreted according to the ordinary meaning of the language, unless a statute explicitly defines some of its terms otherwise or unless the result would be cruel or absurd. Ordinary words are given their ordinary meaning, technical terms are given their technical meaning, and local, cultural terms are recognized as applicable. The Coalition relies on Merriam Webster for the plain meaning of each word.

- Prior – existing earlier in time.
- Lawful – constituted, authorized, or established by law
- Approval – an act or instance of approving.

Based on the plain meaning rule and the definitions above the Coalition defines a Prior Lawful Approval as any ministerial or discretionary approval granted to a project by a Copermittee prior to the Effective Date. Thus, PLAs include, but are not limited to, the approval or issuance of, building permits, grading permits, development agreements, tentative maps, vesting tentative maps, CEQA Notices of Determination, and conditional use permits. However, as discussed in further detail below, the Coalition considers a PLA as a necessary, but not determinative criterion, for granting an exemption from the requirements of section E.3 pursuant to section E.3.e.(1)(a). The Coalition believes that there are three situations in which a Copermittee should recognize a project as having a PLA. These are:

- Where the project has a statutory vested right to proceed under the prior permit. These include projects with Development Agreements or Vesting Tentative Maps pursuant to government code section 65864 et seq and 66498.1 et seq.
- Where the project is so far advanced by performing substantial work and incurring substantial liabilities in good faith reliance on the permit prior to the effective date of the new law. (Avco Community Developers, Inc. v. South Coast Reg'l Comm'n, 17 Cal. 3d. 785, 791 (1976)).
- Where the project has received some other form of approval which addresses water quality objectives and where it would be economically or technically infeasible to fully comply with the MS4 permit standard described in section E.3.e and remain in substantial conformity with the previously granted approval.

The Coastkeeper Letter seems to imply that recognizing anything other than common law vested rights as discussed in Avco would constitute "backsliding". The Coalition respectfully

disagrees. The term backsliding refers to an action taken to diminish a water quality objective necessary to achieve a beneficial use.[2] The recognition of other vested rights or discretionary permits is not backsliding where the discretion to do so is balanced against the MEP standard.

How should the Copermittees apply their discretion?

Where a project has a statutorily vested right to proceed under a prior permit, the Copermittee must still use its discretionary authority to determine whether to allow previous land development requirements to apply. However, that discretionary authority is limited to situations in which the imposition of new permit requirements is necessary for reasons of health and safety or where the Copermittee chooses to use its eminent domain powers. As such, the Coalition believes that Copermittees should be provided with guidance that the use of its discretionary authority to allow a project with a statutorily vested right to proceed under previous land development requirements would be presumed to meet the MEP standard.

Where a project is so far advanced by performing substantial work and incurring substantial liabilities in good faith reliance on the permit prior to the effective date of Permit section E.3.e.(1)(a), the Coalition believes that Copermittees should be provided with guidance that the use of its discretionary authority to allow a project with a statutorily vested right to proceed under previous land development requirements would be presumed to meet the MEP standard. The Coalition believes that this suggestion is in harmony with the Coastkeeper Letter.

Where a project has received some other form of approval which addresses water quality objectives and where it would be economically or technically infeasible to fully comply with the MS4 permit standard described in section E.3.e and remain in substantial conformity with the previously granted approval, the Coalition believes that the presumption must shift. That is, the project proponent must demonstrate with substantial evidence the following:

1. The project design complies with the previous land development requirements.
2. It is not economically or technically feasible to fully comply with the new Permit requirements.
3. By allowing the project to comply with less than the new Permit requirements the Copermittee will still be in compliance with the MEP standard as described in the new Permit.

[2] In the Water Quality Act of 1987, Congress statutorily approved the antibacksliding policy adopted by EPA through regulations prohibiting backsliding from water quality based permit limits under sections 301(b)(1)(C) or 303(d) or (e). It is not clear that Congress intended to apply the antibacksliding policy to strategies intended to implement the MEP standard.

Proposed Guidance

The Coalition suggests that in order to provide the Copermittees, RWQCB staff and interested parties with clear guidance on this matter, the following language be incorporated into the draft permit for consideration and comment by all parties. While the Coalition believes that this language should be adopted as proposed, it also recognizes the importance of providing all interested parties with an opportunity to address this issue if they so see fit and, therefore presents this language as a "straw man" and a place to begin the discussions.

Proposed Clarifying Language

(Replaces Section E.3.e(1)(a); does not alter (b) through (d)

(a) Each Copermittee must require and confirm that for all Priority Development Project applications that have not received prior lawful approval by the Copermittee by the time the BMP Design Manual is implemented pursuant to Provision E3.d, the requirements of Provision E.3 are implemented. For project applications that have received prior lawful approval before the BMP Design Manual is implemented pursuant to Provision E.3.d, the Copermittee may allow previous land development requirements to apply.

i. For private development project, "Prior Lawful Approval" means projects that have entered into a development agreement as defined by the California Government Code or have received a first discretionary approval or ministerial permit which incorporates by design or reference the applicable water quality and hydromodification standards prior to the time the BMP Design Manual is implemented. A Prior Lawful Approval shall include any subsequent discretionary or ministerial entitlements necessary to implement the initial Prior Lawful Approval.

ii. For public projects, the Copermittee shall develop and adopt as part of its JURMP an equivalent approach to that for private projects described in Section i above.

iii. For project application that have obtained a Prior Lawful Approval before the BMP Design Manual is implemented pursuant to Provision E.3.d, the Copermittee shall use its discretion to allow previous land development requirements to apply provided that the Copermittee does not determine that to do so would prevent the Copermittee from achieving water quality objectives to the MEP.

iv. Projects with Prior Lawful Approvals that predate the water quality and hydromodification requirements of Order No. R9-2007-0001 for San Diego Copermittees, Order No. R9-2009-0002 for Orange County Copermittees, and Order

No. R9-2010-0016 for Riverside County Copermittees shall be required to incorporate Treatment Control BMPs necessary to achieve water quality standards set forth in the applicable Orders identified above to the Maximum Extent Practicable, as determined by the Copermittee on a case by case basis.

November 19, 2014

Board Chair Henry Abarbanel
San Diego Regional Water Quality Control Board
2375 Northside Drive, Suite 100
San Diego, CA 92108

Re: Response to Workshop Request:Proposed Prior Lawful Approval Language for Regional MS4 Permit

Sent via Email: Laurie.Walsh@waterboards.ca.gov

Dear Chair Abarbanel:

This letter is to follow up on an earlier communication regarding changes in the 2013 MS4 Permit, which removed references to grading from a footnote defining "prior lawful approval." The Coastal Environmental Rights Foundation and San Diego Coastkeeper appreciate the Regional Board taking time to consider the issue.

For the reasons stated below, our organizations do not believe it is necessary to take any action to define "prior lawful approval," or "grandfather" projects into the 2007 MS4 Permit. If, however, the Regional Board does choose to act we urge the Board to reject the straw man language proposed by the Coalition and instead reinsert references to grading in the last iteration of the MS4 permit.

In earlier discussions, the Board indicated the language was changed because "circumstances that legally prevent the imposition of updated requirements" may "differ among jurisdictions." There was concern that either the judicial vested rights doctrine or statutory vested rights could prevent retrospective application. However, it seems clear that correctly applied, neither judicial nor statutory vested rights would prevent the imposition of updated stormwater requirements in any jurisdiction subject to the Regional Board authority.

Avco remains the principal governing case law on the issue of judicial vested rights as applied to development. In *Avco*, the California Supreme Court held that no vested right existed where a plaintiff had not *both* obtained a final building permit *and* begun grading. *Avco Cmty. Developers, Inc. v. S. Coast Reg'l Com*., 17 Cal. 3d 785, 791 (1976). Courts of Appeal continue to follow the *Avco* model, holding that public entities may enforce changes in regulations notwithstanding prior subdivision approval unless the owner or developer "(1) has obtained a building permit for an identifiable structure, and (2) has performed substantial work in reliance thereon." *Hafen v. Cnty. of Orange*, 128 Cal. App. 4th 133, 143 (2005). A leading treatise further explains: "The vested rights rule requires that the government agency exercise its *final discretion* to issue a grant of authority or permit which *specifically describes* a particular approval or work of improvement. Thereafter, *if the developer begins to perform the work described* in the grant or permit, he or she may acquire a vested right to complete the *specific and particular* work that is described. The grant or permit does not give any rights to complete any work not specifically described." (emphasis added) *Miller & Starr, Cal. Real Estate* (3d ed.2001) § 25:70, pp. 324-325, 327-328. Therefore, the Coalition's proposed language would give

developers the right to proceed under an old permit even if they obtained only a preliminary ministerial approval and no work had begun.

If adopted, the proposed language would expand developers' rights beyond what is required by *Avco* and its progeny. Perhaps more importantly, such a provision would be inconsistent with and contrary to federal law. Following *Avco*, the state legislature enacted statutes that allow some development rights to vest earlier when particular conditions are met, such as entry into a development agreement or approval of a subdivision map. These statutory vested rights prevent local governments from applying certain new regulations retroactively. Importantly, however, they do not apply to local actions that are required by state or federal law. Because MS4 requirements are set by a state agency pursuant to the federal Clean Water Act, no statutory vested rights apply.

While Cal. Gov't Code section 65866 provides that, where a development agreement is in place, the regulations and official policies in force at the time of the agreement will be applied, section 65869.5 qualifies the above: "If state or federal laws or regulations, enacted after a development agreement has been entered into, prevent or preclude compliance with one or more provisions of the development agreement, such provisions of the agreement shall be modified or suspended as may be necessary to comply with such state or federal laws or regulations." Thus, even where statutory vested rights are expressly granted, the Legislature has made it clear that compliance with state and federal law is still an overriding concern.

Likewise, pursuant to the Subdivision Map Act, Gov Code section 66498.1(c) limits the scope of vested rights: "Notwithstanding subdivision (b), the local agency may condition or deny a permit, approval, extension, or entitlement" if "required in order to comply with state or federal law."

Thus, where necessary, a copermittee may deny a permit at any stage in the process in order to bring a project into compliance with the state-mandated MS4 requirements. The Coalition's proposed changes thus attempt to create a right where none existed before.

It is important to note that the Coalition/BIA's proposed language would also be inconsistent with other provisions of the MS4 Permit. Section E.1.a of the Permit requires each copermittee to "establish, maintain, and enforce adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4," and adequate legal authority includes, at a minimum, "requiring the use of BMPs to prevent or reduce the discharge of pollutants into MS4s." (*Order No. R9-2013-0001 E.1.a.(7)*). As explained above, it is well within all copermittees' legal authority to apply new BMPs to projects that have not yet begun work. Pursuant to section E.1.a., copermittees are required to use the full extent of that authority to apply updated requirements.

As the Coalition/BIA concedes, it is the municipality that is ultimately responsible for compliance with the MS4 Permit and meeting the MEP standard. As the Regional Board explained in support of its 2007 MS4 Permit, copermittees are responsible for discharges into and out of their MS4s, in part, because they have the legal authority that authorizes the very development and land uses which generate the pollutants and increased flows in the first place. (Fact Sheet, p. 28, Order NO. R9-2007-0001). The copermittees also have the legal authority to ensure all grading activities are protective of water quality – they can withhold issuance of the grading permit. (*Id*.). In the 2007 San Diego MS4 Permit, it was clear that updated SUSMP and hydromodification

requirements would apply to all priority projects which had not begun grading or construction at the time of any update. (Order NO. R9-2007-0001, p. 17, FN 3).

As further noted by the Coalition, MEP is defined in the Permit: “In the absence of a proposal acceptable to the San Diego Water Board, the San Diego Water Board defines MEP.” (Order No. R9-2013-0001, p. C-7). The Regional Board has effectively defined MEP by adopting the 2013 MS4 Permit – over a year ago. The Coalition asks the Regional Board to delay implementation of MEP by grandfathering projects under the guise of consistency. If the Coalition seeks a consistent, bright line rule, the more appropriate route is to track the 2007 MS4 Permit language which is consistent with vested rights doctrine. Rather, the Coalition suggests a more complicated approach which includes applying 2007 MS4 Permit standards to any ministerial approval that merely references the old standards. This is inconsistent with the increased stringency of the Regional MS4 Permit and iterative approach. It also runs contrary to MEP and *Avco*.

For the reasons stated above, CERF and San Diego Coastkeeper request that the Board not adopt a policy or amendment that could allow for vested rights or prior lawful approval that run counter to the widely accepted law. Should the Board decide it is necessary to adopt such a policy or amendment for clarity or conformity, we urge the Board to reinstate the prior footnote language from the previous MS4 permit.

Again, we appreciate your careful consideration of this issue.

Sincerely,

Matt O’Malley, Waterkeeper
San Diego Coastkeeper

Livia Borak, Legal Advisor
Coastal Environmental Rights Foundation

Substantially Prepared By
Kathryn Kriozere, Legal Fellow
San Diego Coastkeeper

Construction Industry Coalition on Water Quality

November 19, 2014

Ms. Laurie Walsh, Senior Engineer
San Diego Regional Water Quality Control Board
2375 Northside Drive, Suite 100
San Diego, Ca 92108

Via Email: Laurie.Walsh@waterboards.ca.gov

RE: Comment - Tentative Order No. R9-2015-0001, Place ID: 658018LWalsh

Dear Ms. Walsh:

The Construction Industry Coalition on Water Quality (CICWQ) is submitting comments concerning Tentative Order No. R9-2015-0001 (National Pollutant Discharge Elimination System (NPDES) Permit for Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region). We are submitting this letter on behalf of the CICWQ membership, which is described below.

CICWQ is an advocacy, education, and research 501(c)(6) non-profit group of trade associations representing builders and trade contractors, home builders, labor unions, landowners, and project developers. CICWQ membership is comprised of members of four construction and building industry trade associations in southern California: The Associated General Contractors of California, Building Industry Association of Southern California, Engineering Contractors Association, and Southern California Contractors Association, as well as the United Contractors located in San Ramon in northern California. Collectively, members of these associations build a significant portion of the transportation, public and private infrastructure, and commercial and residential land development projects in California.

We present two main points for Regional Board consideration:

I. The Regional Board is requiring increasingly stringent on-site stormwater retention requirements without evidence the existing, 2010 South Orange County MS4 permit water quality requirements are not working to protect water quality and maintain beneficial uses.

With the release of the Draft Regional Permit to incorporate watersheds in South Orange County within the San Diego Regional Water Quality Control Board (Regional Board) jurisdiction, the Regional Board is proposing to enact the most stringent on-site requirements for stormwater runoff anywhere in California. Despite the demonstrable improvements in water quality runoff noted by the Orange County permittees in their

Report of Waste Discharge, and their presentations to the Regional Board in 2014 during stakeholder and Board workshops, Regional Board staff continue to require additional and less flexible on-site prescriptive performance measures for retaining stormwater runoff.

The program changes proposed in the Draft Regional Permit are being made without presenting any factual evidence that the existing low impact development water quality performance standards are not working, which the County of Orange has required since the requirements became effective in 2012. We believe that because the current South Orange County Permit requirements are working well to protect water quality, presenting any evidence to the contrary is not actually possible. We note no Findings in the Draft Regional Permit that would suggest a need for any changes to program implementation and management.

II. The Regional Board is eliminating exemptions for hydromodification control, even when stormwater runoff is conveyed in the MS4 system to significantly hardened or engineered channels.

CICWQ and its membership believe that the regulations are tending, at some point, to require hydromodification control for all priority development projects regardless of receiving water susceptibility to hydromodification effects. This regulatory direction is undoubtedly driven by environmental NGO advocacy for removal of all concrete lined channels and receiving waters and complete restoration of all significantly or completely lined channels to "natural" conditions, regardless of the existing land uses and feasibility. This effort ignores the vital role flood control facilities play in urban infrastructure and the protection of life and property, and it ignores the significant public investment in these systems. Loss of hardened channel exemptions will result undoubtedly in increased costs for new and redevelopment of most public and private properties within the Regional Board's jurisdiction, and require project proponents to engage in a potentially costly and cumbersome bureaucratic process to "mitigate" for the effects (even the lack of) of hydromodification with no environmental benefit.

According to the Regional Board, hydromodification control requirements are being required to maintain geomorphic stability in receiving waters in southern California. However, it is clear that the alignment, grade and cross section of many urban streams has been irrevocably altered. A regulatory requirement to return flows to pre-development conditions will not allow stream restoration to occur. For urban areas, the Permit should support projects that enhance the functions and values of the receiving water within the constraints of the urban environment. Removing exemptions without consideration, or requiring extensive additional study to support exemptions that have been granted for years, appears to be a poor policy decision and one that is not supported technically.

Specifically, nowhere in the Draft Regional Permit is the lack of clear evidence for program changes more evident than the requirements for installing hydromodification controls at priority development sites in Provision E.3.c.(2). In particular, we note the

Regional Board is on a path to remove long-standing exemptions from hydromodification control requirements for certain projects whose discharge is conveyed to receiving waters via significantly or completely hardened and engineered channels. In the Draft Regional MS4 Permit for South Orange County, the Regional Board has provided "interim" exemptions that, while welcome in the interim, should be granted outright and without any additional study or consideration. Nor should additional updates or study be required on the part of the co-permittees to support granting exemptions, as required in the BMP Design Manual update referenced in Provision E.3.c.(2)(e). We would expect that at a minimum, these same conditions are afforded to the Riverside County permittees when their MS4 permit is considered for renewal by the Regional Board in 2015.

And, as we commented on during the adoption process for the San Diego County Regional MS4 permit in 2012 and 2013, new hydromodification control requirements that require a priority project to "avoid critical sediment yield areas" are unnecessarily restrictive, and do not reflect the dynamic and variable nature of the sediment supply that is delivered to stream systems in southern California. Our membership reports several instances where priority development projects are being significantly delayed or stopped all together, because of the inability to comply with the requirement to avoid critical sediment yield areas. The most prevalent reason given is lack of engineering tools and techniques to comply with such a sweeping provision.

In summary, we have commented to the Regional Board about hydromodification control requirements in MS4 permits within its jurisdiction in a number of instances in the recent past, and many of our concerns and comments remain relevant in the current proceedings. While we note many of our suggestions have been ignored or discounted, we incorporate nonetheless those comments by reference here and cite specifically:

1) Administrative Draft Regional Municipal Separate Storm Sewer System (Tentative Order No. R9-2012-0011); submitted September 14, 2012. See Item No. 3, page 6.

2) Comment Letter– Tentative Order No.R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu; submitted January 13, 2013; See Items 3 and 4, pages 4-6.

3) San Diego Regional Water Quality Control Board's Draft MS4 Permit: A case study; submitted May, 2013. See pages 3-8.

These documents are included as attachments to this comment letter.

CICWQ's membership is in the forefront of water quality regulation, providing to water quality regulators practical ideas and solutions that are implementable and that have as their goal clean water outcomes. If you have any questions or want to discuss the content of our comment letter, please feel free to contact me at (951) 781-7310, ext. 210, (909) 525-0623, cell phone, or mgrey@biasc.org.

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Respectfully submitted,

Mark Grey, Ph.D.
Technical Director
Construction Industry Coalition on Water Quality

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January 11, 2013
Mr. Wayne Chiu, P.E.
San Diego Regional Water Quality Control Board
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San Diego, Ca 92123-4340

Re: Comment Letter– Tentative Order No.R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu."

Dear: Mr. Chiu,

On behalf of Building Industry Association of Southern California, Inc. (BIASC), Construction Industry Coalition on Water Quality (CICWQ) and the members of both, we appreciate the opportunity to provide comments on the San Diego Regional Water Quality Control Board Tentative Order No. R9-2013-0001; NPDES No. CAS0109266, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems ("MS4s") Draining the Watersheds within the San Diego Region (the "Tentative Order"). In addition, we respectfully request that our comment letter submitted to the Regional Board on September 14, 2012 be made a part of our overall comments to the Tentative Order and admitted into the formal administrative record, because the constructive suggestions for permit improvement remain relevant at this point in the Tentative Order development.

BIASC is a nonprofit trade association representing nearly 1,000 member companies, which together have nearly 100,000 employees. For decades, BIASC's members have built the majority of the new homes in Ventura, Los Angeles, Orange, Riverside, and San Bernardino Counties in southern California. CICWQ is an education, research, and advocacy water quality coalition comprised of representatives from five industry trade associations (in addition to BIASC) which are involved in the development of public and private building, infrastructure and roads throughout California (Associated General Contractors, Engineering Contractors Association, Southern California Contractors Association, Engineering and General Contractors Association, and United Contractors). All of the above trade associations, their members and the union labor work force are affected by the post-construction runoff control requirements proposed in the Tentative Order, and this letter is meant to provide the San Diego Regional Board with constructive suggestions for improvement.

We appreciate the Regional Board's earlier release of a precursor to the Tentative Order as an Administrative Draft, and the extensive stakeholder involvement process that ensued over the summer and autumn of 2012. Unfortunately, the Tentative Order does not reflect critically important changes to the Tentative Order's Development Planning requirements which we and many other public and private stakeholders recommended, both during the focused stakeholder meetings and in comments submitted to the Regional Board. Moreover, Regional Board staff does not provide sufficient findings of fact to support the priority project water quality and hydromodification control design criteria and performance standards in the Tentative Order. The requirements proposed in the Tentative Order are vastly different from those contained in the 2010 South Orange and South Riverside County MS4 permits, and there is simply insufficient performance data to demonstrate the need for any change.

We are concerned that key water quality and hydromodification control provisions within the Development Planning section (Section C.3) are (i) unsupported by substantial evidence, (ii) very bad public policy, and (iii) not properly considered as legally required. Specifically, certain provisions: (i) lack sufficient auditing or performance data showing the need for or advisability of such requirements, (ii) lack technical or scientific basis, and (iii) depart without any justification from required and approved technical documents that have been issued by the San Diego Regional Board for priority development projects in San Diego, Orange, and Riverside Counties. In addition, the hydromodification control provisions illuminate the Regional Board's failure to consider the factors required by California Water Code section 13241 – especially subsection (b) thereof.

1. There are no findings of fact to support changes in the requirements to evaluate, design and install LID BMPs (Section E.3.c) when comparing the proposed requirements in the Tentative Order with that of the requirements in the 2010 adopted South Orange and South Riverside County MS4 permits.

The Orange and Riverside County permits have been in effect for a short period of time (<2 years); and there is no data (program audits or annual report data, for example) that we can find that would support any changes to priority development project water quality control design criteria (found in Section E.3.C of the Tentative Order). Moreover, in one particular instance concerning which we and others have repeatedly commented to Regional Board staff, there is no technical justification provided by staff for requiring biofiltration LID BMP to be sized at 1.5 times the remaining design capture volume not reliably retained on-site. Section E.3.c.(3)(b)(i)[c] requires that if biofiltration is used as an alternative compliance method the biofiltration BMP is required to be sized to 1.5 times the design capture volume, which is an increase from the existing South Orange County permit. The permit and the fact sheet provide no technical justification for the 1.5 factor and therefore this requirement should be deleted from the permit. BIASC and CICWQ comment letter submitted to the Regional Board on September

14, 2012 and attachments including suggested permit redline remains relevant in this matter. We have provided this here as Attachment1.

2. There are no findings of fact or supporting technical and scientific data indicating the need for changes in hydromodification control requirements for priority development projects.

As we have commented before, there needs to be (i) an in-stream hydromodification control performance standard using the erosion potential (EP) approach; and (ii) the permit must recognize that there are a number of different types of channel hardening that have been used for armoring in stream systems besides concrete. In Attachment 1, we again make suggestions for improving the consistency of hydromodification control standards with those identified and allowed in the South Orange County MS4 permit.

The Tentative Order provides an "on-site" option for addressing hydromodification through flow duration control. This is an important element of the hydromodification control standard. However the Tentative Order is incomplete in that it lacks an option to assess and demonstrate hydromodification control through in-stream metrics. In many cases, significant development within a watershed has already caused hydromodification impacts. Requiring project-by-project flow duration control for each new project may not address the existing issue as effectively as a regionally-coordinated approach that combines upland control with in-stream remedies. Including the EP standard—as BIASC and CICWQ urge--would enable the development of more comprehensive approaches that include both upland controls and stream modifications (i.e., restoration). This option is critical for more effectively and efficiently protecting the region's aquatic resources.

Additionally, the Tentative Order includes an unnecessarily narrow definition of hardened channels that includes only those channels lined with concrete. Other forms of artificial hardening may be comparably resistant to hydromodification impacts, such as channels that are lined with rip rap, armored with soil cement, or armored with other practices. While the co-permittees or the project proponent should be responsible for demonstrating that a specific channel material is sufficiently stable, the narrow definition currently provided by the Tentative Order does not allow the use of sound engineering judgment and does not allow for use of innovative materials.

The comment letter submitted by BIASC and CICWQ to the Regional Board on September 14, 2012 remains relevant here, as the Regional Board staff did not make any changes to the hydromodification control requirements except for minor exemption allowances for using USGB council's LEED for redevelopment program standards. Exemptions, generally, are welcome and appropriate. But, in practice, referencing a voluntary, national green building and

development certification program for use as part of a NPDES permit does not provide a viable pathway for most priority development projects that are located in already urbanized areas that are served by existing MS4 infrastructure. Exemptions identified in the adopted San Diego Hydromodification Management Plan are appropriate and should be cited and referenced in the Tentative Order, and any reference to USGB LEED standards deleted.

3. Preserve the 2010 adopted San Diego County Hydromodification Management Plan elements

The Regional Board staff has provided no technical justification for the new hydromodification provisions. The HMPs for San Diego and South Orange County are based on sound science and should be allowed time to understand if they are adequate for mitigating hydromodification impacts. The Regional Board adopted the San Diego Hydromodification Management Plan (HMP) in July 2010. Significant work, technical analysis and stakeholder input have gone into the development of the HMP and these requirements have been in effect for just 16 months. Rather than providing separate criteria, the permit should acknowledge implementation of the Regional Board approved HMP as a sufficient mechanism for meeting hydromodification requirements. Of particular note and concern is the removal of exemptions for certain priority development projects (projects in urban areas with greater than 70% existing impervious surface, for example) that discharge to an MS4 system that then discharges into a significantly hardened channel system. It is unquestionably bad public policy to require installation of controls (or payment of in-lieu fees to compensate for the inability to install controls) when there is no threat to the receiving water.

To this end--and for sake of brevity, we support and encourage the Regional Board to accept comments from Orange County Public Works which pertain to the hydromodification control requirements. Changes in permit language as indicated in the County's redline of the Tentative Order would sufficiently address our concerns about the tentative hydromodification control requirements, and we urge the Regional Board to accept these changes.

Regional Board staff has publically stated that the proposed hydromodification control requirements in the Tentative Order are consistent with the 2010 adopted HMP and that only minor adaptation is necessary. That assertion is simply not true and in fact adoption of the Tentative Order requirements will render the HMP obsolete and require a total overhaul. According to the County of San Diego and the co-permittees within the County (and private developer stakeholders), more than $1.5 million have been spent to date developing the plan and conducting required monitoring. By changing the performance standards, requiring hydromodification controls at all priority development projects, and removing standard exemptions that are found in all other 4th term MS4 permits in California, the Regional Board is sweeping away years of program development activities and turning program implementation on

its head. The Tentative Order should explicitly recognize the findings of hydromodification management plans (HMPs) that have been previously approved by this Regional Board. The South Orange County HMP and the San Diego County HMPs were both the products of rigorous technical analysis based on the state of the practice, which were reviewed in detail by Regional Board Staff. The findings of these efforts must not be jeopardized under the new terms of the Tentative Order. *S*pecifically, findings regarding exempt water bodies must be appreciated and upheld, and they should be explicitly recognized in the Tentative Order.

4. The Tentative Order's proposed hydromodification control measures betray the Regional Board's failure to take into account the considerations required by California Water Code section 13241

For years, BIASC and CICWQ have been urging the water boards when developing MS4 permit requirements to address and respect their longstanding legal obligation to take into account the six, specified, non-exclusive factors which are set forth in California Government Code section 13241. The water boards have persistently refused. Most recently (just months ago), the Los Angeles Regional Board dismissed its obligation to consider the Section 13241 factors by noting that it had, in fact, more or less considered two of them (economics and some technical considerations). If the Regional Board here were to adhere to such a position, it would act in violation of California law and without justification.

There is perhaps no greater example of a permit condition written pursuant to a failure to consider the Section 13241 factors than the hydromodification control measures in the Tentative Order – particularly those which impose heroic, expensive engineering standards on development that drains into hardened flood control channels. Section 13241, subsection (b), requires consideration of the "[e]nvironmental characteristics of the hydrological unit under consideration…." By imposing expensive hydromodification control measures even where a receiving flood control system is already firmly hardened, the Tentative Order ignores this Section 13241, subsection (b), factor (obviously so, and regrettably consistent with the Regional Board's general refusal to take into account all six Section 13241 considerations).

BIASC and CICWQ believe that the water boards' persistent refusal to take demonstrably and meaningfully into account the Section 13241 required considerations results from a mistaken view of the applicable law. Specifically, the water boards' seemingly hold to the belief that the "maximum extent practicable" standard in federal law absolves the state agencies of any obligation to apply Section 13241when issuing MS4 permits. If indeed the water boards' legal position is thus, then it reflects a mistaken view of the degree of "federalism" reflected in the Clean Water Act and its interplay with the California Water Code. Moreover, such a position would reflect a failure to apply basic "federal preemption principles," which apply any time a party claims that federal law displaces state law.

BIASC and CICWQ urge the Regional Board to reconsider and reverse its refusal to apply meaningfully all six Section 13241 considerations, and to correct the Tentative Order accordingly.

Concluding Remarks:

BIASC and CICWQ have been active participants and contributors to the creation of improved MS4 permits across southern California. We continue to believe that rational, *implementable*, and *effective* permit requirements are critical to achieving great progress concerning water quality and our environment. We hope that these comments are received in the manner in which they are intended – to create a workable permit that improves water quality to the maximum extent practicable. We remain committed to a positive dialog with the Regional Board and its staff – one that will result in an informed, balanced and effective permit.

If you have any questions or want to discuss the content of our comment letter, please feel free to contact me at (951) 781-7310, ext. 213, (909) 525-0623, cell phone, or mgrey@biasc.org.

Sincerely,

Mark Grey, Ph.D.
Director of Environmental Affairs and Technical Director
Building Industry Association of Southern California and
Construction Industry Coalition on Water Quality

Enclosures:
Attachment 1

cc. Andy Henderson, Esq., Building Industry Legal Defense Foundation

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VIA E-MAIL

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September 14, 2012
Ms. Laurie Walsh, Senior Engineer
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San Diego, Ca 92123-4340

Re: ADMINISTRATIVE DRAFT REGIONAL MUNICIPAL SEPARATE STORM SEWER SYSTEM (Tentative Order No. R9-2012-0011)

Dear: Ms. Walsh

On behalf of the Building Industry Association of Southern California, Inc. (BIA/SC) and the Construction Industry Coalition on Water Quality (CICWQ) and the members of both, we appreciate the opportunity to provide comments on the Administrative Draft of the San Diego County Regional MS4 Permit (Administrative Draft Permit). We submit these comments in addition to and in support of comments made by our affiliate in San Diego County, the Building Industry Association of San Diego and its coalition partners, and comments submitted by Rancho Mission Viejo.

BIA/SC is a nonprofit trade association representing nearly 1,000 member companies, which together have nearly 100,000 employees. BIA/SC's members have, for decades, built the majority of the homes in Ventura, Los Angeles, Orange, Riverside, and San Bernardino Counties in southern California. CICWQ is a water quality coalition comprised of representatives from five industry trade associations (in addition to BIA/SC) involved in the development of public and private building, infrastructure and roads throughout California (Associated General Contractors, Engineering Contractors Association, Southern California Contractors Association, Engineering and General Contractors Association, and United Contractors). All of the above trade associations and their members and the union labor work force are affected by the post-construction runoff control requirements proposed in the Draft Permit, and this letter and supporting attachments are intended to provide the San Diego Regional Board staff with constructive suggestions for improvement.

We appreciate the Regional Board's release of the Administrative Draft Permit in April 2012, and the extensive stakeholder involvement process that ensued over the summer of 2012. The comments provided here are intended to further meet the permit's underlying objective of protecting and improving water quality within the watersheds administered by the San Diego Regional Board. Our comments, supporting attachments, and suggested redline permit language

modifications reflect years of working not only on MS4 permits issued by the San Diego Board, but other MS4 permits administered by the Los Angeles, Santa Ana, and San Francisco Bay Regional Water Quality Control Boards.

We have four primary concerns with the Administrative Draft Permit content and the following discussion summarizes those concerns and provides the technical basis for those concerns including supporting attachments:

1. **Administrative Draft Permit Provision E. 3.c.(2)(c) establishes a zero discharge standard for biofiltration-type LID BMPs that are designed with an outlet/underdrain. This type of LID BMP cannot meet the on-site design capture volume standard as it is written. Such a zero discharge standard is scientifically and technically unsound and unsupported.**

Biofiltration is an established LID BMP for use in attempting to mimic pre-development hydrology. The US EPA, in multiple guidance documents produced since 2006, have recognized the use of biofiltration-type systems such as curb contained biofilters, bioswales, rain gardens, and using landscape areas for impervious area disconnection as essential LID BMP elements to include in land development projects, a few of which are cited below. The inclusion of biofiltration BMPs in US EPA's menu is a reflection of the practical limitations to retention of stormwater – retention practices are not universally feasible or desirable. When appropriately selected and designed, biofiltration BMPs achieve high levels of pollutant removal, which may exceed pollutant removal achieved in retention BMPs, particularly in cases where retention BMPs are inappropriately applied.

The retention requirement is contrary to EPA's definition of LID because it disfavors development strategies designed to appropriately "filter" runoff, such as bioretention cells or other vegetated LID BMPs. There are five principal EPA documents regarding LID; and four of them identify the appropriate roles of biotreatment-type BMP, such as detention (i.e., slow down, treat through vegetation, and then release across property lines), filtration, and surface release of stormwater.

In a compilation of case studies by EPA, most of 17 exemplary projects included biotreatment elements, such as bioretention, swales, and wetlands. *See* U.S. EPA 841-F-07-006. Each of two case studies described in another EPA document (s*ee* Attachment 1 at pp. 1-2, EPA 841-B-00-005) included the use of underdrains, and the example in one of the two specifically fed into the MS4 system at issue. Another EPA document updated in January 2009 refers to the many practices used to adhere to LID principles of promoting a watershed's hydrologic and ecological functions, such as bioretention facilities and rain gardens. *See* Attachment 2 at p. 2, EPA-560-F-07-231 (describing "an under-drain system to release treated stormwater off site," permitting planted areas to "safely allow filtration and evapotranspiration of stormwater");

http://www.epa.gov/owow/nps/lid/ (fact sheet describing under-drains used to release treated stormwater off site and permitting planted areas to safely allow filtration of stormwater). Thus, EPA's literature and guidance clearly recognize the important and even necessary role that biofiltration/biotreatment approaches play in real-world implementation of LID principles.

The National Research Council, in their 2008 Report to Congress titled "Urban Stormwater Management in the United States" cite the use of biofiltration and bioretention systems in improving water quality and in attempting to mimic predevelopment hydrology at many different site contexts and locations across the United States. The 2008 NRC report contains and cites numerous examples of using biofiltration type systems to reduce runoff volume and pollutant loads. The 2008 NRC Report clearly recognizes the role that biofiltration systems play in the LID BMP feasibility and selection process, and in achieving runoff management goals. The report states "In some situations ARCD (Aquatic Resources Conservation Design) practices will not be feasible, at least not entirely, and the SCMs [stormwater control measures] conventionally used now and in the recent past (e.g., retention/detention basins, biofiltration without soil enhancement, and sand filters) should be integrated into the overall system to realize the highest management potential." Note that the NRC report definition of ARCD includes both retention and biofiltration elements.

From a management perspective, a review of 4th Term Phase I MS4 permits within California (San Francisco Bay Area, Sacramento Area, North and South Orange County, Western and Southern Riverside County, and San Bernardino County) shows that the use of biofiltration to meet water quality volume and flow control performance standards is clearly allowed (See matrices submitted by BIA/SC_CICWQ at the August 22, 2012 Stakeholder Meeting and provided to the Regional Board by Mark Grey on August 24, 2012). These Regional Boards in California recognize that biofilter-type LID BMPs are an integral component of applying site design principles which seek to mimic pre-development hydrology. Furthermore, these permits implement a clear LID BMP feasibility and selection process, one that first requires examination of on-site retention systems (infiltration, harvest and use, and evapotranspiration), before moving to the evaluation and potential selection of bioinfiltration (some infiltration achieved) and biofiltration systems. This feasibility evaluation hierarchy, which is clearly explained in the South Orange County and South Riverside County MS4 permits adopted by the San Diego Regional Board in 2009 and 2010, respectively, must be preserved and included in the next version of the Administrative Draft Permit.

In summary, the zero discharge standard established by the Administrative Draft Permit significantly narrows the definition of LID, which is contrary to US EPA guidance, the 2008 NRC Report, and the standards established in recently-adopted Permits by the San Diego Regional Board and other Regional Boards. In essence, the proposed provisions would establish a standard that (i) will be impracticable in a relatively large proportion of sites, and (ii) has not

been demonstrated to be necessary to protect receiving water quality. We provide in Attachment 3 suggested permit language to address the continued use of biofiltration.

2. **A mitigation requirement is established when using flow-thru biofiltration-type LID BMPs to manage that portion of the SWQDv that is not retained on-site. This requirement is inconsistent with all other adopted Phase I MS4 permits in California and nationally. Biofiltration and bioretention BMPs are established LID practices; requiring accompanying mitigation of SWQDv that has already been biofiltered penalizes and dis-incentivizes use of these controls.**

Equally problematic, because it does not allow biofiltration type LID BMPs to meet the on-site storm water quality design volume (SWQDv) standard, is the current requirement in Administrative Draft Permit Provision E. 3.c.(2)(c) to "perform mitigation for the portion of the pollutant load that is not retained on-site." In other words, the draft provisions would require that, if a project proponent cannot retain 100 percent of the SWQDv on-site, and must therefore use biofiltration LID BMPs (with a treated discharge), then the use and installation of these systems will trigger an off-site mitigation or in-lieu fee program participation requirement. This provision in the Administrative Draft Permit is technically unjustified, disfavors the use of all types of recognized biofiltration LID BMPs, and could theoretically require a project proponent to not only pay for the installation and O&M of a biofiltration LID BMP, but also require mitigation or fee payment for that portion of runoff managed by it.

Biofiltration BMPs including natural treatment systems such as those that are part of the Irvine Ranch Water District's Natural Treatment System in Orange County (a regional example) can remove vast quantities of pollutant load, and provide other benefits such as habitat, flood control, and aesthetic, recreational and educational value. To relegate multi-benefit biofiltration or biotreatment BMPs applied at a site scale to a status inferior to on-site retention BMPs is not justified on a water quality basis, and is poor public policy, essentially depriving the region of an extremely important and effective approach to managing water quality.

While we agree that project proponents should be required to retain stormwater where technically and economically feasible, there are numerous conditions beyond a project's control that make retention infeasible, undesirable and/or ineffective. For example, in achieving a zero discharge standard, it is necessary to either maintain pre-project ET (which is generally impracticable) or increase the volume of stormwater that is infiltrated (which is the common result). Over-infiltrating rainwater can have adverse consequences such as altering the natural flow regime of the receiving waters such that riparian habitat changes, mobilizing pre-existing contamination in shallow groundwater, increasing inflow and infiltration to sanitary sewers, causing damage from rising groundwater, and other potential effects. By discouraging the use of biofiltration LID BMPs where there are more appropriate than retention, the Administrative

Draft Permit irresponsibly encourages the use of retention where it may have adverse consequences.

Retention BMPs are not necessarily more effective than biofiltration BMPs as the Administrative Draft Permit implies, especially considering the back-to-back-to-back nature of storm systems that arrive in southern California during winter months and deliver the majority of total rainfall volume. The Administrative Draft Permit establishes a SWQDv that must be retained, but does not specify the time over which this volume must be drawn down (i.e., drained) in order to have capacity for the volume from subsequent storms. The rate at which the SWQDv can be drained is a function of the infiltration rates of soils and the demand for harvested water. Where soils are not sufficiently permeable and/or where harvested water demands are moderate to low, the drawdown time of retention BMPs can be in the range of several days to several weeks.

In comparison, biofiltration BMPs are designed with engineered soils that can generally drain the SWQDv much more quickly, on the order of several hours. In cases where retention opportunities are limited, this results in a higher level of capture and treatment by biofiltration BMPs than retention BMPs, which can more than offset the lower "treatment efficiency" afforded by biofiltration compared to full retention. For example, based on rigorous technical analysis contained in the Orange County Technical Guidance Document (Figure III.2, Page III-11), a hypothetical biofiltration BMP draining in 12 hours would achieve approximately 25 percent greater treatment of average annual stormwater runoff volume than an equivalently sized retention BMP that drains in 72 hours and approximately 60 percent greater treatment than a retention BMP that drains in 10 days.

Because drawdown time is an important factor in (i) assessing BMP effectiveness and (ii) evaluating the site-specific determination of whether retention or biofiltration are preferable, we strongly recommend (in addition to allowing the use of biofiltration or biotreatment systems to meet the retention standard) including a secondary performance metric of managing 80 percent of annual runoff volume using continuous simulation modeling. This provides a means of accounting for the performance of strictly on-site retention BMPs versus the addition of biofiltration or biotreatment BMPs which can be designed to manage a greater volume of average annual runoff volume than retention BMPs of the same size. The total amount of water captured and treated and associated pollutant load reduction should be a primary deciding factor in whether retention or biofiltration BMPs are selected for a given project. As written, the Administrative Draft Permit strongly discourages an entire group of effective practices which have the potential to provide better protection of water quality, when compared to retention, in a wide range of cases. Attachment 3 provides suggestions for permit language which corrects these deficiencies.

3. Hydromodification control measures should allow use of the EP method to meet in stream standards; recognize multiple types of channel hardening when evaluating applications for hydromodification control exemptions

In Attachment 3, we also make suggestions for improving the consistency of hydromodification control standards with those identified and allowed in the South Orange County MS4 permit. Specifically, we recommend providing for an in-stream hydromodification control performance standard using the erosion potential (EP) approach and recognizing that there are a number of different types of channel hardening that have been used for armoring in stream systems besides concrete.

The Administrative Draft Permit provides an "on-site" option for addressing hydromodification through flow duration control. This is an important element of the hydromodification control standard. However the Administrative Draft Permit is incomplete without an option to assess and demonstrate hydromodification control through in-stream metrics. In many cases, significant development within a watershed has already caused hydromodification impacts. Requiring project-by-project flow duration control for each new project may not address the existing issue as effectively as a regionally-coordinated approach that combines upland control with in-stream remedies. Including the EP standard enables the development of more comprehensive approaches that include both upland controls and stream modifications (i.e., restoration). This option is critical for more effectively and efficiently protecting the region's aquatic resources.

Additionally, the Administrative Draft Permit includes an unnecessarily narrow definition of hardened channels that includes only those channels lined with concrete. Other forms of artificial hardening may be comparably resistant to hydromodification impacts, such as channels that are lined with rip rap, armored with soil cement, or armored with other practices. While the Permittees or the project proponent should be responsible for demonstrating that a specific channel material is sufficiently stable, the narrow definition currently provided by the Administrative Draft Permit does not allow the use of sound engineering judgment and does not allow for use of innovative materials.

Finally, the Administrative Draft Permit should explicitly recognize the findings of hydromodification management plans (HMPs) that have been previously approved by this Board. The South Orange County HMP and the San Diego County HMPs were both the products of rigorous technical analysis based on the state of the practice, which were reviewed in detail by Board Staff. The findings of these efforts must not be jeopardized under the new terms of the Administrative Draft Permit. Specifically, findings regarding exempt water bodies must be appreciated and upheld, and they should be explicitly recognized in the Administrative Draft Permit per our suggested redline.

4. **The Permit must preserve important provisions for watershed level design and implementation of LID BMPs.**

The proposed development project criteria and requirements in the Administrative Draft Permit do not include the language in the current South Orange County Permit that provides for Alternative Compliance for Watershed-Based Planning (See page 40-41 of the 2009 Permit). We ask that the Regional Board continue to recognize the protections to water quality and enhancements to water bodies which are achieved through watershed-based projects such as the Rancho Mission Viejo Ranch Plan, as it has in the current South County MS4 permit, and define Watershed Planning as an alternative and co-equal approach to the project-specific requirements. Attachment 3 to this submittal contains suggested redline language for addition to the Administrative Draft Permit.

Concluding Remarks:

BIA/SC and CICWQ have been active participants and contributors to the creation of improved MS4 permits across southern California. We continue to believe that rational, *implementable*, and *effective* permit requirements are critical to achieving great progress concerning water quality and our environment. We hope that these comments are received in the manner in which they are intended – to continue the discussion of how we can create a workable permit that improves water quality to the maximum extent practicable. We remain committed to a positive dialog with the Board and its staff – one that will result in an informed, balanced and effective permit.

If you have any questions or want to discuss the content of our comment letter, please feel free to contact me at (951) 781-7310, ext. 213, (909) 525-0623, cell phone, or mgrey@biasc.org.

Sincerely,

Mark Grey, Ph.D.
Director of Environmental Affairs and Technical Director
Building Industry Association of Southern California and
Construction Industry Coalition on Water Quality

SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD DRAFT MS4 PERMIT: A CASE STUDY

Dennis Bowling, PE, MS; Mark Grey, Ph.D; Luis Parra, Ph.D, PE, MS, CPSWQ, ToR, D.WRE; Tory Walker, PE, CFM; Shawn Foy Weeden, GE, PE

On March 27, 2013, the San Diego Regional Water Quality Control Board (Region 9) ("RWQCB") released its Revised Tentative Order No. R9-2013-0001 (National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region) (hereafter, "Revised Draft Permit"). This article analyzes four components of the Revised Draft Permit, and identifies concerns with the Revised Draft Permit's treatment of those components based on the evidence that was before the RWQCB during its crafting of the Revised Draft Permit. The four components of the Revised Draft Permit are: hydromodification BMP requirements, the identification of a "pre-development" condition, Low Impact Development and the removal of pollutants in lieu of retaining stormwater onsite, and sediment transport requirements.

I. Hydromodification BMP Requirements

The Revised Draft Permit's Requirements

The Revised Draft Permit mandates that Copermittees require Priority Development Projects[1] to implement onsite Best Management Practices[2] ("BMPs") to manage hydromodification that may be caused by storm water runoff discharged from a project such that post-project runoff conditions must not exceed pre-development runoff conditions by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat downstream of Priority Development Projects). (Revised Draft Permit, Provision E.3.c.(2)(a).)

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[1] Priority Development Projects include: new development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site), or redevelopment projects that create or replace 5,000 square feet or more of impervious surface (collectively over the entire project site); new projects that create 5,000 square feet or more of impervious surface (collectively over the entire project site), and support restaurant, hillside development project, parking lot, or street, road, highway, freeway and driveway uses; new or redevelopment projects that create or replace 2,500 square feet or more of impervious surface (collectively over the entire project site), and discharge directly to an Environmentally Sensitive Area; new development projects that support use of an automotive repair shop or retail gasoline outlet, and new or redevelopment projects that result in the disturbance of one or more acre of land and are expected to generate pollutants post construction. (Revised Draft Permit, Provision E.3.b.(1))

[2] The Revised Draft Permit defines Best Management Practices as "Defined in 40 CFR 122.2 as schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage." (Revised Draft Permit, Attachment C, p. C-2.)

Copermittees have the discretion to exempt a Priority Development Project from Provision E.3.c.(2)(a)'s hydromodification management BMP performance requirements in three limited circumstances: where the project discharges storm water runoff to existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; where the project discharges stormwater runoff to conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific ocean; where the project discharges storm water runoff to an area identified by the Copermitee as appropriate for an exemption by the Watershed Management Area Analysis incorporated into the Water Quality Improvement Plan pursuant to Provision B.3.b.(4). (Revised Draft Permit, Provision E.3.c.(2)(d).) The Fact Sheet in support of the Revised Draft Permit ("Fact Sheet') states that, other than the projects exempted through the Watershed Management Area Analysis, the exemptions are considered appropriative because there is no threat of erosion to downstream receiving waters. (Fact Sheet, page F-102.)

The RWQCB describes its position regarding its ability to include the hydromodification management requirements in the Revised Draft Permit in its Response to Comments on Tentative Order No. R9-2013-0001 ("Response to Comments"). Specifically, the Board states that federal law mandates that MS4 permits require management practices that will result in reducing pollutants to the maximum extent possible. The RWQCB states that the Revised Draft Permit's requirement that Copermittees require Priority Development Projects to control post-project runoff flow rates and durations so that they do not exceed pre-development runoff flow rates and durations by more than ten percent is appropriate and necessary to reduce erosion and the discharge of pollutants into receiving waters. (Response to Comments, pages 43-45.) In response to concerns regarding the potential requirement of hydromodification management BMPs in instances where hydromodification would not take place, the RWQCB included in the Revised Draft Permit the exemption described above for projects that discharge to conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to the receiving waters. (*Id*.) The RWQCB, however, did not identify the extent to which such channels exist and would be a practical response to the challenge presented by complying with the hydromodification requirements in various venues.

In response to comments regarding the RWQCB's ability to regulate storm flow through hydromodification management requirements, the RWQCB states that the hydromodification management BMP requirements are for the control of pollutants in storm water discharges from the MS4. (Response to Comments, pages. 58-60.) While storm flow itself may be regulated as a result of the regulation of the pollutants within those flows, the RWQCB states that the hydromodification management BMP requirements are necessary to control the discharge of pollutants generated by new development and significant redevelopment projects in storm water discharges from the MS4 to the MEP. (*Id*.)

The Revised Draft Permit's Requirements are Unsupported

Both the Fact Sheet in support of the Revised Draft Permit and the RWQCB's Response to Comments cite to certain evidence that the RWQCB claims supports the hydromodification BMP requirements included in the Revised Draft Permit. However, as described below, this evidence

does not support the manner in which the RWQCB has incorporated hydromodification BMP requirements, particularly in regard to the Revised Draft Permit's failure to categorically exempt from compliance with the Hydromodification BMP requirements those projects that will discharge to a hardened channel that is not lined with concrete.

The Fact Sheet cites Assessing the Health of Southern California Streams, Stormwater Monitoring Coalition, Fact Sheet (Fact Sheet page F-89, Footnote 29[3]) ("SWMC Fact Sheet") in support of its claim that hydromodification is largely responsible for stream system degradation in San Diego County and that steam stressors including percent sands and fines present, channel alteration, and riparian disturbance are related to physical habitat changes caused by hydromodification. In the preparation of the SWMC Fact Sheet, more than 120 sites were sampled to provide data to make this determination, and the Southern California index of biotic integrity used to differentiate stream biological condition. The determination of relative degradation of stream (as compared to minimally disturbed reference sites) was made using a statistical method known as relative risk analysis. However, the SWMC Fact Sheet contains no discussion or presentation of the stream channel conditions found at the more than 120 sites used for the risk analysis.

Further, the SWMC Fact Sheet does not provide any data or support for modifying the existing hydromodification control requirements for significantly hardened channels defined in the 2007 version of the San Diego County MS4 Permit, or the process for obtaining a waiver from onsite compliance per the 2009 approved San Diego Hydromodification Management Program. The SWMC Fact Sheet describes an on-going study of Southern California streams and their biological characteristics relative to changes potentially caused by hydromodification. However, the SWMC Fact Sheet makes no distinction in stream susceptibility to hydromodification for those systems that are already significantly hardened. Accordingly, the SWMC Fact Sheet does not support any conclusions regarding the specific effects of or susceptibility to hydromodification on creeks, streams and associated habitats in San Diego County, or limiting the Draft Revised Permit's hydromodification exemption to only concrete lined channels.

The Fact Sheet cites Schueler and Holland, 2000, Storm Water Strategies for Arid and Semi-Arid Watersheds (article 66) The Practice of Watershed Protection (Fact Sheet page F-90, Footnote 30) to support its finding that increases in watershed imperviousness of 9-22% can result in increased peak flow rates and that these increased flow rates have an effect on channel morphology. This article describes climatalogical and hydrological variables that influence stormwater runoff generation in the arid west, in general, and provides recommendations for managing stormwater runoff using best practices to control pollutants in runoff and protect receiving waters from geomorphological changes. It does not include or address any issue related to already hardened channels systems or their susceptibility to the effects of hydromodification as a result of urban development.

[3] All references to footnotes within the Fact Sheet are in reference to the footnotes as they appear in the March 27, 2013 strikeout version of the Fact Sheet, recognizing that footnote references may change in the final version of the Fact Sheet.

The Fact Sheet cites Stein, E. and Zaleski S., 2005. Technical Report 475. Managing Runoff to Protect Natural Streams: The Latest Developments on Investigation and Management of Hydromodification in California. December 30, 2005. (Fact Sheet page F-90, Footnote 31) for the proposition that increases in uncontrolled imperviousness of as little as 3-10% can result in physical degradation of intermittent and ephemeral streams, and that stream systems in California are more susceptible to morphological changes than other areas in the US. However, the technical paper itself contains qualifying findings, not addressed by RWQCB in the Fact Sheet, concerning management of hydromodification effects. Specifically, Stein and Zaleski conclude that "not all streams will respond in the same manner [to the effects of hydromodification]" and that "Certain management strategies need to account for differences in stream type, stage of channel adjustment, current and expected amount of basin impervious cover, and existing or planned BMPs." (*Stein & Zaleski*, at page 15.)

Further, from a planning perspective, the authors of the technical report recommend that hydromodification should be addressed in both General and Specific Plans in terms of the location and design of new development, as site-by-site or project-specific approaches tend to be less effective and more costly to implement. (*Id.*, pages 11-12.) The authors go on to recommend that streams be surveyed and classified in order to identify areas with the greatest risk of impact from hydromodification. (*Id.*, page 15.) Taken collectively, these statements support recognition of the nature of channel condition in establishing the need for protection from hydromodification effects, which the Draft Revised Permit does not do. To rely on this article for support, the RWQCB would need to defer the proposed hydromodification provision to watershed specific implementation under each WQIP rather than the broad implementation proposed in the Draft Revised Permit.

The Fact Sheet further cites the USEPA, Reducing Stormwater Costs through Low Impact Development Strategies and Practices, December 2007 (Fact Sheet, page F-90 Footnote 32) to support the use of water quality and hydromodification control approaches using Low Impact Development ("LID") type controls, applied at a site scale regardless of receiving water or watershed condition. This USEPA study includes conclusions drawn from case studies done throughout the United States. The Fact Sheet cites the study to support and justify the development of hydromodification control requirements for all projects in San Diego County, yet the document does not include citation to specific evidence as to the need for or effectiveness of controls or whether they would be effective in the San Diego region as opposed to the specific case studies. The study highlights seventeen case studies of the implementation of LID principles into urban stormwater runoff management, with an emphasis on comparing the cost of installing LID BMPs to traditional or conventional stormwater management controls. However, there is no data or analysis presented concerning hydromodification; rather, LID principles are emphasized generally.

The Fact Sheet cites the website www.lowimpactdevelopment.org (Fact Sheet, page F-92 Footnote 34) in support of the Revised Draft Permit's use of the definition of Low Impact Development as crafted by the Low Impact Development Center, located in Maryland. However, this general citation offers no specific evidence or support other than to bolster the RWQCB's emphasis on LID BMPs applied at the site scale as a minimum compliance measure with MS4 permit conditions.

The Fact Sheet cites Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets (USEPA 2008) (Fact Sheet, page F-95 Footnote 38) to support the use of USEPA Green Streets Guidance to design and construct new roadways or significant roadway re-construction, which, if followed, allows project proponents to be exempted from Priority Development Project status. (Fact Sheet, pages F-94-F-95.) It is also cited in support of granting exemptions for construction of new or retrofit paved sidewalks, bicycle lanes, or trails that are designed to direct runoff to vegetated pervious areas (biofiltration systems, for example). According to the Fact Sheet, the exemptions are provided to "encourage these types of projects because they provide multiple environmental benefits such as promoting walking rather than driving, which will in turn improve air quality." (Fact Sheet, page F-94.)

However, the data in the publication do not address any specific requirement related to hydromodification control, but highlight the necessary consideration of the nature of the existing built environment encountered when building in urban areas. The publication's intent is clearly stated in its introduction: "This paper will evaluate programs and policies that have been used to successfully integrate green infrastructure into roads and right-of-ways." Integration of runoff controls into the context of the existing built environment is an essential consideration.

In fact, the logic cited by the RWQCB in the Fact Sheet in allowing exemptions for projects in dense urban areas that use green infrastructure techniques to the maximum extent practicable must be considered and extended to exemptions for hydromodification control when the ultimate receiving waters are significantly hardened using concrete or other armoring techniques. The Fact Sheet finds that by retrofitting the urban landscape with roadways using green infrastructure, it "recognizes that there are spatial constraints associated with these projects, and implementation of structural BMPs are not always feasible." (Fact Sheet, page F-95.) This recognition must be made equally with the need to consider or install hydromodification controls, especially when there is no threat to receiving water channel stability, and/or space constraints may preclude installation of large structural controls.

Housing, retail, and commercial development are now regulated to occur primarily in existing urban areas in order to concentrate population and employment in already dense or increasingly dense urban areas. *See* SANDAG 2050 Regional Transportation Plan, p.3-3 ["[The San Diego] region will meet or exceed [the SB 375] targets by, among other means, using land in ways that make developments more compact, conserving open space, and investing in a transportation network…"]; California Gov't Code § 65584.04(d)(2)(B) [California's metropolitan planning organizations are directed by SB 375 to consider the "availability of land suitable for urban development" -- including "opportunities for infill development and increased residential densities."]; California: A Primer on AB 32 and SB 375, Partnership for Sustainable Communities [an "[I]ncreasing the number of people living in cities and compact suburbs where transit and amenities are already in place may have a bigger impact on regional emissions, because those people will tend to walk to stores and take transit to work.".) Projects located in urban areas must comply with water quality LID treatment control requirements to the MEP, which will provide multiple environmental benefits, including improving receiving water quality for those runoff events up to the 85th percentile 24-hour storm. As urban areas are already served by hardened storm drain systems and flood control channels, there will be no effect on beneficial

uses in the receiving water from runoff greater than the water quality design capture volume. In fact, water quality would be expected to improve through the implementation of LID BMPs, and other benefits will be realized including decreases in traffic and associated pollutant load production, improved air quality through a reduction in vehicle traffic, and an overall increase in urban vegetation through the introduction of vegetated bioretention devices and urban street vegetation plantings as recommended in the Green Streets Guidance document.

Both the Fact Sheet and the Response to Comments cite E.D. Stein, F. Federico, D.B. Booth, B.P. Bledsoe, C. Bowles, Z. Rubin, G.M. Kondolf, A. Sengupta. Technical Report 667. Southern California Coastal Water Research Project. Costa Mesa, CA (2012) (Fact Sheet page F-101 Footnote 41; Response to Comments, pages 171, 183-184). The Fact Sheet cites Technical Report 667 in support of the development and use of an Alternative Compliance Program for those Priority Development Projects that cannot manage the applicable hydromodification control volume onsite, and instead require an off-site location in order to provide equivalent control or in-lieu payments to a fund providing resources to upstream or across watershed boundary projects. (Fact Sheet, page 101.) In addition, the RWQCB's Response to Comments cites the Technical Report in response to stakeholder comments in support of the very limited granting of exemptions to Priority Development Projects for installing onsite hydromodification control.

An Alternative Compliance Program is an established element of fourth term Phase I MS4 permits in California. However, with respect to considering and granting limited hydromodification control exemptions as described in the Response to Comments, at pages 171, 183-184, and 190, the RWQCB misinterprets the Technical Report's findings and the findings of an underlying scientific study cited in the report, and it does not consider other important findings and statements made in the report to support consideration of such exemptions.

In responding to comments regarding Hydromodification BMP requirements, the RWQCB cites two of the Technical Report's findings to support the statement that it "disagrees conceptually that blanket exemptions should be granted to all redevelopment projects that discharge to hardened channels." (Response to Comments, pages 183-184). First, the Regional Board incorrectly cites the Technical Report's finding that "the exemption of many small projects from hydromodification controls can result in cumulative impacts to downstream waterbodies...." (Technical Report 667, page 26; see Response to Comments, pages 183 and 190) This finding was made relative to receiving waters that are known to be susceptible to the additive effects of hydromodification, not with specific respect to receiving waters that are already concrete lined or otherwise significantly hardened. Moreover, the quotation's placement in the report is (i) found within a discussion of watershed scale hydromodification management concepts (especially as it applies to known or potentially susceptible receiving waters), not with specific respect to receiving waters that are already significantly hardened, and (ii) within a specific discussion of how current management strategies in municipal stormwater permits apply hydromodification standards; the author's note that requiring LID at all projects is positive measure for hydromodification, but the RWQCB's citation to Technical Report 667 does not appear to acknowledge this point.

The RWQCB cites the Technical Report work done by Booth and Jackson (1997) in King County, Washington to support its position that blanket exemptions not be granted to Priority Development Projects. This peer reviewed article described work done in an area undergoing rapid urbanization in east King County, Washington, where stream hydromodification sensitivity to land development was being recognized and measured. The empirical underpinning of the article was the changes noted in watershed imperviousness as a result of land development and corresponding changes in receiving water geomorphology as a result of development induced hydromodification. The watersheds and streams draining those watersheds were predominately under forest cover (see Booth and Jackson (1997) Table 1), which is unlike any receiving water system in San Diego County, and the specific stream systems were "natural" in channel condition. The article did not mention or address watersheds containing hardened receiving water channels. The conditions described by Booth and Jackson (1997) are much different and not representative of the conditions experienced by projects being developed within urban areas served by already hardened channel systems, and therefore do not support the RWQCB's position.

Technical Report 667 addresses the fact that stormwater permits may offer exemptions "for projects discharging to hardened channels or waterbodies," and cautions that "these exemptions may not be supportive of future stream restoration possibilities." Yet, its authors hedge such statements by stating that "a further limitation of the current permit structure is that there is no consideration of project characteristics such as position within the watershed and sensitivity of the receiving water reach....." (Technical Report 667, page 26.)

Second, the RWQCB repeatedly quotes Technical Report 667's finding that "an effective management program will likely include combinations of onsite measures (e.g., low-impact development techniques), in-stream measures (e.g., stream habitat restoration), and off-site measures. Off-site measures may include compensatory mitigation measures at upstream locations that are designed to help restore and manage flow and sediment yield in the watershed." (Technical Report 667, Page 26; see Response to Comments, pages 171, 184, 190; Fact Sheet, Page F-101).

The RWQCB cites to this quote to (i) support inclusion of the Alternative Compliance Program (Response to Comments, page 171), and (ii) support granting limited exemptions to Priority Development Projects for hydromodification control (Response to Comments, pages 184 and 190). While it is true that alternative compliance options should exist for those projects that drain to receiving waters known or believed to be susceptible to hydromodification effects, it is inappropriate to consider such options for projects that drain to already hardened channel systems because there is no threat, now or in the future, to downstream beneficial uses as a result of redevelopment. There is no scientific or technical nexus between the impact on the receiving water and the need for control. At worst case, any redevelopment project qualifying as a Priority Development Projects will contribute at least the same amount of runoff to the receiving water and likely much less if LID BMPs are feasible for implementation.

In the same section of comprehensive approaches to hydromodification management described in Technical Report 667 from where the quotation is derived, Technical Report 667's authors state that "the variety of types and conditions of receiving waters should result in a range of

requirements. This also means that objectives, and the management strategies employed to reach them, will need to acknowledge pre-existing impacts associated with historical land uses." The RWQCB must also consider this type of information in establishing appropriate exemptions for already hardened channel systems in urban areas within its jurisdiction.

The Revised Draft Permit's treatment of hydromodification management BMPs represents a significant change from the Final Hydromodification Plan for San Diego County, dated March 2011 ("San Diego HMP"). For redevelopment projects, these performance requirements are more stringent than the performance requirements of the San Diego HMP because they require evaluation of pre-development runoff conditions rather than pre-project runoff conditions.[4] Pre-development runoff conditions are defined as approximate flow rates and durations that exist or existed onsite before land development occurs. (Revised Draft Permit, Attachment C, page C-9.) For redevelopment projects, this equates to runoff conditions from the project footprint assuming infiltration characteristics of the underlying soil, and existing grade (i.e., using the parameters of a pervious area rather than an impervious area).

For many redevelopment projects, the difference between pre-development conditions and pre-project conditions is significant. This would require redevelopment projects on sites that are fully built to size hydromodification management BMPs as large as they would have been sized for a new development based on an estimate of the pre-project condition, yet they must be fit within the constraints of an already developed site. Furthermore, the change from a pre-project condition to pre-development condition requirement effectively invalidates some of the potential exemptions that certain redevelopment projects could have applied for under the approved San Diego HMP. Those approved exemptions could have facilitated the redevelopment process, encouraging redevelopment over new development. The exemptions are reasonable and are supported by extensive science and evidence. For example, under the San Diego HMP, projects that reduce impervious areas and reduce 2-year and 10-year peak flows to all outlets would be exempt. This exemption was a simple way to encourage redevelopment by removing the significant burden of hydromodification management BMPs, while achieving a net improvement to the watershed. Under the Revised Draft Permit, if adopted, this exemption would be effectively invalidated by the requirement to consider pre-development condition instead of pre-project condition because no project can reduce imperviousness below a pre-development condition. (Brown and Caldwell, Final Hydromodification Management Plan, prepared for County of San Diego, California, January 13, 2011.)

The other San Diego HMP exemption that may be invalidated or made more difficult to achieve by the Revised Draft Permit requirement to consider pre-development condition is its urban infill exemption. In the case of the urban infill exemption, a considerable effort was expended by the Copermittees, the San Diego HMP consultant, and the Technical Advisory Committee to prepare a cumulative impacts analysis to determine the thresholds and criteria for this exemption, and it was approved by the RWQCB as part of the San Diego HMP.

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[4] The State Water Resources Control Board recently concluded that determining pre-development conditions and using them as the baseline was not feasible at this time. (See e.g. SWRCB California Department of Transportation Municipal Separate Storm Sewer System (MS4) Permit Comment Response Report (April 27, 2012), at page 4.).

The Revised Draft Permit also presents a list of criteria for exemptions from hydromodification management BMP performance requirements. (Provision E.3.c.(2)(d)) This list of criteria omits certain exemptions that were included in the RWQCB's 2007 MS4 permit, pursuant to Order No. R9-2007-0001. Exemptions available under R9-2007-0001 that are not included in the Revised Draft Permit are: channels that are "significantly hardened (e.g., with rip-rap, sackcrete, etc.)" (note this means channels hardened with materials other than concrete – channels that are concrete lined to the Ocean will still be exempt), and projects where "the sub-watersheds below the projects' discharge points are highly impervious (e.g., >70%) and the potential for single-project and/or cumulative impacts is minimal." The list also does not include exempt river reaches that were approved as part of the Final HMP dated March 2011 (portions of Otay River, San Diego River, San Dieguito River, San Luis Rey River, and Sweetwater River). These exemptions were based on extensive studies. (*See* Brown and Caldwell, Final Hydromodification Management Plan, prepared for County of San Diego, California, January 13, 2011.) While the Revised Draft Permit does not preclude these previously exempt channels, rivers, or highly impervious watershed areas from being exempt under a Water Quality Improvement Plan (WQIP), it requires a complete new analysis ("Watershed Management Area Analysis" defined in Provision B.3.b.(4)(a)), and vetting through the public review and approval process of the WQIP in order to re-establish the exemptions through the WQIP. Copermittees, the San Diego HMP consultant, and the Technical Advisory Committee have already expended considerable efforts to identify criteria for exempt river reaches. The Revised Draft Permit does not identify any evidence that supports this change. Copermittees should not have to prepare a new study to maintain these exemptions, as they have already been reviewed and approved during the development of the San Diego HMP.

Finally, pursuant to Provision E.3.(d) of the Revised Draft Permit, the updated performance requirements for hydromodification management BMPs must be incorporated into the BMP Design Manual (formerly Standard Urban Stormwater Mitigation Plan). Based on Provision F.2.b, this will be due three months following approval of the WQIPs. Pursuant to Provision E.3.d, until a Copermittee has updated its BMP Design Manual, the Copermittee must continue implementing its current BMP Design Manual. On this basis, until the BMP Design Manual is updated and implemented, a pre-project condition rather than pre-development condition will be the standard for curve-matching to meet the San Diego HMP criteria, and all exemptions currently available in the approved San Diego HMP will remain available. New HMP exemptions may be created where appropriate through the WQIP process.

II. **Hydromodification Baseline: Pre-Development Runoff Conditions**

The Revised Draft Permit's Requirements

The Revised Draft Order requires that post-project runoff conditions mimic "pre-*development* runoff conditions", as opposed to pre-*project* runoff conditions. (Revised Draft Order, Provision E.3.c.(2)(a); Fact Sheet, p. F-99.) The Revised Draft Order defines Pre-Development Runoff Conditions as "Approximate flow rates and durations that exist or existed onsite before land development occurs. For new development projects, this equates to runoff conditions immediately before project construction. For redevelopment projects, this equates to runoff conditions from the project footprint assuming infiltration characteristics of the underlying soil,

and existing grade. Runoff coefficients of concrete or asphalt must not be used. A redevelopment Priority Development Project must use available information pertaining to existing underlying soil type and onsite existing grade to estimate pre-development runoff conditions." (Revised Draft Permit, p. C-8.)

The RWQCB stated, without evidence, that using a hydrology baseline that approximates that of an undeveloped, natural watershed is the only way to facilitate the return of more natural hydrological conditions to already built-out watersheds, and ultimately improved stream health, and that using pre-*project* hydrology as a baseline for redevelopment projects would result in propagating the unnatural hydrology of urbanized areas, which would not support conditions for restoring degraded or channelized stream segments. Furthermore, reducing the volume of storm water runoff associated with the urbanized flow regime will also result in reducing the discharge of pollutants into receiving waters, since storm water runoff from impervious surfaces contains untreated pollutants. (Fact Sheet, page F-99.)

The Revised Draft Permit indicates that the RWQCB understands that approximating the pre-development runoff condition associated with a redevelopment site is not straightforward because factors such as natural grade and native vegetation for the site cannot be precisely known. (Fact Sheet, page F-99) For this reason, the RWQCB expects project designers and the Copermittees to approximate pre-development runoff conditions using existing onsite grade and assuming the infiltration characteristics of the underlying soil. (Fact Sheet, pages F-99 – F-100). Redevelopment projects are to use available information pertaining to existing underlying soil types (such as soil maps published by the National Resource Conservation Service), onsite existing grade, and any other readily available pertinent information to estimate pre-development runoff conditions. (*Id*.) The RWQCB asserts that an area's pre-development hydrology can only be roughly estimated and cannot be precisely known, but that using the hydrology of a natural condition, even if not precisely known, will provide significant benefit to receiving waters over using the hydrology associated with developed surfaces. The RWQCB finds that in order to achieve the goals of the Clean Water Act to "restore and maintain the chemical, physical, and biological integrity of the nation's waters [emphasis added]," the most appropriate standard to use for hydromodification management is the standard associated with the pre-development condition. (Fact Sheet, pages F-99-F-100.)

The Revised Draft Permit's Requirements are Unsupported

The RWQCB's findings in support of these hydromodification requirements are contradicted, however, by the California State Water Resources Control Board's ("SWRCB") statements as part of the 2012 renewal of the California Department of Transportation's multiple separate storm sewer system permit. In its April 27, 2012 response to comments regarding hydromodification, the SWRCB stated that the use of a "pre-development" standard for hydromodification is not feasible at this time. (See SWRCB California Department of Transportation Municipal Separate Storm Sewer System (MS4) Permit Comment Response Report (April 27, 2012), at page 4.) Specifically, the Board stated:

> It is not possible to develop a mutually agreed-upon standard for pre-development hydrology without a lengthy stakeholder process.

> One of the biggest complicating factors is that our hydrology has been significantly altered by the addition of dry weather flows, sometimes in volumes that are 3-5 times the volume of stormwater flows. Biocriteria need to be developed for the state and the ecological limits of flow alteration that can be tolerated and still have some favorable biological outcome need to be determined. This is still 5-10 years away. The pre-project standard is appropriate at this time.

The RWQCB should not take action to implement an approach that the SWRCB has determined to be infeasible. (See United States v. California (SWRCB) (1986) 182 Cal.App.3d 82, 109.)

III. LID and Onsite Retention of Stormwater

The Revised Draft Permit's Requirements

The Revised Draft Permit modifies its prior provisions relating to structural BMP performance requirements for Priority Development Projects, requiring that those projects implement onsite structural BMPs to control pollutants in storm water that may be discharged from a project. Specifically, under Provision E.3.c.(1)(a) of the Revised Draft Permit, Priority Development Projects are required to implement Low Impact Development (LID) BMPs that are designed to retain onsite 100 percent of the pollutants contained in the volume of storm water runoff produced from a 24-hour 85th percentile storm event.[5] (Revised Draft Permit, p. 93.)

The Fact Sheet for the Revised Draft Permit indicates that the 85th percentile storm event is the design capture volume that has been used for treatment control BMPs previously, and that it is the MEP standard recognized by the RWQCB and is consistent with the Fourth Term MS4 permits for Los Angeles, Orange, Riverside and Ventura Counties. (Fact Sheet, page F-96.)

Under Provision E.3.c.(1)(a)'s onsite retention requirements, the designer of a Priority Development Project would select a system of BMPs that would retain onsite – through interception, storage, infiltration or evaporation – 100 percent of the pollutants in the 85th percentile storm event design capture volume. (See Fact Sheet, page F-97.) The Fact Sheet for the Revised Draft Permit states that such retention BMPs are necessary to capture and retain the pollutants generated from a Priority Development Project. (*Id.*) Pursuant to Provision E.3.c.(1)(b), in the event a Priority Development Project determines that onsite retention is not

[5] The Revised Draft Permit describes a 24-hour 85th percentile storm event as follows: "This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals." (Revised Draft Permit, page. 93, former Footnote 27.)

feasible, it may utilize flow-through treatment control BMPs to achieve the equivalent pollutant load removal that would have been achieved if the design capture volume were fully retained onsite. However, "In any event, no matter what types of BMPs (or combination of BMPs) are chosen, 100 percent of the pollutants contained in the design capture volume must not be allowed to be discharged from the Priority Development Project." (*Id*.)

Finally, if onsite retention is found to be cost prohibitive or not to provide the water quality benefit to the watershed as would implementing BMPs elsewhere in the watershed, Provision E.3.c.(1)(c) allows for the use of a combination of onsite retention BMPs, and the implementation of an Alternative Compliance Program described in Provision E.3.c.(3).

The Revised Draft Permit's Requirements are Infeasible within the Region

As described below, the requirement is infeasible and not supported by evidence cited to in the Revised Draft Permit, the Fact Sheet that supports it, the RWQCB's Response to Comment, or elsewhere.

Infiltration is Largely Infeasible in Region 9

The soil types in Region 9, and particularly San Diego County, are likely infeasible for infiltration where stormwater could eventually reach the underground aquifer. More than 70 percent of the soil types found in San Diego County possess a Soil Hydrologic Group classification of C and D (USDA, 1973). A large majority of the land area possesses a classification of C or D (SANDAG, 2007) and soft/hard rock (CGS, 2007). Using infiltration as a preferred method of stormwater remediation county-wide, therefore, is unsupported. Clearly stated, in the appropriate soil type, infiltration is a preferred alternative. In the wrong soil type the results could be catastrophic. (See photos 1 & 2).

Photo 1 – La Jolla Landslide (Ardath Shale Formation, Claystone, Hydrologic Group D)

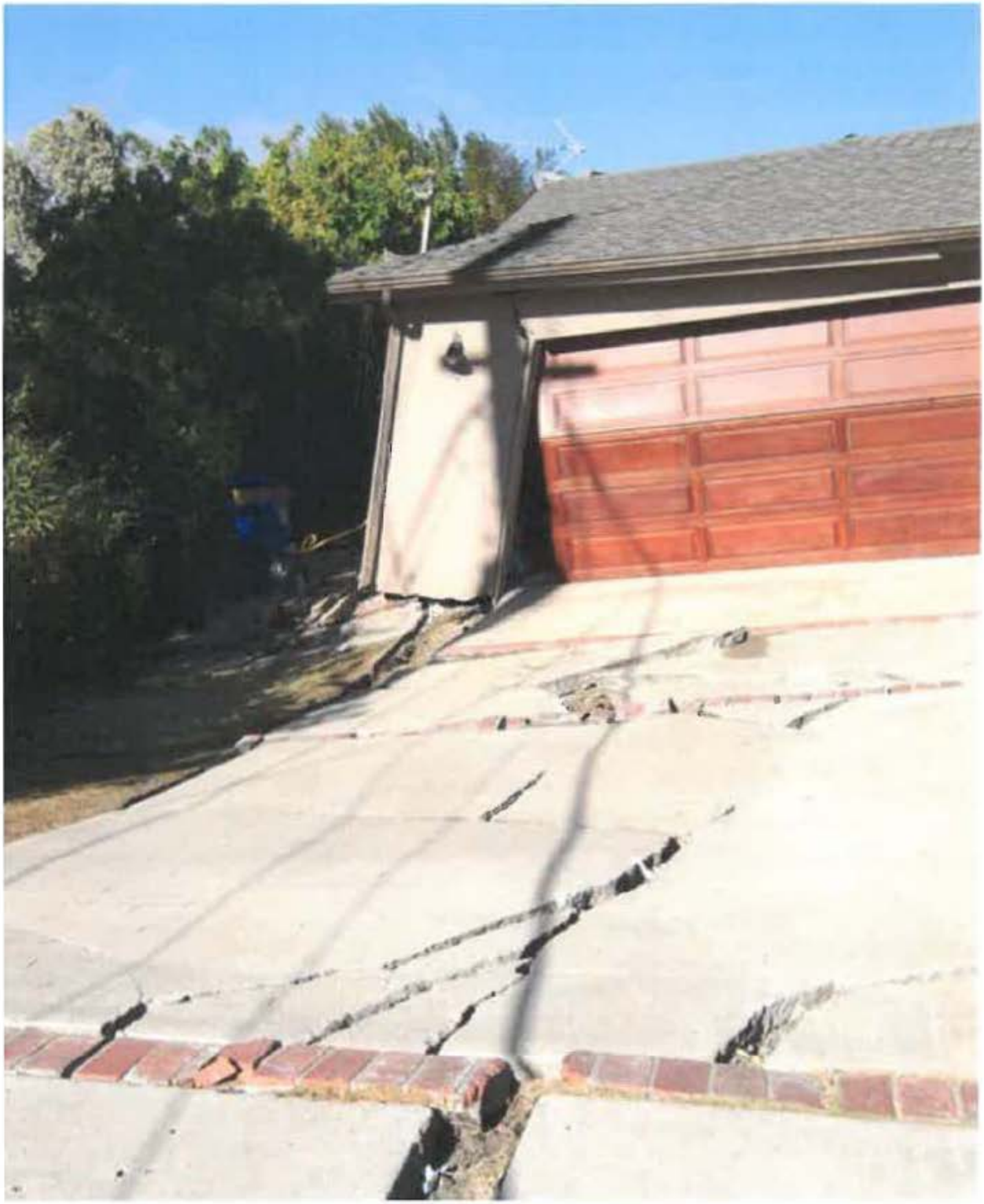

Photo 2 – La Jolla landslide (Ardath Shale Formation, Claystone, Hydrologic D)

For 70 years or more, both geotechnical engineers and civil engineers have designed projects to minimize water infiltration into the soils around and adjacent to buildings. A majority of geotechnical construction litigation is water intrusion related. (See Das, Braja M., Principles of

Geotechnical Engineering, 1994.) Water in clay based soils causes heaving, settling and failure of pavement, retaining walls and buildings. In extreme cases, these soils are prone to slippage, sinkholes or landslides. Additionally, when water enters these soil types it can travel laterally until it finds a utility trench, water or sewer line and then can undermine those systems. (Living with Expansive Soils, Marshall Addison, PhD. http://milliondollarstudent.com/ramjack/PDF/Living_with_Expansive_Soils.pdf; Low Impact Development Handbook, Stormwater Management Strategies, December 31, 2007, Page 39.) The water in these soils cannot infiltrate deep into the ground but moves as it can find voids and areas of better permeability. (Low Impact Development Handbook, Stormwater Management Strategies, December 31, 2007, Page 39.) (See photo 3, below.)

Photo 3 – Perched water visible on lower half of hillside (water migration)

Additionally, there are areas of the County where the soils are hard rock and infiltration cannot occur because water does not easily infiltrate into rock. (United States Department of Agriculture (USDA), Soil Survey, San Diego Area, California, December, 1973; SANDAG, County of San Diego Hydrology Manual Soil Hydrologic Group Map, 2007. California Geologic Survey (CGS), Preliminary Surface Geologic Materials Map, 2007.)

Since much of the construction within San Diego County is slab on grade construction, retaining water onsite through infiltration can even cause minor health and safety problems. Cured

concrete is still a porous material. If water is present in the soil, the slab can wick up water into the building (photos 4, 5 & 6). As buildings are well insulated and energy efficient, this water can lead to mold growth and damage anything placed on the slab (floor coverings, cabinets, furnishings). (Uniform Building Code, Title 24[6].) Water in a warm environment, without sufficient airflow exchange (because of better insulation, windows, etc.) provides the ideal conditions that lead to mold growth. This could create a major construction defect litigation problem for a builder or developer. Again, the geotechnical engineers and civil engineers have stressed the importance of moving water away from building as efficiently and quickly as possible for just this reason. (Building Code Requirements for Structural Concrete (ACI 318-08) and Commentary, American Concrete Institute [requires water barriers below slabs].) While ACI requires this, typically the entire footing doesn't receive a water barrier. Additionally, during construction the water barrier often may be punctured or moved and may not be as effective as called for in the ACI standard.

Photo 4- water migration through slab into cabinetry

[6] This section of the Uniform Building Code includes energy conservation measures, including requirements for better windows, improved weatherstripping, and additional insulation, which all lead to "tighter" and more energy efficient buildings. This is contrasted with older buildings, which "breathe" meaning that they have sufficient air flow to evaporate water wicking up through the slab before it becomes a problem. In newer buildings, water cannot evaporate and problem, such as mold, result.

Photo 5 – water migration through slab (mold under vinyl flooring)

Photo 6 – water migration through slab (white coating is efflorescence)

Retention and Re-use Requirements Raise Additional Concerns

Where onsite infiltration is not feasible, the next option is the capture and storage of stormwater for re-use. If a project will capture water in order to store it, a storage container must be constructed. Since an 85th percentile, 24 hour duration rain event can produce between ½" to ¾" of rainfall in a given area of San Diego (and up to 1-½" in mountainous areas, according to the 85th Percentile Precipitation Isopluvial Map of the San Diego County Hydrology Manual; see also http://www.projectcleanwater.org/html/wg_susmp.html), the amount of water to be stored could be considerable.

The Revised Draft Permit does not effectively address what happens with the retained water or how quickly it needs to be used, since the storage capacity would need to be utilized again for future rain events. Rain barrels are often mentioned as a solution, but care must be taken with regard to water breeding insects. Additionally, most commercially available rain barrels are made of plastic which degrades in the UV from sunlight. After a few years they become brittle and are prone to failure, putting water into the surrounding soils next to the building. Additionally, utilizing the optimum number of rain barrels is impractical, as it is too large to have a significant impact on water usage due to the erratic and clustered nature of the precipitation in San Diego County. According to a continuous simulation study prepared with hourly precipitation data of Lindbergh Airport in San Diego (the best precipitation data set in the County), the optimum rain barrel volume for retention purposes is about 12 – 50 gallon barrels for every 1,000 sq-ft of roof, using the theory of Diminishing Returns. (Parra, StormCon 2010.) Cisterns are another option mentioned as a potentially viable solution. Burying a tank in the ground may not be feasible for infill and redevelopment projects due to various Building Code issues.

Unintended Consequences

Both California AB 32 and SB 375 are landmark environmental laws addressing climate change and land use adaptation to reduce production of greenhouse gases. The intent of this legislation is to:

1. Use the regional transportation planning process to achieve reductions in greenhouse gas emissions consistent with AB 32's goals;
2. Offer California Environmental Quality Act incentives to encourage projects that are consistent with a regional plan that achieves greenhouse gas emission reductions; and
3. Coordinate the regional housing needs allocation process with the regional transportation process while maintaining local authority over land use decisions

The result is to encourage growth to occur inwards into the existing urban footprint. This is defined as "in-fill" development. An unintended consequence of the Revised Draft Permit is that its requirements actually make it more attractive and cost effective to build away from the existing urban footprint because of the land necessary to comply with the new requirements in the Revised Draft Permit. The 100% pollutant capture requirement and the removal of

hydromodification exemptions on infill development render these projects both technically and financially infeasible. (Refer to photograph 7.)

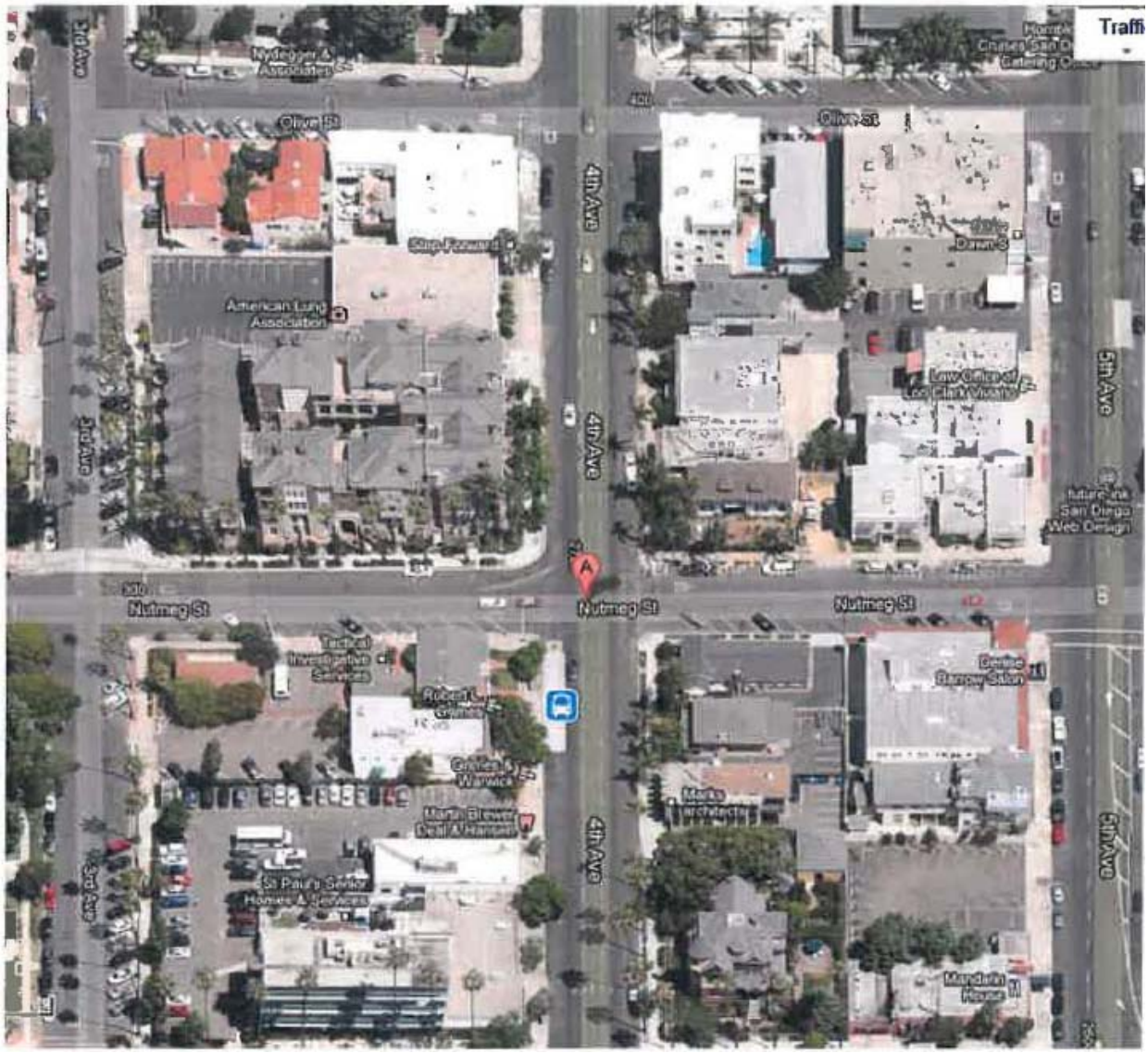

Photo 7 mid-rise condo project at the NW corner of 4th and Nutmeg, San Diego

Photo 7 shows a smart growth project on the northwest corner of 4th & Nutmeg in San Diego's highly urbanized Banker's Hill neighborhood: transit friendly (transit oriented development, TOD); walkable neighborhood; near parks, shopping and recreation (2 blocks from Balboa Park); near San Diego's airport; near Downtown/Hillcrest/Mission Valley work environments; and within the Smart Car (car 2 go) user footprint. Under the Revised Draft Permit, this project would become infeasible because of the 100% pollutant capture (infiltration/reuse) requirement and the loss of the hydromodification exemption previously included in the HMP.

The soil type at this location will not allow for infiltration. Additionally, to achieve the requisite density there is not enough land available to allow for supersizing of BMPs. There is no place to put a retention tank except under the building's parking structure. It may be infeasible to place a

tank under a building for a number of reasons: the difficulty or repairing a tank located below a building; the cost to integrate the tank into the building's foundation; if the tank were to leak, the entire building is subject to settlement issues, or failure, based on the water leaking into the surrounding soils; the added cost to operate and maintain the tank in perpetuity.

Photo 8 (street level) shows the building and that parking is located underneath the building. This is "podium" type construction and next to high-rise development, the most expensive type of construction for "smart growth" infill development. Complying with the Revised Draft Permit means this type of project becomes infeasible, both technically and financially. The Revised Draft Permit is silent on this issue and has not addressed this concern. The current language, whether intended or not, seems to eliminate this type of development project which is mandated and encouraged under SB 375.

Photo 8 – Street view: 4th and Nutmeg, San Diego (notice living units at ground level)

Whether or not water is infiltrated or stored onsite for reuse, the Revised Draft Permit includes no consideration of the fate of the pollutants existent in that water. In a storage tank or cistern, like a septic tank, gravity will cause most of the pollutants to fall to the bottom of the tank where they will remain and build up. Over time, the tank would gather year's worth of pollutants. If the tank owner is drawing the water for re-use, the water typically in any tank is drawn from the bottom, so the pollutants could be redistributed onsite. This raises questions of whether compliance with the Revised Draft Permit requirements would cause a health and safety concern to the person re-using the water, how often such a tank or cistern be emptied for cleaning, whether the mass of pollutants at the bottom of the tank would be considered a regulated waste,

and how and where a property owner could dispose of such a waste. An infiltration trench or basin would have the same pollutant disposal issues. The media (soil, sand gravel, etc.) in the trench or basin would need to be excavated and disposed of.

Another major concern with the new permit standard (infiltration or retention) is that it will deprive watersheds of the water that feeds riparian ecosystems. As the Revised Draft Permit offers creek and stream restoration or rehabilitation as an alternative compliance option to onsite hydromodification management, this raises the question of how can one restore those watercourses without the water that supplies them. (33 U.S.C. §1251(a) [the Clean Water Act was enacted "to restore and maintain the chemical, physical, and biological integrity of Nation's waters"].)

The Revised Draft Permit Includes no Support for the Ability to Comply with its Requirements

As described above, the phrase "retain onsite 100% of the pollutants" was recently added to the water quality management performance standard contained in the Revised Draft Permit (San Diego Regional MS4 permit Section E.3.c.(1)(a)). Unless a Priority Development Project can infiltrate the entire design capture volume, or reliably use the runoff collected in a harvest and use cistern system, retention of 100% of pollutants is impossible, and this is especially true for several pollutants of concern including bacteria or nutrients such as nitrogen or phosphorus.

The Revised Draft Permit offers no technical support for such a standard, including studies or data cited in the Fact Sheet, Response to Comments, or otherwise, that demonstrate 100% of pollutant can be prevented from being discharged from Priority Development Projects into the MS4 and into receiving waters. On the surface, such a requirement is conceptually feasible: no discharge equals no pollutants. However, the selection and application of retention type LID BMPs, principally soil infiltration systems and rainfall harvest and use systems, are subject to a myriad of technical infeasibility constraints, of which the RWQCB and others have identified (See for example, Orange County Model WQMP requirements and supporting Technical Guidance Document--TGD). In the absence of feasible application of infiltration or harvest and use, such a standard is unachievable. Rather, Regional Boards in California use water quality treatment design criteria that require project proponents to demonstrate that it cannot reliably retain 100% of the storm water quality design volume onsite before allowing the proponent to use biofiltration or biotreatment type LID BMPs. Only until the feasibility of these systems is exhausted may the proponent be allowed to use other types of management practices.

In the discussion in the Staff Report regarding justification for using the runoff created by the 24-hr 85th percentile rainfall event as the basis for a project's design capture volume, the RWQCB cites a Southern California Coastal Water Research Project ("SCCWRP") report prepared in 2007. This report includes findings that show the majority of pollutants from urban locations in the Los Angeles area of southern California arrive in receiving waters during the "early" part of storm events, and that the "highest constituent loading was observed early in the storm season, with inter-annual variability driven more by antecedent dry period that amount of rainfall."

The SCCWRP 2007 report also found that the "first flush" effect at land use sites was a function of watershed size. In other words, the smaller the watershed, the more pronounced the first flush

effect. Therefore, the author's note that "capturing constituent loads should focus on more than just the initial portion of the storm at moderate to large catchments". This statement, therefore, supports using the entire suite of LID type BMPs to manage urban runoff, including biofiltration systems, and supports using a secondary metric of sizing LID BMPs for retaining and treating 80% of the annual runoff volume in addition to capturing and treating individual rainfall events. In no case or instance cited in the SCCWRP 2007 report is there a recommendation or finding that supports a retention standard that achieves 100% pollutant containment. The aforementioned Orange County Model WQMP and TGD describe the LID BMP selection process and sizing criteria in detail (using both the 24-hr 85th percentile design storm and 80% annual runoff volume as sizing metrics), and provide several case study examples for support.

Such a restrictive and narrow definition of allowable LID BMPs is inconsistent with U.S. EPA guidance which promotes biofiltration and biotreatment as part of LID. Of five U.S. EPA sources regarding LID, four included biotreatment-type terms, such as detention (i.e., slow down, treat, then release), filtration, and surface release of storm water. In a compilation of case studies by U.S. EPA, most of 17 exemplary projects included biotreatment elements, such as bioretention, swales, wetlands, and green roofs. *See* U.S. EPA 841-F-07-006, discussed in a 2009 submittal from Mr. Eric Strecker, Geosyntec Consultants for the Construction Industry Coalition on Water Quality. In Mr. Strecker's analysis, each of two case studies described in another EPA document, s*ee* EPA 841-B-00-005, included the use of under-drains, and one of them specifically fed into the main storm drain system. A U.S. EPA document updated in January 2009 references additional resources, one of which refers to the many practices used to adhere to LID principles of promoting a watershed's hydrologic and ecological functions, such as bioretention facilities, rain gardens, vegetated rooftops, rain barrels, and permeable pavements. *See* EPA-560-F-07-231. A fact sheet used in conjunction with that document describes under-drains used to release treated storm water off site, permitting planted areas to safely allow filtration of storm water.

The State Water Resources Control Board (SWRCB) identifies LID as a sustainable practice that benefits water supply and contributes to water quality protection, stating that, "The <u>goal</u> of LID is to mimic a site's predevelopment hydrology by using design techniques that infiltrate, <u>filter</u>, store, evaporate, and <u>detain</u> runoff close to the source of rainfall" (emphasis added). SWRCB also states that, "LID practices include; <u>bioretention</u> facilities or rain gardens, grass swales and channels, vegetated rooftops, rain barrels, cisterns, vegetated filter strips, and permeable pavements" (emphasis added). As can be seen, SWRCB defines LID as including filtration, detention, and bioretention, and other practices, each of which produce runoff and would not be part of the LID standard under the tentative order and instead moves a project into "Alternative Compliance". In addition, SWRCB characterizes mimicking pre-development hydrology as a "goal," not an enforceable standard. *Found at*: http://www.waterboards.ca.gov/water_issues/programs/low_impact_development/.

The language in the current tentative Order, while clearly specifying a volume capture approach to sizing LID BMPs, introduces an incorrect definition of LID through restrictive application of BMPs to only those that infiltrate, harvest and use rainwater, and/or evapotranspire all of the captured water. In other words, permit language now requires that projects would be limited to zero discharge of a design storm volume with no runoff whatsoever allowed.

The US EPA defines LID as follows:

> *A comprehensive stormwater management and site-design technique. Within the LID framework, the goal of any construction project is* ***to design a hydrologically functional site that mimics predevelopment conditions.*** *This is achieved by using design techniques that infiltrate,* **filter***, evaporate, and store runoff close to its source.* (emphasis added)

http://cfpub1.epa.gov/npdes/greeninfrastructure/information.cfm#glossary .

Mandating the complete onsite retention of any sizable storm volume (i.e. runoff that never leaves as surface flows) is not a reasonable approach and the tentative Order attempts in places to redefine the allowable site design elements necessary to implement this concept. The tentative Order may implement LID in a way that is contrary to the EPA definition of LID by restricting BMPs to those that only achieve zero discharge—not allowing any BMPs that appropriately "filter" runoff, such as bioretention cells or other vegetated LID BMPs. Total, 100-percent retention remains impractical and unwise in most circumstances, and is not a goal that can be achieved for most projects within reasonable costs, despite best efforts. Moreover, such a mandate abandons the goal to mimic predevelopment conditions to the extent practicable, as EPA encourages.

The retention BMPs of infiltration, harvesting, and evapotranspiration ("ET") may be described as a first tier of LID BMPs, but they should not be universally mandated to the exclusion of all other options. As the EPA definition of LID indicates, biofiltration, bioretention, filter strips, and other BMPs based on using vegetation to promote stormwater treatment via filtration are fundamental to LID implementation. These BMPs may be specified as second tier options (although they best mimic pre-development conditions), but project proponents should have considerable discretion to use these BMPs, and should not be required to apply for a feasibility exception to do so.

The use of conventional BMPs (structural treatment installations) as the principal approach for stormwater management should be a last resort, available only when objective infeasibility criteria are satisfied, and when off-site opportunities are not readily available. When LID BMPs are infeasible, and nearby off-site options are not available, the use of conventional BMPs that have been demonstrated to be effective on the pollutants of concern should be a compliance option.

IV. Sediment Transport Requirements

The Revised Draft Permit's Requirements

The Revised Draft Permit requires Priority Development Projects to avoid known critical sediment yield areas or implement measures that allow coarse sediment to be discharged to receiving waters, such that the sediment supply is unaffected by the project. (Revised Draft Permit, Provision E.3.c.(2)(b).) The Revised Draft Permit does not define "coarse sediment"[7] as

[7] According to the technical literature, the beginning of sediment motion is not defined by the term "coarse sediment" but by more specific terms such as (1) Nearly Uniform Cohesionless

it is used in this section. The Fact Sheet supporting the Revised Draft Permit states that the requirement is necessary because coarse sediment supply is as much an issue for causing erosive conditions to receiving streams as are accelerated flows.[8] (Fact Sheet, page F-100.)

All development involves some loss of sediment. The Revised Draft Permit requires that "critical sediment yield areas" will be identified by studying the watersheds (through the Watershed Management Area Analyses[9]). These analyses would then be incorporated into the Water Quality Improvement Plans for each watershed. Thus, a new category of "Environmentally Sensitive Areas" will be identified and protected. This would be incompatible with development on that property. To understand why introducing a new category of sensitive area into the development planning process is such a concern requires an explanation of hydromodification basics and impacts on receiving waters.

Hydromodification Basics regarding Sediment Transport

Hydromodification is primarily understood within the context of impacts, potential or realized; that is, the effects of changes within a watershed on downstream fluvial systems (i.e., canyons, creeks, streams, rivers, lakes, lagoons, etc.). A change, or a number of changes, can cause or contribute to an imbalance within a fluvial system that has been in a state of dynamic equilibrium (relative stability within a range of erosivity/degradation and sedimentation/aggradation). Related secondary impacts (secondary as a consequence, not necessarily in importance) include habitat degradation, slope failures, infrastructure failures, and increased flooding risks, among others. (ADWR, 1996, 1998; USACOE, 1994).

The most common example of hydromodification is the covering of land with impervious surfaces, which deprives the waterways of naturally occurring sediment yield, while increasing runoff volumes, durations and peaks in those same waterways. Another example is the presence of a flood control dam upstream, which tends to trap sediment but also reduces damaging peak flows and volumes. (Aspen Environmental, 2006.) For the purposes of this paper, hydromodification will be understood as a direct consequence of urbanization, the covering over of land with impervious surfaces.

Sediment (Shields, 1936; Maidment, 1992), (2) Incipient Motion on Ripple and Dune Beds (Chabery et al, 1963; Mantz, 1977) ; Mixture of Nonuniform Cohesionless Sediment Sizes (Egiazoroff, Little and Meyer, Hayashi et al, among many others), and Cohesive Sediment (Mehta, (3 studies, 1986, 1989 and 1989)).

[8] This statement oversimplifies a complex issue, as in some watersheds, fine sands, dunes and ripples, and cohesive sediments can be an important geomorphic factor. (*See* Lane and Carson; Shen and Liu; Task Committee; previous studies).

[9] The Revised Draft Permit is silent as to the method to determine such critical yield areas, which could conceivably be established based upon the USLE equation (Wischmeier et al, 1971), by sediment-delivery ratio equations (Roehl, 1962), by sediment yield empirical formulas based on real measurements (Dendy and Bolton, 1976), or by more complex mathematical formulations (Ponce, 1989).

Understanding Fluvial Processes

Lane's Stream Balance Relationship states that dynamic equilibrium exists between stream power and the discharge of bed material sediment. (Lane, 1947.) It is usually stated as:

$$Q_s * D_{50} \alpha Q_w * S$$

Where Q_s is the sediment discharge, D_{50} is the sediment size, Q_w is the (water) discharge, and S is the bed slope. This proportional relationship is often graphically illustrated with a balance, as shown below, and it is not intended to be used as an equation. Some attempts to convert this relationship into an equation have been carried out. (Ponce, 1999.) The Lane relationship shows that where adjustments or modifications occur in the watershed or in the channel (in terms of Q_w, for example), another adjustment will begin to occur to preserve the equilibrium (in terms of S or Qs, for example).

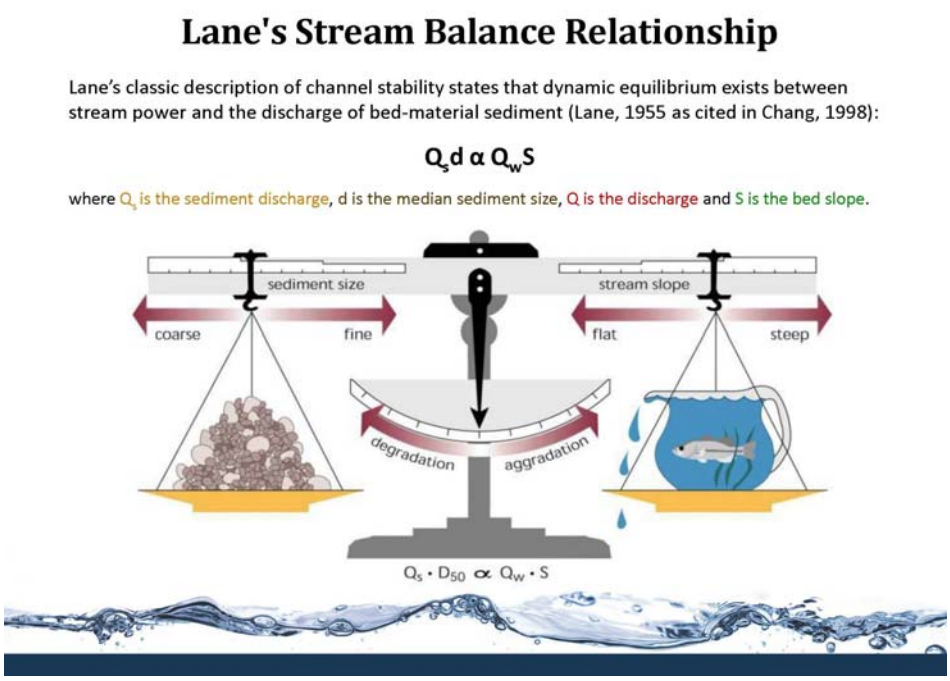

Three Local Examples

Hydromodification impacts vary, sometimes by orders of magnitude. (Hastings, 2005; Hecht, 2000.) The following three examples of fluvial systems within our region illustrate this well. Each is different, and each only represents one reach of the creek. As one travels upstream or downstream each of these creeks, impacts will vary widely.

<u>Oso Creek</u>

The photo below shows a portion of Oso Creek, approximately 1 kilometer (0.7 miles) downstream of a hardened channel. The severe degradation evident in this photo has occurred

within the past 20 years, due to development of a master planned community upstream. The composition of the bed and banks is primarily loose alluvium, so erosion has not been halted. The sediment from this reach is deposited in downstream reaches and has resulted in slope failures, biological degradation and flooding impacts downstream.

Oso Creek, approximately 1 kilometer (0.7 miles) downstream of a hardened channel

Escondido Creek

By contrast, the photo below indicates a creek in dynamic equilibrium 0.7 kilometers downstream of a hardened channel. The City of Escondido, incorporated in 1888, has certainly experienced its share of development, with most of the city draining to this natural channel for more than 100 years. This photo is typical of Escondido Creek for the remaining 23 kilometers (14 miles) to the ocean. That is not to say this creek is not subject to any degradation, only that over the decades the creek has mostly adjusted to a new state of dynamic equilibrium.

Escondido Creek in dynamic equilibrium 0.7 kilometers downstream of a hardened channel

Agua Hedionda Creek

The Agua Hedionda Creek watershed is in portions of several north San Diego jurisdictions. A 2008 Watershed Management Plan (TetraTech, 2008) identified a reach of the creek as a high priority project; Tory R. Walker Engineering, Inc. assembled a multi-disciplined team, which prepared a Preliminary Design Report for the rehabilitation of that reach. (Tory R. Walker Engineering, 2010.) The photo below illustrates the typical impacts of hydromodification within the reach, where an established Oak woodland is threatened.

Agua Hedionda Creek in Buena Vista Park near Melrose Avenue

The figures below illustrate the effects of hydromodification over time on hypothetical stream systems. (TRWE, 2010.)

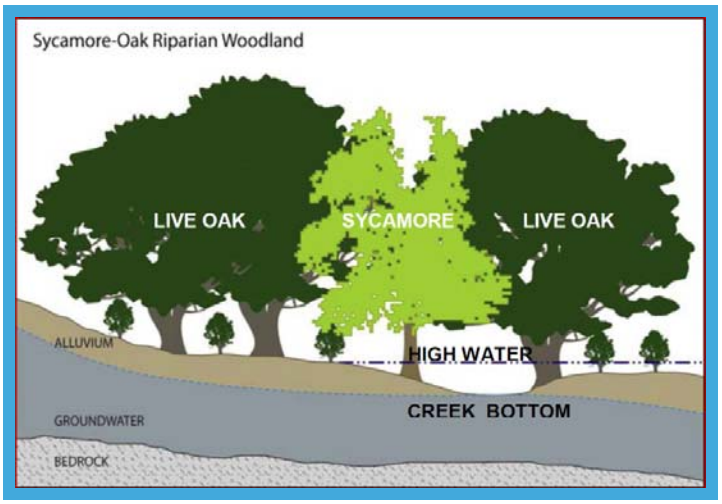

Stable System (circa 1900)

- High Groundwater Recharge
- Equilibrium Sediment Transport
- High Floodplain Function
- Low Discharge Velocities
- Dynamic and Broad Riparian Zone
- Diverse Riparian Habitat
- Sustainable Vegetation Mosaic
- Cool Seasonal Aquatic System

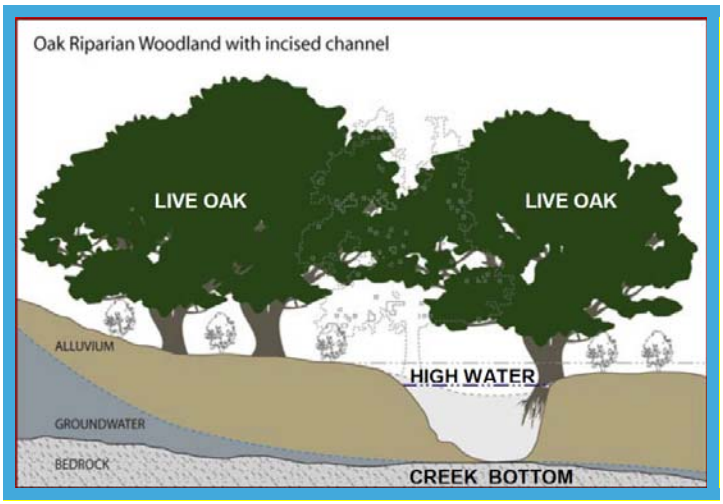

Early Incised System (Present)

- Depressed Groundwater Table
- High Groundwater Export
- Low Groundwater Recharge
- High Channel Bank Erosion
- Confined Low Floodplain Function
- High Discharge Velocities
- Diminishing Riparian Zone Width
- Low Diversity Riparian Habitat
- Poor Riparian Plant Recruitment
- Cool Seasonal/Perennial Aquatic System

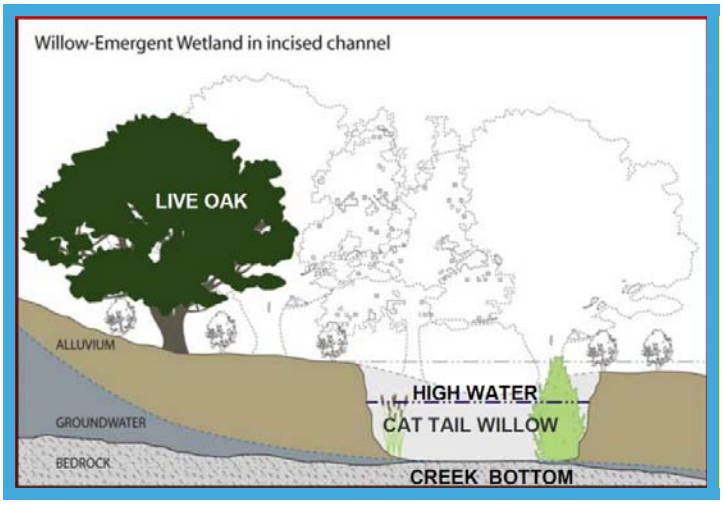

Mature Incised System (circa 2040)

- Groundwater Conditions Same as Now
- High Channel Bank Erosion
- Confined Low Floodplain Function
- High Discharge Velocities
- Diminishing Riparian Zone Width
- Low Diversity, Narrow Riparian Habitat
- High Scour Plant Loss
- Opportunistic Exotic Plant Recruitment
- Warm Seasonal/Perennial Aquatic System

Restoration of ecosystem functions that have been lost due to hydromodification may be accomplished through different mechanisms. The figure below illustrates two paths to the restoration of ecosystem functions over time – with and without human intervention to restore the lost functions. The shorter length of the "blue path" demonstrates the value of restoration/rehabilitation in a creek, whereas the length of the "red path" shows how a much longer period of time is needed for recovery of ecosystem functions when no human restorative action is taken. In the case of Agua Hedionda Creek, those ecosystem functions would be different.

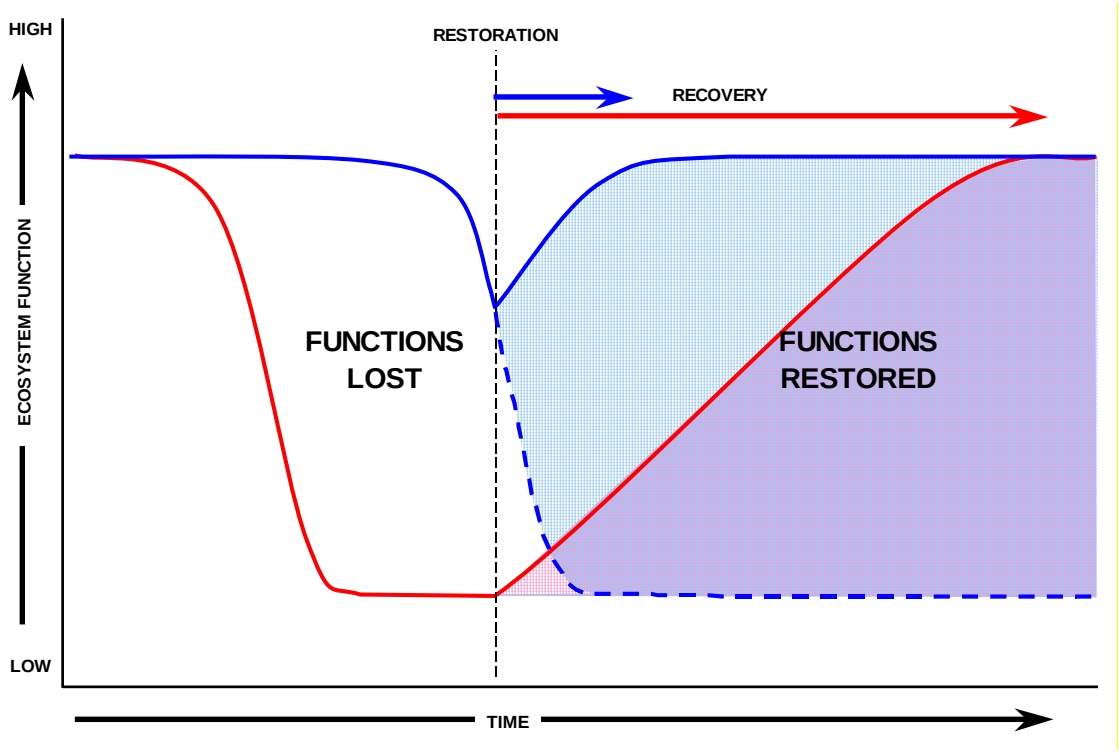

Effects of Ecosystem Trajectory on Restoration Values (TRWE, 2010.)

Stabilization

Stabilization of fluvial systems has generally been considered the typical "fix" to hydromodification. (USACOE, 1994.) Stabilization can be understood very broadly to include everything from concrete lining and piping underground to streambed or bank stabilization utilizing bioengineering techniques exclusively. Between these two "ends of the spectrum" are quite a number of techniques and types of materials, used in combination or separately, to "stabilize" these dynamic systems. Common techniques include grading of new "stable" channels, creating "benches" beside channels (thus increasing flood capacity and stability), constructing drop structures to flatten the longitudinal slopes, or meandering the stream channel to lengthen it. In addition to concrete lining, materials have typically included rock riprap, natural stone, concrete block systems, turf reinforcement mats, vegetation, imported sediment and/or cobbles of a certain gradation, gabion baskets, logs, and root wads. (NRCS, 2002; WSAHGP, 2003.)

Restoration and Rehabilitation

"Restoration" usually refers to attempts to restore a system back to a previous condition, while "rehabilitation" usually refers to attempts to improve a system while accounting for mostly irreversible changes (like a hydromodified watershed). This should not be understood as "giving up" on all efforts to lessen impacts within a watershed; rather, it should be understood within the context of the graph above. Time marches on, as the saying goes, so intervention requires an understanding of where a fluvial system is currently, along with an understanding of the current and future conditions of the watershed. For this reason, most work within fluvial systems is no longer described as "restoration," but rather "rehabilitation."

Onsite Approach Presented in Draft Permit

Attempts to address sediment balance through a directive within a permit will almost always fail; the complexity of the issue defies such an approach. The desire to compensate for the loss of course sediment due to development (even LID), or to avoid sediment yield areas altogether (both of which have been put forth in revisions of the Revised Draft Permit) shows a misunderstanding and a wrong focus on the issue by attempting to address it at the source. The currently proposed language in Section E.3.c.(2)(b) introduces a further complication, in that its implementation must necessarily prohibit the use of land for any compatible use other than allowing erosion to occur so that the downstream system has a supply of coarse sediment. This then becomes a land use decision.

Natural areas have produced sediment as part of a natural cycle of random precipitation events, vegetative cover and burns for millennia. Urbanization introduces a sudden and sometimes dramatic change to an equilibrium that has existed for a very long time (as in Oso Creek). In almost all cases throughout the San Diego Region, the effects of urbanization have already done most of the "work" on the downstream systems, so an onsite approach to the problem is much like closing the barn door after the horse has escaped. With that consideration, attempting to identify critical sediment yield areas within most of the watersheds will be an exercise in futility, as such areas would not typically be able to provide even a fraction of the amount of course sediment required to balance sediment through downstream reaches.

Another unintended consequence of the Revised Draft Permit Provision E.3.c.(2)(b) is that it will create a new land use restriction. The way this will likely proceed is that "critical sediment yield areas" will be identified by studying the watersheds (through the Watershed Management Area Analyses). Specifically, Copermittees will be required to prepare sediment yield studies of watersheds based on watershed-wide models and criteria that will approximately identify these critical sediment yield areas. These analyses would then be incorporated into the Water Quality Improvement Plans for each watershed. Thus, a new category of "Environmentally Sensitive Areas" will be identified and protected. After all, there is no other compatible use of such property, not even roads, so such property will become open space.

Sediment Balance Summary

In summary, sediment balance is very complicated and requires careful study of each watershed and fluvial system to understand how best to approach the issue. Fluvial systems, to transport the same amount of incoming sediment to downstream reaches, and eventually to the ocean, must often be modified. Many such systems are already modified, either as part of a natural process (degradation) or as the result of man-made modification. Attempts to address sediment balance through a directive within a permit will almost always fail; the complexity of the issue defies such an approach. The desire to compensate for the loss of coarse sediment due to development (even LID), or to avoid sediment yield areas altogether (both of which have been put forth in revisions of the Revised Draft Permit) shows a misunderstanding and a wrong focus on the issue by attempting to address it at the source. The currently proposed language in Section E.3.c.(2)(b) of the Revised Draft Permit introduces a further complication, in that its implementation must necessarily prohibit the use of land for any compatible use other than allowing erosion to occur so that the downstream system has a supply of coarse sediment. This

then becomes a land use decision. The best focus for this issue remains the water bodies themselves on a watershed by watershed and reach by reach basis.

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November 19, 2014

David Gibson
Executive Officer
C/O Laurie Walsh
Water Resources Control Engineer
California Regional Water Quality Control Board, San Diego Region
2375 Northside Drive, Suite 100
San Diego, CA 92108-2700

Re: Comment – Tentative Order No. R9-2015-0001, Place ID: 658018LWalsh

Dear Mr. Gibson:

Best Best & Krieger LLP serves as City Attorney for the City of Aliso Viejo ("City"). The City has reviewed the comments submitted by the County of Orange on San Diego Regional Water Quality Control Board Tentative Order No. R9-2015-0001 ("Draft Permit"). The City supports the County's comments and has requested that the City be listed as a "concurring entity" on the County's comment letter. Please consider the City's support for the County's comments when considering revisions to the Draft Permit.

If you have any questions on the City's position on the Draft Permit please do not hesitate to contact me, or Mr. Moy Yahya, the stormwater program director for the City.

Sincerely,

J. G. Andre Monette
of BEST BEST & KRIEGER LLP

cc: Moy Yahya, City of Aliso Viejo

City of Del Mar

November 19, 2014

Ms. Laurie Walsh
California Regional Water Quality Control Board, San Diego Region
2375 Northside Drive, Suite 100
San Diego, California 92108

SUBJECT: Comment – Tentative Order No. R9-2015-0001, Place ID:658010LWalsh

Dear Ms. Walsh:

The City of Del Mar (City) appreciates the process and effort the Regional Water Quality Control Board staff has made to facilitate stakeholder participation in the development of the Tentative Order. The City is providing specific comments to ensure Attachment E accurately reflects the Basin Plan Amendment to incorporate the Total Maximum Daily Load (TMDL) for Sedimentation in Los Peñasquitos Lagoon (Resolution No. R9-2012-0033).

The City participated in the three-year collaborative third party effort to develop the TMDL for Sediment in Los Peñasquitos Lagoon. At the request of the Regional Board, the City of San Diego led and funded the effort, with input from other Responsible Parties, and guidance from the Regional Board, US Environmental Protection Agency, and other stakeholders. The Responsible Parties (City of San Diego, County of San Diego, City of Poway, Caltrans, and the City of Del Mar) dedicated staff time to the development of the TMDL by preparing and reviewing documents and attending frequent meetings. The City of Del Mar generally supported the adoption of the Basin Plan Amendment and would like to ensure the language remains consistent.

Attachment E – 7. Total Maximum Daily Loads for Sediment in Los Peñasquitos Lagoon
The City requests the following revisions to make the language in Attachment E consistent with the language in the Basin Plan Amendment to incorporate the TMDL for Sedimentation in the Los Peñasquitos Lagoon and consistent with other TMDLs incorporated into the MS4 Permit Attachment E. The strikethrough text represents recommended deletions and the underlined bolded text represents recommended additions.

The City requests the following language, similar to adopted Resolution No. R9-2012-0033 page 3, be added to Attachment E on page E-53 section 7.b.(2)(a). Final Water Quality Based Effluent Limitations:

(a) Final Receiving Water Limitations

Discharges from the MS4s must not prohibit the sustainable restoration of **80 percent of the 1973 acreage of the lagoon (tidal and non-tidal)** saltmarsh **habitat** ~~vegetation of at least~~ **(**346 acres**) OR**

(b) Demonstrate that implementation actions are active on and/or affecting 346 acres with continued monitoring to ensure 80 percent target achievement.

The City also requests the following language, similar to adopted Resolution No. R9-2012-0033 page 3 and other TMDLs included in Attachment E, be added to Attachment E on page E-54 section 7.b.(3):

> (a) Successful restoration of **80 percent of the 1973 acreage of lagoon (tidal and non-tidal) salt marsh habitat (346 acres)** ~~346 total acres of tidal and non-tidal saltmarsh vegetation in Los Peñasquitos Lagoon;~~ OR
> **(b) Demonstrate that implementation actions are active on and/or affecting 346 acres with continued monitoring to ensure 80 percent target achievement; OR**
> **(c) There is no direct or indirect discharge from the Responsible Copermittee's MS4 to the receiving water; OR**
> **(d) The final receiving water limitation under Specific Provision 7.b.(2)(a) is met.**

The City also requests the following language for interim compliance options be included to be consistent with other TMDLs incorporated into the MS4 Permit in Attachment E on page E-55 Section 7.c. Interim TMDL Compliance Requirements:

> **(b) There is no direct or indirect discharge from the Responsible Copermittee's MS4 to the receiving water; OR**
> **(c) The final receiving water limitation under Specific Provision 7.b.(2)(a) is met; OR**
> (d) ~~The Responsible Copermittees must comply with the interim WQBELs, expressed as annual loads, by December 31 of the interim compliance year set forth in Table 7.2.~~**There are no exceedances of the Copermittee portion of interim effluent limitations under Table 7.2 at the Responsible Copermittee's MS4 outfalls; OR**
> **(e) The Responsible Copermittee has submitted and is fully implementing a Water Quality Improvement Plan, accepted by the Regional Board, which provides reasonable assurance that the Copermittee portion of interim TMDL compliance requirements will be achieved by the interim compliance date.**

The City requests that the heading on column 2 of Table 7.2 in section 7.c on page E-55 be revised to accurately reflect the TMDL Basin Plan Amendment. It should be changed to "Interim Effluent Limitations (tons/~~year~~ **wet season)**

The City also requests the addition of a footnote to Table 7.2 on page E-55 to acknowledge the sediment load contributions of other Responsible Parties listed in the TMDL Basin Plan Amendment:

> **Responsible Parties include the following: Phase I Municipal Separate Storm Sewer Systems (MS4s) Copermittees (the County of San Diego, City of San Diego, City of Del Mar, and the City of Poway), Phase II MS4 permittees, and general construction storm water NPDES permittees, and general industrial storm water NPDES permittees as presented in Resolution No. R9-2012-0033 Attachment A, page A-5.**

The Assessment and Reporting Requirements on page E-56 Section 7.d(3)(c) needs to be revised to require monitoring to start the first full wet season after the WQIP is accepted by the Regional Board:

(c) For assessing and determining compliance with the final effluent limitations under Specific Provision 7.b.(2)(b), the Responsible Copermittees must use the data acquired under Specific Provision 7.d.(1) to estimate sediment loading into Los Peñasquitos Lagoon. Sediment loading must be evaluated using a 3-year, weighted rolling average. The first reported average shall be calculated using data collected in the **3** years ~~2014-15, 2015-2016, and 2016-2017 wet seasons~~**following Regional Board acceptance of the WQIP.**

The City looks forward to continuing our dialog with Regional Water Quality Control Board staff during the next phases of the permit reissuance process. If you have any questions, please contact me at (619) 994-7074.

Sincerely,

Mikhail Ogawa, P.E.
Clean Water Manager

c: Kathleen A. Garcia, Planning and Community Development Director
File

CITY OF LAKE FOREST

November 19, 2014

Mayor
Dwight Robinson

Mayor Pro Tem
Adam Nick

Council Members
David A. Bass
Kathryn McCullough
Scott Voigts

City Manager
Robert C. Dunek

By email: laurie.walsh@waterboards.ca.gov

Mr. David Gibson
Executive Officer
C/O Laurie Walsh, P.E.
California Regional Water Quality Control Board, San Diego Region
2375 Northside Drive, Suite 100
San Diego, CA 92108-2700

Subject: Comments – Tentative Order No. R9-2015-0001, Place ID: 658018LWalsh

Dear Mr. Gibson:

The City of Lake Forest ("City") submits these comments on the San Diego Regional Water Quality Control Board's Tentative Order No. R9-2015-0001 ("Draft Permit").

As the Regional Board is aware, the City's municipal separate storm sewer system has been subject to regulation by the Santa Ana Regional Water Quality Control Board ("Santa Ana Regional Board") and by the San Diego Regional Water Quality Control Board ("San Diego Regional Board"). Pursuant to Water Code section 13228, the City requested regulation by a single board, the Santa Ana Water Board. The Draft Permit notes that the Santa Ana Water Board and the San Diego Water Board have entered into an agreement allowing the City's stormwater discharges to be subject to the municipal stormwater permit issued by the Santa Ana Board in lieu of regulation under the Draft Permit.

We would like to express our support and appreciation for the efforts of each Regional Board in reaching this agreement. Allowing the City to participate in watershed based programs in the San Diego Region while implementing the Santa Ana Regional Board's permit will reduce costs and administrative burdens currently imposed on the City. The City is grateful for both Boards' efforts in coming to this agreement and supports the proposed change.

In an effort to streamline and clarify regulation of the City by a single water board, the City requests minor revisions to the wording of the Draft Permit. Specifically, the City seeks to conform the Draft Permit language designating the Santa Ana Water Board as the City's regulatory authority with language used in previous permits making a similar designation. This request seeks four changes to the Draft Permit, as follows:

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(949) 461-3400
City Hall Fax: (949) 461-3511

1. Remove "Lake Forest" from Table 1b.

Table 1b. Orange County Copermittees

City of Aliso Viejo	City of Rancho Santa Margarita
City of Dana Point	City of San Clemente
City of Laguna Beach	City of San Juan Capistrano
City of Laguna Hills	City of Laguna Woods
City of Laguna Niguel	County of Orange
~~City of Lake Forest1~~	Orange County Flood Control District
City of Mission Viejo	

2. Remove footnote 1 to Table 1b.

~~1 The MS4 discharges within the jurisdiction of the City of Lake Forest located in the San Diego Region will be regulated by the Santa Ana Water Board Order No. R8-2014-0002 (NPDES No. CAS618030) and any reissuance thereto subject to the terms of the agreement between San Diego Water Board and Santa Ana Water Board.~~

3. Revise footnote 2 to Table B-1 to read as follows:

~~The MS4 discharges within the jurisdiction of~~ The City of Lake Forest ~~located in the San Diego Region will be~~ is wholly regulated by the Santa Ana Water Board under Order No. R8-2014-0002 (NPDES No. CAS618030) ~~and any reissuance thereto.~~ or the most recent iteration thereof, including those portions of the City of Lake Forest within the San Diego Water Board's region. In accordance with the terms of the agreement between San Diego Water Board and Santa Ana Water Board, the City of Lake Forest must ~~also comply with~~ implement the requirements of the Bacteria TMDL in Attachment E of this Order, participate in preparation and implementation of the Water Quality Improvement Plan for the Aliso Creek Watershed Management Area as described in Provision B of this Order and continue implementation of its over-irrigation discharge prohibition in Title 15, Chapter 15, section 14.030, List (b).

4. Revise Finding 29 as follows:

Regional Water Board Designation. The Cities of Laguna Hills, Laguna Woods, and Lake Forest are located partially within the jurisdictions of the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board) and the San Diego Water Board and their ~~dischargers~~ discharges are subject to regulation by both Regional Water Boards. Pursuant to CWC section 13228, the Cities of Laguna Hills, Laguna Woods, and Lake Forest submitted written requests that one Regional Water Board be designated to regulate Phase I MS4 discharges for each of the Cities. The Santa Ana Water Board and the San Diego Water Board have entered into an agreement whereby the Cities of Laguna Woods and Laguna Hills are wholly regulated by the San Diego Water Board ~~is designated to regulate Phase I~~

~~MS4 discharges within the jurisdiction~~ under this Order, including those portions of the Cities of Laguna Woods and Laguna Hills ~~and~~ not within the ~~Santa Ana~~ San Diego Water Board's ~~is designated to regulate Phase I MS4 discharges within the jurisdiction's~~ region. Similarly, the City of Lake Forest, including those portions of the City of Lake Forest ~~pursuant to MS4 permits administered by each Regional Water Board~~ within the San Diego Water Board's region, is wholly regulated by the Santa Ana Water Board under Order No. R8-2014-0002 (NPDES No. CAS618030) or the most recent iteration thereof. The agreement provides that the City of Lake Forest will be required to retain, and continue implementation of, its over-irrigation discharge prohibition in Title 15, Chapter 14.030, List (b) of the City Municipal Code for regulating storm water quality throughout its jurisdiction. The City of Lake Forest will also be required to actively participate during development and implementation of the Aliso Creek Watershed Management Area Water Quality Improvement Plan required pursuant to this Order. Each Regional Water Board retains the authority to enforce provisions of the Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee (Water Code section 13228 (b)). Under the terms of the agreement, any TMDL and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Laguna Woods, Laguna Hills or Lake Forest as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement of the applicable TMDL will remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's San Diego Creek/Newport Bay TMDL and the San Diego Water Board's Indicator Bacteria Project I Beaches and Creeks TMDL. The San Diego Water Board will periodically review the effectiveness of the agreement during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate the agreement with Santa Ana Water Board or otherwise modify the agreement subject to the approval of the Santa Ana Water Board.

In addition to the above, the City is aware that the County of Orange is submitting comments on the Tentative Order. The City supports the County's comments and is listed as a concurring entity on the County's comment letter.

Many of the City's concerns with the Regional Permit issued to the San Diego County permittees (San Diego Regional Board Order R9-2013-0001(NPDES No. CAS0109266)) have not been resolved in the Draft Permit. The City therefore resubmits its prior comments and its petition of the Regional Permit as comments on the Draft Permit. If the City's above requested changes are granted, the City will be largely regulated under the Santa Ana Regional Board's permit for Orange County and many of its existing concerns will be rendered moot. Nonetheless, to ensure the City exhausts all administrative remedies, the City submits the attached additional comments.

The City believes that the changes requested in this letter will ease the regulatory burden consistent with Water Code section 13228. The City is committed to the goal of improving

water quality and to working with the San Diego Regional Board in developing and implementing the Aliso Creek Watershed Management Area Water Quality Improvement Plan.

If you should have any questions, please contact Devin Slaven, Environmental Manager at (949) 461-3436 or me at (949) 461-3481.

Sincerely,

CITY OF LAKE FOREST

Thomas Wheeler, P.E.
Director of Public Work/City Engineer

Attachments: Comment Letter on Tentative Order R9-2013-0001, dated January 11, 2013
Petition for Review of Action Issuing Order R9-2013-0001, dated June 7, 2013

cc: Robert Dunek, City Manager
Devin Slaven, Environmental Manager
Scott Smith, City Attorney
J.G. Andre Monette, Special Counsel
Mary Anne Skorpanich, County of Orange, OC Environmental Resources

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CITY OF LAKE FOREST

January 11, 2013

Via US Mail and E-mail

Mayor
Scott Voigts

Mayor Pro Tem
Kathryn McCullough

Council Members
Peter Herzog
Adam Nick
Dwight Robinson

City Manager
Robert C. Dunek

Mr. David Gibson
Executive Officer
California Regional Water Quality Control Board,
San Diego Region
C/O Mr. Wayne Chiu, P.E.
9174 Sky Park Court, Suite 100
San Diego, CA 92123

Subject: **Comments – Tentative Order No. R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu.**

Dear Mr. Gibson:

The City of Lake Forest ("City") submits this letter to the California Regional Water Quality Control Board, San Diego Region ("SDRWQCB") to convey the City's formal written comments on Tentative Order No. R9-2013-0001/NPDES Permit No. CAS0109266 ("Draft Permit"). The Draft Permit is intended by the SDRWQCB to serve as the basis for stormwater regulation for the City upon the expiration of current Order R9-2009-0002. The City appreciates the efforts of the SDRWQCB staff in the development of the Draft Permit including the most recent revisions from the former Administrative Draft; however, significant concerns remain.

The City is aware that the County of Orange ("County") is submitting a comment letter documenting comprehensive technical and legal concerns identified during the review of the Draft Permit. The County's submittal also includes proposed revisions to the Draft Permit provided via "red line" format per SDRWQCB staff request. City staff have participated closely in the collaborative development of this comprehensive set of comments and the City has requested to be named as a concurring entity in the County's letter. The City would like to express its full support for the County's comments and proposed revisions. While detailed comments are provided within the County's submittal, the City would like to note and specifically highlight several key issues of concern as follows:

- The Receiving Water Limitations provisions in the Tentative Order could expose the City to Clean Water Act liabilities for discharges that cause or contribute to an exceedance of a water quality standard. A clear linkage between the compliance provisions and prohibitions, receiving water limitations, and effluent limitations must be established.

The provisions dealing with land development, Low Impact Development (LID) and hydromodification control are significantly ratcheted up while existing permit programs are only just being implemented and/or pending approval. The City is particularly concerned with the elimination of all exemptions for the hydromodification control requirements, including for discharges to channels that have been engineered to prevent erosion. Exemptions for hydromodification management should include discharges to certain types of receiving waters and certain types of projects. The City additionally questions the Regional Board's authority to impose *any* flow related limitations in an NPDES permit following the District Court's decision in Virgina Dept. of Transportation v. EPA, No. 1:12-CV-775, slip op. (E.D. Va. Jan. 3, 2013).

- The provisions implementing the Beaches and Creeks Total Maximum Daily Load (TMDL) bacteria requirements are inconsistent with the TMDL as it was developed and pose additional significant liabilities. Federal law does not require NPDES permits for municipal discharges to include TMDLs. (*Defenders of Wildlife v. Browner* 191 F.3d 1159 (9th Cir. 1999); 40 C.F.R. § 122.44(d).) Pursuant to state law, permit provisions must be consistent with the corresponding Basin Plan amendments (Cal Water Code § 13263), and may only be included after consideration of "the beneficial uses to be protected, the water quality objectives reasonably required for that purpose, other waste discharges, the need to prevent nuisance, and the provisions of Section 13241." (*Id.*)

- The provisions requiring the development and implementation of a Water Quality Improvement Plan need to be aligned with the Jurisdictional Runoff Management Program requirements so that the programs are complimentary and prioritized instead of additive.

Thank you for your attention to our comments. The City is committed to the goal of water quality improvement and wants to work with the SDRWQCB in developing the most prudent and cost effective permit possible. If you should have any questions, please contact Devin Slaven, Water Quality Administrator, at (949) 461-3436, or dslaven@lakeforestca.gov.

Sincerely,

CITY OF LAKE FOREST

FOR

Thomas Wheeler, P.E.
Director of Public Works/City Engineer

cc: Robert C. Dunek, City Manager
Devin E. Slaven, CPSWQ, QSD/QSP, Water Quality Administrator
Scott Smith, City Attorney, Best Best & Krieger, LLP
Mary Anne Skorpanich, County of Orange, OC Watersheds

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STATE OF CALIFORNIA

STATE WATER RESOURCES CONTROL BOARD

In the matter of the Petition of: THE CITY OF LAKE FOREST FOR REVIEW OF ACTION BY THE CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, SAN DIEGO REGION, IN ISSUING ORDER NO. R9-2013-0001 (NPDES NO. CAS0109266)	PETITION FOR REVIEW [Water Code § 13320(a)]

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Attorneys for Petitioner:
City of Lake Forest, California

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I.

INTRODUCTION

Petitioner, the City of Lake Forest, California ("City" or "Petitioner") seeks review and reversal of the California Regional Water Quality Control Board, San Diego Region's ("Regional Board") actions in adopting Order No. R9-2013-0001 (NPDES No. CAS0109266) ("Permit"), on May 8, 2013. A copy of the Permit is attached hereto as Exhibit "A" and incorporated herein by reference.

The City is a municipal corporation organized pursuant to California law and the California Constitution. As of 2011, the City had a population of 77,490 people, and is located in Orange County, approximately 40 miles south of the City of Los Angeles. The City owns and operates a large municipal separate storm sewer system ("MS4") within the Regional Board's jurisdiction and as such is subject to regulation under the Permit. Due to the boundary line between the Santa Ana and San Diego Regional Boards, the City is also subject to regulation under the Large MS4 Permit for North Orange County issued by the Santa Ana Regional Board. At all times mentioned herein, the City has acted pursuant to applicable legal requirements, and with great concern for the impacts that discharges from its MS4 may have on surrounding surface waters, and the environment in general.

II.

BACKGROUND

The City fully supports the Permit's goal of attaining water quality improvement throughout south Orange County. In order to ensure that this goal could be attained with minimal negative repercussions for the City, the City participated in the Permit development process. Although the Regional Board removed or modified some requirements at the request of the City and other dischargers, as adopted the Permit retains many requirements that exceed applicable law.

Although the Regional Board pursued an informal Permit development process beginning in March, 2012, the first "official" draft of the Permit was issued in October 2012 with a comment period open until early January 2013. The City participated in the informal Permit

development process. The City also submitted written comments to the Regional Board on the "official" drafts within the time frame permitted. A second draft was issued on March 27, 2013, but the Regional Board did not allow additional time for written comments. The Regional Board held its adoption hearing on the Permit in April, 2013 and continued the hearing to May 8, 2013. At its May 8, 2013 hearing, the Regional Board approved the Permit, but introduced changes prior to the adoption hearing without sufficient time for comment.

As described more fully below, by adopting the Permit in its current form the Regional Board exceeded state and/or federal law. The Cities therefore submits this Petition pursuant to Water Code section 13320 and Title 23 of the California Code of Regulations, and respectfully requests that the State Board correct the Regional Board's actions.

III.

NAMES AND ADDRESSES OF PETITIONERS

The names and contact information for Petitioners is as follows:

ROBERT DUNEK
CITY MANAGER
CITY OF LAKE FOREST
25550 Commercentre Drive, Suite 100
Lake Forest, CA 92630
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THOMAS WHEELER
DIRECTOR OF PUBLIC WORKS
CITY OF LAKE FOREST
25550 Commercentre Drive, Suite 100
Lake Forest, CA 92630
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SHAWN HAGERTY
J.G. ANDRE MONETTE
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THE ACTION OR INACTION OF THE REGIONAL WATER BOARD BEING PETITIONED

The Cities seek review and set aside of the Regional Board's actions in adopting Order No. R9-2013-0001 (NPDES No. CAS0109266) on May 8, 2013. A copy of the Permit is attached hereto as Exhibit "A" and incorporated herein by reference.

IV.

DATE THE REGIONAL BOARD ACTED

The Regional Board adopted Order No. R9-2013-0001 (NPDES No. CAS0109266) on May 8, 2013.

V.

STATEMENT OF THE REASONS THE ACTION WAS INAPPROPRIATE OR IMPROPER

The Regional Board exceeded its legal authority, thereby abusing its discretion when issuing the Permit. Among other things, the Regional Board imposed requirements in the Permit that exceed its authority under State and/or Federal law, are not supported by the evidence in the record, and/or exceed the requirements of State and/or Federal law. Specifically, in adopting the Permit in its current form, the Regional Board:

(1) Required strict compliance with Receiving Water Limitations discharge prohibitions without including a BMP-based compliance option in violation of precedential State Board orders;

(2) Imposed infeasible permit conditions on dischargers including the City;

(3) Improperly applied a heightened compliance standard to discharges into and from the MS4;

(4) Imposed post construction, site-design requirements on municipal projects to control the volume of water leaving a completed project site in excess of the Regional Board's (and the City's) authority under State and Federal law including but not limited to the United States Supreme Court's decisions in *Nollan v.*

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California Coastal Commission (1987) 483 U.S. 825 and *Dolan v. City of Tigard* (1994) 512 U.S. 374;

(5) Required dischargers to expend resources and public funds beyond their jurisdictional boundaries or risk violation of the Permit;

(6) Violated State and Federal law by including the Bacterial Indicators TMDL for Beaches and Inland Streams in the Permit without regard to the limitations of Water Code section 13263, the Ninth Circuit Court of Appeals decision in *Defenders of Wildlife v. Browner,* 191 F.3d 1159 (9th Cir. 1999), or the terms and conditions of the TMDL itself;

(7) Included stormwater and non-stormwater "Action Levels" in the Permit that are inconsistent with State and Federal law and could be interpreted as numeric effluent limitations and that otherwise lack findings;

(8) Imposed a regional permit on the City without authority under State or Federal law;

(9) Unlawfully classified natural waters as part of the MS4, and classified natural waters as both a MS4 and Receiving Water;

(10) Violated Due Process requirements in the Permit development process;

(11) Failed to conduct an adequate economic analysis in violation of Water Code sections 13263, and 13241; and

(12) Imposed a federal scheme on the City without an option for compliance in violation of the 10th Amendment to the United States Constitution as defined by Supreme Court's decisions in *Printz v. United States*, 521 U.S. 898, 925 (1997), and *New York v. United States*, 505 U.S. 144, 168 (1992)).

The City, other Permittees and interested parties submitted comment letters to the Regional Board during the Permit renewal process raising these concerns. The City additionally made oral comments at the Permit adoption hearings in support of its comment letters, and the comments of the other Permittees to again raise the above listed concerns. The Regional Board nonetheless adopted the Permit over these objections, in violation of state and federal law.

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VI.

HOW PETITIONER IS AGGRIEVED

Petitioner, City of Lake Forest, owns and operates an MS4 within the Regional Board's jurisdiction and as such is subject to regulation under the Permit. The City, along with other Permittees, is required to implement the Permit's programs, and comply with its technical limitations. The City is aggrieved because the challenged Permit requirements exceed the Regional Board's authority. These requirements will require the City to impose severe restrictions on development within City limits, hinder the Cities' ability to exercise their land use authority in a manner that benefits their residents' economic and environmental interests, and require the Cities to invest significant time and resources complying with arbitrarily selected "WQBELs."

VII.

ACTIONS PETITIONER REQUESTS THE STATE WATER BOARD TAKE

The Cities respectfully requests that the State Board remand the Permit to the Regional Board, and direct the Regional Board to amend the Permit to address the deficiencies raised in Section V, above.

VIII.

MEMORANDUM OF POINTS AND AUTHORITIES IN SUPPORT OF PETITION

The requisite Memorandum of Points and Authorities is attached to this Petition. The City additionally reserve the right to supplement the legal arguments and authorities raised in the attached memorandum of points and authorities if and when such actions is necessary in support of the Petition.

IX.

STATEMENT OF COPIES FURNISHED

In accordance with the requirements of Title 23, Section 2050(a)(8) of the California Code of Regulations, a copy of this Petition has been sent to the California Regional Water Quality Control Board, San Diego Region.

X.

STATEMENT OF ISSUES RAISED

As illustrated in Exhibit "A" attached hereto and incorporated herein, Petitioner, and/or other interested parties submitted written and oral comments on the Permit outlining the above described issues. Through their written and oral comments, Petitioner requested that the Regional Board revise the Permit to address Petitioner's concerns.

XI.

CONCLUSION

For the reasons set forth in this Petition and in the related documents filed herewith, the City of Lake Forest respectfully requests that the State Water Resources Control Board remand the Permit to the Regional Board with direction to revise it to address the concerns raised herein, and take any other actions that the State Board deems necessary and appropriate to address the City's claims.

Dated: June 7, 2013

BEST BEST & KRIEGER LLP

By: _____

SHAWN HAGERTY
J.G. ANDRE MONETTE
Attorneys for Petitioners
Cities of Lake Forest and Aliso Viejo

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STATE OF CALIFORNIA

STATE WATER RESOURCES CONTROL BOARD

In the matter of the Petition of: THE CITY OF LAKE FOREST FOR REVIEW OF ACTION BY THE CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, SAN DIEGO REGION, IN ISSUING ORDER NO. R9-2013-0001 (NPDES NO. CAS0109266)	MEMORANDUM OF POINTS AND AUTHORITIES IN SUPPORT OF PETITION FOR REVIEW [Water Code § 13320(a)]

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Attorneys for Petitioner:
City of Lake Forest, California

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MEMORANDUM OF POINTS AND AUTHORITIES

Petitioner, the City of Lake Forest ("City" or "Petitioner") submits these points and authorities in support of its Petition to the State Water Resources Control Board ("State Board") requesting that the State Board review and set aside all or portions of Order No. R9-2013-0001, NPDES Permit No. CAS0109266 ("Permit"), as adopted by the California Regional Water Quality Control Board, San Diego Region ("Regional Board") on May 8, 2013. The Regional Board's adoption of the Permit was not supported by sufficient evidence and findings, and is arbitrary, capricious and otherwise contrary to law.

The City respectfully requests that the subject petition be granted, and that the challenged terms of the Permit be voided, as the Permit and the terms have not been adopted in accordance with the requirements of State and/or federal law, and because there is insufficient evidence and findings in the record to support its adoption.[1]

I. THE PERMIT SHOULD BE REVISED TO ALLOW BMP-BASED COMPLIANCE WITH RECEIVING WATER LIMITATIONS.

Permit, section II.A.2. governing "Receiving Water Limitations," provides that "discharges from MS4s must not cause or contribute to the violation of water quality standards and/or receiving waters ..." This blanket prohibition is standard permit language that until 2011, was interpreted as a management practice based compliance target. In 2011, the Ninth Circuit Court of Appeals, in *Natural Resources Defense Counsel v. County of Los Angeles* (9th Cir. 2011) 673 F.3d 880, *rev'd on other grounds* by 133 S.Ct. 710 (2013), interpreted this standard language as a stand- alone prohibition requiring strict compliance with Water Quality Standards.

By retaining the Receiving Water Limitations prohibition in the Permit as it was considered by the Ninth Circuit, the Regional Board is holding the City responsible for compliance with numeric Water Quality Standards as an end of pipe limit. For the reasons set

[1] In order to comply with 23 C.C.R.§2050 (a), the City submits a copy of Order R9-2013-0001 with its petition; however, since the entire administrative record will be lodged by the Regional Board with the State Water Board, most citations to the record herein will not be accompanied by duplicative exhibits. As of this filing, the complete transcripts of the three hearing dates are not believed to be available for specific citations. The City reserves the right to submit supplemental or amended points and authorities with specific transcript citations when available for review.

forth below, the Permit's Receiving Water Limitations prohibition is inconsistent with State and Federal law and must be revised.

A. *Federal law does not require Numeric Effluent Limits or strict compliance with Water Quality Standards*

The Federal Clean Water Act and its implementing regulations do not require municipal stormwater permits to include numeric effluent limits or to strictly adhere to Water Quality Standards. The Ninth Circuit Court of Appeals addressed both issues in *Defenders of Wildlife v. Browner*, 191 F.3d 1159 (9th Cir. 1999).

In *Defenders*, the Ninth Circuit held that the United States Environmental Protection Agency ("US EPA") has the authority to impose numeric effluent limits in MS4 Permits, but that the Clean Water Act does not require numeric effluent limits. The Ninth Circuit additionally held that municipal stormwater permits do not need to comply with Water Quality Standards, stating "industrial discharges must comply strictly with state water-quality standards," while Congress chose "not to include a similar provision for municipal storm-sewer discharges."

The decision highlights the difference between traditional, industrial discharges and municipal stormwater. The Ninth Circuit focused on the approach Congress took to addressing this difference holding that Congress replaced the requirements applicable to industrial discharges "with the requirement that municipal storm-sewer dischargers "reduce the discharge of pollutants to the maximum extent practicable. . ." and that the statute "unambiguously demonstrates" that Congress did not require municipal storm-sewer discharges to comply strictly with Water Quality Standards. (*Defenders of Wildlife v. Browner*, 191 F.3d at 1165.)

The Ninth Circuit's holding that has been adopted by California courts. In *Divers' Environmental Conservation Organization v. State Water Resources Control Board (Divers' Environmental)* (2006) 145 Cal.App.4th 246, the plaintiff brought suit claiming that an NPDES Permit issued to the United States Navy by the San Diego Regional Board was contrary to law because it did not incorporate waste load allocations ("WLAs") from a TMDL as numeric effluent limits.

After discussing the relevant requirements of the Clean Water Act, as well as governing

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case authority, the Court of Appeal acknowledged that in regulating stormwater permits EPA "has repeatedly expressed a preference for doing so by the way of BMPs, rather than by way of imposing either technology-based or water quality-based numerical limitations." (*Id.* at 256.) The Court went on to find that "it is now clear that in implementing numeric water quality standards, such as those set forth in CTR, permitting agencies are not required to do so solely by means of a corresponding numeric WQBEL's [Water Quality Based Effluent Limit]." (Id. at 262.)

Likewise, in *Building Industry Association of San Diego County v. State Water Resources Control Board* (2004) 124 Cal.App.4th 866, 874, the Court of Appeal found that Congress intentionally gave the EPA "the authority to fashion NPDES permit requirements to meet water quality standards without specific numeric effluent limits and instead to impose `controls to reduce the discharge of pollutants to the maximum extent practicable."

Federal law simply does not require numeric effluent limits or direct incorporation of Water Quality Standards into municipal stormwater permits. The Clean Water Act instead establishes a unique regulatory structure to address the unique nature of discharges from MS4s. Recognizing that, because of the open nature of the system and wide variability in flow, municipal stormwater discharges are different than other discharges regulated by the Clean Water Act, Congress expressly exempted municipal stormwater discharges from strict compliance with water quality standards. The Permit's infeasible requirement of strict compliance with water quality standards at all times and in all receiving waters is contrary to the Congressional policy reflected in the CWA related to discharges from municipal stormwater systems. To conform to Congressional policy, the Permit should have included a compliance option.

B. *The Receiving Water Limitations prohibition is inconsistent with precedential State Board Orders.*

Pursuant to Government Code section 11425.60, unless otherwise stated in the decision, all State Board orders are binding precedent on both the State Board itself and the nine Regional Water Quality Control Boards. (State Board Order WR 96-01, fn 11.) Compliance with precedential orders is mandatory. (*See California Assn. of Sanitation Agencies v. State Water*

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Resources Control Board (2012) 208 Cal. App. 4th 1438, 1465, fn 20; *see also* State Board statement on precedential orders: "The State Water Board and the nine Regional Water Quality Control Boards (Regional Water Boards) ordinarily will follow State Water Board precedents, or provide a reasoned analysis for not doing so." http://www.swrcb.ca.gov/board_decisions/adopted_orders/ [as of June 1, 2013, emphasis added].)

The State Board has held on numerous occasions, in multiple precedential orders, that its standard receiving water limitations language "does not require strict compliance with water quality standards." (State Water Board Order WQ 2001-15.) Rather, compliance with water quality standards is "to be achieved over time, through an iterative approach requiring improved BMPs." (State Water Board Order WQ 2001-15.) Because the Permit's Receiving Water Limitations prohibition is inconsistent with these precedential State Board orders, it must be revised.

The State Board's position that Water Quality Standards are to be achieved over time through the iterative process was most recently reiterated in State Board Order WQ 2001-15, *In the Matter of the Petitions of Building Industry Assoc. of San Diego County and Western States Petroleum Assoc.* (2001). The State Board issued Order WQ 2001-15 in response to the building industry's claim that the Ninth Circuit's decision in *Defenders of Wildlife v. Browner* rendered requirements in the 2001 San Diego County MS4 Permit unnecessary and contrary to the MEP standard. While retaining the requirement that the San Diego permit prohibit discharges that cause or contribute to violations of water quality standards, the State Board made clear that compliance with this requirement was to be achieved through the iterative process, and that the Water Quality Standards themselves were not hard compliance targets.

In discussing the propriety of requiring strict compliance with water quality standards, and the applicability of the MEP standard in State Board Order WQ 2001-15, the State Board held:

> While we will continue to address water quality standards in municipal storm water permits, we also continue to believe that the iterative approach, which focuses on timely improvements of BMPs, is appropriate. ***We will generally not require "strict compliance" with water quality standards through numeric effluent limits and we will continue to follow a iterative approach, which seeks compliance over time.*** The iterative

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> approach is protective of water quality, but at the same time considers the difficulties of achieving full compliance through BMPs that must be enforced through large and medium municipal storm sewer systems.
>
> (Order 2001-15, p. 7-8 [emphasis added].)

State Board policy is, and has been, that Water Quality Standards are to be achieved over time through the iterative process. In State Board Order WQ 2001-15, the State Board further explained, in the context of its review of the 2001 San Diego MS4 Permit, that:

> In reviewing the language in this permit, and that in Board Order WQ 99-05, we point out that ***our language, similar to U.S. EPA's permit language discussed in the Browner case, does not require strict compliance with water quality standards***. Our language requires that storm water management plans be designed to achieve compliance with water quality standards. ***Compliance is to be achieved over time, through an iterative approach requiring improved BMPs.***
>
> (*Id.*, at 7 [emphasis added].)

The State Board thus established a "middle ground" position where MS4 permits had to require compliance with water quality standards but where compliance was to be achieved over time in recognition of the unique nature of stormwater discharges:

> We are concerned, however, with the language in Discharge Prohibition A.2, which is challenged by BIA. This discharge prohibition is similar to the Receiving Water Limitation, prohibiting discharges that cause or contribute to exceedance of water quality objectives. ***The difficulty with this language, however, is that it is not modified by the iterative process. To clarify that this prohibition also must be complied with through the iterative process, Receiving Water Limitation C.2 must state that it is also applicable to Discharge Prohibition A.2.*** The permit, in Discharge Prohibition A.5, also incorporates a list of Basin Plan prohibitions, one of which also prohibits discharges that are not in compliance with water quality objectives. (See, Attachment A, prohibition 5.) Language clarifying that the iterative approach applies to that prohibition is also necessary.
>
> (*Id.*, at 8-9 [emphasis added].)

The State Board's position on the receiving water limitations language has been consistent and clear: Water Quality Standards are to be achieved over time through the iterative process. Because the language in the Permit is modeled after the State Board's language, it must be revised to align the language with the State Board's precedential orders.

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II. THE PERMIT NEEDS TO BE REVISED TO GIVE THE CITY A FEASIBLE PATH TO ATTAINING COMPLIANCE WITH PERMIT REQUIREMENTS.

As a matter of law, the Clean Water Act does not require permittees to achieve the impossible. That is nonetheless what the Regional Board has asked the City to do by including the Receiving Water Limitations prohibition (and other requirements including but not limited to the TMDL requirements in Attachment E), in the Permit. Compliance with numeric effluent limits tied directly to Water Quality Standards or TMDLs is simply not feasible.

The State Board has recognized that municipal stormwater discharges are different. In 2006, the State Board convened a "Blue Ribbon Panel" of experts to determine whether compliance with numeric effluent limits in stormwater permits was feasible. The panel found that "[m]ost all existing development rely on non-structural control measures, making it difficult, if not impossible to set numeric effluent limits for these areas" and that "[i]t is not feasible at this time to set enforceable numeric effluent criteria for municipal BMPs and in particular urban discharges." (Storm Water Quality Panel Recommendations to the California State Water Resources Control Board – *The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities*, June 19, 2006, pp. 8, 12.)

In *Hughey v. JMS Dev. Corp.*, 78 F.3d 1523 (11th Cir.) *cert. den.*, 519 U.S. 993 (1996), the plaintiff sued JMS Development Corporation ("JMS") for failing to obtain a storm water permit that would authorize the discharge of storm water from its construction project. The plaintiff argued JMS had no authority to discharge any quantity or type of storm water from the project, *i.e.* a "zero discharge standard," until JMS had first obtained an NPDES permit. (*Id.* at 1527.) JMS did not dispute that storm water was being discharged from its property and that it had not obtained an NPDES permit, but claimed it was not in violation of the Clean Water Act (even though the Act required the permit) because the Georgia Environmental Protection Division, the agency responsible for issuing the permit, was not yet prepared to issue such permits. As a result, it was impossible for JMS to comply. (*Id.*)

The Eleventh Circuit Court of Appeal held that the CWA does not require a permittee to

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achieve the impossible, finding that "Congress is presumed not to have intended an absurd (impossible) result." (*Id.* at 1529.) The Court then found that:

> In this case, once JMS began the development, compliance with the zero discharge standard would have been impossible. Congress could not have intended a strict application of the zero discharge standard in section 1311(a) when compliance is factually impossible. The evidence was uncontroverted that whenever it rained in Gwinnett County some discharge was going to occur; nothing JMS could do would prevent all rain water discharge.
>
> (*Id.* at 1530.)

The Court concluded, "*Lex non cogit ad impossibilia*: The law does not compel the doing of impossibilities." (*Id.*) The same rule applies here. (See also *Atl. States Legal Found., Inc. v. Eastman Kodak Co.*, 12 F.3d 353, 357 (2d Cir. 1994) ["it is impossible to identify and rationally limit every chemical or compound present in a discharge of pollutants . . . Compliance with such a permit would be impossible and anybody seeking to harass a permittee need only analyze that permittee's discharge until determining the presence of a substance not identified in the permit"].)

The Clean Water Act does not require municipal permittees to do the impossible. Nor does State law. Because municipal permittees are involuntary permittees, that is, because they have no choice but to obtain a municipal storm water permit, the Permit, as a matter of law, cannot impose terms that are unobtainable. (*Id.*) In this case, as reflected in the numerous comments submitted during the permit adoption process, complying with numeric limits is simply not achievable by the permittees, given the variability of the potential sources of pollutants and urban runoff, as well as the unpredictability of the climate in Southern California.

In fact, as discussed above in *Divers, supra*, 145 Cal.App.4th 246: "In regulating storm water permits the EPA has repeatedly expressed the preference for doing so by way of BMPs, rather than by way of imposing either technology-based or water quality-based numeric limitations." (*Id.* at 256.) According to the *Divers* Court: "EPA has repeatedly noted, storm water consists of a variable stew of pollutants, including toxic pollutants, from a variety of sources which impact the receiving body on a basis which is only as predictable as the weather." (*Id.* at 258.)

Similarly, in *BIA v. State Board, supra*, 124 Cal.App.4th 866, 889-90, after having

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recognized the "practical realities of municipal storm sewer regulation," and the "physical differences between municipal storm water runoff and other pollutant discharges," and finding that the maximum extent practical approach was a "workable enforcement mechanism" (*id.* at 873, 884), the Court concluded that the MEP standard was purposefully intended to be highly flexible concept that balances numerous factors including "technical feasibility, costs, public acceptance, regulatory compliance and effectiveness." (*Id.* at 889-90.)

It is technically and economically infeasible to strictly comply with Water Quality Standards as end of pipe numeric limits. Imposing such requirements goes beyond "the limits of practicability" (*Defenders of Wildlife v. Browner* (1999) 191 F.3d 1159, 1162). Accordingly, the imposition of the Receiving Water Limitations prohibition is not only an attempt to impose an obligation that goes beyond the requirements of State and Federal law, but equally important, represents an attempt to impose provisions that go beyond what is "feasible." These aspects of the Permit must be stricken.

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III. THE PERMIT IMPROPERLY APPLIES A HEIGHTENED COMPLIANCE STANDARD TO DISCHARGES INTO AND FROM THE MS4.

Permit, section II.A.1. entitled "Discharge Prohibitions," requires the Permittees to not only "effectively prohibit" non-storm water discharges, but also, through subsection II.E.2 (entitled "Illicit Discharge Retention and Elimination"), to take action to prevent "non-stormwater" from entering the MS4. In effect, all "non-storm water discharges," unless they are otherwise conditionally permitted to be discharged under subsection E.2. of the Permit, are prohibited. The Permit further treats dry weather discharges *from* the MS4 as industrial discharges and applies an end of pipe standard that violates Section 402(p) of the Clean Water Act. Because both Permit requirements violate State and Federal law, they must be revised.

A. *All discharges from the MS4 are subject to the MEP standard.*

The Regional Board has attempted to create a new standard under the Clean Water Act – ***non-stormwater*** discharges ***from*** the MS4. Permit Finding 15 states:

> Non-Storm Water and Storm Water Discharges. Non-storm water discharges from the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard of

> CWA section 402(p)(3)(B)(iii), which is explicitly for "Municipal ...Stormwater Discharges (emphasis added)"from the MS4s. Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s must be effectively prohibited.

Because all discharges from the MS4 are subject to the Maximum Extent Practicable ("MEP") standard, all Permit requirements based on the false standard referenced in Finding 15 must be removed from the Permit.

Section 402(p)(3)(B) of the Clean Water Act entitled "Municipal Discharge" provides, in its entirety, as follows:

> Permits for discharges from municipal storm sewers –
>
> (i) may be issued on a system– or jurisdictional– wide basis;
>
> (ii) shall include a requirement to ***effectively prohibit non-stormwater discharges into the storm sewers***; and
>
> (iii) shall require controls to reduce ***the discharge of pollutants to the maximum extent practicable***, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants.
>
> (33 U.S.C. § 1342(p)(3)(B) *[emphasis added]*.)

Thus, the plain language of the CWA requires MS4 Permits to "require controls to reduce the discharge of pollutants to the maximum extent practicable." (*Id.*) The CWA applies the MEP standard to the "discharge of pollutants" from the MS4. There is no distinction between the discharge of "stormwater" or "non-stormwater" or dry weather flows and wet weather flows. As such, the Regional Board's attempt to "prohibit non-stormwater discharges through the MS4 to receiving waters" exceeds Federal law.

B. *The Permit prohibits discharges into the MS4 in a manner that is inconsistent with the Federal Clean Water Act and precedential State Board Orders.*

Permit, section II.A.1. entitled "Discharge Prohibitions," requires the Permittees to not only "effectively prohibit," non-storm water discharges, but also, through subsection II.E.2 (entitled "Illicit Discharge Retention and Elimination"), to take action to prevent "non-stormwater" from entering the MS4. In effect, all "non-storm water discharges," unless they are

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otherwise conditionally permitted to be discharged under subsection E.2. of the Permit, are prohibited.

The Clean Water Act requires only a permit condition that says the Co-Permittee shall effectively prohibit discharges of non-stormwater into the MS4. Section 402(p)(3)(B)(ii) provides that permit for discharges from municipal storm sewers "shall include a requirement to effectively prohibit non-stormwater discharges into the storm sewer . . . ." (33 USC § 1342(p)(3)(B)(ii).) (*Id.*) The proposed regional permit uses Section 402(p)(3)(B)(ii) expansively.

"Effectively prohibit" is not the same as prohibit or eliminate. The draft permit appears to strictly prohibit discharges of non-stormwater and holds the Co-Permittees liable for preventing or eliminating such discharges. This exceeds what is required by the CWA.

Federal regulations make clear this only requires the Co-Permittees to prohibit such discharges in their ordinances. (40 C.F.R. § 122.26(d)(2)(i).) Moreover, the State Board addressed this issue in Order WQ-2001-15, expressly stating that discharges into an MS4 are subject to a more flexible standard, holding:

> We find that ***the permit language is overly broad because it applies the MEP standard not only to discharges "from" MS4s, but also to discharges "into" MS4s***. . . the specific language in this prohibition too broadly restricts all discharges "into" an MS4, and does not allow flexibility to use regional solutions, where they could be applied in a manner that fully protects receiving waters.
>
> (*Id.*, at 7 [emphasis added].)

A strict prevention or prohibition of all non-stormwater discharges into the MS4 is not feasible. This requirement therefore exceeds the requirements of Federal Law as well as the State Board's direction on how to manage discharges into the MS4 as set forth in precedential order WQ-2001-015.

IV. THE PERMIT'S NEW DEVELOPMENT AND REDEVELOPMENT REQUIREMENTS ARE UNNECESSARY AND, AS INCORPORATED INTO THE PERMIT, VIOLATE STATE AND FEDERAL LAW.

The Permit imposes site design requirements new development and significant redevelopment projects. The overarching requirement is that the completed project site retain the

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runoff from the 85th percentile storm event. If the project site is unable to retain the runoff because of soil conditions or other site restrictions, the Permit will require some projects to provide additional mitigation. Moreover, in the case of redevelopment projects, the Permit will require a return to pre-project hydrologic conditions.

These Permit requirements are regulating the discharge of stormwater as a pollutant, rather than the pollutants in the stormwater, and are void under the Clean Water Act. They additionally exceed both the City's the Regional Board's authority under the United States Supreme Court's decisions in *Nollan v. California Coastal Commission* (1987) 483 U.S. 825 and *Dolan v. City of Tigard* (1994) 512 U.S. 374, and must be removed from the Permit.

A. *The Permit imposes post construction, site-design requirements on municipal projects to control the volume of water leaving a completed project site in excess of the Regional Board's authority under both the Clean Water Act and Porter Cologne.*

Permit section E.3.c imposes BMP requirements for all priority projects as defined in the Permit. Priority projects include areas of new development and redevelopment. Section E.3.c.(1)(a) requires the following:

> Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite the pollutants contained in the volume of storm water runoff produced from a 24-hour 85th percentile storm event (design capture volume)

Section E.3.c.(2) imposes requirements based solely on the volume of stormwater leaving a completed project site:

> Each Copermittee must require each Priority Development Project to implement onsite BMPs to manage hydromodification that may be caused by storm water runoff discharged from a project

Because these Permit requirements regulate the discharge of stormwater alone, rather than pollutants or waste in stormwater, they exceed the Regional Board's authority under both the Clean Water Act and Porter Cologne.

Regulation of stormwater discharges on a volumetric basis was recently rejected in *Virginia Department of Transportation v. EPA* (2013) U.S. Dist. Lexis 981, 43 ELR. 20002 (E.D. Va.), In that case, US EPA established a TMDL for Accotink Creek to limit the flow of stormwater into the creek. The purpose of the TMDL was to regulate the amount of sediment

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into Accotink, based on EPA's belief that the sediment was the primary cause of its impairment. The parties to the case agreed that sediment is a "pollutant" under the CWA, and that stormwater is not. EPA, however, claimed that the storm water flow rate was a "surrogate" for sediment thereby justifying the stormwater flow TMDL.

The Court found that EPA had no authority to regulate the flow of storm water into the creek, holding finding the Clean Water Act did not authorize it to do so. According to the District Court:

> The language of § 1313(d)(1)(C) is clear. EPA is authorized to set TMDLs to regulate pollutants, and pollutants are carefully defined. Stormwater runoff is not a pollutant, so EPA is not authorized to regulate it via TMDL. Claiming that the stormwater maximum load is a surrogate for sediment, which is a pollutant and therefore regulatable, does not bring stormwater within the ambit of EPA's TMDL authority. Whatever reason EPA has for thinking that a stormwater flow rate TMDL is a better way of limiting sediment load than a sediment load TMDL, EPA cannot be allowed to exceed its limited statutory authority.
>
> (Id. at 14-15.)

Accordingly, the Regional Board in this case has no authority under the Clean Water Act to regulate discharges from completed project sites without specifically identifying a particular pollutant of concern. Similar restrictions exist in State law. Porter Cologne prohibits the discharge of "Waste" without a permit. (Cal Water Code §§ 13260; 12363; 13264.) Waste is defined as:

> sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal.
>
> (Cal Water Code § 13050(d).)

Stormwater itself is not Waste, though it may contain Waste. The Water Code only authorizes the Regional Board to regulate the discharge of Waste. Permit terms that seek to regulate stormwater flows without identifying specific pollutants in such flows are beyond the authority of the Regional Board and must be removed from the Permit.

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B. *The Permit requires the City to impose exactions on projects within their jurisdictions in excess of the City's authority.*

As applied to areas of redevelopment, and offsite mitigation where retention of the 85th percentile storm is not feasible, the Permit's hydromodification requirements exceed the scope of both the City's and the Regional Board's authority under State and Federal law. Permit section E.3.c.(2)(a) states:

> Post-project runoff conditions (flow rates and durations) must not exceed pre-development runoff conditions by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat downstream of Priority Development Projects).

Section E.3.c.(1)(a) requires the following:

> Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite the pollutants contained in the volume of storm water runoff produced from a 24-hour 85th percentile storm event (design capture volume)

In areas of redevelopment, compliance with Section E.3.c.(2)(a) will require a project proponent to return the project site to a condition that predates construction of the original project. The Permit will thus require the City to impose mitigation and/or exactions for impacts that are not a result of the redevelopment project itself.

When imposing a condition on a development permit, a local government is required under the federal and state constitutions to establish that the condition bears a reasonable relationship to the impacts of the project. This rule applies to legislatively enacted requirements and impact fees or exactions. *Building Indus. Ass'n v. City of Patterson*, 171 Cal. App. 4th 886, 898 (2009). Moreover, fees imposed on a discretionary ad hoc basis are subject to heightened scrutiny under a two-part test. First, local governments must show that there is a substantial relationship between the burden created by the impact of development and any fee or exaction. *Nollan v. California Coastal Comm'n*, 483 U.S. 825, 837 (1987). Second, a project's impacts must bear a "rough proportionality" to any development fee or exaction. *Dolan v. City of Tigard*, 512 U.S. 374, 391 (1994).

Under California law, the *Nollan/Dolan* heightened scrutiny test also applies to in-lieu

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fees. *Ehrlich v. City of Culver City*, 12 Cal. 4th 854, 876 (1996). The Legislature has memorialized these requirements in the Mitigation Fee Act which establishes procedures that local governments must follow to impose impact fees. Cal. Gov't Code §§ 66000-66025.

By requiring redevelopment projects to mimic pre-development conditions, the City would be requiring a project developer to make changes to the project site that are not related to the project's impacts. Imposing such requirements would exceed the City's (and the State's) authority under *Nollan v. California Coastal Commission* (1987) 483 U.S. 825 and *Dolan v. City of Tigard* (1994) 512 U.S. 374.

Permit conditions requiring mitigation where onsite retention of the 85th percentile storm is not feasible because of local soil or other pre-project conditions also violate the *Nollan/Dolan* limitations. Imposing offsite mitigation requirements when the original project site is incapable of retaining the 85th percentile storm exceeds the impacts of the proposed project. For that reason, as applied to redevelopment projects, and offsite mitigation where retention of the 85th percentile storm is not feasible, Permit section E.3.c. must be revised to reflect the limitations of the City's authority.

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C. *The Regional Board failed to make adequate findings on the Permit's new development and redevelopment requirements.*

The Permit requires hydromodification controls in every development and redevelopment project with little to no ability to exempt projects where an HMP is infeasible. These requirements are a one size fits all approach across three large counties with varying climates, soil conditions and topography.

The Regional Board had no evidence before it that an across the board requirement to implement hydromodification controls and LID requirements in every development and redevelopment project improves water quality. In fact, the Regional Board has based its entire Permit requirements on one study produced out of the Pacific Northwest, an area that has more pristine steam and site conditions and whose soils better allow for infiltration that do the clay conditions of south Orange County that do not allow infiltration and the capture of on-site pollutants. To that extent, the HMP and LID requirements lack substantial evidence and are

arbitrary and capricious under the California Administrative Procedure Act and violate the Clean Water Act in that the requirements do not on their face demonstrate water quality benefits.

There is also no evidence of water quality benefit to support a pre-development run-off reference requirement. A pre-development standard is entirely subjective. While a project proponent would need to review on-site or nearby soil conditions for this reference, evidence was presented at the adoption hearing that this could not be done as easily as using an Internet website, which was the contention of Regional Board staff in advocating for the new standard. Also, in highly developed concrete areas, it would be difficult to find nearby conditions that could be used as this reference, and is thus, arbitrary and must be removed from the Permit.

V. THE PERMIT WILL REQUIRE THE CITY TO EXPEND RESOURCES AND PUBLIC FUNDS BEYOND ITS JURISDICTIONAL BOUNDARIES AND POTENTIALLY HOLDS THE CITY JOINTLY AND SEVERALLY LIABLE FOR COMPLIANCE.

The Permit's Water Quality Improvement Plan ("WQIP") program includes multiple requirements for joint efforts by the City and other dischargers in a watershed management area, irrespective of the City' jurisdictional boundaries. For example, Permit section B.2.b. states:

> The Copermittees must consider the following, at a minimum, to identify the potential impacts to receiving waters that may be caused or contributed to by discharges from the Copermittees' MS4s . . .
>
> (3) Locations of each Copermittee's MS4 outfalls that discharge to receiving waters;
>
> (4) Locations of MS4 outfalls that are known to persistently discharge non-storm water to receiving waters likely causing or contributing to impacts on receiving water beneficial uses;
>
> (5) Locations of MS4 outfalls that are known to discharge pollutants in storm water causing or contributing to impacts on receiving water beneficial uses; and
>
> (6) The potential improvements in the quality of discharges from the MS4 that can be achieved.

Permit section B.2.c. requires the City to use the information gathered to "develop a list of priority water quality conditions as pollutants, stressors and/or receiving water conditions that are the highest threat to receiving water quality or that most adversely affect the quality of receiving

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waters." The Permit then requires the City to develop goals to address the pollutant sources on the priority list. (Permit section B.2.d.) There are no limitations on jurisdictional boundaries or relative contribution to pollutant loading from individual sources.

Requiring the City to expend resources outside its jurisdiction exceeds the authority granted to the Regional Board under Clean Water Act section 402(p) and the California Water Code. Both statutes hold dischargers responsible for only those pollutants that discharge from their point sources. (33 U.S.C. §§ 1311, 1319, 1342(p)(3)(B) and 1362(12); Water Code §§ 13350(a), 13263(f) and 13376.)[2] For example, although stormwater permits may be issued on a system – or jurisdiction – wide basis, Co-Permittees need only comply with permit conditions relating to discharges from the municipal separate sewers for which they are operating. (33 U.S.C. § 1342(p)(3)(B)(i) and 40 CFR § 122.26(a)(3)(vi).). In addition, EPA has defined the term "Co-Permittee" to mean a permittee who "is only responsible for permit conditions relating to the discharge for which it is operator." (40 CFR § 122.26(b)(1).)

Thus, Co-Permittees are only responsible for pollutants discharged from its MS4, and need only comply with permit conditions related to such discharges. (*So. Fla. Water Mgmt. Dist. v. Miccosukee Tribe of Indians* (2004) 541. U.S. 95, 105; *Jones v. E.R. Shell Contractor, Inc.* (N.D. Ga. 2004) 333 F.Supp.2d 1344; In re *City of Irving, Texas*, Mun. Separate Storm Sewer Sys., 10 E.A.D. 111 (EPA July 16, 2001); 40 CFR §§ 122.26(a)(3)(vi).) Mandatory watershed requirements not linked directly to pollutants discharged from a Co-Permittees MS4 are thus, pursuant to the plaint meaning of the CWA, beyond the responsibility of that Co-Permittee.

Similarly, Porter Cologne focuses on individual discharges (*see, e.g.,* Water Code §§ 13263 and 13350(a)) and makes watershed planning an option that NPDES Co-Permittees may

[2] The Authority acknowledges that EPA and others believe that the watershed approach would result in better water quality results. (*See, e.g.,* EPA's Watershed-Based NPDES Permitting Policy Statement dated January 7, 2003 and the conclusions of the National Research Council's 2009 Report on Urban Stormwater Management in the United States (concluding that the "course of action most likely to check and reverse degradation of the nation's aquatic resources would be to base all stormwater and other wastewater discharge permits on watershed boundaries instead of political boundaries.").) However, it is also acknowledged that structural changes in the CWA and the laws of authorized states would be required to implement such a watershed permitting approach. (*See, e.g.,* National Research Council Report, p 524 (noting that the "national watershed-based approach to stormwater is likely to require legislative amendments . . . .").) In the absence of such structural changes, the CWA must be applied as currently written, and as currently written its focus is on jurisdictional boundaries.

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pursue, not a mandatory requirement with which Co-Permittees must comply.. (Water Code § 16101(a).) The purpose of such voluntary watershed planning is to allow permittees to implement existing and future water quality requirements and regulations on a watershed rather than a jurisdictional level. (*Id.*) If the Regional Board incorporates the watershed plan into the waste discharge requirements issued to a permittee, the implementation of the plan by the permittee may represent compliance with waste discharge requirements. (Water Code § 16102(d) and (c).) Thus, the voluntary watershed approach of Water Code §§ 16100 *et seq.* allows permittees to *elect* the pursue a watershed approach and *offers* the permittee a compliance option as an incentive to move from a jurisdictional approach to a watershed approach.

Moreover, the Clean Water Act is not a contribution statute; dischargers are not jointly and severally liable for water quality conditions in a watershed. Nonetheless, under Attachment E of the Permit, the City could potentially be found out of compliance with an interim or final TMDL target based solely on discharges from other dischargers. Joint liability is imposed by each section of the Permit that sets forth how the dischargers are to establish compliance with the six TMDLs incorporated into the Permit.[3] The following provision is an example of unlawful joint liability imposed by the Permit:

> (3) <u>Interim TMDL Compliance Determination</u>
>
> Compliance with the interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:
>
> . . . .
>
> (d) The pollutant load reductions for discharges from the Responsible *Copermittees'* MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR
>
> (e) The Responsible *Copermittees* can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the *Copermittees'* MS4s are not causing or contributing to the exceedances; OR
>
> (f) There are no exceedances of the interim receiving water

[3] The Permit sections that impose joint liability are: Attachment E, Sections 1.b(3)(d); 2.b(3)(d)(iv-v); 3.b(3)(d); 3.b(3)(e)(iv-v); 3.c(2)(d); 3.c(2)(e); 4.b(3)(d); 4.c(2)(e); 5.b(3)(d-g); 5.c(1)(b)(iv-viii); 6.b(3)(d-f); 6.c(3)(d-h).

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> limitations under Specific Provision 6.c.(2)(a) in the receiving water at, or downstream of the Responsible *Copermittees'* MS4 outfalls; OR
>
> (g) The pollutant load reductions for discharges from the Responsible *Copermittees'* MS4 outfalls are greater than or equal to the interim effluent limitations under Specific Provision 6.c.(2)(b); OR
>
> (h) The Responsible *Copermittees* have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.
>
> Permit at E-46 to E-47 § 6(c)(3) (emphasis added).

Under this provision, which applies to interim compliance determinations for the bacteria TMDL covering twenty beaches and creeks in the San Diego Region, the City would be unable to establish compliance based on its pollutant load reductions, receiving water conditions, or Water Quality Improvement Plan activities unless it can show that all other dischargers are also in full compliance. The Regional Board apparently recognized this problem because it changed "Copermittees" to "Copermittee" in other parts of Attachment E in response to comments from the dischargers, but the Regional Board neglected to make the change consistently.[4]

As a matter of law, the Regional Board cannot impose joint liability on the City. Under Clean Water Act section 402, and California Water Code section 13260, the Regional Board's authority is limited to imposing conditions on a discharge that are reasonably related to the discharge. The Permit's WQIP program provide an additional example of how the Permit could be interpreted as imposing joint liability. The Permit's WQIP requirements will force the City to develop goals and strategies to address sources of pollution in the City' watershed regardless of whether they are in the City' jurisdiction. If they are outside the City' jurisdiction, and the permittee who is responsible refuses to act, the City would not be able to comply with the Permit's WQIP requirements. In that instance, the City could be held liable for failure to develop a WQIP as specified in the Permit.

[4] The Permit sections that the Regional Board changed from "Copermittees" (in the March 27, 2013 Tentative Order) to "Copermittee" (in the Permit) are: Attachment E, Sections 1.b(3)(a)-(c); 4.b(3)(a)-(c); 4.c(2)(a)-(d); 5.b(3)(a)-(c); 5.c(1)(b)(i)-(iii); 6.b(3)(a)-(c); 6.c(3)(a)-(c).

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The Regional Board has no authority to impose such liability on the City. (*City of Modesto Redevelopment Agency v. Superior Court*, (2004) 119 Cal.App.4th 28; *In re Alvin Bacharach and Barbara Borsuk* (Order No. WQ 91-07, SWRCB 1991 ["The Water Code provides for the issuance of cleanup and abatement orders to "'dischargers'"].) Any permit conditions that impose responsibility for discharges that do not originate from point sources owned, operated or controlled by the City exceed the Regional Board's authority and must be stricken from the permit.

VI. THE PERMIT'S INCORPORATION OF THE BACTERIAL INDICATORS TMDL FOR BEACHES AND INLAND STREAMS VIOLATES STATE LAW.

A. *Federal Law does not require the TMDL to be incorporated into the Permit.*

As with Water Quality Standards, there is no question that the Federal Clean Water Act and its implementing regulations do not require municipal stormwater permits to include TMDLs. In *Defenders of Wildlife v. Browner*, 191 F.3d 1159 (9th Cir. 1999), the Ninth Circuit held that municipal stormwater do not need to comply with Water Quality Standards, holding "industrial discharges must comply strictly with state water-quality standards," while Congress chose "not to include a similar provision for municipal storm-sewer discharges."

TMDLs are an expression of Water Quality Standards. (*Pronsolino v. Nastri* (9th Cir. 2002) 291 F.3d 1123, 1129 [TMDLs are primarily informational tools that allow the states to proceed from the identification of waters requiring additional planning to the required plans]; *City of Arcadia v. State Water Resources Control Bd.* (2006) 135 Cal.App.4th 1392, 1415 [TMDL does not establish water quality objectives, but merely implements, under Water Code section 13242, the existing narrative water quality objectives].) The Ninth Circuit's holding that the Clean Water Act and its implementing regulations do not require municipal stormwater permits to include Water Quality Standards therefore applies to TMDLs.

Any inclusion of TMDLs in the Permit is purely a function of State law, and at the discretion of the Regional Board. However, as explained more fully below, the manner in which the Regional Board included the Bacterial Indicators TMDL for Beaches and Inland Streams into the Permit represents an abuse of discretion, and the Permit must be revised.

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B. *To the extent that the TMDL is incorporated as a WQBEL, the Regional Board was required to follow Federal Regulations.*

Although Federal law does not require the inclusion of TMDLs in municipal stormwater permits, when issuing NPDES permits, the Regional Board was required to follow Federal Regulations. (23 Cal Code Regs § 2235.2 ["Waste discharge requirements for discharge from point sources to nagivable waters shall be issued and administered in accordance with the currently applicable federal regulations for the National Pollutant Discharge Elimination System (NPDES) program"].) Thus although inclusion of the TMDL is not required by Federal law, if the Regional Board is going to include it in a permit, it must be in accordance with Federal Regulations. In this case, that meant appropriate development of water quality based effluent limits ("WQBELs") that incorporate the TMDL.

Federal Regulations at 40 C.F.R. § 122.44(d) require the Regional Board to incorporate WQBELs into industrial NPDES permits when it finds there is a "reasonable potential" that the discharge of the pollutant to be regulated "has the reasonable potential to cause, or contributes to an in-stream excursion above a narrative or numeric criteria within a State water quality standard." (40 C.F.R. § 122.44(d)(1)(iii).)[5] To determine whether a permitted discharge has the reasonable potential to "cause, or contributes to an in-stream excursion above a narrative or numeric criteria within a State water quality standard" Federal Regulations require the Regional Board to:

> use procedures which account for existing controls on point and nonpoint sources of pollution, the variability of the pollutant or pollutant parameter in the effluent, the sensitivity of the species to toxicity testing (when evaluating whole effluent toxicity), and where appropriate, the dilution of the effluent in the receiving water.
>
> (40 C.F.R. § 122.44(d)(1)(ii).)

The Regional Board must use this information to develop an appropriate WQBEL for the

[5] Pursuant to the *Defenders of Wildlife* decision, 40 CFR § 122.44(d) does not apply to municipal stormwater permits. Section 122.44(d) requires implementation of WQBELs to attain water quality standards. Under the *Defenders* opinion, water quality standards are not required to be incorporated into this MS4 permit; therefore WQBELs necessary to meet water quality standards are not required in this Permit.

regulated discharge. Before a WQBEL can be developed, a need for it must be established. As the Writers' Manual points out:

> The permit writer should always provide justification for the decision to require WQBELs in the permit fact sheet or statement of basis and must do so where required by federal and state regulations. A thorough rationale is particularly important when the decision to include WQBELs is not based on an analysis of effluent data for the pollutant of concern.
>
> (NPDES Permit Writers' Manual, September 2010, page 6-23.)

Basically, if a TMDL has been developed for the pollutant to be regulated, the WQBEL must be "consistent with the assumptions and requirements of any available wasteload allocation for the discharge prepared by the State and approved by EPA." (40 C.F.R. § 122.44(d)(1)(vii)(B).)

There are two generally accepted approaches to conducting reasonable potential analysis. According to US EPA guidance, "A permit writer can conduct a reasonable potential analysis using effluent and receiving water data and modeling techniques, or using a non-quantitative approach." (NPDES Permit Writers' Manual, September 2010, page 6-23.) The first approach would have required end of pipe monitoring data to be evaluated against in-stream generated ambient (dry weather) data. There is no evidence in the Permit or the Fact Sheet that the Regional Board based the Permit's WQBELs on any such data. (Fact Sheet F-126, F-127.)

As for the second, non-quantitative approach, the Regional Board also failed to provide information in the Permit, or the Fact Sheet stating that it had performed a non-quantitative analysis based on recommended criteria described in US EPA guidance. Neither the administrative record nor the Fact Sheet contains any evidence of the Regional Board having performed a reasonable potential analysis in accordance with either of the two foregoing approaches. (Fact Sheet F-126, F-127.)

Instead both the Permit's Findings, and its Fact Sheet merely recite the requirement that WBELs must be "consistent with the assumptions and requirements of any available wasteload allocation" with no analysis as to how the Permit requirements are consistent or how the WQBELs chosen were based on the required reasonable potential analysis. (Fact Sheet, F-126, F-

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127.) Not only is this a violation of Federal Regulations, but it is also renders the Permit infirm under the California Supreme Court's decision in *Topanga Association for a Scenic Community v. County of Los Angeles* (1974) 11 Cal.3d 506, which requires appropriate findings to "facilitate orderly analysis and minimize the likelihood that the agency will randomly leap from evidence to conclusions." (*Id.*, at 514.)

C. *The Permit's TMDL requirements violate State law.*

Under the California Supreme Court's holding in *Burbank v. State Board* (2005) 35 Cal.4th 613 ("*Burbank*"), a regional board must consider the factors set forth in sections 13263, 13241 and 13000 when adopting an NPDES Permit, unless consideration of those factors "would justify including restrictions that do not comply with federal law." (*Id.* at 627.)

As stated in the *Burbank*, "Section 13263 directs Regional Boards, when issuing waste discharge requirements, to take into account various factors including those set forth in Section 13241." (*Id.* at 625, emphasis added.) Specifically, the Court held that to the extent the NPDES Permit provisions in that case were not compelled by federal law, the Regional Boards were required to consider their "economic" impacts on the dischargers themselves, with the Court finding that such a requirement means that the Water Boards must analyze the "discharger's cost of compliance." (Id. at 618.)

As described above, there is no question that Federal Law does not require TMDLs to be included in municipal stormwater permits. (*Defenders of Wildlife v. Browner*, 191 F.3d 1159 (9th Cir. 1999); 40 C.F.R. § 122.44(d).) Consequently, the Regional Board was required to consider the factors listed in Water Code sections 13000, 13263 and 13241 before including the TMDL in the Permit. (*Burbank v. State Board* (2005) 35 Cal.4th 613.)

Water Code sections 13000, 13263, and 13241 require much more than an economic analysis.[6] First and foremost, they require an analysis of whether the proposed Permit terms are "reasonable, considering all demands being made and to be made on [receiving] waters." (Cal

[6] The Regional Board additionally failed to conduct a sufficient economic analysis of the Permit's requirements. A discussion of the reasons the Regional Board's efforts were deficient is presented in Section XI., below.

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Water Code § 13000.) They further require an analysis of whether specific Permit requirements are necessary given "the beneficial uses to be protected, the water quality objectives reasonably required for that purpose, other waste discharges." (Cal Water Code § 13263(a).)

The Regional Board has failed on both fronts. Permit terms that are infeasible to achieve are by definition, not reasonable. As described in Section II., above, compliance with numeric effluent limits tied directly to Water Quality Standards is simply not feasible. While the Regional Board attempted to "soften the blow" by requiring percentage reductions in bacteria levels instead of strict compliance with the TMDL's WLA, the effect is the same. Stormwater is a diffuse source subject to many areas of input. With regard to bacteria, many of those sources are natural. 100% control is not feasible. If a discharger fails to attain the reductions set forth in the TMDL on a numeric basis, they will be in violation of the Permit.

This kind of strict compliance approach fails to consider "the beneficial uses to be protected, the water quality objectives reasonably required for that purpose, other waste discharges" as required by Water Code section 13263(a). Many of the inland streams to which the TMDL (and the Permit conditions implementing the TMDL) apply are either channelized, fenced, or so shallow as to prevent full body contact recreation. Requiring the City to meet a bacteria standard based on an assumption of full body contact recreation in these areas is an unreasonable abuse of discretion that blatantly fails to consider the true beneficial uses of the waters at issue, and the many naturally occurring sources of bacteria discharges to surface waters in the region.[7] Neither the Permit or the Fact Sheet contain any analysis to the contrary.

More importantly for the purposes of this challenge, the Regional Board's decision to include the TMDL in the Permit violates sections 13263, 13241 and 13000, as well as the California Supreme Court's decision in *Topanga Association for a Scenic Community v. County of Los Angeles* (1974) 11 Cal.3d 506. For that reason, the TMDL requirements must be removed from the Permit.

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[7] Additionally, to the extent the underlying TMDL is flawed, the Regional Board had an obligation to correct the TMDL before imposing it on the City. (*See California Assn. of Sanitation Agencies v. State Water Resources Control Bd.* 208 Cal. App. 4th 1438, 1461 (2012).)

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VII. THE PERMIT'S ACTION LEVEL REQUIREMENTS ARE INCONSISTENT WITH STATE AND FEDERAL LAW.

Permit, section II.C, entitled "Action Levels," imposes a series of Non-stormwater Action Levels ("NALs") and Stormwater Action Levels ("SALs"), as numeric "goals" to be achieved. To the extent an NAL or SAL is based on an interim or final effluent limitation from a TMDL, then such a NAL or SAL becomes an "enforceable effluent limitations" which must be strictly complied with.

A. *The Permit's Action Levels could be interpreted as numeric effluent limitations.*

The Regional Permit, in Provision II.C, sets forth requirements for the incorporation of Non-Storm Water Action Levels ("NALs") and Storm Water Action Levels ("SALs") into Water Quality Implementation Plans ("WQIPs). The preamble to Provision II.C states that the "goal of the action levels is to guide Water Quality Improvement Plan implementation efforts and measure progress towards the protection of water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges." This language establishes that the NALs and SALs are not intended to be enforceable themselves if not attained by the copermittees.

Unfortunately, the language of the Regional Permit is not entirely clear on this point. Footnotes 7 and 9 of the Regional Permit state that NALs and SALs incorporated into a WQIP "*are not considered* by the San Diego Water Board to be enforceable effluent limitations" (unless based on a water quality based effluent limitation ("WQBEL") expressed as an interim or final effluent limitation for a TMDL and the compliance date for that WQBEL has passed). (emphasis supplied).

Given that the Regional Board has an obligation to make ensure that the provisions of the Regional Permit are clear and unambiguous, the City requests that the State Board either amend the footnotes or text of the Regional Permit to make clear that the NALs and SALs are *not* enforceable effluent limitations or direct the Regional Board to take that action.

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B. *The Permit lacks adequate findings that the Action Levels are necessary, or compliant with Water Code sections 13263 or 13241.*

The Permit's Action Level requirements (both NAL and SAL) include several predetermined Action Levels for, among other things, dissolved oxygen, turbidity, pH, copper, zinc, and lead. (Permit section C.1.a.) These pre-set levels were selected by the Regional Board as necessary to achieve the Maximum Extent Practicable standard required by the Clean Water Act. As an initial matter, neither SALs or NALs are required by the Clean Water Act or the MEP standard for the same reasons that TMDLs and numeric effluent limitations are not required by the Clean Water Act or the MEP standard.

More importantly, the Permit contains no findings explaining why the specific levels were chosen, or how their inclusion in the permit is necessary to achieve the MEP standard. It likewise lacks any findings as to how the chosen standards are compliant with factors set forth in Water Code sections 13263 and 13241.

The Fact Sheet includes a discussion of where the initial Action Level numbers came from but includes no analysis of whether they are reasonable or attainable. (See Fact Sheet pp. F-57, F-58.) The Fact Sheet additionally fails to explain why the each pollutant level chosen is necessary for inclusion in the Permit. (*Id.*) Instead, the Fact Sheet refers back to the 2009 and 2010 municipal permits issued for South Orange County and Riverside County and states that the Permit's Action Levels were developed for those permits.[8] The Fact Sheet additionally cites an EPA study but does not discuss the propriety of each preset limit. This level of analysis is required to provide the City with the opportunity to review the numeric limits chosen and provide evidence refuting the rationale under which they were chosen. It was further required to ensure that the Regional Board did not "randomly leap from evidence to conclusions." (*Topanga Association for a Scenic Community v. County of Los Angeles* (1974) 11 Cal.3d 506, 514.)

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[8] The Fact Sheet fails to note that the dischargers objected to the 2009 South Orange County Permit's Action Levels on the grounds that they were arbitrarily chosen. The Fact Sheet further fails to note that the 2009 South Orange County Permit's Action Levels were appealed via petition to the State Board by several of the permittees. Those petitions are currently in abeyance.

Lastly, both the Permit and the Fact Sheet fail to assess whether the Action Levels meet the requirements of Water Code sections 13263, and 13241. Because the Action Levels are not required by Federal law, the Regional Board must comply with state law in imposing these requirements. This includes considering the water quality conditions that could be reasonably achieved and economic considerations. A substantial body of evidence exists that suggests the proposed NALs and SALs may not be reasonably achievable. If Permittees are required to respond to and address all exceedances without reasonable prioritization, the cost will be significant. Because some exceedances will not be indicative of impacts to water quality, the cost to implement the SALs and NALs may have little if any commensurate environmental benefit. There is nothing in the record that suggests that the Regional Board has considered these water quality and economic factors. (*See Topanga Association for a Scenic Community v. County of Los Angeles* (1974) 11 Cal.3d 506, 514.) For that reason they must be removed from the Permit until such time as the Regional Board demonstrates that they are feasible, cost effective, and necessary.

VIII. THE REGIONAL BOARD HAS UNLAWFULLY ADOPTED A REGIONAL PERMIT IN VIOLATION OF THE WATER CODE AND FEDERAL REGULATIONS.

The Permit covers permittees in three large metropolitan counties – Orange, Riverside and San Diego. In May 2012, Orange and Riverside Counties ("Counties") sent letters to Staff Counsel for the Regional Board requesting the legal authority to issue a region-wide permit to the Counties.[9] The Counties contended that in accordance with federal regulations there was no system-wide, jurisdiction-wide or watershed basis to issue a regional permit. The Counties also asserted that they did not apply for the Permit and that there was no administrative basis or other evidence that allowed the Regional Board to adopt a Permit with provisions expressly regulating the Counties without considering a Report of Waste Discharge.

On September 7, 2012, Staff Counsel responded to the Counties stating that there was a jurisdiction-wide and watershed basis to impose a regional permit on the Counties, but offered no

[9] Letter from Ryan M. F. Baron, Office of County Counsel, County of Orange, to Catherine Hagan, Office of Chief Counsel, State Water Resources Control Board, San Diego Region (May 10, 2012); Letter from David H. K. Huff, Office of County Counsel, County of Riverside, to Catherine Hagan, Office of Chief Counsel, State Water Resources Control Board, San Diego Region (May 21, 2012).

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evidence for these bases. Staff Counsel cited examples in the Bay Area and an Alaskan borough where regional permits had been issued.[10] Despite the Regional Board's contentions to the contrary, no law or regulation gives the Regional Board the authority to issue a regional permit.

A. *There Is No System-wide, Jurisdiction-Wide, Watershed or Other Basis by Which to Legally Impose a Region-wide Permit on the Petitioners.*

Finding 2 in the Permit states that the legal and regulatory authority for implementing a region-wide MS4 Permit stems from Section 402(p)(3)(B) of the Clean Water Act ("CWA") and 40 C.F.R. § 122.26(a)(1)(v). The Permit also cites EPA's Final Rule regarding stormwater discharge permit application procedures that there is flexibility to establish system-wide or region-wide permits. (55 Fed. Reg. 47990, 48039-48042.) In the summer of 2012, the Regional Board staff circulated a draft Permit and conducted Focused Meeting Workshops seeking input on the draft Permit. At workshops held on June 27, 2012 and July 11, 2012, Regional Board staff stated that the only reason for a region-wide Permit was to consolidate the three county permits to lessen the amount of permit writing time and reduce Regional Board costs. Upon adoption of the Permit on May 8, 2013, Finding 2 had been amended to state that the "regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall costs savings for the Copermittees and San Diego Water Board." (Permit section I.2.) There was no evidence presented at the adoption hearing of savings by the Copermittees or Regional Board or that the region-wide permit would ensure consistency of regulation. In any case, neither justification is valid under federal or state law. No other basis was given and no evidence was presented demonstrating why three large, geographically different counties would be covered under one Permit.

In 1987, Congress adopted amendments to the CWA requiring EPA to develop a permitting system for large and medium MS4s. As part of a rulemaking proceeding to adopt regulations implementing the CWA amendments, EPA examined how to define an MS4

[10] Letter from Jessica Jahr, California Regional Water Quality Control Board, San Diego Region, to Ryan M. F. Baron, Office of County Counsel, County of Orange, and David H. K. Huff, Office of County Counsel, County of Riverside (Sept. 7, 2012).

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"system." Under the CWA and EPA rules, a "system," *one system*, would be issued a permit by the EPA or State authority allowing the discharge of stormwater into waters of the U.S. EPA's rulemaking proceeding only examined individual MS4s (*i.e.*, city and county unincorporated area) and MS4s within the same geographic area – defined as the same watershed or the political boundary *of the discharger* (*i.e.*, state owned roads, countywide or regional stormwater management authority).

Multiple smaller systems could be defined as a "system" and issued one permit if there were common physical factors and a unified stormwater management plan. The only instance where a larger geographic area would be covered under one permit is where there was an application by a regional stormwater management authority (*e.g.*, joint powers authority) that was legally empowered to perform all the program functions of smaller MS4s and could apply for such a permit. The EPA did not consider defining a "system" based on cost savings or consistency of regulation, and its final rules do not allow for this interpretation.

In adopting a region-wide Permit, the Regional Board has no basis to define the three counties as "one system" and issue one Permit to 39 different jurisdictions without their application or consent. There are no common physical factors to consider and no unified stormwater management plan between the three counties and 39 permittees. The Petitioners do not operate and are not a member of a regional stormwater management authority. Rather, the Regional Board only considered its internal cost savings and issued the Permit based on the geographic boundary of the Regional Board, and not the dischargers (whereas the Regional Board's political boundary spans across several large distinct and separate MS4 systems).

Federal Regulations look to interconnection and similarities between jurisdictions as the basis by which to issue one permit. (33 U.S.C. § 1342(p)(3)(B)(i); 40 C.F.R. § 122.26(a)(1)(v)).) Federal regulations do not authorize and the EPA Final Rule does not contemplate regional permit issuance based on overall reduced cost savings. (55 Fed. Reg. 47990-01.) Here, overall cost savings have not been demonstrated by the Regional Board, and although it may be administratively convenient to impose a one-size fits all Permit, the EPA Final Rule contemplates such consistency within a watershed and not throughout a geographical area the size of the three

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counties.

There is no factual or technical basis in the Permit that meets this criteria or establishes other bases to regulate Orange County under one unified permit. There is also no statistical basis by which to issue a region-wide Permit, as Orange County is comprised of over three million people and is the sixth largest county by population in the U.S. The U.S. Bureau of Census designates Orange County in a different Metropolitan Statistic Area than San Diego County, designating it in a Combined Statistical Area with Los Angeles, Ventura and San Bernardino Counties.

Lastly, the Regional Board cited examples in the Bay Area and in Alaska where region-wide permits were alleged to have been issued. In the Bay Area MS4 permit, various City and counties under that permit [cite] interconnect with one another and drain into the San Francisco Bay. The Bay Area MS4s agreed to end their existing permits early and applied for and consented to a region-wide permit. The Bay Area is also represented by a joint powers organization or regional watershed management program comprised of 8 municipal stormwater programs that performs common watershed functions for its 94 members. In the case of the Alaska example, a "region-wide" permit was issued to the Fairbanks North Star Borough, City of Fairbanks, City of the North Pole, the Alaska Department of Transportation and the University of Alaska Fairbanks. Further review of that permit and the stormwater program maps demonstrate, however, that the region regulated is a borough, the Alaskan equivalent of a county. All of the regulated Alaska permittees are physically interconnected through a storm drain system and roadways and drain into one watershed. In short, neither the Bay Area nor the Fairbanks Borough permits provide sufficient examples of a region-wide permit comparable to the one being issued to the Petitioners.

B. *There Is No Technical Basis to Regulate the Petitioners Due to the Lack of a Report of Waste Discharge Application.*

In order for an MS4 system to be issued a permit, the operator of the system must apply for it. (40 C.F.R. § 122.21.) The Report of Waste Discharge ("ROWD") is the mechanism by which an MS4 applies to discharge stormwater. Every MS4 permit contains a requirement that a

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ROWD be filed within 180 days of the expiration of the permit so that a new permit can be considered and adopted. A ROWD is a several hundred page application that contains information used to determine provisions of a new permit, including, but not limited to, monitoring, program strengths and other tools that are assessed in the new permit. A ROWD contains quantitative data and other evidence by which to make findings, conclusions of law, establish programs, and approve a permit to a system. In short, a ROWD contains the evidence that a Regional Board uses to regulate the permittee.

The Regional Board has adopted a Permit that expressly covers Orange County water bodies and regulates the actions of the Petitioners, but is not based on any ROWD or other application filed by the City. Thus, there is no technical basis for the Permit or substantial evidence in the record by which to regulate the City under a region-wide Permit, or any permit other than the Petitioners existing permit, (Cal Water Code § 13260; *Topanga Association for a Scenic Community v. County of Los Angeles* (1974) 11 Cal.3d 506) and the terms and conditions of the Permit are arbitrary and capricious.

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IX. THE PERMIT CANNOT CLASSIFY NATURAL WATERS AS PART OF THE MS4, AND THE MS4 CANNOT BE CLASSIFIED AS BOTH A MS4 AND RECEIVING WATER.

The Permit states that development often makes use of natural drainage patterns and features as conveyances for runoff. Finding 11 goes on to state that rivers, streams and creeks in developed areas are part of the Petitioners' MS4 whether the river, stream or creek is natural, anthropogenic or partially modified. It further states that these natural water bodies are both an MS4 and a receiving water.

Finding 11 is expressly contradicted by Federal Regulations defining what qualifies as an MS4. Federal Regulations define a municipal separate storm sewer as:

> a conveyance or system of conveyances including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains:
>
> i. Owned or operated by a state, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to state law) ... including special districts under state law such as a sewer district sewer district, flood control district or drainage district, or similar entity, or an

Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the Clean Water Act that discharges into waters of the United States;

ii. Designed or used for collecting or conveying stormwater;

iii. Which is not a combined sewer; and

iv. Which is not part of a publicly owned treatment works (POTW) as defined at 40 CFR 122.2.

This definition only includes man-made channels and systems and does not encompass natural water bodies simply because an outfall discharges to a receiving water. Improvements to natural rivers, streams and creeks do not make them an MS4, or part of an MS4. They are simply an improved water of the U.S.

Lastly, municipalities do not own, control or operate natural rivers, streams and creeks. Such water bodies are often administrated by the State of California in the public trust for the right of the people to use such waters for certain purposes or are privately owned. The Legislature, acting within the confines of the common law public trust doctrine, is the ultimate administrator of the trust and may often be the final arbiter of permissible uses of trust lands. Such waters are not therefore, part of the City's MS4.

X. THE REGIONAL BOARD VIOLATED DUE PROCESS REQUIREMENTS IN THE PERMIT DEVELOPMENT PROCESS.

The period provided to review and comment on the Permit was unreasonably short given the breadth of the Permit. By denying the Co-Permittees a meaningful opportunity to review and comment on a Permit that so drastically affects their rights and finances, the Regional Board has denied the Co-Permittees due process rights under state and federal law. The United States Constitution, the California Constitution and the California Administrative Procedures Act, as applicable to the Regional Board, all require basic procedural due process. (*See Morongo Band of Mission Indians v. State Water Resources Control Board* (2009) 45 Cal.4th 731; Gov. Code § 11425.10.) The essence of due process is the opportunity to be heard at a meaningful time and in a meaningful manner. (*Mathews v. Eldridge* (1976) 424 U.S. 319, 333; *Spring Valley Water*

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Works v. San Francisco (1890) 82 Cal. 286 (1890) (reasonable notice and opportunity to be heard are essential elements of "due process of law," whatever the nature of the power exercised.); *Arkansas Wildlife Fed'n v. ICI Ams.* (8th Cir. 1994) 29 F.3d 376, 381 ("the overall regulatory scheme affords significant citizen participation, even if the state law does not contain precisely the same public notice and comment provisions as those found in the federal CWA."))

Two examples illustrate the lack of compliance by the Regional Board with this "essence" of due process. First, the Regional Board released the Draft Tentative Order at the close of business on March 27, 2013, just before Easter weekend and a state holiday on April 1, 2013. (See Draft Tentative Order R9-2013-0001 (March 27, 2013).) This release date provided just a few business days to review the Draft Tentative Order before the adoption hearings that were scheduled for April 11 and 12, 2013. As the Authority and other Co-Permittees informed the Regional Board in writing before and orally at the April 11 and 12 hearings, this short time period was insufficient to allow the Authority to properly prepare for the hearings. The Authority was thus deprived the "essence" of due process prior to the April hearings.

The same holds true regarding the Regional Board's May 8, 2013 hearing process. The Regional Board released two errata sheets shortly before the final adoption hearing on May 8, 2013. These errata sheets proposed major changes to the March 27, 2013 Tentative Order, most notable the proposed deletion of the compliance option in one version of the errata. Again, this short notice provided insufficient time for the Authority to prepare for and comment on the Permit. The Authority was thus deprived of fair notice and a meaningful opportunity to be heard on this important issue.

XI. THE REGIONAL BOARD FAILED TO ADEQUATELY CONSIDER ECONOMIC IMPACTS PURSUANT TO WATER CODE SECTION 13241

Under the California Supreme Court's holding in *Burbank v. State Board* (2005) 35 Cal.4th 613, a regional board must consider the factors set forth in sections 13263, 13241 and 13000 when adopting an NPDES Permit, unless consideration of those factors "would justify including restrictions that do not comply with federal law." (*Id.* at 627.)

As stated in the *Burbank*, "Section 13263 directs Regional Boards, when issuing waste

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discharge requirements, to take into account various factors including those set forth in Section 13241." (*Id.* at 625, emphasis added.) Specifically, the Court held that to the extent the NPDES Permit provisions in that case were not compelled by federal law, the Regional Boards were required to consider their "economic" impacts on the dischargers themselves, with the Court finding that such a requirement means that the Water Boards must analyze the "discharger's cost of compliance." (Id. at 618.)

There has not been a full consideration of the section 13241 factors, which would include an analysis of the economic impacts that would result from compliance with the existing stormwater permit compared to the costs of complying with the proposed stormwater permit (thereby the costs of complying with the new requirements). Instead, the Permit's analysis begins by stating, and without any quantification, that it would more expensive to not fully implement programs. Section 13241 is not satisfied by this inverse analysis.

The Permit states that the Petitioners have a significant amount of flexibility to choose how to implement BMPs and that "least expensive measures" can be chosen. (Fact Sheet, F-17.) This statement, however, conflicts with the Permit's definition of MEP at Permit section C-6 which expressly acknowledges Chief Counsel's 1993 MEP memo that only the Regional and State Boards determine whether BMPs meet MEP, and that selection of the least expensive BMPs will likely not result in meeting the MEP standard. The Fact Sheet also fails to cite any recent cost benefit numbers but relies on inapplicable cost data such as a 1999 EPA study on household costs and a California State University, Sacramento ("CSUS") Cost Survey assessed program costs for Phase I City.

Nothing in the Fact Sheet links any of the actual conditions of the Phase I permits of the Phase I City studied by CSUS with any of the requirements of the Permit. Therefore, the study tells the public nothing about the costs to implement the Permit. The data included in the Fact Sheet is also more than a decade old. In short, the Fact Sheet uses old data from Phase I programs that have no linkage to any conditions of the Permit. The full costs of implementing the entire program required by the Permit in 2013 dollars must be assessed.

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In addition to relying on outdated and inapplicable data, the Regional Board's cost analysis is fundamentally flawed because it tells the public nothing at all about the relationship between the cost of any particular BMP and the pollution control benefits to be achieved by implementing that BMP. Under this "generalized" approach, extremely costly requirements that bear little or even no relationship (or even a negative relationship) to the pollution control benefits to be achieved could be "justified" as long as the "overall" program costs are within what the Regional Board deems to be an acceptable range.

This is not a proper way to determine whether a control reduces the discharge of pollutants from the MS4 to the MEP. A more individualized assessment of cost is required. Otherwise, dischargers may be required to implement very costly controls that have no relationship to pollution control benefits, a result inconsistent with MEP. This analytical flaw in the Fact Sheet is compounded by the approach taken to assess the benefits of the Permit. Here again, the assessment approach misses the mark because it tells the public nothing about the pollution control benefits to be achieved by implementation of the controls in the Permit. All the Fact Sheet indicates, in essence, is that people like clean water and in theory may be willing to pay for it, that urban storm water may contribute to beach closures, and that such beach closures have an economic impact. This analysis sheds no light on the relationship between a BMP's costs and the pollution control benefits to be achieved by implementing that BMP.

Finally, stormwater agencies cannot readily establish or raise fees to help pay for the BMPs necessary to comply with either the California Toxics Rule criteria or proposed Site Specific Objectives due to the requirements of Proposition 218, Proposition 26 and the Mitigation Fee Act. For instance, Proposition 218 requires that property-related fees be put to a vote, so City cannot assess fees without the consent of two-thirds of the property owners. Therefore, the costs associated with the implementation and maintenance of the BMPs will almost always be expended using local agency General Funds.

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XII. The Permit unlawfully imposes a Federal scheme on the City with no option for compliance

The Permit violates the Tenth Amendment to the United States Constitution because it compels the City and other copermittees to administer a federal regulatory scheme. The Tenth Amendment states that "[t]he powers not delegated to the United States by the Constitution, nor prohibited by it to the States, are reserved to the States respectively, or to the people." U.S. Const. amend. X. The U.S. Supreme Court has held that under the Tenth Amendment, "the Federal Government may not compel the States to implement, by legislation or executive action, federal regulatory programs." *Printz v. United States*, 521 U.S. 898, 925 (1997). The protection afforded by the Tenth Amendment extends to local governments such as the City. *Id.* at 931 n.15; *Envtl. Defense Ctr., Inc. v. EPA*, 344 F.3d 832, 847 (9th Cir. 2003).

A state or local government may be persuaded to implement a federal regulatory program but "the residents of the State or municipality must retain 'the ultimate decision' as to whether or not the State or municipality will comply with the federal regulatory program." *Envtl. Defense Ctr.*, 344 F.3d at 847 (citing *New York v. United States*, 505 U.S. 144, 168 (1992)). Permissible methods of "persuasion" include federal funding that is contingent on participation in a federal program. *Id.* (citing *South Dakota v. Dole*, 483 U.S. 203, 205-08 (1987)). Offering an alternative to implementing a federal regulatory program may also be constitutionally permissible, so long as the alternative does not "unduly infringe on the sovereignty of the State or local government." *City of Abilene v. EPA*, 325 F.3d 657, 662 (5th Cir. 2003) (citing *New York*, 505 U.S. at 176).

An example of an alternative that crosses the line into compulsion is the "take title" provision of the Low-Level Radioactive Waste Policy, which gave states the choice of either regulating radioactive waste according to federal standards, or taking possession of that waste. *New York*, 505 U.S. at 174-77. The Supreme Court determined this provision violates the Tenth Amendment because, "[e]ither way, 'the Act commandeers the legislative processes of the States by directly compelling them to enact and enforce a federal regulatory program.'" *New York*, 505 U.S. at 176 (quoting *Hodel v. Virginia Surface Mining & Reclamation Ass'n, Inc.*, 452 U.S. 264, 288 (1981)). "A choice between two unconstitutionally coercive regulatory techniques is no

choice at all." *Id.*

In the storm water context, a Phase I MS4 permit did not violate the Tenth Amendment even though it required the cities to implement storm water management programs regulating new development, construction sites, sanitary sewers, landfills, hazardous waste treatment facilities, and industrial facilities. *City of Abilene*, 325 F.3d at 660, 662. The court reasoned that the cities had a constitutional alternative to implementing this federal program: accept a permit with effluent limitations instead of storm water management requirements. *Id.* at 662. Likewise, the Ninth Circuit Court of Appeals held that the storm water management requirements in EPA's Phase II MS4 permit rule did not run afoul of the Tenth Amendment because cities had the option to enroll in a Phase I MS4 permit instead, and that permit had already been found constitutional in *City of Abilene. Envtl. Defense Ctr.*, 344 F.3d at 848.

Unlike the MS4 permit requirements challenged in *City of Abilene* and *Environmental Defense Center*, the Permit violates the Tenth Amendment because the City and other copermittees have no choice but to implement a federal regulatory program.[11] The Regional Board has taken the management permit and effluent permit alternatives discussed in *City of Abilene* and made them both compulsory in the Permit. The Permit requires the City to implement the storm water management programs such as the Water Quality Improvement Plans in Provision II.B and the Jurisdictional Runoff Management Programs in Provision II.D, *and* to comply with the de facto effluent limitations in Provision II.A. There is no choice here.

The City respectfully requests that the State Board remand the Permit back to the Regional Board with direction to restore the compliance linkage between the Water Quality Improvement Plans in Provision II.B and the receiving water limitations in Provision II.A. This linkage would cure the legal issues addressed here by giving the City and other copermittees a chance to comply with the Permit and providing a constitutional choice instead of compelling

[11] The Regional Board has found that each and every requirement in the Permit is federally mandated under the Clean Water Act. Permit at F-29 to F-30. The City disagrees with this finding, but notes that the Regional Board cannot have it both ways. If the Permit includes only federal requirements, then the Tenth Amendment must be respected. If the Permit includes state law requirements above and beyond what is required under the Clean Water Act, then those requirements are unfunded state mandates.

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both implementation of federal storm water management programs and compliance with effluent limitations.

CONCLUSION

For the reasons expressed in the Petition, and this Memorandum of Points and Authorities the City's Petition should be granted.

Dated: June 7, 2013

BEST BEST & KRIEGER LLP

By: _____

Attorneys for Defendant

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THE CITY OF SAN DIEGO

November 19, 2014

VIA EMAIL TO: Laurie.Walsh@waterboards.ca.gov

Laurie Walsh, Water Resource Control Engineer
San Diego Regional Water Quality Control Board
2375 Northside Drive, Suite 100
San Diego, CA 92108

Subject: Comment Letter –Tentative Order No. R9-2015-0001, Place ID:658018LWalsh

Dear Ms. Walsh:

The City of San Diego (City) appreciates the opportunity to provide comments on the Amendment to the Regional Municipal Separate Storm Sewer System (MS4) Permit for the San Diego Region (Tentative Order No. R9-2015-0001, herein referred to as the "Draft Amendments") to incorporate the County of Orange, several Incorporated Cities of South Orange County, and the Orange County Flood Control District as Copermittees. The City is committed to protecting and improving water quality in the San Diego Region. From this perspective, the City provides the following comments below. More detailed comments are included in Attachment 1.

- *The City supports the proposed changes to the Areas of Special Biological Significance and hydromodification management provisions.*
- *The Draft Amendments should include revisions to Provision A to establish a linkage between the implementation of Water Quality Improvement Plans (WQIPs) and compliance with the Receiving Water Limitations and Discharge Prohibitions.* The City is expending significant resources to develop and implement WQIPs that include timely implementation of strategies, control measures, and other actions to make progress towards attainment of water quality standards. Therefore, the City requests that the Draft Amendments include implementation of a WQIP as a valid mechanism for demonstrating

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compliance with Receiving Water Limitations and Discharge Prohibitions. The disconnect in the MS4 Permit between the WQIPs and compliance with Receiving Water Limitations raises several significant issues: (1) it undermines the stated intent of the Regional Board to encourage prioritization of pollutants; (2) it requires resource-intensive watershed planning efforts that have no benefit to the Copermittees' ability to comply with the Receiving Water Limitations and Discharge Prohibitions; and (3) it calls into question whether WQIPs are properly required under the MS4 Permit.

- *The Draft Amendments should include a definition of Prior Lawful Approval to clarify the Regional Board's intent in allowing some new development projects to comply with prior requirements.* The current language in the MS4 Permit is unclear. A definition of Prior Lawful Approval should: (1) Provide a clear, bright line; (2) Provide a backstop to ensure that projects with older approvals comply with new requirements unless those approvals confer vested rights; (3) Protect vested rights; and (4) preserve Copermittees' land use authority.
- *The Los Penasquitos Sediment TMDL requirements in the Draft Amendments should be modified to ensure consistency with the TMDL.* The City supported and led the third-party TMDL process, and the resulting TMDL was approved by the Regional Board with broad support from all stakeholders. The City is concerned, however, that the Draft Amendments are inconsistent with the TMDL and place a disproportionate burden on Phase I MS4 Copermittees. In the attached table, the City recommends revisions to reconcile incorrect incorporation of interim and final compliance targets, omission of several compliance pathways indentified in the TMDL, and the assignment of the entire compliance obligation to Phase I MS4 Copermittees without acknowledging the requirements of other Responsible Parties named in the TMDL.
- *MS4 Permit Attachment E should be modified to allow individual jurisdictional compliance with the TMDLs.* The City is committed to protecting and improving water quality and achieving compliance with TMDLs via the implementation of Water Quality Improvement Plans. However, language throughout Attachment E appears to preclude any Copermittee from using the WQIP compliance pathway unless all other Copermittees also are in compliance. The City has no authority to compel other Copermittees to comply and cannot be held liable for the actions or inactions of other agencies. Under federal Clean Water Act regulations that have been incorporated into the MS4 Permit, a Copermittee is responsible only for conditions relating to the discharges for which it is an operator.

Thank you for your time and consideration of these comments. If you have questions, please contact Ruth Kolb at (858) 541-4328 or at rkolb@sandiego.gov.

Sincerely,

Drew Kleis
Deputy Director

DK\rk

Attachments: 1. City of San Diego Comment Table Regarding September 18, 2014 Revisions to Order No. R9-2013-0001
2: Resolution No. R9-2012-0033 and Attachment A

cc: Tony Heinrichs, Deputy Chief Operating Officer
Kris McFadden, Transportation & Storm Water Department Director
Heather Stroud, Deputy City Attorney
Ruth Kolb, Program Manager, Transportation & Storm Water Department
Sumer Hasenin, Senior Engineer, Transportation & Storm Water Department
Mike Hansen, Director of Land Use and Environmental Policy, Office of the Mayor

Permit Section	Permit Page (Original)	Section Title	Reason for Proposed Changes/Comments	Proposed Changes
General Comment	NA	NA	NA	The proposed amendments do not address any of the issues raised in the City's Petition for Review of San Diego Regional Water Quality Control Board (Regional Board) Order No. R9-2013-0001, filed on June 7, 2013. The City does not waive any of those arguments, and urges the Regional Board to address those issues as part of this permit amendment.
A. Prohibitions and Limitations				
A	13-16	Prohibitions and Limitations	Current permit language lacks linkage between Water Quality Improvement Plans (WQIPs) and compliance. Problems caused by current language: (1) it undermines the stated intent of the Regional Board to encourage prioritization of pollutants; (2) it requires resource-intensive watershed planning efforts that have no benefit to the Copermittees' ability to comply with the Receiving Water Limitations and Discharge Prohibitions; and (3) it calls into question whether WQIPs are properly required under the MS4 Permit. The City envisions WQIPs as the foundation for a BMP-based compliance approach for the Discharge Prohibitions and Receiving Water Limitations. However, the language in Provision A does not clearly link compliance with the iterative process set forth in the WQIPs. In essence, the language suggests that even if Copermittees expend significant resources to develop and fully implement WQIPs that are progressing toward attainment of water quality standards, they may still be found to be out of compliance for single exceedances. The iterative process is a fundamental aspect of MS4 programs, as envisioned by State Water Board Order 99-05 and later reconfirmed in Order WQ 2001-15 (BIA Order), and is the mechanism by which MS4 Copermittees should <u>demonstrate</u> compliance (i.e., implementation of the iterative process equals compliance). The WQIPs now provide a mechanism to "raise the bar" with regard to the detail and quantitative analyses used to identify pollutant sources, implement BMPs to address those sources, and increase the number or size of BMPs until water quality standards are attained. However, as Provision A.4 is written, the envisioned strategic compliance process falls short, and the WQIPs are simply documents that do not appear to have a meaningful linkage to MS4 compliance. An unintended but potentially significant consequence of this compliance uncertainty is that the City and other Copermittees may experience increased difficulty securing program funding because even substantial increases in funding would not lead to achieving	Revise Provision A to allow implementation of WQIPs to demonstrate compliance with Receiving Water Limitations and Discharge Prohibitions.

Permit Section	Permit Page (Original)	Section Title	Reason for Proposed Changes/Comments	Proposed Changes
			compliance.	
B. Water Quality Improvement Plans				
B.1	17	Watershed Management Areas	This NPDES Permit is applicable to discharges from Copermittee MS4s as stated in Section A.1. Discharges from other NPDES permits are governed by requirements within those permits.	Modify Section B.1 as follows: The Copermittees must develop a WQIP for their MS4 discharges within each of the Watershed Management Areas in Table B-1.
E. Jurisdictional Runoff Management Programs				
E	93	Structural BMP Approval and Verification Process	A definition of "prior lawful approval" is necessary. Regional Board counsel has indicated that "prior lawful approval" was intended to refer to an approval that conferred a vested right to proceed without complying with the new development requirements of the 2013 MS4 Permit. However, some stakeholders have argued that any approval is sufficient. The current permit language is unclear. A definition is necessary to ensure that the standard the Copermittees will be held to by the Regional Board is expressed in the permit language. Permit language should address the following: 1. Provide a clear, bright line of what constitutes prior lawful approval; 2. Provide a back stop to ensure that projects with older approvals that do not confer vested rights comply with new requirements; 3. Protect vested rights; and, 4. Preserve Copermittees' land use authority.	Define "prior lawful approval." This could be done in a footnote.
E	93	Structural BMP Approval and Verification Process	Including the date the BMP Design Manual will be updated would provide additional clarity and avoid having to read multiple sections of the Permit to determine the referenced date.	(a) Each Copermittee must require and confirm that, for all Priority Development Project applications that have not received prior lawful approval by the Copermittee by ~~the time the BMP Design Manual is implemented updated pursuant to Provision E.3.d~~December 24, 2015, the requirements of Provision E.3 are implemented. For project applications that have received prior lawful approval before ~~the BMP Design Manual is implemented updated pursuant to Provision E.3.d~~December 24, 2015, the Copermittee may allow previous land development requirements to apply.
Attachment A. Discharge Prohibitions and Special Protections				
A	A-5 to A-6	Compliance Plans for Inclusion in Storm Water Management Plans	The redline strikeout version of draft amendment indicates that the entire Area of Special Biological Significance (ASBS) section has been changed, but the proposed resolution indicates that the only change that was made was to reflect State Board Resolution 2012-0031, which changed the deadline for certain provisions from 4 to 6 years.	Support change to Attachment A, section 2.A.2.d.2.

Permit Section	Permit Page (Original)	Section Title	Reason for Proposed Changes/Comments	Proposed Changes
Attachment E. Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2015-0001				
Attachment E, Sections 1.b(3)(d) 1.b(3)(d)(iv) 1.b(3)(d)(v) 2.b(3)(d)(iv) 2.b(3)(d)(v) 3.b(3)(d)(iv) 3.b(3)(d)(v) 4.b(3)(d) 4.b(3)(d)(iv) 4.b(3)(d)(v) 5.b(1)(a) 5.b(3)(d) 5.b(3)(e) 5.b(3)(f) 4.b(3)(g) 4.b(3)(g)(iv) 4.b(3)(g)(v) 5.c(1)(b)(iv) 5.c(1)(b)(v) 5.c(1)(b)(vi) 5.c(1)(b)(vii) 5.c(1)(b)(viii) 6.b(2)(b)(ii) 6.b(3)(d) 6.b(3)(e) 6.b(3)(f) 6.b(3)(f)(iv) 6.b(3)(f)(v) 6.c(2)(a)(i) 6.c(2)(a)(ii) 6.c(3)(d) 6.c(3)(e) 6.c(3)(f) 6.c(3)(g) 6.c(3)(h)	E-4 E-8 E-11 E-16 E-19 E-23 E-24 E-25 E-34 E-36 E-37 E-41 E-42 E-47	Final TMDL Compliance Determination	Compliance language requires all Copermittees to implement a WQIP for any of the Copermittees to utilize the WQIP based compliance approach for TMDLs. Copermittees have no authority to compel other Copermittees to implement BMPs and should not be held liable for the actions or inactions of others. Under 40 C.F.R. §§ 122.26(a)(3)(vi) and 122.26(b)(1), a Copermittee is responsible only for conditions relating to the discharges for which it is the operator.	Revise Attachment E Provisions to allow independent jurisdictional compliance. For example, revise Provisions E.1.b(3)(d) as follows: (d) The Responsible ~~Copermittees~~ Copermittee ~~develop~~ develops and ~~implement~~ implements the Water Quality Improvement Plan as follows: . . . . (iv) The Responsible ~~Copermittees~~ Copermittee ~~continue~~ continues to implement the BMPs required under Specific Provision 1.b.(2)(c), AND (v) The Responsible ~~Copermittees~~ Copermittee ~~continue~~ continues to perform the specific monitoring and assessments specified in Specific Provision 1.d, to demonstrate compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c).
Attachment E, 7.b.2	N/A	Final Effluent Limitations	The Waste Load Allocation is incorrectly stated as an annual load. Instead, the Waste Load Allocation was calculated as loading from the critical wet period of Oct. 1 to Apr. 30, not the entire year. (TMDL Staff Report, Table 6). This error in the MS4 permit makes the Waste Load Allocation, and consequently, the	Modify Table 7.1 heading as follows: Final Effluent Limitations as Expressed as Wet Season (October 1 to April 30) Loads

Permit Section	Permit Page (Original)	Section Title	Reason for Proposed Changes/Comments	Proposed Changes
			Final Effluent Limitation, inconsistent with the TMDL. Some sediment loading may occur during the dry season (May 1 to Sept. 30) for Los Penasquitos Creek (historically flows year round) and for other creeks during significant rainfall events.	from Responsible Parties to Los Peñasquitos Lagoon Constituent Effluent Regarding "Responsible Parties" above, see comment below.
Attachment E, 7.b.2	E-53	Final Effluent Limitations	It is not appropriate to express a Waste Load Allocation that applies to all responsible parties under the TMDL as a numeric effluent limitation that applies only to the Copermittees. The result is that the other responsible parties would have **zero** allocation of sediment, but the recently adopted Caltrans, Phase II, and Industrial storm water permits do not subject those responsible parties to any numeric effluent limitations: • The General Industrial Permit adopted by the State Board on April 1, 2014, includes the general statement that "discharges addressed by this General Permit are considered to be point source discharges, and therefore must comply with effluent limitations that are consistent with the assumptions and requirements of any available waste load allocation for the discharge prepared by the state and approved by USEPA." However, the General Industrial Permit has not yet incorporated specific TMDL compliance provisions, let alone effluent limitations. • Similarly, the General Phase II Permit adopted by the State Board on February 5, 2013, states generally that "discharges from Small MS4s are point source discharges subject to TMDLs," and further states that "this Order requires Permittees to comply with all applicable TMDLs." However, the TMDL provisions in Attachment G of the Phase II Permit do not impose any effluent limitations on Phase II MS4s. • The Caltrans storm water permit amendments to incorporate TMDL requirements, dated July 1, 2014, allow for BMP-based compliance instead of imposing numeric effluent limitations. Because of the disparity in the TMDL provisions in these NPDES permits, it is important to separate allocations for Caltrans, Phase II, and Industrial storm water permits so that future revisions of those permits can responsibly address their portion of the Wasteload Allocation.	Two changes are necessary to acknowledge the sediment loading contributions of other Responsible Parties listed in the TMDL: • The sediment loads stated as the final effluent limitation in Table 7.1 should include only the load specific to storm water runoff from Copermittees, and should not include loads associated with runoff from other Responsible Parties with separate NPDES permits (Resolution No. R9-2012-0033, Attachment A, Page 5 lists the other Responsible Parties as Phase II MS4 permittees, Caltrans, and the General Construction and General Industrial Storm Water NPDES permittees). Similar to methods used by Regional Board staff in other TMDLs, this separation of load can be calculated based on land area of each Responsible Party in the watershed. The percentage of the entire watershed area associated each Responsible Party's area can be used as a multiplier times the entire Wasteload Allocation to determine individual sub-allocations. AND • Table 7.1 should include the footnote: "Responsible Parties include the following: Phase I Municipal Separate Storm Sewer Systems (MS4s) Copermittees (the County of San Diego, City of San Diego, City of Del Mar, and the City of Poway), Phase II MS4 permittees, and general construction storm water NPDES permittees, and general industrial storm water NPDES

Permit Section	Permit Page (Original)	Section Title	Reason for Proposed Changes/Comments	Proposed Changes
				permittees as presented in Resolution No. R9-2012-0033 Attachment A, page A-5."" • Modify Section 7.b.(2)(c) as follows: (ii) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 7.b.(2)(a) <u>or the Copermittee portion of</u> effluent limitations under Specific Provision 7.b.(2)(b) for Los Peñasquitos Lagoon.
Attachment E, Section 7.b(3)(a)	E-54	Final TMDL Compliance Determination	This provision is inconsistent with the TMDL for three reasons: (1) It appears to hold the Phase I Copermittees wholly responsible for Lagoon restoration, instead of recognizing that the other Responsible Parties named in the TMDL are also responsible for meeting this goal. R9-2012-0033 and TMDL Staff Report state that all watershed dischargers are responsible for achieving the Lagoon restoration target. (2) Restoration of 346 acres is not required under the TMDL. The requirement is to achieve 346 acres total of tidal and non-tidal salt marsh habitat. Based on the 2010 vegetation survey, there are currently 262 acres of salt marsh vegetation present, so 84 acres would need to be restored to achieve a total of 346 acres. (3) Language for final compliance determination is not consistent with TMDL (see page A-16 and footnote 1 in Resolution. R9-2012-0033, Attachment A).	Modify Provision 7.b.(3) as follows: (3) Final TMDL Compliance Determination Compliance with the final WQBELs, on or after the final TMDL compliance date may be demonstrated via one of the following methods: (a) ~~Successful restoration of~~ <u>Demonstration that there are a combined total of</u> 346 total acres of tidal and non-tidal salt marsh vegetation in Los Peñasquitos Lagoon <u>or demonstration that implementation actions are active and/or affecting 346 acres with continued monitoring to ensure target achievement</u>; OR
Attachment E, Section 7.b(3)(b)	E-54	Final TMDL Compliance Determination	The WQIP-based compliance option appears to reference the wrong section in two places.	Modify Section 7.b(3)(b) as follows: (b) The Responsible Copermittees must develop and implement the Water Quality Improvement Plan as follows: . . . (ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 7.b.(2)(c)(ii) achieves compliance with Specific Provision 7.b.(~~3~~<u>2</u>)(a),

Permit Section	Permit Page (Original)	Section Title	Reason for Proposed Changes/Comments	Proposed Changes
				. . . (v) The Responsible Copermittees must continue to perform the specific monitoring and assessments specified in Specific Provision 7.d to demonstrate compliance with Specific Provision 2.b.(~~3~~2)(a).
Attachment E, Section 7.b(3)(b)	E-54	Final TMDL Compliance Determination	Final compliance options should be consistent with other TMDLs incorporated into the MS4 Permit in Attachment E. The language as currently drafted omits several compliance options that should be included.	Modify Section 7.b.(3) as follows: (b)(v) . . . ; OR (c) There is no direct or indirect discharge from the Responsible Copermittee's MS4 to the receiving water; OR (d) The final receiving water limitation under Specific Provision 7.b.(2)(a) is met.
Attachment E, Section 7.c	E-55	Interim TMDL Compliance Requirements	The interim compliance requirements are inconsistent with the TMDL, which allows MS4 Permittees to "show progress in improving Lagoon conditions consistent with the specified targets" as an alternative to sediment load reductions (see Los Peñasquitos Lagoon Sediment TMDL Implementation Compliance Schedule on pages A-17 to A-19 in Regional Board Resolution R9-2012-0033, Attachment A).	Modify Section 7.c. as follows: c. INTERIM TMDL COMPLIANCE REQUIREMENTS Compliance with the interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods: (a) The Responsible Copermittee shows progress in improving the Lagoon conditions towards Specific Provision 7.b.(2)(a); OR
Attachment E, Section 7.c	E-55	Interim TMDL Compliance Requirements	Interim compliance options should be consistent with other TMDLs incorporated into the MS4 Permit in Attachment E. The language as currently drafted omits several compliance options that should be included.	Further modify Section 7.c. as follows: (b) There is no direct or indirect discharge from the Responsible Copermittee's MS4 to the receiving water; OR (c) The final receiving water limitation under Specific Provision 7.b.(2)(a) is met; OR (d) ~~The Responsible Copermittees must comply with the interim WQBELs, expressed as annual loads, by December 31 of the interim compliance year set forth in Table 7.2.~~There are no exceedances of the

Permit Section	Permit Page (Original)	Section Title	Reason for Proposed Changes/Comments	Proposed Changes
				Copermittee portion of interim effluent limitations under Table 7.2 at the Responsible Copermittee's MS4 outfalls; OR (e) The Responsible Copermittee has submitted and is fully implementing a Water Quality Improvement Plan, accepted by the Regional Board, which provides reasonable assurance that the Copermittee portion of interim TMDL compliance requirements will be achieved by the interim compliance date.
Attachment E, Table 7.2	E-55	Interim TMDL Compliance Requirements	For consistency with the Table 7.1 final effluent limitation expressed as a load, "associated percentage of reduction" should be removed from Table 7.2 for interim WQBELs. The percentages in Table 7.2 are not total percent reductions expected of the existing load, but are instead percentages of attaining the 67% load reduction to meet the waste load allocation. Therefore, the percentages listed in Table 7.2 lack context and are misleading because they indicate that substantial load reductions are required to meet interim compliance dates.	Delete Table 7.2, third column.
Attachment E, Table 7.2	E-55	Interim TMDL Compliance Requirements	The interim WQBELs were incorrectly stated as annual loads. Instead, the Waste Load Allocation and associated interim load reductions were calculated as loading from the critical wet period of Oct. 1 to Apr. 30, not the entire year. (TMDL Staff Report, Table 6). This error in the MS4 permit makes the Waste Load Allocation, and consequently, the Interim Effluent Limitations, inconsistent with the TMDL.	Modify Section 7.c as follows The heading on column 2 of Table 7.2 should be changed to "Interim Effluent Limitations (tons/~~year~~wet season)"
Attachment E, Table 7.2	E-55	Interim TMDL Compliance Requirements	It is not appropriate to express interim loads that apply to all responsible parties under the TMDL as a numeric effluent limitation that applies only to the Phase I Copermittees. The result is that the other responsible parties would have **zero** allocation of sediment, but the recently adopted Caltrans, Phase II, and Industrial storm water permits do not subject those responsible parties to any numeric effluent limitations (see detailed summary of the TMDL provisions of these permits above). It is important to separate loads for Caltrans, Phase II, and the General Construction and Industrial storm water permits so that future revisions of those permits can responsibly address their potion of interim load reductions.	Two changes are necessary to acknowledge the sediment load contributions of other Responsible Parties listed in the TMDL: • The sediment loads stated as interim effluent limitations in Table 7.2 column 2 should include only loads specific to storm water runoff from Copermittees, and should not include loads associated with runoff from other Responsible Parties with separate NPDES permits (Resolution No. R9-2012-0033 lists these Responsible Parties as Phase II MS4 permittees, Caltrans, and the General Construction and General Industrial Storm Water NPDES permittees). Similar to methods used by Regional Board staff

Permit Section	Permit Page (Original)	Section Title	Reason for Proposed Changes/Comments	Proposed Changes
				in other TMDLs, this separation of load can be calculated based on land area of each Responsible Party in the watershed. The percentage of the entire watershed area associated each Responsible Party's area can be used as a multiplier times the entire Waste Load Allocation to determine individual sub-allocations. AND • Table 7.2 should include the footnote: "Responsible Parties include the following: Phase I Municipal Separate Storm Sewer Systems (MS4s) Copermittees (the County of San Diego, City of San Diego, City of Del Mar, and the City of Poway), Phase II MS4 permittees, and general construction storm water NPDES permittees, and general industrial storm water NPDES permittees as presented in Resolution No. R9-2012-0033 Attachment A, page A-5."
Attachment E, Section 7.d(3)(c)	E-56	Assessment and Reporting Requirements	Provision 7.d(3)(c) states that the first reported average shall be calculated using the data collected in years 2014-2015, 2015-2016, and 2016-2017. This would require Copermittees to start Sediment TMDL compliance monitoring before the WQIP is completed and accepted by the Regional Board. The Sediment TMDL Compliance Monitoring is part of the Los Peñasquitos Monitoring and Assessment Program because the WQIP is serving as the Sediment Load Reduction Plan. This provision should be modified to require monitoring to start the first full wet season after the WQIP is accepted by the Regional Board.	(c) For assessing and determining compliance with the final effluent limitations under Specific Provision 7.b.(2)(b), the Responsible Copermittees must use the data acquired under Specific Provision 7.d.(1) to estimate sediment loading into Los Peñasquitos Lagoon. Sediment loading must be evaluated using a 3-year, weighted rolling average. The first reported average shall be calculated using data collected in the 3 years ~~2014-15, 2015-2016, and 2016-2017 wet seasons~~ following Regional Board acceptance of the WQIP.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

RESOLUTION NO. R9-2012-0033

A RESOLUTION AMENDING *THE WATER QUALITY CONTROL PLAN FOR THE SAN DIEGO BASIN (9)* TO INCORPORATE THE TOTAL MAXIMUM DAILY LOAD FOR SEDIMENTATION IN LOS PEÑASQUITOS LAGOON

WHEREAS, The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), finds that:

1. **Water Quality Control Plan:** The federal Clean Water Act[1] (CWA) and state Porter-Cologne Water Quality Control Act[2] require the San Diego Water Board to establish water quality standards for each waterbody within its region. The water quality standards for coastal waters in the San Diego Region are established in the *Water Quality Control Plan for the San Diego Basin (9)* (Basin Plan) and in the *Water Quality Control Plan for Ocean Waters of California* (Ocean Plan). Water quality standards include beneficial uses, water quality objectives (WQOs), and the antidegradation policy. The Basin Plan contains programs of implementation to achieve water quality standards.[3] Waterbodies that do not meet water quality standards are considered impaired.

2. **Clean Water Act Section 303(d) List of Water Quality Limited Segments:** Pursuant to section 303(d) of the Clean Water Act, each state is required to identify impaired waters and establish a total maximum daily load (TMDL) at a level necessary to implement the applicable water quality standards.[4] Each state is required to develop a list that identifies and establishes a priority ranking for those waters requiring TMDLs.[5] The list is known as the CWA section 303(d) List of Water Quality Limited Segments or more commonly, the 303(d) List. For the specific purpose of developing information, states are also required to estimate TMDLs for all other waters that are not identified on the 303(d) List.[6]

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[1] Clean Water Act section 303; U.S. Code section 1313
[2] California Water Code section 13240
[3] See Water Code section 13050(j). A "Water Quality Control Plan" or "Basin Plan" consists of a designation or establishment for the waters within a specified area of all of the following: (1) Beneficial uses to be protected, (2) Water quality objectives and (3) A program of implementation needed for achieving water quality objectives.
[4] Clean Water Act section 303(d)(1)(C); U.S. Code section 1313(d)(1)(C)
[5] Code of Federal Regulations Title 40 section 130.7(b)(1)
[6] Clean Water Act section 303(d)(3) states that "For the specific purpose of developing information, each State shall identify all waters within its boundaries, which it has not identified under paragraph (1)(A) and (1)(B) of this subsection and estimate for such waters the total maximum daily load with seasonal variations and margin of safety..."

3. **Purpose and Definition of Total Maximum Daily Load (TMDL):** The purpose of a TMDL is to restore an impaired waterbody to water quality conditions under which applicable water quality standards can once again be attained. This is done by establishing and implementing a TMDL for the impairing pollutant. Generally, when the TMDL, numeric targets and associated pollutant allocations are attained, water quality standards in the waterbody should be restored. A TMDL is both (1) a calculation of the maximum loading capacity of the impaired waterbody for each impairing pollutant; and (2) an implementation plan to guide actions necessary to cleanup the waterbody and restore water quality standards.

4. **TMDL Basin Plan Amendment:** Upon establishment and approval of TMDLs, the state is required to incorporate TMDLs into the state water quality management plan.[7] Along with various applicable statewide water quality control plans, the Basin Plan for the San Diego Region serves as the water quality management plan for the watersheds under the jurisdiction of the San Diego Water Board. Incorporating TMDLs into the Basin Plan requires an amendment to the Basin Plan and the development of an Implementation Plan. The Implementation Plan must include a description of the actions necessary to achieve the applicable water quality objectives, a time schedule for the actions to be taken, and a description of the monitoring to be undertaken to determine compliance with the objectives.[8]

5. **Water Quality Impairment of Los Peñasquitos Lagoon:** As required by CWA section 303(d), the Los Peñasquitos Lagoon (Lagoon) was placed on the 1996 List of Water Quality Limited Segments due to sedimentation and siltation loads that exceeded water quality objectives. The beneficial uses that are most sensitive to increased sedimentation are estuarine habitat and preservation of biological habitats of special significance. Deposition of watershed sediment contributes to elevation increases within the Lagoon, which is a critical variable that determines the productivity and stability of these uses. Legacy sediments from construction activities within the lagoon (e.g., construction of the railway berms and construction and operation of access roads) also play a role in the Lagoon's sedimentation impairment.

   Other beneficial uses listed in the Basin Plan for the Lagoon include contact water recreation, non-contact water recreation, wildlife habitat, rare, threatened or endangered species, marine habitat, migration of aquatic organisms, spawning, reproduction and/or early development, and shellfish harvesting.

   Other impacts associated with increased and rapid sedimentation include: reduced tidal mixing within Lagoon channels, increased vulnerability to flooding for surrounding urban and industrial developments, increased turbidity associated with siltation in Lagoon channels, and constricted wildlife corridors.

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[7] Code of Federal Regulations Title 40 section 130.6(c)(1)

[8] Pursuant to the requirements of Article 3, commencing with section 13240, of Chapter 4 of the Porter-Cologne Water Quality Control Act, as amended, codified in Division 7, commencing with section 13000, of the Water Code

6. **Water Quality Objective:** The water quality objective for sediment is contained in the Basin Plan. The Basin Plan states, *"The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses."*

7. **Numeric Targets:** One or more quantitative numeric targets must be selected to calculate a TMDL for an impaired waterbody. Numeric targets are derived from and must be able to interpret and implement water quality standards (beneficial uses, water quality objectives, and the antidegradation policy). This means that attainment of the selected numeric targets in the impaired waterbody represents attainment of applicable water quality standards in the waterbody; i.e., when the numeric targets are met, the TMDL should be met, WQOs should be met and the beneficial uses should be restored. While numeric targets and TMDLs are derived from, represent, interpret, and implement water quality standards, they are not water quality standards.

   The narrative sediment water quality objective requires numeric targets to evaluate attainment of the objective. Consideration of various lines of evidence indicates that the Lagoon was likely achieving the water quality standard for sediment in the mid-1970s. Using land-use coverage and Lagoon mapping, a "reference condition" was developed to establish watershed and Lagoon conditions present during the mid-1970s.

   The historic land use distribution was used to calculate the watershed numeric target, which is expressed as 12,360 tons of sediment per wet period (211 days) or 58.6 tons per day. Lagoon mapping was used to establish the Lagoon numeric target, which is expressed as an increasing trend in the total area of tidal saltmarsh and non-tidal saltmarsh toward 346 acres. This target acreage represents 80 percent of the total acreage of tidal and non-tidal saltmarsh present in 1973. As of the year 2010, 262 acres of tidal saltmarsh and non-tidal saltmarsh are present in the Lagoon. The calculation and interpretation of the numeric target as an increasing trend in acreage takes into account other factors impacting the salt marsh habitat in the lagoon, as well as the length of time necessary to successfully restore the biological, physical, chemical, and hydrological structural characteristics of salt marsh habitat. The final lagoon numeric target requires the successful restoration of tidal and non-tidal salt marsh to achieve a lagoon total of 346 acres. This can either mean:
   1. Successful restoration of 80 percent of the 1973 acreage of lagoon salt marsh habitat (346 acres); or
   2. Demonstrate that implementation actions are active on and/or affecting 346 acres with continued monitoring to ensure 80 percent target achievement.

8. **Sources of Sediment:** Sources of sediment to the Lagoon include erosion of canyon banks, bluffs, scouring stream banks, and tidal influx. Some of these processes are exacerbated by anthropogenic disturbances, such as land

development within the watershed. Land development transforms the natural landscape by exposing sediment and converting pervious surfaces to impervious surfaces, which increases the volume and velocity of runoff resulting in scouring of sediment, primarily below storm water outfalls that discharge into canyon areas. Sediment loads are transported downstream to the Lagoon during storm events causing deposits on the salt flats and in Lagoon channels. These sediment deposits have gradually built-up over the years due to increased sediment loading and inadequate flushing, which directly and indirectly affects Lagoon functions and salt marsh characteristics.

9. **Watershed Point and Non-point Sediment Sources:** There are two broad categories of sediment sources to the Lagoon: 1) watershed sources, and 2) the Pacific Ocean. The watershed sources consist of all point and non-point sources of sediment in the watershed area draining to Los Peñasquitos Lagoon. The total sediment contribution from all watershed sources is presented as the total wasteload allocation (WLA). The sediment contributions from the Pacific Ocean are considered a background source and are presented as the Load Allocation (LA). Hence, the responsible parties are assigned the total WLA and are jointly responsible for meeting the wasteload reductions required in this TMDL project.

10. **Responsible Parties Identification:** Responsible parties include the following: Phase I Municipal Separate Storm Sewer Systems (MS4s) copermittees (the County of San Diego, City of San Diego, City of Del Mar, and City of Poway), Phase II MS4 permittees, Caltrans, general construction storm water National Permit Discharge Elimination System (NPDES) permittees, and general industrial storm water NPDES permittees.

11. **Linkage Analysis:** Reducing watershed sediment loads from the year 2000 levels to historic levels is a necessary component for restoring and providing long-term protection of the Lagoon's beneficial uses. Deposition of watershed sediment contributes to elevation increases within the Lagoon, leading to an increase in height relative to mean sea level. Elevation is a critical variable that determines the productivity and stability of saltmarshes. The long-term existence of the saltmarsh depends on the success of the dominant plants, such as *Sarcoconia pacifica* (also referred to as *Salicornia virginica*) and *Frankenia salina*, and their close relationship to sediment supply, sea level change, and tidal range.

    Reduced sediment loading consistent with the watershed numeric target will encourage the establishment of native vegetation in degraded areas. To represent the linkage between source contributions and receiving water response, models were developed to simulate source loadings and transport of sediment into the Lagoon. The models provide an important tool to evaluate year 2000 conditions, to evaluate historic conditions, and to calculate TMDL load reductions.

    The Lagoon was capable of assimilating these historic sediment loads under historic Lagoon conditions. Because the Lagoon has evolved through time and accumulated

over 40 years of watershed sediment loads, it cannot be assumed that the Lagoon, in the year 2010 conditions, can assimilate the same historic sediment loads. Evaluation of the extent of vegetation types in the Lagoon provides the necessary tool to assess how the Lagoon responds to watershed sediment load reductions and to establish a target Lagoon condition under which the Lagoon can again assimilate the historic sediment loads.

12. TMDL Allocations and Reductions:

Wasteload Allocations to Watershed = 2,580 tons/year

As the primary point source to the Lagoon, a wasteload allocation (WLA) of 2,580 tons/year was assigned to the responsible parties. A 67 percent sediment load reduction from the Year 2000 load to the historical (mid-1970s) load is required of the responsible parties.

Load Allocations to Ocean = 9,780 tons/year

The ocean is a nonpoint source of sediment to the Lagoon and was assigned a load allocation (LA) of 9,780 tons/year. Because the ocean is a natural background source, load reductions are not required of the ocean.

Margin of Safety = Implicit

Conservative assumptions were used in selecting the TMDL numeric targets to provide an implicit margin of safety,

13. TMDL Implementation, Monitoring, and Compliance: The Responsible Parties must develop a Load Reduction Plan that will establish a watershed-wide, programmatic, adaptive management approach for implementation. The plan will include a detailed description of implementation actions, as identified and planned by the responsible parties, to meet the requirements of this TMDL. All responsible parties are responsible for reducing their sediment loads to the receiving waterbody or demonstrating that their discharges are not causing exceedances of the wasteload allocation.

Monitoring is required to assess progress towards achieving the wasteload and load allocations and numeric targets. Furthermore, the monitoring program must be capable of monitoring the effectiveness of implementation actions to improve water quality and saltmarsh habitat and remediation actions to remove sediment from the Lagoon.

Full implementation of the TMDL for sediment must be completed within 20 years from the effective date of the Basin Plan amendment. This timeline takes into consideration the planning needs of the responsible parties and other stakeholders to establish a Load Reduction Plan, time needed to address multiple impairments, and provides adequate time to measure temporal disparities between reductions in upland loading and the corresponding Lagoon water quality response.

14. **Scientific Peer Review:** The scientific basis for this TMDL has undergone external peer review pursuant to Health and Safety Code section 57004. The San Diego Water Board has considered and responded to all comments submitted by the peer review panel and has enhanced the Staff Report appropriately. As a result of the peer review process, changes were made to the TMDL including inclusion of the Lagoon numeric target and revision of the adaptive management approach.

15. **California Environmental Quality Act Requirements:** Pursuant to Public Resources Code section 21080.5, the Resources Agency has approved the San Diego Water Board's basin planning process as a "certified regulatory program" that adequately satisfies the California Environmental Quality Act (CEQA) (Public Resources Code, section 21000 et seq.) requirements for preparing environmental documents [14 CCR 15251(g); 23 CCR 3782]. As such, the "substitute environmental documents" that support the San Diego Water Board's proposed basin planning action contain the required environmental documentation under CEQA [23 CCR 3777]. The substitute environmental documents include the environmental checklist, the detailed Staff Report, peer review and public comments and responses to comments, this resolution, and the Basin Plan Amendment. For CEQA purposes, the "project" is the adoption of a Basin Plan amendment establishing a TMDL for sediment in the Lagoon. The CEQA checklist and other portions of the substitute environmental documents contain significant analysis and numerous findings related to impacts.

16. **Program and Project-Level CEQA Analysis:** In preparing the substitute environmental documents, the San Diego Water Board has considered the requirements of Public Resources Code section 21159 and California Code of Regulations, Title 14, section 15187, and intends those documents to serve as a tier 1 environmental review. This analysis is not intended to be an exhaustive analysis of every conceivable impact, but an analysis of the reasonably foreseeable consequences of the adoption of this regulation, from a programmatic perspective. The "Lead" agencies for tier 2 projects will assure compliance with project-level CEQA analysis of this programmatic project. Project level impacts will need to be considered in any subsequent environmental analysis performed by other public agencies, pursuant to Public Resources Code section 21159.2.

17. **CEQA Findings:** The proposed Basin Plan amendment could have a potentially significant adverse effect on historical, archaeological, and paleontological resources. There are feasible mitigation measures that if employed, would substantially lessen the potentially-significant adverse impacts identified in the substitute environmental documents; however such mitigation measures are within the responsibility and jurisdiction of other public agencies, not the San Diego Water Board. When the parties responsible for implementing this TMDL determine how they will proceed, the parties responsible for those parts of the project can and should incorporate such mitigation into any subsequent projects or project approvals as part of the environmental review process. These mitigation measures are described in more detail in the substitute environmental documents included as

Attachment 3 of the Staff Report and incorporated herein to this Resolution (14 CCR 15091(a)(2)). Where any subsequent project requires approval by the San Diego Water Board, the San Diego Water Board will include sufficient mitigation measures to substantially lessen the potentially significant adverse impacts.

18. **Statement of Overriding Consideration:** To the extent significant adverse environmental effects could occur, the San Diego Water Board has balanced the economic, legal, social, technological, and other benefits of the TMDL against the unavoidable environmental risks and finds that specific economic, legal, social, technological, and other benefits of the TMDL outweigh the unavoidable adverse environmental effects, such that those effects are considered acceptable. The basis for this finding is more fully set forth in the substitute environmental documents, included as Attachment 3 of the Staff Report and incorporated herein to this Resolution (14 CCR section 15093).

19. **Economic Analysis:** The San Diego Water Board has considered the costs of the reasonably foreseeable methods of compliance with the load and wasteload allocations specified in this TMDL. The most reasonably foreseeable methods of compliance involve implementation of structural and non-structural controls. Surface water monitoring will be necessary to evaluate the effectiveness of these controls.

20. **Necessity Standard [Government Code section 11353(b)]:** Amendment of the Basin Plan to establish and implement the sediment TMDL for the Lagoon is necessary because the existing water quality in the Lagoon does not meet applicable water quality objectives for sediment. Clean Water Act section 303(d) requires the establishment and implementation of a TMDL under the water quality conditions that exist at the Lagoon. The TMDL for sedimentation is necessary to promote attainment of applicable water quality objectives and restoration of water quality needed to support the beneficial uses designated for the Lagoon.

21. **Stakeholder & Public Participation:** Interested persons and the public have had reasonable opportunity to participate in review of the proposed TMDL. Efforts to solicit public review and comment included a public workshop and CEQA scoping meeting on February 15, 2011, multiple meetings with the Stakeholder Advisory Group, a public review and comment period consisting of 46 days, and a public hearing on June 13, 2012. Notices for all meetings were sent to interested parties including cities and counties with jurisdiction in the Los Peñasquitos watershed. All of the written comments submitted to the San Diego Water Board during the review and comment periods have been considered.

22. **Public Notice:** The San Diego Water Board has notified all known interested parties and the public of its intent to consider adoption of this Basin Plan amendment in accordance with Water Code section 13244.

Resolution No. R9-2012-0033

NOW, THEREFORE, BE IT RESOLVED THAT

1. **Environmental Documents Certification:** The substitute environmental documents prepared pursuant to Public Resources Code section 21080.5 are hereby certified, and the Executive Officer is directed to file a Notice of Decision with the Resources Agency after State Water Resources Control Board (State Water Board), and Office of Administrative Law (OAL) approval of the Basin Plan amendment, in accordance with section 21080.5(d)(2)(E) of the Public Resources Code and the California Code of Regulations, Title 23, section 3781.

2. **Amendment Adoption:** The San Diego Water Board hereby adopts the attached Basin Plan amendment as set forth in Attachment A hereto to establish a sediment TMDL for the Lagoon.

3. **Agency Approvals:** The Executive Officer is directed to submit this Basin Plan amendment to the State Water Board in accordance with Water Code section 13245.

4. **Non-Substantive Corrections:** If, during the approval process for this amendment, the San Diego Water Board, the State Water Board, or the OAL determines that minor, non-substantive corrections to the language of the amendment are needed for clarity or consistency, the Executive Officer may make such changes, and shall inform the San Diego Water Board of any such changes.

I, David W. Gibson, Executive Officer, do hereby certify the foregoing is a full, true and correct copy of a Resolution adopted by the California Regional Water Quality Control Board, San Diego Region, on June 13, 2012.

David W. Gibson
Executive Officer

ATTACHMENT A
TO RESOLUTION NO. R9-2012-0033

AMENDMENT TO THE *WATER QUALITY CONTROL PLAN FOR THE SAN DIEGO BASIN (9)* TO INCORPORATE THE SEDIMENT TOTAL MAXIMUM DAILY LOAD (TMDL) FOR LOS PEÑASQUITOS LAGOON

This Basin Plan amendment establishes a sediment Total Maximum Daily Load (TMDL) and associated load and wasteload allocations for Los Peñasqutios Lagoon (Lagoon). This amendment includes a program to implement the TMDL and monitor its effectiveness. Chapters 2, 3, and 7 of the Basin Plan are amended as follows:

Chapter 2, *Beneficial Uses*

Table 2-3. *Beneficial Uses of Coastal Waters*
Consecutively number and add the following footnote to Los Peñasqutios Lagoon in Table 2-3:

> Los Peñasquitos Lagoon is designated as a water quality limited segment for sediment pursuant to Clean Water Act section 303(d). A Total Maximum Daily Load has been adopted to address this impairment. See Chapter 3, *Water Quality Objectives*, section entitled "Water Quality Objectives for Sediment." See also Chapter 7, *Total Maximum Daily Loads, section entitled* "Sediment Total Maximum Daily Load for Los Peñasqutios Lagoon."

Renumber any footnotes in Table 2-3 displaced by this new footnote.

Chapter 3, Water Quality Objectives

Water Quality Objectives for Sediment:
Add a second paragraph as follows:

> Los Peñasquitos Lagoon is designated as an impaired water body for sediment pursuant to Clean Water Act section 303(d). A Total Maximum Daily Load has been adopted to address this impairment. See Chapter 2, Beneficial Uses Table 2-3. Beneficial Uses of Coastal Waters, Los Peñasqutios Lagoon, Hydrologic Unit Basin Number 6.10. See also Chapter 7, *Total Maximum Daily Loads, section entitled "Sediment Total Maximum Daily Load for Los Peñasqutios Lagoon."*

Resolution No. R9-2012-0033
Attachment A

Chapter 7, *Total Maximum Daily Loads*

On June 13, 2012, the San Diego Water Board adopted ***Resolution No. R9-2012-0033, A Resolution Amending the Water Quality Control Plan For The San Diego Basin (9) to Incorporate the Sediment Total Maximum Daily Load for Los Peñasquitos Lagoon.*** The TMDL Basin Plan Amendment was subsequently approved by the State Water Resources Control Board (State Board) on [Insert date], the Office of Administrative Law (OAL) on [Insert date], and the USEPA on [Insert date]. For purposes of state law, Resolution No. R9-2012-0033 became effective following OAL approval on [Insert date],

Technical TMDL Analysis

Component	Key Findings and Regulatory Provisions
Problem Statement	Under section 303(d) of the Clean Water Act (CWA), states are required to identify waters whose beneficial uses have been impaired due to specific constituents. Los Peñasquitos Lagoon was placed on the Section 303(d) list of Water Quality Limited Segments in 1996 for sedimentation and siltation with an estimated 469 acres affected. The Lagoon is subject to the development of a total maximum daily load (TMDL) (US EPA, 2009). The Lagoon is an estuarine system that is part of the Torrey Pines State Natural Reserve. In addition to its marine influence, the Lagoon receives freshwater inputs from an approximately 60,000-acre watershed comprised of three major canyons (Carroll Canyon, Los Peñasquitos Canyon, and Carmel Canyon). Given the status of "Natural Preserve" by the California State Parks, the Lagoon is one of the few remaining native saltmarsh lagoons in southern California, providing a home to several endangered species (California State Parks, 2009). The Lagoon is ecologically diverse, supporting a variety of plant species, and provides nursery grounds and habitat for numerous bird, fish, and small mammal populations. The Lagoon also serves as a stopover for the Pacific Flyway, offering migratory birds a safe place to rest and feed, as well as providing refuge for coastal marine species that use the Lagoon to feed and hide from predators. The San Diego Basin Plan states, "The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses." Beneficial uses listed in the Basin Plan for the Lagoon include contact water recreation; non-contact water recreation (although access is not permitted in

Component	Key Findings and Regulatory Provisions
	some areas per California State Parks); preservation of biological habitats of special significance; estuarine habitat; wildlife habitat; rare, threatened or endangered species; marine habitat; migration of aquatic organisms; spawning, reproduction and/or early development; and shellfish harvesting. The beneficial uses that are most sensitive to increased sedimentation are estuarine habitat (EST) and preservation of biological habitats of special significance (BIOL). Estuarine uses may include preservation or enhancement of estuarine habitats, vegetation, fish, shellfish, or wildlife (such as marine mammals or shorebirds). Impacts associated with increased and rapid sedimentation include: reduced tidal mixing within Lagoon channels, degraded and (in some cases) net loss of saltmarsh vegetation, increased vulnerability to flooding for surrounding urban and industrial developments, increased turbidity associated with siltation in Lagoon channels, and constricted wildlife corridors. The Los Peñasquitos Lagoon Enhancement Plan and Program (1985), San Diego Basin Plan, and Clean Water Act section 303(d) highlight sedimentation as a significant impact associated with urban development and a leading cause in the rapid loss of saltmarsh habitat in the Lagoon. Sediment reduction is a management priority. The Lagoon's 565 acres include 262 acres of tidal saltmarsh (including salt panne, tidal channels, and mudflats) and non-tidal saltmarsh and 132 acres of freshwater marsh, herbaceous wetland, and woody riparian (for example southern willow scrub and mulefat scrub) habitats. The remaining 171 acres of saltmarsh and brackish marsh vegetation are impaired by excessive sedimentation, which converted the coastal saltmarsh to *Lolium perenne* infested non-tidal saltmarsh, freshwater marsh, and woody riparian habitats. (California State Parks, 2011) The environmental processes that support wetland habitats in the Lagoon have been altered by urban development in three ways: 1) Increase in the volume and frequency of freshwater input, 2) Increase in sediment deposition, and 3) Decrease in the tidal prism. These factors have led to decreases in tidal and non-tidal saltmarsh habitats and increases in freshwater habitats and the abundance of non-native species.

Component	Key Findings and Regulatory Provisions
Numeric Target	**Numeric Target** The sediment water quality standard applies to sediment loading to the Lagoon and the accumulation of sediment in the Lagoon. The minimum protective target would be to reduce watershed sediment loads to non-anthropogenic levels and return the Lagoon to non-anthropogenic conditions with consideration given to background loading and other factors that also lend to impairment of beneficial uses. The numeric targets are calculated upon the historic condition (mid-1970s) when the sediment water quality standard was once met. A historic coverage for the Los Peñasquitos watershed was developed for this period using US Geological Survey topographic maps from the 1970s. This land-use distribution was used to calculate the watershed numeric target using the LSPC watershed model. This historic (mid-1970s) sediment load of 12,360 tons per critical wet period (211 days), or 58.6 tons per day, represents the sediment TMDL watershed numeric target. An analysis of the vegetation types present in the Lagoon was developed for the mid-1970s using historic aerial photographs from which the Lagoon numeric target was calculated. The Lagoon numeric target is expressed as an increasing trend in the total area of tidal and non-tidal saltmarsh toward 346 acres. This target acreage represents 80 percent of the total acreage of tidal and non-tidal saltmarsh present in 1973.
Sources and Responsible Parties	**Watershed Point and Non-point Sediment Sources** Sources of sediment include erosion of canyon banks, exposed soils, bluffs, scouring stream banks, and tidal influx. Some of these processes are exacerbated by anthropogenic disturbances, such as land development within the watershed. Land development transforms the natural landscape by exposing sediment and converting pervious surfaces to impervious surfaces, which increases the volume and velocity of runoff resulting in scouring of sediment, primarily below storm water outfalls that discharge into canyon areas. Sediment loads are transported downstream to the Lagoon during storm events causing deposits on the salt flats and in Lagoon channels. These sediment deposits have gradually built-up over time due to increased sediment loading and inadequate flushing, which directly and indirectly affects Lagoon functions and salt marsh characteristics.

Component	Key Findings and Regulatory Provisions
	There are two broad categories of sediment sources to the Lagoon: 1) watershed sources, and 2) the Pacific Ocean. The watershed sources consist of all of point and non-point sources of sediment in the watershed area draining to Los Peñasquitos Lagoon. The total sediment contribution from all watershed sources, currently, is presented as the total wasteload allocation (WLA). The watershed sources of sediment due to past historical activities that have resulted in accumulated sediment in the Lagoon over time are presented as the Watershed Load Allocation (LA). This source also includes, but is not limited to, in-Lagoon erosion and scouring. Since this loading could not be estimated given the limited data, the Lagoon numeric target is set as the compliance point for meeting this Watershed Load Allocation. The sediment contributions from the Pacific Ocean are considered a background source and are presented as the Load Allocation from the Ocean (LA). Hence, the responsible parties were assigned the total WLA and are jointly responsible for meeting the wasteload reductions required in this TMDL project. **Responsible Parties** Responsible parties include the following: Phase I Municipal Separate Storm Sewer Systems (MS4s) copermittees (the County of San Diego, City of San Diego, City of Del Mar, and City of Poway), Phase II MS4 permittees, Caltrans, general construction storm water NPDES permittees, and general industrial storm water NPDES permittees.
Linkage Analysis	**Linkage Analysis** Reducing watershed sediment loads from the year 2000 levels to historic levels is a necessary component for restoring and providing long-term protection of the Lagoon's beneficial uses. Deposition of watershed sediment contributes to elevation increases within the Lagoon, leading to an increase in height relative to mean sea level. Elevation is a critical variable that determines the productivity, diversity, and stability of saltmarshes. The long-term existence of the saltmarsh depends on the success of the dominant plants, such as *Sarcoconia pacifica* (also referred to as *Salicornia virginica*) and *Frankenia salina*, and their close relationship to sediment supply, soil salinity, sea level change, and tidal range. Reduced sediment loading consistent with the watershed numeric target will encourage the establishment of native vegetation in degraded areas. To represent the linkage between source

Component	Key Findings and Regulatory Provisions
	contributions and receiving water response, models were developed to simulate source loadings and transport of sediment into the Lagoon. The models provide an important tool to evaluate year 2000 conditions, to evaluate historic conditions, and to calculate TMDL load reductions. The Lagoon was capable of assimilating these historic sediment loads under historic Lagoon conditions. Because the Lagoon has evolved through time and accumulated over 40 years of watershed sediment loads, it cannot be assumed that the Lagoon, in the year 2010 conditions, can assimilate the same historic sediment loads. Evaluation of the extent of vegetation types in the Lagoon provides the necessary tool to assess how the Lagoon responds to watershed sediment load reductions and to establish a target Lagoon condition under which the Lagoon can again assimilate the historic sediment loads.
TMDL, Allocations, and Load Reductions	**TMDL = 12,360 tons of sediment per year** The maximum load of sediment that Los Peñasquitos Lagoon can receive from all sources and still meet the sediment water quality objective is 12,360 tons per year. **Wasteload Allocations to Watershed = 2,580 tons/year** As the primary point source to the Lagoon, a wasteload allocation (WLA) of 2,580 tons/year was assigned to the responsible parties. A 67 percent sediment load reduction from the Year 2000 load to the historical (mid-1970s) load is required of the responsible parties. **Load Allocations to Ocean = 9,780 tons/year** The ocean is a nonpoint source of sediment to the Lagoon and was assigned a load allocation (LA) of 9,780 tons/year. Because the ocean is a natural background source, load reductions are not required of the ocean. **Watershed Load Allocations to Lagoon** Past historical watershed loading has led to accumulated sediment, erosion, and scouring in the Lagoon causing impairment to the Lagoon habitats. The Lagoon numeric target is set as the compliance for this LA: maintain at least 346 acres of tidal and non-tidal saltmarsh, represents 80 percent of the total acreage of tidal and non-tidal saltmarsh present in 1973.

Component	Key Findings and Regulatory Provisions
	Margin of Safety = Implicit Conservative assumptions were used in selecting the TMDL numeric targets to provide an implicit margin of safety.
Critical Conditions	**Critical Location** Due to the variability and dynamic nature of conditions within the Lagoon (e.g., mouth closures, tidal fluctuations, sediment fate and transport, etc.), the entire modeled Lagoon area was assessed as the critical location. Load reductions for sediment were based on achieving the numeric TMDL target across the Lagoon. **Critical Condition** The wet season that includes the 1993 El Nino storm events (October 1, 1992-April 10, 1993) was selected as the critical condition time period for TMDL development. This is one of the wettest periods on record over the past several decades. Because of the large amount of rainfall, sediment loads were significantly higher during this period than in other years with less rainfall.
Seasonal Considerations	**Seasonal Considerations** Sources of sediment are similar for both dry and wet weather seasons (the two general seasons in the San Diego region). Despite the similarity of wet/dry sources, transport mechanisms can vary between the two seasons. Throughout the TMDL monitoring period, the greatest transport of sediment occurred during rainfall events. It is recognized that dry weather will contribute a de minimis discharge of sediment; however, model calibration and TMDL development focused on wet weather conditions as sediment transport is dramatically higher during wet weather.
Margin of Safety	**Margin of Safety (MOS)** An implicit MOS was incorporated through application of conservative assumptions.

Implementation Plan

Component	Key Findings and Regulatory Provisions
Implementation Actions	**Actions San Diego Water Board May Take** The San Diego Water Board may exercise any of its authorities under the Water Code to compel responsible parties to comply with this TMDL.

Component	Key Findings and Regulatory Provisions
	Responsible Parties Identification Under this TMDL, the responsible parties are collectively assigned a single WLA, which they are responsible for meeting. An aggregate WLA allows for flexibility in achieving the load reduction required to meet the TMDL and improve Lagoon conditions. Responsible parties include: Phase I MS4 copermittees (the County of San Diego, City of San Diego, City of Del Mar, and the City of Poway), Phase II MS4 permittees, Caltrans, and the General Construction and General Industrial Storm Water NPDES permittees. The San Diego Water Board encourages cooperation among all the responsible parties. All the responsible parties in the Los Peñasquitos watershed must reduce their collective sediment load. Responsible parties include, but are not limited to, specific identification of General construction and industrial stormwater permittees, such as sand and gravel operation facilities in the watershed *that have capacity for long-term potential loadings into the watershed.* The San Diego Water Board recommends all parties enter into a Memorandum of Understanding (MOU), or a similar formal joint effort, to collaboratively and more successfully implement the adaptive management framework. All responsible entities identified must submit a Comprehensive Load Reduction Plan (CLRP) or SWPPP as appropriate and are strongly encouraged to jointly submit a CLRP to the San Diego Water Board within 18 months of the effective date of the TMDL. The San Diego Water Board expects responsible parties to cooperate in TMDL implementation (e.g., load reduction, lagoon monitoring, lagoon restoration) as necessary to achieve compliance with this TMDL. Responsible Parties that have or are likely to cause or contribute to the CWA Section 303(d) listed impairment for sediment, and are not participating in TMDL implementation, shall be compelled to meet their compliance obligations through other regulatory authorities of the San Diego Water Board. Any Responsible Party identified is required to develop pollutant reduction plan that includes description and schedule for implementing BMPs to reduce sediments from being discharged from their facility, property, etc. The plan must describe how the

Component	Key Findings and Regulatory Provisions
	facility plans to meet the water quality objectives and pollutant reductions set forth in the TMDL. Any Responsible Party as identified for this TMDL shall contribute information regarding the amount of sediments/sedimentation from their facility/entity. This may be produced from existing monitoring plans or by developing a monitoring plan for those entities that currently do not have any discharge monitoring on site. The TMDL has identified a "collective" wasteload allocation that includes several sources of sediments into the watershed. By developing individual site/permitee monitoring plans for flow and TSS discharges, it will be feasible to estimate individual site contributions in the future. Monitoring should address, at minimum, representative values of flow rates and TSS concentrations from the individual permittee's site(s) whenever long-term discharges occur. Individual industrial facilities and construction sites are subject to regulation on two levels: (1) The San Diego Water Board is responsible for ensuring MS4 copermittees comply with the MS4 requirements in the MS4 storm water permit; and (2) each local municipality is responsible, under the MS4 storm water permit, for enforcing its own ordinances and permits (for violations of its ordinances/permits by an individual industrial facility or construction site within its jurisdiction). The San Diego Water Board is also responsible for enforcing the statewide General Industrial and Construction Storm Water NPDES Permits within its jurisdiction. The San Diego Water Board relies upon the municipality to enforce its ordinances/permits and then work with the municipality to coordinate information and actions to compel compliance. **Phased Implementation via the Adaptive Management Approach** A common problem in natural resource management involves a temporal sequence of decisions (or implementation actions), in which the best action at each decision point depends on the state of the managed system. Adaptive management is a structured iterative implementation process that offers flexibility for responsible parties to monitor implementation actions, determine the success of such actions and ultimately, base future management decisions upon the measured results of completed implementation actions and the current state of the system. This process enhances the understanding and estimation of predicted

Component	Key Findings and Regulatory Provisions
	outcomes and ensures refinement of necessary activities to better guarantee desirable results. In this way, understanding of the resource can be enhanced over time, and management can be improved. Adaptive management entails applying the scientific method to the TMDL. A National Research Council review of US EPA's TMDL program strongly suggests that the key to improving the application of science in the TMDL program is to apply the scientific method to TMDL implementation (NRC 2001). For a TMDL, applying the scientific method involves 1) taking immediate actions commensurate with available information, 2) defining and implementing a program for refining the information on which the immediate actions are based, and 3) modifying actions as necessary based on new information. This approach allows the Lagoon to make progress toward attaining water quality standards while regulators and stakeholders improve the understanding of the system through research and observation of how it responds to the immediate actions. Implementation actions to achieve the required WLA and improve the specified numeric targets will be implemented via an iterative process, whereby the information collected at each step will be used to inform the implementation of the next phase. The project will be adjusted, as necessary, based on the latest information collected to optimize the efficiency of implementation efforts. Ultimately, the path moving forward is to create the physical conditions related to remediating sediment impacts associated with this TMDL. The implementation effort can be divided into three primary phases for this TMDL, as described below: • Phase I Implementation includes elements to reduce the amount of sediment that is transported from the watershed to the Lagoon. An important component of Phase I will be to secure the relationships and agreements between cooperating parties and to develop a detailed scope of work with priorities. Phase I includes the following elements: o Incorporate interim limits into WDRs and NPDES permits; o Implement structural and nonstructural BMPs throughout the watershed; and o Develop and initiate a comprehensive monitoring program, which includes compliance monitoring and targeted special studies.

Component	Key Findings and Regulatory Provisions
	If appropriate, the TMDL will be reconsidered by the San Diego Water Board at the end of Phase I to consider completed special studies or policy. • Phase II includes the implementation of additional watershed actions that are targeted to reducing sediment loads from high priority areas, as well as lagoon-specific actions that may be needed to facilitate recovery of beneficial uses that have been affected by various complex processes, including sedimentation, nuisance flows, reduced tidal circulation, and other factors. These actions may include Lagoon sediment remediation efforts, re-connecting the Lagoon's historic tidal channels, and maintenance of the Lagoon inlet in collaboration with State Parks, the San Diego Water Board, the Los Angeles-San Diego-San Luis Obispo (LOSSAN) Rail Corridor Agency, US EPA, and the watershed responsible parties. Phase II may also include additional upstream protections and BMP implementation to further reduce watershed sediment contributions. Responsible parties will develop, prioritize, and implement Phase II elements based on data from compliance monitoring and special studies. • Phase III includes implementation of secondary and additional remediation actions, as necessary, to be in compliance with the required WLA allocation by the end of the compliance schedule. **Develop and Submit a Load Reduction Plan** Responsible parties are required to prepare and submit for San Diego Water Board review, comment, and revision, a Load Reduction Plan that demonstrates how they will comply with this TMDL. The San Diego Water Board expects that Load Reduction Plans will be developed collaboratively by the responsible parties within the watershed. The Load Reduction Plan shall be submitted to the San Diego Water Board within 18 months of the TMDL effective date, and reviewed by the San Diego Water Board Executive Officer within six months of submittal (this period will likely include a round of revisions by the responsible parties based on San Diego Water Board staff comments). The Load Reduction Plan shall establish a watershed-wide, programmatic, adaptive management approach for implementation and include a detailed description of

Component	Key Findings and Regulatory Provisions
	implementation actions, identified and planned by the responsible parties, to meet the requirements of this TMDL. Implementation actions identified by the Load Reduction Plan may include source control techniques, structural and/or non-structural storm water BMPs, and/or special studies that refine the understanding of sediment and pollutant sources within the watershed. The Load Reduction Plan shall include a description and objective of each implementation action, potential BMP locations, a timeline for project or BMP completion, and a monitoring plan to measure the effectiveness of implementation actions. Storm Water Pollution Prevention Plans (SWPPPs) prepared by Phase II MS4s, Industrial Permittees, and Construction Permittees pursuant to their respective statewide general NPDES permits fulfill these entities responsibility to prepare a Load Reduction Plan. Permittees within the Los Peñasquitos watershed shall update their SWPPPs within 12 months of the TMDL effective date with any additional BMPs, monitoring, etc. to account for their site's potential to impact the receiving waterbody with respect to sediment. Sites identified through monitoring data or site inspections as posing an increased risk to the receiving water body may be directed to perform additional monitoring by the San Diego Water Board Executive Officer to quantify sediment load contributions to the receiving waterbody. **Comprehensive Approach** The comprehensive approach to the Load Reduction Plan requires that implementation efforts address all current TMDLs, current 303(d) listed waterbody/pollutant combinations, and other targeted impairments within the Los Peñasquitos watershed. A comprehensive approach to the Load Reduction Plan is consistent with implementation planning currently underway to address all of the impaired segments that were included in the approved bacteria TMDLs for San Diego Region Beaches and Creeks (San Diego Water Board, 2010). The comprehensive approach to the Load Reduction Plan allows the responsible parties to proactively address other listed impairments within the watershed, which requires special studies to investigate sources and the water quality improvements needed to address these pollutants. Such special studies may significantly alter current understanding and refine the TMDL loading and/or allocations. This can impact the selection of subsequent implementation actions and how they are prioritized

Component	Key Findings and Regulatory Provisions
	by responsible parties. A comprehensive approach to development of the Load Reduction Plan will provide a more cost effective and efficient approach for TMDL implementation and will have fewer potential environmental impacts associated with construction of structural BMPs (San Diego Water Board, 2010). **Load Reduction Plan Framework** With increased land development and inadequate management of runoff from impervious areas, increasing amounts of sediment are deposited into the Lagoon annually. To minimize the effects of runoff, proper sediment control can be achieved through the execution of implementation actions such as BMPs. Sediment implementation actions can be grouped into the four categories as summarized below. 1) *Preservation and Restoration:* Significant areas of land have been set aside for open space. Such land acquisition and preservation prevents natural areas from being developed and disturbed. Additionally, the restoration of riparian buffers and wetlands can include the stabilization of steep slopes with native riparian vegetation. This not only helps restore the habitat but also the natural function of the stream. 2) *Education & Outreach:* As a source control technique, education and outreach can function as pollution prevention to reduce or eliminate the amount of sediment generated at its source. Education and outreach can be targeted at specific land user groups and/or staff involved with site maintenance. As an example, implementation actions such as municipal incentives can be used to encourage proper irrigation and landscaping and can significantly reduce volumes of runoff. 3) *Retrofitting, New Development, & Site Management:* Land development (MS4 contribution) is the primary source of anthropogenic sediment contribution above historical conditions. Development can expose sediment and contribute excessive amounts of sediment to the Lagoon. Additionally, increased imperviousness associated with development can lead to increased storm water runoff and soil erosion or gullying within the MS4 and receiving waters. Appropriate site management can partially or fully mitigate the effects of development. The Load Reduction Plan must identify and prioritize BMPs based on an analysis of opportunities and cost/benefit considerations. Furthermore, the Load Reduction Plan must detail BMP

Component	Key Findings and Regulatory Provisions
	projects and locations. Storm water BMPs can be implemented to reduce the effects of pollutant loading and increased storm water flows from development. Structural BMPs include incorporation of low impact development (LID) and storm flow hydrograph matching into new projects. The same structural BMPs can be utilized to retrofit existing sites or be applied as regional MS4 BMPs to treat pollutants and/or flows prior to discharge into receiving waters. 4) *Monitoring:* A coordinated monitoring plan is needed to establish existing watershed conditions (baseline conditions) from which future changes and anticipated improvement in water quality can be measured. Additional monitoring could focus on sensitive species, areas of saltmarsh coverage, extent of invasive plant species, BMP effectiveness, and/or reduction in impervious coverage. Additionally, monitoring is crucial in the assessment of implementation actions to gain an understanding of performance for future adaptive management actions. **<u>Load Reduction Plan Implementation</u>** The Load Reduction Plan must be implemented within 90 days upon receipt of San Diego Water Board comments and recommendation, but in any event, no later than 6 months after submittal. **<u>Monitoring</u>** Monitoring is required to measure the progress of pollutant load reductions and improvements in water and saltmarsh habitat acreage. The information presented below is intended to be a brief overview of the goals of the monitoring. Special studies may be planned to improve understanding of key aspects related to achievement of WLAs and LAs, restore the beneficial uses, and to assist in the modification of structural and non-structural BMPs if necessary. The goals of monitoring include: 1) To determine compliance with the assigned wasteload and load allocations. 2) To monitor the effect of implementation actions proposed by responsible parties to improve water and saltmarsh habitat quality including proposed structural and non-structural BMPs to reduce storm water run-off and sediment loading, and remediation actions to remove sediment from the Lagoon.

Component	Key Findings and Regulatory Provisions
	3) To monitor the extent of vegetation habitat acreages in the Lagoon and determine if additional implementation action should be required. 4) To implement the monitoring in a manner consistent with other TMDL implementation plans and regulatory actions within the Los Peñasquitos watershed. The proposed monitoring program shall be included in the Load Reduction Plan submitted to the San Diego Water Board Executive Officer for review. *Watershed Monitoring* Responsible parties must conduct suspended sediment, bedload, and flow monitoring to calculate total sediment loading to the Lagoon for each wet period (October 1 thru April 30) throughout the 20-year compliance period. The responsible parties must monitor enough storm events throughout to quantify sediment loading over each wet period. The compliance point for the WLA shall be the Lagoon as measured through the cumulative sediment loading from Los Peñasquitos, Carroll Canyon, and Carmel Creeks prior to entering the Lagoon. The responsible parties must monitor as many stations as necessary to quantify sediment loading to the Lagoon. Because of the natural variability in sediment delivery rates, sediment loading shall be evaluated using a 3-year, weighted rolling average. The first average must be calculated following the third critical wet period after the TMDL effective date. Responsible parties are encouraged to collaborate or coordinate their efforts with other regional and local monitoring programs to avoid duplication and reduce associated costs. *Lagoon Monitoring* The responsible parties shall monitor the Lagoon annually in the Fall for changes in extent of the vegetation types. Aerial photos of the Lagoon must be acquired, digitized onscreen (at an approximate 1:2,500 scale), interpreted, and mapped into generalized classifications. Vegetation types must be classified as saltmarsh, non-tidal saltmarsh, freshwater marsh, non-tidal saltmarsh – *Lolium perrene* infested, freshwater marsh, southern willow scrub/mulefat scrub, herbaceous wetland, or upland land cover (urban, beach, dune, upland vegetation, etc.). Vegetation

Component	Key Findings and Regulatory Provisions
	type classifications are described in the *Sediment TMDL for Los Peñasquitos Lagoon Staff Report*. Ground truthing may be performed after aerial photo interpretation to distinguish between vegetation types. **Compliance Schedule** The implementation schedule for this TMDL follows the form of an adaptive management strategy, tracks implementation progress with established milestones or interim goals, and sets forth a final compliance date. It is impractical for land managers to actually measure sediment loading on a daily basis; thus, compliance with the TMDL is most appropriately expressed as an average annual load and should be evaluated as a long-term running average to account for natural fluctuations and inaccuracies in estimating sediment loads. Pursuant to State Board Resolution No. 2000-015 and 2000-030 a TMDL compliance schedule must be as short as practicable, but in no case shall it exceed 20 years from the effective date of the Basin Plan amendment. This timeline in Table {Insert Table number} takes into consideration the planning needs of the responsible parties and other stakeholders to establish a Load Reduction Plan, time needed to address multiple impairments, and provides adequate time to measure temporal disparities between reductions in upland loading and the corresponding Lagoon water quality response. Current studies and other implementation actions or projects are underway to reduce sediment loading to the Lagoon and to gain a better understanding of source contributions. A variety of such projects will continue throughout the development of the Load Reduction Plan, ensuring there are no gaps in implementation efforts throughout the process. At the end of the TMDL compliance schedule, as outlined in Table {insert table number}, waters must meet the Lagoon's sediment water quality standard and therefore, the Lagoon numeric target. The final lagoon numeric target requires the successful restoration of tidal and non-tidal salt marsh to achieve a lagoon total of 346 acres. This can either mean: 1. Successful restoration of 80 percent of the 1973 acreage of lagoon salt marsh habitat (346 acres); or 2. Demonstrate that implementation actions are active on and/or affecting 346 acres with continued monitoring to ensure 80 percent target achievement.

Component	Key Findings and Regulatory Provisions
	If at any point during the implementation plan, monitoring data or special studies indicate that WLAs or LAs will be attained but the Lagoon numeric target may not be achieved, the San Diego Water Board shall reconsider the TMDL to modify WLAs and LAs to ensure that the Lagoon numeric target is attained.

Table {Insert table number}. Los Peñasquitos Lagoon Sediment TMDL Implementation Compliance Schedule

Item	Implementation Action	Responsible Party	Date
1	Obtain approval by OAL of Los Peñasquitos Lagoon Sediment TMDL = Establishes effective date of TMDL	San Diego Water Board, San Diego County, City of San Diego, City of Poway, City of Del Mar, Caltrans, General Storm Industrial and Construction permittees	Estimated June 2013
2a	Issue, reissue, or revise general WDRs and NPDES requirements for Phase I MS4s, including Caltrans, to incorporate requirements for complying with TMDL and WLAs	San Diego Water Board and State Water Board	Completed during permit renewal - within 5 years of applicable permit date, and every 5 years thereafter.
2b	Issue, reissue, or revise general WDRs and NPDES requirements for Construction and Industrial NPDES to incorporate requirements for complying with TMDL and WLAs	San Diego Water Board and State Water Board	Completed during permit renewal - within 5 years of applicable permit date, and every 5 years thereafter.
2c	Issue, reissue, or revise general WDRs and NPDES requirements for Phase II NPDES permittees to incorporate requirements for complying with TMDL and WLAs	San Diego Water Board and State Water Board	Completed during permit renewal - within 5 years of applicable permit date, and every 5 years thereafter.
3a	Completion of Load Reduction Plans	Phase 1 MS4s and Caltrans	Within 18 months of OAL effective date

Component	Key Findings and Regulatory Provisions			
				for sediment TMDL
	3b	Approval of Load Reduction Plan	San Diego Water Board Executive Officer	Within 6 months of submittal
	3c	Phased, adaptive implementation of Load Reduction Plan	Phase 1 MS4s and Caltrans	In accordance with Load Reduction Strategy – ongoing throughout the implementation
	3d	Revision of SWPPPs	Construction, industrial, and Phase II Permittees	Within 12 months of OAL effective date for sediment TMDL
	4a	Submit annual Progress Report to the San Diego Water Board due January 31 each year	Phase 1 MS4s	Annually after reissuance of NPDES WDR
	4b	Submit annual Progress Report to the San Diego Water Board due April 1 each year	Caltrans	Annually after reissuance of NPDES WDR
	5	Enforcement Actions	San Diego Water Board	As needed
	6	Refine Load Reduction Plan	Phase 1 MS4s and Caltrans	As warranted by completion of special studies, additional monitoring and data compilation.
	7	Reopen and reconsider TMDL	San Diego Water Board	As defensible through the collection of additional data and significant findings by the watershed stakeholders.
	8	Meet Interim Milestone #1: Attain 20 percent required reduction in sediment loading (equivalent to 6691 tons of sediment per year) and/or show progress in improving Lagoon	MS4s and NPDES permittees	Within 5 years of approved TMDL

Component	Key Findings and Regulatory Provisions			
		conditions consistent with the specified targets		
	9	Meet Interim Milestone #2: Attain 40 percent required reduction in sediment loading (equivalent to 5663 tons of sediment per year) and/or show progress in improving Lagoon conditions consistent with the specified targets	MS4s and NPDES permittees	Within 9 years of approved TMDL
	10	Meet Interim Milestone #3: Attain 60 percent required reduction in sediment loading (equivalent to 4636 tons of sediment per year) and/or show progress in improving Lagoon conditions consistent with the specified targets	MS4s and NPDES permittees	Within 13 years of approved TMDL
	11	Meet Interim Milestone #4: Attain 80 percent required reduction in sediment loading (equivalent to 3608 tons of sediment per year) and/or show progress in improving Lagoon conditions consistent with the specified targets	MS4s and NPDES permittees	Within 15 years of approved TMDL
	12	Meet Final Milestone: Achieve Lagoon numeric target: the successful restoration of tidal and non-tidal salt marsh to achieve a lagoon total of 346 acres.[1]	All Phase I, Phase II MS4s, Caltrans, and general construction and industrial NPDES enrollees, and other WDR and NPDES	Within 20 years of approved TMDL

[1] This can either mean:
1. Successful restoration of 80 percent of the 1973 acreage of lagoon salt marsh habitat (346 acres); or
2. Demonstrate that implementation actions are active on and/or affecting 346 acres with continued monitoring to ensure 80 percent target achievement.

Component	Key Findings and Regulatory Provisions
	permittees in the watershed[2]
	Note: TMDL implementation schedule may be altered due to TMDL reconsideration; additionally, enforcement actions by the San Diego Water Board will be taken as necessary.

[2] For general construction and industrial permittees and other NPDES/WDR permittees, this applies to those facilities that have potential for long-term loadings into the watershed.

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ORANGE COUNTY
OC PublicWorks
Our Community. Our Commitment.

November 19, 2014

By E-Mail and Delivery

Laurie Walsh, P.E.
California Regional Water Quality Control Board, San Diego region
2375 Northside Drive, Suite 100
San Diego, CA 92108

Subject: Comment – Tentative Order No. R9-2015-0001, Regional MS4 Permit, Place ID: 658018Lwalsh.

Dear Ms. Walsh:

The County of Orange, as Principal Permittee of the Orange County Stormwater Program, appreciates the opportunity to provide comments on *Tentative Order No. R9-2015-0001, An Order Amending the Regional Municipal Separate Storm Sewer (MS4) Permit for the San Diego Region (Order No. R9-2013-0001)* issued on September 18, 2014. The south Orange County Permittees (hereinafter, Copermittees) were involved in the development of these comments and the Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest and Mission Viejo have directed that they be recognized as concurring entities on this letter.

We acknowledge the significant efforts of Regional Board staff to continue to collaboratively engage with the Copermittees and key stakeholders in the further development of a fifth term permit municipal stormwater permit for south Orange County. We also recognize that Tentative Order No. R9-2015-0001 incorporates a number of changes directly in response to specific recommendations made in our Report of Waste Discharge. The Tentative Order, however, still presents key issues of significant concern including the attainability of the proposed Prohibitions and Limitations provisions.

This letter is a summary of five overarching concerns with the Tentative Order and Regional Permit. Attachment A includes a more detailed discussion of these concerns in addition to providing you with comprehensive technical and legal comments on outstanding issues with the Tentative Order. Attachment B consists of proposed redlines to the Tentative Order consistent with the comments made in Attachment A. In addition to these comments, the Copermittees by this reference incorporate all prior letters, comments, reports, presentations, oral and written testimony, data, communications, and other evidence made by, on behalf of, and in support of the Copermittees during the various workshops, hearings, and meetings relevant to the adoption of Order R9-2013-0001 and Tentative Order R9-2015-0001. The Copermittees reserve the right to provide further comment as applicable.

I. The State of the Environment

The Fact Sheet / Technical Report discuss the statutes, regulations, plans and policies that establish the regulatory and evidentiary basis for the Regional Permit. It omits, however, the numerous environmental quality monitoring programs that have been undertaken over many years, and is silent on the environmental rationale for the stormwater mandate. The Findings include a single paragraph on "Water Quality Effects." In contrast, our Report of Waste Discharge included a comprehensive *State of the Environment* discussion that has since been published as a standalone report, summarizing the results of long term monitoring and special studies related to swimming safety and aquatic ecosystem health. The report's findings have significant implications for the structure of the Tentative Order and the compliance framework for stormwater and its future management in south Orange County. Based on the successes of the Orange County Stormwater Program, there is little justification for much of the Tentative Order.

Bacteria: Bacterial contamination of coastal waters in south Orange County is very low during dry weather, as a direct result of the Copermittees' targeted and comprehensive control actions, and beach report card grades are now consistently high. While contamination is more prevalent in wet weather, the annual percentage of A grades for wet weather on the Heal The Bay Report Card has reached 70 percent in recent years. Achieving further reductions in wet weather contamination will be a challenge as bacterial contamination in wet weather arises from a much wider range of sources compared to dry weather. Also, limitations in current monitoring methods make it difficult to determine if human fecal contamination, a significant health threat, is actually present.

Total Dissolved Solids (TDS) and Nutrients: TDS and Nutrients consistently exceed Basin Plan Objectives in wet and dry weather and create the potential for detrimental impacts on aquatic ecosystems. TDS is suspected as a causal factor in poor macroinvertebrate community condition. Nutrient impacts, such as excessive macroalgal growth, are not prevalent in south Orange County streams in spite of exceedances of regulatory thresholds for bio-stimulatory substances. For both constituents, the principal source is unlikely to be urban in nature and instead can be identified as a consequence of marine sedimentary formations characteristic of the area and their overlying saline soils. The key to effective future management efforts will therefore be to determine the environmental significance, if any, of the urban sources of TDS and nutrients. The permit should recognize this current uncertainty and not mandate on-site retention of runoff in the first instance where it may exacerbate the exfiltration of shallow groundwater with elevated TDS and nutrients.

Toxicity: Toxicity occurs sporadically in streams and creeks in south Orange County. It occurs at low levels and at different locations and different times and varies unpredictability across test species. In dry weather, aquatic toxicity is encountered in open (undeveloped) areas at levels equivalent to those in urban areas. This pattern

suggests that dry weather toxicity is not caused by urban sources of pollutants. There is a greater prevalence of toxicity in wet weather and pesticides are implicated as the principal source of this toxicity. Pesticide use, however, presents a moving target for management efforts due to the continuous introduction of new products. Moreover, the regulation of pesticide use is exclusively within the jurisdiction of state and federal agencies and not the role of MS4s.

II. Prohibitions and Limitations Provisions

The proposed Prohibitions and Limitations provisions in the Tentative Order do not provide the Copermittees with the necessary compliance pathway needed to ensure innovation and progress. Although there is flexibility in the water quality management plans, without some form of compliance path, the Copermittees remain strictly liable for any exceedance. This was not the intent of Congress or the EPA under the Clean Water Act and has not been the intent of the State Water Board under Orders 1999-05 and 2001-15.

The required linkage between implementing control programs and the prohibitions and limitations provisions is created if the Tentative Order is modified to affirm an adaptive management process as the basis for compliance. The adaptive management or iterative process is and has been a fundamental tenet of MS4 programs, as envisioned by USEPA, State Water Board Order 99-05 and later reconfirmed in Order WQ 2001 15 (BIA Order), and is the mechanism by which the Copermittees can and should demonstrate compliance. The County strongly supports this approach which we believe is technically necessary given the major findings both in our *State of the Environment Report* and in the recent American Society of Civil Engineers (ASCE) publication – *Pathogens in Urban Stormwater Systems*. The Regional Board has discretion with receiving water limitations language beyond what is required to be included by Order 99-05, and the County envisions the Water Quality Improvement Plan (WQIPs) being the foundation for the required iterative BMP-based compliance approach for the discharge prohibitions and limitations provisions.

III. TMDL Incorporation

The Regional Board has adopted two Basin Plan Amendments to establish Total Maximum Daily Loads (TMDLs) where the Copermittees are assigned wasteload allocations: (1) Indicator Bacteria in Baby Beach in Dana Point Harbor and (2) Indicator Bacteria, Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek).

There are several fundamental and substantive discrepancies between the adopted TMDL Basin Plan Amendments and the provisions of the Tentative Order. These inconsistencies negate the Basin Plan Amendment process that occurred to establish the TMDLs, and clearly contradict the Board's intent for how the TMDLs would be incorporated into the MS4 Permit. The Tentative Order should be revised to ensure that the TMDLs are properly incorporated as mass-based WLAs and not as concentration-based limits and that BMP-based compliance is established for the TMDL provisions. The Tentative Order should also provide an explicit re-opener provision to ensure that any revision to a TMDL is included in the adopted Order.

IV. Complementary Watershed and Jurisdictional Planning

The WQIP framework allows for the identification and development of a program built around the highest priority water quality conditions and constraints within a specific watershed. The WQIP also allows for the integration of all program elements and focuses the efforts on the highest priorities for each watershed through the customization of actions and strategies. If positioned correctly, the WQIP is the necessary next step in making the Tentative Order and corresponding compliance programs truly strategic, adaptive, and optimally supportive of the *Practical Vision (Resolution No. R9-2013-0153).*

The County believes the Tentative Order provisions—especially Provision E, JRMP—deviate from the strategic and adaptive approach to the "one-size fits all" approach. For example, the Existing Development provisions dictate that specific BMPs that must be implemented, regardless of the high priority water quality concerns within a watershed. These provisions become "additive" instead of "prioritized" and are not supportive of the overarching WQIP. The Tentative Order needs to be modified so that the WQIPs and related Jurisdictional Runoff Management Plans can be streamlined and focus on the highest priorities within each watershed.

V. Regional Permit

The Permittees understand that the regional nature of the permit is one of the defining features of our fifth term permit renewal and that this permitting approach is supported by the members of the Regional Board. Nonetheless, it must also be noted that the Regional Board does not have the legal authority to include Orange County in a Regional Permit because there is no system-wide, jurisdiction-wide, or common watershed basis to do so.

Thank you for your attention to our comments. Please contact me directly if you have any questions. For technical questions, please contact Chris Crompton at (714) 955-0630 or Richard Boon at (714) 955-0670. For legal questions, please contact Ryan Baron at (714) 834-5206.

Sincerely,

Mary Anne Skorpanich
Deputy Director, OC Public Works Department
OC Environmental Resources

Attachments: A – Detailed Comments
B – Redline Version of the Tentative Order

Cc: (Electronic copies only)

David Gibson, San Diego Regional Board
Tony Felix, San Diego Regional Board
South Orange County Permittees
Orange County Technical Advisory Committee
Tony Olmos, Orange County Public Works
Todd Snyder, County of San Diego
Jason Uhley, Riverside County Flood Control and Water Conservation District
Andrew Kleis, City of San Diego

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ATTACHMENT A

ORANGE COUNTY DETAILED COMMENTS ON

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD

SAN DIEGO REGION

TENTATIVE ORDER No. R9-2015-0001

NPDES NO. CAS0109266

This document, **Attachment A**, contains the detailed legal and technical comments of the County of Orange and the Orange County Flood Control District (collectively, the "**County**") on Tentative Order No. R9-2015-0001 dated September 18, 2014 ("**Tentative Order**"). These comments are divided into three sections (*General*, *Findings*, and *Permit Provisions*) and address issues relating to specific parts of the Tentative Order. At times, the issues and concerns raised will pertain to more than one section of the Tentative Order. **Attachment B** contains the recommended language changes to the Tentative Order and also includes some minor edits in order to provide additional clarification where necessary.

The County of Orange, as the Principal Permittee, and the cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Lake Forest, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano collectively refer to themselves as "San Diego Region Permittees" or "Permittees." The Tentative Order refers to the County and incorporated cities of South Orange County as the "Copermittees." As such, the comments below use the term "Copermittees" to be consistent with the terminology of the Tentative Order.

GENERAL

1. THE DRAFT ORDER DOES NOT RECOGNIZE THE REPORT OF WASTE DISCHARGE OR THE SIGNIFICANT WATER QUALITY OUTCOMES THAT HAVE BEEN ACHIEVED IN ORANGE COUNTY AND, THEREFORE, LACKS SUBSTANTIAL EVIDENCE TO SUPPORT NEW OR MODIFIED PROGRAM REQUIREMENTS.

The Copermittees submitted a Report of Waste Discharge (ROWD) to the San Diego Regional Water Quality Control Board ("Regional Board") on May 20, 2014. Pursuant to federal law, the Copermittees' ROWD is an application to discharge pollutants from a point source to waters of the United States and be covered by a fifth term municipal separate storm sewer system (MS4) National Pollutant Discharge Elimination System (NPDES) Permit.[1] The ROWD evaluates the fourth term MS4 Permit activities and discusses the accomplishments of the Orange County Stormwater Program. Based on the ROWD's assessment and findings, the application identifies the activities that are proposed for the fifth term Permit and including additional pollutant control initiatives. The ROWD is also the technical basis or substantial evidence for what regulations and activities will be required in the fifth term Permit.

The Copermittees' application for a fifth term Permit is predicated on the assessment of the "State of the Environment" (ROWD, Section 2). This assessment describes the results of the

[1] 40 CFR § 122.21.

long-term monitoring and special studies that are used to examine the condition of the surface water environment in Orange County with an emphasis on recreation and aquatic ecosystem health. The analyses focus on bacteria, nutrients, toxicity and improvements in water quality, as well as recommendations for the fifth term Permit intended to ensure further improvements in surface water quality.

However, despite the comprehensive evaluation of the Orange County Stormwater Program presented in the ROWD, there is no discussion in the Draft Order regarding the "State of the Environment." In fact, the Draft Order Findings and Fact Sheet do not reference the Copermittees' application or cite specific areas in the ROWD to provide a basis for or justify particular fifth term stormwater program modifications. Although Finding 38 states that the Fact Sheet "contains background information, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of this Order," many of the requirements within the Tentative Order lack technical justification. The comments provided herein identify many of the areas where new or modified provisions of the Tentative Order lack factual or technical support in the Findings and/or Fact Sheet. Examples of this include, but are not limited to, the following:

- Basis for including Orange County in the regional municipal stormwater permit;
- Basis for requiring uncontaminated pumped ground water, foundation drains, water from crawl space pumps, and footing drains to obtain coverage under the San Diego Region groundwater extraction permits;
- Basis for requiring conventional BMPs onsite in addition to alternative compliance;
- Basis for biofiltration BMPs required to be sized at 1.5 times the design capture volume;
- Basis for biofiltration BMPs not being an effective LID and treatment measure per the requirement to size them at 1.5 times the design capture volume and also require conventional BMPs when they are used;
- Basis for offsite regional BMPs required to be sized at 1.1 times the design capture volume;
- Basis for verification of coverage under all related permits for construction sites; and
- Basis for establishing Water Quality Based Effluent Limits (WQBELs) expressed as numeric effluent limitations, in lieu of WQBELs expressed as BMPs, for the TMDL provisions.

The Findings (Discharge Characteristics and Runoff Management) only contain generic statements about water quality and excludes the key findings from the ROWD. Although the Findings within Section B of the Draft Order may have been the general factual basis for the Copermittees' first and second term permits, they are not appropriate for an advanced fifth term stormwater program.

The absence of any recognition of the significant water quality outcomes that have been achieved in Orange County *(e.g.*, coastal water quality) creates a false case, in many

instances, for regulatory change. Without support from specific findings and other evidence, the requirements of the Draft Order, in many instances lack substantial evidence and are, arbitrary and capricious, and therefore, cannot be lawfully adopted.[2]

Action: The Draft Order needs to include the key findings from the Report of Waste Discharge (including the State of the Environment) and use this information as the basis for the Draft Order's requirements. The Findings and/or Fact Sheet should be modified to include the technical justification for the requirements listed above.

2. THE NUMBERING IN THE TENTATIVE ORDER SHOULD EXPLICITLY IDENTIFY THE MAJOR SECTIONS TO HELP GUIDE THE READER.

The County is recommending that the Regional Board explicitly identify the numbering system within the Tentative Order subsections in order to assist and orient the reader. For example, within the Provisions (Section II of the Tentative Order):

- The sub-sections within Provision A should be listed as:
  - *A.1 Discharge Prohibitions* instead of *1. Discharge Prohibitions*
  - *A.2 Receiving Water Limitations* instead of *2. Receiving Water Limitations*
- The sub-sections within Provision B should be listed as:
  - *B.1 Watershed Management Areas* instead of *1. Watershed Management Areas*
  - *B.2 Priority Water Quality Conditions* instead of *2. Priority Water Quality Conditions*

Given the styles and formatting currently used within the Tentative Order, these edits were not made within Attachment B.

Action: Incorporate a definitive numbering system.

FINDINGS

3. FINDING 2 (PAGE 1 OF 130) – A REGIONAL PERMIT CANNOT BE ISSUED TO ORANGE COUNTY BECAUSE THERE IS NO SYSTEM-WIDE, JURISDICTION-WIDE, WATERSHED OR OTHER BASIS.

The Tentative Order is intended to cover Copermittees in three large metropolitan counties – Orange, Riverside and San Diego. In May 2012, Orange and Riverside Counties ("**Counties**") sent letters to Staff Counsel for the Regional Board requesting the legal authority to issue a regional permit to the three counties.[3] The Counties contended that, in accordance with federal regulations, there was no system-wide, jurisdiction-wide or watershed basis to issue a regional permit. The Counties also asserted that the lack of a Report of Waste Discharge (ROWD) process for either county prior to the initial adoption of

[2] *City of Rancho Cucamonga v. Regional Water Quality Control Bd.*, 135 Cal. App. 4th 1377, 1384–1385 (2006); Code Civ. Proc. § 1094.5(b).

[3] Letter from Ryan M. F. Baron, Office of County Counsel, County of Orange, to Catherine Hagan, Office of Chief Counsel, State Water Resources Control Board, San Diego Region (May 10, 2012); Letter from David H. K. Huff, Office of County Counsel, County of Riverside, to Catherine Hagan, Office of Chief Counsel, State Water Resources Control Board, San Diego Region (May 21, 2012).

the Tentative Order prevented the issuance of a regional permit on the grounds that there was a conflict with both federal and state law. On September 7, 2012, Staff Counsel responded to the Counties stating that there was a jurisdiction-wide and watershed basis to impose a regional permit on the Counties, and cited legal authority and examples in the Bay Area and an Alaskan borough where regional permits had been issued.[4]

For the following reasons, the County continues to believe that the Regional Board lacks authority to issue a regional permit to Orange County:

1. Orange County's MS4 system does not interconnect with Riverside and San Diego Counties,
2. There is no jurisdictional basis to issue a regional permit to Orange County,
3. Orange County's MS4 does not drain into a shared watershed,
4. Orange County's MS4 is not adjacent to Riverside or San Diego's MS4, and
5. The quantity and nature of pollutants differ between the three counties.

Therefore, the Regional Board cannot under federal and state regulations impose a Regional Permit without the Copermittees expressly consenting to the Board's jurisdiction. The Copermittees therefore enroll in the region-wide permit under protest.

a. There Is No System-wide, Jurisdiction-Wide, Watershed or Other Basis by Which to Legally Impose a Regional Permit on Orange County.

Finding 2 in the Tentative Order states that the legal and regulatory authority for implementing a regional MS4 permit stems from Section 402(p)(3)(B) and 40 CFR 122.26(a)(1)(v). The Tentative Order also cites EPA's Final Rule regarding stormwater discharge permit application procedures that there is flexibility to establish system-wide or region-wide permits.[5] During Focused Meeting Workshops conducted on June 27, 2012 and July 11, 2012, Regional Board staff stated that the reason for a regional permit was to consolidate all three permits into one to lessen the amount of permit writing time for three separate permits and reduce internal costs for writing and issuing permits. The justification at Finding 2 is largely the same although it adds that the "regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall costs savings for the Copermittees and San Diego Water Board."[6]

When EPA established regulations for MS4 permit issuance, the Response to Comments contemplated one permit being issued to a single system. And although it allowed

[4] Letter from Jessica Jahr, California Regional Water Quality Control Board, San Diego Region, to Ryan M. F. Baron, Office of County Counsel, County of Orange, and David H. K. Huff, Office of County Counsel, County of Riverside (Sept. 7, 2012) ("Staff Counsel Letter").

[5] 55 Fed. Reg. 47990, 48039-48042 ("EPA Final Rule").

[6] Part I.2.

discretion to define "system," it did so based on the following criteria – interconnectedness, political jurisdiction, and watershed-based.[7]

Interconnection. Although Orange County geographical boundaries abut San Diego and Riverside Counties, Orange County's MS4 does not interconnect with the counties regulated under the regional permit. There is substantial undeveloped area between the developed jurisdictions of Orange County and Riverside Counties. The Santa Ana Mountains and the Cleveland National Forest separate Orange and Riverside Counties encompassing tens of thousands of acres of total land separating the two counties. Camp Pendleton military base separates Orange and San Diego Counties totaling over 122,000 acres with no adjacent cities or interconnected MS4s. Clean Water Act (CWA) regulations expressly state that a permit can be issued on a system-wide basis covering all discharges from MS4s within a large or medium municipal storm sewer system. One of the primary considerations in defining a "large or medium municipal separate storm sewer system" is one that has physical interconnections with other municipal separate storm sewers.[8] In this case, there are no physical interconnections. A depiction of the County's geographical separation have been entered into the record and is included in Appendix 1.

Jurisdiction. There is no jurisdiction-wide basis to issue a regional permit. 40 CFR 122.26(a)(3)(ii) states that one system-wide permit can cover all discharges from MS4s within a large or medium municipal storm sewer system located within the same jurisdiction. Orange, Riverside and San Diego Counties are separate counties with distinct political and geographical boundaries that do not drain into a common watershed and do not share physical interconnections. The three counties are not within the same political jurisdiction. While Region 9 can be considered one jurisdiction for Regional Water Board purposes, federal regulations state that there has to be one stormwater management regional authority in which to issue a permit, and the Regional Board is not such an authority.[9] Regardless, such a permit can only be issued to a multi-jurisdictional entity upon a permit application and upon there being an interconnected MS4 or adjacent MS4. There is no tri-county stormwater management authority, there is no system-wide interconnection and Orange County is not adjacent to San Diego and Riverside Counties due to the large federal lands that separate the counties.

Watershed. Orange County does not drain into a shared watershed with Riverside and San Diego Counties. The Orange County Copermittees drain into various watersheds that drain into the Pacific Ocean. The Riverside County Copermittees drain into the Santa Margarita watershed. San Diego County drains into various watersheds. Orange County's MS4 does not drain into or share one common watershed with either county, and therefore cannot be regulated on this basis. During the prior adoption hearing for the regional permit, it was asserted by Regional Board staff that one permit can be

[7] 33 USC 1342(p)(3)(B)(i); 40 CFR 122.26(a)(1)(v).

[8] 40 CFR 122.26(b)(4) (defining large systems); 40 CFR 122.26(b)(7) (defining medium systems).

[9] 40 CFR § 122.26(a)(3)(iii)(C).

issued based on adjacency. That is, two or more separate MS4s can be issued one permit for discharges into watersheds adjacent to one another, such that they abut one another. The EPA and Army Corps of Engineers' definition of "adjacent," however, does not include mere proximity, but that one waterbody has a significant effect on the other waterbody. "Adjacent" is a waterbody adjacent to navigable waters or waters of the U.S. because the waterbodies are "inseparably bound up."[10] ''Adjacent waters' are wetlands, ponds, lakes and similar water bodies that provide similar functions which have a significant nexus to traditional navigable waters, interstate waters and the territorial seas. These include waters and wetlands that are adjacent to traditional navigable waters, interstate waters, and the territorial seas as well as waters and wetlands adjacent to other jurisdictional waters such as tributaries and impoundments."[11] In its Proposed Rule, EPA sought comment on clarifying the concept of adjacency as those waters that are ''neighboring.'' "Neighboring" is proposed as possessing "a shallow subsurface or confined surface hydrologic connection to a jurisdictional water," that can exchange water, along with chemicals and organisms within that water, and subsequently have a significant effect, particularly in combination with other adjacent waters in the watershed, on the chemical, physical, or biological integrity of a downstream traditional navigable water, interstate water, and the territorial seas."[12]

Quantity and Nature of Pollutants. Orange, Riverside and San Diego Counties are comprised of different climates, soil types, waterbodies and other notable differences. Based on differing permit requirements for the three counties, such as TMDLs, and data filed in annual reports and past ROWDs, the quantity and nature of pollutants are different between the three counties, and do not serve as a basis or determination by which to lump all three counties into a one-size fits all permit (*e.g.*, hydromodification).

Other Support. In the Staff Counsel Letter, Regional Board staff cited examples in the Bay Area and in Alaska where regional permits have been issued. In the Bay Area, various cities and counties under that permit interconnect in some fashion and drain into the San Francisco Bay. The Bay Area is also represented by a joint powers organization or regional watershed management program comprised of 8 municipal stormwater programs that voluntarily agreed to end their existing permits early and enroll in a regional permit. In the case of the Alaska example, a "regional" permit was issued to the Fairbanks North Star Borough, City of Fairbanks, City of the North Pole, the Alaska Department of Transportation and the University of Alaska Fairbanks. Further examination of that permit and the stormwater program maps demonstrate, though,

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[10] 79 Fed. Reg. 22188, 22191 ("Proposed Rule"). *United States v. Riverside Bayview Homes*, 474 U.S. 121 (1985).

[11] 79 Fed. Reg. 22188, 22195 and 22207 ("Connectivity is a foundational concept in hydrology and freshwater ecology. Connectivity is the degree to which components of a system are joined, or connected, by various transport mechanisms and is determined by the characteristics of both the physical landscape and the biota of the specific system.").

[12] Id. at 22210.

that the region regulated is a borough, the Alaskan equivalent of a county. All of the regulated Copermittees are physically interconnected through its storm drain system and most drain into one watershed. Therefore, neither the Bay Area nor the Fairbanks Borough permits provide sufficient examples of a regional permit comparable to the one being issued to Orange County.

As previously stated, Regional Board staff indicated in the June 27, 2012 and July 11, 2012 workshops that the rationale for implementing a region-wide permit was minimize costs to the Regional Board in preparing permits. Federal regulations, however, do not authorize and the EPA Final Rule does not contemplate regional permit issuance based on overall reduced cost savings. Moreover, cost savings have not been demonstrated in the Tentative Order.[13] Although it may be convenient to ensure consistency of regulation, the EPA Final Rule contemplates such consistency within a watershed and not throughout a geographical area the size of the three counties. And although the EPA Final Rule does use the term "regional" in the Response to Comments, a careful examination of the term shows that EPA was analyzing whether individual permits should be issued to individual cities, a county and its incorporated cities, a set of Copermittees with interconnected sewer systems and other infrastructure, one state entity or a regional stormwater management authority. The largest area by which one permit could be issued under the Final Rule was a state entity that operated a state highway network or one county and its incorporated cities. There is no factual or technical basis in the Tentative Order that meets this criteria or establishes other bases to regulate Orange County under one unified permit. There is also no statistical basis by which to issue a regional permit as Orange County is comprised of over three million people and is the sixth largest county by population in the U.S. In fact, the U.S. Bureau of Census designates Orange County in a different Metropolitan Statistical Area than San Diego County, and is designated in a Combined Statistical Area with Los Angeles, Ventura and San Bernardino Counties.

b. There Is No Technical Basis to Regulate Orange County Due to the Lack of a Report of Waste Discharge Application.

The ROWD is a federally required application that is the technical basis to draft a new permit for a permittee. The information contained in the ROWD is used to determine prospective provisions of the new permit, including but not limited to monitoring, program strengths and other tools that are assessed in the new permit. In other words, the ROWD is the technical basis or substantial evidence for determining what will be required in the new permit. The initial draft of the Regional Permit did not contain a ROWD requirement for Orange County. The Order was subsequently revised to include a ROWD requirement to determine whether modification to the Order upon enrollment by Orange County is necessary, but the Regional Permit was still adopted by the Regional Board with terms and conditions that would also apply to Orange County that were not based on any federally required application or report.

In short, the Regional Permit was adopted by the Regional Board with provisions that regulate Orange County Copermittees, along with specific numeric and other

[13] 55 Fed. Reg. 47990-01.

requirements that only apply to Orange County that were not based on an application process or other documented technical basis. There is no substantial evidence or basis under the Clean Water Act ("CWA") by which to impose certain regulations on the County. Thus, the lack of a ROWD requirement prior to initial adoption of the regional permit is in conflict with the CWA, the Porter Cologne Water Quality Control Act ("Porter Cologne") and the California Administrative Procedure Act.

Action: The County should be issued an individual permit. Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Finding 2 (page 1)*
- *Finding 28 (page 8)*

4. FINDING 7 (PAGE 3 OF 130) - THE IN-STREAM TREATMENT CONTROL SYSTEMS FINDING WILL PRECLUDE THE USE OF REGIONAL BMPS.

In-stream controls must not adversely impact beneficial uses or result in sustained degradation of water quality of the receiving waters. Copermittees and project applicants should have the flexibility to identify creative solutions that meet the alternative compliance goals of mitigating the volume of stormwater not retained onsite or increased potential erosion of downstream receiving waters.

This finding should not prevent the implementation of stream restoration or stream rehabilitation projects and constructed wetlands, or prevent maintenance of reconstruction of existing stream restoration or rehabilitation projects, constructed wetlands, and regional BMPs.

Action: Finding 7 should be modified to allow for the implementation of stream restoration or stream rehabilitation projects and constructed wetlands, or maintenance of reconstruction of existing stream restoration or rehabilitation projects, constructed wetlands, and regional BMPs.

5. FINDING 8 (PAGE 3 OF 130) – IT SHOULD NOT BE PRESUMED THAT DISCHARGES FROM MS4S ALWAYS CONTAIN WASTE OR POLLUTANTS.

Discharges may contain waste or pollutants, but it should not be presumed that they necessarily always contain waste or pollutants.

Under current law, the Regional Board's issuance of the Permit is a quasi-judicial decision.[14] As a quasi-judicial decision, the Regional Board's action must be supported by legally adequate findings, and those findings must be supported by evidence in the record.[15]

Pursuant to the Supreme Court's decision in *Topanga Association for a Scenic Community v. County of Los Angeles* (1974) 11 Cal.3d 506, findings are intended to "facilitate orderly analysis and minimize the likelihood that the agency will randomly leap from evidence to conclusions."[16] Here, there is no cited evidence that stormwater itself is a pollutant or that in

[14] *City of Rancho Cucamonga v. Regional Water Quality Control Board*, 135 Cal.App.4th 1377, 1385 (2006).

[15] T*opanga Association for a Scenic Community v. County of Los Angeles*, 11 Cal.3d 506 (1974).

[16] *Id.*, at 514 (emphasis added).

every instance it contains pollutants or waste as those terms are defined by the CWA and Porter Cologne respectively. Absent evidence demonstrating that this is the case, in all cases, the Regional Board cannot make this finding.

Moreover, as a matter of law, the Regional Board lacks the authority to regulate pure stormwater as a pollutant. The CWA and its implementing regulations define the term "pollutant" to mean:

> dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials (except those regulated under the Atomic Energy Act of 1954, as amended (42 U.S.C. 2011 et seq.)), heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water.[17]

Federal regulations further define the term "stormwater" to mean "storm water runoff, snow melt runoff, and surface runoff and drainage."[18] Notably, the definition of the term "pollutant" does not include "stormwater." Moreover, the text of the CWA requires the discharge of *pollutants* to be reduced to the Maximum Extent Practicable (MEP).[19] There is no prohibition on or comparable authority to regulate the discharge of pure stormwater.

This rationale was recently adopted by the Eastern District of Virginia, when it held that the EPA has no authority under the Clean Water Act to regulate non-pollutants.[20] Specifically, the Court stated:

> "Pollutant is statutorily defined. (33 U.S.C. § 1362(6).) The Court sees no ambiguity in the wording of this statute. EPA is charged with establishing TMDLs for the appropriate pollutants; that does not give them the authority to regulate nonpollutants. The parties agree that sediment is a pollutant under 33 U.S.C. § 1362(6), and stormwater is not. Then how does EPA claim jurisdiction over setting TMDLs for stormwater?"[21]

Likewise, Porter Cologne defines the term "waste" to mean:

> "sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal."[22]

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[17] 33 U.S.C. § 1362(6); 40 C.F.R. § 122.2.

[18] 40 C.F.R. § 122.26(b)(13).

[19] 33 U.S.C. § 1342(p).

[20] Virginia Dept. of Transportation v. EPA, No. 1:12-CV-775, slip op., 2013 WL 53741 (E.D. Va. Jan. 3, 2013).

[21] *Id.*, at 5.

[22] Water Code § 13050(d).

While the definition is certainly different and potentially broader than the definition of "pollutant" under the CWA, the definition of "waste" does not include stormwater or any other discharge that is not created by human activity. As a matter of law, the Regional Board is therefore without authority to regulate all discharges of stormwater as pollutants or waste.

Action: *Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:*

- *Finding 8 (page 3)*
- *Finding 16 (page 5)*
- *Finding 17 (page 5)*

6. FINDING 11 (PAGE 4 OF 130) – NATURAL WATERS CANNOT LEGALLY BE CLASSIFIED AS PART OF THE MS4, AND CANNOT BE CLASSIFIED AS BOTH A MS4 AND RECEIVING WATER.

Rivers, streams, creeks and other natural waterbodies cannot be legally classified as a MS4. The definition of a "municipal separate storm sewer" means "a conveyance or system of conveyances including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains" "owned and operated" by a municipality.[23]

In California, natural waterbodies are not "owned" by the municipality through which they flow. Such water bodies are generally administered by the State of California in the public trust for the right of the people to use such waters for certain purposes.[24] The Legislature, acting within the confines of the common law public trust doctrine, is the ultimate administrator of the trust and may often be the final arbiter of permissible uses of trust lands.

"receiving water" cannot also be an MS4, as is plain from the CWA regulations. An MS4 is itself defined as discharging to waters of the United States.[25] An MS4 cannot, in essence, discharge to itself. Moreover, an "outfall" from an MS4 (the point at which the discharge enters a receiving water) does not, pursuant to 40 C.F.R §122.26 (b)(9), include conveyances connecting "segments of the same stream or other waters of the United States and are used to convey waters of the United States."

In EPA's Preamble to the initial version of the MS4 regulations, the agency expressly determined that "streams, wetlands and other water bodies that are waters of the United States are not storm sewers for the purposes of this rule" and that "stream channelization, and stream bed stabilization, which occur in waters of the United States" were not subject to National Pollutant Discharge Elimination System ("NPDES") permits under Section 402 of

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[23] 40 CFR 122.26(b)(8).

[24] *Marks v. Whitney* 6 Cal. 3d 251, 259, 260 (1971).

[25] 40 C.F.R. §122.26(b)(8).

the CWA.[26] In further support of the point that a MS4 is an artificial, not natural, watercourse, the types of "conveyances" identified in the regulation ("roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains") all refer to anthropogenic structures, not natural streams.[27]

In *South Florida Water Management District v. Miccosukee Tribe of Indians*, the U.S. Supreme Court opined on the issue of whether a NPDES permit was needed when water from a channelized canal was pumped across a levee into a reservoir. The Court held that if the two waterbodies were meaningfully distinct, no permit was needed.[28] Likewise, the Court held in *L.A. County Flood Control District v. NRDC* that the flow of water from an improved portion of a navigable flood control channel into an unimproved portion of the same waterway is not a "discharge of a pollutant" under the CWA.[29] Based on these two holdings, there is no discharge of pollutants under the CWA if a waterbody like a flood control channel is both classified as a MS4 and receiving water.

This issue is currently being considered by U.S. EPA in its Proposed Rule. EPA has indicated in ex parte meetings that it did not seek comment and did not intend that MS4s be characterized as waters of the U.S. Therefore, the Regional Board should refrain from issuing this finding until the Proposed Rule is final and EPA has lawfully established this classification. Otherwise, such a finding is made purely under state law.

Action: Finding 11 should be deleted. Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Finding 11 (page 4)*

7. FINDING 12 (PAGE 4 OF 130) – COPERMITTEES DO NOT ACCEPT FREE AND OPEN ACCESS TO MS4S, AND ARE NOT RESPONSIBLE FOR ALL DISCHARGES NOT PROHIBITED.

The Tentative Order states that MS4s provide free and open access and convey discharges to waters of the U.S., and that MS4 operators then accept all responsibility for such discharges not prohibited or otherwise controlled. This is simply not the case and is legally unsupportable. An MS4 is designed to accept stormwater for flood control purposes and prevent damage to life and property. Although it is true that the Copermittees have an obligation to effectively prohibit non-stormwater discharges, namely illicit connections and unlawful dumping, it is also true that the discharger into the MS4 is ultimately responsible for a condition of pollution or violation of a water quality standard. And, in accordance with California state law, MS4s downstream of upstream flows must accept those flows and

[26] 53 Fed. Reg. 49416, 49442 (Dec. 7, 1988).

[27] 40 CFR § 122.26(b)(8).

[28] 541 U.S. 95, 109-112 (2004) (remanding the case to the Florida District Court to determine the hydrological connection between the two waterbodies).

[29] *L.A. County Flood Control District v. National Resources Defense Council*, 133 S.Ct. 710 (Jan. 8, 2013).

cannot attempt to block or divert such flows.[30] Finding 12 attempts to shift all legal responsibility to the MS4s, which is unsupported by federal and state law.

Action: *Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:*

- *Finding 12 (page 4)*

8. FINDING 15 (PAGE 5 OF 130) – THE TENTATIVE ORDER MUST RECOGNIZE THAT THE DISCHARGE OF ALL POLLUTANTS FROM THE MS4 IS SUBJECT TO THE MEP STANDARD.

Section 402(p)(3)(B)(ii) requires the Copermittees to effectively prohibit non-stormwater discharges into the MS4, namely pollutants generated from illicit connections and unlawful dumping.

The Tentative Order at Finding 15, however, states that "non-stormwater discharges from the MS4s are not considered stormwater discharges and therefore are not subject to the MEP standard….". This finding is not supported by federal law. Although federal law regulates "non-stormwater discharges" into the MS4, Section 402(p)(3)(B)(iii) expressly states that the "discharge of pollutants" shall be reduced to MEP. In drafting this section of the CWA, Congress expressly intended all discharges from MS4s to be subject to MEP as it used the term "pollutant" and did not differentiate between stormwater and nonstormwater, as the Tentative Order attempts to do. Therefore, the duty of the Copermittees to reduce the discharge of pollutants from the MS4 to MEP applies to both stormwater and nonstormwater pollutants.

Furthermore, the focus of the CWA and federal regulations is on a management program that includes a comprehensive planning process to reduce the discharge of pollutants to MEP.[31] One of the elements of the management program is the illicit discharge prevention program.[32] The control and limitation of illicit discharges into the MS4 is intended to achieve the overall MEP standard for discharges from the MS4. This is confirmed by the preamble to EPA regulations that discuss the required elements of the management program. According to EPA:

> [Copermittees are required] to develop management programs for four types of pollutant sources which discharge to large and medium municipal storm sewer systems. Discharges from large and medium municipal storm sewer systems are usually expected to be composed primarily of: (1) Runoff from commercial and residential areas; (2) storm water runoff from industrial areas; (3) runoff from construction sites; and *(4) non-storm water discharges*. Part 2 of the permit application has been designed to allow [Copermittees] the opportunity to propose *MEP control measures for each of these components of the discharge*. 55 Fed Reg at 48052 (emphasis

[30] *Keyes v. Romley*, 64 Cal.2d 396 (1966); *Locklin v. City of Lafayette*, 7 Cal. 4th 327 (1994).

[31] 40 CFR 122.26(d)(2)(iv).

[32] 40 CFR 122.26(d)(2)(iv)(B)(1).

> added). *See also* 55 Fed Reg at 48045 (stating "Part 2 of the proposed permit application [which includes the illicit discharge prevention requirement] is designed to . . . provide municipalities with the opportunity of proposing a comprehensive program of structural and non-structural control measures that will *control the discharge of pollutants, to the maximum extent practicable, from municipal storm sewers*.") (Emphasis added).

EPA's position is consistent with existing State Water Resources Control Board policy which states that discharges into the MS4 are to be controlled through an iterative, BMP based approach that is *less* stringent than the MEP standard.[33] The State Board held:

> An NPDES permit is properly issued for "discharge of a pollutant" to waters of the United States. (Clean Water Act § 402(a).) The Clean Water Act defines "discharge of a pollutant" as an "addition" of a pollutant to waters of the United States from a point source. (Clean Water Act section 502(12).) Section 402(p)(3)(B) authorizes the issuance of permits for discharges "from municipal storm sewers."
>
> We find that the permit language is overly broad because it applies the MEP standard not only to discharges "from" MS4s, but also to discharges "into" MS4s. . . [T]he specific language in this prohibition too broadly restricts all discharges "into" an MS4, and does not allow flexibility to use regional solutions, where they could be applied in a manner that fully protects receiving waters. It is important to emphasize that dischargers into MS4s continue to be required to implement a full range of BMPs, including source control. In particular, dischargers subject to industrial and construction permits must comply with all conditions in those permits prior to discharging storm water into MS4s.[34]

The State Board's decision in the BIA Order makes clear that the CWA does not include a blanket prohibition on discharges of non-stormwater into the MS4. To the extent the Tentative Order would hold the dischargers liable in the event that any discharge into the MS4 occurs, the Tentative Order exceeds the requirements of the CWA and violates existing State Board policy.

It is also technically infeasible in some cases to differentiate between non-stormwater or stormwater pollutants discharged from the MS4. Thus, just as the discharge of non-stormwater into the MS4 is subject to the effective prohibition standard, the discharge of pollutants in non-stormwater from the MS4 is subject to the MEP standard. There are several instances where the specific provisions in the Tentative Order need to be modified in order to reflect this approach.

<u>Action</u>: *Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:*

- *Finding 15 (page 5)*

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[33] Specifically in State Board in Order No. WQ-2001-15, *In the Matter of the Petitions of Building Industry Assoc. of San Diego County and Western States Petroleum Assoc.* (2001) ("BIA Order").

[34] *Id.*, at 9-10.

- *Provisions, A. Prohibitions and Limitations (page 15)*
- *Provisions, E. Jurisdictional Runoff Management Programs (page 78)*
- *Provisions, E.1.a. Legal Authority Establishment and Enforcement (page 78)*
- *Provisions, E.2.a. Illicit Discharge Detection and Elimination (page 80)*

9. FINDING 31 (PAGE 10 OF 130) – THE REQUIREMENTS IN THE TENTATIVE ORDER ARE MORE STRINGENT THAN FEDERAL LAW, REQUIRING AN ECONOMIC ANALYSIS. IN ADDITION, THE CURRENT ECONOMIC ANALYSIS IS INSUFFICIENT.

Finding 31 states that pollutant restrictions are not more stringent than federal law, yet an economic analysis is still conducted pursuant to Water Code § 13241. Despite the finding that the Tentative Order does not exceed federal law requirements, there are a number of requirements that are more stringent.

There has not been a full consideration of the section 13241 factors, which would include an analysis of the economic impacts that would result from compliance with the existing stormwater permit compared to the costs of complying with the proposed stormwater permit (*i.e.*, the costs of complying with the new requirements). Instead, the Order's analysis begins by stating, and without any quantification, that it would more expensive to not fully implement programs. Section 13241 is not satisfied by this inverse analysis.

Additionally, the Tentative Order states that Copermittees have a significant amount of flexibility to choose how to implement BMPs and that "least expensive measures" can be chosen.[35] This statement, however, conflicts with the Order's definition of MEP at C-6 which expressly acknowledges Chief Counsel's 1993 MEP memo that only the Regional and State Boards determine whether BMPs meet MEP, and that selection of the least expensive BMPs will likely not result in meeting the MEP standard.

The Fact Sheet also fails to cite any recent cost benefit numbers but relies on inapplicable cost data such as a 1999 EPA study on household costs.

The analysis of costs contained in the Fact Sheet is deficient in two additional ways. First, the approach to compliance costs is fundamentally deficient because it tells the public nothing at all about the relationship between the cost of any particular control and the pollution control benefits to be achieved by implementing that control. Under this "generalized" approach, extremely costly requirements that bear little or even no relationship (or even a negative relationship) to the pollution control benefits to be achieved could be "justified" as long as the "overall" program costs are within what the Regional Board deems to be an acceptable range. This is not a proper way to determine whether a control reduces the discharge of pollutants from the MS4 to the MEP. A more individualized assessment of cost is required. Otherwise, dischargers may be required to implement very costly controls that have no relationship to pollution control benefits, a result inconsistent with MEP.

This analytical flaw in the Fact Sheet is compounded by the approach taken to assess the benefits of the Tentative Order. Here again, the assessment approach misses the mark

[35] Fact Sheet, Page F-17.

because it tells the public nothing about the pollution control benefits to be achieved by implementation of the controls in the Tentative Order. All the Fact Sheet says, in essence, is that people like clean water and in theory may be willing to pay for it, that urban storm water may contribute to beach closures and that such beach closures have an economic impact. This analysis sheds no light on the relationship between a BMP's costs and the pollution control benefits to be achieved by implementing that BMP.

Second, the Fact Sheet contains faulty assumptions and relies upon outdated or inapplicable data. The California State University, Sacramento (CSUS) Cost Survey assessed program costs for Phase I cities. Nothing in the Fact Sheet links any of the actual conditions of the Phase I permits of the Phase I cities studied by CSUS with any of the requirements of the Tentative Order. Therefore, the study tells the public nothing about the costs to implement the Tentative Order. The data included in the Fact Sheet is also from seven years to more than a decade old. In short, the Fact Sheet uses old data from Phase I programs that have no linkage to any conditions of the Tentative Order. The full costs of implementing the entire program required by the Tentative Order must be assessed.

Lastly, stormwater agencies cannot readily establish or raise fees to help pay for the BMPs necessary to comply with either the California Toxics Rule (CTR) criteria or proposed Site Specific Objectives (SSOs) due to the requirements of Proposition 218, Proposition 26 and the Mitigation Fee Act. For instance, Proposition 218 requires that property-related fees be put to a vote, so cities cannot assess fees without the consent of a majority (two-thirds) of the property owners. Therefore, the costs associated with the implementation and maintenance of the BMPs are more likely to be covered through the stormwater agency General Funds.

Action: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Finding 31 (page 10)*

10. FINDING 32 (PAGE 11 OF 130) – THE REGIONAL BOARD HAS NO LEGAL ABILITY TO DETERMINE WHETHER A PARTICULAR MANDATE IS UNFUNDED.

The Tentative Order finds that none of the requirements therein constitute an unfunded local mandate. This finding, however, should be stricken as the Regional Board has no legal ability to determine whether a particular mandate is unfunded. The Commission on State Mandates is the only State agency that has the jurisdiction and ability to make that determination.

The Fact Sheet's discussion of unfunded state mandates is not consistent with applicable legal authority or the Tentative Order, as discussed below.

Article XIII B, Section 6(a) of the California Constitution ("Section 6") provides that whenever "any state agency mandates a new program or higher level of service on any local government, the state shall provide a subvention of funds to reimburse that local government for the costs of the program or increased level of service . . . ." Section 6 applies to storm water permits issued by the State Board and the Regional Boards.[36] Thus, Section 6 applies to the Tentative Order.

[36] *County of Los Angeles v. Commission on State Mandates* (2007) 150 Cal.App.4th 898, 920.

Section 6 was added to the California Constitution by voter approval in 1979, as part of a larger effort that had as its goal both limiting state and local spending and restricting the ability of local entities to raise revenue. Section 6 must be viewed as a "safety valve" designed to protect local governments from being placed in the untenable position of being required by the state, on the one hand, to implement certain state mandated programs while also, on the other hand, being prohibited from raising the money needed to pay for those state mandated programs.[37] Recognizing that such a situation was neither a fair nor a wise approach to governing, the voters enacted Section 6 to prevent state government from shifting financial responsibility for carrying out governmental functions to local agencies without the state paying for them.

To implement Section 6, the Legislature created the Commission on State Mandates ("Commission"). The Commission has sole and exclusive jurisdiction to determine whether a state law or order of a state agency is an unfunded state mandate.[38] In accordance with Section 6, Government Code section 17500 et seq., and case law, the Commission on State Mandates has determined that an unfunded state mandate exists when: (a) the state imposes a new program or higher level of service that is; (b) mandated by state law, not federal law; and (c) when the local government lacks adequate fee authority to pay for the new program or higher level of service.

Whether and how individual stormwater permit conditions constitute unfunded state mandates is currently the subject of pending litigation. In 2009 and 2010, the Commission on State Mandates determined that parts of the Los Angeles Phase I Permit and major components of the San Diego Phase I Permit constituted unfunded state mandates. The State challenged these two decisions in court, and, in the San Diego matter, the court confirmed that only the Commission on State Mandates could make the ultimate determination of whether a permit condition constituted an unfunded state mandate. Specifically, the court in the San Diego case held that the "Commission has exclusive authority to determine whether the Regional Board has imposed a state mandate." The court in the San Diego case further concluded that the Commission on State Mandates should reconsider its decision to assess whether each of the individual permit conditions were required to achieve the MEP standard. Specifically, the court held that "the Commission must determine whether any of the permit conditions exceed the 'maximum extent practicable' standard." (Emphasis added.) Therefore, contrary to the discussion in the Fact Sheet, each permit condition (control) must be assessed to determine whether it is consistent with MEP.

This issue is currently being addressed by the California Supreme Court in *Department of Finance v. Commission on State Mandates*.[39]

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[37] *Department of Finance v. Commission on State Mandates* (2003) 30 Cal.4th 727, 735; *County of San Diego v. State of California* (1997) 15 Cal.4th 68, 81.

[38] Government Code §§ 17551 and 17552; *Kinlaw v. State of California* (1991) 54 Cal.3d 326, 331-334.

[39] (2013) 220 Cal.App.3th 740.

Action: Finding 32 should be deleted. Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Finding 32 (page 11)*

PERMIT PROVISIONS

GENERAL

11. THE TENTATIVE ORDER INCLUDES LANGUAGE THAT PROVIDES AN OVERLY BROAD INTERPRETATION OF THE STORMWATER REGULATIONS BY REQUIRING MS4S TO "ENHANCE" AND/OR "RESTORE" BENEFICIAL USES OR HABITAT.

The Tentative Order recognizes that the overarching objective of the CWA is "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters" and that, in order to carry out this objective, the CWA utilizes a number permitting programs and regulatory tools to regulate the discharge of pollutants and other materials to Waters of the United States (Waters of the U.S.).

However, CWA section 402(p), that section which governs that permitting for municipal and industrial stormwater discharges, is only one regulatory tool within the CWA. Moreover, it requires the MS4s to focus on the quality and impact of their non-stormwater and stormwater discharges, not on the active enhancement and/or restoration of beneficial uses or habitat.

While the Fact Sheet recognizes that the development and implementation of a WQIP will identify the highest priority water quality conditions and that "addressing these threats and/or adverse impacts should restore the physical, chemical, and biological integrity of receiving waters, and result in the restoration and protection of the beneficial uses of the receiving waters in the Watershed Management Area,"[40] the Tentative Order should not explicitly require the enhancement or restoration of beneficial uses as the CWA only requires that the Copermittees protect beneficial uses and prevent nuisance.[41]

This is important from a prioritization and resource allocation perspective because while the Copermittees must control the discharge of pollutants in order to, ultimately, protect the beneficial uses of the receiving waters, they are not required to actively "enhance" or "restore" the beneficial uses and habitat of the receiving waters. It must be recognized that the actions and resources necessary to "protect" the beneficial uses may, in fact, be different than those that would be required to "enhance" or "restore" the beneficial uses of a particular receiving water.

Action: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Provisions, B. Water Quality Improvement Plans (page 20)*
- *Provisions, E.5.e. Retrofitting and Rehabilitating Areas of Existing Development (page 115)*

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[40] Fact Sheet, Page F-45.

[41] 40 CFR 131.12()(1); CWC 13263(a) and 13050.

12. THE TENTATIVE ORDER INCLUDES LANGUAGE THAT PROVIDES AN OVERLY BROAD USE OF THE TERM "PROHIBIT."

Although some changes were made in the Tentative Order language, the Tentative Order should be reviewed for the correct use of the terminology "effectively prohibit" since it appears that there are a couple of cases where this language was not modified.

The term "prohibit" is broader than CWA requirements and should be changed to "effectively prohibit." CWA section 402(p)(3)(B)(ii) reads as follows:

> (B) Municipal Discharge – Permits for discharges from municipal storm sewers –
>
> (ii) shall include a requirement to effectively prohibit non-stormwater discharges into the storm sewer (Emphasis added)

The Tentative Order shall ensure the County "effectively prohibit non-stormwater discharges" but the Regional Board may exempt certain discharges that are not significant sources of pollutants from the prohibition. The section does not require a full prohibition but rather an effective prohibition. The operative word is "effective," which recognizes the constraints of owning and operating a stormwater drainage system that includes hundreds of miles of open channels. The finding/provision should note that non-stormwater discharges are effectively prohibited.[42]

In addition, discharges that are not significant sources of pollutants are exempted from the prohibition. In a practical sense, the use of word "effective" also provides flexibility to assess the impacts of relatively benign discharges such as air condition condensate, individual car washing, and non-emergency fire-fighting flows or non-anthropogenic sources before instituting a prohibition.

Action: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Provisions, E.1.a. Legal Authority Establishment and Enforcement (page 78)*

PROVISION A – PROHIBITIONS AND LIMITATIONS

13. PROVISION A (ENTIRE PROVISION; BEGINS PAGE 15 OF 130) – A CLEAR LINKAGE BETWEEN THE COMPLIANCE PROVISIONS AND PROHIBITIONS, RECEIVING WATER LIMITATIONS, AND EFFLUENT LIMITATIONS MUST BE ESTABLISHED.

Provision A.2.a states that "[d[ischarges from MS4s must not cause or contribute to the violation of water quality standards in any receiving water." Numerous comments submitted in the 2013 Permit adoption process demonstrated that complying with the receiving water limitations provision is not achievable everywhere, all the time, given the extensive urbanization of Orange County and the variable nature of pollutants. The Tentative Order, however, does not contain any linkage between the compliance provisions of the Permit and the prohibitions, receiving water limitations and effluent limitations. Provision A then can be construed as a standalone provision that holds the Copermittees strictly liable for any exceedance of a water quality standard determined by water quality

[42] CWA § 402(p)(3)(B)(ii).

monitoring results on an outfall-by-outfall basis.[43] Thus, the Copermittees are immediately out of compliance upon enrollment in the Permit.

Historically, this was not the case. MS4 permittees could maintain compliance by implementing the iterative process by diligently and rigorously implementing and increasing best management practices ("BMPs") in response to an exceedance.[44] This approach is not only consistent with prior State Board and Regional Board policy but in accordance with federal law that MS4s be governed by the MEP standard and are not required to adhere to strict numeric standards.[45] This policy allowed MS4s the ability to adjust their programs and utilize the iterative process to meet water quality standards.

The County requests that the Regional Board establish a compliance pathway that allows the County to comply with all numeric limitations consistent with a prior Tentative Order it issued.[46] This is not only consistent with federal law and prior state policy, but allows the Copermittees the true flexibility to design programs and use program funds effectively by prioritizing those funds for pollutants of concern. The iterative process allows Copermittees to implement innovative programs and projects with assurance that those diligent efforts in doing so are helping achieve compliance.[47]

In addition, compliance with Provisions A.1, A.2 and A.3 should be linked to Provision A.4, Provision B, and Attachment E so that it is clear that the compliance mechanism for A.4 is the WQIP (Provision B) and/or the TMDL (Attachment E), as applicable.

Action: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Provisions, A. Prohibitions and Limitations (page 15)*
- *Provisions, A.1. Discharge Prohibitions (page 15)*
- *Provisions, A.2. Receiving Water Limitations (page 16)*

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[43] *Natural Resources Defense Council, Inc. v. County of Los Angeles et al* (9th Cir. 2011), 673 F.3d 880, 883, rev'd on other grounds by *Los Angeles County Flood Control District v. Natural Resources Defense Council, Inc.* (2013) 133 S.Ct. 710.

[44] State Water Resources Control Board, WQ 2001-15 at 7 (Nov. 15, 2001). The State Water Board indicated that the precedential receiving water limitations language in WQ 1999-05 does not require strict compliance with water quality standards.

[45] *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159, 1165; *Divers Environmental Conservation Organization v. State Water Quality Resources Control Board* (2006) 145 Cal. App. 4th 246, 256; *Bldg. Indus. Ass'n v. State Water Quality Resources Control Board* (2004) 124 Cal. App. 4th 866, 889-90; Betsy Jennings, State Board Memorandum, *Definition of Maximum Extent Practicable* (1993).

[46] Draft Tentative Order, R9-2013-0001, § II.B.3.c (March 29, 2013).

[47] A permit that does not contain a compliance pathway is impossible to comply with and is not in accordance with federal and state law. *Atlantic States Legal Fdn., Inc. v Eastman Kodak Co.* (2nd Cir, 1994) 12 F.3d 353, 357; *Hughey v. JMS Development Corp.* (11th Cir. 1996) 78 F.3d 1523, 1530.

14. PROVISION A (ENTIRE PROVISION; BEGINS PAGE 13 OF 130) – THE DISCHARGE PROHIBITIONS MUST ESTABLISH A LINKAGE WITH THE APPROVED COMPLIANCE SCHEDULES FOR TMDLS THAT HAVE BEEN INCORPORATED INTO THE BASIN PLAN.

The Discharge Prohibitions do not establish a sufficient linkage with approved compliance schedules for TMDLs that have been incorporated into the Basin Plan. TMDLs adopted within the region include a schedule to provide MS4 Copermittees the time necessary to develop and implement a plan to achieve water quality standards in impaired waters. The compliance schedules for adopted TMDLs have been incorporated into Attachment E and language is recommended in the Receiving Water Limitations provisions (A.2.c.) and the Effluent Limitations provisions (A.3.b.) pointing to the TMDL compliance schedules.

The Receiving Water Limitations language in the Tentative Order conflicts with TMDL compliance schedules. Language should be included to clarify that in instances where a TMDL is in effect, the Copermittees shall achieve compliance with these provisions as outlined in Attachment E (Specific provisions for TMDLs). Without this change, the Receiving Water Limitations language puts Copermittees in immediate and ongoing non-compliance with the permit, as opposed to incorporating TMDL implementation schedules.

In addition, the footnote to A.2.a.(4)(b) requires Copermittees to not cause or contribute to the more stringent of a water quality objective or a CTR criterion. Instances may exist where it has been determined that one or the other is more appropriate given site specific conditions or analysis (i.e., a TMDL has been established).

Action: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Provisions, A.1. Discharge Prohibitions (page 15)*
- *Provisions, A.2.a. Receiving Water Limitations (page 16)*
- *Provisions, A.2.c. Receiving Water Limitations (page 17)*
- *Footnote #5 to Provision A.2.a(4)(b) (page 17)*

15. PROVISION A (ENTIRE PROVISION; BEGINS PAGE 18 OF 130) – THE RECEIVING WATER LIMITATIONS LANGUAGE IS DISCRETIONARY AND SHOULD BE REVISED TO PROVIDE A CLEAR COMPLIANCE MECHANISM.

WQIPs provide flexibility with a BMP-based compliance approach for the Discharge Prohibitions and Receiving Water Limitations. The language in the Provision A.4 describes the WQIPs as a document trail rather than a compliance mechanism. In essence, the language suggests that Copermittees shall expend significant resources to develop and implement WQIPs, but taking the actions in the WQIPs has no effect on the Regional Board's compliance determination.

The Receiving Water Limitations language should be revised to expressly state that if exceedances of a water quality objective, water quality standard or any effluent limitation persist, or a discharge prohibition stated as an effluent limitation is not complied with, notwithstanding implementation of control measures, BMPs or compliance with the other water quality control program requirements of the Order, the Copermittee shall take actions to further reduce its discharges of such pollutants over time by complying with the iterative

process, and that diligent implementation of the iterative process (i.e., WQIP) constitutes compliance to MEP.

The iterative process is a fundamental aspect of MS4 programs, as envisioned by State Water Board Order 99-05 and later reconfirmed in Order WQ 2001-15 (BIA Order), and is the mechanism by which MS4 Copermittees should demonstrate compliance. The WQIPs now provide a mechanism to provide the detail and quantitative analyses used to identify pollutant sources and implement BMPs to address those sources.

Language in Provision A.4 should be consistent with the California Stormwater Quality Association (CASQA) proposed receiving water limitation language (see **Attachment B**).

Action: Incorporate the specific modifications to Provision A.4, which are provided in Attachment B.

PROVISION B – WATER QUALITY IMPROVEMENT PLANS

16. PROVISION B (ENTIRE PROVISION; BEGINS PAGE 20 OF 130) – THE WATER QUALITY IMPROVEMENT PLANS SHOULD BE THE FOUNDATION FOR A BMP-BASED COMPLIANCE APPROACH.

The Clean Water Act does not require MS4 permits to include watershed planning provisions.[48] Neither does Porter Cologne.[49] The Watershed Improvement Act of 2009 allows, but does not require, MS4 permittees to develop a watershed improvement plan. The County supports a voluntary watershed-based approach that has compliance linkage between the WQIPs in Provision II.b and the receiving water limitations in Provision II.A. This linkage would provide the Copermittees the opportunity to comply with the Permit while allowing for choice.[50] A watershed-based approach is ideal for the implementation of stormwater programs as it allows for the integration of all program elements, focuses efforts on the highest priorities for each watershed through the customization of actions and strategies, and allows for streamlined reporting. This approach also supports the implementation of TMDLs, which are developed and implemented at the watershed scale.

Although the language for the WQIP recognizes the need for the consideration of provisions A.1, A.2, and A.3 as a part of the assessments and identification of water quality priorities, consistent with the intent described in the Fact Sheet, the language within the Tentative Order should explicitly identify that compliance with those provisions is achieved through the development and implementation of the WQIPs and or TMDLs (Attachment E).

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[48] 33 U.S.C. § 1342(p); 40 C.F.R. § 122.26.

[49] Water Code § 1610(e).

[50] Under the Tenth Amendment of the U.S. Constitution, a state or local government must retain the ultimate decision as to implement a federal regulatory program. The Regional Board has found that each and every requirement in the Permit is federally mandated under the CWA. Permit at F-29-30. The Copermittees disagree with this finding. In this case, involuntary WQIP and JURMP requirements in addition to the de facto effluent limitations established due to the lack of a compliance pathway do not allow for regulatory choice. *Printz v. United States* (1997) 521 U.S. 898, 925; *Environmental Defense Ctr., Inc. v EPA* (2003) (2003) 344 F.3d 832, 847; *City of Abilene v. EPA* (2003) 325 F.3d 657, 662.; *New York v. United States* (1997) 505 U.S. 144, 168, 176.

In particular, the Fact Sheet states:[51]

> *Provision B includes requirements for the Copermittees to develop and implement Water Quality Improvement Plans to ultimately comply with the prohibitions and limitations under Provision A*. The Water Quality Improvement Plans will provide the Copermittees a comprehensive program that can achieve the requirements of the CWA. Implementation of the Water Quality Improvement Plans will also improve the quality of the receiving waters in the San Diego Region…..
>
> The Water Quality Improvement Plan also incorporates a program to monitor and assess the progress of the Copermittees' jurisdictional runoff management programs toward improving the quality of discharges from the MS4s, as well as tracking improvements to the quality of receiving waters. *A process to adapt and improve the effectiveness of the Water Quality Improvement Plans has also been incorporated into the requirements of Provision B to be consistent with the "iterative approach" required to achieve compliance with discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a, pursuant to the requirements of Provision A.4.*
>
> [Emphasis added]

In other words, the Water Quality Improvement Plan framework, as outlined within the Tentative Order, is established as the compliance mechanism for Provision A.4. In fact, this would complement the existing language in Provision A.4, which states (as modified below):

> Each Copermittee must achieve compliance with Provisions <u>A.1, A.2, and A.3</u> of this Order through timely implementation of control measures and other actions as specified in Provisions B and E of this Order, including any modifications. The Water Quality Improvement Plans required under Provision B must be designed and adapted to ultimately achieve compliance with Provisions <u>A.1, A2, and A.3</u>.

In addition, the WQIP should identify the high priority water quality issues and conditions and provide direction for the development and implementation of the JRMPs. The goals for the WQIPs should be clearly identified and directly linked to the JURMPs (and the corresponding flexibility provided within the development of the JURMPs) (See also Provision E).

Lastly, although Regional Water Board staff have indicated that the WQIPs, once developed and approved, will functionally replace the CLRPs and BLRPs, the Tentative Order does not formally recognize this. The County recommends that a footnote be added to clarify that this is the case.

<u>Action</u>: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Provisions, B Water Quality Improvement Plans (page 20)*

17. PROVISION B (ENTIRE PROVISION; BEGINS PAGE 20 OF 130) – THE WQIP NUMERIC GOALS ARE USED TO SUPPORT THE WQIP IMPLEMENTATION AND MEASURE PROGRESS, THEY ARE NOT ENFORCEABLE COMPLIANCE STANDARDS.

[51] Fact Sheet, Page F-42.

Similar to the footnotes in Provisions C.1.a and C.2.a, Provision B.2.e should explicitly state that the action levels, interim goals and final goals are not enforceable limitations.

Action: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Provisions, B.3.a.(1), Water Quality Improvement Goals and Schedules (page 26)*

PROVISION C – ACTION LEVELS

18. PROVISION C (ENTIRE PROVISION; BEGINS PAGE 36 OF 130) – THE TENTATIVE ORDER SHOULD ENABLE THE COPERMITTEES TO APPLY NALS/SALS THAT BASED ON THE PRIORITIES OF THE WQIP AND/OR THE IDDE PROGRAM.

Although the Tentative Order states that the Copermittees are to develop and incorporate numeric non-stormwater and numeric stormwater action levels into the Water Quality Improvement Plans (C.1 and C.2, respectively), the Tentative Order appears to contradict this approach by mandating that the Copermittees include all of the numeric actions levels as identified in tables C-1, C-2, C-3, C-4 and C-5.

The mandated action levels are problematic for the following reasons:

1) The NALs for the WQIPs will likely include different constituents and/or values than those values that would be used for the IDDE program.
2) The NALs and SALs will likely include different constituents and/or values between WQIPs depending upon the identified high priority water quality conditions.
3) In Provision B.3 the Copermittees are required to develop and use interim and final numeric goals to measure progress towards the protection of the receiving waters and beneficial uses. The choice of the numeric goals for the watershed may be biological, chemical, or physical based and may include multiple criteria and/or indicators. If the mandated values in Provision C have to be used as action levels within the WQIP, this takes away the flexibility that is should be afforded to the Copermittees. In addition, the NALs may not correspond to the highest priority water quality conditions or the metrics that should be used to measure progress. Thus, the NALs/SALs may direct resources away from the watershed priorities.
4) Source investigations must be focused on the highest priority outfalls, based on the data collected, that are most likely linked to illicit discharges.

It must also be noted that the State's own Blue Ribbon Panel, which was convened specifically to examine the feasibility of incorporating numeric effluent limits in stormwater permits, ultimately concluded that numeric limits were generally infeasible across all three stormwater activities, with few exceptions. However, the Panel did agree that "upset values" or "action levels" could be established to assist Copermittees in identifying "bad actor" catchments which are clearly above the normal observed variability.

The Copermittees had previously developed and implemented an innovative Dry Weather Reconnaissance Program, based upon statistically derived benchmarks to identify illegal discharges and illicit connections during the typically dry summer months of May through

September using a suite of water quality analytes monitored in the field at designated random and targeted drains. A comparison of the probability of an exceedance using the statistical tolerance interval-based approach compared to the NAL-based approach shows that the NALs-based approach can misdirect resources since investigations are triggered at a much higher frequency for many constituents (**Table 1**.).

Table 1. Comparison of 2011-2012 NALs Data Collected in the San Diego Region with the Data from the Dry Weather Reconnaissance Monitoring Program for the 2009-2010 Reporting Period

	NAL Exceedances 2011-2012		Dry Weather Program Action Level Exceedances 2009-2010	
Constituent	**Number**	**%**	**Number**	**%**
pH	1	2	0	0
TDS	42	93	0	0
Dissolved Oxygen	2	4	0	0
Turbidity	3	7	3	1
Surfactants	3	7	14	5
Total Coliform	24	53	0	0
Fecal Coliform	19	42	0	0
Enterococcus	42	93	0	0
Unionized Ammonia	3	7	8	3
Total N / Nitrate	41	91	0	0
Total P / Ortho PO4	38	84	11	4
Cadmium	13	28	0	0
Copper	1	2	0	0
Nickel	7	15	0	0
Zinc	1	2	0	0
Total # of Site Visits	**45**		**274**	

The Dry Weather Reconnaissance Program was specifically designed to detect "abnormal" results that are indicative of illicit discharges, typically short term, transient, non-stormwater discharges. Consequently, the Copermittees perform many more site visits but initiate fewer investigations, as they are able to discern between discharges that are most likely to be illicit and those that are not. In contrast, the NAL-based program is designed to compare urban runoff from an outfall to a water quality objective that has been established

for a receiving water. As demonstrated in the ROWD, aquatic chemistry in many parts of south Orange County results trigger exceedances of the NALs the majority of the time, which does not allow the Copermittees to differentiate between typical site conditions and true illicit discharges.

The Copermittees have monitored water quality for several years and found that naturally derived pollutants in surface waters can often exceed water quality criteria both in undeveloped catchments as well as in developed watersheds. In recent years, efforts led by the County to characterize natural sources related to ambient geology have demonstrated that natural sources in specific areas are the primary contributor for many constituents of concern such as cadmium, nickel, total dissolved solids, chloride, and sulfate. The concentration ranges measured from the natural sources are shown in the table below.

Constituent	**Concentration Range**	**Water Quality Criterion**
Arsenic	<1 - 53 ppb	36 ppb[2]
Cadmium	<1 - 200 ppb	7.3 ppb[2]
Copper	1.2 - 23 ppb	18 ppb[2]
Nickel	6.4 - 1300 ppb	169 ppb[2]
Selenium	<1 - 220 ppb	5.0 ppb[2]
Zinc	<1 - 1800 ppb	379 ppb[2]
Chloride	470 - 2400 ppm	250 ppb[1]
Sulfate	1200 - 11000 ppm	250 ppb[1]
Total Dissolved Solids	3700 - 22000 ppm	500 ppb[1]
Total Nitrogen as N	<0.1 - 38 ppm	1.0 ppb[1]

1) Basin Plan Water Quality Objective
2) California Toxics Rule, Criterion Continuous Concentration at hardness of 400 mg/L

The County is currently collaborating with the University of Southern California ("USC") to develop a modeling approach that could "fingerprint" water sources based on isotopic composition. This work will provide a much better understanding about natural and anthropogenic sources of water and contaminants to streams in south Orange County. It is key information since the Copermittees have found strong positive linear relationships between levels of metals associated with runoff and groundwater seepage from the Monterey and Capistrano marine sedimentary formations. Until this work is completed, the Copermittees will be unable to discriminate between instances of illicit discharges and conditions that are essentially artifacts of a constructed storm drain system and/or the local geology.

The conclusions from the implementation of the Orange County NAL-based program to date are:

- The NAL program replaced a previously existing and effective program (the Dry Weather Reconnaissance program);

- The Dry Weather Reconnaissance Program resulted in focused source investigations for key constituents indicative of illicit discharges;
- The NAL program has required increased resources and has resulted in everything being a priority (thus, nothing is a priority). In addition, the NAL-based triggers have, in many cases been the result of constituents attributable to natural sources within the watersheds;
- There have been many exceedances that have been due to non-IDDE factors such as local geology (especially for nickel and cadmium);
- It has been very difficult to determine the endpoints, the sources, of the various non-stormwater discharges since the discharges are so commingled; and
- There is a strong need for a regionally-based prioritization, so that there is not a mis-direction of limited resources.

Regional Board staff needs to evaluate the results of the Orange County program to date and consider the proposed revisions in order to assist with the prioritization of resources and water quality issues. As proposed, the NAL program lacks substantial evidence by which to justify If the Copermittees are required to continue to use the NAL-based program, they will lose the ability to prioritize the water quality issues and discriminate between true instances of IDDE and ambient urban conditions in a storm drain systems draining landscapes underlain by marine sedimentary formations containing phosphorous and a number of metals.

The Copermittees recommend the following in order to address these issues.

- Modify the NALs (Provision C.1) language to recognize that, for the purposes of the IDDE program, the Copermittees should be allowed to develop and/or use previously established NALs, especially if they are shown to be more effective at identifying "true" upset values and allow for a prioritization of resources.
- The mandated NALs should only be considered "default" values if the Copermittees do not develop their own NALs or use previously established values.

Action: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Provisions, B.3.a.(1), Water Quality Improvement Goals and Schedules (page 26)*
- *Provisions, C. Action Levels (page 36-43)*

PROVISION D – MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS

***19.* PROVISION D (ENTIRE PROVISION; BEGINS PAGE 47 OF 130) – THE COPERMITTEES NEED TO HAVE THE FLEXIBILITY TO DEVELOP OR USE ANALYTICAL MONITORING REQUIREMENTS IN THE WATER QUALITY IMPROVEMENT PLANS BASED ON ASSESSMENTS OF CURRENT SOURCES THAT MAY CONTRIBUTE TO THE SECTION 303(D) WATER BODY IMPAIRMENTS.**

The Regional Board should recognize the inherent difficulties associated with monitoring 303(d) constituents such as the legacy pesticides or the monitoring of aquatic toxicity. Many

existing developments were never subjected to the application of legacy pesticides such as DDT and, as such, these constituents are highly unlikely to be found in modern communities. The Regional Board should also recognize that laboratory toxicity tests provide a cumulative perspective of pollutant effects that may or may not be sampled as part of a monitoring program.

The Copermittees should be relieved of analytical monitoring requirements if supporting information can be provided to document the current pollutant concentrations or may provide historic information to support the absence of usage of these constituents in the MS4 drainage area. Additionally, the Copermittees should be allowed to develop an alternate approach for monitoring that allows the Copermittees to evaluate and identify the cause of toxicity currently affecting receiving waters and to iteratively adapt the monitoring program to address these chemical stressors in their MS4 outfall discharges through the WQIPs.

Action: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Provisions, D.2.a.(3)(e) Transitional Wet Weather MS4 Outfall Discharge Analytical Monitoring (page 65)*
- *Provisions, D.2.b.(2)(e) Non-Storm Water Persistent Flow MS4 Outfall Discharge Analytical Monitoring (page 69)*
- *Provisions, D.2.c.(5)(f) Wet Weather MS4 Outfall Discharge Analytical Monitoring (page 72)*
- *Provisions, D – Tables D-3 (page 51), D-6 (page 65), D-7 (page 70)*

PROVISION E – JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS

20. PROVISION E (ENTIRE PROVISION; BEGINS PAGE 79 OF 130) – THE JRMP PROVISIONS MUST BE MODIFIED SO AS NOT TO NEGATE THE VERY INTENT AND PURPOSE OF THE WATERSHED APPROACH AND THE FOCUS ON THE HIGHEST PRIORITIES WITHIN EACH WATERSHED MANAGEMENT AREA.

The Tentative Order states that the purpose of the WQIPs is to guide the Copermittees' jurisdictional runoff management programs towards achieving improved water quality by identifying the highest priority water quality conditions within a watershed and implementing strategies through the jurisdictional runoff management programs (Provision B).

Provision E goes on to state that the jurisdictional runoff management programs will be implemented in accordance with the strategies identified in the WQIPs. In addition, the Fact Sheet states:

> "Where the Water Quality Improvement Plan is the '*comprehensive planning process*' on a Watershed Management Area scale, requiring '*intergovernmental coordination*', the jurisdictional runoff management program document is the '*comprehensive planning process*' on a jurisdictional scale that should be coordinated with the other

> Copermittees in the Watershed Management Area to achieve the goals of the Water Quality Improvement Plan."[52]

The Fact Sheet also states:

> "Based on the economic considerations below, the San Diego Water Board has provided the Copermittees a significant amount of flexibility to choose how to implement the requirements of the Order. This Order also allows the Copermittees to customize their plans, programs, and monitoring requirements. In the end, it is up to the Copermittees to determine the effective BMPs and measures necessary to comply with this Order. The Copermittees can choose to implement the least expensive measures that are effective in meeting the requirements of this Order."[53]

Although the Fact Sheet states that "Implementation of the components of each Copermittee's jurisdictional runoff management program must be consistent with the water quality improvement strategies identified within the Water Quality Improvement Plan,"[54] the Tentative Order requires the Copermittees to incorporate <u>all</u> of the requirements identified within Provision E regardless of the high priority water quality conditions that have been identified within the WQIP. If the Copermittees are required to implement <u>all</u> of the requirements in Provision E instead of prioritizing and implementing those requirements that directly address the highest priority water quality conditions and support watershed strategies, then the program is not prioritized and focused and does not allow Copermittee discretion to tailor its WQIP. The approach in Provision E then negates the prioritized and strategic approach outlined in Provision B.

The Tentative Order should provide a clear linkage between Provision B and Provision E and state that the WQIP should guide the customization of the JRMP to meet the highest water quality priorities and strategies in a given watershed.

(See also the corresponding comments under Provision E.2, E.3. E.4, E.5, and E.7)

<u>Action</u>: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Provisions, E. Jurisdictional Runoff Management Programs (page 79)*

PROVISION E.1 - LEGAL AUTHORITY ESTABLISHMENT AND ENFORCEMENT

21. PROVISION E.1 (PAGE 79 OF 130) – THE COPERMITTEES ARE ONLY RESPONSIBLE FOR ADMINISTERING AND ENFORCING THE CODES AND ORDINANCES APPLICABLE TO THEIR JURISDICTIONS.

Provision E.1.a(2) requires the Copermittees to establish the legal authority to control the contribution of pollutants in discharges of runoff associated with industrial and construction activity within their jurisdictions. Since the Copermittees can only administer and enforce their local codes and ordinances, it is unnecessary to include the language

[52] Fact Sheet, Page F-71.

[53] Fact Sheet, Page F-17.

[54] Fact Sheet, Page F-71.

regarding the Statewide Industrial and Construction General Permits. The sites subject to the Statewide Permits (which are administered and enforced by the State and Regional Boards) are already inspected by state staff and are included within the Copermittee inventories, inspection and enforcement programs.

In addition, language that acknowledges that local codes and ordinances will include the legal authorities identified within the Tentative Order to the extent permitted by the Constitution should be included.

Action: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Provisions, E.1.a.(2) Legal Authority Establishment and Enforcement (page 79)*
- *Provisions, E.1.a.(10) Legal Authority Establishment and Enforcement (page 80)*

22. PROVISION E (ENTIRE PROVISION; BEGINS PAGE 79 OF 130) – THE REQUIREMENT FOR THIRD PARTY BMP EFFECTIVENESS DOCUMENTATION IS DUPLICATIVE.

The Tentative Order includes a provision that requires the Copermittees to demonstrate that they have the legal authority to require documentation on the effectiveness of BMPs.

As it is currently written, this provision broadly applies to any aspect of the stormwater program where BMPs have been implemented – the result is that this provision sets up a process for the establishment of multiple third party monitoring programs and expenditure of significant public funds to monitor the effectiveness of BMPs. If the Regional Board's desire is to document the effectiveness of certain types of BMPs, it would be more effective and scientifically defensible to establish special studies by entities qualified to conduct such sampling instead of requiring potentially hundreds of third parties to conduct a monitoring program for every BMP that is implemented.

This provision is redundant with other requirements in the Tentative Order in that it ignores the fact that the New Development/Significant Redevelopment section of the Drainage Area Management Plan (DAMP) (Section 7.0) establishes a process for the selection, design, and long-term maintenance of permanent BMPs for new development and significant redevelopment projects and requires developers to select BMPs that have been demonstrated as effective for their project category.

This provision also ignores the fact that the Copermittees have already established legal authority for their development standards, so that project proponents have to incorporate and implement the required BMPs.

Action: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Provisions, E.1.a.(8) Legal Authority Establishment and Enforcement (page 80)*

PROVISION E.2 - ILLICIT DISCHARGE DETECTION AND ELIMINATION

23. PROVISION E.2 (PAGE 81 OF 130) – THE ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM PROVISIONS MUST BE MODIFIED SO AS NOT TO NEGATE THE VERY INTENT AND PURPOSE OF THE WATERSHED APPROACH AND THE FOCUS ON THE HIGHEST PRIORITIES WITHIN EACH WATERSHED MANAGEMENT AREA.

(See the corresponding comments under Provision E – Jurisdictional Runoff Management Programs)

Action: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Provisions, E.2 Illicit Discharge Detection and Elimination (page 81)*

24. PROVISION E.2 (PAGE 81 OF 130) – THE COPERMITTEES SHOULD BE ALLOWED THE FLEXIBILITY TO PRIORITIZE THEIR IDDE PROGRAM TO FOCUS ON THOSE NON-STORMWATER DISCHARGES THAT ARE LIKELY TO BE A SOURCE OF POLLUTANTS.

Provision E.2.a identifies several categories of discharges that are to be considered "non-stormwater discharges" (do not need to be addressed as an illicit discharge). The categories include the following:

- E.2.a.(1) and E.2.a.(2) - Those discharges which have coverage under a separate NPDES Permit;
- E.2.a.(3) - Those discharges which are recognized within the federal regulations as acceptable unless they are identified as a source of pollutants to the receiving waters;
- E.2.a.(4) - Those discharges that are addressed by a set of requirements/BMPs; and
- E.2.a.(5) - Firefighting related discharges that are addressed by a set of requirements/BMPs.

In comparison, 40 C.F.R § 122.26(d)(2)(iv)(B)(1) states that, as a part of an illicit discharge program, the Copermittees shall incorporate a series of items including the following:

> A description of a program, including inspections, to implement and enforce an ordinance, orders or similar means to prevent illicit discharges to the municipal separate storm sewer system; this program description shall address all types of illicit discharges, <u>however the following category of non-storm water discharges or flows shall be addressed where such discharges are identified by the municipality as sources of pollutants to waters of the United States</u>: [Emphasis added and items re-ordered based on Tentative Order (TO) structure]
>
> - landscape irrigation, [not included in TO]
> - irrigation water, [not included in TO]
> - lawn watering, [not included in TO]
> - street wash water [not included in TO]
> - *uncontaminated pumped ground water, [E.2.a.(1)]*
> - *foundation drains, [E.2.a.(3)]; [E.2.a.(1)]*
> - *water from crawl space pumps, [E.2.a.(1)]*
> - *footing drains, [E.2.a.(3)]; [E.2.a.(1)]*
> - water line flushing, [E.2.a.(2)]
> - diverted stream flows, [E.2.a.(3)]

- rising ground waters, [E.2.a.(3)]
- springs, [E.2.a.(3)]
- uncontaminated ground water infiltration (as defined at 40 CFR 35.2005(20)) to separate storm sewers, [E.2.a.(3)]
- flows from riparian habitats and wetlands, [E.2.a.(3)]
- discharges from potable water sources, [E.2.a.(3)]
- air conditioning condensation, [E.2.a.(4)]
- individual residential car washing, [E.2.a.(4)]
- dechlorinated swimming pool discharges, and [E.2.a.(4)]

(program descriptions shall address discharges or flows from firefighting [E.2.a.(5)] only where such discharges or flows are identified as significant sources of pollutants to waters of the United States);

Although the discharges listed within the Federal Regulations are generally considered to be conditionally exempt from the illicit discharge program (unless they are found to be sources of pollutants), the Regional Board has determined that the following categories of non-stormwater discharges

- uncontaminated pumped ground water [E.2.a.(1)]
- foundation drains [E.2.a.(3)]; [E.2.a.(1)]
- water from crawl space pumps [E.2.a.(1)]
- footing drains [E.2.a.(3)]; [E.2.a.(1)]

will be considered to be illicit discharges unless the discharge has coverage under the following two NPDES Permits (NPDES Permit No. CAG919001 (Order No. R9-2007-0034 and NPDES Permit No. CAG919002 (Order No. R9-2008-002)

The County would submit, however, that it is unnecessary to move these discharges (uncontaminated pumped groundwater, foundation drains, water from crawl space pumps, and footing drains) from the E.2.a.(3) category to the E.2.a.(1) category and require them to obtain coverage under one of these two permits for the following reasons:

- There is no technical basis or demonstrated water quality concern that justifies the need for these discharges to obtain coverage under these permits;
- The two permits are clearly defined for groundwater extraction activities where there is groundwater containing or potentially containing petroleum hydrocarbons, solvents, or other pollutants (in fact, one of the categories of discharges required to obtain coverage is '<u>uncontaminated</u> pumped groundwater');
- One of the permits is clearly defined for temporary discharges, not permanent discharges; and
- The categories of discharges are non-stormwater discharges that are generally not expected to be a source of pollutants to receiving waters.

Action: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Provisions, E.2 Illicit Discharge Detection and Elimination (page 81)*
- *Provisions, E.2a.(1) Illicit Discharge Detection and Elimination (page 81)*
- *Provisions, E.2a.(3) Illicit Discharge Detection and Elimination (page 82)*
- *Provisions, E.2a.(4) Illicit Discharge Detection and Elimination (page 82)*

25. PROVISION E.2.A.(5) (PAGE 83 OF 130) – THE FIRE FIGHTING BMP PROVISIONS SHOULD REFLECT THE LANGUAGE INCLUDED IN THE CURRENT ORANGE COUNTY PERMIT.

Provision E.2.a includes a requirement for the Copermittees to establish BMPs for both emergency and non-emergency firefighting activities. While the Copermittees already have established guidelines for non-emergency firefighting activities, it is unclear why the approach and language in the Tentative Order regarding the emergency firefighting activities has been modified from Order R9-2009-0002. In fact, the language in the Tentative Order is actually inconsistent with the Phase I Final Rule (55 FR 48037), which states:

> "In the case of firefighting it is not the intention of these rules to prohibit in any circumstances the protection of life and public and private property through the use of water or other fire retardants that flow into separate storm sewers." [Emphasis added]

Thus, there should not be a circumstance in which the Copermittees or the Regional Board would identify emergency firefighting discharges as illicit discharges or a significant source of pollutants to receiving waters. The language previously adopted by the Regional Board in Order R9-2009-0002 regarding emergency firefighting discharges is recommended.

Action: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Provisions, E.2.a.(5) Non-Storm Water Discharges (page 83)*

26. PROVISION E (ENTIRE PROVISION; BEGINS PAGE 81 OF 130) – THE TENTATIVE ORDER SHOULD NOT REQUIRE THE REDUCTION OR ELIMINATION OF ALL NON-STORMWATER DISCHARGES AS A PART OF THE IDDE PROGRAM .

Federal regulations include two provisions designed implement the "effective prohibition"[55] of Clean Water Act Section 402(p)(3)(B)(ii)

- The first provision requires Copermittees to perform a screening analysis, intended to provide sufficient information to develop priorities for a program to detect and remove illicit discharges.[56]

[55] 55 Fed. Reg. 47989, 48037.

[56] 40 CFR § 122.26(d)(1)(iv)(D).

- The second provision requires Copermittees to develop a recommended site-specific management plan to detect and remove illicit discharges (or ensure they are covered by an NPDES permit) and to control improper disposal to MS4s.[57]

Therefore, Provision E.2.a(7) misapplies the federal regulations that require the Copermittees to identify the non-stormwater discharge as an illicit discharge prior to having an obligation to effectively prohibit it. There is not a presumption to reduce or eliminate it otherwise.

Action: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Provisions, A.1. Discharge Prohibitions (page 20)*
- *Provisions, E.1. Legal Authority Establishment and Enforcement (page 79)*
- *Provisions, E.2. Illicit Discharge Detection and Elimination (page 81)*

PROVISION E.3 – DEVELOPMENT PLANNING

The Tentative Order's land development requirements are some of the most challenging requirements in the Tentative Order. Indeed, a number of the land development requirements, particularly hydromodification controls, potentially pose federal constitutional issues as well as conflict with the CWA, the State Administrative Procedure Act, California Environmental Quality Act (CEQA), the Mitigation Fee Act and federal court decisions.

The following discussion examines the overarching legal concerns with the land development requirements, and is followed by specific technical analyses for individual requirements.

a. Land Development Requirements Expose the Copermittees to Significant Litigation Risk And Will Be Largely Unenforceable.

Many of the land development requirements, such as hydromodification, pose constitutional issues either exposing municipalities to litigation and/or will result in municipalities being unable and unwilling to implement such requirements. Specifically, but not limited to, Orange County is most concerned with the provisions: 1) ultimately requiring Copermittees to compel development projects that have no impact on hydromodification to implement on-site or alternative compliance hydromodification mitigation measures, 2) using pre-development (naturally occurring) runoff reference condition as applied to sites that are, in fact, developed, and 3) ***STREAM***, channel and habitat restoration.

The Copermittees are concerned that implementing these requirements has the potential to subject the Copermittees to liability under the Takings Clauses of the U.S. and California Constitutions and violate the Mitigation Fee Act because of the questionable nexus between a project's impacts on hydromodification and the hydromodification management measures in the Tentative Order. When imposing a condition on a development permit, a local government is required to establish that the condition bears a reasonable relationship to the impacts of the project. This rule applies evenly to legislatively enacted requirements and

[57] 40 CFR §§ 122.26(d)(1)(iv)(D) and 122.26(d)(2)(B).

impact fees or exactions.[58] Moreover, fees imposed on a discretionary ad-hoc basis are subject to heightened scrutiny under a two-part test. First, local governments must show that there is a substantial relationship between the burden created by the impact of development and any fee or exaction.[59] Second, a project's impacts must bear a rough proportionality to any development fee or exaction.[60] Under California law and a recent U.S. Supreme Court opinion, the *Nollan/Dolan* heightened scrutiny test also applies to in-lieu fees.[61]

The Legislature has memorialized these requirements in the Mitigation Fee Act, which establishes procedures that local governments must follow to impose impact fees.[62] Irrespective of whether the hydromodification management requirements are implemented by legislative act or on an ad-hoc basis, the Copermittees attempt to enforce them as proposed in the Tentative Order will likely result in claims alleging unconstitutional takings of private property and violations of the Mitigation Fee Act. This is because a developer could argue that limiting hydromodification impacts of already developed property to its naturally occurring state, or requiring hydromodification mitigation measures for impacts not imposed by the project, would not have a legally sufficient nexus to the impact of the development project.

Additionally, CEQA does not allow a local government discretionary approval to require over-mitigation of a project. The CEQA Guidelines provide that "a lead agency for a project has the authority to require feasible changes in any or all activities involved in the project in order to substantially lessen or avoid significant effects on the environment, consistent with applicable constitutional requirements such as the 'nexus' and 'rough proportionality' standards established by case law."[63] Thus, Copermittees would most assuredly be exposed to CEQA challenges, which are the most prevalent lawsuits against projects.

In all likelihood, municipalities will not risk constitutional challenges and the high litigation costs of such challenges, but will instead exempt projects from certain requirements or limit their applicability based on documented technical and legal reasons. Such actions then would only be addressed through a Regional Board audit years after a project has been approved and developed. Therefore, predevelopment runoff reference conditions and stream, channel and habitat restoration requirements should be eliminated in their entirety.

b. Stream, Channel and Habitat Restoration Cannot Be Required Due to Conflicts with Federal and State Laws.

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[58] *Building Ass'n Industry v. City of Patterson*, 171 Cal. App. 4th 886, 898 (2009).

[59] *Nollan v. Calif. Coastal Comm'n*, 483 U.S. 825, 837 (1987).

[60] *Dolan v. City of Tigard*, 512 U.S. 374, 391 (1994).

[61] *Ehrlich v. City of Culver City*, 12 Cal. 4th 854, 876 (1996).

[62] Gov't Code §§ 66000-66025.

[63] Cal. Code Regs. Tit. 14, § 15041 (citing *Nollan/Dolan*).

The Tentative Order requires stream, channel and habitat restoration and/or retrofitting depending on certain land development projects. The prior analysis above discussed the litigation risk to which municipalities will be exposed. The following discussion focuses on the direct conflicts with federal and state laws that also prohibit such requirements.

The objective of the CWA is to restore and maintain the chemical, physical and biological integrity of the Nation's waters.[64] In carrying out this objective, Section 402(p) requires municipalities to reduce the discharge of pollutants from the MS4 to the MEP standard. The Tentative Order, however, goes well beyond the Congressional intent of the CWA to only address pollutants by requiring both Copermittees and the property owners to restore and/or retrofit streams, channels and habitat, with no technical evidence as to how this will reduce the discharge of pollutants to MEP or under what legal authority these requirements can be imposed.

Not only do such requirements go beyond MEP, but go beyond the scope of the CWA's focus on pollutant reduction. First, there is no evidence in the Order for how restoration requirements reduce pollutants from leaving the MS4. Second, in a recent decision in the Eastern District of Virginia, a federal court has held that the EPA has no authority under the Clean Water Act to regulate non-pollutants.[65] Restoration as described in the Tentative Order does not regulate pollutants directly, but requires costly over-mitigation by project proponents to do more than address pollutants by restoring streams, channels and habitat to a subjective, predevelopment standard. Essentially, the Tentative Order uses restoration as a surrogate for pollutants, and tries to unlawfully regulate the flow of water, not pollutants themselves.

Under state law, the Orange County Flood Control District has been delegated authority by the Legislature to construct flood control channels and infrastructure to protect life and property. Under this authority, the Orange County Flood Control District has exclusive authority to control the flow of water in these channels. Although the State and Regional Boards may have some ability to impose conditions that impact volumetric flows (which is now called into question by the VDOT case), this authority does not extend to NPDES permits.[66] Returning channels to natural conditions impinges on municipal flood control authority as removing concrete and performing other restoration efforts would alter the flow of water in those channels.

Engineered channels serve the public health and safety through flood control protection. A significant portion of Orange County lies in a flood plain whereby property owners are required to carry flood insurance. Concrete channels are used to better control the flow of water and minimize flooding and reduce insurance premiums. State courts have long recognized that residents living near flood control improvements have a right to rely on the

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[64] CWA § 101(a).

[65] *Virginia Dept. of Transportation v. EPA*, No. 1:12-CV-775, slip op. (E.D. Va. Jan. 3, 2013) ("VDOT").

[66] *S.D. Warren Co. v. Me. Bd. of Envtl. Prot.*, 547 U.S. 370 (2006); *PUD No.1 v. Washington Dep't of Ecology*, 511 U.S. 700 (1994).

current standards of a particular channel to protect against flooding.[67] Restoring a stream or channel to a natural state would not ensure against flooding as engineering is used to ensure that stormwater is controlled to certain patterns. Many developments are built up to flood control channels, and thus, restoration would expose residents to threats of flood, potential property damage and loss of life and expose municipalities to claims of inverse condemnation and other torts based on relied upon flood control protections by the public. Restoration in some cases would also require use of eminent domain authority, which the State cannot require municipalities to exercise.

27. PROVISION E.3 (PAGE 94 OF 130) – THE DEVELOPMENT PLANNING PROVISIONS MUST BE MODIFIED SO AS NOT TO NEGATE THE VERY INTENT AND PURPOSE OF THE WATERSHED APPROACH AND THE FOCUS ON THE HIGHEST PRIORITIES WITHIN EACH WATERSHED MANAGEMENT AREA.

See the corresponding comments under Provision E – Jurisdictional Runoff Management Programs.

Action: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Provisions, E.3. Development Planning (page 94)*

28. PROVISION E.3 (PAGE 98 OF 130) – PORTIONS OF REDEVELOPMENT PROJECTS THAT ALREADY HAVE WATER QUALITY TREATMENT BMPS SHOULD NOT BE SUBJECT TO THE NEW PDP REQUIREMENTS.

Some redevelopment projects already have portions of the project that were subject to previous permit PDP requirements. These portions of redevelopment that were subject to prior PDP requirements should not be subject to the new PDP requirements as these projects already have water quality treatment. Such an approach is consistent with the Los Angeles and Ventura MS4 permits.

Action: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Provisions, E.3.b.(2) Special Considerations for Redevelopment Projects (page 98)*

29. PROVISION E.3 (PAGE 98 OF 130) – THE REGIONAL PERMIT SHOULD INCLUDE A PRIORITY DEVELOPMENT PROJECT EXEMPTION FOR FLOOD CONTROL AND STREAM RESTORATION PROJECTS.

Exemptions should be added for flood control and stream restoration projects as these projects do not meet the intent of requiring treatment for land development projects as they are not a source of pollutants, and can actually be defined as mitigation projects.

Action: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Provisions, E.3.b.(3) Priority Development Project Exemptions (page 98)*

[67] *Arreola v. County of Monterey*, 99 Cal.App.4th 722 (2002).

30. PROVISION E.3 (PAGE 98 OF 130) – THE REGIONAL PERMIT SHOULD INCLUDE A PRIORITY DEVELOPMENT PROJECT EXEMPTION FOR EMERGENCY PUBLIC SAFETY PROJECTS WHERE A DELAY DUE TO A STANDARD STORMWATER MITIGATION PLAN (SSMP) WOULD COMPROMISE PUBLIC SAFETY, PUBLIC HEALTH AND/OR THE ENVIRONMENT.

An exemption should be added for emergency public safety projects where a delay due to a Standard Stormwater Mitigation Plan (SSMP) would compromise public safety, public health and/or the environment. In reality, emergency projects will be implemented immediately where public safety, public health and/or the environment is threatened. There will be no time for the development, processing and plan check and revisions of a SSMP prior to these projects. Emergency projects are provided exempt status in many other MS4 permits including the OC Santa Ana Region Permit (Order No. R8-2009-0030 – Section XII.B.2.j) and the Los Angeles County MS4 Permit (Order R4-2012-0175 – Section VI.D.7.b.ii.c.(i)).

Action: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Provisions, E.3.b.(3) Priority Development Project Exemptions (page 98)*

31. PROVISION E.3.C (PAGE 98 OF 130) – FLEXIBILITY SHOULD BE PROVIDED TO THE STRUCTURAL BMP PERFORMANCE STANDARDS IF WATERSHED-SPECIFIC PERFORMANCE STANDARDS ARE DEVELOPED IN THE WATER QUALITY IMPROVEMENT PLANS.

Utilizing the watershed approach, it is conceivable that the Water Quality Improvement Plans will identify an alternate performance standard than do the provisions in E.3.c. . To fully realize the watershed approach, the Copermittees should be given the opportunity to develop alternative BMP performance standards consistent with the goals and objectives developed in the Water Quality Improvement Plans.

Action: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Provisions, E.3.c Priority Development Project Structural BMP Performance Requirements (page 98)*

32. PROVISION E.3 (PAGE 98 OF 130) – TERMINOLOGY IS INCONSISTENT ESPECIALLY WITH THE USE OF LOW IMPACT DEVELOPMENT BMPS AND SHOULD BE MODIFIED.

Provision E.3.c. specifies the requirements for structural BMPs. Furthermore, Provision E.3.c.(1) introduces the concepts for onsite structural BMPs and LID BMPs. The County recommends that the Tentative Order be modified to provide more consistency in terminology. The County views LID as a strategy of BMPs that is used to mimic preproject water balance. (See Provision E.3.a(3)). There is also no single definition for LID BMPs that has gained widespread recognition. Although Attachment C includes a definition for LID BMPs, this definition is not widely accepted. LID is rather a concept (the Attachment C definition does adequately capture this concept) made up of various non-structural and structural BMPs. While the onsite BMP requirements should be defined (*e.g.*, retention of the 85% storm) the Tentative Order could be greatly simplified by avoiding multiple terms and uses. The County has provided suggested edits throughout the Development Planning provision to provide better consistency.

33. PROVISION E.3.C (PAGE 100 OF 130) – IF PROJECTS USE ALTERNATIVE COMPLIANCE CONVENTIONAL BMPS SHOULD NOT BE ALSO REQUIRED ONSITE.

Section E.3.c.(1)(c) requires that if projects use alternative compliance, conventional BMPs must also be implemented onsite. Although the Fact Sheet identifies that the intent of this provision is to reduce the pollutants onsite to the MEP there is not adequate technical justification for effectively requiring additional mitigation. This provision requires additional mitigation for projects, and in effect, requires double mitigation that goes well beyond the MEP standard. Providing mitigation offsite for the PDP requirements offsite in itself is adequate to meet the MEP standard.

Action: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Provisions, E.3.c.(1) Storm Water Pollutant Control BMP Requirements (page 100)*

34. PROVISION E (ENTIRE PROVISION; BEGINS PAGE 94 OF 130) – THE HYDROMODIFICATION MANAGEMENT REQUIREMENTS SHOULD BE BASED ON A WATERSHED MANAGEMENT APPROACH, BE CONSISTENT WITH THE WQIPS, AND CONSIDER THE CURRENT COPERMITTEE HMPS.

Hydromodification management should be based on the conditions of receiving waters and on the impacts and potential impacts from development projects. The basis to make hydromodification management decisions needs to be an understanding of the watershed and the receiving waters within a watershed. Understanding a watershed is achieved through watershed analysis and analysis of the susceptibility of the receiving waters to hydromodification impacts. This approach of watershed analysis is identified in the Southern California Coastal Water Research Project ("SCCWRP") Technical Report 667 – *Hydromodification Assessment and Management in California* **(Appendix A-2).** The SCCWRP report identifies that watershed analysis is the first step and most critical step in the development of watershed hydromodification management. The SCCWRP report concluded that hydromodification management is not a one size fits all approach, but needs to consider watershed analysis. This was also concluded by the authors of the SCCWRP report at the Hydromodification Management Meeting in August of 2012 and by State Board staff at the California Stormwater Quality Association (CASQA) General Meeting on January 10, 2012. The Tentative Order hydromodification requirements are, however, a one size fits all approach as the requirements do not allow consideration of watershed analysis or receiving water information.

The County believes the best way to implement the vision of the SCCWRP Report for development of effective hydromodification management is to develop clear hydromodification management objectives that are watershed specific and developed through a stakeholder process. The intent of the WQIPs is to improve water quality in the WMAs based on the highest priorities for water quality in the watershed. Unless more is known about the watersheds and their receiving waters, however, including their susceptibility to hydromodification, the appropriate standards and performance criteria cannot be identified. The WQIPs can build on the current Hydromodification Management Plans (HMPs) that have been developed and can use additional watershed and receiving waters information to develop appropriate watershed specific hydromodification standards

and where they should apply in a specific watershed. Instead of hydromodification requirements that do not consider specific watershed analysis and conditions of receiving waters and that were developed unilaterally by Regional Board staff, the County suggests that watershed specific requirements be developed as part of the WQIPs as part of a watershed stakeholder process.

Matching pre-development (naturally occurring) flow rates and duration is identified as the performance standard for hydromodification management. The purpose of the CWA does is not to restore waters to pre-Columbian (pre-development) conditions. Rather, the objective must be taken in context of section 402(p) and reflect the stormwater compliance standard to reduce pollutants to the maximum extent practicable. The hydromodification standard should reflect the developed urban environment. To do otherwise would negate the engineering efforts done to date to protect life and property from floods and create an impractical solution for municipalities. Furthermore, the current hydromodification standard as provided for in numerous municipal permits in California is to match post development with "pre-project" conditions. The current pre-development standard goes well beyond federal law with no technical justification and can only be adopted under state authority.

Hydromodification effects may also be caused from other sources that are not in the Copermittees' jurisdiction. Initial implementation of the pre-development (naturally occurring) hydromodification performance standard has identified that BMPs to comply with the standard are of significant size even for smaller projects. Implementing the hydromodification requirements can disturb a significant area of land, which has its own environmental impacts, including changing the natural hydrology. This is antithetical to the LID concept. This can also cause a decrease in open space, which is in conflict the Orange County General Plan requiring certain thresholds of open space for developments. For smaller redevelopment projects and other infill projects, it may not be technically or economically feasible to build these projects, and will be a lost opportunity to improve water quality through implementation of LID requirements.

In addition, identifying "naturally occurring" conditions for redevelopment sites is difficult and entirely subjective, as in most cases there are no historical records of the natural condition of the site, raising whether there is a technical question as to how far back a Copermittee goes historically in determining the proper predevelopment timeframe. In cases where natural conditions of a site are not known, the best approach is to use an undeveloped natural site in proximity to the re-development site as a reference site. The vegetative cover, soil type and slope will most affect the hydrology of a site and so approximating these conditions for a redevelopment site using a natural reference site where these parameters can be measured is a way to approximate the natural conditions of a redevelopment site. Locating a natural reference site in proximity to a redevelopment site is difficult, however, as the entire sub-watershed or watershed may be developed. Additionally the conditions of the natural reference site may be much different than the "naturally occurring" conditions of the redevelopment site as vegetative cover, soil type and slope may have been very different. Without historical records, there is no way of knowing the actual "naturally occurring" conditions of a redevelopment site. The subjectivity of the pre-development approach not only puts municipalities in a position to violate the U.S. and California Constitutions on unlawful takings, but it also conflicts with the Mitigation Fee

Act, CEQA and the State Administrative Procedure Act in that the Tentative Order does not contain an adequate record justifying the reasonableness of this standard.

The County is therefore suggesting an approach to hydromodification management that is not a one size fits all approach, is consistent with the watershed approach and the intent of the WQIPs, considers the current Copermittee HMPs, and provides an opportunity to develop watershed specific requirements as part of a watershed stakeholder process that have the best chance of improving water quality.

Action: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Provisions, E.3.c.(2) Hydromodification Management BMP Requirements (page 100)*

35. PROVISION E.3.C (PAGE 99 OF 130) – BIOFILTRATION BMPS SHOULD BE SIZED FOR THE DESIGN CAPTURE VOLUME AND IF USED FOR ALTERNATIVE COMPLIANCE CONVENTIONAL BMPS SHOULD NOT ALSO BE REQUIRED.

Section E.3.c.(3)(b)(i)[c] requires that if biofiltration is used as an alternative compliance method, the biofiltration BMP is required to be sized to 1.5 times the design capture volume. This is an increase from the prior Orange County permit. The Fact Sheet provides no technical justification for the 1.5 factor.

Studies based on work conducted within Orange County by Geosyntec Consultants provide information contrary to the unsupported inclusion of a 1.5 factor. The following documents are submitted for the record at Appendix A-3 & Appendix A-4.

Storage and Reuse Systems for Stormwater Management – Preliminary Cost and Performance Estimates for Residential Use in Irvine, CA, Eric Strecker (2009 presentation to Santa Ana Regional Board). Assessed the costs and modeled the performance of harvest and use retention BMPs and compared average annual total suspended solids (TSS) load removed and annual TSS concentrations with BMPs. In both scenarios presented, biofiltration provided superior TSS results to harvest and use.

The Water Report Issue #65: Stormwater Retention on Site, An Analysis of Feasibility and Desirability.[68] The paper identified significant limitations with all retention BMPs and states, "There needs to be a more technical vetting of "retain on site" and stormwater harvest and use before these approaches are made mandatory." The authors also caution that a "one size fits all" approach requiring retention may not be desirable and "in many cases would lead to undesirable results."

Based on the above information, the requirement to oversize biofiltration BMPs should be deleted from the Tentative Order. Biofiltration should be considered equivalent to other retention BMPs and should remain a full part of the LID toolbox without penalization.

Section E.3.c.(3)(b)(i)(d) requires that PDPs that use biofiltration as an alternative compliance option must also implement conventional BMPs. This provision requires additional mitigation for projects and in effect requires double mitigation when it is not needed. Biofiltration BMPs are more effective than conventional BMPs, and requiring both does not make technical sense . Furthermore the Fact Sheet provides no technical

[68] Eric Strecker and Aaron Poresky (2009).

justification for requiring conventional treatment in addition to biofiltration and this is not the standard in the current Orange County and Riverside permits or any other permits in California.

Action: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Provisions, E.3.c.(1) Storm Water Pollutant Control BMP Requirements (page 99)*

36. PROVISION E.3.C (PAGE 102 OF 130) – THE REGIONAL PERMIT INADVERTENTLY CREATES A TIMING GAP IN COVERAGE FOR EXEMPTIONS TO HYDROMODIFICATION REQUIREMENTS.

A strict reading of the revised permit section E.3.c.(2)(e) suggests that there could be a lapse of the exemptions for engineered channels and the large river even if the WMA Analysis supports keeping the exemptions because once the BMP design manual is submitted with WQIP the interim exemptions appear to expire and it could be some time before the Regional Board approves the WQIP and the WMA Analysis supporting keeping the interim exemptions. We suggest that clarification be provided that notes that the interim timeframe exemptions are in place until the Board approves the BMP Design Manual.

Action: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Provisions, Development Planning E.3.c.(2)(e) - (page 102)*

37. PROVISION E.3.C (PAGE 104 OF 130) – THE COPERMITTEES SHOULD BE ALLOWED THE FLEXIBILITY PROVIDED UNDER EPA POLICY TO DEVELOP A TRADING AND WATER QUALITY CREDIT SYSTEM.

The Copermittees appreciate the flexibility of the Tentative Order to implement a water quality credit system as an alternative compliance schedule. Trading systems create cost-effective, market-based mechanisms for pollutant reduction, and have been successful in other water quality and air quality contexts. The Copermittees note that any water quality trading system should be implemented in accordance with EPA's 2003 Final Water Quality Trading Policy, which allows for flexibility in generating and trading credits and offsets. The Tentative Order appears to limit a trading system to no net impacts caused by projects meeting the onsite structural BMP performance requirements of Provisions E.3.c(1) and E.3.c(2).

The Copermittees request that this language be stricken and that Copermittees be allowed the flexibility provided under the EPA 2003 Policy. Trading systems differ from program to program and are highly robust and complex credit mechanisms. Therefore, no net impact limitations should be addressed on a case-by-case basis subject to Executive Office approval, and should not immediately be limited by permit language, as certain projects may offer other significant environmental benefits.

Action: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Provisions, Development Planning E.3.c.(3)(d) - (page 104)*

PROVISION E.4 – CONSTRUCTION MANAGEMENT

38. PROVISION E.4 (PAGE 104 OF 130) – THE CONSTRUCTION MANAGEMENT PROGRAM PROVISIONS MUST BE MODIFIED SO AS NOT TO NEGATE THE VERY INTENT AND PURPOSE OF THE WATERSHED APPROACH AND THE FOCUS ON THE HIGHEST PRIORITIES WITHIN EACH WATERSHED MANAGEMENT AREA.

See the corresponding comments under Provision E – Jurisdictional Runoff Management Programs.

Action: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Provisions, E.4. Construction Management (page 104)*

PROVISION E.5 – EXISTING DEVELOPMENT MANAGEMENT

39. PROVISION E.5 (PAGE 108 OF 130) –THE EXISTING DEVELOPMENT PROGRAM PROVISIONS MUST BE MODIFIED SO AS NOT TO NEGATE THE VERY INTENT AND PURPOSE OF THE WATERSHED APPROACH AND THE FOCUS ON THE HIGHEST PRIORITIES WITHIN EACH WATERSHED MANAGEMENT AREA.

(See the corresponding comments under Provision E – Jurisdictional Runoff Management Programs)

Action: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Provisions, E.5. Existing Development Management (page 108)*
- *Provisions, E.5.b Existing Development BMP Implementation and Maintenance (page 110)*

40. PROVISION E.5.E (PAGE 116 OF 130) – REMOVE THE REQUIREMENT TO EVALUATE RETROFIT OF STREAM CHANNELS FROM THE TENTATIVE ORDER.

It is not the responsibility of the Copermittees to restore receiving waters, but rather reduce the discharge of pollutants in stormwater and non-stormwater to the maximum extent practicable.

Action: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Provisions, E.5.e.(2) Stream, Channel and/or Habitat Rehabilitation in Areas of Existing Development (page 115)*

PROVISION E.6 – ENFORCEMENT RESPONSE PLANS

41. PROVISION E.6 (PAGE 116 OF 130) – THE COPERMITTEES SHOULD BE ALLOWED TO UTILIZE EXISTING GUIDELINES AND PROCEDURES FOR ENFORCEMENT.

As a part of the development and implementation of a robust Illegal Discharge/Illicit Connection (ID/IC) Program, the Copermittees have developed an *Investigative Guidance Document* and *Enforcement Consistency Guide* ("Guide"). The Tentative Order should be modified to allow the Copermittees to continue to use and implement established, equivalent guidelines and procedures for enforcement.

Action: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Provisions, E.6 Enforcement Response Plans (page 116)*

42. PROVISION E.6.D (PAGE 118 OF 130) – THE TERM AND DEFINITION FOR "ESCALATED ENFORCEMENT" SHOULD BE REDEFINED.

Although Provision E.6.d requires each Copermittee to include "Escalated Enforcement" in the required Enforcement Response Plan, the definition of what is intended by "Escalated Enforcement" is different within the Tentative Order than the Fact Sheet and may not be enforceable.

The Tentative Order defines "Escalated Enforcement" as "any enforcement scenario where a violation or other non-compliance is determined to cause or contribute to the highest water quality conditions identified in the Water Quality Improvement Plan." This definition seems to indicate that a Copermittee may enforce differently in a particular situation if it involves a high priority pollutant of concern. Not only does the County take exception to the notion that they would enforce differently solely based on the constituent involved, the legality of such an enforcement action is questionable. In fact, when selecting enforcement options, the Copermittee must ensure that violations of a similar nature are subjected to similar-types of enforcement remedies in order to avoid any claim of selective enforcement of the Ordinance.

However, the Fact Sheet seems to indicate that "Escalated Enforcement" would instead require the Copermittee to "take progressively stricter response to enforce its legal authority and achieve compliance…." The County supports this approach, especially since this is consistent with other ID/IC programs in California and the established guidance that has been developed and implemented by the Copermittees. In fact, the established guidance recognizes that a more severe enforcement option may be selected when a violator has either a history of noncompliance or has failed to take good faith actions to eliminate continuing violations or to meet a previously imposed compliance schedule. Ultimately, enforcement is in the prosecutorial discretion of the Copermittee.

The Tentative Order should be modified as indicated below so that it reflects a standard progressive response approach.

Action: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Provisions, E.6.d Escalated Enforcement (page 118)*
- *Attachment C*

PROVISION E.7 – PUBLIC EDUCTION AND PARTICIPATION

43. PROVISION E.7 (PAGE 118 OF 130) – THE PUBLIC EDUCATION PROGRAM PROVISIONS MUST BE MODIFIED SO AS NOT TO NEGATE THE VERY INTENT AND PURPOSE OF THE WATERSHED APPROACH AND THE FOCUS ON THE HIGHEST PRIORITIES WITHIN EACH WATERSHED MANAGEMENT AREA.

See the corresponding comments under Provision E – Jurisdictional Runoff Management Programs.

Action: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Provisions, E.7 Public Education and Participation (page 118)*
- *Provisions, E.7.a Public Education (page 119)*

PROVISION F – REPORTING

44. PROVISION F (ENTIRE PROVISION; BEGINS PAGE 121 OF 130) – THE PROCESS FOR THE DEVELOPMENT AND UPDATES OF THE VARIOUS PLANS NEEDS TO BE ALIGNED AND ALLOW FOR THE TIME NECESSARY TO COMPLETE THE WORK AND TO SUBMIT THE ROWD.

Provision F includes requirements for the documents and reports that Copermittees must prepare and provide to the Regional Board. This provision incorporates significantly expanded requirements for public participation and involvement in the development and implementation of the WQIPs and JRMPs.

However, the timeframe outlined in this section links each step of the development of the WQIP and JRMP to the commencement of coverage under the Order instead of to the development step that precedes it. The three steps outlined for the development of the WQIP need to be sequential so that the Copermittees have adequate time to complete each step and build the program based on comments received. In addition, the timeframe needs to explicitly incorporate adequate time for the Copermittees to review and respond to comments received on the current action before moving on to the next step of development. For example, it is unclear how the Copermittees would establish their water quality improvement strategies (step 2 of development) at the same time as the establishment of the priority water quality conditions and numeric goals (step 1 of development).

It should also be noted that this approach appears to establish a heavy workload for the public, the Copermittees and the Regional Board. A more streamlined approach for the development of the WQIPs should be considered that would provide the Copermittees with the necessary time to develop the final WQIP without extending the overall timeframe. For example, instead of requiring a formal public notice and solicitation of comments by the Regional Board for all three (3) steps of each WQIP, the Copermittees could work with stakeholders to solicit comments for the first two steps of the development of the WQIP and only require formal public noticing for the final approval of the WQIP. Although this is one approach to streamline the development of the WQIP, an alternative approach would be to modify the timelines as indicated below.

It should be noted that the preparation of a regional WQIP will require a CEQA determination by the Copermittee acting as lead agency. This should be recognized in setting the timeline as noted within the table below.

A comparison of the current and recommended approach is provided in the table below.

Steps and Timelines	Existing Approach in Tentative Order	Total Time from Effective Date of Order	Recommended Approach (w/ edits provided in Tentative Order)	Total Time from Effective Date of Order
Establish Priority Water Quality	Within 6 months of commencement of	6 months	Within 6 months of	6 months

Steps and Timelines	Existing Approach in Tentative Order	Total Time from Effective Date of Order	Recommended Approach (w/ edits provided in Tentative Order)	Total Time from Effective Date of Order
Conditions and Numeric Goals	coverage		commencement of coverage	
Request Public Comments	60 days from posting	8 months	30 days from posting	7 months
Revise Priority Water Quality Conditions and Numeric Goals	Not specified	? months	30 days from receiving comments	8 months
Establish Water Quality Improvement Strategies and Schedules	Within 9 months of commencement of coverage	9 months	Within 3 months of finalizing Priority Water Quality Conditions and Numeric Goals	11 months
Request Public Comments	60 days from posting	11 months	30 days with stakeholders	12 months
Revise Water Quality Improvement Strategies and Schedules	Not specified	? months	30 days from receiving comments	13 months
Develop WQIP	Within 18 months of commencement of coverage	18 months	Within 18 months of commencement of coverage	**18 months (this allows 5 months for the development of the document)**
Request Public Comments	30 days from posting	19 months	30 days from posting	19 months
If no hearing, Regional Board notify Copermittees that the WQIP is accepted	Within 6 months of the public request for comments	25 months	Within 6 months of the public request for comments	25 months
Finalize WQIP	Not specified	? months	60 days from receiving comments (this assumes	? months

Steps and Timelines	Existing Approach in Tentative Order	Total Time from Effective Date of Order	Recommended Approach (w/ edits provided in Tentative Order)	Total Time from Effective Date of Order
			that it is concurrent with the Regional Board notification above)	
Review for CEQA Requirements	*It should be noted that the preparation of a regional WQIP may trigger local requirements under CEQA. This should be recognized in setting the timeline. This would likely take 30-60 days.*			
Posting on Regional Clearinghouse	Within 30 days of acceptance by Regional Board	26 months	Within 30 days of acceptance by Regional Board	26 months

Action: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Provisions, F.1.a.(2)(f) Reporting (page 122)*
- *Provisions, F.1.a.(3)(d) Reporting (page 123)*
- *Provisions, F.2.a.(5) Updates (page 125)*

ATTACHMENT C – ACRONYMS, ABBREVIATIONS AND DEFINITIONS

45. ATTACHMENT C (ENTIRE ATTACHMENT; BEGINS PAGE C-1) – ATTACHMENT C SHOULD CLARIFY THE MEANING OR INTENT OF SPECIFIC TERMS USED WITHIN THE ORDER.

In addition to the acronyms and abbreviations, Attachment C includes definitions that may provide an explanation or description of the meaning or intent of specific terms or phrases that are used within the Order. The County recommends the addition and/or modification of the following definitions in order to assist in describing the meaning or intent of these terms and to avoid unnecessary confusion.

Action: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The terms include:

- This term did not have a definition - *Channel Rehabilitation and Improvement*
- This definition should provide additional clarification – *Illicit Connection*
- This term did not have a definition - *Progressive Enforcement*
- This definition should provide additional clarification - *Redevelopment*
- This definition should remain consistent with the Federal regulations – *Storm Water*

- This definition should remain consistent with the State regulations – *Waters of the State*
- This term should clarify that a wet weather period should be preceded by a minimum dry weather period, unless defined differently in another regulatory mechanism – *Wet Weather*

ATTACHMENT E – SPECIFIC PROVISIONS FOR TOTAL MAXIMUM DAILY LOADS

46. ATTACHMENT E (ENTIRE ATTACHMENT; BEGINS PAGE E-1) – PERMIT PROVISIONS MUST BE CONSISTENT WITH THE CORRESPONDING BASIN PLAN AMENDMENTS.

The Regional Board has adopted two Basin Plan Amendments ("BPAs") to establish Total Maximum Daily Loads ("TMDLs") where the Copermittees are identified as Responsible Parties and assigned wasteload allocations ("WLAs"): (1) Indicator Bacteria in Baby Beach in Dana Point Harbor[69] and (2) Indicator Bacteria, Project I - Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)[70] (Beaches and Creeks Bacteria TMDL).

There are several fundamental and substantive discrepancies, however, between the adopted TMDL BPAs and the provisions of the Tentative Order. These inconsistencies negate the Basin Planning process that occurred to establish the TMDLs and clearly contradict the Board's intent for how the TMDLs would be incorporated into the MS4 Permit. As the TMDLs have been incorporated into the Basin Plan, the TMDLs constitute the "program of implementation needed for achieving water quality objectives"[71] and the provisions in the MS4 Permit must, therefore, be consistent with the Basin Plan.

For example:

- Both the Baby Beach and Beaches and Creeks TMDLs clearly establish mass-based wasteload allocations. These wasteload allocations are entirely absent from the Tentative Order (see additional comments below for further discussion). Instead, the Tentative Order establishes water quality based effluent limits (WQBELs) based upon an effluent concentration (set equal to the numeric targets).
- For the Beaches and Creeks TMDL, the Tentative Order is not consistent with the compliance schedule approach provided for the comprehensive load reduction plans (CLRPs) established in the BPA. The CLRPs that will be submitted by Copermittees will propose interim compliance dates, as allowed by the BPA, to meet the 50% reduction milestone for dry and wet weather. The CLRPs submitted by Copermittees may not all propose the same interim compliance dates and the Tentative Order should acknowledge the flexibility allowed by the TMDL[72]. In fact, this scheduling

[69] Resolution R9-2008-0027.

[70] Resolution R9-2010-0001.

[71] Water Code § 13050(j).

[72] Page 68 of Attachment A of the Basin Plan Amendment.

flexibility was a primary "incentive" for Copermittees to develop CLRPs instead of Bacteria Load Reduction Plans (BLRPs).

- For the Baby Beach TMDL, the BPA includes two paths for the implementation of the TMDL – one where the beach has been delisted from the 303(d) list and one where the beach remains impaired[73]. Where a beach has been delisted, the BPA requires that Responsible Copermittees monitor and continue implementation of existing implementation actions "to ensure REC-1 water quality objectives are maintained" (i.e., the beach is not placed back on the 303(d) list). Only if the beach is placed back on the 303(d), the NPDES permit is to be revised to include "requirements consistent with these TMDLs." As Baby Beach is not on the most recent 303(d) list for REC-1 bacteria objectives, the requirements for Responsible Copermittees must be limited to monitoring and implementation of existing implementation actions. The Tentative Order does not recognize the approach for delisted beaches or recognize that Baby Beach is delisted.
- For the Beaches and Creeks TMDL, the BPA clearly establishes that no additional actions are required for beaches that are delisted[74]. This language is not included in the Tentative Order.
- Monitoring requirements in the Tentative Order must be consistent with the requirements of the BPAs. Both the Baby Beach TMDL and the Beaches and Creeks TMDL provide certain flexibility in monitoring, via the BLRPs and CLRPs, respectively, and this flexibility is not captured in the Tentative Order.
- Both the Baby Beach TMDL and the Beaches and Creeks TMDL clearly acknowledges that exceedances in the receiving water may not be from the MS4 and contains specific compliance language to address such a situation. This language is not provided in the Tentative Order.

These examples are not exhaustive of the inconsistencies between the BPAs and the Tentative Order (additional inconsistencies are identified and modified language is proposed in **Attachment B**).

During the workshops on the Tentative Order, Regional Board members raised the question of feasibility of attaining the TMDLs. The Basin Plan Amendments included many considerations and requirements that cumulatively result in a more feasible program of implementation. If many of the requirements of the BPAs are modified or not included in the MS4 permit, such as the mass-based WLAs, flexible monitoring programs, no further action for delisted beaches, and reconsideration of the TMDLs through reopeners, the Tentative Order establishes requirements that are not only inconsistent with the BPAs, but that make attainment of the TMDLs infeasible.

Action: Modify the requirements in Attachment E to establish provisions that are consistent with the adopted Basin Plan Amendments. Specific modifications to address these inconsistencies are

[73] Basin Plan Amendment, Page A-12.

[74] Basin Plan Amendment, Pages A2, A12, A66.

provided in Attachment B. Certain key inconsistencies are noted in the subsequent comments below. Additional inconsistencies are also captured in the modifications detailed in Attachment B.

47. ATTACHMENT E (ENTIRE ATTACHMENT; BEGINS PAGE E-1) – THE TENTATIVE ORDER'S NUMERIC WQBELS VIOLATE THE REQUIREMENTS OF LAW BECAUSE THEY ARE INFEASIBLE.

Due to the nature of urban runoff and the extensive urbanization of Orange County, the Tentative Order's numeric WQBELs are economically and technically infeasible.[75] The Copermittees transport stormwater for flood control purposes, and do not generate pollutants. The Copermittees are legally and practically unable to control all aspects of the urban landscape and prevent illicit substances, such as copper, from entering the environment. The state and federal government has direct oversight over consumer goods and services and can better regulate these pollutants than can local government which has little jurisdiction over consumer issues due to Commerce Clause in the U.S. Constitution and other limitations. Furthermore, the are insufficient technologies to control and treat all the pollutants that threaten receiving waters, and it is economically infeasible to expend billions of dollars in local government general funds on research and development, particularly when the Permit does not contain a compliance pathway.[76]

Federal law does not require the Copermittees to meet numeric standards.[77] Moreover, meeting numeric standards in all places at all times is technically and economically infeasible and therefore beyond MEP. Any numeric WQBELs that are adopted in the Permit are done under authority of state law.[78]

The State Board has consistently rejected the incorporation of numeric WQBELs as evidenced by its adoption of the Caltrans MS4 Permit, affirming that "it is not feasible at this

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[75] A WQBEL is an enforceable translation in an MS4 permit for attaining compliance with a TMDL WLA, which serves to protect beneficial uses of a receiving water. 40 C.F.R. § 130.2.

[76] For example, in the final technical report prepared by the Regional Board, entitled "Revised Total Maximum Daily Loads for Indicator Bacteria Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)" (including beaches in Orange County), the Board concluded that the cost of implementing the particular TMDL in issue may be as high as $973 million, with annual maintenance running as great as $68 million annually. (See TMDL Report, http://www.swrcb.ca.gov/sandiego/ water_issues/programs/tmdls/bacbacte.shtml, at p. 144 ["The cost estimates for treating 10 percent of the watershed with structural BMPs ranged from $50,000 to $973 million, depending on BMP selection, with yearly maintenance costs estimated from $10,000 to $68 million."]; see also Total Maximum Daily Load for Bacteria in the Los Angeles River Watershed, http://www.waterboards.ca.gov/losangeles/board_decisions/basin_plan_amendments/technical_documents/bpa_80_R10-007_td.shtml, at p. 81[estimating the cost to implement the bacteria TMDL for the LA River at "$5.4 billion."].

[77] *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159, 1167.

[78] *Long Beach Unified School District v. State of California* (1990) 225 Cal.App.3d 155, 173; *National Resources Defense Council, Inc. v. U.S. E.P.A.* (9th Cir. 1992) 966 F.2d 1292, 1308.

time to set enforceable numeric effluent criteria for municipal BMPs and in particular urban discharges."[79]

The Caltrans MS4 permit's fact sheet also supports the use of BMP-based WQBELs as a means of meeting TMDLs and other quality standards. The Caltrans MS4 permit is also subject to TMDLs adopted by the Regional Board and USEPA. If this aspect of the Tentative Order is not corrected, Orange County MS4 Copermittees will be compelled to comply strictly with numeric WQBELs and receiving water limitations while Caltrans need only implement WQBEL BMPs to achieve compliance with the same TMDLs. This inconsistency lacks any justification.

48. ATTACHMENT E (ENTIRE ATTACHMENT; BEGINS PAGE E-1) – THE TENTATIVE ORDER'S WQBELS WERE IMPROPERLY FORMULATED.

The Tentative Order fails to provide adequate justification for incorporating numeric WQBELs in the Tentative Order for each of the incorporated TMDLs to which they apply. Further, the Tentative Order fails to establish that an adequate requisite Reasonable Potential Analysis ("RPA") has been conducted.

The Tentative Order fails to establish if discharges from any individual Copermittee's MS4 have the reasonable potential to cause or contribute to an excursion above any State water quality standard including State narrative criteria for water quality.

There are two generally accepted approaches to conducting an RPA. According to USEPA guidance, "A permit writer can conduct a reasonable potential analysis using effluent and receiving water data and modeling techniques . . . or using a non-quantitative approach."[80]

Neither the administrative record nor the Tentative Order's fact sheet contains any evidence of that an RPA has been performed in accordance with the two foregoing approaches. Regarding the first approach, such an analysis would in any case have been impossible to perform given that no outfall (effluent) monitoring has been required for any prior Orange County MS4 permit. No modeling appears to have been conducted either.

Beyond this, federal regulations not only require that an RPA be performed to determine if an excursion above a water quality standard occurred, but also that the storm water discharge must be measured against an "allowable" ambient concentration.[81]

A WQBEL is a means of attaining a TMDL WLA, a translation of a WLA into prescribed actions or limits which has in the past been typically expressed as a BMP. Before a WQBEL can be developed, however, a need for it must be established. As the Permit Writers' Manual indicates:

> The permit writer should always provide justification for the decision to require WQBELs in the permit fact sheet or statement of basis and must do so where

[79] Fact Sheet for NPDES Permit and Waste Discharges Requirements for State of California Department of Transportation, NPDES Permit No. CAS000003, Order No. 2012-0011-DWQ, page 9 (Sept. 7, 2012).

[80] NPDES Permit Writers' Manual, September 2010, page 6-23.

[81] 40 C.F.R. § 122.44(d)(iii).

> required by federal and state regulations. *A thorough rationale is particularly important when the decision to include WQBELs is not based on an analysis of effluent data for the pollutant of concern*.[82]

No such rationale is provided in the Fact Sheet, which in the absence of effluent data derived from outfall monitoring, would have been absolutely necessary to justify the need for a numeric WQBEL.

49. ATTACHMENT E (ENTIRE ATTACHMENT; BEGINS PAGE E-1) – WQBELS FOR BOTH BABY BEACH BACTERIA TMDL AND BEACHES AND CREEKS TMDLS INAPPROPRIATELY INCLUDE TMDL NUMERIC TARGETS.

Federal regulations require that NPDES permits contain effluent limits consistent with the assumptions and requirements of all available WLAs.[83] As currently established in the Tentative Order, the WQBELs are not consistent with the WLAs and are therefore not consistent with federal regulations. Therefore, any adjustment of the TMDL in the Permit is taken under state authority.

The Tentative Order establishes WQBELs based upon the numeric targets (set equal to water quality objectives) in addition to the mass-based WLAs established by the TMDL. To justify this approach, the Fact Sheet states:

> Because *numeric targets* for TMDLs typically include a component that will be protective of water quality standards, a TMDL will likely include one or more numeric receiving water limitations and/or effluent limitations as part of the assumptions or requirements of the TMDL. *Any numeric receiving water limitations and/or effluent limitations developed as part of the assumptions or requirements of a TMDL must be incorporated and included as part of a WQBELs for the MS4s.*[84].
>
> However, federal regulations require that the WLAs, not the numeric targets, are incorporated into the Tentative Order. Further, federal regulations do not require that any receiving water limitation or effluent limitation developed as part of the TMDL must be incorporated. Rather, federal regulations require that the WQBELs are consistent with the assumptions and requirements of the WLAs. Federal regulations expressly state: When developing water quality based effluent limits under this paragraph the permitting authority shall ensure that: (B) Effluent limits developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, *are consistent with the assumptions and requirements of any available wasteload allocation* for the discharge prepared by the State and approved by EPA pursuant to 40 CFR 130.7.[85]

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[82] *Id.*

[83] 40 CFR § 122.44(d)(1)(vii)(B).

[84] Fact Sheet, pg. F-38 (emphasis added).

[85] 40 CFR § 122.44(d)(1)(vii)(B).

While in most cases the numeric targets are a component of the allocations, there are numerous additional assumptions and requirements of the WLAs that are also a component of the WLAs. Wasteload allocations take into account various considerations, including the multiple sources of a pollutant, flow rates, critical conditions and margin of safety. By only incorporating the numeric target component of the WLAs, the Regional Permit fails to include all other assumptions and requirements of the WLAs as required by federal regulations. Only incorporating the numeric targets negates the entire TMDL analysis and Basin Planning process. Otherwise, TMDLs would be as simple as assigning numeric effluent limitations to MS4 discharges equal to the numeric objectives in the Basin Plan, which is explicitly contrary to the TMDLs that have been established in the Basin Plan.

In fact, simply defining the WQBELs as the numeric targets of the TMDL is contrary to the purpose of the Basin Plan itself, which not only requires the establishment of water quality objectives, but also the program of implementation needed to achieve the water quality objectives.[86] A TMDL, once incorporated into the Basin Plan, is exactly that – a program of implementation needed for achieving water quality objectives.

The following language from the Basin Plan Amendment is controlling:

<u>Beaches and Creeks Bacteria TMDL BPA</u>

> TMDLs must be established at levels necessary to attain and maintain the applicable narrative and numerical water quality standards with seasonal variations and a margin of safety which takes into account any lack of knowledge between effluent limitations and water quality. [87]

<u>Baby Beach Bacteria TMDL BPA</u>:

> The loading capacities are defined as the maximum amount of fecal coliform, total coliform and Enterococcus that the waterbody can receive and still attain water quality objectives necessary for the protection of designated beneficial uses. Each TMDL must accommodate all known sources of a pollutant, whether from natural background, nonpoint sources, or point sources, and must include a margin of safety (MOS) to preclude pollutant loading from exceeding the actual assimilative capacities of the waterbodies. The TMDL calculations also account for seasonal variations and critical conditions and were developed in a manner consistent with guidelines published by USEPA[88]"

In both TMDLs, the WLAs clearly take into consideration factors other than the numeric targets, such as flow rates, as the WLAs are expressed as mass-based limits. If it was the Regional Board's intent to establish a concentration-based TMDL, then the WLAs would be

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[86] See Water Code section 13050(j) and as stated in the Beaches and Creeks Bacteria TMDL (Resolution, Pg.2): "A "Water Quality Control Plan" or "Basin Plan" consists of a designation or establishment for the waters within a specified area of all of the following: (1) Beneficial uses to be protected, (2) Water quality objectives and (3) A program of implementation needed for achieving water quality objectives."

[87] Resolution, Page 2.

[88] Resolution, Page 4.

expressed as a concentration. By establishing mass-based WLAs, however, the TMDL purposefully and explicitly establishes WLAs that incorporate many other factors than just the concentrations of the numeric targets. Therefore, establishing WQBELs that fail to incorporate the mass-based WLAs is inconsistent with the assumptions and requirements of the WLAs as well as inconsistent with the intent of the Basin Plan itself.

Action: Modify the requirements in Attachment E to include:

- *Fact Sheet, (page F-38)*
- *Attachment E*

Baby Beach Bacteria TMDL

In addition to the universal issues identified above, there are additional concerns with the WQBELs specific to the Baby Beach Bacteria TMDL.

Of particular concern are the WQBELs established for wet weather for total coliform (TC) and fecal coliform (FC). The BPA establishes WLAs for those indicators based upon existing conditions as the loading capacity was determined to be greater than the current discharges and clearly states that no further reductions are necessary. The BPA states:

> "According to Tables 7-26 and 7-27, no wet weather wasteload reductions are required for total and fecal coliform indicator bacteria. This means that according to the wet weather models for Baby Beach, REC-1 water quality objectives for total and fecal coliform indicator bacteria are not expected to be exceeded due to discharges from the MS4s. The only wet weather wasteload reductions required for MS4s discharging into the receiving waters along the shoreline at Baby Beach is for Enterococcus indicator bacteria."[89]

These existing conditions WLAs were based upon a *load assessment, not a concentration assessment* (e.g., the numeric targets). The final compliance date for these WLAs was set equal to the effective date of the TMDL, given that the WLAs were set to existing conditions and no further reductions were required. Therefore, not only are the WLAs in the Tentative Order not incorporated properly as mass-based WQBELs, but the Copermittees are not provided any time to attain these new and inappropriately established concentration-based WQBELs as the effective date, and therefore final compliance date, was 2009.

Beaches and Creeks Bacteria TMDL

In addition to the universal issues identified above, there are additional concerns with the WQBELs specific to the Beaches and Creeks Bacteria TMDL.

Attachment E specifies WQBELs for dry weather flows as both receiving water and effluent limitations, in terms of zero allowable exceedances of the single sample maximum and the 30-day geometric mean. However, the dry weather component of the TMDL only considered the 30-day geometric mean and did not consider the single sample maximum within its calculation. Incorporating single sample effluent limitations into the Tentative Order goes beyond the TMDL requirements.

[89] Basin Plan Amendment, Page A-23.

In addition, if the TMDL had included single sample limits, there would have been a corresponding allowable exceedance frequency, just as for wet weather. The 22% allowable exceedance rate for wet weather was based on a reference beach within the Los Angeles Region, and although not used in the technical approach for the San Diego Beaches and Creeks TMDL, the reference beach also exhibits exceedances during dry weather, which is incorporated into beach TMDLs in the Los Angeles region.

Action: Modify the Tentative Order to be consistent with the assumptions and requirements of the WLAs by incorporating the WLAs into the Permit. See Attachment B for the specific modifications.

50. ATTACHMENT E (ENTIRE ATTACHMENT; BEGINS PAGE E-1) – WQBELS SHOULD ONLY BE DEFINED AS EFFLUENT LIMITATIONS.

There is a significant legal distinction between the Receiving Water Limitations established in Provision A (Discharge Prohibitions) and the Receiving Water Limitations established as part of the WQBELs in Attachment E (TMDL provisions). As currently (and inappropriately) defined, WQBELs include receiving water limitations based on the numeric targets (set equal to WQOs) in addition to WLAs.

Ensuring that MS4 discharges do not cause or contribute to exceedances of WQOs is already and more appropriately addressed in Provision A.2. When an exceedance occurs under Provision A (Discharge Prohibitions), there is the potential for an enforcement action at the discretion of the Regional Board (*e.g.*, issuing a Notice of Violation). Where an exceedance occurs for a WQBEL, however, the Copermittees may be subject to Mandatory Minimum Penalties (MMPs) where the Regional Board does not have discretion.

As set forth above, the WQBELs are inappropriately defined to include TMDL numeric targets, and not just the WLAs. Ensuring that discharges do not cause or contribute to exceedances of WQOs is already addressed via Provision A.2. Therefore, the inclusion of receiving water limitations in the definition of the WQBELs is inconsistent with the assumptions and requirements of the WLAs and unnecessarily exposes Copermittees to MMPs without any requisite change to the protection of water quality.

Throughout the Beaches and Creeks Bacteria TMDL, the BPA consistently refers to attaining the numeric targets *(e.g.*, the water quality objectives) via receiving water limitations. Therefore, establishing the mass-based WLAs as the WQBELs and the numeric targets as receiving water limitations is consistent with federal regulations for the incorporation of WLAs and the BPA for establishing the receiving water limitations.

The WQBELs should be defined only as the mass-based effluent limitations, consistent with the WLAs in the BPAs. Although the Copermittees prefer that the receiving water limitations are simply addressed with a cross-reference back to Provision A.2, if the Regional Board prefers to keep the receiving water limitations as part of the TMDL provisions, they must be distinct from and excluded from the definition of the WQBELs.

Action: Modify the Tentative Order to be consistent with the assumptions and requirements of the WLAs by defining the WQBELs as equal to the WLAs. Receiving water limitations should be excluded from the definition of WQBELs as they are not part of the WLAs.

51. ATTACHMENT E (ENTIRE ATTACHMENT; BEGINS PAGE E-1) – COMPLIANCE DETERMINATION FOR FINAL WQBELS SHOULD BE BASED ON THE IMPLEMENTATION OF BMPS AND NOT NUMERIC EFFLUENT LIMITATIONS.

For interim water quality-based effluent limitations and receiving water limitations, A BMP-based path to compliance is provided via the implementation of an approved Water Quality Improvement Plan.[90] A voluntary WQIP acknowledges the inherent challenges unique to stormwater management and provides appropriate flexibility to implement the necessary BMPs. However, the same approach is not applied to the final WQBELs.

a. Regional Board has Discretion to Establish BMP-Based Compliance

State and federal law do not require the use of numeric effluent limitations for MS4 Copermittees, but rather encourage flexible implementation of best management practices through an iterative process. Specifically, the choice to include either management practices or numeric limitations in MS4 permits is within the Regional Board's discretion acting under state law.

Over the last decade, EPA has issued a succession of policy memoranda and guidance documents regarding the incorporation of TMDLs into stormwater permits, including:

1) *Guidance for Developing TMDLs in California* (EPA Region 9). January 7, 2000
2) *Establishing Total Maximum Daily Load (TMDL) WLAs for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs* (Wayland and Hanlon). November 22, 2002
3) *TMDLs to Stormwater Permit Handbook* (Draft) (EPA). November 2008
4) Untitled Letter (Kevin Weiss). March 17, 2011

In each of these EPA documents, EPA allows for discretion on the part of the permitting authority in the use of numeric effluent limitations for stormwater or BMP-based effluent limitations.

Further, it is important to note that the EPA documents did not identify any differences in how interim and final WQBELs may be addressed by effluent limitations. In particular, the guidance did not limit BMP-based effluent limitation approaches to interim WQBELs. EPA guidance does emphasize that NPDES provisions implementing TMDLs be enforceable, objective and measurable.

The Tentative Order provides for enforceable, objective and measurable provisions via the Water Quality Improvement Programs (WQIPs). Establishing an additional compliance path for the final WQBELs would therefore be consistent with the approach already provided in the Tentative Order for interim WQBELs as well as guidance issued by EPA over the last.

b. Compliance Mechanism Matters

The Regional Board has the opportunity to exercise discretion in drafting and approving the compliance language in the Order; however, if the Regional Board continues to opt for

[90] Attachment E.5.e.(1)(f)); Attachment E.6.e.(1)(f)

numeric effluent limitations for final WQBELs, the Regional Board will no longer have discretion for enforcement decisions during implementation of the Order as Copermittees may be subject to Mandatory Minimum Penalties (MMPs).

Take for example a watershed where a group of Copermittees implement a suite of BMPs designed to achieve the final WQBELs. The Copermittees work closely with Regional Board staff and non-governmental organizations in developing and implementing the plan. Implementation of the BMPs achieves a 90% reduction in bacteria loads and results in the delisting of the waterbody from the State's 303(d) list, yet the reductions do not attain the WQBELs. Another Copermittee does little to nothing to address the TMDL and achieves no reductions in bacteria loads, the waterbody continues to be listed as impaired on the State's 303(d) list, and the WQBELs are not attained.

If numeric effluent limitations continue as the compliance mechanism for final WQBELs, both Copermittees (the group that achieved the 90% reduction and the Copermittee that did little to nothing) would equally be out of compliance with the Order and equally subject to MMPs. If a BMP-based compliance option is provided for final WQBELs, the Regional Board would have the ability to exercise discretion. The Regional Board could continue to work with the group or Copermittees that are successfully implementing actions and evaluate appropriate additional actions. For the Copermittee that did little to nothing, the Regional Board would still be able to take appropriate enforcement action.

BMP-based compliance is not a request to decrease accountability or the efforts of the Copermittees or the commitment to water quality, it is a request for the Regional Board to utilize its discretion to establish Permit provisions that will support and reward actions taken by Copermittees that are achieving the intended purposes of the TMDLs.

c. Consistent with Regional Board Approach to Enforcement

A BMP-based compliance mechanism for final WQBELs is consistent with the Regional Board's stated approach to enforcement (as noted in the BPA establishing the Indicator Bacteria TMDL for Baby Beach):

> Regional Board typically implements enforcement through an escalating series of actions to:
>
> > (1) assist cooperative dischargers in achieving compliance; (2) compel compliance for repeat violations and recalcitrant violators; and (3) provide a disincentive for noncompliance.[91]

The Regional Board can structure the final WQBEL compliance options to achieve this escalating approach to enforcement. A BMP-based compliance option can be provided via the implementation of the WQIPs where discrete milestones and actions are identified. For Copermittees that do not implement the WQIPs, this compliance mechanism would no longer be an option and Copermittees would be compelled to comply via the other mechanisms (essentially, no discharge or numeric effluent limitations). Such an approach achieves all three of the escalating compliance approaches identified by the Regional Board in the Baby Beach Bacteria TMDL, while numeric effluent limitations remove the Regional

[91] Baby Beach Bacteria TMDL Basin Plan Amendment, Page A-20.

Board's discretion and will require that the Board treat cooperative dischargers and recalcitrant violators equally.

d. Consistent with Basin Plan Amendments

Establishing a BMP-based compliance path is also consistent with the Basin Plan Amendments for both TMDLs.

Beaches and Creeks TMDL:[92]

> The San Diego Water Board will revise and re-issue the WDRs and NPDES requirements for Phase I MS4s to incorporate the following:
>
> WQBELs consistent with the requirements and assumptions of the Municipal MS4 WLAs. WQBELs may be expressed as numeric effluent limitations, when feasible, and/or as a BMP program of expanded or better-tailored BMPs.

Baby Beach Bacteria TMDL (emphasis added):

> WQBELs consistent with the requirements and assumptions of the bacteria WLAs described in Tables [Insert table numbers] and a schedule of compliance applicable to the MS4 discharges into the impaired shoreline segments described in Tables [Insert table numbers]. *At a minimum, WQBELs shall include a BMP program to attain the WLAs*.[93]
>
> If the WQBELs consist of BMP programs, then the reporting requirements shall consist of annual progress reports on BMP planning, implementation, and effectiveness in attaining the WQOs in impaired shoreline segments, and annual water quality monitoring reports.[94]
>
> The BLRPs are the municipal dischargers' opportunity to propose methods for assessing compliance with WQBELs that implement TMDLs.[95]

Additionally, the compliance schedule anticipates revisions to the TMDL after the final compliance date, potentially through the Natural Sources Exclusion Approach (NSEA).[96] It is inconsistent with the assumptions and requirements of the BPA to require strict compliance via numeric effluent limitations at Year 10 when the TMDL explicitly anticipates revisions occurring after that final date. The intent from the BPA is to have 10 years of implementation, evaluate progress and assess whether additional regulatory options (such as the NSEA) are necessary and/or warranted. This approach can only be accomplished if BMP-based compliance is provided as an option for the final WQBELs.

---

[92] Basin Plan Amendment, Page A-41.

[93] Basin Plan Amendment, Page A-14.

[94] Basin Plan Amendment, Page A-15.

[95] Basin Plan Amendment, Page A-19.

[96] Basin Plan Amendment, Page A-24.

e. BMP-Based Compliance is Not a "Safe Harbor"

BMP-based compliance through the iterative process is not a safe harbor under the law. A safe harbor exists in the law where certain misconduct is deemed not to violate a given rule.[97] For instance, if a purchaser of property conducts a Phase 1 Environmental Assessment of that property prior to purchase, it generally insulates the purchaser from liability related to contamination found to be caused from a prior owner. In this case, BMP-based compliance pathways can be structured to provide accountability and enforceability so long as BMPs are diligently and rigorously being implemented with specific actions and timetables and where progress is being made. This form of BMP implementation is measurable and objective, and can thus be enforced. If BMP-based compliance was a true safe harbor, any BMP-based action would qualify as a safe harbor. This is not what is being recommended by the Copermittees

The concept of "safe harbor" was raised during the hearing for the recently adopted Los Angeles Region MS4 Permit. The Regional Board as well as Executive Officer of the Regional Board directly addressed the question if BMP-based compliance, via the implementation of a Watershed Management Program (equivalent to the WQIPs), constituted a "safe harbor." Both the Board and Executive Officer determined that BMP-based compliance was not a "safe harbor" and the Watershed Management Programs provided objective and measureable elements whereby Copermittees would be required to implement actions and would have clear accountability.

Equating BMP-based compliance as a "safe harbor" is legally inaccurate, as it does not account for the way in which the law defines safe harbors. The Regional Board should frame the issue through accountability, objectivity and enforceability.

f. Numeric Effluent Limitations are Not Feasible

The Regional Board has discretion in how the WLAs are incorporated into the MS4 Permit. The concept of feasibility relates to *achieving* the numeric effluent limitations, not to *calculating* a numeric effluent limitation. As all TMDLs have numeric WLAs, it would be "feasible" for most all TMDLs, from the very first TMDL ever established, to utilize numeric effluent limitations if simply calculating a WQBEL was the intended definition. As Wayland and Hanlon (2002) (EPA's policy memorandum regarding incorporation of TMDLs into stormwater Permits) noted EPA "expects that most WQBELs for NPDES-regulated municipal and small construction storm water discharges will be in the form of BMPs, and that numeric limits will be used only in rare instances." Therefore, in EPA's policy memoranda, the concept of feasibility is not related to the ability to simply calculate the WQBELs. The concept of "feasibility" really relates to whether or not *achieving* numeric effluent limitations are feasible for the stormwater permit.

The State Water Resources Control Board convened a Blue Ribbon Panel in 2006 to investigate this very question – are numeric effluent limitations feasible for stormwater permits? This panel of national experts ultimately concluded that numeric limits were

[97] "Safe Harbor," Black's Law Dictionary, (1996).

generally infeasible across all three stormwater activities (municipal, industrial, and construction), with a few exceptions.[98]

Therefore, without providing the BMP-based compliance option for Copermittees, the Tentative Order directly contradicts the State Water Resources Control Board's finding regarding the feasibility of achieving numeric effluent limitations for municipal stormwater discharges.

Action: Establish a BMP-based compliance path for final WQBELs by adding the following provisions as Attachment E.5.e(2)(f) and as Attachment E.6.e.(2)(e):

> *The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the final compliance requirements will be achieved by the final compliance dates. A Responsible Copermittee that does not implement its WQIP in accordance with the milestones and compliance schedules shall demonstrate compliance with the final WQBELs pursuant to Attachment E.5.e(2)(a - e)/Attachment E.6.e(2)(a-d).*

52. ATTACHMENT E (ENTIRE ATTACHMENT; BEGINS PAGE E-1) – AN EXPLICIT RE-OPENER PROVISION IS NECESSARY.

In both the Baby Beach TMDL and the Beaches and Creeks TMDL, the BPAs have included an implementation schedule that defines a point at which the TMDL will be reconsidered to incorporate new information and potentially modify targets, allocations and/or implementation requirements. The intent of the approach is clear in both BPAs:

- **Beaches and Creeks TMDL:** There is an entire section of the Basin Plan Amendment that details modifications to the TMDL through a future Basin Plan Amendment. The BPA specifically notes (BPA pg. A49):

  > As the implementation of these TMDLs progress, the San Diego Water Board recognizes that revisions to the Basin Plan may be necessary in the future.

- **Baby Beach TMDL:** The intent to reassess this TMDL is built directly into several sections of the implementation plan as well as the compliance schedule (emphasis added):

  - The San Diego Water Board recognizes that there are potential problems associated with using indicator bacteria WQOs to indicate the presence of human pathogens in receiving waters free of sewage discharges. The indicator bacteria WQOs were developed, in part, based on epidemiological studies in waters with sewage inputs. The risk of contracting a water-borne illness from contact with urban runoff devoid of sewage, or human-source bacteria is not known. Some pathogens, such as giardia and cryptosporidium can be contracted from animal hosts. Likewise, domestic animals can pass on human pathogens through their feces. *These and other uncertainties need to be*

[98] *The Feasibility of Numeric Effluent Limits Applicable to Discharges of Stormwater Associated with Municipal, Industrial and Construction Activities, June 19, 2006.*

addressed through special studies and, as a result, revisions to the TMDLs may be appropriate."[99]

- "Ultimately, the San Diego Water Board supports the idea of measuring pathogens (the agents causing impairment of beneficial uses) or an acceptable alternative indicator, rather than indicator bacteria (surrogates for pathogens). However, as stated previously, indicator bacteria have been used to measure water quality historically because measurement of pathogens is both difficult and costly. The San Diego Water Board is supportive of any efforts by the scientific community to perform epidemiological studies and/or investigate the feasibility of measuring pathogens directly. *The San Diego Water Board further supports subsequent modification of WQOs as a result of such studies. Ultimately, TMDLs will be recalculated if WQOs are modified due to results from future studies.*"[100]
- Excerpt from Baby Beach Bacteria TMDL Compliance Schedule. Revisions to the TMDL are anticipated to occur in Year 10+ (after the final compliance date).

Table 1. Excerpt from Baby Beach Bacteria TMDL Compliance Schedule.[101] Revisions to the TMDL are anticipated to occur in Year 10+ (after the final compliance date).

Year (after OAL approval)	Required Wasteload Reduction	TMDL Compliance Action
10	100 percent *Enterococcus* reduction	• Water Quality Monitoring • Implement BMPs • Submit request for removal from 303(d) List • (if not requested and removed earlier)
10+	Same as above	• Water Quality Monitoring • Implement BMPs • *Submit request for TMDL revisions based on Natural Sources Exclusion Approach if supported by data (if not requested and recalculated earlier)* • Submit request for removal from

[99] Basin Plan Amendment, Page A-22.

[100] Basin Plan Amendment, Page A-23.

[101] Basin Plan Amendment, Page A-24.

		303(d) List (if not requested and removed earlier)

Although the County is not advocating for technical revisions to the TMDL as part of the Tentative Order issuance (such revisions would appropriately occur through the Basin Plan Amendment process with any subsequent revisions incorporated into the Permit), there is a well-documented level of uncertainty in the BPAs with the existing TMDLs where revisions to the targets, allocations, and implementation plans and schedules may be warranted. Such uncertainty should be incorporated into the provisions via an explicit re-opener in Provision H (Modifications of Programs) of the Tentative Order.

The explicit re-opener provision for the Tentative Order would serve two purposes:

- Provide a trigger to reconsider the compliance mechanism (BMP-based compliance in lieu of numeric effluent limits) prior to any compliance dates; and
- Ensure that the WQBELs are reconsidered, consistent with the intent of the TMDLs to revisit and revise as necessary the targets, allocations, and implementation actions prior to final compliance being required. This aspect is especially critical as the Beaches and Creeks re-opener would occur during this permit term (request must be made by the Copermittees by 2016) and the Baby Beach TMDL has final WQBELs compliance dates within the permit term (2014 and 2019).

While the Copermittees recognize the authority of the Regional Board to re-open the Permit at any time, the explicit re-opener captures the Regional Board's intent to revisit and revise as necessary the TMDL provisions, consistent with the assumption and requirements of the BPAs. Based upon the first year data summary for the on-going San Diego Regional Stream Reference Study,[102] such revisions may likely be warranted. The first year data show that during dry weather, the reference systems demonstrated a 34.1% exceedance rate of the single sample maximum and a 71% exceedance rate of the 30 day geometric mean for enterococci. The TMDL currently allows for a 0% exceedance rate during dry weather. During storm events, the reference systems had a 71% - 100% exceedance rate of the single sample maximum for enterococci. The TMDL currently only allows for a 22% exceedance rate during storm events. Providing for an explicit reopener in the Permit will ensure that such compelling information, such as the results of the Reference Study, are considered prior to subjecting Copermittees to enforcement actions, such as Mandatory Minimum Penalties.

The explicit re-opener is consistent with the Regional Board's stated approach to enforcement, an escalating enforcement approach that contemplates "cooperative dischargers" as well as "recalcitrant violators." Lastly, such an approach was built into the recently adopted Los Angeles MS4 Permit.[103]

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[102]Southern California Coastal Water Research Project (SCCWRP). *San Diego Regional Stream Reference Study, Monitoring Progress Report #3 and Year 1 Data Summary, October 2011 through November 2012* (Jan. 3, 2013).

[103] Order R4-2012-0175.

Action: Provide an explicit Permit re-opener to capture the Regional Board's intent to revisit and revise as necessary the TMDL provisions prior to final compliance dates. The following additional language is provided as Provision H.6 and H.7:

H.6. Modifications of the Order shall be initiated to incorporate provisions as a result of future amendments to the Basin Plan, such as new or revised water quality objectives or the adoption or reconsideration of a TMDL, including the program of implementation. As soon as practicable, but no later than 6 months of the effective date of a revised TMDL where the revisions warrant a change to the provisions of this Order, the Regional Water Board shall modify this Order consistent with the assumptions and requirements of the revised WLA(s), including the program of implementation.

H.7. Modification to the Order shall be considered 18 months prior to the compliance date for final WQBELs where the compliance mechanism is based upon numeric effluent limitations. The intent of the reconsideration is to include provisions or modifications to WQBELs in Attachment E of this Order prior to the final compliance deadlines, if practicable, that would allow an action-based, BMP compliance demonstration approach with regard to final WQBELs.

53. ATTACHMENT E (ENTIRE ATTACHMENT; BEGINS PAGE E-1) – COMPLIANCE MECHANISM IS NECESSARY PRIOR TO APPROVAL OF THE WATER QUALITY IMPROVEMENT PLANS.

The Tentative Order currently provides for BMP-based compliance with interim WQBELs via the implementation of the WQIPs.[104] However, as the BMP-based compliance mechanism is contingent upon implementation of an approved WQIP, the Copermittees are not provided with a BMP-based compliance mechanism during the development of the WQIPs. Without any modifications to the Tentative Order, the Copermittees would be subject to numeric effluent limitations for during WQIP development, then provided BMP-based compliance for interim WQBELs during WQIP implementation. Prior to the approval of the WQIPs, Copermittees should be provided a similar BMP-based compliance mechanism while resources are devoted to plan development and the continuation with the implementation of the existing programs.

Recognizing that the shift to a watershed approach is an important and necessary shift in the management of stormwater, in the recently adopted Los Angeles MS4 Permit,[105] such compliance was provided during the plan development phase.

Action: Provide BMP-based compliance as a compliance option during the development of the WQIPs through incorporation of the following provisions:

- *Interim WQBELs Compliance (Attachment E.5.e(1) and Attachment E.6.e(1)):*

  Upon the effective date of this Order, a Copermittee's full compliance with all of the following requirements shall constitute a Copermittee's compliance with provisions pertaining to interim WQBELs with compliance deadlines occurring prior to approval of a WQIP.

---

[104] Attachment E.5.e.(1)(f)); Attachment E.6.e.(1)(f)

[105] R4-2012-0175.

(1) Meets all interim and final deadlines for development of a WQIP,

(3 Targets implementation of watershed control measures in its existing storm water management program, including watershed control measures to eliminate non-storm water discharges of pollutants through the MS4 to receiving waters, to address known contributions of pollutants from MS4 discharges that cause or contribute to the impairment(s) addressed by the TMDL(s), and

(4) Receives final approval of its WQIP from the Regional Board.

- *If the Regional Board makes modifications to provide for a BMP-based compliance path for final WQBELs, the same revisions are requested to be added to Attachment E.5.e(2) and Attachment E.6.e(2).*

54. ATTACHMENT E (ENTIRE ATTACHMENT; BEGINS PAGE E-1) – CLARIFYING LANGUAGE IS NEEDED IN THE FACT SHEET REGARDING THE ITERATIVE APPROACH AND TMDLS.

The Fact Sheet includes language on pg. F-41 to describe an exception to the iterative approach and adaptive management process for receiving waters with adopted and approved TMDLs. The language notes that for TMDLs incorporated into the Order there is a specific date for compliance to be achieved. After this date, the iterative approach and adaptive management process required under Provision A.4 no longer provides the flexibility to achieve compliance. This language implies that prior to the compliance date for each TMDL, Provision A.4 does provide flexibility to achieve compliance. This point of linkage between Provision A and the TMDL Provisions in Attachment E is significant and it was raised in the County of Orange's comment letter on the Tentative Order for the Regional Permit.

For clarity, the Fact Sheet should also include language that explicitly states that during the implementation of the TMDL, prior to the final compliance date, Provision A.4 provides flexibility to achieve compliance with the applicable Receiving Water Limitations. In addition, the Regional Permit also needs to provide clarity in the permit provisions in Provision A.4.

Further, the Fact Sheet includes the following language on pg. F-41:

> Thus, after interim or final compliance dates for a contributing violation of WQBELs, if the discharges from the Copermittees' MS4s are causing or contributing to a violation of WQBELS, exceedances of WQBELs must be strictly enforced by the San Diego Water Board.

It is unclear what "strictly enforced" means in this context as neither interim or final WQBELs are established strictly as numeric effluent limitations in the Regional Permit. This language is counter to the compliance options provided for both interim and final WQBELs in Attachment E.

55. ATTACHMENT E (ENTIRE ATTACHMENT; BEGINS PAGE E-1) – CLARIFYING LANGUAGE IS NEEDED IN THE FACT SHEET REGARDING INCORPORATION OF NEW TMDLS INTO WQIPS.

The Fact Sheet includes language on pg. F-111 that states the WQIPs can incorporate new TMDLs prior to the Order being re-opened to incorporate the requirements of the new TMDLs. This approach is included as a requirement in the Regional Permit at F.2.c.(2). The

Fact Sheet needs to clarify that while the WQIPs can incorporate fully approved, effective TMDLs, the Regional Permit must be re-opened to incorporate the TMDLs into the Permit. As TMDLs are not self-implementing, the Permit must be reopened to include new TMDL provisions and requirements (e.g., addition WQBELs).

Action: Specific modifications are included in Attachment A (see Fact Sheet, pg. F-111; Regional Permit, Provision F.2.c.(2)).

ATTACHMENT A

**ORANGE COUNTY LEGAL &TECHNICAL COMMENTS ON
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
TENTATIVE ORDER No. R9-2013-0001
NPDES NO. CAS0109266**

Appendix A-1

Regional Map

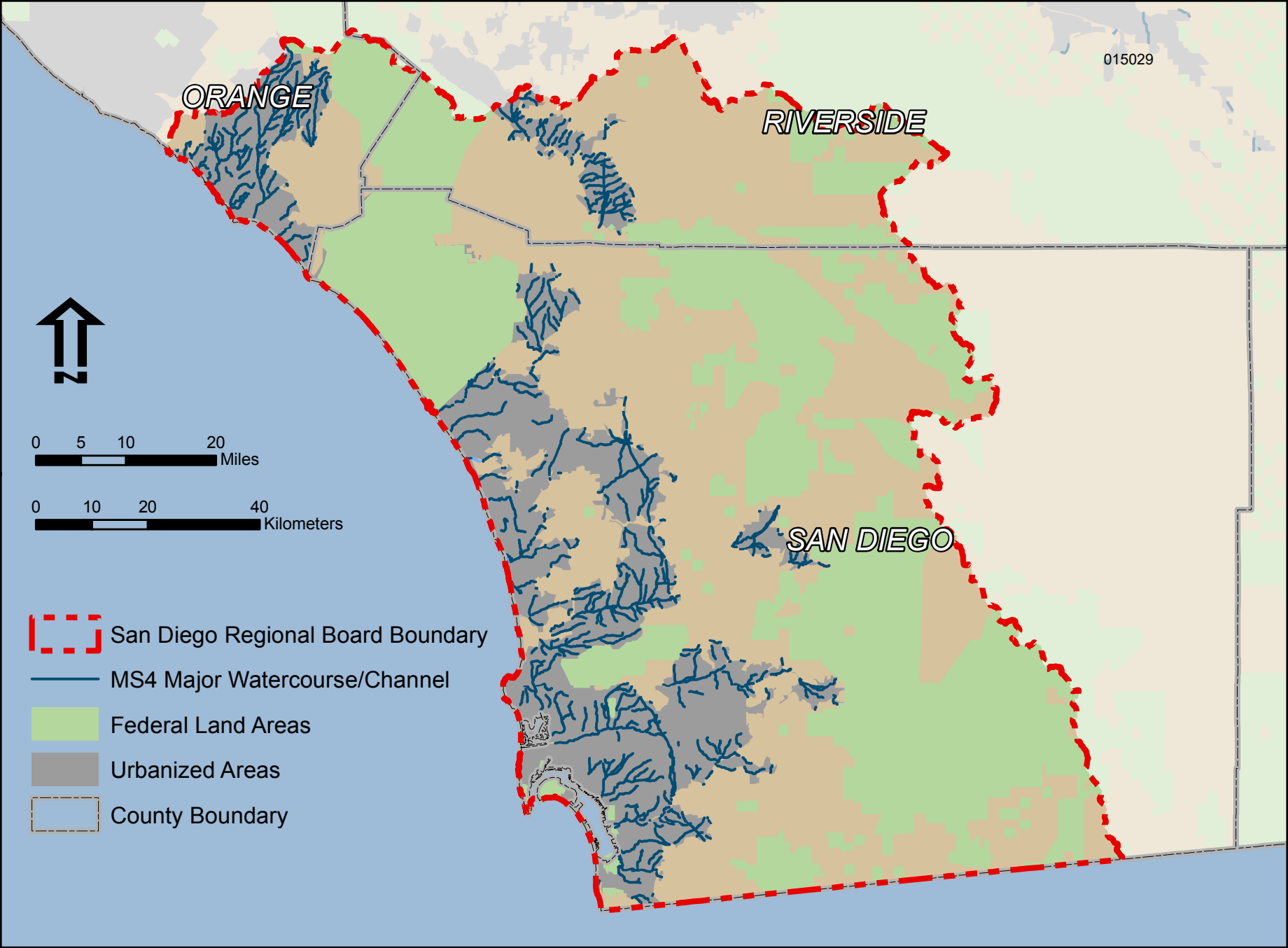
015029
ORANGE
RIVERSIDE
SAN DIEGO
N
0 5 10 20
Miles
0 10 20 40
Kilometers
San Diego Regional Board Boundary
MS4 Major Watercourse/Channel
Federal Land Areas
Urbanized Areas
County Boundary

ATTACHMENT A

**ORANGE COUNTY LEGAL &TECHNICAL COMMENTS ON
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
TENTATIVE ORDER No. R9-2013-0001
NPDES NO. CAS0109266**

Appendix A-2

SCCWRP Report

015031

HYDROMODIFICATION ASSESSMENT AND MANAGEMENT IN CALIFORNIA

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Southern California Coastal Water Research Project

Technical Report 667 - April 2012

Hydromodification Assessment and Management in California

Commissioned and Sponsored by California State Water Resources Control Board Stormwater Program

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April 2012

Technical Report 667

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EXECUTIVE SUMMARY

Most jurisdictions in California are now required to address the effects of *hydromodification* through either a municipal stormwater permit or the statewide construction general permit. Hydromodification is generally defined as changes in channel form associated with alterations in flow and sediment due to past or proposed future land-use alteration. Hydromodification management has emerged as a prominent issue because degradation of the physical structure of a channel is often indicative of and associated with broader impacts to many beneficial uses, including water supply, water quality, habitat, and public safety. Conversely, reducing hydromodification and its effects has the potential to protect and restore those same beneficial uses. Although hydromodification has the potential to affect all water body types, this document focuses on assessing and managing effects to streams because they are the most prevalent, widely studied, and arguably most responsive type of receiving water.

Hydromodification by definition results from alteration of watershed processes; therefore, correcting the root causes of hydromodification ought to be most effective if based on integrated watershed-scale solutions. To date, such a watershed approach has not been adopted in California; most hydromodification management plans simply consist of site-based runoff control with narrow, local objectives and little coordination between projects within a watershed. Furthermore, each municipality is required to develop its own approach to meeting hydromodification management requirements rather than drawing from standard or recommended approaches that facilitate regional or watershed-scale integration. Long-term reversal of hydromodification effects, however, will require movement away from reliance on such site-based approaches to more integrated watershed-based strategies.

This document has two goals, and hence two audiences. The first goal is to describe the elements of effective hydromodification assessment, management and monitoring. The audience for this goal is primarily the State and Regional Water Boards, since meeting this goal will require integration of watershed and site-scale activities that are likely beyond the responsibility or control of any individual municipality. Success will require fundamental changes in the regulatory and management approach to hydromodification that will likely advance only iteratively and potentially require one or more NPDES permit cycles to fully implement. The second goal of this document is to provide near-term technical assistance for implementing current and pending hydromodification management requirements. This goal can be achieved by municipalities within the construct of existing programs and therefore the primary audience for this aspect of the document is local jurisdictions. Achieving this goal will facilitate greater consistency and effectiveness between hydromodification management strategies, giving them a stronger basis in current scientific understanding.

Watershed analysis should be the foundation of all hydromodification management plans (Figure ES-1). This analysis should begin with a documentation of watershed characteristics and processes, and past, current, and expected future land uses. The analysis should lead to identification of existing opportunities and constraints that can be used to help prioritize areas of greater concern, areas of restoration potential, infrastructure constraints, and pathways for potential cumulative effects. The combination of watershed and site-based analyses should be used to establish clear objectives to guide management actions. These objectives should articulate desired and reasonable physical and biological

conditions for various reaches or portions of the watershed and should prioritize areas for protection, restoration, or management. Strategies to achieve these objectives should be customized based on consideration of current and expected future channel and watershed conditions. A one-size-fits-all approach should be avoided. Even where site-based control measures, such as flow-control basins, are judged appropriate, their location and design standards should be determined in the context of the watershed analysis.

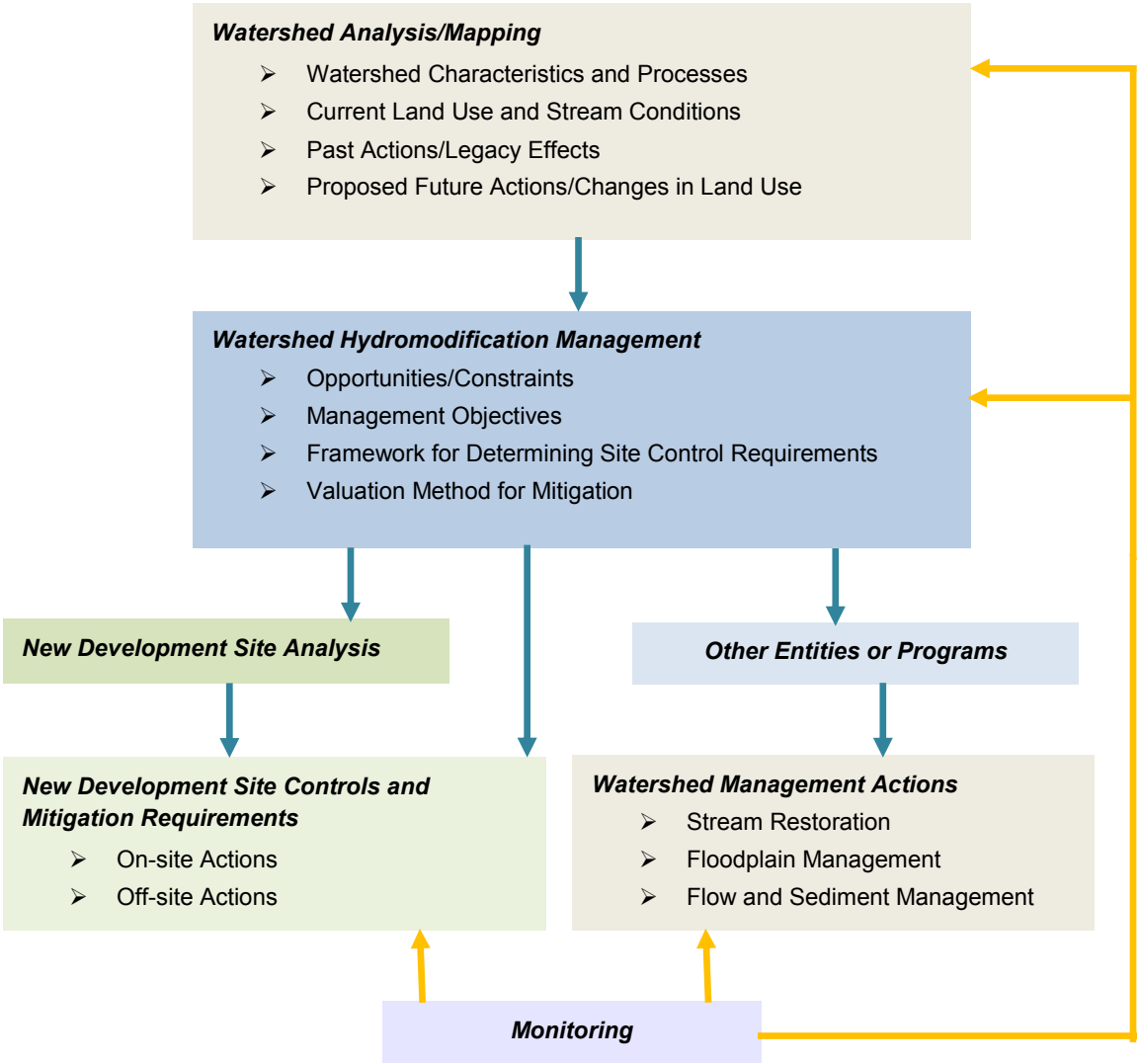

Figure ES-1. Framework for Integrated Hydromodification Management.

An effective management program will likely include combinations of on-site measures (e.g., low-impact development techniques, flow-control basins), in-stream measures (e.g., stream habitat restoration), floodplain and riparian zone actions, and off-site measures. Off-site measures may include compensatory mitigation measures at upstream locations that are designed to help restore and manage flow and sediment yield in the watershed.

Project-specific analysis and design requirements should vary depending on location, discharge point, and size. The range of efforts may include:

- Application of scalable, standardized designs for flow control based on site-specific soil type and drainage design. The assumptions used to develop these scalable designs should be conservative, to account for loss of sediment and uncertainties in the analysis and our understanding of stream impacts.
- Use of an erosion potential metric, based on long-term flow duration analysis and in-stream hydraulic calculations. Guidelines should specify stream reaches where in-stream controls would and would not be allowed to augment on-site flow control.
- Implementation of more detailed hydraulic modeling for projects of significant size or that discharge to reaches of special concern to understand the interaction of sediment supply and flow changes.
- Analysis of the water-balance for projects discharging into streams with sensitive habitat. This may include establishment of requirements for matching metrics such as number of days with flow based on the needs of species present.

Achieving these goals will require that hydromodification management strategies operate across programs beyond those typically regulated by NPDES/MS4 requirements. Successful strategies will need to be developed, coordinated, and implemented through land-use planning, habitat management and restoration, and regulatory programs. Regulatory coordination should include programs administered by the Water Boards, such as non-point source runoff control, Section 401 Water Quality Certifications and Waste Discharge Requirement programs, and traditional stormwater management programs. It should also include other agency programs, such as the Department of Fish and Game Streambed Alteration Program and the Corps of Engineers Section 404 Wetland Regulatory Program. Thus, all levels of the regulatory framework—federal, state, and local—will need to participate in developing and implementing such a program. The integrated watershed-based approach will likely take one or more permit cycles (i.e., at least ten years) to fully implement.

Short- and long-term recommendations for management are summarized in Table ES-1 below.

Table ES-1. Recommendations for implementing watershed-based hydromodification management.

Time Frame	Programmatic: State and Regional Water Boards	Local: City and County Jurisdictions
Short-term (<10 years)	• Establish consistent standards for HMPs • Promote use of watershed approaches in HMPs to move away from reliance on project-based management actions • Develop a valuation method to determine appropriate off-site mitigation • Transition to a broader set of monitoring endpoints including flow, geomorphology, and biology	• Implement watershed analysis of opportunities and constraints related to hydromodification • Implement a broader set of tools to improve on-site management actions • Develop institutional capacity to oversee and review modeling and assessment tools • Develop capacity for information/data management and dissemination
Long-term (1+ decades)	• Develop watershed-based regulatory programs and policies for hydromodification management • Integrate hydromodification management needs into other regulatory programs (e.g. TMDL, 401/WDR)	• Develop institution capacity to implement watershed-based hydromodification programs • Incorporate hydromodification and other water quality management into the land use planning process

To successfully accomplish these various recommendations for implementation, both agencies and private-sector practitioners will need to make use of a range of analytical tools. Such tools generally fall into three categories: descriptive tools, mechanistic models, and empirical/statistical models. Models may be used deterministically and/or in a probabilistic manner. These different types of tools can be selected or combined, depending on the specific objective, such as characterizing stream condition, predicting response, establishing criteria / requirements, or evaluating the effectiveness of management actions. Selection of tools should also consider the type of output, intensity of resource requirements (i.e., data, time, cost), and the extent to which uncertainty is explicitly addressed. It is important to note that deterministic modeling without accompanying probabilistic analysis may mask the uncertainties inherent in predicting hydromodification effects. Short-term and long-term recommendations for the application and improvement of tools to support the management framework are shown in Table ES-2.

Although there is sufficient scientific and engineering understanding of hydromodification causes and effects to begin implementing more effective management approaches now, improvements should be informed and adapted based on subsequent monitoring data. To be useful, monitoring programs should be designed to answer questions and test hypotheses that are implicit in the choice of management actions, such that practices that prove effective can be emphasized in the future (and those that prove ineffective can be abandoned). The focus of monitoring efforts, however, needs to be tailored to the time frame of the questions being addressed and the implementing agency (Table ES-3), reflecting the dual goals and audiences of this document.

Table ES-2. Recommendations for the application and improvement of tools in support of the proposed management framework.

Time Frame	Programmatic: State and Regional Water Boards	Local: City and County Jurisdictions
Short-term (<10 years)	• Develop quality control and standardization for continuous simulation modeling • Perform additional testing and demonstration of probabilistic modeling for geomorphic response • Pursue development of biologically- and physically-based compliance endpoints	• Work cooperatively with adjacent jurisdictions to implement hydromodification risk mapping at the watershed scale • Implement continuous simulation modeling for project impact analysis
Long-term (1+ decades)	• Improve tools for sediment analysis and develop tools for sediment mitigation design • Develop tools for biological response prediction • Improve tools for geomorphic response prediction	• Expand use of probabilistic and statistical modeling for geomorphic response • Apply biological tools for predicting and evaluating waterbody condition

Table ES–3. Recommendations for hydromodification monitoring.

Time Frame	Programmatic: State and Regional Water Boards	Local: City and County Jurisdictions
Short-term (<10 years)	• Define the watershed context for local monitoring (at coarse scale) • Evaluate whether permit requirements are making positive improvements	• Evaluate whether specific projects/ regulations are meeting objectives • Identify the highest priority action(s) to take
Long-term (1+ decades)	• Define watershed context and setting benchmarks for local-scale monitoring (i.e., greater precision, if/as needed) • Demonstrate how permit requirements can improve receiving-water "health," state-wide (and change those requirements, as needed)	• Evaluate and demonstrate whether actions (on-site, instream, and watershed scale) are improving receiving-water conditions • Assess program cost-effectiveness • Identify any critical areas for resource protection

Identifying and, ultimately, achieving the desired conditions in receiving waters requires multiple lines of evidence to characterize condition in an integrative fashion. At their most comprehensive, the chosen metrics should include measures of flow, geomorphic condition, chemistry, and biotic integrity. Biological criteria are key to integrative assessment: in general, biological criteria are more closely related to the designated uses of waterbodies than are physical or chemical measurements. This understanding is reflected in the State's proposed bio-objectives policy, which includes explicit links to hydromodification management.

In summary, transitioning from the current site-based to a more effective watershed-based approach to hydromodification management that addresses both legacy and future impacts will require cooperation between the State and Regional Water Boards and local jurisdictions. Both technical and regulatory/program approaches will need to be updated or revised altogether over the next several permit cycles to realize this long-term goal. Substantial resources will be necessary to realize these goals; therefore, opportunities for joint funding and leveraging of resource should be vigorously pursued from the onset. This cooperative approach should replace the current fragmented efforts among regions and jurisdictions.

1. Overview and Intended Uses of the Document

1.1 Overall Objectives and Intended Audience

Regulation and management of hydromodification is in its infancy in California. As with any new endeavor, initial attempts to meet this need is unproven, inconsistent, and relatively narrow in focus. To improve on existing efforts, the State Water Resources Control Board (SWRCB) has engaged a team of experts to provide technical support to both regulators and permittees for development of Hydromodification Management Plans (HMPs) and their associated permit requirements. This resulting document has two goals and hence two audiences.

The first goal of this document is to provide broad perspectives on what would constitute effective hydromodification assessment, management and monitoring, based on our current best scientific understanding of the topic. The audience for this goal is primarily the State and Regional Water Boards, since meeting this goal will require integration of watershed and site-scale activities that are likely beyond the control or responsibility of any individual municipality. Success will require fundamental changes in the regulatory and management approach to hydromodification that will likely be possible only iteratively and potentially requiring one or more NPDES permit cycles to fully implement. The State and Regional Water Boards will need to provide leadership in implementing these changes, but they will also need to work cooperatively with permittees so that planning, management and monitoring programs can be adapted to operate in a more integrated manner over the broader spatial scales and longer time frames that are necessary to achieve genuine success. Furthermore, hydromodification management plans will need to address preexisting conditions from previous (i.e., legacy) land uses. Clearly, addressing such past effects will require approaches beyond regulation of new development.

This document provides broad perspectives on what would constitute effective hydromodification assessment, management and monitoring, based on our current best scientific understanding of the topic. The document also provides near-term technical assistance for implementing current and pending hydromodification management requirements.

The second goal of this document is to provide near-term technical assistance for implementing current and pending hydromodification management requirements. This goal can be achieved by municipalities within the construct of existing programs, and therefore the primary audience for this aspect of the document is MS4 permittees. Achieving this goal will facilitate greater consistency and effectiveness between HMPs, giving them a stronger basis in current scientific understanding, and will also serve as initial steps toward realizing the broader goal stated above.

1.2 Rationale and Justification

The process of urbanization has the potential to affect stream courses by altering watershed hydrology and geomorphic processes. Development and redevelopment can increase impervious surfaces on formerly undeveloped landscapes and reduce the capacity of remaining pervious surfaces to capture and infiltrate rainfall. The most immediate result is that as a watershed develops, a larger percentage of

rainfall becomes surface runoff during any given storm. In addition, runoff reaches the stream channel much more efficiently, so that the peak discharge rates for floods are higher for an equivalent rainfall than they were prior to development. This process has been termed hydromodification. In some instances, direct channel alteration such as construction of dams and channel armoring has also been termed "hydromodification." Such direct alterations are not the focus of this document. Rather, this document focuses on the geomorphic and biological changes associated with changes in land use in the contributing watershed, which in turn alter patterns and rates of runoff and sediment yield. These changes can result in adverse impacts to channel form, stream habitat, surface water quality, and water supply that can alter habitat and threaten infrastructure, homes, and businesses.

The State and Regional Water Boards have recognized the need to manage and control the effects of hydromodification in order to protect beneficial uses in streams and other receiving water bodies. This recognition has led to the inclusion of requirements for development of "hydromodification management plans" (HMPs) in many Phase 1 and some Phase 2 Municipal Stormwater (MS4) permits. Most HMPs require the permitted municipalities to develop programs and policies to assess the potential effects of hydromodification associated with new development and redevelopment, to require the inclusion of management measures to control the impacts of hydromodification, and to develop monitoring programs to assess the effectiveness of HMP implementation at controlling and/or mitigating the impacts of hydromodification.

Development of HMPs is challenging for several reasons. First, there are few accepted approaches for assessing the impacts of hydromodification. Traditional modeling tools are generally untested and may be difficult to apply or inappropriate for use in some California watersheds and streams. Responses of streams to hydromodification are difficult to assess, given inherent climatic variability and the highly stochastic nature of rainfall and the resulting response of streams to runoff events. There are few local examples or case studies from which to draw experiences or conclusions.

As a result of these challenges, individual HMPs to date have utilized a variety of approaches with little coordination or consistency between them. Little information is available on the relative efficacy of any of these approaches. Furthermore, where approaches and tools developed for HMPs in one region of the State (or even from a different region of the country altogether) have been used in subsequent HMPs elsewhere, there has been little or no consideration of the effect of regional climatological or physiographical differences on the transferability of analytical techniques and tools.

1.3 Need for an Expanded Approach

Current site-based hydromodification management approaches are limited in their ability to address the underlying processes that are responsible for most deleterious impacts of hydromodification. Hydromodification effects, by definition, are watershed-dependent processes that are influenced by water and sediment discharge, movement, and storage patterns that may be occurring up- or downstream of a specific project site. Ideally, then, the first step of any hydromodification management plan (HMP) should be a watershed analysis; management of processes at the site or project scale should be done only in the context of such a watershed analysis. Understanding larger-scale processes

facilitates prioritization of activities in areas of greatest need and allows for management measures to be located where they have the largest potential benefit, even if that is not on or adjacent to the project site where the current impact is occurring. It also allows for expansion of site based management beyond simple flow control and/or channel stabilization toward strategies that consider flow, sediment, and biological conditions as an integrated set of desired endpoints.

Because watershed boundaries are often not the same as geopolitical boundaries of cities or counties, incorporation of watershed analysis will require leadership from the State and Regional Water Boards. Changes to the current regulatory structure may be necessary to accommodate inter-jurisdictional cooperation and regional information sharing. Similarly, program implementation by both large and small municipalities must include mechanisms that allow site-specific decisions to be informed by watershed-scale analysis.

This document is intended to help address some of these challenges and needs by providing technical recommendations, both to state and regional program developers and to local implementing agencies, for assessment, modeling, development of management strategies, and monitoring. This document can support current HMP development and, at the same time, serve as a first step toward achieving the longer term goals of more integrated, watershed-based hydromodification management.

Current site-based approaches are limited in their ability to address the underlying processes that are responsible for hydromodification impacts.

Effective management of hydromodification will require coordinated approaches across programs at the watershed scale that address all aspects of runoff, sediment generation and storage, instream habitat, and floodplain management.

Adopting this broader approach means that managing the effects of hydromodification cannot be the purview of the stormwater (MS4) program alone. Effective management of hydromodification will require coordinated approaches across programs at the watershed scale that address all aspects of runoff, sediment generation and storage, instream habitat, and floodplain management. Various SWRCB programs have the opportunity and ability to contribute to the goals of comprehensive hydromodification management, including the non-point source control program, water quality certifications, waste discharge requirements, basin planning, SWAMP, and the emerging State Wetland Policy and Freshwater Bio-objectives program. Each of these programs can take advantage of the tools and approaches outlined in this paper to contribute to coordinated management of hydromodification in order to protect beneficial uses and meet basin plan objectives. Furthermore, successful control and mitigation of hydromodification effects will support other programs by improving water quality, enhancing groundwater recharge, and protecting habitat. Therefore, hydromodification management can be a unifying element of many programs and support integrated regional watershed planning.

It is important to note that hydromodification has the potential to affect all water body types; therefore, HMPs should address potential effects to all streams and receiving waters. Because streams are most directly affected by hydromodification, they have been the focus of current regulatory requirements and, therefore, most HMPs. Consequently, this document emphasizes tools and approaches applicable

to fluvial systems, which are broadly defined to include wadeable streams, large rivers, headwater streams, intermittent and ephemeral drainages, and alluvial fans (although new specific tools may be necessary for assessment and management of alluvial fans). We recognize, however, that hydromodification can also affect nearshore and coastal environments, including bays, harbors, and estuaries, by altering estuary channel structure, water quality, sand delivery, siltation, and salinity. These effects have been less extensively studied or documented and have received substantially less attention in current hydromodification requirements. Future efforts should more directly address hydromodification effects to all receiving waters, but the information is not presently available to provide equally comprehensive guidance here.

1.4 Scope and Organization

This document is not intended to be prescriptive or to serve as a "cookbook" for development of hydromodification management strategies. Rather, it is a resource to evaluate the utility of existing tools and approaches, and it proposes a framework for integrating multiple approaches for more comprehensive assessment and management. This framework should be used to aid in the development of HMPs that are appropriate for specific regions and settings and take advantage of the best available science. It can also be used to improve consistency in assessment and monitoring approaches so that information collected across regions and programs can be compiled and leveraged to provide more comprehensive assessments of the effectiveness of management actions. Ultimately, such consistency should improve the effectiveness of all programs.

The authors, a team of technical experts, developed the content for this document in consultation with agency staff and regulated entities. The document begins with a brief general discussion of the effects of hydromodification and stream response mechanisms, providing the best available science to support subsequent recommendations. The main body of the document focuses on presenting a proposed new management paradigm where site-based management is nested within an overall watershed assessment that accounts for past, current, and proposed future land use. The body of the document also includes a discussion of existing tools and how they can be used more effectively and appropriately to evaluate potential impacts and guide decisions on selection and design of management practices. The third major section of the document focuses on monitoring that includes evaluation of hydrologic, geomorphic, and biologic conditions with an overriding goal of adaptive management. The document concludes with several technical appendices that offer specific guidance on the appropriate application of tools and models within the existing HMP approaches, and a bibliography of resources.

2. HYDROMODIFICATION SCIENCE

2.1 Introduction

Land-use changes can alter a wide variety of watershed processes, including site water balance, surface and near-surface runoff, groundwater recharge, and sediment delivery and transport. Although alteration to these watershed processes (referred to collectively as hydromodification) can affect many elements of a landscape, the focus of this document is on impacts to stream systems. Furthermore, while this paper will often refer to urbanization, it is recognized that other types of land-use changes (grazing, agricultural, forestry, etc.) can have similar impacts. This section reviews relevant hydrologic processes and summarizes the impact of urbanization on hydrologic, biologic, and geomorphic systems, and it describes our current understanding of the physical mechanisms underlying these impacts. This provides a foundation for establishing assessment tools and predictive models, as well as for developing management and monitoring programs.

Although not addressed by this report, urbanization also has a range of effects on water quality (*Heaney and Huber* 1984, *Brabec et al.* 2002) by increasing pollutant loads (*Owe et al.* 1982), increasing nutrient loads (*Wanielista and Yousef* 1993, *Hubertz and Cahoon* 1999), and diluting dissolved minerals through increased runoff and decreased infiltration and soil contact (*Loucaides et al.* 2007). As a result of both its physical and chemical effects, urbanization also affects the integrity of biota (*Heaney and Huber* 1984) including fishes (*Klein* 1979, *Weaver and Garman* 1994, *Wang et al.* 2000) and invertebrates (*Sonneman et al.* 2001, *Wang and Kanehl* 2003). These impacts are acknowledged and evaluated in the discussion of monitoring Section 4, but the details of their interactions and effects are not otherwise addressed here.

Land-use changes can alter a wide variety of watershed processes, including site water balance, surface and near-surface runoff, groundwater recharge, and sediment delivery and transport. Alteration to these watershed processes are referred to collectively as hydromodification.

2.2 Hydrology Overview

To understand the effects of urbanization, the basic processes of the hydrologic system must be highlighted. A watershed's drainage system consists of all the features of the landscape that water flows over or through (*Booth* 1991). These features include vegetation, soil, underlying bedrock, and stream channels. Urban elements such as roofs, gutters, storm sewers, culverts, pipes, impervious surfaces such as parking lots and roads, and cleared and compacted surfaces fundamentally change the rate and character of hydrologic processes. Generally, the hydrologic changes associated with development and urbanization increases the speed and efficiency with which water enters and moves through the drainage system. In undeveloped watersheds, only a portion of the precipitation that falls ever enters the stream channel. Instead, precipitation may be: 1) evaporated off the ground surface or intercepted by vegetation and evaporated; 2) transpired from the soil; or 3) infiltrated deeply into regional aquifers. For the portion of precipitation that ultimately enters the stream, the rate and processes of delivery vary between watersheds, with important implications for how urbanization will affect runoff.

Flow can be classified as stormflow (or "quickflow") if it enters the stream channel within a day or two of rainfall (*Dunne and Leopold* 1978). Quickflow occurs through 1) infiltration excess (also called "Horton") overland flow, wherever rainfall intensity exceeds the infiltration capacity of the soil and water flows over the ground surface; 2) saturation excess overland flow, where overland flow occurs following filling of all pore space in surface soils; 3) shallow subsurface flow, where water flows relatively quickly through permeable shallow soils (but still more slowly than either Horton or saturation overland flow); and 4) precipitation directly into stream channels. Conversely, water that infiltrates more deeply is classified as delayed flow, because it travels slowly as deep groundwater and emerges into a stream slowly over time.

As a storm progresses, runoff patterns and rates can change, even within the same catchment. For example, surficial soils may become saturated during the course of a storm (or a storm season) as the water table rises, and this can induce a shift in runoff from shallow (or even deep) subsurface flow to the quickflow process of saturation excess overland flow (*Booth* 1991). Even under scenarios in which rainfall intensity exceeds infiltration capacity, Horton overland flow will not be connected to stream channels until surface depressions are filled.

2.3 Impacts of Urbanization

The archetypal model of development involves clearing vegetation; grading, removing, and compacting soils; building roads and stormwater sewers; constructing buildings; and re-landscaping. The specific ways in which these activities alter runoff processes are discussed below. Development may also directly alter stream, such as through channel straightening, levee construction, and flood control reservoirs; however, discussion of the impacts of these alterations is beyond the scope of this document.

2.3.1 Decreased Interception

When rainfall occurs in a watershed, some of the precipitation will be intercepted by vegetation and leaf litter and prevented from entering the stream channel network (Figure 2-1). The percentage of precipitation that can be intercepted varies according to cover type and the character of rainfall (rainfall intensity, storm duration, storm frequency, evaporation conditions) (*Dunne and Leopold* 1978). The effectiveness of interception decreases as a storm progresses because once the surface area of a tree is completely wetted, water will drip off leaves and run down the vegetation as stem flow. Typically, 10-35% of precipitation is intercepted by trees and 5-20% by crops, though these amounts vary widely (*Dunne and Leopold* 1978, *Xiao and McPherson* 2002, *Reid and Lewis* 2009, *Miralles et al.* 2010). In urban environments where vegetative cover is greatly reduced, landscape-scale interception may be lower by an order of magnitude (*Xiao and McPherson* 2002). Precipitation that is not intercepted enters the drainage system. Thus, the mere reduction in interception in urban areas may produce the hydrologic equivalent of a storm that is 10-30% larger.

Figure 2-1. Vegetation reduces runoff by intercepting a portion of the total rainfall and preventing water from entering the drainage system. (Illustration by Jennifer Natali).

The influence of urbanization on climate is complex and varied. For example, urbanization has been shown to increase temperature (*Kalnay and Cai* 2003), increase or decrease wind speeds (*Oke* 1978, *Balling and Brazel* 1987, *Grimmond* 2007), increase pan-evaporation rates (*Balling and Brazel* 1987), and increase shading of the ground surface (*Kalnay and Cai* 2003). In most studies of urban hydrology, the dynamics of evapotranspiration (ET) are typically, explicitly or implicitly, ignored (*Grimmond and Oke* 1999). This exclusion exists because of the widespread assumption that urban ET is negligible compared to rural areas with higher proportions of vegetation-covered soils (*Chandler* 1976, *Oke* 1979). In cases such as urban deforestation in the temperate Eastern United States, it is appropriate to assume a net loss of ET due to urbanization (*Bosch and Hewlett* 1982, *Sun et al.* 2005, *Roy et al.* 2009). However, spatial variability and the site-specific dynamics of climate, vegetation, and land-use should be considered carefully in arid and semi-arid regions where vegetation is limited prior to development. In drier climates (including much of southern California), primary productivity (and ET) may be substantially increased through the irrigation of urban landscaping (*Buyantuyev and Wu* 2008).

2.3.2 Decreased Infiltration

Infiltration in urban areas is decreased due to several factors: impermeable surfaces such as roads, parking lots, and roofs prevent infiltration by blocking water from reaching soils; heavy-equipment construction operations cause soil compaction and degrade soil structures; construction projects may remove surface soils and expose subsurface soils with poorer infiltration capacity; vegetation-clearing and bare-earth construction increase erosion and loss of topsoil (*Pitt et al.* 2008). The effect of impervious surfaces is intuitive, visible, and dramatic (*Booth and Jackson* 1997), but not all impervious areas affect runoff processes equally. For example, if an impervious surface is built over clayey soils with poor infiltration, the overall runoff rates will be less affected than if built over sandy soils with high natural infiltration rates. While the loss of pervious area has received substantial attention within scientific and policy communities, until recent years considerably less attention has been paid to the effects of compaction and the reductions in infiltration capacity of soils (*Pitt et al.* 2008). Commonly, an area of green is assumed to be permeable, but playing fields and even ornamental lawns may have very

low infiltration capacities (*Pitt et al.* 2008). A study of urban runoff in Washington found that impervious areas generated only 20% more runoff than what appeared to be green, pervious areas of lawns (*Wigmosta et al.* 1994). Factors such as excavation and lawn-establishment methods appear to be more significant for infiltration than any other factor including grain size of the original sediments (*Hamilton and Waddington* 1999). Tillage may increase infiltration slightly, while compost or peat soil amendments can increase infiltration by 29 to 50 percent (*Kolsti et al.* 1995).

2.3.3 Increased Connectivity and Efficiency of the Drainage System

Rainfall in urban areas moves quickly as overland flow into storm sewers and the stream channel network (Figure 2-2). The delivery of precipitation into urban stream channels is extremely efficient, transforming essentially all precipitation into stormflow and creating nearly instantaneous runoff. Under natural conditions, in contrast, most runoff to streams is via groundwater paths that typically flow at least one or two orders of magnitude slower than surface water. Thus converting subsurface flow into surface stormflow has dramatic consequences. Furthermore, artificial surfaces such as roofs, pavement, and storm sewers are 1) straight, which shortens the travel distance required for delivery into the channel network; and 2) smooth, which decreases friction and allows flow to travel more quickly than in natural channels (*Hollis* 1975). Storm sewer systems increase the density of "channels," which further shortens runoff travel distances (Figure 2-3). In particular, upland regions that may not have had any surface channels prior to urbanization are frequently fitted with storm sewers, which dramatically increase delivery efficiency into the channel network (*Roy et al.* 2009). In sum, urbanization transforms watershed processes and flow paths that were once slow, circuitous, and disconnected into engineered and non-engineered systems that are highly efficient, direct, and connected.

In contrast to the slow measured runoff to natural streams by surface and subsurface pathways, the delivery of precipitation into urban stream channels is extremely efficient, transforming essentially all precipitation into stormflow and creating nearly instantaneous runoff.

2.3.4 Decreased Infiltration into Stream Beds

Concreting of bed and banks, channel narrowing, and channel straightening limit infiltration from a stream into the ground. Concrete channel margins create infiltration barriers, while channel narrowing and straightening limit the surface area accessible for infiltration and also create a less complex channel. Channel complexity such as pools, riffles, steps, and debris dams create hydraulics that slow flow velocities and also divert water into the subsurface (*Lautz et al.* 2005). In arid and semi-arid watersheds where streams may flow only occasionally, infiltration through bed, banks, and floodplain areas may significantly lower peak flows and may sustain aquifers vital to regional water supplies and natural habitats (*Kresan* 1988, *Dahan et al.* 2008). Increasing recognition is being paid in the scientific literature to the infiltration services provided by natural channels and floodplains (*Macheleidt et al.* 2006, *Schubert* 2006).

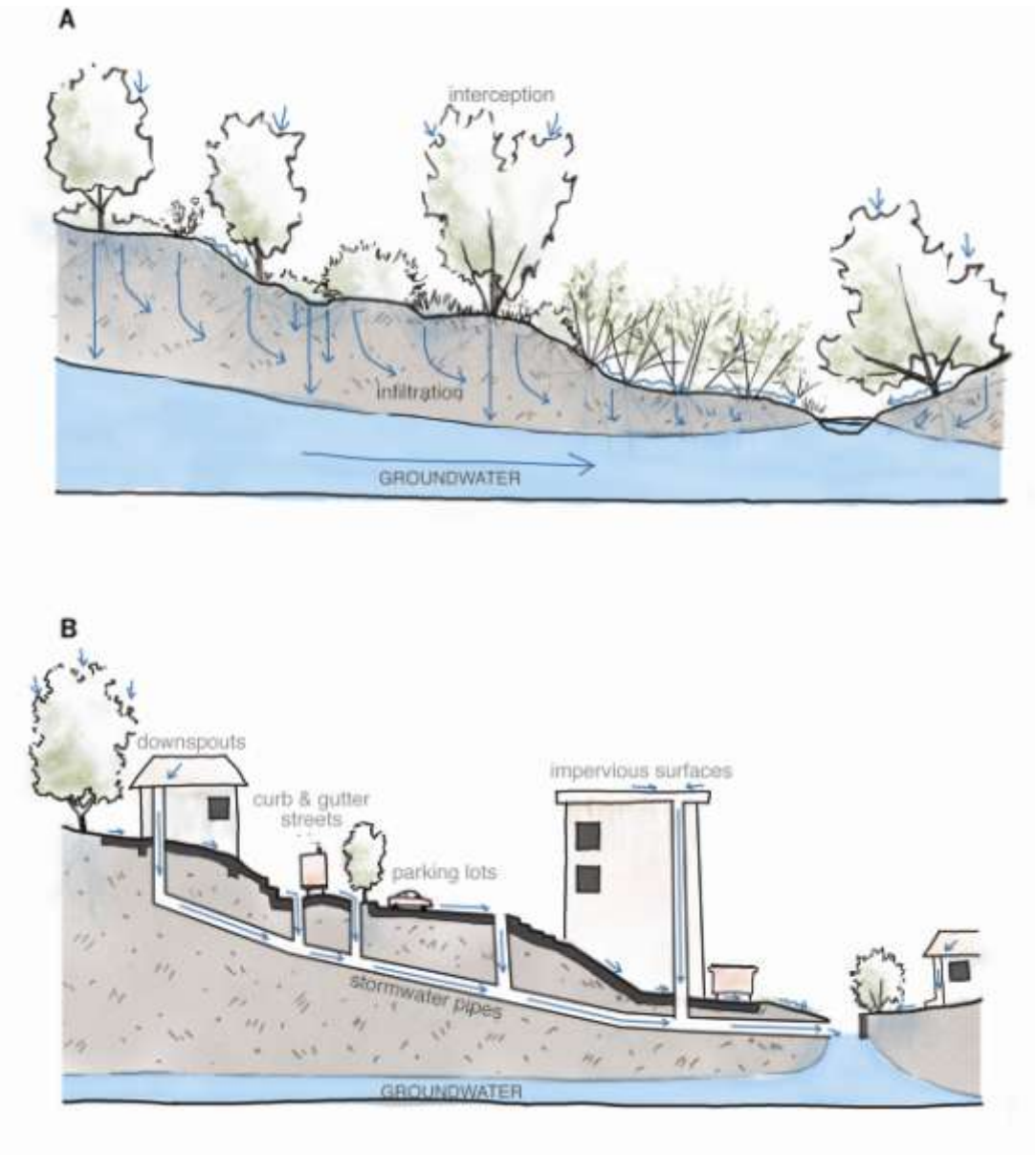

Figure 2-2. Stormwater flowpaths are shortened and quickened through paving, building, soil compaction, and sewer infrastructure. The rapid concentration of streamflow increases storm peaks. Rapid runoff and reduced infiltration prevent groundwater recharge. (Illustration by Jennifer Natali).

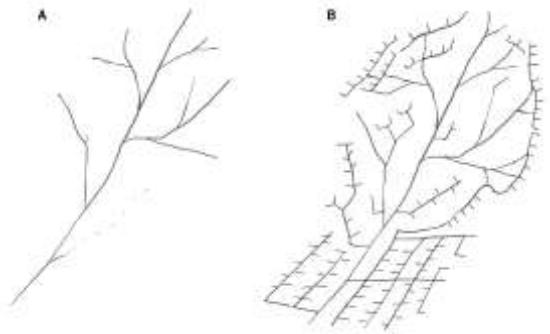

Figure 2-3. Increased surface runoff causes an extension of the channel network. This occurs through increased channel erosion or through constructed networks (to manage increased surface flow). The expanded channel network delivers runoff to downstream reaches much more efficiently. (Illustration by Jennifer Natali).

2.4 Changes in Instream Flow

The instream flow changes resulting from urbanization depend upon site-specific watershed and development characteristics, but typically they include modification of the timing, frequency, magnitude, and duration of both stormflows and baseflow. Urbanization has been shown to increase the magnitude of stormflows, increase the frequency of flood events, decrease the lag time to peak flow, and quicken the flow recession (Figure 2-4; *Hollis* 1975, *Konrad and Booth* 2005, *Walsh et al.* 2005). Because the effects of urbanization manifest differently for different components of the hydrograph, the hydrologic alterations of moderate storms, large storms, and baseflow are discussed individually below.

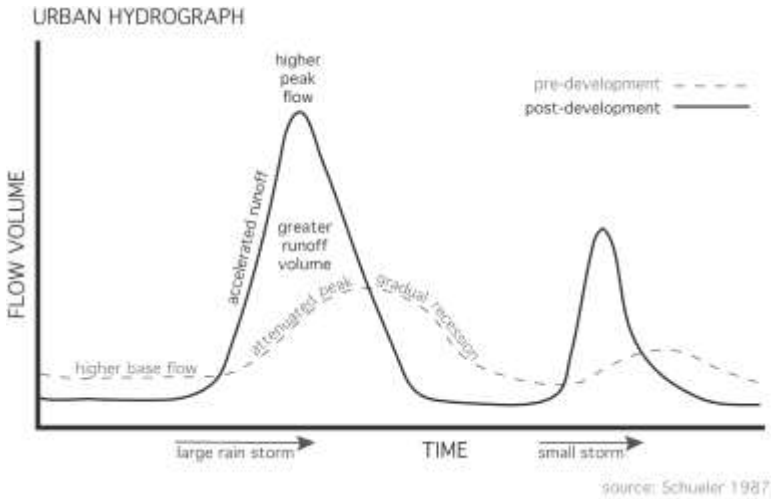

Figure 2-4. Increased runoff efficiency causes higher magnitude peak flows, shorter duration runoff events, decreased baseflow, and dramatic increases in small storms that may have generated little or no runoff under pre-development conditions. (Illustration by Jennifer Natali).

2.4.1 Moderate Stormflow

Urbanization of a watershed can drastically increase the frequency and magnitude of small and moderate flow events (Hawley and Bledsoe 2011). The magnitude of flow amplification increases generally in proportion to the amount of impervious area (*Leopold* 1968, *Hollis* 1975). For example, flows with a return period of one year or longer were shown to be unaffected by paving 5% of the watershed, yet the magnitude of a one-year flow could be more than ten times higher when 20% of a watershed is paved (*Hollis* 1975). In undeveloped watersheds, small storms may not generate any overland flow or streamflow increase at all, because interception, infiltration, soil absorption, and evapotranspiration contain all the precipitation.

Urbanization of a watershed can drastically increase the frequency, duration, and magnitude of small and moderate flow events by factors of 10 or more.

The change to a flashier regime with larger magnitude streamflow generated from small and moderate storms has two primary consequences. First, the stream power and sediment-transport capacity of the stream increase significantly, potentially creating channel erosion and/or stressing instream biota. Second, the season of stormflow is likely to be extended. In undeveloped watersheds, early or late-season storms typically do not generate significant runoff because soils are dry, can effectively absorb most precipitation, and therefore do not generate overland flow or streamflow. Antecedent moisture conditions are less important in urban watersheds where overland flow is generated regardless, and streamflow is generated by even a small storm in a dry watershed. Through magnifying small and moderate storms, urbanization may increase the duration of sediment-transporting and habitat-disturbing flows by factors of 10 or more (*Booth* 1991, *Booth and Jackson* 1997).

2.4.2 Large, Infrequent Storms

In large storms with return intervals of 10 or more years, the influence of urbanization is less pronounced though still present. Whereas a 1-year stormflow may be increased by ten times by paving 20% of the watershed, historical data from humid-region watersheds suggest that the peak magnitude of a 100-year flood would not even be doubled (*Hollis* 1975). The diminishing influence of urbanization on floods of higher recurrence intervals is understood by recognizing that the hydrologic processes of large storms resemble the processes of urban runoff. Essentially, a 100-yr flood is an event that is long in duration, severe in intensity, and likely occurs when soils are already wet. Even in an undeveloped watershed, a storm of this magnitude can typically generate (saturation) overland flow and transport water efficiently into the channel network in a manner more generally comparable to an urban setting.

2.4.3 Baseflow

Urbanization does not affect instream baseflows consistently. Many studies have documented baseflow reductions and/or lowered groundwater levels that have been attributed to decreased infiltration (*Simmons and Reynolds* 1982, *Ferguson and Suckling* 1990) and groundwater extraction (*Postel* 2000). In extreme cases, baseflow in urban watersheds can disappear completely during drought years, dry

seasons, or even between storm events during the wet season. The effect of reducing infiltration may be counteracted in urban and suburban landscapes, however, through irrigation of lawns, parks, golf courses, and other water inputs such as septic systems, leaky pipes, and sewage treatment outflow which typically import water from outside the watershed and contribute to both streamflow and groundwater recharge (*Konrad and Booth* 2005, *Walsh et al.* 2005, *Roy et al.* 2009). Indeed, imported water volumes in very dense cities may be an order of magnitude greater than precipitation. Lerner (2002) judged that leakage in water importation and delivery infrastructure typically ranges from 20-50%, and in general this leakage will increase groundwater recharge in urban areas. Similarly, other studies have found municipal irrigation capable of raising groundwater levels and causing surface flooding (*Rushton and Al-Othman* 1994) and changing ephemeral streams into perennial streams (*Rubin and Hecht* 2006, *Roy et al.* 2009). In summary, the magnitude and direction baseflow and groundwater recharge alteration depends on climate, land use, water use, and the infrastructure system of the watershed. There are no simple "rules."

2.5 Changes in Sediment Yield

The role of watershed sediment yield in the behavior of watersheds was first characterized systematically by Wolman (1967) in a three-part conceptual framework of how rivers respond to urban development, in which 1) pre-development quasi-equilibrium conditions are followed by 2) a period of active construction involving grading, vegetation removal, and bare earth exposed to erosion; and 3) the establishment of an urban landscape consisting of pavement, houses, gutters and sewers etc. The construction period is marked by an increase in sediment (typically 2-10 times pre-development rates) produced from bare surfaces and the disturbances associated with construction (*Chin* 2006). The sediment produced during construction is often deposited within stream channels, initiating aggradation and/or channel widening. Following the construction period, sediment production decreases (Figure 2-5) and runoff increases, resulting in increased transport capacity and the potential for severe channel erosion that can result in channel enlargement of commonly 2-3 (and as much as 15) times the original channel cross-section (*Chin* 2006). Changes in post-construction sediment production rates are not well studied, though case studies have found sediment yields in post-construction watersheds to be somewhat higher than rural, undeveloped basins.

The combination of increased runoff and decreased sediment production can result in channel enlargement of commonly 2-3 (and as much as 15) times the original channel cross-section.

Post-construction sediment loads are typically derived from channel enlargement as a result of increased peak flows and the legacy of construction-phase disturbance (*Trimble* 1997, *Nelson and Booth* 2002). The rate of decline in post-construction sediment yields is therefore predominantly controlled by the degree of channel instability caused by the construction phase and the effect of increased peak flows. If the channel margins are armored, densely vegetated, or otherwise erosion resistant, sediment yields may decline quickly following urbanization. If channel instability ensues, elevated sediment yields may persist for decades or more.

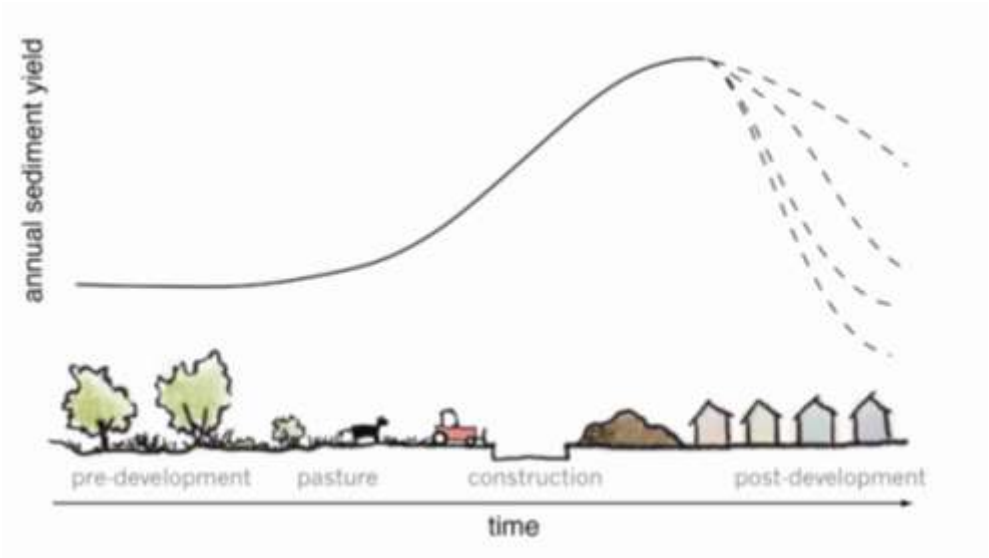

Figure 2-5. Increased sediment yields occur during the land-clearing and construction phases of development. Post-construction sediment yields decrease, though the rate of decrease varies considerably depending on the degree of channel instability caused by the construction phase and by increased runoff. (Illustration by Jennifer Natali).

2.6 Impacts on Channel Form and Stability

Channel form and stability reflect both hydrologic and geomorphic processes. Changes to runoff characteristics and sediment supply can affect all aspects of stream morphology, including planform, cross-sectional geometry, longitudinal profile, bed topography (e.g., pools, riffles), and bed sediment size and mobility. While many factors influence the type and degree of impacts (discussed below), a suite of commonly observed morphological changes due to hydromodification include channel enlargement (incision and widening), decreased bank stability, increased local sediment yield from eroding reaches, overall simplification of stream habitat features such as pools and riffles, changes in bed substrate conditions, loss of connectivity between channel and floodplain (*Segura and Booth* 2010), and changes in sediment delivery to coastal waters (*Jacobson et al.* 2001). Impacts may also propagate upstream as headcuts resulting from reductions in base level due to excess erosion. Likewise, tributaries entering downstream of a developed area may also experience the upstream propagation of headcuts due to base level reductions of the mainstem.

In addition to Jacobson *et al.* (2001), two well-researched literature reviews of morphological impacts (as well impacts to riparian habitat and biota) can be found in: “Impacts of Impervious Cover on Aquatic Systems” by The Center for Watershed Protection (2003) and “Physical Effects of Wet Weather Flows on Aquatic Habitats: Present Knowledge and Research Needs” published by Water Environment Research Foundation (*Roesner and Bledsoe* 2003). Note that these two studies differ significantly in how they

synthesize and interpret the reviewed literature, and the CWP publication acknowledges that it does not necessarily apply to streams in the arid west.

2.6.1 Physical Principles Underlying Channel Impacts

A convenient conceptual framework for the physical impacts of hydromodification on stream morphology is "Lane's Balance" (*Lane* 1955; Figure 2-6). This framework encapsulates a fundamental (albeit qualitative) relationship between the hydrologic and geomorphic processes that balance water flow and sediment in a channel. It expresses the condition of sediment transport capacity, as controlled by water discharge and slope, in broad balance with the supplied load and size of bed sediment for a channel in equilibrium. An increase in streamflow or a decrease in sediment supply (for example) will typically initiate a corresponding decrease in slope and/or increase in grain size in order to reestablish equilibrium. That decrease in slope is expressed by channel incision or degradation. In contrast, an increase in sediment supply or decrease in streamflow will typically result in aggradation and a corresponding increase in slope.

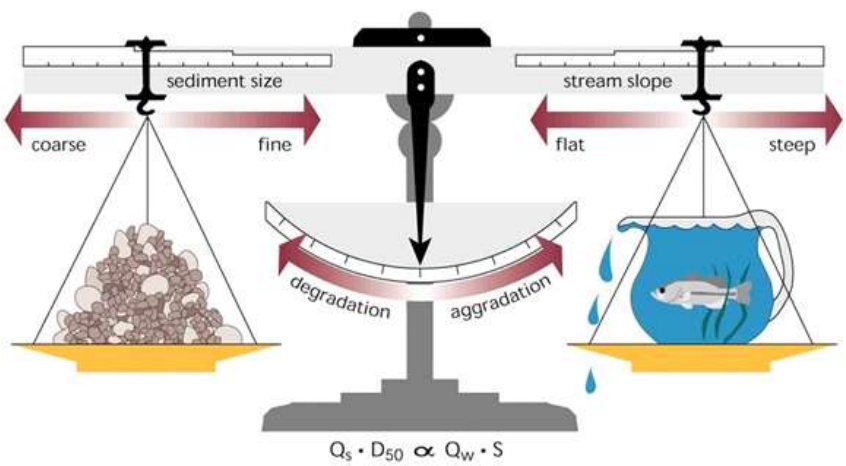

Figure 2-6. Lane's Balance, showing the interrelationship between sediment discharge (Q_s), median bed sediment size (D_{50}), water discharge (Q_w), and channel slope (S).

Slope and grain size are not the only modes of adjustment, as stream channels have many more degrees of freedom in responding to changes in streamflow and sediment supply. For example, Schumm (1969) extended Lane's Balance to include width, depth, sinuosity, and meander wavelength. More quantitatively (and more complexly), adjustments to channel form resulting from hydromodification are controlled by interactions among flow-generated shear stresses (described by hydraulic equations for open channel flow, as a function of channel geometry, roughness, and longitudinal slope), inflowing sediment load, and the shear strength of the bed and bank sediments (a function of their size distribution and cohesiveness).

2.6.2 Natural Variability in Stream Systems

Understanding natural variability in streams is critical to predicting and assessing anthropogenic impacts. A stream may be considered "stable" or "at equilibrium" when its overall planform, cross-section and profile are maintained with no net degradation or aggradation within a range of variance, over extended timeframes (*Mackin* 1948, *Schumm* 1977, *Leopold and Bull* 1979, *Biedenharn et al.* 1997). Such systems can often withstand short-term disturbances without significant change. Even without discrete disturbances, natural streams may be in a state of dynamic equilibrium (*Schumm* 1977), where the channel exhibits stability over the long term even while actively migrating laterally such that erosion of outer banks is accompanied by sediment deposition and bar building on inner banks. Streams may also be fluctuating between aggradation/ degradation/ stability, all within a limited range of conditions. A large-scale event, like a flood or landslide, can cause dramatic changes in channel form, but the channel will often re-established its pre-event planform, geometry and slope over time.

In contrast, a persistent alteration like hydromodification can cause the rate of change to increase. As a result, the channel may begin an evolutionary (or catastrophic) change in morphology, leading to enlargement and instability. A geomorphic threshold is the condition at which there is an abrupt and significant channel adjustment or failure because the channel has evolved to a critical situation. It is the condition at which the proverbial straw breaks the camel's back. Channels that are near a geomorphic threshold can exhibit significant adjustments in response to a relatively small degree of hydromodification. For example, a channel with banks that are near the height and angle for geotechnical failure may widen abruptly due to slight incision.

2.6.3 The Role of Sediment Transport and Flow Frequency in Channel Morphology

Extensive research has been devoted to establishing specific relationships between flow frequency and characteristics of channel morphology. The concept of "effective discharge" was introduced by Wolman and Miller (1960), using a magnitude-frequency analysis to assess the effectiveness of flow events to transport sediment. They concluded that, for the rivers in their analysis, relatively frequent events (occurring on average about 1 times/year) are most effective over the long term in transporting sediment. This concept has formed the basis for a large body of literature (and occasional controversy) over the subsequent five decades relating to the relationships between these flow frequencies and principal channel dimensions (e.g., bankfull stage, width-to-depth ratio), and the application of these relationships to stream design and restoration, as well as prediction and control of hydromodification impacts. Much of the controversy has related to the use of a single event ("dominant discharge" or "bankfull flow") as the basis for such applications, with the implicit assumption that control for that single discharge will result in commensurate channel changes regardless of the distribution of flow frequencies and flow durations over a wider range of discharges.

More recently, the concept of a *range* of moderately frequent, "geomorphically significant" flows that transport the majority of the sediment over the long term (King County 1990, *Bledsoe* 2002, *Roesner and Bledsoe* 2003) was proposed to replace the focus on a single event. The geomorphically significant flow range is considered to be the most influential in determining channel form, as this collective group

of flows typically does the most "work" on the channel boundary over engineering time scales. Controlling changes to the frequency of flows within this range is therefore critical to reducing impacts to stream morphology, and is the scientific basis for the "flow-duration" control criteria discussed in the following sections. A flow-duration criterion aims to match the pre-development volumes, durations, and frequencies of this critical range of sediment transporting flows over a period of many decades. Even this concept, however, relies on the implicit assumption that infrequent large events, no matter how dramatic their effects, typically occur "too infrequently" to reset channel morphology and habitat over the timescales of concern in meeting regulatory requirements. These events are typically managed through traditional flood control practices as opposed to hydromodification management.

A flow-duration management approach aims to match the pre-development volumes, durations, and frequencies of this critical range of sediment transporting flows over a period of many decades.

2.6.4 Applicability to California Streams

The traditional concepts of dynamic equilibrium in streams and geomorphically significant flows, discussed above, derive largely from studies on perennial streams in humid areas. An important question is: to what extent do these concepts apply to managing hydromodification impacts to streams within arid and semi-arid areas (such as large portions of California, and particularly the southern and eastern regions)? In such climate regions, precipitation is highly variable, with low annual totals and episodic, large events. Many streams are ephemeral or intermittent and located in a setting of extremely high sediment production associated with erosive geology resulting from high rates of tectonic uplift, sparse vegetative cover and frequent fires (*Graf* 1988, *Stillwater Sciences* 2007). These streams are often characterized by multi-thread sand-bed channels that are inherently unstable and readily respond to changes in flow conditions. In the ephemeral streams described by Bull (1997), for example, the natural behavior is one of alternating periods and locations of aggradation and degradation, varying both temporally and spatially. In such "episodic" streams, the vast majority of sediment may be moved by extreme, highly infrequent events. The importance of understanding the role of episodic events has been emphasized for semi-arid and arid fluvial systems (e.g., *Wolman and Gerson* 1978, *Brunsden and Thornes* 1979, *Yu and Wolman* 1987). The latter authors reviewed concepts of frequency and magnitude in geomorphology research and noted that episodic behavior hinges on frequency of episodic events relative to the time required to return to an "equilibrium" channel form. Episodic behavior is more prevalent where the average long-term disturbance is low but the year-to-year variability is high, a characteristic of arid and semi-arid climates.

Although the morphology of arid and semi-arid streams may be more strongly influenced by extreme events under natural conditions, hydromodification has nevertheless been shown to cause rapid and significant physical changes in such California streams (*Trimble* 1997, *Coleman et al.* 2005, *Hawley and Bledsoe* 2011). Such dramatic responses to the effects of urbanization on relatively frequent flows, often over periods of a decade or less, have profound implications for aquatic life and physical habitat. Despite the flashy streamflow regimes, high sediment supplies, and steep gradients of many streams in the region, the responses of California streams are controlled by the same physical processes as those in

other regions that have been studied more extensively. As such, the key controls of stream response can be identified and managed to mitigate the chronic effects of hydromodification between infrequent extreme events. However, it is always advisable to ensure that the application of tools and approaches for prediction and assessment should be based on reference data and empirical models (where applicable) drawn from stream types that are similar in both hydrologic and geomorphic characteristics.

2.6.5 Factors Determining Extent of Impacts

The extent and nature of impacts to stream morphology and habitat from a given change in runoff and sediment supply vary widely, depending on the channel geometry, longitudinal slope, channel material type(s) and size(s), and the type and density of channel vegetation (*Center for Watershed Protection* 2003, *Roesner and Bledsoe* 2003). For example, increased flows within a deep, narrow channel may result in significantly higher shear stresses at the bed; this same increase in a wide, shallow channel may become predominantly overbank flow, with less effect on bed shear stress. Where all other factors are equal, fewer impacts would be expected where flows have access to broad overbank areas (i.e., floodplains) during relatively common floods (*Segura and Booth* 2010), channel materials are more resistant, and stabilizing riparian vegetation is present. Conversely, where erosion and bank instability result in the loss of vegetation reinforcement, a positive feedback response may cause erosion to be accelerated. Furthermore, the relative erosive resistance of bed and bank materials will influence the extent of lateral versus vertical channel adjustments (*Simon and Rinaldi* 2006, *Simon et al.* 2007). For example, if bank resistance is lower than bed resistance, then the channel will tend to widen rather than deepen.

The extent and nature of impacts to stream morphology and habitat from a given change in runoff and sediment supply vary widely, depending on the channel geometry, longitudinal slope, channel material type(s) and size(s), and the type and density of channel vegetation, and the spatial and temporal patterns of urban development

The extent of impacts will also depend on the stream's physiographic context and spatial and temporal patterns of urban development within the watershed (Konrad and Booth 2005). Large-scale studies of hydrologic responses to urbanization (Chin 2006, Poff et al. 2006) also highlighted the regional variation in these responses and reinforced the need to understand local watershed and channel characteristics when managing hydromodification impacts. The presence of road crossings and other infrastructure can provide local grade control and create sediment bottlenecks which often translate to exacerbated erosion in the immediately downstream areas.

An additional consideration relates to the pre-development balance between sediment and streamflow, which is dependent on precipitation patterns, the location of a stream reach within the watershed, the associated sediment behavior of that reach (i.e., production, transport or deposition zone), and local rates of sediment production.

While many of these factors may be quantified for a given time and location, stream systems are enormously complex both spatially and temporally. The existence of physical thresholds and feedback systems can cause an incremental change to result in a disproportionately large response (*Schumm* 1977, 1991). Furthermore, there may be significant temporal lags between the point in time at which

land use is altered and when channel impacts are observed (*Trimble* 1995, 1997). In recognition of these effects and the associated uncertainty, predictive models and management tools may present results in terms of probabilities or within the context of a risk-based approach, as discussed further in this document. Such effects also have substantial implications for the design of assessment and monitoring programs.

There may be significant temporal lags between the point in time at which land use is altered and when channel impacts are observed.

2.6.6 Impacts on Other Types of Receiving Waters

Although outside the scope of this document, hydromodification impacts to other water body types are recognizable and should be the subject of additional research and future consideration.

Wetlands, Estuaries, and Coastal Ecosystems. Urbanization can alter water quality, quantity and sediment delivery to wetlands and sensitive coastal ecosystems. Urbanization has led to loss or degradation of wetlands and estuaries as a result of 1) draining and conversion to agriculture (*Dahl*, 1997); 2) upstream alterations to flow and sediment regimes that can change the magnitude, frequency, timing, duration, and rate of change of estuarine salinity, turbidity, freshwater flooding, freshwater baseflow, and groundwater recharge dynamics (*Azous and Horner* 2001); and 3) contaminated runoff from urban areas (*Paul and Meyer* 2001, *J Brown et al.* 2010). Urbanization may also lead to coastal erosion in circumstances where reservoir sediment trapping or post-development decreases in sediment yield reduce the sediment supply to the coast (*Pasternack et al.* 2001, *Syvitski et al.* 2005).

Alluvial Fans. Alluvial fans are dynamic landforms that are under increased development pressure in recent decades, particularly in the expanding cities of the American West. Upstream urbanization, and the resultant flashier flow regime, shortens the time available for infiltration and groundwater recharge in alluvial fans. Furthermore, development on fans themselves results in channel straightening and/or construction of concrete flood conveyance channels that also reduce or eliminate infiltration. The reduction in infiltration amplifies the flood risk further downstream. Additionally, alluvial fans may be more vulnerable than other landscapes to channel instability resulting from hydromodification, because they lack intrinsic geologic controls on channel gradient, and commonly have little vegetation or bank cohesion to provide stability in the purely alluvial deposits (*Chin* 2006).

2.6.7 Influence of Scale

The ability to detect impacts from land-use changes depends upon the spatial and temporal scale at which they are measured. Issues of hydrograph timing and the relative size of the storm system with respect to the watershed area may confound relationships at larger spatial scales. Furthermore, a number of fluvial geomorphic features that are commonly used as metrics of geomorphic condition are scale-dependent. For example, width-depth ratio, tendency toward braiding, and channel depth relative to stable bank height all commonly increase downstream. Other factors, such as the influence of vegetation, depend on protrusion relative to width and rooting depth relative to bank height. The

temporal scale over which channel changes occur will be influenced by precipitation variability, in addition to the many physical factors already discussed.

These scale considerations, as well as previous discussion of factors influencing stream response, are important when determining the choice of both management tools and monitoring approaches. It is generally much easier to predict the direction of response than the magnitude. Accurate, detailed predictions of response are difficult to make, and they are generally only possible when applied to specific locations, using extensive data input, to answer very specific questions; even then they are subject to uncertainty. Policies or assessment methods aimed to address a range of streams and geographic conditions are better suited to probabilistic approaches that explicitly acknowledge uncertainty, as described further in subsequent sections.

2.7 Impacts on Fluvial Riparian Vegetation

Stream channel form and stability is closely linked with the ecology of instream and floodplain habitats (Figure 2-7). Spatial and temporal distributions of plant communities are tied to moisture availability and seasonality. The ability of vegetation to stabilize soils, trap sediments, and reduce flow velocities (*Sandercock et al.* 2007) can create positive feedback that promotes further vegetation establishment and enhancement of these stabilizing features. This can result in a strong influence on channel geometric features, specifically channel narrowing (*Anderson et al.* 2004). The change in frequency of overbank flows resulting from channel incision will also affect riparian processes, including nutrient transfer and seed dispersal. For example, it is believed that *Tamarix* dominance over native species along Western US rivers would be less extensive if not for anthropogenic alteration of streamflow regimes (most recently supported by Merritt and Poff (2010)).

Impacts to stream biota may occur through the alteration of habitat structure and habitat dynamics caused by hydrologic and geomorphic changes, as well as directly from hydrologic alteration.

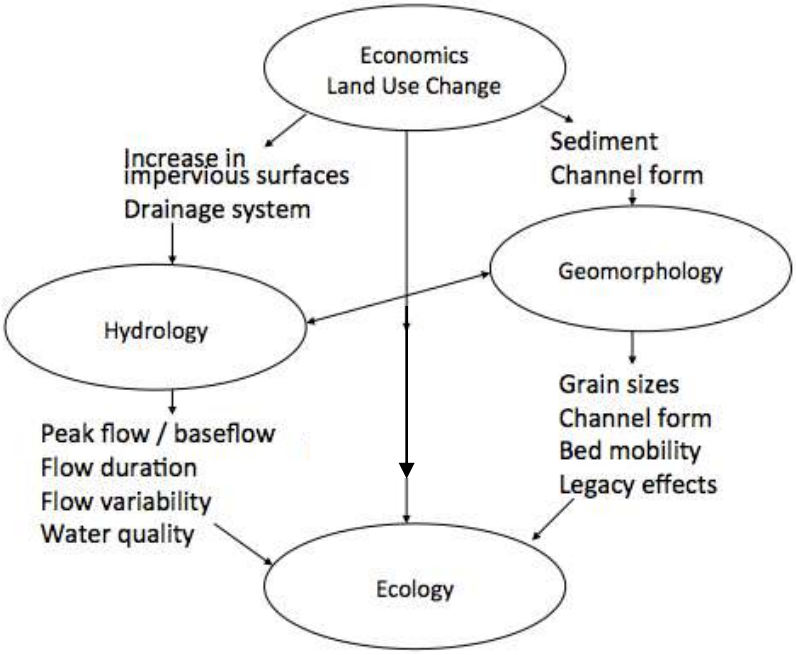

Figure 2-7. Land use changes, hydrology, geomorphology and ecology are closely and complexly interrelated. (Adapted from Palmer *et al.* 2004).

Vegetation changes not only are a result of morphological impacts but also can result directly from changes in streamflow. These findings continue to be supported by recent studies; for example, increases or decreases in baseflow or changes to the seasonal availability of water can determine the extent and type of riparian vegetation capable of thriving in that environment (*White and Greer* 2006). Vegetation changes can have cascading effects on indigenous fauna that require native plants for food or nesting (*Riley et al.* 2005). Channel incision can also result in phreatic draining of adjacent wetland and floodplain habitats and result in loss of key riparian species (*Scott et al.* 2000).

2.8 Impacts on In-Stream Biota

As shown in Figure 2-7, impacts to stream biota may occur through the alteration of habitat structure and habitat dynamics caused by hydrologic and geomorphic changes, as well as directly from hydrologic alteration. (The term biota is used here to refer to a range of non-plant species including algae, macroinvertebrates, amphibians, fishes, etc.) Because of these relationships, the condition of in-stream biota is considered to reflect the effects of all other impacts and has been recommended as an integrative measure of stream health (discussed further in Section 5).

Studies continue to build on Poff *et al.* (1997), who highlighted the importance of the "natural flow regime" and its variability as critical to ecosystem function and native biodiversity. Streamflow pattern or "regime" interacts with the geomorphic context to control the physical and biological response of streams to hydromodification. The basic characteristics of streamflow regimes are typically described in five ways: magnitude, frequency, duration, timing, and rate of change. There is a large body of science

linking one or more of these five elements of flow regimes to geomorphic processes, physical habitat, and ecological structure and function. A few examples of linkages with physical habitat are provided in Table 2-1; these linkages describe the mechanisms by which flow changes can impact stream ecology through morphological alterations.

Table 2-1. Examples of Relationships between Flow Regime Attributes and Physical Habitat Characteristics (adapted from Roesner and Bledsoe 2002).

Flow Attribute	Example Relationships with Physical Habitat
Magnitude	• Determines extent to which erosion/removal thresholds for substrate, banks, vegetation, and structural habitat features are exceeded • Determines whether floodplain inundation/exchange occurs • Habitat refugia may become ineffective during extreme events
Frequency	• Flashiness can affect potential for recovery of quasi-equilibrium channel forms between events, bank stability, and streambank/riparian vegetation assemblages • Frequency of substrate disturbance can act as a major determinant of fish reproductive success and benthic macroinvertebrate abundance and composition
Duration	• Determines the impact of a threshold exceeding event, e.g., scour depths • Urbanization frequently increases the duration of geomorphically effective flows which also affect bank vegetation establishment and maintenance • Extended durations of high suspended sediment concentrations can act as chronic and acute stressors on fish communities
Timing	• The temporal sequence of flow events affects channel form and stability as geomorphic systems may be “primed” for abrupt changes. • Stream biota may use flow timing as a life-cycle cue • Predictability of flow can affect utilization of habitat refugia
Rate of Change	• Affects bank drainage regimes (bank stability) and sedimentation processes, e.g., re-suspended fine sediment concentrations during storm hydrographs, embeddedness, armoring • Rapid drawdown can result in stranding of instream biota • Rise and fall rates control riparian water table dynamics and seedling recruitment

The mechanisms of such impacts are also well detailed by Center for Watershed Protection (2003); for example, increased flows are related to a reduction in habitat diversity and simplification of habitat features such as pools; this in turn reduces the availability of deep-water cover and feeding areas.

Many studies support the conclusion that stream biota are also directly impacted by altered flow regimes, independent of channel instability and erosion. Konrad and Booth (2005) identified four hydrologic changes resulting from urban development that are potentially significant to stream ecosystems: increased frequency of high flows, redistribution of water from baseflow to stormflows,

increased daily variation in streamflow, and reduction in low flow. They caution that ecological benefits of improving physical habitat and water quality may be tempered by persistent effects of altered streamflow and sediment discharge, and that hydrologic effects of urban development must be addressed for restoration of urban streams. Walsh *et al.* (2007) concluded that low-impact watershed drainage design was more important than riparian revegetation with respect to indicators of macroinvertebrate health. Bioengineered bank stabilization can also have positive effects on habitat and macroinvertebrates, but it cannot completely mitigate impacts of urbanization with respect to stream biotic integrity (*Sudduth and Meyer* 2006). Walters and Post (2011) and Brooks *et al.* (2011) found impacts to benthic macroinvertebrates due to upstream water abstractions, including reductions in total biomass of insects and reductions in abundance respectively.

2.9 Conclusions

Alterations in streamflow and sediment transport as a result of land use change can have severe impacts on streams. Common responses include changes in water balance, surface and near-surface runoff timing and magnitude, groundwater recharge, sediment delivery and transport, channel enlargement, widespread incision, and habitat degradation. The extent and consequences of these impacts depend on stream type, watershed context, and local controls on channel adjustment; as such, stream responses to hydromodification are complex and difficult to predict with any precision. Due to the direct impacts of streamflow modification on vegetation and biota, channel morphology cannot be the sole measure of hydromodification impacts. Thus, mitigation efforts that are narrowly focused on channel stability may be insufficient for sustaining key ecological attributes. Likewise, reach-scale stabilization of streams will not necessarily result in the return of comparable habitat quality and complexity (Henshaw and Booth 2000, Roesner and Bledsoe 2003). Hydromodification management should be considered in the context of an overall watershed-scale strategy that targets maintenance and restoration of critical processes in critical locations in the watershed. Furthermore, it is imperative that monitoring and adaptive management be focused on achieving desired objectives for aquatic life and overall stream “health” in addition to simply measures of geomorphic response.

3. Framework for Hydromodification Management

3.1 Introduction and Overview

The current approach to managing hydromodification impacts on a project-by-project basis is not sufficient to protect beneficial uses of streams. This section outlines a comprehensive, alternative framework that begins with watershed analysis and uses the results to guide the site-based management decisions that are the current focus of most hydromodification management strategies. It also recommends the implementation of a compensatory mitigation program in support of hydromodification management objectives identified in the watershed analysis. Figure 3-1 summarizes this approach and illustrates how current site-based management relates to the larger framework.

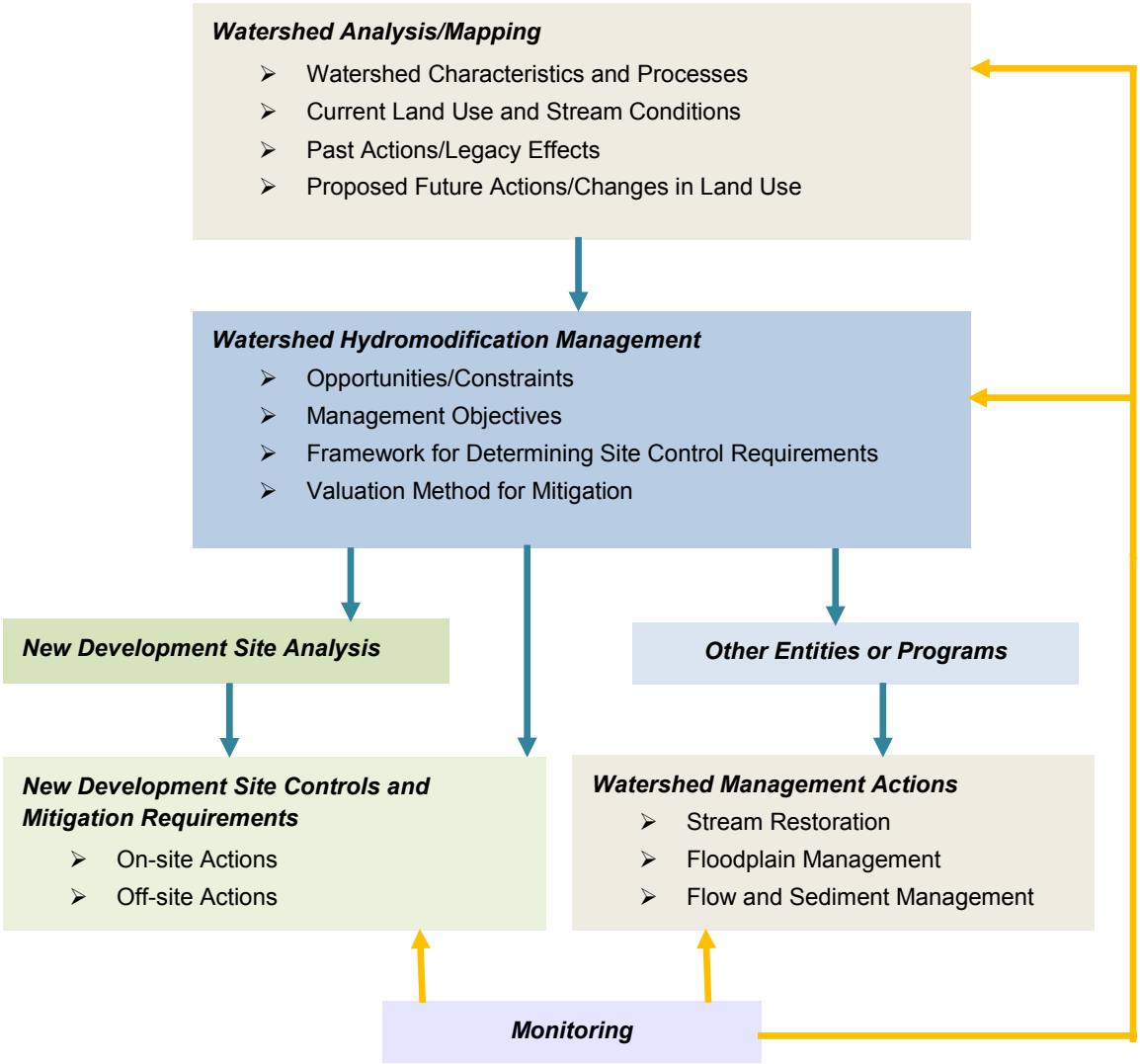

Figure 3-1. Framework for Integrated Hydromodification Management.

This section discusses the details of the integrated framework proposed in Figure 3-1. Key features of this comprehensive approach to hydromodification management are:

- Hydromodification management needs to occur primarily at the watershed scale. The foundation of any hydromodification management approach should be an analysis of existing and proposed future land use and stream conditions that identifies the relative risks, opportunities, and constraints of various portions of the watershed. Site-based control measures should be determined in the context of this analysis.
- Clear objectives should be established to guide management actions. These objectives should articulate desired and reasonable physical and biological conditions for various reaches or portions of the watershed. Management strategies should be customized based on consideration of current and expected future channel and watershed conditions. A one-size-fits-all approach should be avoided.
- An effective management program will likely include combinations of on-site measures (e.g., low-impact development techniques), in-stream measures (e.g., stream habitat restoration), and off-site measures. Off-site measures may include compensatory mitigation measures at upstream locations that are designed to help restore and manage flow and sediment yield in the watershed.
- Management measures should be informed and adapted based on monitoring data. Similarly, monitoring programs should be designed to answer questions and test hypotheses that are implicit in the choice of management measures, such that measures that prove effective can be emphasized in the future (and those that prove ineffective can be abandoned).
- Hydromodification potentially affects all downstream receiving waters; therefore, there generally should be no areas exempted from hydromodification management plans. However, the variety of types and conditions of receiving waters should result in a range of requirements. This also means that objectives, and the management strategies employed to reach them, will need to acknowledge pre-existing impacts associated with historical land uses.

A watershed-based approach to hydromodification management will allow integration of objectives with related programs such as water quality management, groundwater management, and habitat management and restoration through mechanisms such as Integrated Regional Water Resources Management Plans.

Implementation of this approach will likely require changes in the current administration of hydromodification management plans statewide, both in the development and promulgation of regulations by the State and Regional Water Boards and in the administration and execution of those regulations by local jurisdictions (Table 3-1). In the short term, municipalities will need to broaden the approaches to on-site management measures and expand monitoring and adaptive management programs based on the tools described in this document. In the long term, regulatory agencies will need to develop watershed-based programs that allow for implementation of management measures in the locations and manner that will have the greatest impact on controlling hydromodification effects. A

watershed-based approach will also allow the integration of hydromodification management objectives with related programs such as water quality management, groundwater management, and habitat management and restoration through mechanisms such as Integrated Regional Water Resources Management Plans.

Table 3-1. Recommendations for implementation of watershed-based hydromodification management, organized by the scale of implementation and the time frame in which useful results should be anticipated.

Time Frame	Programmatic: State and Regional Water Boards	Local: City and County Jurisdictions
Short-term (<10 years)	• Define the watershed context for local monitoring (at coarse scale) • Evaluate whether permit requirements are making positive improvements	• Evaluate whether specific projects/ regulations are meeting objectives • Identify the highest priority action(s) to take
Long-term (1+ decades)	• Define watershed context and setting benchmarks for local-scale monitoring (i.e., greater precision, if/as needed) • Demonstrate how permit requirements can improve receiving-water "health," state-wide (and change those requirements, as needed)	• Evaluate and demonstrate whether actions (on-site, instream, and watershed scale) are improving receiving-water conditions • Assess program cost-effectiveness • Identify any critical areas for resource protection

3.2 Background on Existing Strategies and Why They are Insufficient

Current hydromodification approaches and strategies, such as flow and sediment-control basins, have been long-recognized as insufficient to fully address hydromodification impacts (e.g., Booth and Jackson 1997, Maxted and Horner 1999). Present understanding of the causes and effects of urbanization suggest that such approaches must be expanded to include integrated flow and sediment management at the watershed scale, along with stream corridor/floodplain restoration (NRC 2009).

Flow management has its origins in flood-control basins intended to reduce peak discharge through stormwater detention (Dunne and Leopold 1978). A key shortcoming of these approaches for hydromodification management is that they do not address (and may exacerbate) cumulative erosive forces on the receiving channel because they trap sediment and release sediment-starved water to downstream areas. Simple detention can increase the frequency and duration with which channels are exposed to erosive effects (McCuen and Moglen 1988, Bledsoe *et al.* 2007), resulting in an increase in the downstream impacts of hydromodification.

Since the late 1980's in parts of the US, hydromodification management plans began to explore "flow-duration" control standards as a way to address this shortcoming. These standards require that the post-project discharge rates *and durations* may not deviate above the pre-project discharge rates and

durations by more than a specific (and typically quite small) percent, across a broad range of discharges at and above the presumed threshold of instream erosion and sediment transport, as averaged over a multi-year period of measured (or simulated) record. This approach is a dramatic improvement over earlier methods, although it does not adequately address the issues of sediment deficit associated with urbanization (Chin 2006). In addition, current flow-duration standards do not fully account for the effects of flow alteration on in-stream habitat and biological functions (e.g., they do not address the seasonality of peak flows, rates of hydrograph rise and recession, low-flow magnitude and duration) and therefore may not be protective of all beneficial uses of downstream waterbodies.

Current strategies are also insufficient with respect to how municipal stormwater permits apply hydromodification standards. Currently, development triggers are established to determine if a project is subject to the standards. These triggers are generally specified by either project land use type in conjunction with size, or by project size alone (e.g., 20 units or more of single family residential housing, or 10,000 square feet or more of new impervious area). The exemption of many small projects from hydromodification controls can result in cumulative impacts to downstream waterbodies (see Booth and Jackson, 1997, for an example from western Washington of the cumulative effects of a small-project exemption); a move to include LID requirements that apply to all projects, regardless of size, is a positive development to begin to address this issue. There is usually also an exemption for projects discharging to hardened channels or waterbodies; however these exemptions may not be supportive of future stream restoration possibilities, and do not address the impacts of hydromodification on lentic and coastal waterbodies (as yet not fully understood). A further limitation of the current permit structure is that there is no consideration of project characteristics such as position within the watershed, sensitivity of the receiving stream reach, or level of coarse sediment production on the proposed project site. Finally, current programs rely solely on regulating new development and re-development to prevent hydromodification impacts without addressing pre-existing conditions which may limit the effectiveness of future management actions.

Shortcoming of current hydromodification standards that may limit their effectiveness include the exemption of many small projects, which can result in cumulative impacts to downstream waterbodies, and the reliance solely on regulating new development and re-development without addressing pre-existing conditions which may limit the effectiveness of future management actions.

When flow-control measures of whatever regulatory standard have failed to protect streams from erosion, hydromodification "management" typically consists of bank or channel armoring, drop structures, and other hard engineering approaches. Although these methods may reduce local hydromodification impacts, it is typically at the expense of other in-stream or riparian functions or beneficial uses. For example, channel armoring can reduce habitat and water conservation functions and services by direct habitat removal, increased bed scour, and decreased connectivity between the channel and its floodplain. In addition to loss of biological and physical stream function, many armoring solutions degrade or fail over time because they address only the localized channel instability rather than the overarching processes that led to the instability (Kondolf and Piegay 2004). For example, drop structures constructed to stabilize a specific channel reach will tend to shift downstream the

consequences of an insufficient sediment load—the reach immediately upstream of the drop structure is "protected," but that immediately downstream is degraded even more severely. In extreme cases, the structure itself can be undermined by downstream erosion and headcutting that is exacerbated by the sudden shift in velocity and associated eddy effects (i.e., hydraulic jump) that often occurs downstream of grade stabilization (Chin 2006). Bank armoring can also fail due to being undermined by erosion at the toe of slope, which can lead to scour (Figure 3-2). In both cases, structural failures often lead to a sequence of incremental increases in the size and extent of the structural solution in an attempt to continually repair increasing channel degradation. In extreme cases, catastrophic failure of bank or grade stabilization can lead to sudden and dramatic changes in channel form, which can be associated with devastating loss of habitat, infrastructure, and property.

Figure 3-2. Undermining of grade control and erosion of banks downstream of structures intended to stabilize a particular stream reach. Left photo is looking upstream at drop structure; right photo is looking downstream from the drop structure.

3.3 Development of Comprehensive Hydromodification Management Approaches

The goal of hydromodification management should be to protect and restore overall receiving water conditions, by maintaining or reestablishing the watershed processes that support those conditions, in the face of urbanization. Achieving these goals will require that hydromodification management strategies operate across programs beyond those typically regulated by NPDES/MS4 requirements. Successful strategies will need to be developed, coordinated, and implemented through land-use planning, non-point source runoff control, and Section 401 Water Quality Certifications and Waste Discharge Requirement programs in addition to traditional stormwater management programs. Thus, all levels of the regulatory framework—federal, state, and local—will need to participate in developing such a program, with program development occurring mainly through regulatory and resource protection agencies and program implementation occurring mainly through local jurisdictions.

As shown in Figure 3-1, watershed-scale hydromodification management should include all of the following key elements:

- Watershed-wide assessment of the condition of key watershed processes, to understand the natural functioning of the watershed and what has been (or is at risk of being) altered by urbanization.
- Watershed-wide assessment of hydromodification risk, to categorize areas based on the likelihood of hydromodification impacts and to identify opportunities for restoration or protection of key reaches or sub-basins.

The goal of hydromodification management should be to protect and restore overall receiving water conditions, by maintaining or reestablishing the watershed processes that support those conditions, in the face of urbanization.

- Appropriate management objectives for various stream reaches and/or portions of the watershed.
- Process for selecting management actions and mitigation measures for project sites and stream reaches.
- Monitoring program that is consistent with the goals of the HMP so that information generated can be used to improve the HMP over time.

3.4 Watershed Mapping and Analysis – Identification of Opportunities and Constraints

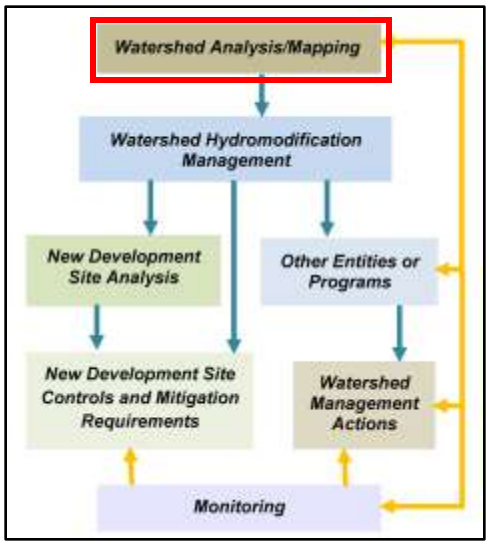

Watershed analysis should be the foundation of all hydromodification management plans. Analysis should identify the nature and distribution of key watershed processes, existing opportunities and constraints in order to help prioritize areas of greater vs. lesser concern, areas.

"Watershed analysis" has several steps, of which the first is mapping. Mapping may occur at the watershed or regional (i.e., multiple watersheds) scale. Mapping should include data layers to facilitate the following analyses. Most of these data layers are freely available as online. Further information on analysis tools is provided in the next section. These maps should be designed for iterative updates over time as new information becomes available:

- Dominant watershed processes – analysis of topography (10-m digital elevation model), hydrology, climate patterns, soil type (NRCS soil classifications) and surficial geology can be used to identify the location and type of dominant watershed processes, such as sediment source areas and areas where infiltration is important or where overland flow likely dominates. This can provide a template for the eventual design of management measures that correspond most

closely to the pre-development conditions, which support processes that promote long-term channel health. The Central Coast Hydromodification Control Program (the "Joint Effort"; see Booth *et al.* 2011) provides an example of this type of analysis.

- Existing stream conditions – At a minimum the National Hydrography Database (NHD) can provide maps of streams and lakes in the watershed. Additional information on stream condition should be included to the extent that it is available. This could include major bed material composition, channel planform, grade control locations and condition, and approximate channel evolution stage. These maps can also be used to conduct general stream power evaluations.
- Current (Past) and anticipated future land use - Current land use and land cover plus proposed changes due to general or specific plans. Historical information on past land use practices or stream conditions should be included if it is readily available. Classified land cover (NLCD 2006) is available from the Multi-Resolution Land Characteristics Consortium (MRLC).
- Potential coarse and fine sediment yield areas – methods such as the Geomorphic Land Use (GLU) approach (Booth *et al.* 2010) can be used that to estimate potential sediment yield areas based on geology, slope and land cover.
- Existing flood control infrastructure and channel structures – maps should include major channels, constrictions, grade control, etc. that affect water and sediment movement through the watershed. Any available information on water quality, flood control or hydromodification management basins should also be included.
- Habitat – both upland and in-stream and riparian habitat should be mapped to help determine areas of focus for both resource protection and restoration. This may be based on readily available maps such as the National Wetlands Inventory and National Land Cover Database, aerial photo interpretation, or detailed local mapping.
- Areas of Particular Management Concern – these may include sensitive biological resources, critical infrastructure, 303(d) listed waterbodies, priority restoration areas or other locations or portions of the watershed that have particular management needs.
- Economic and social opportunities and constraints – comprehensive watershed management includes consideration of opportunities for improving community amenities associated with streams, economic redevelopment zones, etc. Details on this are beyond the scope of this paper, but emphasize the need to include planning agencies in the development of hydromodification management plans.

Substantial resources will be necessary to implement a watershed analysis approach; therefore, opportunities for joint funding and leveraging of resources should be vigorously pursued.

Watershed analysis will be challenging especially for smaller municipalities with limited resources or where their jurisdiction only encompasses a portion of the watershed. Substantial resources will be necessary to implement this approach; therefore, opportunities for joint funding and leveraging of resource should be vigorously pursued. A cooperative approach should replace the current fragmented efforts among regions and jurisdictions. Furthermore, the State and Regional Water Boards should support completion of these maps and common technical tools as the foundation for future hydromodification management actions.

3.5 Defining Management Objectives

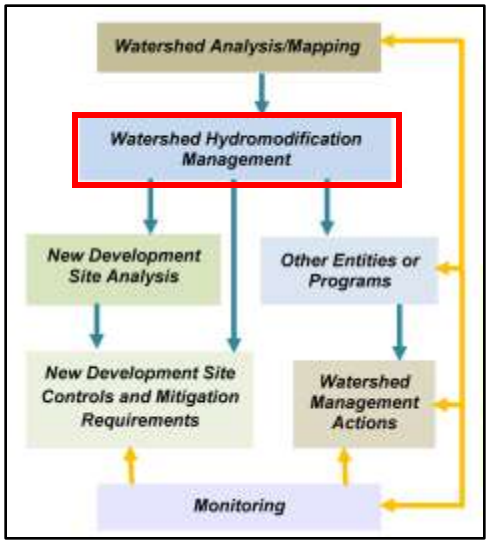

Results of the watershed analysis should be used to determine the most appropriate management actions for specific portions of the watershed. Management strategies should be tailored to meet the objectives, desired future conditions, and constraints of the specific channel reach being addressed.

Decisions should be based on considerations of areas suitable for specific ecosystem services, opportunities, and constraints as described above. Management objectives may be aimed at reducing effects of proposed future land use or mitigating for the effects of past land use, and they may apply to stream reaches or upland areas. Potential management objectives for specific stream reaches may include: protect, restore, or manage as a new channel form.

The specific manifestation of each of these strategies will differ by location, based on constraints of the stream, watershed plan objectives, etc. Decisions about appropriate objectives will need to consider current and future opportunities and constraints in upland, floodplain, and in-stream portions of the watershed. General definitions are provided below as a starting point for case-specific refinement.

Management strategies should be tailored to meet the objectives, desired future conditions, and constraints of the specific channel reach being addressed. Objectives for specific stream reaches may include:

- **Protect**
- **Restore**
- **Manage as a new channel form**

3.5.1 Protect

This approach consists of protecting the functions and services of relatively unimpacted streams in their current form through conservation and anti-degradation programs. This strategy should not be used if streams are degraded, or nearing thresholds of planform adjustment or changes in vegetation community. This strategy may apply following natural disturbances such as floods depending on the condition of the stream reach and the ability for natural rehabilitation to occur (due to how intact

watershed processes are). The goal of this strategy is not to create an artificial preserve (such as a created stream running through an urban park) but rather a naturally function river system. Fully channelized systems are not considered in this framework. Examples of specific actions include:

- Preserving intact channel systems through easements, restrictions, covenants, etc. This should be considered in the watershed context to ensure adequate connectivity with upstream and downstream reaches of similar condition, and to ensure that the watershed processes responsible for creating and maintaining instream conditions will persist.
- Providing appropriate space for channel processes to occur (e.g., floodplain connectivity).
- Establishing transitional riparian and upland buffer zones that are protected from encroachment by infrastructure or development.

3.5.2 Restore

There are many definitions of "restoration". For the purposes of this document, restoration is considered re-establishing the natural processes and characteristics of a stream. The process involves converting an unstable, altered, or degraded stream corridor, including adjacent riparian zone (buffers), uplands, and flood-prone areas, to a natural condition. In most cases, restoration plans should be based on a consideration of watershed processes and their ability to support a desired stream type. The watershed analysis discussed above should be used to determine how and where watershed process should be protected or restored in order to best support stream and stream-corridor restoration. This process should be based on a reference condition/reach for the valley type and includes restoring the appropriate geomorphic dimension (cross-section), pattern (sinuosity), and profile (channel slopes), as well as reestablishing the biological and chemical integrity, including physical processes such as transport of the water and sediment produced by the stream's watershed in order to achieve dynamic equilibrium. Design of restoration structural elements must be based on existing and anticipated upstream land uses, and reflect the modified hydrology resulting from these uses. Restoration should apply to streams that are already on a degradation trajectory where there is a reasonable expectation that a more stable equilibrium condition that reflects previously existing conditions can be recreated and maintained via some intervention. Creating a stream system that differs from "natural conditions" is not considered restoration. All elements of the "protection" strategy should also be included once the restoration actions are complete. Examples of specific actions include:

- Floodplain and in-stream measures that restore natural channel form consistent with current and/or anticipated hydrology and sediment yield. Examples include recontouring, biotechnical slope stabilization, soft-grade control features (e.g., woody debris).
- Revegetation of stream banks and beds, including removal of invasive species.
- Preserving intact channel systems through easements, restrictions, covenants, etc. This should be considered in the watershed context to ensure adequate connectivity with upstream and downstream reaches of similar pristine condition.

- Providing appropriate space for channel processes to occur (e.g. channel migration at allowable levels, floodplain connectivity, and development of self-sustaining riparian vegetation).
- Establishing transitional riparian and upland buffer zones that are protected from encroachment by infrastructure or development.

3.5.3 Manage as New Channel Form

Once a stream channel devolves far enough down the channel evolution sequence, it is extremely difficult to recover and restore without substantial investment of resources. If critical thresholds in key structural elements, such as planform or bank height, are surpassed, streams should be allowed to continue progressing toward a new stable equilibrium condition that is consistent with the current setting and watershed forcing functions, if such progress does not pose a danger to property and infrastructure. Substantial alteration of flow or sediment discharge, slope or floodplain width may make it improbable that a stream can be restored to its previous condition. In such circumstances, it may be preferable to determine appropriate channel form given expected future conditions and "recreate" a new channel to match the appropriate equilibrium state under future conditions. For example, a multi-thread braided system may not be the appropriate planform based on new runoff and sediment pattern; instead, a single-thread channel or step-pool structure may be a more appropriate target. Examples of specific actions include:

- In-channel recontouring or reconstruction of channel form.
- Floodplain recontouring or reconstruction that improves connectivity with the channel.
- In extreme circumstances based on channel condition, position in the watershed, etc. this may involve hardening portions of the channel and focusing "mitigation" measures at off-site measures at a different part of the watershed. Off-site mitigation can be informed by "hydromodification risk mapping".
- Re-establishing longitudinal connectivity for sediment transport and ecological linkages.
- Preserving intact channel systems through easements, restrictions, covenants, etc. This should be considered in the watershed context to ensure adequate connectivity with upstream and downstream reaches of similar pristine condition.
- Providing appropriate space for channel processes to occur (e.g. floodplain connectivity).
- Establishing transitional riparian and upland buffer zones that are protected from encroachment by infrastructure or development.

Several authors have previously noted that in urban systems, natural channel state often can no longer be sustained under changed hydrological conditions. Thus, different management goals are probably appropriate for watersheds at varying stages of development (Booth, 2005) and at varying degrees of adjustment (Chin and Gregory 2005). In this context, identifying which channels are suitable for

protection, restoration, or alternative channel form can be used to guide restoration and management efforts (Booth *et al.* 2004).

Upland objectives should be established to support management objectives for stream reaches. These objectives will have direct implications and will influence site-specific control requirements (discussed below). Potential management objectives for upland areas may include:

- *Conserve open space for infiltration*: Infiltration reduces the magnitude and duration of runoff to the stream channel and allows flow to re-enter the stream through diffuse overland flow, shallow subsurface flow, or groundwater recharge. This in turn reduces the work (energy) on the channel bed and banks and helps promote stability.
- *Conserve open space for stream buffers*: Buffers allow many of the same infiltration processes discussed above to occur. In addition, they provide space for channel migration and overbank flow, both of which function to reduce energy and allow the channel to better withstand potentially erosive forces associated with high flow events.
- *Conserve open space for coarse sediment production*: Course sediment functions to naturally armor the stream bed and reduce the erosive forces associated with high flows. Absence of coarse sediment often results in erosion of in-channel substrate during high flows. In addition, coarse sediment contributes to formation of in-channel habitats necessary to support native flora and fauna.
- *Encourage development on poorly-infiltrating soils*: The difference between pre and post development runoff patterns is less when development occurs on soils that have low infiltration rates and functioned somewhat like paved surfaces. Focusing development on these areas reduces changes in hydrology associated with transition to developed land uses.
- *Encourage urban infill*: Urban infill reduces the effect on watershed processes by concentrating development on previously impacted areas. This reduces disruption of hydrology and sediment process compared to developing on open space or other natural areas.

3.6 Selecting Appropriate Management Objectives

The combination of expected force acting on the stream channel (in terms of higher flow and less sediment) and estimated resistance (in the form of channel and floodplain condition) can be used to inform selection of an appropriate management objective for a specific stream reach, as shown in Figure 3-3. This figure represents a conceptual approach to selecting appropriate management objectives, in which modifications to runoff and sediment are compared against stream reach conditions. By weighing these factors within the context of watershed opportunities, constraints and resources, management objectives and specific actions can be determined. More complete decision support systems or guidance will need to be developed for individual

Selection of appropriate management objectives should consider changes to runoff and sediment, and existing stream reach conditions, within the context of watershed opportunities, constraints and resources.

hydromodification management plans that account for other considerations such as upstream and downstream conditions, cost, infrastructure constraints, availability of floodplain area for restoration, presence of downstream sensitive resources, etc. All decisions should be made in the context of the watershed position of a project site relative to existing opportunities and constraints as discussed above.

A number of tools are available to be used in conjunction with watershed mapping to inform this prioritization process. For example, GLU mapping (Booth *et al.* 2010) and hydromodification risk mapping can be used to assign high, medium or low ratings to watershed resistance (i.e., susceptibility to change). Similarly, field based tools such as the hydromodification screening tool (Bledsoe *et al.* 2010) or European tools such as Fluvial Audit or River Habitat Survey can be used to assign a rating of high, medium or low at the reach scale. In addition to geomorphic assessments, habitat assessments such as the California Rapid Assessment Method (CRAM; Collins *et al.* 2008) or biological evaluations via an index of biotic integrity (IBI; e.g., Ode *et al.* 2005) should be used as measures of biological condition to provide a more complete stream assessment. The next section provides an overview of hydromodification assessment and prediction tools, as well as further details on specific tools to support the selection of management objectives.

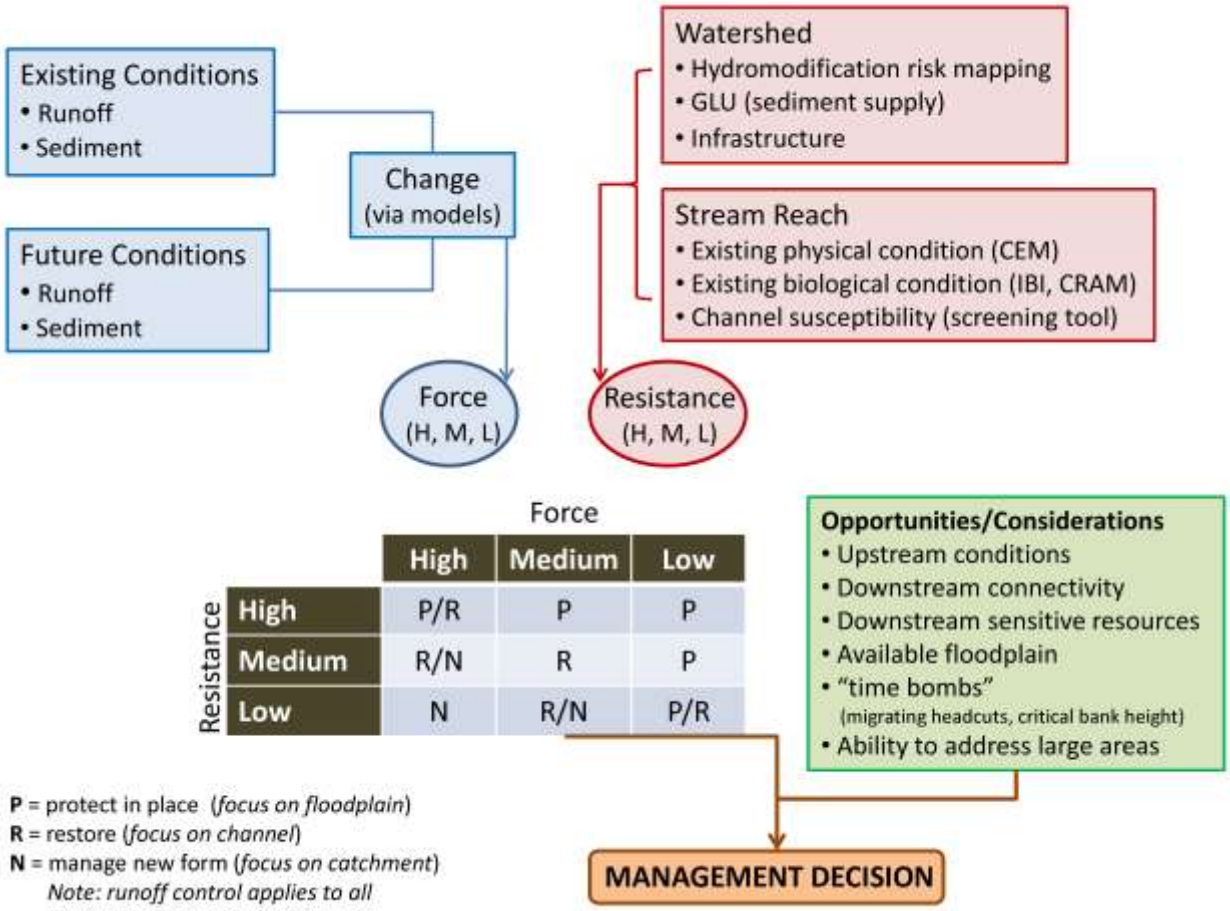

Figure 3-3: Example of a hydromodification management decision-making process.

3.7 Framework for Determining Site-Specific Control Requirements

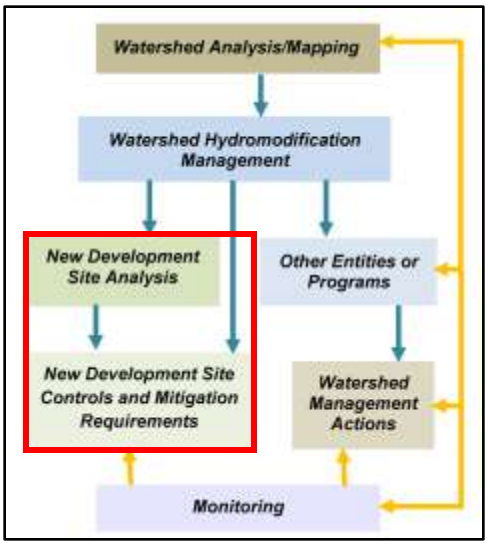

Once the watershed analysis is complete and opportunities, constraints and management objectives have been identified for both upland areas and stream reaches, a framework should be developed for site-specific project analyses and control requirements. The level of detail required for the analysis of proposed projects should be based on a combination of factors including project size, location within the watershed, and point of discharge to receiving waterbody.

The HMP should specify how these factors will be evaluated within the context of the identified management objectives to determine analysis requirements. The HMP should also ideally contain scalable BMP designs (based on conservative assumptions and consistent with prevailing watershed conditions) that can be applied by small projects where appropriate to avoid overly burdensome requirements for site-specific analysis. The framework should include the following components:

- A set of standard on-site management measures/BMPs that should apply to all projects; no projects should be exempted from these measures as they will have broader water quality benefits beyond helping to control the effects of hydromodification. These management actions consist of reducing the effects of urbanization on catchment runoff and sediment yield. On-site management measures should attempt to reduce excess runoff, maintain coarse sediment yield (if possible) and provide for appropriate discharge to receiving streams to support in-stream biological resources. In some cases, common features or facilities may be able to accommodate these objectives. In other cases, separate features or facilities will be necessary to deal with distinct objectives. On-site measures should ***generally be applied in all cases*** as allowed by site-specific geotechnical constraints, with specific management practices informed by the watershed processes most important at particular locations in the watershed, as well as by the nature of downstream receiving waters:
    - Low impact development (LID) practices.
    - Disconnecting impervious cover through infiltration, interception, and diversion.
    - Coarse sediment bypass through avoidance of sediment yield areas or measures that allow coarse sediment to be discharged to the receiving stream.
    - Flow-duration control basins to reduce runoff below a threshold value.

- Specification of the level of analysis detail and design requirements for the project, depending on project location, discharge point, and project size. Levels of analysis and design requirements may include:
    - Application of scalable, standardized designs for flow control based on site-specific soil type and drainage design. The assumptions used to develop these scalable designs should be conservative, to account for loss of sediment and uncertainties in the analysis and our understanding of stream impacts.
    - Use of an erosion potential metric, based on long-term flow duration analysis and in-stream hydraulic calculations. Guidelines should specify stream reaches where in-stream controls would and would not be allowed to augment on-site flow control.
    - Implementation of more detailed hydraulic modeling for projects of significant size or that discharge to reaches of special concern to understand the interaction of sediment supply and flow changes.
    - Analysis of the water-balance for projects discharging into streams with sensitive habitat. This may include establishment of requirements for matching metrics such as number of days with flow based on the needs of species present.
- Guidelines for prioritization of on-site or regional flow and sediment control facilities. Watershed analysis will help identify opportunities for regional flow or sediment control facilities, which may help to mitigate for existing hydromodification impacts.

Appendix A provides detailed guidance on the appropriate application of tools to meet site control requirements.

3.8 Off-site Compensatory Mitigation Measures

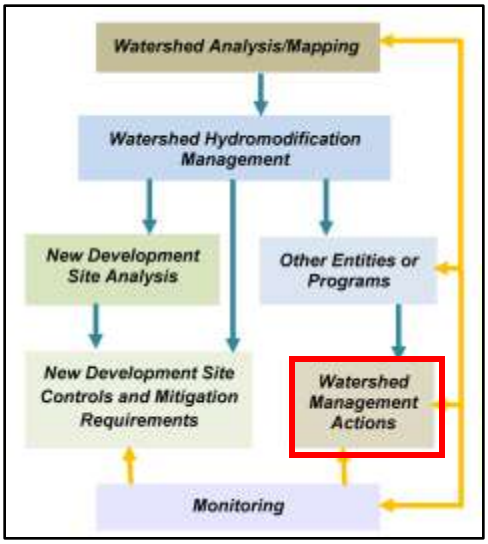

In some cases, on-site control of water and sediment will not be sufficient to offset the effects of hydromodification on receiving waters. In these cases, off-site compensatory mitigation measures will be necessary (similar to the concepts used in the Section 401/404 permitting programs). Off-site measures could be implemented by project proponents or through the use of regional mitigation banks or in-lieu fee programs.

Off-site mitigation may be necessary for several reasons:

- Off-site measures may be more effective at addressing effects or at achieving desired management goals. This may be particularly true for sites near the bottom of a watershed where upstream measures may be preferred

- Off-site measures may be necessary to supply compensation for residual project impacts where on-site measures are limited by site constraints or solutions are beyond the scope of what can be accomplished on an individual site.
- Off-site measures may be necessary where accomplishing specified management objectives is not practical using on-site measures alone. Off-site measures may be desired to remedy legacy effects of prior land use or to achieve desired beneficial uses.

Performance monitoring and adaptive management must be a part of compensatory mitigation given its inherent uncertainty.

The location and type of mitigation should be determined in the context of the watershed analysis and should account for the size and nature of the impact, location in the watershed, pre-existing conditions in the watershed, and uncertainty associated with the success of the proposed mitigation actions. In some cases these measures may be near the project site (e.g., restoring a stream reach downstream of the project site), but in other cases the off-site mitigation may be in the form of in-lieu fee or "mitigation bank" type contributions to a project located in a different portion of the watershed (e.g. upstream grade control, protection of sediment source areas). Such off-site mitigation relatively far from the site will only be possible if conducted in the context of an overall watershed plan, as discussed above. Off-site measures may include:

In cases where on-site control of water and sediment will not be sufficient to offset the effects of hydromodification on receiving waters, off-site compensatory mitigation measures will be necessary. Implementation of this approach will require that the State Water Board develop a valuation method to help determine appropriate off-site mitigation requirements in light of the anticipated impacts of hydromodification on receiving streams.

- Stream corridor restoration
- Purchase, restoration and protection of floodplain/floodway habitat
- Purchase and/or protection of critical sediment source or transport areas
- Regional basins or other retention facilities
- Upstream or downstream natural/bio-engineered grade control
- Retrofit or repair of currently undersized structures (e.g. culverts, bridge crossings)
- Removal or hydrologically disconnecting impervious surfaces

A valuation method will be necessary for assigning appropriate mitigation requirements in light of the anticipated impacts of hydromodification on receiving streams. The valuation method should be developed by the State Water Board.

To support the management approaches discussed above, HMPs should provide general guidance for application of models and other tools based on the questions being asked and the desired outcomes of

the HMP. Models can also be used to help communicate levels of uncertainty in particular management actions and to guide restoration / in-channel management actions. Modeling and other tools are discussed in detail in Section 4 and Appendices A and B.

Finally, management endpoints should articulate the desired physical and biological conditions for various reaches or portions of the watershed. To the extent possible, these desired conditions should be expressed in numeric, quantifiable terms to avoid ambiguity. Additionally, since regulatory strategies will invariably rely on quantifiable measures to determine whether stormwater management actions achieve these desired conditions, identifying appropriate numeric objectives will support determinations of regulatory compliance. As desired physical and biological watershed conditions are expressed in quantifiable terms to the extent possible, a similar need would apply to site control requirements. Control measures should be linked to, a) a desired condition (or goal), b) the parameter(s) that best define that condition, and c) quantifiable measures that serve to evaluate performance of the control measure. Direct measures (e.g., volume of runoff to be retained) as well as indirect or surrogate measures (IBI scores) are appropriate if they are quantifiable.

Management endpoints should articulate the desired physical and biological conditions for various reaches or portions of the watershed. To the extent possible, these desired conditions should be expressed in numeric, quantifiable terms to avoid ambiguity.

4. Overview of Assessment and Prediction Tools

4.1 Introduction

The previous section discussed a number of potential actions for managing hydromodification impacts. These ranged from high-level watershed-scale characterization to the site-specific design of a proposed development. This section provides an overview of the current and emerging assessment and prediction tools available to inform these management actions. An organizing framework helps explain the appropriate application of these tools, as well as their strengths and weaknesses. Specific tools that support the selection of management objectives are also discussed. Examples of "suites" of tools that are commonly used together to predict stream responses and formulate management prescriptions for channels of varying susceptibility are presented in Appendix B. Appendix A provides detailed guidance on the appropriate application of tools to meet site control requirements.

Municipalities are the primary audience for this section, as they select and incorporate these tools into their HMPs. However, the State and Regional Water Boards should be aware of the overall capabilities, appropriate uses, and gaps in our current toolbox. The development of new and improved tools should ideally be coordinated at the State level for optimum cost effectiveness and widest applicability. The table below identifies the key actions necessary at both the programmatic and local level to address the considerations discussed above, within the context of the goals of the framework described in Section 3.

Table 4-1. Recommendations for the application and improvement of tools in support of the proposed management framework.

Time Frame	Programmatic: State and Regional Water Boards	Local: City and County Jurisdictions
Short-term (<10 years)	• Develop quality control and standardization for continuous simulation modeling • Perform additional testing and demonstration of probabilistic modeling for geomorphic response • Pursue development of biologically- and physically-based compliance endpoints	• Work cooperatively with adjacent jurisdictions to implement hydromodification risk mapping at the watershed scale • Implement continuous simulation modeling for project impact analysis
Long-term (1+ decades)	• Improve tools for sediment analysis and develop tools for sediment mitigation design • Develop tools for biological response prediction • Improve tools for geomorphic response prediction	• Expand use of probabilistic and statistical modeling for geomorphic response • Apply biological tools for predicting and evaluating waterbody condition

4.2 Background

In the context of hydromodification, tools and models are typically used to help answer one or more of the following questions involving an assessment of natural and human influences at various spatial and temporal scales:

- How does the stream work in its watershed context?
- Where is the stream going? For example, have past human actions induced channel changes? What are the effects on sediment transport and channel form? What is the magnitude of current and potential channel incision following land use conversion?
- How will the stream likely respond to alterations in runoff and sediment supply?
- How can we manage hydromodification and simultaneously improve the state of the stream?

Previous sections have underscored the variability and complexity of relationships among land use, the hydrologic cycle, and the physical and ecological conditions of stream systems. It follows that the process of assessing stream condition and predicting future conditions is highly challenging and subject to uncertainty. Therefore it is important to understand the inherent strengths and limitations of the available tools, especially with respect to prediction uncertainty and how it is expressed for various tools. Considerable judgment is needed to choose the appropriate model for the question at hand. In addition to prediction uncertainty, considerations in choosing the right model for a particular application include appropriate spatial and temporal detail, cost of calibration and testing, meaningful outputs, and simplicity in application and understanding (NRC 2001; Reckhow 1999a,b).

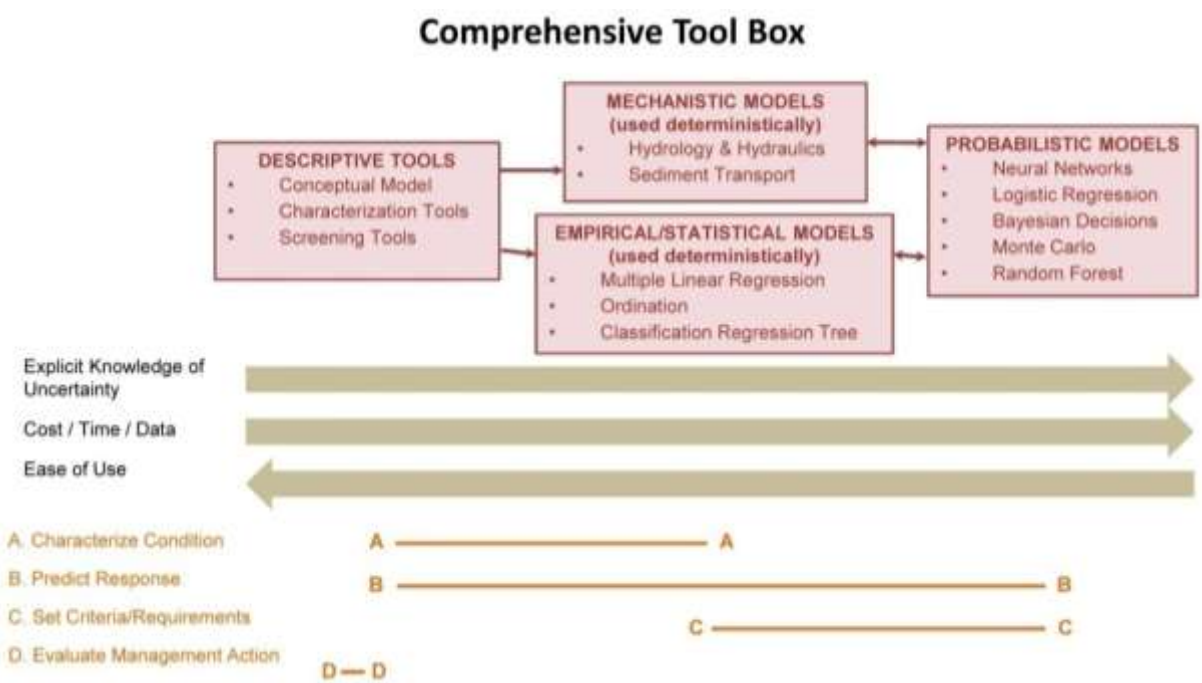

Figure 4-1. Organizing Framework for understanding hydromodification assessment and management tools.

4.3 Organizing Framework

Figure 4-1 presents an organizing framework by which to understand the available tools that may be applied in support of hydromodification management and policy development. Tools fall into three major categories: descriptive tools, mechanistic and empirical/statistical models that are used deterministically, and probabilistic models/predictive assessments with explicitly quantified uncertainty. The organizing framework relates these categories to the types of question the tools are designed to answer, specifically: characterization of stream condition, prediction of response, establishment of criteria/requirements, or evaluation of management actions. The framework also characterizes the tools according to the following features: intensity of resource requirements (i.e., data, time, cost), and the extent to which uncertainty is explicitly addressed. Subsequent sections of this section discuss each of the three major categories in turn, highlighting examples of specific tools within each category.

Given the uncertainty associated with predicting hydromodification impacts, probabilistic models should be incorporated into analysis and design, particularly where resource values or potential consequences of impacts are high.

Tools required to support the management framework presented in Section 3 include watershed characterization and analysis tools and project analysis and design tools. The level of resolution that is required will depend on the point in the planning process. At early stages, descriptive tools will be sufficient, but more precise tools will be required toward the design phase. Currently, most projects rely solely on deterministic models. However, given the uncertainty associated with predicting hydromodification impacts, probabilistic models should be incorporated into analysis and design, particularly where resource values or potential consequences of impacts are high.

4.3.1 Descriptive Tools

Descriptive tools include conceptual models, screening tools, and characterization tools. These tools are used to answer the question: *What is the existing condition of a stream or watershed?* Although descriptive tools are not explicitly predictive, they can be used to assess levels of susceptibility to future stressors by correlation with relationships seen elsewhere. The application of some type of descriptive tool, such as a characterization tool, is almost always necessary before applying a deterministic model. In particular, descriptive tools can aid in understanding the key processes and boundary conditions that may need to be represented in more detailed models.

Conceptual Models. A conceptual model, in the context of river systems, is a written description or a simplified visual representation of the system being examined, such as the relationship between physical or ecological entities, or processes, and the stressors to which they may be exposed. Conceptual models have been used to describe processes in a wide range of physical and ecological fields of study, including stream-channel geomorphology (Bledsoe *et al.* 2008). For example, Channel Evolution Models (CEMs) are conceptual models which describe a series of morphological configurations of a channel, either as a longitudinal progression from the upper to the lower watershed, or as a series at a fixed location over time subsequent to a disturbance. The incised channel CEM developed by

Schumm *et al.* (1984) is one of the most widely known conceptual models within fluvial geomorphology. This CEM documents a sequence of five stages of adjustment and ultimate return to quasi-equilibrium that has been observed and validated in many regions and stream types (ASCE 1998, Simon and Rinaldi 2000). The Schumm *et al.* (1984) CEM has been modified for streams characteristic of southern California, including transitions from single-thread to multi-thread and braided evolutionary endpoints (Hawley et al., in press).

Conceptual models also include planform classifications of braided, meandering and straight, and other general geomorphic classifications, which categorize streams by metrics such as slope, sinuosity, width-to-depth ratio, and bed material size. The qualitative response model described by Lane's diagram (1955), and discussed earlier in this report, is also a conceptual model.

Characterization Tools. Examples of characterization tools include baseline geomorphic assessments, river habitat surveys, and fluvial audits. A fluvial audit uses contemporary field survey, historical map and documentary information and scientific literature resources to gain a comprehensive understanding of the river system and its watershed. Fluvial audits, along with watershed baseline surveys are a standardized basis for monitoring change in fluvial systems. These types of comprehensive assessments are comprised of numerous, more detailed field methodologies, such as morphologic surveys, discharge measurements, and estimates of boundary material critical shear strength through measurements of resistance (for cohesive sediments) or size. Baseline assessments may also draw on empirical relationships such as sediment supply estimation models.

Screening Tools. Screening tools can be used to predict the relative severity of morphologic and physical-habitat changes that may occur due to hydromodification, as a critical first step toward tailoring appropriate management strategies and mitigation measures to different geomorphic settings. However, assessing site-specific stream susceptibility to hydromodification is challenging for several reasons, including the existence of geomorphic thresholds and non-linear responses, spatial and temporal variability in channel boundary materials, time lags, historical legacies, and the large number of interrelated variables that can simultaneously respond to hydromodification (Schumm 1991, Trimble 1995, Richards and Lane 1997).

Screening tools can be used to predict the relative severity of morphologic and physical-habitat changes due to hydromodification, as a critical first step toward tailoring appropriate management strategies and mitigation measures to different geomorphic settings.

Despite the foregoing difficulties, the need for practical tools in stream management have prompted many efforts to develop qualitative or semi-quantitative methods for understanding the potential response trajectories of channels based on their current state. For example, predictors of channel planform can be used to identify pattern thresholds and the potential for planform shifts (e.g., van den Berg 1995, Bledsoe and Watson 2001, Kleinhans and van den Berg 2010).

In addition, regional CEMs (discussed above) can partially address the needs of the hydromodification management community by providing a valuable framework for interpreting past and present response trajectories, identifying the relative severity of potential response sequences, applying appropriate

models in estimating future channel changes, and developing strategies for mitigating the impacts of processes likely to dominate channel response in the future (Simon 1995).

More recent screening-level tools for assessing channel instability and response potential, especially in the context of managing bridge crossings and other infrastructure, have borrowed elements of the CEM approach and combined various descriptors of channel boundary conditions and resisting vs. erosive forces. For example, Simon and Downs (1995) and Johnson *et al.* (1999) developed rapid assessment techniques for alluvial channels based on diverse combinations of metrics describing bed material, CEM stage, existing bank erosion, vegetative resistance, and other controls on channel response. Although based on a strong conceptual foundation of the underlying mechanisms controlling channel form, these specific examples are either overly qualitative with respect to the key processes, or developed with goals and intended applications (e.g., evaluating potential impacts to existing infrastructure such as bridges or culverts) that differ from what is needed by current hydromodification management programs.

SCCWRP has recently proposed a general framework for developing screening-level tools that help assess channel susceptibility to hydromodification, and a new region-specific tool for rapid, field-based assessments in urbanizing watersheds of southern California (Booth *et al.* 2010, Bledsoe *et al.* 2010). The criteria used to assign susceptibility ratings are designed to be repeatable, transparent, and transferable to a wide variety of geomorphic contexts and stream types. The assessment tool is structured as a decision tree with a transparent, process-based flow of logic that yields four categorical susceptibility ratings through a combination of relatively simple but quantitative input parameters derived from both field and GIS data. The screening rating informs the level of data collection, modeling, and ultimate mitigation efforts that can be expected for a particular stream-segment type and geomorphic setting. The screening tool incorporates various measures of stream bed and bank erodibility, probabilistic thresholds of channel instability and bank failure based on regional field data, integration of rapid field assessments with desktop analyses, and separate ratings for channel susceptibility in vertical and lateral dimensions.

An example of a specific analysis component that predicts changes in post-development sediment delivery, and that can be applied within this screening tool framework, is a GIS-based catchment analyses of “Geomorphic Landscape Units” (GLUs). A GLU analysis integrates readily available data on geology, hillslope, and land cover to generate categories of relative sediment production under a watershed’s current configuration of land use. Those areas subject to future development are identified, and corresponding sediment-production levels are determined by substituting developed land cover for the original categories and reassessing the relative sediment production. The resultant maps can be used to aid in planning decisions by indicating areas where changes in land use will likely have the largest (or smallest) effect on sediment yield to receiving channels.

Effective screening tools for assessing the susceptibility of streams to hydromodification necessarily rely on both field and office-based elements to examine local characteristics within their broader watershed context. Proactive mapping of flow energy measures (e.g., specific stream power) throughout drainage networks has the potential to complement field-based assessments in identifying hotspots for channel

instability and sediment discontinuities as streamflows change with land use. Such analyses may partially guide subsequent field reconnaissance; however, this approach also has limitations in that some geomorphic settings are inherently difficult to map using widely available digital elevation data. In particular, maps of stream power in narrow entrenched valleys and low gradient valleys (ca. <1%) with sinuous channels should be carefully field-truthed and used with a level of caution commensurate with the accuracy of the input data.

Moreover, spatial variability in channel boundary materials and form cannot be accurately mapped at present using remotely sensed data. Thus, boundary materials and channel width are typically assumed in watershed-scale mapping efforts, thereby introducing potential inaccuracies. Coupling desktop analysis with a field-based assessment when using such an approach can help resolve variation in site-specific features such as the erodibility of bed and bank materials, channel width, entrenchment, grade control features, and proximity to geomorphic thresholds.

4.3.2 Mechanistic and Empirical/Statistical Models with Deterministic Outputs

Mechanistic/deterministic models are simplified mathematical representations of a system based on physical laws and relationships (*link to next*). Empirical/statistical models use observed input and output data to develop relationships among independent and dependent variables. Statistical analyses determine the extent to which variation in output can be explained by input variables. Both types of models are typically used to generate a single output or answer for a given set of inputs. These tools can be used to help answer such questions as: *What are the expected responses in the stream and watershed given some future conditions? What criteria should be set to prevent future hydromodification impacts?* However, hydromodification modeling embodies substantial uncertainties in terms of both the forcing processes and the stream response. Deterministic representations of processes and responses can therefore mask uncertainties and be misleadingly precise, unless prediction uncertainty is explicitly characterized as described later in this section.

Although valuable, deterministic representations (such as those derived from continuous simulation modeling) of processes and responses can mask uncertainties and be misleadingly precise unless prediction uncertainty is explicitly characterized.

Hydrologic Models are used to simulate watershed hydrologic processes, including runoff and infiltration, using precipitation and other climate variables as inputs. Some models, such as the commonly-used HEC-HMS, can be run for either single-event simulations or in a continuous-simulation mode which tracks soil moisture over months or years. Other hydrologic models that are commonly used for event-based and continuous simulation modeling include HSPF and SWMM. It is widely accepted that continuous simulation modeling, rather than event-based modeling, is required to assess long term changes in geomorphically-significant flow events (Booth and Jackson 1997; Roesner *et al.* 2001).

Several HSPF-based continuous simulation models have been developed specifically for use in hydromodification planning. These include the Western Washington Hydrology Model (WWHM) and

the Bay Area Hydrology Model (BAHM). Hydromodification Management Plans (HMPs) in Contra Costa County, San Diego County and Sacramento County have developed sizing calculators for BMPs based on modeling done using HSPF models. To illustrate the point about uncertainly in mechanistic models, HSPF contains approximately 80 parameters, only about 8 of which are commonly adjusted as part of the calibration process.

Hydraulic Models are used to simulate water-surface profiles, shear stresses, stream power values and other hydraulic characteristics generated by stream flow, using a geometric representation of channel segments. The industry standard hydraulic model is the HEC River Analysis System (HEC-RAS).

Coupled Hydrologic and Hydraulic Models represent a valuable tool in hydromodification management. Because the streamflow regime interacts with its geomorphic context to control physical habitat dynamics and biotic organization, it is often necessary to translate discharge characteristics into hydraulic variables that provide a more accurate physical description of the controls on channel erosion potential, habitat disturbance, and biological response. For example, a sustained discharge of 100 cfs could potentially result in significant incision in a small sand bed channel but have no appreciable effect on the form of a larger channel with a cobble bed. By converting a discharge value into a hydraulic variable (common choices are shear stress, or stream power per unit area of channel relative to bed sediment size), a "common currency" for managing erosion and associated effects can be established and applied across many streams in a region. Such a common currency can improve predictive accuracy across a range of stream types. As opposed to focusing on the shear stress or stream power characteristics of a single discharge, it is usually necessary to integrate the effects of hydromodification on such hydraulic variables over long simulated periods of time (on the order of decades) to fully assess the potential for stream channel changes. By using channel morphology to estimate hydraulic variables across a range of discharges, models like HEC-RAS provides a means of translating hydrologic outputs from continuous simulations in HEC-HMS, SWMM, or HSPF into distributions of shear stress and stream power across the full spectrum of flows.

Sediment Transport Models such as HEC-6T, the sediment transport module in HEC-RAS, CONCEPTS, MIKE 11 and FLUVIAL12, use sediment transport and supply relationships to simulate potential changes in channel morphology (mobile boundary) resulting from imbalances in sediment continuity. This means that hydraulic characteristics are calculated as channel form and cross-section evolve through erosion and deposition over time. Such models have high mechanistic detail but are often difficult to apply effectively. Although it is not a mobile boundary model, the SIAM (Sediment Impact Analysis Method) module in HEC-RAS represents an intermediate complexity model designed to predict sediment imbalances at the stream network scale and to describe likely zones of aggradation and degradation.

Statistical Models use descriptive tools and empirical data to develop relationships that quantify the risk of specific stream behaviors. For example, Hawley (2009) developed a statistical model to explain variance in channel enlargement based on measures of erosive energy and channel features such grade control and median bed sediment size. Such models often include independent variables based on input from the mechanistic models described above; however, a key difference is that statistical models do not explicitly represent actual physical processes in their mathematical structure. Instead, these models

simply express the observed correlations between dependent and independent variables. Like mechanistic models, the output from these models is commonly treated as precise results in management decisions, despite the fact that predictions from most statistical models could be readily (and more accurately) expressed in terms of confidence intervals with a range of uncertainty.

Probabilistic/Risk-based Models integrate many of the tools discussed above, using modeled changes in hydrology as input to hydraulic models, which in turn provide input to various types of statistical models to predict response. However, the predictions are not represented as deterministic outputs, instead, the range of (un)certainty in the likelihood of the predicted response is explicitly quantified. Although not commonly used for hydromodification management at this time, there are well established models based on these principals currently in use in other scientific disciplines. An example of a probabilistic approach that has been used for hydromodification management is a logistic regression analysis that was used to produce a threshold "erosion potential metric" that can be used to quantify the risk of a degraded channel state. More details on this approach are provided in Appendix B.

Risk-based modeling in urbanizing streams provides a more scientifically defensible alternative to standardization of stormwater controls across stream types, and can inform management decisions about acceptable levels of risk.

Risk-based modeling in urbanizing streams provides a more scientifically defensible alternative to standardization of stormwater controls across stream types. A probabilistic representation of possible outcomes also improves understanding of the uncertainty that is inherent in model predictions, and can inform management decisions about acceptable levels of risk.

Predictive Tools for Habitat Quality and Stream Biota. The tools discussed above focus on physical stream impacts; however, as discussed in the preceding chapter, it is recognized that maintenance of stream "stability" does not necessarily conserve habitat quality and biological potential. In general, the knowledge base for biota/habitat associations is not generally adequate to allow for prediction of how whole communities will change in response to environmental alterations associated with urbanization. Making such predictions deterministically requires a thorough knowledge of species-specific environmental responses, as well as an adequate (accurate) characterization of habitat structure and habitat dynamics (both of which are modified by urbanization). However, recent studies have demonstrated that the effects of hydrologic alterations induced by urbanization on selected stream biota can be quantitatively described without a full mechanistic understanding, using stressor-response type relationships and empirical correlations from field-measured conditions (Konrad and Booth 2005, Konrad *et al.* 2008, DeGasperi *et al.* 2009).

In moving beyond a narrow focus on linkages between flow alteration and channel instability, scientific understanding of hydrologic controls on stream ecosystems has recently led to new approaches for assessing the ecological implications of hydromodification. The essential steps in developing quantitative "flow-ecology relationships" have been recently described in the Ecological Limits of Hydrologic Alteration (ELOHA) process (Poff *et al.* 2010), a synthesis of a number of existing hydrologic techniques and environmental flow methods. ELOHA provides a regional framework for elucidating the

key hydrologic influences on biota of interest, and translating that understanding into relationships between hydromodification and biological endpoints that can be used in management decision making. This requires a foundation of hydrologic data provided by modeling and/or monitoring, and sufficient biological data across regional gradients of hydromodification. Although hydrologic–ecological response relationships may be confounded to some extent by factors such as chemical and thermal stressors, there are numerous case studies from the US and abroad in which stakeholders and decision-makers reached consensus in defining regional flow standards for conservation of stream biota and ecological restoration (Poff *et al.* 2010; http://conserveonline.org/workspaces/eloha).

4.3.3 Strengths, Limitations and Uncertainties

The Organizing Framework shown in Figure 4-1 shows the applicability of the three major categories of tools in support of various management actions. This section addresses a range of issues relating to strengths, limitations and uncertainty of the tools discussed above. Detailed analysis of individual models is beyond the scope of this document, but EPA/600/R-05/149 (2005) contains an extensive comparison of functions and features across a wide range of hydrologic and hydraulic models.

Explicit consideration, quantification, and gradual reduction of model uncertainty will be necessary to advance hydromodification management.

The uncertainty inherent to hydromodification modeling underscores the need for carefully designed monitoring and adaptive management programs.

General Considerations. The well-known statistician George Box famously said that "all models are wrong, some are useful." The usefulness of a model for a particular application depends on many factors including prediction accuracy, spatial and temporal detail, cost of calibration and testing, meaningful outputs, and simplicity in application and understanding. There is no cookbook for selecting models with an optimal balance of these characteristics. Models of stream response to land-use change will always be imperfect representations of reality with associated uncertainty in their predictions. In addition to the prediction errors of standard hydrologic models, common limitations and sources of uncertainties include insufficient spatial and/or temporal resolution, and poorly known parameters and boundary conditions. Ultimately, the focus of scientific study in support of decision making should be on the decisions (or objectives) associated with the resource and not on the model or basic science. Each model has limitations in terms of its utility in addressing decisions and objectives of primary concern to stakeholders. Prediction error, not perception of mechanistic correctness, should be the most important criterion reflecting the usefulness of a model (NRC 2001; Reckhow 1999a,b). The predictive models discussed above may be thought of as predictive scientific assessments; that is, a flexible, changeable mix of small mechanistic models, statistical analyses, and expert scientific judgment.

Region-Specific Considerations. Because all models are vulnerable to improper specification and omission of significant processes, caution must be exercised in transferring existing models to new

regional conditions. For example, mobile boundary hydraulic models are mechanistically detailed but not generally well-suited to many southern California streams given the prevalence of near-supercritical flow, braiding and split flow (Dust 2009). In addition, bed armoring and channel widening resulting from both fluvial erosion and mass wasting processes are key influences on channel response in semi-arid environments. These processes are not well-represented and constrained in current mobile boundary models. Accordingly, the appropriateness of existing models for addressing a particular hydromodification management question should be empirically tested and supported with regionally appropriate data from diverse stream settings.

Managing Uncertainty. To date, hydromodification management has generally relied on oversimplified models or deterministic outputs from numerical models that consume considerable resources but yield highly uncertain predictions that can be difficult to apply in management decisions. Numerical models are nevertheless an important part of the hydromodification toolbox, especially in characterizing rainfall-response over decades of land-use change. It is challenging to rigorously quantify the prediction accuracy of these mechanistic numerical models; however, their utility of can be enhanced by addressing prediction uncertainties in number of ways (Cui *et al.* 2011). Candidate models can be subjected to sensitivity analysis to understand their relative efficacy for assessment and prediction of hydromodification effects. Moreover, it should also be demonstrated that selected models can reasonably reproduce background conditions before they are applied in predicting the future. Modeling results that are used in relative comparisons of outcomes are generally much more reliable than predictions of absolute magnitudes of response.

Hydromodification modeling embodies substantial uncertainties in terms of both the forcing processes and stream response. Deterministic representations of processes and responses can mask uncertainties and can be misleading unless prediction uncertainty is explicitly quantified. Errors may be transferred and compounded through coupled hydrologic, geomorphic, and biologic models. Accordingly, explicit consideration, quantification, and gradual reduction of model uncertainty will be necessary to advance hydromodification management. This points to two basic needs. First, there is a need to develop more robust probabilistic modeling approaches that can be systematically updated and refined as knowledge increases over time. Such approaches must be amenable to categorical inputs and outputs, as well as combining data from a mix of sources including mechanistic hydrology models, statistical models based on field surveys of stream characteristics, and expert judgment. Second, the uncertainty inherent to hydromodification modeling underscores the need for carefully designed monitoring and adaptive management programs, as discussed in Section 5.

A risked-based framework can provide a more rational and transparent basis for prediction and decision-making by explicitly recognizing uncertainty in both the reasoning about stream response and the quality of information used to drive the models. Prediction uncertainty can be quantified for any of the types of models described above; however, some types are more amenable to uncertainty analysis than others. For example, performing a Monte Carlo analysis of a coupled hydrologic-hydraulic model is a very demanding task. A simple sensitivity analysis of high, medium, and low values of plausible model parameters is much more tractable and still provides an improved understanding of the potential range of system responses. Such information can be subsequently integrated with other model outputs and

expert judgment into a probabilistic framework. For example, Bayesian probability network approaches can accommodate a mix of inputs from mechanistic and statistical models, and expert judgment to quantify the probability of categorical states of stream response. Such networks also provide an explicit quantification of uncertainty, and lend themselves to continual updating and refinement as information and knowledge increase over time. As such, they have many attractive features for hydromodification management, and are increasingly used in environmental modeling in support of water quality (Reckhow 1999a,b) and stream restoration decision-making (Stewart-Koster *et al.* 2010).

Sediment Supply. As described above, a reduction in sediment supply to a stream may result in instability and impacts, even if pre- and post-land use change flows are perfectly matched. Thus, there is a need to develop management approaches to protect stream channels when sediment supply is reduced, and to refine and simplify tools to support these approaches. This continues to prove challenging because, the effects of urban development on sediment supply in different geologic settings are not well understood and poorly represented in current models. As a starting point, models used to analyze development proposals that reduce sediment supply could be applied with more protective assumptions with respect to parameters and boundary conditions (inflowing sediment loads). Effects of altered sediment supply on stream response could be addressed in a probabilistic framework by adjusting conditional probabilities of stream states to reflect the influence of reductions in important sediment sources due to land use change.

5. MONITORING

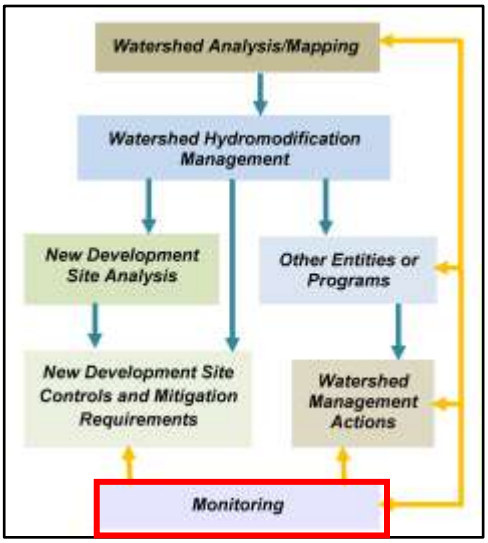

"Monitoring" can cover a tremendous range of activities in the context of stormwater management in general, and of hydromodification in particular. For example, the NPDES Phase 2 general permit for California (SWRCB, 2003 (*www.swrcb.ca.gov/**water**_issues/.../storm**water**/.../final_ms4_**permit**.p...)*, National Pollutant Discharge Elimination System (NPDES) General Permit No. CAS000004, p. 11) notes that the objectives of a monitoring program may include:

- Assessing compliance with the General Permit.
- Measuring and improving the effectiveness of stormwater management plans.
- Assessing the chemical, physical, and biological impacts on receiving waters resulting from urban runoff.
- Characterizing storm water discharges.
- Identifying sources of pollutants.
- Assessing the overall health and evaluating long-term trends in receiving water quality.

These objectives span multiple goals, ranging from verifying of compliance, evaluating effectiveness, characterizing existing conditions, and tracking changes over time. Each would likely require different monitoring methods, duration of measurement, and uses of the resulting data (Table 5-1). This variability emphasizes what we consider the key starting point of any monitoring program: to answer the questions, "What is the purpose of monitoring? How will the data be used?" Even secondary considerations can exert great influence over every aspect of the design of a monitoring program: "How quickly do you need to have an answer?" And, perhaps most influential of all, "What are the resources available to provide that answer?"

Table 5-1. The recommended purpose(s) of monitoring associated with hydromodification control plans, organized by the scale of implementation and the time frame in which useful results should be anticipated.

Time Frame	Programmatic: State and Regional Water Boards	Local: City and County Jurisdictions
Short-term (<10 years)	• Define the watershed context for local monitoring (at coarse scale) • Evaluate whether permit requirements are making positive improvements	• Evaluate whether specific projects/ regulations are meeting objectives • Identify the highest priority action(s) to take
Long-term (1+ decades)	• Define watershed context and setting benchmarks for local-scale monitoring (i.e., greater precision, if/as needed) • Demonstrate how permit requirements can improve receiving-water "health," state-wide (and change those requirements, as needed)	• Evaluate and demonstrate whether actions (on-site, instream, and watershed scale) are improving receiving-water conditions • Assess program cost-effectiveness • Identify any critical areas for resource protection

5.1 The Purpose of Monitoring

In the context of hydromodification assessment and management, we propose three interrelated purposes for monitoring that will guide the discussion and recommendations in this section:

- **Characterizing the conditions** of receiving waters downstream of urban development (including any trends in those conditions over time).
- **Evaluating the effectiveness** of hydromodification controls at protecting or improving the conditions of downstream receiving waters (and modify them, as needed).
- **Setting priorities** on the wide variety of hydromodification control practices, as promulgated by the State and Regional Boards and as implemented by local jurisdictions.

These needs give rise to several interrelated types of monitoring, all common to many watershed and stormwater monitoring programs. They are typically executed at different spatial and temporal scales, and if well-designed and executed they can collectively help guide management actions. We define them here, using terms and definitions that are common to the monitoring literature:

- **Performance monitoring,** by which is normally meant the evaluation of a particular stormwater facility relative to its intended (or designed) performance, but independent of whether that intended design is actually beneficial for downstream receiving waters.
- **Effectiveness monitoring,** by which we mean the assessment of how well specific management actions or suites of actions reduce or eliminate the direct impacts of stormwater on receiving waters. This type of monitoring can answer a question common to stormwater management: does a particular facility actually achieve its intended goal (e.g., flow releases from a stormwater facility protect the stream channel downstream from erosion)? More broadly, monitoring can evaluate the "effectiveness" of a suite of measures or an overall program designed to produce

beneficial outcomes (or avoid negative ones) in downstream receiving waters. In this context, the precise boundaries division between effectiveness monitoring and other types are blurry and unnecessarily artificial.

- **Trends monitoring,** by which we mean an integrative assessment of whether our "endpoint" indicators (physical, chemical, or biological) are showing any consistent, statistically significant change over time. Such monitoring rarely "proves" the direct impacts of a specific stressor on a receiving water, but it is critical to setting and evaluating progress towards integrative assessment endpoints at a regional scale. If well-designed, trend monitoring commonly provides useful information at smaller spatial scales as well, particularly in evaluating response to recent management actions or recovery from a prior disturbance.
- **Characterization monitoring**, by which is commonly meant the identification and (or) the quantification of various parameters in stormwater or a receiving-water body. Characterizing the condition of an outflow discharge or a water body at a particular time and place is always an outcome of the other kinds of monitoring; when it is called out as a goal in-and-of itself, however, it is can be useful to prioritize actions—but only if there is a preexisting standard for what constitutes a "good" or "acceptable" condition (also termed "status monitoring"), and a program to implement (or at least to set the priority for implementing) actions to improve the condition of waterbodies found to be "not good" or "unacceptable."

Without a context for evaluation, characterization monitoring is prone to generate large quantities of rarely used data. We strongly encourage that the purpose of any "characterization" monitoring be clearly articulated in hypothesis testing, priority setting, or systematic trend evaluation. As noted by NRC (2009, p. 508) with respect to this type of monitoring, "…monitoring under all three (NPDES municipal, industrial, and construction) stormwater permits is according to minimum requirements not founded in any particular objective or question. It therefore produces data that cannot be applied to any question that may be of importance to guide management programs, and it is entirely unrelated to the effects being produced in the receiving waters." We seek to proactively avoid this problem.

Monitoring should occur at two scales:

- **Regional or state-wide scale- this will require a time frame of one to several decades**
- **Local scale – this is required to evaluate the performance and effectiveness of specific management measures.**

In this sub-section, we focus our discussion on two interrelated scales at which these various types of monitoring should be applied as outlined in Table 5-1 at the beginning of this section. The first, which here and elsewhere in this document is termed "programmatic," has a regional or state-wide spatial scale; many of its key actions will require a time frame of one to several decades. Monitoring data from this scale should inform the broadly construed "health" of receiving waters to assess whether the range of hydromodification strategies being implemented is maintaining desired conditions across the (state-wide) range of physiography, climate, land-use change, and regulatory approaches of the regional boards. They should be used to identify particularly promising (or particularly ineffective) combinations of control strategies and landscape conditions. Finally, they should provide regionally tailored benchmarks for what constitutes "healthy

watersheds" and "healthy receiving waters" so regulators and permittees alike know what still needs to be done, where it should be done, and how urgently it needs to happen.

The second scale of monitoring data we term "local." It comprises the generation of monitoring data to evaluate the performance and effectiveness of specific management measures (be they structural or nonstructural) at reducing the negative consequences of hydromodification on downstream receiving waters. Useful information at this scale will normally be generated in the time frame of an NPDES permit cycle (i.e., ~5 years) and should provide direct guidance on whether the evaluated management strategies are working, need refinement, or should be abandoned altogether. They should also provide guidance on the degree to which management efforts should be prioritized where regulatory flexibility exists, given the conditions (and, perhaps, the potential responsiveness) of downstream receiving waters. Over longer time frames, monitoring at this scale can also provide public demonstration of the value of regulatory and programmatic efforts, and it can also help identify the most cost-effective mix of publically funded projects and regulatory protection to achieve (or maintain) receiving-water health.

5.2 Programmatic Monitoring at the Regional Scale

5.2.1 Defining Watershed Context

Although not "monitoring" in the strictest sense of this word, establishing a watershed context for the measurement and evaluation of receiving waters is a hallmark of virtually all recommended monitoring strategies (e.g., Beechie *et al.* 2010, Brierley *et al*. 2010). Monitoring programs should be consistent with the watershed perspective that forms the basis for the management framework discussed in Section 3. In California (as in most other states), this can only be executed at a supra-jurisdictional scale, because most watersheds cross one or more city and/or county boundaries. This presents the long-term challenge that many jurisdictions do not have authority over parts of the landscape that can affect the quality of rivers and streams that pass through their boundaries; more immediately, however, it makes an inclusive watershed assessment almost impossible to execute at a local level.

5.2.2 Determining the Effectiveness of Permit Requirements

A second, more challenging contextual need at the regional scale is the definition of thresholds or endpoints against which to compare the results of monitoring or modeling. Both of these "assessment tools" can guide the application of hydromodification control strategies, evaluate their real or likely success, and predict the consequences of hydromodification on downstream receiving waters. However, they provide little insight into the question, "how good is good enough?" Answering this question requires a definition of "assessment endpoints" (borrowing the term from NRC 1994), which in turn requires objective, quantifiable criteria for evaluating progress or outright success.

Most existing HMPs require the permitted municipalities to develop programs and policies to assess the potential effects of hydromodification associated with new development and redevelopment, to include management measures to control the effects of hydromodification, and to implement a monitoring program that assesses the effectiveness of HMP implementation at controlling and/or mitigating the

effects of hydromodification. Yet the appropriate objectives of such management measures, or a basis to evaluate success or failure of the HMP through monitoring data, are rarely provided in consort. Setting these endpoints is beyond the capacity of any but the largest municipalities—and even for those, neither the field of watershed science nor the arena of public policy is so clear that an unequivocally "correct" answer is likely to emerge without much additional work. Any such finding would also lack state-wide applicability; California is far too physically and ecologically diverse for an assessment endpoint developed in one part of the state to transfer everywhere without careful consideration.

For these reasons, we consider this aspect of monitoring at the regional scale to be a long-term, state-wide effort. This reflects the challenge of conducting meaningful characterization (or "status") monitoring: it requires a benchmark against which the measured condition can be compared, and to which an absolute rating ("good," bad," etc.) can be assigned.

In contrast, "trends" monitoring requires no such benchmark, only equivalent measurements undertaken at multiple times coupled with an understanding of what direction of change is desirable. For this reason, evaluating whether permit requirements are making positive improvements is a reasonable (and probably critical) short-term effort, one that can be conducted locally (see below). It should also be integrated and compiled at a regional level, however, the better to inform the continued development of hydromodification requirements.

5.3 Monitoring at the Local Scale

The needs of a monitoring program for local jurisdictions should complement those being satisfied at a regional scale. Showing net improvement is critical to maintaining support for regulatory actions and capital expenditures, but any monitoring program must reflect the typical constraints of showing rapid results while acknowledging constraints on staff resources and expertise (Scholz and Booth 2001). No less urgent is the need to identify what to do "next"—not necessarily establishing a multi-year capital improvement plan, but at least identifying key problems with one or two associated actions that would likely result in significant improvements in receiving-water conditions. Watershed characterization, as discussed above and applied to a specific jurisdiction, can provide useful guidance for such identification; even without it, local knowledge is commonly sufficient in-and-of itself. Targeted monitoring can normally confirm (or refute) such inferences in short order, which is why we place this monitoring application in the "short-term" category.

However, a monitoring program can also provide longer term guidance to local jurisdictions. When supported by the regional context of receiving-water conditions, local monitoring data can demonstrate trends over time that can lend support to (or indicate necessary changes to) hydromodification control plans. In combination with economic data, they can show long-term cost-effectiveness. Finally, site-specific monitoring data, when analyzed in the context of an appropriate scale of watershed characterization, can guide the stratification of less developed and undeveloped watershed areas into those where more assertive protection (or restoration) will be most worthwhile. None of these outcomes depend solely on collecting monitoring data, which is why none of them are presumed to be credible "short-term" applications of monitoring data. However, they have found expression in other

parts of the country having long-term monitoring efforts, and they should provide similar benefits to California as well.

5.4 Developing a Monitoring Plan

"Monitoring" the effects of a management action, whether it is a new regulation, a change in operational procedures, or a constructed project, is commonly included by design or required by regulation. The collection of monitoring data may be seen as a worthwhile activity in its own right, but this discussion uses a more restrictive, implementation-based definition: any "monitoring" needs to demonstrate a direct connection to management actions, such that the results of monitoring are translated into on-the-ground management actions (or changes in management actions). This focus on the *use* of monitoring data requires clear linkages between a management action, the uncertainties associated with that action, the ways in which the effects of that action are expressed (and can be measured) in the world, and the management changes that should be implemented if monitoring results provide unanticipated (or equivocal) resolution to those uncertainties. This is the basis for establishing an "adaptive management" approach to hydromodification monitoring, discussed in more detail in Appendix C. Here, we discuss the design of a monitoring program and outline the variety of measurements that can be made, under the assumption that the intended use(s) of the monitoring data have already been established.

"Stormwater management would benefit most substantially from a well-balanced monitoring program that encompasses chemical, biological, and physical parameters from outfalls to receiving waters" (NRC 2009, p. 257). In pursuit of a comprehensive monitoring program we might also add regular documentation of weather and climate conditions and land-cover changes. As a practical matter, however, monitoring at a site scale is almost never coordinated with other equivalent efforts at other locations, nor placed in a broader spatial context being developed as part of a regional effort. For monitoring data to have greatest value, however, such coordination and context-setting is needed.

Stormwater management would benefit most substantially from a well-balanced monitoring program that encompasses chemical, biological, and physical parameters… (NRC, 2009)

5.4.1 Design of a Monitoring Plan

As noted at the beginning of this section, the overarching question that must be asked and answered at the beginning of any monitoring design effort is "What is its purpose?" The considerations enumerated below cannot be addressed without an explicit answer to this question, because the outcome of those considerations will depend on how the data are to be used. For certain common application of monitoring data we suggest guidance that will be widely appropriate, but there are no recommendations in this section (or any other monitoring guidance document) that apply universally.

Multiple authors have condensed their guidance for designing a monitoring plan into a short list of steps that should precede the first instance of field data collection (e.g., Shaver *et al.* 2007). Although all

differ in details and intended audience, they share significant commonalities that can be distilled as follows:

- Articulate the purpose of the monitoring (the "management question").
- Identify key constraints, in particular the geographic range and scale over which the monitoring can occur, financial/staff resources available, and the time frame in which results must be generated.
- Evaluate existing information, model outputs, and/or regulatory requirements to identify promising metrics and specific sites appropriate to the management question.
- Identify the specifics of the monitoring plan: what parameter(s), where, for how often and for how long. This may include multiple iterations, wherein the guidance of Step 3 must align with the constraints of Step 2.

Most such guidance is written with site-specific, "local" monitoring in mind—the existing literature provides less direction for monitoring that is herein recommended to occur at a regional scale over the next one or more decades. However, the basic principles are the same at all scales: a coherent, explicit purpose needs to be articulated, resource constraints need to be acknowledged, and a credible strategy needs to be developed with its specifics fleshed out. Below we discuss some of the primary considerations in this last step, because they are common across a wide range of monitoring purposes, programmatic constraints, and indicator types.

5.4.2 Constraints (Step 2 of the Monitoring Plan)

Ideally, a monitoring program should be designed to detect trends, assess effectiveness and allow for source identification.

Scale. Ideally, a monitoring program should encompass multiple, nested scales of monitoring that are determined by the question(s) being addressed. For hydromodification applications, the broadest scale of monitoring is that of the integrated effect of stormwater impacts and stormwater management on receiving waters. *Trends monitoring* (and characterization monitoring, if regionally appropriate ranges of quality have been determined) addresses these questions, and it also allows stormwater and resource managers to measure the broad benefits obtained from management investments. Site-specific conditions normally cannot be traced back to specific generators of pollution (NRC 2009), and so monitoring at the broadest scales (i.e., many tens of square miles and larger) should not attempt to do so. Instead, identifying overall conditions and trends requires a broad spatial scale over long time frames (i.e., multiple years), the essence of trends monitoring. This level of effort is recommended as a regional responsibility, because the area(s) of interest will normally far exceed the geographic limits of any single jurisdiction.

If trends monitoring (or long-standing prior knowledge) indicates that there are impacts on beneficial uses, a second (and more site-specific) scale is invoked, that of *effectiveness monitoring:* which of our many stormwater-management actions are achieving the greatest reduction in downstream impacts

(and which are not)? On the whole, such stormwater control measures, both structural and nonstructural, vary by land use—the measures suitable for a residential neighborhood will likely be impractical or ineffective (or both) in an industrial setting. We therefore anticipate that most effectiveness monitoring will be stratified by land use and conducted by individual jurisdictions (see, for example, such an approach in the Nationwide Stormwater Quality Database, which contains water-quality data from more than 8600 events and 100 municipalities throughout the country).

The finest scale of monitoring is that of *source identification*, a form of characterization monitoring: what specific locations and which parts of the landscape generate stormwater of sufficiently deleterious quantity and (or) quality to cause impacts to beneficial uses, be they direct or indirect effects? This question is widely posed in stormwater management programs, and a number of existing monitoring programs seek to provide answers. The science of stormwater already suggests where the greatest attention is probably warranted (NRC 2009), namely a particular focus on areas of well-connected (or "effective") impervious area, high vehicular traffic, and exposure to toxic chemicals. We therefore suggest these categories should define areas of highest priority for this type of targeted investigation, allowing even a resource-constrained jurisdiction to conduct a useful, well-focused monitoring effort with good efficiencies.

Siting. Site selection is most commonly guided by the location of the management action being evaluated while dictated by more mundane considerations of property ownership and access logistics. In general, sites need to meet a few following basic criteria.

- Appropriate scale: the upstream area should be dominated by, or at least significantly affected by, the management action of interest.
- Responsiveness: at the chosen location, the parameters being measured should be amenable to change in response to the management action (e.g., monitoring for geomorphic change in a concrete channel is ill-advised).
- Representativeness: the results at the chosen location should be credibly extrapolated to "similar" sites, and those sites in aggregate should constitute a widespread (or otherwise important) subset of the landscape as a whole.
- Access: the site should be easily reached by the appropriate personnel and equipment, and with a cost of doing so consistent with the frequency of measurements being made. Any equipment left unattended needs to be secure (or well-hidden).

There are institutional considerations in site selection as well. Multiple programs implement monitoring or impose monitoring requirements, and coordination can provide mutual benefits and efficiencies to all. In particular, monitoring driven by management actions at a particular location (i.e., a local scale) will always benefit from information from one or more regional-scale reference sites that can characterize natural or background variability. Local studies will rarely have resources to execute such an effort themselves, again emphasizing the importance of a nested (and coordinated) hierarchy of monitoring programs.

Time and Variability. Evaluating the effectiveness of management actions requires a preliminary judgment of the time frame over which effects can be recognized. For water-quality parameters, storm-specific grab samples or continuous flow-weighted sampling has been most common; for changes in geomorphic form or in the population attributes of benthic macroinvertebrates, one-time annual sampling that presumes to integrate the effects of the past year are typical. Flow metrics are normally extracted from "continuous" (i.e., 5-, 15-, or 60-minute) measurements of discharge. However, every measurement has some degree of variability, a consequence of "natural" variability, measurement errors, and induced change (i.e., the effects of the management action we are trying to perceive). Separating these components is a matter of statistical analysis (see next section) based on repeated measurements, either in time or in space (or both).

We note that many practices common to past monitoring efforts, particularly the use of individual grab samples to characterize stormwater quality, have yielded results with little to no subsequent value: "…to use stormwater data for decision making in a scientifically defensible fashion, grab sampling should be abandoned as a credible stormwater sampling approach for virtually all applications" (NRC 2009, p. 330).

The duration of a monitoring program is commonly determined by the desire for "timely" answers, although normally the ability to generate statistically significant results is a function of the system being evaluated and the indicators being measured. This often creates a conflict between the intended "mission" of the monitoring program and its ability to produce defensible results, a conflict that can only be avoided by a design that identifies meaningful variables to measure, conducts sufficiently frequent measurements to dampen random variability, and must persist~~s~~ for long enough to allow a management "signal" to emerge from the data. This is the essence of the iteration noted above in Step 4 of monitoring-plan design above.

The monitoring program design must persist long enough to a allow management "signal" to emerge from the data. Consequently, long-term records (i.e., one to several decades) will be needed to detect all but the most dramatic of trends in biological indicators.

In one of relatively few quantitative studies of variability in biological indicators, Mazor *et al.* (2009) found that year-to-year variability for the same site sampled in the same season showed a variability (i.e., ±1σ) was typically about 10 points for a benthic IBI. With average scores for their 5 sites ranging from 28–51 (on a 100-point scale), this reflects a coefficient of variation of about 25%. Individual metrics were even more variable. This emphasizes that long-term records (i.e., one to several decades) will be needed to detect all but the most dramatic of trends in biological indicators.

The duration of monitoring also needs to capture the events that are most important to the anticipated responses of the measured system. For evaluating the effects of hydromodification, frequent storms (i.e., those that are normally expected to occur one to several times per year) are commonly judged important and their effects would normally be captured by a monitoring effort of even just one or a few years' duration. Particularly in more semi-arid regions of the state, however, significant channel-altering events may occur only after many decades of relative quiescence and stability, and noticeable (or documentable) response of streams to hydromodification may only occur under certain circumstances or following specific combination of events. Therefore, the lack of channel response on an annual basis

may not necessarily indicate that management actions are effective. Thus a long-term, ongoing monitoring effort is necessary to capture the responses to infrequent, stochastic events, but determining the likely duration of such a program requires some knowledge (or assumptions) of the critical drivers of those responses. It therefore requires a well-posed set of management questions underlying the monitoring effort as well.

For management questions concerning the effectiveness of hydromodification controls, monitoring will almost always benefit from long-term flow monitoring at multiple sites, especially those in the mid to upper watershed (and key tributaries, depending on the scale of the effort). Local rainfall measurements are nearly as essential, since flow data without rainfall data resolved at a similar spatial and temporal scale are useless at best, misleading at worst. Baseline (pre-project) monitoring normally is also invaluable. However, each of these elements will normally require some combination of a multi-scale, long-term, coordinated monitoring program with an investment of at least several years' duration in anticipation of (and follow-up after) a specific management action at a specific location. Despite the value for evaluating the effects of hydromodification (and hydromodification control efforts), such monitoring almost never occurs to this degree. To the extent this remains a practical constraint on implementation, the range of management questions needs to be commensurately narrowed as well.

Statistical Considerations. The statistical design of a monitoring program is beyond the scope of this section, because the range of possible requirements and approaches is tremendously broad. Several general principals are worth articulating, however, because they apply almost universally (and are commonly ignored):

- Although trends can be "suggested" by monitoring data, only statistically rigorous results can be offered as "proof." Thus, ignoring this dimension of monitoring program design severely limits future applicability of the results.
- Most natural parameters display high variability when measured outside a laboratory, and thus the magnitude of change caused by a management action also needs to be great before it can be recognized. There is a trade-off between the relative magnitude of change and the number of samples required to recognize it (i.e., large relative changes require fewer samples), but many monitoring efforts pay little attention to this basic fact. Where sampling can only occur during specified storm conditions or once during the same season each year, the duration of a monitoring campaign sufficient to detect even large changes in naturally variable parameters is likely to be a decade or longer. For many management applications, this is tantamount to generating no useful information at all (but is significantly more costly).
- The level of effort needed can be estimated *a priori* to help guide final monitoring design, but only if the degree of variability and the magnitude of change to be perceived are known or estimated ahead of time. One such example is given below, where the diagonal lines are labeled with the number of independent samples needed to achieve a typical level of statistical power for various combinations of permissible error from the "true" value (x axis), and the intrinsic variability in values across the population being measured (y axis) in Figure 5-1 below.

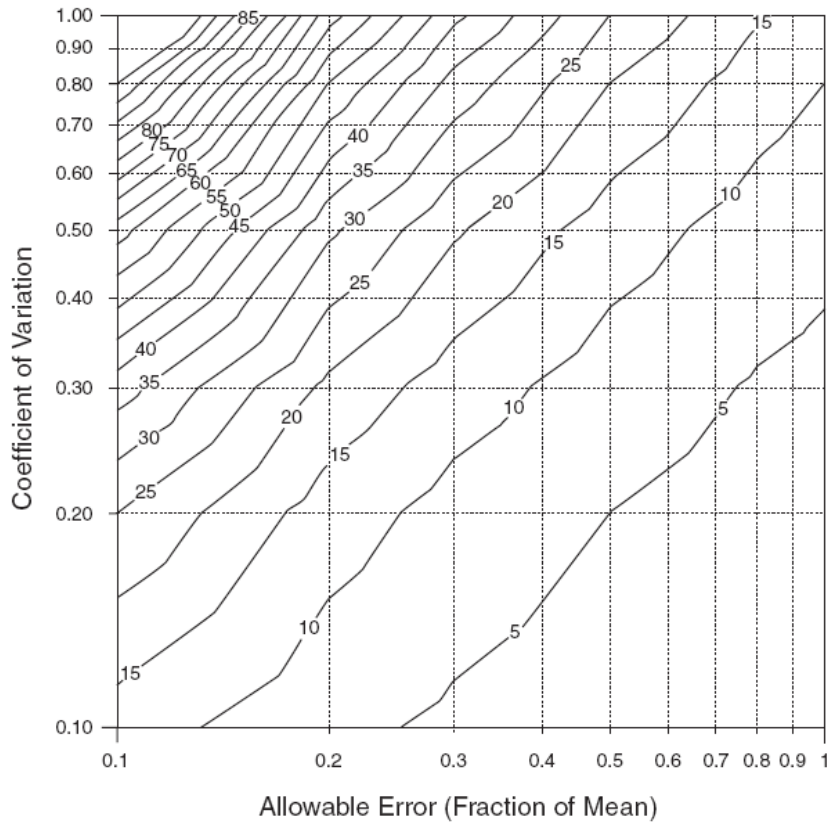

Figure 5-1. Sample requirements for confidence of 95% (α = 0.05) and power of 80% (β = 0.20). Figure from Pitt and Parmer 1995.

5.4.3 What to Monitor (Step 3 of the Monitoring Plan)

The choice of "what to monitor" follows from the choice of assessment endpoints, which in turn depends on the choice of management goals: for example, if "stable stream channels" is the intended outcome of an HMP, then measurement of the physical form of a channel over time would be appropriate. If diagnosing the cause of observed changes is also desired, then some evaluation of potential causal agents (e.g., hydrology, sediment input, or direct disturbance) would also be needed. Because management goals are now commonly (and appropriately) cast more broadly, however, they can embrace less clearly defined endpoints such as "watershed health" or "biological integrity." Many such endpoints fail the test of quantifiable objectivity.

However, these goals invoke a broad scope of concern, embracing not only physical stream conditions but also a range of chemical, hydrologic, and biological attributes. They encompass a broader catalog of receiving waters that may need to be evaluated. Finally, they emphasize the importance of looking more broadly to identify the cause of observed changes—both spatially, to conditions throughout a watershed that may have influence downstream; and temporally, to recognize ongoing adjustments to past disturbance (i.e., legacy effects) and to future environmental changes (e.g., climate change) that commonly lie well beyond the ability of local watershed managers to address. The imprecision of these

goals should not obscure the importance of broadening the scope of stormwater and hydromodification assessments to include not only the traditionally emphasized characterization of selected water-quality constituents and channel stability, but also more integrative measures.

These considerations suggest two broad categories of assessments, which largely but not entirely align with the two scales of implementation (i.e., "programmatic" and "local") defined in Table 4–1:

- Integrative: defining an overall level of "health" of the watershed, as expressed in the condition(s) of its receiving waters. Current scientific consensus suggests that biological indicators are best suited to this scale of evaluation (Karr and Chu 1999), insofar as they integrate the consequences of multiple stressors on aquatic systems and because many management goals (and regulatory requirements) are cast in biological terms. To be meaningful, however, any such indicators need to be suitably chosen and stratified for their particular geo-hydro-climatological region (e.g., "ecoregions"; Omernick and Bailey 1997).
- Targeted: demonstrating the achievement of an established regulatory standard or a designated threshold (typically, a measured or modeled pre-development condition) by a particular parameter, commonly one or more chemical constituents or a specific hydrologic metric of flow. This can be evaluated at the outfall of a single stormwater facility, at the discharge point for a site, or in the receiving water itself. Many of these thresholds are important in their own right—to protect human health, to preserve riparian property from erosion, to avoid flooding of previously non-inundated lands. However, they should be recognized as providing only one-dimensional views of a much broader system. Thus, targeted monitoring can supplement but should not replace more integrative measures.

Integrative assessment endpoints require multiple lines of evidence to characterize receiving-water conditions. At their most comprehensive, they should include measures of flow, geomorphic condition, chemistry, and biotic integrity (Griffith *et al.* 2005, Johnson and Hering 2009). However, biological criteria are generally key to integrative assessment: "In general, biological criteria are more closely related to the designated uses of waterbodies than are physical or chemical measurements" (NRC 2001, p. 8). In most applications, such assessments are compared to one or more reference sites where conditions have been independently judged as "excellent," or where human disturbance is minimal and so best-quality conditions are assumed.

Integrative assessment endpoints require multiple lines of evidence to characterize receiving-water conditions. At their most comprehensive, they should include measures of flow, geomorphic condition, chemistry, and biotic integrity.

The task of identifying and quantifying reference conditions in California streams is presently being carried out by the Reference Condition Management Program (RCMP) of the State Water Board's Surface Water Ambient Monitoring Program (SWAMP; see 2009 Recommendations). About 600 sites have been recognized by this program as "reference" based on having minimal human disturbance, and they have been geographically stratified into the 12 Level III ecoregions mapped for the state of California (by USEPA 2000). The metrics chosen to characterize their biologic conditions should provide an appropriate list for the evaluation of impaired (or potentially impaired) streams.

An equivalent set of reference sites and conditions for other receiving-water types does not presently exist. California also presently lacks a systematic basis for defining relative categories of "poor," "fair," "good," or "excellent" based on numeric values of biological indicators, such as exists in parts of the Pacific Northwest. Several regions, however, now have multimetric biological indicators with defined reference conditions (see below).

Elsewhere, however, there is as yet no context for setting assessment endpoints for biological indicators in California receiving waters. Such an effort is in progress, at least for streams, and its eventual completion to support the management application of more local monitoring results is a key recommendation of this report. Biological assessment endpoints will need to be established region by region on an as-needed basis; in the interim, locally collected data can be very useful for trend monitoring of receiving water but not for defining existing levels of "health."

5.4.3.1 An Example from Washington State

The Puget Sound region of western Washington State provides an instructive example for identifying indicators and establishing desired assessment endpoints. Multiple agencies over the last two decades have sought to measure the overall ecological health of the region and to define targets for recovery. Following the most recent three-year process, the lead agency for the current effort released its set of 20 "dashboard indicators" designed both to express scientific understanding of conditions needed for ecological health and to communicate that understanding in a public-accessible manner (http://www.psp.wa.gov/pm_dashboard.php; accessed September 5, 2011). They cover physical, chemical, and biological indicators: all expressed in terms of relative improvement or quantified conditions to be reached by the year 2020.

This level of target-setting is possible only after extensive study and public discussion; it falls far beyond the scope of the present document. It is instructive for the state of California, however, in several regards as it looks to the future:

- The physiographic scope of the indicators and their target values is well-constrained to a particular geographic region with broadly similar geologic, hydrologic, and climatological attributes. Multiple parallel efforts would almost certainly be needed for a more diverse region (such as the entire state).
- Each indicator has a strong scientific basis for inclusion and at least some scientific basis for specific targets. Their communication value with the public was also an explicit criterion for inclusion.
- The most numerous indicators are biological, and they address multiple levels of the trophic chain from top predators to plants (a planktonic metric, however, was rejected as requiring too much additional scientific study and offering little communication value to the general public).
- Although emphasizing biology, the indicators are broadly distributed amongst biological, chemical, and physical metrics; most are broadly integrative in nature (e.g., reference to "bug populations" (the Puget Sound B-IBI) and a "freshwater quality index").

- The set of physical indicators is most parsimonious for instream conditions, and excluding marine nearshore and estuary conditions is restricted to a single hydrologic metric (chosen for its presumed influence on fish). This stands in stark contrast to most existing hydromodification monitoring plans, which emphasize measures of channel geomorphology and a wider range of hydrologic metrics. Such indicators may provide useful performance measures, but they should not be mistaken for more integrative measures of ecosystem or watershed "health."
- Although each indicator has a specified, numeric goal to be reached by 2020, there are no articulated changes to the current management plan if any of those goals are not reached (or if interim measures suggest that they will not be reached). This is a recognized shortcoming of the present plan but there is no mechanism yet in place to address it. As such, it does not currently meet the test for "adaptive management" (see Appendix C).

In California, such a list of integrative assessment indicators (let alone quantified endpoints for those indicators) cannot presently be defined, except in a few specific localities where data collection and analysis have been ongoing for many years. Thus, we recognize the value of such targets but must guide the present development of monitoring in recognition of their near-complete absence. Rectifying this shortcoming is the central recommendation for long-term program development; in the interim, short-term monitoring at both the regional and local levels need to acknowledge the absence of an integrative context in which to interpret their results.

In California, a list of integrative assessment indicators (let alone quantified endpoints for those indicators) cannot presently be defined, except in a few specific localities. Rectifying this shortcoming is the central recommendation for long-term program development.

Regulatory standards are established on the assumption that "clean water" will result in "healthy streams," but the elements of a watershed are far too complexly interrelated to permit such a simplistic perspective. Although the inverse ("polluted water results in unhealthy streams") is almost always true, the challenge for inferring causality from typical monitoring data is that *many* such stressors can all yield the same, degraded outcome. For this reason, targeted monitoring can provide useful diagnostic information and demonstrate regulatory compliance, but it cannot provide sufficient information to address integrative assessment endpoints.

5.4.3.2 Indicators from Existing Programs

We now turn to some of the most common indicators used in monitoring programs today, recognizing that their suitability in any given application depends on the questions being asked, the characteristics of the natural system being measured, and the practical constraints imposed on the monitoring program.

Hydrologic Indicators. Historically, the effects of urbanization on flow were characterized exclusively in terms of peak flow increases (e.g., Leopold 1968, Hollis 1975). Study since those early works has emphasized the degree to which other attributes of a stream hydrograph are changed by watershed imperviousness, and the importance of assessing the *duration* of moderate flows that are capable of transporting channel sediments and the frequency with which those geomorphically active flows occur

(Section 2). Thus, monitoring relevant to a particular hydromodification management application will likely include a variety of flow metrics (e.g., Konrad and Booth 2005, Degasperi *et al*. 2009).

In moving beyond a narrow focus on linkages between watershed urbanization, flow alteration, and in-stream effects, scientific understanding of hydrologic controls on stream ecosystems has recently led to new approaches for assessing the ecological implications of hydromodification. For example, the ecological limits of hydrologic alteration (ELOHA) framework is a synthesis of a number of existing hydrologic techniques and environmental flow methods that allows water-resource managers and stakeholders to develop socially acceptable goals and standards for streamflow management (Poff *et al.* 2010). The central focus of the ELOHA framework is the development empirically testable relationships between hydrologic alteration and ecological responses for different types of streams. This requires a foundation of hydrologic data provided by gaging and/or monitoring, and sufficient biological data across regional gradients of hydromodification. Although hydrologic–ecological response relationships may be confounded to some extent by factors such as chemical and thermal stressors, there are numerous case studies from the US and abroad in which stakeholders and decision-makers have reached consensus in defining regional flow standards for conservation and ecological restoration of streams and rivers (Poff *et al.* 2010).

Hydrologic monitoring provides essential information needed for establishing flow–geomorphology–ecology relationships, validating conceptual models, and assessing effectiveness of management actions in developing watersheds. Implementing regional flow standards should proceed in an adaptive management context, where collection of monitoring data or targeted field sampling data allows for testing of flow alteration–geomorphic–ecological response relationships. This allows for a fine-tuning of flow management targets based on improved understanding of the actual mechanisms; however, such monitoring can be expensive and it may take many years to adequately characterize the full spectrum of streamflows. Thus, hydrologic monitoring programs should be carefully planned and executed so that they are cost-effective and address the key uncertainties In this paper we primarily focus on indicators that do not require additional, extensive data collection.

Hydrologic indicators provide essential information needed for establishing flow–geomorphology–ecology relationships, validating conceptual models, and assessing effectiveness of management actions in developing watersheds.

Geomorphic indicators have been long-recognized as simple, easy-to-measure, and relatively responsive indicators of changes to the flow regime or sediment supply of a river or stream.

Biological indicators provide an integrative view of river condition, or river health.

Hydrologic monitoring is feasible in the context of a short-term program only if the purpose is to evaluate the engineering performance of a particular facility. For most applications, however, at least two (and commonly many more) years are necessary to measure a range of variable conditions sufficient to capture significant geomorphic and/or biological effects. Measurement of precipitation, generally a less cost-intensive effort than flow monitoring, must occur in consort for the data to be useful. In an effort to minimize the cost of continuous long-term flow modeling, a hydrologic model may be calibrated on one or two years of actual data and then used *in lieu* of further data to predict flow conditions. Whether the level of imprecision so introduced is appropriate will depend on the

management questions being asked, but in general such an approach is normally judged more appropriate for comparative results (e.g., did a specified flow magnitude increase in frequency or duration?) than for absolute results (what is the magnitude of the 2-year discharge?).

Geomorphic Indicators. Geomorphic indicators have been long-recognized as simple, easy-to-measure, and relatively responsive indicators of changes to the flow regime or sediment supply of a river or stream (e.g., Leopold 1968). They require little specialized equipment, many commonly can be measured "in the dry" (or close to it), they typically change little from week-to-week (and so are often measured only once per year), and the morphologic features of interest provide the physical template on which a wide range of biological conditions are expressed.

Scholtz and Booth (2000) recognized five geomorphological "channel features" commonly measured as part of monitoring programs:

- Channel geometry (cross sections, longitudinal profile).
- Channel erosion and bank stability.
- Large woody debris.
- Channel-bed sediment.
- In-stream physical habitat (pools, riffles, etc.).

To this list, others have also added:

- Floodplain connectivity.
- Channel planform (meandering, braiding, rates of channel shifting).

Each metric has well-defined methods for field (or, in some cases, airphoto) measurements that need not be repeated here. However, despite broad agreement on *how* to measure each parameter, there is substantially less agreement on the meaning of particular measurements, or indeed under what circumstances (if any) such measurements should be made at all. Most contentious are the various protocols for assessing instream physical habitat (#5 above)—seemingly the most "relevant" for a host of biological applications and for evaluating restoration success. However, a variety of studies have documented a high level of uncertainty imposed by observer bias:

> "Habitat-unit classification was not designed to quantify or monitor aquatic habitat. At the level necessary for use as a stream habitat monitoring tool, the method is not precise, suffers from poor repeatability, cannot be precisely described or accurately transferred among investigators, can be insensitive to important human land-use activities, is affected by stream characteristics that vary naturally and frequently, and is not based on direct, quantitative measurements of the physical characteristics of interest. Relying on habitat-unit classification as a basis for time-trend monitoring is time-consuming, expensive, and ill-advised." (Poole *et al*. 1997, p. 894)

Other geomorphic metrics, in contrast, can provide a robust, albeit coarse, characterization of the channel boundaries. Some changes, particularly if consistently expressed by multiple adjacent cross-

sections, can provide clear documentation of systematic channel changes over time that can be credibly associated with upstream changes (e.g., increased discharge from urbanization leading to channel enlargement). Other changes, however, may have a more indirect or uncertain association with upstream conditions (e.g., grain-size changes) because of the potential for rapid, ill-described changes over time without a corresponding human "cause." This emphasizes the importance of having a well-crafted purpose for the monitoring program into which the utility of any chosen parameter can be clearly described.

Biological Indicators. Biological indicators have been long-applied in society's evaluation of stream conditions, but historically that application has been rather informal. Observation of major fish kills, for example, is the application of a "biological indicator," but it provides little diagnostic or discriminatory information except in those streams where conditions are so poor that even casual awareness is inescapable. As a more refined assessment tool, however, their application to freshwater streams is only a few decades old. As such, the science is still under construction and some basic principles are still debated.

The rationale behind using biological indicators, however, is relatively undisputed. Karr (1999) has provided a useful summary of that rationale, of which the key elements are:

- Biological monitoring and biological endpoints provide the most integrative view of river condition, or river health.
- Biological monitoring is essential to identify *biological* responses (emphasis added) to human actions.
- Communicating results of biological monitoring to citizens and political leaders is critical if biological monitoring is to influence environmental policies.

Some of the earliest references to biological monitoring are associated with the development of RIVPACS, the River Invertebrate Prediction and Classification System, developed by the Centre for Ecology and Hydrology in the United Kingdom and now applied in a number of countries worldwide to predict instream biological conditions from a suite of watershed and channel variables. Since that beginning, other approaches have been advanced and practiced (e.g., the US Environmental Protection Agency's *Rapid Bioassessment Protocols*) that provide alternative, but likely near-equivalent results (e.g., Herbst and Silldorf 2004).

In this section we compare several biological indicators recently applied in various regions of California. This not intended as a comprehensive comparison of all available approaches potentially applicable to California; rather, it simply provides a few examples that illustrate the differences, and the similarities, of the various approaches. As the comparisons demonstrate, there is no "right" approach—but all share commonalities that are likely to be valuable elements of any biological monitoring program. We focus exclusively on benthic macroinvertebrates (BMI), because these have seen the longest and most widespread application (both in California and worldwide) given their species diversity and their relative geographic immobility. However, a variety of other biological metrics (particularly fish and periphyton) have relevance to biological monitoring and strong advocates in the scientific community. Their

omission here is not a judgment on their value, merely a reflection of the broader applicability and richer scientific development of BMI-based indicators.

Multimetric indices are presently completed for four areas of the state (Eastern Sierra, North Coast, Central Valley, and Southern Coast). They are not standardized or calibrated state-wide (nor should they necessarily be), and they do not provide statewide coverage. In addition, the City of Santa Barbara (Ecology Consultants 2010) has sponsored development of its own BMI index (geographically embedded within the Southern Coast region), with both commonalities and differences between it and the others.

Eastern Sierra Nevada. Herbst and Silldorf (2009) developed an IBI based on streams from the upper Owens River north to the Truckee River. Their purpose was both to provide a region-specific IBI for future use and to evaluate the results of such an approach with others that also make use of BMIs to assess stream conditions. They evaluated the performance of 12-, 10-, and 8-metric indices, recommending the 10-metric index as providing the best overall performance included in the 12-metric index were these 10 and also predator richness and EPT% abundance:

- % tolerant percent richness (% of taxa with TV= 7,8,9,10).
- Richness (total number of taxa).
- Chironomidae Percent Richness (% of taxa that are midges).
- Ephemeroptera (E) Richness (number of mayfly taxa).
- Plecoptera (P) Richness (number of stonefly taxa).
- Trichoptera (T) Richness (number of caddisfly taxa).
- Dominance 3 (proportion of 3 most common taxa)
- Biotic Index (modified Hilsenhoff, composite tolerance).
- Acari richness (number of water mite taxa).
- Percent shredders (% of total number that are shredders).

A statistical analysis suggests that as many as 10 distinct classes can be discriminated using this IBI, although their recommended application uses only five categories of quality.

North Coast. Rehn *et al.* (2005) developed an IBI based on coastal-draining streams from Marin County north to the Oregon border. They evaluated 77 individual metrics, testing them for responsiveness to human disturbance and redundancy, and ultimately settled on eight:

- EPT richness.
- Coleoptera richness.
- Diptera Richness.
- Percent intolerant individuals.

- Percent non-gastropod scraper individuals.
- Percent predator individuals.
- Percent shredder taxa.
- Percent non-insect taxa.

Their statistical analysis indicated that five categories of quality could be discriminated; response was driven most strongly by watershed land cover (natural vs. unnatural) and percent of substrate that was sand-sized or finer. They also suggested a set of thresholds for rejecting potential "reference" sites (Rehn *et al.* 2005; Table 5-2), which was also used in the Southern Coast study (Ode *et al.* 2005; see below):

Table 5-2. Thresholds for rejecting potential "reference" sites.

Stressor	Threshold
Percentage of unnatural land use at the local scale	> 5%
Percentage of urban land use at the local scale	> 3%
Percentage of total agriculture at the local scale	> 5%
Road density at the local scale	> 1.5 km/km^2
Population density (2000 census) at the local scale	> 25 ind./ km^2
Percentage of unnatural land use at the watershed scale	> 5%
Percentage of urban land use at the watershed scale	> 3%
Percentage of total agriculture at the watershed scale	> 5 %
Road density at the watershed scale	> 2.0 km/km^2
Population density (2000 census) at the watershed scale	> 50 ind./ km^2

Central Valley. Rehn *et al.* (2008) also developed an IBI for Central Valley streams, evaluating 80 candidate metrics to yield a final list of five:

- Collector richness.
- Predator richness.
- Percent EPT taxa.
- Percent clinger taxa.
- Shannon diversity (a composite measure of taxonomic richness and evenness of abundance).

They found that reach-scale physical habitat variables were more critical in their data set than water chemistry or land use. They also presented their findings with greater caution than with other regions of the state, noting the difficulty of identifying truly "unimpaired" reference conditions and the geographic concentration of much of their source data.

Southern Coast. Ode *et al.* (2005) developed a BMI index of biological integrity based on 61 potential metrics from reference sites drawn from relatively undisturbed coastal-draining watersheds from Monterey Bay south to the Mexican border. They included seven final metrics:

- Percent tolerant taxa.
- Percent collector-gatherer + collector-filterer individuals.
- Predator richness.
- Percent intolerant individuals.
- EPT richness.
- Percent noninsect taxa.
- Coleoptera richness.

They note that the last two on the list are not common in other multimetric B-IBIs but were statistically appropriate for their data set. They judge that this "SoCal B-IBI" can discriminate 5 categories of condition, using 5 categories evenly divided along a 100-point scale. Particularly strong correlations amongst all seven metrics were displayed in comparison to road density and percent "watershed unnatural."

A portion of the Southern Coast region has also been the subject of independent IBI development over the past decade (Ecology Consultants 2010, 2011). The region of study spans the Santa Barbara coastal streams from the Ventura County line west about 45 miles to Gaviota Creek. Their work led to the development of an IBI using the following 7 metrics:

- # of insect families
- # of EPT families
- % EPT minus Baetidae
- % PT
- Tolerance value average
- % sensitive BMIs
- % predators + shredders

In the course of this work, tolerance values were adjusted for certain taxa based on local observations of presence/absence relative to the level of watershed disturbance. With these changes, they found strong statistical basis for discriminating five categories of biological quality. They also found that considering both watershed-level land use patterns and localized physical habitat conditions were necessary to achieve the best prediction of biological integrity.

Summary. A compilation of the various metrics (Table 5-3) demonstrates only broad commonalities between the various regional IBI's presently available for specific parts of California, suggesting that additional work needs to be done before comprehensive recommendations for biological monitoring can be made. At present, perhaps half(?) of the state's area is covered by existing multimetric indices as noted above, and for these areas they provide the best (indeed, the only) guidance for meaningful collection and interpretation of biological data. Elsewhere, however, only a few general points can be made:

- Biological monitoring in un-assessed regions of the state cannot be used to identify absolute conditions of biological health (i.e., "status" monitoring). However, they will likely be useful for "trends" monitoring, where only the change relative to a prior state is being sought.
- Despite the variability in metric choices amongst the various regions (Table 5-2), some broad commonalities are apparent. In particular, several types of metrics are likely to provide useful indicators of change in a known direction (i.e., an increase or decrease in the metric can be confidently assigned to a change in quality in a known direction):
    - One or more measures of tolerance or intolerance
    - One or more measures of predator prevalence
    - One or more measures of EPT taxa or taxa richness

This list does not purport to describe a true multimetric B-IBI, nor to provide a basis to evaluate instream biological health on an absolute scale (i.e., from "poor" to "excellent"). In the absence of any region-specific guidance, however, changes in one or more of these metrics are each likely to provide some initial, useful indication of temporal trends in biological health until such time as the types of studies referenced above can be conducted.

Table 5-3. Compilation of metrics used in the five regional B-IBI's described in the text.

METRIC	Eastern Sierra	North coast	Central Valley	Southern coast	Santa Barbara
Percent intolerant individuals		X		X	X
% tolerant (% of taxa with TV= 7,8,9,10)	X			X	
Tolerance value average					X
# of insect families					X
Percent non-insect taxa		X		X	
Percent shredders (% of total number that are shredders)	X	X			
Percent predator individuals		X			
% predators + shredders					X
Predator richness			X	X	
Collector richness			X		
Percent non-gastropod scraper individuals		X			
Percent clinger taxa			X		
Percent collector-gatherer + collector-filterer individuals				X	
EPT richness		X		X	X
Percent EPT taxa			X		
% EPT minus Baetidae					X
% PT					X
Ephemeroptera (E) Richness (number of mayfly taxa)	X				
Plecoptera (P) Richness (number of stonefly taxa)	X				
Trichoptera (T) Richness (number of caddisfly taxa)	X				
Coleoptera richness		X		X	
Diptera Richness		X			
Chironomidae Percent Richness (% of taxa that are midges)	X				
Richness (total number of taxa)	X				
Dominance 3 (proportion of 3 most common taxa)	X				
Biotic Index (modified Hilsenhoff, composite tolerance)	X				
Acari richness (number of water mite taxa)	X				
Shannon diversity index			X		

5.5 Recommendations

Based on this review of monitoring theory, current applications, and current needs, the following steps are recommended to advance a state-wide program of monitoring to support the management of hydromodification control plans.

5.5.1 Programmatic Monitoring

Over the next several years, the following actions should be implemented at the state and/or regional level:

- Executing broad-scale, GIS-based watershed characterization;
- Identifying a set of representative indicator watersheds, and a basic suite of regular measurements that are suitable for establishing trends in physical, chemical, and biological indicators;
- Identifying (and multi-metric monitoring within) a relatively small set of watersheds that have implemented recent hydromodification control plans to initiate the long-term evaluation of downstream trends.

Over the course of the next several NPDES permit cycles (i.e., one or more decades), the following actions should also be undertaken as a regional responsibility:

- Setting regionally appropriate endpoints for biological health of receiving waters;
- Identifying particularly promising (or particularly ineffective) combinations of control strategies across a range of different landscape conditions;
- Providing supplemental data collection at reference sites to support trends monitoring by local jurisdictions;
- Compiling local results to guide development and refinement of regionally appropriate hydromodification control strategies.

5.5.2 Local Monitoring

Over the next several years, the following actions should be implemented by local jurisdictions at a local scale:

- Implementing a program of source identification at one or more high-risk locations (e.g., high vehicular traffic, high imperviousness, toxic chemical storage/transport);
- Demonstrating the hydrologic performance of one or more representative hydromodification control facilities;
- Monitoring trends at one or more representative receiving waters, ideally at a regionally identified site (see the second bullet under “Programmatic monitoring,” above);

- Conducting a synoptic evaluation of waterbodies, stratified by watershed type (see the first bullet under “Programmatic monitoring,” above), to identify highest priority systems for protection or rehabilitation, if not already known.

Over the course of the next several NPDES permit cycles, the following long-term actions should also be undertaken as a local responsibility:

- Monitoring representative conditions to evaluate whether management actions are improving overall receiving-water health;
- Evaluating cost-effectiveness of implemented hydromodification control measures;
- Identifying critical areas for resource protection by virtue of existing high-quality conditions.

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APPENDIX A: GUIDANCE FOR APPROPRIATE APPLICATION OF HYDROLOGIC AND HYDRAULIC ANALYSES

Information contained in this document is intended solely for guidance purposes only. It is not intended to be an instruction manual and use of any of the guidance provided herein is at the risk of the user. No other person or entity shall be entitled to rely on the services, opinions, recommendations, plans or specifications provided in the document.

1. INTRODUCTION AND PURPOSE

The purpose of this Appendix is to provide technical guidance on hydrologic and hydraulic analyses, including the use of Continuous Simulation (Hydrologic) Modeling (CSM), in support of hydromodification assessment and mitigation. CSM is the industry standard developed since the early 2000s for use in the assessment and mitigation of hydromodification. The fundamental difference between CSM and peak flow hydrologic modeling, is that CSM considers the full range of flow events over a long period of record, typically 30 years or more, to develop flow duration curves, whereas peak flow hydrologic modeling generally considers synthetically (usually calibrated to measured data) produced event-based hydrographs (2-, 10-, 50-, 100- and 200-year return frequency events). CSM allows flow duration curves and other derived hydraulic metrics to be compared between existing and proposed conditions in order to assess hydromodification impact potential and to develop mitigation strategies. The guidance provided in this appendix is the product of the experience gained in the application of hydromodification management strategies to multiple urban development projects. This appendix is not intended to be an instruction manual but to provide guidance to engineers, planners and regulatory staff on specific modeling elements involved with HMPs.

MODELING METOHDOLOGY REVIEW

Modeling Approaches

A common approach to mitigating hydromodification impacts from development projects is to construct best management practices (BMPs) which capture, infiltrate and retain runoff, where possible. In such cases, the water is detained and released over a period of time at rates which more closely mimic pre-project hydrology. Methods commonly used to size hydromodification BMPs include hydrograph matching (matching pre and post-project flow regimes), volume control and flow duration control. Hydrograph matching is most traditionally used to design flood detention facilities for a specific storm recurrence interval, such as the 100-year storm, whereby the outflow hydrograph for a project area matches the pre-project hydrograph for a design storm. Volume control matches pre- and post-project runoff volume for a project site; however, the frequency and duration of the flows are not controlled. This can result in higher erosive forces during storms. Flow duration control matches both the duration and magnitude of a range of storm events for pre- and post-project runoff. The complete hydrologic record is taken into account, and runoff magnitudes and volumes are matched as closely as possible.

It is generally accepted that flow duration control matching is the most appropriate method to be used in the design of hydromodification BMPs. The flow duration control approach has been used in at least half a dozen HMPs in California, all of which used a CSM to match flow durations. However, differences exist in how the continuous simulation modeling is used between programs.

OVERVIEW OF APPENDIX

This appendix covers the following specific topics, addressed in the order in which they would arise as part of a hydromodification analysis for a major development project:

Section 2 addresses calculation of a flow control range, including identification of an acceptable low flow value, based upon critical flow for incipient motion of the channel material. .

Section 3 addresses the development of evaluation criteria to assess the effectiveness of a proposed mitigation design, including a discussion of flow duration matching and the erosion potential metric.

Section 4 addresses CSM, including precipitation data requirements, hydrologic time steps, model calibration and validation, and other modeling considerations and tips.

2. METHOD FOR SELECTION OF A FLOW CONTROL RANGE

INTRODUCTION TO FLOW CONTROL

Most hydromodification plans (HMPs) in California have adopted a flow control approach, which establishes a range of flow magnitudes discharging from the proposed site that must be controlled. The magnitude of the flow range is commonly expressed in terms of a percentage of the return period flow to which it is equivalent; for example: from 10% of the Q2 to 100% of the Q10. Flow magnitudes within the prescribed range must not occur more frequently under the proposed condition than they do in the existing (or pre-project) condition. Another way of expressing this is that the long term (decadal) cumulative duration of these flows must not be longer in the post-project condition compared to the pre-project condition. Generally, a small exceedance tolerance is allowed. For example, the following is a typical criterion that has been used in HMPs:

> For flow rates ranging from 10% of the pre-project 2-year recurrence interval event (XQ2) to the pre-project 10-year runoff event (Q10), the post-project discharge rates and durations shall not deviate above the pre-project rates and durations by more than 10% over and more than 10% of the length of the flow duration curve. The specific lower flow threshold should be influenced by results from the channel susceptibility assessment.

The rationale behind setting an upper limit is the understanding that when less frequent, high intensity/volume precipitation events occur, the watershed reaches a saturation level and responds in a similar manner for undeveloped and developed conditions. Furthermore, while these less frequent, high magnitude events do induce significant geomorphic change, they occur so infrequently that over a long time period, they comprise only a small portion of the work done on a channel. For example GeoSyntec (2007) used a hydro-geomorphic model to assess cumulative sediment transport on Laguna Creek (near Sacramento) and determined that 95% of the total erosion and sediment transport in the creek is accomplished by flow rates less than Q_{10}.

The purpose of determining a low flow range is one of practical design consideration when meeting a requirement for flow duration matching. The requirement to match flow durations between a pre- and post-project condition requires that runoff be detained and infiltrated within a BMP (e.g. open basin or underground vault). If flow matching is required to be achieved for all flows down to zero, the BMP

volume will be significantly larger (and therefore more costly) than if there were some low flow below which runoff could be discharged at durations longer than in the pre-project condition. A key assumption underlying the concept of a low-flow discharge is that the increase in discharge durations below this rate will not increase channel erosion because the flows are too small to initiate movement of channel materials to any significant extent. Another critical assumption in the flow duration matching approach is that a single discharge value is valid across the range of grain sizes and geometries in the streams to which that low flow value applies.

For a specific set of hydraulic conditions (e.g., cross sectional shape, channel slope, bed and bank roughness), the flow rate can be calculated where the critical shear strength value is reached. Thus with an estimate of the critical shear strength of the materials composing a channel's bed or banks, and the hydraulic conditions occurring at the same location, the critical flow rate can be determined at which transport (or erosion) begins. This critical flow rate (Q_c) can then be compared to the magnitude of a flood peak which occurs every two years (Q_2) to establish the estimate of percent Q_2 to be used as the lower flow threshold.

Thus in order to calculate the lower flow threshold as expressed by a percentage of Q_2, three values must be determined for each analysis location (described in further detail below):

- The critical shear strength (τ_c) of bed and bank materials;
- The critical flow rate (Q_c) at which this critical shear strength is reached and exceeded;
- The magnitude of a flood peak which occurs every two years (Q_2).

In contrast, when using an erosion potential (Ep) metric (rather than flow duration matching) for BMP sizing, the Ep analysis incorporates channel geometry to estimate shear stresses generated at various flow rates, and then compares these to estimated critical shear stresses (i.e., shear stress required to initiate transport) for the grain size distribution within the stream. However, for either flow duration matching or for erosion potential analysis, the first step is to determine the critical shear stress for incipient motion of channel materials.

DETERMINATION OF CRITICAL SHEAR STRESS

The composition and condition of the bed and banks of a stream channel are the best indicators of how a channel will react (i.e., its susceptibility) to hydrologic changes resulting from development projects (i.e., hydromodification). Channels composed of materials more resistant to erosion are less susceptible to excessive erosion due to hydromodification than channels composed of less resistant materials. Channel material type can vary widely between, as well as within, watersheds. Figure 2-1 **Error! Reference source not found.**a. and b. illustrate stream incision through (a) relatively loosely consolidated, non-cohesive sand and gravels, and (b) relatively cohesive silty-clays. The resistance of bed and bank materials is quantified by their critical shear strengths, (τ_c) that is, the value where entrainment or transport begins.

Typical stream erosion in a southern California stream (granular, non-cohesive
(Photo courtesy of Eric Stein, SCCWRP)

Typical stream erosion in a northern California stream (generally cohesive silty clays)
(Photo cbec, inc.)

Notes:	cbec	*Guidance on the Use of Continuous Simulation Hydrologic Modeling* **Examples of Stream Erosion in Southern and Northern California**		
		Project: 11-1001	Created By: CBB	**Figure 2-1**

Figure 2-1. a. Example of a loosely consolidated, non-cohesive sand and gravel stream bed. b. Example of a relatively cohesive silty-clay stream bed.

Several methods are available for the estimation of critical shear stress, including laboratory studies (e.g., flume studies) and field measurements, with different methods utilized for cohesive materials and non-cohesive materials.

Estimating Critical Shear Stress for Non-Cohesive Materials

The most common method for determining the critical shear stress of a non-cohesive material is through the application of the Shields relationship. This relationship is applicable to the calculation of critical shear stress for a uniform size mixture of sediment with a known particle size and specific gravity. Since it was originally proposed by Shields in 1936, the relationship has been tested and further investigated by several other researchers, resulting in a variety of modifications, primarily through variation of the Shields parameter. The original value of the Shields parameter proposed by Shields was 0.06, however, values from 0.03-0.06 have been suggested, with 0.045 acknowledged as a good approximation. Recent research has demonstrated that a value of 0.03 may be more appropriate for estimating incipient motion in streams with gravel beds (Neill 1968, Parker et al. 2008, Wilcock et al. 2009), where D50 estimates are based upon data collected via pebble count. The decision of what value of Shields parameter is used can have a large influence on the resulting τ_c estimate. For example, if a value of 0.06 is used, it results in twice as large of an estimate of τ_c than if a value of 0.03 is used.

While the Shields relationship was developed for a mixture of uniform sized sediment, it can be applied to a mixture of sediment with varying sizes as long as the distribution is uni-modal and does not have a high standard deviation of grain sizes (Wilcock 1993). In contrast, for sediment mixtures which are bimodal (e.g., if there is a large amount of sand in addition to gravel), a different approach (e.g., Wilcock and Crowe 2003) is recommended. For a more in depth discussion of sediment transport and incipient motion, the reader is referred to Wilcock et al. (2009).

In order to apply the Shields relationship to determine τ_c, the median grain size (d50) present on the channel surface must be determined. River channels are often armored; meaning that coarser material is present on the surface than is present underneath the armor layer. However to access and transport the finer material beneath, the surface layer must first be mobilized. The median grain size is determined by analysis of a particle size distribution.

A particle size distribution can take the form of: 1) a cumulative *frequency* distribution which is determined by way of a pebble count or photographic analysis, or 2) a cumulative *weight* distribution. For a cumulative frequency distribution a subset of particles present on the surface are measured, and the frequency of particles within different size class bins is used. **Error! Reference source not found.** shows a sample particle size distribution graph developed from a pebble count. For a cumulative weight distribution, a bulk sample of the surface material is collected, and then sorted using a set of sieves with different screen sizes. The amount of material retained by each sieve is weighed and then used to plot the cumulative weight distribution. Both approaches have advantages and disadvantages.

A pebble count is a relatively straightforward field technique that is easily applied in streams which are wadable. **Error! Reference source not found.** shows photographs of pebble counts being conducted in the field. They can be performed relatively quickly, which means more samples can be collected to better characterize the conditions present in a reach. However, there are a variety of ways a pebble count can be conducted, and there is tremendous opportunity to introduce bias to the measurement. Furthermore, while studies often cite Wolman (1954) as the method employed in data collection, strict adherence to this protocol is not always achieved. Rather than the method suggested by Wolman (1954), a refined, more regimented approach has been suggested by Bundte and Abt (2001a), and is recommended. In addition, it should be noted that pebble counts generally do a poor job of characterizing sand and smaller sized material. In addition to pebble counts, software can be used to process a digital image of an area of the bed. The software samples a subset of particles present in the image, and using assumptions regarding the amount of given particle that is visible, is able to provide a cumulative frequency distribution.

Collecting a bulk sample for sieve analysis is another method frequently employed to determine values for typical characteristic indices of a particle size distribution. In this method a sample is collected from the channel surface, and then the sample is segregated into various size classes with sieves. One advantage of this approach is that it utilizes all the data available from the sampled area (as opposed to a pebble count which uses a subset of the entire population, e.g., ~100 particles as opposed to thousands), however the sampled area is typically smaller than the area sampled within one pebble count. One disadvantage is the size of sample that is necessary. Because the resulting particle size distribution is based upon weight, the largest particles present can have a very large influence on the resulting particle size distribution. Research has suggested that the weight of the entire sample must exceed 100x the weight of the largest particle present to escape this possible bias. This means large (volume and weight) samples are often required. Some sieving can occur on site through the use of shaker sieves, but typically some portion of the sample is also taken back to the lab for further analysis. Thus, bulk samples typically require more effort and equipment to establish a particle size distribution, however they provide a much more accurate estimate, especially when a large fraction of the sample is sand sized (2mm) and smaller.

For a more in depth discussion of sampling methods to determine particle size distributions in wadable streams, the reader is referred to Bunte and Abt (2001).

Estimating Critical Shear Stress for Cohesive Materials

The methods described above are not appropriate for cohesive materials, which due to chemical cohesion between particles exhibit larger τ_c values than would be estimated by consideration of particle size/weight in isolation (i.e., cohesive properties not considered). One method that allows for the determination of τ_c *in situ* is the application of a jet test (ASTM 2007). The jet-testing apparatus and analytical methods were developed by researchers at the USDA Agricultural Research Station (Hanson and Cook 1999; Hanson et al. 2002; Hanson and Cook 2004; ASTM 2007). The method uses a submerged impinging jet of water directed perpendicularly at the material surface, in order to erode the material. As erosion occurs, a scour hole is created. The depth of this hole is measured periodically as time

progresses through the test. As the scour hole increases in depth, the strength of the jet is reduced because it is travelling longer distance through water from the jet orifice to the soil surface. Eventually, the energy of the jet is dissipated enough that it no longer has energy in excess of the material's shear strength and erosion stops. **Error! Reference source not found.** shows a photograph of a jet testing rig deployed in a stream bank.

In addition to jet testing, *in situ* testing of shear strength can be obtained through the application of a field vane shear test (ASTM 2008). This method provides τ_c values based upon the assumption that the bed or bank will fail via large blocks (composed of thousands of particles), as opposed to erosion occurring particle by particle. As such, the values measured by a shear vane are often several orders of magnitude larger than those obtained via testing with the jet-device.

Estimating Critical Shear Stress Through the Use of Literature Values

An alternative to the measurement/calculation of τ_c, is the use of values found in the literature. Indeed, several HMPs have several HMPs have been developed through assumption of material resistance properties found in the literature based upon literature based upon a textural description of the material. An often-cited reference is Fischenich (2001), which provides a (2001), which provides a summary (compiled from the relevant literature) for critical shear strength values for various values for various materials. An extract from this reference is provided in

Figure 2-5.

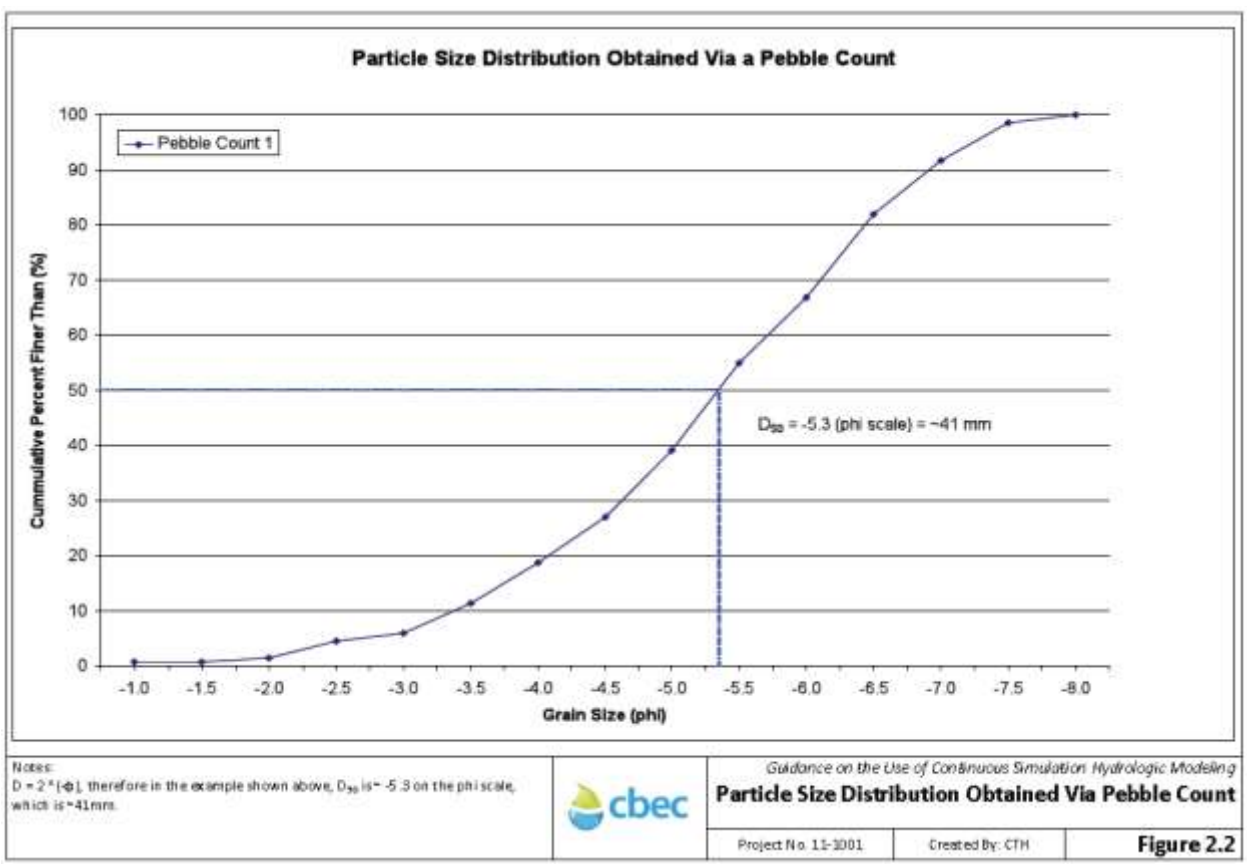

Figure 2-2. Particle Size Distribution Graph Developed from a Pebble Count

Notes:	cbec	*Guidance on the Use of Continuous Simulation Hydrologic Modeling* **Pebble Counts Being Conducted in the Field**		
		Project: 11-1001	Created By: CBB	**Figure 2-3**

Figure 2-3. Pebble Counts Being Conducted in the Field

Typical installation of jet testing equipment in stream bank

Hole created in cohesive bank material by jet impinging on surface

Notes:	cbec	*Guidance on the Use of Continuous Simulation Hydrologic Modeling* **Jet Testing Equipment Deployed in a Stream Bank**		
		Project: 11-1001	Created By: CBB	**Figure 2-4**

Figure 2-4. Jest Testing Equipment Deployed in a Stream

Table 2. Permissible Shear and Velocity for Selected Lining Materials[1]

Boundary Category	Boundary Type	Permissible Shear Stress (lb/sq ft)	Permissible Velocity (ft/sec)	Citation(s)
Soils	Fine colloidal sand	0.02 - 0.03	1.5	A
	Sandy loam (noncolloidal)	0.03 - 0.04	1.75	A
	Alluvial silt (noncolloidal)	0.045 - 0.05	2	A
	Silty loam (noncolloidal)	0.045 - 0.05	1.75 – 2.25	A
	Firm loam	0.075	2.5	A
	Fine gravels	0.075	2.5	A
	Stiff clay	0.26	3 – 4.5	A, F
	Alluvial silt (colloidal)	0.26	3.75	A
	Graded loam to cobbles	0.38	3.75	A
	Graded silts to cobbles	0.43	4	A
	Shales and hardpan	0.67	6	A
Gravel/Cobble	1-in.	0.33	2.5 – 5	A
	2-in.	0.67	3 – 6	A
	6-in	2.0	4 – 7.5	A
	12-in.	4.0	5.5 – 12	A
Vegetation	Class A turf	3.7	6 – 8	E, N
	Class B turf	2.1	4 - 7	E, N
	Class C turf	1.0	3.5	E, N
	Long native grasses	1.2 – 1.7	4 – 6	G, H, L, N
	Short native and bunch grass	0.7 - 0.95	3 – 4	G, H, L, N
	Reed plantings	0.1-0.6	N/A	E, N
	Hardwood tree plantings	0.41-2.5	N/A	E, N
Temporary Degradable RECPs	Jute net	0.45	1 – 2.5	E, H, M
	Straw with net	1.5 – 1.65	1 – 3	E, H, M
	Coconut fiber with net	2.25	3 – 4	E, M
	Fiberglass roving	2.00	2.5 - 7	E, H, M
Non-Degradable RECPs	Unvegetated	3.00	5 – 7	E, G, M
	Partially established	4.0-6.0	7.5 – 15	E, G, M
	Fully vegetated	8.00	8 – 21	F, L, M
Riprap	6 – in. d_{50}	2.5	5 – 10	H
	9 – in. d_{50}	3.8	7 – 11	H
	12 – in. d_{50}	5.1	10 – 13	H
	18 – in. d_{50}	7.6	12 – 16	H
	24 – in. d_{50}	10.1	14 – 18	E
Soil Bioengineering	Wattles	0.2 – 1.0	3	C, I, J, N
	Reed fascine	0.6-1.25	5	E
	Coir roll	3 - 5	8	E, M, N
	Vegetated coir mat	4 - 8	9.5	E, M, N
	Live brush mattress (initial)	0.4 – 4.1	4	B, E, I
	Live brush mattress (grown)	3.90-8.2	12	B, C, E, I, N
	Brush layering (initial/grown)	0.4 – 6.25	12	E, I, N
	Live fascine	1.25-3.10	6 – 8	C, E, I, J
	Live willow stakes	2.10-3.10	3 – 10	E, N, O
Hard Surfacing	Gabions	10	14 – 19	D
	Concrete	12.5	>18	H

[1] Ranges of values generally reflect multiple sources of data or different testing conditions.

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Notes:

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Guidance on the Use of Continuous Simulation Hydrologic Modeling

Permissible Shear Strength and Velocity for Selected Lining Materials

Project No:11-1001 | Created By: CBB | **Figure 2-5**

Figure 2-5. Permissible Shear and Velocity for Selected Lining Materials

DETERMINATION OF CRITICAL FLOW (Q_c)

For a specific set of hydraulic conditions at a location (i.e., cross sectional shape, channel slope, bed and bank roughness), the flow rate at which critical shear values are reached can be calculated. These calculations can be made with a programed spreadsheet analysis, or with a hydraulic model (e.g., HEC-RAS, Brunner 2010). Because of their ease of use and the ease at which multiple flow rates can be assessed (in order to determine when τ_c is reached), hydraulic models are typically employed for this part of the analysis. Average boundary shear stress is calculated with the following equation:

$$\tau = \rho g R s$$

where *p* represents the density of water, *g* represents the gravitational constant, R represents the hydraulic radius (defined as the wetted area dived by the wetted perimeter), and *s* represents the slope. For wide channels the value of the hydraulic radius is approximately equal to the average depth of the cross section. The hydraulic model calculates the value for R for a given discharge based on the channel dimensions.

Typically one-dimensional approximations are used for this analysis, which means that the value of Q_c determined is that where the cross sectional average of τ_c is reached, not the highest value which is occurring at the deepest point of the cross section. This is typically considered reasonable because the grain size is determined for the bed of the cross section, not just the shallow or deep area.

Analyses can be conducted at a station, or in other words just looking at one cross section in isolation using normal depth calculations, or within a larger hydraulic model constructed for the entire reach (i.e., multiple distributed cross sections upstream and downstream of the location of interest). The advantage of looking at the cross section of interest within the context of the entire reach is that conditions downstream (e.g. a constriction which causes a backwater condition) may affect the flow depth (or hydraulic radius), yielding different results than would be obtained if the cross-section was analyzed in isolation.

It is important that the determination of τ_c (via pebble count or other means) and the hydraulic calculations to determine Q_c, occur at the same location. Typically the analysis is undertaken at a riffle because these are the high points of a long profile and are what are controlling incision in the system. Bed material characterization in a pool is much more difficult (because of the depth of water), in addition the resulting calculated shear values are typically much higher, because of the added depth.

If HEC-RAS is used (which is typical), the way the bank markers are set can have a dramatic influence on the calculated shear results. The bank markers are used to delineate differences in roughness across the channel and flood plain (typically higher values are used on the lateral margins to include the influence of vegetation roughness in the resulting depth calculations). The shear values calculated by HEC-RAS are segregated by these bank markers, and thus may include values for each of the floodplains as well as the channel. If bank markers are set too wide, and the shear stress calculation may include a portion of the floodplain too, and subsequently the conditions in the actual channel will be greatly underestimated. Remember that the model is essentially using the average depth for the entire cross section (as limited by the bank markers), so including floodplain with shallow depths greatly influences the average depth and thus the resulting calculated shear value.

DETERMINATION OF Q_2

The determination of a value of Q_2 is the third and final piece of the equation used to determine what percent of Q_2 the lower threshold should be. As with the other two pieces, several options are available, and again the decision on what method is used can have a profound influence upon the final results. Q_2 can be determined through the results of a calibrated and validated hydrologic model (e.g., HEC-HMS, HSPF, SWMM, etc.) which uses precipitation, sub basin area, soil conditions, etc. to calculate a runoff hydrograh. This type of model can be used in one of two ways, to simulate a single precipitation event or to simulate a long term (e.g., 50 year) precipitation record. The first approach produces a single runoff hydrograph resulting from a "design" storm, from which the peak magnitude can be determined. As such the results are largely controlled by the precipitation hyetograph, so a good understanding of how that was developed is important. This method has been used considerably less than the approach detailed below. The advantage of this method is that, if any existing model has already been developed (e.g., SacCalc; DFCE 2001), it will be cheaper and easier for an agency to review. However, it can yield different values for Q_2, due to differing assumptions employed in the modeling.

The second method uses a long-term precipitation record for simulation which results in a flow record containing a large number of runoff events of varying magnitudes (i.e., which are subsequently analyzed to determine the magnitude of the 2 year recurrence interval event). This method is more typical for HMP assessments, but again methodical decisions can have a large influence on the results. The rigor of the model calibration and validation has a strong influence. If the model is not representing through simulation what is actually occurring, then the simulation results are questionable.

Assuming the model has been calibrated and satisfactorily validated or verified, the manner in which the simulated runoff record is analyzed is important. The first basic distinction is whether an annual maximum series (AMS) or a partial duration series (PDS) is used. In an AMS analysis, just the single largest flood peak of any given year is used in the analysis, and the second and third largest events of the year are ignored. This is the method typically utilized when analyzing the flood frequency of large, less frequently occurring flood events. In the second approach, PDS, multiple flood events are considered in any given year. This is important when the second or third largest flood events in one year are greater than the annual maximum of another year. Because more large events are included, the resulting estimate of the given return period event (e.g., Q_2) is larger. For example, Langbein (1960) showed that a 1.45 year event determined with PDS is the same magnitude as a 2 year event with an AMS, and a 2 year event determined with PDS is a 2.54 year event with an AMS. Thus the value of Q_2 determined by PDS is larger than the value of Q_2 determined by AMS. While significant differences are apparent for smaller magnitude, more frequently occurring events (e.g., Q_2), for return periods greater than 10 years, there is almost no difference between the results obtained from the AMS and PDS.

When compiling a PDS for a recurrence interval analysis, the manner in which events are identified as independent can also have an effect upon the results. One typical method is to include all flood peaks above a certain base magnitude. This base value is often selected as equal to the lowest annual maximum flood of record, however can also be chosen such that the PDS only contains as many peaks as

there are years of record. Some analysts have established a base value (e.g., 0.002 cfs/acre), and then added a duration below this base value as well (i.e., flow must be below 0.002 cfs/acre for at least 24 hours for events to be considered independent). One additional method is to identify individual events by extracting the highest peak (not just the maximum value) within a moving time window (e.g., 3 days), and therefore determine independence through time, rather than the discharge rate receding to a non-storm condition. With all of these options available, and no prescribed standard, the use of a PDS can have different Q_2 results even if an identical flow time series is used.

SUMMARY

The determination of the lower flow threshold, defined as a percentage of Q_2, is heavily influenced by three primary inputs: τ_c, Q_c, and Q_2. The determination of each of these values is sensitive to a variety of factors determined by the particular methodology. To demonstrate the sensitivity of the lower flow threshold to methodological decisions, a few examples are provided below.

- If 0.06 is used rather than 0.03 for Shields parameter in Shields relationship, τ_c increases, subsequently Q_c increases and ultimately the lower limit increases
- If bank markers are set too wide (including the floodplain and not just the channel) in the hydraulic analysis, a larger value for Q_c is calculated (because of a reduction of the hydraulic radius due to the inclusion of extensive shallow floodplain areas), resulting in an increase of the lower limit.
- If an annual maximum series is used in place of a partial duration series, the calculated Q_2 will be less than that obtained by a PDS analysis, and the ratio of Q_c to Q_2 will be higher if the AMS is used.

3. DEVELOPMENT OF EVALUATION CRITERIA

FLOW DURATION CONTROL AND PEAK FLOW CURVE MATCHING

Flow Duration Control (FDC) and Peak Flow Curve (PFC) matching criteria in their current form for many counties in CA are similar in form to the curve matching criteria from WA (WADOE, 2001). The curve matching criteria typically include a goodness of fit or variance due to the difficulty in achieving a precise match across the range of flows. The criteria are typically applied at the subwatershed scale based on continuous simulation flow results for pre- and post-project conditions to size individual BMP or LID features. In this instance, flow matching at the subwatershed scale assumes that there are no routing or timing effects in the treated runoff when it rejoins the receiving waterbody; however, this may not be true in all cases. For example, if treated runoff is delayed and rejoins the upstream runoff such that there is an increase in flow rates and durations or an increase in the peak flows in the receiving waterbody, then there is the potential to impair the receiving waterbody. To address this potential concern, the FDC and PFC criteria could be applied to the routed flows in the receiving waterbody as a

check.

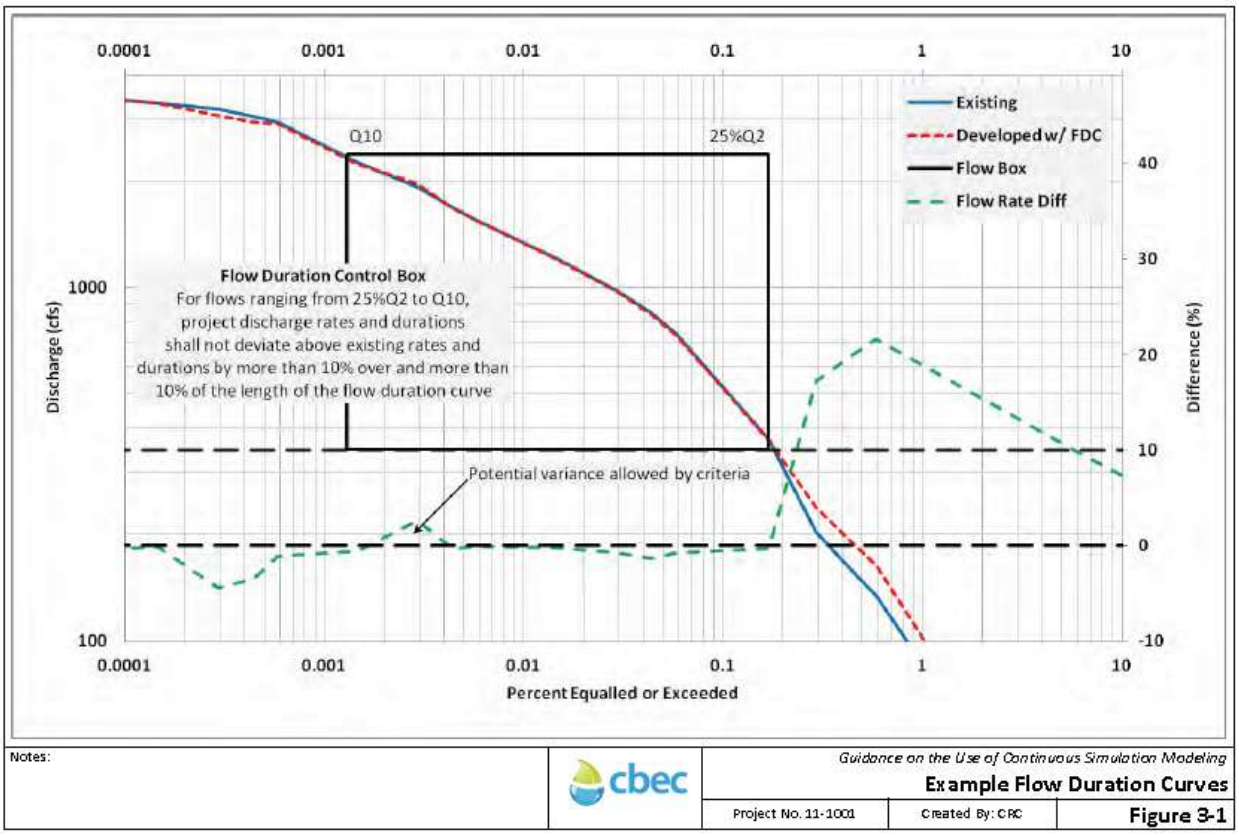

Figure 3-1 shows an example of FDC matching on the routed flows within a receiving waterbody with an example of the variance allowed by the criteria. However, it is cautioned that the FDC variance (e.g., "…by more than 10 percent over and more than 10 percent of the length…") may need to be reduced to something less than 10 percent (perhaps based on a ratio of watershed areas) to account for cumulative effects if there remain the potential for continued development in the watershed.

EROSION POTENTIAL

Erosion Potential (EP) is an index to indicate the impact of increased flows on stream stability and is based on bed mobility and an integration of work (as a function of velocity and excess shear stress in the channel only) over time, expressed as a ratio of post-project work divided by pre-project work in the receiving waterbody. Total work is based on integrating effective stream power as:

$$W = \sum_{i=1}^{n} (\tau_i - \tau_c)^e \cdot V_i \cdot \Delta t_i$$

where W is the total work done (ft-lbf/ft^2), τ is the average channel shear stress, τ_c is the critical shear stress to initiate erosion, e is an exponent varying from 1 to 2.5 to account for the exponential rise in stream power with flow, V is the velocity (ft/sec), and Δt is the numerical time step (sec). The EP index is then calculated as the ratio of W_{dev} / W_{ex} where W_{ex} and W_{dev} is the total work for existing and developed conditions, respectively. EP can be calculated at any location in the waterbody based on

continuous simulation time series of flow, velocity, and excess shear stress in the channel as derived from hydraulic model outputs.

EP criteria are not widely integrated into HMPs. Notably Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP) included EP criteria in their HMP, but in so much as it was used to inform their overall management objective (i.e., post-project runoff shall not exceed estimated pre-project rates and/or durations) and the development of their FDC / PFC criteria. In the SCVURPPP (2005) final HMP, an EP ratio <= 1.0 was recommended as the instream target value to be maintained for stream segments downstream of the point of discharge for HMP management. From a risk management perspective, the chance of a stream becoming unstable at an EP of 1.0 is 9%, meaning that 1 in 11 streams could become unstable even with controls (SCVURPPP, 2005). As such, instream EP must be evaluated considering the effects of the cumulative changes that have or may take place in the watershed.

Even though EP criteria are not widely promoted in county HMPs, that does not preclude analyses based on EP from being used, especially when instream measures permit more robust geomorphic analyses (e.g., SCVURPPP final HMP; SSQP draft HMP). While EP analyses are more time and data intensive, there is the potential outcome to discharge runoff at higher rates and durations than FDC / PFC criteria would allow, thus resulting in possibly smaller onsite measures. The time and data intensiveness of EP analyses stem from the need to evaluate the hydraulic and geomorphic conditions of the receiving waterbody to be protected at multiple locations based on continuous simulation hydraulic model outputs and geomorphic data. Potential hydraulic model considerations when performing EP calculations are addressed below.

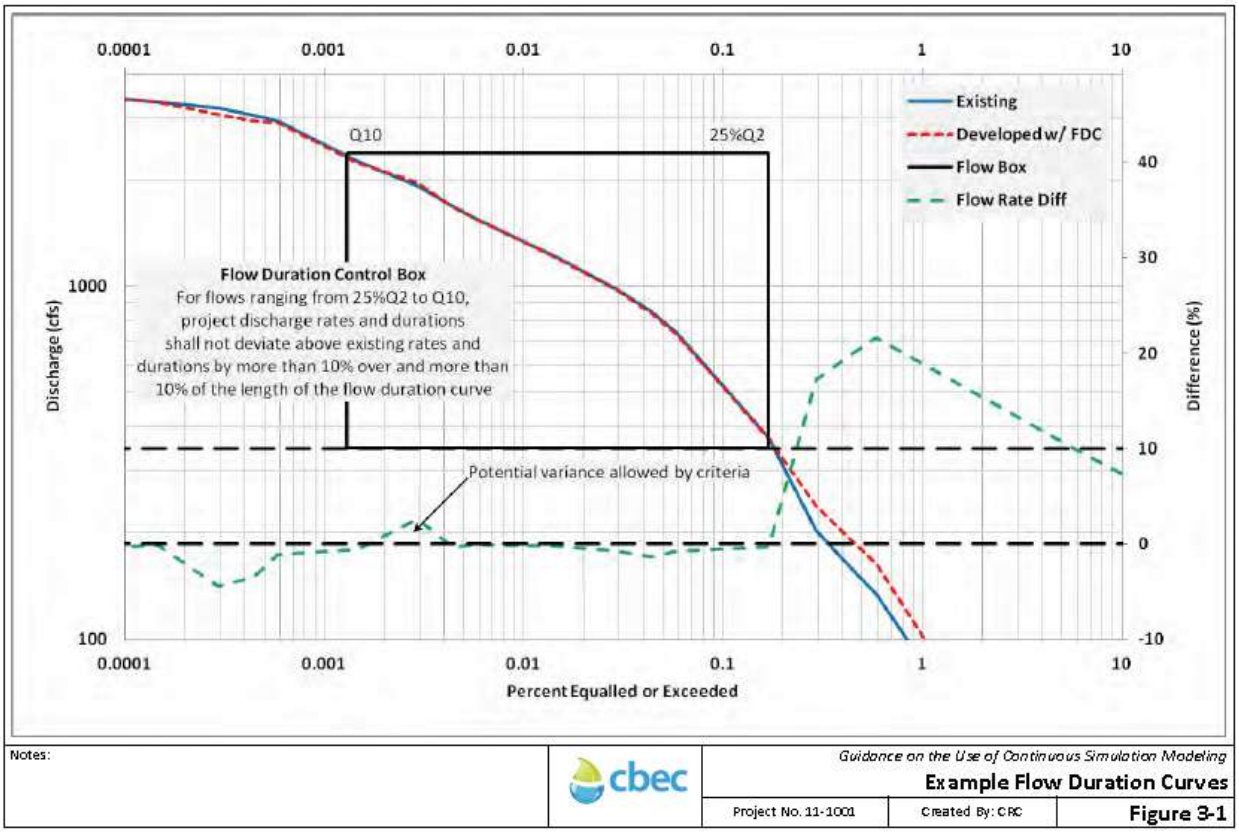

Figure 3-1. Example Flow Duration Curves

4. DATA REQUIREMENTS FOR CSM AND HYDRAULIC ANALYSIS

Hydrologic models capable of performing long-term continuous simulation to support HMPs include, but are not limited to, HSPF, HEC-HMS soil moisture accounting (SMA) method, and other hydrology models, such as the Bay Area Hydrology Model (BAHM). The first two are public domain software models and the third is a proprietary software model customized for specific counties that uses HSPF as its computational engine. A fourth modeling tool based on continuous simulation results, and also using HSPF as its computational engine, are the suite of BMP sizing calculators specifically designed for HMP management for select counties. These have been developed for Contra Costa and San Diego County and Sacramento County (in draft form). All four suites of models use site conditions (i.e., topography, soils, vegetation, and land use) and long-term precipitation data to calculate the various components of the hydrologic cycle (i.e., infiltration, surface runoff, soil moisture, evapotranspiration, percolation, interflow, and groundwater). Specific details about each model and model comparisons (e.g., TetraTech, 2011) are not discussed here, but can be reviewed in available literature.

Following model selection, hydrologic models are created for existing and project conditions based on various considerations, some of which are discussed in subsequent sections. For project conditions, county specific HMP measures need to be specified to manage project runoff to meet the evaluation criteria identified above. The BMP sizing calculators and BAHM-type hydrology models do have optimization routines to size BMP and LID measures. Automatic sizing allows for efficient and quick sizing of such features based on county specific, model specific (e.g., the sizing calculator for San Diego and Contra Costa County is based on pre-defined sizing factors such that site specific continuous simulations do not need to be performed, and is limited to drainage management units of less than 100 acres), and user-defined (e.g., the BAHM-type hydrology models require site specific continuous simulation with a wide selection of measure configurations) assumptions and limitations. As standalone models, HSPF and HEC-HMS offer flexibility as it relates to model configuration, model inputs, and user-defined parameters. However, these models do not have optimization routines to size various BMP and LID measures, thus requiring manual iteration to achieve a satisfactory solution.

PRECIPITATION DATA

Long-term precipitation data in the range of 30 to 50 years is typically needed to generate a sufficiently long flow record from which FDC and PFC analyses and/or subsequent hydraulic analyses can be performed. The precipitation data observation interval should ideally be no coarser than hourly, and if available, can be sub-hourly (e.g., 15 minutes) to coincide with a finer continuous simulation time step.

The precipitation data should ideally be located near the project site, and if needed, scaled to the project site based on a ratio of mean annual precipitation as derived from county specific mapping or regional sources (e.g., PRISM [http://www.prism.oregonstate.edu/]) and reviewed to ensure that it captures key IDF characteristics from county specific mapping or regional sources (e.g., NOAA Atlas 14 [http://www.nws.noaa.gov/oh/hdsc/index.html]). A variety of precipitation data sources exist, and include, but are not limited to:

- ALERT system for individual counties (e.g., Sacramento [http://www.sacflood.org/])
- Western Region Climate Center (WRCC [http://www.wrcc.dri.edu/])
- NOAA National Climatic Data Center (NCDC [http://www.ncdc.noaa.gov/])
- California Irrigation Management Information System (CIMIS [http://wwwcimis.water.ca.gov/])

HYDROLOGIC SIMULATION TIME STEP

The continuous simulation time step and output reporting interval for the four models identified above has traditionally has traditionally been hourly. However, an hourly time step is often significantly larger than the time of concentration for concentration for developed subwatersheds relative to existing subwatersheds, especially those commonly configured commonly configured developed subwatersheds that are limited to less than 100 acres. The sizing calculator and BAHM-type calculator and BAHM-type models are hardwired at hourly, but the public domain software still affords the user to go to a the user to go to a finer time step. As such, a sub-hourly time step and output reporting interval is preferred in order to preferred in order to adequately resolve and sample flow from developed subwatershed elements where time of where time of concentrations are typically less than one hour. As shown by

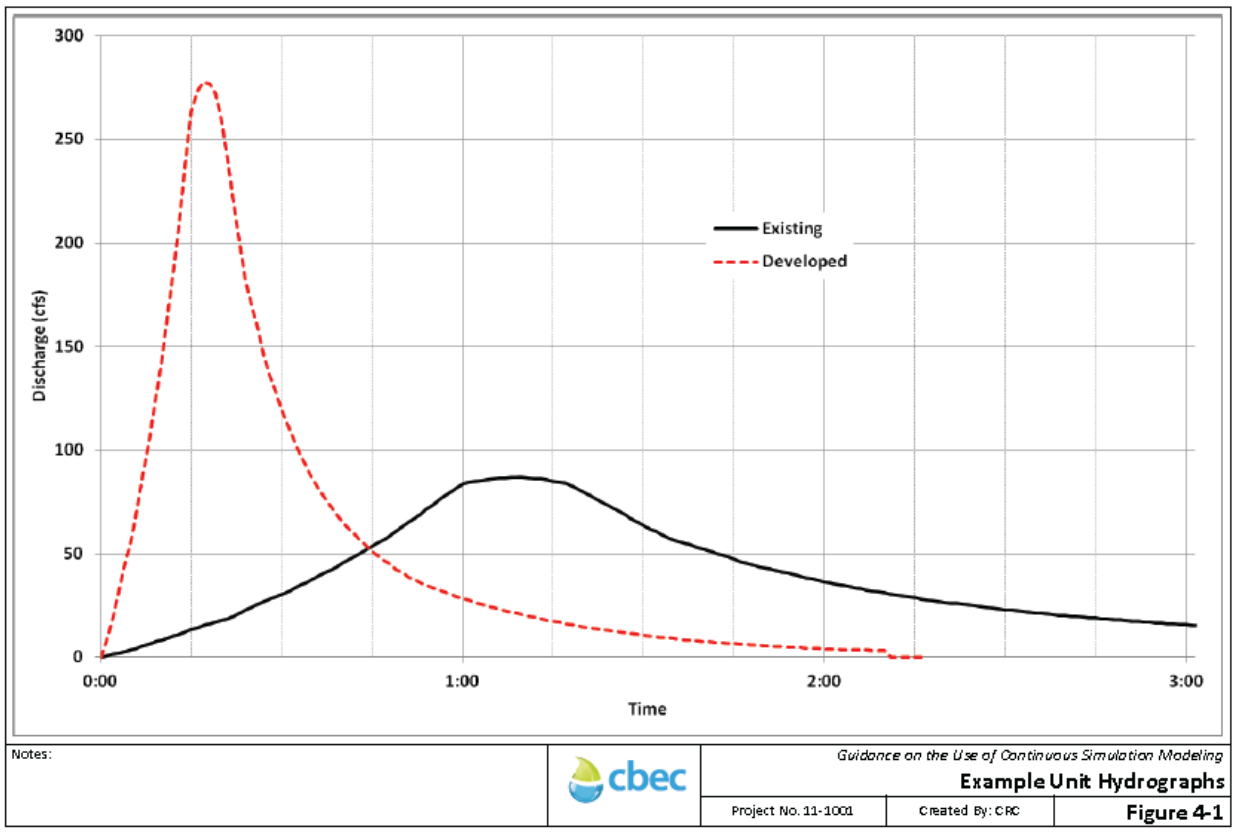

Figure 4-1 for a typical developed subwatershed, the unit hydrograph for developed conditions is flashier, peaks quicker (well within one hour), and the recession limb becomes small quickly. While a sub-hourly time step and output reporting interval may not be desirable due to the volume of model output that will be generated, it is possible to bias the results in favor of the developed condition due to under sampling of the flashier and larger developed flows under an hourly time step.

HYDROLOGIC MODEL CALIBRATION AND VALIDATION

In developing continuous simulation models, the model parameters describing soil characteristics, land use descriptions, and evapotranspiration should be derived from published data (e.g., soil survey, local studies, county standards, etc.). These parameters should be calibrated and validated, where applicable, by comparing modeled flows to measured or observed flows with the receiving waterbody for specific overlapping periods when there is adequate precipitation, evapotranspiration, and flow data. In the absence of site-specific data for calibration and validation, calibrated model parameters from neighboring watersheds within the region could be used so long as proper justification is provided that said parameters are appropriate. However, it is not recommended that local studies rely upon calibrated parameters from other regions where soil characteristics and land use descriptions are markedly different. Rather, when calibration cannot be performed, general review and comparison of continuous simulation model outputs (e.g., hydrograph shape, AMS, etc.) to standardized event-based approaches could be performed to demonstrate that continuous simulation results are generally consistent with local standards and methodologies.

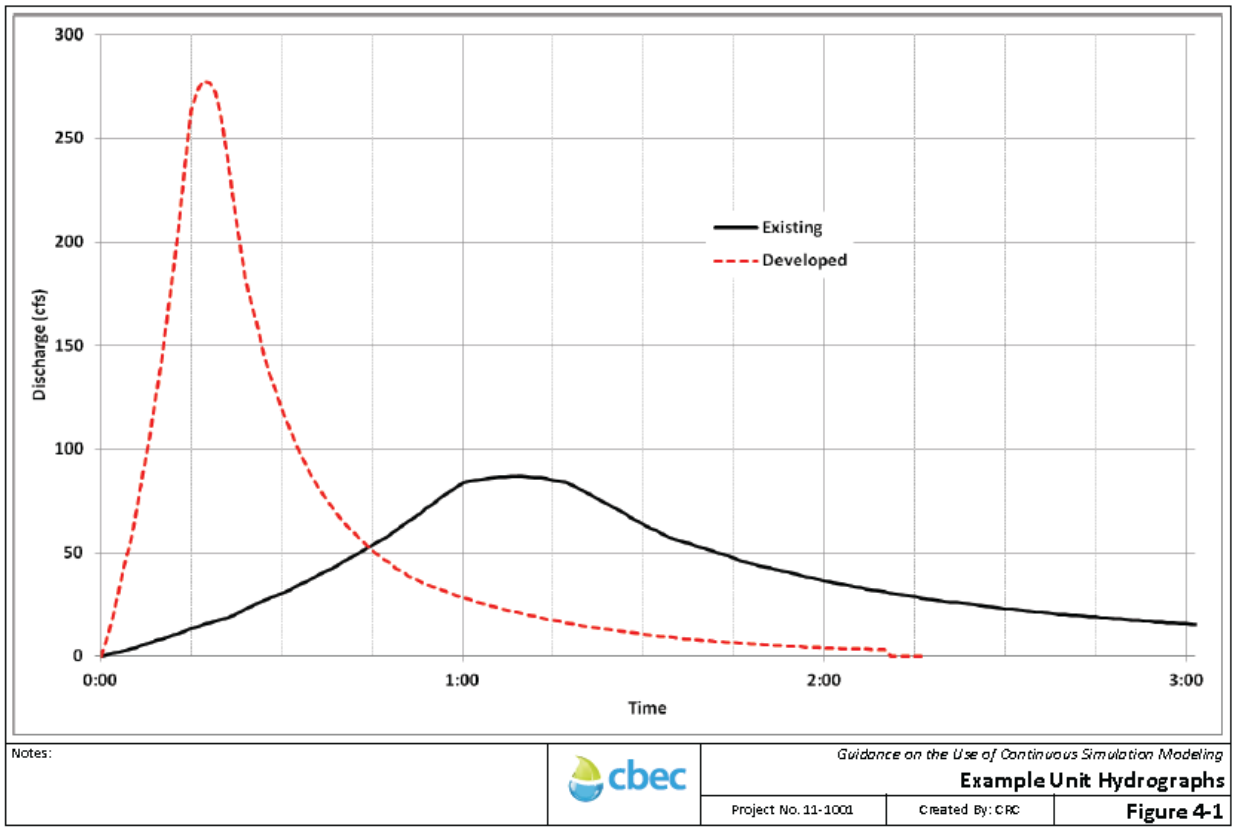

Figure 4-1. Unit Hydrograph Method

For example, continuous simulation modeling in Sacramento County for some developments has relied up conversion of SacCalc (HEC-1 pre- and post-processor) event-based models to the SMA method within HEC-HMS. This conversion often involves retaining the surface infiltration rate determined by SacCalc based on accepted land use descriptions, but parameterizing the subsurface based on soil survey information and local studies, using local potential evapotranspiration data, and reviewing model hydrographs for reasonableness.

HYDRAULIC MODEL CONSIDERATIONS

Sometimes hydraulic models are needed since the basic flow routing within the hydrologic models is not adequate to characterize the potential changes to the hydraulic and geomorphic character of the receiving waterbody, especially when instream measures are suggested or EP is used as the evaluation criteria. Potential considerations and issues encountered when developing and using hydraulic models for continuous simulation include:

1. Low flow instabilities can introduce anomalies into model output (which is commonly encountered in HEC-RAS), so careful hydraulic model selection is important for accuracy and efficiency
2. The sensitivity of the hydraulic model outputs (i.e., velocity and shear stress) to accurate hydraulic description of the receiving waterbody (i.e., cross section geometry (i.e., is it based on LiDAR influenced by vegetation or ground survey), proper definition of channel transitions, proper definition of channel bank markers, appropriate Manning's n-values, etc.)
3. Selection of appropriate compliance points that are representative of the reach and capture flow changes (e.g., downstream of points of discharge and not in backwater areas).

All of these issues have the potential to introduce error and subjectivity into long-term hydraulic analyses and care should be taken to systematically address each source of error.

GENERAL TIPS

A series of general tips are provided as follows. These can be used to increase efficiency and accuracy when performing CSM.

- To shorten the simulation time, the precipitation record can be truncated to only the rainy season (e.g., October through May) by removing the dry summer months from the simulation, especially in ephemeral systems where applicable.
- Hourly precipitation data does not prohibit the continuous simulation model from being run at a sub-hourly time step.
- Subwatershed delineation between existing conditions and developed conditions can often result in relatively large existing subwatersheds compared to relatively small developed subwatersheds. It is commonly known that smaller subwatersheds have flashier flows, so making existing and developed conditions subwatershed sizing consistent is recommended to provide a more meaningful comparison.

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APPENDIX B: APPLICATION OF SUITES OF MODELING AND ASSESSMENT TOOLS

Introduction. This appendix provides a discussion of four example "suites of tools" that can be used to perform predictive scientific assessments and address specific questions related to hydromodification assessment and management. The suites are changeable mixes of mechanistic models, statistical analyses, and expert scientific judgment that incorporate a number of the tools discussed in Chapter 4, combined in various ways. For example, some suites apply a series of cascading models, in which the output from one is used as input to the next; other suites apply a number of models in parallel to develop an assessment based on the weight of evidence. The suites of tools discussed below are used to perform a baseline stability assessment, a channel forming discharge analysis, an erosion potential analysis, and a sediment transport analysis. Most of these standard tools (with the exception of the erosion potential suite) have been widely employed in a variety of stream management activities for decades, and are considered essential components of the broader fluvial geomorphology toolbox. This is far from a comprehensive list of tools, as there are many other important tools (focused on both geomorphic and biologic endpoints) relevant to hydromodification management (Kondolf et al. 2003; Poff et al. 2010); however, the purpose of this appendix is to briefly illustrate how several standard tools can be integrated to answer key questions about stream responses and to provide a stronger technical basis for hydromodification management.

Application of these tools provides basic geomorphic data and knowledge that are typically needed to manage a stream for some desired future state in a watershed with changing land uses. This critical information comes at a cost—the tools require substantially more time and effort to apply than has been the norm in hydromodification management because they involve examining streams within their watershed context with a deeper level of geomorphic analysis. Stormwater management programs typically have made the "practical" assumptions that stream reaches can be managed in isolation from the larger systems of which they are a part, and that effective management prescriptions can be formulated with little or no substantive geomorphic analysis. ***These assumptions are in direct conflict with current understanding in fluvial geomorphology and stream ecology, which indicates that protection of stream integrity is often predicated upon careful assessments of geologic and historical context, performing detailed hydraulic and sedimentation analyses where appropriate, and developing basic understanding of streamflow-ecology linkages***. If hydromodification management policies are to have a reasonable chance of actually achieving their aims, then it will most likely be necessary to reject these simplifying assumptions and instead rely on approaches rooted in current scientific understanding of stream systems.

The suites of tools described below go beyond screening level assessments that are designed, in part, to identify which streams lend themselves to relatively straightforward management prescriptions versus which streams do not. For streams that do not lend themselves to generic management prescriptions, the level of analysis performed with these tools should increase with the level of risk and geomorphic / biologic susceptibility of the streams. This does not mean that every stream will require in-depth analysis by local permitting agencies. It is not possible to carry out sufficient geomorphic analyses with the tools illustrated below on a permit-by-permit basis, and local governments may lack the resources and/or technical capacity to effectively apply these tools. Instead, ***the vital information provided by these tools***

will need to be obtained through proactive regional studies that involve baseline assessments followed by progressively more in-depth analyses as necessary to provide local governments with a sound basis for effective project-by-project decision-making within a broader watershed management framework.

1. **Baseline Stability Assessment**. This suite of tools is designed to answer the following key questions:
   - What is the trajectory of the stream's form over time?
   - How has the channel form responded to changes in water and sediment supply over the years?
   - Is the channel close to a geomorphic threshold that could result in rapid, significant change in response to only minor flow alteration?
   - How can past channel responses provide insight into potential responses to future watershed change, and so aid in prediction of future hydromodification-induced changes?
   - What level of subsequent geomorphic analysis is appropriate given the complexity of the situation and the susceptibility of the streams of interest?

   The goals of a baseline stability assessment are to:
   - Document the historical trends of the system;
   - Establish the present stability status of the system and identify the dominant processes and features within the system;
   - Provide the foundation for projecting future trends with and without proposed project features;
   - Provide critical data for calibration and proper interpretation of models; and
   - Provide a rational basis for identification and design of effective alternatives to meet project goals.

   The key tools that comprise this suite include:
   - GIS mapping of topography, soils, geology, land use/land cover across the contributing watershed (e.g., Thorne 2002)
   - Analysis of hydro-climatic data, e.g. streamflow gauge records, changes in stage-discharge relationships over time (e.g., Thorne 2002)
   - Analysis of aerial photos and historical data (e.g., Thorne 2002)
   - Field reconnaissance (e.g., Thorne 1998)
   - Qualitative response (e.g., Lane 1955b, Schumm 1969, Henderson 1966 relations)
   - Classification systems - (e.g., Thorne 1997; Schumm et al. 1982; and channel evolution model developed for S CA by Hawley et al. in press)
   - Relationships between sediment transport and hydraulic variables
   - Regional hydraulic geometry (e.g., Hawley 2008; Haines in prep)
   - Regional planform and stability predictors (e.g., Hawley et al. in press, Bledsoe et al. in press, Dust and Wohl 2010)

- Bank stability analysis (e.g., BSTEM http://www.ars.usda.gov/Research/docs.htm?docid=5044, Hawley (2009), Bledsoe et al. in press, Osman and Thorne 1988; Thorne et al. 1998)
- Sediment budgets (Booth et al. 2010; Reid and Dunne 1996)
- Fluvial audit (Thorne 2002 – a comprehensive framework for performing baseline assessments)

A baseline assessment is completed by integrating information from all the available data sources and analytical tools. Analysis with each of the individual tools may yield a verdict of aggradation, degradation, or dynamic equilibrium with respect to the channel bed, and stable or unstable with respect to the banks. The individual assessments can produce contradictory results. In this case, one should assign a level of confidence to the various components based on the reliability and availability of the data, and the analyst's own experience level. As is often the case in the management of fluvial systems, there is no "cookbook" answer, and we must always incorporate sound judgment.

A process-based channel evolution model (CEM) is a particularly useful element of the baseline assessment process. A CEM aids in identifying the dominant processes and trends of channel change and provides a framework for subsequent, more detailed modeling (ASCE 2008). In some locations, CEMs have already been developed and calibrated with regional data. For example, the CSU / SCCWRP Screening Tool (Bledsoe et al. 2010) grew out of a regional CEM (Hawley et al. in press) and integrates several baseline assessment tools including regionally-calibrated braiding, incision, and bank stability thresholds, and sediment supply analysis with "Geomorphic Landscape Units" (Booth et al. 2010). In locations where a CEM has not been sufficiently defined, the baseline assessment suite of tools can provide the data and understanding needed to develop a regionally calibrated CEM.

The following are example outputs from a baseline stability assessment, including channel stability and bank stability diagrams associated with key geomorphic thresholds of management concern in the channel evolution sequence (i.e. braiding, incision, and bank failure):

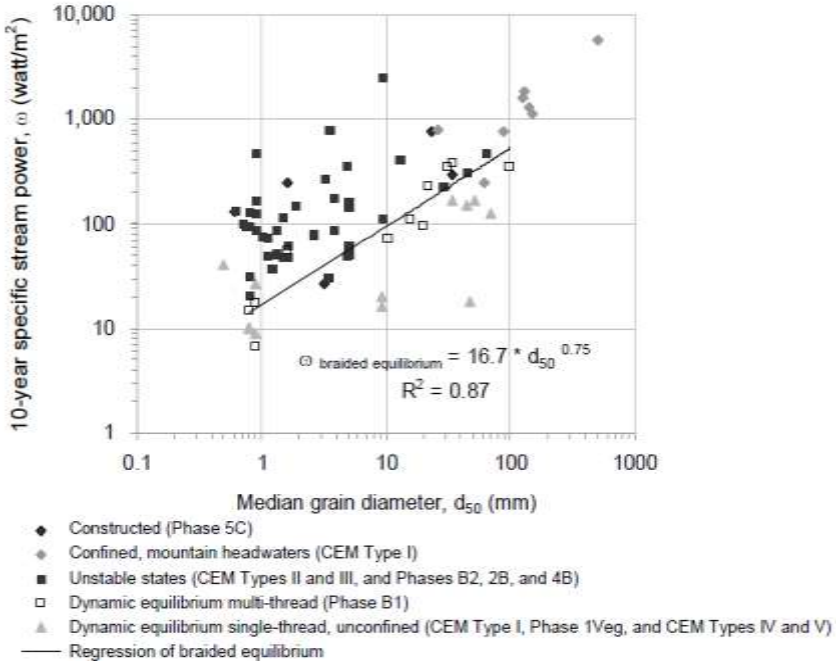

Figure B-1. Stability thresholds for channel types of southern CA, as identified through the development of a regional CEM (Hawley et al., in press).

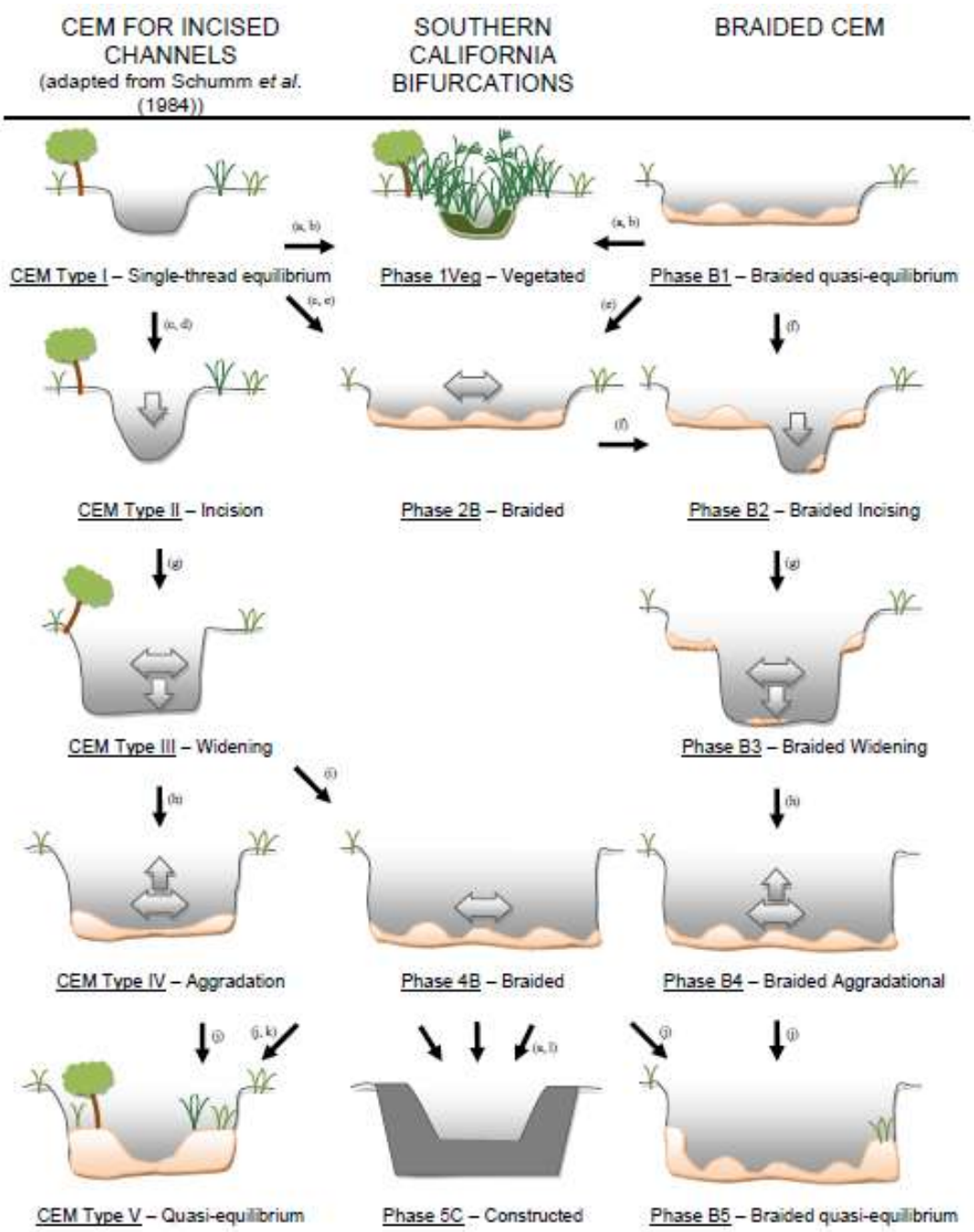

Figure B-2. Channel evolution model of response to hydromodification in southern California (Hawley et al. in press). Red and blue ovals highlight geomorphic thresholds that may be quantified using the baseline assessment suite of tools. By developing a general physical understanding of channel evolution sequences commonly observed in urbanizing watersheds of southern CA, two braiding thresholds and a bank stability threshold of management concern were identified. Channels may shift from single thread to braided planforms if widening is the dominant mode of initial adjustment. Alternatively, single thread channels may become braided after an initial period of incision that triggers geotechnical instability and failure of the banks. Quantitative predictors of these thresholds of braiding, incision, and bank failure can be developed in the baseline assessment process to evaluate the proximity of streams to these critical stages of channel evolution and instability.

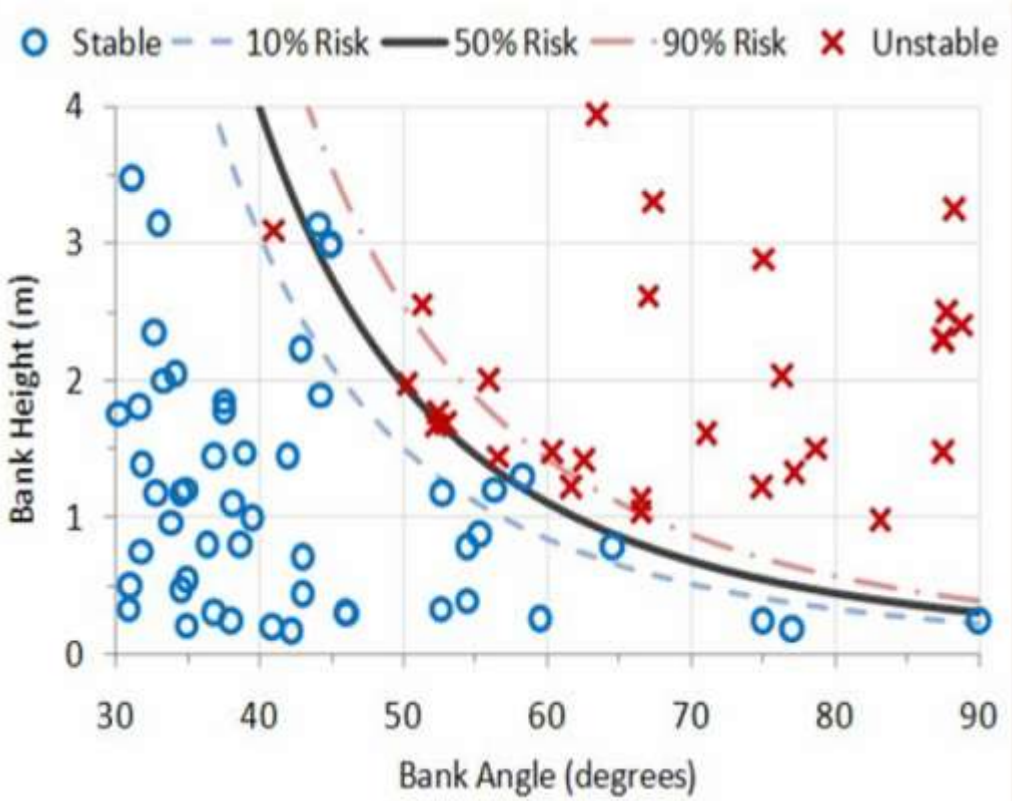

Figure B-3. Bank stability threshold for mass wasting identified through analysis of field data from southern California streams with stable and unstable banks (Bledsoe et al., in press).

2. **Channel-forming discharge suite of tools.** This suite of tools is designed to answer the following key questions:
   - What ranges of discharges are most influential in controlling channel form and processes over decadal time scales?
   - What channel-forming discharge should be used in sediment transport analyses to identify sediment transport capacity, equilibrium slope and geometry, etc.?

   The tools that comprise this suite include the following:
   - Effective discharge computations (e.g., Soar and Thorne 2001; Biedenharn et al. 2000; GeoTools – Bledsoe et al. 2007). An effective discharge analysis directly quantifies the range of discharges that transport the largest portion of the annual sediment yield over a period of many years.
   - Field identification of high water elevations, depositional surfaces, and "bankfull" features
   - Flood frequency analysis
   - Un-gauged site analysis (e.g. USGS StreamStats) http://water.usgs.gov/osw/streamstats/california.html; Hawley and Bledsoe (2011), regional flow duration curve extrapolation – Biedenharn et al. 2000)

This suite incorporates a number of parallel analyses that can be used to establish likely upper and lower bounds to the range of influential discharges, and that can be assessed through a weight-of-evidence evaluation. The following is an example output from the channel forming discharge suite of tools:

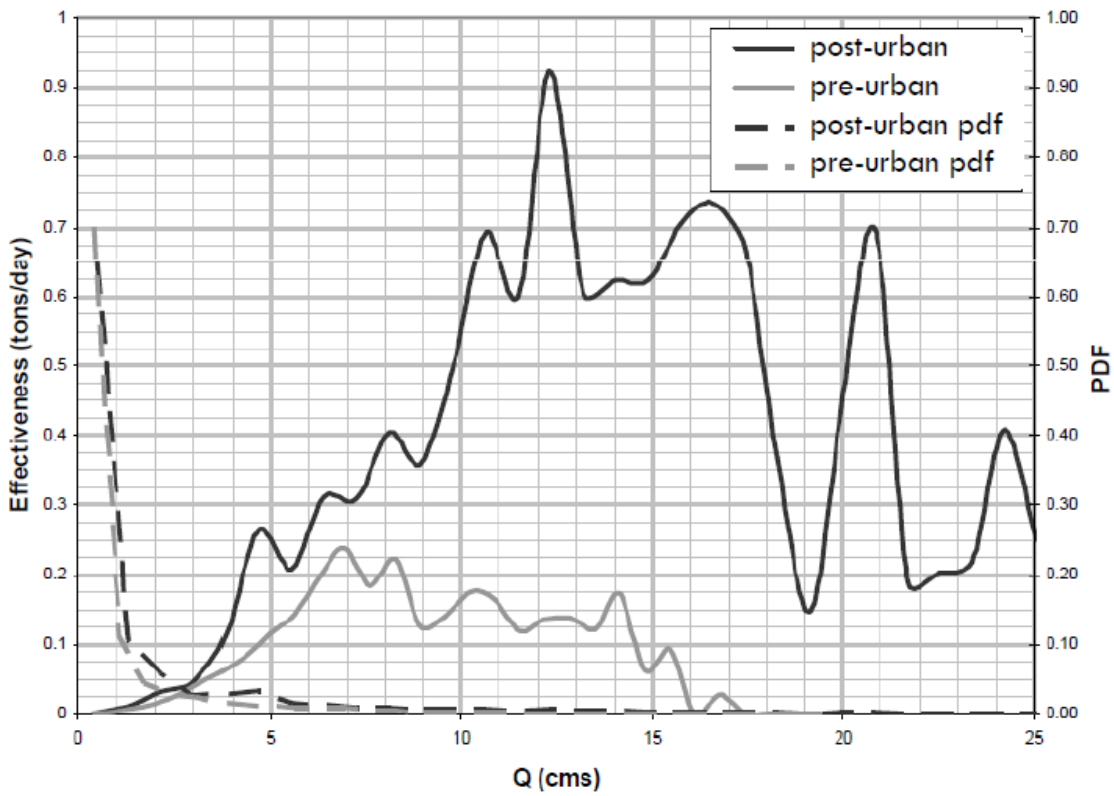

Figure B-4. Flow effectiveness curves for continuous series of pre-urban and post-urban discharges (Biedenharn et al. 2000; Bledsoe et al. 2007). Cumulative sediment yield is approximated by the area under the respective curves. If the stream bed is the most erodible channel boundary, the ratio of areas under these curves would be the erosion potential metric described below in the next suite of tools.

3. **Erosion potential suite of tools.** This suite of tools is designed to answer the following key questions:
   - How do proposed land-use changes or channel alteration affect the capacity of a channel to transport the *most erodible material in its boundary* over a period of many years (erosion potential – Ep)?
   - Do proposed mitigation approaches match the pre- vs. post- development erosion potential over the full spectrum of erosive flows?
   - Do past changes in erosion potential correspond to different states of channel stability and degradation in this region?
   - Does a proposed change in streamflow make it more likely that a channel will enter an alternative / degraded state?

The underlying premise of the erosion potential approach advances the concept of flow duration control (discussed in Chapters 2 and 3) by addressing in-stream processes related to sediment transport. An erosion potential calculation combines flow parameters with stream geometry to assess long term (decadal) changes in the sediment transport capacity. The cumulative distribution of shear stress, specific stream power and sediment transport capacity across the entire range of relevant flows can be calculated and expressed using an erosion potential metric, Ep (e.g., Bledsoe, 2002). This erosion potential metric is a simple ratio of post- vs. pre-development sediment transport capacity over a period of many years. The calculated capacity to transport sediment can be based on the channel bed material or the bank material, depending on which one is more erodible.

This Ep suite of tools has been applied in two primary ways:

a) At a project-level analysis, it has been applied to answer the first two questions above. A municipal stormwater permit may require a project design to achieve an erosion potential (Ep) value of 1.0. This means that a project must be designed so that the long-term erosion potential of the site's stormwater discharge is equal to the erosion potential of the pre-development condition. Section 3.1 below explains the process by which this analysis is conducted.
b) At a regional level, this suite of tools can be applied to answer the third and fourth questions above and to provide further guidance to project-level assessments. For example, practical engineering considerations generally require that a tolerance be permitted around a target design value. It is unlikely that a project design can match an Ep target of 1.0 across all conditions and through all stream reaches, due to variations in a multitude of contributing factors. The selection of an acceptable tolerance or variance from 1.0 is a management decision that should be informed by regional data presented in a risk-based format. Section 3.2 below explains how such a study has been conducted, using the Santa Clara Valley example from northern California.

3.1. *Project-Level Analysis.* As applied to the analysis of project impacts and mitigation design, the steps and associated tools that comprise this suite include the following (Figure B-5):

- Perform continuous simulation of hydrology (e.g. SWMM, HEC-HMS, HSPF) for the project site, for both pre-project condition and post-project condition with the proposed mitigation design.
- Convert discharges and field surveys to hydraulic parameters (shear stress and specific stream power) – e.g., for uniform flow analysis use Manning's equation, GeoTools; for varied flow analysis use HEC-RAS
- Convert hydraulic parameters into sediment transport capacity – e.g., at-a-station hydraulic geometry, HEC-RAS, GeoTools, sediment transport relationships (bedload and total load)
- Integrate Ep over time – e.g., GeoTools

- Compare Ep values for pre-development and post development to determine if the proposed mitigation design is adequate. Adjust stormwater controls as necessary to meet target Ep.

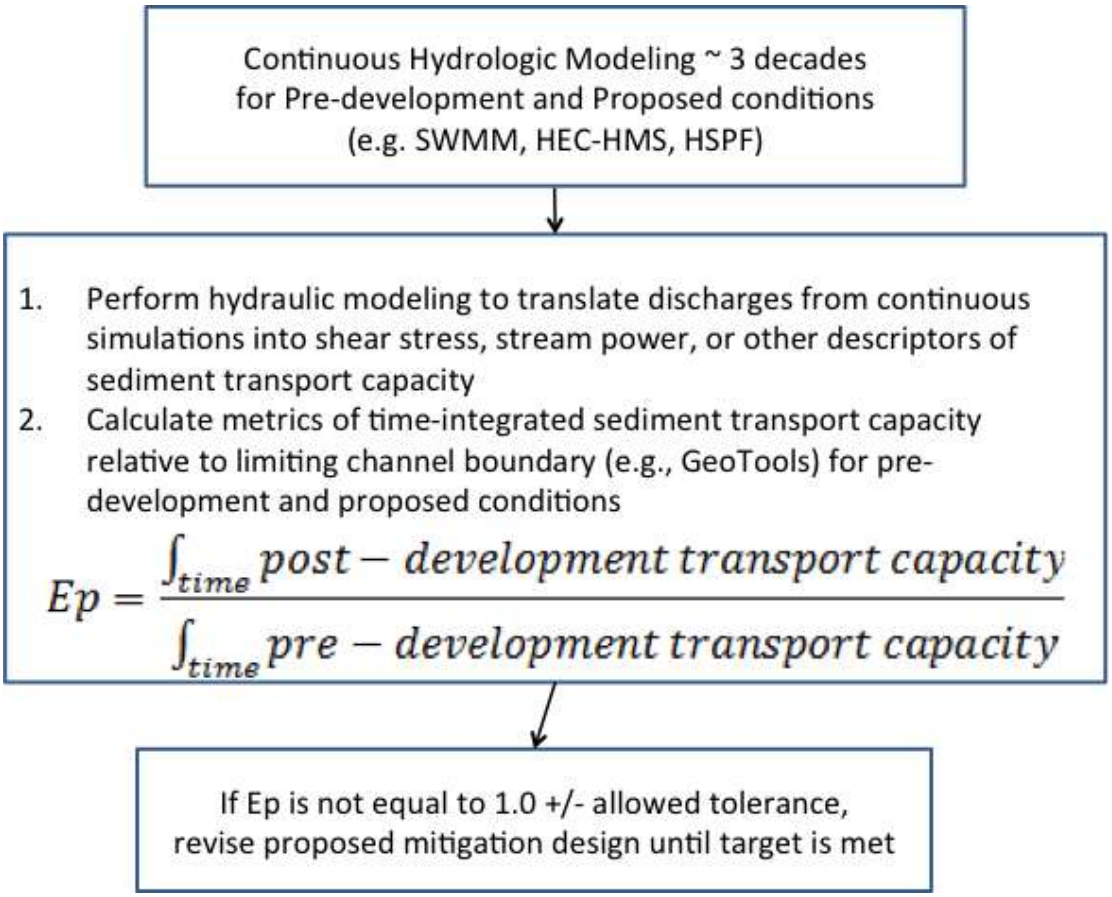

Figure B-5: Steps involved in a project-level Erosion Potential analysis

3.2. *Risk-Based Regional Analysis*. Risk-based modeling estimates the probability of stream geomorphic states. Decision-makers can then choose acceptable risk levels based on an explicit estimate of prediction error. The foundation of risk-based modeling in the context of hydromodification management is the integration of hydrologic and geomorphic data derived from the output of continuous hydrologic simulation models to generate metrics describing expected departures in the most important stream processes. These physical metrics are provided as inputs to probabilistic models that estimate the risk of streams shifting to some undesirable state. Because the decision endpoint is often categorical (e.g., stable, good habitat) the statistical tools of choice

are often logistic regression, classification and regression trees (CART), and/or Bayesian probability networks.

The steps below are used to develop a risk-based framework (Fig. B-6) for assessing how hydromodification may impact streams within a region, and for understanding the relationships between deviation from an Ep of 1.0 and the likelihood of channel instability. Illustrating figures are taken from a risk-based approach was used in the development of the Santa Clara Valley Urban Runoff Program Hydromodification Management Plan (www.SCVURPPP.org). This study demonstrated that a time-integrated index of erosion potential based on continuous hydrologic simulation and an assessment of stream power relative to the erodibility of channel boundary materials could be used to distinguish between channels of a particular regional type that are stable vs. degraded by hydromodification in urban watersheds.

- Perform project-level analysis as described in section 3.1 above for existing developments throughout the study watersheds.
- Perform stream surveys throughout the study watersheds to characterize condition (i.e., stable, unstable)
- Create statistical relationships between Ep and different channel states – e.g., logistic regression in R, SAS, Statistica, Minitab, etc. Note that standard regression techniques are applied when the dependent variable and the explanatory variables are quantitative and continuous. To analyze a binary qualitative variable (e.g., 0 or 1, stable or unstable, healthy or degraded) as a function of a number of explanatory variables, alternative techniques must be used. The regression problem may be revised so that, rather than predicting a binary variable, the regression model predicts a continuous probability of the binary variable that stays within 0–1 bounds. One of the most common regression models that accomplishes this is the logit or logistic regression model (Menard, 1995; Christensen, 1997).

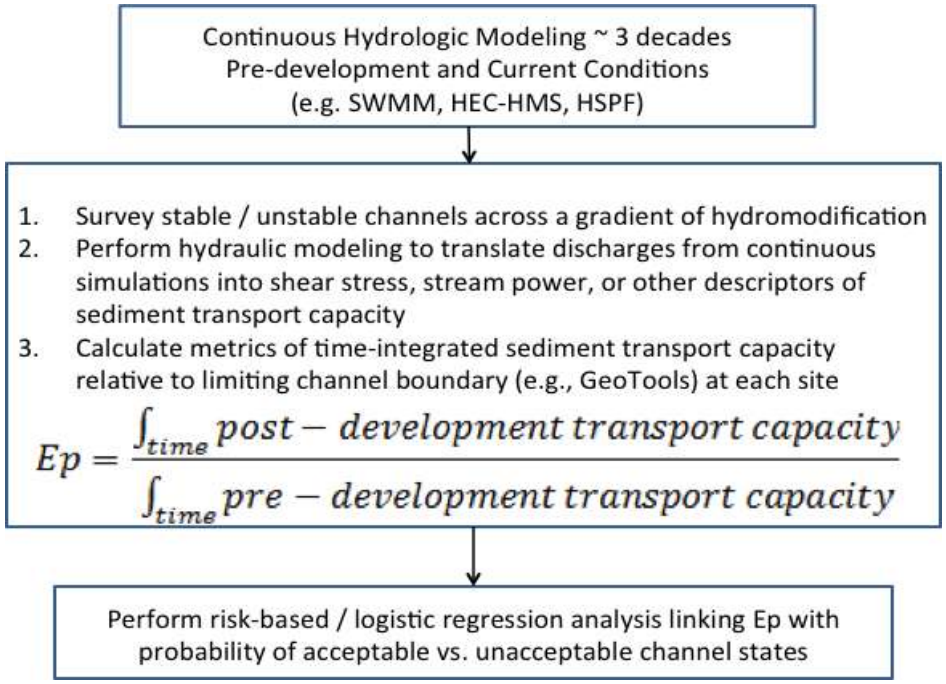

Figure B-6: Steps involved in a Risk-Based Erosion Potential analysis

The variables included in risk-based models of stream response are not limited to erosion potential. Additional multi-scale controls could be included. For example, simple categories of physical habitat condition and ecological integrity could be predicted by augmenting erosion potential metrics with descriptors of the condition of channel banks and riparian zones, geologic influences, floodplain connectedness, hydrologic metrics describing flashiness, proximity to known thresholds of planform change, and BMP types. Furthermore, although most of the emphasis to date has been on predicting geomorphic endpoints, the risk-based approach can be extended to the prediction of biological states in urban streams if the necessary data are available.

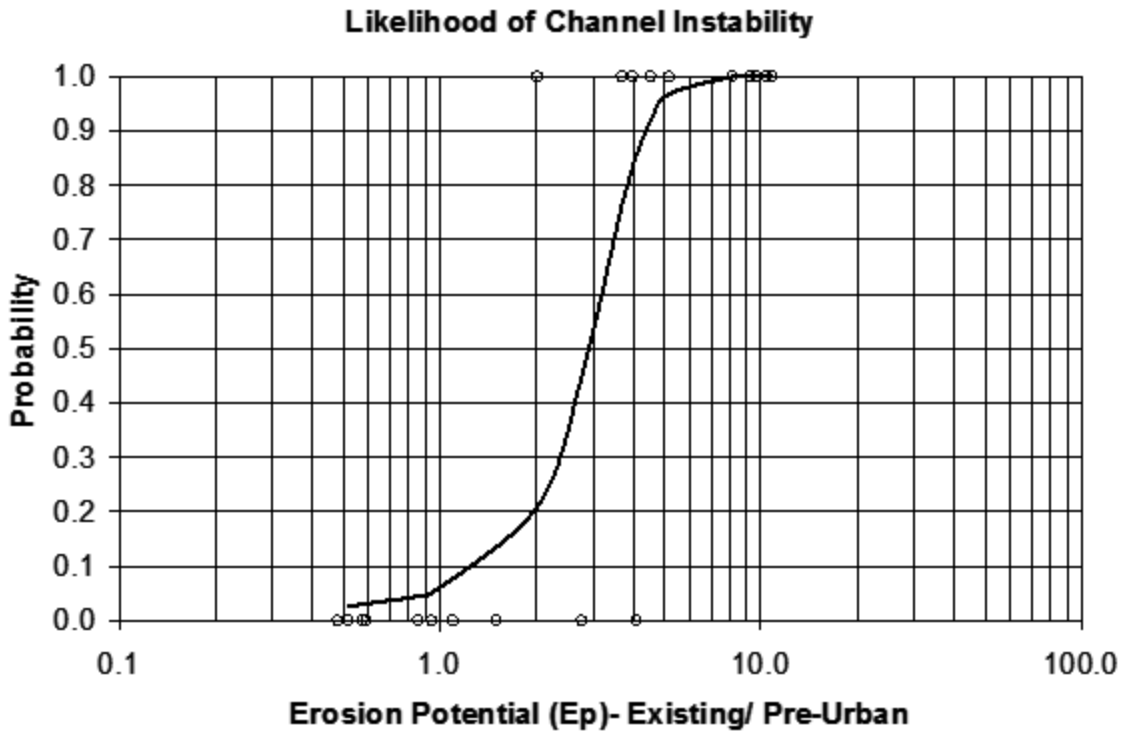

Figure B-7: Example of a logistic regression analysis of stable vs. unstable channels (Bledsoe and Watson, 2001; Bledsoe et al., 2007). The vertical axis represents the probability of stream instability which increases rapidly for channels with sediment transport capacity increased by urban hydromodification (Ep > 1).

3.3. *Strengths and Limitations.* The Erosion Potential approach combines a sound physical basis with probabilistic outputs and requires a substantial modeling effort. Such an effort is necessary to adequately characterize the effects of hydromodification on the stability of streams that are not armored with very coarse material such as large cobbles and boulders. Although policies based on this approach should reduce impacts to channel morphology, they may still fail to protect stream functions and biota. Key simplifying assumptions and prediction uncertainty in the inputs (hydrologic modeling, assumptions of static channel geometry in developing long term series of shear stresses or stream powers, assumptions of stationarity in sediment supply, etc.) have not been rigorously addressed. Its effectiveness also depends on careful stratification of streams in a region such that fundamentally different stream types are not lumped together (e.g. labile sand channels vs. armored threshold channels with grade control) in developing general relationships for instability risk. Endpoints to date have been rather coarse, e.g. stable vs. unstable; as such, they do not provide sufficient resolution for envisioning future stream states. However, the Erosion Potential approach provides

promise as an important tool for hydromodification management; it is recommended that it be refined to address sediment supply changes and to provide more finely resolved endpoints for improved predictive capabilities.

4. **Sediment transport analysis suite of tools.** This suite of tools is designed to answer the following questions:
   - Do I need to incorporate sediment transport analysis in predicting channel response to hydromodification, i.e. what is the sensitivity of channel slope and geometry to inflowing sediment load?
   - At what discharges are different fractions of bed material mobilized in a particular stream segment?
   - What is inflowing sediment load to a stream segment, i.e. what is the water discharge Q(t) and sediment supply rate Qs(t) and grain size D(t) delivered to the upstream end of the channel segment of interest?
   - How will the available flow move the supplied sediment through the segment of interest?
   - What is the new equilibrium slope given some change in streamflow, and how much incision would be necessary to achieve this new slope?
   - What is the sediment transport capacity of the segment of interest *relative to* the inflowing sediment load from *upstream* supply reaches?
   - What is the sediment transport capacity of the segment of interest *relative to* the capacity of *downstream* reaches?
   - At the network scale, where are zones of low vs. high energy, aggradation vs. degradation potential, and coarse sediment constriction located?

   The primary tools that comprise this suite include the following:
   - Tools for estimating watershed sediment supply (Reid and Dunne 1996), including the RUSLE (Renard et al. 1997; http://www.ars.usda.gov/Research/docs.htm?docid=5971) and WEPP (Laflin et al. 1991; http://www.ars.usda.gov/Research/docs.htm?docid=10621) models.
   - Effective discharge analysis (see above)
   - Incipient motion analysis (tractive force, e.g. ASCE 2008; Brown and Caldwell 2011; Buffington and Montgomery 1998; Lane 1955a)
   - Sediment continuity analysis at single dominant discharge with an appropriate sediment transport relation – e.g., HEC-RAS, Bedload Assessment for Gravel-bed Streams (BAGS -Pitlick et al. 2009; GeoTools)
   - Equilibrium slope / geometry analysis e.g., HEC-RAS – Copeland et al. 2001, iSURF-NCED 2011)
   - Sensitivity to inflowing sediment load analysis e.g., Copeland's method in HEC-RAS, iSURF-NCED 2011)
   - Sediment continuity analysis over the entire flow frequency distribution e.g., Capacity-Supply Ratio of Soar and Thorne (2001), BAGS, GeoTools

- Network scale sediment balance – Sediment Impact Analysis Methods (SIAM) module in HEC-RAS

Movable bed / mobile boundary models also provide a mechanistic tool for estimating the trend and magnitude of changes in channel geometry due to hydromodification. However, a recent study evaluated the potential applicability of various movable bed and/or boundary models to streams in southern CA (Dust 2009), including HEC-RAS, CONCEPTS (Langendoen, 2000), and FLUVIAL 12 (Chang, 2006). The results of tests performed on urban streams in southern CA indicate that these models are difficult to apply and have high prediction uncertainty due to flows near critical, split flow conditions, and lack of fidelity to complex widening, bank failure, and armoring processes.

The following figures depict example outputs from an application of the sediment-transport suite of tools:

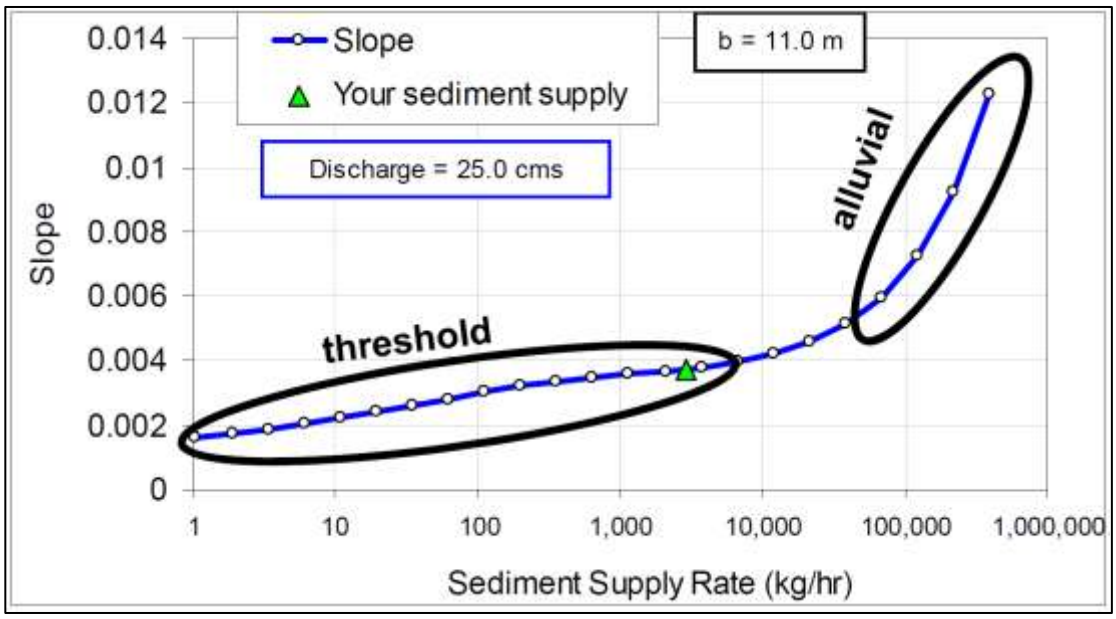

Figure B-8. Sensitivity analysis of equilibrium channel slope to inflowing sediment load (from iSURF, NCED 2011). Slopes of alluvial channels with high sediment supply are much more sensitive than threshold channels with relatively low sediment supply. Channels with beds composed of sand and fine gravels are generally much more geomorphically sensitive to hydromodification than threshold channels in which coarse bed sediments are primarily transported at relatively high flows.

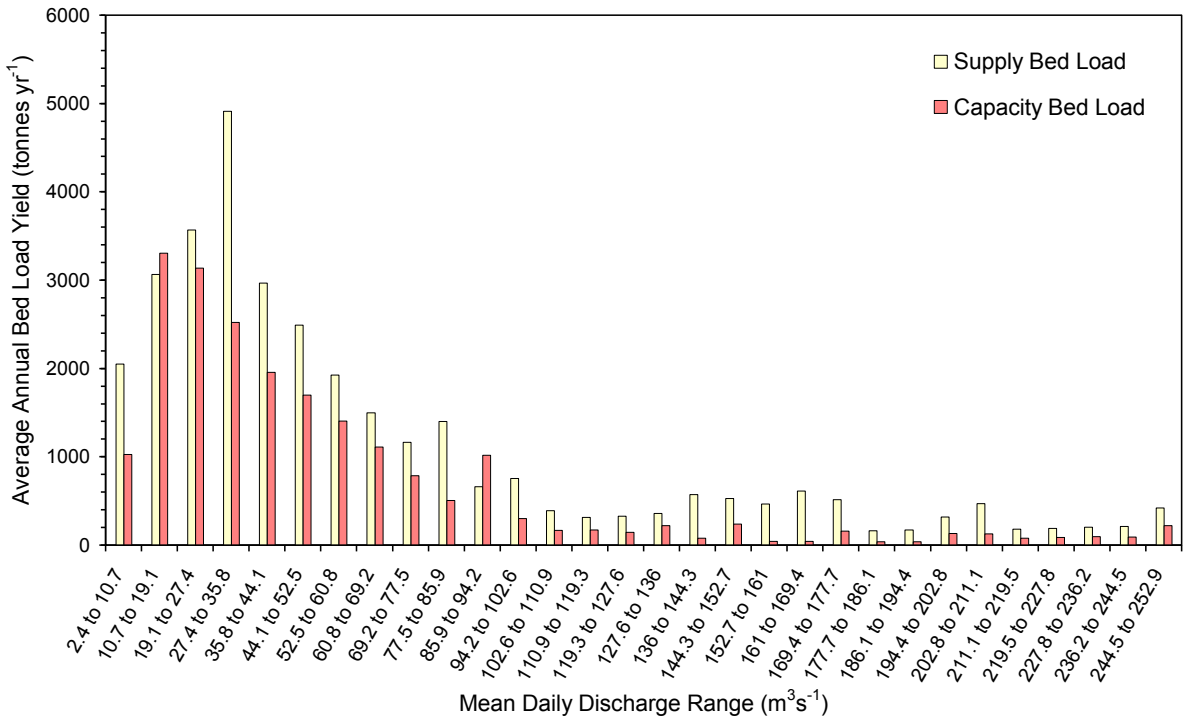

Figure B-9. Analysis of sediment transport capacity vs. inflowing sediment load over the full spectrum of stream discharges (capacity-supply ratio; Soar and Thorne 2001). In this case, the time-integrated capacity to transport bedload is 64% of the supplied bedload and significant aggradation is expected.

5. **Relationship to Management Framework**. These suites of tools could be applied to establish project-specific requirements for hydromodification assessment and mitigation, as recommended in the Management Framework presented in Chapter 3. In the example shown in the diagram below, results of the Baseline Assessment are used as a screening tool to assign high, moderate or low risk levels for stream reaches, in conjunction with the proposed land-use changes. Thus, the Baseline Assessment suite of tools is crucial in determining whether a detailed survey-level assessment and additional suites of tools are necessary for an adequate analysis. The need to apply additional suites of tools in formulating a management approach is commensurate with the level of risk and susceptibility of the stream. More complex and rigorous analysis with multiple suites of tools is necessary in predictive assessments for relatively susceptible stream types such as alluvial channels with sand beds.

   Although a stream may have relatively low susceptibility for overall geomorphic change, it may nevertheless have ecological attributes that are highly susceptible to hydromodification. Thus, suites of tools focused on both geomorphic and biological endpoints must be used to fully assess stream susceptibility to hydromodification. More work will be required to develop tools for prediction of biological response to flow alterations throughout California, as noted in Chapter 3 (see Poff et al., 2010 and http://conserveonline.org/workspaces/eloha).

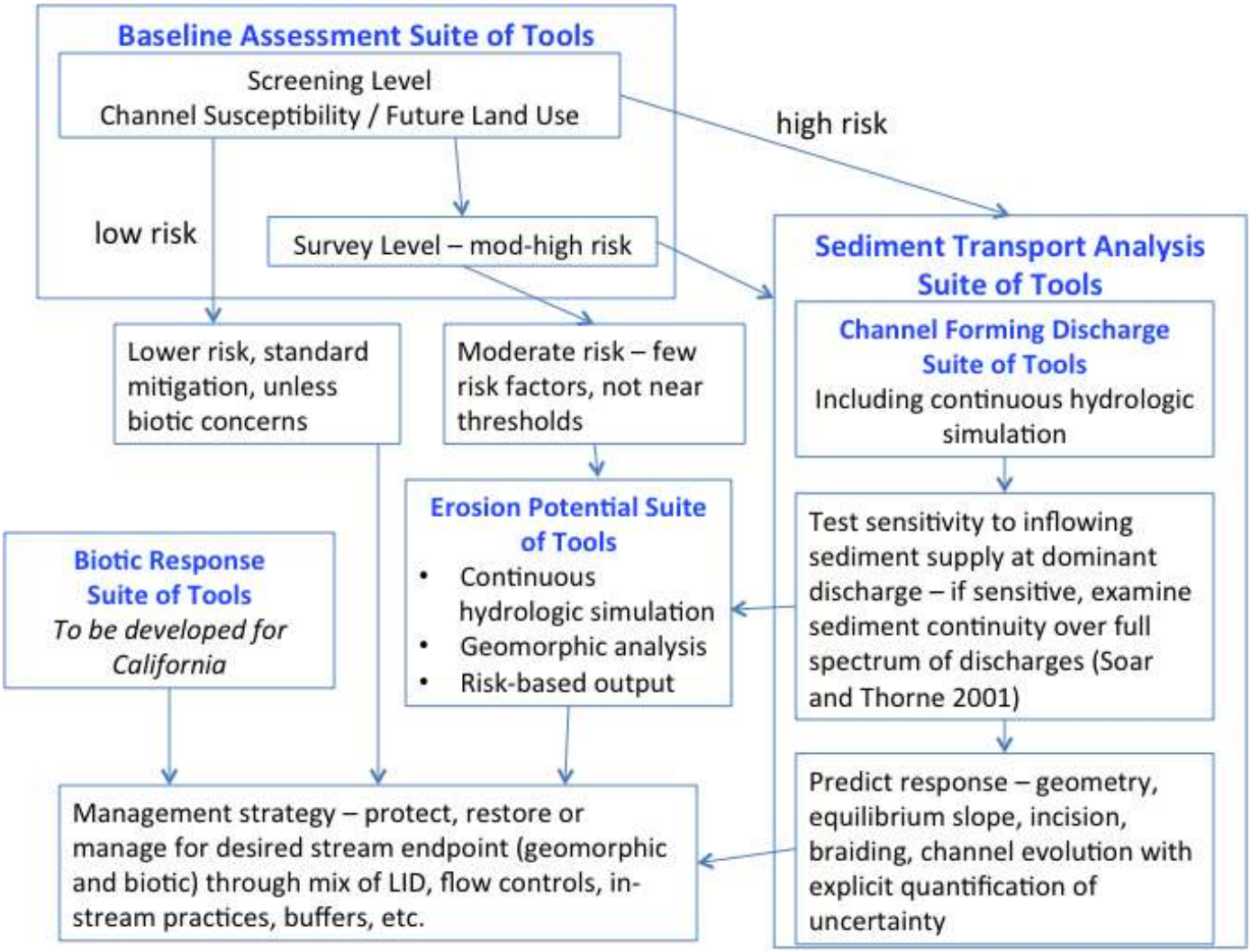

Figure B-10. Conceptual diagram showing relationships among the four suites of existing tools and biotic response tools to be developed in the future. Additional analyses will be required for engineering design.

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APPENDIX C: ADAPTIVE MANAGEMENT

WHAT IS ADAPTIVE MANAGEMENT

Adaptive management is a formalized approach for overcoming the inescapable difficulty in predicting ecological outcomes resulting from natural-resource management actions. It accomplishes this by treating all "management actions" (whether intentional or not) as experimental components within the larger structure of a monitoring program (Holling 1978, Walters 1986, Lee 1999, Ralph and Poole 2003). In other words, specific management actions that may affect ecological processes and functions are systematically evaluated, via "monitoring," to provide the data to affirm or refute the expected outcomes. To the extent that the monitoring results indicate a need to revise the scientific understanding or the management actions built on that understanding, establishing the mechanism to change management actions is a precursor, not an afterthought, of the monitoring program.

Adaptive Management was first articulated over 30 years ago (Holling, 1978) and more recently embraced through various conservation efforts worldwide. Fundamental to this approach is the integration of management and monitoring, recognizing that any management action in the context of a complex ecological system is ultimately experimental, requiring feedback to make progress.

The process of adaptive implementation is iterative and continuous; new knowledge is actively incorporated into revised experiments, a practice best described as "learning while doing" (Lee 1999). The key difference between this approach and other commonly implemented environmental management strategies is the application of scientific principles, such as hypotheses-testing,[is used] to explicitly define the relationships between policy decisions, management actions, and their measured ecological outcomes. Furthermore, this approach provides a means to understand and document these cause-and-effect relationships; it can also point to alternative actions that may produce more desirable outcomes. Uncertainty is embraced and serves as a focal point for defining ever-more specific evaluations.

Scientifically credible and relevant information can only be generated when the management "experiments" are designed with clear hypotheses about the effects of proposed actions or prescriptions. These hypotheses must be testable at multiple scales using available technology and methods (Conquest and Ralph 1998; Currens *et al*. 2000). Hypotheses that cannot be tested, are trivial (e.g., "water flows downhill"), are not credible ("water flows uphill"), or only account for site-specific conditions are not useful in considerations of the singular or cumulative effects of management actions.

In order to retain clear linkages between key questions, hypotheses, and monitoring protocols, the experimental approach must be designed before determining which goals and endpoints are appropriate (Ralph and Poole 2003) since appropriate goals should be *outcomes* of the

effort, not a precondition; and the approach must explicitly tie stated hypotheses to the key ecological questions.

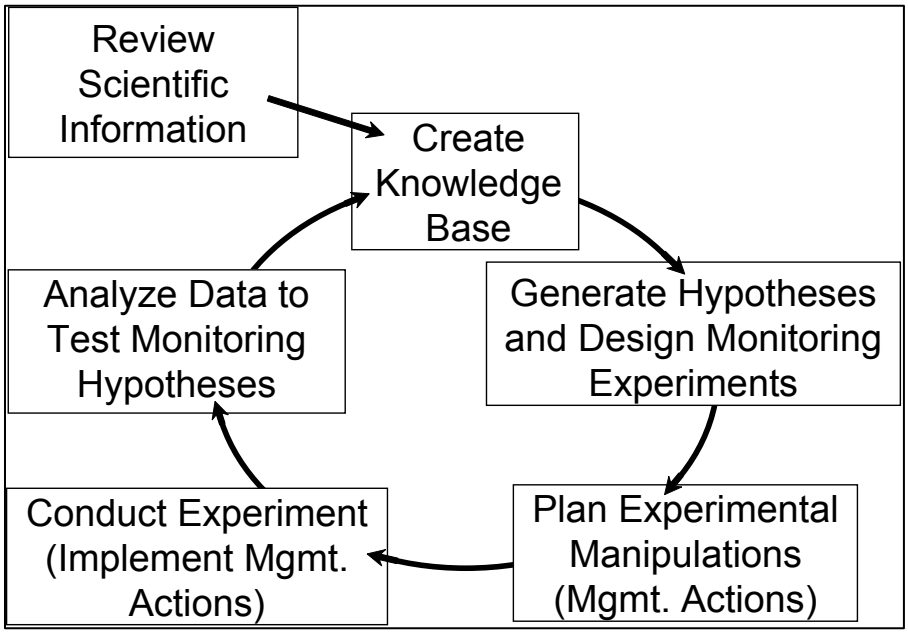

Figure A-1. Framework for an adaptive management program. The key feature of this cycle is the foundation of scientific principles and hypothesis generation; design of the management actions and the monitoring to evaluate their effects are integrated and designed to test assumptions, improve understanding, and reduce uncertainty (modified from Ralph and Poole 2003, Figure 3).

Wagner (2006) asserts that [stormwater] regulatory programs in the past often failed because they were designed in ways that ignored technological and scientific limitations. "Science-based" does not simply mean the monitoring of status and trends followed by responding to imposed benchmarks and goals, but rather that scientific principles must be the foundation of regulatory program design, and that these programs must rely on scientific methods to demonstrate results. Wagner suggests that regulations can still be designed despite incomplete or developing knowledge, but that gaps and limitations must be acknowledged and used to inform ongoing investigations. His argument clearly echoes those of scientists who insist that monitoring experiments and testable hypotheses must frame management decisions and land-use objectives.

WHAT IS *NOT* ADAPTIVE MANAGEMENT, AND WHY IS IT SO PROBLEMATIC?

Unlike the experimental approach embodied by adaptive management, an alternative process traditionally dominates in natural resource management: (1) a problem is identified, but a cause is simultaneously presumed (e.g., "increased sediment inputs into a stream are negatively impacting salmonid survival"); (2) a solution or set of solutions is proposed (e.g., timber harvest is restricted and riparian buffer width is increased), but the prescription is not translated into a testable hypothesis associated with the problem or question; and (3) if the problem is not solved within an arbitrarily reasonable period of time (e.g., a few years) then a different solution is proposed (e.g., "augmented upland and riparian restoration must be implemented"). Although simplified, this outline displays its divergence from adaptive management and from the basic principles of the scientific process—the resulting process is perpetually reactive.

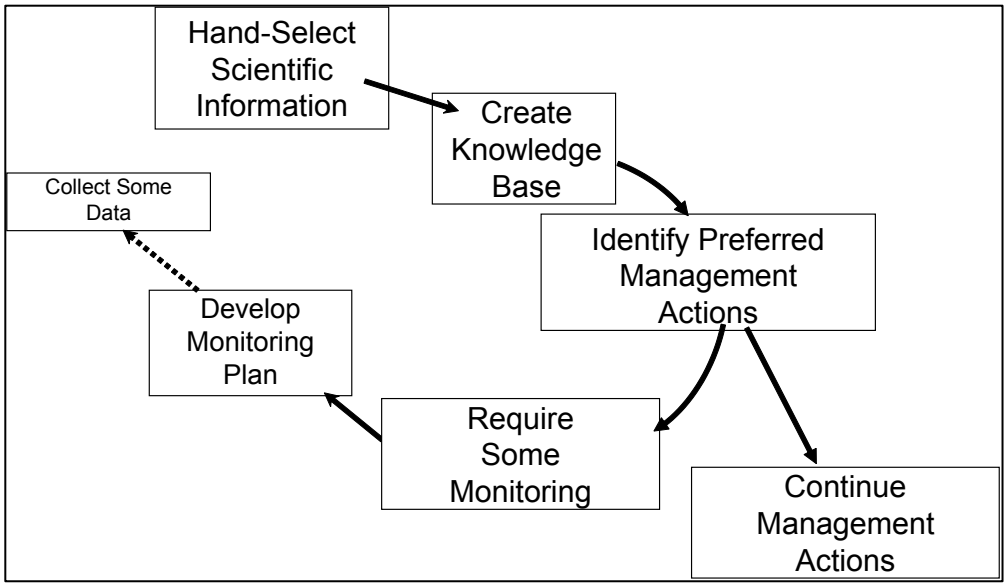

Figure A-2. Common framework for monitoring outside of an adaptive management structure. Management actions are chosen with a presumptive effect on ecological systems, and monitoring is conducted without any feedback to future actions. Even where monitoring is intended to "inform" future management actions, the absence of an explicit experimental design normally limits the utility of any monitoring data to provide meaningful insights.

In its best form, this paradigm has been termed passive adaptive management:

> Restoration planners' current management approach has been described as a "passive" adaptive management approach: science is used to

> develop best-guess predictive models, make policies according to these models, and revise them as data become available. The National Academies advise that every effort be made to take a more "active" adaptive management approach by developing alternative hypotheses for the expected consequences of a particular project and then design the project so the hypotheses can be experimentally tested" (from the summary to *Adaptive Monitoring and Assessment for the Comprehensive Everglades Restoration Plan*, 2003, National Academies Press, 122 pp.).

Ralph and Poole (2003) have aptly named this approach "socio-political adaptive management" (i.e., SPAM).

BARRIERS TO IMPLEMENTING "ACTIVE" ADAPTIVE MANAGEMENT

Although the virtues of active adaptive management are readily articulated, the framework is surprisingly rare in practice. Some of these barriers are practical or logistical, and they include such issues as:

- Longevity and long-term institutionalization of monitoring;
- Effective data management systems that allow managers to readily access data;
- Ability to differentiate effects from natural variability and events, such as flood and fire;
- Cost and technical limitations of necessary data collection.

The most severe impediments, however, are not scientific but social: "We suggest that watershed-scale adaptive management must be recognized as a radical departure from established ways of managing natural resources if it is to achieve its promise... Adaptive management encourages scrutiny of prevailing social and organizational norms and this is unlikely to occur without a change in the culture of natural resource management and research" (Allan et al. 2008).

While science can provide defensible and replicable insights regarding the ecological outcomes of management prescriptions, it cannot offer absolute certainty. Policy can be and should be informed by science but is ultimately based on a variety of considerations that are not always amenable to the spatial, temporal, and technological limitations of the scientific process (Van Cleave et al. 2004). This is an uncomfortable truth for agency managers and elected officials to acknowledge, and it commonly results in funding decisions and public pronouncements using the "language" of science but not its substance.

Although efforts to build large, collaborative programs are commonly characterized by increasing stakeholder involvement and outreach, greater participation does not necessarily

mean that true adaptive management is occurring, or that scientific principals are being applied to either the choice of management actions or their evaluation. These efforts, however, do reflect a movement to extend natural resource management decision-making processes beyond just technical experts in order to reflect evolving social values (Pahl-Wostl *et al*. 2007). If they are successful, this approach can open a path to achieving the best of both realms, namely scientific rigor with a broad base of community support.

ATTRIBUTES OF USEFUL HYPOTHESES FOR AN ADAPTIVE MANAGEMENT PROGRAM

A key element of any adaptive management approach is the set of hypotheses that guide both the management actions and their associated monitoring. Because these management actions are recognized as "experimental" (because in a complex system most outcome(s) cannot be predicted with absolute certainty), their selection must be guided by assumptions about what *might happen,* or what is *expected* to happen. This defines the first attribute of a useful hypothesis: it is **credible**, typically because it is based on prior knowledge or scientific understanding of the system. Indeed, some hypotheses may already be so well evaluated and understood (e.g., "Stormwater runoff from freeways carries measurably elevated concentrations of toxic pollutants") that there is little point in framing them in this structure at all—as new monitoring programs to address such hypotheses are highly unlikely to result in new information or knowledge and might be perceived as an unwise expenditure of scarce monitoring resources.

The second attribute of a useful hypothesis stems from the scientific reality that any experiment, whether conducted in the laboratory or across the landscape, provides value only insofar as its outcomes are measured and the effects are distinguishable from the influence of other, unrelated factors. Thus, the hypothesis that guides the experiment should not only be credible but also **testable**. Otherwise, why bother making measurements at all?

Lastly, these actions and measurements and analyses do not occur in a vacuum. Thus, the final guiding principle for any hypothesis in an adaptive management approach is that it be **actionable**, or that different outcomes, as revealed by monitoring, can (and will) result in different management responses. If no difference occurs, then clearly there is no reason to have made the effort in the first place.

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ATTACHMENT A

**ORANGE COUNTY LEGAL &TECHNICAL COMMENTS ON
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
TENTATIVE ORDER No. R9-2013-0001
NPDES NO. CAS0109266**

Appendix A-3

2009 Presentation to Santa Ana Regional Board

015183

Storage and Reuse Systems for Stormwater Mangement

Preliminary Cost and Performance Estimates for Residential Land Use in Irvine, CA

Eric Strecker, P.E.

Geosyntec consultants

Summary of Study

- Compared hypothetical scenarios for rainwater harvesting and reuse systems (cisterns)
  - single lot scenario
  - 100 ac neighborhood scenario
- Compared resulting costs and for both scenarios
- Performed modeling (long term simulation) analysis for neighborhood scenario
- Evaluated water quality loading differences between rainwater harvesting and reuse systems and typical bioretention installation for single family residential
- Performed preliminary review of applicable codes

Rainwater harvesting and Reuse Systems

Impervious Area

- Roof tops
- Driveways
- Streets

Stormwater Conveyance and Pretreatment

- Pipes
- Filters

Storage

- Cistern
- Storage Basin
- Underground Vault

Treatment

- UV treatment
- Filtration

Pumping and Piping

- Pipes back to house (purple)

Indoor Use and Irrigation

- Toilet flushing
- Yard and Garden irrigation

Geosyntec consultants

Single Lot Scenario

- Two reuse demands were examined: 1) indoor use only (toilet flushing), and 2) indoor and outdoor use (toilets and irrigation)

- Lot Characteristics:
  - 0.1 acres
  - 69% impervious area
    - Roof area - 2400 ft^2
    - Other (patio) - 600 ft^2
  - 3.5 people/house
  - Toilet use/capita = 18.5

- Method assumptions:
  - Rational Method
    - Impervious Runoff Coeff. (0.9)
    - Precipitation Depth – 0.8 in (85th percentile for large parts of Orange County)
    - Toilet use / house = 65 gal/day
    - Irrigation /house = 77 gal/day (Avg. from Irvine Water District data)

Geosyntec consultants

Single Lot Scenario Results

Water Collected From:	Roof	Roof + Other Impervious area
Demand Scenario	**Average Drawdown Time (days)**	
Toilets only	17	21
Both Toilets & Outdoor uses	7.6	9.5

Note: Outdoor demand assumes that irrigation demand is immediate; more sophisticated modeling would allow more accurate characterize of irrigation demand, but for purposes of this analyses, it was assumed to be immediate. This likely significantly overstates the demand for irrigation.

Geosyntec consultants

Neighborhood Scenario

- Two reuse demands were examined: 1) indoor use only (toilet flushing), and 2) indoor and outdoor use (toilets and irrigation)

- Neighborhood Properties:
  - 100 acres – 60 % impervious
  - 0.1 acre lots at 4.5 du/ac = 450 houses
  - 3.5 people/house
  - Toilet use/capita = 18.5
  - Basin used to store runoff

- Method assumptions:
  - Rational Method
    - Impervious Runoff Coeff. (0.9)
    - Precipitation Depth – 0.8 in (85th percentile for large parts of Orange County)
    - Toilet use / house = 65 gal/day
    - Irrigation /house = 77 gal/day (Avg. from Irvine Water District data)

Geosyntec consultants

Neighborhood Scenario Results

Demand Scenario	Average Drawdown Time (days)
Toilets only	45
Both Toilets & Outdoor uses	10

Note: Outdoor demand assumes that irrigation demand is immediate; more sophisticated modeling would allow more accurate characterize of irrigation demand, but for purposes of this analyses, it was assumed to be immediate. This likely significantly overstates the demand for irrigation.

General Cost List

015190

Item	Description	Cost	Reference/Source
TANKS			
Galvanized steel	200 gal	$225	Fairfax County, 2005
Polyethylene	165 gal	$160	Fairfax County, 2005
Fiberglass	350 gal	$660	Fairfax County, 2005
Plastic	800 gal	$400	Plastic-mart.com
Plastic	1100 gal	$550	Plastic-mart.com
Plastic	1350	$600	Plastic-mart.com
Plastic cone	1500 gal w/metal stand	$1500	Plastic-mart.com
Plastic	2500 gal	$900	Plastic-mart.com
Plastic	5000 gal	$3000	Plastic-mart.com
Plastic	10000 gal	$6000	Plastic-mart.com
[1] Dry Det. Basin(1997)	$C = 12.4V^{0.760}$: for 1 ac-ft	$41,600	stormwatercenter.net
[2] Below Ground Vault	$C = 38.1 (V / 0.02832)^{0.6816}$	$55,300	fhwa.dot.gov
Concrete	1,000,000 gal above g. (O&P)	$548,000	RSMeans
Steel	1,000,000 gal above g. (O&P)	$467,000	RSMeans
TREATMENT			
UV (house-scale)	Whole system - 12 gpm	$700-$900	rainwatercollection.com
UV bulb	Life: 10,000 hrs or 14 months	$80-$110	rainwatercollection.com
UV (neighborhood-scale)	Whole system - 200 gpm	$10,000	Bigbrandwater.com
Downspout filter	Placed in Gutter	$20 - $500	many online
1st Flush Diverter	Vertical pipe w/ ball float	$50-$100	raintankdepot.com
PUMP	1 hp (all in one package)	$575 - varies	rainwatercollection.com
PIPING (Purple)			
to Tank (lot)	PVC: 2”-6” (O&P)	$2-$12 / LF	RSMeans
to House (lot)	PVC: 2”-6” (O&P)	$2-$12 / LF	RSMeans
to Tank (neighbor.)	Concrete: 6” – 18” (O&P)	$15-$30 /LF	RSMeans
to House (neighbor.)	HDPE- 4” – 10” (O&P)	$11-$27 / LF	RSMeans
to Irrigation	PVC: 2”-6” (O&P)	$2-$12 / LF	RSMeans
Backflow prev. valve	Each	$100-$200	web
STENCILS	Non-potable water	----	
INSTALLATION	Percentage of material cost	40 % – 50%	

[1] This dry detention cost equation - Brown and Schueler, 1997: C is the construction, design and permitting cost and V is the volume (cu-ft) need to control the 10-year design storm. In this case, the 0.8” storm runoff volume was used in place of the 10-yr design storm volume.

[2] This below ground storage vault equation - Weigand et al., 1986:C is the construction cost estimate (1995 dollars), and V is the runoff volume (cubic meters)

Geosyntec consultants

Single Lot Costs

Item	Description	Cost
TANKS		
Plastic	1100 gal and 1350 gal	$550
TREATMENT		
UV	Whole system - 12 gpm	$800
UV bulb	Life: 10,000 hrs or 14 months	$80-$110
Downspout filter	Placed in Gutter	$250
1st FLUSH DIVERTER	Vertical pipe w/ ball float	$100
PUMP	1 hp (all in one package)	$575
PIPING (Purple)		
to Tank (lot)	PVC: 2”-6” (O&P) 20ft	$8 / LF
to House (lot)	PVC: 2”-6” (O&P) 50ft	$8/ LF
to Irrigation	PVC: 2”-6” (O&P) 50ft	$8 / LF
Backflow prev. valve	each	$200
STENCILS	Non-potable water	----
INSTALLATION	40% of material cost	$1400
TOTAL		**$4,900**

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Neighborhood Costs

Item	Description	Cost	Units Assumed
TANKS			
Dry Det. Basin(1997)	$C = 12.4V^{0.760}$	$119,000	174,000ft^3
Below Ground Vault	$C = 38.1 (V / 0.02832)^{0.6816}$	$142,000	174,000ft^3
TREATMENT			
UV - neighborhood	Whole system - 200 gpm	$10000	
Catch basin filters	1 every 2 acres	$2000	50 catch basins
PUMP		$50,000	
PIPING (Purple)			
to Tank (neighbor.)	Concrete: 6” – 18” (O&P)	$15-$30 /LF	$23 - 14000 ft
to House (neighbor.)	HDPE- 4” – 10” (O&P)	$11-$27 / LF	$19 - 14000 ft
to Irrigation	PVC: 2”-6” (O&P)	$2-$12 / LF	$8 - 60 ft /house
Backflow prev. valve	each	$100-$200	$200 per house
STENCILS	Non-potable water	----	
INSTALLATION	40% of material cost	$470,000	
TOTAL		**$1,650,000**	

Geosyntec consultants

SWMM Modeling Analysis

- Long term (40 yr) analysis of the neighborhood scenario was performed using SWMM. Two scenarios analyzed:
  - 0.8 inch design storm
  - 1.6 inch design storm
- Modeling assumptions:
  1. Toilet flushing – same as scenarios and applied as constant rate
  2. Irrigation – monthly values (from the IRWD) applied as constant rates by month (i.e. demand occurs continuously during and after storm event)
  3. Overflow from tanks considered to be untreated bypass
  4. Same total area and impervious areas in both studies

SWMM Modeling Results

	Units	Scenario			
		A	**B**	**C**	**D**
		Toilet Flushing Only, 0.8" design storm	Toilet Flushing + Irrigation, 0.8" design storm	Toilet Flushing Only, 1.6" design storm	Toilet Flushing + Irrigation, 1.6" design storm
Average Annual Drawdown Time	**days**	**47**	**8.5**	**94**	**17**
Average Stormwater % Capture and Reuse	**%**	**32%**	**55%**	**41%**	**68%**
Avg Annual Volume of Stormwater Reused	MG | CCF	5.2 | 6,950	8.8 | 11,800	6.5 | 8,700	10.9 | 14,620
Avg % of Total Residential Demand Satisfied	**%**	**6.2%**	**11%**	**7.8%**	**13%**

Note: Outdoor demand assumes that irrigation demand is immediate; more sophisticated modeling would allow more accurate characterize of irrigation demand, but for purposes of this analyses, it was assumed to be immediate. This likely significantly overstates the demand for irrigation.

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Pollutant Loading Example

Assumptions

- Median Runoff EMC for TSS for HSFD: **70 mg/L**
- Median Effluent Concentration for TSS for Media Filters from International BMP Database: **15 mg/L**
- % Captured by cistern per SWMM (Scenario B – 0.8" design storm with toilet and irrigation re-use): **55%**
- % Captured by Bioretention with Underdrains per DAMP requirement: **80%** (requires approx 0.4" design storm)
- Bypass from both BMPs assumed to be untreated

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Pollutant Loading Example

Results – Average Annual TSS Load Removed

Cisterns and Re-Use: **55%**

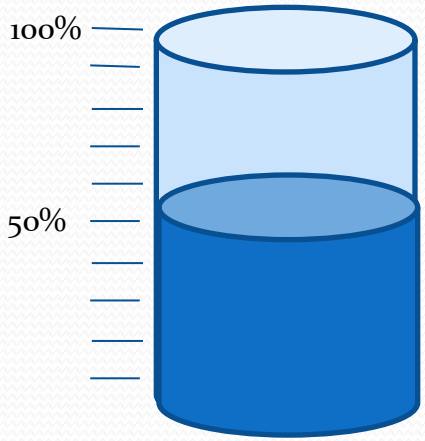

Bioretention with Underdrains: **63%**

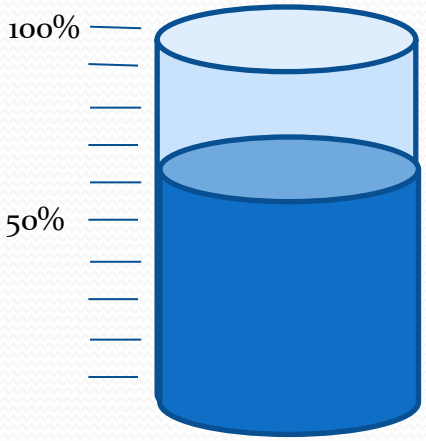

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Pollutant Loading Example

Results – Average Annual TSS Concentration with BMPs

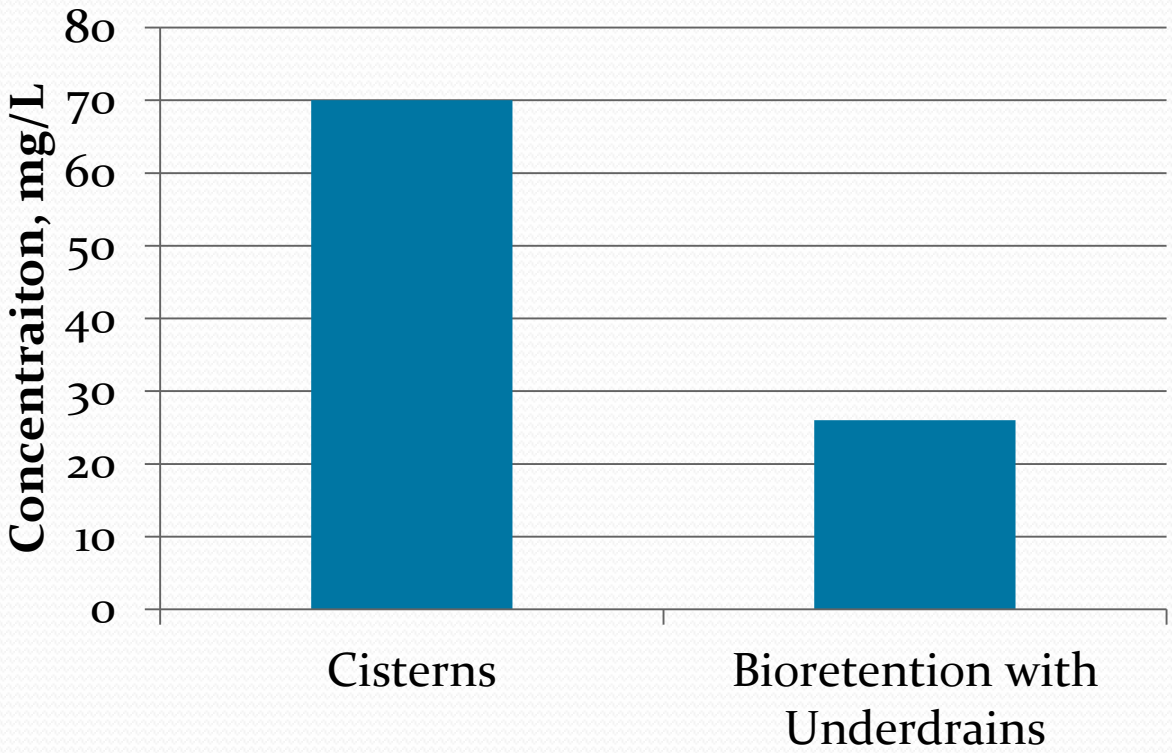

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Rainwater Harvesting - Code and Regulations

Applicable Codes

- Title 24—Building Standards Code (plumbing code)
  - Mechanical design and installation procedures
- Title 22—Social Security (recycled water quality standards)
  - Current technologies can meet this requirement (filtration, UV, and others)
- Title 17—Public Health (public water system cross-connection and backflow prevention)

Preliminary Conclusions

Since state codes do not currently recognize rainwater harvesting and reuse, discretion in approval will likely reside at the county and/or City levels through local codes and ordinances.

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ATTACHMENT A

**ORANGE COUNTY LEGAL &TECHNICAL COMMENTS ON
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
TENTATIVE ORDER No. R9-2013-0001
NPDES NO. CAS0109266**

Appendix A-4

The Water Report Issue #65:
Stormwater Retention on Site, An Analysis Of Feasibility and Desirability, Strecker and Poresky (2009)

015200

The Water Report™

Water Rights, Water Quality & Water Solutions in the West

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Obama Water Policy

Groundwater Decline

Tribal Water Needs

& More!

STORMWATER RETENTION ON SITE

AN ANALYSIS OF FEASIBILITY AND DESIRABILITY

by Eric W. Strecker, PE, and Aaron Poresky, EIT, Geosyntec Consultants (Portland, OR)

INTRODUCTION

Both nationally and in various localities, there is increasing regulatory pressure to maximize or require the retention of stormwater on site with compliance often linked to matching post-development runoff with predevelopment hydrology.

For example, in California the recently adopted Ventura Municipal Separate Storm Sewer System (MS4) NPDES permit requires retention on site — via infiltration, evapotranspiration and/or harvest and "re-use" — of precipitation from storms ranging up in size to the permit-defined "design storm" (Standard Urban Stormwater Mitigation Plan (SUSMP) depth of 3/4 of a inch — "design storms" are events defined in regulation and reflected in stormwater system design). There is an exception allowed where it is not feasible to retain the entire volume: the project may then retain "only" 70 percent of the SUSMP storm on site and mitigate the remaining volume off site. Another example is the North Orange County permit, which requires that infiltration, evapotranspiration, and/or harvest and re-use be employed to manage the water quality design storm, unless infeasible.

Nationally, the recent Energy Independence and Security Act (EISA) Section 438 requires that any Federal project with over 5,000 square feet of impervious area "maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow." Guidance for compliance with this provision allows either retention of the 90th percentile, 24-hour storm event or a model-based evaluation of discharge rates and volumes, matching predevelopment with post-development runoff hydrology. In effect , both of these conditions mandate substantial on site retention.

These permits/regulations have "narrowed" the traditional definition of Low Impact Development (LID) down to only a few elements — i.e., infiltration, evapotranspiration and/or harvest and use. This narrowing precludes management options present in the broader LID definition, such as detention and bio-filtration in vegetation-based facilities that provide incidental infiltration and evapotranspiration, but have a surface discharge point (e.g. bioretention with underdrains).

Nationally, the US Environmental Protection Agency (EPA) has also limited the definition of LID in some of their various guidance documents. For example, *Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices*, December 2007 (EPA 841-F-07-006) includes the definition: "LID comprises a set of approaches and practices that are designed to reduce runoff of water and pollutants from the site at which they are generated. By means of **infiltration, evapotranspiration, and reuse of rainwater**, LID techniques manage water and water pollutants at the source and thereby prevent or reduce the impact of development on rivers, streams, lakes, coastal waters, and ground water." (Emphasis added) It should be noted that other EPA documents include

Stormwater On Site

LID Definitions

Harvested Water

Natural Balance

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definitions with the broader definition of filtration and surface release (see **Table 1**). It also should be noted that even in the guidance that includes the narrowed definition, in most cases the examples and guidance details include filtration and surface release of runoff.

Table 1. Summary of Filtration and Surface Release Inclusion in LID Definitions and associated guidance

Document/Reference	Filtration and Surface Release	
	In Definition	In Guidance/Examples
Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices, December 2007 (EPA 841-F-07-006)	No	Yes
Low Impact Development (LID) Literature Review, October 2000 (EPA-841-B-00-005	Yes	Yes
Low-Impact Development: An Integrated Environmental Design Approach (Prepared by the Prince George's County Maryland Department of Environmental Resources Programs and Planning Division, with assistance from EPA), June 1999	Yes	Yes
Polluted Runoff (Nonpoint Source Pollution) Low Impact Development (LID), Last updated on Thursday, January 15th, 2009 Additional information from linked factsheet: *Design Principles for Stormwater Management on Compacted, Contaminated Soils in Dense Urban Areas*, April 2008 (EPA-560-F-07-231)	Not Clear	Yes
Low Impact Development (LID) and Other Green Design Strategies, Last updated on October 09, 2008	No	Not Clear

To date, the retention of stormwater on site has been primarily been accomplished via infiltration and, to a much more limited extent, evapotranspiration. Only in a few cases has harvest and use (the authors believe that stormwater that is captured and used is not ”re-used”) been employed on a site scale (typically as a part of a Leadership in Energy and Environmental Design (LEED) rating process). Uses for harvested water typically include non-potable uses such as irrigation and toilet flushing and in some cases process water for industrial uses.

The feasibility and desirability of retaining stormwater on site up to some design storm level has not been vetted technically on a national or regional scale. For example, in the EPA *Reducing Stormwater Costs* Guidance referenced above there is virtually no assessment via monitoring or modeling information of the potential results of the case studies presented. It is primarily a compendium of antidotal information. There has been almost no consideration of the natural water balance (i.e., predevelopment conditions) in technical guidance or whether infiltrating more volume than occurs under natural conditions (as would tend to result from matching runoff hydrology without matching evapotranspiration) could, in many cases, cause problems. This paper attempts to present some of the considerations for retaining on site to determine whether it is feasible and/or desirable. It focuses on Southern California examples, but the factors discussed are applicable to much of the West and beyond.

It should be noted that “retaining stormwater on site” in its contemporary usage typically only refers to not having surface discharges result from specific “design storm” events. This usage ignores the fact that infiltrated or evapotranspirated stormwater is not actually “retained” on site — it either enters a deeper aquifer, flows as shallow interflow which may emerge elsewhere or, in the case of evapotranspiration, escapes to rain another day.

The authors believe that, while one should try to maximize the retention of stormwater on site, such retention should not be mandated, as site specific circumstances often indictate wiser alternatives.

PERFORMANCE OF STORMWATER BEST MANAGEMENT PRACTICES (BMPs)

General Considerations

In order to assess the performance of stormwater treatment Best Management Practices (BMPs), it is important to understand the range of factors which may impact BMP performance. BMP performance is effected by: runoff patterns; pollutant types and forms; the storage volume and/or treatment rate; the ability to recover storage capacity (for BMPs that rely on storage); the treatment processes for released flows (to surface waters or groundwaters); and operations and maintenance issues that affect the ability of the BMP to continue operations (Strecker, et. al., 2006). For storage-based BMPs, methods for recovering storage capacity include: surface discharge; evapotranspiration; deeper infiltration; and putting the stored water to use. For systems which include cisterns (harvest and use), one of the most critical factors is the ability to quickly recover storage capacity before the next storm event arrives. Typically, if storage capacity cannot be recovered within two-to-four days, then the amount of runoff bypassing storage becomes significant due to the cistern being partially to nearly full.

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Stormwater On Site

Storage Capacity Recovery

Weather and Resulting Runoff Patterns

In Southern California and the West Coast in general, precipitation patterns in most urban areas are affected by the presence or absence of a high pressure ridge that in essence blocks-out low pressure storm systems. Typically, once the high pressure ridge is absent a series of storms arrives, delivering "back-to-back" storms until a high pressure ridge re-establishes. Storms arrive about every two to three days during this period. If the storage capacity is not quickly recovered, these back-to-back storms can result in storage-based BMPs that are full or partially full when the next storm arrives, which then causes significant bypass or overflow to occur. In Southern California, most precipitation arrives from December to March. **Figure 1** shows the monthly normal rainfall in Irvine California (and monthly **e**vapo**t**ranspiration (ET)). Monthly normals tend to mask the patterns that occur within specific months in the period of record. **Figure 2** shows a typical precipitation pattern for the same gage, which includes the effect of 'back-to-back" storm events on a weekly timescale in an actual year. These weather patterns indicate that the recovery of storage on a sub-weekly time scale is critical to ensure that sequential storms do not result in excessive bypass or overflow of BMPs. Study of typical storm patterns indicates that storage capacity should be regenerated within two-to-three days to maximize the stormwater management performance when harvesting stormwater.

Precipitation v. "ET"

Figure 1. Monthly Precipitation vs. Monthly Evapotranspiration for Irvine, California.

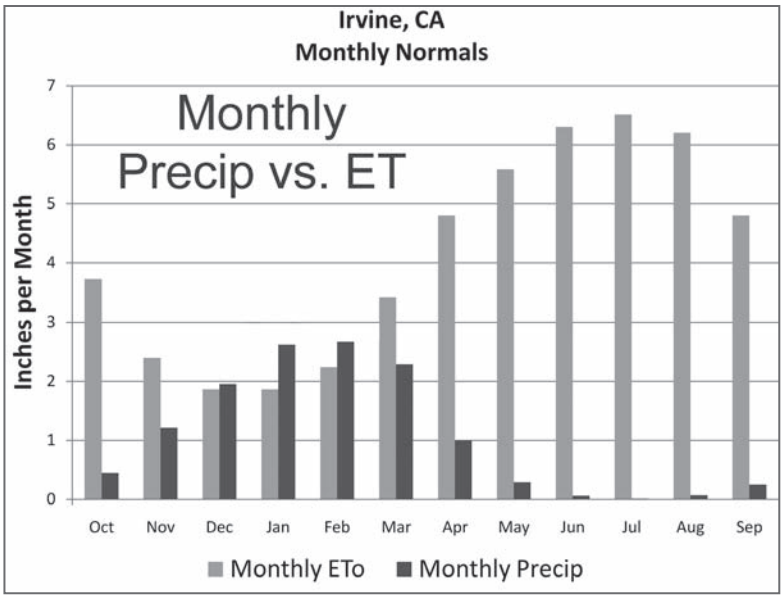

Precipitation Pattern

Figure 2. Typical Precipitation Pattern Showing Back-to-Back Storms at Irvine California for a Near Average Water Year.

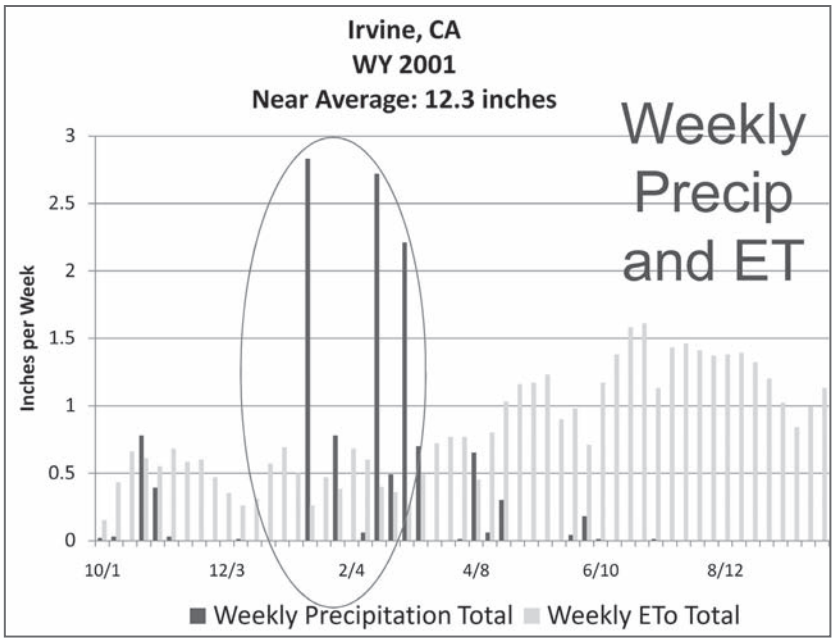

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Stormwater On Site

Infiltration Issues

Infiltration is the primary method that is employed to retain stormwater on site. This is because, when it can be accomplished, infiltration is the method most likely to be successful. However, the authors believe that three key questions/issues need to be addressed when considering infiltration strategies if unintended, problematic consequences are to be avoided.

Key infiltration considerations include:

- Can you do it?
- Should you do it and, if so, to what extent?
- If you do employ infiltration, what factors need to be addressed to insure a desirable outcome?

Infiltration: Can You Do It?

Soil Factors

Underlying soils greatly affect the ability to infiltrate. In much of Southern California (and the West) urban areas are situated atop soils that are difficult for infiltration. Some practitioners have suggested soil amendments as a strategy for increasing infiltration. However, amending soils typically only addresses surface soils, so if underlying soils are still difficult for infiltration, soil amendments may only be increasing the storage available (vs. significantly increasing underlying infiltration rates). **Figure 3** presents a map that shows underling soils for the North Orange County, California permit area. It is expected that, in general, infiltration will only be successful in areas with A and B soil types. Of course, in mapping broader soils groups, there may be pockets where infiltration is more feasible. However, the converse is also true. In this Orange County example, a little over 58% of the permit area has C and D soil types that would be unlikely to promote infiltration at an acceptable rate. Infiltration facilities that ignore low underlying infiltration rates in their design would tend to be full for much of the wet season, resulting in substantial bypass/overflow, thereby greatly reducing retention on site. Infiltration facilities designed with lower infiltration rates in mind would have shallower allowable ponding depths and thus require a greater amount of site area, possibly promoting sprawl. To ascertain feasibility, maps like this should be developed prior to requiring infiltration or on site stormwater retention.

Infiltration Rates & Design

Infiltration: Should You Do It?

The next question is "should you (or how much should you) infiltrate?" In many areas there are unnatural (e.g., solvent) or natural (e.g., selenium) plumes or soil contamination that infiltration could negatively impact by either moving or spreading the contaminants. Infiltration in industrial areas is often not desirable due to general concerns about groundwater contamination resulting from potentially elevated

Figure 3. Soil types for North Orange County MS4 NPDES Permit Area

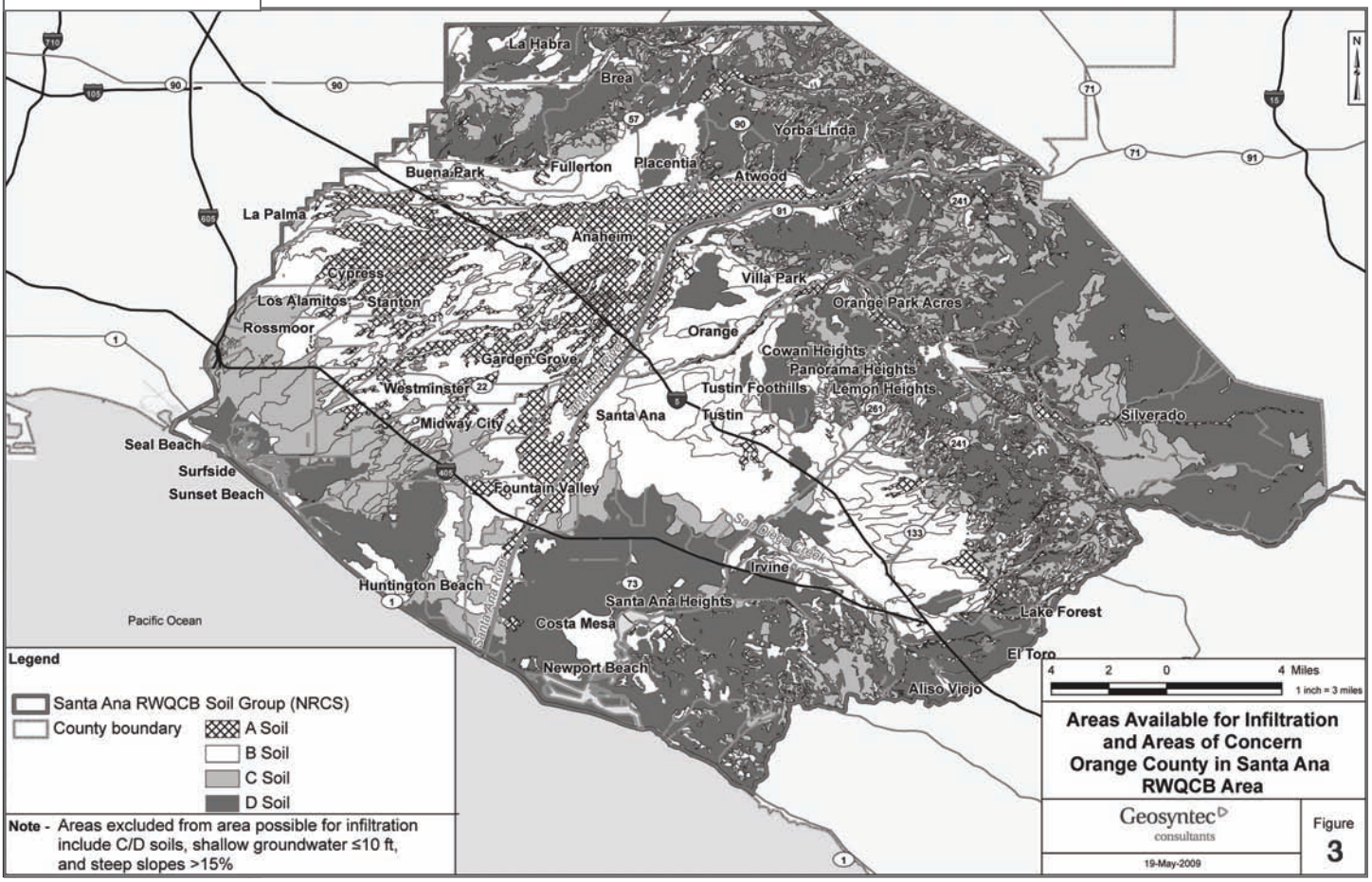

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Stormwater On Site

Water Balance Consequences

pollutant concentrations in industrial stormwater runoff. Geotechnical issues associated with steep slopes or expansive soils may also be an issue for infiltration. Depth to groundwater typically limits infiltration to areas with 10 or more feet of separation from the bottom of infiltration facilities to groundwater. Finally, in some locations upgradient of an ephemeral stream, increased infiltration may cause undesirable habitat type changes downstream of the site due to increased periods of base flows that result in vegetation changes (e.g. conversion of dry wash to a thickly vegetated system). There has been a lack of consideration of the overall water balance consequences that a "retention on site" requirement may have in terms of habitat.

As an example, **Figure 4** presents a map of the North Orange County permit area that shows the areas remaining with good potential for infiltration after consideration of some of the issues covered above. The area remaining within the permit area for consideration of infiltration is less than 23 percent of the permit area, even without considering habitat issues or regulated facilities (small contamination areas shown as dots). There are large urbanized areas where infiltration would not be either feasible or desirable.

Groundwater Quality

Infiltration: Do It Carefully

Finally, infiltration should be done carefully to ensure that groundwater quality is protected and widespread stormwater management facility failure does not occur. Proper treatment of infiltrating water should occur before this water reaches groundwater either via treatment with BMPs or ensuring that soils are adequate to provide treatment while passing infiltrating water. Infiltration facilities have often failed due to poor maintenance and operation of the facilities. One needs to think through how to design infiltration facilities to minimize maintenance issues, including whether widely-distributed infiltration facilities can be maintained as adequately as one centralized facility. Water districts that utilize groundwater should obviously be involved in decisions about where and how to infiltrate stormwater so that groundwater supplies are protected.

Maintenance Issues

Infiltration: Summary

Infiltration must be done carefully to ensure that it can be successful on a long-term basis as well as be protective of water supplies. The best opportunities for successful infiltration are in areas where groundwater is actively managed for water supply. Such areas are unlikely to face as many water balance hindrances or other issues. For example, areas along the Santa Ana River are actively managed for recharge and withdrawals by the Orange County Water District. These localities provide the best opportunity for successful infiltration.

Figure 4. Areas available for infiltration for the North Orange County Permit Area

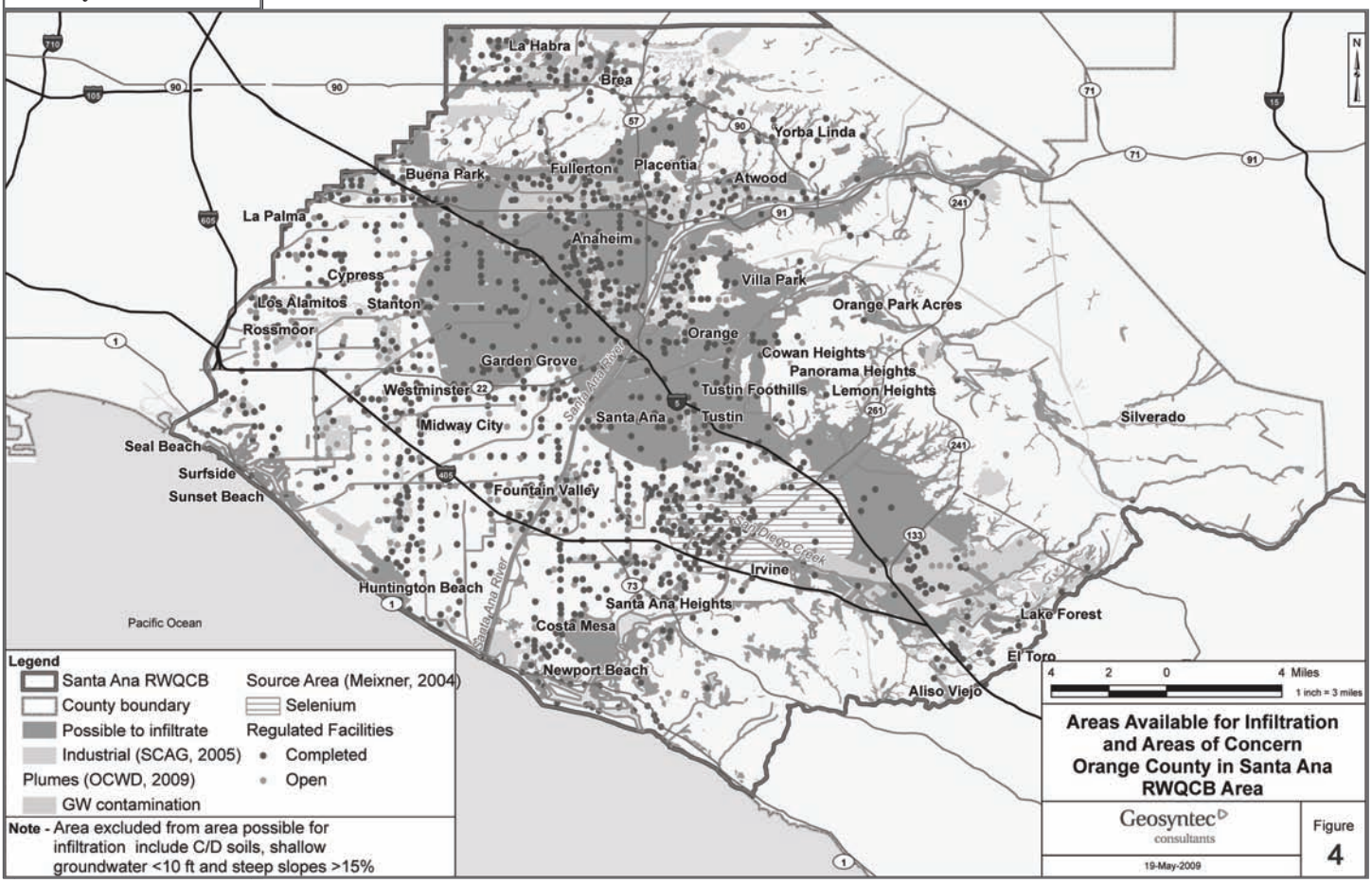

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Stormwater On Site

Development Factors

Precipitation v. ET

In Soil Storage Recovery

Water Balance

EVAPOTRANSPIRATION (ET)

After an area undergoes development there will be less available area for **e**vapo**t**ranspiration (ET)to occur. This holds true even when vegetated roofs, pervious pavements, and other "green" development practices are employed and is especially true for high density projects. Some analysts have compared monthly or seasonal ET to precipitation levels to assess the potential for ET losses as a significant retain-runoff on site measure. This is particularly inappropriate on the West Coast in light of the region's tendency for back-to-back storm events.

Refer again to **Figures 1 and 2** appearing above. **Figure 1** shows monthly normal comparisons of precipitation versus ET, while **Figure 2** shows precipitation and ET as weekly totals for an example year. While the former suggests that ET matches or exceeds precipitation on a monthly normal bases, it does not account for back-to-back storms or the fact that months with higher than normal rainfall would be the same months that correspond to lower than normal ET. **Figure 2** clearly demonstrates that ET cannot keep up with precipitation on a weekly basis in critical periods of the typical back-to-back storms of an average year. During these critical periods, the storage provided in soils would not have recovered in time for subsequent rainfall. While ET of stormwater should be maximized, it almost certainly will not be able to match pre-development levels and is likely a minor component of retaining stormwater on site (without storage and use for irrigation).

ET is a very important consideration when assessing the ability to mimic predevelopment runoff volume. **Figure 5** presents typical arid southwest water balances for: undisturbed areas; areas developed with infiltration facilities (Example Developed with LID – no underdrains); and for areas developed using LID with underdrains. Predevelopment ET can range upwards of 80 to 97 percent of the precipitation on an average annual basis. It is very unlikely that predevelopment ET will be matched by post-development ET due to reduction in vegetated open soils areas. So, the choice for development, particularly high density development, is to either have more runoff than predevelopment or more infiltration, or a combination of the two. This fact and its ramifications have not been considered during the development of on site retention requirements that are focused on surface hydrology versus overall hydrology (including sub-surface).

Figure 5. Typical Water Balance from Precipitation in Arid Southwest Climate

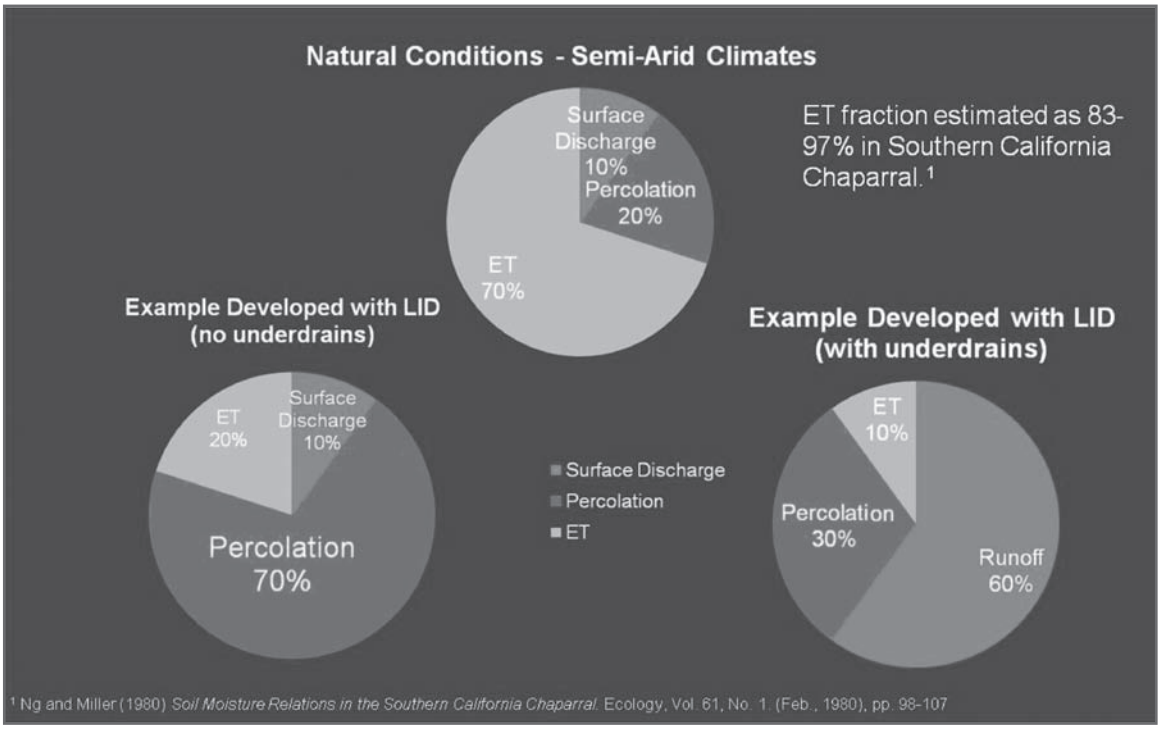

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Stormwater On Site

Harvest Demand

CAPTURE & USE ("RE-USE")

In most all cases where infiltration is not feasible or possible, the only option remaining to meet the retain on site requirements is to capture (harvest) and use the stormwater. In North Orange County, for example, this would be the option in about 77 percent of the permit area or more.

The key factor for success of capture and use of stormwater as a means to retaining water on site is the rate at which storage can be made available for subsequent events. This means having a demand for the captured water that is high enough, especially during the rainy season. The two most obvious uses for captured stormwater are for irrigation and toilet flushing. There are significant code issues with capture and use for internal non-potable demand in many jurisdictions. In addition, there are water rights issues associated with capture of stormwater in some areas (e.g., Colorado and Utah). These limitations are not the focus of this article. Other potential uses include process water for commercial or industrial purposes. A scenario for a residential development was conducted to illustrate the potential for capture and use of stormwater. This scenario is discussed next.

Capture and Use: Residential Scenario

Model Assumptions

Your authors modeled and evaluated a100-acre residential catchment with 60 percent overall impervious area using a continuous simulation model (SWMM) as an example of a capture-and-use scenario. It was assumed that infiltration losses would be minimal (due to shallow groundwater depth, poor soils for infiltration and/or other issues). A tank (above ground storage) of 1.3 million gallons (equivalent to the runoff from the catchment resulting from a 0.8 inch storm event — the water quality design storm) was evaluated with toilet flushing and irrigation uses combined. Toilet flushing assumed 65 gallons per day per dwelling unit at 4.5 units per acre. For simplicity, irrigation demands were assumed to equal the monthly average ET levels for the 30 acres of landscaped areas. It was also assumed that irrigation was always on, even during rainfall (note that irrigation demands during and after rainfall are significantly over-estimated in this analysis). A 21-year hourly long-term simulation model was run to ascertain the potential effectiveness of such a system for retaining runoff on-site. We also evaluated potential pollutant removal results as compared to biofiltration with an underdrain (surface water release).

Capture & Use Levels

Overall the system resulted in an estimated capture and use of stormwater of about 48% of the total runoff volume (52% bypassing with no treatment — though one could treat the bypass as well). The capture and use levels varied annually from less than 30 percent to 100 percent for the 21 water years evaluated (**Figure 6**).

Figure 6. Predicted Annual Runoff and Overflow for Example Cistern System

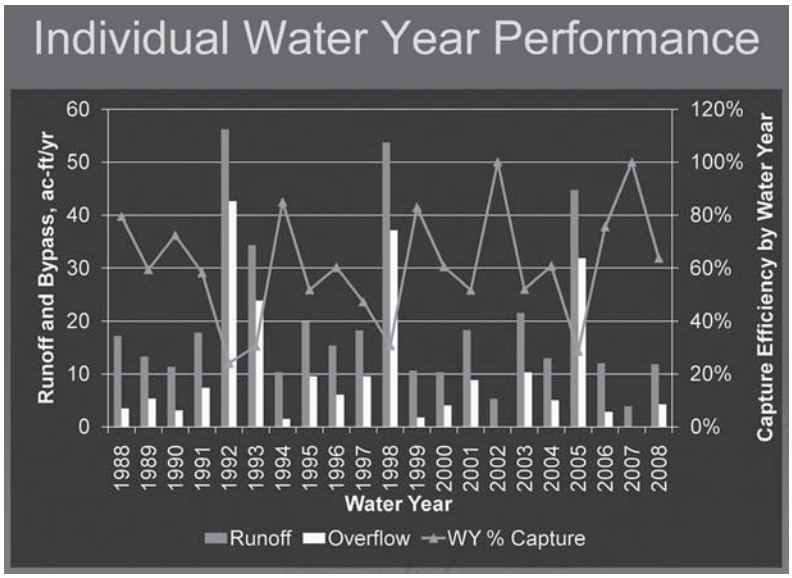

Biofiltration Comparison

Using data from International BMP Database (see: www.bmpdatabase.org), a comparison of total loadings performance to a biofiltration system with underdrains was made. This comparison showed that the biofiltration system reduced **t**otal **s**uspended **s**olids (TSS) loads by about 63% compared to 48% for the cistern scenario for the 21-year simulation. So, in this case the assumption that retain on site is the most effective at reducing pollutant loadings is not valid, unless one also required treatment of the bypassed flows (in essence an additional BMP treatment requirement). Finally, the average annual potable water saved was on the order of about 10 percent of the average annual demand.

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Stormwater On Site

Another scenario was run doubling the size of the cistern tank to 2.6 million gallons (equivalent to a 1.6 inch design storm). Under this scenario, the capture and use level went up to about 57 percent (so doubling the tank size resulted in another nine percent of the runoff being captured and used). Again, this emphasizes the point that being able to drain the cistern relatively rapidly is the key to success for capture and use.

Capture and Use: Limiting Factors

Evaluation Factors

As illustrated in these examples, one should evaluate carefully potential scenarios to help ensure that choices made regarding retention on site requirements actually result in the desired results. Evaluation should consider land use and density assumptions as well as assessment of local precipitation and runoff patterns, irrigation needs, and ability to use water for toilet flushing or other non-potable uses.

Rapid Storage Recovery

For capture and use to work, the storage must be quickly recovered. Irrigation typically is not an effective use for recovering storage quickly as irrigation needs during wet periods are minimal and in some cases (i.e., colder climates) there is no irrigation demand for long periods. In addition, much of the arid southwest is encouraging "xeri-scaping" (drought tolerant plants), which is likely much more effective at reducing potable demand than capture and use for irrigation. Xeriscape plant pallets typically do not like to be saturated for long periods, as would occur via over-irrigation if irrigation use was maximized. Further, use of a water-loving plant palate to maximize the use of captured runoff during normal and wet years could exert an additional demand for potable water during dry years.

Toilet Use Ratio

For toilet flushing to be effective, there needs to be a high enough ratio of Toilet Users To Impervious Area (TUTIA). Perhaps in high-rise condominiums, office buildings, institutional buildings, etc. this ratio would be high enough to drain the tank sufficiently fast and in these cases capture and use should be considered.

However, there would be a "competition" for reclaimed water in much of the arid west. Reclaimed water systems tend to be limited in their ability to distribute water in the wetter and colder periods of the year due to low irrigation demands. In addition, in some locations use of reclaimed water for toilet flushing is required in high density projects. One has to question if the capture and use of stormwater that may result in reclaimed water being discharged is an effective strategy. Under this scenario, the captured stormwater would not be reducing potable water demand.

Infrastructure Needs

Finally, there is significant infrastructure (**Figure 7**) that would be required to employ cistern and use on a site basis, including piping, storage, treatment, pumping, and separate piping (purple pipes). Questions about sustainability for these systems need to be explored and assessed.

Figure 7. Typical Components of a Stormwater Harvest and Use system.

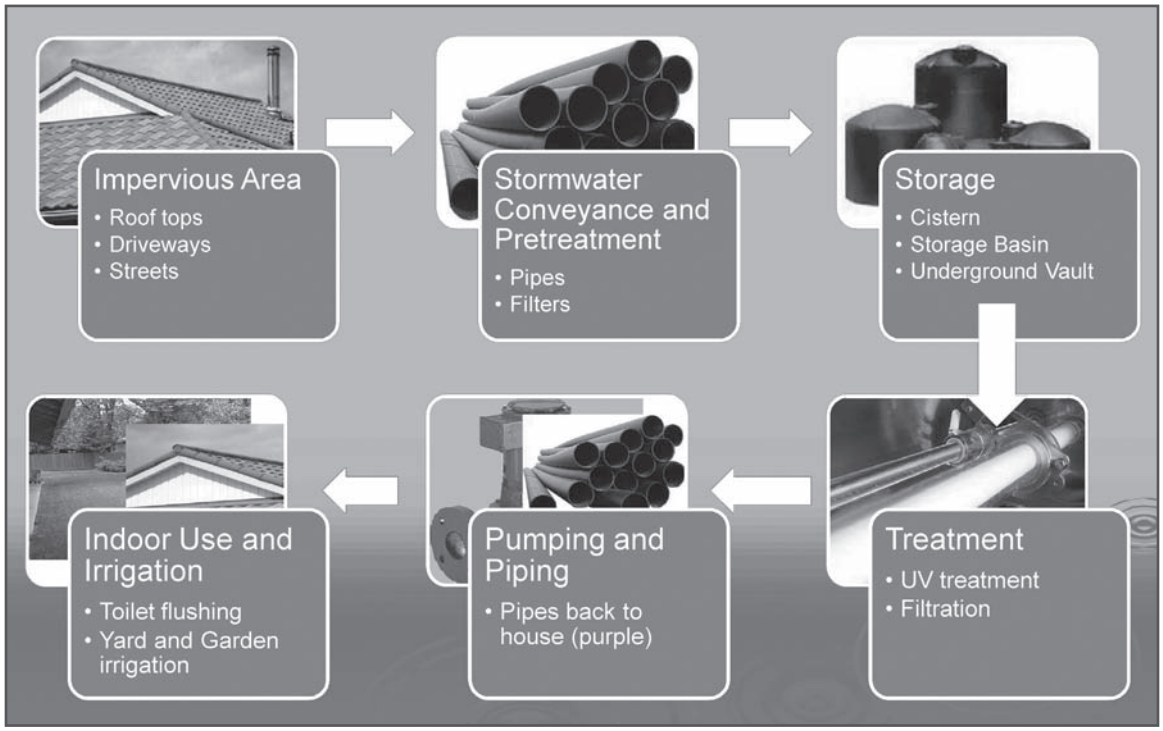

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Stormwater On Site

Key Considerations

Unique Factors

CONCLUSIONS

In Summary:

- Infiltration is often not broadly feasible, effective and/or desirable. While it should be maximized where appropriate, studies are needed to identify suitable areas and also identify areas where infiltration may be feasible but not appropriate.
- Precipitation/runoff patterns in California and much of the West limit the ability of evapotranspiration-based BMPs to achieve retention on site requirements. Evapotranspiration of stormwater should be maximized, but will not be a significant component of retaining stormwater on site in densely developed areas.
- Precipitation/runoff patterns coupled with landscaping and reclaimed water considerations limit the applications where capture and use of runoff can be effective. Generally, only scenarios with high indoor demand and no competing requirements to use reclaimed water can be expected to provide a complete and reliable stormwater solution. Capture and use should be maximized in these cases, but in other cases it should be carefully considered against other options such as biofiltration and discharge to determine which option is most effective in meeting stormwater management goals.
- The overall water balance should be considered when making choices on proper levels of infiltration versus surface runoff.
- There needs to be more technical vetting of "retain on site" and stormwater harvest and use before these approaches are made mandatory.

Each watershed and site has unique soils, topography, groundwater, water quality, land uses, receiving water sensitivities, wastewater strategies, etc. which should be considered when evaluating retention on site as a requirement or strategy. The authors believe that management approaches that are "one size fit all" are not appropriate and in many cases would likely lead to undesirable results.

Proper Stormwater Management Includes:

- Source controls
- Infiltration where feasible and appropriate
- Maximizing ET losses
- Harvest and use where it makes sense
- Capture and treat with effective (i.e. vegetated) BMPs where it makes sense

We believe that significant progress could be made by improving BMP selection and design guidance for all BMPs to better target unit processes (i.e. physical, biological, chemical treatment processes) to the pollutants and parameters of concern for each watershed.

For Additional Information:

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Aaron Poresky, E.I.T. has more than four years of experience in water resources and urban stormwater management. At Geosyntec, he has been involved in a variety of projects including structural BMP design and evaluation, water quality planning and impact analysis, hydromodification planning and impact analysis, stormwater policy support, and modeling methodology development. Key project areas have included stormwater retrofit planning and design for a variety of municipal and private clients, modeling methodology development and implementation, new development stormwater planning, and regulatory analysis. Mr. Poresky has been an invited speaker on the topics of modeling, BMP design, and stormwater policy.

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CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

ORDER NO. R9-2013-0001
NPDES NO. CAS0109266
(AS AMENDED BY ORDER R9-2015-0001)

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The San Diego County Copermittees in Table 1a are subject to waste discharge requirements set forth in this Order.

Table 1a. San Diego County Copermittees

City of Carlsbad	City of Oceanside
City of Chula Vista	City of Poway
City of Coronado	City of San Diego
City of Del Mar	City of San Marcos
City of El Cajon	City of Santee
City of Encinitas	City of Solana Beach
City of Escondido	City of Vista
City of Imperial Beach	County of San Diego
City of La Mesa	San Diego County Regional Airport Authority
City of Lemon Grove	San Diego Unified Port District
City of National City	

~~After the San Diego Water Board receives and considers~~ T~~t~~he Orange County Copermittees~~' Report of Waste Discharge and makes any necessary changes to this Order, the Orange County Copermittees~~ in Table 1b are ~~will become~~ subject to waste discharge requirements set forth in this Order. ~~after expiration of Order No. R9-2009-0002, NPDES No. CAS0108740 on or after December 16, 2014.~~

Table 1b. Orange County Copermittees

City of Aliso Viejo	City of Rancho Santa Margarita
City of Dana Point	City of San Clemente
City of Laguna Beach	City of San Juan Capistrano
City of Laguna Hills	City of Laguna Woods
City of Laguna Niguel	County of Orange
City of Lake Forest[1]	Orange County Flood Control District

[1] The MS4 discharges within the jurisdiction of the City of Lake Forest located in the San Diego Region will be regulated by the Santa Ana Water Board Order No. R8-2014-0002 (NPDES No. CAS618030) and any reissuance thereto subject to the terms of the agreement between San Diego Water Board and Santa Ana Water Board.

City of Mission Viejo	

After the San Diego Water Board receives and considers the Riverside County Copermittees' Report of Waste Discharge and makes any necessary changes to this Order, the Riverside County Copermittees in Table 1c will become subject to waste discharge requirements set forth in this Order after expiration of Order No.R9-2010-0016, NPDES No. CAS0108766 on or after November 10, 2015.

Table 1c. Riverside County Copermittees

City of Murrieta	County of Riverside
City of Temecula	Riverside County Flood Control and Water Conservation District
City of Wildomar	

The ~~Orange County Copermittees and~~ Riverside County Copermittees may become subject to the requirements of this Order at a date earlier than the expiration date of their current Order~~s~~ subject to the conditions described in Provision F.6 of this Order if the Riverside County Copermittees ~~in the respective county~~ receive ~~a~~ notification of coverage from the San Diego Water Board.

The term Copermittee in this Order refers to any San Diego County, Orange County, or Riverside County Copermittee covered under this Order, unless specified otherwise.

This Order provides permit coverage for the Copermittee discharges described in Table 2.

Table 2. Discharge Locations and Receiving Waters

Discharge Points	Locations throughout San Diego Region
Discharge Description	Municipal Separate Storm Sewer System (MS4) Discharges
Receiving Waters	Inland Surface Waters, Enclosed Bays and Estuaries, and Coastal Ocean Waters of the San Diego Region

Table 3. Administrative Information

This Order was adopted by the San Diego Water Board on:	**May 8, 2013**
~~This~~ Order R9-2013-0001 ~~will become~~ became effective on:	**June 27, 2013**
This Order as amended by R9-2015-0001 became effective on:	**April 1, 2015**
This Order will expire on:	**June 27, 2018**
The Copermittees must file a Report of Waste Discharge in accordance with Title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than 180 days in advance of the Order expiration date.	

I, David W. Gibson, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on May 8, 2013, as amended by adoption of Order No. R9-2015-0001 on February 11, 2015.

David W. Gibson
Executive Officer

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Attachment B - Standard Permit Provisions and General Provisions B-1
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I. FINDINGS

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), finds that:

JURISDICTION

1. **MS4 Ownership or Operation.** Each of the Copermittees owns or operates an MS4, through which it discharges storm water and non-storm water into waters of the U.S. within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the U.S.

2. **Legal and Regulatory Authority.** This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]) adopted by the United States Environmental Protection Agency (USEPA), and chapter 5.5, division 7 of the California Water Code (CWC) (commencing with section 13370). This Order serves as an NPDES permit for discharges from MS4s to surface waters. This Order also serves as waste discharge requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

   ~~The San Diego Water Board has the legal authority to issue a regional MS4 permit pursuant to its authority under CWA section 402(p)(3)(B) and 40 CFR 122.26(a)(1)(v). The USEPA also made it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide permits (55 Federal Register [FR] 47990, 48039-48042). The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees and San Diego Water Board.~~

   The federal regulations make it clear that the Copermittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators (40 CFR 122.26(a)(3)(vi)). This Order does not require the Copermittees to manage storm water outside of their jurisdictional boundaries, but rather to work collectively to improve storm water management within watersheds.

3. **CWA NPDES Permit Conditions.** Pursuant to CWA section 402(p)(3)(B), NPDES permits for storm water discharges from MS4s must include requirements to effectively prohibit non-storm water discharges into MS4s, and require controls to reduce the discharge of pollutants in storm water to the maximum extent practicable (MEP), and to require other provisions as the San Diego Water Board determines are appropriate to control such pollutants. This Order prescribes conditions to assure compliance with the CWA requirements for owners and operators of MS4s to

effectively prohibit non-storm water discharges into the MS4s, and require controls to reduce the discharge of pollutants in storm water from the MS4s to the MEP.

4. **CWA and CWC Monitoring Requirements.** CWA section 308(a) and 40 CFR 122.41(h),(j)-(l) and 122.48 require that NPDES permits must specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s also specify additional monitoring and reporting requirements in 40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c). CWC section 13383 authorizes the San Diego Water Board to establish monitoring, inspection, entry, reporting and recordkeeping requirements. This Order establishes monitoring and reporting requirements to implement federal and State requirements. This Order also includes requirements for the Orange County Copermittees to implement a unified approach to beach water quality monitoring and assessment as set forth in Monitoring and Reporting Program No. XX, issued pursuant to CWC sections 13225, 13267, and 13383.

5. **Total Maximum Daily Loads.** CWA section 303(d)(1)(A) requires that "[e]ach state shall identify those waters within its boundaries for which the effluent limitations are not stringent enough to implement any water quality standard applicable to such waters." The CWA also requires states to establish a priority ranking of impaired water bodies known as Water Quality Limited Segments and to establish Total Maximum Daily Loads (TMDLs) for such waters. This priority list of impaired water bodies is called the Clean Water Act Section 303(d) List of Water Quality Limited Segments, commonly referred to as the 303(d) List. The CWA requires the 303(d) List to be updated every two years.

   TMDLs are numerical calculations of the maximum amount of a pollutant that a water body can assimilate and still meet water quality standards. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point sources (waste load allocations or WLAs) and non-point sources (load allocations or LAs), background contribution, plus a margin of safety. Discharges from MS4s are point source discharges. The federal regulations (40 CFR 122.44(d)(1)(vii)(B)) require that NPDES permits incorporate water quality based effluent limitations (WQBELs) developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, consistent with the assumptions and requirements of any available WLA for the discharge. Requirements of this Order implement the TMDLs established ~~adopted~~ by the San Diego Water Board or ~~and~~ ~~approved by~~ USEPA as of the time this Order was ~~is~~ ~~issued~~ amended in 2015. This Order establishes WQBELs consistent with the assumptions and requirements of all available TMDL WLAs assigned to discharges from the Copermittees' MS4s.

6. **Non-Storm Water Discharges.** Pursuant to CWA section 402(p)(3)(B)(ii), this Order requires each Copermittee to effectively prohibit discharges of non-storm water into its MS4. Nevertheless, non-storm water discharges into and from the MS4s continue to be reported to the San Diego Water Board by the Copermittees and other persons. Monitoring conducted by the Copermittees, as well as the 303(d)

List, have identified dry weather, non-storm water discharges from the MS4s as a source of pollutants causing or contributing to receiving water quality impairments in the San Diego Region. The federal regulations (40 CFR 122.26(d)(2)(iv)(B)(1)) require the Copermittees to have a program to prevent illicit discharges to the MS4. The federal regulations, however, allow for specific categories of non-storm water discharges ~~or flows~~ to be addressed as illicit discharges only where such discharges are identified as sources of pollutants to waters of the U.S.

7. ~~**In-Stream Treatment Systems.** Pursuant to federal regulations (40 CFR 131.10(a)), in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S. Authorizing the construction of a runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to accepting waste assimilation as an appropriate use for that water body. Runoff treatment must occur prior to the discharge of runoff into receiving waters. Treatment control best management practices (BMPs) must not be constructed in waters of the U.S. Construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body.~~

DISCHARGE CHARACTERISTICS AND RUNOFF MANAGEMENT

8. **Point Source Discharges of Pollutants.** Discharges from the MS4s may contain waste, as defined in the CWC, and pollutants that adversely affect the quality of the waters of the state. A discharge from an MS4 is a "discharge of pollutants from a point source" into waters of the U.S. as defined in the CWA. Storm water and non-storm water discharges from the MS4s may contain pollutants that cause or threaten to cause a violation of surface water quality standards, as outlined in the Water Quality Control Plan for the San Diego Basin (Basin Plan). Storm water and non-storm water discharges from the MS4s are subject to the conditions and requirements established in the Basin Plan for point source discharges.

9. **Potential Beneficial Use Impairment.** The discharge of pollutants and/or increased flows from MS4s may cause or threaten to cause the concentration of pollutants to exceed applicable receiving water quality objectives and impair or threaten to impair designated beneficial uses resulting in a condition of pollution, contamination, or nuisance.

10. **Pollutants Generated by Land Development.** Land development has created and continues to create new sources of non-storm water discharges and pollutants in storm water discharges as human population density increases. This brings higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash. Pollutants from these sources are dumped or washed off the surface by non-storm water or storm water flows into and from the MS4s. When development converts natural vegetated pervious ground cover to impervious surfaces such as paved highways, streets, rooftops, and parking

lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving a developed area without BMPs ~~that can maintain pre-development runoff conditions~~ will contain greater pollutant loads and have significantly greater runoff volume, velocity, and peak flow rate than pre-development runoff conditions from the same area.

11. **Runoff Discharges to Receiving Waters.** The MS4s discharge runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within the eleven hydrologic units comprising the San Diego Region. Historic and current development makes use of natural drainage patterns and features as conveyances for runoff. ~~Rivers, streams and creeks in developed areas used in this manner are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and receiving water.~~ Numerous receiving water bodies and water body segments have been designated as impaired by the San Diego Water Board pursuant to CWA section 303(d).

12. **Pollutants in Runoff.** The most common pollutants in runoff discharged from the MS4s include total suspended solids, sediment, pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., cadmium, copper, lead, and zinc), petroleum products and polynuclear aromatic hydrocarbons, synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus), oxygen-demanding substances (e.g., decaying vegetation, animal waste), detergents, and trash. As operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. ~~By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not prohibit or otherwise control.~~ These discharges may cause or contribute to a condition of pollution or a violation of water quality standards.

13. **Human Health and Aquatic Life Impairment.** Pollutants in runoff discharged from the MS4s can threaten and adversely affect human health and aquatic organisms. Adverse responses of organisms to chemicals or physical agents in runoff range from physiological responses such as impaired reproduction or growth anomalies to mortality. Increased volume, velocity, rate, and duration of storm water runoff greatly accelerate the erosion of downstream natural channels. This alters stream channels and habitats and can adversely affect aquatic and terrestrial organisms.

14. **Water Quality Effects.** The Copermittees' water quality monitoring data submitted to date documents persistent exceedances of Basin Plan water quality objectives for runoff-related pollutants at various watershed monitoring stations. Persistent toxicity has also been observed at several watershed monitoring stations. In addition, bioassessment data indicate that the majority of the monitored receiving waters have Poor to Very Poor Index of Biological Integrity (IBI) ratings. These findings indicate that runoff discharges are causing or contributing to water quality impairments, and

are a leading cause of such impairments in the San Diego Region. Non-storm water discharges from the MS4s have been shown to contribute significant levels of pollutants and flow in arid, developed Southern California watersheds, and contribute significantly to exceedances of applicable receiving water quality objectives.

15. **Non-Storm Water and Storm Water Discharges.** The discharge of pollutants from the MS4 is subject to the MEP standard notwithstanding whether the pollutants are transported by stormwater or non-stormwater.~~Non-storm water discharges from the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard of CWA section 402(p)(3)(B)(iii), which is explicitly for "Municipal … *Stormwater Discharges* (emphasis added)" from the MS4s.~~ Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s, namely identified illicit discharges and pollutants from unlawful dumping, must be effectively prohibited.

16. **Best Management Practices.** Waste and pollutants which are deposited and accumulate in MS4 drainage structures ~~will~~ may be discharged from these structures to waters of the U.S. unless they are removed. These discharges may cause or contribute to, or threaten to cause or contribute to, a condition of pollution in receiving waters. For this reason, pollutants in storm water discharges from the MS4s can be and must be effectively reduced in runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Pollution prevention is the reduction or elimination of pollutant generation at its source and is the best "first line of defense." Source control BMPs (both structural and non-structural) minimize the contact between pollutants and runoff, therefore keeping pollutants onsite and out of receiving waters. Treatment control BMPs remove pollutants that have been mobilized by storm water or non-storm water flows.

17. **BMP Implementation.** Runoff needs to be addressed during the three major phases of development (planning, construction, and use) in order to reduce the discharge of storm water pollutants to the MEP, effectively prohibit non-storm water discharges, and protect receiving waters. Development which is not guided by water quality planning policies and principles can result in increased pollutant load discharges, flow rates, and flow durations which can negatively affect receiving water beneficial uses. Construction sites without adequate BMP implementation result in sediment runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. Existing development can generate substantial pollutant loads which are discharged in runoff to receiving waters. Retrofitting areas of existing development with storm water pollutant control and hydromodification management BMPs may, in many cases be ~~is~~ necessary to address storm water discharges from existing development that may cause or contribute to a condition of pollution or a violation of water quality standards.

18. **Water Quality Improvements.** Since 1990, the Copermittees have been

developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges to the MS4s and control pollutants in storm water discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the CWA.

19. **Long Term Planning and Implementation.** Federal regulations require municipal storm water permits to expire 5 years from adoption, after which the permit must be renewed and reissued. The San Diego Water Board recognizes that the degradation of water quality and impacts to beneficial uses of the waters in the San Diego Region occurred over several decades. The San Diego Water Board further recognizes that a decade or more may be necessary to realize demonstrable improvement to the quality of waters in the San Diego Region. This Order includes a long term planning and implementation approach that will require more than a single permit term to complete.

WATER QUALITY STANDARDS

20. **Basin Plan.** The San Diego Water Board adopted the Water Quality Control Plan for the San Diego Basin (Basin Plan) on September 8, 1994, that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for receiving waters addressed through the plan. The Basin Plan was subsequently approved by the State Water Resources Control Board (State Water Board) on December 13, 1994. Subsequent revisions to the Basin Plan have also been adopted by the San Diego Water Board and approved by the State Water Board. Requirements of this Order implement the Basin Plan.

    The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Process Supply (PROC), Industrial Service Supply (IND), Ground Water Recharge (GWR), Contact Water Recreation (REC1), Non-contact Water Recreation (REC2), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Freshwater Replenishment (FRSH), Hydropower Generation (POW), and Preservation of Biological Habitats of Special Significance (BIOL). The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region: Navigation (NAV), Commercial and Sport Fishing (COMM), Estuarine Habitat (EST), Marine Habitat (MAR), Aquaculture (AQUA), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN), and Shellfish Harvesting (SHELL).

21. **Ocean Plan.** The State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, and 2005. The State Water Board adopted the latest amendment on April 21, 2005 and it became effective on February 14, 2006. The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean. Requirements of this Order implement the Ocean Plan.

    The Ocean Plan identifies the following beneficial uses of ocean waters of the state to be protected: Industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture; preservation and enhancement of designated Areas of Special Biological Significance; rare and endangered species; marine habitat; fish spawning and shellfish harvesting.

22. **Sediment Quality Control Plan**. On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes: 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

23. **National Toxics Rule and California Toxics Rule.** USEPA adopted the National Toxics Rule (NTR) on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the NTR applied in California. On May 18, 2000, USEPA adopted the California Toxics Rule (CTR). The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants.

24. **Antidegradation Policy.** This Order is in conformance with the federal Antidegradation Policy described in 40 CFR 131.12, and State Water Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality Waters in California*. Federal regulations at 40 CFR 131.12 require that the State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. State Water Board Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies.

25. **Anti-Backsliding Requirements.** Section 402(o)(2) of the CWA and federal regulations at 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations may be relaxed. All effluent limitations in this Order are at least as stringent as effluent limitations in the previous permits.

CONSIDERATIONS UNDER FEDERAL AND STATE LAW

26. **Coastal Zone Act Reauthorization Amendments.** Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states with approved coastal zone management programs to address non-point source pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point source pollution: agriculture, silviculture, urban, marinas, and hydromodification. This Order addresses the management measures required for the urban category, with the exception of septic systems. The runoff management programs developed pursuant to this Order fulfills the need for coastal cities to develop a runoff non-point source plan identified in the Non-Point Source Program Strategy and Implementation Plan. The San Diego Water Board addresses septic systems through the administration of other programs.

27. **Endangered Species Act.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 USC sections 1531 to 1544). This Order requires compliance with receiving water limits, and other requirements to protect the beneficial uses of waters of the State. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

28. **Report of Waste Discharge Process.** The waste discharge requirements set forth in this Order are based upon the Report of Waste Discharge submitted by the San Diego County Copermittees prior to the expiration of Order No. R9-2007-0001 (NPDES No. CAS0109266) and the Report of Waste Discharge submitted by the Orange County Copermittees prior to the expiration of Order No. R9-2009-0002 (CAS0108740). The ~~Orange County and~~ Riverside County Copermittees are not immediately covered by the waste discharge requirements in this Order. The San Diego Water Board understands that each municipality is unique ~~although the Counties share watersheds and/or geographical boundaries~~. The Order will continue to use the Report of Waste Discharge process prior to initially making ~~Orange County or~~ Riverside County Copermittees subject to the requirements of this Order.

The federal regulations (40 CFR 122.21(d)(2)) and CWC section 13376 impose a duty on the Copermittees to reapply for continued coverage through submittal of a Report of Waste Discharge no later than 180 days prior to expiration of a currently

effective permit. This requirement is set forth in the ~~Orange County Copermittees' and~~ Riverside County Copermittees' currently effective permit~~s~~ at Provision~~s K.2.b and~~ K.2.c~~, respectively~~. The ~~Orange County Permit, Order No. R9-2009-0002 (NPDES No. CAS0108740) expires on December 16, 2014 and the~~ Riverside County MS4 Permit, Order No. R9-2010-0016 (NPDES No. CAS0108766) expires on November 10, 2015.

Unless the ~~Orange County or~~ Riverside County Copermittees apply for and receive early coverage under this Order, ~~the Orange County Copermittees' and~~ the Riverside County Copermittees' ~~respective~~ permit~~s~~ will be superseded by this Order upon expiration of their ~~respective~~ permit~~s~~, subject to any necessary revisions to the requirements of this Order made after the San Diego Water Board considers their ~~respective~~ Report~~s~~ of Waste Discharge through the public process provided in 40 CFR Part 124.

29. Regional Water Board Designation. The Cities of Laguna Hills, Laguna Woods, and Lake Forest are located partially within the jurisdictions of the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board) and the San Diego Water Board and their dischargers are subject to regulation by both Regional Water Boards. Pursuant to CWC section13228, the Cities of Laguna Hills, Laguna Woods, and Lake Forest submitted written requests that one Regional Water Board be designated to regulate Phase I MS4 discharges for each of the Cities. The Santa Ana Water Board and the San Diego Water Board have entered into an agreement whereby the San Diego Water Board is designated to regulate Phase I MS4 discharges within the jurisdiction of the Cities of Laguna Woods and Laguna Hills and the Santa Ana Water Board is designated to regulate Phase I MS4 discharges within the jurisdiction of the City of Lake Forest pursuant to MS4 permits administered by each Regional Water Board. The agreement provides that the City of Lake Forest will be required to retain, and continue implementation of, its over-irrigation discharge prohibition in Title 15, Chapter 14.030, List (b) of the City Municipal Code for regulating storm water quality throughout its jurisdiction. The City of Lake Forest will also be required to actively participate during development and implementation of the Aliso Creek Watershed Management Area Water Quality Improvement Plan required pursuant to this Order. Each Regional Water Board retains the authority to enforce provisions of the Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee (Water Code section 13228 (b)). Under the terms of the agreement, any TMDL and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Laguna Woods, Laguna Hills or Lake Forest as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement of the applicable TMDL will remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's San Diego Creek/Newport Bay TMDL and the San Diego Water Board's Indicator Bacteria Project I Beaches and Creeks TMDL. The San

Diego Water Board will periodically review the effectiveness of the agreement during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate the agreement with Santa Ana Water Board or otherwise modify the agreement subject to the approval of the Santa Ana Water Board.

~~29.~~30. **Integrated Report and Clean Water Act Section 303(d) List.** The San Diego Water Board and State Water Board submit an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. USEPA issued its *Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act* on July 29, 2005, which advocates the use of a five category approach for classifying the attainment status of water quality standards for water bodies in the Integrated Report. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 in the Integrated Report are placed on the 303(d) List.

Water bodies with available data and/or information that indicate at least one beneficial use is not being supported or is threatened, but a TMDL is not required, are included in Category 4 in the Integrated Report. Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

Implementation of the requirements of this Order may allow the San Diego Water Board to include surface waters impaired by discharges from the Copermittees' MS4s in Category 4 in the Integrated Report for consideration during the next 303(d) List submittal by the State to USEPA.

~~30.~~31. **Economic Considerations.** The California Supreme Court has ruled that although CWC section 13263 requires the State and Regional Water Boards (collectively Water Boards) to consider factors set forth in CWC section 13241 when issuing an NPDES permit, the Water Board may not consider the factors to justify imposing pollutant restrictions that are less stringent than the applicable federal regulations require. (*City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 618, 626-627.) However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

As noted in the following finding, the San Diego Water Board finds that the requirements in this Order are ~~not~~ more stringent than the minimum federal requirements. Therefore, a CWC section 13241 analysis is ~~not~~ required for permit requirements that implement the effective prohibition on the discharge of non-storm

water into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determined appropriate to control such pollutants, as those requirements are mandated by federal law. ~~Notwithstanding the above, the San Diego Water Board has developed an economic analysis of the requirements in this Order.~~ The economic analysis is provided in the Fact Sheet.

~~31.~~32. **Unfunded Mandates.** ~~This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following~~:

~~a. This Order implements federally mandated requirements under CWA section 402 (33 USC section 1342(p)(3)(B)).~~

~~b. The local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental and new dischargers who are issued NPDES permits for storm water and non-storm water discharges.~~

~~c. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order.~~

~~d. The Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)) and in lieu of numeric restrictions on their MS4 discharges (i.e. effluent limitations).~~

~~e. The local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under State law predates the enactment of Article XIIIB, Section (6) of the California Constitution.~~

~~f. The provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state develops a TMDL, federal law requires that permits must contain water quality based effluent limitations consistent with the assumptions and requirements of any applicable wasteload allocation (40 CFR 122.44(d)(1)(vii)(B)).~~

~~See the Fact Sheet for further discussion of unfunded mandates~~.

~~32.~~33. **California Environmental Quality Act.** The issuance of waste discharge requirements and an NPDES permit for the discharge of runoff from MS4s to waters of the U.S. is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 et seq.) in accordance with CWC section 13389.

STATE WATER BOARD DECISIONS

33.34. **Compliance with Prohibitions and Limitations.** The receiving water limitation language specified in this Order is consistent with language recommended by the USEPA and established in State Water Board Order WQ 99-05, *Own Motion Review of the Petition of Environmental Health Coalition to Review Waste Discharge Requirements Order No. 96-03, NPDES Permit No. CAS0108740*, adopted by the State Water Board on June 17, 1999. The receiving water limitation language in this Order requires storm water discharges from MS4s to not cause or contribute to a violation of water quality standards, which is to be achieved through an iterative approach requiring the implementation of improved and better-tailored BMPs over time. Implementation of the iterative approach to comply with receiving water limitations based on applicable water quality standards is necessary to ensure that storm water discharges from the MS4 will not ultimately cause or contribute to violations of water quality standards and will not create conditions of pollution, contamination, or nuisance.

34.35. **Special Conditions for Areas of Special Biological Significance.** On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving an general exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges (General Exception). On June 19, 2012, the State Water Board adopted Order No. 2012-0031, amending the General Exception to require pollutant reductions to be achieved within six years in accordance with ASBS Compliance Plans and ASBS Pollution Prevention Plans. The General Exception State Water Board Resolution No. 2012-0012 requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject to the terms and conditions of the General Exception as amended State Water Board Resolution No. 2012-0012. The Special Protections contained in Attachment B to the General Exception as amendedResolution No. 2012-0012, are applicable to these discharges, and are hereby incorporated into Attachment A of this Order. as if fully set forth herein.

ADMINISTRATIVE FINDINGS

35.36. **Executive Officer Delegation of Authority.** The San Diego Water Board by prior resolution has delegated all matters that may legally be delegated to its Executive Officer to act on its behalf pursuant to CWC section 13223. Therefore, the Executive Officer is authorized to act on the San Diego Water Board's behalf on any matter within this Order unless such delegation is unlawful under CWC section 13223 or this Order explicitly states otherwise.

36.37. **Standard Provisions.** Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR 122.42, are provided in Attachment B to this Order.

37.38. **Fact Sheet.** The Fact Sheet for this Order contains background information, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of this Order. The Fact Sheet is hereby incorporated into this Order and constitutes part of the Findings of this Order.

38.39. **Public Notice.** In accordance with State and federal laws and regulations, the San Diego Water Board notified the Copermittees, and interested agencies and persons of its intent to prescribe waste discharge requirements for the control of discharges into and from the MS4s to waters of the U.S. and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet.

39.40. **Public Hearings.** The San Diego Water Board held a public hearing on April 10 and 11, 2013, that was continued to May 8, 2013 and heard and considered all comments pertaining to the terms and conditions of this Order. The San Diego Water Board also held a public hearing on February 11, 2015, and heard and considered all comments pertaining to the amendment of this Order through Order No. R9-2015-0001. Details of these public hearing are provided in the Fact Sheet.

40.41. **Effective Date.** This Order serves as an NPDES permit pursuant to CWA section 402 or amendments thereto, and as to the San Diego County Copermittees listed in Table 2.a., became becomes effective fifty (50) days after the date of its adoption, and as to the Orange County Copermittees listed in Table 2.b., becomes effective on April 1, 2015 after the date Order R9-2015-0001 is adopted, provided that the Regional Administrator, USEPA, Region IX, does not object to this Order.

41.42. **Review by the State Water Board.** Any person aggrieved by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with CWC section 13320 and California Code of Regulations, title 23, sections 2050, et seq and following. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date of this Order San Diego Water Board action, except that if the thirtieth day following the actiondate of this Order falls on a Saturday, Sunday or State holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

THEREFORE, IT IS HEREBY ORDERED that the Copermittees, in order to meet the provisions contained in division 7 of the CWC (commencing with section 13000) and regulations adopted thereunder, and the provisions of the CWA and regulations adopted thereunder, must each comply with the requirements of this Order. This action in no way prevents the San Diego Water Board from taking enforcement action for past violations of the previous Order. If any part of this Order is subject to a temporary stay of enforcement, unless otherwise specified, the Copermittees must comply with the analogous portions of the previous Order, which will remain in effect for all purposes during the pendency of the stay.

II. PROVISIONS

A. PROHIBITIONS AND LIMITATIONS

~~The purpose of this provision is to describe the conditions under which storm water and non-storm water discharges into and from MS4s are prohibited or limited.~~ The goal of the prohibitions and limitations is to protect the water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through the implementation of water quality improvement strategies and runoff management programs that effectively prohibit non-storm water discharges into the Copermittees' MS4s, and reduce pollutants in storm water and non-stormwater discharges from the Copermittees' MS4s to the MEP. The process for determining compliance with the Discharge Prohibitions (A.1), Receiving Water Limitations (A.2), and Effluent Limitations (A.3, including effluent limitations derived from the TMDL requirements – Attachment E) is defined in Provision A.4.

1. Discharge Prohibitions

a. Except as provided for in Provisions A.1.e or A.4, d~~D~~ischarges from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the state are prohibited.

b. Non-storm water discharges into MS4s are to be effectively prohibited, through the implementation of Provision E.2, unless such discharges are ~~authorized by a separate NPDES permit~~a category of non-storm water discharges that must be addressed pursuant to Provisions E.2.a.(1) – (5) of this Order.

c. Discharges from MS4s are subject to all waste discharge prohibitions in the Basin Plan, included in Attachment A to this Order.

d. Storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 applicable to these discharges, included in Attachment A to this Order. All other discharges from the Copermittees' MS4s to ASBS are

prohibited.

e. For discharges associated with water body pollutant combinations addressed in a TMDL in Attachment E of this Order, the affected Copermittees shall achieve compliance as outlined in Attachment E.

2. Receiving Water Limitations

a. Discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters, including but not limited to all applicable provisions contained in the list below to the extent that they remain in effect and are operative, unless such discharges are being addressed by the Compermittee(s) through processes set forth in this Order (Provision A.4 and Attachment E). Where a TMDL has been developed and its terms have been incorporated into this Order (in a manner that is consistent with the waste load allocations set forth in the TMDL), a Permittee shall also be considered in compliance with such TMDL-related requirements provided in this Order, if it is timely and in good faith implementing the MEP-compliant control measures otherwise established by this Order.~~:~~

(1) The San Diego Water Board's Basin Plan, including beneficial uses, water quality objectives, and implementation plans;

(2) State Water Board plans for water quality control including the following:

(a) Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries (Thermal Plan), and

(b) The Ocean Plan, including beneficial uses, water quality objectives, and implementation plans;

(3) State Water Board policies for water and sediment quality control including the following:

(a) Water Quality Control Policy for the Enclosed Bays and Estuaries of California,

(b) Sediment Quality Control Plan which includes the following narrative objectives for bays and estuaries:

(i) Pollutants in sediments shall not be present in quantities that, alone or in combination, are toxic to benthic communities, and

(ii) Pollutants shall not be present in sediments at levels that will bioaccumulate in aquatic life to levels that are harmful to human health,

(c) The Statement of Policy with Respect to Maintaining High Quality of

Waters in California;[2]

(4) Priority pollutant criteria promulgated by the USEPA through the following:

(a) National Toxics Rule (NTR)[3] (promulgated on December 22, 1992 and amended on May 4, 1995), and

(b) California Toxics Rule (CTR).[4,5]

b. Discharges from MS4s composed of storm water runoff must not alter natural ocean water quality in an ASBS.

c. For receiving water limitations associated with water body pollutant combination addressed in a TMDL in Attachment E of this Order, the affected Copermittees shall achieve compliance as outlined in Attachment E.

[2] State Water Board Resolution No. 68-16
[3] 40 CFR 131.36
[4] 65 Federal Register 31682-31719 (May 18, 2000), adding Section 131.38 to 40 CFR
[5] If a water quality objective and a CTR criterion are in effect for the same priority pollutant, the more stringent of the two applies, unless a previous regulatory action (i.e. TMDL) has specified otherwise.

3. Effluent Limitations

a. Technology Based Effluent Limitations

Pollutants in storm water discharges from MS4s must be reduced to the MEP.[6]

b. Water Quality Based Effluent Limitations

Each Copermittee must comply with applicable WQBELs established for the TMDLs in Attachment E to this Order, pursuant to the applicable TMDL compliance schedules.

4. Compliance with Discharge Prohibitions, ~~and~~ Receiving Water Limitations, and Effluent Limitations

Each Copermittee must achieve compliance with Provisions A.1, A.2, and A.3 ~~A.1.a, A.1.c and A.2.a~~ of this Order through timely implementation of control measures and other actions as specified in Provisions B and E of this Order, including any modifications. The Water Quality Improvement Plans required under Provision B must be designed and adapted to ultimately achieve compliance with Provisions A.1, A.2, and A.3 ~~A.1.a, A.1.c and A.2.a~~.

a. Except as provided in Parts 4.c, 4.d, 4.e, or 4.f below, discharges from the MS4 for which a Copermittee is responsible shall not cause or contribute to an exceedance of any applicable water quality standard.

b. Except as provided in Parts 4.c, 4.d, 4.e, or 4.f below, discharges from the MS4 of storm water, or non-storm water, for which a Copermittee is responsible, shall not cause a condition of nuisance.

~~a.~~**c.** In instances where discharges from the MS4 for which the Copermittee is responsible (1) causes or contributes to an exceedance of any applicable water quality standard or causes a condition of nuisance in the receiving water; (2) the receiving water is not subject to an approved TMDL that is in effect for the constituent(s) involved; and (3) the constituent(s) associated with the discharge is otherwise not specifically addressed by a provision of this Order (such as specific scheduled actions in a Water Quality Improvement Plan), the Copermittee shall comply with the following iterative procedure:~~If exceedance(s) of water quality standards persist in receiving waters notwithstanding implementation of this Order, the Copermittees must comply with the following procedures~~:

(1) ~~For exceedance(s) of a water quality standard in the process of being~~

[6] This does not apply to MS4 discharges which receive subsequent treatment to reduce pollutants in storm water discharges to the MEP prior to entering receiving waters (e.g., low flow diversions to the sanitary sewer). Runoff treatment must occur prior to the discharge of runoff into receiving waters per Finding 7.

addressed by the Water Quality Improvement Plan, the Copermittee(s) must implement the Water Quality Improvement Plan as accepted by the San Diego Water Board, and update the Water Quality Improvement Plan, as necessary, pursuant to Provision F.2.c;

(2) Upon a determination by either the Copermittees or the San Diego Water Board that discharges from the MS4 are causing or contributing to a new exceedance of an applicable water quality standard not addressed by the Water Quality Improvement Plan, the Copermittees must submit the following updates to the Water Quality Improvement Plan pursuant to Provision F.2.c or as part of the Water Quality Improvement Plan Annual Report required under Provision F.3.b, unless the San Diego Water Board directs an earlier submittal: Submit a report to the Regional Water Board that:

(a) Summarizes and evaluates water quality data associated with the pollutant of concern in the context of applicable water quality objectives including the magnitude and frequency of the exceedances.

(b) Includes a work plan to identify the sources of the constituents of concern (including those not associated with the MS4 such that non-MS4 sources can be pursued).

(c) Describes the strategy and schedule for implementing best management practices (BMPs) and other controls (including those that are currently being implemented) that will address the Permittee's sources of constituents that are causing or contributing to the exceedances of an applicable water quality standard or causing a condition of nuisance, and are reflective of the severity of the exceedances. The strategy shall demonstrate that the selection of BMPs will address the Permittee's sources of constituents and include a mechanism for tracking BMP implementation. The strategy shall provide for future refinement pending the results of the source identification work plan noted in 4.c.(a)(ii) above.

(d) Outlines, if necessary, additional monitoring to evaluate improvement in water quality and, if appropriate, special studies that will be undertaken to support future management decisions.

(e) Includes a methodology (ies) that will assess the effectiveness of the BMPs to address the exceedances.

(f) This report may be submitted in conjunction with the Annual Report unless the Regional Water Board directs an earlier submittal.

(a)(g) The water quality improvement strategies being implemented that are effective and will continue to be implemented,

(b)(h) Water quality improvement strategies (i.e. BMPs, retrofitting

projects, stream and/or habitat rehabilitation projects, adjustments to jurisdictional runoff management programs, etc.) that will be implemented to reduce or eliminate any pollutants or conditions that are causing or contributing to the exceedance of water quality standards,

(c) Updates to the schedule for implementation of the existing and additional water quality improvement strategies, and

(d)(i) Updates to the monitoring and assessment program to track progress toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a of this Order;

(3) The San Diego Water Board may require the incorporation of additional modifications to the Water Quality Improvement Plan required under Provision B. The applicable Copermittees must submit any modifications to the update to the Water Quality Improvement Plan within 90 days of notification that additional modifications are required by the San Diego Water Board, or as otherwise directed Submit any modifications to the report required by the Regional Water Board within 60 days of notification. The Report is deemed approved within 60 days of its submission if no reponse is received from the Regional Water Board;

(4) Implement the actions specified in the report in accordance with the acceptance or approval, including the implementation schedule and any modifications to this Order.

(5) As long as the Permittee has complied with the procedure set forth above and is implementing the actions, the Permittee does not have to repeat the same procedure for continuing or recurring exceedances of the same receiving water limitations unless directed by the Regional Water Board to develop additional BMPs.

(3)(6) The information developed pursuant to A.4.c must be evaluated and incorporated into the Water Quality Improvement Plans and/or the Jurisdictional Runoff Management Plans, as needed.

(4) Within 90 days of the San Diego Water Board determination that the modifications to the Water Quality Improvement Plan required under Provision A.4.a.(3) meet the requirements of this Order, the applicable Copermittees must revise the jurisdictional runoff management program documents to incorporate the modified water quality improvement strategies that have been and will be implemented, the implementation schedule, and any additional monitoring required; and

(5)(7) Each Copermittee must implement the updated Water Quality Improvement Plan.

d. For Receiving Water Limitations associated with waterbody-pollutant combinations addressed in an adopted TMDL that is in effect and that has been incorporated in this Order, a Permittee that is in compliance with Attachment E (Total Maximum Daily Load Provisions) is in compliance with Parts 4.a and 4.b above. For Receiving Water Limitations associated with waterbody-pollutant combinations on the CWA 303(d) list, which are not otherwise addressed by Attachment E or other applicable pollutant-specific provision of this Order, a Permittee that is in compliance with Part 4.c is in compliance with Parts 4.a and 4.b..

e. The procedure set forth above to achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order do not have to be repeated for continuing or recurring exceedances of the same water quality standard(s) following implementation of scheduled actions unless directed to do otherwise by the San Diego Water Board.

b.f. Alternatively, a Permittee that is in compliance with Provision B (Development and Implementation of Water Quality Improvement Plans) is in compliance with Parts 4.a and 4.b above

c.g. If a Permittee is found to have discharges from the MS4 for which it is responsible that causes an exceedance of an applicable water quality standard in the receiving water or causes a condition of nuisance in the receiving water, the Permittee shall be in compliance with Parts 4.a and 4.b above, if the Permittee is in compliance with Parts 4.c, 4.d, or 4.e, or requirements otherwise covered by a provision of this Order specifically addressing the constituent in question, as applicable..Nothing in Provisions A.4.a and A.4.b prevents the San Diego Water Board from enforcing any provision of this Order while the applicable Copermittees prepare and implement the above update to the Water Quality Improvement Plan and jurisdictional runoff management programs.

B. WATER QUALITY IMPROVEMENT PLANS[7]

The purpose of this provision is to develop Water Quality Improvement Plans (WQIPs) that guide the Copermittees' jurisdictional runoff management programs towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plans is to further the Clean Water Act's objective to protect, preserve, enhance, and ~~restore~~ protect the water quality and designated beneficial uses of waters of the state. Therefore, implementation of the WQIPs also provides the basis for complying with Provisions A.1, A.2, and A.3, as described in Provision A.4. This goal will be accomplished through an adaptive planning and management process that identifies the highest priority water quality conditions within a watershed and implements strategies through the jurisdictional runoff management programs to achieve improvements in the quality of discharges from the MS4s and receiving waters. As such, the requirements outlined in Provision E. may be modified for consistency with the WQIP priorities for the applicable Watershed management Area, is appropriate justification is provided.

1. Watershed Management Areas

The Copermittees must develop a Water Quality Improvement Plan for each of the Watershed Management Areas in Table B-1. A total of ten Water Quality Improvement Plans must be developed for the San Diego Region.

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
San Juan (901.00)	South Orange County	- Aliso Creek - San Juan Creek - San Mateo Creek - Pacific Ocean - Heisler Park ASBS	- City of Aliso Viejo[1] - City of Dana Point[1] - City of Laguna Beach[1] - City of Laguna Hills[1] - City of Laguna Niguel[1] - City of Laguna Woods[1] - City of Lake Forest[1~~2~~] - City of Mission Viejo[1] - City of Rancho Santa Margarita[1] - City of San Clemente[1] - City of San Juan Capistrano[1] - County of Orange[1] - Orange County Flood Control District[1]
Santa Margarita (902.00)	Santa Margarita River	- Murrieta Creek - Temecula Creek - Santa Margarita River - Santa Margarita Lagoon - Pacific Ocean	- City of Murrieta[~~2~~3] - City of Temecula[~~2~~3] - City of Wildomar[~~2~~3] - County of Riverside[~~2~~3] - County of San Diego[~~3~~4] - Riverside County Flood Control and Water Conservation District[~~2~~3]

[7] Once developed and approved, the Water Quality Improvement Plan and corresponding Jurisdictional Runoff Management Plan will functionally replace the Load Reduction Plans.

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
San Luis Rey (903.00)	San Luis Rey River	- San Luis Rey River - San Luis Rey Estuary - Pacific Ocean	- City of Oceanside - City of Vista - County of San Diego
Carlsbad (904.00)	Carlsbad	- Loma Alta Slough - Buena Vista Lagoon - Agua Hedionda Lagoon - Batiquitos Lagoon - San Elijo Lagoon - Pacific Ocean	- City of Carlsbad - City of Encinitas - City of Escondido - City of Oceanside - City of San Marcos - City of Solana Beach - City of Vista - County of San Diego
San Dieguito (905.00)	San Dieguito River	- San Dieguito River - San Dieguito Lagoon - Pacific Ocean	- City of Del Mar - City of Escondido - City of Poway - City of San Diego - City of Solana Beach - County of San Diego
Penasquitos (906.00)	Penasquitos	- Los Penasquitos Lagoon - Pacific Ocean	- City of Del Mar - City of Poway - City of San Diego - County of San Diego
	Mission Bay	- Mission Bay - Pacific Ocean - San Diego Marine Life Refuge ASBS	- City of San Diego
San Diego (907.00)	San Diego River	- San Diego River - Pacific Ocean	- City of El Cajon - City of La Mesa - City of San Diego - City of Santee - County of San Diego
Pueblo San Diego (908.00) Sweetwater (909.00) Otay (910.00)	San Diego Bay	- Sweetwater River - Otay River - San Diego Bay - Pacific Ocean	- City of Chula Vista - City of Coronado - City of Imperial Beach - City of La Mesa - City of Lemon Grove - City of National City - City of San Diego - County of San Diego - San Diego County Regional Airport Authority - San Diego Unified Port District
Tijuana (911.00)	Tijuana River	- Tijuana River - Tijuana Estuary - Pacific Ocean	- City of Imperial Beach - City of San Diego - County of San Diego

Notes:

1. The MS4 discharges within the jurisdiction of the City of Laguna Hills and the City of Laguna Woods located in the Santa Ana Region will be regulated by San Diego Water Board Order No. R9-2013-0001. The City of Laguna Hills and Laguna Woods must also comply with the requirements of the San Diego Creek/Newport Bay TMDL in section XVIII of Santa Ana Water Board Order No. R8-2014-0002 and any reissuance thereto.
2. ~~The Orange County Copermittees will be covered under this Order after expiration of Order No. R9-2009-0002, or earlier if the Orange County Copermittees meet the conditions in Provision F.6.~~The MS4 discharges within the jurisdiction of the City of Lake Forest located in the San Diego Region will be regulated by the Santa Ana Water Board Order No. R8-2014-0002 (NPDES No. CAS618030) and any reissuance thereto. The City of Lake Forest must also comply with the requirements of the Bacteria TMDL in Attachment E of this Order, participate in preparation and implementation of the Water Quality Improvement Plan for the Aliso Creek Watershed Management Area as described in Provision B of this Order and continue implementation of its over-irrigation discharge prohibition in Title 15, Chapter 15, section 14.030, List (b).

~~2.~~3. The Riverside County Copermittees will be covered under this Order after expiration of Order No. R9-2010-0016, or earlier if the Riverside County Copermittees meet the conditions in Provision F.6.

~~3~~4.. The County of San Diego is not required to implement the requirements of Provision B for its jurisdiction within the Santa Margarita River Watershed Management Area until the Riverside County Copermittees have been notified of coverage under this

Order. The County of San Diego is required to implement the requirements of Provisions D, F.3.b, and Attachment E until the Riverside County Copermittees have been notified of coverage under this Order.

2. Priority Water Quality Conditions

The Copermittees must identify the water quality priorities within each Watershed Management Area that will be addressed by the Water Quality Improvement Plan. Where appropriate, Watershed Management Areas may be separated into subwatersheds to focus water quality prioritization and jurisdictional runoff management program implementation efforts by receiving water.

a. Assessment of Receiving Water Conditions

The Copermittees must consider the following, at a minimum, to identify water quality priorities based on impacts of MS4 discharges on receiving water beneficial uses:

(1) Receiving waters listed as impaired on the CWA Section 303(d) List of Water Quality Limited Segments (303(d) List);

(2) TMDLs adopted and under development by the San Diego Water Board;

(3) Receiving waters recognized as sensitive or highly valued by the Copermittees, including estuaries designated under the National Estuary Program under CWA section 320, wetlands defined by the State or U.S. Fish and Wildlife Service's National Wetlands Inventory as wetlands, waters having the Preservation of Biological Habitats of Special Significance (BIOL) beneficial use designation, and receiving waters identified as ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(4) The receiving water limitations of Provision A.2;

(5) Known historical versus current physical, chemical, and biological water quality conditions;

(6) Available, relevant, and appropriately collected and analyzed physical, chemical, and biological receiving water monitoring data, including, but not limited to, data describing:

(a) Chemical constituents,

(b) Water quality parameters (i.e. pH, temperature, conductivity, etc.),

(c) Toxicity Identification Evaluations for both receiving water column and sediment,

(d) Trash impacts,

(e) Bioassessments, and

(f) Physical habitat;

(7) Available evidence of erosional impacts in receiving waters due to accelerated flows (i.e. hydromodification);

(8) Available evidence of adverse impacts to the chemical, physical, and biological integrity of receiving waters; and

(9) The potential improvements in the overall condition of the Watershed Management Area that can be achieved.

b. ASSESSMENT OF IMPACTS FROM MS4 DISCHARGES

The Copermittees must consider the following, at a minimum, to identify the potential impacts to receiving waters that may be caused or contributed to by discharges from the Copermittees' MS4s:

(1) The discharge prohibitions of Provision A.1 and effluent limitations of Provision A.3; and

(2) Available, relevant, and appropriately collected and analyzed storm water and non-storm water monitoring data from the Copermittees' MS4 outfalls;

(3) Locations of each Copermittee's MS4 outfalls that discharge to receiving waters;

(4) Locations of MS4 outfalls that are known to persistently discharge non-storm water to receiving waters likely causing or contributing to impacts on receiving water beneficial uses;

(5) Locations of MS4 outfalls that are known to discharge pollutants in storm water causing or contributing to impacts on receiving water beneficial uses; and

(6) The potential improvements in the quality of discharges from the MS4 that can be achieved.

c. IDENTIFICATION OF PRIORITY WATER QUALITY CONDITIONS

(1) The Copermittees must use the information gathered for Provisions B.2.a and B.2.b to develop a list of priority water quality conditions as pollutants, stressors and/or receiving water conditions that are the highest threat to receiving water quality or that most adversely affect the quality of receiving

waters. The list must include the following information for each priority water quality condition:

(a) The beneficial use(s) associated with the priority water quality condition;

(b) The geographic extent of the priority water quality condition within the Watershed Management Area, if known;

(c) The temporal extent of the priority water quality condition (e.g., dry weather and/or wet weather);

(d) The Copermittees with MS4s discharges that may cause or contribute to the priority water quality condition; and

(e) An assessment of the adequacy of and data gaps in the monitoring data to characterize the conditions causing or contributing to the priority water quality condition, including a consideration of spatial and temporal variation.

(2) The Copermittees must identify the highest priority water quality conditions to be addressed by the Water Quality Improvement Plan, and provide a rationale for selecting a subset of the water quality conditions identified pursuant to Provision B.2.c.(1) as the highest priorities.

d. IDENTIFICATION OF MS4 SOURCES OF POLLUTANTS AND/OR STRESSORS

The Copermittees must identify and prioritize known and suspected sources of storm water and non-storm water pollutants and/or other stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c. The identification of known and suspected sources of pollutants and/or stressors that cause or contribute to the highest priority water quality conditions as identified for Provision B.2.c must consider the following:

(1) Pollutant generating facilities, areas, and/or activities within the Watershed Management Area, including:

(a) Each Copermittee's inventory of construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas,

(b) Publicly owned parks and/or recreational areas,

(c) Open space areas,

(d) All currently operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste, and

(e) Areas not within the Copermittees' jurisdictions (e.g., Phase II MS4s, tribal lands, state lands, federal lands) that are known or suspected to be discharging to the Copermittees' MS4s;

(2) Locations of the Copermittees' MS4s, including the following:

(a) All MS4 outfalls that discharge to receiving waters, and

(b) Locations of major structural controls for storm water and non-storm water (e.g., retention basins, detention basins, major infiltration devices, etc.);

(3) Other known and suspected sources of non-storm water or pollutants in storm water discharges to receiving waters within the Watershed Management Area, including the following:

(a) Other MS4 outfalls (e.g., Phase II Municipal and Caltrans),

(b) Other NPDES permitted discharges,

(c) Any other discharges that may be considered point sources (e.g., private outfalls), and

(d) Any other discharges that may be considered non-point sources (e.g., agriculture, wildlife or other natural sources);

(4) Review of available data, including but not limited to:

(a) Findings from the Copermittees' illicit discharge detection and elimination programs,

(b) Findings from the Copermittees' MS4 outfall discharge monitoring,

(c) Findings from the Copermittees' receiving water monitoring,

(d) Findings from the Copermittees' MS4 outfall discharge and receiving water assessments, and

(e) Other available, relevant, and appropriately collected data, information, or studies related to pollutant sources and/or stressors that contribute to the highest priority water quality conditions as identified for Provision B.2.c.

(5) The adequacy of the available data to identify and prioritize sources and/or stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c.

e. IDENTIFICATION OF POTENTIAL WATER QUALITY IMPROVEMENT STRATEGIES

The Copermittees must evaluate the findings identified under Provisions B.2.a-d, and identify potential strategies that can result in improvements to water quality

in MS4 discharges and/or receiving waters within the Watershed Management Area. Potential water quality improvement strategies that may be implemented within the Watershed Management Area must include the following:

(1) Structural BMPs, non-structural BMPs, incentives, or programs that can potentially be implemented to address the highest priority water quality conditions identified under Provision B.2.c, or MS4 sources of pollutants or stressors identified under Provision B.2.d,

(2) Retrofitting projects in areas of existing development within the Watershed Management Area that can potentially be implemented to reduce MS4 sources of pollutants or stressors identified under Provision B.2.d causing or contributing to the highest priority water quality conditions identified under Provision B.2.c, and

(3) Stream, channel, and/or habitat rehabilitation projects within the Watershed Management Area that can potentially be implemented to protect and/or improve conditions in receiving waters from MS4 pollutants and/or stressors identified under Provision B.2.d causing or contributing to the highest priority water quality conditions identified under Provision B.2.c.

3. Water Quality Improvement Goals, Strategies and Schedules

The Copermittees must identify and develop specific water quality improvement goals and strategies to address the highest priority water quality conditions identified within a Watershed Management Area. The water quality improvement goals and strategies must address the highest priority water quality conditions by effectively prohibiting non-storm water discharges to the MS4, reducing pollutants in storm water discharges from the MS4 to the MEP, and protecting the water quality standards of receiving waters.

a. Water Quality Improvement Goals and Schedules

(1) Numeric Goals

The Copermittees must develop and incorporate numeric goals[8] into the Water Quality Improvement Plan. Numeric goals must be used to support Water Quality Improvement Plan implementation and measure reasonable progress towards addressing the highest priority water quality conditions identified under Provision B.2.c. Action levels and numeric goals,

[8] Interim and final numeric goals may take a variety of forms such as TMDL established WQBELs, action levels, pollutant concentration, load reductions, number of impaired water bodies delisted from the List of Water Quality Impaired Segments, Index of Biotic Integrity (IBI) scores, or other appropriate metrics. Interim and final numeric goals are not necessarily limited to one criterion or indicator, but may include multiple criteria and/or indicators. Except for TMDL established WQBELs, interim and final numeric goals and corresponding schedules may be revised through the adaptive management process under Provision B.5.

themselves, are not enforceable compliance standards, effluent limits, or receiving water limitations. The Copermittees must establish and incorporate the following numeric goals in the Water Quality Improvement Plan:

(a) Final numeric goals must be based on measureable criteria or indicators capable of demonstrating one or more of the following:

(i) Discharges from the Copermittees' MS4s will not cause or contribute to exceedances of water quality standards in receiving waters, AND/OR

(ii) The conditions of receiving waters and associated habitat are protected from MS4 discharges, AND/OR

(iii) Beneficial uses of receiving waters are protected from MS4 discharges and will be supported.

(b) Interim numeric goals must be based on measureable criteria or indicators capable of demonstrating reasonable incremental progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges as follows:

(i) One or more interim numeric goals may be established to demonstrate progress toward achieving each final numeric goal,

(ii) For each final numeric goal, at least one interim numeric goal must be expressed as a reasonable increment toward achievement of the final numeric goal,

(iii) For each final numeric goal, reasonable interim numeric goals must be established to be accomplished during each 5 year period between the acceptance of the Water Quality Improvement Plan and the achievement of the final numeric goals.

(2) Schedules for Achieving Numeric Goals

The Copermittees must develop and incorporate schedules for achieving the numeric goals into the Water Quality Improvement Plan. The schedules must demonstrate reasonable progress toward achieving the final numeric goals required for Provision B.3.a.(1). The Copermittees must incorporate the schedules for achieving the numeric goals into the Water Quality Improvement Plan based on the following considerations:

(a) Final dates for achieving all final numeric goals must be established considering the following:

(i) Final compliance dates for any applicable TMDLs in Attachment E to this Order;

(ii) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see

Attachment A);

(iii) Achievement of the final numeric goals for the highest water quality priorities must be as soon as possible;

(iv) Final dates for achieving the final numeric goals must reflect a realistic assessment of the shortest practicable time required based on the temporal and spatial extent and factors associated with the highest priority water quality conditions identified under Provision B.2.c, and taking into account the time reasonably required to implement the water quality improvement strategies required pursuant to Provision B.3.b.

(b) Interim dates for achieving all interim numeric goals must be established considering the following:

(i) Interim compliance dates for any applicable TMDLs in Attachment E to this Order;

(ii) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(iii) Interim dates for achieving the interim numeric goals must reflect a realistic assessment of the shortest practicable time reasonably required, taking into account the time needed to implement new or significantly expanded programs and securing financing, if necessary; and

(iv) ~~(iv)~~ For each final numeric goal, at least one interim numeric goal must be established that the Copermittees will work toward achieving within the term of this Order.

(b) The schedules for achieving the interim and final goals will be evaluated with each annual report and/or as a part of the ROWD development to determine if they should be modified

b. WATER QUALITY IMPROVEMENT STRATEGIES AND SCHEDULES

Based on the likely effectiveness and efficiency of the potential water quality improvement strategies identified under Provision B.2.e to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a, the Copermittees must identify the strategies that will be implemented in each Watershed Management Area as follows:

(1) Jurisdictional Strategies

(a) Each Copermittee in the Watershed Management Area must identify the strategies that will be implemented within its jurisdiction as part of its jurisdictional runoff management program requirements under Provisions E.2 through E.7, including descriptions of the following:

(i) For each of the inventories developed for its jurisdiction, as required under Provisions D.2.a.(1), E.3.e.(2), E.4.b, and E.5.a, each Copermittee must identify the known and suspected areas or sources causing or contributing to the highest priority water quality conditions in the Watershed Management Area that the Copermittee will focus on in its efforts to effectively prohibit non-storm water discharges to its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, and achieve the interim and final numeric goals identified under Provision B.3.a;

(ii) BMPs that each Copermittee will implement, or require to be implemented, as applicable, for those areas or sources within its jurisdiction;

(iii) Education programs that each Copermittee will implement, as applicable, for those areas or sources within its jurisdiction;

(iv) Frequencies that each Copermittee will conduct inspections on those areas or sources within its jurisdiction;

(v) Incentive and enforcement programs that each Copermittee will implement, as applicable, for those areas or sources within its jurisdiction; and

(vi) Any other BMPs, incentives, or programs that each Copermittee will implement for those areas or sources within its jurisdiction.

(b) Identify the optional jurisdictional strategies that each Copermittee will implement within its jurisdiction, as necessary, to effectively prohibit non-storm water discharges to its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. Descriptions of the optional jurisdictional strategies must include:

(i) BMPs, incentives, or programs that may be implemented by the Copermittee within its jurisdiction in addition to the requirements of Provisions B.3.b.(1)(a);

(ii) Incentives or programs that may be implemented by the Copermittee to encourage or implement projects to retrofit areas of existing development within its jurisdiction;

(iii) Incentives or programs that may be implemented by the Copermittee to encourage or implement projects that will rehabilitate the conditions of channels or habitats within its jurisdiction;

(iv) The funds and/or resources that must be secured by the Copermittee to implement the optional strategies described for Provisions B.3.b.(1)(b)(i)-(iii) within its jurisdiction; and

(v) The circumstances necessary to trigger implementation of the optional jurisdictional strategies, in addition to the requirements of Provision B.3.b.(1)(a), to achieve the interim and final numeric goals within the schedules established under Provision B.3.a.

(c) Identify the strategies that will be implemented by the Copermittee in coordination with or with the cooperation of other agencies (e.g. Caltrans, water districts, school districts) and/or entities (e.g. non-governmental organizations) within its jurisdiction.

(2) Watershed Management Area Strategies

The Copermittees must identify the optional regional or multi-jurisdictional strategies that will be implemented in the Watershed Management Area, as necessary, to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. Descriptions of the optional regional or multi-jurisdictional strategies must include:

(a) Regional or multi-jurisdictional BMPs, incentives, or programs that may be implemented by the Copermittees in the Watershed Management Area;

(b) Incentives or programs that may be implemented by the Copermittees in the Watershed Management Area to encourage or implement regional or multi-jurisdictional projects to retrofit areas of existing development;

(c) Incentives or programs that may be implemented by the Copermittees to encourage or implement regional or multi-jurisdictional projects that will rehabilitate the conditions of channels, streams, or habitats within the Watershed Management Area;

(d) The funds and/or resources that must be secured by the Copermittees to implement the optional strategies described for Provisions B.3.b.(2)(a)-(c) within the Watershed Management Area; and

(e) The circumstances necessary to trigger implementation of the optional regional or multi-jurisdictional strategies to achieve the interim and final

numeric goals within the schedules established under Provision B.3.a.

(3) Schedules for Implementing Strategies

The Copermittees must develop reasonable schedules for implementing the water quality improvement strategies identified under Provisions B.3.b.(1) and B.3.b.(2) to achieve the interim and final numeric goals identified and schedules established under Provision B.3.a. The Copermittees must incorporate the schedules to implement the water quality improvement strategies into the Water Quality Improvement Plan as follows:

(a) Each Copermittee must develop schedules for the jurisdictional strategies identified pursuant to Provisions B.3.b.(1)(a)-(b). Each schedule must specify:

(i) If each jurisdictional strategy identified pursuant to Provision B.3.b.(1)(a) will or will not be initiated upon acceptance of the Water Quality Improvement Plan;

(ii) For each jurisdictional strategy identified pursuant to Provision B.3.b.(1)(a) that will not be initiated upon acceptance~~approval~~ of the Water Quality Improvement Plan, the shortest practicable time in which each jurisdictional strategy will be initiated after acceptance of the Water Quality Improvement Plan;

(iii) For each optional jurisdictional strategy identified pursuant to Provision B.3.b.(1)(b), a realistic assessment of the shortest practicable time required to:

[a] Secure the resources needed to fund the optional jurisdictional strategy, and
[b] Procure the resources, materials, labor, and applicable permits necessary to initiate implementation of the optional jurisdictional strategy;

(iv) If each jurisdictional strategy identified pursuant to Provisions B.3.b.(1)(a)-(b) is expected to be continuously implemented (e.g. inspections) or completed within a schedule (e.g. construction of structural BMP); and

(v) If a jurisdictional strategy identified pursuant to Provisions B.3.b.(1)(a)-(b) is expected to be completed within a schedule, the anticipated time to complete based on a realistic assessment of the shortest practicable time required.

(b) The Copermittees in the Watershed Management Area must develop schedules for the regional or multi-jurisdictional strategies identified

pursuant to Provision B.3.b.(2). Each schedule must specify:

(i) A realistic assessment of the shortest practicable time to:

[a] Secure the resources needed to fund the optional regional or multi-jurisdictional strategy, and

[b] Procure the resources, materials, labor, and permits necessary to initiate the implementation of the optional regional or multi-jurisdictional strategy;

(ii) If each regional or multi-jurisdictional strategy identified pursuant to Provision B.3.b.(2) is expected to be continuously implemented (e.g. inspections) or completed within a schedule (e.g. construction of structural BMP); and

(iii) If a regional or multi-jurisdictional strategy and/or activity identified pursuant to Provisions B.3.b.(2) is expected to be completed within a schedule, the anticipated time to complete based on a realistic assessment of the shortest practicable time required.

(4) Optional Watershed Management Area Analysis

(a) For each Watershed Management Area, the Copermittees have the option to perform a Watershed Management Area Analysis for the purpose of developing watershed-specific requirements for structural BMP implementation, as described in Provision E.3.c.(3). The Watershed Management Area Analysis must include GIS layers (maps) as output. The analysis must include the following information, to the extent it is available, in order to characterize the Watershed Management Areas:

(i) A description of dominant hydrologic processes, such as areas where infiltration or overland flow likely dominates;

(ii) A description of existing streams in the watershed, including bed material and composition, and if they are perennial or ephemeral;

(iii) Current and anticipated future land uses;

(iv) Potential coarse sediment yield areas; and

(v) Locations of existing flood control structures and channel structures, such as stream armoring, constrictions, grade control structures, and hydromodification or flood management basins.

(b) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify and compile a list of candidate projects that could potentially be used as alternative compliance options for Priority Development Projects, to be implemented in lieu of onsite structural BMP performance requirements

described in Provisions E.3.c.(1) and E.3.c.(2). Specifically, the Copermittees must identify opportunities to be included in the list of candidate projects in each Watershed Management Area, such as:

(i) Stream or riparian area rehabilitation;

(ii) Retrofitting existing infrastructure to incorporate storm water retention or treatment;

(iii) Regional BMPs;

(iv) Groundwater recharge projects;

(v) Water supply augmentation projects; and

(vi) Land purchases to preserve floodplain functions.

(c) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify areas within the Watershed Management Area where it is appropriate to allow Priority Development Projects to be exempt from the hydromodification management BMP performance requirements described in Provision E.3.c.(2), including supporting rationale.

4. Water Quality Improvement Monitoring and Assessment Program

a. The Copermittees in each Watershed Management Area must develop and incorporate an integrated monitoring and assessment program into the Water Quality Improvement Plan that assesses: 1) the progress toward achieving the numeric goals and schedules, 2) the progress toward addressing the highest priority water quality conditions for each Watershed Management Area, and 3) each Copermittee's overall efforts to implement the Water Quality Improvement Plan.

b. The monitoring and assessment program must incorporate the monitoring and assessment requirements of Provision D, which may allow the Copermittees to modify the program to be consistent with and focus on the highest priority water quality conditions for each Watershed Management Area.

c. For Watershed Management Areas with applicable TMDLs, the monitoring and assessment program must incorporate the specific monitoring and assessment requirements of Attachment E.

d. For Watershed Management Areas with any ASBS, the water quality monitoring and assessment program must incorporate the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

5. Iterative Approach and Adaptive Management Process

The Copermittees in each Watershed Management Area must implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1, A.2, and A.3 ~~A.1.a, A.1.c and A.2.a~~, and must include the following:

a. Re-Evaluation of Priority Water Quality Conditions

The priority water quality conditions and potential water quality improvement strategies included in the Water Quality Improvement Plan pursuant to Provisions B.2.c and B.2.e may be re-evaluated by the Copermittees as needed during the term of this Order as part of the Water Quality Improvement Plan Annual Report. Re-evaluation and recommendations for modifications to the priority water quality conditions and potential water quality improvement strategies must be provided in the Report of Waste Discharge, and must consider the following:

(1) Achieving the outcome of improved water quality in MS4 discharges and receiving waters through implementation of the water quality improvement strategies identified in the Water Quality Improvement Plan;

(2) New information developed when the requirements of Provisions B.2.a-c have been re-evaluated;

(3) Spatial and temporal accuracy of monitoring data collected to inform prioritization of water quality conditions and implementation strategies to address the highest priority water quality conditions;

(4) Availability of new information and data from sources other than the jurisdictional runoff management programs within the Watershed Management Area that informs the effectiveness of the actions implemented by the Copermittees;

(5) San Diego Water Board recommendations; and

(6) Recommendations for modifications solicited through a public participation process.

b. Adaptation of Goals, Strategies and Schedules

The water quality improvement goals, strategies and schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.3, must be re-evaluated and adapted as new information becomes available to result in more effective and efficient measures to address the highest priority water quality

conditions identified pursuant to Provision B.2.c. Re-evaluation of and modifications to the water quality improvement goals, strategies and schedules must be provided in the Water Quality Improvement Plan Annual Report, and must consider the following:

(1) Modifications to the priority water quality conditions based on Provision B.5.a;

(2) Progress toward achieving interim and final numeric goals in receiving waters and MS4 discharges for the highest priority water quality conditions in the Watershed Management Area,

(3) Progress toward achieving outcomes according to established schedules;

(4) New policies or regulations that may affect identified numeric goals;

(5) Measurable or demonstrable reductions of non-storm water discharges to and from each Copermittee's MS4;

(6) Measurable or demonstrable reductions of pollutants in storm water discharges from each Copermittee's MS4 to the MEP;

(7) New information developed when the requirements of Provisions B.2.b and B.2.d have been re-evaluated;

(8) Efficiency in implementing the Water Quality Improvement Plan;

(9) San Diego Water Board recommendations; and

(10) Recommendations for modifications solicited through a public participation process.

c. ADAPTATION OF MONITORING AND ASSESSMENT PROGRAM

The water quality improvement monitoring and assessment program, included in the Water Quality Improvement Plan pursuant to Provision B.4, must be re-evaluated and adapted when new information becomes available. Re-evaluation and recommendations for modifications to the monitoring and assessment program, pursuant to the requirements of Provision D, may be provided in the Water Quality Improvement Plan Annual Report, but must be provided in the Report of Waste Discharge.

6. Water Quality Improvement Plan Submittal, Updates, and Implementation

a. The Copermittees must submit and commence implementation of the Water

Quality Improvement Plans in accordance with the requirements of Provision F.1.

b. The Copermittees must submit proposed updates to the Water Quality Improvement Plan for acceptance by the San Diego Water Board Executive Officer in accordance with the requirements of Provision F.2.c.

C. ACTION LEVELS

The purpose of this provision is for the Copermittees to incorporate numeric non-stormwater action levels (NALs) and stormwater action levels (SALs) in the Water Quality Improvement Plans and numeric non-stormwater action levels (NALs) in the Illicit Discharge Detection and Elimination (IDDE) Program.

- For the purposes of the WQIPs, t~~T~~he goal of the action levels is to guide Water Quality Improvement Plan implementation efforts and measure progress towards the protection of the high priority water quality conditions and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through monitoring and assessing the quality of the MS4 discharges during the implementation of the Water Quality Improvement Plans.

- For the purposes of the IDDE Program, the goal of the action levels is to assist in the effective prohibition of non-stormwater discharges into the MS4.

Action levels will be developed and incorporated into the WQIP (Provision B) and the IDDE Program (Provision E). Depending upon the goals/objectives for the use of the action levels and the priority receiving water conditions, the constituents and values at which they are set may differ between watersheds. Copermittees may:

- Use existing action levels;
- Develop Watershed Management Area specific numeric action levels for non-stormwater and stormwater MS4 discharges using an approach approved by the Regional Board; or
- Use the default non-stormwater and stormwater action levels prescribed in C.1 and C.2 below.

The Copermittees will submit the action levels as a part of the WQIP and JURMP submittals. The action levels currently established will serve as the interim action levels until revised action levels are completed and approved. Exceedances of the action levels are not subject to enforcement or non-compliance actions under this Order.

1. Default Non-Storm Water Action Levels[9]

The following non-stormwater action levels (NALs) must be incorporated in the WQIPs and IDDE program if the Copermittees have not developed their own NALs for the identified high priority constituents using an approach listed above.~~The~~

[9] NALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, unless the NAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed.

~~Copermittees must develop and incorporate numeric non-storm water action levels (NALs) into the Water Quality Improvement Plan to: 1) support the development and prioritization of water quality improvement strategies for effectively prohibiting non-storm water discharges to the MS4s, 2) assess the effectiveness of the water quality improvement strategies toward addressing MS4 non-storm water discharges, required pursuant to Provision D.4.b.(1), and 3) support the detection and elimination of non-storm water and illicit discharges to the MS4, required pursuant to Provision E.2.~~[10]

a. The following NALs must be incorporated:

(1) Non-Storm Water Discharges from MS4s to Ocean Surf Zone

Table C-1. Non-Storm Water Action Levels for Discharges from MS4s to Ocean Surf Zone

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Total Coliform	MPN/100 ml	1,000	-	10,000/1,000[1]	OP
Fecal Coliform	MPN/100 ml	200[2]	-	400	OP
Enterococci	MPN/100 ml	35	-	104[3]	OP

Abbreviations/Acronyms
AMAL – average monthly action level
OP – Ocean Plan water quality objective
MDAL – maximum daily action level
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Total coliform density NAL is 1,000 MPN/100 ml when the fecal/total coliform ratio exceeds 0.1.
2. Fecal coliform density NAL is 200 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas."

(2) Non-Storm Water Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Table C-2. Non-Storm Water Action Levels for Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Turbidity	NTU	75	-	225	OP
pH	Units	Within limit of 6.0 to 9.0 at all times			OP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	35	-	104[3]	BP
Priority Pollutants	µg/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
OP – Ocean Plan water quality objective
NTU – Nephelometric Turbidity Units
µg/L – micrograms per liter
MDAL – maximum daily action level
BP – Basin Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas" and is not applicable to water bodies that are not designated with the water contact recreation (REC-1) beneficial use.

[10] The Copermittees may utilize NALs or other benchmarks currently established by the Copermittees as interim NALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

Table C-3. Non-Storm Water Action Levels for Priority Pollutants

Parameter	Units	Freshwater (CTR)		Saltwater (CTR)	
		MDAL	AMAL	MDAL	AMAL
Cadmium	µg/L	**	**	16	8
Copper	µg/L	*	*	5.8	2.9
Chromium III	µg/L	**	**	-	-
Chromium VI	µg/L	16	8.1	83	41
Lead	µg/L	*	*	14	2.9
Nickel	µg/L	**	**	14	6.8
Silver	µg/L	*	*	2.2	1.1
Zinc	µg/L	*	*	95	47

Abbreviations/Acronyms:
CTR – California Toxic Rule
AMAL – average monthly action level
µg/L – micrograms per liter
MDAL – maximum daily action level

Notes:
* Action levels developed on a case-by-case basis (see below)
** Action levels developed on a case-by-case basis (see below), but calculated criteria are not to exceed Maximum Contaminant Levels (MCLs) under the California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64431

The Cadmium, Copper, Chromium (III), Lead, Nickel, Silver and Zinc NALs for MS4 discharges to freshwater receiving waters will be developed on a case-by-case basis based on site-specific water quality data (receiving water hardness). For these priority pollutants, refer to 40 CFR 131.38(b)(2).

(3) Non-Storm Water Discharges from MS4s to Inland Surface Waters

Table C-4. Non-Storm Water Action Levels for Discharges from MS4s to Inland Surface Waters

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Dissolved Oxygen	mg/L	Not less than 5.0 in WARM waters and not less than 6.0 in COLD waters			BP
Turbidity	NTU	-	20	See MDAL	BP
pH	Units	Within limit of 6.5 to 8.5 at all times			BP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	33	-	61[3]	BP
Total Nitrogen	mg/L	-	1.0	See MDAL	BP
Total Phosphorus	mg/L	-	0.1	See MDAL	BP
MBAS	mg/L	-	0.5	See MDAL	BP
Iron	mg/L	-	0.3	See MDAL	BP
Manganese	mg/L	-	0.05	See MDAL	BP
Priority Pollutants	µg/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
BP – Basin Plan water quality objective
COLD – cold freshwater habitat beneficial use
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
MDAL – maximum daily action level
WARM – warm freshwater habitat beneficial use
MBAS – Methylene Blue Active Substances
MPN/100 ml – most probable number per 100 milliliters
µg/L – micrograms per liter

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for freshwater "designated beach areas" and is not applicable to water bodies that are not designated with the water contact recreation (REC-1) beneficial use.

b. If not identified in Provision C.1.a, NALs must be identified, developed and incorporated in the Water Quality Improvement Plan for any pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in receiving waters associated with the highest priority water quality conditions related to non-storm water discharges from the MS4s. NALs must be based on:

(1) Applicable water quality standards which may be dependent upon site-specific or receiving water-specific conditions or assumptions to be identified by the Copermittees; or

(2) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. ~~For the NALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary NALs specific to the Watershed Management Area at levels greater than the NALs required by Provisions C.1.a and C.1.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for effectively prohibiting non-storm water discharges to the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and from the MS4. The~~

~~secondary NALs may be developed using an approach acceptable to the San Diego Water Board.~~

d. Dry weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.b may be utilized to develop or revise NALs based on watershed-specific data, subject to San Diego Water Board Executive Officer approval.

2. Default Storm Water Action Levels[11]

The Copermittees must develop and incorporate numeric storm water action levels (SALs) in the Water Quality Improvement Plans to: 1) support the development and prioritization of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s, and 2) assess the effectiveness of the water quality improvement strategies toward reducing pollutants in storm water discharges, required pursuant to Provision D.4.b.(2).[12]

The following stormwater action levels (SALs) must be incorporated in the WQIPs if the Copermittees have not developed their own SALs for the identified high priority constituents using an approach approved by the Regional Board.

a. The following SALs for discharges of storm water from the MS4 must be incorporated:

Table C-5. Storm Water Action Levels for Discharges from MS4s to Receiving Waters

Parameter	Units	Action Level
Turbidity	NTU	126
Nitrate & Nitrite (Total)	mg/L	2.6
Phosphorus (Total P)	mg/L	1.46
Cadmium (Total Cd)*	µg/L	3.0
Copper (Total Cu)*	µg/L	127
Lead (Total Pb)*	µg/L	250
Zinc (Total Zn)*	µg/L	976

Abbreviations/Acronyms:
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
µg/L – micrograms per liter

Notes:
* The sampling must include a measure of receiving water hardness at each MS4 outfall. If a total metal concentration exceeds the corresponding metals SAL in Table C-5, that concentration must be compared to the California Toxics Rule criteria and the USEPA 1-hour maximum concentration for the detected level of receiving water hardness associated with that sample. If it is determined that the sample's total metal concentration for that specific metal

[11] SALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, unless the SAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed.

[12] The Copermittees may utilize SALs or other benchmarks currently established by the Copermittees as interim SALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

exceeds that SAL, but does not exceed the applicable USEPA 1-hour maximum concentration criterion for the measured level of hardness, then the sample result will not be considered above the SAL for that measurement.

b. If not identified in Provision C.2.a, SALs must be identified, developed and incorporated in the Water Quality Improvement Plan for pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in receiving waters associated with the highest priority water quality conditions related to storm water discharges from the MS4s. SALs must be based on:

(1) Federal and State water quality guidance and/or water quality standards; and

(2) Site-specific or receiving water-specific conditions; or

(3) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. ~~For the SALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary SALs specific to the Watershed Management Area at levels greater than the SALs required by Provisions C.2.a and C.2.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s. The secondary SALs may be developed based on the approaches recommended by the State Water Board's Storm Water Panel[13] or using an approach acceptable to the San Diego Water Board~~.

d. Wet weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.c may be used to develop or revise SALs based upon watershed-specific data, subject to San Diego Water Board Executive Officer approval.

[13] ~~Storm Water Panel Recommendations to the California State Water Resources Control Board: The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities (June 2006)~~

D. MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS

The purpose of this provision is for the Copermittees to monitor and assess the impact on the conditions of receiving waters caused by discharges from the Copermittees' MS4s under wet weather and dry weather conditions. The goal of the monitoring and assessment program is to inform the Copermittees about the nexus between the health of receiving waters and the water quality condition of the discharges from their MS4s. This goal will be accomplished through monitoring and assessing the conditions of the receiving waters, discharges from the MS4s, pollutant sources and/or stressors, and effectiveness of the water quality improvement strategies implemented as part of the Water Quality Improvement Plans.

1. Receiving Water Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the condition of the receiving waters in each Watershed Management Area during dry weather and wet weather. Following San Diego Water Board acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct long-term receiving water monitoring during implementation of the Water Quality Improvement Plan to assess the long term trends and determine if conditions in receiving waters are improving. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following receiving water monitoring procedures:

a. TRANSITIONAL RECEIVING WATER MONITORING

Until the monitoring requirements and schedules of Provisions D.1.b-e are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following receiving water monitoring in the Watershed Management Area:

(1) Continue the receiving water monitoring programs required in Order Nos. R9-2007-0001 (Monitoring and Reporting Program No. R9-2007-0001 Sections II.A.1-A.5), R9-2009-0002, and R9-2010-0016;

(2) Continue the monitoring in the Hydromodification Management Plans approved by the San Diego Water Board;

(3) Participate in the following regional receiving water monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring,

(b) Southern California Bight Regional Monitoring, and

(c) Sediment Quality Monitoring;

(4) Implement the monitoring programs developed as part of any implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) for the TMDLs in Attachment E to this Order; and

(5) For Watershed Management Areas with ASBS, implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

b. LONG-TERM RECEIVING WATER MONITORING STATIONS

The Copermittees must select at least one long-term receiving water monitoring station from among the existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees to be representative of the receiving water quality in the Watershed Management Area. Additional long-term receiving water monitoring stations must be selected where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

c. DRY WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three dry weather monitoring events at each of the long-term receiving water monitoring stations. At least one monitoring event must be conducted during the dry season (May 1 – September 30) and at least one monitoring event must be conducted during a dry weather period during the wet season (October 1 – April 30), after the first wet weather event of the season, with an antecedent dry period of at least 72 hours following a storm event producing measureable rainfall of greater than 0.1 inch.

(1) Dry Weather Receiving Water Field Observations

For each dry weather monitoring event, the Copermittees must record field observations consistent with Table D-1 at each long-term receiving water monitoring station.

Table D-1 Field Observations for Receiving Water Monitoring Stations

Table D-1. Field Observations for Receiving Water Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) • Station description (i.e. deposits or stains, vegetation condition, structural condition, and observable biology) • Presence and assessment of trash in and around station

(2) Dry Weather Receiving Water Field Monitoring

For each dry weather monitoring event, if conditions allow the collection of the data, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

Table D-2 Field Monitoring Parameters for Receiving Water Monitoring Stations

Table D-2. Field Monitoring Parameters for Receiving Water Monitoring Stations

Parameters
• pH • Temperature • Specific conductivity • Dissolved oxygen • Turbidity

(3) Dry Weather Receiving Water Analytical Monitoring

For each dry weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable NAL constituents, and

(v) Constituents listed in Table D-3.

Table D-3 Analytical Monitoring Constituents for Receiving Water Monitoring Stations

Table D-3. Analytical Monitoring Constituents for Receiving Water Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Pesticides	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Mercury • Nickel • Selenium • Thallium • Zinc	• Organophosphate Pesticides • Pyrethroid Pesticides	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for ~~Fecal~~ Total Coliform at inland receiving water monitoring stations.

(4) Dry Weather Receiving Water Toxicity Monitoring

For each dry weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for aquatic toxicity in accordance with Table D-4. When the State Water Board's Policy for Toxicity Assessment and Control (Toxicity Policy) is approved and in effect, the San Diego Water Board Executive Officer may direct the Copermittees to replace current toxicity program elements with standardized procedures in the Toxicity Policy.

Table D-4 Dry Weather Toxicity Testing for Receiving Water Monitoring Stations

Table D-4. Dry Weather Chronic[1] Toxicity Testing for Receiving Water Monitoring Stations

Organism	Units	Test	USEPA Protocol
Freshwater			
Pimephales promelas (Fathead Minnow)	Pass / Fail	Larval Survival and Growth	EPA-821-R-02-013
Ceriodaphnia dubia (*Daphnid*)	Pass / Fail	Survival and Production	EPA-821-R-02-013
Selenastrum capricornutum (Green Algae)	Pass / Fail	Growth	EPA-821-R-02-013
Marine and Estuarine			
Strongylocentrotus purpuratus *(Purple Sea Urchin)*	Pass / Fail	Embryo-Larval Development	EPA-600-R-95-136

Notes:
1. Chronic toxicity testing is not required at receiving water monitoring stations located at mass loading stations if the channel flows are diverted year-round during dry weather conditions to the sanitary sewer for treatment.

(a) Freshwater Test Species and Methods: If samples are collected in receiving waters with salinity less than 1 ppt, the Copermittees must follow the methods for chronic toxicity tests as established in 40 CFR 136.3 using a single-concentration test design for routine monitoring, or a five-concentration test design for additional toxicity testing if the limitation is exceeded. The Copermittees must estimate the critical life stage chronic toxicity on undiluted samples in accordance with species and short term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms (EPA-821-R-02-013; Table IA, 40 CFR 136). Additional test species may be used by the Copermittees if approved by the San Diego Water Board Executive Officer. The Copermittees must conduct:

(i) A static renewal toxicity test with the fathead minnow, *Pimephales promelas* (Larval Survival and Growth Test Method 1000.0);

(ii) A static renewal toxicity test with the daphnid, *Ceriodaphnia dubia* (Survival and Reproduction Test Method 1002.0); and

(iii) A static renewal toxicity test with the green alga, *Selenastrum capricornutum* (also named *Raphidocelis subcapitata*) (Growth Test Method 1003.0).

(b) Marine and Estuarine Test Species and Methods: If samples are collected in receiving waters with salinity greater or equal to 1 ppt, the Copermittees must follow the methods for chronic toxicity tests as established in 40 CFR 136.3 using a single-concentration test design for routine monitoring, or a five-concentration test design for additional toxicity testing if the limitation is exceeded. The Copermittees must conduct the following critical life state chronic toxicity tests on undiluted samples in accordance with species and short term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms (EPA-600-R-95-136; 1995). Artificial sea salts must be used to increase sample salinity. The Copermittees must conduct a static non-renewal toxicity test with the purple sea urchin, *Strongylocentrotus purpuratus* (Embryo-larval Development Test Method). Additional species may be used by the Copermittees if approved by the San Diego Water Board Executive Officer.

(c) Holding Times: All toxicity tests must be conducted as soon as possible following sample collection. The 36-hour sample holding time for test initiation shall be targeted. However, no more than 72 hours shall elapse before the conclusion of sample collection and test initiation.

(d) Test Species Sensitivity Screening: To determine the most sensitive test species for freshwater, the Copermittees must screen 2 wet weather and 2 dry weather toxicity tests with a vertebrate, an invertebrate, and a plant species. After this screening period, subsequent monitoring must be conducted using the most sensitive test species. Alternatively, if a sensitive test species has already been determined, or if there is prior knowledge of potential toxicant(s) and a test species is sensitive to such toxicant(s), then monitoring must be conducted using only that test species. Sensitive test species determinations must also consider the most sensitive test species used for proximal receiving water monitoring. Rescreening must occur once each permit term.

(e) Chronic toxicity test biological endpoint data must be analyzed using the Test of Significant Toxicity t-test approach specified in *National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document* (USEPA, Office of Wastewater Management, Washington, D.C., EPA-833-R-10-003, 2010). For this monitoring program, the critical chronic instream waste concentration (IWC) is set at 100 percent receiving water (i.e. no dilution) for receiving water samples. A 100 percent receiving water and a control must be tested.

(f) Toxicity Identification Evaluation (TIE) / Toxicity Reduction Evaluation (TRE): If chronic toxicity is detected in receiving waters, the Copermittees must discuss the need for conducting a TIE/TRE in the assessments required under Provision D.4.a.(2), and develop a plan for implementing the TIE/TRE to be incorporated in the Water Quality Improvement Plan.

(5) Dry Weather Receiving Water Bioassessment Monitoring

Bioassessment monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must conduct bioassessment monitoring during at least one dry weather monitoring event at each long-term receiving water monitoring station as follows:

(a) The following bioassessment samples and measurements must be collected:

(i) Macroinvertebrate samples must be collected in accordance with the "Reachwide Benthos (Multihabitat) Procedure" in the most current Surface Water Ambient Monitoring Program (SWAMP) Bioassessment Standard Operating Procedures (SOP), and amendments, as applicable;[14]

(ii) The "Full" suite of physical habitat characterization measurements must be collected in accordance with the most current SWAMP Bioassessment SOP, and as summarized in the SWAMP Stream Habitat Characterization Form – Full Version;[15] and

(iii) Freshwater algae samples must be collected in accordance with the SWAMP Standard Operating Procedures for Collecting Algae Samples.[16] Analysis of samples must include algal taxonomic composition (diatoms and soft algae) and algal biomass.

(b) The bioassessment samples, measurements, and appropriate water chemistry data must be used to calculate the following:

(i) An Index of Biological Integrity (IBI) for macroinvertebrates for each monitoring station where bioassessment monitoring was conducted, based on the most current calculation method;[17] and

[14] Ode, P.R.. 2007. Standard operating procedures for collecting macroinvertebrate samples and associated physical and chemical data for ambient bioassessments in California. California State Water Resources Control Board Surface Water Ambient Monitoring Program (SWAMP) Bioassessment SOP 001. http://www.swrcb.ca.gov/water_issues/programs/swamp/tools.shtml#monitoring

[15] Available at: http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/reports/fieldforms_fullversion052908.pdf

[16] Fetscher et al. 2009. Standard Operating Procedures for Collecting Stream Algae Samples and Associated Physical Habitat and Chemical Data for Ambient Bioassessments in California.

[17] The most current calculation method at the time the Order was adopted is outlined in "A Quantitative Tool for Assessing the Integrity of Southern California Coastal Streams" (Ode, et al. 2005. Environmental Management. Vol. 35, No. 1, pp. 1-13). If an updated or new calculation method is developed, either both (i.e. current and updated/new) methods must be used, or historical IBIs must be recalculated with the updated or new calculation method.

(ii) An IBI for algae for each monitoring station where bioassessment monitoring was conducted, when a calculation method is developed.[18]

(c) In lieu of the requirements of Provision D.1.c.(5)(a), the Copermittees may conduct the bioassessment monitoring in accordance with the "Triad" assessment approach[19] to calculate the IBIs required for Provision D.1.c.(5)(b). The Copermittees must conduct sampling, analysis, and reporting of specified in-stream biological and habitat data according to the protocols specified in the SCCWRP Technical Report No. 539, or subsequent protocols, if developed.

(6) Dry Weather Receiving Water Hydromodification Monitoring

In addition to the hydromodification monitoring conducted as part of the Copermittees' Hydromodification Management Plans, hydromodification monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must collect the following hydromodification monitoring observations and measurements within an appropriate domain of analysis during at least one dry weather monitoring event for each long-term receiving water monitoring station:

(a) Channel conditions, including:

(i) Channel dimensions,

(ii) Hydrologic and geomorphic conditions, and

(iii) Presence and condition of vegetation and habitat;

(b) Location of discharge points;

(c) Habitat integrity;

(d) Photo documentation of existing erosion and habitat impacts, with location (i.e. latitude and longitude coordinates) where photos were taken;

(e) Measurement or estimate of dimensions of any existing channel bed or bank eroded areas, including length, width, and depth of any incisions; and

[18] When a calculation method is developed, IBIs must be calculated for all available and appropriate historical data.
[19] Stormwater Monitoring Coalition Model Monitoring Technical Committee, 2004. Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California. Technical Report #419. August 2004.

(f) Known or suspected cause(s) of existing downstream erosion or habitat impact, including flow, soil, slope, and vegetation conditions, as well as upstream land uses and contributing new and existing development.

d. WET WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three wet weather monitoring events at each long-term receiving water monitoring station. At least one wet weather monitoring event must be conducted during the first wet weather event of the wet season (October 1 – April 30), and at least one wet weather monitoring event during a wet weather event that occurs after February 1.

(1) Wet Weather Receiving Water Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each long-term receiving water monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event;

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(d) Presence and assessment of trash in and around station.

(2) Wet Weather Receiving Water Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

(3) Wet Weather Receiving Water Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) Constituents listed in Table D-3.

(4) Wet Weather Receiving Water Toxicity Monitoring

For each wet weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for chronic aquatic toxicity in accordance with Provisions D.1.c.(4)(a)-(f).

e. Other Receiving Water Monitoring Requirements

(1) Regional Monitoring

The Copermittees must participate in the following regional receiving waters monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring; and

(b) Southern California Bight Regional Monitoring~~.~~ and

(c) Unified Beach Water Quality Monitoring and Assessment Program
The Orange County Copermittees shall participate in and, together with South Orange County Wastewater Authority and Orange County Health Care Agency, shall share responsibility for implementation of a unified regional beach water quality monitoring and assessment program in south Orange County, as set forth in Monitoring and Reporting Program No. XXX, issued pursuant to CWC sections 13225, 13267, and 13383 and subject to future revision.

(2) Sediment Quality Monitoring

The Copermittees must perform sediment monitoring to assess compliance with sediment quality receiving water limits applicable to MS4 discharges to enclosed bays and estuaries. The monitoring may be performed either by individual or multiple Copermittees to assess compliance with receiving water limits, or through participation in a water body monitoring coalition. A Sediment Monitoring Plan which satisfies the requirements of the State Water Board's Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part 1 Sediment Quality (Sediment Control Plan) must be submitted as part of the monitoring and assessment program in the Water Quality Improvement Plan.

(a) The Sediment Monitoring Plan design must include the following:

(i) The elements required under Section VII.D (Receiving Water Limits Monitoring Frequency) and Section VII.E (Sediment Monitoring) of the Sediment Control Plan;

(ii) A Quality Assurance Project Plan (QAPP) describing the project objectives and organization, functional activities, and quality assurance/quality control protocols for the water and sediment monitoring; and

(iii) A schedule for completion of all sample collection and analysis activities and submission of Sediment Monitoring Reports.

(b) The Copermittees must implement the Sediment Monitoring Plan in accordance with the schedule contained in the Sediment Monitoring Plan, unless otherwise directed in writing by the San Diego Water Board Executive Officer.

(c) The Copermittees must incorporate a Sediment Monitoring Report as part of the Water Quality Improvement Plan Annual Report in accordance with the schedule contained in the Sediment Monitoring Plan, unless otherwise directed in writing by the San Diego Water Board Executive Officer. The Sediment Monitoring Report must contain the following information:

(i) Analysis: An evaluation, interpretation and tabulation of the water and sediment monitoring data, including interpretations and conclusions as to whether applicable Receiving Water Limitations in this Order have been attained at each sample station;

(ii) Sample Location Map: The locations, type, and number of samples must be identified and shown on a site map; and

(iii) California Environmental Data Exchange Network: A statement certifying that the monitoring data and results have been uploaded into the California Environmental Data Exchange Network (CEDEN).

(d) Based on the Sediment Monitoring Report conclusions the San Diego Water Board may require a human health risk assessment to determine if the human health objective contained in Receiving Water Limitations in Provision A.2.a.(3)(b)(ii) has been attained at each sample station. In conducting a risk assessment, the Copermittees must consider any applicable and relevant information, including California Environmental Protection Agency's (Cal/EPA) Office of Environmental Health Hazard Assessment (OEHHA) policies for fish consumption and risk assessment, Cal/EPA's Department of Toxic Substances Control (DTSC) Risk Assessment, and USEPA Human Health Risk Assessment policies.

(3) ASBS Monitoring

For Watershed Management Areas with ASBS, the Copermittees must implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

f. ALTERNATIVE WATERSHED MONITORING REQUIREMENTS

The San Diego Water Board may direct the Copermittees to participate in an effort to develop alternative watershed monitoring with other regulated entities, other interested parties, and the San Diego Water Board to refine, coordinate, and implement regional monitoring and assessment programs to determine the status and trends of water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams.

~~In lieu of the Receiving Water Monitoring Program requirements specified in 1.a to 1.d, the Copermittees may participate in the development and implementation of monitoring for the collaborative receiving waters monitoring program. It is expected that a regional monitoring will allow for a more effective and efficient receiving waters monitoring program. The regional monitoring plan must be submitted to the Executive Officer for review and approval. Documentation of participation and monitoring shall be included in the annual report.~~

2. MS4 Outfall Discharge Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the discharges from the MS4 outfalls in each Watershed Management Area during dry weather and wet weather. Following San Diego Water Board acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct MS4 outfall discharge monitoring during implementation of the Water Quality Improvement Plan to assess the effectiveness of their jurisdictional runoff management programs toward effectively prohibiting non-storm water discharges into the MS4 and reducing pollutants in storm water discharges from their MS4s to the MEP. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following MS4 outfall monitoring procedures:

a. TRANSITIONAL MS4 OUTFALL DISCHARGE MONITORING

Until the monitoring requirements and schedules of Provisions D.2.b-c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following MS4 outfall discharge monitoring in the Watershed Management Area:

(1) MS4 Outfall Discharge Monitoring Station Inventory

Each Copermittee must identify all major MS4 outfalls that discharge directly to receiving waters within its jurisdiction and geo-locate those outfalls on a map of the MS4 pursuant to Provision E.2.b.(1). This information must be compiled into a MS4 outfall discharge monitoring station inventory, and must include the following information:

(a) Latitude and longitude of MS4 outfall point of discharge;

(b) Watershed Management Area;

(c) Hydrologic subarea;

(d) Outlet size;

(e) Accessibility (i.e. safety and without disturbance of critical habitat);

(f) Approximate drainage area; and

(g) Classification of whether the MS4 outfall is known to have persistent dry weather flows, transient dry weather flows, no dry weather flows, or unknown dry weather flows.

(2) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Until the monitoring requirements and schedules of Provision D.2.b are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, each Copermittee must perform dry weather MS4 outfall field screening monitoring to identify non-storm water and illicit discharges within its jurisdiction in accordance with Provision E.2.c, to determine which discharges are transient flows and which are persistent flows, and prioritize the dry weather MS4 discharges that will be investigated and eliminated in accordance with Provision E.2.d.

(a) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Frequency

Each Copermittee must field screen the MS4 outfalls in its inventory developed pursuant to Provision D.2.a.(1) as follows:

(i) For Copermittees with less than 125 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 80 percent of the outfalls must be visually inspected two times per year during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv).

(ii) For Copermittees with 125 major MS4 outfalls or more, but less than or equal to 500 that discharge to receiving waters within a Watershed Management Area, all the outfalls must be visually inspected at least annually during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv).

(iii) For Copermittees with more than 500 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 500 outfalls must be visually inspected at least annually during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv).

Copermittees with more than 500 major MS4 outfalls within a Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(iv) For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major MS4 outfalls within its jurisdiction, at least 500 major MS4 outfalls within its inventory must be visually inspected at least annually during dry weather conditions. Copermittees with more than 500 major MS4 outfalls in more than one Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(v) Inspections of major MS4 outfalls conducted in response to public reports and staff or contractor reports and notifications may count toward the required visual inspections of MS4 outfall discharge monitoring stations.

(b) Transitional Dry Weather MS4 Outfall Discharge Field Screening Visual Observations

(i) An antecedent dry period of at least 72 hours following any storm event producing measurable rainfall greater than 0.1 inch is required prior to conducting field screening visual observations during a field screening monitoring event.

(ii) During the field screening monitoring event, each Copermittee must record visual observations consistent with Table D-5 at each MS4 outfall discharge monitoring station inspected.

Table D-5 Field Screening Visual Observations for MS4 Outfall Discharge Monitoring Stations

Table D-5. Field Screening Visual Observations for MS4 Outfall Discharge Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) - Flow source(s) suspected or identified from non-storm water source investigation - Flow source(s) eliminated during non-storm water source identification • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) - Known or suspected source(s) of pooled or ponded water • Station description (i.e. deposits or stains, vegetation condition, structural condition, observable biology) • Presence and assessment of trash in and around station • Evidence or signs of illicit connections or illegal dumping

(iii) Each Copermittee must implement the requirements of Provisions E.2.d.(2)(c)-(e) based on the field observations required pursuant to Provision D.2.a.(2)(b)(ii).

(iv) Each Copermittee must evaluate field observations together with existing information available from prior reports, inspections and monitoring results to determine whether any observed flowing, pooled, or ponded waters are likely to be transient or persistent flow.[20]

(c) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Records

Based upon the results of the transitional dry weather MS4 outfall discharge field screening monitoring conducted pursuant to Provisions D.2.a.(2)(a)-(b), each Copermittee must update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow.

(3) Transitional Wet Weather MS4 Outfall Discharge Monitoring

Until the monitoring requirements and schedules of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the

[20] Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(a) Transitional Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees must select wet weather MS4 outfall discharge monitoring stations from the inventories developed pursuant to Provision D.2.a.(1) for each Watershed Management Area as follows:

(i) At least five wet weather MS4 outfall discharge monitoring stations that are representative of storm water discharges from areas consisting primarily of residential, commercial, industrial, and typical mixed-use land uses present within the Watershed Management Area;

(ii) At least one wet weather MS4 outfall discharge monitoring station for each Copermittee within the Watershed Management Area; and

(iii) The County of San Diego may select at least two (2) wet weather MS4 outfall discharge monitoring stations for the portion of the Santa Margarita River Watershed Management Area within its jurisdiction to be monitored during the transitional period until the Riverside County Copermittees are notified of coverage under this Order. After the Riverside County Copermittees are notified of coverage under this Order, the Copermittees in the Watershed Management Area must select wet weather MS4 outfall discharge monitoring stations consistent with the requirements above.

(b) Transitional Wet Weather MS4 Outfall Discharge Monitoring Frequency

Each wet weather MS4 outfall discharge monitoring station selected pursuant to Provision D.2.a.(3)(a) must be monitored once during the wet season (October 1 – April 30). The wet weather monitoring events must be selected to be representative of the range of hydrological conditions experienced in the region. At least 10 percent of samples must be conducted during the first wet weather event of the wet season, to include at least one such sample in each Watershed Management Area.

~~Transitional wet weather MS4 outfall discharge monitoring may begin in year 2 of the transitional period once the MS4 outfall discharge monitoring stations have been inventoried and evaluated pursuant to Provision D.2.a.(1).~~

(c) Transitional Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative

descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(i) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(ii) The flow rates and volumes measured or estimated from the MS4 outfall (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(d) Transitional Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(e) Transitional Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, and indicator bacteria;

(iv) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

[a] Time-weighted composites collected over the length of the storm event or the first 24 hour period whichever is shorter, composed of discrete samples, which may be collected through the use of automated equipment, or

[b] Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

[c] If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours;

(v) Only one analysis of the composite of aliquots is required;

(vi) The samples must be analyzed for the following constituents:

[a] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List with the exception of toxicity[21],

[b] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and

[c] Constituents listed in Table D-6.

Table D-6 Analytical Monitoring Constituents for Wet Weather MS4 Outfall Discharge Monitoring Stations

Table D-6. Analytical Monitoring Constituents for Wet Weather MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Nickel • Selenium • Thallium • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Total Fecal Coliform for discharges to inland surface waters.

e] The Copermittee may be relieved of analytical monitoring requirements [a] to [c] if supporting information can be provided or

[21] Copermittees may provide an alternate approach to evaluate and identify the cause of toxicity currently affecting receiving waters and to iteratively adapt the monitoring program to address these chemical stressors in their MS4 outfall discharges in the monitoring plan which is subject to Regional Board approval.

has historical data that can demonstrate or provide justification that the analysis of the constituent is not necessary.

(f) Other Transitional Wet Weather MS4 Outfall Discharge Monitoring

The San Diego County Copermittees must continue the wet weather MS4 outfall monitoring program developed under Order No. R9-2007-0001, as approved by the San Diego Water Board, through its planned completion.

b. DRY WEATHER MS4 OUTFALL DISCHARGE MONITORING

Each Copermittee must perform dry weather MS4 outfall monitoring to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. Each Copermittee must conduct the following dry weather MS4 outfall discharge monitoring within its jurisdiction:

(1) Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Each Copermittee must continue to perform the dry weather MS4 outfall discharge field screening monitoring in accordance with the requirements of Provision D.2.a.(2). The Copermittee may adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of persistent flow non-storm water discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of visual inspections performed is equivalent to the number of visual inspections required under Provision D.2.a.(2)(a).

(2) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring

Each Copermittee must perform non-storm water persistent flow MS4 outfall discharge monitoring to determine which persistent non-storm water discharges contain concentrations of pollutants below NALs, and which persistent non-storm water discharges impact receiving water quality during dry weather. Each Copermittee must conduct the following non-storm water persistent flow MS4 outfall discharge monitoring within its jurisdiction:

(a) Prioritization of Non-Storm Water Persistent Flow MS4 Outfalls

Based upon the dry weather MS4 outfall discharge field screening monitoring records developed pursuant to Provision D.2.a.(2)(c), each Copermittee must identify and prioritize the MS4 outfalls with persistent flows based on the highest priority water quality conditions identified in the Water Quality Improvement Plan and any additional criteria developed by

the Copermittee, which may include historical data and data from sources other than what the Copermittee collects.

(b) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring Frequency

(i) Based on the prioritization of major MS4 outfalls developed under Provision D.2.b.(2)(a), each Copermittee must identify, at a minimum, the 5 highest priority major MS4 outfalls with non-storm water persistent flows that the Copermittee will monitor within its jurisdiction in each Watershed Management Area. For Responsible Copermittees identified by a TMDL in Attachment E to this Order, if the 5 chosen outfall locations are not sufficient to determine compliance with the TMDL(s), then each Responsible Copermittee must identify additional MS4 outfall monitoring locations within its jurisdiction sufficient to address compliance with the TMDL(s). If a Copermittee has less than 5 major outfalls within a Watershed Management Area, then the Copermittee must monitor all of its major MS4 outfalls with persistent flows within each Watershed Management Area. The location of the highest priority non-storm water persistent flow MS4 outfall monitoring stations must be identified on the map required pursuant to Provision E.2.b.(1). The map must specify which MS4 outfalls are being monitored for compliance with a TMDL.

(ii) Each of the highest priority non-storm water persistent flow MS4 outfall monitoring stations identified pursuant to Provision D.2.b.(2)(b)(i) must be monitored under dry weather conditions at least semi-annually until one of the following occurs:

[a] The non-storm water discharges have been effectively eliminated (i.e. no flowing, pooled, or ponded water) for three consecutive dry weather monitoring events; or

[b] The source(s) of the persistent flows has been identified as a category of non-storm water discharges that does not require an NPDES permit and does not have to be addressed as an illicit discharge because it was not identified as a source of pollutants (i.e. constituents in non-storm water discharge do not exceed NALs), and the persistent flow can be re-prioritized to a lower priority; or

[c] The constituents in the persistent flow non-storm water discharge do not exceed NALs, and the persistent flow can be re-prioritized to a lower priority; or

[d] The source(s) of the persistent flows has been identified as a non-storm water discharge authorized by a separate NPDES permit.

(iii) Where the criteria under Provision D.2.b.(2)(b)(ii) are not met, but the threat to water quality has been reduced by the Copermittee, the

highest priority persistent flow MS4 outfall monitoring stations may be reprioritized accordingly for continued dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1).

(iv) Each Copermittee must document removal or re-prioritization of the highest priority persistent flow MS4 outfall monitoring stations identified under Provision D.2.b.(2)(a) in the Water Quality Improvement Plan Annual Report. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized major MS4 outfall in the Watershed Management Area within its jurisdiction, unless there are no remaining qualifying major MS4 outfalls within the Copermittee's jurisdiction in the Watershed Management Area.

(c) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Observations

During each semi-annual monitoring event, each Copermittee must record field observations consistent with Table D-5 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(d) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Monitoring

During each semi-annual monitoring event, if conditions allow the collection of the data, each Copermittee must monitor and record the parameters in Table D-2 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(e) Non-Storm Water Persistent Flow MS4 Outfall Discharge Analytical Monitoring

During each semi-annual monitoring event in which measurable flow is present, each Copermittee must collect and analyze samples from each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Collect grab or composite samples to be analyzed at a qualified laboratory for the following constituents:

[a] Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

[b] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List with the exception of toxicity[22],

[c] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

[d] Applicable NAL constituents, and

[e] Constituents listed in Table D-7. The Copermittees may adjust the list of constituents for the Watershed Management Area if historical data or supporting information can be provided that demonstrates or justifies the analysis of a constituent is not necessary.

[f] The Copermittee may be relieved of analytical monitoring requirements if supporting information can be provided or has historical data that can demonstrate or provide justification that the analysis of the constituent is not necessary.

[22] Copermittees may provide an alternate approach to evaluate and identify the cause of toxicity currently affecting receiving waters and to iteratively adapt the monitoring program to address these chemical stressors in their MS4 outfall discharges in the monitoring plan which is subject to Regional Board approval.

Table D-7 Analytical Monitoring Constituents for Persistent Flow MS4 Outfall Discharge Monitoring Stations

Table D-7. Analytical Monitoring Constituents for Persistent Flow MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Total Hardness • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Cadmium • Copper • Lead • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Total ~~Fecal~~ Coliform for discharges to inland surface waters.

(iv) If the Copermittee identifies and eliminates the source of the persistent flow non-storm water discharge, analysis of the sample is not required.

c. WET WEATHER MS4 OUTFALL DISCHARGE MONITORING

The Copermittees must perform wet weather MS4 outfall monitoring to identify pollutants in storm water discharges from the MS4s, to guide pollutant source identification efforts, and to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order. The Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(1) Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees may adjust the wet weather MS4 outfall discharge monitoring locations in the Watershed Management Area, as needed, to identify pollutants in storm water discharges from MS4s, to guide pollutant source identification efforts, and to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of stations is at least equivalent to the number of stations required under Provision D.2.a.(3)(a). Additional outfall monitoring locations, above the minimum per jurisdiction, may be required to demonstrate compliance with the WQBELs associated with the applicable TMDLs in Attachment E.

(2) Wet Weather MS4 Outfall Discharge Monitoring Frequency

The Copermittees must monitor the wet weather MS4 outfall discharge monitoring stations in the Watershed Management Area at least once (1) per year. The Copermittees may need to increase the frequency of monitoring in order to identify pollutants in storm water discharges from the MS4s causing or contributing to the highest priority water quality conditions, to guide pollutant source identification efforts, or to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order.

(3) Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(4) Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(5) Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate

the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites collected over the length of the storm event or the first 24 hour period, whichever is shorter , composed of discrete samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

(iii) If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours.

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List with the exception of toxicity[23],

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) The Copermittees may adjust the analytical monitoring required for the Watershed Management Area, if the Copermittees have historical data or supporting information that can demonstrate or provide justification that the analysis of a constituent is not necessary.

[23] Copermittees may provide an alternate approach to evaluate and identify the cause of toxicity currently affecting receiving waters and to iteratively adapt the monitoring program to address these chemical stressors in their MS4 outfall discharges in the monitoring plan which is subject to Regional Board approval.

3. Special Studies

a. Within the term of this Order, the Copermittees must initiate the following special studies:

(1) At least two special studies in each Watershed Management Area to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that cause or contribute to highest priority water quality conditions identified in the Water Quality Improvement Plan.

(2) At least one special study for the San Diego Region to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that are impacting receiving waters on a regional basis in the San Diego Region.

(3) One of the two special studies in each Watershed Management Area required pursuant to Provision D.3.a.(1) may be replaced by a special study implemented pursuant to Provision D.3.a.(2).

b. The special studies must, at a minimum, be in conformance with the following criteria:

(1) The special studies must be related to the highest priority water quality conditions identified by the Copermittees in the Watershed Management Area and/or for the entire San Diego Region;

(2) The special studies developed pursuant to Provision D.3.a.(1) must:

(a) Be implemented within the applicable Watershed Management Area, and

(b) Require some form of participation by all the Copermittees within the Watershed Management Area;

(3) The special studies developed pursuant to Provision D.3.a.(2) must:

(a) Be implemented within the San Diego Region, and

(b) Require some form of participation by all Copermittees covered under the requirements of this Order.

(4) The Copermittees are encouraged to partner with environmental groups or third parties knowledgeable of watershed conditions to complete the required special studies.

c. Special studies developed to identify sources of pollutants and/or stressors should be pollutant and/or stressor specific and based on historical monitoring

data and monitoring performed pursuant to Provisions D.1 and D.2. Development of source identification special studies should include the following:

(1) A compilation of known information on the specific pollutant and/or stressor, including data on potential sources and movement of the pollutant and/or stressor within the watershed. Data generated by the Copermittees and others, as well as information available from a literature research on the pollutant and/or stressor should be compiled and analyzed as appropriate.

(2) An identification of data gaps, based on the compiled information generated on the specific pollutant and/or stressor identified in Provision D.3.c.(1). Source identification special studies should be developed to fill identified data gaps.

(3) A monitoring plan that will collect and provide data the Copermittees can utilize to do the following:

(a) Quantify the relative loading or impact of a pollutant and/or stressor from a particular source or pollutant generating activity;

(b) Improve understanding of the fate of a pollutant and/or stressor in the environment;

(c) Develop an inventory of known and suspected sources of a pollutant and/or stressor in the Watershed Management Area; and/or

(d) Prioritize known and suspected sources of a pollutant and/or stressor based on relative magnitude in discharges, geographical distribution (i.e., regional or localized), frequency of occurrence in discharges, human health risk, and controllability.

d. Special studies initiated prior to the effective date of this Order that meet the requirements of Provision D.3.b and are implemented during the term of this Order as part of the Water Quality Improvement Plan may be utilized to fulfill the special study requirements of Provision D.3.a. Special studies completed before the effective date of this Order cannot be utilized to fulfill the special study requirements of Provision D.3.a.

e. The Copermittees must submit the monitoring plans for the special studies in the Water Quality Improvement Plans required pursuant to Provision F.1.

f. The Copermittees are encouraged to share the results of the special studies regionally among the Copermittees to provide information useful in improving and adapting the management of non-storm water and storm water runoff through the implementation of the Water Quality Improvement Plans.

4. Assessment Requirements

Each Copermittee must evaluate the data collected pursuant to Provisions D.1, D.2 and D.3, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E, to assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a. Assessments must be performed as described in the following provisions:

a. Receiving Waters Assessments

(1) The Copermittees must assess and report the conditions of the receiving waters in the Watershed Management Area as follows:

(a) Based on data collected pursuant to Provision D.1.a, the assessments under Provision D.4.a.(2) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(b) Based on the data collected pursuant to Provisions D.1.a-e, the assessments required under Provision D.4.a.(2) must be included in the Report of Waste Discharge required pursuant to Provision F.5.b.

(2) The Copermittees must assess the status and trends of receiving water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under dry weather and wet weather conditions. For each of the three types of receiving waters in each Watershed Management Area the Copermittees must:

(a) Determine whether or not the conditions of the receiving waters are meeting the numeric goals established pursuant to Provision B.3.a;

(b) Identify the most critical beneficial uses that must be protected to ensure overall health of the receiving water;

(c) Determine whether or not those critical beneficial uses are being protected;

(d) Identify short-term and/or long-term improvements or degradation of those critical beneficial uses;

(e) Determine whether or not the strategies established in the Water Quality Improvement Plan contribute towards progress in achieving the interim and final numeric goals of the Water Quality Improvement Plan; and

(f) Identify data gaps in the monitoring data necessary to assess Provisions D.4.a.(2)(a)-(e).

b. MS4 OUTFALL DISCHARGES ASSESSMENTS

(1) Non-Storm Water Discharges Reduction Assessments

(a) Each Copermittee must assess and report the progress of its illicit discharge detection and elimination program, required to be implemented pursuant to Provision E.2, toward effectively prohibiting non-storm water and illicit discharges into the MS4 within its jurisdiction as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(2), the assessments under Provision D.4.b.(1)(b) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(ii) Based on the data collected pursuant to Provisions D.2.b, the assessments required under Provision D.4.b.(1)(c) must be included in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

(iii) Based on the data collected pursuant to Provisions D.2.b, the assessment required under Provision D.4.b.(1)(c) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.a.(2), each Copermittee must assess and report the following:

(i) Identify the known and suspected controllable sources (e.g. facilities, areas, land uses, pollutant generating activities) of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area;

(ii) Identify sources of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area that have been reduced or eliminated; and

(iii) Identify modifications to the field screening monitoring locations and frequencies for the MS4 outfalls in its inventory necessary to identify and eliminate sources of persistent flow non-storm water discharges pursuant to Provision D.2.b.

(c) Based on the dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1), each Copermittee must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(1)(b);

(ii) Based on the data collected and applicable NALs in the Water Quality Improvement Plan, rank the MS4 outfalls in the Copermittee's jurisdiction according to potential threat to receiving water quality, and produce a prioritized list of major MS4 outfalls for follow-up action to update the Water Quality Improvement Plan, with the goal of eliminating persistent flow non-storm water discharges and/or pollutant loads in order of the ranked priority list through targeted programmatic actions and source investigations;

(iii) For the highest priority major MS4 outfalls with persistent flows that are in exceedance of NALs, identify the known and suspected sources within the Copermittee's jurisdiction in the Watershed Management Area that may cause or contribute to the NAL exceedances;

(iv) Each Copermittee must analyze the data collected pursuant to Provision D.2.b, and utilize a model or other method, to calculate or estimate the non-storm water volumes and pollutant loads collectively discharged from all the major MS4s outfalls in its jurisdiction identified as having persistent dry weather flows during the monitoring year. These calculations or estimates must be updated annually.

[a] Each Copermittee must calculate or estimate the annual non-storm water volumes and pollutant loads collectively discharged from the Copermittee's major MS4 outfalls to receiving waters within the Copermittee's jurisdiction, with an estimate of the percent contribution from each known source for each MS4 outfall;

[b] Each Copermittee must annually identify and quantify (i.e. volume and pollutant loads) sources of non-storm water not subject to the Copermittee's legal authority that are discharged from the Copermittee's major MS4 outfalls to downstream receiving waters.

(v) Each Copermittee must review the data collected pursuant to Provision D.2.b and findings from the assessments required pursuant to Provision D.4.b.(1)(c)(i)-(iv) at least once during the term of this Order to:

[a] Identify reductions and progress in achieving reductions in non-storm water and illicit discharges to the Copermittee's MS4 in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction, with an estimate, if possible, of the non-storm water volume and/or pollutant load reductions

attributable to specific water quality strategies implemented by the Copermittee; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittee in the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction.

(vi) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(1)(c)(i)-(v).

(2) Storm Water Pollutant Discharges Reduction Assessments

(a) The Copermittees must assess and report the progress of the water quality improvement strategies, required to be implemented pursuant to Provisions B and E, toward reducing pollutants in storm water discharges from the MS4s within the Watershed Management Area as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(3), the assessments under Provision D.4.b.(2)(b) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(ii) Based on the data collected pursuant to Provisions D.2.c, the assessments required under Provision D.4.b.(2)(c) must be included in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

(iii) Based on the data collected pursuant to Provisions D.2.c, the assessment required under Provisions D.4.b.(2)(c)-(d) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.a.(3) the Copermittees must assess and report the following:

(i) The Copermittees must analyze the monitoring data collected pursuant to Provision D.2.a.(3), and utilize a watershed model or other method, to calculate or estimate the following for each monitoring year:

[a] The average storm water runoff coefficient for each land use type within the Watershed Management Area;

[b] The volume of storm water and pollutant loads discharged from ~~each of~~ the Copermittee's monitored MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch;

[c] The total flow volume and pollutant loadings discharged from the Copermittee's jurisdiction within the Watershed Management Area over the course of the wet season, extrapolated from the data produced from the monitored MS4 outfalls; and

[d] The percent contribution of storm water volumes and pollutant loads discharged from each land use type within each hydrologic subarea with a major MS4 outfall to receiving waters or within each major MS4 outfall to receiving waters in the Copermittee's jurisdiction within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch.

(ii) Identify modifications to the wet weather MS4 outfall discharge monitoring locations and/or frequencies necessary to identify pollutants in storm water discharges from the MS4s in the Watershed Management Area pursuant to Provision D.2.c.(1).

(c) Based on the wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.c the Copermittees must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(2)(b);

(ii) Based on the data collected and applicable SALs in the Water Quality Improvement Plan, analyze and compare the monitoring data to the analyses and assumptions used to develop the Water Quality Improvement Plans, including strategies developed pursuant to Provision B.3, and evaluate whether those analyses and assumptions should be updated as a component of the adaptive management efforts pursuant to Provision B.5 for follow-up action to update the Water Quality Improvement Plan;

(iii) The Copermittees must review the data collected pursuant to Provision D.2.c and findings from the assessments required pursuant to Provisions D.4.b.(2)(c)(i)-(ii) at least once during the term of this Order to:

[a] Identify reductions or progress in achieving reductions in pollutant concentrations and/or pollutant loads from different land uses and/or drainage areas discharging from the Copermittees' MS4s in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters within the Watershed Management Area to the MEP, with an estimate, if possible, of the pollutant load reductions attributable to specific water quality strategies implemented by the Copermittees; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittees in the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters in the Watershed Management Area to the MEP.

(iv) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(iii).

(d) The Copermittees must evaluate all the data collected pursuant to Provision D.2.c, and incorporate new outfall monitoring data into time series plots for each long-term monitoring constituent for the Watershed Management Area, and perform statistical trends analysis on the cumulative long-term wet weather MS4 outfall discharge water quality data set.

c. Special Studies Assessments

The Copermittees must annually evaluate the results and findings from the special studies developed and implemented pursuant to Provision D.3, and assess their relevance to the Copermittees' efforts to characterize receiving water conditions, understand sources of pollutants and/or stressors, and control and reduce the discharges of pollutants from the MS4 outfalls to receiving waters in the Watershed Management Area. The Copermittees must report the results of the special studies assessments applicable to the Watershed Management Area, and identify any necessary modifications or updates to the Water Quality Improvement Plan based on the results in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

d. Integrated Assessment of Water Quality Improvement Plan

As part of the iterative approach and adaptive management process required for the Water Quality Improvement Plan pursuant to Provision B.5, the Copermittees in each Watershed Management Area must integrate the data collected pursuant to Provisions D.1-D.3, the findings from the assessments required pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to assess the effectiveness of, and identify necessary modifications to, the Water Quality Improvement Plan as follows:

(1) The Copermittees must re-evaluate the priority water quality conditions and numeric goals for the Watershed Management Area, as needed, during the term of this Order pursuant to Provision B.5.a. The re-evaluation and recommendations for modifications to the priority water quality conditions, and/or numeric goals and corresponding schedules may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to

Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The priority water quality conditions and numeric goals for the Watershed Management Area must be re-evaluated as follows:

(a) Re-evaluate the receiving water conditions in the Watershed Management Area in accordance with Provision B.2.a;

(b) Re-evaluate the impacts on receiving waters in the Watershed Management Area from MS4 discharges in accordance with Provision B.2.b;

(c) Re-evaluate the identification of MS4 sources of pollutants and/or stressors in accordance with Provision B.2.d;

(d) Identify beneficial uses of the receiving waters that are protected in accordance with Provision D.4.a;

(e) Evaluate the progress toward achieving the interim and final numeric goals for protecting impacted beneficial uses in the receiving waters.

(2) The Copermittees must re-evaluate the water quality improvement strategies for the Watershed Management Area during the term of this Order pursuant to Provision B.5.b. The re-evaluation and recommendations for modifications to the water quality improvement strategies and schedules may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The water quality improvement strategies for the Watershed Management Area must be re-evaluated as follows:

(a) Identify the non-storm water and storm water pollutant loads from the Copermittees' MS4 outfalls in the Watershed Management Area, calculated or estimated pursuant to Provisions D.4.b;

(b) Identify the non-storm water and storm water pollutant load reductions, or other improvements to receiving water or water quality conditions, that are necessary to attain the interim and final numeric goals identified in the Water Quality Improvement Plan for protecting beneficial uses in the receiving waters;

(c) Identify the non-storm water and storm water pollutant load reductions, or other improvements to the quality of MS4 discharges, that are necessary for the Copermittees to demonstrate that non-storm water and storm water discharges from their MS4s are not causing or contributing to exceedances of receiving water limitations;

(d) Evaluate the progress of the water quality improvement strategies toward

achieving the interim and final numeric goals identified in the Water Quality Improvement Plan for protecting beneficial uses in the receiving waters.

(3) The Copermittees must re-evaluate and adapt the water quality monitoring and assessment program for the Watershed Management Area when new information becomes available to improve the monitoring and assessment program pursuant to Provision B.5.c. The re-evaluation and recommendations for modifications to the monitoring and assessment program may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. Modifications to the water quality monitoring and assessment program must be consistent with the requirements of Provision D.1-D.3. The re-evaluation of the water quality monitoring and assessment program for the Watershed Management Area must consider the data gaps identified by the assessments required pursuant to Provisions D.4.a-b, and results of the special studies implemented pursuant to Provision D.4.c.

5. Monitoring Provisions

Each Copermittee must comply with all the monitoring, reporting, and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

E. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS

The purpose of this provision is for each Copermittee to implement a program to control non-stormwater discharges ~~the contribution of pollutants~~ into and ~~the~~ discharges from the MS4 within its jurisdiction and to focus and prioritize those implementation actions based on the highest water quality priorities identified within the associated Water Quality Improvement Plan. The goal of the jurisdictional runoff management programs is to implement strategies and actions that effectively prohibit non-storm water discharges into the MS4 and reduce the discharge of pollutants in non-stormwater and storm water from the MS4 to the MEP. This goal will be accomplished through implementing the jurisdictional runoff management programs in accordance with the water quality priorities and strategies identified in the Water Quality Improvement Plans. Each Copermittee shall prioritize the implementation actions based on the highest water quality priorities identified within the applicable Water Quality Improvement Plan.

Each Copermittee must update its jurisdictional runoff management program document, in accordance with Provision F.2.a, to incorporate ~~all~~ the requirements of Provision E consistent with the highest water quality priorities as identified in the corresponding Water Quality Improvement Plan. The requirements outlined below may be modified and prioritized as appropriate for consistency with the Water Quality Improvement Plan. Until the Copermittee has updated its jurisdictional runoff management program document with the requirements of Provision E, the Copermittee must continue implementing its current jurisdictional runoff management program.

1. Legal Authority Establishment and Enforcement

a. Each Copermittee must establish, maintain, and enforce adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 through statute, ordinance, permit, contract, order, or similar means. This legal authority must, at a minimum, authorize the Copermittee to:

(1) Effectively p~~P~~rohibit ~~and eliminate all~~ illicit discharges and illicit connections into its MS4;

(2) Control the contribution of pollutants in discharges of runoff associated with industrial and construction activity into its MS4 and control the quality of runoff from industrial and construction sites[24]~~, including industrial and construction sites which have coverage under the statewide General Permit for Discharges of Storm Water Associated with Industrial Activities (Industrial General Permit) or General Permit for Discharges of Storm Water Associated with Construction Activities (Construction General Permit), as well as to those sites which do not~~;

[24] The Compermittees are only responsible for administering and enforcing the codes and ordinances applicable to their jurisdictions (i.e., a municipality is not responsible for administering and/or enforcing a permit issued by the State of California).

(3) Control the discharge of spills, dumping, or disposal of materials other than storm water into its MS4;

(4) Control through interagency agreements among Copermittees the contribution of pollutants from one portion of the MS4 to another portion of the MS4;

(5) Control, by coordinating and cooperating with other owners of the MS4 such as Caltrans, the U.S. federal government, or sovereign Native American Tribes through interagency agreements, where possible, the contribution of pollutants from their portion of the MS4 to the portion of the MS4 within the Copermittee's jurisdiction;

(6) Require compliance with conditions in its statutes, ordinances, permits, contracts, orders, or similar means to hold dischargers to its MS4 accountable for their contributions of pollutants and flows;

(7) Require the use of BMPs to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

~~(8) Require documentation on the effectiveness of BMPs implemented to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;~~

~~(9)~~(8) Utilize enforcement mechanisms to require compliance with its statutes, ordinances, permits, contracts, orders, or similar means; and

~~(10)~~(9) Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with its statutes, ordinances, permits, contracts, orders, or similar means and with the requirements of this Order, including the effective prohibition of illicit discharges and connections to its MS4. The Copermittees ordinance must include adequate legal authority, to the extent permitted by California and Federal Law and subject to the limitations on municipal action under the constitutions of California and the United States. T~~; t~~he Copermittee must also have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from industrial facilities, including construction sites, discharging into its MS4.

b. With the first Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3), each Copermittee must submit a statement certified by its Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative that the Copermittee has taken the necessary steps to obtain and maintain full legal authority within its jurisdiction to implement and enforce each of the requirements contained in this Order.

2. Illicit Discharge Detection and Elimination

Each Copermittee must implement a program to actively detect and eliminate illicit discharges and improper disposal into the MS4, or otherwise require the discharger to apply for and obtain a separate NPDES permit. The illicit discharge detection and elimination program must be implemented in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1). and include, at a minimum, the following requirements: The requirements of the jurisdictional runoff management programs as outlined below may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality improvement Plan(s).

a. Non-Storm Water Discharges

Each Copermittee must address all non-storm water discharges as illicit discharges, where the likelihood exists that they are a source of pollutants to the waters of the state, unless thea non-storm water discharge is either identified as a discharge authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to the following requirements:

(1) Discharges of non-storm water to the MS4 from the following categories must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG919001 (Order No. R9-2007-0034, or subsequent order) for discharges to San Diego Bay, or NPDES Permit No. CAG919002 (Order No. R9-2008-0002, or subsequent order) for discharges to surface waters other than San Diego Bay:

(1) Uncontaminated pumped ground water;

(2) Discharges from foundation drains;[25]

(3) Water from crawl space pumps; and

(4) Water from footing drains.[25][19]

(2)(1) Discharges of non-storm water from water line flushing and water main breaks to the MS4 must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG 679001 (Order No. R9-2010-0003 or subsequent order). This category includes water line flushing and water main break discharges from water purveyors issued a water supply permit by the California Department of Public Health or federal military installations. Discharges from recycled or reclaimed water lines to the

[25] Provision E.2.a.(1) only applies to this category of non-storm water if the system is designed to be located at or below the groundwater table to actively or passively extract groundwater during any part of the year.

MS4 must be addressed as illicit discharges, unless the discharges have coverage under a separate NPDES permit.

~~(3)~~(2) Discharges of non-storm water into the MS4 from the following categories must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a source of pollutants to receiving waters:

(a) Diverted stream flows;

(b) Rising ground waters;

(c) Uncontaminated ground water infiltration to MS4s;

(d) Uncontaminated pumped ground water;

~~(c)~~(e) Discharges from foundation drains;[26]

(f) Springs;

(g) Water from crawl space pumps;

~~(d)~~(h) Water from footing drains;[19]

~~(e)~~(i) Flows from riparian habitats and wetlands;

~~(f)~~(j) Discharges from potable water sources;

~~(g)~~(k) Discharges from foundation drains;[27] and

~~(h)~~(l) Discharges from footing drains.[20]

~~(4)~~(3) Discharges of non-storm water into the MS4 from the following categories must be controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means, where there is evidence that those discharges are a source of pollutants to waters of the state. Discharges of non-storm water into the MS4 from the following categories not controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means must be addressed by the Copermittee as illicit discharges.

[26] Provision E.2.a.(1) only applies to this category on non-storm water if the system is designed to be located at or below the highest historical groundwater table to actively or passively extract groundwater during any part of the year.

[27] Provision E.2.a.(3) only applies to this category of non-storm water discharge if the system is designed to be located above the groundwater table at all times of the year, and the system is only expected to discharge non-storm water under unusual circumstances.

(a) Air conditioning condensation

The discharge of air conditioning condensation should be directed to landscaped areas or other pervious surfaces, or to the sanitary sewer, where feasible.

(b) Individual residential vehicle washing

(i) The discharge of wash water should be directed to landscaped areas or other pervious surfaces where feasible; and

(ii) The minimization of water, washing detergent and other vehicle wash products used for residential vehicle washing, and the implementation of other practices or behaviors that will prevent the discharge of pollutants associated with individual residential vehicle washing from entering the MS4 must be encouraged.

(c) Dechlorinated swimming pool discharges

(i) Residual chlorine, algaecide, filter backwash, or other pollutants from swimming pools must be eliminated prior to discharging to the MS4; and

(ii) The discharge of saline swimming pool water must be directed to the sanitary sewer, landscaped areas, or other pervious surfaces that can accommodate the volume of water, unless the saline swimming pool water can be discharged via a pipe or concrete channel directly to a naturally saline water body (e.g. Pacific Ocean).

~~(5)~~(4) Firefighting discharges to the MS4 must continue be addressed by the Copermittees ~~as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a significant source of pollutants to receiving waters. Firefighting discharges to the MS4 not identified as a significant source of pollutants to receiving waters, must be addressed, at a minimum,~~ as follows:

(a) Non-emergency firefighting discharges

(i) Building fire suppression system maintenance discharges (e.g. sprinkler line flushing) to the MS4 must be addressed as illicit discharges unless BMPs are implemented to prevent pollutants associated with such discharges to the MS4.

(ii) Non-emergency firefighting discharges (i.e., discharges from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems) must be addressed by a program, to be developed and implemented by the Copermittee, in conjunction with the local Fire Authority/District, to reduce or eliminate pollutants in such discharges from entering the

MS4.

(b) Emergency firefighting discharges (i.e., flows necessary for the protection of life or property) do not require BMPs and need not be prohibited.

~~Each Copermittee should develop and encourage implementation of BMPs to reduce or eliminate pollutants in emergency firefighting discharges to the MS4s and receiving waters within its jurisdiction. During emergency situations, priority of efforts should be directed toward life, property, and the environment (in descending order). BMPs should not interfere with immediate emergency response operations or impact public health and safety.~~

~~(6)~~(5) If the Copermittee or San Diego Water Board identifies any category of non-storm water discharges listed under Provisions E.2.a.(1)-(4) as a source of pollutants to receiving waters, the category must be prohibited through ordinance, order, or similar means and addressed as an illicit discharge. Alternatively, the Copermittee may propose controls to be implemented for the category of non-storm water discharges as part of the Water Quality Improvement Plan instead of prohibiting the category of non-storm water discharges, and implement the controls if accepted by the San Diego Water Board as part of the Water Quality Improvement Plan.

(7) ~~Each Copermittee must, where feasible and priorities and resources allow, reduce or eliminate non-storm water discharges listed under Provisions E.2.a.(1)-(4) into its MS4, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit.~~

b. PREVENT AND DETECT ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to prevent and detect illicit discharges to the MS4:

(1) Each Copermittee must maintain an updated map of its entire MS4 and the corresponding drainage areas. The accuracy of the MS4 map must be confirmed during the field screening required pursuant to Provision E.2.c. The MS4 map must be included as part of the jurisdictional runoff management program document. Any geographic information system (GIS) layers or files used by the Copermittee to maintain the MS4 map must be made available to the San Diego Water Board upon request. The MS4 map must identify the following:

(a) All segments of the MS4 owned, operated, and maintained by the Copermittee;

(b) All known locations of inlets that discharge and/or collect runoff into the Copermittee's MS4;

(c) All known locations of connections with other MS4s not owned or operated by the Copermittee (e.g. Caltrans MS4s);

(d) All known locations of MS4 outfalls and private outfalls that discharge runoff collected from areas within the Copermittee's jurisdiction;

(e) All segments of receiving waters within the Copermittee's jurisdiction that receive and convey runoff discharged from the Copermittee's MS4 outfalls;

(f) Locations of the MS4 outfalls, identified pursuant to Provision D.2.a.(1), within its jurisdiction; and

(g) Locations of the non-storm water persistent flow MS4 outfall discharge monitoring stations, identified pursuant to Provision D.2.b.(2), within its jurisdiction.

(2) Each Copermittee must use Copermittee personnel and contractors to assist in identifying and reporting illicit discharges and connections during their daily employment activities.

(3) Each Copermittee must promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges into or from the MS4, including the following methods for public reporting:

(a) Operate a public hotline, which can be Copermittee-specific or shared by the Copermittees, and must be capable of receiving reports in both English and Spanish 24 hours per day and seven days per week; and

(b) Designate an e-mail address for receiving electronic reports from the public, which can be Copermittee-specific or shared by the Copermittees, and must be prominently displayed on the Copermittee's webpage and the Regional Clearinghouse required pursuant to Provision F.4.

(4) Each Copermittee must implement practices and procedures (including a notification mechanism) to prevent, respond to, contain, and clean up any spills that may discharge into the MS4 within its jurisdiction from any source. The Copermittee must coordinate, to the extent possible, with spill response teams to prevent entry of spills into the MS4, and prevent contamination of surface water, ground water, and soil. The Copermittee must coordinate spill prevention, containment, and response activities throughout all appropriate Copermittee departments, programs, and agencies.

(5) Each Copermittee must implement practices and procedures to prevent and limit infiltration of seepage from sanitary sewers (including private laterals and failing septic systems) to the MS4.

(6) Each Copermittee must coordinate, when necessary, with upstream Copermittees and/or entities to prevent illicit discharges from upstream sources into the MS4 within its jurisdiction.

c. Field Screening

Each Copermittee must conduct field screening (i.e. visual observations, field testing, and/or analytical testing) of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect ~~non-storm water and~~ illicit discharges and connections to the MS4 in accordance with the dry weather MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

d. Investigate and Eliminate Illicit Discharges And Connections

Each Copermittee must include the following measures within its program to investigate and eliminate illicit discharges to the MS4:

(1) Each Copermittee must prioritize and determine when follow-up investigations will be performed in response to visual observations and/or water quality monitoring data collected during an investigation of a detected ~~non-storm water or~~ illicit discharge into or from the MS4. The criteria for prioritizing investigations must consider the following:

(a) Pollutants identified as causing or contributing to the highest water quality priorities identified in the Water Quality Improvement Plan;

(b) Pollutants identified as causing or contributing, or threatening to cause or contribute to impairments in water bodies on the 303(d) List and/or in environmentally sensitive areas (ESAs), located within its jurisdiction;

(c) Pollutants identified from sources or land uses known to exist within the area, drainage basin, or watershed that discharges to the portion of the MS4 within its jurisdiction included in the investigation;

(d) Pollutants identified as causing or contributing to an exceedance of a NAL ~~in the Water Quality Improvement Plan~~described in Provision C.1; and

(e) Pollutants identified as an immediate and significant threat to human health or the environment.

(2) Each Copermittee must implement procedures to investigate and inspect portions of its MS4 that, based on reports or notifications, field screening, or other appropriate information, indicate a reasonable potential of receiving, containing, or discharging pollutants due to illicit discharges or~~,~~ illicit connections~~, or other sources of non-storm water~~. The procedures must

include the following:

(a) Each Copermittee must develop criteria to:

(i) Assess the validity of each report or notification received; and

(ii) Prioritize the response to each report or notification received.

(b) Each Copermittee must prioritize and respond to each valid report or notification (e.g., public reports, staff or contractor reports and notifications, etc.) of an incident in a timely manner.

(c) In accordance with the requirements of Provision E.2.d.(1), each Copermittee must investigate and seek to identify the source(s) of ~~discharges of non-storm water where flows are~~illicit discharges or illicit connections observed ~~in and from the MS4~~ during the field screening required pursuant to Provision D.2.b.(1) as follows:

(i) Obvious illicit discharges must be immediately investigated to identify the source(s)~~ of non-storm water discharges~~;

(ii) The investigation must include field investigations to identify sources or potential sources for the discharge, unless the source or potential source has already been identified during previous investigations; and

(iii) The investigation may include follow-up field investigations and/or reviewing Copermittee inventories and other land use data to identify potential sources of the discharge.

(d) Each Copermittee must maintain records and a database of the following information:

(i) Location of incident, including hydrologic subarea, portion of MS4 receiving the ~~non-storm water or~~ illicit discharge or connection, and point of discharge or potential discharge from MS4 to receiving water;

(ii) Source of information initiating the investigation (e.g., public reports, staff or contractor reports and notifications, field screening, etc.);

(iii) Date the information used to initiate the investigation was received;

(iv) Date the investigation was initiated;

(v) Dates of follow-up investigations;

(vi) Identified or suspected source of the illicit discharge or connection, if determined;

(vii) Known or suspected related incidents, if any;

(viii) Result of the investigation; and

(ix) If a source cannot be identified and the investigation is not continued, document the response pursuant to the requirements of Provision E.2.d.(4).

(e) Each Copermittee must maintain records and, in accordance with the priorities of the Water Quality Improvement Plan, seek to identify the source(s) of ~~non-storm water discharges from the MS4 where there is evidence of non-storm water having been discharged into or from the MS4 (e.g., pooled water~~the illicit discharge or connections~~),~~ in accordance with MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

(3) Each Copermittee must initiate the implementation of procedures, in a timely manner, to eliminate all detected and identified illicit discharges and connections within its jurisdiction. The procedures must include the following responses:

(a) Each Copermittee must enforce its legal authority, as required under Provision E.1, to eliminate illicit discharges and connections to the MS4.

(b) If the Copermittee identifies the source as a controllable source ~~of non-storm water or illicit discharge or connection~~, the Copermittee must implement its Enforcement Response Plan pursuant to Provision E.6 and enforce its legal authority to prohibit and eliminate illicit discharges and connections to its MS4.

(c) If the Copermittee identifies the source of the discharge as a category of non-storm water discharges in Provision E.2.a, and the discharge is in exceedance of the NALs ~~in the Water Quality Improvement Plan~~, then the Copermittee must determine if: (1) this is an isolated incident or set of circumstances that will be addressed through its Enforcement Response Plan pursuant to Provision E.6, or (2) the category of discharge must be addressed through the prohibition of that category of discharge as an illicit discharge pursuant to Provision E.2.a.(6).

(d) If the Copermittee suspects the source illicit discharge or connection ~~of the non-storm water discharge~~ as natural in origin (i.e. non-anthropogenically influenced) and in conveyance into the MS4, then the Copermittee must document and provide the data and evidence necessary to demonstrate to the San Diego Water Board that it is natural in origin and does not require further investigation.

(e) If the Copermittee is unable to identify and document the source of a recurring ~~non-storm water discharge to or from the MS4~~illicit discharge or connection, then the Copermittee must ~~address the discharge as an illicit discharge and~~ update its jurisdictional runoff management program to address the common and suspected sources of the ~~non-storm water~~

discharge within its jurisdiction in accordance with the Copermittee's priorities.

(4) Each Copermittee must submit a summary of the ~~non-storm water discharges and~~ illicit discharges and connections investigated and eliminated within its jurisdiction with each Water Quality Improvement Plan Annual Report required under Provision F.3.b.(3) of this Order.

3. Development Planning

Each Copermittee must use their land use and planning authorities to implement a development planning program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1). The requirements of the jurisdictional runoff management programs as outlined below may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality Improvement Plan(s). ~~and includes, at a minimum, the following requirements~~:

a. BMP Requirements for All Development Projects

Each Copermittee must prescribe the following BMP requirements during the planning process (i.e. prior to project approval and issuance of local permits) for all development projects (regardless of project type or size), where local permits are issued, including unpaved roads and flood management projects:

(3) General Requirements

(a) Onsite BMPs must be located so as to remove pollutants from runoff prior to its discharge to any receiving waters, and as close to the source as possible;

(b) Structural BMPs must not be constructed within waters of the U.S.

(c) Onsite BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors (e.g. mosquitos, rodents, or flies).

(4) Source Control BMP Requirements

The following source control BMPs must be implemented at all development projects where applicable and feasible:

(a) Prevention of illicit discharges into the MS4;

(b) Storm drain system stenciling or signage;

(c) Protect outdoor material storage areas from rainfall, run-on, runoff, and

wind dispersal;

(d) Protect materials stored in outdoor work areas from rainfall, run-on, runoff, and wind dispersal;

(e) Protect trash storage areas from rainfall, run-on, runoff, and wind dispersal; and

(f) Any additional BMPs determined to be necessary by the Copermittee to minimize pollutant generation at each project.

(5) Low Impact Development (LID) BMP Requirements

The following LID BMPs must be implemented at all development projects where applicable and feasible:

(a) Maintenance or restoration of natural storage reservoirs and drainage corridors (including topographic depressions, areas of permeable soils, natural swales, and ephemeral and intermittent streams);[28]

(b) Buffer zones for natural water bodies (where buffer zones are technically infeasible, require project applicant to include other buffers such as trees, access restrictions, etc.);

(c) Conservation of natural areas within the project footprint including existing trees, other vegetation, and soils;

(d) Construction of streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided public safety is not compromised;

(e) Minimization of the impervious footprint of the project;

(f) Minimization of soil compaction to landscaped areas;

(g) Disconnection of impervious surfaces through distributed pervious areas;

[28] Development projects proposing to dredge or fill materials in waters of the U.S. must obtain a CWA Section 401 Water Quality Certification. Projects proposing to dredge or fill waters of the state must obtain waste discharge requirements.

(h) Landscaped or other pervious areas designed and constructed to effectively receive and infiltrate, retain and/or treat runoff from impervious areas, prior to discharging to the MS4;

(i) Small collection strategies located at, or as close as possible to, the source (i.e. the point where storm water initially meets the ground) to minimize the transport of runoff and pollutants to the MS4 and receiving waters;

(j) Use of permeable materials for projects with low traffic areas and appropriate soil conditions;

(k) Landscaping with native or drought tolerant species; and

(l) Harvesting and using precipitation.

b. PRIORITY DEVELOPMENT PROJECTS

Priority Development Projects are land development projects that fall under the planning and building authority of the Copermittee for which the Copermittee must impose specific requirements, in addition to those described in Provision E.3.a, including the implementation of structural BMPs to meet the performance requirements described in Provision E.3.c.

(1) Definition of Priority Development Project

Priority Development Projects include the following:

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(b) Redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site on an existing site of 10,000 square feet or more of impervious surfaces). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(c) New and redevelopment projects that create 5,000 square feet or more of impervious surface (collectively over the entire project site), and support one or more of the following uses:

(i) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812).

(ii) Hillside development projects. This category includes development on any natural slope that is twenty-five percent or greater.

(iii) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce.

(iv) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

(d) New or redevelopment projects that create or replace 2,500 square feet or more of impervious surface (collectively over the entire project site), and discharging directly to an Environmentally Sensitive Area (ESA). "Discharging directly to" includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands).

(e) New development projects that support one or more of the following uses:

(i) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

(ii) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

(f) New or redevelopment projects that result in the disturbance of one or more acres of land and are expected to generate pollutants post construction.

(2) <u>Special Considerations for Redevelopment Projects</u>

The structural BMP performance requirements of Provision E.3.c are applicable to redevelopment Priority Development Projects, as defined in E.3.b.(1), as follows:

(a) Where redevelopment results in the creation or replacement of impervious surface in an amount of less than fifty percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provision E.3.c apply only to the creation or replacement of impervious surface, and not the entire development; or

(b) Where redevelopment results in the creation or replacement of impervious surface in an amount of more than fifty percent of the surface area of the previously existing development, and was not subject to previous Priority Project Development requirements, then the structural BMP performance requirements of Provision E.3.c apply to the entire development.

(3) Priority Development Project Exemptions

Each Copermittee has the discretion to exempt the following projects from being defined as Priority Development Projects:

(a) New or retrofit paved sidewalks, bicycle lanes, or trails that meet the following criteria:

(i) Designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas; OR

(ii) Designed and constructed to be hydraulically disconnected from paved streets or roads; OR

(iii) Designed and constructed with permeable pavements or surfaces in accordance with USEPA Green Streets guidance.[29]

(b) Retrofitting or redevelopment of existing paved alleys, streets or roads that are designed and constructed in accordance with the USEPA Green Streets guidance.[30]

(c) Flood control and stream restoration projects.

(d) Emergency public safety projects in any of the Priority Development Categories may be excluded if the delay caused due to the requirement for a SSMP compromises public safety, public health and/or environmental protection.

c. Priority Development Project Structural BMP Performance Requirements

In addition to the BMP requirements listed for all development projects under Provision E.3.a, Priority Development Projects must also implement structural BMPs that conform to performance requirements described below. If watershed-specific performance requirements are developed as part of a Water Quality Improvement Plan; these requirements would take precedence over the performance requirements below. The watershed-specific requirement must provide at least equal protection as the performance requirements below.

[29] See "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).
[30] Ibid.

(1) Storm Water Pollutant Control BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite structural BMPs to control pollutants in storm water that may be discharged from a project as follows:

(a) Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite, or offsite if the offsite BMP receives discharges from the PDP prior to discharge to the receiving water, the pollutants contained in the volume of storm water runoff produced from a 24-hour 85th percentile storm event (design capture volume);[31]

(i) If a Copermittee determines that implementing BMPs to retain the full design capture volume onsite, or offsite if the offsite BMP receives discharges from the PDP prior to discharge to the receiving water, for a Priority Development Project is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize biofiltration BMPs. Biofiltration BMPs must be designed to have an appropriate hydraulic loading rate to maximize storm water retention and pollutant removal, as well as to prevent erosion, scour, and channeling within the BMP,[32] and must be sized to:

[a] Treat 1.5 times the design capture volume not reliably retained onsite, OR

[b] Treat the design capture volume not reliably retained onsite with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite.

(ii) If a Copermittee determines that biofiltration is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize flow-thru treatment control BMPs to treat runoff leaving the site, AND mitigate for the design capture volume not reliably retained onsite pursuant to Provision E.3.c.(1)(b). Flow thru treatment control BMPs must be sized and designed to:

[31] This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals.

[32] As part of the Copermittee's update to its BMP Design Manual, pursuant to Provision E.3.d, the Copermittee must provide guidance for hydraulic loading rates and other biofiltration design criteria necessary to maximize storm water retention and pollutant removal.

[a] Remove pollutants from storm water to the MEP;

[b] Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;

[c] Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Flow-thru treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of flow-thru treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

(b) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1)(a). The Priority Development Project must mitigate for the portion of the pollutant load in the design capture volume not retained onsite if Provision E.3.c.(3) is utilized. ~~If a Priority Development Project is allowed to utilize alternative compliance, flow-thru treatment control BMPs must be implemented to treat the portion of the design capture volume that is not reliably retained onsite. Flow-thru treatment control BMPs must be sized and designed in accordance with Provisions E.3.c.(1)(a)(ii)[a]-[c].~~

(2) On-site Hydromodification Management Structural BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite BMPs to manage hydromodification to ensure that ~~may be caused by~~ storm water runoff discharged from a project ~~as follows~~does not cause adverse hydromodification impacts in the downstream receiving waters.~~:~~

The Copermittees in each Watershed Management Area may establish, as part of the WQIP, watershed specific requirements that will apply to priority development projects based on the susceptibility of the receiving waters to hydromodification impacts and historic receiving water changes from development. If watershed specific requirements are developed they will supersede requirements in the HMP. The watershed specific requirements must include the following:

(a) Post-project runoff conditions (flow rates and durations) must not exceed the performance standard to be determined as a part of the development of the WQIPs for each watershed Management Area ~~pre-development~~

~~runoff conditions~~ by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat downstream of Priority Development Projects).

(i) In evaluating the range of flows that results in increased potential for erosion of natural (non-hardened) channels, the lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks.

(ii) The Copermittees may use monitoring results collected pursuant to Provision D.1.a.(2) to re-define the range of flows resulting in increased potential for erosion, or degraded instream habitat conditions, as warranted by the data.

(b) Each Priority Development Project must avoid critical sediment yield areas known to the Copermittee or identified by the optional Watershed Management Area Analysis pursuant to Provision B.3.b.(4), or implement measures that allow critical coarse sediment to be discharged to receiving waters, such that there is no net impact to the receiving water.

(c) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the performance requirements of Provision E.3.c.(2)(a). The Priority Development Project must mitigate for the post-project runoff conditions not fully managed onsite if Provision E.3.c.(3) is utilized.

(d) Exemptions

Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provisions E.3.c.(2) where the project discharges storm water runoff to:

(i) Existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;

(ii) Conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; or

(iii) An area identified by the Copermittees as appropriate for an exemption by the optional Watershed Management Area Analysis incorporated into the Water Quality Improvement Plan pursuant to Provision B.3.b.(4).

(e) Interim Timeframe Exemptions

Until the Copermittees have updated their BMP Design Manual and received Regional Board approval in accordance with Provision F.2.b with the requirements of Provision E, the Copermittees have the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provision E.3.c.(2) where the project discharges storm water runoff directly to:

(i) An engineered channel conveyance system with a capacity to convey peak flows generated by the 10-year storm event all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; and

(ii) Large river reaches with a drainage area larger than 100 square miles and a 100-year flow capacity in excess of 20,000 cubic feet per second, provided that properly sized energy dissipation is included at all Priority Development Project discharge points.

(3) Alternative Compliance Program to Onsite Structural BMP Implementation

At the discretion of each Copermittee, Priority Development Projects may be allowed to participate in an alternative compliance program in lieu of implementing the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a), provided that the Water Quality Improvement Plan includes the optional Watershed Management Area Analysis described in Provision B.3.b.(4). The alternative compliance

program is available to a Priority Development Project only if the Priority Development Project applicant enters into a voluntary agreement with the Copermittee authorizing this arrangement. In addition to the voluntary agreement, relief from implementing structural BMPs onsite may be authorized by the Copermittee under the following conditions:

(a) Watershed Management Area Analysis Candidate Projects

The Priority Development Project applicant agrees to fund, contribute funds to, or implement a candidate project identified by the Copermittees in the Watershed Management Area Analysis included in the Water Quality Improvement Plan, pursuant to Provisions B.3.b.(4) subject to the following conditions:

(i) The Copermittee must determine that implementation of the candidate project will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a) onsite;

(ii) If the Priority Development Project applicant chooses to fully or partially fund a candidate project, then the in-lieu fee structure described in Provision E.3.c.(3)(c) must be followed;

(iii) If the Priority Development Project applicant chooses to fully or partially fund a candidate project, then the Copermittee must ensure that the funds to be obtained from the Priority Development Project applicant are sufficient to mitigate for impacts caused by not fully implementing structural BMPs onsite, pursuant to the performance requirements described in Provisions E.3.c.(1) and E.3.c.(2)(a);

(iv) If the Priority Development Project applicant chooses to implement a candidate project, then the Copermittee must ensure that pollutant control and/or hydromodification management within the candidate project are sufficient to mitigate for impacts caused by not implementing structural BMPs fully onsite, pursuant to the performance requirements described in Provisions E.3.c.(1) and E.3.c.(2)(a);

(v) The voluntary agreement to fund, partially fund, or implement a candidate project must include reliable sources of funding for operation and maintenance of the candidate project;

(vi) Design of the candidate project must be conducted under an appropriately qualified engineer, geologist, architect, landscape architect, or other professional, licenses where applicable, and competent and proficient in the fields pertinent to the candidate project design;

(vii) The candidate project must be constructed as soon as possible, but no later than 4 years after the certificate of occupancy is granted for

the first Priority Development Project that contributed funds toward the construction of the candidate project, unless a longer period of time is authorized by the San Diego Water Board Executive Officer; and

(viii) If the candidate project is constructed after the Priority Development Project is constructed, the Copermittee must require temporal mitigation for pollutant loads and altered flows that are discharged from the Priority Development Project.

(b) Project Applicant Proposed Alternative Compliance Projects

The Copermittee may allow a Priority Development Project applicant to propose and fund, contribute funds to, or implement an alternative compliance project not identified by the Watershed Management Area Analysis included in the Water Quality Improvement Plan pursuant to Provisions B.3.b.(4). This option is allowed provided the Copermittee determines that implementation of the alternative compliance project will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a) onsite, and is subject to the requirements described in Provisions E.3.c.(3)(a)(ii)-(viii).

(c) Alternative Compliance In-Lieu Fee Structure

If a Copermittee chooses to allow a Priority Development Project applicant to fund, or partially fund a candidate project or an alternative compliance project, then the Copermittee must develop and implement an in-lieu fee structure. This may be developed individually or with other Copermittees and/or entities, as a means for designing, developing, constructing, operating and maintaining offsite alternative compliance projects. The in-lieu fee must be transferred to the Copermittee (for public projects) or an escrow account (for private projects) prior to the construction of the Priority Development Project.

(d) Alternative Compliance Water Quality Credit System Option

The Copermittee may develop and implement an alternative compliance water quality credit system option, individually or with other Copermittees and/or entities. ~~, provided that such a credit system clearly exhibits that it will not allow discharges from Priority Development Projects to cause or contribute to a net impact over and above the impact caused by projects meeting the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a)~~. Any credit system that a Copermittee chooses to implement must be submitted to the San Diego Water Board Executive Officer for review and acceptance as part of the Water Quality Improvement Plan.

(4) Long-Term Structural BMP Maintenance

Each Copermittee must require the project applicant to submit proof of the mechanism under which ongoing long-term maintenance of all structural BMPs will be conducted.

(5) Infiltration and Groundwater Protection

(a) Structural BMPs designed to primarily function as large, centralized infiltration devices (such as large infiltration trenches and infiltration basins) must not cause or contribute to an exceedance of an applicable groundwater quality objective. At a minimum, such infiltration BMPs must be in conformance with the design criteria listed below, unless the development project applicant demonstrates to the Copermittee that one or more of the specific design criteria listed below are not necessary to protect groundwater quality. The design criteria listed below do not apply to small infiltration systems dispersed throughout a development project.

(i) Runoff must undergo pretreatment such as sedimentation or filtration prior to infiltration;

(ii) Pollution prevention and source control BMPs must be implemented at a level appropriate to protect groundwater quality at sites where infiltration BMPs are to be used;

(iii) Infiltration BMPs must be adequately maintained to remove pollutants in storm water to the MEP;

(iv) The vertical distance from the base of any infiltration BMP to the seasonal high groundwater mark must be at least 10 feet. Where groundwater basins do not support beneficial uses, this vertical distance criteria may be reduced, provided groundwater quality is maintained;

(v) The soil through which infiltration is to occur must have physical and chemical characteristics (e.g., appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses;

(vi) Infiltration BMPs must not be used for areas of industrial or light industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee, unless source control BMPs to prevent exposure of high threat activities are implemented, or runoff from such activities is first treated or filtered to remove pollutants prior to infiltration; and

(vii) Infiltration BMPs must be located a minimum of 100 feet horizontally from any water supply wells.

(b) The Copermittee may develop, individually or with other Copermittees, alternative mandatory design criteria to that listed above for infiltration BMPs which are designed to primarily function as centralized infiltration devices. Before implementing the alternative design criteria in the development planning process the Copermitee(s) must:

(i) Notify the San Diego Water Board of the intent to implement the alternative design criteria submitted; and

(ii) Comply with any conditions set by the San Diego Water Board.

d. BMP DESIGN MANUAL UPDATE

Each Copermittee must update its BMP Design Manual[33] pursuant to Provision F.2.b. Until the Copermittee has updated its BMP Design Manual with the requirements of Provisions E.3.a-c, the Copermittee must continue implementing its current BMP Design Manual. Unless directed otherwise by the San Diego Water Board, the Copermittee must implement the BMP Design Manual within 180 days of completing the update. The update of the BMP Design Manual must include the following:

(1) Updated procedures to determine the nature and extent of storm water requirements applicable to a potential development or redevelopment projects. These procedures must inform project applicants of the storm water management requirements applicable to their project including, but not limited to, general requirements for all development projects, structural BMP design procedures and requirements, hydromodification management requirements, requirements specific to phased projects, and procedures specific to private developments and public improvement projects;

(2) Updated procedures to identify pollutants and conditions of concern for selecting the most appropriate structural BMPs that consider, at a minimum, the following:

(a) Receiving water quality (including pollutants for which receiving waters are listed as impaired under the CWA section 303(d) List);

(b) Pollutants, stressors, and/or receiving water conditions that cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(c) Land use type of the project and pollutants associated with that land use type; and

[33] The BMP Design Manual was formerly known as the Standard Storm Water Mitigation Plan under Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016.

(d) Pollutants expected to be present onsite.

(3) Updated procedures for designing structural BMPs, including any updated performance requirements to be consistent with the requirements of Provision E.3.c for all structural BMPs listed in the BMP Design Manual;

(4) Long-term maintenance criteria for each structural BMP listed in the BMP Design Manual; and

(5) Alternative compliance criteria, in accordance with the requirements under Provision E.3.c.(3), if the Copermittee elects to allow Priority Development Projects within its jurisdiction to utilize alternative compliance.

e. PRIORITY DEVELOPMENT PROJECT BMP IMPLEMENTATION AND OVERSIGHT

Each Copermittee must implement a program that requires and confirms structural BMPs on all Priority Development Projects are designed, constructed, and maintained to remove pollutants in storm water to the MEP.

(1) Structural BMP Approval and Verification Process

(a) Each Copermittee must require and confirm that for all Priority Development Project applications that have not received prior lawful approval by the Copermittee by the time the BMP Design Manual is implemented~~updated~~ pursuant to Provision E.3.d, the requirements of Provision E.3 are implemented. For project applications that have received prior lawful approval before the BMP Design Manual is implemented~~updated~~ pursuant to Provision E.3.d, the Copermittee may allow previous land development requirements to apply.

(b) Each Copermittee must identify the roles and responsibilities of its various municipal departments in implementing the structural BMP requirements, including each stage of a project from application review and approval through BMP maintenance and inspections.

(c) Each Copermittee must require and confirm that appropriate easements and ownerships are properly recorded in public records and the information is conveyed to all appropriate parties when there is a change in project or site ownership.

(d) Each Copermittee must require and confirm that prior to occupancy and/or intended use of any portion of the Priority Development Project, each structural BMP is inspected to verify that it has been constructed and is operating in compliance with all of its specifications, plans, permits, ordinances, and the requirements of this Order.

(2) Priority Development Project Inventory and Prioritization

(a) Each Copermittee must develop, maintain, and update at least annually, a watershed-based database to track and inventory all Priority Development Projects and associated structural BMPs within its jurisdiction. Inventories must be accurate and complete beginning from December 2002 for the San Diego County Copermittees, February 2003 for the Orange County Copermittees, and July 2005 for the Riverside County Copermittees. The use of an automated database system, such as GIS, is highly recommended. The database must include, at a minimum, the following information:

(i) Priority Development Project location (address and hydrologic subarea);

(ii) Descriptions of structural BMP type(s);

(iii) Date(s) of construction;

(iv) Party responsible for structural BMP maintenance;

(v) Dates and findings of structural BMP maintenance verifications; and

(vi) Corrective actions and/or resolutions, when applicable.

(b) Each Copermittee must prioritize the Priority Development Projects with structural BMPs within its jurisdiction. The designation of Priority Development Projects as high priority must consider the following:

(i) The highest water quality priorities identified in the Water Quality Improvement Plan;

(ii) Receiving water quality;

(iii) Number and sizes of structural BMPs;

(iv) Recommended maintenance frequency of structural BMPs;

(v) Likelihood of operation and maintenance issues of structural BMPs;

(vi) Land use and expected pollutants generated; and

(vii) Compliance record.

(3) Structural BMP Maintenance Verifications and Inspections

Each Copermittee is required to verify that structural BMPs on each Priority Development Project are adequately maintained, and continue to operate effectively to remove pollutants in storm water to the MEP through inspections, self-certifications, surveys, or other equally effective approaches.

(a) All (100 percent) of the structural BMPs at Priority Development Projects that are designated as high priority must be inspected directly by the

Copermittee annually prior to each rainy season;

(b) For verifications performed through a means other than direct Copermittee inspection, adequate documentation must be required by the Copermittee to provide assurance that the required maintenance of structural BMPs at each Priority Development Project has been completed; and

(c) Appropriate follow-up measures (including re-inspections, enforcement, etc.) must be conducted to ensure that structural BMPs at each Priority Development Project continue to reduce pollutants in storm water to the MEP as originally designed.

f. Development Project Enforcement

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all development projects, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

4. Construction Management

Each Copermittee must implement a construction management program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1). ~~and includes, at a minimum, the following requirements:~~ The requirements of the jurisdictional runoff management programs as outlined below may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality improvement Plan(s).

a. Project Approval Process

Prior to issuance of any local permit(s) that allows the commencement of construction projects that involve ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff, each Copermittee must:

(1) Require a pollution control plan, construction BMP plan, and/or an erosion and sediment control plan, to be submitted by the project applicant to the Copermittee;

(2) Confirm the pollution control plan, construction BMP plan, and/or erosion and sediment control plan, complies with the local grading ordinance, other applicable local ordinances, and the requirements of this Order;

(3) Confirm the pollution control, construction BMP, and/or erosion and sediment control plan, includes seasonally appropriate and effective BMPs and management measures described in Provision E.4.c, as applicable to the

project; and

(4) Verify that the project applicant has obtained coverage under the statewide Construction General Permit (Order ~~2012-0006~~2009-0009-DWQ or subsequent Order), if applicable.

b. CONSTRUCTION SITE INVENTORY AND TRACKING

(1) Each Copermittee must maintain and update, at least quarterly, a watershed-based inventory of all construction projects issued a local permit that allows ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff. The use of an automated database system, such as GIS, is highly recommended. The inventory must include:

(a) Relevant contact information for each site (e.g., name, address, phone, and email for the owner and contractor);

(b) The basic site information including location (address and hydrologic subarea), Waste Discharge Identification (WDID) number (if applicable), size of the site, and approximate area of disturbance;

(c) Whether or not the site is considered a high threat to water quality, as defined in Provision E.4.b.(2) below;

(d) The project start and completion dates;

(e) The required inspection frequency, as defined in the Copermittee's jurisdictional runoff management program document;

(f) The date the Copermittee accepted or approved the pollution control plan, construction BMP plan, and/or erosion and sediment control plan; and

(g) Whether or not there are ongoing enforcement actions administered to the site.

(2) Each Copermittee must identify all construction sites within its jurisdiction that represent a high threat to downstream surface water quality. The designation of construction sites as high threat to water quality must consider the following:

(a) Sites located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Sites located within the same hydrologic subarea and tributary to a water body segment listed as impaired for sediment on the CWA section 303(d) List;

(c) Sites located within, directly adjacent to, or discharging directly to a receiving water within an ESA; and

(d) Other sites determined by the Copermittees or the San Diego Water Board as a high threat to water quality.

c. CONSTRUCTION SITE BMP IMPLEMENTATION

Each Copermittee must implement, or require the implementation of effective BMPs to reduce discharges of pollutants in storm water from construction sites to the MEP, and effectively prohibit non-storm water discharges from construction sites into the MS4. These BMPs must be site specific, seasonally appropriate, and construction phase appropriate. BMPs must be implemented at each construction site year round. Dry season BMP implementation must plan for and address unseasonal rain events that may occur during the dry season (May 1 through September 30). Copermittees must implement, or require the implementation of, BMPs in the following categories:

(1) Project Planning;

(2) Good Site Management "Housekeeping", including waste management;

(3) Non-storm Water Management;

(4) Erosion Control;

(5) Sediment Control;

(6) Run-on and Run-off Control; and

(7) Active/Passive Sediment Treatment Systems, where applicable.

d. CONSTRUCTION SITE INSPECTIONS

Each Copermittee must conduct construction site inspections to require and confirm compliance with its local permits and applicable local ordinances, and the requirements of this Order. Priority for site inspections must consider threat to water quality pursuant to Provision E.4.b as well as the nature of the construction activity, topography, and the characteristics of soils and receiving water quality.

(1) <u>Inspection Frequency</u>

(a) Each Copermittee must conduct inspections at all inventoried sites, including high threat to water quality sites, at an appropriate frequency for each phase of construction to confirm the site reduces the discharge of pollutants in storm water from construction sites to the MEP, and

effectively prohibits non-storm water discharges from entering the MS4.

(b) Each Copermittee must establish appropriate inspection frequencies for high threat to water quality sites, and all other sites, for each phase of construction. Inspection frequencies appropriate for addressing the highest water quality priorities identified in the Water Quality Improvement Plan, and for complying with the requirements of this Order must be identified in each Copermittee's jurisdictional runoff management program document.

(c) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e., re-inspection, enforcement) necessary to require and confirm site compliance with its local permits and applicable local ordinances, and the requirements of this Order.

(2) Inspection Content

Inspections of construction sites by the Copermittee must include, at a minimum:

(a) Verification of coverage under the Construction General Permit (Notice of Intent (NOI) and/or WDID number) during initial inspections, when applicable;

(b) Assessment of compliance with its local permits and applicable local ordinances related to pollution prevention, including the implementation and maintenance of applicable BMPs;

(c) Assessment of BMP adequacy and effectiveness;

(d) Visual observations of actual non-storm water discharges;

(e) Visual observations of actual or potential discharge of sediment and/or construction related materials from the site;

(f) Visual observations of actual or potential illicit connections; and

(g) If any violations are found and BMP corrections are needed, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried construction sites. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made

available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Site name, location (address and hydrologic subarea), and WDID number (if applicable);

(b) Inspection date;

(c) ~~Approximate amount of rainfall since last~~ Weather conditions during the inspection;

(d) Description of problems observed with BMPs and indication of need for BMP addition/repair/replacement and any scheduled re-inspection, and date of re-inspection;

(e) Descriptions of any other specific inspection comments which must, at a minimum, include rationales for longer compliance time;

(f) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(g) Resolution of problems noted and date problems fixed.

e. CONSTRUCTION SITE ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried construction sites, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

5. Existing Development Management

Each Copermittee must implement an existing development management program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1). ~~and includes, at a minimum, the following requirements:~~ The requirements of the jurisdictional runoff management programs as outlined below may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality improvement Plan(s).

a. EXISTING DEVELOPMENT INVENTORY AND TRACKING

Each Copermittee must maintain, and update at least annually, a watershed-based inventory of the existing development within its jurisdiction that may discharge a high priority pollutant load to and from the MS4. The use of an automated database system, such as GIS, is highly recommended. The

inventory must, at a minimum, evaluate and include the following if identified as a source of a high priority pollutant ~~include~~:

(1) Name, location (hydrological subarea and address, if applicable) of the following types of existing development with its jurisdiction:

(a) Commercial facilities or areas;

(b) Industrial facilities;

(c) Municipal facilities, including:

(i) MS4 and related structures;[34]
(ii) Roads, streets, and highways;
(iii) Parking facilities;
(iv) Municipal airfields;
(v) Parks and recreation facilities;
(vi) Flood management facilities, flood control devices and structures;
(vii) Operating or closed municipal landfills;
(viii) Publicly owned treatment works (including water and wastewater treatment plants) and sanitary sewer collection systems;
(ix) Corporate yards, including maintenance and storage yards for materials, waste, equipment, and vehicles;
(x) Hazardous waste collection facilities;
(xi) Other treatment, storage or disposal facilities for municipal waste; and
(xii) Other municipal facilities that the Copermittee determines may contribute a significant high priority pollutant load to the MS4.

(d) Residential areas, which may be designated by one or more of the following:

(i) Residential management area;
(ii) Drainage basin or area;
(iii) Land use (e.g., single family, multi-family, rural);
(iv) Neighborhood;
(v) Common Interest Area;
(vi) Home Owner Association;
(vii) Mobile home park; and/or
(viii) Other designations accepted by the San Diego Water Board

[34] The inventory may refer to the MS4 map required to be maintained pursuant to Provision E.2.b.(1).

Executive Officer.

(2) A description of the facility or area, including the following information:

(a) Classification as commercial, industrial, municipal, or residential;

(b) Status of facility or area as active or inactive;

(c) Identification if a business is a mobile business;

(d) SIC Code or NAICS Code, if applicable;

(e) Industrial General Permit NOI and/or WDID number, if applicable;

(f) Identification if a residential area is or includes a Common Interest Area / Home Owner Association, or mobile home park;

(g) Identification of the high priority pollutants generated and potentially generated by the facility or area;

(h) Whether the facility or area is adjacent to an ESA;

(i) Whether the facility or area is tributary to and within the same hydrologic subarea as a water body segment listed as impaired on the CWA section 303(d) List and generates pollutants for which the water body segment is impaired; and

(3) An annually updated map showing the location of inventoried existing development, watershed boundaries, and water bodies.

b. EXISTING DEVELOPMENT BMP IMPLEMENTATION AND MAINTENANCE

Each Copermittee must designate a ~~minimum~~ set of BMPs required for all inventoried existing development, including special event venues. The designated ~~minimum~~ BMPs must be specific to the identified high priority facility or area types and high priority pollutant generating activities, as appropriate.

(1) Commercial, Industrial, and Municipal Facilities and Areas

(a) Pollution Prevention

Each Copermittee must require the use of pollution prevention methods by the commercial, industrial, and municipal facilities and areas in its inventoried existing development to address the priorities and strategies in the Water Quality Improvement Plan.

(b) BMP Implementation

Each Copermittee must require the implementation of designated BMPs at

commercial facilities and areas, industrial facilities, and implement designated BMPs at municipal facilities in its inventoried existing development.

(c) BMP Operation and Maintenance

(i) Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development.

(ii) Each Copermittee must implement a schedule of operation and maintenance activities for its MS4 and related structures (including but not limited to catch basins, storm drain inlets, detention basins, etc.), and verify proper operation of all its municipal structural treatment controls designed to reduce pollutants (including floatables) in storm water discharges to or from its MS4s and related drainage structures. Operation and maintenance activities may include, but is not limited to, the following:

[a] Inspections of the MS4 and related structures;
[b] Cleaning of the MS4 and related structures; and
[c] Proper disposal of materials removed from cleaning of the MS4 and related structures.

(iii) Each Copermittee must implement a schedule of operation and maintenance for public streets, unpaved roads, paved roads, and paved highways within its jurisdiction to minimize pollutants that can be discharged in storm water.

(iv) Each Copermittee must implement controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers. Copermittees that operate both a municipal sanitary sewer system and a MS4 must implement controls and measures to prevent and eliminate seeping sewage from infiltrating the MS4. Copermittees that do not operate both a municipal sanitary sewer system and a MS4 must coordinate with sewering agencies to keep themselves informed of relevant and appropriate maintenance activities and sanitary sewage projects in their jurisdiction that may cause or contribute to seepage of sewage into the MS4.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must require the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from commercial facilities and areas and industrial facilities, and implement BMPs at municipal facilities in its inventoried existing development. Such BMPs must include,

as appropriate, educational activities, permits, certifications and other measures for applicators and distributors.

(2) Residential Areas

(a) Pollution Prevention

Each Copermittee must promote and encourage the use of pollution prevention methods, where appropriate, by the residential areas in its inventoried existing development.

(b) BMP Implementation

Each Copermittee must promote and encourage the implementation of designated BMPs at residential areas in its inventoried existing development.

(c) BMP Operation and Maintenance

Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at residential areas in its inventoried existing development.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must promote and encourage the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from residential areas in its inventoried existing development.

c. Existing Development Inspections

Each Copermittee must conduct inspections of inventoried existing development to ensure compliance with applicable local ordinances and permits, and the requirements of this Order.

(1) Inspection Frequency

(a) Each Copermittee must establish appropriate inspection frequencies for inventoried existing development in accordance with the following requirements:

(i) At a minimum, inventoried existing development must be inspected once every five years utilizing one or more of the following methods:

[a] Drive-by inspections by Copermittee municipal and contract staff;

[b] Onsite inspections by Copermittee municipal and contract staff; and/or

[c] Visual inspections of publicly accessible inventoried facilities or areas by volunteer monitoring or patrol programs that have been trained by the Copermittee;

(ii) The frequency of inspections must be appropriate to confirm that BMPs are being implemented to reduce the discharge of pollutants in storm water from the MS4 to the MEP and effectively prohibit non-storm water discharges into the MS4;

(iii) The frequency of inspections must be based on the potential for a facility or area to discharge non-storm water and pollutants in storm water, and should reflect the priorities set forth in the Water Quality Improvement Plan;

(iv) Each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development;[35] and

(v) Inventoried existing development must be inspected by the Copermittee, as needed, in response to valid public complaints.

(b) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e. education and outreach, re-inspection, enforcement) necessary to require and confirm compliance with its applicable local ordinances and permits and the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

(2) Inspection Content

(a) Inspections of existing development must include, at a minimum:

(i) Visual inspections for the presence of actual non-storm water discharges;

(ii) Visual inspections for the presence of actual or potential discharge of pollutants;

(iii) Visual inspections for the presence of actual or potential illicit connections; and

(iv) Verification that the description of the facility or area in the inventory, required pursuant to Provision E.5.a.(2), has not changed.

[35] If any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspection may count toward the total annual inspection requirement. This requirement excludes linear municipal facilities (i.e., MS4 linear channels, sanitary sewer collection systems, streets, roads and highways).

(b) Onsite inspections of existing development by the Copermittee must include, at a minimum:

(i) Assessment of compliance with its applicable local ordinances and permits related to non-storm water and storm water discharges and runoff;

(ii) Assessment of the implementation of the designated BMPs;

(iii) Verification of coverage under the Industrial General Permit, when applicable; and

(iv) If any problems or violations are found, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried existing development. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Name and location of the facility or area (address and hydrologic subarea) consistent with the inventory name and location, pursuant to Provision E.5.a.(1);

(b) Inspection and re-inspection date(s);

(c) Inspection method(s) (i.e. drive-by, onsite);

(d) Observations and findings from the inspection(s);

(e) For onsite inspections of existing development by Copermittee municipal or contract staff, the records must also include, as applicable:

(i) Description of any problems or violations found during the inspection(s);

(ii) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(iii) The date problems or violations were resolved.

d. EXISTING DEVELOPMENT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried existing development, as necessary, to

achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

e. RETROFITTING AND REHABILITATING AREAS OF EXISTING DEVELOPMENT

(1) Retrofitting Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to retrofit areas of existing development within its jurisdiction to address identified sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify areas of existing development as candidates for retrofitting, focusing on areas where retrofitting will address pollutants and/or stressors that contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for retrofitting projects may be utilized to reduce pollutants that may be discharged in storm water from areas of existing development, and/or address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of retrofitting projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting projects; and

(e) Where retrofitting projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional retrofitting projects (i.e. projects that can receive and/or treat storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment) adjacent to and/or downstream of the areas of existing development.

(2) Stream, Channel and/or Habitat Rehabilitation in Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management

program document, a program to rehabilitate streams, channels, and/or habitats in areas of existing development within its jurisdiction or just downstream of its jurisdiction to address the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) ~~Each Copermittee must identify streams, channels, and/or habitats in areas of existing development as candidates for rehabilitation, focusing on areas where stream, channel, and/or habitat rehabilitation projects will address the highest priority water quality conditions identified in the Water Quality Improvement Plan~~;

(b) Candidates for stream, channel, and/or habitat rehabilitation projects may be utilized to address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters, rehabilitate channelized or hydromodified streams, ~~restore~~ protect wetland and riparian habitat, ~~restore~~ protect watershed functions, and/or ~~restore~~ protect beneficial uses of receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of stream, channel, and/or habitat rehabilitation projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance stream, channel, and/or habitat rehabilitation projects; and

(e) Where stream, channel, and/or habitat rehabilitation projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional stream, channel, and/or habitat rehabilitation projects (i.e. projects that can receive storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment).

6. Enforcement Response Plans

Each Copermittee must develop and implement an Enforcement Response Plan as part of its jurisdictional runoff management program document. The Enforcement Response Plan must describe the applicable approaches and options to enforce its legal authority established pursuant to Provision E.1, as necessary, to achieve compliance with the requirements of this Order. Copermittees may continue to utilize and implement established, equivalent guidelines and procedures for

enforcement. The Enforcement Response Plan must be in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include the following:

a. ENFORCEMENT RESPONSE PLAN COMPONENTS

The Enforcement Response Plan must include and/or address the following individual components:

(1) Illicit Discharge Detection and Elimination Enforcement Component;

(2) Development Planning Enforcement Component;

(3) Construction Management Enforcement Component; and

(4) Existing Development Enforcement Component.

b. ENFORCEMENT RESPONSE APPROACHES AND OPTIONS

Each component of the Enforcement Response Plan must describe the enforcement response approaches that the Copermittee will implement to compel compliance with its statutes, ordinances, permits, contracts, orders, or similar means, and the requirements of this Order. The description must include the protocols for implementing progressively stricter enforcement responses. The enforcement response approaches must include appropriate sanctions to compel compliance, including, at a minimum, the following tools or their equivalent:

(1) Verbal and written notices of violation;

(2) Cleanup requirements;

(3) Fines;

(4) Bonding requirements;

(5) Administrative and criminal penalties;

(6) Liens;

(7) Stop work orders; and

(8) Permit and occupancy denials.

c. CORRECTION OF VIOLATIONS

(1) Violations must be corrected in a timely manner with the goal of correcting the violations within 30 calendar days after the violations are discovered, or prior

to the next predicted rain event, whichever is sooner.

(2) If more than 30 calendar days are required to achieve compliance, then a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

d. ~~ESCALATED~~ PROGRESSIVE ENFORCEMENT

(1) The Enforcement Response Plan must include a definition of "~~escalated~~ progressive enforcement." ~~Escalated~~ Progressive enforcement must include a series of enforcement actions that match the severity of the violations and include distinct, progressive steps. ~~any enforcement scenario where a violation or other non-compliance is determined to cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan.~~ Progressive ~~Escalated~~ enforcement may be defined differently for development planning, construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and/or residential areas.

(2) Where the Copermittee determines ~~escalated~~ progressive enforcement is not required, a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

(3) ~~Escalated~~ Progressive enforcement actions must continue to increase in severity, as necessary, to compel compliance as soon as possible.

e. REPORTING OF NON-COMPLIANT SITES

(1) Each Copermittee must notify the San Diego Water Board in writing within five (5) calendar days of issuing escalated enforcement (as defined in the Copermittee's Enforcement Response Plan) to a construction site that poses a significant threat to water quality as a result of violations or other non-compliance with its permits and applicable local ordinances, and the requirements of this Order. Written notification may be provided electronically by email to the appropriate San Diego Water Board staff.

(2) Each Copermittee must notify the San Diego Water Board of any persons required to obtain coverage under the statewide Industrial General Permit and Construction General Permit and failing to do so, within five (5) calendar days from the time the Copermittee become aware of the circumstances. Written notification may be provided electronically by email to R9_Nonfilers@waterboards.ca.gov ~~Nonfilers_R9@waterboards.ca.gov~~.

7. Public Education and Participation

Each Copermittee must implement, individually or with other Copermittees, a public education and participation program in accordance with the strategies identified in the Water Quality Improvement Plan to promote and encourage the development of

programs, management practices, and behaviors that reduce the discharge of pollutants in storm water to the MEP, prevent controllable non-storm water discharges from entering the MS4, and protect water quality standards in receiving waters. The public education and participation program must be implemented in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1). The requirements of the jurisdictional runoff management programs as outlined below may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality improvement Plan(s). ~~and include, at a minimum, the following requirements:~~

a. PUBLIC EDUCATION

The public education program component implemented within the Copermittee's jurisdiction ~~must~~ may include~~, at a minimum,~~ the following:

(1) Educational activities, public information activities, and other appropriate outreach activities intended to reduce pollutants associated with the ~~application of pesticides, herbicides and fertilizer and other pollutants of concern in storm water discharges to and from its MS4 to the MEP, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed to address the~~ highest priority water quality conditions identified in the Water Quality Improvement Plan;

(2) Educational activities, public information activities, and other appropriate outreach activities to facilitate the proper management and disposal of used oil and toxic materials; and

(3) Appropriate education and training measures for specific target audiences, such as construction site operators, residents, underserved target audiences and school-aged children, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed, based on high risk behaviors and pollutants of concern.

b. PUBLIC PARTICIPATION

The public participation program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) A process for members of the public to participate in updating the highest priority water quality conditions, numeric goals, and water quality improvement strategies in the Water Quality Improvement Plan;

(2) Opportunities for members of the public to participate in providing the Copermittee recommendations for improving the effectiveness of the water quality improvement strategies implemented within its jurisdiction; and

(3) Opportunities for members of the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or protection of the quality of receiving waters.

8. Fiscal Analysis

a. Each Copermittee must secure the resources necessary to meet all the requirements of this Order.

b. Each Copermittee must conduct an annual fiscal analysis of its jurisdictional runoff management program in its entirety. The fiscal analysis must include the following:

(1) Identification of the various categories of expenditures necessary to implement the requirements of this Order, including a description of the specific capital, operation and maintenance, and other expenditure items to be accounted for in each category of expenditures;

(2) The staff resources needed and allocated to meet the requirements of this Order, including any development, implementation, and enforcement activities required;

(3) The estimated expenditures for Provisions E.8.b.(1) and E.8.b.(2) for the current fiscal year; and

(4) The source(s) of funds that are proposed to meet the necessary expenditures described in Provisions E.8.b.(1) and E.8.b.(2), including legal restrictions on the use of such funds, for the current fiscal year and next fiscal year.

c. Each Copermittee must submit a summary of the annual fiscal analysis with each Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3).

d. Each Copermittee must provide the documentation used to develop the summary of the annual fiscal analysis upon request by the San Diego Water Board.

F. REPORTING

The purpose of this provision is to determine and document compliance with the requirements set forth in this Order. The goal of reporting is to communicate to the San Diego Water Board and the people of the State of California the implementation status of each jurisdictional runoff management program and compliance with the requirements of this Order. This goal is to be accomplished through the submittal of specific deliverables to the San Diego Water Board by the Copermittees.

1. Water Quality Improvement Plans

The Copermittees for each Watershed Management Area must develop and submit the Water Quality Improvement Plan in accordance with the following requirements:

a. WATER QUALITY IMPROVEMENT PLAN DEVELOPMENT

Each Water Quality Improvement Plan must be developed in accordance with the following process:

(1) Public Participation Process

The Copermittees must implement a public participation process to solicit data, information, and recommendations to be utilized in the development of the Water Quality Improvement Plan. The public participation process must include the following:

(a) The Copermittees must develop a publicly available and noticed schedule of the opportunities for the public to participate and provide comments during the development of the Water Quality Improvement Plan. The schedule may be adjusted as necessary by the Copermittees, provided the public is provided timely notification of the changes to the schedule.

(b) The Copermittees must form a Water Quality Improvement Consultation Panel to provide recommendations during the development of the Water Quality Improvement Plan. The Water Quality Improvement Consultation Panel must consist of at least the following members:

(i) A representative of the San Diego Water Board;

(ii) A representative of the environmental community familiar with the water quality conditions of concern of the receiving waters in the Watershed Management Area, preferably from an environmental interest group associated with a water body within the Watershed Management Area; and

(iii) A representative of the development community familiar with the opportunities and constraints for implementing structural BMPs, retrofitting projects, and stream, channel or habitat rehabilitation

projects in the Watershed Management Area, preferably with relevant engineering, hydrology, and/or geomorphology experience in the Watershed Management Area.

(c) The Copermittees must coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public time and opportunity to participate during the development of the Water Quality Improvement Plans.

(2) Priority Water Quality Conditions

(a) The Copermittees must solicit data, information and recommendations from the public to be utilized in the development and identification of the priority water quality conditions and potential water quality improvement strategies for the Watershed Management Area.

(b) The Copermittees must review the priority water quality conditions the Copermittees plan on including in the Water Quality Improvement Plan with the Water Quality Improvement Consultation Panel to receive recommendations or concurrence.

(c) The Copermittees must consider revisions to the priority water quality conditions based on recommendations from the Water Quality Improvement Consultation Panel.

(d) The Copermittees must include all the potential water quality improvement strategies identified by the public and the Water Quality Improvement Consultation Panel with the submittal of the priority water quality conditions to the San Diego Water Board.

(e) The Copermittees must submit the Water Quality Improvement Plan requirements of Provision B.2 to the San Diego Water Board as early as 6 months and no later than 12 months after the commencement of coverage under this Order. Upon receipt, the San Diego Water Board will issue a public notice and release the proposed priority water quality conditions and potential water quality improvement strategies for public review and comment for a minimum of 30 days.

(f) Within 30 days of receiving the public comments, t~~T~~he Copermittees must consider revisions to the priority water quality conditions and potential water quality improvement strategies developed pursuant to Provision B.2 ~~based on public comments received by the close of the comment period~~.

(3) Water Quality Improvement Goals, Strategies and Schedules

(a) The Copermittees must solicit recommendations from the public on potential numeric goals for the highest priority water quality conditions

identified for the Watershed Management Area, and recommendations on the strategies that should be implemented to achieve the potential numeric goals.

(b) The Copermittees must consult with the Water Quality Improvement Consultation Panel and consider revisions to the following items based on the Panel's recommendations:

(i) The numeric goals and schedules the Copermittees propose to include in the Water Quality Improvement Plan;

(ii) The water quality improvement strategies and schedules the Copermittees propose to implement in the Watershed Management Area and include in the Water Quality Improvement Plan; and

(iii) If the Copermittees choose to implement Provision B.3.b.(4), the results of the Watershed Management Area Analysis the Copermittees proposed to incorporate into the Water Quality Improvement Plan.

(c) The Copermittees must submit the Water Quality Improvement Plan requirements of Provision B.3 to the San Diego Water Board as early as 9 months and no later than 18 months after the commencement of coverage under this Order. Upon receipt, the San Diego Water Board will issue a public notice and release the proposed water quality improvement goals, strategies and schedules for public review and comment for a minimum of 30 days.

(d) Within 30 days of receiving the public comments, t~~T~~he Copermittees must consider revisions to the water quality improvement goals, strategies and schedules developed pursuant to Provision B.3 ~~based on public comments received by the close of the comment period~~.

b. WATER QUALITY IMPROVEMENT PLAN SUBMITTAL AND IMPLEMENTATION

(1) Within 24 months after the commencement of coverage under this Order, the Copermittees for each Watershed Management Area must submit a complete Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order to the San Diego Water Board. The San Diego Water Board will issue a public notice and release the Water Quality Improvement Plan for public review and comment for a minimum of 30 days.

(2) The Copermittees must consider revisions to the Water Quality Improvement Plan based on written comments received by the close of the public comment period.

(3) The Copermittees must promptly submit any revisions to the Water Quality Improvement Plan to the San Diego Water Board no later than 60 days after the close of the public comment period.

(4) If issues concerning the Water Quality Improvement Plan are resolved informally through discussions among the Copermittees, the San Diego Water Board and interested parties, the San Diego Water Board Executive Officer may provide written notification of acceptance to the Copermittees that the Water Quality Improvement Plan meets the requirements of Provision B. However, if the Executive Officer determines that significant issues with the Water Quality Improvement Plan remain, the matter will be scheduled for San Diego Water Board consideration at a public meeting.

(5) The Copermittees must commence with implementation of the Water Quality Improvement Plan, in accordance with the water quality improvement strategies and schedules therein, upon written notification of acceptance with the Water Quality Improvement Plan by the San Diego Water Board Executive Officer.

(6) During implementation of the Water Quality Improvement Plan the Copermittees must correct any deficiencies in the Plan identified by the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report following a request by the Board to do so.

(7) The Water Quality Improvement Plan must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of receiving notification of acceptance with the Water Quality Improvement Plan by the San Diego Water Board Executive Officer.

2. Updates

a. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATES

Each Copermittee must update its jurisdictional runoff management program document in accordance with the following requirements:

(1) Each Copermittee is encouraged to seek public and key stakeholder participation and comments, as early and often as possible during the process of developing updates to its jurisdictional runoff management program document;

(2) Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E concurrent with the submittal of the Water Quality Improvement Plan. Each Copermittee must correct any deficiencies in the jurisdictional runoff management program document based on comments received from the San Diego Water Board in

the updates submitted with the Water Quality Improvement Plan Annual Report;

(3) Each Copermittee must submit updates to its jurisdictional runoff management program, with the supporting rationale for the modifications, either in the Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b;

(4) The Copermittee must revise proposed modifications to its jurisdictional runoff management program as directed by the San Diego Water Board Executive Officer; and

(5) Updated jurisdictional runoff management program documents must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of ~~submitting the Water Quality Improvement Plan Annual Report~~completing the updates.

b. BMP DESIGN MANUAL UPDATES

Each Copermittee must update its BMP Design Manual in accordance with the following requirements:

(1) Each Copermittee must update its BMP Design Manual to incorporate the requirements of Provisions E.3.a-d concurrent with the submittal of the Water Quality Improvement Plan. Each Copermittee must correct any deficiencies in the BMP Design Manual based on comments received from the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report;

(2) Subsequent updates to the BMP Design Manual must be consistent with the requirements of Provisions E.3.a-d and must be submitted as part of the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b; and

(3) Updated BMP Design Manuals must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of completing the update.

c. WATER QUALITY IMPROVEMENT PLAN UPDATES

(1) The Water Quality Improvement Plans must be updated in accordance with the following process:

(a) The Copermittees must develop and implement a public participation process to obtain data, information and recommendations for updating the Water Quality Improvement Plan. The public participation process must provide for a publicly available and noticed schedule of opportunities for the public to participate and provide comments during the development of updates to the Water Quality Improvement Plan;

(b) The Copermittees must consult with the Water Quality Improvement Consultation Panel on proposed updates of the Water Quality Improvement Plan, and consider the Water Quality Improvement Consultation Panel's recommendations in finalizing the proposed updates;

(c) The Copermittees for each Watershed Management Area must submit 1) proposed updates to the Water Quality Improvement Plan and supporting rationale, and 2) recommendations received from the public and the Water Quality Improvement Consultation Panel and the rationale for the requested updates, either in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The updates submitted will be deemed accepted for inclusion in the Water Quality Improvement Plan ninety (90) days after submission unless otherwise directed in writing by the San Diego Water Board Executive Officer;

(d) The Copermittees must revise the requested updates as directed by the San Diego Water Board Executive Officer; and

(e) Updated Water Quality Improvement Plans must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance of the requested updates by the San Diego Water Board.

(2) No later than six months following ~~Office of Administrative Law and USEPA approval of~~ the effective date of any TMDL Basin Plan amendment with wasteload allocations (WLAs) assigned to the Copermittees during the term of this Order, the Copermittees must initiate an update to the applicable Water Quality Improvement Plans in accordance with Provision F.1 or Provision F.2.c.(1) to ensure the WQIP includes actions to address the pollutant-waterbody combination. As TMDLs are not self-implementing, the Order must be re-opened to incorporate the TMDL WLAs. ~~incorporate the requirements of the TMDL WLAs~~.

3. Progress Reporting

a. Progress Report Presentations

The Copermittees for each Watershed Management Area must periodically appear before the San Diego Water Board, as requested by the Board, to provide progress reports on the implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs.

b. Annual Reports

(1) Transitional Jurisdictional Runoff Management Program Annual Reports

(a) Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) no later than October 31 of each year for each jurisdictional runoff management program reporting period (i.e. July 1 to June 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted.

(b) Each Copermittee must submit the information on the Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) specific to the area within its jurisdiction in each Watershed Management Area.

(c) In addition to submitting the Jurisdictional Runoff Management Program Annual Report Form during the transitional reporting period, each Copermittee may continue to utilize and submit the jurisdictional runoff management program annual reporting format of its previous NPDES permit until the first Water Quality Improvement Plan Annual Report is required to be submitted.

(2) Transitional Monitoring and Assessment Program Annual Reports

The Copermittees for each Watershed Management Area must submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted under this Order. The Transitional Monitoring and Assessment Program Annual Reports must include:

(a) The receiving water and MS4 outfall discharge monitoring data collected

pursuant to Provisions D.1.a and D.2.a, summarized and presented in tabular and graphical form; and

(b) The findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

(3) Water Quality Improvement Plan Annual Reports

The Copermittees for each Watershed Management Area must submit a Water Quality Improvement Plan Annual Report for each reporting period no later than January 31 of the following year. The annual reporting period consists of two different periods: 1) July 1 to June 30 of the following year for the jurisdictional runoff management programs, 2) October 1 to September 30 of the following year for the monitoring and assessment programs. The Water Quality Improvement Plan Annual Reports must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Each Annual Report must include the following:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, summarized and presented in tabular and graphical form;

(b) The progress of the special studies required pursuant to Provision D.3, and the findings, interpretations and conclusions of a special study, or each phase of a special study, upon its completion;

(c) The findings, interpretations and conclusions from the assessments required pursuant to Provision D.4;

(d) The progress of implementing the Water Quality Improvement Plan, including, but not limited to, the following:

(i) The progress toward achieving the interim and final numeric goals for the highest water quality priorities for the Watershed Management Area;

(ii) The water quality improvement strategies that were implemented and/or no longer implemented by each of the Copermittees during the reporting period and previous reporting periods;

(iii) The water quality improvement strategies planned for implementation during the next reporting period;

(iv) Proposed modifications to the water quality improvement strategies, the public comments received and the supporting rationale for the proposed modifications;

(v) Previous modifications or updates incorporated into the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff

management program document and implemented by the Copermittees in the Watershed Management Area; and

(vi) Proposed modifications or updates to the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document;

(e) A completed Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) for each Copermittee in the Watershed Management Area, certified by a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative; and

(f) Each Copermittee must provide any data or documentation utilized in developing the Water Quality Improvement Plan Annual Report upon request by the San Diego Water Board. Any Copermittee monitoring data utilized in developing the Water Quality Improvement Plan Annual Report must be uploaded to the California Environmental Data Exchange Network (CEDEN).[36] Any Copermittee monitoring and assessment data utilized in developing the Water Quality Improvement Plan Annual Report must be available for access on the Regional Clearinghouse required pursuant to Provision F.4.

C. Regional Monitoring and Assessment Report

(1) The Copermittees must submit a Regional Monitoring and Assessment Report no later than 180 days prior to the expiration date of this Order. The Regional Monitoring and Assessment Report may be submitted as part of the Report of Waste Discharge required pursuant to Provision F.5.b. In preparing the report the Copermittees must consider the receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, and the findings, interpretations, and conclusions from the assessments required pursuant to Provision D.4. Based on these considerations the report must assess the following:

(a) The beneficial uses of the receiving waters within the San Diego Region that are supported and not adversely affected by the Copermittees' MS4 discharges;

(b) The beneficial uses of the receiving waters within the San Diego Region that are adversely impacted by the Copermittees' MS4 discharges;

(c) The progress toward protecting the beneficial uses in the receiving waters

[36] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

within the San Diego Region from the Copermittees' discharges; and

(d) Pollutants or conditions of emerging concern that may impact beneficial uses in the receiving waters within the San Diego Region.

(2) The Regional Monitoring and Assessment Report must include recommendations for improving the implementation and assessment of the Water Quality Improvement Plans and jurisdictional runoff management programs.

(3) Each Copermittee must provide any data or documentation utilized in developing the Regional Monitoring and Assessment Report upon request by the San Diego Water Board. Any Copermittee monitoring and assessment data utilized in developing the Regional Monitoring and Assessment Report must be available for access on the Regional Clearinghouse required pursuant to Provision F.4.

4. Regional Clearinghouse

The Copermittees must develop, update, and maintain an internet-based Regional Clearinghouse that is made available to the public no later than 18 months after the effective date of this Order.[37]

a. The Copermittees, through the Regional Clearinghouse, must make the following documents and data available for access, and organized by Watershed Management Area. The documents and data may be linked to other internet-based data portals and databases where the original documents are stored:

(1) Water Quality Improvement Plan for the Watershed Management Area, and all updated versions with date of update;

(2) Annual Reports for the Watershed Management Area;

(3) Jurisdictional Runoff Management Program document for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(4) BMP Design Manual for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(5) Reports from special studies (e.g. source identification, BMP effectiveness assessment) conducted in the Watershed Management Area;

[37] The Copermittees may develop, update and maintain the clearinghouse(s) of other Copermittees or agencies.

(6) Monitoring data collected pursuant to Provision D for each Watershed Management Area must be uploaded to CEDEN,[38] with links to the uploaded data; and

(7) Available GIS data, layers, and/or shapefiles used to develop the maps generated and maintained by the Copermittees for the Water Quality Improvement Plans, Annual Reports, and jurisdictional runoff management program documents.

b. The Copermittees, through the Regional Clearinghouse, must make the following information and documents available for access:

(1) Contact information (point of contact, phone number, email address, and mailing address) for each Copermittee;

(2) Public hotline number for reporting non-storm water and illicit discharges for each Copermittee;

(3) Email address for reporting non-storm water and illicit discharges for each Copermittee;

(4) Link to each Copermittee's website, if available, where the public may find additional information about the Copermittee's storm water management program and for requesting records for the implementation of its program;

(5) Information about opportunities for the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or protection of the quality of receiving waters; and

(6) Reports from regional monitoring programs in which the Copermittees participate (e.g. Southern California Monitoring Coalition, Southern California Coastal Water Research Project Bight Monitoring);

(7) Regional Monitoring and Assessment Reports; and

(8) Any other information, data, and documents the Copermittees determine as appropriate for making available to the public.

[38] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

5. Report of Waste Discharge

a. The ~~Orange County Copermittees and the~~ Riverside County Copermittees are required to submit a complete Report of Waste Discharge pursuant to the requirements of their current Order~~s~~. The San Diego Water Board will review and consider the Report~~s~~ of Waste Discharge to determine whether modification to this Order, pursuant to the requirements of Provision H, will be required prior to the ~~Orange County Copermittees and/or~~ Riverside County Copermittees obtaining coverage under this Order. The current Order ~~s~~ for ~~the Orange County Copermittees and~~ Riverside County Copermittees is ~~are~~ rescinded upon the date of effective coverage under this Order except for enforcement purposes.

b. The Copermittees subject to the requirements of this Order must submit to the San Diego Water Board a complete Report of Waste Discharge as an application for the re-issuance of this Order and NPDES permit. The Report of Waste Discharge must be submitted no later than 180 days in advance of the expiration date of this Order. The Report of Waste Discharge must contain the following minimum information:

(1) Names and addresses of the Copermittees;

(2) Names and titles of the primary contacts of the Copermittees;

(3) Proposed changes to the Copermittees' Water Quality Improvement Plans and the supporting justification;

(4) Proposed changes to the Copermittees' jurisdictional runoff management programs and the supporting justification;

(5) Any other information necessary for the re-issuance of this Order;

(6) Any information to be included as part of the Report of Waste Discharge pursuant to the requirements of this Order; and

(7) Any other information required by federal regulations for NPDES permit reissuance.

6. Application for Early Coverage

a. The ~~Orange County Copermittees, collectively, or~~ Riverside County Copermittees~~, collectively,~~ may apply for early coverage under this Order by submitting a Report of Waste Discharge Form 200, with a written request for early coverage under this Order.

b. The San Diego Water Board will review the application for early coverage. A notification of coverage under this Order will be issued to the Copermittees in the

respective county by the San Diego Water Board upon completion of the early coverage application requirements. The effective coverage date will be specified in the notification of coverage. The Copermittees in the respective county are authorized to have MS4 discharges pursuant to the requirements of this Order starting on the effective coverage date specified in the notification of coverage. The existing Order for the respective county is rescinded upon the effective coverage date specified in the notification of coverage except for enforcement purposes.

7. Reporting Provisions

Each Copermittee must comply with all the reporting and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

G. PRINCIPAL WATERSHED COPERMITTEE RESPONSIBILITIES

1. The Copermittees within each Watershed Management Area must designate a Principal Watershed Copermittee and notify the San Diego Water Board of the name of the Principal Watershed Copermittee. An individual Copermittee should not be designated a Principal Watershed Copermittee for more than two Watershed Management Areas. The notification may be submitted with the Water Quality Improvement Plan required pursuant to Provision F.1 of this Order.

2. The Principal Watershed Copermittee is responsible for, at a minimum, the following:

a. Serving as liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues, and when necessary and appropriate, representing the Copermittees in the Watershed Management Area before the San Diego Water Board;

b. Facilitating the development of the Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order;

c. Coordinating the submittal of the deliverables required by Provisions F.1, F.2, F.3.a, and F.3.b of this Order; and

d. Coordinating and developing, with the other Principal Watershed Copermittees, the requirements of Provisions F.3.c, F.4, and F.5.b of this Order.

3. The Principal Watershed Copermittee is not responsible for ensuring that the other Copermittees within the Watershed Management Area are in compliance with the requirements of this Order. Each Copermittee within the Watershed Management Area is responsible for complying with the requirements of this Order.

H. MODIFICATION OF ORDER

1. Modifications of the Order may be initiated by the San Diego Water Board or by the Copermittees. Requests by Copermittees must be made to the San Diego Water Board.

2. Minor modifications to the Order may be made by the San Diego Water Board where the proposed modification complies with all the prohibitions and limitations, and other requirements of this Order.

3. This Order may also be re-opened and modified, revoked and, reissued or terminated in accordance with the provisions of 40 CFR 122.44, 122.62 to 122.64, and 124.5. Causes for taking such actions include, but are not limited to, failure to comply with any condition of this Order and permit, and endangerment to human health or the environment resulting from the permitted activity.

4. This Order may be re-opened for modification for cause including but not limited to the following:

   a. The State Water Board determines that revisions are warranted, and the San Diego Water Board concurs that revisions are necessary to those provisions of the Order addressing compliance with water quality standards in the receiving water and/or those provisions of the Order establishing an iterative process for implementation of management practices to assure compliance with water quality standards in the receiving water;

   b. An application for early coverage under this Order is received pursuant to Provision F.6;

   c. Any of the TMDLs in Attachment E to this Order are amended in the Basin Plan by San Diego Water Board, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA;

   d. The Basin Plan is amended by the San Diego Water Board to incorporate a new TMDL, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA; or

   e. Updating or revising the monitoring and reporting requirements is determined to be necessary, at the discretion of the San Diego Water Board. Such modification(s) may include, but is (are) not limited to, revision(s) to: (i) implement recommendations from Southern California Coastal Water Research Project (SCCWRP), (ii) develop, refine, implement, and/or coordinate a regional monitoring program, (iii) develop and implement improved monitoring and assessment programs in keeping with San Diego Water Board Resolution No. R9-2012-0069, Resolution in Support of a Regional Monitoring Framework, and/or (iv) add provisions to require the Copermittees to evaluate and provide information on cost and values of the monitoring and reporting program.

5. The San Diego Water Board, after opportunity for public comment and a public hearing, will re-open and consider modifications to this Order when the Orange County Copermittees or the Riverside County Copermittees submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders.

I. STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

Each Copermittee must comply with all the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

ATTACHMENT A

DISCHARGE PROHIBITIONS AND SPECIAL PROTECTIONS

1. Basin Plan Waste Discharge Prohibitions

California Water Code Section 13243 provides that a Regional Water Board, in a water quality control plan, may specify certain conditions or areas where the discharge of waste or certain types of waste is not permitted. The following waste discharge prohibitions in the Water Quality Control Plan for the San Diego Basin (Basin Plan) are applicable to any person, as defined by Section 13050(c) of the California Water Code, who is a citizen, domiciliary, or political agency or entity of California whose activities in California could affect the quality of waters of the state within the boundaries of the San Diego Region.

1. The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in California Water Code Section 13050, is prohibited.

2. The discharge of waste to land, except as authorized by waste discharge requirements or the terms described in California Water Code Section 13264 is prohibited.

3. The discharge of pollutants or dredged or fill material to waters of the United States except as authorized by a National Pollutant Discharge Elimination System (NPDES) permit or a dredged or fill material permit (subject to the exemption described in California Water Code Section 13376) is prohibited.

4. Discharges of recycled water to lakes or reservoirs used for municipal water supply or to inland surface water tributaries thereto are prohibited, unless this San Diego Water Board issues a NPDES permit authorizing such a discharge; the proposed discharge has been approved by the State Department of Health Services (DHS) and the operating agency of the impacted reservoir; and the discharger has an approved fail-safe long-term disposal alternative.

5. The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the San Diego Water Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

6. The discharge of waste in a manner causing flow, ponding, or surfacing on lands not owned or under the control of the discharger is prohibited, unless the discharge is authorized by the San Diego Water Board.

7. The dumping, deposition, or discharge of waste directly into waters of the state, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the San Diego Water Board.

8. Any discharge to a storm water conveyance system that is not composed entirely of "*storm water*" is prohibited unless authorized by the San Diego Water Board. [The federal regulations, 40 CFR 122.26(b)(13), define storm water as storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from firefighting activities.] [§122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

9. The unauthorized discharge of treated or untreated sewage to waters of the state or to a storm water conveyance system is prohibited.

10. The discharge of industrial wastes to conventional septic tank/subsurface disposal systems, except as authorized by the terms described in California Water Code Section 13264, is prohibited.

11. The discharge of radioactive wastes amenable to alternative methods of disposal into the waters of the state is prohibited.

12. The discharge of any radiological, chemical, or biological warfare agent into waters of the state is prohibited.

13. The discharge of waste into a natural or excavated site below historic water levels is prohibited unless the discharge is authorized by the San Diego Water Board.

14. The discharge of sand, silt, clay, or other earthen materials from any activity, including land grading and construction, in quantities which cause deleterious bottom deposits, turbidity or discoloration in waters of the state or which unreasonably affect, or threaten to affect, beneficial uses of such waters is prohibited.

15. The discharge of treated or untreated sewage from vessels to Mission Bay, Oceanside Harbor, Dana Point Harbor, or other small boat harbors is prohibited.

16. The discharge of untreated sewage from vessels to San Diego Bay is prohibited.

17. The discharge of treated sewage from vessels to portions of San Diego Bay that are less than 30 feet deep at mean lower low water (MLLW) is prohibited.

18. The discharge of treated sewage from vessels, which do not have a properly functioning US Coast Guard certified Type I or Type II marine sanitation device, to portions of San Diego Bay that are greater than 30 feet deep at mean lower low water (MLLW) is prohibited.

2. Attachment B to State Water Board Resolution 2012-0012, as amended by State Water Board Resolution No. 2012-0031.

Special Protections for Areas of Special Biological Significance (ASBS), Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges

I. PROVISIONS FOR POINT SOURCE DISCHARGES OF STORM WATER AND NONPOINT SOURCE WASTE DISCHARGES

The following terms, prohibitions, and special conditions (hereafter collectively referred to as special conditions) are established as limitations on point source storm water and nonpoint source discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in Areas of Special Biological Significance (ASBS), as required for State Water Quality Protection Areas pursuant to California Public Resources Code Sections 36700(f) and 36710(f). These Special Protections are adopted by the State Water Board as part of the California Ocean Plan (Ocean Plan) General Exception.

The special conditions are organized by category of discharge. The State Water Resources Control Board (State Water Board) and Regional Water Quality Control Boards (Regional Water Boards) will determine categories and the means of regulation for those categories [e.g., Point Source Storm Water National Pollutant Discharge Elimination System (NPDES) or Nonpoint Source].

A. PERMITTED POINT SOURCE DISCHARGES OF STORM WATER

1. General Provisions for Permitted Point Source Discharges of Storm Water

a. Existing storm water discharges into an ASBS are allowed only under the following conditions:

(1) The discharges are authorized by an NPDES permit issued by the State Water Board or Regional Water Board;

(2) The discharges comply with all of the applicable terms, prohibitions, and special conditions contained in these Special Protections; and

(3) The discharges:

(i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

(ii) Are designed to prevent soil erosion;

(iii) Occur only during wet weather;

(iv) Are composed of only storm water runoff.

b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

c. The discharge of trash is prohibited.

d. Only discharges from existing storm water outfalls are allowed. Any proposed or new storm water runoff discharge shall be routed to existing storm water discharge outfalls and shall not result in any new contribution of waste to an ASBS (i.e., no additional pollutant loading). "Existing storm water outfalls" are those that were constructed or under construction prior to January 1, 2005. "New contribution of waste" is defined as any addition of waste beyond what would have occurred as of January 1, 2005. A change to an existing storm water outfall, in terms of re-location or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges are prohibited except as provided below:

(1) The term "non-storm water discharges" means any waste discharges from a municipal separate storm sewer system (MS4) or other NPDES permitted storm drain system to an ASBS that are not composed entirely of storm water.

(2) (i) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability or occur naturally:

(a) Discharges associated with emergency fire fighting operations.

(b) Foundation and footing drains.

(c) Water from crawl space or basement pumps.

(d) Hillside dewatering.

(e) Naturally occurring groundwater seepage via a storm drain.

(f) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(ii) An NPDES permitting authority may authorize non-storm water discharges to an MS4 with a direct discharge to an ASBS only to the extent the NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

2. Compliance Plans for Inclusion in Storm Water Management Plans (SWMP) and Storm Water Pollution Prevention Plans (SWPPP).

The discharger shall specifically address the prohibition of non-storm water runoff and the requirement to maintain natural water quality for storm water discharges to an ASBS in an ASBS Compliance Plan to be included in its SWMP or a SWPPP, as appropriate to permit

type. If a statewide permit includes a SWMP, then the discharger shall prepare a stand-alone compliance plan for ASBS discharges. The ASBS Compliance Plan is subject to approval by the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (for permits issued by Regional Water Boards).

a. The Compliance Plan shall include a map of surface drainage of storm water runoff, showing areas of sheet runoff, prioritize discharges, and describe any structural Best Management Practices (BMPs) already employed and/or BMPs to be employed in the future. Priority discharges are those that pose the greatest water quality threat and which are identified to require installation of structural BMPs. The map shall also show the storm water conveyances in relation to other features such as service areas, sewage conveyances and treatment facilities, landslides, areas prone to erosion, and waste and hazardous material storage areas, if applicable. The SWMP or SWPPP shall also include a procedure for updating the map and plan when changes are made to the storm water conveyance facilities.

b. The ASBS Compliance Plan shall describe the measures by which all non-authorized non-storm water runoff (e.g., dry weather flows) has been eliminated, how these measures will be maintained over time, and how these measures are monitored and documented.

c. For Municipal Separate Storm Sewer System (MS4s), the ASBS Compliance Plan shall require minimum inspection frequencies as follows:

(1) The minimum inspection frequency for construction sites shall be weekly during rainy season;

(2) The minimum inspection frequency for industrial facilities shall be monthly during the rainy season;

(3) The minimum inspection frequency for commercial facilities (e.g., restaurants) shall be twice during the rainy season; and

(4) Storm water outfall drains equal to or greater than 18 inches (457 mm) in diameter or width shall be inspected once prior to the beginning of the rainy season and once during the rainy season and maintained to remove trash and other anthropogenic debris.

d. The ASBS Compliance Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff, that are necessary to comply with these special conditions, will be achieved through BMPs. Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that such installation would pose a threat to health or safety. BMPs to control storm water runoff discharges (at the end-of-pipe) during a design storm shall be designed to achieve on average the following target levels:

(1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

(2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges.

The baseline for these determinations is the effective date of the Exception, except for those structural BMPs installed between January 1, 2005 and adoption of these Special Protections, and the reductions must be achieved and documented within six (6) years of the effective date.

e. The ASBS Compliance Plan shall address erosion control and the prevention of anthropogenic sedimentation in ASBS. The natural habitat conditions in the ASBS shall not be altered as a result of anthropogenic sedimentation.

f. The ASBS Compliance Plan shall describe the non-structural BMPs currently employed and planned in the future (including those for construction activities), and include an implementation schedule. The ASBS Compliance Plan shall include non-structural BMPs that address public education and outreach. Education and outreach efforts must adequately inform the public that direct discharges of pollutants from private property not entering an MS4 are prohibited. The ASBS Compliance Plan shall also describe the structural BMPs, including any low impact development (LID) measures, currently employed and planned for higher threat discharges and include an implementation schedule. To control storm water runoff discharges (at the end-of-pipe) during a design storm, permittees must first consider, and use where feasible, LID practices to infiltrate, use, or evapotranspirate storm water runoff on-site, if LID practices would be the most effective at reducing pollutants from entering the ASBS.

g. The BMPs and implementation schedule shall be designed to ensure that natural water quality conditions in the receiving water are achieved and maintained by either reducing flows from impervious surfaces or reducing pollutant loading, or some combination thereof.

h. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents in storm water runoff that alter natural ocean water quality and the sources of these constituents.

(2) The report shall describe BMPs that are currently being implemented, BMPs that are identified in the SWMP or SWPPP for future implementation, and any additional BMPs that may be added to the SWMP or SWPPP to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the BMPs.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits), the discharger shall revise its ASBS Compliance Plan to incorporate any new or modified BMPs that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised SWMP or SWPPP, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural ocean water quality conditions due to the same constituent.

(5) The requirements of this section are in addition to the terms, prohibitions, and conditions contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within eighteen (18) months from the effective date of the Exception, the discharger shall submit a draft written ASBS Compliance Plan to the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that describes its strategy to comply with these special conditions, including the requirement to maintain natural water quality in the affected ASBS. The ASBS Compliance Plan shall include a description of appropriate non-structural controls and a time schedule to implement structural controls (implementation schedule) to comply with these special conditions for inclusion in the discharger's SWMP or SWPPP, as appropriate to permit type. The final ASBS Compliance Plan, including a description and final schedule for structural controls based on the results of runoff and receiving water monitoring, must be submitted within thirty (30) months from the effective date of the Exception.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these special conditions shall be implemented.

d. Within six (6) years of the effective date of the Exception, any structural controls identified in the ASBS Compliance Plan that are necessary to comply with these special conditions shall be operational.

e. Within six (6) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water, pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data, and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe

the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. for municipalities, a demonstration of significant hardship to discharger ratepayers, by showing the relationship of storm water fees to annual household income for residents within the discharger's jurisdictional area, and the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or

2. for other governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

B. NONPOINT SOURCE DISCHARGES

1. General Provisions for Nonpoint Sources

a. Existing nonpoint source waste discharges are allowed into an ASBS only under the following conditions:

(1) The discharges are authorized under waste discharge requirements, a conditional waiver of waste discharge requirements, or a conditional prohibition issued by the State Water Board or a Regional Water Board.

(2) The discharges are in compliance with the applicable terms, prohibitions, and special conditions contained in these Special Protections.

(3) The discharges:

(i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

(ii) Are designed to prevent soil erosion;

(iii) Occur only during wet weather;

(iv) Are composed of only storm water runoff.

b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

c. The discharge of trash is prohibited.

d. Only existing nonpoint source waste discharges are allowed. "Existing nonpoint source waste discharges" are discharges that were ongoing prior to January 1, 2005. "New nonpoint source discharges" are defined as those that commenced on or after January 1, 2005. A change to an existing nonpoint source discharge, in terms of relocation or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges from nonpoint sources (those not subject to an NPDES Permit) are prohibited except as provided below:

(1) The term "non-storm water discharges" means any waste discharges that are not composed entirely of storm water.

(2) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability, or occur naturally:

(i) Discharges associated with emergency fire fighting operations.

(ii) Foundation and footing drains.

(iii) Water from crawl space or basement pumps.

(iv) Hillside dewatering.

(v) Naturally occurring groundwater seepage via a storm drain.

(vi) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

f. At the San Clemente Island ASBS, discharges incidental to military training and research, development, test, and evaluation operations are allowed. Discharges incidental to underwater demolition and other in-water explosions are not allowed in the two military closure areas in the vicinity of Wilson Cove and Castle Rock. Discharges must not result in a violation of the water quality objectives, including the protection of the marine aquatic life beneficial use, anywhere in the ASBS.

g. At the San Nicolas Island and Begg Rock ASBS, discharges incidental to military research, development, testing, and evaluation of, and training with, guided missile and other weapons systems, fleet training exercises, small-scale amphibious warfare training, and special warfare training are allowed. Discharges incidental to underwater demolition and other in-water explosions are not allowed. Discharges must not result in a violation of the water quality objectives, including the protection of the marine aquatic life beneficial use, anywhere in the ASBS.

h. All other nonpoint source discharges not specifically authorized above are prohibited.

2. Planning and Reporting

a. The nonpoint source discharger shall develop an ASBS Pollution Prevention ~~P~~lan, including an implementation schedule, to address storm water runoff and any other nonpoint source discharges from its facilities. The ASBS Pollution Prevention Plan must be equivalent in contents to an ASBS Compliance Plan as described in I (A)(2) in this document. The ASBS Pollution Prevention Plan is subject to approval by the Executive Director of the State Water Board (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements).

b. The ASBS Pollution Prevention Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff that are necessary to comply with these special conditions, will be achieved through Management Measures and associated Management Practices (Management Measures/Practices). Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director or Regional Water Board Executive Officer that such installation would pose a threat to health or safety. Management Measures to control storm water runoff during a design storm shall achieve on average the following target levels:

(1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

(2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges.

The baseline for these determinations is the effective date of the Exception, except for those structural BMPs installed between January 1, 2005 and adoption of these Special Protections, and the reductions must be achieved and documented within six (6) years of the effective date.

c. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff or other nonpoint source pollution is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and the Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents that alter natural water quality and the sources of these constituents.

(2) The report shall describe Management Measures/Practices that are currently being implemented, Management Measures/Practices that are identified in the ASBS Pollution Prevention Plan for future implementation, and any additional Management Measures/Practices that may be added to the Pollution Prevention Plan to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the Management Measures/Practices.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of

the Regional Water Board (Regional Water Board waivers or waste discharge requirements), the discharger shall revise its ASBS Pollution Prevention Plan to incorporate any new or modified Management Measures/Practices that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised ASBS Pollution Prevention Plan, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural water quality conditions due to the same constituent.

(5) The requirements of this section are in addition to the terms, prohibitions, and conditions contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within eighteen (18) months from the effective date of the Exception, the discharger~~s~~ shall submit a draft written ASBS Pollution Prevention Plan to the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) that describes its strategy to comply with these special conditions, including the requirement to maintain natural ocean water quality in the affected ASBS. The Pollution Prevention Plan shall include a description of appropriate non-structural controls and a time schedule to implement structural controls to comply with these special conditions for inclusion in the discharger's Pollution Prevention Plan. The final ASBS Pollution Prevention Plan, including a description and final schedule for structural controls based on the results of runoff and receiving water monitoring, must be submitted within thirty (30) months from the effective date of the Exception.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these Special Protections shall be implemented.

d. Within six (6) years of the effective date of the Exception, any structural controls identified in the ASBS Pollution Prevention Plan that are necessary to comply with these special conditions shall be operational.

e. Within six (6) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board

waivers or waste discharge requirements) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. a demonstration that the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or

2. for governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

II. ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES

In addition to the provisions in Section I (A) or I (B), respectively, a discharger with parks and recreation facilities shall comply with the following:

A. The discharger shall include a section in an ASBS Compliance Plan (for NPDES dischargers) or an ASBS Pollution Prevention Plan (for nonpoint source dischargers) to address storm water runoff from parks and recreation facilities.

1. The plan shall identify all pollutant sources, including sediment sources, which may result in waste entering storm water runoff. Pollutant sources include, but are not limited to, roadside rest areas and vistas, picnic areas, campgrounds, trash receptacles, maintenance facilities, park personnel housing, portable toilets, leach fields, fuel tanks, roads, piers, and boat launch facilities.

2. The plan shall describe BMPs or Management Measures/Practices that will be implemented to control soil erosion (both temporary and permanent erosion controls) and reduce or eliminate pollutants in storm water runoff in order to achieve and maintain natural water quality conditions in the affected ASBS. The plan shall include BMPs or Management Measures/Practices to ensure that trails and culverts are maintained to prevent erosion and minimize waste discharges to ASBS.

3. The plan shall include BMPs or Management Measures/Practices to prevent the discharge of pesticides or other chemicals, including agricultural chemicals, in storm water runoff to the affected ASBS.

4. The plan shall include BMPs or Management Measures/Practices that address public education and outreach. The goal of these BMPs or Management Measures/Practices is to ensure that the public is adequately informed that waste discharges to the affected ASBS are prohibited or limited by special conditions in these Special Protections. The BMPs or Management Measures/Practices shall include signage at camping, picnicking, beach and roadside parking areas, and visitor centers, or other appropriate measures, which notify the public of any applicable requirements of these Special Protections and identify the ASBS boundaries.

5. The plan shall include BMPs or Management Measures/Practices that address the prohibition against the discharge of trash to ASBS. The BMPs or Management Measures/Practices shall include measures to ensure that adequate trash receptacles are available for public use at visitor facilities, including parking areas, and that the receptacles are adequately maintained to prevent trash discharges into the ASBS. Appropriate measures include covering trash receptacles to prevent trash from being wind blown and periodically emptying the receptacles to prevent overflows.

6. The plan shall include BMPs or Management Measures/Practices to address runoff from parking areas and other developed features to ensure that the runoff does not alter natural water quality in the affected ASBS. BMPs or Management Measures/Practices shall include measures to reduce pollutant loading in runoff to the ASBS through installation of natural area buffers (LID), treatment, or other appropriate measures.

B. Maintenance and repair of park and recreation facilities must not result in waste discharges to the ASBS. The practice of road oiling must be minimized or eliminated, and must not result in waste discharges to the ASBS.

III. ADDITIONAL REQUIREMENTS – WATERFRONT AND MARINE OPERATIONS

In addition to the provisions in Section I (A) or I (B), respectively, a discharger with waterfront and marine operations shall comply with the following:

A. For discharges related to waterfront and marine operations, the discharger shall develop a Waterfront and Marine Operations Management Plan (Waterfront Plan). This plan shall contain appropriate Management Measures/Practices to address nonpoint source pollutant discharges to the affected ASBS.

1. The Waterfront Plan shall contain appropriate Management Measures/Practices for any waste discharges associated with the operation and maintenance of vessels, moorings, piers, launch ramps, and cleaning stations in order to ensure that beneficial uses are protected and natural water quality is maintained in the affected ASBS.

2. For discharges from marinas and recreational boating activities, the Waterfront Plan shall include appropriate Management Measures, described in The Plan for California's Nonpoint Source Pollution Control Program, for marinas and recreational boating, or equivalent practices, to ensure that nonpoint source pollutant discharges do not alter natural water quality in the affected ASBS.

3. The Waterfront Plan shall include Management Practices to address public education and outreach to ensure that the public is adequately informed that waste discharges to the affected ASBS are prohibited or limited by special conditions in these Special Protections. The management practices shall include appropriate signage, or similar measures, to inform the public of the ASBS restrictions and to identify the ASBS boundaries.

4. The Waterfront Plan shall include Management Practices to address the prohibition against trash discharges to ASBS. The Management Practices shall include the provision of adequate trash receptacles for marine recreation areas, including parking areas, launch ramps, and docks. The plan shall also include appropriate Management Practices to ensure that the receptacles are adequately maintained and secured in order to prevent trash discharges into the ASBS. Appropriate Management Practices include covering the trash receptacles to prevent trash from being windblown, staking or
securing the trash receptacles so they don't tip over, and periodically emptying the receptacles to prevent overflow.

5. The discharger shall submit its Waterfront Plan to the by the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) within six months of the effective date of these special conditions. The Waterfront Plan is subject to approval by the State Water Board Executive Director or the Regional Water Board Executive Officer, as appropriate. The plan must be fully implemented within 18 months of the effective date of the Exception.

B. The discharge of chlorine, soaps, petroleum, other chemical contaminants, trash, fish offal, or human sewage to ASBS is prohibited. Sinks and fish cleaning stations are point source discharges of wastes and are prohibited from discharging into ASBS. Anthropogenic accumulations of discarded fouling organisms on the sea floor must be minimized.

C. Limited-term activities, such as the repair, renovation, or maintenance of waterfront facilities, including, but not limited to, piers, docks, moorings, and breakwaters, are authorized only in accordance with Chapter III.E.2 of the Ocean Plan.

D. If the discharger anticipates that the discharger will fail to fully implement the approved Waterfront Plan within the 18 month deadline, the discharger shall submit a technical report as soon as practicable to the State Water Board Executive Director or the Regional Water Board Executive Officer, as appropriate. The technical report shall contain reasons for failing to meet the deadline and propose a revised schedule to fully implement the plan.

E. The State Water Board or the Regional Water Board may, for good cause, authorize additional time to comply with the Waterfront Plan. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that

caused or would cause it to fail to meet the deadline in Section III.A.5. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality. The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. a demonstration of significant hardship by showing that the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate.

2. for governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

IV. MONITORING REQUIREMENTS

Monitoring is mandatory for all dischargers to assure compliance with the Ocean Plan. Monitoring requirements include both: (A) core discharge monitoring, and (B) ocean receiving water monitoring. The State and Regional Water Boards must approve sampling site locations and any adjustments to the monitoring programs. All ocean receiving water and reference area monitoring must be comparable with the Water Boards' Surface Water Ambient Monitoring Program (SWAMP).

Safety concerns: Sample locations and sampling periods must be determined considering safety issues. Sampling may be postponed upon notification to the State and Regional Water Boards if hazardous conditions prevail.

Analytical Chemistry Methods: All constituents must be analyzed using the lowest minimum detection limits comparable to the Ocean Plan water quality objectives. For metal analysis, all samples, including storm water effluent, reference samples, and ocean receiving water samples, must be analyzed by the approved analytical method with the lowest minimum detection limits (currently Inductively Coupled Plasma/Mass Spectrometry) described in the Ocean Plan.

A. CORE DISCHARGE MONITORING PROGRAM

1. General sampling requirements for timing and storm size:

Runoff must be collected during a storm event that is greater than 0.1 inch and generates runoff, and at least 72 hours from the previously measurable storm event. Runoff samples shall be collected during the same storm and at approximately the same time when post-storm receiving water is sampled, and analyzed for the same constituents as receiving water and reference site samples (see section IV B) as described below.

2. Runoff flow measurements

a. For municipal/industrial storm water outfalls in existence as of December 31, 2007, 18 inches (457mm) or greater in diameter/width (including multiple outfall pipes in combination having a width of 18 inches, runoff flows must be measured or calculated, using a method acceptable to and approved by the State and Regional Water Boards.

b. This will be reported annually for each precipitation season to the State and Regional Water Boards.

3. Runoff samples – storm events

a. For outfalls equal to or greater than 18 inches (0.46m) in diameter or width:

(1) samples of storm water runoff shall be collected during the same storm as receiving water samples and analyzed for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

(2) samples of storm water runoff shall be collected and analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

(3) If an applicant has no outfall greater than 36 inches, then storm water runoff from the applicant's largest outfall shall be further collected during the same storm as receiving water samples and analyzed for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates).

b. For outfalls equal to or greater than 36 inches (0.91m) in diameter or width:

(1) samples of storm water runoff shall be collected during the same storm as receiving water samples and analyzed for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

(2) samples of storm water runoff shall be further collected during the same storm as receiving water samples and analyzed for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates); and

(3) samples of storm water runoff shall be collected and analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

c. For an applicant not participating in a regional monitoring program [see below in Section IV (B)] in addition to (a.) and (b.) above, a minimum of the two largest outfalls or 20 percent of the larger outfalls, whichever is greater, shall be sampled (flow weighted composite samples) at least three times annually during wet weather (storm event)

and analyzed for all Ocean Plan Table A constituents, Table B constituents for marine aquatic life protection (except for toxicity, only chronic toxicity for three species shall be required), DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, and Ocean Plan indicator bacteria. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one (the largest) such discharge shall be sampled annually in each Region.

4. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may reduce or suspend core monitoring once the storm runoff is fully characterized. This determination may be made at any point after the discharge is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

B. Ocean Receiving Water and Reference Area Monitoring Program

In addition to performing the Core Discharge Monitoring Program in Section II.A above, all applicants having authorized discharges must perform ocean receiving water monitoring. In order to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS, dischargers may choose either (1) an individual monitoring program, or (2) participation in a regional integrated monitoring program.

1. Individual Monitoring Program: The requirements listed below are for those dischargers who elect to perform an individual monitoring program to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within the affected ASBS. In addition to Core Discharge Monitoring, the following additional monitoring requirements shall be met:

   a. Three times annually, during wet weather (storm events), the receiving water at the point of discharge from the outfalls described in section (IV)(A)(3)(c) above shall be sampled and analyzed for Ocean Plan Table A constituents, Table B constituents for marine aquatic life, DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, salinity, chronic toxicity (three species), and Ocean Plan indicator bacteria.

      The sample location for the ocean receiving water shall be in the surf zone at the point of discharges; this must be at the same location where storm water runoff is sampled. Receiving water shall be sampled prior to (pre-storm) and during (or immediately after) the same storm (post storm). Post storm sampling shall be during the same storm and at approximately the same time as when the runoff is sampled. Reference water quality shall also be sampled three times annually and analyzed for the same constituents pre-storm and post-storm, during the same storm seasons when receiving water is sampled. Reference stations will be determined by the State Water Board's Division of Water Quality and the applicable Regional Water Board(s).

   b. Sediment sampling shall occur at least three times during every five (5) year period. The subtidal sediment (sand or finer, if present) at the discharge shall be sampled and analyzed for Ocean Plan Table B constituents for marine aquatic life, DDT, PCBs, PAHs, pyrethroids, and OP pesticides. For sediment toxicity testing, only an acute toxicity test using the amphipod *Eohaustorius estuarius* must be performed.

c. A quantitative survey of intertidal benthic marine life shall be performed at the discharge and at a reference site. The survey shall be performed at least once every five (5) year period. The survey design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The results of the survey shall be completed and submitted to the State Water Board and Regional Water Board at least six months prior to the end of the permit cycle.

d. Once during each five (5) year period, a bioaccumulation study shall be conducted to determine the concentrations of metals and synthetic organic pollutants at representative discharge sites and at representative reference sites. The study design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The bioaccumulation study may include California mussels (*Mytilus californianus*) and/or sand crabs (*Emerita analoga* or *Blepharipoda occidentalis*). Based on the study results, the Regional Water Board and the State Water Board's Division of Water Quality, may adjust the study design in subsequent permits, or add or modify additional test organisms (such as shore crabs or fish), or modify the study design appropriate for the area and best available sensitive measures of contaminant exposure.

e. Marine Debris: Representative quantitative observations for trash by type and source shall be performed along the coast of the ASBS within the influence of the discharger's outfalls. The design, including locations and frequency, of the marine debris observations is subject to approval by the Regional Water Board and State Water Board's Division of Water Quality.

f. The monitoring requirements of the Individual Monitoring Program in this section are minimum requirements. After a minimum of one (1) year of continuous water quality monitoring of the discharges and ocean receiving waters, the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may require additional monitoring, or adjust, reduce or suspend receiving water and reference station monitoring. This determination may be made at any point after the discharge and receiving water is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

2. Regional Integrated Monitoring Program: Dischargers may elect to participate in a regional integrated monitoring program, in lieu of an individual monitoring program, to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS. This regional approach shall characterize natural water quality, pre- and post-storm, in ocean reference areas near the mouths of identified open space watersheds and the effects of the discharges on natural water quality (physical, chemical, and toxicity) in the ASBS receiving waters, and should include benthic marine aquatic life and bioaccumulation components. The design of the ASBS stratum of a regional integrated monitoring program may deviate from the otherwise prescribed individual monitoring approach (in Section IV.B.1) if approved by the State Water Board's Division of Water Quality and the Regional Water Boards.

a. Ocean reference areas shall be located at the drainages of flowing watersheds with minimal development (in no instance more than 10% development), and shall not be located in CWA Section 303(d) listed waterbodies or have tributaries that are 303(d) listed. Reference areas shall be free of wastewater discharges and anthropogenic non- storm water runoff. A minimum of low threat storm runoff discharges (e.g.

stream highway overpasses and campgrounds) may be allowed on a case-by-case basis. Reference areas shall be located in the same region as the ASBS receiving water monitoring occurs. The reference areas for each Region are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean reference water samples must be collected from each station, each from a separate storm during the same storm season that receiving water is sampled. A minimum of one reference location shall be sampled for each ASBS receiving water site sampled per responsible party. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

b. ASBS ocean receiving water must be sampled in the surf zone at the location where the runoff makes contact with ocean water (i.e. at "point zero"). Ocean receiving water stations must be representative of worst-case discharge conditions (i.e. co-located at a large drain greater than 36 inches, or if drains greater than 36 inches are not present in the ASBS then the largest drain greater than18 inches.) Ocean receiving water stations are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean receiving water samples must be collected during each storm season from each station, each from a separate storm. A minimum of one receiving water location shall be sampled in each ASBS per responsible party in that ASBS. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

c. Reference and receiving water sampling shall commence during the first full storm season following the adoption of these special conditions, and post-storm samples shall be collected during the same storm event when storm water runoff is sampled. Sampling shall occur in a minimum of two storm seasons. For those ASBS dischargers that have already participated in the Southern California Bight 2008 ASBS regional monitoring effort, sampling may be limited to only one storm season.

d. Receiving water and reference samples shall be analyzed for the same constituents as storm water runoff samples. At a minimum, constituents to be sampled and analyzed in reference and discharge receiving waters must include oil and grease, total suspended solids, Ocean Plan Table B metals for protection of marine life, Ocean Plan PAHs, pyrethroids, OP pesticides, ammonia, nitrate, phosphates, and critical life stage chronic toxicity for three species. In addition, within the range of the southern sea otter, indicator bacteria or some other measure of fecal contamination shall be analyzed.

3. Waterfront and Marine Operations: In addition to the above requirements for ocean receiving water monitoring, additional monitoring must be performed for marinas and boat launch and pier facilities:

a. For all marina or mooring field operators, in mooring fields with 10 or more occupied moorings, the ocean receiving water must be sampled for Ocean Plan indicator bacteria, residual chlorine, copper, zinc, grease and oil, methylene blue active substances (MBAS), and ammonia nitrogen.

(1) For mooring field operators opting for an individual monitoring program (Section IV.B.1 above), this sampling must occur weekly (on the weekend) from May through October.

(2) For mooring field operators opting to participate in a regional integrated monitoring program (Section IV.B.2 above), this sampling must occur monthly from May through October on a high use weekend in each month. The Water Boards may allow a reduction in the frequency of sampling, through the regional monitoring program, after the first year of monitoring.

b. For all mooring field operators, the subtidal sediment (sand or finer, if present) within mooring fields and below piers shall be sampled and analyzed for Ocean Plan Table B metals (for marine aquatic life beneficial use), acute toxicity, PAHs, and tributyltin. For sediment toxicity testing, only an acute toxicity test using the amphipod *Eohaustorius estuarius* must be performed. This sampling shall occur at least three times during a five (5) year period. For mooring field operators opting to participate in a regional integrated monitoring program, the Water Boards may allow a reduction in the frequency of sampling after the first sampling effort's results are assessed.

Glossary

At the point of discharge(s) – Means in the surf zone immediately where runoff from an outfall meets the ocean water (a.k.a., at point zero).

Areas of Special Biological Significance (ASBS) – Those areas designated by the State Water Board as ocean areas requiring protection of species or biological communities to the extent that alteration of natural water quality is undesirable. All Areas of Special Biological Significance are also classified as a subset of State Water Quality Protection Areas.

Design storm – For purposes of these Special Protections, a design storm is defined as the volume of runoff produced from one inch of precipitation per day or, if this definition is inconsistent with the discharger's applicable storm water permit, then the design storm shall be the definition included in the discharger's applicable storm water permit.

Development – Relevant to reference monitoring sites, means urban, industrial, agricultural, grazing, mining, and timber harvesting land uses.

Higher threat discharges - Permitted storm drains discharging equal to or greater than 18 inches, industrial storm drains, agricultural runoff discharged through an MS4, discharges associated with waterfront and marina operations (e.g., piers, launch ramps, mooring fields, and associated vessel support activities, except for passive discharges defined below), and direct discharges associated with commercial or industrial activities to ASBS.

Low Impact Development (LID) – A sustainable practice that benefits water supply and contributes to water quality protection. Unlike traditional storm water management, which entails collecting and conveying storm water runoff through storm drains, pipes, or other conveyances to a centralized storm water facility, LID focuses on using site design and storm water management to maintain the site's pre-development runoff rates and volumes. The goal of LID is to mimic a site's predevelopment hydrology by using design techniques that infiltrate, filter, store, evaporate, and detain runoff close to the source of rainfall.

Marine Operations – Marinas or mooring fields that contain slips or mooring locations for 10 or more vessels.

Management Measure (MM) - Economically achievable measures for the control of the addition of pollutants from various classes of nonpoint sources of pollution, which reflect the greatest degree of pollutant reduction achievable through the application of the best available nonpoint pollution control practices, technologies, processes, siting criteria, operating methods, or other alternatives. For example, in the "marinas and recreational boating" land- use category specified in the Plan for California's Nonpoint Source Pollution Control Program (NPS Program Plan) (SWRCB, 1999), "boat cleaning and maintenance" is considered a MM or the source of a specific class or type of NPS pollution.

Management Practice (MP) - The practices (e.g., structural, non-structural, operational, or other alternatives) that can be used either individually or in combination to address a specific MM class or classes of NPS pollution. For example, for the "boat cleaning and maintenance" MM, specific MPs can include, but are not limited to, methods for the selection of environmentally sensitive hull paints or methods for cleaning/removal of hull copper anti- fouling paints.

Municipal Separate Storm Sewer System (MS4) – A municipally-owned storm sewer system regulated under the Phase I or Phase II storm water program implemented in compliance with Clean Water Act section 402(p). Note that an MS4 program's boundaries are not necessarily congruent with the permittee's political boundaries.

Natural Ocean Water Quality - The water quality (based on selected physical, chemical and biological characteristics) that is required to sustain marine ecosystems, and which is without apparent human influence, *i.e.*, an absence of significant amounts of: (a) man-made constituents (*e.g.,* DDT); (b) other chemical (*e.g.,* trace metals), physical (temperature/thermal pollution, sediment burial), and biological (*e.g.*, bacteria) constituents at concentrations that have been elevated due to man's activities above those resulting from the naturally occurring processes that affect the area in question; and (c) non-indigenous biota (*e.g.,* invasive algal bloom species) that have been introduced either deliberately or accidentally by man. Discharges "*shall not alter natural ocean water quality*" as determined by a comparison to the range of constituent concentrations in reference areas agreed upon via the regional monitoring program(s). If monitoring information indicates that *natural ocean water quality* is not maintained, but there is sufficient evidence that a discharge is not contributing to the alteration of natural water quality, then the Regional Water Board may make that determination. In this case, sufficient information must include runoff sample data that has equal or lower concentrations for the range of constituents at the applicable reference area(s).

Nonpoint source – Nonpoint pollution sources generally are sources that do not meet the definition of a point source. Nonpoint source pollution typically results from land runoff, precipitation, atmospheric deposition, agricultural drainage, marine/boating operations or hydrologic modification. Nonpoint sources, for purposes of these Special Protections, include discharges that are not required to be regulated under an NPDES permit.

Non-storm water discharge – Any runoff that is not the result of a precipitation event. This is often referred to as "dry weather flow."

Non-structural control – A Best Management Practice that involves operational, maintenance, regulatory (e.g., ordinances) or educational activities designed to reduce or eliminate pollutants in runoff, and that are not structural controls (i.e. there are no physical structures involved).

Physical impossibility - Means any act of God, war, fire, earthquake, windstorm, flood or natural catastrophe; unexpected and unintended accidents not caused by discharger or its employees' negligence; civil disturbance, vandalism, sabotage or terrorism; restrain by court order or public authority or agency; or action or non-action by, or inability to

obtain the necessary authorizations or approvals from any governmental agency other than the permittee.

Representative sites and monitoring procedures – Are to be proposed by the discharger, with appropriate rationale, and subject to approval by Water Board staff.

Sheet-flow – Runoff that flows across land surfaces at a shallow depth relative to the cross- sectional width of the flow. These types of flow may or may not enter a storm drain system before discharge to receiving waters.

Storm Season – Also referred to as rainy season, means the months of the year from the onset of rainfall during autumn until the cessation of rainfall in the spring.

Structural control – A Best Management Practice that involves the installation of engineering solutions to the physical treatment or infiltration of runoff.

Surf Zone - The surf zone is defined as the submerged area between the breaking waves and the shoreline at any one time.

Surface Water Ambient Monitoring Program (SWAMP) comparable – Means that the monitoring program must 1) meet or exceed 2008 SWAMP Quality Assurance Program Management Plan (QAPP) Measurement Quality Objectives, or 2) have a Quality Assurance Project Plan that has been approved by SWAMP; in addition data must be formatted to match the database requirements of the SWAMP Information Management System. Adherence to the measurement quality objectives in the Southern California Bight 2008 ASBS Regional Monitoring Program QAPP and data base management comprises being SWAMP comparable.

Waterfront Operations - Piers, launch ramps, and cleaning stations in the water or on the adjacent shoreline.

Attachment 1
Special Protections Sections I(A)(3)(e) and I(B)(3)(e)
Flowchart to Deteremine Compliance with natural Water Quality

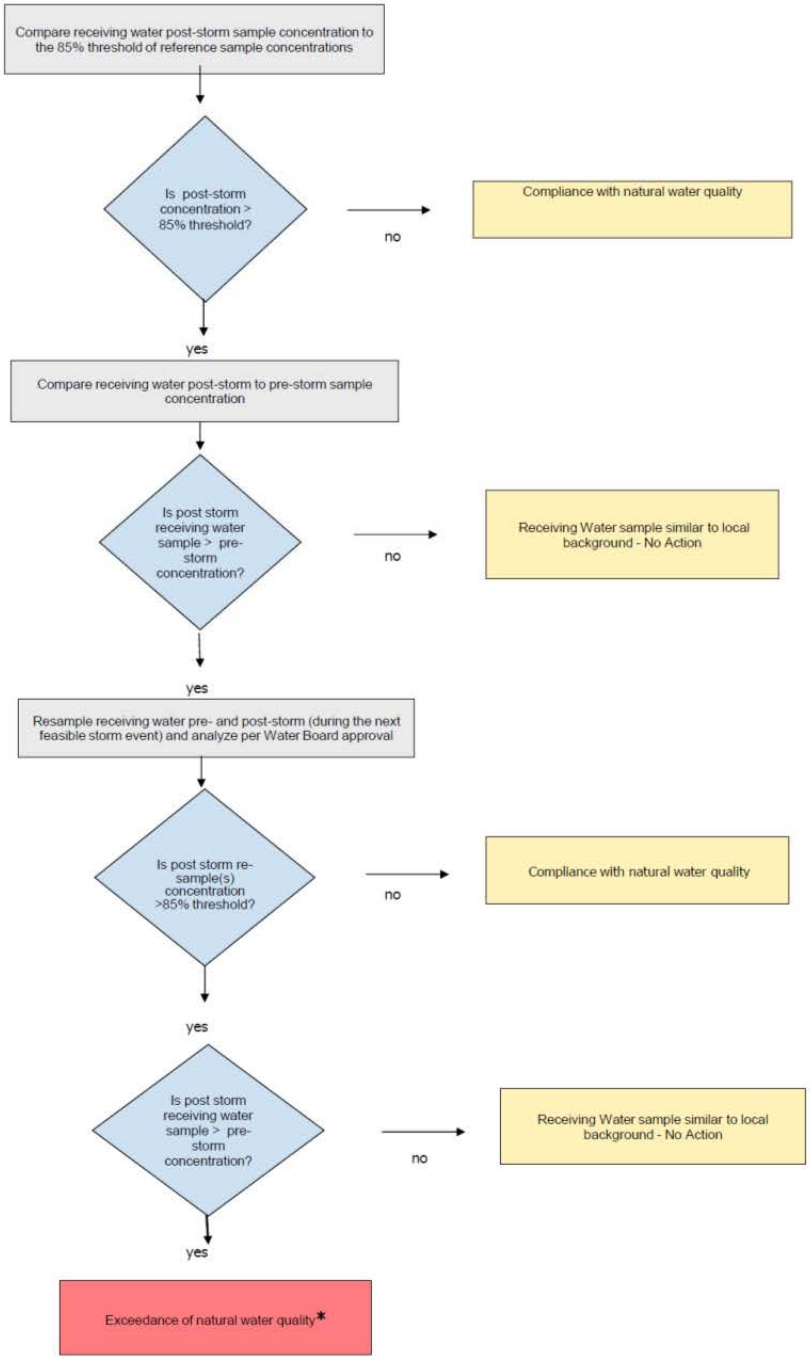

*** When an exceedance of natural water quality occurs, the discharger must comply with section I.A.2.h (for permitted storm water) or section I.B.2.c (for nonpoint sources). Note, when sampling data is available, end-of-pipe effluent concentrations will be considered by the Water Boards in making this determination.**

ATTACHMENT B

STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

1. Standard Permit Provisions

Code of Federal Regulations Title 40 Section 122.41 (40 CFR 122.41) includes conditions, or provisions, that apply to all National Pollutant Discharge Elimination System (NPDES) permits. Additional provisions applicable to NPDES permits are in 40 CFR 122.42. All applicable provisions in 40 CFR 122.41 and 40 CFR 122.42 must be incorporated into this Order and NPDES permit. The applicable 40 CFR 122.41 and 40 CFR 122.42 provisions are as follows:

a. DUTY TO COMPLY [40 CFR 122.41(a)]

The Copermittee must comply with all of the provisions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

(1) The Copermittee must comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement. [40 CFR 122.41(a)(1)]

(2) The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to a civil penalty not to exceed $25,000 per day for each violation. The CWA provides that any person who *negligently* violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than 2 years, or both. Any person who *knowingly* violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both. Any person who knowingly violates Section 301, 302, 303, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, and who knows at that time that he thereby places another person in imminent

danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.
[40 CFR 122.41(a)(2)]

(3) Any person may be assessed an administrative penalty by the San Diego Regional Water Quality Control Board (San Diego Water Board), State Water Resources Control Board (State Water Board), or United States Environmental Protection Agency (USEPA) for violating Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.
[40 CFR 122.41(a)(3)]

b. DUTY TO REAPPLY [40 CFR 122.41(b)]

If a Copermittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Copermittee must apply for and obtain a new permit.

c. NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE [40 CFR 122.41(c)]

It shall not be a defense for a Copermittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

d. DUTY TO MITIGATE [40 CFR 122.41(d)]

The Copermittee must take all reasonable steps to minimize or prevent any discharge or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

e. PROPER OPERATION AND MAINTENANCE [40 CFR 122.41(e)]

The Copermittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Copermittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by a Copermittee only when the operation is necessary to achieve compliance with the conditions of this permit.

f. PERMIT ACTIONS [40 CFR 122.41(f)]

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Copermittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

g. PROPERTY RIGHTS [40 CFR 122.41(g)]

This permit does not convey any property rights of any sort, or any exclusive privilege.

h. DUTY TO PROVIDE INFORMATION [40 CFR 122.41(h)]

The Copermittee must furnish to the San Diego Water Board, State Water Board, or USEPA within a reasonable time, any information which the San Diego Water Board, State Water Board, or USPEA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Copermittee must also furnish to the San Diego Water Board, State Water Board, or USPEA upon request, copies of records required to be kept by this permit.

i. INSPECTION AND ENTRY [40 CFR 122.41(i)]

The Copermittee must allow the San Diego Water Board, State Water Board, USEPA, and/or their authorized representative (including an authorized contractor acting as their representative), upon presentation of credentials and other documents as may be required by law, to:

(1) Enter upon the Copermittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit; [40 CFR 122.41(i)(1)]

(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit; [40 CFR 122.41(i)(2)]

(3) Inspect and photograph at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; [40 CFR 122.41(i)(3)] and

(4) Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location. [40 CFR 122.41(i)(4)]

j. MONITORING AND RECORDS [40 CFR 122.41(j)]

(1) Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity. [40 CFR 122.41(j)(1)]

(2) Except for records of monitoring information required by this permit related to the Copermittee's sewage sludge use and disposal activities, which shall be retained for

a period of at least five (5) years (or longer as required by 40 CFR Part 503), the Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time. [40 CFR 122.41(j)(2)]

(3) Records for monitoring information must include: [40 CFR 122.41(j)(3)]

(a) The date, exact place, and time of sampling or measurements; [40 CFR 122.41(j)(3)(i)]
(b) The individual(s) who performed the sampling or measurements; [40 CFR 122.41(j)(3)(ii)]
(c) The date(s) analyses were performed; [40 CFR 122.41(j)(3)(iii)]
(d) The individual(s) who performed the analyses; [40 CFR 122.41(j)(3)(iv)]
(e) The analytical techniques or methods used; [40 CFR 122.41(j)(3)(v)] and
(f) The results of such analyses. [40 CFR 122.41(j)(3)(vi)]

(4) Monitoring must be conducted according to test procedures under 40 CFR Part 136 unless another method is required under 40 CFR Subchapters N or O. [40 CFR 122.41(j)(4)]

In the case of pollutants for which there are no approved methods under 40 CFR Part 136 or otherwise required under 40 CFR Subchapters N and O, monitoring must be conducted according to a test procedure specified in the permit for such pollutants. [40 CFR 122.44(i)(1)(iv)]

(5) The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. [40 CFR 122.41(j)(5)]

k. SIGNATORY REQUIREMENT [40 CFR 122.41(k)]

(1) All applications, reports, or information submitted to the San Diego Water Board, State Water Board, or USEPA must be signed and certified. (See 40 CFR 122.22) [40 CFR 122.41(k)(1)]

(a) *For a municipality, State, Federal, or other public agency.* [All applications must be signed] by either a principal executive officer or ranking elected official. [40 CFR 122.22(a)(3)]

(b) All reports required by permits, and other information requested by the San Diego Water Board, State Water Board, or USEPA must be signed by a person described in paragraph (a) of this section, or by a duly authorized

representative of that person. A person is a duly authorized representative only if: [40 CFR 122.22(b)]

(i) The authorization is made in writing by a person described in paragraph (a) of this section; [40 CFR 122.22(b)(1)]

(ii) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company, (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) [40 CFR 122.22(b)(2)] and,

(iii) The written authorization is submitted to the San Diego Water Board and State Water Board. [40 CFR 122.22(b)(3)]

(c) *Changes to authorization.* If an authorization under paragraph (b) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (b) of this section must be submitted to the San Diego Water Board prior to or together with any reports, information, or applications to be signed by an authorized representative. [40 CFR 122.22(c)]

(d) *Certification.* Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." [40 CFR 122.22(d)]

(2) The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both. [40 CFR 122.41(k)(2)]

I. REPORTING REQUIREMENTS [40 CFR 122.41(l)]

(1) *Planned changes.* The Copermittee must give notice to the San Diego Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when: [40 CFR 122.41(l)(1)]

(a) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); [40 CFR 122.41(l)(1)(i)] or

(b) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1). [40 CFR 122.41(l)(1)(ii)]

(c) The alteration or addition results in a significant change in the Copermittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. [40 CFR 122.41(l)(1)(iii)]

(2) *Anticipated noncompliance*. The Copermittee must give advance notice to the San Diego Water Board or State Water Board of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements. [40 CFR 122.41(l)(2)]

(3) *Transfers*. This permit is not transferable to any person except after notice to the San Diego Water Board. The San Diego Water Board may require modification or revocation and reissuance of the permit to change the name of the Copermittee and incorporate such other requirements as may be necessary under the CWA. [40 CFR 122.41(l)(3)]

(4) *Monitoring reports.* Monitoring results must be reported at the intervals specified elsewhere in this permit. [40 CFR 122.41(l)(4)]

(a) Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the San Diego Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices. [40 CFR 122.41(l)(4)(i)]

(b) If the Copermittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or another method required for an industry-specific waste stream under 40 CFR Subchapters N or O, the results of this monitoring must be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the San Diego Water Board or State Water Board. [40 CFR 122.41(l)(4)(ii)]

(c) Calculations for all limitations which require averaging of measurements must utilize an arithmetic mean unless otherwise specified in the permit. [40 CFR 122.41(l)(4)(iii)]

(5) *Compliance schedules*. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date. [40 CFR 122.41(l)(5)]

(6) *Twenty-four hour reporting.*

(a) The Copermittee must report any noncompliance that may endanger health or the environment. Any information must be provided orally within 24 hours from the time the Copermittee becomes aware of the circumstances. A written submission must also be provided within five (5) days of the time the Copermittee becomes aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6)(i)]

(b) The following must be included as information which must be reported within 24 hours under this paragraph: [40 CFR 122.41(l)(6)(ii)]

(i) Any unanticipated bypass that exceeds any effluent limitation in the permit (See 40 CFR 122.41(g)). [40 CFR 122.41(l)(6)(ii)(A)]
(ii) Any upset which exceeds any effluent limitation in the permit. [40 CFR 122.41(l)(6)(ii)(B)] and,
(iii) Violation of a maximum daily discharge limitation for any of the pollutants listed by the San Diego Water Board in the permit to be reported within 24 hours. (See 40 CFR 122.44(g)) [40 CFR 122.41(l)(6)(ii)(C)]

(c) The San Diego Water Board may waive the above-required written report on a case-by-case basis if the oral report has been received within 24 hours. [40 CFR 122.41(l)(6)(iii)]

(7) *Other noncompliance.* The Copermittee must report all instances of noncompliance not reported in accordance with the standard provisions required under 40 CFR 122.41(l)(4), (5), and (6), at the time monitoring reports are submitted. The reports must contain the information listed in the standard provisions required under 40 CFR 122.41(l)(6). [40 CFR 122.41(l)(7))]

(8) *Other information.* When the Copermittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the San Diego Water Board, State Water Board, or USEPA, the Copermittee must promptly submit such facts or information. [40 CFR 122.41(l)(8)]

m. BYPASS [40 CFR 122.41(m)]

(1) *Definitions.*

(a) "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. [40 CFR 122.41(m)(1)(i)] or

(b) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or

substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
[40 CFR 122.41(m)(1)(ii)]

(2) *Bypass not exceeding limitations*. The Copermittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the standard provisions required under 40 CFR 122.41(m)(3) and (4).
[40 CFR 122.41(m)(2)]

(3) *Notice.*

(a) *Anticipated bypass*. If the Copermittee knows in advance of the need for a bypass, it must submit a notice, if possible at least ten days before the date of the bypass. [40 CFR 122.41(m)(3)(i)] or

(b) *Unanticipated bypass*. The Copermittee must submit notice of an unanticipated bypass in accordance with the standard provisions required under 40 CFR 122.41(l)(6) (24-hour notice).
[40 CFR 122.41(m)(3)(ii)]

(4) *Prohibition of Bypass.*

(a) Bypass is prohibited, and the San Diego Water Board may take enforcement action against a Copermittee for bypass, unless:
[40 CFR 122.41(m)(4)(i)]

(i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; [40 CFR 122.41(m)(4)(i)(A)]
(ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance;
[40 CFR 122.41(m)(4)(i)(B)] and,
(iii) The Copermittee submitted notice in accordance with the standard provisions required under 40 CFR 122.41(m)(3).
[40 CFR 122.41(m)(4)(i)(C)]

(b) The San Diego Water Board may approve an anticipated bypass, after considering its adverse effects, if the San Diego Water Board determines that it will meet the three conditions listed above.
[40 CFR 122.41(m)(4)(ii)]

n. UPSET [40 CFR 122.41(n)]

(1) *Definition.* "Upset" means an exceptional incident in which there is unintentional and

temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Copermittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. [40 CFR 122.41(n)(1)]

(2) *Effect of an upset*. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the standard provisions required under 40 CFR 122.41(n)(3) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. [40 CFR 122.41(n)(2)]

(3) *Conditions necessary for a demonstration of upset*. A Copermittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that: [40 CFR 122.41(n)(3)]

(a) An upset occurred and that the Copermittee can identify the cause(s) of the upset; [40 CFR 122.41(n)(3)(i)]
(b) The permitted facility was at the time being properly operated; [40 CFR 122.41(n)(3)(ii)] and
(c) The Copermittee submitted notice of the upset in accordance with the standard provisions required under 40 CFR 122.41(l)(6)(ii)(B) (24-hour notice). [40 CFR 122.41(n)(3)(iii)]
(d) The Copermittee complied with any remedial measures pursuant to the standard provisions required under 40 CFR 122.41(d). [40 CFR 122.41(n)(3)(iii)]

(4) *Burden of proof*. In any enforcement proceeding, the Copermittee seeking to establish the occurrence of an upset has the burden of proof. [40 CFR 122.41(n)(4)]

o. STANDARD PERMIT PROVISIONS FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS [40 CFR 122.42(c)]

The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the San Diego Water Board or State Water Board under 40 CFR 122.26(a)(1)(v) must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report must include:

(1) The status of implementing the components of the storm water management program that are established as permit conditions; [40 CFR 122.42(c)(1)]

(2) Proposed changes to the storm water management programs that are established as permit conditions. Such proposed changes must be consistent with 40 CFR 122.26(d)(2)(iii); [40 CFR 122.42(c)(2)] and

(3) Revisions, if necessary, to the assessment of controls and the fiscal analysis

reported in the permit application under 40 CFR 122.26(d)(2)(iv) and (v); [40 CFR 122.42(c)(3)]

(4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; [40 CFR 122.42(c)(4)]

(5) Annual expenditures and budget for year following each annual report; [40 CFR 122.42(c)(5)]

(6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; [40 CFR 122.42(c)(6)]

(7) Identification of water quality improvements or degradation. [40 CFR 122.42(c)(7)]

p. STANDARD PERMIT PROVISIONS FOR STORM WATER DISCHARGES [40 CFR 122.42(d)]

The initial permits for discharges composed entirely of storm water issued pursuant to 40 CFR 122.26(e)(7) must require compliance with the conditions of the permit as expeditiously as practicable, but in no event later than three years after the date of issuance of the permit.

2. General Provisions

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. The general provisions applicable to this Order and NPDES permit are as follows:

a. DISCHARGE OF WASTE IS A PRIVILEGE

No discharge of waste into the waters of the State, whether or not such discharge is made pursuant to waste discharge requirements, shall create a vested right to continue such discharge. All discharges of waste into waters of the State are privileges, not rights. [CWC Section 13263(g)]

b. DURATION OF ORDER AND NPDES PERMIT

(1) *Effective date*. This Order and NPDES permit becomes effective on April 1st, 2015 ~~the 50th day~~ after its adoption provided the USEPA has no objection. If the USEPA objects to its issuance, this Order shall not become effective until such objection is withdrawn. This Order supersedes Order No. R9-2007-0001 for the San Diego County Copermittees listed in Table 2.a and became effective on June 27, 2014.~~upon the effective date of this Order~~. This Order as amended by Order R9-2015-0001~~, and~~ supersedes Order No~~s~~. R9-2009-0002 and becomes effective ~~fifty (50) days~~ April 1, 2015 after the date Order No. R9-2015-0001 is adopted. This Order supersedes Order No. R9-2010-0016 upon its ~~their~~ expiration or earlier notice of coverage.

(2) *Expiration*. This Order and NPDES permit expires five years after its effective date.

[40 CFR 122.46(a)]

(3) *Continuation of expired order*. After this Order and NPDES permit expires, the terms and conditions of this Order and NPDES permit are automatically continued pending issuance of a new permit if all requirements of the federal NPDES regulations on the continuation of expired permits (40 CFR 122.6) are complied with.

c. AVAILABILITY

A copy of this Order must be kept at a readily accessible location and must be available to on-site personnel at all times.

d. CONFIDENTIALITY OF INFORMATION

Except as provided for in 40 CFR 122.7, no information or documents submitted in accordance with or in application for this Order will be considered confidential, and all such information and documents shall be available for review by the public at the San Diego Water Board office.

Claims of confidentiality for the following information will be denied:
[40 CFR 122.7(b)]

(1) The name and address of any permit applicant or Copermittee;
[40 CFR 122.7(b)(1)] and

(2) Permit applications and attachments, permits, and effluent data.
[40 CFR 122.7(b)(2)]

e. EFFLUENT LIMITATIONS

(1) *Interim effluent limitations*. The Copermittee must comply with any interim effluent limitations as established by addendum, enforcement action, or revised waste discharge requirements which have been, or may be, adopted by the San Diego Water Board.

(2) *Other effluent limitations and standards*. If any applicable toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant and that standard or prohibition is more stringent than any limitation on the pollutant in the permit, the San Diego Water Board shall institute proceedings under these regulations to modify or revoke and reissue the permit to conform to the toxic effluent standard or prohibition. [40 CFR 122.44(b)(1)]

f. DUTY TO MINIMIZE OR CORRECT ADVERSE IMPACTS

The Copermittee must take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this Order, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the noncompliance.

g. PERMIT ACTIONS

The filing of a request by the Copermittee for modification, revocation and reissuance, or termination of this Order, or a notification of planned change in or anticipated noncompliance with this Order does not stay any condition of this Order. (See 40 CFR 122.41(f)) In addition, the following provisions apply to this Order:

(1) Upon application by any affected person, or on its own motion, the San Diego Water Board may review and revise the requirements in this Order. All requirements must be reviewed periodically. [CWC Section 13263(e)]

(2) This Order may be terminated or modified for cause, including, but not limited to, all of the following: [CWC Section 13381]

(a) Violation of any condition contained in the requirements of this Order. [CWC Section 13381(a)]

(b) Obtaining the requirements in this Order by misrepresentation, or failure to disclose fully all relevant facts. [CWC Section 13381(b)]

(c) A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge. [CWC Section 13381(c)]

(3) When this Order is transferred to a new owner or operator, such requirements as may be necessary under the CWC may be incorporated into this Order.

h. NPDES PERMITTED NON-STORM WATER DISCHARGES

The San Diego Water Board has, in prior years, issued a limited number of individual NPDES permits for non-storm water discharges to MS4s. The San Diego Water Board or State Water Board may in the future, upon prior notice to the Copermittee(s), issue an NPDES permit for any non-storm water discharge (or class of non-storm water discharges) to an MS4.

i. MONITORING

In addition to the standard provisions required under 40 CFR 122.41(j) and (l)(4), the following general monitoring provisions apply to this Order:

(1) Where procedures are not otherwise specified in Order, sampling, analysis and quality assurance/quality control must be conducted in accordance with the Quality Assurance Management Plan (QAMP) for the State of California's Surface Water Ambient Monitoring Program (SWAMP), adopted by the State Water Resources Control Board (State Water Board).

(2) Pursuant to 40 CFR 122.41(j)(2) and CWC Section 13383(a), each Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring

instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five (5) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time.

(3) All chemical, bacteriological, and toxicity analyses must be conducted at a laboratory certified for such analyses by the California Department of Public Health or a laboratory approved by the San Diego Water Board.

(4) For priority toxic pollutants that are identified in the California Toxics Rule (CTR) (65 Fed. Reg. 31682), the Copermittees must instruct their laboratories to establish calibration standards that are equivalent to or lower than the Minimum Levels (MLs) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP). If a Copermittee can demonstrate that a particular ML is not attainable, in accordance with procedures set forth in 40 CFR Part 136, the lowest quantifiable concentration of the lowest calibration standard analyzed by a specific analytical procedure (assuming that all the method specified sample weights, volumes, and processing steps have been followed) may be used instead of the ML listed in Appendix 4 of the SIP. The Copermittee must submit documentation from the laboratory to the San Diego Water Board for approval prior to raising the ML for any priority toxic pollutant.

j. ENFORCEMENT

(1) The San Diego Water Board is authorized to enforce the terms of this Order under several provisions of the CWC, including, but not limited to, CWC Sections 13385, 13386, and 13387.

(2) Nothing in this Order shall be construed to protect the Copermittee from its liabilities under federal, state, or local laws.

(3) The CWC provides for civil and criminal penalties comparable to, and in some cases greater than, those provided for under the CWA.

(4) Except as provided in the standard conditions required under 40 CFR 122.41(m) and (n), nothing in this Order shall be construed to relieve the Copermittee from civil or criminal penalties for noncompliance.

(5) Nothing in this Order shall be construed to preclude the institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties to which the Copermittee is or may be subject to under Section 311 of the CWA.

(6) Nothing in this Order shall be construed to preclude institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authoring preserved by Section 510 of the CWA.

k. SEVERABILITY

The provisions of this Order are severable, and if any provision of this Order, or the

application of any provisions of this Order to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this Order shall not be affected thereby.

l. APPLICATIONS

Any application submitted by a Copermittee for reissuance or modification of this Order must satisfy all applicable requirements specified in federal regulations as well as any additional requirements for submittal of a Report of Waste Discharge specified in the CWC and the California Code of Regulations.

m. IMPLEMENTATION

All plans, reports and subsequent amendments submitted in compliance with this Order must be implemented immediately (or as otherwise specified). All submittals by Copermittees must be adequate to implement the requirements of this Order.

n. REPORT SUBMITTALS

(1) All report submittals must include an executive summary, introduction, conclusion, recommendations, and signed certified statement.

(2) Each Copermittee must submit a signed certified statement covering its responsibilities for each applicable submittal.

(3) The Principal Watershed Copermittee(s) must submit a signed certified statement covering its responsibilities for each applicable submittal and the sections of the submittals for which it is responsible.

(4) Unless otherwise directed, the Copermittees must submit one hard copy and one electronic copy of each report required under this Order to the San Diego Water Board, and one electronic copy to the USEPA.

(5) The Copermittees must submit reports and provide notifications as required by this Order to the following:

EXECUTIVE OFFICER
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
2375 NORTHSIDE DRIVE~~9174 SKY PARK COURT~~, SUITE 100
SAN DIEGO CA 9210~~823-4340~~8
Telephone: ~~(858) 467-2952~~(619) 516-1990 Fax: ~~(858) 571-6972~~(619) 516-1994

EUGENE BROMLEY
US ENVIRONMENTAL PROTECTION AGENCY
REGION IX
PERMITS ISSUANCE SECTION (W-5-1)
75 HAWTHORNE STREET
SAN FRANCISCO CA 94105

ATTACHMENT C

ACRONYMS AND ABBREVIATIONS

AMAL	Average Monthly Action Level
ASBS	Area(s) of Special Biological Significance
BMP	Best Management Practice
Basin Plan	Water Quality Control Plan for the San Diego Basin
CEQA	California Environmental Quality Act
CCR	California Code of Regulations
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWC	California Water Code
CZARA	Coastal Zone Act Reauthorization Amendments of 1990
ESAs	Environmentally Sensitive Areas
GIS	Geographic Information System
IBI	Index of Biological Integrity
LID	Low Impact Development
MDAL	Maximum Daily Action Level
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
NAL	Non-Storm Water Action Level
NAICS	North American Industry Classification System
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
ROWD	Report of Waste Discharge (application for NPDES reissuance)
SAL	Storm Water Action Level
San Diego Water Board	California Regional Water Quality Control Board, San Diego Region
SIC	Standard Industrial Classification Code
State Water Board	State Water Resources Control Board
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
WDID	Waste Discharge Identification Number
WLA	Waste Load Allocation
WQBEL	Water Quality Based Effluent Limitation

DEFINITIONS

Active/Passive Sediment Treatment - Using mechanical, electrical or chemical means to flocculate or coagulate suspended sediment for removal from runoff from construction sites prior to discharge.

Anthropogenic Litter – Trash generated from human activities, not including sediment.

Average Monthly Action Level – The highest allowable average of daily discharges over a calendar month.

Beneficial Uses - The uses of water necessary for the survival or wellbeing of man, plants, and wildlife. These uses of water serve to promote tangible and intangible economic, social, and environmental goals. "Beneficial Uses" of the waters of the State that may be protected include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. Existing beneficial uses are uses that were attained in the surface or ground water on or after November 28, 1975; and potential beneficial uses are uses that would probably develop in future years through the implementation of various control measures. "Beneficial Uses" are equivalent to "Designated Uses" under federal law. [California Water Code Section 13050(f)].

Best Management Practices (BMPs) - Defined in 40 CFR 122.2 as schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Bioassessment - The use of biological community information to evaluate the biological integrity of a water body and its watershed. With respect to aquatic ecosystems, bioassessment is the collection and analysis of samples of the benthic macroinvertebrate community together with physical/habitat quality measurements associated with the sampling site and the watershed to evaluate the biological condition (i.e. biotic integrity) of a water body.

Biofiltration - Practices that use vegetation and amended soils to detain and treat runoff from impervious areas. Treatment is through filtration, infiltration, adsorption, ion exchange, and biological uptake of pollutants.

Biological Integrity - Defined in Karr J.R. and D.R. Dudley. 1981. Ecological perspective on water quality goals. *Environmental Management* 5:55-68 as: "A balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitat of the region." Also referred to as ecosystem health.

BMP Design Manual – A plan developed to eliminate, reduce, or mitigate the impacts of runoff from development projects, including Priority Development Projects.

Channel Rehabilitation and Improvement – Remedial measures or activities for the purpose of improving the environmental health of streams, channels, or river systems. Techniques may

vary from in-stream restoration techniques to off-line stormwater management practices installed in the system corridor or upland areas. Rehabilitation techniques may include, but are not limited to the following: riparian zone restoration, constructed wetlands, bank stabilization, channel modifications, and daylighting of drainage systems. Effectiveness may be measured in various manners, including: assessments of habitat, reduced streambank erosion, and/or restoration of water and sediment transport balance.

Chronic Toxicity – A measurement of sublethal effect (e.g. reduced growth, reproduction) to experimental test organisms exposed to an effluent or receiving waters compared to that of the control organisms.

Clean Water Act Section 303(d) Water Body - An impaired water body in which water quality does not meet applicable water quality standards and/or is not expected to meet water quality standards, even after the application of technology based pollution controls required by the CWA. The discharge of runoff to these water bodies by the Copermittees is significant because these discharges can cause or contribute to violations of applicable water quality standards.

Construction Site – Any project, including projects requiring coverage under the Construction General Permit, that involves soil disturbing activities including, but not limited to, clearing, grading, disturbances to ground such as stockpiling, and excavation.

Contamination - As defined in the Porter-Cologne Water Quality Control Act, contamination is "an impairment of the quality of waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste whether or not waters of the State are affected."

Copermittee – A permittee to a NPDES permit that is only responsible for permit conditions relating to the discharge for which it is operator [40 CFR 122.26(b)(1)]. For the purposes of this Order, a Copermittee is one of the individual permittees identified in Tables 1a-1c of this Order.

Copermittees – All of the individual Copermittees, collectively.

Critical Channel Flow (Qc) – The channel flow that produces the critical shear stress that initiates bed movement or that erodes the toe of channel banks. When measuring Qc, it should be based on the weakest boundary material – either bed or bank.

Daily Discharge – Defined as either: (1) the total mass of the constituent discharged over the calendar day or any 24 hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g. concentration.)

The Daily Discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day, or other 24 hour period other than a day), or by the arithmetic mean of analytical results from one or more grab samples taken over the course of a day.

Development Projects - Construction, rehabilitation, redevelopment, or reconstruction of any public or private projects.

Dry Season –May 1 to September 30.

Dry Weather – Weather is considered dry if the preceding 72 hours has been without measurable precipitation (>0.1 inch).

Enclosed Bays – Enclosed bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost bay works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays do not include inland surface waters or ocean waters.

Erosion – When land is diminished or worn away due to wind, water, or glacial ice. Often the eroded debris (silt or sediment) becomes a pollutant via storm water runoff. Erosion occurs naturally but can be intensified by land clearing activities such as farming, development, road building, and timber harvesting.

Environmentally Sensitive Areas (ESAs) - Areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; areas designated as preserves or their equivalent under the Natural Communities Conservation Program within the Cities and County of Orange; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.

Estuaries – Waters, including coastal lagoons, located at the mouth of streams that serve as areas of mixing fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and ocean water. Estuaries do not include inland surface waters or ocean waters.

Existing Development – Any area that has been developed and exists for municipal, commercial, industrial, or residential purposes, uses, or activities. May include areas that are not actively used for its originally developed purpose, but may be re-purposed or redeveloped for another use or activity.

Flow Duration – The long-term period of time that flows occur above a threshold that causes significant sediment transport and may cause excessive erosion damage to creeks and streams (not a single storm event duration). The simplest way to visualize this is to consider a histogram of pre- and post-project flows using long-term records of hourly data. To maintain pre-development flow duration means that the total number of hours (counts) within each range of flows in a flow-duration histogram cannot increase between the pre- and post-development condition. Flow duration within the range of geomorphologically significant flows is important for managing erosion.

Grading - The cutting and/or filling of the land surface to a desired slope or elevation.

Groundwater – Subsurface water that occurs beneath the water table in soils and geologic formations that are fully saturated.

Hazardous Material – Any substance that poses a threat to human health or the environment due to its toxicity, corrosiveness, ignitability, explosive nature or chemical reactivity. These also include materials named by the USEPA in 40 CFR 116 to be reported if a designated quantity of the material is spilled into the waters of the U.S. or emitted into the environment.

Hazardous Waste - Hazardous waste is defined as "any waste which, under Section 600 of Title 22 of this code, is required to be managed according to Chapter 30 of Division 4.5 of Title 22 of this code" [CCR Title 22, Division 4.5, Chapter 11, Article 1].

Household Hazardous Waste – Paints, cleaning products, and other hazardous wastes generated during home improvement or maintenance activities.

Hydromodification – The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

Illicit Connection – Any man-made conveyance or drainage system through which the discharge of any pollutant ~~a non-storm water discharge~~ to the storm water drainage system occurs or may occur. Any connection to the MS4 that conveys an illicit discharge.

Illicit Discharge - Any discharge to the MS4 that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from firefighting activities [40 CFR 122.26(b)(2)].

Inactive Areas – Areas of construction activity that are not active and those that have been active and are not scheduled to be re-disturbed for at least 14 days.

Infiltration – In the context of low impact development, infiltration is defined as the percolation of water into the ground. Infiltration is often expressed as a rate (inches per hour), which is determined through an infiltration test. In the context of non-storm water, infiltration is water other than wastewater that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow [40 CFR 35.2005(20)].

Inland Surface Waters – Includes all surface waters of the State that do not include the ocean, enclosed bays, or estuaries.

Jurisdictional Runoff Management Program Document – A written description of the specific jurisdictional runoff management measures and programs that each Copermittee will implement to comply with this Order and ensure that storm water pollutant discharges in runoff are reduced to the MEP and do not cause or contribute to a violation of water quality standards.

Low Impact Development (LID) – A storm water management and land development strategy that emphasizes conservation and the use of on-site natural features integrated with

engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions.

Low Impact Development Best Management Practices (LID BMPs) – LID BMPs include schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States through storm water management and land development strategies that emphasize conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions. LID BMPs include retention practices that do not allow runoff, such as infiltration, rain water harvesting and reuse, and evapotranspiration. LID BMPs also include flow-through practices such as biofiltration that may have some discharge of storm water following pollutant reduction.

Major Outfall – As defined in the Code of Federal Regulations, a major outfall is a MS4 outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (i.e. discharge from a single conveyance other than a circular pipe which is associated with a drainage area of more than 50 acres); or, for MS4s that receive storm water from lands zoned for industrial activity (based on comprehensive zoning plans or equivalent), a MS4 outfall that discharges from a single pipe with an inside diameter of 12 inches or more or from its equivalent (i.e. discharge from other than a circular pipe associated with a drainage area of 2 acres or more).

Maximum Daily Action Level (MDAL) –The highest allowable daily discharge of a pollutant, over a calendar day (or 24 hour period). For pollutants with action levels expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with action levels expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

Maximum Extent Practicable (MEP) – The technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) for storm water that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) in combination with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than BAT. A definition for MEP is not provided either in the statute or in the regulations. Instead the definition of MEP is dynamic and will be defined by the following process over time: municipalities propose their definition of MEP by way of their runoff management programs. Their total collective and individual activities conducted pursuant to the runoff management programs becomes their proposal for MEP as it applies both to their overall effort, as well as to specific activities (e.g., MEP for street sweeping, or MEP for MS4 maintenance). In the absence of a proposal acceptable to the San Diego Water Board, the San Diego Water Board defines MEP.

In a memo dated February 11, 1993, entitled "Definition of Maximum Extent Practicable," Elizabeth Jennings, Senior Staff Counsel, SWRCB addressed the achievement of the MEP standard as follows:

> "*To achieve the MEP standard, municipalities must employ whatever Best Management Practices (BMPs) are technically feasible (i.e., are likely to be effective) and are not cost prohibitive. The major emphasis is on technical feasibility. Reducing pollutants to the MEP*

means choosing effective BMPs, and rejecting applicable BMPs only where other effective BMPs will serve the same purpose, or the BMPs would not be technically feasible, or the cost would be prohibitive. In selecting BMPs to achieve the MEP standard, the following factors may be useful to consider:

a. Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?
b. Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?
c. Public Acceptance: Does the BMP have public support?
d. Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?
e. Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc.?

The final determination regarding whether a municipality has reduced pollutants to the maximum extent practicable can only be made by the Regional or State Water Boards, and not by the municipal discharger. If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit derived, it would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs that would address a pollutant source, or to pick a BMP based solely on cost, which would be clearly less effective. In selecting BMPs the municipality must make a serious attempt to comply and practical solutions may not be lightly rejected. In any case, the burden would be on the municipal discharger to show compliance with its permit. After selecting a menu of BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented."

Monitoring Year – October 1 to September 30

Municipal Separate Storm Sewer System (MS4) – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designated or used for collecting or conveying storm water; (iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.26.

National Pollutant Discharge Elimination System (NPDES) - The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the CWA.

Non-Storm Water - All discharges to and from a MS4 that do not originate from precipitation

events (i.e., all discharges from a MS4 other than storm water). Non-storm water includes illicit discharges and NPDES permitted discharges.

Nuisance - As defined in the Porter-Cologne Water Quality Control Act, a nuisance is "anything which meets all of the following requirements: 1) Is injurious to health, or is indecent, or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. 2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. 3) Occurs during, or as a result of, the treatment or disposal of wastes."

Ocean Waters – The territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the State Board's California Ocean Plan.

Order – Unless otherwise specified, refers to this Order, Order No. R9-2013-0001 (NPDES No. CAS0109266)

Outfall - Outfall means a point source as defined by 40 CFR 122.2 at the point where a municipal separate storm sewer discharges to waters of the US and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels or other conveyances which connect segments of the same stream or other waters of the US and are used to convey waters of the US.

Persistent Flow - Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

Person - A person is defined as an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof [40 CFR 122.2].

Point Source - Any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, landfill leachate collection systems, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

Pollutant - Any agent that may cause or contribute to the degradation of water quality such that a condition of pollution or contamination is created or aggravated.

Pollution - As defined in the Porter-Cologne Water Quality Control Act, pollution is "the alteration of the quality of the waters of the State by waste, to a degree which unreasonably affects either of the following: 1) The waters for beneficial uses; or 2) Facilities that serve these beneficial uses." Pollution may include contamination.

Pollution Prevention - Pollution prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control BMPs, treatment control BMPs, or disposal.

Pre-Development Runoff Conditions – Approximate flow rates and durations that exist or existed onsite before land development occurs. For new development projects, this equates to runoff conditions immediately before project construction. For redevelopment projects, this equates to runoff conditions from the project footprint assuming infiltration characteristics of the underlying soil, and existing grade. Runoff coefficients of concrete or asphalt must not be used. A redevelopment Priority Development Project must use available information pertaining to existing underlying soil type and onsite existing grade to estimate pre-development runoff conditions.

Priority Development Projects - New development and redevelopment projects defined under Provision E.3.b of Order No. R9-2013-0001.

Progressive Enforcement – A series of enforcement actions that increase in severity commensurate with the violation. Such enforcement actions may include verbal and written notices of violation, fines, stop work orders, administrative penalties, criminal penalties, etc.

Rainy Season (aka Wet Season) –October 1 to April 30

Receiving Waters – Waters of the United States.

Receiving Water Limitations - Waste discharge requirements issued by the San Diego Water Board typically include both: (1) "Effluent Limitations" (or "Discharge Limitations") that specify the technology-based or water-quality-based effluent limitations; and (2) "Receiving Water Limitations" that specify the water quality objectives in the Basin Plan as well as any other limitations necessary to attain those objectives. In summary, the "Receiving Water Limitations" provision is the provision used to implement the requirements of CWA section 402(p)(3)(B).

Redevelopment - The creation and/or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include trenching and resurfacing associated with utility work; parking lots; resurfacing existing roadways; cutting and reconfiguring of surface parking lots; new sidewalk construction, pedestrian ramps, or bike lane on existing roads; and routine replacement of damaged pavement, such as pothole repair.

Regional Clearinghouse – A central location for the collection and distribution of information developed and maintained by the Copermittees including, but not limited to, plans, reports, manuals, data, contact information, and/or links to such documents and information.

Rehabilitation - Remedial measures or activities for the purpose of improving or restoring the beneficial uses of streams, channels or river systems. Techniques may vary from in-stream restoration techniques to off-line storm water management practices installed in the system corridor or upland areas, or a combination of in-stream and out of stream techniques. Rehabilitation techniques may include, but are not limited to the following: riparian zone restoration, constructed wetlands, channel modifications that improve habitat and stability, and daylighting of drainage systems.

Reporting Period – The period of information that is reported in the Water Quality Improvement

Plan Annual Report. The reporting period consists of two components: 1) July 1 to June 30, consistent with the fiscal year, for the implementation of the jurisdictional runoff management programs, and 2) October 1 to September 30, consistent with the monitoring year for the monitoring and assessment programs. Together, these two time periods constitute the reporting year for the Water Quality Improvement Plan Annual Report due January 31 following the end of the monitoring year.

Retain – Keep or hold in a particular place, condition, or position without discharge to surface waters.

Retrofitting – Storm water management practice put into place after development has occurred in watersheds where the practices previously did not exist or are ineffective. Retrofitting of developed areas is intended to improve water quality, protect downstream channels, reduce flooding, or meet other specific objectives. Retrofitting developed areas may include, but is not limited to replacing roofs with green roofs, disconnecting downspouts or impervious surfaces to drain to pervious surfaces, replacing impervious surfaces with pervious surfaces, installing rain barrels, installing rain gardens, and trash area enclosures.

Runoff - All flows in a storm water conveyance system that consists of the following components: (1) storm water (wet weather flows) and (2) non-storm water including dry weather flows.

San Diego Water Board – As used in this document the term "San Diego Water Board" is synonymous with the term "Regional Board" as defined in Water Code section 13050(b) and is intended to refer to the California Regional Water Quality Control Board for the San Diego Region as specified in Water Code Section 13200.

Sediment - Soil, sand, and minerals washed from land into water. Sediment resulting from anthropogenic sources (i.e. human induced land disturbance activities) is considered a pollutant. This Order regulates only the discharges of sediment from anthropogenic sources and does not regulate naturally occurring sources of sediment. Sediment can destroy fish-nesting areas, clog animal habitats, and cloud waters so that sunlight does not reach aquatic plants.

Source Control BMP – Land use or site planning practices, or structural or nonstructural measures that aim to prevent runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between pollutants and runoff.

Storm Water – Per 40 CFR 122.26(b)(13), means storm water runoff, snowmelt runoff and surface runoff and drainage. ~~Surface runoff and drainage pertains to runoff and drainage resulting from precipitation events~~.

Structural BMPs - A subset of BMPs which detains, retains, filters, removes, or prevents the release of pollutants to surface waters from development projects in perpetuity, after construction of a project is completed.

Test of Significant Toxicity (TST) - A statistical approach used to analyze toxicity test data. The TST incorporates a restated null hypothesis, Welch's t-test, and biological effect thresholds for chronic and acute toxicity.

Total Maximum Daily Load (TMDL) - The maximum amount of a pollutant that can be

discharged into a water body from all sources (point and non-point) and still maintain water quality standards. Under CWA section 303(d), TMDLs must be developed for all water bodies that do not meet water quality standards after application of technology-based controls.

Toxicity - Adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies. The water quality objectives for toxicity provided in the Basin Plan, state in part…"All waters shall be free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life….The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge."

Toxicity Identification Evaluation (TIE) - A set of procedures for identifying the specific chemical(s) responsible for toxicity. These procedures are performed in three phases (characterization, identification, and confirmation) using aquatic organism toxicity tests.

Toxicity Reduction Evaluation (TRE) - A study conducted in a step-wise process designed to identify the causative agents of effluent or ambient toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in toxicity. The first steps of the TRE consist of the collection of data relevant to the toxicity, including additional toxicity testing, and an evaluation of facility operations and maintenance practices, and best management practices. A Toxicity Identification Evaluation (TIE) may be required as part of the TRE, if appropriate.

Treatment Control BMP – Any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media absorption or any other physical, biological, or chemical process.

Unpaved Road – Any long, narrow stretch without pavement used for traveling by motor passenger vehicles between two or more points. Unpaved roads are generally constructed of dirt, gravel, aggregate or macadam and may be improved or unimproved.

Waste - As defined in CWC Section 13050(d), "waste includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal."

Article 2 of CCR Title 23, Chapter 15 (Chapter 15) contains a waste classification system that applies to solid and semi-solid waste, which cannot be discharged directly or indirectly to water of the state and which therefore must be discharged to land for treatment, storage, or disposal in accordance with Chapter 15. There are four classifications of waste (listed in order of highest to lowest threat to water quality): hazardous waste, designated waste, non-hazardous solid waste, and inert waste.

Water Quality Objective - Numerical or narrative limits on constituents or characteristics of water designated to protect designated beneficial uses of the water. [California Water Code Section 13050 (h)]. California's water quality objectives are established by the State and Regional Water Boards in the Water Quality Control Plans. Numeric or narrative limits for pollutants or characteristics of water designed to protect the beneficial uses of the water. In other words, a water quality objective is the maximum concentration of a pollutant that can exist

in a receiving water and still generally ensure that the beneficial uses of the receiving water remain protected (i.e., not impaired). Since water quality objectives are designed specifically to protect the beneficial uses, when the objectives are violated the beneficial uses are, by definition, no longer protected and become impaired. This is a fundamental concept under the Porter Cologne Act. Equally fundamental is Porter Cologne's definition of pollution. A condition of pollution exists when the water quality needed to support designated beneficial uses has become unreasonably affected or impaired; in other words, when the water quality objectives have been violated. These underlying definitions (regarding beneficial use protection) are the reason why all waste discharge requirements implementing the federal NPDES regulations require compliance with water quality objectives. (Water quality objectives are also called water quality criteria in the CWA.)

Water Quality Standards - Water quality standards, as defined in Clean Water Act section 303(c) consist of the beneficial uses (e.g., swimming, fishing, municipal drinking water supply, etc.,) of a water body and criteria (referred to as water quality objectives in the California Water Code) necessary to protect those uses. Under the Water Code, the water boards establish beneficial uses and water quality objectives in water quality control or basin plans. Together with an anti-degradation policy, these beneficial uses and water quality objectives serve as water quality standards under the Clean Water Act. In Clean Water Act parlance, state beneficial uses are called "designated uses" and state water quality objectives are called "criteria." Throughout this Order, the relevant term is used depending on the statutory scheme.

Waters of the State - Any ~~water,~~ surface or groundwater ~~underground~~, including saline waters within the boundaries of the State [CWC section 13050 (e)]. The definition of the Waters of the State is broader than that for the Waters of the United States in that all water in the State is considered to be a Waters of the State ~~regardless of circumstances or condition~~.

Waters of the United States - As defined in the 40 CFR 122.2, the Waters of the U.S. are defined as: "(a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate "wetlands;" (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters otherwise defined as waters of the United States under this definition: (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial seas; and (g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA."

Watershed - That geographical area which drains to a specified point on a water course, usually a confluence of streams or rivers (also known as drainage area, catchment, or river basin).

Wet Season (aka Rainy Season) – October 1 to April 30

Wet Weather – Wet weather must be preceded by 72 hours of dry weather and ~~Weather~~ is considered wet up to 72 hours after a storm event of 0.1 inches and greater, unless otherwise defined by another regulatory mechanism (e.g. a TMDL).

ATTACHMENT D

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM

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JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM
FY _____

I. COPERMITTEE INFORMATION

Copermittee Name:

Copermittee Primary Contact Name:

Copermittee Primary Contact Information:
Address:
City: County: State: Zip:
Telephone: Fax: Email:

II. LEGAL AUTHORITY

Has the Copermittee established adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 that complies with Order No. R9-2013-0001?	YES NO	☐ ☐
A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority?	YES NO	☐ ☐

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

Was an update of the jurisdictional runoff management program document required or recommended by the San Diego Water Board?	YES NO	☐ ☐
If YES to the question above, did the Copermittee update its jurisdictional runoff management program document and make it available on the Regional Clearinghouse?	YES NO	☐ ☐

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

Has the Copermittee implemented a program to actively detect and eliminate illicit discharges and connections to its MS4 that complies with Order No. R9-2013-0001?	YES NO	☐ ☐

Number of non-storm water discharges reported by the public	
Number of non-storm water discharges detected by Copermittee staff or contractors	
Number of non-storm water discharges investigated by the Copermittee	
Number of sources of non-storm water discharges identified	
Number of non-storm water discharges eliminated	
Number of sources of illicit discharges or connections identified	
Number of illicit discharges or connections eliminated	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

V. DEVELOPMENT PLANNING PROGRAM

Has the Copermittee implemented a development planning program that complies with Order No. R9-2013-0001?	YES NO	☐ ☐
Was an update to the BMP Design Manual required or recommended by the San Diego Water Board?	YES NO	☐ ☐
If YES to the question above, did the Copermittee update its BMP Design Manual and make it available on the Regional Clearinghouse?	YES NO	☐ ☐

Number of proposed development projects in review	
Number of Priority Development Projects in review	
Number of Priority Development Projects approved	
Number of approved Priority Development Projects exempt from any BMP requirements	
Number of approved Priority Development Projects allowed alternative compliance	
Number of Priority Development Projects granted occupancy	

Number of completed Priority Development Projects in inventory	
Number of high priority Priority Development Project structural BMP inspections	
Number of Priority Development Project structural BMP violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM

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VI. CONSTRUCTION MANAGEMENT PROGRAM

Has the Copermittee implemented a construction management program that complies with Order No. R9-2013-0001?	YES	☐
	NO	☐

Number of construction sites in inventory	
Number of active construction sites in inventory	
Number of inactive construction sites in inventory	
Number of construction sites closed/completed during reporting period	
Number of construction site inspections	
Number of construction site violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

Has the Copermittee implemented an existing development management program that complies with Order No. R9-2013-0001?	YES	☐
	NO	☐

	Municipal	Commercial	Industrial	Residential
Number of facilities or areas in inventory				
Number of existing development inspections				
Number of follow-up inspections				
Number of violations				
Number of enforcement actions issued				
Number of escalated enforcement actions issued				

VIII. PUBLIC EDUCATION AND PARTICIPATION

Has the Copermittee implemented a public education program component that complies with Order No. R9-2013-0001?	YES	☐
	NO	☐
Has the Copermittee implemented a public participation program component that complies with Order No. R9-2013-0001?	YES	☐
	NO	☐

IX. FISCAL ANALYSIS

Has the Copermittee attached to this form a summary of its fiscal analysis that complies with Order No. R9-2013-0001?	YES	☐
	NO	☐

X. CERTIFICATION

I [☐ Principal Executive Officer ☐ Ranking Elected Official ☐ Duly Authorized Representative] certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature	Date
Print Name	Title
Telephone Number	Email

ATTACHMENT E

SPECIFIC PROVISIONS FOR TOTAL MAXIMUM DAILY LOADS APPLICABLE TO ORDER NO. R9-2013-0001

These provisions implement load allocations (LAs) and wasteload allocations (WLAs) of the Total Maximum Daily Loads (TMDLs) ~~adopted~~ established by the San Diego Water Board or ~~and approved by~~ USEPA under Clean Water Act section 303(c), applicable to discharges regulated under this Order. The provisions and schedules for implementation of the TMDLs described below must be incorporated into the Water Quality Improvement Plans, required pursuant to Provision B of this Order, for the specified Watershed Management Areas.

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed
2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin
3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed
4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek
5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay
6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)
7. Total Maximum Daily Load for Sediment in Los Peñasquitos Lagoon

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2002-0123

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	August 14, 2002
State Water Board Approval Date:	July 16, 2003
Office of Administrative Law Approval Date:	September 11, 2003
US EPA Approval Date:	November 3, 2003

(3) TMDL Effective Date: September 11, 2003

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final diazinon TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must be in compliance with the final TMDL compliance requirements as of December 31, 2010.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations:

Table 1.1
Final Receiving Water Limitations Expressed as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Diazinon	Acute	0.08 µg/L	1 hour
	Chronic	0.05 µg/L	4 days

(b) Final Effluent Limitations

Discharges from the MS4s containing concentrations that do not exceed the following effluent limitations will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 1.b.(2)(a):

Table 1.2
Final Effluent Limitations Expressed as Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation	Averaging Period
Diazinon	Acute	0.072 µg/L	1 hour
	Chronic	0.045 µg/L	4 days

(c) Best Management Practices

The following BMPs for Chollas Creek must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area and implemented by the Responsible Copermittees:

(i) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 1.b.(2)(a) and/or the effluent limitations under Specific Provision 1.b.(2)(b) for Chollas Creek.

(ii) The Responsible Copermittees must implement the Diazinon Toxicity Control Plan and Diazinon Public Outreach/Education Program as described in the report titled, *Technical Report for Total Maximum Daily Load for Diazinon in Chollas Creek Watershed, San Diego County*, dated August 14, 2002, including subsequent modifications, in order to achieve the receiving water limitations under Specific Provision 1.b.(2)(a) and/or the effluent limitations under Specific Provision 1.b.(2)(b).

(iii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 1.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 1.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 1.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 1.b.(2)(c) achieves compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 1.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 1.d, to demonstrate compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The Responsible Copermittees must be in compliance with the final diazinon TMDL compliance requirements as of December 31, 2010.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls for diazinon within the Chollas Creek watershed, and calculate or estimate the annual diazinon loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment

Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 1.b.(2)(b), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0019

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	September 22, 2005
Office of Administrative Law Approval Date:	December 2, 2005
US EPA Approval Date:	February 8, 2006

(3) TMDL Effective Date: December 2, 2005

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Shelter Island Yacht Basin

(6) Responsible Copermittee: City of San Diego

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final dissolved copper TMDL compliance requirements for Shelter Island Yacht Basin consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittee must be in compliance with the final TMDL compliance requirements as of December 2, 2005.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations:

Table 2.1
Final Receiving Water Limitations Expressed as Concentrations in Shelter Island Yacht Basin

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Dissolved Copper	Acute	4.8 µg/L x WER*	1 hour
	Chronic	3.1 µg/L x WER*	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 2.b.(3)(a):

Table 2.2
Final Effluent Limitations as Expressed as Annual Loads in MS4 Discharges to Shelter Island Yacht Basin

Constituent	Effluent Limitation
Dissolved Copper	30 kg/yr*

* If the water quality objectives for dissolved copper in Shelter Island Yacht Basin are changed in the future, then the margin of safety (MOS), TMDL and allocations will be recalculated using the *Method for Recalculation of the Total Maximum Daily Load for Dissolved Copper in the Shelter Island Yacht Basin, San Diego Bay* in the Basin Plan (p. 7-14).

(c) Best Management Practices

The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 2.b.(2)(a) and/or the effluent limitations under Specific Provision 2.b.(2)(b) for Shelter Island Yacht Basin. The BMPs must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 2.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 2.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittee develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 2.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 2.b.(2)(c) achieves compliance with Specific Provisions 2.b.(3)(a), 2.b.(3)(b) and/or 2.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 2.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 2.d, to demonstrate compliance with Specific Provisions 2.b.(3)(a), 2.b.(3)(b) and/or 2.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The Responsible Copermittees must be in compliance with the final dissolved copper TMDL compliance requirements as of December 2, 2005.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

The Responsible Copermittee must monitor the effluent of its MS4 outfalls for dissolved copper, and calculate or estimate the monthly and annual dissolved copper loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.(b)(2)of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0036

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	November 16, 2005
Office of Administrative Law Approval Date:	February 1, 2006
US EPA Approval Date:	March 22, 2006

(3) TMDL Effective Date: February 1, 2006

(4) Watershed Management Area: Santa Margarita River

(5) Water Body: Rainbow Creek

(6) Responsible Copermittee: County of San Diego

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final total nitrogen and total phosphorus TMDL compliance requirements for Rainbow Creek consist of the following

(1) Final TMDL Compliance Date

The Responsible Copermittee must comply with final TMDL compliance requirements by December 31, 2021.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance date under Specific Provision 3.b.(1):

Table 3.1
Final Receiving Water Limitations Expressed as Concentrations in Rainbow Creek

Constituent	Receiving Water Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing concentrations that do not exceed the following effluent limitations by the compliance date under Specific Provision 3.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 3.b.(2)(a):

Table 3.2
Final Effluent Limitations Expressed as Concentrations in MS4 Discharges to Rainbow Creek

Constituent	Effluent Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(ii) Annual pollutant loads from given land uses discharging to and from the MS4s that do not exceed the following annual loads by the compliance date under Specific Provision 3.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 3.b.(2)(a):

Table 3.3
Final Effluent Limitations Expressed as Annual Loads in MS4 Discharges to Rainbow Creek

Land Use	Total N	Total P
Commercial nurseries	116 kg/yr	3 kg/yr
Park	3 kg/yr	0.1 kg/yr
Residential areas	149 kg/yr	12 kg/yr
Urban areas	27 kg/yr	6 kg/yr

(c) Best Management Practices

(i) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 3.b.(2)(a) and/or the effluent limitations under Specific Provision 3.b.(2)(b) for Rainbow Creek.

(ii) The Responsible Copermittee should coordinate any BMPs implemented to address this TMDL with Caltrans and other sources as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under

Specific Provision 3.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 3.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the final effluent limitations under Specific Provision 3.b.(2)(b)(ii); OR

(e) The Responsible Copermittee develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 3.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Specific Provision 3.b.(2)(c) achieves compliance with Specific Provisions 3.b.(3)(a), 3.b.(3)(b), 3.b.(3)(c) and/or 3.b.(3)(d),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 3.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 3.d, to demonstrate compliance with Specific Provisions 3.b.(3)(a), 3.b.(3)(b), 3.b.(3)(c) and/or 3.b.(3)(d).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim total nitrogen and total phosphorus TMDL compliance requirements for Rainbow Creek consist of the following:

(1) Interim Compliance Dates and WQBELs

The Responsible Copermittee must comply with the interim WQBELs, expressed as annual loads, by December 31 of the interim compliance year given in Table 3.4.

Table 3.4
Interim Water Quality Based Effluent Limitations Expressed as Annual Loads in MS4 Discharges from Specific Land Uses to Rainbow Creek

	Total N Interim Effluent Limitations (kg/yr)			Total P Interim Effluent Limitations (kg/yr)		
	Interim Compliance Date			Interim Compliance Date		
Land Use	**2009**	**2013**	**2017**	**2009**	**2013**	**2017**
Commercial nurseries	390	299	196	20	16	10
Park	5	3	3	0.15	0.10	0.10
Residential areas	507	390	260	99	74	47
Urban areas	40	27	27	9	6	6

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 3.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 3.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the final effluent limitations under Specific Provision 3.b.(2)(b)(ii); OR

(e) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the interim effluent limitations under Specific Provision 3.c.(1); OR

(f) The Responsible Copermittee has submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittee must incorporate into the Water Quality Improvement Plan and implement the Sampling and Analysis Plan for Rainbow Creek Nutrient Reduction TMDL Implementation Water Quality Monitoring, dated January 2010.

(2) The results of any monitoring conducted during the reporting period, and assessment of whether the interim and final TMDL compliance requirements have been achieved must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 3.b.(2)(b)(i), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2007-0043

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2007
State Water Board Approval Date:	July 15, 2008
Office of Administrative Law Approval Date:	October 22, 2008
US EPA Approval Date:	December 18, 2008

(3) TMDL Effective Date: October 22, 2008

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final dissolved copper, lead, and zinc TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must comply with the final TMDL compliance requirements by October 22, 2028.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance date under Specific Provision 4.b.(1):

Table 4.1
Final Receiving Water Limitations Expressed as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$(0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$(0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$(0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$(0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations by the compliance date under Specific Provision 4.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 4.b.(2)(a):

Table 4.2
Final Effluent Limitations as Expressed Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(c) Best Management Practices

(i) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 4.b.(2)(a) and/or the effluent limitations under Specific Provision 4.b.(2)(b) for Chollas Creek.

(ii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans and the U.S. Navy as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 4.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 4.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 4.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 4.b.(2)(c) achieves compliance with Specific Provisions 4.b.(3)(a), 4.b.(3)(b) and/or 4.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 4.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 4.d, to demonstrate compliance with Specific Provisions 4.b.(3)(a), 4.b.(3)(b) and/or 4.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim dissolved copper, lead, and zinc TMDL compliance requirements for Chollas Creek consist of the following:

(1) Interim Compliance Date and WQBELs

The Responsible Copermittee must comply with the interim WQBELs, expressed as concentrations, by the interim compliance date given in Table 4.3:

Table 4.3
Interim Water Quality Based Effluent Limitations Expressed as Concentrations in MS4 Discharges to Chollas Creek

Interim Compliance Date	Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
October 22, 2018	Dissolved Copper	Acute	1.2 x 90% x (0.96) x $e^{[0.9422 \times \ln(\text{hardness}) - 1.700]}$ x WER*	1 hour
		Chronic	1.2 x 90% x (0.96) x $e^{[0.8545 \times \ln(\text{hardness}) - 1.702]}$ x WER*	4 days
	Dissolved Lead	Acute	1.2 x 90% x [1.46203 – 0.145712 x ln(hardness)] x $e^{[1.273 \times \ln(\text{hardness}) - 1.460]}$ x WER*	1 hour
		Chronic	1.2 x 90% x [1.46203 – 0.145712 x ln(hardness)] x $e^{[1.273 \times \ln(\text{hardness}) - 4.705]}$ x WER*	4 days
	Dissolved Zinc	Acute	1.2 x 90% x (0.978) x $e^{[0.8473 \times \ln(\text{hardness}) + 0.884]}$ x WER*	1 hour
		Chronic	1.2 x 90% x (0.986) x $e^{[0.8473 \times \ln(\text{hardness}) + 0.884]}$ x WER*	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 4.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 4.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) There are no exceedances of the interim effluent limitations under Specific

Provision 4.c.(1) at the Responsible Copermittee's MS4 outfalls; OR

(e) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance date.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*, when it is amended to include monitoring requirements for the Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls discharging to Chollas Creek for dissolved copper, lead, and zinc, and calculate or estimate the monthly and annual dissolved copper, lead, and zinc loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 4.b.(2)(b) or 4.c.(1), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2008-0027

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 11, 2008
State Water Board Approval Date:	June 16, 2009
Office of Administrative Law Approval Date:	September 15, 2009
US EPA Approval Date:	October 26, 2009

(3) TMDL Effective Date: September 15, 2009

(4) Watershed Management Areas: See Table 5.0

(5) Water Bodies: See Table 5.0

(6) Responsible Copermittees: See Table 5.0

Table 5.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County	Dana Point Harbor	Baby Beach	-City of Dana Point -County of Orange
San Diego Bay	San Diego Bay	Shelter Island Shoreline Park	- San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final indicator bacteria TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0[39] consist of the following:

(3) Final TMDL Compliance Dates

(a) Baby Beach in Dana Point Harbor

The Responsible Copermittees for MS4 discharges to Baby Beach must be in compliance with the final TMDL compliance requirements according

[39] Per Resolution R9-2008-0027, the interim and final WQBELs only apply to waterbodies that remain on the 303(d) list for REC-1 water quality objectives due to impacts from controllable sources of bacteria. If waterbodies are put back on the list or delisted in subsequent iterations, the San Diego Water Board will revise the current NPDES requirements and/or issue additional waste discharge requirements to be consistent with these TMDLs.

to the following compliance dates:

Table 5.1
Compliance Dates to Achieve Final TMDL Compliance Requirements For Baby Beach in Dana Point Harbor

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform	September 15, 2014	September 15, 2009
Fecal Coliform		September 15, 2009
Enterococcus		September 15, 2019

(b) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park must be in compliance with the final TMDL compliance requirements as of December 31, 2012.

(4) Final Receiving Water ~~Quality Based Effluent Water~~ Limitations

~~(a) Final Receiving Water Limitations~~
The Receiving Water Limitations for segments or areas of the water bodies listed in Table 5.0[40] consist of the following:

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance dates under Specific Provision 5.b.(1):

Table 5.2
Final Receiving Water Limitations Expressed as Bacteria Densities in the Water Body

Constituent	Receiving Water Limitations	
	Single Sample Maximum[1,2]	30-Day Geometric Mean[2]
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.

[40] Per Resolution R9-2008-0027, the Receiving Water Limitations only apply to waterbodies that remain on the 303(d) list for REC-1 water quality objectives due to impacts from controllable sources of bacteria. If waterbodies are put back on the list or delisted in subsequent iterations, the San Diego Water Board will revise the current NPDES requirements and/or issue additional waste discharge requirements to be consistent with these TMDLs.

If the above receiving water limitations are not met in the receiving water, the Responsible Copermittees must demonstrate that the discharges from the MS4s are not causing or contributing to the exceedance of receiving water limitations. Such demonstration may be achieved by demonstrating the attainment of the final WQBELs in Provision 5.b.(2).

(3) Final Water Quality Based Effluent Limitations

(a~~b~~) Final Effluent Limitations

(i) Discharges from the MS4s must not ~~containing indicator bacteria densities that do not~~ exceed the following mass-based effluent limitations by the compliance dates under Specific Provision 5.b.(1) to demonstrate that the discharge is ~~will~~ not causing~~e~~ or contributing~~e~~ to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

~~**Table 5.3a**~~
~~*Final Effluent Limitations as Expressed as Bacteria Densities in MS4 Discharges to the Water Body*~~

~~Constituent~~	~~Effluent Limitations~~ ~~Single Sample Maximum[1,2]~~	~~30-Day Geometric Mean[2]~~
~~Total Coliform~~	~~10,000 MPN/100mL~~	~~1,000 MPN/100mL~~
~~Fecal Coliform~~	~~400 MPN/100mL~~	~~200 MPN/100mL~~
~~*Enterococcus*~~	~~104 MPN/100mL~~	~~35 MPN/100mL~~

~~Notes:~~
~~1. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.~~
~~2. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.~~

~~(ii) Discharges from the MS4s containing indicator bacteria loads that do not exceed the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):~~

Table 5.4a
Final Effluent Limitations as Mass-Based Limits ~~Expressed as Bacteria Loads~~ in MS4 Discharges
to the Baby Beach in Dana Point Harbor

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0.86×10^9 MPN/day	$3{,}254 \times 10^9$ MPN/30days
Fecal Coliform	0.17×10^9 MPN/day	112×10^9 MPN/30days
Enterococcus	0.03×10^9 MPN/day	114×10^9 MPN/30days

Table 5.4b
Final Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to the Shelter Island Shoreline Park in San Diego Bay

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0 MPN/day	198×10^9 MPN/30days
Fecal Coliform	0 MPN/day	8×10^9 MPN/30days
Enterococcus	0 MPN/day	26×10^9 MPN/30days

(iii) Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.5a
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to Baby Beach in Dana Point Harbor*

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	90.4%	0%
Fecal Coliform	82.7%	0%
Enterococcus	96.2%	62.2%

Notes:
* The percent load reductions are relative to data collected between 1996-2002. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittees' MS4s must not exceed the loads in Table 5.4a, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the water body.

Table 5.5b
*Final Effluent Limitations Expressed as Percent Load Reductions** in MS4 Discharges to Shelter Island Shoreline Park in San Diego Bay*

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0%	0%
Fecal Coliform	0%	0%
Enterococcus	0%	0%

Notes:
* The percent load reductions are relative to data collected between 1999-2004. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittee's MS4s must not exceed the loads in Table 5.4b, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the water body.

If the final WQBELs are not met in the MS4 discharges, the Responsible Copermittees must demonstrate that the discharges from the MS4s are not causing or contributing to the exceedance of receiving water limitations. Such demonstration may be achieved by (1) demonstrating the attainment of the Receiving Water Limitations in Provision 5.c.(1), or (2) demonstrating that the natural and background sources appear to be the sole source of the continued impairment. The natural sources exclusion approach (NSEA) may be applied. The Municipal Dischargers are responsible for collection of the data to support the application of the NSEA to recalculate the TMDL.

(b~~c~~) Best Management Practices

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 5.0 must incorporate the Bacteria Load Reduction Plan (BLRP) required to be developed pursuant to Resolution No. R9-2008-0027.

(ii) The Responsible Copermittee must implement BMPs to support the achievement of the ~~receiving water limitations under Specific Provision 5.b.(2)(a) and/or the~~ effluent limitations under Specific Provision 5.b.(2)(b) for the segments or areas of the water bodies listed in Table 5.0

(4) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no ~~direct or indirect~~ discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.b.(2)(b)(ii); OR

(e) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 5.b.(2)(b)(iii); OR

(f) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(g) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 5.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 5.b.(2)(c) achieves compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 5.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 5.d, to demonstrate compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim indicator bacteria TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0[41] consist of the following:

(1) Baby Beach in Dana Point Harbor

(a) Interim TMDL Compliance Dates and WQBELs

The Responsible Copermittees for MS4 discharges to Baby Beach must comply with the following interim WQBELs by the interim compliance dates given in Tables 5.6a and/or 5.6b:

Table 5.6a
Interim Water Quality Based Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to Baby Beach in Dana Point Harbor

Constituent	Interim Compliance Dates	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	4.93×10^9 MPN/day	$3{,}254 \times 10^9$ MPN/30days*
Fecal Coliform	September 15, 2012	0.59×10^9 MPN/day	112×10^9 MPN/30days*
Enterococcus	September 15, 2012	0.42×10^9 MPN/day	301×10^9 MPN/30days
	September 15, 2016	0.03×10^9 MPN/day *	207×10^9 MPN/30days

Notes:
* Same as the final effluent limitations in Table 5.4a.

Table 5.6b
Interim Water Quality Based Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to Baby Beach in Dana Point Harbor*

Constituent	Interim Compliance Dates	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	45.2%	0%**
Fecal Coliform	September 15, 2012	41.4%	0%**
Enterococcus	September 15, 2012	48.1%	0%
	September 15, 2016	96.2%**	31.1%

Notes:
* The percent load reductions are relative to data collected between 1996-2002. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittees' MS4s must not exceed

[41] Per Resolution R9-2008-0027, the interim and final WQBELs only apply to waterbodies that remain on the 303(d) list for REC-1 water quality objectives due to impacts from controllable sources of bacteria. If waterbodies are put back on the list or delisted in subsequent iterations, the San Diego Water Board will revise the current NPDES requirements and/or issue additional waste discharge requirements to be consistent with these TMDLs.

the loads in Table 5.6a, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the waterbody.

** Same as the final effluent limitations in Table 5.5a.

(b) Interim Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(i) There is no ~~direct or indirect~~ discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(ii) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(iii) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(iv) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.b(2)(b)(ii); OR

(v) The Responsible Copermittees can demonstrate that exceedances of the applicable receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(vi) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the interim effluent limitations under Table 5.6a of Specific Provision 5.c.(1)(a); OR

(vii) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the interim effluent limitations under Table 5.6b of Specific Provision 5.c.(1)(a); OR

(viii) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

Upon the effective date of this Order, a Copermittee's full compliance with all of the following requirements shall constitute a Copermittee's compliance with provisions pertaining to interim WQBELs with compliance deadlines occurring prior to approval of a WQIP.

(i) Meets all interim and final deadlines for development of a WQIP,

(ii) Targets implementation of watershed control measures in its existing storm water management program, including watershed control

measures to eliminate non-storm water discharges of pollutants through the MS4 to receiving waters, to address known contributions of pollutants from MS4 discharges that cause or contribute to the impairment(s) addressed by the TMDL(s), and

(iii) Receives final approval of its WQIP from the Regional Board.

~~(viii)~~(ix)

(2) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park must be in compliance with the final indicator bacteria TMDL requirements as of December 31, 2012.

d. Specific Monitoring and Assessment Requirements

The BLRPs to be submitted by the Responsible Copermittees and approved by the Regional Board Executive Officer contain monitoring programs. Implementation of those Regional Board-approved monitoring programs constitutes compliance with the Monitoring Station and Monitoring Procedure requirements described below.

(1) Monitoring Stations

Monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[42] If discharges of bacteria from the MS4 persist at levels that exceed the applicable ~~interim or final WQBELs~~receiving water limitations, additional monitoring locations and/or other source identification methods must be implemented to identify the controllable sources causing the chronic contamination ~~exceedances~~. ~~The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.~~

If natural and background sources appear to be the sole source of the impairment, Responsible Copermittees may collect and provide additional data and the application of the NSEA to revise the TMDLs may be appropriate. Such revisions would be made to the TMDL via a Basin Plan Amendment and then subsequently incorporated into this Order consistent with Provision H.5.

(2) Monitoring Procedures

(a) The Responsible Copermittees must conduct the dry and wet weather monitoring consistent with the monitoring and reporting program developed as part of the BLRP. ~~collect dry weather monitoring samples from the receiving water monitoring stations at least monthly~~. Dry weather samples collected from additional monitoring stations established to support application of the NSEA ~~identify sources~~ must be collected at an appropriate frequency to demonstrate bacteria loads from the identified controllable anthropogenic sources have been addressed and ~~are no longer causing exceedances in the receiving waters~~do not indicate a health risk.

(b) The Responsible Copermittees must collect wet weather monitoring

[42] Commonly referred to as AB 411 monitoring

samples within the first 24 hours of a storm event[43] of the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to ~~identify sources~~support the application of the NSEA must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and ~~are no longer causing exceedances in the receiving waters~~do not indicate a health risk.

(c) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

[43] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs have been achieved.

(b) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 5.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(c) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to correlate elevated bacteria levels with known or suspected sewage spills from wastewater collection systems and treatment plants or boats.

(d) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2010-0001

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 10, 2010
State Water Board Approval Date:	December 14, 2010
Office of Administrative Law Approval Date:	April 4, 2011
US EPA Approval Date:	June 22, 2011

(3) TMDL Effective Date: April 4, 2011

(4) Watershed Management Areas: See Table 6.0

(5) Water Bodies: See Table 6.0

(6) Responsible Copermittees: See Table 6.0

Table 6.0[44]
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	-City of Laguna Beach -County of Orange -Orange County Flood Control District
		at Heisler Park - North	
	Pacific Ocean Shoreline	at Main Laguna Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Woods -County of Orange -Orange County Flood Control District
		Laguna Beach at Ocean Avenue	
		Laguna Beach at Cleo Street	
		Arch Cove at Bluebird Canyon Road	
		Laguna Beach at Dumond Drive	
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Hills -City of Laguna Niguel -City of Laguna Woods -City of Lake Forest
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries:	

[44] These TMDL provisions do not apply to waterbodies, segments, or areas, removed from the 303(d) list for REC-1 indicator bacteria numeric objectives, consistent with the assumptions and requirements of the Basin Plan amendment. If the waterbodies are subsequently placed back on the 303(d) list for exceedances of the REC-1 indicator bacteria numeric objectives, all TMDL provisions will apply to those waterbodies and the Responsible Copermittees for those waterbodies.

		- Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	-City of Mission Viejo -County of Orange -Orange County Flood Control District
	Aliso Creek Mouth	at mouth	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	-City of Dana Point -City of Laguna Beach -City of Laguna Niguel -County of Orange -Orange County Flood Control District
		Aliso Beach at Table Rock Drive	
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)	
		at Salt Creek (large outlet)	
		Salt Creek Beach at Salt Creek service road	
		Salt Creek Beach at Strand Road	
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	-City of Dana Point -City of Laguna Hills -City of Laguna Niguel -City of Mission Viejo -City of Rancho Santa Margarita -City of San Juan Capistrano -County of Orange -Orange County Flood Control District
	San Juan Creek	lower 1 mile	
	San Juan Creek Mouth	at mouth	
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	-City of Dana Point -City of San Clemente -County of Orange -Orange County Flood Control District
		Ole Hanson Beach Club Beach at Pico Drain	
		San Clemente City Beach at El Portal Street Stairs	
		San Clemente City Beach at Mariposa Street	
		San Clemente City Beach at Linda Lane	
		San Clemente City Beach at South Linda Lane	
		San Clemente City Beach at Lifeguard Headquarters	
		under San Clemente Municipal Pier	

		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	
		San Clemente State Beach at Riviera Beach	
		Can Clemente State Beach at Cypress Shores	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	-City of Oceanside -City of Vista -County of San Diego
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	-City of Carlsbad -City of Encinitas -City of Escondido -City of San Marcos -County of San Diego
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	-City of Del Mar -City of Escondido -City of Poway -City of San Diego -City of Solana Beach -County of San Diego
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	-City of Del Mar -City of Poway -City of San Diego -County of San Diego
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	-City of San Diego
		La Jolla Shores Beach at Caminito del Oro	
		La Jolla Shores Beach at Vallecitos	
		La Jolla Shores Beach at Avenida de la Playa	
		at Casa Beach, Children's Pool	
		South Casa Beach at Coast Boulevard	
		Whispering Sands Beach at Ravina Street	
		Windansea Beach at Vista de la Playa	
		Windansea Beach at Bonair Street	
		Windansea Beach at Playa del Norte	
		Windansea Beach at Palomar Avenue	
		at Tourmaline Surf Park	
		Pacific Beach at Grand Avenue	
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I- Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	-City of El Cajon -City of Santee -County of San Diego
	San Diego River	lower 6 miles	-City of El Cajon -City of La Mesa -City of San Diego -City of Santee -County of San Diego
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	-City of La Mesa -City of Lemon Grove -City of San Diego -County of San Diego - San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final indicator bacteria TMDL compliance requirements for the water bodies listed in Table 6.0 consist of the following:

(1) ~~Final TMDL~~WQBELs Compliance Dates

The Responsible Copermittees for MS4 discharges to a segment or area of the water bodies listed in Table 6.0[45] are required to achieve the Wasteload Allocations (WLAs) defined as the WQBELs under Specific Provision 6.b, ~~must be in compliance with the final TMDL compliance requirements~~ according to the following compliance dates:

Table 6.1
Compliance Dates to Achieve ~~Final TMDL Compliance Requirements~~Indicator Bacteria WLAs

Constituent	Dry Weather TMDL Compliance Date	Wet Weather TMDL Compliance Date
Total Coliform	April 4, 2021	April 4, 2031
Fecal Coliform		
Enterococcus		

(1) Final Receiving Water Limitations Compliance Requirements

[45] The WQBELs (WLAs) do not apply to waterbodies that are not on the 303(d) list for exceedances of the REC-1 indicator bacteria numeric objectives. Consistent with the assumptions and requirements of the Basin Plan Amendment, no further action is required for these waterbodies. If the waterbodies are subsequently placed back on the 303(d) list or delisted in subsequent iterations, the San Diego Water Board will revise the current NPDES requirements and/or issue additional waste discharge requirements to be consistent with these TMDLs.

The Responsible Copermittees for MS4 discharges to a segment or area of the water bodies listed in Table 6.0[46] are required to achieve the Final Receiving Water Limitations according to the following compliance schedule:

Table 6.6
Compliance Schedule Dates to Achieve Indicator Bacteria WLAs

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform*	April 4, 2021	April 4, 2031
Fecal Coliform		
Enterococcus		

* Total coliform receiving water limitations only apply to segments or areas of Pacific Ocean Shoreline listed in Table 6.0.

[46] The WQBELs (WLAs) do not apply to waterbodies that are not on the 303(d) list for exceedances of the REC-1 indicator bacteria numeric objectives. Consistent with the assumptions and requirements of the Basin Plan Amendment, no further action is required for these waterbodies. If the waterbodies are subsequently placed back on the 303(d) list for exceedances of the REC-1 indicator bacteria numeric objectives, all TMDL provisions will apply to these waterbodies and the Responsible Copermittees for those waterbodies.

(2) Final Receiving Water ~~Quality Based Effluent~~ Limitations[47]

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance dates under Specific Provision 6.b.(1), unless the responsible Copermittees provide evidence that indicates another controllable or uncontrollable source is responsible for the exceedances in the receiving water (as described in E.6.(3)(b)):

Table 6.2a
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Beaches

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency[c]
Total Coliform[f]	10,000	22%	1,000	0%
Fecal Coliform	400	22%	200	0%
Enterococcus	104[d, e]	22%	35[d]	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved (the geometric mean does not apply to wet weather days).
b. During dry weather days, ~~the single sample maximum and~~ only the 30-day geometric mean receiving water limitations are required to be achieved (the single sample maximum does not apply to dry weather days).
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan.
d. This *Enterococcus* receiving water limitation applies to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
e. A wet weather receiving water limitation for Enterococcus of 104 MPN/100mL may be applied as a receiving water limitation for creeks, instead of 61 MPN/100mL, if one or more of the creeks addressed by these TMDLs (San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek, San Diego River, and/or Chollas Creek) is designated with a "moderately to lightly used area" or less frequent usage frequency in the Basin Plan. Otherwise, the wet weather receiving water limitation of 61 MPN/100mL for Enterococcus will be used to assess compliance with the wet weather allowable exceedance frequency.
f Total Coliform Receiving Water Limitations only apply to the Pacific Ocean Shoreline segments listed in Table 6.0 and do not apply to the creeks or creek mouths listed in Table 6.0.

Table 6.2b
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Creeks

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance

[47] The Final Receiving Water Limitations requirements do not apply to waterbodies that are not on the 303(d) list for exceedances of the REC-1 indicator bacteria numeric objectives. Consistent with the assumptions and requirements of the Basin Plan Amendment, no further action is required for these waterbodies. If the waterbodies are subsequently placed back on the 303(d) list for exceedances of the REC-1 indicator bacteria numeric objectives, all TMDL provisions will apply to these waterbodies and the Responsible Copermittees for those waterbodies.

	Frequency[c]			Frequency
Fecal Coliform	400	22%	200	0%
Enterococcus	61[e] (104)	22%	33[e]	0%

Notes:

a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Basin Plan.
d. A single sample maximum of 104 MPN/100ml for *Enterococcus* may be applied as a receiving water limitation for creeks, instead of 61 MPN/100mL, if one or more of the creeks addressed by these TMDLs (San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek, San Diego River, and/or Chollas Creek) is designated with a "moderately to lightly used area" or less frequent usage frequency in the Basin Plan. Otherwise, the single sample maximum of 61 MPN/100mL for *Enterococcus* must be used to assess compliance with the allowable exceedance frequency.
e. This *Enterococcus* receiving water limitations applies to segments or areas of creeks or creek mouths listed in Table 6.0.

(a) If the above receiving water limitations are not met in the receiving water, the Responsible Copermittees must demonstrate that the discharges from the MS4s are not causing or contributing to the violation of receiving water limitations. Such demonstration may be achieved by (1) demonstrating that the discharges from the MS4s are meeting the effluent limitations under Specific Provision 6.b.(1) for dry weather discharges and Specific Provision 6.b.(2) for wet weather discharges, (2) through~~.~~ the attainment of the final WQBELs in Specific Provision 6.b.(1) for dry weather discharges and Specific Provision 6.b.(2) for wet weather discharges, (3) by providing data from their discharge points to the receiving waters, (4) by providing data collected at jurisdictional boundaries, and/or (5) by using other methods accepted by the San Diego Water Board, which may include but are not limited to the reference system antidegradation approach (RSAA) or natural sources exclusion approach (NSEA)[48]..

(b) Final Water Quality Based Effluent Limitations [49]

The WQBELs for segments or areas of the water bodies listed in Table 6.0 consist of the following:

Table 6.1
Final Dry Weather WQBELs Expressed as Mass-Based Limits

	Effluent Limitation		
Waterbody	**Total Coliform Billion MPN/month**	**Fecal Coliform Billion MPN/month**	**Enterococcus Billion MPN/month**
San Joaquin Hills/ Laguna Hills HSAs (901.11 and 901.12)	1,134	**227**	40
Aliso HSA (901.13)	1,208	242	40
Dana Point HSA (901.14)	462	92	16
Lower San Juan HSA (901.27)	8,342	1,665	275
San Clemente HA (901.30)		192	

[48] Resolution R9-2008-0028
[49] The Water Quality Based Effluent Limitations, both interim and final, do not apply to the waterbodies and the associated Responsible Copermittees for that waterbody if the waterbody segment in Table 6.0 is not on the 303(d) list for exceedances of the REC-1 numeric objectives for indicator bacteria. If the waterbody is subsequently placed back on the 303(d) for exceedances of the REC-1 numeric objectives for indicator bacteria, the WQBELs, both interim and final, will apply to the associated Responsible Copermittees for that waterbody.

Table 6.2
Final Wet Weather WQBELs Expressed as Mass-Based Limits

Waterbody	Effluent Limitation		
	Total Coliform Billion MPN/year	Fecal Coliform Billion MPN/year	Enterococcus Billion MPN/year
San Joaquin Hills/ Laguna Hills HSAs (901.11 and 901.12)	880,652	37,167	66,417
Aliso HSA (901.13)	8,923,264	477,069	735,490
Dana Point HSA (901.14)	3,404,008	152,446	219,528
Lower San Juan HSA (901.27)	16,093,160	1,156,419	1,385,094
San Clemente HA (901.30)	3,477,739	192,653	295,668

~~(i) Discharges from the MS4s containing indicator bacteria densities that do not exceed the following effluent limitations by the compliance dates under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a):~~

~~**Table 6.2c**~~
~~*Final Effluent Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies in MS4 Discharges to the Water Body*~~

Constituent	Concentration-Based Effluent Limitations			
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform[d]	10,000	22%	1,000	0%
Fecal Coliform	400	22%	200	0%
Enterococcus	104[e] / 61[f]	22%	35[e] / 33[f]	0%

Notes:
a. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan for discharges to beaches, and the Basin Plan for discharges to creeks and creek mouths.
d. Total coliform effluent limitations only apply to MS4 outfalls that discharge to the Pacific Ocean Shorelines and creek mouths listed in Table 6.0.
e. This *Enterococcus* effluent limitation applies to MS4 discharges to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
f. This *Enterococcus* effluent limitation applies to MS4 discharges to segments or areas of creeks or creek mouths listed in Table 6.0.

(3) Final Water Quality Based Effluent Limitations[50]

(ii) Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the compliance dates under Specific Provision 6.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a):

Table 6.3
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	*Watershed and Water Bodies*	*Load-Based Effluent Limitations*					
		Dry Weather			*Wet Weather*		
		Total Coliform	*Fecal Coliform*	*Entero-coccus*	*Total Coliform*	*Fecal Coliform*	*Entero-coccus*
South Orange County	San Joaquin Hills HSA (901.11) and Laguna Hills HSA (901.12) - Pacific Ocean Shoreline	91.78%	91.72%	98.28%	46.85%	52.07%	51.26%
	Aliso HSA (901.13) - Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	95.47%	95.58%	99.13%	25.29%	26.62%	27.52% (27.37%)**
	Dana Point HSA (901.14) - Pacific Ocean Shoreline	95.04%	95.03%	98.98%	13.15%	14.86%	15.16%
	Lower San Juan HSA (901.27) - Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	72.96%	74.21%	94.94%	19.21%	12.82%	27.12% (26.90%)**
	San Clemente HA (901.30) - Pacific Ocean Shoreline	94.28%	94.23%	98.83%	23.85%	24.58%	25.26%

[50] The Water Quality Based Effluent Limitations, both interim and final, do not apply to the waterbodies and the associated Responsible Copermittees for that waterbody if the waterbody segment in Table 6.0 is not on the 303(d) list for exceedances of the REC-1 numeric objectives for indicator bacteria. If the waterbody is subsequently placed back on the 303(d) list for exceedances of the REC-1 numeric objectives for indicator bacteria, the WQBELs, both interim and final, will apply to the associated Responsible Copermittees for that waterbody.

Watershed Management Areas	*Watershed and Water Bodies*	*Load-Based Effluent Limitations*					
		Dry Weather			*Wet Weather*		
		Total Coliform	*Fecal Coliform*	*Entero-coccus*	*Total Coliform*	*Fecal Coliform*	*Entero-coccus*
San Luis Rey River	San Luis Rey HU (903.00) - Pacific Ocean Shoreline	38.13%	39.09%	87.38%	5.62%	3.12%	11.69%

Table 6.3 (Cont'd)
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watershed and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
Carlsbad	San Marcos HA (904.50) - Pacific Ocean Shoreline	82.82%	82.55%	96.03%	18.47%	18.98%	20.19%
San Dieguito River	San Dieguito HU (905.00) - Pacific Ocean Shoreline	14.39%	20.72%	83.48%	4.29%	1.46%	7.72%
Penasquitos	Miramar Reservoir HA (906.10) - Pacific Ocean Shoreline	96.50%	96.59%	99.42%	1.61%	1.99%	1.93%
Mission Bay	Scripps HA (906.30) - Pacific Ocean Shoreline	96.44%	96.42%	99.25%	16.32%	21.14%	18.82%
	Tecolote HA (906.50) - Tecolote Creek	94.51%	94.59%	98.94%	16.51%	20.47%	18.15% (18.08%)**
San Diego River	Mission San Diego HSA (907.11) and Santee HSA (907.12) - Pacific Ocean Shoreline - Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles)	74.03%	69.44%	93.96%	38.14%	53.22%	42.74% (42.47%)**
San Diego Bay	Chollas HSA (908.22) - Chollas Creek	92.06%	92.15%	98.46%	17.82%	24.84%	21.46% (21.36%)**

Notes:
* The percent load reductions are based on reducing loads compared to pollutant loads from 2001 to 2002.
** The alternative *Enterococcus* percent load reduction was calculated based on a numeric target of 104 MPN/100mL instead of 61 MPN/100mL, protective of the REC-1 "moderately to lightly used area" usage frequency that is protective of freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative pollutant load reductions can be utilized.

(c) Best Management Practices

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 6.0 must incorporate the Bacteria Load Reduction Plans (BLRPs) or Comprehensive Load Reduction Plans (CLRPs) required to be developed pursuant to Resolution No. R9-2010-0001. For segments or areas in Table 6.0 that have been delisted from the Clean Water Act Section 303(d) List of Water Quality Limited Segments, a BLRP and/or CLRP is not required.

(ii) The Responsible Copermittee must implement BMPs to support the achievement of the receiving water limitations under Specific Provision 6.b.(2)(a) and/or the effluent limitations under Specific Provision 6.b.(2)(b) for the segments or areas of the water bodies listed in Table 6.0.

(iii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans, owners/operators of small MS4s, and/or agricultural dischargers as possible.

~~(3)~~(4) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no ~~direct or indirect~~ discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(f) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 6.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 6.b.(2)(c) achieves compliance with Specific Provisions 6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), and/or 6.b.(3)(e),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 6.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 6.d, to demonstrate compliance with Specific Provisions 6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), 6.b.(3)(e) and/or 6.b.(3)(f).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim indicator bacteria TMDL compliance requirements for the water bodies listed in Table 6.0 consist of the following:

(1) Interim Receiving Water Limitations Compliance Requirements
(2)
(3) The Responsible Copermittees must comply with ~~the following interim~~the Interim ~~WQBELs~~ Receiving Water Limitations ~~by the interim compliance dates:~~by the interim compliance dates specified within the Regional Board approved CLRPs or BLRPs.
~~(1) Interim TMDL Compliance Dates~~

~~The Responsible Copermittees must achieve compliance with the interim TMDL compliance requirements, as determined in accordance with Specific Provision 6.c.(3), by the interim compliance dates given in Table 6.4, unless alternative interim compliance dates are accepted by the San Diego Water Board Executive Officer as part of the Water Quality Improvement Plan.~~

Table 6.4
Interim Compliance Dates to Achieve Interim TMDL Compliance Requirements

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	April 4, 2016	April 4, 2021
		at Heisler Park - North		
	Pacific Ocean Shoreline	at Main Laguna Beach	April 4, 2016	April 4, 2021
		Laguna Beach at Ocean Avenue		
		Laguna Beach at Cleo Street		
		Arch Cove at Bluebird Canyon Road		
		Laguna Beach at Dumond Drive		
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	April 4, 2016	April 4, 2021
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	April 4, 2018	April 4, 2021
	Aliso Creek Mouth	at mouth	April 4, 2018	April 4, 2021
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	April 4, 2016	April 4, 2021
		Aliso Beach at Table Rock Drive		
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)		
		at Salt Creek (large outlet)		
		Salt Creek Beach at Salt Creek service road	April 4, 2017	April 4, 2021
		Salt Creek Beach at Strand Road	April 4, 2017	April 4, 2021

Table 6.4 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates	
			Interim Dry Weather WQBELs	Interim Wet Weather WQBELs
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	April 4, 2016	April 4, 2021
	San Juan Creek	lower 1 mile	April 4, 2018	April 4, 2021
	San Juan Creek Mouth	at mouth	April 4, 2016	April 4, 2021
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	April 4, 2016	April 4, 2021
		Ole Hanson Beach Club Beach at Pico Drain	April 4, 2016	April 4, 2021
		San Clemente City Beach at El Portal Street Stairs	April 4, 2017	April 4, 2021
		San Clemente City Beach at Mariposa Street		
		San Clemente City Beach at Linda Lane	April 4, 2016	April 4, 2021
		San Clemente City Beach at South Linda Lane	April 4, 2018	April 4, 2021
		San Clemente City Beach at Lifeguard Headquarters	April 4, 2017	April 4, 2021
		under San Clemente Municipal Pier		
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	April 4, 2018	April 4, 2021
		San Clemente State Beach at Riviera Beach	April 4, 2016	April 4, 2021
		Can Clemente State Beach at Cypress Shores	April 4, 2017	April 4, 2021
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	April 4, 2017	April 4, 2021
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	April 4, 2016	April 4, 2021
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	April 4, 2016	April 4, 2021

Table 6.4 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates	
			Interim Dry Weather WQBELs	Interim Wet Weather WQBELs
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	April 4, 2016	April 4, 2021
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	April 4, 2016	April 4, 2021
		La Jolla Shores Beach at Caminito del Oro		
		La Jolla Shores Beach at Vallecitos		
		La Jolla Shores Beach at Avenida de la Playa		
		at Casa Beach, Children's Pool		
		South Casa Beach at Coast Boulevard		
		Whispering Sands Beach at Ravina Street		
		Windansea Beach at Vista de la Playa		
		Windansea Beach at Bonair Street		
		Windansea Beach at Playa del Norte		
		Windansea Beach at Palomar Avenue		
		at Tourmaline Surf Park		
		Pacific Beach at Grand Avenue		
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries		
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	April 4, 2018	April 4, 2021
	San Diego River	lower 6 miles		
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach		
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	April 4, 2018	April 4, 2021

~~(2)~~(4) Interim Water Quality Based Effluent Limitations

The Responsible Copermittees for discharges to the water bodies in Table 6.0 must comply with the following interim WQBELs by the interim compliance dates given in Specific Provision 6.c.(1):

(a) Interim Receiving Water Limitations

(i) *Interim Dry Weather Receiving Water Limitations*

The Responsible Copermittee must calculate the "existing" exceedance frequencies of the 30-day geometric mean water quality objectives for each of the indicator bacteria by analyzing the available monitoring data collected between January 1, 1996 and December 31, 2002. "Existing" exceedance frequencies may be calculated by segment or area of a water body or by waterbody, and/or by Watershed Management Area listed in Table 6.0. Separate "existing" exceedance frequencies must be calculated for beaches and creeks/creek mouths.

The Responsible Copermittees must achieve a 50 percent reduction in the "existing" exceedance frequency of the 30-day geometric mean Receiving Water Limitations ~~WQBELs~~ for the segments or areas of the water bodies listed in Table 6.0 by the interim compliance dates given in Table 6.4. A 50 percent reduction in the "existing" exceedance frequency is equivalent to half of the "existing" exceedance frequency of the 30-day geometric mean final Receiving Water Limitations~~WQBELs~~.

The "existing" exceedance frequencies and the interim dry weather allowable exceedance frequencies (i.e. interim dry weather receiving water limitations) calculated by the Responsible Copermittees must be included in the Water Quality Improvement Plans for the applicable Watershed Management Areas. Consistent with the assumptions and requirements of the Basin Plan Amendment, the Responsible Copermittees may provide evidence that indicates another controllable or uncontrollable source is responsible for the exceedances in the receiving waters. Responsible Copermittees may therefore include such demonstrations (including but not limited to reference system exceedance frequencies, natural source exclusion approach) as part of the "existing" exceedance frequency calculation.

The schedule for attaining the interim Receiving Water Limitations is specified in Provision 6.d.(3).

(ii) *Interim Wet Weather Receiving Water Limitations*

The Responsible Copermittees must achieve the interim wet weather receiving water limitations in Table 6.5, expressed as interim wet weather allowable exceedance frequencies, by the interim compliance dates given in Table 6.4.

The Responsible Copermittees must achieve a 50 percent reduction in the "existing" exceedance frequency of the applicable wet weather Receiving Water Limitation for the segments or areas of the water bodies listed in Table 6.0[40]. A 50 percent reduction in the "existing" exceedance frequency is equivalent to half of the "existing" exceedance frequency of the applicable final Receiving Water Limitations. The exceedance frequency estimated to be equivalent to a 50 percent reduction in the "existing" exceedance frequency is shown in Table 6.4. Unless the Responsible Copermittees calculate a revised "existing" exceedance frequency that is part of an approved WQIP, the allowable existing exceedance frequencies in Table 6.~~4~~3 shall apply.

As the wet weather Receiving Water Limitations include an allowable exceedance frequency, the 50 percent reduction shall not require Responsible Permittees to attain an exceedance frequency less than the final allowable exceedance frequency.

Where Responsible Copermittees elect to calculate a revised "existing" exceedance frequency, the "existing" exceedance frequencies and the interim wet weather allowable exceedance frequencies (i.e. interim wet weather Receiving Water Limitations) calculated by the Responsible Copermittees must be included in the Water Quality Improvement Plans for the applicable Watershed Management Areas. Consistent with the assumptions and requirements of the Basin Plan Amendment, the Responsible Copermittees may provide evidence that indicates another controllable or uncontrollable source is responsible for the exceedances in the receiving waters. Responsible Copermittees may therefore include such demonstrations (including but not limited to reference system antidegradation approach or natural source exclusion approach) as part of the "existing" exceedance frequency calculation.

The schedule for attaining the interim Receiving Water Limitations is specified in Provision 6.d(3).

Table 6.5
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	38%	37%	39%
		at Heisler Park - North			
	Pacific Ocean Shoreline	at Main Laguna Beach			
		Laguna Beach at Ocean Avenue			
		Laguna Beach at Cleo Street			
		Arch Cove at Bluebird Canyon Road			
		Laguna Beach at Dumond Drive			
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	41%	41%	42%
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	41%	41%	42%
	Aliso Creek Mouth	at mouth	41%	41%	42%
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	36%	36%	36%
		Aliso Beach at Table Rock Drive			
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)			
		at Salt Creek (large outlet)			
		Salt Creek Beach at Salt Creek service road			
		Salt Creek Beach at Strand Road			

Table 6.5 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	44%	44%	48%
	San Juan Creek	lower 1 mile	44%	44%	47%
	San Juan Creek Mouth	at mouth	44%	44%	47%
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	35%	35%	36%
		Ole Hanson Beach Club Beach at Pico Drain			
		San Clemente City Beach at El Portal Street Stairs			
		San Clemente City Beach at Mariposa Street			
		San Clemente City Beach at Linda Lane			
		San Clemente City Beach at South Linda Lane			
		San Clemente City Beach at Lifeguard Headquarters			
		under San Clemente Municipal Pier			
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)			
		San Clemente State Beach at Riviera Beach			
		Can Clemente State Beach at Cypress Shores			
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	45%	44%	47%
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	40%	40%	41%
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	33%	33%	36%

Table 6.5 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	26%	26%	26%
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	37%	37%	37%
		La Jolla Shores Beach at Caminito del Oro			
		La Jolla Shores Beach at Vallecitos			
		La Jolla Shores Beach at Avenida de la Playa			
		at Casa Beach, Children's Pool			
		South Casa Beach at Coast Boulevard			
		Whispering Sands Beach at Ravina Street			
		Windansea Beach at Vista de la Playa			
		Windansea Beach at Bonair Street			
		Windansea Beach at Playa del Norte			
		Windansea Beach at Palomar Avenue			
		at Tourmaline Surf Park			
		Pacific Beach at Grand Avenue			
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries	49%	49%	51%
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	46%	43%	49%
	San Diego River	lower 6 miles	46%	43%	49%
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	46%	43%	51%
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	41%	41%	43%

(b) Interim Effluent Limitations

Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the interim compliance dates under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.c.(2)(a):

Table 6.6
Interim Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	*Watersheds and Water Bodies*	*Load-Based Effluent Limitations*					
		Dry Weather			*Wet Weather*		
		Total Coliform	*Fecal Coliform*	*Entero-coccus*	*Total Coliform*	*Fecal Coliform*	*Entero-coccus*
South Orange County	San Joaquin Hills HSA (901.11) and Laguna Hills HSA (901.12) - Pacific Ocean Shoreline	45.89%	45.86%	49.14%	23.43%	26.04%	25.63%
	Aliso HSA (901.13) - Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	47.74%	47.79%	49.57%	12.65%	13.31%	13.76% (13.69%)**
	Dana Point HSA (901.14) - Pacific Ocean Shoreline	47.52%	47.52%	49.49%	6.58%	7.43%	7.58%
	Lower San Juan HSA (901.27) - Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	36.48%	37.11%	47.47%	9.61%	6.41%	13.56% (13.45%)**
	San Clemente HA (901.30) - Pacific Ocean Shoreline	47.14%	47.12%	49.42%	11.93%	12.29%	12.63%
San Luis Rey River	San Luis Rey HU (903.00) - Pacific Ocean Shoreline	19.07%	19.55%	43.69%	2.81%	1.56%	5.85%
Carlsbad	San Marcos HA (904.50) - Pacific Ocean Shoreline	41.41%	41.28%	48.02%	9.24%	9.49%	10.10%

Table 6.6 (Cont'd)
Interim Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watersheds and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
San Dieguito River	San Dieguito HU (905.00) - Pacific Ocean Shoreline	7.20%	10.36%	41.74%	2.15%	0.73%	3.86%
Penasquitos	Miramar Reservoir HA (906.10) - Pacific Ocean Shoreline	48.25%	48.30%	49.71%	0.81%	1.00%	0.97%
Mission Bay	Scripps HA (906.30) - Pacific Ocean Shoreline	48.22%	48.21%	49.63%	8.16%	10.57%	9.41%
	Tecolote HA (906.50) - Tecolote Creek	47.26%	47.30%	49.47%	8.26%	10.24%	9.08% (9.04%)**
San Diego River	Mission San Diego HSA (907.11) and Santee HSA (907.12) - Pacific Ocean Shoreline - Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles)	37.02%	34.72%	46.98%	19.07%	26.61%	21.37% (21.24%)**
San Diego Bay	Chollas HSA (908.22) - Chollas Creek	46.03%	46.08%	49.23%	8.91%	12.42%	10.73% (10.68%)**

Notes:
* The percent load reductions are based on reducing loads compared to pollutant loads from 2001 to 2002.
** The alternative *Enterococcus* percent load reduction was calculated based on a numeric target of 104 MPN/100mL instead of 61 MPN/100mL, protective of the REC-1 "moderately to lightly used area" usage frequency that is protective of freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative pollutant load reductions can be utilized.

~~(3)~~(5) Interim TMDL Compliance Determination

Compliance with the interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no ~~direct or indirect~~ discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(f) There are no exceedances of the interim receiving water limitations under Specific Provision 6.c.(2)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(g) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the interim effluent limitations under Specific Provision 6.c.(2)(b); OR

(h) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates; OR

(i) Upon the effective date of this Order, a Copermittee's full compliance with all of the following requirements shall constitute a Copermittee's compliance with provisions pertaining to interim WQBELs with compliance deadlines occurring prior to approval of a WQIP.

(i) Meets all interim and final deadlines for development of a WQIP,

(ii) Targets implementation of watershed control measures in its existing storm water management program, including watershed control measures to eliminate non-storm water discharges of pollutants through the MS4 to receiving waters, to address known contributions of pollutants from MS4 discharges that cause or contribute to the impairment(s) addressed by the TMDL(s), and

(iii) Receives final approval of its WQIP from the Regional Board.

~~(h)~~(j) ~~.~~

(2) Submittals to Support TMDL Basin Plan Amendment

The Responsible Copermittees are encouraged to submit data to support the TMDL reopener scheduled for April 2016 including but not limited to data related to implementation of the reference system antidegradation approach (RSAA), the natural sources exclusion approach (NSEA), reference watershed monitoring and beneficial use usage frequency.

d. Specific Monitoring and Assessment Requirements

(1) Monitoring and Assessment Requirements for Beaches

The BLRPs and CLRPs to be submitted by the Copermittees and approved by the Regional Board Executive Officer contain monitoring programs. Implementation of those Regional Board-approved monitoring programs constitutes compliance with the Monitoring Station and Monitoring Procedure requirements, described below.

Waterbodies that have been delisted are not required to develop and/or implement a BLRP or CLRP, including additional monitoring. Therefore, the monitoring requirements of this provision do not apply to delisted waterbodies. Delisted waterbodies shall continue monitoring consistent with Provision D.

(a) Monitoring Stations

For beaches addressed by the TMDL, monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[51] If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations at least once within ~~the first~~ 24 hours of the end of a storm event[52] during the rainy

[51] Commonly referred to as AB 411 monitoring

[52] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to

season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer in exceedance of the allowable exceedance frequencies in the receiving waters.

(iii) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(iv) For Pacific Ocean Shoreline segments or areas listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs for the Pacific Ocean Shoreline segments or areas listed in Table 6.0 have been achieved.

(ii) Dry weather exceedance frequencies must be calculated as follows:

[a] 30-day geometric means must be calculated from the results of any dry weather samples collected from the segments or areas for each water body listed in Table 6.0;
[b] The method and number of samples need for calculating the 30-day geometric means must be consistent with the number of samples required by the Ocean Plan;
[c] Where there are multiple segments or areas associated with a water body listed in Table 6.0, the Copermittees may calculate geometric means for each segment or area, or combine the dry weather monitoring data from all the segments or areas to calculate geometric means for the water body;
[d] The exceedance frequency must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of

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storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

geometric means calculated from samples collected during the dry season.

(iii) Wet weather exceedance frequencies must be calculated as follows:

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;

[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;

[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria densities reported from each storm event sampled; and

[d] The single sample maximum exceedance frequency must be calculated by dividing the number of wet weather days that exceed the single sample maximum receiving water limitations in Table 6.2 by the total number of wet weather days during the rainy season.

[e] The data collected for dry weather must be used in addition to the data collected for wet weather to calculate the wet weather 30-day geometric means. The exceedance frequency of the wet weather 30-day geometric means must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the wet season.

(iv) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(v) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) Monitoring and Assessment Requirements for Creeks and Creek Mouths

The BLRPs and CLRPs to be submitted by the Copermittees and approved by

the Regional Board Executive Officer contain monitoring programs. Implementation of those Regional Board-approved monitoring programs constitutes compliance with the Monitoring Station and Monitoring Procedure requirements, described below.

Waterbodies that have been delisted are not required to develop and/or implement a BLRP or CLRP, including additional monitoring. Therefore, the monitoring requirements of this provision do not apply to delisted waterbodies. Delisted waterbodies shall continue monitoring consistent with Provision D.

(a) Monitoring Stations

For creeks addressed by the TMDL, monitoring locations should consist of, at a minimum, a location at or near the mouth of the creek (e.g. Mass Loading Station or Mass Emission Station) and one or more locations upstream of the mouth (e.g. Watershed Assessment Station). If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations in accordance with the requirements of Provision D.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations within ~~the first~~ 24 hours of the end of a storm event[53] during the rainy season (i.e. October 1 through April 30).

(iii) Samples collected from receiving water monitoring stations must be analyzed for fecal coliform and *Enterococcus* indicator bacteria.

(iv) For creeks or creek mouths listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather

[53] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the receiving water monitoring data to assess whether the interim and final receiving water WQBELs for the creeks and creek mouths listed in Table 6.0 have been achieved.

(ii) Dry weather exceedance frequencies must be calculated as follows:

[a] 30-day geometric means must be calculated from the results of any dry weather samples collected from the segment or area for each water body listed in Table 6.0;
[b] The method and number of samples need for calculating the 30-day geometric means must be consistent with the number of samples required by the Basin Plan;
[c] The exceedance frequency must be calculated by dividing the number of 30-day geometric means that exceed the 30-day geometric mean receiving water limitations in Table 6.2 by the total number of 30-day geometric means calculated from samples collected during the dry season.

(iii) Wet weather exceedance frequencies must be calculated as follows:

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;
[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;
[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria densities reported from each of the storm events sampled; and

[d] The exceedance frequency must be calculated by dividing the number of wet weather days that exceed the single sample maximum receiving water limitations in Table 6.2 by the total number of wet weather days during the rainy season.
[e] The data collected for dry weather must be used in addition to the data collected for wet weather to calculate the wet weather 30-day geometric means. The exceedance frequency of the wet

weather 30-day geometric means must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the wet season.

(iv) The Responsible Copermittee must identify and incorporate additional MS4 outfall and receiving water monitoring stations and/or adjust monitoring frequencies to identify sources causing exceedances of the receiving water WQBELs.

(v) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(vi) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

7. Total Maximum Daily Loads for Sediment in Los Peñasquitos Lagoon

a. Applicability

(1) TMDL Basin Plan Amendment: Resolution No. R9-2012-0033

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2012
State Water Board Approval Date:	January 21, 2014
Office of Administrative Law Approval Date:	July 14, 2014
US EPA Approval Date:	Month XX, Year

(3) TMDL Effective Date: July 14, 2014

(4) Watershed Management Area: Los Peñasquitos

(5) Water Body: Los Peñasquitos Lagoon

(6) Responsible Copermittees: County of San Diego, City of San Diego, City of Del Mar, and City of Poway

b. Final TMDL Compliance Requirements

The final sediment TMDL compliance requirements for Los Peñasquitos Lagoon consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must be in compliance with the final TMDL compliance requirements by December 31, 2034.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not prohibit the sustainable restoration of tidal and non-tidal saltmarsh vegetation of at least 346 acres.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations by the compliance date under Provision 7.b(1) will not cause or contribute to a failure of the receiving water condition specified under Specific Provision 7.b.(2)(a):

Table 7.1
Final Effluent Limitations as Expressed as Annual Loads in MS4 Discharges to Los Peñasquitos Lagoon

Constituent	Effluent Limitation
Sediment	2,580 tons/yr

(c) Best Management Practices

(i) The Water Quality Improvement Plan for the Los Peñasquitos Watershed Management Area must incorporate the Sediment Load Reduction Plan required to be developed pursuant to Resolution No. R9-2012-0033.

(ii) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 7.b.(2)(a) and the effluent limitations under Specific Provision 7.b.(2)(b) for Los Peñasquitos Lagoon.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) Successful restoration of 346 total acres of tidal and non-tidal saltmarsh vegetation in Los Peñasquitos Lagoon; OR

(b) The Responsible Copermittees must develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 7.b.(2)(c)(ii) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 7.b.(2)(c)(ii) achieves compliance with Specific Provision 7.b.(3)(a),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees must continue to implement the BMPs required under Specific Provision 7.b.(2)(c)(ii), AND

(v) The Responsible Copermittees must continue to perform the specific monitoring and assessments specified in Specific Provision 7.d to demonstrate compliance with Specific Provision 2.b.(3)(a).

c. Interim TMDL Compliance Requirements

The Responsible Copermittees must comply with the interim WQBELs, expressed as annual loads, by December 31 of the interim compliance year set forth in Table 7.2.

Table 7.2
Interim Water Quality Based Effluent Limitations Expressed as Annual Loads in MS4 Discharges

Interim Compliance Date	Interim Effluent Limitations (tons/yr)	Associated Percentage of Reduction
December 31, 2019	6,691	20%
December 31, 2023	5,663	40%
December 31, 2027	4,636	60%
December 31, 2029	3,608	80%

d. Specific Monitoring and Assessment Requirements

(1) Watershed Monitoring

The Responsible Copermittees must conduct suspended sediment, bed load, and flow monitoring to calculate total sediment loading to the Los Peñasquitos Lagoon for each wet season (October 1 thru April 30) as set forth below:

(a) The Responsible Copermittees must monitor enough storm events throughout the season to quantify sediment loading over each wet season, and

(b) The Responsible Copermittees must monitor at least 3 stations to quantify cumulative sediment loading into Los Peñasquitos Lagoon. Stations must be located within the Los Peñasquitos, Carroll Canyon, and Carmel Creek tributaries prior to discharging into Los Peñasquitos Lagoon.

(2) Lagoon Monitoring

The Responsible Copermittees must monitor Los Peñasquitos Lagoon each Fall for changes in the extent of the vegetation types as set forth below:

(a) The Responsible Copermittees must acquire aerial photos of Los Peñasquitos Lagoon and digitize them at an approximate scale of 1:2,500,

(b) The Responsible Copermittees must appropriately interpret the vegetation and classify the various types as saltmarsh, non-tidal saltmarsh, freshwater marsh, non-tidal saltmarsh –*Lolium perrene* infested, southern willow scrub/mulefat scrub, herbaceous wetland, or upland land cover.

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the monitoring data collected under Specific Provision 7.d(1) and 7.d(2) to assess whether the interim and final WQBELs have been achieved.

(b) For assessing and determining compliance with the final receiving water limitations under Specific Provision 7.b.(2)(a), the Responsible Copermittees must use the data acquired under Specific Provision 7.d.(2) to estimate the acreage of tidal and non-tidal saltmarsh actually restored.

(c) For assessing and determining compliance with the final effluent limitations under Specific Provision 7.b.(2)(b), the Responsible Copermittees must use the data acquired under Specific Provision 7.d.(1) to estimate sediment loading into Los Peñasquitos Lagoon. Sediment loading must be evaluated using a 3-year, weighted rolling average. The first reported average shall be calculated using data collected in the year 2014-2015, 2015-2016, and 2016-2017 wet seasons.

(d) The monitoring and assessment results must be submitted as part of the Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

ATTACHMENT F

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD SAN DIEGO REGION

FACT SHEET / TECHNICAL

REPORT FOR

ORDER NO. R9-2013-0001
NPDES NO.
CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

VIII. PROVISIONS

The provisions (i.e. NPDES permit requirements) of the Order are discussed below.

A. Prohibitions and Limitations

Provision A.3 (Effluent Limitations) specifies the condition of the discharges from the Copermittees' MS4s that must be achieved if and when there are discharges.

Consistent with CWA section 301(b)(1)(A) and 40 CFR 122.44(a), Provision A.3.a includes the technology-based effluent limitations that must be included in the Order. The technology-based effluent limits, representing the minimum level of control that must be imposed in a permit under CWA section 402, requires that pollutants in discharges of storm water from the Copermittees' MS4s be reduced to the MEP. This provision applies specifically to storm water discharges. Non-storm water discharges must be effectively prohibited, as required under Provision A.1.b. Non-storm water (dry weather) discharges from the MS4 are not considered storm water (wet weather) discharges and therefore are not subject to the MEP standard.

The technology-based MEP standard is an ever-evolving, flexible, and advancing concept. Neither Congress nor USEPA has specifically defined the term "maximum extent practicable." Congress established this flexible MEP standard so that the administrative bodies would have "*the tools to meet the fundamental goals of the Clean Water Act in the context of storm water pollution*." (*Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 884.) As knowledge about controlling storm water runoff and discharges continues to evolve, so does the knowledge which constitutes MEP. Reducing the discharge of pollutants in storm water from the MS4 to the MEP requires the Copermittees to assess each program component and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP.

The San Diego Water Board or the State Water Board ultimately define MEP, and may include requirements that provide specific guidance on what is expected to demonstrate MEP. It is the responsibility of the Copermittees to propose actions that implement BMPs to reduce storm water pollution to the MEP. In other words, the Copermittees' runoff management programs developed and implemented under the Order are the Copermittees' proposals for achieving MEP. Their total collective and individual activities conducted pursuant to their runoff management programs become their proposal for achieving MEP as it applies both to their overall effort, as well as to specific activities. Provisions B through E of the Order provides a minimum framework to guide the Copermittees in achieving the MEP standard for discharges of pollutants in storm water.

Provision A.3.b incorporates any water quality based effluent limitations (WQBELs) applicable to the MS4s established for TMDLs adopted and approved for the San

Diego Region and requires the Copermittees to comply with those WQBELs. This is consistent with 40 CFR 122.44(d)(1)(vii)(B), which requires that NPDES permits to incorporate WQBELs "*developed to protect a narrative water quality criterion, a numeric water quality criterion, or both…consistent with the assumptions and requirements of any available wasteload allocation for the discharge...*"

Pursuant to CWA section 303(d), for surface water bodies identified as impaired by one or more pollutants, the San Diego Water Board is required to establish TMDLs "*at a level necessary to implement the applicable water quality standards with seasonal variations and a margin of safety which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality*." The

TMDLs identify sources of the pollutants causing the impairments and assign portions of the TMDL as WLAs to point sources, which include MS4s.
~~WLAs must be expressed in NPDES permits as WQBELs, which may include one or more numeric components such as numeric effluent limits, and/or receiving water limitations, and/or BMP requirements. Because numeric targets for TMDLs typically include a component that will be protective of water quality standards, a TMDL will likely include one or more numeric receiving water limitations and/or effluent limitations as part of the assumptions or requirements of the TMDL. Any numeric receiving water limitations and/or effluent limitations developed as part of the assumptions or requirements of a TMDL must be incorporated and included as part of WQBELs for the MS4s.~~

Because the development and approval of new TMDLs, or modification of existing TMDLs, may occur during the term of this Order, the specific provisions of those TMDLs, including effluent limitations applicable to MS4s are provided within Attachment E to the Order. Attachment E will be updated with new TMDLs and modifications to existing TMDLs in a timely manner as they occur.

Provision A.4 (Compliance with Discharge Prohibitions and Receiving Water Limitations) describes the process required to be implemented by the Copermittees if compliance with the discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a are not being achieved under current conditions.

In its Phase II Stormwater Regulations, Final Rule, USEPA states that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL.*"[18] In a series of comment letters on MS4 permits issued by various Regional Water Boards, USEPA has also reiterated that MS4 discharges must meet water quality standards.[19] In addition, the Ninth Circuit Court of Appeals explained in a recent ruling that, *"[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*"[20]

Water quality standards for the San Diego Region are established in the Basin Plan. The water quality standards of the Basin Plan are incorporated into this Order as the discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a. The discharge prohibitions and receiving water limitations in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations or prohibitions to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan, water quality control plans or policies adopted by the State Water Board, including Resolution No. 68-16, or federal regulations, including but not limited to, 40 CFR 131.12 and 131.38. The waste discharge prohibitions and water quality objectives in the Basin Plan have been approved by USEPA and combined with the designated beneficial uses constitute the water quality standards required under federal law.

[18] Phase II Stormwater Regulations, Final Rule, 64 Fed. Reg. 68722, 68737.
[19] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.
[20] NRDC v. County of Los Angeles (9th Cir. 2011), 673 F.3d 880, 886 (revd. on other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013))). See also, *Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 884-886, citing *Defenders of Wildlife v. Browning,* (9th Cir. 1999) 191 F.3d 1159.)

Under federal law (CWA section 402(p)(3)(B)(iii)), an MS4 permit must include "*controls to reduce the discharge of pollutants to the maximum extent practicable...and such other provision as...the State determines appropriate for control of such pollutants*." The State Water Board has previously determined that limitations necessary to meet water quality standards are appropriate for the control of pollutants discharged by MS4s and must be included in MS4 permits. (State Water Board Orders WQ 91-03, 98-01, 99-05, 2001-15; see also *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159.) This Order prohibits discharges that cause or contribute to violations of water quality standards.
The discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a are included in this Order to ensure that discharges from the MS4s do not cause or contribute to exceedances of water quality objectives necessary to protect the beneficial uses of the receiving waters.

Provision A.4 is consistent with the precedent-setting language in State Water Board Order WQ 99-05 required to be included in municipal storm water permits. State Water Board Order WQ 2001-15 refined Order WQ 99-05 by requiring an iterative approach to compliance with water quality standards involving ongoing assessments and revisions, as referred to as the "iterative process." The "iterative process" is a fundamental NPDES requirement for municipal storm water permits to achieve the objectives of the CWA.

The State Water Board and Regional Water Boards have stated that the provisions under Provisions A.1.a, A.1.c, A.2.a, and A.4 are independently applicable, meaning that compliance with one provision does not provide a "safe harbor" where there is non-compliance with another provision (i.e., compliance with the Provision A.4 does not shield a Copermittee who may have violated Provision A.1.a, A.1.c, or A.2.a from an enforcement action). The intent of Provision A.4 is to ensure that the Copermittees have the necessary storm water management programs and controls in place, and that they are modified by the Copermittees in a timely fashion when necessary, so that compliance with Provisions A.1.a, A.1.c, and/or A.2.a is achieved as soon as possible. USEPA expressed the importance of this independent applicability in a series of comment letters on MS4 permits proposed by various Regional Water Boards. At that time, USEPA expressly objected to certain MS4 permits that included language stating, *"permittees will not be in violation of this [receiving water limitation] provision … [if certain steps are taken to evaluate and improve the effectiveness of the jurisdictional runoff management programs],"* concluding that this phrase would not comply with the CWA.[21]

The Ninth Circuit held in *Natural Resources Defense Council v. County of Los Angeles* (2011) 673 F3d. 880, 886 (revd. on other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013))) that engagement in the iterative process does not provide a safe harbor from liability for violations of permit terms prohibiting exceedances of water quality standards. The Ninth Circuit holding is consistent with the position of the State and

Regional Water Boards that exceedances of water quality standards in an MS4 permit constitute violations of permit terms subject to enforcement by the Water Boards or through a citizen suit. While the Water Boards have generally directed dischargers to achieve compliance by improving control measures through the iterative process, the San Diego Water Board retains the discretion to take other appropriate enforcement and the iterative process does not shield dischargers from citizen suits under the CWA.

The requirements of Provision A.4, therefore, are required to be implemented until the water quality standards expressed under Provisions A.1.a, A.1.c, and A.2.a are achieved. The CWA requires MS4 permits to "*require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." The requirements of this Order have been deemed or determined to be "appropriate" to achieve water quality standards in receiving waters.

Part of the "*controls*" required by the Order is the process described in Provision A.4. Provision A.4 includes the process that is ultimately expected to achieve compliance with the requirement that discharges from the MS4 do not cause or contribute to violations of water quality standards in the receiving waters. The implementation of Provision A.4 is required when the Copermittees or the San Diego Water Board have determined that discharges from the MS4 are causing or contributing to violations of water quality standards in the receiving waters.

The Copermittees must effectively prohibit non-storm water discharges into the MS4s, reduce the discharge of pollutants in storm water from the MS4s to the MEP, and ensure that their MS4 discharges do not cause or contribute to violations of water quality standards. If the Copermittees have effectively prohibited non-storm water discharges and reduced storm water pollutant discharges to the MEP, but their discharges are still causing or contributing to violations of water quality standards, Provision A.4 provides a clear "iterative process" for the Copermittees to follow.

Provision A.4 essentially requires the Copermittees to implement additional BMPs until MS4 discharges no longer cause or contribute to a violation of water quality standards.

[21] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.

In assessing compliance and potential enforcement actions, the San Diego Water Board looks at the Copermittees' efforts in total to meet the requirements of Provisions A.1.a, A.1.c, A.2.a and Provision A.4. The Copermittees need to demonstrate that they are making improvements to their programs and making progress toward achieving the discharge prohibitions and receiving water limitations in Provisions A.1.a, A.1.c, and A.2.a by implementing the requirements of Provision A.4. The San Diego Water Board would consider these efforts prior to strictly enforcing the requirements of Provisions A.1.a, A.1.c, and A.2.a. Causes of exceedances of the receiving water limitations can often be more difficult to identify and attribute solely to the Copermittees' MS4s. The intent of the Order is to provide the Copermittees more clarity and flexibility in addressing these exceedances through the iterative approach and adaptive management process until the requirements under Provisions A.1.a, A.1.c, and A.2.a are fully achieved.

An exception to the iterative approach and adaptive management process would be in receiving waters subject to adopted and approved TMDLs. For TMDLs that are incorporated into the Order, there is a specific date for compliance to be achieved. The Copermittees are in compliance with Provision A.4 as long as the Copermittees demonstrate compliance consistent with one of the methods identified in Attachment E for interim or final WQBELs consistent with the specific compliance dates~~, after which the iterative approach and adaptive management process required under Provision A.4 no longer provides the flexibility to achieve compliance. Where compliance dates for a TMDL have passed, compliance with the WQBELs incorporated into the Order established by a TMDL in Attachment E to protect water quality standards is required. Thus, after the interim or final compliance dates for a TMDL have passed, if the discharges from the Copermittees' MS4s are causing or contributing to a violation of WQBELs, exceedances of WQBELs must be strictly enforced by the San Diego Water Board. In the meantime, however, the Copermittees are in compliance with the interim or final TMDL requirements in Attachment E as long as the interim or final WQBELs are being achieved in accordance with the interim or final compliance dates.~~

Provision F.2 (Updates) requires the Copermittees to update specific documents that the Copermittees will utilize to implement the requirements of this Order.

Each Copermittee is required to continue implementing a jurisdictional runoff management program, as required under Provision E. Implementation of each Copermittee's jurisdictional runoff management program is directed by its jurisdictional runoff management program document. Provision F.2.a requires each Copermittee to update its jurisdictional runoff management program document to be consistent with the requirements of Provision E concurrent with the submittal of the Water Quality Improvement Plan.

Likewise, each Copermittee must continue to require new development and redevelopment projects to implement BMPs to control pollutants in storm water runoff. The control of pollutants in storm water runoff from development and redevelopment projects within each Copermittee's jurisdiction is guided and directed by its BMP Design Manual, formerly known as a Standard Storm Water Mitigation Plan (SSMP). Provision F.2.b requires each Copermittee to update its BMP Design Manual to be consistent with the requirements of Provision E.3 concurrent with the submittal of the Water Quality Improvement Plan.

In general, the requirements of the Order should not necessitate a complete rewrite of each Copermittee's jurisdictional runoff management program document or BMP Design Manual, as was required by the Third Term Permits. The jurisdictional runoff management program and BMP Design Manual requirements of this Order are not significantly different than the requirements of the Fourth Term Permits. Thus, only sections of the Order which are new or have been significantly changed should warrant revisions to specific sections of the Copermittee's jurisdictional runoff management program document and BMP Design Manual.

Finally, the Water Quality Improvement Plans are expected to require updates as the iterative approach and adaptive management process included in the Water Quality Improvement Plan, as required under Provision B.5, is implemented by the Copermittees. Provision F.2.c.(1) requires the Copermittees to implement a public participation process for the proposed updates, review the proposed updates with the Panel, and submit the updates to the Water Quality Improvement Plan as part of the Annual Reports required under Provision F.3.b.

Also, because TMDLs are likely to be developed, adopted and approved during the term of the Order, Provision F.2.c.(2) has been included to expedite the ~~incorporation~~ inclusion of actions to implement TMDLs into the Copermittees' Water Quality Improvement Plans as part of the update process, potentially before the Order is re-opened to incorporated the requirements of the new TMDLs. While WQIPs may be updated to include additional actions, TMDLs are not self-implementing and the Order must be re-opened to incorporate the TMDLs. Therefore TMDL requirements

and associated provisions, including WQBELs, are not enforceable until incorporated into the Order.

County of San Diego

RICHARD E. CROMPTON
DIRECTOR

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November 19, 2014

Ms. Laurie Walsh
San Diego Regional Water Quality Control Board
2375 Northside Drive, Suite 100
San Diego, CA 92108

Tentative Order R9-2015-0001, Place ID: 658018LWalsh

Dear Ms. Walsh:

Please accept this correspondence as the County of San Diego's technical comments on the above Tentative Order. Legal comments will be submitted under separate cover from the Office of County Counsel.

Permit Provision II.E.3.c.(3) enables each Copermittee, at its own discretion, to allow Priority Development Projects (PDPs) to participate in an alternative compliance program in lieu of implementing the onsite structural BMP performance requirements of Provisions II.E.3.c.(1) and II.E.3.c.(2). Alternative compliance is only allowed if the Copermittee determines that implementation of an alternative compliance project will result in a greater overall water quality benefit for the Watershed Management Area than fully complying with the onsite performance requirements.

A regional technical advisory committee (TAC) and stakeholder group have been formed to develop "Water Quality Equivalency" calculations that can be used to establish an objective, science-based method for determining whether an alternative compliance project will result in "greater overall water quality benefit." For example, if a PDP proposes to fund a stream rehabilitation project in lieu of fully implementing the stormwater retention requirements onsite, Water Quality Equivalency calculations would be used to establish an "apples-to-apples" comparison of the relative water quality benefits of each project. TAC members include representatives from various Copermittees, Regional Board staff, industry groups, environmental groups, academia, and regional technical experts, including SCCWRP, SANDAG, and CASQA.

The County of San Diego requests that the Water Quality Equivalency calculations currently under development by the TAC be included as an optional Copermittee deliverable for review and acceptance by the Regional Board Executive Officer. Water Quality Equivalency calculations will provide the scientific basis for Copermittees to create offsite alternative compliance programs via Section II.E.3.c.(3)(b) 'Project Applicant Proposed Alternative Compliance Projects'; Section II.E.3.c.(3)(c) 'Alternative Compliance In-lieu Fee Structure'; and/or Section II.E.3.c.(3)(d) 'Alternative Compliance Water Quality Credit System Option'. Regional Board acceptance of the proposed Water Quality Equivalency calculations would add a much needed measure of validity to the Copermittees' approach. Submittal to the Regional Board would also allow for public comment and participation from those not directly participating through the TAC or stakeholder group. The County requests that the Water Quality Equivalency calculations be accepted by the Regional Board Executive Officer before significant time and resources are expended on developing further offsite alternative compliance implementation strategies within the region.

We request the following language for inclusion at Section II.E.3.c.(3)(b) as follows:

> (b) Water Quality Equivalency
> The Copermittees may develop and submit Water Quality Equivalency calculations to the San Diego Water Board Executive Officer for review and acceptance. The purpose of Water Quality Equivalency calculations is to establish a regional and technical basis for determining the water quality benefits associated with alternative compliance projects as required in Provisions E.3.c.(3)(a)(i). Accepted Water Quality Equivalency calculations must be incorporated as part of any jurisdictional Alternative Compliance Program necessary for processing project applicant proposed projects, in-lieu fee structure, or water quality credit system.

Thank you for your consideration. If you have any questions, please contact Christine Sloan at (858) 495-5257 or by email at Christine.Sloan@sdcounty.ca.gov.

Sincerely,

Todd Snyder

Todd Snyder, Watershed Protection Program Manager
Department of Public Works

November 19, 2014

San Diego Regional Water Quality Control Board
2375 Northside Drive, Ste. 100
San Diego, CA 92108-2700 SENT VIA EMAIL: Laurie.Walsh@waterboards.ca.gov

Attn: Ms. Laurie Walsh

Subject: Comment – Tentative Order No. R9-2015-0001, Place ID:658018LWalsh

Dear Ms. Walsh,

On behalf of the members of the Industrial Environmental Association, thank you for this opportunity to provide the following comment regarding Tentative Order No. R9-2015-001. We believe additional clarification is necessary to help avoid any confusion in the future regarding the Board's intentions for assigning waste load allocations.

Tentative Order No. R9-2015-0001 (An Order Amending the Regional Municipal Separate Storm Sewer (MS4) Permit for the San Diego Region (Order No. R9-2013-0001)) contains new requirements for implementation of the Total Maximum Daily Load (TMDL) for sediment in the Los Penasquitos Lagoon (Attachment E, Section 7). This TMDL was adopted by the San Diego Regional Water Quality Control Board (Resolution R9-2012-0033) on June 13, 2012 and has been approved by the State Water Resources Control Board, the California Office of Administrative Law and the US EPA-Region 9. Its effective date is 7/14/14.

The TMDL establishes a number of "Responsible Parties" including, but not limited to, the County of San Diego and the cities of San Diego, Poway and Del Mar, which are collectively assigned a single waste load allocation (WLA). The responsible parties are collectively responsible for meeting the WLA of 2,580 tons per year.

Table 7.1 in Section 7 (Attachment E) identifies the "Final Effluent Limitations as Expressed as Annual Loads MS4 Discharges to Los Penasquitos Lagoon". The identified limitation is "2,580 tons/yr." of "Sediment". Since this effluent limit is the same as the WLA for all of the TMDL's Responsible Parties, this could be misinterpreted to imply that the Responsible Copermittees have been allocated the entire WLA, leaving no (i.e., "0") WLA to the other Responsible Parties under the approved TMDL.

To clarify in the MS4 permit that the WLA is shared amongst all of the Responsible Parties, we request the following language changes in Attachment 7:

Section 7.b.2.b. - Revise to state:

"(b) Final Effluent Limitations

Discharges from the MS4s (together with the other Responsible Parties in Resolution R9-2012-0033) containing pollutant loads that do not exceed the following effluent limitations…".

Section 7.b.2.b.(Table 7.1) - Revise to state:

"Table 7.1

Final Effluent Limitations as Expressed as Annual Loads in MS4 Discharges (together with the other Responsible Parties in Resolution R9-2012-0033) to Los Penasquitos Lagoon"

Should you have any questions regarding this recommendation, please feel free to contact me directly. In the meantime, thank you for your consideration.

Sincerely,

Jack Monger
Executive Director

WARREN D. WILLIAMS
General Manager-Chief Engineer

015494

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RIVERSIDE COUNTY FLOOD CONTROL
AND WATER CONSERVATION DISTRICT

November 19, 2014

sent via email 11/19/14: Laurie.Walsh@waterboards.ca.gov

Ms. Laurie Walsh, P.E., WRC Engineer
CRWQCB - San Diego Region
2375 Northside Drive, Suite 100
San Diego, CA 92108

Dear Ms. Walsh:

Re: Comment - Tentative Order No. R9-2015-0001Place ID:65801LWalsh

This letter is written by the Riverside County Flood Control and Water Conservation District (District), on behalf of itself, the County of Riverside and the Cities of Murrieta, Temecula, and Wildomar (collectively, the Riverside County Co-Permittees) regarding Tentative Order No. R9-2015-0001 (Tentative Order). The Tentative Order proposes to add the County of Orange and other agencies located in South Orange County within the existing San Diego County Municipal Separate Storm Sewer System (MS4) Permit. The Riverside County Co-Permittees appreciate the opportunity provided by the San Diego Regional Water Quality Control Board (Regional Board) to offer its comments on the Tentative Order.

The Riverside County Co-Permittees wish to reiterate their concerns regarding a Regional MS4 Permit for San Diego, Orange, and Riverside Counties. Those concerns are set out more fully in our written comment letter dated January 10, 2013, on Order No. R9-2013-0001. The Riverside County Co-Permittees will be submitting a Report of Waste Discharge prior to the expiration of their current MS4 Permit, seeking either modification to the Regional Permit or an individual permit covering only those Co-Permittees. For your convenience, the January 10, 2013 comments are attached to this letter. The Co-Permittees request that this comment letter and attachments be added to the record for the Tentative Order, since most of the issues raised in those comments still pertain to the Tentative Order. The Co-Permittees also request that the oral testimony of Riverside County Co-Permittees on Order No. R9-2013-0001 be included in the record for the Tentative Order. The Riverside County Co-Permittees support the South Orange County Co-Permittees general approach to the issues raised by the Tentative Order.

Notwithstanding the Riverside County Co-Permittees' concerns to a Regional Permit, and subject to it, the Co-Permittees offer the following observations regarding the Tentative Order.

1. Need for Path to Compliance

As set forth in our written and oral comments on Order No. R9-2013-0001, the Riverside County Co-Permittees continue to believe strongly that every MS4 permit, including the Tentative Order, should

incorporate a clear and achievable path to compliance for Co-Permittees. As the Executive Officer and staff indicated in the hearings on Order No. R9-2013-0001, the San Diego County Co-Permittees will be out of compliance with the Permit's receiving water limitations (RWL) provisions for years. We agree with staff's assessment, and state further, that the lack of a provision to allow Co-Permittees to be considered in compliance with the RWL provisions leaves the Co-Permittees open to possible enforcement by third-parties and, as importantly, threatens the compliance approach that has been successfully employed by the Riverside County Co-Permittees to address water quality impairments in the Santa Margarita Region.

The Riverside County Co-Permittees agree with staff that a MS4 permit which allows the Permittees to adopt a "fail early and fail often" iterative approach to water quality is preferable to a permit which simply mandates certain actions. The Santa Margarita River Watershed Water Quality Workplan in Riverside County follows an iterative, flexible, and priority-setting approach that is intended to enable the Co-Permittees to focus on the most important water quality impairments in the Region, and make real, quantifiable improvements in water quality. As we have previously commented, if the Co-Permittees have no protection from liability for exceedances of water quality standards, they must address each such exceedance, even when that exceedance may be transitory or of minimal environmental or public health consequence. Stretching resources to address such issues diverts limited Co-Permittee resources from the most important threats to water quality and delays overall water quality improvement.

Recognizing this deficiency in the 2001 MS4 Permit for the Los Angeles County Co-Permittees, in its 2012 Permit, the Los Angeles Water Board adopted a path to compliance with RWLs through the development of adaptive and prioritized watershed management plans. The Riverside County Co-Permittees believe that a similar approach to RWL compliance should be included in the Tentative Order.

2. Hydromodification Provisions

While most of the substantive changes in the Tentative Order have specific application only to San Diego and/or South Orange Counties, the Riverside County Co-Permittees support exemptions for engineered channels and large river reaches in Provision E.3.c.(2)(e). This provision also provides an interim timeframe exemption for the implementation of hydromodification management BMP requirements for priority development projects.

The exemptions identified in Provision E.3.c.(2)(e) are appropriate and reasonable, and should be made permanent exemptions moving forward.

3. Basin Planning and Water Quality Improvement Plan (WQIP) General Comments

For the WQIPs to ultimately succeed, they need to be based upon regionally appropriate water quality standards. These water quality standards require review to ensure that they reflect sustainable conditions for beneficial uses, explicitly consider regulatory policy and environmental trade-offs

inherent in the protection of beneficial uses, and address the nature and impact of stormwater upon beneficial uses.

The Riverside County Co-Permittees would like to thank the Regional Board and staff for working with the Santa Margarita River Nutrient Initiative Group on such a review. This group, which includes dischargers, tribal interests, interested non-profits, scientists, and Regional Board staff, is using a scientifically based and rigorous approach to evaluate potential water quality targets for, and sources of, nutrients in the Santa Margarita Watershed. It is our belief that this effort will lead to more considered, effective, and appropriate management of local receiving waters, and thereby promote quicker and more effective environmental outcomes. It may also assist with the identification and development of innovative and alternative programs to manage nutrients within the Region. This effort will inform the development of the Santa Margarita River Watershed Water Quality Workplan and other regulatory programs.

The Co-Permittees request and encourage Regional Board staff to work with other stakeholders to consider, prioritize, and address other perceived constraints and inconsistencies within the San Diego Region Basin Plan. Such efforts will ultimately result in a better focus of local and regional compliance programs, including the WQIPs, on actions that are more likely to effectively and quickly address public health risks and environmental risks to receiving waters. Such an approach is exactly in line with staff's emphasis on workable solutions to these challenges.

The Riverside County Co-Permittees appreciate the opportunity to comment on the Tentative Order. Should you have any questions regarding these comments, please contact David Garcia at 951.955.1330/dhgarcia@rcflood.org.

Very truly yours,

for JASON E. UHLEY
Chief of Watershed Protection Division

Attachment

DHG:cw
P8/165901

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RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

January 10, 2013

Mr. Wayne Chiu, P.E.
California Regional Water Quality
Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego, California 92123-4340

Dear Mr. Chiu:

Re: Tentative Order No. R9-2013-0001
Regional MS4 Permit
Place ID: 786088Wchiu

The Riverside County Flood Control and Water Conservation District (District) is submitting this comment letter on the above listed Tentative Draft Order on behalf of the Riverside County MS4 Copermittees within the San Diego Region (Riverside County Copermittees) which includes the District, the County of Riverside and the Cities of Murrieta, Temecula and Wildomar. Tentative Draft Order R9-2013-0001 (Draft Permit) was drafted by Board staff to cover Phase I municipal separate storm sewer system (MS4) Copermittees in San Diego County, southern Orange County, and the portion of southwestern Riverside County within the Santa Margarita Hydrologic Unit.

The Riverside County Copermittees have previously commented that the San Diego Water Board lacks authority to adopt a regional permit covering Orange and Riverside Counties, in addition to San Diego County; a comment which is discussed in further detail below and in the attached legal comments. Notwithstanding such objection, and subject to it, the Riverside County Copermittees are providing comments on the Draft Permit.

In the workshop on the Administrative Draft Order held on April 22, 2012 San Diego Water Board staff identified the following desired outcomes for the proposed permit:

- Improving the quality of water discharged from the MS4
- Restoring or enhancing Beneficial Uses and Receiving Water quality

It was further identified by Board staff that to be able to meet those goals, the proposed regional MS4 permit needed to be 1) Strategic, 2) Adaptive, and 3) Synergistic.

Notwithstanding the concerns of the Riverside County Copermittees with regard to the legal authority to issue a regional MS4 permit, the Copermittees agree that being able to adapt and direct resources toward specific water quality priorities in a given watershed, rather than all potential problems simultaneously, is more likely to result in actual and meaningful improvements in water quality. However, to be able to achieve those improvements the MS4 Permit must be crafted to provide the Copermittees with the ability to truly and fully

adaptively manage their programs to focus resources on those BMP strategies and monitoring efforts that are identified as being most effective, consistent with the MEP standard, at addressing watershed priorities.

Unfortunately, many provisions in the Draft Permit, including but not limited to the Receiving Water limitation provisions in Provision A and others discussed in this letter, still do not fully support the achievement of those outcomes. The Draft Permit does not provide the Copermittees with the flexibility to be fully strategic in managing their resources nor the ability to fully adapt their programs to focus on the highest priority water quality needs of the watershed. This comment letter and the other documents submitted herewith (a redline of the Draft Permit and Legal Comments) identify some suggestions which, if adopted by the San Diego Water Board, will help to address these limitations and facilitate the desired improvements.

This comment letter is organized as follows:

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2 GENERAL COMMENTS 3
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3.15 ATTACHMENT C 33

As noted, the Riverside County Copermittees also are submitting a redline of the Draft Permit ("Redline") that proposes alternative language intended at achieving solutions to the various issues raised in this letter, and a Legal Comment document ("Legal Comments") that provides additional legal context for the various issues raised in this letter. The Riverside County Copermittees reserve their right, in the context of filing a Report of Waste Discharge ("ROWD") prior to the expiration of Order R9-2010-0016 (the 2010 MS4 Permit), to again address these issues and others relevant and appropriate to the SMR.

1 BACKGROUND

The Riverside County Copermittees were issued an extensive and prescriptive MS4 Permit in November 2010 which greatly expanded monitoring obligations, required special studies, a jurisdictional runoff management program, and Watershed Workplan requirements that were very different than the requirements set forth in the previous MS4 Permit issued to the Copermittees. Development and implementation of the 2010 MS4 Permit compliance requirements has been very expensive, especially in comparison to the relatively few demonstrated impairments of Beneficial Uses in the region and the Copermittees' resources. These requirements have left other important societal needs unfulfilled by the Riverside County Copermittees during a period of unprecedented and continuing economic distress. Further, the Riverside County Copermittees are still in the process of developing and implementing these 2010 MS4 Permit requirements, which is a serious concern given the very different compliance approach proposed in the Draft Permit. The Copermittees hope that the compliance efforts under the current MS4 Permit are taken into account when they submit their ROWD at the expiration of the 2010 MS4 Permit.

2 General Comments

2.1 Regional Permit

The Riverside County Copermittees respectfully submit that the San Diego Water Board is not authorized under the Clean Water Act or under its implementing regulations to issue a regional permit to Copermittees in San Diego County, South Orange County and the Santa Margarita Region (SMR) of Riverside County. As discussed more fully in the Legal Comments, the only circumstance under which the San Diego Water Board could issue such a permit would be if the Copermittees in these counties agreed to such a permit. Additionally, while the Draft Permit purports to affect the conduct of the Riverside County Copermittees upon expiration of the 2010 MS4 Permit in November 2015, the Riverside County Copermittees have not submitted a ROWD requesting coverage under a regional permit. Because no application has been made for the regional permit, which is a requirement set forth in the CWA regulations, the San Diego Water Board lacks jurisdiction to name the Riverside County Copermittees on the Draft Permit at this time.

Notwithstanding the above, the Riverside County Copermittees are submitting the comments in this letter based on:

- The San Diego Water Board staff's stated intent to enroll the Riverside County Copermittees in this permit upon expiration of the 2010 MS4 Permit.
- Statements made by San Diego Water Board staff that this comment period would serve as the primary opportunity for the Riverside County Copermittees to influence their next term MS4 Permit. The Riverside County Copermittees are entitled, as part of the ROWD process, to again raise relevant issues regarding permit provisions, but have undertaken in these comments to address major current concerns.

2.2 Outcome Focus

As mentioned above, the Copermittees agree that being able to adapt and direct resources toward addressing the specific water quality priorities in a given watershed, rather than all potential problems simultaneously, is more likely to result in actual/meaningful improvements in water quality. However, to be able to achieve those improvements, the MS4 Permit must fully integrate the following principles:

- **The Jurisdictional Program requirements must be fully flexible:** The Permit must be written in a way that allows the Copermittees to truly and adaptively manage their programs to fully focus their existing resources on those BMP strategies and monitoring efforts that are identified within the Water Quality Improvement Plan (WQIP) as being most effective, consistent with the Maximum Extent Practicable (MEP) standard, at addressing the watershed's priorities. We understand this to be the goal of the San Diego Water Board as well. While some elements of the Draft Permit embody this need, others do not and require dedication of resources to specific pre-defined efforts, regardless of the identified need for that effort in the watershed. The specific program areas that need more work to this end are:

    - The approach to addressing Non-stormwater discharges
    - Development Planning
    - Retrofitting
    - Channel Rehabilitation

These issues and proposed new language to address these issues are included throughout this letter and/or in the attached Redline.

- **Basin Plan updates need to be Prioritized by the San Diego Water Board:** For outcome-based permitting to be successful, the desired outcomes must be achievable by and appropriate to the Copermittee. To do that, the outcomes must take into account the background conditions in the watershed, and be appropriate for the attainment of Beneficial Uses in the specific waterbody, based on the specific conditions within and influencing that waterbody. The values in the Basin Plan should be comprehensively re-evaluated to ensure that water quality standards are scientifically justified to protect Beneficial Uses. Without updating the Basin Plan, the outcomes that the Copermittees target in the WQIPs would be arbitrary and not guaranteed to achieve the desired beneficial use improvements. Such an update should be pursued aggressively, led by and adequately funded by the San Diego Water Board, with participation by the MS4 Copermittees and other dischargers and stakeholders in the watershed.

- **Other Dischargers need to be Similarly Regulated by the San Diego Water Board:** The MS4 Copermittees are not the only dischargers of pollutants in the watershed. For example, the SMR of Riverside County includes State Lands (such as Caltrans), Tribal Lands, Agricultural Operators, Industrial Permit dischargers, Construction Permit dischargers, Phase II entities, Water Districts, and 'De Minimus' dischargers issued general permit coverage; all of which:

- Have separate regulatory programs (such as permits or waivers) implemented by the San Diego Water Board;
- May discharge pollutants, including non-stormwater, that can affect the quantity and quality of runoff, both directly within Receiving Waters, and in runoff discharges that may enter into and be discharged from the MS4; and
- Cannot be regulated by the Copermittees for the quantity and quality of their runoff because of their separate permits or waivers granted by the NPDES Program Administrator.

As such, while MS4 Copermittees can implement programs to reduce pollutants in discharges that are within their legal jurisdiction, no amount of effort by the MS4 Copermittees can be expected to fully attain water quality standards in the Receiving Waters. The only way to achieve that outcome will be for the NPDES Program Administrator (the San Diego Water Board in most cases) to directly regulate each of these entities to similar levels and standards as set forth by this Permit.

2.3 Responsibility for meeting goals of CWA

The CWA requires Copermittees subject to any MS4 permit, including the Draft Permit, only to address discharges from their MS4s. 33 U.S.C. § 1342(p)(3)(B). The Copermittees are not required to restore Beneficial Uses in any Receiving Water, or to address sources of pollution to those Receiving Waters that are not being discharged into or from those MS4s. However, in various provisions in the Draft Permit, there is a suggestion that the Copermittees are solely responsible for attaining water quality standards in their respective Receiving Waters. The San Diego Water Board must make clear in the Draft Permit that the responsibilities of the Copermittees are limited to their MS4s and the requirements of the CWA for municipal stormwater dischargers. Redline changes have been proposed in the above referenced portions of the Draft Permit to address this issue.

3 Specific Comments

The following comments represent specific high level concerns that the Riverside County Copermittees have identified at this time. Additional comments on the Draft Permit can be found in the Redline, as well as in the attached Legal Comments.

3.1 Findings

The Riverside County Copermittees have two separate sets of comments on the Findings. The first addresses the need for additional findings, with respect to aspects of California law and the physical setting of the SMR. The second set of comments focuses on existing Findings in the Draft Permit.

3.1.1 Needed Additional Findings

The Findings in the Draft Permit fail to fully address the context and conditions under which the proposed permit requirements are to be applied. A more complete explanation of this background is necessary to ensure that the Provisions ultimately included in the Draft Permit are credible, appropriate and legally required, and that the Permit Provisions (which must stem from the Findings) reflect the

context of the broader issues that affect MS4s within the region. The Riverside County Copermittees request that San Diego Water Board staff work with the MS4 Copermittees to expand the Findings, including the addition of findings to address the following:

California Water Law

California law requires that downstream entities must accept runoff from up-gradient properties. Owners and operators of MS4s are not exempt from this legal mandate, even if that runoff contains pollutants. Moreover, flood control districts, including the District, are mandated by the California Legislature (Legislature) to protect the lives and property of residents from floodwaters. The Riverside County Copermittees request that a finding, in the form set forth in the Redlines, be added to the Draft Permit.

Flooding

Many areas that would be under the jurisdiction of the Draft Permit are subject to periodic catastrophic flooding, which results from natural conditions, specifically the presence of mountains and hilly areas in close proximity to development, along with the effect of strong Pacific storms. This flooding would occur even in the absence of development. The Legislature recognized the importance of this issue in the early 20th Century, when it established flood control districts across the state, including in Riverside, Orange and San Diego Counties. Such flooding has, and if not controlled, could result in loss of life and widespread property damage. Further, the flooding can mobilize significant amounts of pollutants from industrial, commercial, residential and agricultural lands, damaging watercourses, habitat, and the Beneficial Uses therein. MS4 systems are designed and constructed to mitigate these impacts. The Riverside County Copermittees request that a finding in the form set forth in the Redline be added to the Draft Permit.

Flood Control District Acts

As noted above, the Legislature established Flood Control Districts in Orange, Riverside, and San Diego Counties through a series of Flood Control Acts. The Legislature determined that protection of life and property from the effects of flooding through the implementation of flood control improvements was a priority, and assigned those Districts with the sole responsibility to design, construct and maintain those improvements necessary to manage and contain floodwaters to prevent such negative impacts, as well as to conserve floodwaters for beneficial use. As noted above, these improvements represent fundamental water quality BMPs inasmuch as they reduce the widespread exposure of runoff to pollutants. The Flood Control Districts, while owners and operators of MS4s, have no authority or powers beyond those granted by the Legislature. The Legislature did not provide the Flood Control Districts, for example, the authority to regulate land uses within the municipal jurisdictions of Riverside County, nor to control the volume or quality of runoff discharged by those land uses. Findings describing the legislative priority for flood control and the limitations on the governing power of the Flood Control Districts should be added to set forth the appropriate role of the Flood Control Districts as MS4 Copermittees. The Riverside County Copermittees request that a finding, in the form set forth in the Redline, be added to the Draft Permit.

Limits on Extent of Permittee Legal Authority

The MS4 Copermittees lack the authority to regulate many significant sources of pollutants that may impact Receiving Waters. For example, the Copermittees cannot regulate pollutants discharged from federal and state lands, facilities, tribal lands, special districts, utilities, agricultural lands, or railroads. Moreover, the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) preclude local regulation of pesticides. The Riverside County Copermittees request that a finding in the form set forth in the Redline be added to the Draft Permit.

3.1.2 Comments on Existing Findings

Findings 3 and 15 (and elsewhere in Draft Permit)

In Findings 3 and 15 (and throughout the Draft Permit), it is stated that the CWA requires controls to reduce the discharge of pollutants "in stormwater" to the MEP. Finding 15, moreover, states that non-stormwater discharges from the MS4 are "not considered stormwater discharges and therefore are not subject to the MEP standard, stating that the MEP standard "is explicitly for 'Municipal . . . Stormwater Discharges" from the MS4s.

These conclusions are directly contrary to the plain language of the CWA, as set forth in the November 16, 1990 preamble accompanying the CWA stormwater regulations. Those authorities provide that the MEP standard applies to *all* pollutants discharged from the MS4, notwithstanding that some may be transported by non-stormwater. Additionally, the Redline reflects deletion of the limitation of the MEP standard to stormwater discharges in multiple locations, reflecting federal law. For a further discussion of this issue, please see the Legal Comments. The Riverside County Copermittees also request deletion of Finding 15.

Finding 11

This Finding states that "[r]ivers, streams and creeks in developed areas used [to convey runoff] . . . are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and Receiving Water." This statement is incorrect and must be deleted (as reflected in the Redline). For reasons more fully set forth in the Legal Comments, natural streams cannot be considered MS4; there is no MS4 "outfall" from a channelized river or stream to a natural stream; and, USEPA itself requires a distinction between MS4s and Receiving Waters.

Finding 12

This Finding states that as operators of MS4s, "Copermittees cannot passively receive and discharge pollutants from third parties." By providing free and open access to an MS4 that conveys discharges to Waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not prohibit or otherwise control. This statement is incorrect and must be deleted (as set forth in the Redline). As the discussion in the Legal Comments indicates, municipalities must maintain the MS4 to protect the lives and property of their citizens and to prevent nuisance. Flood Control Districts have a statutory obligation to operate and maintain such MS4, an obligation which is not affected by

either the CWA or the terms of the Draft Permit. While an MS4 operator has the obligation to effectively prohibit the entry of non-stormwater into the MS4, it does not have legal responsibility for such discharges, which are the responsibility of the discharger itself and subject to the jurisdiction of the San Diego Water Board, pursuant to Water Code section 13260 *et seq.*

Finding 28

This Finding recites that the San Diego Water Board finds that the requirements of the Draft Permit "are not more stringent than the minimum federal requirements." The Riverside County Copermittees disagree with this finding, as it is not supported by the evidence, *i.e.*, the many requirements in the Draft Permit which exceed the federal MEP standard. Moreover, any decision by the San Diego Water Board to adopt "other provisions" going beyond MEP is not a federal requirement, but rather a discretionary decision taken by a state agency under authorization in the CWA. *See Defenders of Wildlife v. Browner,* 191 F.3d 1159, 1164-65 (9th Cir. 1999). Please see discussion in the Legal Comments. The Finding also indicates that the San Diego Water Board has developed an economic analysis of the Draft Permit. As set forth in the Legal Comments, the Riverside County Copermittees challenge the adequacy of that analysis.

Finding 29

This finding purports to find that the Draft Permit does not constitute an unfunded state mandate. The Riverside County Copermittees disagree with the conclusions set forth in this finding. More importantly, the finding is without legal effect because exclusive jurisdiction as to whether a state mandate exists, and whether it is unfunded lies with the Commission on State Mandates. Government Code §§ 17751 and 17552; *Lucia Mar Unified School District v. Honig* (1988) 44 Cal.3d 830, 837; *Hayes v. Commission on State Mandates* (1992) 11 Cal.App.4th 1546, 1596-97. The finding of an agency that has no jurisdiction to make that finding is entitled to no weight and should be deleted, as shown in the Redline. For an additional discussion of these issues, please see the Legal Comments.

Finding 31

The Riverside County Copermittees believe that the Receiving Water Limitation ("RWL") language set forth in the Draft Permit renders compliance with the permit impossible, since exceedances of water quality standards occur routinely through no fault of the MS4 Permittees. Thus, unless the RWL is modified to provide the Copermittees with a means to be in compliance, those Copermittees risk the threat of arbitrary San Diego Water Board enforcement or the bringing of citizen suit lawsuits under the CWA, which could nullify compliance with all other terms set forth in the Draft Permit, as discussed more fully in the Legal Comments. The exposure to third party litigation from the proposed RWL language is one of the most significant threats to an otherwise collaborative approach to achieving long term water quality improvement. This threat was emphasized by the recent bringing of a citizen suit lawsuit against the City of Malibu, the County of Los Angeles and the Los Angeles County Flood Control District based on similar language in the 2001 Los Angeles County MS4 Permit. The Riverside County Copermittees have suggested modifications to Provision A in the Redline and as discussed below and in the Legal Comments that are intended to better support the Iterative Process for compliance authorized by the State Water Resources Control Board in Order No.

2001-15, through the WQIP process. The Copermittees also note that the State Board considered the problems with the RWL language at a recent workshop, which may eventually result in modifications which should, if applicable, be reflected in the Draft Permit. Other requested changes to the Findings are set forth in the Redline.

3.2 Provision A, Prohibitions and Limitations

As noted above, the requirements set forth in Provision A are of great concern to the Riverside County Copermittees. The Copermittees generally support an approach to compliance that utilizes WIQPs as the implementing mechanism for the 'Iterative Process' described in Provision A.4, and that by implementing that iterative process in accordance with A.4, that the Copermittee should be in compliance with Provisions A.1 and A.2. The Redline reflects edits of Provision A to clarify the linkage between the prohibitions and limitations in Provisions A.1. through A.3. and Provision A.4 – which is described as the method for complying with the prohibitions and limitations. It must be noted, however, that the Riverside County Copermittees do not agree with the approach suggested, that any WQIP-based compliance approach be necessarily accompanied by a Reasonable Assurance Analysis. Such analyses can be extremely complex, expensive and time-intensive to develop, and similar analyses are commonly developed within TMDL models; taking a number of years to develop and refine. Given that the Santa Margarita Watershed has no adopted TMDLs; thus, comprehensive pollutant transport and BMP models are not available for the suite of constituents that might be considered for prioritization within a WQIP for the Santa Margarita Watershed. In the context of a TMDL, such models would be developed by the combined resources of the San Diego Water Board and a range of stakeholders and dischargers. Undertaking such an exercise solely with the public resources of the 275,000 residents of the SMR is beyond the financial ability of the Copermittees and would shift the responsibility for development of TMDLs from the San Diego Water Board to the Copermittees. Comments on Provision A can be found below, in the Redline and in the Legal Comments.

3.2.1 Overview of Key Issues

As noted above, an overriding issue for the Riverside County Copermittees is having a permit that, while being appropriately proactive and aggressive at addressing the prioritized water quality conditions with the Receiving Waters, is one that all Copermittees can remain in compliance with while implementing those requirements. As presently drafted (and as made clear by statements in the Fact Sheet), Provision A imposes immediate potential liability on every Copermittee if monitoring in the Receiving Waters reflects exceedances of water quality standards that may have been caused or contributed to by MS4 discharges. San Diego Water Board staff has repeatedly indicated in workshop presentations that they expect that Copermittees will not be able to comply with the Receiving Water Limitations and Discharge Prohibitions for some time. Staff has separately indicated that they are interested in having the Copermittees undertake bold initiatives in trying to address urban runoff pollution, and that the Copermittees have actually been encouraged to "fail early and fail often" as this would reflect such progress in refining these initiatives. The iterative, flexible and priority-setting approach reflected in the WQIP is intended to allow the Copermittees to focus on the most important problems in their watershed. The entire approach is endangered, however, by RWL provisions which would allow either the San Diego Water Board or a citizen plaintiff to sue the Copermittees for any individual exceedance of the

RWLs. Under the current version of Provision A, the unmitigated risk of such actions leads not to bold initiatives but rather to attempts to minimize liability.

As set forth in the Legal Comments, this approach is not mandated by the CWA, State Board orders or the opinion of the Ninth Circuit Court of Appeals in *Natural Resources Defense Council v. County of Los Angeles*, 673 F.3d 880 (9th Cir. 2011), *reversed*, 568 U.S. __ (January 8, 2013). As importantly, the threat of immediate potential noncompliance actually interferes with the ability of the Copermittees, including the Riverside County Copermittees, to comply with the Draft Permit. Instead of being able to focus on pollutants of highest concern in the watershed, as called for in the WQIP, the Copermittees will be forced to try to address every pollutant monitored, since the exceedance of any water quality standard leads to immediate potential liability. Moreover, because citizen plaintiffs are entitled to injunctive relief under Section 505(a) of the CWA, a federal judge could order the Copermittees to undertake steps completely independent of the WQIP or other compliance provisions in the Draft Permit.

The Riverside County Copermittees do not object to compliance provisions that will provide a means to achieve real improvement in water quality. The Copermittees are willing to undertake these Provisions, because the success or failure is in their control. Compliance with the requirements of Provision A, however, is beyond the control of the Copermittees. Based on the statements made during the workshop process, the Riverside County Copermittees believe that the San Diego Water Board is serious about working with the Copermittees on a permit that provides flexibility and problem solving approaches. To ensure that this flexibility is not lost, the Draft Permit must tie in compliance with Provisions A.1 through A.3 to a process set forth in Provision A.4. This approach is shown in the Redline and is discussed further below.

3.2.2 Comments in support of specific changes

Provision A, Introduction

The introduction notes that pollutants "in stormwater discharges" from the MS4 must be controlled to the MEP. As discussed above, the CWA does not differentiate between stormwater and non-stormwater discharges from the MS4; both must be controlled to the MEP standard. The Riverside County Copermittees have requested revised language in the Redline. Additionally, the linkage between compliance with Discharge Prohibitions (Provision A.1), Receiving Water Limitations (Provision A.2) and Effluent Limitations (Provision A.3) should be noted as being defined by Provision A.4. This change is reflected in the Redline.

A.1.a

First, language must be added providing that compliance may be addressed through the process set forth in Provision A.4. This language is provided in the Redline. Second, the Provision prohibiting discharges which are "threatening to cause" a condition of pollution, etc., is unenforceable, because it prohibits an action that, with respect to MS4 operators, is beyond their control. Moreover, there is no authority for such provisions in the Porter-Cologne Act. The Riverside County Copermittees request

deletion of this phrase, as shown in the Redline. Additionally, as set forth in the Legal Comments, the Provision improperly expands the Discharge Prohibitions to Waters of the State.

A.1.b

40 CFR § 122.26(d)(2)(iv)(B)(1) clarifies that the requirement for an MS4 Copermittee to "effectively prohibit" the discharge of Non-stormwater/illegal discharges into its MS4s is to be accomplished through "a program, including inspections, to implement and enforce an ordinance, orders or similar means…". The language of this Provision should reflect federal law in this respect. The Redline reflects this change.

A.1.c

First, this Provision requires the Copermittees to comply with the Basin Plan prohibitions listed in Attachment A. This list is over-inclusive, as it contains requirements that are not applicable to some or all of the Copermittees' MS4 discharges, or to the Riverside County Copermittees in particular. The Riverside County Copermittees request that this Provision be amended to read as follows: "Discharges from MS4s are subject to all applicable waste Discharge Prohibitions in the Basin Plan." This change is noted in the Redline. Second, language must be added providing that compliance with this restriction can be obtained through the process set forth in Provision A.4. This language is provided in the Redline.

A.2.a

First, this Provision and Provisions A.1. and A.3 should be linked to the iterative process described in A.4. Please see the Redline.

Second, not all plans, policies, etc. set forth in Provision A.2.a.(1)-(4) may qualify as "water quality standards" or be applicable to all the MS4 Copermittees. These subsections should be deleted, and replaced with a reference to "Water Quality Standards," which is a defined term in the Draft Permit (This change is reflected in the Redline). Otherwise, the MS4 Permit would become over inclusive with respect to what is considered a water quality standard. Such standards must be established in accordance with federal and state law. If this process has not been followed for a particular requirement, it is not a "water quality standard."

A.3.a

As discussed above, this Provision erroneously states that pollutants "in stormwater discharges" from MS4s must be reduced to the MEP. Please see the Redline.

A.3.b

This Provision should also provide that compliance with a TMDL constitutes compliance with Provisions A.1 and A.2, for those pollutants/waterbodies subject to the TMDL.

A.4.a

The Riverside County Copermittees support an approach whereby compliance with Provisions A.1 through A.3 are achieved through a truly iterative approach, one which reflects the intent of the

precedential State Water Board Order Nos. 99-05 and 2001-015. As set forth in the Redline, the Riverside County Copermittees believe that they and the other Copermittees under the Draft Permit should be considered in compliance with Provisions A.1, A.2 and A.3, as applicable, through development of the WQIP, unless the San Diego Water Board denies approval of a WQIP or amendment thereof. This ensures that the Iterative Process which is the focus of the WQIP, is utilized to provide a means to be in compliance for the Copermittees.

A.4.c

This Provision should be deleted, as is reflected in the Redline. Again, this Provision defeats the purpose of an iterative approach to compliance with the Provisions A.1 through A.3, because it allows the San Diego Water Board to enforce any provision of the Draft Permit, including those provisions at any time. The San Diego Water Board obviously retains full ability to enforce the provisions of the Draft Permit, including with respect to the failure of the Copermittees to carry out required provisions. To short circuit the WQIP/JRMP process, however, is to defeat the entire intent of the Draft Permit.

3.3 Provision B, Water Quality Improvement Plans

3.3.1 Overview of Key Issues

- The goals and requirements of the WQIP need to be aligned with the requirements of the CWA that were established specifically for MS4 permits, and not impose the restoration of Receiving Waters entirely upon MS4 Copermittees.
- The WQIP should focus on addressing sources of pollutants within the jurisdiction of the respective Copermittees.
- The BMP strategies identified in the WQIP should fully inform the selection and design of programs identified in the JRMP. Some minor edits were proposed in Provision B, with additional edits as warranted in Provisions D and E.

3.3.2 Comments in support of specific changes

Introductory paragraph

The introductory language implies that the WQIP should be designed to unilaterally protect, preserve, enhance, and restore water quality and Beneficial Uses in waters of the state. As noted in Section 2.3 above, MS4 Copermittees are responsible only for discharges from their MS4s, not the unilateral protection of Beneficial Uses within their watersheds.

Redline edits were provided to:

- Tie the goals of the WQIP to the requirements of the CWA applicable to MS4 Permits.
- Replace 'waters of the state' with 'Receiving Waters' to be consistent with federal law.
- Clarify the linkage between Provision A and Provision B.

Additionally, Redline edits were provided to clarify that the strategies identified in the WQIP are intended to guide the specific actions that will be implemented by the Copermittees pursuant to Provision E.

B.1

The Riverside Copermittees support the redlines of the San Diego County Copermittees with regard to setting forth that the WQIP for the Santa Margarita Watershed Management Area (WMA) would commence upon enrollment of the Riverside County Copermittees into the Order.

B.2.e.

Two changes have been proposed, as shown in the Redline:

- The introductory paragraph includes language that clarifies that the Numeric Goals are not enforceable compliance standards, effluent limitations, or Receiving Water limitations. This clarification is consistent with San Diego Water Board staffs' verbally stated intent.
- Provision B.2.e.(1) as written requires that the final Numeric Goals be "capable of demonstrating the achievement of the restoration and/or protection of water quality standards in Receiving Waters". As discussed in Provision 2.3 above, meeting WQS in Receiving Waters is a goal of the overall NPDES regulatory programs under the CWA and not as a requirement to be accomplished alone by MS4 Copermittees. Redline edits have been provided to clarify that such goals are only required to be for MS4 discharges.

B.3.

In the Redline, edits were made to the introductory paragraph to ensure that the requirements are consistent with federal law. The CWA requires the 'effective prohibition' of non-stormwater discharges, not 'preventing' or 'eliminating' them.

Edits were also made to Provision B.3.a. to link the strategies more clearly to the Numeric Goals developed pursuant to Provision B.2.e, as well as to link them to the JRMP programs in Provision E.

B.5

In the Redline, edits were made to the introductory paragraph to clarify that the WQIP (and by extension the JRMP and Monitoring programs) are intended to meet the requirements of Provisions A.1, A.2, and A.3. The Tentative Order particularly excluded Provision A.1.b. (dealing with non-stormwater discharges). However, as discussed in the attached Legal Comments, the CWA requires that illegal discharges must be addressed via a program (as included in Provision E.2), and it is appropriate that the program be guided by the priorities and strategies included in the WQIP.

Other edits were made to clearly link Provision B.5 to the applicable requirements of Provision F.

3.4 Provision C, Action Levels

3.4.1 Overview of Key Issues

- The Action Levels (non-stormwater, and stormwater) applicable within each watershed should only be those that are associated with the priority water quality conditions in that watershed, or that are 303(d) listed for that watershed. For example, if Zinc is not a priority pollutant for a watershed, and is not 303(d) listed, there should not be a Zinc action level. This change is needed because Provision D requires analysis for all 'action level' parameters. Analysis for pollutants that are not a priority for a watershed is a waste of Copermittee resources.
- The Copermittees should be able to establish alternative action levels that are appropriate to the WMA within their WQIP. Such alternative action levels would be subject to Executive Officer approval as part of the WQIP approval process.
- Footnote 8 and 10 need to clarify that the NALs and SALs are not enforceable limitations.
- Various references to 'waters of the state' need to be changed to Receiving Waters for consistency with the Draft Order and the CWA.

Please see the Redline for further detailed comments and language changes.

3.5 Provision D, Monitoring and Assessment

The Riverside County Copermittees appreciate the changes in the monitoring program reflected in the Draft Permit, as compared to the Administrative Draft. However, elements of the revised requirements are still infeasible for the Riverside County Copermittees. The comments below identify modifications of areas of the monitoring requirement's which can significantly improve the Copermittees' ability to implement and comply with the requirements, while still maintaining appropriate jurisdictional accountability and assessment requirements to guide the implementation of the WQIPs and JRMP programs. The Redline provides further detailed comments and language changes.

3.5.1 Overview of Key Issues

- Dry Weather MS4 Outfall Monitoring
  - The level of effort dedicated to monitoring and addressing outfalls with non-stormwater discharges should be commensurate with the potential impact that discharge has on a Receiving Water. If a discharge, whether persistent or transient, has no or little potential for impacting a flowing Receiving Water, (e.g. due to infiltration, evaporation, or treatment of the flows), the outfall should be de-emphasized relative to other outfalls that have discharges that have connectivity to a flowing Receiving Water.
  - Outfall Dry Weather Field Screening – As currently drafted, the number of required visual inspections of outfalls during dry weather required per Provision D.2.a.(2)(a) and Provision D.2.b.(1) is both excessive and disproportionate. This will particularly impact smaller jurisdictions, which may be required to do more visual inspections of MS4 outfalls than would larger jurisdictions with more outfalls and more resources.
  - Similarly, as written, the Persistent Flow Outfall Monitoring requirements of Provision D.2.b.(2)(b) are excessive and also will disproportionately impact smaller jurisdictions.

Jurisdictions with several hundred outfalls will likely have significantly more resources to perform the required monitoring than smaller jurisdictions with fewer outfalls, yet both are required to implement the same level of persistent flow monitoring.

- Assessment Requirements
  - The assessment requirements require modeled extrapolation of monitored outfall data to non-monitored outfalls for the purposes of calculating loads from each outfall in each jurisdiction. Such extrapolations though modeling or other calculations will not accurately reflect actual jurisdictional loads, and have no benefit that directly analyzing the monitored data cannot more accurately provide.

3.5.2 Other Global Issues

- As currently drafted, MS4s operated by a flood control district within a city or county would be effectively double-counted for identification of outfalls in each jurisdiction and for performance of the load calculations from each jurisdiction. Additionally, Flood Control Districts have no land use or enforcement authorities outside of the MS4 and rely on the local Copermittee to address pollutant sources and discharges to their MS4. Redline edits have been included to clarify the relationship between districts and the municipal jurisdictions they serve for the purposes of outfall monitoring and the assessment requirements.
- Timelines for monitoring and assessments were clarified throughout and linked to specific reporting requirements of Provision F in the Redline.

3.5.3 Comments in support of specific changes

D.1.a.(3) and D.1.e.

The Redline clarifies that the Receiving Water monitoring described in these sections must be conducted as applicable to the WMA and the Copermittees' MS4 discharges, because some of the monitoring requirements only apply to MS4 discharges to certain waterbodies. Not all Copermittees within a WMA will have discharges to that waterbody.

D.1.b.

The Redline proposes language to allow for alternative long-term monitoring stations to be identified. Using the SMR as an example, the Copermittees might wish to utilize a location other than the existing stations due to the influence of groundwater during dry weather and/or the general lack of MS4 contributions in dry weather to those locations.

Table D-1 and D-6

The Redline proposes an addition to the list of field observations, an assessment for flow connectivity of any MS4 discharges to the sampled Receiving Water. It is important to know whether the sampled Receiving Water included a contribution of flows from MS4 discharges, or whether the data reflect conditions in the absence of an apparent MS4 discharge contribution.

D.2.a.(2)

The Redline clarifies that the identification of annual outfall monitoring requirements is based on municipal Copermittee boundaries, inclusive of Flood Control District MS4 outfalls within their jurisdiction.

The Redline clarifies that the field screening requirements apply to those outfalls in the Copermittee's inventory that are 'accessible'. If an outfall is inaccessible for safety reasons or due to habitat restrictions, it would not need to be field screened.

The Redline simplifies the 'tiers' in Provision D.2.a.(2)(a) by removing the lower tier (i), and expanding the second tier (ii) to cover all Copermittees with 500 or less outfalls. This resolves the disproportionality that occurs for Copermittees with a number of outfalls near the current 125 outfall threshold. For example, as currently drafted, a city with 150 outfalls would be required to do 150 visual inspections per year, but a smaller city with 120 outfalls would be required to do 192 visual inspections per year. The Redline also maintains the 80% requirement from the first tier to help smaller Copermittees manage their workload for meeting the field screening requirements while also conducting the additional source identifications that are required under the Draft Permit.

The Redline includes edits to Footnote 19 to clarify that persistent flow should effectively be a discharge that is hydraulically connected to a flowing Receiving Water. Any other discharges that are not affecting a flowing Receiving Water (such as pooled or ponded water) would be addressed as a Transient Discharge, with source IDs any time an obvious illegal discharge (i.e. color or odor) is identified.

D.2.a.(3)

The Redline incorporates edits proposed by the San Diego County Copermittees to require 10% of the samples in each WMA to be from a first storm event. As described in the comments of the San Diego County Copermittees, this will help avoid overly skewing of the data to 'first flush' data, while still incorporating such data into the data and analyses.

D.2.b.(1)

The Redline removes the requirement that the number of visual inspections performed be equivalent to the number of inspections required under Provision D.2.a.(2)(a).

As areas within a jurisdiction are confirmed not to have non-stormwater discharges, inspections of other outfalls would have to be perpetually (and unnecessarily) increased to maintain compliance with this requirement. For example, if a Copermittee had 150 outfalls, but after the transitional period it confirmed that 100 of those outfalls had no evidence of non-stormwater discharges to flowing Receiving Waters, it would have to visit the remaining 50 outfalls for up to three times a year to meet the requirement in this Provision. As the Copermittee got closer to eliminating non-stormwater flows at more outfalls, inspections at the remaining outfalls would quickly become excessive and unreasonable. Removing this requirement will better incentivize the elimination of non-stormwater

flows, as a Copermittee can look forward to reducing its workload in areas confirmed to not have non-stormwater flows.

D.2.b.(2)(b)

While the Riverside County Copermittees support the San Diego County Copermittees' proposal to reduce the number of required outfalls from 10 to 5 persistently flowing outfalls per WMA, the Riverside County Copermittees believe that applying the same minimum bar to all Copermittees is inappropriate and disproportionately affects smaller Copermittees that have commensurately less staff and resources.

The Riverside County Copermittees propose requiring monitoring of the top 10% of the prioritized persistent flow outfalls, with a lower and upper limit of 1 and 5 respectively, as shown in the redlines. With this change, the level of effort required of any individual Copermittee would scale consistent with the number of persistent flow outfalls within each Copermittees' jurisdiction.

Additionally, the Riverside County Copermittees request changing the requirement of Provision D.2.b.(2)(b)(ii) to require annual monitoring rather than semi-annual monitoring. With this change, a Copermittee could focus more of their annual budget on conduction Source ID efforts – which can result in eliminating problematic non-stormwater flows, rather than on a second monitoring event. Copermittees would still have the option to conduct a second monitoring event if they have more resources available and want to remove the outfall from their monitoring list sooner in accordance with Sub-Provisions [a] through [d].

D.2.b.(2)(e)

The Riverside County Copermittees support the San Diego County Copermittees' comments regarding allowing for a tailored list of constituents to be developed for each WMA. The Redline incorporates those edits.

D.3.

The Riverside County Copermittees support the changes recommended by the San Diego County Copermittees to this section, and these changes are reflected in the Redline.

D.4.a.(2)

This Provision as drafted would require the MS4 Copermittees to make comprehensive evaluations of Beneficial Uses that are beyond their expertise or the scope of an MS4 permit. Such evaluations and determinations would require advanced studies and cannot be answered with the monitoring data collected through this permit. This Provision should either be deleted or, alternatively the Riverside County Copermittees request that the assessments be focused on determining the status and progress toward addressing any Numeric Goals established for those Receiving Waters in the WQIP. Please see the Redline.

D.4.b.(1)

The Redline clarifies that outfall assessments are to be done for the area covered by each Municipal Copermittee (consistent with the proposed definition), and that the data to be used by each Municipal Copermittee would include the data collected from any Flood Control District Copermittee operated MS4s within its jurisdiction. This ensures that jurisdictional data is not double reported for Flood Control District MS4s within a city or county.

For Sub-Provision D.4.b.(1)(c)(iv) three key changes are requested in the Redline:

1) Annual volumes and pollutant loads should only be calculated from the monitored outfalls with persistent discharge to a flowing Receiving Water. This is directly applicable to the purpose of the Draft Permit and an important change, because volume and pollutant data extrapolated to non-monitored MS4 outfalls would be inaccurate and potentially misused if taken out of context. It is understood that San Diego Water Board staff want to ensure that jurisdictional accountability is maintained. However, since MS4 outfall monitoring will be conducted within each jurisdiction, inter-jurisdiction comparisons and accountability can be accomplished using the monitoring data directly without such extrapolations.
2) Added language to require a Copermittee to include in its jurisdictional load calculations any discharge that was demonstrated to have entered another Copermittees' MS4 before being discharged into the flowing Receiving Waters. This is important to ensure that each Copermittee maintains accountability for pollutants discharged to flowing Receiving Waters from within its jurisdiction.
3) The Redline proposes that the calculations of pollutant loads be only for the priority water quality constituents identified in the WQIP.

D.4.b.(2)(b)

Two key changes are recommended in the Redline:

1) Annual volumes and pollutant loads should only be calculated from the monitored outfalls for the monitored storm events. This is an important change because volume and pollutant data extrapolated to non-monitored events would be inaccurate and potentially misused if taken out of context. It is understood that San Diego Water Board staff want to ensure that jurisdictional accountability is maintained, so the Redline proposes that data from the monitored outfalls be extrapolated to identify loads for each jurisdiction during each monitored event. With this information, inter-jurisdiction comparisons and the desired 'accountability' can be accomplished using the monitoring data directly without such extrapolations to non-monitored events.
2) The Redline requests that calculations of pollutant loads be performed only for the priority water quality constituents identified in the WQIP.

D.4.b.(2)(c)

The Redline edits are consistent with those proposed by the San Diego County Copermittees, with minor modifications for clarity.

D.4.d.(2)(c)

It would be difficult to proactively determine the pollutant load reductions that *would* be necessary to demonstrate that discharges *are not* causing or contributing to exceedances of Receiving Water Limitations. Instead it would make more sense to calculate the necessary pollutant load reductions where the discharge has been demonstrated to be causing or contributing to such exceedances. In such circumstances, the necessary parameters would be known to calculate the needed load reduction. These changes are set forth in the Redline.

3.6 Provision E.1, Legal Authority

3.6.1 Overview of Key Issues

The Riverside County Copermittees note that Provision E.1, relating to the establishment of adequately legal authority, exceeds the requirements of federal CWA regulations in several respects. The federal regulations at 40 CFR 122.26(d)(2)(i)(A)-(F), provide explicit guidance for the Copermittees in developing the necessary legal authority to control MS4 discharges within its jurisdiction. However, several of the subsections of Provision E.1 go beyond these federal requirements, with respect to areas not within the responsibility of MS4 dischargers, such as negotiating with non-Copermittee entities. The Riverside County Copermittees have provided requested changes in the Redline, which are explained briefly below.

3.6.2 Comments in support of specific changes

E.1.a(1)

Changes in the Redline to accurately reflect the language of 40 CFR 122.26(d)(2)(i)(B).

E.1.a(2)

Changes in the Redline to accurately reflect the language of 40 CFR 122.26(d)(2)(i)(A). In addition, the Provision as written improperly requires the Copermittees to control the quality of runoff from sites covered by the state general permits for industrial activity and construction. These general permits are enforced by the State Board and the regional boards, and it is a state responsibility which cannot be handed off to the Municipal Copermittees.

E.1.a(3)

Changes in the Redline to accurately reflect the language of 40 CFR 122.26(d)(2)(i)(C).

E.1.a(5)

The Redline requests deletion of this Provision, which is not a requirement for municipal stormwater dischargers set forth in the CWA regulations. The Provision also improperly requests the Municipal Copermittees to attempt to negotiate with third parties the contribution of pollutants to the Copermittees' MS4. The Copermittees have no jurisdiction over such parties. The San Diego Water

Board has such jurisdiction, and should take responsibility for addressing non-MS4 sources of pollutants that may ultimately enter the MS4.

E.1.a(6)

Changes in the Redline to reflect accurately the language of 40 CFR 122.26(d)(2)(i)(E).

E.1.a(7)

The Redline requests deletion of this Provision, which is not a requirement for municipal stormwater dischargers set forth in the CWA regulations.

E.1.a(8)

The Redline requests deletion of this Provision, which is not a requirement for municipal stormwater dischargers set forth in the CWA regulations.

E.1.a(9)

The Redline requests deletion of this Provision, which is not a requirement for municipal stormwater dischargers set forth in the CWA regulations.

E.1.a(10)

The Redline requests both correction of the language in this Provision to comport with the federal regulations in 40 CFR 122.26(d)(2)(i)(F) and deletion of the second clause of this Provision, which is not found in 40 CFR 122.26(d)(2)(i)(F). Moreover, the requirement to inspect and monitor in the first clause of this Provision covers the issues set forth in the second clause. It is therefore unnecessary.

3.7 Provision E.2, IDDE

3.7.1 Overview of Key Issues

- The Draft Permit requires the Copermittees to address all non-stormwater discharges from the MS4 as illegal discharges, and then describes certain sources that need not be prohibited. This is effectively a 'guilty until proven innocent' provision, where a Copermittee will be required to expend potentially significant resources conducting source identification efforts any time non-stormwater is observed discharging from the MS4. In addition to the issues discussed in the Legal Comments, the Provision raises two practical and logistical problems:

    - This requirement is entirely independent of the determination that there are in fact any significant pollutants in such a discharge. A Copermittee could be spending substantial sums tracking (and then potentially enforcing upon) the source of a discharge that is not negatively impacting Receiving Waters. This not only is a waste of public resources, but would undermine the credibility of stormwater programs.
    - The San Diego Water Board and the State Water Board do not treat non-stormwater flows in the same manner across all of their regulatory mechanisms. For example, Order

> No. R9-2008-0002 allows non-stormwater discharges to occur, POTWs are issued permits for their discharges and agricultural operators can discharge irrigation water. The Copermittees should not be forced to conduct an expensive source investigation, only to find that the discharge complies with a permit or a waiver granted by the Water Board. The Copermittee would have no ability to address such a discharge as an 'illegal discharge', and further would have no ability to recuperate their costs for the source identification.

The best way to address these issues, is to require the Copermittee to have and enforce an effective prohibition of illegal discharges of *pollutants* (through statutes, ordinances, permits, contracts, orders or similar means), and then allow the Copermittee full discretion to determine which non-stormwater discharges have the potential to negatively impact Receiving Waters, consistent with the WQIP priorities – and address those as illegal discharges.

- Several categories of non-stormwater discharge that were previously conditionally exempt consistent with the CWA, are required by the Draft Permit to be treated as illegal discharges, unless they have coverage under another order issued by the San Diego Water Board. In addition to the problems identified above for conducting enforcement in the absence of a pollutant discharge, the San Diego Water Board, not the Copermittees, is responsible for evaluating coverage, need for coverage, and compliance with other orders issued by the Water Board. The Copermittees have neither authority nor jurisdiction. Please see the Redline.
- Several categories of non-stormwater discharge that were previously conditionally exempt consistent with the CWA, are required by the draft permit to be 'controlled' or otherwise prohibited by the Copermittees. The Fact Sheet further describes that such controls are warranted because they could potentially contain pollutants. However, the CWA only requires controls where the discharges are determined to be a significant source of pollutants. Please see Legal Comments for a further discussion of this issue as well as the Redline.
- The Draft Permit eliminates the conditional exemptions for Landscape Irrigation, Irrigation Water, and Lawn Watering (collectively 'irrigation runoff'). The San Diego Water Board has provided no data demonstrating that these discharge categories have contributed a significant pollutant load to Receiving Waters within Riverside County. Information discussed in the Fact Ssheet focuses on data from other counties. The only data from Riverside County is public educational material referring to irrigation runoff; this material, however, was adapted from public education material from other counties. That public educational material was intended to help prevent such discharges from becoming a significant source of impact on the Receiving Waters, and did not constitute a determination that such discharges are in fact, actually a significant source that needs to be subject to a prohibition. See the discussion in the Legal Comments as well as the Redline.
- The Draft Permit, in Provision E.2.a.(7) requires efforts to minimize or eliminate all non-stormwater flows, including those that are natural, conditionally exempt, or otherwise permitted by the San Diego Water Board, regardless of whether or not such discharges are not contributing pollutants to the MS4. Such a requirement conflicts with the prior Provisions E.2.a.(1) through

(5), which state conditions where such discharges need not be prohibited. The requirement should therefore be removed, as set forth in the Redline.

3.7.2 Comments in support of specific changes

E.2.a.(1) and (3)

The Riverside County Copermittees request that this Provision be deleted (as shown in the Redline) and the categories of non-stormwater discharges be re-incorporated into Provision E.2.a.(3). The apparent premise of Provision E.2.a(1) as drafted is that since the San Diego Water Board requires those discharges to have coverage under a separate order, they are illegal if they lack such coverage. The MS4 Copermittees, however, are not responsible for enforcing discharge coverage under separate San Diego Water Board orders; that is the responsibility of the San Diego Water Board itself. Requiring the Copermittees to enforce such entities for their lack of coverage under a separate San Diego Order shifts that responsibility from the Board to Copermittees. This is not authorized by the CWA or the Porter-Cologne Water Quality Act. The Copermittees are, under the CWA, only required to address such discharges as illegal discharges if the discharge is found to be contributing a significant pollutant load to the MS4. By moving those categories to Provision E.2.a.(3), as shown in the Redline, the Copermittees will still be required to treat such discharges as illegal discharges if and when they are found to be contributing significant pollutants to the MS4. This proposed approach is consistent with other MS4 permits in the state, including prior San Diego Water Board orders, and is further consistent with the approach taken for the WQIP, which is intended to allow the Copermittees to focus resources on addressing the specific impacts that MS4 discharges are having on Receiving Water quality.

E.2.a.(2)

This Provision requires the Copermittees to treat water line breaks as illegal discharges, which in turn requires the Copermittee to conduct enforcement measures. Water main breaks are accidental occurrences, or may be the result of acts of nature. It is no more appropriate to treat accidents as illegal and subject to enforcement than it would be for a city to declare vehicular accidents as illegal, and conduct enforcement against those involved. This language needs to be removed as shown in the Redline. Additionally, as discussed in the Legal Comments, a recent case from the federal district court in Virginia suggests that the regulation of mere flow may exceed the authority of the CWA.

E.2.a.(4)

The Redline clarifies that if the 'statues, ordinances, permits, contracts, orders or similar means' are enacted/adopted by a Copermittee, the categories of non-stormwater discharges listed do not need to be treated as illegal discharges. Otherwise, the language could be read to imply that, for example, if it was infeasible for a particular resident to direct wash water to landscaped areas, that the Copermittee would be required to treat that residents' discharge as illegal and enforce upon them.

E.2.a.(5)

Contrary to the provisions of the CWA regulations, prior MS4 permits issued by the San Diego Water Board and other permits in the state, the Draft Permit requires implementation of BMPs, where

feasible, during emergency firefighting activities. During such emergencies, all focus of public resources must appropriately be dedicated to protecting life and property. Any diversions from that mission would only serve to diminish and potentially compromise that mission. The Redline proposes language consistent with that adopted by the San Diego Water Board in 2010 for the Riverside County MS4 Permit (Order R9-2010-0016).

E.2.a.(7)

Provisions E.2.a.(1) through E.2.a.(6) describe circumstances where non-stormwater discharges need not be prohibited. This Provision then requires the Copermittees to minimize such 'conditionally allowed' flows anyway. This requirement exceeds the scope of the CWA and its implementing regulations and makes no sense. The Redline requests deletion of these Provisions.

E.2.b.(1)(d)

This Provision requires the MS4 Copermittees to map all known private outfalls to Receiving Waters. Such a requirement is beyond the scope of an MS4 permit and should be removed, as shown in the Redline. The Draft Permit does not require a Copermittee to address private outfalls to Receiving Waters; this is the responsibility of the San Diego Water Board, which governs all waste dischargers under the authority of the CWA or the Porter-Cologne Act.

E.2.b.(4)

This Provision requires the Copermittees, in conjunction with a spill, to 'prevent contamination of surface water, groundwater, and soil.'This requirement is clearly beyond the scope of an MS4 permit issued under the CWA (which regulates only discharges of water containing pollutants *from* the MS4 to Receiving Waters) and must be removed, as shown in the Redline. The Draft Permit could more appropriately require the Copermittees to 'coordinate, to the extent possible, with spill response teams to prevent entry of spills into the MS4.'

E.2.d.(2)(e)

The Redline requests edits to clarify that the intent of this Provision is to document and attempt to quantify any obvious sources of non-stormwater illegal discharges in response to the outfall monitoring, and that it is not necessary to conduct a full source identification any time there is evidence of water near an outfall.

New Provisions E.2.d.(3)(e)-(f)

The Redline adds two new provisions to this section to address a gap in potential outcomes from a source identification effort. These Provisions address scenarios where a Copermittee identifies A) the illegal discharge is coming from another upstream Copermittees' MS4, or B) that the discharge has been authorized by the San Diego Water Board, either through an order or waiver of WDRs. In the first scenario, the responsibility to continue the source identification, and conduct enforcement, would be transferred to the upstream Copermittee. In the second scenario, the responsibility for follow-up would fall on the San Diego Water Board, after receiving relevant information from the Copermittee. This Provision also provides for reimbursement to the Copermittee for the cost of the source identification, since the San Diego Water Board required the Copermittee to conduct the investigation,

while not commensurately prohibiting all non-storm water discharges from all other sources regulated by the Water Boards.

3.8 Provision E.3, Development Planning

3.8.1 Overview of Key Issues

- Priority Development Projects - The Tentative Order identifies categories of projects that are to be defined as 'Priority Development Projects' (PDPs), which in turn will be required to comply with specific water quality and Hydromodification mitigation and quantitative requirements. The criteria for PDPs is quite broad and would include the majority of development projects, from small convenience stores and residences, to mega malls and specific plan developments. The Fact Sheet describes that while some smaller project types may not have significant pollutant loads, they may have a hydrologic impact upon Receiving Waters. However, it is important to recognize that pursuant to Provision E.3.a., All projects are required to implement a variety of LID principles such as disconnecting impervious surfaces, draining impervious surfaces to landscaped areas, and minimization of soil compaction in landscaped areas. Since such LID principles will be implemented wherever feasible consistent with the MEP standard, these smaller development projects are unlikely to create a pollutant or hydrologic impact. Additionally, the Fact Sheet advocates incentivizing LID design concepts and green infrastructure and building principles. Accordingly, the Redline requests changes to Provision E.3.b.(3) as described in Provision 3.8.2 below. The Legal Comments further note the potential impact of the Virginia case (*Virginia Dept. of Transp. v. U.S. Environmental Protection* Agency) holding that the CWA does not regulate stormwater as a pollutant.
- Design Capture Volume – There are two problems with how the Draft Permit defines the Design Capture Volume:
    - The Draft Permit changes the 'design capture volume' from previous permits by eliminating the term 'runoff'. Prior permits described that the design capture volume is the volume of stormwater <u>runoff</u> from the 24-hour 85th percentile storm event. This permit changes that to be the volume of stormwater <u>produced</u> from a 24-hour 85th percentile storm event. The elimination of the term 'runoff' means that BMPs would need to be sized potentially much larger than previously. For example, if the 85th percentile storm is 1" and a BMP is designed to treat 1 acre of residential land with a coefficient of runoff of 0.6, then under the current permits the BMP must be sized to hold 2,178 cubic feet of water. However, under the language of the Draft Permit, the BMP treating the same area would be required to hold 3,630 cubic feet of water, a 70% increase in BMP size. Accordingly, the Redline restores the term 'runoff'.
    - Additionally, the Draft Permit defines the Design Capture Volume alternatively as: *"the volume of storm water that would be retained onsite if the site was fully undeveloped and naturally vegetated, as determined using continuous simulation modeling techniques based on site-specific soil conditions and typical native vegetative cover."* In addition, to the problem identified above regarding the volume of storm water <u>runoff</u>, this language does not provide a temporal standard for determining which volume to

calculate from a continuous simulation model. Additionally, such models are not commonly used among general practitioners in the civil engineering community. The Redlines propose an alternative and simpler approach for this second definition: "The volume of stormwater runoff produced from a 24-hour 85th percentile storm event, that would be retained onsite in the pre-project condition." This definition is advantageous for several reasons: 1) it is simple for any civil engineer to understand, calculate, and comply with and is based on the same storm and hydrologic calculations as the first option, 2) it respects natural hydrology for the site, which may have had runoff in the pre-project condition, and as such, is more compatible with the intent of LID to mimic natural hydrology, and 3) as a result it is less likely to result in potential degradation of Beneficial Uses downstream, from reductions in flows beyond the pre-project condition.

- Pre-Project vs Pre-Development – Both the Storm Water Pollutant Control BMP requirements and the Hydromodification Management BMP requirements in the Draft Permit specify a 'pre-development' condition as the mitigation standard for all PDPs. In addition to the legal problems with such a standard as set forth in the Legal Comments, there are practical problems with the standard.
    - The presumption made in the discussions in the Fact Sheet are that all Receiving Waters can, and will, be restored to a fully natural condition - effectively to a natural floodplain. This presumption does not address reality, which is that development has occurred in those floodplains over many generations. The San Diego Water Board obviously lacks the authority to force homeowners and businesses to vacate such floodplains to effectuate restored natural conditions. Such an action would represent an unconstitutional taking. Moreover, the Legislature, in the Flood Control Acts covering all three counties proposed to be covered by the Draft Permit, has specifically authorized Flood Control Districts to construct flood control structures required to protect the lives and properties of the citizens.
    - Mitigation to a pre-development condition also may not be necessary to protect Receiving Waters from the effects of Hydromodification. If, for example a Receiving Water with existing development tributary to it, has not experienced increased erosion due to that existing development, there is no reason to require Hydromodification mitigation to anything more than the existing condition. In the counter-example, if under the existing condition the Receiving Water has experienced increased erosion due to that existing development, then, legal issues aside, there would be technical benefit to mitigating to that pre-development condition.

  The Redline proposes alternative language that requires mitigation to a pre-development standard only where it is legal and technically justified based on the conditions of the Receiving Water.
- Alternative Compliance – The alternative compliance project options as set forth in the Draft Permit pose two key problems:

- Several statements are conflicting and thus confusing as to what the required standard is for the various alternative compliance projects. For example, throughout Provision E.3.c. it is stated that 'a PDP may be allowed to comply with Provision E.3.c.(1)(a) and/or Provision E.3.c.(2) if they …'. This language can be mis-read to imply that the project must comply both with Provisions E.3.c.(1)(a) and E.3.c.(2) *and* implement the alternative compliance project (thus negating the benefit of alternative compliance). The Redline clarifies this language.
- The Biofiltration option set forth in the Draft Permit arbitrarily, and without technical basis or justification, **doubles** the sizing standard for biofiltration BMPs from 0.75 times the design capture volume (as set forth in the 2010 MS4 Permit and the 2009 Orange County Permit) to 1.5 times the design capture volume. The existing 0.75 standard was set due to the fact that 1) the 85th percentile 24-hour storm occurs over a period of time, and 2) such BMPs have outflows and will regain some capacity during the storm event, and as such, do not need to instantaneously hold the entire 'Design Capture Volume' to have fully treated that volume. In fact, studies have shown that in addition to yielding excellent pollutant concentration reductions, LID Biofiltration BMPs are excellent at reducing the volume of runoff similar to retention BMPs. According to the ASCE International BMP database 60% or more of the long-term volume of runoff from a site can be retained within a Bioretention BMP (Bioretention BMPs are the primary 'biofiltration' BMP now allowed in Riverside County). In comparison, a Retention BMP sized to hold the runoff from the 85th percentile storm event (the Design Capture Volume) will end up retaining approximately 80% of the long-term volume of runoff. Thus, by simple proportions, a Bioretention BMP sized to 'hold' 100% of the Design Capture Volume may also be able to retain 80% of the long-term volume of runoff. $\left(\frac{0.75\times DCV}{60\%\ retained}=\frac{1.0\times DCV}{80\%\ retained}\right)$. This is being validated through Bioretention BMPs that have been constructed and are being monitored for such volume reductions at the Riverside County Flood Control District's headquarters in Riverside. Further, Biofiltration BMPs have the added benefit of providing better overall treatment of back to back storms. Where a Retention BMP would be full after the first storm, fully bypassing the second storm without treatment, a Biofiltration BMP will have restored some capacity after the first storm, providing for treatment of some or all of the second of the back to back storms. Thus, the attached redlines propose changing the sizing factor for Biofiltration BMPs to 1.0 times the Design Capture Volume. The Redline proposes changes consistent with these comments.

3.8.2 Comments in support of specific changes

Introduction

Provision E.3.g (Strategies to address the highest priority water quality conditions) was moved to the beginning to support and better integrate the development planning programs in the JRMP with the strategies developed in the WQIP.

E.3.a.(3)

The Redline changes the title of this section (and other appropriate references to this Provision) to refer to LID Principles, as identified in the CASQA LID Manual for Southern California (https://www.casqa.org/LIDDemo/LowImpactDevelopmentManual/tabid/242/Default.aspx)

E.3.b.(1)(c) (New Provision)

This Provision was added to clarify the requirements if a project that was already subjected to SSMP requirements redevelops a portion of the site.

E.3.b.(2)

The Redline edits shown for this Provision are primarily to simplify this Provision, by grouping various categories by their applicable square footage threshold and including some of the specifics in the definitions (Attachment C). Other changes (beyond reorganization) include:

- Removing the addition of 'driveways' from subsection (g) as described in Provision 3.8.1 of this letter.
- Adding a footnote for parking lots, to clarify that the trigger would not include parking lots that are not exposed to runoff, such as subterranean or covered parking lots. It is beneficial to not have parking lots exposed to runoff; excluding such parking lots from being defined as a PDP is a good way to encourage such practices.
- Hillside development projects were not included as it is not believed to be necessary anymore with the relatively low threshold (10,000 square feet) identified for other categories included in this and other recent MS4 permits.
- The definition for "Environmentally Sensitive Areas" from existing MS4 permits was restored to include the language referring to discharges that are not commingled with flows from adjacent or other upstream lands (note that the change is shown in the definitions per the re-organization suggested above).

E.3.b.(3)

- The PDP exemption for sidewalks, bicycle lanes, or trails, [E.3.b.(3)(a)] has been expanded to as shown in the Redline to include driveways and parking lots. If those projects implement criteria already described in that section, they are also unlikely to create an impact to Receiving Waters. Further, including those project types in that exemption will further incentivize developers to utilize those LID Principles.
- The exemption described in Provision E.3.b(3)(b), was modified as shown in the Redline, and as discussed in the comment letter submitted by the Riverside County Transportation Department. Please see that letter for a justification for the requested changes.
- As shown in the Redline, the exemptions for new and redeveloped single family residences [E.3.b.(3)(c) and (d)] were consolidated into a new provision [E.3.b.(3)(c)], covering all single family residential projects (both new and redeveloped). The key difference is that such projects would be considered exempt if they are both 1) not part of a larger common plan of development or planned subdivision, and 2) successfully incorporate each of the applicable source control and LID Principles identified in Provision E.2.a.(2)-(3) to the MEP.

- A new Provision-E.3.b.(3)(d), titled 'Watershed Protection Projects' was added in the Redline. The project types described therein are all projects that are undertaken to rehabilitate or prevent environmental, social, and economic damage within the watershed, including Receiving Waters. These projects, while they may in some cases require some level of impervious surfaces to be constructed, are 1) not designed for human use or activity that would generate pollutants, or are designed specifically to mitigate such pollutants; and 2) will implement each of the applicable source control and LID Principles identified in Provision E.2.a.(2)-(3) to the MEP.

E.3.c.(1)

In addition to the edits discussed in Provision 3.8.1 of this letter, the Redline removed subprovision E.3.c.(1)(c) , for two reasons:

- The requirements that must be met to when implementing an alternative compliance project are more fully described in Provision E.3.c.(3).
- The language, as drafted, appeared to require double-mitigation. It requires that: 1) conventional treatment is required to treat the entire volume not retained onsite, and 2) the pollutant load discharged must also be mitigated with an alternative compliance project. Such a scenario would be requiring double-mitigation. The Redline provides a clearer and more simple mitigation standard.

E.3.c.(2)

The Riverside County Copermittees have two concerns with this Provision:

- The first concern is the universal requirement to mitigate to the 'pre-development' standard, as discussed above in section 3.8.1 of this letter. The Copermittees in the Redline propose that this language be changed to the 'pre-project' condition. For new development projects, the 'pre-project' condition will be equivalent to the 'pre-development' condition. For redevelopment projects, the standard would be the conditions that exist onsite prior to the construction of the project. This is appropriate, because in many areas, particularly in areas of existing development that would be subject to 'redevelopment', Receiving Waters are engineered and maintained to 1) provide flood protection for the public, 2) ensure that floodwaters don't comingle with pollutants on adjacent private properties and 3) to ensure that the existing development draining to that system does not cause erosion. In cases where the Receiving Waters are not engineered and maintained, and erosion problems caused by existing development are observed, language has been added to the Redline to provide for additional standards to be developed in the WQIP, based on the WQIP priorities.
- Additionally, the Redline proposes an additional exemption from HMP requirements for projects that discharge into conveyance channels that are engineered and maintained for the build-out condition all the way from the project to a waterbody that is sufficiently resistant to Hydromodification. This language is consistent with the above discussions, and ensures the PDPs are not required to mitigate for non-existent impacts. Please see the specific language in the Redline. The engineered channel exemption can be found in other recent MS4 permits, including the recently adopted Los Angeles County MS4 Permit.

E.3.c.(3)(a) and (b)

These two Provisions were re-written in the Redline to be simpler and clearer on what BMPs, criteria, sizing standards are required for what type of project. This alternative language still meets the intent of the Draft Permit, while being easier to understand and comply with. Aside from simplifying the language, the following other changes were made in the Redline:

- The alternative compliance options must be determined to provide an equal or greater overall water quality benefit for the WMA.
- Additional options were provided for who can design the alternative compliance projects
- All alternative compliance projects are required to be consistent with the strategies in the WQIP. While the specific alternative compliance project would not be required to be identified in the WQIP, the goal of this language is to ensure that allowing the alternative compliance project would not in any way be detrimental to or contrary to the strategies in the WQIP.
- Requirements E.3.c.(3)(a)(iv) and (v) were removed entirely, as they conflict with E.3.c.(3)(a)(iii) which allowed the projects to be in the same WMA (preferably the same HSA)
- Changed the sizing factor for Biofiltration BMPs to 1.0 as discussed in section 3.8.1 of this letter, and deleted the option [d] which required triple mitigation by requiring Biofiltration + Conventional Treatment + Alternative Compliance projects.
- Added Conventional Treatment Control BMPs as an alternative compliance option, only where it has been shown to be technically infeasible to meet E.3.c.(1) and technically infeasible to implement LID Biofiltration Treatment Control BMPs.

E.3.c.(3)(c)

Redline edits in this section are primarily to simplify and consolidate the requirements. Sub-Provision [C] was removed, as it was duplicative of the mitigation standards for the alternative compliance project are specified in E.3.c.(3)(b) and E.3.c.(3)(c)(i)[a].

3.9 Provision E.4, Construction

3.9.1 Overview of Key Issues

This Riverside County Copermittees' comments and edits are set forth in the Redline.

- One key issue for the Copermittees is the edit shown in the Redline to Provision E.4.c, which clarifies that the Copermittees are responsible for *requiring* BMPs at private construction sites, and *implementing* BMPs at Copermittee construction sites.

3.9.2 Comments in support of specific changes

The Redline edits include comments supporting the requested edits.

3.10 Provision E.5., Existing Development

3.10.1 Overview of Key Issues

The Draft Permit includes requirements for advanced programs to identify opportunities and implement programs to facilitate the construction of Retrofit and Stream/Channel/Habitat Rehabilitation projects on private properties. Such requirements are clearly beyond the requirements of the CWA for a management plan to be implemented by an MS4 Copermittee. The Riverside County Copermittees request deletion of these requirements.

Alternatively, the Riverside County Copermittees have the following comments:

While these retrofitting and rehabilitation approaches can be helpful and/or needed in some circumstances, they are not required in all circumstances, nor are required to address all pollutants that may be identified in a WQIP as the highest priority water quality conditions. For example, some pollutants are best addressed with regulatory source controls at the state or federal level, such as the removal of copper from brake pads, and controls on pesticides, while other pollutants can be adequately addressed through inspections and enforcement. There are several problems with requiring Copermittee resources to be invested in such Retrofit and/or Rehabilitation strategies (collectively referred to as 'retrofit'):

- Land Ownership: The land that could potentially be identified for retrofit would likely not be owned by a Copermittee. The Copermittee therefore has no ability to force the property owner to retrofit their property. Although the Copermittee could potentially implement programs to "facilitate" implementation, such a program would still be limited by the rights of the individual property owner. Even if a Copermittee were to attempt to purchase a privately owned existing development for the purposes of retrofit (a step going far beyond any requirements in the CWA or the Porter-Cologne Act), such a process can take many years, and if the owner is unwilling to sell, the retrofit project could never be realized. In any scenario, the process to facilitate such "retrofits" is extremely costly and lengthy, with no guarantee of a benefit to water quality. Retrofits should only be undertaken where the Copermittee identifies it as a necessary step to addressing the MS4 contributions to Receiving Water problems to the MEP. Otherwise, it forces the Copermittee to utilize resources very ineffectively, which is contrary to the goals of the WQIP and may actually be detrimental to water quality.
- Permitting: Aside from the limitations discussed above, stream/channel/habitat restorations have the additional complexities of requiring other regulatory permits that are not the discretion of the San Diego Water Board nor the Copermittees to issue. Such projects can take many decades to implement, and thus, are not expected to be highly effective at addressing the goals of the WQIP, except in rare circumstances.

Redline edits have been provided to clarify that these strategies and programs should only be used when, and to the extent directed by the strategies developed in the WQIP.

3.10.2 Comments in support of specific changes

E.5.b.(1)(b) and (d)

BMP implementation requirements of Provision E.5.b.(1)(b) and (d) have been clarified in the Redline to require the Copermittee to implement BMPs on their existing development, and require implementation of BMPs on private existing development.

E.5.c.(1)(a)(iv)

The Riverside County Copermittees request deletion of this Provision. The Copermittees should be provided the flexibility to schedule inspections as they see fit, provided that the schedules they establish pursuant to E.5.c.(1)(a), and the minimum frequency in E.5.c.(1)(a)(i) are met. Requiring 20% every year will be difficult to track as businesses may be opened or closed throughout the year and throughout the permit term.

Additionally, the Riverside Copermittees understand that other Copermittees may be recommending that E.5.c.(1)(a)(i) be changed to 'once per permit term'. The Riverside Copermittees believe that the current language of 'once every five years' is more appropriate for two reasons: 1) not all Copermittees (i.e. OC and Riverside) will be enrolled into the permit at the beginning of the 'permit term', and 2) not all businesses will be in existence at the beginning of the permit term. Accordingly it is more appropriate to simply require the minimum to be once every five years, that way a program manager can simply look at the last time a facility was inspected, and use that date to schedule the next inspection.

3.11 Provision E.6, Enforcement Response Plans

3.11.1 Overview of Key Issues

The Riverside County Copermittees' edits and comments are shown in the Redline and discussed below.

3.11.2 Comments in support of specific changes

E.6.d.

The terminology in this Provision was changed in the Redline from 'escalated' enforcement to 'progressive' enforcement. The proposed language better reflects the nature of enforcement actions, which are not simply 'escalated' or 'not escalated', as implied by Provision E.6.d.(2), but are progressive as needed in response to the severity of the violation. Since every violation comes with a unique set of circumstances, it is not reasonable to presume that a single set of 'triggers' will universally result in the same level of enforcement.

3.12 Provision E.7, Public Education

3.12.1 Overview of Key Issues

The Riverside County Copermittees' edits and comments are shown in the Redline.

3.13 Provision, E.8 Fiscal Analysis

3.13.1 Overview of Key Issues

The requirement that the Copermittees "must secure all the resources necessary to comply with this Order" exceeds the requirements of the CWA and illegally intrudes on the home rule authority of municipalities to govern themselves. This must be deleted. Please also see Legal Comments.

With regard to other provisions, the Riverside County Copermittees' edits and comments are shown in the Redline.

3.14 Provision F

3.14.1 Overview of Key Issues

- F.1 – WQIP Submittal
  - Based on the schedule for the initial submittal of the Priority Water Quality Conditions and Numeric Goals, and the subsequent 60-day public review, only one month would be left for the Copermittees to finalize strategies based on those conditions and goals and the public input received. This is an insufficient amount of time. The Redline requests modifications to the schedule that would provide for the submittal of the final WQIP within 24 months (instead of 18), to provide additional time for the development of strategies.
- F.1 and F.2.
  - The schedules for submittals should be linked to the receipt of comments on prior submittals, or the approval of prior submittals, rather than the permit adoption date. If it is tied to the permit adoption date, the submittal dates could become out of sync with the comment periods or San Diego Water Board approvals if any unexpected delays occur (for example if the San Diego Water Board is delayed in approving a document, or posting a document online for public comment). The Redline requests appropriate modifications.
  - Implementation dates for the plans are unclear / undefined. The Redline clarifies this issue.
- F.3. Progress Reports
  - The reporting requirements across the transitional period were unclear. Redlines are provided to clarify and consolidate.
  - The Regional Monitoring and Assessment Report language was revised to be consistent with the requirements of the Integrated Assessment of the Water Quality Improvement Plan, rather than an additional, slightly different report, due at the same time.

015529

3.15 Attachments B and C

Comments and edits to Attachments B and C are shown in the Redline.

Very truly yours,

for JASON E. UHLEY
Chief of Watershed Protection Division

CP:cw
P8/

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

TENTATIVE
ORDER NO. R9-2013-0001
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The San Diego County Copermittees in Table 1a are subject to waste discharge requirements set forth in this Order.

Table 1a. San Diego County Copermittees

Municipal Copermittees	
City of Carlsbad	City of Oceanside
City of Chula Vista	City of Poway
City of Coronado	City of San Diego
City of Del Mar	City of San Marcos
City of El Cajon	City of Santee
City of Encinitas	City of Solana Beach
City of Escondido	City of Vista
City of Imperial Beach	County of San Diego
City of La Mesa	San Diego County Regional Airport Authority
City of Lemon Grove	San Diego Unified Port District
City of National City	

After the San Diego Water Board receives and considers the Orange County Copermittees' Report of Waste Discharge and makes any necessary changes to the Order, the Orange County Copermittees in Table 1b will become subject to waste discharge requirements set forth in this Order after expiration of Order No. R9-2009-0002, NPDES No. CAS0108740 on or after December 16, 2014.

Table 1b. Orange County Copermittees

Municipal Copermittees	
City of Aliso Viejo	City of Rancho Santa Margarita
City of Dana Point	City of San Clemente
City of Laguna Beach	City of San Juan Capistrano
City of Laguna Hills	City of Laguna Woods
City of Laguna Niguel	County of Orange
City of Lake Forest	~~Orange County Flood Control District~~

City of Mission Viejo	
Special District Copermittee	
Orange County Flood Control District	

After the San Diego Water Board receives and considers the Riverside County Copermittees' Report of Waste Discharge and makes any necessary changes to this Order, the Riverside County Copermittees in Table 1c will become subject to waste discharge requirements set forth in this Order after expiration of Order No. R9-2010-0016, NPDES No. CAS0108766 on or after November 10, 2015.

Table 1c. Riverside County Copermittees

Municipal Copermittee	
City of Murrieta	County of Riverside
City of Temecula	~~Riverside County Flood Control and Water Conservation District~~
City of Wildomar	
Special District Copermittee	
Riverside County Flood Control and Water Conservation District	

The Orange County Copermittees and Riverside County Copermittees may become subject to the requirements of this Order at a date earlier than the expiration date of their current Orders subject to the conditions described in Provision F.6 of this Order if the Copermittees in the respective county receive a notification of coverage from the San Diego Water Board.

The term Copermittee in this Order refers to any San Diego County, Orange County, or Riverside County Copermittee covered under this Order, unless specified otherwise.

This Order provides permit coverage for the Copermittee discharges described in Table 2.

Table 2. Discharge Locations and Receiving Waters

Discharge Points	Locations throughout San Diego Region
Discharge Description	Municipal Separate Storm Sewer System (MS4) Discharges
Receiving Waters	Inland Surface Waters, Enclosed Bays and Estuaries, and Coastal Ocean Waters of the San Diego Region

Table 3. Administrative Information

This Order was adopted by the San Diego Water Board on:	**Month Day, 2013**
This Order will become effective on:	**Month Day, 2013**
This Order will expire on:	**Month Day, 2018**
The Copermittees must file a Report of Waste Discharge in accordance with Title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than 180 days in advance of the Order expiration date.	

I, David W. Gibson, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on Month Day, 2013.

TENTATIVE

David W. Gibson
Executive Officer

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ATTACHMENTS

Attachment A - Discharge Prohibitions and Special Protections A-1
Attachment B - Standard Permit Provisions and General Provisions B-1
Attachment C - Acronyms, Abbreviations and Definitions C-1
Attachment D - Jurisdictional Runoff Management Program Annual Report Form D-1
Attachment E - Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2013-0001 ..... E-1
Attachment F - Fact Sheet / Technical Report for Order No. R9-2013-0001 ..... F-1

I. FINDINGS

Comment [A1]: See discussions in section 3.1 of the comment letter

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), finds that:

JURISDICTION

1. **MS4 Ownership or Operation.** Each of the Copermittees owns or operates an MS4, through which it discharges storm water and non-storm water into waters of the U.S. within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the U.S.

Many geographical areas subject to this Order are subject to the threat of periodic catastrophic flooding resulting from natural conditions, specifically the presence of mountains and hilly areas in close proximity to urban development and the effect of period strong Pacific Ocean storms. Such flooding would occur in the absence of development. The Legislature recognized the importance of this issue when it established flood control districts across the state, including in Orange, Riverside and San Diego Counties. Such flooding has in the past, and if not controlled, could in the future result in loss of life and property damage. Such flooding can also mobilize significant Pollutants from industrial, commercial, residential and agricultural lands, damaging watercourses and the beneficial uses thereof, including habitat. MS4s are designed and constructed to mitigate such impacts.

2. Riverside County Flood Control and Water Conservation District.

Comment [A2]: See discussion in section 3.1.1 of the comment letter.

In 1945, the California Legislature enacted the Riverside County Flood Control and Water Conservation District Act, establishing the Riverside County Flood Control and Water Conservation District (District). The objects and purposes of the Act are to provide for the control and conservation of flood and storm waters and for the protection of watercourses, watersheds, public highways, life and property within the District from damage or destruction from flood waters. Among its other powers, the District also has the power to conserve, reclaim and save such waters for beneficial use. However the Act does not provide the District with the power to control the volume or quality of discharges that runs off of private property, which may end up in the District's flood control system. The District is governed by the District's Board of Supervisors as a separate legal entity from the County of Riverside.

Many of the flood management systems that the District operates are defined by the Clean Water Act as an MS4, and include many of the larger MS4s within the Santa Margarita watershed region of Riverside County (SMR). District does not however

own or operate streets, catch basins or storm drains smaller than 36 inches that collect runoff from the incorporated and unincorporated jurisdictions within the SMR, and commonly connect into the District's flood management system. Such systems are typically owned and operated by either the County of Riverside or the incorporated Cities within the SMR.

The waters and pollutants that may enter the regional receiving waters and/or the District's flood management systems come from various sources. These sources can include storm water and non-storm water from the Municipal Copermittees under this permit as well as from other NPDES and non-NPDES permittees, including industrial waste water dischargers, waste water treatment facilities, industrial and construction stormwater dischargers, water suppliers, tribal lands, other state and federal government entities, and Caltrans. Sources can also include discharges from Phase II entities such as school districts and discharges from entities that have been granted waste discharge requirements or waivers of waste discharge requirements, including agricultural operations.

The District does not own or operate any municipal sanitary sewer systems, public streets, roads, or highways. The District has no planning, zoning, development permitting or other land use authority, thus, it has no permitting or governing authority over industrial or commercial facilities, residents, new developments or re-development projects, and development construction sites located in any incorporated or unincorporated areas within its service area, including the SMR. The Copermittees that have such authority are responsible for implementing a storm water management program to address pollutants discharged from such industrial and commercial facilities, residential areas, new development and re-development projects, and development construction sites within their jurisdictional boundaries. Nonetheless, as an owner and operator of an MS4, the District is required to control pollutant discharges into and from its MS4, such as through interagency agreements among Copermittees and other owners of a MS4, the contribution of pollutants from one portion of the MS4 to another portion of the MS4 within their jurisdiction.

2. **Legal and Regulatory Authority.** This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]) adopted by the United States Environmental Protection Agency (USEPA), and chapter 5.5, division 7 of the California Water Code (CWC) (commencing with section 13370). This Order serves as an NPDES permit for discharges from MS4s to surface waters. This Order also serves as waste discharge requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

   The San Diego Water Board has the legal authority to issue a regional MS4 permit pursuant to its authority under CWA section 402(p)(3)(B) and 40 CFR 122.26(a)(1)(v). The USEPA also made it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide permits (55 Federal Register [FR] 47990, 48039-48042). The regional nature of this Order will ensure consistency of regulation within watersheds and is expected

to result in overall cost savings for the Copermittees and San Diego Water Board.

The federal regulations make it clear that the Copermittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators (40 CFR 122.26(a)(3)(vi)). This Order does not require the Copermittees to manage storm water outside of their jurisdictional boundaries, but rather to work collectively to improve storm water management within watersheds.

3. **CWA NPDES Permit Conditions.** Pursuant to CWA section 402(p)(3)(B), NPDES permits for storm water discharges from MS4s must include requirements to effectively prohibit non-storm water discharges into MS4s, and require controls to reduce the discharge of pollutants from the MS4s ~~in storm water~~ to the maximum extent practicable (MEP), and to require other provisions as the San Diego Water Board determines are appropriate to control such pollutants. This Order prescribes conditions to assure compliance with the CWA requirements for owners and operators of MS4s to effectively prohibit non-storm water discharges in to the MS4s, and require controls to reduce the discharge of pollutants ~~in storm water~~ from the MS4s to the MEP.

Comment [A3]: See discussion in section 3.1.2 of the comment letter.

4. **CWA and CWC Monitoring Requirements.** CWA section 308(a) and 40 CFR 122.41(h),(j)-(l) and 122.48 require that NPDES permits must specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s also specify additional monitoring and reporting requirements in 40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c). CWC section 13383 authorizes the San Diego Water Board to establish monitoring, inspection, entry, reporting and recordkeeping requirements. This Order establishes monitoring and reporting requirements to implement federal and State requirements.

5. **Total Maximum Daily Loads.** CWA section 303(d)(1)(A) requires that "[e]ach state shall identify those waters within its boundaries for which the effluent limitations…are not stringent enough to implement any water quality standard applicable to such waters." The CWA also requires states to establish a priority ranking of impaired water bodies known as Water Quality Limited Segments and to establish Total Maximum Daily Loads (TMDLs) for such waters. This priority list of impaired water bodies is called the Clean Water Act Section 303(d) List of Water Quality Limited Segments, commonly referred to as the 303(d) List. The CWA requires the 303(d) List to be updated every two years.

   TMDLs are numerical calculations of the maximum amount of a pollutant that a water body can assimilate and still meet water quality standards. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point sources (waste load allocations or WLAs) and non-point sources (load allocations or LAs), background contribution, plus a margin of safety. Discharges from MS4s are point source discharges. The federal regulations (40 CFR 122.44(d)(1)(vii)(B)) require that NPDES permits to incorporate water quality based effluent limitations (WQBELs) developed to protect a narrative water quality criterion, a numeric water

quality criterion, or both, consistent with the assumptions and requirements of any available WLA for the discharge. Requirements of this Order implement the TMDLs adopted by the San Diego Water Board and approved by USEPA.

6. **Non-Storm Water Discharges.** Pursuant to CWA section 402(p)(3)(B)(ii), this Order requires each Copermittee to effectively prohibit discharges of non-storm water into its MS4. Nevertheless, non-storm water discharges into and from the MS4s continue to be reported to the San Diego Water Board by the Copermittees and other persons. Monitoring conducted by the Copermittees, as well as the 303(d) List, have identified dry weather, non-storm water discharges from the MS4s as a source of pollutants causing or contributing to receiving water quality impairments in the San Diego Region. The federal regulations (40 CFR 122.26(d)(2)(iv)(B)(1)) require the Copermittees to have a program to prevent illicit discharges to the MS4. The federal regulations, however, allow for specific categories of non-storm water discharges or flows to be addressed as illicit discharges only where such discharges are identified as sources of pollutants to waters of the U.S.

7. **In-Stream Treatment Systems.** Pursuant to federal regulations (40 CFR 131.10(a)), in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S. Authorizing the construction of a runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to accepting waste assimilation as an appropriate use for that water body. Runoff treatment must occur prior to the discharge of runoff into receiving waters. Treatment control best management practices (BMPs) must not be constructed in waters of the U.S. Construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body.

DISCHARGE CHARACTERISTICS AND RUNOFF MANAGEMENT

8. **Point Source Discharges of Pollutants.** Discharges from the MS4s may contain waste, as defined in the CWC, and pollutants that adversely affect the quality of the waters of the state. A discharge from an MS4 is a "discharge of pollutants from a point source" into waters of the U.S. as defined in the CWA. Storm water and non-storm water discharges from the MS4s may contain pollutants that cause or threaten to cause a violation of surface water quality standards, as outlined in the Water Quality Control Plan for the San Diego Basin (Basin Plan). ~~Storm water and non-storm water discharges from the MS4s are subject to the conditions and requirements established in the Basin Plan for point source discharges.~~

9. **Potential Beneficial Use Impairment.** The discharge of pollutants and/or increased flows from MS4s may cause or threaten to cause the concentration of pollutants to exceed applicable receiving water quality objectives and impair or threaten to impair designated beneficial uses or which may result~~ing~~ in a condition of pollution, contamination, or nuisance. In addition, the reduction of flows below the

existing condition may impact negatively impact beneficial uses.

10. **Pollutants Generated by Land Development.** Land development has created and continues to create new sources of non-storm water discharges and pollutants in storm water discharges as human population density increases. This brings higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash. Pollutants from these sources are dumped or washed off the surface by non-storm water or storm water flows into and from the MS4s. When development converts natural vegetated pervious ground cover to impervious surfaces such as paved highways, streets, rooftops, and parking lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving a developed area without BMPs that can maintain pre-development conditions will contain greater pollutant loads and have significantly greater runoff volume, velocity, and peak flow rate than pre-development runoff from the same area.

11. **Runoff Discharges to Receiving Waters.** The MS4s discharge runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within the eleven hydrologic units comprising the San Diego Region. ~~Historic and current development makes use of natural drainage patterns and features as conveyances for runoff. Rivers, streams and creeks in developed areas used in this manner are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and receiving water.~~ Numerous receiving water bodies and water body segments have been designated as impaired by the San Diego Water Board pursuant to CWA section 303(d).

Comment [A4]: See discussion in section 3.1.2 of the comment letter.

Pollutants in Runoff. The most common pollutants in runoff discharged from the MS4s include total suspended solids, sediment, pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., cadmium, copper, lead, and zinc), petroleum products and polynuclear aromatic hydrocarbons, synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus), oxygen-demanding substances (e.g., decaying vegetation, animal waste), detergents, and trash. ~~As operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not effectively prohibit or otherwise control.~~ These discharges may cause or contribute to a condition of pollution or a violation of water quality standards. California law requires downstream landowners, including owners and operators of MS4, to accept upstream flows, even if that flow contains Pollutants. Failure to do can create conditions.

Comment [A5]: See discussion in section 3.1.2 of the comment letter.

Limitation on Powers of Copermittees. This Order regulates the discharge of non-stormwater into and Pollutants from non-agricultural Anthropogenic sources from the MS4s owned and/or operated by the Copermittees. The Copermittees lack legal

Comment [A6]: This finding is based on Findings I.B and I.C in Order R8-2010-33, applicable to portions of Riverside County within the Santa Ana region.

jurisdiction over discharges into their MS4 from agricultural activities, State and federal facilities, public schools and hospitals, utilities, railroads, special districts, Native American tribal lands, wastewater management agencies and other point and non-point source discharges otherwise permitted by the Water Board. The Water Board recognizes that the Copermittees should not be held responsible for discharges from such facilities or Pollutants in those discharges. Also, certain activities and sources that generate pollutants present in urban runoff may be beyond the ability of the Copermittees to prevent or eliminate. Examples of these activities and sources include, but are not limited to: emissions from internal combustion engines, brake pad wear and tear, atmospheric deposition, non-Anthropogenic sources of bacteria (including wildlife and feral cats and dogs), the regulation of pesticides and leaching of naturally occurring nutrients and minerals from local soils. This Order is not intended to address background or naturally occurring Pollutants or flows.

12.

13. **Human Health and Aquatic Life Impairment.** Pollutants in runoff discharged from the MS4s can threaten and adversely affect human health and aquatic organisms. Adverse responses of organisms to chemicals or physical agents in runoff range from physiological responses such as impaired reproduction or growth anomalies to mortality. Increased volume, velocity, rate, and duration of storm water runoff greatly accelerate the erosion of downstream natural channels. This alters stream channels and habitats and can adversely affect aquatic and terrestrial organisms.

14. **Water Quality Effects.** The Copermittees' water quality monitoring data submitted to date documents various persistent exceedances of Basin Plan water quality objectives for runoff-related pollutants at various watershed monitoring stations. Persistent toxicity has also been observed at several watershed monitoring stations. In addition, bioassessment data indicate that the majority of the monitored receiving waters have Poor to Very Poor Index of Biological Integrity (IBI) ratings. ~~These findings indicate that runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in the San Diego Region. Non-storm water discharges from the MS4s have been shown to contribute significant levels of pollutants and flow in arid, developed Southern California watersheds, and contribute significantly to exceedances of applicable receiving water quality objectives.~~

Comment [A7]: These statements are completely unsubstantiated.

15. ~~**Non-Storm Water and Storm Water Discharges.** Non-storm water discharges from the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard of CWA section 402(p)(3)(B)(iii), which is explicitly for "Municipal … *Stormwater Discharges* (emphasis added)" from the MS4s. Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s must be effectively prohibited.~~

Comment [A8]: See discussion in section 3.1.2 of the comment letter.

16. **Best Management Practices.** Waste and pollutants which are deposited and accumulate in MS4 drainage structures may~~will~~ be discharged from these structures

to waters of the U.S. unless they are removed. These discharges may cause or contribute to, or threaten to cause or contribute to, a condition of pollution in receiving waters. For this reason, pollutants in storm water discharges from the MS4s can be and must be effectively reduced in runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Pollution prevention is the reduction or elimination of pollutant generation at its source and is the best "first line of defense". Source control BMPs (both structural and non-structural) minimize the contact between pollutants and runoff, therefore keeping pollutants onsite and out of receiving waters. Treatment control BMPs remove pollutants that have been mobilized by storm water or non-storm water flows.

17. **BMP Implementation.** Runoff needs to be addressed during the three major phases of development (planning, construction, and use) in order to reduce the discharge of storm water pollutants to the MEP, effectively prohibit non-storm water discharges, and protect receiving waters. Development which is not guided by water quality planning policies and principles can result in increased pollutant load discharges, flow rates, and flow durations which can negatively affect receiving water beneficial uses. Construction sites without adequate BMP implementation result in sediment runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. Existing development can generate substantial pollutant loads which are discharged in runoff to receiving waters. Retrofitting areas of existing development with storm water pollutant control and hydromodification management BMPs may in many cases be ~~is~~ necessary to address storm water discharges from existing development that may cause or contribute to a condition of pollution or a violation of water quality standards.

Comment [A9]: It is not necessary in all cases.

18. **Long Term Planning and Implementation.** Federal regulations require municipal storm water permits to expire 5 years from adoption, after which the permit must be renewed and reissued. The San Diego Water Board recognizes that the degradation of water quality and impacts to beneficial uses of the waters in the San Diego Region occurred over several decades. The San Diego Water Board further recognizes that a decade or more may be necessary to realize demonstrable improvement to the quality of waters in the Region. This Order includes a long term planning and implementation approach that will require more than a single permit term to complete.

WATER QUALITY STANDARDS

19. **Basin Plan.** The San Diego Water Board adopted the Water Quality Control Plan for the San Diego Basin (Basin Plan) on September 8, 1994 that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for receiving waters addressed through the plan. The Basin Plan was subsequently approved by the State Water

Resources Control Board (State Water Board) on December 13, 1994. Subsequent revisions to the Basin Plan have also been adopted by the San Diego Water Board and approved by the State Water Board. Requirements of this Order implement the Basin Plan.

The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Process Supply (PROC), Industrial Service Supply (IND), Ground Water Recharge (GWR), Contact Water Recreation (REC1), Non-contact Water Recreation (REC2), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Freshwater Replenishment (FRSH), Hydropower Generation (POW), and Preservation of Biological Habitats of Special Significance (BIOL). The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region: Navigation (NAV), Commercial and Sport Fishing (COMM), Estuarine Habitat (EST), Marine Habitat (MAR), Aquaculture (AQUA), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN), and Shellfish Harvesting (SHELL).

20. **Ocean Plan.** The State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, and 2005. The State Water Board adopted the latest amendment on April 21, 2005 and it became effective on February 14, 2006. The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean. Requirements of this Order implement the Ocean Plan.

    The Ocean Plan identifies the following beneficial uses of ocean waters of the state to be protected: Industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture; preservation and enhancement of designated Areas of Special Biological Significance; rare and endangered species; marine habitat; fish spawning and shellfish harvesting

21. **Sediment Quality Control Plan**. On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes: 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

22. **National Toxics Rule and California Toxics Rule.** USEPA adopted the National Toxics Rule (NTR) on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the NTR applied in California. On May 18, 2000, USEPA adopted the California Toxics Rule (CTR). The CTR promulgated

new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants.

23. **Antidegradation Policy.** This Order is in conformance with the federal Antidegradation Policy described in 40 CFR 131.12, and State Water Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality Waters in California*. Federal regulations at 40 CFR 131.12 require that the State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. State Water Board Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies.

CONSIDERATIONS UNDER FEDERAL AND STATE LAW

24. **Coastal Zone Act Reauthorization Amendments.** Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states with approved coastal zone management programs to address non-point source pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point source pollution: agriculture, silviculture, urban, marinas, and hydromodification. This Order addresses the management measures required for the urban category, with the exception of septic systems. The runoff management programs developed pursuant to this Order fulfills the need for coastal cities to develop a runoff non-point source plan identified in the Non-Point Source Program Strategy and Implementation Plan. The San Diego Water Board addresses septic systems through the administration of other programs.

25. **Endangered Species Act.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 USC sections 1531 to 1544). This Order requires compliance with receiving water limits, and other requirements to protect the beneficial uses of waters of the State. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

26. **Report of Waste Discharge Process.** The waste discharge requirements set forth in this Order are based upon the Report of Waste Discharge submitted by the San Diego County Copermittees prior to the expiration of Order No. R9-2007-0001 (NPDES No. CAS0109266). The Orange County and Riverside County Copermittees are not immediately covered by the waste discharge requirements in this Order. The San Diego Water Board understands that each municipality is

unique although the Counties share watersheds and geographical boundaries. The Order will continue to use the Report of Waste Discharge process prior to initially making Orange County or Riverside County Copermittees subject to the requirements of this Order.

The federal regulations (40 CFR 122.21(d)(2)) and CWC section 13376 impose a duty on the Copermittees to reapply for continued coverage through submittal of a Report of Waste Discharge no later than 180 days prior to expiration of a currently effective permit. This requirement is set forth in the Orange County Copermittees' and Riverside County Copermittees' currently effective permits at Provisions K.2.b and K.2.c, respectively. The Orange County Permit, Order No. R9-2009-0002 (NPDES No. CAS0108740) expires on December 16, 2014 and the Riverside County MS4 Permit, Order No. R9-2010-0016 (NPDES No. CAS0108766) expires on November 10, 2015.

Unless the Orange County or Riverside County Copermittees apply for and receive early coverage under this Order, the Orange County Copermittees' and the Riverside County Copermittees' respective permits will be superseded by this Order upon expiration of their respective permits, subject to any necessary revisions to the requirements of this Order made after the San Diego Water Board considers their respective Reports of Waste Discharge through the public process provided in 40 CFR 124.

Comment [A10]: Please see Comment Letter and Legal Comments regarding regional permit authority,

27. **Integrated Report and Clean Water Act Section 303(d) List.** The San Diego Water Board and State Water Board submit an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. USEPA issued its *Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act* on July 29, 2005, which advocates the use of a five category approach for classifying the attainment status of water quality standards for water bodies in the Integrated Report. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 in the Integrated Report are placed on the 303(d) List.

Water bodies with available data and/or information that indicate at least one beneficial use is not being supported or is threatened, but a TMDL is not required, are included in Category 4 in the Integrated Report. Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

Implementation of the requirements of this Order may allow the San Diego Water Board to include surface waters impaired by discharges from the Copermittees'

MS4s in Category 4 in the Integrated Report for consideration during the next 303(d) List submittal by the State to USEPA.

28. **Economic Considerations.** The California Supreme Court has ruled that although CWC section 13263 requires the State and Regional Water Boards (collectively Water Boards) to consider factors set forth in CWC section 13241 when issuing an NPDES permit, the Water Board may not consider the factors to justify imposing pollutant restrictions that are less stringent than the applicable federal regulations require. (*City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 618, 626-627.) However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

As noted in the following finding, the San Diego Water Board finds that the requirements in this permit are not more stringent than the minimum federal requirements. Therefore, a CWC section 13241 analysis is not required for permit requirements that implement the effective prohibition on the discharge of non-storm water into the MS4 or for controls to reduce the discharge of pollutants ~~in storm water~~ to the MEP, or other provisions that the San Diego Water Board has determined appropriate to control such pollutants, as those requirements are mandated by federal law. Notwithstanding the above, the San Diego Water Board has developed an economic analysis of the requirements in this Order. The economic analysis is provided in the Fact Sheet.

Comment [A11]: See discussion in section 3.1.2 of the Comment Letter and also Legal Comments..

29. ~~**Unfunded Mandates.** This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following:~~

~~**a.** This Order implements federally mandated requirements under CWA section 402 (33 USC section 1342(p)(3)(B)).~~

~~**b.** The local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental and new dischargers who are issued NPDES permits for storm water and non-storm water discharges.~~

~~**c.** The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order.~~

~~**d.** The Copermittees have requested permit coverage in lieu of compliance with the complete effective prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)) and in lieu of numeric restrictions on their MS4 discharges (i.e. effluent limitations).~~

~~**e.** The local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under State law predates the enactment of Article XIIIB, Section (6) of the California Constitution.~~

Comment [A12]: See discussion in section 3.1.2 of the comment letter and in the Legal Comments.

~~f. The provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state develops a TMDL, federal law requires that permits must contain water quality based effluent limitations consistent with the assumptions and requirements of any applicable wasteload allocation (40 CFR 122.44(d)(1)(vii)(B)).~~

~~See the Fact Sheet for further discussion of unfunded mandates.~~

30. **California Environmental Quality Act.** The issuance of waste discharge requirements and an NPDES permit for the discharge of runoff from MS4s to waters of the U.S. is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 et seq.) in accordance with CWC section 13389.

STATE WATER BOARD DECISIONS

31. **Compliance with Prohibitions and Limitations.** The receiving water limitation language specified in this Order is consistent with language recommended by the USEPA and established in State Water Board Order WQ 99-05, *Own Motion Review of the Petition of Environmental Health Coalition to Review Waste Discharge Requirements Order No. 96-03, NPDES Permit No. CAS0108740*, adopted by the State Water Board on June 17, 1999. The receiving water limitation language in this Order requires storm water discharges from MS4s to not cause or contribute to a violation of water quality standards, which is to be achieved through an iterative approach requiring the implementation of improved and better-tailored BMPs over time. Implementation of the iterative approach to comply with receiving water limitations based on applicable water quality standards is necessary to ensure that Pollutant ~~storm water~~ discharges from the MS4 will not ultimately cause or contribute to violations of water quality standards and will not create conditions of pollution, contamination, or nuisance.

Comment [A13]: See discussion in section 3.1.2 of the comment letter.

Comment [A14]: Please see discussion in section 3.1.2 of the Comment Letter and Legal Comments.

32. **Special Conditions for Areas of Special Biological Significance.** On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving an exception to the Ocean Plan effective prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges. State Water Board Resolution No. 2012-0012 requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, effective prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject terms and conditions of State Water Board Resolution No. 2012-0012. The Special

Protections contained in Attachment B to Resolution No. 2012-0012, applicable to these discharges, are hereby incorporated into this Order as if fully set forth herein.

ADMINISTRATIVE FINDINGS

33. **Executive Officer Delegation of Authority.** The San Diego Water Board by prior resolution has delegated all matters that may legally be delegated to its Executive Officer to act on its behalf pursuant to CWC section 13223. Therefore, the Executive Officer is authorized to act on the San Diego Water Board's behalf on any matter within this Order unless such delegation is unlawful under CWC section 13223 or this Order explicitly states otherwise.

34. **Standard Provisions.** Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR 122.42, are provided in Attachment B to this Order.

35. **Fact Sheet.** The Fact Sheet for this Order contains background information, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of this Order. The Fact Sheet is hereby incorporated into this Order and constitutes part of the Findings of this Order.

36. **Public Notice.** In accordance with State and federal laws and regulations, the San Diego Water Board notified the Copermittees, and interested agencies and persons of its intent to prescribe waste discharge requirements for the control of discharges into and from the MS4s to waters of the U.S. and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet.

37. **Public Hearing.** The San Diego Water Board held a public hearing on Month Day, 2013 and heard and considered all comments pertaining to the terms and conditions of this Order. Details of the public hearing are provided in the Fact Sheet.

38. **Effective Date.** This Order serves as an NPDES permit pursuant to CWA section 401 or amendments thereto, and becomes effective fifty (50) days after the date of its adoption, provided that the Regional Administrator, USEPA, Region IX, does not object to this Order.

39. **Review by the State Water Board.** Any person aggrieved by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with CWC section 13320 and California Code of Regulations, title 23, sections 2050, et seq. The State Water Board must receive the petition by 5:00 p.m., 30 days after the San Diego Water Board action, except that if the thirtieth day following the action falls on a Saturday, Sunday or State holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the

Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

THEREFORE, IT IS HEREBY ORDERED that the Copermittees, in order to meet the provisions contained in division 7 of the CWC and regulations adopted thereunder, and the provisions of the CWA and regulations adopted thereunder, must each comply with the following:

II. PROVISIONS

A. PROHIBITIONS AND LIMITATIONS

Comment [A15]: See discussion in section 3.2 of the comment letter.

The purpose of this provision is to describe the conditions under which storm water and non-storm water discharges into and from MS4s are to be effectively prohibited or limited. The goal of the prohibitions and limitations is to protect the water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through the implementation of water quality improvement strategies and runoff management programs that effectively prohibit non-storm water discharges into the Copermittees' MS4s, and reduce pollutants in ~~storm water~~ discharges from the Copermittees' MS4s to the MEP. The process for determination of compliance with the Discharge Prohibitions (A.1), Receiving Water Limitations (A.2), and Effluent Limitations (A.3) is defined in Provisions A.3.b and A.4.

1. Discharge Prohibitions

a. Discharges from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters ~~of the state~~ are to be ~~prohibited.~~ effectively prohibited, unless the Regional Board determines such discharges are addressed by the Copermittee through A.3.b or A.4, including any modifications.~~prohibited.~~

Comment [A16]: See discussion in section 3.2.2 of the comment letter.

b. Non-storm water discharges into MS4s are to be effectively prohibited through a program consistent with the requirements of provision E.2. of this order, including inspections, to implement and enforce an ordinance, orders or similar means to prevent illicit discharges to the MS4, unless such discharges are either authorized by a separate NPDES permit, or the discharge is a category of non-storm water discharges or flows that must be addressed pursuant to Provisions E.2.a.(1)-(5) of this Order.

Comment [A17]: See discussion in section 3.2.2 of the comment letter.

c. Discharges from MS4s are subject to all applicable waste discharge prohibitions in the Basin Plan, included in Attachment A to this Order, unless the Regional Board determines such discharges are addressed by the Copermittee through A.3.b or A.4, including any modifications.

Comment [A18]: See discussion in section 3.2.2 of the comment letter.

d. Storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No.

2012-0012 applicable to these discharges, included in Attachment A to this Order. All other discharges from the Copermittees' MS4s to ASBS are ~~to be effectively~~ prohibited.

2. Receiving Water Limitations

Comment [A19]: See discussion in section 3.2.2 of the comment letter.

a. Discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters, including but not limited to all applicable provisions ~~contained in:~~below, unless the Regional Board determines such discharges are addressed by the Copermittee through A.3.b or A.4::~~contained in:~~

(1) The San Diego Water Board's Basin Plan, including beneficial uses, water quality objectives, and implementation plans;

(2) State Water Board plans for water quality control including the following:

(a) Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries (Thermal Plan), and

(b) The Ocean Plan, including beneficial uses, water quality objectives, and implementation plans;

(3) State Water Board policies for water and sediment quality control including the following:

(a) Water Quality Control Policy for the Enclosed Bays and Estuaries of California,

(b) Sediment Quality Control Plan which includes the following narrative objectives for bays and estuaries:

(i) Pollutants in sediments shall not be present in quantities that, alone or in combination, are toxic to benthic communities, and

(ii) Pollutants shall not be present in sediments at levels that will bioaccumulate in aquatic life to levels that are harmful to human health,

(c) The Statement of Policy with Respect to Maintaining High Quality of Waters in California;[1]

(4) Priority pollutant criteria promulgated by the USEPA through the following:

[1] State Water Board Resolution No. 68-16

(a) National Toxics Rule (NTR)[2] (promulgated on December 22, 1992 and amended on May 4, 1995), and

(b) California Toxics Rule (CTR).[3,4]

b. Discharges from MS4s composed of storm water runoff must not alter natural ocean water quality in an ASBS.

[2] 40 CFR 131.36
[3] 65 Federal Register 31682-31719 (May 18, 2000), adding Section 131.38 to 40 CFR
[4] If a water quality objective and a CTR criterion are in effect for the same priority pollutant, the more stringent of the two applies.

3. Effluent Limitations

a. TECHNOLOGY BASED EFFLUENT LIMITATIONS

Comment [A20]: See discussion in section 3.2.2 of the comment letter.

Pollutants in ~~storm water~~ discharges from MS4s must be reduced to the MEP.[5]

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

This Order establishes water quality based effluent limitations (WQBELs) consistent with the assumptions and requirements of all available TMDL waste load allocations (WLAs) assigned to discharges from the Copermittees' MS4s. Each Copermittee must comply with applicable WQBELs established for the TMDLs in Attachment E to this Order, pursuant to the applicable TMDL compliance schedules.

4. Compliance with Discharge Prohibitions and Receiving Water Limitations

Comment [A21]: See discussion in section 3.2.2 of the comment letter.

Each Copermittee must achieve compliance with Provisions A.1.a~~,~~ through A.1.c and A.2.a of this Order through timely implementation of control measures and other actions as specified in Provisions B and E of this Order, including any modifications. The Water Quality Improvement Plans required under Provision B must be designed and adapted to ultimately achieve compliance with Provisions A.1.a~~,~~ through A.1.c and A.2.a~~.~~, as described in Provision B.2.~~.~~

a. If exceedance(s) of water quality standards persist in receiving waters notwithstanding implementation of this Order, the Copermittees must comply with the following procedures:

(1) For exceedance(s) of a water quality standard in the process of being addressed by the Water Quality Improvement Plan, the Copermittee(s) must implement the Water Quality Improvement Plan as accepted by the San Diego Water Board, and update the Water Quality Improvement Plan, as necessary, pursuant to Provision F.2.c;

(2) Upon a determination by either the Copermittees or the San Diego Water Board that discharges from the MS4 are causing or contributing to a new exceedance of an applicable water quality standard not addressed by the Water Quality Improvement Plan, the Copermittees must submit the following updates to the Water Quality Improvement Plan pursuant to Provision F.2.c or as part of the Annual Report required under Provision F.3.b, unless the San

[5] This does not apply to MS4 discharges which receive subsequent treatment to reduce pollutants in storm water discharges to the MEP prior to entering receiving waters (e.g., low flow diversions to the sanitary sewer). Runoff treatment must occur prior to the discharge of runoff into receiving waters per Finding 7.

Diego Water Board directs an earlier submittal:

(a) The water quality improvement strategies being implemented that are effective and will continue to be implemented,

(b) Water quality improvement strategies (i.e. BMPs, retrofitting projects, stream and/or habitat rehabilitation or restoration projects, adjustments to jurisdictional runoff management programs, etc.) that will be implemented to reduce or eliminate any pollutants or conditions that are causing or contributing to the exceedance of water quality standards,

(c) Updates to the schedule for implementation of the existing and additional water quality improvement strategies, and

(d) Updates to the monitoring and assessment program to track progress toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a of this Order;

(3) The San Diego Water Board may require the incorporation of additional modifications to the Water Quality Improvement Plan required under Provision B. The applicable Copermittees must submit any modifications to the update to the Water Quality Improvement Plan within 90 days of notification that additional modifications are required by the San Diego Water Board, or as otherwise directed;

(4) Within 90 days of the San Diego Water Board determination that the update to the Water Quality Improvement Plan meets the requirements of this Order, the applicable Copermittees must revise the jurisdictional runoff management program documents to incorporate the updated water quality improvement strategies that have been and will be implemented, the implementation schedule, and any additional monitoring required; and

(5) Each Copermittee must implement the updated Water Quality Improvement Plan.

b. The procedure set forth above to achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order do not have to be repeated for continuing or recurring exceedances of the same water quality standard(s) following implementation of scheduled actions unless directed to do otherwise by the San Diego Water Board.

c. Nothing in Provisions A.4.a and A.4.b prevents the San Diego Water Board from enforcing any of provisions B through I of this Order while the applicable Copermittees prepare and implement the above update to the Water Quality Improvement Plan and jurisdictional runoff management programs.

B. WATER QUALITY IMPROVEMENT PLANS

The purpose of this provision is to develop Water Quality Improvement Plans (WQIPs) that guide the Copermittees' jurisdictional runoff management programs towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plans is to ~~protect, preserve, enhance, and restorerestore the~~address the impacts of MS4 discharges so that such discharges do not impair water quality and designated beneficial uses of receiving waters~~. of the state.~~ Therefore, implementation of the WQIPs also provides the basis for complying with Provisions II.A.1, II.A.2, and II.A.3, as described in Provision II.A.4. This goal will be accomplished through an adaptive planning and management process that identifies the highest priority water quality conditions within a watershed and implements strategies through the jurisdictional runoff management programs to achieve improvements in the quality of discharges from the MS4s ~~and~~ to receiving waters. As such, the requirements outlined in Provision E may be modified for consistency with the WQIP priorities for the applicable Watershed Management Area, if appropriate justification is provided approved within the WQIP.

Comment [A22]: See section 3.3 of the comment letter for discussions of the changes requested herein.

Comment [A23]: See discussion in section 3.3.2 of the comment letter.

1. Watershed Management Areas

Comment [A24]: See discussion in section 3.3.2 of the comment letter.

The Copermittees must develop a Water Quality Improvement Plan for each of the Watershed Management Areas in Table B-1. A total of ten Water Quality Improvement Plans must be developed for the San Diego Region.

Development of the Water Quality Improvement Plan for the Santa Margarita River Watershed Management Area shall commence upon notification of coverage of the Riverside County Copermittees under this Order. Until this time, the County of San Diego shall use the water quality priorities in the Santa Margarita River Watershed Urban Runoff Management Plan, developed pursuant to Order No. R9-2007-0001, to guide implementation of Provisions D and E within its jurisdiction

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
San Juan (901.00)	South Orange County	- Aliso Creek - San Juan Creek - San Mateo Creek - Pacific Ocean - Heisler Park ASBS	- City of Aliso Viejo[1] - City of Dana Point[1] - City of Laguna Beach[1] - City of Laguna Hills[1] - City of Laguna Niguel[1] - City of Laguna Woods[1] - City of Lake Forest[1] - City of Mission Viejo[1] - City of Rancho Santa Margarita[1] - City of San Clemente[1] - City of San Juan Capistrano[1] - County of Orange[1] - Orange County Flood Control District[1]

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
Santa Margarita (902.00)	Santa Margarita River	- Murrieta Creek - Temecula Creek - Santa Margarita River - Santa Margarita Lagoon - Pacific Ocean	- City of Murrieta[2] - City of Temecula[2] - City of Wildomar[2] - County of Riverside[2] - County of San Diego[3] - Riverside County Flood Control and Water Conservation District[2]
San Luis Rey (903.00)	San Luis Rey River	- San Luis Rey River - San Luis Rey Estuary - Pacific Ocean	- City of Oceanside - City of Vista - County of San Diego
Carlsbad (904.00)	Carlsbad	- Loma Alta Slough - Buena Vista Lagoon - Agua Hedionda Lagoon - Batiquitos Lagoon - San Elijo Lagoon - Pacific Ocean	- City of Carlsbad - City of Encinitas - City of Escondido - City of Oceanside - City of San Marcos - City of Solana Beach - City of Vista - County of San Diego
San Dieguito (905.00)	San Dieguito River	- San Dieguito River - San Dieguito Lagoon - Pacific Ocean	- City of Del Mar - City of Escondido - City of Poway - City of San Diego - City of Solana Beach - County of San Diego
Penasquitos (906.00)	Penasquitos	- Los Penasquitos Lagoon - Pacific Ocean	- City of Del Mar - City of Poway - City of San Diego - County of San Diego
	Mission Bay	- Mission Bay - Pacific Ocean - San Diego Marine Life Refuge ASBS	- City of San Diego
San Diego (907.00)	San Diego River	- San Diego River - Pacific Ocean	- City of El Cajon - City of La Mesa - City of San Diego - City of Santee - County of San Diego
Pueblo San Diego (908.00) Sweetwater (909.00) Otay (910.00)	San Diego Bay	- Sweetwater River - Otay River - San Diego Bay - Pacific Ocean	- City of Chula Vista - City of Coronado - City of Imperial Beach - City of La Mesa - City of Lemon Grove - City of National City - City of San Diego - County of San Diego - San Diego County Regional Airport Authority - San Diego Unified Port District
Tijuana (911.00)	Tijuana River	- Tijuana River - Tijuana Estuary - Pacific Ocean	- City of Imperial Beach - City of San Diego - County of San Diego

Notes:
1. The Orange County Copermittees will be covered under this Order after expiration of Order No. R9-2009-0002, or earlier if the Orange County Copermittees meet the conditions in Provision F.6.
2. The Riverside County Copermittees will be covered under this Order after expiration of Order No. R9-2010-0016, or earlier if the Riverside County Copermittees meet the conditions in Provision F.6.
3. The County of San Diego is required to implement the requirements of Provision B for its jurisdiction within the Santa

Margarita River Watershed Management Area until the Riverside County Copermittees have been notified of coverage under this Order.

2. Priority Water Quality Conditions

The Copermittees must identify the water quality priorities within each Watershed Management Area that will be addressed by the Water Quality Improvement Plan. Where appropriate, Watershed Management Areas may be separated into subwatersheds to focus water quality prioritization and jurisdictional runoff management program implementation efforts by receiving water.

a. Assessment of Receiving Water Conditions

The Copermittees must consider the following, at a minimum, to identify water quality priorities based on impacts of MS4 discharges on receiving water beneficial uses:

(1) Receiving waters listed as impaired on the CWA Section 303(d) List of Water Quality Limited Segments (303(d) List);

(2) TMDLs adopted and under development by the San Diego Water Board;

(3) Receiving waters recognized as sensitive or highly valued by the Copermittees, including estuaries designated under the National Estuary Program under CWA section 320, wetlands defined by the State or U.S. Fish and Wildlife Service's National Wetlands Inventory as wetlands, and receiving waters identified as ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (Attachment A);

(4) The receiving water limitations of Provision A.2;

(5) Known historical versus current physical, chemical, and biological water quality conditions;

(6) Available, relevant, and appropriately collected and analyzed physical, chemical, and biological receiving water monitoring data, including, but not limited to, data describing:

(a) Chemical constituents,

(b) Water quality parameters (i.e. pH, temperature, conductivity, etc.),

(c) Toxicity Identification Evaluations for both receiving water column and sediment,

(d) Trash impacts,

(e) Bioassessments, and

(f) Physical habitat;

(7) Available evidence of erosional impacts in receiving waters due to accelerated flows (i.e. hydromodification);

(8) Available evidence of adverse impacts to the chemical, physical, and biological integrity of receiving waters; and

(9) The potential improvements in the overall condition of the Watershed Management Area that can be achieved.

b. ASSESSMENT OF IMPACTS FROM MS4 DISCHARGES

The Copermittees must consider the following, at a minimum, to identify the potential impacts to receiving waters that may be caused or contributed to by discharges from the Copermittees' MS4s:

(1) The discharge prohibitions of Provision A.1 and effluent limitations of Provision A.3; and

(2) Available, relevant, and appropriately collected and analyzed storm water and non-storm water monitoring data from the Copermittees' MS4 outfalls;

(3) Locations of each Copermittee's MS4 outfalls that discharge to receiving waters;

(4) Locations of MS4 outfalls that are known to persistently discharge non-storm water to receiving waters likely causing or contributing to impacts on receiving water beneficial uses;

(5) Locations of MS4 outfalls that are known to discharge pollutants in storm water causing or contributing to impacts on receiving water beneficial uses; and

(6) The potential improvements in the quality of discharges from the MS4 that can be achieved.

c. IDENTIFICATION OF PRIORITY WATER QUALITY CONDITIONS

(1) The Copermittees must use the information gathered for Provisions B.2.a and B.2.b to develop a list of priority water quality conditions as pollutants, stressors and/or receiving water conditions that are the highest threat to receiving water quality or that most adversely affect the physical, chemical, and biological integrity of receiving waters. The list must include the following information for each priority water quality condition:

(a) The beneficial use(s) associated with the priority water quality condition;

(b) The geographic extent of the priority water quality condition within the Watershed Management Area, if known;

(c) The temporal extent of the priority water quality condition (e.g., dry weather and/or wet weather);

(d) The Copermittees with MS4s discharges that may cause or contribute to the priority water quality condition; and

(e) An assessment of the adequacy of and data gaps in the monitoring data to characterize the conditions causing or contributing to the priority water quality condition, including a consideration of spatial and temporal variation.

(2) The Copermittees must identify the highest priority water quality conditions to be addressed by the Water Quality Improvement Plan, and provide a rationale for selecting a subset of the water quality conditions identified pursuant to Provision B.2.c.(1) as the highest priorities.

d. IDENTIFICATION OF MS4 SOURCES OF POLLUTANTS AND/OR STRESSORS

The Copermittees must identify and prioritize known and suspected sources of storm water and non-storm water pollutants and/or other stressors within their jurisdiction, associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c. ~~The identification of known and suspected sources of pollutants and/or stressors that cause or contribute to the highest priority water quality conditions as identified for Provision B.2.c must~~ considering the following:

(1) Pollutant generating facilities, areas, and/or activities within the Watershed Management Area, including:

(a) Each Copermittee's inventory of construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas,

(b) Publicly owned parks and/or recreational areas,

(c) Open space areas,

(d) All currently operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste,,, and

(e) Areas not within the Copermittees' jurisdictions (e.g., Phase II MS4s, tribal lands, state lands, federal lands) that are known or suspected to be discharging to the Copermittees' MS4s;

(2) Locations of the Copermittees' MS4s, including the following:

(a) All major MS4 outfalls [per 40CFR 122.26 (b)(5)] that discharge to receiving waters, and

(b) Locations of major structural controls for storm water and non-storm water (e.g., retention basins, detention basins, major infiltration devices, etc.);

(3) Other known and suspected sources of non-storm water or pollutants in storm water discharges to receiving waters within the Watershed Management Area, including the following:

(a) Other MS4 outfalls (e.g., Phase II Municipal and Caltrans),

(b) Other NPDES permitted discharges,

(c) Any other discharges that may be considered point sources (e.g., private outfalls), and

(d) Any other discharges that may be considered non-point sources (e.g., agriculture, wildlife or other natural sources);

(4) Review of available data, including but not limited to:

(a) Findings from the Copermittees' illicit discharge detection and elimination programs,

(b) Findings from the Copermittees' MS4 outfall discharge monitoring,

(c) Findings from the Copermittees' receiving water monitoring,

(d) Findings from the Copermittees' MS4 outfall discharge and receiving water assessments, and

(e) Other available, relevant, and appropriately collected data, information, or studies related to pollutant sources and/or stressors that contribute to the highest priority water quality conditions as identified for Provision B.2.c.

(5) The adequacy of the available data to identify and prioritize sources and/or stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c.

e. NUMERIC GOALS AND SCHEDULES

Comment [A25]: See discussion in section 3.3.2 of the comment letter.

The Copermittees must develop and incorporate action levels, interim and final numeric goals[6] and schedules into the Water Quality Improvement Plan. Numeric goals must be used to support Water Quality Improvement Plan implementation and measure progress towards addressing the highest priority water quality conditions identified under Provision B.2.c. . Action Levels, Numeric goals are not enforceable compliance standards, effluent limitations, or receiving water limitations. When establishing numeric goals and corresponding schedules, the Copermittees must consider the following:

(1) Final numeric goals must be based on measureable criteria or indicators, to be achieved in ~~the receiving waters and/or~~ MS4 discharges for the highest priority water quality conditions which will ~~be capable of demonstrating the achievement of the restoration and/or protection~~ comply with the Receiving Water Limitations (A.2) of this Order; ~~water quality standards in receiving waters;~~

(2) Interim numeric goals must be based on measureable criteria or indicators capable of demonstrating incremental progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges; and

(3) Schedules must be adequate for measuring progress toward achieving the interim and final numeric goals required for Provisions B.2.e.(1) and B.2.e.(2). Schedules must incorporate the following:

(a) Interim dates for achieving the interim numeric goals,

(b) Compliance schedules for any applicable TMDLs in Attachment E to this Order,

(c) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A),

(d) Achievement of the final numeric goals in the receiving waters and/or MS4 discharges for the highest water quality priorities must be as soon as possible, and

[6] Interim and final numeric goals may take a variety of forms such as TMDL established WQBELs, action levels, pollutant concentration, load reductions, number of impaired water bodies delisted from the List of Water Quality Impaired Segments, Index of Biotic Integrity (IBI) scores, or other appropriate metrics. Interim and final numeric goals are not necessarily limited to one criterion or indicator, but may include multiple criteria and/or indicators. Except for TMDL established WQBELs, interim and final numeric goals and corresponding schedules may be revised through the adaptive management process under Provision B.5.

(e) Final dates for achieving the final numeric goals must not initially extend more than 10 years beyond the effective date of this Order, unless a longer period of time is authorized by the San Diego Water Board Executive Officer through an approved WQIP or the schedule includes an applicable TMDL in Attachment E to this Order[7].

Comment [A26]: Clarify that a longer period can be granted through the WQIP process.

[7] Achievement of final numeric goals within 10 years represents progress towards attainment of water quality standards, but is not a requirement to fully attain all applicable water quality standards or all priority receiving water conditions within 10 years.

3. Water Quality Improvement Strategies and Schedules

Comment [A27]: See discussion in section 3.3.2 of the comment letter.

The Copermittees must develop specific water quality improvement strategies to address the highest priority water quality conditions identified within a Watershed Management Area. The water quality improvement strategies must address the highest priority water quality conditions by ensuring the effective prohibition of~~preventing or eliminating~~ non-storm water discharges to and from the MS4, reducing pollutants in ~~storm water~~ discharges from the MS4 to the MEP, as applicable to the priority water quality conditions established per provision B.2. ~~and restoring and/or protecting the water quality standards of receiving waters~~.

a. Water Quality Improvement Strategies

The Copermittees must identify and prioritize water quality improvement strategies based on their likely effectiveness and efficiency, and design the JRMP programs to focus resources on those strategies to~~implement strategies to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, improve the physical, chemical, and biological receiving water conditions, and~~ achieve the interim and final numeric goals in accordance with the schedules required for Provision B.2.e.(3). The following water quality improvement strategies must be included and described in the Water Quality Improvement Plan:

(1) Specific strategies and/or activities that may be implemented by one or more Copermittees within their jurisdictions through the jurisdictional runoff management programs that will address the highest priority water quality conditions within the Watershed Management Area, in accordance with the following requirements:

(a) Strategies and/or activities must, at a minimum, be described for each jurisdictional runoff management program component where strategies to address the highest priority water quality conditions are required under Provision E;

(b) The Water Quality Improvement Plan must describe the circumstances or conditions when and where the strategies or/activities should be or will be implemented, but specific details about how each Copermittee will implement the strategies and/or activities within its jurisdiction are not required; and

(c) Descriptions of strategies and/or activities must include any monitoring, information collection, special studies, and/or data analysis that is necessary to assess the effectiveness of the strategy and/or activity toward addressing the highest priority water quality conditions.

(2) Additional strategies and/or activities that may be implemented within the Watershed Management Area on a jurisdictional, sub-watershed, or watershed scale by one or more Copermittees, not specifically required under

Provision E, which are designed to achieve the interim and final numeric goals identified in Provisions B.2.e.(1) and B.2.e.(2);

b. IMPLEMENTATION SCHEDULES

(1) The Copermittees must develop schedules for implementing the water quality improvement strategies identified under Provision B.3.a to achieve the interim and final numeric goals identified under Provision B.2.e.(1) and B.2.e.(2). Schedules must be developed for both the water quality improvement strategies implemented by each Copermittee within its jurisdiction and for strategies that the Copermittees choose to implement on a collaborative basis.

(2) The Copermittees must incorporate the implementation compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

4. Water Quality Improvement Monitoring and Assessment Program

a. The Copermittees in each Watershed Management Area must develop and incorporate an integrated monitoring and assessment program into the Water Quality Improvement Plan that assesses: 1) the progress toward achieving the numeric goals and schedules, 2) the progress toward addressing the highest priority water quality conditions for each Watershed Management Area, and 3) each Copermittee's overall efforts to implement the Water Quality Improvement Plan.

b. The monitoring and assessment program must incorporate the monitoring and assessment requirements of Provision D, which may allow the Copermittees to modify the program to be consistent with and focus on the highest priority water quality conditions for each Watershed Management Area.

c. For Watershed Management Areas with applicable TMDLs, the monitoring and assessment program must incorporate the specific monitoring and assessment requirements of Attachment E.

d. For Watershed Management Areas with any ASBS, the water quality monitoring and assessment program must incorporate the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

5. Iterative Approach and Adaptive Management Process

Comment [A28]: See discussion in section 3.3.2 of the comment letter.

The Copermittees in each Watershed Management Area must implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management

programs to become more effective toward achieving compliance with Provisions A.1, A.2, and A.3.~~A.1.a, A.1.c and A.2.a~~, and must include the following:

a. RE-EVALUATION OF PRIORITY WATER QUALITY CONDITIONS

The priority receiving water quality conditions, and numeric goals and corresponding schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.2.c and B.2.e, may be re-evaluated by the Copermittees as needed during the term of this Order as part of the Annual Report. Re-evaluation and recommendations for modifications to the priority water quality conditions, and numeric goals and corresponding schedules must be provided in the Regional Monitoring and Assessment Report pursuant to F.3.c~~Report of Waste Discharge~~, and must consider the following:

(1) Achieving the outcome of improved water quality in MS4 discharges and receiving waters through implementation of the water quality improvement strategies identified in the Water Quality Improvement Plan;

(2) Progress toward achieving interim and final numeric goals in receiving waters and/or MS4 discharges for the highest priority water quality conditions in the Watershed Management Area,

(3) Progress toward achieving outcomes according to established schedules;

(4) New information developed when the requirements of Provisions B.2.a-c have been re-evaluated;

(5) New policies or regulations that may affect identified numeric goals;

(6) Spatial and temporal accuracy of monitoring data collected to inform prioritization of water quality conditions and implementation strategies to address the highest priority water quality conditions;

(7) Availability of new information and data from sources other than the jurisdictional runoff management programs within the Watershed Management Area that informs the effectiveness of the actions implemented by the Copermittees;

(8) San Diego Water Board recommendations; and

(9) Recommendations for modifications solicited through a public participation process.

b. ADAPTATION OF STRATEGIES AND SCHEDULES

The water quality improvement strategies and schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.3, must be re-evaluated and adapted as new information becomes available to result in more effective and efficient measures to achieve the numeric goals established pursuant to

Provision B.2.e. Re-evaluation of and modifications to the water quality improvement strategies, if determined to be necessary, must be provided in the applicable Annual Report per F.3.b.(3)., and must consider the following:

(1) Modifications to the priority water quality conditions, and numeric goals and corresponding schedules based on Provision B.5.a;

(2) Measurable or demonstrable reductions of non-storm water discharges to and from each Copermittee's MS4;

(3) Measurable or demonstrable reductions of pollutants in ~~storm water~~ discharges from each Copermittee's MS4 to the MEP;

(4) New information developed when the requirements of Provisions B.2.b and B.2.d have been re-evaluated;

(5) Efficiency in implementing the Water Quality Improvement Plan;

(6) San Diego Water Board recommendations; and

(7) Recommendations for modifications solicited through a public participation process.

c. ADAPTATION OF MONITORING AND ASSESSMENT PROGRAM

The water quality improvement monitoring and assessment program, included in the Water Quality Improvement Plan pursuant to Provisions B.4, must be re-evaluated and adapted when new information becomes available. Re-evaluation and recommendations for modifications to the monitoring and assessment program, pursuant to the requirements of Provision D, may be provided in the Annual Report, but must be provided in the Report of Waste Discharge.

6. Water Quality Improvement Plan Submittal, Updates, and Implementation

a. The Copermittees must submit the Water Quality Improvement Plans in accordance with the requirements of Provision F.1.

b. The Copermittees must submit proposed updates to the Water Quality Improvement Plan for acceptance by the San Diego Water Board Executive Officer in accordance with the requirements of Provision F.2.c.

c. The Copermittees must commence with implementation of the Water Quality Improvement Plans ~~immediately after acceptance by the San Diego Water Board, in accordance with the schedules, or subsequently updated schedules, within the Water Quality Improvement Plan.~~in accordance with Provision F.1.b.(5).

C. ACTION LEVELS

Comment [A29]: See comment letter section 3.4 for a discussion of the redlines shown herein.

The purpose of this provision is for the Copermittees to incorporate numeric non-stormwater action levels (NALs) and stormwater action levels (SALs) in the Water Quality Improvement Plans (Provision B), and numeric non-stormwater action levels (NALs) in the Illicit Discharge Detection and Elimination (IDDE) program (Provision E.2.).

- For the purposes of the WQIPs, ~~T~~the goal of the action levels is to guide ~~Water Quality Improvement Plan~~ the implementation efforts and measure progress towards the protection of the identified high priority water quality conditions and associated designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through monitoring and assessing the quality of the MS4 discharges during the implementation of the Water Quality Improvement Plans.

- For the purposes of the IDDE program, the goal of the non-stormwater action levels is to assist in determining whether a persistent non-stormwater discharge into or from the MS4 contains pollutants at levels that have the potential to negatively affect the identified high priority water quality conditions.

Action levels will be developed and incorporated into the WQIP (Provision B) and the IDDE Program (Provision E). Depending upon the goals/objectives for the use of the action levels and the priority receiving water conditions, the constituents and values at which they are set may differ between watersheds. Copermittees may develop Watershed Management Area specific numeric action levels for non-stormwater and stormwater MS4 discharges using an approach approved by the Regional Board or use the default non-stormwater and stormwater action levels prescribed in C.1 and C.2 below.

The Copermittees will submit the action levels as a part of the WQIP and JRMP submittals. The action levels currently established will serve as the interim action levels until revised action levels are completed and approved. Exceedances of the action levels are not subject to enforcement or non-compliance actions under this Order.

1. Default Non-Storm Water Action Levels[8]

~~The Copermittees must develop and incorporate numeric non-storm water action levels (NALs) into the Water Quality Improvement Plan to: 1) support the development and prioritization of water quality improvement strategies for addressing non-storm water discharges to and from the MS4s, 2) assess the effectiveness of the water quality improvement strategies toward addressing MS4~~

Comment [A30]: As discussed in section 2.4 of the Riverside comment letter.

[8] NALs are not ~~considered by the San Diego Water Board to be~~ enforceable limitations under this Order.

~~non-storm water discharges, required pursuant to Provision D.4.b.(1), and 3) support the detection and elimination of non-storm water and illicit discharges to and from the MS4, required pursuant to Provision E.2.~~[9]

a. The following NALs must be incorporated as applicable to the WMA and the Copermittees' MS4 discharges,~~:~~ if the Copermittees do not establish numeric action levels within the WQIP based on watershed priorities:

(1) Non-Storm Water Discharges from MS4s to Ocean Surf Zone

Table C-1. Non-Storm Water Action Levels for Discharges from MS4s to Ocean Surf Zone

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Total Coliform	MPN/100 ml	1,000	-	10,000/1,000[1]	OP
Fecal Coliform	MPN/100 ml	200[2]	-	400	OP
Enterococci	MPN/100 ml	35	-	104[3]	OP

Abbreviations/Acronyms

AMAL – average monthly action level
MDAL – maximum daily action level
OP – Ocean Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Total coliform density NAL is 1,000 MPN/100 ml when the fecal/total coliform ratio exceeds 0.1.
2. Fecal coliform density NAL is 200 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas."

[9] ~~The Copermittees may utilize NALs or other benchmarks currently established by the Copermittees as interim NALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.~~

(2) Non-Storm Water Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Table C-2. Non-Storm Water Action Levels for Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Turbidity	NTU	75	-	225	OP
pH	Units	Within limit of 6.0 to 9.0 at all times			OP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	35	-	104[3]	BP
Priority Pollutants	ug/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
OP – Ocean Plan water quality objective
NTU – Nephelometric Turbidity Units
ug/L – micrograms per liter
MDAL – maximum daily action level
BP – Basin Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas" and is not applicable to waterbodies that are not designated with the water contact recreation (REC-1) beneficial use.

Table C-3. Non-Storm Water Action Levels for Priority Pollutants

Parameter	Units	Freshwater (CTR)		Saltwater (CTR)	
		MDAL	AMAL	MDAL	AMAL
Cadmium	ug/L	**	**	16	8
Copper	ug/L	*	*	5.8	2.9
Chromium III	ug/L	**	**	-	-
Chromium VI	ug/L	16	8.1	83	41
Lead	ug/L	*	*	14	2.9
Nickel	ug/L	**	**	14	6.8
Silver	ug/L	*	*	2.2	1.1
Zinc	ug/L	*	*	95	47

Abbreviations/Acronyms:
CTR – California Toxic Rule
AMAL – average monthly action level
ug/L – micrograms per liter
MDAL – maximum daily action level

Notes:
* Action levels developed on a case-by-case basis (see below)
** Action levels developed on a case-by-case basis (see below), but calculated criteria are not to exceed Maximum Contaminant Levels (MCLs) under the California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64431

The Cadmium, Copper, Chromium (III), Lead, Nickel, Silver and Zinc NALs for MS4 discharges to freshwater receiving waters will be developed on a case-by-case basis because the freshwater criteria are based on site-specific water quality data (receiving water hardness). For these priority pollutants, refer to ~~the following equations (~~40 CFR 131.38.b.2 for details~~) will be required~~:

~~Cadmium (Total Recoverable) = exp(0.7852[ln(hardness)] - 2.715)~~
~~Chromium III (Total Recoverable) = exp(0.8190[ln(hardness)] + 0.6848)~~
~~Copper (Total Recoverable) = exp(0.8545[ln(hardness)] - 1.702)~~
~~Lead (Total Recoverable) = exp(1.273[ln(hardness)] - 4.705)~~
~~Nickel (Total Recoverable) = exp(.8460[ln(hardness)] + 0.0584)~~
~~Silver (Total Recoverable) = exp(1.72[ln(hardness)] - 6.52)~~
~~Zinc (Total Recoverable) = exp(0.8473[ln(hardness)] + 0.884)~~

Comment [A31]: Consistent with SD Permittee recommendations.

(3) Non-Storm Water Discharges from MS4s to Inland Surface Waters

Table C-4. Non-Storm Water Action Levels for Discharges from MS4s to Inland Surface Waters

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Dissolved Oxygen	mg/L	Not less than 5.0 in WARM waters and not less than 6.0 in COLD waters			BP
Turbidity	NTU	-	20	See MDAL	BP
pH	Units	Within limit of 6.5 to 8.5 at all times			BP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	33	-	61[3]	BP
Total Nitrogen	mg/L	-	1.0	See MDAL	BP
Total Phosphorus	mg/L	-	0.1	See MDAL	BP
MBAS	mg/L	-	0.5	See MDAL	BP
Iron	mg/L	-	0.3	See MDAL	BP
Manganese	mg/L	-	0.05	See MDAL	BP
Priority Pollutants	ug/L	See Table C-3			

Abbreviations/Acronyms:

AMAL – average monthly action level
BP – Basin Plan water quality objective
COLD – cold freshwater habitat beneficial use
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
MDAL – maximum daily action level
WARM – warm freshwater habitat beneficial use
MBAS – Methylene Blue Active Substances
MPN/100 ml – most probable number per 100 milliliters
ug/L – micrograms per liter

Notes:

1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for freshwater "designated beach areas" and is not applicable to waterbodies that are not designated with the water contact recreation (REC-1) beneficial use.

b. NALs must be identified, developed and incorporated in the Water Quality Improvement Plan for any pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in Receiving waters ~~of the state~~ associated with the highest priority water quality conditions related to non-storm water discharges from the MS4s. NALs must be based on:

(1) Applicable water quality standards which may be dependent upon site-specific or receiving water-specific conditions or assumptions to be identified by the Copermittees; or

(2) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. ~~For the NALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary NALs specific to the Watershed Management Area at levels greater than the NALs required by Provisions C.1.a and C.1.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for addressing non-~~

~~storm water discharges to and from the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and from the MS4. The secondary NALs may be developed using an approach acceptable to the San Diego Water Board.~~

d. Dry weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.b may be utilized to develop or revise NALs based on watershed-specific data, subject to San Diego Water Board Executive Officer approval.

2. Default Storm Water Action Levels[10]

The Copermittees must develop and incorporate numeric storm water action levels (SALs) in the Water Quality Improvement Plans to: 1) support the development and prioritization of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s, and 2) assess the effectiveness of the water quality improvement strategies toward reducing pollutants in storm water discharges, required pursuant to Provision D.4.b.(2).[11]

a. The following SALs for discharges of storm water from the MS4 must be incorporated~~:~~ if the Copermittees do not establish stormwater action levels within the WQIP based on watershed priorities::~~:~~

Table C-5. Storm Water Action Levels for Discharges from MS4s to Receiving Waters

Parameter	Units	Action Level
Turbidity	NTU	126
Nitrate & Nitrite (Total)	mg/L	2.6
Phosphorus (Total P)	mg/L	1.46
Cadmium (Total Cd)*	µg/L	3.0
Copper (Total Cu)*	µg/L	127
Lead (Total Pb)*	µg/L	250
Zinc (Total Zn)*	µg/L	976

Abbreviations/Acronyms:
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
ug/L – micrograms per liter

Notes:
* The sampling must include a measure of receiving water hardness at each MS4 outfall. If a total metal concentration exceeds the corresponding metals SAL in Table C-5, that concentration must be compared to the California Toxics Rule criteria and the USEPA 1-hour maximum concentration for the detected level of receiving water hardness associated with that sample. If it is determined that the sample's total metal concentration for that specific metal exceeds that SAL, but does not exceed the applicable USEPA 1-hour maximum concentration criterion for the measured level of hardness, then the sample result will not be considered above the SAL for that measurement.

[10] SALs are not ~~considered by the San Diego Water Board to be~~ enforceable limitations under this Order.
[11] The Copermittees may utilize SALs or other benchmarks currently established by the Copermittees as interim SALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

b. SALs must be identified, developed and incorporated in the Water Quality Improvement Plan for pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in Receiving waters ~~of the state~~ associated with the highest water quality priorities related to storm water discharges from the MS4s. SALs must be based on:

(1) Federal and State water quality guidance and/or water quality standards; and

(2) Site-specific or receiving water-specific conditions; or

(3) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. ~~For the SALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary SALs specific to the Watershed Management Area at levels greater than the SALs required by Provisions C.2.a and C.2.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s. The secondary SALs may be developed based on the approaches recommended by the State Water Board's Storm Water Panel[12] or using an approach acceptable to the San Diego Water Board.~~

d. Wet weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.c may be used to develop or revise SALs based upon watershed-specific data, subject to San Diego Water Board Executive Officer approval.

~~[12] Storm Water Panel Recommendations to the California State Water Resources Control Board: The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities (June 2006)~~

D. MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS

Comment [A32]: See discussion in section 3.5 of the comment letter.

The purpose of this provision is for the Copermittees to monitor and assess the impact on the chemical, physical, and biological conditions of receiving waters caused by discharges from the Copermittees' MS4s under wet weather and dry weather conditions. The goal of the monitoring and assessment program is to inform the Copermittees about the nexus between the health of receiving waters and the water quality condition of the discharges from their MS4s to those receiving waters.~~.~~ This goal will be accomplished through monitoring and assessing the conditions of the receiving waters, discharges from the MS4s to those receiving waters, pollutant sources and/or stressors, and effectiveness of the water quality improvement strategies implemented as part of the Water Quality Improvement Plans.

1. Receiving Water Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the condition of the receiving waters in each Watershed Management Area during dry weather and wet weather. Following acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct long-term receiving water monitoring during implementation of the Water Quality Improvement Plan to assess the long term trends and determine if water quality conditions in receiving waters are improving. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following receiving water monitoring procedures:

a. TRANSITIONAL RECEIVING WATER MONITORING

Beginning October 1st or May 1st (whichever is sooner) following enrollment under this order and until~~Until~~ the monitoring requirements of Provisions D.1.b-e are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following receiving water monitoring in the Watershed Management Area:

(1) Continue the receiving water monitoring programs required in Order Nos. R9-2007-0001~~,~~ (Attachment A, Section II. A. 1-5),~~,~~ R9-2009-0002, and R9-2010-0016;

(2) Continue the monitoring in the Hydromodification Management Plans approved by the San Diego Water Board;

(3) Participate in the following regional receiving water monitoring programs, as applicable to the Watershed Management Area and each Copermittees' MS4 discharges:

Comment [A33]: See discussion in section 3.5.3 of the comment letter.

(a) Storm Water Monitoring Coalition Regional Monitoring,

(b) Southern California Bight Regional Monitoring, and

(c) Sediment Quality Monitoring;

(4) Implement the monitoring programs developed as part of any implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) for the TMDLs in Attachment E to this Order; and

(5) For Watershed Management Areas with ASBS, implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

b. LONG-TERM RECEIVING WATER MONITORING STATIONS

The Copermittees must select at least one long-term receiving water monitoring station from among the existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees to be representative of the receiving water quality in the Watershed Management Area. Additional or alternative long-term receiving water monitoring stations may~~must~~ be selected where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

Comment [A34]: See discussion in section 3.5.3 of the comment letter.

c. DRY WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three dry weather monitoring events at each of the long-term receiving water monitoring stations. At least one monitoring event must be conducted during the dry season (May 1 – September 30) and at least one monitoring event must be conducted during a dry weather period during the wet season (October 1 – April 30), after the first wet weather event of the season, with an antecedent dry period of at least 72 hours following a storm event producing measureable rainfall of greater than 0.1 inch.

(1) Dry Weather Receiving Water Field Observations

For each dry weather monitoring event, the Copermittees must record field observations consistent with Table D-1 at each long-term receiving water monitoring station.

Table D-1. Field Observations for Receiving Water Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) • Assessment of any observed connectivity of MS4 discharges to a flowing receiving water. • Station description (i.e. deposits or stains, vegetation condition, structural condition, and observable biology) • Presence and assessment of trash in and around station

Comment [A35]: See discussion in section 3.5.3 of the comment letter.

(2) Dry Weather Receiving Water Field Monitoring

For each dry weather monitoring event, if conditions allow the collection of the data, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

Table D-2. Field Monitoring Parameters for Receiving Water Monitoring Stations

Parameters
• pH • Temperature • Specific conductivity • Dissolved oxygen • Turbidity

(3) Dry Weather Receiving Water Analytical Monitoring

For each dry weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity,

dissolved oxygen, turbidity, hardness, and indicator bacteria Grab samples may also be collected for the analyses described in (f) where MS4 discharge runoff constitutes less than ten percent of the flow;

Comment [A36]: The receiving water stations in Riverside County either do not receive runoff from MS4 discharges or receive deminimus flows during dry weather conditions. The flow at these stations during dry weather consists virtually entirely of rising groundwater. Background receiving water quality conditions In such cases composite samples of receiving waters not affected by MS4 discharges is not warranted.

(d) For all other constituents where runoff constitutes more than ten percent of the flow, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable NAL constituents, and

(v) Constituents listed in Table D-3.

Table D-3. Analytical Monitoring Constituents for Receiving Water Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Pesticides	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1]	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Mercury • Nickel • Selenium • Thallium • Zinc	• Organophosphate Pesticides • Pyrethroid Pesticides	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

• Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia			

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(4) Dry Weather Receiving Water Toxicity Monitoring

For each dry weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for toxicity in accordance with Table D-4:

Table D-4. Dry Weather Toxicity Testing for Receiving Water Monitoring Stations

Freshwater Organism	Test Approach	USEPA Protocol[2]
Pimephales promelas	1 acute 1 chronic[1]	EPA-821-R-02-012
Hyalella Azteca	1 acute 1 chronic[1]	EPA-821-R-02-012
Psuedokirchneriella subcapitata	1 acute 1 chronic[1]	EPA-821-R-02-013

Notes:
1. Chronic toxicity testing is not required at receiving water monitoring stations located at mass loading stations if the channel flows are diverted year-round during dry weather conditions to the sanitary sewer for treatment.
2. USEPA protocols must be utilized for toxicity testing unless alternate toxicity testing protocols have been approved by the San Diego Water Board.

(5) Dry Weather Receiving Water Bioassessment Monitoring

Bioassessment monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must conduct bioassessment monitoring during at least one dry weather monitoring event at each long-term receiving water monitoring station as follows:

(a) The following bioassessment samples and measurements must be collected:

(i) Macroinvertebrate samples must be collected in accordance with the "Reachwide Benthos (Multihabitat) Procedure" in the most current Surface Water Ambient Monitoring Program (SWAMP) Bioassessment Standard Operating Procedures (SOP), and amendments, as applicable;[13]

(ii) The "Full" suite of physical habitat characterization measurements

[13] Ode, P.R.. 2007. Standard operating procedures for collecting macroinvertebrate samples and associated physical and chemical data for ambient bioassessments in California. California State Water Resources Control Board Surface Water Ambient Monitoring Program (SWAMP) Bioassessment SOP 001. http://www.swrcb.ca.gov/water_issues/programs/swamp/tools.shtml#monitoring

must be collected in accordance with the most current SWAMP Bioassessment SOP, and as summarized in the SWAMP Stream Habitat Characterization Form – Full Version;[14] and

(iii) Freshwater algae samples must be collected in accordance with the SWAMP Standard Operating Procedures for Collecting Algae Samples.[15] Analysis of samples must include algal taxonomic composition (diatoms and soft algae) and algal biomass.

(b) The bioassessment samples, measurements, and appropriate water chemistry data must be used to calculate the following:

(i) An Index of Biological Integrity (IBI) for macroinvertebrates for each monitoring station where bioassessment monitoring was conducted, based on the most current calculation method;[16] and

(ii) An IBI for algae for each monitoring station where bioassessment monitoring was conducted, when a calculation method is developed.[17]

(c) In lieu of the requirements of Provision D.1.c.(5)(a), the Copermittees may conduct the bioassessment monitoring in accordance with the "Triad" assessment approach[18] to calculate the IBIs required for Provision D.1.c.(5)(b). The Copermittees must conduct sampling, analysis, and reporting of specified in-stream biological and habitat data according to the protocols specified in the SCCWRP Technical Report No. 539, or subsequent protocols, if developed.

(6) Dry Weather Receiving Water Hydromodification Monitoring

In addition to the hydromodification monitoring conducted as part of the Copermittees' Hydromodification Management Plans, hydromodification monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must collect the

[14] Available at: http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/reports/fieldforms_fullversion052908.pdf

[15] Fetscher et al. 2009. Standard Operating Procedures for Collecting Stream Algae Samples and Associated Physical Habitat and Chemical Data for Ambient Bioassessments in California.

[16] The most current calculation method at the time the Order was adopted is outlined in "A Quantitative Tool for Assessing the Integrity of Southern California Coastal Streams" (Ode, et al. 2005. Environmental Management. Vol. 35, No. 1, pp. 1-13). If an updated or new calculation method is developed, either both (i.e. current and updated/new) methods must be used, or historical IBIs must be recalculated with the updated or new calculation method.

[17] When a calculation method is developed, IBIs must be calculated for all available and appropriate historical data.

[18] Stormwater Monitoring Coalition Model Monitoring Technical Committee, 2004. Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California. Technical Report #419. August 2004.

following hydromodification monitoring observations and measurements within an appropriate domain of analysis during at least one dry weather monitoring event for each long-term receiving water monitoring station:

(a) Channel conditions, including:

(i) Channel dimensions,

(ii) Hydrologic and geomorphic conditions, and

(iii) Presence and condition of vegetation and habitat;

(b) Location of discharge points;

(c) Habitat integrity;

(d) Photo documentation of existing erosion and habitat impacts, with location (i.e. latitude and longitude coordinates) where photos were taken;

(e) Measurement or estimate of dimensions of any existing channel bed or bank eroded areas, including length, width, and depth of any incisions; and

(f) Known or suspected cause(s) of existing downstream erosion or habitat impact, including flow, soil, slope, and vegetation conditions, as well as upstream land uses and contributing new and existing development.

d. WET WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three wet weather monitoring events at each long-term receiving water monitoring station. At least one wet weather monitoring event must be conducted during the first wet weather event of the wet season (October 1 – April 30), and at least one wet weather monitoring event during a wet weather event that occurs after February 1.

(1) Wet Weather Receiving Water Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each long-term receiving water monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event;

(b) The flow rates and volumes measured or estimated (data from nearby

USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(d) Presence and assessment of trash in and around station.

(2) Wet Weather Receiving Water Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

(3) Wet Weather Receiving Water Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) Constituents listed in Table D-3.

(4) Wet Weather Receiving Water Toxicity Monitoring

For each wet weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for toxicity in accordance with Table D-5:

Table D-5. Wet Weather Toxicity Testing for Receiving Water Monitoring Stations

Freshwater Organism	Test Approach	USEPA Protocol[1]
Pimephales promelas	1 acute	EPA-821-R-02-012
Hyalella Azteca	1 acute	EPA-821-R-02-012
Psuedokirchneriella subcapitata	1 acute	EPA-821-R-02-013

Notes:
1. USEPA protocols must be utilized for toxicity testing unless alternate toxicity testing protocols have been approved by the San Diego Water Board.

e. OTHER RECEIVING WATER MONITORING REQUIREMENTS

(1) Regional Monitoring

The Copermittees must participate in the following regional receiving waters monitoring programs, as applicable to the Watershed Management Area and the Copermittee's MS4 discharges:

(a) Storm Water Monitoring Coalition Regional Monitoring; and

(b) Southern California Bight Regional Monitoring.

(2) Sediment Quality Monitoring

The applicable Copermittees must perform sediment monitoring to assess compliance with sediment quality receiving water limits applicable to MS4

discharges to enclosed bays and estuaries. The monitoring may be performed either by individual or multiple affected Copermittees to assess compliance with receiving water limits, or through participation in a water body monitoring coalition. The Copermittees must identify sediment sampling stations that are spatially representative of the sediment within the water body segment or region of interest. Sediment quality monitoring must be conducted in conformance with the monitoring requirements set forth in the State Water Board Sediment Quality Control Plan.

(3) ASBS Monitoring

For Watershed Management Areas with ASBS, the applicable Copermittees must implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

f. ALTERNATIVE WATERSHED MONITORING REQUIREMENTS

The San Diego Water Board may direct the Copermittees to participate in an effort to develop alternative watershed monitoring with other regulated entities, other interested parties, and the San Diego Water Board to refine, coordinate, and implement regional monitoring and assessment programs to determine the status and trends of water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and/or 3) streams. As directed by the San Diego Water Board, such alternative watershed monitoring would be done in place and stead of the commensurate requirements set forth in Provision D.1.

2. MS4 Outfall Discharge Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the discharges from the major MS4 outfalls to receiving waters in each Watershed Management Area during dry weather and wet weather. Following acceptance of the Water Quality Improvement Plans and schedule for implementation of monitoring for each Watershed Management Area, the Copermittees must conduct MS4 outfall discharge monitoring during implementation of the Water Quality Improvement Plan to assess the effectiveness of their jurisdictional runoff management programs toward effectively prohibiting non-storm water discharges into the MS4 and reducing pollutants in ~~storm water~~ discharges ~~to and~~ from their MS4s to the MEP. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following MS4 outfall monitoring procedures:

Comment [A37]: Suggest same edits for SD and OC.

a. TRANSITIONAL MS4 OUTFALL DISCHARGE MONITORING

Beginning October 1st or May 1st (whichever is sooner) following enrollment under this order and until~~Until~~ the monitoring requirements of Provisions D.2.b-c

are incorporated into a Water Quality Improvement Plan and schedule for implementation of monitoring that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following monitoring of MS4 outfall discharges to flowing receiving waters ~~monitoring~~ in the Watershed Management Area:

(1) MS4 Outfall Discharge Monitoring Station Inventory

Each Municipal Copermittee must identify all major MS4 outfalls (including those operated by a Special District Copermittee) that discharge directly to receiving waters within its jurisdiction and geo-locate those outfalls on a map of the MS4 pursuant to Provision E.2.b.(1). This information must be compiled into a MS4 outfall discharge monitoring station inventory, and must include the following information:

(a) Latitude and longitude of MS4 outfall point of discharge;

(b) Watershed Management Area;

(c) Hydrologic subarea;

(d) Outlet size;

(e) Accessibility (i.e. safety and without disturbance of critical habitat);

(f) Approximate drainage area; and

(g) Classification of whether the MS4 outfall is known to have persistent dry weather flows, transient dry weather flows, no dry weather flows, or unknown dry weather flows.

(2) Transitional Dry Weather MS4 Outfall ~~Discharge~~ Field Screening ~~Monitoring~~

Until the monitoring requirements of Provision D.2.b are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, each Municipal Copermittee must perform the following dry weather MS4 outfall field screening monitoring to identify non-storm water and illicit discharges being discharged from MS4s within its jurisdiction in accordance with Provision E.2.c, to determine which discharges are transient ~~flows~~ and which are persistent discharges to flowing receiving waters~~flows~~, and prioritize the dry weather MS4 discharges that will be investigated and eliminated in accordance with Provision E.2.d. ~~Each Copermittee must conduct the following dry weather MS4 outfall discharge field screening monitoring within its jurisdiction:~~

Comment [A38]: Suggested change of title to better characterize the requirements of this section, compared to that of D.2.b.

Comments in this section are discussed in section 3.5.3 of the comment letter.

Comment [A39]: Duplicative of previous sentence

(a) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Frequency

Each Municipal Copermittee must field screen the accessible MS4 outfalls in its inventory developed pursuant to Provision D.2.a.(1) as follows:

(i) ~~For Copermittees with less than 125 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 80 percent of the outfalls must be visually inspected two times per year during dry weather conditions.~~

(ii) For Municipal Copermittees with ~~125 major MS4 outfalls or more, but~~ less than or equal to 500 MS4 outfalls~~,~~ that discharge to receiving waters within a Watershed Management Area, ~~all~~ at least 80 percent of the accessible outfalls must be visually inspected at least annually during dry weather conditions.

(iii) For Municipal Copermittees with more than 500 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 500 outfalls must be visually inspected at least annually during dry weather conditions. Copermittees with more than 500 major MS4 outfalls within a Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(iv) Municipal Copermittees with more than 500 major MS4 outfalls within its jurisdiction that are located in more than one Watershed Management Area, at least 500 major MS4 outfalls within its inventory must be visually inspected at least annually during dry weather conditions. Copermittees with more than 500 major MS4 outfalls in more than one Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;

[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and

[e] Flow rate.

(v) Inspections of major MS4 outfalls conducted in response to public reports and staff or contractor reports and notifications may count toward the required visual inspections of MS4 outfall discharge monitoring stations.

(b) Transitional Dry Weather MS4 Outfall Discharge Field Screening Visual Observations

(i) An antecedent dry period of at least 72 hours following any storm event producing measurable rainfall greater than 0.1 inch is required prior to conducting field screening visual observations during a field screening monitoring event.

(ii) During the field screening monitoring event, each Municipal Copermittee must record visual observations consistent with Table D-6 at each MS4 outfall discharge monitoring station inspected.

Table D-6. Field Screening Visual Observations for MS4 Outfall Discharge Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) - Flow source(s) suspected or identified from non-storm water source investigation - Flow source(s) eliminated during non-storm water source identification • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) - Known or suspected source(s) of pooled or ponded water • Assessment of any observed MS4 discharge ~~with~~ to a flowing receiving water. • Station description (i.e. deposits or stains, vegetation condition, structural condition, observable biology) • Presence and assessment of trash in and around station • Evidence or signs of illicit connections or illegal dumping

(iii) Each Municipal Copermittee must implement the requirements of Provisions E.2.d.(2)(c)-(e) based on the field observations.

(iv) Each Copermittee must evaluate field observations together with existing information available from prior reports, inspections and monitoring results to determine whether any observed flowing,

pooled, or ponded waters are likely to be transient or persistent flow.[19]

Comment [A40]: See footnote edits

(c) Transitional Dry Weather MS4 Outfall Discharge Field Screening ~~Monitoring~~ Records

Based upon the results of the transitional dry weather MS4 outfall discharge field screening monitoring conducted pursuant to Provisions D.2.a.(2)(a)-(b), each Municipal Copermittee must update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow.

(3) Transitional Wet Weather MS4 Outfall Discharge Monitoring

Comment [A41]: See discussion in section 3.5.3 of the comment letter.

Until the monitoring requirements of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(a) Transitional Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees must select at least five wet weather MS4 outfall discharge monitoring stations from the inventories developed pursuant to Provision D.2.a.(1) that are representative of storm water discharges from areas consisting primarily of residential, commercial, industrial, and typical mixed-use land uses present within the Watershed Management Area.

(b) Transitional Wet Weather MS4 Outfall Discharge Monitoring Frequency

Each wet weather MS4 outfall discharge monitoring station selected pursuant to Provision D.2.a.(3)(a) must be monitored twice during the wet season (October 1 – April 30~~)).~~) in the transitional period. The~~). One~~ wet weather monitoring ~~event~~events shall be selected to be representative of the range of hydrologic conditions experienced in the region. At least 10% of samples~~event~~ must be conducted during the first wet weather event of the wet season, ~~and~~to include~~and one wet weather monitoring event~~ at least one such sample in each Watershed Management Area~~, a month after the first wet weather event of the wet season.~~

[19] Persistent flow, for the purposes of provision II.D.2.b.(2) is defined as the presence of an MS4 discharge that is hydraulically connected to a flowing receiving~~, pooled, or ponded~~ water more than 72 hours after a measureable rainfall event of 0.1 inch or greater, during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

(c) Transitional Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded of the flow from~~at~~ each wet weather MS4 outfall discharge monitoring station:

(i) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(ii) The flow rates and volumes measured or estimated from the outfall (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(iii) ~~Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and~~

(iv) Presence ~~and assessment~~ of trash in and around station.

Comment [A42]: This isn't appropriate for a wet weather event.

Comment [A43]: This isn't appropriate for a wet weather event.

(d) Transitional Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(e) Transitional Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, and indicator bacteria;

(iv) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant

concentrations and runoff flows using one of the following techniques:

[a] Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

[b] Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

[c] If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours;

(v) Only one analysis of the composite of aliquots is required;

(vi) The samples must be analyzed for the following constituents:

[a] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

[b] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and

[c] Constituents listed in in Table D-7.

Table D-7. Analytical Monitoring Constituents for Wet Weather MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Nickel • Selenium • Thallium • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(f) Other Transitional Wet Weather MS4 Outfall Discharge Monitoring

The San Diego County Copermittees must continue the wet weather MS4 outfall monitoring program developed under Order No. R9-2007-0001, as approved by the San Diego Water Board, through its planned completion.

b. DRY WEATHER MS4 OUTFALL DISCHARGE MONITORING

Each Municipal Copermittee must perform the following dry weather MS4 outfall monitoring within its jurisdiction to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. ~~Each Copermittee must conduct the following dry weather MS4 outfall discharge monitoring within its jurisdiction:~~

(1) Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Each Municipal Copermittee must continue to perform the dry weather MS4 outfall discharge field screening monitoring in accordance with the requirements of Provision D.2.a.(2),~~. The~~ however the Municipal Copermittee may adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of persistent ~~flow~~ non-storm water illegal discharges from the MS4 to flowing receiving waters in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan.~~, provided the~~

Comment [A44]: Repetitive of previous sentence

Comment [A45]: See discussion in section 3.5.3 of the comment letter.

~~number of visual inspections performed is equivalent to the number of visual inspections required under Provision D.2.a.(2)(a).~~

Comment [A46]: See comments in comment letter

(2) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring

Each Municipal Copermittee must perform the following non-storm water monitoring of MS4 outfalls that persistently ~~flow MS4 outfall~~ discharge to flowing receiving waters ~~monitoring~~ to determine which persistent non-storm water discharges contain concentrations of pollutants below NALs, and which persistent non-storm water discharges impact receiving water quality during dry weather. ~~Each Copermittee must conduct the following non-storm water persistent flow MS4 outfall discharge monitoring within its jurisdiction:~~

Comment [A47]: Repetitive of previous sentence.

(a) Prioritization of Non-Storm Water Persistent Flow MS4 Outfalls

Based upon the dry weather MS4 outfall discharge field screening monitoring records developed pursuant to Provision D.2.a.(2)(c), each Municipal Copermittee must identify and prioritize the MS4 outfalls within its jurisdiction that have~~with~~ persistent discharges to flowing receiving waters ~~flows~~ based on the highest priority water quality conditions identified in the Water Quality Improvement Plan and any additional criteria developed by the Copermittee, which may include historical data and data from sources other than what the Copermittee collects.

(b) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring Frequency

Comment [A48]: See comment letter section 3.5.3

(i) Based on the prioritization of major MS4 outfalls developed under Provision D.2.b.(2)(a), each Municipal Copermittee must identify, at a minimum, the top 10 percent of the~~10~~ highest priority major MS4 outfalls with non-storm water persistent flows that the Copermittee will monitor within each Watershed Management Area within its jurisdiction, with a minimum of one persistent ~~flow~~discharge outfall, and a maximum of 5 required per WMA. The location of the selected highest priority non-storm water persistent ~~flow~~ discharge MS4 outfall monitoring stations must be identified on the map required pursuant to Provision E.2.b.(1).

(ii) Each of the highest priority non-storm water persistent flow MS4 outfall monitoring stations identified pursuant to Provision D.2.b.(2)(b)(i) must be monitored under dry weather conditions at least ~~semi~~ annually until one of the following occurs:

[a] The non-storm water discharges have been effectively eliminated (i.e. no flowing, pooled, or ponded water) for three consecutive dry weather monitoring events; or

[b] The source(s) of the persistent flows has been identified as a category of non-storm water discharges that does not require an NPDES permit and does not have to be addressed as an illicit discharge because it was not identified as a source of pollutants (i.e. constituents in non-storm water discharge do not exceed NALs), and the persistent flow can be re-prioritized to a lower priority; or

[c] The constituents in the persistent flow non-storm water discharge do not exceed NALs, and the persistent flow can be re-prioritized to a lower priority; or

[d] The source(s) of the persistent flows has been identified as a non-storm water discharge authorized by a separate NPDES permit.

(iii) Where the criteria under Provision D.2.b.(2)(c)(ii) are not met, but the threat to water quality has been reduced by the Copermittee, the highest priority persistent flow MS4 outfall monitoring stations may be reprioritized accordingly for continued dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1).

(iv) Each Municipal Copermittee must document removal or re-prioritization of the highest priority persistent flow MS4 outfall monitoring stations identified under Provision D.2.b.(2)(b) in the Annual Report. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized MS4 major outfall in the Watershed Management Area within its jurisdiction, unless there are no remaining qualifying major MS4 outfalls within the Copermittee's jurisdiction in the Watershed Management Area.

(c) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Observations

During each semi-annual monitoring event, each Municipal Copermittee must record field observations consistent with Table D-6 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(d) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Monitoring

During each ~~semi-annual~~ monitoring event, if conditions allow the collection of the data, each Municipal Copermittee must monitor and record the parameters in Table D-2 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(e) Non-Storm Water Persistent Flow MS4 Outfall Discharge Analytical Monitoring

Comment [A49]: See discussion in section 3.5.3 of the comment letter.

During each semi-annual monitoring event in which measurable flow from the MS4 outfall to a flowing receiving water is present, each Municipal Copermittee must collect and analyze samples from each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) During development of the WQIP, for each WMA, consider the following sources to select constituents for collection of~~Collect~~ grab or composite samples to be analyzed at a qualified analytical laboratory::~~for the following constituents:~~

[a] Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,
[b] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,
[c] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,
[d] Applicable NAL constituents, and
[e] Constituents listed in Table D-8, unless the Copermittee has historical data that can demonstrate or provide justification that the analysis of the constituent is not necessary.

(iv) Copermittees may adjust the analytical list for a given WMA in successive monitoring events to add or eliminate constituents based on data that can demonstrate or provide justification regarding need or lack of need for the analysis of specific constituents.

Table D-8. Analytical Monitoring Constituents for Persistent Flow MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Total Hardness • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen	• Cadmium • Copper • Lead • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

• Ammonia		

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

~~(iv)~~(v) If the Copermittee identifies and eliminates the source of the persistent flow non-storm water discharge, analysis of the sample is not required.

c. WET WEATHER MS4 OUTFALL DISCHARGE MONITORING

The Copermittees must perform wet weather MS4 outfall monitoring to identify sources areas of pollutants in ~~storm water~~ discharges from the MS4s in the Watershed Management Area. The Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(1) Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees may adjust the wet weather MS4 outfall discharge monitoring locations and frequencies in the Watershed Management Area, as needed, to identify sources of pollutants in storm water discharges from MS4s in the Watershed Management Area in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of stations is at least equivalent to the number of stations required under Provision D.2.a.(3)(a).

(2) Wet Weather MS4 Outfall Discharge Monitoring Frequency

The Copermittees must monitor the wet weather MS4 outfall discharge monitoring stations in the Watershed Management Area at an appropriate frequency to identify source areas of pollutants in ~~storm water~~ discharges from the MS4s causing or contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan.

(3) Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or

estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

~~(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and~~

~~(d) Presence and assessment of trash in and around station.~~

Comment [A50]: These are inappropriate for wet weather observations.

(4) Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(5) Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

(iii) If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours.

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and

(iv) Applicable SAL constituents.

3. Special Studies

Comment [A51]: See discussion in section 3.5.3 of the comment letter.

a. Within the term of this Order, the Copermittees must initiate~~develop and implement~~ the following special studies:

(1) At least two~~three~~ special studies in each Watershed Management Area to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that cause or contribute to highest priority water quality conditions identified in the Water Quality Improvement Plan.

(2) At least one~~two~~ special study~~studies~~ for the San Diego Region to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that are impacting receiving waters on a regional basis in the San Diego Region.

(3) One of the two~~three~~ special studies in each Watershed Management Area may be replaced by a special study implemented pursuant to Provision D.3.a.(2).

b. The special studies must, at a minimum, be in conformance with the following criteria:

(1) The special studies must be related to the highest priority water quality conditions identified by the Copermittees in the Watershed Management Area and/or for the entire San Diego Region;

(2) The special studies developed pursuant to Provision D.3.a.(1) must:

(a) Be implemented within the applicable Watershed Management Area, and

(b) Require some form of participation by all the Copermittees within the Watershed Management Area;

(3) The special studies developed pursuant to Provision D.3.a.(2) must:

(a) Be implemented within the San Diego Region, and

(b) Require some form of participation by all Copermittees covered under the requirements of this Order.

c. Special studies developed to identify sources of pollutants and/or stressors should be pollutant and/or stressor specific and based on historical monitoring data and monitoring performed pursuant to Provisions D.1 and D.2. Development of source identification special studies should include the following:

(1) A compilation of known information on the specific pollutant and/or stressor, including data on potential sources and movement of the pollutant and/or stressor within the watershed. Data generated by the Copermittees and others, as well as information available from a literature research on the pollutant and/or stressor should be compiled and analyzed as appropriate.

(2) An identification of data gaps, based on the compiled information generated on the specific pollutant and/or stressor in Provision D.3.d.(1). Source identification special studies should be developed to fill identified data gaps.

(3) A monitoring plan that will collect and provide data the Copermittees can utilize to do the following:

(a) Quantify the relative loading or impact of a pollutant and/or stressor from a particular source or pollutant generating activity;

(b) Improve understanding of the fate of a pollutant and/or stressor in the environment;

(c) Develop an inventory of known and suspected sources of a pollutant and/or stressor in the Watershed Management Area; and/or

(d) Prioritize known and suspected sources of a pollutant and/or stressor based on relative magnitude in discharges, geographical distribution (i.e.,

regional or localized), frequency of occurrence in discharges, human health risk, and controllability.

d. Special studies initiated prior to the term~~acceptance~~ of ~~the~~this Order~~the Water Quality Improvement Plan~~ that meet the requirements of Provision D.3.b and are implemented~~completed~~ during the term of this Order may be utilized to fulfill the special study requirements of Provision D.3.a.

e. The Copermittees must submit the monitoring plans for the special studies in the Water Quality Improvement Plans required pursuant to Provision F.1.

f. The Copermittees are encouraged to share the results of the special studies regionally among the Copermittees to provide information useful in improving and adapting the management of non-storm water and storm water runoff through the implementation of the Water Quality Improvement Plans.

4. Assessment Requirements

Each Copermittee must evaluate the data collected pursuant to Provisions D.1, D.2 and D.3, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E, to assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a. Assessments must be performed as described in the following provisions:

a. RECEIVING WATERS ASSESSMENTS

(1) The Copermittees must assess and report the conditions of the receiving waters in the Watershed Management Area as follows:

(a) Based on data collected pursuant to Provision D.1.a, the assessments under Provision D.4.a.(2) must be included in the transitional~~first~~ Annual Report required pursuant to Provision F.3.b.(2~~1~~).

Comment [A52]: See our edits to that section

(b) Based on the data collected pursuant to Provisions D.1.a-e, the assessments required under Provision D.4.a.(2) must be included in the Report of Waste Discharge required pursuant to Provision F.5.b.

(2) The Copermittees must assess the status and trends of receiving water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under dry weather and wet weather conditions, as those conditions are affected by discharges from the Copermittees' MS4, to determine the progress towards meeting interim or final goals of the Water Quality Implementation Plan for the Watershed Management Area~~.~~ For each of the three types of receiving waters that are present in each Watershed Management Area the applicable Copermittees must:

Comment [A53]: See discussion in section 3.5.3 of the comment letter.

(a) Determine whether or not the conditions of the receiving waters are meeting any applicable numeric goals established pursuant to provision B.2.e.~~protective of the designated beneficial uses~~;

~~(b) Identify the most critical beneficial uses that must be protected or restored to ensure overall health of the receiving water;~~

~~(c) Determine whether or not those critical beneficial uses are being protected and where those beneficial used must be restored;~~

~~(d)~~(b) Identify short-term and/or long-term improvements or degradation of Receiving Water conditions related to those numeric goals~~those critical beneficial uses~~;

~~(e)~~(c) Identify data gaps in the monitoring data necessary to assess Provisions D.4.a.(2)(a)-(d).

b. MS4 OUTFALL DISCHARGES ASSESSMENTS

(1) Non-Storm Water Discharges Reduction Assessments

Comment [A54]: See discussion in section 3.5.3 of the comment letter for key changes. Other changes are described in comments below.

(a) ~~Each Copermittee must assess and report the progress of its illicit discharge detection and elimination program, required to be implemented pursuant to Provision E.2, toward reducing and effectively prohibiting non-storm water and illicit discharges into the MS4 within its jurisdiction as follows:~~

~~(i) Based on data collected pursuant to Provisions D.2.a.(2), the assessments under Provision D.4.b.(1)(b) must be included when complete in the Annual Report required pursuant to Provision F.3.b.(1).~~

~~(ii) Based on the data collected pursuant to Provisions D.2.b, the assessments required under Provision D.4.b.(1)(c) must be included in the first Annual Report required pursuant to Provision F.3.b.(1), and annually thereafter.~~

~~(iii) Based on the data collected pursuant to Provisions D.2.b, the assessment required under Provision D.4.b.(1)(c) must be included in the Report of Waste Discharge required pursuant to F.5.b.~~

Comment [A55]: For clarity and simplicity, these timelines were integrated into the following sections.

(b) Based on the transitional dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.a.(2), each

Municipal Copermittee must assess and report the following, as applicable to discharges from the MS4 (including Special District Copermittee MS4s) to flowing receiving waters within their jurisdiction, in the Annual Report required pursuant to Provision F.3.b.(2):~~:~~

(i) Identify the known and suspected controllable sources (e.g. facilities, areas, land uses, pollutant generating activities) of transient and persistent flow discharges to flowing receiving waters~~flows~~ within the Copermittee's jurisdiction in the Watershed Management Area;

(ii) Identify sources of transient and persistent flow discharges to flowing receiving waters~~flows~~ within the Copermittee's jurisdiction in the Watershed Management Area that have been reduced or eliminated; and

(iii) Identify modifications to the field screening monitoring locations and frequencies for the MS4 outfalls in its inventory necessary to identify and eliminate sources of persistent flow non-storm water discharges to flowing receiving waters, pursuant to Provision D.2.b.(1).

(c) Based on the dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b, each Municipal Copermittee must assess and report the following, as applicable to discharges from the MS4 (including Special District Copermittee MS4s) within their jurisdiction, in each Annual Report required pursuant to F.3.b.(3) and in the Report of Waste Discharge required pursuant to Provision F.5.b.:~~:~~

(i) The assessments required pursuant to Provision D.4.b.(1)(a~~b~~);

(ii) Based on the data collected and applicable NALs in the Water Quality Improvement Plan, rank the MS4 outfalls in the Copermittee's jurisdiction according to potential threat to receiving water quality, and produce a prioritized list of major MS4 outfalls for follow-up action to update the Water Quality Improvement Plan, with the goal of eliminating persistent flow non-storm water discharges to flowing receiving waters and/or pollutant loads in order of the ranked priority list through targeted programmatic actions and source investigations;

(iii) For the highest priority major MS4 outfalls with persistent flow discharges to a flowing receiving water~~flows~~ that are in exceedance of NALs, identify the known and suspected sources within the Copermittee's jurisdiction in the Watershed Management Area that may cause or contribute to the NAL exceedances;

(iv) Each Copermittee must analyze the data collected pursuant to Provision D.2.b.(2), and: ~~utilize a model or other method, to calculate or estimate the non-storm water volumes and pollutant loads collectively discharged from all the major MS4s outfalls in its jurisdiction identified as having persistent dry weather flows during~~

Comment [A56]: Per edits to that section

Comment [A57]: Per edits to that section

Comment [A58]: Per edits above

Comment [A59]: Edits to this section (and sub-sections) is different than SD edits.

~~the monitoring year. These calculations or estimates must be updated annually. Each Copermittee must calculate or estimate:~~

[a] Calculate or estimate annual non-storm water volumes and pollutant loads (associated with the priority constituents identified in the WQIP) collectively discharged from the monitored persistently flowing ~~Copermittee's~~ major MS4 outfalls discharging to flowing receiving waters within the Copermittee's jurisdiction, or discharged into another Copermittee's MS4 as demonstrated through provision E.2.d.~~with an estimate of the percent contribution from each known and suspected source for each MS4 outfall~~;

[b] Identify ~~identify~~ and quantify, where feasible, known sources of non-stormwater flows not ~~[b] Annual non-storm water volumes and pollutant loads from areas or facilities~~ subject to the Copermittee's legal authority that are discharged from the Copermittee's major MS4 outfalls to downstream receiving waters.

Comment [A60]: This is to help ensure jurisdictional accountability for what is being discharged from their jurisdiction.

(v) Each Copermittee must review the data collected pursuant to Provision D.2.b and findings from the assessments required pursuant to Provision D.4.b.(1)(c)(i)-(iv) ~~once per Permit termon an annual basis, and then report~~ within the Regional Monitoring and Assessment Report per Provision F.3.c., the following ~~to~~:

[a] Identify reductions and progress in achieving reductions in non-storm water and illicit discharges to the Copermittee's MS4 in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction, with an estimate, if possible, of the non-storm water volume and/or pollutant load reductions attributable to specific water quality strategies implemented by the Copermittee; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittee in the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction.

(vi) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(v).

(2) Storm Water Pollutant Discharges Reduction Assessments

(a) ~~The Copermittees must assess and report the progress of the water quality improvement strategies, required to be implemented pursuant to~~

~~Provisions B and E, toward reducing pollutants in storm water discharges from the MS4s within the Watershed Management Area as follows:~~

~~(i) Based on data collected pursuant to Provisions D.2.a.(3), the assessments under Provision D.4.b.(2)(b) must be included in the first Annual Report required pursuant to Provision F.3.b.(1).~~

~~Based on the data collected pursuant to Provisions D.2.c, the assessments required under ProvisionProvision first Annual Report required pursuant to Provision F.3.b.(1), and annually thereafter.~~

~~Based on the data collected pursuant to Provisions D.2.c, the assessment required under Provisions D.4.b.(2)(c)-(d) must be included in the Report of Waste Discharge required pursuant to F.5.b.~~

(b) Based on the transitional wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.a.(3) the Copermittees must assess and report the following in the Transitional Period Monitoring Report required pursuant to Provision F.3.b.(2):

(i) The Copermittees must analyze the monitoring data collected pursuant to Provision D.2.a.(3), and utilize a watershed model or other method, to calculate or estimate: ~~storm water volumes and pollutant loads discharged from the MS4s in each Copermittee's jurisdiction within the Watershed Management Area. The Copermittees must calculate or estimate the following for each monitoring year:~~

[a] The average storm water runoff coefficient for each land use type within the Watershed Management Area;

[b] The volume of storm water and pollutant loads discharged from each of the Copermittee's monitored major MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each monitored storm event with measurable rainfall greater than 0.1 inch, for each of the priority water quality constituents identified in the WQIP;

[c] The total volume and pollutant loads potentially discharged from each Municipal Copermittee's jurisdiction within the watershed management area, for each monitored event, extrapolated from the data produced from the monitored outfalls.

~~The pollutant loads discharged from each of the Copermittee's major MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch; and~~

~~[d] The percent contribution of storm water volumes and pollutant loads discharged from each land use type within the drainage basin to each of the Copermittee's major MS4 outfalls in its~~

Comment [A61]: See discussion in section 3.5.3 of the comment letter.

Comment [A62]: Removed as this was confusing as it was duplicative of the subsections below.

Comment [A63]: There is no need to perform this analysis for other pollutants not identified as priorities in the WQIP.

~~jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch.~~

(ii) Identify modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify ~~sources~~ pollutants in storm water discharges from the MS4s in the Watershed Management Area pursuant to Provision D.2.c.(1).

(c) Based on the wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.c the Copermittees must assess and report (i) and (ii) below in the annual reports required per F.3.b.(3), and (i) through (iv) below in the Regional Monitoring and Assessment Report required per F.3.c. ~~the following~~:

(i) The assessments required pursuant to Provision D.4.b.(2)(a~~b~~);

(ii) Based on the data collected and applicable SALs in the Water Quality Improvement Plan, analyze and compare the monitoring data to the analyses and assumptions used to develop the Water Quality Improvement Plans, including strategies developed per Provision B.3, and evaluate whether ~~,rank the MS4 outfalls in the Watershed Management Area according to potential threat to receiving water quality, and produce a prioritized list of major MS4~~ there is a need to update the Water Quality Improvement Plan;

(iii) The Copermittees must review the data collected pursuant to Provision D.2.c and findings from the assessments required pursuant to Provisions D.4.b.(2)(c)(i)-(ii) ~~on an annual basis~~ to:

[a] Identify reductions and progress in achieving reductions in pollutant concentrations and/or pollutant loads from different land uses and/or drainage areas discharging from the Copermittees' MS4s in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing pollutants in ~~storm water~~ discharges from the MS4s to receiving waters within the Watershed Management Area to the MEP, with an estimate, if possible, of the pollutant load reductions attributable to specific water quality strategies implemented by the Copermittees; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittees in the Watershed Management Area toward reducing pollutants in ~~storm water~~ discharges from the MS4s to receiving waters in the Watershed Management Area to the MEP.

(iv) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(iii).

Comment [A64]: See discussion in section 3.5.3 of the comment letter.

Comment [A65]: Per edits to that section

Comment [A66]: Per edits above

(d) Within the Regional Monitoring and Assessment report required pursuant to F.3.c.~~The~~ Copermittees must evaluate all the data collected pursuant to Provision D.2.c, and incorporate new outfall monitoring data into time series plots for each long-term monitoring constituent for the Watershed Management Area, and perform statistical trends analysis on the cumulative long-term wet weather MS4 outfall discharge water quality data set.

c. SPECIAL STUDIES ASSESSMENTS

The Copermittees must in the applicable annual report required pursuant to F.3.b.,~~annually~~ evaluate the results and findings from the special studies developed and implemented pursuant to Provision D.3, and assess their relevance to the Copermittees' efforts to characterize receiving water conditions, understand sources of pollutants and/or stressors, and control and reduce the discharges of pollutants from the MS4 outfalls to receiving waters in the Watershed Management Area. The Copermittees must report the results of the special studies assessments applicable to the Watershed Management Area, and identify any necessary modifications or updates to the Water Quality Improvement Plan based on the results in the Annual Reports required pursuant to Provision F.3.b.

d. INTEGRATED ASSESSMENT OF WATER QUALITY IMPROVEMENT PLAN

As part of the iterative approach and adaptive management process required for the Water Quality Improvement Plan pursuant to Provision B.5, the Copermittees in each Watershed Management Area must integrate the data collected pursuant to Provisions D.1-D.3, the findings from the assessments required pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to assess the effectiveness of, and identify necessary modifications to, the Water Quality Improvement Plan as follows:

(1) The Copermittees must re-evaluate the priority water quality conditions and numeric goals for the Watershed Management Area, as needed, during the term of this Order pursuant to Provision B.5.a. The re-evaluation and recommendations for modifications to the priority water quality conditions, and/or numeric goals and corresponding schedules may be provided in the Annual Reports required pursuant to Provision F.3.b, but must at least be provided in the Regional Monitoring and Assessment Report ~~of Waste Discharge~~ pursuant to Provision F.3.c~~5.b~~. The priority water quality conditions and numeric goals for the Watershed Management Area must be re-evaluated as follows:

(a) Re-evaluate the receiving water conditions in the Watershed Management Area in accordance with Provision B.2.a;

(b) Re-evaluate the impacts on receiving waters in the Watershed Management Area from MS4 discharges in accordance with Provision B.2.b;

(c) Re-evaluate the identification of MS4 sources of pollutants and/or stressors in accordance with Provision B.2.d;

(d) Identify beneficial uses of the receiving waters that are protected or must be restored in accordance with Provision D.4.a;

(e) Evaluate the progress toward achieving the interim and final numeric goals for restoring impacted beneficial uses in the receiving waters.

(2) The Copermittees must re-evaluate the water quality improvement strategies for the Watershed Management Area during the term of this Order pursuant to Provision B.5.b. The re-evaluation and recommendations for modifications to the water quality improvement strategies and schedules may be provided in the Annual Reports required pursuant to Provision F.3.b, but must at least be provided in the Regional Monitoring and Assessment Report pursuant to Provision F.3.c~~must be provided in the Annual Reports required pursuant to Provision F.3.b, and provided in the Report of Waste Discharge pursuant to Provision F.5.b~~. The water quality improvement strategies for the Watershed Management Area must be re-evaluated as follows:

(a) Identify the non-storm water and storm water pollutant loads from the Copermittees' MS4 outfalls in the Watershed Management Area, calculated or estimated pursuant to Provisions D.4.b;

(b) Identify the non-storm water and storm water pollutant load reductions, or other improvements to receiving water or water quality conditions, that are necessary to attain the interim and final numeric goals identified in the WQIP~~for restoring impacted beneficial uses in the receiving waters~~;

(c) Identify any~~the~~ non-storm water and storm water pollutant load reductions, or other improvements to the quality of MS4 discharges, that are necessary for the Copermittees to ~~demonstrate that non-storm water and storm water~~ reduce discharges of pollutants from their MS4s that have been demonstrated to be~~are not~~ causing or contributing to exceedances of receiving water limitations;

Comment [A67]: See discussion in section 3.5.3 of the comment letter.

(d) Evaluate the progress of the water quality improvement strategies toward achieving the interim and final numeric goals identified in the WQIP~~for restoring impacted beneficial uses in the receiving waters~~.

(3) The Copermittees must re-evaluate and adapt the water quality monitoring and assessment program for the Watershed Management Area when new information becomes available to improve the monitoring and assessment

program pursuant to Provision B.5.c. The re-evaluation and recommendations for modifications to the monitoring and assessment program may be provided in the Annual Reports required pursuant to Provision F.3.b, but must at least be provided in the Regional Monitoring and Assessment Report ~~of Waste Discharge~~ pursuant to Provision F.3.c~~5.b~~. Modifications to the water quality monitoring and assessment program must be consistent with the requirements of Provision D.1-D.3. The re-evaluation of the water quality monitoring and assessment program for the Watershed Management Area must consider the data gaps identified by the assessments required pursuant to Provisions D.4.a-b, and results of the special studies implemented pursuant to Provision D.4.c.

5. Monitoring Provisions

Each Copermittee must comply with all the monitoring, reporting, and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

E. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS

The purpose of this provision is for each Copermittee to implement a program to control the contribution of pollutants to and the discharges from the MS4 within its jurisdiction. The goal of the jurisdictional runoff management programs is to implement strategies that effectively prohibit non-storm water discharges to the MS4 and reduce the discharge of pollutants in ~~storm water~~ to the MEP. This goal will be accomplished through implementing the jurisdictional runoff management programs in accordance with the strategies identified in the Water Quality Improvement Plans.

Each Copermittee must update its jurisdictional runoff management program document, in accordance with Provision F.2.a, to incorporate all the requirements of Provision E, consistent with their legal authority. Until the Copermittee has updated its jurisdictional runoff management program document with the applicable requirements of Provision E, the Copermittee must continue implementing its current jurisdictional runoff management program.

Modification of Jurisdictional Runoff Management Program Requirements

Modifications shall be considered and where selected, proposed according to the process in Provision B.5. Proposed modifications may increase, decrease, and/or replace minimum requirements identified in Provision E.

1. Legal Authority Establishment and Enforcement

Comment [A68]: See discussion in section 3.6 of the comment letter.

a. Each Copermittee must establish, maintain, and enforce adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 through statute, ordinance, permit, or series of contracts, ~~order, or similar means~~ which~~. This legal authority must~~, at a minimum, authorize the Copermittee to:

(1) Effectively prohibit through ordinance, order or other similar means~~Prohibit and eliminate all~~ illicit discharges ~~and illicit connections~~ to its MS4;

(2) Control, through ordinance, permit, contract, order or similar means the contribution of pollutants in discharges to the MS4 by storm water discharges ~~of runoff~~ associated with industrial and construction activity~~ to its MS4~~, and ~~control~~ the quality of storm water discharges ~~runoff~~ from sites of industrial and construction activity~~sites~~, whose discharges have not been separately authorized through~~ that do not, including industrial and construction sites which~~ have coverage under the statewide General Permit for Discharges of Storm Water Associated with Industrial Activities (Industrial General Permit) or General Permit for Discharges of Storm Water Associated with Construction Activities (Construction General Permit)~~, as well as to those sites which do not;~~

Comment [A69]: See discussion in section 3.6.2 of the comment letter.

(3) Control, through ordinance, order or similar means the discharge to the MS4 of spills, dumping, or disposal of materials other than storm water~~ into its~~

Comment [A70]: See discussion in section 3.6.2 of the comment letter.

~~MS4~~;

(4) Control through interagency agreements among Copermittees the contribution of pollutants from one portion of the MS4 to another portion of the MS4;

(5) ~~Control, by coordinating and cooperating with other owners of the MS4 such as Caltrans, the U.S. federal government, or sovereign Native American Tribes through interagency agreements, where possible, the contribution of from their portion of the MS4 to the portion of the MS4 within the Copermittee's jurisdiction;~~

(6) Require compliance with conditions in its ~~statutes,~~ ordinances, permits, contracts, or orders~~, or similar means to hold dischargers to its MS4 accountable for their contributions of pollutants and flows~~;

(7) ~~Require the use of BMPs to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;~~

(8) ~~Require documentation on the effectiveness of BMPs implemented to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;~~

(9) ~~Utilize enforcement mechanisms to require compliance with its statutes, ordinances, permits, contracts, orders, or similar means; and~~

(10) Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with permit conditions~~its statutes, ordinances, permits, contracts, orders, or similar means and with the requirements of this Order~~, including the prohibition of illicit discharges and connections to its MS4; ~~the Copermittee must also have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from industrial facilities, including construction sites, discharging into its MS4.~~

b. With the first Annual Report required pursuant to Provision F.3.b, each Copermittee must submit a statement certified by its Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative that the Copermittee has taken the necessary steps to obtain and maintain full legal authority within its jurisdiction to implement and enforce each of the requirements contained in this Order.

2. Illicit Discharge Detection and Elimination

Each Copermittee must implement a program to actively detect and eliminate illicit discharges and improper disposal into the MS4, or otherwise require the discharger

Comment [A71]: See discussion in section 3.6.2 of the comment letter.

Comment [A72]: See discussion in section 3.6.2 of the comment letter.

Comment [A73]: See discussion in section 3.6.2 of the comment letter.

Comment [A74]: See discussion in section 3.6.2 of the comment letter.

Comment [A75]: See discussion in section 3.7 of the comment letter.

to apply for and obtain a separate NPDES permit. The illicit discharge detection and elimination program must be implemented in accordance with the strategies identified in the Water Quality Improvement Plan and include, at a minimum, the following requirements:

STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the illicit discharge detection and elimination program to address ~~non-storm water and~~ illicit discharges and connections that the Copermittee has identified as potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate~~ additional~~ BMPs, focus education, and/or increase/decrease frequency of inspections in specific areas); and

(2) The strategies and/or activities ~~must~~ may be modified from ~~consistent with~~ the default requirements of Provisions E.2.b-e~~a-d~~ ~~and~~ to be consistent with the strategies identified in the Water Quality Improvement Plan;

(3) The requirements of the programs as outlined in the following sub-provisions may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality improvement Plan(s).

a. NON-STORM WATER DISCHARGES

To the extent allowable by law, each~~Each~~ Copermittee must address all non-storm water discharges ~~from~~into the MS4 as illicit discharges, where the likelihood exists that they are a source of pollutants to the Receiving Waters, unless ~~a non-storm water~~the discharge is either identified as a discharge authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that is consistent with~~must be addressed pursuant to~~ the following requirements:

(1) ~~Discharges of non-storm water to the MS4 from the following categories must be addressed as illicit dischargeunless the discharge has coverage under NPDES Permit No. CAG919001 (Order No. R9-2007-0034, or subsequent order) for discharges to San Diego Bay, or NPDES Permit No. CAG919002 (Order No. R9-2008-0002, or subsequent order) for discharges to surface waters other than San Diego Bay.~~

Comment [A76]: See discussion in section 3.7.2 of the comment letter.

~~(a) Uncontaminated pumped ground water;~~

~~(b) Discharges from foundation drains;~~[20]

~~(c) Water from crawl space pumps; and~~

~~(d) Water from footing drains.~~[19]

(2) Discharges of non-storm water from water line flushing and water main breaks to the MS4 must be addressed as illicit discharges unless the discharge has coverage under a valid NPDES Permit, ~~No. CAG 679001~~ (Order No. R9-2010-0003, or a subsequent order). This category includes potable water line flushing ~~and water main break~~ discharges from water purveyors issued a water supply permit by the California Department of Public Health or federal military installations. Discharges from recycled or reclaimed water lines to the MS4 must be addressed as illicit discharges, unless the discharges have coverage under a separate NPDES permit.

Comment [A77]: See discussion in section 3.7.2 of the comment letter.

(3) Discharges of non-storm water into the MS4 from the following categories must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the individual discharge as a source of pollutants to receiving waters:

Comment [A78]: See discussion in section 3.7.2 of the comment letter.

(a) Diverted stream flows;

(b) Rising ground waters;

(c) Uncontaminated ground water infiltration to MS4s;

(d) Uncontaminated pumped ground water;

(e) Springs;

(f) Water from crawl space pumps;

~~(e)~~(g) Flows from riparian habitats and wetlands;

(h) Landscape irrigation;

(i) Irrigation water;

(j) Lawn watering;

Comment [A79]: See Legal Comments discussion.

~~[20] Provision E.2.a.(1) only applies to this category on non-storm water if the system is designed to be located at or below the highest historical groundwater table to actively or passively extract groundwater during any part of the year.~~

~~(d)~~(k) Discharges from potable water sources;

~~(e)~~(l) Discharges from foundation drains;[21] ~~and~~

(m)Discharges from footing drains. .[21]

(4) Discharges of non-storm water into the MS4 from the following categories must be controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means. ~~Discharges of non-storm water to the MS4 from the following categories not controlled by the requirements given below through~~ If such statutes, ordinances, permits, contracts, orders, or similar means have not been enacted by the Copermittee, the applicable categories below must be addressed by the Copermittee as illicit discharges.

(a) Air conditioning condensation

The discharge of air conditioning condensation should~~must~~ be directed to landscaped areas or other pervious surfaces where feasible.

(b) Individual residential vehicle washing

(i) The discharge of wash water ~~must~~ should be directed to landscaped areas or other pervious surfaces where feasible; and

(ii) Minimize the use of water for vehicle washing, use as little washing detergent and other vehicle wash products as possible, wash vehicles at commercial wash facilities, and implement other practices or behaviors that will prevent the discharge of pollutants associated with individual residential vehicle washing from entering the MS4.

(c) Dechlorinated swimming pool discharges

(i) Eliminate residual chlorine, algaecide, filter backwash, or other pollutants from swimming pools prior to discharging to the MS4; and

(ii) The discharge of saline swimming pool water must be directed to the sanitary sewer, landscaped areas, or other pervious surfaces that can accommodate the volume of water, unless the saline swimming pool water can be discharged via a pipe or concrete channel directly to a naturally saline water body (e.g. Pacific Ocean).

(5) Firefighting discharges to the MS4 must be addressed by the Copermittee as

Comment [A80]: See discussion in section 3.7.2 of the comment letter.

Comment [A81]: See discussion in section 3.7.2 of the comment letter.

[21] ~~Provision E.2.a.(3) only applies to this category of non-storm water discharge if the system is designed to be located above the highest historical groundwater table at all times of the year, and the system is only expected to discharge non-storm water under unusual circumstances.~~

follows:illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a significant source of pollutants to receiving waters. Firefighting discharges to the MS4 not identified as a significant source of pollutants to receiving waters, must be addressed, at a minimum, as follows:

(a) Non-emergency firefighting discharges

(i) Building fire suppression system maintenance discharges (e.g.., sprinkler line flushing) to the MS4 must be addressed as illicit discharges unless appropriate BMPs are implemented.

(ii) Non-emergency firefighting discharges (i.e., discharges from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems) must be addressed by a program, to be developed and implemented by the Copermittee in conjunction with the local Fire Authority/District, to reduce or eliminate pollutants in such discharges from entering the MS4.

(b) Emergency firefighting discharges (i.e., flows necessary for the protection of life or property) do not require BMPs and need not be prohibited.

Each Copermittee should develop and encourage implementation of BMPs to reduce or eliminate pollutants in emergency firefighting discharges to the MS4s and receiving waters within its jurisdiction. During emergency situations, priority of efforts should be directed toward life, property, and the environment (in descending order). BMPs should not interfere with immediate emergency response operations or impact public health and safety.

(6) If the Copermittee or San Diego Water Board identifies any category of non-storm water discharges listed under Provisions E.2.a.(1)-(4) as a source of pollutants to receiving waters, the category must be effectively prohibited through ordinance, order, or similar means and addressed as an illicit discharge.

(7) Each Copermittee must, where feasible, reduce or eliminate non-storm water discharges listed under Provisions E.2.a.(1)-(4) into its MS4 whether or not the non-storm water discharge has been identified as an illicit discharge, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit.

Comment [A82]: See discussion in section 3.7.2 of the comment letter.

b. Prevent And Detect Illicit Discharges And Connections

Each Copermittee must include the following measures within its program to prevent and detect illicit discharges to the MS4:

(1) Each Copermittee must maintain an updated map of its entire MS4 and the corresponding drainage areas. The accuracy of the MS4 map must be confirmed during the field screening required pursuant to Provision E.2.c. The MS4 map must be included as part of the jurisdictional runoff management program document. Any geographic information system (GIS) layers or files used by the Copermittee to maintain the MS4 map must be made available to the San Diego Water Board upon request. The MS4 map must identify the following:

(a) All segments of the MS4 owned, operated, and maintained by the Copermittee;

(b) All known locations of inlets that discharge and/or collect runoff into the Copermittee's MS4;

(c) All known locations of connections with other MS4s not owned or operated by the Copermittee (e.g. Caltrans MS4s);

(d) All known locations of major MS4 outfalls as defined by 40 CFR §122.26(b)(5-6) ~~and private outfalls,~~ that discharge runoff collected from areas within the Copermittee's jurisdiction;

Comment [A83]: See discussion in section 3.7.2 of the comment letter.

(e) All segments of receiving waters within the Copermittee's jurisdiction that receive and convey runoff discharged from the Copermittee's MS4 outfalls;

(f) Locations of the MS4 outfalls, identified pursuant to Provision D.2.a.(1), within its jurisdiction; and

(g) Locations of the non-storm water persistent flow MS4 outfall discharge monitoring stations, identified pursuant to Provision D.2.b.(2)(b), within its jurisdiction.

(2) Each Copermittee must use Copermittee personnel and contractors to assist in identifying and reporting illicit discharges and connections during their daily employment activities.

(3) Each Copermittee must promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges to or from the MS4, including the following methods for public reporting:

(a) Operate a public hotline, which can be Copermittee-specific or shared by the Copermittees, and must be capable of receiving reports in both English and Spanish 24 hours per day and seven days per week; and

(b) Designate an e-mail address for receiving electronic reports from the public, which can be Copermittee-specific or shared by the Copermittees, and must be prominently displayed on the Copermittee's webpage and the Regional Clearinghouse required pursuant to Provision F.4.

(4) Each Copermittee must implement practices and procedures (including a notification mechanism) to prevent, respond to, contain, and clean up any spills that may discharge into the MS4 within its jurisdiction from any source. Such practices and procedures may include the coordination with other parties, such as sanitary sewer operators. The Copermittee must coordinate, to the extent possible, with spill response teams to prevent entry of spills into the MS4~~, and prevent contamination of surface water, ground water, and soil.~~ The Copermittee must coordinate spill prevention, containment, and response activities throughout all appropriate internal~~Copermittee~~ departments, programs, and agencies.

Comment [A84]: See discussion in section 3.7.2 of the comment letter.

(5) Each Copermittee must implement practices and procedures to ~~prevent~~ control and limit infiltration of seepage from sanitary sewers owned by a Copermittee agency (including private laterals and failing septic systems) to the MS4.

(6) Each Copermittee shall~~must~~ coordinate, when necessary, with upstream Copermittees and/or entities to prevent illicit discharges from upstream sources into the MS4 within its jurisdiction.

c. FIELD SCREENING

Each Copermittee must conduct field screening (i.e. visual observations, field testing, and/or analytical testing) of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4 in accordance with the dry weather MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

d. INVESTIGATE AND ELIMINATE ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to investigate and eliminate illicit discharges to the MS4 to comply with provision A.1.b:

(1) Each Copermittee must prioritize and determine when follow-up investigations will be performed in response to visual observations and/or water quality monitoring data collected during an investigation of a detected non-storm water ~~or~~ illicit discharge into or from the MS4. The criteria for prioritizing investigations must consider the following:

(a) Pollutants identified as causing or contributing to the highest water quality

priorities identified in the Water Quality Improvement Plan;

(b) Pollutants identified as causing or contributing, or threatening to cause or contribute to impairments in water bodies on the 303(d) List and/or in environmentally sensitive areas (ESAs), located within its jurisdiction;

(c) Pollutants identified from sources or land uses known to exist within the area, drainage basin, or watershed that discharges to the portion of the MS4 within its jurisdiction included in the investigation;

(d) Pollutants identified as causing or contributing to an exceedance of a NAL in the Water Quality Improvement Plan, where the source has not been identified as natural or otherwise permitted; and

(e) Pollutants identified as an immediate and significant threat to human health or the environment.

(2) Each Copermittee must implement procedures to investigate and inspect portions of its MS4 that, based on reports or notifications, field screening, or other appropriate information, indicate a reasonable potential of receiving, containing, or discharging pollutants due to illicit discharges, or illicit connections~~, or other sources of non-storm water~~. The procedures must include the following:

(a) Each Copermittee must develop criteria to:

(i) Assess the validity of each report or notification received; and

(ii) Prioritize the response to each report or notification received.

(b) Each Copermittee must prioritize and respond to each valid report or notification (e.g., public reports, staff or contractor reports and notifications, etc.) of an incident in a timely manner.

(c) ~~Each~~In accordance with the procedures defined in Provision E.2.d.(1), each~~Each~~ Copermittee must investigate and seek to identify the source(s) of discharges of non-storm water illicit discharges or illicit connections ~~where flows are~~ observed into and from the MS4 during the field screening required pursuant to Provision D.2.b.(1) as follows:

(i) Obvious illicit discharges (i.e., unusual color or odor) must be immediately investigated to identify the source(s) of non-storm water illegal discharges;

(ii) The investigation must include field investigations to identify sources or potential sources for the discharge, unless the source or potential source has already been identified during previous investigations; and

(iii) The investigation may include follow-up field investigations and/or reviewing Copermittee inventories and other land use data to identify potential sources of the discharge.

(d) Each Copermittee must maintain records and a database of the following information:

(i) Location of incident, including hydrologic subarea, portion of MS4 receiving the non-storm water ~~or~~ illicit discharge, and point of discharge or potential discharge from MS4 to receiving water;

(ii) Source of information initiating the investigation (e.g., public reports, staff or contractor reports and notifications, field screening, etc.);

(iii) Date the information used to initiate the investigation was received;

(iv) Date the investigation was initiated;

(v) Dates of follow-up investigations;

(vi) Identified or suspected source of the illicit discharge or connection, if determined;

(vii) Known or suspected related incidents, if any;

(viii) Result of the investigation; and

(ix) If a source cannot be identified and the investigation is not continued, a rationale for why a discharge does not pose a threat to water quality and/or does not require additional investigation.

(e) Each Copermittee must ~~track~~ document, and where feasible quantify, any readily~~and seek to~~ identifiable~~y~~ the source(s) of non-storm water illegal discharges from the MS4 where there is evidence of non-storm water ~~having been discharged~~illegal discharges or connections into or from the MS4 (e.g., pooled water), in accordance with MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.

Comment [A85]: See discussion in section 3.7.2 of the comment letter.

(3) Each Copermittee must initiate the implementation of procedures, in a timely manner, to eliminate all detected and identified illicit discharges and connections within its jurisdiction. The procedures must include the following responses:

(a) Each Copermittee must enforce its legal authority, as required under Provision E.1, to eliminate illicit discharges and connections to the MS4.

(b) If the Copermittee identifies the source as a controllable source of non-storm water ~~or~~ illicit discharge or connection, the Copermittee must implement its Enforcement Response Plan pursuant to Provision E.6 and enforce its legal authority to effectively prohibit and with the goal of eliminating~~e~~ illicit discharges and connections to its MS4.

(c) If the Copermittee identifies the source of the discharge as a category of non-storm water discharges in Provision E.2.a, and the discharge is in exceedance of NALs in the Water Quality Improvement Plan, then the Copermittee must determine if: (1) this is an isolated incident or set of circumstances that will be addressed through its Enforcement Response Plan pursuant to Provision E.6, or (2) the category of discharge must be addressed through the effective prohibition of that category of discharge as an illicit discharge pursuant to Provision E.2.a.(6).

(d) If the Copermittee suspects the source of the non-storm water discharge as natural in origin (i.e. non-anthropogenically influenced) and in conveyance into the MS4, then the Copermittee must document and provide the data and evidence necessary to demonstrate to the San Diego Water Board that it is natural in origin and does not require further investigation.

(e) If the Copermittee identifies that the discharge is coming from another Copermittees' jurisdiction, the receiving Copermittee must document and provide the findings to the upstream Copermittee. The obligation to implement the requirements of provision E.2.d.(3) are thenceforth the responsibility of the upstream Copermittee.

(f) If the Copermittee identifies the source as a non-storm water discharge that has been separately authorized by the San Diego Water Board, or that is contributing pollutants to the MS4 and that may require coverage under a WDR from the San Diego Water Board, the Copermittee shall provide all relevant findings to the San Diego Water Board and may back charge the Regional Board for the entire cost of conducting the source investigation.

Comment [A86]: See discussion in section 3.7.2 of the comment letter.

~~(e)~~(g) If the Copermittee is unable to identify and document the source of a recurring non-storm water discharge to or from the MS4, then the Copermittee must ~~address the discharge as an illicit discharge and~~ update its jurisdictional runoff management program to address the common and suspected sources of the non-storm water discharge within its jurisdiction in accordance with the Copermittee's priorities.

(4) Each Copermittee must submit a summary of the non-storm water discharges and illicit discharges and connections investigated and eliminated within its jurisdiction with each Annual Report required under Provision F.3.b of this Order.

3. Development Planning

Comment [A87]: See discussion in section 3.8 of the comment letter.

Each Copermittee must, within their jurisdiction, use their land use and planning

authorities, to the extent that they may lawfully impose requirements, to implement a development planning program in accordance with the strategies identified in the Water Quality Improvement Plan and includes, at a minimum, the following requirements:

STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Comment [A88]: See discussion in section 3.8.2 of the comment letter.

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the development planning program to address development and redevelopment projects that may become sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional or alternative BMPs, focus education, increase frequency of verifications and/or inspections, alternative compliance options);

(2) Each Copermittee must identify areas within its jurisdiction where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting and/or stream, channel, or habitat rehabilitation projects;

(3) Each Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify regional alternative compliance projects that Priority Development Projects may be allowed or should be encouraged to implement or participate in implementing; and

(4) The requirements of the programs as outlined in the following sub-provisions may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality improvement Plan(s).~~The strategies and/or activities must be consistent with the requirements of Provisions E.3.a-c and E.3.e-f and the strategies identified in the Water Quality Improvement Plan.~~

a. BMP REQUIREMENTS FOR ALL DEVELOPMENT PROJECTS

Each Copermittee, as practical and feasible, must prescribe the following BMP requirements during the planning process (i.e. prior to project approval and issuance of local permits) for all development projects (regardless of project type or size), where local permits are issued, including unpaved roads and flood management projects, except emergency / public safety projects implemented for the protection of persons and property:

(1) General Requirements

(a) Onsite BMPs must be located so as to remove pollutants from runoff prior to its discharge to any receiving waters, and as close to the source as possible; and

(b) Structural BMPs must not be constructed within a waters of the U.S.. ~~or waters of the state.~~

(2) Source Control BMP Requirements

The following source control BMPs must be implemented at all development projects where applicable and feasible:

(a) Prevention of illicit discharges into the MS4;

(b) Storm drain system stenciling or signage;

(c) Properly designed outdoor material storage areas;

(d) Properly designed outdoor work areas;

(e) Properly designed trash storage areas; and

(f) Any additional BMPs determined necessary by the Copermittee to minimize pollutant generation at each project.

(3) Low Impact Development (LID) ~~BMP Requirements~~Principles

Comment [A89]: See discussion in section 3.8.2 of the comment letter.

The following LID ~~BMPs~~ Principles must be implemented at all development projects where applicable and feasible:

(a) Maintenance or restoration of natural storage reservoirs and drainage corridors (including topographic depressions, areas of permeable soils, natural swales, and ephemeral and intermittent streams);[22]

(b) Buffer zones for natural water bodies (where buffer zones are technically infeasible, require project applicant to include other buffers such as trees, access restrictions, etc.);

(c) Conservation of natural areas within the project footprint including existing trees, other vegetation, and soils;

[22] Development projects proposing to dredge or fill materials in waters of the U.S. must obtain a CWA Section 401 Water Quality Certification. Projects proposing to dredge or fill waters of the state must obtain waste discharge requirements.

(d) Construction of streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided public safety is not compromised;

(e) Minimization of the impervious footprint of the project;

(f) Minimization of soil compaction to landscaped areas;

(g) Disconnection of impervious surfaces through distributed pervious areas;

(h) Landscaped or other pervious areas designed and constructed to effectively receive and infiltrate, retain and/or treat runoff from impervious areas, prior to discharging to the MS4;

(i) Small collection strategies located at, or as close as possible to, the source (i.e. the point where storm water initially meets the ground) to minimize the transport of runoff and pollutants to the MS4 and receiving waters;

(j) Use of permeable materials for projects with low traffic areas and appropriate soil conditions;

(k) Landscaping with native or drought tolerant species; and

(l) Harvesting and using precipitation.

b. PRIORITY DEVELOPMENT PROJECTS

(1) Definition of Priority Development Project

Priority Development Projects include the following:

(a) All new development projects that fall under the Priority Development Project categories listed under Provision E.3.b.(2) (where a new development project feature, such as a parking lot, falls into a Priority Development Project category, the entire project footprint is subject to Priority Development Project requirements); and

(b) Those redevelopment projects that create, add, or replace at least 5,000 square feet of impervious surfaces on an already developed site, and the redevelopment project is a Priority Development Project category listed under Provision E.3.b.(2) (where redevelopment results in an increase of less than fifty percent of the impervious surfaces of a previously existing development, and the existing development was not subject to Priority Development Project requirements, the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) apply only to the addition or replacement, and not to the entire development; where redevelopment

results in an increase of more than fifty percent of the impervious surfaces of a previously existing development, the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) apply to the entire development).

(c) Projects where redevelopment results in an increase of more than fifty percent of impervious surfaces of a previously existing development, and the existing development *was* subject to previous Priority Project Development Requirements, only the altered portion of development is subject to the new Priority Development Project requirements.

Comment [A90]: See discussion in section 3.8.2 of the comment letter.

(2) Priority Development Project Categories

Comment [A91]: See discussion in section 3.8.2 of the comment letter.

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This category includes commercial, industrial, residential, mixed-use, and public development projects on public or private land which fall under the planning and building authority of the Copermittee.

(b) New development projects that create 5,000 square feet or more of impervious surfaces (collectively over the entire project site), and are designed for support one or more of the following uses (see Appendix for definitions):

(i) Automotive repair shop
(ii) Restaurant
(iii) Parking lot[23]
(iv) Street, road, highway, freeway
(v) Retail gasoline outlet (RGO)

Comment [A92]: See footnote

~~(b) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.~~

~~(c) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812), where the land area for development is 5,000 square feet or more.~~

~~(d) Hillside development projects. This category includes any development which creates 5,000 square feet or more of impervious surface which is~~

[23] Excluding parking lots that are not subject to runoff, such as but not limited to covered or subterranean parking lots

located in an area with known erosive soil conditions, where the development will grade on any natural slope that is twenty-five percent or greater.

(e)(c) New development projects that create 2,500 square feet or more of impervious surfaces (collectively over the entire project site), and are Environmentally sensitive areas (ESAs). This category includes any development located within, directly adjacent to, or discharging directly to an ESA, which either creates 2,500 square feet of impervious surface on a proposed project site or increases the area of imperviousness of a proposed project site to 10 percent or more of its naturally occurring condition. "Directly adjacent to" means situated within 200 feet of the ESA. "Discharging directly to" means outflow from a drainage conveyance system that collects runoff from the subject development or redevelopment site and terminates at or in receiving waters within the ESA and is not commingled with flows from adjacent or other upstream lands.

(f) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce that has 5,000 square feet or more of impervious surface.

(g) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface that is 5,000 square feet or more used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

(h) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

(i)(d) Large development projects. This category includes any post-construction pollutant-generating new development projects that result in the permanent disturbance of one acre or more of land.

(3) Priority Development Project Exemptions

Comment [A93]: See discussion in section 3.8.2 of the comment letter.

Each Copermittee has the discretion to exempt the following projects from being defined as Priority Development Projects:

(a) New paved sidewalks, driveways, parking lots, bicycle lanes, or trails that meet the following criteria:

(i) Designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas; OR

(ii) Designed and constructed to be hydraulically disconnected from paved streets or roads; OR

(iii) Designed and constructed with permeable pavements or surfaces in accordance with USEPA Green Streets guidance.[24]

(b) Any impervious surface that is 5,000 square feet or more used for the transportation of automobiles, trucks, motorcycles, and other vehicles that is designed and constructed to the Maximum Extent Practicable in accordance with the USEPA Green Streets Guidance "Managing Wet Weather with Green Infrastructure: Green Streets"[25]. ~~Retrofitting of existing paved alleys, streets or roads that meet the following criteria:~~

~~(i) Must be two lanes or less; AND~~

~~(ii) Must be a retrofitting project implemented as part of an alternative compliance project option under Provision E.3.c.(3)(b)(v) to achieve the performance requirements of Provisions E.3.c.(1) and/or E.3.c.(2) for a Priority Development Project; AND~~

~~(iii) Designed and constructed in accordance with the USEPA Green Streets guidance.[26]~~

(c) Single-family residential projects that meet the following criteria:

(i) Must not be constructed as part of a larger development or proposed subdivision;

(ii) Successfully incorporate and document that they have incorporated, each of the applicable Source Control and LID BMP strategies identified in provisions E.3.a.(2)-(3) to the MEP.

~~(c) New single family residences that meet the following criteria:~~

~~(i) Must not be constructed as part of a larger development or proposed subdivision; AND~~

~~(ii) Designed and constructed to be certified under the U.S. Green Building Council (USGCB) Leadership in Energy and Environmental Design (LEED) for Homes green building certification program, receiving at least four (4) Surface Water Management credits under the Sustainable Sites category[27] OR~~

~~Designed and constructed with structural BMPs that will achieve the~~

[24] USEPA. 2008. http://water.epa.gov/infrastructure/greeninfrastructure/upload/gi_munichandbook_green_streets.pdf and http://water.epa.gov/infrastructure/greeninfrastructure/gi_policy.cfm#municipalhandbook ~~See "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).~~

~~[26] Ibid.~~

~~[27] See LEED for Homes rating system at http://www.usgbc.org~~

~~performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite~~

~~(d) Redevelopment of existing single family residences that meet the following criteria:~~

~~(i) Designed and constructed to be certified under the USGCB LEED for Homes green building certification program, receiving at least four (4) Surface Water Management credits under the Sustainable Sites category;[28] OR~~

~~(ii) Designed and constructed with structural BMPs that will achieve the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite.~~

(d) Watershed Protection Projects that meet the following criteria:

(i) Projects undertaken to rehabilitate or prevent environmental, social, and economic damage to the watershed, including receiving waters, by providing one or more of the following:

- Water quality protection by the proper management of stormwater and floodplains
- Flood risk reduction to adjacent land uses, stored matter and stockpiled material
- Elimination of the comingling of stormwater and hazardous materials
- Erosion Mitigation
- Restoration of Rivers and Ecosystems
- Groundwater Recharge
- Creation of new open space and wetlands
- Programs for water conservation, stormwater capture and management
- Retrofit projects constructed to improve water quality or address hydromodification.

(ii) AND are not expected to be pollutant generating or are designed to reduce existing pollutant loads

(iii) AND incorporate and document that they have incorporated, each of the applicable Source Control and LID BMP strategies identified in provisions E.3.a.(2)-(3) to the MEP.

(e) Emergency public safety projects in any of the Priority Development Categories may be excluded if the delay caused due to the requirement for a SSMP compromises public safety, public health and/or environmental protection

[28] ~~See LEED for Homes rating system at http://www.usgbc.org~~

c. Priority Development Project Structural BMP Performance Requirements

In addition to the BMP requirements listed for all development projects under Provision E.3.a, Priority Development Projects must also implement structural BMPs that conform to performance requirements below. If watershed-specific performance requirements are ~~may be~~ developed as part of a Water Quality Improvement Plan; these requirements would take precedence over the general performance requirements below. The watershed-specific requirement must provide at least equal protection as the general performance requirements below.

(1) Storm Water Pollutant Control BMP Requirements

Comment [A94]: See discussion in section 3.8.2 of the comment letter.

Each Copermittee must require each Priority Development Project to implement onsite structural BMPs to control pollutants in storm water that may be discharged from a project as follows:

(a) Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite the pollutants contained in the design capture volume. The design capture volume is equivalent to:

(i) The volume of storm water runoff produced from a 24-hour 85th percentile storm event;[29] OR

(ii) The volume of storm water runoff produced from a 24-hour 85th percentile storm event, that would be retained onsite ~~if~~ in the pre-project condition. ~~site was fully undeveloped and naturally vegetated~~, ~~as determined using continuous simulation modeling techniques based on site-specific soil conditions and typical native vegetative cover.~~

(b) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of~~to~~ complying with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1)(a).

~~(c) If a Priority Development project is allowed to utilize alternative compliance pursuant to Provisions E.3.c.(1)(b), flow-thru conventional~~

[29] This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals. The volume is a single event-based volume that occurs after an extended dry period.

~~treatment control BMPs must be implemented to treat the portion of the design capture volume that is not retained onsite. Additionally, project applicants must mitigate for the portion of the pollutant load in the design capture volume that is not retained onsite through one or more alternative compliance options under Provision E.3.c.(3). Conventional treatment control BMPs must be sized and designed to:~~

~~(i) Remove pollutants from storm water to the MEP;~~

~~(ii) Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;~~

~~(iii) Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Conventional treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of conventional treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.~~

(2) Hydromodification Management BMP Requirements

Comment [A95]: See discussion in section 3.8.2 of the comment letter.

Each Copermittee must require each Priority Development Project disturbing greater than one acre to implement management measures~~onsite structural BMPs~~ to ensure ~~manage hydromodification~~ that ~~may be caused by~~ storm water runoff discharged from the~~a~~ project won't cause adverse Hydromodification impacts in the downstream receiving waters as follows:

The Copermittees in each Watershed Management Area may establish within the WQIP, watershed specific mitigation requirements that will apply to priority development projects, based on the susceptibility of the receiving waters to Hydromodification impacts caused by the project, and consistent with the priorities and strategies identified in the WQIP. Such requirements may be uniform across a Hydrologic Unit, or identified at an appropriate smaller scale to ensure that receiving waters are properly protected.

(a) Post-project runoff flow rates and durations must not exceed pre-project ~~development (naturally occurring)~~ runoff flow rates and durations by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat conditions downstream of Priority Development Projects~~)~~.

(i) In evaluating the range of flows that results in increased potential for

erosion of natural (non-hardened) channels, the lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks.

~~(ii) For artificially hardened channels, analysis to identify the lower boundary must use characteristics of a natural stream segment similar to that found in the watershed. The lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or erodes the toe of the channel banks.~~

~~(iii)~~(ii) The Copermittees may use monitoring results collected pursuant to Provision D.1.a.(2) to re-define the range of flows resulting in increased potential for erosion, or degraded instream habitat conditions, as warranted by the data.

(b) Priority Development Projects ~~Post-project runoff flow rates and durations~~ must implement appropriate measures to minimize the ~~compensate~~ for the loss of sediment supply delivered ~~due~~ to the Receiving Waters, consistent with WQIP priorities, ~~development project,~~ should loss of sediment supply be anticipated to occur as a result of the development project.

(c) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of~~to comply with~~ the performance requirements of Provisions E.3.c.(2)(a)-(b).

(d) Exemptions

Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provisions E.3.c.(2)(a)-(b) where the project:

(i) Discharges storm water runoff into existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;

(ii) Discharges of storm water into conveyance channels whose bed and bank are engineered and maintained for the 10-year ultimate development flow rate all the way from the point of discharge from the project to an water body that is sufficiently resistant to hydromodification (water storage reservoirs, lakes, enclosed embayments, pacific ocean, or other water bodies identified in the WQIP);

~~(ii)~~(iii) Is a redevelopment Priority Development Project that meets the alternative compliance requirements of Provision E.3.c.(3)(b)(ii); or

~~(iii)~~(iv) Discharges storm water runoff into other areas identified by the San Diego Water Board as exempt from the requirements of Provisions E.3.c.(2)(a)-(b), through an approved WQIP.

(3) Alternative Compliance to Onsite Structural BMP Performance Requirements

Comment [A96]: See discussion in section 3.8.2 of the comment letter.

(a) Applicability

At the discretion of each Copermittee, Priority Development Projects may be allowed to implement one or more of the alternative compliance project options described in E.3.c.(3)(b) below, in lieu of complying with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2), under the following conditions:

(i) The Copermittee must determine that implementation of the alternative compliance option will have an equal or greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite;

(ii) The alternative compliance options must be designed by a registered professional engineer, geologist, architect, biologist, hydrologist, landscape architect, or other appropriate certified professional;

(iii) The alternative compliance option must be consistent with the strategies developed within the WQIP, for the highest priority water quality conditions.

(iv) The alternative compliance options must be implemented within the same Watershed Management Area as the Priority Development Project, and preferably within the same hydrologic subarea;

(v) The alternative compliance options must have reliable sources of funding for operation and maintenance.

(b) Alternative Compliance Options

(i) *LID Biofiltration Treatment Control BMPs*

LID biofiltration treatment control BMPs may be used as an alternative compliance option if the BMPs are sized and designed to:

[a] Remove pollutants from storm water to the MEP; AND
[b] Have an appropriate surface loading rate to prevent erosion, scour and channeling; AND
[c] Biofilter at least 1.0 times the design capture volume that is not reliably retained onsite

(ii) *LEED Certified Redevelopment Projects*

Priority Development Projects that are designed and constructed to be certified under the USGCB LEED for New Construction and Major Renovations green building certification program, or other locally accepted certification of equivalent effectiveness, may be considered as an acceptable alternative compliance option if the project meets the following criteria:

[a] The project is designed to receive at least: One (1) Site Design credit, and Two (2) Stormwater Design credits under the Sustainable Sites category.[30] , and

[b] The existing and future configuration of the receiving water must not be unnaturally altered or adversely impacted by the project.

(iii) *Watershed-Based Planned Development Projects*

Priority Development Projects greater than 100 acres in total project size (or smaller than 100 acres in size yet part of a larger common plan of development that is over 100 acres) may be considered as an acceptable alternative compliance option if the project meets the following conditions:

[a] The Priority Development Project was planned utilizing watershed and/or subwatershed based water quality, hydrologic, and fluvial geomorphologic planning principles that implement regional LID BMPs in accordance with the performance and location criteria of this Order and acceptable to the San Diego Water Board;

[b] Regional LID BMPs may be used provided that the BMPs capture and retain the volume of runoff produced from the design capture volume defined in Provision E.3.c.(1)(a)(i) and that such controls are located upstream of receiving waters;

[c] Regional LID BMPs must clearly exhibit that they will not result in a net impact from pollutant loadings over and above the impact caused by capture and retention of the design capture volume;

[d] Any portion of the design capture volume that is not retained by the regional LID BMPs must be treated using biofiltration BMPs; and

[e] Where regional LID BMPs are demonstrated to the Copermittee as technically infeasible to retain the entire design capture volume, any volume up to and including the design capture volume not retained by regional LID BMPs, nor treated by biofiltration BMPs, must be treated using conventional treatment control BMPs and the project applicant must implement additional alternative compliance project, in-lieu fee and/or water quality

[30] See LEED for New Construction and Major Renovations rating system at http://www.usgbc.org

credit system options below.

(iv) *Offsite Projects*

Offsite Projects, such as but not limited to Regional BMPs; Retrofitting Projects; Channel, Stream or Habitat Rehabilitation Projects; Water Supply Augmentation Projects; or other Offsite Projects proposed by a project proponent, may be considered as an acceptable alternative compliance option if the offsite project meets the following requirements:

- The project must provide a net result of at least the same level of pollutant removal, and/or protection from potential downstream and upstream erosion in the receiving water as would be required to meet the performance requirements of Provision E.3.c.(1) and E.3.c.(2), as applicable.
- The project must be consistent with the strategies identified in the WQIP.
- The project must be constructed and operational prior to occupancy being granted for the PDP.

(v) *Conventional Treatment Control BMPs*

Onsite Conventional Treatment Control BMPs may be used as an alternative compliance option, only if the following criteria have been met:

[a] It has been demonstrated to the satisfaction of the Copermittee that it is technically infeasible to comply with the onsite requirements of E.3.c.(1), AND

[b] It has been demonstrated to the satisfaction of the Copermittee that it is technically infeasible to implement onsite Biofiltration Treatment Control BMPs, AND

[c] The Conventional Treatment Control BMPs will remove pollutants from storm water to the MEP; AND

[d] The Conventional Treatment Control BMPs will filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two; AND

[e] The Conventional Treatment Control BMPs are ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Conventional treatment control BMPs with a low removal

efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of conventional treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

~~(a) Applicability~~

~~At the discretion of each Copermittee, Priority Development Projects may be allowed to utilize an alternative option to comply with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) under the following conditions:~~

~~(i) The Copermittee must determine that implementation of the alternative compliance option will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite;~~

~~(ii) The alternative compliance options must be designed by a registered professional engineer, geologist, architector landscape architect;~~

~~(iii) The alternative compliance options must be implemented within the same hydrologichydrologic unit as the Priority Development Project, and preferably within the same hydrologic subarea;~~

~~(iv) Receiving waters must not be utilized to convey storm water runoff to the alternative compliance options;~~

~~(v) The pollutants in storm water runoff from the Priority Development Project must be treated to the MEP by the alternative compliance options prior to being discharged to receiving waters;~~

~~(vi) Unless otherwise allowed by Provision E.3.c.(3)(b), the alternative compliance options must have a net result of at least the same level of pollutant removal as would have been achieved if the Priority Development Project had fully complied with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1) onsite;~~

~~(vii) Unless otherwise allowed by Provision E.3.c.(3)(b), the alternative compliance options must have a net result of at least the same level of protection from potential downstream and upstream erosion in the receiving water as would have been achieved if the Priority Development Project had fully complied with the hydromodification management BMP performance requirements of Provision E.3.c.(2) onsite; and~~

~~(viii) The alternative compliance options utilized by the Priority Development Project must have reliable sources of funding for operation and maintenance.~~

~~(b) Alternative Compliance Project Options~~

~~The Copermittee may allow implementation of one or more of the following project options as part of an alternative approach to complying with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2):~~

~~(i) *Onsite LID Biofiltration Treatment Control BMPs*~~

~~The Copermittee may allow Priority Development Projects to utilize onsite LID biofiltration treatment control BMPs to comply with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1). Onsite LID biofiltration treatment control BMPs must be sized and designed to:~~

~~[a] Remove pollutants from storm water to the MEP; AND~~
~~[b] Have an appropriate surface loading rate to prevent erosion, scour and channeling within the BMP; AND~~
~~[c] Biofilter at least 1.5 times the design capture volume that is not reliably retained onsite; OR~~
~~[d] Biofilter up to the design capture volume that is not reliably retained onsite, AND 1) treat the remaining portion of the design capture volume not retained onsite with conventional treatment control BMPs in accordance with Provision E.3.c.(1)(c), and 2) if necessary, mitigate for the portion of the pollutant load in the design capture volume not retained onsite through one or more alternative compliance project, in-lieu fee and/or water quality credit system options below.~~

~~(ii) *LEED Certified Redevelopment Projects*~~

~~The Copermittee may allow redevelopment Priority Development Projects to comply with designed and constructed to be certified under the USGCB LEED for New Construction and Major Renovations green building certification program. The Priority Development Project must receive at least one (1) Site Design credit and two (2) Stormwater Design credits under the Sustainable Sites category.[31] In addition, the existing and future configuration of the receiving water must not be unnaturally altered or adversely impacted by storm water flow rates and durations discharged from the site.~~

~~(iii) *Watershed Based Planned Development Projects*~~

~~The Copermittee may allow Priority Development Projects greater than 100 acres in total project size (or smaller than 100 acres in size~~

~~[31] See LEED for New Construction and Major Renovations rating system at http://www.usgbc.org~~

~~yet part of a larger common plan of development that is over 100 acres) to comply with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2). The Priority Development Project must comply with the following conditions:~~

~~[a] The Priority Development Project was planned utilizing watershed and/or subwatershed based water quality, hydrologic, and fluvial geomorphologic planning principles that implement regional LID BMPs in accordance with the performance and location criteria of this Order and acceptable to the San Diego Water Board;~~

~~[b] Regional LID BMPs may be used provided that the BMPs capture and retain the volume of runoff produced from the design capture volume defined in Provision E.3.c.(1)(a)(i) and that such controls are located upstream of receiving waters;~~

~~[c] Regional LID BMPs must clearly exhibit that they will not result in a net impact from pollutant loadings over and above the impact caused by capture and retention of the design capture volume;~~

~~[d] Any portion of the design capture volume that is not retained by the regional LID BMPs must be treated using biofiltration BMPs; and~~

~~[e] Where regional LID BMPs are demonstrated to the Copermittee as technically infeasible to retain the entire design capture volume, any volume up to and including the design capture volume not retained by regional LID BMPs, nor treated by biofiltration BMPs, must be treated using conventional treatment control BMPs and the project applicant must implement additional alternative compliance project, in-lieu fee and/or water quality credit system options below.~~

~~(iv) *Offsite Regional BMPs*~~

~~[a] The Copermittee may allow Priority Development Projects to utilize offsite regional BMPs to comply with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1) if the offsite regional BMPs have the capacity to receive and retain at least 1.1 times the design capture volume that is not reliably retained onsite.~~

~~[b] The Copermittee may allow Priority Development Projects to utilize offsite regional BMPs to comply with the hydromodification management BMP performance requirements of Provision E.3.c.(2) if the offsite regional BMPs have the capacity to manage the storm water flows rates and durations from the site such that the receiving waters are protected from the potential for increased erosion that would be caused if the unmanaged portion of the runoff was discharged from the site.~~

~~(v) *Offsite Retrofitting Projects*~~

~~The Copermittee may allow Priority Development Projects to utilize offsite retrofitting projects to comply with the storm water pollutant control and hydromodification management BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) if the retrofitting projects have been identified within the strategies included in the Water Quality Improvement Plan, or identified as potential retrofitting projects by the Copermittee pursuant to Provision E.5.~~

~~(vi) *Offsite Channel, Stream, or Habitat Rehabilitation Projects*~~

~~The Copermittee may allow Priority Development Projects to utilize offsite channel, stream, or habitat rehabilitation projects to comply with the hydromodification management BMP performance requirements of Provision E.3.c.(2) if the rehabilitation projects have been identified within the strategies included in the Water Quality Improvement Plan, or identified as potential channel rehabilitation projects by the Copermittee pursuant to Provision E.5. The channel, stream, or habitat rehabilitation project cannot be utilized for pollutant treatmentexcept where artificial wetlands areand located upstream of receiving waters.~~

~~(vii) *Offsite Regional Water Supply Augmentation Projects*~~

~~The Copermittee may allow Priority Development Projects to utilize offsite regional water supply augmentation projects (i.e. groundwater recharge, recycled water, storm water harvesting) to comply with the storm water pollutant control and hydromodification management BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) if the projects have been identified within the strategies included in the Water Quality Improvement Plan.~~

~~(viii) *Project Applicant Proposed Alternative Compliance Projects*~~

~~The Copermittee may allow one or more Priority Development Project applicant(s) to propose and implement alternative compliance projects to comply with the storm water pollutant control and hydromodification management BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) if the alternative compliance projects are consistent with, and will address the highest water quality priorities of the Water Quality Improvement Plan, and comply with the requirements of Provision E.3.c.(3)(a).~~

(c) Alternative Compliance In-Lieu Fee Option

The Copermittee may develop and implement an alternative compliance in-lieu fee option, individually or with other Copermittees and/or entities, as a means for designing, developing, constructing, operating and/or maintaining offsite alternative compliance projects under Provision E.3.c.(3)(b). Priority Development Projects allowed to utilize the

alternative compliance in-lieu fee option must comply with the following conditions:

(i) The in-lieu fee must be collected and held in accordance with the Mitigation Fee Act and all other applicable development fee laws. ~~transferred to the Copermittee (for public projects) or an escrow account (for private projects) prior to the date construction of the Priority Development Project is initiated~~.

Comment [A97]: Please see Legal Comments.

(ii) If the in-lieu fee is applied to the development, design, ~~and~~ construction, operation and maintenance of offsite alternative compliance projects, the following conditions must be met:

[a] The offsite alternative compliance projects must meet ~~allow~~ the criteria identified within E.3.c.(3)(b)-, for each Priority Development Project relying on~~to comply with~~ the alternative compliance project;~~onsite BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2);~~

[b] The offsite alternative compliance projects must be constructed as soon as possible, but no later than 4 years after the certificate of occupancy is granted for the first Priority Development Project that contributed funds toward the construction of the offsite alternative compliance projects, unless a longer period of time is provided for in an approved WQIP~~authorized by the San Diego Water Board Executive Officer~~;

~~[c] The in-lieu fee for the Priority Development Project must include mitigation of the pollutant loads and increased storm water flow rates and durations that are allowed to discharge from the site before the offsite alternative compliance projects are constructed; and~~

[d] The in-lieu fee must also include the cost to operate and maintain the offsite alternative compliance projects for the anticipated life of the constructed priority development project.

(iii) If the in-lieu fee applies only~~is applied~~ to the operation and maintenance of offsite alternative compliance projects that have already been constructed, the offsite alternative compliance projects must meet~~allow~~ the requirements of E.3.c.(3)(a)(iv) and (v) as applicable, for each Priority Development Project relying on~~to comply with~~ the alternative compliance project..~~onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2).~~

(d) Alternative Compliance Water Quality Credit System Option

The Copermittee may develop and implement an alternative compliance water quality credit system option, individually or with other Copermittees

and/or entities, provided that such a credit system clearly exhibits that it will not allow discharges from Priority Development Projects to cause or contribute to a net impact over and above the impact caused by projects meeting the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2). Any credit system that a Copermittee chooses to implement must be submitted to the San Diego Water Board Executive Officer for review and acceptance as part of the Water Quality Improvement Plan.

(4) Long-Term Structural BMP Maintenance

Each Copermittee must require the project applicant to submit proof of the mechanism under which ongoing long-term maintenance of all structural BMPs will be conducted.

(5) Infiltration and Groundwater Protection

(a) Structural BMPs designed to primarily function as large, centralized infiltration devices (such as large infiltration trenches and infiltration basins) must not cause or contribute to an exceedance of an applicable groundwater quality objective. At a minimum, such infiltration BMPs must be in conformance with the design criteria listed below, unless the development project applicant demonstrates to the Copermittee that one or more of the specific design criteria listed below are not necessary to protect groundwater quality. The design criteria listed below do not apply to small infiltration systems dispersed throughout a development project.

(i) Runoff must undergo pretreatment such as sedimentation or filtration prior to infiltration;

(ii) Pollution prevention and source control BMPs must be implemented at a level appropriate to protect groundwater quality at sites where infiltration BMPs are to be used;

(iii) Infiltration BMPs must be adequately maintained to remove pollutants in storm water to the MEP;

(iv) The vertical distance from the base of any infiltration BMP to the seasonal high groundwater mark must be at least 10 feet. Where groundwater basins do not support beneficial uses, this vertical distance criteria may be reduced, provided groundwater quality is maintained;

(v) The soil through which infiltration is to occur must have physical and chemical characteristics (e.g., appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses;

(vi) Infiltration BMPs must not be used for areas of industrial or light

industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee, unless first treated or filtered to remove pollutants prior to infiltration; and

(vii) Infiltration BMPs must be located a minimum of 100 feet horizontally from any water supply wells.

(b) The Copermittee may develop, individually or with other Copermittees, alternative mandatory design criteria to that listed above for infiltration BMPs which are designed to primarily function as centralized infiltration devices. Before implementing the alternative design criteria in the development planning process the Copermitee(s) must:

(i) Notify the San Diego Water Board of the intent to implement the alternative design criteria submitted; and

(ii) Comply with any conditions set by the San Diego Water Board.

d. BMP DESIGN MANUAL UPDATE

Each Copermittee must update and implement its BMP Design Manual[32] pursuant to Provision F.2.b. ~~Until the Copermittee has updated its BMP Design Manual with the requirements of Provisions E.3.a-c, the Copermittee must continue implementing its current BMP Design Manual. Unless directed otherwise by the San Diego Water Board, the Copermittee must implement the BMP Design Manual within 180 days of completing the update.~~ The update of the BMP Design Manual must include the following:

Comment [A98]: This info was incorporated into F.2.b.

(1) Updated procedures to determine the nature and extent of storm water requirements applicable to a potential development or redevelopment projects. These procedures must inform project applicants of the storm water management requirements applicable to their project including, but not limited to, general requirements for all development projects, structural BMP design procedures and requirements, hydromodification management requirements, requirements specific to phased projects, and procedures specific to private developments and public improvement projects;

(2) Updated procedures to identify ~~pollutants and conditions of concern for selecting~~ the most appropriate structural BMPs that consider, at a minimum, the following:

(a) The requirements of E.3.c.(1) and (2)

~~(a)~~(b) Receiving water quality (including pollutants for which receiving waters are listed as impaired under the CWA section 303(d) List);

[32] The BMP Design Manual was formerly known as the Standard Storm Water Mitigation Plan under Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016.

~~(b)~~(c) Pollutants, stressors, and/or receiving water conditions that cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

~~(c)~~(d) Land use type of the project and pollutants associated with that land use type; and

~~(d)~~(e) Pollutants expected to be present onsite.

(3) Updated procedures for designing structural BMPs, including any updated performance requirements to be consistent with the requirements of Provision E.3.c for all structural BMPs listed in the BMP Design Manual;

(4) Long-term maintenance criteria for each structural BMP listed in the BMP Design Manual; and

(5) Alternative compliance criteria, in accordance with the requirements under Provision E.3.c.(3), if the Copermittee elects to allow Priority Development Projects within its jurisdiction to utilize alternative compliance.

e. PRIORITY DEVELOPMENT PROJECT BMP IMPLEMENTATION AND OVERSIGHT

Each Copermittee must implement a program that requires and confirms structural BMPs on all Priority Development Projects are designed, constructed, and maintained to remove pollutants in storm water to the MEP.

(1) Structural BMP Approval and Verification Process

(a) Each Copermittee must require and confirm that for all Priority Development Project applications that have not received prior lawful approval by the Copermittee by 18 months after the commencement of coverage under this Order, the requirements of Provision E.3 are implemented. For project applications that have received prior lawful approval by 18 months after the commencement of coverage under this Order, the Copermittee may allow previous land development requirements to apply.

(b) Each Copermittee must identify the roles and responsibilities of their various municipal departments in implementing the structural BMP requirements, including each stage of a project from application review and approval through BMP maintenance and inspections.

(c) Each Copermittee must require and confirm that appropriate easements and ownerships are properly recorded in public records and the information is conveyed to all appropriate parties when there is a change in project or site ownership.

(d) Each Copermittee must require and confirm that prior to occupancy and/or intended use of any portion of the Priority Development Project, each structural BMP is inspected to verify that it has been constructed and is operating in compliance with all of its specifications, plans, permits, ordinances, and the requirements of this Order.

(2) Priority Development Project Inventory and Prioritization

(a) Each Copermittee must develop, maintain, and update ~~at~~regularly~~at least annually~~, a watershed-based database to track and inventory all constructed Priority Development Projects and associated structural BMPs within its jurisdiction. Inventories must be accurate and complete beginning from January 2002 for the San Diego County Copermittees, February 2003 for the Orange County Copermittees, and July 2005 for the Riverside County Copermittees~~.~~, where data is available.~~.~~ The use of an automated database system, such as GIS, is highly recommended. The database must include, at a minimum, the following information:

(i) Priority Development Project location (address and hydrologic subarea);

(ii) Descriptions of structural BMP type(s);

(iii) Date(s) of construction;

(iv) Party responsible for structural BMP maintenance;

(v) Dates and findings of structural BMP maintenance verifications; and

(vi) Corrective actions and/or resolutions when applicable.

(b) Each Copermittee must prioritize the Priority Development Projects with structural BMPs within its jurisdiction. The designation of Priority Development Projects as high priority must consider the following:

(i) The highest water quality priorities identified in the Water Quality Improvement Plan;

(ii) Receiving water quality;

(iii) Number and sizes of structural BMPs;

(iv) Recommended maintenance frequency of structural BMPs;

(v) Likelihood of operation and maintenance issues of structural BMPs;

(vi) Land use and expected pollutants generated; and

(vii) Compliance record.

(3) Structural BMP Maintenance Verifications and Inspections

Each Copermittee is required to verify that structural BMPs on each Priority

Development Project are adequately maintained, and continue to operate effectively to remove pollutants in storm water to the MEP through inspections, self-certifications, surveys, or other equally effective approaches.

(a) All (100 percent) of the structural BMPs at Priority Development Projects that are designated as high priority must be inspected directly by the Copermittee annually prior to each rainy season;

(b) For verifications performed through a means other than direct Copermittee inspection, adequate documentation must be required by the Copermittee to provide assurance that the required maintenance of structural BMPs at each Priority Development Project has been completed; and

(c) Appropriate follow-up measures (including re-inspections, enforcement, etc.) must be conducted to ensure that structural BMPs at each Priority Development Project continue to reduce pollutants in storm water to the MEP as originally designed.

f. DEVELOPMENT PROJECT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all development projects, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

g. ~~STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS~~

Comment [A99]: This section was moved to the beginning of provision E.3.

~~Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the development planning program to address development and redevelopment projects that may become sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:~~

~~(5) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, increase frequency of verifications and/or inspections, alternative compliance options);~~

~~(6) Each Copermittee must identify areas within its jurisdiction where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting and/or stream, channel, or habitat rehabilitation projects;~~

~~(7) Each Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify regional alternative compliance projects that Priority Development Projects may be allowed or should be encouraged to implement or participate in implementing; and~~

~~(8) The strategies and/or activities must be consistent with the requirements of Provisions E.3.a-c and E.3.e-f and the strategies identified in the Water Quality Improvement Plan.~~

4. Construction Management

Each Copermittee must implement a construction management program in accordance with the strategies identified in the Water Quality Improvement Plan and includes, at a minimum, the following requirements:

STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Comment [A100]: This section was moved from provision E.4.f, Changes are shown in Redline

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the construction management program to address construction sites that the Copermittee has identified as potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, and/or increase/decrease frequency of inspections for specific types of sites and/or activities); and

(2) The strategies and/or activities must be consistent with the requirements of Provisions E.4.c-e and the strategies identified in the Water Quality Improvement Plan.

(3) The requirements of the programs as outlined in the following sub-provisions may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality improvement Plan(s).

a. PROJECT APPROVAL PROCESS

Prior to issuance of any local permit(s) that allows the commencement of construction projects that involve ground disturbance or soil disturbing activities that has the reasonable potential to discharge a pollutant load to and from the MS4, as defined in each Copermittees' JRMP~~can potentially generate pollutants in storm water runoff~~, each Copermittee must:

(1) Require a ~~site-specific~~ Pollution Control Plan~~pollution control~~, construction BMP, and/or erosion and sediment control plan, to be submitted by the project applicant to the Copermittee;

(2) Confirm the Pollution Control Plan~~pollution control~~, construction BMP, and/or erosion and sediment control plan, complies with the local grading ordinance, other applicable local ordinances, and the requirements of this Order;

(3) Confirm the Pollution Control Plan~~pollution control~~, construction BMP, and/or erosion and sediment control plan, includes seasonally appropriate and effective BMPs and management measures described in Provision E.4.c, as applicable to the project; and

(4) Verify that the project applicant has obtained coverage under ~~applicable permits, including, but not limited to~~ the Construction General Permit~~, Clean Water Act Section 401 Water Quality Certification and Section 404 Permit, and California Department of Fish and Game Streambed Alteration Agreement~~.

b. CONSTRUCTION SITE INVENTORY AND TRACKING

(1) Each Copermittee must maintain, and update ~~at least monthly~~regularly, a watershed-based inventory of all construction projects issued a local permit that allows ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff. The use of an automated database system, such as GIS, is highly recommended. The inventory must include:

(a) Relevant contact information for each site (e.g., name, address, phone, and email for the owner and contractor);

(b) The basic site information including location (address and hydrologic subarea), Waste Discharge Identification (WDID) number (if applicable), size of the site, and approximate area of disturbance;

(c) Whether or not the site is considered a high threat to water quality, as defined in Provision E.4.b.(2) below;

(d) The project start and ~~anticipated~~ completion dates;

~~(e) Current construction phase;~~

~~(f)~~(e) The required inspection frequency, as defined in the Copermittee's jurisdictional runoff management program document;

~~(g)~~(f) The date the Copermittee accepted and/or approved the ~~site-specific~~ pollution control plan, construction BMP, and/or erosion and sediment control plan; and

~~(h)~~(g) Whether or not there are ongoing enforcement actions administered to the site.

Comment [A101]: Some of the info can only be updated based on an inspection, which may or may not be monthly year round for all sites.

Comment [A102]: The anticipated completion date is often unknown and can fluctuate based on unpredictable and unforeseen circumstances. Keeping track of accurate dates in an inventory would be difficult and would not add significant value to the database. Construction Inspectors keep a close eye on the progress of projects and would not need to rely on inventory data to achieve effective stormwater management and oversight. Once a project is completed, the date can be entered into the database,.

(2) Each Copermittee must identify all construction sites within its jurisdiction that represent a high threat to downstream surface water quality. The designation of construction sites as high threat to water quality must consider the following:

(a) Sites located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Sites located within the same hydrologic subarea and tributary to a water body segment listed as impaired for sediment on the CWA section 303(d) List;

(c) Sites located within, directly adjacent to, or discharging directly to a receiving water within an ESA; and

(d) Other sites determined by the Copermittees or the San Diego Water Board as a high threat to water quality.

c. CONSTRUCTION SITE BMP IMPLEMENTATION

Comment [A103]: See discussion in section 3.9.1 of the comment letter.

Each Copermittee must implement, or require the implementation of effective BMPs (for Copermittee construction sites and private construction sites, respectively) to reduce discharges of pollutants in ~~storm water~~ runoff from construction sites to the MEP, and effectively prohibit~~prevent~~ non-storm water discharges from construction sites into the MS4. These BMPs must be site specific, seasonally appropriate, and construction phase appropriate. BMPs must be implemented at each construction site year round. Dry season BMP implementation must plan for and address unseasonal rain events that may occur during the dry season (May 1 through September 30). Copermittees must implement, or require the implementation of, BMPs in the following categories:

(1) Project Planning;

(2) Good Site Management “Housekeeping”, including waste management;

(3) Non-storm Water Management;

(4) Erosion Control;

(5) Sediment Control;

(6) Run-on and Run-off Control; and

(7) Active/Passive Sediment Treatment Systems, where applicable.

d. CONSTRUCTION SITE INSPECTIONS

Each Copermittee must conduct construction site inspections to require and confirm compliance with its local permits and applicable local ordinances, and the requirements of this Order. Priority for site inspections must consider threat to water quality pursuant to Provision E.4.b as well as the nature of the construction activity, topography, and the characteristics of soils and receiving water quality.

(1) Inspection Frequency

(a) Each Copermittee must conduct inspections at all inventoried sites, including high threat to water quality sites, at an appropriate frequency for each phase of construction to confirm~~ensure~~ the site reduces the discharge of pollutants in runoff~~storm water~~ from construction sites to the MEP, and effectively prevents non-storm water discharges from entering the MS4.

(b) Each Copermittee must establish appropriate inspection frequencies for high threat to water quality sites, and all other sites, for each phase of construction. Inspection frequencies appropriate for addressing the highest water quality priorities identified in the Water Quality Improvement Plan, and for complying with the requirements of this Order must be identified in each Copermittee's jurisdictional runoff management program document.

(c) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e., re-inspection, enforcement) necessary to require and confirm site compliance with its local permits and applicable local ordinances, and the requirements of this Order.

(2) Inspection Content

Inspections of construction sites by the Copermittee must include, at a minimum:

(a) Verification of coverage under the Construction General Permit (Notice of Intent (NOI) and/or WDID number) during initial inspections, when applicable;

(b) Assessment of compliance with its local permits and applicable local ordinances related to pollution prevention, including the implementation and maintenance of applicable BMPs;

(c) Assessment of BMP adequacy and effectiveness;

(d) Visual observations of actual non-storm water discharges;

(e) Visual observations of actual or potential discharge of sediment and/or construction related materials from the site;

(f) Visual observations of actual or potential illicit connections; and

(g) If any violations are found and BMP corrections are needed, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried construction sites. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Site name, location (address and hydrologic subarea), and WDID number (if applicable);

(b) Inspection date;

(c) Weather condition during~~Approximate amount of rainfall since last~~ inspection;

(d) Description of problems observed with BMPs and indication of need for BMP addition/repair/replacement and any scheduled re-inspection, and date of re-inspection;

(e) Descriptions of any other specific inspection comments which must, at a minimum, include rationales for longer compliance time;

(f) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(g) Resolution of problems noted and date problems fixed.

e. CONSTRUCTION SITE ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried construction sites, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

5. Existing Development Management

Comment [A104]: See discussion in section 3.10 of the comment letter.

Each Copermittee must implement an existing development management program in accordance with the strategies identified in the Water Quality Improvement Plan. and includes, at a minimum, the following requirements:

STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Comment [A105]: Moved from sub-provision e. Changes shown in redline

Each Copermittee must implement the water quality improvement strategies, where necessary, to address areas of existing development within its jurisdiction that are identified as sources of pollutants and/or stressors contributing to the highest priority water quality conditions in the Watershed Management Area. For the existing development management program, the following strategies must be implemented:

(1) Specific Existing Development Management Program Strategies

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented within its jurisdiction to address areas of existing development that the Copermittee has identified as sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(a) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, and/or increase/decrease frequency of inspections for specific types of facilities, areas and/or activities);

(b) The facilities and/or areas within the Copermittee's jurisdiction where the strategies and/or activities will be implemented; and

(2) The requirements of the programs as outlined in the following sub-provisions may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality improvement Plan(s).~~The strategies and/or activities must be consistent with the requirements of Provisions E.5.b-d and the strategies identified in the Water Quality Improvement Plan.~~

a. EXISTING DEVELOPMENT INVENTORY AND TRACKING

Each Copermittee must maintain, and update at least annually, a watershed-based inventory of the existing development within its jurisdiction that ~~may~~has the reasonable potential to~~may~~ discharge a high priority pollutant load to and from the MS4, as defined in the Copermittee's JRMP. The use of an automated database system, such as GIS, is highly recommended. The inventory must, at a minimum, evaluate and include the following if identified as a source of a high priority pollutant~~include~~:

(1) Name, location (hydrological subarea and address, if applicable) of the following types of existing development with its jurisdiction:

(a) Commercial facilities or areas;

(b) Industrial facilities;

(c) Copermittee owned Municipal facilities, including:

(i) MS4 and related structures,[33]

(ii) Roads, streets, and highways,

(iii) Parking facilities,

(iv) Municipal airfields,

(v) Parks and recreation facilities,

(vi) Flood management projects and flood control devices and structures,

(vii) Operating or closed municipal landfills,

(viii) Publicly owned treatment works (including water and wastewater treatment plants) and sanitary sewer collection systems,

(ix) Corporate yards, including maintenance and storage yards for materials, waste, equipment, and vehicles,

(x) Hazardous waste collection facilities,

(xi) Other treatment, storage or disposal facilities for municipal waste, and

(xii) Other Copermittee owned municipal facilities that the Copermittee determines may contribute a significant high priority pollutant load to the MS4; and

(d) Residential areas, which may be designated by one or more of the following:

(i) Residential management area,

(ii) Drainage basin or area,

(iii) Land use (e.g., single family, multi-family, rural),

(iv) Neighborhood,

[33] The inventory may refer to the MS4 map required to be maintained pursuant to Provision E.2.b.(1).

(v) Common Interest Area,

(vi) Home Owner Association,

(vii) Mobile home park, and/or

(viii) Other designations accepted by the San Diego Water Board Executive Officer.

(2) A description of the facility or area, including the following information:

(a) Classification as commercial, industrial, municipal, or residential;

(b) Status of facility or area as active or inactive;

(c) Identification if a business is a mobile business;

(d) SIC Code or NAICS Code, if applicable;

(e) Industrial General Permit NOI and/or WDID number, if applicable;

(f) Identification if a residential area is or includes a Common Interest Area / Home Owner Association, or mobile home park;

(g) Identification of pollutants generated and potentially generated by the facility or area;

(h) Whether the facility or area is adjacent to an ESA;

(i) Whether the facility or area is tributary to and within the same hydrologic subarea as a water body segment listed as impaired on the CWA section 303(d) List and generates pollutants for which the water body segment is impaired; and

(j) Whether the facility or area contributes or potentially contributes to the highest priority water quality conditions identified in the Water Quality Improvement Plan.

(3) An annually updated map showing the location of inventoried existing development, watershed boundaries, and water bodies.

b. EXISTING DEVELOPMENT BMP IMPLEMENTATION AND MAINTENANCE

Each Copermittee must designate a minimum set of BMPs required for all inventoried existing development, including special event venues. The designated minimum BMPs must be specific to facility or area types and pollutant generating activities, as appropriate.

(1) Commercial, Industrial, and Municipal Facilities and Areas

(a) Pollution Prevention

Each Copermittee must require the use of appropriate pollution prevention methods by the commercial, industrial, and municipal facilities and areas in its inventoried existing development, as determined necessary by the Copermittee to address the priorities and strategies addressed in the WQIP.

(b) BMP Implementation

Comment [A106]: See discussion in section 3.10.2 of the comment letter.

Each Copermittee must ~~implement, or~~ require the implementation of, designated BMPs at commercial facilities and areas, industrial facilities, and implement designated BMPs at municipal facilities in its inventoried existing development, as determined necessary by the Copermittee to address the priorities and strategies addressed in the WQIP.

(c) BMP Operation and Maintenance

(i) Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development.

(ii) Each Copermittee must implement a schedule of operation and maintenance activities for its MS4 and related structures (including but not limited to catch basins, storm drain inlets, detention basins, etc.), and verify proper operation of all its municipal structural treatment controls designed to reduce pollutants (including floatables) in storm water discharges to or from its MS4s and related drainage structures. Operation and maintenance activities may include, but is not limited to, the following:

[a] Inspections of the MS4 and related structures;
[b] Cleaning of the MS4 and related structures; and
[c] Proper disposal of materials removed from cleaning of the MS4 and related structures.

(iii) Each Copermittee must implement a schedule of operation and maintenance for public streets, unpaved roads, paved roads, and paved highways and freeways within its jurisdiction to minimize pollutants that can be discharged in storm water.

(iv) Each Copermittee must implement the following controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers:

[a]~~.~~ Copermittees that operate both a municipal sanitary sewer system and a MS4 must implement controls and measures to

prevent and eliminate seeping sewage from infiltrating the MS4.

[b]- Copermittees that do not operate both a municipal sanitary sewer system and a MS4 must coordinate with sewering agencies to keep themselves informed of relevant and appropriate maintenance activities and sanitary sewage projects in their jurisdiction that may cause or contribute to seepage of sewage into the MS4.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Comment [A107]: See discussion in section 3.10.2 of the comment letter.

Each Copermittee must implement BMPs, or require the implementation of BMPs, to reduce pollutants in runoffstorm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from commercial facilities and areas, industrial facilities;, and implement such BMPs at municipal facilities in its inventoried existing development. Such BMPs must include, as appropriate, educational activities, permits, certifications and other measures for applicators and distributors.

(2) Residential Areas

(a) Pollution Prevention

Each Copermittee must promote and encourage the use of pollution prevention methods, where appropriate, by the residential areas in its inventoried existing development.

(b) BMP Implementation

Each Copermittee must promote and encourage the implementation of designated BMPs at residential areas in its inventoried existing development.

(c) BMP Operation and Maintenance

Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at residential areas in its inventoried existing development.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must promote and encourage the implementation of BMPs to reduce pollutants in runoffstorm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from residential areas in its inventoried existing development.

c. Existing Development Inspections

Each Copermittee must conduct inspections of inventoried existing development that have been identified by the Copermittee as having the reasonable potential to discharge pollutant loads from their MS4, to ensure compliance with applicable local ordinances and permits, and the requirements of this Order.

(1) Inspection Frequency

(a) Each Copermittee must establish appropriate inspection frequencies for inventoried existing development in accordance with the following requirements:

(i) At a minimum, inventoried existing development must be inspected once every five years utilizing one or more of the following methods:

[a] Drive-by inspections by Copermittee municipal and contract staff,
[b] Onsite inspections by Copermittee municipal and contract staff, and/or
[c] Inspections by volunteer monitoring or patrol programs trained by the Copermittee;

(ii) The frequency of inspections must be appropriate to confirm that BMPs are being implemented to reduce the discharge of pollutants in runoff~~storm water~~ from the MS4 to the MEP and effectively prohibit non-storm water discharges to the MS4;

(iii) The frequency of inspections must be based on the potential for a facility or area to discharge non-storm water and pollutants in storm water, and should reflect the priorities set forth in the Water Quality Improvement Plan;

~~(iv) Each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development;[34] and~~

~~(v)~~(iv) Inventoried existing development must be inspected by the Copermittee, as needed, in response to valid public complaints and findings from the Copermittee's municipal and contract staff or volunteer monitoring or patrol program inspections.

(b) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e. education and outreach, re-inspection, enforcement) necessary to require and confirm compliance with its applicable local

Comment [A108]: Recommend keeping this instead of SD proposed 'during the permit term'. The 'during the permit term' language is problematic for businesses that are added to the inventory during the permit term. For example, if a business is added to the inventory one month before the expiration of the permit, it may not be reasonable to expect it to be immediately inspected. It is also problematic for Riverside (and OC?), who may be added to the permit less than two years before the end of the permit term.

Comment [A109]: See discussion in section 3.10.2 of the comment letter.

~~[34] If any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspection may count toward the total annual inspection requirement. This requirement excludes linear municipal facilities (i.e., MS4, streets, roads and highways).~~

ordinances and permits and the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

(2) Inspection Content

(a) Inspections of existing development by the Copermittee or volunteer monitoring or patrol programs must include, at a minimum:

(i) Visual inspections for actual non-storm water discharges, if present;

(ii) Visual inspections for actual or potential discharge of pollutants, if present;

(iii) Visual inspections for actual or potential illicit connections, if present; and

(iv) Verification that the description of the facility or area in the inventory, required pursuant to Provision E.5.a.(2), has not changed.

(b) Onsite inspections of existing development by the Copermittee must include, at a minimum:

(i) Assessment of compliance with its applicable local ordinances and permits related to non-storm water and storm water discharges and runoff;

(ii) Assessment of the implementation of the designated BMPs;

(iii) Verification of coverage under the Industrial General Permit, when applicable; and

(iv) If any problems or violations are found, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried existing development. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Name and location of facility or area (address and hydrologic subarea) consistent with the inventory name and location, pursuant to Provision E.5.a.(1);

(b) Inspection and re-inspection date(s);

(c) Inspection method(s) (i.e. drive-by, onsite);

(d) Observations and findings from the inspection(s);

(e) For onsite inspections of existing development by Copermittee municipal or contract staff, the records must also include, as applicable:

(i) Description of any problems or violations found during the inspection(s),

(ii) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6, and

(iii) The date problems or violations were resolved.

d. EXISTING DEVELOPMENT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried existing development, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

e. RETROFITTING AND REHABILITATION~~STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS~~

~~Each Copermittee must implement the water quality improvement strategies, where necessary, to address areas of existing development within its jurisdiction that are identified as sources of pollutants and/or stressors contributing to the highest priority water quality conditions in the Watershed Management Area. For the existing development management program, the following strategies must be implemented:~~

~~(3) Specific Existing Development Management Program Strategies~~

~~Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented within its jurisdiction to address areas of existing development that the Copermittee has identified as sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:~~

~~(a) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, and/or increase/decrease frequency of inspections for specific types of facilities, areas and/or activities);~~

~~(b) The facilities and/or areas within the Copermittee's jurisdiction where the strategies and/or activities will be implemented; and~~

~~(c)~~(a) ~~The strategies and/or activities must be consistent with the requirements of Provisions E.5.b-d and the strategies identified in the Water Quality Improvement Plan.~~

~~(4)~~(3) Retrofitting Areas of Existing Development

Where identified in the WQIP as a required strategy to address the highest priority water quality conditions, each~~Each~~ Copermittee must describe in its jurisdictional runoff management program document, a program to retrofit areas of existing development within its jurisdiction to address identified sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must, where necessary pursuant to the strategies identified in the WQIP, identify areas of existing development as candidates for retrofitting, focusing on areas where retrofitting will address pollutants and/or stressors that contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for retrofitting projects may be utilized to reduce pollutants that may be discharged in storm water from areas of existing development, and/or address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of retrofitting projects, where needed in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting projects; and

(e) Where retrofitting projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional retrofitting projects (i.e. projects that can receive and/or treat storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment) adjacent to and/or downstream of the areas of existing development.

~~(5)~~(4) Stream, Channel and/or Habitat Rehabilitation in Areas of Existing Development

Where identified in the WQIP as a required strategy to address the highest priority water quality conditions, each~~Each~~ Copermittee must describe in its jurisdictional runoff management program document, a program to rehabilitate streams, channels, and/or habitats in areas of existing development within its jurisdiction to address the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must, where necessary pursuant to the strategies identified in the WQIP, identify streams, channels, and/or habitats in areas of existing development as candidates for rehabilitation, focusing on areas where stream, channel, and/or habitat rehabilitation projects will address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for stream, channel, and/or habitat rehabilitation projects may be utilized to address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters, rehabilitate channelized or hydromodified streams, restore wetland and riparian habitat, restore watershed functions, and/or ~~restore~~ protect beneficial uses of receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of stream, channel, and/or habitat rehabilitation projects, where needed, in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance stream, channel, and/or habitat rehabilitation projects; and

(e) Where stream, channel, and/or habitat rehabilitation projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional stream, channel, and/or habitat rehabilitation projects (i.e. projects that can receive storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment).

(5) Upon Regional Board Executive Officer approval the Copermittees may reallocate resources in the WQIPs for retrofit and rehabilitation project(s).

6. Enforcement Response Plans

Each Copermittee must develop and implement an Enforcement Response Plan as part of its jurisdictional runoff management program document. The Enforcement Response Plan must describe the applicable approaches and options to enforce its legal authority established pursuant to Provision E.1, as necessary, to achieve compliance with the requirements of this Order. Copermittees may continue to utilize and implement established, equivalent guidelines and procedures for enforcement. If such equivalent guidelines and procedures have not been developed, ~~T~~the Enforcement Response Plan must include the following:

a. ENFORCEMENT RESPONSE PLAN COMPONENTS

The Enforcement Response Plan must include the following individual components:

(1) Illicit Discharge Detection and Elimination Enforcement Component;

(2) Development Planning Enforcement Component;

(3) Construction Management Enforcement Component; and

(4) Existing Development Enforcement Component.

b. ENFORCEMENT RESPONSE APPROACHES AND OPTIONS

Each component of the Enforcement Response Plan must describe the enforcement response approaches that the Copermittee will implement to compel compliance with its statutes, ordinances, permits, contracts, orders, or similar means, and the requirements of this Order. The description must include the protocols for implementing progressively stricter enforcement responses. The enforcement response approaches must include appropriate sanctions, as legally appropriate, to compel compliance, including, at a minimum, the following tools or their equivalent:

(1) Verbal and written notices of violation;

(2) Cleanup requirements;

(3) Fines;

(4) Bonding requirements;

(5) Administrative and criminal (if intentional or criminally negligent) penalties;

(6) Liens;

(7) Stop work orders; and

(8) Permit and occupancy denials.

c. CORRECTION OF VIOLATIONS

(1) Violations must be corrected in a timely manner with the goal of correcting the violations within 30 calendar days after the violations are discovered, or prior to the next predicted rain event, whichever is sooner.

(2) The status of the enforcement actions~~If more than 30 calendar days are required to achieve compliance, then a rationale~~ must be recorded and updated in the applicable electronic database or tabular system used to track violations.

Comment [A110]: This is just asking for paperwork violations if someone forgets to write a specific justification – even if all appropriate steps are being diligently pursued. Request alternatively to simply require that the status be updated as appropriate.

d. ~~ESCALATED~~ PROGRESSIVE ENFORCEMENT

Comment [A111]: See discussion in section 3.11.2 of the comment letter.

(1) The Enforcement Response Plan must include a definition of "~~escalated~~ progressive enforcement." ~~Escalated~~ Progressive enforcement must include a series of enforcement actions that match the severity of the violations and include distinct, progressive steps. ~~any enforcement scenario where a violation or other non-compliance is determined to cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan~~. ~~Escalated~~ Progressive enforcement may be defined differently for development planning, construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and/or residential areas.

(2) Where the Copermittee determines ~~escalated~~ the identified progressive enforcement steps ~~is~~are not required, a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

(3) ~~Escalated~~ Progressive enforcement actions must continue to increase in severity, as necessary, to compel compliance as soon as possible.

e. REPORTING OF NON-COMPLIANT SITES

(1) Each Copermittee must notify the San Diego Water Board in writing within ~~22~~5 calendar~~2 working~~ days of issuing escalated enforcement (as defined in the Copermittee's Enforcement Response Plan) to a construction site that poses a significant threat to water quality as a result of violations or other non-compliance with its permits and applicable local ordinances, and the requirements of this Order. Written notification may be provided electronically by email.

(2) Each Copermittee must notify the San Diego Water Board of non-filers under the Industrial General Permit and Construction General Permit by email to Nonfilers_R9@waterboards.ca.gov.

7. Public Education and Participation

Each Copermittee must implement, individually or with other Copermittees, a public education and participation program in accordance with the strategies identified in the Water Quality Improvement Plan to promote and encourage the development of programs, management practices, and behaviors that reduce the discharge of pollutants in runoff~~storm water~~ to the MEP, prevent controllable non-storm water discharges from entering the MS4, and protect water quality standards in receiving waters.

STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Comment [A112]: Recommended move from (c)

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented within its jurisdiction, as applicable, to educate the public and encourage public participation to address potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) The target audiences and/or areas within the Copermittee's jurisdiction where the strategies and/or activities will be implemented;

(2) Provide specific details about how the strategies and/or activities will be implemented (e.g. educational topics, materials and/or activities, public outreach and participation programs and/or opportunities);

(3) Each Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify and implement regional public education and participation activities, programs and opportunities;

(4) Each Copermittee must incorporate a mechanism for evaluating and assessing educational and other public outreach activities, as needed, to identify progress and incorporate modifications necessary to increase the effectiveness of the public education and participation program.

(5) The requirements of the programs as outlined in the following sub-provisions

may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality improvement Plan(s).

a. PUBLIC EDUCATION

The public education program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) Educational activities, public information activities, and other appropriate outreach activities intended to reduce pollutants associated with the ~~application of pesticides, herbicides and fertilizer- and other pollutants of concern in storm water discharges to and from its MS4 to the MEP, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed to address the~~ highest priority water quality conditions identified in the Water Quality Improvement Plan;

(2) Educational activities, public information activities, and other appropriate outreach activities to facilitate the proper management and disposal of used oil and toxic materials; and

(3) Appropriate education and training measures for specific target audiences, such as construction site operators, residents, underserved target audiences and school-aged children, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed, based on high risk behaviors and pollutants of concern.

b. PUBLIC PARTICIPATION

The public participation program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) A process for members of the public to participate in updating the highest priority water quality conditions, numeric goals, and water quality improvement strategies in the Water Quality Improvement Plan.

(2) Opportunities for members of the public to participate in providing the Copermittee recommendations for improving the effectiveness of the water quality improvement strategies implemented within its jurisdiction.

(3) Opportunities for members of the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in ~~storm wate~~r discharges from

the MS4, and/or ~~restoration and~~ protection of the quality of receiving waters.

8. Fiscal Analysis

a. ~~Each Copermittee must secure the resources necessary to meet all the requirements of this Order~~.

b. Each Copermittee must conduct an annual fiscal analysis of its jurisdictional runoff management program in its entirety. The fiscal analysis must include the following:

(1) Identification of the various categories of expenditures necessary to implement the requirements of this Order, including a description of the specific capital, operation and maintenance, and other expenditure items to be accounted for in each category of expenditures;

(2) The staff resources needed and allocated to meet the requirements of this Order, including any development, implementation, and enforcement activities required;

(3) The estimated expenditures for Provisions E.8.b.(1) and E.8.b.(2) for the current fiscal year; and

(4) The source(s) of funds that are proposed to meet the necessary expenditures described in Provisions E.8.b.(1) and E.8.b.(2), including legal restrictions on the use of such funds, for the current fiscal year and next fiscal year.

c. Each Copermittee must submit a summary of the annual fiscal analysis with each Annual Report required pursuant to Provision F.3.b.

d. Each Copermittee must provide the documentation used to develop the summary of the annual fiscal analysis upon request by the San Diego Water Board.

Comment [A113]: Since the monitoring period is different than a fiscal year, we won't be able to consistently and accurately report monitoring costs incurred by the Copermittees. (which are a big part of overall budgets)

Comment [A114]: Please see Legal Comments.

F. REPORTING

Comment [A115]: See discussion in section 3.14 of the comment letter.

The purpose of this provision is to determine and document compliance with the requirements set forth in this Order. The goal of reporting is to communicate to the San Diego Water Board and the people of the State of California the implementation status of each jurisdictional runoff management program and compliance with the requirements of this Order. This goal is to be accomplished through the submittal of specific deliverables to the San Diego Water Board by the Copermittees.

1. Water Quality Improvement Plans

Comment [A116]: See discussion in section 3.14.1 of the comment letter.

The Copermittees for each Watershed Management Area must develop and submit the Water Quality Improvement Plan in accordance with the following requirements:

a. WATER QUALITY IMPROVEMENT PLAN DEVELOPMENT

Each Water Quality Improvement Plan must be developed in accordance with the following process:

(1) Priority Water Quality Conditions and Numeric Goals

(a) The Copermittees must implement a public participation process to solicit data and information to be utilized in the development and identification of the priority water quality conditions for the Watershed Management Area.

(b) The Copermittees are encouraged to involve the public and key stakeholders as early and often as possible during the development of the priority water quality conditions and numeric goals to be included in the Water Quality Improvement Plan.

(c) Within 6 months after the commencement of coverage under this Order, the Copermittees must develop and submit the Water Quality Improvement Plan requirements of Provision B.2 to the San Diego Water Board. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of 60 days.

(d) The Copermittees must revise the priority water quality conditions and numeric goals based on comments received and/or recommendations or direction from the San Diego Water Board Executive Officer.

(2) Water Quality Improvement Strategies and Schedules

(a) The Copermittees are encouraged to involve the public and key stakeholders as early and often as possible during the development of the water quality improvement strategies and schedules to be included in the Water Quality Improvement Plan.

(b) Within 9 months after receipt~~the commencement~~ of public comments and/or recommendations from the Executive Officer per (1)(c) above~~coverage under this Order~~, the Copermittees must develop and submit the Water Quality Improvement Plan requirements of Provision B.3 to the San Diego Water Board. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of 60 days.

(c) The Copermittees must revise the water quality improvement strategies and schedules based on comments received and/or recommendations or direction from the San Diego Water Board Executive Officer.

b. WATER QUALITY IMPROVEMENT PLAN SUBMITTAL

(1) Within 6~~18~~ months after receipt~~the commencement~~ of public comments and/or recommendations from the Executive Officer per (2)(c) above~~coverage under this Order~~, the Copermittees for each Watershed Management Area must submit a complete Water Quality Improvement Plan in accordance with the requirements of Provision B to the San Diego Water Board. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of 30 days.

(2) Based on the comments received, the San Diego Water Board will determine whether to hold a public hearing or to limit public input to submittal of written comments. If no hearing is held the San Diego Water Board will notify the Copermittees within 6 months that the Water Quality Improvement Plan has been accepted as complete following its review and determination that the Water Quality Improvement Plan meets the requirements of this Order.

(3) The Copermittees must revise the Water Quality Improvement Plan based on comments received and/or recommendations or direction from the San Diego Water Board Executive Officer.

(4) The Water Quality Improvement Plan must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance by the San Diego Water Board.

(5) Copermittees must commence with implementation of the BMP strategies identified in the Water Quality Improvement Plan no later than the fiscal year (July 1) following San Diego Water Board approval of the Water Quality Improvement Plan, and the monitoring strategies identified in the Water Quality Improvement Plan no later than October 1st (or May 1st, whichever is sooner) following the San Diego Water Board approval of the Water Quality Improvement Plan.

2. Updates

Comment [A117]: See discussion in section 3.14.1 of the comment letter.

a. Jurisdictional Runoff Management Program Document Updates

Each Copermittee must update its jurisdictional runoff management program document in accordance with the following requirements:

(1) Each Copermittee is encouraged to involve the public and key stakeholders as early and often as possible to solicit recommendations for updates to its jurisdictional runoff management program document.

(2) Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E and the strategies identified in the applicable WQIPs no later than 6~~18~~ months after approval~~the commencement~~ of the applicable Water Quality Improvement Plans (or updates thereto).~~coverage under this Order.~~

(3) The updated JRMP document must be implemented beginning July 1st following completion of the update, unless directed otherwise by the Executive Officer.

~~(3)~~(4) Each Copermittee must submit any subsequent updates to its jurisdictional runoff management program, with a rationale for the modifications, either in the Annual Report required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge required pursuant to Provision F.5.b.

~~(4)~~(5) The Copermittee must revise the modifications as directed by the San Diego Water Board Executive Officer.

~~(5)~~(6) Updated jurisdictional runoff management program documents must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of submitting the Annual Report.

b. BMP Design Manual Updates

Each Copermittee must update its BMP Design Manual in accordance with the following requirements:

(1) Each Copermittee must update its BMP Design Manual to incorporate the requirements of Provisions E.3.a-d, and E.3.g. no later than 6~~18~~ months after approval~~the commencement~~ of the applicable Water Quality Improvement Plans..

Comment [A118]: This is necessary for the WQIP strategies to inform the Development Planning process

(2) Unless directed otherwise by the San Diego Water Board, the Copermittee must implement the updated BMP Design Manual within 180 days of

Comment [A119]: An implementation date was missing from the Tentative Order

completing updates to the BMP Design Manual.

~~(1)~~(3) Until the Copermittee begins implementation of its updated BMP Design Manual, the Copermittee must continue implementing its current BMP Design Manual~~coverage under this Order~~.

Comment [A120]: This was moved to here

~~(2)~~(4) Subsequent updates must be consistent with the requirements of Provisions E.3.a-d and must be submitted as part of the Annual Reports required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge required pursuant to Provision F.5.b.

~~(3)~~(5) Updated BMP Design Manuals must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of completing the update.

c. WATER QUALITY IMPROVEMENT PLAN UPDATES

The Water Quality Improvement Plans must be updated in accordance with the following process:

(1) The Copermittees must implement a public participation process to solicit data and information to be utilized in updating the Water Quality Improvement Plan.

(2) The Copermittees are encouraged to involve the public and key stakeholders as early and often as possible during the updates to the Water Quality Improvement Plan.

(3) The Copermittees for each Watershed Management Area must submit requested updates to the Water Quality Improvement Plan, with the public input received and the rationale for the requested updates, either in the Annual Reports required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The requested updates are considered accepted by the San Diego Water Board if no response is provided to the Copermittee after 3 months of submitting the request.

(4) The Copermittees must revise the requested updates as directed by the San Diego Water Board Executive Officer.

(5) Updated Water Quality Improvement Plans must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance of the requested updates by the San Diego Water Board.

3. Progress Reporting

Comment [A121]: See discussion in section 3.14.1 of the comment letter.

a. PROGRESS REPORT PRESENTATIONS

The Copermittees for each Watershed Management Area must appear before the San Diego Water Board, as requested by the San Diego Water Board, to provide progress reports on the implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs.

b. ANNUAL REPORTS

Comment [A122]: See discussion in section 3.14.1 of the comment letter.

(1) Transitional Period JRMP Reports: Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (Attachment D or accepted revision) no later than October 31 of each year prior to the implementation of updated JRMP programs pursuant to F.2.a. Each Copermittee must submit the information on the Jurisdictional Runoff Management Program Annual Report Form specific to the area within its jurisdiction in each Watershed Management Area.

(2) Transitional Period Monitoring Report: The transitional period monitoring conducted pursuant to D.1.a and D.2.a. shall be reported in a single report that covers the entire reporting period from the initiation of the transitional period monitoring (as described in D.1.a and D.2.a.), through September 30th following approval of the Water Quality Improvement Plan. The Transitional Period Monitoring Report shall include the assessments required per D.4.a.(1)(a), D.4.b.(1)(a) and D.4.b.(2)(a); and be submitted by January 31st following completion of the above mentioned transitional period.

~~(1)~~(3) Post-Transitional Annual Reports – Following the initial transitional period after enrollment into this Order, the~~The~~ Copermittees for each Watershed Management Area must submit an combined Annual Report for each reporting period no later than January 31 of the following year. The annual reporting period consists of two periods: 1) July 1 to June 30 of the following year for the jurisdictional runoff management programs, 2) October 1 to September 30 of the following year for the monitoring and assessment programs~~. The first Annual Report must be prepared for the reporting period beginning July 1 after commencement of coverage under this Order, and upon San Diego Water Board determination that the Water Quality Improvement Plan meets the requirements of this Order to June 30 in the following year for the jurisdictional runoff management programs, and September 30 in the following year for the monitoring and assessment programs.~~ Annual Reports must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Each Annual Report must include the following:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, summarized and presented in tabular and graphical form;

(b) Progress of the special studies required pursuant to Provision D.3, and the results or findings when a special study, or each phase of a special study, is completed;

(c) The findings from the applicable assessments required pursuant to Provision D.4;

Comment [A123]: Not all are required annually.

(d) The progress of implementing the Water Quality Improvement Plan, including, but not limited to, the following:

(i) The progress toward achieving the interim and final numeric goals for the highest water quality priorities for the Watershed Management Area,

(ii) The water quality improvement strategies that were implemented and/or no longer implemented by each of the Copermittees during the reporting period and previous reporting periods, and are planned to be implemented during the next reporting period,

(iii) Proposed modifications to the water quality improvement strategies, with public input received and rationale for the proposed modifications,

(iv) Previously proposed modifications or updates incorporated into the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document and implemented by the Copermittees in the Watershed Management Area, and

(v) Proposed modifications or updates to the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document;

(e) A completed Jurisdictional Runoff Management Program Annual Report Form (Attachment D or accepted revision) for each Copermittee in the Watershed Management Area, certified by a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative.

~~(2) Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (Attachment D or accepted revision) no later than October 31 of each year until the first Annual Report is required to be submitted. Each Copermittee must submit the information on the Jurisdictional Runoff Management Program Annual Report Form specific to the area within its jurisdiction in each Watershed Management Area.~~

Comment [A124]: Adapted into new section (1)

~~(3)~~(4) Each Copermittee must provide any data or documentation utilized in

developing the Annual Report upon request by the San Diego Water Board. ~~AnyAny~~Copermittee~~Any~~ monitoring data utilized in developing the Annual Report must be uploaded to the California Environmental Data Exchange Network (CEDEN).[35] Any Copermittee monitoring and assessment data utilized in developing the Annual Report must be provided on the Regional Clearinghouse required pursuant to Provision F.4.

C. Regional Monitoring and Assessment Report

(1) The Copermittees must submit a Regional Monitoring and Assessment Report no later than 180 days in advance of the expiration date of this Order. The Regional Monitoring and Assessment Report may be submitted as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The Regional Monitoring and Assessment Report shall incorporate the Integrated Assessment of the Water Quality Improvement Plan per D.4.d.

~~(1) The Copermittees must review the receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, and findings from the assessments required pursuant to Provision D.4, to assess the following:~~

~~(2)~~

~~(3) The beneficial uses of the receiving waters within the San Diego Region that are protected or must be restored;~~

~~(4)~~

~~(5) The progress toward restoring impacted beneficial uses in the receiving waters within the San Diego Region; and~~

~~(6)~~

~~(7) Pollutants or conditions of emerging concern that may impact beneficial uses in the receiving waters within the San Diego Region.~~

~~(8)~~

~~(9) The Regional Monitoring and Assessment Report must include recommendations for improving the implementation and assessment of the Water Quality Improvement Plans and jurisdictional runoff management programs.~~

(2) Each Copermittee must provide any data or documentation utilized in developing the Regional Monitoring and Assessment Report upon request by the San Diego Water Board. Any monitoring and assessment data utilized in developing the Regional Monitoring and Assessment Report must be provided on the Regional Clearinghouse required pursuant to Provision F.4.

[35] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

4. Regional Clearinghouse

The Copermittees must develop, update, and maintain an internet-based Regional Clearinghouse that is made available to the public no later than 18 months after the effective date of this Order.[36]

a. The Copermittees, through the Regional Clearinghouse, must make the following documents and data available, organized by Watershed Management Area, which may be linked to other internet-based data portals and databases where the original documents are stored:

(1) Water Quality Improvement Plan for the Watershed Management Area, and all updated versions with date of update;

(2) Annual Reports for the Watershed Management Area;

(3) Jurisdictional Runoff Management Program document for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(4) BMP Design Manual for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(5) Reports from special studies (e.g. source identification, BMP effectiveness assessment) conducted in the Watershed Management Area;

(6) Monitoring data collected pursuant to Provision D for each Watershed Management Area must be uploaded to CEDEN,[37] with links to the uploaded data; and

(7) Available GIS data, layers, and/or shapefiles used to develop the maps generated and maintained by the Copermittees for the Water Quality Improvement Plans, Annual Reports, and jurisdictional runoff management program documents.

b. The Copermittees, through the Regional Clearinghouse, must make the following information and documents available:

(1) Contact information (point of contact, phone number, email address, and mailing address) for each Copermittee;

[36] The Copermittee may elect to develop and maintain the clearinghouse(s) provided by other Copermittees or agencies.

[37] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

(2) Public hotline number for reporting non-storm water and illicit discharges for each Copermittee;

(3) Email address for reporting non-storm water and illicit discharges for each Copermittee;

(4) Link to each Copermittee's website, if available, where the public may find additional information about the Copermittee's storm water management program and for requesting records for the implementation of its program;

(5) Information about opportunities for the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in ~~storm water~~ discharges from the MS4, and/or restoration and protection of the quality of receiving waters; and

(6) Reports from regional monitoring programs in which the Copermittees participate (e.g. Southern California Monitoring Coalition, Southern California Coastal Water Research Project Bight Monitoring);

(7) Regional Monitoring and Assessment Reports; and

(8) Any other information, data, and documents the Copermittees determine as appropriate for making available to the public.

5. Report of Waste Discharge

a. The Orange County Copermittees and the Riverside County Copermittees are required to submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders. The San Diego Water Board will review and consider the Reports of Waste Discharge to determine whether modification to this Order, pursuant to the requirements of Provision H, will be required prior the Orange County Copermittees and/or Riverside County Copermittees becoming covered under this Order. The current Orders for the Orange County Copermittees and Riverside County Copermittees are rescinded upon notification of coverage under this Order except for enforcement purposes.

b. The Copermittees subject to the requirements of this Order must submit to the San Diego Water Board a complete Report of Waste Discharge as an application for the re-issuance of this Order and NPDES permit. The Report of Waste Discharge must be submitted no later than 180 days in advance of the expiration date of this Order. The Report of Waste Discharge must contain the following minimum information:

(1) Names and addresses of the Copermittees;

(2) Names and titles of the primary contacts of the Copermittees;

(3) Proposed changes to the Copermittees' Water Quality Improvement Plans and the supporting justification;

(4) Proposed changes to the Copermittees' jurisdictional runoff management programs and the supporting justification;

(5) Any other information necessary for the re-issuance of this Order;

(6) Any information to be included as part of the Report of Waste Discharge pursuant to the requirements of this Order; and

(7) Any other information required by federal regulations for NPDES permit reissuance.

6. Application for Early Coverage

a. The Orange County Copermittees, collectively, or Riverside County Copermittees, collectively, may apply for early coverage under this Order by submitting a Report of Waste Discharge Form 200, with a written request for early coverage under this Order.

Comment [A125]: This form requests information that is not applicable to MS4s.

b. The San Diego Water Board will review the application for early coverage. A notification of coverage under this Order will be issued to the Copermittees in the respective county by the San Diego Water Board upon completion of the early coverage application requirements. The effective coverage date will be specified in the notification of coverage. The Copermittees in the respective county are authorized to have MS4 discharges pursuant to the requirements of this Order starting on the effective coverage date specified in the notification of coverage. The existing Order for the respective county is rescinded upon the effective coverage date specified in the notification of coverage except for enforcement purposes.

7. Reporting Provisions

Each Copermittee must comply with all the reporting and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

G. PRINCIPAL WATERSHED COPERMITTEE RESPONSIBILITIES

1. The Copermittees within each Watershed Management Area must designate a Principal Watershed Copermittee and notify the San Diego Water Board of the name of the Principal Watershed Copermittee. ~~An individual Copermittee should not be designated a Principal Watershed Copermittee for more than two Watershed Management Areas.~~ The notification may be submitted with the Water Quality Improvement Plan required pursuant to Provision F.1 of this Order.

2. The Principal Watershed Copermittee is responsible for, at a minimum, the following:

a. Serving as liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues, and when necessary and appropriate, representing the Copermittees in the Watershed Management Area before the San Diego Water Board.

b. Facilitating the development of the Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order

c. Coordinating the submittal of the deliverables required by Provisions F.1, F.2, F.3.a, and F.3.b of this Order.

d. Coordinating the development of~~and developing~~, with the other Principal Watershed Copermittees, the requirements of Provisions F.3.c, F.4, and F.5.b of this Order.

H. MODIFICATION OF PROGRAMS

1. Modifications of the Order may be initiated by the San Diego Water Board or by the Copermittees, including as part of the ROWD process applicable to the Orange County and Riverside County Copermittees. Requests by Copermittees must be made to the San Diego Water Board.

2. Minor modifications to the Order may be made by the San Diego Water Board Executive Officer, where the proposed modification complies with all the effective prohibitions and limitations, and other requirements of this Order.

3. Proposed modifications to the Order outside of the WQIP process that are not minor require amendment of this Order in accordance with this Order's rules, policies, and procedures.

4. The San Diego Water Board may re-open and modify this Order at any time prior to its expiration, after opportunity for public comment and a public hearing, if the State Water Board determines that revisions are warranted to those provisions of the Order addressing compliance with water quality standards in the receiving water and/or those provisions of the Order establishing an iterative process for implementation of management practices to assure compliance with water quality standards in the receiving water.

I. STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

Each Copermittee must comply with all the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

ATTACHMENT A

DISCHARGE PROHIBITIONS AND SPECIAL PROTECTIONS

1. Basin Plan Waste Discharge Prohibitions

California Water Code Section 13243 provides that a Regional Water Board, in a water quality control plan, may specify certain conditions or areas where the discharge of waste or certain types of waste is not permitted. The following waste discharge effective prohibitions in the Water Quality Control Plan for the San Diego Basin (Basin Plan) are applicable to any person, as defined by Section 13050(c) of the California Water Code, who is a citizen, domiciliary, or political agency or entity of California whose activities in California could affect the quality of waters of the state within the boundaries of the San Diego Region.

1. The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in California Water Code Section 13050, is prohibited.

2. The discharge of waste to land, except as authorized by waste discharge requirements or the terms described in California Water Code Section 13264 is prohibited.

3. The discharge of pollutants or dredged or fill material to waters of the United States except as authorized by a National Pollutant Discharge Elimination System (NPDES) permit or a dredged or fill material permit (subject to the exemption described in California Water Code Section 13376) is prohibited.

4. Discharges of recycled water to lakes or reservoirs used for municipal water supply or to inland surface water tributaries thereto are prohibited, unless this San Diego Water Board issues a NPDES permit authorizing such a discharge; the proposed discharge has been approved by the State Department of Health Services (DHS) and the operating agency of the impacted reservoir; and the discharger has an approved fail-safe long-term disposal alternative.

5. The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the San Diego Water Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

6. The discharge of waste in a manner causing flow, ponding, or surfacing on lands not owned or under the control of the discharger is prohibited, unless the discharge is authorized by the San Diego Water Board.

7. The dumping, deposition, or discharge of waste directly into waters of the state, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the San Diego Water Board.

8. Any discharge to a storm water conveyance system that is not composed entirely of "*storm water*" is effectively prohibited unless authorized by the San Diego Water Board. [The federal regulations, 40 CFR 122.26(b)(13), define storm water as storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from fire fighting activities.] [§122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

9. The unauthorized discharge of treated or untreated sewage to waters of the state or to a storm water conveyance system is prohibited.

10. The discharge of industrial wastes to conventional septic tank/subsurface disposal systems, except as authorized by the terms described in California Water Code Section 13264, is prohibited.

11. The discharge of radioactive wastes amenable to alternative methods of disposal into the waters of the state is prohibited.

12. The discharge of any radiological, chemical, or biological warfare agent into waters of the state is prohibited.

13. The discharge of waste into a natural or excavated site below historic water levels is prohibited unless the discharge is authorized by the San Diego Water Board.

14. The discharge of sand, silt, clay, or other earthen materials from any activity, including land grading and construction, in quantities which cause deleterious bottom deposits, turbidity or discoloration in waters of the state or which unreasonably affect, or threaten to affect, beneficial uses of such waters is prohibited.

15. The discharge of treated or untreated sewage from vessels to Mission Bay, Oceanside Harbor, Dana Point Harbor, or other small boat harbors is prohibited.

16. The discharge of untreated sewage from vessels to San Diego Bay is prohibited.

17. The discharge of treated sewage from vessels to portions of San Diego Bay that are less than 30 feet deep at mean lower low water (MLLW) is prohibited.

18. The discharge of treated sewage from vessels, which do not have a properly functioning US Coast Guard certified Type I or Type II marine sanitation device, to portions of San Diego Bay that are greater than 30 feet deep at mean lower low water (MLLW) is prohibited.

2. Attachment B to State Water Board Resolution 2012-0012

Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges

I. PROVISIONS FOR POINT SOURCE DISCHARGES OF STORM WATER AND NONPOINT SOURCE WASTE DISCHARGES

The following terms, effective prohibitions, and special conditions (hereafter collectively referred to as special conditions) are established as limitations on point source storm water and nonpoint source discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in Areas of Special Biological Significance (ASBS), as required for State Water Quality Protection Areas pursuant to California Public Resources Code Sections 36700(f) and 36710(f). These Special Protections are adopted by the State Water Board as part of the California Ocean Plan (Ocean Plan) General Exception.

The special conditions are organized by category of discharge. The State Water Resources Control Board (State Water Board) and Regional Water Quality Control Boards (Regional Water Boards) will determine categories and the means of regulation for those categories [e.g., Point Source Storm Water National Pollutant Discharge Elimination System (NPDES) or Nonpoint Source].

A. PERMITTED POINT SOURCE DISCHARGES OF STORM WATER

1. General Provisions for Permitted Point Source Discharges of Storm Water

   a. Existing storm water discharges into an ASBS are allowed only under the following conditions:

      (1) The discharges are authorized by an NPDES permit issued by the State Water Board or Regional Water Board;

      (2) The discharges comply with all of the applicable terms, effective prohibitions, and special conditions contained in these Special Protections; and

      (3) The discharges:

         (i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

         (ii) Are designed to prevent soil erosion;

         (iii) Occur only during wet weather;

         (iv) Are composed of only storm water runoff.

   b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

   c. The discharge of trash is effectively prohibited.

d. Only discharges from existing storm water outfalls are allowed. Any proposed or new storm water runoff discharge shall be routed to existing storm water discharge outfalls and shall not result in any new contribution of waste to an ASBS (i.e., no additional pollutant loading). “Existing storm water outfalls” are those that were constructed or under construction prior to January 1, 2005. “New contribution of waste” is defined as any addition of waste beyond what would have occurred as of January 1, 2005. A change to an existing storm water outfall, in terms of re-location or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges are effectively prohibited except as provided below:

(1) The term “non-storm water discharges” means any waste discharges from a municipal separate storm sewer system (MS4) or other NPDES permitted storm drain system to an ASBS that are not composed entirely of storm water.

(2) (i) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability or occur naturally:

(a) Discharges associated with emergency fire fighting operations.

(b) Foundation and footing drains.

(c) Water from crawl space or basement pumps.

(d) Hillside dewatering.

(e) Naturally occurring groundwater seepage via a storm drain.

(f) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(ii) An NPDES permitting authority may authorize non-storm water discharges to an MS4 with a direct discharge to an ASBS only to the extent the NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

2. Compliance Plans for Inclusion in Storm Water Management Plans (SWMP) and Storm Water Pollution Prevention Plans (SWPPP).

The discharger shall specifically address the effective prohibition of non-storm water runoff and the requirement to maintain natural water quality for storm water discharges to an ASBS in an ASBS Compliance Plan to be included in its SWMP or a SWPPP, as appropriate to permit type. If a statewide permit includes a SWMP, then the discharger shall prepare a stand-alone compliance plan for ASBS discharges. The ASBS Compliance Plan is subject to approval by the Executive Director of the State Water Board (statewide permits) or

Executive Officer of the Regional Water Board (for permits issued by Regional Water Boards).

a. The Compliance Plan shall include a map of surface drainage of storm water runoff, showing areas of sheet runoff, prioritize discharges, and describe any structural Best Management Practices (BMPs) already employed and/or BMPs to be employed in the future. Priority discharges are those that pose the greatest water quality threat and which are identified to require installation of structural BMPs. The map shall also show the storm water conveyances in relation to other features such as service areas, sewage conveyances and treatment facilities, landslides, areas prone to erosion, and waste and hazardous material storage areas, if applicable. The SWMP or SWPPP shall also include a procedure for updating the map and plan when changes are made to the storm water conveyance facilities.

b. The ASBS Compliance Plan shall describe the measures by which all non-authorized non-storm water runoff (e.g., dry weather flows) has been eliminated, how these measures will be maintained over time, and how these measures are monitored and documented.

c. For Municipal Separate Storm Sewer System (MS4s), the ASBS Compliance Plan shall require minimum inspection frequencies as follows:

   (1) The minimum inspection frequency for construction sites shall be weekly during rainy season;

   (2) The minimum inspection frequency for industrial facilities shall be monthly during the rainy season;

   (3) The minimum inspection frequency for commercial facilities (e.g., restaurants) shall be twice during the rainy season; and

   (4) Storm water outfall drains equal to or greater than 18 inches (457 mm) in diameter or width shall be inspected once prior to the beginning of the rainy season and once during the rainy season and maintained to remove trash and other anthropogenic debris.

d. The ASBS Compliance Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff, that are necessary to comply with these special conditions, will be achieved through BMPs. Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that such installation would pose a threat to health or safety. BMPs to control storm water runoff discharges (at the end-of-pipe) during a design storm shall be designed to achieve on average the following target levels:

   (1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

   (2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges. The baseline for the reduction is the effective date of the Exception. The

baseline for these determinations is the effective date of the Exception, and the reductions must be achieved and documented within four (4) years of the effective date.

e. The ASBS Compliance Plan shall address erosion control and the prevention of anthropogenic sedimentation in ASBS. The natural habitat conditions in the ASBS shall not be altered as a result of anthropogenic sedimentation.

f. The ASBS Compliance Plan shall describe the non-structural BMPs currently employed and planned in the future (including those for construction activities), and include an implementation schedule. The ASBS Compliance Plan shall include non-structural BMPs that address public education and outreach. Education and outreach efforts must adequately inform the public that direct discharges of pollutants from private property not entering an MS4 are effectively prohibited. The ASBS Compliance Plan shall also describe the structural BMPs, including any low impact development (LID) measures, currently employed and planned for higher threat discharges and include an implementation schedule. To control storm water runoff discharges (at the end-of-pipe) during a design storm, permittees must first consider using LID practices to infiltrate, use, or evapotranspirate storm water runoff on-site.

g. The BMPs and implementation schedule shall be designed to ensure that natural water quality conditions in the receiving water are achieved and maintained by either reducing flows from impervious surfaces or reducing pollutant loading, or some combination thereof.

h. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents in storm water runoff that alter natural ocean water quality and the sources of these constituents.

(2) The report shall describe BMPs that are currently being implemented, BMPs that are identified in the SWMP or SWPPP for future implementation, and any additional BMPs that may be added to the SWMP or SWPPP to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the BMPs.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits), the discharger shall revise its ASBS Compliance Plan to incorporate any new or modified BMPs that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised SWMP or SWPPP, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural ocean water quality conditions due to the same constituent.

(5) Compliance with this section does not excuse violations of any term, effective prohibition, or condition contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within one year from the effective date of the Exception, the discharger shall submit a written ASBS Compliance Plan to the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that describes its strategy to comply with these special conditions, including the requirement to maintain natural water quality in the affected ASBS. The ASBS Compliance Plan shall include a time schedule to implement appropriate non-structural and structural controls (implementation schedule) to comply with these special conditions for inclusion in the discharger's SWMP or SWPPP, as appropriate to permit type.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these special conditions shall be implemented.

d. Within four (4) years of the effective date of the Exception, any structural controls identified in the ASBS Compliance Plan that are necessary to comply with these special conditions shall be operational.

e. Within four (4) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water, pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data, and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

(1) for municipalities, a demonstration of significant hardship to discharger ratepayers, by showing the relationship of storm water fees to annual household income for residents within the discharger's jurisdictional area, and the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or
(2) for other governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process.

B. NONPOINT SOURCE DISCHARGES

[NOT INCLUDED]
[PROVISIONS FOR NONPOINT SOURCE DISCHARGES NOT APPLICABLE]

II. ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES

[NOT INCLUDED]
[ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES NOT APPLICABLE]

III. ADDITIONAL REQUIREMENTS – WATERFRONT AND MARINE OPERATIONS

[NOT INCLUDED]
[ADDITIONAL REQUIREMENTS FOR WATERFRONT AND MARINE OPERATIONS NOT APPLICABLE]

IV. MONITORING REQUIREMENTS

Monitoring is mandatory for all dischargers to assure compliance with the Ocean Plan. Monitoring requirements include both: (A) core discharge monitoring, and (B) ocean receiving water monitoring. The State and Regional Water Boards must approve sampling site locations and any adjustments to the monitoring programs. All ocean receiving water and reference area monitoring must be comparable with the Water Boards' Surface Water Ambient Monitoring Program (SWAMP).

Safety concerns: Sample locations and sampling periods must be determined considering safety issues. Sampling may be postponed upon notification to the State and Regional Water Boards if hazardous conditions prevail.

Analytical Chemistry Methods: All constituents must be analyzed using the lowest minimum detection limits comparable to the Ocean Plan water quality objectives. For metal analysis, all samples, including storm water effluent, reference samples, and ocean receiving water samples, must be analyzed by the approved analytical method with the lowest minimum detection limits (currently Inductively Coupled Plasma/Mass Spectrometry) described in the Ocean Plan.

A. CORE DISCHARGE MONITORING PROGRAM

1. General sampling requirements for timing and storm size:

   Runoff must be collected during a storm event that is greater than 0.1 inch and generates runoff, and at least 72 hours from the previously measurable storm event. Runoff samples shall be collected when post-storm receiving water is sampled, and analyzed for the same constituents as receiving water and reference site samples (see section IV B) as described below.

2. Runoff flow measurements

   a. For municipal/industrial storm water outfalls in existence as of December 31, 2007, 18 inches (457mm) or greater in diameter/width (including multiple outfall pipes in combination having a width of 18 inches, runoff flows must be measured or calculated, using a method acceptable to and approved by the State and Regional Water Boards.
   b. This will be reported annually for each precipitation season to the State and Regional Water Boards.

3. Runoff samples – storm events

   a. For outfalls equal to or greater than 18 inches (0.46m) in diameter or width:

      (1) samples of storm water runoff shall be analyzed during the same storm as receiving water samples for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination, ; and

      (2) samples of storm water runoff shall be analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS

      (3) If an applicant has no outfall greater than 36 inches, then storm water runoff from the applicant's largest outfall shall be further analyzed during the same storm as receiving water samples for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates).

   b. For outfalls equal to or greater than 36 inches (0.91m) in diameter or width:

      (1) samples of storm water runoff shall be analyzed during the same storm as receiving water samples for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

      (2) samples of storm water runoff shall be further analyzed during the same storm as receiving water samples for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides

(pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates) and

(3) samples of storm water runoff shall be analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

c. For an applicant not participating in a regional monitoring program [see below in Section IV (B)] in addition to (a.) and (b.) above, a minimum of the two largest outfalls or 20 percent of the larger outfalls, whichever is greater, shall be sampled (flow weighted composite samples) at least three times annually during wet weather (storm event) and analyzed for all Ocean Plan Table A constituents, Table B constituents for marine aquatic life protection (except for toxicity, only chronic toxicity for three species shall be required), DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, and Ocean Plan indicator bacteria. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one (the largest) such discharge shall be sampled annually in each Region.

4. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may reduce or suspend core monitoring once the storm runoff is fully characterized. This determination may be made at any point after the discharge is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

B. OCEAN RECEIVING WATER AND REFERENCE AREA MONITORING PROGRAM

In addition to performing the Core Discharge Monitoring Program in Section II.A above, all applicants having authorized discharges must perform ocean receiving water monitoring. In order to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS, dischargers may choose either (1) an individual monitoring program, or (2) participation in a regional integrated monitoring program.

1. Individual Monitoring Program: The requirements listed below are for those dischargers who elect to perform an individual monitoring program to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within the affected ASBS. In addition to Core Discharge Monitoring, the following additional monitoring requirements shall be met:

   a. Three times annually, during wet weather (storm events), the receiving water at the point of discharge from the outfalls described in section (IV)(A)(3)(c) above shall be sampled and analyzed for Ocean Plan Table A constituents, Table B constituents for marine aquatic life, DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, salinity, chronic toxicity (three species), and Ocean Plan indicator bacteria.

      The sample location for the ocean receiving water shall be in the surf zone at the point of discharges; this must be at the same location where storm water runoff is sampled. Receiving water shall be sampled at approximately the same time prior to (pre-storm) and during (or immediately after) the same storm (post storm). Reference water quality shall also be sampled and analyzed for the same constituents pre-storm and post-storm, during the same storms when receiving water is sampled. Reference stations will be

determined by the State Water Board's Division of Water Quality and the applicable Regional Water Board(s).

b. Sediment sampling shall occur at least three times during every five (5) year period. The subtidal sediment (sand or finer, if present) at the discharge shall be sampled and analyzed for Ocean Plan Table B constituents for marine aquatic life, DDT, PCBs, PAHs, pyrethroids, and OP pesticides. For sediment toxicity testing, only an acute toxicity test using the amphipod Eohaustorius estuarius must be performed.

c. A quantitative survey of intertidal benthic marine life shall be performed at the discharge and at a reference site. The survey shall be performed at least once every five (5) year period. The survey design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The results of the survey shall be completed and submitted to the State Water Board and Regional Water Board at least six months prior to the end of the permit cycle.

d. Once during each five (5) year period, a bioaccumulation study shall be conducted to determine the concentrations of metals and synthetic organic pollutants at representative discharge sites and at representative reference sites. The study design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The bioaccumulation study may include California mussels (Mytilus californianus) and/or sand crabs (Emerita analoga or Blepharipoda occidentalis). Based on the study results, the Regional Water Board and the State Water Board's Division of Water Quality, may adjust the study design in subsequent permits, or add or modify additional test organisms (such as shore crabs or fish), or modify the study design appropriate for the area and best available sensitive measures of contaminant exposure.

e. Marine Debris: Representative quantitative observations for trash by type and source shall be performed along the coast of the ASBS within the influence of the discharger's outfalls. The design, including locations and frequency, of the marine debris observations is subject to approval by the Regional Water Board and State Water Board's Division of Water Quality.

f. The monitoring requirements of the Individual Monitoring Program in this section are minimum requirements. After a minimum of one (1) year of continuous water quality monitoring of the discharges and ocean receiving waters, the Executive Director of the State Water Board (statewide permits) or Executive officer of the Regional Water Board (Regional Water Board permits) may require additional monitoring, or adjust, reduce or suspend receiving water and reference station monitoring. This determination may be made at any point after the discharge and receiving water is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

2. Regional Integrated Monitoring Program: Dischargers may elect to participate in a regional integrated monitoring program, in lieu of an individual monitoring program, to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS. This regional approach shall characterize natural water quality, pre- and post-storm, in ocean reference areas near the mouths of identified open space watersheds and the effects of the discharges on natural water quality (physical, chemical, and toxicity) in the ASBS receiving waters, and should include benthic marine aquatic life and bioaccumulation components. The design of the ASBS stratum of a regional integrated monitoring program may deviate from the otherwise prescribed individual

monitoring approach (in Section IV.B.1) if approved by the State Water Board's Division of Water Quality and the Regional Water Boards.

a. Ocean reference areas shall be located at the drainages of flowing watersheds with minimal development (in no instance more than 10% development), and shall not be located in CWA Section 303(d) listed waterbodies or have tributaries that are 303(d) listed. Reference areas shall be free of wastewater discharges and anthropogenic non-storm water runoff. A minimum of low threat storm runoff discharges (e.g. stream highway overpasses and campgrounds) may be allowed on a case-by-case basis. Reference areas shall be located in the same region as the ASBS receiving water monitoring occurs. The reference areas for each Region are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean reference water samples must be collected from each station, each from a separate storm. A minimum of one reference location shall be sampled for each ASBS receiving water site sampled per responsible party. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

b. ASBS ocean receiving water must be sampled in the surf zone at the location where the runoff makes contact with ocean water (i.e. at "point zero"). Ocean receiving water stations must be representative of worst-case discharge conditions (i.e. co-located at a large drain greater than 36 inches, or if drains greater than 36 inches are not present in the ASBS then the largest drain greater than18 inches.) Ocean receiving water stations are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean receiving water samples must be collected during each storm season from each station, each from a separate storm. A minimum of one receiving water location shall be sampled in each ASBS per responsible party in that ASBS. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

c. Reference and receiving water sampling shall commence during the first full storm season following the adoption of these special conditions, and post-storm samples shall be collected when annual storm water runoff is sampled. Sampling shall occur in a minimum of two storm seasons. For those ASBS dischargers that have already participated in the Southern California Bight 2008 ASBS regional monitoring effort, sampling may be limited to only one storm season.

d. Receiving water and reference samples shall be analyzed for the same constituents as storm water runoff samples. At a minimum, constituents to be sampled and analyzed in reference and discharge receiving waters must include oil and grease, total suspended solids, Ocean Plan Table B metals for protection of marine life, Ocean Plan PAHs, pyrethroids, OP pesticides, ammonia, nitrate, phosphates, and critical life stage chronic toxicity for three species. In addition, within the range of the southern sea otter, indicator bacteria or some other measure of fecal contamination shall be analyzed.

3. Waterfront and Marine Operations: In addition to the above requirements for ocean receiving water monitoring, additional monitoring must be performed for marinas and boat launch and pier facilities:

a. For all marina or mooring field operators, in mooring fields with 10 or more occupied moorings, the ocean receiving water must be sampled for Ocean Plan indicator bacteria, residual chlorine, copper, zinc, grease and oil, methylene blue active substances (MBAS), and ammonia nitrogen.

   (1) For mooring field operators opting for an individual monitoring program (Section IV.B.1 above), this sampling must occur weekly (on the weekend) from May through October.

   (2) For mooring field operators opting to participate in a regional integrated monitoring program (Section IV.B.2 above), this sampling must occur monthly from May through October on a high use weekend in each month. The Water Boards may allow a reduction in the frequency of sampling, through the regional monitoring program, after the first year of monitoring.

b. For all mooring field operators, the subtidal sediment (sand or finer, if present) within mooring fields and below piers shall be sampled and analyzed for Ocean Plan Table B metals (for marine aquatic life beneficial use), acute toxicity, PAHs, and tributyltin. For sediment toxicity testing, only an acute toxicity test using the amphipod Eohaustorius estuarius must be performed. This sampling shall occur at least three times during a five (5) year period. For mooring field operators opting to participate in a regional integrated monitoring program, the Water Boards may allow a reduction in the frequency of sampling after the first sampling effort's results are assessed.

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ATTACHMENT B

STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

1. Standard Permit Provisions

Code of Federal Regulations Title 40 Section 122.41 (40 CFR 122.41) includes conditions, or provisions, that apply to all National Pollutant Discharge Elimination System (NPDES) permits. Additional provisions applicable to NPDES permits are in 40 CFR 122.42. All applicable provisions in 40 CFR 122.41 and 40 CFR 122.42 must be incorporated into this Order and NPDES permit. The applicable 40 CFR 122.41 and 40 CFR 122.42 provisions are as follows:

a. DUTY TO COMPLY [40 CFR 122.41(a)]

The Copermittee must comply with all of the provisions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

(1) The Copermittee must comply with effluent standards or effective prohibitions established under Section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or effective prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement. [40 CFR 122.41(a)(1)]

(2) The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to a civil penalty not to exceed $25,000 per day for each violation. The CWA provides that any person who *negligently* violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than 2 years, or both. Any person who *knowingly* violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both. Any person who knowingly violates Section 301, 302, 303, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, and who knows at that time that he thereby places another person in imminent danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of

not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.
[40 CFR 122.41(a)(2)]

(3) Any person may be assessed an administrative penalty by the San Diego Regional Water Quality Control Board (San Diego Water Board), State Water Resources Control Board (State Water Board), or United States Environmental Protection Agency (USEPA) for violating Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.
[40 CFR 122.41(a)(3)]

b. DUTY TO REAPPLY [40 CFR 122.41(b)]

If a Copermittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Copermittee must apply for and obtain a new permit.

c. NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE [40 CFR 122.41(c)]

It shall not be a defense for a Copermittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

d. DUTY TO MITIGATE [40 CFR 122.41(d)]

The Copermittee must take all reasonable steps to minimize or prevent any discharge or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

e. PROPER OPERATION AND MAINTENANCE [40 CFR 122.41(e)]

The Copermittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Copermittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by a Copermittee only when the operation is necessary to achieve compliance with the conditions of this permit.

f. PERMIT ACTIONS [40 CFR 122.41(f)]

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Copermittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

g. PROPERTY RIGHTS [40 CFR 122.41(g)]

This permit does not convey any property rights of any sort, or any exclusive privilege.

h. DUTY TO PROVIDE INFORMATION [40 CFR 122.41(h)]

The Copermittee must furnish to the San Diego Water Board, State Water Board, or USEPA within a reasonable time, any information which the San Diego Water Board, State Water Board, or USPEA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Copermittee must also furnish to the San Diego Water Board, State Water Board, or USPEA upon request, copies of records required to be kept by this permit.

i. INSPECTION AND ENTRY [40 CFR 122.41(i)]

The Copermittee must allow the San Diego Water Board, State Water Board, USEPA, and/or their authorized representative (including an authorized contractor acting as their representative), upon presentation of credentials and other documents as may be required by law, to:

(1) Enter upon the Copermittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit; [40 CFR 122.41(i)(1)]

(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit; [40 CFR 122.41(i)(2)]

(3) Inspect and photograph at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; [40 CFR 122.41(i)(3)] and

(4) Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location. [40 CFR 122.41(i)(4)]

j. MONITORING AND RECORDS [40 CFR 122.41(j)]

(1) Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity. [40 CFR 122.41(j)(1)]

(2) Except for records of monitoring information required by this permit related to the Copermittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five (5) years (or longer as required by 40 CFR Part 503), the

Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time. [40 CFR 122.41(j)(2)]

(3) Records for monitoring information must include: [40 CFR 122.41(j)(3)]

(a) The date, exact place, and time of sampling or measurements; [40 CFR 122.41(j)(3)(i)]
(b) The individual(s) who performed the sampling or measurements; [40 CFR 122.41(j)(3)(ii)]
(c) The date(s) analyses were performed; [40 CFR 122.41(j)(3)(iii)]
(d) The individual(s) who performed the analyses; [40 CFR 122.41(j)(3)(iv)]
(e) The analytical techniques or methods used; [40 CFR 122.41(j)(3)(v)] and
(f) The results of such analyses. [40 CFR 122.41(j)(3)(vi)]

(4) Monitoring must be conducted according to test procedures under 40 CFR Part 136 unless another method is required under 40 CFR Subchapters N or O. [40 CFR 122.41(j)(4)]

In the case of pollutants for which there are no approved methods under 40 CFR Part 136 or otherwise required under 40 CFR Subchapters N and O, monitoring must be conducted according to a test procedure specified in the permit for such pollutants. [40 CFR 122.44(i)(1)(iv)]

(5) The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. [40 CFR 122.41(j)(5)]

k. SIGNATORY REQUIREMENT [40 CFR 122.41(k)]

(1) All applications, reports, or information submitted to the San Diego Water Board, State Water Board, or USEPA must be signed and certified. (See 40 CFR 122.22) [40 CFR 122.41(k)(1)]

(a) *For a municipality, State, Federal, or other public agency.* [All applications must be signed] [b]y either a principal executive officer or ranking elected official. [40 CFR 122.22(a)(3)]

(b) All reports required by permits, and other information requested by the San Diego Water Board, State Water Board, or USEPA must be signed by a person described in paragraph (a) of this section, or by a duly authorized representative of that person. A person is a duly authorized representative only if: [40 CFR 122.22(b)]

(i) The authorization is made in writing by a person described in paragraph (a) of this section; [40 CFR 122.22(b)(1)]

(ii) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company, (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) [40 CFR 122.22(b)(2)] and,

(iii) The written authorization is submitted to the San Diego Water Board and State Water Board. [40 CFR 122.22(b)(3)]

(c) *Changes to authorization.* If an authorization under paragraph (b) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (b) of this section must be submitted to the San Diego Water Board prior to or together with any reports, information, or applications to be signed by an authorized representative. [40 CFR 122.22(c)]

(d) *Certification.* Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." [40 CFR 122.22(d)]

(2) The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both. [40 CFR 122.41(k)(2)]

I. REPORTING REQUIREMENTS [40 CFR 122.41(l)]

(1) *Planned changes.* The Copermittee must give notice to the San Diego Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when: [40 CFR 122.41(l)(1)]

(a) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); [40 CFR 122.41(l)(1)(i)] or

(b) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which

are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1).
[40 CFR 122.41(l)(1)(ii)]

(c) The alteration or addition results in a significant change in the Copermittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. [40 CFR 122.41(l)(1)(iii)]

(2) *Anticipated noncompliance*. The Copermittee must give advance notice to the San Diego Water Board or State Water Board of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.
[40 CFR 122.41(l)(2)]

(3) *Transfers*. This permit is not transferable to any person except after notice to the San Diego Water Board. The San Diego Water Board may require modification or revocation and reissuance of the permit to change the name of the Copermittee and incorporate such other requirements as may be necessary under the CWA.
[40 CFR 122.41(l)(3)]

(4) *Monitoring reports.* Monitoring results must be reported at the intervals specified elsewhere in this permit. [40 CFR 122.41(l)(4)]

(a) Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the San Diego Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices. [40 CFR 122.41(l)(4)(i)]

(b) If the Copermittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or another method required for an industry-specific waste stream under 40 CFR Subchapters N or O, the results of this monitoring must be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the San Diego Water Board or State Water Board.
[40 CFR 122.41(l)(4)(ii)]

(c) Calculations for all limitations which require averaging of measurements must utilize an arithmetic mean unless otherwise specified in the permit.
[40 CFR 122.41(l)(4)(iii)]

(5) *Compliance schedules*. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date. [40 CFR 122.41(l)(5)]

(6) *Twenty-four hour reporting.*

(a) The Copermittee must report any noncompliance that may endanger health or the environment. Any information must be provided orally within 24 hours from the time the Copermittee becomes aware of the circumstances. A written submission must also be provided within five (5) days of the time the Copermittee becomes aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6)(i)]

(b) The following must be included as information which must be reported within 24 hours under this paragraph: [40 CFR 122.41(l)(6)(ii)]

(i) Any unanticipated bypass that exceeds any effluent limitation in the permit (See 40 CFR 122.41(g)). [40 CFR 122.41(l)(6)(ii)(A)]

(ii) Any upset which exceeds any effluent limitation in the permit. [40 CFR 122.41(l)(6)(ii)(B)] and,

(iii) Violation of a maximum daily discharge limitation for any of the pollutants listed by the San Diego Water Board in the permit to be reported within 24 hours. (See 40 CFR 122.44(g)) [40 CFR 122.41(l)(6)(ii)(C)]

(c) The San Diego Water Board may waive the above-required written report on a case-by-case basis if the oral report has been received within 24 hours. [40 CFR 122.41(l)(6)(iii)]

(7) *Other noncompliance.* The Copermittee must report all instances of noncompliance not reported in accordance with the standard provisions required under 40 CFR 122.41(l)(4), (5), and (6), at the time monitoring reports are submitted. The reports must contain the information listed in the standard provisions required under 40 CFR 122.41(l)(6). [40 CFR 122.41(l)(7))]

(8) *Other information.* When the Copermittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the San Diego Water Board, State Water Board, or USEPA, the Copermittee must promptly submit such facts or information. [40 CFR 122.41(l)(8)]

~~**m. BYPASS** [40 CFR 122.41(m)]~~

~~(1) *Definitions.*~~

~~(a) "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. [40 CFR 122.41(m)(1)(i)] or~~

~~(b) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be~~

Comment [A126]: While this is a standard condition for NPDES permits, it is manifestly inapplicable to MS4 permits. Since BMPs constructed to comply with the Order include bypass provisions to protect their entirety, the Copermittees would have to notify the Regional Board whenever a storm was predicted. This provision should be deleted.

~~expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.~~
~~[40 CFR 122.41(m)(1)(ii)]~~

~~(2) *Bypass not exceeding limitations*. The Copermittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the standard provisions required under 40 CFR 122.41(m)(3) and (4).~~
~~[40 CFR 122.41(m)(2)]~~

~~(3) *Notice*.~~

~~(a) *Anticipated bypass*. If the Copermittee knows in advance of the need for a bypass, it must submit a notice, if possible at least ten days before the date of the bypass. [40 CFR 122.41(m)(3)(i)] or~~

~~(b) *Unanticipated bypass*. The Copermittee must submit notice of an unanticipated bypass in accordance with the standard provisions required under 40 CFR 122.41(l)(6) (24 hour notice).~~
~~[40 CFR 122.41(m)(3)(ii)]~~

~~(4) *Prohibition of Bypass*.~~

~~(a) Bypass is prohibited, and the San Diego Water Board may take enforcement action against a Copermittee for bypass, unless:~~
~~[40 CFR 122.41(m)(4)(i)]~~

~~(i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; [40 CFR 122.41(m)(4)(i)(A)]~~
~~(ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance;~~
~~[40 CFR 122.41(m)(4)(i)(B)] and,~~
~~(iii) The Copermittee submitted notice in accordance with the standard provisions required under 40 CFR 122.41(m)(3).~~
~~[40 CFR 122.41(m)(4)(i)(C)]~~

~~(b) The San Diego Water Board may approve an anticipated bypass, after considering its adverse effects, if the San Diego Water Board determines that it will meet the three conditions listed above.~~
~~[40 CFR 122.41(m)(4)(ii)]~~

~~n.~~m. **UPSET** [40 CFR 122.41(n)]

(1) *Definition.* "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Copermittee. An upset does not

include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. [40 CFR 122.41(n)(1)]

(2) *Effect of an upset*. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the standard provisions required under 40 CFR 122.41(n)(3) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. [40 CFR 122.41(n)(2)]

(3) *Conditions necessary for a demonstration of upset*. A Copermittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that: [40 CFR 122.41(n)(3)]

(a) An upset occurred and that the Copermittee can identify the cause(s) of the upset; [40 CFR 122.41(n)(3)(i)]
(b) The permitted facility was at the time being properly operated; [40 CFR 122.41(n)(3)(ii)] and
(c) The Copermittee submitted notice of the upset in accordance with the standard provisions required under 40 CFR 122.41(l)(6)(ii)(B) (24-hour notice). [40 CFR 122.41(n)(3)(iii)]
(d) The Copermittee complied with any remedial measures pursuant to the standard provisions required under 40 CFR 122.41(d). [40 CFR 122.41(n)(3)(iii)]

(4) *Burden of proof*. In any enforcement proceeding, the Copermittee seeking to establish the occurrence of an upset has the burden of proof. [40 CFR 122.41(n)(4)]

~~o.~~n. STANDARD PERMIT PROVISIONS FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS

[40 CFR 122.42(c)]

The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the San Diego Water Board or State Water Board under 40 CFR 122.26(a)(1)(v) must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report must include:

(1) The status of implementing the components of the storm water management program that are established as permit conditions; [40 CFR 122.42(c)(1)]

(2) Proposed changes to the storm water management programs that are established as permit conditions. Such proposed changes must be consistent with 40 CFR 122.26(d)(2)(iii); [40 CFR 122.42(c)(2)] and

(3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under 40 CFR 122.26(d)(2)(iv) and (v); [40 CFR 122.42(c)(3)]

(4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; [40 CFR 122.42(c)(4)]

(5) Annual expenditures and budget for year following each annual report; [40 CFR 122.42(c)(5)]

(6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; [40 CFR 122.42(c)(6)]

(7) Identification of water quality improvements or degradation. [40 CFR 122.42(c)(7)]

~~p.~~o. **STANDARD PERMIT PROVISIONS FOR STORM WATER DISCHARGES** [40 CFR 122.42(d)]

The initial permits for discharges composed entirely of storm water issued pursuant to 40 CFR 122.26(e)(7) must require compliance with the conditions of the permit as expeditiously as practicable, but in no event later than three years after the date of issuance of the permit.

2. General Provisions

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. The general provisions applicable to this Order and NPDES permit are as follows:

a. DISCHARGE OF WASTE IS A PRIVILEGE

No discharge of waste into the waters of the State, whether or not such discharge is made pursuant to waste discharge requirements, shall create a vested right to continue such discharge. All discharges of waste into waters of the State are privileges, not rights. [CWC Section 13263(g)]

b. DURATION OF ORDER AND NPDES PERMIT

(1) *Effective date*. This Order and NPDES permit becomes effective on the 50th day after its adoption provided the USEPA has no objection. If the USEPA objects to its issuance, this Order shall not become effective until such objection is withdrawn. This Order supersedes Order No. R9-2007-0001 upon the effective date of this Order, and supersedes Order Nos. R9-2009-0002 and R9-2010-0016 upon their expiration or earlier notice of coverage.

(2) *Expiration*. This Order and NPDES permit expires five years after its effective date. [40 CFR 122.46(a)]

(3) *Continuation of expired order*. After this Order and NPDES permit expires, the terms and conditions of this Order and NPDES permit are automatically continued pending issuance of a new permit if all requirements of the federal NPDES regulations on the continuation of expired permits (40 CFR 122.6) are complied with.

c. AVAILABILITY

A copy of this Order must be kept at a readily accessible location and must be available to on-site personnel at all times.

d. CONFIDENTIALITY OF INFORMATION

Except as provided for in 40 CFR 122.7, no information or documents submitted in accordance with or in application for this Order will be considered confidential, and all such information and documents shall be available for review by the public at the San Diego Water Board office.

Claims of confidentiality for the following information will be denied:
[40 CFR 122.7(b)]

(1) The name and address of any permit applicant or Copermittee;
[40 CFR 122.7(b)(1)] and

(2) Permit applications and attachments, permits, and effluent data.
[40 CFR 122.7(b)(2)]

e. EFFLUENT LIMITATIONS

(1) *Interim effluent limitations*. The Copermittee must comply with any interim effluent limitations as established by addendum, enforcement action, or revised waste discharge requirements which have been, or may be, adopted by the San Diego Water Board.

(2) *Other effluent limitations and standards*. If any applicable toxic effluent standard or effective prohibition (including any schedule of compliance specified in such effluent standard or effective prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant and that standard or effective prohibition is more stringent than any limitation on the pollutant in the permit, the San Diego Water Board shall institute proceedings under these regulations to modify or revoke and reissue the permit to conform to the toxic effluent standard or effective prohibition. [40 CFR 122.44(b)(1~~)]~~)]. ~~)]~~

f. DUTY TO MINIMIZE OR CORRECT ADVERSE IMPACTS

The Copermittee must take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this Order, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the noncompliance.

g. PERMIT ACTIONS

The filing of a request by the Copermittee for modification, revocation and reissuance, or termination of this Order, or a notification of planned change in or anticipated

noncompliance with this Order does not stay any condition of this Order. (See 40 CFR 122.41(f)) In addition, the following provisions apply to this Order:

(1) Upon application by any affected person, or on its own motion, the San Diego Water Board may review and revise the requirements in this Order. All requirements must be reviewed periodically. [CWC Section 13263(e)]

(2) This Order may be terminated or modified for cause, including, but not limited to, all of the following: [CWC Section 13381]

(a) Violation of any condition contained in the requirements of this Order. [CWC Section 13381(a)]

(b) Obtaining the requirements in this Order by misrepresentation, or failure to disclose fully all relevant facts. [CWC Section 13381(b)]

(c) A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge. [CWC Section 13381(c)]

(3) When this Order is transferred to a new owner or operator, such requirements as may be necessary under the CWC may be incorporated into this Order.

h. NPDES PERMITTED NON-STORM WATER DISCHARGES

The San Diego Water Board has, in prior years, issued a limited number of individual NPDES permits for non-storm water discharges to MS4s. The San Diego Water Board or State Water Board may in the future, upon prior notice to the Copermittee(s), issue an NPDES permit for any non-storm water discharge (or class of non-storm water discharges) to an MS4. A Copermittee will not be held responsible for pollutants in its MS4 discharge originating from an NPDES-permitted non-storm water discharge.

Comment [A127]: This comment reflects the appropriate responsibility between NPDES dischargers.

i. MONITORING

In addition to the standard provisions required under 40 CFR 122.41(j) and (l)(4), the following general monitoring provisions apply to this Order:

(1) Where procedures are not otherwise specified in Order, sampling, analysis and quality assurance/quality control must be conducted in accordance with the Quality Assurance Management Plan (QAMP) for the State of California's Surface Water Ambient Monitoring Program (SWAMP), adopted by the State Water Resources Control Board (State Water Board).

(2) Pursuant to 40 CFR 122.41(j)(2) and CWC Section 13383(a), each Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five (5) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time.

Comment [A128]: This provision and the provision in Attachment B 1.j(2) conflict. The Water Board should reconcile these provisions or delete one.

(3) All chemical, bacteriological, and toxicity analyses must be conducted at a laboratory certified for such analyses by the California Department of Public Health or a laboratory approved by the San Diego Water Board.

(4) For priority toxic pollutants that are identified in the California Toxics Rule (CTR) (65 Fed. Reg. 31682), the Copermittees must instruct their laboratories to establish calibration standards that are equivalent to or lower than the Minimum Levels (MLs) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP). If a Copermittee can demonstrate that a particular ML is not attainable, in accordance with procedures set forth in 40 CFR Part 136, the lowest quantifiable concentration of the lowest calibration standard analyzed by a specific analytical procedure (assuming that all the method specified sample weights, volumes, and processing steps have been followed) may be used instead of the ML listed in Appendix 4 of the SIP. The Copermittee must submit documentation from the laboratory to the San Diego Water Board for approval prior to raising the ML for any priority toxic pollutant.

j. ENFORCEMENT

(1) The San Diego Water Board is authorized to enforce the terms of this Order under several provisions of the CWC, including, but not limited to, CWC Sections 13385, 13386, and 13387.

(2) Nothing in this Order shall be construed to protect the Copermittee from its liabilities under federal, state, or local laws.

(3) The CWC provides for civil and criminal penalties comparable to, and in some cases greater than, those provided for under the CWA.

(4) Except as provided in the standard conditions required under 40 CFR 122.41(m) and (n), nothing in this Order shall be construed to relieve the Copermittee from civil or criminal penalties for noncompliance.

(5) Nothing in this Order shall be construed to preclude the institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties to which the Copermittee is or may be subject to under Section 311 of the CWA.

(6) Nothing in this Order shall be construed to preclude institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authoring preserved by Section 510 of the CWA.

k. SEVERABILITY

The provisions of this Order are severable, and if any provision of this Order, or the application of any provisions of this Order to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this Order shall not be affected thereby.

l. APPLICATIONS

Any application submitted by a Copermittee for reissuance or modification of this Order must satisfy all applicable requirements specified in federal regulations as well as any additional requirements for submittal of a Report of Waste Discharge specified in the CWC and the California Code of Regulations.

m. IMPLEMENTATION

All plans, reports and subsequent amendments submitted in compliance with this Order must be implemented immediately (or as otherwise specified). All submittals by Copermittees must be adequate to implement the requirements of this Order.

n. REPORT SUBMITTALS

(1) All report submittals must include an executive summary, introduction, conclusion, recommendations, and signed certified statement.

(2) Each Copermittee must submit a signed certified statement covering its responsibilities for each applicable submittal.

(3) The Principal Watershed Copermittee(s) must submit a signed certified statement covering its responsibilities for each applicable submittal and the sections of the submittals for which it is responsible.

(4) Unless otherwise directed, the Copermittees must submit one hard copy and one electronic copy of each report required under this Order to the San Diego Water Board, and one electronic copy to the USEPA.

(5) The Copermittees must submit reports and provide notifications as required by this Order to the following:

EXECUTIVE OFFICER
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
9174 SKY PARK COURT, SUITE 100
SAN DIEGO CA 92123-4340
Telephone: (858) 467-2952 Fax: (858) 571-6972

EUGENE BROMLEY
US ENVIRONMENTAL PROTECTION AGENCY
REGION IX
PERMITS ISSUANCE SECTION (W-5-1)
75 HAWTHORNE STREET
SAN FRANCISCO CA 94105

ATTACHMENT C

ACRONYMS AND ABBREVIATIONS

AMAL	Average Monthly Action Level
ASBS	Area(s) of Special Biological Significance
BMP	Best Management Practice
Basin Plan	Water Quality Control Plan for the San Diego Basin
CEQA	California Environmental Quality Act
CCR	California Code of Regulations
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWC	California Water Code
CZARA	Coastal Zone Act Reauthorization Amendments of 1990
ESAs	Environmentally Sensitive Areas
GIS	Geographic Information System
IBI	Index of Biological Integrity
LID	Low Impact Development
MDAL	Maximum Daily Action Level
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
NAL	Non-Storm Water Action Level
NAICS	North American Industry Classification System
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
ROWD	Report of Waste Discharge (application for NPDES reissuance)
SAL	Storm Water Action Level
San Diego Water Board	California Regional Water Quality Control Board, San Diego Region
SIC	Standard Industrial Classification Code
State Water Board	State Water Resources Control Board
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
WDID	Waste Discharge Identification Number
WLA	Waste Load Allocation
WQBEL	Water Quality Based Effluent Limitation

DEFINITIONS

Active/Passive Sediment Treatment - Using mechanical, electrical or chemical means to flocculate or coagulate suspended sediment for removal from runoff from construction sites prior to discharge.

Anthropogenic Litter – Trash generated from human activities, not including sediment.

Automotive Repair Shop – a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539 or equivalent NAICS code.

Average Monthly Action Level – The highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month, or the geometric mean for bacteria, as applicable.

Beneficial Uses - The uses of water necessary for the survival or wellbeing of man, plants, and wildlife. These uses of water serve to promote tangible and intangible economic, social, and environmental goals. "Beneficial Uses" ~~of the waters of the State~~ that may be protected include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. Existing beneficial uses are uses that were attained in the surface or ground water on or after November 28, 1975; and potential beneficial uses are uses that would probably develop in future years through the implementation of various control measures. "Beneficial Uses" are equivalent to "Designated Uses" under federal law. [California Water Code Section 13050(f)].

Best Management Practices (BMPs) - Defined in 40 CFR 122.2 as schedules of activities, effective prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. In the case of municipal discharge permits, BMPs may be used in the place of numeric effluent limits.

Bioassessment - The use of biological community information to evaluate the biological integrity of a water body and its watershed. With respect to aquatic ecosystems, bioassessment is the collection and analysis of samples of the benthic macroinvertebrate community together with physical/habitat quality measurements associated with the sampling site and the watershed to evaluate the biological condition (i.e. biotic integrity) of a water body.

Biofiltration - Practices that use vegetation and amended soils to detain and treat runoff from impervious areas. Treatment is through filtration, infiltration, adsorption, ion exchange, and biological uptake of pollutants.

Biological Integrity - Defined in Karr J.R. and D.R. Dudley. 1981. Ecological perspective on water quality goals. *Environmental Management* 5:55-68 as: "A balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitat of the region." Also referred to as ecosystem health.

BMP Design Manual – A plan developed to eliminate, reduce, or mitigate the impacts of runoff from development projects, including Priority Development Projects.

Channel Rehabilitation and Improvement – Remedial measures or activities for the purpose of improving or restoring the environmental health of streams, channels or river systems. Techniques may vary from in-stream restoration techniques to off-line stormwater management practices installed in the system corridor or upland areas. Rehabilitation techniques may include, but are not limited to the following: riparian zone restoration, constructed wetlands, bank stabilization, channel modifications, and day lighting of drainage systems.

Comment [A129]: This term should be defined in Attachment C given its use in the Order.

Clean Water Act Section 303(d) Water Body - An impaired water body in which water quality does not meet applicable water quality standards and/or is not expected to meet water quality standards, even after the application of technology based pollution controls required by the CWA. The discharge of runoff to these water bodies by the Copermittees is significant because these discharges can cause or contribute to violations of applicable water quality standards.

Construction Site – Any project, including projects requiring coverage under the Construction General Permit, that involves soil disturbing activities greater than 10,000 square feet including, but not limited to, clearing, grading, disturbances to ground such as stockpiling, and excavation. This does not include interior construction activities such as interior remodeling, plumbing, electrical, or mechanical work.

Contamination - As defined in the Porter-Cologne Water Quality Control Act, contamination is "an impairment of the quality of waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste whether or not waters of the State are affected."

Copermittee – An incorporated city within the County of Orange, County of Riverside, or County of San Diego in the San Diego Region~~,~~ (Region 9),~~,~~ the County of Orange, the County of Riverside, the County of San Diego, the Orange County Flood Control District, the Riverside County Water Conservation and Flood Control District, the San Diego Regional Airport Authority, or the San Diego Unified Port District. See also "Municipal Copermittee" and "Special District Copermittee".

Comment [A130]: As set forth above, the Riverside County Copermittees make a distinction in these classes of Copermittees based on their respective legal authorities.

Copermittees – All of the individual Copermittees, collectively, unless the obligation in question is directed to one or a sub-group of Copermittees.

Comment [A131]: This clarifies that not all obligations in the Order directed to "Copermittees" are in fact applicable to all Copermittees.

Critical Channel Flow (Qc) – The channel flow that produces the critical shear stress that initiates bed movement or that erodes the toe of channel banks. When measuring Qc, it should be based on the weakest boundary material – either bed or bank.

Daily Discharge – Defined as either: (1) the total mass of the constituent discharged over the calendar day or any 24 hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g. concentration.)

The Daily Discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day, or other 24 hour period other than a day), or by the arithmetic mean of analytical results from one or more grab samples taken over the course of a

day.

Development Projects - Construction, rehabilitation, redevelopment, or reconstruction of any public or private residential project, industrial~~,~~ or commercial facility, or any other projects designed for post-construction human activity or occupation and involving land disturbance activities.

Comment [A132]: This definition clarifies the nature of Development Projects covered under the Order.

Direct Discharge to an Environmentally Sensitive Area – refers to outflow from a drainage conveyance system that collects runoff from the subject development or redevelopment site and terminates at or in receiving waters within the ESA, and is not commingled with flows from adjacent or other upstream lands.

Dry Season –May 1 to September 30.

Dry Weather – Weather is considered dry if the preceding 72 hours has been without measurable precipitation (>0.1 inch).

Enclosed Bays – Enclosed bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost bay works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays do not include inland surface waters or ocean waters.

Erosion – When land is diminished or worn away due to wind, water, or glacial ice. Often the eroded debris (silt or sediment) becomes a pollutant via storm water runoff. Erosion occurs naturally but can be intensified by land clearing activities such as farming, development, road building, and timber harvesting. This permit is concerned particularly with non-naturally occurring Erosion that eventually results in a Sediment discharge from MS4s into Receiving Waters.

Environmentally Sensitive Areas (ESAs) - Areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; areas designated as preserves or their equivalent under the Natural Communities Conservation Program within the Cities and County of Orange; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.

Estuaries – Waters, including coastal lagoons, located at the mouth of streams that serve as areas of mixing fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and ocean water. Estuaries do not include inland surface waters or ocean waters.

Existing Development – Any area that has been developed and exists for municipal, commercial, industrial, or residential purposes, uses, or activities. May include areas that are not actively used for its originally developed purpose, but may be re-purposed or redeveloped

for another use or activity.

Flow Duration – The long-term period of time that flows occur above a threshold that causes significant sediment transport and may cause excessive erosion damage to creeks and streams (not a single storm event duration). The simplest way to visualize this is to consider a histogram of pre- and post-project flows using long-term records of hourly data. To maintain pre-development flow duration means that the total number of hours (counts) within each range of flows in a flow-duration histogram cannot increase between the pre- and post-development condition. Flow duration within the range of geomorphologically significant flows is important for managing erosion.

Grading - The cutting and/or filling of the land surface to a desired slope or elevation.

Hazardous Material – Any substance that poses a threat to human health or the environment due to its toxicity, corrosiveness, ignitability, explosive nature or chemical reactivity. These also include materials named by the USEPA in 40 CFR 116 to be reported if a designated quantity of the material is spilled into the waters of the U.S. or emitted into the environment.

Hazardous Waste - Hazardous waste is defined as "any waste which, under Section 600 of Title 22 of this code, is required to be managed according to Chapter 30 of Division 4.5 of Title 22 of this code" [CCR Title 22, Division 4.5, Chapter 11, Article 1].

Household Hazardous Waste – Paints, cleaning products, and other hazardous wastes generated during home improvement or maintenance activities.

Hydromodification – The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

Illicit Connection – Any connection to the MS4 that conveys an illicit discharge.

Illicit Discharge - Any discharge to the MS4 that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from fire fighting activities [40 CFR 122.26(b)(2)]. Discharges from natural sources or from conditionally exempt sources described in this Order are not considered Illicit Discharges.

Inactive Areas – Areas of construction activity that are not active and those that have been active and are not scheduled to be re-disturbed for at least 14 days.

Infiltration – Water other than wastewater that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow [40 CFR 35.2005(20)].

Comment [A133]: Wrong definition. Should be defining infiltration (of stormwater into soil)

Inland Surface Waters – Includes all surface waters of the U.S.~~State~~ that do not include the ocean, enclosed bays, or estuaries.

Jurisdictional Runoff Management Program Document – A written description of the specific jurisdictional runoff management measures and programs that each Copermittee will implement to comply with this Order and ensure that illicit discharges are effectively prohibited, and storm water pollutant discharges in runoff are reduced to the MEP and do not cause or contribute to a violation of water quality standards.

Low Impact Development (LID) – A storm water management and land development strategy that emphasizes conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions.

Low Impact Development Best Management Practices (LID BMPs) – LID BMPs include schedules of activities, effective prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States through storm water management and land development strategies that emphasize conservation ~~s~~and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions. LID BMPs include retention practices that do not allow runoff, such as infiltration, rain water harvesting and reuse, and evapotranspiration. LID BMPs also include flow-through practices such as biofiltration that may have some discharge of storm water following pollutant reduction.

Major Outfall – As defined in the Code of Federal Regulations, a major outfall is a MS4 outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (i.e. discharge from a single conveyance other than a circular pipe which is associated with a drainage area of more than 50 acres); or, for MS4s that receive storm water from lands zoned for industrial activity (based on comprehensive zoning plans or equivalent), a MS4 outfall that discharges from a single pipe with an inside diameter of 12 inches or more or from its equivalent (i.e. discharge from other than a circular pipe associated with a drainage area of 2 acres or more).

Maximum Daily Action Level (MDAL) –The highest allowable daily discharge of a pollutant, over a calendar day (or 24 hour period). For pollutants with action levels expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with action levels expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

Maximum Extent Practicable (MEP) – The technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) ~~for storm water~~ that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) in combination with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than BAT. A definition for MEP is not provided either in the statute or in the regulations. Instead the definition of MEP is dynamic and will be defined by the following process over time: municipalities propose their definition of MEP by way of their runoff management programs. Their total collective and individual activities conducted pursuant to the runoff management programs becomes their proposal for MEP as it applies both to their overall effort, as well as to specific activities (e.g., MEP for street sweeping, or MEP for MS4 maintenance). In the absence of a proposal acceptable to the San Diego Water Board, the San Diego Water Board

defines MEP.

In a memo dated February 11, 1993, entitled "Definition of Maximum Extent Practicable," Elizabeth Jennings, Senior Staff Counsel, SWRCB addressed the achievement of the MEP standard as follows:

> "*To achieve the MEP standard, municipalities must employ whatever Best Management Practices (BMPs) are technically feasible (i.e., are likely to be effective) and are not cost prohibitive. The major emphasis is on technical feasibility. Reducing pollutants to the MEP means choosing effective BMPs, and rejecting applicable BMPs only where other effective BMPs will serve the same purpose, or the BMPs would not be technically feasible, or the cost would be prohibitive. In selecting BMPs to achieve the MEP standard, the following factors may be useful to consider:*
>
> *a. Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?*
> *b. Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?*
> *c. Public Acceptance: Does the BMP have public support?*
> *d. Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?*
> *e. Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc.?*
>
> *The final determination regarding whether a municipality has reduced pollutants to the maximum extent practicable can only be made by the Regional or State Water Boards, and not by the municipal discharger. If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit derived, it would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs that would address a pollutant source, or to pick a BMP based solely on cost, which would be clearly less effective. In selecting BMPs the municipality must make a serious attempt to comply and practical solutions may not be lightly rejected. In any case, the burden would be on the municipal discharger to show compliance with its permit. After selecting a menu of BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented."*

Monitoring Year – October 1 to September 30

Municipal Copermittee – Any Copermittee, exclusive of Special District Copermittees.

Comment [A134]: This definition clarifies distinction between municipal and special district copermittees.

Municipal Separate Storm Sewer System (MS4) – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designated or used for collecting or conveying storm water;

(iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.226. Copermittees need only comply with permit conditions relating to "discharges from the municipal separate storm sewers for which they are operators." 40 CFR 122.26(a)(vi).

Comment [A135]: These changes correct a citation and clarifies the responsibility of the copermittees as to other MS4s.

National Pollutant Discharge Elimination System (NPDES) - The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the CWA.

Non-Storm Water - All discharges to and from a MS4 that do not originate from precipitation events (i.e., all discharges from a MS4 other than storm water). ~~Non-storm water includes illicit discharges and NPDES permitted discharges.~~

Comment [A136]: This is overly limiting, There are other types of Non-storm discharges that do not fit these two categories (e.g. irrigated agriculture, natural flows, conditionally exempt flows, others). Rather than trying to identify all types of non-stormwater discharges, suggest just deleting this sentence.

Nuisance - As defined in the Porter-Cologne Water Quality Control Act, a nuisance is "anything which meets all of the following requirements: 1) Is injurious to health, or is indecent, or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. 2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. 3) Occurs during, or as a result of, the treatment or disposal of wastes."

Ocean Waters – the territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the State Board's California Ocean Plan.

Order – Unless otherwise specified, refers to this Order, Order No. R9-2013-0001 (NPDES No. CAS0109266)

Outfall – *Outfall* means a *point source* as defined by 40 CFR 122.2 at the point where a MS4 discharges to waters of the United States and does not include open conveyances connecting two MS4s, or pipes, tunnels or other conveyances which connect segments of the same stream or other waters of the United States and are used to convey waters of the United. 40 CFR 122.26(b)(9).

Comment [A137]: This federal regulatory definition clarifies the nature of an outfall.

Parking Lot – a land area or facility for the tempraory parking or storage of motor vehicles used personally, for business, or for commerce.

Comment [A138]: Definition placed in Attachment C for consistency.

Persistent Flow - Persistent flow is defined as the presence of an MS4 discharge that is hydraulically connected to a flowing~~, pooled, or ponded~~ receiving water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

Comment [A139]: Changes reflect the necessity of a connection to flowing receiving waters. Discharges that are pooled are not discharges to waters of the United States. Please see Comment Letter section 3.5.3.

Person - A person is defined as an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof [40 CFR 122.2].

Point Source - Any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, landfill leachate collection systems, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return

flows from irrigated agriculture or agricultural storm water runoff.

Pollutant - Any agent that may cause or contribute to the degradation of water quality such that a condition of pollution or contamination is created or aggravated.

Pollution - As defined in the Porter-Cologne Water Quality Control Act, pollution is "the alteration of the quality of the waters of the State by waste, to a degree that unreasonably affects the either of the following: 1) The waters for beneficial uses; or 2) Facilities that serve these beneficial uses." Pollution may include contamination.

Pollution Prevention - Pollution prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control BMPs, treatment control BMPs, or disposal.

Pre-Project~~Development~~ Runoff Conditions – Runoff conditions that exist~~existed~~ onsite immediately before the ~~existing development was constructed, or exists onsite before~~ planned development activities occur. Pre-development is not intended to be interpreted as that period before any human-induced land disturbance has occurred. 64 FR 68761.

Comment [A140]: This definition reflects the exact language used by U.S. EPA in the Federal Register. Moreover, it avoids the constitutional and statutory problems with requiring developers to mitigate for impacts not attributable to their project. It also is consistent with the CEQA standard for project impact mitigation.

Priority Development Projects - New development and redevelopment projects defined under Provision E.3.b of Order No. R9-2012-0011.

Properly Designed – Designed in accordance with the Copermittee's BMP Design Manual and/or any appropriate design requirements set forth by the Copermittee and based on widely accepted design criteria and in accordance with this Order.

Comment [A141]: This definition is required to address this standard, which is mentioned in the Order but not defined.

Rainy Season (aka Wet Season) –October 1 to April 30

Receiving Waters – Waters of the United States.

Receiving Water Limitations - Waste discharge requirements issued by the San Diego Water Board typically include both: (1) "Effluent Limitations" (or "Discharge Limitations") that specify the technology-based or water-quality-based effluent limitations; and (2) "Receiving Water Limitations" that specify the water quality objectives in the Basin Plan as well as any other limitations necessary to attain those objectives. In summary, the "Receiving Water Limitations" provision is the provision used to implement the requirements of CWA section 402(p)(3)(B).

Redevelopment - The creation, addition, and or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include trenching and resurfacing associated with utility work; parking lots; resurfacing existing roadways; cutting and reconfiguring of surface parking lots; new sidewalk construction, pedestrian ramps, or bike lane on existing roads; and routine replacement of damaged pavement, such as pothole repair and emergency restoration and public safety projects.

Comment [A142]: The changes requested in this definition appropriately exempts de minimis or emergency/public safety projects.

Reporting Period – The period of information that is reported in the Annual Report. The reporting period consists of two components: 1) July 1 to June 30, consistent with the fiscal

year, for the implementation of the jurisdictional runoff management programs, and 2) October 1 to September 30, consistent with the monitoring year for the monitoring and assessment programs. Together, these two time periods constitute the reporting year for the Annual Report due January 31 following the end of the monitoring year.

Restaurant – a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812).

Retail gasoline outlet (RGO) – a business that sells automotive or truck fuel to the general public with a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

Retain –Keep or hold in a particular place, condition, or position without discharge to ~~surface~~ Receiving W~~w~~aters.

Retrofitting – Storm water management practices put into place after development has occurred in watersheds where the practices previously did not exist~~.~~ or are ineffective.~~.~~ Retrofitting of developed areas is intended to improve water quality, protect downstream channels, reduce flooding, or meet other specific objectives. Retrofitting developed areas may include, but is not limited to replacing roofs with green roofs, disconnecting downspouts or impervious surfaces to drain to pervious surfaces, replacing impervious surfaces with pervious surfaces, installing rain barrels, installing rain gardens, and trash area enclosures.

Runoff - All flows in a storm water conveyance system that consists of the following components: (1) storm water (wet weather flows) and (2) non-storm water including dry weather flows.

San Diego Water Board – As used in this document the term "San Diego Water Board" is synonymous with the term "Regional Board" as defined in Water Code section 13050(b) and is intended to refer to the California Regional Water Quality Control Board for the San Diego Region as specified in Water Code Section 13200.

Sediment - Soil, sand, and minerals washed from land into water. Sediment resulting from anthropogenic sources (i.e. human induced land disturbance activities) that is discharged into Receiving Waters is considered a pollutant. This Order regulates only the discharges of sediment from anthropogenic sources into Receiving Waters and does not regulate naturally occurring sources of sediment. Sediment can destroy fish-nesting areas, clog animal habitats, and cloud waters so that sunlight does not reach aquatic plants.

Special District Copermittee – A separate legal entity that may own or operate MS4 systems, but has no land use authorities outside of their MS4. The Riverside County Flood Control and Water Conservation District [and Orange County Flood Control District?] is a [are] Special District Copermittee[s].

Source Control BMP – Land use or site planning practices, or structural or nonstructural measures that aim to prevent runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between pollutants and runoff.

Storm Water – Per 40 CFR 122.26(b)(13), means storm water runoff, snowmelt runoff and surface runoff and drainage. ~~Surface runoff and drainage pertains to runoff and drainage resulting from precipitation events.~~

Comment [A143]: Relocation of definition to Attachment C.

Comment [A144]: Definition added for clarity and consistency with prior redlines

Comment [A145]: Edit clarifies intent of definition.

Stream, Channel, or Habitat Rehabilitation – Measures or activities for the purpose of improving or restoring the environmental health (i.e. physical, chemical and biological integrity) of streams, channels, or river systems. Rehabilitation techniques may include, but are not limited to, riparian zone restoration, constructed wetlands, bank stabilization, channel reconfiguration, and daylighting drainage systems.

Street, Road, Highway, Freeway– Any paved impervious surface that is used for the transportation of automobiles, trucks, motorcycles, and other vehicles, with an ADT of at least 100 vehicles per day.

Comment [A146]: Definition relocated to Attachment C.

Comment [A147]: Consistent with RGO definition.

Structural BMPs - A subset of BMPs which detains, retains, filters, removes, or prevents the release of pollutants to surface waters from development projects in perpetuity, after construction of a project is completed.

Total Maximum Daily Load (TMDL) - The maximum amount of a pollutant that can be discharged into a water body from all sources (point and non-point) and still maintain water quality standards. Under CWA section 303(d), TMDLs must be developed for all water bodies that do not meet water quality standards after application of technology-based controls.

Toxicity - Adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies). The water quality objectives for toxicity provided in the Basin Plan, state in part…"All waters shall be free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life….The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge".

Treatment Control BMP – Any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media absorption or any other physical, biological, or chemical process.

Unpaved Road – Any long, narrow stretch without pavement used for traveling by motor passenger vehicles between two or more points. Unpaved roads are generally constructed of dirt, gravel, aggregate or macadam and may be improved or unimproved.

Waste - As defined in CWC Section 13050(d), "waste includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal."

Article 2 of CCR Title 23, Chapter 15 (Chapter 15) contains a waste classification system that applies to solid and semi-solid waste, which cannot be discharged directly or indirectly to water of the state and which therefore must be discharged to land for treatment, storage, or disposal in accordance with Chapter 15. There are four classifications of waste (listed in order of highest to lowest threat to water quality): hazardous waste, designated waste, non-hazardous solid waste, and inert waste.

Water Quality Objective - Numerical or narrative limits on constituents or characteristics of

water designated to protect designated beneficial uses of the water. [California Water Code Section 13050 (h)]. California's water quality objectives are established by the State and Regional Water Boards in the Water Quality Control Plans. Numeric or narrative limits for pollutants or characteristics of water designed to protect the beneficial uses of the water. In other words, a water quality objective is the maximum concentration of a pollutant that can exist in a receiving water and still generally ensure that the beneficial uses of the receiving water remain protected (i.e., not impaired). Since water quality objectives are designed specifically to protect the beneficial uses, when the objectives are violated the beneficial uses are, by definition, no longer protected and become impaired. This is a fundamental concept under the Porter Cologne Act. Equally fundamental is Porter Cologne's definition of pollution. A condition of pollution exists when the water quality needed to support designated beneficial uses has become unreasonably affected or impaired; in other words, when the water quality objectives have been violated. These underlying definitions (regarding beneficial use protection) are the reason why all waste discharge requirements implementing the federal NPDES regulations require compliance with water quality objectives. (Water quality objectives are also called water quality criteria in the CWA.)

Water Quality Standards - Water quality standards, as defined in Clean Water Act section 303(c) consist of the beneficial uses (e.g., swimming, fishing, municipal drinking water supply, etc.,) of a water body and criteria (referred to as water quality objectives in the California Water Code) necessary to protect those uses. Under the Water Code, the water boards establish beneficial uses and water quality objectives in water quality control or basin plans. Together with an anti-degradation policy, these beneficial uses and water quality objectives serve as water quality standards under the Clean Water Act. In Clean Water Act parlance, state beneficial uses are called "designated uses" and state water quality objectives are called "criteria." Throughout this Order, the relevant term is used depending on the statutory scheme.

Waters of the State - Any water, surface or underground, including saline waters within the boundaries of the State [CWC section 13050 (e)]. The definition of the Waters of the State is broader than that for the Waters of the United States in that all water in the State is considered to be a Waters of the State. ~~regardless of circumstances or condition.~~

Comment [A148]: The intent of the definition is to cover natural water sources, and not anthropogenic structures that collect runoff to reduce volume/velocity or pollutants.

Waters of the United States - As defined in the 40 CFR 122.2, the Waters of the U.S. are defined as: "(a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate "wetlands;" (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters otherwise defined as waters of the United States under this definition: (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial seas; and (g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA."

Watershed - That geographical area which drains to a specified point on a water course, usually a confluence of streams or rivers (also known as drainage area, catchment, or river basin).

Wet Season (aka Rainy Season) –October 1 to April 30

Wet Weather – Weather is considered wet if there is a storm event of 0.1 inches and greater and the following 72 hours, unless otherwise defined by the Copermittee for the purposes of monitoring consistent with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), or developed pursuant to another regulatory mechanism.

Comment [A149]: This is important as the monitoring requirements require you to sample the first 'Wet Weather' event. 0.1" of rainfall doesn't result in runoff in all watersheds. Copermittees should be able to define mobilization criteria to identify storms that are likely to produce runoff in that drainage area consistent with this EPA guidance.

LEGAL AND FACT SHEET COMMENTS ON TENTATIVE ORDER R9-2013-0001 MADE ON BEHALF OF THE RIVERSIDE COUNTY COPERMITTEES

This document provides comments on various legal issues raised by Tentative Order No. R9-2013-0001 (the "Draft Permit") and associated attachments, including Attachment F, the Fact Sheet/Technical Report ("Fact Sheet"), and are made on behalf of the Riverside County Flood Control & Water Conservation District ("District"), the County of Riverside and the Cities of Murrieta, Temecula and Wildomar (collectively, the "Riverside County Copermittees").

These legal comments are in addition to the other comments on the Draft Permit and attachments made by the Riverside County Copermittees (including the Comment Letter dated January 10, 2013 and signed by Jason E. Uhley, Chief of the District's Watershed Protection Division) and the redline attachment ("Redline"), as well as any comments or testimony which may be offered at the public hearing(s) on the Draft Permit. The Comment Letter and Redline also discuss legal issues. The Riverside County Copermittees appreciate this opportunity to comment and welcome any questions that Water Board staff may have.

These comments are submitted subject to the same reservations set forth in the Comment Letter regarding the Water Board's lack of authority, in the absence of agreement by the Riverside County Copermittees or the filing of a Report of Waste Discharge ("ROWD"), to issue a regional municipal separate storm sewer system ("MS4") permit to the Riverside County Copermittees. Submission of these comments does not waive this objection.

Request for Additional Public Comment

Before turning to comments on the Draft Permit, the Riverside County Copermittees wish to note that in view of the extensive comments made by them, as well as what we anticipate will be extensive comments by the South Orange County and San Diego County Copermittees, as well as from other stakeholders, it would greatly facilitate the permit adoption process if the Water Board were to release a revised Tentative Order for further review and comment prior to final adoption of the Permit. This will enable the Water Board staff to address the comments in a more orderly fashion and provide all parties with the opportunity to see how staff proposes to incorporate the comments in the Draft Permit.

Comments on Findings

Finding 2 and Fact Sheet Section VII.B: This finding recites that the Water Board "has the legal authority to issue a regional MS4 permit pursuant to its authority under Clean Water Act ("CWA") section 402(p)(3)(B) and 40 CFR 122.26(a)(i)(v)." Section VII.B of the Fact Sheet provides a more detailed rationale for this finding (at pages F-22-23).

The Riverside County Copermittees respectfully disagree with this finding and the analysis provided in the Fact Sheet. We do not believe that a regional MS4 permit is authorized under the CWA or the implementing regulations, absent agreement by the copermittees to be bound by such a MS4 permit (as is the case with the Bay Area MS4 permit covering discharges into the Bay).

The CWA itself does not explicitly authorize MS4 permits that, like the Draft Permit, cross county lines. CWA section 402(p)(3)(B) provides only that "[p]ermits for discharges from municipal storm sewers . . . may be issued on a system- or jurisdiction-wide basis." This language, contrary to the conclusion in Finding 2, indicates that a multi-county permit, covering several distinct non-interconnected municipal stormwater "systems" in multiple watersheds with multiple receiving waters, is not one issued on a "system-wide" basis and that an MS4 permit covering multiple jurisdictions in three different counties is not one issued on a "jurisdiction-wide basis." Because neither "system-wide" nor "jurisdiction-wide" are defined in the CWA, however, the CWA regulations must also be reviewed.

The regulatory provision cited in Finding 2, 40 CFR § 122.26(a)(1)(v), does not add clarity, since it merely repeats the "system-wide" and "jurisdiction-wide" language of the Act and the regulations define neither term. The regulations do, however, suggest that "system-wide" is not intended to cover multiple large MS4s in different jurisdictions. The regulations, at 40 CFR § 122.26(a)(1)(v) state that in making the determination to designate a system-wide or jurisdiction-wide basis" the permitting authority should consider the location of the "discharge" with respect to waters of the United States, the size of the discharge, the quantity and nature of the pollutants discharge and other relevant factors.

The Draft Permit covers multiple "discharges" into receiving waters located in three separate counties and the size, quality and nature of the discharges vary widely, due to varying hydrologic and climatic conditions in the three areas.

The Fact Sheet cites 40 CFR § 122.26(a)(3)(iv), which provides, in relevant part, that the Water Board "may issue one systemwide permit covering all, or a portion of all municipal separate storm systems in adjacent or interconnected large or medium municipal separate storm sewer systems." This provision does not, however, authorize issuance of a regional MS4 permit covering multiple counties and multiple watersheds that are not interconnected and which do not share a common receiving water. In fact, the only common fact uniting the various MS4s in the three counties under the Water Board's jurisdiction is that common jurisdiction.

First, even if the subject MS4 facilities otherwise met the criteria specified in the federal regulations (which, as noted below, they do not), the prospective permittees must apply for such a MS4 permit, as set forth in the first sentence of 40 CFR § 122.26(a)(3)(iv): "*One permit application may be submitted for all or a portion of all* municipal separate storm sewers within adjacent or interconnected large or medium municipal separate storm sewer systems." (emphasis supplied). No such application has been filed with respect to the Draft Permit. Only the San Diego County copermittees submitted a ROWD for MS4 facilities within that county.[1]

[1] Moreover, the fact that permittees have the ability to determine the geographic scope of the permit is reinforced by the language in 40 CFR § 122.26(a)(3)(iii)(B), which allows an individual municipality to submit "a distinct permit application which only covers discharges from the [MS4] for which the owner is responsible . . ." If a permittee can "opt out" of a multi-MS4 permit by submitting a individual permit application, a permitting authority such as a water board cannot impose a multi-MS4 permit on that permittee.

Second, this provision requires that the MS4s to be covered in the permit be "adjacent or interconnected." This is not true with respect to the MS4s proposed to be included within the Draft Permit. For example, the MS4 within the Santa Margarita Region of Riverside County is not "interconnected" with any other MS4s except those within that region. This is true also of the MS4s within South Orange County and San Diego County, which are not interconnected. Additionally, none of the MS4s in the three counties is "adjacent" to each other – each is separated by miles of non-urban area. In the SMR for example, the confluence of Temecula and Murrieta Creeks to form the Santa Margarita River is miles upstream of Rainbow Creek, the first discharge from San Diego County to the River. And, the confluence of Temecula and Murrieta Creeks is over 30 miles from the discharge of the Santa Margarita River to the Pacific Ocean.

The next inquiry is whether the three separate county MS4s could be considered, together, to form a single "large municipal separate storm sewer system." The federal MS4 regulations define this term as follows:

> *Large municipal separate storm sewer system* means all municipal separate storm sewers that are either:
>
> (i) Located in an incorporated place with a population of 250,000 or more . . . ."
>
> (ii) Located in the counties listed in Appendix H, except municipal separate storm sewers that are located in the incorporated places, townships or towns within such counties; or
>
> (iii) Owned or operated by a municipality other than those described [in paragraphs (i) and (ii)] . . . and that are designated by the Director as part of the large or medium municipal separate storm sewer system due to the interrelationship between the discharges of the designated storm sewer and the discharges from municipal separate storm sewers described [in paragraphs (i) and (ii)]. In making this determination the Director may consider the following factors:
>
> (A) Physical interconnections between the municipal separate storm sewers;
>
> (B) The location of discharges from the designated municipal separate storm sewer relative to discharges from municipal separate storm sewers described in [paragraph (i)];
>
> (C) The quantity and nature of pollutants discharged to waters of the United States;
>
> (D) The nature of the receiving waters; and
>
> (E) Other relevant factors, or
>
> (iv) The Director may, upon petition, designate as a large municipal separate storm sewer system, municipal separate storm sewers located within the boundaries of a region

> defined by a storm water management regional authority based on a jurisdictional, watershed, or other appropriate basis that includes one or more of the systems described [in paragraphs (i), (ii) or (iii)].

40 CFR § 122.26(b)(4).

None of paragraphs (i), (ii) or (iii) authorizes a regional MS4 permit such as that envisioned in the Draft Permit. The Draft Permit applies beyond a single incorporated place, County or municipality. Of these paragraphs, only paragraph (iv) could arguably be used to define the MS4s in the three Counties as a single MS4 and thus authorize a regional permit. The key limiting language is, however, "within the boundaries of a region **defined by a storm water management regional authority,** based on a jurisdictional, watershed, or other appropriate basis . . . ." A regional water board is not a stormwater management regional authority. This is clear from the MS4 regulations, which provide that a "**regional authority may be responsible for submitting a permit application"** under certain conditions. 40 CFR § 122.26(a)(3)(iii)(C). Clearly, a Water Board is not responsible for submitting MS4 permit applications.

U.S. EPA, in the Preamble to the final Phase I MS4 regulations (55 Fed Reg. 47990, November 16, 1990), further illuminated the meaning of the regulatory language. The Preamble indicates that commenters proposed eight different MS4 permitting options:

> Option 1 – systems owned or operated by incorporated places augmented by integrated discharges; Option 2 – systems owned or operated by incorporated places augmented with significant other municipal discharges; Option 3 – systems owned or operated by counties; Option 4 – systems owned and operated by States or State departments of transportation; Option 5 – systems within the boundaries of an incorporated place; Option 6 – systems within the boundaries of counties; Option 7 – systems in census designated urbanized areas; and Option 8 – systems defined by watershed boundaries.

55 Fed Reg. at 48039. None of these options encompasses the fact pattern presented by the Draft Permit, which covers multiple counties and multiple watersheds, are not interconnected, do not share common receiving waters and are located in separate census designated urbanized areas.

In explaining the derivation of 40 CFR 122.26(b)(4)(iv), U.S. EPA noted that it was "an outgrowth of comments on all options, especially Option 4 (State owned systems/State highways) and Option 8 (watersheds)." 55 Fed. Reg. at 48040. Thus, the Caltrans MS4 permit (which applies statewide) is authorized under paragraph (iv), since the "storm water management regional authority" defining the region to be covered is Caltrans itself. No such single authority exists for the three-county area proposed to be included in the Draft Permit, which also would encompass multiple watersheds.

Moreover, paragraph (iv) provides that the regional authority must "petition" the U.S. EPA Director to have a single MS4 designated within the boundaries of the region defined by the regional authority. Because California has been delegated NPDES permitting authority, a regional authority would presumably need to petition its Water Board to authorize such a regional permit. Since no such regional authority exists to establish the geographical basis for a

three-county MS4 permit, there is no such entity to "petition" the Water Board to establish a regional permit. This is clear from the Preamble to the Phase I regulations, which indicate that "regional storm water authorities" established by "some States or counties" may "petition the Director [or its state designee] to assume a regional role. 55 Fed. Reg. at 48042. It is clear from the Preamble that it is not the Water Board that has the authority to make such a petition, but rather the "storm water authorities" (i.e., municipalities, districts and Caltrans).

It should be noted that the Bay Area Regional MS4 Permit was a joint Bay Area Water Board and copermittee effort, coordinated by the Bay Area Stormwater Agencies Management Association ("BASMAA"). It is not the case that the Bay Area Water Board imposed this regional MS4 permit. The copermittees, coordinated by BASMAA, themselves determined to develop a regional MS4 permit. Further, all of the copermittees to the Bay Area Regional MS4 Permit discharge to a common receiving water, San Francisco Bay. Also, an Alaska MS4 permit cited in a letter from the Office of Chief Counsel to county counsel for Orange and Riverside Counties was issued to several municipalities and entities within a single "borough," which is equivalent in Alaska to a county.

Additionally, neither the Riverside County Copermittees nor those in South Orange County have filed ROWDs with the San Diego Water Board, which serve as the application for an NPDES MS4 permit in California. Water Code § 13260. The current Riverside County MS4 permit for the Santa Margarita Region provides that the ROWD is not required to be filed until May 2015, 180 days prior to the November 10, 2015 expiration date of that permit. Order R9-2010-0016, Part II.K.2.c.

> This ROWD must include:
>
> (1) Proposed changes to the Copermittees' runoff management programs; (2) Proposed changes to monitoring programs; (3) Justification for proposed changes; (4) Name and mailing addresses of the Copermittees; (5) Names and titles of primary contacts of the Copermittees; (6) Any other information necessary for the reissuance of this Order and (7) Any other information required by federal regulations for permit reapplications.

Id. It should be noted that several items of this ROWD are specifically intended to assist in the formulation of a new, SMR-specific MS4 permit, including proposed changes to the runoff management and monitoring programs, as well as justification for such changes, information necessary for "reissuance" of the SMR MS4 permit and information required by the federal regulations for MS4 permit reapplications.

As a simple jurisdictional matter, the Water Board cannot issue a regional MS4 permit to MS4 dischargers that have not applied for it. Moreover, as noted above, the SMR copermittees are entitled to apply for an MS4 permit applicable to their jurisdiction. Further, each individual copermittee has the right to apply for a MS4 permit covering only its discharges, as has the City of Long Beach in the Los Angeles Region.

Finding 3, Finding 15, in Fact Sheet Section VII.A and in Multiple Locations Throughout Draft Permit: In Finding 3, the Fact Sheet and in multiple locations throughout the Draft Permit (which are identified in the redline of the Draft Permit submitted with these comments by the Riverside County Copermittees ("Redline")), it is stated that the maximum extent practicable ("MEP") applies only to "storm water" discharges from the MS4. This is not correct.[2]

In fact, the Clean Water Act does not distinguish between non-stormwater and stormwater in terms of MS4 discharges which must be controlled to the MEP standard. *See* 33 U.S.C. § 1342(p)(3)(B)(iii)(the MS4 permit "shall require controls to reduce the discharge of pollutants to the maximum extent practicable . . . ." While the heading of 33 U.S.C. § 1342(p) refers to "Municipal and industrial stormwater discharges," this is not dispositive, as 33 U.S.C. § 1342(p)(3)(B)(ii), which requires the effective prohibition of "non-stormwater discharges" into the MS4. Thus, the language of this heading does not in fact support the argument that the MEP standard applies only to pollutants in stormwater discharges.

That both non-stormwater and stormwater must be controlled to the MEP standard was made clear by U.S. EPA itself in the preamble to the final Phase I stormwater regulations. In that preamble, U.S. EPA made it clear that "MEP control measures" would be implemented to address not only pollutants in "storm water" but also from "non-storm water discharges." As the preamble states:

> "Permittees are required to develop management programs for four types of pollutant sources which discharge to large and medium municipal storm sewer systems. Discharges from [such systems] are usually expected to be composed primarily of: (1) Runoff from commercial and residential areas; (2) storm water runoff from industrial areas; (3) runoff from construction sites; and (4) *non-storm water discharges*. Part 2 of the permit application has been designed to allow [permittees] the opportunity to propose *MEP control measures for each* of these components of the discharge."

55 Fed. Reg. at 48052 (emphasis supplied).

This language sets forth USEPA's understanding of the plain language of the CWA: "pollutants" must be controlled to the MEP from any MS4 "discharge," not merely pollutants in stormwater.

Finding 11: This finding, in relevant part, states that "[h]istoric and current development makes use of natural drainage patterns and features as conveyances for runoff. Rivers, streams and creeks in developed areas used in this manner are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and receiving water." This conclusion is legally incorrect.

First, under no circumstance can a natural stream constitute an MS4. The definition of "MS4" in the CWA regulations (a definition found in Attachment C of the Draft Permit) refers to a

[2] Finding 15 also states, erroneously, that the MEP standard "is explicitly for "Municipal . . . *Stormwater Discharges* (emphasis added)" from the MS4.

"conveyance or system of conveyances" "owned or operated" by a municipality. 40 CFR §122.26(b)(8). In California, natural rivers and streams are not "owned" nor "operated" by the municipality through which they flow. Moreover, a municipality obviously cannot "operate" a natural creek or stream. In further support of the point that a MS4 is an artificial, not natural, watercourse, the types of "conveyances" identified in the regulation ("roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains") all refer to anthropogenic structures, not natural streams. 40 CFR § 122.26(b)(8).

Second, a "receiving water" cannot also be an MS4, as is plain from the CWA regulations. An MS4 is itself defined as discharging to waters of the United States. 40 C.F.R. §122.26(b)(8). An MS4 cannot, in essence, discharge to itself. Moreover, an "outfall" from an MS4 (the point at which the discharge enters a receiving water) does not, pursuant to 40 C.F.R §122.26 (b)(9), include conveyances connecting "segments of the same stream or other waters of the United States and are used to convey waters of the United States."

Moreover, U.S. EPA, in the Preamble to the initial version of the MS4 regulations (53 Fed. Reg. 49416 (Dec. 7, 1988)) expressly determined that "streams, wetlands and other water bodies that are waters of the United States are not storm sewers for the purposes of this rule" and that "stream channelization, and stream bed stabilization, which occur in waters of the United States" were not subject to National Pollutant Discharge Elimination System ("NPDES") permits under Section 402 of the CWA. 53 Fed. Reg. at 49442.

Additionally, the United States Supreme Court recently reversed the Ninth Circuit Court of Appeals and ruled that flows from sections of the Los Angeles and San Gabriel Rivers that are comprised of concrete flood control channels are not a "discharge" under the CWA, confirming that such rivers, even if improved, are "receiving waters" along with any natural portions of those rivers. *Los Angeles County Flood Control Dist. v. Natural Resources Defense Council*, 568 U.S. __(January 8, 2013) (slip op.).

The above-cited statement in the finding is incorrect and should be stricken, as recommended in the Redline.

Finding 12: This finding states, in relevant part, that "[a]s operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not prohibit or otherwise control." This statement is legally incorrect, and ignores the salient point that the "discharger" of a pollutant is primarily responsible for controlling/permitting that discharge, under both the CWA and the Porter-Cologne Act. For example, under the Porter-Cologne Act, any persons discharging or proposing to discharge "waste" into waters of the state must file a report of waste discharge and obtain a waste discharge requirement. Water Code §§ 13260, 13263. The operator of the MS4 into which that water eventually flows is not "essentially accepting" responsibility for the discharge. The responsibility of the MS4 operator is established under the CWA, and that is to effectively prohibit non-stormwater discharges into [the MS4] and to control the discharge of pollutants from the MS4 to the MEP.

Moreover, the statement ignores the fact that in California, downstream property owners (including municipalities owning and operating MS4 facilities) must accept the flow of upstream waters. In fact, for a downstream municipality to block such flow would constitute an inverse condemnation or the creation of a nuisance under California law. *See Arreola v. County of Monterey* (2002) 99 Cal.App.4th 722 (obstruction of flood waters by improperly designed highway constituted inverse condemnation and nuisance).

Finding 28 and Fact Sheet Section VI: In the Finding, it is stated that the Water Board "finds that the requirements in this permit are not more stringent than the minimum federal requirements" and that therefore "a CWC section 13241 analysis is not required." The Finding further recites that notwithstanding this fact, "the San Diego Water Board has developed an economic analysis of the requirements in this Order."

For the reasons set forth in the comments of the Riverside County Copermittees, numerous provisions in the Draft Permit are in fact more stringent than the requirements of the CWA and its implementing regulations and therefore require an adequate Water Code § 13241 analysis. Unfortunately, this analysis is not provided in the Fact Sheet.

First, the economic analysis set forth in the Fact Sheet does not meet the requirements of Section 13241, as it does not analyze the six specific factors required to be analyzed under the section. Second, the analysis uses cost data from other sources, only a few of which were from the municipalities proposed to be included under the Draft Permit. These data are also a number of years old; the most recent study referenced in the Fact Sheet, the one done for the State Board by Cal State Sacramento, was dated January 2005 and included decade-old cost data from the City of Encinitas that dated from 2002-2003.

Third, the section of the Fact Sheet discussing the benefits of water quality notes that "there have been no studies for the San Diego Region to quantify the added value that surface waters with healthy water quality can provide." Thus, the Water Board has no evidence with which to compare the costs and benefits of the programs set forth in the Draft Permit. Moreover, the discussion makes the incorrect assumption that the alternative to the programs in the Draft Permit would be no controls on pollutants in urban runoff. As the Fact Sheet correctly notes, the Draft Permit is the fifth term MS4 permit for the copermittees. The previous four permits all contained increasingly complex and expensive control requirements, both structural and non-structural, designed to improve the quality of MS4 discharges. Thus, an appropriate cost analysis must compare the incremental costs of the programs set forth in the Draft Permit and the incremental benefits attributable to that permit. This has not been done in the Fact Sheet. Finally, the analysis does not recognize that the receiving waters provided economic benefits to residents of the San Diego Region long before issuance of the first MS4 permits in 1990. It is thus illogical to suggest that these pre-existing economic benefits would be lost if the Draft Permit is not adopted.

Finding 29 and Fact Sheet Section VII.F: The finding and the supporting argument in the Fact Sheet represents an attempt by Water Board staff to address whether the requirements of the Draft Permit represent an unfunded state mandate. That attempt, however, is beyond the scope of the Water Board's powers, since the *only* agency charged by the Legislature with determining

the presence of a state mandate, and whether that mandate is unfunded, is the Commission on State Mandates. Govt. Code § 17552; *Kinlaw v. State of California* (1991) 54 Cal.3d 326, 333. The Water Board has no jurisdiction to make a legal finding or discuss in the Fact Sheet that the Draft Permit, in whole or in part, does not constitute an unfunded state mandate.

Additionally fact sheets are required, under the CWA regulations, to provide the legal authority and reasons for each substantive permit provision (40 CFR § 124.8(a)(4); 40 CFR § 124.56(a)). *See also City of Rancho Cucamonga v. Regional Water Quality Control Board-Santa Ana Region* (2006), 135 Cal.App.4th 1377, 1382 (stating that fact sheets contains "the legal and factual grounds for the Water Board's recommendation to adopt the . . . permit"). Finding 29 and the discussion in Section VII.F of the Fact Sheet do not relate to any Draft Permit provision, nor provide legal authority or justification for the Draft Permit's adoption. As such, the finding and Fact Sheet discussion are surplussage and should be deleted.

The Riverside County Copermittees disagree with each of the arguments set forth in the Finding and Fact Sheet as to why the Draft Permit does not constitute an unfunded state mandate. Nevertheless, because the exclusive arena for such disagreements is the Commission on State Mandates, whose jurisdiction does not commence unless and until a test claim is filed before the Commission, the Copermittees need not and will not address those arguments.

Comments on Provisions in Draft Permit

Provision A and Fact Sheet Section VIII.A:

Lack of True Iterative Compliance Process

As set forth in the Redline and in the Comment Letter, the Riverside County Copermittees believe that to effectuate the iterative approach to compliance with water quality standards and other discharge prohibitions in the Draft Permit, the copermittees must be provided with the means to be in compliance. Based on monitoring, exceedances of water quality standards are occurring in the receiving waters subject to the Draft Permit, as set forth in Table G-14 to the latest 2011-2012 monitoring report submitted by the Riverside County Copermittees. Thus, if the copermittees are not provided an iterative means to be in compliance, which was contemplated by State Board's Order No. 2001-15, the copermittees will be issued an illegal MS4 permit, since it is a permit with which they cannot comply. This violates the intent of Congress in the CWA, which "is presumed not to have intended absurd (impossible) results." *Hughey v. JMS Development Corp.*, 78 F.3d 1523, 1529 (11th Cir. 1996); *accord, Mississippi River Revival v. City of Minneapolis*, 319 F.3d 1013, 1017-1018 (8th Cir. 2003).

With regard to the iterative process, Water Board staff has indicated numerous times during the workshop process that achievement of water quality standards is expected to take many years. The entire WQIP approach is aimed at the eventual attainment of such standards, as are the TMDLs issued to other copermittees, which have final compliance dates years into the future.

This approach is, however, put into jeopardy by the requirement, as expressed in the Fact Sheet at F-39, that the discharge prohibition and receiving water limitation provisions are

"independently applicable, meaning that compliance with one provision does not provide a 'safe harbor' where there is non-compliance with another provision (i.e., compliance with Provision A.4 does not shield a Copermittee who may have violated Provision A.1.a, A.1.c, or A.2.a from an enforcement action." While the Fact Sheet appropriately notes how this process should work through Provision A.4 (which "essentially requires the Copermittees to implement additional BMPs until MS4 discharges no longer cause or contribute to a violation of water quality standards") it also states that despite this iterative process, "the San Diego Water Board retains the discretion to take other appropriate enforcement and the iterative process does not shield dischargers from citizen suits under the CWA." Fact Sheet at F-40.

The consequences of this approach cannot be overemphasized. Despite the copermittees' good faith undertaking to follow the iterative process outlined in Provision A.4, a Water Board enforcement proceeding or a citizen suit can be brought for violations of water quality standards and, if the citizen plaintiff is successful, a federal judge is empowered to use his/her injunctive powers under Section 505(a) of the CWA to throw out the WQIP, JRMP or other compliance efforts of the copermittees and require other efforts. In such a case, the time and money spent by the copermittees in trying to comply with the Draft Permit, as well as the effort spent by the copermittees and Water Board staff in developing the Draft Permit's terms, are completely wasted.

Thus, the essential conundrum of Provision A, as presently drafted, is clearly exposed. Even though a copermittee may spend significant sums and undertake significant tasks under its WQIP or JRMP, be conducting expensive monitoring and special studies, and be in *full compliance* with all of the programmatic requirements of the Draft Permit, it would still face either a Water Board enforcement action or a citizen suit under Section 505 of the CWA. And, such a suit would allege exceedances of water quality standards (some of which are hardly capable of laboratory detection, much less control) that the Water Board acknowledges cannot be achieved for years.

Provision A is not, however, required by the CWA, as held by the Ninth Circuit in *Defenders of Wildlife v. Browner*, 191 F.3d 1159 (9th Cir. 1999). The holding in *Browner* is further reflected in State Board Order WQ 2001-15 (which the Fact Sheet acknowledges incorporates an "iterative process") which states:

> [O]ur [receiving water limitation] language, similar to the U.S. EPA's permit language discussed in the Browner case, **does not require strict compliance with water quality standards.** Our language requires that **storm water management plans be designed to achieve compliance with water quality standards**. **Compliance is to be achieved over time, through an iterative approach requiring improved BMPs**. As pointed out by the Browner court, there is nothing inconsistent between this approach and the determination that the Clean Water Act does not mandate strict compliance with water quality standards.

Order WQ 2001-15 at 7 (emphasis added). Thus, Provision A is inconsistent with the State Board's own precedential order, which requires the iterative approach effectuated by the suggested Redline changes.[3]

In further support, it may be noted that the U.S. EPA-drafted MS4 permit for the District of Columbia does not contain the type of language found in Provision A, but rather requires "an iterative and an adaptive management process for pollutant reduction and for achieving applicable water quality standard and/or total maximum daily load (TMDL) compliance." DC MS4 Permit Fact Sheet, page 5 (attached as Exhibit A).

Also, despite the assertion in the Fact Sheet that the copermittees are seeking a "safe harbor" from liability, this is incorrect. Every provision of an MS4 permit is subject to enforcement; given the complexity of the Draft Permit, the failure by a copermittee to comply with any provision could lead to such enforcement.

As noted above, MS4 discharges may not be achieving compliance with strict water quality standards, as recognized by the Issue Paper released by State Board staff in preparation for a November 20, 2012 workshop on receiving water limitation issues raised by *NRDC v. County of Los Angeles*. That Issue Paper stated that as "the storm water management programs of municipalities have matured, **an increasing body of monitoring data indicates that water quality standards are in fact not being met by many MS4s.**" (State Board Issue Paper, Page 2, emphasis supplied) (*see* Exhibit B.)

Perhaps most importantly, requiring strict and immediate compliance with discharge prohibition and receiving water limitations inhibits, not supports, the philosophy of the Draft Permit, which is to encourage the copermittees to focus on the most significant problems in their watersheds and to prioritize their resources to address those problems. Provision A, by contrast, discourages innovative approaches or prioritization, since all pollutants exceeding water quality standards create liability. Moreover, as discussed above, in the event of a citizen suit being brought such as that in the *NRDC* case, a federal judge could award injunctive relief to a successful plaintiff that could completely ignore or supplant the WQIP and other permit terms.

For additional discussion of receiving water limitations issues, please see Exhibit C, a letter submitted by the District to the State Board in connection with the recent workshop held by the State Board on receiving water limitations language. The Riverside County Copermittees hereby reference and incorporate this Exhibit into these comments.

The Riverside County Copermittees support a true iterative process that requires refinement and amendment of the WQIP and associated BMPs when receiving water limitation violations are recorded. That is the essence of the iterative process; the identification of problems and the development of BMPs to attempt to address those problems.

[3] While the Fact Sheet cites as authority *Natural Resources Defense Council v. County of Los Angeles*, discussed above, the Ninth Circuit was simply responding to language in the former Los Angeles County MS4 permit, and did not determine that such non-iterative language was required by the CWA.

The Redline proposes a means to achieve compliance using the WQIPs, which are intended to bring the copermittees into compliance with the discharge prohibition and receiving water limitation provisions of the Draft Permit over time. The Redline links compliance with Provisions A.1, A.2 and A.3 to A.4, which indicates that compliance is obtained through the preparation and updating of the WQIPs.

It must be noted, however, that the Riverside County Copermittees do not agree with the approach suggested by others, that any WQIP-based compliance approach be necessarily accompanied by a "Reasonable Assurance Analysis." Such an analysis could be extremely complex, expensive and time intensive to develop. Generally, such analyses are developed in the preparation of TMDLs and take a number of years to develop and refine. Given that the Santa Margarita Watershed has no adopted TMDLs, there are no comprehensive pollutant transport or BMP models available for the suite of constituents that might be considered for prioritization within a WQIP for that watershed. In the context of a TMDL, such models would be developed by the combined resources of the Water Board, stakeholders and dischargers. Requiring such an exercise to be undertaken solely with the public resources of the residents of the SMR is beyond the Copermittees' financial ability and would shift responsibility for development of TMDLs from the Water Board to the Copermittees.

Discussion in Fact Sheet

The Fact Sheet discussion also contains a number of legal and factual errors. First, the statement on page F-34 that non-stormwater discharges from the MS4 are subject to NPDES permitting requirements is unsupported by the plain language of the CWA, which (as noted above) applies the MEP standard to *all* discharges of pollutants from the MS4, not just those in stormwater. Also, such discharges are not subject to separate requirements under the NPDES program, as suggested on F-34, and non-storm water discharges are not the same, legally, as "illicit discharges." Please see discussion below.

Similarly, the Fact Sheet's conclusion that "Regional Water Boards are not limited by the iterative MEP approach to storm water regulation in crafting appropriate regulations for non-storm water discharges" is incorrect. The Fact Sheet correctly states that MEP has not been defined in the CWA or by U.S. EPA in the CWA regulations. However, the Fact Sheet incorrectly concludes that MEP is "ultimately defined" by the Water Boards or the State Board. What constitutes "MEP" is a question of federal law under the CWA, not a matter for definition by agencies which merely have been delegated the authority to enforce the CWA in California. The only source for such a finding is a memorandum from a State Board attorney, not case authority.

Moreover, Provisions B-E of the Draft Permit, far from establishing a "minimum framework" for the copermittees to achieve the MEP standard, sets forth in many cases requirements that far exceed the plain requirements of the CWA, the implementing regulations and in some cases even state law, or which require the copermittees to undertake steps that are not "practicable." These requirements are identified in the comments of the Riverside County Copermittees. In such respects, those requirements do not represent a "minimum framework" for MEP.

Other Issues

The Riverside County Copermittees also object to the provision in A.1.a and other portions of the Draft Permit that prohibit certain discharges into "waters of the state." The CWA regulates discharges into waters of the United States, which are surface waters. Expanding the prohibition to cover waters of the state expands the scope of the Draft Permit to protect groundwater, as a matter of state law. It should be noted that the recent Los Angeles County MS4 Permit appropriately applies this prohibition to waters of the United States.

Provision B.5: As noted in the Comment Letter, the CWA requires that illegal discharges into the MS4 be addressed by a program of steps taken to address such discharges. The Redline emphasizes that this program be guided by WQIP priorities, which is consistent with the overall intent of the Draft Program.

Provision E.2.a and E.2.a.(7): These provisions require the Copermittees to, as a part of their Illicit Discharge Detection and Elimination (IDDE) program, address all non-stormwater discharges as "illicit discharges," thus requiring the copermittees to "reduce or eliminate non-stormwater discharges" whether or not the discharges have been identified as "illicit."

The Fact Sheet asserts that "Provision E.2.a.(7) is consistent with the requirements of the CWA section 402(p)(3)(B)(ii) and 40CFR 122.26(d)(1)(v)(B). That assertion is not correct. Section 402(p)(3)(B)(ii) of the CWA states that MS4 permits "shall include a requirement to *effectively prohibit* non-stormwater discharges into the storm sewers" (emphasis supplied). The CWA regulations include two provisions designed to begin implementation of the "effective prohibition." The first provision requires MS4 permittees to perform a screening analysis, intended to provide sufficient information to develop priorities for a program to detect and remove illicit discharges. 40 CFR 122.26(d)(1)(iv)(D). The second requires MS4 permittees to develop a recommended site-specific management plan to detect and remove illicit discharges (or ensure they are covered by an NPDES permit) and to control improper disposal to MS4s. 40 CFR 122.26(d)(1)(iv)(D) and 122.26(d)(2)(B). The MS4 permittees are required to identify the non-stormwater discharge as an illicit discharge prior to having an obligation to effectively prohibit it. There is not otherwise a presumption to reduce or eliminate it.

40 CFR 122.26(d)(1)(v)(B), cited in the Fact Sheet, requires "[a] description of the existing program to identify illicit connections to the municipal storm sewer system. The description should include inspection procedures and methods for detecting and preventing illicit discharges, and describe areas where this program has been implemented."

The provision and rationale within the Fact Sheet blur the distinction between the copermittees' need to "effectively" prohibit non-stormwater discharges and to detect and eliminate illicit discharges.

- The requirement is "effectively prohibit" non-stormwater discharges, not "reduce or eliminate" non-stormwater discharges.
- Although copermittees are required to have a program to prevent illicit discharges to the MS4, non-stormwater discharges should only be addressed as illicit discharges where

such discharges are identified as sources of pollutants that may cause or contribute to an exceedance of a water quality objective.

- The IDDE program is established to detect and eliminate "illicit discharges", not non-stormwater discharges in general.

Please see the Redline for modifications to Provision E.2 addressing these issues.

Provision E.2.a.(3): In the Redline, the Riverside County Copermittees request that categories of irrigation runoff discharges (landscape irrigation, irrigation water and lawn watering) be considered as conditionally exempt discharges (not subject to treatment as illicit discharges).

The rationale for not including irrigation runoff discharges lacks a legal and factual basis. As noted in the Comment Letter, the only factual basis for this provision with respect to the Riverside County Copermittees is discussion in a public information informational brochure, which was itself based on a similar document from Orange County. Fact Sheet F-76. Despite assertions to the contrary in the Fact Sheet, this brochure does not represent a determination by the Riverside County Copermittees that irrigation runoff is a category of non-stormwater discharge that must be effectively prohibited. The other evidence in support of prohibiting the conditional exemption for irrigation runoff is entirely from different areas of the region, with different urban development patterns, lithology and hydrology. No specific determination has been made by the Copermittees (or the Water Board) that irrigation runoff in the Santa Margarita Region has actually been shown to be significant source of pollutants to receiving waters in the SMR.

EPA, in the preamble to the federal MS4 regulations, required that a *permittee* must make a finding that the "irrigation water" discharges must be a "source of pollutants to waters of the United States . . . ." 55 Fed. Reg. 48037. Moreover, such discharges must represent a "significant" source of pollutants to waters of the United States "under certain conditions." U.S. EPA, *Guidance Manual for the Preparation of Part 2 of the NPDES Permit Application for Discharges from Municipal Separate Storm Sewer Systems,* November 1992 ("EPA Part 2 Guidance Manual"), at p. 6-33. These conditions require a focus not on an entire category of discharges, but rather a discharger-by-discharger examination.

In the MS4 regulatory preamble, EPA stated that "[i]n general, municipalities will not be held responsible for prohibited some specific components of discharges or flows listed below through their [MS4], even though such components may be considered non-storm water discharges, unless such discharges *are specifically identified on a case-by-case basis as needing to be addressed."* 55 Fed. Reg. 47995 (emphasis supplied). In the Guidance Manual, EPA states:

> If an applicant knows . . . that landscape irrigation water from a ***particular site*** flows through and picks up pesticides **or *excess*** nutrients from fertilizer applications, there may be a reasonable potential for a storm water discharge to result in a water quality impact. In such an event, the applicant should contact the NPDES permitting authority to request that the authority order ***the discharger*** . . . to obtain a separate NPDES permit (or in this case, the discharge could be controlled through the storm water management program of the MS4).

EPA Part 2 Guidance Manual, p. 6-33 (emphasis added). Read in this context of this language, the Water Board has no power greater than a municipality in terms of its ability to identify non-stormwater discharges as "illicit" and thus required to be regulated, and must identify specific discharges, and not entire categories of discharges. *See* 55 Fed. Reg. 48037. This has not been done in the Fact Sheet.

Provision E.3(c): This provision requires the Copermittees to compel development projects that may not result in a hydromodification impact to the applicable receiving waters, to implement on-site or "alternative compliance" hydromodification mitigation measures and to use using "pre-development (naturally occurring)" runoff reference condition as applied to sites that are, in fact, developed.

The Riverside County Copermittees are concerned that implementing these requirements would subject the Copermittees to liability under the takings clauses of the U.S. and California Constitutions as well as under the Mitigation Fee Act because of the questionable nexus between such a project's lack of actual hydromodification impacts upon the receiving waters, and the hydromodification management measures required in the Draft Permit.

When imposing a condition on a development permit, a local government is required under the federal and state constitutions to establish that the condition bears a reasonable relationship to the impacts of the development project. This rule applies even to legislatively enacted requirements and impact fees or exactions.[4] Moreover, fees imposed on a discretionary ad hoc basis are subject to heightened scrutiny under a two-part test. First, local governments must show that there is a substantial relationship between the burden created by the impact of development and any fee or exaction.[5] Second, a development project's impacts must bear a "rough proportionality" to any development fee or exaction.[6] Under California law, the *Nollan/Dolan* heightened scrutiny test also applies to in-lieu fees.[7]

The Legislature has memorialized these requirements in the Mitigation Fee Act, which establishes procedures that local governments must follow to impose impact fees.[8] Irrespective of whether the hydromodification management requirements are implemented by legislative act or on an ad hoc basis, the copermittees' attempt to enforce them as proposed in the Draft Permit would likely result in claims by developers and property owners alleging unconstitutional takings of private property and violations of the Mitigation Fee Act. This is because a developer could argue that limiting hydromodification impacts of already developed property to its "naturally occurring" state, or requiring hydromodification mitigation measures for impacts not imposed by the project, would not have a legally sufficient nexus to the impact of the development project.

In addition, the Copermittees wish to bring the Water Board's attention to a recent case, *Virginia Dept. of Transportation v. United States Environmental Protection Agency*, Civ. Action No.

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[4] *Building Indus. Ass'n v. City of Patterson* (2009)171 Cal. App. 4th 886, 898.
[5] *Nollan v. California Coastal Comm'n*, 483 U.S. 825, 837 (1987).
[6] *Dolan v. City of Tigard*, 512 U.S. 374, 391 (1994).
[7] *Ehrlich v. City of Culver City* (1996) 12 Cal. 4th 854, 876.
[8] Cal. Gov't Code §§ 66000-66025.

1:12-CV-775 (E.D. Va. January 3, 2013) (slip op.), which is attached for the Water Board's convenience as Exhibit D. In this case, a federal district judge found that the CWA did not authorize U.S. EPA to regulate stormwater itself as a pollutant. The impact of this case is not known at this time, as it will probably be appealed to the Fourth Circuit Court of Appeals. Still, any approach to hydromodification which focuses on flows *per se*, as opposed to pollutants, may not withstand legal scrutiny.

Provision E.3.c.(3)(c)(i): This provision requires the entire alternative compliance in-lieu fee to be transferred to the copermittee or an escrow account prior to construction of a Priority Development Project (PDP). This provision is problematic, as development fees (which would include the in-lieu fees) are collected at the time of building permit issuance. In large-scale projects, permits may be issued (and development fees collected) in phases. Further, for master-planned developments, fees are generally negotiated through a development agreement to be collected based on certain development milestones. Therefore, collecting and holding the entire in-lieu fee prior to construction interferes with the development practice and may violate the Mitigation Fee Act and local development ordinances. The Redline requests that in-lieu fees be collected in accordance with state and local law.

Provision E.5: In addition to other comments on this provision and others in the Draft Permit relating to retrofitting, any requirements in Draft Permit relating to the retrofitting of engineered channels and other structures employed for flood control purposes must be consistent with the judgment of the flood control districts, to which the Legislature has assigned sole authority for the protection of the lives and property of their citizens from flooding. (Please see Comment Letter and proposed new findings in Redline for further discussion). Due to the urbanization of the counties over the past 150 years, as well as the particular topography and weather conditions found in Southern California, there is a great risk of flooding and hence the need for flood control structures and channels. The flood control districts have both the expertise and the sole legal authority to determine whether retrofitting of flood control structures can be accomplished in light of their statutory obligations, and that expertise and authority must be recognized in the Draft Permit.

Provision E.8: As noted in the Redline, the first requirement under Fiscal Analysis, that each "Copermittee must secure the resources necessary to meet all the requirements of this Order" has been deleted. This requirement is not found in the CWA regulations, which require only the conduct of a fiscal analysis. Moreover, this requirement intrudes on the home rule power of cities and counties by requiring, in essence, that municipal budgets must reflect the priority of compliance with the Order over any competing obligation, including police, fire protection and public health. A key issue in complying with stormwater and MS4 obligations is the ability of municipalities to afford the increasing costs associated with those obligations. In California, of course, the ability to raise taxes to pay for such obligations has been severely curtailed through several voter-approved propositions.

The Riverside County Copermittees request that Provision E.8.a be deleted.

EXHIBIT A

NPDES Permit No. DC0000221

AUTHORIZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM MUNICIPAL SEPARATE STORM SEWER SYSTEM PERMIT

In compliance with the provisions of the Clean Water Act, 33 U.S.C. §§ 1251 *et seq.*

Government of the District of Columbia
The John A. Wilson Building
1350 Pennsylvania Avenue, N.W.
Washington, D.C. 20004

is authorized to discharge from all portions of the municipal separate storm sewer system owned and operated by the District of Columbia to receiving waters named:

Potomac River, Anacostia River, Rock Creek and stream segments tributary to each such water body

in accordance with the Stormwater Management Program(s) dated February 19, 2009, subsequent updates, and related reports, strategies, effluent limitations, monitoring requirements and other conditions set forth in Parts I through IX herein.

The effective issuance date of this permit is: October 7, 2011.

This permit and the authorization to discharge shall expire at midnight, on: October 7, 2016.

Signed this 30th day of September, 2011.

Jon M. Capacasa, Director
Water Protection Division
U.S. Environmental Protection Agency
Region III

1. DISCHARGES AUTHORIZED UNDER THIS PERMIT

1.1 Permit Area

This permit covers all areas within the jurisdictional boundary of the District of Columbia served by, or otherwise contributing to discharges from, the Municipal Separate Storm Sewer System (MS4) owned or operated by the District of Columbia. This permit also covers all areas served by or contributing to discharges from MS4s owned or operated by other entities within the jurisdictional boundaries of the District of Columbia unless those areas have separate NPDES MS4 permit coverage or are specifically excluded herein from authorization under the District's stormwater program. Hereinafter these areas collectively are referred to as "MS4 Permit Area".

1.2 Authorized Discharges

This permit authorizes all stormwater point source discharges to waters of the United States from the District of Columbia's MS4 that comply with the requirements of this permit. This permit also authorizes the discharge of stormwater commingled with flows contributed by process wastewater, non-process wastewater, or stormwater associated with industrial activity provided such discharges are authorized under separate NPDES permits.

This permit authorizes the following non-stormwater discharges to the MS4 when appropriate stormwater activities and controls required through this permit have been applied and which are: (1) discharges resulting from clear water flows, roof drainage, dechlorinated water line flushing, landscape irrigation, ornamental fountains, diverted stream flows, rising ground waters, uncontaminated ground water infiltration to separate storm sewers, uncontaminated pumped ground water, discharges from potable water sources, foundation drains, air conditioning condensation, irrigation waters, springs, footing drains, lawn watering, individual resident car washing, flows from riparian habitats and wetlands, dechlorinated swimming pool discharges, wash water, fire fighting activities, and similar types of activities; and (2) which are managed so that water quality is not further impaired and that the requirements of the federal Clean Water Act, 33 U.S.C. §§ 1251 *et seq.*, and EPA regulations are met.

1.3 Limitations to Coverage

1.3.1 Non-stormwater Discharges

The permittee, as defined herein, shall effectively prohibit non-stormwater discharges into the MS4, except to the extent such discharges are regulated with an NPDES permit.

1.3.2 Waivers and Exemptions

This permit does not authorize the discharge of any pollutant from the MS4 which arises from or is based on any existing waivers and exemptions that may otherwise apply and are not consistent with the Federal Clean Water Act and other pertinent guidance, policies, and regulations. This narrative prohibition on the applicability of such waivers and exemptions extends to any activity that would otherwise be authorized under District law, regulations or

ordinance but which impedes the reduction or control of pollutants through the use of stormwater control measures and/or prevents compliance with the narrative /numeric effluent limits of this permit. Any such discharge not otherwise authorized may constitute a violation of this permit.

1.4 Discharge Limitations

The permittee must manage, implement and enforce a stormwater management program (SWMP) in accordance with the Clean Water Act and corresponding stormwater NPDES regulations, 40 C.F.R. Part 122, to meet the following requirements:

1.4.1. Effectively prohibit pollutants in stormwater discharges or other unauthorized discharges into the MS4 as necessary to comply with existing District of Columbia Water Quality Standards (DCWQS);

1.4.2. Attain applicable wasteload allocations (WLAs) for each established or approved Total Maximum Daily Load (TMDL) for each receiving water body, consistent with 33 U.S.C. § 1342(p)(3)(B)(iii); 40 C.F.R. § 122.44(k)(2) and (3); and

1.4.3. Comply with all other provisions and requirements contained in this permit, and in plans and schedules developed in fulfillment of this permit.

Compliance with the performance standards and provisions contained in Parts 2 through 8 of this permit shall constitute adequate progress toward compliance with DCWQS and WLAs for this permit term.

2. LEGAL AUTHORITY, RESOURCES AND STORMWATER PROGRAM ADMINSTRATION

2.1 Legal Authority

2.1.1 The permittee shall use its existing legal authority to control discharges to and from the Municipal Separate Storm Sewer System in order to prevent or reduce the discharge of pollutants to achieve water quality objectives, including but not limited to applicable water quality standards. To the extent deficiencies can be addressed through regulation or other Executive Branch action, the permittee shall remedy such deficiencies within 120 days. Deficiencies that can only be addressed through legislative action shall be remedied within 2 years of the effective date of this permit, except where otherwise stipulated, in accordance with the District's legislative process. Any changes to or deficiencies in the legal authority shall be explained in each Annual Report.

2.1.2 No later than 18 months following the effective date of this permit, the District shall update and implement Chapter 5 of Title 21 of District of Columbia Municipal Regulations (Water Quality and Pollution) ("updated DC Stormwater Regulations"), to address the control of stormwater throughout the MS4 Permit Area. Such regulations shall be consistent with this

FACT SHEET

National Pollutant Discharge Elimination System (NPDES)
Municipal Separate Storm Sewer System (MS4)
Permit No. DC0000221 (Government of the District of Columbia)

NPDES PERMIT NUMBER: DC0000221 (Reissuance)

FACILITY NAME AND MAILING ADDRESS:

Government of the District of Columbia
The John A. Wilson Building
1350 Pennsylvania Avenue, N.W.
Washington, D.C. 20004

MS4 ADMINISTRATOR NAME AND MAILING ADDRESS:

Director, District Department of the Environment
1200 First Street, N.E., 6th Floor
Washington, D.C. 20002

FACILITY LOCATION:

District of Columbia's Municipal Separate Storm Sewer System (MS4)

RECEIVING WATERS:

Potomac River, Anacostia River, Rock Creek, and Stream Segments Tributary
To Each Such Water Body

INTRODUCTION:

Today's action finalizes reissuance of the District of Columbia Municipal Separate Storm Sewer System (MS4) Permit. In the Final Permit EPA has continued to integrate the adaptive management approach with enhanced control measures to address the complex issues associated with urban stormwater runoff within the corporate boundaries of the District of Columbia, where stormwater discharges via the Municipal Separate Storm Sewer System (MS4).

Since the United States Environmental Protection Agency, Region III (EPA) issued the District of Columbia (the District) its first MS4 Permit in 2000, the Agency has responded to a number of legal challenges involving both that Permit (as well as amendments thereto) and the second-round MS4 Permit issued in 2004. For the better part of ten years, the Agency has worked with various parties in the litigation, including the District and two non-governmental organizations, Defenders of Wildlife and Friends of the Earth, to address the concerns of the various parties. The Agency has engaged in both litigation and negotiation, including formal

mediation.[1] These activities ultimately led to an enhanced stormwater management strategy in the District, consisting of measurable outputs for addressing the issues raised during the litigation and mediation process.

FACILITY BACKGROUND AND DESCRIPTION:

The Government of the District of Columbia owns and operates its own MS4, which discharges stormwater from various outfall locations throughout the District into its waterways.[2]

On April 21, 2010 EPA public noticed the Draft Permit. The Draft Fact Sheet published with that Draft Permit contains more extensive permit background information, and the reader is referred to that document for the history of the District of Columbia MS4 permit.

The public comment period closed on June 4, 2010. EPA received comments from 21 individual commenters and an additional 53 form letters. The Draft Permit, Draft Fact Sheet, and comments received on those documents are all available at: http://www.epa.gov/reg3wapd/npdes/draft_permits.html. The Final Permit reflects many of the comments received. EPA is simultaneously releasing a responsiveness summary responding to these comments.

ACTION TO BE TAKEN:

EPA is today reissuing the District of Columbia NPDES MS4 Permit. The Final Permit replaces the 2004 Permit, which expired on August 18, 2009 and has been administratively extended since that time. The Final Permit incorporates concepts and approaches developed from studies and pilot projects that were planned and implemented by the District under the 2000 and 2004 MS4 permits and modifying Letters of Agreement, and implements Total Maximum Daily Loads (TMDLs) that have been finalized since the prior permit was issued, including the Chesapeake Bay TMDL. A number of applicable measurable performance standards have been incorporated into the Final Permit. These and other changes between the 2004 Permit and today's Final Permit are reflected in a Comparison Document that is part of today's Permit issuance.

WATER QUALITY IN DISTRICT RECEIVING WATERS:

The District's *2008 Integrated Report to the Environmental Protection Agency and U.S. Congress Pursuant to Sections 305(b) and 303(d) Clean Water Act*[3] documents the serious water

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1 A procedural history of Permit appeals can be viewed at the EPA Environmental Appeals Board web: http://yosemite.epa.gov/oa/EAB_Web_Docket.nsf/77355bee1a56a5aa8525711400542d23/b5e5b68e89edabe98525714f00731c6f!OpenDocument&Highlight=2.municipal.

2 Portions of the District are served by a combined sanitary and storm sewer system. The discharges from the combined sewer system are not subject to the MS4 permit, but are covered under NPDES Permit No. xxxx issued to the District of Columbia Water and Sewer Authority.

3 District Department of the Environment, *The District of Columbia Water Quality Assessment, 2008 Integrated Report to the Environmental Protection Agency and U.S. Congress Pursuant to Sections 305(b) and 303(d) Clean Water Act* (hereinafter "2008 Integrated Report").

quality impairments in the surface waters in and around the District. A number of the relevant designated uses are not being met, *e.g.*, aquatic life, fish consumption, and full body contact, and there are a number of specific pollutants of concern that have been identified (for additional discussion on relevant TMDLs *see* Section 4.10 of this Final Fact Sheet).

Commenters on the Draft Permit expressed some frustration over very slow progress or even lack of progress after a decade of implementation of the MS4 program and even longer for other water quality programs. EPA appreciates this concern. Although the District's receiving waters are affected by a range of discharge sources, discharges from the MS4 are a significant contributor of pollutants and cause of stream degradation. EPA also recognizes, however, that stormwater management efforts that achieve a reversal of the ongoing degradation of water quality caused by urban stormwater discharges entail a long term, multi-faceted approach.

Consistent with the federal stormwater regulations for characterizing discharges from the MS4 (40 C.F.R. §122.26(d)(2)(iii)), the first two permit terms for the District's MS4 program required end-of-pipe monitoring to determine the type and severity of pollutants discharging via the system. The monitoring program was not designed to evaluate receiving water quality *per se*, therefore detection of trends or patterns was not reasonably possible. Today's Final Permit includes requirements for a Revised Monitoring Program, and one of the objectives for the program is to use a suite of approaches and indicators to evaluate and track water quality over the long-term (*see* discussion of Section 5.1 in this Final Fact Sheet).
There have been identified improvements in some areas. For example the *2008 Integrated Report* noted improvements in the diversity of submerged aquatic vegetation in the Potomac River, as well as improvements in fish species richness in Rock Creek. Biota metrics are often the best indicators of the integrity of any aquatic system.

EPA also notes that there are a variety of indirect measures indicative of improvement. The federal stormwater regulations foresaw the difficulty, especially in the near-term, of detecting measurable improvement in receiving waters, and relied instead on indirect measures, such as estimates of pollutant load reductions (40 C.F.R. §122.26(d)(2)(v)). The District documents these types of indirect measures in its annual reports, *e.g.*, tons of solids collected from catch basin clean-outs, amount of household hazardous waste collected, number of trees planted, square footage of green roofs installed, and many other measures of success.[4]

EPA believes that documenting trends in water quality, whether improvements, no change, or even further degradation, is an important element of a municipal water quality program. Today's Final Permit recognizes this principle, both in the types of robust measures required as well as the transition to new monitoring paradigms. EPA encourages all interested parties to provide the District with input during the development of these program elements.

THIS FACT SHEET:

(http://ddoe.dc.gov/ddoe/frames.asp?doc=/ddoe/lib/ddoe/information2/water.reg.leg/DC_IR_2008_Revised_9-9-2008.pdf)

4 District MS4 Annual Reports can be found at: http://ddoe.dc.gov/ddoe/cwp/view,a,1209,q,495855.asp

This Final Fact Sheet is organized to correspond with the chronological organization and numbering in today's Final Permit. Where descriptions or discussions may be relevant to more than one element of the Final Permit the reader will be referred to the relevant section(s).

To keep today's Final Fact Sheet of readable length, many of the elements included in the fact sheet published with the Draft Permit (Draft Fact Sheet) on April 21, 2010 have not been repeated, but are referenced. Readers are referred to the Draft Fact Sheet published with the Draft Permit for additional discussion on provisions that have been finalized as proposed.[5] The Final Fact Sheet does discuss significant changes since the 2004 Permit (even if discussed in the Draft Fact Sheet). The Final Fact Sheet also contains additional explanation of the Final Permit where commenters requested additional clarification. In addition, this Final Fact Sheet explains modifications to the Final Permit where provisions were changed in response to comments.

In many cases EPA made a number of very simple modifications to the Final Permit, *e.g.*, a word, phrase, or minor reorganization, simply for purposes of clarification. These modifications were not intended to change the substance of the permit provisions, only to clarify them. Most of those types of edits are not discussed in this Final Fact Sheet, but EPA has provided a Comparison Document of the Draft and Final Permits for readers who would like that level of detail.

Many commenters noted that the Draft Permit was not logically organized. EPA agrees. The major reorganization principles include:

1) There is a new Section 3, Stormwater Management Program (SWMP) Plan consolidating the various plans, strategies and other documents developed in fulfillment of permit requirements.
2) All implementation measures, *i.e.*, those stipulating management measures and implementation policies, are included in Section 4 of today's Final Permit. This includes "Source Identification" elements (Section 3 in the Draft Permit) and "Other Applicable Provisions" elements (Section 8 in the Draft Permit), which included TMDL requirements.
3) All monitoring requirements are consolidated in Section 5 of the Final Permit.
4) All reporting requirements are consolidated in Section 6 of the Final Permit.

EPA also refers readers to the Responsiveness Summary released today along with the Final Permit and Final Fact Sheet, for responses to comments and questions received on the Draft Permit. That document contains additional detailed explanations of the rationale for changes made to the Draft Permit in the Final Permit.

Finally, EPA made significant effort to avoid appending or incorporating by reference other documents containing permit requirements into the Final Permit. In the interest of clarity

5 The Permit and Fact Sheet proposed on April 21, 2010 can be viewed at: http://www.epa.gov/reg3wapd/npdes/draft_permits.html

and transparency EPA, to the extent possible, has included all requirements directly in the permit. Thus, EPA reviewed a variety of documents with relevant implementation measures, *e.g.*, TMDL Implementation Plans and the 2008 Modified Letter of Agreement to the 2004 permit[6], and translated elements of those plans and strategies into specific permit requirements that are now contained in the Final Permit. This Fact Sheet provides an explanation of the sources of provisions that are significant and are a direct result of one of those strategies.

1. DISCHARGES AUTHORIZED UNDER THIS PERMIT

(1.2 Authorized Discharges): The Final Permit authorizes certain non-stormwater discharges, including discharges from water line flushing. One commenter noted that many of these discharges, especially from potable water systems, contain concentrations of chlorine that may exceed water quality standards. EPA agrees, and has therefore clarified that dechlorinated water line flushing is authorized to be discharged under the Final Permit.

(1.4 Discharge Limitations): Comments on the language in Part 1.4 varied widely. Some commenters did not believe it was reasonable to require discharges to meet water quality standards. Other commenters believed this to be an unambiguous requirement of the Clean Water Act.

Today's Final Permit is premised upon EPA's longstanding view that the MS4 NPDES permit program is both an iterative and an adaptive management process for pollutant reduction and for achieving applicable water quality standard and/or total maximum daily load (TMDL) compliance. *See generally,* "National Pollutant Discharge Elimination System Permit Application Regulations for Stormwater Discharges," 55 F.R. 47990 (Nov. 16, 1990).

EPA is aware that many permittees, especially those in highly urbanized areas such as the District, likely will be unable to attain all applicable water quality standards within one or more MS4 permit cycles. Rather the attainment of applicable water quality standards as an incremental process is authorized under section 402(p)(3)(B)(iii) of the Clean Water Act, 33 U.S.C. § 1342(p)(3)(B)(iii), which requires an MS4 permit "to reduce the discharge of pollutants to the maximum extent practicable" (MEP) "and such other provisions" deemed appropriate to control pollutants in municipal stormwater discharges. To be clear, the goal of EPA's stormwater program is attainment of applicable water quality standards, but Congress expected that many municipal stormwater dischargers would need several permit cycles to achieve that goal.

Specifically, the Agency expects that attainment of applicable water quality standards in waters to which the District's MS4 discharges, requires staged implementation and increasingly more stringent requirements over several permitting cycles. During each cycle, EPA will continue to review deliverables from the District to ensure that its activities constitute sufficient progress toward standards attainment. With each permit reissuance EPA will continue to increase

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6 District Department of the Environment, *Modification to the Letter of Agreement dated November 27, 2007 for the NPDES Municipal Separate Storm Sewer (MS4) Permit DC0000222* (2008) http://www.epa.gov/reg3wapd/npdes/pdf/DCMS4/Letter.PDF

stringency until such time as standards are met in all receiving waters. Therefore today's Final Permit is clear that attainment of applicable water quality standards and consistency with the assumptions and requirements of any applicable WLA are requirements of the Permit, but, given the iterative nature of this requirement under CWA Section 402(p)(3)(B)(iii), the Final Permit is also clear that "compliance with all performance standards and provisions contained in the Final Permit shall constitute adequate progress toward compliance with DCWQS and WLAs for this permit term" (Section 1.4).

EPA believes that permitting authorities have the obligation to write permits with clear and enforceable provisions and thus the determination of what is the "maximum extent practicable" under a permit is one that must be made by the permitting authority and translated into provisions that are understandable and measurable. In this Final Permit EPA has carefully evaluated the maturity of the District stormwater program and the water quality status of the receiving waters, including TMDL wasteload allocations. In determining whether certain measures, actions and performance standards are practicable, EPA has also looked at other programs and measures around the country for feasibility of implementation. Therefore today's Final Permit does not qualify any provision with MEP thus leaving this determination to the discretion of the District. Instead each provision has already been determined to be the maximum extent practicable for this permit term for this discharger.

EPA modified the language in the Final Permit to provide clarity on the expectations consistent with the preceding explanation. Specifically Section 1.4.2 of the Final Permit requires that discharges 'attain' applicable wasteload allocations rather than just 'be consistent' with them, since the latter term is somewhat ambiguous.

In addition, the general discharge limitation 'no increase in pollutant loadings from discharges from the MS4 may occur to receiving waters' was removed because of the difficulty in measuring, demonstrating and enforcing this provision. Instead, consistent with EPA's belief that the Final Permit must include all of the enforceable requirements that would achieve this principle, the following discharge limitation is substituted: "comply with all other provisions and requirements contained in this permit, and in plans and schedules developed in fulfillment of this permit."

In addition, EPA made the following modifications: "Compliance with <u>the</u> performance standards and provisions contained in <u>Parts 2 through 8 of</u> this permit shall constitute adequate progress towards compliance with DCWQS <u>and WLAs for this permit term</u>" (*underlined text added*) (Section 1.4 of the Final Permit). EPA eliminated circularity with the addition of "Parts 2 through 8", clarifying that this requirement does not circle back to include the statements in 1.4.1 and 1.4.2, but rather interprets them. Also, although WLAs are a mechanism for attainment of water quality standards, EPA added the specific language "and WLAs" to make this concept explicit rather than just implicit. In addition this revised language emphasizes that the specific measures contained in the Final Permit, while appropriate for this permit term, will not necessarily constitute full compliance in subsequent permit terms. It is the expectation that with each permit reissuance, additional or enhanced requirements will be included with the objective

of ensuring that MS4 discharges do not cause or contribute to an exceedance of applicable water quality standards, including attainment of relevant WLAs.

2. LEGAL AUTHORITY, RESOURCES, AND STORMWATER PROGRAM ADMINISTRATION

(2.1 Legal Authority): Several commenters pointed out that there were a number of requirements in the Draft Permit without clear compliance schedules or deadlines, or with deadlines that did not correspond well to others in the permit. In the Final Permit, EPA has made several revisions to address these comments. For example, EPA changed a requirement that deficiencies in legal authority must be remedied "as soon as possible" to a 120-day requirement for deficiencies that can be addressed through regulation, and two years for deficiencies that require legislative action (Section 2.1.1). Also, EPA increased the compliance schedule for updating the District's stormwater regulation from twelve months to eighteen months, *id.,* so that this action could be adequately coordinated with the development of the District's new offsite mitigation/payment-in-lieu program (for more discussion see Section 4.1.3 below).

(2.2 Fiscal Resources): One commenter suggested eliminating the reference to the District's Enterprise Fund since funding was likely to come from a number of different budgets within the District. EPA agrees with this comment and has removed this reference.

On the other hand, many commenters noted that the implementation costs of the District's stormwater program will be significant. EPA agrees. The federal stormwater regulations identify the importance of adequate financial resources [40 C.F.R. §122.26(d)(1)(vi) and (d)(2)(vi)]. In addition, after seeing notable differences in the caliber of stormwater programs across the country, EPA recognizes that dedicated funding is critical for implementation of effective MS4 programs.[7,8,9] In 2009 the District established, and in 2010 revised, an impervious-based surface area fee for service to provide core funding to the stormwater program[10] (understanding that stormwater-related financing may still come from other sources as they fulfill multiple purposes, *e.g.,* street and public right-of-way retrofits). In conjunction with the 2010 rule-making to revise the fee the District issued a Frequently Asked Questions document[11] that indicates the intent to restrict this fee to its original purpose, *i.e.*, dedicated funding to implement the stormwater program and comply with MS4 permit requirements. EPA believes this action is essential, and he expects that the District will maintain a dedicated source of funding for the stormwater program.

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7 National Research Council, *Urban Stormwater Management in the United States* (2009) National Academy of Sciences http://www.nap.edu/catalog.php?record_id=12465

8 National Association of Flood and Stormwater Agencies, Funded by EPA, *Guidance for Municipal Stormwater Funding* (2006) http://www.nafsma.org/Guidance%20Manual%20Version%202X.pdf

9 EPA, *Funding Stormwater Programs* (2008) http://www.epa.gov/npdes/pubs/region3_factsheet_funding.pdf

10 District of Columbia, Rule 21-566 Stormwater Fees, http://www.dcregs.dc.gov/Gateway/RuleHome.aspx?RuleID=474056

11 District of Columbia, FAQ Document *Changes to the District's Stormwater Fee* (2010) http://ddoe.dc.gov/ddoe/frames.asp?doc=/ddoe/lib/ddoe/information2/water.reg.leg/Stormwater_Fee_FAQ_10-5-10_-final.pdf

EXHIBIT B

CALIFORNIA Water Boards

EDMUND G. BROWN JR. GOVERNOR

MATTHEW RODRIQUEZ SECRETARY FOR ENVIRONMENTAL PROTECTION

State Water Resources Control Board

State Water Resources Control Board

Issue Paper
Municipal Storm Water Permit Receiving Water Limitations
Board Workshop
November 20, 2012

ISSUE:

The State Water Resources Control Board (State Water Board) has been asked, in public comments received on National Pollutant Discharge Elimination System (NPDES) permits for Municipal Separate Storm Sewer Systems (MS4s), to adopt permit provisions that create a partial or complete exemption from enforcement for violations of water quality standards while a discharger engages in an iterative process of improving controls (commonly referred to as a "safe harbor" provision). The State Water Board has scheduled a public workshop to consider the issue.

DISCUSSION:

Background:

The Clean Water Act generally requires NPDES permits to include technology-based effluent limitations and any more stringent limitations necessary to meet water quality standards. In the context of NPDES permits for MS4s, however, the Clean Water Act does not reference the requirement to meet water quality standards. MS4 discharges must meet a technology-based standard of reducing pollutants in the discharge to the Maximum Extent Practicable (MEP), but requirements to meet water quality standards are at the discretion of the permitting agency.[1] Further, under the Porter-Cologne Water Quality Control Act, waste discharge requirements must implement applicable water quality control plans, including water quality objectives; however, the Porter-Cologne Act also affords the State Water Board and regional water quality control boards (collectively, Water Boards) flexibility to consider other factors, such as economics, when establishing any NPDES permit requirements that are more stringent than required by the Clean Water Act.[2]

The State Water Board has exercised its discretion with regard to requiring compliance with water quality standards in MS4 permits by directing, in precedential orders, that MS4 permits contain provisions requiring discharges to be controlled so as not to cause or contribute to exceedances of water quality standards in receiving waters.[3] However, consistent with federal

[1] 33 U.S.C. § 1342(p); *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159.

[2] Wat. Code, §§ 13241, 13263; *City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613.

[3] SWRCB Order WQ 98-01 (*Environmental Health Coalition*), WQ 99-05 (*Environmental Health Coalition)*.

law, the State Water Board has found it appropriate to implement Best Management Practices (BMPs) in lieu of numeric water quality-based effluent limitations to meet water quality standards.[4] Additionally, in lieu of "strict compliance" with water quality standards, the State Water Board has prescribed an iterative process whereby an exceedance of a water quality standard triggers a process of BMP improvements: reporting of the violation, submission of a report describing proposed improvements to BMPs expected to better meet water quality standards, and implementation of these new BMPs.

While the Water Boards have generally directed dischargers to achieve compliance with water quality standards by improving control measures through the iterative process, the iterative process does not provide a "safe harbor" to MS4 permittees: that is, when a discharger is shown to be causing or contributing to an exceedance of water quality standards, that discharger is in violation of the relevant discharge prohibitions and receiving water limitations of the permit and potentially subject to enforcement by the Water Boards or through a citizen suit, even if the discharger is actively engaged in the iterative process. Despite the lack of a safe harbor provision, however, the Water Boards have, as a matter of practice, declined to initiate enforcement actions against MS4 permittees who have been actively engaged in the iterative process. The Water Boards' decisions to decline to include a safe harbor in MS4 permits have been upheld by courts of appeal.[5]

Need for and Purpose of Workshop:

The lack of a safe harbor in the iterative process was recently highlighted by the Ninth Circuit's decision in a citizen suit brought by the Natural Resources Defense Council (NRDC) against the County of Los Angeles and the Los Angeles County Flood Control District for violations of the receiving water limitations of their MS4 permit. The Ninth Circuit confirmed that, as the receiving water limitations of the Water Boards' MS4 permits are currently drafted, engagement in the iterative process does not excuse liability for violations of water quality standards.[6]

As the storm water management programs of municipalities have matured, an increasing body of monitoring data indicates that water quality standards are in fact not being met by many MS4s. MS4s accordingly assert that the receiving water limitations and iterative process provisions of the Water Boards' permits do not afford them with a viable path to compliance for these violations, which may take years of technical efforts to correct, especially for wet weather discharges. MS4s argue that they are increasingly vulnerable to citizen suits and/or Water Board enforcement. This concern has been raised by the California Stormwater Quality Association (CASQA) in comments on the proposed Phase II MS4 permit and by the California Department of Transportation (Caltrans) in comments on the Caltrans MS4 permit adopted

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[4] *See* SWRCB Orders WQ 91-03 (*Citizens for a Better Environment)*, WQ 98-01 (*Environmental Health Coalition*), WQ 2001-15 (*Building Industry Association of San Diego County*); *See also* 40 C.F.R. § 122.44(k); Interim Permitting Approach for Water Quality-Based Effluent Limitations In Storm Water Permits, USEPA, September 1995. In such orders and guidance, the State Water Board and Environmental Protection Agency acknowledge that the storm water program may evolve over time to incorporate stricter limitations, including improved BMPs to meet water quality standards or numeric water quality based effluent limitations.

[5] *Building Industry Assn. of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866; *City of Rancho Cucamonga v. Regional Water Quality Control Bd.* (2006) 135 Cal.App.4th 1377; see also *Natural Resources Defense Council v. County of Los Angeles* (9th Cir. 2011) 673 F.3d 880, 897, n.7.

[6] *Natural Resources Defense Council v. County of Los Angeles, supra*, 673 F.3d at p. 897. On July 13, 2012, the United States Supreme Court granted review of this case on other grounds.

September 19, 2012, as well as by numerous MS4s and interested persons in comments on both permits. The issue is additionally relevant to the Phase I MS4 permits issued by the regional water quality control boards.[7]

At the same time, the environmental community has commented that the iterative process has been underutilized and ineffective to date in bringing MS4 discharges into compliance with water quality standards. Environmental parties argue that direct enforcement of water quality standards is necessary to protect water quality, especially in such second- or third-generation permits where dischargers have already had a number of years to come into compliance.

Because of the broad applicability of any policy decisions regarding the receiving water limitations and iterative process provisions, the State Water Board is holding a public workshop to consider several alternatives in addressing the issue and to seek public input on these alternatives. Following the workshop, the State Water Board may propose revisions to the receiving water limitations in the Caltrans MS4 and Phase II MS4 permits, and as necessary, re-open those permits after public review and comment, to make the revisions.

ALTERNATIVES FOR CONSIDERATION:

The State Water Board may consider the alternatives below, individually or in combination, to address concerns with the receiving water limitations in the Caltrans or Phase II MS4 permits. While the listed alternatives attempt to capture the range of alternatives before the State Water Board, the Board welcomes comments proposing other options and will not be limiting its consideration to the alternatives as listed in this issue paper.

The receiving water limitations language prescribed by State Water Board Order WQ 99-05 is attached as Attachment 1 and forms the basis of Alternative 1. CASQA has submitted specific proposed language for the Receiving Water Limitations provision of the proposed Phase II MS4 permit (CASQA Proposal). The CASQA Proposal is attached as Attachment 2 and is referenced as appropriate in the discussion of the alternatives below.

Alternative 1: Keep the status quo of no safe harbor.

This alternative makes no changes to the existing State Water Board approach or to the current language of the adopted Caltrans MS4 permit or the proposed Phase II MS4 permit. As stated previously, the current MS4 permit provisions laying out the iterative process are based on language set forth in precedential State Water Board orders. (See Attachment 1.) Alternative 1 adheres to the prescribed language. Under this alternative, the Water Boards may choose to exercise their enforcement discretion to refrain from taking action against dischargers engaged in good faith implementation of the iterative process; however, they would not be constrained from enforcing the receiving water limitations when an MS4 causes or contributes to exceedances of water quality standards. As a limitation within an NPDES permit, dischargers who cause or contribute to an exceedance of water quality standards could be subject to citizen suits.

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[7] Note that the issue is not relevant to any other NPDES permits, including permits for storm water discharges associated with industrial activity, because all other NPDES permits must include technology-based effluent limitations and any more stringent limitations necessary to meet water quality standards. (33 U.S.C. § 1311(b)(1)(C).)

Alternative 2: No safe harbor, but provide greater clarity and specificity for iterative process implementation and wet weather data analysis.

Greater clarity and specificity in the MS4 permits as to the iterative process requirements may result in increased efforts to improve controls and achieve compliance. Such clarity and specificity may include:

1. Clarification on how compliance with the relevant discharge prohibitions and receiving water limitations is determined, including type and frequency of monitoring;
2. Clarification that dischargers must begin the iterative process after documentation of violations without waiting to be directed to do so by the Water Boards;
3. Specification of the minimum efforts that will constitute meaningful compliance with the iterative process;
4. Specification of the scope of any corrective action, including whether it applies only at the location where exceedances are measured or throughout the relevant watershed;
5. Specification of additional wet weather data analysis to better define and assess the impact of municipal storm water discharges on receiving waters, as well as the efficacy of specific best management practices.

As the MS4 program continues to mature and more data becomes available, this alternative may be enhanced by the development of water quality-based effluent limitations for pollutants, as appropriate, as a means of determining compliance with receiving water limitations. In addition, the enhanced wet weather data could be used to identify surrogates that could be used as a measure of protecting beneficial uses. In time, the data could be used to develop actual wet weather water quality standards or wet weather implementation provisions for existing water quality standards that could be applied consistently on a statewide basis.

Given the nature of storm water discharges and of MS4s, questions such as where and how compliance with water quality standards should be measured and how narrowly or broadly corrective actions should be applied, pose complicated technical issues that require careful study and consideration. These challenges notwithstanding, water quality improvements are more likely to be achieved as the iterative process becomes automatic and dischargers follow clear guidelines for determining and addressing non-compliance with permit terms. Such improvements may dissuade the Water Boards and the public from bringing enforcement actions/citizen suits for all except the most egregious and repeated violations.

In addition to being a stand-alone alternative, Alternative 2 may be considered in combination with Alternatives 3 through 5. The CASQA Proposal incorporates some greater specificity in the iterative process requirements as a component of its proposed receiving water limitations.

Alternative 3: Safe harbor that applies only if a discharger is in compliance with the implementation provisions of an approved TMDL.

Under Alternative 3, the receiving water limitations would be amended to provide a safe harbor for permittees that are in compliance with the implementation provisions of a TMDL. In effect, as long as the permittee is in compliance with the TMDL (including any compliance schedule) the terms of the TMDL would replace the requirement to comply with water quality standards for the pollutants that are covered by the TMDL.

The CASQA Proposal contemplates a safe harbor for dischargers in compliance with a TMDL as a component of the receiving water limitations.

Alternative 4: Safe harbor that applies if a discharger is in compliance with the implementation provisions of an approved TMDL, as in Alternative 3, and, in addition, that applies when the discharger engages in good faith compliance with the iterative process for exceedances caused by wet weather discharges.

In addition to the safe harbor for TMDL implementation, Alternative 4 would provide a safe harbor when dischargers engage in the iterative process in good faith to address violations of permit terms caused by wet weather discharges. Thus, if a storm water discharge from an MS4 is causing or contributing to an exceedance of a water quality standard in the receiving water, the exceedance would not constitute a violation of the permit as long as the discharger was engaged in good faith efforts to address the exceedance through improved controls. Alternative 4 recognizes that wet weather discharges from MS4s frequently cause or contribute to violations of water quality standards and allows the MS4s time to address these violations by improving control measures.

However, the safe harbor would not extend to dry weather discharges. Non-storm water discharges are generally prohibited in MS4 permits and only a few categories of non-storm water discharges are exempted from the prohibition, with the condition that these exempted discharges also be prohibited if they are identified as sources of pollutants to receiving waters.

Alternative 5: Full safe harbor.

This alternative would provide a full safe harbor to dischargers complying with the implementation provisions of a TMDL or engaging in the iterative process to address exceedances caused by wet or dry weather discharges.

The CASQA Proposal attached provides for a full safe harbor.

Attachments Removed

EXHIBIT C

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RIVERSIDE COUNTY FLOOD CONTROL
AND WATER CONSERVATION DISTRICT

November 13, 2012

Honorable Members of the State Water Resources Control Board
Attn: Ms. Jeanine Townsend, Clerk to the Board
State Water Resources Control Board
1001 I Street, 24th Floor
Sacramento, CA 95814

Dear Honorable Board Members and Ms. Townsend:

Re: Comment Letter – Receiving Water Limitations Language Workshop

I am writing on behalf of the Riverside County Flood Control and Water Conservation District ("District") regarding the State Water Resources Control Board's consideration of Receiving Water Limitations ("RWL") language in MS4 permits. This review was triggered by a decision of the Ninth Circuit United States Court of Appeals in *Natural Resources Defense Council v. County of Los Angeles* (9th Cir. 2011) 673 F.3d 880, *cert granted,* __ U.S. __ (June 25, 2012) ("*NRDC*"). This letter is being submitted in advance of the State Board's November 20, 2012 workshop on reform of the RWL language to be incorporated into MS4 permits as a matter of statewide policy.

The District is the Principal Permittee for three Phase I MS4 permits applicable to municipalities across Riverside County: Order R8-2010-0033, issued by the Santa Ana Regional Water Board to municipalities within the Santa Ana River Region of Riverside County; Order R9-2010-016, issued by the San Diego Regional Water Board to municipalities within the Santa Margarita Region of Riverside County; and Order R7-2008-0001, issued by the Colorado River Regional Water Board to municipalities within the Whitewater River Region of Riverside County. Given our unique perspective as the manager of three Phase 1 MS4 permits, the District and its staff thus, have considerable experience and expertise in developing and administering MS4 permits, and a keen understanding of the issues that the above mentioned court case creates.

The District strongly supports reform of the RWL language to make clear the State Board's often-expressed intention that MS4 Permittees' compliance with RWL be effectuated through an iterative process. However, under the Ninth Circuit's interpretation, any MS4 discharge that causes or contributes to an exceedance of a Water Quality Standard subjects the MS4 Permittee to civil penalty liability, injunctive relief and the payment of attorneys' fees in an action brought by a citizen plaintiff, even where the Permittee is fully implementing the programmatic requirements of their MS4 Permit.

The District supports the California Stormwater Quality Association's ("CASQA") efforts to obtain RWL language that ensures that the iterative process favored by the State Board is honored. The District also supports the comments of the California State Association of Counties, and believes the proposed RWL language attached to those comments is a step in the right direction.

This letter contains additional District comments about the RWL language and the iterative process. We believe that they are best expressed in terms of correcting misperceptions regarding the current RWL language, as interpreted by the Ninth Circuit.

Misperception Number One: Strict compliance with Water Quality Standards is required of MS4 Permittees by the Clean Water Act.

The Clean Water Act provides that MS4 discharges must control pollutants in discharges from the MS4 to the "Maximum Extent Practicable" (33 U.S.C. § 1342(p)(3)(B)(iii)). Unlike the case with other NPDES Permittees, the Clean Water Act does not require that municipalities strictly comply with Water Quality Standards, as determined by the Ninth Circuit in *Browner v. Defenders of Wildlife*. The State Board's own precedential Order WQ 2001-15 recognizes this fact and states that the RWL language was intended to be consistent with the *Browner* case. In that Order, which interpreted RWL language similar to that in *NRDC*, the Board stated:

> *[O]ur language, similar to the U.S. EPA's permit language discussed in the Browner case, does not require strict compliance with water quality standards. Our language requires that storm water management plans be designed to achieve compliance with water quality standards. Compliance is to be achieved over time, through an iterative approach requiring improved BMPs. As pointed out by the Browner court, there is nothing inconsistent between this approach and the determination that the Clean Water Act does not mandate strict compliance with water quality standards. [Order WQ 2001-15 at 7 (emphasis added)].*

Unfortunately, the Ninth Circuit completely disregarded this language, and the Order, in holding that strict compliance was required of MS4 Permittees.

USEPA itself has issued MS4 permits (in non-delegated states) that do not contain RWL language requiring strict compliance with Water Quality Standards. Therefore, it is clear that such compliance is not required by the Clean Water Act nor is such compliance established by USEPA policy. The most prominent example of a recent MS4 permit promulgated by USEPA is that for the District of Columbia ("DC Permit") (relevant portions of which are attached as Exhibit A), which was adopted in 2011.

Part 1.4 of the DC Permit contains the requirements relating to Water Quality Standards and provides, in relevant part: "Compliance with the performance standards and provisions contained in Parts 2 through 8 of the permit shall constitute adequate progress towards compliance with DCWQS [water quality standards] and WLAs [established under TMDLs] for this permit term." The DC Permit Fact Sheet explains the rationale for that language as follows [DC Permit Fact Sheet, Pages 5-6, emphasis added, attached as Exhibit B]:

> *Comments on the language in Part 1.4 varied widely. Some commenters did not believe it was reasonable to require discharges to meet water quality standards. Other commenters believed this to be an unambiguous requirement of the Clean Water Act.*

Today's Final Permit is premised upon **EPA's longstanding view that the MS4 NPDES permit program is both an iterative and an adaptive management process for pollutant reduction and for achieving applicable water quality standard and/or total maximum daily load (TMDL) compliance.** *See generally, "National Pollutant Discharge Elimination System Permit Application Regulations for Stormwater Discharges," 55 F.R. 47990 (Nov. 16, 1990).*

EPA is aware that many Permittees, especially those in highly urbanized areas such as the District, likely will be unable to attain all applicable water quality standards within one or more MS4 permit cycles. *Rather the attainment of applicable water quality standards* **as an incremental process** *is authorized under section 402(p)(3)(B)(iii) of the Clean Water Act, 33 U.S.C. § 1342(p)(3)(B)(iii), which requires an MS4 permit "to reduce the discharge of pollutants to the maximum extent practicable" (MEP) "and such other provisions" deemed appropriate to control pollutants in municipal stormwater discharges.* **To be clear, the goal of EPA's stormwater program is attainment of applicable water quality standards, but Congress expected that many municipal stormwater dischargers would need several permit cycles to achieve that goal.**

Specifically, the Agency expects that attainment of applicable water quality standards in waters to which the District's MS4 discharges, requires staged implementation and increasingly more stringent requirements over several permitting cycles. During each cycle, EPA will continue to review deliverables from the District to ensure that its activities constitute sufficient progress toward standards attainment. With each permit reissuance EPA will continue to increase stringency until such time as standards are met in all receiving waters. **Therefore today's Final Permit is clear that attainment of applicable water quality standards and consistency with the assumptions and requirements of any applicable WLA are requirements of the Permit, but, given the iterative nature of this requirement under CWA Section 402(p)(3)(B)(iii), the Final Permit is also clear that "compliance with all performance standards and provisions contained in the Final Permit shall constitute adequate progress toward compliance with DCWQS and WLAs for this permit term" (Section 1.4).**

USEPA is now proposing clarifying changes to this language and to other sections of the DC Permit as the result of a settlement with various parties. However, those changes do not require strict compliance with Water Quality Standards, but rather compliance through the programs developed under the Permit.

The State Board is thus, free to adopt new RWL language that effectuates its previously expressed intent that MS4 permits not require strict compliance with Water Quality Standards with regard to contributions from discharges from MS4s.

Misperception Number Two: The MS4 Permittees are Seeking a "Safe Harbor" that would Insulate them from Responsibility Under the Clean Water Act.

While State Board staff's "Issue Paper" uses the term "safe harbor" in describing the iterative process, the District believes that this is fundamentally misleading. Even a cursory review of the terms of a typical MS4 permit in California reveals that it is full of compliance points. In the three MS4 Permits in which the District serves as Principal Permittee, literally every sentence is a separate point of compliance.

This fact is supported by the language of the Permits themselves. For example, in Order R8-2010-0033 Part XX.G provides: **"The Permittees must comply with all terms, requirements, and conditions of this Order. Any violation of this Order constitutes a violation of the CWA, its regulations and the California Water Code, and is grounds for enforcement action . . . ."** (emphasis added). Similar provisions are contained in the other two Riverside County MS4 Permits. Even without the strict Water Quality Standard language imposed under the Ninth Circuit's opinion, there is no "safe harbor" from liability under the Clean Water Act or, where applicable, the California Water Code, for any Permittee that fails to fully implement each the detailed and prescriptive requirements of its MS4 Permit.

There is a fundamental difference however, between fully complying with activities within the control and responsibility of the Permittees, such as monitoring, implementing BMPs and performing other programmatic requirements of the MS4 Permit; and being forced to guarantee that MS4 discharges will not cause or contribute to exceedances of Water Quality Standards in Receiving Waters, a guarantee that the Permittees' have no ability to make.

What the District and other MS4 Permittees seek is relief from what is essentially "guaranteed non-compliance" where a Permittee can be found in violation of their MS4 Permit even if the exceedance occurs at no fault of or failure by the Permittee, or put another way, even in circumstances where there is nothing a Permittee could have done to prevent that exceedance from occurring. In such a case, the Permittee can be held liable for potentially millions of dollars in legal costs, penalties and other expenses. We note that the City of Malibu, a city of only 13,000 residents, spent more than $2 million in defending against a citizen suit filed with respect to its MS4 Permit and more than $6 million to settle the case, including payment of $750,000 in attorney fees to plaintiffs. Given the tremendous financial challenges faced by every California municipality, including the District, the County of Riverside and the Permittee cities within the County, such a diversion of resources that otherwise would be directed at clean water programs or other vital municipal programs is a poor policy choice. And, as noted, it is not a policy choice that is required by the Clean Water Act, nor is it required by USEPA in their own Permits.

The District recognizes that regulatory enforcement actions and citizen suits are authorized by the Clean Water Act and that such suits may be an appropriate remedy where, for example, a Permittee has failed to comply with the programmatic requirements of its MS4 Permit. Where, however, the Permittees are complying with those requirements in good faith but, due to circumstances beyond

their control, their MS4 discharge causes or contributes to a Water Quality Standard exceedance in Receiving Waters, a citizen suit based on those exceedances potentially throws away the work done by the Permittees and the Water Boards under the MS4 Permit, as discussed below.

Misperception Number Three: MS4 can achieve compliance with strict Water Quality Standards.

MS4 Permittees cannot guarantee that discharges from their MS4s will in fact, not cause or contribute to an exceedance of Water Quality Standards in a Receiving Water. The monitoring conducted under our MS4 Permits reflects exceedances of various Water Quality Standards in Receiving Waters, and we understand that such results are typical for MS4 discharges around the state (please see Pages 2-3 of the CASQA comment letter dated November 2, 2012). The extreme variability of stormwater quality and quantity itself (which, in Southern California, arrives infrequently and from widely varying storm sizes) combined with a multitude of potential pollutant sources beyond a Permittee's ability to truly "control", make it impossible for a municipality to ensure that no discharges from its MS4 will ever cause or contribute to exceedances of Water Quality Standards in Receiving Waters. This was recognized by the Issue Paper released by State Board staff in preparation for the November 20th workshop, which found that as "the storm water management programs of municipalities have matured, **an increasing body of monitoring data indicates that water quality standards are in fact not being met by many MS4s**" (Issue Paper, Page 2 (emphasis supplied)).

Thus, even if municipal Permittees are to be held strictly liable for the ensuring that no discharges from their MS4s cause or contribute to an exceedance of Water Quality Standards, as the Ninth Circuit has interpreted the current RWL language, those Permittees have no ability to attain those standards. The reasons are several-fold and include the following:

1) Unlike an industrial NPDES Permittee, a municipal Permittee is not typically the source of the pollutants in the MS4 discharge (whether wet or dry). The municipality can regulate sources to some degree (through, for example, the operation of structural and non-structural BMPs and implementation of an Illegal Connection/Illicit Discharge program), but the municipality cannot guarantee that pollutants will not enter the MS4 and then be discharged into the Receiving Waters.

2) Municipalities cannot control natural sources of pollutants that are discharged through the MS4. Monitoring has indicated that many pollutants are likely from natural and not anthropogenic sources.

3) While Permittees conduct extensive public education programs as part of their MS4 programs, municipalities cannot "control" human behavior, or "prevent" an individual from taking an action that might cause pollution to enter the MS4. As an example, a resident may, despite all ordinances, regulations, potential penalties or enforcement, public outreach, available BMPs, etc., choose not to pick up after their pets, and

stormwater may, through no fault of the Permittee, pick up animal waste and deposit into the MS4.

4) MS4 Permittees cannot "prevent" flows from entering their MS4. To protect the health and property of their residents, MS4 operators must allow the legitimate flows of water into their drains. This is especially true for the District, which is charged directly by the Legislature [in Water Code App. §48-9] with the task of taking necessary steps to protect the people, properties and watersheds of Riverside County from the negative impacts of flooding. The District cannot, in effect, cause flooding by preventing flows from entering their storm drain, simply because such flows may contain pollutants that cause a violation of the Receiving Waters Limitation provisions of their MS4 Permits. In fact, California law requires downstream property owners (such as MS4 operators) to accept flows from upstream property owners.

5) Further, the authorities granted to flood control districts, such as this District, by the Legislature are narrow and do not include the authority to condition or regulate the quality or nature of stormwater runoff discharged from up gradient properties. This responsibility is appropriately assigned by the Legislature to the Regional Boards.

Similarly, MS4 Permittees cannot guarantee compliance with Water Quality Standards in dry weather. "Alternative 4" in the staff's Issue Paper suggests an alternative RWL approach that would not extend the iterative approach to dry weather discharges. The District submits that this alternative does not reflect the reality of urban runoff. Monitoring conducted under the Riverside County MS4 Permits reflects exceedances of Water Quality Standards during dry weather as well as wet weather. There is no justification for imposition of strict liability for exceedances during such conditions, for the following reasons:

1) During dry weather, other NPDES-permitted discharges continue to flow into the Receiving Waters. For example, much of the flow in the Santa Ana River during dry weather conditions is from non-MS4 sources, such as publicly owned treatment works. Additionally, numerous other separate NPDES-permitted discharges will occur, potentially at concentrations of pollutants that exceed Water Quality Standards. Evidence generated during the *NRDC* case involving the County of Los Angeles, for example, indicated that NPDES permits covering hundreds of these dischargers, including POTWs allowed the discharge of pollutants at concentrations *greater* than Water Quality Standards. Because of these discharges, which are legal and authorized by the Regional Boards, the MS4 Permittees have essentially no more control over compliance with Water Quality Standards in dry weather than they would have during wet weather conditions.

2) Accidental or even intentional illicit discharges by third parties into the MS4 obviously can occur during dry weather as well as wet weather. Such discharges would potentially have an even greater impact on sampling, since they are not diluted by large volumes of stormwater. For example, a vehicular accident recently caused hundreds of gallons of

asphalt tar to enter Sandia Creek, a Receiving Water in Riverside County. While this spill was not discharged through an MS4, if the vehicular accident had occurred in another portion of the watershed, the spill could feasibly have entered into and been discharged from an MS4. Similarly in many places throughout the State, sanitary sewer systems are owned and operated by special districts that have no relation to the MS4 Permittees that own or operate the MS4 systems. Nevertheless, an overflow of such sanitary sewer systems may cause an unavoidable discharge into, and from a Permittee-owned MS4. Such accidental or illicit discharges cannot be "prevented" or "controlled" by the Permittees except to the extent that they can be cleaned up or blocked if promptly reported. However, if the discharge has reached Receiving Waters and caused a measured exceedance of Water Quality Standards, under the Ninth Circuit's interpretation, liability for civil penalties, injunctive relief and attorneys fees will attach to the MS4 Permittee.

3) Enforcing strict Water Quality Standard limits in dry or wet weather is counter-productive to the watershed planning-based MS4 Permits currently being promulgated by many regional water boards. Enforcing such limits will divert Permittee attention and resources from watershed-based, monitoring-heavy compliance programs, as will be discussed in greater detail below.

In essence, under the Ninth Circuit's interpretation of the current RWL language, the District, and potentially every other MS4 Permittee in the state, is in violation of its Permit any time that an exceedance of a Water Quality Standard is recorded and attributed to a discharge from its MS4. This means that the Regional Water Boards have issued, and continue to adopt permits that include RWL language **which cannot be complied with**. The Clean Water Act, however, does not require Permittees to achieve the impossible. *See, e.g., Hughey v. JMS Development Corp.* (11th Cir. 1996) 78 F.3d 1523, 1530 ("In interpreting the liability provisions of the CWA, we realize that Congress is presumed not to have intended absurd (impossible) results.").

Misperception Number Four: The Current RWL Language is more Protective of Receiving Water Quality.

This statement is not only untrue but maintaining the current RWL language actually **impedes** efforts to protect Receiving Water Quality.

We understand that some stakeholders believe that there should be Numeric Effluent Limitations (NELs) contained in the MS4 Permits for purposes of accountability. In response, we note that many MS4 permits now contain numeric Stormwater and Non-stormwater Action Levels ("SALs" and "NALs") or other numeric targets or goals, the exceedance of which trigger specific compliance responses by the Permittees. It is these action levels (which were advocated by the Blue Ribbon Panel established by the State Board to investigate the appropriateness of NELs in MS4 permits) which provide such "numeric" accountability. This is in addition to the numerous other compliance documentation and reporting provisions required of MS4 Permittees that also provide measures of accountability.

More importantly, the current RWL language as interpreted by the Ninth Circuit actually impedes efforts by municipalities to protect water quality. First, by requiring immediate compliance, the language undermines efforts to bring Water Quality Standard-impaired waterbodies into compliance through the Total Maximum Daily Load ("TMDL") program. TMDLs are designed with the recognition that, due to the complexity of the issues causing the waterbody to be impaired in the first place, meeting these requirements cannot be achieved immediately. Therefore, TMDL compliance plans include timelines to achieve such compliance over periods of years and sometimes decades.

Second, most MS4 permits have begun incorporating sophisticated watershed management plans, which prioritize pollutants by waterbody and attempt, through aggressive monitoring and source identification efforts, to identify and address the sources of those prioritized pollutants. Municipalities subject to strict RWL language will have no ability to prioritize pollutants, since they must address any pollutant that exceeds a Water Quality Standard, irrespective of the relative impact that that discharge may have had upon the environment or beneficial uses. Moreover, these watershed management plan approaches employ cooperative monitoring and other watershed-based approaches. Permittees faced with potential liability for any exceedance of Water Quality Standards in Receiving Waters that may be caused or contributed to by discharges of their MS4s, will not likely volunteer to cooperate on any watershed-based approach, if cooperation could subject them to additional unnecessary liability.

Third, in a citizen suit brought under the Clean Water Act, a federal judge is free to impose any appropriate injunctive relief to enforce a permit (33 U.S.C. § 1365(a)). Thus, for example, a court could ignore the provisions of a MS4 permit in ordering municipal defendants to address Water Quality Standard exceedances in Receiving Water. This means that the thousands of people-hours invested in the Permit's development, implementation and oversight by municipalities, the Regional Water Boards and other stakeholders would be wasted. In essence, under the Ninth Circuit's reading of the RWL language, all other language in an MS4 permit appears to be superfluous, since the RWL language would control all compliance efforts. This result, of course, is not required by plain language of the Clean Water Act.

Fourth, if a municipality is in unavoidable and automatic non-compliance with the requirements of its MS4 Permit, it will be unable to justify budgeting for water quality management programs and BMPs otherwise required by the Permit as the municipality will simply receive no benefit from making compliance investments. To gain public support for stormwater programs, a municipality must demonstrate to its residents that such investments will constitute compliance with the Permit.

Discussion of Alternatives

The State Board staff's Issue Paper sets forth five alternatives for consideration. Alternative 1, no change in the current RWL language, is completely unacceptable to the District (and, we believe, to other municipalities across the state) because it fails to address the "guaranteed non-compliance" problem of the current language.

Alternative 2, which proposes to maintain the language that puts the MS4 Permittees in a situation of unavoidable and potentially "guaranteed" non-compliance, but would add greater specification as to how the iterative process might be carried out, is also unacceptable as the MS4 Permittees will still have no viable means to ensure their compliance with the RWL language. While the District does not object in principle to RWL language that spells out clearly, and in achievable terms, what is required of MS4 Permittees when exceedances are recorded, such a change alone does not address the fundamental issues identified in this letter.

Alternative 3, which proposes to provide an iterative process for compliance with the RWL only for pollutants being addressed by dischargers in compliance with an approved TMDL, is better than the first two alternatives, but is still entirely insufficient. By failing to provide a viable means for compliance with the RWL language for non-TMDL pollutants, this alternative language would force Permittees into unavoidable non-compliance, and require them to redirect their efforts and resources away from the TMDL activities, to those other pollutants, due to the strict liability attached to those exceedances. This would be a poor policy choice, as pollutants that are not subject to a TMDL may have significantly less, or even no impact on beneficial uses in the Receiving Waters, as noted in the CASQA comment letter.

Alternative 4, which excludes dry weather discharges from the iterative process to comply with the RWL, is unacceptable for the reasons previously set forth regarding an MS4 Permittees inability to truly "prevent" or "control" accidental or illegal dry weather discharges.

Alternative 5, which provides viable means for compliance with the RWL, for all types of MS4 discharges, is the only viable solution among the alternatives presented by State Board staff. In an era of limited budgets, the only and best way to make progress toward improving the quality our Receiving Waters, is to provide MS4 Permittees the ability to prioritize their efforts, as required in the Watershed Management Plan provisions contained in the most recent MS4 Permits, including the Los Angeles County Permit and the proposed Regional Permit for the San Diego Regional Water Board. As previously discussed, such prioritization cannot occur in the context of strict liability for the exceedance of Water Quality Standards in the Receiving Waters. For all of the reasons set forth in this letter, no other alternative makes policy sense or is congruent with the Maximum Extent Practicable standard in the Clean Water Act.

The District would add that Alternative 5 should additionally incorporate the concept of achieving RWL compliance through watershed management plans, and requests the Board to direct staff to work with stakeholders to ensure that any revised RWL language does not force intermittent or minor exceedances of Water Quality Standards to become de-facto higher priorities than those set by the watershed stakeholders.

In summary, the District supports CASQA, the California State Association of Counties and other municipal stakeholders in advocating for a fully iterative and viable approach to compliance with RWL language in both wet and dry weather conditions. Only when such an approach is in place and endorsed by the State Board will Permittees, including the District, feel confident that they can focus

fully on efforts to address pollutants in discharges into and from their MS4s, and not on preparing for costly and pointless litigation.

The District therefore, respectfully requests the State Board direct its staff to commence development of new language providing for an enforceable, iterative and viable process for MS4 Permittees to comply with the RWL language included in MS4 permits.

We wish to thank you and State Board staff for your consideration of these comments and any further comments, written or oral, that the District may make on these important issues.

Very truly yours,

Steve Thomas

for WARREN D. WILLIAMS
General Manager-Chief Engineer

CP:cw
P8/150189

EXHIBIT D

FILED
JAN - 3 2013
CLERK, U.S. DISTRICT COURT
ALEXANDRIA, VIRGINIA

IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF VIRGINIA
Alexandria Division

VIRGINIA DEPARTMENT OF TRANSPORTATION, ET AL, Plaintiffs, -v- UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, ET AL, Defendants.	Civil Action No. 1:12-CV-775

Memorandum Opinion

Before the Court is the Plaintiffs' motion for judgment on the pleadings under Federal Rule of Civil Procedure 12(c). The Defendants opposed the motion, and the Plaintiffs replied. The Court heard oral arguments on December 14, 2012 and now issues this memorandum opinion and accompanying order granting the Plaintiffs' motion.

Background

The Clean Water Act, 33 U.S.C. § 1251 et seq., establishes the basic structure for regulating discharge of pollutants into the waters of the United States, and provides certain mechanisms to improve and maintain the quality of surface waters.

One such mechanism is the requirement that states identify "designated uses" for each body of water within their borders, as well as "water quality criteria" sufficient to support those uses. 33 U.S.C. § 1313(c)(2)(A). The Environmental Protection Agency ("EPA") evaluates the uses and criteria developed by the states, and either approves them or else proposes and

promulgates its own set of standards. § 1313(c)(3).

Once the standards are in place, each state is required to maintain a list—also subject to approval or modification by EPA—of its waterbodies that are "impaired" because they do not meet their respective water quality criteria. 33 U.S.C. § 1313(d)(1)(A). For each waterbody on the impaired list, the state is required to establish a set of total maximum daily loads ("TMDLs") sufficient to bring the body back into compliance with its water quality criteria. § 1313(d)(1)(C). Each TMDL establishes the maximum amount of a pollutant that may be added to the waterbody daily from all sources (runoff, point sources, etc.). EPA is required to publish a list of pollutants suitable for maximum daily load measurement, § 1314(a)(2)(D), and it has determined that *all* pollutants are suitable for TMDLs, *see* Total Maximum Daily Loads Under Clean Water Act, 43 Fed. Reg. 60,662. Therefore, any pollutant that falls within the relatively broad definition of "pollutant" set forth in § 1362(6) may be regulated via TMDL. EPA can approve or modify as it sees fit TMDLs proposed by the states. § 1313(d)(2).

Here the state in question is Virginia, and the waterbody is a 25-mile long tributary of the Potomac River, located in Fairfax County, called Accotink Creek. The creek has been the subject of litigation in the past that is not relevant to this matter except the result: EPA was required to set TMDLs for Accotink Creek once Virginia failed to do so by a certain date. Specifically, the creek had been identified as having "benthic impairments," which is to say the community of organisms that live on or near the bottom of the creek were not as numerous or healthy as they should be. EPA was to set appropriate TMDLs to improve the health of the benthic community in Accotink Creek.

On April 18, 2011, EPA established a TMDL for Accotink Creek which limited the flow rate of stormwater into Accotink Creek to 681.8 ft^3/acre-day. The TMDL was designed to

regulate the amount of sediment in the Accotink, because EPA believed sediment was a primary cause of the benthic impairment. Both parties agree that sediment is a pollutant, and that stormwater is not. EPA refers to stormwater flow rate as a "surrogate" for sediment.

The Plaintiffs are now challenging the TMDL on multiple grounds, but presently before the Court is a single issue: Does the Clean Water Act authorize the EPA to regulate the level of a pollutant in Accotink Creek by establishing a TMDL for the flow of a nonpollutant into the creek?

Analysis

I. Standard of Review

Count I of the complaint, at issue here, is brought under the Administrative Procedures Act. *See* Comp. ¶ 169. The APA "confines judicial review of executive branch decisions to the administrative record of proceedings before the pertinent agency." *Shipbuilders Council of Am. V. U.S. Dept. of Homeland Sec.*, 770 F. Supp. 2d 793, 802 (E.D. Va. 2011). As such, the district court "sits as an appellate tribunal," and APA claims can be resolved equally well in the context of Rule 12 or Rule 56. *Univ. Med. Ctr. Of S. Nev. V. Shalala*, 173 F.3d 438, 441 n. 3 (D.C. Cir. 1999).

Because Count I presents a question of statutory interpretation, the Court reviews EPA's decision using the two-step analysis set forth in *Chevron, U.S.A., Inc. v. NRDC, Inc.*, 467 U.S. 837 (1984). For a given question of statutory interpretation, the first step under *Chevron* is to determine whether Congress addressed the "precise question at issue." 467 U.S. at 842. "If the intent of Congress is clear, that is the end of the matter . . . ." *Id.* If the Court cannot find that Congress has squarely addressed the question, the Court must move to Chevron's second step. In

the second step of statutory construction under *Chevron*, the Court must determine whether the agency's interpretation of the statute is "permissible." *Id.* at 843. The agency's construction is permissible if it is reasonable, but it need not be what the Court considers the *best* or *most reasonable* construction. *See id.* at 845. The Court is not to simply impose its own construction on the statute, but instead it gives deference to any reasonable statutory construction by the agency. *Id.* at 843.

II. Chevron Step One

Whether statutory ambiguity exists so that the issue cannot be settled at *Chevron's* first step is for the Court to decide, and the Court "owe[s] the agency no deference on the existence of ambiguity." *Am. Bar Ass'n v. FTC*, 430 F.3d 457, 468 (D.C. Cir. 2005). The Court begins the inquiry by "employing traditional tools of statutory construction." *Chevron*, 467 U.S. at 843 n.9. As always, the analysis begins with the text of the statute. *Nat'l Elec. Mfrs. Ass'n v. U.S. Dept'l of Energy*, 654 F.3d 496, 504 (4th Cir. 2011).

The text of the statute that requires states to establish their own TMDLs, 33 U.S.C. § 1313(d)(1)(C), is:

> Each State shall establish for the waters identified in paragraph (1)(A) of this subsection, and in accordance with the priority ranking, **the total maximum daily load, for those pollutants which the Administrator identifies** under section 1314(a)(2) of this title as suitable for such calculation. Such load shall be established at a level necessary to implement the applicable water quality standards with seasonal variations and a margin of safety which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality. (emphasis added)

The next subsection, § 1313(d)(2), grants EPA the authority to set TMDLs when the state

has not done so adequately. "Pollutant" is a statutorily defined term. 33 U.S.C. § 1362(6).

The Court sees no ambiguity in the wording of this statute. EPA is charged with establishing TMDLs for the appropriate pollutants; that does not give them authority to regulate nonpollutants. The parties agree that sediment is a pollutant under 33 U.S.C. § 1362(6), and stormwater is not. Then how does EPA claim jurisdiction over setting TMDLs for stormwater?

EPA frames the stormwater TMDL as a surrogate. EPA's research apparently indicates that the "[sediment] load in Accotink Creek is a function of the amount of stormwater runoff generated within the watershed." Def. Opp. at 8. And EPA believes that framing the TMDL in terms of stormwater flow rate is superior to simply expressing it in terms of maximum sediment load.

The DC Circuit has considered and rejected a similar attempt by EPA to take liberties with the way Congress intended it to express its TMDLs. In *Friends of the Earth, Inc. v. Env. Protection Agency*, EPA had promulgated TMDLs for the Anacostia River that expressed the maximum load of certain pollutants in terms of annual and seasonal amounts. 446 F.3d 140, 143 (D.C. Cir. 2006). The court found that expressing a TMDL in terms of annual or seasonal maximums was not allowed, because the statute granted authority only for daily loads. *Id.* at 148. The court reached its conclusion even though EPA apparently made a strong argument that expressing TMDLs in terms of annual or seasonal loads was an effective and reasonable approach. *See id.* Presumably a daily load could have been derived by simply dividing the annual load by 365, yet the court still required expression in the terms dictated by Congress.

Here too, EPA hopes to express a TMDL in terms other than those contemplated by the statute, arguing that such an expression is the most effective method. But, as *Friends of the Earth* illustrates, EPA may not regulate something over which it has no statutorily granted power—

annual loads or nonpollutants—as a proxy for something over which it *is* granted power—daily loads or pollutants.

EPA's argument that its surrogate approach should be allowed because the statute does not specifically forbid it fails. EPA is not explicitly forbidden from establishing total maximum *annual* loads any more than they are explicitly barred from establishing TMDLs for nonpollutants. The question is whether the statute grants the agency the authority it is claiming, not whether the statute explicitly withholds that authority. And in this case, as in *Friends of the Earth*, the statute simply does not grant EPA the authority it claims.

The dicta in *Weyerhaeuser Co. v. Costle* is not as helpful to EPA's case as it would like. 590 F.2d 1011, 1022 n.6 (D.C. Cir. 1978). It is true that the court said in a footnote "[i]t is well recognized that EPA can use pollution parameters that are not harmful in themselves, but act as indicators of harm." *Id.* But in that case, the non-harmful pollution parameters the EPA sought to regulate were components of the effluent commonly discharged from paper mills, *id.* at 1022, making them effluents themselves. And power to regulate effluents is expressly granted to the EPA in the relevant statutory section. *See* 33 U.S.C. § 1314(b).

EPA would like to create the impression that Congress has given it loose rein to determine exactly what it could and could not regulate. On page 16 of its opposition to this motion, EPA points out that "Congress authorized EPA to determine which pollutants were suitable for TMDL calculation and measurement." (Internal quotes removed). While this may be true, EPA glosses over the fact that 33 U.S.C. § 1314(a)(2)(D) only gives EPA the power to regulate pollutants as that term is defined—by Congress—elsewhere in the statute. And, as discussed above, sediment is a pollutant for these purposes, but stormwater is not.

In a similar vein, EPA regulations which imply that the agency has discretion to set the

TMDL as it sees fit do not bear on the question now before the Court. EPA has promulgated a regulation allowing TMDLs to be "expressed in terms of either mass per time, toxicity, or other appropriate measure," 40 C.F.R. § 130.2(i), and another that allows TMDLs to be expressed as a "property of pollution," 50 Fed. Reg. 1774, 1776 (Jan. 11, 1985). But, EPA citing these regulations to demonstrate that the surrogate TMDL approach is permissible is mere bootstrapping. To the extent the regulations allow EPA to set TMDLs for nonpollutants, they exceed the statutory authority of EPA.

The plain language of the statute trumps all, but legislative history also supports Plaintiffs' argument. Congress's intent to limit EPA's discretion in this context is evidenced by the committee record cited by Plaintiffs, which has also been used by the Ninth Circuit, in which Senator Randolph, Chairman of the Senate committee that amended the act in 1972, explained, "We have written into law precise standards and definite guidelines on how the environment should be protected. We have done more than just provide broad directives [for] administrators to follow." Pl. Mot. 7, *citing Nw. Envtl. Def. Ctr. v. Brown*, 640 F.3d 1063, 1072 (9th Cir. 2011). Congress created a statutory scheme that included a precise definition of the word "pollutant," and then gave EPA authority to set TMDLs for those pollutants. Senator Randolph's comments strongly imply that Congress did not intend anything more or less than what is written in the statute.

The Court considers the language of 33 U.S.C. § 1313(d)(1)(C) to be unambiguous. Congress has spoken directly on the question at issue, and its answer is that EPA's authority does not extend to establishing TMDLs for nonpollutants as surrogates for pollutants. The legislative history of the CWA is consistent with this reading. Therefore, this Court finds EPA's interpretation of § 1313 and the related provisions to be impermissibly broad based on analysis

under the first step of *Chevron* analysis.

III. Chevron Step Two

Because the Court considers Congress's intent to be clear and unambiguously expressed by the language of the statute, it need not move to the second step of *Chevron* analysis. But the Court notes that there is substantial reason to believe EPA's motives go beyond "permissible gap-filling."

Page 9 of EPA's opposition says, "stormwater flow rates as a surrogate would more effectively address the process by which sediment impairs aquatic life in Accontink Creek." If the sediment levels in Accotink Creek have become dangerously high, what better way to address the problem than by limiting the amount of sediment permitted in the creek? If sediment level is truly "a function of" the amount of stormwater runoff, as EPA claims, then the TMDL could just as easily be expressed in terms of sediment load.

In fact, the Board of Supervisors of Fairfax County argued at the December 14th hearing (without objection from EPA) that EPA has approved 3,700 TMDLs for sediment nationwide, and in Virginia has addressed 111 benthic impairments with TMDLs. None of them regulated the flow rate of stormwater. By comparison, EPA has tried out its novel approach of regulating sediment via flow in only four instances nationwide, and all four attempts were challenged in court. One has settled, the other three are still pending.

The Court suspects that the decision to regulate stormwater flow as a surrogate for sediment load would not constitute a permissible construction of § 1313(d)(1)(C), even given the deference due at *Chevron's* second step. This is especially likely because EPA is attempting to increase the extent of its own authority via flow TMDLs, which courts must examine carefully.

See Brown & Williamson Tobacco Corp. v. Food & Drug Admin., 153 F.3d 155, 161-62 (4th Cir. 1998). EPA's attempt to set TMDLs for nonpollutants probably goes beyond "permissible gap-filling" and is instead an impermissible construction of the statute.

Conclusion

The language of § 1313(d)(1)(C) is clear. EPA is authorized to set TMDLs to regulate pollutants, and pollutants are carefully defined. Stormwater runoff is not a pollutant, so EPA is not authorized to regulate it via TMDL. Claiming that the stormwater maximum load is a surrogate for sediment, which is a pollutant and therefore regulable, does not bring stormwater within the ambit of EPA's TMDL authority. Whatever reason EPA has for thinking that a stormwater flow rate TMDL is a better way of limiting sediment load than a sediment load TMDL, EPA cannot be allowed to exceed its clearly limited statutory authority. For these reasons, the Plaintiffs' motion for Rule 12(c) judgment on the pleadings on Count I of their complaint is granted.

January 3, 2013
Alexandria, Virginia

/s/ LOG
Liam O'Grady
United States District Judge

FILED
JAN - 3 2013
CLERK, U.S. DISTRICT COURT
ALEXANDRIA, VIRGINIA

IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF VIRGINIA
Alexandria Division

VIRGINIA DEPARTMENT OF TRANSPORTATION, ET AL, Plaintiffs, -v- UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, ET AL, Defendants.	Civil Action No. 1:12-CV-775

Order

In accordance with the memorandum opinion that accompanies this order, it is now **ORDERED**:

1. Plaintiffs' motion (Dkt. No. 29) for judgment on the pleadings as to Count I of the complaint is **GRANTED**.
2. The clerk shall enter judgment in favor of the Plaintiffs.
3. The Accotink Creek TMDL is remanded to EPA for reconsideration consistent with this order.

January 3, 2013
Alexandria, Virginia

/s/
Liam O'Grady
United States District Judge

SAN DIEGO UNIFIED PORT DISTRICT
OFFICE OF THE GENERAL COUNSEL

November 19, 2014

VIA EMAIL
Laurie.Walsh@waterboards.ca.gov

Ms. Laurie Walsh
San Diego Regional Water Quality Control Board
2375 Northside Drive, Suite 100
San Diego, CA 92108

Re: Comments - Tentative Order No. R9-2015-0001, Place ID: 658018LWalsh

Dear Ms. Walsh:

The San Diego Unified Port District ("Port District") respectfully submits the following comments on Tentative Order R9-2015-0001, *An Order Amending Order No. R9-2013-001, NPDES No. CAS010266 National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* ("Tentative Order").

The Port District appreciates the time, energy, and thoughtfulness devoted by the San Diego Regional Water Quality Control Board ("Regional Board") to regulate MS4 discharges in a manner that protects human and ecological health while also balancing the substantial economic and practicable feasibility constraints faced by fellow public agencies, such as the Port District. The Port District continues to work with the other San Diego County MS4 copermittees to implement the regional MS4 permit and looks forward to working with the Regional Board to accomplish our many shared goals for San Diego Bay.

The Tentative Order amends but repeats verbatim provisions of the MS4 permit previously issued by the Regional Board, Order No. R9-2013-001, regarding which the Port District respectfully submitted comments and a currently pending petition to the California State Water Resources Control Board ("State Board"). The Port District's comments on Order No. R9-2013-001 apply with equal force to the Tentative Order. Accordingly, the Port District repeats and incorporates by reference those previously submitted comments with regard to the Tentative Order, which are set forth in letters

dated September 14, 2012, and January 11, 2013, and in the transcript from the hearing that took place before the Regional Board on April 10 and 11, and on May 8, 2013. The Port District also incorporates by reference its position on these provisions as set forth in its petition to the State Board, submitted on June 7, 2013 (Petition No. A-2254(o)). Copies of the Port District's previously submitted comment letters are enclosed for your convenience.

Please do not hesitate to contact me should you have any questions.

Sincerely,

John Carter
Deputy General Counsel

cc: Thomas A. Russell, General Counsel
John Bolduc, Acting President/CEO
Randa Coniglio, Executive Vice President
Jason Giffen, Director, ELUM

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September 14, 2012

VIA EMAIL
lwalsh@waterboards.ca.gov
wchiu@waterboards.ca.gov

Laurie Walsh
Wayne Chiu
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Re: Comments on the Administrative Draft of Permit Requirements for Discharges from the Municipal Separate Storm Sewer System in the San Diego Region (Tentative Order No. R9-2012-0011)

Dear Ms. Walsh and Mr. Chiu:

The San Diego Unified Port District (Port) submits the following comments supplementing other comments by the Port to the Administrative Draft of Permit Requirements for Discharges from the Municipal Separate Storm Sewer System (MS4) in the San Diego Region (the Permit). We note at the outset that the Port supports the objectives of the Permit. We wish simply to address one point regarding the current draft Permit. The Permit should clarify that each Copermittee is responsible only for discharges from that portion of the MS4 which it owns and operates, not for discharges from all MS4 facilities within that Copermittee's jurisdictional boundaries.

The Clean Water Act upon which the MS4 permit is grounded defines "copermittee" as "a permittee to an NPDES permit that is only responsible for permit conditions relating to the discharge *for which it is operator*." (40 Code of Federal Regulations §122.6(b)(1) [emphasis added].) The Regional Board's recent September 7, 2012, letter addressing its authority states that "[t]he federal regulations make it clear that Copermittees need only comply with permit conditions relating to discharges from the MS4s ***for which they are operators***." (Emphasis added, citing 40 CFR Part 122.26(a)(3)(vi).) The Port is unaware of any legal authority that equates operation with jurisdictional location. Nor is such an interpretation consistent with the

common and plain meaning of the word "operate." "Operate" strongly connotes the performance of a function or exertion of physical control or power over the object being operated.

This is a potentially significant distinction for the Port. The Port's jurisdiction overlaps with the jurisdiction of a number of Copermittees. Due to this fact, a significant amount of the MS4 facilities within the Port's geographic jurisdiction are not operated by the Port, but are instead owned and/or operated by others under easements or other forms of ownership and operation. Accordingly, the Permit should include language affirming the intent of the CWA on this point.

This distinction is also not a hypothetical concern, as the Regional Board has previously construed the Port's responsibility for MS4 facilities more broadly than the plain language of the CWA allows. The Port would propose the following clarifying language, which could be placed in the cover for the Permit, just ahead of Table 2 and just following the sentence added by the Copermittees in their proposed redline version of the Permit referencing 40 CFR §122.21(a)(vi):

"The location of an MS4 facility within any Copermittee's jurisdiction boundaries does not, of itself, make the Copermittee an owner or operator of that MS4 facility."

We emphasize that the Port strongly supports the objectives of the Permit. We welcome the opportunity to respond to any questions the Regional Board may have with respect to our comments. Please contact the undersigned or Bill Brown at (760) 633-4485 if you have any questions or would like any clarification of the Port's position.

Very truly yours,

Scott E. Patterson

SEP/jd
cc: William D. McMinn, Esq.

Unified Port
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January 11, 2013

Mr. Wayne Chiu
San Diego Regional Water Quality Control Board
9174 Sky Park Ct., Suite 100
San Diego, CA 92123-4340

Submitted via email: wchiu@waterboards.ca.gov

Subject: Comment – Tentative Order No. R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu

Dear Mr. Chiu,

The San Diego Unified Port District (Port) respectfully submits this comment letter regarding Tentative Order R9-2013-0001 National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) in the San Diego Region (Tentative Order).

The Port has been actively involved in the development process of the Tentative Order and we support the Regional Board's Water Quality Improvement Plan (WQIP) concept in the Tentative Order with its proposed flexibility to focus resources on the priority problems in the watershed. However, the Tentative Order also contains prescriptive requirements that are in addition to the WQIP and would be very costly and at times infeasible to implement. With constrained budgets and staff resources, these additional costs may unintentionally limit the ability to conduct other water quality efforts having greater environmental benefits for the Bay.

The Port has worked alongside the other San Diego County Municipal Copermitees (Copermitees) to collectively submit a red-line strikeout document recommending changes to the permit language. With the exception of the proposed WQIP-based compliance option, the Port fully supports the recommendations provided in the Copermittee red-line strike-out. This document will be submitted through the County of San Diego. The changes help to clarify permit compliance points and provide a more efficient monitoring program to support the end goal of improving water quality. We strongly encourage you to consider the Copermittee's proposal and the Port's comments listed below.

1. Jurisdictional Accountability

The Port is committed to our role as an environmental steward of San Diego Bay. That commitment is reflected in a number of programs both regulatory driven and beyond compliance, that are focused on protecting and rehabilitating the Bay's resources. The

Port's Stormwater Program is an important part of this effort. At the same time we recognize that discharges from upstream jurisdictions impact our efforts to protect bay water quality. San Diego Bay is the receiving water body for a large watershed in which the Port is located at the extreme end. We are aware that most discharges from the MS4 to San Diego Bay are from storm drain easements under the authority of other jurisdictions. With this in mind, we support jurisdictional accountability throughout the watershed and we encourage the Regional Board to incorporate these concepts throughout the Permit.

2. WQIP-based Compliance and Modifications to Provision A

The Regional Board staff has presented the WQIP as an iterative process that allows for adaptive management so that compliance with water quality standards is achieved over time. It is the Port's opinion that the WQIP process, as currently proposed in the Tentative Order, adequately allows for compliance based upon WQIP implementation. However, what is missing is the linkage between the Discharge Prohibitions, Effluent Limitations, and Receiving Water Limitations in Provision A and the iterative process set forth in the WQIPs.

Modifications to Provision A are required to ensure implementation of that iterative process. Without a modification, jurisdictions are potentially open to third-party lawsuits and their resources may be directed to addressing a one-time exceedance. The Port requests that the Permit establishes a clear linkage between compliance with Provision A to compliance with the WQIP and the other Provisions of the Permit.

3. WQIP Development Timeline

The Tentative Order proposes an aggressive schedule for WQIP development and JURMP program updates. The timeline for WQIP development (9 months) does not allow for adequate time between due dates for required deliverables. Concerns with the timeline are as follows:

- Formal agreements such as a Memorandum of Understanding and/or Cost Share agreements will be required within the watershed groups. Although the preliminary work may begin before permit adoption, the process cannot be completed until the Permit is adopted and the requirements are known. These agreements are integral to upholding jurisdictional accountability within the watershed groups. This process will take an estimated three months.

- The water quality priorities and goals are due within the first six months, followed by a two month public comment period. While this first deliverable deadline may be feasible, potential modifications to the priorities and goals may be necessary as a result of the public comments received. Should modifications to the priorities and goals be required, there will be little time to develop the strategies and schedules.

- Time is needed to address comments from the public or Regional Board throughout the process and to obtain management and jurisdictional governing body approvals. Governing body approvals take an average of three months.

The Port requests that the timeframe for permit deliverables is extended as outlined in the Copermittee's revised WQIP development schedule in the red-line strike-out submittal.

4. Illegal Discharges: Air Conditioning Condensation

The Tentative Order requires air conditioning condensation to be directed to landscaped areas or other pervious surfaces where feasible. Substantial structural modifications may be required to meet this requirement and discharges of this type may not be a priority pollutant source that is identified in the WQIP. The Port requests that the requirement to direct air conditioning condensation to landscaping be encouraged and not required.

5. Retention Requirement for Priority Development Projects

As proposed in the Tentative Order, Priority Development Projects are to implement BMPs to retain the volume of runoff equivalent to the design capture volume or the estimated volume that would be retained if the site was fully undeveloped. Due to the Port's location at the headwaters of San Diego Bay, a high groundwater table and existing soils with low infiltration rates, retention is not technically feasible on Port tidelands. The Port is at the bottom of the watershed so consequently retained runoff must be stored for a longer period of time after the peak of a storm. Large underground storage tanks to store the runoff would be infeasible because most tanks would have significant design constraints due to the high groundwater table, flat topography, and high receiving water elevation, making gravity flow drainage systems nearly impossible. Above ground storage tanks would be infeasible because most of Port tidelands are built-out and there is limited room for these facilities. Also, above ground storage tanks pose a vector hazard and a visual nuisance.

Similarly, the proposed alternative compliance options such as an offsite mitigation option or increasing the treatment area onsite also is not feasible for the Port. The land within the Port is largely built-out and area to use for additional treatment is extremely limited. Meeting this requirement would come at a cost to proposed projects that would make them infeasible. Furthermore, mitigation outside of the Port's jurisdiction is also not an option because the Port would not have the authority to enforce the implementation and maintenance of BMPs outside of its jurisdiction. The Port requests that the retention requirement be removed from the permit.

6. Predevelopment Design Reference Used for Hydromodification Controls

The Tentative Order requires the use of "**pre-development** (naturally occurring)" as a runoff reference condition for hydromodification controls. Establishing the

pre-development condition of a site requires a reference start date, which is not outlined in the draft, and also requires accepted and defensible references to the **pre-development** soils, vegetation and topography which are also not identified in the permit. This requirement will also create additional and unnecessary costs to each jurisdiction and to the project without additional water quality benefits. A recommended alternative would be the use of a "**pre-project**" runoff reference. This reference point is already being used by the Copermittees in the current MS4 permit and has been used in other MS4 permits in the State. The Port requests that the **pre-development** design reference in the permit is replaced with **pre-project**.

7. Hydromodification Exemption

An exemption to hydromodification requirements that is in the current MS4 permit has been removed in the Tentative Order. The exemption applies to projects that discharge to conveyance channels that are stabilized (i.e. concrete lined) all the way to the receiving water. Hydromodification requirements are included in the permit to mitigate for potential erosion and channel degradation downstream of a development project. Projects that discharge to a stabilized conveyance channel do not present potential erosive impacts downstream or channel degradation therefore, the imposition of hydromodification requirements on such projects is unnecessary and will not provide water quality benefits. The Port requests that the hydromodification exemption for projects that discharge to stabilized conveyance systems be reinserted in the permit.

On behalf of the Port, I wanted to thank you for providing us the opportunity to engage with you and the other stakeholders through the public workshops, and the ability to submit comments on the Tentative Order. Please contact Allison Vosskuhler at (619) 686-6434 or avosskuhler@portofsandiego.org if you have any questions or would like additional clarification on the information provided.

Sincerely,

Randa Coniglio

Randa Coniglio,
Executive Vice President, Operations
San Diego Unified Port District

cc: Paul Fanfera
Bill McMinn
Karen Holman
Allison Vosskuhler

DM#557567

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January 11, 2013

VIA EMAIL
wchiu@waterboards.ca.gov

Wayne Chiu
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Re: **Comments - Tentative Order No. R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu**

Dear Mr. Chiu:

The San Diego Unified Port District (Port) submits the following comments to the revised Tentative Order No. R9-2013-0001, NPDES No. CAS0109266, *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4) Draining the Watersheds within the San Diego Region* (the Permit). Except to any extent inconsistent with the comments below and other comments submitted directly on behalf of the Port, the Port concurs with the San Diego Copermittees' comments throughout the process. The Port wishes to separately address several issues in the current draft Permit. The Port continues to support the objectives of the Permit and welcomes any opportunity to work with the Regional Board to improve the Permit.

1. Establish Connection between Discharge Prohibitions/Receiving Water Limitations and TMDL Compliance Schedules

The Permit as currently drafted includes specific provisions and schedules for implementation of total maximum daily loads (TMDLs) that have been incorporated into the Water Quality Control Plan for the San Diego Basin. *See* Permit, Attachment E. These compliance schedules have been incorporated into the Effluent Limitations provision of the Permit. Permit, II.A.3.b. ("Each Copermittee must comply with applicable WQBELs established from the TMDLs in Attachment E to this Order, pursuant to the applicable TMDL compliance schedule.").

However, no similar language is included in the Discharge Prohibitions (II.A.1.) or the Receiving Water Limitations (II.A.2.) provisions. The absence of similar language regarding TMDL compliance schedules in these provisions could potentially result in Copermittees being in violation of the Permit even though the TMDL implementation dates have not passed. In order for a Copermittee to be in compliance when the Permit becomes effective, it must also be in compliance with the applicable TMDL compliance schedule. Where a TMDL is in place, the Permit establishes compliance schedules for Discharge Prohibitions and Receiving Water Limitations that are in conflict with the TMDL compliance schedules.

The Port requests that the Discharge Prohibitions and Receiving Water Limitations provisions of the Permit be revised to make clear that the Copermittee shall not be in violation of these provisions when the Copermittee is complying with the applicable TMDL compliance schedule. Provision II.A.2.c., which appeared in the previous permit draft contains appropriate language linking the TMDL compliance schedules with the compliance schedules for Discharge Prohibitions and Receiving Water Limitations. The Port requests that similar language be included in Provisions II.A.1. and II.A.2. of the Permit.

2. <u>Permit Compliance Should be Based on the Iterative Process and Implementing Provisions of TMDL and the WQIP Rather than Numeric Limits</u>

The Permit provides that the Copermittees must be in compliance with numeric limits in order to meet water quality standards and to avoid violating the Permit. *See* Permit, II.A.1.a., II.A.1.c., II.A.2.a. The Permit also provides that each Copermittee must engage in an iterative process to implement water quality improvement strategies should water quality exceedances occur to achieve compliance with the discharge prohibitions and receiving water limitations. Permit, II.A.4. However, the Permit states that these provisions are "independently applicable, meaning that compliance with one provision does not provide a 'safe harbor' where there is no compliance with another provision." Permit, Fact Sheet, F-39.

Currently, the Permit creates a situation where the Copermittees may be in violation of the Permit the moment it goes into effect. There may be non-compliance with the Permit by a Copermittee where it is shown that a Copermittee is causing or contributing to an exceedance of water quality standards, even if that Copermittee is actively engaged in the iterative process.

While the Port acknowledges that the Regional Board may choose not to strictly enforce these permit conditions, the Copermittees remain potentially subject to an enforcement action by the Regional Board or a third-party citizen suit unless this point of compliance is clarified. The Regional Board has clear authority under the CWA and State Board policy to issue an MS4 permit that allows for iterative Best Management Practices (BMPs), rather than requiring strict adherence to water quality standards through numeric effluent limitations. *See* State Water Resources Control Board Order No. 2001-15, at pg. 8; *see also Defenders of Wildlife v. Browner,* 191 F.3d 1159, 1163, 165 (9th Cir. 1999).

Accordingly, the Permit should be revised to allow the Copermittees to achieve compliance by actively engaging in a BMP-based iterative process and by complying with implementation provisions of applicable TMDLs. The Port supports using the Receiving Water Limitations Language proposed by the California Stormwater Quality Association (CASQA), attached as Exhibit 1.

3. The Permit Should Clarify the Limits and Basis for Copermittee Liability for Any Exceedances

As noted, the Permit should clarify that Copermittee compliance is achieved through compliance with iterative approaches as set forth in the WQIP and any applicable BMPs, rather than any numeric limits. However, if numeric limits remain in the Permit, certain modifications should be made to avoid improper imposition of liability on Copermittees, consistent with the CWA. As discussed in the Port's comments to the previous draft of the Permit, dated September 14, 2012, the Permit should be revised to make clear that a Copermittee is only responsible for exceedances introduced into portions of MS4 facilities that it owns or operates, not merely discharges into or from all MS4 facilities within that Copermittee's geographical jurisdictional boundaries. There are numerous MS4 facilities and outfalls within the Port's tidelands jurisdictions which the Port does not own or operate. The language of the CWA, repeated in the Permit, confirms that a Copermittee is only responsible for MS4 facilities that it operates. (40 CFR 122.26(a)(3)(vi).)

For this reason, the Port cannot properly be liable for discharges into or from an MS4 facility merely because it is within the Port's tidelands jurisdiction – it must own or operate that MS4 facility. To clarify this point, the Port proposes adding the following language, which could be placed in the cover for the Permit, immediately preceding Table 2:

"The location of an MS4 facility within any Copermittee's jurisdiction boundaries does not, of itself, make the Copermittee an owner or operator of that MS4 facility."

Furthermore, the Permit must include additional provisions that ensure a Copermittee is not improperly held liable for discharges attributable to other Copermittees' MS4 inputs. Of key concern is the specter of liability for downstream MS4 operators. As one of the farthest downstream jurisdictions, the Port faces greater risk of being downstream of other Copermittees' input and discharges into the upstream MS4 facilities. The Permit should be revised to clarify that each Copermittee is liable for any input and discharges into and from its MS4 that may exceed numeric limits, but not for the input and discharges by other Copermittees, whether upstream or downstream. Unless such provisions are included, Copermittees such as the Port will face the risk of legally improper "end of the pipe" liability, even if it did not contribute any pollutants.

As written, the Permit lacks clarity regarding the appropriate basis for determining that any Copermittee has actually caused or contribute to an exceedance of water quality standards. As the Permit states, "[e]ach of the Copermittees owns or operates an MS4, through which it discharges storm water and non-storm water into water of the U.S. within the San Diego Region." Permit, Findings, I.1. It further states:

> The federal regulations make it clear that the Copermittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators (40 CFR 122.26(a)(3)(vi)). This Order does not require Copermittees to manage storm water outside of their jurisdiction boundaries, but rather to work collectively to improve storm water management within watersheds.

Permit, Findings, I.2. While this language is consistent with the CWA, additional provisions are needed to ensure that one Copermittee does not become liable for input and discharges from other Copermittees. The Port requests that the Permit include language clarifying that each Copermittee is only liable for its share of the excess pollutants that it introduces into its MS4 facilities and which result in exceedances of the receiving water limits.

Such a provision is necessary since a Copermittee on an MS4 permit is only responsible for its own discharges or those over which it has control, not discharges or inputs by other Copermittees. *Jones v. E.R. Shell Contractor, Inc.*, 333 F.Supp.2d 1344, 1348 (N.D. Ga. 2004). Similarly, both the California Water Code and the Clean Water Act contemplates that liability for violations shall fall upon the "person" responsible for the violations. *See* Cal. Water Code §§ 13263(f), 13350(a); 33 U.S.C. § 1319. A Copermittee that does not generate or add pollutants to its MS4 facilities cannot credibly be characterized as having discharged pollutants. Likewise, a Copermittee cannot properly be subject to liability for excess pollutants introduced into segments of the MS4 outside its jurisdiction. Copermittees cannot control such MS4 facilities and the CWA clearly does not require a Copermittee to exert such control.

To alleviate this problem and to ensure compliance with the applicable statutes and case law, the Port requests that the Permit be revised to explicitly state the each Copermittee is only liable for the portion of any excess pollutants that cause or contribute to any violations of the Permit that are introduced into the portion of the MS4 owned or operated by that Copermittee.

a. <u>The Permit Should Include the Appropriate Regional Board Burden of Proof to Establish Liability of a Copermittee for MS4 Discharges</u>

The Permit should also include provisions that will ensure one Copermittee is not held liable for pollutant discharges generated by or introduced into the MS4 facilities by other Copermittees. Without delineating the basis for assigning and/or apportioning liability among the Copermittees, there is an unacceptable risk that "end of pipe" Copermittees may be held liable for violations caused by pollutants generated and introduced into MS4 facilities primarily,

or even exclusively, by "upstream" Copermittees. In particular, as the trustee of the tidelands of the San Diego Bay, the Port is one of the Copermittees located farthest downstream. There is an attendant increased risk that in the event any pollutants are discharged into the San Diego Bay, such pollutants would not have originated from any Port MS4 facilities but from MS4 facilities farther upstream.

To ensure that the Regional Board does not hold Copermittees such as the Port responsible for pollutants introduced into or originating from other Copermittees' MS4 facilities, the Permit must be revised to include and clarify the Regional Board's burden of proof for establishing a particular Copermittees' liability. *See Rapanos v. United States*, 547 U.S. 715, 745 (2006); *see also Sackett v. E.P.A*, 622 F.3d 1139, 1145-1147 (9th Cir. 2010), reversed on other grounds, *Sackett v. E.P.A.* (2012) 132 S. Ct. 1367 ("We further interpret the CWA to require that penalties for noncompliance with a compliance order be assessed only after the EPA proves, in district court, and according to traditional rule of evidence and burdens of proof, that defendants violated the CWA in the manner alleged in the compliance order."). The Regional Board must have the affirmative duty to prove that a Copermittee introduced pollutants into the MS4 that are discharged in the violation of the Permit.

In contrast to this legally required approach, the Permit presently states that the Copermittees must comply with certain procedures to come into compliance in the event an exceedance occurs. *See* Permit, II.A.4.a. The language would effectively impose liability on all Copermittees until a Copermittee could prove that it did not contribute to the excess pollutants in the discharge, even though the Regional Board would not have raised, and would not legally be entitled to, a rebuttable presumption that the exceedance resulted from that particular Copermittee's actions. To prevent a Copermittee being put in the legally untenable position of having to prove its innocence in the first instance, the Regional Board should have an initial burden of proving that the exceedances relate to contribution by a particular Copermittee.

Accordingly, the Port requests that Section II.A.4.a. is revised to read:

> If exceedance(s) of water quality standards persist in receiving waters notwithstanding implementation of this Order, *upon a showing by the Regional Board by a preponderance of the evidence that the discharges of pollutant from the MS4 for which each Copermittee is an owner or operator caused or contributed to the exceedance(s) of the water quality standards, those* Copermittees must comply with the following procedures: (emphasis added).

b. <u>Monitoring Requirements Should be Revised to Include Monitoring that Will Ensure Jurisdiction Accountability</u>

As a further necessary safeguard against improperly broad or joint and several liability for discharges, the Permit must include provisions that will allow the Regional Board and the

Copermittees to determine the sources of any exceedances discharged to receiving waters. Unless the Permit requires such monitoring, there remains the risk that downstream Copermittees will be held liable for upstream discharges. This issue of identifying and establishing a Copermittee's violation of an MS4 permit is critical and has been the subject of recent judicial attention. The Port requests that the Permit include a monitoring program that meets and satisfies the evidentiary standards discussed in *Los Angeles County Flood Control District v. Natural Resources Defense Council, Inc., et al.*, No. 11-460 (U.S. Jan. 8, 2013) and *Natural Resources Defense Council, Inc. v. County of Los Angeles*, 673 F.3d 880 (9th Cir. 2011), necessary to establish a particular Copermittee's discharges and/or violations of the Permit. Without such monitoring, the risk persists that "end of pipe" Copermittees will be held liable for upstream jurisdictional discharges, without proper jurisdictional accountability.

We again emphasize that the Port is dedicated to the protection and enhancement of water quality and that the Port strongly supports the objectives of the Permit. We welcome the opportunity to work with the Regional Board in order to achieve our mutual goals. Please contact us if you have any questions or would like any clarification of the Port's position.

Very truly yours,

Scott E. Patterson

SEP/BPS
cc: William D. McMinn, Esq.

EXHIBIT 1

CASQA Proposal for Receiving Water Limitation Provision

D. RECEIVING WATER LIMITATIONS

1. Except as provided in Parts D.3, D.4, and D.5 below, discharges from the MS4 for which a Permittee is responsible shall not cause or contribute to an exceedance of any applicable water quality standard.

2. Except as provided in Parts D.3, D.4 and D.5, discharges from the MS4 of storm water, or non-storm water, for which a Permittee is responsible, shall not cause a condition of nuisance.

3. In instances where discharges from the MS4 for which the permittee is responsible (1) causes or contributes to an exceedance of any applicable water quality standard or causes a condition of nuisance in the receiving water; (2) the receiving water is not subject to an approved TMDL that is in effect for the constituent(s) involved; and (3) the constituent(s) associated with the discharge is otherwise not specifically addressed by a provision of this Order, the Permittee shall comply with the following iterative procedure:

    a. Submit a report to the State or Regional Water Board (as applicable) that:

        i. Summarizes and evaluates water quality data associated with the pollutant of concern in the context of applicable water quality objectives including the magnitude and frequency of the exceedances.

        ii. Includes a work plan to identify the sources of the constituents of concern (including those not associated with the MS4to help inform Regional or State Water Board efforts to address such sources).

        iii. Describes the strategy and schedule for implementing best management practices (BMPs) and other controls (including those that are currently being implemented) that will address the Permittee's sources of constituents that are causing or contributing to the exceedances of an applicable water quality standard or causing a condition of nuisance, and are reflective of the severity of the exceedances. The strategy shall demonstrate that the selection of BMPs will address the Permittee's sources of constituents and include a mechanism for tracking BMP implementation. The strategy shall provide for future refinement pending the results of the source identification work plan noted in D.3. ii above.

        iv. Outlines, if necessary, additional monitoring to evaluate improvement in water quality and, if appropriate, special studies that will be undertaken to support future management decisions.

        v. Includes a methodology (ies) that will assess the effectiveness of the BMPs to address the exceedances.

        vi. This report may be submitted in conjunction with the Annual Report unless the State or Regional Water Board directs an earlier submittal.

b. Submit any modifications to the report required by the State of Regional Water Board within 60 days of notification. The report is deemed approved within 60 days of its submission if no response is received from the State or Regional Water Board.

c. Implement the actions specified in the report in accordance with the acceptance or approval, including the implementation schedule and any modifications to this Order.

d. As long as the Permittee has complied with the procedure set forth above and is implementing the actions, the Permittee does not have to repeat the same procedure for continuing or recurring exceedances of the same receiving water limitations unless directed by the State Water Board or the Regional Water Board to develop additional BMPs.

4. For Receiving Water Limitations associated with waterbody-pollutant combinations addressed in an adopted TMDL that is in effect and that has been incorporated in this Order, the Permittees shall achieve compliance as outlined in Part XX (Total Maximum Daily Load Provisions) of this Order. For Receiving Water Limitations associated with waterbody-pollutant combinations on the CWA 303(d) list, which are not otherwise addressed by Part XX or other applicable pollutant-specific provision of this Order, the Permittees shall achieve compliance as outlined in Part D.3 of this Order.

5. If a Permittee is found to have discharges from its MS4 causing or contributing to an exceedance of an applicable water quality standard or causing a condition of nuisance in the receiving water, the Permittee shall be deemed in compliance with Parts D.1 and D.2 above, unless it fails to implement the requirements provided in Parts D.3 and D.4 or as otherwise covered by a provision of this order specifically addressing the constituent in question, as applicable.

Walsh, Laurie@Waterboards

From: Tory Walker <tory@trwengineering.com>
Sent: Wednesday, November 19, 2014 4:25 PM
To: Walsh, Laurie@Waterboards
Subject: Comment - Tentative Order No. R9-2015-0001, Place ID:658018LWalsh

Laurie,

I appreciate the opportunity to comment on the above referenced tentative order. My comments are brief, but substantive, in that they relate to some important foundational assumptions:

1) Hydromodification requirements in the San Diego Region cannot properly be based on one category of stream or channel and treated as either geomorphically "stable" or highly dynamic – there is a wide variety, even within watersheds. This faulty assumption will not lead to good solutions for the streams they are intended to help.
2) Flow rate reductions caused by dams artificially reduces channel degradation – the hydromodification impacts from many of these dams means that runoff from PDPs may actually promote a more natural dynamic condition. The failure to recognize this possibility will also lead to solutions that are foundationally flawed.
3) All of this points to the need for the permit to accommodate more site-specific flexibility to reflect natural conditions.

Thanks,

Tory Walker, PE, CFM, LEED GA

TORY R. WALKER ENGINEERING
Reliable Solutions in Water Resources
122 Civic Center Dr. #206, Vista, CA 92084
P: 760-414-9212 W: TRWEngineering.com

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Smith, Alex@Waterboards

Subject: FW: regional MS4 permit revision / unified beach wq monitoring program

From: Posthumus, Bruce@Waterboards
Sent: Monday, December 01, 2014 6:35 PM
To: Barker, David@Waterboards; Becker, Eric@Waterboards; Walsh, Laurie@Waterboards; Arias, Christina@Waterboards; Hagan, Catherine@Waterboards
Cc: Outwin-Beals, Brandi@Waterboards; Lim, Joann@Waterboards
Subject: regional MS4 permit revision / unified beach wq monitoring program

David, Eric, Laurie, Christina & Catherine -

I suggest revising the language about the Unified Beach Water Quality Monitoring and Assessment Program on p. 49 in the tentative revised regional MS4 permit by deleting the language highlighted in red below and adding the language highlighted in green below. With these revisions, the language in the MS4 permit would correspond to the language we decided on for the SOCWA permits.

e. OTHER RECEIVING WATER MONITORING REQUIREMENTS
(1) Regional Monitoring
The Copermittees must participate in the following regional receiving waters monitoring programs, as applicable to the Watershed Management Area:
(a) Storm Water Monitoring Coalition Regional Monitoring; and

(b) Southern California Bight Regional Monitoring. and

(c) Unified Beach Water Quality Monitoring and Assessment Program

The Orange County Copermittees shall participate in and, together with South Orange County Wastewater Authority and Orange County Health Care Agency, shall share responsibility for implementation of a unified regional beach water quality monitoring and assessment program in south Orange County, as set forth in Monitoring and Reporting Program No. XXX, issued pursuant to CWC sections 13225, 13267, and 13383 and subject to future revision as directed by the San Diego Water Board Executive Officer pursuant to Water Code section 13383.

Future revisions to the unified program may be made by the San Diego Water Board Executive Officer, provided that the unified program, as revised, remains consistent with and meets the requirements of state law, including the California Ocean Plan, for beach water quality monitoring and related public notification and reporting. Revisions to the section 13383 letter directive are subject to a thirty-day public comment period, subject to a request for a hearing before the San Diego Water Board, and may be appealed to the State Water Board.

Walsh, Laurie@Waterboards

From: lyris@swrcb18.waterboards.ca.gov
Sent: Tuesday, November 25, 2014 10:17 AM
To: Walsh, Laurie@Waterboards
Subject: Comments Received on Tentative Order R9-2015-0001 Orange County MS4 Permit - Proposed Revisions to Regional MS4 Permit

This is a message from the California Regional Water Quality Control Board, San Diego Region (9).

Copermittees and Interested Persons,

The San Diego Water Board has posted comment letters it received on Tentative Order R9-2015-0001 *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* during the public comment period ending November 19, 2014 on our website at:

http://www.swrcb.ca.gov/sandiego/water_issues/programs/stormwater/oc_stormwater.shtml

Regards,

Laurie Walsh P.E.

San Diego Water Board

619-521-3373

lwalsh@waterboards.ca.gov

You are currently subscribed to reg9_sandiegoco_ms4permit as: Laurie.Walsh@waterboards.ca.gov.

To unsubscribe click here: leave-3076124-517889.992bd9006c3392a974839ac12d93b37b@swrcb18.waterboards.ca.gov

Walsh, Laurie@Waterboards

From: lyris@swrcb18.waterboards.ca.gov
Sent: Wednesday, January 21, 2015 5:14 PM
To: Walsh, Laurie@Waterboards
Subject: Response to Comments and Revised Tentative Order R9-2015-0001 with Revised Attachments
Attachments: 2015-0108 Public Hearing Notice.pdf

Water Boards This is a message from the California Regional Water Quality Control Board, San Diego Region (9).

Copermittees and Interested Stakeholder,

The Response to Comments and Revised Tentative Order R9-2015-0001, *An Order Amending Order No. R9-2013-0001, NPDES No. CAS010266, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Tentative Order) are now available on the Regional Board's website at http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/oc_stormwater.shtml. Revisions made in response to comments to the Tentative Order and its Attachments are highlighted yellow.

For your convenience, the public hearing notice on this matter is attached. The public hearing will be held during the San Diego Water Board meeting scheduled for **9:00 a.m. on February 11, 2015 in the Council Chambers of the City of Mission Viejo, located at 200 Civic Center, Mission Viejo, CA 92691.**

Please Note: Elected officials will be invited to speak on this item no sooner than 1:30 p.m.

Laurie Walsh, PE
San Diego Water Board

2375 Northside Drive, Suite 100
San Diego, CA 92108
Direct Phone: 619-521-3373
Main Line: 619-516-1990
Fax No. (619) 516-1994
lwalsh@waterboards.ca.gov

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD
www.waterboards.ca.gov/sandiego/

You are currently subscribed to reg9_sandiegoco_ms4permit as: Laurie.Walsh@waterboards.ca.gov.

To unsubscribe click here: leave-3417967-517889.992bd9006c3392a974839ac12d93b37b@swrcb18.waterboards.ca.gov

CALIFORNIA Water Boards

EDMUND G. BROWN JR. GOVERNOR

MATTHEW RODRIQUEZ SECRETARY FOR ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

NOTICE OF PUBLIC HEARING

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) is scheduled to hold a public hearing to consider adoption of Tentative Order No. R9-2015-0001, *An Order Amending Order No. R9-2013-0001, NPDES No. CAS010266*, *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Tentative Order).

The Tentative Order proposes to amend Order No. R9-2013-0001, the Regional MS4 Permit, to address a variety of issues including coverage for Copermittees in Orange County consisting of the County of Orange, Orange County Flood Control District, and the cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano, and incorporation of limited permit provisions applicable to the City of Lake Forest. If adopted, the Tentative Order will supersede the Orange County Copermittees' current Fourth Term MS4 Permit, Order No. R9-2009-0002.

The public hearing on this matter will be held during the San Diego Water Board meeting scheduled for **February 11, 2015 in the Council Chambers of the City of Mission Viejo, located at 200 Civic Center, Mission Viejo, CA 92691**. The item will be heard during the meeting that starts at 9:00 A.M. The meeting notice and agenda, which will indicate any changes in the meeting location and may provide other specific information concerning this hearing, will be posted at least two weeks prior to the meeting date at http://www.waterboards.ca.gov/sandiego/board_info/agendas/.

Written comments including testimony, technical documentation and factual information pertaining to the terms and conditions of the Tentative Order are no longer being accepted. However, oral testimony at the public hearing will be allowed. The scope of oral testimony at the public hearing will be strictly limited to summarizing the previously submitted written comments, comments on revisions to the Tentative Order made in response to comments, and making policy statements. Oral testimony will be limited in time by the Board Chair.

The procedures governing San Diego Water Board meetings may be found at Title 23, California Code of Regulations, section 647, et seq. and are available upon request. The hearing facilities will be accessible to persons with disabilities. The meeting notice and agenda for this meeting will provide contact information for persons requesting special accommodations.

Information related to this matter, including revisions made to the Tentative Order in response to written comments timely submitted, as well as the San Diego Water Board's responses to written comments timely submitted, will be available at the San Diego Water Board's office and the San Diego Water Board's storm water web page in advance of the public hearing. A separate notice will be sent announcing the availability of the revised Tentative Order and the responses to comments upon website posting of the documents.

Please contact Laurie Walsh at (619) 521-3382 or Laurie.Walsh@waterboards.ca.gov for questions or comments regarding this hearing notice.

Please bring the foregoing to the attention of any person known to you who would be interested in this matter.

DAVID W. GIBSON
Executive Officer
January 9, 2015

California Regional Water Quality Control Board
San Diego Region

Response to Comments Report

Tentative Order No. R9-2015-0001

An Order Amending Order No. R9-2013-0001, NPDES No. CAS010266 National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges From the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds Within the San Diego Region

January 21, 2015

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
2375 Northside Drive, Suite 100, San Diego, California 92108
Phone • (619) 516-1990 • Fax (619) 516-1994
http://www.waterboards.ca.gov/sandiego

Documents are available at: http://www.waterboards.ca.gov/sandiego

California Regional Water Quality Control Board
San Diego Region

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David W. Gibson, *Executive Officer*
James Smith, *Assistant Executive Officer*

Catherine Hagan, *Senior Staff Counsel, Office of Chief Counsel*

This report was prepared under the direction of

David T. Barker, *P.E., Supervising Water Resource Control Engineer, Surface Water Protection Branch*
Eric Becker, *P.E., Senior Water Resource Control Engineer, Storm Water Management Unit*

By

Laurie Walsh, *P.E., Water Resource Control Engineer*
Christina Arias, *P.E., Water Resource Control Engineer*

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Response to Comments on Tentative Order No. R9-2015-0001
January 21, 2015

Introduction

This report contains responses to written comments timely received on Tentative Order No. R9-2015-0001, *An Order Amending Order No. R9-2013-0001, NPDES No. CAS010266*, *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region*. The Tentative Order and its attachments were available for public review and comment for 60 days, with the comment period ending on November 19, 2014. Specifically, the San Diego Water Board requested comments on the following three documents:

- Tentative Order No. R9-2015-0001;
- Attachment No. 1 – Revised Order No. R9-2013-0001; and
- Attachment No. 2 – Revised Fact Sheet to Order No. R9-2013-0001.

The phrases "Tentative Order" and "Tentative Order as it amends Order No. R9-2013-0001" in the following response to comments table refers to both Tentative Order No. R9-2015-0001 and the two attachments. Comments and responses are organized by the section of either Attachment 1 or Attachment 2 that is being referenced. Wherever possible, comments are grouped based on content and summarized by the San Diego Water Board. The actual comment letters can be accessed on the San Diego Water Board website at:
http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/oc_stormwater.shtml.

List of Commenters:

Comments were submitted by the following organizations, public agencies, or individuals:

1. City of Aliso Viejo
2. City of Del Mar
3. City of Lake Forest
4. City of San Diego
5. Coalition (San Diego Building Industry Association, Building Industry Association of Southern California, Associated General Contractors, Associated Builders and Contractors, San Diego Regional Chamber of Commerce, Business Leadership Alliance, San Diego Association of Realtors, San Diego Apartment Association, National Association of Industrial & Office Properties, Building Office & Management Association, San Diego Chapter of the American Society of Landscape Architects)
6. Coastal Environmental Rights Foundation
7. Construction Industry Coalition on Water Quality (The Associated General Contractors of California, Building Industry Association of Southern California,

Engineering Contractors Association, Southern California Contractors Association, and the United Contractors located in San Ramon in Northern California)

8. County of Orange
9. County of San Diego
10. County of Riverside
11. Industrial Environmental Association
12. San Diego Coastkeeper
13. San Diego Unified Port District
14. Tory R. Walker Engineering, Inc.

Acronyms and Abbreviations

The following acronyms and abbreviations are used in the response to comments table.

ASBS	Area(s) of Special Biological Significance
BMP	Best Management Practice
Basin Plan	Water Quality Control Plan for the San Diego Basin
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWC	California Water Code
LID	Low Impact Development
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
NAL	Non-Storm Water Action Level
NPDES	National Pollutant Discharge Elimination System
ROWD	Report of Waste Discharge (application for NPDES reissuance)
SAL	Storm Water Action Level
San Diego Water Board	California Regional Water Quality Control Board, San Diego Region
State Water Board	State Water Resources Control Board
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
WLA	Waste Load Allocation
WQBEL	Water Quality Based Effluent Limitation

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RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 21, 2015

PR- 1	PREVIOUSLY SUBMITTED COMMENT LETTERS	
	COMMENT: *All prior comments, evidence, and objections made during adoption of Order No. R9-2013-0001 are applicable to Tentative Order No. R9-2015-0001 are requested to be incorporated during consideration of Tentative Order No. R9-2015-0001.* Because of the uncertainty of the legal impact the anticipated adoption of Tentative Order No. R9-2015-0001 might have upon pending appeals with the State Water Resources Control Board (State Board) of the Order being amended (Order No. R9-2013-0001), the commenters wish to renew all objections to various aspects of the Tentative Order as described in any petition already before the State Board and further wish to incorporate all evidence pertaining to those objections.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District • County of San Diego Concurring Cities: Petitioners in proceeding A-2254 • San Diego Unified Port District • Riverside County Copermittees • City of San Diego
	RESPONSE: The San Diego Water Board understands the concerns expressed by the commenters. The San Diego Water Board reviewed Tentative Order No. R9-2015-0001 and its Attachments and has determined that the March 27, 2013 responses to comments document prepared during the 2013 adoption process of Order No. R9-2013-0001 and the oral responses to comments during the workshop and hearings during that process address the renewed comments. The San Diego Water Board incorporates its written responses to comments and oral responses to comments raised during the workshops and hearing on Order No. R9-2013-0001 into these responses. To the extent commenters incorporate issues and objections raised in petitions for review of Order No. R9-2013-0001 filed with the State Board in SWRCB/OCC File A-2254(a)-(p), the San Diego Water Board notes that it has not yet had an opportunity to submit written responses to those petitions for review and is not specifically addressing those petitions for review in these responses to comments. The San Diego Water Board will submit written responses to the petitions for review at the appropriate time in the State Board's petition proceeding. No changes to the Tentative Order or its Attachments were made based on the renewed comments.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 21, 2015

PR-2	PREVIOUSLY SUBMITTED COMMENT LETTERS	
	COMMENT: *The Construction Industry Coalition on Water Quality resubmits its comment letters on hydromodification management cited in letters dated September 14, 2012 and January 11, 2013, which were submitted as part of the May 2013 adoption process of Order No. R9-2013-0001.*	Construction Industry Coalition on Water Quality • San Diego Building Industry Association • Building Industry Association of Southern CA • Associated General Contractors • Associated Builders and Contractors • San Diego Regional Chamber of Commerce • Business Leadership Alliance • San Diego Association of Realtors • San Diego Apartment Association • National Association of Industrial & Office Properties • Building Office & Management Association • San Diego Chapter of American Society of Landscape Architects
	RESPONSE: The San Diego Water Board understands the concerns expressed by the commenter. The San Diego Water Board reviewed Tentative Order No. R9-2015-0001 and its Attachments and has determined that the March 27, 2013 responses to comments document prepared during the 2013 adoption process of Order No. R9-2013-0001 and the oral responses to comments during the workshop and hearings during that process address the renewed comments. The San Diego Water Board incorporates its written responses to comments and oral responses to comments raised during the workshops and hearing on Order No. R9-2013-0001 into these responses. To the extent commenters incorporate issues and objections raised in petitions for review of Order No. R9-2013-0001 filed with the State Board in SWRCB/OCC File A-2254(a)-(p), the San Diego Water Board notes that it has not yet had an opportunity to submit written responses to those petitions for review and is not specifically addressing those petitions for review in these responses to comments. The San Diego Water Board will submit written responses to the petitions for review at the appropriate time in the State Board's petition proceeding. No changes to the Tentative Order or its Attachments were made based on the renewed comments.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 21, 2015

Gnl-1	GENERAL COMMENTS	
	COMMENT: *Remove City of Lake Forest from Table 1b and the associated footnote.* The City of Lake Forest requests changes to the Tentative Order to clarify regulation of the City of Lake Forest by a single water board as described in the agreement between the Santa Ana Water Board and the San Diego Water Board.	City of Lake Forest
	RESPONSE: The San Diego Water Board generally agrees with the City's comment. The City of Lake Forest was removed from the list of Copermittees in Table 1b and a footnote to the Table was added to identify the requirements of the Order that apply to the City of Lake Forest.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 21, 2015

GnI-2	GENERAL COMMENTS	
	COMMENT: *The Tentative Order toxicity requirements do not take into account information presented in the Orange County Copermittees ROWD.* The County of Orange and Concurring Cities, and Orange County Flood Control District comment that toxicity occurs sporadically in streams and creeks in south Orange County and toxicity is encountered in open (undeveloped) areas at levels equivalent to those in urban areas. They also comment that there is a greater prevalence of toxicity in wet weather and pesticides are implicated as the principal source of this toxicity. This pattern suggests that dry weather toxicity is not caused by urban sources of pollutants. Moreover pesticide use, presents a moving target for MS4 management efforts due to the continuous introduction of new products. Regulation of pesticide use is exclusively within the jurisdiction of state and federal agencies and not the role of MS4s.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees with the comment. The San Diego Water Board reviewed and considered the information pertaining to toxicity within the Copermittees' ROWD. Generally speaking, numerous sources of potential pollutants in storm water runoff exist, including contributions from urban activities such as industry, transportation, and residential development or from agricultural activities. Runoff from pervious and impervious areas (i.e., streets, parking lots, lawns, golf courses and agricultural land) carries accumulated contaminants (i.e., atmospheric dust, trace metals, street dirt, hydrocarbons, fertilizers and pesticides) into receiving waters. This problem is exacerbated in Southern California, where urbanization dominates most watersheds. In southern California, the runoff from urbanized watersheds contributes substantial loadings of a variety of constituents to receiving water environments. For example, the Southern California Coastal Water Research Project (SCCWRP) has estimated the cumulative loads of lead and zinc from all of the urbanized watersheds in the Southern California Bight to the coastal oceans represent over half of the combined mass emissions from all sources, which include traditional point sources such as publicly owned treatment works, industrial facilities, and power generating stations. Because of the additive and antagonistic interactions of the many chemical constituents found in storm water runoff, there is a strong potential for receiving water quality impacts related to toxicity. Moreover, the varied structural BMPs in use to reduce pollutant levels in urban runoff are not capable of reducing the most toxic fraction of runoff, the dissolved phase. Metals typically associated with fine particles in storm water runoff also have the potential to accumulate in the sediments of downstream receiving waters where they may contribute to the risk of toxicity. Therefore, even when BMPs have been shown to reduce the larger particulates found in runoff, it cannot be assumed that treatment processes are also reducing toxicity. Consequently, direct	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 21, 2015

GnI-2	GENERAL COMMENTS	
	measurement of toxicity in storm water runoff and receiving water sediments is needed. The requirements for toxicity sampling were updated during the adoption of Order No. R9-2013-0001 in response to comments provided by USEPA to make the toxicity requirements more consistent with recently adopted MS4 permits (i.e. Caltrans and Los Angeles County MS4 Permits). The recently adopted Caltrans and Los Angeles County MS4 Permits include updated toxicity data collection procedures and data analysis methods that are consistent with the Draft State Water Resources Control Board Policy for Toxicity Assessment and Control, June 2012 (Draft State Board Toxicity Policy). See also response to comment D-1. Sediment monitoring requirements were also updated in Water Quality Control Plan for Enclosed Bays and Estuaries, Part 1 Sediment Quality (State Plan). Based on these considerations, no revisions to the Tentative Order are needed.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 21, 2015

Gnl-3	GENERAL COMMENTS	
	COMMENT: *Numbering in Tentative Order should explicitly identify the major sections to help the reader.*	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board agrees that the Tentative Order should explicitly identify the major permit sections to increase readability. Footers throughout the Tentative Order indicate the subsections, e.g. A.1, A.2, to orient the reader. Additionally, the electronic PDF version of the Tentative Order has bookmarks for the major provisions to assist in navigating the requirements. Therefore, the San Diego Water Board did not make the requested revisions because existing footers and navigation capabilities address the comment.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 21, 2015

Gnl-4	GENERAL COMMENTS	
	COMMENT: *The Tentative Order provides an overly broad interpretation of the storm water regulations by requiring MS4s to "enhance" and "restore" beneficial uses as the CWA only requires that Copermittees protect beneficial uses and prevent nuisance.*	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees that the Tentative Order provides an overly broad interpretation of the storm water regulations. The San Diego Water Board reviewed and considered this comment during the adoption process of Order No. R9-2013-0001 (Regional MS4 Permit), making changes that replaced language which referred to "restoring water quality standards in receiving water" to language that required protection of water quality standards in receiving water from MS4 discharges. The Fact Sheet, pages 114-115 to Tentative Order No. R9-2015-0001 clearly states that Provisions E.5.e.(1)-(2) do not require the implementation of channel, streams, and/or habitat rehabilitation projects, but do require the Copermittees to develop a program with strategies to facilitate the implementation of these types of projects in areas of existing development. The strategies are expected to include allowing and encouraging Priority Development Projects to implement retrofitting types of projects as a means of compliance with the structural BMP performance criteria requirements of Provisions E.3.c.(1) and E.3.c.(2). Therefore, no revisions were made to Tentative Order No. R9-2015-0001 or its Attachments.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 21, 2015

Gnl-5	GENERAL COMMENTS	
	COMMENT: *The Tentative Order includes language that provides an overly broad use of the term "prohibit."*	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees that the Tentative Order provides an overly board use of the term prohibit. The Clean Water Act requires MS4 permits to include a requirement that non-storm water discharges are to be "effectively prohibited" to the MS4. The Code of Federal Regulations requires each Copermittee to have the legal authority to "prohibit" non-storm water discharges to the MS4. The Phase I Final Rule clarifies what "effectively prohibit" means (55 FR 47995): "Section 402(p)(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit (other than the permit for the discharge from the municipal separate storm sewer.)" During the 2013 adoption process for Order No. R9-2013-0001, where appropriate, the language in Order No. R9-2013-0001 was revised to be consistent with the language of the Clean Water Act to include the term "effectively prohibit" instead of "prohibit" or "reduce and eliminate." In other cases, the language was maintained to be consistent with the requirements of the Code of Federal Regulations requiring the Copermittees to establish the legal authority to "prohibit" non-storm water discharges to their MS4s and enforce that legal authority. The establishment and enforcement of the legal authority to "prohibit" non-storm water discharges to their MS4s is how the Copermittees will "effectively prohibit" non-storm water discharges to their MS4s. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

Gnl-6: Tentative Order's WQBELs were improperly formulated.

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 21, 2015

Gnl-6	GENERAL COMMENTS	
	COMMENT: *The Tentative Order's WQBELs were improperly formulated.*	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: There are TMDLs in the Basin Plan that established wasteload allocations for MS4 discharges causing or contributing to exceedances of water quality standards in specified impaired water bodies. The San Diego Water Board has included WQBELs that are consistent with the requirements and assumptions and requirements of the TMDLs wasteload allocations (WLAs) in accordance with applicable federal regulations at 40 CFR 122.44(d)(1) (vii)(B) and 40 CFR 122.44(k)(2)-(4). TMDLs included in Attachment 1 to the Tentative Order have been approved by USEPA during the TMDL development process and again reviewed by USEPA as part of the Regional MS4 2013 Permit adoption process. NPDES permits must limit and control all pollutants that are or may be discharged at a level that "will cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard including narrative criteria." (See 40 CFR 122.44(d)(1)(i)). The analysis that is performed to determine what pollutants require WQBELs is commonly referred to as the "reasonable potential analysis." NPDES permits must include WQBELs for all pollutants with "reasonable potential." (see 40 CFR 122.44(d)(1)(i)) Where a WLA has been assigned to a discharge in a TMDL, it is concluded that there is reasonable potential for the discharger to cause or contribute to an excursion of water quality standards. Because there are TMDLs in the Basin Plan that have identified the established WLAs for MS4s as discharges causing or contributing to exceedances of water quality standards, demonstration of reasonable potential is presumed for the purposes of establishing a WQBEL based on an applicable WLA. (see 40 CFR 122.44(d)(1)(ii))	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 21, 2015

Gnl-7	GENERAL COMMENTS	
	COMMENT: *WQBELs should only be defined as effluent limitations.*	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board has included WQBELs that are consistent with the assumptions and requirements of TMDL wasteload allocations in accordance with applicable federal regulations at 40 CFR 122.44(d)(1)(vii)(B). WQBELs can be expressed as (1) conditions in receiving waters that are to be attained to restore or protect water quality standards in receiving waters, (2) conditions in discharges that will not cause or contribute to exceedances of water quality standards in receiving waters, (3) BMPs that will ensure discharges will not cause or contribute to exceedances of water quality standards in receiving waters, or (4) a combination of one or more of (1)-(3). This is consistent with 40 CFR 122.44(d)(1)(vii)(B) and 122.44(k)(2)-(4). The San Diego Water Board has incorporated options (1)-(3) under the WQBEL requirements for each of the TMDLs in Attachment E. In most cases, if the WQBEL expressed as a receiving water limitation is achieved, the discharges from the MS4s are assumed to be in compliance with the TMDL requirements. If not, then the Copermittees must demonstrate that discharges from the MS4s are not causing or contributing to the exceedances in the receiving waters by achieving the WQBELs expressed as effluent limitations. In every case, the Copermittees are required to implement BMPs to ensure that discharges from their MS4s do not cause or contribute to exceedances of water quality standards in receiving waters.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 21, 2015

Lgl-1	LEGAL COMMENTS	
	COMMENT: *Land Development requirements expose Copermittees to significant litigation risk and will be largely unenforceable. Therefore, predevelopment runoff reference conditions and stream, channel and habitat restoration requirements should be eliminated in their entirety.* Commenters generally expressed concerns with the Copermittees' legal authority to imposed requirements on development projects where a nexus between impact on the receiving water and the project cannot be established. The Copermittees assert that they would be subject to liability under takings clauses of the US and California Constitutions and the Mitigation Fee Act for requiring hydromodification management BMP requirements on new development or redevelopment projects that discharge to hardened channels where a hydromodification impact would be questionable and difficult to establish.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board recognizes the concerns of the Copermittees' legal authority to impose hydromodification management requirements on development that causes no hydromodification impacts and responded to nearly identical comments during the adoption process for Order No. R9-2013-0001. As stated in response to comment Gnl-1, the San Diego Water Board incorporates those responses into this response to comments document. As stated in the 2013 responses to comments document: Federal law mandates that permits issued to MS4s require management practices that will result in reducing pollutants to the maximum extent practicable. The state is required, by law, to select the BMPs. (See NRDC v. USEPA (9th Cir. 1992) 966 F.2d 1292; Environmental Defense Center v. USEPA (9th Cir. 2002) 344 F.3d 832, 855; Rancho Cucamonga v. Regional Water Quality Control Bd., Santa Ana Region (2006) 135 Cal.App.4th 1377, 1389.) The Tentative Order's requirements for Low Impact Development and hydromodification management controls are authorized by federal law. Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(2) provides that Copermittees develop and implement a management program which is to include "A description of planning procedures including a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal separate storm sewers which receive discharges from areas of new development and significant redevelopment. Such plans shall address controls to reduce pollutants in discharges from municipal separate storm sewers after construction is completed." The Tentative Order does not impose land use regulations, nor does it restrict or control local land-use decision-making authority. Rather, the Tentative Order requires the permittees to fulfill Clean Water Act requirements and protect water quality in their land use decisions. The requirements in the Tentative Order	

Lgl-1	LEGAL COMMENTS	
	allow for flexibility in compliance options to the extent allowable under the Clean Water Act. The substantive regulatory requirements of the Clean Water Act are a valid exercise of the federal government's enumerated powers and authority over navigable waters. (NRDC v. USEPA (9th Cir. 1998) 863 F.2d 1420, 1436.) Environmental regulation is not land use regulation, and therefore does not infringe upon local authority over land use decisions. (California Coastal Commission v. Granite Rock (1987) 480 U.S. 572. In addition, local land use planning must be consistent with general statewide laws. (County of Los Angeles v. California State Water Resources Control Board (2006) 143 Cal.App.4th 985, 1003.) Article 11, section 7, of the California Constitution states that a county or city may not enact laws that conflict with general laws. The Porter-Cologne Water Quality Control Act contains the California Legislature's finding that water quality is a matter of state-wide concern, requiring a statewide program administered at a regional level. (See, e.g., Wat. Code, § 13000; see also generally Southern California Edison v. State Water Resources Control Board (1981) 116 Cal.App.3d 751, 758.) Section 101 of the CWA has a companion policy statement, where Congress found that water quality is a matter of federal concern. The Tentative Order also does not dictate specific methods of compliance or dictate the manner in which the Copermittees use their land. Where the Tentative Order includes detailed requirements, it is to comply with the Clean Water Act and its regulations. USEPA's regulations mandate that certain requirements be included in MS4 permits in order to achieve the requirements of the Clean Water Act. Thus, federal law mandates that permits issued for MS4s require certain actions that will result in the elimination or reduction of pollutants to receiving waters and the state is required, by federal law, to select the controls necessary to meet this standard. (See NRDC v. USEPA (9th Cir. 1992) 966 F .2d 1292, 1308; City of Rancho Cucamonga v. Regional Water Quality Control Bd., Santa Ana Region (2006) 135 Cal.App.4th 1377, 1389-90.) The requirement that the Copermittees require Priority Development Projects to control post-project runoff flow rates and durations so that they do not exceed pre-development runoff flow rates and durations by more than ten percent is appropriate and necessary to reduce erosion and the discharge of pollutants into receiving waters. It does not require mitigation beyond redevelopment project impacts because the requirement lessens (although does not eliminate) the perpetuating impacts that originated upon initial land alteration (i.e., the project would continue to cause accelerated erosion) absent improved controls of post-project runoff flow rates and durations. The San Diego Water Board maintains that the Copermittees have authority to implement this requirement, and that if implemented it would not rise to the level of a taking of private property. The pre-development condition provision is also consistent with the requirements in both the current Orange County and Riverside County MS4 permits.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 21, 2015

Lgl-1	LEGAL COMMENTS	
	To remove the question of the nexus between a project's impacts on an already hardened channel, the Tentative Order includes a hydromodification management exemption for projects that discharge to conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 21, 2015

Lgl-2	LEGAL COMMENTS	
	COMMENT: *Tentative Order numeric WQBELs violate the requirements of law because they are infeasible.*	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees that including numeric WQBELs for the TMDLs in the Tentative Order violate the requirements of law. The federal regulations under 40 CFR 122.44(d)(1)(vii)(B) require that NPDES permit requirements incorporate WQBELs that must be consistent with the requirements and assumptions of any available wasteload allocations (WLAs) developed under TMDLs. The federal regulations under 40 CFR 122.44(k) do not require WQBELs to be BMP-based if numeric effluent limitations are infeasible, but only that WQBELs that implement WLAs may be expressed in the form of BMPs. BMP-based WQBELs may be allowed if BMPs alone adequately implement WLAs, and additional controls are not necessary. This is consistent with a 2002 USEPA memorandum for "*Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs*." WQBELs are required for point source discharges that have the reasonable potential to cause or contribute to an excursion of water quality standards and technology based effluent limitations or standards are not sufficient to achieve water quality standards. Where a WLA has been assigned to a discharge in a TMDL, it is concluded that there is reasonable potential for the discharger to cause or contribute to an excursion of water quality standards. The memorandum "*Revisions to the November 22, 2002 Memorandum 'Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs)" issued by USEPA on November 26, 2014 states*, "*Where the NPDES authority determine that MS4 discharges have a reasonable potential to cause or contribute to a water quality standard excursion, EPA recommends that, where feasible, the NPDES permitting authority exercise its discretion to include numeric effluent limitations necessary to meet water quality standards*." The "where feasible" in the memorandum applies to the NPDES permitting authority's discretion to include numeric effluent limitations necessary to meet water quality standards, not to the feasibility of achieving the numeric effluent limitations. The State Water Board, in Order WQ 2006-0012 (Boeing), has made clear that "infeasibility" in the context of numeric effluent limitations refers to "the ability or propriety of establishing" numeric limits, as	

Lgl-2	LEGAL COMMENTS	
	opposed to the feasibility of compliance. The Caltrans MS4 permit is issued by the State Water Board. Even though the Caltrans MS4 permit may allow for BMP-based WQBELs, this does not require the San Diego Water Board to include BMP-based WQBELs in the Tentative Order regardless of any potential or apparent conflict. The San Diego Water Board will issue additional requirements to Caltrans with numeric WQBELs when and where warranted. The San Diego Water Board considered the feasibility of incorporating numeric WQBELs to implement the requirements of each of the TMDLs and has determined that they are feasible, and necessary, to include to meet water quality standards, consistent with the 2014 USEPA memorandum. Numeric WQBELs are also "additional controls" necessary to implement the WLAs, consistent with the 2002 USEPA memorandum. Each of the TMDLs in the Tentative Order, however, includes BMP-based WQBELs which must be implemented to achieve the numeric WQBELs. The Tentative Order requires the Copermittees to implement the BMP-based WQBELs to achieve the numeric WQBELs. This is consistent with the 40 CFR 122.44(d)(1)(vii)(B) and 40 CFR 122.44(k), and the recommendations of the 2014 USEPA memorandum. The Tentative Order has also been revised to include interim and final TMDL compliance determination options that allow the Copermittees to demonstrate that the BMP-based WQBELs will achieve the numeric WQBELs. The numeric WQBELs are necessary for the Copermittees to quantitatively demonstrate that the BMPs implemented are achieving the WLAs of the TMDLs. Thus, the Tentative Order appropriately includes numeric WQBELs and does not violate any requirements of law.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 21, 2015

Lgl-3	LEGAL COMMENTS	
	COMMENT: *San Diego Water Board does not have the legal authority to issue a regional MS4 permit.* The County of Orange and Concurring Cities and Orange County Flood Control District request that they be issued an individual permit. The Commenters claim the San Diego Water Board does not have the legal authority to include Orange County in a Regional Permit because there is no system-wide, jurisdiction-wide, or common watershed basis to do so.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board incorporates its responses to comments for the adoption of Order No. R9-2013-0001 and other documents in the record including the September 7, 2012, legal memorandum prepared by San Diego Water Board counsel. The San Diego Water Board disagrees with the commenters that the federal regulations do not authorize the issuance of a region-wide MS4 permit coextensive with the jurisdictional boundaries of the San Diego Region. The San Diego Water Board reviewed and considered this comment during the adoption process of Order No. R9-2013-0001 (Regional MS4 Permit) and reaffirms its position that despite the geographic separation, the San Diego Water Board has legal authority to issue a regional MS4 permit through its authority in the Clean Water Act. (September 7, 2012 Letter from San Diego Water Board Counsel on Legal Authority Supporting Issuance of a Regional MS4 Permit) Section 402, subpart (p)(3)(B) of the Clean Water Act states that "Permits for discharges from municipal storm sewers – (i) may be issued on a system- or jurisdiction-wide basis . . . ." The federal storm water regulations in 40 CFR at Part 122.26, subdivision (a)(1)(v) also state that the Director (the San Diego Water Board) may designate dischargers from municipal separate storm sewers on a system-wide or jurisdiction-wide basis, taking into consideration the following factors: (A) location of the discharge with respect to waters of the United States; (B) the size of the discharge; (C) the quantity and nature of the pollutants discharged to waters of the United States and (D) other relevant factors. Consideration of these factors provides wide discretion to the San Diego Water Board in issuing MS4 permits. More specifically, the regulations permit issuance of system-wide permits covering all MS4s in "adjacent . . . large or medium separate storm sewer systems." (See 40 CFR sec. 122.26(a)(3)(iv). The regulations also support issuance of MS4 permits on watershed or "other basis" contemplating that such permits may "specify different conditions relating to different discharges covered by the permit, including different management programs for different drainage areas . . . ." (40 CFR Part 122.26(a)(3)(v).) The USEPA responses to comments for the above regulations also make clear that the permitting authority, in	

Lgl-3	LEGAL COMMENTS	
	this case, the San Diego Water Board, has flexibility to establish system- or region-wide permits. In the Final Rule published in the Federal Register and containing USEPA's responses to comments, USEPA notes that paragraph (iv) of section 122.26(a)(3) would allow an entire system in a geographical region under the purview of a state agency to be designated under a permit. (National Pollutant Discharge Elimination System Permit Application Regulations for Storm Water Discharges, 55 Fed. Reg. 47990, 48030-48042 (Nov. 16, 1990).) It is important to note that a regional MS4 permit does not expand the requirements for each municipality beyond its borders as the federal regulations make clear that MS4 permittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators. (40 CFR Part 122.26(a)(3)(vi).) See also September 7, 2012, memorandum from Jessica Jahr and Catherine Hagan, State Water Board's Office of Chief Counsel, to Ryan Baron and David Huff, counsels for Orange and Riverside Counties, respectively.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 21, 2015

Lgl-4	LEGAL COMMENTS	
	COMMENT: *The Requirements in the Tentative Order are more stringent than federal law, requiring an economic analysis.* The County of Orange and Concurring Cities and Orange County Flood Control District assert that several requirements of Tentative Order go beyond the requirements of Federal law, thus an analysis pursuant to California Water code section 13241 is required. The commenters also make several assertions about deficiencies in the economic considerations discussed in the Fact Sheet, and assert that a cost-benefit analysis needs to be included in the Fact Sheet discussion.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees that "several requirements of Tentative Order go beyond the requirements of Federal law." The San Diego Water Board is charged with construction of and administration of the Clean Water Act in the San Diego Region. In issuing MS4 permits, "[t]he permitting agency has discretion to decide what practices, techniques, methods and other provisions are appropriate and necessary to control the discharge of pollutants." (City of Rancho Cucamonga v. Regional Water Quality Control Board-Santa Ana Region (2006) 135 Cal.App.4th 1377,1389.) However, the "Regional Board must comply with federal law requiring detailed conditions for NPDES permits." (Ibid.) Further, USEPA expects the permitting authority to develop the specific practices that comply with the Clean Water Act on a permit-by-permit basis. (NRDC v. USEPA (9th Cir. 1992) 966 F.2d 1292, 1308.) To the extent the Board is exercising discretion in including certain permit requirements, the Board is exercising discretion required and/or authorized by federal law, not state law. (See City of Rancho Cucamonga, supra, 135 Cal.App.4th at 1389; Building Industry Association of San Diego County v. State Water Resources Control Bd. (2004) 124 Cal.App.4th 866, 882-883.) Further, the MEP standard is a flexible standard that balances a number of considerations, including technical feasibility, cost, public acceptance, regulatory compliance, and effectiveness. (Id. at pp. 873, 874, 889.) Such considerations change over time with advances in technology and with experience gained in storm water management. (55 Fed. Reg. 47990, 48052 (Nov. 16, 1990).) Accordingly, a determination of whether the conditions contained in Tentative Order exceed the requirements of federal law cannot be based on a point by point comparison of the permit conditions with federal law. The appropriate focus is whether the permit conditions as a whole exceed the MEP standard. The commenters assert that provisions of the Tentative Order are more stringent than the requirements of the Clean Water Act and therefore require an analysis of the factors, including economic considerations, in Water Code section	

Lgl-4	LEGAL COMMENTS	
	13241 before the San Diego Water Board can approve such provisions. As indicated above, the San Diego Water Board disagrees that provisions of the Tentative Order are more stringent than requirements of the Clean Water Act. Because the Tentative Order is not more stringent than federal law, its adoption does not require the San Diego Water Board to consider Water Code section 13241 factors. The California Supreme Court in *City of Burbank v. State Water Resources Control Board, et al.,* ((2005) 35 Cal.4th 613) (*Burbank*), held: [Water Code] section 13377 specifies that wastewater discharge permits must meet the federal standards set by federal law. In effect, section 13377 forbids a regional board's consideration of any economic hardship on the part of the permit holder if doing so would result in the dilution of the requirements set by Congress in the Clean Water Act. That act prohibits the discharge of pollutants into the navigable waters of the United States unless there is compliance with federal law (33 U.S.C. § 1322(a)), and publicly operated wastewater treatment plants such as those before us here must comply with the act's clean water standards, regardless of cost [citations]. Because [Water Code] section 13263 cannot authorize what federal law forbids, it cannot authorize a regional board, when issuing a wastewater discharge permit, to use compliance costs to justify pollutant restrictions that do not comply with federal clean water standards." (*Burbank,* 35 Cal.4th at 625.) While the *Burbank* decision does require an analysis of Water Code section 13241 factors when the state adopts permit conditions that are more stringent than federal law (*id.* at 618) Tentative Order No. R9-2015-0001 reflects that all of the challenged provisions are necessary to implement federal law. Thus, the San Diego Water Board is not required to consider economic information to justify a "dilution of the requirements" established in federal law. Even when applicable, consideration of economic information pursuant to section 13241 does not require a cost-benefit analysis, as some commenters suggest. And section 13241 neither specifies how regional water boards must consider its enumerated factors nor does it require that regional water boards may specific findings documenting consideration of the factors. (See *California Ass'n of Sanitation Agencies, et al. v. State Water Resources Control Board, et al.,* (208 Cal.App.4th 1438, 1464 (2012).) Nonetheless, the Fact Sheet and Response to Comments reflect economic information that has either been developed or gathered by the San Diego Water Board or has been submitted by Copermittees. To the extent that economic information in connection with compliance and other costs associated with challenged permit provisions, the San Diego Water Board has fully considered this information. Under these circumstances, *Burbank* does not require more. See also comment response Fnd-8.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

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Lgl-5	LEGAL COMMENTS	
	COMMENT: *The San Diego Water Board cannot determine whether a particular mandate is unfunded.* The County of Orange and Concurring Cities and the Orange County Flood Control District assert that the San Diego Water Board does not have the legal authority to determine whether any provisions in the Tentative Order constitute a state mandate, and only the Commission on State Mandates can make the determination.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: In proposing Tentative Order No. R9-2015-0001, the San Diego Water Board proposes amendments to Order No. R9-2013-0001 which includes Finding 31 and corresponding discussion in the Fact Sheet setting forth the San Diego Water Board's conclusion and supporting reasoning that Order No. R9-2013-0001 does not constitute an unfunded state mandate requiring subvention. The San Diego Water Board incorporates its responses to comments on the adoption of Order No. R9-2013-0001 into this response. The San Diego Water Board does not dispute that the Commission on State Mandate ultimately has jurisdiction to determine whether the State has imposed a mandate requiring state subvention. However, it remains entirely appropriate for the San Diego Water Board to set forth its legal basis to support its conclusion Order No. R9-2013-0001, as amended by Tentative Order No. R9-2015-0001, contains provisions the Board finds to be necessary and appropriate to meet the federal Clean Water Act standards. While the Commission may be expert in state mandates, it has no expertise in the field of water law. As indicated in response to comment Lgl-5, above, the San Diego Water Board does not agree that Order No. R9-2013-0001 as amended by Tentative Order No. R9-2015-0001 exceed federal requirements of the Clean Water Act. The San Diego Water Board is charged by law with administering and constructing the Clean Water Act's requirements and is entitled to considerable deference in its interpretation of the Act. (See Building Industry Association of San Diego, supra, 124 Cal.App.5th at pp. 873, 879 fn.9; County of Los Angeles v. California State Water Resources Control Bd. (2006) 143 Cal.App.4th 985, 997.) In issuing MS4 permits, "[t]he permitting agency has discretion to decide what practices, techniques, methods and other provisions are appropriate and necessary to control the discharge of pollutants." (City of Rancho Cucamonga v. Regional Water Quality Control Board-Santa Ana Region (2006) 135 Cal.App.4th 1377,1389.) However, the "Regional Board must comply with federal law requiring detailed conditions for NPDES permits." (Ibid.) Further, USEPA expects the permitting authority to develop the specific practices that comply with the Clean Water Act on a permit-by-permit basis. (NRDC v. USEPA (9th Cir. 1992) 966 F.2d 1292, 1308.) To the extent the Board is exercising discretion in including certain permit requirements, the Board is exercising discretion required and/or authorized by federal law, not state law. (See City of Rancho Cucamonga, supra, 135 Cal.App.4th at 1389;	

Lgl-5	LEGAL COMMENTS	
	Building Industry Association of San Diego County v. State Water Resources Control Bd. (2004) 124 Cal.App.4th 866, 882-883.) Further, the MEP standard is a flexible standard that balances a number of considerations, including technical feasibility, cost, public acceptance, regulatory compliance, and effectiveness. (Id. at pp. 873, 874, 889.) Such considerations change over time with advances in technology and with experience gained in storm water management. (55 Fed. Reg. 47990, 48052 (Nov. 16, 1990).) The San Diego Water Board's findings are the expert conclusions of the principal state agency charged with implementing the NPDES program in California. (Cal. Wat. Code §§ 13001, 13370.) The San Diego Water Board is not precluded from including provisions in Tentative Order No. R9-2015-0001 which commenters may contend are state mandates and it is well within the San Diego Water Board's authority to conclude, based on its expertise in administering the Clean Water Act, Tentative Order No. R9-2015-0001 does not exceed federal law and is therefore not a state mandate subject to subvention.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

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Fnd-1	FINDINGS	
	COMMENT: *Modify findings and/or Fact Sheet to include additional key findings from the Report of Waste Discharge (including the State of the Environment) and use this information as the basis for the Draft Order's requirements.* The County of Orange and Concurring Cities and the Orange County Flood Control District are concerned that the San Diego Water Board did not review and consider the "State of the Environment" discussion in their ROWD based on the Findings and Fact Sheet amendments presented in the Tentative Order and its Attachments.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees with the comment. The San Diego Water Board reviewed and considered all information in the Copermittees ROWD, as is documented in the Findings of Tentative Order No. R9-2015-0001 (i.e. Findings 1 through 4). Based on the ROWD review newly proposed requirements specific to southern Orange County Copermittees (i.e. interim hydromodification exemptions for large rivers and engineered channels) are presented in Attachment No. 1 to the Tentative Order (i.e. Order No. R9-2013-0001 as Amended by Order No. R9-2015-0001). San Diego Water Board reviewed the ROWD, including the "State of the Environment" discussion and the San Diego Water Board concluded that many of the ROWD recommendations could be accommodated by the requirements in Order No. R9-2013-0001 with only a limited number of changes required. The new flexible regulatory approach (described in the Fact Sheet for Order No. 2013-0001) and proposed requirements, puts more control in the hands of the Copermittees to develop a watershed-based planning approach. As described in Finding 2 of the Tentative Order, development of a watershed-based planning approach is portrayed in the ROWD as the most important next step to take in the development of the storm water programs in Orange County. The Tentative Order also provides the Copermittees with the flexibility to continue taking advantage of opportunities to reduce dry weather flows (a repeated recommendation throughout the ROWD).	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

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Fnd-2	FINDINGS	
	COMMENT: *Modify Finding 7 - In-Stream Treatment Control Systems to allow for the implementation of stream restoration or stream rehabilitation projects and constructed wetlands, or maintenance of reconstruction of existing stream restoration or rehabilitation projects, constructed wetlands, and regional BMPs.* The County of Orange and Concurring Cities and the Orange County Flood Control District suggest modify the language in Finding 7 to allow for full flexibility to identify creative solutions that meet the Tentative Order's alternative compliance goals through implementation of stream restoration or rehabilitation.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees that the language in Finding 7 of Order No. R9-2013-0001 stifles Copermittee ability to meet the Tentative Order's alternative compliance goals through creative solutions such as implementation of stream restoration or stream rehabilitation projects and constructed wetlands, or prevents maintenance of reconstruction of existing stream restoration or rehabilitation projects, constructed wetlands, and regional BMPs. Finding 7 states that pursuant to federal regulations (40CFR 131.10(a)) states cannot adopt waste transport or waste assimilation as a designated use for any waters of the U.S. Authorizing the construction of a runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to accepting waste assimilation as an appropriate use for that water body. Finding 7 concludes that treatment control best management practices (BMPs) must not be constructed in waters of the U.S. The language of Finding 7 does not impinge upon a Copermittees ability to take full advantage of the flexibility provided in the Tentative Order's alternative compliance option. Permit Provision II.E.3.c.(3) of Order No. R9-2013-0001 enables each Copermittee, at its own discretion, to allow Priority Development Projects (POPs) to participate in an alternative compliance program in lieu of implementing the onsite structural BMP performance requirements of Provisions II.E.3.c.(1) and II.E.3.c.(2). Alternative compliance is only allowed if the Copermittee determines that implementation of an alternative compliance project will result in a greater overall water quality benefit for the Watershed Management Area than fully complying with the onsite performance requirements. This alternative compliance option establishes a mechanism for Copermittees to provide alternative candidate projects for those land development projects that are unable to fully implement controls onsite. Copermittees can develop and make available a variety of candidate alternative compliance projects, including stream restoration and rehabilitation projects within a water body, as long as such projects do not entail placement of a treatment facility or treatment control BMPs within the water body. A vast variety of candidate projects could	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

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Fnd-2	FINDINGS	
	be proposed under Permit Provision II.E.3.c.(3) and it is expected that candidate projects will not include projects that entail construction, operation, and maintenance of a pollution treatment control facilities or BMPs in a water body. The placement of structures of this type in a water body is contrary to the intent of 40CFR 131.10(a) and; therefore the Tentative Order does not propose any modifications to Finding 7. Many candidate project options exist that could a) achieve the greater overall water quality benefit envisioned by the alternative noncompliance permit provision, and b) support the physical, chemical, and biological integrity, as well as the beneficial uses of a particular water body, and c) not entail constructing treatment facilities or BMPs within a water body. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

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Fnd-3	FINDINGS	
	COMMENT: *Modify Finding 8, 16, and 17 to remove presumption that discharges from MS4s always contain waste.* The County of Orange and Concurring Cities and the Orange County Flood Control District object to Finding 8 of Order No. R9-2013-0001 stating that discharges from the MS4s contain waste, and that Finding 8 does not acknowledge that there may not be pollutants in the discharges from the MS4s. The commenters requested revisions to Findings 8, 16 and 17 to reflect this position.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees with the commenters that Findings 8, 16, or 17 need revision. The Tentative Order implements the requirements of the California Water Code as well as the requirements of the Clean Water Act. Under California Water Code section 13376, any person discharging waste, or proposing to discharge wastes to waters of the State is not authorized to discharge waste unless issued waste discharge requirements. The requirements of the Clean Water Act, specific to discharges of pollutants to waters of the U.S. are also included in the California Water Code, Chapter 5.5 of Division 7. Thus, under the California Water Code, any person discharging pollutants, or proposing to discharge pollutants to waters of the U.S. is not authorized to discharge pollutants unless issued waste discharge requirements that include NPDES requirements. Waste discharge requirements that include NPDES requirements is also an NPDES permit under the Clean Water Act. The Clean Water Act and the California Water Code requires municipalities to obtain and comply with NPDES permits for authorized discharges of pollutants to waters of the U.S. from their MS4s. Municipalities proposing to discharge pollutants from an MS4 must obtain an NPDES permit before they can lawfully discharge. Comments received assert that the definition of "waste" in California Water Code section 13050 does not include storm water or any discharge that is not created by human activity. Comments received also assert that waste discharge requirements and NPDES permits cannot regulate the discharge of "pure storm water" and that not all discharges from the MS4 contain pollutants. Discharges from the MS4 are not "pure storm water." Storm water that flows over the surface of any developed area, which includes the MS4 itself, do not enter or discharge from the MS4 without coming into contact with pollutants or constituents that alter the storm water such that it is no longer "pure storm water." Thus, storm water discharges from the MS4 contains pollutants and contain waste. It is well-known and documented that urban runoff and storm water contains pollutants. (See, e.g., State Water Board Order WQ	

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Fnd-3	FINDINGS	
	2001-015 ("As we stated in Board Order WQ 95-2, the requirement to adopt permits for urban runoff is undisputed, and Regional Water Boards are not required to obtain any information on the impacts of runoff prior to issuing a permit (citation). It is also undisputed that urban runoff contains 'waste' within the meaning of Water Code section 13050(d), and that the federal regulations define 'discharge of a pollutant' to include 'additions of pollutants into waters of the United States from surface runoff which is collected or channeled by man.' (40 C.F.R. § 122.2.) But it is the waste or pollutants in the runoff that meet these definitions of 'waste' and 'pollutant.' And not the runoff itself. [fn]. (p. 5.)) Tentative Order No. R9-2015-0001 (like the current adopted version of Order No. R9-2013-0001) does not regulate "pure storm water." The Tentative Order regulates the discharge of storm water that is being discharged as a waste and contains pollutants. Finding 8 of Order No. R9-2013-0001 accurately states that discharges from the MS4s contain waste, as defined in the California Water Code. Finding 8 also accurately states that discharges from MS4s contain pollutants that adversely affect the quality of waters of the state. Findings 16 and 17 also accurately conclude that BMPs and implementation of BMPs are necessary to remove waste and pollutants in storm water discharges from MS4s. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

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Fnd-4	FINDINGS	
	COMMENT: *Delete Finding 11. Natural waters cannot legally be classified as part of the MS4, and a part of both MS4 and receiving water.* The County of Orange and Concurring Cities and the Orange County Flood Control District assert that Finding 11 is inaccurate and the San Diego Water Board cannot classify natural waters as part of the MS4.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees with this comment. An MS4 is defined in the federal regulations as a conveyance or system of conveyances owned or operated by a Copermittee, and designed or used for collecting or conveying runoff. Therefore, the San Diego Water Board considers natural drainages that are used by the Copermittees as conveyances of runoff, as both part of the MS4 and as receiving waters. The State Water Board supports this approach. In reviewing a Petition on Order No. R9-2001-0001, the State Water Board stated "*We also agree with the Regional Water Board's concern, as stated in its response, that there may be instances where MS4s use 'waters of the United States as part of their sewer system* [...]" State Water Resources Control Board Order WQ 2001-15. Furthermore, the U.S. Supreme Court's 2006 *Rapanos* decision supports the conclusion that natural streams in developed areas can be both receiving waters and MS4s by confirming that ephemeral and intermittent streams can be waters of the U.S. subject to regulation under Clean Water Act section 404 and also be considered point sources of pollution discharges regulated under Clean Water Act section 402. (See *Rapanos, et al. v. United States and Carabell et al. v. United States Army Corps of Engineers, et al. (2006) 547 U.S. 715, 743-744.)* Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

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Fnd-5	FINDINGS	
	COMMENT: *Modify Finding 12 to more accurately describe that Copermittees do not accept free and open access to MS4s, and are not responsible for all discharges not prohibited.* The County of Orange and Concurring Cities and the Orange County Flood Control District object to Finding 12 stating that the Copermittees provide free and open access to MS4s. The Copermittees assert that they are not responsible for discharges from their MS4s that are from third parties that are subject to the jurisdiction of the San Diego Water Board	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees that Finding 12 is inaccurate. The Copermittees have the option to request the authority to discharge from their MS4s under an NPDES permit or comply with the complete prohibition against the discharge of pollutants pursuant to Clean Water Act section 301(a) (33 U.S.C. § 1311(a)). These choices are provided by the federal Clean Water Act, not state laws. The Copermittees have opted to discharge from their MS4s under an NPDES permit. In doing so, they are responsible for discharges from the MS4s. Thus, Finding 12 correctly establishes that the Copermittees provide free and open access for third party discharges to their MS4s and that in doing so the Copermittees are responsible for discharges into the MS4 that they do not prohibit or otherwise control. Finding 12 also correctly concludes that the Copermittees cannot passively receive and discharge pollutants from third parties. The Copermittees have the responsibility of identifying the sources of discharges and pollutants from their MS4s. If the Copermittees are not actively identifying sources and cannot identify sources of discharges and pollutants to and from their MS4s, then the Copermittees are the source of the MS4s discharges and pollutants to receiving waters, even if they believe third parties are responsible for the discharges and pollutants. If, however, the Copermittees identify the sources of discharges and pollutants to or from the MS4s as outside of their legal authority to prohibit or otherwise control, then they are not passively receiving and discharging pollutants, even if they are providing free and open access to the MS4s. The data and information that the Copermittees collect to identify the third party sources can provide the evidence that the Copermittees are not responsible for the discharges and pollutants from the MS4s that can be attributed to third parties. Until the data and information are provided to identify those third parties, and demonstrate those parties are not subject to the Copermittees' legal authority, then the Copermittees are responsible for all of the discharges to and from their MS4s unless such discharges are authorized by a separate NPDES permit.	

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Fnd-5	FINDINGS	
	Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

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Fnd-6	FINDINGS	
	COMMENT: *Modify Finding 15 to recognize that the discharge of all pollutants from the MS4 is subject to the MEP standard.* The County of Orange and Concurring Cities and the Orange County Flood Control District assert Finding 15 is inaccurate. The Copermittees assert that the Tentative Order is inconsistent with the Clean Water Act and the MEP standard applies to both non-storm and water storm water, not just storm water.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees with the comment and incorporates its responses to comments on this topic from the San Diego Water Board's adoption proceedings on Order No. R9-2013-0001. The San Diego Water Board disagrees that the MEP standard applies to both non-storm water and storm water. The San Diego Water Board also disagrees that Finding 15 of Order No. R9-2013-0001should be revised. Finding 15 accurately states the requirements of the Clean Water Act. The San Diego Water Board maintains that MEP standard only applies to pollutants in storm water. See also, Memorandum from San Diego Water Board Counsel to San Diego Water Board dated 5 November 2009, incorporated by reference herein. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

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Fnd-7	FINDINGS	
	COMMENT: *Modify Finding 29 to clarify single water board regulations of Cities of Lake Forest, Laguna Woods, Laguna Hills.* The City of Lake Forest provided suggested language changes to Finding 29 of the Tentative Order to clarify single water board regulation of the Cities of Lake Forest, Laguna Woods, and Laguna Hills. Suggested language changes were for the most part accepted by the San Diego Water Board.	City of Lake Forest
	RESPONSE: The San Diego Water Board agrees with most of the suggested language changes proposed by the City of Lake Forest. The City of Lake Forest provided suggested language changes to Finding 29 of the Tentative Order to clarify single water board regulation of the Cities of Lake Forest, Laguna Woods, and Laguna Hills. The Tentative Order was modified to reflect, for the most part, the City's recommended changes. The word "wholly" was not added as requested by City of Lake Forest because it is unnecessary to clarify the terms of the Water Code section 13228 agreement. The permit language and the Water Code section 13228 designation agreement specify in detail how the Santa Ana Water Board and the San Diego Water Board will, respectively, regulate the City of Lake Forest as well as the Cities of Laguna Hills and Laguna Woods under each Region's respective MS4 permits. The San Diego Water Board notes that the current Riverside County MS4 permit (Order No. R9-2010-0016) includes the term "wholly" but the San Diego Water Board will consider removing that term when it considers the County of Riverside and Riverside Copermittees' Report of Waste Discharge for the reason set forth above.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 21, 2015

Fnd-8	FINDINGS	
	COMMENT: *Modify Finding 31 to state the Tentative Order is more stringent than Federal Law, requiring an analysis of the factors pursuant to Water Code Section 13241.* The County of Orange and Concurring Cities and the Orange County Flood Control District assert that several requirements of the Tentative Order go beyond the requirements of Federal law, thus an analysis pursuant to California Water code section 13241 is required. The commenters also make several assertions about the deficiencies they perceive with the economic considerations discussed in the Fact Sheet, and assert that a cost-benefit analysis needs to be included in the Fact Sheet discussion.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees with this comment and incorporates its responses to comments on this topic from the San Diego Water Board's adoption proceedings on Order No. R9-2013-0001. The provisions of the Tentative Order do not go beyond the requirements of the Clean Water Act or Code of Federal Regulations. The San Diego Water Board again considered economic information in developing the Tentative Order No. R9-2015-0001 using the best available information, but did not do so in accordance with an analysis pursuant to California Water code section 13241. The provisions of the Tentative Order No. R9-2015-0001 are based on and fully supported by federal requirements, as demonstrated by the legal authority provided by the Clean Water Act and Code of Federal Regulations sections cited in the Fact Sheet. Thus, the San Diego Water Board maintains that an analysis pursuant to California Water Code section 13241 is not required. Federal NPDES regulations do not require that the San Diego Water Board conduct a cost-benefit analysis. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted. Please also see response to comment Lgl-4 and Lgl-5.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 21, 2015

Fnd-9	FINDINGS	
	COMMENT: *Delete Finding 32. The San Diego Water Board has no legal ability to determine whether a particular mandate is unfunded.* The County of Orange and Concurring Cities and the Orange County Flood Control District assert that the San Diego Water Board does not have the legal authority to determine whether any provisions in the Tentative Order constitute a state mandate, and only the Commission on State Mandates can make the determination.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: See response to comment Lgl-5.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 21, 2015

A-1	PROVISION A: PROHIBITIONS AND LIMITATIONS	
	COMMENT: *Tentative Order needs to include language that shows a clear pathway to compliance with the discharge prohibitions, receiving water limitations, and effluent limitations in Provision A.1.* Orange County and Concurring Cities, the Orange County Flood Control District, Riverside County Copermittees and the City of San Diego each submitted comments requesting that the requirements of Provision A be modified to provide a clear linkage between the prohibitions and limitations of Provisions A.1 to A.3 with the iterative process required under Provision A.4 to be demonstrated through the implementation of the Water Quality Improvement Plans. The commenters are concerned that the language of Provision A, if not modified, will be interpreted as requiring strict and immediate compliance with the prohibitions and limitations, and the implementation of the iterative process would not be enough the demonstrate compliance with the prohibitions and limitations. Among the many recommended modifications to the requirements of Provision A, the commenters are generally requesting that the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c and A.2.a specifically state that implementation of Provision A.4 constitutes compliance. Furthermore, the Copermittees have requested that Provision A.4 explicitly state that the implementation of the iterative process constitutes compliance with any of the prohibitions and limitations under Provision A.1 to A.3, including compliance with the effective prohibitions of non-storm water discharges to the MS4s, and the TMDL requirements. During adoption of Order No. R9-2013-0001, commenters from environmental organizations were strongly in support of maintaining the existing language and asserted that modifications to Provision A would "weaken" the requirements, or provide "safe harbor" and would violate federal anti-backsliding requirements.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District • Riverside County Copermittees • City of San Diego
	RESPONSE: The San Diego Water Board understands the concerns that the Copermittees have expressed regarding the requirements of Provision A and the apparent lack of a linkage between the iterative process under Provision A.4 and the strict compliance with the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c and A.2.a. This language, however, is consistent with the precedential language that was issued under State Water Board Order WQ-1999-05 and has been implemented in all MS4 permits issued by the San Diego Water Board since 2001. The State Water Board has not yet issued an order or taken other action to supersede this precedential language. Recently, the State Water Board issued a Draft Order on November 21, 2014 in response to petitions challenging the 2012 Los Angeles MS4 Permit in which compliance with receiving water limitations is a major focus. Although the State Water Board's Draft Order generally upholds the Los Angeles Water Board Order, no final decision has been made. The State Water Board held a December 16, 2014 public workshop to receive comments and discuss the Draft Order with	

A-1	PROVISION A: PROHIBITIONS AND LIMITATIONS	
	Copermittees and interested persons. No decision was made at the workshop. The State Water Board did not indicate when a final Order might be issued. Under the Porter-Cologne Water Quality Control Act, waste discharge requirements must implement applicable water quality control plans, including water quality objectives. The discharge prohibitions and receiving water limitations of Provision A.1.a, A.1.c and A.2.a are consistent with this requirement, and are included in all NPDES permits and Waste Discharge Requirements issued by the San Diego Water Board. These are the fundamental requirements that protect water quality by ensuring that discharges comply with applicable water quality standards to ensure protection of receiving water beneficial uses. The San Diego Water Board does recognize an increasing body of monitoring data indicates that water quality standards are in fact not being met by many of the Copermittees' MS4 discharges. The San Diego Water Board has as a matter of practice not sought to enforce the discharge prohibitions and receiving water limitations of Provision A.1.a, A.1.c or A.2.a where the Copermittees are actively engaged in implementing the other requirements of the MS4 permit. The focus of the previous MS4 permits and the San Diego Water Board has been on compliance with implementation of the actions required by the permit, rather than the water quality outcomes that are expected to be achieved. As noted by the Copermittees, however, the approach of the Tentative Order is a significant departure from the approach of previous MS4 permits. Previous MS4 permits did not provide the Copermittees enough flexibility to truly implement an iterative process to adaptively manage their programs to identify innovative new ways to improve the quality of discharges from their MS4s or in the receiving waters, because the actions required by the permit were relatively fixed and prescriptive. In contrast, the Tentative Order is structured to allow the Copermittees to take advantage of the iterative process and adaptively manage their programs to focus on achieving outcomes. Since the State Water Board has yet to issue a final decision response to the petitions challenging the 2012 Los Angeles Water Board MS4 Permit, the San Diego Water Board did not revise Provisions A.1.a, A.1.c, A.2.a and A.4, and the language of Provision A remains consistent with the language in precedential State Water Board Order No. WQ 1999-05. However, the San Diego Water Board supports the concept of an alternative compliance option and considered it during the adoption of the Regional MS4 Permit in 2013. The San Diego Water Board will consider incorporation of the Riverside County Copermittees into the Regional MS4 Permit in late 2015 or early 2016. As part of this process, the San Diego Water Board will also consider the incorporation of a well-defined, transparent, and finite alternative compliance option similar to the option	

A-1	PROVISION A: PROHIBITIONS AND LIMITATIONS	
	proposed in 2013, but also consistent with any decisions/guidance from the State Water Board. A rigorous alternative compliance option would allow the Copermittees that are willing to pursue significant receiving water quality improvements beyond the iterative process to be deemed in compliance with the receiving water limitations. Inclusion of the alternative compliance option during the extensive public process for the Riverside County Copermittees will provide the stakeholders the necessary opportunity to discuss, comment, and suggest changes to any proposed language. An administrative finding documenting the San Diego Water Board's intent to consider incorporation of an alternative compliance option during the MS4 NPDES permit reissuance proceedings for the Riverside County Copermittees has been added to the Tentative Order.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 21, 2015

B-1	PROVISION B: WATER QUALITY IMPROVEMENT PLANS	
	COMMENT: *Water Quality Improvement Plans should be the foundation for a BMP-based compliance approach.* Orange County and Concurring Cities, the Orange County Flood Control District, Riverside County Copermittees and the City of San Diego request that Copermittees be allowed to utilize the development and implementation of the Water Quality Improvement Plans as a compliance mechanism for the prohibitions and limitations of Provisions A.1 to A.3.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District • Riverside County Copermittees • City of San Diego
	RESPONSE: The San Diego Water Board understands the concerns raised by the comments from the Copermittees. The Tentative Order includes the State Water Board precedential language. At this time the San Diego Water Board has chosen to keep the State Water Board precedential language in Attachment 1 to the Tentative Order until the State Water Board takes action with regards to this issue. Should the State Water Board decide to issue revised precedential language regarding mechanisms for compliance with Provision A.1 to A.3, the San Diego Water Board will then update the Regional MS4 Permit as necessary. Additionally, the discussion in the Fact Sheet under Provision B6 describes the San Diego Water Boards intentions to use the Water Quality Improvement Plans as functionally equivalent documents to TMDL Load Reduction Plans. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted. See also response to comment A-1.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 21, 2015

B-2	PROVISION B: WATER QUALITY IMPROVEMENT PLANS	
	COMMENT: *Water Quality Improvement Plans need to be based on regionally appropriate water quality standards that reflect sustainable conditions for beneficial uses.*	Riverside County Copermittees
	RESPONSE: The San Diego Water Board understands the concerns raised by the Riverside County Copermittees, however the proceedings on the Tentative Order are not the proper forum for addressing proposals to modify Basin Plan water quality standards. Water quality standards and beneficial uses are established in the San Diego Water Board's Basin Plan and not the Tentative Order /. The San Diego Water Board suggests the Riverside County Copermittees bring the comment forth during the San Diego Water Boards process for conducting the Triennial Review of Basin Plan water quality standards which is currently underway. . It is within the Triennial Review process that the San Diego Water Board reviews the Basin Plan water quality standards and beneficial uses. Information on the Triennial Review process can be accessed on the San Diego Water Board website at: http://www.waterboards.ca.gov/sandiego/water_issues/programs/basin_plan/tri_review.shtml Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 21, 2015

B1-1	PROVISION B.1: Watershed Management Areas	
	COMMENT: *Revise footnote 2 to Table B-1 to clarify single water regulation of City of Lake Forest.* The City of Lake forest suggests revision to footnote 2 to Table B-1 to clarify single board regulation.	City of Lake Forest
	RESPONSE: The San Diego Water Board understands the City's comment and has modified the footnote language to be consistent with the language in Finding 29. Please see response to Comment Fnd-7.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 21, 2015

B1-2	PROVISION B.1: Watershed Management Areas	
	COMMENT: *Revise language in Tentative Order to clarify NPDES permit is applicable to discharges from Copermittees MS4s.* The City of San Diego requests that the requirements of the Tentative Order "clarify" the responsibilities of the Copermittees to develop a Water Quality Improvement Plan "for their MS4 discharges within" each of the Watershed Management Areas.	City of San Diego
	RESPONSE: The San Diego Water Board disagrees with the comment that clarification is necessary. The San Diego Water Board did not revise the language with the qualifying phrases requested by the Copermittees. The Copermittees are required to establish the legal authority to implement the requirements of the Tentative Order. The Tentative Order does not require the Copermittees to implement requirements outside of their jurisdictions or outside of their legal authority. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 21, 2015

B3-1	PROVISION B.3: Water Quality Improvement Goals, Strategies and Schedules	
	COMMENT: *Provision B.3.a should explicitly state that the action levels, interim goals and final goals are not enforceable limitations.*	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees with the comment. After further clarification with the commenters on their references to footnotes in Provision B and C, Footnote 8 to Provision C.1 for Non-Storm Water Action Levels (NALs) and Footnote 10 to Provision C.2 Storm Water Action Levels (SALs) clearly state NALs and SALs incorporated in the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, unless the NAL or SAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 21, 2015

C-1	PROVISION C: ACTION LEVELS	
	COMMENT: *The Tentative Order should enable the Copermittees to apply NALs/SALs based on the priorities of the Water Quality Improvement Plan and/or the IDDE program.* The County of Orange and Concurring Cities and the Orange County Flood Control District are concerned that the Tentative Order contradicts itself by stating Copermittees must develop and incorporate numeric NALs and SALs into the Water Quality Improvement Plan and/or IDDE program, then mandates Copermittees include all of the numeric action levels identified in tables C-1 to C-5. The Copermittees expressed concern that requiring the prescribed NALs and SALs under Provision C would result in unnecessary analyses for constituents that are not a priority identified in the Water Quality Improvement Plan.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees with the request to modify the requirements as suggested. The NALs and SALs under Provision C have been included to support the development and prioritization of the water quality strategies that will be implemented based on the highest priority water quality conditions identified by the Copermittees in the Water Quality Improvement Plans. The NALs and SALs have been included as a tool that the Copermittees and the San Diego Water Board can utilize to determine if the Copermittees are implementing the requirements of the Clean Water Act for MS4 permits to *effectively prohibit non-storm water discharges to the MS4* and *reduce pollutants in storm water discharges from the MS4 to the MEP*. The NALs and SALs are not new, and are included in both of the current MS4 permits issued to Orange County (Order No. R9-2009-0002) and Riverside County (Order No. R9-2010-0016). The Copermittees are required to effectively prohibit non-storm water discharges to their MS4s, which in turn should result in little to no discharges from their MS4s to receiving waters. If there are non-storm water discharges from the Copermittees' MS4s to receiving waters, those discharges should only be NPDES permitted discharges. Even if those discharges are NPDES permitted discharges, the Copermittees are responsible for demonstrating that those discharges are not illicit discharges by identifying the sources as NPDES permitted discharges. The prescribed NALs in Table C-1 through C-4 are associated with most if not all the pollutants that are known	

C-1	PROVISION C: ACTION LEVELS	
	or suspected to be causing or contributing to impairments in water bodies on the 303(d) List for the San Diego Region. The NALs are appropriately based on water quality objectives because non-storm water discharges that do not contain pollutants at levels in exceedance of the NALs are not expected to cause or contribute to exceedances of water quality standards in receiving waters. Thus, the prescribed NALs have been included to allow the Copermittees to prioritize their efforts in effectively prohibiting unpermitted non-storm water discharges to their MS4s, demonstrate that they have effectively prohibited non-storm water discharges to their MS4s that could cause or contribute to exceedances of water quality standards, or identify NPDES permitted sources that are resulting in discharges from their MS4s that are causing or contributing to exceedances of water quality standards in receiving waters. In any case, the prescribed NALs are necessary to allow the San Diego Water Board to determine if the Copermittees are effectively prohibiting non-storm water discharges to the MS4. The Tentative Order also allows Copermittees the flexibility to develop and include NALs, for which values are not already included provision C-1, for those pollutants that are causing or contributing, or threatening to cause or contribute to a condition of pollution or nuisance in receiving waters associated with the highest priority water quality conditions related to non-storm water discharges from the MS4s into the Water Quality Improvement Plans and IDDE Program. The Tentative Order does not prohibit the Copermittees from using any "previously established NALs" in addition to those listed in C-1 to C-4. In contrast, the prescribed SALs are not based on water quality objectives, but set at higher levels because the San Diego Water Board recognizes that reducing pollutants in wet weather discharges from the MS4s to water quality objectives is challenging. The prescribed SALs, however, will allow the Copermittees to prioritize their efforts in reducing pollutants in storm water discharges from their MS4s, and allow the San Diego Water Board to determine if the Copermittees are reducing pollutants in storm water discharges from their MS4s to the MEP. The San Diego Water Board disagrees with the concerns about monitoring for constituents that are not associated with the highest priority water quality conditions. Periodically analyzing non-storm water and storm water discharges from the Copermittees' MS4 for pollutants other than those associated with the highest priority water quality conditions is necessary if the Copermittees would like to re-prioritize or identify new priority water quality conditions that will be addressed. The San Diego Water Board does recognize that there is a cost associated with analyzing for additional constituents. Thus, the San Diego Water Board has modified the MS4 outfall monitoring requirements to reduce the number of dry weather MS4 outfall monitoring stations that must be analyzed (see Provision D.2.b.(2)(b) of Order No. R9-2013-0001) and provided the Copermittees some flexibility to modify the analytes for the wet weather MS4 outfall monitoring stations (see Provision	

C-1	PROVISION C: ACTION LEVELS	
	D.2.c.(5)(f)). As for the concerns about the chemically-based NALs and the biologically- or physically-based numeric goals for receiving waters, the San Diego Water Board disagrees that they cannot be linked or may be incompatible. Biologically- or physically-based numeric goals will likely be measured in the receiving waters. The chemically-based NALs apply to the MS4 outfalls. The quality of the MS4 discharges and the improvement of biological or physical measurements can be linked. Both are likely necessary to demonstrate that MS4 discharges are either not causing or contributing to a biological or physical impairment of the receiving water, or an improvement in MS4 discharges is resulting in improvements in the biological or physical conditions of the receiving water. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 21, 2015

D-1	PROVISION D: MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS	
	COMMENT: *Copermittees need to have the flexibility to adjust analytical monitoring in the water quality improvement plans based on assessments of current sources that may contribute to the section 303(d) water body impairments*. The County of Orange and Concurring Cities and Orange County Flood Control District requested relief of analytical monitoring requirements if supporting information can be provided to document the current pollutant concentrations or may provide historic information to support the absence of usage of these constituents in the MS4 drainage area.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees with the suggested revisions to the Tentative Order. Monitoring required in Provision D of Attachment No. 1 to the Tentative Order describes the minimum monitoring required to inform the Copermittees, San Diego Water Board, and the public on the progress the Copermittees make within their Phase 1 storm water programs to: 1) effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water from the MS4 to the maximum extent practicable; and 2) implement strategies to control the discharge of pollutants in MS4 discharges and improve receiving water quality. These minimum monitoring requirements do not prohibit the Copermittees from conducting monitoring for which it considers necessary to identify constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan. Each Copermittee is required to achieve compliance with the Basin Plan prohibitions and receiving water limitations (Provision A.1.a, A.1.c, and A.2.a, in Attachment 1 to the Tentative Order) through implementation of control measures and other actions as specified in the Tentative Order. The monitoring and assessment information collected and reported is expected to be key to the iterative approach and adaptive management process required by the Tentative Order (Provision A.4 of Attachment 1). Under the adaptive management provision, Copermittees are expected to change their monitoring programs to collect the necessary data for them to be able to demonstrate that their jurisdictional storm water management programs are making measurable progress towards achieving compliance with Basin Plan prohibitions and receiving water limitations. Changes to the monitoring programs would be presented during the development of or subsequent updates to the Water Quality Improvement Plan. All Copermittees are required to conduct the minimum monitoring described in Provision D, however through the adaptive management approach in Provision A of Attachment 1 to the Tentative Order, Copermittees are allocated sufficient flexibility to make changes to their monitoring program to collect the data most necessary to that their control strategies and other actions are	

D-1	PROVISION D: MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS	
	making measurable progress towards effectively eliminating non-storm water discharges, and reducing pollutants in storm water to the maximum extent practicable to ultimately achieve compliance with the Basin Plan prohibitions and receiving water limitations (Provision A in Attachment 1 to the Tentative Order). Based on this consideration no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted. See also response to comment Gnl-2.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 21, 2015

D-2	PROVISION D: MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS	
	COMMENT: *Modify Tentative Order requirements to be consistent with language in the South Orange County Wastewater Authority permit language.* The San Diego Water Board Monitoring and Assessment staff requests the Tentative Order be modified to update the Unified Beach Water Quality Monitoring language.	San Diego Water Board Staff of the Monitoring and Assessment Group
	RESPONSE: The San Diego Water Board agrees with the comment and has made the suggested language changes to the Tentative Order The Tentative Order language was revised to be consistent with the December 5, 2014 Executive Officer's letter directive, issued pursuant to California Water Code section 13383, requiring Copermittee participation in and shared responsibility for implementation of the Unified Beach Water Quality Program. Effective April 1, 2015, the requirements established through issuance of this Water Code section 13383 letter directive will become an enforceable component of the monitoring and reporting requirements in the Tentative Order.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 21, 2015

E-1	PROVISION E: JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS	
	COMMENT: *Water Quality Improvement Plans and related Jurisdictional Runoff Management Programs should be streamlined and focus on the watershed's highest priorities.* The County of Orange and Concurring Cities and the Orange County Flood Control District commented that the Tentative Order, Attachment 1 at Provision E deviates from the strategic and adaptive approach of the Water Quality Improvement Plan concept, and is instead a "one-size-fits-all" approach. The commenters recommend modifying the Tentative Order so that the Water Quality Improvement Plans and jurisdictional runoff management programs can be streamlined and focus on the highest priorities within the watersheds.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board agrees that the Water Quality Improvement Plan framework allows for the identification and development of a storm water management program built around the highest priority water quality conditions within a specific watershed. The Tentative Order is structured so that the Water Quality Improvement Plan identifies the highest priority conditions of concern for a particular watershed, and also strategies, numeric goals, and schedules for making improvements for those conditions of concern. The jurisdictional runoff management programs are meant to be the implementing mechanism for the Water Quality Improvement Plans, i.e. they must incorporate the strategies identified in the Water Quality Improvement Plans. The San Diego Water Board disagrees that the requirements of Provision E deviate from the strategic and adaptive approach of the Water Quality Improvement Plan concept and that modifications are needed. The commenters should note that the requirements of the Provision E of the Tentative Order are substantially less prescriptive than those of the previous Fourth Term MS4 permits. Whereas the requirements of the Fourth Term MS4 permits were very specific, detailed, and prescriptive, the requirements of the Tentative Order include only basic program elements that meet the minimum requirements of 40 CFR 122.26(d)(2)(iv), but include much more flexibility in how the Copermittees implement their programs. The Copermittees can emphasize or de-emphasize different aspects of their programs to accomplish the overarching goals of the Water Quality Improvement Plans. For example, a Copermittee may choose to emphasize a certain program element by increasing the frequency of BMP inspections for discharges that are likely to contribute to the priority conditions of concern, while maintaining other program elements at the minimum required levels. Unlike the Fourth Term MS4 permits, the Tentative Order allows each Copermittee to specify, for example, the minimum inspection frequency for each specific program element. In this way, Copermittees are allowed to run their programs at minimum baseline levels, but also direct their resources where needed to achieve improvements in water quality and to address the highest priority conditions of concern.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

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E-1	PROVISION E: JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS	
	Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 21, 2015

E1-1	PROVISION E.1: Legal Authority Establishment and Enforcement	
	COMMENT: *The Copermittees are only responsible for administering and enforcing the codes and ordinances applicable to their jurisdictions.* The County of Orange and Concurring Cities and the Orange County Flood Control District request that the requirements of Provision E.1 be modified to specify that the legal authority established by the Copermittees applies only to discharges within their jurisdictions, and that it is unnecessary to include language pertaining to discharges regulated by the Statewide Industrial and Construction General Permits.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees that it is necessary to specify that the legal authority established by the Copermittees is only applicable to their jurisdictions. The requirements of Provision E.1 are consistent with the requirements under 40 CFR 122.26(d)(2)(i)(A)-(F) and do not go beyond those requirements. The legal authority that each Copermittee is required to establish for its jurisdiction is logically only expected to apply to its jurisdiction. Provision E.1.a.(2) is consistent with 40 CFR 122.26(d)(2)(i)(A), which requires the Copermittee to "*Control through ordinance, permit, contract, order or similar means, the contribution of pollutants to the municipal storm sewer by storm water discharges associated with industrial activity and the quality of storm water discharged from sites of industrial activity*." 40 CFR 122.26(d)(2)(i)(A) does not make a distinction between industrial activity (which includes construction activity according to 40 CFR 122.26(b)(14)(x) that is regulated by an NPDES permit, such as the Statewide Industrial and Construction General Permits, and those that are not. Even if there are industrial and construction sites regulated by the Statewide Industrial or Construction General Permits, those sites are still subject to the Copermittees ordinances and the Copermittee must have the legal authority to control discharges from those sites. Provision E.1.a.(10) is consistent with 40 CFR 122.26(d)(2)(i)(F), which requires the Copermittee to "*Carry out all inspection, surveillance and monitoring procedures necessary to determine compliance and noncompliance with permit conditions including the prohibition on illicit discharges to the municipal separate storm sewer*." Therefore no modifications are warranted, and the San Diego Water Board did not make revisions to the requirements of Provision E.1 requested by the Commenters.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 21, 2015

E1-2	PROVISION E.1: Legal Authority Establishment and Enforcement	
	COMMENT: *The requirement for third party BMP effectiveness documentation is duplicative.* The County of Orange and Concurring Cities and the Orange County Flood Control District state that Provision E.1.a.(8) of the Tentative Order requires the Copermittees to obtain legal authority to require documentation of the effectiveness of BMPs, and that this requirement sets up a process for the establishment of multiple third party monitoring programs and expenditure of public funds to monitor the effectiveness of BMPs. The commenters state that this requirement ignores the fact that Copermittees have already established legal authority for their development standards, and is therefore redundant.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees that Provision E.1.a.(8) sets up a process for the establishment of multiple third party monitoring programs and expenditure of significant public funds to monitor the effectiveness of BMPs. The Provision simply states that each Copermittee must establish legal authority that authorizes the Copermittee to require documentation on the effectiveness of BMPs from any of its dischargers. The Copermittee is not required to exercise this legal authority, but the legal authority must be established and available to the Copermittees in the event that the Copermittee could benefit from obtaining this type of information. The requirement is not duplicative because the legal authority to impose development standards is separate from the legal authority to require documentation on BMP effectiveness. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 21, 2015

E2-1	PROVISION E.2: Illicit Discharge Detection and Elimination	
	COMMENT: *Modify the Illicit Discharge Detection and Elimination Program provisions so as not to negate the very intent and purpose of the watershed approach and the focus on the highest priorities within each watershed management area.* The County of Orange and Concurring Cities and the Orange County Flood Control District request modification to the introductory paragraph of the Illicit Discharge Detection and Elimination Provisions to better reflect the watershed approach and program focus on highest priority conditions of concern.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees that modifications to the Illicit Discharge Detection and Elimination Program Provisions are needed for the reasons stated in the Response to Comment E1-1. Copermittees are afforded flexibility in meeting the requirements of Provision E.2. They are required to meet a minimum baseline program (with limited prescriptiveness compared to previous Fourth Term MS4 permits) as stated in the Tentative Order, and within that framework may focus on the highest priority conditions of concern as described in the Water Quality Improvement Plans. All illicit discharges are to be actively detected and eliminated in a prioritized manner. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

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E2a-1	PROVISION E.2.a: Non-Storm Water Discharges	
	COMMENT: *Copermittees should be given flexibility to prioritize their IDDE program to focus on non-storm water discharges likely to be a source of pollutants.* The County of Orange and Concurring Cities and the Orange County Flood Control District request that the requirements under Provision E.2.a be revised to allow the Copermittees to focus on eliminating non-storm water discharges that are a source of pollutants and not require the elimination of all non-storm water discharges.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees with the commenter's' request. Provision E.2 does provide the Copermittees with a mechanism to address illicit discharges regardless of whether or not constituents of concern are present within the flows. The Copermittees are required to prioritize the non-storm water discharges that they will address, and eliminate the highest priority non-storm water discharges first. The Clean Water Act requires NPDES permit for MS4s to effectively prohibit non-storm water discharges to the MS4. As explained in the Fact Sheet, the Phase I Final Rule clarifies that non-storm water discharges through an MS4 are not authorized under the CWA (55 FR 47995): "*Today's rule defines the term "illicit discharge" to describe any discharge through a municipal separate storm sewer system that is not composed entirely of storm water and that is not covered by an NPDES permit. Such illicit discharges are not authorized under the Clean Water Act. Section 402(p(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit*." Thus, all non-storm water discharges that do not have authorization under an NPDES permit or are a category of non-storm water discharges that have been identified as a source of pollutants must ultimately be removed (i.e. prevented or eliminated) from the MS4 or become subject to an NPDES permit. The requirements under Provisions E.2.a.(1) and E.2.a.(3) are consistent with the Clean Water Act, the Code of Federal Regulations and the clarification in the Phase I Final Rule for non-storm water discharges. The non-storm water categories listed under Provision E.2.a.(3) generally are expected to be discharged from natural, uncontrollable, or unanticipated sources. Non-storm water discharges from foundation drains and footing drains designed to be above the groundwater table are not generally expected to occur. If they do occur, the Copermittee is expected to implement its illicit discharge detection and elimination program to	

E2a-1	PROVISION E.2.a: Non-Storm Water Discharges	
	determine if the discharge is transient or persistent, a source of pollutants or not, and whether the discharge must be eliminated in accordance with its priorities. In general, the requirements under Provision E.2 are focused on the ultimate removal of unauthorized non-storm water discharges to the MS4 to "effectively prohibit" non-storm water discharges to the MS4, as required by the Clean Water Act. The San Diego Water Board is not requiring the Copermittee to enforce any NPDES permits issued by the San Diego Water Board or State Water Board. The Copermittees are only required to use their legal authority to prohibit illicit discharges to their MS4s established pursuant to Provision E.1.a.(1). The San Diego Water Board did not revise Provision E.2 as recommended by the commenters.	

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E2a-2	PROVISION E.2.a: Non-Storm Water Discharges	
	COMMENT: *Modify Provision E.2.a.(5) to reflect the language previously adopted by the Regional Board in Order No. R9-2009-0002 regarding emergency firefighting discharges.* The County of Orange and Concurring Cities and the Orange County Flood Control District request that the Tentative Order be modified to clarify that there should not be a circumstance in which the Copermittees or the San Diego Water Board would identify emergency firefighting discharges as illicit discharges or a significant source of pollutants, and therefore in no instance would require BMP implementation.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees that the language in Provision E.2.a.(5) requires revision. This Provision does not require the implementation of BMPs for emergency firefighting discharges, nor does it prohibit emergency firefighting discharges to the MS4. Provision E.2.a.(5)(b) only requires the Copermittees to "encourage" the implementation of BMPs in emergency situations. Provision E.2.a.(5)(b) is a recommendation for the Copermittees to implement, not a requirement for compliance.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

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E2a-3	PROVISION E.2.a: Non-Storm Water Discharges	
	COMMENT: *The Tentative Order should not require the elimination of non-storm water discharges as a part of the IDDE Program.* The County of Orange and Concurring Cities and the Orange County Flood Control District state that Provision E.2.a.(7) misapplies the federal regulations that require the Copermittees to identify non-storm water discharges as illicit discharges prior to having an obligation to effectively prohibit it, and therefore the Provision should be removed.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees that it is appropriate to remove Provision E.2.a.(7) because it is consistent with Clean Water Act, the Code of Federal Regulations and the clarification in the Phase I Final Rule for non-storm water discharges. Please see the response to comment E2a-1 for further discussion.	

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E3-1	PROVISION E.3: Development Planning	
	COMMENT: *The Development Planning Provisions must be modified so as not to negate the very intent and purpose of the watershed approach and the focus on the highest priorities within each Watershed Management Area.* The County of Orange and Concurring Cities and the Orange County Flood Control District request modification to the introductory paragraph of the Development Planning Provisions to better reflect the watershed approach and program focus on highest priority conditions of concern.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees that modifications to the Development Planning Program Provisions are needed for the reasons stated in the Response to Comment E1-1. Copermittees are afforded flexibility in meeting the requirements of Provision E.3. They are required to meet a minimum baseline program (with limited prescriptiveness compared to Fourth Term MS4 permits) as stated in the Tentative Order, and within that framework may focus on the highest priority conditions of concern as described in the Water Quality Improvement Plans. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

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E3b-1	PROVISION E.3.b: Priority Development Projects	
	COMMENT: *Portions of redevelopment projects that already have water quality treatment BMPS should not be subject to the new PDP requirements.* The County of Orange and Concurring Cities and the Orange County Flood Control District request that language be added to the Tentative Order that would specify structural BMP requirements are not applicable to Priority Development Projects (or portions thereof) if the project already has implemented structural BMPs pursuant to requirements of prior MS4 permits.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees in concept with the Copermittees' request. Although some projects may already have structural BMPs onsite, the performance requirements of those BMPs do not necessarily meet the MEP requirements of the Tentative Order. Priority Development Projects subject to the requirements of older MS4 permits may not have BMPs that meet the numerical storm water pollutant control retention performance standard, or the flow control hydromodification performance standard. Therefore, when redevelopment sites, that were subject to older MS4 permit requirements, want to create and/or replace 5,000 square feet or more of impervious surface on the project site (collectively over the entire project site on an existing site with 10,000 square feet or more of impervious surfaces), the redevelopment site must update the BMPs during the design phase. Furthermore, the commenter should note that the pollutant control and hydromodification management BMP requirements of the Tentative Order are the same as the previous South Orange County MS4 permit, Order No. R9-2009-0002. Therefore Priority Development Projects that were subject to these requirements developed in 2009 should already be in compliance with the requirements of the Tentative Order. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

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E3b-2	PROVISION E.3.b: Priority Development Projects	
	COMMENT: *Tentative Order should include a priority development project exemption for flood control and stream restoration projects.* The County of Orange and Concurring Cities and the Orange County Flood Control District request that the Tentative Order should include exemptions for flood control and stream restoration projects from the requirement to implement structural BMPs since they are not a source of pollutants.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board believes that it may be suitable to relax the structural BMP standards for, or exempt flood control projects, but not before projects are evaluated on a case-by-case basis. In many instances, water quality protective measures may be appropriate for implementation in flood control projects, but such options would not be evaluated if the Tentative Order provided a blanket exemption. Furthermore, 40 CFR 122.26(d)(2)(iv)(A)(4) requires Copermittees to include in their applications mechanisms "to assure that flood management projects assess the impacts on the water quality of receiving water bodies and that existing structural flood control devices have been evaluated to determine if retrofitting the device to provide additional pollutant removal from storm water is feasible." Such evaluations would not occur if flood control projects were provided blanket exemption from Priority Development Project status, therefore a blanket exemption is not appropriate. Stream restoration projects do not fit any of the Priority Development Project categories, therefore no exemptions are needed. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

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E3b-3	PROVISION E.3.b: Priority Development Projects	
	COMMENT: *Tentative Order should include a priority development project exemption for emergency public safety projects.* The County of Orange and Concurring Cities and the Orange County Flood Control District request the Tentative Order include exemptions for emergency public safety projects from the requirement to implement structural BMPs because *a delay due to the development and approval of a Standard Stormwater Mitigation Plan (SSMP) would compromise public safety, public health and/or the environment.*	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees that modifications to the Tentative Order to exempt emergency public safety projects from the requirement to implement structural BMPs is necessary. The Commenters state that emergency projects will be implemented immediately where public safety, public health, and/or the environment is threatened, and that there will be no time for the development, processing, and plan check for these projects. The San Diego Water Board agrees. Provision E.3 describes requirements that pertain to development *planning*. Emergency situations, by definition, are not planned projects and therefore do not involve the design, approval, and construction of a building or structure. Therefore an explicit exemption is not needed. Regardless of the conditions (i.e. emergency conditions) under which a public safety project requires installation, if a public safety project meets the Priority Development Project criteria of Provision E.3.b, then the public safety project needs to include the structural BMP controls of Provision E.3.c. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

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E3c-1	PROVISION E.3.c: Priority Development Project Structural BMP Performance Requirements	
	COMMENT: *Modify the Tentative Order to allow flexibility in the structural BMP performance standards if watershed-specific performance standards are developed in the water quality improvement plans.* The County of Orange and Concurring Cities and the Orange County Flood Control District submitted comments stating that the Copermittees should be given the opportunity to develop alternative BMP performance standards consistent with the goals of the Water Quality Improvement Plans.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board agrees that greater improvements to water quality in the watersheds may be realized if Priority Development Projects were allowed to implement some requirements offsite, as opposed to strictly onsite. For this reason, the Attachment No. 1 of the Tentative Order allows for "alternative compliance" in instances where the Copermittee determines that offsite measures will have a greater overall water quality benefit for the Watershed Management Area than if the Priority Development Project were to implement structural BMPs onsite. Consequently, watershed-specific structural BMP requirements are present in Attachment No. 1 to the Tentative Order that provide for allowable compliance offsite. Therefore no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted. The alternative compliance program, which is described in Provision E.3.c.(3), is an option for Priority Development Projects where the Copermittee has participated in the development of a Watershed Management Area Analysis as part of the Water Quality Improvement Plan (described in Provision B.3.b.(4)). Such an approach is consistent with the latest findings in hydromodification management by the scientific community. In the Southern California Coastal Water Research Project (SCCWRP) Technical Report No. 667, the authors state: "*An effective [hydromodification] management program will likely include combinations of on-site measures (e.g., low-impact development techniques, flow-control basins), in-stream measures (e.g., stream habitat restoration), floodplain and riparian zone actions, and off-site measures. Off-site measures may include compensatory mitigation measures at upstream locations that are designed to help restore and manage flow and sediment yield in the watershed.*" Consistent with the ideas brought forth by the SCCWRP report, in the optional Watershed Management Area Analysis of Provision B.3.b.(4), the Copermittees must develop watershed maps that include as much detail about factors that affect the hydrology of the watersheds as is available. Such factors included identification of areas suitable for infiltration, coarse sediment supply areas, and locating stream channel structures and constrictions. Once these factors are mapped and studied, the Copermittees can identify areas in the	

E3c-1	PROVISION E.3.c: Priority Development Project Structural BMP Performance Requirements	
	watersheds where "candidate projects" may be implemented that are expected to improve water quality in the watershed by providing more opportunity for infiltration, slowing down storm water flows, or attenuation of pollutants naturally via healthy stream habitat. These projects may be in the form of retrofitting existing development, rehabilitating degraded stream segments, identifying regional BMPs, purchasing land to preserve valuable floodplain functions, and any other projects that the Copermittees identify. Under the alternative compliance program, Priority Development Project applicants may be allowed to fund, partially fund, or implement a candidate project, in lieu of implementing structural BMPs onsite, if they enter into a voluntary agreement with the Copermittee permitting this arrangement. If compliance involves funding or implementing a project that is outside the jurisdiction of the Copermittee, then that Copermittee may enter into an inter-agency agreement with the appropriate jurisdiction(s). Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

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E3c1-1	PROVISION E.3.c.(1): Storm Water Pollutant Control BMP Requirements	
	COMMENT: *Terminology is inconsistent with the use of "Low Impact Development" BMPs*. The County of Orange and Concurring Cities and the Orange County Flood Control District request modification to the Provision E.3 to provide consistency with the use of "Low Impact Development" terminology.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board has reviewed the suggested edits to Provision E.3 and did not find any suggestions pertaining to Low Impact Development terminology. Based on this consideration no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

E3c1-2	PROVISION E.3.c.(1): Storm Water Pollutant Control BMP Requirements	
	COMMENT: *The San Diego Water Board is requiring increasingly stringent onsite storm water retention requirements.* The Construction Industry Coalition on Water Quality (CICWQ) submitted comments stating that the San Diego Water Board is requiring increasingly stringent onsite storm water retention requirements without evidence that existing requirements under Order No. R9-2009-0002 are not working to protect water quality and beneficial uses. The commenter asserts that the San Diego Water Board is proposing to enact the most stringent onsite requirements for storm water runoff anywhere in California, and that the requirements are less flexible than earlier MS4 permits.	Construction Industry Coalition on Water Quality • San Diego Building Industry Association • Building Industry Association of Southern CA • Associated General Contractors • Associated Builders and Contractors • San Diego Regional Chamber of Commerce • Business Leadership Alliance • San Diego Association of Realtors • San Diego Apartment Association • National Association of Industrial & Office Properties • Building Office & Management Association • San Diego Chapter of American Society of Landscape Architects
	RESPONSE: The commenter incorrectly asserts that Attachment No. 1 to Tentative Order requires increasingly stringent onsite storm water retention requirements over and above the requirements of Order No. R9-2009-0002, the Fourth Term MS4 permit for Orange County Copermittees. The purpose of the onsite retention requirement in both the Tentative Order and Order No. R9-2009-0002 is to retain onsite the pollutants contained in the volume of storm water runoff produced from a 24-hour 85th percentile storm event. This requirement has not changed from Order No. R9-2009-0002, and therefore the commenter is incorrect in stating that the San Diego Water Board is requiring additional prescriptive performance measures for retaining storm water runoff. This is the MEP standard recognized by the San Diego Water Board and is consistent with the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), as well as Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit), and Los Angeles Water Board Order No. R4-2012-0175 (Los Angeles County MS4 Permit). Additionally, the San Diego Water Board disagrees with the commenter's assertion that the retention standard	

E3c1-2	PROVISION E.3.c.(1): Storm Water Pollutant Control BMP Requirements	
	is less flexible in the Tentative Order than in Order No. R9-2009-0002. In fact, the pollutant control and hydromodification management BMP requirements are more flexible in the Tentative Order than in the Fourth Term MS4 permits because the Tentative Order allows Priority Development Projects to comply by mitigating offsite, if doing so would provide greater water quality benefit for the watershed. Please see the response to Comment No. E3c1-2 for a discussion of the Watershed Management Analysis and the ability to perform offsite mitigation.	

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E3c1-3	PROVISION E.3.c.(1): Storm Water Pollutant Control BMP Requirements	
	COMMENT: *The Tentative Order and Fact Sheet ignore the findings of the Copermittee's Report of Waste Discharge.* The County of Orange and Concurring Cities and the Orange County Flood Control District submitted comments stating that there is little justification for the requirements of the Tentative Order based on the successes of the Copermittee's storm water programs, as reported in the Report of Waste Discharge (ROWD). The Copermittees report successes in reducing bacterial contamination in coastal waters during dry weather, and also assert that exceedances of total dissolved solids (TDS) and nutrients are unlikely due to urban sources. The commenters also state that the Tentative Order should recognize this uncertainty and not mandate on-site retention of runoff in the first instance where it may exacerbate the exfiltration of shallow groundwater with elevated TDS and nutrients. Finally, the commenters state that toxicity occurs sporadically in receiving waters in Orange County, indicating that the causes are not urban in nature, and that pesticide regulation is not within the Copermittees' jurisdictions.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board recognizes that the Copermittees have made great strides in improvements in water quality and attainment of beneficial uses through rigorous implementation of their storm water management programs, but disagrees that the requirements of Attachment No. 1 to the Tentative Order should be removed. The Copermittees note that bacterial contamination is low during dry weather, but concede that achieving reductions in bacteria concentrations in wet weather is challenging. The San Diego Water Board is charged with protecting the beneficial uses of receiving waters at all times, regardless of season or weather conditions. The fact that there are still impairments with bacterial contamination in the receiving waters during the rainy season is exactly why the requirements in the Tentative Order are necessary. The San Diego Water Board agrees that it is worthwhile to understand the environmental significance TDS and nutrients and their relationship, or lack thereof, to urban sources. The San Diego Water Board disagrees, however, that the Tentative Order does not recognize the need to protect shallow groundwater from exfiltration of TDS and nutrients. Although the Tentative Order at Provision E.3.c.(1)(a) requires onsite retention of the design capture volume, this can be accomplished via several physical mechanisms such as interception, storage, evaporation, and evapotranspiration, in addition to infiltration. Therefore the Tentative Order does not automatically mandate on-site retention of runoff in the form of infiltration in every instance, as the commenter	

E3c1-3	PROVISION E.3.c.(1): Storm Water Pollutant Control BMP Requirements	
	asserts. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted. See also response to comment Gnl-2.	

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E3c1-4	PROVISION E.3.c.(1): Storm Water Pollutant Control BMP Requirements	
	COMMENT: *If priority development projects use alternative compliance, onsite conventional BMPs should not also be required.* The County of Orange and Concurring Cities and the Orange County Flood Control District state that there is not adequate technical justification for requiring onsite conventional BMPs when a Priority Development Project is allowed alternative compliance offsite. The commenters state that requiring both is double mitigation that goes well beyond the MEP standard.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees with this comment. Onsite pollutant treatment using conventional BMPs is a minimum general requirement to remove pollutants from runoff prior to its discharge to any receiving water. The storm water pollutant control BMP requirement for Priority Development Projects is to retain, onsite, the pollutants contained in the volume of storm water runoff produced from a 24-hour 85th percentile storm event (design capture volume). If it is not technically feasible to retain pollutants within the design capture volume, onsite, then the Tentative Order provides for an alternative means of compliance. If the Priority Development Project proponent is allowed to implement BMPs offsite, then the portion of the design capture volume that is not reliably retained onsite must be treated prior to discharging pollutants into the receiving water. 40 CFR 131.10(a) prohibits use of the receiving water as a treatment system and therefore, requires treatment of runoff to occur prior to the discharge of runoff to receiving waters (See Finding 7 in Attachment 1 of the Tentative Order). If Priority Development Projects are allowed to forgo onsite conventional treatment of runoff, then the Priority Development Projects would discharge untreated runoff from their site into receiving waters which is prohibited under 40 CFR. Retention of the 85th percentile storm is clearly the MEP standard for storm water pollutant control, as represented by the Tentative Order and its Attachments, recently adopted MS4 permits in the state (R8-2009-0030 and R8-2010-0033; North Orange and Riverside County MS4 permits, R4-2010-0108 and R4-2012-0175; Ventura County and Los Angeles County MS4 permits, and San Diego Water Board Order Nos. R9-2009-0030 and R9-2010-0016; South Orange County and Riverside County MS4 permits), and elsewhere in the United States. Retention of anything less than the design storm volume must be mitigated because the MEP standard has not been met. Therefore, Attachment 1 to the Tentative Order includes a requirement that mitigation is necessary for the portion of the design storm volume that is not retained onsite because, although this remaining volume of storm water would be treated to some level, the MEP standard as represented by the structural BMP performance requirements would not have been met.	

E3c1-4	PROVISION E.3.c.(1): Storm Water Pollutant Control BMP Requirements	
	Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

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E3c-5	PROVISION E.3.c: Priority Development Project Structural BMP Performance Requirements	
	COMMENT: *Biofiltration BMPs should be sized for the design capture volume.* The County of Orange and Concurring Cities and Orange County Flood Control District assert that the requirement to oversize biofiltration BMPs to treat 1.5 times the design capture volume, if used to meet the pollutant control BMP requirements, is an increase over the prior Orange County MS4 permit. The commenters state that the Fact Sheet provides no technical justification for the sizing factor, and that biofiltration should be considered equivalent to onsite retention. The commenters also assert that Priority Development Projects that use biofiltration BMPs must also implement conventional BMPs, effectively requiring double mitigation when it is not needed.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The commenter incorrectly states that the requirement to size biofiltration BMPs to treat 1.5 times the design capture volume not reliably retained onsite is an increase from the prior Orange County MS4 permit (Order No. R9-2009-0002). This methodology of sizing the BMP was included in the Tentative Order *in addition to*, and not *in replacement of*, the methodology of sizing the BMP in Order No. R9-2009-0002. As a result, Priority Development Projects have two options for sizing biofiltration BMPs: 1.5 times the design capture volume not reliably retained onsite, OR a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite. The 1.5 sizing factor was included in the Tentative Order to offer more than one method of complying with the requirement. As described in the Fact Sheet, the 1.5 multiplier is based on the finding in the Ventura County Technical Guidance Manual that biofiltration of 1.5 times the design capture volume not retained onsite will provide approximately the same pollutant removal as retention of the design capture volume on an annual basis. This standard is consistent with the Los Angeles Water Board's Los Angeles County and Ventura County municipal storm water permits (Order Nos. R4-2012-0175 and R4-2010-0108, respectively). The commenter argues that biofiltration should be considered equivalent to other retention BMPs and therefore the 1.5 sizing factor is not needed. However, biofiltration is a flow-thru system, and therefore is not capable of retaining pollutants onsite (and preventing discharges of pollutants to receiving waters) in the equivalent manner as retention BMPs. The commenter compares the performance of harvest and use BMPs to biofiltration BMPs for the removal of total suspended solids, but fails to evaluate the performance of a range of retention BMPs, such as infiltration or evapotranspiration, which are widely accepted as effective pollutant control strategies.	

E3c-5	PROVISION E.3.c: Priority Development Project Structural BMP Performance Requirements	
	The commenter incorrectly asserts that Priority Development Projects that use biofiltration as an alternative compliance option must also implement conventional BMPs, and in effect requires double mitigation. Provision E.3.c.(1)(a)(i) of the Tentative Order allows for the use of biofiltration BMPs where retention of the full design capture volume is not technically feasible, but does not also require the use of conventional treat-and-release BMPs. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

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E3c2-1	PROVISION E.3.c.(2): Hydromodification Management BMP Requirements	
	COMMENT: *Hydromodification requirements are based on faulty foundational assumptions.* Tory Walker, PE, submitted comments stating that the hydromodification requirements of the Tentative Order are based on faulty foundational assumptions. The commenter states that 1) the requirements cannot be based on a category of stream being either stable or highly dynamic, 2) flow rate reductions caused by dams reduces channel degradation, and runoff from Priority Development Projects may compensate for this and promote a more natural condition, and 3) as a result, the Tentative Order needs to accommodate more site-specific flexibility.	Tory Walker Engineering
	RESPONSE: The San Diego Water Board disagrees that the hydromodification management requirements in the Tentative Order are based on faulty assumptions that preclude the accommodation of site-specific conditions. In fact, the Tentative Order incorporates the ability to accommodate site-specific conditions much more so than previous Fourth Term MS4 permits. The requirements in the Tentative Order provide that post-project runoff conditions must not exceed pre-development runoff conditions by more than 10 percent (for the range of flows that result in increased potential for erosion or degraded instream habitat downstream of the Priority Development Project). Note that the requirement is not to control *all* flows, but only those flows that are expected to cause erosion downstream. Because the downstream receiving water may or may not be susceptible to erosion, then the BMPs needed upstream, on the Priority Development Project will necessarily vary. In essence, when configuring BMPs for a particular Priority Development Project, the project proponent must evaluate both site-specific conditions and runoff conditions expected from the project, as well as the receiving water's susceptibility to erosion. The requirements in the Tentative Order do not specify that channels are to be treated as either stable or highly dynamic. The commenter states that hydromodification impacts caused by dams could actually be offset by runoff from Priority Development Projects. The San Diego Water Board recognizes this possibility, therefore the Tentative Order allows for offsite compliance in lieu of implementing hydromodification management BMPs onsite, where the Copermittee finds offsite compliance to provide a greater water quality benefit to the watershed. In this example, if the Copermittees in the watershed complete the optional Watershed Management Area Analysis described in Provision B.3.b(4) and find that flows generated from Priority Development Projects would actually help offset the runoff impounded by upstream dams, then the Copermittees could allow the Priority Development Projects located downstream of the dams the ability to comply offsite. For these reasons, the	

E3c2-1	PROVISION E.3.c.(2): Hydromodification Management BMP Requirements	
	San Diego Water Board disagrees that the hydromodification management requirements of the Tentative Order should be modified. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 21, 2015

E3c2-2	PROVISION E.3.c.(2): Hydromodification Management BMP Requirements	
	COMMENT: *Hydromodification management requirements should be based on a watershed management approach, be consistent with the WQIPs, and consider the current Copermittee HMPs.* The County of Orange and Concurring Cities and the Orange County Flood Control District state that hydromodification management should be based on the conditions of receiving waters and on the impacts and potential impacts from development projects, and the basis for management should be an understanding of the watershed and specific receiving waters. The commenters state that hydromodification management objectives should be watershed specific and developed through a stakeholder process. The commenters assert that the hydromodification management requirements in the Tentative Order are a one-size-fits-all approach that does not allow consideration of watershed analysis or receiving water information. The commenters state that requirement to use the pre-development runoff conditions as the performance standard goes beyond federal law by taking the Clean Water Act's purpose to restore waters out of context of section 402(p). The requirement does not reflect the developed urban environment and negates the engineering efforts to date to protect life and property from floods. The commenters also state that identifying "naturally occurring" conditions for redevelopment sites is difficult; raising the technical question as to how far back a Copermittee goes historically in determining the proper predevelopment timeframe. The commenters conclude by suggesting an approach to hydromodification management that is consistent with the intent of the Water Quality Improvement Plan approach, and considers the Copermittee's current Hydromodification Management Plans.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees that the hydromodification management requirements in the Tentative Order are a one-size-fits all approach and that the requirements do not allow consideration of watershed analysis or receiving water information. The requirements of the Tentative Order provide that post-project runoff conditions must not exceed pre-development runoff conditions by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat downstream of Priority Development Projects). Note that the requirement is not to control *all* post-project flows, but only those that are expected to *cause erosion or degraded habitat* downstream of the Priority Development Project. The performance standards of the Tentative Order are the same as those of the Commenters existing Order No. R9-2009-0002.	

E3c2-2	PROVISION E.3.c.(2): Hydromodification Management BMP Requirements	
	Since each Priority Development Project is expected to result in a specific post-project runoff condition, and the susceptibility of the receiving water to erosion could vary substantially based on location within a watershed, then the range of flows to control, and hence the specific BMPs required, will necessarily vary and is not a one-size-fits all requirement. In this way, the requirements in the Tentative Order specifically address both watershed and receiving water information. The Tentative Order allows for hydromodification management BMP implementation, and also exemptions, specific to the San Juan Watershed Management Area based on Copermittee's analysis of the watershed. See the response to Comment No. E3c1-1 regarding the Watershed Management Area Analysis as part of Water Quality Improvement Plan development, and how the Copermittees can use the results of the analysis to allow watershed-specific offsite mitigation in lieu of structural BMP implementation onsite, and also allow exemptions from the requirements. The Commenters incorrectly assert that the requirements in the Tentative Order attempt to restore waters to pre-Columbian conditions because of the requirement to use pre-development runoff conditions rather than pre-project runoff conditions in evaluating the need for hydromodification management BMPs. The Tentative Order requires the use of pre-development runoff conditions as a means of restoring a more natural hydrology to allow for stream rehabilitation, but there is no requirement to return the landscape to pre-Columbian conditions, nor is there a need to speculate how far back a Copermittee must go in in determining the appropriate timeframe. Because pre-development runoff conditions cannot be precisely known for a redevelopment project, the Tentative Order allows the use of any readily available information to estimate pre-development runoff conditions. Pre-development runoff conditions for redevelopment projects are defined in Attachment C to the Tentative Order as "runoff conditions from the project footprint assuming infiltration characteristic of the underlying soil, and existing grade." A Priority Development Project must use available information to estimate these parameters, and there is no need to perform extensive historical assessments, as the commenter asserts. The requirement to use pre-development runoff conditions as the performance standard is needed because using a hydrology baseline that approximates that of an undeveloped, natural watershed is the only way to facilitate the return of more natural hydrological conditions to already built-out watersheds. Using the pre-project hydrology as a baseline for redevelopment projects results in propagating the unnatural hydrology of urbanized areas, which is largely made up of impervious surfaces. Flows from impervious surfaces are highly erosive and consequently have detrimental effects on receiving waters in the San Diego Region. Furthermore, propagating the urbanized flow regime does not support conditions for restoring degraded or channelized	

E3c2-2	PROVISION E.3.c.(2): Hydromodification Management BMP Requirements	
	stream segments, and would forever sentence such streams to the degraded state. Identification of areas suitable for rehabilitating degraded stream segments is a critical component of the Tentative Order and is expected to be incorporated into Copermittee's strategies for improving water quality in the watersheds. Finally, the Copermittees will be allowed to use the Hydromodification Management Plan developed under Order No. R9-2009-0002. The performance standards of the Tentative Order are the same as those of Order No. R9-2009-0002, therefore there is no need for the Copermittees to develop new requirements or methodologies, or otherwise update their Hydromodification Management Plan. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

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E3c2-3	PROVISION E.3.c.(2): Hydromodification Management BMP Requirements	
	COMMENT: *The San Diego Water Board is eliminating exemptions for hydromodification control when storm water runoff is conveyed to significantly hardened or engineered channels.* The Construction Industry Coalition on Water Quality (CICWQ) assert that regulations are tending to require hydromodification controls for Priority Development Projects, regardless of receiving water susceptibility. CICWQ states that this direction is driven by environmental advocacy for removal of all concrete lined channels regardless of existing land uses and feasibility, and that such efforts ignore the vital role that flood control facilities play in urban infrastructure and the protection of life and property. The alignment, grade, and cross section of many urban streams have been irrevocably altered, and a regulatory requirement to return flows to pre-development conditions will not allow stream restoration to occur. CICWQ and the Riverside County Copermittees both submitted comments stating that the interim exemptions from hydromodification controls allowed for engineered channels should be granted outright without further study from the Copermittees.	Construction Industry Coalition on Water Quality • San Diego Building Industry Association • Building Industry Association of Southern CA • Associated General Contractors • Associated Builders and Contractors • San Diego Regional Chamber of Commerce • Business Leadership Alliance • San Diego Association of Realtors • San Diego Apartment Association • National Association of Industrial & Office Properties • Building Office & Management Association • San Diego Chapter of American Society of Landscape Architects Riverside County Copermittees
	RESPONSE: The San Diego Water Board disagrees that the hydromodification management requirements in the Tentative Order mandate controls on Priority Development Projects, regardless of receiving water susceptibility. The requirements of the Tentative Order provide that post-project runoff conditions must not exceed pre-development runoff conditions by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat downstream of Priority Development Projects). Note that the requirement is not to control *all* post-project flows, but only those that are expected to *cause erosion or degraded habitat* downstream of the Priority Development Project. Since each Priority Development Project is expected to result in a specific post-project runoff condition, and the susceptibility of the receiving water to erosion could vary substantially based on location within a watershed, then the range of flows to control, and hence the specific BMPs required, will necessarily vary and is not a one-size-fits all requirement. In this way, the requirements in the Tentative Order specifically address the susceptibility of the receiving water.	

E3c2-3	PROVISION E.3.c.(2): Hydromodification Management BMP Requirements	
	The commenter correctly asserts that the driver behind the requirement to use the pre-development performance standard is the sustainability of geomorphically stable channels and the ability to return urbanized streams to a more natural state. As explained in the response to Comment No. E.3.c2-2, the requirement to use pre-development runoff conditions as the performance standard is needed because using a hydrology baseline that approximates that of an undeveloped, natural watershed is the only way to facilitate the return of more natural hydrological conditions to already built-out watersheds, which in turn supports conditions for rehabilitating degraded or channelized stream segments. Contrary to what the commenter asserts, the Tentative Order does not require Copermittees to remove concrete from channels that are engineered to relieve flooding and protect life and property. The Tentative Order provides exemptions for Priority Development Projects that discharge to receiving waters where there is little threat of erosion, and subsequently implementing BMPs onsite would do little to protect the beneficial uses of such receiving waters. The commenter correctly states that the exemption for engineered channels is temporary. However, the commenter should note that there is a high likelihood that exemptions for engineered channels will become permanent. The Tentative Order allows for the Copermittees to recommend permanent exemptions based on completion of an optional Watershed Management Area Analysis pursuant to Provision B.3.b.(4). As part of this effort, the Copermittees would identify, for example, areas in the watershed suitable for urban retrofitting, and areas suitable for stream rehabilitation. The Copermittees would also identify areas suitable for exemptions for hydromodification management, such as engineered channels that are needed for the protection of life and property. The interim exemption for engineered channels is not granted outright as permanent exemptions because the areas have not yet been analyzed in the context of stream rehabilitation opportunities. The San Diego Water Board does not anticipate the Watershed Management Area Analysis to be burdensome on the Copermittees because they have already completed a Watershed Management Planning Tool, with similar goals as the Watershed Management Area Analysis, as part of their storm water management programs. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

E3c2-4	PROVISION E.3.c.(2): Hydromodification Management BMP Requirements	
	COMMENT: *Hydromodification control requirements to avoid critical sediment yield areas are unnecessarily restrictive.* The Construction Industry Coalition on Water Quality (CICWQ) assert that the hydromodification management requirements of the Tentative Order to "avoid critical sediment yield areas" are unnecessarily restrictive. The commenters state that several Priority Development Projects have been significantly delayed or stopped because of the inability to comply with this requirement.	Construction Industry Coalition on Water Quality • San Diego Building Industry Association • Building Industry Association of Southern CA • Associated General Contractors • Associated Builders and Contractors • San Diego Regional Chamber of Commerce • Business Leadership Alliance • San Diego Association of Realtors • San Diego Apartment Association • National Association of Industrial & Office Properties • Building Office & Management Association • San Diego Chapter of American Society of Landscape Architects
	RESPONSE: The San Diego Water Board disagrees that the requirements to avoid critical sediment yield areas are unnecessarily restrictive. The requirements are necessary to protect receiving waters from erosive flows caused by land development. As explained in the Fact Sheet to the Tentative Order, hydromodification, which is caused by both altered storm water flow and altered sediment flow regimes, is largely responsible for degradation of creeks, streams, and associated habitats in the San Diego Region. In an ongoing study by the Stormwater Monitoring Coalition to assess the health of streams throughout Southern California, researchers found that three of the four highest risk stressors to creeks (percent sands and fines present, channel alteration, and riparian disturbance) were related to physical habitat (Assessing the Health of Southern California Streams, Stormwater Monitoring Coalition, Fact Sheet). Researchers studying flood frequencies in Riverside County have found that increases in watershed imperviousness of only 9-22 percent can result in increases in peak flow rates for the two-year storm event of up to 100 percent (Schueler and Holland, 2000. Storm Water Strategies for Arid and Semi-Arid Watersheds, (Article 66). The Practice of Watershed Protection). Such changes in runoff have significant impacts on channel morphology. Placement of impervious surfaces as a result of urbanization is largely responsible for erosional impacts to	

E3c2-4	PROVISION E.3.c.(2): Hydromodification Management BMP Requirements	
	streams because placement of impervious surfaces encapsulates "good" sediment (such as sand, gravel, rocks and cobbles) that would normally replenish creek beds and banks to help stabilize them. For this reason, the Tentative Order requires Priority Development Projects to avoid critical sediment yield areas, as defined by the Copermittees, or implement measures to allow coarse sediment to be discharged to receiving waters. Such measures are designed to protect receiving waters and avoid impacts experienced by past land development practices. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

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E3c2-5	PROVISION E.3.c.(2): Hydromodification Management BMP Requirements	
	COMMENT: *Modify Tentative Order to clarify that the interim hydromodification exemptions are in place until the San Diego Water Board approves the BMP Design Manual.* The County of Orange and Concurring Cities and the Orange County Flood Control District recommend that the interim timeframe exemptions for engineered channels and large rivers from hydromodification management remain in place until the BMP Design Manual is approved by the San Diego Water Board, as opposed to when the BMP Design Manual has been updated. The commenters have made this request so that there is no timing gap in coverage for the exemptions.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees that any changes are needed to the language in Provision E.3.c.(2)e. The Tentative Order requires the Copermittees to update their BMP Design Manuals in accordance with Provision F.2.b. The Copermittees are required to update their BMP Design Manual, but there is no requirement to seek San Diego Water Board approval before the BMP Design Manual goes into effect 180 days after completing the update. If there is a discrepancy in approving the Water Quality Improvement Plan with recommended exemptions before the BMP Design Manual goes into effect, then the San Diego Water Board could direct the Copermittees to delay implementation of the BMP Design Manual. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

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E3c3-1	PROVISION E.3.c.(3): Alternative Compliance to Onsite Structural BMP Implementation	
	COMMENT: *Requests for the Water Quality Equivalency calculations be included as an optional Copermittee deliverable.* The County of San Diego requests that the Water Quality Equivalency calculations and methodologies currently under development by the Copermittees in support of the Alternative Compliance Program be included in the Tentative Order as an optional deliverable for review and acceptance by the San Diego Water Board's Executive Officer.	County of San Diego
	RESPONSE: The San Diego Water Board agrees with this comment and has modified the Tentative Order at Provision E.3.c.(3) to incorporate the recommendation.	

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E3c3-2	PROVISION E.3.c.(3): Alternative Compliance to Onsite Structural BMP Implementation	
	COMMENT: *Copermittees should be allowed flexibility to develop a trading and water quality credit system.* The County of Orange and Concurring Cities and the Orange County Flood Control District requests that language pertaining to the water quality credit system be revised to remove the no-net impact limitations because certain projects may offer significant environmental benefits that are not necessarily related to water quality, and that any water quality trading system should be implemented in accordance with EPA's 2003 Final Water Quality Trading Policy.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees with the commenters that the no-net impact language should be removed from the Tentative Order. The optional credit system described in Provision E.3.c.(3)(d) is based on meeting the structural BMP performance standards as they pertain to protecting and improving water quality. A credit system that would allow other environmental benefits cannot necessarily ensure that water quality would be protected to the MEP standard, for which the performance standards are structured to achieve. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

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E3e-1	PROVISION E.3.e: Priority Development Project BMP Implementation and Oversight	
	COMMENT: *Include the date the BMP manual will be implemented to provide clarity.* The City of San Diego requests that the date that the BMP Manual will go into effect for the San Diego County Copermittees (December 24, 2015) be explicitly expressed in the Tentative Order.	City of San Diego
	RESPONSE: The San Diego Water Board disagrees that including the date when the BMP Manual will go into effect is appropriate, because this date will be different for the various Copermittees covered under the Tentative Order (i.e. San Diego County Copermittees, South Orange County Copermittees, and eventually Riverside County Copermittees). Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

E3e-2	PROVISION E.3.e: Priority Development Project BMP Implementation and Oversight	
	COMMENT: *Revise the Tentative Order to define when a priority development project has prior lawful approval.* The City of San Diego requests a definition of prior lawful approval be added to the Tentative Order to clarify when it is appropriate to allow Priority Development Projects to comply with BMP standards of previous MS4 permits. The City of San Diego recommends including a definition that can 1) provide a clear, bright line; 2) provide a backstop to ensure that older projects with approvals comply with new requirements unless those approvals confer vested rights; 3) protect vested rights; and 4) preserve Copermittee's land use authority. Similarly, the Coalition provided comments requesting that the Tentative Order be modified to include a definition of prior lawful approval, stating that clarifying the intent of the San Diego Water Board will assist all interested parties in understanding the factors that the Copermittees need to balance in applying their discretion with Provision E.3.e.(1)(a) of the Tentative Order. In contrast, the Coastal Environmental Rights Foundation and San Diego Coastkeeper submitted comments that it is not necessary to take any action to define prior lawful approval, stating that doing so could allow for vested rights that run counter to widely accepted law.	Construction Industry Coalition on Water Quality • San Diego Building Industry Association • Building Industry Association of Southern CA • Associated General Contractors • Associated Builders and Contractors • San Diego Regional Chamber of Commerce • Business Leadership Alliance • San Diego Association of Realtors • San Diego Apartment Association • National Association of Industrial & Office Properties • Building Office & Management Association • San Diego Chapter of American Society of Landscape Architects San Diego Coastkeeper Coastal Environmental Rights Foundation City of San Diego
	RESPONSE: The San Diego Water Board has carefully considered the comments received regarding prior lawful approval, and whether or not it is appropriate to define this term in the Tentative Order. The San Diego Water Board understands the concerns regarding the difficulty the Copermittees face in applying their discretion to the concept of prior lawful approval in a consistent manner that complies with the intent of Provision E.3.e.(1)(a). Therefore, for the reasons presented by the commenters, the San Diego Water Board agrees that clarification regarding the intent of the Provision and the San Diego Water Board's expectation in how the Copermittees use their discretion, would be helpful to all parties. The Tentative Order has been modified to include a definition for prior lawful approval for both private and public Priority Development Projects that is intended to provide guidance and clarification to Copermittees in	

E3e-2	PROVISION E.3.e: Priority Development Project BMP Implementation and Oversight	
	exercising their discretion in this matter. For private development projects, prior lawful approval is a development approval or construction permit that complies with the Priority Development Project requirements of the Fourth Term MS4 permits (Order Nos. R9-2007-0001 for San Diego County, R9-2009-0002 for south Orange County, or R9-2010-0016 for Riverside County) and includes the design of the storm water drainage system for the project in its entirety as accepted by the Copermittee. Alternatively, prior lawful approval is a development approval or construction permit that confers a vested right to Priority Development Projects to proceed under storm water structural BMP requirements of prior MS4 permits. If a Copermittee grants prior lawful approval to a Priority Development Project based on one of the two aforementioned conditions, then the Copermittee must ensure that 1) any subsequent project approvals must be issued within 5 years of the effective date of the BMP Design Manual, and 2) BMP installation under subsequent approvals must remain in substantial conformity with the design of the storm water drainage system included in the initial approval. For public projects, prior approval allowing implementation of Fourth Term MS4 Permit structural BMP requirements in lieu of the requirements of the Tentative Order is acceptable if the storm water drainage system for the project, in its entirety, has been stamped by the City or County Engineer by the time the BMP Design Manual goes into effect. The San Diego Water Board recognizes that the Copermittees will need to determine whether or not a project has prior lawful approval under the Order based on the circumstances of each project. Nevertheless, the San Diego Water Board expects each Copermittee to require the implementation of Provision E.3 of the Tentative Order wherever it can lawfully do so. Some projects will have received prior lawful approval by the effective date of the BMP Design Manual and hence the requirements of the Fourth Term MS4 permits will govern. The San Diego Water Board expects that very few Priority Development Projects, if any, will be allowed to implement BMP requirements from prior MS4 permits. In cases where BMP requirements from the Fourth Term (or earlier) MS4 permits govern the structural BMP design requirements of a Priority Development Project, the San Diego Water Board expects the Copermittees to be able to demonstrate, in a programmatic audit or other means, that the project has prior lawful approval within the meaning of Provision E.3 of this Order. The San Diego Water Board has conducted and will continue to conduct programmatic audits of the Copermittee's land development programs to evaluate MS4 permit compliance. In all cases the San Diego Water Board expects the Copermittees to only approve projects with adequate post construction BMPs that are protective of water quality. In summary, Attachment 1 of the Tentative Order has been modified at Provision E.3.e.(1) to include a definition of the term "prior lawful approval." This language is intended to provide clarity on how the term	

E3e-2	PROVISION E.3.e: Priority Development Project BMP Implementation and Oversight	
	should be interpreted in determining structural BMP requirements for Priority Development Projects, and will also assist the San Diego Water Board in assessing Copermittee compliance with implementing the structural BMP requirements for Priority Development Projects to the maximum extent practicable (MEP) standard.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

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E4-1	PROVISION E.4: Construction Management	
	COMMENT: *Modify Construction Management Program provisions so as not to negate the very intent and purpose of the watershed approach and the focus on the highest priorities within each watershed management area.* The County of Orange and Concurring Cities and Orange County Flood Control District requests the introductory paragraph of the Construction Management Provisions be modified to better reflect the watershed approach and program focus on highest priority conditions of concern.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees that modifications to the Construction Management Program Provisions are needed for the reasons stated in the Response to Comment E1-1. Copermittees are afforded flexibility in meeting the requirements of Provision E.4. They are required to meet a minimum baseline program (with limited prescriptiveness compared to Fourth Term MS4 permits) as stated in the Tentative Order, and within that framework focus on the highest priority conditions of concern as described in the Water Quality Improvement Plans. Based on this consideration no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

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E5-1	PROVISION E.5: Existing Development Management	
	COMMENT: *Modify Existing Development Program provisions so as not to negate the very intent and purpose of the watershed approach and the focus on the highest priorities within each watershed management area.* The County of Orange and Concurring Cities and the Orange County Flood Control District request modification to the introductory paragraph of the Existing Development Provisions to better reflect the watershed approach and program focus on highest priority conditions of concern.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees that modifications to the Existing Development Management Program Provisions are needed for the reasons stated in the Response to Comment E1-1. Copermittees are afforded flexibility in meeting the requirements of Provision E.5. They are required to meet a minimum baseline program (with limited prescriptiveness compared to Fourth Term MS4 permits) as stated in the Tentative Order, and within that framework focus on the highest priority conditions of concern as described in the Water Quality Improvement Plans. Based on this consideration no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

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E5-2	PROVISION E.5: Existing Development Management	
	COMMENT: *Delete the requirement to evaluate retrofit of stream channels.* The County of Orange and Concurring Cities and Orange County Flood Control District requested removal of the requirement to evaluate retrofit of stream channels from the Tentative Order because it is not the Copermittee's responsibility to restore receiving waters.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board agrees that it is not the responsibility of the Copermittees to restore receiving waters. None of the provisions in the Tentative Order requires the Copermittees to perform stream restorations. The Tentative Order at Provision E.5.e.(2) requires the Copermittees to describe a program to rehabilitate streams, channels, and habitats in existing developed areas by first identifying viable candidates, then developing a strategy to facilitate the implementation of the rehabilitations. Rehabilitation of streams, channels, and habitats may also serve as candidates for alternative compliance (to implementation of structural BMPs; see Tentative Order at Provision E.3.c.(3)), and is an important element of the Tentative Order in achieving improvements in water quality and watershed functions. Based on this consideration no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 21, 2015

E6-1	PROVISION E.6: Enforcement Response Plans	
	COMMENT: *Copermittees should be allowed to utilize existing guidelines and procedures for enforcement.* The County of Orange and Concurring Cities and the Orange County Flood Control District request Provision E.6 be modified to specify that a Copermittee may utilize and implement established, equivalent guidelines and procedures for enforcement.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees that any changes to the Tentative Order are needed. A Copermittee will be able to continue using and implementing existing enforcement guidelines and procedures if the Copermittee demonstrates the procedures and guidelines comply with the requirements of Provision E.6. Provision E.6 requires each Copermittee to document enforcement processes and procedures in an Enforcement Response Plan, as part of its jurisdictional runoff management program document and specifically describes what must be included in the Plan. The Enforcement Response Plan will promote transparency and accountability by ensuring that Copermittee enforcement programs and procedures are clear and accessible to the San Diego Water Board and the public, and can be used to evaluate the adequacy of Copermittee enforcement programs and progress towards meeting enforcement goals. Because the Copermittees already have procedures in place for enforcement, there will likely only be minor modifications needed to the programs to meet the requirements of Provision E.6. The Enforcement Response Plan is expected to be a tool the Copermittee can refer to when issuing enforcement actions to compel compliance with its statutes, ordinances, permits, contracts, order, or similar means, and the requirements of the Tentative Order. The Enforcement Response Plan is also expected to result in more consistent enforcement and enforcement actions by the Copermittee within its jurisdiction. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 21, 2015

E6-2	PROVISION E.6: Enforcement Response Plans	
	COMMENT: *The definition for "Escalated Enforcement" should be redefined.* The County of Orange and Concurring Cities, and the Orange County Flood Control District request Provision E.6.d be modified to be "Progressive Enforcement" instead of "Escalated Enforcement" because the process should reflect a standard progressive approach.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees with the recommendation to modify the language in Provision E.6.d from "escalated enforcement" to "progressive enforcement". The Copermittees are expected to implement "progressive enforcement" in all cases of enforcement. For enforcement issues that are associated with the highest priority water quality conditions identified by the Copermittees in the Watershed Management Area, the Copermittees are expected to implement enforcement swiftly. "Escalated enforcement" refers to the Copermittee escalating its enforcement measures and resources to a) ensure compliance with local statutes, ordinances, permits, contracts, order, or similar means, and the requirements of the Tentative Order, b) compel prompt correction of violations and the conditions that led to the violations, and c) deter future violations. The term "escalated enforcement" correctly reflects this added level of urgency and focus to compel compliance. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 21, 2015

E7-1	PROVISION E.7: Public Education and Participation	
	COMMENT: *The Public Education Program provisions must be modified so as not to negate the very intent and purpose of the watershed approach and the focus on the highest priorities within each watershed management area.* The County of Orange and Concurring Cities and the Orange County Flood Control District request modification to the introductory paragraph of the Public Education Program Provisions to better reflect the watershed approach and program focus on highest priority conditions of concern.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees that modifications to the Public Education Program Provisions are needed for the reasons stated in the Response to Comment E1-1. Copermittees are afforded flexibility in meeting the requirements of Provision E.7. The Copermittees are required to meet a minimum baseline program (with limited prescriptiveness compared to Fourth Term MS4 permits) as stated in the Tentative Order, and within that framework focus on the highest priority conditions of concern as described in the Water Quality Improvement Plans. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted .	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 21, 2015

F-1	PROVISION F: REPORTING	
	COMMENT: *Modify Tentative Order to better align reporting requirements with the process for development and updates of the various plans to allow for the time necessary to complete the work and to submit the ROWD.* The County of Orange and Concurring Cities and Orange County Flood Control District suggest the due dates for development of each component of the Water Quality Improvement Plan be linked to the development step that precedes it and not to the commencement of coverage under the Order. The commenters also suggest the timeframe for development of the Water Quality Improvement Plan incorporate adequate time for the Copermittees to review and respond to comments received on the current action before moving on to the next step of development. The Copermittees are also concerned that the schedule proposed in the Tentative Order would impart an overly burdensome schedule on members of the public participating in the Consultation Panels and reviewing documents during the public review periods and do not allow for adequate time to conduct CEQA.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The Tentative Order accommodates the commenters concerns with the amount of time needed to develop the Water Quality Improvement Plan and submit the deliverables by providing a flexible range within which the Copermittees may submit each component of the Water Quality Improvement Plan. Copermittees may submit the requirements of Provision B.2 (i.e. priority water quality conditions, source of conditions, and potential water quality improvement strategies) as early as 6 months and no later than 12 months after commencement of coverage and Provision B.3 (i.e. goals, strategies, and schedules) as early as 9 months, and no later than 18 months after commencement of coverage. By including this range within which the deliverable can be submitted, the San Diego Water Board is allowing adequate time and adequate flexibility for the Copermittees to a) create the deliverable, b) accept and review comments received on the deliverable during development of the Water Quality Improvement Plan, and c) complete any CEQA compliance as the Copermittee determines to be necessary. The San Diego Water Board expects each partial deliverable to be well thought out and complete but also realizes that additional time exists in the process to further incorporate comments and input received during the public comment period and San Diego Water Board staff review. As such the Tentative Order requires the final version of the Water Quality Improvement Plan to be submitted within 24 months after commencement of coverage under the Tentative Order as it amends Order No. R9-2013-0001. By requiring submittal of individual components of the Water Quality Improvement Plan, members of the Consultation Panel, the public, and the San Diego Water Board will be able to provide input early on in the Plan	

F-1	PROVISION F: REPORTING	
	development. The San Diego Water Board expects that any deficiencies in the Water Quality Improvement Plan will be identified early on either during the public review and comment period or during the review by the San Diego Water Board. The Orange County Copermittees may wish to consult with San Diego County Copermittees to benefit from their experience in developing the Water Quality Improvement Plans. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 21, 2015

H-1	PROVISION H: MODIFICATION OF PROGRAMS	
	COMMENT: *Modify Tentative Order to include an explicit re-opener provision.*	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees that additional revisions to the explicit re-opener provisions in the Tentative Order are necessary. Provision H.4.c of the Tentative Order already explicitly states that the San Diego Water Board will re-open the Order if any of the TMDLs in Attachment E are amended in the Basin Plan by the San Diego Water Board, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 21, 2015

AttA-1	ATTACHMENT A: Discharge Prohibitions and Special Protections	
	COMMENT: *The City supports the proposed changes to the Areas of Special Biological Significance.*	City of San Diego
	RESPONSE: The San Diego Water Board acknowledges the City's support of this change.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 21, 2015

AttC-1	ATTACHMENT C: Acronyms, Abbreviations, and Definitions	
	COMMENT: *Request for additional or modified definitions*. Several comments were submitted requesting modifications to existing definitions and/or the addition of new definitions to Attachment C to the Tentative Order.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board reviewed and considered the requested modifications to existing definitions and additional definitions. All of the requested additions or modifications were submitted during the 2013 adoption process for Order No. R9-2013-0001. The San Diego Water Board reconsidered the requested additions or modifications and determined, in all cases, that the requested modifications or additions were still not appropriate, not necessary, or both. Therefore, no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 21, 2015

AttE-1	ATTACHMENT E: Specific Provisions for Total Maximum Daily Loads	
	COMMENT: *Compliance determination for final WQBELs should be based on implementation of BMPs and not numeric effluent limitations.*	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board has already included a compliance determination option for final WQBELs based on implementation of BMPs in the Tentative Order. WQBELs can be expressed as (1) conditions in receiving waters that are to be attained to restore or protect water quality standards in receiving waters, (2) conditions in discharges that will not cause or contribute to exceedances of water quality standards in receiving waters, (3) BMPs that will ensure discharges will not cause or contribute to exceedances of water quality standards in receiving waters, or (4) a combination of one or more of (1)-(3). This is consistent with 40 CFR 122.44(d)(1)(vii)(B) and 122.44(k)(2)-(4). The San Diego Water Board has incorporated options (1)-(3) under the WQBEL requirements for each of the TMDLs in Attachment E. In most cases, if the WQBEL expressed as a receiving water limitation is achieved, the discharges from the MS4s are assumed to be in compliance with the TMDL requirements. If not, then the Copermittees must demonstrate that discharges from the MS4s are not causing or contributing to the exceedances in the receiving waters by achieving the WQBELs expressed as effluent limitations. In every case, the Copermittees are required to implement BMPs to ensure that discharges from their MS4s do not cause or contribute to exceedances of water quality standards in receiving waters. For the interim TMDL compliance determination requirements, the Copermittees are allowed to demonstrate compliance by implementing a Water Quality Improvement Plan that has been accepted by the San Diego Water Board, with a “reasonable assurance” that the implementation of the BMPs will achieve the interim TMDL WQBELs within the interim compliance dates. The Copermittees will be provided considerable flexibility for demonstrating compliance with achieving the interim WQBELs. For the final TMDL compliance determination requirements, the Copermittees are allowed to demonstrate compliance with the final WQBELs by implementing a Water Quality Improvement Plan that includes an	

AttE-1	ATTACHMENT E: Specific Provisions for Total Maximum Daily Loads	
	analysis to demonstrate that the implementation of the BMPs required by the TMDL achieves compliance with one or more of the final numeric WQBELs. The Water Quality Improvement Plan must include monitoring and assessments to confirm that the Water Quality Improvement Plan is achieving the final TMDL requirement. The San Diego Water Board must accept and continue to accept the Water Quality Improvement Plan and analysis, and the Copermittees must continue to implement the BMPs and demonstrate through the analysis that the final numeric WQBELs are being achieved. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 21, 2015

AttE-2	ATTACHMENT E: Specific Provisions for Total Maximum Daily Loads	
	COMMENT: *Modify Tentative Order to include a compliance mechanism prior to approval of the Water Quality Improvement Plans.*	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees that it is necessary to include a compliance mechanism prior to approval of the Water Quality Improvement Plan. If a TMDL in Attachment E includes interim or final compliance dates that have passed, the Copermittees are expected to have data to demonstrate that one or more of the compliance determination options have already been met. If interim or final TMDL compliance dates have not passed, compliance with the interim or final TMDL compliance requirements do not have to be demonstrated yet, thus a compliance determination mechanism is not yet required. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 21, 2015

AttE5-1	ATTACHMENT E 5: Baby Beach and Shelter Island Shoreline Park Bacteria TMDL	
	COMMENT: *Correct discrepancies between adopted TMDLs in the Basin Plan and provisions in the Tentative Order.*	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees that there are discrepancies between the TMDLs in the Basin Plan and the provisions in the Tentative Order. The TMDLs as developed are all intended to restore the water quality standards in receiving waters impaired by specific pollutants. The WLAs and LAs as developed are all intended to ensure that discharges from point and nonpoint sources to receiving waters will not cause or contribute to exceedances of water quality standards in receiving waters. The TMDL requirements in Attachment E are consistent with the intent of the TMDLs, and the WLAs for MS4s. In other words, the TMDL requirements in Attachment E are intended to ensure that discharges from the Responsible Copermittees' MS4s will not cause or contribute, and will continue to not cause or contribute to exceedances of water quality standards in receiving waters. According to each TMDL, when all point sources and nonpoint sources achieve their WLAs and LAs, including the WLAs for MS4s, the water quality standards in receiving waters will be restored. The San Diego Water Board included TMDL requirements in Attachment E that are entirely consistent with the requirements of the TMDLs as adopted and incorporated into the Basin Plan. The implementation plans of the TMDLs in the Basin Plan are essentially "instructions" for the San Diego Water Board to incorporate the requirements into the regulatory mechanisms that will implement the requirements of the TMDL to attain the water quality standards that are being impaired by a pollutant in a water body. In each case, the "instructions" provide the permit writer considerable flexibility in how to express the WLAs as WQBELs in the permit, but not as much flexibility in the compliance schedules for achieving the WLAs. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 21, 2015

AttE5-2	ATTACHMENT E 5: Baby Beach and Shelter Island Shoreline Park Bacteria TMDL	
	COMMENT: *WQBELs for Baby Beach TMDL inappropriately include TMDL numeric targets.*	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board has included WQBELs that are consistent with the requirements and assumptions of the TMDLs. The federal regulations under 40 CFR 122.44(d)(1)(vii)(B) require that NPDES permit requirements incorporate WQBELs that must be consistent with the requirements and assumptions of any available WLAs developed under TMDLs. WQBELs can be expressed as (1) conditions in receiving waters that are to be attained to restore or protect water quality standards in receiving waters, (2) conditions in discharges that will not cause or contribute to exceedances of water quality standards in receiving waters, (3) BMPs that will ensure discharges will not cause or contribute to exceedances of water quality standards in receiving waters, or (4) a combination of one or more of (1)-(3). This is consistent with 40 CFR 122.44(d)(1)(vii)(B) and 122.44(k)(2)-(4). The San Diego Water Board has incorporated options (1)-(3) under the WQBEL requirements for each of the TMDLs in Attachment E. In most cases, if the WQBEL expressed as a receiving water limitation is achieved, the discharges from the MS4s are assumed to be in compliance with the TMDL requirements. If not, then the Copermittees must demonstrate that discharges from the MS4s are not causing or contributing to the exceedances in the receiving waters by achieving the WQBELs expressed as effluent limitations. In every case, the Copermittees are required to implement BMPs to ensure that discharges from their MS4s do not cause or contribute to exceedances of water quality standards in receiving waters. The WQBELs are also consistent with the assumptions and requirements of the WLAs. In each case, the WLAs are calculated based on numeric targets that are assumed to be able to restore or protect water quality standards in receiving waters and/or ensure discharges from the Responsible Copermittees' MS4s will not cause or contribute to exceedances of water quality standards in receiving waters. The numeric targets are required to be based on water quality objectives in the Basin Plan. Discharges from the MS4s are required to	

AttE5-2	ATTACHMENT E 5: Baby Beach and Shelter Island Shoreline Park Bacteria TMDL	
	achieve the numeric targets for their discharges to protect water quality standards in receiving waters to meet the WLAs. The WQBELs for the TMDLs in Attachment E are consistent with the numeric targets, and thus consistent with the underlying assumptions and requirements of the numeric targets that are the basis of the WLAs. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 21, 2015

AttE6-1	ATTACHMENT E 6: Beaches and Creeks Bacteria TMDL	
	COMMENT: *Correct discrepancies between adopted TMDL Basin Plan and provision in Tentative Order.*	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees that there are discrepancies between the TMDLs in the Basin Plan and the provisions in the Tentative Order. The TMDLs as developed are all intended to restore the water quality standards in receiving waters impaired by specific pollutants. The WLAs and LAs as developed are all intended to ensure that discharges from point and nonpoint sources to receiving waters will not cause or contribute to exceedances of water quality standards in receiving waters. The TMDL requirements in Attachment E are consistent with the intent of the TMDLs, and the WLAs for MS4s. In other words, the TMDL requirements in Attachment E are intended to ensure that discharges from the Responsible Copermittees' MS4s will not cause or contribute, and will continue to not cause or contribute to exceedances of water quality standards in receiving waters. According to each TMDL, when all point sources and nonpoint sources achieve their WLAs and LAs, including the WLAs for MS4s, the water quality standards in receiving waters will be restored. The San Diego Water Board included TMDL requirements in Attachment E that are entirely consistent with the requirements of the TMDLs as adopted and incorporated into the Basin Plan. The implementation plans of the TMDLs in the Basin Plan are essentially "instructions" for the San Diego Water Board to incorporate the requirements into the regulatory mechanisms that will implement the requirements of the TMDL to attain the water quality standards that are being impaired by a pollutant in a water body. In each case, the "instructions" provide the permit writer considerable flexibility in how to express the WLAs as WQBELs in the permit, but not as much flexibility in the compliance schedules for achieving the WLAs. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 21, 2015

AttE6-2	ATTACHMENT E 6: Beaches and Creeks Bacteria TMDL	
	COMMENT: *Modify Attachment E.5, WQBELs for Beaches and Creeks TMDL inappropriately include TMDL numeric targets.*	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board has included WQBELs that are consistent with the requirements and assumptions of the TMDLs. The federal regulations under 40 CFR 122.44(d)(1)(vii)(B) require that NPDES permit requirements incorporate WQBELs that must be consistent with the requirements and assumptions of any available WLAs developed under TMDLs. WQBELs can be expressed as (1) conditions in receiving waters that are to be attained to restore or protect water quality standards in receiving waters, (2) conditions in discharges that will not cause or contribute to exceedances of water quality standards in receiving waters, (3) BMPs that will ensure discharges will not cause or contribute to exceedances of water quality standards in receiving waters, or (4) a combination of one or more of (1)-(3). This is consistent with 40 CFR 122.44(d)(1)(vii)(B) and 122.44(k)(2)-(4). The San Diego Water Board has incorporated options (1)-(3) under the WQBEL requirements for each of the TMDLs in Attachment E. In most cases, if the WQBEL expressed as a receiving water limitation is achieved, the discharges from the MS4s are assumed to be in compliance with the TMDL requirements. If not, then the Copermittees must demonstrate that discharges from the MS4s are not causing or contributing to the exceedances in the receiving waters by achieving the WQBELs expressed as effluent limitations. In every case, the Copermittees are required to implement BMPs to ensure that discharges from their MS4s do not cause or contribute to exceedances of water quality standards in receiving waters. The WQBELs are also consistent with the assumptions and requirements of the WLAs. In each case, the WLAs are calculated based on numeric targets that are assumed to be able to restore or protect water quality standards in receiving waters and/or ensure discharges from the Responsible Copermittees' MS4s will not cause or contribute to exceedances of water quality standards in receiving waters. The numeric targets are required to be based on water quality objectives in the Basin Plan. Discharges from the MS4s are required to	

AttE6-2	ATTACHMENT E 6: Beaches and Creeks Bacteria TMDL	
	achieve the numeric targets for their discharges to protect water quality standards in receiving waters to meet the WLAs. The WQBELs for the TMDLs in Attachment E are consistent with the numeric targets, and thus consistent with the underlying assumptions and requirements of the numeric targets that are the basis of the WLAs. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 21, 2015

AttE7-1	ATTACHMENT E 7: Los Peñasquitos Lagoon Sediment TMDL	
	COMMENT: *Modify the Tentative Order to allow individual jurisdictional compliance with TMDLs.* The City of San Diego requests the Tentative Order be modified so that Final TMDL Compliance Determination using the Water Quality Improvement Plan pathway is based on individual jurisdictional compliance instead of all Copermittees collectively.	City of San Diego
	RESPONSE: The San Diego Water Board disagrees that modifications are needed to the language pertaining to TMDL compliance determination. The commenter correctly asserts that the intent of the language, and in fact, the intent of the Water Quality Improvement Plan concept, is that the Copermittees develop the Water Quality Improvement Plans collectively and evaluate water quality improvement strategies on a watershed basis. The San Diego Water Board recognizes that the Copermittees have no authority over other Copermittees to compel TMDL compliance; therefore, the Tentative Order has multiple compliance pathways available to each Copermittee to achieve compliance. These pathways are presented in each of the 7 Specific (TMDL) Provisions at X.b.(3). These alternative compliance pathways do not rely on actions or inactions of other Copermittees.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 21, 2015

AttE7-2	ATTACHMENT E 7: Los Peñasquitos Lagoon Sediment TMDL	
	COMMENT: *Clarify that waste load allocations include discharges from other responsible parties in addition to Responsible Copermittees.* The City of San Diego, City of Del Mar, and Industrial Environmental Association submitted comments requesting the final effluent limitations expressed in Table 7.1, which were derived from waste load allocations, recognize the contribution of sediment loading to the Los Penasquitos Watershed from dischargers other than the Copermittees. Without this recognition, the other dischargers would have a zero sediment loading allocation, contrary to the intent of the TMDL.	Industrial Environmental Association City of San Diego City of Del Mar
	RESPONSE: Although the Tentative Order is an NPDES permit specifically issued to the Phase I MS4 Copermittees, the San Diego Water Board has nonetheless modified Table 7.1 to state that the effluent limitation of 2,580 tons/year is shared amongst all dischargers identified in Resolution No. R9-2012-0033. Provision 7.b.(2)(c)(ii) has likewise been modified to clarify that the Responsible Copermittees must implement BMPs to achieve only their portion of the effluent limitations, as opposed to other discharger's contributions. The City of San Diego suggested dividing up the collective load in proportion to land area occupied by each discharger, but the San Diego Water Board cannot impose a TMDL distribution methodology through the permitting process that has not been peer reviewed and vetted through the TMDL development stakeholder process. Assigning a waste load allocation and subsequent effluent limitation applicable to all dischargers within a watershed collectively, is consistent with the San Diego Water Board's approach to TMDL expression for other waterbodies and constituents.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 21, 2015

AttE7-3	ATTACHMENT E 7: Los Peñasquitos Lagoon Sediment TMDL	
	COMMENT: *Revise the Final TMDL compliance determination to be consistent with the Basin Plan Amendment and other TMDLs.* The City of Del Mar and the City of San Diego submitted comments requesting the language pertaining to final TMDL compliance determination be modified to be consistent with the Basin Plan Amendment adopted by the San Diego Water Board under Resolution No. R9-2012-0033, and offer multiple compliance pathways similar to other TMDLs.	City of Del Mar City of San Diego
	RESPONSE: The San Diego Water Board agrees to modify the language of Provision 7.b.(3)(a) to match the language of the Basin Plan Amendment (page A-16). However, the San Diego Water Board disagrees that the suggested revisions to add additional language to incorporate a compliance pathway related to "implementation actions" is necessary. Specifically, both the City of San Diego and City of Del Mar requested the following language to be added: "Demonstrate that implementation actions are active on and/or affecting 346 acres with continued monitoring to ensure 80 percent target achievement" This language is not needed because Provision 7.b.(3)(b) regarding the development of the Water Quality Improvement Plan as a compliance pathway serves the same purpose as the suggested language. The phrase "implementation actions" has been added to Provision 7.b.(3)(b)(ii) to incorporate all ideas from the Basin Plan Amendment language into the Water Quality Improvement Plan concept. The San Diego Water Board considered the request to add two additional compliance pathways similar to those included in other TMDLs. As this sediment TMDL is different than other adopted TMDLs because the primary focus is lagoon saltmarsh restoration, as opposed to the quality of the MS4 discharges, the San Diego Water Board did not incorporate the suggested modifications. The intent of the TMDL efforts was to facilitate successful restoration of 346 acres of saltmarsh vegetation, and the Tentative Order appropriately uses this metric as the primary compliance pathway. The schedule to achieve compliance is 20 years, as established by the TMDL. In contrast, the NPDES permit as represented by the Tentative Order is on a 5-year cycle. Revisions to the compliance pathways available to the Responsible Parties can be revisited upon reissuance of the NPDES permit at a later date. The San Diego Water Board believes it is more appropriate to offer multiple compliance pathways after data have been collected showing the effects of sediment reduction efforts on lagoon restoration. If a positive linkage can be	

AttE7-3	ATTACHMENT E 7: Los Peñasquitos Lagoon Sediment TMDL	
	established between the reduction in sediment discharges and the successful restoration of the lagoon, then the Responsible Parties can make this request at subsequent permit reissuance proceedings.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 20, 2015

AttE7-4	ATTACHMENT E 7: Los Peñasquitos Lagoon Sediment TMDL	
	COMMENT: *Correct references in the Los Penasquitos final TMDL compliance determination.* The City of San Diego requested modifications to Specific Provision 7.b(3)(b) to correct errors.	City of San Diego
	RESPONSE: The San Diego Water Board has reviewed the recommendation to change the text to reference 7.b.(2)(a) and has not made changes because the references to Specific Provision 7.b.(3)(a) are correct. The incorrect reference to Specific Provision 2 has been changed to Specific Provision 7	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 21, 2015

AttE7-5	ATTACHMENT E 7: Los Peñasquitos Lagoon Sediment TMDL	
	COMMENT: *Revise the interim TMDL compliance determination to be consistent with the Basin Plan Amendment and other TMDLs.* The City of Del Mar and the City of San Diego submitted comments requesting that the language pertaining to interim TMDL compliance determination be modified to be consistent with the Basin Plan Amendment adopted by the San Diego Water Board under Resolution No. R9-2012-0033, and offer multiple compliance pathways similar to other TMDLs.	City of Del Mar City of San Diego
	RESPONSE: The San Diego Water Board agrees with the recommendation and has added multiple compliance options for interim TMDL compliance at Specific Provision 7.c.(2), as suggested by the commenters. Interim TMDL compliance, on or after the interim compliance dates shown in Table 7.2, may be demonstrated via one of the following methods: (a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR (b) The final receiving water limitation under Specific Provision 7.b.(2)(a) is met; OR (c) There are no exceedances of the Copermittee's portion of interim effluent limitations under Table 7.2 at the Responsible Copermittee's MS4 outfalls; OR (d) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the Copermittee's portion of the interim TMDL compliance requirements will be achieved by the interim compliance date.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 21, 2015

AttE7-6	ATTACHMENT E 7: Los Peñasquitos Lagoon Sediment TMDL	
	COMMENT: *Revise Tables 7.1 and 7.2 in Specific Provision 7 to Reflect the Basin Plan Amendment.* The City of San Diego and the City of Del Mar submitted comments requesting modifications to Tables 7.1 and 7.2 to 1) change the heading from interim effluent limitations in tons/year to tons/wet season, and 2) add a footnote acknowledging that the effluent limitation is shared by all Responsible Parties identified in Resolution R9-2012-0033.	City of Del Mar City of San Diego
	RESPONSE: The San Diego Water Board reviewed the wasteload allocations in the Basin Plan Amendment and notes that they are reported in tons/year on both page A-6 and the Table on page A-17. Nevertheless, Table 7.2 has been modified to report the effluent limitations in tons per wet season, as the commenters requested. A footnote was also added to acknowledge the other Responsible Parties identified in Resolution R9-2012-0033. The San Diego Water Board agrees that the third column of Table 7.2 is misleading and not useful, therefore it was deleted.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 21, 2015

AttE7-1	ATTACHMENT E 7: Los Peñasquitos Lagoon Sediment TMDL	
	COMMENT: *Revise monitoring start date to be the first full wet season after the Water Quality Improvement Plan is accepted.* The City of San Diego and the City of Del Mar submitted comments requesting that the Assessment and Reporting Requirements in Specific Provision 7.d.(3) be revised so that the first data collection occurs after the San Diego Water Board acceptance of the Water Quality Improvement Plan.	City of Del Mar City of San Diego
	RESPONSE: The San Diego Water Board agrees that the start date for the monitoring requirements should be delayed, but disagrees that acceptance of the Water Quality Improvement Plan is needed first. The language has been changed so that the start date occurs in the 2015-2016 wet season. The monitoring requirements were developed as part of the TMDL Basin Plan Amendment that was adopted by the San Diego Water Board in 2012. The TMDL became effective, and the compliance timeline started, when it was approved by the Office of Administrative Law in July, 2014. The Responsible Parties need not wait for acceptance of the Water Quality Improvement Plan to begin implementing their required monitoring program under the TMDL.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 21, 2015

AttF-1	ATTACHMENT F: Fact Sheet / Technical Report	
	COMMENT: *Based on the successes of the Orange County Storm Water Program, there is little justification for much of the Tentative Order.*	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: Attachment F to the Tentative Order includes the Fact Sheet. The Fact Sheet sets forth a brief summary of the basis for the draft permit conditions, the principal facts and the significant factual, legal, methodological, and policy questions the San Diego Water Board considered in preparing the Tentative Order. The Fact Sheet. In accordance with the Code of Federal Regulations (CFR) Title 40 Parts 124.8 and 124.56 (40 CFR 124.8 and 40 CFR 124.56), this Fact Sheet includes, but is not limited to, the following information: 1. Contact information 2. Public process and notification procedures 3. Background of municipal storm water permits 4. Regional MS4 Permit approach 5. Economic considerations 6. Applicable statutes, regulations, plans and policies 7. Discussion of the provisions in the Order The Fact Sheet also references the Permit Reissuance Process specific to Orange County Copermittees, and references the San Diego Water Board receipt and consideration of the Report of Waste Discharge during development of the Tentative Order. Based on San Diego Water Board review of the Report of Waste Discharge and consideration of the State of Environment discussion, very few changes to Order No. R9-2013-0001 (Regional MS4 Permit) were necessary in the Tentative Order to accommodate the recommendations made in the Report of Waste Discharge. The Fact Sheet was modified to include a brief summary of the basis for any change made in the Tentative Order either related to the State of the Environment discussion in the Report of Waste Discharge or the comments included herein. The Tentative Order requirements reflect the progress made by the Orange County Copermittees' programs and provides them with considerably more flexibility to further improve water quality. See also comment E3c-1 and Gnl-2.	

AttF-1	ATTACHMENT F: Fact Sheet / Technical Report	
	Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 21, 2015

AttF-2	ATTACHMENT F: Fact Sheet / Technical Report	
	COMMENT: *Modify Fact Sheet to include language explaining the iterative approach and TMDLs.*	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees that additional language is necessary to explain the iterative approach and TMDLs. The iterative approach is for NPDES storm water discharges that are not subject to requirements set forth in TMDLs and are causing or contributing to exceedances of water quality standards in receiving waters. Attachment E to the Tentative Order includes requirements that must be met to be in compliance with the TMDLs. For most of the TMDLs in Attachment E, the requirements also include provisions that provide additional flexibility for determining and achieving compliance with the interim TMDL requirements. The Fact Sheet accurately describes the difference between the iterative approach of the MS4 Permit and compliance with TMDL requirements. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 21, 2015

AttF-3	ATTACHMENT F: Fact Sheet / Technical Report	
	COMMENT: *Modify Fact Sheet to include language explaining the incorporation of new TMDLs into the Water Quality Improvement Plans.*	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees that additional language is necessary to explain the incorporation of new TMDLs into the Water Quality Improvement Plans. Going forward, the San Diego Water Board is assuming that the Copermittees will be involved as a stakeholder in the development of any new TMDLs that may include the MS4 as a source of pollutants contributing to impairment. As a stakeholder, the Copermittees are expected to work with the San Diego Water Board TMDL development staff to identify appropriate WLAs and implementation measures to address MS4 discharges. Because of this knowledge, the Copermittees will have the background and information that will be useful during the re-opening of the MS4 Permit to include the new TMDL requirements. Provision F.2.c.(2) requires the Copermittees to "initiate" an update to the Water Quality Improvement Plans after Office of Administrative Law (OAL) and USEPA approval. The Copermittees may "initiate" the update by working with San Diego Water Board MS4 permitting staff to re-open the Regional MS4 Permit and concurrently begin the process of incorporating any new water quality improvement strategies that may be necessary to include into the Water Quality Improvement Plan. In addition, the expectation is that the Water Quality Improvement Plans will reduce the need for new TMDLs in the future. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

2375 Northside Drive, Suite 100, San Diego, CA 92108
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TENTATIVE ORDER NO. R9-2015-0001

AN ORDER AMENDING ORDER NO. R9-2013-0001, NPDES NO. CAS010266 NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The California Regional Water Quality Control Board, San Diego Region (hereinafter San Diego Water Board), finds that:

ENROLLMENT OF ORANGE COUNTY COPERMITTEES

1. **Enrollment Process.** On May 8, 2013, the San Diego Water Board adopted Order No. R9-2013-0001, NPDES No. CAS019266, *National Pollutant Discharge Elimination System Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Order No. R9-2013-0001, Order or Regional MS4 Permit). Provision F.5 of that Order outlines a process to designate (enroll) the County of Orange, the Orange County Flood Control District and the south Orange County Cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Lake Forest, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano (collectively Orange County) as Copermittees under Order No. R9-2013-0001, responsible for compliance with the terms and the conditions of the Order. Provision F.5 provides that prior to such enrollment the San Diego Water Board must first review and consider a Report of Waste Discharge (RoWD), submitted by the Orange County Copermittees under their current MS4 NPDES Order No. R9-2009-0002, to determine whether the Copermittees should be enrolled under Order No. R9-2013-0001 and what changes to the Order proposed in the RoWD are appropriate.

2. **Report of Waste Discharge.** By letter dated May 20, 2014, the Orange County Copermittees jointly submitted a RoWD in application for the reissuance of waste discharge requirements, pursuant to the requirements of section K.2.b of Order No. R9-2009-0002, for MS4 discharges draining the San Juan Hydraulic Unit within the San Diego Region. The RoWD discusses the MS4 Permit compliance activities and accomplishments of the Orange County Copermittees over the period June 2009 through June 2013. The RoWD also identifies all of the activities, research, and pilot studies the Copermittees propose to undertake during the next permit term based

upon consideration of the effectiveness of the Orange County Storm Water Program and the need for additional pollutant control initiatives. Development of a watershed-based planning approach is portrayed in the RoWD as the most important next step to take in the development of the storm water programs in Orange County. The RoWD concludes that such a comprehensive approach offers the opportunity to identify the environmental and recreational benefits that can be realized in each watershed and the management strategies that will most effectively ensure their realization. Among several recommendations, the RoWD included a request that permit requirements be amended to provide an initial or time limited exemption from hydromodification control best management practices (BMPs) for conveyance channels that are engineered and regularly maintained with the capacity to convey peak flows generated from the 10-year or greater storm event from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean. The County of Orange also separately requested a second exemption for discharges to “large river” low gradient reaches with a very wide flood plain by letter dated November 22, 2013. The San Diego Water Board has reviewed the RoWD and determined it is complete.

3. **Permit Hydromodification Control Requirement Modifications.** The hydromodification control BMP requirements in Provision E.3.c.(2) of Order No. R9-2013-0001 require modification to address the hydromodification exemption issues identified in the Orange County Copermittees’ RoWD application and November 22, 2013 letter. To facilitate the transition of the Orange County Copermittees (and eventually the Riverside County Copermittees) to the Regional MS4 Permit from the current Phase I MS4 NPDES permit (Order No. R9-2009-0002), two temporary exemptions from hydromodification control BMP requirements should be provided. The first temporary exemption would allow relief from hydromodification control BMP requirements for Priority Development Projects discharging directly to an engineered channel conveyance system with a capacity to convey peak flows generate by the 10-year storm event all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean. The second temporary exemption would allow relief from hydromodification control BMP requirements for Priority Development Projects discharging directly to large river reaches with drainage areas larger than 100 square miles and a 100-year flow capacity in excess of 20,000 cubic feet per second.

4. **Orange County Copermittees Enrollment.** After consideration of the Orange County RoWD and changes needed to Order No. R9-2013-0001, the San Diego Water Board has determined that the County of Orange, the Orange County Flood Control District and the south Orange County Cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano should be enrolled as Copermittees under Order No. R9-2013-0001 (Order) and responsible for compliance with the terms and the conditions of the Order. Enrolling the Orange County Copermittees into Order No. R9-2013-0001 (and the eventual enrollment of Riverside County Copermittees upon expiration of their current MS4 permit) will

provide regulatory consistency in the implementation of MS4 permit requirements throughout the San Diego Region, improve communication and coordination among Copermittees within watersheds crossing multiple jurisdictions, and maximize efficiency and economy of resources for the San Diego Water Board achieved through the redirection of staff permitting resources to better advance the storm water program. The enrollment of the Cities of Laguna Hills, Laguna Woods and Lake Forest is subject to a California Water Code (Water Code) section 13228 agreement as set forth in the findings of this Order.

DESIGNATION OF A REGIONAL WATER BOARD

5. **Regional Water Board Designation.** The Cities of Laguna Woods, Laguna Hills and Lake Forest (Cities) are located partially within the jurisdictions of both the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board) and the San Diego Water Board. Written requests for designation of a single Regional Water Board to regulate matters pertaining to permitting of Phase I MS4 discharges were submitted to the San Diego Water Board by the City of Laguna Woods by letter dated September 8, 2014, the City of Laguna Hills by letter dated March 12, 2014, and the City of Lake Forest by letters dated January 14, 2013, and April 4, 2014. The Cities of Laguna Hills and Laguna Woods requested designation of the San Diego Water Board, and the City of Lake Forest requested designation of the Santa Ana Water Board. Water Code section 13228 specifies the circumstances that allow, and the process for, designation of a Regional Water Board.

6. **Factual Considerations**. The Santa Ana Water Board and San Diego Water Board establish generally consistent requirements for MS4 discharges to meet the technology-based standard of reducing pollutants in the discharge to the maximum extent practicable (MEP), a related iterative process to ensure MS4 discharges meet receiving water quality standards, and non-storm water discharges to be effectively prohibited from entering the MS4. However due to the unique nature of watersheds and water quality issues in the San Diego Region and Santa Ana Region, MS4 permit requirements between the two Regional Water Boards may also vary to address region specific pollutant discharges and watershed conditions. The Cities of Laguna Woods, Laguna Hills, and Lake Forest report that management and implementation of municipal programs to comply with two different MS4 permits creates a significant administrative and financial burden that is not contributing to greater overall water quality improvements in either region.

7. **Regional Water Board Agreement**. In an effort to address the concerns of the Cities, the San Diego Water Board and the Santa Ana Water Board have entered into an agreement whereby the San Diego Water Board is designated to regulate Phase I MS4 discharges within the jurisdiction of the Cities of Laguna Woods and Laguna Hills and the Santa Ana Water Board is designated to regulate Phase I MS4 discharges within the jurisdiction of the City of Lake Forest. Both the Santa Ana Water Board and the San Diego Water Board Phase I MS4 permits for Orange

County Copermittees, including Cities, require amendments to make the designations effective. To avoid gaps or duplication in regulation for the Cities, the agreement, dated January XX, 2015, is effective on the later effective date of this Order or the Santa Ana Water Board's reissuance (Tentative Order No. R8-2015-0001). Under the terms of the agreement the City of Lake Forest will be required to retain and continue implementing the prohibition of over-irrigation discharges identified in Title 15, Chapter 15, Section 14.030 of the City Municipal Code for regulating storm water quality throughout its jurisdiction, which was established during the permit term of Order No. R9-2009-0002. The City of Lake Forest will also be required to actively participate in the development and implementation of the Aliso Creek Watershed Management Area Water Quality Improvement Plan required pursuant to the San Diego Water Board's Regional MS4 Permit, Order No. R9-2013-0001. Under the terms of the agreement, any Total Maximum Daily Load (TMDL) and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Laguna Woods, Laguna Hills or Lake Forest as a responsible party, will be incorporated into the appropriate MS4 permit by reference. Enforcement of the applicable TMDL would remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's San Diego Creek/Newport Bay TMDL and the San Diego Water Board's Indicator Bacteria Project I Beaches and Creeks TMDL.

8. **Periodic Review of Regional Water Board Agreement.** The basis supporting the Cities of Laguna Woods, Laguna Hills, and Lake Forest requests to designate a specific Regional Water Board for regulatory oversight of MS4 discharges may change under future conditions and circumstances. Therefore the San Diego Water Board will periodically review the effectiveness of the agreement during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate the agreement with the Santa Ana Water Board or otherwise modify the agreement subject to the approval of the Santa Ana Water Board.

WATER QUALITY CONTROL PLANS AND POLICIES

9. **Cause for Modification.** Federal NPDES regulations at 40 CFR 122.62(a)(3) provide that NPDES permits may be modified when the standards or regulations on which the permit was based have been changed by promulgation of amended standards or regulations or by judicial decision after the permit was issued. Standard Permit Provision 1.f of Attachment B to Order No. R9-2013-0001 provides in relevant part that the Order may be modified for cause. Section II.H.4.d. of the Order provides that the Order may be reopened during its term for cause including when the *Water Quality Control Plan for the San Diego Basin (9)* (Basin Plan) is amended by the San Diego Water Board to incorporate a new TMDL, and the amendment is approved by the State Water Resources Control Board (State Water Board), Office of Administrative Law, and the United State Environmental Protection Agency (USEPA). The amended changes to water quality control plans and policies set forth in the findings below represent changes to standards on which Order No.

R9-2013-0001 was based.

10. **Special Conditions for Areas of Special Biological Significance**. On March 20, 2012, in Resolution No. 2012-0012, the State Water Board adopted a General Exception to the Ocean Plan Areas of Special Biological Significance (ASBS) waste discharge prohibition for storm water and nonpoint source discharges, including Special Protections for Beneficial Uses. On June 19, 2012, in Resolution No. 2012-0031, the State Water Board amended the General Exception to require pollutant load reductions to be achieved over a six year term. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject to the terms and conditions of State Water Board General Exception, as amended.

11. **Total Maximum Daily Loads (TMDLs)**. On June 13 2012 the San Diego Water Board in Resolution No. R9-2012-0033 amended the Basin Plan to incorporate the Los Penasquitos Lagoon Sediment TMDL. This TMDL Basin Plan amendment was approved by the State Water Board on January 21, 2014, by the Office of Administrative Law (OAL) on July 14, 2014, and USEPA on ~~Month XX, Year~~October 30, 2014. The County of San Diego, City of San Diego, City of Del Mar, and the City of Poway are among the responsible parties collectively assigned a single wasteload allocation applicable to MS4 discharges under the terms and conditions of the TMDL.

BEACH WATER QUALITY MONITORING AND ASSESSMENT PROGRAM

12. **Unified Approach Beach Water Quality Monitoring.** In November 2010, the State Water Board adopted Resolution No. 2010-0053, directing regional water boards to work with dischargers to modify beach water quality monitoring programs required by regional water board-issued permits in order to eliminate redundancies and incorporate beach water quality monitoring required by applicable statutes, where appropriate. Beginning in 2012, the San Diego Water Board reviewed the various beach water quality monitoring programs conducted in south Orange County and convened a stakeholder workgroup to develop a unified regional beach water quality monitoring and assessment program (Unified Program). The Unified Program is outlined in the San Diego Water Board report entitled "*Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County,*" dated September 2014. The Unified Program is consistent with and will meet or exceed the minimum requirements for beach water quality monitoring and related public notification and reporting established by State law, including the California Ocean Plan. The Unified Program will help protect the health of swimmers, surfers, and others who use south Orange County beach waters for water contact recreational activities.

13. **Monitoring Framework Consistency**. The Unified Program is consistent with and will help implement "*A Framework for Monitoring and Assessment in the San Diego Region*," which emphasizes the need for question-driven, beneficial use-oriented monitoring and assessment. The primary purpose of the Unified Program will be to answer the question "Does beach water quality meet standards for the beneficial use of water contact recreation?"

14. **Unified Program Implementation**. The San Diego Water Board Executive Officer has issued a written directive, pursuant to California Water Code sections 13225, 13267, and 13383, for the South Orange County Wastewater Authority (SOCWA) and the south Orange County Copermittees to implement the Unified Program, in cooperation with the Orange County Health Care Agency (OCHCA). After appropriate opportunity for public input, the Executive Officer may make revisions to the Unified Program, provided that the Unified Program, as revised, continues to be consistent with and meet the requirements of State law, including the California Ocean Plan, for beach water quality monitoring and related public notification and reporting. The Unified Program will supersede the existing routine, ongoing, beach water quality monitoring programs in south Orange County that are conducted in accordance with the existing requirements of the NPDES permits for discharges from SOCWA ocean outfalls and the south Orange County Copermittees' MS4s. The requirement for the Orange County Copermittees to participate in "regional monitoring" of beach water quality replaces requirements to conduct "core monitoring" of beach water quality, as provided for in Appendix III of the 2012 California Ocean Plan.

DEFINITION OF PRIOR LAWFUL APPROVAL

~~14.~~15. **Prior Lawful Approval.** Provision E.3.e.(1) of Order No. R9-2013-0001 requires Copermittees to impose the structural BMP requirements of Provision E.3.c on Priority Development Projects that have not received prior lawful approval by the effective date of the BMP Design Manual. The San Diego Water Board has determined that a definition of the term "prior lawful approval" should be included in Order No. R9-2013-0001 to provide clarity to the San Diego, Orange, and Riverside County Copermittees, the land development community, and the general public on how the term should be interpreted in determining structural BMP requirements for Priority Development Projects. A definition of the term "prior lawful approval" will also assist the San Diego Water Board in assessing Copermittee compliance with implementing the structural BMP requirements for Priority Development Projects to the maximum extent practicable (MEP) standard.

ADMINISTRATIVE FINDINGS

~~15.~~16. **Effect of this Order.** This Order amends Order No. R9-2013-0001 to:

a. Enroll the County of Orange, the Orange County Flood Control District and the south Orange County Cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano as Copermittees responsible for compliance with the terms and conditions of Order No. R9-2013-0001,as amended by this Order;

b. Designate the San Diego Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the Cities of Laguna Woods and Laguna Hills and the Santa Ana Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the City of Lake Forest, subject to the terms of the agreement between San Diego Water Board and the Santa Ana Water Board described in Finding 7 of this Order;

c. Establish interim exceptions to land development requirements for those Priority Development Projects that discharge to engineered channels and large river reaches described in Finding 3 of this Order;

d. Incorporate the amended requirements of the State Water Board's General Exception to require that pollutant reductions be achieved within 6 years for storm water and nonpoint source discharges to ASBS;

e. Incorporate applicable requirements of the Los Peñasquitos Lagoon Sediment TMDL; ~~*and*~~

f. Require the Orange County Copermittees to implement the "*Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County,*" dated September 2014, made effective in the Monitoring and Reporting Program/Order issued pursuant to California Water Code sections 13225, 13267, and 13383 and subject to future revisions by the Executive Officer after appropriate public input~~.~~, and

g. Include additional language that clarifies the term "prior lawful approval" for the implementation of appropriate structural BMP requirements to Priority Development Projects.

17. **Effect of this Order.** Order No. R9-2013-0001 is not being reopened for any other purpose than the revisions contained herein. Except as contradicted or superseded by the findings and directives set forth in this Order, all of the previous findings and directives of Order No. R9-2013-0001 shall remain in full force and effect.

18. **Future Consideration of Alternative Compliance Option.** San Diego, Orange County, and Riverside County Copermittees have asserted that the prohibitions and receiving water limitations in Provision A.1.a, A.1.c, and A.2 of Order No. R9-2013-0001 may result in many years of noncompliance because years of technical efforts may ultimately be required to achieve compliance with the receiving water limitations, especially for wet weather discharges. To address this issue, the San Diego Water Board plans to consider the incorporation of a well-defined, transparent, and finite alternative path to compliance in Order No. R9-2013-0001, as amended by Order No. R9-2015-0001, during the MS4 NPDES permit reissuance proceedings for the Riverside County Copermittees scheduled for fiscal year 2015-16. This alternative compliance option would allow the Copermittees that are willing to pursue significant receiving water quality improvements beyond the iterative process to be deemed in compliance with the receiving water limitations. An alternative compliance option of this type was previously considered by the San Diego Water Board during the adoption proceedings for Order No. R9-2013-0001.

~~16.~~19. **California Environmental Quality Act**. This action is exempt from the requirement of preparation of environmental documents under the California Environmental Quality Act [Public Resources Code, Division 13, Chapter 3, Section 21000 et seq.] in accordance with California Water Code section 13389.

~~17.~~20. **Public Notice.** In accordance with State and federal laws and regulations, the San Diego Water Board has notified San Diego County, Orange County and Riverside County Copermittees, and all known interested agencies and persons of its intent to adopt this Order and has provided them with an opportunity to submit their written comments and recommendations.

~~18.~~21. **Public Hearing.** The San Diego Water Board held a public hearing on February 11, 2015 and heard and considered all comments pertaining to the adoption of this Order.

~~19.~~22. **Notification.** Any person aggrieved by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with California Water Code section 13320 and California Code of Regulations, title 23, sections 2050 et seq. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date of this Order. Copies of the law and regulations applicable to filing petitions may be found on the Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

THEREFORE, IT IS HEREBY ORDERED,

1. This Order amends the Regional MS4 Permit, Order No. R9-2013-0001 and the Fact Sheet (Attachment F of the Order) as described in the revised versions of Order No. R9-2013-0001 and Fact Sheet included as Attachments 1 and 2 to this Order. Added text to Order No. R9-2013-0001 and the Fact Sheet is displayed in blue-

underline text and deleted text is displayed as red-strikeout text.

2. The amended version of Order No. 2013-0001 and Fact Sheet included as Attachments 1 and 2 to this Order shall become effective on April 1, 2015.

3. Amended Order No. R9-2013-0001 shall supersede Order No. R9-2009-0002 for the Orange County Copermittees except for enforcement purposes.

4. San Diego Water Board staff is directed to prepare and post a conformed copy of Order No. R9-2013-0001 and the Fact Sheet incorporating the revisions made by this Order.

I, David W. Gibson, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on February 11, 2015.

_____
David W. Gibson
Executive Officer

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

ORDER NO. R9-2013-0001, AS AMENDED BY ORDER NO. R9-2015-0001
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The San Diego County Copermittees in Table 1a are subject to waste discharge requirements set forth in this Order.

Table 1a. San Diego County Copermittees

City of Carlsbad	City of Oceanside
City of Chula Vista	City of Poway
City of Coronado	City of San Diego
City of Del Mar	City of San Marcos
City of El Cajon	City of Santee
City of Encinitas	City of Solana Beach
City of Escondido	City of Vista
City of Imperial Beach	County of San Diego
City of La Mesa	San Diego County Regional Airport Authority
City of Lemon Grove	San Diego Unified Port District
City of National City	

~~After the San Diego Water Board receives and considers~~ Tthe Orange County Copermittees~~' Report of Waste Discharge and makes any necessary changes to this Order, the Orange County Copermittees~~ in Table 1b are ~~will become~~ subject to waste discharge requirements set forth in this Order. ~~after expiration of Order No. R9-2009-0002, NPDES No. CAS0108740 on or after December 16, 2014.~~

Table 1b. Orange County Copermittees[1]

City of Aliso Viejo	City of Rancho Santa Margarita
City of Dana Point	City of San Clemente
City of Laguna Beach	City of San Juan Capistrano
City of Laguna Hills	City of Laguna Woods
City of Laguna Niguel	County of Orange
~~City of Lake Forest[1]~~	Orange County Flood Control District

[1] ~~The MS4 discharges within the jurisdiction of the City of Lake Forest located in the San Diego Region will be regulated by the Santa Ana Water Board Order No. R8-2014-0002 (NPDES No. CAS618030) and any reissuance thereto subject to the terms of the agreement between San Diego Water Board and Santa Ana Water Board.~~ While not listed in Table 1b., the City of Lake Forest remains a Copermittee under this Order until the later effective date of this Order or the effective date of Santa Ana Water Board Tentative Order No. R8-2015-0001. Thereafter, the City of Lake Forest will no longer be considered a Copermittee under this Order because its Phase I MS4 discharges will be

City of Mission Viejo	

After the San Diego Water Board receives and considers the Riverside County Copermittees' Report of Waste Discharge and makes any necessary changes to this Order, the Riverside County Copermittees in Table 1c will become subject to waste discharge requirements set forth in this Order after expiration of Order No.R9-2010-0016, NPDES No. CAS0108766 on or after November 10, 2015.

Table 1c. Riverside County Copermittees

City of Murrieta	County of Riverside
City of Temecula	Riverside County Flood Control and Water Conservation District
City of Wildomar	

The ~~Orange County Copermittees and~~ Riverside County Copermittees may become subject to the requirements of this Order at a date earlier than the expiration date of their current Order~~s~~ subject to the conditions described in Provision F.6 of this Order if the Riverside County Copermittees ~~in the respective county~~ receive ~~a~~ notification of coverage from the San Diego Water Board.

The term Copermittee in this Order refers to any San Diego County, Orange County, or Riverside County Copermittee covered under this Order, unless specified otherwise.

This Order provides permit coverage for the Copermittee discharges described in Table 2.

Table 2. Discharge Locations and Receiving Waters

Discharge Points	Locations throughout San Diego Region
Discharge Description	Municipal Separate Storm Sewer System (MS4) Discharges
Receiving Waters	Inland Surface Waters, Enclosed Bays and Estuaries, and Coastal Ocean Waters of the San Diego Region

Table 3. Administrative Information

This Order was adopted by the San Diego Water Board on:	**May 8, 2013**
~~This~~ Order R9-2013-0001 ~~will become~~ became effective on:	**June 27, 2013**
This Order as amended by R9-2015-0001 became effective on:	**April 1, 2015**
This Order will expire on:	**June 27, 2018**
The Copermittees must file a Report of Waste Discharge in accordance with Title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than 180 days in advance of the Order expiration date.	

I, David W. Gibson, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water

regulated by the Santa Ana Water Board pursuant to Water Code section 13228 designation. The requirements of this Order that apply to the City of Lake Forest for the duration of this Order, however, are described in Finding 29 and Footnote 2 to Table B-1.

Quality Control Board, San Diego Region, on May 8, 2013, as amended by adoption of Order No. R9-2015-0001 on February 11, 2015.

David W. Gibson
Executive Officer

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I. FINDINGS

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), finds that:

JURISDICTION

1. **MS4 Ownership or Operation.** Each of the Copermittees owns or operates an MS4, through which it discharges storm water and non-storm water into waters of the U.S. within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the U.S.

2. **Legal and Regulatory Authority.** This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]) adopted by the United States Environmental Protection Agency (USEPA), and chapter 5.5, division 7 of the California Water Code (CWC) (commencing with section 13370). This Order serves as an NPDES permit for discharges from MS4s to surface waters. This Order also serves as waste discharge requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

   The San Diego Water Board has the legal authority to issue a regional MS4 permit pursuant to its authority under CWA section 402(p)(3)(B) and 40 CFR 122.26(a)(1)(v). The USEPA also made it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide permits (55 Federal Register [FR] 47990, 48039-48042). The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees and San Diego Water Board.

   The federal regulations make it clear that the Copermittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators (40 CFR 122.26(a)(3)(vi)). This Order does not require the Copermittees to manage storm water outside of their jurisdictional boundaries, but rather to work collectively to improve storm water management within watersheds.

3. **CWA NPDES Permit Conditions.** Pursuant to CWA section 402(p)(3)(B), NPDES permits for storm water discharges from MS4s must include requirements to effectively prohibit non-storm water discharges into MS4s, and require controls to reduce the discharge of pollutants in storm water to the maximum extent practicable (MEP), and to require other provisions as the San Diego Water Board determines are appropriate to control such pollutants. This Order prescribes conditions to assure

compliance with the CWA requirements for owners and operators of MS4s to effectively prohibit non-storm water discharges into the MS4s, and require controls to reduce the discharge of pollutants in storm water from the MS4s to the MEP.

4. **CWA and CWC Monitoring Requirements.** CWA section 308(a) and 40 CFR 122.41(h),(j)-(l) and 122.48 require that NPDES permits must specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s also specify additional monitoring and reporting requirements in 40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c). CWC section 13383 authorizes the San Diego Water Board to establish monitoring, inspection, entry, reporting and recordkeeping requirements. This Order establishes monitoring and reporting requirements to implement federal and State requirements. This Order also includes requirements for the Orange County Copermittees to participate in, and together with South Orange County Wastewater Authority and Orange County Health Care Agency, share responsibility for implementing the unified approach to beach water quality monitoring and assessment program set forth in the October 2014 report, *Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County* ~~as set forth in Monitoring and Reporting Program No. XX~~, issued pursuant to CWC section~~s 13225, 13267, and~~ 13383 in the San Diego Water Board December 5, 2014 Letter Directive.

5. **Total Maximum Daily Loads.** CWA section 303(d)(1)(A) requires that "[e]ach state shall identify those waters within its boundaries for which the effluent limitations are not stringent enough to implement any water quality standard applicable to such waters." The CWA also requires states to establish a priority ranking of impaired water bodies known as Water Quality Limited Segments and to establish Total Maximum Daily Loads (TMDLs) for such waters. This priority list of impaired water bodies is called the Clean Water Act Section 303(d) List of Water Quality Limited Segments, commonly referred to as the 303(d) List. The CWA requires the 303(d) List to be updated every two years.

   TMDLs are numerical calculations of the maximum amount of a pollutant that a water body can assimilate and still meet water quality standards. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point sources (waste load allocations or WLAs) and non-point sources (load allocations or LAs), background contribution, plus a margin of safety. Discharges from MS4s are point source discharges. The federal regulations (40 CFR 122.44(d)(1)(vii)(B)) require that NPDES permits incorporate water quality based effluent limitations (WQBELs) developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, consistent with the assumptions and requirements of any available WLA for the discharge. Requirements of this Order implement the TMDLs established ~~adopted~~ by the San Diego Water Board or ~~and approved by~~ USEPA as of the ~~time~~ date this Order was ~~is issued~~ amended in 2015. This Order establishes WQBELs consistent with the assumptions and requirements of all available TMDL WLAs assigned to discharges from the Copermittees' MS4s.

6. **Non-Storm Water Discharges.** Pursuant to CWA section 402(p)(3)(B)(ii), this Order requires each Copermittee to effectively prohibit discharges of non-storm water into its MS4. Nevertheless, non-storm water discharges into and from the MS4s continue to be reported to the San Diego Water Board by the Copermittees and other persons. Monitoring conducted by the Copermittees, as well as the 303(d) List, have identified dry weather, non-storm water discharges from the MS4s as a source of pollutants causing or contributing to receiving water quality impairments in the San Diego Region. The federal regulations (40 CFR 122.26(d)(2)(iv)(B)(1)) require the Copermittees to have a program to prevent illicit discharges to the MS4. The federal regulations, however, allow for specific categories of non-storm water discharges or flows to be addressed as illicit discharges only where such discharges are identified as sources of pollutants to waters of the U.S.

7. **In-Stream Treatment Systems.** Pursuant to federal regulations (40 CFR 131.10(a)), in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S. Authorizing the construction of a runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to accepting waste assimilation as an appropriate use for that water body. Runoff treatment must occur prior to the discharge of runoff into receiving waters. Treatment control best management practices (BMPs) must not be constructed in waters of the U.S. Construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body.

DISCHARGE CHARACTERISTICS AND RUNOFF MANAGEMENT

8. **Point Source Discharges of Pollutants.** Discharges from the MS4s contain waste, as defined in the CWC, and pollutants that adversely affect the quality of the waters of the state. A discharge from an MS4 is a “discharge of pollutants from a point source” into waters of the U.S. as defined in the CWA. Storm water and non-storm water discharges from the MS4s contain pollutants that cause or threaten to cause a violation of surface water quality standards, as outlined in the Water Quality Control Plan for the San Diego Basin (Basin Plan). Storm water and non-storm water discharges from the MS4s are subject to the conditions and requirements established in the Basin Plan for point source discharges.

9. **Potential Beneficial Use Impairment.** The discharge of pollutants and/or increased flows from MS4s may cause or threaten to cause the concentration of pollutants to exceed applicable receiving water quality objectives and impair or threaten to impair designated beneficial uses resulting in a condition of pollution, contamination, or nuisance.

10. **Pollutants Generated by Land Development.** Land development has created and continues to create new sources of non-storm water discharges and pollutants in

storm water discharges as human population density increases. This brings higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash. Pollutants from these sources are dumped or washed off the surface by non-storm water or storm water flows into and from the MS4s. When development converts natural vegetated pervious ground cover to impervious surfaces such as paved highways, streets, rooftops, and parking lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving a developed area without BMPs that can maintain pre-development runoff conditions will contain greater pollutant loads and have significantly greater runoff volume, velocity, and peak flow rate than pre-development runoff conditions from the same area.

11. **Runoff Discharges to Receiving Waters.** The MS4s discharge runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within the eleven hydrologic units comprising the San Diego Region. Historic and current development makes use of natural drainage patterns and features as conveyances for runoff. Rivers, streams and creeks in developed areas used in this manner are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and receiving water. Numerous receiving water bodies and water body segments have been designated as impaired by the San Diego Water Board pursuant to CWA section 303(d).

12. **Pollutants in Runoff.** The most common pollutants in runoff discharged from the MS4s include total suspended solids, sediment, pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., cadmium, copper, lead, and zinc), petroleum products and polynuclear aromatic hydrocarbons, synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus), oxygen-demanding substances (e.g., decaying vegetation, animal waste), detergents, and trash. As operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not prohibit or otherwise control. These discharges may cause or contribute to a condition of pollution or a violation of water quality standards.

13. **Human Health and Aquatic Life Impairment.** Pollutants in runoff discharged from the MS4s can threaten and adversely affect human health and aquatic organisms. Adverse responses of organisms to chemicals or physical agents in runoff range from physiological responses such as impaired reproduction or growth anomalies to mortality. Increased volume, velocity, rate, and duration of storm water runoff greatly accelerate the erosion of downstream natural channels. This alters stream channels and habitats and can adversely affect aquatic and terrestrial organisms.

14. **Water Quality Effects.** The Copermittees' water quality monitoring data submitted

to date documents persistent exceedances of Basin Plan water quality objectives for runoff-related pollutants at various watershed monitoring stations. Persistent toxicity has also been observed at several watershed monitoring stations. In addition, bioassessment data indicate that the majority of the monitored receiving waters have Poor to Very Poor Index of Biological Integrity (IBI) ratings. These findings indicate that runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in the San Diego Region. Non-storm water discharges from the MS4s have been shown to contribute significant levels of pollutants and flow in arid, developed Southern California watersheds, and contribute significantly to exceedances of applicable receiving water quality objectives.

15. **Non-Storm Water and Storm Water Discharges.** Non-storm water discharges from the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard of CWA section 402(p)(3)(B)(iii), which is explicitly for "Municipal … *Stormwater Discharges* (emphasis added)" from the MS4s. Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s must be effectively prohibited.

16. **Best Management Practices.** Waste and pollutants which are deposited and accumulate in MS4 drainage structures will be discharged from these structures to waters of the U.S. unless they are removed. These discharges may cause or contribute to, or threaten to cause or contribute to, a condition of pollution in receiving waters. For this reason, pollutants in storm water discharges from the MS4s can be and must be effectively reduced in runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Pollution prevention is the reduction or elimination of pollutant generation at its source and is the best "first line of defense." Source control BMPs (both structural and non-structural) minimize the contact between pollutants and runoff, therefore keeping pollutants onsite and out of receiving waters. Treatment control BMPs remove pollutants that have been mobilized by storm water or non-storm water flows.

17. **BMP Implementation.** Runoff needs to be addressed during the three major phases of development (planning, construction, and use) in order to reduce the discharge of storm water pollutants to the MEP, effectively prohibit non-storm water discharges, and protect receiving waters. Development which is not guided by water quality planning policies and principles can result in increased pollutant load discharges, flow rates, and flow durations which can negatively affect receiving water beneficial uses. Construction sites without adequate BMP implementation result in sediment runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. Existing development can generate substantial pollutant loads which are discharged in runoff to receiving waters. Retrofitting areas of existing development with storm water pollutant control and hydromodification management BMPs is necessary to address storm water discharges from existing development that may cause or contribute to a

condition of pollution or a violation of water quality standards.

18. **Water Quality Improvements.** Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges to the MS4s and control pollutants in storm water discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the CWA.

19. **Long Term Planning and Implementation.** Federal regulations require municipal storm water permits to expire 5 years from adoption, after which the permit must be renewed and reissued. The San Diego Water Board recognizes that the degradation of water quality and impacts to beneficial uses of the waters in the San Diego Region occurred over several decades. The San Diego Water Board further recognizes that a decade or more may be necessary to realize demonstrable improvement to the quality of waters in the San Diego Region. This Order includes a long term planning and implementation approach that will require more than a single permit term to complete.

WATER QUALITY STANDARDS

20. **Basin Plan.** The San Diego Water Board adopted the Water Quality Control Plan for the San Diego Basin (Basin Plan) on September 8, 1994, that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for receiving waters addressed through the plan. The Basin Plan was subsequently approved by the State Water Resources Control Board (State Water Board) on December 13, 1994. Subsequent revisions to the Basin Plan have also been adopted by the San Diego Water Board and approved by the State Water Board. Requirements of this Order implement the Basin Plan.

    The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Process Supply (PROC), Industrial Service Supply (IND), Ground Water Recharge (GWR), Contact Water Recreation (REC1), Non-contact Water Recreation (REC2), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Freshwater Replenishment (FRSH), Hydropower Generation (POW), and Preservation of Biological Habitats of Special Significance (BIOL). The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region: Navigation (NAV), Commercial and Sport Fishing (COMM), Estuarine Habitat (EST), Marine Habitat

(MAR), Aquaculture (AQUA), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN), and Shellfish Harvesting (SHELL).

21. **Ocean Plan.** The State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, and 2005. The State Water Board adopted the latest amendment on April 21, 2005 and it became effective on February 14, 2006. The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean. Requirements of this Order implement the Ocean Plan.

    The Ocean Plan identifies the following beneficial uses of ocean waters of the state to be protected: Industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture; preservation and enhancement of designated Areas of Special Biological Significance; rare and endangered species; marine habitat; fish spawning and shellfish harvesting.

22. **Sediment Quality Control Plan**. On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes: 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

23. **National Toxics Rule and California Toxics Rule.** USEPA adopted the National Toxics Rule (NTR) on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the NTR applied in California. On May 18, 2000, USEPA adopted the California Toxics Rule (CTR). The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants.

24. **Antidegradation Policy.** This Order is in conformance with the federal Antidegradation Policy described in 40 CFR 131.12, and State Water Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality Waters in California*. Federal regulations at 40 CFR 131.12 require that the State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. State Water Board Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific

findings. The Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies.

25. **Anti-Backsliding Requirements.** Section 402(o)(2) of the CWA and federal regulations at 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations may be relaxed. All effluent limitations in this Order are at least as stringent as effluent limitations in the previous permits.

CONSIDERATIONS UNDER FEDERAL AND STATE LAW

26. **Coastal Zone Act Reauthorization Amendments.** Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states with approved coastal zone management programs to address non-point source pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point source pollution: agriculture, silviculture, urban, marinas, and hydromodification. This Order addresses the management measures required for the urban category, with the exception of septic systems. The runoff management programs developed pursuant to this Order fulfills the need for coastal cities to develop a runoff non-point source plan identified in the Non-Point Source Program Strategy and Implementation Plan. The San Diego Water Board addresses septic systems through the administration of other programs.

27. **Endangered Species Act.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 USC sections 1531 to 1544). This Order requires compliance with receiving water limits, and other requirements to protect the beneficial uses of waters of the State. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

28. **Report of Waste Discharge Process.** The waste discharge requirements set forth in this Order are based upon the Report of Waste Discharge submitted by the San Diego County Copermittees prior to the expiration of Order No. R9-2007-0001 (NPDES No. CAS0109266) and the Report of Waste Discharge submitted by the Orange County Copermittees prior to the expiration of Order No. R9-2009-0002 (CAS0108740). The ~~Orange County and~~ Riverside County Copermittees are not immediately covered by the waste discharge requirements in this Order. The San Diego Water Board understands that each municipality is unique although the Counties share watersheds and/or geographical boundaries. The Order will continue to use the Report of Waste Discharge process prior to initially making ~~Orange County or~~ Riverside County Copermittees subject to the requirements of this Order.

The federal regulations (40 CFR 122.21(d)(2)) and CWC section 13376 impose a duty on the Copermittees to reapply for continued coverage through submittal of a Report of Waste Discharge no later than 180 days prior to expiration of a currently effective permit. This requirement is set forth in the ~~Orange County Copermittees' and~~ Riverside County Copermittees' currently effective permit~~s~~ at Provision~~s K.2.b and~~ K.2.c~~, respectively~~. The ~~Orange County Permit, Order No. R9-2009-0002 (NPDES No. CAS0108740) expires on December 16, 2014 and the~~ Riverside County MS4 Permit, Order No. R9-2010-0016 (NPDES No. CAS0108766) expires on November 10, 2015.

Unless the ~~Orange County or~~ Riverside County Copermittees apply for and receive early coverage under this Order, ~~the Orange County Copermittees' and~~ the Riverside County Copermittees' ~~respective~~ permit~~s~~ will be superseded by this Order upon expiration of their ~~respective~~ permit~~s~~, subject to any necessary revisions to the requirements of this Order made after the San Diego Water Board considers their ~~respective~~ Report~~s~~ of Waste Discharge through the public process provided in 40 CFR Part 124.

29. Regional Water Board Designation. The Cities of Laguna Hills, Laguna Woods, and Lake Forest are located partially within the jurisdictions of the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board) and the San Diego Water Board and their discharges are subject to regulation by both Regional Water Boards. Pursuant to CWC section 13228, the Cities of Laguna Hills, Laguna Woods, and Lake Forest submitted written requests that one Regional Water Board be designated to regulate Phase I MS4 discharges for each of the Cities. The Santa Ana Water Board and the San Diego Water Board have entered into an agreement dated January XX, 2015, whereby the Cities of Laguna Woods and Laguna Hills are largely regulated by the San Diego Water Board under this Order, including those portions of the Cities of Laguna Woods and Laguna Hills not within the San Diego Water Board's jurisdiction, upon the effective date of this Order or Santa Ana Water Board Order No. R8-2015-0001, whichever is later. Similarly, the City of Lake Forest, including those portions of the City of Lake Forest within the San Diego Water Board's jurisdiction, is largely regulated by the Santa Ana Water Board under Order No. R8-2015-0001 (NPDES No. CAS618030) upon the later effective date of this Order or Order No. R8-2015-0001.~~is designated to regulate Phase I MS4 discharges within the jurisdiction of the Cities of Laguna Woods and Laguna Hills and the Santa Ana Water Board is designated to regulate Phase I MS4 discharges within the jurisdiction of the City of Lake Forest pursuant to MS4 permits administered by each Regional Water Board~~. The agreement provides that the City of Lake Forest is required to retain, and continue implementation of, its over-irrigation discharge prohibition in Title 15, Chapter 14.030, List (b) of the City Municipal Code for regulating storm water quality throughout its jurisdiction. The agreement also requires the City of Lake Forest to actively participate during development and implementation of the Aliso Creek Watershed Management Area Water Quality Improvement Plan required pursuant to this Order. Each Regional Water Board retains the authority to enforce provisions of its Phase I MS4 permits

issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee under the terms of the agreement (Water Code section 13228 (b)). Under the terms of the agreement, any TMDL and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Laguna Woods, Laguna Hills or Lake Forest as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement of the applicable TMDL will remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's San Diego Creek/Newport Bay TMDL and the San Diego Water Board's Indicator Bacteria Project I Beaches and Creeks TMDL. The San Diego Water Board will periodically review the effectiveness of the agreement during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate the agreement with Santa Ana Water Board or otherwise modify the agreement subject to the approval of the Santa Ana Water Board.

~~29.~~30. **Integrated Report and Clean Water Act Section 303(d) List.** The San Diego Water Board and State Water Board submit an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. USEPA issued its *Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act* on July 29, 2005, which advocates the use of a five category approach for classifying the attainment status of water quality standards for water bodies in the Integrated Report. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 in the Integrated Report are placed on the 303(d) List.

Water bodies with available data and/or information that indicate at least one beneficial use is not being supported or is threatened, but a TMDL is not required, are included in Category 4 in the Integrated Report. Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

Implementation of the requirements of this Order may allow the San Diego Water Board to include surface waters impaired by discharges from the Copermittees' MS4s in Category 4 in the Integrated Report for consideration during the next 303(d) List submittal by the State to USEPA.

~~30.~~31. **Economic Considerations.** The California Supreme Court has ruled that although CWC section 13263 requires the State and Regional Water Boards

(collectively Water Boards) to consider factors set forth in CWC section 13241 when issuing an NPDES permit, the Water Board may not consider the factors to justify imposing pollutant restrictions that are less stringent than the applicable federal regulations require. (*City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 618, 626-627.) However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

As noted in the following finding, the San Diego Water Board finds that the requirements in this Order are not more stringent than the minimum federal requirements. Therefore, a CWC section 13241 analysis is not required for permit requirements that implement the effective prohibition on the discharge of non-storm water into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determined appropriate to control such pollutants, as those requirements are mandated by federal law. Notwithstanding the above, the San Diego Water Board has developed an economic analysis of the requirements in this Order. The economic analysis is provided in the Fact Sheet.

~~31.~~32. **Unfunded Mandates.** This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following:

a. This Order implements federally mandated requirements under CWA section 402 (33 USC section 1342(p)(3)(B)).

b. The local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental and new dischargers who are issued NPDES permits for storm water and non-storm water discharges.

c. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order.

d. The Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)) and in lieu of numeric restrictions on their MS4 discharges (i.e. effluent limitations).

e. The local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under State law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

f. The provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state develops a TMDL, federal law requires that permits must contain water quality

based effluent limitations consistent with the assumptions and requirements of any applicable wasteload allocation (40 CFR 122.44(d)(1)(vii)(B)).

See the Fact Sheet for further discussion of unfunded mandates.

~~32.~~33. **California Environmental Quality Act.** The issuance of waste discharge requirements and an NPDES permit for the discharge of runoff from MS4s to waters of the U.S. is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 et seq.) in accordance with CWC section 13389.

STATE WATER BOARD DECISIONS

~~33.~~34. **Compliance with Prohibitions and Limitations.** The receiving water limitation language specified in this Order is consistent with language recommended by the USEPA and established in State Water Board Order WQ 99-05, *Own Motion Review of the Petition of Environmental Health Coalition to Review Waste Discharge Requirements Order No. 96-03, NPDES Permit No. CAS0108740*, adopted by the State Water Board on June 17, 1999. The receiving water limitation language in this Order requires storm water discharges from MS4s to not cause or contribute to a violation of water quality standards, which is to be achieved through an iterative approach requiring the implementation of improved and better-tailored BMPs over time. Implementation of the iterative approach to comply with receiving water limitations based on applicable water quality standards is necessary to ensure that storm water discharges from the MS4 will not ultimately cause or contribute to violations of water quality standards and will not create conditions of pollution, contamination, or nuisance.

~~34.~~35. **Special Conditions for Areas of Special Biological Significance.** On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving a~~n~~ general exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges (General Exception). On June 19, 2012, the State Water Board adopted Order No. 2012-0031, amending the General Exception to require pollutant reductions to be achieved within six years in accordance with ASBS Compliance Plans and ASBS Pollution Prevention Plans. The General Exception ~~State Water Board Resolution No. 2012-0012~~ requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject to the terms and conditions of the General Exception as amended ~~State Water Board Resolution No. 2012-0012~~. The

Special Protections contained in Attachment B to the General Exception as amended~~Resolution No. 2012-0012,~~ are applicable to these discharges, and are hereby incorporated into Attachment A of this Order. ~~as if fully set forth herein.~~

ADMINISTRATIVE FINDINGS

~~35.~~**36. Executive Officer Delegation of Authority.** The San Diego Water Board by prior resolution has delegated all matters that may legally be delegated to its Executive Officer to act on its behalf pursuant to CWC section 13223. Therefore, the Executive Officer is authorized to act on the San Diego Water Board's behalf on any matter within this Order unless such delegation is unlawful under CWC section 13223 or this Order explicitly states otherwise.

~~36.~~37. **Standard Provisions.** Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR 122.42, are provided in Attachment B to this Order.

~~37.~~38. **Fact Sheet.** The Fact Sheet for this Order contains background information, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of this Order. The Fact Sheet is hereby incorporated into this Order and constitutes part of the Findings of this Order.

~~38.~~39. **Public Notice.** In accordance with State and federal laws and regulations, the San Diego Water Board notified the Copermittees, and interested agencies and persons of its intent to prescribe waste discharge requirements for the control of discharges into and from the MS4s to waters of the U.S. and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet.

~~39.~~40. **Public Hearings.** The San Diego Water Board held a public hearing on April 10 and 11, 2013, that was continued to May 8, 2013 and heard and considered all comments pertaining to the terms and conditions of this Order. The San Diego Water Board also held a public workshop on October 8, 2015, and a public hearing on February 11, 2015, and heard and considered all comments pertaining to the amendment of this Order through Order No. R9-2015-0001. Details of these public hearings are provided in the Fact Sheet.

~~40.~~41. **Effective Date.** This Order serves as an NPDES permit pursuant to CWA section 402 or amendments thereto, and as to the San Diego County Copermittees listed in Table 2.a., became ~~becomes~~ effective fifty (50) days after the date of its adoption, and as to the Orange County Copermittees listed in Table 2.b., becomes effective on April 1, 2015, after Order R9-2015-0001 is adopted, provided that the Regional Administrator, USEPA, Region IX, does not object to this Order.

~~41.~~42. **Review by the State Water Board.** Any person aggrieved by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with CWC section 13320 and California Code of Regulations, title 23, sections 2050, ~~et seq~~ and following. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date of this Order ~~San Diego Water Board action~~, except that if the thirtieth day following the ~~action~~date of this Order falls on a Saturday, Sunday or State holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

THEREFORE, IT IS HEREBY ORDERED that the Copermittees, in order to meet the provisions contained in division 7 of the CWC (commencing with section 13000) and regulations adopted thereunder, and the provisions of the CWA and regulations adopted thereunder, must each comply with the requirements of this Order. This action in no way prevents the San Diego Water Board from taking enforcement action for past violations of the previous Order. If any part of this Order is subject to a temporary stay of enforcement, unless otherwise specified, the Copermittees must comply with the analogous portions of the previous Order, which will remain in effect for all purposes during the pendency of the stay.

II. PROVISIONS

A. PROHIBITIONS AND LIMITATIONS

The purpose of this provision is to describe the conditions under which storm water and non-storm water discharges into and from MS4s are prohibited or limited. The goal of the prohibitions and limitations is to protect the water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through the implementation of water quality improvement strategies and runoff management programs that effectively prohibit non-storm water discharges into the Copermittees' MS4s, and reduce pollutants in storm water discharges from the Copermittees' MS4s to the MEP.

1. Discharge Prohibitions

a. Discharges from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the state are prohibited.

b. Non-storm water discharges into MS4s are to be effectively prohibited, through the implementation of Provision E.2, unless such discharges are authorized by a separate NPDES permit.

c. Discharges from MS4s are subject to all waste discharge prohibitions in the Basin Plan, included in Attachment A to this Order.

d. Storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 applicable to these discharges, included in Attachment A to this Order. All other discharges from the Copermittees' MS4s to ASBS are prohibited.

2. Receiving Water Limitations

a. Discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters, including but not limited to all applicable provisions contained in:

(1) The San Diego Water Board's Basin Plan, including beneficial uses, water quality objectives, and implementation plans;

(2) State Water Board plans for water quality control including the following:

(a) Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries (Thermal Plan), and

(b) The Ocean Plan, including beneficial uses, water quality objectives, and implementation plans;

(3) State Water Board policies for water and sediment quality control including the following:

(a) Water Quality Control Policy for the Enclosed Bays and Estuaries of California,

(b) Sediment Quality Control Plan which includes the following narrative objectives for bays and estuaries:

(i) Pollutants in sediments shall not be present in quantities that, alone or in combination, are toxic to benthic communities, and

(ii) Pollutants shall not be present in sediments at levels that will bioaccumulate in aquatic life to levels that are harmful to human health,

(c) The Statement of Policy with Respect to Maintaining High Quality of Waters in California;[2]

(4) Priority pollutant criteria promulgated by the USEPA through the following:

(a) National Toxics Rule (NTR)[3] (promulgated on December 22, 1992 and amended on May 4, 1995), and

(b) California Toxics Rule (CTR).[4,5]

b. Discharges from MS4s composed of storm water runoff must not alter natural ocean water quality in an ASBS.

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[2] State Water Board Resolution No. 68-16
[3] 40 CFR 131.36
[4] 65 Federal Register 31682-31719 (May 18, 2000), adding Section 131.38 to 40 CFR
[5] If a water quality objective and a CTR criterion are in effect for the same priority pollutant, the more stringent of the two applies.

3. Effluent Limitations

a. Technology Based Effluent Limitations

Pollutants in storm water discharges from MS4s must be reduced to the MEP.[6]

b. Water Quality Based Effluent Limitations

Each Copermittee must comply with applicable WQBELs established for the TMDLs in Attachment E to this Order, pursuant to the applicable TMDL compliance schedules.

4. Compliance with Discharge Prohibitions and Receiving Water Limitations

Each Copermittee must achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order through timely implementation of control measures and other actions as specified in Provisions B and E of this Order, including any modifications. The Water Quality Improvement Plans required under Provision B must be designed and adapted to ultimately achieve compliance with Provisions A.1.a, A.1.c and A.2.a.

a. If exceedance(s) of water quality standards persist in receiving waters notwithstanding implementation of this Order, the Copermittees must comply with the following procedures:

(1) For exceedance(s) of a water quality standard in the process of being addressed by the Water Quality Improvement Plan, the Copermittee(s) must implement the Water Quality Improvement Plan as accepted by the San Diego Water Board, and update the Water Quality Improvement Plan, as necessary, pursuant to Provision F.2.c;

(2) Upon a determination by either the Copermittees or the San Diego Water Board that discharges from the MS4 are causing or contributing to a new exceedance of an applicable water quality standard not addressed by the Water Quality Improvement Plan, the Copermittees must submit the following updates to the Water Quality Improvement Plan pursuant to Provision F.2.c or as part of the Water Quality Improvement Plan Annual Report required under Provision F.3.b, unless the San Diego Water Board directs an earlier submittal:

(a) The water quality improvement strategies being implemented that are effective and will continue to be implemented,

[6] This does not apply to MS4 discharges which receive subsequent treatment to reduce pollutants in storm water discharges to the MEP prior to entering receiving waters (e.g., low flow diversions to the sanitary sewer). Runoff treatment must occur prior to the discharge of runoff into receiving waters per Finding 7.

(b) Water quality improvement strategies (i.e. BMPs, retrofitting projects, stream and/or habitat rehabilitation projects, adjustments to jurisdictional runoff management programs, etc.) that will be implemented to reduce or eliminate any pollutants or conditions that are causing or contributing to the exceedance of water quality standards,

(c) Updates to the schedule for implementation of the existing and additional water quality improvement strategies, and

(d) Updates to the monitoring and assessment program to track progress toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a of this Order;

(3) The San Diego Water Board may require the incorporation of additional modifications to the Water Quality Improvement Plan required under Provision B. The applicable Copermittees must submit any modifications to the update to the Water Quality Improvement Plan within 90 days of notification that additional modifications are required by the San Diego Water Board, or as otherwise directed;

(4) Within 90 days of the San Diego Water Board determination that the modifications to the Water Quality Improvement Plan required under Provision A.4.a.(3) meet the requirements of this Order, the applicable Copermittees must revise the jurisdictional runoff management program documents to incorporate the modified water quality improvement strategies that have been and will be implemented, the implementation schedule, and any additional monitoring required; and

(5) Each Copermittee must implement the updated Water Quality Improvement Plan.

b. The procedure set forth above to achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order do not have to be repeated for continuing or recurring exceedances of the same water quality standard(s) following implementation of scheduled actions unless directed to do otherwise by the San Diego Water Board.

c. Nothing in Provisions A.4.a and A.4.b prevents the San Diego Water Board from enforcing any provision of this Order while the applicable Copermittees prepare and implement the above update to the Water Quality Improvement Plan and jurisdictional runoff management programs.

B. WATER QUALITY IMPROVEMENT PLANS

The purpose of this provision is to develop Water Quality Improvement Plans that guide the Copermittees' jurisdictional runoff management programs towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plans is to further the Clean Water Act's objective to protect, preserve, enhance, and restore the water quality and designated beneficial uses of waters of the state. This goal will be accomplished through an adaptive planning and management process that identifies the highest priority water quality conditions within a watershed and implements strategies through the jurisdictional runoff management programs to achieve improvements in the quality of discharges from the MS4s and receiving waters.

1. Watershed Management Areas

The Copermittees must develop a Water Quality Improvement Plan for each of the Watershed Management Areas in Table B-1. A total of ten Water Quality Improvement Plans must be developed for the San Diego Region.

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
San Juan (901.00)	South Orange County	- Aliso Creek - San Juan Creek - San Mateo Creek - Pacific Ocean - Heisler Park ASBS	- City of Aliso Viejo[~~1~~] - City of Dana Point[~~1~~] - City of Laguna Beach[~~1~~] - City of Laguna Hills[1] - City of Laguna Niguel[~~1~~] - City of Laguna Woods[1] - City of Lake Forest[~~1~~2] - City of Mission Viejo[~~1~~] - City of Rancho Santa Margarita[~~1~~] - City of San Clemente[1] - City of San Juan Capistrano[~~1~~] - County of Orange[~~1~~] - Orange County Flood Control District[~~1~~]
Santa Margarita (902.00)	Santa Margarita River	- Murrieta Creek - Temecula Creek - Santa Margarita River - Santa Margarita Lagoon - Pacific Ocean	- City of Murrieta[~~2~~3] - City of Temecula[~~2~~3] - City of Wildomar[~~2~~3] - County of Riverside[~~2~~3] - County of San Diego[~~3~~4] - Riverside County Flood Control and Water Conservation District[~~2~~3]
San Luis Rey (903.00)	San Luis Rey River	- San Luis Rey River - San Luis Rey Estuary - Pacific Ocean	- City of Oceanside - City of Vista - County of San Diego

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
Carlsbad (904.00)	Carlsbad	- Loma Alta Slough - Buena Vista Lagoon - Agua Hedionda Lagoon - Batiquitos Lagoon - San Elijo Lagoon - Pacific Ocean	- City of Carlsbad - City of Encinitas - City of Escondido - City of Oceanside - City of San Marcos - City of Solana Beach - City of Vista - County of San Diego
San Dieguito (905.00)	San Dieguito River	- San Dieguito River - San Dieguito Lagoon - Pacific Ocean	- City of Del Mar - City of Escondido - City of Poway - City of San Diego - City of Solana Beach - County of San Diego
Penasquitos (906.00)	Penasquitos	- Los Penasquitos Lagoon - Pacific Ocean	- City of Del Mar - City of Poway - City of San Diego - County of San Diego
	Mission Bay	- Mission Bay - Pacific Ocean - San Diego Marine Life Refuge ASBS	- City of San Diego
San Diego (907.00)	San Diego River	- San Diego River - Pacific Ocean	- City of El Cajon - City of La Mesa - City of San Diego - City of Santee - County of San Diego
Pueblo San Diego (908.00) Sweetwater (909.00) Otay (910.00)	San Diego Bay	- Sweetwater River - Otay River - San Diego Bay - Pacific Ocean	- City of Chula Vista - City of Coronado - City of Imperial Beach - City of La Mesa - City of Lemon Grove - City of National City - City of San Diego - County of San Diego - San Diego County Regional Airport Authority - San Diego Unified Port District
Tijuana (911.00)	Tijuana River	- Tijuana River - Tijuana Estuary - Pacific Ocean	- City of Imperial Beach - City of San Diego - County of San Diego

Notes:

1. By agreement dated January XX, 2015, pursuant to Water Code section 13228, ~~T~~the Phase I MS4 discharges within the jurisdiction of the City of Laguna Hills and the City of Laguna Woods located in the Santa Ana Region ~~will be~~are regulated by San Diego Water Board Order No. R9-2013-0001 as amended by Order No. R9-2015-0001, upon the later effective date of Order No. R9-2015-0001 or Santa Ana Water Board Tentative Order No. R8-2015-0001. The City of Laguna Hills and Laguna Woods must also comply with the requirements of the San Diego Creek/Newport Bay TMDL in section XVIII of Santa Ana Water Board Order No. ~~R8-2014-0002 and any reissuance thereto.~~R8-2015-0001.
2. ~~The Orange County Copermittees will be covered under this Order after expiration of Order No. R9-2009-0002, or earlier if the Orange County Copermittees meet the conditions in Provision F.6.The MS4 discharges within the jurisdiction of the City of Lake Forest located in the San Diego Region will be regulated by the Santa Ana Water Board Order No. R8-2014-0002 (NPDES No. CAS618030) and any reissuance thereto~~. By agreement dated January XX, 2015, pursuant to Water Code section 13228, Phase I MS4 discharges within the City of Lake Forest located within the San Diego Water Board Region are regulated by the Santa Ana Water Board Order No. R8-2015-0001 (NPDES No. CAS618030) upon the later effective date of this Order or Santa Ana Water Board Tentative Order No. R8-2015-0001. In accordance with the terms of the agreement between the San Diego Water Board and the Santa Ana Water Board, the City of Lake Forest must implement the requirements of the Bacteria TMDL in Attachment E of this Order, participate in preparation and implementation of the Water Quality Improvement Plan for the Aliso Creek Watershed Management Area as described in Provision B of this Order and continue implementation of its over-irrigation discharge prohibition in its City Ordinance, Title 15, Chapter 15, section 14.030, List (b).
~~2.~~3. The Riverside County Copermittees will be covered under this Order after expiration of Order No. R9-2010-0016~~,~~ or earlier if the Riverside County Copermittees meet the conditions in Provision F.6, upon further amendment of this Order.

~~3~~4. The County of San Diego is not required to implement the requirements of Provision B for its jurisdiction within the Santa Margarita River Watershed Management Area until the Riverside County Copermittees have been notified of coverage under this Order. The County of San Diego is required to implement the requirements of Provisions D, F.3.b, and Attachment E until the Riverside County Copermittees have been notified of coverage under this Order.

2. Priority Water Quality Conditions

The Copermittees must identify the water quality priorities within each Watershed Management Area that will be addressed by the Water Quality Improvement Plan. Where appropriate, Watershed Management Areas may be separated into subwatersheds to focus water quality prioritization and jurisdictional runoff management program implementation efforts by receiving water.

a. Assessment of Receiving Water Conditions

The Copermittees must consider the following, at a minimum, to identify water quality priorities based on impacts of MS4 discharges on receiving water beneficial uses:

(1) Receiving waters listed as impaired on the CWA Section 303(d) List of Water Quality Limited Segments (303(d) List);

(2) TMDLs adopted and under development by the San Diego Water Board;

(3) Receiving waters recognized as sensitive or highly valued by the Copermittees, including estuaries designated under the National Estuary Program under CWA section 320, wetlands defined by the State or U.S. Fish and Wildlife Service's National Wetlands Inventory as wetlands, waters having the Preservation of Biological Habitats of Special Significance (BIOL) beneficial use designation, and receiving waters identified as ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(4) The receiving water limitations of Provision A.2;

(5) Known historical versus current physical, chemical, and biological water quality conditions;

(6) Available, relevant, and appropriately collected and analyzed physical, chemical, and biological receiving water monitoring data, including, but not limited to, data describing:

(a) Chemical constituents,

(b) Water quality parameters (i.e. pH, temperature, conductivity, etc.),

(c) Toxicity Identification Evaluations for both receiving water column and

sediment,

(d) Trash impacts,

(e) Bioassessments, and

(f) Physical habitat;

(7) Available evidence of erosional impacts in receiving waters due to accelerated flows (i.e. hydromodification);

(8) Available evidence of adverse impacts to the chemical, physical, and biological integrity of receiving waters; and

(9) The potential improvements in the overall condition of the Watershed Management Area that can be achieved.

b. ASSESSMENT OF IMPACTS FROM MS4 DISCHARGES

The Copermittees must consider the following, at a minimum, to identify the potential impacts to receiving waters that may be caused or contributed to by discharges from the Copermittees' MS4s:

(1) The discharge prohibitions of Provision A.1 and effluent limitations of Provision A.3; and

(2) Available, relevant, and appropriately collected and analyzed storm water and non-storm water monitoring data from the Copermittees' MS4 outfalls;

(3) Locations of each Copermittee's MS4 outfalls that discharge to receiving waters;

(4) Locations of MS4 outfalls that are known to persistently discharge non-storm water to receiving waters likely causing or contributing to impacts on receiving water beneficial uses;

(5) Locations of MS4 outfalls that are known to discharge pollutants in storm water causing or contributing to impacts on receiving water beneficial uses; and

(6) The potential improvements in the quality of discharges from the MS4 that can be achieved.

c. IDENTIFICATION OF PRIORITY WATER QUALITY CONDITIONS

(1) The Copermittees must use the information gathered for Provisions B.2.a and B.2.b to develop a list of priority water quality conditions as pollutants,

stressors and/or receiving water conditions that are the highest threat to receiving water quality or that most adversely affect the quality of receiving waters. The list must include the following information for each priority water quality condition:

(a) The beneficial use(s) associated with the priority water quality condition;

(b) The geographic extent of the priority water quality condition within the Watershed Management Area, if known;

(c) The temporal extent of the priority water quality condition (e.g., dry weather and/or wet weather);

(d) The Copermittees with MS4s discharges that may cause or contribute to the priority water quality condition; and

(e) An assessment of the adequacy of and data gaps in the monitoring data to characterize the conditions causing or contributing to the priority water quality condition, including a consideration of spatial and temporal variation.

(2) The Copermittees must identify the highest priority water quality conditions to be addressed by the Water Quality Improvement Plan, and provide a rationale for selecting a subset of the water quality conditions identified pursuant to Provision B.2.c.(1) as the highest priorities.

d. IDENTIFICATION OF MS4 SOURCES OF POLLUTANTS AND/OR STRESSORS

The Copermittees must identify and prioritize known and suspected sources of storm water and non-storm water pollutants and/or other stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c. The identification of known and suspected sources of pollutants and/or stressors that cause or contribute to the highest priority water quality conditions as identified for Provision B.2.c must consider the following:

(1) Pollutant generating facilities, areas, and/or activities within the Watershed Management Area, including:

(a) Each Copermittee's inventory of construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas,

(b) Publicly owned parks and/or recreational areas,

(c) Open space areas,

(d) All currently operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste, and

(e) Areas not within the Copermittees' jurisdictions (e.g., Phase II MS4s, tribal lands, state lands, federal lands) that are known or suspected to be discharging to the Copermittees' MS4s;

(2) Locations of the Copermittees' MS4s, including the following:

(a) All MS4 outfalls that discharge to receiving waters, and

(b) Locations of major structural controls for storm water and non-storm water (e.g., retention basins, detention basins, major infiltration devices, etc.);

(3) Other known and suspected sources of non-storm water or pollutants in storm water discharges to receiving waters within the Watershed Management Area, including the following:

(a) Other MS4 outfalls (e.g., Phase II Municipal and Caltrans),

(b) Other NPDES permitted discharges,

(c) Any other discharges that may be considered point sources (e.g., private outfalls), and

(d) Any other discharges that may be considered non-point sources (e.g., agriculture, wildlife or other natural sources);

(4) Review of available data, including but not limited to:

(a) Findings from the Copermittees' illicit discharge detection and elimination programs,

(b) Findings from the Copermittees' MS4 outfall discharge monitoring,

(c) Findings from the Copermittees' receiving water monitoring,

(d) Findings from the Copermittees' MS4 outfall discharge and receiving water assessments, and

(e) Other available, relevant, and appropriately collected data, information, or studies related to pollutant sources and/or stressors that contribute to the highest priority water quality conditions as identified for Provision B.2.c.

(5) The adequacy of the available data to identify and prioritize sources and/or stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c.

e. IDENTIFICATION OF POTENTIAL WATER QUALITY IMPROVEMENT STRATEGIES

The Copermittees must evaluate the findings identified under Provisions B.2.a-d, and identify potential strategies that can result in improvements to water quality in MS4 discharges and/or receiving waters within the Watershed Management Area. Potential water quality improvement strategies that may be implemented within the Watershed Management Area must include the following:

(1) Structural BMPs, non-structural BMPs, incentives, or programs that can potentially be implemented to address the highest priority water quality conditions identified under Provision B.2.c, or MS4 sources of pollutants or stressors identified under Provision B.2.d,

(2) Retrofitting projects in areas of existing development within the Watershed Management Area that can potentially be implemented to reduce MS4 sources of pollutants or stressors identified under Provision B.2.d causing or contributing to the highest priority water quality conditions identified under Provision B.2.c, and

(3) Stream, channel, and/or habitat rehabilitation projects within the Watershed Management Area that can potentially be implemented to protect and/or improve conditions in receiving waters from MS4 pollutants and/or stressors identified under Provision B.2.d causing or contributing to the highest priority water quality conditions identified under Provision B.2.c.

3. Water Quality Improvement Goals, Strategies and Schedules

The Copermittees must identify and develop specific water quality improvement goals and strategies to address the highest priority water quality conditions identified within a Watershed Management Area. The water quality improvement goals and strategies must address the highest priority water quality conditions by effectively prohibiting non-storm water discharges to the MS4, reducing pollutants in storm water discharges from the MS4 to the MEP, and protecting the water quality standards of receiving waters.

a. WATER QUALITY IMPROVEMENT GOALS AND SCHEDULES

(1) Numeric Goals

The Copermittees must develop and incorporate numeric goals[7] into the Water Quality Improvement Plan. Numeric goals must be used to support Water Quality Improvement Plan implementation and measure reasonable

[7] Interim and final numeric goals may take a variety of forms such as TMDL established WQBELs, action levels, pollutant concentration, load reductions, number of impaired water bodies delisted from the List of Water Quality Impaired Segments, Index of Biotic Integrity (IBI) scores, or other appropriate metrics. Interim and final numeric goals are not necessarily limited to one criterion or indicator, but may include multiple criteria and/or indicators. Except for TMDL established WQBELs, interim and final numeric goals and corresponding schedules may be revised through the adaptive management process under Provision B.5.

progress towards addressing the highest priority water quality conditions identified under Provision B.2.c. The Copermittees must establish and incorporate the following numeric goals in the Water Quality Improvement Plan:

(a) Final numeric goals must be based on measureable criteria or indicators capable of demonstrating one or more of the following:

(i) Discharges from the Copermittees' MS4s will not cause or contribute to exceedances of water quality standards in receiving waters, AND/OR

(ii) The conditions of receiving waters and associated habitat are protected from MS4 discharges, AND/OR

(iii) Beneficial uses of receiving waters are protected from MS4 discharges and will be supported.

(b) Interim numeric goals must be based on measureable criteria or indicators capable of demonstrating reasonable incremental progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges as follows:

(i) One or more interim numeric goals may be established to demonstrate progress toward achieving each final numeric goal,

(ii) For each final numeric goal, at least one interim numeric goal must be expressed as a reasonable increment toward achievement of the final numeric goal,

(iii) For each final numeric goal, reasonable interim numeric goals must be established to be accomplished during each 5 year period between the acceptance of the Water Quality Improvement Plan and the achievement of the final numeric goals.

(2) Schedules for Achieving Numeric Goals

The Copermittees must develop and incorporate schedules for achieving the numeric goals into the Water Quality Improvement Plan. The schedules must demonstrate reasonable progress toward achieving the final numeric goals required for Provision B.3.a.(1). The Copermittees must incorporate the schedules for achieving the numeric goals into the Water Quality Improvement Plan based on the following considerations:

(a) Final dates for achieving all final numeric goals must be established considering the following:

(i) Final compliance dates for any applicable TMDLs in Attachment E to this Order;

(ii) Compliance schedules for any ASBS subject to the provisions of

Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(iii) Achievement of the final numeric goals for the highest water quality priorities must be as soon as possible;

(iv) Final dates for achieving the final numeric goals must reflect a realistic assessment of the shortest practicable time required based on the temporal and spatial extent and factors associated with the highest priority water quality conditions identified under Provision B.2.c, and taking into account the time reasonably required to implement the water quality improvement strategies required pursuant to Provision B.3.b.

(b) Interim dates for achieving all interim numeric goals must be established considering the following:

(i) Interim compliance dates for any applicable TMDLs in Attachment E to this Order;

(ii) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(iii) Interim dates for achieving the interim numeric goals must reflect a realistic assessment of the shortest practicable time reasonably required, taking into account the time needed to implement new or significantly expanded programs and securing financing, if necessary; and

(iv) For each final numeric goal, at least one interim numeric goal must be established that the Copermittees will work toward achieving within the term of this Order.

b. WATER QUALITY IMPROVEMENT STRATEGIES AND SCHEDULES

Based on the likely effectiveness and efficiency of the potential water quality improvement strategies identified under Provision B.2.e to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a, the Copermittees must identify the strategies that will be implemented in each Watershed Management Area as follows:

(1) Jurisdictional Strategies

(a) Each Copermittee in the Watershed Management Area must identify the strategies that will be implemented within its jurisdiction as part of its jurisdictional runoff management program requirements under Provisions

E.2 through E.7, including descriptions of the following:

(i) For each of the inventories developed for its jurisdiction, as required under Provisions D.2.a.(1), E.3.e.(2), E.4.b, and E.5.a, each Copermittee must identify the known and suspected areas or sources causing or contributing to the highest priority water quality conditions in the Watershed Management Area that the Copermittee will focus on in its efforts to effectively prohibit non-storm water discharges to its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, and achieve the interim and final numeric goals identified under Provision B.3.a;

(ii) BMPs that each Copermittee will implement, or require to be implemented, as applicable, for those areas or sources within its jurisdiction;

(iii) Education programs that each Copermittee will implement, as applicable, for those areas or sources within its jurisdiction;

(iv) Frequencies that each Copermittee will conduct inspections on those areas or sources within its jurisdiction;

(v) Incentive and enforcement programs that each Copermittee will implement, as applicable, for those areas or sources within its jurisdiction; and

(vi) Any other BMPs, incentives, or programs that each Copermittee will implement for those areas or sources within its jurisdiction.

(b) Identify the optional jurisdictional strategies that each Copermittee will implement within its jurisdiction, as necessary, to effectively prohibit non-storm water discharges to its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. Descriptions of the optional jurisdictional strategies must include:

(i) BMPs, incentives, or programs that may be implemented by the Copermittee within its jurisdiction in addition to the requirements of Provisions B.3.b.(1)(a);

(ii) Incentives or programs that may be implemented by the Copermittee to encourage or implement projects to retrofit areas of existing development within its jurisdiction;

(iii) Incentives or programs that may be implemented by the Copermittee to encourage or implement projects that will rehabilitate the conditions of channels or habitats within its jurisdiction;

(iv) The funds and/or resources that must be secured by the Copermittee to implement the optional strategies described for Provisions B.3.b.(1)(b)(i)-(iii) within its jurisdiction; and

(v) The circumstances necessary to trigger implementation of the optional jurisdictional strategies, in addition to the requirements of Provision B.3.b.(1)(a), to achieve the interim and final numeric goals within the schedules established under Provision B.3.a.

(c) Identify the strategies that will be implemented by the Copermittee in coordination with or with the cooperation of other agencies (e.g. Caltrans, water districts, school districts) and/or entities (e.g. non-governmental organizations) within its jurisdiction.

(2) Watershed Management Area Strategies

The Copermittees must identify the optional regional or multi-jurisdictional strategies that will be implemented in the Watershed Management Area, as necessary, to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. Descriptions of the optional regional or multi-jurisdictional strategies must include:

(a) Regional or multi-jurisdictional BMPs, incentives, or programs that may be implemented by the Copermittees in the Watershed Management Area;

(b) Incentives or programs that may be implemented by the Copermittees in the Watershed Management Area to encourage or implement regional or multi-jurisdictional projects to retrofit areas of existing development;

(c) Incentives or programs that may be implemented by the Copermittees to encourage or implement regional or multi-jurisdictional projects that will rehabilitate the conditions of channels, streams, or habitats within the Watershed Management Area;

(d) The funds and/or resources that must be secured by the Copermittees to implement the optional strategies described for Provisions B.3.b.(2)(a)-(c) within the Watershed Management Area; and

(e) The circumstances necessary to trigger implementation of the optional regional or multi-jurisdictional strategies to achieve the interim and final numeric goals within the schedules established under Provision B.3.a.

(3) Schedules for Implementing Strategies

The Copermittees must develop reasonable schedules for implementing the water quality improvement strategies identified under Provisions B.3.b.(1) and B.3.b.(2) to achieve the interim and final numeric goals identified and schedules established under Provision B.3.a. The Copermittees must incorporate the schedules to implement the water quality improvement strategies into the Water Quality Improvement Plan as follows:

(a) Each Copermittee must develop schedules for the jurisdictional strategies identified pursuant to Provisions B.3.b.(1)(a)-(b). Each schedule must specify:

(i) If each jurisdictional strategy identified pursuant to Provision B.3.b.(1)(a) will or will not be initiated upon acceptance of the Water Quality Improvement Plan;

(ii) For each jurisdictional strategy identified pursuant to Provision B.3.b.(1)(a) that will not be initiated upon acceptance~~approval~~ of the Water Quality Improvement Plan, the shortest practicable time in which each jurisdictional strategy will be initiated after acceptance of the Water Quality Improvement Plan;

(iii) For each optional jurisdictional strategy identified pursuant to Provision B.3.b.(1)(b), a realistic assessment of the shortest practicable time required to:

[a] Secure the resources needed to fund the optional jurisdictional strategy, and
[b] Procure the resources, materials, labor, and applicable permits necessary to initiate implementation of the optional jurisdictional strategy;

(iv) If each jurisdictional strategy identified pursuant to Provisions B.3.b.(1)(a)-(b) is expected to be continuously implemented (e.g. inspections) or completed within a schedule (e.g. construction of structural BMP); and

(v) If a jurisdictional strategy identified pursuant to Provisions B.3.b.(1)(a)-(b) is expected to be completed within a schedule, the anticipated time to complete based on a realistic assessment of the shortest practicable time required.

(b) The Copermittees in the Watershed Management Area must develop schedules for the regional or multi-jurisdictional strategies identified pursuant to Provision B.3.b.(2). Each schedule must specify:

(i) A realistic assessment of the shortest practicable time to:

[a] Secure the resources needed to fund the optional regional or multi-jurisdictional strategy, and

[b] Procure the resources, materials, labor, and permits necessary to initiate the implementation of the optional regional or multi-jurisdictional strategy;

(ii) If each regional or multi-jurisdictional strategy identified pursuant to Provision B.3.b.(2) is expected to be continuously implemented (e.g. inspections) or completed within a schedule (e.g. construction of structural BMP); and

(iii) If a regional or multi-jurisdictional strategy and/or activity identified pursuant to Provisions B.3.b.(2) is expected to be completed within a schedule, the anticipated time to complete based on a realistic assessment of the shortest practicable time required.

(4) Optional Watershed Management Area Analysis

(a) For each Watershed Management Area, the Copermittees have the option to perform a Watershed Management Area Analysis for the purpose of developing watershed-specific requirements for structural BMP implementation, as described in Provision E.3.c.(3). The Watershed Management Area Analysis must include GIS layers (maps) as output. The analysis must include the following information, to the extent it is available, in order to characterize the Watershed Management Areas:

(i) A description of dominant hydrologic processes, such as areas where infiltration or overland flow likely dominates;

(ii) A description of existing streams in the watershed, including bed material and composition, and if they are perennial or ephemeral;

(iii) Current and anticipated future land uses;

(iv) Potential coarse sediment yield areas; and

(v) Locations of existing flood control structures and channel structures, such as stream armoring, constrictions, grade control structures, and hydromodification or flood management basins.

(b) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify and compile a list of candidate projects that could potentially be used as alternative compliance options for Priority Development Projects, to be implemented in lieu of onsite structural BMP performance requirements described in Provisions E.3.c.(1) and E.3.c.(2). Specifically, the Copermittees must identify opportunities to be included in the list of candidate projects in each Watershed Management Area, such as:

(i) Stream or riparian area rehabilitation;

(ii) Retrofitting existing infrastructure to incorporate storm water retention or treatment;

(iii) Regional BMPs;

(iv) Groundwater recharge projects;

(v) Water supply augmentation projects; and

(vi) Land purchases to preserve floodplain functions.

(c) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify areas within the Watershed Management Area where it is appropriate to allow Priority Development Projects to be exempt from the hydromodification management BMP performance requirements described in Provision E.3.c.(2), including supporting rationale.

4. Water Quality Improvement Monitoring and Assessment Program

a. The Copermittees in each Watershed Management Area must develop and incorporate an integrated monitoring and assessment program into the Water Quality Improvement Plan that assesses: 1) the progress toward achieving the numeric goals and schedules, 2) the progress toward addressing the highest priority water quality conditions for each Watershed Management Area, and 3) each Copermittee's overall efforts to implement the Water Quality Improvement Plan.

b. The monitoring and assessment program must incorporate the monitoring and assessment requirements of Provision D, which may allow the Copermittees to modify the program to be consistent with and focus on the highest priority water quality conditions for each Watershed Management Area.

c. For Watershed Management Areas with applicable TMDLs, the monitoring and assessment program must incorporate the specific monitoring and assessment requirements of Attachment E.

d. For Watershed Management Areas with any ASBS, the water quality monitoring and assessment program must incorporate the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

5. Iterative Approach and Adaptive Management Process

The Copermittees in each Watershed Management Area must implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management

programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a, and must include the following:

a. RE-EVALUATION OF PRIORITY WATER QUALITY CONDITIONS

The priority water quality conditions and potential water quality improvement strategies included in the Water Quality Improvement Plan pursuant to Provisions B.2.c and B.2.e may be re-evaluated by the Copermittees as needed during the term of this Order as part of the Water Quality Improvement Plan Annual Report. Re-evaluation and recommendations for modifications to the priority water quality conditions and potential water quality improvement strategies must be provided in the Report of Waste Discharge, and must consider the following:

(1) Achieving the outcome of improved water quality in MS4 discharges and receiving waters through implementation of the water quality improvement strategies identified in the Water Quality Improvement Plan;

(2) New information developed when the requirements of Provisions B.2.a-c have been re-evaluated;

(3) Spatial and temporal accuracy of monitoring data collected to inform prioritization of water quality conditions and implementation strategies to address the highest priority water quality conditions;

(4) Availability of new information and data from sources other than the jurisdictional runoff management programs within the Watershed Management Area that informs the effectiveness of the actions implemented by the Copermittees;

(5) San Diego Water Board recommendations; and

(6) Recommendations for modifications solicited through a public participation process.

b. ADAPTATION OF GOALS, STRATEGIES AND SCHEDULES

The water quality improvement goals, strategies and schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.3, must be re-evaluated and adapted as new information becomes available to result in more effective and efficient measures to address the highest priority water quality conditions identified pursuant to Provision B.2.c. Re-evaluation of and modifications to the water quality improvement goals, strategies and schedules must be provided in the Water Quality Improvement Plan Annual Report, and must consider the following:

(1) Modifications to the priority water quality conditions based on Provision

B.5.a;

(2) Progress toward achieving interim and final numeric goals in receiving waters and MS4 discharges for the highest priority water quality conditions in the Watershed Management Area,

(3) Progress toward achieving outcomes according to established schedules;

(4) New policies or regulations that may affect identified numeric goals;

(5) Measurable or demonstrable reductions of non-storm water discharges to and from each Copermittee's MS4;

(6) Measurable or demonstrable reductions of pollutants in storm water discharges from each Copermittee's MS4 to the MEP;

(7) New information developed when the requirements of Provisions B.2.b and B.2.d have been re-evaluated;

(8) Efficiency in implementing the Water Quality Improvement Plan;

(9) San Diego Water Board recommendations; and

(10) Recommendations for modifications solicited through a public participation process.

c. ADAPTATION OF MONITORING AND ASSESSMENT PROGRAM

The water quality improvement monitoring and assessment program, included in the Water Quality Improvement Plan pursuant to Provision B.4, must be re-evaluated and adapted when new information becomes available. Re-evaluation and recommendations for modifications to the monitoring and assessment program, pursuant to the requirements of Provision D, may be provided in the Water Quality Improvement Plan Annual Report, but must be provided in the Report of Waste Discharge.

6. Water Quality Improvement Plan Submittal, Updates, and Implementation

a. The Copermittees must submit and commence implementation of the Water Quality Improvement Plans in accordance with the requirements of Provision F.1.

b. The Copermittees must submit proposed updates to the Water Quality Improvement Plan for acceptance by the San Diego Water Board Executive Officer in accordance with the requirements of Provision F.2.c.

C. ACTION LEVELS

The purpose of this provision is for the Copermittees to incorporate numeric action levels in the Water Quality Improvement Plans. The goal of the action levels is to guide Water Quality Improvement Plan implementation efforts and measure progress towards the protection of water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through monitoring and assessing the quality of the MS4 discharges during the implementation of the Water Quality Improvement Plans.

1. Non-Storm Water Action Levels[8]

The Copermittees must develop and incorporate numeric non-storm water action levels (NALs) into the Water Quality Improvement Plan to: 1) support the development and prioritization of water quality improvement strategies for effectively prohibiting non-storm water discharges to the MS4s, 2) assess the effectiveness of the water quality improvement strategies toward addressing MS4 non-storm water discharges, required pursuant to Provision D.4.b.(1), and 3) support the detection and elimination of non-storm water and illicit discharges to the MS4, required pursuant to Provision E.2.[9]

a. The following NALs must be incorporated:

(1) Non-Storm Water Discharges from MS4s to Ocean Surf Zone

Table C-1. Non-Storm Water Action Levels for Discharges from MS4s to Ocean Surf Zone

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Total Coliform	MPN/100 ml	1,000	-	10,000/1,000[1]	OP
Fecal Coliform	MPN/100 ml	200[2]	-	400	OP
Enterococci	MPN/100 ml	35	-	104[3]	OP

Abbreviations/Acronyms
AMAL – average monthly action level
MDAL – maximum daily action level
OP – Ocean Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Total coliform density NAL is 1,000 MPN/100 ml when the fecal/total coliform ratio exceeds 0.1.
2. Fecal coliform density NAL is 200 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas."

[8] NALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, unless the NAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed.
[9] The Copermittees may utilize NALs or other benchmarks currently established by the Copermittees as interim NALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

(2) Non-Storm Water Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Table C-2. Non-Storm Water Action Levels for Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Turbidity	NTU	75	-	225	OP
pH	Units	Within limit of 6.0 to 9.0 at all times			OP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	35	-	104[3]	BP
Priority Pollutants	µg/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
OP – Ocean Plan water quality objective
NTU – Nephelometric Turbidity Units
µg/L – micrograms per liter
MDAL – maximum daily action level
BP – Basin Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas" and is not applicable to water bodies that are not designated with the water contact recreation (REC-1) beneficial use.

Table C-3. Non-Storm Water Action Levels for Priority Pollutants

Parameter	Units	Freshwater (CTR)		Saltwater (CTR)	
		MDAL	AMAL	MDAL	AMAL
Cadmium	µg/L	**	**	16	8
Copper	µg/L	*	*	5.8	2.9
Chromium III	µg/L	**	**	-	-
Chromium VI	µg/L	16	8.1	83	41
Lead	µg/L	*	*	14	2.9
Nickel	µg/L	**	**	14	6.8
Silver	µg/L	*	*	2.2	1.1
Zinc	µg/L	*	*	95	47

Abbreviations/Acronyms:
CTR – California Toxic Rule
AMAL – average monthly action level
µg/L – micrograms per liter
MDAL – maximum daily action level

Notes:
* Action levels developed on a case-by-case basis (see below)
** Action levels developed on a case-by-case basis (see below), but calculated criteria are not to exceed Maximum Contaminant Levels (MCLs) under the California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64431

The Cadmium, Copper, Chromium (III), Lead, Nickel, Silver and Zinc NALs for MS4 discharges to freshwater receiving waters will be developed on a case-by-case basis based on site-specific water quality data (receiving water hardness). For these priority pollutants, refer to 40 CFR 131.38(b)(2).

(3) Non-Storm Water Discharges from MS4s to Inland Surface Waters

Table C-4. Non-Storm Water Action Levels for Discharges from MS4s to Inland Surface Waters

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Dissolved Oxygen	mg/L	Not less than 5.0 in WARM waters and not less than 6.0 in COLD waters			BP
Turbidity	NTU	-	20	See MDAL	BP
pH	Units	Within limit of 6.5 to 8.5 at all times			BP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	33	-	61[3]	BP
Total Nitrogen	mg/L	-	1.0	See MDAL	BP
Total Phosphorus	mg/L	-	0.1	See MDAL	BP
MBAS	mg/L	-	0.5	See MDAL	BP
Iron	mg/L	-	0.3	See MDAL	BP
Manganese	mg/L	-	0.05	See MDAL	BP
Priority Pollutants	µg/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
BP – Basin Plan water quality objective
COLD – cold freshwater habitat beneficial use
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
MDAL – maximum daily action level
WARM – warm freshwater habitat beneficial use
MBAS – Methylene Blue Active Substances
MPN/100 ml – most probable number per 100 milliliters
µg/L – micrograms per liter

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for freshwater "designated beach areas" and is not applicable to water bodies that are not designated with the water contact recreation (REC-1) beneficial use.

b. If not identified in Provision C.1.a, NALs must be identified, developed and incorporated in the Water Quality Improvement Plan for any pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in receiving waters associated with the highest priority water quality conditions related to non-storm water discharges from the MS4s. NALs must be based on:

(1) Applicable water quality standards which may be dependent upon site-specific or receiving water-specific conditions or assumptions to be identified by the Copermittees; or

(2) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the NALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary NALs specific to the Watershed Management Area at levels greater than the NALs required by Provisions C.1.a and C.1.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for effectively prohibiting non-storm water discharges to the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and from the MS4. The

secondary NALs may be developed using an approach acceptable to the San Diego Water Board.

d. Dry weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.b may be utilized to develop or revise NALs based on watershed-specific data, subject to San Diego Water Board Executive Officer approval.

2. Storm Water Action Levels[10]

The Copermittees must develop and incorporate numeric storm water action levels (SALs) in the Water Quality Improvement Plans to: 1) support the development and prioritization of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s, and 2) assess the effectiveness of the water quality improvement strategies toward reducing pollutants in storm water discharges, required pursuant to Provision D.4.b.(2).[11]

a. The following SALs for discharges of storm water from the MS4 must be incorporated:

Table C-5. Storm Water Action Levels for Discharges from MS4s to Receiving Waters

Parameter	Units	Action Level
Turbidity	NTU	126
Nitrate & Nitrite (Total)	mg/L	2.6
Phosphorus (Total P)	mg/L	1.46
Cadmium (Total Cd)*	µg/L	3.0
Copper (Total Cu)*	µg/L	127
Lead (Total Pb)*	µg/L	250
Zinc (Total Zn)*	µg/L	976

Abbreviations/Acronyms:
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
µg/L – micrograms per liter

Notes:
* The sampling must include a measure of receiving water hardness at each MS4 outfall. If a total metal concentration exceeds the corresponding metals SAL in Table C-5, that concentration must be compared to the California Toxics Rule criteria and the USEPA 1-hour maximum concentration for the detected level of receiving water hardness associated with that sample. If it is determined that the sample's total metal concentration for that specific metal exceeds that SAL, but does not exceed the applicable USEPA 1-hour maximum concentration criterion for the measured level of hardness, then the sample result will not be considered above the SAL for that measurement.

[10] SALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, unless the SAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed.

[11] The Copermittees may utilize SALs or other benchmarks currently established by the Copermittees as interim SALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

b. If not identified in Provision C.2.a, SALs must be identified, developed and incorporated in the Water Quality Improvement Plan for pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in receiving waters associated with the highest priority water quality conditions related to storm water discharges from the MS4s. SALs must be based on:

(1) Federal and State water quality guidance and/or water quality standards; and

(2) Site-specific or receiving water-specific conditions; or

(3) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the SALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary SALs specific to the Watershed Management Area at levels greater than the SALs required by Provisions C.2.a and C.2.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s. The secondary SALs may be developed based on the approaches recommended by the State Water Board's Storm Water Panel[12] or using an approach acceptable to the San Diego Water Board.

d. Wet weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.c may be used to develop or revise SALs based upon watershed-specific data, subject to San Diego Water Board Executive Officer approval.

[12] Storm Water Panel Recommendations to the California State Water Resources Control Board: The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities (June 2006)

D. MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS

The purpose of this provision is for the Copermittees to monitor and assess the impact on the conditions of receiving waters caused by discharges from the Copermittees' MS4s under wet weather and dry weather conditions. The goal of the monitoring and assessment program is to inform the Copermittees about the nexus between the health of receiving waters and the water quality condition of the discharges from their MS4s. This goal will be accomplished through monitoring and assessing the conditions of the receiving waters, discharges from the MS4s, pollutant sources and/or stressors, and effectiveness of the water quality improvement strategies implemented as part of the Water Quality Improvement Plans.

1. Receiving Water Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the condition of the receiving waters in each Watershed Management Area during dry weather and wet weather. Following San Diego Water Board acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct long-term receiving water monitoring during implementation of the Water Quality Improvement Plan to assess the long term trends and determine if conditions in receiving waters are improving. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following receiving water monitoring procedures:

a. TRANSITIONAL RECEIVING WATER MONITORING

Until the monitoring requirements and schedules of Provisions D.1.b-e are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following receiving water monitoring in the Watershed Management Area:

(1) Continue the receiving water monitoring programs required in Order Nos. R9-2007-0001 (Monitoring and Reporting Program No. R9-2007-0001 Sections II.A.1-A.5), R9-2009-0002, and R9-2010-0016;

(2) Continue the monitoring in the Hydromodification Management Plans approved by the San Diego Water Board;

(3) Participate in the following regional receiving water monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring,

(b) Southern California Bight Regional Monitoring, and

(c) Sediment Quality Monitoring;

(4) Implement the monitoring programs developed as part of any implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) for the TMDLs in Attachment E to this Order; and

(5) For Watershed Management Areas with ASBS, implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

b. LONG-TERM RECEIVING WATER MONITORING STATIONS

The Copermittees must select at least one long-term receiving water monitoring station from among the existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees to be representative of the receiving water quality in the Watershed Management Area. Additional long-term receiving water monitoring stations must be selected where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

c. DRY WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three dry weather monitoring events at each of the long-term receiving water monitoring stations. At least one monitoring event must be conducted during the dry season (May 1 – September 30) and at least one monitoring event must be conducted during a dry weather period during the wet season (October 1 – April 30), after the first wet weather event of the season, with an antecedent dry period of at least 72 hours following a storm event producing measureable rainfall of greater than 0.1 inch.

(1) Dry Weather Receiving Water Field Observations

For each dry weather monitoring event, the Copermittees must record field observations consistent with Table D-1 at each long-term receiving water monitoring station.

Table D-1. Field Observations for Receiving Water Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) • Station description (i.e. deposits or stains, vegetation condition, structural condition, and observable biology) • Presence and assessment of trash in and around station

(2) Dry Weather Receiving Water Field Monitoring

For each dry weather monitoring event, if conditions allow the collection of the data, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

Table D-2. Field Monitoring Parameters for Receiving Water Monitoring Stations

Parameters
• pH • Temperature • Specific conductivity • Dissolved oxygen • Turbidity

(3) Dry Weather Receiving Water Analytical Monitoring

For each dry weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable NAL constituents, and

(v) Constituents listed in Table D-3.

Table D-3. Analytical Monitoring Constituents for Receiving Water Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Pesticides	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Mercury • Nickel • Selenium • Thallium • Zinc	• Organophosphate Pesticides • Pyrethroid Pesticides	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(4) Dry Weather Receiving Water Toxicity Monitoring

For each dry weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for aquatic toxicity in accordance with Table D-4. When the State Water Board's Policy for Toxicity Assessment and Control (Toxicity Policy) is approved and in effect, the San Diego Water Board Executive Officer may direct the Copermittees to replace current toxicity program elements with standardized procedures in the Toxicity Policy.

Table D-4. Dry Weather Chronic[1] Toxicity Testing for Receiving Water Monitoring Stations

Organism	Units	Test	USEPA Protocol
Freshwater			
Pimephales promelas (Fathead Minnow)	Pass / Fail	Larval Survival and Growth	EPA-821-R-02-013
Ceriodaphnia dubia (*Daphnid*)	Pass / Fail	Survival and Production	EPA-821-R-02-013
Selenastrum capricornutum (Green Algae)	Pass / Fail	Growth	EPA-821-R-02-013
Marine and Estuarine			
Strongylocentrotus purpuratus *(Purple Sea Urchin)*	Pass / Fail	Embryo-Larval Development	EPA-600-R-95-136

Notes:
1. Chronic toxicity testing is not required at receiving water monitoring stations located at mass loading stations if the channel flows are diverted year-round during dry weather conditions to the sanitary sewer for treatment.

(a) Freshwater Test Species and Methods: If samples are collected in receiving waters with salinity less than 1 ppt, the Copermittees must follow the methods for chronic toxicity tests as established in 40 CFR 136.3 using a single-concentration test design for routine monitoring, or a five-concentration test design for additional toxicity testing if the limitation is exceeded. The Copermittees must estimate the critical life stage chronic toxicity on undiluted samples in accordance with species and short term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms (EPA-821-R-02-013; Table IA, 40 CFR 136). Additional test species may be used by the Copermittees if approved by the San Diego Water Board Executive Officer. The Copermittees must conduct:

(i) A static renewal toxicity test with the fathead minnow, *Pimephales promelas* (Larval Survival and Growth Test Method 1000.0);

(ii) A static renewal toxicity test with the daphnid, *Ceriodaphnia dubia* (Survival and Reproduction Test Method 1002.0); and

(iii) A static renewal toxicity test with the green alga, *Selenastrum capricornutum* (also named *Raphidocelis subcapitata*) (Growth Test Method 1003.0).

(b) Marine and Estuarine Test Species and Methods: If samples are collected in receiving waters with salinity greater or equal to 1 ppt, the Copermittees must follow the methods for chronic toxicity tests as established in 40 CFR 136.3 using a single-concentration test design for routine monitoring, or a five-concentration test design for additional toxicity testing if the limitation is exceeded. The Copermittees must conduct the following critical life state chronic toxicity tests on undiluted samples in accordance with species and short term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms (EPA-600-R-95-136; 1995). Artificial sea salts must be used to increase sample salinity. The Copermittees must conduct a static non-renewal toxicity test with the purple sea urchin, *Strongylocentrotus purpuratus* (Embryo-larval Development Test Method). Additional species may be used by the Copermittees if approved by the San Diego Water Board Executive Officer.

(c) Holding Times: All toxicity tests must be conducted as soon as possible following sample collection. The 36-hour sample holding time for test initiation shall be targeted. However, no more than 72 hours shall elapse before the conclusion of sample collection and test initiation.

(d) Test Species Sensitivity Screening: To determine the most sensitive test species for freshwater, the Copermittees must screen 2 wet weather and 2 dry weather toxicity tests with a vertebrate, an invertebrate, and a plant species. After this screening period, subsequent monitoring must be conducted using the most sensitive test species. Alternatively, if a sensitive test species has already been determined, or if there is prior knowledge of potential toxicant(s) and a test species is sensitive to such toxicant(s), then monitoring must be conducted using only that test species. Sensitive test species determinations must also consider the most sensitive test species used for proximal receiving water monitoring. Rescreening must occur once each permit term.

(e) Chronic toxicity test biological endpoint data must be analyzed using the Test of Significant Toxicity t-test approach specified in *National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document* (USEPA, Office of Wastewater Management, Washington, D.C., EPA-833-R-10-003, 2010). For this monitoring program, the critical chronic instream waste concentration (IWC) is set at 100 percent receiving water (i.e. no dilution) for receiving water samples. A 100 percent receiving water and a control must be tested.

(f) Toxicity Identification Evaluation (TIE) / Toxicity Reduction Evaluation (TRE): If chronic toxicity is detected in receiving waters, the Copermittees must discuss the need for conducting a TIE/TRE in the assessments required under Provision D.4.a.(2), and develop a plan for implementing the TIE/TRE to be incorporated in the Water Quality Improvement Plan.

(5) Dry Weather Receiving Water Bioassessment Monitoring

Bioassessment monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must conduct bioassessment monitoring during at least one dry weather monitoring event at each long-term receiving water monitoring station as follows:

(a) The following bioassessment samples and measurements must be collected:

(i) Macroinvertebrate samples must be collected in accordance with the "Reachwide Benthos (Multihabitat) Procedure" in the most current Surface Water Ambient Monitoring Program (SWAMP) Bioassessment Standard Operating Procedures (SOP), and amendments, as applicable;[13]

(ii) The "Full" suite of physical habitat characterization measurements must be collected in accordance with the most current SWAMP Bioassessment SOP, and as summarized in the SWAMP Stream Habitat Characterization Form – Full Version;[14] and

(iii) Freshwater algae samples must be collected in accordance with the SWAMP Standard Operating Procedures for Collecting Algae Samples.[15] Analysis of samples must include algal taxonomic composition (diatoms and soft algae) and algal biomass.

(b) The bioassessment samples, measurements, and appropriate water chemistry data must be used to calculate the following:

(i) An Index of Biological Integrity (IBI) for macroinvertebrates for each monitoring station where bioassessment monitoring was conducted, based on the most current calculation method;[16] and

[13] Ode, P.R.. 2007. Standard operating procedures for collecting macroinvertebrate samples and associated physical and chemical data for ambient bioassessments in California. California State Water Resources Control Board Surface Water Ambient Monitoring Program (SWAMP) Bioassessment SOP 001. http://www.swrcb.ca.gov/water_issues/programs/swamp/tools.shtml#monitoring

[14] Available at: http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/reports/fieldforms_fullversion052908.pdf

[15] Fetscher et al. 2009. Standard Operating Procedures for Collecting Stream Algae Samples and Associated Physical Habitat and Chemical Data for Ambient Bioassessments in California.

[16] The most current calculation method at the time the Order was adopted is outlined in "A Quantitative Tool for Assessing the Integrity of Southern California Coastal Streams" (Ode, et al. 2005. Environmental Management. Vol. 35, No. 1, pp. 1-13). If an updated or new calculation method is developed, either both (i.e. current and updated/new) methods must be used, or historical IBIs must be recalculated with the updated or new calculation method.

(ii) An IBI for algae for each monitoring station where bioassessment monitoring was conducted, when a calculation method is developed.[17]

(c) In lieu of the requirements of Provision D.1.c.(5)(a), the Copermittees may conduct the bioassessment monitoring in accordance with the "Triad" assessment approach[18] to calculate the IBIs required for Provision D.1.c.(5)(b). The Copermittees must conduct sampling, analysis, and reporting of specified in-stream biological and habitat data according to the protocols specified in the SCCWRP Technical Report No. 539, or subsequent protocols, if developed.

(6) Dry Weather Receiving Water Hydromodification Monitoring

In addition to the hydromodification monitoring conducted as part of the Copermittees' Hydromodification Management Plans, hydromodification monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must collect the following hydromodification monitoring observations and measurements within an appropriate domain of analysis during at least one dry weather monitoring event for each long-term receiving water monitoring station:

(a) Channel conditions, including:

(i) Channel dimensions,

(ii) Hydrologic and geomorphic conditions, and

(iii) Presence and condition of vegetation and habitat;

(b) Location of discharge points;

(c) Habitat integrity;

(d) Photo documentation of existing erosion and habitat impacts, with location (i.e. latitude and longitude coordinates) where photos were taken;

(e) Measurement or estimate of dimensions of any existing channel bed or bank eroded areas, including length, width, and depth of any incisions; and

[17] When a calculation method is developed, IBIs must be calculated for all available and appropriate historical data.
[18] Stormwater Monitoring Coalition Model Monitoring Technical Committee, 2004. Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California. Technical Report #419. August 2004.

(f) Known or suspected cause(s) of existing downstream erosion or habitat impact, including flow, soil, slope, and vegetation conditions, as well as upstream land uses and contributing new and existing development.

d. WET WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three wet weather monitoring events at each long-term receiving water monitoring station. At least one wet weather monitoring event must be conducted during the first wet weather event of the wet season (October 1 – April 30), and at least one wet weather monitoring event during a wet weather event that occurs after February 1.

(1) Wet Weather Receiving Water Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each long-term receiving water monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event;

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(d) Presence and assessment of trash in and around station.

(2) Wet Weather Receiving Water Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

(3) Wet Weather Receiving Water Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) Constituents listed in Table D-3.

(4) Wet Weather Receiving Water Toxicity Monitoring

For each wet weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for chronic aquatic toxicity in accordance with Provisions D.1.c.(4)(a)-(f).

e. OTHER RECEIVING WATER MONITORING REQUIREMENTS

(1) Regional Monitoring

The Copermittees must participate in the following regional receiving waters monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring; and

(b) Southern California Bight Regional Monitoring~~.~~ and

(c) Unified Beach Water Quality Monitoring and Assessment Program. The Orange County Copermittees shall participate in and, together with South Orange County Wastewater Authority and Orange County Health Care Agency, shall share responsibility for implementation of a unified regional beach water quality monitoring and assessment program in south Orange County, as set forth in the October 2014 report, *Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County* ~~Monitoring and Reporting Program No. XXX~~, issued pursuant to CWC section~~s~~ ~~13225, 13267, and~~ 13383 and subject to future revision in the San Diego Water Board December 5, 2014 Letter Directive.

(2) Sediment Quality Monitoring

The Copermittees must perform sediment monitoring to assess compliance with sediment quality receiving water limits applicable to MS4 discharges to enclosed bays and estuaries. The monitoring may be performed either by individual or multiple Copermittees to assess compliance with receiving water limits, or through participation in a water body monitoring coalition. A Sediment Monitoring Plan which satisfies the requirements of the State Water Board's Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part 1 Sediment Quality (Sediment Control Plan) must be submitted as part of the monitoring and assessment program in the Water Quality Improvement Plan.

(a) The Sediment Monitoring Plan design must include the following:

(i) The elements required under Section VII.D (Receiving Water Limits Monitoring Frequency) and Section VII.E (Sediment Monitoring) of the Sediment Control Plan;

(ii) A Quality Assurance Project Plan (QAPP) describing the project objectives and organization, functional activities, and quality assurance/quality control protocols for the water and sediment monitoring; and

(iii) A schedule for completion of all sample collection and analysis activities and submission of Sediment Monitoring Reports.

(b) The Copermittees must implement the Sediment Monitoring Plan in accordance with the schedule contained in the Sediment Monitoring Plan, unless otherwise directed in writing by the San Diego Water Board Executive Officer.

(c) The Copermittees must incorporate a Sediment Monitoring Report as part of the Water Quality Improvement Plan Annual Report in accordance with the schedule contained in the Sediment Monitoring Plan, unless otherwise directed in writing by the San Diego Water Board Executive Officer. The Sediment Monitoring Report must contain the following information:

(i) Analysis: An evaluation, interpretation and tabulation of the water and sediment monitoring data, including interpretations and conclusions as to whether applicable Receiving Water Limitations in this Order have been attained at each sample station;

(ii) Sample Location Map: The locations, type, and number of samples must be identified and shown on a site map; and

(iii) California Environmental Data Exchange Network: A statement certifying that the monitoring data and results have been uploaded into the California Environmental Data Exchange Network (CEDEN).

(d) Based on the Sediment Monitoring Report conclusions the San Diego Water Board may require a human health risk assessment to determine if the human health objective contained in Receiving Water Limitations in Provision A.2.a.(3)(b)(ii) has been attained at each sample station. In conducting a risk assessment, the Copermittees must consider any applicable and relevant information, including California Environmental Protection Agency's (Cal/EPA) Office of Environmental Health Hazard Assessment (OEHHA) policies for fish consumption and risk assessment, Cal/EPA's Department of Toxic Substances Control (DTSC) Risk Assessment, and USEPA Human Health Risk Assessment policies.

(3) ASBS Monitoring

For Watershed Management Areas with ASBS, the Copermittees must implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

f. ALTERNATIVE WATERSHED MONITORING REQUIREMENTS

The San Diego Water Board may direct the Copermittees to participate in an effort to develop alternative watershed monitoring with other regulated entities, other interested parties, and the San Diego Water Board to refine, coordinate,

and implement regional monitoring and assessment programs to determine the status and trends of water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams.

2. MS4 Outfall Discharge Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the discharges from the MS4 outfalls in each Watershed Management Area during dry weather and wet weather. Following San Diego Water Board acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct MS4 outfall discharge monitoring during implementation of the Water Quality Improvement Plan to assess the effectiveness of their jurisdictional runoff management programs toward effectively prohibiting non-storm water discharges into the MS4 and reducing pollutants in storm water discharges from their MS4s to the MEP. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following MS4 outfall monitoring procedures:

a. TRANSITIONAL MS4 OUTFALL DISCHARGE MONITORING

Until the monitoring requirements and schedules of Provisions D.2.b-c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following MS4 outfall discharge monitoring in the Watershed Management Area:

(1) MS4 Outfall Discharge Monitoring Station Inventory

Each Copermittee must identify all major MS4 outfalls that discharge directly to receiving waters within its jurisdiction and geo-locate those outfalls on a map of the MS4 pursuant to Provision E.2.b.(1). This information must be compiled into a MS4 outfall discharge monitoring station inventory, and must include the following information:

(a) Latitude and longitude of MS4 outfall point of discharge;

(b) Watershed Management Area;

(c) Hydrologic subarea;

(d) Outlet size;

(e) Accessibility (i.e. safety and without disturbance of critical habitat);

(f) Approximate drainage area; and

(g) Classification of whether the MS4 outfall is known to have persistent dry weather flows, transient dry weather flows, no dry weather flows, or unknown dry weather flows.

(2) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Until the monitoring requirements and schedules of Provision D.2.b are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, each Copermittee must perform dry weather MS4 outfall field screening monitoring to identify non-storm water and illicit discharges within its jurisdiction in accordance with Provision E.2.c, to determine which discharges are transient flows and which are persistent flows, and prioritize the dry weather MS4 discharges that will be investigated and eliminated in accordance with Provision E.2.d.

(a) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Frequency

Each Copermittee must field screen the MS4 outfalls in its inventory developed pursuant to Provision D.2.a.(1) as follows:

(i) For Copermittees with less than 125 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 80 percent of the outfalls must be visually inspected two times per year during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv).

(ii) For Copermittees with 125 major MS4 outfalls or more, but less than or equal to 500 that discharge to receiving waters within a Watershed Management Area, all the outfalls must be visually inspected at least annually during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv).

(iii) For Copermittees with more than 500 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 500 outfalls must be visually inspected at least annually during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv). Copermittees with more than 500 major MS4 outfalls within a Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(iv) For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major MS4 outfalls within its jurisdiction, at least 500 major MS4 outfalls within its inventory must be visually inspected at least annually during dry weather conditions. Copermittees with more than 500 major MS4 outfalls in more than one Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(v) Inspections of major MS4 outfalls conducted in response to public reports and staff or contractor reports and notifications may count toward the required visual inspections of MS4 outfall discharge monitoring stations.

(b) Transitional Dry Weather MS4 Outfall Discharge Field Screening Visual Observations

(i) An antecedent dry period of at least 72 hours following any storm event producing measurable rainfall greater than 0.1 inch is required prior to conducting field screening visual observations during a field screening monitoring event.

(ii) During the field screening monitoring event, each Copermittee must record visual observations consistent with Table D-5 at each MS4 outfall discharge monitoring station inspected.

Table D-5. Field Screening Visual Observations for MS4 Outfall Discharge Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) - Flow source(s) suspected or identified from non-storm water source investigation - Flow source(s) eliminated during non-storm water source identification • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) - Known or suspected source(s) of pooled or ponded water • Station description (i.e. deposits or stains, vegetation condition, structural condition, observable biology) • Presence and assessment of trash in and around station • Evidence or signs of illicit connections or illegal dumping

(iii) Each Copermittee must implement the requirements of Provisions E.2.d.(2)(c)-(e) based on the field observations required pursuant to Provision D.2.a.(2)(b)(ii).

(iv) Each Copermittee must evaluate field observations together with existing information available from prior reports, inspections and monitoring results to determine whether any observed flowing, pooled, or ponded waters are likely to be transient or persistent flow.[19]

(c) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Records

Based upon the results of the transitional dry weather MS4 outfall discharge field screening monitoring conducted pursuant to Provisions D.2.a.(2)(a)-(b), each Copermittee must update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow.

(3) Transitional Wet Weather MS4 Outfall Discharge Monitoring

Until the monitoring requirements and schedules of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the

[19] Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(a) Transitional Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees must select wet weather MS4 outfall discharge monitoring stations from the inventories developed pursuant to Provision D.2.a.(1) for each Watershed Management Area as follows:

(i) At least five wet weather MS4 outfall discharge monitoring stations that are representative of storm water discharges from areas consisting primarily of residential, commercial, industrial, and typical mixed-use land uses present within the Watershed Management Area;

(ii) At least one wet weather MS4 outfall discharge monitoring station for each Copermittee within the Watershed Management Area; and

(iii) The County of San Diego may select at least two (2) wet weather MS4 outfall discharge monitoring stations for the portion of the Santa Margarita River Watershed Management Area within its jurisdiction to be monitored during the transitional period until the Riverside County Copermittees are notified of coverage under this Order. After the Riverside County Copermittees are notified of coverage under this Order, the Copermittees in the Watershed Management Area must select wet weather MS4 outfall discharge monitoring stations consistent with the requirements above.

(b) Transitional Wet Weather MS4 Outfall Discharge Monitoring Frequency

Each wet weather MS4 outfall discharge monitoring station selected pursuant to Provision D.2.a.(3)(a) must be monitored once during the wet season (October 1 – April 30). The wet weather monitoring events must be selected to be representative of the range of hydrological conditions experienced in the region. At least 10 percent of samples must be conducted during the first wet weather event of the wet season, to include at least one such sample in each Watershed Management Area..

(c) Transitional Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(i) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the

storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(ii) The flow rates and volumes measured or estimated from the MS4 outfall (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(d) Transitional Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(e) Transitional Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, and indicator bacteria;

(iv) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

[a] Time-weighted composites collected over the length of the storm event or the first 24 hour period whichever is shorter, composed of discrete samples, which may be collected through the use of automated equipment, or

[b] Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

[c] If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours;

(v) Only one analysis of the composite of aliquots is required;

(vi) The samples must be analyzed for the following constituents:

[a] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

[b] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and

[c] Constituents listed in Table D-6.

Table D-6. Analytical Monitoring Constituents for Wet Weather MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Nickel • Selenium • Thallium • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(f) Other Transitional Wet Weather MS4 Outfall Discharge Monitoring

The San Diego County Copermittees must continue the wet weather MS4 outfall monitoring program developed under Order No. R9-2007-0001, as approved by the San Diego Water Board, through its planned completion.

b. Dry Weather MS4 Outfall Discharge Monitoring

Each Copermittee must perform dry weather MS4 outfall monitoring to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. Each Copermittee must conduct the following dry weather MS4 outfall discharge monitoring within its jurisdiction:

(1) Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Each Copermittee must continue to perform the dry weather MS4 outfall discharge field screening monitoring in accordance with the requirements of Provision D.2.a.(2). The Copermittee may adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of persistent flow non-storm water discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of visual inspections performed is equivalent to the number of visual inspections required under Provision D.2.a.(2)(a).

(2) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring

Each Copermittee must perform non-storm water persistent flow MS4 outfall discharge monitoring to determine which persistent non-storm water discharges contain concentrations of pollutants below NALs, and which persistent non-storm water discharges impact receiving water quality during dry weather. Each Copermittee must conduct the following non-storm water persistent flow MS4 outfall discharge monitoring within its jurisdiction:

(a) Prioritization of Non-Storm Water Persistent Flow MS4 Outfalls

Based upon the dry weather MS4 outfall discharge field screening monitoring records developed pursuant to Provision D.2.a.(2)(c), each Copermittee must identify and prioritize the MS4 outfalls with persistent flows based on the highest priority water quality conditions identified in the Water Quality Improvement Plan and any additional criteria developed by the Copermittee, which may include historical data and data from sources other than what the Copermittee collects.

(b) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring Frequency

(i) Based on the prioritization of major MS4 outfalls developed under Provision D.2.b.(2)(a), each Copermittee must identify, at a minimum, the 5 highest priority major MS4 outfalls with non-storm water persistent flows that the Copermittee will monitor within its jurisdiction in each Watershed Management Area. For Responsible Copermittees identified by a TMDL in Attachment E to this Order, if the 5 chosen outfall locations are not sufficient to determine compliance with the TMDL(s), then each Responsible Copermittee must identify additional MS4 outfall monitoring locations within its jurisdiction sufficient to address compliance with the TMDL(s). If a Copermittee has less than 5 major outfalls within a Watershed

Management Area, then the Copermittee must monitor all of its major MS4 outfalls with persistent flows within each Watershed Management Area. The location of the highest priority non-storm water persistent flow MS4 outfall monitoring stations must be identified on the map required pursuant to Provision E.2.b.(1). The map must specify which MS4 outfalls are being monitored for compliance with a TMDL.

(ii) Each of the highest priority non-storm water persistent flow MS4 outfall monitoring stations identified pursuant to Provision D.2.b.(2)(b)(i) must be monitored under dry weather conditions at least semi-annually until one of the following occurs:

[a] The non-storm water discharges have been effectively eliminated (i.e. no flowing, pooled, or ponded water) for three consecutive dry weather monitoring events; or

[b] The source(s) of the persistent flows has been identified as a category of non-storm water discharges that does not require an NPDES permit and does not have to be addressed as an illicit discharge because it was not identified as a source of pollutants (i.e. constituents in non-storm water discharge do not exceed NALs), and the persistent flow can be re-prioritized to a lower priority; or

[c] The constituents in the persistent flow non-storm water discharge do not exceed NALs, and the persistent flow can be re-prioritized to a lower priority; or

[d] The source(s) of the persistent flows has been identified as a non-storm water discharge authorized by a separate NPDES permit.

(iii) Where the criteria under Provision D.2.b.(2)(b)(ii) are not met, but the threat to water quality has been reduced by the Copermittee, the highest priority persistent flow MS4 outfall monitoring stations may be reprioritized accordingly for continued dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1).

(iv) Each Copermittee must document removal or re-prioritization of the highest priority persistent flow MS4 outfall monitoring stations identified under Provision D.2.b.(2)(a) in the Water Quality Improvement Plan Annual Report. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized major MS4 outfall in the Watershed Management Area within its jurisdiction, unless there are no remaining qualifying major MS4 outfalls within the Copermittee's jurisdiction in the Watershed Management Area.

(c) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Observations

During each semi-annual monitoring event, each Copermittee must record field observations consistent with Table D-5 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(d) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Monitoring

During each semi-annual monitoring event, if conditions allow the collection of the data, each Copermittee must monitor and record the parameters in Table D-2 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(e) Non-Storm Water Persistent Flow MS4 Outfall Discharge Analytical Monitoring

During each semi-annual monitoring event in which measurable flow is present, each Copermittee must collect and analyze samples from each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Collect grab or composite samples to be analyzed at a qualified laboratory for the following constituents:

[a] Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,
[b] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,
[c] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,
[d] Applicable NAL constituents, and
[e] Constituents listed in Table D-7. The Copermittees may adjust the list of constituents for the Watershed Management Area if historical data or supporting information can be provided that demonstrates or justifies the analysis of a constituent is not necessary.

Table D-7. Analytical Monitoring Constituents for Persistent Flow MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Total Hardness • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Cadmium • Copper • Lead • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(iv) If the Copermittee identifies and eliminates the source of the persistent flow non-storm water discharge, analysis of the sample is not required.

c. WET WEATHER MS4 OUTFALL DISCHARGE MONITORING

The Copermittees must perform wet weather MS4 outfall monitoring to identify pollutants in storm water discharges from the MS4s, to guide pollutant source identification efforts, and to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order. The Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(1) Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees may adjust the wet weather MS4 outfall discharge monitoring locations in the Watershed Management Area, as needed, to identify pollutants in storm water discharges from MS4s, to guide pollutant source identification efforts, and to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of stations is at least equivalent to the number of stations required under Provision D.2.a.(3)(a). Additional outfall monitoring locations, above the minimum per jurisdiction, may be required to demonstrate compliance with the WQBELs associated with the applicable TMDLs in Attachment E.

(2) Wet Weather MS4 Outfall Discharge Monitoring Frequency

The Copermittees must monitor the wet weather MS4 outfall discharge monitoring stations in the Watershed Management Area at least once (1) per year. The Copermittees may need to increase the frequency of monitoring in order to identify pollutants in storm water discharges from the MS4s causing or contributing to the highest priority water quality conditions, to guide pollutant source identification efforts, or to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order.

(3) Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(4) Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(5) Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate

the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites collected over the length of the storm event or the first 24 hour period, whichever is shorter , composed of discrete samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

(iii) If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours.

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) The Copermittees may adjust the analytical monitoring required for the Watershed Management Area, if the Copermittees have historical data or supporting information that can demonstrate or provide justification that the analysis of a constituent is not necessary.

3. Special Studies

a. Within the term of this Order, the Copermittees must initiate the following special studies:

(1) At least two special studies in each Watershed Management Area to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that cause or contribute to highest priority water quality conditions identified in the Water Quality Improvement Plan.

(2) At least one special study for the San Diego Region to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that are impacting receiving waters on a regional basis in the San Diego Region.

(3) One of the two special studies in each Watershed Management Area required pursuant to Provision D.3.a.(1) may be replaced by a special study implemented pursuant to Provision D.3.a.(2).

b. The special studies must, at a minimum, be in conformance with the following criteria:

(1) The special studies must be related to the highest priority water quality conditions identified by the Copermittees in the Watershed Management Area and/or for the entire San Diego Region;

(2) The special studies developed pursuant to Provision D.3.a.(1) must:

(a) Be implemented within the applicable Watershed Management Area, and

(b) Require some form of participation by all the Copermittees within the Watershed Management Area;

(3) The special studies developed pursuant to Provision D.3.a.(2) must:

(a) Be implemented within the San Diego Region, and

(b) Require some form of participation by all Copermittees covered under the requirements of this Order.

(4) The Copermittees are encouraged to partner with environmental groups or third parties knowledgeable of watershed conditions to complete the required special studies.

c. Special studies developed to identify sources of pollutants and/or stressors should be pollutant and/or stressor specific and based on historical monitoring data and monitoring performed pursuant to Provisions D.1 and D.2. Development of source identification special studies should include the following:

(1) A compilation of known information on the specific pollutant and/or stressor,

including data on potential sources and movement of the pollutant and/or stressor within the watershed. Data generated by the Copermittees and others, as well as information available from a literature research on the pollutant and/or stressor should be compiled and analyzed as appropriate.

(2) An identification of data gaps, based on the compiled information generated on the specific pollutant and/or stressor identified in Provision D.3.c.(1). Source identification special studies should be developed to fill identified data gaps.

(3) A monitoring plan that will collect and provide data the Copermittees can utilize to do the following:

(a) Quantify the relative loading or impact of a pollutant and/or stressor from a particular source or pollutant generating activity;

(b) Improve understanding of the fate of a pollutant and/or stressor in the environment;

(c) Develop an inventory of known and suspected sources of a pollutant and/or stressor in the Watershed Management Area; and/or

(d) Prioritize known and suspected sources of a pollutant and/or stressor based on relative magnitude in discharges, geographical distribution (i.e., regional or localized), frequency of occurrence in discharges, human health risk, and controllability.

d. Special studies initiated prior to the effective date of this Order that meet the requirements of Provision D.3.b and are implemented during the term of this Order as part of the Water Quality Improvement Plan may be utilized to fulfill the special study requirements of Provision D.3.a. Special studies completed before the effective date of this Order cannot be utilized to fulfill the special study requirements of Provision D.3.a.

e. The Copermittees must submit the monitoring plans for the special studies in the Water Quality Improvement Plans required pursuant to Provision F.1.

f. The Copermittees are encouraged to share the results of the special studies regionally among the Copermittees to provide information useful in improving and adapting the management of non-storm water and storm water runoff through the implementation of the Water Quality Improvement Plans.

4. Assessment Requirements

Each Copermittee must evaluate the data collected pursuant to Provisions D.1, D.2 and D.3, and information collected during the implementation of the jurisdictional

runoff management programs required pursuant to Provision E, to assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a. Assessments must be performed as described in the following provisions:

a. RECEIVING WATERS ASSESSMENTS

(1) The Copermittees must assess and report the conditions of the receiving waters in the Watershed Management Area as follows:

(a) Based on data collected pursuant to Provision D.1.a, the assessments under Provision D.4.a.(2) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(b) Based on the data collected pursuant to Provisions D.1.a-e, the assessments required under Provision D.4.a.(2) must be included in the Report of Waste Discharge required pursuant to Provision F.5.b.

(2) The Copermittees must assess the status and trends of receiving water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under dry weather and wet weather conditions. For each of the three types of receiving waters in each Watershed Management Area the Copermittees must:

(a) Determine whether or not the conditions of the receiving waters are meeting the numeric goals established pursuant to Provision B.3.a;

(b) Identify the most critical beneficial uses that must be protected to ensure overall health of the receiving water;

(c) Determine whether or not those critical beneficial uses are being protected;

(d) Identify short-term and/or long-term improvements or degradation of those critical beneficial uses;

(e) Determine whether or not the strategies established in the Water Quality Improvement Plan contribute towards progress in achieving the interim and final numeric goals of the Water Quality Improvement Plan; and

(f) Identify data gaps in the monitoring data necessary to assess Provisions D.4.a.(2)(a)-(e).

b. MS4 OUTFALL DISCHARGES ASSESSMENTS

(1) Non-Storm Water Discharges Reduction Assessments

(a) Each Copermittee must assess and report the progress of its illicit discharge detection and elimination program, required to be implemented pursuant to Provision E.2, toward effectively prohibiting non-storm water and illicit discharges into the MS4 within its jurisdiction as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(2), the assessments under Provision D.4.b.(1)(b) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(ii) Based on the data collected pursuant to Provisions D.2.b, the assessments required under Provision D.4.b.(1)(c) must be included in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

(iii) Based on the data collected pursuant to Provisions D.2.b, the assessment required under Provision D.4.b.(1)(c) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.a.(2), each Copermittee must assess and report the following:

(i) Identify the known and suspected controllable sources (e.g. facilities, areas, land uses, pollutant generating activities) of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area;

(ii) Identify sources of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area that have been reduced or eliminated; and

(iii) Identify modifications to the field screening monitoring locations and frequencies for the MS4 outfalls in its inventory necessary to identify and eliminate sources of persistent flow non-storm water discharges pursuant to Provision D.2.b.

(c) Based on the dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1), each Copermittee must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(1)(b);

(ii) Based on the data collected and applicable NALs in the Water Quality Improvement Plan, rank the MS4 outfalls in the Copermittee's jurisdiction according to potential threat to receiving water quality, and produce a prioritized list of major MS4 outfalls for follow-up action to update the Water Quality Improvement Plan, with the goal of eliminating persistent flow non-storm water discharges and/or pollutant loads in order of the ranked priority list through targeted programmatic actions and source investigations;

(iii) For the highest priority major MS4 outfalls with persistent flows that are in exceedance of NALs, identify the known and suspected sources within the Copermittee's jurisdiction in the Watershed Management Area that may cause or contribute to the NAL exceedances;

(iv) Each Copermittee must analyze the data collected pursuant to Provision D.2.b, and utilize a model or other method, to calculate or estimate the non-storm water volumes and pollutant loads collectively discharged from all the major MS4s outfalls in its jurisdiction identified as having persistent dry weather flows during the monitoring year. These calculations or estimates must be updated annually.

[a] Each Copermittee must calculate or estimate the annual non-storm water volumes and pollutant loads collectively discharged from the Copermittee's major MS4 outfalls to receiving waters within the Copermittee's jurisdiction, with an estimate of the percent contribution from each known source for each MS4 outfall;

[b] Each Copermittee must annually identify and quantify (i.e. volume and pollutant loads) sources of non-storm water not subject to the Copermittee's legal authority that are discharged from the Copermittee's major MS4 outfalls to downstream receiving waters.

(v) Each Copermittee must review the data collected pursuant to Provision D.2.b and findings from the assessments required pursuant to Provision D.4.b.(1)(c)(i)-(iv) at least once during the term of this Order to:

[a] Identify reductions and progress in achieving reductions in non-storm water and illicit discharges to the Copermittee's MS4 in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction, with an estimate, if possible, of the non-storm water volume and/or pollutant load reductions

attributable to specific water quality strategies implemented by the Copermittee; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittee in the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction.

(vi) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(1)(c)(i)-(v).

(2) Storm Water Pollutant Discharges Reduction Assessments

(a) The Copermittees must assess and report the progress of the water quality improvement strategies, required to be implemented pursuant to Provisions B and E, toward reducing pollutants in storm water discharges from the MS4s within the Watershed Management Area as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(3), the assessments under Provision D.4.b.(2)(b) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(ii) Based on the data collected pursuant to Provisions D.2.c, the assessments required under Provision D.4.b.(2)(c) must be included in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

(iii) Based on the data collected pursuant to Provisions D.2.c, the assessment required under Provisions D.4.b.(2)(c)-(d) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.a.(3) the Copermittees must assess and report the following:

(i) The Copermittees must analyze the monitoring data collected pursuant to Provision D.2.a.(3), and utilize a watershed model or other method, to calculate or estimate the following for each monitoring year:

[a] The average storm water runoff coefficient for each land use type within the Watershed Management Area;

[b] The volume of storm water and pollutant loads discharged from each of the Copermittee's monitored MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch;

[c] The total flow volume and pollutant loadings discharged from the Copermittee's jurisdiction within the Watershed Management Area over the course of the wet season, extrapolated from the data produced from the monitored MS4 outfalls; and

[d] The percent contribution of storm water volumes and pollutant loads discharged from each land use type within each hydrologic subarea with a major MS4 outfall to receiving waters or within each major MS4 outfall to receiving waters in the Copermittee's jurisdiction within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch.

(ii) Identify modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify pollutants in storm water discharges from the MS4s in the Watershed Management Area pursuant to Provision D.2.c.(1).

(c) Based on the wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.c the Copermittees must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(2)(b);

(ii) Based on the data collected and applicable SALs in the Water Quality Improvement Plan, analyze and compare the monitoring data to the analyses and assumptions used to develop the Water Quality Improvement Plans, including strategies developed pursuant to Provision B.3, and evaluate whether those analyses and assumptions should be updated as a component of the adaptive management efforts pursuant to Provision B.5 for follow-up action to update the Water Quality Improvement Plan;

(iii) The Copermittees must review the data collected pursuant to Provision D.2.c and findings from the assessments required pursuant to Provisions D.4.b.(2)(c)(i)-(ii) at least once during the term of this Order to:

[a] Identify reductions or progress in achieving reductions in pollutant concentrations and/or pollutant loads from different land uses and/or drainage areas discharging from the Copermittees' MS4s in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters within the Watershed Management Area to the MEP, with an estimate, if possible, of the pollutant load reductions attributable to specific water quality strategies implemented by the Copermittees; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittees in the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters in the Watershed Management Area to the MEP.

(iv) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(iii).

(d) The Copermittees must evaluate all the data collected pursuant to Provision D.2.c, and incorporate new outfall monitoring data into time series plots for each long-term monitoring constituent for the Watershed Management Area, and perform statistical trends analysis on the cumulative long-term wet weather MS4 outfall discharge water quality data set.

c. Special Studies Assessments

The Copermittees must annually evaluate the results and findings from the special studies developed and implemented pursuant to Provision D.3, and assess their relevance to the Copermittees' efforts to characterize receiving water conditions, understand sources of pollutants and/or stressors, and control and reduce the discharges of pollutants from the MS4 outfalls to receiving waters in the Watershed Management Area. The Copermittees must report the results of the special studies assessments applicable to the Watershed Management Area, and identify any necessary modifications or updates to the Water Quality Improvement Plan based on the results in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

d. Integrated Assessment of Water Quality Improvement Plan

As part of the iterative approach and adaptive management process required for the Water Quality Improvement Plan pursuant to Provision B.5, the Copermittees in each Watershed Management Area must integrate the data collected pursuant to Provisions D.1-D.3, the findings from the assessments required pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to assess the effectiveness of, and identify necessary modifications to, the Water Quality Improvement Plan as follows:

(1) The Copermittees must re-evaluate the priority water quality conditions and numeric goals for the Watershed Management Area, as needed, during the term of this Order pursuant to Provision B.5.a. The re-evaluation and recommendations for modifications to the priority water quality conditions, and/or numeric goals and corresponding schedules may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to

Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The priority water quality conditions and numeric goals for the Watershed Management Area must be re-evaluated as follows:

(a) Re-evaluate the receiving water conditions in the Watershed Management Area in accordance with Provision B.2.a;

(b) Re-evaluate the impacts on receiving waters in the Watershed Management Area from MS4 discharges in accordance with Provision B.2.b;

(c) Re-evaluate the identification of MS4 sources of pollutants and/or stressors in accordance with Provision B.2.d;

(d) Identify beneficial uses of the receiving waters that are protected in accordance with Provision D.4.a;

(e) Evaluate the progress toward achieving the interim and final numeric goals for protecting impacted beneficial uses in the receiving waters.

(2) The Copermittees must re-evaluate the water quality improvement strategies for the Watershed Management Area during the term of this Order pursuant to Provision B.5.b. The re-evaluation and recommendations for modifications to the water quality improvement strategies and schedules may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The water quality improvement strategies for the Watershed Management Area must be re-evaluated as follows:

(a) Identify the non-storm water and storm water pollutant loads from the Copermittees' MS4 outfalls in the Watershed Management Area, calculated or estimated pursuant to Provisions D.4.b;

(b) Identify the non-storm water and storm water pollutant load reductions, or other improvements to receiving water or water quality conditions, that are necessary to attain the interim and final numeric goals identified in the Water Quality Improvement Plan for protecting beneficial uses in the receiving waters;

(c) Identify the non-storm water and storm water pollutant load reductions, or other improvements to the quality of MS4 discharges, that are necessary for the Copermittees to demonstrate that non-storm water and storm water discharges from their MS4s are not causing or contributing to exceedances of receiving water limitations;

(d) Evaluate the progress of the water quality improvement strategies toward

achieving the interim and final numeric goals identified in the Water Quality Improvement Plan for protecting beneficial uses in the receiving waters.

(3) The Copermittees must re-evaluate and adapt the water quality monitoring and assessment program for the Watershed Management Area when new information becomes available to improve the monitoring and assessment program pursuant to Provision B.5.c. The re-evaluation and recommendations for modifications to the monitoring and assessment program may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. Modifications to the water quality monitoring and assessment program must be consistent with the requirements of Provision D.1-D.3. The re-evaluation of the water quality monitoring and assessment program for the Watershed Management Area must consider the data gaps identified by the assessments required pursuant to Provisions D.4.a-b, and results of the special studies implemented pursuant to Provision D.4.c.

5. Monitoring Provisions

Each Copermittee must comply with all the monitoring, reporting, and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

E. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS

The purpose of this provision is for each Copermittee to implement a program to control the contribution of pollutants to and the discharges from the MS4 within its jurisdiction. The goal of the jurisdictional runoff management programs is to implement strategies that effectively prohibit non-storm water discharges to the MS4 and reduce the discharge of pollutants in storm water to the MEP. This goal will be accomplished through implementing the jurisdictional runoff management programs in accordance with the strategies identified in the Water Quality Improvement Plans.

Each Copermittee must update its jurisdictional runoff management program document, in accordance with Provision F.2.a, to incorporate all the requirements of Provision E. Until the Copermittee has updated its jurisdictional runoff management program document with the requirements of Provision E, the Copermittee must continue implementing its current jurisdictional runoff management program.

1. Legal Authority Establishment and Enforcement

a. Each Copermittee must establish, maintain, and enforce adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 through statute, ordinance, permit, contract, order, or similar means. This legal authority must, at a minimum, authorize the Copermittee to:

(1) Prohibit and eliminate all illicit discharges and illicit connections to its MS4;

(2) Control the contribution of pollutants in discharges of runoff associated with industrial and construction activity to its MS4 and control the quality of runoff from industrial and construction sites, including industrial and construction sites which have coverage under the statewide General Permit for Discharges of Storm Water Associated with Industrial Activities (Industrial General Permit) or General Permit for Discharges of Storm Water Associated with Construction Activities (Construction General Permit), as well as to those sites which do not;

(3) Control the discharge of spills, dumping, or disposal of materials other than storm water into its MS4;

(4) Control through interagency agreements among Copermittees the contribution of pollutants from one portion of the MS4 to another portion of the MS4;

(5) Control, by coordinating and cooperating with other owners of the MS4 such as Caltrans, the U.S. federal government, or sovereign Native American Tribes through interagency agreements, where possible, the contribution of pollutants from their portion of the MS4 to the portion of the MS4 within the Copermittee's jurisdiction;

(6) Require compliance with conditions in its statutes, ordinances, permits, contracts, orders, or similar means to hold dischargers to its MS4 accountable for their contributions of pollutants and flows;

(7) Require the use of BMPs to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(8) Require documentation on the effectiveness of BMPs implemented to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(9) Utilize enforcement mechanisms to require compliance with its statutes, ordinances, permits, contracts, orders, or similar means; and

(10) Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with its statutes, ordinances, permits, contracts, orders, or similar means and with the requirements of this Order, including the prohibition of illicit discharges and connections to its MS4; the Copermittee must also have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from industrial facilities, including construction sites, discharging into its MS4.

b. With the first Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3), each Copermittee must submit a statement certified by its Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative that the Copermittee has taken the necessary steps to obtain and maintain full legal authority within its jurisdiction to implement and enforce each of the requirements contained in this Order.

2. Illicit Discharge Detection and Elimination

Each Copermittee must implement a program to actively detect and eliminate illicit discharges and improper disposal into the MS4, or otherwise require the discharger to apply for and obtain a separate NPDES permit. The illicit discharge detection and elimination program must be implemented in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include, at a minimum, the following requirements:

a. Non-Storm Water Discharges

Each Copermittee must address all non-storm water discharges as illicit discharges unless a non-storm water discharge is either identified as a discharge authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to the following requirements:

(1) Discharges of non-storm water to the MS4 from the following categories must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG919001 (Order No. R9-2007-0034, or subsequent order) for discharges to San Diego Bay, or NPDES Permit No. CAG919002 (Order No. R9-2008-0002, or subsequent order) for discharges to surface waters other than San Diego Bay:

(1) Uncontaminated pumped ground water;

(2) Discharges from foundation drains;[20]

(3) Water from crawl space pumps; and

(4) Water from footing drains.[20]

(2) Discharges of non-storm water from water line flushing and water main breaks to the MS4 must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG 679001 (Order No. R9-2010-0003 or subsequent order). This category includes water line flushing and water main break discharges from water purveyors issued a water supply permit by the California Department of Public Health or federal military installations. Discharges from recycled or reclaimed water lines to the MS4 must be addressed as illicit discharges, unless the discharges have coverage under a separate NPDES permit.

(3) Discharges of non-storm water to the MS4 from the following categories must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a source of pollutants to receiving waters:

(a) Diverted stream flows;

(b) Rising ground waters;

(c) Uncontaminated ground water infiltration to MS4s;

(d) Springs;

(e) Flows from riparian habitats and wetlands;

(f) Discharges from potable water sources;

[20] Provision E.2.a.(1) only applies to this category of non-storm water if the system is designed to be located at or below the groundwater table to actively or passively extract groundwater during any part of the year.

(g) Discharges from foundation drains;[21] and

(h) Discharges from footing drains.[21]

(4) Discharges of non-storm water to the MS4 from the following categories must be controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means. Discharges of non-storm water to the MS4 from the following categories not controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means must be addressed by the Copermittee as illicit discharges.

(a) Air conditioning condensation

The discharge of air conditioning condensation should be directed to landscaped areas or other pervious surfaces, or to the sanitary sewer, where feasible.

(b) Individual residential vehicle washing

(i) The discharge of wash water should be directed to landscaped areas or other pervious surfaces where feasible; and

(ii) The minimization of water, washing detergent and other vehicle wash products used for residential vehicle washing, and the implementation of other practices or behaviors that will prevent the discharge of pollutants associated with individual residential vehicle washing from entering the MS4 must be encouraged.

(c) Dechlorinated swimming pool discharges

(i) Residual chlorine, algaecide, filter backwash, or other pollutants from swimming pools must be eliminated prior to discharging to the MS4; and

(ii) The discharge of saline swimming pool water must be directed to the sanitary sewer, landscaped areas, or other pervious surfaces that can accommodate the volume of water, unless the saline swimming pool water can be discharged via a pipe or concrete channel directly to a naturally saline water body (e.g. Pacific Ocean).

(5) Firefighting discharges to the MS4 must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a significant source of pollutants to receiving waters. Firefighting discharges to the MS4 not identified as a significant source of pollutants to receiving waters, must be addressed, at a minimum, as follows:

[21] Provision E.2.a.(3) only applies to this category of non-storm water discharge if the system is designed to be located above the groundwater table at all times of the year, and the system is only expected to discharge non-storm water under unusual circumstances.

(a) Non-emergency firefighting discharges

(i) Building fire suppression system maintenance discharges (e.g. sprinkler line flushing) to the MS4 must be addressed as illicit discharges unless BMPs are implemented to prevent pollutants associated with such discharges to the MS4.

(ii) Non-emergency firefighting discharges (i.e., discharges from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems) must be addressed by a program, to be developed and implemented by the Copermittee, to reduce or eliminate pollutants in such discharges from entering the MS4.

(b) Emergency firefighting discharges

Each Copermittee should develop and encourage implementation of BMPs to reduce or eliminate pollutants in emergency firefighting discharges to the MS4s and receiving waters within its jurisdiction. During emergency situations, priority of efforts should be directed toward life, property, and the environment (in descending order). BMPs should not interfere with immediate emergency response operations or impact public health and safety.

(6) If the Copermittee or San Diego Water Board identifies any category of non-storm water discharges listed under Provisions E.2.a.(1)-(4) as a source of pollutants to receiving waters, the category must be prohibited through ordinance, order, or similar means and addressed as an illicit discharge. Alternatively, the Copermittee may propose controls to be implemented for the category of non-storm water discharges as part of the Water Quality Improvement Plan instead of prohibiting the category of non-storm water discharges, and implement the controls if accepted by the San Diego Water Board as part of the Water Quality Improvement Plan.

(7) Each Copermittee must, where feasible and priorities and resources allow, reduce or eliminate non-storm water discharges listed under Provisions E.2.a.(1)-(4) into its MS4, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit.

b. PREVENT AND DETECT ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to prevent and detect illicit discharges to the MS4:

(1) Each Copermittee must maintain an updated map of its entire MS4 and the corresponding drainage areas. The accuracy of the MS4 map must be confirmed during the field screening required pursuant to Provision E.2.c.

The MS4 map must be included as part of the jurisdictional runoff management program document. Any geographic information system (GIS) layers or files used by the Copermittee to maintain the MS4 map must be made available to the San Diego Water Board upon request. The MS4 map must identify the following:

(a) All segments of the MS4 owned, operated, and maintained by the Copermittee;

(b) All known locations of inlets that discharge and/or collect runoff into the Copermittee's MS4;

(c) All known locations of connections with other MS4s not owned or operated by the Copermittee (e.g. Caltrans MS4s);

(d) All known locations of MS4 outfalls and private outfalls that discharge runoff collected from areas within the Copermittee's jurisdiction;

(e) All segments of receiving waters within the Copermittee's jurisdiction that receive and convey runoff discharged from the Copermittee's MS4 outfalls;

(f) Locations of the MS4 outfalls, identified pursuant to Provision D.2.a.(1), within its jurisdiction; and

(g) Locations of the non-storm water persistent flow MS4 outfall discharge monitoring stations, identified pursuant to Provision D.2.b.(2), within its jurisdiction.

(2) Each Copermittee must use Copermittee personnel and contractors to assist in identifying and reporting illicit discharges and connections during their daily employment activities.

(3) Each Copermittee must promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges to or from the MS4, including the following methods for public reporting:

(a) Operate a public hotline, which can be Copermittee-specific or shared by the Copermittees, and must be capable of receiving reports in both English and Spanish 24 hours per day and seven days per week; and

(b) Designate an e-mail address for receiving electronic reports from the public, which can be Copermittee-specific or shared by the Copermittees, and must be prominently displayed on the Copermittee's webpage and the Regional Clearinghouse required pursuant to Provision F.4.

(4) Each Copermittee must implement practices and procedures (including a notification mechanism) to prevent, respond to, contain, and clean up any spills that may discharge into the MS4 within its jurisdiction from any source. The Copermittee must coordinate, to the extent possible, with spill response teams to prevent entry of spills into the MS4, and prevent contamination of surface water, ground water, and soil. The Copermittee must coordinate spill prevention, containment, and response activities throughout all appropriate Copermittee departments, programs, and agencies.

(5) Each Copermittee must implement practices and procedures to prevent and limit infiltration of seepage from sanitary sewers (including private laterals and failing septic systems) to the MS4.

(6) Each Copermittee must coordinate, when necessary, with upstream Copermittees and/or entities to prevent illicit discharges from upstream sources into the MS4 within its jurisdiction.

c. FIELD SCREENING

Each Copermittee must conduct field screening (i.e. visual observations, field testing, and/or analytical testing) of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4 in accordance with the dry weather MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

d. INVESTIGATE AND ELIMINATE ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to investigate and eliminate illicit discharges to the MS4:

(1) Each Copermittee must prioritize and determine when follow-up investigations will be performed in response to visual observations and/or water quality monitoring data collected during an investigation of a detected non-storm water or illicit discharge to or from the MS4. The criteria for prioritizing investigations must consider the following:

(a) Pollutants identified as causing or contributing to the highest water quality priorities identified in the Water Quality Improvement Plan;

(b) Pollutants identified as causing or contributing, or threatening to cause or contribute to impairments in water bodies on the 303(d) List and/or in environmentally sensitive areas (ESAs), located within its jurisdiction;

(c) Pollutants identified from sources or land uses known to exist within the area, drainage basin, or watershed that discharges to the portion of the MS4 within its jurisdiction included in the investigation;

(d) Pollutants identified as causing or contributing to an exceedance of a NAL in the Water Quality Improvement Plan; and

(e) Pollutants identified as a threat to human health or the environment.

(2) Each Copermittee must implement procedures to investigate and inspect portions of its MS4 that, based on reports or notifications, field screening, or other appropriate information, indicate a reasonable potential of receiving, containing, or discharging pollutants due to illicit discharges, illicit connections, or other sources of non-storm water. The procedures must include the following:

(a) Each Copermittee must develop criteria to:

(i) Assess the validity of each report or notification received; and

(ii) Prioritize the response to each report or notification received.

(b) Each Copermittee must prioritize and respond to each valid report or notification (e.g., public reports, staff or contractor reports and notifications, etc.) of an incident in a timely manner.

(c) In accordance with the requirements of Provision E.2.d.(1), each Copermittee must investigate and seek to identify the source(s) of discharges of non-storm water where flows are observed in and from the MS4 during the field screening required pursuant to Provision D.2.b.(1) as follows:

(i) Obvious illicit discharges must be immediately investigated to identify the source(s) of non-storm water discharges;

(ii) The investigation must include field investigations to identify sources or potential sources for the discharge, unless the source or potential source has already been identified during previous investigations; and

(iii) The investigation may include follow-up field investigations and/or reviewing Copermittee inventories and other land use data to identify potential sources of the discharge.

(d) Each Copermittee must maintain records and a database of the following information:

(i) Location of incident, including hydrologic subarea, portion of MS4 receiving the non-storm water or illicit discharge, and point of discharge or potential discharge from MS4 to receiving water;

(ii) Source of information initiating the investigation (e.g., public reports, staff or contractor reports and notifications, field screening, etc.);

(iii) Date the information used to initiate the investigation was received;

(iv) Date the investigation was initiated;

(v) Dates of follow-up investigations;

(vi) Identified or suspected source of the illicit discharge or connection, if determined;

(vii) Known or suspected related incidents, if any;

(viii) Result of the investigation; and

(ix) If a source cannot be identified and the investigation is not continued, document the response pursuant to the requirements of Provision E.2.d.(4).

(e) Each Copermittee must maintain records and, in accordance with the priorities of the Water Quality Improvement Plan, seek to identify the source(s) of non-storm water discharges from the MS4 where there is evidence of non-storm water having been discharged into or from the MS4 (e.g., pooled water), in accordance with MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

(3) Each Copermittee must initiate the implementation of procedures, in a timely manner, to eliminate all detected and identified illicit discharges and connections within its jurisdiction. The procedures must include the following responses:

(a) Each Copermittee must enforce its legal authority, as required under Provision E.1, to eliminate illicit discharges and connections to the MS4.

(b) If the Copermittee identifies the source as a controllable source of non-storm water or illicit discharge or connection, the Copermittee must implement its Enforcement Response Plan pursuant to Provision E.6 and enforce its legal authority to prohibit and eliminate illicit discharges and connections to its MS4.

(c) If the Copermittee identifies the source of the discharge as a category of non-storm water discharges in Provision E.2.a, and the discharge is in exceedance of NALs in the Water Quality Improvement Plan, then the Copermittee must determine if: (1) this is an isolated incident or set of circumstances that will be addressed through its Enforcement Response Plan pursuant to Provision E.6, or (2) the category of discharge must be addressed through the prohibition of that category of discharge as an illicit discharge pursuant to Provision E.2.a.(6).

(d) If the Copermittee suspects the source of the non-storm water discharge as natural in origin (i.e. non-anthropogenically influenced) and in conveyance into the MS4, then the Copermittee must document and

provide the data and evidence necessary to demonstrate to the San Diego Water Board that it is natural in origin and does not require further investigation.

(e) If the Copermittee is unable to identify and document the source of a recurring non-storm water discharge to or from the MS4, then the Copermittee must address the discharge as an illicit discharge and update its jurisdictional runoff management program to address the common and suspected sources of the non-storm water discharge within its jurisdiction in accordance with the Copermittee's priorities.

(4) Each Copermittee must submit a summary of the non-storm water discharges and illicit discharges and connections investigated and eliminated within its jurisdiction with each Water Quality Improvement Plan Annual Report required under Provision F.3.b.(3) of this Order.

3. Development Planning

Each Copermittee must use their land use and planning authorities to implement a development planning program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. BMP Requirements for All Development Projects

Each Copermittee must prescribe the following BMP requirements during the planning process (i.e. prior to project approval and issuance of local permits) for all development projects (regardless of project type or size), where local permits are issued, including unpaved roads and flood management projects:

(3) General Requirements

(a) Onsite BMPs must be located so as to remove pollutants from runoff prior to its discharge to any receiving waters, and as close to the source as possible;

(b) Structural BMPs must not be constructed within waters of the U.S.

(c) Onsite BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors (e.g. mosquitos, rodents, or flies).

(4) Source Control BMP Requirements

The following source control BMPs must be implemented at all development projects where applicable and feasible:

(a) Prevention of illicit discharges into the MS4;

(b) Storm drain system stenciling or signage;

(c) Protect outdoor material storage areas from rainfall, run-on, runoff, and wind dispersal;

(d) Protect materials stored in outdoor work areas from rainfall, run-on, runoff, and wind dispersal;

(e) Protect trash storage areas from rainfall, run-on, runoff, and wind dispersal; and

(f) Any additional BMPs determined to be necessary by the Copermittee to minimize pollutant generation at each project.

(5) Low Impact Development (LID) BMP Requirements

The following LID BMPs must be implemented at all development projects where applicable and feasible:

(a) Maintenance or restoration of natural storage reservoirs and drainage corridors (including topographic depressions, areas of permeable soils, natural swales, and ephemeral and intermittent streams);[22]

(b) Buffer zones for natural water bodies (where buffer zones are technically infeasible, require project applicant to include other buffers such as trees, access restrictions, etc.);

(c) Conservation of natural areas within the project footprint including existing trees, other vegetation, and soils;

(d) Construction of streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided public safety is not compromised;

(e) Minimization of the impervious footprint of the project;

(f) Minimization of soil compaction to landscaped areas;

(g) Disconnection of impervious surfaces through distributed pervious areas;

[22] Development projects proposing to dredge or fill materials in waters of the U.S. must obtain a CWA Section 401 Water Quality Certification. Projects proposing to dredge or fill waters of the state must obtain waste discharge requirements.

(h) Landscaped or other pervious areas designed and constructed to effectively receive and infiltrate, retain and/or treat runoff from impervious areas, prior to discharging to the MS4;

(i) Small collection strategies located at, or as close as possible to, the source (i.e. the point where storm water initially meets the ground) to minimize the transport of runoff and pollutants to the MS4 and receiving waters;

(j) Use of permeable materials for projects with low traffic areas and appropriate soil conditions;

(k) Landscaping with native or drought tolerant species; and

(l) Harvesting and using precipitation.

b. PRIORITY DEVELOPMENT PROJECTS

Priority Development Projects are land development projects that fall under the planning and building authority of the Copermittee for which the Copermittee must impose specific requirements, in addition to those described in Provision E.3.a, including the implementation of structural BMPs to meet the performance requirements described in Provision E.3.c.

(1) Definition of Priority Development Project

Priority Development Projects include the following:

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(b) Redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site on an existing site of 10,000 square feet or more of impervious surfaces). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(c) New and redevelopment projects that create 5,000 square feet or more of impervious surface (collectively over the entire project site), and support one or more of the following uses:

(i) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812).

(ii) Hillside development projects. This category includes development on any natural slope that is twenty-five percent or greater.

(iii) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce.

(iv) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

(d) New or redevelopment projects that create or replace 2,500 square feet or more of impervious surface (collectively over the entire project site), and discharging directly to an Environmentally Sensitive Area (ESA). "Discharging directly to" includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands).

(e) New development projects that support one or more of the following uses:

(i) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

(ii) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

(f) New or redevelopment projects that result in the disturbance of one or more acres of land and are expected to generate pollutants post construction.

(2) <u>Special Considerations for Redevelopment Projects</u>

The structural BMP performance requirements of Provision E.3.c are applicable to redevelopment Priority Development Projects, as defined in E.3.b.(1), as follows:

(a) Where redevelopment results in the creation or replacement of impervious surface in an amount of less than fifty percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provision E.3.c apply only to the creation or replacement of impervious surface, and not the entire development; or

(b) Where redevelopment results in the creation or replacement of impervious surface in an amount of more than fifty percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provision E.3.c apply to the entire development.

(3) Priority Development Project Exemptions

Each Copermittee has the discretion to exempt the following projects from being defined as Priority Development Projects:

(a) New or retrofit paved sidewalks, bicycle lanes, or trails that meet the following criteria:

(i) Designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas; OR

(ii) Designed and constructed to be hydraulically disconnected from paved streets or roads; OR

(iii) Designed and constructed with permeable pavements or surfaces in accordance with USEPA Green Streets guidance.[23]

(b) Retrofitting or redevelopment of existing paved alleys, streets or roads that are designed and constructed in accordance with the USEPA Green Streets guidance.[24]

c. Priority Development Project Structural BMP Performance Requirements

In addition to the BMP requirements listed for all development projects under Provision E.3.a, Priority Development Projects must also implement structural BMPs that conform to performance requirements described below.

(1) Storm Water Pollutant Control BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite structural BMPs to control pollutants in storm water that may be discharged from a project as follows:

(a) Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite the pollutants contained in the volume of storm water runoff produced from a 24-hour 85th percentile storm event (design capture volume);[25]

[23] See "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).
[24] Ibid.
[25] This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are

(i) If a Copermittee determines that implementing BMPs to retain the full design capture volume onsite for a Priority Development Project is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize biofiltration BMPs. Biofiltration BMPs must be designed to have an appropriate hydraulic loading rate to maximize storm water retention and pollutant removal, as well as to prevent erosion, scour, and channeling within the BMP,[26] and must be sized to:

[a] Treat 1.5 times the design capture volume not reliably retained onsite, OR

[b] Treat the design capture volume not reliably retained onsite with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite.

(ii) If a Copermittee determines that biofiltration is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize flow-thru treatment control BMPs to treat runoff leaving the site, AND mitigate for the design capture volume not reliably retained onsite pursuant to Provision E.3.c.(1)(b). Flow thru treatment control BMPs must be sized and designed to:

[a] Remove pollutants from storm water to the MEP;

[b] Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;

[c] Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Flow-thru treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of flow-thru treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

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encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals.

[26] As part of the Copermittee's update to its BMP Design Manual, pursuant to Provision E.3.d, the Copermittee must provide guidance for hydraulic loading rates and other biofiltration design criteria necessary to maximize storm water retention and pollutant removal.

(b) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1)(a). The Priority Development Project must mitigate for the portion of the pollutant load in the design capture volume not retained onsite if Provision E.3.c.(3) is utilized. If a Priority Development Project is allowed to utilize alternative compliance, flow-thru treatment control BMPs must be implemented to treat the portion of the design capture volume that is not reliably retained onsite. Flow-thru treatment control BMPs must be sized and designed in accordance with Provisions E.3.c.(1)(a)(ii)[a]-[c].

(2) Hydromodification Management BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite BMPs to manage hydromodification that may be caused by storm water runoff discharged from a project as follows:

(a) Post-project runoff conditions (flow rates and durations) must not exceed pre-development runoff conditions by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat downstream of Priority Development Projects).

(i) In evaluating the range of flows that results in increased potential for erosion of natural (non-hardened) channels, the lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks.

(ii) The Copermittees may use monitoring results collected pursuant to Provision D.1.a.(2) to re-define the range of flows resulting in increased potential for erosion, or degraded instream habitat conditions, as warranted by the data.

(b) Each Priority Development Project must avoid critical sediment yield areas known to the Copermittee or identified by the optional Watershed Management Area Analysis pursuant to Provision B.3.b.(4), or implement measures that allow critical coarse sediment to be discharged to receiving waters, such that there is no net impact to the receiving water.

(c) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the performance requirements of Provision E.3.c.(2)(a). The Priority Development Project must mitigate for the post-project runoff conditions not fully managed onsite if Provision E.3.c.(3) is utilized.

(d) Exemptions

Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provisions E.3.c.(2) where the project discharges storm water runoff to:

(i) Existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;

(ii) Conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; or

(iii) An area identified by the Copermittees as appropriate for an exemption by the optional Watershed Management Area Analysis incorporated into the Water Quality Improvement Plan pursuant to Provision B.3.b.(4).

(e) Interim Timeframe Exemptions

Until the Copermittees have updated their BMP Design Manual in accordance with Provision F.2.b with the requirements of Provision E, the Copermittees have the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provision E.3.c.(2) where the project discharges storm water runoff directly to:

(i) An engineered channel conveyance system with a capacity to convey peak flows generated by the 10-year storm event all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; and

(ii) Large river reaches with a drainage area larger than 100 square miles and a 100-year flow capacity in excess of 20,000 cubic feet per second, provided that properly sized energy dissipation is included at all Priority Development Project discharge points.

(3) Alternative Compliance Program to Onsite Structural BMP Implementation

At the discretion of each Copermittee, Priority Development Projects may be allowed to participate in an alternative compliance program in lieu of implementing the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a), provided that the Water Quality Improvement Plan includes the optional Watershed Management Area Analysis described in Provision B.3.b.(4)~~.~~, and Water Quality Equivalency

calculations have been accepted by the San Diego Water Board's Executive Officer pursuant to Provision E.3.c.(3)(a). The alternative compliance program is available to a Priority Development Project only if the Priority Development Project applicant enters into a voluntary agreement with the Copermittee authorizing this arrangement. In addition to the voluntary agreement, relief from implementing structural BMPs onsite may be authorized by the Copermittee under the following conditions:

(a) Water Quality Equivalency

Copermittees must submit Water Quality Equivalency calculations for acceptance by the San Diego Water Board's Executive Officer prior to administering an alternative compliance program in order to establish a regional and technical basis for determining the water quality benefits associated with alternative compliance projects. Accepted Water Quality Equivalency calculations must be incorporated as part of any Copermittee's alternative compliance program necessary for evaluating Watershed Management Area Analysis candidate projects, project applicant-proposed alternative compliance projects, alternative compliance in lieu fee structures, and alternative compliance water quality credit systems as described in Provisions E.3.c.(3)(b)-(e).

~~(a)~~(b) Watershed Management Area Analysis Candidate Projects

The Priority Development Project applicant agrees to fund, contribute funds to, or implement a candidate project identified by the Copermittees in the Watershed Management Area Analysis included in the Water Quality Improvement Plan, pursuant to Provisions B.3.b.(4) subject to the following conditions:

(i) The Copermittee must determine that implementation of the candidate project will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a) onsite;

(ii) If the Priority Development Project applicant chooses to fully or partially fund a candidate project, then the in-lieu fee structure described in Provision E.3.c.(3)(c) must be followed;

(iii) If the Priority Development Project applicant chooses to fully or partially fund a candidate project, then the Copermittee must ensure that the funds to be obtained from the Priority Development Project applicant are sufficient to mitigate for impacts caused by not fully implementing structural BMPs onsite, pursuant to the performance requirements described in Provisions E.3.c.(1) and E.3.c.(2)(a);

(iv) If the Priority Development Project applicant chooses to implement a candidate project, then the Copermittee must ensure that pollutant

control and/or hydromodification management within the candidate project are sufficient to mitigate for impacts caused by not implementing structural BMPs fully onsite, pursuant to the performance requirements described in Provisions E.3.c.(1) and E.3.c.(2)(a);

(v) The voluntary agreement to fund, partially fund, or implement a candidate project must include reliable sources of funding for operation and maintenance of the candidate project;

(vi) Design of the candidate project must be conducted under an appropriately qualified engineer, geologist, architect, landscape architect, or other professional, licenses where applicable, and competent and proficient in the fields pertinent to the candidate project design;

(vii) The candidate project must be constructed as soon as possible, but no later than 4 years after the certificate of occupancy is granted for the first Priority Development Project that contributed funds toward the construction of the candidate project, unless a longer period of time is authorized by the San Diego Water Board Executive Officer; and

(viii) If the candidate project is constructed after the Priority Development Project is constructed, the Copermittee must require temporal mitigation for pollutant loads and altered flows that are discharged from the Priority Development Project.

~~(b)~~(c) Project Applicant Proposed Alternative Compliance Projects

The Copermittee may allow a Priority Development Project applicant to propose and fund, contribute funds to, or implement an alternative compliance project not identified by the Watershed Management Area Analysis included in the Water Quality Improvement Plan pursuant to Provisions B.3.b.(4). This option is allowed provided the Copermittee determines that implementation of the alternative compliance project will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a) onsite, and is subject to the requirements described in Provisions E.3.c.(3)(a)(ii)-(viii).

~~(c)~~(d) Alternative Compliance In-Lieu Fee Structure

If a Copermittee chooses to allow a Priority Development Project applicant to fund, or partially fund a candidate project or an alternative compliance project, then the Copermittee must develop and implement an in-lieu fee structure. This may be developed individually or with other Copermittees and/or entities, as a means for designing, developing, constructing, operating and maintaining offsite alternative compliance projects. The in-

lieu fee must be transferred to the Copermittee (for public projects) or an escrow account (for private projects) prior to the construction of the Priority Development Project.

~~(d)~~(e) Alternative Compliance Water Quality Credit System Option

The Copermittee may develop and implement an alternative compliance water quality credit system option, individually or with other Copermittees and/or entities, provided that such a credit system clearly exhibits that it will not allow discharges from Priority Development Projects to cause or contribute to a net impact over and above the impact caused by projects meeting the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a). Any credit system that a Copermittee chooses to implement must be submitted to the San Diego Water Board Executive Officer for review and acceptance as part of the Water Quality Improvement Plan.

(4) Long-Term Structural BMP Maintenance

Each Copermittee must require the project applicant to submit proof of the mechanism under which ongoing long-term maintenance of all structural BMPs will be conducted.

(5) Infiltration and Groundwater Protection

(a) Structural BMPs designed to primarily function as large, centralized infiltration devices (such as large infiltration trenches and infiltration basins) must not cause or contribute to an exceedance of an applicable groundwater quality objective. At a minimum, such infiltration BMPs must be in conformance with the design criteria listed below, unless the development project applicant demonstrates to the Copermittee that one or more of the specific design criteria listed below are not necessary to protect groundwater quality. The design criteria listed below do not apply to small infiltration systems dispersed throughout a development project.

(i) Runoff must undergo pretreatment such as sedimentation or filtration prior to infiltration;

(ii) Pollution prevention and source control BMPs must be implemented at a level appropriate to protect groundwater quality at sites where infiltration BMPs are to be used;

(iii) Infiltration BMPs must be adequately maintained to remove pollutants in storm water to the MEP;

(iv) The vertical distance from the base of any infiltration BMP to the seasonal high groundwater mark must be at least 10 feet. Where groundwater basins do not support beneficial uses, this vertical

distance criteria may be reduced, provided groundwater quality is maintained;

(v) The soil through which infiltration is to occur must have physical and chemical characteristics (e.g., appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses;

(vi) Infiltration BMPs must not be used for areas of industrial or light industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee, unless source control BMPs to prevent exposure of high threat activities are implemented, or runoff from such activities is first treated or filtered to remove pollutants prior to infiltration; and

(vii) Infiltration BMPs must be located a minimum of 100 feet horizontally from any water supply wells.

(b) The Copermittee may develop, individually or with other Copermittees, alternative mandatory design criteria to that listed above for infiltration BMPs which are designed to primarily function as centralized infiltration devices. Before implementing the alternative design criteria in the development planning process the Copermitee(s) must:

(i) Notify the San Diego Water Board of the intent to implement the alternative design criteria submitted; and

(ii) Comply with any conditions set by the San Diego Water Board.

d. BMP DESIGN MANUAL UPDATE

Each Copermittee must update its BMP Design Manual[27] pursuant to Provision F.2.b. Until the Copermittee has updated its BMP Design Manual with the requirements of Provisions E.3.a-c, the Copermittee must continue implementing its current BMP Design Manual. Unless directed otherwise by the San Diego Water Board, the Copermittee must implement the BMP Design Manual within 180 days of completing the update. The update of the BMP Design Manual must include the following:

(1) Updated procedures to determine the nature and extent of storm water requirements applicable to a potential development or redevelopment projects. These procedures must inform project applicants of the storm water management requirements applicable to their project including, but not limited to, general requirements for all development projects, structural BMP design procedures and requirements, hydromodification management requirements,

[27] The BMP Design Manual was formerly known as the Standard Storm Water Mitigation Plan under Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016.

requirements specific to phased projects, and procedures specific to private developments and public improvement projects;

(2) Updated procedures to identify pollutants and conditions of concern for selecting the most appropriate structural BMPs that consider, at a minimum, the following:

(a) Receiving water quality (including pollutants for which receiving waters are listed as impaired under the CWA section 303(d) List);

(b) Pollutants, stressors, and/or receiving water conditions that cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(c) Land use type of the project and pollutants associated with that land use type; and

(d) Pollutants expected to be present onsite.

(3) Updated procedures for designing structural BMPs, including any updated performance requirements to be consistent with the requirements of Provision E.3.c for all structural BMPs listed in the BMP Design Manual;

(4) Long-term maintenance criteria for each structural BMP listed in the BMP Design Manual; and

(5) Alternative compliance criteria, in accordance with the requirements under Provision E.3.c.(3), if the Copermittee elects to allow Priority Development Projects within its jurisdiction to utilize alternative compliance.

e. PRIORITY DEVELOPMENT PROJECT BMP IMPLEMENTATION AND OVERSIGHT

Each Copermittee must implement a program that requires and confirms structural BMPs on all Priority Development Projects are designed, constructed, and maintained to remove pollutants in storm water to the MEP.

(1) Structural BMP Approval and Verification Process

(a) Each Copermittee must require and confirm that for all Priority Development Project applications that have not received prior lawful approval by the Copermittee by the ~~time~~ effective date of the BMP Design Manual ~~is implemented~~~~updated~~ pursuant to Provision E.3.d, the requirements of Provision E.3 ~~are~~ must be implemented. For project applications that have received prior lawful approval before the effective date of the BMP Design Manual ~~is implemented~~~~updated~~ pursuant to Provision E.3.d, the Copermittee may allow previous land development requirements to apply.

(b) For private development projects, prior lawful approval under this Order is a development approval or construction permit that either: 1) complies with the Priority Development Project requirements of the Fourth Term MS4 permits[28] and includes the design of the storm water drainage system for the project in its entirety as accepted by the Copermittee, or 2) confers a vested right to proceed under prior storm water requirements. For public projects, approval means that the design of the storm water drainage system for the project in its entirety has been stamped by the City or County Engineer. For any applicable portion(s) of the project, approvals may be extended to any subsequent discretionary or ministerial approvals necessary to implement the initial project approval with the following conditions:

(i) All subsequent permits must be issued within 5 years of the effective date of the BMP Design Manual pursuant to Provision E.3.d; and

(ii) BMP installation under subsequent approvals must remain in substantial conformity with the design of the storm water drainage system included in the initial approval.

~~(b)~~(c) Each Copermittee must identify the roles and responsibilities of its various municipal departments in implementing the structural BMP requirements, including each stage of a project from application review and approval through BMP maintenance and inspections.

~~(c)~~(d) Each Copermittee must require and confirm that appropriate easements and ownerships are properly recorded in public records and the information is conveyed to all appropriate parties when there is a change in project or site ownership.

~~(d)~~(e) Each Copermittee must require and confirm that prior to occupancy and/or intended use of any portion of the Priority Development Project, each structural BMP is inspected to verify that it has been constructed and is operating in compliance with all of its specifications, plans, permits, ordinances, and the requirements of this Order.

[28] Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016 for San Diego, Orange, and Riverside Counties, respectively.

(2) Priority Development Project Inventory and Prioritization

(a) Each Copermittee must develop, maintain, and update at least annually, a watershed-based database to track and inventory all Priority Development Projects and associated structural BMPs within its jurisdiction. Inventories must be accurate and complete beginning from December 2002 for the San Diego County Copermittees, February 2003 for the Orange County Copermittees, and July 2005 for the Riverside County Copermittees. The use of an automated database system, such as GIS, is highly recommended. The database must include, at a minimum, the following information:

(i) Priority Development Project location (address and hydrologic subarea);

(ii) Descriptions of structural BMP type(s);

(iii) Date(s) of construction;

(iv) Party responsible for structural BMP maintenance;

(v) Dates and findings of structural BMP maintenance verifications; and

(vi) Corrective actions and/or resolutions, when applicable.

(b) Each Copermittee must prioritize the Priority Development Projects with structural BMPs within its jurisdiction. The designation of Priority Development Projects as high priority must consider the following:

(i) The highest water quality priorities identified in the Water Quality Improvement Plan;

(ii) Receiving water quality;

(iii) Number and sizes of structural BMPs;

(iv) Recommended maintenance frequency of structural BMPs;

(v) Likelihood of operation and maintenance issues of structural BMPs;

(vi) Land use and expected pollutants generated; and

(vii) Compliance record.

(3) Structural BMP Maintenance Verifications and Inspections

Each Copermittee is required to verify that structural BMPs on each Priority Development Project are adequately maintained, and continue to operate effectively to remove pollutants in storm water to the MEP through inspections, self-certifications, surveys, or other equally effective approaches.

(a) All (100 percent) of the structural BMPs at Priority Development Projects that are designated as high priority must be inspected directly by the

Copermittee annually prior to each rainy season;

(b) For verifications performed through a means other than direct Copermittee inspection, adequate documentation must be required by the Copermittee to provide assurance that the required maintenance of structural BMPs at each Priority Development Project has been completed; and

(c) Appropriate follow-up measures (including re-inspections, enforcement, etc.) must be conducted to ensure that structural BMPs at each Priority Development Project continue to reduce pollutants in storm water to the MEP as originally designed.

f. DEVELOPMENT PROJECT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all development projects, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

4. Construction Management

Each Copermittee must implement a construction management program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. PROJECT APPROVAL PROCESS

Prior to issuance of any local permit(s) that allows the commencement of construction projects that involve ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff, each Copermittee must:

(1) Require a pollution control plan, construction BMP plan, and/or an erosion and sediment control plan, to be submitted by the project applicant to the Copermittee;

(2) Confirm the pollution control plan, construction BMP plan, and/or erosion and sediment control plan, complies with the local grading ordinance, other applicable local ordinances, and the requirements of this Order;

(3) Confirm the pollution control, construction BMP, and/or erosion and sediment control plan, includes seasonally appropriate and effective BMPs and management measures described in Provision E.4.c, as applicable to the project; and

(4) Verify that the project applicant has obtained coverage under the statewide

Construction General Permit (Order ~~2012-0006~~2009-0009-DWQ or subsequent Order), if applicable.

b. CONSTRUCTION SITE INVENTORY AND TRACKING

(1) Each Copermittee must maintain and update, at least quarterly, a watershed-based inventory of all construction projects issued a local permit that allows ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff. The use of an automated database system, such as GIS, is highly recommended. The inventory must include:

(a) Relevant contact information for each site (e.g., name, address, phone, and email for the owner and contractor);

(b) The basic site information including location (address and hydrologic subarea), Waste Discharge Identification (WDID) number (if applicable), size of the site, and approximate area of disturbance;

(c) Whether or not the site is considered a high threat to water quality, as defined in Provision E.4.b.(2) below;

(d) The project start and completion dates;

(e) The required inspection frequency, as defined in the Copermittee's jurisdictional runoff management program document;

(f) The date the Copermittee accepted or approved the pollution control plan, construction BMP plan, and/or erosion and sediment control plan; and

(g) Whether or not there are ongoing enforcement actions administered to the site.

(2) Each Copermittee must identify all construction sites within its jurisdiction that represent a high threat to downstream surface water quality. The designation of construction sites as high threat to water quality must consider the following:

(a) Sites located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Sites located within the same hydrologic subarea and tributary to a water body segment listed as impaired for sediment on the CWA section 303(d) List;

(c) Sites located within, directly adjacent to, or discharging directly to a receiving water within an ESA; and

(d) Other sites determined by the Copermittees or the San Diego Water Board as a high threat to water quality.

c. CONSTRUCTION SITE BMP IMPLEMENTATION

Each Copermittee must implement, or require the implementation of effective BMPs to reduce discharges of pollutants in storm water from construction sites to the MEP, and effectively prohibit non-storm water discharges from construction sites into the MS4. These BMPs must be site specific, seasonally appropriate, and construction phase appropriate. BMPs must be implemented at each construction site year round. Dry season BMP implementation must plan for and address unseasonal rain events that may occur during the dry season (May 1 through September 30). Copermittees must implement, or require the implementation of, BMPs in the following categories:

(1) Project Planning;

(2) Good Site Management "Housekeeping", including waste management;

(3) Non-storm Water Management;

(4) Erosion Control;

(5) Sediment Control;

(6) Run-on and Run-off Control; and

(7) Active/Passive Sediment Treatment Systems, where applicable.

d. CONSTRUCTION SITE INSPECTIONS

Each Copermittee must conduct construction site inspections to require and confirm compliance with its local permits and applicable local ordinances, and the requirements of this Order. Priority for site inspections must consider threat to water quality pursuant to Provision E.4.b as well as the nature of the construction activity, topography, and the characteristics of soils and receiving water quality.

(1) <u>Inspection Frequency</u>

(a) Each Copermittee must conduct inspections at all inventoried sites, including high threat to water quality sites, at an appropriate frequency for each phase of construction to confirm the site reduces the discharge of pollutants in storm water from construction sites to the MEP, and effectively prohibits non-storm water discharges from entering the MS4.

(b) Each Copermittee must establish appropriate inspection frequencies for

high threat to water quality sites, and all other sites, for each phase of construction. Inspection frequencies appropriate for addressing the highest water quality priorities identified in the Water Quality Improvement Plan, and for complying with the requirements of this Order must be identified in each Copermittee's jurisdictional runoff management program document.

(c) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e., re-inspection, enforcement) necessary to require and confirm site compliance with its local permits and applicable local ordinances, and the requirements of this Order.

(2) Inspection Content

Inspections of construction sites by the Copermittee must include, at a minimum:

(a) Verification of coverage under the Construction General Permit (Notice of Intent (NOI) and/or WDID number) during initial inspections, when applicable;

(b) Assessment of compliance with its local permits and applicable local ordinances related to pollution prevention, including the implementation and maintenance of applicable BMPs;

(c) Assessment of BMP adequacy and effectiveness;

(d) Visual observations of actual non-storm water discharges;

(e) Visual observations of actual or potential discharge of sediment and/or construction related materials from the site;

(f) Visual observations of actual or potential illicit connections; and

(g) If any violations are found and BMP corrections are needed, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried construction sites. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Site name, location (address and hydrologic subarea), and WDID number

(if applicable);

(b) Inspection date;

(c) Approximate amount of rainfall since last inspection;

(d) Description of problems observed with BMPs and indication of need for BMP addition/repair/replacement and any scheduled re-inspection, and date of re-inspection;

(e) Descriptions of any other specific inspection comments which must, at a minimum, include rationales for longer compliance time;

(f) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(g) Resolution of problems noted and date problems fixed.

e. CONSTRUCTION SITE ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried construction sites, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

5. Existing Development Management

Each Copermittee must implement an existing development management program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. EXISTING DEVELOPMENT INVENTORY AND TRACKING

Each Copermittee must maintain, and update at least annually, a watershed-based inventory of the existing development within its jurisdiction that may discharge a pollutant load to and from the MS4. The use of an automated database system, such as GIS, is highly recommended. The inventory must, at a minimum, include:

(1) Name, location (hydrological subarea and address, if applicable) of the following types of existing development with its jurisdiction:

(a) Commercial facilities or areas;

(b) Industrial facilities;

(c) Municipal facilities, including:

(i) MS4 and related structures;[29]

(ii) Roads, streets, and highways;

(iii) Parking facilities;

(iv) Municipal airfields;

(v) Parks and recreation facilities;

(vi) Flood management facilities, flood control devices and structures;

(vii) Operating or closed municipal landfills;

(viii) Publicly owned treatment works (including water and wastewater treatment plants) and sanitary sewer collection systems;

(ix) Corporate yards, including maintenance and storage yards for materials, waste, equipment, and vehicles;

(x) Hazardous waste collection facilities;

(xi) Other treatment, storage or disposal facilities for municipal waste; and

(xii) Other municipal facilities that the Copermittee determines may contribute a significant pollutant load to the MS4.

(d) Residential areas, which may be designated by one or more of the following:

(i) Residential management area;

(ii) Drainage basin or area;

(iii) Land use (e.g., single family, multi-family, rural);

(iv) Neighborhood;

(v) Common Interest Area;

(vi) Home Owner Association;

(vii) Mobile home park; and/or

(viii) Other designations accepted by the San Diego Water Board Executive Officer.

(2) A description of the facility or area, including the following information:

(a) Classification as commercial, industrial, municipal, or residential;

(b) Status of facility or area as active or inactive;

(c) Identification if a business is a mobile business;

[29] The inventory may refer to the MS4 map required to be maintained pursuant to Provision E.2.b.(1).

(d) SIC Code or NAICS Code, if applicable;

(e) Industrial General Permit NOI and/or WDID number, if applicable;

(f) Identification if a residential area is or includes a Common Interest Area / Home Owner Association, or mobile home park;

(g) Identification of pollutants generated and potentially generated by the facility or area;

(h) Whether the facility or area is adjacent to an ESA;

(i) Whether the facility or area is tributary to and within the same hydrologic subarea as a water body segment listed as impaired on the CWA section 303(d) List and generates pollutants for which the water body segment is impaired; and

(3) An annually updated map showing the location of inventoried existing development, watershed boundaries, and water bodies.

b. EXISTING DEVELOPMENT BMP IMPLEMENTATION AND MAINTENANCE

Each Copermittee must designate a minimum set of BMPs required for all inventoried existing development, including special event venues. The designated minimum BMPs must be specific to facility or area types and pollutant generating activities, as appropriate.

(1) Commercial, Industrial, and Municipal Facilities and Areas

(a) Pollution Prevention

Each Copermittee must require the use of pollution prevention methods by the commercial, industrial, and municipal facilities and areas in its inventoried existing development to address the priorities and strategies in the Water Quality Improvement Plan.

(b) BMP Implementation

Each Copermittee must require the implementation of designated BMPs at commercial facilities and areas, industrial facilities, and implement designated BMPs at municipal facilities in its inventoried existing development.

(c) BMP Operation and Maintenance

(i) Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at commercial facilities and areas, industrial facilities, and municipal

facilities in its inventoried existing development.

(ii) Each Copermittee must implement a schedule of operation and maintenance activities for its MS4 and related structures (including but not limited to catch basins, storm drain inlets, detention basins, etc.), and verify proper operation of all its municipal structural treatment controls designed to reduce pollutants (including floatables) in storm water discharges to or from its MS4s and related drainage structures. Operation and maintenance activities may include, but is not limited to, the following:

[a] Inspections of the MS4 and related structures;
[b] Cleaning of the MS4 and related structures; and
[c] Proper disposal of materials removed from cleaning of the MS4 and related structures.

(iii) Each Copermittee must implement a schedule of operation and maintenance for public streets, unpaved roads, paved roads, and paved highways within its jurisdiction to minimize pollutants that can be discharged in storm water.

(iv) Each Copermittee must implement controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers. Copermittees that operate both a municipal sanitary sewer system and a MS4 must implement controls and measures to prevent and eliminate seeping sewage from infiltrating the MS4. Copermittees that do not operate both a municipal sanitary sewer system and a MS4 must coordinate with sewering agencies to keep themselves informed of relevant and appropriate maintenance activities and sanitary sewage projects in their jurisdiction that may cause or contribute to seepage of sewage into the MS4.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must require the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from commercial facilities and areas and industrial facilities, and implement BMPs at municipal facilities in its inventoried existing development. Such BMPs must include, as appropriate, educational activities, permits, certifications and other measures for applicators and distributors.

(2) <u>Residential Areas</u>

(a) Pollution Prevention

Each Copermittee must promote and encourage the use of pollution prevention methods, where appropriate, by the residential areas in its

inventoried existing development.

(b) BMP Implementation

Each Copermittee must promote and encourage the implementation of designated BMPs at residential areas in its inventoried existing development.

(c) BMP Operation and Maintenance

Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at residential areas in its inventoried existing development.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must promote and encourage the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from residential areas in its inventoried existing development.

c. EXISTING DEVELOPMENT INSPECTIONS

Each Copermittee must conduct inspections of inventoried existing development to ensure compliance with applicable local ordinances and permits, and the requirements of this Order.

(1) Inspection Frequency

(a) Each Copermittee must establish appropriate inspection frequencies for inventoried existing development in accordance with the following requirements:

(i) At a minimum, inventoried existing development must be inspected once every five years utilizing one or more of the following methods:

[a] Drive-by inspections by Copermittee municipal and contract staff;
[b] Onsite inspections by Copermittee municipal and contract staff; and/or
[c] Visual inspections of publicly accessible inventoried facilities or areas by volunteer monitoring or patrol programs that have been trained by the Copermittee;

(ii) The frequency of inspections must be appropriate to confirm that BMPs are being implemented to reduce the discharge of pollutants in storm water from the MS4 to the MEP and effectively prohibit non-storm water discharges to the MS4;

(iii) The frequency of inspections must be based on the potential for a facility or area to discharge non-storm water and pollutants in storm water, and should reflect the priorities set forth in the Water Quality Improvement Plan;

(iv) Each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development;[30] and

(v) Inventoried existing development must be inspected by the Copermittee, as needed, in response to valid public complaints.

(b) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e. education and outreach, re-inspection, enforcement) necessary to require and confirm compliance with its applicable local ordinances and permits and the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

(2) Inspection Content

(a) Inspections of existing development must include, at a minimum:

(i) Visual inspections for the presence of actual non-storm water discharges;

(ii) Visual inspections for the presence of actual or potential discharge of pollutants;

(iii) Visual inspections for the presence of actual or potential illicit connections; and

(iv) Verification that the description of the facility or area in the inventory, required pursuant to Provision E.5.a.(2), has not changed.

(b) Onsite inspections of existing development by the Copermittee must include, at a minimum:

(i) Assessment of compliance with its applicable local ordinances and permits related to non-storm water and storm water discharges and runoff;

(ii) Assessment of the implementation of the designated BMPs;

(iii) Verification of coverage under the Industrial General Permit, when

[30] If any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspection may count toward the total annual inspection requirement. This requirement excludes linear municipal facilities (i.e., MS4 linear channels, sanitary sewer collection systems, streets, roads and highways).

applicable; and

(iv) If any problems or violations are found, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried existing development. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Name and location of the facility or area (address and hydrologic subarea) consistent with the inventory name and location, pursuant to Provision E.5.a.(1);

(b) Inspection and re-inspection date(s);

(c) Inspection method(s) (i.e. drive-by, onsite);

(d) Observations and findings from the inspection(s);

(e) For onsite inspections of existing development by Copermittee municipal or contract staff, the records must also include, as applicable:

(i) Description of any problems or violations found during the inspection(s);

(ii) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(iii) The date problems or violations were resolved.

d. EXISTING DEVELOPMENT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried existing development, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

e. RETROFITTING AND REHABILITATING AREAS OF EXISTING DEVELOPMENT

(1) Retrofitting Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to retrofit areas of existing development within

its jurisdiction to address identified sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify areas of existing development as candidates for retrofitting, focusing on areas where retrofitting will address pollutants and/or stressors that contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for retrofitting projects may be utilized to reduce pollutants that may be discharged in storm water from areas of existing development, and/or address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of retrofitting projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting projects; and

(e) Where retrofitting projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional retrofitting projects (i.e. projects that can receive and/or treat storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment) adjacent to and/or downstream of the areas of existing development.

(2) Stream, Channel and/or Habitat Rehabilitation in Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to rehabilitate streams, channels, and/or habitats in areas of existing development within its jurisdiction to address the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify streams, channels, and/or habitats in areas of existing development as candidates for rehabilitation, focusing on areas where stream, channel, and/or habitat rehabilitation projects will address the highest priority water quality conditions identified in the Water

Quality Improvement Plan;

(b) Candidates for stream, channel, and/or habitat rehabilitation projects may be utilized to address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters, rehabilitate channelized or hydromodified streams, restore wetland and riparian habitat, restore watershed functions, and/or restore beneficial uses of receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of stream, channel, and/or habitat rehabilitation projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance stream, channel, and/or habitat rehabilitation projects; and

(e) Where stream, channel, and/or habitat rehabilitation projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional stream, channel, and/or habitat rehabilitation projects (i.e. projects that can receive storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment).

6. Enforcement Response Plans

Each Copermittee must develop and implement an Enforcement Response Plan as part of its jurisdictional runoff management program document. The Enforcement Response Plan must describe the applicable approaches and options to enforce its legal authority established pursuant to Provision E.1, as necessary, to achieve compliance with the requirements of this Order. The Enforcement Response Plan must be in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include the following:

a. ENFORCEMENT RESPONSE PLAN COMPONENTS

The Enforcement Response Plan must include the following individual components:

(1) Illicit Discharge Detection and Elimination Enforcement Component;

(2) Development Planning Enforcement Component;

(3) Construction Management Enforcement Component; and

(4) Existing Development Enforcement Component.

b. ENFORCEMENT RESPONSE APPROACHES AND OPTIONS

Each component of the Enforcement Response Plan must describe the enforcement response approaches that the Copermittee will implement to compel compliance with its statutes, ordinances, permits, contracts, orders, or similar means, and the requirements of this Order. The description must include the protocols for implementing progressively stricter enforcement responses. The enforcement response approaches must include appropriate sanctions to compel compliance, including, at a minimum, the following tools or their equivalent:

(1) Verbal and written notices of violation;

(2) Cleanup requirements;

(3) Fines;

(4) Bonding requirements;

(5) Administrative and criminal penalties;

(6) Liens;

(7) Stop work orders; and

(8) Permit and occupancy denials.

c. CORRECTION OF VIOLATIONS

(1) Violations must be corrected in a timely manner with the goal of correcting the violations within 30 calendar days after the violations are discovered, or prior to the next predicted rain event, whichever is sooner.

(2) If more than 30 calendar days are required to achieve compliance, then a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

d. ESCALATED ENFORCEMENT

(1) The Enforcement Response Plan must include a definition of "escalated enforcement." Escalated enforcement must include any enforcement scenario where a violation or other non-compliance is determined to cause or contribute to the highest priority water quality conditions identified in the

Water Quality Improvement Plan. Escalated enforcement may be defined differently for development planning, construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas.

(2) Where the Copermittee determines escalated enforcement is not required, a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

(3) Escalated enforcement actions must continue to increase in severity, as necessary, to compel compliance as soon as possible.

e. REPORTING OF NON-COMPLIANT SITES

(1) Each Copermittee must notify the San Diego Water Board in writing within five (5) calendar days of issuing escalated enforcement (as defined in the Copermittee's Enforcement Response Plan) to a construction site that poses a significant threat to water quality as a result of violations or other non-compliance with its permits and applicable local ordinances, and the requirements of this Order. Written notification may be provided electronically by email to the appropriate San Diego Water Board staff.

(2) Each Copermittee must notify the San Diego Water Board of any persons required to obtain coverage under the statewide Industrial General Permit and Construction General Permit and failing to do so, within five (5) calendar days from the time the Copermittee become aware of the circumstances. Written notification may be provided electronically by email to R9_Nonfilers@waterboards.ca.gov ~~Nonfilers_R9@waterboards.ca.gov~~.

7. Public Education and Participation

Each Copermittee must implement, individually or with other Copermittees, a public education and participation program in accordance with the strategies identified in the Water Quality Improvement Plan to promote and encourage the development of programs, management practices, and behaviors that reduce the discharge of pollutants in storm water to the MEP, prevent controllable non-storm water discharges from entering the MS4, and protect water quality standards in receiving waters. The public education and participation program must be implemented in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include, at a minimum, the following requirements:

a. PUBLIC EDUCATION

The public education program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) Educational activities, public information activities, and other appropriate outreach activities intended to reduce pollutants associated with the application of pesticides, herbicides and fertilizer and other pollutants of concern in storm water discharges to and from its MS4 to the MEP, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed to address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(2) Educational activities, public information activities, and other appropriate outreach activities to facilitate the proper management and disposal of used oil and toxic materials; and

(3) Appropriate education and training measures for specific target audiences, such as construction site operators, residents, underserved target audiences and school-aged children, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed, based on high risk behaviors and pollutants of concern.

b. PUBLIC PARTICIPATION

The public participation program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) A process for members of the public to participate in updating the highest priority water quality conditions, numeric goals, and water quality improvement strategies in the Water Quality Improvement Plan;

(2) Opportunities for members of the public to participate in providing the Copermittee recommendations for improving the effectiveness of the water quality improvement strategies implemented within its jurisdiction; and

(3) Opportunities for members of the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or protection of the quality of receiving waters.

8. Fiscal Analysis

a. Each Copermittee must secure the resources necessary to meet all the requirements of this Order.

b. Each Copermittee must conduct an annual fiscal analysis of its jurisdictional runoff management program in its entirety. The fiscal analysis must include the following:

(1) Identification of the various categories of expenditures necessary to implement the requirements of this Order, including a description of the specific capital, operation and maintenance, and other expenditure items to

be accounted for in each category of expenditures;

(2) The staff resources needed and allocated to meet the requirements of this Order, including any development, implementation, and enforcement activities required;

(3) The estimated expenditures for Provisions E.8.b.(1) and E.8.b.(2) for the current fiscal year; and

(4) The source(s) of funds that are proposed to meet the necessary expenditures described in Provisions E.8.b.(1) and E.8.b.(2), including legal restrictions on the use of such funds, for the current fiscal year and next fiscal year.

c. Each Copermittee must submit a summary of the annual fiscal analysis with each Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3).

d. Each Copermittee must provide the documentation used to develop the summary of the annual fiscal analysis upon request by the San Diego Water Board.

F. REPORTING

The purpose of this provision is to determine and document compliance with the requirements set forth in this Order. The goal of reporting is to communicate to the San Diego Water Board and the people of the State of California the implementation status of each jurisdictional runoff management program and compliance with the requirements of this Order. This goal is to be accomplished through the submittal of specific deliverables to the San Diego Water Board by the Copermittees.

1. Water Quality Improvement Plans

The Copermittees for each Watershed Management Area must develop and submit the Water Quality Improvement Plan in accordance with the following requirements:

a. WATER QUALITY IMPROVEMENT PLAN DEVELOPMENT

Each Water Quality Improvement Plan must be developed in accordance with the following process:

(1) Public Participation Process

The Copermittees must implement a public participation process to solicit data, information, and recommendations to be utilized in the development of the Water Quality Improvement Plan. The public participation process must include the following:

(a) The Copermittees must develop a publicly available and noticed schedule of the opportunities for the public to participate and provide comments during the development of the Water Quality Improvement Plan. The schedule may be adjusted as necessary by the Copermittees, provided the public is provided timely notification of the changes to the schedule.

(b) The Copermittees must form a Water Quality Improvement Consultation Panel to provide recommendations during the development of the Water Quality Improvement Plan. The Water Quality Improvement Consultation Panel must consist of at least the following members:

(i) A representative of the San Diego Water Board;

(ii) A representative of the environmental community familiar with the water quality conditions of concern of the receiving waters in the Watershed Management Area, preferably from an environmental interest group associated with a water body within the Watershed Management Area; and

(iii) A representative of the development community familiar with the opportunities and constraints for implementing structural BMPs, retrofitting projects, and stream, channel or habitat rehabilitation

projects in the Watershed Management Area, preferably with relevant engineering, hydrology, and/or geomorphology experience in the Watershed Management Area.

(c) The Copermittees must coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public time and opportunity to participate during the development of the Water Quality Improvement Plans.

(2) Priority Water Quality Conditions

(a) The Copermittees must solicit data, information and recommendations from the public to be utilized in the development and identification of the priority water quality conditions and potential water quality improvement strategies for the Watershed Management Area.

(b) The Copermittees must review the priority water quality conditions the Copermittees plan on including in the Water Quality Improvement Plan with the Water Quality Improvement Consultation Panel to receive recommendations or concurrence.

(c) The Copermittees must consider revisions to the priority water quality conditions based on recommendations from the Water Quality Improvement Consultation Panel.

(d) The Copermittees must include all the potential water quality improvement strategies identified by the public and the Water Quality Improvement Consultation Panel with the submittal of the priority water quality conditions to the San Diego Water Board.

(e) The Copermittees must submit the Water Quality Improvement Plan requirements of Provision B.2 to the San Diego Water Board as early as 6 months and no later than 12 months after the commencement of coverage under this Order. Upon receipt, the San Diego Water Board will issue a public notice and release the proposed priority water quality conditions and potential water quality improvement strategies for public review and comment for a minimum of 30 days.

(f) The Copermittees must consider revisions to the priority water quality conditions and potential water quality improvement strategies developed pursuant to Provision B.2 based on public comments received by the close of the comment period.

(3) Water Quality Improvement Goals, Strategies and Schedules

(a) The Copermittees must solicit recommendations from the public on potential numeric goals for the highest priority water quality conditions

identified for the Watershed Management Area, and recommendations on the strategies that should be implemented to achieve the potential numeric goals.

(b) The Copermittees must consult with the Water Quality Improvement Consultation Panel and consider revisions to the following items based on the Panel's recommendations:

(i) The numeric goals and schedules the Copermittees propose to include in the Water Quality Improvement Plan;

(ii) The water quality improvement strategies and schedules the Copermittees propose to implement in the Watershed Management Area and include in the Water Quality Improvement Plan; and

(iii) If the Copermittees choose to implement Provision B.3.b.(4), the results of the Watershed Management Area Analysis the Copermittees proposed to incorporate into the Water Quality Improvement Plan.

(c) The Copermittees must submit the Water Quality Improvement Plan requirements of Provision B.3 to the San Diego Water Board as early as 9 months and no later than 18 months after the commencement of coverage under this Order. Upon receipt, the San Diego Water Board will issue a public notice and release the proposed water quality improvement goals, strategies and schedules for public review and comment for a minimum of 30 days.

(d) The Copermittees must consider revisions to the water quality improvement goals, strategies and schedules developed pursuant to Provision B.3 based on public comments received by the close of the comment period.

b. WATER QUALITY IMPROVEMENT PLAN SUBMITTAL AND IMPLEMENTATION

(1) Within 24 months after the commencement of coverage under this Order, the Copermittees for each Watershed Management Area must submit a complete Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order to the San Diego Water Board. The San Diego Water Board will issue a public notice and release the Water Quality Improvement Plan for public review and comment for a minimum of 30 days.

(2) The Copermittees must consider revisions to the Water Quality Improvement Plan based on written comments received by the close of the public comment period.

(3) The Copermittees must promptly submit any revisions to the Water Quality Improvement Plan to the San Diego Water Board no later than 60 days after the close of the public comment period.

(4) If issues concerning the Water Quality Improvement Plan are resolved informally through discussions among the Copermittees, the San Diego Water Board and interested parties, the San Diego Water Board Executive Officer may provide written notification of acceptance to the Copermittees that the Water Quality Improvement Plan meets the requirements of Provision B. However, if the Executive Officer determines that significant issues with the Water Quality Improvement Plan remain, the matter will be scheduled for San Diego Water Board consideration at a public meeting.

(5) The Copermittees must commence with implementation of the Water Quality Improvement Plan, in accordance with the water quality improvement strategies and schedules therein, upon written notification of acceptance with the Water Quality Improvement Plan by the San Diego Water Board Executive Officer.

(6) During implementation of the Water Quality Improvement Plan the Copermittees must correct any deficiencies in the Plan identified by the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report following a request by the Board to do so.

(7) The Water Quality Improvement Plan must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of receiving notification of acceptance with the Water Quality Improvement Plan by the San Diego Water Board Executive Officer.

2. Updates

a. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATES

Each Copermittee must update its jurisdictional runoff management program document in accordance with the following requirements:

(1) Each Copermittee is encouraged to seek public and key stakeholder participation and comments, as early and often as possible during the process of developing updates to its jurisdictional runoff management program document;

(2) Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E concurrent with the submittal of the Water Quality Improvement Plan. Each Copermittee must correct any deficiencies in the jurisdictional runoff management program document based on comments received from the San Diego Water Board in

the updates submitted with the Water Quality Improvement Plan Annual Report;

(3) Each Copermittee must submit updates to its jurisdictional runoff management program, with the supporting rationale for the modifications, either in the Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b;

(4) The Copermittee must revise proposed modifications to its jurisdictional runoff management program as directed by the San Diego Water Board Executive Officer; and

(5) Updated jurisdictional runoff management program documents must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of submitting the Water Quality Improvement Plan Annual Report.

b. BMP DESIGN MANUAL UPDATES

Each Copermittee must update its BMP Design Manual in accordance with the following requirements:

(1) Each Copermittee must update its BMP Design Manual to incorporate the requirements of Provisions E.3.a-d concurrent with the submittal of the Water Quality Improvement Plan. Each Copermittee must correct any deficiencies in the BMP Design Manual based on comments received from the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report;

(2) Subsequent updates to the BMP Design Manual must be consistent with the requirements of Provisions E.3.a-d and must be submitted as part of the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b; and

(3) Updated BMP Design Manuals must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of completing the update.

c. WATER QUALITY IMPROVEMENT PLAN UPDATES

(1) The Water Quality Improvement Plans must be updated in accordance with the following process:

(a) The Copermittees must develop and implement a public participation process to obtain data, information and recommendations for updating the Water Quality Improvement Plan. The public participation process must provide for a publicly available and noticed schedule of opportunities for the public to participate and provide comments during the development of updates to the Water Quality Improvement Plan;

(b) The Copermittees must consult with the Water Quality Improvement Consultation Panel on proposed updates of the Water Quality Improvement Plan, and consider the Water Quality Improvement Consultation Panel's recommendations in finalizing the proposed updates;

(c) The Copermittees for each Watershed Management Area must submit 1) proposed updates to the Water Quality Improvement Plan and supporting rationale, and 2) recommendations received from the public and the Water Quality Improvement Consultation Panel and the rationale for the requested updates, either in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The updates submitted will be deemed accepted for inclusion in the Water Quality Improvement Plan ninety (90) days after submission unless otherwise directed in writing by the San Diego Water Board Executive Officer;

(d) The Copermittees must revise the requested updates as directed by the San Diego Water Board Executive Officer; and

(e) Updated Water Quality Improvement Plans must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance of the requested updates by the San Diego Water Board.

(2) No later than six months following Office of Administrative Law and USEPA approval of any TMDL Basin Plan amendment with wasteload allocations (WLAs) assigned to the Copermittees during the term of this Order, the Copermittees must initiate an update to the applicable Water Quality Improvement Plans in accordance with Provision F.1 or Provision F.2.c.(1) to incorporate the requirements of the TMDL WLAs.

3. Progress Reporting

a. Progress Report Presentations

The Copermittees for each Watershed Management Area must periodically appear before the San Diego Water Board, as requested by the Board, to provide progress reports on the implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs.

b. Annual Reports

(1) Transitional Jurisdictional Runoff Management Program Annual Reports

(a) Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) no later than October 31 of each year for each jurisdictional runoff management program reporting period (i.e. July 1 to June 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted.

(b) Each Copermittee must submit the information on the Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) specific to the area within its jurisdiction in each Watershed Management Area.

(c) In addition to submitting the Jurisdictional Runoff Management Program Annual Report Form during the transitional reporting period, each Copermittee may continue to utilize and submit the jurisdictional runoff management program annual reporting format of its previous NPDES permit until the first Water Quality Improvement Plan Annual Report is required to be submitted.

(2) Transitional Monitoring and Assessment Program Annual Reports

The Copermittees for each Watershed Management Area must submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted under this Order. The Transitional Monitoring and Assessment Program Annual Reports must include:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1.a and D.2.a, summarized and presented in tabular and graphical form; and

(b) The findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

(3) Water Quality Improvement Plan Annual Reports

The Copermittees for each Watershed Management Area must submit a Water Quality Improvement Plan Annual Report for each reporting period no later than January 31 of the following year. The annual reporting period consists of two different periods: 1) July 1 to June 30 of the following year for the jurisdictional runoff management programs, 2) October 1 to September 30 of the following year for the monitoring and assessment programs. The Water Quality Improvement Plan Annual Reports must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Each Annual Report must include the following:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, summarized and presented in tabular and graphical form;

(b) The progress of the special studies required pursuant to Provision D.3, and the findings, interpretations and conclusions of a special study, or each phase of a special study, upon its completion;

(c) The findings, interpretations and conclusions from the assessments required pursuant to Provision D.4;

(d) The progress of implementing the Water Quality Improvement Plan, including, but not limited to, the following:

(i) The progress toward achieving the interim and final numeric goals for the highest water quality priorities for the Watershed Management Area;

(ii) The water quality improvement strategies that were implemented and/or no longer implemented by each of the Copermittees during the reporting period and previous reporting periods;

(iii) The water quality improvement strategies planned for implementation during the next reporting period;

(iv) Proposed modifications to the water quality improvement strategies, the public comments received and the supporting rationale for the proposed modifications;

(v) Previous modifications or updates incorporated into the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document and implemented by the Copermittees in the Watershed Management Area; and

(vi) Proposed modifications or updates to the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document;

(e) A completed Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) for each Copermittee in the Watershed Management Area, certified by a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative; and

(f) Each Copermittee must provide any data or documentation utilized in developing the Water Quality Improvement Plan Annual Report upon request by the San Diego Water Board. Any Copermittee monitoring data utilized in developing the Water Quality Improvement Plan Annual Report must be uploaded to the California Environmental Data Exchange Network (CEDEN).[31] Any Copermittee monitoring and assessment data utilized in developing the Water Quality Improvement Plan Annual Report must be available for access on the Regional Clearinghouse required pursuant to Provision F.4.

C. REGIONAL MONITORING AND ASSESSMENT REPORT

(1) The Copermittees must submit a Regional Monitoring and Assessment Report no later than 180 days prior to the expiration date of this Order. The Regional Monitoring and Assessment Report may be submitted as part of the Report of Waste Discharge required pursuant to Provision F.5.b. In preparing the report the Copermittees must consider the receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, and the findings, interpretations, and conclusions from the assessments required pursuant to Provision D.4. Based on these considerations the report must assess the following:

(a) The beneficial uses of the receiving waters within the San Diego Region that are supported and not adversely affected by the Copermittees' MS4 discharges;

(b) The beneficial uses of the receiving waters within the San Diego Region that are adversely impacted by the Copermittees' MS4 discharges;

(c) The progress toward protecting the beneficial uses in the receiving waters within the San Diego Region from the Copermittees' discharges; and

[31] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

(d) Pollutants or conditions of emerging concern that may impact beneficial uses in the receiving waters within the San Diego Region.

(2) The Regional Monitoring and Assessment Report must include recommendations for improving the implementation and assessment of the Water Quality Improvement Plans and jurisdictional runoff management programs.

(3) Each Copermittee must provide any data or documentation utilized in developing the Regional Monitoring and Assessment Report upon request by the San Diego Water Board. Any Copermittee monitoring and assessment data utilized in developing the Regional Monitoring and Assessment Report must be available for access on the Regional Clearinghouse required pursuant to Provision F.4.

4. Regional Clearinghouse

The Copermittees must develop, update, and maintain an internet-based Regional Clearinghouse that is made available to the public no later than 18 months after the effective date of this Order.[32]

a. The Copermittees, through the Regional Clearinghouse, must make the following documents and data available for access, and organized by Watershed Management Area. The documents and data may be linked to other internet-based data portals and databases where the original documents are stored:

(1) Water Quality Improvement Plan for the Watershed Management Area, and all updated versions with date of update;

(2) Annual Reports for the Watershed Management Area;

(3) Jurisdictional Runoff Management Program document for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(4) BMP Design Manual for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(5) Reports from special studies (e.g. source identification, BMP effectiveness assessment) conducted in the Watershed Management Area;

[32] The Copermittees may develop, update and maintain the clearinghouse(s) of other Copermittees or agencies.

(6) Monitoring data collected pursuant to Provision D for each Watershed Management Area must be uploaded to CEDEN,[33] with links to the uploaded data; and

(7) Available GIS data, layers, and/or shapefiles used to develop the maps generated and maintained by the Copermittees for the Water Quality Improvement Plans, Annual Reports, and jurisdictional runoff management program documents.

b. The Copermittees, through the Regional Clearinghouse, must make the following information and documents available for access:

(1) Contact information (point of contact, phone number, email address, and mailing address) for each Copermittee;

(2) Public hotline number for reporting non-storm water and illicit discharges for each Copermittee;

(3) Email address for reporting non-storm water and illicit discharges for each Copermittee;

(4) Link to each Copermittee's website, if available, where the public may find additional information about the Copermittee's storm water management program and for requesting records for the implementation of its program;

(5) Information about opportunities for the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or protection of the quality of receiving waters; and

(6) Reports from regional monitoring programs in which the Copermittees participate (e.g. Southern California Monitoring Coalition, Southern California Coastal Water Research Project Bight Monitoring);

(7) Regional Monitoring and Assessment Reports; and

(8) Any other information, data, and documents the Copermittees determine as appropriate for making available to the public.

[33] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

5. Report of Waste Discharge

a. The ~~Orange County Copermittees and the~~ Riverside County Copermittees are required to submit a complete Report of Waste Discharge pursuant to the requirements of their current Order~~s~~. The San Diego Water Board will review and consider the Report~~s~~ of Waste Discharge to determine whether modification to this Order, pursuant to the requirements of Provision H, will be required prior to the ~~Orange County Copermittees and/or~~ Riverside County Copermittees obtaining coverage under this Order. The current Order ~~s~~ for ~~the Orange County Copermittees and~~ Riverside County Copermittees is ~~are~~ rescinded upon the date of effective coverage under this Order except for enforcement purposes.

b. The Copermittees subject to the requirements of this Order must submit to the San Diego Water Board a complete Report of Waste Discharge as an application for the re-issuance of this Order and NPDES permit. The Report of Waste Discharge must be submitted no later than 180 days in advance of the expiration date of this Order. The Report of Waste Discharge must contain the following minimum information:

(1) Names and addresses of the Copermittees;

(2) Names and titles of the primary contacts of the Copermittees;

(3) Proposed changes to the Copermittees' Water Quality Improvement Plans and the supporting justification;

(4) Proposed changes to the Copermittees' jurisdictional runoff management programs and the supporting justification;

(5) Any other information necessary for the re-issuance of this Order;

(6) Any information to be included as part of the Report of Waste Discharge pursuant to the requirements of this Order; and

(7) Any other information required by federal regulations for NPDES permit reissuance.

6. Application for Early Coverage

a. The ~~Orange County Copermittees, collectively, or~~ Riverside County Copermittees~~, collectively,~~ may apply for early coverage under this Order by submitting a Report of Waste Discharge Form 200, with a written request for early coverage under this Order.

b. The San Diego Water Board will review the application for early coverage. A notification of coverage under this Order will be issued to the Copermittees in the

respective county by the San Diego Water Board upon completion of the early coverage application requirements. The effective coverage date will be specified in the notification of coverage. The Copermittees in the respective county are authorized to have MS4 discharges pursuant to the requirements of this Order starting on the effective coverage date specified in the notification of coverage. The existing Order for the respective county is rescinded upon the effective coverage date specified in the notification of coverage except for enforcement purposes.

7. Reporting Provisions

Each Copermittee must comply with all the reporting and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

G. PRINCIPAL WATERSHED COPERMITTEE RESPONSIBILITIES

1. The Copermittees within each Watershed Management Area must designate a Principal Watershed Copermittee and notify the San Diego Water Board of the name of the Principal Watershed Copermittee. An individual Copermittee should not be designated a Principal Watershed Copermittee for more than two Watershed Management Areas. The notification may be submitted with the Water Quality Improvement Plan required pursuant to Provision F.1 of this Order.

2. The Principal Watershed Copermittee is responsible for, at a minimum, the following:

a. Serving as liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues, and when necessary and appropriate, representing the Copermittees in the Watershed Management Area before the San Diego Water Board;

b. Facilitating the development of the Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order;

c. Coordinating the submittal of the deliverables required by Provisions F.1, F.2, F.3.a, and F.3.b of this Order; and

d. Coordinating and developing, with the other Principal Watershed Copermittees, the requirements of Provisions F.3.c, F.4, and F.5.b of this Order.

3. The Principal Watershed Copermittee is not responsible for ensuring that the other Copermittees within the Watershed Management Area are in compliance with the requirements of this Order. Each Copermittee within the Watershed Management Area is responsible for complying with the requirements of this Order.

H. MODIFICATION OF ORDER

1. Modifications of the Order may be initiated by the San Diego Water Board or by the Copermittees. Requests by Copermittees must be made to the San Diego Water Board.

2. Minor modifications to the Order may be made by the San Diego Water Board where the proposed modification complies with all the prohibitions and limitations, and other requirements of this Order.

3. This Order may also be re-opened and modified, revoked and, reissued or terminated in accordance with the provisions of 40 CFR 122.44, 122.62 to 122.64, and 124.5. Causes for taking such actions include, but are not limited to, failure to comply with any condition of this Order and permit, and endangerment to human health or the environment resulting from the permitted activity.

4. This Order may be re-opened for modification for cause including but not limited to the following:

   a. The State Water Board determines that revisions are warranted, and the San Diego Water Board concurs that revisions are necessary to those provisions of the Order addressing compliance with water quality standards in the receiving water and/or those provisions of the Order establishing an iterative process for implementation of management practices to assure compliance with water quality standards in the receiving water;

   b. An application for early coverage under this Order is received pursuant to Provision F.6;

   c. Any of the TMDLs in Attachment E to this Order are amended in the Basin Plan by San Diego Water Board, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA;

   d. The Basin Plan is amended by the San Diego Water Board to incorporate a new TMDL, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA; or

   e. Updating or revising the monitoring and reporting requirements is determined to be necessary, at the discretion of the San Diego Water Board. Such modification(s) may include, but is (are) not limited to, revision(s) to: (i) implement recommendations from Southern California Coastal Water Research Project (SCCWRP), (ii) develop, refine, implement, and/or coordinate a regional monitoring program, (iii) develop and implement improved monitoring and assessment programs in keeping with San Diego Water Board Resolution No. R9-2012-0069, Resolution in Support of a Regional Monitoring Framework, and/or (iv) add provisions to require the Copermittees to evaluate and provide information on cost and values of the monitoring and reporting program.

5. The San Diego Water Board, after opportunity for public comment and a public hearing, will re-open and consider modifications to this Order when the ~~Orange County Copermittees or the~~ Riverside County Copermittees submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders.

I. STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

Each Copermittee must comply with all the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

ATTACHMENT A

DISCHARGE PROHIBITIONS AND SPECIAL PROTECTIONS

1. Basin Plan Waste Discharge Prohibitions

California Water Code Section 13243 provides that a Regional Water Board, in a water quality control plan, may specify certain conditions or areas where the discharge of waste or certain types of waste is not permitted. The following waste discharge prohibitions in the Water Quality Control Plan for the San Diego Basin (Basin Plan) are applicable to any person, as defined by Section 13050(c) of the California Water Code, who is a citizen, domiciliary, or political agency or entity of California whose activities in California could affect the quality of waters of the state within the boundaries of the San Diego Region.

1. The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in California Water Code Section 13050, is prohibited.

2. The discharge of waste to land, except as authorized by waste discharge requirements or the terms described in California Water Code Section 13264 is prohibited.

3. The discharge of pollutants or dredged or fill material to waters of the United States except as authorized by a National Pollutant Discharge Elimination System (NPDES) permit or a dredged or fill material permit (subject to the exemption described in California Water Code Section 13376) is prohibited.

4. Discharges of recycled water to lakes or reservoirs used for municipal water supply or to inland surface water tributaries thereto are prohibited, unless this San Diego Water Board issues a NPDES permit authorizing such a discharge; the proposed discharge has been approved by the State Department of Health Services (DHS) and the operating agency of the impacted reservoir; and the discharger has an approved fail-safe long-term disposal alternative.

5. The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the San Diego Water Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

6. The discharge of waste in a manner causing flow, ponding, or surfacing on lands not owned or under the control of the discharger is prohibited, unless the discharge is authorized by the San Diego Water Board.

7. The dumping, deposition, or discharge of waste directly into waters of the state, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the San Diego Water Board.

8. Any discharge to a storm water conveyance system that is not composed entirely of "*storm water*" is prohibited unless authorized by the San Diego Water Board. [The federal regulations, 40 CFR 122.26(b)(13), define storm water as storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from firefighting activities.] [§122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

9. The unauthorized discharge of treated or untreated sewage to waters of the state or to a storm water conveyance system is prohibited.

10. The discharge of industrial wastes to conventional septic tank/subsurface disposal systems, except as authorized by the terms described in California Water Code Section 13264, is prohibited.

11. The discharge of radioactive wastes amenable to alternative methods of disposal into the waters of the state is prohibited.

12. The discharge of any radiological, chemical, or biological warfare agent into waters of the state is prohibited.

13. The discharge of waste into a natural or excavated site below historic water levels is prohibited unless the discharge is authorized by the San Diego Water Board.

14. The discharge of sand, silt, clay, or other earthen materials from any activity, including land grading and construction, in quantities which cause deleterious bottom deposits, turbidity or discoloration in waters of the state or which unreasonably affect, or threaten to affect, beneficial uses of such waters is prohibited.

15. The discharge of treated or untreated sewage from vessels to Mission Bay, Oceanside Harbor, Dana Point Harbor, or other small boat harbors is prohibited.

16. The discharge of untreated sewage from vessels to San Diego Bay is prohibited.

17. The discharge of treated sewage from vessels to portions of San Diego Bay that are less than 30 feet deep at mean lower low water (MLLW) is prohibited.

18. The discharge of treated sewage from vessels, which do not have a properly functioning US Coast Guard certified Type I or Type II marine sanitation device, to portions of San Diego Bay that are greater than 30 feet deep at mean lower low water (MLLW) is prohibited.

2. Attachment B to State Water Board Resolution 2012-0012, as amended by State Water Board Resolution No. 2012-0031.

Special Protections for Areas of Special Biological Significance (ASBS), Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges

I. PROVISIONS FOR POINT SOURCE DISCHARGES OF STORM WATER AND NONPOINT SOURCE WASTE DISCHARGES

The following terms, prohibitions, and special conditions (hereafter collectively referred to as special conditions) are established as limitations on point source storm water and nonpoint source discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in Areas of Special Biological Significance (ASBS), as required for State Water Quality Protection Areas pursuant to California Public Resources Code Sections 36700(f) and 36710(f). These Special Protections are adopted by the State Water Board as part of the California Ocean Plan (Ocean Plan) General Exception.

The special conditions are organized by category of discharge. The State Water Resources Control Board (State Water Board) and Regional Water Quality Control Boards (Regional Water Boards) will determine categories and the means of regulation for those categories [e.g., Point Source Storm Water National Pollutant Discharge Elimination System (NPDES) or Nonpoint Source].

A. PERMITTED POINT SOURCE DISCHARGES OF STORM WATER

1. General Provisions for Permitted Point Source Discharges of Storm Water

a. Existing storm water discharges into an ASBS are allowed only under the following conditions:

(1) The discharges are authorized by an NPDES permit issued by the State Water Board or Regional Water Board;

(2) The discharges comply with all of the applicable terms, prohibitions, and special conditions contained in these Special Protections; and

(3) The discharges:

(i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

(ii) Are designed to prevent soil erosion;

(iii) Occur only during wet weather;

(iv) Are composed of only storm water runoff.

b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

c. The discharge of trash is prohibited.

d. Only discharges from existing storm water outfalls are allowed. Any proposed or new storm water runoff discharge shall be routed to existing storm water discharge outfalls and shall not result in any new contribution of waste to an ASBS (i.e., no additional pollutant loading). "Existing storm water outfalls" are those that were constructed or under construction prior to January 1, 2005. "New contribution of waste" is defined as any addition of waste beyond what would have occurred as of January 1, 2005. A change to an existing storm water outfall, in terms of re-location or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges are prohibited except as provided below:

(1) The term "non-storm water discharges" means any waste discharges from a municipal separate storm sewer system (MS4) or other NPDES permitted storm drain system to an ASBS that are not composed entirely of storm water.

(2) (i) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability or occur naturally:

(a) Discharges associated with emergency fire fighting operations.

(b) Foundation and footing drains.

(c) Water from crawl space or basement pumps.

(d) Hillside dewatering.

(e) Naturally occurring groundwater seepage via a storm drain.

(f) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(ii) An NPDES permitting authority may authorize non-storm water discharges to an MS4 with a direct discharge to an ASBS only to the extent the NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

2. Compliance Plans for Inclusion in Storm Water Management Plans (SWMP) and Storm Water Pollution Prevention Plans (SWPPP).

The discharger shall specifically address the prohibition of non-storm water runoff and the requirement to maintain natural water quality for storm water discharges to an ASBS in an ASBS Compliance Plan to be included in its SWMP or a SWPPP, as appropriate to permit

type. If a statewide permit includes a SWMP, then the discharger shall prepare a stand-alone compliance plan for ASBS discharges. The ASBS Compliance Plan is subject to approval by the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (for permits issued by Regional Water Boards).

a. The Compliance Plan shall include a map of surface drainage of storm water runoff, showing areas of sheet runoff, prioritize discharges, and describe any structural Best Management Practices (BMPs) already employed and/or BMPs to be employed in the future. Priority discharges are those that pose the greatest water quality threat and which are identified to require installation of structural BMPs. The map shall also show the storm water conveyances in relation to other features such as service areas, sewage conveyances and treatment facilities, landslides, areas prone to erosion, and waste and hazardous material storage areas, if applicable. The SWMP or SWPPP shall also include a procedure for updating the map and plan when changes are made to the storm water conveyance facilities.

b. The ASBS Compliance Plan shall describe the measures by which all non-authorized non-storm water runoff (e.g., dry weather flows) has been eliminated, how these measures will be maintained over time, and how these measures are monitored and documented.

c. For Municipal Separate Storm Sewer System (MS4s), the ASBS Compliance Plan shall require minimum inspection frequencies as follows:

(1) The minimum inspection frequency for construction sites shall be weekly during rainy season;

(2) The minimum inspection frequency for industrial facilities shall be monthly during the rainy season;

(3) The minimum inspection frequency for commercial facilities (e.g., restaurants) shall be twice during the rainy season; and

(4) Storm water outfall drains equal to or greater than 18 inches (457 mm) in diameter or width shall be inspected once prior to the beginning of the rainy season and once during the rainy season and maintained to remove trash and other anthropogenic debris.

d. The ASBS Compliance Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff, that are necessary to comply with these special conditions, will be achieved through BMPs. Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that such installation would pose a threat to health or safety. BMPs to control storm water runoff discharges (at the end-of-pipe) during a design storm shall be designed to achieve on average the following target levels:

(1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

(2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges.

The baseline for these determinations is the effective date of the Exception, except for those structural BMPs installed between January 1, 2005 and adoption of these Special Protections, and the reductions must be achieved and documented within six (6) years of the effective date.

e. The ASBS Compliance Plan shall address erosion control and the prevention of anthropogenic sedimentation in ASBS. The natural habitat conditions in the ASBS shall not be altered as a result of anthropogenic sedimentation.

f. The ASBS Compliance Plan shall describe the non-structural BMPs currently employed and planned in the future (including those for construction activities), and include an implementation schedule. The ASBS Compliance Plan shall include non-structural BMPs that address public education and outreach. Education and outreach efforts must adequately inform the public that direct discharges of pollutants from private property not entering an MS4 are prohibited. The ASBS Compliance Plan shall also describe the structural BMPs, including any low impact development (LID) measures, currently employed and planned for higher threat discharges and include an implementation schedule. To control storm water runoff discharges (at the end-of-pipe) during a design storm, permittees must first consider, and use where feasible, LID practices to infiltrate, use, or evapotranspirate storm water runoff on-site, if LID practices would be the most effective at reducing pollutants from entering the ASBS.

g. The BMPs and implementation schedule shall be designed to ensure that natural water quality conditions in the receiving water are achieved and maintained by either reducing flows from impervious surfaces or reducing pollutant loading, or some combination thereof.

h. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents in storm water runoff that alter natural ocean water quality and the sources of these constituents.

(2) The report shall describe BMPs that are currently being implemented, BMPs that are identified in the SWMP or SWPPP for future implementation, and any additional BMPs that may be added to the SWMP or SWPPP to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the BMPs.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits), the discharger shall revise its ASBS Compliance Plan to incorporate any new or modified BMPs that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised SWMP or SWPPP, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural ocean water quality conditions due to the same constituent.

(5) The requirements of this section are in addition to the terms, prohibitions, and conditions contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within eighteen (18) months from the effective date of the Exception, the discharger shall submit a draft written ASBS Compliance Plan to the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that describes its strategy to comply with these special conditions, including the requirement to maintain natural water quality in the affected ASBS. The ASBS Compliance Plan shall include a description of appropriate non-structural controls and a time schedule to implement structural controls (implementation schedule) to comply with these special conditions for inclusion in the discharger's SWMP or SWPPP, as appropriate to permit type. The final ASBS Compliance Plan, including a description and final schedule for structural controls based on the results of runoff and receiving water monitoring, must be submitted within thirty (30) months from the effective date of the Exception.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these special conditions shall be implemented.

d. Within six (6) years of the effective date of the Exception, any structural controls identified in the ASBS Compliance Plan that are necessary to comply with these special conditions shall be operational.

e. Within six (6) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water, pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data, and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe

the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. for municipalities, a demonstration of significant hardship to discharger ratepayers, by showing the relationship of storm water fees to annual household income for residents within the discharger's jurisdictional area, and the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or

2. for other governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

B. NONPOINT SOURCE DISCHARGES

1. General Provisions for Nonpoint Sources

a. Existing nonpoint source waste discharges are allowed into an ASBS only under the following conditions:

(1) The discharges are authorized under waste discharge requirements, a conditional waiver of waste discharge requirements, or a conditional prohibition issued by the State Water Board or a Regional Water Board.

(2) The discharges are in compliance with the applicable terms, prohibitions, and special conditions contained in these Special Protections.

(3) The discharges:

(i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

(ii) Are designed to prevent soil erosion;

(iii) Occur only during wet weather;

(iv) Are composed of only storm water runoff.

b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

c. The discharge of trash is prohibited.

d. Only existing nonpoint source waste discharges are allowed. "Existing nonpoint source waste discharges" are discharges that were ongoing prior to January 1, 2005. "New nonpoint source discharges" are defined as those that commenced on or after January 1, 2005. A change to an existing nonpoint source discharge, in terms of relocation or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges from nonpoint sources (those not subject to an NPDES Permit) are prohibited except as provided below:

(1) The term "non-storm water discharges" means any waste discharges that are not composed entirely of storm water.

(2) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability, or occur naturally:

(i) Discharges associated with emergency fire fighting operations.

(ii) Foundation and footing drains.

(iii) Water from crawl space or basement pumps.

(iv) Hillside dewatering.

(v) Naturally occurring groundwater seepage via a storm drain.

(vi) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

f. At the San Clemente Island ASBS, discharges incidental to military training and research, development, test, and evaluation operations are allowed. Discharges incidental to underwater demolition and other in-water explosions are not allowed in the two military closure areas in the vicinity of Wilson Cove and Castle Rock. Discharges must not result in a violation of the water quality objectives, including the protection of the marine aquatic life beneficial use, anywhere in the ASBS.

g. At the San Nicolas Island and Begg Rock ASBS, discharges incidental to military research, development, testing, and evaluation of, and training with, guided missile and other weapons systems, fleet training exercises, small-scale amphibious warfare training, and special warfare training are allowed. Discharges incidental to underwater demolition and other in-water explosions are not allowed. Discharges must not result in a violation of the water quality objectives, including the protection of the marine aquatic life beneficial use, anywhere in the ASBS.

h. All other nonpoint source discharges not specifically authorized above are prohibited.

2. Planning and Reporting

a. The nonpoint source discharger shall develop an ASBS Pollution Prevention ~~P~~lan, including an implementation schedule, to address storm water runoff and any other nonpoint source discharges from its facilities. The ASBS Pollution Prevention Plan must be equivalent in contents to an ASBS Compliance Plan as described in I (A)(2) in this document. The ASBS Pollution Prevention Plan is subject to approval by the Executive Director of the State Water Board (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements).

b. The ASBS Pollution Prevention Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff that are necessary to comply with these special conditions, will be achieved through Management Measures and associated Management Practices (Management Measures/Practices). Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director or Regional Water Board Executive Officer that such installation would pose a threat to health or safety. Management Measures to control storm water runoff during a design storm shall achieve on average the following target levels:

(1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

(2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges.

The baseline for these determinations is the effective date of the Exception, except for those structural BMPs installed between January 1, 2005 and adoption of these Special Protections, and the reductions must be achieved and documented within six (6) years of the effective date.

c. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff or other nonpoint source pollution is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and the Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents that alter natural water quality and the sources of these constituents.

(2) The report shall describe Management Measures/Practices that are currently being implemented, Management Measures/Practices that are identified in the ASBS Pollution Prevention Plan for future implementation, and any additional Management Measures/Practices that may be added to the Pollution Prevention Plan to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the Management Measures/Practices.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of

the Regional Water Board (Regional Water Board waivers or waste discharge requirements), the discharger shall revise its ASBS Pollution Prevention Plan to incorporate any new or modified Management Measures/Practices that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised ASBS Pollution Prevention Plan, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural water quality conditions due to the same constituent.

(5) The requirements of this section are in addition to the terms, prohibitions, and conditions contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within eighteen (18) months from the effective date of the Exception, the discharger~~s~~ shall submit a draft written ASBS Pollution Prevention Plan to the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) that describes its strategy to comply with these special conditions, including the requirement to maintain natural ocean water quality in the affected ASBS. The Pollution Prevention Plan shall include a description of appropriate non-structural controls and a time schedule to implement structural controls to comply with these special conditions for inclusion in the discharger's Pollution Prevention Plan. The final ASBS Pollution Prevention Plan, including a description and final schedule for structural controls based on the results of runoff and receiving water monitoring, must be submitted within thirty (30) months from the effective date of the Exception.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these Special Protections shall be implemented.

d. Within six (6) years of the effective date of the Exception, any structural controls identified in the ASBS Pollution Prevention Plan that are necessary to comply with these special conditions shall be operational.

e. Within six (6) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board

waivers or waste discharge requirements) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. a demonstration that the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or

2. for governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

II. ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES

In addition to the provisions in Section I (A) or I (B), respectively, a discharger with parks and recreation facilities shall comply with the following:

A. The discharger shall include a section in an ASBS Compliance Plan (for NPDES dischargers) or an ASBS Pollution Prevention Plan (for nonpoint source dischargers) to address storm water runoff from parks and recreation facilities.

1. The plan shall identify all pollutant sources, including sediment sources, which may result in waste entering storm water runoff. Pollutant sources include, but are not limited to, roadside rest areas and vistas, picnic areas, campgrounds, trash receptacles, maintenance facilities, park personnel housing, portable toilets, leach fields, fuel tanks, roads, piers, and boat launch facilities.

2. The plan shall describe BMPs or Management Measures/Practices that will be implemented to control soil erosion (both temporary and permanent erosion controls) and reduce or eliminate pollutants in storm water runoff in order to achieve and maintain natural water quality conditions in the affected ASBS. The plan shall include BMPs or Management Measures/Practices to ensure that trails and culverts are maintained to prevent erosion and minimize waste discharges to ASBS.

3. The plan shall include BMPs or Management Measures/Practices to prevent the discharge of pesticides or other chemicals, including agricultural chemicals, in storm water runoff to the affected ASBS.

4. The plan shall include BMPs or Management Measures/Practices that address public education and outreach. The goal of these BMPs or Management Measures/Practices is to ensure that the public is adequately informed that waste discharges to the affected ASBS are prohibited or limited by special conditions in these Special Protections. The BMPs or Management Measures/Practices shall include signage at camping, picnicking, beach and roadside parking areas, and visitor centers, or other appropriate measures, which notify the public of any applicable requirements of these Special Protections and identify the ASBS boundaries.

5. The plan shall include BMPs or Management Measures/Practices that address the prohibition against the discharge of trash to ASBS. The BMPs or Management Measures/Practices shall include measures to ensure that adequate trash receptacles are available for public use at visitor facilities, including parking areas, and that the receptacles are adequately maintained to prevent trash discharges into the ASBS. Appropriate measures include covering trash receptacles to prevent trash from being wind blown and periodically emptying the receptacles to prevent overflows.

6. The plan shall include BMPs or Management Measures/Practices to address runoff from parking areas and other developed features to ensure that the runoff does not alter natural water quality in the affected ASBS. BMPs or Management Measures/Practices shall include measures to reduce pollutant loading in runoff to the ASBS through installation of natural area buffers (LID), treatment, or other appropriate measures.

B. Maintenance and repair of park and recreation facilities must not result in waste discharges to the ASBS. The practice of road oiling must be minimized or eliminated, and must not result in waste discharges to the ASBS.

III. ADDITIONAL REQUIREMENTS – WATERFRONT AND MARINE OPERATIONS

In addition to the provisions in Section I (A) or I (B), respectively, a discharger with waterfront and marine operations shall comply with the following:

A. For discharges related to waterfront and marine operations, the discharger shall develop a Waterfront and Marine Operations Management Plan (Waterfront Plan). This plan shall contain appropriate Management Measures/Practices to address nonpoint source pollutant discharges to the affected ASBS.

1. The Waterfront Plan shall contain appropriate Management Measures/Practices for any waste discharges associated with the operation and maintenance of vessels, moorings, piers, launch ramps, and cleaning stations in order to ensure that beneficial uses are protected and natural water quality is maintained in the affected ASBS.

2. For discharges from marinas and recreational boating activities, the Waterfront Plan shall include appropriate Management Measures, described in The Plan for California's Nonpoint Source Pollution Control Program, for marinas and recreational boating, or equivalent practices, to ensure that nonpoint source pollutant discharges do not alter natural water quality in the affected ASBS.

3. The Waterfront Plan shall include Management Practices to address public education and outreach to ensure that the public is adequately informed that waste discharges to the affected ASBS are prohibited or limited by special conditions in these Special Protections. The management practices shall include appropriate signage, or similar measures, to inform the public of the ASBS restrictions and to identify the ASBS boundaries.

4. The Waterfront Plan shall include Management Practices to address the prohibition against trash discharges to ASBS. The Management Practices shall include the provision of adequate trash receptacles for marine recreation areas, including parking areas, launch ramps, and docks. The plan shall also include appropriate Management Practices to ensure that the receptacles are adequately maintained and secured in order to prevent trash discharges into the ASBS. Appropriate Management Practices include covering the trash receptacles to prevent trash from being windblown, staking or
securing the trash receptacles so they don't tip over, and periodically emptying the receptacles to prevent overflow.

5. The discharger shall submit its Waterfront Plan to the by the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) within six months of the effective date of these special conditions. The Waterfront Plan is subject to approval by the State Water Board Executive Director or the Regional Water Board Executive Officer, as appropriate. The plan must be fully implemented within 18 months of the effective date of the Exception.

B. The discharge of chlorine, soaps, petroleum, other chemical contaminants, trash, fish offal, or human sewage to ASBS is prohibited. Sinks and fish cleaning stations are point source discharges of wastes and are prohibited from discharging into ASBS. Anthropogenic accumulations of discarded fouling organisms on the sea floor must be minimized.

C. Limited-term activities, such as the repair, renovation, or maintenance of waterfront facilities, including, but not limited to, piers, docks, moorings, and breakwaters, are authorized only in accordance with Chapter III.E.2 of the Ocean Plan.

D. If the discharger anticipates that the discharger will fail to fully implement the approved Waterfront Plan within the 18 month deadline, the discharger shall submit a technical report as soon as practicable to the State Water Board Executive Director or the Regional Water Board Executive Officer, as appropriate. The technical report shall contain reasons for failing to meet the deadline and propose a revised schedule to fully implement the plan.

E. The State Water Board or the Regional Water Board may, for good cause, authorize additional time to comply with the Waterfront Plan. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that

caused or would cause it to fail to meet the deadline in Section III.A.5. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality. The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. a demonstration of significant hardship by showing that the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate.

2. for governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

IV. MONITORING REQUIREMENTS

Monitoring is mandatory for all dischargers to assure compliance with the Ocean Plan. Monitoring requirements include both: (A) core discharge monitoring, and (B) ocean receiving water monitoring. The State and Regional Water Boards must approve sampling site locations and any adjustments to the monitoring programs. All ocean receiving water and reference area monitoring must be comparable with the Water Boards' Surface Water Ambient Monitoring Program (SWAMP).

Safety concerns: Sample locations and sampling periods must be determined considering safety issues. Sampling may be postponed upon notification to the State and Regional Water Boards if hazardous conditions prevail.

Analytical Chemistry Methods: All constituents must be analyzed using the lowest minimum detection limits comparable to the Ocean Plan water quality objectives. For metal analysis, all samples, including storm water effluent, reference samples, and ocean receiving water samples, must be analyzed by the approved analytical method with the lowest minimum detection limits (currently Inductively Coupled Plasma/Mass Spectrometry) described in the Ocean Plan.

A. CORE DISCHARGE MONITORING PROGRAM

1. General sampling requirements for timing and storm size:

Runoff must be collected during a storm event that is greater than 0.1 inch and generates runoff, and at least 72 hours from the previously measurable storm event. Runoff samples shall be collected during the same storm and at approximately the same time when post-storm receiving water is sampled, and analyzed for the same constituents as receiving water and reference site samples (see section IV B) as described below.

2. Runoff flow measurements

a. For municipal/industrial storm water outfalls in existence as of December 31, 2007, 18 inches (457mm) or greater in diameter/width (including multiple outfall pipes in combination having a width of 18 inches, runoff flows must be measured or calculated, using a method acceptable to and approved by the State and Regional Water Boards.

b. This will be reported annually for each precipitation season to the State and Regional Water Boards.

3. Runoff samples – storm events

a. For outfalls equal to or greater than 18 inches (0.46m) in diameter or width:

(1) samples of storm water runoff shall be collected during the same storm as receiving water samples and analyzed for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

(2) samples of storm water runoff shall be collected and analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

(3) If an applicant has no outfall greater than 36 inches, then storm water runoff from the applicant's largest outfall shall be further collected during the same storm as receiving water samples and analyzed for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates).

b. For outfalls equal to or greater than 36 inches (0.91m) in diameter or width:

(1) samples of storm water runoff shall be collected during the same storm as receiving water samples and analyzed for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

(2) samples of storm water runoff shall be further collected during the same storm as receiving water samples and analyzed for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates); and

(3) samples of storm water runoff shall be collected and analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

c. For an applicant not participating in a regional monitoring program [see below in Section IV (B)] in addition to (a.) and (b.) above, a minimum of the two largest outfalls or 20 percent of the larger outfalls, whichever is greater, shall be sampled (flow weighted composite samples) at least three times annually during wet weather (storm event)

and analyzed for all Ocean Plan Table A constituents, Table B constituents for marine aquatic life protection (except for toxicity, only chronic toxicity for three species shall be required), DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, and Ocean Plan indicator bacteria. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one (the largest) such discharge shall be sampled annually in each Region.

4. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may reduce or suspend core monitoring once the storm runoff is fully characterized. This determination may be made at any point after the discharge is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

B. Ocean Receiving Water and Reference Area Monitoring Program

In addition to performing the Core Discharge Monitoring Program in Section II.A above, all applicants having authorized discharges must perform ocean receiving water monitoring. In order to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS, dischargers may choose either (1) an individual monitoring program, or (2) participation in a regional integrated monitoring program.

1. Individual Monitoring Program: The requirements listed below are for those dischargers who elect to perform an individual monitoring program to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within the affected ASBS. In addition to Core Discharge Monitoring, the following additional monitoring requirements shall be met:

   a. Three times annually, during wet weather (storm events), the receiving water at the point of discharge from the outfalls described in section (IV)(A)(3)(c) above shall be sampled and analyzed for Ocean Plan Table A constituents, Table B constituents for marine aquatic life, DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, salinity, chronic toxicity (three species), and Ocean Plan indicator bacteria.

      The sample location for the ocean receiving water shall be in the surf zone at the point of discharges; this must be at the same location where storm water runoff is sampled. Receiving water shall be sampled prior to (pre-storm) and during (or immediately after) the same storm (post storm). Post storm sampling shall be during the same storm and at approximately the same time as when the runoff is sampled. Reference water quality shall also be sampled three times annually and analyzed for the same constituents pre-storm and post-storm, during the same storm seasons when receiving water is sampled. Reference stations will be determined by the State Water Board's Division of Water Quality and the applicable Regional Water Board(s).

   b. Sediment sampling shall occur at least three times during every five (5) year period. The subtidal sediment (sand or finer, if present) at the discharge shall be sampled and analyzed for Ocean Plan Table B constituents for marine aquatic life, DDT, PCBs, PAHs, pyrethroids, and OP pesticides. For sediment toxicity testing, only an acute toxicity test using the amphipod *Eohaustorius estuarius* must be performed.

c. A quantitative survey of intertidal benthic marine life shall be performed at the discharge and at a reference site. The survey shall be performed at least once every five (5) year period. The survey design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The results of the survey shall be completed and submitted to the State Water Board and Regional Water Board at least six months prior to the end of the permit cycle.

d. Once during each five (5) year period, a bioaccumulation study shall be conducted to determine the concentrations of metals and synthetic organic pollutants at representative discharge sites and at representative reference sites. The study design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The bioaccumulation study may include California mussels (*Mytilus californianus*) and/or sand crabs (*Emerita analoga* or *Blepharipoda occidentalis*). Based on the study results, the Regional Water Board and the State Water Board's Division of Water Quality, may adjust the study design in subsequent permits, or add or modify additional test organisms (such as shore crabs or fish), or modify the study design appropriate for the area and best available sensitive measures of contaminant exposure.

e. Marine Debris: Representative quantitative observations for trash by type and source shall be performed along the coast of the ASBS within the influence of the discharger's outfalls. The design, including locations and frequency, of the marine debris observations is subject to approval by the Regional Water Board and State Water Board's Division of Water Quality.

f. The monitoring requirements of the Individual Monitoring Program in this section are minimum requirements. After a minimum of one (1) year of continuous water quality monitoring of the discharges and ocean receiving waters, the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may require additional monitoring, or adjust, reduce or suspend receiving water and reference station monitoring. This determination may be made at any point after the discharge and receiving water is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

2. Regional Integrated Monitoring Program: Dischargers may elect to participate in a regional integrated monitoring program, in lieu of an individual monitoring program, to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS. This regional approach shall characterize natural water quality, pre- and post-storm, in ocean reference areas near the mouths of identified open space watersheds and the effects of the discharges on natural water quality (physical, chemical, and toxicity) in the ASBS receiving waters, and should include benthic marine aquatic life and bioaccumulation components. The design of the ASBS stratum of a regional integrated monitoring program may deviate from the otherwise prescribed individual monitoring approach (in Section IV.B.1) if approved by the State Water Board's Division of Water Quality and the Regional Water Boards.

a. Ocean reference areas shall be located at the drainages of flowing watersheds with minimal development (in no instance more than 10% development), and shall not be located in CWA Section 303(d) listed waterbodies or have tributaries that are 303(d) listed. Reference areas shall be free of wastewater discharges and anthropogenic non- storm water runoff. A minimum of low threat storm runoff discharges (e.g.

stream highway overpasses and campgrounds) may be allowed on a case-by-case basis. Reference areas shall be located in the same region as the ASBS receiving water monitoring occurs. The reference areas for each Region are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean reference water samples must be collected from each station, each from a separate storm during the same storm season that receiving water is sampled. A minimum of one reference location shall be sampled for each ASBS receiving water site sampled per responsible party. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

b. ASBS ocean receiving water must be sampled in the surf zone at the location where the runoff makes contact with ocean water (i.e. at "point zero"). Ocean receiving water stations must be representative of worst-case discharge conditions (i.e. co-located at a large drain greater than 36 inches, or if drains greater than 36 inches are not present in the ASBS then the largest drain greater than18 inches.) Ocean receiving water stations are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean receiving water samples must be collected during each storm season from each station, each from a separate storm. A minimum of one receiving water location shall be sampled in each ASBS per responsible party in that ASBS. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

c. Reference and receiving water sampling shall commence during the first full storm season following the adoption of these special conditions, and post-storm samples shall be collected during the same storm event when storm water runoff is sampled. Sampling shall occur in a minimum of two storm seasons. For those ASBS dischargers that have already participated in the Southern California Bight 2008 ASBS regional monitoring effort, sampling may be limited to only one storm season.

d. Receiving water and reference samples shall be analyzed for the same constituents as storm water runoff samples. At a minimum, constituents to be sampled and analyzed in reference and discharge receiving waters must include oil and grease, total suspended solids, Ocean Plan Table B metals for protection of marine life, Ocean Plan PAHs, pyrethroids, OP pesticides, ammonia, nitrate, phosphates, and critical life stage chronic toxicity for three species. In addition, within the range of the southern sea otter, indicator bacteria or some other measure of fecal contamination shall be analyzed.

3. Waterfront and Marine Operations: In addition to the above requirements for ocean receiving water monitoring, additional monitoring must be performed for marinas and boat launch and pier facilities:

a. For all marina or mooring field operators, in mooring fields with 10 or more occupied moorings, the ocean receiving water must be sampled for Ocean Plan indicator bacteria, residual chlorine, copper, zinc, grease and oil, methylene blue active substances (MBAS), and ammonia nitrogen.

(1) For mooring field operators opting for an individual monitoring program (Section IV.B.1 above), this sampling must occur weekly (on the weekend) from May through October.

(2) For mooring field operators opting to participate in a regional integrated monitoring program (Section IV.B.2 above), this sampling must occur monthly from May through October on a high use weekend in each month. The Water Boards may allow a reduction in the frequency of sampling, through the regional monitoring program, after the first year of monitoring.

b. For all mooring field operators, the subtidal sediment (sand or finer, if present) within mooring fields and below piers shall be sampled and analyzed for Ocean Plan Table B metals (for marine aquatic life beneficial use), acute toxicity, PAHs, and tributyltin. For sediment toxicity testing, only an acute toxicity test using the amphipod *Eohaustorius estuarius* must be performed. This sampling shall occur at least three times during a five (5) year period. For mooring field operators opting to participate in a regional integrated monitoring program, the Water Boards may allow a reduction in the frequency of sampling after the first sampling effort's results are assessed.

Glossary

At the point of discharge(s) – Means in the surf zone immediately where runoff from an outfall meets the ocean water (a.k.a., at point zero).

Areas of Special Biological Significance (ASBS) – Those areas designated by the State Water Board as ocean areas requiring protection of species or biological communities to the extent that alteration of natural water quality is undesirable. All Areas of Special Biological Significance are also classified as a subset of State Water Quality Protection Areas.

Design storm – For purposes of these Special Protections, a design storm is defined as the volume of runoff produced from one inch of precipitation per day or, if this definition is inconsistent with the discharger's applicable storm water permit, then the design storm shall be the definition included in the discharger's applicable storm water permit.

Development – Relevant to reference monitoring sites, means urban, industrial, agricultural, grazing, mining, and timber harvesting land uses.

Higher threat discharges - Permitted storm drains discharging equal to or greater than 18 inches, industrial storm drains, agricultural runoff discharged through an MS4, discharges associated with waterfront and marina operations (e.g., piers, launch ramps, mooring fields, and associated vessel support activities, except for passive discharges defined below), and direct discharges associated with commercial or industrial activities to ASBS.

Low Impact Development (LID) – A sustainable practice that benefits water supply and contributes to water quality protection. Unlike traditional storm water management, which entails collecting and conveying storm water runoff through storm drains, pipes, or other conveyances to a centralized storm water facility, LID focuses on using site design and storm water management to maintain the site's pre-development runoff rates and volumes. The goal of LID is to mimic a site's predevelopment hydrology by using design techniques that infiltrate, filter, store, evaporate, and detain runoff close to the source of rainfall.

Marine Operations – Marinas or mooring fields that contain slips or mooring locations for 10 or more vessels.

Management Measure (MM) - Economically achievable measures for the control of the addition of pollutants from various classes of nonpoint sources of pollution, which reflect the greatest degree of pollutant reduction achievable through the application of the best available nonpoint pollution control practices, technologies, processes, siting criteria, operating methods, or other alternatives. For example, in the "marinas and recreational boating" land- use category specified in the Plan for California's Nonpoint Source Pollution Control Program (NPS Program Plan) (SWRCB, 1999), "boat cleaning and maintenance" is considered a MM or the source of a specific class or type of NPS pollution.

Management Practice (MP) - The practices (e.g., structural, non-structural, operational, or other alternatives) that can be used either individually or in combination to address a specific MM class or classes of NPS pollution. For example, for the "boat cleaning and maintenance" MM, specific MPs can include, but are not limited to, methods for the selection of environmentally sensitive hull paints or methods for cleaning/removal of hull copper anti- fouling paints.

Municipal Separate Storm Sewer System (MS4) – A municipally-owned storm sewer system regulated under the Phase I or Phase II storm water program implemented in compliance with Clean Water Act section 402(p). Note that an MS4 program's boundaries are not necessarily congruent with the permittee's political boundaries.

Natural Ocean Water Quality - The water quality (based on selected physical, chemical and biological characteristics) that is required to sustain marine ecosystems, and which is without apparent human influence, *i.e.*, an absence of significant amounts of: (a) man-made constituents (*e.g.,* DDT); (b) other chemical (*e.g.,* trace metals), physical (temperature/thermal pollution, sediment burial), and biological (*e.g.*, bacteria) constituents at concentrations that have been elevated due to man's activities above those resulting from the naturally occurring processes that affect the area in question; and (c) non-indigenous biota (*e.g.,* invasive algal bloom species) that have been introduced either deliberately or accidentally by man. Discharges "*shall not alter natural ocean water quality*" as determined by a comparison to the range of constituent concentrations in reference areas agreed upon via the regional monitoring program(s). If monitoring information indicates that *natural ocean water quality* is not maintained, but there is sufficient evidence that a discharge is not contributing to the alteration of natural water quality, then the Regional Water Board may make that determination. In this case, sufficient information must include runoff sample data that has equal or lower concentrations for the range of constituents at the applicable reference area(s).

Nonpoint source – Nonpoint pollution sources generally are sources that do not meet the definition of a point source. Nonpoint source pollution typically results from land runoff, precipitation, atmospheric deposition, agricultural drainage, marine/boating operations or hydrologic modification. Nonpoint sources, for purposes of these Special Protections, include discharges that are not required to be regulated under an NPDES permit.

Non-storm water discharge – Any runoff that is not the result of a precipitation event. This is often referred to as "dry weather flow."

Non-structural control – A Best Management Practice that involves operational, maintenance, regulatory (e.g., ordinances) or educational activities designed to reduce or eliminate pollutants in runoff, and that are not structural controls (i.e. there are no physical structures involved).

Physical impossibility - Means any act of God, war, fire, earthquake, windstorm, flood or natural catastrophe; unexpected and unintended accidents not caused by discharger or its employees' negligence; civil disturbance, vandalism, sabotage or terrorism; restrain by court order or public authority or agency; or action or non-action by, or inability to

obtain the necessary authorizations or approvals from any governmental agency other than the permittee.

Representative sites and monitoring procedures – Are to be proposed by the discharger, with appropriate rationale, and subject to approval by Water Board staff.

Sheet-flow – Runoff that flows across land surfaces at a shallow depth relative to the cross- sectional width of the flow. These types of flow may or may not enter a storm drain system before discharge to receiving waters.

Storm Season – Also referred to as rainy season, means the months of the year from the onset of rainfall during autumn until the cessation of rainfall in the spring.

Structural control – A Best Management Practice that involves the installation of engineering solutions to the physical treatment or infiltration of runoff.

Surf Zone - The surf zone is defined as the submerged area between the breaking waves and the shoreline at any one time.

Surface Water Ambient Monitoring Program (SWAMP) comparable – Means that the monitoring program must 1) meet or exceed 2008 SWAMP Quality Assurance Program Management Plan (QAPP) Measurement Quality Objectives, or 2) have a Quality Assurance Project Plan that has been approved by SWAMP; in addition data must be formatted to match the database requirements of the SWAMP Information Management System. Adherence to the measurement quality objectives in the Southern California Bight 2008 ASBS Regional Monitoring Program QAPP and data base management comprises being SWAMP comparable.

Waterfront Operations - Piers, launch ramps, and cleaning stations in the water or on the adjacent shoreline.

Attachment 1
Special Protections Sections I(A)(3)(e) and I(B)(3)(e)
Flowchart to Deteremine Compliance with natural Water Quality

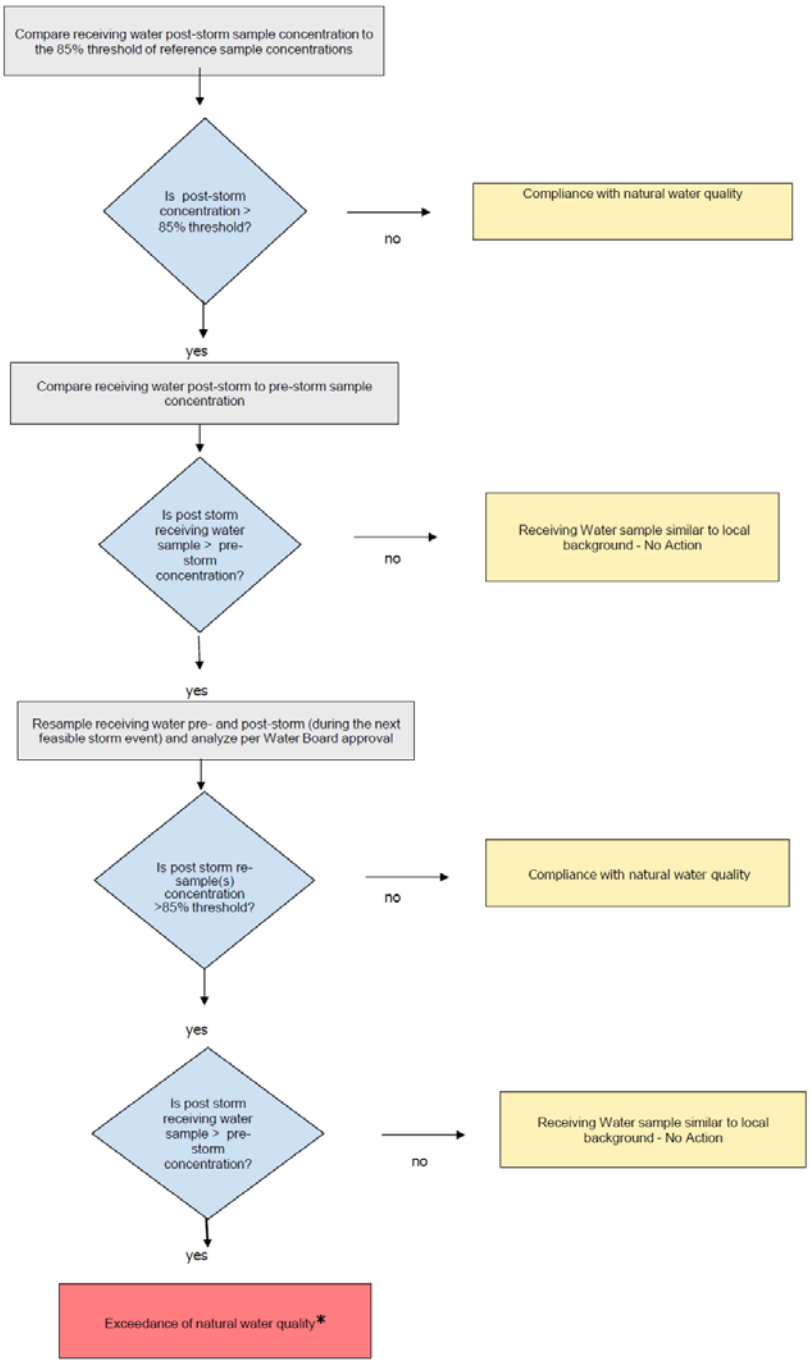

*** When an exceedance of natural water quality occurs, the discharger must comply with section I.A.2.h (for permitted storm water) or section I.B.2.c (for nonpoint sources). Note, when sampling data is available, end-of-pipe effluent concentrations will be considered by the Water Boards in making this determination.**

ATTACHMENT B

STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

1. Standard Permit Provisions

Code of Federal Regulations Title 40 Section 122.41 (40 CFR 122.41) includes conditions, or provisions, that apply to all National Pollutant Discharge Elimination System (NPDES) permits. Additional provisions applicable to NPDES permits are in 40 CFR 122.42. All applicable provisions in 40 CFR 122.41 and 40 CFR 122.42 must be incorporated into this Order and NPDES permit. The applicable 40 CFR 122.41 and 40 CFR 122.42 provisions are as follows:

a. DUTY TO COMPLY [40 CFR 122.41(a)]

The Copermittee must comply with all of the provisions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

(1) The Copermittee must comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement. [40 CFR 122.41(a)(1)]

(2) The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to a civil penalty not to exceed $25,000 per day for each violation. The CWA provides that any person who *negligently* violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than 2 years, or both. Any person who *knowingly* violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both. Any person who knowingly violates Section 301, 302, 303, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, and who knows at that time that he thereby places another person in imminent

danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.
[40 CFR 122.41(a)(2)]

(3) Any person may be assessed an administrative penalty by the San Diego Regional Water Quality Control Board (San Diego Water Board), State Water Resources Control Board (State Water Board), or United States Environmental Protection Agency (USEPA) for violating Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.
[40 CFR 122.41(a)(3)]

b. DUTY TO REAPPLY [40 CFR 122.41(b)]

If a Copermittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Copermittee must apply for and obtain a new permit.

c. NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE [40 CFR 122.41(c)]

It shall not be a defense for a Copermittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

d. DUTY TO MITIGATE [40 CFR 122.41(d)]

The Copermittee must take all reasonable steps to minimize or prevent any discharge or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

e. PROPER OPERATION AND MAINTENANCE [40 CFR 122.41(e)]

The Copermittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Copermittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by a Copermittee only when the operation is necessary to achieve compliance with the conditions of this permit.

f. PERMIT ACTIONS [40 CFR 122.41(f)]

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Copermittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

g. PROPERTY RIGHTS [40 CFR 122.41(g)]

This permit does not convey any property rights of any sort, or any exclusive privilege.

h. DUTY TO PROVIDE INFORMATION [40 CFR 122.41(h)]

The Copermittee must furnish to the San Diego Water Board, State Water Board, or USEPA within a reasonable time, any information which the San Diego Water Board, State Water Board, or USPEA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Copermittee must also furnish to the San Diego Water Board, State Water Board, or USPEA upon request, copies of records required to be kept by this permit.

i. INSPECTION AND ENTRY [40 CFR 122.41(i)]

The Copermittee must allow the San Diego Water Board, State Water Board, USEPA, and/or their authorized representative (including an authorized contractor acting as their representative), upon presentation of credentials and other documents as may be required by law, to:

(1) Enter upon the Copermittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit; [40 CFR 122.41(i)(1)]

(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit; [40 CFR 122.41(i)(2)]

(3) Inspect and photograph at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; [40 CFR 122.41(i)(3)] and

(4) Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location. [40 CFR 122.41(i)(4)]

j. MONITORING AND RECORDS [40 CFR 122.41(j)]

(1) Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity. [40 CFR 122.41(j)(1)]

(2) Except for records of monitoring information required by this permit related to the Copermittee's sewage sludge use and disposal activities, which shall be retained for

a period of at least five (5) years (or longer as required by 40 CFR Part 503), the Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time. [40 CFR 122.41(j)(2)]

(3) Records for monitoring information must include: [40 CFR 122.41(j)(3)]

(a) The date, exact place, and time of sampling or measurements; [40 CFR 122.41(j)(3)(i)]
(b) The individual(s) who performed the sampling or measurements; [40 CFR 122.41(j)(3)(ii)]
(c) The date(s) analyses were performed; [40 CFR 122.41(j)(3)(iii)]
(d) The individual(s) who performed the analyses; [40 CFR 122.41(j)(3)(iv)]
(e) The analytical techniques or methods used; [40 CFR 122.41(j)(3)(v)] and
(f) The results of such analyses. [40 CFR 122.41(j)(3)(vi)]

(4) Monitoring must be conducted according to test procedures under 40 CFR Part 136 unless another method is required under 40 CFR Subchapters N or O. [40 CFR 122.41(j)(4)]

In the case of pollutants for which there are no approved methods under 40 CFR Part 136 or otherwise required under 40 CFR Subchapters N and O, monitoring must be conducted according to a test procedure specified in the permit for such pollutants. [40 CFR 122.44(i)(1)(iv)]

(5) The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. [40 CFR 122.41(j)(5)]

k. SIGNATORY REQUIREMENT [40 CFR 122.41(k)]

(1) All applications, reports, or information submitted to the San Diego Water Board, State Water Board, or USEPA must be signed and certified. (See 40 CFR 122.22) [40 CFR 122.41(k)(1)]

(a) *For a municipality, State, Federal, or other public agency.* [All applications must be signed] by either a principal executive officer or ranking elected official. [40 CFR 122.22(a)(3)]

(b) All reports required by permits, and other information requested by the San Diego Water Board, State Water Board, or USEPA must be signed by a person described in paragraph (a) of this section, or by a duly authorized

representative of that person. A person is a duly authorized representative only if: [40 CFR 122.22(b)]

(i) The authorization is made in writing by a person described in paragraph (a) of this section; [40 CFR 122.22(b)(1)]

(ii) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company, (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) [40 CFR 122.22(b)(2)] and,

(iii) The written authorization is submitted to the San Diego Water Board and State Water Board. [40 CFR 122.22(b)(3)]

(c) *Changes to authorization.* If an authorization under paragraph (b) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (b) of this section must be submitted to the San Diego Water Board prior to or together with any reports, information, or applications to be signed by an authorized representative. [40 CFR 122.22(c)]

(d) *Certification.* Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." [40 CFR 122.22(d)]

(2) The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both. [40 CFR 122.41(k)(2)]

I. REPORTING REQUIREMENTS [40 CFR 122.41(l)]

(1) *Planned changes.* The Copermittee must give notice to the San Diego Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when: [40 CFR 122.41(l)(1)]

(a) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); [40 CFR 122.41(l)(1)(i)] or

(b) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1). [40 CFR 122.41(l)(1)(ii)]

(c) The alteration or addition results in a significant change in the Copermittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. [40 CFR 122.41(l)(1)(iii)]

(2) *Anticipated noncompliance*. The Copermittee must give advance notice to the San Diego Water Board or State Water Board of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements. [40 CFR 122.41(l)(2)]

(3) *Transfers*. This permit is not transferable to any person except after notice to the San Diego Water Board. The San Diego Water Board may require modification or revocation and reissuance of the permit to change the name of the Copermittee and incorporate such other requirements as may be necessary under the CWA. [40 CFR 122.41(l)(3)]

(4) *Monitoring reports.* Monitoring results must be reported at the intervals specified elsewhere in this permit. [40 CFR 122.41(l)(4)]

(a) Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the San Diego Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices. [40 CFR 122.41(l)(4)(i)]

(b) If the Copermittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or another method required for an industry-specific waste stream under 40 CFR Subchapters N or O, the results of this monitoring must be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the San Diego Water Board or State Water Board. [40 CFR 122.41(l)(4)(ii)]

(c) Calculations for all limitations which require averaging of measurements must utilize an arithmetic mean unless otherwise specified in the permit. [40 CFR 122.41(l)(4)(iii)]

(5) *Compliance schedules*. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date. [40 CFR 122.41(l)(5)]

(6) *Twenty-four hour reporting.*

(a) The Copermittee must report any noncompliance that may endanger health or the environment. Any information must be provided orally within 24 hours from the time the Copermittee becomes aware of the circumstances. A written submission must also be provided within five (5) days of the time the Copermittee becomes aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6)(i)]

(b) The following must be included as information which must be reported within 24 hours under this paragraph: [40 CFR 122.41(l)(6)(ii)]

(i) Any unanticipated bypass that exceeds any effluent limitation in the permit (See 40 CFR 122.41(g)). [40 CFR 122.41(l)(6)(ii)(A)]
(ii) Any upset which exceeds any effluent limitation in the permit. [40 CFR 122.41(l)(6)(ii)(B)] and,
(iii) Violation of a maximum daily discharge limitation for any of the pollutants listed by the San Diego Water Board in the permit to be reported within 24 hours. (See 40 CFR 122.44(g)) [40 CFR 122.41(l)(6)(ii)(C)]

(c) The San Diego Water Board may waive the above-required written report on a case-by-case basis if the oral report has been received within 24 hours. [40 CFR 122.41(l)(6)(iii)]

(7) *Other noncompliance.* The Copermittee must report all instances of noncompliance not reported in accordance with the standard provisions required under 40 CFR 122.41(l)(4), (5), and (6), at the time monitoring reports are submitted. The reports must contain the information listed in the standard provisions required under 40 CFR 122.41(l)(6). [40 CFR 122.41(l)(7))]

(8) *Other information.* When the Copermittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the San Diego Water Board, State Water Board, or USEPA, the Copermittee must promptly submit such facts or information. [40 CFR 122.41(l)(8)]

m. BYPASS [40 CFR 122.41(m)]

(1) *Definitions.*

(a) "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. [40 CFR 122.41(m)(1)(i)] or

(b) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or

substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
[40 CFR 122.41(m)(1)(ii)]

(2) *Bypass not exceeding limitations*. The Copermittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the standard provisions required under 40 CFR 122.41(m)(3) and (4).
[40 CFR 122.41(m)(2)]

(3) *Notice.*

(a) *Anticipated bypass*. If the Copermittee knows in advance of the need for a bypass, it must submit a notice, if possible at least ten days before the date of the bypass. [40 CFR 122.41(m)(3)(i)] or

(b) *Unanticipated bypass*. The Copermittee must submit notice of an unanticipated bypass in accordance with the standard provisions required under 40 CFR 122.41(l)(6) (24-hour notice).
[40 CFR 122.41(m)(3)(ii)]

(4) *Prohibition of Bypass.*

(a) Bypass is prohibited, and the San Diego Water Board may take enforcement action against a Copermittee for bypass, unless:
[40 CFR 122.41(m)(4)(i)]

(i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; [40 CFR 122.41(m)(4)(i)(A)]
(ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance;
[40 CFR 122.41(m)(4)(i)(B)] and,
(iii) The Copermittee submitted notice in accordance with the standard provisions required under 40 CFR 122.41(m)(3).
[40 CFR 122.41(m)(4)(i)(C)]

(b) The San Diego Water Board may approve an anticipated bypass, after considering its adverse effects, if the San Diego Water Board determines that it will meet the three conditions listed above.
[40 CFR 122.41(m)(4)(ii)]

n. UPSET [40 CFR 122.41(n)]

(1) *Definition.* "Upset" means an exceptional incident in which there is unintentional and

temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Copermittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. [40 CFR 122.41(n)(1)]

(2) *Effect of an upset*. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the standard provisions required under 40 CFR 122.41(n)(3) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. [40 CFR 122.41(n)(2)]

(3) *Conditions necessary for a demonstration of upset*. A Copermittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that: [40 CFR 122.41(n)(3)]

(a) An upset occurred and that the Copermittee can identify the cause(s) of the upset; [40 CFR 122.41(n)(3)(i)]
(b) The permitted facility was at the time being properly operated; [40 CFR 122.41(n)(3)(ii)] and
(c) The Copermittee submitted notice of the upset in accordance with the standard provisions required under 40 CFR 122.41(l)(6)(ii)(B) (24-hour notice). [40 CFR 122.41(n)(3)(iii)]
(d) The Copermittee complied with any remedial measures pursuant to the standard provisions required under 40 CFR 122.41(d). [40 CFR 122.41(n)(3)(iii)]

(4) *Burden of proof*. In any enforcement proceeding, the Copermittee seeking to establish the occurrence of an upset has the burden of proof. [40 CFR 122.41(n)(4)]

o. STANDARD PERMIT PROVISIONS FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS [40 CFR 122.42(c)]

The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the San Diego Water Board or State Water Board under 40 CFR 122.26(a)(1)(v) must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report must include:

(1) The status of implementing the components of the storm water management program that are established as permit conditions; [40 CFR 122.42(c)(1)]

(2) Proposed changes to the storm water management programs that are established as permit conditions. Such proposed changes must be consistent with 40 CFR 122.26(d)(2)(iii); [40 CFR 122.42(c)(2)] and

(3) Revisions, if necessary, to the assessment of controls and the fiscal analysis

reported in the permit application under 40 CFR 122.26(d)(2)(iv) and (v); [40 CFR 122.42(c)(3)]

(4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; [40 CFR 122.42(c)(4)]

(5) Annual expenditures and budget for year following each annual report; [40 CFR 122.42(c)(5)]

(6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; [40 CFR 122.42(c)(6)]

(7) Identification of water quality improvements or degradation. [40 CFR 122.42(c)(7)]

p. STANDARD PERMIT PROVISIONS FOR STORM WATER DISCHARGES [40 CFR 122.42(d)]

The initial permits for discharges composed entirely of storm water issued pursuant to 40 CFR 122.26(e)(7) must require compliance with the conditions of the permit as expeditiously as practicable, but in no event later than three years after the date of issuance of the permit.

2. General Provisions

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. The general provisions applicable to this Order and NPDES permit are as follows:

a. DISCHARGE OF WASTE IS A PRIVILEGE

No discharge of waste into the waters of the State, whether or not such discharge is made pursuant to waste discharge requirements, shall create a vested right to continue such discharge. All discharges of waste into waters of the State are privileges, not rights. [CWC Section 13263(g)]

b. DURATION OF ORDER AND NPDES PERMIT

(1) *Effective date*. ~~This Order and NPDES permit becomes effective on April 1st, 2015 the 50th day after its adoption provided the USEPA has no objection. If the USEPA objects to its issuance, this Order shall not become effective until such objection is withdrawn.~~ This Order supersedes Order No. R9-2007-0001 for the San Diego County Copermittees listed in Table 2.a and became effective on June 27, 2013 for those Copermittees.~~upon the effective date of this Order~~. This Order as amended by Order R9-2015-0001~~, and~~ supersedes Order No~~s~~. R9-2009-0002 and becomes effective ~~fifty (50) days~~ April 1, 2015, following ~~after~~ the date Order No. R9-2015-0001 is adopted. This Order supersedes Order No. R9-2010-0016 upon ~~its their expiration~~further amendment or earlier notice of coverage.

(2) *Expiration*. This Order and NPDES permit expires five years after its effective date.

[40 CFR 122.46(a)]

(3) *Continuation of expired order*. After this Order and NPDES permit expires, the terms and conditions of this Order and NPDES permit are automatically continued pending issuance of a new permit if all requirements of the federal NPDES regulations on the continuation of expired permits (40 CFR 122.6) are complied with.

c. AVAILABILITY

A copy of this Order must be kept at a readily accessible location and must be available to on-site personnel at all times.

d. CONFIDENTIALITY OF INFORMATION

Except as provided for in 40 CFR 122.7, no information or documents submitted in accordance with or in application for this Order will be considered confidential, and all such information and documents shall be available for review by the public at the San Diego Water Board office.

Claims of confidentiality for the following information will be denied:
[40 CFR 122.7(b)]

(1) The name and address of any permit applicant or Copermittee;
[40 CFR 122.7(b)(1)] and

(2) Permit applications and attachments, permits, and effluent data.
[40 CFR 122.7(b)(2)]

e. EFFLUENT LIMITATIONS

(1) *Interim effluent limitations*. The Copermittee must comply with any interim effluent limitations as established by addendum, enforcement action, or revised waste discharge requirements which have been, or may be, adopted by the San Diego Water Board.

(2) *Other effluent limitations and standards*. If any applicable toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant and that standard or prohibition is more stringent than any limitation on the pollutant in the permit, the San Diego Water Board shall institute proceedings under these regulations to modify or revoke and reissue the permit to conform to the toxic effluent standard or prohibition. [40 CFR 122.44(b)(1)]

f. DUTY TO MINIMIZE OR CORRECT ADVERSE IMPACTS

The Copermittee must take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this Order, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the noncompliance.

g. PERMIT ACTIONS

The filing of a request by the Copermittee for modification, revocation and reissuance, or termination of this Order, or a notification of planned change in or anticipated noncompliance with this Order does not stay any condition of this Order. (See 40 CFR 122.41(f)) In addition, the following provisions apply to this Order:

(1) Upon application by any affected person, or on its own motion, the San Diego Water Board may review and revise the requirements in this Order. All requirements must be reviewed periodically. [CWC Section 13263(e)]

(2) This Order may be terminated or modified for cause, including, but not limited to, all of the following: [CWC Section 13381]

(a) Violation of any condition contained in the requirements of this Order. [CWC Section 13381(a)]

(b) Obtaining the requirements in this Order by misrepresentation, or failure to disclose fully all relevant facts. [CWC Section 13381(b)]

(c) A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge. [CWC Section 13381(c)]

(3) When this Order is transferred to a new owner or operator, such requirements as may be necessary under the CWC may be incorporated into this Order.

h. NPDES PERMITTED NON-STORM WATER DISCHARGES

The San Diego Water Board has, in prior years, issued a limited number of individual NPDES permits for non-storm water discharges to MS4s. The San Diego Water Board or State Water Board may in the future, upon prior notice to the Copermittee(s), issue an NPDES permit for any non-storm water discharge (or class of non-storm water discharges) to an MS4.

i. MONITORING

In addition to the standard provisions required under 40 CFR 122.41(j) and (l)(4), the following general monitoring provisions apply to this Order:

(1) Where procedures are not otherwise specified in Order, sampling, analysis and quality assurance/quality control must be conducted in accordance with the Quality Assurance Management Plan (QAMP) for the State of California's Surface Water Ambient Monitoring Program (SWAMP), adopted by the State Water Resources Control Board (State Water Board).

(2) Pursuant to 40 CFR 122.41(j)(2) and CWC Section 13383(a), each Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring

instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five (5) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time.

(3) All chemical, bacteriological, and toxicity analyses must be conducted at a laboratory certified for such analyses by the California Department of Public Health or a laboratory approved by the San Diego Water Board.

(4) For priority toxic pollutants that are identified in the California Toxics Rule (CTR) (65 Fed. Reg. 31682), the Copermittees must instruct their laboratories to establish calibration standards that are equivalent to or lower than the Minimum Levels (MLs) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP). If a Copermittee can demonstrate that a particular ML is not attainable, in accordance with procedures set forth in 40 CFR Part 136, the lowest quantifiable concentration of the lowest calibration standard analyzed by a specific analytical procedure (assuming that all the method specified sample weights, volumes, and processing steps have been followed) may be used instead of the ML listed in Appendix 4 of the SIP. The Copermittee must submit documentation from the laboratory to the San Diego Water Board for approval prior to raising the ML for any priority toxic pollutant.

j. ENFORCEMENT

(1) The San Diego Water Board is authorized to enforce the terms of this Order under several provisions of the CWC, including, but not limited to, CWC Sections 13385, 13386, and 13387.

(2) Nothing in this Order shall be construed to protect the Copermittee from its liabilities under federal, state, or local laws.

(3) The CWC provides for civil and criminal penalties comparable to, and in some cases greater than, those provided for under the CWA.

(4) Except as provided in the standard conditions required under 40 CFR 122.41(m) and (n), nothing in this Order shall be construed to relieve the Copermittee from civil or criminal penalties for noncompliance.

(5) Nothing in this Order shall be construed to preclude the institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties to which the Copermittee is or may be subject to under Section 311 of the CWA.

(6) Nothing in this Order shall be construed to preclude institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authoring preserved by Section 510 of the CWA.

k. SEVERABILITY

The provisions of this Order are severable, and if any provision of this Order, or the

application of any provisions of this Order to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this Order shall not be affected thereby.

l. APPLICATIONS

Any application submitted by a Copermittee for reissuance or modification of this Order must satisfy all applicable requirements specified in federal regulations as well as any additional requirements for submittal of a Report of Waste Discharge specified in the CWC and the California Code of Regulations.

m. IMPLEMENTATION

All plans, reports and subsequent amendments submitted in compliance with this Order must be implemented immediately (or as otherwise specified). All submittals by Copermittees must be adequate to implement the requirements of this Order.

n. REPORT SUBMITTALS

(1) All report submittals must include an executive summary, introduction, conclusion, recommendations, and signed certified statement.

(2) Each Copermittee must submit a signed certified statement covering its responsibilities for each applicable submittal.

(3) The Principal Watershed Copermittee(s) must submit a signed certified statement covering its responsibilities for each applicable submittal and the sections of the submittals for which it is responsible.

(4) Unless otherwise directed, the Copermittees must submit one hard copy and one electronic copy of each report required under this Order to the San Diego Water Board, and one electronic copy to the USEPA.

(5) The Copermittees must submit reports and provide notifications as required by this Order to the following:

EXECUTIVE OFFICER
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
2375 NORTHSIDE DRIVE~~9174 SKY PARK COURT~~, SUITE 100
SAN DIEGO CA 92108~~23-4340~~
Telephone: ~~(858) 467-2952~~(619) 516-1990~~-~~ Fax: ~~(858) 571-6972~~(619) 516-1994

EUGENE BROMLEY
US ENVIRONMENTAL PROTECTION AGENCY
REGION IX
PERMITS ISSUANCE SECTION (W-5-1)
75 HAWTHORNE STREET
SAN FRANCISCO CA 94105

ATTACHMENT C

ACRONYMS AND ABBREVIATIONS

AMAL	Average Monthly Action Level
ASBS	Area(s) of Special Biological Significance
BMP	Best Management Practice
Basin Plan	Water Quality Control Plan for the San Diego Basin
CEQA	California Environmental Quality Act
CCR	California Code of Regulations
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWC	California Water Code
CZARA	Coastal Zone Act Reauthorization Amendments of 1990
ESAs	Environmentally Sensitive Areas
GIS	Geographic Information System
IBI	Index of Biological Integrity
LID	Low Impact Development
MDAL	Maximum Daily Action Level
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
NAL	Non-Storm Water Action Level
NAICS	North American Industry Classification System
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
ROWD	Report of Waste Discharge (application for NPDES reissuance)
SAL	Storm Water Action Level
San Diego Water Board	California Regional Water Quality Control Board, San Diego Region
SIC	Standard Industrial Classification Code
State Water Board	State Water Resources Control Board
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
WDID	Waste Discharge Identification Number
WLA	Waste Load Allocation
WQBEL	Water Quality Based Effluent Limitation

DEFINITIONS

Active/Passive Sediment Treatment - Using mechanical, electrical or chemical means to flocculate or coagulate suspended sediment for removal from runoff from construction sites prior to discharge.

Anthropogenic Litter – Trash generated from human activities, not including sediment.

Average Monthly Action Level – The highest allowable average of daily discharges over a calendar month.

Beneficial Uses - The uses of water necessary for the survival or wellbeing of man, plants, and wildlife. These uses of water serve to promote tangible and intangible economic, social, and environmental goals. "Beneficial Uses" of the waters of the State that may be protected include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. Existing beneficial uses are uses that were attained in the surface or ground water on or after November 28, 1975; and potential beneficial uses are uses that would probably develop in future years through the implementation of various control measures. "Beneficial Uses" are equivalent to "Designated Uses" under federal law. [California Water Code Section 13050(f)].

Best Management Practices (BMPs) - Defined in 40 CFR 122.2 as schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Bioassessment - The use of biological community information to evaluate the biological integrity of a water body and its watershed. With respect to aquatic ecosystems, bioassessment is the collection and analysis of samples of the benthic macroinvertebrate community together with physical/habitat quality measurements associated with the sampling site and the watershed to evaluate the biological condition (i.e. biotic integrity) of a water body.

Biofiltration - Practices that use vegetation and amended soils to detain and treat runoff from impervious areas. Treatment is through filtration, infiltration, adsorption, ion exchange, and biological uptake of pollutants.

Biological Integrity - Defined in Karr J.R. and D.R. Dudley. 1981. Ecological perspective on water quality goals. *Environmental Management* 5:55-68 as: "A balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitat of the region." Also referred to as ecosystem health.

BMP Design Manual – A plan developed to eliminate, reduce, or mitigate the impacts of runoff from development projects, including Priority Development Projects.

Chronic Toxicity – A measurement of sublethal effect (e.g. reduced growth, reproduction) to experimental test organisms exposed to an effluent or receiving waters compared to that of the

control organisms.

Clean Water Act Section 303(d) Water Body - An impaired water body in which water quality does not meet applicable water quality standards and/or is not expected to meet water quality standards, even after the application of technology based pollution controls required by the CWA. The discharge of runoff to these water bodies by the Copermittees is significant because these discharges can cause or contribute to violations of applicable water quality standards.

Construction Site – Any project, including projects requiring coverage under the Construction General Permit, that involves soil disturbing activities including, but not limited to, clearing, grading, disturbances to ground such as stockpiling, and excavation.

Contamination - As defined in the Porter-Cologne Water Quality Control Act, contamination is "an impairment of the quality of waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste whether or not waters of the State are affected."

Copermittee – A permittee to a NPDES permit that is only responsible for permit conditions relating to the discharge for which it is operator [40 CFR 122.26(b)(1)]. For the purposes of this Order, a Copermittee is one of the individual permittees identified in Tables 1a-1c of this Order.

Copermittees – All of the individual Copermittees, collectively.

Critical Channel Flow (Qc) – The channel flow that produces the critical shear stress that initiates bed movement or that erodes the toe of channel banks. When measuring Qc, it should be based on the weakest boundary material – either bed or bank.

Daily Discharge – Defined as either: (1) the total mass of the constituent discharged over the calendar day or any 24 hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g. concentration.)

The Daily Discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day, or other 24 hour period other than a day), or by the arithmetic mean of analytical results from one or more grab samples taken over the course of a day.

Development Projects - Construction, rehabilitation, redevelopment, or reconstruction of any public or private projects.

Dry Season –May 1 to September 30.

Dry Weather – Weather is considered dry if the preceding 72 hours has been without measurable precipitation (>0.1 inch).

Enclosed Bays – Enclosed bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost bay works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays do not include

inland surface waters or ocean waters.

Erosion – When land is diminished or worn away due to wind, water, or glacial ice. Often the eroded debris (silt or sediment) becomes a pollutant via storm water runoff. Erosion occurs naturally but can be intensified by land clearing activities such as farming, development, road building, and timber harvesting.

Environmentally Sensitive Areas (ESAs) - Areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; areas designated as preserves or their equivalent under the Natural Communities Conservation Program within the Cities and County of Orange; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.

Estuaries – Waters, including coastal lagoons, located at the mouth of streams that serve as areas of mixing fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and ocean water. Estuaries do not include inland surface waters or ocean waters.

Existing Development – Any area that has been developed and exists for municipal, commercial, industrial, or residential purposes, uses, or activities. May include areas that are not actively used for its originally developed purpose, but may be re-purposed or redeveloped for another use or activity.

Flow Duration – The long-term period of time that flows occur above a threshold that causes significant sediment transport and may cause excessive erosion damage to creeks and streams (not a single storm event duration). The simplest way to visualize this is to consider a histogram of pre- and post-project flows using long-term records of hourly data. To maintain pre-development flow duration means that the total number of hours (counts) within each range of flows in a flow-duration histogram cannot increase between the pre- and post-development condition. Flow duration within the range of geomorphologically significant flows is important for managing erosion.

Grading - The cutting and/or filling of the land surface to a desired slope or elevation.

Groundwater – Subsurface water that occurs beneath the water table in soils and geologic formations that are fully saturated.

Hazardous Material – Any substance that poses a threat to human health or the environment due to its toxicity, corrosiveness, ignitability, explosive nature or chemical reactivity. These also include materials named by the USEPA in 40 CFR 116 to be reported if a designated quantity of the material is spilled into the waters of the U.S. or emitted into the environment.

Hazardous Waste - Hazardous waste is defined as “any waste which, under Section 600 of Title 22 of this code, is required to be managed according to Chapter 30 of Division 4.5 of Title 22 of this code” [CCR Title 22, Division 4.5, Chapter 11, Article 1].

Household Hazardous Waste – Paints, cleaning products, and other hazardous wastes generated during home improvement or maintenance activities.

Hydromodification – The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

Illicit Connection – Any man-made conveyance or drainage system through which a non-storm water discharge to the storm water drainage system occurs or may occur. Any connection to the MS4 that conveys an illicit discharge.

Illicit Discharge - Any discharge to the MS4 that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from firefighting activities [40 CFR 122.26(b)(2)].

Inactive Areas – Areas of construction activity that are not active and those that have been active and are not scheduled to be re-disturbed for at least 14 days.

Infiltration – In the context of low impact development, infiltration is defined as the percolation of water into the ground. Infiltration is often expressed as a rate (inches per hour), which is determined through an infiltration test. In the context of non-storm water, infiltration is water other than wastewater that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow [40 CFR 35.2005(20)].

Inland Surface Waters – Includes all surface waters of the State that do not include the ocean, enclosed bays, or estuaries.

Jurisdictional Runoff Management Program Document – A written description of the specific jurisdictional runoff management measures and programs that each Copermittee will implement to comply with this Order and ensure that storm water pollutant discharges in runoff are reduced to the MEP and do not cause or contribute to a violation of water quality standards.

Low Impact Development (LID) – A storm water management and land development strategy that emphasizes conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions.

Low Impact Development Best Management Practices (LID BMPs) – LID BMPs include schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States through storm water management and land development strategies that emphasize conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions. LID BMPs include retention

practices that do not allow runoff, such as infiltration, rain water harvesting and reuse, and evapotranspiration. LID BMPs also include flow-through practices such as biofiltration that may have some discharge of storm water following pollutant reduction.

Major Outfall – As defined in the Code of Federal Regulations, a major outfall is a MS4 outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (i.e. discharge from a single conveyance other than a circular pipe which is associated with a drainage area of more than 50 acres); or, for MS4s that receive storm water from lands zoned for industrial activity (based on comprehensive zoning plans or equivalent), a MS4 outfall that discharges from a single pipe with an inside diameter of 12 inches or more or from its equivalent (i.e. discharge from other than a circular pipe associated with a drainage area of 2 acres or more).

Maximum Daily Action Level (MDAL) –The highest allowable daily discharge of a pollutant, over a calendar day (or 24 hour period). For pollutants with action levels expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with action levels expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

Maximum Extent Practicable (MEP) – The technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) for storm water that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) in combination with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than BAT. A definition for MEP is not provided either in the statute or in the regulations. Instead the definition of MEP is dynamic and will be defined by the following process over time: municipalities propose their definition of MEP by way of their runoff management programs. Their total collective and individual activities conducted pursuant to the runoff management programs becomes their proposal for MEP as it applies both to their overall effort, as well as to specific activities (e.g., MEP for street sweeping, or MEP for MS4 maintenance). In the absence of a proposal acceptable to the San Diego Water Board, the San Diego Water Board defines MEP.

In a memo dated February 11, 1993, entitled "Definition of Maximum Extent Practicable," Elizabeth Jennings, Senior Staff Counsel, SWRCB addressed the achievement of the MEP standard as follows:

> "*To achieve the MEP standard, municipalities must employ whatever Best Management Practices (BMPs) are technically feasible (i.e., are likely to be effective) and are not cost prohibitive. The major emphasis is on technical feasibility. Reducing pollutants to the MEP means choosing effective BMPs, and rejecting applicable BMPs only where other effective BMPs will serve the same purpose, or the BMPs would not be technically feasible, or the cost would be prohibitive. In selecting BMPs to achieve the MEP standard, the following factors may be useful to consider:*
>
> *a. Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?*
> *b. Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?*
> *c. Public Acceptance: Does the BMP have public support?*

d. Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?
e. Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc.?

The final determination regarding whether a municipality has reduced pollutants to the maximum extent practicable can only be made by the Regional or State Water Boards, and not by the municipal discharger. If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit derived, it would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs that would address a pollutant source, or to pick a BMP based solely on cost, which would be clearly less effective. In selecting BMPs the municipality must make a serious attempt to comply and practical solutions may not be lightly rejected. In any case, the burden would be on the municipal discharger to show compliance with its permit. After selecting a menu of BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented."

Monitoring Year – October 1 to September 30

Municipal Separate Storm Sewer System (MS4) – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designated or used for collecting or conveying storm water; (iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.26.

National Pollutant Discharge Elimination System (NPDES) - The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the CWA.

Non-Storm Water - All discharges to and from a MS4 that do not originate from precipitation events (i.e., all discharges from a MS4 other than storm water). Non-storm water includes illicit discharges and NPDES permitted discharges.

Nuisance - As defined in the Porter-Cologne Water Quality Control Act, a nuisance is "anything which meets all of the following requirements: 1) Is injurious to health, or is indecent, or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. 2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or

damage inflicted upon individuals may be unequal. 3) Occurs during, or as a result of, the treatment or disposal of wastes."

Ocean Waters – The territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the State Board's California Ocean Plan.

Order – Unless otherwise specified, refers to this Order, Order No. R9-2013-0001 (NPDES No. CAS0109266)

Outfall - Outfall means a point source as defined by 40 CFR 122.2 at the point where a municipal separate storm sewer discharges to waters of the US and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels or other conveyances which connect segments of the same stream or other waters of the US and are used to convey waters of the US.

Persistent Flow - Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

Person - A person is defined as an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof [40 CFR 122.2].

Point Source - Any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, landfill leachate collection systems, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

Pollutant - Any agent that may cause or contribute to the degradation of water quality such that a condition of pollution or contamination is created or aggravated.

Pollution - As defined in the Porter-Cologne Water Quality Control Act, pollution is "the alteration of the quality of the waters of the State by waste, to a degree which unreasonably affects either of the following: 1) The waters for beneficial uses; or 2) Facilities that serve these beneficial uses." Pollution may include contamination.

Pollution Prevention - Pollution prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control BMPs, treatment control BMPs, or disposal.

Pre-Development Runoff Conditions – Approximate flow rates and durations that exist or existed onsite before land development occurs. For new development projects, this equates to runoff conditions immediately before project construction. For redevelopment projects, this equates to runoff conditions from the project footprint assuming infiltration characteristics of the underlying soil, and existing grade. Runoff coefficients of concrete or asphalt must not be used. A redevelopment Priority Development Project must use available information pertaining to existing underlying soil type and onsite existing grade to estimate pre-development runoff conditions.

Priority Development Projects - New development and redevelopment projects defined under Provision E.3.b of Order No. R9-2013-0001.

Rainy Season (aka Wet Season) –October 1 to April 30

Receiving Waters – Waters of the United States.

Receiving Water Limitations - Waste discharge requirements issued by the San Diego Water Board typically include both: (1) "Effluent Limitations" (or "Discharge Limitations") that specify the technology-based or water-quality-based effluent limitations; and (2) "Receiving Water Limitations" that specify the water quality objectives in the Basin Plan as well as any other limitations necessary to attain those objectives. In summary, the "Receiving Water Limitations" provision is the provision used to implement the requirements of CWA section 402(p)(3)(B).

Redevelopment - The creation and/or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include trenching and resurfacing associated with utility work; resurfacing existing roadways; new sidewalk construction, pedestrian ramps, or bike lane on existing roads; and routine replacement of damaged pavement, such as pothole repair.

Regional Clearinghouse – A central location for the collection and distribution of information developed and maintained by the Copermittees including, but not limited to, plans, reports, manuals, data, contact information, and/or links to such documents and information.

Rehabilitation - Remedial measures or activities for the purpose of improving or restoring the beneficial uses of streams, channels or river systems. Techniques may vary from in-stream restoration techniques to off-line storm water management practices installed in the system corridor or upland areas, or a combination of in-stream and out of stream techniques. Rehabilitation techniques may include, but are not limited to the following: riparian zone restoration, constructed wetlands, channel modifications that improve habitat and stability, and daylighting of drainage systems.

Reporting Period – The period of information that is reported in the Water Quality Improvement Plan Annual Report. The reporting period consists of two components: 1) July 1 to June 30, consistent with the fiscal year, for the implementation of the jurisdictional runoff management programs, and 2) October 1 to September 30, consistent with the monitoring year for the monitoring and assessment programs. Together, these two time periods constitute the reporting year for the Water Quality Improvement Plan Annual Report due January 31 following the end of the monitoring year.

Retain – Keep or hold in a particular place, condition, or position without discharge to surface waters.

Retrofitting – Storm water management practice put into place after development has occurred in watersheds where the practices previously did not exist or are ineffective. Retrofitting of developed areas is intended to improve water quality, protect downstream channels, reduce

flooding, or meet other specific objectives. Retrofitting developed areas may include, but is not limited to replacing roofs with green roofs, disconnecting downspouts or impervious surfaces to drain to pervious surfaces, replacing impervious surfaces with pervious surfaces, installing rain barrels, installing rain gardens, and trash area enclosures.

Runoff - All flows in a storm water conveyance system that consists of the following components: (1) storm water (wet weather flows) and (2) non-storm water including dry weather flows.

San Diego Water Board – As used in this document the term "San Diego Water Board" is synonymous with the term "Regional Board" as defined in Water Code section 13050(b) and is intended to refer to the California Regional Water Quality Control Board for the San Diego Region as specified in Water Code Section 13200.

Sediment - Soil, sand, and minerals washed from land into water. Sediment resulting from anthropogenic sources (i.e. human induced land disturbance activities) is considered a pollutant. This Order regulates only the discharges of sediment from anthropogenic sources and does not regulate naturally occurring sources of sediment. Sediment can destroy fish-nesting areas, clog animal habitats, and cloud waters so that sunlight does not reach aquatic plants.

Source Control BMP – Land use or site planning practices, or structural or nonstructural measures that aim to prevent runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between pollutants and runoff.

Storm Water – Per 40 CFR 122.26(b)(13), means storm water runoff, snowmelt runoff and surface runoff and drainage. Surface runoff and drainage pertains to runoff and drainage resulting from precipitation events.

Structural BMPs - A subset of BMPs which detains, retains, filters, removes, or prevents the release of pollutants to surface waters from development projects in perpetuity, after construction of a project is completed.

Test of Significant Toxicity (TST) - A statistical approach used to analyze toxicity test data. The TST incorporates a restated null hypothesis, Welch's t-test, and biological effect thresholds for chronic and acute toxicity.

Total Maximum Daily Load (TMDL) - The maximum amount of a pollutant that can be discharged into a water body from all sources (point and non-point) and still maintain water quality standards. Under CWA section 303(d), TMDLs must be developed for all water bodies that do not meet water quality standards after application of technology-based controls.

Toxicity - Adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies. The water quality objectives for toxicity provided in the Basin Plan, state in part…"All waters shall be free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life….The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge."

Toxicity Identification Evaluation (TIE) - A set of procedures for identifying the specific

chemical(s) responsible for toxicity. These procedures are performed in three phases (characterization, identification, and confirmation) using aquatic organism toxicity tests.

Toxicity Reduction Evaluation (TRE) - A study conducted in a step-wise process designed to identify the causative agents of effluent or ambient toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in toxicity. The first steps of the TRE consist of the collection of data relevant to the toxicity, including additional toxicity testing, and an evaluation of facility operations and maintenance practices, and best management practices. A Toxicity Identification Evaluation (TIE) may be required as part of the TRE, if appropriate.

Treatment Control BMP – Any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media absorption or any other physical, biological, or chemical process.

Unpaved Road – Any long, narrow stretch without pavement used for traveling by motor passenger vehicles between two or more points. Unpaved roads are generally constructed of dirt, gravel, aggregate or macadam and may be improved or unimproved.

Waste - As defined in CWC Section 13050(d), "waste includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal."

Article 2 of CCR Title 23, Chapter 15 (Chapter 15) contains a waste classification system that applies to solid and semi-solid waste, which cannot be discharged directly or indirectly to water of the state and which therefore must be discharged to land for treatment, storage, or disposal in accordance with Chapter 15. There are four classifications of waste (listed in order of highest to lowest threat to water quality): hazardous waste, designated waste, non-hazardous solid waste, and inert waste.

Water Quality Objective - Numerical or narrative limits on constituents or characteristics of water designated to protect designated beneficial uses of the water. [California Water Code Section 13050 (h)]. California's water quality objectives are established by the State and Regional Water Boards in the Water Quality Control Plans. Numeric or narrative limits for pollutants or characteristics of water designed to protect the beneficial uses of the water. In other words, a water quality objective is the maximum concentration of a pollutant that can exist in a receiving water and still generally ensure that the beneficial uses of the receiving water remain protected (i.e., not impaired). Since water quality objectives are designed specifically to protect the beneficial uses, when the objectives are violated the beneficial uses are, by definition, no longer protected and become impaired. This is a fundamental concept under the Porter Cologne Act. Equally fundamental is Porter Cologne's definition of pollution. A condition of pollution exists when the water quality needed to support designated beneficial uses has become unreasonably affected or impaired; in other words, when the water quality objectives have been violated. These underlying definitions (regarding beneficial use protection) are the reason why all waste discharge requirements implementing the federal NPDES regulations require compliance with water quality objectives. (Water quality objectives are also called water quality criteria in the CWA.)

Water Quality Standards - Water quality standards, as defined in Clean Water Act section 303(c) consist of the beneficial uses (e.g., swimming, fishing, municipal drinking water supply, etc.,) of a water body and criteria (referred to as water quality objectives in the California Water Code) necessary to protect those uses. Under the Water Code, the water boards establish beneficial uses and water quality objectives in water quality control or basin plans. Together with an anti-degradation policy, these beneficial uses and water quality objectives serve as water quality standards under the Clean Water Act. In Clean Water Act parlance, state beneficial uses are called "designated uses" and state water quality objectives are called "criteria." Throughout this Order, the relevant term is used depending on the statutory scheme.

Waters of the State - Any water, surface or underground, including saline waters within the boundaries of the State [CWC section 13050 (e)]. The definition of the Waters of the State is broader than that for the Waters of the United States in that all water in the State is considered to be a Waters of the State regardless of circumstances or condition.

Waters of the United States - As defined in the 40 CFR 122.2, the Waters of the U.S. are defined as: "(a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate "wetlands;" (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters otherwise defined as waters of the United States under this definition: (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial seas; and (g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA."

Watershed - That geographical area which drains to a specified point on a water course, usually a confluence of streams or rivers (also known as drainage area, catchment, or river basin).

Wet Season (aka Rainy Season) – October 1 to April 30

Wet Weather – Weather is considered wet up to 72 hours after a storm event of 0.1 inches and greater, unless otherwise defined by another regulatory mechanism (e.g. a TMDL).

ATTACHMENT D

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM

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JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM
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I. COPERMITTEE INFORMATION

Copermittee Name:

Copermittee Primary Contact Name:

Copermittee Primary Contact Information:
Address:
City: County: State: Zip:
Telephone: Fax: Email:

II. LEGAL AUTHORITY

Has the Copermittee established adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 that complies with Order No. R9-2013-0001?	YES NO	☐ ☐
A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority?	YES NO	☐ ☐

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

Was an update of the jurisdictional runoff management program document required or recommended by the San Diego Water Board?	YES NO	☐ ☐
If YES to the question above, did the Copermittee update its jurisdictional runoff management program document and make it available on the Regional Clearinghouse?	YES NO	☐ ☐

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

Has the Copermittee implemented a program to actively detect and eliminate illicit discharges and connections to its MS4 that complies with Order No. R9-2013-0001?	YES NO	☐ ☐

Number of non-storm water discharges reported by the public	
Number of non-storm water discharges detected by Copermittee staff or contractors	
Number of non-storm water discharges investigated by the Copermittee	
Number of sources of non-storm water discharges identified	
Number of non-storm water discharges eliminated	
Number of sources of illicit discharges or connections identified	
Number of illicit discharges or connections eliminated	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

V. DEVELOPMENT PLANNING PROGRAM

Has the Copermittee implemented a development planning program that complies with Order No. R9-2013-0001?	YES NO	☐ ☐
Was an update to the BMP Design Manual required or recommended by the San Diego Water Board?	YES NO	☐ ☐
If YES to the question above, did the Copermittee update its BMP Design Manual and make it available on the Regional Clearinghouse?	YES NO	☐ ☐

Number of proposed development projects in review	
Number of Priority Development Projects in review	
Number of Priority Development Projects approved	
Number of approved Priority Development Projects exempt from any BMP requirements	
Number of approved Priority Development Projects allowed alternative compliance	
Number of Priority Development Projects granted occupancy	

Number of completed Priority Development Projects in inventory	
Number of high priority Priority Development Project structural BMP inspections	
Number of Priority Development Project structural BMP violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM

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VI. CONSTRUCTION MANAGEMENT PROGRAM

Has the Copermittee implemented a construction management program that complies with Order No. R9-2013-0001?	YES	☐
	NO	☐

Number of construction sites in inventory	
Number of active construction sites in inventory	
Number of inactive construction sites in inventory	
Number of construction sites closed/completed during reporting period	
Number of construction site inspections	
Number of construction site violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

Has the Copermittee implemented an existing development management program that complies with Order No. R9-2013-0001?	YES	☐
	NO	☐

	Municipal	Commercial	Industrial	Residential
Number of facilities or areas in inventory				
Number of existing development inspections				
Number of follow-up inspections				
Number of violations				
Number of enforcement actions issued				
Number of escalated enforcement actions issued				

VIII. PUBLIC EDUCATION AND PARTICIPATION

Has the Copermittee implemented a public education program component that complies with Order No. R9-2013-0001?	YES	☐
	NO	☐
Has the Copermittee implemented a public participation program component that complies with Order No. R9-2013-0001?	YES	☐
	NO	☐

IX. FISCAL ANALYSIS

Has the Copermittee attached to this form a summary of its fiscal analysis that complies with Order No. R9-2013-0001?	YES	☐
	NO	☐

X. CERTIFICATION

I [☐ Principal Executive Officer ☐ Ranking Elected Official ☐ Duly Authorized Representative] certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature	Date
Print Name	Title
Telephone Number	Email

ATTACHMENT E

SPECIFIC PROVISIONS FOR TOTAL MAXIMUM DAILY LOADS APPLICABLE TO ORDER NO. R9-2013-0001

These provisions implement load allocations (LAs) and wasteload allocations (WLAs) of the Total Maximum Daily Loads (TMDLs) ~~adopted~~ established by the San Diego Water Board or ~~and approved by~~ USEPA under Clean Water Act section 303(c), applicable to discharges regulated under this Order. The provisions and schedules for implementation of the TMDLs described below must be incorporated into the Water Quality Improvement Plans, required pursuant to Provision B of this Order, for the specified Watershed Management Areas.

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed
2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin
3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed
4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek
5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay
6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)
7. Total Maximum Daily Load for Sediment in Los Peñasquitos Lagoon

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2002-0123

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	August 14, 2002
State Water Board Approval Date:	July 16, 2003
Office of Administrative Law Approval Date:	September 11, 2003
US EPA Approval Date:	November 3, 2003

(3) TMDL Effective Date: September 11, 2003

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final diazinon TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must be in compliance with the final TMDL compliance requirements as of December 31, 2010.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations:

Table 1.1
Final Receiving Water Limitations Expressed as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Diazinon	Acute	0.08 µg/L	1 hour
	Chronic	0.05 µg/L	4 days

(b) Final Effluent Limitations

Discharges from the MS4s containing concentrations that do not exceed the following effluent limitations will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 1.b.(2)(a):

Table 1.2
Final Effluent Limitations Expressed as Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation	Averaging Period
Diazinon	Acute	0.072 µg/L	1 hour
	Chronic	0.045 µg/L	4 days

(c) Best Management Practices

The following BMPs for Chollas Creek must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area and implemented by the Responsible Copermittees:

(i) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 1.b.(2)(a) and/or the effluent limitations under Specific Provision 1.b.(2)(b) for Chollas Creek.

(ii) The Responsible Copermittees must implement the Diazinon Toxicity Control Plan and Diazinon Public Outreach/Education Program as described in the report titled, *Technical Report for Total Maximum Daily Load for Diazinon in Chollas Creek Watershed, San Diego County*, dated August 14, 2002, including subsequent modifications, in order to achieve the receiving water limitations under Specific Provision 1.b.(2)(a) and/or the effluent limitations under Specific Provision 1.b.(2)(b).

(iii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 1.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 1.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 1.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 1.b.(2)(c) achieves compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 1.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 1.d, to demonstrate compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The Responsible Copermittees must be in compliance with the final diazinon TMDL compliance requirements as of December 31, 2010.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls for diazinon within the Chollas Creek watershed, and calculate or estimate the annual diazinon loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment

Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 1.b.(2)(b), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0019

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	September 22, 2005
Office of Administrative Law Approval Date:	December 2, 2005
US EPA Approval Date:	February 8, 2006

(3) TMDL Effective Date: December 2, 2005

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Shelter Island Yacht Basin

(6) Responsible Copermittee: City of San Diego

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final dissolved copper TMDL compliance requirements for Shelter Island Yacht Basin consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittee must be in compliance with the final TMDL compliance requirements as of December 2, 2005.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations:

Table 2.1
Final Receiving Water Limitations Expressed as Concentrations in Shelter Island Yacht Basin

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Dissolved Copper	Acute	4.8 µg/L x WER*	1 hour
	Chronic	3.1 µg/L x WER*	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 2.b.(3)(a):

Table 2.2
Final Effluent Limitations as Expressed as Annual Loads in MS4 Discharges to Shelter Island Yacht Basin

Constituent	Effluent Limitation
Dissolved Copper	30 kg/yr*

* If the water quality objectives for dissolved copper in Shelter Island Yacht Basin are changed in the future, then the margin of safety (MOS), TMDL and allocations will be recalculated using the *Method for Recalculation of the Total Maximum Daily Load for Dissolved Copper in the Shelter Island Yacht Basin, San Diego Bay* in the Basin Plan (p. 7-14).

(c) Best Management Practices

The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 2.b.(2)(a) and/or the effluent limitations under Specific Provision 2.b.(2)(b) for Shelter Island Yacht Basin. The BMPs must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 2.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 2.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittee develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 2.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 2.b.(2)(c) achieves compliance with Specific Provisions 2.b.(3)(a), 2.b.(3)(b) and/or 2.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 2.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 2.d, to demonstrate compliance with Specific Provisions 2.b.(3)(a), 2.b.(3)(b) and/or 2.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The Responsible Copermittees must be in compliance with the final dissolved copper TMDL compliance requirements as of December 2, 2005.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

The Responsible Copermittee must monitor the effluent of its MS4 outfalls for dissolved copper, and calculate or estimate the monthly and annual dissolved copper loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.(b)(2)of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0036

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	November 16, 2005
Office of Administrative Law Approval Date:	February 1, 2006
US EPA Approval Date:	March 22, 2006

(3) TMDL Effective Date: February 1, 2006

(4) Watershed Management Area: Santa Margarita River

(5) Water Body: Rainbow Creek

(6) Responsible Copermittee: County of San Diego

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final total nitrogen and total phosphorus TMDL compliance requirements for Rainbow Creek consist of the following

(1) Final TMDL Compliance Date

The Responsible Copermittee must comply with final TMDL compliance requirements by December 31, 2021.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance date under Specific Provision 3.b.(1):

Table 3.1
Final Receiving Water Limitations Expressed as Concentrations in Rainbow Creek

Constituent	Receiving Water Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing concentrations that do not exceed the following effluent limitations by the compliance date under Specific Provision 3.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 3.b.(2)(a):

Table 3.2
Final Effluent Limitations Expressed as Concentrations in MS4 Discharges to Rainbow Creek

Constituent	Effluent Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(ii) Annual pollutant loads from given land uses discharging to and from the MS4s that do not exceed the following annual loads by the compliance date under Specific Provision 3.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 3.b.(2)(a):

Table 3.3
Final Effluent Limitations Expressed as Annual Loads in MS4 Discharges to Rainbow Creek

Land Use	Total N	Total P
Commercial nurseries	116 kg/yr	3 kg/yr
Park	3 kg/yr	0.1 kg/yr
Residential areas	149 kg/yr	12 kg/yr
Urban areas	27 kg/yr	6 kg/yr

(c) Best Management Practices

(i) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 3.b.(2)(a) and/or the effluent limitations under Specific Provision 3.b.(2)(b) for Rainbow Creek.

(ii) The Responsible Copermittee should coordinate any BMPs implemented to address this TMDL with Caltrans and other sources as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under

Specific Provision 3.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 3.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the final effluent limitations under Specific Provision 3.b.(2)(b)(ii); OR

(e) The Responsible Copermittee develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 3.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Specific Provision 3.b.(2)(c) achieves compliance with Specific Provisions 3.b.(3)(a), 3.b.(3)(b), 3.b.(3)(c) and/or 3.b.(3)(d),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 3.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 3.d, to demonstrate compliance with Specific Provisions 3.b.(3)(a), 3.b.(3)(b), 3.b.(3)(c) and/or 3.b.(3)(d).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim total nitrogen and total phosphorus TMDL compliance requirements for Rainbow Creek consist of the following:

(1) Interim Compliance Dates and WQBELs

The Responsible Copermittee must comply with the interim WQBELs, expressed as annual loads, by December 31 of the interim compliance year given in Table 3.4.

Table 3.4
Interim Water Quality Based Effluent Limitations Expressed as Annual Loads in MS4 Discharges from Specific Land Uses to Rainbow Creek

	Total N Interim Effluent Limitations (kg/yr)			Total P Interim Effluent Limitations (kg/yr)		
	Interim Compliance Date			Interim Compliance Date		
Land Use	**2009**	**2013**	**2017**	**2009**	**2013**	**2017**
Commercial nurseries	390	299	196	20	16	10
Park	5	3	3	0.15	0.10	0.10
Residential areas	507	390	260	99	74	47
Urban areas	40	27	27	9	6	6

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 3.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 3.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the final effluent limitations under Specific Provision 3.b.(2)(b)(ii); OR

(e) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the interim effluent limitations under Specific Provision 3.c.(1); OR

(f) The Responsible Copermittee has submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittee must incorporate into the Water Quality Improvement Plan and implement the Sampling and Analysis Plan for Rainbow Creek Nutrient Reduction TMDL Implementation Water Quality Monitoring, dated January 2010.

(2) The results of any monitoring conducted during the reporting period, and assessment of whether the interim and final TMDL compliance requirements have been achieved must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 3.b.(2)(b)(i), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2007-0043

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2007
State Water Board Approval Date:	July 15, 2008
Office of Administrative Law Approval Date:	October 22, 2008
US EPA Approval Date:	December 18, 2008

(3) TMDL Effective Date: October 22, 2008

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final dissolved copper, lead, and zinc TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must comply with the final TMDL compliance requirements by October 22, 2028.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance date under Specific Provision 4.b.(1):

Table 4.1
Final Receiving Water Limitations Expressed as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$(0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$(0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$(0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$(0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations by the compliance date under Specific Provision 4.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 4.b.(2)(a):

Table 4.2
Final Effluent Limitations as Expressed Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(c) Best Management Practices

(i) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 4.b.(2)(a) and/or the effluent limitations under Specific Provision 4.b.(2)(b) for Chollas Creek.

(ii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans and the U.S. Navy as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 4.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 4.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 4.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 4.b.(2)(c) achieves compliance with Specific Provisions 4.b.(3)(a), 4.b.(3)(b) and/or 4.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 4.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 4.d, to demonstrate compliance with Specific Provisions 4.b.(3)(a), 4.b.(3)(b) and/or 4.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim dissolved copper, lead, and zinc TMDL compliance requirements for Chollas Creek consist of the following:

(1) Interim Compliance Date and WQBELs

The Responsible Copermittee must comply with the interim WQBELs, expressed as concentrations, by the interim compliance date given in Table 4.3:

Table 4.3
Interim Water Quality Based Effluent Limitations Expressed as Concentrations in MS4 Discharges to Chollas Creek

Interim Compliance Date	Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
October 22, 2018	Dissolved Copper	Acute	$1.2 \times 90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
	Dissolved Lead	Acute	$1.2 \times 90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
	Dissolved Zinc	Acute	$1.2 \times 90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 4.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 4.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) There are no exceedances of the interim effluent limitations under Specific

Provision 4.c.(1) at the Responsible Copermittee's MS4 outfalls; OR

(e) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance date.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*, when it is amended to include monitoring requirements for the Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls discharging to Chollas Creek for dissolved copper, lead, and zinc, and calculate or estimate the monthly and annual dissolved copper, lead, and zinc loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 4.b.(2)(b) or 4.c.(1), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2008-0027

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 11, 2008
State Water Board Approval Date:	June 16, 2009
Office of Administrative Law Approval Date:	September 15, 2009
US EPA Approval Date:	October 26, 2009

(3) TMDL Effective Date: September 15, 2009

(4) Watershed Management Areas: See Table 5.0

(5) Water Bodies: See Table 5.0

(6) Responsible Copermittees: See Table 5.0

Table 5.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County	Dana Point Harbor	Baby Beach	-City of Dana Point -County of Orange
San Diego Bay	San Diego Bay	Shelter Island Shoreline Park	- San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final indicator bacteria TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Final TMDL Compliance Dates

(a) Baby Beach in Dana Point Harbor

The Responsible Copermittees for MS4 discharges to Baby Beach must be in compliance with the final TMDL compliance requirements according to the following compliance dates:

Table 5.1
Compliance Dates to Achieve Final TMDL Compliance Requirements For Baby Beach in Dana Point Harbor

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform	September 15, 2014	September 15, 2009
Fecal Coliform		September 15, 2009
Enterococcus		September 15, 2019

(b) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park must be in compliance with the final TMDL compliance requirements as of December 31, 2012.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance dates under Specific Provision 5.b.(1):

Table 5.2
Final Receiving Water Limitations Expressed as Bacteria Densities in the Water Body

	Receiving Water Limitations	
Constituent	Single Sample Maximum[1,2]	30-Day Geometric Mean[2]
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing indicator bacteria densities that do not exceed the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.3a
Final Effluent Limitations as Expressed as Bacteria Densities in MS4 Discharges to the Water Body

	Effluent Limitations	
Constituent	**Single Sample Maximum[1,2]**	**30-Day Geometric Mean[2]**
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.

(ii) Discharges from the MS4s containing indicator bacteria loads that do not exceed the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.4a
Final Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to the Baby Beach in Dana Point Harbor

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0.86×10^9 MPN/day	$3{,}254 \times 10^9$ MPN/30days
Fecal Coliform	0.17×10^9 MPN/day	112×10^9 MPN/30days
Enterococcus	0.03×10^9 MPN/day	114×10^9 MPN/30days

Table 5.4b
Final Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to the Shelter Island Shoreline Park in San Diego Bay

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0 MPN/day	198×10^9 MPN/30days
Fecal Coliform	0 MPN/day	8×10^9 MPN/30days
Enterococcus	0 MPN/day	26×10^9 MPN/30days

(iii) Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.5a
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to Baby Beach in Dana Point Harbor*

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	90.4%	0%
Fecal Coliform	82.7%	0%
Enterococcus	96.2%	62.2%

Notes:
* The percent load reductions are relative to data collected between 1996-2002. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittees' MS4s must not exceed the loads in Table 5.4a, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the water body.

Table 5.5b
*Final Effluent Limitations Expressed as Percent Load Reductions** in MS4 Discharges to Shelter Island Shoreline Park in San Diego Bay*

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0%	0%
Fecal Coliform	0%	0%
Enterococcus	0%	0%

Notes:
* The percent load reductions are relative to data collected between 1999-2004. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittee's MS4s must not exceed the loads in Table 5.4b, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the water body.

(c) Best Management Practices

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 5.0 must incorporate the Bacteria Load Reduction Plan (BLRP) required to be developed pursuant to Resolution No. R9-2008-0027.

(ii) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 5.b.(2)(a) and/or the effluent limitations under Specific Provision 5.b.(2)(b) for the segments or areas of the water bodies listed in Table 5.0

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.b.(2)(b)(ii); OR

(e) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 5.b.(2)(b)(iii); OR

(f) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(g) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 5.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 5.b.(2)(c) achieves compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 5.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 5.d, to demonstrate compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim indicator bacteria TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Baby Beach in Dana Point Harbor

(a) Interim TMDL Compliance Dates and WQBELs

The Responsible Copermittees for MS4 discharges to Baby Beach must comply with the following interim WQBELs by the interim compliance dates given in Tables 5.6a and/or 5.6b:

Table 5.6a
Interim Water Quality Based Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to Baby Beach in Dana Point Harbor

Constituent	Interim Compliance Dates	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	4.93×10^9 MPN/day	$3{,}254 \times 10^9$ MPN/30days*
Fecal Coliform	September 15, 2012	0.59×10^9 MPN/day	112×10^9 MPN/30days*
Enterococcus	September 15, 2012	0.42×10^9 MPN/day	301×10^9 MPN/30days
	September 15, 2016	0.03×10^9 MPN/day *	207×10^9 MPN/30days

Notes:
* Same as the final effluent limitations in Table 5.4a.

Table 5.6b
Interim Water Quality Based Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to Baby Beach in Dana Point Harbor*

Constituent	Interim Compliance Dates	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	45.2%	0%**
Fecal Coliform	September 15, 2012	41.4%	0%**
Enterococcus	September 15, 2012	48.1%	0%
	September 15, 2016	96.2%**	31.1%

Notes:
* The percent load reductions are relative to data collected between 1996-2002. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittees' MS4s must not exceed the loads in Table 5.6a, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the waterbody.
** Same as the final effluent limitations in Table 5.5a.

(b) Interim Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(i) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(ii) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(iii) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(iv) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.b(2)(b)(ii); OR

(v) The Responsible Copermittees can demonstrate that exceedances of the applicable receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(vi) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the interim effluent limitations under Table 5.6a of Specific Provision 5.c.(1)(a); OR

(vii) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the interim effluent limitations under Table 5.6b of Specific Provision 5.c.(1)(a); OR

(viii) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

(2) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park must be in compliance with the final indicator bacteria TMDL requirements as of December 31, 2012.

d. Specific Monitoring and Assessment Requirements

(1) Monitoring Stations

Monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[34] If discharges of bacteria from the MS4 exceed the applicable interim or final WQBELs, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(2) Monitoring Procedures

(a) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) The Responsible Copermittees must collect wet weather monitoring samples within the first 24 hours of a storm event[35] of the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(c) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

[34] Commonly referred to as AB 411 monitoring
[35] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs have been achieved.

(b) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 5.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(c) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to correlate elevated bacteria levels with known or suspected sewage spills from wastewater collection systems and treatment plants or boats.

(d) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2010-0001

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 10, 2010
State Water Board Approval Date:	December 14, 2010
Office of Administrative Law Approval Date:	April 4, 2011
US EPA Approval Date:	June 22, 2011

(3) TMDL Effective Date: April 4, 2011

(4) Watershed Management Areas: See Table 6.0

(5) Water Bodies: See Table 6.0

(6) Responsible Copermittees: See Table 6.0

Table 6.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	-City of Laguna Beach -County of Orange -Orange County Flood Control District
		at Heisler Park - North	
	Pacific Ocean Shoreline	at Main Laguna Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Woods -County of Orange -Orange County Flood Control District
		Laguna Beach at Ocean Avenue	
		Laguna Beach at Cleo Street	
		Arch Cove at Bluebird Canyon Road	
		Laguna Beach at Dumond Drive	
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Hills -City of Laguna Niguel -City of Laguna Woods -City of Lake Forest -City of Mission Viejo -County of Orange -Orange County Flood Control District
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	
	Aliso Creek Mouth	at mouth	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	-City of Dana Point -City of Laguna Beach -City of Laguna Niguel -County of Orange -Orange County Flood Control District
		Aliso Beach at Table Rock Drive	
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)	
		at Salt Creek (large outlet)	
		Salt Creek Beach at Salt Creek service road	
		Salt Creek Beach at Strand Road	
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	-City of Dana Point -City of Laguna Hills -City of Laguna Niguel -City of Mission Viejo -City of Rancho Santa Margarita -City of San Juan Capistrano -County of Orange -Orange County Flood Control District
	San Juan Creek	lower 1 mile	
	San Juan Creek Mouth	at mouth	
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	-City of Dana Point -City of San Clemente -County of Orange -Orange County Flood Control District
		Ole Hanson Beach Club Beach at Pico Drain	
		San Clemente City Beach at El Portal Street Stairs	
		San Clemente City Beach at Mariposa Street	
		San Clemente City Beach at Linda Lane	
		San Clemente City Beach at South Linda Lane	
		San Clemente City Beach at Lifeguard Headquarters	
		under San Clemente Municipal Pier	
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	
		San Clemente State Beach at Riviera Beach	
		Can Clemente State Beach at Cypress Shores	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	-City of Oceanside -City of Vista -County of San Diego
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	-City of Carlsbad -City of Encinitas -City of Escondido -City of San Marcos -County of San Diego
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	-City of Del Mar -City of Escondido -City of Poway -City of San Diego -City of Solana Beach -County of San Diego
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	-City of Del Mar -City of Poway -City of San Diego -County of San Diego
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	-City of San Diego
		La Jolla Shores Beach at Caminito del Oro	
		La Jolla Shores Beach at Vallecitos	
		La Jolla Shores Beach at Avenida de la Playa	
		at Casa Beach, Children's Pool	
		South Casa Beach at Coast Boulevard	
		Whispering Sands Beach at Ravina Street	
		Windansea Beach at Vista de la Playa	
		Windansea Beach at Bonair Street	
		Windansea Beach at Playa del Norte	
		Windansea Beach at Palomar Avenue	
		at Tourmaline Surf Park	
		Pacific Beach at Grand Avenue	
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I- Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	-City of El Cajon -City of Santee -County of San Diego
	San Diego River	lower 6 miles	-City of El Cajon -City of La Mesa -City of San Diego -City of Santee -County of San Diego
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	-City of La Mesa -City of Lemon Grove -City of San Diego -County of San Diego - San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final indicator bacteria TMDL compliance requirements for the water bodies listed in Table 6.0 consist of the following:

(1) Final TMDL Compliance Dates

The Responsible Copermittees for MS4 discharges to the water bodies listed in Table 6.0 must be in compliance with the final TMDL compliance requirements according to the following compliance dates:

Table 6.1
Compliance Dates to Achieve Final TMDL Compliance Requirements

Constituent	Dry Weather TMDL Compliance Date	Wet Weather TMDL Compliance Date
Total Coliform	April 4, 2021	April 4, 2031
Fecal Coliform		
Enterococcus		

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance dates under Specific Provision 6.b.(1):

Table 6.2a
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Beaches

	Wet Weather Days		Dry Weather Days	
Constituent	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform	10,000	22%	1,000	0%
Fecal Coliform	400	22%	200	0%
Enterococcus	104	22%	35	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan.

Table 6.2b
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Creeks

	Wet Weather Days		Dry Weather Days	
Constituent	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Fecal Coliform	400	22%	200	0%
Enterococcus	61 (104)	22%	33	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Basin Plan.
d. A single sample maximum of 104 MPN/100ml for *Enterococcus* may be applied as a receiving water limitation for creeks, instead of 61 MPN/100mL, if one or more of the creeks addressed by these TMDLs (San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek, San Diego River, and/or Chollas Creek) is designated with a "moderately to lightly used area" or less frequent usage frequency in the Basin Plan. Otherwise, the single sample maximum of 61 MPN/100mL for *Enterococcus* must be used to assess compliance with the allowable exceedance frequency.

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing indicator bacteria densities that do not exceed the following effluent limitations by the compliance dates under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a):

Table 6.2c
Final Effluent Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies in MS4 Discharges to the Water Body

Constituent	Concentration-Based Effluent Limitations			
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform[d]	10,000	22%	1,000	0%
Fecal Coliform	400	22%	200	0%
Enterococcus	104[e] / 61[f]	22%	35[e] / 33[f]	0%

Notes:
a. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan for discharges to beaches, and the Basin Plan for discharges to creeks and creek mouths.
d. Total coliform effluent limitations only apply to MS4 outfalls that discharge to the Pacific Ocean Shorelines and creek mouths listed in Table 6.0.
e. This *Enterococcus* effluent limitation applies to MS4 discharges to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
f. This *Enterococcus* effluent limitation applies to MS4 discharges to segments or areas of creeks or creek mouths listed in Table 6.0.

(ii) Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the compliance dates under Specific Provision 6.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a):

Table 6.3
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	*Watershed and Water Bodies*	*Load-Based Effluent Limitations*					
		Dry Weather			*Wet Weather*		
		Total Coliform	*Fecal Coliform*	*Entero-coccus*	*Total Coliform*	*Fecal Coliform*	*Entero-coccus*
South Orange County	San Joaquin Hills HSA (901.11) and Laguna Hills HSA (901.12) - Pacific Ocean Shoreline	91.78%	91.72%	98.28%	46.85%	52.07%	51.26%
	Aliso HSA (901.13) - Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	95.47%	95.58%	99.13%	25.29%	26.62%	27.52% (27.37%)**
	Dana Point HSA (901.14) - Pacific Ocean Shoreline	95.04%	95.03%	98.98%	13.15%	14.86%	15.16%
	Lower San Juan HSA (901.27) - Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	72.96%	74.21%	94.94%	19.21%	12.82%	27.12% (26.90%)**
	San Clemente HA (901.30) - Pacific Ocean Shoreline	94.28%	94.23%	98.83%	23.85%	24.58%	25.26%
San Luis Rey River	San Luis Rey HU (903.00) - Pacific Ocean Shoreline	38.13%	39.09%	87.38%	5.62%	3.12%	11.69%

Table 6.3 (Cont'd)
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watershed and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
Carlsbad	San Marcos HA (904.50) - Pacific Ocean Shoreline	82.82%	82.55%	96.03%	18.47%	18.98%	20.19%
San Dieguito River	San Dieguito HU (905.00) - Pacific Ocean Shoreline	14.39%	20.72%	83.48%	4.29%	1.46%	7.72%
Penasquitos	Miramar Reservoir HA (906.10) - Pacific Ocean Shoreline	96.50%	96.59%	99.42%	1.61%	1.99%	1.93%
Mission Bay	Scripps HA (906.30) - Pacific Ocean Shoreline	96.44%	96.42%	99.25%	16.32%	21.14%	18.82%
	Tecolote HA (906.50) - Tecolote Creek	94.51%	94.59%	98.94%	16.51%	20.47%	18.15% (18.08%)**
San Diego River	Mission San Diego HSA (907.11) and Santee HSA (907.12) - Pacific Ocean Shoreline - Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles)	74.03%	69.44%	93.96%	38.14%	53.22%	42.74% (42.47%)**
San Diego Bay	Chollas HSA (908.22) - Chollas Creek	92.06%	92.15%	98.46%	17.82%	24.84%	21.46% (21.36%)**

Notes:
* The percent load reductions are based on reducing loads compared to pollutant loads from 2001 to 2002.
** The alternative *Enterococcus* percent load reduction was calculated based on a numeric target of 104 MPN/100mL instead of 61 MPN/100mL, protective of the REC-1 "moderately to lightly used area" usage frequency that is protective of freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative pollutant load reductions can be utilized.

(c) Best Management Practices

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 6.0 must incorporate the Comprehensive Load Reduction Plans (CLRPs) required to be developed pursuant to Resolution No. R9-2010-0001.

(ii) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 6.b.(2)(a) and/or the effluent limitations under Specific Provision 6.b.(2)(b) for the segments or areas of the water bodies listed in Table 6.0.

(iii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans, owners/operators of small MS4s, and agricultural dischargers as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(f) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 6.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 6.b.(2)(c) achieves compliance with Specific Provisions 6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), and/or 6.b.(3)(e),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 6.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 6.d, to demonstrate compliance with Specific Provisions 6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), 6.b.(3)(e) and/or 6.b.(3)(f).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim indicator bacteria TMDL compliance requirements for the water bodies listed in Table 6.0 consist of the following:

(1) Interim TMDL Compliance Dates

The Responsible Copermittees must achieve compliance with the interim TMDL compliance requirements, as determined in accordance with Specific Provision 6.c.(3), by the interim compliance dates given in Table 6.4, unless alternative interim compliance dates are accepted by the San Diego Water Board Executive Officer as part of the Water Quality Improvement Plan.

Table 6.4
Interim Compliance Dates to Achieve Interim TMDL Compliance Requirements

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	April 4, 2016	April 4, 2021
		at Heisler Park - North		
	Pacific Ocean Shoreline	at Main Laguna Beach	April 4, 2016	April 4, 2021
		Laguna Beach at Ocean Avenue		
		Laguna Beach at Cleo Street		
		Arch Cove at Bluebird Canyon Road		
		Laguna Beach at Dumond Drive		
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	April 4, 2016	April 4, 2021
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	April 4, 2018	April 4, 2021
	Aliso Creek Mouth	at mouth	April 4, 2018	April 4, 2021
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	April 4, 2016	April 4, 2021
		Aliso Beach at Table Rock Drive		
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)		
		at Salt Creek (large outlet)		
		Salt Creek Beach at Salt Creek service road	April 4, 2017	April 4, 2021
		Salt Creek Beach at Strand Road	April 4, 2017	April 4, 2021

Table 6.4 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates	
			Interim Dry Weather WQBELs	Interim Wet Weather WQBELs
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	April 4, 2016	April 4, 2021
	San Juan Creek	lower 1 mile	April 4, 2018	April 4, 2021
	San Juan Creek Mouth	at mouth	April 4, 2016	April 4, 2021
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	April 4, 2016	April 4, 2021
		Ole Hanson Beach Club Beach at Pico Drain	April 4, 2016	April 4, 2021
		San Clemente City Beach at El Portal Street Stairs	April 4, 2017	April 4, 2021
		San Clemente City Beach at Mariposa Street		
		San Clemente City Beach at Linda Lane	April 4, 2016	April 4, 2021
		San Clemente City Beach at South Linda Lane	April 4, 2018	April 4, 2021
		San Clemente City Beach at Lifeguard Headquarters	April 4, 2017	April 4, 2021
		under San Clemente Municipal Pier		
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	April 4, 2018	April 4, 2021
		San Clemente State Beach at Riviera Beach	April 4, 2016	April 4, 2021
		Can Clemente State Beach at Cypress Shores	April 4, 2017	April 4, 2021
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	April 4, 2017	April 4, 2021
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	April 4, 2016	April 4, 2021
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	April 4, 2016	April 4, 2021

Table 6.4 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates	
			Interim Dry Weather WQBELs	Interim Wet Weather WQBELs
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	April 4, 2016	April 4, 2021
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	April 4, 2016	April 4, 2021
		La Jolla Shores Beach at Caminito del Oro		
		La Jolla Shores Beach at Vallecitos		
		La Jolla Shores Beach at Avenida de la Playa		
		at Casa Beach, Children's Pool		
		South Casa Beach at Coast Boulevard		
		Whispering Sands Beach at Ravina Street		
		Windansea Beach at Vista de la Playa		
		Windansea Beach at Bonair Street		
		Windansea Beach at Playa del Norte		
		Windansea Beach at Palomar Avenue		
		at Tourmaline Surf Park		
		Pacific Beach at Grand Avenue		
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries		
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	April 4, 2018	April 4, 2021
	San Diego River	lower 6 miles		
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach		
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	April 4, 2018	April 4, 2021

(2) Interim Water Quality Based Effluent Limitations

The Responsible Copermittees for discharges to the water bodies in Table 6.0 must comply with the following interim WQBELs by the interim compliance dates given in Specific Provision 6.c.(1):

(a) Interim Receiving Water Limitations

(i) *Interim Dry Weather Receiving Water Limitations*

The Responsible Copermittee must calculate the "existing" exceedance frequencies of the 30-day geometric mean water quality objectives for each of the indicator bacteria by analyzing the available monitoring data collected between January 1, 1996 and December 31, 2002. "Existing" exceedance frequencies may be calculated by water body and/or by Watershed Management Area listed in Table 6.0. Separate "existing" exceedance frequencies must be calculated for beaches and creeks/creek mouths.

The Responsible Copermittees must achieve a 50 percent reduction in the "existing" exceedance frequency of the 30-day geometric mean WQBELs for the water bodies listed in Table 6.0 by the interim compliance dates given in Table 6.4. A 50 percent reduction in the "existing" exceedance frequency is equivalent to half of the "existing" exceedance frequency of the 30-day geometric mean WQBELs.

The "existing" exceedance frequencies and the interim dry weather allowable exceedance frequencies (i.e. interim dry weather receiving water limitations) calculated by the Responsible Copermittees must be included in the Water Quality Improvement Plans for the applicable Watershed Management Areas.

(ii) *Interim Wet Weather Receiving Water Limitations*

The Responsible Copermittees must achieve the interim wet weather receiving water limitations in Table 6.5, expressed as interim wet weather allowable exceedance frequencies, by the interim compliance dates given in Table 6.4.

Table 6.5
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	38%	37%	39%
		at Heisler Park - North			
	Pacific Ocean Shoreline	at Main Laguna Beach			
		Laguna Beach at Ocean Avenue			
		Laguna Beach at Cleo Street			
		Arch Cove at Bluebird Canyon Road			
		Laguna Beach at Dumond Drive			
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	41%	41%	42%
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	41%	41%	42%
	Aliso Creek Mouth	at mouth	41%	41%	42%
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	36%	36%	36%
		Aliso Beach at Table Rock Drive			
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)			
		at Salt Creek (large outlet)			
		Salt Creek Beach at Salt Creek service road			
		Salt Creek Beach at Strand Road			

Table 6.5 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	44%	44%	48%
	San Juan Creek	lower 1 mile	44%	44%	47%
	San Juan Creek Mouth	at mouth	44%	44%	47%
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	35%	35%	36%
		Ole Hanson Beach Club Beach at Pico Drain			
		San Clemente City Beach at El Portal Street Stairs			
		San Clemente City Beach at Mariposa Street			
		San Clemente City Beach at Linda Lane			
		San Clemente City Beach at South Linda Lane			
		San Clemente City Beach at Lifeguard Headquarters			
		under San Clemente Municipal Pier			
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)			
		San Clemente State Beach at Riviera Beach			
		Can Clemente State Beach at Cypress Shores			
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	45%	44%	47%
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	40%	40%	41%
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	33%	33%	36%

Table 6.5 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	26%	26%	26%
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	37%	37%	37%
		La Jolla Shores Beach at Caminito del Oro			
		La Jolla Shores Beach at Vallecitos			
		La Jolla Shores Beach at Avenida de la Playa			
		at Casa Beach, Children's Pool			
		South Casa Beach at Coast Boulevard			
		Whispering Sands Beach at Ravina Street			
		Windansea Beach at Vista de la Playa			
		Windansea Beach at Bonair Street			
		Windansea Beach at Playa del Norte			
		Windansea Beach at Palomar Avenue			
		at Tourmaline Surf Park			
		Pacific Beach at Grand Avenue			
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries	49%	49%	51%
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	46%	43%	49%
	San Diego River	lower 6 miles	46%	43%	49%
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	46%	43%	51%
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	41%	41%	43%

(b) Interim Effluent Limitations

Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the interim compliance dates under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.c.(2)(a):

Table 6.6
Interim Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	*Watersheds and Water Bodies*	*Load-Based Effluent Limitations*					
		Dry Weather			*Wet Weather*		
		Total Coliform	*Fecal Coliform*	*Entero-coccus*	*Total Coliform*	*Fecal Coliform*	*Entero-coccus*
South Orange County	San Joaquin Hills HSA (901.11) and Laguna Hills HSA (901.12) - Pacific Ocean Shoreline	45.89%	45.86%	49.14%	23.43%	26.04%	25.63%
	Aliso HSA (901.13) - Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	47.74%	47.79%	49.57%	12.65%	13.31%	13.76% (13.69%)**
	Dana Point HSA (901.14) - Pacific Ocean Shoreline	47.52%	47.52%	49.49%	6.58%	7.43%	7.58%
	Lower San Juan HSA (901.27) - Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	36.48%	37.11%	47.47%	9.61%	6.41%	13.56% (13.45%)**
	San Clemente HA (901.30) - Pacific Ocean Shoreline	47.14%	47.12%	49.42%	11.93%	12.29%	12.63%
San Luis Rey River	San Luis Rey HU (903.00) - Pacific Ocean Shoreline	19.07%	19.55%	43.69%	2.81%	1.56%	5.85%
Carlsbad	San Marcos HA (904.50) - Pacific Ocean Shoreline	41.41%	41.28%	48.02%	9.24%	9.49%	10.10%

Table 6.6 (Cont'd)
Interim Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watersheds and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
San Dieguito River	San Dieguito HU (905.00) - Pacific Ocean Shoreline	7.20%	10.36%	41.74%	2.15%	0.73%	3.86%
Penasquitos	Miramar Reservoir HA (906.10) - Pacific Ocean Shoreline	48.25%	48.30%	49.71%	0.81%	1.00%	0.97%
Mission Bay	Scripps HA (906.30) - Pacific Ocean Shoreline	48.22%	48.21%	49.63%	8.16%	10.57%	9.41%
	Tecolote HA (906.50) - Tecolote Creek	47.26%	47.30%	49.47%	8.26%	10.24%	9.08% (9.04%)**
San Diego River	Mission San Diego HSA (907.11) and Santee HSA (907.12) - Pacific Ocean Shoreline - Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles)	37.02%	34.72%	46.98%	19.07%	26.61%	21.37% (21.24%)**
San Diego Bay	Chollas HSA (908.22) - Chollas Creek	46.03%	46.08%	49.23%	8.91%	12.42%	10.73% (10.68%)**

Notes:
* The percent load reductions are based on reducing loads compared to pollutant loads from 2001 to 2002.
** The alternative *Enterococcus* percent load reduction was calculated based on a numeric target of 104 MPN/100mL instead of 61 MPN/100mL, protective of the REC-1 "moderately to lightly used area" usage frequency that is protective of freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative pollutant load reductions can be utilized.

(3) Interim TMDL Compliance Determination

Compliance with the interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(f) There are no exceedances of the interim receiving water limitations under Specific Provision 6.c.(2)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(g) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the interim effluent limitations under Specific Provision 6.c.(2)(b); OR

(h) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

d. Specific Monitoring and Assessment Requirements

(1) Monitoring and Assessment Requirements for Beaches

(a) Monitoring Stations

For beaches addressed by the TMDL, monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[36] If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source

[36] Commonly referred to as AB 411 monitoring

identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations at least once within the first 24 hours of the end of a storm event[37] during the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer in exceedance of the allowable exceedance frequencies in the receiving waters.

(iii) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(iv) For Pacific Ocean Shoreline segments or areas listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the dry weather and

[37] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

wet weather monitoring data to assess whether the interim and final WQBELs for the Pacific Ocean Shoreline segments or areas listed in Table 6.0 have been achieved.

(ii) Dry weather exceedance frequencies must be calculated as follows:

[a] 30-day geometric means must be calculated from the results of any dry weather samples collected from the segments or areas for each water body listed in Table 6.0;
[b] The method and number of samples need for calculating the 30-day geometric means must be consistent with the number of samples required by the Ocean Plan;
[c] Where there are multiple segments or areas associated with a water body listed in Table 6.0, the Copermittees may calculate geometric means for each segment or area, or combine the dry weather monitoring data from all the segments or areas to calculate geometric means for the water body;
[d] The exceedance frequency must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the dry season.

(iii) Wet weather exceedance frequencies must be calculated as follows:

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;
[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;
[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria densities reported from each storm event sampled; and
[d] The single sample maximum exceedance frequency must be calculated by dividing the number of wet weather days that exceed the single sample maximum receiving water limitations in Table 6.2 by the total number of wet weather days during the rainy season.
[e] The data collected for dry weather must be used in addition to the data collected for wet weather to calculate the wet weather 30-day geometric means. The exceedance frequency of the wet weather 30-day geometric means must be calculated by dividing the number of geometric means that exceed the geometric mean

receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the wet season.

(iv) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(v) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) Monitoring and Assessment Requirements for Creeks and Creek Mouths

(a) Monitoring Stations

For creeks addressed by the TMDL, monitoring locations should consist of, at a minimum, a location at or near the mouth of the creek (e.g. Mass Loading Station or Mass Emission Station) and one or more locations upstream of the mouth (e.g. Watershed Assessment Station). If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations in accordance with the requirements of Provision D.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations within the first 24 hours of the end of a storm event[38] during the rainy season (i.e. October 1 through April 30).

[38] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(iii) Samples collected from receiving water monitoring stations must be analyzed for fecal coliform and *Enterococcus* indicator bacteria.

(iv) For creeks or creek mouths listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the receiving water monitoring data to assess whether the interim and final receiving water WQBELs for the creeks and creek mouths listed in Table 6.0 have been achieved.

(ii) Dry weather exceedance frequencies must be calculated as follows:

[a] 30-day geometric means must be calculated from the results of any dry weather samples collected from the segment or area for each water body listed in Table 6.0;
[b] The method and number of samples need for calculating the 30-day geometric means must be consistent with the number of samples required by the Basin Plan;
[c] The exceedance frequency must be calculated by dividing the number of 30-day geometric means that exceed the 30-day geometric mean receiving water limitations in Table 6.2 by the total number of 30-day geometric means calculated from samples collected during the dry season.

(iii) Wet weather exceedance frequencies must be calculated as follows:

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;
[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;
[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria densities reported from each of the storm events sampled; and

[d] The exceedance frequency must be calculated by dividing the number of wet weather days that exceed the single sample maximum receiving water limitations in Table 6.2 by the total number of wet weather days during the rainy season.

[e] The data collected for dry weather must be used in addition to the data collected for wet weather to calculate the wet weather 30-day geometric means. The exceedance frequency of the wet weather 30-day geometric means must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the wet season.

(iv) The Responsible Copermittee must identify and incorporate additional MS4 outfall and receiving water monitoring stations and/or adjust monitoring frequencies to identify sources causing exceedances of the receiving water WQBELs.

(v) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(vi) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

7. Total Maximum Daily Loads for Sediment in Los Peñasquitos Lagoon

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2012-0033

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2012
State Water Board Approval Date:	January 21, 2014
Office of Administrative Law Approval Date:	July 14, 2014
US EPA Approval Date:	October 30,2014~~Month XX, Year~~

(3) TMDL Effective Date: July 14, 2014

(4) Watershed Management Area: Los Peñasquitos

(5) Water Body: Los Peñasquitos Lagoon

(6) Responsible Copermittees: County of San Diego, City of San Diego, City of Del Mar, and City of Poway

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final sediment TMDL compliance requirements for Los Peñasquitos Lagoon consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must be in compliance with the final TMDL compliance requirements by December 31, 2034.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not prohibit the sustainable restoration of tidal and non-tidal saltmarsh vegetation of at least 346 acres.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations by the compliance date under Provision 7.b(1) will not cause or contribute to a failure of the receiving water condition specified under Specific Provision 7.b.(2)(a):

Table 7.1
*Final Effluent Limitations as Expressed as ~~Annual~~ Wet Season Loads in MS4 Discharges to Los Peñasquitos Lagoon**

Constituent	Effluent Limitation
Sediment	2,580 tons/~~yr~~wet season

*Final effluent limitations are to be achieved by the following Responsible Parties: County of San Diego, City of San Diego, City of Del Mar, City of Poway, Phase II MS4 permittees, Caltrans, general construction storm water NPDES permittees, and general industrial storm water NPDES permittees.

(c) Best Management Practices

(i) The Water Quality Improvement Plan for the Los Peñasquitos Watershed Management Area must incorporate the Sediment Load Reduction Plan required to be developed pursuant to Resolution No. R9-2012-0033.

(ii) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 7.b.(2)(a) and/or the Copermittee's portion of the effluent limitations under Specific Provision 7.b.(2)(b) for Los Peñasquitos Lagoon.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) Successful restoration of 80 percent of the 1973 acreage of tidal and non-tidal lagoon salt marsh (346 ~~total~~ acres) ~~of tidal and non-tidal saltmarsh vegetation in Los Peñasquitos Lagoon~~; OR

(b) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 7.b.(2)(c)(ii) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 7.b.(2)(c)(ii) or other implementation actions achieve~~s~~ compliance with Specific Provision 7.b.(3)(a),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 7.b.(2)(c)(ii) or other implementation

actions, AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 7.d to demonstrate compliance with Specific Provision ~~2~~7.b.(3)(a).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim sediment TMDL compliance requirements for Los Penasquitos Lagoon consist of the following:

(1) Interim Compliance Dates and WQBELs

The Responsible Copermittees must comply with the interim WQBELs, expressed as ~~annual~~ wet season loads, by December 31 of the interim compliance year set forth in Table 7.2.

Table 7.2
*Interim Water Quality Based Effluent Limitations Expressed as ~~Annual~~ Wet Season Loads in MS4 Discharges**

Interim Compliance Date	Interim Effluent Limitations (tons/~~yr~~wet season)	~~Associated Percentage of Reduction~~
December 31, 2019	6,691	~~20%~~
December 31, 2023	5,663	~~40%~~
December 31, 2027	4,636	~~60%~~
December 31, 2029	3,608	~~80%~~

*Final effluent limitations are to be achieved by the following Responsible Parties: County of San Diego, City of San Diego, City of Del Mar, City of Poway, Phase II MS4 permittees, Caltrans, general construction storm water NPDES permittees, and general industrial storm water NPDES permittees.

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) The final receiving water limitation under Specific Provision 7.b.(2)(a) is met; OR

(c) There are no exceedances of the Copermittee's portion of interim effluent limitations under Table 7.2 at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the Copermittee's portion of the interim TMDL compliance requirements will be achieved by the interim compliance date.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) Watershed Monitoring

The Responsible Copermittees must conduct suspended sediment, bed load, and flow monitoring to calculate total sediment loading to the Los Peñasquitos Lagoon for each wet season (October 1 thru April 30) as set forth below:

(a) The Responsible Copermittees must monitor enough storm events throughout the season to quantify sediment loading over each wet season, and

(b) The Responsible Copermittees must monitor at least 3 stations to quantify cumulative sediment loading into Los Peñasquitos Lagoon. Stations must be located within the Los Peñasquitos, Carroll Canyon, and Carmel Creek tributaries prior to discharging into Los Peñasquitos Lagoon.

(2) Lagoon Monitoring

The Responsible Copermittees must monitor Los Peñasquitos Lagoon each Fall for changes in the extent of the vegetation types as set forth below:

(a) The Responsible Copermittees must acquire aerial photos of Los Peñasquitos Lagoon and digitize them at an approximate scale of 1:2,500,

(b) The Responsible Copermittees must appropriately interpret the vegetation and classify the various types as saltmarsh, non-tidal saltmarsh, freshwater marsh, non-tidal saltmarsh –*Lolium perrene* infested, southern willow scrub/mulefat scrub, herbaceous wetland, or upland land cover.

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the monitoring data collected under Specific Provision 7.d(1) and 7.d(2) to assess whether the interim and final WQBELs have been achieved.

(b) For assessing and determining compliance with the final receiving water limitations under Specific Provision 7.b.(2)(a), the Responsible Copermittees

must use the data acquired under Specific Provision 7.d.(2) to estimate the acreage of tidal and non-tidal saltmarsh actually restored.

(c) For assessing and determining compliance with the final effluent limitations under Specific Provision 7.b.(2)(b), the Responsible Copermittees must use the data acquired under Specific Provision 7.d.(1) to estimate sediment loading into Los Peñasquitos Lagoon. Sediment loading must be evaluated using a 3-year, weighted rolling average. The first reported average shall be calculated using data collected in the year ~~2014-2015~~, 2015-2016, ~~and~~ 2016-2017, and 2017-2018 wet seasons.

(d) The monitoring and assessment results must be submitted as part of the Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

ATTACHMENT F

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

FACT SHEET / TECHNICAL REPORT

FOR

ORDER NO. R9-2013-0001
AS AMENDED BY ORDER No. R9-2015-0001
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT
AND WASTE DISCHARGE REQUIREMENTS FOR
DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s)
DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

MAY 8, 2013
Amended on February 11, 2015

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I. FACT SHEET FORMAT

This Fact Sheet briefly sets forth the principal facts and the significant factual, legal, methodological, and policy questions that the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) considered in preparing Order No. R9-2013-0001 (Order) as amended by Order No. R9-2015-0001. In accordance with the Code of Federal Regulations (CFR) Title 40 Parts 124.8 and 124.56 (40 CFR 124.8 and 40 CFR 124.56), this Fact Sheet includes, but is not limited to, the following information:

1. Contact information
2. Public process and notification procedures
3. Background of municipal storm water permits
4. Regional MS4 Permit approach
5. Economic considerations
6. Applicable statutes, regulations, plans and policies
7. Discussion of the provisions in the Order

Tentative Order No. R9-2013-0001 was distributed for public review on October 31, 2012. The San Diego Water Board accepted written comments on the Tentative Order until January 11, 2013. A public hearing was subsequently held on April 10 and 11, 2013, that was continued to May 8, 2013 to receive oral comments from interested persons. The San Diego Water Board adopted Order No. R9-2013-0001 on May 8, 2013.

Order No. R9-2015-0001, an Order amending Order No. R9-2013-0001, was distributed for public review on September 19, 2014. Order No. R9-2015-0001 amended the findings and provisions of Order No. R9-2013-0001 to:

a. Enroll the County of Orange, the Orange County Flood Control District and the south Orange County Cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano as Copermittees responsible for compliance with the terms and conditions of Order No. R9-2013-0001, as amended by Order No. R9-2015-0001;

b. Designate the San Diego Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the Cities of Laguna Woods and Laguna Hills and agree to the designation of the Santa Ana Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the City of Lake Forest, subject to the terms of the agreement between San Diego Water Board and the Santa Ana Water Board described in Finding 29 of this Order, upon the later effective date of Order No. R9-2015-0001 or Order No. R8-2015-0001 (superseding Order No. R8-2009-0030);

c. Establish interim exceptions to land development requirements for those priority development projects that discharge to engineered channels and large river reaches as described in Provision E.3.c(2)(e) of this Order;

d. Incorporate the amended requirements of the State Water Resources Control Board's (State Water Board) General Exception to require that pollutant reductions be achieved within 6 years for storm water and nonpoint source discharges to ASBS within the Region;

e. Incorporate applicable requirements of the Los Peñasquitos Lagoon Sediment TMDL;

f. Require the Orange County Copermittees to implement the "*Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County*," dated ~~September~~ October 2014, made effective in the Monitoring and Reporting Program/Order issued pursuant to California Water Code section~~s 13225, 13267, and~~ 13383 in the December 5, 2014 San Diego Water Board Letter Directive and subject to future revisions by the Executive Officer after appropriate public input;

g. Include additional language that clarifies the term "prior lawful approval" for the implementation of appropriate structural BMP requirements to Priority Development Projects.

A public hearing was held on February 11, 2015, to receive oral comments from Copermittees and interested persons. The San Diego Water Board adopted Order No. R9-2015-0001 amending Order No. R9-2013-0001 on February 11, 2015.

The San Diego Water Board files applicable to the issuance of Order No. R9-2013-0001 and amendments thereto are incorporated into the administrative record in support of the findings and requirements of the Order.

II. CONTACT INFORMATION

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The Order and other related documents can be downloaded from the San Diego Water Board website at

http://www.swrcb.ca.gov/rwqcb9/water_issues/programs/stormwater/index.shtml
http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/oc_stormwater.shtml

The documents referenced in this Fact Sheet and in Order No. R9-2013-0001 and amendments thereto are available for public review at the San Diego Water Board office, located at the address listed above. Public records are available for inspection during regular business hours, from 8:00 am to 5:00 pm Monday through Friday. To schedule an appointment to inspect public records, contact the San Diego Water Board Records Management Officer at 858-467-2952619-516-1990.

COPERMITTEES

Orange County Copermittees

- County of Orange
  - City of Aliso Viejo
  - City of Dana Point
  - City of Laguna Beach
  - City of Laguna Hills
  - City of Laguna Niguel
  - City of Laguna Woods
  - City of Lake Forest*
  - City of Mission Viejo
  - City of Ranch Santa Margarita
  - City of San Clemente
  - City of San Juan Capistrano
  - Orange County Flood Control District

* While not listed in the above table, the City of Lake Forest remains a Copermittee under this Order until the later effective date of this Order or Santa Ana Water Board Tentative Order No. R8-2015-0001. Thereafter, the City of Lake Forest will no longer be considered a Copermittee under this Order because its Phase I MS4 discharges will be regulated by the Santa Ana Water Board pursuant to Water Code section 13328 designation. The requirements of this Order that apply to the City of Lake Forest for the duration of this Order, consistent with the Water Code section 13228 agreement dated January XX, 2015, are described in Finding 29 and Footnote 2 to Table B-1.

Riverside County Copermittees

- County of Riverside
  - City of Murrieta
  - City of Temecula
  - City of Wildomar
  - Riverside County Flood Control and Water Conservation District

San Diego County Copermittees

- County of San Diego
  - City of Carlsbad
  - City of Chula Vista
  - City of Coronado
  - City of Del Mar
  - City of El Cajon
  - City of Encinitas
  - City of Escondido
  - City of Imperial Beach
  - City of La Mesa
  - City of Lemon Grove
  - City of National City
  - City of Oceanside
  - City of Poway
  - City of San Diego
  - City of San Marcos
  - City of Santee
  - City of Solana Beach
  - City of Vista
  - San Diego County Regional Airport Authority
  - San Diego Unified Port District

III. PUBLIC PROCESS AND NOTIFICATION PROCEDURES

The San Diego Water Board followed the schedule listed below for the preparation of Order No. R9-2013-0001:

San Diego County Copermittee Permit Reissuance Process

1. On February 8, 2011, the San Diego Water Board met with the San Diego County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No. R9-2007-0001.

2. Between February and May 2011, the San Diego Water Board met with select San Diego County, Orange County, and Riverside County Copermittees, as well as representatives of the environmental community to discuss concepts and receive recommendations for elements to be incorporated in a Regional Municipal Separate Storm Sewer System Permit (Regional MS4 Permit).

3. On June 27, 2011 the San Diego Water Board received the Report of Waste Discharge from the San Diego County Copermittees for the renewal of their NPDES permit, Order No. R9-2007-0001.

4. On April 9, 2012, the San Diego Water Board released an administrative draft of Tentative Order No. R9-2013-0001 for preliminary informal comments and feedback.

5. On April 25, 2012, the San Diego Water Board held an informal public workshop to present the administrative draft of Tentative Order No. R9-2013-0001 and receive verbal comments.

6. Between June and August 2012, the San Diego Water Board held four (4) focused meetings with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community, and USEPA) to discuss and receive preliminary comments and feedback about specific elements in the administrative draft of Tentative Order No. R9-2013-0001.

7. On September 5, 2012, the San Diego Water Board held an informal public workshop to present the modifications that were expected to be incorporated into the Tentative Order based on the preliminary comments and feedback received during the focused meetings held between June and August 2012.

8. Informal written comments on the administrative draft of Tentative Order No. R9-2013-0001 were accepted until September 14, 2012.

9. On October 12, 2012, the San Diego Water Board released a revised administrative draft of Tentative Order No. R9-2013-0001.

10. On October 24, 2012, the San Diego Water Board held a focused meeting with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community, and USEPA) to discuss modifications incorporated into the administrative draft of Tentative Order No. R9-2013-0001.

11. On October 31, 2012, the San Diego Water Board released Tentative Order No. R9-2013-0001 for formal public review and comment.

12. On November 13, 2012 and December 12, 2012, the San Diego Water Board held a formal public Board workshop to present the public draft of Tentative Order No. R9-2013-0001 and receive verbal comments.

13. Formal written comments on the public draft of Tentative Order No. R9-2013-0001 were accepted until January 11, 2013.

14. A public hearing of Tentative Order No. R9-2013-0001 was conducted on April 10 and 11, 2013, that was continued to May 8, 2013.

Orange County Copermittee Permit Reissuance Process

15. On May 20, 2014 the San Diego Water Board received the Report of Waste Discharge from the Orange County Copermittees for the renewal of their MS4 NPDES permit, Order No. R9-2009-0002.

16. On June 24, 2014, the San Diego Water Board met with the Orange County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No.R9-2009-0002 and the process for enrollment as Copermittees under Regional MS4 Permit Order No. R9-2013-0001.

17. On July 1, 2014, the San Diego Water Board held a public meeting to discuss the Orange County Report of Waste Discharge (RoWD) and receive comments on potential modifications to Order No. R9-2013-0001. Based on comments received from the Orange County Copermittees and other interested persons at this meeting, the San Diego Water Board determined that additional public meetings were not needed prior to release of Tentative Order No. R9-2015-0001, amending Order No. R9-2013-0001 in redlined – strikeout format for public review and comment.

18. On September 19, 2014, the San Diego Water Board released Tentative Order No. R9-2015-0001 for a 60 day public review and comment period.

19. On October 8, 2014, the San Diego Water Board held a formal public workshop at a regular board meeting to receive information and discuss the proposed amendments to Order No. R9-2013-0001 described in Tentative Order No. R9-2015-0001.

20. In accordance with State and federal laws and regulations, the San Diego Water Board notified San Diego County, Orange County and Riverside County Copermittees, and all known interested agencies and persons of its intent to adopt Tentative Order No. R9-2015-0001 and provided them with an opportunity to submit their written comments and recommendations. Written comments and recommendations on Tentative Order No. R9-2015-0001 were accepted until November 19, 2014.

21. The San Diego Water Board held a public workshop on October 8, 2014, and a public hearing on February 11, 2015, and heard and considered all comments pertaining to the adoption of Tentative Order No. R9-2015-0001 on February 11, 2015.

IV. BACKGROUND OF THE SAN DIEGO REGION MUNICIPAL STORM WATER PERMITS

In developed and developing areas, storm water runoff is commonly transported through municipal separate storm sewer systems (MS4s) and discharged into local receiving water bodies. As the storm water runs off and flows over the land or impervious surfaces (e.g., paved streets, parking lots, and building rooftops), it accumulates debris, chemicals, sediment, and other pollutants that can adversely affect receiving water quality if discharged untreated. The United States Environmental Protection Agency (USEPA) recognizes wet weather flows from urban areas as the number one source of estuarine pollution in coastal communities,[1] such as those within the San Diego Region.

The federal Clean Water Act (CWA) was amended in 1987 to address and regulate discharges of storm water associated with industrial activities and from municipal storm sewers. With the amendments, many municipalities throughout the United States were obligated for the first time to obtain National Pollutant Discharge Elimination System (NPDES) permits for discharges of storm water from their MS4s.

In response to the CWA 1987 amendment, as well as the pending federal NPDES regulations which would implement the amendment, the San Diego Water Board issued "early" MS4 permits. The San Diego Water Board adopted and issued Order Nos. 90-38, 90-42, and 90-46 to regulate storm water discharges from the MS4s in Orange County, San Diego County, and Riverside County, respectively, within the San Diego Region on July 16, 1990.

The "early" MS4 permits, or First Term Permits, were issued prior to the November 1990 promulgation of the final federal NPDES storm water regulations. By issuing these First Term Permits before the federal regulations took effect, the San Diego Water Board was able to provide the Copermittees additional flexibility in addressing and managing storm water discharges. The First Term Permits contained the essentials of the 1990 regulations, and required the Copermittees to develop and implement runoff management programs, but provided little specificity about what was required to be included in or actually achieved by those programs.

The flexibility provided in the First Term Permits was generally continued through the Second Term Permits. The combination of the lack of specificity in the First and Second Term Permits, a general lack of meaningful action by the Copermittees and a general lack of corresponding reaction (i.e. enforcement) by the San Diego Water Board during the first ten years of the storm water program, resulted in few substantive steps

[1] US EPA. 1999. 40 CFR Parts 9, 122, 123, and 124. National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. 64 FR 68727.

towards achieving improvements in the quality of receiving waters or storm water discharges from the MS4s.

From 2001, the regulatory approach incorporated into Third Term Permits was a significant departure from the regulatory approach of the First and Second Term Permits. The Third Term Permits issued by the San Diego Water Board included more detailed requirements that outlined the minimum level of implementation required for the Copermittees' programs to meet the maximum extent practicable (MEP) standard for storm water. The Third Term Permits included more detail to emphasize and enhance the jurisdictional runoff management programs developed by the Copermittees and introduced requirements for developing and implementing watershed-based programs.

The Third Term Permits also incorporated two precedent setting decisions by the State Water Board. In Order WQ 99-05, the State Water Board established receiving water limitation language to be included in all MS4 permits. The State Water Board's precedential language clarified that municipal storm water permits must include provisions requiring discharges to be controlled to attain water quality standards in receiving waters. Unlike previously adopted versions of the receiving water limitation language in the First and Second Term Permits, the language no longer stated that "*violations of water quality standards are not violations of the municipal storm water permit under certain conditions*." In addition, the receiving water limitation language no longer indicated that the "*implementation of best management practices is the 'functional equivalent' of meeting water quality standards*." State Water Board Order WQ 99-05 specifically requires language in MS4 permits for the Copermittees to comply with water quality standards based discharge prohibitions and receiving water limitations through timely implementation of control measures and other actions to reduce pollutants in discharges. (See State Water Board Order WQ 99-05 (*Environmental Health Coalition*)).

In Order WQ 2000-11, also a precedential decision, the State Water Board addressed design standards for structural post-construction best management practices (BMPs) for new development and significant redevelopment. The State Water Board found that the design standards, which require that runoff generated by 85 percent of storm events from specific development categories be infiltrated or treated, reflect the MEP standard. State Water Board Order WQ 2000-11 also found that the post-construction BMP provisions, or Standard Storm Water Mitigation Plan (SSMP) provisions, constitute MEP for addressing storm water pollutant discharges resulting from specific development categories.

The Third Term San Diego County and Orange County Permits (Order Nos. 2001-01 and R9-2002-0001, respectively) were appealed to the State Water Board. Minor modifications were made by the State Water Board, but the requirements were largely upheld. In State Water Board Order WQ 2001-15, the State Water Board upheld the Third Term San Diego County Permit requirements with certain modifications. The State Water Board removed the prohibition of storm water discharges *into* the MS4 that cause or contribute to exceedances of water quality objectives. The revision allows for

treatment of pollutants in storm water runoff after the pollutants have entered the MS4. State Water Board Order WQ 2001-15 otherwise upheld all the other requirements of the permit.

In addition to the modification to the discharge prohibition in Order WQ 2001-15, the State Water Board refined Order WQ 99-05 by making clear that the Copermittees may use an iterative approach to achieving compliance with water quality standards that involves ongoing assessments and revisions. Thus, the language for the discharge prohibitions and receiving water limitations was revised to explicitly require the Copermittees to implement an iterative process of assessments and revisions to comply with the discharge prohibitions and receiving water limitations. The San Diego Water Board retained the authority to enforce receiving water limitations and discharge prohibitions even if the Copermittee is engaged in the iterative process.

The Third Term San Diego County Permit was subsequently challenged in the Superior Court of the State of California and the Court of Appeal, Fourth Appellate District. The Court of Appeal, Fourth Appellate District, found that the approach of the Third Term San Diego County Permit to regulating discharges into the MS4 was appropriate (*Building Industry Ass'n. v. State Water Resources Control Bd., et al.,* 124 Cal.App.4th 866 (2004)). The State of California Supreme Court denied review sought by the Building Industry Association in March 2005.

The Fourth Term Permits, or current MS4 permits, began with the adoption of Order No. R9-2007-0001 issued to the Copermittees of San Diego County in January 2007. Order Nos. R9-2009-0002 and R9-2010-0016 were subsequently issued to the Copermittees of Orange County and Riverside County. The Fourth Term Permits continued to include more detailed requirements to be implemented by each Copermittee's jurisdictional runoff management program. The Fourth Term Permits also include requirements to further emphasize a watershed management approach and for more coordination among jurisdictional runoff management programs. In addition, the Fourth Term Permits included more requirements for assessing the effectiveness of the runoff management programs being implemented by the Copermittees. The intent of the inclusion of additional requirements was to enhance and better define elements of the permit that were expected to be incorporated into the iterative process for managing runoff from each Copermittee's jurisdiction and within the watersheds of the San Diego Region.

The Fourth Term Permits include several new and emerging approaches for managing storm water runoff and discharges. Low impact development (LID) requirements are included for development and significant redevelopment to reduce pollutants in storm water runoff from sites through more natural processes such as infiltration and biofiltration closer to the source, rather than utilizing conventional mechanical end-of-pipe treatment systems. Hydrograph modification (hydromodification) management requirements also are included to mitigate the potential for increased erosion in receiving waters due to increased runoff rates and durations often caused by development and increased impervious surfaces. The Fourth Term Orange County and

Riverside County Permits introduced requirements to identify areas of existing development where retrofitting with LID projects would be feasible and could be implemented to reduce storm water runoff and pollutants in storm water discharges.

The Fourth Term Orange County and Riverside County Permits included a clearer distinction between storm water and non-storm water discharges. The term "urban runoff" was completely removed, and a distinction between storm water (wet weather) runoff and non-storm water (dry weather) runoff was emphasized. This clarification was made to prevent any potential misunderstanding that regulation under the MS4 permits is limited only to urbanized areas, and to prevent non-storm water runoff from being managed in the same manner as storm water runoff. The term "urban runoff" is not defined in the Code of Federal Regulations (CFR) or Federal Register (FR) in the regulation of MS4 discharges. According to the CWA 402(p)(3)(B)(ii), MS4 permits must include a requirement to effectively prohibit non-storm water discharges into the MS4s.

Finally, for the Fourth Term Orange County and Riverside County Permits the San Diego Water Board found that non-storm water discharges to the MS4 from over application of irrigation water are sources of pollutants. The San Diego Water Board found that non-storm water discharges resulting from over-irrigation must be prohibited from entering the MS4 in accordance with the requirements of the CWA and pursuant to 40 CFR 122.26(d)(2)(iv)(B)(1).

The requirements of the Fourth Term Permits issued to the Copermittees in each county within the San Diego Region now have substantively the same core requirements such as discharge prohibitions, receiving water limitations, jurisdictional runoff management program components, and monitoring program requirements. There are, however, several inconsistencies that exist among the three Fourth Term Permits which complicate oversight and implementation of the permits by the San Diego Water Board.

The Fourth Term San Diego County Permit expired in January 2012. The Fourth Term Orange County permit ~~and Riverside County Permits will~~ expired in December 2014 and the Fourth Term Riverside County Permit will expire in November 2015. ~~, respectively.~~ Issuing the Fifth Term Permits within five years for three counties under three different permits would require the San Diego Water Board to expend significant time and resources for the issuance of the permits through three separate public proceedings, thereby greatly reducing the time and resources available to oversee implementation and compliance. Multiple permits also create confusion for determining compliance among regulated entities, especially for the land development community.

The San Diego Water Board has acknowledged that issuing a single MS4 permit for all the Copermittees in the San Diego Region can and is expected to result in more consistent implementation, improve communication among agencies within watersheds crossing multiple jurisdictions, and minimize resources spent with each permit renewal process. Within the findings of the Fourth Term Riverside County Permit issued in

November 2010, the San Diego Water Board notified the public of its intent to develop and issue a single Regional MS4 Permit.

V. REGIONAL MS4 PERMIT APPROACH

The Fifth Term Permit, or Regional MS4 Permit, shifts the focus of the permit requirements from a minimum level of actions to be implemented by the Copermittees to identifying outcomes to be achieved by those actions. Order No. R9-2013-0001 represents an important paradigm shift in the approach for MS4 permits within the San Diego Region.

Historical Permitting Approach

The First and Second Term Permits were very broad and provided little specificity about what was required to be developed and implemented by the Copermittees. The Third Term Permits began to become more specific about the minimum level of implementation required by the Copermittees. The Fourth Term Permits~~, or current permits,~~ subsequently increased in specificity. The MS4 permits have progressively become more detailed and focused on specifying the minimum level of actions expected to be implemented by the Copermittees. As detailed and specific as the MS4 permits have become, however, they include very little detail about what the desired outcomes of the required actions are expected to achieve. Compliance with the permit requirements has essentially been tracking numbers of actions and reporting, not tracking progress or actual improvements in the quality of receiving waters or discharges from the MS4s. The result has been an increase in actions being implemented by the Copermittees with little or no ability or expectations to determine whether or not improvements in water quality are being achieved.

The Fourth Term Permits result in significant resource expenditure by the Copermittees to report permit compliance information to the San Diego Water Board in the form of annual jurisdictional runoff management program, watershed program, and monitoring program reports. The San Diego Water Board must then expend much of its limited resources on reviewing more than 50 voluminous reports submitted annually by the Copermittees. The information currently reported by the Copermittees is of limited value when trying to measure progress toward achieving improvements in the quality of receiving waters or discharges from the MS4s. Oversight of the MS4 permits is further complicated by the inconsistencies among the requirements issued to the Orange County, San Diego County, and Riverside County Copermittees under three separate MS4 permits.

Under the Fourth Term Permits, the Copermittees must expend a significant portion of their limited resources collecting data of limited value, and putting together reports to submit that information to the San Diego Water Board. Likewise, the San Diego Water Board must expend most of its limited resources reviewing reports, and developing permits instead of working directly with the Copermittees to identify solutions to problems causing impacts to water quality. This is an unsustainable course that will continue to demand more resources from the Copermittees and the San Diego Water Board, and would continue to result in unknown water quality benefits.

New Permitting Approach

The goal of the Regional MS4 Permit is twofold: 1) bring a consistent set of MS4 permit requirements to all of the Copermittees within the San Diego Region; and, 2) provide an MS4 permit with requirements that will allow the Copermittees to focus their efforts and resources on achieving goals and desired outcomes toward the improvement of water quality rather than completing specific actions.

The overall approach included in the Regional MS4 Permit with respect to the jurisdictional runoff management programs will not differ significantly from the current permits. The general requirements for the jurisdictional runoff management program components and compliance with those requirements will remain and be applied consistently throughout the San Diego Region under the Regional MS4 Permit.

The most significant difference in the new permitting approach is the specific manner of implementation for those jurisdictional runoff management programs. Implementation will be based on decisions made by the Copermittees in accordance with what they have identified as their highest priority water quality conditions. In other words, the Copermittees will have significant control in how to implement the jurisdictional runoff management programs to best utilize their available resources in addressing a specific set of priorities effectively, instead of trying to address all the water quality priorities ineffectively.

The Copermittees are given the responsibility of identifying their highest priority water quality conditions that they intend to address. The Copermittees will develop goals that can be used to measure and demonstrate progress or improvements toward addressing those priorities. In addition to the goals, the Copermittees will provide a schedule for achieving the goals for those highest priorities. The measurement of progress toward achieving the goals for those highest priorities requires a better defined and more focused program of monitoring and assessment than under the Fourth Term Permits.

The monitoring and assessment program must be designed to inform the Copermittees of their progress, and the need for modifications in their jurisdictional runoff management programs and schedules to achieve their goals to improve water quality. The monitoring and assessment program requirements will have a more central role in the Regional MS4 Permit than in earlier permits. The monitoring and assessment requirements must also be designed to enable the Copermittees to focus and direct their efforts in implementing their jurisdictional runoff management programs toward their stated desired outcomes to improve the quality of receiving waters and/or discharges from the MS4s.

By providing an MS4 permit that allows the Copermittees to make more decisions about how to utilize and focus their resources, along with a better defined monitoring and assessment program to inform their water quality management decisions, the Copermittees will have the opportunity to:

1) *Plan strategically*. The Copermittees must have the ability to identify their available resources and develop and implement long term plans that can organize, collect, and use those resources in the most strategically advantageous and efficient manner possible. This ability to develop long term plans will allow the Copermittees to focus and utilize their resources in a more concerted way over the short term and long term to address specific water quality priorities through stated desired outcomes.

2) *Manage adaptively*. The Copermittees must be given the ability to modify their plans as additional information and data are collected from the monitoring and assessment programs. The Copermittees' plans may require modifications to the programs, priorities, goals, strategies, and/or schedules in order for the Copermittees to achieve a stated desired outcome.

3) *Identify synergies*. The Copermittees must be given more flexibility to identify efficiencies within and among their jurisdictional runoff management programs as the strategies are developed and implemented to increase the Copermittees' collective effectiveness. The Copermittees must also be able to identify and utilize resources available from other agencies and entities to further augment and enhance their jurisdictional runoff management programs and/or to collectively work with those other agencies and entities toward achieving a stated desired outcome.

The Regional MS4 Permit requirements will provide the Copermittees the flexibility and responsibility to decide what actions will be necessary to achieve an outcome that is tailored and designed by the Copermittees to improve specific prioritized water quality conditions. The San Diego Water Board expects the approach of the Regional MS4 Permit to give the Copermittees a greater sense of ownership for restoring the quality of receiving waters in the San Diego Region by becoming an integral part of the decision making process in identifying water quality conditions to be addressed, as well as determining the best use of their resources.

VI. ECONOMIC CONSIDERATIONS

Statutory Considerations

California Water Code (CWC) section 13241 requires the San Diego Water Board to consider certain factors, including economic considerations, in the adoption of water quality objectives. CWC section 13263 requires the San Diego Water Board to take into consideration the provisions of CWC section 13241 in adopting waste discharge requirements.

In *City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, the California Supreme Court considered whether Regional Water Boards must comply with CWC section 13241 when issuing waste discharge requirements under CWC section 13263(a) by taking into account the costs a permittee will incur in complying with the permit requirements. The Court concluded that whether it is necessary to consider such cost information "*depends on whether those restrictions meet or exceed the requirements of the federal Clean Water Act.*" (*Id.* at p. 627.) The Court ruled that Regional Water Boards may not consider the factors in CWC section 13241, including economics, to justify imposing pollutant restrictions that are less stringent than applicable federal law requires. (*Id.* At pp. 618, 626-627 ["*[Water Code section 13377 specifies that [] discharge permits issued by California's regional boards must meet the federal standards set by federal law. In effect, section 13377 forbids a regional board's consideration of any economic hardship on the part of the permit holder if doing so would result in the dilution of the requirements set by Congress in the Clean Water Act...Because CWC section 13263 cannot authorize what federal law forbids, it cannot authorize a regional board, when issuing a [] discharge permit, to use compliance costs to justify pollutant restrictions that do not comply with federal clean water standards*."]). However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Regional Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

As discussed in Section VII.F, Unfunded State Mandates, the San Diego Water Board finds that the requirements in this Order are not more stringent than the minimum federal requirements. Among other requirements, federal law requires MS4 permits to include requirements to effectively prohibit non-storm water discharges into the MS4s, in addition to requiring controls to reduce the discharge of pollutants in storm water to the MEP, and other provisions as USEPA or the State determines are appropriate for the control of pollutants in MS4 discharges.

The requirements in this Order may be more specific or detailed than those enumerated in federal regulations under 40 CFR 122.26 or in the USEPA guidance. However, the requirements have been designed to be consistent with and within the federal statutory mandates described in CWA section 402(p)(3)(B)(ii) and (iii) and the related federal regulations and guidance. Consistent with federal law, all of the

conditions in this Order could have been included in a permit adopted by USEPA in the absence of the in lieu authority of California to issue NPDES permits.

Moreover, the inclusion of numeric WQBELs in this Order does not cause this Order to be more stringent than federal law. Federal law authorizes both narrative and numeric effluent limitations to meet state water quality standards. The inclusion of WQBELs as discharge specifications in an NPDES permit in order to achieve compliance with water quality standards is not a more stringent requirement than the inclusion of BMP based permit limitations to achieve water quality standards (State Water Board Order No. WQ 2006-0012 (*Boeing*)). Therefore, consideration of the factors set forth in CWC section 13241 is not required for permit requirements to implement the effective prohibition on the discharge of non-storm water discharges into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determine appropriate to control such pollutants, as those requirements are mandated by federal law.

Included in the provisions of the Order are monitoring and reporting requirements that are designed to demonstrate that the Copermittees are implementing programs to comply with the CWA municipal storm water requirements. CWA section 308(a) and 40 CFR 122.41(h), (j)-(l), 122.44(i) and 122.48 require that all NPDES permits specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s (40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c)) also specify additional monitoring and reporting requirements. In addition to the federal requirements of the CWA, the San Diego Water Board also has the authority in CWC 13383 to establish monitoring, reporting, and recordkeeping requirements that implement federal and state laws and regulations through NPDES permits.

The monitoring and assessment information that will be reported to the San Diego Water Board is necessary to determine if the Copermittees are making progress toward achieving compliance with the discharge prohibitions, receiving water limitations, and effluent limitations under Provision A of the Order. The monitoring and assessment information that will be reported is also expected to be key to the iterative approach and adaptive management process that is required to be implemented by the Copermittees if they cannot meet the discharge prohibitions and receiving water limitations under the present conditions, which is also part of the requirements under Provision A of the Order.

Notwithstanding the above, the San Diego Water Board has considered cost information in issuing this Order, as discussed below. The San Diego Water Board has also considered all of the evidence that has been presented to the San Diego Water Board regarding the CWC section 13241 factors in adopting this Order. The San Diego Water Board finds that the requirements in this Order are reasonably necessary to protect beneficial uses identified in the Basin Plan and the economic information related to costs of compliance and other CWC section 13241 factors are not sufficient to justify failing to protect those beneficial uses. Where appropriate, the

San Diego Water Board has provided or will consider providing the Copermittees with additional time to implement control measures to achieve final WQBELs and/or water quality standards.

Cost Information

Discussions of the financial and economic ramifications of municipal storm water management programs tend to focus on the significant costs incurred by municipalities in developing and implementing the programs. When considering the cost of implementing the programs, however, it is also important to consider the alternative costs that are incurred when programs are not fully implemented, as well as the economic benefits which result from effective program implementation.

The recent financial and economic conditions have amplified the concerns about the costs incurred by the municipalities in developing and implementing their programs. The reduction in resources resulting from the recent financial and economic conditions has been cited by many of the Copermittees as a justification for reducing the requirements that must be met by their programs. While the recent conditions are a cause for concern in the short term, these programs also have an opportunity to identify and implement improvements and efficiencies before the next period of growth and development, resulting in more effective and sustainable programs over the long term.

In addition, it is very difficult to ascertain the true cost of implementation of the Copermittees' management programs because of inconsistencies in reporting by the Copermittees. Reported costs of compliance for the same program element can vary widely from city to city, often by a very wide margin that is not easily explained.[2] Despite these problems, efforts have been made to identify management program costs, which can be helpful in understanding the costs of program implementation.

The San Diego Water Board recognizes that the Copermittees will incur costs in implementing this Order, potentially above and beyond the costs from the Copermittees' prior permits. The San Diego Water Board also recognizes that, due to California's current economic condition, many Copermittees currently have limited staff and resources to implement actions to address its MS4 discharges. Based on the economic considerations below, the San Diego Water Board has provided the Copermittees a significant amount of flexibility to choose how to implement the requirements of the Order.

The Order also allows the Copermittees to customize their plans, programs, and monitoring requirements. In the end, it is up to the Copermittees to determine the effective BMPs and measures necessary to comply with this Order. The Copermittees can choose to implement the least expensive measures that are effective in meeting

[2] LARWQCB, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.

the requirements of this Order. This Order also does not require the Copermittees to fully implement all requirements within a single permit term. Where appropriate, the Board has provided the Copermittees with additional time outside of the permit term to implement control measures to achieve final WQBELs and/or water quality standards.

The San Diego Water Board has considered available cost information associated with compliance with this Order. It is not possible to predict accurately the cost impact of the requirements that involve an unknown level of implementation or that depend on environmental variables that are as yet undefined. Only general conclusions can be drawn from this information.

Estimated Municipal Storm Water Program Implementation Costs

The USEPA, the State Water Board, and the California Regional Water Quality Control Boards (Regional Water Boards) have attempted to evaluate the costs of implementing municipal storm water programs. The assessments have demonstrated that the true costs are difficult to ascertain and reported costs vary widely. In addition, reported fiscal analyses tend to neglect the costs incurred to municipalities when storm water and non-storm water runoff is not effectively managed, which are incurred as a result of pollution, contamination, nuisance, and damage to ecosystems, property, and human health. Nonetheless, they provide a useful context for considering the costs of requirements within Order No. R9-2013-0001.

In 1999, the USEPA reported on multiple studies it conducted to determine the cost of management programs. A study of Phase II municipalities determined that the annual cost of the Phase II program was expected to be $9.16 per household. The USEPA also studied 35 Phase I municipalities, finding costs to be $9.08 per household annually, similar to those anticipated for Phase II municipalities.[3]

The State Water Board commissioned a study by the California State University, Sacramento to assess costs of the Phase I MS4 program. This study includes an assessment of costs incurred by Phase I MS4s throughout the state to implement their programs. Annual cost per household in the study ranged from $18 to $46, with the Fresno-Clovis Metropolitan Area representing the lower end of the range, and the City of Encinitas (in San Diego County) representing the upper end of the range.[4]

A study on Phase I MS4 program costs was also conducted by the California Regional Water Quality Control Board, Los Angeles Region (Los Angeles Water Board), where program costs reported in the municipalities' annual reports were assessed. The Los

[3] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791-68792.
[4] State Water Board, 2005. NPDES Stormwater Cost Survey. P. ii.

Angeles Water Board estimated that average per household cost to implement the MS4 program in Los Angeles County was $12.50. [5]

It is important to note that reported program costs are not all attributable to solely complying with MS4 permits. Many program components, and their associated costs, existed before any MS4 permits were ever issued. For example, street sweeping and trash collection costs cannot be solely or even principally attributable to MS4 permit compliance, since these practices have long been expected from and implemented by municipalities.

Therefore, true program cost resulting from MS4 permit requirements is some fraction of reported costs. The California State University, Sacramento study found that only 38 percent of program costs are new costs fully attributable to MS4 permits. The remainder of the program costs was either pre-existing or resulted from enhancement of pre-existing programs.[6] In 2000, the County of Orange found that even lower amounts of program costs are solely attributable to MS4 permit compliance, reporting that the amount attributable to implement the County or Orange Drainage Area Management Plan (DAMP), was less than 20 percent of the total budget. The remaining 80 percent was attributable to pre-existing programs.[7] More current data from the County of Orange is not used in this discussion because the County of Orange no longer reports such information.

Estimated Value of Healthy Water Quality

Economic considerations of municipal storm water management programs cannot be limited only to program costs. Evaluation of programs must also consider information on the benefits derived from environmental protection and improvement.[8] Attention is often focused on municipal storm water management program costs, but the programs must also be viewed in terms of their value to the public.

Placing a value on healthy receiving waters is very difficult. Often the value of receiving waters with good water quality manifests in other forms, such as tourism, recreational opportunities, and/or increased property values. When surface water bodies are degraded, thereby degrading the habitat within and adjacent to the water bodies, the public loses the value and benefits associated with being able to use the area in and around the water bodies. Surface waters that are able to support the beneficial uses designated in the Basin Plan can sustain plants and wildlife that can attract visitors and residents, providing aesthetic, recreational, as well as monetary value to the public. At this time, however, there have been no studies for the San

[5] Los Angeles Water Board, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.
[6] State Water Board, 2005. NPDES Stormwater Cost Survey. P. 58.
[7] County of Orange, 2000. A NPDES Annual Progress Report. P. 60.
[8] Ribaudo M.O. and D. Heelerstein. 1992, *Estimating Water Quality Benefits: Theoretical and Methodological Issues.* U.S. Department of Agriculture. Technical Bulletin No. 1808.

Diego Region to quantify the added value that surface waters with healthy water quality can provide.

USEPA has estimated that household willingness to pay for improvements in fresh water quality for fishing and boating is approximately $158-$210.[9] This estimate can be considered conservative, since it does not include important considerations such as marine waters benefits, wildlife benefits, or flood control benefits. Another study conducted by California State University, Sacramento reported that the annual household willingness to pay for statewide clean water is approximately $180.[10]

A study conducted by the University of Southern California and University of California, Los Angeles assessed the costs and benefits of implementing various approaches for achieving compliance with the MS4 permits in the Los Angeles region. The study found that non-structural systems would cost $2.8 billion but provide $5.6 billion in benefit. If structural systems were determined to be needed, the study found that total costs would be $5.7 to $7.4 billion, while benefits could reach $18 billion.[11] Costs are anticipated to be borne over many years, probably at least ten years.

As can be seen, the benefits of the municipal storm water management programs are expected to considerably exceed their costs. Such findings are corroborated by USEPA, which found that the benefits of implementation of its Phase II storm water rule would also outweigh the costs.[12]

[9] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68793.
[10] State Water Board, 2005. NPDES Stormwater Cost Survey. P. iv.
[11] Los Angeles Water Board, 2004. Alternative Approaches to Stormwater Control.
[12] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791.

VII. APPLICABLE STATUTES, REGULATIONS, PLANS AND POLICIES

A. Legal Authorities – Federal Clean Water Act and California Water Code

This Order is issued pursuant to section 402 of the CWA and implementing regulations adopted by the USEPA and chapter 5.5, division 7 of the CWC (commencing with section 13370). This Order serves as an NPDES permit for point source discharges to surface waters. This Order also serves as waste discharge requirements pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

The objective of the CWA is "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*." To carry out this objective, the CWA requires the implementation of permit programs to regulate the discharge of pollutants and dredged or fill material to the navigable waters of the U.S. and to regulate the use and disposal of sewage sludge. CWA section 402 provides the legal authority to issue a permit for the discharge of pollutants to waters of the U.S. under the NPDES. The CWA provides that NPDES permits may be issued by states which are authorized to implement the provisions of that act. California became authorized to implement the NPDES permit program on May 14, 1973.

The Porter-Cologne Water Quality Control Act (Division 7, commencing with CWC section 13000) established the State Water Resources Control Board (State Water Board) and nine Regional Water Quality Control Boards (Regional Water Boards) as the principal state agencies with primary responsibility for the coordination and control of water quality. CWC section 13200(f) established the San Diego Water Board, which has the primary responsibility for the coordination and control of water quality in the San Diego Region, which includes all the basins draining into the Pacific Ocean between the southern boundary of the Santa Ana Region and the California-Mexico boundary. The San Diego Water Board implements the CWA through Chapter 5.5 of the CWC, commencing with section 13370. CWC section 13377 provides the San Diego Water Board the legal authority to issue waste discharge requirements to ensure compliance with all applicable provisions of the CWA and acts amendatory thereof or supplementary, thereto, to implement water quality control plans, or for the protection of beneficial uses, or to prevent nuisance.

CWA section 402(p) requires the USEPA or authorized state to issue NPDES permits for storm water discharges from municipal separate storm sewer systems (MS4s) to waters of the U.S. CWA section 402(p)(3)(B)(ii) requires that NPDES permits for storm water discharges from MS4s "*effectively prohibit non-storm water discharges*" into the MS4s. CWA section 402(p)(3)(B)(iii) requires that NPDES permits for storm water discharges from MS4s to "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable* [MEP], *including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control*

of such pollutants."

The USEPA published implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]), which prescribe permit application requirements for storm water discharges from MS4s pursuant to CWA 402(p), on November 16, 1990. The USEPA published an Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems, which provided guidance on permit application requirements for regulated MS4s, on May 17, 1996. The federal regulations in 40 CFR 122 and guidance issued by USEPA serve as the foundation for the provisions of Order No. R9-2013-0001. The legal authorities provided by the above statutes and regulations are included as part of the discussions in Section VIII of this Fact Sheet.

B. Legal Authority for the Permit Issued on a Region-wide Basis

CWA section 402(p)(3)(B) provides the San Diego Water Board the legal authority to issue an NPDES permit for the San Diego Region as compared to separate MS4 permits based upon County- and partial County-wide boundaries as they exist within the San Diego Region. CWA section 402(p)(3)(B) states that "*Permits for discharges from municipal storm sewers- (i) may be issued on a system- or jurisdiction-wide basis ....*" The federal regulations in 40 CFR 122.26(a)(1)(v) also state that the San Diego Water Board "*may designate dischargers from municipal separate storm sewers on a system-wide or jurisdiction-wide basis. In making this determination, the [San Diego Water Board] may consider the following factors: (A) the location of the discharge with respect to waters of the United States; (B) the size of the discharge; (C) the quantity and nature of the pollutants discharged to waters of the United States; and (D) other relevant factors*."

More specifically, the federal regulations provide that for large and medium MS4 systems, the San Diego Water Board may issue a regional permit. Specifically, the federal regulation in 40 CFR 122.26(a)(3) provide:

"*(ii) The Director may either issue one system-wide permit covering all discharges from municipal separate storm sewers within a large or medium municipal storm sewer system or issue distinct permits for appropriate categories of discharges within a large or municipal separate storm sewer system including, but not limited to: all discharges owned or operated by the same municipality; located within the same jurisdiction; all discharges within a system that discharge to the same watershed; discharges within a system that are similar in nature; or for individual discharges from municipal separate storm sewers within the system.*

(iii) The operator of a discharge from a municipal separate storm sewer which is part of a large or medium municipal separate storm sewer system must either: (A) Participate in a permit application (to be a permittee or a co-permittee) with one or more other operator of discharges from the large or medium municipal

storm sewer system which covers all, or a portion of all, discharges from the municipal separate storm sewer system; (B) Submit a distinct permit application which only covers discharges from the municipal separate storm sewers for which the operator is responsible; or (C) A regional authority may be responsible for submitting a permit application under the following guidelines....

(iv) One permit application may be submitted for all or a portion of all municipal separate storm sewers within adjacent or interconnected large or medium municipal separate storm sewer systems. The Director may issue one systemwide permit covering all, or a portion of all municipal separate storm sewers in adjacent or interconnected large or medium municipal separate storm sewer systems.

(v) Permits for all or a portion of all discharges from large or medium municipal separate storm sewer systems that are issued on a system-wide, jurisdiction-wide, watershed or other basis may specify different conditions relating to different discharges covered by the permit, including different management programs for different drainage areas which contribute storm water to the system."

Based on these regulations, the San Diego Water Board may issue a region-wide MS4 permit. The regulations also clarify that the permit may include different conditions for separate discharges covered by the permit. This allows the San Diego Water Board to ensure that suitable water quality conditions and provisions are identified for each watershed.

The USEPA's responses to comments in the Final Rule for the above-mentioned regulations also make it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide, permits. In the Final Rule published in the Federal Register and containing the responses to comments, USEPA notes that 40 CFR 122.26(a)(3)(iv) would allow an entire system in a geographical region under the purview of a State agency to be designated under a permit.[13] USEPA also states that many commenters wanted to allow the permitting authority broad discretion to establish system-wide permits, and that EPA believes that paragraphs 40 CFR 122.26 (a)(1)(v) and (a)(3)(ii) allow for such broad discretion.[14]

This Order creates watershed requirements that apply to multiple counties. The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees. Managing storm water on a regional and watershed basis is expected to result in improved water quality, as the Order focuses on monitoring and management practices necessary to improve each watershed rather than political boundaries. A single permit also allows the San Diego Water Board staff to expend fewer resources developing successive multiple permits and allows more resources to be devoted to working cooperatively with all three

[13] 55 Federal Register 47990-01, 48042
[14] Ibid

current groups of Copermittees to ensure implementation of this Order results in improved water quality.

C. Federal and California Endangered Species Acts

This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2115.5) or the Federal Endangered Species Act (16 United States Code [USC] sections 1531 to 1544). This Order requires compliance with requirements to protect the beneficial uses of waters of the U.S. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

D. California Environmental Quality Act

The action to adopt an NPDES Permit is exempt from the provisions of Chapter 3 of the California Environmental Quality Act (CEQA) (Public Resources Code section 21100, et seq.) pursuant to CWC section 13389. (*County of Los Angeles v. Cal. Water Boards* (2006) 143 Cal.App.4th 985.)

E. State and Federal Regulations, Plans and Policies

The legal authority provided by the following regulations, plans, and policies are also included as part of the discussions in Section VIII of this Fact Sheet.

Water Quality Control Plan for the San Diego Basin

The CWA requires the San Diego Water Board to establish water quality standards for each water body in its region. Water quality standards include beneficial uses, water quality objectives and criteria that are established at levels sufficient to protect beneficial uses, and an antidegradation policy to prevent degrading of waters. On September 8, 1994, the San Diego Water Board adopted the *Water Quality Control Plan for the San Diego Basin (*Basin Plan). The Basin Plan designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters in the San Diego Region. The San Diego Water Board has amended the Basin Plan on multiple occasions since 1994. In addition, the Basin Plan implements State Water Board Resolution No. 88-63, which established state policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply. Beneficial uses applicable to the surface water bodies that receive discharges from the MS4s within the San Diego Region generally include those listed below:

The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region:

- Municipal and Domestic Supply (MUN)
- Agricultural Supply (AGR)
- Industrial Process Supply (PROC)
- Industrial Service Supply (IND)
- Ground Water Recharge (GWR)
- Contact Water Recreation (REC1)
- Non-contact Water Recreation (REC2)
- Warm Freshwater Habitat (WARM)
- Cold Freshwater Habitat (COLD)
- Wildlife Habitat (WILD)
- Rare, Threatened, or Endangered Species (RARE)
- Freshwater Replenishment (FRSH)
- Hydropower Generation (POW)
- Preservation of Biological Habitats of Special Significance (BIOL)

The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region:

- Navigation (NAV)
- Commercial and Sport Fishing (COMM)
- Estuarine Habitat (EST)
- Marine Habitat (MAR)
- Aquaculture (AQUA)
- Migration of Aquatic Organisms (MIGR)
- Spawning, Reproduction, and/or Early Development (SPWN)
- Shellfish Harvesting (SHELL)

Pursuant to Water Code sections 13263 and 13377, the requirements of this Order implement the Basin Plan.

Water Quality Control Plan for Ocean Waters of California, California Ocean Plan

In 1972, the State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan). The State Water Board adopted the most recent amended Ocean Plan on September 15, 2009. The Office of Administrative Law approved it on March 10, 2010. On October 8, 2010, USEPA approved the 2009 Ocean Plan. The Ocean Plan is applicable, in its entirety, to ocean waters of the State. In order to protect beneficial uses, the Ocean Plan establishes water quality objectives and a program of implementation. Pursuant to Water Code sections 13263 and 13377, the requirements of this Order implement the Ocean Plan. The Ocean Plan identifies the beneficial uses of ocean waters of the State to be

protected as summarized below:

- Industrial water supply
- Water contact and non-contact recreation, including aesthetic enjoyment; navigation
- Commercial and sport fishing
- Mariculture
- Preservation and enhancement of designated Areas of Special Biological Significance
- Rare and endangered species
- Marine habitat
- Fish spawning and shellfish harvesting

On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving an exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges. On June 19, 2012, the State Water Board adopted Order No. 2012-0031, amending Order No. 2012-0012 to require pollutant load reductions to be achieved within six years for the ASBS Compliance Plans, section A.2.d(2) and ASBS Pollution Prevention Plans, section B.2.b(2). The State Water Board Resolution No. 2012-0012, as amended requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject terms and conditions of State Water Board Resolution No. 2012-0012, as amended. The Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012, as amended, applicable to these discharges, are ~~hereby~~ incorporated in Attachment A of this Order ~~as if fully set forth herein~~. Requirements of this Order implement the Ocean Plan.

Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality

On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

Antidegradation Policy

Federal regulations (40 CFR 131.12) require that the state water quality standards include an antidegradation policy consistent with the federal antidegradation policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16 ("Statement of Policy with Respect to Maintaining the Quality of the Waters of the State"). State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law.

The San Diego Water Board's Basin Plan implements and incorporates by reference both the State and federal antidegradation policies. State Water Board Resolution No. 68-16 and 40 CFR 131.12 require the San Diego Water Board to maintain high quality waters of the State until it is demonstrated that any change in quality will be consistent with maximum benefit to the people of the State, will not unreasonably affect beneficial uses, and will not result in water quality less than that described in the San Diego Water Boards' policies. State Water Board Resolution No. 68-16 requires that discharges of waste be regulated to meet best practicable treatment or control to assure that pollution or nuisance will not occur and the highest water quality consistent with the maximum benefit to the people of the State be maintained.

The discharges permitted in this Order are consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Board Resolution No. 68-16. Many of the water bodies within the area covered by this Order are of high quality. The Order requires the Copermittees to meet best practicable treatment or control to meet water quality standards. As required by 40 CFR 122.44(a), the Copermittees must comply with the "maximum extent practicable" technology-based standard set forth in CWA section 402(p) for discharges of pollutants in storm water from the MS4s.

Many of the waters within the area covered by this Order are impaired and listed on the State's CWA Section 303(d) List and the San Diego Water Board has established TMDLs to address the impairments. This Order requires the Copermittees to comply with permit provisions to implement the WLAs set forth in the TMDLs in order to restore the beneficial uses of the impaired water bodies consistent with the assumptions and requirements of the TMDLs. This Order includes requirements to develop and implement storm water management programs, achieve WQBELs, and effectively prohibit non-storm water discharges into the MS4. The issuance of this Order does not authorize an increase in the amount of discharge of waste.

Anti-Backsliding Requirements

CWA sections 402(o) and 303(d)(4) and 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations or conditions may be relaxed. All effluent limitations and other conditions in this Order are at least as stringent as the effluent limitations in the previous permits issued to the San Diego County Copermittees, the Orange County Copermittees and the Riverside County Copermittees.

Clean Water Act Section 303(d) List

CWA section 303(d)(1) requires each State to identify specific water bodies within its boundaries where water quality standards are not being met or are not expected to be met after implementation of technology-based effluent limitations on point sources. Water bodies that do not meet water quality standards are considered impaired and are placed on the state's "303(d) List." Periodically, USEPA approves the State's 303(d) List.

Most recently, USEPA approved the State's 2010 303(d) List of impaired water bodies on October 11, 2011, which includes certain receiving waters in the San Diego Region. For each listed water body, the state or USEPA is required to establish a TMDL of each pollutant impairing the water quality standards in that water body. A TMDL is a tool for implementing water quality standards and is based on the relationship between pollution sources and in-stream water quality conditions. The TMDL establishes the allowable pollutant loadings for a water body and thereby provides the basis to establish water quality-based controls. These controls should provide the pollution reduction necessary for a water body to meet water quality standards.

A TMDL is the sum of the allowable pollutant loads of a single pollutant from all contributing point sources (the waste load allocations or WLAs) and non-point sources (load allocations of LAs) plus the contribution from background sources and a margin of safety (40 CFR 130.2(i)). MS4 discharges are considered point source discharges. For 303(d)-listed water bodies and pollutants in the San Diego Region, the San Diego Water Board or USEPA develops and adopts TMDLs that specify these requirements.

Since 2002, the San Diego Water Board has established ~~six (6)~~ seven (7) TMDLs to remedy water quality impairments in various water bodies within the San Diego Region (see Attachment E to the Order). These TMDLs identify MS4 discharges as a source of pollutants to these water bodies, and, as required, establish WLAs for MS4 discharges to reduce the amount of pollutant discharged to receiving waters. CWA section 402(p)(3)(B)(iii) requires the San Diego Water Board to impose permit conditions, including: "management practices, control techniques and system, design and engineering methods, and *such other provisions as the Administrator or the State determines appropriate for the control of such pollutants."* (Emphasis added.) CWA section 402(a)(1) also requires states to issue permits with conditions necessary to carry out the provisions of the CWA. Federal regulations also require that NDPES permits contain WQBELs consistent with the assumptions and requirements of all available WLAs (40 CFR 122.44(d)(1)(vii)(B)). CWC section 13377 also requires that NPDES permits include limitations necessary to implement water quality control plans. Therefore, this Order includes WQBELs and other provisions to implement the TMDL WLAs assigned to Copermittees regulated by this Order.

Other Regulations, Plans and Policies

This Order implements all other applicable federal regulations and State regulations, plans and policies, including the California Toxics Rule at 40 CFR 131.38 (Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California Rule [California Toxics Rule or CTR]), and State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP).

F. Unfunded State Mandates

Article XIII B, Section 6(a) of the California Constitution provides that whenever "*any state agency mandates a new program or higher level of service on any local government, the state shall provide a subvention of funds to reimburse that local government for the costs of the program or increased level of service*." The requirements of this Order do not constitute state mandates that are subject to a subvention of funds for several reasons, including, but not limited to, the following.

First, the requirements of this Order do not constitute a new program or a higher level of service as compared to the requirements contained in the previous Fourth Term Permits. The overarching requirement to impose controls to reduce the pollutants in discharges from MS4s is dictated by the CWA and is not new to this permit cycle (33 USC section 1342(p)(3)(B)). The inclusion of new and advanced measures as the MS4 programs evolve and mature over time is anticipated under the CWA (55 FR 47990, 48052 (Nov. 16, 1990)), and to the extent requirements in this Order are interpreted as new advanced measures, they do not constitute a new program or higher level of service.

Second, and more broadly, mandates imposed by federal law, rather than by a state agency, are exempt from the requirement that the local agency's expenditures be reimbursed (Cal. Const., art. XIII B, section 9, subd. (b)). This Order implements federally mandated requirements under the CWA and its requirements are therefore not subject to subvention of funds. This includes federal requirements to effectively prohibit non-storm water discharges, to reduce the discharge of pollutants in storm water to the MEP, and to include such other provisions as the Administrator or the State determines appropriate for the control of such pollutants (33 USC section 1342(p)(3)(B)). Federal cases have held these provisions require the development of permits and permit provisions on a case-by-case basis to satisfy federal requirements. (*Natural Resources Defense Council, Inc., v. USEPA* (9th Cir. 1992) 966 F.2d 1292, 1308, fn. 17.)

The authority exercised under this Order is not reserved state authority under the CWA's savings clause (cf. *Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 627-628 [relying on 33 USC section 1370, which allows a state to develop requirements which are not "less stringent" than federal requirements]), but instead is part of a federal mandate to develop pollutant reduction requirements for municipal separate storm sewer systems. To this extent, it is entirely federal authority that forms the legal basis to establish the permit provisions. (See, *City of Rancho Cucamonga v. Regional Water Quality Control Board, Santa Ana Region* (2006) 135 Cal.App.4th 1377, 1389; *Building Industry Ass'n of San Diego Co. v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 882-883.)

The MEP standard is a flexible standard that balances a number of considerations, including technical feasibility, cost, public acceptance, regulatory compliance, and effectiveness. (*Building Ind. Ass'n., supra,* 124 Cal.App.4th at pp. 873-874, 889.) Such

considerations change over time with advances in technology and with experience gained in storm water management (55 FR 47990, 48052 (Nov. 16, 1990)). Accordingly, a determination of whether the conditions contained in this Order exceed the requirements of federal law cannot be based on a point by point comparison of the permit conditions and the minimum control measures that are required "at a minimum" to reduce pollutants to the maximum extent practicable and to protect water quality (40 CFR 122.34). Rather, the appropriate focus is whether the permit conditions, as a whole, exceed the MEP standard.

In recent months, the County of Los Angeles and County of Sacramento Superior Courts have granted writs setting aside decisions of the Commission on State Mandates that held certain requirements in Phase I permits constituted unfunded mandates. In both cases, the courts have found that the correct analysis in determining whether an MS4 permit constituted a state mandate was to evaluate whether the permit as a whole exceeds the MEP standard. (*State of Cal. v. Comm. on State Mandates* (Super. Ct. Sacramento County, 2012, No. 34-2010-80000604), *State of California v. County of Los Angeles* (Super. Ct. Los Angeles County, 2011, No. BS130730.) Both cases are currently pending appeal.

The requirements of the Order, taken as a whole rather than individually, are necessary to reduce the discharge of pollutants to the MEP and to protect water quality. The San Diego Water Board finds that the requirements of the Order are practicable, do not exceed federal law, and thus do not constitute an unfunded mandate. These findings are the expert conclusions of the principal state agency charged with implementing the NPDES program in California (CWC sections 13001, 13370).

It should also be noted that the provisions in this Order to effectively prohibit non-storm water discharges are also mandated by the CWA (33 USC section 1342(p)(3)(B)(ii)). Likewise, the provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state establishes or adopts a TMDL, federal law requires that permits must contain effluent limitations consistent with the assumptions and requirements of any applicable waste load allocation in a TMDL (40 CFR 122.44(d)(1)(vii)(B)).

Third, the local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental dischargers who are issued NPDES permits for storm water discharges. With a few inapplicable exceptions, the CWA regulates the discharge of pollutants from point sources (33 USC section 1342) and the Porter-Cologne Act regulates the discharge of waste (CWC section 13263), both without regard to the source of the pollutant or waste. As a result, the "costs incurred by local agencies" to protect water quality reflect an overarching regulatory scheme that places similar requirements on governmental and non-governmental dischargers. (See *County of Los Angeles v. State of California* (1987) 43 Cal.3d 46, 57-58 [finding comprehensive workers' compensation scheme did not create a cost for local agencies that was subject to state subvention].)

The CWA and the Porter-Cologne Act largely regulate storm water with an even hand, but to the extent there is any relaxation of this even-handed regulation, it is in favor of the local agencies. Generally, the CWA requires point source dischargers, including dischargers of storm water associated with industrial or construction activity, to comply strictly with water quality standards (33 USC section 1311(b)(1)(C); *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159, 1164-1165 [noting that industrial discharges must strictly comply with water quality standards]). As discussed in prior State Water Board decisions, certain provisions of this Order do not require strict compliance with water quality standards (State Water Board Order No. WQ 2001-0015, p. 7). Those provisions of this Order regulate the discharge of waste in municipal storm water under the CWA's MEP standard, not the BAT/BCT standard that applies to other types of discharges. These provisions, therefore, regulate the discharge of waste in municipal storm water more leniently than the discharge of waste from non-governmental sources.

Fourth, the Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)). To the extent that the local agency Copermittees have voluntarily availed themselves of the permit, the program is not a state mandate. (Accord, *County of San Diego v. State of California* (1997) 15 Cal.4th 68, 107-108.)

Fifth, the local agency Copermittees' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under state law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

Finally, even if any of the permit provisions could be considered unfunded mandates, under Government Code section 17556, subdivision (d), a state mandate is not subject to reimbursement if the local agency has the authority to charge a fee. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order, subject to certain voting requirements contained in the California Constitution. (See Cal. Const., Art. XIII D, section 6, subd. (c); see also *Howard Jarvis Taxpayers Ass'n v. City of Salinas* (2002) 98 Cal.App.4th 1351, 1358-1359.) The Fact Sheet demonstrates that numerous activities contribute to the pollutant loading in the MS4. Local agencies can levy service charges, fees, or assessments on these activities, independent of real property ownership. (See, e.g., *Apartment Ass'n of Los Angeles County, Inc., v. City of Los Angeles* (2001(24 Cal.4th 830, 842 [upholding inspection fees associated with renting property].) The authority and ability of a local agency to defray the cost of a program without raising taxes indicates that a program does not entail a cost subject to subvention. (*Clovis Unified School Dist. V. Chiang* (2010) 188 Cal.App.4th 794, 812, citing *Connell v. Sup. Ct.* (1997) 59 Cal.App.4th 382, 401; *County of Fresno v. State of California* (1991) 53 Cal. 3d. 482, 487-488.)

VIII. PROVISIONS

The provisions (i.e. NPDES permit requirements) of the Order are discussed below.

A. Prohibitions and Limitations

Purpose: Provision A includes the prohibitions and limitations requirements that are the foundation of all the subsequent requirements included in the Order. Compliance with the prohibitions and limitations will restore and protect receiving waters from impacts that may be caused by discharges into and from the Copermittees' MS4s and ultimately achieve the objective of the CWA.

In meeting the requirements set forth in the Order, the Copermittees must be cognizant that the prohibitions and limitations exist and will be the standard by which the San Diego Water Board will be measuring the progress and success of their implementation of the NPDES permit requirements.

***Discussion*:** The objective of the CWA is to "*restore and maintain the chemical, physical, and biological integrity of the Nation's waters*." The CWA requires the implementation of NPDES permit programs to regulate discharges of pollutants and dredged or fill material to the navigable waters of the U.S. For discharges into and from MS4s, the CWA requires the NPDES permits to "*effectively prohibit non-stormwater discharges into the storm sewers*" and "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable.*"

Provision A includes limitations, consistent with the requirements of the CWA for discharges from MS4s. Provision A expresses these limitations as discharge prohibitions, receiving water limitations, and effluent limitations. Compliance with the discharge prohibitions and receiving water limitations is also explicitly described, in conformance with precedential State Water Board Orders.

More specific and detailed discussions of the requirements of Provision A are provided below.

Provision A.1 (Discharge Prohibitions) prohibits the discharge of specific types of waste into and/or from the Copermittees' MS4s.

Provision A.1.a restates and reiterates Basin Plan Waste Discharge Prohibition 1, by prohibiting discharges into and from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the

state. The terms pollution,[15] contamination,[16] and nuisance[17] are defined under CWC 13050. Provision A.1.c incorporates all the waste discharge prohibitions of the Basin Plan into the requirements of the Order. The waste discharge prohibitions from the Basin Plan have been reproduced and provided in Attachment A to the Order.

Provision A.1.b requires non-storm water discharges into the MS4s to be effectively prohibited, consistent with the requirements of the CWA for MS4 permits to "*effectively prohibit non-stormwater discharges into the storm sewers*." The effective prohibition is required to be implemented by each Copermittee within its jurisdiction through the illicit discharge detection and elimination requirements under Provision E.2. The prohibition does not apply to NPDES permitted discharges into the Copermittees' MS4s.

The CWA employs the strategy of prohibiting the discharge of any pollutant from a point source into waters of the United States unless the discharger of the pollutant(s) obtains an NPDES permit pursuant to CWA Section 402. The 1987 amendment to the CWA includes provision 402(p) that specifically addresses NPDES permitting requirements for storm water discharges from MS4s. CWA section 402(p) prohibits the discharge of pollutants from specified MS4s to waters of the U.S. except as authorized by an NPDES permit and identifies two substantive standards for MS4 storm water permits. MS4 permits (1) "*shall include a requirement to effectively prohibit nonstormwater discharges into the storm sewers*" and (2) "*shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or State determines appropriate for the control of such pollutants*." (CWA section 402(p)(3)(B)(ii-iii).)

In November 1990, the USEPA published regulations addressing storm water discharges from MS4s (55 FR 47990 and following (Nov. 16, 1990) (Phase I Final Rule)). The regulations establish minimum requirements for MS4 permits, and generally focus on the requirement that MS4s implement programs to reduce the amount of pollutants found in storm water discharges to the MEP. The CWA's municipal storm water MEP standard does not require storm water discharges to strictly meet water quality standards, as is required for other NPDES permitted

[15] CWC 13050(l): "(1) 'Pollution' means an alteration of the quality of waters of the state by waste to a degree which unreasonably affects either of the following: (A) The water for beneficial uses. (B) Facilities which serve beneficial uses. (2) 'Pollution' may include "contamination.

[16] CWC 13050(k): "Contamination' means an impairment of the quality of waters of the state by waste to a degree which creates a hazard to public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste, whether or not waters of the state are affected."

[17] CWC 13050(m): "Nuisance' means anything which meets all of the following requirements: (1) Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. (2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. (3) Occurs during, or as a result of, the treatment or disposal of wastes."

discharges. Compliance is achieved through an iterative approach of continuous implementation of improved BMPs. This distinction reflects Congress's recognition that variability in flow and intensity of storm events render difficult strict compliance with water quality standards by MS4 permittees. In describing the controls that permits must include to reduce pollutants in storm water discharges to the MEP, the statute (CWA section 402(p)(3)(B)(iii)) states that the controls shall include: "*management practices, control techniques and system, design and engineering methods, and such other provisions as the [permit writer] determines appropriate for the control of such pollutants*."

In contrast, non-storm water discharges from the MS4 that are not authorized by separate NPDES permits are subject to requirements under the NPDES program, including discharge prohibitions, technology based effluent limitations and water quality-based effluent limitations (40 CFR 122.44). The regulations also require the Copermittee's program to include an element to detect and remove illicit discharges and improper disposal into the storm sewer (40 CFR 122.26(d)(2)(iv)(B)).

While "non-storm water" is not defined in the CWA or federal regulations, the federal regulations (at 40 CFR 122.26(b)(2)) define "*illicit discharge*" as *"any discharge to a municipal separate storm sewer that is not composed entirely of storm water and that is not covered by an NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer and discharges resulting from fire fighting activities)*." This definition is the most closely applicable definition of "non-storm water" contained in federal law. As stated in the Phase I Final Rule, USEPA added the illicit discharge program requirement to begin implementation of the 'effective prohibition' requirement to detect and control non-storm water discharges to their municipal system.

Thus, federal law mandates that permits issued to MS4s must require management practices that will result in reducing storm water pollutants to the MEP yet at the same time requires that non-storm water discharges be effectively prohibited from entering the MS4. "Effectively" prohibit does not mean that non-storm water discharges are authorized to be discharged into and from the Copermittees' MS4s. The Phase I Final Rule clarifies what "effectively prohibit" means (55 FR 47995):

> "*Section 402(p)(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…<u>Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit</u> (other than the permit for the discharge from the municipal separate storm sewer)*" [Emphasis added].

Consistent with federal law, unless non-storm water discharges to the MS4 are authorized by a separate NPDES permit, non-storm water discharges are

appropriately subject to the effective prohibition requirement in the CWA and Regional Water Boards are not limited by the iterative MEP approach to storm water regulation in crafting appropriate regulations for non-storm water discharges.

The federal regulations (40CFR122.26(d)(2)(i)(B)) require the Copermittees to establish the legal authority which authorizes or enables the Copermittees to prohibit illicit discharges to the MS4s. The federal regulations (40 CFR 122.26(d)(2)(vi)(B)(1)) require the Copermittees to "*implement and enforce an ordinance, order or similar means*" to prevent non-storm water discharges to their MS4s. Thus, the Copermittees are required to "*effectively*" prohibit non-storm water discharges to their MS4s through enforcing their legal authority established under "*ordinance, order or similar means*" and either remove those discharges to their MS4s, or require those discharges to obtain coverage under a separate NPDES permit. More detail about the program that must be implemented to "*effectively*" prohibit non-storm water discharges to the Copermittees' MS4s is provided under the discussion for Provision E.2.

Provision A.1.d was included to be consistent Resolution No. 2012-0012, adopted by the State Water Board on March 20, 2012. Provision A.1.d prohibits discharges from MS4s to Areas of Special Biological Significance (ASBS), except for storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach to the Heisler Park ASBS subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012. The pertinent Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 are provided in Attachment A to the Order.

Provision A.2 (Receiving Water Limitations) specifies the condition of the receiving waters that must be achieved when there are discharges from the Copermittees' MS4s. Receiving water limitations are included in all NPDES permits issued pursuant to the CWA section 402. CWA section 402(p)(3)(B)(iii) authorizes the inclusion of "*such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." This requirement gives USEPA or the State permitting authority, in this case the San Diego Water Board, discretion to determine what permit conditions are necessary to control pollutants.

In its Phase I Final Rule (see 55 FR 47990, 47994 (Nov. 16, 1990)), USEPA elaborated on these requirements, stating that, "*permits for discharges from municipal separate storm sewer systems must require controls to reduce the discharge of pollutants to the maximum extent practicable, and where necessary water quality-based controls*." USEPA reiterated in its Phase II Final Rule (64 FR 68722, 68737), that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL*." CWC section 13377 also requires that NPDES permits include limitations necessary to implement water quality control plans. Both the State Water Board and the San Diego Water Board have previously concluded that discharges from the MS4 contain pollutants that have

the reasonable potential to cause or contribute to excursions above water quality standards. As such, inclusion of receiving water limitations is appropriate to control MS4 discharges.

The inclusion of receiving water limitations is also consistent with the Ninth Circuit Court of Appeals' ruling in *Defenders of Wildlife v. Browner* (191 F.3d 1159, 1166 (1999)) that the permitting authority has discretion regarding the nature and timing of requirements that it includes as MS4 permit conditions to attain water quality standards. The Ninth Circuit Court of Appeals recently explained that, "*[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*" (*Natural Resources Defense Council v. County of Los Angeles* (9th Cir. 2011) 673 F.3d 880, 886 (revd. On other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013)))

The receiving water limitations included in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan or in water quality control plans or policies adopted by the State Water Board, including State Water Board Resolution No. 68-16, or in federal regulations, including but not limited to 40 CFR 131.12 and 131.38. The water quality objectives in the Basin Plan and other State Water Board plans and policies have been approved by USEPA and combined with designated beneficial uses constitute the water quality standards required under federal law.

Provision A.2.a requires that discharges from the Copermittees' MS4s must not cause or contribute to the violation of water quality standards in receiving waters. The water quality standards of the receiving waters must be protected from the impacts that may be caused by the Copermittees' MS4 discharges. Water quality standards applicable to the surface waters in the San Diego Region must be achieved through meeting the technology based standard of MEP through an iterative process of improved management actions. Provision A.2.a is also consistent with State Water Board Order WQ 99-05 precedent-setting language requiring discharges from MS4s to attain receiving water quality standards. The water quality control plans and policies with water quality standards applicable to the waters in the San Diego Region are included under Provision A.2.a.

Provisions A.2.b was included to be consistent with the requirements of State Water Board Resolution No. 2012-0012, adopted on March 20, 2012.

<u>Provision A.3 (Effluent Limitations)</u> specifies the condition of the discharges from the Copermittees' MS4s that must be achieved if and when there are discharges.

Consistent with CWA section 301(b)(1)(A) and 40 CFR 122.44(a), Provision A.3.a includes the technology-based effluent limitations that must be included in the Order. The technology-based effluent limits, representing the minimum level of control that must be imposed in a permit under CWA section 402, requires that pollutants in discharges of storm water from the Copermittees' MS4s be reduced to the MEP. This provision applies specifically to storm water discharges. Non-storm water discharges must be effectively prohibited, as required under Provision A.1.b. Non-storm water (dry weather) discharges from the MS4 are not considered storm water (wet weather) discharges and therefore are not subject to the MEP standard.

The technology-based MEP standard is an ever-evolving, flexible, and advancing concept. Neither Congress nor USEPA has specifically defined the term "maximum extent practicable." Congress established this flexible MEP standard so that the administrative bodies would have "*the tools to meet the fundamental goals of the Clean Water Act in the context of storm water pollution*." (*Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 884.) As knowledge about controlling storm water runoff and discharges continues to evolve, so does the knowledge which constitutes MEP. Reducing the discharge of pollutants in storm water from the MS4 to the MEP requires the Copermittees to assess each program component and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP.

The San Diego Water Board or the State Water Board ultimately define MEP, and may include requirements that provide specific guidance on what is expected to demonstrate MEP. It is the responsibility of the Copermittees to propose actions that implement BMPs to reduce storm water pollution to the MEP. In other words, the Copermittees' runoff management programs developed and implemented under the Order are the Copermittees' proposals for achieving MEP. Their total collective and individual activities conducted pursuant to their runoff management programs become their proposal for achieving MEP as it applies both to their overall effort, as well as to specific activities. Provisions B through E of the Order provides a minimum framework to guide the Copermittees in achieving the MEP standard for discharges of pollutants in storm water.

Provision A.3.b incorporates any water quality based effluent limitations (WQBELs) applicable to the MS4s established for TMDLs adopted and approved for the San Diego Region and requires the Copermittees to comply with those WQBELs. This is consistent with 40 CFR 122.44(d)(1)(vii)(B), which requires that NPDES permits to incorporate WQBELs "*developed to protect a narrative water quality criterion, a numeric water quality criterion, or both…consistent with the assumptions and requirements of any available wasteload allocation for the discharge...*"

Pursuant to CWA section 303(d), for surface water bodies identified as impaired by one or more pollutants, the San Diego Water Board is required to establish TMDLs "*at a level necessary to implement the applicable water quality standards with seasonal*

variations and a margin of safety which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality." The TMDLs identify sources of the pollutants causing the impairments and assign portions of the TMDL as WLAs to point sources, which include MS4s.

WLAs must be expressed in NPDES permits as WQBELs, which may include one or more numeric components such as numeric effluent limits, and/or receiving water limitations, and/or BMP requirements. Because numeric targets for TMDLs typically include a component that will be protective of water quality standards, a TMDL will likely include one or more numeric receiving water limitations and/or effluent limitations as part of the assumptions or requirements of the TMDL. Any numeric receiving water limitations and/or effluent limitations developed as part of the assumptions or requirements of a TMDL must be incorporated and included as part of WQBELs for the MS4s.

Because the development and approval of new TMDLs, or modification of existing TMDLs, may occur during the term of this Order, the specific provisions of those TMDLs, including effluent limitations applicable to MS4s are provided within Attachment E to the Order. Attachment E will be updated with new TMDLs and modifications to existing TMDLs in a timely manner as they occur.

Provision A.4 (Compliance with Discharge Prohibitions and Receiving Water Limitations) describes the process required to be implemented by the Copermittees if compliance with the discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a are not being achieved under current conditions.

In its Phase II Stormwater Regulations, Final Rule, USEPA states that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL.*"[18] In a series of comment letters on MS4 permits issued by various Regional Water Boards, USEPA has also reiterated that MS4 discharges must meet water quality standards.[19] In addition, the Ninth Circuit Court of Appeals explained in a recent ruling that, *"[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*"[20]

[18] Phase II Stormwater Regulations, Final Rule, 64 Fed. Reg. 68722, 68737.
[19] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.
[20] NRDC v. County of Los Angeles (9th Cir. 2011), 673 F.3d 880, 886 (revd. on other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013))). See also, *Building Industry Ass'n of San Diego County v. State Water Resources*

Water quality standards for the San Diego Region are established in the Basin Plan. The water quality standards of the Basin Plan are incorporated into this Order as the discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a. The discharge prohibitions and receiving water limitations in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations or prohibitions to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan, water quality control plans or policies adopted by the State Water Board, including Resolution No. 68-16, or federal regulations, including but not limited to, 40 CFR 131.12 and 131.38. The waste discharge prohibitions and water quality objectives in the Basin Plan have been approved by USEPA and combined with the designated beneficial uses constitute the water quality standards required under federal law.

Under federal law (CWA section 402(p)(3)(B)(iii)), an MS4 permit must include "*controls to reduce the discharge of pollutants to the maximum extent practicable...and such other provision as...the State determines appropriate for control of such pollutants*." The State Water Board has previously determined that limitations necessary to meet water quality standards are appropriate for the control of pollutants discharged by MS4s and must be included in MS4 permits. (State Water Board Orders WQ 91-03, 98-01, 99-05, 2001-15; see also *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159.) This Order prohibits discharges that cause or contribute to violations of water quality standards.

The discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a are included in this Order to ensure that discharges from the MS4s do not cause or contribute to exceedances of water quality objectives necessary to protect the beneficial uses of the receiving waters.

Provision A.4 is consistent with the precedent-setting language in State Water Board Order WQ 99-05 required to be included in municipal storm water permits. State Water Board Order WQ 2001-15 refined Order WQ 99-05 by requiring an iterative approach to compliance with water quality standards involving ongoing assessments and revisions, as referred to as the "iterative process." The "iterative process" is a fundamental NPDES requirement for municipal storm water permits to achieve the objectives of the CWA.

The State Water Board and Regional Water Boards have stated that the provisions under Provisions A.1.a, A.1.c, A.2.a, and A.4 are independently applicable, meaning that compliance with one provision does not provide a "safe harbor" where there is non-compliance with another provision (i.e., compliance with the Provision A.4 does not shield a Copermittee who may have violated Provision A.1.a, A.1.c, or A.2.a from

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Control Bd. (2004) 124 Cal.App.4th 866, 884-886, citing *Defenders of Wildlife v. Browning,* (9th Cir. 1999) 191 F.3d 1159.)

an enforcement action). The intent of Provision A.4 is to ensure that the Copermittees have the necessary storm water management programs and controls in place, and that they are modified by the Copermittees in a timely fashion when necessary, so that compliance with Provisions A.1.a, A.1.c, and/or A.2.a is achieved as soon as possible. USEPA expressed the importance of this independent applicability in a series of comment letters on MS4 permits proposed by various Regional Water Boards. At that time, USEPA expressly objected to certain MS4 permits that included language stating, *"permittees will not be in violation of this [receiving water limitation] provision … [if certain steps are taken to evaluate and improve the effectiveness of the jurisdictional runoff management programs],"* concluding that this phrase would not comply with the CWA.[21]

The Ninth Circuit held in *Natural Resources Defense Council v. County of Los Angeles* (2011) 673 F3d. 880, 886 (revd. on other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013))) that engagement in the iterative process does not provide a safe harbor from liability for violations of permit terms prohibiting exceedances of water quality standards. The Ninth Circuit holding is consistent with the position of the State and Regional Water Boards that exceedances of water quality standards in an MS4 permit constitute violations of permit terms subject to enforcement by the Water Boards or through a citizen suit. While the Water Boards have generally directed dischargers to achieve compliance by improving control measures through the iterative process, the San Diego Water Board retains the discretion to take other appropriate enforcement and the iterative process does not shield dischargers from citizen suits under the CWA.

The requirements of Provision A.4, therefore, are required to be implemented until the water quality standards expressed under Provisions A.1.a, A.1.c, and A.2.a are achieved. The CWA requires MS4 permits to "*require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." The requirements of this Order have been deemed or determined to be "appropriate" to achieve water quality standards in receiving waters.

Part of the "*controls*" required by the Order is the process described in Provision A.4. Provision A.4 includes the process that is ultimately expected to achieve compliance with the requirement that discharges from the MS4 do not cause or contribute to violations of water quality standards in the receiving waters. The implementation of Provision A.4 is required when the Copermittees or the San Diego Water Board have

[21] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.

determined that discharges from the MS4 are causing or contributing to violations of water quality standards in the receiving waters.

The Copermittees must effectively prohibit non-storm water discharges into the MS4s, reduce the discharge of pollutants in storm water from the MS4s to the MEP, and ensure that their MS4 discharges do not cause or contribute to violations of water quality standards. If the Copermittees have effectively prohibited non-storm water discharges and reduced storm water pollutant discharges to the MEP, but their discharges are still causing or contributing to violations of water quality standards, Provision A.4 provides a clear "iterative process" for the Copermittees to follow.

Provision A.4 essentially requires the Copermittees to implement additional BMPs until MS4 discharges no longer cause or contribute to a violation of water quality standards.

In assessing compliance and potential enforcement actions, the San Diego Water Board looks at the Copermittees' efforts in total to meet the requirements of Provisions A.1.a, A.1.c, A.2.a and Provision A.4. The Copermittees need to demonstrate that they are making improvements to their programs and making progress toward achieving the discharge prohibitions and receiving water limitations in Provisions A.1.a, A.1.c, and A.2.a by implementing the requirements of Provision A.4. The San Diego Water Board would consider these efforts prior to strictly enforcing the requirements of Provisions A.1.a, A.1.c, and A.2.a. Causes of exceedances of the receiving water limitations can often be more difficult to identify and attribute solely to the Copermittees' MS4s. The intent of the Order is to provide the Copermittees more clarity and flexibility in addressing these exceedances through the iterative approach and adaptive management process until the requirements under Provisions A.1.a, A.1.c, and A.2.a are fully achieved.

An exception to the iterative approach and adaptive management process would be in receiving waters subject to adopted and approved TMDLs. For TMDLs that are incorporated into the Order, there is a specific date for compliance to be achieved, after which the iterative approach and adaptive management process required under Provision A.4 no longer provides the flexibility to achieve compliance. Where compliance dates for a TMDL have passed, compliance with the WQBELs incorporated into the Order established by a TMDL in Attachment E to protect water quality standards is required. Thus, after the interim or final compliance dates for a TMDL have passed, if the discharges from the Copermittees' MS4s are causing or contributing to a violation of WQBELs, exceedances of WQBELs must be strictly enforced by the San Diego Water Board. In the meantime, however, the Copermittees are in compliance with the interim or final TMDL requirements in Attachment E as long as the interim or final WQBELs are being achieved in accordance with the interim or final compliance dates.

B. Water Quality Improvement Plans

Purpose: Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges to the MS4s and control pollutants in storm water discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the Clean Water Act.

Provision B includes requirements for the Copermittees to develop and implement Water Quality Improvement Plans to ultimately comply with the prohibitions and limitations under Provision A. The Water Quality Improvement Plans will provide the Copermittees a comprehensive program that can achieve the requirements and further the objectives of the CWA. Implementation of the Water Quality Improvement Plans will also improve the quality of the receiving waters in the San Diego Region.

The Water Quality Improvement Plan is the backbone of the Regional MS4 Permit requirements. Provision B provides the guidance, criteria, and minimum expectations and requirements for the elements of the Water Quality Improvement Plan to be developed and implemented by the Copermittees. The Water Quality Improvement Plans will be implemented in the Watershed Management Area by the Copermittees within their jurisdictions through their jurisdictional runoff management programs.

The Water Quality Improvement Plan also incorporates a program to monitor and assess the progress of the Copermittees' jurisdictional runoff management programs toward improving the quality of discharges from the MS4s, as well as tracking improvements to the quality of receiving waters. A process to adapt and improve the effectiveness of the Water Quality Improvement Plans has also been incorporated into the requirements of Provision B to be consistent with the "iterative approach" required to achieve compliance with discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a, pursuant to the requirements of Provision A.4.

The Water Quality Improvement Plans have also been structured to incorporate the requirements of any TMDLs that have been adopted for the San Diego Region. Incorporating the requirements of the TMDLs into the requirements of Provision B allows the Copermittees to develop a single plan, instead of separate plans, to coordinate their non-storm water and storm water runoff management programs. The Water Quality Improvement Plans allow the Copermittees to meet the requirements of this Order, as well as fulfill the requirements of the TMDLs.

As an added benefit, if the Copermittees demonstrate that impaired water bodies within the Watershed Management Area listed on the 303(d) List will be addressed with their Water Quality Improvement Plans in a reasonable period of time, the San Diego Water Board may be able to remove the water bodies from the 303(d) List, which would greatly reduce the need for the San Diego Water Board to develop additional TMDLs that would have to be incorporated into the Order and implemented by the Copermittees.

***Discussion*:** The federal NPDES regulations require the Copermittees to develop a proposed management program (40 CFR 122.26(d)(2)(iv)). The proposed management program must include "*a comprehensive planning process*" and "*where necessary intergovernmental coordination*" for the "*duration of the permit.*" The Water Quality Improvement Plan is the Copermittees' "*comprehensive planning process*" document for the proposed management program that will be implemented within a Watershed Management Area. Implementation of the Water Quality Improvement Plan requires "*intergovernmental coordination*" among the Copermittees for at least the "*duration of the permit*," and likely into and beyond the next iteration of the permit.

Developing Water Quality Improvement Plans based upon watersheds is consistent with federal regulations that support the development of permit conditions, as well as implementation of storm water management programs, at a watershed scale (40 CFR 122.26(a)(3)(ii), 122.26(a)(3)(v), and 122.26(d)(2)(iv)). In 2003, USEPA issued a Watershed-Based NPDES Permitting Policy Statement (USEPA, 2003) that defines watershed-based permitting as an approach that produces NPDES permits that are issued to point sources on a geographic or watershed basis. In this policy statement, USEPA explains that "*[t]he utility of this tool relies heavily on a detailed, integrated, and inclusive watershed planning process*." USEPA identifies a number of important benefits of watershed permitting, including more environmentally effective results, the ability to emphasize measuring the effectiveness of targeted actions on improvements in water quality, reduced cost of improving the quality of the nation's waters and more effective implementation of watershed plans, including TMDLs, among others.

An emphasis on watersheds is appropriate at this stage in the San Diego Region's MS4 program to shift the focus to more targeted, water quality driven planning and implementation. Addressing discharges on a watershed scale focuses on water quality results by emphasizing the receiving waters in the watershed. The conditions of the receiving waters drive management actions, which in turn focus measures to address pollutant contributions from MS4 discharges.

The Water Quality Improvement Plan gives the Copermittees the responsibility of developing a comprehensive plan to coordinate the efforts of their jurisdictional runoff management programs for addressing the problems related to MS4 discharges causing impacts to water quality in the Watershed Management Area. The development of the plan provides the Copermittees the opportunity to provide

significant input on how to implement their jurisdictional runoff management programs, and how to best utilize their available resources in addressing a focused set of priorities that they believe will result in measureable improvements to water quality within the Watershed Management Area.

The Copermittees are encouraged to separate the Watershed Management Area into subwatersheds, as appropriate. This allows the Copermittees to identify priorities applicable to a subset of the Copermittees or specific water bodies or areas within the Watershed Management Area.

Included in the requirements for the elements to be included in the Water Quality Improvement Plan are monitoring and assessment requirements that are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order. In addition to the federal requirements of the CWA section 308(a) and 40 CFR 122.26(d), the San Diego Water Board has the authority to establish monitoring, reporting, and recordkeeping requirements for NPDES permits under CWC 13383.

More specific and detailed discussions of the requirements of Provision B are provided below.

Provision B.1 (Watershed Management Areas) requires the Copermittees to develop a Water Quality Improvement Plan for each of the Watershed Management Areas defined by the San Diego Water Board.

Pursuant to 40 CFR 122.26(d)(2)(iv), proposed management programs "*may impose controls on a…watershed basis…*" The Water Quality Improvement Plan is the Copermittees' proposed management program. A Water Quality Improvement Plan must be developed for each Watershed Management Area identified in the Order.

The Watershed Management Areas are identified in Table B-1. Table B-1 establishes ten (10) Watershed Management Areas, and identifies the Copermittees that are responsible for developing and implementing the Water Quality Improvement Plan for each Watershed Management Area.

The Copermittees from each of the three counties within the San Diego Region are expected to be phased in as their respective NPDES municipal storm water permits expire. Because Order No. R9-2007-0001 expired in January 2012, the San Diego County Copermittees ~~are~~were covered under the Regional MS4 Permit on June 27, 2013, the effective date of the Order. Because Order No. R9-2009-0002 expired in December 2014, the Orange County Copermittees are covered under the Regional MS4 Permit on April 1, 2015, the effective date of Order No. R9-2013-0001 as amended by Order No. R9-2015-0001.

After the San Diego Water Board receives and considers the Report~~s~~ of Waste

Discharge required to be submitted by the ~~Orange County Copermittees and~~ Riverside County Copermittees pursuant to the requirements of their current permit~~s~~, and makes any necessary changes to the Order, the ~~Orange County Copermittees and~~ Riverside County Copermittees will be covered under the Regional MS4 Permit after ~~Order No. R9-2009-0002 expires in November 2014, and~~ Order No. R9-2010-0016 expires in December 2015~~, respectively~~.

The ~~Orange County Copermittees and~~ Riverside County Copermittees also have the option to obtain coverage under the Regional MS4 Permit earlier than their respective permit expiration dates. The process to apply for early coverage is described Provision F.6.

Because the Santa Margarita River Watershed Management Area includes Copermittees from both San Diego County and Riverside County, a footnote to Table B-1 has been included to specify that the requirements of Provision B are not required to be implemented by the County of San Diego until the Riverside County Copermittees have received a notice of coverage under the Order. Until the Riverside County Copermittees are notified of coverage under the Order, the County of San Diego is subject to the prohibitions and limitations under Provision A, responsible for continuing to implement its existing jurisdictional runoff management program, and responsible for implementing the transitional monitoring and assessment requirements of Provision D, the transitional annual reporting requirements of Provision F.3.b, and the TMDL requirements of Attachment E to the Order.

The City of Laguna Woods and Laguna Hills are located partially within the jurisdictions of both the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board) and the San Diego Water Board. Written requests for designation of a single Regional Water Board to regulate matters pertaining to permitting of Phase I MS4 discharges were submitted to the San Diego Water Board and the Santa Ana Water Board by the City of Laguna Woods by letter dated September 8, 2014, and the City of Laguna Hills by letter dated March 12, 2014. The Cities of Laguna Woods and Laguna Hills requested designation of the San Diego Water Board pursuant to CWC section 13228. The Cities of Laguna Woods and Laguna Hills reported that management and implementation of municipal programs to comply with two different Phase I MS4 permits creates a significant administrative and financial burden and inhibits their ability to contribute to greater overall water quality improvements in either Region. In an effort to address these concerns, the San Diego Water Board and the Santa Ana Water Board have entered into an agreement dated January XX, 2015, whereby the San Diego Water Board is designated to regulate Phase I MS4 discharges within the jurisdiction of the Cities of Laguna Woods and Laguna Hills including areas in the Santa Region upon the later effective date of this Order or Tentative Order No. R8-2015-0001. Under the terms of the agreement, each Regional Water Board retains the authority to enforce provisions of the Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee (Water Code

section 13228 (b)). Also under the terms of the agreement, any TMDL and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Laguna Woods or Laguna Hills as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement of the applicable TMDL would remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Boards' San Diego Creek/Newport Bay TMDL and the San Diego Water Boards indicator Bacteria Project I Beaches and Creeks TMDL. In conformance with this agreement, a footnote to Table B-1 has been included to specify coverage under Order No. R9-2013-0001 for those Phase I MS4 discharges within the jurisdictional boundaries of the Cities of Laguna Woods and Laguna Hills within the Santa Ana Region. The footnote specifies that the City of Laguna Woods and Laguna Hills are identified as responsible Copermittees in the San Diego Creek/Newport Bay TMDL in the Santa Ana Region and remain obligated to comply with the San Diego Creek/Newport Bay TMDL pursuant to section XVIII of ~~Order No. R8-2014-0002~~Tentative Order No. R8-2015-0001 (NPDES No. CAS618030) and any reissuance thereof.

The City of Lake Forest is located partially within the jurisdictions of both the Santa Ana Water Board and the San Diego Water Board. By letters dated January 14, 2013 and April 4, 2014 the City of Lake Forest submitted a written request, pursuant to CWC section 13228, to the San Diego Water Board and the Santa Ana Water Board requesting the Santa Ana Water Board be designated to regulate matters within the City of Lake Forest pertaining to permitting of their Phase I MS4 discharges. The City of Lake Forest reported that management and implementation of municipal programs to comply with two different Phase I MS4 permits creates a significant administrative and financial burden and inhibits their ability to contribute to greater overall water quality improvements in either Region. In an effort to address these concerns, the San Diego Water Board and the Santa Ana Water Board have entered into an agreement dated January XX, 2015, whereby the Santa Ana Water Board is designated to regulate Phase I MS4 discharges within the jurisdiction of the City of Lake Forest within the San Diego Region upon the later date of this Order or Santa Ana Water Board Tentative Order No. R8-2015-0001. Under the terms of the agreement, each Regional Water Board retains the authority to enforce provisions of the Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee (Water Code section 13228 (b)). Also under the terms of the agreement, any TMDL and associated Phase I MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the City of Lake Forest as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement authority for the applicable TMDL would remain with the Regional Water Board which has the jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Boards' San Diego Creek/Newport Bay TMDL and the San Diego Water Boards'

indicator Bacteria Project I Beaches and Creeks TMDL. In conformance with this agreement, a footnote to Table B-1 has been included to specify that Phase I MS4 discharges within the jurisdictional boundaries of the City of Lake Forest located within the San Diego Region will be regulated under Santa Ana Water Board Order No. ~~R8-2014-0002~~R8-2015-0001 (NPDES No. CAS618030) and any reissuance thereof. The footnote specifies that the City of Lake Forest is an identified responsible Copermittee in the Indicator Bacteria Project I Beaches and Creeks TMDL (Bacteria TMDL) in the San Diego Region and remains obligated to comply with the Bacteria TMDL pursuant to Attachment E of Order No. R9-2013-0001 and any reissuance thereto. The City is also identified as a responsible Copermittee in the San Diego Creek/Newport Bay TMDL established by the Santa Ana Water Board. The City remains obligated to comply with the San Diego Creek/New Port Bay TMDL pursuant to the Santa Ana Water Board's Phase I MS4 Permit (Tentative Order No. R8-2015-0001 (NPDES No. CAS618030)~~to section XVIII of Order No. R8-2014-0002 (NPDES No. CAS618030) and any reissuance thereto~~. Under the terms of the agreement, ~~The footnote also provides that~~ the City of Lake Forest must retain and continue implementation of the over irrigation prohibition in Title 15, Chapter 15, Section 14.030, List (b) of the City Municipal Code throughout its jurisdiction. Also under the terms of the agreement, ~~The footnote further provides that~~ the City of Lake Forest must actively participate in the development and implementation of the Aliso Creek Watershed Management Area Water Quality Improvement Plan required pursuant to Order No. R9-2013-0001, and any reissuance thereof.

The bases supporting the Cities of Laguna Woods, Laguna Hills, and Lake Forest requests to designate a specific Regional Water Board for regulatory oversight of Phase I MS4 discharges may change under future conditions and circumstances, therefore the San Diego Water Board will periodically review the effectiveness of the agreement during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate the agreement with the Santa Ana Water Board or otherwise modify the agreement subject to the approval of the Santa Ana Water Board.

Provision B.2 (Priority Water Quality Conditions) requires the Copermittees in each Watershed Management Area to identify the highest priority water quality conditions which will be the focus of the Water Quality Improvement Plan implementation.

Provisions B.2.a and B.2.b provide the criteria that must be assessed when characterizing the receiving water quality and potential impacts from MS4 discharges of the receiving waters within the Watershed Management Area. The criteria are based primarily on the requirements in 40 CFR 122.26(d)(1)(iv)(C) and (C)(1)-(9). Characterizing the receiving water quality and identifying the potential impacts caused by MS4 discharges to receiving waters in the Watershed Management Area is necessary to identify the impacts to receiving waters associated with MS4 discharges that are of the most concern to the Copermittees.

Based on the information required to be considered under Provisions B.2.a and B.2.b, Provision B.2.c requires to Copermittees to identify the highest priority water quality conditions related to discharges from the MS4s that will be the primary focus of the Water Quality Improvement Plan in the Watershed Management Area. Addressing and improving these highest priority water quality conditions will become the focus of each Copermittee's jurisdictional runoff management program as the Water Quality Improvement Plan is implemented in the Watershed Management Area. The highest priority water quality conditions are expected to include source of pollutants and/or stressors, and/or receiving water conditions, that the Copermittees consider the highest threats or most likely to have adverse impacts on the physical, chemical, and biological integrity of receiving waters. Addressing these threats and/or adverse impacts should restore the physical, chemical, and biological integrity of receiving waters, and result in the restoration and protection of the beneficial uses of the receiving waters in the Watershed Management Area.

Provision B.2.d requires the Copermittees to identify known and suspected sources of pollutants and/or stressors contributing to the highest priority water quality conditions. The requirements of Provision B.2.d are based primarily on the requirements in 40 CFR 122.26(d)(1)(iii)(B)(1)-(6). The Copermittees are required to evaluate several factors in the identification of those sources. The Copermittees must consider and evaluate the following: (1) the land uses that may contribute toward impacts to receiving waters, (2) the locations of the Copermittees' MS4s that can convey and discharge runoff and pollutants to receiving waters, (3) other sources that discharge into the Copermittees' MS4s and receiving waters, and (4) other information and data that can help the Copermittees to evaluate the relative importance of or contribution from those sources toward the highest priority water quality conditions. Identifying the known and suspected sources, and their relative contribution toward the highest priority water quality conditions, will help the Copermittees to focus, direct, and prioritize their resources and implementation efforts within their jurisdictions.

Provision B.2.e requires the Copermittees to identify potential strategies that can result in improvements to water quality in MS4 discharges and/or receiving waters within the Watershed Management Area. Potential water quality improvement strategies will not necessarily be implemented by the Copermittees, but provide a "menu" of options that the Copermittees will consider for implementation. The public participation process that will be implemented during the development of the Water Quality Improvement Plan is where the potential water quality improvement strategies will be identified.

Provision B.3 (Water Quality Improvement Goals, Strategies and Schedules) requires the Copermittees in each Watershed Management Area to identify the goals that the Copermittees' jurisdictional runoff management programs will work toward achieving to address and improve the highest priority water quality conditions identified under Provision B.2.c; the strategies that will be implemented by the Copermittees within their jurisdictions and the Watershed Management Area to achieve the goals; and, the schedules for implementing the strategies and achieving the goals. The element of

the Water Quality Improvement Plan required under Provision B.3 is where the "*comprehensive planning*" and "*intergovernmental coordination*" [40 CFR 122.26(d)(2)(iv)] of the Copermittees' actions for the proposed management programs within the Watershed Management Area is required to be described.

Provision B.3.a requires the Copermittees to identify interim and final numeric goals, and schedules to achieve those goals as part of the Water Quality Improvement Plans. Provision B.3.a.(1) requires the Copermittees to identify two types of numeric goals to be achieved:

(1) Final numeric goals in the receiving waters and/or MS4 discharges that will result in the protection of the water quality standards of the receiving waters for the highest priority water quality conditions identified by the Copermittees for Provision B.2.c. These final numeric goals are the ultimate goals for the Water Quality Improvement Plan, and the achievement and maintenance of these final numeric goals will indicate that one or more beneficial uses have been successfully restored and/or protected from MS4 discharges.

(2) Interim numeric goals that can be used by the Copermittees to demonstrate progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges for the highest priority water quality conditions in the Watershed Management Area. Achievement of the interim numeric goals will demonstrate to the San Diego Water Board that the Copermittees' implementation efforts are progressing toward achieving the final numeric goals.

Provision B.3.a.(1) does not specify what the interim and final numeric goals must be based on, but they essentially must be designed to achieve compliance with water quality standards in the receiving waters. To that end, the interim goals must be based on measureable criteria or indicators capable of demonstrating progress toward achieving the numeric goals."

The interim and final numeric goals can be based on the water quality objectives in the Basin Plan. The water quality objectives in the Basin Plan, however, consist of numeric and narrative water quality objectives. Numeric water quality objectives can be directly used as numeric goals. Narrative water quality objectives, on the other hand, will require some interpretation to identify numeric goals. The achievement of multiple numeric goals based on the water quality objectives, used in combination, may be necessary to demonstrate that beneficial uses have been restored and/or protected.

The Copermittees could also propose other numeric goals that are not necessarily water quality objectives from the Basin Plan. For example, the Copermittees could propose a numeric goal that consists of achieving some percent improvement of a measureable indicator, such as acreage of a specific habitat or increase in a specific plant or animal species population. Other examples may include pollutant load

reductions, number of impaired waterbodies delisted from the List of Water Quality Impaired Segments, Index of Biological Integrity (IBI) scores, etc.

The Copermittees may choose to develop interim numeric goals based on the final numeric goals they develop, such as incremental steps toward ultimately achieving the final numeric goals. The Copermittees may also choose to develop interim numeric goals that are based on other measureable indicators that can indirectly indicate improvements and progress toward the final numeric goals.

There are no limits to the types of interim numeric goals that could be proposed by the Copermittees, other than the goals must be based on measureable criteria or indicators capable of demonstrating progress toward achieving the numeric goals. Likewise, there are no limits to the types of final numeric goals that could be proposed by the Copermittees, other than the goals must "*restore and protect the water quality standards of the receiving waters.*"

Finally, Provision B.3.a.(2) also requires the Copermittees to develop schedules for measuring progress and achieving the interim and final numeric goals. Several criteria are included for the development of the schedules, but the Copermittees are required to achieve the numeric goals as soon as possible, consistent with federal NPDES regulations (40 CFR 122.47(a)(1)).

The Copermittees are also required to incorporate any compliance schedules for any applicable ASBS or TMDL requirements. Applicable ASBS and TMDL compliance schedules are set forth in Attachment A and Attachment E to the Order, respectively. The information provided by the Copermittees under Provision B.3.a.(2) will be used by the Copermittees and the San Diego Water Board to gauge and track the progress of the Copermittees' efforts in addressing the highest priority water quality conditions identified in the Water Quality Improvement Plan.

Provision B.3.b requires the Copermittees to identify the strategies and schedules to implement those strategies as part of the Water Quality Improvement Plans. Provision B.3.b requires the Copermittees to identify the water quality improvement strategies that will be and may be implemented within the Watershed Management Area to 1) reduce of pollutants in storm water discharged from the MS4 to the MEP, 2) effectively prohibit non-storm water discharges from entering the MS4, 3) protect water quality standards in receiving waters by controlling MS4 discharges so that they do not cause or contribute to exceedances of receiving water limitations, and 4) achieve applicable WQBELs that implement TMDLs. The Copermittees will select the strategies to be implemented based on the likely effectiveness and efficiency of the potential water quality improvement strategies identified under Provision B.2.e to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, and/or achieve the interim and final numeric goals identified under Provision B.3.a.

Provision B.3.b.(1) requires each Copermittee to identify the strategies that will be or may be implemented within its jurisdiction. Each Copermittee is required to describe the strategies it is committed to implementing as part of its jurisdictional runoff management requirements under Provisions E.2 through E.7, and the optional jurisdictional strategies that the Copermittee will implement, as necessary, to achieve the numeric goals.

Each Copermittee is expected to implement the optional jurisdictional strategies identified under Provisions B.3.b.(1)(b) when the jurisdictional strategies it has committed to implement under Provision B.3.b.(1)(a) are not making adequate progress toward the interim and final numeric goals in accordance with the schedules established under Provision B.3.a. Provision B.3.b.(1)(b)(v) requires each Copermittee to describe the circumstances necessary to trigger implementation of the optional jurisdictional strategies, in addition to the requirements of Provisions B.3.b.(1)(a).

The San Diego Water Board recognizes that there may be optional jurisdictional strategies that will likely require funding and/or resources for planning, permitting, procurement of labor and materials, and implementation. Thus, Provision B.3.b.(1)(b)(iv) requires each Copermittee to describe the funding and/or resources that are necessary to implement these optional jurisdictional strategies. This information may provide interested groups and members of the public an understanding of the resources that they could provide or assist in obtaining to implement these optional jurisdictional strategies.

Provision B.3.b.(2) requires the Copermittees in the Watershed Management Area to identify the regional or multi-jurisdictional strategies that may be implemented, as necessary, to achieve the numeric goals. Similar to the requirements of Provision B.3.b.(1)(b), these regional or multi-jurisdictional strategies will likely require funding and/or resources for planning, permitting, procurement of labor and materials, and implementation, and San Diego Water Board recognizes that these strategies may be difficult to implement with only Copermittee resources. Thus, Provision B.3.b.(2)(d) requires the Copermittees to describe the funding and/or resources necessary to implement these optional regional or multi-jurisdictional strategies. This information may provide interested groups and members of the public an understanding of the resources that they could provide or assist in obtaining to implement these optional regional or multi-jurisdictional strategies.

Provision B.3.b.(3) requires the Copermittees to develop and include schedules in the Water Quality Improvement Plan for implementing the water quality improvement strategies identified under Provisions B.3.b.(1) and B.3.b.(2). The schedule for implementing the water quality improvement strategies will be used by the Copermittees and San Diego Water Board to measure and demonstrate the progress of the Copermittees' implementation efforts toward reducing pollutants in storm water discharged from the MS4 to the MEP, and eliminating illicit non-storm water

discharges from entering the MS4.

Provision B.3.b.(4) provides the Copermittees in each Watershed Management Area the option of implementing watershed-specific structural BMP requirements for Priority Development Projects. Historically, storm water permits have included very specific performance standards for permanent, structural BMPs. These standards describe the expectation for the capture or treatment of pollutants and control of excessive flow before storm water is discharged from a site. The Copermittees were also allowed to develop waiver programs for Priority Development Projects to avoid implementing the structural BMPs; however, the waiver programs were not necessarily tied into any sort of holistic watershed strategy. The result is that implementation of BMP requirements is largely done on a site-by-site basis. This requires proper design on the part of the Priority Development Project and strict oversight on the part of the Copermittee.

Provision B.3.b.(4) promotes the evaluation of multiple strategies for water quality improvement, in addition to the implementation of permanent structural BMPs, on a watershed-scale versus the site-by-site approach. In a report issued by the Southern California Coastal Water Research Project (SCCWRP) and several other research institutions, the report emphasized that a successful hydromodification management program will involve watershed analysis as a first step, and that integrating multiple watershed-based strategies is preferable over a site-by-site approach. Indeed, the report states that the watershed analysis "…*should lead to identification of existing opportunities and constraints that can be used to help prioritize areas of greater concern, areas of restoration potential, infrastructure constraints, and pathways for potential cumulative effects*."[22] Provision B.3.b.(4) promotes the findings and recommendations of the report by providing a pathway for Copermittees to develop an integrated approach to their land development programs.

Under Provision B.3.b.(4), the Copermittees in a Watershed Management Area must first perform an analysis by gathering as much information pertaining to the physical characteristics of the Watershed Management Area as possible. This includes, for example, identifying potential areas of coarse sediment supply, present and anticipated future land uses, and locations of physical structures within receiving streams and upland areas that affect the watershed hydrology (such as bridges, culverts, and flood management basins). Once this information is collected, the Copermittees must produce GIS layers (maps) that include this information.

From there, the Copermittees must use the results of the Watershed Management Area Analysis to identify and compile a list of candidate projects that could potentially be used as alternative compliance options for Priority Development Projects. Such projects include, for example, opportunities for stream or riparian area rehabilitation, opportunities for retrofitting existing infrastructure to incorporate storm water retention

[22] 2012. ED Stein, F Federico, DB Booth, BP Bledsoe, C Bowles, Z Rubin, GM Kondolf, A Sengupta. Technical Report 667. Southern California Coastal Water Research Project. Costa Mesa, CA.

or treatment, and opportunities for regional BMPs, among others. Once these candidate projects are identified, Copermittees may allow Priority Development Projects to fund, partially fund, or completely implement these candidate projects. The Copermittees must first find that implementing such a candidate project would provide greater overall benefit to the watershed than requiring implementation of the structural BMPs onsite, and also enter into a voluntary agreement with the Priority Development Project that authorizes this arrangement. The Copermittees may use Provision B.3.b.(4) as both 1) a mechanism to reach their stated goals of the Water Quality Improvement Plan by using Priority Development Projects to either fund or implement projects that will provide water quality benefit, and 2) an alternative to requiring strict adherence to the structural BMP design standards.

Additionally, Provision B.3.b.(4) allows the Copermittees to use the results of the Watershed Management Area Analysis to identify areas within the Watershed Management Area where it is appropriate to allow Priority Development Projects to be exempt from the hydromodification management BMP performance requirements. Provision E.3.c.(2) already allows exemptions for Priority Development Projects that discharge to a conveyance channel whose bed and bank are concrete lined from the point of discharge to an enclosed embayment or the Pacific Ocean. However, there may be cases where further exemptions are warranted. The Copermittees may identify such cases on a watershed basis and include them in the Watershed Management Area Analysis; however, they must provide the supporting rationale to support all claims for exemptions.

Provision B.3.b.(4) provides an innovative pathway for Copermittees to regulate their land development programs by allowing alternative compliance in lieu of implementing structural BMPs on each and every Priority Development Project. This approach facilitates the integration of watershed-scale solutions for improving overall water quality and assisting Copermittees to achieve their stated goals of the Water Quality Improvement Plan. The San Diego Water Board understands, however, that undertaking this approach, which involves extensive planning, could be resource intensive for the Copermittees. Therefore, the Watershed Management Area Analysis is optional and not a requirement. The Copermittees can choose not to perform the watershed planning and mapping exercise described in Provision B.3.b.(4), and instead choose to require strict implementation of the structural BMPs onsite, pursuant to Provision E.3.b.

Provision B.4 (Water Quality Improvement Monitoring and Assessment) requires the Copermittees to develop an integrated monitoring and assessment program to track the progress of the Water Quality Improvement Plan toward meeting the implementation goals and schedules, and improving the water quality of the Watershed Management Area. Provision B.4 is the part of the Water Quality Improvement Plan where the Copermittees describe the monitoring data that will be collected, which is not only necessary to implement the “iterative approach” required by Provision A.4, but inform the adaptive management and “*comprehensive planning*

process" that allows the Copermittees to make adjustments and modifications to the Water Quality Improvement Plans and the jurisdictional runoff management programs.

Provision B.4 requires the Copermittees, at a minimum, to include the requirements of Provision D as part of the water quality improvement monitoring and assessment program for the Water Quality Improvement Plan. The Copermittees, however, are not limited to the requirements of Provision D and may include additional monitoring and assessment methods to track progress toward improving water quality in the Watershed Management Area.

In addition to incorporating the requirements of Provision D, the water quality improvement monitoring and assessment program must incorporate any monitoring and assessment requirements specified for any applicable TMDLs included in Attachment E to the Order, and the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 for Watershed Management Areas with ASBS.

The monitoring and assessments required to be incorporated into the Water Quality Improvement Plan are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order.

Provision B.5 (Iterative Approach and Adaptive Management Process) requires the Copermittees to implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a.

Provision B.5 requires the Copermittees in each Watershed Management Area to re-evaluate the highest priority water quality conditions and potential water quality improvement strategies, the water quality improvement goals, strategies and schedules, and the water quality improvement monitoring and assessment program and provide recommendations for modifying those elements to improve the effectiveness of the Water Quality Improvement Plan. The re-evaluation of the Water Quality Improvement Plan is part of the assessment requirements of Provision D.

Provision B.6 (Water Quality Improvement Plan Submittal, Updates, and Implementation) requires to Copermittees to submit, update, and implement the Water Quality Improvement Plans.

The requirements for the process to develop and submit the Water Quality Improvement Plans is described in more detail under the discussion for Provision F.1. The process will include several opportunities for the public to provide input during the development of the Water Quality Improvement Plans. The process for updating the Water Quality Improvement Plans is described in more detail under the discussion for Provision F.3.c. Upon acceptance of the Water Quality Improvement Plan and

updates, the Copermittees are required to immediately begin implementing the Water Quality Improvement Plan and subsequent updates.

The Water Quality Improvement Plan is expected to be a dynamic document that will evolve over time. The Water Quality Improvement Plan is also expected to be a long term plan that focuses the Copermittees' efforts and resources on a limited set of priority water quality conditions, with the ultimate goal of protecting all the beneficial uses of the receiving waters within the Watershed Management Area from impacts that may be caused or contributed to by MS4 discharges. As the Copermittees collect data, implement their jurisdictional runoff management programs, and review the results from their water quality improvement monitoring and assessment program, the Water Quality Improvement Plan is expected to be continually reviewed and updated until compliance with Provisions A.1.a, A.1.b, and A.2.a is achieved.

However, in specific cases supported by robust analytical documentation the implementation of the Water Quality Improvement Plans may demonstrate that TMDLs are not necessary for identified impaired water bodies within the Watershed Management Area if the analytical record demonstrates that technology-based effluent limitations required by the CWA, more stringent effluent limitations required by state, local, or federal authority, and/or other pollution control requirements (e.g., best management practices) required by local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time.[23]

The San Diego Water Board submits an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. According to USEPA guidance for the Integrated Report,[24] water bodies are placed in one of five categories. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 are placed on the 303(d) List.

Category 4 in the Integrated Report is for water bodies where available data and/or information indicate that at least one beneficial use is not being supported or is threatened, but a TMDL is not needed. [25] Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

[23] 40 CFR 130.7(b)(1)
[24] USEPA, 2005. Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act
[25] Ibid

Impaired water bodies can be included in Category 4a if a TMDL has been adopted and approved. The TMDLs in Attachment E to the Order implement the requirements of the TMDLs adopted by the San Diego Water Board, and approved by the State Water Board and USEPA. The water bodies in Attachment E will be included in Category 4a in the Integrated Report and removed from the 303(d) List.

Impaired water bodies can be included in Category 4b if there are *acceptable* "pollution control requirements" required by a local, state or federal authority stringent enough to implement applicable water quality standards within a reasonable period of time (e.g., a compliance date is set). When evaluating whether a particular set of pollution controls are "requirements," the USEPA considers a number of factors, including: (1) the authority (local, state, federal) under which the controls are required and will be implemented with respect to sources contributing to the water quality impairment (examples may include: self-executing state or local regulations, permits, and contracts and grant/funding agreements that require implementation of necessary controls), (2) existing commitments made by the sources and completion or soon to be completed implementation of the controls (including an analysis of the amount of actual implementation that has already occurred), (3) the certainty of dedicated funding for the implementation of the controls, and (4) other relevant factors as determined by USEPA depending on case-specific circumstances.[26]

Impaired water bodies can be included in Category 4c if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution. Pollution, as defined by the CWA is "the man-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of water."[27] In other cases, pollution does not result from a pollutant and a TMDL is not required. Examples of circumstances where an impaired segment may be placed in Category 4c include segments impaired solely due to lack of adequate flow, stream channelization, or hydromodification. In these situations, there may be water quality management actions that can address the cause(s) of the impairment, but a TMDL may not be required to implement the actions.

The Water Quality Improvement Plans will require the implementation of pollution controls and water quality management actions (i.e. water quality improvement strategies) which can result in the attainment of water quality standards in water bodies impaired by discharges from the Copermittees' MS4s. The Water Quality Improvement Plans also include requirements that are expected to attain water quality standards in a reasonable period of time. The San Diego Water Board considers the Water Quality Improvement Plans to be a commitment by the Copermittees to develop, plan, budget for, and implement pollution controls that will attain water quality

[26] Ibid
[27] CWA section 502(19)

standards in receiving waters in a reasonable period of time, or as soon as possible. The results of the Copermittees' efforts in implementing the Water Quality Improvement Plans can be used to re-evaluate the condition of the impaired water bodies during the next update to the 303(d) List.

After the Copermittees submit the Water Quality Improvement Plans and demonstrate that water quality standards are being attained or will be attained in a reasonable period of time, the San Diego Water Board may re-evaluate the water bodies on the 303(d) List. These water bodies on the 303(d) List may be re-evaluated and placed into Category 4b or Category 4c in the Integrated Report. The water bodies placed in Category 4b or Category 4c in the Integrated Report must show a record that the water bodies are attaining water quality standards or supporting the identified beneficial uses, or will attain water quality standards or support identified beneficial uses in a reasonable period of time, in order for the water bodies to be appropriately removed from the 303(d) List.

C. Action Levels

Purpose: Provision C includes requirements for the Copermittees to identify and include numeric action levels in the Water Quality Improvement Plan to direct and focus the Copermittees' jurisdictional runoff management program implementation efforts for controlling MS4 discharges to receiving waters.

***Discussion*:** Under Provision C, the numeric action levels required are for non-storm water discharges and storm water discharges. The non-storm water action levels (NALs) are applicable to non-storm water discharges from the Copermittees' MS4s, which can occur year-round. The storm water action levels (SALs) are applicable to storm water discharges from the Copermittees' MS4s, which occur during the rainy season defined as the period between October 1 and April 30.

The action levels required by Provision C are based on the action level requirements that were developed and incorporated into Order Nos. R9-2009-0002 and R9-2010-0016, the Orange County and Riverside County MS4 Permits, respectively. The Fact Sheets for these Orders provide detailed discussions about the development of the numeric NALs and SALs included in this Order.

Order Nos. R9-2009-0002 and R9-2010-0016 required the Copermittees to perform prescribed actions if the NALs or SALs are exceeded. The actions required under Order Nos. R9-2009-0002 and R9-2010-0016 generally included conducting additional monitoring and source investigations when a discharge from the MS4 is observed to exceed one or more NALs and/or SALs.

For this Order, however, the action levels of Provision C are to be used by the Copermittees to prioritize the actions to be implemented as part of the Water Quality Improvement Plan. Monitoring data collected by the Copermittees from MS4 outfalls will be compared with the NALs and SALs. Exceedances of the NALs and SALs will not require the Copermittees to immediately identify sources causing exceedances, but will provide some numeric indicator levels that can give the Copermittees a way to measure the relative severity of a pollutant contributing to receiving water quality impacts.

NALs and SALs must be included in the Water Quality Improvement Plans to be used by the Copermittees in directing and focusing their water quality improvement strategies. The Copermittees are expected to utilize the NALs and SALs to help focus their implementation efforts on addressing pollutants that have the most significant potential or observed impacts to receiving waters. The NALs and SALs will be used as part of the MS4 discharges assessments required under Provision D.4.b. The NALs and SALs may also be used by the Copermittees as the numeric goals to be achieved in MS4 discharges and/or receiving waters as the Water Quality Improvement Plans are implemented.

More specific and detailed discussions of the requirements of Provision C are provided below.

Provision C.1 (Non-storm Water Action Levels) requires the Copermittees to incorporate NALs into the Water Quality Improvement Plan for pollutants and/or constituents that are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions identified in the Water Quality Improvement Plan related to non-storm water discharges from the MS4s. NALs generally must be consistent with the water quality objectives found within the Basin Plan.

The NALs have been included to ensure that the Copermittees are implementing and complying with several requirements of the MS4 permit. The federal CWA requires permits for municipal storm sewer systems to "*effectively prohibit non-storm water discharges into the storm sewers*." The federal NPDES regulations, which were promulgated to implement the CWA requirements for discharges from municipal storm sewers, require a program to address illicit discharges, which are non-storm water discharges. Provision A.1.b prohibits "*[n]on-storm water discharges into MS4s*" unless the non-storm water discharge authorized by a separate NPDES permit. The NALs will be used as part of the illicit discharge detection and elimination program required pursuant to Provision E.2, as well as part of the MS4 discharges assessments required pursuant to Provision D.4.b.

Provision A.1.a prohibits non-storm water discharges from the MS4 from "*causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state.*" In addition, pursuant to Provision A.2.a, non-storm water discharges "*must not cause or contribute to the violation of water quality standards in any receiving waters*."

Ideally, the Copermittees' jurisdictional runoff management programs will eliminate all non-storm water discharges entering the MS4s within their jurisdictions. The complete elimination of non-storm water discharges to the Copermittees' MS4s would be in compliance with the CWA requirements for non-storm water discharges, as well as the prohibitions and limitations of Provisions A.1.a and A.2.a.

The federal regulations, however, also refer to several non-storm water discharge categories that must be addressed as illicit discharges if they are found to be a source of pollutants. The federal regulations thus identify some non-storm water discharges that are not required to be addressed as illicit discharges if they are not a source of pollutants (e.g. non-storm water discharges specified in Provisions E.2.a.(1)-(5)). Thus, these regulations imply that some non-storm water discharges into and from the MS4 may occur even if non-storm water discharges are "effectively" prohibited by the Copermittees.

If the source of a non-storm water discharge is identified as a category of non-storm water specified in Provisions E.2.a.(1)-(5), the NALs can be used to determine the category of non-storm water discharges is a source of pollutants. For other non-storm water discharges not specified in Provisions E.2.a.(1)-(5), the CWA requires those discharges to be "*effectively"* prohibited by removing the discharge to the MS4 through enforcement of the Copermittees' legal authority established under "*ordinance, order or similar means*" to prohibit illicit discharges to the MS4s.

If there are non-storm water discharges that are not required to be addressed as illicit discharges, those discharges must comply, at a minimum, with the discharge prohibitions and receiving water limitations of Provision A. Thus, the non-storm water discharges from the MS4 must be at levels that will not cause or contribute to a condition of pollution, contamination, or nuisance (Provision A.1.a), and must not cause or contribute to a violation of water quality standards in receiving waters (Provision A.2.a) to be consistent with the discharge prohibitions and receiving water limitations of Provisions A.1.a and A.2.a.

Furthermore, the San Diego Region has predominantly intermittent and ephemeral rivers and streams which vary in flow volume and duration at spatial and temporal scales. For most of these river and stream systems, non-storm water discharges from the MS4 are likely to be the most significant or the only source contributing to surface flows present within the receiving water, especially during the dry season.

Therefore, because of the prohibitions and limitations of Provision A.1.a and A.2.a, and the likelihood that non-storm water discharges from the MS4 are the most significant or only source contributing to surface flows present within the receiving water, NALs generally must be consistent with the water quality objectives found within the Basin Plan. Non-storm water discharges that are meeting the NALs would not be expected to cause or contribute to an exceedance of water quality objectives in receiving waters, which would be consistent with the discharge prohibitions and receiving water limitations of Provisions A.1.a and A.2.a.

Exceedances of the NALs would then provide an indication of the relative severity of a pollutant in non-storm water discharges from the MS4 contributing to potential or observed receiving water quality impacts. The relative severity or significance of a pollutant in non-storm water discharges from the MS4 will provide the Copermittees a valuable source of information that can be used to identify priority water quality conditions within a Watershed Management Area and within each Copermittee's jurisdiction.

Tables C-1 through C-4 under Provision C.1.a specify numeric NALs for several parameters or pollutant constituents for non-storm water discharges from the MS4 to several water body types. The NALs for MS4 discharges given under Provision C.1.a are based on the water quality objectives for inland surface waters in the Basin Plan, and the water quality objectives for ocean waters in the Ocean Plan. The NALs for

most of the metals were calculated based on the State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP). The NALs provided in Tables C-1 through C-4 must be included in the Water Quality Improvement Plans required to be developed pursuant to Provision B.

Provision C.1.b requires the Copermittees to identify NALs for pollutants and/or constituents, not specified in Provision C.1.a, which are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions of the Watershed Management Area related to non-storm water discharges from the MS4s. The NALs must be based on the water quality objectives in the Basin Plan. The NALs identified under Provision C.1.b must be included in the Water Quality Improvement Plan.

The San Diego Water Board recognizes that some of the NALs required pursuant to Provisions C.1.a and C.1.b may be exceeded more frequently than not. Thus, Provision C.1.c has been included in the Order to provide the Copermittees the option to develop secondary NALs that are set at levels greater than the levels required pursuant to Provisions C.1.a and C.1.b to further refine the prioritization and assessment of water quality improvement strategies for addressing non-storm water discharges to and from the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and from the MS4.

Provision C.2 (Storm Water Action Levels) requires the Copermittees to incorporate SALs into the Water Quality Improvement Plan for pollutants and/or constituents causing or contributing, or may be causing or contributing, to the highest priority water quality conditions identified in the Water Quality Improvement Plan related to storm water discharges from the MS4s.

The SALs have been included to ensure that the Copermittees are implementing and complying with several requirements of the MS4 permit. Provision A.1.a prohibits storm water discharges from the MS4 from "*causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state.*" In addition, pursuant to Provision A.2.a, storm water discharges "*must not cause or contribute to the violation of water quality standards in any receiving waters*."

Provision A.3.a, however, implicitly acknowledges that compliance with Provisions A.1.a and A.2.a cannot be achieved immediately for discharges of storm water from the MS4 by applying the MEP standard. Thus, Provision A.4 requires the Copermittees to implement an iterative approach to demonstrate that MEP is being achieved. This approach is supported by USEPA.

The federal CWA requires permits for municipal storm sewer systems to "*require controls to reduce the discharge of pollutants [in storm water] to the maximum extent*

practicable, *including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants.*" MEP is an ever-evolving, flexible, and advancing concept. As knowledge about controlling storm water runoff and discharges evolves, so does the knowledge which constitutes MEP. Reducing the discharge of storm water pollutants from the MS4 to the MEP requires the Copermittees to assess their jurisdictional runoff management programs and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP. The SALs provide the Copermittees measureable goals that may be used to demonstrate the achievement of MEP for reducing pollutants in storm water discharges from the MS4. The SALs will be used as part of the MS4 discharges assessments required under Provision D.4.a.

In June of 2006, the State Water Board's Blue Ribbon Storm Water Panel released its report titled "*The Feasibility of Numerical Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities*." In the recommendations, the Blue Ribbon panel proposed storm water effluent limitations which are computed using statistical based population approaches. The SALs specified in Table C-5 under Provision C.2.a were developed from a regional subset of nationwide Phase I MS4 data by using USEPA Rain Zone 6 (arid west) data.[28] Additionally, utilization of regional data is appropriate due to the addition of data into the nationwide Phase I MS4 monitoring dataset in February 2008. This additional data increased the number of USEPA Rain Zone 6 samples to more than 400, and included additional monitoring events within Southern California.

Utilizing data from USEPA Rain Zone 6 resulted in SALs which closely reflect the environmental conditions experienced in the San Diego Region. The localized subset of data includes sampling events from multiple Southern California locations including Orange, San Diego, Riverside, Los Angeles, and San Bernardino Counties. The dataset includes samples taken from highly built-out impervious areas and from storm events representative of Southern California conditions.

The SALs for cadmium, copper, lead and zinc require the measurement of hardness and to provide more specificity in the assessment of samples with SALs for total metal concentrations. While USEPA Rain Zone 6 data include a large sample size for concentrations of total metals, the impact the concentration will have on receiving waters will vary with receiving water hardness. Since it is the goal of the SALs, through the iterative process and MEP standard, to have MS4 storm water discharges meet all applicable water quality objectives, the hardness of the receiving water should be used when assessing the total metal concentration of a sample.

Thus, when there is an exceedance of a SAL for a metal, the Copermittee must determine if that exceedance is above the existing applicable water quality objectives

[28] Data used to develop SAL were obtained from http://rpitt.eng.ua.edu/Research/ms4/mainms4.shtml

based upon the hardness of the receiving water. The water quality objectives Copermittees must use to assess total metal SAL exceedances are the California Toxic Rule (CTR) and USEPA National Recommended Water Quality Criteria for Freshwater Aquatic Life 1 hour maximum concentrations. The 1 hour maximum concentration is to be used for comparison since it is expected to most replicate the impacts to waters of the State from the first flush following a precipitation event.

The statistically calculated SALs given in Table C-5 are at levels greater than the water quality objectives in the Basin Plan or Ocean Plan. Because the objective of the CWA is to "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*", meaning eventually pollutants in storm water discharges must be reduced to a level that cannot cause or contribute to an exceedance of water quality objectives in receiving waters, over time the SALs are expected to be reduced to a level that is based on the water quality objectives rather than statistical calculations. The San Diego Water Board will review the SALs as more data for discharges of storm water from the MS4s are collected, and revise them as conditions improve and the MEP standard advances. For the Water Quality Improvement Plans required under this Order, the SALs identified under Provision C.2.a must be included.

Provision C.2.b requires the Copermittees to identify SALs for pollutants and/or constituents, not specified in Provision C.2.a, which are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions of the Watershed Management Area related to storm water discharges from the MS4s. The SALs identified under Provision C.2.b must be included in the Water Quality Improvement Plan.

The San Diego Water Board recognizes that some of the SALs required pursuant to Provisions C.2.a and C.2.b may be exceeded more frequently than not. Thus, Provision C.2.c has been included in the Order to provide the Copermittees the option to develop secondary SALs that are set at levels greater than the levels required pursuant to Provisions C.2.a and C.2.b to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s.

D. Monitoring and Assessment Program Requirements

Purpose: Provision D includes minimum monitoring and assessment requirements that must be developed and implemented by the Copermittees as part of the Water Quality Improvement Plans. Implementation of the monitoring and assessment requirements of Provision D will allow the Copermittees to demonstrate that the requirements of the CWA to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP are being achieved. Implementation of the monitoring and assessment requirements of Provision D will also allow the Copermittees and the San Diego Water Board to track improvements to the water quality in the San Diego Region. The monitoring and assessment program requirements are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order.

***Discussion*:** The San Diego Water Board recognized that changes to the monitoring and assessment requirements of the Fourth Term Permit were necessary to improve the usefulness and usability of monitoring data collected by the Copermittees to support their jurisdictional storm water programs more efficiently and with increased effectiveness. The data collected are needed to better inform the Copermittees' understanding of the physical, chemical, and biological condition of the receiving waters and the quality of the MS4 discharges. The monitoring program needs to provide opportunities for the Copermittees to integrate regional monitoring efforts into municipal storm water monitoring requirements to provide a cost-effective approach to monitoring and avoid duplication of efforts.

The requirements in Provision D were largely recommended by the Copermittees as an outcome of the San Diego Water Boards Focused Meeting process. The monitoring and assessment program requirements now require collection of more specific information necessary for each Copermittee to adapt its jurisdictional runoff management program in such a way that focuses resources on a watershed's highest priority water quality conditions. The monitoring and assessment program will require the Copermittees to collect data that can be utilized to answer both watershed level management questions (e.g. Are the chemical, physical, and biological conditions of a receiving water protective, or likely protective of beneficial uses?), and specific jurisdictional runoff management program activity questions (e.g. Are the water quality improvement strategies of the jurisdictional program effectively eliminating non-storm water discharges to the MS4?).

The monitoring data collected and assessment information that will be reported to the San Diego Water Board are necessary to determine if the Copermittees are complying with the prohibitions and limitations of Provision A. The required monitoring and assessments that must be reported to the San Diego Water Board will be utilized for three purposes:

(1) Inform the Copermittees, San Diego Water Board, and the public on the progress of the Copermittees' efforts to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP;

(2) Inform the Copermittees, San Diego Water Board, and the public on the condition of water bodies receiving discharges from the Copermittees' MS4, and the progress of the Copermittees' water quality improvement implementation efforts toward improving the receiving water quality; and

(3) Inform the Copermittees, the San Diego Water Board, and the public on the effectiveness of the Water Quality Improvement Plan toward achieving (1) and (2).

The monitoring and assessment information reported pursuant to Provision F is also expected to be key to the iterative approach and adaptive management process required under Provision A.4 and implemented through the Water Quality Improvement Plan required under Provision B. As required by Provision A.4, the iterative approach and adaptive management process is required if the Copermittees cannot meet the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c, and/or A.2.a under the present conditions.

Provision D provides the minimum monitoring and assessment requirements that must be included in each Water Quality Improvement Plan to be developed and implemented by the Copermittees. The Copermittees, however, are not limited to the requirements of Provision D and may include additional methods to track progress toward improving water quality in a Watershed Management Area.

More specific and detailed discussions of the requirements of Provision D are provided below.

Provision D.1 (Receiving Water Monitoring Requirements) specifies the minimum receiving water monitoring that the Copermittees must conduct within the Watershed Management Area and include as part of the Water Quality Improvement Plan.

Provision D.1 establishes minimum monitoring requirements that must be conducted by the Copermittees within each Watershed Management Area. Provision D.1 requires the Copermittees to collect and develop the data and information necessary to determine potential impacts to the beneficial uses in the receiving waters due to discharges from the MS4s. The monitoring required under Provision D.1 will also provide the data that will allow the Copermittees to gauge the effectiveness and progress of its Water Quality Improvement Plan implementation efforts toward improving the quality of receiving waters.

The receiving water monitoring requirements of Provision D.1 are focused primarily on monitoring the conditions and response of the receiving waters to the Copermittees' collective implementation efforts to reduce receiving water impacts that may be caused by the discharges from the MS4s. The preference of the San Diego Water Board is for the Copermittees to spend their resources achieving tangible and observable improvements in receiving water conditions instead of collecting samples and analyzing data that has consistently indicated that receiving water conditions are degraded and require improvement. In general, the ability to measure potential improvements in receiving water conditions due to any actions implemented by the Copermittees as part of the Water Quality Improvement Plan may require several years before a response can be observed. Thus, the frequency of collecting receiving water monitoring data has been kept to a minimum.

During the transitional period between adoption of this Order and San Diego Water Board acceptance of a Water Quality Improvement Plan, the Copermittees must conduct receiving water monitoring in accordance with Provision D.1.a. This approach to collecting receiving water data is different from what was required in the Fourth Term Permits, but one that truly embraces the concept of an integrated, cost-effective, streamlined receiving water monitoring approach.

Provision D.1.a requires Copermittees to continue performing the receiving water monitoring programs required in Order Nos. R-2007-0001, R9-2009-002, and R9-2010-0016; plus participation in: hydromodification management plan monitoring approved by the San Diego Water Board, monitoring plans as part of load reduction plans (either Bacteria Load Reduction Plans or Comprehensive Load Reduction Plans) for TMDLs in Attachment E of the Order, Storm Water Monitoring Coalition Regional Monitoring, Southern California Bight Regional Monitoring, Sediment Quality Monitoring, and ASBS Monitoring as applicable to a Watershed Management Area.

Provision D.1.a also provides an opportunity for the Copermittees to use third party data to meet receiving water monitoring requirements where feasible. Allowing the Copermittees to use the data currently collected through its participation in existing regional receiving water programs and that of third parties provides an efficiency of resources in obtaining the data necessary to inform the Copermittees and the San Diego Water Board about the physical, chemical, and biological conditions of the receiving waters, which can also help to focus the receiving water monitoring during the implementation of the Water Quality Improvement Plan. Once a Water Quality Improvement Plan is developed for a Watershed Management Area in compliance with Provision B of this Order, the transitional period is over and Copermittees are required to conduct receiving water monitoring according to the requirements of Provisions D.1.b-e.

Provision D.1.b requires each Copermittee to identify at least one long term receiving water monitoring station to be representative of receiving water quality within each Watershed Management Area. Long term receiving water monitoring stations can be

located at any existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees. The requirements under Provision D.1.b. are consistent with 40 CFR 122.26(d)(2)(iii)(D), which specifies that a "*monitoring program for representative data collection for the term of the permit*" may include "*instream locations.*" For each Watershed Management Area, at least one long term watershed monitoring station is required to be established and monitored. The Copermittees may choose to establish additional long term monitoring stations where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

Provision D.1.b. requires the Copermittees to locate the long term receiving water monitoring station at one of these existing receiving water monitoring stations to provide the Copermittees an opportunity to experience monitoring cost savings while continuing to collect the necessary data to assess the status and trends of receiving water quality conditions in 1) coastal water, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under both dry weather and wet weather conditions. Ideally these stations will continue to be monitored as part of the receiving water monitoring for each Watershed Management Area to maintain a consistent set of locations and a period of data that can be built upon with the monitoring required under this Order.

The receiving water monitoring requirements are separated into monitoring required during dry weather conditions pursuant to Provision D.1.c, and wet weather conditions pursuant to Provision D.1.d.

At each long term monitoring station the Copermittees must conduct at least three dry weather monitoring events as required pursuant to Provision D.1.c and at least three wet weather monitoring events as required pursuant to Provision D.1.d per permit term. Provisions D.1.c and D.1.d require the Copermittees to monitor priority water quality conditions identified in the Water Quality Improvement Plan, constituents listed as causing impairment of receiving waters in the Watershed Management Area, applicable NALs, toxicity, constituents listed in Tables D-2 and D-3, and constituents for implementation plans (e.g. Bacteria Load Reduction Plans and Comprehensive Load Reduction Plans). Required toxicity monitoring was changed to reflect an updated understanding of the unique challenges associated with sampling storm water for toxicity. Copermittees are required to sample storm water for toxicity during each dry weather and each wet weather event pursuant to Provision D.1.c.(4) and D.1.d.(4). Required toxicity monitoring is now consistent with the State Water Resources Control Board Policy for Toxicity Assessment and Control (Draft June 2012) and recently adopted MS4 permits for Caltrans and Los Angeles Water Board. Receiving water monitoring efforts in this Order have been streamlined to redirect resources to monitoring efforts that better support pollutant reduction solutions with an increasing emphasis on MS4 outfall monitoring, source identification and source abatement activities.

In addition to the receiving water monitoring requirements under Provisions D.1.b-d, Provision D.1.e requires the Copermittees participate in and/or conduct other types of receiving water monitoring. As recommended and requested by the Copermittees, Provision D.1.e.(1) requires the Copermittees to participate in existing regional monitoring, as applicable to each Watershed Management Area. Existing regional monitoring includes monitoring conducted by the Storm Water Monitoring Coalition and for the Southern California Bight. Participation in and use of monitoring data collected from these existing regional water quality monitoring programs provide the Copermittees a greater opportunity for efficiency in the use of their resources to manage their storm water programs and those controllable discharges under their authority. Provision D.1.e.(1)(c) requires the south Orange County MS4 Copermittees to participate in "unified regional beach water quality monitoring." This monitoring replaces requirements to conduct "core monitoring" of beach water quality, as provided for in Appendix III of the 2012 California Ocean Plan.

Several different public agencies currently conduct routine, ongoing beach water quality monitoring in south Orange County in accordance with several different sets of requirements. The monitoring programs implemented to meet those requirements overlap temporally and spatially. These monitoring programs are partially but not fully integrated. In November 2010, the State Water Board adopted Resolution No. 2010-0053, which directed regional water boards to work with dischargers to modify beach water quality monitoring programs required by regional board-issued permits in order to eliminate redundancies and incorporate beach water quality monitoring required by beach water quality statutes, where appropriate.

In April 2012, the San Diego Water Board requested that its staff review beach water quality monitoring conducted in south Orange County. To assist in responding to that request, staff of the Board convened a workgroup that included representatives of the three public agencies that currently conduct almost all of the routine, ongoing beach water quality monitoring in south Orange County, i.e., South Orange County Wastewater Authority (SOCWA), Orange County Public Works, and Orange County Health Care Agency (OCHCA). The workgroup also included other interested parties, including representatives of the Sierra Club and Surfrider Foundation. In December 2012, the San Diego Water Board adopted Resolution No. R9-2012-0069, which endorsed the San Diego Water Board staff report entitled "A Framework for Monitoring and Assessment in the San Diego Region," dated November 2012.

The unified program is consistent with and will meet or exceed the minimum requirements for beach water quality monitoring and related public notification and reporting established by State law, including the California Ocean Plan. The unified program is consistent with State Water Board Resolution No. 2010-0053. The unified program is also consistent with and will help implement, "A Framework for Monitoring and Assessment in the San Diego Region," which emphasizes the need for question-driven, beneficial use-oriented monitoring and assessment. The primary purpose of

the unified program will be to answer the question "Does beach water quality meet standards for the beneficial use of water contact recreation?"

The unified program is intended to be protective; it will help protect the health of swimmers, surfers, and others who use south Orange County beach waters for water contact recreational activities. The unified program is also intended to be reasonable; it will eliminate duplicative monitoring and will include triggers for public notification and additional sampling at all sampling stations year-round. The unified program is intended to be equitable; responsibility for implementation of the unified program will be shared and the responsible agencies will jointly make arrangements to implement the program and will have the flexibility to jointly make short and/or long term changes in those arrangements.

The San Diego Water Board Executive Officer ~~has~~ issued a written directive on December 5, 2014, pursuant to California Water Code section~~s 13225, 13267, and~~ 13383, for SOCWA and the south Orange County MS4 Copermittees to implement the unified program in cooperation with OCHCA. The Executive Officer may make revisions to the unified program, provided that the unified program, as revised, continues to be consistent with and meet the requirements of State law, including the California Ocean Plan, for beach water quality monitoring and related public notification and reporting. Following a thirty day public comment period, and subject to a request for a hearing before the San Diego Water Board, any such revision shall take effect as specified in a written directive issued by the Executive Officer pursuant to California Water Code sections ~~13225, 13267, and/or~~ 13383. The program and any Executive Officer issued revisions to the program are subject to California Water Code section 13320 right of review from the date of issuance.

The unified program will supersede the existing routine, ongoing, beach water quality monitoring programs in south Orange County that are conducted in accordance with the existing requirements of the NPDES permits for discharges from the SOCWA ocean outfalls and the south Orange County MS4s. The requirement to participate in "regional monitoring" of beach water quality replaces requirements to conduct "core monitoring" of beach water quality, as provided for in Appendix III of the 2012 California Ocean Plan.

The State Water Resources Control Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part 1 Sediment Quality which became effective August 25, 2009 (Sediment Quality Monitoring Policy). Provision D.1.e.(2) requires any Copermittees with MS4 discharges to an enclosed bay or estuary to monitoring the sediments in the enclosed bay or estuary receiving water in accordance with the sediment quality monitoring procedures as prescribed in the Sediment Quality Monitoring Policy.

The State Water Board adopted Resolution No. 2012-0012 which approved exceptions to the California Ocean Plan for selected discharges into Areas of Special Biological

Significance (ASBS), including special protections for beneficial uses. State Board Resolution No. 2012-0012 became effective on March 20, 2012, and Attachment B to the Resolution established limitations on point source storm water discharges to ASBS. Copermittees with MS4s that discharge to an ASBS must monitor its discharge to assure compliance with State Board Resolution No. 2012-0012 as required pursuant to Provision D.1.e.(3).

The San Diego Water Board is currently developing a regional monitoring strategy to assess the conditions of receiving waters in the San Diego Region. The monitoring requirements of Provision D.1 are expected to be incorporated or serve as a foundation of this regional monitoring strategy, but may require some modifications. When the San Diego Water Board develops an alternative regional monitoring strategy, the Copermittees will be required to participate in the development and implementation of the alternative regional monitoring program pursuant to Provision D.1.f.

Provision D.2 (MS4 Outfall Discharge Monitoring Requirements) specifies the minimum MS4 outfall discharge monitoring requirements that the Copermittees must incorporate and implement as part of the Water Quality Improvement Plan.

The dry weather MS4 outfall discharge monitoring requirements are included under Provisions D.2.a.(2) and D.2.b. The dry weather MS4 outfall discharge monitoring requirements are part of the "*program, including a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer*" required by 40 CFR 122.26(d)(2)(iv)(B), which is expected to achieve compliance with the CWA section 402(p)(3)(B)(ii) statutory requirement for municipal storm water permits to require the Copermittees to "*effectively prohibit non-storm water discharges into the storm sewers*." The dry weather MS4 outfall discharge monitoring data collection requirements are based on requirements under 40 CFR 122.26(d)(1)(iv)(D) and 122.26(d)(2)(iv)(B)(3).

The dry weather MS4 outfall discharge monitoring requirements are designed to provide wide spatial and temporal coverage of each jurisdiction to better understand the extent and magnitude of non-storm water discharges to receiving waters, and make a distinction between persistent and transient non-storm water flows. This information is expected to allow each Copermittee to focus its resources on eliminating and controlling the highest priority threats to receiving water quality, as well as integrating other elements of the storm water programs (e.g. complaint call response) and third party data to efficiently and effectively assist in efforts to eliminate non-storm water discharges.

The dry weather MS4 outfall discharge monitoring requirements of Provision D.2.a.(2) and D.2.b are separated into monitoring required before and after the San Diego Water Board accepts the Copermittees' Water Quality Improvement Plan. Outfall

monitoring conducted prior to acceptance of the Water Quality Improvement Plan is referred to in the Order as Transitional MS4 Outfall Discharge Monitoring. Provision D.2.a.(2) includes the transitional dry weather MS4 outfall discharge monitoring requirements.

The requirements under Provision D.2.a.(2) are based on the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B), which include the requirements for a monitoring program to identify, detect, and eliminate illicit connections and illegal discharges to the MS4s. The federal regulations (40 CFR 122.26(d)(1)(iv)(D)) require the monitoring program to include "*a field screening analysis for illicit connections and illegal dumping [that]…[a]t a minimum, include[s] a narrative description, for either each field screening point or major outfall, of visual observations made during dry weather periods.*" The federal regulations (40 CFR 122.26(d)(1)(v)(B)) require the monitoring program to include "*inspection procedures and methods for detecting and preventing illicit discharges, and describe areas where this program has been implemented.*" Furthermore, the monitoring program is required by federal regulations (40 CFR 122.26(d)(2)(iv)(B)) to include "*a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer.*"

Dry weather transitional MS4 outfall discharge monitoring requires each Copermittee to field screen (inspect) its major MS4 outfalls to classify the MS4 outfall locations as having persistent dry weather flows, transient dry weather flows, or no dry weather flows. To account for the variance in size of the 39 jurisdictions covered under this Order, the Copermittees recommended a tiered approach to the number of major MS4 outfalls that must be inspected. Provision D.2.a.(2)(a) provides a tiered approach to the number of major MS4 outfalls that must be visually inspected per jurisdiction as well as a minimum frequency each Copermittee must inspect each major MS4 outfall per year. This tiered approach is based on the total number of major MS4 outfalls within a Copermittees jurisdiction within each Watershed Management Area.

Based on the field screening, each Copermittee is required to make a determination whether any observed flowing, pooled, or ponded waters are transient or persistent flows. Based on this field screening information, other jurisdictional program information, and third party information, each Copermittee is required to prioritize the MS4 outfalls within its jurisdiction for follow up investigation and elimination of the non-storm water discharge, as part of its illicit discharge detection and elimination program required pursuant to Provision E.2. In accordance with the requirements of Provision E.2, each Copermittee is required to immediately investigate obvious illicit discharges (e.g. outfall discharges with unusual color, unusual odor, or high flows).

This approach allows a Copermittee to use all of its resources, as well as leverage resources and information provided by third parties, to effectively eliminate non-storm water discharges from its MS4 outfalls. If the source of the non-storm water discharge cannot be immediately eliminated, the Copermittee uses the persistent flow or

transient flow classification along with other programmatic implementation data to prioritize the MS4 outfalls for future investigation. In accordance with the adaptive management approach deployed throughout this Order, Provision D.2.a.(2)(c) requires each Copermittee to update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow. The requirement of Provision D.2.a.(2)(c) assures that each Copermittee is collecting data that can be used to demonstrate compliance with the CWA requirement that each Copermittee must implement a program to "*effectively prohibit non-storm water discharges into the [MS4]*" and with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

Provision D.2.b describes the dry weather MS4 outfall discharge monitoring required to be incorporated and implemented as part of the Water Quality Improvement Plan. Dry weather MS4 outfall discharge monitoring must be performed by each Copermittee to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. The emphasis of the dry weather MS4 outfall discharge monitoring required pursuant to Provision D.2.b is consistent with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

Provision D.2.b.(1) requires each Copermittee to continue field screening its major MS4 outfalls and identifying those with persistent flows and transient flows, as conducted during the transitional period (i.e. before the Water Quality Improvement Plan was developed). However, each Copermittee now has the flexibility to adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of non-storm water persistent flow discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan. In order to ensure a minimum number of outfalls are inspected, Provision D.2.b.(1) requires the number of visual inspections be equal to the number of visual inspections required in the tiered inspection program pursuant to Provision D.2.a.(2)(a).

Provision D.2.b.(2)(b) requires each Copermittee to monitor a minimum of 5 major MS4 outfalls with persistent flows identified as the highest priorities within a Copermittee's jurisdiction, within each Watershed Management Area. In other words, Copermittees located in more than one Watershed Management Area must identify at least 5 major MS4 outfalls with persistent flows in its jurisdiction in each Watershed Management Area. If a Copermittee is located in more than one Watershed Management Area, and they have less than 5 major MS4 outfalls with persistent flows per jurisdictional area per Watershed Management Area, all of the major MS4 outfalls must be identified as high priority dry weather persistent flow MS4 outfalls. The Copermittees identified as Responsible Copermittees by a TMDL in Attachment E of

the Order may need to monitor more than 5 dry weather major MS4 outfall locations to determine compliance with the requirements of the TMDL(s).

Monitoring must occur at the highest priority outfall locations at least semi-annually until the non-storm water discharges have been eliminated for three consecutive dry weather monitoring events; identified to be authorized by a separate NPDES Permit; or reprioritized to a lower priority. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized MS4 major outfall in the Copermittee's jurisdiction within the Watershed Management Area, unless there are no remaining qualifying major MS4 outfalls within the Copermittees jurisdiction. The Copermittees must continually update their dry weather persistent flow MS4 outfall discharge monitoring locations with the next highest priority non-storm water flow that have yet to be eliminated until all persistent and transient flows are eliminated or its threat reduced.

Non-storm water persistent flow MS4 outfall discharge monitoring data collected during each semi-annual monitoring event, must be collected and analyzed according to the requirements of Provision D.2.b.(2)(b)–(e). These monitoring requirements are consistent with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

The wet weather MS4 outfall discharge monitoring requirements are included under Provisions D.2.a.(3) and D.2.c. The wet weather MS4 outfall discharge monitoring requirements are necessary for the Copermittees to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable, using management practices, control techniques and system, design and engineering methods, and such other provisions which are appropriate*" required by 40CFR 122.26(d)(2)(iv), which is expected to achieve compliance with the CWA section 402(p)(3)(B)(iii) statutory requirement for municipal storm water permits to require "*controls to reduce the discharge of pollutants [in storm water] to the maximum extent practicable*." The wet weather MS4 outfall discharge monitoring data collection requirements are based on requirements under 40 CFR 122.26(d)(2)(iii), 122.26(d)(2)(iii)(A) and 122.26(d)(2)(iii)(A)(1)-(4), and 40 CFR 122.21(g)(7)(i)-(ii).

The wet weather MS4 outfall discharge monitoring requirements of Provision D.2.a.(3) and D.2.c are separated into monitoring required before and after the San Diego Water Board accepts the Copermittees' Water Quality Improvement Plan. Outfall monitoring conducted prior to acceptance of the Water Quality Improvement Plan is referred to in the Order as Transitional MS4 Outfall Discharge Monitoring. Provision D.2.a.(3) includes the transitional wet weather MS4 outfall discharge monitoring requirements.

Until the wet weather MS4 outfall discharge monitoring requirements of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board, the Copermittees must comply with the requirements of

transitional wet weather MS4 outfall monitoring requirements pursuant to Provision D.2.a.(3). Provision D.2.a.(3) requires the Copermittees in each Watershed Management Area to sample, at least five of the major MS4 outfalls inventoried pursuant to Provision D.2.a.(1) once per wet season for the monitoring data required to be collected pursuant to Provision D.2.a.(3)(c)-(e). Provision D.2.a.(3) further requires at least one major MS4 outfall monitoring station be located in each Copermittee's jurisdiction within the Watershed Management Area.

At a minimum, the five sampling locations chosen must be representative of storm water discharges from residential, commercial, industrial, and typical mixed-use land uses present within a Watershed Management Area. The San Diego Water Board expects the Copermittees to extrapolate from these data to similar land uses throughout the Watershed Management Area to better inform the Water Quality Improvement Plan development process by prioritizing drainages for implementation of storm water control efforts required pursuant to Provision E.

Provision D.2.c describes the wet weather MS4 outfall discharge monitoring required to be included and implemented as part of the Water Quality Improvement Plan. Provision D.2.c provides the Copermittees the flexibility to adjust the wet weather MS4 outfall discharge monitoring locations and frequencies in the Watershed Management Area, as needed, to identify sources of pollutants in storm water discharges from MS4s in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan.

Although Provision D.2.c.(1) allows the Copermittees to adaptively manage the wet weather MS4 outfall discharge monitoring locations and frequencies, the provision requires a minimum of at least five wet weather outfall stations to be monitored. Provision D.2.c.(2) further allows the Copermittees to modify the monitoring frequency at each wet weather MS4 outfall station to meet the goals of the Water Quality Improvement Plan as long as the monitoring frequency occurs at least once per year and is at an appropriate frequency to identify sources of pollutants in storm water discharges, guide pollutant source identification efforts, or determine compliance with the requirements of the applicable TMDLs in Attachment E to the Order.

The wet weather MS4 outfall discharge monitoring requirements of Provisions D.2.c.(3) and D.2.c.(4) are the same as the transitional wet weather MS4 outfall discharge monitoring. In contrast, the requirements of Provision D.2.c.(5) are focused on collecting analytical data specific to the highest priority water quality conditions in the Watershed Management Area identified in the Water Quality Improvement Plan. The wet weather MS4 outfall discharge monitoring data collection requirements are consistent with the requirements under 40 CFR 122.26(d)(2)(iii), 122.26(d)(2)(iii)(A) and 122.26(d)(2)(iii)(A)(1)-(4), and 40 CFR 122.21(g)(7)(i)-(ii).

<u>Provision D.3 (Special Studies)</u> requires the Copermittees to develop special studies that will be conducted for each Watershed Management Area and the entire San

Diego Region. Data collected pursuant to Provision D.3 is to be used by the Copermittees to improve the effectiveness of the strategies implemented by the jurisdictional runoff management programs toward achieving the numeric goals identified in the Water Quality Improvement Plans and ultimately achieve compliance with the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c, and A.2.a, which is consistent with the requirements of Provision A.4.

Special studies are often necessary to fill data gaps or provide more refined information that allow the Copermittees to better manage the generation or elimination of pollutants and discharges to and from the MS4. In the Fourth Term Permits, the Copermittees have been required to implement special studies as directed by the San Diego Water Board. The special studies required by this Order provide the Copermittees more flexibility to identify and implement special studies that will be most useful to improving the effectiveness of their jurisdictional runoff management programs.

Provision D.3.a.(1) requires the Copermittees to develop and conduct at least two special studies per Watershed Management Area, to be determined by the Copermittees. One of the two special studies may be accomplished through participation in a Regional Special Study required under Provision D.3.a.(2). The requirements provide the Copermittees great latitude in identifying and developing the special studies. Watershed Management Area special studies are required, at a minimum, to: (a) relate in some way to the highest water quality priorities identified by the Copermittees in the Water Quality Improvement Plan, (b) be conducted within the Watershed Management Area, and (c) include some form of participation (e.g. contribution of funds, personnel services, project management) by all the responsible Copermittees within the Watershed Management Area.

Examples of Watershed Management Area special studies might include, but are not limited to: (1) focused pollutant source identification studies, (2) BMP effectiveness and/or comparison studies, (3) pilot tests for new or emerging pollutant control methods, (4) receiving water pollutant or stressor source identification and/or mitigation studies, or (5) pollutant fate and transport studies. The Watershed Management Area special studies are expected to provide data that can be utilized by the Copermittees to improve the Water Quality Improvement Plan or implementation of the Copermittees' jurisdictional runoff management programs to address the highest priority water quality conditions.

Provision D.3.a.(2) requires the Copermittees to develop at least one special study that will be conducted for the entire San Diego region. The regional special study is expected to provide data that can be utilized by the Copermittees to improve the Water Quality Improvement Plan or implementation of the Copermittees' jurisdictional runoff management programs to identify or address regional water quality concerns and priorities.

An example of a regional special study would be to develop and establish allowable exceedance frequencies of the bacteria water quality objectives for several types of water bodies, during different wet and dry weather conditions the San Diego region. The special study would be related to bacteria, which is a priority for the San Diego region due to the adoption of "*Bacteria TMDL Project I – Beaches and Creeks in the San Diego Region*." The study results could be used to inform the Copermittees and the San Diego Water Board about the indictor bacteria water quality objective exceedance frequencies that occur in natural or reference watersheds.

Provision D.4 (Assessment Requirements) specifies the assessments that the Copermittees are required to perform, based on the monitoring data collected, and will be reported as part of the Annual Report for the Water Quality Improvement Plan implementation. Provision D.4 requires the Copermittees assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c, and A.2.a.

Provision D.4 specifies the assessments that Copermittees must perform for each Watershed Management Area to assess the effectiveness of each Copermittee's jurisdictional runoff management program and the Water Quality Improvement Plan. The effectiveness of each Copermittee's jurisdictional runoff management program and Water Quality Improvement Plan is measured through these types of assessments: (a) Receiving Waters Assessments (b) MS4 Outfall Discharges Assessments, (c) Special Studies Assessments, and (d) Integrated Assessment of Water Quality Improvement Plan.

Provision D.4.a requires the Copermittees to assess the status of receiving water conditions annually during the transitional monitoring period (during development of the Water Quality Improvement Plan) and after acceptance of the Water Quality Improvement Plan. The monitoring data collected pursuant to Provision D.1 will be evaluated, among other information, to assess the condition of a Watershed Management Area's streams, coastal waters, enclosed bays, harbors, estuaries, and lagoons. The focus of the receiving waters assessments is to measure progress toward the objective of the CWA to "*restore and maintain the chemical, physical, and biological integrity of the Nation's waters*" as the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program are implemented within a Watershed Management Area. Provision D.4.a is consistent with 40 CFR 122.42(c)(7) which requires the Copermittees to annually report the *"[i]dentification of water quality improvements or degradation."*

Provision D.4.b includes the MS4 outfall discharges assessment requirements. The focus of MS4 outfall discharges assessments is to determine if the Copermittees' are implementing programs that comply with the requirements of the CWA for MS4 permits to "*effectively prohibit non-stormwater discharges into the storm sewers*" and "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable.*" The monitoring data collected pursuant to Provisions D.2 will be

evaluated, among other information, to assess the effectiveness of the transitional MS4 outfall field screening monitoring, the implementation of the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program. The MS4 outfall discharge assessments consist of Non-Storm Water Discharges Reduction Assessments and Storm Water Pollutant Discharges Reduction Assessments.

The Non-Storm Water Discharges Reduction Assessments are how each Copermittee will demonstrate that its jurisdictional runoff management program implementation efforts are achieving the CWA requirement to "*effectively prohibit non-stormwater discharges into the storm sewers.*" Provision D.4.b.(1) requires each Copermittee to assess and report on its illicit discharge detection and elimination program required pursuant to Provision E.2 to reduce and effectively prohibit non-storm water and illicit discharges into the MS4 within its jurisdiction. The Non-Storm Water Discharges Reduction Assessments include specific assessment requirements applicable to each Copermittee.

As each Copermittee collects and analyzes the data collected pursuant to dry weather MS4 outfall discharges monitoring requirements of Provisions D.2.a.(2) and D.2.b, Provision D.4.b.(1) requires each Copermittee to assess the progress, assess the effectiveness of its current actions, and identify modifications necessary to increase the effectiveness of its actions toward reducing and eliminating non-storm water and illicit discharges to its MS4. The findings from these assessments are expected to be utilized by the Copermittee as part of its procedures to prioritize the non-storm water discharges that will be addressed by its Illicit Discharge Detection and Elimination program required pursuant to Provision E.2.

The assessment requirements of Provision D.4.a.(1) are consistent with 40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(3) which require "*procedures…to investigate portions of the separate storm sewer system that, <u>based on the results of the field screen, or other appropriate information</u> [emphasis added], indicate a reasonable potential of contain illicit discharges or other sources of non-storm water*" as part of a "*program…to detect and remove…illicit discharges and improper disposal into the storm sewer.*" The assessment requirements of Provision D.4.a.(1) are also consistent with 40 CFR122.42(c)(1) requires the Copermittees to annually report the "*status of implementing the components of the storm water management program that are established as permit conditions.*"

The Storm Water Pollutant Discharges Reduction Assessment is how the Copermittees in each Watershed Management Area will demonstrate that their jurisdictional runoff management program implementation efforts are achieving the CWA requirement to "*reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable*." Provision D.4.b.(2) requires the Copermittees in each Watershed Management Area to assess and report the progress of the Copermittees' efforts to reduce pollutants in storm water discharges from the MS4s to the MEP. The

Storm Water Pollutant Discharges Reduction Assessments include specific assessment requirements during both the transitional monitoring period and after acceptance of the Water Quality Improvement Plan applicable to the Watershed Management Area and each Copermittee.

As the Copermittees collect and analyze the data collected pursuant to wet weather MS4 outfall discharges monitoring requirements of Provisions D.2.a.(3) and D.2.c, Provision D.4.b.(2) requires the Copermittees to assess runoff conditions during the transitional period, and the progress of the Water Quality Improvement Plan strategies toward reducing pollutants in storm water from the MS4 to the MEP. The findings from these assessments are expected to be utilized by the Copermittees to identify any modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify sources of pollutants in storm water discharges from the MS4s, as well as focus, modify, and improve the water quality improvement strategies implemented by each Copermittee within its jurisdiction to reduce pollutants in storm water discharges to the MEP.

The assessment requirements of Provision D.4.b.(2) are consistent with 40 CFR 122.26(d)(2)(iii)(B) which requires "*[e]stimates of the annual pollutant load of the cumulative discharges to waters of the United States from all identified municipal outfalls…during a storm event…accompanied by a description of the procedures for estimating constituent loads and concentrations, including any modeling, data analysis, and calculation methods.*" The assessment requirements of Provision D.4.a.(2) are consistent with 40 CFR 122.26(d)(2)(v) which requires that each Copermittee assesses the *"estimated reductions in loadings of pollutants from discharges of municipal storm sewer constituents from municipal storm sewer systems expected as the result of the municipal storm water quality management program."* The assessment requirements of Provision D.4.b.(2) are also consistent with 40 CFR122.42(c)(1) requires the Copermittees to annually report the "*status of implementing the components of the storm water management program that are established as permit conditions.*"

Provision D.4.c includes the special studies assessment requirements. Performing special studies are how the Copermittees will address data gaps identified during the development of and updates to the Water Quality Improvement Plan. The relevant findings from the special studies assessments are expected to be incorporated as part of the applicable receiving water assessments, MS4 outfall discharge assessments, and integrated water quality improvement assessments required in Provision D.4.a, D.4.b, and D.4.d, respectively.

The assessment requirements in Provision D.4.d are part of the iterative approach and adaptive management process required by Provision A.4. The Copermittees are required to integrate the data collected pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to re-evaluate the Water Quality Improvement Plan.

The monitoring data collected pursuant to Provisions D.1 and D.2, and the results of the assessment required pursuant to Provisions D.4.a-c, will be used to determine whether the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program are effective, or require modifications or improvements to become more effective to achieve the requirements of the CWA. The assessments required by Provision D.4.d are consistent with 40 CFR 122.42(c)(1) which requires that the Copermittees to report the *"[t]he status of implementing the components of the storm water management program that are established as permit conditions."*

E. Jurisdictional Runoff Management Programs

Purpose: Provision E includes the requirements for the jurisdictional runoff management programs to be implemented by each of the Copermittees. Compliance with the requirements for the jurisdictional runoff management programs will allow the Copermittees to demonstrate that they are implementing programs to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP. The jurisdictional runoff management program document prepared by each Copermittee will also provide the details for implementing the water quality improvement strategies identified in the Water Quality Improvement Plan specifically within its jurisdiction.

***Discussion*:** Implementation of the jurisdictional runoff management program requirements under Provision E is how the Copermittees "*effectively prohibit non-stormwater discharges into the storm sewer,*" and outlines the "*controls to reduce the discharge of pollutants to the maximum extent practicable"* consistent with the federal regulations under 40 CFR 122.26. The jurisdictional runoff management program is part of the "*comprehensive planning process*" that is required pursuant to 40 CFR 122.26(d)(2)(iv). Where the Water Quality Improvement Plan is the "*comprehensive planning process*" on a Watershed Management Area scale, requiring "*intergovernmental coordination,*" the jurisdictional runoff management program document is the "*comprehensive planning process*" on a jurisdictional scale that should be coordinated with the other Copermittees in the Watershed Management Area to achieve the goals of the Water Quality Improvement Plan.

The jurisdictional runoff management program requirements are included to provide each Copermittee criteria that can be used to demonstrate that its storm water management program is implementing the "*comprehensive planning process*" within its jurisdiction to "*effectively prohibit non-stormwater discharges into the storm sewers,*" and to identify and implement the most effective "*controls to reduce the discharge of pollutants to the maximum extent practicable"* in accordance with the performance standards given in the CWA.

Provision E includes the requirements for each of the components that must be included in the Copermittee's jurisdictional runoff management program document that will be implemented by the Copermittee within its jurisdiction. Implementation of the components of each Copermittee's jurisdictional runoff management program must incorporate the water quality improvement strategies identified by each Copermittee in the Water Quality Improvement Plans, described pursuant to Provision B.3.b.(1)(a).

More specific and detailed discussions of the requirements of Provision E are provided below.

Provision E.1 (Legal Authority Establishment and Enforcement) requires each Copermittee to establish and enforce sufficient legal authority to control discharges to the MS4 within its jurisdiction.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system*" and be able to demonstrate that it can "*operate pursuant to legal authority established by statute, ordinance or series of contracts.*" Provision E.1.a describes the minimum legal authorities each Copermittee must establish for itself within its jurisdiction to control discharges to its MS4. The requirements of Provision E.1.a are consistent with the requirements set forth in 40 CFR 122.26(d)(2)(i)(A)-(F).

The certification statement required from each Copermittee by Provision E.1.b is included to provide the San Diego Water Board additional documentation that each Copermittee has established the legal authorities consistent with Provision E.1.a and 40 CFR 122.26(d)(2)(i)(A)-(F), and the Copermittee can "*operate pursuant to legal authority established by statute, ordinance or series of contracts.*"

Provision E.2 (Illicit Discharge Detection and Elimination) requires each Copermittee to implement an illicit discharge detection and elimination program to effectively prohibit non-storm water discharges to the MS4 by actively detecting and eliminating illicit discharges and disposal into its MS4.

Provision E.2 establishes the minimum requirements that each Copermittee must implement within its jurisdiction to effectively prohibit non-storm water discharges from entering its MS4. The federal CWA requires permits for municipal storm sewer systems to "*effectively prohibit non-storm water discharges into the storm sewers*." The federal regulations (40CFR122.26(d)(2)(i)(B)) require each Copermittee to establish the legal authority to prohibit illicit discharges to its MS4s. Under 40 CFR 122.26(d)(2)(iv)(B), each Copermittee must implement a "*program…to detect and remove…illicit discharges and improper disposal into the storm sewer.*" The federal NPDES regulations, under 40 CFR 122.26(b)(2), define illicit discharges as "*any discharge to a municipal separate storm sewer that is not composed entirely of storm water*." Thus, non-storm water discharges are not authorized to enter the MS4 and are considered to be illicit discharges, unless authorized by a separate NPDES permit.

The Phase I Final Rule clarifies that non-storm water discharges through an MS4 are not authorized under the CWA (55 FR 47995):

> "*Today's rule defines the term "illicit discharge" to describe any discharge through a municipal separate storm sewer system that is not composed entirely of storm water and that is not covered by an NPDES permit. Such illicit discharges are not authorized under the Clean Water Act. Section 402(p)(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm*

sewer…Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit."

The federal NPDES requirements for the program to address illicit discharges must include "*inspections, to implement and enforce an ordinance, orders, or other similar means to prevent illicit discharges to the MS4*." The federal NPDES regulations also reference several categories of "*non-storm water discharges or flows* [which] *shall be addressed where such discharges are identified…as sources of pollutants to waters of the United States*." The Phase I Final Rule (55 FR 48037) further clarified the requirements of 40 CFR 122.26(d)(2)(iv)(B)(1) as follows:

"*EPA is clarifying that section 402(p)(3)(B) of the CWA (which requires permits for municipal separate storm sewers to 'effectively' prohibit non-storm water discharges) does not require permits for municipalities to prohibit certain discharges or flows of nonstorm water to waters of the United States through municipal separate storm sewers in all cases*."

In previous iterations of the municipal storm water permits for the San Diego Region, these categories were simply listed and referred to as categories of non-storm water discharges "not prohibited" unless identified as a source of pollutants. The Copermittees have often referred to these categories as "exempt" discharges. In both cases, however, the language is inconsistent with the federal CWA and NPDES regulations. And, the clarification provided in the Phase I Final Rule does not specifically state that such discharges are "not prohibited" or "exempt" or in any way authorized. The federal NPDES regulations do, however, state that specific categories of non-storm water discharges must be "*addressed*" if identified as "*sources of pollutants to waters of the United States*."

The language of Provision E.2.a has been revised to be fully consistent with the language of the CWA and the requirements of the federal regulations under 40 CFR 122.26(d)(2)(iv)(B)(1). Provision E.2.a requires each Copermittee to address <u>all</u> types of non-storm water discharges into its MS4 as illicit discharges, <u>unless</u> the discharge is authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to Provisions E.2.a.(1) through E.2.a.(5). Only non-NPDES-permitted non-storm water discharges identified as a category of non-storm water discharges under Provisions E.2.a.(1) through E.2.a.(5) <u>and</u> *not identified as a source of pollutants* do not have to be addressed as illicit discharges. Categories of non-storm water discharges that meet the requirements of Provisions E.2.a.(1) through E.2.a.(5) do not have to be addressed by the Copermittee as illicit discharges.

Several of the non-storm water categories listed in 40 CFR 122.26(d)(2)(iv)(B)(1) have not been included in Provisions E.2.a.(1) through E.2.a.(5), including: street wash water, landscape irrigation, irrigation water, and lawn watering. Because these are no

longer included within the categories listed under Provisions E.2.a.(1) through E.2.a.(5), the Copermittees must prohibit these types of non-storm water discharges from entering the MS4. This is consistent with the clarification of 40 CFR 122.26(d)(2)(iv)(B)(1) in the Phase I Final Rule (55 FR 48037), which states:

> "*[T]he Director may include permit conditions that either require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*."

Street wash water is a category of non-storm water discharges that was removed when the Third Term Permits were issued. Street wash water is a source of several pollutants (e.g., metals, oil and grease, petroleum hydrocarbons, chlorinated solvents, sediment) which are generated during the street washing process. The removal of this category requires the Copermittees to prohibit this type of non-storm water discharge from entering the MS4.

The landscape irrigation, irrigation water, and lawn watering categories, collectively referred to hereafter as "over-irrigation" discharges, were removed from the list of non-storm water discharge categories in the Fourth Term Orange County and Riverside County Permits. Non-storm water discharges resulting from over-irrigation have been found to be a source of several types of pollutants (e.g., nutrients, bacteria, pesticides, sediment) in receiving waters. The San Diego Water Board and the Copermittees have identified categories of non-storm water discharges associated with over-irrigation as a source of pollutants and conveyance of pollutants to the MS4 and waters of the United States in the following documents:

- **SmartTimer/Edgescape Evaluation Program (SEEP) Grant Application**

  The State Water Board allocated grant funding to the SEEP project grant application submitted in 2006, which targeted irrigation runoff by retrofitting areas of existing development and documenting the conservation and runoff improvements. The basis of this grant project is that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 is a source and conveyance of pollutants. In addition, the grant application indicated that this alteration of natural flows is impacting the beneficial uses of waters of the state and U.S. Results from the study indicate that that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 *is* a source and conveyance of pollutants. The results of this study can be applied broadly to any area where over-irrigation takes place. The grant application included the following statements:

  > "*Irrigation runoff contributes flow & pollutant loads to creeks and beaches that are 303(d) listed for bacteria indicators.*"
  >
  > "*Regional program managers agree that the reduction and/or elimination of irrigation-related urban flows and associated pollutant loads may be key to successful attainment of water quality and beneficial use goals as outlined in*

the San Diego Basin Plan and Bacteria TMDL over the long term."

"*Elevated dry-weather storm drain flows, composed primarily … of landscape irrigation water wasted as runoff, carry pollutants that impair recreational use and aquatic habitats all along Southern California's urbanized coastline. Storm drain systems carry the wasted water, along with landscape derived pollutants such as bacteria, nutrients and pesticides, to local creeks and the ocean. Given the local Mediterranean climate, excessive perennial dry season stream flows are an unnatural hydrologic pattern, causing species shifts in local riparian communities and warm, unseasonal contaminated freshwater plumes in the near-shore marine environment.*"

- **2006-2007 Orange County Watershed Action Plan Annual Reports**

The Watershed Action Plan Annual Reports for the 2006-2007 reporting period were submitted by the County of Orange, Orange County Flood Control District and Copermittees within the San Juan Creek, Laguna Coastal Streams, Aliso Creek, and Dana Point Coastal Streams Watersheds. San Juan Creek, Laguna Coastal Streams, Aliso Creek and Dana Point Coastal Streams are all currently 303(d) listed as impaired for indicator bacteria within their watersheds and/or in the Pacific Ocean at the discharge points of their watersheds. The Orange County Copermittees, within their Watershed Action Strategy Table for fecal indicator bacteria included the following:

"*Support programs to reduce or eliminate the discharge of anthropogenic dry weather nuisance flow throughout the…watershed. Dry weather flow is the transport medium for bacteria and other 303(d) constituents of concern.*"

Additionally, they state that "*conditions in the MS4 contribute to high seasonal bacteria propagation in-pipe during warm weather. Landscape irrigation is a major contributor to dry weather flow, both as surface runoff due to over-irrigation and overspray onto pavements; and as subsurface seepage that finds its way into the MS4*."

- **Fiscal Year 2008 Carlsbad Watershed Urban Runoff Management Program Annual Report**

The Carlsbad Watershed Urban Runoff Management Program Annual Report for Fiscal Year 2008 was submitted by the Carlsbad Watershed Copermittees (Cities of Carlsbad, Encinitas, Escondido, Oceanside, San Marcos, Solana Beach, and Vista, and the County of San Diego). In the Annual Report, the Carlsbad Watershed Copermittees stated the following:

"The Carlsbad Watershed Management Area (WMA) collective watershed

strategy identifies bacteria, sediment, and nutrients as high priority water quality pollutants in the Agua Hedionda (904.3 – bacteria and sediment), Buena Vista (904.2 – bacteria), and San Marcos Creek (904.5 – nutrients) Hydrologic Areas. Bacteria, sediment, and nutrients have been identified as potential discharges from over-irrigation."

- **2007-2008 San Diego Bay Watershed Urban Runoff Management Program Annual Report**

  The San Diego Bay Watershed Urban Runoff Management Program 2007-2008 Annual Report was submitted by the San Diego Bay Watershed Copermittees (Cities of Chula Vista, Coronado, Imperial Beach, La Mesa, Lemon Grove, National City, and San Diego, the County of San Diego, the Port of San Diego, and the San Diego County Airport Authority). In Appendix D of the Annual Report, titled "Likely Sources of Pollutants," the San Diego Bay Watershed Copermittees identified over-irrigation of lawns as a pollutant generating activity from business and/or residential land uses for bacteria, pesticides, and sediment.

- **Copermittee Public Education Materials**

  The Orange County Public Works *Tips for Landscape & Gardening* public education brochure states: "*Fertilizers, pesticides and other chemicals that are left on yards or driveways can be blown or washed into storm drains that flow to the ocean. Overwatering lawns can also send materials into storm drains*."

  The Riverside County Flood Control and Water Conservation District *Landscape and Garden* public education brochure states: *"Soil, yard wastes, over-watering and garden chemicals become part of the urban runoff mix that winds its way through streets, gutters and storm drains before entering lakes, rivers, streams, etc. Urban runoff pollution contaminates water and harms aquatic life!"*

- **Los Peñasquitos Lagoon Sedimentation/Siltation TMDL Technical Report**

  The Los Peñasquitos Lagoon Sedimentation/Siltation TMDL technical report was prepared for the City of San Diego and USEPA in October 2010. The technical report was included as a technical supporting document attached to the Sediment TMDL for Los Peñasquitos Lagoon staff report prepared by the San Diego Water Board, dated June 13, 2012. Under the Source Assessment section, the technical report states the following:

  "*Dry weather loading is dominated by nuisance flows from urban land use activities such as car washing, sidewalk washing, and lawn over-irrigation, which pick up and transport sediment into receiving waters.*"

These documents confirm that non-storm water discharges associated with over-irrigation are a source of pollutants and should be addressed as illicit discharges to the MS4. Prohibiting non-storm water discharges associated with over-irrigation, however, is not a new requirement for the Copermittees because it is also consistent with and required by the Water Conservation in Landscaping Act (AB 1881, Laird).

The Water Conservation in Landscaping Act required the Department of Water Resources (DWR) to prepare a Model Water Efficient Landscape Ordinance for use by local agencies (e.g. the Copermittees). All local agencies were required to adopt a water efficient landscape ordinance by January 1, 2010. Local agencies could adopt the Water Efficient Landscape Ordinance developed by DWR, or an ordinance considered at least as effective as the Model Ordinance. The Water Efficient Landscape Ordinance includes a requirement that local agencies prohibit runoff from irrigation (§ 493.2):

> "*Local agencies shall prevent water waste resulting from inefficient landscape irrigation by* <u>*prohibiting runoff from leaving the target landscape*</u> *[emphasis added] due to low head drainage, overspray, or other similar conditions where water flows onto adjacent property, non-irrigated areas, walks, roadways, parking lots, or structures. Penalties for violation of these prohibitions shall be established locally*."

Furthermore, non-storm water discharges from over-irrigation not only transport and discharge pollutants to receiving waters, but are also a likely source of the dry weather flows causing changes to habitat within and along the receiving water bodies. Examples of habitat changes from the dry weather flows include perennialization of ephemeral streams, and conversion of saltwater and brackish water marsh habitats to freshwater marsh habitats (e.g. Los Peñasquitos Lagoon). Both of these examples have resulted in the promotion of invasive species in several areas of the San Diego Region.

The removal of the over-irrigation discharges categories does not require the Copermittees to strictly prohibit lawn and landscape irrigation, but does require the prohibition of excessive irrigation water that results in non-storm water discharges to the MS4. Non-storm water discharges to the MS4 from over-irrigation must be addressed as illicit discharges by the Copermittees pursuant to the requirements of Provision E.2.

The remaining non-storm water categories listed in 40 CFR 122.26(d)(2)(iv)(B)(1) are listed under Provisions E.2.a.(1) through E.2.a.(5) and generally fall into four categories: (1) non-storm water discharges subject to existing San Diego Water Board waste discharge requirements and NPDES permits; (2) non-storm water discharges generally not expected to be a source of pollutants to receiving waters; (3) non-storm water discharges likely to contain pollutants requiring some form of control to address the pollutants prior to discharging to the MS4; and (4) non-storm water discharges or flows associated with firefighting.

Provisions E.2.a.(1) and E.2.a.(2) include several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) for which the San Diego Water Board already has developed general waste discharge requirements and NPDES permits to address the discharges. The Copermittees are only required to address these types of non-storm water discharges as illicit discharges if the Copermittees or the San Diego Water Board identifies these non-storm water discharges not having coverage under the applicable NPDES permit.

Provision E.2.a.(3) includes several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) which are generally not expected to be a source of pollutants to receiving waters, many of which originate from what are typically natural, uncontrollable sources. The Copermittees are only required to address these types of non-storm water discharges as illicit discharges if the Copermittees or the San Diego Water Board identifies these non-storm water discharges as a source of pollutants to receiving waters. Because many of these sources are generally uncontrollable, enforcing a prohibition may not be a possibility for the Copermittees. The Copermittees would be able to address these non-storm water discharges by preventing these non-storm water discharges from entering the MS4. This could potentially be achieved by sealing their MS4 structures so the discharges cannot enter the MS4.

Provision E.2.a.(4) includes several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) that are likely to contain pollutants requiring some form of control to address the pollutants prior to discharging to the MS4. At this time, an outright prohibition of these types of non-storm water discharges does not yet appear to be warranted. Thus, Provision E.2.a.(4) includes several requirements for the Copermittees to control the pollutants from these types of non-storm water discharges. This is consistent with the clarification of the federal regulations in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board has the authority to require the Copermittees to "*control any of these types of discharges where appropriate*."

Unlike non-storm water discharges from over-irrigation, these types of non-storm water discharges are not expected to occur in close proximity to each other or very frequently. Provided these types of non-storm water discharges are controlled as required in Provision E.2.a.(4), the Copermittees would only be required to address these types of non-storm water discharges as illicit discharges if the Copermittee or the San Diego Water Board identifies these non-storm water discharges as a source of pollutants to receiving waters.

Provision E.2.a.(5) includes specific requirements for fire fighting discharges and flows. The requirements for non-storm water discharges and flows associated with fire fighting have been separated into requirements for: a) non-emergency fire fighting discharges and flows, and b) emergency fire fighting discharges and flows.

The San Diego Water Board has found that discharges from building fire suppression system maintenance (e.g. fire sprinklers) contain waste and potentially a significant source of pollutants to receiving waters. As such, the San Diego Water Board is requiring these discharges be addressed as illicit discharges by the Copermittees. Thus, the discharges to the MS4 are to be prohibited via ordinance, order or similar means. For other non-emergency firefighting discharges and flows (i.e. flows from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems), the Copermittees are required to develop and implement a program to address pollutants in these non-storm water discharges and flows. This is consistent with the clarification of the federal regulations in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board has the authority to require the Copermittees to "*control any of these types of discharges where appropriate*."

For emergency firefighting discharges and flows, the Phase I Final Rule (55 FR 48037) has clarified the requirements of 40 CFR 122.26(d)(2)(iv)(B)(1) pertaining to emergency firefighting flows and discharges, which states:

> "*In the case of firefighting it is not the intention of these rules to prohibit in any circumstances the protection of life and public or private property through the use of water or other fire retardants that flow into separate storm sewers*."

Thus, the requirements have been made to be consistent with the guidance provided by the Phase I Final Rule. The Order recommends that the Copermittees develop and encourage implementation of BMPs to reduce or eliminate the discharge of pollutants from emergency firefighting flows to the MS4s and receiving waters. The Order does not include any requirements that should be interpreted as requiring the implementation of BMPs for emergency firefighting flows to the MS4s and receiving waters.

The Copermittees are expected to review the dry weather MS4 outfall discharge monitoring data they collect to determine if and when there are non-storm water discharges to or from their MS4s that are a source of pollutants to receiving waters. If the Copermittees identify one of the types of non-storm water discharges listed in Provisions E.2.a.(1) through E.2.a.(4) as a source of pollutants to receiving waters based on the review and evaluation of monitoring data, Provision E.2.a.(6) requires the Copermittees to prohibit those categories of discharges from entering the MS4 through ordinance, order or similar means. In addition, Provision E.2.a.(6) clarifies that the San Diego Water Board may identify categories of non-storm water discharges or flows listed under Provisions E.2.a.(1) through E.2.a.(4) that must be prohibited.

Provision E.2.a.(6) also provides the Copermittees an option to propose controls to be implemented for the category of non-storm water discharges as part of the Water Quality Improvement Plan instead of prohibiting the category of non-storm water

discharges. If the Water Quality Improvement Plan is accepted by the San Diego Water Board with the proposed controls, the Copermittees will not be required to prohibit the category of non-storm water discharges to their MS4s as long as the controls are implemented. This is consistent with the clarification of 40 CFR 122.26(d)(2)(iv)(B)(1) in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board may "*require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*."

Finally, Provision E.2.a.(7) has been included in the requirements for non-storm water discharges to clarify that any non-storm water discharges to the Copermittee's MS4, even those identified pursuant to Provisions E.2.a.(1) through E.2.a.(4), must be reduced or eliminated, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit. Provision E.2.a.(7) is consistent with the requirements of CWA section 402(p)(3)(B)(ii) and 40 CFR 122.26(d)(1)(v)(B), as clarified in the Phase I Final Rule (55 FR 47995) that "*[u]ltimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit*." However, the reduction or elimination of those non-storm water discharges are expected to be achieved as feasible, in accordance with the priorities in the Water Quality Improvement Plan and when the resources are available to the Copermittee.

Consistent with 40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(1), each Copermittee must implement a "*program…to prevent illicit discharges to the municipal storm sewer system*" and "*detect…illicit discharges and improper disposal into the storm sewer.*" Provision E.2.b requires each Copermittee to implement measures to prevent and detect illicit discharges and connections to its MS4 as part of its illicit discharge detection and elimination program.

As part of the program to prevent and detect illicit discharges to the MS4, 40 CFR 122.26(d)(2)(iv)(B)(2) requires "*procedures to conduct on-going field screening activities during the life of the permit, including areas or locations that will be evaluated by such field screens*." As part of the procedures, each Copermittee is required to maintain an updated map of its entire MS4 and the corresponding drainage areas within its jurisdiction. Having knowledge about where inlets, access points, connections with other MS4s, and outfalls are located is necessary for each Copermittee to track, identify, and eliminate illicit discharges and connections. Thus, Provision E.2.b.(1) of the Order specifies that the map must include the segments of the storm sewer system owned, operated, and maintained by the Copermittee, and include locations of all known inlets, connections with other MS4s, and outfalls to the Copermittee's MS4. The remaining requirements of Provision E.2.b are consistent with the requirements of 40 CFR 122.26(d)(2)(iv)(B)(3)-(7) related to implementing measures to prevent and detect illicit discharges and connections to the MS4.

Provision E.2.c requires each Copermittee to conduct field screening and monitoring of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm

water and illicit discharges and connections to the MS4. Field screening is a required element of the program to detect and eliminate illicit discharges and connections to the MS4, pursuant to 40 CFR 122.26(d)(2)(iv)(B)(2). The field screening requirement will be implemented through the dry weather MS4 outfall discharge monitoring required under Provisions D.2.a.(2) and D.2.b.(1).

Provision E.2.d specifies the measures each Copermittee must implement to eliminate illicit discharges and connections to its MS4. Elimination of illicit discharges and connections to the MS4 is consistent with the requirement of 40 CFR 122.26(d)(2)(iv)(B) "*to detect and remove [emphasis added]…illicit discharges and improper disposal into the storm sewer*" and will achieve the CWA requirement for MS4 permits to "*effectively prohibit non-storm water discharges into the storm sewers*."

Generally, each Copermittee is responsible for prioritizing its efforts to eliminate non-storm water and illicit discharges or connections to its MS4 based on field screening and monitoring data, NALs, illicit discharge investigation records, and the known or suspected sources. Sources of non-storm water and illicit discharges or connections must be eliminated by enforcing the legal authority established by each Copermittee pursuant to Provision E.1.

Provision E.3 (Development Planning) requires each Copermittee to use its land use and planning authority to implement a development planning program to control and reduce the discharge of pollutants in storm water from new development and significant redevelopment to the MEP. Proper implementation of the development planning program will also contribute toward effectively prohibiting non-storm water discharges from development projects to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." As part of the management program, 40 CFR 122.26(d)(2)(iv)(A)(2) requires "*planning procedures including a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment*."

Land development generally alters the natural conditions of the land by removing vegetative cover, compacting soil, and/or placement of concrete, asphalt, or other impervious surfaces. These impervious surfaces concentrate urban pollutants (such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not found in high concentrations in the natural environment. Pollutants that accumulate on impervious surfaces are not easily biodegraded nor subject to natural treatment processes.

Impervious surfaces greatly affect the natural hydrology of the land because they do not allow natural infiltration and treatment of storm water runoff to take place. Instead, storm water runoff from impervious surfaces is typically directed through pipes, curbs, gutters, and other hardscape into receiving waters, with little treatment, at significantly increased volumes and accelerated flow rates over what would occur naturally. The increased pollutant loads, storm water volume, discharge rates and velocities, and discharge durations from the MS4 adversely impact stream habitat by causing accelerated, unnatural erosion and scouring within creek bed and banks. Placement of impervious surfaces also encapsulates "good" sediment (such as sand, gravel, rocks and cobbles) that would normally replenish creek beds and banks to help stabilize them. Collectively, these changes to natural hydrologic processes are termed hydrograph modification, or hydromodification.

Hydromodification, which is caused by both altered storm water flow and altered sediment flow regimes, is largely responsible for degradation of creeks, streams, and associated habitats in the San Diego Region. In an ongoing study by the Stormwater Monitoring Coalition to assess the health of streams throughout Southern California, researchers found that three of the four highest risk stressors to creeks (percent sands and fines present, channel alteration, and riparian disturbance) were related to physical habitat.[29] Researchers studying flood frequencies in Riverside County have found that increases in watershed imperviousness of only 9-22 percent can result in increases in peak flow rates for the two-year storm event of up to 100 percent.[30] Such changes in runoff have significant impacts on channel morphology.

In addition, a technical report issued by the Southern California Coastal Water Research Project (SCCWRP) stated that "*[r]ecent studies indicate that California's intermittent and ephemeral streams are more susceptible to the effects of hydromodification than streams from other parts of the United States. Physical degradation of stream channels in the central and eastern United States can initially be detected when watershed impervious cover approaches 10 percent, although biological effects (which may be more difficult to detect) may occur at lower levels. In contrast, initial response of streams in the semi-arid portions of California appears to occur between 3 and 5 percent impervious cover*."[31] These studies highlight the extent to which impacts originating from impervious surfaces created by land development are responsible for the degradation of creek and stream habitat.

This is consistent with what USEPA has noted, that "*[m]ost stormwater runoff is the result of the man-made hydrologic modifications that normally accompany development. The addition of impervious surfaces, soil compaction, and tree and*

[29] Assessing the Health of Southern California Streams, Stormwater Monitoring Coalition, Fact Sheet
[30] Schueler and Holland, 2000. Storm Water Strategies for Arid and Semi-Arid Watersheds (Article 66). The Practice of Watershed Protection.
[31] Stein, E. and Zaleski, S., 2005. Technical Report 475, Managing Runoff to Protect Natural Streams: The Latest Development on Investigation and Management of Hydromodification in California. December 30, 2005.

vegetation removal result in alterations to the movement of water through the environment. As interception, evapotranspiration, and infiltration are reduced and precipitation is converted to overland flow, these modifications affect not only the characteristics of the developed site but also the watershed in which the development is located. Stormwater has been identified as one of the leading sources of pollution for all waterbody types in the United States. Furthermore, the impacts of stormwater pollution are not static; they usually increase with more development and urbanization."[32]

Reducing the impact from the increased pollutant loads and flows generated by impervious surfaces within a watershed is essential to protecting and restoring the integrity of the receiving waters. Provision E.3 includes the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment*." The requirements of Provision E.3 will 1) minimize the generation and discharge of pollutants in storm water from the MS4, and 2) minimize the potential of storm water discharges from the MS4 from causing altered flow regimes and excessive downstream erosion in receiving waters.

The requirements of Provision E.3.a include the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment*" applicable to all development projects, regardless of size or purpose of development. In general, all development projects must implement onsite BMPs to remove pollutants from runoff prior to its discharge to any receiving waters, as close to the pollutant generating source as possible, and structural BMPs must not be constructed within waters of the U.S.

Furthermore, the onsite BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors (e.g. mosquitos, rodents, and flies). If not properly designed or maintained, certain BMPs implemented or required by municipalities may create a habitat for vectors. Monitoring studies conducted by the California Department of Public Health (CDPH) have documented that mosquitoes opportunistically breed in structural storm water BMPs, particularly those that hold standing water for over 96 hours. Certain site design features that hold standing water may similarly produce mosquitoes.

Structural BMPs and site design features should incorporate design, construction, and maintenance principles to promote drainage within 96 hours to minimize standing water available to mosquitoes. Nuisances and public health impacts resulting from

[32] USEPA, 2007. Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices, December 2007.

vector breeding can be prevented with close collaboration and cooperative effort between municipalities and local vector control agencies and the CDPH during the development and implementation of storm water runoff management programs. The CDPH also has issued guidance for BMP implementation that will minimize potential nuisances and public health impacts resulting from vector breeding.[33]

All development projects are required to implement source control BMPs that will minimize the generation of pollutants. Additionally, each development project must implement, where applicable and feasible, low impact development (LID) BMPs to mimic the natural hydrology of the site and retain and/or treat pollutants in storm water runoff prior to discharging to and from the MS4.

The LID Center defines LID as "*a comprehensive land planning and engineering design approach with a goal of maintaining and enhancing the pre-development hydrologic regime of urban and developing watersheds.*"[34] LID designs seek to control storm water at the source, using small-scale integrated site design and management practices to mimic the natural hydrology of a site, retain storm water runoff by minimizing soil compaction and impervious surfaces, and disconnect storm water runoff from conveyances to the storm drain system.

LID BMPs may utilize interception, storage, evaporation, evapotranspiration, infiltration, and filtration processes to retain and/or treat pollutants in storm water before it is discharged from a site. Because of these numerous options, the San Diego Water Board expects that every development project will be able to implement some form of LID BMPs. Examples of LID BMPs include using permeable pavements, rain gardens, rain barrels, grassy swales, soil amendments, and native plants.

Provision E.3.a also includes requirements for all development projects to, where feasible, landscape with native and/or low water use plants to minimize the discharge of non-storm water discharges associated with excessive irrigation, as well as harvest (i.e., storage) and use precipitation to promote the concept of utilizing storm water as a resource.

While all development projects are subject to the requirements of Provision E.3.a, Provision E.3.b identifies Priority Development Projects that exceed given size thresholds and/or fit under specific use categories. Priority Development Projects are required to incorporate specific performance criteria for structural BMPs into the project plan to reduce the generation of pollutants, and address potential impacts from hydromodification.

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[33] California Department of Public Health, 2012. Best Management Practices for Mosquito Control in California. (http://www.cdph.ca.gov/HealthInfo/discond/Documents/BMPforMosquitoControl07-12.pdf)
[34] www.lowimpactdevelopment.org

The Priority Development Project categories are based on the requirements of the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), and do not differ significantly from the Fourth Term Permit for San Diego County. Furthermore, the Priority Development Project categories are consistent with Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), and Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit).

Because of the impact of relatively small increases in watershed impervious surfaces to receiving waters, Provision E.3.b.(1)(c)(iv) has been updated to include large driveways that are 5,000 square feet or more. The San Diego Water Board finds that large driveways can exacerbate altered flow regimes if not properly controlled.

Provision E.3.b.(3) describes projects that are exempt from Priority Development Project status. These include new or retrofit paved sidewalks, bicycle lanes, or trails that are designed and constructed to direct runoff to vegetated areas or be hydraulically disconnected from paved areas. The exemptions have been provided to encourage these types of projects because they provide multiple environmental benefits, such as promoting walking rather than driving, which will in turn improve air quality. Additionally, retrofitting of existing alleys, streets, or roads are exempt from Priority Development Project status if they are constructed using USEPA Green Streets guidance.[35] By doing so, retrofitting of these types of projects is encouraged. The San Diego Water Board recognizes that there are spatial constraints associated with these projects, and implementation of structural BMPs are not always feasible.

For development projects identified as Priority Development Projects, the requirements of Provision E.3.c are the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment.*" Provisions E.3.c.(1)-(3) describe the performance criteria for the structural BMPs that must be implemented for each Priority Development Project defined by Provision E.3.b.

Provision E.3.c.(1) describes the storm water pollutant control BMP requirements that must be implemented by all Priority Development Projects. The purpose of Provision E.3.c.(1) is to reduce pollutants in storm water runoff to the MEP from Priority Development Projects before it is discharged to the MS4. Of all the available treatment processes available, retention of storm water, and therefore capture of the pollutants in the storm water, will achieve 100 percent pollutant removal efficiency for the volume of storm water retained. No other method of treatment can achieve 100 percent pollutant removal efficiency. Thus, retention of as much storm water onsite is

[35] "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).

the most effective way to reduce pollutants in storm water discharges to, and consequently from the MS4, and controls pollutants in storm water discharges from a site to the MEP.

Under Provision E.3.c.(1)(a), retention of the pollutants in the runoff produced from the 85th percentile storm event ("design capture volume") is the design standard to which Priority Development Projects must comply. Since the 85th percentile storm event has previously been used as the numeric design standard for treatment control BMPs, this same size storm event is used as the numeric design standard for storm water retention. This is the MEP standard recognized by the San Diego Water Board and is consistent with the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), as well as Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit), and Los Angeles Water Board Order No. R4-2012-0175 (Los Angeles County MS4 Permit).

The 85th percentile storm event is the event that has a precipitation total greater than or equal to 85 percent of all storm events over a given period of record in a specific area or location. For example, to determine what the 85th percentile storm event is in a specific location, all 24 hour storms that have recorded values over a 30 year period would be tabulated and a 85th percentile storm would be determined from this record (i.e. 15 percent of the storms would be greater than the number determined to be the 85th percentile storm). Most jurisdictions in the San Diego Region have already developed isopluvial maps that can provide this type of information. The 85th percentile storm might be determined to be a number such as 1.0 inch, and this would be multiplied by the total area of the project footprint producing runoff to calculate the design capture volume. The Priority Development Project designer would then select a system of BMPs that would retain (i.e. intercept, store, infiltrate, evaporate, or evapotranspire) the pollutants contained in the design capture volume onsite.

Retention BMPs are necessary to capture and retain pollutants generated from a Priority Development Project. In a recent study performed by SCCWRP in the Los Angeles Region, they found "*that the magnitude of constituent load associated with storm water runoff depends, at least in part, on the amount of time available for pollutant build-up on land surfaces. The extended dry period that typically occurs in arid climates such as southern California maximizes the time for constituents to build-up on land surfaces, resulting in proportionally higher concentrations and loads during initial storms of the season*."[36] This implies that the "first flush" of a rainy season and the first storm events after long antecedent dry periods tend to have the highest pollutant loads. Capturing and retaining the pollutant loads of the "first flush" of a rainy

[36] Stein, E.D., Tiefenthaler, L.L., and Schiff, K.C., 2007. Technical Report 510, Sources, Patterns and Mechanisms of Storm Water Pollutant Loading from Watershed and Land Uses of the Greater Los Angeles Area, California, USA. March 20, 2007.

season and the first storm events after long antecedent dry periods will reduce a significant portion of the pollutants in storm water discharged to and from the MS4.

The San Diego Water Board, however, acknowledges that in some situations retention of the full design capture volume onsite may not be technically feasible. In this event, the Copermittee may allow the Priority Development Project to use biofiltration BMPs to treat 1.5 times the design capture volume not reliably retained onsite, or biofiltration BMPs with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite.

The 1.5 multiplier is based on the finding in the Ventura County Technical Guidance Manual that biofiltration of 1.5 times the design capture volume not retained onsite will provide approximately the same pollutant removal as retention of the design capture volume on an annual basis.[37] This standard is consistent with the Los Angeles Water Board's Los Angeles County and Ventura County municipal storm water permits (Order Nos. R4-2012-0175 and R4-2010-0108, respectively). The flow-thru design of 0.75 times the portion of the design capture volume not reliably retained onsite is consistent with the San Diego Water Board's Fourth Term Permits for Orange County and Riverside County ~~municipal storm water permits~~ (Order Nos. R9-2009-0002 and R9-2010-0016, respectively). In either case, the biofiltration BMPs must be designed with an appropriate hydraulic loading rate to maximize storm water retention and pollutant removal, as well as to prevent erosion, scour, and channeling within the BMP. Each Copermittee is required to update its BMP Design Manual to provide guidance for hydraulic loading rates and other biofiltration design criteria necessary to maximize storm water retention and pollutant removal.

The San Diego Water Board further recognizes that, in addition to not being technically feasible, retention of the full design capture storm onsite may be cost prohibitive, or may not provide as much water quality benefit to the Watershed Management Area as would implementing BMPs elsewhere in the watershed. Thus, Provision E.3.c.(1)(b) allows for the use of a combination of onsite retention BMPs, and the implementation of an Alternative Compliance Program described in Provision E.3.c.(3). Provision E.3.c.(3) is discussed in more detail below.

If the full design capture volume is not retained onsite either because biofiltration is not technically feasible, or a Copermittee grants a Priority Development Project permission to utilize the Alternative Compliance Program, then the pollutants in the portion of the design capture volume that are not reliably retained onsite must still be reduced to the MEP. Thus, flow-thru treatment control BMPs are required to be implemented on Priority Development Projects in addition to the retention BMPs. The requirements of Provisions E.3.c.(1)(a)(ii)[a]-[c] include the performance standards for flow-thru

[37] Ventura Countywide Stormwater Management Program. 2011. Ventura Technical Guidance Manual, Manual Update, 2011.

treatment control BMPs, consistent with the Fourth Term Permits in the San Diego Region.

Whereas the purpose of the requirements under Provision E.3.c.(1) is to reduce pollutants in storm water runoff to the MEP, the purpose of the requirements under Provision E.3.c.(2) is to maintain or restore more natural hydrologic flow regimes to prevent accelerated, unnatural erosion in downstream receiving waters, also to the MEP standard. Provision E.3.c.(2) describes hydromodification management BMP requirements that must be implemented by all Priority Development Projects.

The performance criteria for the implementation of hydromodification management BMPs on Priority Development Projects are consistent with the requirements in the Fourth Term Permits for Orange and Riverside Counties (Order Nos. R9-2009-0002 and R9-2010-0016, respectively). Modifications to the Orange County and Riverside County Hydromodification Management Plans (HMPs) will likely be minor, or may not be necessary. The HMP for San Diego County will likely require some minor modifications to incorporate the requirements of Provision E.3.c.(2) and become consistent with the Orange County and Riverside County HMPs. The San Diego Water Board does not, however, expect that it will be necessary for the San Diego County Copermittees to develop a new approach or significantly re-write the San Diego County HMP. This is because the premise of the hydromodification management BMP requirements, which are to control storm water runoff conditions (flow rates and durations) for Copermittee-defined range of flows, is unchanged from all Fourth Term Permits in the San Diego Region.

Provision E.3.c.(2)(a) requires that post-project runoff conditions mimic the *pre-development* runoff conditions, and not the *pre-project* runoff conditions. Fundamentally, the San Diego Water Board believes that using a hydrology baseline that approximates that of an undeveloped, natural watershed is the only way to facilitate the return of more natural hydrological conditions to already built-out watersheds, and ultimately improved stream health. On the other hand, using the *pre-project* hydrology as a baseline for redevelopment projects results in propagating the unnatural hydrology of urbanized areas. Propagating the urbanized flow regime does not support conditions for restoring degraded or channelized stream segments, and would forever sentence such streams to the degraded state. Furthermore, reducing the volume of storm water runoff associated with the urbanized flow regime will also result in reducing the discharge of pollutants into receiving waters, since storm water runoff from impervious surfaces contains untreated pollutants.

The San Diego Water Board understands that approximating the pre-development runoff condition associated with a redevelopment site is not necessarily straightforward because factors such as natural grade and native vegetation for the site cannot be precisely known. Therefore, the San Diego Water Board does not expect project designers to estimate historical conditions associated with redevelopment sites. Rather, the San Diego Water Board expects project designers and the Copermittees to

approximate pre-development runoff conditions using the parameters of a *pervious* area rather than an *impervious* area. This means that for redevelopment sites, approximating pre-development runoff conditions equates to using existing onsite grade and assuming the infiltration characteristics of the underlying soil. A redevelopment Priority Development Project must not use runoff coefficients of concrete or asphalt to estimate pre-development runoff conditions. Rather, redevelopment projects must use available information pertaining to existing underlying soil type (such as soil maps published by the National Resource Conservation Service), onsite existing grade, and any other readily available pertinent information to estimate pre-development runoff conditions.

The San Diego Water Board understands, indeed asserts, that the pre-development hydrology of an area in question can only be roughly estimated and cannot be precisely known. However, using the hydrology of a natural condition, even if not precisely known, will provide significant benefit to receiving waters over using the hydrology associated with impervious (developed) surfaces. Therefore in order to achieve the goals of the Clean Water Act, which are to "*restore and maintain the chemical, physical, and biological integrity of the nation's waters* [emphasis added]," the most appropriate standard to use for hydromodification management is the standard associated with the pre-development condition.

Provision E.3.c.(2)(b) requires Priority Development Projects to avoid known critical sediment yield areas or implement measures that would allow coarse sediment to be discharged to receiving waters, such that the natural sediment supply is unaffected by the project. This is necessary because the availability of coarse sediment supply is as much an issue for causing erosive conditions to receiving streams as are accelerated flows.

The San Diego Water Board recognizes that in some situations implementing the hydromodification management BMP requirements for flow control fully onsite may not be technically feasible, may be cost prohibitive, or may not provide any overall water quality benefits to the Watershed Management Area. Thus, Provision E.3.c.(2)(c) allows for the use of a combination of onsite hydromodification management BMPs for flow control and alternative compliance options described in Provision E.3.c.(3).

Provision E.3.c.(3) allows for alternative compliance in instances where the Copermittee determines that offsite measures will have a greater overall water quality benefit for the Watershed Management Area than if the Priority Development Project were to implement structural BMPs onsite. Consequently, watershed-specific structural BMP requirements are present in this Order in the form of allowable compliance offsite. The Alternative Compliance Program to Onsite Structural BMP Implementation Provision is intended to integrate with the Copermittees' planning efforts in the Water Quality Improvement Plans.

The Alternative Compliance Program is an option for Priority Development Projects where the governing Copermittee has participated in the development of a Watershed Management Area Analysis as part of the Water Quality Improvement Plan (described in Provision B.3.b.(4)). Such an approach is consistent with the latest findings in hydromodification management by the scientific community. In a Technical Report entitled *Hydromodification Assessment and Management in California,*[38] the report states:

> *"An effective [hydromodification] management program will likely include combinations of on-site measures (e.g., low-impact development techniques, flow-control basins), in-stream measures (e.g., stream habitat restoration), floodplain and riparian zone actions, and off-site measures. Off-site measures may include compensatory mitigation measures at upstream locations that are designed to help restore and manage flow and sediment yield in the watershed."*

Consistent with the ideas brought forth in the report, in the Watershed Management Area Analysis of Provision B.3.b.(4), which is optional, the Copermittees will develop watershed maps that include as much detail about factors that affect the hydrology of the watershed as is available. Such factors included identification of areas suitable for infiltration, coarse sediment supply areas, and locating stream channel structures and constrictions. Once these factors are mapped and studied, the Copermittees can identify areas in the watershed where candidate projects may be implemented that are expected to improve water quality in the watershed by providing more opportunity for infiltration, slowing down storm water flows, or attenuation of pollutants naturally via healthy stream habitat. These candidate projects may be in the form of retrofitting existing development, rehabilitating degraded stream segments, identifying regional BMPs, purchasing land to preserve valuable floodplain functions, and any other project(s) that the Copermittees identify.

Under the Alternative Compliance Program, Priority Development Projects may be allowed to fund, partially fund, or implement a candidate project, in lieu of implementing structural BMPs onsite, if they enter into a voluntary agreement with the governing Copermittee permitting this arrangement. Project proponents may also propose an alternative project not previously identified by the Copermittees. In either case, whether a project proponent implements a candidate project identified by the Copermittees or a separate alternative compliance project, the governing Copermittee must determine that implementation of the project will have a greater overall water quality benefit for the Watershed Management Area than fully implementing structural BMPs onsite. Determination of greater overall water quality benefits associated with alternative compliance projects would be accomplished by utilizing Water Quality Equivalency calculations developed pursuant to Provision E.3.c.(3)(a). Water Quality Equivalency calculations are necessary to establish a regional and technical basis for

[38] 2012. ED Stein, F Federico, DB Booth, BP Bledsoe, C Bowles, Z Rubin, GM Kondolf, A Sengupta. Technical Report 667. Southern California Coastal Water Research Project. Costa Mesa, CA.

determining water quality benefits associated with alternative compliance projects, which can be consistently used by all Copermittees in the San Diego Region. Finally, if ~~If~~ alternative compliance involves funding or implementing a project that is outside the jurisdiction of the governing Copermittee, then that Copermittee may enter into an inter-agency agreement with the appropriate jurisdiction.

Finally, Provision E.3.c.(2)(d) allows Priority Development Projects to be exempt from the hydromodification management BMP requirements if there is no threat of erosion to downstream receiving waters (i.e. the receiving stream is concrete lined from the point of discharge all the way to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean). If the Copermittees believe that more exemptions are warranted, then they must perform the optional Watershed Management Area Analysis of Provision B.3.b.(4). Additional exemptions other than those specified in this Order may be established on a watershed basis, provided the Copermittees perform the analysis, provide supporting rationale for the exemptions, and complete the Water Quality Improvement Plan approval process pursuant to Provision F.1.

To facilitate the transition to this Order from the Fourth Term Permits for Orange and Riverside County Copermittees, Provision E.3.c.(2)(e) allows two additional temporary exemptions from hydromodification management BMP implementation. The first temporary exemption allows relief from hydromodification management BMP implementation for Priority Development Projects discharging directly to an engineered channel conveyance system with a capacity to convey peak flows generated by the 10-year storm event all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean. Similar to the exemption allowed for concrete-lined channels, this exemption is premised on the concept that there is little threat of erosion to these types of engineered channel systems.

The second temporary exemption allows relief from hydromodification management BMP implementation for Priority Development Projects discharging directly to large river reaches with drainage areas larger than 100 square miles and a 100-year flow capacity in excess of 20,000 cubic feet per second. If this exemption is claimed, then properly sized energy dissipation is required at all discharge points associated with the Priority Development Project. This exemption is premised on the concept that large river reaches can essentially assimilate the accelerated flow rates associated with individual Priority Development Projects because they are inconsequential compared to the flow rate in the large river reach. Both of these exemptions are included in the Hydromodification Management Plan for San Diego County[39].

These temporary exemptions are allowed as a means to facilitate Orange and Riverside County Copermittees' transition to this Order from the Fourth Term Permits and are not meant to reside as permanent exemptions without additional rigorous

[39] Final Hydromodification Management Plan Prepared for County of San Diego, March 2011

technical analyses specific to each County. Therefore, these exemptions will no longer apply once the Copermittees' land development programs are fully updated to reflect the requirements of this Order, i.e., upon implementation of the BMP Design Manual pursuant to Provision F.2.b. If the Copermittees believe that these or other exemptions are warranted in the context of water quality improvement and stream restoration opportunities, then the Copermittees must perform the optional Watershed Management Area Analysis of Provision B.3.b.(4) and provide supporting rationale for the exemptions. The San Diego County Copermittees are also required to perform the optional Watershed Management Area Analysis to provide supporting rationale to justify use of these and other exemptions. Updated BMP Design Manuals including rationale to justify use of exemptions will be reviewed by the San Diego Water Board pursuant to Provision F.2.b.

Provisions E.3.c.(4) and E.3.c.(5) were included under the BMP requirements applicable to all development projects in the Fourth Term Permits for San Diego, Orange, and Riverside Counties (Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016, respectively). In this Order, the long-term BMP maintenance and infiltration and groundwater protection requirements apply to structural BMPs implemented by Priority Development Projects only.

Provision E.3.d requires the Copermittees to update their BMP Design Manual as needed to incorporate the requirements of Provision E.3. The BMP Design Manual is formerly known as the Standard Storm Water Mitigation Plan, or SSMP, and was renamed so that the title has a more accurate description of the document content. The contents of the BMP Design Manual are largely unchanged from the previous Standard Storm Water Mitigation Plans required under the Fourth Term Permits. The BMP Design Manual fulfills the 40 CFR 122.26(d)(2)(iv)(A)(2) requirement that the Copermittee's development planning program includes "*a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment*."

As part of the "*planning procedures,*" 40 CFR 122.26(d)(2)(iv)(A)(2) requires the procedures to "*address controls to reduce pollutants in discharges from municipal separate storm sewers after construction is completed*." The requirements applicable to the implementation and oversight of structural BMPs at Priority Development Projects are provided under Provision E.3.e.

Proper installation of the structural BMPs approved for a Priority Development Project is necessary to ensure that pollutants in storm water discharges will be reduced to the MEP after the project is completed. In addition to the proper installation of structural BMPs, the maintenance of structural BMPs on Priority Development Projects is necessary to ensure that pollutants in storm water discharges will continue to be reduced to the MEP. Provision E.3.e.(1) includes the minimum requirements that each Copermittee must implement to ensure structural BMPs are properly installed and will

be properly maintained. Provision E.3.e.(1) provides clarification regarding the meaning of the term "prior lawful approval" used in this Order. Clarification about how the San Diego Water Board intends the term to be interpreted is reasonable and appropriate and will provide guidance and certainty about the permit requirement for the Copermittees, the land development community, and the general public.

Provision E.3.e.(1) requires Copermittees to implement the land development requirements of Provision E.3 for projects that have not received prior lawful approval from the Copermittee by the effective date of the BMP Design Manual pursuant to Provision E.3.d. For projects that have received prior lawful approval from the Copermittee by the effective date of the BMP Design Manual, then the Copermittee may allow previous land development requirements to apply. For private development projects, prior lawful approval is a development approval or construction permit that complies with the Priority Development Project requirements of the Fourth Term MS4 permits (Order Nos. R9-2007-0001 for San Diego County, R9-2009-0002 for Orange County, and R9-2010-0016 for Riverside County), and includes the design of the storm water drainage system for the project in its entirety as accepted by the Copermittee. Alternatively, prior lawful approval is a development approval or construction permit that confers a vested right for a Priority Development Project to proceed under storm water structural BMP requirements of prior MS4 permits. If a Copermittee confers prior lawful approval to a Priority Development Project based on one of the two aforementioned conditions, then the Copermittee must ensure that 1) any subsequent project approvals must be issued within 5 years of the effective date of the BMP Design Manual, and 2) BMP installation under subsequent approvals must remain in substantial conformity with the design of the storm water drainage system included in the initial approval.

For public projects, prior approval allowing implementation of Fourth Term MS4 Permit structural BMP requirements in lieu of the requirements of this Order is acceptable if the storm water drainage system for the project, in its entirety, has been stamped by the City or County Engineer by the effective date of the BMP Design Manual.

The San Diego Water Board recognizes that Copermittees will need to determine whether or not a project has prior lawful approval for purposes of implementing the requirements of Provision E.3 of this Order based on the circumstances of each project. Nevertheless, the San Diego Water Board expects each Copermittee to require the implementation of Provision E.3 of this Order wherever it can lawfully do so. Some projects will have received prior lawful approval by the effective date of the BMP Design Manual and hence the requirements of the Fourth Term MS4 permits will apply to those projects. The San Diego Water Board expects that very few Priority Development Projects, if any, will be allowed to implement BMP requirements from earlier term MS4 permits. In cases where BMP requirements from the Fourth Term (or earlier) MS4 permits govern the structural BMP design requirements of a Priority Development Project, the San Diego Water Board expects the Copermittees to be able to demonstrate, in a programmatic audit or other means, that a project has prior lawful

approval within the meaning of Provision E.3.e.(1) of this Order. In any event, the San Diego Water Board expects the Copermittees to only approve Priority Development Projects that have adequate structural BMPs that are protective of water quality.

The requirements under Provision E.3.e.(2)-(3) are necessary to demonstrate each Copermittee is implementing a program that complies with Provisions E.3.b-c and E.3.e.(1), and ensure structural BMPs at Priority Development Project will continue to be able to reduce pollutants in storm water discharges to the MEP.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary for any development projects to compel compliance with the requirements of Provision E.3 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.3.f requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Provision E.4 (Construction Management) requires each Copermittee to implement a construction management program to control and reduce the discharge of pollutants in storm water from construction sites to the MEP. Proper implementation of the construction management program will also contribute toward effectively prohibiting non-storm water discharges from construction sites to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." As part of the management program, 40 CFR 122.26(d)(2)(iv)(D) requires "*a program to implement and maintain structural and non-structural best management practices to reduce pollutants in storm water runoff from construction sites to the municipal storm sewer system.*"

Construction sites can be significant sources of sediment, trash, and other pollutants to receiving waters. Although sediment is naturally occurring in the natural environment, the discharge of sediment under unnatural conditions is problematic to receiving waters. Fine sediment in creeks causes high turbidity that interferes with the functionality of native flora and fauna in local creeks. For example, turbidity interferes with both photosynthesis of water-philic plants, as well as successful foraging and reproduction of benthic macroinvertebrates. Sediment can also make it difficult for fish to breathe because it clogs fish gills. Other pollutants such as heavy metals or pesticides can adhere to sediment and are transported to receiving waters during storm events, where they dissolve in the water column and become bioavailable to aquatic organisms. Sediment is recognized as a major stressor to surface waters and

is responsible for the impairment of several lagoons and creeks in the San Diego Region.

Provision E.4 includes requirements that each Copermittee must implement to minimize the discharge of sediment and other pollutants from construction sites to the MS4 within its jurisdiction. The requirements under Provision E.4 are consistent with the Fourth Term Permits for San Diego, Orange, and Riverside Counties. Therefore, Copermittees are expected to implement the requirements seamlessly, with minimal changes to their existing construction management programs. The Copermittees, however, are given more flexibility to run their programs as needed to maximize efficiency, and also to be consistent with the Water Quality Improvement Plan for the Watershed Management Area.

As part of the construction management program, 40 CFR 122.26(d)(2)(iv)(D)(1) requires "*procedures for site planning which incorporate consideration of potential water quality impacts.*" Provision E.4.a describes the minimum elements each Copermittee is required to include as part of the construction site planning and project approval process. The construction site planning and approval process is based primarily on ensuring each project had an adequate site-specific pollution control, construction BMP, and/or erosion and sediment control plan that will be implemented to minimize the discharge of pollutants in storm water to the MEP, and minimize impacts to receiving waters.

The requirements under Provision E.4.b provide the data and information necessary to identify "*priorities for inspecting sites and enforcing control measures*" required pursuant to 40 CFR 122.26(d)(2)(iv)(D)(3). Under Provision E.4.b, each Copermittee must identify construction sites that are considered a high threat to downstream surface waters. Designation of "high threat to water quality" construction sites will necessitate the Copermittees to develop criteria to identify such sites. Provision E.4.b.(2) describes a list of factors that must be considered when the Copermittee considers threat to water quality. For example, a Copermittee must identify sites as "high threat to water quality" if it is located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions, according to the Water Quality Improvement Plan. This ensures that construction management program implementation is compatible with the Copermittee's identified highest priority water quality conditions.

Pursuant to 40 CFR 122.26(d)(2)(iv)(D)(2) each Copermittee is required describe "*requirements for nonstructural and structural best management practices*" at construction sites. Provision E.4.c includes the types of construction site BMPs that the Copermittees must implement, or require the implementation of, at each construction site to reduce pollutants in storm water discharges to the MEP.

Each Copermittee is expected to require the implementation of appropriate BMPs given specific site conditions, the season and likelihood of rain events, and

construction phase (i.e. grading vs. vertical construction). This means that throughout the life of the project construction, the appropriate BMPs will vary, especially if the construction of the project spans multiple wet seasons. As opposed to describing specific minimum BMPs that must be implemented, the Order describes major BMP categories that should be considered for each site.

Each Copermittee is expected to use its 20 years of storm water experience and knowledge to require implementation of appropriate BMPs from the various categories at each construction site within its jurisdiction. For example, the San Diego Water Board expects that each site will be required to implement erosion control and sediment control. The San Diego Water Board also expects each Copermittee to require implementation of active/passive sediment treatment systems at sites where other BMPs have been tried and are known to be inadequate, and discharges of sediment are causing or contributing to water quality impairment downstream. Each Copermittee is granted flexibility in specifying the minimum level of BMP requirements at each site, but the San Diego Water Board expects each site to be capable of controlling pollutants in storm water discharges to the MEP and preventing illicit discharges.

The requirements under Provision E.4.d are necessary to demonstrate that each Copermittee is implementing a program that complies with Provisions E.4.a and E.4.c and ensure BMPs at construction sites will reduce pollutants in storm water discharges to the MEP.

Provision E.4.d does not include minimum required inspection frequencies for construction sites. Each Copermittee must use its experience and knowledge to specify an appropriate inspection frequency for both high priority and lower priority sites in their jurisdictional runoff management program documents, and in accordance with the Water Quality Improvement Plan. Appropriate inspection frequencies may vary by Copermittee, but the San Diego Water Board expects that the stated frequency will be adequate for each Copermittee to properly oversee the construction sites within its jurisdiction, confirm BMPs are implemented to reduce pollutants in storm water discharges from constructions sites to the MEP, and make needed changes to its program on an ongoing basis as necessary.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary for any development projects to compel compliance with the requirements of Provision E.4 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.4.e requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Provision E.5 (Existing Development Management) requires each Copermittee to implement an existing development management program to control and reduce the discharge of pollutants in storm water from areas of existing development to the MEP. Proper implementation of the existing development management program will also contribute toward effectively prohibiting non-storm water discharges from areas of existing development to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." Within 40 CFR 122.26(d)(2)(iv)(A) and (C), the management program is required to reduce impacts on receiving waters and reduce pollutants in storm water discharges to the MEP from commercial and residential areas, industrial facilities, and municipal facilities.

Commercial and residential areas, industrial facilities, and municipal facilities must be addressed by each Copermittee with the existing development management program required under Provision E.5. All other areas within each Copermittee's jurisdiction should be either undeveloped open space, or areas that are being developed or under construction. Areas being developed or under construction will be addressed by the Copermittee under the requirements of Provision E.3 (Development Planning) or Provision E.4 (Construction Management).

Areas of existing development typically include impervious surfaces such as sidewalks, driveways, roads, and rooftops, which generate and concentrate pollutants (such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not found in high concentrations in the natural environment. Pollutants that accumulate on impervious surfaces are not easily biodegraded or not subject to natural treatment processes. When it rains, these pollutants are transported in storm water runoff from these impervious surfaces into receiving waters, resulting in poor water quality and degradation of beneficial uses.

In addition to the generation of pollutants, areas of existing development have generally altered the natural conditions of the land and removed vegetative cover, reduced the perviousness of the surface, and reduced the capacity of storm water that can be intercepted, captured, stored, infiltrated, evaporated, and/or evapotranspired. The alteration of the natural conditions and the impervious surfaces associated with areas of existing development causes water quality problems due to the alteration of natural flow regimes within the watersheds; resulting in hydromodification of channels, streams, and habitats that exist within or adjacent to the areas of existing development.

Thus, storm water discharges from areas of existing development are responsible for poor water quality, degraded habitats, and hydromodified channels throughout the developed portions of the watersheds in the San Diego Region. To improve the health

and functionality of the receiving waters in a Watershed Management Area, land use practices and the amount of impervious surfaces in areas of existing development must change to reduce the various impacts caused by hydromodification and pollutants from storm water runoff generated in developed areas. Each Copermittee must be aggressive to address pollutant sources and runoff from areas of existing development to be able to reduce pollutants in storm water discharges from the MS4 to the MEP.

There is some overlap in the requirements under Provision E.5 with the requirements under Provisions E.2 (Illicit Discharge Detection and Elimination), E.3 (Development Planning), and E.4 (Construction Management). Illicit discharges frequently originate from areas of existing development. New development projects, when completed will become some type of residential, commercial, industrial or municipal existing development. Redevelopment projects are, by definition, redeveloping areas of existing development. And, redevelopment projects become construction sites located in areas of existing development. Much of the data and information collected, inspections performed, and enforcement actions taken for the requirements under Provisions E.2 to E.4 may also be utilized by the existing development management program. The requirements under Provision E.5, however, are focused primarily on reducing pollutants generated in areas of existing development that can be transported in storm water runoff and discharged to and from the MS4.

The requirements under Provision E.5 build upon existing program elements being implemented by the Copermittees. Provision E.5 is generally consistent with the existing development requirements of the Fourth Term Permits for Orange and Riverside Counties (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), but modified to provide more flexibility to implement the programs so resources can be better focused toward addressing the highest priority water quality conditions identified in the Water Quality Improvement Plans.

For a Copermittee to properly manage areas of existing development, having knowledge of what development exists within its jurisdiction is essential. Provision E.5.a requires each Copermittee to maintain a watershed-based inventory of all the existing development within its jurisdiction. This requirement is necessary for each Copermittee to implement the requirements of Provision E.5.b-e.

As opposed to just maintaining separate inventories based on the type of site, each Copermittee must maintain a watershed-based inventory that includes all types of existing development within its jurisdiction. By utilizing a watershed-based inventory, the Copermittees within a Watershed Management Area can combine their inventories and review the inventories by watershed in addition to by jurisdiction. Pollutant sources and strategies for abatement can then be evaluated on a watershed level, as opposed to evaluating sources and strategies strictly by type of site.

Provision E.5.a includes the information that must be included in the inventory. Provision E.5.a.(1) specifies what facilities or areas must be included in the inventory. A commercial type of existing development may be identified in the inventory as a facility (e.g. individual building, individual business) or an area (e.g. shopping center, commercial zone). An industrial type of existing development must be identified in the inventory by facility (e.g. individual industrial entity). A municipal type of existing development must be identified in the inventory by facility, with a list of specific municipal facilities that must be included in the inventory. A residential type of existing development must be identified by areas to be designated by the Copermittee. For each of the facilities and areas identified in the Copermittee's inventory developed pursuant to Provision E.5.a.(1), Provision E.5.a.(2) specifies the information that must be included in the description for the facility or area.

Provision E.5.a.(3) requires each Copermittee to maintain an updated map showing the location of inventoried existing development, watershed boundaries, and water bodies. This requirement was included because this information is expected to help the Copermittees in a Watershed Management Area identify and prioritize sources of pollutants and/or stressors in areas of existing development that contribute toward the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Knowledge of the existing development that are likely to be sources of pollutants contributing to the highest priority water quality conditions is expected to be a key element in the Copermittees' development of the water quality improvement strategies that will be included in the Water Quality Improvement Plans. The strategies described in the Water Quality Improvement Plans will direct efforts within the existing development management programs implemented by each Copermittee.

Pursuant to 40 CFR 122.26(d)(2)(iv)(A) each Copermittee is required describe "*structural and source control measures to reduce pollutants*" in storm water runoff discharged from areas of existing development. Provision E.5.b includes the BMP implementation and maintenance requirements that the each Copermittee must require at areas of existing development to reduce pollutants in storm water discharges to the MEP. The San Diego Water Board, however, recognizes that BMP implementation and maintenance for residential areas will require much more education and encouragement through less authoritative measures than for commercial, industrial and municipal facilities and areas. Thus, the BMP implementation and maintenance requirements have been separated between requirements under Provision E.5.b.(1) for commercial, industrial and municipal facilities and areas, and Provision E.5.b.(2) for residential areas.

Most of the requirements in Provision E.5.b are consistent with the related requirements in the Fourth Term Permits. The level of specificity, however, has been changed to allow each Copermittee the flexibility to implement its program to achieve

maximum efficiency, and to perform functions that will address the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Each Copermittee is expected to require the implementation of appropriate BMPs to address the expected pollutants from each facility or area. The Third and Fourth Term Permits described specific minimum BMPs that must be implemented at various sites. This Order, however, requires each Copermittee to designate minimum BMPs themselves and require implementation. Consistent with the Fourth Term Permits, each Copermittee is required to maintain, or require the maintenance of, all BMPs as needed.

The BMP implementation and maintenance requirements include a schedule of operation and maintenance activities for the MS4 and related structures (such as catch basins, storm drain inlets, and detention basins), as well as public streets and roads. Public streets and roads specifically include public unpaved roads. The San Diego Water Board identified, through investigations and complaints, sediment discharges from unpaved roads as a significant source of water quality problems in the San Diego Region. Inspection activities conducted by the San Diego Water Board since the Third Term Permits have found a lack of source control for many unpaved roads within the jurisdiction of the Copermittees.

Unpaved roads are a source of sediment that can be discharged in runoff to receiving waters, especially during storm events. Erosion of unpaved roadways occurs when soil particles are loosened and carried away from the roadway base, ditch, or road bank by water, wind, traffic, or other transport means. Exposed soils, high runoff velocities and volumes, sandy or silty soil types, and poor compaction increase the potential for erosion.

Road construction, culvert installation, and other maintenance activities can disturb the soil and drainage patterns to streams in undeveloped areas, causing excess runoff and thereby erosion and the release of sediment. Poorly designed unpaved roads can act as preferential drainage pathways that carry runoff and sediment into natural streams, impacting water quality. In addition, other public works activities along unpaved roads have the potential to significantly affect sediment discharge and transport within streams and other waterways, which can degrade the beneficial uses of those waterways.

USEPA also recognizes that discharges from unpaved roads pose a significant potential threat to water quality. USEPA guidance[40] emphasizes the threat of unpaved roads to water quality:

[40] USEPA, 2006. Environmentally Sensitive Maintenance for Dirt and Gravel Roads. Gesford and Anderson, USEPA-PA-2005.

> "*Dirt and gravel roads are a major potential source of these pollutants [sediment] and pollutants that bind to sediment such as oils, nutrients, pesticides, herbicides, and other toxic substances. Many roads have unstable surfaces and bases. Roads act like dams, concentrating flows that accelerate erosion of road materials and roadsides. Both unstable surfaces and accelerated erosion then lead to sediment and dust.*"

There are several guidance documents, developed by the USEPA,[41] the US Forest Service,[42] the University of California,[43] and others, that include design and construction specifications and BMPs that are readily available for implementation by public entities. Implementing design and other source control BMPs for unpaved roads in the region is necessary to reduce and minimize the impacts of sediment discharged during storm events from unpaved roads to the MS4s and receiving waters.

Provision E.5.c describes existing development site inspection frequency, content, and tracking that each Copermittee must incorporate into their existing development management programs. The requirements under Provision E.5.c are necessary to demonstrate each Copermittee is implementing a program that complies with Provision E.5.b and ensure BMPs implemented in areas of existing development will reduce pollutants in storm water discharges to the MEP. Provision E.5.c has been modified to include a minimum of once every 5 years for all inventoried facilities and areas of existing development, utilizing one or more methods of inspection.

In addition to onsite inspections, the methods of inspection have been expanded to include drive-by inspections. Inspections may be performed by the Copermittee's municipal and contract staff, or by volunteer monitoring or patrol programs. Volunteer monitoring or patrol programs are not expected to enforce the Copermittee's ordinances, or to inspect areas or facilities where members of the public are not allowed access. Volunteer monitoring or patrol programs must be trained by the Copermittee, and are only expected to collect visual observations. By utilizing drive-by inspections and volunteer monitoring or patrol programs, the Copermittees will be able to maximize and efficiently use their resources to identify and address sources of pollutants in areas of existing development.

The municipal and contract staff of each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial, industrial, and municipal facilities and areas in its inventoried existing development pursuant to Provision E.5.c.(1)(a)(iv). An "equivalent" of at least 20 percent means if any commercial, industrial, or municipal facilities or areas require multiple onsite

[41] Ibid
[42] US Forest Service, 1996. Forest Service Specifications for Construction of Roads & Bridges. EM-7720-100. Revised August 1996.
[43] University of California Division of Agriculture and Natural Resources, 2007. Rural Roads: A Construction and Maintenance Guide of California Landowners. Publication 8262.

inspections during any given year, those additional inspections may count toward the total annual inspection requirement. Linear municipal facilities (i.e. MS4 linear channels, sanitary sewer collection systems, streets, roads and highways) in the Copermittee's existing development inventory are not subject to the inspection frequency requirement of Provision E.5.c.(1)(a)(iv).

The inspection content specified in Provision E.5.c.(2)(a) includes the information required to be collected during an inspection by any method. The inspection content specified in Provision E.5.c.(2)(b) includes additional information that must be collected when a Copermittee's municipal or contract staff perform an onsite inspection. Provision E.5.c.(3) specifies the information that each Copermittee must maintain in its existing development inspection records.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary to compel compliance with the requirements of Provision E.5 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.5.d requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Provisions E.5.e.(1)-(2) specifically require the Copermittee to identify areas of existing development as candidates for retrofitting, and streams, channels, and/or habitats as candidates for rehabilitation. Provisions E.5.e.(1)-(2) are based on the retrofitting requirements of the Fourth Term Permits for Orange and Riverside Counties, but modified to also include identifying projects to rehabilitate channels within areas of existing development. The requirements have also been modified to be more focused on utilizing these types of projects for addressing the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Interest and opportunity to retrofit areas of existing development and rehabilitate channels located in areas of existing development has been observed in several programs the San Diego Water Board oversees (e.g., CWA Section 401 Water Quality Certification program, supplemental environmental projects, and grant programs). Each jurisdiction has miles and miles of streets that could be retrofitted to become green streets. Reshaping landscaped areas from convex to concave configurations can detain storm water instead of directing runoff as quickly as possible to the MS4. Retrofit projects could also include simply replacing impervious surfaces with permeable surfaces.

Retrofitting projects do not necessarily have to be expensive. Retrofitting projects could be as simple as redirecting downspouts from roofs to pervious or landscaped areas instead of to hardscaped areas discharging directly to the MS4, providing rain barrels to harvest storm water from downspouts for use at a later time, or planting

more trees in areas with little vegetation to provide canopy that can intercept storm water. The San Diego Water Board encourages the Copermittees to identify simple, low-cost retrofitting opportunities that can be easily implemented, in addition to other more expensive retrofitting and channel rehabilitation projects.

Rehabilitation of channels, streams, and/or habitat will require more significant planning and resources to implement. There are, however, also abundant opportunities to rehabilitate channels, streams and/or habitats in or adjacent to areas of existing development. Each Watershed Management Area likely has several creeks and stream reaches that have been undergrounded, artificially hardened, or hydromodified that could be rehabilitated to be more sustainably configured, which would slow down storm water flows and potentially have more assimilative capacity for pollutants while still being supportive of designated beneficial uses.

The San Diego Water Board recognizes that it may be infeasible to implement retrofitting or channel rehabilitation projects within certain areas of a Copermittee's jurisdictions. For such areas, the Copermittee must instead identify, develop, and implement regional retrofitting and channel rehabilitation projects (i.e. projects that can retain and/or treat storm water from one or more areas of existing development) adjacent to and/or downstream of the areas of existing development.

Provisions E.5.e.(1)-(2) do not require the implementation of retrofitting and rehabilitation projects, but do require the Copermittee to develop a program with strategies to facilitate the implementation of these types of projects in areas of existing development. The strategies are expected to include allowing and encouraging Priority Development Projects to implement retrofitting types of projects as a means of compliance with the structural BMP performance criteria requirements of Provisions E.3.c.(1) and E.3.c.(2).

Provision E.6 (Enforcement Response Plans) requires each Copermittee to develop an Enforcement Response Plan as part of its jurisdictional runoff management program document. Proper implementation of the Enforcement Response Plans is necessary to effectively prohibit non-storm water discharges to the MS4, and reduce the discharge of pollutants in storm water from the MS4 to the MEP.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system*" and be able to demonstrate that it can "*operate pursuant to legal authority established by statute, ordinance or series of contracts*" to control the discharge of non-storm water and pollutants in storm water to and from its MS4. Pursuant to 40 CFR 122.26(d)(2)(i)(E) each Copermittee is specifically required to have the legal authority to "*[r]equire compliance with conditions in ordinances, permits, contracts or orders*."

The requirements under Provision E.6 are necessary to demonstrate that each Copermittee can enforce its legal authority to *"effectively prohibit non-stormwater discharges"* and "*reduce the discharge of pollutants to the maximum extent practicable*" as well as "*[r]equire compliance with conditions in ordinances, permits, contracts or order*."

The Enforcement Response Plan required under Provision E.6 will serve as a reference for the Copermittee and the San Diego Water Board to determine if consistent enforcement actions are being implemented to achieve timely and effective compliance from all public and private entities that are not in compliance with the Copermittee's ordinances, permits, or other requirements. The Enforcement Response Plan must contain clear direction for the Copermittee to take immediate enforcement action, when appropriate and necessary, in their illicit discharge detection and elimination, development planning, construction management, and existing development management programs.

If the entities subject to the Copermittee's legal authority do not implement appropriate corrective actions in a timely manner, or if violations repeat, the Copermittee must take progressively stricter responses to enforce its legal authority and achieve compliance with its ordinances, permits, or other requirements to *"effectively prohibit non-stormwater discharges"* and "*reduce the discharge of pollutants to the maximum extent practicable.*"

Provision E.7 (Public Education and Participation) requires each Copermittee to implement a public education and participation program. Proper implementation of the public education and participation program as part of its jurisdictional runoff management program will contribute toward effectively prohibiting non-storm water discharges to the MS4, and toward the reduction of pollutants in storm water from the MS4 to the MEP.

Provision E.7 establishes the minimum requirements that each Copermittee must implement to engage members of the public as part of its jurisdictional runoff management program. In the Fourth Term Permits, the public education program requirements and the public participation requirements were included as separate jurisdictional runoff management program components. In this Order, the public education requirements have been consolidated with the public participation requirements, as both sets of requirements are related to the engagement of the public by each Copermittee. Engagement of the public is critical for the success of each Copermittee's jurisdictional runoff management program.

The Copermittees have been implementing public education programs for the last 20 years, which are now well established. The specificity of expected public education program elements of the Fourth Term Permits has been removed. For the most part, the public education program requirements in Provision E.7.a have been reduced to a set of requirements that are specifically included in the federal regulations under 40

CFR 122.26(d)(2)(iv)(A)(6), 122.26(d)(2)(B)(6) and 122.26(d)(2)(D)(4), which should already be incorporated into each Copermittee's existing public education program. Each Copermittee is expected to utilize the information and data collected from the monitoring and assessments conducted within the Watershed Management Area, and from its inventories and inspections to best direct its public education program resources toward addressing the highest priority water quality conditions identified within the Water Quality Improvement Plan.

According to 40 CFR 122.26(d)(2)(iv), public participation is required to be included as part of the "*comprehensive planning process*", which includes the development and implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs. The requirements under Provision E.7.b specify the opportunities that the public must be provided to be involved in the "*comprehensive planning process*", as required by to 40 CFR 122.26(d)(2)(iv).

Provision E.8 (Fiscal Analysis) requires each Copermittee to secure the resources and provide an analysis of the resources that will be necessary to implement the requirements of the Order. Adequate fiscal resources are necessary for a jurisdictional runoff management program to effectively prohibit non-storm water discharges to the MS4, and reduce pollutants in storm water from the MS4 to the MEP.

According to 40 CFR 122.26(d)(2)(vi), each Copermittee is responsible for providing "*a fiscal analysis of the necessary capital and operation and maintenance expenditures necessary to accomplish the activities*" required by this Order, including "*a description of the source of funds that are proposed to meet the necessary expenditures, including legal restrictions on the use of such funds.*" The fiscal analysis requirements of Provision E.8 are consistent with 40 CFR 122.26(d)(2)(vi).

The San Diego Water Board has chosen not to require a description of fiscal benefits realized from implementation of the jurisdictional runoff management programs. This is a recommendation from the National Association of Flood and Stormwater Management Agencies.[44] For instance, the fiscal analysis requirements do not address city-wide fiscal benefits of protection (e.g., public health, tourism, property values, economic activity, beneficial uses, etc.), even though many costs currently reported to the San Diego Water Board are for related activities. This type of assessment may help Copermittees improve the allocation of resources and it may help the Copermittees secure adequate funding for the program. Qualitative assessments, however, could be overly subjective and most Copermittees likely lack the ability to provide accurate quantitative assessments. The San Diego Water Board encourages the Copermittees to consider means for conducting assessments of fiscal benefits derived from the programs. Such assessments could be conducted on a

[44] National Association of Flood and Stormwater Management Agencies. 2006. *Guidance for Municipal Stormwater Funding.* Prepared under a grant provided by the USEPA.

regional scale similar to studies of program costs conducted by the State Water Board.[45]

[45] State Water Board, 2005. NPDES Stormwater Cost Survey.

F. Reporting

Purpose: Provision F includes the requirements for the documents and reports that the Copermittees must prepare and provide to the San Diego Water Board. The documents prepared by the Copermittees and provided to the San Diego Water Board and made available to the public will provide the documentation that the Copermittees are complying with the requirements of the Order.

***Discussion*:** Provision F requires the Copermittees to prepare several documents and reports that must be provided to the San Diego Water Board and made available to the public. The reporting requirements have been significantly reduced compared to the Fourth Term Permit reporting requirements. The reduction in reporting requirements was recommended by the San Diego County Copermittees in the Report of Water Discharge submitted in June 2011.

More specific and detailed discussions of the requirements of Provision F are provided below.

Provision F.1 (Water Quality Improvement Plans) requires the Copermittees in each Watershed Management Area to develop and submit a Water Quality Improvement Plan in accordance with the requirements of Provision B.

Of all the requirements of Provision F, the Water Quality Improvement Plans will likely be the documents requiring the most significant effort to develop. The content of the Water Quality Improvement Plans, however, is expected to include content that should already have been developed for the Watershed Plans and several elements that are included in the Monitoring and Reporting Programs required under the Fourth Term Permits.

Because the Water Quality Improvement Plan is part of the "*comprehensive planning process which involves public participation*," Provision F.1 includes requirements to give multiple opportunities to the public to provide input on the content of the plans.

Provision F.1.a.(1) specifies the elements that the Copermittees must include in the public participation process for the development of the Water Quality Improvement Plans. In order for the public to be aware of the opportunities to provide input, Provision F.1.a.(1)(a) requires the Copermittees to develop a publicly available and noticed schedule of the opportunities for the public to participate and provide comments during the development of the Water Quality Improvement Plan. These opportunities are when the public can provide the data, information, and recommendations that the Copermittees can consider during the development of the Water Quality Improvement Plans.

The San Diego Water Board recognizes, however, that the Copermittees cannot be expected to incorporate all the data, information, and recommendations that the public may provide into the Water Quality Improvement Plans. The Copermittees will have to review the data, information, and recommendations received and make some decisions on what to incorporate into the Water Quality Improvement Plans. Before the Copermittees finalize their decisions, members of the public should be allowed to review the Copermittees' decisions. Thus, Provision F.1.a.(1)(b) requires the Copermittees to form a Water Quality Improvement Consultation Panel (Panel).

The Panel will consist of a member from the environmental community and a member from the development community familiar with the Watershed Management Area. A representative from the San Diego Water Board staff will also be part of the Panel. The Copermittees may choose to include additional members, but the Panel is only required to include three panel members.

The Panel will serve as an additional public participation and input mechanism during the development of the Water Quality Improvement Plans. The knowledge and expertise from these Panel members are expected to provide the Copermittees valuable direction during their decision-making process. The Copermittees will review the content of their planned submittals with the Panel members to receive recommendations. If the Panel provides recommendations, the Copermittees must consider revisions to the Water Quality Improvement Plan submittals.

The San Diego Water Board recognizes that the development of multiple Water Quality Improvement Plans concurrently may limit the ability of the public to review and provide comments to the Copermittees. Thus, Provision F.1.a.(1)(c) requires the Copermittees to coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public time and opportunity to participate during the development of the Water Quality Improvement Plans.

Provision F.1.a.(2) requires the Copermittees to develop and submit the first Water Quality Improvement Plan component, in accordance with the requirements of Provision B.2, which includes the identification of the priority water quality conditions and potential water quality improvement strategies. The public must be provided an opportunity to provide data, information and recommendations to be utilized in the development and identification of the priority water quality conditions and potential water quality improvement strategies for the Watershed Management Area. The Copermittees must consult with the Panel and consider making revisions. The Copermittees may submit the requirements of Provision B.2 as early as 6 months and no later than 12 months after the commencement of coverage under this Order. After the requirements of Provision B.2 are submitted to the San Diego Water Board, the public will be provided another opportunity to provide comments.

Provision F.1.a.(3) requires the Copermittees to develop and submit the second Water Quality Improvement Plan component, in accordance with the requirements of

Provision B.3, which includes the identification of the numeric goals for the highest priority water quality conditions identified for the Watershed Management Area, and the strategies that will be implemented to achieve the potential numeric goals. The Copermittees may also develop the Optional Watershed Management Area Analysis, in accordance with the requirements of Provision B.3.b.(4), as part of this submittal. The public must be provided an opportunity to provide data, information and recommendations to be utilized in the development and identification of the numeric goals and water quality improvement strategies for the Watershed Management Area. The Copermittees must consult with the Panel and consider making revisions. The Copermittees may submit the requirements of Provision B.3 as early as 9 months and no later than 18 months after the commencement of coverage under this Order. After the requirements of Provision B.3 are submitted to the San Diego Water Board, the public will be provided another opportunity to provide comments.

Finally, Provision F.1.b describes the process for the submittal and implementation of the Water Quality Improvement Plans. The complete Water Quality Improvement Plans are required to be submitted by the Copermittees within 24 months after the commencement of coverage under this Order. The San Diego Water Board will provide the public an opportunity to provide comments on each complete Water Quality Improvement Plan.

The San Diego Water Board will review each Water Quality Improvement Plan and the public comments received to determine if the Copermittees have submitted a Water Quality Improvement Plan that meets the requirements of Provision B. If a Water Quality Improvement Plan does not meet the requirements of Provision B, the Copermittees will be considered out of compliance and directed in writing by the San Diego Water Board Executive Officer to correct the deficiencies.

When a Water Quality Improvement Plan meets the requirements of Provision B, the San Diego Water Board will determine whether to hold a public hearing or to limit public input to submittal of written comments before accepting the Water Quality Improvement Plan. Implementation of the Water Quality Improvement Plan must begin within 30 days of acceptance.

The San Diego Water Board expects that any deficiencies in the Water Quality Improvement Plan will be identified either in the public comments or during the review by the San Diego Water Board before implementation begins. In the event any deficiencies are identified after the implementation of the Water Quality Improvement Plan, Provision F.1.b.(7) clarifies that the San Diego Water Board maintains the right to require the Copermittees to correct any deficiencies that may be identified.

Provision F.2 (Updates) requires the Copermittees to update specific documents that the Copermittees will utilize to implement the requirements of this Order.

Each Copermittee is required to continue implementing a jurisdictional runoff management program, as required under Provision E. Implementation of each Copermittee's jurisdictional runoff management program is directed by its jurisdictional runoff management program document. Provision F.2.a requires each Copermittee to update its jurisdictional runoff management program document to be consistent with the requirements of Provision E concurrent with the submittal of the Water Quality Improvement Plan.

Likewise, each Copermittee must continue to require new development and redevelopment projects to implement BMPs to control pollutants in storm water runoff. The control of pollutants in storm water runoff from development and redevelopment projects within each Copermittee's jurisdiction is guided and directed by its BMP Design Manual, formerly known as a Standard Storm Water Mitigation Plan (SSMP). Provision F.2.b requires each Copermittee to update its BMP Design Manual to be consistent with the requirements of Provision E.3 concurrent with the submittal of the Water Quality Improvement Plan.

In general, the requirements of the Order should not necessitate a complete rewrite of each Copermittee's jurisdictional runoff management program document or BMP Design Manual, as was required by the Third Term Permits. The jurisdictional runoff management program and BMP Design Manual requirements of this Order are not significantly different than the requirements of the Fourth Term Permits. Thus, only sections of the Order which are new or have been significantly changed should warrant revisions to specific sections of the Copermittee's jurisdictional runoff management program document and BMP Design Manual.

Finally, the Water Quality Improvement Plans are expected to require updates as the iterative approach and adaptive management process included in the Water Quality Improvement Plan, as required under Provision B.5, is implemented by the Copermittees. Provision F.2.c.(1) requires the Copermittees to implement a public participation process for the proposed updates, review the proposed updates with the Panel, and submit the updates to the Water Quality Improvement Plan as part of the Annual Reports required under Provision F.3.b.

Also, because TMDLs are likely to be developed, adopted and approved during the term of the Order, Provision F.2.c.(2) has been included to expedite the incorporation of TMDLs into the Copermittees' Water Quality Improvement Plans as part of the update process, potentially before the Order is re-opened to incorporated the requirements of the new TMDLs.

Provision F.3 (Progress Reporting) requires the Copermittees to report on the progress of implementing the Water Quality Improvement Plans.

The requirements of Provision F.3 are to report the progress toward improving water quality that the Copermittees are achieving with the implementation of the Water

Quality Improvement Plans and each Copermittee's jurisdictional runoff management program. The Progress Report Presentations required under Provision F.3.a are included to provide the Copermittees an opportunity to communicate directly with the San Diego Water Board and the public. The Progress Report Presentations will also provide the members of the San Diego Water Board and members of the public an opportunity to become more acquainted with the Copermittees and their projects and programs to address non-storm water and storm water discharges into and from their MS4s.

The Annual Report requirements of Provision F.3.b are a consolidation of several reporting requirements from the Fourth Term Permits, including the Jurisdictional Runoff Management Program Annual Reports, the Watershed Annual Reports, and the Monitoring and Reporting Program Annual Reports. Furthermore, the Annual Report requirements are consistent with the requirements under 40 CFR 122.42(c).

Pursuant to 40 CFR 122.42(c), "*[t]he operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the Director…must submit an annual report*", which must include the following:

(1) *The status of implementing the components of the storm water management program that are established as permit conditions* [40 CFR 122.42(c)(1)];

(2) *Proposed changes to the storm water management programs that are established as permit conditions* [40 CFR 122.42(c)(2)];

(3) *Revisions, if necessary, to the assessment of controls and fiscal analysis* [40 CFR 122.42(c)(3)];

(4) *A summary of data, including monitoring data, that is accumulated throughout the reporting year* [40 CFR 122.42(c)(4)];

(5) *Annual expenditures and budget for year following each annual report* [40 CFR 122.42(c)(5)];

(6) *A summary describing the number and nature of enforcement actions, inspections, and public education programs* [40 CFR 122.42(c)(6)];

(7) *Identification of water quality improvements or degradation* [40 CFR 122.42(c)(7)].

Under the Fourth Term Permits, each Copermittee is responsible for submitting a Jurisdictional Runoff Management Program Annual Report; the Copermittees in each designated watershed are responsible for submitting a Watershed Annual Report; and the Copermittees from each county are responsible for submitting a Monitoring and Reporting Program Annual Report.

There are 39 Copermittees in the San Diego Region, each required to prepare and submit a Jurisdictional Runoff Management Program Annual Report. There are 9 designated watersheds in San Diego County, 6 designated watersheds in Orange County, and 1 designated watershed in Riverside County for a total of 16 designated watersheds, each requiring a Watershed Annual Report. There are 3 sets of Copermittees in 3 counties in the San Diego Region, requiring Copermittees from each county to prepare and submit a Monitoring and Reporting Program Annual Report. Thus each Copermittee is currently required to prepare, or participate in the preparation of at least 3 annual reports. In addition, the San Diego County Copermittees are required to prepare and submit a Regional Urban Runoff Management Plan Annual Report.

In total, there are 59 annual reports that are prepared by the Copermittees and submitted to the San Diego Water Board for the Fourth Term Permits. The preparation of these annual reports requires significant time and resources from each Copermittee, which could otherwise be expended on actions that could improve water quality within its jurisdiction. In turn, significant time and resources are required from the San Diego Water Board staff to review these reports, which could otherwise be expended on working directly with the Copermittees to improve their implementation efforts toward restoring and protecting water quality.

Until the Water Quality Improvement Plans are developed, there will be a transitional period during which the Copermittees will continue to implement their existing jurisdictional runoff management programs. There will also be a transitional period during which the Copermittees will implement the transitional monitoring and assessment requirements of Provision D. During the transitional period, the Copermittees will submit annual reports pursuant to the requirements of Provisions F.3.b.(1) and F.3.b.(2).

Provision F.3.b.(1) includes the transitional annual reporting requirements for each Copermittee's jurisdictional runoff management program. The reporting of the jurisdictional runoff management program implementation efforts have been reduced to a single 2-page form. Each Copermittee is required to complete and submit a Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D or a revised form accepted by the San Diego Water Board) no later than October 31 of each year for each jurisdictional runoff management program reporting period (i.e. July 1 to June 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted. The Jurisdictional Runoff Management Program Annual Report Form will certify that each Copermittee has implemented its jurisdictional runoff management program in accordance with the requirements of Provision E. Each Copermittee may choose to continue to utilize and submit the jurisdictional runoff management program annual reporting format of its current Order until the first Water Quality Improvement Plan Annual Report is required to be submitted.

Provision F.3.b.(2) includes the transitional annual reporting requirements for the transitional monitoring and assessment program for each Watershed Management Area. The Copermittees in the Watershed Management Area are required to submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted. The Transitional Monitoring and Assessment Program Annual Report is required to include the transitional period monitoring data collected pursuant to Provisions D.1.a and D.2.a, and the findings from the transitional period findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

Provision F.3.b.(3) includes the Water Quality Improvement Plan Annual Report requirements. Only one Water Quality Improvement Plan Annual Report is required for each of the ten (10) Watershed Management Areas designated under Provision B.1, which is a significant reduction in the number of annual reports required to be prepared and submitted by the Copermittees. The Water Quality Improvement Plan Annual Report will document the Copermittees' efforts to implement the Water Quality Improvement Plan. Each Water Quality Improvement Plan Annual Report will be focused primarily on reporting the analysis of the monitoring data collected pursuant to Provisions D.1-D.3 during the reporting period, and the assessments that are required pursuant to Provision D.4 based on the data. The monitoring data analyses and the assessments that are provided in the Water Quality Improvement Plan Annual Report will be the core of the report. The reporting of the jurisdictional runoff management program implementation efforts have been reduced to a single 2-page form, and will no longer be the primary focus of the reporting requirements as in the Third and Fourth Term Permits.

Each Copermittee will continue to prepare and submit a Jurisdictional Runoff Management Program Annual Report Form as part of the Water Quality Improvement Plan Annual Report to certify that each Copermittee has implemented its jurisdictional runoff management program in accordance with the requirements of Provision E. Instead of reviewing a voluminous report from each Copermittee, as was required under the Third and Fourth Term Permits, the San Diego Water Board will conduct audits of each Copermittee's jurisdictional runoff management program to investigate and confirm the information provided by each Copermittee on its Jurisdictional Runoff Management Program Annual Report Form. The audits will allow the San Diego Water Board to become more familiar with the each Copermittee's jurisdictional runoff management program, and each Copermittee will become more informed about the expectations of the San Diego Water Board.

The reduction in the number and content of the Water Quality Improvement Plan Annual Reports should result in significant time, cost and resource savings for the Copermittees, as well as the San Diego Water Board. Those savings should offset a significant portion of any additional costs that may be incurred to develop the Water

Quality Improvement Plans and to implement the monitoring and assessment program requirements of Provision D.

The reporting period for the Water Quality Improvement Plan Annual Reports consists of two periods. Because the jurisdictional runoff management programs are typically budgeted and implemented during a fiscal year, the information provided on the Jurisdictional Runoff Management Program Annual Report Forms will cover the period from July 1 to June 30 of the following year.

The Water Quality Improvement Plan Annual Reports, however, are focused primarily on the monitoring data and the assessments based on the monitoring data. The monitoring data is collected during the monitoring year, which begins October 1 and ends September 30 of the following year. The monitoring year begins after the beginning of the fiscal year and ends after the end of the fiscal year. Therefore, to accommodate and capture the information collected during the fiscal year and the monitoring year, the Annual Report reporting period incorporates both periods.

Finally, Provision F.3.c requires the Copermittees to develop and submit a Regional Monitoring and Assessment Report. The Regional Monitoring and Assessment Report is similar to the Long Term Effectiveness Assessment required under the Fourth Term San Diego County Permit. The Regional Monitoring and Assessment Report is expected to utilize the entire body of data and information collected by the Copermittees during the term of this Order to assess improvements to water quality on a regional scale.

Provision F.4 (Regional Clearinghouse) requires the Copermittees to develop, update, and maintain an internet-based Regional Clearinghouse that can be used to store, disseminate, and share the Copermittees' documents, monitoring data, special studies, and any other data or information.

Most of the documents and data that are generated by the Copermittees can be provided in electronic format, and made available to the San Diego Water Board and the public on the internet. The San Diego Water Board has been gradually transitioning its document submittal requirements to electronic submittals. Provision F.4 has been included to further these efforts.

Provision F.4 has also been included to improve the exchange and availability of information among the Copermittees, as well as between the Copermittees and the San Diego Water Board. Provision F.4 will also make the information generated during the implementation of the Order more accessible to the public.

Provision F.5 (Report of Waste Discharge) requires the Copermittees to submit a Report of Waste Discharge to reapply for renewal of the Order prior to its expiration, in accordance with 40 CFR 122.21(d)(2) and CWC section 13376.

Because the ~~Orange County and~~ Riverside County Copermittees will not be subject to the requirements of this Order until they are notified of coverage, Provision F.5.a describes the process of submitting a ~~their~~ Report~~s~~ of Waste Discharge pursuant to the requirements of their current permit~~s~~ to obtain coverage under this Order.

For the Copermittees subject to the requirements of this Order, Provision F.5.b requires the Copermittees to submit a Report of Waste Discharge 180 days in advance of the expiration of this Order. Provision F.5.b also describes the minimum information to be included in the Report of Waste Discharge, based on USEPA guidance "Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems," dated May 17, 1996.

Provision F.6 (Application for Early Coverage) describes the process that would allow the Orange County and/or Riverside County Copermittees to obtain coverage under this Order earlier than the expiration of their current Orders.

If the ~~Orange County and/or~~ Riverside County Copermittees choose to obtain coverage under this Order earlier than the expiration of their current Orders, the preparation and submittal of a Report of Waste Discharge, as required by the Fourth Term Permits, will not be necessary. The existing Order for the respective county will be rescinded upon the effective coverage date under this Order, except for enforcement purposes.

G. Principal Watershed Copermittee Responsibilities

Purpose: Provision G includes the requirements for the Principal Watershed Copermittee designated by the Copermittees in each Watershed Management Area.

***Discussion*:** Unlike previous NPDES requirements, there will no longer be a single Principal Copermittee. Provision G.1 requires the Copermittees to designate a Principal Watershed Copermittee for each Watershed Management Area. There are ten (10) Watershed Management Areas in the San Diego Region, as defined in Table B-1 under Provision B.1 of the Order. An individual Copermittee should not be the Principal Watershed Copermittee for more than two (2) Watershed Management Areas. There could be up to ten (10) Principal Water Copermittees designated for the Watershed Management Areas in the San Diego Region.

Provision G.2 describes the minimum responsibilities of each Principal Watershed Copermittee. The primary responsibility of the Principal Watershed Copermittees is to serve as the liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues. Ideally, the Principal Watershed Copermittee can represent the interests of all the Copermittees within a Watershed Management Area during discussions or meetings to facilitate communication with the San Diego Water Board. The Principal Watershed Copermittees are also responsible for facilitating and coordinating the implementation efforts of the Copermittees and submittals of required documents and reports.

The Principal Watershed Copermittee is responsible for facilitating the efforts of the Copermittees within the Watershed Management Area to develop the Water Quality Improvement Plan required under Provision B, and submit it for approval in accordance with Provision F.1. The Principal Watershed Copermittee is also responsible for coordinating the submittal of the document updates, Progress Report Presentations, and Annual Reports required from the Copermittees within each Watershed Management Area under Provisions F.2, F.3.a, and F.3.b. The Principal Watershed Copermittees are responsible for coordinating with each other to develop and submit the Regional Clearinghouse, Regional Monitoring and Assessment Report, and the Report of Waste Discharge required under Provisions F.3.c, F.4, and F.5.

The designated Principal Watershed Copermittee for each Watershed Management Area does not necessarily have to serve as the Principal Watershed Copermittee for the entire term of the Order. If the Copermittees in a Watershed Management Area choose to designate a new Principal Watershed Copermittee, the change may be submitted as part of the Annual Report required under Provision F.3.b, with an update to the Water Quality Improvement Plan in accordance with Provision F.2.c.

Provision G.3 specifies that the Principal Watershed Copermittee is not responsible for ensuring that the other Copermittees within the Watershed Management Area are in compliance with the requirements of this Order

H. Modification of Order

Purpose: Provision H provides the conditions under which modifications to Order No. R9-2013-0001, as amended, may occur.

***Discussion*:** Provision H allows for modifications to Order No. R9-2013-0001, as amended, for bases in addition to modifications (minor and major) allowed under the federal regulations at~~. Minor modifications may be made by the San Diego Water Board Executive Officer without a public notice or public hearing. Minor modifications are defined under~~ 40 CFR 122.62 and 122.63. ~~Minor modifications under 40 CFR 122.63 potentially applicable to this Order are the following:~~

~~Correcting typographical errors;~~

~~Requiring more frequent monitoring or reporting by the Copermittees;~~

~~Changing an interim compliance date in a schedule of compliance, provided the new date is not more than 120 days after the date specified in the existing permit and does not interfere with attainment of the final compliance date requirement.~~

Modifications ~~that are not one of the above minor modifications will~~to the Order require re-opening the Order (see Water Code section 13223), subject to the requirements of 40 CFR 122.44, 122.62 to 122.64, and 124.5, but only for the specific provisions subject to the modification. Proposed m~~M~~odifications of the Order ~~that are not minor require a draft Order with the proposed modifications~~will be made available for public review, a public notice and comment period, and a public hearing if requested. Comments on the provisions not subject to the proposed modifications are not required to be considered in the San Diego Water Board's responses to comments or during the public hearing.

Provision H.4 was included to specify that the Order will be re-opened for modifications if the State Water Board determines revisions to Provision A are warranted, an application for early coverage under the Order is received pursuant to Provision F.6, the Basin Plan is amended to modify an existing TMDL or incorporate a new TMDL, or the monitoring and assessment program requirements need to be updated or revised.

Provision H.5 was included to specify that the San Diego Water Board will re-open and consider modifications to this Order when the Orange County Copermittees or the Riverside County Copermittees submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders

I. Standard Permit Provisions and General Provisions

Purpose: Provision I incorporates the standard permit provisions required to be included in all NPDES permits, as well as several other general provisions.

***Discussion*:** Provision I refers to Attachment B to the Order. Attachment B expressly incorporates the conditions applicable to all NPDES permits as provided under 40 CFR 122.41(a)-(n), as well as the applicable conditions for MS4s and storm water discharges provided under 40 CFR 122.42(c) and 40 CFR 122.42(d), respectively. Attachment B also includes several general provisions that are typically included in or applicable to waste discharge requirements issued by the San Diego Water Board.

IX. ATTACHMENTS

The attachments to the Order are discussed below. The discussions describe the content of the attachments.

Attachment A – Discharge Prohibitions and Special Protections

Section 1 of Attachment A includes the Waste Discharge Prohibitions from the Basin Plan. They have been provided verbatim in their entirety.

Section 2 of Attachment A includes the "*Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges*" applicable to permitted point source discharges of storm water, adopted under State Water Board Resolution No. 2012-0012, as amended by Resolution No. 2012-0031. The terms, prohibitions, and special conditions (collectively referred to as special conditions) are established as limitations on point source storm water discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in ASBS, as required for State Water Quality Protection Areas pursuant to California Public Resources Code sections 36700(f) and 36710(f). These Special Protections were adopted by the State Water Board as part of the Ocean Plan General Exception.

Attachment B – Standard Permit Provisions and General Provisions

Conditions applicable to all NPDES permits, as required under 40 CFR 122.41, and conditions applicable to MS4s and storm water discharges, as required under 40 CFR 122.42(c) and 122.42(d), respectively are provided in Attachment B to the Order. They have been provided expressly in their entirety.

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. These general provisions are typically included in or applicable to waste discharge requirements issued by the San Diego Water Board. Many of the general provisions were developed by the State Water Board. Where a general provision is derived from statute or regulation, a citation of the statute or regulation section is provided. General provisions that do not provide a citation are included under the authority provided CWC 13377.

Attachment C – Acronyms, Abbreviations and Definitions

The acronyms and abbreviations that are used in the Order are provided in Attachment C. Attachment C also includes definitions that may provide an explanation or description of the meaning or intent of specific terms or phrases included in the Order.

Attachment D – Jurisdictional Runoff Management Program Annual Report Form

An example of the Jurisdictional Runoff Management Program Annual Report Form required to be submitted by each Copermittee as part of the Annual Reports required under Provision F.3.b.(1)(e) is provided as Attachment D to the Order. An electronic version of the form will be available from the San Diego Water Board after the adoption of the Order.

The Jurisdictional Runoff Management Program Annual Report Form includes the minimum information necessary to demonstrate that the Copermittee is implementing and in compliance with the requirements of Provision E, and includes much of the information required to be reported pursuant to 40 CFR 122.42(c).

The information that must be provided on the Jurisdictional Runoff Management Program Annual Report Form is limited to the fiscal year, which begins July 1 and ends June 30 of the following year. The information expected to be provided by the Copermittees in each section of the Jurisdictional Runoff Management Program Annual Report Form is discussed below.

I. COPERMITTEE INFORMATION

The name of the Copermittee (e.g. name of city, county, or special district) and the contact information for the storm water program manager are provided under this section.

II. LEGAL AUTHORITY

The Copermittee must confirm whether or not the legal authorities under Provision E.1.a have been established for itself within its jurisdiction.

The Copermittee must also confirm whether or not a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority, as required under Provision E.1.b. The certification statement required by Provision E.1.b is only required to be submitted with the first Annual Report required under Provision F.3.b.

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

The Copermittee must inform the San Diego Water Board whether or not an update to its jurisdictional runoff management program document was required or recommended by the San Diego Water Board during the reporting period. An update to the jurisdictional runoff management program is required under Provision F.2.a. The San Diego Water Board may recommend modifications to the jurisdictional runoff management program as part of the iterative approach and adaptive management process required under Provision B.5, which may result in an update that is necessary for the Copermittee's jurisdictional runoff management document.

If an update was required or recommended, the Copermittee must confirm whether or not the update was completed and made available on the Regional Clearinghouse within the reporting period. If no update was required or recommended, an answer is not required. If the answer is NO, meaning the required or recommended update was not completed and/or made available on the Regional Clearinghouse, the Copermittee must attach a

schedule for the completion of the update and/or posting of the updated document on the Regional Clearinghouse.

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

The Copermittee must confirm whether or not a program was implemented during the fiscal year to actively detect and eliminate illicit discharges and connections in accordance with the requirements under Provision E.2.

In addition to confirming that a program to detect and eliminate illicit discharges was implemented during the reporting period, the Copermittee is also required to report on several items related to the program. The information that must be reported is limited to the fiscal year for the Annual Report.

All non-storm water discharges are considered illicit discharges unless the source is identified as one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5). If a non-storm water discharge is identified as one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5), the discharge is a non-storm water discharge, but not an illicit discharge. If a non-storm water discharge is identified but not in one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5), the discharge is both a non-storm water discharge and an illicit discharge.

V. DEVELOPMENT PLANNING PROGRAM

The Copermittee must confirm whether or not a development planning program was implemented during the fiscal year in accordance with the requirements under Provision E.3.

The Copermittee must also inform the San Diego Water Board whether or not an update to its BMP Design Manual was required or recommended by the San Diego Water Board during the fiscal year. An update to the BMP Design Manual is required under Provision F.2.b. The San Diego Water Board may recommend modifications to the BMP Design Manual, which may result in an update that is necessary for Copermittee's the BMP Design Manual.

If an update was required or recommended, the Copermittee must confirm whether or not the update was completed and made available on the Regional Clearinghouse within the reporting period. If no update was required or recommended, an answer is not required. If the answer is NO, meaning the required or recommended update was not completed and/or made available on the Regional Clearinghouse, the Copermittee must attach a schedule for the completion of the update and/or posting of the updated document on the Regional Clearinghouse.

The Copermittee is also required to report on several items related to the program. For the development and redevelopment projects that are reviewed under the program, the Copermittee must report the total number projects submitted for review during the fiscal year. Of those projects, the Copermittee must report the number that are Priority Development Projects, as defined under Provision E.3.b.(1). The Copermittee must also report the number of Priority Development Projects that were approved and/or granted occupancy during the fiscal year, regardless of when the project was originally submitted for review. Any projects that were approved during the fiscal year and granted any

exemptions from the BMP Design Manual requirements and/or allowed to implement alternative compliance options in accordance with Provision E.3.c.(3) must be reported.

Finally, the Copermittee must also report on several items related to its oversight of permanent BMPs on Priority Development Projects within its jurisdiction, as required under Provision E.3.e. The information that must be reported is limited to the fiscal year for the Annual Report.

VI. CONSTRUCTION MANAGEMENT PROGRAM

The Copermittee must confirm whether or not a construction management program was implemented during the fiscal year in accordance with the requirements under Provision E.4.

The Copermittee is also required to report on several items related to its oversight construction projects within its jurisdiction. The information that must be reported is limited to the fiscal year for the Annual Report.

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

The Copermittee must confirm whether or not an existing development management program was implemented during the fiscal year in accordance with the requirements under Provision E.5.

The Copermittee is also required to report on several items related to its oversight in areas of existing development within its jurisdiction. The information that must be reported is limited to the fiscal year for the Annual Report. The information must also be separated into four categories of existing development: municipal, commercial, industrial, and residential.

VIII. PUBLIC EDUCATION AND PARTICIPATION

The Copermittee must confirm whether or not a public education program component was implemented during the fiscal year in accordance with the requirements under Provision E.7.a.

The Copermittee must also confirm whether or not a public participation program component was implemented during the fiscal year in accordance with the requirements under Provision E.7.b.

IX. FISCAL ANALYSIS

The Copermittee must confirm a summary of its fiscal analysis, conducted in accordance with the requirements under Provision E.8, has been attached to the form.

X. CERTIFICATION

A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative must sign and certify the Jurisdictional Runoff Management Program Annual Report Form. The appropriate box must be checked to indicate the whether a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative is signing the form.

Attachment E – Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2013-0001

Attachment E provides specific provisions for implementing the load allocations (LAs) and wasteload allocations (WLAs) of Total Maximum Daily Loads (TMDLs) adopted by the San Diego Water Board and approved by USEPA in which the Copermittees are identified as responsible for discharges subject to the requirements of the TMDLs. Federal regulations require that NPDES requirements incorporate water quality based effluent limitations (WQBELs) that must be consistent with the requirements and assumptions of any available WLAs,[46] which may be expressed as numeric effluent limitations, when feasible, and/or as a best management practice (BMP) program of expanded or better-tailored BMPs.[47] Where the TMDL includes WLAs that provide numeric pollutant load or pollutant parameter objectives, the WLA has been, where feasible, translated into numeric WQBELs.[48]

For each TMDL in Attachment E, four sections are included:

a. Applicability: This section provides the resolution under which the TMDL Basin Plan amendment was adopted and approved, with the applicable adoption and approval dates. This section also gives the effective date of the TMDL and where the TMDL is applicable (i.e. Watershed Management Area and water body). The Copermittees that are responsible for implementing the specific provisions are also given in this section.

b. Final TMDL Compliance Requirements: For each TMDL, the final TMDL compliance requirements consist of the final TMDL compliance date(s), the final WQBELs, and the final TMDL compliance determination requirements. The final WQBELs are expressed in terms of receiving water limitations, effluent limitations, and/or best management practices (BMPs). The final WQBELs for the TMDLs are incorporated by reference into Provision A of the Order. The final WQBELs become enforceable when the final TMDL compliance dates have passed. Applicable BMPs within the final WQBELs must be incorporated into the Water Quality Improvement Plans. Compliance with the final WQBELs will be determined in accordance with the options provided under the final TMDL compliance determination requirements.

c. Interim TMDL Compliance Requirements: If the final TMDL compliance date has not passed and there are interim TMDL compliance requirements, they are included in this section. If there are interim WQBELs with interim compliance dates, the interim WQBELs become enforceable when the corresponding interim compliance dates have passed. Compliance with the interim WQBELs will be determined in accordance with the options provided under the interim TMDL compliance determination requirements.

d. Specific Monitoring and Assessment Requirements: If there are specific monitoring and assessment requirements that cannot be met with the monitoring and assessment program

[46] 40 CFR 122.44(d)(1)(vii)(B)
[47] 40 CFR 122.44(k)(2) and 40 CFR 122.44(k)(3)
[48] November ~~12, 2010~~26, 2014 Memorandum from the USEPA, Revisions to the November 22, 2002 Memorandum "Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLA""

requirements under Provision D of the Order, the additional requirements are included in this section.

The requirements of the TMDLs are based on and consistent with the assumptions and requirements of any available adopted and approved TMDLs that have been incorporated into the Basin Plan. Modifications to the requirements for the TMDLs in Attachment E cannot be made unless the TMDLs are modified in the Basin Plan.

A modification to any aspect of a TMDL in the Basin Plan requires a Basin Plan amendment. A Basin Plan amendment to modify a TMDL will require the San Diego Water Board to adopt a resolution to amend the Basin Plan, which includes a separate public process. When the San Diego Water Board adopts a Basin Plan amendment, it subsequently requires approval from the State Water Board, the Office of Administrative Law, and the USEPA before it becomes effective.

If and when the TMDLs are a modified in the Basin Plan, the San Diego Water Board will revise the requirements of the Order ~~TMDL~~ in accordance with the Basin Plan amendment. When a Basin Plan amendment to modify a TMDL becomes effective, the San Diego Water Board will modify the requirements of the Order~~TMDL~~ pursuant to the requirements of Provision H.4 of the Order as soon as possible.

Walsh, Laurie@Waterboards

From: lyris@swrcb18.waterboards.ca.gov
Sent: Friday, January 09, 2015 1:56 PM
To: Walsh, Laurie@Waterboards
Subject: NOTICE OF PUBLIC HEARING, MS4 PERMIT REISSUANCE
Attachments: 2015-0108 Cvr Ltr Hearing Notice.pdf; 2015-0108 Public Hearing Notice.pdf

Water Boards This is a message from the California Regional Water Quality Control Board, San Diego Region (9).

Dear Interested Persons,

The San Diego Water Board is scheduled to hold a public hearing to consider adoption of Tentative Order No. R9-2015-0001, An Order Amending Order No. R9-2013-0001, the Regional Municipal Separate Storm Sewer (MS4) Permit for the San Diego Region.

The public hearing to consider the Tentative Order will be held at the San Diego Water Board meeting at the following date and location:

February 11, 2015, beginning at 9 a.m.
Council Chambers of the City of Mission Viejo
200 Civic Center, Mission Viejo, CA 92691

Please see attached Notice of Public Hearing for further details.

You are currently subscribed to reg9_board_meetings as: lwalsh@waterboards.ca.gov.

To unsubscribe click here: leave-3318869-582080.2b1a8f503bf3f4d830f4f0246161fb81@swrcb18.waterboards.ca.gov

CALIFORNIA Water Boards

EDMUND G. BROWN JR. GOVERNOR

MATTHEW RODRIQUEZ SECRETARY FOR ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

NOTICE OF PUBLIC HEARING

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) is scheduled to hold a public hearing to consider adoption of Tentative Order No. R9-2015-0001, *An Order Amending Order No. R9-2013-0001, NPDES No. CAS010266*, *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Tentative Order).

The Tentative Order proposes to amend Order No. R9-2013-0001, the Regional MS4 Permit, to address a variety of issues including coverage for Copermittees in Orange County consisting of the County of Orange, Orange County Flood Control District, and the cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano, and incorporation of limited permit provisions applicable to the City of Lake Forest. If adopted, the Tentative Order will supersede the Orange County Copermittees' current Fourth Term MS4 Permit, Order No. R9-2009-0002.

The public hearing on this matter will be held during the San Diego Water Board meeting scheduled for **February 11, 2015 in the Council Chambers of the City of Mission Viejo, located at 200 Civic Center, Mission Viejo, CA 92691**. The item will be heard during the meeting that starts at 9:00 A.M. The meeting notice and agenda, which will indicate any changes in the meeting location and may provide other specific information concerning this hearing, will be posted at least two weeks prior to the meeting date at http://www.waterboards.ca.gov/sandiego/board_info/agendas/.

Written comments including testimony, technical documentation and factual information pertaining to the terms and conditions of the Tentative Order are no longer being accepted. However, oral testimony at the public hearing will be allowed. The scope of oral testimony at the public hearing will be strictly limited to summarizing the previously submitted written comments, comments on revisions to the Tentative Order made in response to comments, and making policy statements. Oral testimony will be limited in time by the Board Chair.

The procedures governing San Diego Water Board meetings may be found at Title 23, California Code of Regulations, section 647, et seq. and are available upon request. The hearing facilities will be accessible to persons with disabilities. The meeting notice and agenda for this meeting will provide contact information for persons requesting special accommodations.

Information related to this matter, including revisions made to the Tentative Order in response to written comments timely submitted, as well as the San Diego Water Board's responses to written comments timely submitted, will be available at the San Diego Water Board's office and the San Diego Water Board's storm water web page in advance of the public hearing. A separate notice will be sent announcing the availability of the revised Tentative Order and the responses to comments upon website posting of the documents.

Please contact Laurie Walsh at (619) 521-3382 or Laurie.Walsh@waterboards.ca.gov for questions or comments regarding this hearing notice.

Please bring the foregoing to the attention of any person known to you who would be interested in this matter.

DAVID W. GIBSON
Executive Officer
January 9, 2015

CALIFORNIA Water Boards

EDMUND G. BROWN JR. GOVERNOR

MATTHEW RODRIQUEZ SECRETARY FOR ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

January 9, 2015

Sent via E-mail

San Diego County Copermittees
Orange County Copermittees
Riverside County Copermittees

In reply refer to / attn:
Place ID: 658018Lwalsh

Subject: NOTICE OF PUBLIC HEARING
Tentative Order No. R9-2015-0001, An Order Amending Order No. R9-2013-0001, the Regional Municipal Separate Storm Sewer (MS4) Permit for the San Diego Region

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) is scheduled to hold a public hearing to consider adoption of Tentative Order No. R9-2015-0001, *An Order Amending Order No. R9-2013-0001, NPDES No. CAS010266*, *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Tentative Order).

The Tentative Order proposes to amend Order No. R9-2013-0001, the Regional MS4 Permit, in response to the Orange County Copermittees' Report of Waste Discharge submitted by letter dated May 20, 2014, to designate the Orange County Copermittees (the County of Orange, Orange County Flood Control District, and the cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano) as MS4 dischargers responsible for compliance with the terms and the conditions of the Permit. The Tentative Order also proposes to amend the Regional MS4 Permit to address a variety of other issues including 1) Regional Water Board designation to consolidate regulation of Phase I MS4 discharges for the Cities of Laguna Hills, Laguna Woods, and Lake Forest pursuant to Water Code section 13228, 2) incorporation of the Los Peñasquitos Lagoon Sediment Total Maximum Daily Load requirements, 3) extension of a pollutant reduction deadline for MS4 discharges to Areas of Special Biological Significance, 4) incorporation of interim exemptions for hydromodification management, and 5) implementation of a uniform approach for monitoring beach water quality in south Orange County.

The public hearing on this matter will be held during the San Diego Water Board meeting scheduled for **9:00 a.m. on February 11, 2015 in the Council Chambers of the City of Mission Viejo, located at 200 Civic Center, Mission Viejo, CA 92691.** Please see the

attached *Notice of Public Hearing* for further details regarding the San Diego Water Board meeting and public hearing to consider the Tentative Order.

Availability of Revised Tentative Order
The Tentative Order was released for a 60-day public review and comment period on September 18, 2014. Revisions made to the Tentative Order in response to written comments timely submitted, as well as the San Diego Water Board's responses to written comments timely submitted, will be available at the San Diego Water Board's office and the San Diego Water Board's storm water web page in advance of the public hearing. A separate notice will be sent announcing the availability of the revised Tentative Order and the responses to comments upon website posting of the documents.

Contact for further Information
For questions or comments concerning this notice, please contact Laurie Walsh by phone at (619) 521-3373, or by email at Laurie.Walsh@waterboards.ca.gov .

Respectfully,

David Barker

David Barker, P.E.
Supervising Engineer
San Diego Regional Water Quality Control Board

DTB:esb:law

cc (via email):

San Diego County Copermittees
Orange County Copermittees
Riverside County Copermittees
Natural Resource Agencies
San Diego County MS4 Permit E-mail Service List
Riverside County MS4 Permit E-mail Service List
Orange County MS4 Permit E-mail Service List
San Diego Water Board Agenda E-mail Service List

Tech Staff Info & Use	
Tentative Order No.	R9-2015-0001
NPDES No.	CAS0109266
Place ID	658018

San Diego County Copermittees

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THE REGISTER

This space for filing stamp only

625 N GRAND AVE, SANTA ANA, CA 92701
Telephone (714) 796-7000 / Fax (714) 796-6059

PROOF OF PUBLICATION

(2015.5 C.C.P.)

State of California)
County of ORANGE) ss

Notice Type: GPN - GOVT PUBLIC NOTICE

Ad Description:
Public Hearing MS4 Permit

I am a citizen of the United States and a resident of the State of California; I am over the age of eighteen years, and not a party to or interested in the above entitled matter. I am the principal clerk of the printer and publisher of the THE REGISTER, a newspaper published in the English language in the city of SANTA ANA, county of ORANGE, and adjudged a newspaper of general circulation as defined by the laws of the State of California by the Superior Court of the County of ORANGE, State of California, under date 11/19/1905, Case No. A21046. That the notice, of which the annexed is a printed copy, has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to-wit:

01/11/2015

Executed on: 01/11/2015
At SANTA ANA, California

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Signature

CNS #: 2706406

NOTICE OF PUBLIC HEARING The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) is scheduled to hold a public hearing to consider adoption of Tentative Order No. R9-2015-0001, An Order Amending Order No. R9-2013-0001, NPDES No. CAS010266, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region (Tentative Order). The Tentative Order proposes to amend Order No. R9-2013-0001, the Regional MS4 Permit, to address a variety of issues including coverage for Copermittees in Orange County consisting of the County of Orange, Orange County Flood Control District, and the cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano, and incorporation of limited permit provisions applicable to the City of Lake Forest. If adopted, the Tentative Order will supersede the Orange County Copermittees' current Fourth Term MS4 Permit, Order No. R9-2009-0002. The public hearing on this matter will be held during the San Diego Water Board meeting scheduled for February 11, 2015 in the Council Chambers of the City of Mission Viejo, located at 200 Civic Center, Mission Viejo, CA 92691. The item will be heard during the meeting that starts at 9:00 A.M. The meeting notice and agenda, which will indicate any changes in the meeting location and may provide other specific information concerning this hearing, will be posted at least two weeks prior to the meeting date at http://www.waterboards.ca.gov/sandiego/board_info/agendas/. Written comments including testimony, technical documentation and factual information pertaining to the terms and conditions of the Tentative Order are no longer being accepted. However, oral testimony at the public hearing will be allowed. The scope of oral testimony at the public hearing will be strictly limited to summarizing the previously submitted written comments, comments on revisions to the Tentative Order made in response to comments, and making policy statements. Oral testimony will be limited in time by the Board Chair. The procedures governing San Diego Water Board meetings may be found at Title 23, California Code of Regulations, section 647, et seq. and are available upon request. The hearing facilities will be accessible to persons with disabilities. The meeting notice and agenda for this meeting will provide contact information for persons requesting special accommodations. Information related to this matter, including revisions made to the Tentative Order in response to written comments, comments on revisions to the Tentative Order made in response to comments, and making policy statements. Oral testimony will be limited in time by the Board Chair. The procedures governing San Diego Water Board meetings may be found at Title 23, California Code of Regulations, section 647, et seq. and are available upon request. The hearing facilities will be accessible to persons with disabilities. The meeting notice and agenda for this meeting will provide contact information for persons requesting special accommodations. Information related to this matter, including revisions made to the Tentative Order in response to written comments timely submitted, as well as the San Diego Water Board's responses to written comments timely submitted, will be available at the San Diego Water Board's office and the San Diego Water Board's storm water web page in advance of the public hearing. A separate notice will be sent announcing the availability of the revised Tentative Order and the responses to comments upon website posting of the documents. Please contact Laurie Walsh at (619) 521-3382 or Laurie.Walsh@waterboards.ca.gov for questions or comments regarding this hearing notice. Please bring the foregoing to the attention of any person known to you who would be interested in this matter. DAVID W. GIBSON Executive Officer January 9, 2015
1/11/15
CNS-2706406#
THE REGISTER

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1/11/15

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THE REGISTER

R-27 10007723

U-T San Diego

P.O. Box 120191, San Diego, CA 92112-0191

AFFIDAVIT OF PUBLICATION

CALIFORNIA NEWSPAPER SERVICE
P.O. BOX 60460
LOS ANGELES, CA 90060

STATE OF CALIFORNIA} ss.
County of San Diego}

The Undersigned, declares under penalty of perjury under the laws of the State of California: That he is a resident of the County of San Diego. That he is and at all times herein mentioned was a citizen of the United States, over the age of twenty-one years, and that he is not a party to, nor interested in the above entitled matter; that he is Chief Clerk for the publisher of

The San Diego Union-Tribune

a newspaper of general circulation, printed and published daily in the City of San Diego, County of San Diego, and which newspaper is published for the dissemination of local news and intelligence of a general character, and which newspaper at all the times herein mentioned had and still has a bona fide subscription list of paying subscribers, and which newspaper has been established, printed and published at regular intervals in the said City of San Diego, County of San Diego, for a period exceeding one year next preceding the date of publication of the notice hereinafter referred to, and which newspaper is not devoted to nor published for the interests, entertainment or instruction of a particular class, profession, trade, calling, race, or denomination, or any number of same; that the notice of which the annexed is a printed copy, has been published in said newspaper in accordance with the instructions of the person(s) requesting publication, and not in any supplement thereof on the following dates, to wit:

Jan 11, 2015

Zach Manuel
Chief Clerk for the Publisher

1/16/15
Date

NOTICE

NOTICE OF PUBLIC HEARING The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) is scheduled to hold a public hearing for consider adoption of Tentative Order No. R9-2015-0001, An Order Amending Order No. R9-2013-0001 NPDES No. CAS010266, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region (Tentative Order). The Tentative Order proposes to amend Order No. R9-2013-0001, the Regional MS4 Permit, to address a variety of issues including coverage for Copermittees in Orange County consisting of the County of Orange, Orange County Flood Control District, and the cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano, and incorporation of limited permit provisions applicable to the City of Lake Forest. If adopted, the Tentative Order will supersede the Orange County Copermittees' current Fourth Term MS4 Permit, Order No. R9-2009-0002. The public hearing on this matter will be held during the San Diego Water Board meeting scheduled for February 11, 2015 in the Council Chambers of the City of Mission Viejo, located at 200 Civic Center, Mission Viejo, CA 92691. The item will be heard during the meeting that starts at 9:00 A.M. The meeting notice and agenda, which will indicate any changes in the meeting location and may provide other specific information concerning this hearing, will be posted at least two weeks prior to the meeting date at http://www.waterboards.ca.gov/sandiego/board_info/agendas/. Written comments including testimony, technical documentation and factual information pertaining to the terms and conditions of the Tentative Order are no longer being accepted. However, oral testimony at the public hearing will be allowed. The scope of oral testimony at the public hearing will be strictly limited to summarizing the previously submitted written comments, comments on revisions to the Tentative Order made in response to comments, and making policy statements. Oral testimony will be limited in time by the Board Chair. The procedures governing San Diego Water Board meetings may be found at Title 23, California Code of Regulations, section 647, et seq. and are available upon request. The hearing facilities will be accessible to persons with disabilities. The meeting notice and agenda for this meeting will provide contact information for persons requesting special accommodations. Information related to this matter, including revisions made to the Tentative Order in response to written comments timely submitted, as well as the San Diego Water Board's responses to written comments timely submitted, will be available at the San Diego Water Board's office and the San Diego Water Board's storm water web page in advance of the public hearing. A separate notice will be sent announcing the availability of the revised Tentative Order and the responses to comments upon website posting of the documents. Please contact Laurie Walsh at (619) 521-3382 or Laurie.Walsh@waterboards.ca.gov for questions or comments regarding this hearing notice. Please bring the foregoing to the attention of any person known to you who would be interested in this matter. DAVID W. GIBSON Executive Officer January 9, 2015
1/11/15
CNS-2706405#

Affidavit of Publication of

Legal Advertisement
Ad # 0010894204#
ORDERED BY: ELWYN

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THE PRESS-ENTERPRISE

1825 Chicago Ave, Suite 100
Riverside, CA 92507
951-684-1200
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PROOF OF PUBLICATION
(2010, 2015.5 C.C.P)

Publication(s): The Press-Enterprise

PROOF OF PUBLICATION OF

Ad Desc.: / 2706404

I am a citizen of the United States. I am over the age of eighteen years and not a party to or interested in the above entitled matter. I am an authorized representative of THE PRESS-ENTERPRISE, a newspaper in general circulation, printed and published daily in the County of Riverside, and which newspaper has been adjudicated a newspaper of general circulation by the Superior Court of the County of Riverside, State of California, under date of April 25, 1952, Case Number 54446, under date of March 29, 1957, Case Number 65673, under date of August 25, 1995, Case Number 267864, under date of February 4, 2013, Case Number RIC 1215735, under date of July 25, 2013, Case Number RIC 1305730, and under date of September 16, 2013, Case Number RIC 1309013; that the notice, of which the annexed is a printed copy, has been published in said newspaper in accordance with the instructions of the person(s) requesting publication, and not in any supplement thereof on the following dates, to wit:

01/15/2015

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Date: January 15, 2015
At: Riverside, California

CALIF NEWSPAPER SERV BUREAU
PO BOX 60460
LOS ANGELES, CA 90060

Ad Number: 0010008091-01

P.O. Number: 2706404

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016333

NOTICE OF PUBLIC HEARING

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) is scheduled to hold a public hearing to consider adoption of Tentative Order No. R9-2015-0001, An Order Amending Order No. R9-2013-0001, NPDES No. CAS010266, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region (Tentative Order). The Tentative Order proposes to amend Order No. R9-2013-0001, the Regional MS4 Permit, to address a variety of issues including coverage for Copermittees in Orange County consisting of the County of Orange, Orange County Flood Control District, and the cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano, and incorporation of limited permit provisions applicable to the City of Lake Forest. If adopted, the Tentative Order will supersede the Orange County Copermittees' current Fourth Term MS4 Permit, Order No. R9-2009-0002. The public hearing on this matter will be held during the San Diego Water Board meeting scheduled for February 11, 2015 in the Council Chambers of the City of Mission Viejo, located at 200 Civic Center, Mission Viejo, CA 92691. The item will be heard during the meeting that starts at 9:00 A.M. The meeting notice and agenda, which will indicate any changes in the meeting location and may provide other specific information concerning this hearing, will be posted at least two weeks prior to the meeting date at http://www.waterboards.ca.gov/sandiego/board_info/agendas/. Written comments including testimony, technical documentation and factual information pertaining to the terms and conditions of the Tentative Order are no longer being accepted. However, oral testimony at the public hearing will be allowed. The scope of oral testimony at the public hearing will be strictly limited to summarizing the previously submitted written comments, comments on revisions to the Tentative Order made in response to comments, and making policy statements. Oral testimony will be limited in time by the Board Chair. The procedures governing San Diego Water Board meetings may be found at Title 23, California Code of Regulations, section 647, et seq. and are available upon request. The hearing facilities will be accessible to persons with disabilities. The meeting notice and agenda for this meeting will provide contact information for persons requesting special accommodations. Information related to this matter, including revisions made to the Tentative Order in response to written comments timely submitted, as well as the San Diego Water Board's responses to written comments timely submitted, will be available at the San Diego Water Board's office and the San Diego Water Board's storm water web page in advance of the public hearing. A separate notice will be sent announcing the availability of the revised Tentative Order and the responses to comments upon website posting of the documents. Please contact Laurie Walsh at (619) 521-3382 or Laurie.Walsh@waterboards.ca.gov for questions or comments regarding this hearing notice. Please bring the foregoing to the attention of any person known to you who would be interested in this matter. DAVID W. GIBSON Executive Officer January 9, 2015

1/15/15
CNS-2706404#
THE PRESS ENTERPRISE

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Ryan M. F. Baron
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January 30, 2015

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DEPUTIES

David Gibson, Executive Officer
San Diego Regional Water Quality Control Board
2375 Northside Drive, Suite 100
San Diego, CA 92108-2700

Re: Orange County Request for Continuance

Dear Mr. Gibson:

On behalf of the County of Orange and the Orange County Flood Control District ("County"), our office is requesting a 30-day continuance of the February 11, 2015 adoption hearing for Tentative Order No. R9-2015-0001, which would enroll the Orange County permittees into the Regional Permit. A significantly revised Tentative Order, along with 133 pages of response to comments, was released on January 21, 2015 just 15 working days prior to the proposed adoption hearing. In order to properly review staff's detailed responses and timely prepare for a potentially lengthy adjudicatory proceeding, the County respectfully requests that more time be granted so that the County may properly prepare evidence and testimony. At the initial adoption of the Regional Permit, the permittees, stakeholders and the public participated in a lengthy formal adjudicatory proceeding where numerous witnesses provided testimony and presented evidence on the permit, a hearing that lasted for three full days (April 10 and 11, May 8, 2013). At that time, the County and other stakeholders requested a reasonable continuance that was ultimately denied. It is our opinion that a continuance in that case could have minimized some of the questions and controversy generated at that hearing so the permittees could have properly prepared and understood the revisions. We believe the same to be true here.

I will note that the County will also be filing comments on February 13, 2015 regarding its permit with the Santa Ana Regional Water Board, which has just been released for a second revision. For that permit, staff is allowing an additional comment period and a proposed adoption hearing at least two months after the Response to Comments were released. For the San Diego hearing, however, the County is only requesting a modest 30-day extension.

The County would also like to discuss with you the potential for an alternative compliance option in the Regional Permit and the reasoning behind why an option was not proposed in the Tentative Oder. Both the Fact Sheet and your letter to the State Water Board regarding its Proposed Order on the Los Angeles MS4 permit upholding an alternative compliance option note that an option will be developed upon enrollment of the Riverside County permittees. We believe this issue should be discussed prior to Orange

County enrolling into the permit, so as to avoid any confusion or unnecessary time spent at the February 11 hearing. It should be further noted that in proposed permit for the Santa Ana region, staff has just proposed an alternative compliance option similar to the one upheld by the State Board. It is our belief that an alternative compliance option for Orange County could be developed in due time without significantly delaying our enrollment.

In addition, the Hearing Notice for the February 11, 2015 hearing appears to limit the permittees' rights to provide oral testimony by limiting comments to summarizing prior written comments and comments on the revisions to the Tentative Order. Under Government Code sections 11400 *et seq.*, Evidence Code sections 801-805, Gov't Code section 11513 and title 23 of the California Code of Regulations, sections 648 *et seq.,* and applicable case law, the County has the right to request a formal proceeding and provide any oral comments relevant to the proceedings. Furthermore federal law allows the public comment process to be extended to the close of any hearing on an MS4 permit. 40 C.F.R. § 124.10. As such, we request that the permittees be allowed to right of cross-examination if needed as well as the ability to present on all issues relevant to the permit.

Lastly, the County requests that the Orange County permittees be collectively provided a two-hour time period by which to make presentations, provide testimony, submit evidence and cross-examine witnesses, as such right is provided by the aforementioned statutes. We also request that an order of proceedings be published establishing the time periods for presentations and testimony and recognizing parties that will be designated to participate in the proceedings.

Thank you for your consideration.

Very truly yours,

NICHOLAS S. CHRISOS
COUNTY COUNSEL

By /s/ Ryan Baron

Ryan M. F. Baron, Senior Deputy

RMFB:azs
Mary Anne Skorpanich, OC Public Works
Chris Crompton, OC Public Works
Richard Boon, OC Public Works
Catherine Hagen, San Diego Regional Water Board

Hagan, Catherine@Waterboards

From: Hagan, Catherine@Waterboards
Sent: Tuesday, February 10, 2015 3:34 PM
To: ryan.baron@coco.ocgov.com
Cc: Barker, David@Waterboards; Becker, Eric@Waterboards; Arias, Christina@Waterboards; Walsh, Laurie@Waterboards
Subject: Response to Procedural Points in January 30, 2015 Letter
Attachments: 013015 Baron Letter.pdf

Dear Mr. Baron:

David Gibson asked me to respond to the procedural requests in your letter to him dated January 30, 2015. In the interest of time, I am responding by e-mail rather than formal letter but will include this email along with your letter (attached) in the record for this proceeding.

Request for 30-day Continuance
The San Diego Regional Water Quality Control Board (San Diego Water Board) Chair has considered the County of Orange and Orange County Flood Control District's (Orange County) request for a 30 day continuance of the public hearing in the matter of Tentative Order No. R9-2015-0001, An Order Amending Order No. R9-2013-0001, NPDES No. CAS010266, National Pollutant Discharge Elimination System Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region
(Tentative Order). I understand Mr. Gibson already conveyed to you that the San Diego Water Board plans to proceed with the public hearing scheduled on February 11, 2015. There are relatively few new issues involved in this amendment proceeding, especially compared to the volume of contentious issues extensively considered during the public hearings to consider and adopt San Diego Water Board Order No. R9-2013-0001 (Regional MS4 Permit). The San Diego Water Board provided a 60-day rather than the legally required 30-day (see 40 CFR sec. 124.10(b)(2)) written public comment period and held a public workshop at its meeting in Orange County on October 2014. Revisions to the Tentative Order were released three weeks before the scheduled hearing and arise from comments submitted during the written comment period and the revisions are highlighted to facilitate focused review. While the written responses to comments report is lengthy, the vast majority of comments submitted on the Tentative Order largely incorporated or duplicated comments submitted during the 2013 Regional MS4 Permit proceeding and are therefore not new. The San Diego Water Board is not obligated to provide responses to comments to the public for their review in advance of the hearing. (See 40 CFR sec. 124.17(a) and (c).) The Chair determined it was not necessary to continue the hearing based on the reasons cited in your letter.

Scope of Comments and Testimony
The scope of oral comments at the public hearing was identified in the Notice of Public Hearing dated January 9, 2015. The San Diego Water Board is permitted to place reasonable controls on public comment and, as indicated above, already provided a 60-day written comment period and an additional 21-day opportunity for oral comment on revisions to the Tentative Order. Reliance on Title 40 CFR section 124.10 (as referenced in sections 124.12(c) and 124.13) as requiring the board to allow the identification of new issues at the public hearing is misplaced. Neither of these sections providing that the public comment period extend to the close of the public hearing is applicable to the San Diego Water Board as it considers this permit amendment. (See 40 CFR sec. 123.25(a).)

Request for Formal Hearing Procedures
You have requested a more formal hearing process than the board typically uses at its NPDES hearings but the Chair will allow questions of staff or parties subject to reasonable limitations at the discretion of the Chair. The Chair has considered your request for two hours for the Orange County Copermittees but given the relatively narrow scope of new issues in this proceeding, will grant 45 minutes, including time for questions and closing comments. As always, requests for more time based on good cause may be granted at the discretion of the Chair. To clarify, oral and written comments submitted during the 2013 Regional MS4 Permit proceeding are considered part of the record carried forward to this amendment proceeding. In written comments on the Tentative Order, most commenters incorporated by reference all of their earlier submitted comments and objections. The San Diego Water Board likewise incorporates its 2013 written and oral responses to comments in the responses to comments report prepared by staff.

Please let me know if you have further questions.

Sincerely,

-Catherine
Catherine George Hagan
Senior Staff Counsel
Office of Chief Counsel
State Water Resources Control Board
2375 Northside Drive, Suite 100
San Diego, CA 92108
Tel. 619-521-3012
Fax 619-516-1994
E-mail: catherine.hagan@waterboards.ca.gov

Please note my new mailing address and telephone/fax numbers.

Catherine George Hagan
Senior Staff Counsel
Office of Chief Counsel
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E-mail: catherine.hagan@waterboards.ca.gov

Please note my new mailing address and telephone/fax numbers.

STATE OF CALIFORNIA
REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

MEETING NOTICE AND AGENDA[1]

Wednesday, February 11, 2015
9:00 a.m.

City of Mission Viejo
Council Chambers
200 Civic Center
Mission Viejo, California

The purpose of this meeting is for the San Diego Water Board to obtain testimony and information from concerned and affected persons and to make decisions based on the information received. Persons who want to submit written comments or evidence on any agenda item must comply with the procedures described in the agenda and agenda notes. Persons wishing to speak at the meeting should complete an attendance card (see Note F, attached to this Notice). The San Diego Water Board requests that all lengthy comments be submitted in writing in advance of the meeting date. To ensure that the San Diego Water Board members and staff have the opportunity to review and consider written material, comments should be received in the San Diego Water Board's office no later than noon on Tuesday, January 27, 2015* and should indicate the agenda item to which it is applicable. If the submitted written material is more than 5 pages or contains foldouts, color graphics, maps, two copies must be submitted. Written material submitted after 5:00 P.M. on Tuesday, February 3, 2015, will not be provided to the Board members and may not be considered by the San Diego Water Board (See Note D, attached to this Notice).

****PLEASE NOTE THAT SOME ITEMS ON THE AGENDA MAY HAVE BEEN PREVIOUSLY NOTICED WITH EARLIER DEADLINES FOR SUBMITTING WRITTEN COMMENTS OR MAY HAVE A SEPARATE HEARING PROCEDURES DOCUMENT THAT ESTABLISHES DIFFERENT DEADLINES OR PROCEDURES FOR SUBMITTING WRITTEN MATERIALS. IN THOSE CASES THE DIFFERENT DEADLINES OR PROCEDURES APPLY.***

Comments on agenda items will be accepted by E-mail subject to the same conditions set forth for other written submissions as long as the total submittal (including attachments) does not exceed five printed pages in length. E-mail must be submitted to: rb9agenda@waterboards.ca.gov. Type the word “Agenda” in the subject line.

[1] Versión en español disponible también en: http://www.waterboards.ca.gov/sandiego/board_info/agendas/index.shtml

Pursuant to Title 23, California Code of Regulations, section 648.4, the San Diego Water Board may refuse to admit written testimony or evidence into the record if it is not submitted to the San Diego Water Board in a timely manner and shall refuse to do so if admitting it would prejudice any party or the board, unless the proponent demonstrates that compliance with the deadline would create an unreasonable hardship.

NOTE D, attached to this Notice, refers to the procedures that will be followed by the San Diego Water Board in contested adjudicatory matters if a separate Hearing Procedures Document has not been issued for a particular agenda item. Parties requesting an alternate hearing process must do so in accord with the directions in NOTE D. Any such request, together with supporting material, must be received in the San Diego Water Board's office no later than noon on Tuesday, February 3, 2015 (unless an earlier deadline is established in a separate hearing procedures document).

Copies of the agenda items to be considered by the San Diego Water Board as they are available are posted on the San Diego Water Board's website at http://www.waterboards.ca.gov/sandiego/board_info/agendas

Except for items designated as time certain, there are no set times for agenda items. Items may be taken out of order at the discretion of the Chairman.

1. Roll Call and Introductions.

2. PUBLIC FORUM: Any person may address the Board regarding a matter within the Board's jurisdiction that is not related to an item on this meeting agenda and is not scheduled for a future meeting. **Comments will generally be limited to three minutes, unless otherwise directed by the Board Chairperson**. Any person wishing to make a longer presentation should contact the Executive Officer at least ten days prior to the meeting.

3. Minutes of Board Meeting: December 11, 2014

4. Chairman's, Board Members', State Board Liaison's and Executive Officer's Reports: These items are for Board discussion only. No public testimony will be allowed, and the Board will take no formal action.

5. Future Agenda Items: Board members may discuss items for possible inclusion on future agendas. (*David Gibson*)

Consent Calendar: Item 6 is considered a non-controversial issue. (NOTE: If there is public interest, concern, or discussion regarding any consent calendar item or a request for a public hearing, then the item(s) will be removed from the consent calendar and considered after all other agenda items have been completed.)

6. New WDRs: Waste Discharge Requirements for the United States Navy Remote Training Site Wastewater Treatment Plant, Warner Springs, San Diego County (Tentative Order No. R9-2015-0012). (*Fisayo Osibodu*)

Remainder of the Agenda (Non-Consent Items):

7. Update on Implementation of the Practical Vision and Operational Plan for 2015. (*David Gibson*)

8. Information Item: Meeting Statewide Recycled Water Goals by 2020—Progress and Challenges in the San Diego Region. (*Julie Chan and Fisayo Osibodu*)

9. Tentative Resolution: Tentative Resolution in Support of Funding Projects that Further the Practical Vision with Consideration to Disadvantaged Communities and Recovery of Streams, Wetlands, and Riparian Systems (Tentative Resolution No. R9-2015-0020). (*Chiara Clemente*)

10. NPDES Permit Amendment: An Order to amend Order R9-2013-0001, NPDES No. CAS0109266, *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region*. The amendment includes, but is not limited to, incorporation of the County of Orange, several incorporated Cities of Orange County, and the Orange County Flood Control District as Copermittees (Tentative Order No. R9-2015-0001). (*Laurie Walsh and Christina Arias*) **Please Note: Elected officials will be invited to speak on this item no sooner than 1:30 p.m.**

11. Election of Regional Board Chair and Vice Chair for 2015. (*David Gibson*)

12. *Closed Session*—Discussion of Ongoing Litigation [Authorized under Government Code Section 11126, subd. (e)]. The San Diego Water Board may meet in closed session to discuss ongoing litigation for the following cases:

    Civil Actions (Judicial and Administrative, other than Petitions for Review filed with the State Water Board)

    a. *In re: Test Claim on California Regional Water Quality Control Board, San Diego Region, Order No. R9-2007-001, (NPDES No. CAS0108758) Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego County, the San Diego Unified Port District, and the San Diego County Regional Airport Authority adopted on January 24, 2007. Test Claim filed by San Diego County, et al., with Commission on State Mandates, No. 07-TC-09* (filed June 2008). (*Catherine George Hagan*)

    b. *State of California Department of Finance, State Water Resources Control Board, And California Regional Water Quality Control Board, San Diego Region v. Commission on State Mandates.* Petition for Writ of Administrative Mandamus. Sacramento County Superior Court, Case No. 34-2010-80000604 (filed July 2010). (*Catherine George Hagan*)

    c. *In re: Citizens Development Corporation, Debtor and Debtor in Possession*, Case No. 10-15142-LT11. United States Bankruptcy Court, Southern District

of California. (San Diego Water Board Claim in Bankruptcy) (filed June 2011). (*Catherine George Hagan*)

d. *Test Claim on California Regional Water Quality Control Board, San Diego Region, Order No. R9-2009-0002, (NPDES No. CAS0108740) Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of Orange, the Incorporated Cities of the County of Orange, and the Orange County Flood Control District adopted on December 16, 2009. Test Claim filed by County of Orange, et al., with Commission on State Mandates, No. 10-TC-11* (filed June 2011). *(Catherine George Hagan)*

e. *Test Claim on California Regional Water Quality Control Board, San Diego Region, Order No. R9-2010-0016 (NPDES No. CAS0108766) adopted November 10, 2010, County of Riverside, Riverside County Flood Control and Water Conservation District, and the Cities of Murrieta, Temecula and Wildomar, Co-Claimants, filed with Commission on State Mandates, No. 11-TC-03 (filed November 2011). (Catherine George Hagan)*

f. *City of San Diego v. California Regional Water Quality Control Board, San Diego Division, SFPP, L.P., A Delaware Limited Partnership, and Kinder Morgan Energy Partners, L.P., A Delaware Limited Partnership, Real Parties-in-Interest.* Petition for Writ of Administrative Mandamus. San Diego County Superior Court, Case No. 37-2013-00047614-CU-WM-CTL (filed May 2013). (*Ben Neill*)

g. *Coastal Environmental Rights Foundation, a CA non-profit public benefit corporation v. California Regional Water Quality Control Board, San Diego Region.* Petition for Writ of Administrative Mandamus. San Diego County Superior Court, Case No. 37-2014-00038672-CU-WM-CTL (filed November 2014). (*Ben Neill*)

Petitions for Review Pending Before State Water Resources Control Board[2]

h. Petition of Citizens Development Corporation (Water Code Section 13267 Investigative Order No. R9-2011-0033 dated September 14, 2011, Requiring Submission of Technical Reports Pertaining to Investigation of Lake San Marcos Nutrient Impairment, San Diego County), SWRCB/OCC File A-2185, filed October 2011. (*Laurie Walsh*)

i. Petition of City of San Diego (Time Schedule Order No. R9-2011-0052 dated September 14, 2011, for the Kinder Morgan Energy Partners, Mission Valley Terminal Remediation Dewatering Discharge to Murphy Canyon Creek, San Diego County), SWRCB/OCC File A-2186, filed October 2011. (*Ben Neill*)

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[2] Petitions for review of San Diego Water Board actions or inactions filed with the State Water Board being held in abeyance by the State Water Board are generally not listed in the agenda. The titles of these matters are available at the San Diego Water Board. Please contact Catherine George Hagan at catherine.hagan@waterboards.ca.gov or 619-521-3012 for more information.

j. Petitions for Review of San Diego Bay Shipyard Sediment Cleanup and Abatement Order No. R9-2012-0024 for Campbell Industries, City of San Diego, San Diego Gas & Electric (SDG&E) and San Diego Unified Port District (Port District) issued March 14, 2012. Petitions for Review and Requests for Stay filed by NASSCO, and City of San Diego. Petitions for Review w/o requests for stay filed by SDG&E, Star & Crescent Boat Company and Port District. SWRCB/OCC File A-2205(c), (d), and (e), filed April 2012. (*Frank Melbourn)*

k. Petition of South Laguna Civic Association for Review of Order No. R9-2012-0013, NPDES No. CA0107611, NPDES Permit Reissuance: South Orange County Waste Authority, Discharges to the Pacific Ocean via Aliso Creek Ocean Outfall, adopted April 11, 2012, SWRCB/OCC File A-2211, filed May 2012. (*Joann Lim*)

l. Petition of City of San Diego for Review of Resolution No. R9-2012-0045, re Authorizing Executive Officer to Increase Daily Average Discharge Flow Rate Limitation under Order No. R9-2008-0002 [NPDES No. CAG919002] for the Kinder Morgan Energy Partner's Mission Valley Terminal Remediation Dewatering Discharge to Murphy Canyon Creek, June 13, 2012, SWRCB/OCC File A-2222, filed July 2012. (*Ben Neill*)

m. Petitions for Review of Regional Municipal Separate Storm Sewer System Order No. R9-2013-0001 (NPDES No. CAS0109266), adopted May 8, 2013, filed by (1) San Diego County Regional Airport Authority (stay requested), (2) City of Lake Forest (abeyance request), (3) City of Aliso Viejo (abeyance request), (4) City of Laguna Hills (abeyance request), (5) City of Rancho Santa Margarita (abeyance request), (6) City of Chula Vista, (7) City of National City, (8) Riverside County Flood Control and Water Conservation District, the County of Riverside, and the Cities of Murrieta, Temecula, and Wildomar (abeyance request), (9) City of Dana Point (abeyance request), (10) City of Mission Viejo (abeyance request), (11) City of San Clemente (abeyance request), (12) County of Orange and Orange County Flood Control District (abeyance request), (13) San Diego Unified Port District, (14) City of San Diego (abeyance request), (15) County of San Diego, and (16) City of Laguna Niguel. SWRCB/OCC File A-2254(a)-(p), filed June 2013. (*Wayne Chiu*)

n. Petition of San Diego United Port District, Waste Discharge Requirements Order No. R9-2013-0093 for San Diego Shipyard Sediment Remediation Project, San Diego Bay, San Diego County, July 10, 2013, SWRCB/OCC File A-2263, filed August 2013 (stay requested). (*Alan Monji*)

o. Petition of Donan Environmental Services, Inc., Cleanup and Abatement Order No. R9-2013-0022 at the Site of the Former Santa Ysabel Chevron Station, 30350 Highway 78, Santa Ysabel, San Diego County, September 18, 2013, SWRCB/OCC File A-2277, filed October 2013. (*Sean McClain*)

p. Petition of Kinder Morgan Energy Partners, L.P., for Review of Denial of Request to Rescind or Modify Time Schedule Order No. R9-2011-0052,

November 26, 2014, SWRCB/OCC File A-XXXX, Filed December 23, 2014 (Stay Requested). (*Ben Neill*)

13. *Closed Session*—Consideration of Initiation of Litigation or Discussion of Significant Exposure to Litigation. The San Diego Water Board may meet in closed session to initiate or consider initiating litigation concerning matters within its jurisdiction or to discuss significant exposure to litigation [Authorized under Government Code Section 11126(e)]. *(David Gibson)*

14. *Closed Session*—Deliberation on a Decision to be Reached Based on Evidence Introduced in a Hearing. The San Diego Water Board may meet in closed session to consider evidence received in an adjudicative hearing and to deliberate on a decision to be reached based upon that evidence [Authorized under Government Code Section 11126(c)(3)].

15. *Closed Session*—Personnel. The San Diego Water Board may meet in closed session to consider the appointment, employment, evaluation of performance, or dismissal of a public employee or to hear complaints or charges brought against that employee by another person or employee unless the employee requests a public hearing [Authorized under Government Code Section 11126(a)].

16. Arrangements for Next Meeting and Adjournment:

    Monday, March 16, 2015—9:00 a.m.
    NTC at Liberty Station
    McMillin Companies Event Center
    2875 Dewey Road
    San Diego, California

NOTIFICATIONS

A. **Follow the Board Meeting on Twitter**: Updates on the progress of the San Diego Water Board meeting will be posted on Twitter at www.twitter.com/SDWaterBoard. The San Diego Water Board's use of Twitter is a courtesy and is for informational purposes only. It is not always reliable, and is not a substitute for personal attendance at a Board meeting.

DIRECTIONS TO MEETING

From San Diego: I-5 North to Oso Parkway exit. Right on Oso Parkway to Marguerite Parkway. Left on Marguerite Parkway to Civic Center. Turn left onto Civic Center. Destination will be on the right. Please park in the paved parking lot, not the cobblestones in front of the building.

From the North: I-5 South to La Paz Road exit. Left on La Paz Road to Marguerite Parkway. Right on Marguerite Parkway to Civic Center. Turn right to Civic Center. Destination will be on the right. Please park in the paved parking lot, not the cobblestones in front of the building.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
Summary of Board Actions and Proceedings
At the December 11, 2014 Board Meeting

MINUTES	REGIONAL BOARD ACTIONS
Minutes of the November 12, 2014 Board Meeting.	Approved Minutes.
CONSENT ITEMS	
NPDES Permit Amendment: An order to amend Order No. R9-2012-0006, NPDES No. CA0109258, *Waste Discharge Requirements for Liquid Stone Holdings, LLC, Koochenvagner's Brewing Company dba Stone Brewing Co., Discharge to the Pacific Ocean via the San Elijo Ocean Outfall* (Tentative Order No. R9-2014-0097). (*Vicente Rodriguez*)	Approved Order No. R9-2014-0097.
NPDES Permit Amendment: An order to amend Order No. R9-2010-0012, NPDES Permit No. CA0108952, *Waste Discharge Requirements for the Sweetwater Authority Richard A. Reynolds Desalination Facility Discharge to the Lower Sweetwater River Basin, San Diego County* (Tentative Order No. R9-2014-0109). (*Ben Neill*)	Approved Order No. R9-2014-0109.
NPDES Permit Amendment: An order to amend Order No. R9-2011-0016, NPDES Permit No. CA0107433, *Waste Discharge Requirements for the City of Oceanside San Luis Rey Water Reclamation Facility, La Salina Wastewater Treatment Plant, and Mission Basin Desalting Facility Discharges to the Pacific Ocean via the Oceanside Ocean Outfall* (Tentative Order No. R9-2014-0108). (*Kristin Schwall*)	Approved Order No. R9-2014-0108.

NON-CONSENT ITEMS

Information Item: Introduction of the Division of Drinking Water. (*David Gibson*)	Information Item only; no action taken.
NPDES Permit Amendment: An order to amend Order No. R9-2012-0012, NPDES Permit No. CA0107417, *Waste Discharge Requirements for the South Orange County Wastewater Authority Discharge to the Pacific Ocean through the San Juan Creek Ocean Outfall* to Incorporate Revised Beach Water Quality Monitoring (Tentative Order No. R9-2014-0105). (*Joann Lim and Bruce Posthumus*)	Approved Order No. R9-2014-0105.
NPDES Permit Amendment: An order to amend Order No. R9-2012-0013, NPDES Permit No. CA0107611, *Waste Discharge Requirements for the South Orange County Wastewater Authority Discharge to the Pacific Ocean through the Aliso Creek Ocean Outfall* to Incorporate Revised Beach Water Quality Monitoring (Tentative Order No. R9-2014-0098). (*Joann Lim and Bruce Posthumus*)	Approved Order No. R9-2014-0098.

NOTES:

A. GENERAL STATEMENT. The primary duty of the San Diego Water Board is to protect the quality of the waters within the region for all beneficial uses. This duty is implemented by formulation and adoption of water quality plans for specific ground or surface water basins and by prescribing and enforcing requirements on all domestic and industrial waste discharges. Responsibilities and procedures of the Regional Water Quality Control Board come from the State's Porter-Cologne Water Quality Act and the Nation's Clean Water Act.

   The purpose of the meeting is for the Board to obtain testimony and information from concerned and affected parties and make decisions after considering the recommendations made by the Executive Officer.

   All interested persons may speak at the San Diego Water Board meeting and are expected to orally summarize their written submittals. Testimony should be presented in writing prior to the meeting and only a summary of pertinent points presented orally. Oral testimony (i.e., direct testimony or comment) will be limited in time by the Board Chair (typically 3 minutes for interested persons and no more than 10 minutes for designated parties). A timer may be used and speakers are expected to honor the time limits.

B. PROCEDURE FOR CONSENT (UNCONTESTED) CALENDAR (see also 23 C.C.R. § 647.2) Consent or uncontested agenda items are items for which there appears to be no controversy and which can be acted upon by the San Diego Water Board with no discussion. Such items have been properly noticed and all interested parties consent to the staff recommendation. The San Diego Water Board Chair will recognize late revisions submitted by staff and will then call for a motion and vote on all of the consent calendar items by the San Diego Water Board.

   If any San Diego Water Board member or member of the public raises a question or issue regarding an item that requires San Diego Water Board discussion, the item may be removed from the consent calendar and considered separately in an order determined by the Chair. Anyone wishing to contest a consent item on the agenda is expected to appear in person at the San Diego Water Board meeting and explain to the San Diego Water Board the reason that it is contested.

C. PROCEDURE FOR INFORMATION ITEMS (see also 23 C.C.R. 649, et. seq.). Information items are items presented to the San Diego Water Board for discussion only and for which no San Diego Water Board action or vote is normally taken. The San Diego Water Board usually will hear a presentation by staff, but may hear presentations by others. Comments by interested persons shall also be allowed. Members of the public wishing to address the San Diego Water Board on the topic under discussion should submit an attendance card beforehand indicating their request to speak to the San Diego Water Board. Comment from the public should be for clarification or to add to the San Diego Water Board’s understanding of the item; such comment must not be testimonial in nature or argumentative, as speakers are not under oath and the proceeding is not adversarial. Time limits may be imposed on interested persons.

D. PROCEDURES FOR NON-CONSENT (CONTESTED) AGENDA ITEMS. Non-consent or contested agenda items are items to which the parties involved have not consented and the staff recommendation is in dispute. The procedure that applies to such items depends on the nature of the matter. Matters before the San Diego Water Board may be quasi-legislative or quasi-judicial (adjudicative proceedings). Such items may require a public hearing and all interested persons will be provided an opportunity to make comments.

Contested Adjudicative Matters

Contested agenda items that are adjudicative, not quasi-legislative, are governed by the rules for adjudicative proceedings. State Water Resources Control Board (State Water Board) regulations setting forth the procedures for adjudicative proceedings before the State and Regional Water Boards are codified in Title 23, California Code of Regulations, Division 3. Adjudicative proceedings before the State and Regional Water Boards are governed by State Water Board regulations as authorized by Chapter 4.5 of the Administrative Procedures Act (commencing with section 11400 of the Government Code). State Water Board regulations further provide that, with certain exceptions, adjudicative proceedings will be conducted in accordance with sections 800-805 of the Evidence Code and section 11513 of Chapter 5 of the Government Code. (Other provisions of Chapter 5 of the Government Code do not apply to adjudicative proceedings before the State and Regional Water Boards). A copy of those regulations and Chapter 4.5 of the Administrative Procedures Act, section 11513 of the Government Code and sections 801-805 of the Evidence Code can be found at http://www.waterboards.ca.gov/laws_regulations/.

An adjudicative proceeding is a hearing to receive evidence for determination of facts pursuant to which the State or Regional Water Board formulates and issues a decision. A decision determines a legal right, duty, privilege, immunity or other legal interest of a particular person or persons. Examples of adjudicative proceedings include hearings to receive evidence concerning the issuance of waste discharge requirements or National Pollutant Discharge Elimination System (NPDES) permits, concerning cease and desist orders, and concerning orders imposing administrative civil liability. Adjudicative proceedings are not conducted according to the technical rules of evidence, and the San Diego Water Board will accept testimony and comments that are reasonably relevant to the issues before the Board. Testimony or comments that are not reasonably relevant, or that are repetitious, will be excluded.

In some adjudicative matters, most frequently administrative civil liability matters, a separate Hearing Procedures Document has been issued. In those cases, the procedures set forth in that Document will apply, subject to discretionary modification by the Chairman. For other adjudicatory matters, the Chair may establish specific procedures for each item, and consistent with section 648, subdivision (d) of title 23 of the California Code of Regulations may waive nonstatutory provisions of the regulations. Generally, all witnesses testifying before the San Diego Water Board must affirm the truth of their testimony and are subject to questioning by the Board Members.

Absent a separate Hearing Procedures Document, the Board normally conducts adjudicative proceedings in an informal manner. That is, the Board does not,

generally, require the designation of parties, the prior identification of witnesses, prior submission of written testimony, or the cross examination of witnesses. Any requests for an alternate hearing process should be directed to the Executive Officer and must be received by the San Diego Water Board by the deadline set forth on pages 1-2 of the Agenda.

When the San Diego Water Board determines that a hearing will be formal (as opposed to informal, as described above), participants in a contested agenda item are either “designated parties” or “interested persons.” Only designated parties will have the right to cross-examination, and may be subject to cross-examination. Interested persons (i.e., nondesignated parties) do not have a right to cross-examination, but may ask the San Diego Water Board to clarify testimony. Interested persons may also be asked to clarify their statements at the discretion of the San Diego Water Board.

Designated parties include:
-Discharger or Responsible Party
-Persons directly affected by the discharge
-Staff of the San Diego Water Board (if specified in the applicable hearing procedures)

All other persons wishing to testify or provide comments for a formal hearing are “interested persons” and not “designated parties.” Such interested persons may request status as a designated party for purposes of the formal hearing by submitting such request in writing to the San Diego Water Board no later than the date specified at the beginning of the Agenda Notice or in the applicable Notice of Public Hearing or Hearing Procedures Document. The request must explain the basis for status as a designated party and, in particular, how the person is directly affected by the discharge.

All persons testifying must state their name, address, affiliation, and whether they have taken the oath before testifying. The order of testimony for formal hearings generally will be as follows, unless modified by the San Diego Water Board Chair:

-Testimony and cross-examination of San Diego Water Board staff
-Testimony and cross-examination of discharger
-Testimony and cross-examination of other designated parties
-Testimony by interested persons
-Closing statement by designated parties other than discharger
-Closing statement by discharger
-Closing statement by staff
-Recommendation by Executive Officer (as appropriate)
-Close hearing
-Deliberation and voting by San Diego Water Board

Closing statements shall be for the purpose of summarization and rebuttal and are not to be used to introduce new evidence or testimony. After considering evidence, testimony, and comments, the San Diego Water Board may choose to adopt an order regarding a proposed agenda item.

Quasi-legislative Matters

Quasi-legislative matters include rulemaking and some informational proceedings. These matters may include hearings for the adoption or amendment of regulations, water quality control plans, and hearings to gather information to assist the State and Regional Water Boards in formulating policy for future action. They are not adjudicative proceedings and are subject to different procedures. (See PROCEDURE FOR INFORMATION ITEMS, above, and Cal. Code Regs. Tit. 23, § 649, et seq.)

E. CONTRIBUTIONS TO SAN DIEGO WATER BOARD MEMBERS. Persons applying for or actively supporting or opposing waste discharge requirements or other San Diego Water Board orders must comply with legal requirements if they or their agents have contributed or proposed to contribute $250 or more to the campaign of a San Diego Water Board member for elected office. Contact the San Diego Water Board for details if you fall into this category.

F. PROCEDURAL INFORMATION. The San Diego Water Board may meet in closed session to discuss matters in litigation, including discussion of initiated litigation, significant exposure to litigation, or decisions to initiate litigation [Authority: Government Code § 11126(e)]; deliberate on a decision to be reached based upon evidence introduced in an adjudicatory hearing [Authority: Government Code § 11126(d)]; or to consider the appointment, employment or dismissal of a public employee to hear complaints or charges brought against a public employee [Authority: Government Code §11126(a)].

The San Diego Water Board may break for lunch at approximately noon at the discretion of the Chairman. During the lunch break San Diego Water Board members may have lunch together. Other than properly noticed closed session items, San Diego Water Board business will not be discussed.

Agenda items are subject to postponement. A listing of postponed items will be posted in the meeting room. You may contact the designated staff contact person in advance of the meeting day for information on the status of any agenda item.

Speaker Cards. All persons desiring to address the San Diego Water Board are required to fill out a speaker card. Cards are normally provided near the entrance to the meeting room. San Diego Water Board staff can assist you in locating the cards.

Please fill out a separate card for each item you plan to speak on. All relevant sections, including the oath, must be completed. Please use the appropriate color card, as indicated below:

Blue: Public Comments (for items requiring no San Diego Water Board action - Public Forum, status reports, etc.).
Green: Public Testimony, in support of the tentative action.
Pink: Public Testimony, opposed to the tentative action.

G. AVAILABILITY OF EXECUTIVE OFFICER'S REPORT AND AGENDA MATERIAL. Visit our website at www.waterboards.ca.gov/sandiego to view the Executive Officer's Report over the internet two days prior to the San Diego Water Board meeting. A copy can also be obtained by contacting the staff office. A limited number of copies are available at the meeting.

Copies of most agenda items to be considered by the San Diego Water Board are posted as available on the San Diego Water Board's website at http://www.waterboards.ca.gov/sandiego/board_info/agendas.

Details concerning other agenda items are available for public reference during normal working hours at the San Diego Water Board's office. The appropriate staff contact person, indicated with the specific agenda item, can answer questions and provide additional information. For additional information about the Board, please see the attached sheet.

H. PETITION OF SAN DIEGO WATER BOARD ACTION. In accordance with California Water Code section 13320 and California Code of Regulations, title 23, section 2050 et seq., any person affected adversely by most decisions of the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) may petition the State Water Resources Control Board (State Board) to review the decision. The petition must be received by the State Board within 30 days of the San Diego Water Board's meeting at which the adverse action was taken. Copies of the law and regulations applicable to filing petitions will be provided upon request.

I. HEARING RECORD. Material presented to the Board as part of testimony (e.g. photographs, slides, charts, diagrams etc.) that is to be made part of the record must be left with the Board. Photographs or slides of large exhibits are acceptable.

All Board files, exhibits, and agenda material pertaining to items on this agenda are hereby made a part of the record.

J. ACCESSIBILITY. The facility is accessible to people with disabilities. Individuals who have special accommodation or language needs, please contact Ms. Chris Blank at (619) 521-3382 or cblank@waterboards.ca.gov at least 5 working days prior to the meeting. TTY/TDD/Speech-to-Speech users may dial 7-1-1 for the California Relay Service.

K. PRESENTATION EQUIPMENT. Providing and operating projectors and other presentation aids are the responsibilities of the speakers. Some equipment may be available at the Board Meeting; however, the type of equipment available will vary dependent on the meeting location. Because of compatibility issues, provision and operation of laptop computers and projectors for Power Point presentations will generally be the responsibility of the individual speakers. To ascertain the availability of presentation equipment please contact Ms. Chris Blank at (619) 521-3382 or cblank@waterboards.ca.gov at least 5 working days prior to the meeting.

State of California
Regional Water Quality Control Board
San Diego Region

EXECUTIVE OFFICER SUMMARY REPORT
February 11, 2015

ITEM: 10

SUBJECT: NPDES Permit Amendment: An Order to amend Order No. R9-2013-0001, NPDES No. CAS0109266, *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Regional MS4 Permit or Permit). The amendment includes, but is not limited to, incorporation of the County of Orange, several cities of South Orange County, and the Orange County Flood Control District as Copermittees. (Tentative Order No. R9-2015-0001) (*Laurie Walsh and Christina Arias*)

PURPOSE: To consider adoption of Tentative Order No. R9-2015-0001 amending Order No. R9-2013-0001 **(Supporting Document 1)**.

RECOMMENDATION: Adoption of Tentative Order No. R9-2015-0001 is recommended.

KEY ISSUES:

1. An administrative finding has been added to the Tentative Order announcing the San Diego Water Board's intent to consider incorporation of an alternative compliance option, for complying with receiving water limitations, into the Regional MS4 Permit during the Riverside County Copermittees' MS4 Permit reissuance proceedings scheduled for FY 2015-16.

2. The Tentative Order was revised to include a definition of "prior lawful approval" in the Regional MS4 Permit to provide clarity on how the term should be interpreted in determining structural BMP requirements for Priority Development Projects.

3. Pursuant to the federal Clean Water Act and regulations adopted thereunder, Attachment E of Attachment 1 of the Tentative Order incorporates water quality-based effluent limitations (WQBELs) consistent with the assumptions and requirements of approved Total Maximum Daily Load

(TMDL) wasteload allocations. The Copermittees object to the inclusion of WQBELs because they do not believe the WQBELs are achievable.

PRACTICAL VISION: The Regional MS4 Permit directly implements several chapters of the San Diego Water Board's Practical Vision entitled *Healthy Waters, Healthy People.* Multiple provisions of the Permit pertain to the development and implementation of strategies to achieve healthy waters and recovery of stream, wetlands, and riparian ecosystems. These strategies implement an outcome-based approach, with a focus on achieving measureable reductions in MS4 pollutant discharges and improvements in receiving water quality. By extending the coverage of the Regional MS4 Permit to incorporate the Orange County Copermittees, the Tentative Order will enable these Copermittees to more flexibly deploy resources to achieve goals that will yield the greatest water quality improvements.

DISCUSSION: The County of Orange, Orange County Flood Control District and the cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Lake Forest, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano (collectively referred to as Orange County Copermittees) are currently regulated by MS4 Permit Order No. R9-2009-0002, which expired on December 16, 2014. The Orange County Copermittees jointly submitted a Report of Waste Discharge (RoWD) in application for MS4 permit reissuance on May 20, 2014. A map showing the boundaries of these municipalities and the San Diego Water Board's jurisdiction is provided in **Supporting Document 2**. The recommendations set forth in the RoWD for revised permit requirements are largely consistent with the requirements of the Regional MS4 Permit adopted by the San Diego Water Board on May 8, 2013.

The Tentative Order proposes to amend the Regional MS4 Permit to incorporate the Orange County Copermittees. The Tentative Order also proposes to amend the Regional MS4 Permit to address a variety of other issues including: 1) Regional Water Board designation to consolidate regulation of Phase I MS4 discharges for the Cities of Laguna Hills, Laguna Woods, and Lake Forest pursuant to Water Code section 13228; 2) incorporation of the Los Peñasquitos Lagoon Sediment TMDL requirements; 3) extension of a pollutant reduction deadline for MS4 discharges to Areas of

Special Biological Significance; 4) incorporation of interim exemptions for hydromodification management; and 5) implementation of a uniform approach for monitoring beach water quality in south Orange County. The Executive Officer's Summary Report from the October 8, 2014, workshop contains a summary of these proposed revisions and background information on the Regional MS4 Permit (**Supporting Document 3**). These proposed revisions to the Regional MS4 Permit, which were initially proposed in the draft Tentative Order issued on September 18, 2014, are highlighted in blue underline and red-strikeout text in Attachments 1 and 2 of the Tentative Order.

The San Diego Water Board released the Tentative Order for a 60-day review and comment period that concluded on November 19, 2014. Fourteen comment letters were timely received and are presented in **Supporting Document 4**. In response to comments, the San Diego Water Board made further revisions to the Tentative Order which are highlighted in yellow text. The San Diego Water Board also prepared responses to comments timely received. These responses are presented in **Supporting Document 5**. A summary of the major revisions made to the Tentative Order in response to comments is provided below.

Future Consideration of Alternative Compliance Option
The San Diego Water Board received several comment letters from Copermittees requesting that the discharge prohibitions and receiving water limitations in Provision A of the Regional MS4 Permit be modified to provide an "alternative compliance option" for meeting receiving water limitations that is clearly linked to good faith engagement by the Copermittees in the iterative process for Water Quality Improvement Plan development and implementation. The receiving water limitations are Permit requirements, based on precedential State Water Board orders, that specify MS4 discharges must not cause or contribute to exceedances of water quality standards in the waters of the United States that receive those discharges. The Copermittees are requesting that the Permit language be modified so that development and implementation of the Water Quality Improvement Plans constitute compliance with the prohibitions and receiving water limitations of Provision A.

On November 21, 2014, the State Water Resources Control Board (State Water Board) released a Draft Order in

response to petitions challenging the 2012 Los Angeles County MS4 Permit, which includes an alternative compliance option. The current version of the Draft Order affirms the concept of an alternative compliance option and recommends that Regional Water Boards consider inclusion of the option in MS4 permits. On December 16, 2014, the State Water Board held a public workshop to receive comments and discuss the Draft Order. No decision regarding whether or not it was appropriate to include the alternative compliance option was made at the workshop, and the State Water Board did not indicate when a final Order may be issued. The San Diego Water Board provided comments on the Draft Order by memorandum dated January 21, 2015 **(Supporting Document 6)**.

During adoption of the Regional MS4 Permit in 2013, commenters from environmental organizations were strongly opposed to the concept of an alternative compliance option, and asserted that such modifications to Provision A would a) "weaken" the requirements, b) inappropriately exempt the Copermittees from enforcement for receiving water limitations violations (commonly referred to as a "safe harbor"), and c) violate federal anti-backsliding requirements. The San Diego Water Board considered inclusion of an alternative compliance option during the adoption proceedings for the Regional MS4 Permit, but ultimately voted against including one at the time. Based on the change of direction on this issue the State Water Board appears to be taking in their Draft Order, the alternative compliance option should be revisited again. The San Diego Water Board will be considering incorporation of the Riverside County Copermittees into the Regional MS4 Permit in late 2015 or early 2016. As part of this process, the San Diego Water Board should also consider the incorporation of a well-defined, transparent, and finite alternative compliance option similar to the option proposed in 2013, but also consistent with any decisions/guidance that may be forthcoming from the State Water Board. A rigorous alternative compliance option would allow the Copermittees that are willing to pursue significant receiving water quality improvements beyond the iterative process to be deemed in compliance with the receiving water limitations. Inclusion of the alternative compliance option during the proceedings for the Riverside County Copermittees will provide stakeholders with the necessary opportunity to discuss, comment, and suggest changes to any proposed language. A proposed

administrative finding (Finding 18) addressing these considerations has been added to the Tentative Order.

Definition of Prior Lawful Approval

The San Diego Water Board received two comment letters, one from the City of San Diego and one from the Construction Industry Coalition on Water Quality (a non-profit group representing the land development community), requesting that the Tentative Order be revised to incorporate a definition for the term "prior lawful approval" as it pertains to the Permit requirement to implement structural BMPs on Priority Development Projects. The San Diego Water Board also received one comment letter from San Diego Coastkeeper and Coastal Environmental Rights Foundation cautioning that including a definition could allow for vested rights that run counter to widely accepted law.

After careful consideration of the issue, the Tentative Order was revised to include a definition for the term "prior lawful approval" that is intended to provide guidance and clarification to San Diego, Orange, and Riverside County Copermittees in determining structural BMP requirements for Priority Development Projects. The definition will also assist the San Diego Water Board in assessing the Copermittees' compliance with implementing the structural BMP requirements for Priority Development Projects to the maximum extent practicable (MEP) standard. A proposed finding (Finding 15) addressing these considerations has been added to the Tentative Order. The proposed definition of the term can be found in Attachment 1of the Tentative Order at page 97 of 132.

Other Modifications

The San Diego Water Board also made other, less substantial, changes to the Tentative Order in response to comments. The San Diego Water Board added a requirement to include water quality equivalency calculations for San Diego Water Board approval before Copermittees are allowed to administer an offsite alternative compliance program (i.e. an alternative to implementing structural BMPs onsite). This will ensure consistency in administering these programs among the Copermittees. This revision can be found in Attachment 1of the Tentative Order at page 92 of 132.

The San Diego Water Board also made revisions to the language in the Los Peñasquitos Lagoon Sediment TMDL in response to suggestions made by the City of San Diego and the City of Del Mar. Most notably, the wasteload allocation was modified to clarify that it is assigned to all responsible parties identified during TMDL development, not just the MS4 Copermittees. This revision can be found in Attachment 1of the Tentative Order at page E-54.

LEGAL CONCERNS: Responses to legal comments received during the public comment period are included in the Response to Comments document at Lgl-1 through Lgl-5 and Fnd-1 through Fnd-9.

SUPPORTING DOCUMENTS:

1. Tentative Order No. R9-2015-0001 with Attachments:
   1) Revised Order No. R9-2013-0001
   2) Revised Fact Sheet to Order No. R9-2013-0001
2. Map – San Juan Hydrologic Unit Showing Copermittee Boundaries
3. October 8, 2014 Workshop Executive Officer Summary Report
4. Comment Letters Received on Tentative Order No. R9-2015-0001 and Attachments thereto
5. San Diego Water Board Response to Comments
6. January 21, 2015 San Diego Water Board comment submittal on State Water Board Draft Order in review of the Los Angeles County MS4 Order
7. Notice of Public Hearing

PUBLIC NOTICE: Notice of this item was provided to interested persons via the San Diego Water Board e-mail subscription list on January 9, 2015 **(Supporting Document 7)**. Notice was also published in the Riverside Press Enterprise, San Diego Union, and Orange County Register newspapers. It was also provided in the Meeting Notice and Agenda for the February 11, 2015 Board meeting, which is posted on the San Diego Water Board's website.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

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TENTATIVE ORDER NO. R9-2015-0001

AN ORDER AMENDING ORDER NO. R9-2013-0001, NPDES NO. CAS010266 NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The California Regional Water Quality Control Board, San Diego Region (hereinafter San Diego Water Board), finds that:

ENROLLMENT OF ORANGE COUNTY COPERMITTEES

1. **Enrollment Process.** On May 8, 2013, the San Diego Water Board adopted Order No. R9-2013-0001, NPDES No. CAS019266, *National Pollutant Discharge Elimination System Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Order No. R9-2013-0001, Order or Regional MS4 Permit). Provision F.5 of that Order outlines a process to designate (enroll) the County of Orange, the Orange County Flood Control District and the south Orange County Cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Lake Forest, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano (collectively Orange County) as Copermittees under Order No. R9-2013-0001, responsible for compliance with the terms and the conditions of the Order. Provision F.5 provides that prior to such enrollment the San Diego Water Board must first review and consider a Report of Waste Discharge (RoWD), submitted by the Orange County Copermittees under their current MS4 NPDES Order No. R9-2009-0002, to determine whether the Copermittees should be enrolled under Order No. R9-2013-0001 and what changes to the Order proposed in the RoWD are appropriate.

2. **Report of Waste Discharge.** By letter dated May 20, 2014, the Orange County Copermittees jointly submitted a RoWD in application for the reissuance of waste discharge requirements, pursuant to the requirements of section K.2.b of Order No. R9-2009-0002, for MS4 discharges draining the San Juan Hydraulic Unit within the San Diego Region. The RoWD discusses the MS4 Permit compliance activities and accomplishments of the Orange County Copermittees over the period June 2009 through June 2013. The RoWD also identifies all of the activities, research, and pilot studies the Copermittees propose to undertake during the next permit term based

upon consideration of the effectiveness of the Orange County Storm Water Program and the need for additional pollutant control initiatives. Development of a watershed-based planning approach is portrayed in the RoWD as the most important next step to take in the development of the storm water programs in Orange County. The RoWD concludes that such a comprehensive approach offers the opportunity to identify the environmental and recreational benefits that can be realized in each watershed and the management strategies that will most effectively ensure their realization. Among several recommendations, the RoWD included a request that permit requirements be amended to provide an initial or time limited exemption from hydromodification control best management practices (BMPs) for conveyance channels that are engineered and regularly maintained with the capacity to convey peak flows generated from the 10-year or greater storm event from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean. The County of Orange also separately requested a second exemption for discharges to "large river" low gradient reaches with a very wide flood plain by letter dated November 22, 2013. The San Diego Water Board has reviewed the RoWD and determined it is complete.

3. **Permit Hydromodification Control Requirement Modifications.** The hydromodification control BMP requirements in Provision E.3.c.(2) of Order No. R9-2013-0001 require modification to address the hydromodification exemption issues identified in the Orange County Copermittees' RoWD application and November 22, 2013 letter. To facilitate the transition of the Orange County Copermittees (and eventually the Riverside County Copermittees) to the Regional MS4 Permit from the current Phase I MS4 NPDES permit (Order No. R9-2009-0002), two temporary exemptions from hydromodification control BMP requirements should be provided. The first temporary exemption would allow relief from hydromodification control BMP requirements for Priority Development Projects discharging directly to an engineered channel conveyance system with a capacity to convey peak flows generate by the 10-year storm event all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean. The second temporary exemption would allow relief from hydromodification control BMP requirements for Priority Development Projects discharging directly to large river reaches with drainage areas larger than 100 square miles and a 100-year flow capacity in excess of 20,000 cubic feet per second.

4. **Orange County Copermittees Enrollment.** After consideration of the Orange County RoWD and changes needed to Order No. R9-2013-0001, the San Diego Water Board has determined that the County of Orange, the Orange County Flood Control District and the south Orange County Cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano should be enrolled as Copermittees under Order No. R9-2013-0001 (Order) and responsible for compliance with the terms and the conditions of the Order. Enrolling the Orange County Copermittees into Order No. R9-2013-0001 (and the eventual enrollment of Riverside County Copermittees upon expiration of their current MS4 permit) will

provide regulatory consistency in the implementation of MS4 permit requirements throughout the San Diego Region, improve communication and coordination among Copermittees within watersheds crossing multiple jurisdictions, and maximize efficiency and economy of resources for the San Diego Water Board achieved through the redirection of staff permitting resources to better advance the storm water program. The enrollment of the Cities of Laguna Hills, Laguna Woods and Lake Forest is subject to a California Water Code (Water Code) section 13228 agreement as set forth in the findings of this Order.

DESIGNATION OF A REGIONAL WATER BOARD

5. **Regional Water Board Designation.** The Cities of Laguna Woods, Laguna Hills and Lake Forest (Cities) are located partially within the jurisdictions of both the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board) and the San Diego Water Board. Written requests for designation of a single Regional Water Board to regulate matters pertaining to permitting of Phase I MS4 discharges were submitted to the San Diego Water Board by the City of Laguna Woods by letter dated September 8, 2014, the City of Laguna Hills by letter dated March 12, 2014, and the City of Lake Forest by letters dated January 14, 2013, and April 4, 2014. The Cities of Laguna Hills and Laguna Woods requested designation of the San Diego Water Board, and the City of Lake Forest requested designation of the Santa Ana Water Board. Water Code section 13228 specifies the circumstances that allow, and the process for, designation of a Regional Water Board.

6. **Factual Considerations**. The Santa Ana Water Board and San Diego Water Board establish generally consistent requirements for MS4 discharges to meet the technology-based standard of reducing pollutants in the discharge to the maximum extent practicable (MEP), a related iterative process to ensure MS4 discharges meet receiving water quality standards, and non-storm water discharges to be effectively prohibited from entering the MS4. However due to the unique nature of watersheds and water quality issues in the San Diego Region and Santa Ana Region, MS4 permit requirements between the two Regional Water Boards may also vary to address region specific pollutant discharges and watershed conditions. The Cities of Laguna Woods, Laguna Hills, and Lake Forest report that management and implementation of municipal programs to comply with two different MS4 permits creates a significant administrative and financial burden that is not contributing to greater overall water quality improvements in either region.

7. **Regional Water Board Agreement**. In an effort to address the concerns of the Cities, the San Diego Water Board and the Santa Ana Water Board have entered into an agreement whereby the San Diego Water Board is designated to regulate Phase I MS4 discharges within the jurisdiction of the Cities of Laguna Woods and Laguna Hills and the Santa Ana Water Board is designated to regulate Phase I MS4 discharges within the jurisdiction of the City of Lake Forest. Both the Santa Ana Water Board and the San Diego Water Board Phase I MS4 permits for Orange

County Copermittees, including Cities, require amendments to make the designations effective. To avoid gaps or duplication in regulation for the Cities, the agreement, dated January XX, 2015, is effective on the later effective date of this Order or the Santa Ana Water Board's reissuance (Tentative Order No. R8-2015-0001). Under the terms of the agreement the City of Lake Forest will be required to retain and continue implementing the prohibition of over-irrigation discharges identified in Title 15, Chapter 15, Section 14.030 of the City Municipal Code for regulating storm water quality throughout its jurisdiction, which was established during the permit term of Order No. R9-2009-0002. The City of Lake Forest will also be required to actively participate in the development and implementation of the Aliso Creek Watershed Management Area Water Quality Improvement Plan required pursuant to the San Diego Water Board's Regional MS4 Permit, Order No. R9-2013-0001. Under the terms of the agreement, any Total Maximum Daily Load (TMDL) and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Laguna Woods, Laguna Hills or Lake Forest as a responsible party, will be incorporated into the appropriate MS4 permit by reference. Enforcement of the applicable TMDL would remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's San Diego Creek/Newport Bay TMDL and the San Diego Water Board's Indicator Bacteria Project I Beaches and Creeks TMDL.

8. **Periodic Review of Regional Water Board Agreement.** The basis supporting the Cities of Laguna Woods, Laguna Hills, and Lake Forest requests to designate a specific Regional Water Board for regulatory oversight of MS4 discharges may change under future conditions and circumstances. Therefore the San Diego Water Board will periodically review the effectiveness of the agreement during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate the agreement with the Santa Ana Water Board or otherwise modify the agreement subject to the approval of the Santa Ana Water Board.

WATER QUALITY CONTROL PLANS AND POLICIES

9. **Cause for Modification.** Federal NPDES regulations at 40 CFR 122.62(a)(3) provide that NPDES permits may be modified when the standards or regulations on which the permit was based have been changed by promulgation of amended standards or regulations or by judicial decision after the permit was issued. Standard Permit Provision 1.f of Attachment B to Order No. R9-2013-0001 provides in relevant part that the Order may be modified for cause. Section II.H.4.d. of the Order provides that the Order may be reopened during its term for cause including when the *Water Quality Control Plan for the San Diego Basin (9)* (Basin Plan) is amended by the San Diego Water Board to incorporate a new TMDL, and the amendment is approved by the State Water Resources Control Board (State Water Board), Office of Administrative Law, and the United State Environmental Protection Agency (USEPA). The amended changes to water quality control plans and policies set forth in the findings below represent changes to standards on which Order No.

R9-2013-0001 was based.

10. **Special Conditions for Areas of Special Biological Significance**. On March 20, 2012, in Resolution No. 2012-0012, the State Water Board adopted a General Exception to the Ocean Plan Areas of Special Biological Significance (ASBS) waste discharge prohibition for storm water and nonpoint source discharges, including Special Protections for Beneficial Uses. On June 19, 2012, in Resolution No. 2012-0031, the State Water Board amended the General Exception to require pollutant load reductions to be achieved over a six year term. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject to the terms and conditions of State Water Board General Exception, as amended.

11. **Total Maximum Daily Loads (TMDLs)**. On June 13 2012 the San Diego Water Board in Resolution No. R9-2012-0033 amended the Basin Plan to incorporate the Los Penasquitos Lagoon Sediment TMDL. This TMDL Basin Plan amendment was approved by the State Water Board on January 21, 2014, by the Office of Administrative Law (OAL) on July 14, 2014, and USEPA on ~~Month XX, Year~~October 30, 2014. The County of San Diego, City of San Diego, City of Del Mar, and the City of Poway are among the responsible parties collectively assigned a single wasteload allocation applicable to MS4 discharges under the terms and conditions of the TMDL.

BEACH WATER QUALITY MONITORING AND ASSESSMENT PROGRAM

12. **Unified Approach Beach Water Quality Monitoring.** In November 2010, the State Water Board adopted Resolution No. 2010-0053, directing regional water boards to work with dischargers to modify beach water quality monitoring programs required by regional water board-issued permits in order to eliminate redundancies and incorporate beach water quality monitoring required by applicable statutes, where appropriate. Beginning in 2012, the San Diego Water Board reviewed the various beach water quality monitoring programs conducted in south Orange County and convened a stakeholder workgroup to develop a unified regional beach water quality monitoring and assessment program (Unified Program). The Unified Program is outlined in the San Diego Water Board report entitled "*Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County,*" dated September 2014. The Unified Program is consistent with and will meet or exceed the minimum requirements for beach water quality monitoring and related public notification and reporting established by State law, including the California Ocean Plan. The Unified Program will help protect the health of swimmers, surfers, and others who use south Orange County beach waters for water contact recreational activities.

13. **Monitoring Framework Consistency**. The Unified Program is consistent with and will help implement "*A Framework for Monitoring and Assessment in the San Diego Region*," which emphasizes the need for question-driven, beneficial use-oriented monitoring and assessment. The primary purpose of the Unified Program will be to answer the question "Does beach water quality meet standards for the beneficial use of water contact recreation?"

14. **Unified Program Implementation**. The San Diego Water Board Executive Officer has issued a written directive, pursuant to California Water Code sections 13225, 13267, and 13383, for the South Orange County Wastewater Authority (SOCWA) and the south Orange County Copermittees to implement the Unified Program, in cooperation with the Orange County Health Care Agency (OCHCA). After appropriate opportunity for public input, the Executive Officer may make revisions to the Unified Program, provided that the Unified Program, as revised, continues to be consistent with and meet the requirements of State law, including the California Ocean Plan, for beach water quality monitoring and related public notification and reporting. The Unified Program will supersede the existing routine, ongoing, beach water quality monitoring programs in south Orange County that are conducted in accordance with the existing requirements of the NPDES permits for discharges from SOCWA ocean outfalls and the south Orange County Copermittees' MS4s. The requirement for the Orange County Copermittees to participate in "regional monitoring" of beach water quality replaces requirements to conduct "core monitoring" of beach water quality, as provided for in Appendix III of the 2012 California Ocean Plan.

DEFINITION OF PRIOR LAWFUL APPROVAL

~~14.~~15. **Prior Lawful Approval.** Provision E.3.e.(1) of Order No. R9-2013-0001 requires Copermittees to impose the structural BMP requirements of Provision E.3.c on Priority Development Projects that have not received prior lawful approval by the effective date of the BMP Design Manual. The San Diego Water Board has determined that a definition of the term "prior lawful approval" should be included in Order No. R9-2013-0001 to provide clarity to the San Diego, Orange, and Riverside County Copermittees, the land development community, and the general public on how the term should be interpreted in determining structural BMP requirements for Priority Development Projects. A definition of the term "prior lawful approval" will also assist the San Diego Water Board in assessing Copermittee compliance with implementing the structural BMP requirements for Priority Development Projects to the maximum extent practicable (MEP) standard.

ADMINISTRATIVE FINDINGS

~~15.~~16. **Effect of this Order.** This Order amends Order No. R9-2013-0001 to:

a. Enroll the County of Orange, the Orange County Flood Control District and the south Orange County Cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano as Copermittees responsible for compliance with the terms and conditions of Order No. R9-2013-0001,as amended by this Order;

b. Designate the San Diego Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the Cities of Laguna Woods and Laguna Hills and the Santa Ana Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the City of Lake Forest, subject to the terms of the agreement between San Diego Water Board and the Santa Ana Water Board described in Finding 7 of this Order;

c. Establish interim exceptions to land development requirements for those Priority Development Projects that discharge to engineered channels and large river reaches described in Finding 3 of this Order;

d. Incorporate the amended requirements of the State Water Board's General Exception to require that pollutant reductions be achieved within 6 years for storm water and nonpoint source discharges to ASBS;

e. Incorporate applicable requirements of the Los Peñasquitos Lagoon Sediment TMDL; ~~*and*~~

f. Require the Orange County Copermittees to implement the "*Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County,*" dated September 2014, made effective in the Monitoring and Reporting Program/Order issued pursuant to California Water Code sections 13225, 13267, and 13383 and subject to future revisions by the Executive Officer after appropriate public input~~.~~, and

g. Include additional language that clarifies the term "prior lawful approval" for the implementation of appropriate structural BMP requirements to Priority Development Projects.

17. **Effect of this Order.** Order No. R9-2013-0001 is not being reopened for any other purpose than the revisions contained herein. Except as contradicted or superseded by the findings and directives set forth in this Order, all of the previous findings and directives of Order No. R9-2013-0001 shall remain in full force and effect.

18. **Future Consideration of Alternative Compliance Option.** San Diego, Orange County, and Riverside County Copermittees have asserted that the prohibitions and receiving water limitations in Provision A.1.a, A.1.c, and A.2 of Order No. R9-2013-0001 may result in many years of noncompliance because years of technical efforts may ultimately be required to achieve compliance with the receiving water limitations, especially for wet weather discharges. To address this issue, the San Diego Water Board plans to consider the incorporation of a well-defined, transparent, and finite alternative path to compliance in Order No. R9-2013-0001, as amended by Order No. R9-2015-0001, during the MS4 NPDES permit reissuance proceedings for the Riverside County Copermittees scheduled for fiscal year 2015-16. This alternative compliance option would allow the Copermittees that are willing to pursue significant receiving water quality improvements beyond the iterative process to be deemed in compliance with the receiving water limitations. An alternative compliance option of this type was previously considered by the San Diego Water Board during the adoption proceedings for Order No. R9-2013-0001.

~~16.~~19. **California Environmental Quality Act**. This action is exempt from the requirement of preparation of environmental documents under the California Environmental Quality Act [Public Resources Code, Division 13, Chapter 3, Section 21000 et seq.] in accordance with California Water Code section 13389.

~~17.~~20. **Public Notice.** In accordance with State and federal laws and regulations, the San Diego Water Board has notified San Diego County, Orange County and Riverside County Copermittees, and all known interested agencies and persons of its intent to adopt this Order and has provided them with an opportunity to submit their written comments and recommendations.

~~18.~~21. **Public Hearing.** The San Diego Water Board held a public hearing on February 11, 2015 and heard and considered all comments pertaining to the adoption of this Order.

~~19.~~22. **Notification.** Any person aggrieved by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with California Water Code section 13320 and California Code of Regulations, title 23, sections 2050 et seq. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date of this Order. Copies of the law and regulations applicable to filing petitions may be found on the Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

THEREFORE, IT IS HEREBY ORDERED,

1. This Order amends the Regional MS4 Permit, Order No. R9-2013-0001 and the Fact Sheet (Attachment F of the Order) as described in the revised versions of Order No. R9-2013-0001 and Fact Sheet included as Attachments 1 and 2 to this Order. Added text to Order No. R9-2013-0001 and the Fact Sheet is displayed in blue-

underline text and deleted text is displayed as red-strikeout text.

2. The amended version of Order No. 2013-0001 and Fact Sheet included as Attachments 1 and 2 to this Order shall become effective on April 1, 2015.

3. Amended Order No. R9-2013-0001 shall supersede Order No. R9-2009-0002 for the Orange County Copermittees except for enforcement purposes.

4. San Diego Water Board staff is directed to prepare and post a conformed copy of Order No. R9-2013-0001 and the Fact Sheet incorporating the revisions made by this Order.

I, David W. Gibson, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on February 11, 2015.

_____
David W. Gibson
Executive Officer

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

ORDER NO. R9-2013-0001, AS AMENDED BY ORDER NO. R9-2015-0001
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The San Diego County Copermittees in Table 1a are subject to waste discharge requirements set forth in this Order.

Table 1a. San Diego County Copermittees

City of Carlsbad	City of Oceanside
City of Chula Vista	City of Poway
City of Coronado	City of San Diego
City of Del Mar	City of San Marcos
City of El Cajon	City of Santee
City of Encinitas	City of Solana Beach
City of Escondido	City of Vista
City of Imperial Beach	County of San Diego
City of La Mesa	San Diego County Regional Airport Authority
City of Lemon Grove	San Diego Unified Port District
City of National City	

~~After the San Diego Water Board receives and considers~~ Tthe Orange County Copermittees~~' Report of Waste Discharge and makes any necessary changes to this Order, the Orange County Copermittees~~ in Table 1b are ~~will become~~ subject to waste discharge requirements set forth in this Order. ~~after expiration of Order No. R9-2009-0002, NPDES No. CAS0108740 on or after December 16, 2014.~~

Table 1b. Orange County Copermittees[1]

City of Aliso Viejo	City of Rancho Santa Margarita
City of Dana Point	City of San Clemente
City of Laguna Beach	City of San Juan Capistrano
City of Laguna Hills	City of Laguna Woods
City of Laguna Niguel	County of Orange
~~City of Lake Forest[1]~~	Orange County Flood Control District

[1] ~~The MS4 discharges within the jurisdiction of the City of Lake Forest located in the San Diego Region will be regulated by the Santa Ana Water Board Order No. R8-2014-0002 (NPDES No. CAS618030) and any reissuance thereto subject to the terms of the agreement between San Diego Water Board and Santa Ana Water Board.~~ While not listed in Table 1b., the City of Lake Forest remains a Copermittee under this Order until the later effective date of this Order or the effective date of Santa Ana Water Board Tentative Order No. R8-2015-0001. Thereafter, the City of Lake Forest will no longer be considered a Copermittee under this Order because its Phase I MS4 discharges will be

City of Mission Viejo	

After the San Diego Water Board receives and considers the Riverside County Copermittees' Report of Waste Discharge and makes any necessary changes to this Order, the Riverside County Copermittees in Table 1c will become subject to waste discharge requirements set forth in this Order after expiration of Order No.R9-2010-0016, NPDES No. CAS0108766 on or after November 10, 2015.

Table 1c. Riverside County Copermittees

City of Murrieta	County of Riverside
City of Temecula	Riverside County Flood Control and Water Conservation District
City of Wildomar	

The ~~Orange County Copermittees and~~ Riverside County Copermittees may become subject to the requirements of this Order at a date earlier than the expiration date of their current Order~~s~~ subject to the conditions described in Provision F.6 of this Order if the Riverside County Copermittees ~~in the respective county~~ receive ~~a~~ notification of coverage from the San Diego Water Board.

The term Copermittee in this Order refers to any San Diego County, Orange County, or Riverside County Copermittee covered under this Order, unless specified otherwise.

This Order provides permit coverage for the Copermittee discharges described in Table 2.

Table 2. Discharge Locations and Receiving Waters

Discharge Points	Locations throughout San Diego Region
Discharge Description	Municipal Separate Storm Sewer System (MS4) Discharges
Receiving Waters	Inland Surface Waters, Enclosed Bays and Estuaries, and Coastal Ocean Waters of the San Diego Region

Table 3. Administrative Information

This Order was adopted by the San Diego Water Board on:	**May 8, 2013**
~~This~~ Order R9-2013-0001 ~~will become~~ became effective on:	**June 27, 2013**
This Order as amended by R9-2015-0001 became effective on:	**April 1, 2015**
This Order will expire on:	**June 27, 2018**
The Copermittees must file a Report of Waste Discharge in accordance with Title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than 180 days in advance of the Order expiration date.	

I, David W. Gibson, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water

regulated by the Santa Ana Water Board pursuant to Water Code section 13228 designation. The requirements of this Order that apply to the City of Lake Forest for the duration of this Order, however, are described in Finding 29 and Footnote 2 to Table B-1.

Quality Control Board, San Diego Region, on May 8, 2013, as amended by adoption of Order No. R9-2015-0001 on February 11, 2015.

David W. Gibson
Executive Officer

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ATTACHMENTS

Attachment A - Discharge Prohibitions and Special Protections A-1
Attachment B - Standard Permit Provisions and General Provisions B-1
Attachment C - Acronyms, Abbreviations and Definitions C-1
Attachment D - Jurisdictional Runoff Management Program Annual Report Form D-1
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Attachment F - Fact Sheet / Technical Report for Order No. R9-2013-0001 as amended by Order No. R9-2015-0001 ..... F-1

I. FINDINGS

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), finds that:

JURISDICTION

1. **MS4 Ownership or Operation.** Each of the Copermittees owns or operates an MS4, through which it discharges storm water and non-storm water into waters of the U.S. within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the U.S.

2. **Legal and Regulatory Authority.** This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]) adopted by the United States Environmental Protection Agency (USEPA), and chapter 5.5, division 7 of the California Water Code (CWC) (commencing with section 13370). This Order serves as an NPDES permit for discharges from MS4s to surface waters. This Order also serves as waste discharge requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

   The San Diego Water Board has the legal authority to issue a regional MS4 permit pursuant to its authority under CWA section 402(p)(3)(B) and 40 CFR 122.26(a)(1)(v). The USEPA also made it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide permits (55 Federal Register [FR] 47990, 48039-48042). The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees and San Diego Water Board.

   The federal regulations make it clear that the Copermittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators (40 CFR 122.26(a)(3)(vi)). This Order does not require the Copermittees to manage storm water outside of their jurisdictional boundaries, but rather to work collectively to improve storm water management within watersheds.

3. **CWA NPDES Permit Conditions.** Pursuant to CWA section 402(p)(3)(B), NPDES permits for storm water discharges from MS4s must include requirements to effectively prohibit non-storm water discharges into MS4s, and require controls to reduce the discharge of pollutants in storm water to the maximum extent practicable (MEP), and to require other provisions as the San Diego Water Board determines are appropriate to control such pollutants. This Order prescribes conditions to assure

compliance with the CWA requirements for owners and operators of MS4s to effectively prohibit non-storm water discharges into the MS4s, and require controls to reduce the discharge of pollutants in storm water from the MS4s to the MEP.

4. **CWA and CWC Monitoring Requirements.** CWA section 308(a) and 40 CFR 122.41(h),(j)-(l) and 122.48 require that NPDES permits must specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s also specify additional monitoring and reporting requirements in 40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c). CWC section 13383 authorizes the San Diego Water Board to establish monitoring, inspection, entry, reporting and recordkeeping requirements. This Order establishes monitoring and reporting requirements to implement federal and State requirements. This Order also includes requirements for the Orange County Copermittees to participate in, and together with South Orange County Wastewater Authority and Orange County Health Care Agency, share responsibility for implementing the unified approach to beach water quality monitoring and assessment program set forth in the October 2014 report, *Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County* ~~as set forth in Monitoring and Reporting Program No. XX~~, issued pursuant to CWC section~~s 13225, 13267, and~~ 13383 in the San Diego Water Board December 5, 2014 Letter Directive.

5. **Total Maximum Daily Loads.** CWA section 303(d)(1)(A) requires that "[e]ach state shall identify those waters within its boundaries for which the effluent limitations are not stringent enough to implement any water quality standard applicable to such waters." The CWA also requires states to establish a priority ranking of impaired water bodies known as Water Quality Limited Segments and to establish Total Maximum Daily Loads (TMDLs) for such waters. This priority list of impaired water bodies is called the Clean Water Act Section 303(d) List of Water Quality Limited Segments, commonly referred to as the 303(d) List. The CWA requires the 303(d) List to be updated every two years.

   TMDLs are numerical calculations of the maximum amount of a pollutant that a water body can assimilate and still meet water quality standards. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point sources (waste load allocations or WLAs) and non-point sources (load allocations or LAs), background contribution, plus a margin of safety. Discharges from MS4s are point source discharges. The federal regulations (40 CFR 122.44(d)(1)(vii)(B)) require that NPDES permits incorporate water quality based effluent limitations (WQBELs) developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, consistent with the assumptions and requirements of any available WLA for the discharge. Requirements of this Order implement the TMDLs established ~~adopted~~ by the San Diego Water Board or ~~and approved by~~ USEPA as of the ~~time~~ date this Order was ~~is issued~~ amended in 2015. This Order establishes WQBELs consistent with the assumptions and requirements of all available TMDL WLAs assigned to discharges from the Copermittees' MS4s.

6. **Non-Storm Water Discharges.** Pursuant to CWA section 402(p)(3)(B)(ii), this Order requires each Copermittee to effectively prohibit discharges of non-storm water into its MS4. Nevertheless, non-storm water discharges into and from the MS4s continue to be reported to the San Diego Water Board by the Copermittees and other persons. Monitoring conducted by the Copermittees, as well as the 303(d) List, have identified dry weather, non-storm water discharges from the MS4s as a source of pollutants causing or contributing to receiving water quality impairments in the San Diego Region. The federal regulations (40 CFR 122.26(d)(2)(iv)(B)(1)) require the Copermittees to have a program to prevent illicit discharges to the MS4. The federal regulations, however, allow for specific categories of non-storm water discharges or flows to be addressed as illicit discharges only where such discharges are identified as sources of pollutants to waters of the U.S.

7. **In-Stream Treatment Systems.** Pursuant to federal regulations (40 CFR 131.10(a)), in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S. Authorizing the construction of a runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to accepting waste assimilation as an appropriate use for that water body. Runoff treatment must occur prior to the discharge of runoff into receiving waters. Treatment control best management practices (BMPs) must not be constructed in waters of the U.S. Construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body.

DISCHARGE CHARACTERISTICS AND RUNOFF MANAGEMENT

8. **Point Source Discharges of Pollutants.** Discharges from the MS4s contain waste, as defined in the CWC, and pollutants that adversely affect the quality of the waters of the state. A discharge from an MS4 is a “discharge of pollutants from a point source” into waters of the U.S. as defined in the CWA. Storm water and non-storm water discharges from the MS4s contain pollutants that cause or threaten to cause a violation of surface water quality standards, as outlined in the Water Quality Control Plan for the San Diego Basin (Basin Plan). Storm water and non-storm water discharges from the MS4s are subject to the conditions and requirements established in the Basin Plan for point source discharges.

9. **Potential Beneficial Use Impairment.** The discharge of pollutants and/or increased flows from MS4s may cause or threaten to cause the concentration of pollutants to exceed applicable receiving water quality objectives and impair or threaten to impair designated beneficial uses resulting in a condition of pollution, contamination, or nuisance.

10. **Pollutants Generated by Land Development.** Land development has created and continues to create new sources of non-storm water discharges and pollutants in

storm water discharges as human population density increases. This brings higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash. Pollutants from these sources are dumped or washed off the surface by non-storm water or storm water flows into and from the MS4s. When development converts natural vegetated pervious ground cover to impervious surfaces such as paved highways, streets, rooftops, and parking lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving a developed area without BMPs that can maintain pre-development runoff conditions will contain greater pollutant loads and have significantly greater runoff volume, velocity, and peak flow rate than pre-development runoff conditions from the same area.

11. **Runoff Discharges to Receiving Waters.** The MS4s discharge runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within the eleven hydrologic units comprising the San Diego Region. Historic and current development makes use of natural drainage patterns and features as conveyances for runoff. Rivers, streams and creeks in developed areas used in this manner are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and receiving water. Numerous receiving water bodies and water body segments have been designated as impaired by the San Diego Water Board pursuant to CWA section 303(d).

12. **Pollutants in Runoff.** The most common pollutants in runoff discharged from the MS4s include total suspended solids, sediment, pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., cadmium, copper, lead, and zinc), petroleum products and polynuclear aromatic hydrocarbons, synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus), oxygen-demanding substances (e.g., decaying vegetation, animal waste), detergents, and trash. As operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not prohibit or otherwise control. These discharges may cause or contribute to a condition of pollution or a violation of water quality standards.

13. **Human Health and Aquatic Life Impairment.** Pollutants in runoff discharged from the MS4s can threaten and adversely affect human health and aquatic organisms. Adverse responses of organisms to chemicals or physical agents in runoff range from physiological responses such as impaired reproduction or growth anomalies to mortality. Increased volume, velocity, rate, and duration of storm water runoff greatly accelerate the erosion of downstream natural channels. This alters stream channels and habitats and can adversely affect aquatic and terrestrial organisms.

14. **Water Quality Effects.** The Copermittees' water quality monitoring data submitted

to date documents persistent exceedances of Basin Plan water quality objectives for runoff-related pollutants at various watershed monitoring stations. Persistent toxicity has also been observed at several watershed monitoring stations. In addition, bioassessment data indicate that the majority of the monitored receiving waters have Poor to Very Poor Index of Biological Integrity (IBI) ratings. These findings indicate that runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in the San Diego Region. Non-storm water discharges from the MS4s have been shown to contribute significant levels of pollutants and flow in arid, developed Southern California watersheds, and contribute significantly to exceedances of applicable receiving water quality objectives.

15. **Non-Storm Water and Storm Water Discharges.** Non-storm water discharges from the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard of CWA section 402(p)(3)(B)(iii), which is explicitly for "Municipal … *Stormwater Discharges* (emphasis added)" from the MS4s. Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s must be effectively prohibited.

16. **Best Management Practices.** Waste and pollutants which are deposited and accumulate in MS4 drainage structures will be discharged from these structures to waters of the U.S. unless they are removed. These discharges may cause or contribute to, or threaten to cause or contribute to, a condition of pollution in receiving waters. For this reason, pollutants in storm water discharges from the MS4s can be and must be effectively reduced in runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Pollution prevention is the reduction or elimination of pollutant generation at its source and is the best "first line of defense." Source control BMPs (both structural and non-structural) minimize the contact between pollutants and runoff, therefore keeping pollutants onsite and out of receiving waters. Treatment control BMPs remove pollutants that have been mobilized by storm water or non-storm water flows.

17. **BMP Implementation.** Runoff needs to be addressed during the three major phases of development (planning, construction, and use) in order to reduce the discharge of storm water pollutants to the MEP, effectively prohibit non-storm water discharges, and protect receiving waters. Development which is not guided by water quality planning policies and principles can result in increased pollutant load discharges, flow rates, and flow durations which can negatively affect receiving water beneficial uses. Construction sites without adequate BMP implementation result in sediment runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. Existing development can generate substantial pollutant loads which are discharged in runoff to receiving waters. Retrofitting areas of existing development with storm water pollutant control and hydromodification management BMPs is necessary to address storm water discharges from existing development that may cause or contribute to a

condition of pollution or a violation of water quality standards.

18. **Water Quality Improvements.** Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges to the MS4s and control pollutants in storm water discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the CWA.

19. **Long Term Planning and Implementation.** Federal regulations require municipal storm water permits to expire 5 years from adoption, after which the permit must be renewed and reissued. The San Diego Water Board recognizes that the degradation of water quality and impacts to beneficial uses of the waters in the San Diego Region occurred over several decades. The San Diego Water Board further recognizes that a decade or more may be necessary to realize demonstrable improvement to the quality of waters in the San Diego Region. This Order includes a long term planning and implementation approach that will require more than a single permit term to complete.

WATER QUALITY STANDARDS

20. **Basin Plan.** The San Diego Water Board adopted the Water Quality Control Plan for the San Diego Basin (Basin Plan) on September 8, 1994, that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for receiving waters addressed through the plan. The Basin Plan was subsequently approved by the State Water Resources Control Board (State Water Board) on December 13, 1994. Subsequent revisions to the Basin Plan have also been adopted by the San Diego Water Board and approved by the State Water Board. Requirements of this Order implement the Basin Plan.

    The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Process Supply (PROC), Industrial Service Supply (IND), Ground Water Recharge (GWR), Contact Water Recreation (REC1), Non-contact Water Recreation (REC2), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Freshwater Replenishment (FRSH), Hydropower Generation (POW), and Preservation of Biological Habitats of Special Significance (BIOL). The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region: Navigation (NAV), Commercial and Sport Fishing (COMM), Estuarine Habitat (EST), Marine Habitat

(MAR), Aquaculture (AQUA), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN), and Shellfish Harvesting (SHELL).

21. **Ocean Plan.** The State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, and 2005. The State Water Board adopted the latest amendment on April 21, 2005 and it became effective on February 14, 2006. The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean. Requirements of this Order implement the Ocean Plan.

    The Ocean Plan identifies the following beneficial uses of ocean waters of the state to be protected: Industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture; preservation and enhancement of designated Areas of Special Biological Significance; rare and endangered species; marine habitat; fish spawning and shellfish harvesting.

22. **Sediment Quality Control Plan**. On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes: 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

23. **National Toxics Rule and California Toxics Rule.** USEPA adopted the National Toxics Rule (NTR) on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the NTR applied in California. On May 18, 2000, USEPA adopted the California Toxics Rule (CTR). The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants.

24. **Antidegradation Policy.** This Order is in conformance with the federal Antidegradation Policy described in 40 CFR 131.12, and State Water Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality Waters in California*. Federal regulations at 40 CFR 131.12 require that the State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. State Water Board Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific

findings. The Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies.

25. **Anti-Backsliding Requirements.** Section 402(o)(2) of the CWA and federal regulations at 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations may be relaxed. All effluent limitations in this Order are at least as stringent as effluent limitations in the previous permits.

CONSIDERATIONS UNDER FEDERAL AND STATE LAW

26. **Coastal Zone Act Reauthorization Amendments.** Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states with approved coastal zone management programs to address non-point source pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point source pollution: agriculture, silviculture, urban, marinas, and hydromodification. This Order addresses the management measures required for the urban category, with the exception of septic systems. The runoff management programs developed pursuant to this Order fulfills the need for coastal cities to develop a runoff non-point source plan identified in the Non-Point Source Program Strategy and Implementation Plan. The San Diego Water Board addresses septic systems through the administration of other programs.

27. **Endangered Species Act.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 USC sections 1531 to 1544). This Order requires compliance with receiving water limits, and other requirements to protect the beneficial uses of waters of the State. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

28. **Report of Waste Discharge Process.** The waste discharge requirements set forth in this Order are based upon the Report of Waste Discharge submitted by the San Diego County Copermittees prior to the expiration of Order No. R9-2007-0001 (NPDES No. CAS0109266) and the Report of Waste Discharge submitted by the Orange County Copermittees prior to the expiration of Order No. R9-2009-0002 (CAS0108740). The ~~Orange County and~~ Riverside County Copermittees are not immediately covered by the waste discharge requirements in this Order. The San Diego Water Board understands that each municipality is unique although the Counties share watersheds and/or geographical boundaries. The Order will continue to use the Report of Waste Discharge process prior to initially making ~~Orange County or~~ Riverside County Copermittees subject to the requirements of this Order.

The federal regulations (40 CFR 122.21(d)(2)) and CWC section 13376 impose a duty on the Copermittees to reapply for continued coverage through submittal of a Report of Waste Discharge no later than 180 days prior to expiration of a currently effective permit. This requirement is set forth in the ~~Orange County Copermittees' and~~ Riverside County Copermittees' currently effective permit~~s~~ at Provision~~s K.2.b and~~ K.2.c~~, respectively~~. The ~~Orange County Permit, Order No. R9-2009-0002 (NPDES No. CAS0108740) expires on December 16, 2014 and the~~ Riverside County MS4 Permit, Order No. R9-2010-0016 (NPDES No. CAS0108766) expires on November 10, 2015.

Unless the ~~Orange County or~~ Riverside County Copermittees apply for and receive early coverage under this Order, ~~the Orange County Copermittees' and~~ the Riverside County Copermittees' ~~respective~~ permit~~s~~ will be superseded by this Order upon expiration of their ~~respective~~ permit~~s~~, subject to any necessary revisions to the requirements of this Order made after the San Diego Water Board considers their ~~respective~~ Report~~s~~ of Waste Discharge through the public process provided in 40 CFR Part 124.

29. Regional Water Board Designation. The Cities of Laguna Hills, Laguna Woods, and Lake Forest are located partially within the jurisdictions of the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board) and the San Diego Water Board and their discharges are subject to regulation by both Regional Water Boards. Pursuant to CWC section 13228, the Cities of Laguna Hills, Laguna Woods, and Lake Forest submitted written requests that one Regional Water Board be designated to regulate Phase I MS4 discharges for each of the Cities. The Santa Ana Water Board and the San Diego Water Board have entered into an agreement dated January XX, 2015, whereby the Cities of Laguna Woods and Laguna Hills are largely regulated by the San Diego Water Board under this Order, including those portions of the Cities of Laguna Woods and Laguna Hills not within the San Diego Water Board's jurisdiction, upon the effective date of this Order or Santa Ana Water Board Order No. R8-2015-0001, whichever is later. Similarly, the City of Lake Forest, including those portions of the City of Lake Forest within the San Diego Water Board's jurisdiction, is largely regulated by the Santa Ana Water Board under Order No. R8-2015-0001 (NPDES No. CAS618030) upon the later effective date of this Order or Order No. R8-2015-0001.~~is designated to regulate Phase I MS4 discharges within the jurisdiction of the Cities of Laguna Woods and Laguna Hills and the Santa Ana Water Board is designated to regulate Phase I MS4 discharges within the jurisdiction of the City of Lake Forest pursuant to MS4 permits administered by each Regional Water Board~~. The agreement provides that the City of Lake Forest is required to retain, and continue implementation of, its over-irrigation discharge prohibition in Title 15, Chapter 14.030, List (b) of the City Municipal Code for regulating storm water quality throughout its jurisdiction. The agreement also requires the City of Lake Forest to actively participate during development and implementation of the Aliso Creek Watershed Management Area Water Quality Improvement Plan required pursuant to this Order. Each Regional Water Board retains the authority to enforce provisions of its Phase I MS4 permits

issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee under the terms of the agreement (Water Code section 13228 (b)). Under the terms of the agreement, any TMDL and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Laguna Woods, Laguna Hills or Lake Forest as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement of the applicable TMDL will remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's San Diego Creek/Newport Bay TMDL and the San Diego Water Board's Indicator Bacteria Project I Beaches and Creeks TMDL. The San Diego Water Board will periodically review the effectiveness of the agreement during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate the agreement with Santa Ana Water Board or otherwise modify the agreement subject to the approval of the Santa Ana Water Board.

~~29.~~30. **Integrated Report and Clean Water Act Section 303(d) List.** The San Diego Water Board and State Water Board submit an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. USEPA issued its *Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act* on July 29, 2005, which advocates the use of a five category approach for classifying the attainment status of water quality standards for water bodies in the Integrated Report. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 in the Integrated Report are placed on the 303(d) List.

Water bodies with available data and/or information that indicate at least one beneficial use is not being supported or is threatened, but a TMDL is not required, are included in Category 4 in the Integrated Report. Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

Implementation of the requirements of this Order may allow the San Diego Water Board to include surface waters impaired by discharges from the Copermittees' MS4s in Category 4 in the Integrated Report for consideration during the next 303(d) List submittal by the State to USEPA.

~~30.~~31. **Economic Considerations.** The California Supreme Court has ruled that although CWC section 13263 requires the State and Regional Water Boards

(collectively Water Boards) to consider factors set forth in CWC section 13241 when issuing an NPDES permit, the Water Board may not consider the factors to justify imposing pollutant restrictions that are less stringent than the applicable federal regulations require. (*City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 618, 626-627.) However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

As noted in the following finding, the San Diego Water Board finds that the requirements in this Order are not more stringent than the minimum federal requirements. Therefore, a CWC section 13241 analysis is not required for permit requirements that implement the effective prohibition on the discharge of non-storm water into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determined appropriate to control such pollutants, as those requirements are mandated by federal law. Notwithstanding the above, the San Diego Water Board has developed an economic analysis of the requirements in this Order. The economic analysis is provided in the Fact Sheet.

~~31.~~**32. Unfunded Mandates.** This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following:

a. This Order implements federally mandated requirements under CWA section 402 (33 USC section 1342(p)(3)(B)).

b. The local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental and new dischargers who are issued NPDES permits for storm water and non-storm water discharges.

c. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order.

d. The Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)) and in lieu of numeric restrictions on their MS4 discharges (i.e. effluent limitations).

e. The local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under State law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

f. The provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state develops a TMDL, federal law requires that permits must contain water quality

based effluent limitations consistent with the assumptions and requirements of any applicable wasteload allocation (40 CFR 122.44(d)(1)(vii)(B)).

See the Fact Sheet for further discussion of unfunded mandates.

32.33. **California Environmental Quality Act.** The issuance of waste discharge requirements and an NPDES permit for the discharge of runoff from MS4s to waters of the U.S. is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 et seq.) in accordance with CWC section 13389.

STATE WATER BOARD DECISIONS

33.34. **Compliance with Prohibitions and Limitations.** The receiving water limitation language specified in this Order is consistent with language recommended by the USEPA and established in State Water Board Order WQ 99-05, *Own Motion Review of the Petition of Environmental Health Coalition to Review Waste Discharge Requirements Order No. 96-03, NPDES Permit No. CAS0108740*, adopted by the State Water Board on June 17, 1999. The receiving water limitation language in this Order requires storm water discharges from MS4s to not cause or contribute to a violation of water quality standards, which is to be achieved through an iterative approach requiring the implementation of improved and better-tailored BMPs over time. Implementation of the iterative approach to comply with receiving water limitations based on applicable water quality standards is necessary to ensure that storm water discharges from the MS4 will not ultimately cause or contribute to violations of water quality standards and will not create conditions of pollution, contamination, or nuisance.

34.35. **Special Conditions for Areas of Special Biological Significance.** On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving an general exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges (General Exception). On June 19, 2012, the State Water Board adopted Order No. 2012-0031, amending the General Exception to require pollutant reductions to be achieved within six years in accordance with ASBS Compliance Plans and ASBS Pollution Prevention Plans. The General Exception State Water Board Resolution No. 2012-0012 requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject to the terms and conditions of the General Exception as amended State Water Board Resolution No. 2012-0012. The

Special Protections contained in Attachment B to the General Exception as amendedResolution No. 2012-0012, are applicable to these discharges, and are hereby incorporated into Attachment A of this Order. as if fully set forth herein.

ADMINISTRATIVE FINDINGS

35.36. **Executive Officer Delegation of Authority.** The San Diego Water Board by prior resolution has delegated all matters that may legally be delegated to its Executive Officer to act on its behalf pursuant to CWC section 13223. Therefore, the Executive Officer is authorized to act on the San Diego Water Board's behalf on any matter within this Order unless such delegation is unlawful under CWC section 13223 or this Order explicitly states otherwise.

~~36.~~37. Standard Provisions. Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR 122.42, are provided in Attachment B to this Order.

~~37.~~38. Fact Sheet. The Fact Sheet for this Order contains background information, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of this Order. The Fact Sheet is hereby incorporated into this Order and constitutes part of the Findings of this Order.

~~38.~~39. Public Notice. In accordance with State and federal laws and regulations, the San Diego Water Board notified the Copermittees, and interested agencies and persons of its intent to prescribe waste discharge requirements for the control of discharges into and from the MS4s to waters of the U.S. and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet.

~~39.~~40. Public Hearings. The San Diego Water Board held a public hearing on April 10 and 11, 2013, that was continued to May 8, 2013 and heard and considered all comments pertaining to the terms and conditions of this Order. The San Diego Water Board also held a public workshop on October 8, 2015, and a public hearing on February 11, 2015, and heard and considered all comments pertaining to the amendment of this Order through Order No. R9-2015-0001. Details of these public hearings are provided in the Fact Sheet.

~~40.~~41. Effective Date. This Order serves as an NPDES permit pursuant to CWA section 402 or amendments thereto, and as to the San Diego County Copermittees listed in Table 2.a., became ~~becomes~~ effective fifty (50) days after the date of its adoption, and as to the Orange County Copermittees listed in Table 2.b., becomes effective on April 1, 2015, after Order R9-2015-0001 is adopted, provided that the Regional Administrator, USEPA, Region IX, does not object to this Order.

~~41.~~42. Review by the State Water Board. Any person aggrieved by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with CWC section 13320 and California Code of Regulations, title 23, sections 2050, ~~et seq~~ and following. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date of this Order ~~San Diego Water Board action~~, except that if the thirtieth day following the ~~action~~date of this Order falls on a Saturday, Sunday or State holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

THEREFORE, IT IS HEREBY ORDERED that the Copermittees, in order to meet the provisions contained in division 7 of the CWC (commencing with section 13000) and regulations adopted thereunder, and the provisions of the CWA and regulations adopted thereunder, must each comply with the requirements of this Order. This action in no way prevents the San Diego Water Board from taking enforcement action for past violations of the previous Order. If any part of this Order is subject to a temporary stay of enforcement, unless otherwise specified, the Copermittees must comply with the analogous portions of the previous Order, which will remain in effect for all purposes during the pendency of the stay.

II. PROVISIONS

A. PROHIBITIONS AND LIMITATIONS

The purpose of this provision is to describe the conditions under which storm water and non-storm water discharges into and from MS4s are prohibited or limited. The goal of the prohibitions and limitations is to protect the water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through the implementation of water quality improvement strategies and runoff management programs that effectively prohibit non-storm water discharges into the Copermittees' MS4s, and reduce pollutants in storm water discharges from the Copermittees' MS4s to the MEP.

1. Discharge Prohibitions

a. Discharges from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the state are prohibited.

b. Non-storm water discharges into MS4s are to be effectively prohibited, through the implementation of Provision E.2, unless such discharges are authorized by a separate NPDES permit.

c. Discharges from MS4s are subject to all waste discharge prohibitions in the Basin Plan, included in Attachment A to this Order.

d. Storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 applicable to these discharges, included in Attachment A to this Order. All other discharges from the Copermittees' MS4s to ASBS are prohibited.

2. Receiving Water Limitations

a. Discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters, including but not limited to all applicable provisions contained in:

(1) The San Diego Water Board's Basin Plan, including beneficial uses, water quality objectives, and implementation plans;

(2) State Water Board plans for water quality control including the following:

(a) Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries (Thermal Plan), and

(b) The Ocean Plan, including beneficial uses, water quality objectives, and implementation plans;

(3) State Water Board policies for water and sediment quality control including the following:

(a) Water Quality Control Policy for the Enclosed Bays and Estuaries of California,

(b) Sediment Quality Control Plan which includes the following narrative objectives for bays and estuaries:

(i) Pollutants in sediments shall not be present in quantities that, alone or in combination, are toxic to benthic communities, and

(ii) Pollutants shall not be present in sediments at levels that will bioaccumulate in aquatic life to levels that are harmful to human health,

(c) The Statement of Policy with Respect to Maintaining High Quality of Waters in California;[2]

(4) Priority pollutant criteria promulgated by the USEPA through the following:

(a) National Toxics Rule (NTR)[3] (promulgated on December 22, 1992 and amended on May 4, 1995), and

(b) California Toxics Rule (CTR).[4,5]

b. Discharges from MS4s composed of storm water runoff must not alter natural ocean water quality in an ASBS.

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[2] State Water Board Resolution No. 68-16
[3] 40 CFR 131.36
[4] 65 Federal Register 31682-31719 (May 18, 2000), adding Section 131.38 to 40 CFR
[5] If a water quality objective and a CTR criterion are in effect for the same priority pollutant, the more stringent of the two applies.

3. Effluent Limitations

a. Technology Based Effluent Limitations

Pollutants in storm water discharges from MS4s must be reduced to the MEP.[6]

b. Water Quality Based Effluent Limitations

Each Copermittee must comply with applicable WQBELs established for the TMDLs in Attachment E to this Order, pursuant to the applicable TMDL compliance schedules.

4. Compliance with Discharge Prohibitions and Receiving Water Limitations

Each Copermittee must achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order through timely implementation of control measures and other actions as specified in Provisions B and E of this Order, including any modifications. The Water Quality Improvement Plans required under Provision B must be designed and adapted to ultimately achieve compliance with Provisions A.1.a, A.1.c and A.2.a.

a. If exceedance(s) of water quality standards persist in receiving waters notwithstanding implementation of this Order, the Copermittees must comply with the following procedures:

(1) For exceedance(s) of a water quality standard in the process of being addressed by the Water Quality Improvement Plan, the Copermittee(s) must implement the Water Quality Improvement Plan as accepted by the San Diego Water Board, and update the Water Quality Improvement Plan, as necessary, pursuant to Provision F.2.c;

(2) Upon a determination by either the Copermittees or the San Diego Water Board that discharges from the MS4 are causing or contributing to a new exceedance of an applicable water quality standard not addressed by the Water Quality Improvement Plan, the Copermittees must submit the following updates to the Water Quality Improvement Plan pursuant to Provision F.2.c or as part of the Water Quality Improvement Plan Annual Report required under Provision F.3.b, unless the San Diego Water Board directs an earlier submittal:

(a) The water quality improvement strategies being implemented that are effective and will continue to be implemented,

[6] This does not apply to MS4 discharges which receive subsequent treatment to reduce pollutants in storm water discharges to the MEP prior to entering receiving waters (e.g., low flow diversions to the sanitary sewer). Runoff treatment must occur prior to the discharge of runoff into receiving waters per Finding 7.

(b) Water quality improvement strategies (i.e. BMPs, retrofitting projects, stream and/or habitat rehabilitation projects, adjustments to jurisdictional runoff management programs, etc.) that will be implemented to reduce or eliminate any pollutants or conditions that are causing or contributing to the exceedance of water quality standards,

(c) Updates to the schedule for implementation of the existing and additional water quality improvement strategies, and

(d) Updates to the monitoring and assessment program to track progress toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a of this Order;

(3) The San Diego Water Board may require the incorporation of additional modifications to the Water Quality Improvement Plan required under Provision B. The applicable Copermittees must submit any modifications to the update to the Water Quality Improvement Plan within 90 days of notification that additional modifications are required by the San Diego Water Board, or as otherwise directed;

(4) Within 90 days of the San Diego Water Board determination that the modifications to the Water Quality Improvement Plan required under Provision A.4.a.(3) meet the requirements of this Order, the applicable Copermittees must revise the jurisdictional runoff management program documents to incorporate the modified water quality improvement strategies that have been and will be implemented, the implementation schedule, and any additional monitoring required; and

(5) Each Copermittee must implement the updated Water Quality Improvement Plan.

b. The procedure set forth above to achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order do not have to be repeated for continuing or recurring exceedances of the same water quality standard(s) following implementation of scheduled actions unless directed to do otherwise by the San Diego Water Board.

c. Nothing in Provisions A.4.a and A.4.b prevents the San Diego Water Board from enforcing any provision of this Order while the applicable Copermittees prepare and implement the above update to the Water Quality Improvement Plan and jurisdictional runoff management programs.

B. WATER QUALITY IMPROVEMENT PLANS

The purpose of this provision is to develop Water Quality Improvement Plans that guide the Copermittees' jurisdictional runoff management programs towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plans is to further the Clean Water Act's objective to protect, preserve, enhance, and restore the water quality and designated beneficial uses of waters of the state. This goal will be accomplished through an adaptive planning and management process that identifies the highest priority water quality conditions within a watershed and implements strategies through the jurisdictional runoff management programs to achieve improvements in the quality of discharges from the MS4s and receiving waters.

1. Watershed Management Areas

The Copermittees must develop a Water Quality Improvement Plan for each of the Watershed Management Areas in Table B-1. A total of ten Water Quality Improvement Plans must be developed for the San Diego Region.

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
San Juan (901.00)	South Orange County	- Aliso Creek - San Juan Creek - San Mateo Creek - Pacific Ocean - Heisler Park ASBS	- City of Aliso Viejo[~~1~~] - City of Dana Point[~~1~~] - City of Laguna Beach[~~1~~] - City of Laguna Hills[1] - City of Laguna Niguel[~~1~~] - City of Laguna Woods[1] - City of Lake Forest[~~1~~2] - City of Mission Viejo[~~1~~] - City of Rancho Santa Margarita[~~1~~] - City of San Clemente[1] - City of San Juan Capistrano[~~1~~] - County of Orange[~~1~~] - Orange County Flood Control District[~~1~~]
Santa Margarita (902.00)	Santa Margarita River	- Murrieta Creek - Temecula Creek - Santa Margarita River - Santa Margarita Lagoon - Pacific Ocean	- City of Murrieta[~~2~~3] - City of Temecula[~~2~~3] - City of Wildomar[~~2~~3] - County of Riverside[~~2~~3] - County of San Diego[~~3~~4] - Riverside County Flood Control and Water Conservation District[~~2~~3]
San Luis Rey (903.00)	San Luis Rey River	- San Luis Rey River - San Luis Rey Estuary - Pacific Ocean	- City of Oceanside - City of Vista - County of San Diego

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
Carlsbad (904.00)	Carlsbad	- Loma Alta Slough - Buena Vista Lagoon - Agua Hedionda Lagoon - Batiquitos Lagoon - San Elijo Lagoon - Pacific Ocean	- City of Carlsbad - City of Encinitas - City of Escondido - City of Oceanside - City of San Marcos - City of Solana Beach - City of Vista - County of San Diego
San Dieguito (905.00)	San Dieguito River	- San Dieguito River - San Dieguito Lagoon - Pacific Ocean	- City of Del Mar - City of Escondido - City of Poway - City of San Diego - City of Solana Beach - County of San Diego
Penasquitos (906.00)	Penasquitos	- Los Penasquitos Lagoon - Pacific Ocean	- City of Del Mar - City of Poway - City of San Diego - County of San Diego
	Mission Bay	- Mission Bay - Pacific Ocean - San Diego Marine Life Refuge ASBS	- City of San Diego
San Diego (907.00)	San Diego River	- San Diego River - Pacific Ocean	- City of El Cajon - City of La Mesa - City of San Diego - City of Santee - County of San Diego
Pueblo San Diego (908.00) Sweetwater (909.00) Otay (910.00)	San Diego Bay	- Sweetwater River - Otay River - San Diego Bay - Pacific Ocean	- City of Chula Vista - City of Coronado - City of Imperial Beach - City of La Mesa - City of Lemon Grove - City of National City - City of San Diego - County of San Diego - San Diego County Regional Airport Authority - San Diego Unified Port District
Tijuana (911.00)	Tijuana River	- Tijuana River - Tijuana Estuary - Pacific Ocean	- City of Imperial Beach - City of San Diego - County of San Diego

Notes:

1. By agreement dated January XX, 2015, pursuant to Water Code section 13228, ~~T~~the Phase I MS4 discharges within the jurisdiction of the City of Laguna Hills and the City of Laguna Woods located in the Santa Ana Region ~~will be~~are regulated by San Diego Water Board Order No. R9-2013-0001 as amended by Order No. R9-2015-0001, upon the later effective date of Order No. R9-2015-0001 or Santa Ana Water Board Tentative Order No. R8-2015-0001. The City of Laguna Hills and Laguna Woods must also comply with the requirements of the San Diego Creek/Newport Bay TMDL in section XVIII of Santa Ana Water Board Order No. ~~R8-2014-0002 and any reissuance thereto.~~R8-2015-0001.
2. ~~The Orange County Copermittees will be covered under this Order after expiration of Order No. R9-2009-0002, or earlier if the Orange County Copermittees meet the conditions in Provision F.6.The MS4 discharges within the jurisdiction of the City of Lake Forest located in the San Diego Region will be regulated by the Santa Ana Water Board Order No. R8-2014-0002 (NPDES No. CAS618030) and any reissuance thereto~~. By agreement dated January XX, 2015, pursuant to Water Code section 13228, Phase I MS4 discharges within the City of Lake Forest located within the San Diego Water Board Region are regulated by the Santa Ana Water Board Order No. R8-2015-0001 (NPDES No. CAS618030) upon the later effective date of this Order or Santa Ana Water Board Tentative Order No. R8-2015-0001. In accordance with the terms of the agreement between the San Diego Water Board and the Santa Ana Water Board, the City of Lake Forest must implement the requirements of the Bacteria TMDL in Attachment E of this Order, participate in preparation and implementation of the Water Quality Improvement Plan for the Aliso Creek Watershed Management Area as described in Provision B of this Order and continue implementation of its over-irrigation discharge prohibition in its City Ordinance, Title 15, Chapter 15, section 14.030, List (b).
~~2.~~3. The Riverside County Copermittees will be covered under this Order after expiration of Order No. R9-2010-0016~~,~~ or earlier if the Riverside County Copermittees meet the conditions in Provision F.6, upon further amendment of this Order.

~~3~~4. The County of San Diego is not required to implement the requirements of Provision B for its jurisdiction within the Santa Margarita River Watershed Management Area until the Riverside County Copermittees have been notified of coverage under this Order. The County of San Diego is required to implement the requirements of Provisions D, F.3.b, and Attachment E until the Riverside County Copermittees have been notified of coverage under this Order.

2. Priority Water Quality Conditions

The Copermittees must identify the water quality priorities within each Watershed Management Area that will be addressed by the Water Quality Improvement Plan. Where appropriate, Watershed Management Areas may be separated into subwatersheds to focus water quality prioritization and jurisdictional runoff management program implementation efforts by receiving water.

a. Assessment of Receiving Water Conditions

The Copermittees must consider the following, at a minimum, to identify water quality priorities based on impacts of MS4 discharges on receiving water beneficial uses:

(1) Receiving waters listed as impaired on the CWA Section 303(d) List of Water Quality Limited Segments (303(d) List);

(2) TMDLs adopted and under development by the San Diego Water Board;

(3) Receiving waters recognized as sensitive or highly valued by the Copermittees, including estuaries designated under the National Estuary Program under CWA section 320, wetlands defined by the State or U.S. Fish and Wildlife Service's National Wetlands Inventory as wetlands, waters having the Preservation of Biological Habitats of Special Significance (BIOL) beneficial use designation, and receiving waters identified as ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(4) The receiving water limitations of Provision A.2;

(5) Known historical versus current physical, chemical, and biological water quality conditions;

(6) Available, relevant, and appropriately collected and analyzed physical, chemical, and biological receiving water monitoring data, including, but not limited to, data describing:

(a) Chemical constituents,

(b) Water quality parameters (i.e. pH, temperature, conductivity, etc.),

(c) Toxicity Identification Evaluations for both receiving water column and

sediment,

(d) Trash impacts,

(e) Bioassessments, and

(f) Physical habitat;

(7) Available evidence of erosional impacts in receiving waters due to accelerated flows (i.e. hydromodification);

(8) Available evidence of adverse impacts to the chemical, physical, and biological integrity of receiving waters; and

(9) The potential improvements in the overall condition of the Watershed Management Area that can be achieved.

b. ASSESSMENT OF IMPACTS FROM MS4 DISCHARGES

The Copermittees must consider the following, at a minimum, to identify the potential impacts to receiving waters that may be caused or contributed to by discharges from the Copermittees' MS4s:

(1) The discharge prohibitions of Provision A.1 and effluent limitations of Provision A.3; and

(2) Available, relevant, and appropriately collected and analyzed storm water and non-storm water monitoring data from the Copermittees' MS4 outfalls;

(3) Locations of each Copermittee's MS4 outfalls that discharge to receiving waters;

(4) Locations of MS4 outfalls that are known to persistently discharge non-storm water to receiving waters likely causing or contributing to impacts on receiving water beneficial uses;

(5) Locations of MS4 outfalls that are known to discharge pollutants in storm water causing or contributing to impacts on receiving water beneficial uses; and

(6) The potential improvements in the quality of discharges from the MS4 that can be achieved.

c. IDENTIFICATION OF PRIORITY WATER QUALITY CONDITIONS

(1) The Copermittees must use the information gathered for Provisions B.2.a and B.2.b to develop a list of priority water quality conditions as pollutants,

stressors and/or receiving water conditions that are the highest threat to receiving water quality or that most adversely affect the quality of receiving waters. The list must include the following information for each priority water quality condition:

(a) The beneficial use(s) associated with the priority water quality condition;

(b) The geographic extent of the priority water quality condition within the Watershed Management Area, if known;

(c) The temporal extent of the priority water quality condition (e.g., dry weather and/or wet weather);

(d) The Copermittees with MS4s discharges that may cause or contribute to the priority water quality condition; and

(e) An assessment of the adequacy of and data gaps in the monitoring data to characterize the conditions causing or contributing to the priority water quality condition, including a consideration of spatial and temporal variation.

(2) The Copermittees must identify the highest priority water quality conditions to be addressed by the Water Quality Improvement Plan, and provide a rationale for selecting a subset of the water quality conditions identified pursuant to Provision B.2.c.(1) as the highest priorities.

d. IDENTIFICATION OF MS4 SOURCES OF POLLUTANTS AND/OR STRESSORS

The Copermittees must identify and prioritize known and suspected sources of storm water and non-storm water pollutants and/or other stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c. The identification of known and suspected sources of pollutants and/or stressors that cause or contribute to the highest priority water quality conditions as identified for Provision B.2.c must consider the following:

(1) Pollutant generating facilities, areas, and/or activities within the Watershed Management Area, including:

(a) Each Copermittee's inventory of construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas,

(b) Publicly owned parks and/or recreational areas,

(c) Open space areas,

(d) All currently operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste, and

(e) Areas not within the Copermittees' jurisdictions (e.g., Phase II MS4s, tribal lands, state lands, federal lands) that are known or suspected to be discharging to the Copermittees' MS4s;

(2) Locations of the Copermittees' MS4s, including the following:

(a) All MS4 outfalls that discharge to receiving waters, and

(b) Locations of major structural controls for storm water and non-storm water (e.g., retention basins, detention basins, major infiltration devices, etc.);

(3) Other known and suspected sources of non-storm water or pollutants in storm water discharges to receiving waters within the Watershed Management Area, including the following:

(a) Other MS4 outfalls (e.g., Phase II Municipal and Caltrans),

(b) Other NPDES permitted discharges,

(c) Any other discharges that may be considered point sources (e.g., private outfalls), and

(d) Any other discharges that may be considered non-point sources (e.g., agriculture, wildlife or other natural sources);

(4) Review of available data, including but not limited to:

(a) Findings from the Copermittees' illicit discharge detection and elimination programs,

(b) Findings from the Copermittees' MS4 outfall discharge monitoring,

(c) Findings from the Copermittees' receiving water monitoring,

(d) Findings from the Copermittees' MS4 outfall discharge and receiving water assessments, and

(e) Other available, relevant, and appropriately collected data, information, or studies related to pollutant sources and/or stressors that contribute to the highest priority water quality conditions as identified for Provision B.2.c.

(5) The adequacy of the available data to identify and prioritize sources and/or stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c.

e. IDENTIFICATION OF POTENTIAL WATER QUALITY IMPROVEMENT STRATEGIES

The Copermittees must evaluate the findings identified under Provisions B.2.a-d, and identify potential strategies that can result in improvements to water quality in MS4 discharges and/or receiving waters within the Watershed Management Area. Potential water quality improvement strategies that may be implemented within the Watershed Management Area must include the following:

(1) Structural BMPs, non-structural BMPs, incentives, or programs that can potentially be implemented to address the highest priority water quality conditions identified under Provision B.2.c, or MS4 sources of pollutants or stressors identified under Provision B.2.d,

(2) Retrofitting projects in areas of existing development within the Watershed Management Area that can potentially be implemented to reduce MS4 sources of pollutants or stressors identified under Provision B.2.d causing or contributing to the highest priority water quality conditions identified under Provision B.2.c, and

(3) Stream, channel, and/or habitat rehabilitation projects within the Watershed Management Area that can potentially be implemented to protect and/or improve conditions in receiving waters from MS4 pollutants and/or stressors identified under Provision B.2.d causing or contributing to the highest priority water quality conditions identified under Provision B.2.c.

3. Water Quality Improvement Goals, Strategies and Schedules

The Copermittees must identify and develop specific water quality improvement goals and strategies to address the highest priority water quality conditions identified within a Watershed Management Area. The water quality improvement goals and strategies must address the highest priority water quality conditions by effectively prohibiting non-storm water discharges to the MS4, reducing pollutants in storm water discharges from the MS4 to the MEP, and protecting the water quality standards of receiving waters.

a. WATER QUALITY IMPROVEMENT GOALS AND SCHEDULES

(1) Numeric Goals

The Copermittees must develop and incorporate numeric goals[7] into the Water Quality Improvement Plan. Numeric goals must be used to support Water Quality Improvement Plan implementation and measure reasonable

[7] Interim and final numeric goals may take a variety of forms such as TMDL established WQBELs, action levels, pollutant concentration, load reductions, number of impaired water bodies delisted from the List of Water Quality Impaired Segments, Index of Biotic Integrity (IBI) scores, or other appropriate metrics. Interim and final numeric goals are not necessarily limited to one criterion or indicator, but may include multiple criteria and/or indicators. Except for TMDL established WQBELs, interim and final numeric goals and corresponding schedules may be revised through the adaptive management process under Provision B.5.

progress towards addressing the highest priority water quality conditions identified under Provision B.2.c. The Copermittees must establish and incorporate the following numeric goals in the Water Quality Improvement Plan:

(a) Final numeric goals must be based on measureable criteria or indicators capable of demonstrating one or more of the following:

(i) Discharges from the Copermittees' MS4s will not cause or contribute to exceedances of water quality standards in receiving waters, AND/OR

(ii) The conditions of receiving waters and associated habitat are protected from MS4 discharges, AND/OR

(iii) Beneficial uses of receiving waters are protected from MS4 discharges and will be supported.

(b) Interim numeric goals must be based on measureable criteria or indicators capable of demonstrating reasonable incremental progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges as follows:

(i) One or more interim numeric goals may be established to demonstrate progress toward achieving each final numeric goal,

(ii) For each final numeric goal, at least one interim numeric goal must be expressed as a reasonable increment toward achievement of the final numeric goal,

(iii) For each final numeric goal, reasonable interim numeric goals must be established to be accomplished during each 5 year period between the acceptance of the Water Quality Improvement Plan and the achievement of the final numeric goals.

(2) Schedules for Achieving Numeric Goals

The Copermittees must develop and incorporate schedules for achieving the numeric goals into the Water Quality Improvement Plan. The schedules must demonstrate reasonable progress toward achieving the final numeric goals required for Provision B.3.a.(1). The Copermittees must incorporate the schedules for achieving the numeric goals into the Water Quality Improvement Plan based on the following considerations:

(a) Final dates for achieving all final numeric goals must be established considering the following:

(i) Final compliance dates for any applicable TMDLs in Attachment E to this Order;

(ii) Compliance schedules for any ASBS subject to the provisions of

Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(iii) Achievement of the final numeric goals for the highest water quality priorities must be as soon as possible;

(iv) Final dates for achieving the final numeric goals must reflect a realistic assessment of the shortest practicable time required based on the temporal and spatial extent and factors associated with the highest priority water quality conditions identified under Provision B.2.c, and taking into account the time reasonably required to implement the water quality improvement strategies required pursuant to Provision B.3.b.

(b) Interim dates for achieving all interim numeric goals must be established considering the following:

(i) Interim compliance dates for any applicable TMDLs in Attachment E to this Order;

(ii) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(iii) Interim dates for achieving the interim numeric goals must reflect a realistic assessment of the shortest practicable time reasonably required, taking into account the time needed to implement new or significantly expanded programs and securing financing, if necessary; and

(iv) For each final numeric goal, at least one interim numeric goal must be established that the Copermittees will work toward achieving within the term of this Order.

b. WATER QUALITY IMPROVEMENT STRATEGIES AND SCHEDULES

Based on the likely effectiveness and efficiency of the potential water quality improvement strategies identified under Provision B.2.e to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a, the Copermittees must identify the strategies that will be implemented in each Watershed Management Area as follows:

(1) Jurisdictional Strategies

(a) Each Copermittee in the Watershed Management Area must identify the strategies that will be implemented within its jurisdiction as part of its jurisdictional runoff management program requirements under Provisions

E.2 through E.7, including descriptions of the following:

(i) For each of the inventories developed for its jurisdiction, as required under Provisions D.2.a.(1), E.3.e.(2), E.4.b, and E.5.a, each Copermittee must identify the known and suspected areas or sources causing or contributing to the highest priority water quality conditions in the Watershed Management Area that the Copermittee will focus on in its efforts to effectively prohibit non-storm water discharges to its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, and achieve the interim and final numeric goals identified under Provision B.3.a;

(ii) BMPs that each Copermittee will implement, or require to be implemented, as applicable, for those areas or sources within its jurisdiction;

(iii) Education programs that each Copermittee will implement, as applicable, for those areas or sources within its jurisdiction;

(iv) Frequencies that each Copermittee will conduct inspections on those areas or sources within its jurisdiction;

(v) Incentive and enforcement programs that each Copermittee will implement, as applicable, for those areas or sources within its jurisdiction; and

(vi) Any other BMPs, incentives, or programs that each Copermittee will implement for those areas or sources within its jurisdiction.

(b) Identify the optional jurisdictional strategies that each Copermittee will implement within its jurisdiction, as necessary, to effectively prohibit non-storm water discharges to its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. Descriptions of the optional jurisdictional strategies must include:

(i) BMPs, incentives, or programs that may be implemented by the Copermittee within its jurisdiction in addition to the requirements of Provisions B.3.b.(1)(a);

(ii) Incentives or programs that may be implemented by the Copermittee to encourage or implement projects to retrofit areas of existing development within its jurisdiction;

(iii) Incentives or programs that may be implemented by the Copermittee to encourage or implement projects that will rehabilitate the conditions of channels or habitats within its jurisdiction;

(iv) The funds and/or resources that must be secured by the Copermittee to implement the optional strategies described for Provisions B.3.b.(1)(b)(i)-(iii) within its jurisdiction; and

(v) The circumstances necessary to trigger implementation of the optional jurisdictional strategies, in addition to the requirements of Provision B.3.b.(1)(a), to achieve the interim and final numeric goals within the schedules established under Provision B.3.a.

(c) Identify the strategies that will be implemented by the Copermittee in coordination with or with the cooperation of other agencies (e.g. Caltrans, water districts, school districts) and/or entities (e.g. non-governmental organizations) within its jurisdiction.

(2) Watershed Management Area Strategies

The Copermittees must identify the optional regional or multi-jurisdictional strategies that will be implemented in the Watershed Management Area, as necessary, to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. Descriptions of the optional regional or multi-jurisdictional strategies must include:

(a) Regional or multi-jurisdictional BMPs, incentives, or programs that may be implemented by the Copermittees in the Watershed Management Area;

(b) Incentives or programs that may be implemented by the Copermittees in the Watershed Management Area to encourage or implement regional or multi-jurisdictional projects to retrofit areas of existing development;

(c) Incentives or programs that may be implemented by the Copermittees to encourage or implement regional or multi-jurisdictional projects that will rehabilitate the conditions of channels, streams, or habitats within the Watershed Management Area;

(d) The funds and/or resources that must be secured by the Copermittees to implement the optional strategies described for Provisions B.3.b.(2)(a)-(c) within the Watershed Management Area; and

(e) The circumstances necessary to trigger implementation of the optional regional or multi-jurisdictional strategies to achieve the interim and final numeric goals within the schedules established under Provision B.3.a.

(3) Schedules for Implementing Strategies

The Copermittees must develop reasonable schedules for implementing the water quality improvement strategies identified under Provisions B.3.b.(1) and B.3.b.(2) to achieve the interim and final numeric goals identified and schedules established under Provision B.3.a. The Copermittees must incorporate the schedules to implement the water quality improvement strategies into the Water Quality Improvement Plan as follows:

(a) Each Copermittee must develop schedules for the jurisdictional strategies identified pursuant to Provisions B.3.b.(1)(a)-(b). Each schedule must specify:

(i) If each jurisdictional strategy identified pursuant to Provision B.3.b.(1)(a) will or will not be initiated upon acceptance of the Water Quality Improvement Plan;

(ii) For each jurisdictional strategy identified pursuant to Provision B.3.b.(1)(a) that will not be initiated upon acceptance~~approval~~ of the Water Quality Improvement Plan, the shortest practicable time in which each jurisdictional strategy will be initiated after acceptance of the Water Quality Improvement Plan;

(iii) For each optional jurisdictional strategy identified pursuant to Provision B.3.b.(1)(b), a realistic assessment of the shortest practicable time required to:

[a] Secure the resources needed to fund the optional jurisdictional strategy, and
[b] Procure the resources, materials, labor, and applicable permits necessary to initiate implementation of the optional jurisdictional strategy;

(iv) If each jurisdictional strategy identified pursuant to Provisions B.3.b.(1)(a)-(b) is expected to be continuously implemented (e.g. inspections) or completed within a schedule (e.g. construction of structural BMP); and

(v) If a jurisdictional strategy identified pursuant to Provisions B.3.b.(1)(a)-(b) is expected to be completed within a schedule, the anticipated time to complete based on a realistic assessment of the shortest practicable time required.

(b) The Copermittees in the Watershed Management Area must develop schedules for the regional or multi-jurisdictional strategies identified pursuant to Provision B.3.b.(2). Each schedule must specify:

(i) A realistic assessment of the shortest practicable time to:

[a] Secure the resources needed to fund the optional regional or multi-jurisdictional strategy, and

[b] Procure the resources, materials, labor, and permits necessary to initiate the implementation of the optional regional or multi-jurisdictional strategy;

(ii) If each regional or multi-jurisdictional strategy identified pursuant to Provision B.3.b.(2) is expected to be continuously implemented (e.g. inspections) or completed within a schedule (e.g. construction of structural BMP); and

(iii) If a regional or multi-jurisdictional strategy and/or activity identified pursuant to Provisions B.3.b.(2) is expected to be completed within a schedule, the anticipated time to complete based on a realistic assessment of the shortest practicable time required.

(4) Optional Watershed Management Area Analysis

(a) For each Watershed Management Area, the Copermittees have the option to perform a Watershed Management Area Analysis for the purpose of developing watershed-specific requirements for structural BMP implementation, as described in Provision E.3.c.(3). The Watershed Management Area Analysis must include GIS layers (maps) as output. The analysis must include the following information, to the extent it is available, in order to characterize the Watershed Management Areas:

(i) A description of dominant hydrologic processes, such as areas where infiltration or overland flow likely dominates;

(ii) A description of existing streams in the watershed, including bed material and composition, and if they are perennial or ephemeral;

(iii) Current and anticipated future land uses;

(iv) Potential coarse sediment yield areas; and

(v) Locations of existing flood control structures and channel structures, such as stream armoring, constrictions, grade control structures, and hydromodification or flood management basins.

(b) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify and compile a list of candidate projects that could potentially be used as alternative compliance options for Priority Development Projects, to be implemented in lieu of onsite structural BMP performance requirements described in Provisions E.3.c.(1) and E.3.c.(2). Specifically, the Copermittees must identify opportunities to be included in the list of candidate projects in each Watershed Management Area, such as:

(i) Stream or riparian area rehabilitation;

(ii) Retrofitting existing infrastructure to incorporate storm water retention or treatment;

(iii) Regional BMPs;

(iv) Groundwater recharge projects;

(v) Water supply augmentation projects; and

(vi) Land purchases to preserve floodplain functions.

(c) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify areas within the Watershed Management Area where it is appropriate to allow Priority Development Projects to be exempt from the hydromodification management BMP performance requirements described in Provision E.3.c.(2), including supporting rationale.

4. Water Quality Improvement Monitoring and Assessment Program

a. The Copermittees in each Watershed Management Area must develop and incorporate an integrated monitoring and assessment program into the Water Quality Improvement Plan that assesses: 1) the progress toward achieving the numeric goals and schedules, 2) the progress toward addressing the highest priority water quality conditions for each Watershed Management Area, and 3) each Copermittee's overall efforts to implement the Water Quality Improvement Plan.

b. The monitoring and assessment program must incorporate the monitoring and assessment requirements of Provision D, which may allow the Copermittees to modify the program to be consistent with and focus on the highest priority water quality conditions for each Watershed Management Area.

c. For Watershed Management Areas with applicable TMDLs, the monitoring and assessment program must incorporate the specific monitoring and assessment requirements of Attachment E.

d. For Watershed Management Areas with any ASBS, the water quality monitoring and assessment program must incorporate the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

5. Iterative Approach and Adaptive Management Process

The Copermittees in each Watershed Management Area must implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management

programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a, and must include the following:

a. RE-EVALUATION OF PRIORITY WATER QUALITY CONDITIONS

The priority water quality conditions and potential water quality improvement strategies included in the Water Quality Improvement Plan pursuant to Provisions B.2.c and B.2.e may be re-evaluated by the Copermittees as needed during the term of this Order as part of the Water Quality Improvement Plan Annual Report. Re-evaluation and recommendations for modifications to the priority water quality conditions and potential water quality improvement strategies must be provided in the Report of Waste Discharge, and must consider the following:

(1) Achieving the outcome of improved water quality in MS4 discharges and receiving waters through implementation of the water quality improvement strategies identified in the Water Quality Improvement Plan;

(2) New information developed when the requirements of Provisions B.2.a-c have been re-evaluated;

(3) Spatial and temporal accuracy of monitoring data collected to inform prioritization of water quality conditions and implementation strategies to address the highest priority water quality conditions;

(4) Availability of new information and data from sources other than the jurisdictional runoff management programs within the Watershed Management Area that informs the effectiveness of the actions implemented by the Copermittees;

(5) San Diego Water Board recommendations; and

(6) Recommendations for modifications solicited through a public participation process.

b. ADAPTATION OF GOALS, STRATEGIES AND SCHEDULES

The water quality improvement goals, strategies and schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.3, must be re-evaluated and adapted as new information becomes available to result in more effective and efficient measures to address the highest priority water quality conditions identified pursuant to Provision B.2.c. Re-evaluation of and modifications to the water quality improvement goals, strategies and schedules must be provided in the Water Quality Improvement Plan Annual Report, and must consider the following:

(1) Modifications to the priority water quality conditions based on Provision

B.5.a;

(2) Progress toward achieving interim and final numeric goals in receiving waters and MS4 discharges for the highest priority water quality conditions in the Watershed Management Area,

(3) Progress toward achieving outcomes according to established schedules;

(4) New policies or regulations that may affect identified numeric goals;

(5) Measurable or demonstrable reductions of non-storm water discharges to and from each Copermittee's MS4;

(6) Measurable or demonstrable reductions of pollutants in storm water discharges from each Copermittee's MS4 to the MEP;

(7) New information developed when the requirements of Provisions B.2.b and B.2.d have been re-evaluated;

(8) Efficiency in implementing the Water Quality Improvement Plan;

(9) San Diego Water Board recommendations; and

(10) Recommendations for modifications solicited through a public participation process.

c. ADAPTATION OF MONITORING AND ASSESSMENT PROGRAM

The water quality improvement monitoring and assessment program, included in the Water Quality Improvement Plan pursuant to Provision B.4, must be re-evaluated and adapted when new information becomes available. Re-evaluation and recommendations for modifications to the monitoring and assessment program, pursuant to the requirements of Provision D, may be provided in the Water Quality Improvement Plan Annual Report, but must be provided in the Report of Waste Discharge.

6. Water Quality Improvement Plan Submittal, Updates, and Implementation

a. The Copermittees must submit and commence implementation of the Water Quality Improvement Plans in accordance with the requirements of Provision F.1.

b. The Copermittees must submit proposed updates to the Water Quality Improvement Plan for acceptance by the San Diego Water Board Executive Officer in accordance with the requirements of Provision F.2.c.

C. ACTION LEVELS

The purpose of this provision is for the Copermittees to incorporate numeric action levels in the Water Quality Improvement Plans. The goal of the action levels is to guide Water Quality Improvement Plan implementation efforts and measure progress towards the protection of water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through monitoring and assessing the quality of the MS4 discharges during the implementation of the Water Quality Improvement Plans.

1. Non-Storm Water Action Levels[8]

The Copermittees must develop and incorporate numeric non-storm water action levels (NALs) into the Water Quality Improvement Plan to: 1) support the development and prioritization of water quality improvement strategies for effectively prohibiting non-storm water discharges to the MS4s, 2) assess the effectiveness of the water quality improvement strategies toward addressing MS4 non-storm water discharges, required pursuant to Provision D.4.b.(1), and 3) support the detection and elimination of non-storm water and illicit discharges to the MS4, required pursuant to Provision E.2.[9]

a. The following NALs must be incorporated:

(1) Non-Storm Water Discharges from MS4s to Ocean Surf Zone

Table C-1. Non-Storm Water Action Levels for Discharges from MS4s to Ocean Surf Zone

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Total Coliform	MPN/100 ml	1,000	-	10,000/1,000[1]	OP
Fecal Coliform	MPN/100 ml	200[2]	-	400	OP
Enterococci	MPN/100 ml	35	-	104[3]	OP

Abbreviations/Acronyms
AMAL – average monthly action level
MDAL – maximum daily action level
OP – Ocean Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Total coliform density NAL is 1,000 MPN/100 ml when the fecal/total coliform ratio exceeds 0.1.
2. Fecal coliform density NAL is 200 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas."

[8] NALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, unless the NAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed.
[9] The Copermittees may utilize NALs or other benchmarks currently established by the Copermittees as interim NALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

(2) Non-Storm Water Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Table C-2. Non-Storm Water Action Levels for Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Turbidity	NTU	75	-	225	OP
pH	Units	Within limit of 6.0 to 9.0 at all times			OP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	35	-	104[3]	BP
Priority Pollutants	µg/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
OP – Ocean Plan water quality objective
NTU – Nephelometric Turbidity Units
µg/L – micrograms per liter
MDAL – maximum daily action level
BP – Basin Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas" and is not applicable to water bodies that are not designated with the water contact recreation (REC-1) beneficial use.

Table C-3. Non-Storm Water Action Levels for Priority Pollutants

Parameter	Units	Freshwater (CTR)		Saltwater (CTR)	
		MDAL	AMAL	MDAL	AMAL
Cadmium	µg/L	**	**	16	8
Copper	µg/L	*	*	5.8	2.9
Chromium III	µg/L	**	**	-	-
Chromium VI	µg/L	16	8.1	83	41
Lead	µg/L	*	*	14	2.9
Nickel	µg/L	**	**	14	6.8
Silver	µg/L	*	*	2.2	1.1
Zinc	µg/L	*	*	95	47

Abbreviations/Acronyms:
CTR – California Toxic Rule
AMAL – average monthly action level
µg/L – micrograms per liter
MDAL – maximum daily action level

Notes:
* Action levels developed on a case-by-case basis (see below)
** Action levels developed on a case-by-case basis (see below), but calculated criteria are not to exceed Maximum Contaminant Levels (MCLs) under the California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64431

The Cadmium, Copper, Chromium (III), Lead, Nickel, Silver and Zinc NALs for MS4 discharges to freshwater receiving waters will be developed on a case-by-case basis based on site-specific water quality data (receiving water hardness). For these priority pollutants, refer to 40 CFR 131.38(b)(2).

(3) Non-Storm Water Discharges from MS4s to Inland Surface Waters

Table C-4. Non-Storm Water Action Levels for Discharges from MS4s to Inland Surface Waters

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Dissolved Oxygen	mg/L	Not less than 5.0 in WARM waters and not less than 6.0 in COLD waters			BP
Turbidity	NTU	-	20	See MDAL	BP
pH	Units	Within limit of 6.5 to 8.5 at all times			BP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	33	-	61[3]	BP
Total Nitrogen	mg/L	-	1.0	See MDAL	BP
Total Phosphorus	mg/L	-	0.1	See MDAL	BP
MBAS	mg/L	-	0.5	See MDAL	BP
Iron	mg/L	-	0.3	See MDAL	BP
Manganese	mg/L	-	0.05	See MDAL	BP
Priority Pollutants	µg/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
BP – Basin Plan water quality objective
COLD – cold freshwater habitat beneficial use
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
MDAL – maximum daily action level
WARM – warm freshwater habitat beneficial use
MBAS – Methylene Blue Active Substances
MPN/100 ml – most probable number per 100 milliliters
µg/L – micrograms per liter

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for freshwater "designated beach areas" and is not applicable to water bodies that are not designated with the water contact recreation (REC-1) beneficial use.

b. If not identified in Provision C.1.a, NALs must be identified, developed and incorporated in the Water Quality Improvement Plan for any pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in receiving waters associated with the highest priority water quality conditions related to non-storm water discharges from the MS4s. NALs must be based on:

(1) Applicable water quality standards which may be dependent upon site-specific or receiving water-specific conditions or assumptions to be identified by the Copermittees; or

(2) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the NALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary NALs specific to the Watershed Management Area at levels greater than the NALs required by Provisions C.1.a and C.1.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for effectively prohibiting non-storm water discharges to the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and from the MS4. The

secondary NALs may be developed using an approach acceptable to the San Diego Water Board.

d. Dry weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.b may be utilized to develop or revise NALs based on watershed-specific data, subject to San Diego Water Board Executive Officer approval.

2. Storm Water Action Levels[10]

The Copermittees must develop and incorporate numeric storm water action levels (SALs) in the Water Quality Improvement Plans to: 1) support the development and prioritization of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s, and 2) assess the effectiveness of the water quality improvement strategies toward reducing pollutants in storm water discharges, required pursuant to Provision D.4.b.(2).[11]

a. The following SALs for discharges of storm water from the MS4 must be incorporated:

Table C-5. Storm Water Action Levels for Discharges from MS4s to Receiving Waters

Parameter	Units	Action Level
Turbidity	NTU	126
Nitrate & Nitrite (Total)	mg/L	2.6
Phosphorus (Total P)	mg/L	1.46
Cadmium (Total Cd)*	µg/L	3.0
Copper (Total Cu)*	µg/L	127
Lead (Total Pb)*	µg/L	250
Zinc (Total Zn)*	µg/L	976

Abbreviations/Acronyms:
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
µg/L – micrograms per liter

Notes:
* The sampling must include a measure of receiving water hardness at each MS4 outfall. If a total metal concentration exceeds the corresponding metals SAL in Table C-5, that concentration must be compared to the California Toxics Rule criteria and the USEPA 1-hour maximum concentration for the detected level of receiving water hardness associated with that sample. If it is determined that the sample's total metal concentration for that specific metal exceeds that SAL, but does not exceed the applicable USEPA 1-hour maximum concentration criterion for the measured level of hardness, then the sample result will not be considered above the SAL for that measurement.

[10] SALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, unless the SAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed.

[11] The Copermittees may utilize SALs or other benchmarks currently established by the Copermittees as interim SALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

b. If not identified in Provision C.2.a, SALs must be identified, developed and incorporated in the Water Quality Improvement Plan for pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in receiving waters associated with the highest priority water quality conditions related to storm water discharges from the MS4s. SALs must be based on:

(1) Federal and State water quality guidance and/or water quality standards; and

(2) Site-specific or receiving water-specific conditions; or

(3) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the SALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary SALs specific to the Watershed Management Area at levels greater than the SALs required by Provisions C.2.a and C.2.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s. The secondary SALs may be developed based on the approaches recommended by the State Water Board's Storm Water Panel[12] or using an approach acceptable to the San Diego Water Board.

d. Wet weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.c may be used to develop or revise SALs based upon watershed-specific data, subject to San Diego Water Board Executive Officer approval.

[12] Storm Water Panel Recommendations to the California State Water Resources Control Board: The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities (June 2006)

D. MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS

The purpose of this provision is for the Copermittees to monitor and assess the impact on the conditions of receiving waters caused by discharges from the Copermittees' MS4s under wet weather and dry weather conditions. The goal of the monitoring and assessment program is to inform the Copermittees about the nexus between the health of receiving waters and the water quality condition of the discharges from their MS4s. This goal will be accomplished through monitoring and assessing the conditions of the receiving waters, discharges from the MS4s, pollutant sources and/or stressors, and effectiveness of the water quality improvement strategies implemented as part of the Water Quality Improvement Plans.

1. Receiving Water Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the condition of the receiving waters in each Watershed Management Area during dry weather and wet weather. Following San Diego Water Board acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct long-term receiving water monitoring during implementation of the Water Quality Improvement Plan to assess the long term trends and determine if conditions in receiving waters are improving. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following receiving water monitoring procedures:

a. TRANSITIONAL RECEIVING WATER MONITORING

Until the monitoring requirements and schedules of Provisions D.1.b-e are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following receiving water monitoring in the Watershed Management Area:

(1) Continue the receiving water monitoring programs required in Order Nos. R9-2007-0001 (Monitoring and Reporting Program No. R9-2007-0001 Sections II.A.1-A.5), R9-2009-0002, and R9-2010-0016;

(2) Continue the monitoring in the Hydromodification Management Plans approved by the San Diego Water Board;

(3) Participate in the following regional receiving water monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring,

(b) Southern California Bight Regional Monitoring, and

(c) Sediment Quality Monitoring;

(4) Implement the monitoring programs developed as part of any implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) for the TMDLs in Attachment E to this Order; and

(5) For Watershed Management Areas with ASBS, implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

b. LONG-TERM RECEIVING WATER MONITORING STATIONS

The Copermittees must select at least one long-term receiving water monitoring station from among the existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees to be representative of the receiving water quality in the Watershed Management Area. Additional long-term receiving water monitoring stations must be selected where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

c. DRY WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three dry weather monitoring events at each of the long-term receiving water monitoring stations. At least one monitoring event must be conducted during the dry season (May 1 – September 30) and at least one monitoring event must be conducted during a dry weather period during the wet season (October 1 – April 30), after the first wet weather event of the season, with an antecedent dry period of at least 72 hours following a storm event producing measureable rainfall of greater than 0.1 inch.

(1) Dry Weather Receiving Water Field Observations

For each dry weather monitoring event, the Copermittees must record field observations consistent with Table D-1 at each long-term receiving water monitoring station.

Table D-1. Field Observations for Receiving Water Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) • Station description (i.e. deposits or stains, vegetation condition, structural condition, and observable biology) • Presence and assessment of trash in and around station

(2) Dry Weather Receiving Water Field Monitoring

For each dry weather monitoring event, if conditions allow the collection of the data, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

Table D-2. Field Monitoring Parameters for Receiving Water Monitoring Stations

Parameters
• pH • Temperature • Specific conductivity • Dissolved oxygen • Turbidity

(3) Dry Weather Receiving Water Analytical Monitoring

For each dry weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable NAL constituents, and

(v) Constituents listed in Table D-3.

Table D-3. Analytical Monitoring Constituents for Receiving Water Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Pesticides	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Mercury • Nickel • Selenium • Thallium • Zinc	• Organophosphate Pesticides • Pyrethroid Pesticides	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(4) Dry Weather Receiving Water Toxicity Monitoring

For each dry weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for aquatic toxicity in accordance with Table D-4. When the State Water Board's Policy for Toxicity Assessment and Control (Toxicity Policy) is approved and in effect, the San Diego Water Board Executive Officer may direct the Copermittees to replace current toxicity program elements with standardized procedures in the Toxicity Policy.

Table D-4. Dry Weather Chronic[1] Toxicity Testing for Receiving Water Monitoring Stations

Organism	Units	Test	USEPA Protocol
Freshwater			
Pimephales promelas (Fathead Minnow)	Pass / Fail	Larval Survival and Growth	EPA-821-R-02-013
Ceriodaphnia dubia (*Daphnid*)	Pass / Fail	Survival and Production	EPA-821-R-02-013
Selenastrum capricornutum (Green Algae)	Pass / Fail	Growth	EPA-821-R-02-013
Marine and Estuarine			
Strongylocentrotus purpuratus *(Purple Sea Urchin)*	Pass / Fail	Embryo-Larval Development	EPA-600-R-95-136

Notes:
1. Chronic toxicity testing is not required at receiving water monitoring stations located at mass loading stations if the channel flows are diverted year-round during dry weather conditions to the sanitary sewer for treatment.

(a) Freshwater Test Species and Methods: If samples are collected in receiving waters with salinity less than 1 ppt, the Copermittees must follow the methods for chronic toxicity tests as established in 40 CFR 136.3 using a single-concentration test design for routine monitoring, or a five-concentration test design for additional toxicity testing if the limitation is exceeded. The Copermittees must estimate the critical life stage chronic toxicity on undiluted samples in accordance with species and short term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms (EPA-821-R-02-013; Table IA, 40 CFR 136). Additional test species may be used by the Copermittees if approved by the San Diego Water Board Executive Officer. The Copermittees must conduct:

(i) A static renewal toxicity test with the fathead minnow, *Pimephales promelas* (Larval Survival and Growth Test Method 1000.0);

(ii) A static renewal toxicity test with the daphnid, *Ceriodaphnia dubia* (Survival and Reproduction Test Method 1002.0); and

(iii) A static renewal toxicity test with the green alga, *Selenastrum capricornutum* (also named *Raphidocelis subcapitata*) (Growth Test Method 1003.0).

(b) Marine and Estuarine Test Species and Methods: If samples are collected in receiving waters with salinity greater or equal to 1 ppt, the Copermittees must follow the methods for chronic toxicity tests as established in 40 CFR 136.3 using a single-concentration test design for routine monitoring, or a five-concentration test design for additional toxicity testing if the limitation is exceeded. The Copermittees must conduct the following critical life state chronic toxicity tests on undiluted samples in accordance with species and short term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms (EPA-600-R-95-136; 1995). Artificial sea salts must be used to increase sample salinity. The Copermittees must conduct a static non-renewal toxicity test with the purple sea urchin, *Strongylocentrotus purpuratus* (Embryo-larval Development Test Method). Additional species may be used by the Copermittees if approved by the San Diego Water Board Executive Officer.

(c) Holding Times: All toxicity tests must be conducted as soon as possible following sample collection. The 36-hour sample holding time for test initiation shall be targeted. However, no more than 72 hours shall elapse before the conclusion of sample collection and test initiation.

(d) Test Species Sensitivity Screening: To determine the most sensitive test species for freshwater, the Copermittees must screen 2 wet weather and 2 dry weather toxicity tests with a vertebrate, an invertebrate, and a plant species. After this screening period, subsequent monitoring must be conducted using the most sensitive test species. Alternatively, if a sensitive test species has already been determined, or if there is prior knowledge of potential toxicant(s) and a test species is sensitive to such toxicant(s), then monitoring must be conducted using only that test species. Sensitive test species determinations must also consider the most sensitive test species used for proximal receiving water monitoring. Rescreening must occur once each permit term.

(e) Chronic toxicity test biological endpoint data must be analyzed using the Test of Significant Toxicity t-test approach specified in *National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document* (USEPA, Office of Wastewater Management, Washington, D.C., EPA-833-R-10-003, 2010). For this monitoring program, the critical chronic instream waste concentration (IWC) is set at 100 percent receiving water (i.e. no dilution) for receiving water samples. A 100 percent receiving water and a control must be tested.

(f) Toxicity Identification Evaluation (TIE) / Toxicity Reduction Evaluation (TRE): If chronic toxicity is detected in receiving waters, the Copermittees must discuss the need for conducting a TIE/TRE in the assessments required under Provision D.4.a.(2), and develop a plan for implementing the TIE/TRE to be incorporated in the Water Quality Improvement Plan.

(5) Dry Weather Receiving Water Bioassessment Monitoring

Bioassessment monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must conduct bioassessment monitoring during at least one dry weather monitoring event at each long-term receiving water monitoring station as follows:

(a) The following bioassessment samples and measurements must be collected:

(i) Macroinvertebrate samples must be collected in accordance with the "Reachwide Benthos (Multihabitat) Procedure" in the most current Surface Water Ambient Monitoring Program (SWAMP) Bioassessment Standard Operating Procedures (SOP), and amendments, as applicable;[13]

(ii) The "Full" suite of physical habitat characterization measurements must be collected in accordance with the most current SWAMP Bioassessment SOP, and as summarized in the SWAMP Stream Habitat Characterization Form – Full Version;[14] and

(iii) Freshwater algae samples must be collected in accordance with the SWAMP Standard Operating Procedures for Collecting Algae Samples.[15] Analysis of samples must include algal taxonomic composition (diatoms and soft algae) and algal biomass.

(b) The bioassessment samples, measurements, and appropriate water chemistry data must be used to calculate the following:

(i) An Index of Biological Integrity (IBI) for macroinvertebrates for each monitoring station where bioassessment monitoring was conducted, based on the most current calculation method;[16] and

[13] Ode, P.R.. 2007. Standard operating procedures for collecting macroinvertebrate samples and associated physical and chemical data for ambient bioassessments in California. California State Water Resources Control Board Surface Water Ambient Monitoring Program (SWAMP) Bioassessment SOP 001. http://www.swrcb.ca.gov/water_issues/programs/swamp/tools.shtml#monitoring

[14] Available at: http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/reports/fieldforms_fullversion052908.pdf

[15] Fetscher et al. 2009. Standard Operating Procedures for Collecting Stream Algae Samples and Associated Physical Habitat and Chemical Data for Ambient Bioassessments in California.

[16] The most current calculation method at the time the Order was adopted is outlined in "A Quantitative Tool for Assessing the Integrity of Southern California Coastal Streams" (Ode, et al. 2005. Environmental Management. Vol. 35, No. 1, pp. 1-13). If an updated or new calculation method is developed, either both (i.e. current and updated/new) methods must be used, or historical IBIs must be recalculated with the updated or new calculation method.

(ii) An IBI for algae for each monitoring station where bioassessment monitoring was conducted, when a calculation method is developed.[17]

(c) In lieu of the requirements of Provision D.1.c.(5)(a), the Copermittees may conduct the bioassessment monitoring in accordance with the "Triad" assessment approach[18] to calculate the IBIs required for Provision D.1.c.(5)(b). The Copermittees must conduct sampling, analysis, and reporting of specified in-stream biological and habitat data according to the protocols specified in the SCCWRP Technical Report No. 539, or subsequent protocols, if developed.

(6) Dry Weather Receiving Water Hydromodification Monitoring

In addition to the hydromodification monitoring conducted as part of the Copermittees' Hydromodification Management Plans, hydromodification monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must collect the following hydromodification monitoring observations and measurements within an appropriate domain of analysis during at least one dry weather monitoring event for each long-term receiving water monitoring station:

(a) Channel conditions, including:

(i) Channel dimensions,

(ii) Hydrologic and geomorphic conditions, and

(iii) Presence and condition of vegetation and habitat;

(b) Location of discharge points;

(c) Habitat integrity;

(d) Photo documentation of existing erosion and habitat impacts, with location (i.e. latitude and longitude coordinates) where photos were taken;

(e) Measurement or estimate of dimensions of any existing channel bed or bank eroded areas, including length, width, and depth of any incisions; and

[17] When a calculation method is developed, IBIs must be calculated for all available and appropriate historical data.
[18] Stormwater Monitoring Coalition Model Monitoring Technical Committee, 2004. Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California. Technical Report #419. August 2004.

(f) Known or suspected cause(s) of existing downstream erosion or habitat impact, including flow, soil, slope, and vegetation conditions, as well as upstream land uses and contributing new and existing development.

d. WET WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three wet weather monitoring events at each long-term receiving water monitoring station. At least one wet weather monitoring event must be conducted during the first wet weather event of the wet season (October 1 – April 30), and at least one wet weather monitoring event during a wet weather event that occurs after February 1.

(1) Wet Weather Receiving Water Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each long-term receiving water monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event;

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(d) Presence and assessment of trash in and around station.

(2) Wet Weather Receiving Water Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

(3) Wet Weather Receiving Water Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) Constituents listed in Table D-3.

(4) Wet Weather Receiving Water Toxicity Monitoring

For each wet weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for chronic aquatic toxicity in accordance with Provisions D.1.c.(4)(a)-(f).

e. OTHER RECEIVING WATER MONITORING REQUIREMENTS

(1) Regional Monitoring

The Copermittees must participate in the following regional receiving waters monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring; and

(b) Southern California Bight Regional Monitoring and

(c) Unified Beach Water Quality Monitoring and Assessment Program. The Orange County Copermittees shall participate in and, together with South Orange County Wastewater Authority and Orange County Health Care Agency, shall share responsibility for implementation of a unified regional beach water quality monitoring and assessment program in south Orange County, as set forth in the October 2014 report, *Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County* Monitoring and Reporting Program No. XXX, issued pursuant to CWC sections 13225, 13267, and 13383 and subject to future revision in the San Diego Water Board December 5, 2014 Letter Directive.

(2) Sediment Quality Monitoring

The Copermittees must perform sediment monitoring to assess compliance with sediment quality receiving water limits applicable to MS4 discharges to enclosed bays and estuaries. The monitoring may be performed either by individual or multiple Copermittees to assess compliance with receiving water limits, or through participation in a water body monitoring coalition. A Sediment Monitoring Plan which satisfies the requirements of the State Water Board's Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part 1 Sediment Quality (Sediment Control Plan) must be submitted as part of the monitoring and assessment program in the Water Quality Improvement Plan.

(a) The Sediment Monitoring Plan design must include the following:

(i) The elements required under Section VII.D (Receiving Water Limits Monitoring Frequency) and Section VII.E (Sediment Monitoring) of the Sediment Control Plan;

(ii) A Quality Assurance Project Plan (QAPP) describing the project objectives and organization, functional activities, and quality assurance/quality control protocols for the water and sediment monitoring; and

(iii) A schedule for completion of all sample collection and analysis activities and submission of Sediment Monitoring Reports.

(b) The Copermittees must implement the Sediment Monitoring Plan in accordance with the schedule contained in the Sediment Monitoring Plan, unless otherwise directed in writing by the San Diego Water Board Executive Officer.

(c) The Copermittees must incorporate a Sediment Monitoring Report as part of the Water Quality Improvement Plan Annual Report in accordance with the schedule contained in the Sediment Monitoring Plan, unless otherwise directed in writing by the San Diego Water Board Executive Officer. The Sediment Monitoring Report must contain the following information:

(i) Analysis: An evaluation, interpretation and tabulation of the water and sediment monitoring data, including interpretations and conclusions as to whether applicable Receiving Water Limitations in this Order have been attained at each sample station;

(ii) Sample Location Map: The locations, type, and number of samples must be identified and shown on a site map; and

(iii) California Environmental Data Exchange Network: A statement certifying that the monitoring data and results have been uploaded into the California Environmental Data Exchange Network (CEDEN).

(d) Based on the Sediment Monitoring Report conclusions the San Diego Water Board may require a human health risk assessment to determine if the human health objective contained in Receiving Water Limitations in Provision A.2.a.(3)(b)(ii) has been attained at each sample station. In conducting a risk assessment, the Copermittees must consider any applicable and relevant information, including California Environmental Protection Agency's (Cal/EPA) Office of Environmental Health Hazard Assessment (OEHHA) policies for fish consumption and risk assessment, Cal/EPA's Department of Toxic Substances Control (DTSC) Risk Assessment, and USEPA Human Health Risk Assessment policies.

(3) <u>ASBS Monitoring</u>

For Watershed Management Areas with ASBS, the Copermittees must implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

f. ALTERNATIVE WATERSHED MONITORING REQUIREMENTS

The San Diego Water Board may direct the Copermittees to participate in an effort to develop alternative watershed monitoring with other regulated entities, other interested parties, and the San Diego Water Board to refine, coordinate,

and implement regional monitoring and assessment programs to determine the status and trends of water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams.

2. MS4 Outfall Discharge Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the discharges from the MS4 outfalls in each Watershed Management Area during dry weather and wet weather. Following San Diego Water Board acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct MS4 outfall discharge monitoring during implementation of the Water Quality Improvement Plan to assess the effectiveness of their jurisdictional runoff management programs toward effectively prohibiting non-storm water discharges into the MS4 and reducing pollutants in storm water discharges from their MS4s to the MEP. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following MS4 outfall monitoring procedures:

a. TRANSITIONAL MS4 OUTFALL DISCHARGE MONITORING

Until the monitoring requirements and schedules of Provisions D.2.b-c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following MS4 outfall discharge monitoring in the Watershed Management Area:

(1) <u>MS4 Outfall Discharge Monitoring Station Inventory</u>

Each Copermittee must identify all major MS4 outfalls that discharge directly to receiving waters within its jurisdiction and geo-locate those outfalls on a map of the MS4 pursuant to Provision E.2.b.(1). This information must be compiled into a MS4 outfall discharge monitoring station inventory, and must include the following information:

(a) Latitude and longitude of MS4 outfall point of discharge;

(b) Watershed Management Area;

(c) Hydrologic subarea;

(d) Outlet size;

(e) Accessibility (i.e. safety and without disturbance of critical habitat);

(f) Approximate drainage area; and

(g) Classification of whether the MS4 outfall is known to have persistent dry weather flows, transient dry weather flows, no dry weather flows, or unknown dry weather flows.

(2) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Until the monitoring requirements and schedules of Provision D.2.b are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, each Copermittee must perform dry weather MS4 outfall field screening monitoring to identify non-storm water and illicit discharges within its jurisdiction in accordance with Provision E.2.c, to determine which discharges are transient flows and which are persistent flows, and prioritize the dry weather MS4 discharges that will be investigated and eliminated in accordance with Provision E.2.d.

(a) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Frequency

Each Copermittee must field screen the MS4 outfalls in its inventory developed pursuant to Provision D.2.a.(1) as follows:

(i) For Copermittees with less than 125 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 80 percent of the outfalls must be visually inspected two times per year during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv).

(ii) For Copermittees with 125 major MS4 outfalls or more, but less than or equal to 500 that discharge to receiving waters within a Watershed Management Area, all the outfalls must be visually inspected at least annually during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv).

(iii) For Copermittees with more than 500 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 500 outfalls must be visually inspected at least annually during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv). Copermittees with more than 500 major MS4 outfalls within a Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(iv) For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major MS4 outfalls within its jurisdiction, at least 500 major MS4 outfalls within its inventory must be visually inspected at least annually during dry weather conditions. Copermittees with more than 500 major MS4 outfalls in more than one Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(v) Inspections of major MS4 outfalls conducted in response to public reports and staff or contractor reports and notifications may count toward the required visual inspections of MS4 outfall discharge monitoring stations.

(b) Transitional Dry Weather MS4 Outfall Discharge Field Screening Visual Observations

(i) An antecedent dry period of at least 72 hours following any storm event producing measurable rainfall greater than 0.1 inch is required prior to conducting field screening visual observations during a field screening monitoring event.

(ii) During the field screening monitoring event, each Copermittee must record visual observations consistent with Table D-5 at each MS4 outfall discharge monitoring station inspected.

Table D-5. Field Screening Visual Observations for MS4 Outfall Discharge Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) - Flow source(s) suspected or identified from non-storm water source investigation - Flow source(s) eliminated during non-storm water source identification • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) - Known or suspected source(s) of pooled or ponded water • Station description (i.e. deposits or stains, vegetation condition, structural condition, observable biology) • Presence and assessment of trash in and around station • Evidence or signs of illicit connections or illegal dumping

(iii) Each Copermittee must implement the requirements of Provisions E.2.d.(2)(c)-(e) based on the field observations required pursuant to Provision D.2.a.(2)(b)(ii).

(iv) Each Copermittee must evaluate field observations together with existing information available from prior reports, inspections and monitoring results to determine whether any observed flowing, pooled, or ponded waters are likely to be transient or persistent flow.[19]

(c) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Records

Based upon the results of the transitional dry weather MS4 outfall discharge field screening monitoring conducted pursuant to Provisions D.2.a.(2)(a)-(b), each Copermittee must update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow.

(3) Transitional Wet Weather MS4 Outfall Discharge Monitoring

Until the monitoring requirements and schedules of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the

[19] Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(a) Transitional Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees must select wet weather MS4 outfall discharge monitoring stations from the inventories developed pursuant to Provision D.2.a.(1) for each Watershed Management Area as follows:

(i) At least five wet weather MS4 outfall discharge monitoring stations that are representative of storm water discharges from areas consisting primarily of residential, commercial, industrial, and typical mixed-use land uses present within the Watershed Management Area;

(ii) At least one wet weather MS4 outfall discharge monitoring station for each Copermittee within the Watershed Management Area; and

(iii) The County of San Diego may select at least two (2) wet weather MS4 outfall discharge monitoring stations for the portion of the Santa Margarita River Watershed Management Area within its jurisdiction to be monitored during the transitional period until the Riverside County Copermittees are notified of coverage under this Order. After the Riverside County Copermittees are notified of coverage under this Order, the Copermittees in the Watershed Management Area must select wet weather MS4 outfall discharge monitoring stations consistent with the requirements above.

(b) Transitional Wet Weather MS4 Outfall Discharge Monitoring Frequency

Each wet weather MS4 outfall discharge monitoring station selected pursuant to Provision D.2.a.(3)(a) must be monitored once during the wet season (October 1 – April 30). The wet weather monitoring events must be selected to be representative of the range of hydrological conditions experienced in the region. At least 10 percent of samples must be conducted during the first wet weather event of the wet season, to include at least one such sample in each Watershed Management Area..

(c) Transitional Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(i) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the

storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(ii) The flow rates and volumes measured or estimated from the MS4 outfall (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(d) Transitional Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(e) Transitional Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, and indicator bacteria;

(iv) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

[a] Time-weighted composites collected over the length of the storm event or the first 24 hour period whichever is shorter, composed of discrete samples, which may be collected through the use of automated equipment, or

[b] Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

[c] If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours;

(v) Only one analysis of the composite of aliquots is required;

(vi) The samples must be analyzed for the following constituents:

[a] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

[b] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and

[c] Constituents listed in Table D-6.

Table D-6. Analytical Monitoring Constituents for Wet Weather MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Nickel • Selenium • Thallium • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(f) Other Transitional Wet Weather MS4 Outfall Discharge Monitoring

The San Diego County Copermittees must continue the wet weather MS4 outfall monitoring program developed under Order No. R9-2007-0001, as approved by the San Diego Water Board, through its planned completion.

b. Dry Weather MS4 Outfall Discharge Monitoring

Each Copermittee must perform dry weather MS4 outfall monitoring to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. Each Copermittee must conduct the following dry weather MS4 outfall discharge monitoring within its jurisdiction:

(1) Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Each Copermittee must continue to perform the dry weather MS4 outfall discharge field screening monitoring in accordance with the requirements of Provision D.2.a.(2). The Copermittee may adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of persistent flow non-storm water discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of visual inspections performed is equivalent to the number of visual inspections required under Provision D.2.a.(2)(a).

(2) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring

Each Copermittee must perform non-storm water persistent flow MS4 outfall discharge monitoring to determine which persistent non-storm water discharges contain concentrations of pollutants below NALs, and which persistent non-storm water discharges impact receiving water quality during dry weather. Each Copermittee must conduct the following non-storm water persistent flow MS4 outfall discharge monitoring within its jurisdiction:

(a) Prioritization of Non-Storm Water Persistent Flow MS4 Outfalls

Based upon the dry weather MS4 outfall discharge field screening monitoring records developed pursuant to Provision D.2.a.(2)(c), each Copermittee must identify and prioritize the MS4 outfalls with persistent flows based on the highest priority water quality conditions identified in the Water Quality Improvement Plan and any additional criteria developed by the Copermittee, which may include historical data and data from sources other than what the Copermittee collects.

(b) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring Frequency

(i) Based on the prioritization of major MS4 outfalls developed under Provision D.2.b.(2)(a), each Copermittee must identify, at a minimum, the 5 highest priority major MS4 outfalls with non-storm water persistent flows that the Copermittee will monitor within its jurisdiction in each Watershed Management Area. For Responsible Copermittees identified by a TMDL in Attachment E to this Order, if the 5 chosen outfall locations are not sufficient to determine compliance with the TMDL(s), then each Responsible Copermittee must identify additional MS4 outfall monitoring locations within its jurisdiction sufficient to address compliance with the TMDL(s). If a Copermittee has less than 5 major outfalls within a Watershed

Management Area, then the Copermittee must monitor all of its major MS4 outfalls with persistent flows within each Watershed Management Area. The location of the highest priority non-storm water persistent flow MS4 outfall monitoring stations must be identified on the map required pursuant to Provision E.2.b.(1). The map must specify which MS4 outfalls are being monitored for compliance with a TMDL.

(ii) Each of the highest priority non-storm water persistent flow MS4 outfall monitoring stations identified pursuant to Provision D.2.b.(2)(b)(i) must be monitored under dry weather conditions at least semi-annually until one of the following occurs:

[a] The non-storm water discharges have been effectively eliminated (i.e. no flowing, pooled, or ponded water) for three consecutive dry weather monitoring events; or

[b] The source(s) of the persistent flows has been identified as a category of non-storm water discharges that does not require an NPDES permit and does not have to be addressed as an illicit discharge because it was not identified as a source of pollutants (i.e. constituents in non-storm water discharge do not exceed NALs), and the persistent flow can be re-prioritized to a lower priority; or

[c] The constituents in the persistent flow non-storm water discharge do not exceed NALs, and the persistent flow can be re-prioritized to a lower priority; or

[d] The source(s) of the persistent flows has been identified as a non-storm water discharge authorized by a separate NPDES permit.

(iii) Where the criteria under Provision D.2.b.(2)(b)(ii) are not met, but the threat to water quality has been reduced by the Copermittee, the highest priority persistent flow MS4 outfall monitoring stations may be reprioritized accordingly for continued dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1).

(iv) Each Copermittee must document removal or re-prioritization of the highest priority persistent flow MS4 outfall monitoring stations identified under Provision D.2.b.(2)(a) in the Water Quality Improvement Plan Annual Report. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized major MS4 outfall in the Watershed Management Area within its jurisdiction, unless there are no remaining qualifying major MS4 outfalls within the Copermittee's jurisdiction in the Watershed Management Area.

(c) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Observations

During each semi-annual monitoring event, each Copermittee must record field observations consistent with Table D-5 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(d) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Monitoring

During each semi-annual monitoring event, if conditions allow the collection of the data, each Copermittee must monitor and record the parameters in Table D-2 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(e) Non-Storm Water Persistent Flow MS4 Outfall Discharge Analytical Monitoring

During each semi-annual monitoring event in which measurable flow is present, each Copermittee must collect and analyze samples from each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Collect grab or composite samples to be analyzed at a qualified laboratory for the following constituents:

[a] Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,
[b] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,
[c] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,
[d] Applicable NAL constituents, and
[e] Constituents listed in Table D-7. The Copermittees may adjust the list of constituents for the Watershed Management Area if historical data or supporting information can be provided that demonstrates or justifies the analysis of a constituent is not necessary.

Table D-7. Analytical Monitoring Constituents for Persistent Flow MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Total Hardness • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Cadmium • Copper • Lead • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(iv) If the Copermittee identifies and eliminates the source of the persistent flow non-storm water discharge, analysis of the sample is not required.

c. WET WEATHER MS4 OUTFALL DISCHARGE MONITORING

The Copermittees must perform wet weather MS4 outfall monitoring to identify pollutants in storm water discharges from the MS4s, to guide pollutant source identification efforts, and to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order. The Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(1) Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees may adjust the wet weather MS4 outfall discharge monitoring locations in the Watershed Management Area, as needed, to identify pollutants in storm water discharges from MS4s, to guide pollutant source identification efforts, and to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of stations is at least equivalent to the number of stations required under Provision D.2.a.(3)(a). Additional outfall monitoring locations, above the minimum per jurisdiction, may be required to demonstrate compliance with the WQBELs associated with the applicable TMDLs in Attachment E.

(2) Wet Weather MS4 Outfall Discharge Monitoring Frequency

The Copermittees must monitor the wet weather MS4 outfall discharge monitoring stations in the Watershed Management Area at least once (1) per year. The Copermittees may need to increase the frequency of monitoring in order to identify pollutants in storm water discharges from the MS4s causing or contributing to the highest priority water quality conditions, to guide pollutant source identification efforts, or to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order.

(3) Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(4) Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(5) Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate

the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites collected over the length of the storm event or the first 24 hour period, whichever is shorter , composed of discrete samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

(iii) If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours.

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) The Copermittees may adjust the analytical monitoring required for the Watershed Management Area, if the Copermittees have historical data or supporting information that can demonstrate or provide justification that the analysis of a constituent is not necessary.

3. Special Studies

a. Within the term of this Order, the Copermittees must initiate the following special studies:

(1) At least two special studies in each Watershed Management Area to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that cause or contribute to highest priority water quality conditions identified in the Water Quality Improvement Plan.

(2) At least one special study for the San Diego Region to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that are impacting receiving waters on a regional basis in the San Diego Region.

(3) One of the two special studies in each Watershed Management Area required pursuant to Provision D.3.a.(1) may be replaced by a special study implemented pursuant to Provision D.3.a.(2).

b. The special studies must, at a minimum, be in conformance with the following criteria:

(1) The special studies must be related to the highest priority water quality conditions identified by the Copermittees in the Watershed Management Area and/or for the entire San Diego Region;

(2) The special studies developed pursuant to Provision D.3.a.(1) must:

(a) Be implemented within the applicable Watershed Management Area, and

(b) Require some form of participation by all the Copermittees within the Watershed Management Area;

(3) The special studies developed pursuant to Provision D.3.a.(2) must:

(a) Be implemented within the San Diego Region, and

(b) Require some form of participation by all Copermittees covered under the requirements of this Order.

(4) The Copermittees are encouraged to partner with environmental groups or third parties knowledgeable of watershed conditions to complete the required special studies.

c. Special studies developed to identify sources of pollutants and/or stressors should be pollutant and/or stressor specific and based on historical monitoring data and monitoring performed pursuant to Provisions D.1 and D.2. Development of source identification special studies should include the following:

(1) A compilation of known information on the specific pollutant and/or stressor,

including data on potential sources and movement of the pollutant and/or stressor within the watershed. Data generated by the Copermittees and others, as well as information available from a literature research on the pollutant and/or stressor should be compiled and analyzed as appropriate.

(2) An identification of data gaps, based on the compiled information generated on the specific pollutant and/or stressor identified in Provision D.3.c.(1). Source identification special studies should be developed to fill identified data gaps.

(3) A monitoring plan that will collect and provide data the Copermittees can utilize to do the following:

(a) Quantify the relative loading or impact of a pollutant and/or stressor from a particular source or pollutant generating activity;

(b) Improve understanding of the fate of a pollutant and/or stressor in the environment;

(c) Develop an inventory of known and suspected sources of a pollutant and/or stressor in the Watershed Management Area; and/or

(d) Prioritize known and suspected sources of a pollutant and/or stressor based on relative magnitude in discharges, geographical distribution (i.e., regional or localized), frequency of occurrence in discharges, human health risk, and controllability.

d. Special studies initiated prior to the effective date of this Order that meet the requirements of Provision D.3.b and are implemented during the term of this Order as part of the Water Quality Improvement Plan may be utilized to fulfill the special study requirements of Provision D.3.a. Special studies completed before the effective date of this Order cannot be utilized to fulfill the special study requirements of Provision D.3.a.

e. The Copermittees must submit the monitoring plans for the special studies in the Water Quality Improvement Plans required pursuant to Provision F.1.

f. The Copermittees are encouraged to share the results of the special studies regionally among the Copermittees to provide information useful in improving and adapting the management of non-storm water and storm water runoff through the implementation of the Water Quality Improvement Plans.

4. Assessment Requirements

Each Copermittee must evaluate the data collected pursuant to Provisions D.1, D.2 and D.3, and information collected during the implementation of the jurisdictional

runoff management programs required pursuant to Provision E, to assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a. Assessments must be performed as described in the following provisions:

a. RECEIVING WATERS ASSESSMENTS

(1) The Copermittees must assess and report the conditions of the receiving waters in the Watershed Management Area as follows:

(a) Based on data collected pursuant to Provision D.1.a, the assessments under Provision D.4.a.(2) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(b) Based on the data collected pursuant to Provisions D.1.a-e, the assessments required under Provision D.4.a.(2) must be included in the Report of Waste Discharge required pursuant to Provision F.5.b.

(2) The Copermittees must assess the status and trends of receiving water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under dry weather and wet weather conditions. For each of the three types of receiving waters in each Watershed Management Area the Copermittees must:

(a) Determine whether or not the conditions of the receiving waters are meeting the numeric goals established pursuant to Provision B.3.a;

(b) Identify the most critical beneficial uses that must be protected to ensure overall health of the receiving water;

(c) Determine whether or not those critical beneficial uses are being protected;

(d) Identify short-term and/or long-term improvements or degradation of those critical beneficial uses;

(e) Determine whether or not the strategies established in the Water Quality Improvement Plan contribute towards progress in achieving the interim and final numeric goals of the Water Quality Improvement Plan; and

(f) Identify data gaps in the monitoring data necessary to assess Provisions D.4.a.(2)(a)-(e).

b. MS4 OUTFALL DISCHARGES ASSESSMENTS

(1) Non-Storm Water Discharges Reduction Assessments

(a) Each Copermittee must assess and report the progress of its illicit discharge detection and elimination program, required to be implemented pursuant to Provision E.2, toward effectively prohibiting non-storm water and illicit discharges into the MS4 within its jurisdiction as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(2), the assessments under Provision D.4.b.(1)(b) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(ii) Based on the data collected pursuant to Provisions D.2.b, the assessments required under Provision D.4.b.(1)(c) must be included in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

(iii) Based on the data collected pursuant to Provisions D.2.b, the assessment required under Provision D.4.b.(1)(c) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.a.(2), each Copermittee must assess and report the following:

(i) Identify the known and suspected controllable sources (e.g. facilities, areas, land uses, pollutant generating activities) of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area;

(ii) Identify sources of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area that have been reduced or eliminated; and

(iii) Identify modifications to the field screening monitoring locations and frequencies for the MS4 outfalls in its inventory necessary to identify and eliminate sources of persistent flow non-storm water discharges pursuant to Provision D.2.b.

(c) Based on the dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1), each Copermittee must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(1)(b);

(ii) Based on the data collected and applicable NALs in the Water Quality Improvement Plan, rank the MS4 outfalls in the Copermittee's jurisdiction according to potential threat to receiving water quality, and produce a prioritized list of major MS4 outfalls for follow-up action to update the Water Quality Improvement Plan, with the goal of eliminating persistent flow non-storm water discharges and/or pollutant loads in order of the ranked priority list through targeted programmatic actions and source investigations;

(iii) For the highest priority major MS4 outfalls with persistent flows that are in exceedance of NALs, identify the known and suspected sources within the Copermittee's jurisdiction in the Watershed Management Area that may cause or contribute to the NAL exceedances;

(iv) Each Copermittee must analyze the data collected pursuant to Provision D.2.b, and utilize a model or other method, to calculate or estimate the non-storm water volumes and pollutant loads collectively discharged from all the major MS4s outfalls in its jurisdiction identified as having persistent dry weather flows during the monitoring year. These calculations or estimates must be updated annually.

[a] Each Copermittee must calculate or estimate the annual non-storm water volumes and pollutant loads collectively discharged from the Copermittee's major MS4 outfalls to receiving waters within the Copermittee's jurisdiction, with an estimate of the percent contribution from each known source for each MS4 outfall;

[b] Each Copermittee must annually identify and quantify (i.e. volume and pollutant loads) sources of non-storm water not subject to the Copermittee's legal authority that are discharged from the Copermittee's major MS4 outfalls to downstream receiving waters.

(v) Each Copermittee must review the data collected pursuant to Provision D.2.b and findings from the assessments required pursuant to Provision D.4.b.(1)(c)(i)-(iv) at least once during the term of this Order to:

[a] Identify reductions and progress in achieving reductions in non-storm water and illicit discharges to the Copermittee's MS4 in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction, with an estimate, if possible, of the non-storm water volume and/or pollutant load reductions

attributable to specific water quality strategies implemented by the Copermittee; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittee in the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction.

(vi) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(1)(c)(i)-(v).

(2) Storm Water Pollutant Discharges Reduction Assessments

(a) The Copermittees must assess and report the progress of the water quality improvement strategies, required to be implemented pursuant to Provisions B and E, toward reducing pollutants in storm water discharges from the MS4s within the Watershed Management Area as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(3), the assessments under Provision D.4.b.(2)(b) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(ii) Based on the data collected pursuant to Provisions D.2.c, the assessments required under Provision D.4.b.(2)(c) must be included in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

(iii) Based on the data collected pursuant to Provisions D.2.c, the assessment required under Provisions D.4.b.(2)(c)-(d) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.a.(3) the Copermittees must assess and report the following:

(i) The Copermittees must analyze the monitoring data collected pursuant to Provision D.2.a.(3), and utilize a watershed model or other method, to calculate or estimate the following for each monitoring year:

[a] The average storm water runoff coefficient for each land use type within the Watershed Management Area;

[b] The volume of storm water and pollutant loads discharged from each of the Copermittee's monitored MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch;

[c] The total flow volume and pollutant loadings discharged from the Copermittee's jurisdiction within the Watershed Management Area over the course of the wet season, extrapolated from the data produced from the monitored MS4 outfalls; and

[d] The percent contribution of storm water volumes and pollutant loads discharged from each land use type within each hydrologic subarea with a major MS4 outfall to receiving waters or within each major MS4 outfall to receiving waters in the Copermittee's jurisdiction within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch.

(ii) Identify modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify pollutants in storm water discharges from the MS4s in the Watershed Management Area pursuant to Provision D.2.c.(1).

(c) Based on the wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.c the Copermittees must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(2)(b);

(ii) Based on the data collected and applicable SALs in the Water Quality Improvement Plan, analyze and compare the monitoring data to the analyses and assumptions used to develop the Water Quality Improvement Plans, including strategies developed pursuant to Provision B.3, and evaluate whether those analyses and assumptions should be updated as a component of the adaptive management efforts pursuant to Provision B.5 for follow-up action to update the Water Quality Improvement Plan;

(iii) The Copermittees must review the data collected pursuant to Provision D.2.c and findings from the assessments required pursuant to Provisions D.4.b.(2)(c)(i)-(ii) at least once during the term of this Order to:

[a] Identify reductions or progress in achieving reductions in pollutant concentrations and/or pollutant loads from different land uses and/or drainage areas discharging from the Copermittees' MS4s in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters within the Watershed Management Area to the MEP, with an estimate, if possible, of the pollutant load reductions attributable to specific water quality strategies implemented by the Copermittees; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittees in the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters in the Watershed Management Area to the MEP.

(iv) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(iii).

(d) The Copermittees must evaluate all the data collected pursuant to Provision D.2.c, and incorporate new outfall monitoring data into time series plots for each long-term monitoring constituent for the Watershed Management Area, and perform statistical trends analysis on the cumulative long-term wet weather MS4 outfall discharge water quality data set.

c. Special Studies Assessments

The Copermittees must annually evaluate the results and findings from the special studies developed and implemented pursuant to Provision D.3, and assess their relevance to the Copermittees' efforts to characterize receiving water conditions, understand sources of pollutants and/or stressors, and control and reduce the discharges of pollutants from the MS4 outfalls to receiving waters in the Watershed Management Area. The Copermittees must report the results of the special studies assessments applicable to the Watershed Management Area, and identify any necessary modifications or updates to the Water Quality Improvement Plan based on the results in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

d. Integrated Assessment of Water Quality Improvement Plan

As part of the iterative approach and adaptive management process required for the Water Quality Improvement Plan pursuant to Provision B.5, the Copermittees in each Watershed Management Area must integrate the data collected pursuant to Provisions D.1-D.3, the findings from the assessments required pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to assess the effectiveness of, and identify necessary modifications to, the Water Quality Improvement Plan as follows:

(1) The Copermittees must re-evaluate the priority water quality conditions and numeric goals for the Watershed Management Area, as needed, during the term of this Order pursuant to Provision B.5.a. The re-evaluation and recommendations for modifications to the priority water quality conditions, and/or numeric goals and corresponding schedules may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to

Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The priority water quality conditions and numeric goals for the Watershed Management Area must be re-evaluated as follows:

(a) Re-evaluate the receiving water conditions in the Watershed Management Area in accordance with Provision B.2.a;

(b) Re-evaluate the impacts on receiving waters in the Watershed Management Area from MS4 discharges in accordance with Provision B.2.b;

(c) Re-evaluate the identification of MS4 sources of pollutants and/or stressors in accordance with Provision B.2.d;

(d) Identify beneficial uses of the receiving waters that are protected in accordance with Provision D.4.a;

(e) Evaluate the progress toward achieving the interim and final numeric goals for protecting impacted beneficial uses in the receiving waters.

(2) The Copermittees must re-evaluate the water quality improvement strategies for the Watershed Management Area during the term of this Order pursuant to Provision B.5.b. The re-evaluation and recommendations for modifications to the water quality improvement strategies and schedules may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The water quality improvement strategies for the Watershed Management Area must be re-evaluated as follows:

(a) Identify the non-storm water and storm water pollutant loads from the Copermittees' MS4 outfalls in the Watershed Management Area, calculated or estimated pursuant to Provisions D.4.b;

(b) Identify the non-storm water and storm water pollutant load reductions, or other improvements to receiving water or water quality conditions, that are necessary to attain the interim and final numeric goals identified in the Water Quality Improvement Plan for protecting beneficial uses in the receiving waters;

(c) Identify the non-storm water and storm water pollutant load reductions, or other improvements to the quality of MS4 discharges, that are necessary for the Copermittees to demonstrate that non-storm water and storm water discharges from their MS4s are not causing or contributing to exceedances of receiving water limitations;

(d) Evaluate the progress of the water quality improvement strategies toward

achieving the interim and final numeric goals identified in the Water Quality Improvement Plan for protecting beneficial uses in the receiving waters.

(3) The Copermittees must re-evaluate and adapt the water quality monitoring and assessment program for the Watershed Management Area when new information becomes available to improve the monitoring and assessment program pursuant to Provision B.5.c. The re-evaluation and recommendations for modifications to the monitoring and assessment program may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. Modifications to the water quality monitoring and assessment program must be consistent with the requirements of Provision D.1-D.3. The re-evaluation of the water quality monitoring and assessment program for the Watershed Management Area must consider the data gaps identified by the assessments required pursuant to Provisions D.4.a-b, and results of the special studies implemented pursuant to Provision D.4.c.

5. Monitoring Provisions

Each Copermittee must comply with all the monitoring, reporting, and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

E. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS

The purpose of this provision is for each Copermittee to implement a program to control the contribution of pollutants to and the discharges from the MS4 within its jurisdiction. The goal of the jurisdictional runoff management programs is to implement strategies that effectively prohibit non-storm water discharges to the MS4 and reduce the discharge of pollutants in storm water to the MEP. This goal will be accomplished through implementing the jurisdictional runoff management programs in accordance with the strategies identified in the Water Quality Improvement Plans.

Each Copermittee must update its jurisdictional runoff management program document, in accordance with Provision F.2.a, to incorporate all the requirements of Provision E. Until the Copermittee has updated its jurisdictional runoff management program document with the requirements of Provision E, the Copermittee must continue implementing its current jurisdictional runoff management program.

1. Legal Authority Establishment and Enforcement

a. Each Copermittee must establish, maintain, and enforce adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 through statute, ordinance, permit, contract, order, or similar means. This legal authority must, at a minimum, authorize the Copermittee to:

(1) Prohibit and eliminate all illicit discharges and illicit connections to its MS4;

(2) Control the contribution of pollutants in discharges of runoff associated with industrial and construction activity to its MS4 and control the quality of runoff from industrial and construction sites, including industrial and construction sites which have coverage under the statewide General Permit for Discharges of Storm Water Associated with Industrial Activities (Industrial General Permit) or General Permit for Discharges of Storm Water Associated with Construction Activities (Construction General Permit), as well as to those sites which do not;

(3) Control the discharge of spills, dumping, or disposal of materials other than storm water into its MS4;

(4) Control through interagency agreements among Copermittees the contribution of pollutants from one portion of the MS4 to another portion of the MS4;

(5) Control, by coordinating and cooperating with other owners of the MS4 such as Caltrans, the U.S. federal government, or sovereign Native American Tribes through interagency agreements, where possible, the contribution of pollutants from their portion of the MS4 to the portion of the MS4 within the Copermittee's jurisdiction;

(6) Require compliance with conditions in its statutes, ordinances, permits, contracts, orders, or similar means to hold dischargers to its MS4 accountable for their contributions of pollutants and flows;

(7) Require the use of BMPs to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(8) Require documentation on the effectiveness of BMPs implemented to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(9) Utilize enforcement mechanisms to require compliance with its statutes, ordinances, permits, contracts, orders, or similar means; and

(10) Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with its statutes, ordinances, permits, contracts, orders, or similar means and with the requirements of this Order, including the prohibition of illicit discharges and connections to its MS4; the Copermittee must also have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from industrial facilities, including construction sites, discharging into its MS4.

b. With the first Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3), each Copermittee must submit a statement certified by its Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative that the Copermittee has taken the necessary steps to obtain and maintain full legal authority within its jurisdiction to implement and enforce each of the requirements contained in this Order.

2. Illicit Discharge Detection and Elimination

Each Copermittee must implement a program to actively detect and eliminate illicit discharges and improper disposal into the MS4, or otherwise require the discharger to apply for and obtain a separate NPDES permit. The illicit discharge detection and elimination program must be implemented in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include, at a minimum, the following requirements:

a. Non-Storm Water Discharges

Each Copermittee must address all non-storm water discharges as illicit discharges unless a non-storm water discharge is either identified as a discharge authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to the following requirements:

(1) Discharges of non-storm water to the MS4 from the following categories must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG919001 (Order No. R9-2007-0034, or subsequent order) for discharges to San Diego Bay, or NPDES Permit No. CAG919002 (Order No. R9-2008-0002, or subsequent order) for discharges to surface waters other than San Diego Bay:

(1) Uncontaminated pumped ground water;

(2) Discharges from foundation drains;[20]

(3) Water from crawl space pumps; and

(4) Water from footing drains.[20]

(2) Discharges of non-storm water from water line flushing and water main breaks to the MS4 must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG 679001 (Order No. R9-2010-0003 or subsequent order). This category includes water line flushing and water main break discharges from water purveyors issued a water supply permit by the California Department of Public Health or federal military installations. Discharges from recycled or reclaimed water lines to the MS4 must be addressed as illicit discharges, unless the discharges have coverage under a separate NPDES permit.

(3) Discharges of non-storm water to the MS4 from the following categories must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a source of pollutants to receiving waters:

(a) Diverted stream flows;

(b) Rising ground waters;

(c) Uncontaminated ground water infiltration to MS4s;

(d) Springs;

(e) Flows from riparian habitats and wetlands;

(f) Discharges from potable water sources;

[20] Provision E.2.a.(1) only applies to this category of non-storm water if the system is designed to be located at or below the groundwater table to actively or passively extract groundwater during any part of the year.

(g) Discharges from foundation drains;[21] and

(h) Discharges from footing drains.[21]

(4) Discharges of non-storm water to the MS4 from the following categories must be controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means. Discharges of non-storm water to the MS4 from the following categories not controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means must be addressed by the Copermittee as illicit discharges.

(a) Air conditioning condensation

The discharge of air conditioning condensation should be directed to landscaped areas or other pervious surfaces, or to the sanitary sewer, where feasible.

(b) Individual residential vehicle washing

(i) The discharge of wash water should be directed to landscaped areas or other pervious surfaces where feasible; and

(ii) The minimization of water, washing detergent and other vehicle wash products used for residential vehicle washing, and the implementation of other practices or behaviors that will prevent the discharge of pollutants associated with individual residential vehicle washing from entering the MS4 must be encouraged.

(c) Dechlorinated swimming pool discharges

(i) Residual chlorine, algaecide, filter backwash, or other pollutants from swimming pools must be eliminated prior to discharging to the MS4; and

(ii) The discharge of saline swimming pool water must be directed to the sanitary sewer, landscaped areas, or other pervious surfaces that can accommodate the volume of water, unless the saline swimming pool water can be discharged via a pipe or concrete channel directly to a naturally saline water body (e.g. Pacific Ocean).

(5) Firefighting discharges to the MS4 must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a significant source of pollutants to receiving waters. Firefighting discharges to the MS4 not identified as a significant source of pollutants to receiving waters, must be addressed, at a minimum, as follows:

[21] Provision E.2.a.(3) only applies to this category of non-storm water discharge if the system is designed to be located above the groundwater table at all times of the year, and the system is only expected to discharge non-storm water under unusual circumstances.

(a) Non-emergency firefighting discharges

(i) Building fire suppression system maintenance discharges (e.g. sprinkler line flushing) to the MS4 must be addressed as illicit discharges unless BMPs are implemented to prevent pollutants associated with such discharges to the MS4.

(ii) Non-emergency firefighting discharges (i.e., discharges from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems) must be addressed by a program, to be developed and implemented by the Copermittee, to reduce or eliminate pollutants in such discharges from entering the MS4.

(b) Emergency firefighting discharges

Each Copermittee should develop and encourage implementation of BMPs to reduce or eliminate pollutants in emergency firefighting discharges to the MS4s and receiving waters within its jurisdiction. During emergency situations, priority of efforts should be directed toward life, property, and the environment (in descending order). BMPs should not interfere with immediate emergency response operations or impact public health and safety.

(6) If the Copermittee or San Diego Water Board identifies any category of non-storm water discharges listed under Provisions E.2.a.(1)-(4) as a source of pollutants to receiving waters, the category must be prohibited through ordinance, order, or similar means and addressed as an illicit discharge. Alternatively, the Copermittee may propose controls to be implemented for the category of non-storm water discharges as part of the Water Quality Improvement Plan instead of prohibiting the category of non-storm water discharges, and implement the controls if accepted by the San Diego Water Board as part of the Water Quality Improvement Plan.

(7) Each Copermittee must, where feasible and priorities and resources allow, reduce or eliminate non-storm water discharges listed under Provisions E.2.a.(1)-(4) into its MS4, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit.

b. PREVENT AND DETECT ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to prevent and detect illicit discharges to the MS4:

(1) Each Copermittee must maintain an updated map of its entire MS4 and the corresponding drainage areas. The accuracy of the MS4 map must be confirmed during the field screening required pursuant to Provision E.2.c.

The MS4 map must be included as part of the jurisdictional runoff management program document. Any geographic information system (GIS) layers or files used by the Copermittee to maintain the MS4 map must be made available to the San Diego Water Board upon request. The MS4 map must identify the following:

(a) All segments of the MS4 owned, operated, and maintained by the Copermittee;

(b) All known locations of inlets that discharge and/or collect runoff into the Copermittee's MS4;

(c) All known locations of connections with other MS4s not owned or operated by the Copermittee (e.g. Caltrans MS4s);

(d) All known locations of MS4 outfalls and private outfalls that discharge runoff collected from areas within the Copermittee's jurisdiction;

(e) All segments of receiving waters within the Copermittee's jurisdiction that receive and convey runoff discharged from the Copermittee's MS4 outfalls;

(f) Locations of the MS4 outfalls, identified pursuant to Provision D.2.a.(1), within its jurisdiction; and

(g) Locations of the non-storm water persistent flow MS4 outfall discharge monitoring stations, identified pursuant to Provision D.2.b.(2), within its jurisdiction.

(2) Each Copermittee must use Copermittee personnel and contractors to assist in identifying and reporting illicit discharges and connections during their daily employment activities.

(3) Each Copermittee must promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges to or from the MS4, including the following methods for public reporting:

(a) Operate a public hotline, which can be Copermittee-specific or shared by the Copermittees, and must be capable of receiving reports in both English and Spanish 24 hours per day and seven days per week; and

(b) Designate an e-mail address for receiving electronic reports from the public, which can be Copermittee-specific or shared by the Copermittees, and must be prominently displayed on the Copermittee's webpage and the Regional Clearinghouse required pursuant to Provision F.4.

(4) Each Copermittee must implement practices and procedures (including a notification mechanism) to prevent, respond to, contain, and clean up any spills that may discharge into the MS4 within its jurisdiction from any source. The Copermittee must coordinate, to the extent possible, with spill response teams to prevent entry of spills into the MS4, and prevent contamination of surface water, ground water, and soil. The Copermittee must coordinate spill prevention, containment, and response activities throughout all appropriate Copermittee departments, programs, and agencies.

(5) Each Copermittee must implement practices and procedures to prevent and limit infiltration of seepage from sanitary sewers (including private laterals and failing septic systems) to the MS4.

(6) Each Copermittee must coordinate, when necessary, with upstream Copermittees and/or entities to prevent illicit discharges from upstream sources into the MS4 within its jurisdiction.

c. FIELD SCREENING

Each Copermittee must conduct field screening (i.e. visual observations, field testing, and/or analytical testing) of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4 in accordance with the dry weather MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

d. INVESTIGATE AND ELIMINATE ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to investigate and eliminate illicit discharges to the MS4:

(1) Each Copermittee must prioritize and determine when follow-up investigations will be performed in response to visual observations and/or water quality monitoring data collected during an investigation of a detected non-storm water or illicit discharge to or from the MS4. The criteria for prioritizing investigations must consider the following:

(a) Pollutants identified as causing or contributing to the highest water quality priorities identified in the Water Quality Improvement Plan;

(b) Pollutants identified as causing or contributing, or threatening to cause or contribute to impairments in water bodies on the 303(d) List and/or in environmentally sensitive areas (ESAs), located within its jurisdiction;

(c) Pollutants identified from sources or land uses known to exist within the area, drainage basin, or watershed that discharges to the portion of the MS4 within its jurisdiction included in the investigation;

(d) Pollutants identified as causing or contributing to an exceedance of a NAL in the Water Quality Improvement Plan; and

(e) Pollutants identified as a threat to human health or the environment.

(2) Each Copermittee must implement procedures to investigate and inspect portions of its MS4 that, based on reports or notifications, field screening, or other appropriate information, indicate a reasonable potential of receiving, containing, or discharging pollutants due to illicit discharges, illicit connections, or other sources of non-storm water. The procedures must include the following:

(a) Each Copermittee must develop criteria to:

(i) Assess the validity of each report or notification received; and

(ii) Prioritize the response to each report or notification received.

(b) Each Copermittee must prioritize and respond to each valid report or notification (e.g., public reports, staff or contractor reports and notifications, etc.) of an incident in a timely manner.

(c) In accordance with the requirements of Provision E.2.d.(1), each Copermittee must investigate and seek to identify the source(s) of discharges of non-storm water where flows are observed in and from the MS4 during the field screening required pursuant to Provision D.2.b.(1) as follows:

(i) Obvious illicit discharges must be immediately investigated to identify the source(s) of non-storm water discharges;

(ii) The investigation must include field investigations to identify sources or potential sources for the discharge, unless the source or potential source has already been identified during previous investigations; and

(iii) The investigation may include follow-up field investigations and/or reviewing Copermittee inventories and other land use data to identify potential sources of the discharge.

(d) Each Copermittee must maintain records and a database of the following information:

(i) Location of incident, including hydrologic subarea, portion of MS4 receiving the non-storm water or illicit discharge, and point of discharge or potential discharge from MS4 to receiving water;

(ii) Source of information initiating the investigation (e.g., public reports, staff or contractor reports and notifications, field screening, etc.);

(iii) Date the information used to initiate the investigation was received;

(iv) Date the investigation was initiated;

(v) Dates of follow-up investigations;

(vi) Identified or suspected source of the illicit discharge or connection, if determined;

(vii) Known or suspected related incidents, if any;

(viii) Result of the investigation; and

(ix) If a source cannot be identified and the investigation is not continued, document the response pursuant to the requirements of Provision E.2.d.(4).

(e) Each Copermittee must maintain records and, in accordance with the priorities of the Water Quality Improvement Plan, seek to identify the source(s) of non-storm water discharges from the MS4 where there is evidence of non-storm water having been discharged into or from the MS4 (e.g., pooled water), in accordance with MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

(3) Each Copermittee must initiate the implementation of procedures, in a timely manner, to eliminate all detected and identified illicit discharges and connections within its jurisdiction. The procedures must include the following responses:

(a) Each Copermittee must enforce its legal authority, as required under Provision E.1, to eliminate illicit discharges and connections to the MS4.

(b) If the Copermittee identifies the source as a controllable source of non-storm water or illicit discharge or connection, the Copermittee must implement its Enforcement Response Plan pursuant to Provision E.6 and enforce its legal authority to prohibit and eliminate illicit discharges and connections to its MS4.

(c) If the Copermittee identifies the source of the discharge as a category of non-storm water discharges in Provision E.2.a, and the discharge is in exceedance of NALs in the Water Quality Improvement Plan, then the Copermittee must determine if: (1) this is an isolated incident or set of circumstances that will be addressed through its Enforcement Response Plan pursuant to Provision E.6, or (2) the category of discharge must be addressed through the prohibition of that category of discharge as an illicit discharge pursuant to Provision E.2.a.(6).

(d) If the Copermittee suspects the source of the non-storm water discharge as natural in origin (i.e. non-anthropogenically influenced) and in conveyance into the MS4, then the Copermittee must document and

provide the data and evidence necessary to demonstrate to the San Diego Water Board that it is natural in origin and does not require further investigation.

(e) If the Copermittee is unable to identify and document the source of a recurring non-storm water discharge to or from the MS4, then the Copermittee must address the discharge as an illicit discharge and update its jurisdictional runoff management program to address the common and suspected sources of the non-storm water discharge within its jurisdiction in accordance with the Copermittee's priorities.

(4) Each Copermittee must submit a summary of the non-storm water discharges and illicit discharges and connections investigated and eliminated within its jurisdiction with each Water Quality Improvement Plan Annual Report required under Provision F.3.b.(3) of this Order.

3. Development Planning

Each Copermittee must use their land use and planning authorities to implement a development planning program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. BMP Requirements for All Development Projects

Each Copermittee must prescribe the following BMP requirements during the planning process (i.e. prior to project approval and issuance of local permits) for all development projects (regardless of project type or size), where local permits are issued, including unpaved roads and flood management projects:

(3) General Requirements

(a) Onsite BMPs must be located so as to remove pollutants from runoff prior to its discharge to any receiving waters, and as close to the source as possible;

(b) Structural BMPs must not be constructed within waters of the U.S.

(c) Onsite BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors (e.g. mosquitos, rodents, or flies).

(4) Source Control BMP Requirements

The following source control BMPs must be implemented at all development projects where applicable and feasible:

(a) Prevention of illicit discharges into the MS4;

(b) Storm drain system stenciling or signage;

(c) Protect outdoor material storage areas from rainfall, run-on, runoff, and wind dispersal;

(d) Protect materials stored in outdoor work areas from rainfall, run-on, runoff, and wind dispersal;

(e) Protect trash storage areas from rainfall, run-on, runoff, and wind dispersal; and

(f) Any additional BMPs determined to be necessary by the Copermittee to minimize pollutant generation at each project.

(5) Low Impact Development (LID) BMP Requirements

The following LID BMPs must be implemented at all development projects where applicable and feasible:

(a) Maintenance or restoration of natural storage reservoirs and drainage corridors (including topographic depressions, areas of permeable soils, natural swales, and ephemeral and intermittent streams);[22]

(b) Buffer zones for natural water bodies (where buffer zones are technically infeasible, require project applicant to include other buffers such as trees, access restrictions, etc.);

(c) Conservation of natural areas within the project footprint including existing trees, other vegetation, and soils;

(d) Construction of streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided public safety is not compromised;

(e) Minimization of the impervious footprint of the project;

(f) Minimization of soil compaction to landscaped areas;

(g) Disconnection of impervious surfaces through distributed pervious areas;

[22] Development projects proposing to dredge or fill materials in waters of the U.S. must obtain a CWA Section 401 Water Quality Certification. Projects proposing to dredge or fill waters of the state must obtain waste discharge requirements.

(h) Landscaped or other pervious areas designed and constructed to effectively receive and infiltrate, retain and/or treat runoff from impervious areas, prior to discharging to the MS4;

(i) Small collection strategies located at, or as close as possible to, the source (i.e. the point where storm water initially meets the ground) to minimize the transport of runoff and pollutants to the MS4 and receiving waters;

(j) Use of permeable materials for projects with low traffic areas and appropriate soil conditions;

(k) Landscaping with native or drought tolerant species; and

(l) Harvesting and using precipitation.

b. PRIORITY DEVELOPMENT PROJECTS

Priority Development Projects are land development projects that fall under the planning and building authority of the Copermittee for which the Copermittee must impose specific requirements, in addition to those described in Provision E.3.a, including the implementation of structural BMPs to meet the performance requirements described in Provision E.3.c.

(1) Definition of Priority Development Project

Priority Development Projects include the following:

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(b) Redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site on an existing site of 10,000 square feet or more of impervious surfaces). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(c) New and redevelopment projects that create 5,000 square feet or more of impervious surface (collectively over the entire project site), and support one or more of the following uses:

(i) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812).

(ii) Hillside development projects. This category includes development on any natural slope that is twenty-five percent or greater.

(iii) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce.

(iv) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

(d) New or redevelopment projects that create or replace 2,500 square feet or more of impervious surface (collectively over the entire project site), and discharging directly to an Environmentally Sensitive Area (ESA). "Discharging directly to" includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands).

(e) New development projects that support one or more of the following uses:

(i) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

(ii) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

(f) New or redevelopment projects that result in the disturbance of one or more acres of land and are expected to generate pollutants post construction.

(2) <u>Special Considerations for Redevelopment Projects</u>

The structural BMP performance requirements of Provision E.3.c are applicable to redevelopment Priority Development Projects, as defined in E.3.b.(1), as follows:

(a) Where redevelopment results in the creation or replacement of impervious surface in an amount of less than fifty percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provision E.3.c apply only to the creation or replacement of impervious surface, and not the entire development; or

(b) Where redevelopment results in the creation or replacement of impervious surface in an amount of more than fifty percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provision E.3.c apply to the entire development.

(3) Priority Development Project Exemptions

Each Copermittee has the discretion to exempt the following projects from being defined as Priority Development Projects:

(a) New or retrofit paved sidewalks, bicycle lanes, or trails that meet the following criteria:

(i) Designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas; OR

(ii) Designed and constructed to be hydraulically disconnected from paved streets or roads; OR

(iii) Designed and constructed with permeable pavements or surfaces in accordance with USEPA Green Streets guidance.[23]

(b) Retrofitting or redevelopment of existing paved alleys, streets or roads that are designed and constructed in accordance with the USEPA Green Streets guidance.[24]

c. Priority Development Project Structural BMP Performance Requirements

In addition to the BMP requirements listed for all development projects under Provision E.3.a, Priority Development Projects must also implement structural BMPs that conform to performance requirements described below.

(1) Storm Water Pollutant Control BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite structural BMPs to control pollutants in storm water that may be discharged from a project as follows:

(a) Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite the pollutants contained in the volume of storm water runoff produced from a 24-hour 85th percentile storm event (design capture volume);[25]

[23] See "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).
[24] Ibid.
[25] This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are

(i) If a Copermittee determines that implementing BMPs to retain the full design capture volume onsite for a Priority Development Project is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize biofiltration BMPs. Biofiltration BMPs must be designed to have an appropriate hydraulic loading rate to maximize storm water retention and pollutant removal, as well as to prevent erosion, scour, and channeling within the BMP,[26] and must be sized to:

[a] Treat 1.5 times the design capture volume not reliably retained onsite, OR

[b] Treat the design capture volume not reliably retained onsite with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite.

(ii) If a Copermittee determines that biofiltration is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize flow-thru treatment control BMPs to treat runoff leaving the site, AND mitigate for the design capture volume not reliably retained onsite pursuant to Provision E.3.c.(1)(b). Flow thru treatment control BMPs must be sized and designed to:

[a] Remove pollutants from storm water to the MEP;

[b] Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;

[c] Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Flow-thru treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of flow-thru treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

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encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals.

[26] As part of the Copermittee's update to its BMP Design Manual, pursuant to Provision E.3.d, the Copermittee must provide guidance for hydraulic loading rates and other biofiltration design criteria necessary to maximize storm water retention and pollutant removal.

(b) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1)(a). The Priority Development Project must mitigate for the portion of the pollutant load in the design capture volume not retained onsite if Provision E.3.c.(3) is utilized. If a Priority Development Project is allowed to utilize alternative compliance, flow-thru treatment control BMPs must be implemented to treat the portion of the design capture volume that is not reliably retained onsite. Flow-thru treatment control BMPs must be sized and designed in accordance with Provisions E.3.c.(1)(a)(ii)[a]-[c].

(2) Hydromodification Management BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite BMPs to manage hydromodification that may be caused by storm water runoff discharged from a project as follows:

(a) Post-project runoff conditions (flow rates and durations) must not exceed pre-development runoff conditions by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat downstream of Priority Development Projects).

(i) In evaluating the range of flows that results in increased potential for erosion of natural (non-hardened) channels, the lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks.

(ii) The Copermittees may use monitoring results collected pursuant to Provision D.1.a.(2) to re-define the range of flows resulting in increased potential for erosion, or degraded instream habitat conditions, as warranted by the data.

(b) Each Priority Development Project must avoid critical sediment yield areas known to the Copermittee or identified by the optional Watershed Management Area Analysis pursuant to Provision B.3.b.(4), or implement measures that allow critical coarse sediment to be discharged to receiving waters, such that there is no net impact to the receiving water.

(c) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the performance requirements of Provision E.3.c.(2)(a). The Priority Development Project must mitigate for the post-project runoff conditions not fully managed onsite if Provision E.3.c.(3) is utilized.

(d) Exemptions

Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provisions E.3.c.(2) where the project discharges storm water runoff to:

(i) Existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;

(ii) Conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; or

(iii) An area identified by the Copermittees as appropriate for an exemption by the optional Watershed Management Area Analysis incorporated into the Water Quality Improvement Plan pursuant to Provision B.3.b.(4).

(e) Interim Timeframe Exemptions

Until the Copermittees have updated their BMP Design Manual in accordance with Provision F.2.b with the requirements of Provision E, the Copermittees have the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provision E.3.c.(2) where the project discharges storm water runoff directly to:

(i) An engineered channel conveyance system with a capacity to convey peak flows generated by the 10-year storm event all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; and

(ii) Large river reaches with a drainage area larger than 100 square miles and a 100-year flow capacity in excess of 20,000 cubic feet per second, provided that properly sized energy dissipation is included at all Priority Development Project discharge points.

(3) Alternative Compliance Program to Onsite Structural BMP Implementation

At the discretion of each Copermittee, Priority Development Projects may be allowed to participate in an alternative compliance program in lieu of implementing the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a), provided that the Water Quality Improvement Plan includes the optional Watershed Management Area Analysis described in Provision B.3.b.(4)~~.~~, and Water Quality Equivalency

calculations have been accepted by the San Diego Water Board's Executive Officer pursuant to Provision E.3.c.(3)(a). The alternative compliance program is available to a Priority Development Project only if the Priority Development Project applicant enters into a voluntary agreement with the Copermittee authorizing this arrangement. In addition to the voluntary agreement, relief from implementing structural BMPs onsite may be authorized by the Copermittee under the following conditions:

(a) Water Quality Equivalency

Copermittees must submit Water Quality Equivalency calculations for acceptance by the San Diego Water Board's Executive Officer prior to administering an alternative compliance program in order to establish a regional and technical basis for determining the water quality benefits associated with alternative compliance projects. Accepted Water Quality Equivalency calculations must be incorporated as part of any Copermittee's alternative compliance program necessary for evaluating Watershed Management Area Analysis candidate projects, project applicant-proposed alternative compliance projects, alternative compliance in lieu fee structures, and alternative compliance water quality credit systems as described in Provisions E.3.c.(3)(b)-(e).

~~(a)~~(b) Watershed Management Area Analysis Candidate Projects

The Priority Development Project applicant agrees to fund, contribute funds to, or implement a candidate project identified by the Copermittees in the Watershed Management Area Analysis included in the Water Quality Improvement Plan, pursuant to Provisions B.3.b.(4) subject to the following conditions:

(i) The Copermittee must determine that implementation of the candidate project will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a) onsite;

(ii) If the Priority Development Project applicant chooses to fully or partially fund a candidate project, then the in-lieu fee structure described in Provision E.3.c.(3)(c) must be followed;

(iii) If the Priority Development Project applicant chooses to fully or partially fund a candidate project, then the Copermittee must ensure that the funds to be obtained from the Priority Development Project applicant are sufficient to mitigate for impacts caused by not fully implementing structural BMPs onsite, pursuant to the performance requirements described in Provisions E.3.c.(1) and E.3.c.(2)(a);

(iv) If the Priority Development Project applicant chooses to implement a candidate project, then the Copermittee must ensure that pollutant

control and/or hydromodification management within the candidate project are sufficient to mitigate for impacts caused by not implementing structural BMPs fully onsite, pursuant to the performance requirements described in Provisions E.3.c.(1) and E.3.c.(2)(a);

(v) The voluntary agreement to fund, partially fund, or implement a candidate project must include reliable sources of funding for operation and maintenance of the candidate project;

(vi) Design of the candidate project must be conducted under an appropriately qualified engineer, geologist, architect, landscape architect, or other professional, licenses where applicable, and competent and proficient in the fields pertinent to the candidate project design;

(vii) The candidate project must be constructed as soon as possible, but no later than 4 years after the certificate of occupancy is granted for the first Priority Development Project that contributed funds toward the construction of the candidate project, unless a longer period of time is authorized by the San Diego Water Board Executive Officer; and

(viii) If the candidate project is constructed after the Priority Development Project is constructed, the Copermittee must require temporal mitigation for pollutant loads and altered flows that are discharged from the Priority Development Project.

~~(b)~~(c) Project Applicant Proposed Alternative Compliance Projects

The Copermittee may allow a Priority Development Project applicant to propose and fund, contribute funds to, or implement an alternative compliance project not identified by the Watershed Management Area Analysis included in the Water Quality Improvement Plan pursuant to Provisions B.3.b.(4). This option is allowed provided the Copermittee determines that implementation of the alternative compliance project will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a) onsite, and is subject to the requirements described in Provisions E.3.c.(3)(a)(ii)-(viii).

~~(c)~~(d) Alternative Compliance In-Lieu Fee Structure

If a Copermittee chooses to allow a Priority Development Project applicant to fund, or partially fund a candidate project or an alternative compliance project, then the Copermittee must develop and implement an in-lieu fee structure. This may be developed individually or with other Copermittees and/or entities, as a means for designing, developing, constructing, operating and maintaining offsite alternative compliance projects. The in-

lieu fee must be transferred to the Copermittee (for public projects) or an escrow account (for private projects) prior to the construction of the Priority Development Project.

~~(d)~~(e) Alternative Compliance Water Quality Credit System Option

The Copermittee may develop and implement an alternative compliance water quality credit system option, individually or with other Copermittees and/or entities, provided that such a credit system clearly exhibits that it will not allow discharges from Priority Development Projects to cause or contribute to a net impact over and above the impact caused by projects meeting the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a). Any credit system that a Copermittee chooses to implement must be submitted to the San Diego Water Board Executive Officer for review and acceptance as part of the Water Quality Improvement Plan.

(4) Long-Term Structural BMP Maintenance

Each Copermittee must require the project applicant to submit proof of the mechanism under which ongoing long-term maintenance of all structural BMPs will be conducted.

(5) Infiltration and Groundwater Protection

(a) Structural BMPs designed to primarily function as large, centralized infiltration devices (such as large infiltration trenches and infiltration basins) must not cause or contribute to an exceedance of an applicable groundwater quality objective. At a minimum, such infiltration BMPs must be in conformance with the design criteria listed below, unless the development project applicant demonstrates to the Copermittee that one or more of the specific design criteria listed below are not necessary to protect groundwater quality. The design criteria listed below do not apply to small infiltration systems dispersed throughout a development project.

(i) Runoff must undergo pretreatment such as sedimentation or filtration prior to infiltration;

(ii) Pollution prevention and source control BMPs must be implemented at a level appropriate to protect groundwater quality at sites where infiltration BMPs are to be used;

(iii) Infiltration BMPs must be adequately maintained to remove pollutants in storm water to the MEP;

(iv) The vertical distance from the base of any infiltration BMP to the seasonal high groundwater mark must be at least 10 feet. Where groundwater basins do not support beneficial uses, this vertical

distance criteria may be reduced, provided groundwater quality is maintained;

(v) The soil through which infiltration is to occur must have physical and chemical characteristics (e.g., appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses;

(vi) Infiltration BMPs must not be used for areas of industrial or light industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee, unless source control BMPs to prevent exposure of high threat activities are implemented, or runoff from such activities is first treated or filtered to remove pollutants prior to infiltration; and

(vii) Infiltration BMPs must be located a minimum of 100 feet horizontally from any water supply wells.

(b) The Copermittee may develop, individually or with other Copermittees, alternative mandatory design criteria to that listed above for infiltration BMPs which are designed to primarily function as centralized infiltration devices. Before implementing the alternative design criteria in the development planning process the Copermitee(s) must:

(i) Notify the San Diego Water Board of the intent to implement the alternative design criteria submitted; and

(ii) Comply with any conditions set by the San Diego Water Board.

d. BMP DESIGN MANUAL UPDATE

Each Copermittee must update its BMP Design Manual[27] pursuant to Provision F.2.b. Until the Copermittee has updated its BMP Design Manual with the requirements of Provisions E.3.a-c, the Copermittee must continue implementing its current BMP Design Manual. Unless directed otherwise by the San Diego Water Board, the Copermittee must implement the BMP Design Manual within 180 days of completing the update. The update of the BMP Design Manual must include the following:

(1) Updated procedures to determine the nature and extent of storm water requirements applicable to a potential development or redevelopment projects. These procedures must inform project applicants of the storm water management requirements applicable to their project including, but not limited to, general requirements for all development projects, structural BMP design procedures and requirements, hydromodification management requirements,

[27] The BMP Design Manual was formerly known as the Standard Storm Water Mitigation Plan under Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016.

requirements specific to phased projects, and procedures specific to private developments and public improvement projects;

(2) Updated procedures to identify pollutants and conditions of concern for selecting the most appropriate structural BMPs that consider, at a minimum, the following:

(a) Receiving water quality (including pollutants for which receiving waters are listed as impaired under the CWA section 303(d) List);

(b) Pollutants, stressors, and/or receiving water conditions that cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(c) Land use type of the project and pollutants associated with that land use type; and

(d) Pollutants expected to be present onsite.

(3) Updated procedures for designing structural BMPs, including any updated performance requirements to be consistent with the requirements of Provision E.3.c for all structural BMPs listed in the BMP Design Manual;

(4) Long-term maintenance criteria for each structural BMP listed in the BMP Design Manual; and

(5) Alternative compliance criteria, in accordance with the requirements under Provision E.3.c.(3), if the Copermittee elects to allow Priority Development Projects within its jurisdiction to utilize alternative compliance.

e. PRIORITY DEVELOPMENT PROJECT BMP IMPLEMENTATION AND OVERSIGHT

Each Copermittee must implement a program that requires and confirms structural BMPs on all Priority Development Projects are designed, constructed, and maintained to remove pollutants in storm water to the MEP.

(1) Structural BMP Approval and Verification Process

(a) Each Copermittee must require and confirm that for all Priority Development Project applications that have not received prior lawful approval by the Copermittee by the ~~time~~ effective date of the BMP Design Manual ~~is implementedupdated~~ pursuant to Provision E.3.d, the requirements of Provision E.3 ~~are~~ must be implemented. For project applications that have received prior lawful approval before the effective date of the BMP Design Manual ~~is implementedupdated~~ pursuant to Provision E.3.d, the Copermittee may allow previous land development requirements to apply.

(b) For private development projects, prior lawful approval under this Order is a development approval or construction permit that either: 1) complies with the Priority Development Project requirements of the Fourth Term MS4 permits[28] and includes the design of the storm water drainage system for the project in its entirety as accepted by the Copermittee, or 2) confers a vested right to proceed under prior storm water requirements. For public projects, approval means that the design of the storm water drainage system for the project in its entirety has been stamped by the City or County Engineer. For any applicable portion(s) of the project, approvals may be extended to any subsequent discretionary or ministerial approvals necessary to implement the initial project approval with the following conditions:

(i) All subsequent permits must be issued within 5 years of the effective date of the BMP Design Manual pursuant to Provision E.3.d; and

(ii) BMP installation under subsequent approvals must remain in substantial conformity with the design of the storm water drainage system included in the initial approval.

~~(b)~~(c) Each Copermittee must identify the roles and responsibilities of its various municipal departments in implementing the structural BMP requirements, including each stage of a project from application review and approval through BMP maintenance and inspections.

~~(c)~~(d) Each Copermittee must require and confirm that appropriate easements and ownerships are properly recorded in public records and the information is conveyed to all appropriate parties when there is a change in project or site ownership.

~~(d)~~(e) Each Copermittee must require and confirm that prior to occupancy and/or intended use of any portion of the Priority Development Project, each structural BMP is inspected to verify that it has been constructed and is operating in compliance with all of its specifications, plans, permits, ordinances, and the requirements of this Order.

[28] Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016 for San Diego, Orange, and Riverside Counties, respectively.

(2) Priority Development Project Inventory and Prioritization

(a) Each Copermittee must develop, maintain, and update at least annually, a watershed-based database to track and inventory all Priority Development Projects and associated structural BMPs within its jurisdiction. Inventories must be accurate and complete beginning from December 2002 for the San Diego County Copermittees, February 2003 for the Orange County Copermittees, and July 2005 for the Riverside County Copermittees. The use of an automated database system, such as GIS, is highly recommended. The database must include, at a minimum, the following information:

(i) Priority Development Project location (address and hydrologic subarea);

(ii) Descriptions of structural BMP type(s);

(iii) Date(s) of construction;

(iv) Party responsible for structural BMP maintenance;

(v) Dates and findings of structural BMP maintenance verifications; and

(vi) Corrective actions and/or resolutions, when applicable.

(b) Each Copermittee must prioritize the Priority Development Projects with structural BMPs within its jurisdiction. The designation of Priority Development Projects as high priority must consider the following:

(i) The highest water quality priorities identified in the Water Quality Improvement Plan;

(ii) Receiving water quality;

(iii) Number and sizes of structural BMPs;

(iv) Recommended maintenance frequency of structural BMPs;

(v) Likelihood of operation and maintenance issues of structural BMPs;

(vi) Land use and expected pollutants generated; and

(vii) Compliance record.

(3) Structural BMP Maintenance Verifications and Inspections

Each Copermittee is required to verify that structural BMPs on each Priority Development Project are adequately maintained, and continue to operate effectively to remove pollutants in storm water to the MEP through inspections, self-certifications, surveys, or other equally effective approaches.

(a) All (100 percent) of the structural BMPs at Priority Development Projects that are designated as high priority must be inspected directly by the

Copermittee annually prior to each rainy season;

(b) For verifications performed through a means other than direct Copermittee inspection, adequate documentation must be required by the Copermittee to provide assurance that the required maintenance of structural BMPs at each Priority Development Project has been completed; and

(c) Appropriate follow-up measures (including re-inspections, enforcement, etc.) must be conducted to ensure that structural BMPs at each Priority Development Project continue to reduce pollutants in storm water to the MEP as originally designed.

f. DEVELOPMENT PROJECT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all development projects, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

4. Construction Management

Each Copermittee must implement a construction management program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. PROJECT APPROVAL PROCESS

Prior to issuance of any local permit(s) that allows the commencement of construction projects that involve ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff, each Copermittee must:

(1) Require a pollution control plan, construction BMP plan, and/or an erosion and sediment control plan, to be submitted by the project applicant to the Copermittee;

(2) Confirm the pollution control plan, construction BMP plan, and/or erosion and sediment control plan, complies with the local grading ordinance, other applicable local ordinances, and the requirements of this Order;

(3) Confirm the pollution control, construction BMP, and/or erosion and sediment control plan, includes seasonally appropriate and effective BMPs and management measures described in Provision E.4.c, as applicable to the project; and

(4) Verify that the project applicant has obtained coverage under the statewide

Construction General Permit (Order 2012-0006 2009-0009-DWQ or subsequent Order), if applicable.

b. CONSTRUCTION SITE INVENTORY AND TRACKING

(1) Each Copermittee must maintain and update, at least quarterly, a watershed-based inventory of all construction projects issued a local permit that allows ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff. The use of an automated database system, such as GIS, is highly recommended. The inventory must include:

(a) Relevant contact information for each site (e.g., name, address, phone, and email for the owner and contractor);

(b) The basic site information including location (address and hydrologic subarea), Waste Discharge Identification (WDID) number (if applicable), size of the site, and approximate area of disturbance;

(c) Whether or not the site is considered a high threat to water quality, as defined in Provision E.4.b.(2) below;

(d) The project start and completion dates;

(e) The required inspection frequency, as defined in the Copermittee's jurisdictional runoff management program document;

(f) The date the Copermittee accepted or approved the pollution control plan, construction BMP plan, and/or erosion and sediment control plan; and

(g) Whether or not there are ongoing enforcement actions administered to the site.

(2) Each Copermittee must identify all construction sites within its jurisdiction that represent a high threat to downstream surface water quality. The designation of construction sites as high threat to water quality must consider the following:

(a) Sites located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Sites located within the same hydrologic subarea and tributary to a water body segment listed as impaired for sediment on the CWA section 303(d) List;

(c) Sites located within, directly adjacent to, or discharging directly to a receiving water within an ESA; and

(d) Other sites determined by the Copermittees or the San Diego Water Board as a high threat to water quality.

c. CONSTRUCTION SITE BMP IMPLEMENTATION

Each Copermittee must implement, or require the implementation of effective BMPs to reduce discharges of pollutants in storm water from construction sites to the MEP, and effectively prohibit non-storm water discharges from construction sites into the MS4. These BMPs must be site specific, seasonally appropriate, and construction phase appropriate. BMPs must be implemented at each construction site year round. Dry season BMP implementation must plan for and address unseasonal rain events that may occur during the dry season (May 1 through September 30). Copermittees must implement, or require the implementation of, BMPs in the following categories:

(1) Project Planning;

(2) Good Site Management "Housekeeping", including waste management;

(3) Non-storm Water Management;

(4) Erosion Control;

(5) Sediment Control;

(6) Run-on and Run-off Control; and

(7) Active/Passive Sediment Treatment Systems, where applicable.

d. CONSTRUCTION SITE INSPECTIONS

Each Copermittee must conduct construction site inspections to require and confirm compliance with its local permits and applicable local ordinances, and the requirements of this Order. Priority for site inspections must consider threat to water quality pursuant to Provision E.4.b as well as the nature of the construction activity, topography, and the characteristics of soils and receiving water quality.

(1) <u>Inspection Frequency</u>

(a) Each Copermittee must conduct inspections at all inventoried sites, including high threat to water quality sites, at an appropriate frequency for each phase of construction to confirm the site reduces the discharge of pollutants in storm water from construction sites to the MEP, and effectively prohibits non-storm water discharges from entering the MS4.

(b) Each Copermittee must establish appropriate inspection frequencies for

high threat to water quality sites, and all other sites, for each phase of construction. Inspection frequencies appropriate for addressing the highest water quality priorities identified in the Water Quality Improvement Plan, and for complying with the requirements of this Order must be identified in each Copermittee's jurisdictional runoff management program document.

(c) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e., re-inspection, enforcement) necessary to require and confirm site compliance with its local permits and applicable local ordinances, and the requirements of this Order.

(2) Inspection Content

Inspections of construction sites by the Copermittee must include, at a minimum:

(a) Verification of coverage under the Construction General Permit (Notice of Intent (NOI) and/or WDID number) during initial inspections, when applicable;

(b) Assessment of compliance with its local permits and applicable local ordinances related to pollution prevention, including the implementation and maintenance of applicable BMPs;

(c) Assessment of BMP adequacy and effectiveness;

(d) Visual observations of actual non-storm water discharges;

(e) Visual observations of actual or potential discharge of sediment and/or construction related materials from the site;

(f) Visual observations of actual or potential illicit connections; and

(g) If any violations are found and BMP corrections are needed, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried construction sites. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Site name, location (address and hydrologic subarea), and WDID number

(if applicable);

(b) Inspection date;

(c) Approximate amount of rainfall since last inspection;

(d) Description of problems observed with BMPs and indication of need for BMP addition/repair/replacement and any scheduled re-inspection, and date of re-inspection;

(e) Descriptions of any other specific inspection comments which must, at a minimum, include rationales for longer compliance time;

(f) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(g) Resolution of problems noted and date problems fixed.

e. CONSTRUCTION SITE ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried construction sites, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

5. Existing Development Management

Each Copermittee must implement an existing development management program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. EXISTING DEVELOPMENT INVENTORY AND TRACKING

Each Copermittee must maintain, and update at least annually, a watershed-based inventory of the existing development within its jurisdiction that may discharge a pollutant load to and from the MS4. The use of an automated database system, such as GIS, is highly recommended. The inventory must, at a minimum, include:

(1) Name, location (hydrological subarea and address, if applicable) of the following types of existing development with its jurisdiction:

(a) Commercial facilities or areas;

(b) Industrial facilities;

(c) Municipal facilities, including:

(i) MS4 and related structures;[29]

(ii) Roads, streets, and highways;

(iii) Parking facilities;

(iv) Municipal airfields;

(v) Parks and recreation facilities;

(vi) Flood management facilities, flood control devices and structures;

(vii) Operating or closed municipal landfills;

(viii) Publicly owned treatment works (including water and wastewater treatment plants) and sanitary sewer collection systems;

(ix) Corporate yards, including maintenance and storage yards for materials, waste, equipment, and vehicles;

(x) Hazardous waste collection facilities;

(xi) Other treatment, storage or disposal facilities for municipal waste; and

(xii) Other municipal facilities that the Copermittee determines may contribute a significant pollutant load to the MS4.

(d) Residential areas, which may be designated by one or more of the following:

(i) Residential management area;

(ii) Drainage basin or area;

(iii) Land use (e.g., single family, multi-family, rural);

(iv) Neighborhood;

(v) Common Interest Area;

(vi) Home Owner Association;

(vii) Mobile home park; and/or

(viii) Other designations accepted by the San Diego Water Board Executive Officer.

(2) A description of the facility or area, including the following information:

(a) Classification as commercial, industrial, municipal, or residential;

(b) Status of facility or area as active or inactive;

(c) Identification if a business is a mobile business;

[29] The inventory may refer to the MS4 map required to be maintained pursuant to Provision E.2.b.(1).

(d) SIC Code or NAICS Code, if applicable;

(e) Industrial General Permit NOI and/or WDID number, if applicable;

(f) Identification if a residential area is or includes a Common Interest Area / Home Owner Association, or mobile home park;

(g) Identification of pollutants generated and potentially generated by the facility or area;

(h) Whether the facility or area is adjacent to an ESA;

(i) Whether the facility or area is tributary to and within the same hydrologic subarea as a water body segment listed as impaired on the CWA section 303(d) List and generates pollutants for which the water body segment is impaired; and

(3) An annually updated map showing the location of inventoried existing development, watershed boundaries, and water bodies.

b. EXISTING DEVELOPMENT BMP IMPLEMENTATION AND MAINTENANCE

Each Copermittee must designate a minimum set of BMPs required for all inventoried existing development, including special event venues. The designated minimum BMPs must be specific to facility or area types and pollutant generating activities, as appropriate.

(1) Commercial, Industrial, and Municipal Facilities and Areas

(a) Pollution Prevention

Each Copermittee must require the use of pollution prevention methods by the commercial, industrial, and municipal facilities and areas in its inventoried existing development to address the priorities and strategies in the Water Quality Improvement Plan.

(b) BMP Implementation

Each Copermittee must require the implementation of designated BMPs at commercial facilities and areas, industrial facilities, and implement designated BMPs at municipal facilities in its inventoried existing development.

(c) BMP Operation and Maintenance

(i) Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at commercial facilities and areas, industrial facilities, and municipal

facilities in its inventoried existing development.

(ii) Each Copermittee must implement a schedule of operation and maintenance activities for its MS4 and related structures (including but not limited to catch basins, storm drain inlets, detention basins, etc.), and verify proper operation of all its municipal structural treatment controls designed to reduce pollutants (including floatables) in storm water discharges to or from its MS4s and related drainage structures. Operation and maintenance activities may include, but is not limited to, the following:

[a] Inspections of the MS4 and related structures;
[b] Cleaning of the MS4 and related structures; and
[c] Proper disposal of materials removed from cleaning of the MS4 and related structures.

(iii) Each Copermittee must implement a schedule of operation and maintenance for public streets, unpaved roads, paved roads, and paved highways within its jurisdiction to minimize pollutants that can be discharged in storm water.

(iv) Each Copermittee must implement controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers. Copermittees that operate both a municipal sanitary sewer system and a MS4 must implement controls and measures to prevent and eliminate seeping sewage from infiltrating the MS4. Copermittees that do not operate both a municipal sanitary sewer system and a MS4 must coordinate with sewering agencies to keep themselves informed of relevant and appropriate maintenance activities and sanitary sewage projects in their jurisdiction that may cause or contribute to seepage of sewage into the MS4.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must require the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from commercial facilities and areas and industrial facilities, and implement BMPs at municipal facilities in its inventoried existing development. Such BMPs must include, as appropriate, educational activities, permits, certifications and other measures for applicators and distributors.

(2) <u>Residential Areas</u>

(a) Pollution Prevention

Each Copermittee must promote and encourage the use of pollution prevention methods, where appropriate, by the residential areas in its

inventoried existing development.

(b) BMP Implementation

Each Copermittee must promote and encourage the implementation of designated BMPs at residential areas in its inventoried existing development.

(c) BMP Operation and Maintenance

Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at residential areas in its inventoried existing development.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must promote and encourage the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from residential areas in its inventoried existing development.

c. EXISTING DEVELOPMENT INSPECTIONS

Each Copermittee must conduct inspections of inventoried existing development to ensure compliance with applicable local ordinances and permits, and the requirements of this Order.

(1) Inspection Frequency

(a) Each Copermittee must establish appropriate inspection frequencies for inventoried existing development in accordance with the following requirements:

(i) At a minimum, inventoried existing development must be inspected once every five years utilizing one or more of the following methods:

[a] Drive-by inspections by Copermittee municipal and contract staff;
[b] Onsite inspections by Copermittee municipal and contract staff; and/or
[c] Visual inspections of publicly accessible inventoried facilities or areas by volunteer monitoring or patrol programs that have been trained by the Copermittee;

(ii) The frequency of inspections must be appropriate to confirm that BMPs are being implemented to reduce the discharge of pollutants in storm water from the MS4 to the MEP and effectively prohibit non-storm water discharges to the MS4;

(iii) The frequency of inspections must be based on the potential for a facility or area to discharge non-storm water and pollutants in storm water, and should reflect the priorities set forth in the Water Quality Improvement Plan;

(iv) Each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development;[30] and

(v) Inventoried existing development must be inspected by the Copermittee, as needed, in response to valid public complaints.

(b) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e. education and outreach, re-inspection, enforcement) necessary to require and confirm compliance with its applicable local ordinances and permits and the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

(2) Inspection Content

(a) Inspections of existing development must include, at a minimum:

(i) Visual inspections for the presence of actual non-storm water discharges;

(ii) Visual inspections for the presence of actual or potential discharge of pollutants;

(iii) Visual inspections for the presence of actual or potential illicit connections; and

(iv) Verification that the description of the facility or area in the inventory, required pursuant to Provision E.5.a.(2), has not changed.

(b) Onsite inspections of existing development by the Copermittee must include, at a minimum:

(i) Assessment of compliance with its applicable local ordinances and permits related to non-storm water and storm water discharges and runoff;

(ii) Assessment of the implementation of the designated BMPs;

(iii) Verification of coverage under the Industrial General Permit, when

[30] If any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspection may count toward the total annual inspection requirement. This requirement excludes linear municipal facilities (i.e., MS4 linear channels, sanitary sewer collection systems, streets, roads and highways).

applicable; and

(iv) If any problems or violations are found, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried existing development. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Name and location of the facility or area (address and hydrologic subarea) consistent with the inventory name and location, pursuant to Provision E.5.a.(1);

(b) Inspection and re-inspection date(s);

(c) Inspection method(s) (i.e. drive-by, onsite);

(d) Observations and findings from the inspection(s);

(e) For onsite inspections of existing development by Copermittee municipal or contract staff, the records must also include, as applicable:

(i) Description of any problems or violations found during the inspection(s);

(ii) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(iii) The date problems or violations were resolved.

d. EXISTING DEVELOPMENT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried existing development, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

e. RETROFITTING AND REHABILITATING AREAS OF EXISTING DEVELOPMENT

(1) Retrofitting Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to retrofit areas of existing development within

its jurisdiction to address identified sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify areas of existing development as candidates for retrofitting, focusing on areas where retrofitting will address pollutants and/or stressors that contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for retrofitting projects may be utilized to reduce pollutants that may be discharged in storm water from areas of existing development, and/or address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of retrofitting projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting projects; and

(e) Where retrofitting projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional retrofitting projects (i.e. projects that can receive and/or treat storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment) adjacent to and/or downstream of the areas of existing development.

(2) Stream, Channel and/or Habitat Rehabilitation in Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to rehabilitate streams, channels, and/or habitats in areas of existing development within its jurisdiction to address the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify streams, channels, and/or habitats in areas of existing development as candidates for rehabilitation, focusing on areas where stream, channel, and/or habitat rehabilitation projects will address the highest priority water quality conditions identified in the Water

Quality Improvement Plan;

(b) Candidates for stream, channel, and/or habitat rehabilitation projects may be utilized to address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters, rehabilitate channelized or hydromodified streams, restore wetland and riparian habitat, restore watershed functions, and/or restore beneficial uses of receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of stream, channel, and/or habitat rehabilitation projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance stream, channel, and/or habitat rehabilitation projects; and

(e) Where stream, channel, and/or habitat rehabilitation projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional stream, channel, and/or habitat rehabilitation projects (i.e. projects that can receive storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment).

6. Enforcement Response Plans

Each Copermittee must develop and implement an Enforcement Response Plan as part of its jurisdictional runoff management program document. The Enforcement Response Plan must describe the applicable approaches and options to enforce its legal authority established pursuant to Provision E.1, as necessary, to achieve compliance with the requirements of this Order. The Enforcement Response Plan must be in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include the following:

a. Enforcement Response Plan Components

The Enforcement Response Plan must include the following individual components:

(1) Illicit Discharge Detection and Elimination Enforcement Component;

(2) Development Planning Enforcement Component;

(3) Construction Management Enforcement Component; and

(4) Existing Development Enforcement Component.

b. ENFORCEMENT RESPONSE APPROACHES AND OPTIONS

Each component of the Enforcement Response Plan must describe the enforcement response approaches that the Copermittee will implement to compel compliance with its statutes, ordinances, permits, contracts, orders, or similar means, and the requirements of this Order. The description must include the protocols for implementing progressively stricter enforcement responses. The enforcement response approaches must include appropriate sanctions to compel compliance, including, at a minimum, the following tools or their equivalent:

(1) Verbal and written notices of violation;

(2) Cleanup requirements;

(3) Fines;

(4) Bonding requirements;

(5) Administrative and criminal penalties;

(6) Liens;

(7) Stop work orders; and

(8) Permit and occupancy denials.

c. CORRECTION OF VIOLATIONS

(1) Violations must be corrected in a timely manner with the goal of correcting the violations within 30 calendar days after the violations are discovered, or prior to the next predicted rain event, whichever is sooner.

(2) If more than 30 calendar days are required to achieve compliance, then a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

d. ESCALATED ENFORCEMENT

(1) The Enforcement Response Plan must include a definition of "escalated enforcement." Escalated enforcement must include any enforcement scenario where a violation or other non-compliance is determined to cause or contribute to the highest priority water quality conditions identified in the

Water Quality Improvement Plan. Escalated enforcement may be defined differently for development planning, construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas.

(2) Where the Copermittee determines escalated enforcement is not required, a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

(3) Escalated enforcement actions must continue to increase in severity, as necessary, to compel compliance as soon as possible.

e. REPORTING OF NON-COMPLIANT SITES

(1) Each Copermittee must notify the San Diego Water Board in writing within five (5) calendar days of issuing escalated enforcement (as defined in the Copermittee's Enforcement Response Plan) to a construction site that poses a significant threat to water quality as a result of violations or other non-compliance with its permits and applicable local ordinances, and the requirements of this Order. Written notification may be provided electronically by email to the appropriate San Diego Water Board staff.

(2) Each Copermittee must notify the San Diego Water Board of any persons required to obtain coverage under the statewide Industrial General Permit and Construction General Permit and failing to do so, within five (5) calendar days from the time the Copermittee become aware of the circumstances. Written notification may be provided electronically by email to R9_Nonfilers@waterboards.ca.gov ~~Nonfilers_R9@waterboards.ca.gov~~.

7. Public Education and Participation

Each Copermittee must implement, individually or with other Copermittees, a public education and participation program in accordance with the strategies identified in the Water Quality Improvement Plan to promote and encourage the development of programs, management practices, and behaviors that reduce the discharge of pollutants in storm water to the MEP, prevent controllable non-storm water discharges from entering the MS4, and protect water quality standards in receiving waters. The public education and participation program must be implemented in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include, at a minimum, the following requirements:

a. PUBLIC EDUCATION

The public education program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) Educational activities, public information activities, and other appropriate outreach activities intended to reduce pollutants associated with the application of pesticides, herbicides and fertilizer and other pollutants of concern in storm water discharges to and from its MS4 to the MEP, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed to address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(2) Educational activities, public information activities, and other appropriate outreach activities to facilitate the proper management and disposal of used oil and toxic materials; and

(3) Appropriate education and training measures for specific target audiences, such as construction site operators, residents, underserved target audiences and school-aged children, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed, based on high risk behaviors and pollutants of concern.

b. PUBLIC PARTICIPATION

The public participation program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) A process for members of the public to participate in updating the highest priority water quality conditions, numeric goals, and water quality improvement strategies in the Water Quality Improvement Plan;

(2) Opportunities for members of the public to participate in providing the Copermittee recommendations for improving the effectiveness of the water quality improvement strategies implemented within its jurisdiction; and

(3) Opportunities for members of the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or protection of the quality of receiving waters.

8. Fiscal Analysis

a. Each Copermittee must secure the resources necessary to meet all the requirements of this Order.

b. Each Copermittee must conduct an annual fiscal analysis of its jurisdictional runoff management program in its entirety. The fiscal analysis must include the following:

(1) Identification of the various categories of expenditures necessary to implement the requirements of this Order, including a description of the specific capital, operation and maintenance, and other expenditure items to

be accounted for in each category of expenditures;

(2) The staff resources needed and allocated to meet the requirements of this Order, including any development, implementation, and enforcement activities required;

(3) The estimated expenditures for Provisions E.8.b.(1) and E.8.b.(2) for the current fiscal year; and

(4) The source(s) of funds that are proposed to meet the necessary expenditures described in Provisions E.8.b.(1) and E.8.b.(2), including legal restrictions on the use of such funds, for the current fiscal year and next fiscal year.

c. Each Copermittee must submit a summary of the annual fiscal analysis with each Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3).

d. Each Copermittee must provide the documentation used to develop the summary of the annual fiscal analysis upon request by the San Diego Water Board.

F. REPORTING

The purpose of this provision is to determine and document compliance with the requirements set forth in this Order. The goal of reporting is to communicate to the San Diego Water Board and the people of the State of California the implementation status of each jurisdictional runoff management program and compliance with the requirements of this Order. This goal is to be accomplished through the submittal of specific deliverables to the San Diego Water Board by the Copermittees.

1. Water Quality Improvement Plans

The Copermittees for each Watershed Management Area must develop and submit the Water Quality Improvement Plan in accordance with the following requirements:

a. WATER QUALITY IMPROVEMENT PLAN DEVELOPMENT

Each Water Quality Improvement Plan must be developed in accordance with the following process:

(1) Public Participation Process

The Copermittees must implement a public participation process to solicit data, information, and recommendations to be utilized in the development of the Water Quality Improvement Plan. The public participation process must include the following:

(a) The Copermittees must develop a publicly available and noticed schedule of the opportunities for the public to participate and provide comments during the development of the Water Quality Improvement Plan. The schedule may be adjusted as necessary by the Copermittees, provided the public is provided timely notification of the changes to the schedule.

(b) The Copermittees must form a Water Quality Improvement Consultation Panel to provide recommendations during the development of the Water Quality Improvement Plan. The Water Quality Improvement Consultation Panel must consist of at least the following members:

(i) A representative of the San Diego Water Board;

(ii) A representative of the environmental community familiar with the water quality conditions of concern of the receiving waters in the Watershed Management Area, preferably from an environmental interest group associated with a water body within the Watershed Management Area; and

(iii) A representative of the development community familiar with the opportunities and constraints for implementing structural BMPs, retrofitting projects, and stream, channel or habitat rehabilitation

projects in the Watershed Management Area, preferably with relevant engineering, hydrology, and/or geomorphology experience in the Watershed Management Area.

(c) The Copermittees must coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public time and opportunity to participate during the development of the Water Quality Improvement Plans.

(2) Priority Water Quality Conditions

(a) The Copermittees must solicit data, information and recommendations from the public to be utilized in the development and identification of the priority water quality conditions and potential water quality improvement strategies for the Watershed Management Area.

(b) The Copermittees must review the priority water quality conditions the Copermittees plan on including in the Water Quality Improvement Plan with the Water Quality Improvement Consultation Panel to receive recommendations or concurrence.

(c) The Copermittees must consider revisions to the priority water quality conditions based on recommendations from the Water Quality Improvement Consultation Panel.

(d) The Copermittees must include all the potential water quality improvement strategies identified by the public and the Water Quality Improvement Consultation Panel with the submittal of the priority water quality conditions to the San Diego Water Board.

(e) The Copermittees must submit the Water Quality Improvement Plan requirements of Provision B.2 to the San Diego Water Board as early as 6 months and no later than 12 months after the commencement of coverage under this Order. Upon receipt, the San Diego Water Board will issue a public notice and release the proposed priority water quality conditions and potential water quality improvement strategies for public review and comment for a minimum of 30 days.

(f) The Copermittees must consider revisions to the priority water quality conditions and potential water quality improvement strategies developed pursuant to Provision B.2 based on public comments received by the close of the comment period.

(3) Water Quality Improvement Goals, Strategies and Schedules

(a) The Copermittees must solicit recommendations from the public on potential numeric goals for the highest priority water quality conditions

identified for the Watershed Management Area, and recommendations on the strategies that should be implemented to achieve the potential numeric goals.

(b) The Copermittees must consult with the Water Quality Improvement Consultation Panel and consider revisions to the following items based on the Panel's recommendations:

(i) The numeric goals and schedules the Copermittees propose to include in the Water Quality Improvement Plan;

(ii) The water quality improvement strategies and schedules the Copermittees propose to implement in the Watershed Management Area and include in the Water Quality Improvement Plan; and

(iii) If the Copermittees choose to implement Provision B.3.b.(4), the results of the Watershed Management Area Analysis the Copermittees proposed to incorporate into the Water Quality Improvement Plan.

(c) The Copermittees must submit the Water Quality Improvement Plan requirements of Provision B.3 to the San Diego Water Board as early as 9 months and no later than 18 months after the commencement of coverage under this Order. Upon receipt, the San Diego Water Board will issue a public notice and release the proposed water quality improvement goals, strategies and schedules for public review and comment for a minimum of 30 days.

(d) The Copermittees must consider revisions to the water quality improvement goals, strategies and schedules developed pursuant to Provision B.3 based on public comments received by the close of the comment period.

b. WATER QUALITY IMPROVEMENT PLAN SUBMITTAL AND IMPLEMENTATION

(1) Within 24 months after the commencement of coverage under this Order, the Copermittees for each Watershed Management Area must submit a complete Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order to the San Diego Water Board. The San Diego Water Board will issue a public notice and release the Water Quality Improvement Plan for public review and comment for a minimum of 30 days.

(2) The Copermittees must consider revisions to the Water Quality Improvement Plan based on written comments received by the close of the public comment period.

(3) The Copermittees must promptly submit any revisions to the Water Quality Improvement Plan to the San Diego Water Board no later than 60 days after the close of the public comment period.

(4) If issues concerning the Water Quality Improvement Plan are resolved informally through discussions among the Copermittees, the San Diego Water Board and interested parties, the San Diego Water Board Executive Officer may provide written notification of acceptance to the Copermittees that the Water Quality Improvement Plan meets the requirements of Provision B. However, if the Executive Officer determines that significant issues with the Water Quality Improvement Plan remain, the matter will be scheduled for San Diego Water Board consideration at a public meeting.

(5) The Copermittees must commence with implementation of the Water Quality Improvement Plan, in accordance with the water quality improvement strategies and schedules therein, upon written notification of acceptance with the Water Quality Improvement Plan by the San Diego Water Board Executive Officer.

(6) During implementation of the Water Quality Improvement Plan the Copermittees must correct any deficiencies in the Plan identified by the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report following a request by the Board to do so.

(7) The Water Quality Improvement Plan must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of receiving notification of acceptance with the Water Quality Improvement Plan by the San Diego Water Board Executive Officer.

2. Updates

a. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATES

Each Copermittee must update its jurisdictional runoff management program document in accordance with the following requirements:

(1) Each Copermittee is encouraged to seek public and key stakeholder participation and comments, as early and often as possible during the process of developing updates to its jurisdictional runoff management program document;

(2) Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E concurrent with the submittal of the Water Quality Improvement Plan. Each Copermittee must correct any deficiencies in the jurisdictional runoff management program document based on comments received from the San Diego Water Board in

the updates submitted with the Water Quality Improvement Plan Annual Report;

(3) Each Copermittee must submit updates to its jurisdictional runoff management program, with the supporting rationale for the modifications, either in the Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b;

(4) The Copermittee must revise proposed modifications to its jurisdictional runoff management program as directed by the San Diego Water Board Executive Officer; and

(5) Updated jurisdictional runoff management program documents must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of submitting the Water Quality Improvement Plan Annual Report.

b. BMP DESIGN MANUAL UPDATES

Each Copermittee must update its BMP Design Manual in accordance with the following requirements:

(1) Each Copermittee must update its BMP Design Manual to incorporate the requirements of Provisions E.3.a-d concurrent with the submittal of the Water Quality Improvement Plan. Each Copermittee must correct any deficiencies in the BMP Design Manual based on comments received from the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report;

(2) Subsequent updates to the BMP Design Manual must be consistent with the requirements of Provisions E.3.a-d and must be submitted as part of the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b; and

(3) Updated BMP Design Manuals must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of completing the update.

c. WATER QUALITY IMPROVEMENT PLAN UPDATES

(1) The Water Quality Improvement Plans must be updated in accordance with the following process:

(a) The Copermittees must develop and implement a public participation process to obtain data, information and recommendations for updating the Water Quality Improvement Plan. The public participation process must provide for a publicly available and noticed schedule of opportunities for the public to participate and provide comments during the development of updates to the Water Quality Improvement Plan;

(b) The Copermittees must consult with the Water Quality Improvement Consultation Panel on proposed updates of the Water Quality Improvement Plan, and consider the Water Quality Improvement Consultation Panel's recommendations in finalizing the proposed updates;

(c) The Copermittees for each Watershed Management Area must submit 1) proposed updates to the Water Quality Improvement Plan and supporting rationale, and 2) recommendations received from the public and the Water Quality Improvement Consultation Panel and the rationale for the requested updates, either in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The updates submitted will be deemed accepted for inclusion in the Water Quality Improvement Plan ninety (90) days after submission unless otherwise directed in writing by the San Diego Water Board Executive Officer;

(d) The Copermittees must revise the requested updates as directed by the San Diego Water Board Executive Officer; and

(e) Updated Water Quality Improvement Plans must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance of the requested updates by the San Diego Water Board.

(2) No later than six months following Office of Administrative Law and USEPA approval of any TMDL Basin Plan amendment with wasteload allocations (WLAs) assigned to the Copermittees during the term of this Order, the Copermittees must initiate an update to the applicable Water Quality Improvement Plans in accordance with Provision F.1 or Provision F.2.c.(1) to incorporate the requirements of the TMDL WLAs.

3. Progress Reporting

a. Progress Report Presentations

The Copermittees for each Watershed Management Area must periodically appear before the San Diego Water Board, as requested by the Board, to provide progress reports on the implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs.

b. Annual Reports

(1) Transitional Jurisdictional Runoff Management Program Annual Reports

(a) Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) no later than October 31 of each year for each jurisdictional runoff management program reporting period (i.e. July 1 to June 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted.

(b) Each Copermittee must submit the information on the Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) specific to the area within its jurisdiction in each Watershed Management Area.

(c) In addition to submitting the Jurisdictional Runoff Management Program Annual Report Form during the transitional reporting period, each Copermittee may continue to utilize and submit the jurisdictional runoff management program annual reporting format of its previous NPDES permit until the first Water Quality Improvement Plan Annual Report is required to be submitted.

(2) Transitional Monitoring and Assessment Program Annual Reports

The Copermittees for each Watershed Management Area must submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted under this Order. The Transitional Monitoring and Assessment Program Annual Reports must include:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1.a and D.2.a, summarized and presented in tabular and graphical form; and

(b) The findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

(3) Water Quality Improvement Plan Annual Reports

The Copermittees for each Watershed Management Area must submit a Water Quality Improvement Plan Annual Report for each reporting period no later than January 31 of the following year. The annual reporting period consists of two different periods: 1) July 1 to June 30 of the following year for the jurisdictional runoff management programs, 2) October 1 to September 30 of the following year for the monitoring and assessment programs. The Water Quality Improvement Plan Annual Reports must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Each Annual Report must include the following:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, summarized and presented in tabular and graphical form;

(b) The progress of the special studies required pursuant to Provision D.3, and the findings, interpretations and conclusions of a special study, or each phase of a special study, upon its completion;

(c) The findings, interpretations and conclusions from the assessments required pursuant to Provision D.4;

(d) The progress of implementing the Water Quality Improvement Plan, including, but not limited to, the following:

(i) The progress toward achieving the interim and final numeric goals for the highest water quality priorities for the Watershed Management Area;

(ii) The water quality improvement strategies that were implemented and/or no longer implemented by each of the Copermittees during the reporting period and previous reporting periods;

(iii) The water quality improvement strategies planned for implementation during the next reporting period;

(iv) Proposed modifications to the water quality improvement strategies, the public comments received and the supporting rationale for the proposed modifications;

(v) Previous modifications or updates incorporated into the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document and implemented by the Copermittees in the Watershed Management Area; and

(vi) Proposed modifications or updates to the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document;

(e) A completed Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) for each Copermittee in the Watershed Management Area, certified by a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative; and

(f) Each Copermittee must provide any data or documentation utilized in developing the Water Quality Improvement Plan Annual Report upon request by the San Diego Water Board. Any Copermittee monitoring data utilized in developing the Water Quality Improvement Plan Annual Report must be uploaded to the California Environmental Data Exchange Network (CEDEN).[31] Any Copermittee monitoring and assessment data utilized in developing the Water Quality Improvement Plan Annual Report must be available for access on the Regional Clearinghouse required pursuant to Provision F.4.

c. Regional Monitoring and Assessment Report

(1) The Copermittees must submit a Regional Monitoring and Assessment Report no later than 180 days prior to the expiration date of this Order. The Regional Monitoring and Assessment Report may be submitted as part of the Report of Waste Discharge required pursuant to Provision F.5.b. In preparing the report the Copermittees must consider the receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, and the findings, interpretations, and conclusions from the assessments required pursuant to Provision D.4. Based on these considerations the report must assess the following:

(a) The beneficial uses of the receiving waters within the San Diego Region that are supported and not adversely affected by the Copermittees' MS4 discharges;

(b) The beneficial uses of the receiving waters within the San Diego Region that are adversely impacted by the Copermittees' MS4 discharges;

(c) The progress toward protecting the beneficial uses in the receiving waters within the San Diego Region from the Copermittees' discharges; and

[31] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

(d) Pollutants or conditions of emerging concern that may impact beneficial uses in the receiving waters within the San Diego Region.

(2) The Regional Monitoring and Assessment Report must include recommendations for improving the implementation and assessment of the Water Quality Improvement Plans and jurisdictional runoff management programs.

(3) Each Copermittee must provide any data or documentation utilized in developing the Regional Monitoring and Assessment Report upon request by the San Diego Water Board. Any Copermittee monitoring and assessment data utilized in developing the Regional Monitoring and Assessment Report must be available for access on the Regional Clearinghouse required pursuant to Provision F.4.

4. Regional Clearinghouse

The Copermittees must develop, update, and maintain an internet-based Regional Clearinghouse that is made available to the public no later than 18 months after the effective date of this Order.[32]

a. The Copermittees, through the Regional Clearinghouse, must make the following documents and data available for access, and organized by Watershed Management Area. The documents and data may be linked to other internet-based data portals and databases where the original documents are stored:

(1) Water Quality Improvement Plan for the Watershed Management Area, and all updated versions with date of update;

(2) Annual Reports for the Watershed Management Area;

(3) Jurisdictional Runoff Management Program document for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(4) BMP Design Manual for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(5) Reports from special studies (e.g. source identification, BMP effectiveness assessment) conducted in the Watershed Management Area;

[32] The Copermittees may develop, update and maintain the clearinghouse(s) of other Copermittees or agencies.

(6) Monitoring data collected pursuant to Provision D for each Watershed Management Area must be uploaded to CEDEN,[33] with links to the uploaded data; and

(7) Available GIS data, layers, and/or shapefiles used to develop the maps generated and maintained by the Copermittees for the Water Quality Improvement Plans, Annual Reports, and jurisdictional runoff management program documents.

b. The Copermittees, through the Regional Clearinghouse, must make the following information and documents available for access:

(1) Contact information (point of contact, phone number, email address, and mailing address) for each Copermittee;

(2) Public hotline number for reporting non-storm water and illicit discharges for each Copermittee;

(3) Email address for reporting non-storm water and illicit discharges for each Copermittee;

(4) Link to each Copermittee's website, if available, where the public may find additional information about the Copermittee's storm water management program and for requesting records for the implementation of its program;

(5) Information about opportunities for the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or protection of the quality of receiving waters; and

(6) Reports from regional monitoring programs in which the Copermittees participate (e.g. Southern California Monitoring Coalition, Southern California Coastal Water Research Project Bight Monitoring);

(7) Regional Monitoring and Assessment Reports; and

(8) Any other information, data, and documents the Copermittees determine as appropriate for making available to the public.

[33] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

5. Report of Waste Discharge

a. The ~~Orange County Copermittees and the~~ Riverside County Copermittees are required to submit a complete Report of Waste Discharge pursuant to the requirements of their current Order~~s~~. The San Diego Water Board will review and consider the Report~~s~~ of Waste Discharge to determine whether modification to this Order, pursuant to the requirements of Provision H, will be required prior to the ~~Orange County Copermittees and/or~~ Riverside County Copermittees obtaining coverage under this Order. The current Order ~~s~~ for ~~the Orange County Copermittees and~~ Riverside County Copermittees is ~~are~~ rescinded upon the date of effective coverage under this Order except for enforcement purposes.

b. The Copermittees subject to the requirements of this Order must submit to the San Diego Water Board a complete Report of Waste Discharge as an application for the re-issuance of this Order and NPDES permit. The Report of Waste Discharge must be submitted no later than 180 days in advance of the expiration date of this Order. The Report of Waste Discharge must contain the following minimum information:

(1) Names and addresses of the Copermittees;

(2) Names and titles of the primary contacts of the Copermittees;

(3) Proposed changes to the Copermittees' Water Quality Improvement Plans and the supporting justification;

(4) Proposed changes to the Copermittees' jurisdictional runoff management programs and the supporting justification;

(5) Any other information necessary for the re-issuance of this Order;

(6) Any information to be included as part of the Report of Waste Discharge pursuant to the requirements of this Order; and

(7) Any other information required by federal regulations for NPDES permit reissuance.

6. Application for Early Coverage

a. The ~~Orange County Copermittees, collectively, or~~ Riverside County Copermittees~~, collectively,~~ may apply for early coverage under this Order by submitting a Report of Waste Discharge Form 200, with a written request for early coverage under this Order.

b. The San Diego Water Board will review the application for early coverage. A notification of coverage under this Order will be issued to the Copermittees in the

respective county by the San Diego Water Board upon completion of the early coverage application requirements. The effective coverage date will be specified in the notification of coverage. The Copermittees in the respective county are authorized to have MS4 discharges pursuant to the requirements of this Order starting on the effective coverage date specified in the notification of coverage. The existing Order for the respective county is rescinded upon the effective coverage date specified in the notification of coverage except for enforcement purposes.

7. Reporting Provisions

Each Copermittee must comply with all the reporting and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

G. PRINCIPAL WATERSHED COPERMITTEE RESPONSIBILITIES

1. The Copermittees within each Watershed Management Area must designate a Principal Watershed Copermittee and notify the San Diego Water Board of the name of the Principal Watershed Copermittee. An individual Copermittee should not be designated a Principal Watershed Copermittee for more than two Watershed Management Areas. The notification may be submitted with the Water Quality Improvement Plan required pursuant to Provision F.1 of this Order.

2. The Principal Watershed Copermittee is responsible for, at a minimum, the following:

a. Serving as liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues, and when necessary and appropriate, representing the Copermittees in the Watershed Management Area before the San Diego Water Board;

b. Facilitating the development of the Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order;

c. Coordinating the submittal of the deliverables required by Provisions F.1, F.2, F.3.a, and F.3.b of this Order; and

d. Coordinating and developing, with the other Principal Watershed Copermittees, the requirements of Provisions F.3.c, F.4, and F.5.b of this Order.

3. The Principal Watershed Copermittee is not responsible for ensuring that the other Copermittees within the Watershed Management Area are in compliance with the requirements of this Order. Each Copermittee within the Watershed Management Area is responsible for complying with the requirements of this Order.

H. MODIFICATION OF ORDER

1. Modifications of the Order may be initiated by the San Diego Water Board or by the Copermittees. Requests by Copermittees must be made to the San Diego Water Board.

2. Minor modifications to the Order may be made by the San Diego Water Board where the proposed modification complies with all the prohibitions and limitations, and other requirements of this Order.

3. This Order may also be re-opened and modified, revoked and, reissued or terminated in accordance with the provisions of 40 CFR 122.44, 122.62 to 122.64, and 124.5. Causes for taking such actions include, but are not limited to, failure to comply with any condition of this Order and permit, and endangerment to human health or the environment resulting from the permitted activity.

4. This Order may be re-opened for modification for cause including but not limited to the following:

   a. The State Water Board determines that revisions are warranted, and the San Diego Water Board concurs that revisions are necessary to those provisions of the Order addressing compliance with water quality standards in the receiving water and/or those provisions of the Order establishing an iterative process for implementation of management practices to assure compliance with water quality standards in the receiving water;

   b. An application for early coverage under this Order is received pursuant to Provision F.6;

   c. Any of the TMDLs in Attachment E to this Order are amended in the Basin Plan by San Diego Water Board, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA;

   d. The Basin Plan is amended by the San Diego Water Board to incorporate a new TMDL, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA; or

   e. Updating or revising the monitoring and reporting requirements is determined to be necessary, at the discretion of the San Diego Water Board. Such modification(s) may include, but is (are) not limited to, revision(s) to: (i) implement recommendations from Southern California Coastal Water Research Project (SCCWRP), (ii) develop, refine, implement, and/or coordinate a regional monitoring program, (iii) develop and implement improved monitoring and assessment programs in keeping with San Diego Water Board Resolution No. R9-2012-0069, Resolution in Support of a Regional Monitoring Framework, and/or (iv) add provisions to require the Copermittees to evaluate and provide information on cost and values of the monitoring and reporting program.

5. The San Diego Water Board, after opportunity for public comment and a public hearing, will re-open and consider modifications to this Order when the ~~Orange County Copermittees or the~~ Riverside County Copermittees submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders.

I. STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

Each Copermittee must comply with all the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

ATTACHMENT A

DISCHARGE PROHIBITIONS AND SPECIAL PROTECTIONS

1. Basin Plan Waste Discharge Prohibitions

California Water Code Section 13243 provides that a Regional Water Board, in a water quality control plan, may specify certain conditions or areas where the discharge of waste or certain types of waste is not permitted. The following waste discharge prohibitions in the Water Quality Control Plan for the San Diego Basin (Basin Plan) are applicable to any person, as defined by Section 13050(c) of the California Water Code, who is a citizen, domiciliary, or political agency or entity of California whose activities in California could affect the quality of waters of the state within the boundaries of the San Diego Region.

1. The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in California Water Code Section 13050, is prohibited.

2. The discharge of waste to land, except as authorized by waste discharge requirements or the terms described in California Water Code Section 13264 is prohibited.

3. The discharge of pollutants or dredged or fill material to waters of the United States except as authorized by a National Pollutant Discharge Elimination System (NPDES) permit or a dredged or fill material permit (subject to the exemption described in California Water Code Section 13376) is prohibited.

4. Discharges of recycled water to lakes or reservoirs used for municipal water supply or to inland surface water tributaries thereto are prohibited, unless this San Diego Water Board issues a NPDES permit authorizing such a discharge; the proposed discharge has been approved by the State Department of Health Services (DHS) and the operating agency of the impacted reservoir; and the discharger has an approved fail-safe long-term disposal alternative.

5. The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the San Diego Water Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

6. The discharge of waste in a manner causing flow, ponding, or surfacing on lands not owned or under the control of the discharger is prohibited, unless the discharge is authorized by the San Diego Water Board.

7. The dumping, deposition, or discharge of waste directly into waters of the state, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the San Diego Water Board.

8. Any discharge to a storm water conveyance system that is not composed entirely of "*storm water*" is prohibited unless authorized by the San Diego Water Board. [The federal regulations, 40 CFR 122.26(b)(13), define storm water as storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from firefighting activities.] [§122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

9. The unauthorized discharge of treated or untreated sewage to waters of the state or to a storm water conveyance system is prohibited.

10. The discharge of industrial wastes to conventional septic tank/subsurface disposal systems, except as authorized by the terms described in California Water Code Section 13264, is prohibited.

11. The discharge of radioactive wastes amenable to alternative methods of disposal into the waters of the state is prohibited.

12. The discharge of any radiological, chemical, or biological warfare agent into waters of the state is prohibited.

13. The discharge of waste into a natural or excavated site below historic water levels is prohibited unless the discharge is authorized by the San Diego Water Board.

14. The discharge of sand, silt, clay, or other earthen materials from any activity, including land grading and construction, in quantities which cause deleterious bottom deposits, turbidity or discoloration in waters of the state or which unreasonably affect, or threaten to affect, beneficial uses of such waters is prohibited.

15. The discharge of treated or untreated sewage from vessels to Mission Bay, Oceanside Harbor, Dana Point Harbor, or other small boat harbors is prohibited.

16. The discharge of untreated sewage from vessels to San Diego Bay is prohibited.

17. The discharge of treated sewage from vessels to portions of San Diego Bay that are less than 30 feet deep at mean lower low water (MLLW) is prohibited.

18. The discharge of treated sewage from vessels, which do not have a properly functioning US Coast Guard certified Type I or Type II marine sanitation device, to portions of San Diego Bay that are greater than 30 feet deep at mean lower low water (MLLW) is prohibited.

2. Attachment B to State Water Board Resolution 2012-0012, as amended by State Water Board Resolution No. 2012-0031.

Special Protections for Areas of Special Biological Significance (ASBS), Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges

I. PROVISIONS FOR POINT SOURCE DISCHARGES OF STORM WATER AND NONPOINT SOURCE WASTE DISCHARGES

The following terms, prohibitions, and special conditions (hereafter collectively referred to as special conditions) are established as limitations on point source storm water and nonpoint source discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in Areas of Special Biological Significance (ASBS), as required for State Water Quality Protection Areas pursuant to California Public Resources Code Sections 36700(f) and 36710(f). These Special Protections are adopted by the State Water Board as part of the California Ocean Plan (Ocean Plan) General Exception.

The special conditions are organized by category of discharge. The State Water Resources Control Board (State Water Board) and Regional Water Quality Control Boards (Regional Water Boards) will determine categories and the means of regulation for those categories [e.g., Point Source Storm Water National Pollutant Discharge Elimination System (NPDES) or Nonpoint Source].

A. PERMITTED POINT SOURCE DISCHARGES OF STORM WATER

1. General Provisions for Permitted Point Source Discharges of Storm Water

a. Existing storm water discharges into an ASBS are allowed only under the following conditions:

(1) The discharges are authorized by an NPDES permit issued by the State Water Board or Regional Water Board;

(2) The discharges comply with all of the applicable terms, prohibitions, and special conditions contained in these Special Protections; and

(3) The discharges:

(i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

(ii) Are designed to prevent soil erosion;

(iii) Occur only during wet weather;

(iv) Are composed of only storm water runoff.

b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

c. The discharge of trash is prohibited.

d. Only discharges from existing storm water outfalls are allowed. Any proposed or new storm water runoff discharge shall be routed to existing storm water discharge outfalls and shall not result in any new contribution of waste to an ASBS (i.e., no additional pollutant loading). "Existing storm water outfalls" are those that were constructed or under construction prior to January 1, 2005. "New contribution of waste" is defined as any addition of waste beyond what would have occurred as of January 1, 2005. A change to an existing storm water outfall, in terms of re-location or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges are prohibited except as provided below:

(1) The term "non-storm water discharges" means any waste discharges from a municipal separate storm sewer system (MS4) or other NPDES permitted storm drain system to an ASBS that are not composed entirely of storm water.

(2) (i) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability or occur naturally:

(a) Discharges associated with emergency fire fighting operations.

(b) Foundation and footing drains.

(c) Water from crawl space or basement pumps.

(d) Hillside dewatering.

(e) Naturally occurring groundwater seepage via a storm drain.

(f) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(ii) An NPDES permitting authority may authorize non-storm water discharges to an MS4 with a direct discharge to an ASBS only to the extent the NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

2. Compliance Plans for Inclusion in Storm Water Management Plans (SWMP) and Storm Water Pollution Prevention Plans (SWPPP).

The discharger shall specifically address the prohibition of non-storm water runoff and the requirement to maintain natural water quality for storm water discharges to an ASBS in an ASBS Compliance Plan to be included in its SWMP or a SWPPP, as appropriate to permit

type. If a statewide permit includes a SWMP, then the discharger shall prepare a stand-alone compliance plan for ASBS discharges. The ASBS Compliance Plan is subject to approval by the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (for permits issued by Regional Water Boards).

a. The Compliance Plan shall include a map of surface drainage of storm water runoff, showing areas of sheet runoff, prioritize discharges, and describe any structural Best Management Practices (BMPs) already employed and/or BMPs to be employed in the future. Priority discharges are those that pose the greatest water quality threat and which are identified to require installation of structural BMPs. The map shall also show the storm water conveyances in relation to other features such as service areas, sewage conveyances and treatment facilities, landslides, areas prone to erosion, and waste and hazardous material storage areas, if applicable. The SWMP or SWPPP shall also include a procedure for updating the map and plan when changes are made to the storm water conveyance facilities.

b. The ASBS Compliance Plan shall describe the measures by which all non-authorized non-storm water runoff (e.g., dry weather flows) has been eliminated, how these measures will be maintained over time, and how these measures are monitored and documented.

c. For Municipal Separate Storm Sewer System (MS4s), the ASBS Compliance Plan shall require minimum inspection frequencies as follows:

(1) The minimum inspection frequency for construction sites shall be weekly during rainy season;

(2) The minimum inspection frequency for industrial facilities shall be monthly during the rainy season;

(3) The minimum inspection frequency for commercial facilities (e.g., restaurants) shall be twice during the rainy season; and

(4) Storm water outfall drains equal to or greater than 18 inches (457 mm) in diameter or width shall be inspected once prior to the beginning of the rainy season and once during the rainy season and maintained to remove trash and other anthropogenic debris.

d. The ASBS Compliance Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff, that are necessary to comply with these special conditions, will be achieved through BMPs. Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that such installation would pose a threat to health or safety. BMPs to control storm water runoff discharges (at the end-of-pipe) during a design storm shall be designed to achieve on average the following target levels:

(1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

(2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges.

The baseline for these determinations is the effective date of the Exception, except for those structural BMPs installed between January 1, 2005 and adoption of these Special Protections, and the reductions must be achieved and documented within six (6) years of the effective date.

e. The ASBS Compliance Plan shall address erosion control and the prevention of anthropogenic sedimentation in ASBS. The natural habitat conditions in the ASBS shall not be altered as a result of anthropogenic sedimentation.

f. The ASBS Compliance Plan shall describe the non-structural BMPs currently employed and planned in the future (including those for construction activities), and include an implementation schedule. The ASBS Compliance Plan shall include non-structural BMPs that address public education and outreach. Education and outreach efforts must adequately inform the public that direct discharges of pollutants from private property not entering an MS4 are prohibited. The ASBS Compliance Plan shall also describe the structural BMPs, including any low impact development (LID) measures, currently employed and planned for higher threat discharges and include an implementation schedule. To control storm water runoff discharges (at the end-of-pipe) during a design storm, permittees must first consider, and use where feasible, LID practices to infiltrate, use, or evapotranspirate storm water runoff on-site, if LID practices would be the most effective at reducing pollutants from entering the ASBS.

g. The BMPs and implementation schedule shall be designed to ensure that natural water quality conditions in the receiving water are achieved and maintained by either reducing flows from impervious surfaces or reducing pollutant loading, or some combination thereof.

h. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents in storm water runoff that alter natural ocean water quality and the sources of these constituents.

(2) The report shall describe BMPs that are currently being implemented, BMPs that are identified in the SWMP or SWPPP for future implementation, and any additional BMPs that may be added to the SWMP or SWPPP to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the BMPs.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits), the discharger shall revise its ASBS Compliance Plan to incorporate any new or modified BMPs that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised SWMP or SWPPP, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural ocean water quality conditions due to the same constituent.

(5) The requirements of this section are in addition to the terms, prohibitions, and conditions contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within eighteen (18) months from the effective date of the Exception, the discharger shall submit a draft written ASBS Compliance Plan to the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that describes its strategy to comply with these special conditions, including the requirement to maintain natural water quality in the affected ASBS. The ASBS Compliance Plan shall include a description of appropriate non-structural controls and a time schedule to implement structural controls (implementation schedule) to comply with these special conditions for inclusion in the discharger's SWMP or SWPPP, as appropriate to permit type. The final ASBS Compliance Plan, including a description and final schedule for structural controls based on the results of runoff and receiving water monitoring, must be submitted within thirty (30) months from the effective date of the Exception.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these special conditions shall be implemented.

d. Within six (6) years of the effective date of the Exception, any structural controls identified in the ASBS Compliance Plan that are necessary to comply with these special conditions shall be operational.

e. Within six (6) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water, pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data, and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe

the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. for municipalities, a demonstration of significant hardship to discharger ratepayers, by showing the relationship of storm water fees to annual household income for residents within the discharger's jurisdictional area, and the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or

2. for other governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

B. NONPOINT SOURCE DISCHARGES

1. General Provisions for Nonpoint Sources

a. Existing nonpoint source waste discharges are allowed into an ASBS only under the following conditions:

(1) The discharges are authorized under waste discharge requirements, a conditional waiver of waste discharge requirements, or a conditional prohibition issued by the State Water Board or a Regional Water Board.

(2) The discharges are in compliance with the applicable terms, prohibitions, and special conditions contained in these Special Protections.

(3) The discharges:

(i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

(ii) Are designed to prevent soil erosion;

(iii) Occur only during wet weather;

(iv) Are composed of only storm water runoff.

b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

c. The discharge of trash is prohibited.

d. Only existing nonpoint source waste discharges are allowed. "Existing nonpoint source waste discharges" are discharges that were ongoing prior to January 1, 2005. "New nonpoint source discharges" are defined as those that commenced on or after January 1, 2005. A change to an existing nonpoint source discharge, in terms of relocation or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges from nonpoint sources (those not subject to an NPDES Permit) are prohibited except as provided below:

(1) The term "non-storm water discharges" means any waste discharges that are not composed entirely of storm water.

(2) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability, or occur naturally:

(i) Discharges associated with emergency fire fighting operations.

(ii) Foundation and footing drains.

(iii) Water from crawl space or basement pumps.

(iv) Hillside dewatering.

(v) Naturally occurring groundwater seepage via a storm drain.

(vi) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

f. At the San Clemente Island ASBS, discharges incidental to military training and research, development, test, and evaluation operations are allowed. Discharges incidental to underwater demolition and other in-water explosions are not allowed in the two military closure areas in the vicinity of Wilson Cove and Castle Rock. Discharges must not result in a violation of the water quality objectives, including the protection of the marine aquatic life beneficial use, anywhere in the ASBS.

g. At the San Nicolas Island and Begg Rock ASBS, discharges incidental to military research, development, testing, and evaluation of, and training with, guided missile and other weapons systems, fleet training exercises, small-scale amphibious warfare training, and special warfare training are allowed. Discharges incidental to underwater demolition and other in-water explosions are not allowed. Discharges must not result in a violation of the water quality objectives, including the protection of the marine aquatic life beneficial use, anywhere in the ASBS.

h. All other nonpoint source discharges not specifically authorized above are prohibited.

2. Planning and Reporting

a. The nonpoint source discharger shall develop an ASBS Pollution Prevention Plan, including an implementation schedule, to address storm water runoff and any other nonpoint source discharges from its facilities. The ASBS Pollution Prevention Plan must be equivalent in contents to an ASBS Compliance Plan as described in I (A)(2) in this document. The ASBS Pollution Prevention Plan is subject to approval by the Executive Director of the State Water Board (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements).

b. The ASBS Pollution Prevention Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff that are necessary to comply with these special conditions, will be achieved through Management Measures and associated Management Practices (Management Measures/Practices). Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director or Regional Water Board Executive Officer that such installation would pose a threat to health or safety. Management Measures to control storm water runoff during a design storm shall achieve on average the following target levels:

(1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

(2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges.

The baseline for these determinations is the effective date of the Exception, except for those structural BMPs installed between January 1, 2005 and adoption of these Special Protections, and the reductions must be achieved and documented within six (6) years of the effective date.

c. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff or other nonpoint source pollution is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and the Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents that alter natural water quality and the sources of these constituents.

(2) The report shall describe Management Measures/Practices that are currently being implemented, Management Measures/Practices that are identified in the ASBS Pollution Prevention Plan for future implementation, and any additional Management Measures/Practices that may be added to the Pollution Prevention Plan to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the Management Measures/Practices.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of

the Regional Water Board (Regional Water Board waivers or waste discharge requirements), the discharger shall revise its ASBS Pollution Prevention Plan to incorporate any new or modified Management Measures/Practices that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised ASBS Pollution Prevention Plan, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural water quality conditions due to the same constituent.

(5) The requirements of this section are in addition to the terms, prohibitions, and conditions contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within eighteen (18) months from the effective date of the Exception, the discharger~~s~~ shall submit a draft written ASBS Pollution Prevention Plan to the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) that describes its strategy to comply with these special conditions, including the requirement to maintain natural ocean water quality in the affected ASBS. The Pollution Prevention Plan shall include a description of appropriate non-structural controls and a time schedule to implement structural controls to comply with these special conditions for inclusion in the discharger's Pollution Prevention Plan. The final ASBS Pollution Prevention Plan, including a description and final schedule for structural controls based on the results of runoff and receiving water monitoring, must be submitted within thirty (30) months from the effective date of the Exception.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these Special Protections shall be implemented.

d. Within six (6) years of the effective date of the Exception, any structural controls identified in the ASBS Pollution Prevention Plan that are necessary to comply with these special conditions shall be operational.

e. Within six (6) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board

waivers or waste discharge requirements) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. a demonstration that the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or

2. for governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

II. ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES

In addition to the provisions in Section I (A) or I (B), respectively, a discharger with parks and recreation facilities shall comply with the following:

A. The discharger shall include a section in an ASBS Compliance Plan (for NPDES dischargers) or an ASBS Pollution Prevention Plan (for nonpoint source dischargers) to address storm water runoff from parks and recreation facilities.

1. The plan shall identify all pollutant sources, including sediment sources, which may result in waste entering storm water runoff. Pollutant sources include, but are not limited to, roadside rest areas and vistas, picnic areas, campgrounds, trash receptacles, maintenance facilities, park personnel housing, portable toilets, leach fields, fuel tanks, roads, piers, and boat launch facilities.

2. The plan shall describe BMPs or Management Measures/Practices that will be implemented to control soil erosion (both temporary and permanent erosion controls) and reduce or eliminate pollutants in storm water runoff in order to achieve and maintain natural water quality conditions in the affected ASBS. The plan shall include BMPs or Management Measures/Practices to ensure that trails and culverts are maintained to prevent erosion and minimize waste discharges to ASBS.

3. The plan shall include BMPs or Management Measures/Practices to prevent the discharge of pesticides or other chemicals, including agricultural chemicals, in storm water runoff to the affected ASBS.

4. The plan shall include BMPs or Management Measures/Practices that address public education and outreach. The goal of these BMPs or Management Measures/Practices is to ensure that the public is adequately informed that waste discharges to the affected ASBS are prohibited or limited by special conditions in these Special Protections. The BMPs or Management Measures/Practices shall include signage at camping, picnicking, beach and roadside parking areas, and visitor centers, or other appropriate measures, which notify the public of any applicable requirements of these Special Protections and identify the ASBS boundaries.

5. The plan shall include BMPs or Management Measures/Practices that address the prohibition against the discharge of trash to ASBS. The BMPs or Management Measures/Practices shall include measures to ensure that adequate trash receptacles are available for public use at visitor facilities, including parking areas, and that the receptacles are adequately maintained to prevent trash discharges into the ASBS. Appropriate measures include covering trash receptacles to prevent trash from being wind blown and periodically emptying the receptacles to prevent overflows.

6. The plan shall include BMPs or Management Measures/Practices to address runoff from parking areas and other developed features to ensure that the runoff does not alter natural water quality in the affected ASBS. BMPs or Management Measures/Practices shall include measures to reduce pollutant loading in runoff to the ASBS through installation of natural area buffers (LID), treatment, or other appropriate measures.

B. Maintenance and repair of park and recreation facilities must not result in waste discharges to the ASBS. The practice of road oiling must be minimized or eliminated, and must not result in waste discharges to the ASBS.

III. ADDITIONAL REQUIREMENTS – WATERFRONT AND MARINE OPERATIONS

In addition to the provisions in Section I (A) or I (B), respectively, a discharger with waterfront and marine operations shall comply with the following:

A. For discharges related to waterfront and marine operations, the discharger shall develop a Waterfront and Marine Operations Management Plan (Waterfront Plan). This plan shall contain appropriate Management Measures/Practices to address nonpoint source pollutant discharges to the affected ASBS.

1. The Waterfront Plan shall contain appropriate Management Measures/Practices for any waste discharges associated with the operation and maintenance of vessels, moorings, piers, launch ramps, and cleaning stations in order to ensure that beneficial uses are protected and natural water quality is maintained in the affected ASBS.

2. For discharges from marinas and recreational boating activities, the Waterfront Plan shall include appropriate Management Measures, described in The Plan for California's Nonpoint Source Pollution Control Program, for marinas and recreational boating, or equivalent practices, to ensure that nonpoint source pollutant discharges do not alter natural water quality in the affected ASBS.

3. The Waterfront Plan shall include Management Practices to address public education and outreach to ensure that the public is adequately informed that waste discharges to the affected ASBS are prohibited or limited by special conditions in these Special Protections. The management practices shall include appropriate signage, or similar measures, to inform the public of the ASBS restrictions and to identify the ASBS boundaries.

4. The Waterfront Plan shall include Management Practices to address the prohibition against trash discharges to ASBS. The Management Practices shall include the provision of adequate trash receptacles for marine recreation areas, including parking areas, launch ramps, and docks. The plan shall also include appropriate Management Practices to ensure that the receptacles are adequately maintained and secured in order to prevent trash discharges into the ASBS. Appropriate Management Practices include covering the trash receptacles to prevent trash from being windblown, staking or
securing the trash receptacles so they don't tip over, and periodically emptying the receptacles to prevent overflow.

5. The discharger shall submit its Waterfront Plan to the by the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) within six months of the effective date of these special conditions. The Waterfront Plan is subject to approval by the State Water Board Executive Director or the Regional Water Board Executive Officer, as appropriate. The plan must be fully implemented within 18 months of the effective date of the Exception.

B. The discharge of chlorine, soaps, petroleum, other chemical contaminants, trash, fish offal, or human sewage to ASBS is prohibited. Sinks and fish cleaning stations are point source discharges of wastes and are prohibited from discharging into ASBS. Anthropogenic accumulations of discarded fouling organisms on the sea floor must be minimized.

C. Limited-term activities, such as the repair, renovation, or maintenance of waterfront facilities, including, but not limited to, piers, docks, moorings, and breakwaters, are authorized only in accordance with Chapter III.E.2 of the Ocean Plan.

D. If the discharger anticipates that the discharger will fail to fully implement the approved Waterfront Plan within the 18 month deadline, the discharger shall submit a technical report as soon as practicable to the State Water Board Executive Director or the Regional Water Board Executive Officer, as appropriate. The technical report shall contain reasons for failing to meet the deadline and propose a revised schedule to fully implement the plan.

E. The State Water Board or the Regional Water Board may, for good cause, authorize additional time to comply with the Waterfront Plan. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that

caused or would cause it to fail to meet the deadline in Section III.A.5. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality. The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. a demonstration of significant hardship by showing that the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate.

2. for governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

IV. MONITORING REQUIREMENTS

Monitoring is mandatory for all dischargers to assure compliance with the Ocean Plan. Monitoring requirements include both: (A) core discharge monitoring, and (B) ocean receiving water monitoring. The State and Regional Water Boards must approve sampling site locations and any adjustments to the monitoring programs. All ocean receiving water and reference area monitoring must be comparable with the Water Boards' Surface Water Ambient Monitoring Program (SWAMP).

Safety concerns: Sample locations and sampling periods must be determined considering safety issues. Sampling may be postponed upon notification to the State and Regional Water Boards if hazardous conditions prevail.

Analytical Chemistry Methods: All constituents must be analyzed using the lowest minimum detection limits comparable to the Ocean Plan water quality objectives. For metal analysis, all samples, including storm water effluent, reference samples, and ocean receiving water samples, must be analyzed by the approved analytical method with the lowest minimum detection limits (currently Inductively Coupled Plasma/Mass Spectrometry) described in the Ocean Plan.

A. CORE DISCHARGE MONITORING PROGRAM

1. General sampling requirements for timing and storm size:

   Runoff must be collected during a storm event that is greater than 0.1 inch and generates runoff, and at least 72 hours from the previously measurable storm event. Runoff samples shall be collected during the same storm and at approximately the same time when post-storm receiving water is sampled, and analyzed for the same constituents as receiving water and reference site samples (see section IV B) as described below.

2. Runoff flow measurements

a. For municipal/industrial storm water outfalls in existence as of December 31, 2007, 18 inches (457mm) or greater in diameter/width (including multiple outfall pipes in combination having a width of 18 inches, runoff flows must be measured or calculated, using a method acceptable to and approved by the State and Regional Water Boards.

b. This will be reported annually for each precipitation season to the State and Regional Water Boards.

3. Runoff samples – storm events

a. For outfalls equal to or greater than 18 inches (0.46m) in diameter or width:

(1) samples of storm water runoff shall be collected during the same storm as receiving water samples and analyzed for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

(2) samples of storm water runoff shall be collected and analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

(3) If an applicant has no outfall greater than 36 inches, then storm water runoff from the applicant's largest outfall shall be further collected during the same storm as receiving water samples and analyzed for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates).

b. For outfalls equal to or greater than 36 inches (0.91m) in diameter or width:

(1) samples of storm water runoff shall be collected during the same storm as receiving water samples and analyzed for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

(2) samples of storm water runoff shall be further collected during the same storm as receiving water samples and analyzed for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates); and

(3) samples of storm water runoff shall be collected and analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

c. For an applicant not participating in a regional monitoring program [see below in Section IV (B)] in addition to (a.) and (b.) above, a minimum of the two largest outfalls or 20 percent of the larger outfalls, whichever is greater, shall be sampled (flow weighted composite samples) at least three times annually during wet weather (storm event)

and analyzed for all Ocean Plan Table A constituents, Table B constituents for marine aquatic life protection (except for toxicity, only chronic toxicity for three species shall be required), DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, and Ocean Plan indicator bacteria. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one (the largest) such discharge shall be sampled annually in each Region.

4. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may reduce or suspend core monitoring once the storm runoff is fully characterized. This determination may be made at any point after the discharge is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

B. Ocean Receiving Water and Reference Area Monitoring Program

In addition to performing the Core Discharge Monitoring Program in Section II.A above, all applicants having authorized discharges must perform ocean receiving water monitoring. In order to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS, dischargers may choose either (1) an individual monitoring program, or (2) participation in a regional integrated monitoring program.

1. Individual Monitoring Program: The requirements listed below are for those dischargers who elect to perform an individual monitoring program to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within the affected ASBS. In addition to Core Discharge Monitoring, the following additional monitoring requirements shall be met:

   a. Three times annually, during wet weather (storm events), the receiving water at the point of discharge from the outfalls described in section (IV)(A)(3)(c) above shall be sampled and analyzed for Ocean Plan Table A constituents, Table B constituents for marine aquatic life, DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, salinity, chronic toxicity (three species), and Ocean Plan indicator bacteria.

      The sample location for the ocean receiving water shall be in the surf zone at the point of discharges; this must be at the same location where storm water runoff is sampled. Receiving water shall be sampled prior to (pre-storm) and during (or immediately after) the same storm (post storm). Post storm sampling shall be during the same storm and at approximately the same time as when the runoff is sampled. Reference water quality shall also be sampled three times annually and analyzed for the same constituents pre-storm and post-storm, during the same storm seasons when receiving water is sampled. Reference stations will be determined by the State Water Board's Division of Water Quality and the applicable Regional Water Board(s).

   b. Sediment sampling shall occur at least three times during every five (5) year period. The subtidal sediment (sand or finer, if present) at the discharge shall be sampled and analyzed for Ocean Plan Table B constituents for marine aquatic life, DDT, PCBs, PAHs, pyrethroids, and OP pesticides. For sediment toxicity testing, only an acute toxicity test using the amphipod *Eohaustorius estuarius* must be performed.

c. A quantitative survey of intertidal benthic marine life shall be performed at the discharge and at a reference site. The survey shall be performed at least once every five (5) year period. The survey design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The results of the survey shall be completed and submitted to the State Water Board and Regional Water Board at least six months prior to the end of the permit cycle.

d. Once during each five (5) year period, a bioaccumulation study shall be conducted to determine the concentrations of metals and synthetic organic pollutants at representative discharge sites and at representative reference sites. The study design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The bioaccumulation study may include California mussels (*Mytilus californianus*) and/or sand crabs (*Emerita analoga* or *Blepharipoda occidentalis*). Based on the study results, the Regional Water Board and the State Water Board's Division of Water Quality, may adjust the study design in subsequent permits, or add or modify additional test organisms (such as shore crabs or fish), or modify the study design appropriate for the area and best available sensitive measures of contaminant exposure.

e. Marine Debris: Representative quantitative observations for trash by type and source shall be performed along the coast of the ASBS within the influence of the discharger's outfalls. The design, including locations and frequency, of the marine debris observations is subject to approval by the Regional Water Board and State Water Board's Division of Water Quality.

f. The monitoring requirements of the Individual Monitoring Program in this section are minimum requirements. After a minimum of one (1) year of continuous water quality monitoring of the discharges and ocean receiving waters, the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may require additional monitoring, or adjust, reduce or suspend receiving water and reference station monitoring. This determination may be made at any point after the discharge and receiving water is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

2. Regional Integrated Monitoring Program: Dischargers may elect to participate in a regional integrated monitoring program, in lieu of an individual monitoring program, to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS. This regional approach shall characterize natural water quality, pre- and post-storm, in ocean reference areas near the mouths of identified open space watersheds and the effects of the discharges on natural water quality (physical, chemical, and toxicity) in the ASBS receiving waters, and should include benthic marine aquatic life and bioaccumulation components. The design of the ASBS stratum of a regional integrated monitoring program may deviate from the otherwise prescribed individual monitoring approach (in Section IV.B.1) if approved by the State Water Board's Division of Water Quality and the Regional Water Boards.

a. Ocean reference areas shall be located at the drainages of flowing watersheds with minimal development (in no instance more than 10% development), and shall not be located in CWA Section 303(d) listed waterbodies or have tributaries that are 303(d) listed. Reference areas shall be free of wastewater discharges and anthropogenic non- storm water runoff. A minimum of low threat storm runoff discharges (e.g.

stream highway overpasses and campgrounds) may be allowed on a case-by-case basis. Reference areas shall be located in the same region as the ASBS receiving water monitoring occurs. The reference areas for each Region are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean reference water samples must be collected from each station, each from a separate storm during the same storm season that receiving water is sampled. A minimum of one reference location shall be sampled for each ASBS receiving water site sampled per responsible party. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

b. ASBS ocean receiving water must be sampled in the surf zone at the location where the runoff makes contact with ocean water (i.e. at "point zero"). Ocean receiving water stations must be representative of worst-case discharge conditions (i.e. co-located at a large drain greater than 36 inches, or if drains greater than 36 inches are not present in the ASBS then the largest drain greater than18 inches.) Ocean receiving water stations are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean receiving water samples must be collected during each storm season from each station, each from a separate storm. A minimum of one receiving water location shall be sampled in each ASBS per responsible party in that ASBS. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

c. Reference and receiving water sampling shall commence during the first full storm season following the adoption of these special conditions, and post-storm samples shall be collected during the same storm event when storm water runoff is sampled. Sampling shall occur in a minimum of two storm seasons. For those ASBS dischargers that have already participated in the Southern California Bight 2008 ASBS regional monitoring effort, sampling may be limited to only one storm season.

d. Receiving water and reference samples shall be analyzed for the same constituents as storm water runoff samples. At a minimum, constituents to be sampled and analyzed in reference and discharge receiving waters must include oil and grease, total suspended solids, Ocean Plan Table B metals for protection of marine life, Ocean Plan PAHs, pyrethroids, OP pesticides, ammonia, nitrate, phosphates, and critical life stage chronic toxicity for three species. In addition, within the range of the southern sea otter, indicator bacteria or some other measure of fecal contamination shall be analyzed.

3. Waterfront and Marine Operations: In addition to the above requirements for ocean receiving water monitoring, additional monitoring must be performed for marinas and boat launch and pier facilities:

a. For all marina or mooring field operators, in mooring fields with 10 or more occupied moorings, the ocean receiving water must be sampled for Ocean Plan indicator bacteria, residual chlorine, copper, zinc, grease and oil, methylene blue active substances (MBAS), and ammonia nitrogen.

(1) For mooring field operators opting for an individual monitoring program (Section IV.B.1 above), this sampling must occur weekly (on the weekend) from May through October.

(2) For mooring field operators opting to participate in a regional integrated monitoring program (Section IV.B.2 above), this sampling must occur monthly from May through October on a high use weekend in each month. The Water Boards may allow a reduction in the frequency of sampling, through the regional monitoring program, after the first year of monitoring.

b. For all mooring field operators, the subtidal sediment (sand or finer, if present) within mooring fields and below piers shall be sampled and analyzed for Ocean Plan Table B metals (for marine aquatic life beneficial use), acute toxicity, PAHs, and tributyltin. For sediment toxicity testing, only an acute toxicity test using the amphipod *Eohaustorius estuarius* must be performed. This sampling shall occur at least three times during a five (5) year period. For mooring field operators opting to participate in a regional integrated monitoring program, the Water Boards may allow a reduction in the frequency of sampling after the first sampling effort's results are assessed.

Glossary

At the point of discharge(s) – Means in the surf zone immediately where runoff from an outfall meets the ocean water (a.k.a., at point zero).

Areas of Special Biological Significance (ASBS) – Those areas designated by the State Water Board as ocean areas requiring protection of species or biological communities to the extent that alteration of natural water quality is undesirable. All Areas of Special Biological Significance are also classified as a subset of State Water Quality Protection Areas.

Design storm – For purposes of these Special Protections, a design storm is defined as the volume of runoff produced from one inch of precipitation per day or, if this definition is inconsistent with the discharger's applicable storm water permit, then the design storm shall be the definition included in the discharger's applicable storm water permit.

Development – Relevant to reference monitoring sites, means urban, industrial, agricultural, grazing, mining, and timber harvesting land uses.

Higher threat discharges - Permitted storm drains discharging equal to or greater than 18 inches, industrial storm drains, agricultural runoff discharged through an MS4, discharges associated with waterfront and marina operations (e.g., piers, launch ramps, mooring fields, and associated vessel support activities, except for passive discharges defined below), and direct discharges associated with commercial or industrial activities to ASBS.

Low Impact Development (LID) – A sustainable practice that benefits water supply and contributes to water quality protection. Unlike traditional storm water management, which entails collecting and conveying storm water runoff through storm drains, pipes, or other conveyances to a centralized storm water facility, LID focuses on using site design and storm water management to maintain the site's pre-development runoff rates and volumes. The goal of LID is to mimic a site's predevelopment hydrology by using design techniques that infiltrate, filter, store, evaporate, and detain runoff close to the source of rainfall.

Marine Operations – Marinas or mooring fields that contain slips or mooring locations for 10 or more vessels.

Management Measure (MM) - Economically achievable measures for the control of the addition of pollutants from various classes of nonpoint sources of pollution, which reflect the greatest degree of pollutant reduction achievable through the application of the best available nonpoint pollution control practices, technologies, processes, siting criteria, operating methods, or other alternatives. For example, in the "marinas and recreational boating" land- use category specified in the Plan for California's Nonpoint Source Pollution Control Program (NPS Program Plan) (SWRCB, 1999), "boat cleaning and maintenance" is considered a MM or the source of a specific class or type of NPS pollution.

Management Practice (MP) - The practices (e.g., structural, non-structural, operational, or other alternatives) that can be used either individually or in combination to address a specific MM class or classes of NPS pollution. For example, for the "boat cleaning and maintenance" MM, specific MPs can include, but are not limited to, methods for the selection of environmentally sensitive hull paints or methods for cleaning/removal of hull copper anti- fouling paints.

Municipal Separate Storm Sewer System (MS4) – A municipally-owned storm sewer system regulated under the Phase I or Phase II storm water program implemented in compliance with Clean Water Act section 402(p). Note that an MS4 program's boundaries are not necessarily congruent with the permittee's political boundaries.

Natural Ocean Water Quality - The water quality (based on selected physical, chemical and biological characteristics) that is required to sustain marine ecosystems, and which is without apparent human influence, *i.e.*, an absence of significant amounts of: (a) man-made constituents (*e.g.,* DDT); (b) other chemical (*e.g.,* trace metals), physical (temperature/thermal pollution, sediment burial), and biological (*e.g.*, bacteria) constituents at concentrations that have been elevated due to man's activities above those resulting from the naturally occurring processes that affect the area in question; and (c) non-indigenous biota (*e.g.,* invasive algal bloom species) that have been introduced either deliberately or accidentally by man. Discharges "*shall not alter natural ocean water quality*" as determined by a comparison to the range of constituent concentrations in reference areas agreed upon via the regional monitoring program(s). If monitoring information indicates that *natural ocean water quality* is not maintained, but there is sufficient evidence that a discharge is not contributing to the alteration of natural water quality, then the Regional Water Board may make that determination. In this case, sufficient information must include runoff sample data that has equal or lower concentrations for the range of constituents at the applicable reference area(s).

Nonpoint source – Nonpoint pollution sources generally are sources that do not meet the definition of a point source. Nonpoint source pollution typically results from land runoff, precipitation, atmospheric deposition, agricultural drainage, marine/boating operations or hydrologic modification. Nonpoint sources, for purposes of these Special Protections, include discharges that are not required to be regulated under an NPDES permit.

Non-storm water discharge – Any runoff that is not the result of a precipitation event. This is often referred to as "dry weather flow."

Non-structural control – A Best Management Practice that involves operational, maintenance, regulatory (e.g., ordinances) or educational activities designed to reduce or eliminate pollutants in runoff, and that are not structural controls (i.e. there are no physical structures involved).

Physical impossibility - Means any act of God, war, fire, earthquake, windstorm, flood or natural catastrophe; unexpected and unintended accidents not caused by discharger or its employees' negligence; civil disturbance, vandalism, sabotage or terrorism; restrain by court order or public authority or agency; or action or non-action by, or inability to

obtain the necessary authorizations or approvals from any governmental agency other than the permittee.

Representative sites and monitoring procedures – Are to be proposed by the discharger, with appropriate rationale, and subject to approval by Water Board staff.

Sheet-flow – Runoff that flows across land surfaces at a shallow depth relative to the cross- sectional width of the flow. These types of flow may or may not enter a storm drain system before discharge to receiving waters.

Storm Season – Also referred to as rainy season, means the months of the year from the onset of rainfall during autumn until the cessation of rainfall in the spring.

Structural control – A Best Management Practice that involves the installation of engineering solutions to the physical treatment or infiltration of runoff.

Surf Zone - The surf zone is defined as the submerged area between the breaking waves and the shoreline at any one time.

Surface Water Ambient Monitoring Program (SWAMP) comparable – Means that the monitoring program must 1) meet or exceed 2008 SWAMP Quality Assurance Program Management Plan (QAPP) Measurement Quality Objectives, or 2) have a Quality Assurance Project Plan that has been approved by SWAMP; in addition data must be formatted to match the database requirements of the SWAMP Information Management System. Adherence to the measurement quality objectives in the Southern California Bight 2008 ASBS Regional Monitoring Program QAPP and data base management comprises being SWAMP comparable.

Waterfront Operations - Piers, launch ramps, and cleaning stations in the water or on the adjacent shoreline.

Attachment 1
Special Protections Sections I(A)(3)(e) and I(B)(3)(e)
Flowchart to Deteremine Compliance with natural Water Quality

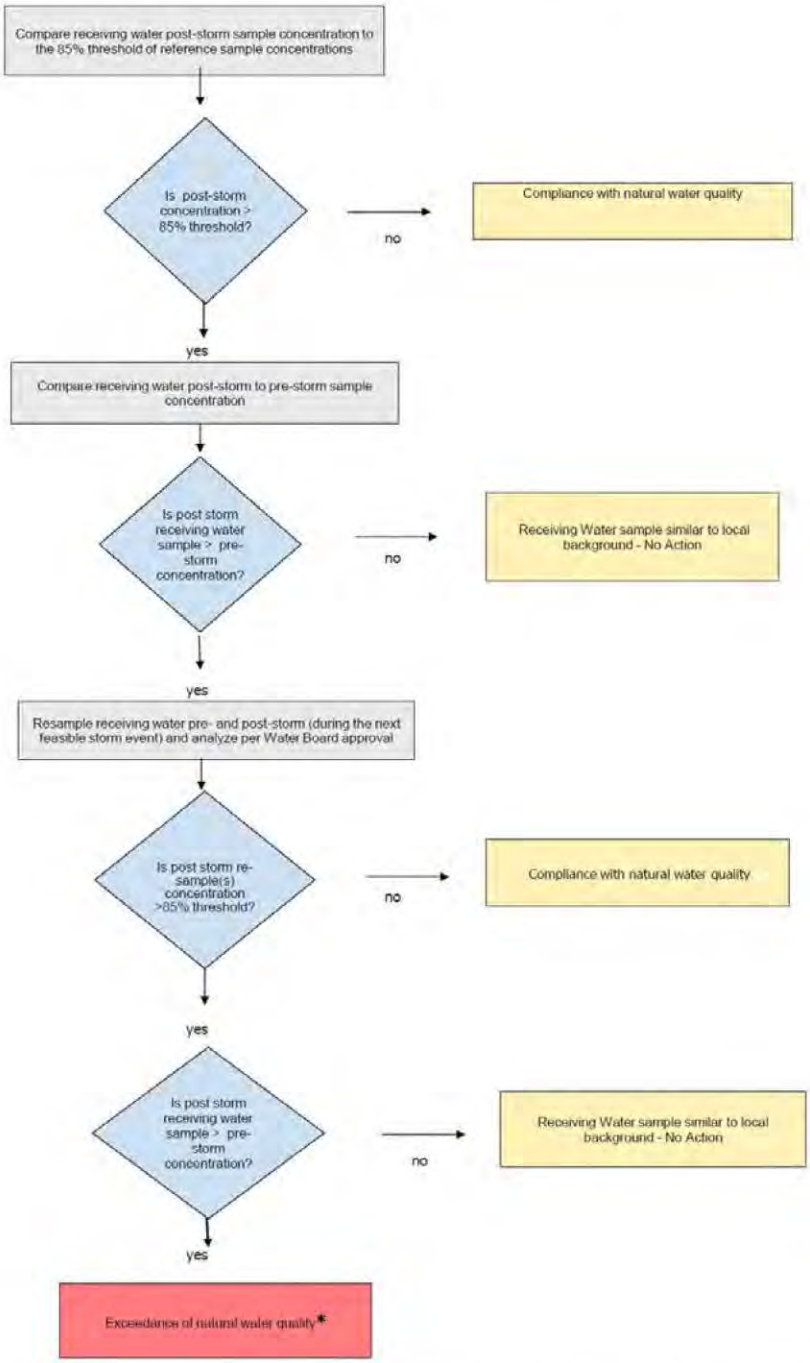

*** When an exceedance of natural water quality occurs, the discharger must comply with section I.A.2.h (for permitted storm water) or section I.B.2.c (for nonpoint sources). Note, when sampling data is available, end-of-pipe effluent concentrations will be considered by the Water Boards in making this determination.**

ATTACHMENT B

STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

1. Standard Permit Provisions

Code of Federal Regulations Title 40 Section 122.41 (40 CFR 122.41) includes conditions, or provisions, that apply to all National Pollutant Discharge Elimination System (NPDES) permits. Additional provisions applicable to NPDES permits are in 40 CFR 122.42. All applicable provisions in 40 CFR 122.41 and 40 CFR 122.42 must be incorporated into this Order and NPDES permit. The applicable 40 CFR 122.41 and 40 CFR 122.42 provisions are as follows:

a. DUTY TO COMPLY [40 CFR 122.41(a)]

The Copermittee must comply with all of the provisions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

(1) The Copermittee must comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement. [40 CFR 122.41(a)(1)]

(2) The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to a civil penalty not to exceed $25,000 per day for each violation. The CWA provides that any person who *negligently* violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than 2 years, or both. Any person who *knowingly* violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both. Any person who knowingly violates Section 301, 302, 303, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, and who knows at that time that he thereby places another person in imminent

danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.
[40 CFR 122.41(a)(2)]

(3) Any person may be assessed an administrative penalty by the San Diego Regional Water Quality Control Board (San Diego Water Board), State Water Resources Control Board (State Water Board), or United States Environmental Protection Agency (USEPA) for violating Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.
[40 CFR 122.41(a)(3)]

b. DUTY TO REAPPLY [40 CFR 122.41(b)]

If a Copermittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Copermittee must apply for and obtain a new permit.

c. NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE [40 CFR 122.41(c)]

It shall not be a defense for a Copermittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

d. DUTY TO MITIGATE [40 CFR 122.41(d)]

The Copermittee must take all reasonable steps to minimize or prevent any discharge or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

e. PROPER OPERATION AND MAINTENANCE [40 CFR 122.41(e)]

The Copermittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Copermittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by a Copermittee only when the operation is necessary to achieve compliance with the conditions of this permit.

f. PERMIT ACTIONS [40 CFR 122.41(f)]

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Copermittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

g. PROPERTY RIGHTS [40 CFR 122.41(g)]

This permit does not convey any property rights of any sort, or any exclusive privilege.

h. DUTY TO PROVIDE INFORMATION [40 CFR 122.41(h)]

The Copermittee must furnish to the San Diego Water Board, State Water Board, or USEPA within a reasonable time, any information which the San Diego Water Board, State Water Board, or USPEA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Copermittee must also furnish to the San Diego Water Board, State Water Board, or USPEA upon request, copies of records required to be kept by this permit.

i. INSPECTION AND ENTRY [40 CFR 122.41(i)]

The Copermittee must allow the San Diego Water Board, State Water Board, USEPA, and/or their authorized representative (including an authorized contractor acting as their representative), upon presentation of credentials and other documents as may be required by law, to:

(1) Enter upon the Copermittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit; [40 CFR 122.41(i)(1)]

(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit; [40 CFR 122.41(i)(2)]

(3) Inspect and photograph at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; [40 CFR 122.41(i)(3)] and

(4) Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location. [40 CFR 122.41(i)(4)]

j. MONITORING AND RECORDS [40 CFR 122.41(j)]

(1) Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity. [40 CFR 122.41(j)(1)]

(2) Except for records of monitoring information required by this permit related to the Copermittee's sewage sludge use and disposal activities, which shall be retained for

a period of at least five (5) years (or longer as required by 40 CFR Part 503), the Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time. [40 CFR 122.41(j)(2)]

(3) Records for monitoring information must include: [40 CFR 122.41(j)(3)]

(a) The date, exact place, and time of sampling or measurements; [40 CFR 122.41(j)(3)(i)]
(b) The individual(s) who performed the sampling or measurements; [40 CFR 122.41(j)(3)(ii)]
(c) The date(s) analyses were performed; [40 CFR 122.41(j)(3)(iii)]
(d) The individual(s) who performed the analyses; [40 CFR 122.41(j)(3)(iv)]
(e) The analytical techniques or methods used; [40 CFR 122.41(j)(3)(v)] and
(f) The results of such analyses. [40 CFR 122.41(j)(3)(vi)]

(4) Monitoring must be conducted according to test procedures under 40 CFR Part 136 unless another method is required under 40 CFR Subchapters N or O. [40 CFR 122.41(j)(4)]

In the case of pollutants for which there are no approved methods under 40 CFR Part 136 or otherwise required under 40 CFR Subchapters N and O, monitoring must be conducted according to a test procedure specified in the permit for such pollutants. [40 CFR 122.44(i)(1)(iv)]

(5) The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. [40 CFR 122.41(j)(5)]

k. SIGNATORY REQUIREMENT [40 CFR 122.41(k)]

(1) All applications, reports, or information submitted to the San Diego Water Board, State Water Board, or USEPA must be signed and certified. (See 40 CFR 122.22) [40 CFR 122.41(k)(1)]

(a) *For a municipality, State, Federal, or other public agency.* [All applications must be signed] by either a principal executive officer or ranking elected official. [40 CFR 122.22(a)(3)]

(b) All reports required by permits, and other information requested by the San Diego Water Board, State Water Board, or USEPA must be signed by a person described in paragraph (a) of this section, or by a duly authorized

representative of that person. A person is a duly authorized representative only if: [40 CFR 122.22(b)]

(i) The authorization is made in writing by a person described in paragraph (a) of this section; [40 CFR 122.22(b)(1)]

(ii) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company, (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) [40 CFR 122.22(b)(2)] and,

(iii) The written authorization is submitted to the San Diego Water Board and State Water Board. [40 CFR 122.22(b)(3)]

(c) *Changes to authorization.* If an authorization under paragraph (b) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (b) of this section must be submitted to the San Diego Water Board prior to or together with any reports, information, or applications to be signed by an authorized representative. [40 CFR 122.22(c)]

(d) *Certification.* Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." [40 CFR 122.22(d)]

(2) The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both. [40 CFR 122.41(k)(2)]

I. REPORTING REQUIREMENTS [40 CFR 122.41(l)]

(1) *Planned changes.* The Copermittee must give notice to the San Diego Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when: [40 CFR 122.41(l)(1)]

(a) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); [40 CFR 122.41(l)(1)(i)] or

(b) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1). [40 CFR 122.41(l)(1)(ii)]

(c) The alteration or addition results in a significant change in the Copermittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. [40 CFR 122.41(l)(1)(iii)]

(2) *Anticipated noncompliance*. The Copermittee must give advance notice to the San Diego Water Board or State Water Board of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements. [40 CFR 122.41(l)(2)]

(3) *Transfers*. This permit is not transferable to any person except after notice to the San Diego Water Board. The San Diego Water Board may require modification or revocation and reissuance of the permit to change the name of the Copermittee and incorporate such other requirements as may be necessary under the CWA. [40 CFR 122.41(l)(3)]

(4) *Monitoring reports.* Monitoring results must be reported at the intervals specified elsewhere in this permit. [40 CFR 122.41(l)(4)]

(a) Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the San Diego Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices. [40 CFR 122.41(l)(4)(i)]

(b) If the Copermittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or another method required for an industry-specific waste stream under 40 CFR Subchapters N or O, the results of this monitoring must be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the San Diego Water Board or State Water Board. [40 CFR 122.41(l)(4)(ii)]

(c) Calculations for all limitations which require averaging of measurements must utilize an arithmetic mean unless otherwise specified in the permit. [40 CFR 122.41(l)(4)(iii)]

(5) *Compliance schedules*. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date. [40 CFR 122.41(l)(5)]

(6) *Twenty-four hour reporting.*

(a) The Copermittee must report any noncompliance that may endanger health or the environment. Any information must be provided orally within 24 hours from the time the Copermittee becomes aware of the circumstances. A written submission must also be provided within five (5) days of the time the Copermittee becomes aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6)(i)]

(b) The following must be included as information which must be reported within 24 hours under this paragraph: [40 CFR 122.41(l)(6)(ii)]

(i) Any unanticipated bypass that exceeds any effluent limitation in the permit (See 40 CFR 122.41(g)). [40 CFR 122.41(l)(6)(ii)(A)]
(ii) Any upset which exceeds any effluent limitation in the permit. [40 CFR 122.41(l)(6)(ii)(B)] and,
(iii) Violation of a maximum daily discharge limitation for any of the pollutants listed by the San Diego Water Board in the permit to be reported within 24 hours. (See 40 CFR 122.44(g)) [40 CFR 122.41(l)(6)(ii)(C)]

(c) The San Diego Water Board may waive the above-required written report on a case-by-case basis if the oral report has been received within 24 hours. [40 CFR 122.41(l)(6)(iii)]

(7) *Other noncompliance.* The Copermittee must report all instances of noncompliance not reported in accordance with the standard provisions required under 40 CFR 122.41(l)(4), (5), and (6), at the time monitoring reports are submitted. The reports must contain the information listed in the standard provisions required under 40 CFR 122.41(l)(6). [40 CFR 122.41(l)(7))]

(8) *Other information.* When the Copermittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the San Diego Water Board, State Water Board, or USEPA, the Copermittee must promptly submit such facts or information. [40 CFR 122.41(l)(8)]

m. BYPASS [40 CFR 122.41(m)]

(1) *Definitions.*

(a) "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. [40 CFR 122.41(m)(1)(i)] or

(b) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or

substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
[40 CFR 122.41(m)(1)(ii)]

(2) *Bypass not exceeding limitations*. The Copermittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the standard provisions required under 40 CFR 122.41(m)(3) and (4).
[40 CFR 122.41(m)(2)]

(3) *Notice.*

(a) *Anticipated bypass*. If the Copermittee knows in advance of the need for a bypass, it must submit a notice, if possible at least ten days before the date of the bypass. [40 CFR 122.41(m)(3)(i)] or

(b) *Unanticipated bypass*. The Copermittee must submit notice of an unanticipated bypass in accordance with the standard provisions required under 40 CFR 122.41(l)(6) (24-hour notice).
[40 CFR 122.41(m)(3)(ii)]

(4) *Prohibition of Bypass.*

(a) Bypass is prohibited, and the San Diego Water Board may take enforcement action against a Copermittee for bypass, unless:
[40 CFR 122.41(m)(4)(i)]

(i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; [40 CFR 122.41(m)(4)(i)(A)]

(ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance;
[40 CFR 122.41(m)(4)(i)(B)] and,

(iii) The Copermittee submitted notice in accordance with the standard provisions required under 40 CFR 122.41(m)(3).
[40 CFR 122.41(m)(4)(i)(C)]

(b) The San Diego Water Board may approve an anticipated bypass, after considering its adverse effects, if the San Diego Water Board determines that it will meet the three conditions listed above.
[40 CFR 122.41(m)(4)(ii)]

n. UPSET [40 CFR 122.41(n)]

(1) *Definition.* "Upset" means an exceptional incident in which there is unintentional and

temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Copermittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. [40 CFR 122.41(n)(1)]

(2) *Effect of an upset*. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the standard provisions required under 40 CFR 122.41(n)(3) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. [40 CFR 122.41(n)(2)]

(3) *Conditions necessary for a demonstration of upset*. A Copermittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that: [40 CFR 122.41(n)(3)]

(a) An upset occurred and that the Copermittee can identify the cause(s) of the upset; [40 CFR 122.41(n)(3)(i)]
(b) The permitted facility was at the time being properly operated; [40 CFR 122.41(n)(3)(ii)] and
(c) The Copermittee submitted notice of the upset in accordance with the standard provisions required under 40 CFR 122.41(l)(6)(ii)(B) (24-hour notice). [40 CFR 122.41(n)(3)(iii)]
(d) The Copermittee complied with any remedial measures pursuant to the standard provisions required under 40 CFR 122.41(d). [40 CFR 122.41(n)(3)(iii)]

(4) *Burden of proof*. In any enforcement proceeding, the Copermittee seeking to establish the occurrence of an upset has the burden of proof. [40 CFR 122.41(n)(4)]

o. STANDARD PERMIT PROVISIONS FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS [40 CFR 122.42(c)]

The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the San Diego Water Board or State Water Board under 40 CFR 122.26(a)(1)(v) must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report must include:

(1) The status of implementing the components of the storm water management program that are established as permit conditions; [40 CFR 122.42(c)(1)]

(2) Proposed changes to the storm water management programs that are established as permit conditions. Such proposed changes must be consistent with 40 CFR 122.26(d)(2)(iii); [40 CFR 122.42(c)(2)] and

(3) Revisions, if necessary, to the assessment of controls and the fiscal analysis

reported in the permit application under 40 CFR 122.26(d)(2)(iv) and (v); [40 CFR 122.42(c)(3)]

(4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; [40 CFR 122.42(c)(4)]

(5) Annual expenditures and budget for year following each annual report; [40 CFR 122.42(c)(5)]

(6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; [40 CFR 122.42(c)(6)]

(7) Identification of water quality improvements or degradation. [40 CFR 122.42(c)(7)]

p. STANDARD PERMIT PROVISIONS FOR STORM WATER DISCHARGES [40 CFR 122.42(d)]

The initial permits for discharges composed entirely of storm water issued pursuant to 40 CFR 122.26(e)(7) must require compliance with the conditions of the permit as expeditiously as practicable, but in no event later than three years after the date of issuance of the permit.

2. General Provisions

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. The general provisions applicable to this Order and NPDES permit are as follows:

a. DISCHARGE OF WASTE IS A PRIVILEGE

No discharge of waste into the waters of the State, whether or not such discharge is made pursuant to waste discharge requirements, shall create a vested right to continue such discharge. All discharges of waste into waters of the State are privileges, not rights. [CWC Section 13263(g)]

b. DURATION OF ORDER AND NPDES PERMIT

(1) *Effective date*. ~~This Order and NPDES permit becomes effective on April 1st, 2015 the 50th day after its adoption provided the USEPA has no objection. If the USEPA objects to its issuance, this Order shall not become effective until such objection is withdrawn.~~ This Order supersedes Order No. R9-2007-0001 for the San Diego County Copermittees listed in Table 2.a and became effective on June 27, 2013 for those Copermittees.~~upon the effective date of this Order~~. This Order as amended by Order R9-2015-0001~~, and~~ supersedes Order No~~s~~. R9-2009-0002 and becomes effective ~~fifty (50) days~~ April 1, 2015, following ~~after~~ the date Order No. R9-2015-0001 is adopted. This Order supersedes Order No. R9-2010-0016 upon ~~its their expiration~~further amendment or earlier notice of coverage.

(2) *Expiration*. This Order and NPDES permit expires five years after its effective date.

[40 CFR 122.46(a)]

(3) *Continuation of expired order*. After this Order and NPDES permit expires, the terms and conditions of this Order and NPDES permit are automatically continued pending issuance of a new permit if all requirements of the federal NPDES regulations on the continuation of expired permits (40 CFR 122.6) are complied with.

c. AVAILABILITY

A copy of this Order must be kept at a readily accessible location and must be available to on-site personnel at all times.

d. CONFIDENTIALITY OF INFORMATION

Except as provided for in 40 CFR 122.7, no information or documents submitted in accordance with or in application for this Order will be considered confidential, and all such information and documents shall be available for review by the public at the San Diego Water Board office.

Claims of confidentiality for the following information will be denied:
[40 CFR 122.7(b)]

(1) The name and address of any permit applicant or Copermittee; [40 CFR 122.7(b)(1)] and

(2) Permit applications and attachments, permits, and effluent data. [40 CFR 122.7(b)(2)]

e. EFFLUENT LIMITATIONS

(1) *Interim effluent limitations*. The Copermittee must comply with any interim effluent limitations as established by addendum, enforcement action, or revised waste discharge requirements which have been, or may be, adopted by the San Diego Water Board.

(2) *Other effluent limitations and standards*. If any applicable toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant and that standard or prohibition is more stringent than any limitation on the pollutant in the permit, the San Diego Water Board shall institute proceedings under these regulations to modify or revoke and reissue the permit to conform to the toxic effluent standard or prohibition. [40 CFR 122.44(b)(1)]

f. DUTY TO MINIMIZE OR CORRECT ADVERSE IMPACTS

The Copermittee must take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this Order, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the noncompliance.

g. PERMIT ACTIONS

The filing of a request by the Copermittee for modification, revocation and reissuance, or termination of this Order, or a notification of planned change in or anticipated noncompliance with this Order does not stay any condition of this Order. (See 40 CFR 122.41(f)) In addition, the following provisions apply to this Order:

(1) Upon application by any affected person, or on its own motion, the San Diego Water Board may review and revise the requirements in this Order. All requirements must be reviewed periodically. [CWC Section 13263(e)]

(2) This Order may be terminated or modified for cause, including, but not limited to, all of the following: [CWC Section 13381]

(a) Violation of any condition contained in the requirements of this Order. [CWC Section 13381(a)]

(b) Obtaining the requirements in this Order by misrepresentation, or failure to disclose fully all relevant facts. [CWC Section 13381(b)]

(c) A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge. [CWC Section 13381(c)]

(3) When this Order is transferred to a new owner or operator, such requirements as may be necessary under the CWC may be incorporated into this Order.

h. NPDES PERMITTED NON-STORM WATER DISCHARGES

The San Diego Water Board has, in prior years, issued a limited number of individual NPDES permits for non-storm water discharges to MS4s. The San Diego Water Board or State Water Board may in the future, upon prior notice to the Copermittee(s), issue an NPDES permit for any non-storm water discharge (or class of non-storm water discharges) to an MS4.

i. MONITORING

In addition to the standard provisions required under 40 CFR 122.41(j) and (l)(4), the following general monitoring provisions apply to this Order:

(1) Where procedures are not otherwise specified in Order, sampling, analysis and quality assurance/quality control must be conducted in accordance with the Quality Assurance Management Plan (QAMP) for the State of California's Surface Water Ambient Monitoring Program (SWAMP), adopted by the State Water Resources Control Board (State Water Board).

(2) Pursuant to 40 CFR 122.41(j)(2) and CWC Section 13383(a), each Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring

instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five (5) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time.

(3) All chemical, bacteriological, and toxicity analyses must be conducted at a laboratory certified for such analyses by the California Department of Public Health or a laboratory approved by the San Diego Water Board.

(4) For priority toxic pollutants that are identified in the California Toxics Rule (CTR) (65 Fed. Reg. 31682), the Copermittees must instruct their laboratories to establish calibration standards that are equivalent to or lower than the Minimum Levels (MLs) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP). If a Copermittee can demonstrate that a particular ML is not attainable, in accordance with procedures set forth in 40 CFR Part 136, the lowest quantifiable concentration of the lowest calibration standard analyzed by a specific analytical procedure (assuming that all the method specified sample weights, volumes, and processing steps have been followed) may be used instead of the ML listed in Appendix 4 of the SIP. The Copermittee must submit documentation from the laboratory to the San Diego Water Board for approval prior to raising the ML for any priority toxic pollutant.

j. ENFORCEMENT

(1) The San Diego Water Board is authorized to enforce the terms of this Order under several provisions of the CWC, including, but not limited to, CWC Sections 13385, 13386, and 13387.

(2) Nothing in this Order shall be construed to protect the Copermittee from its liabilities under federal, state, or local laws.

(3) The CWC provides for civil and criminal penalties comparable to, and in some cases greater than, those provided for under the CWA.

(4) Except as provided in the standard conditions required under 40 CFR 122.41(m) and (n), nothing in this Order shall be construed to relieve the Copermittee from civil or criminal penalties for noncompliance.

(5) Nothing in this Order shall be construed to preclude the institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties to which the Copermittee is or may be subject to under Section 311 of the CWA.

(6) Nothing in this Order shall be construed to preclude institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authoring preserved by Section 510 of the CWA.

k. SEVERABILITY

The provisions of this Order are severable, and if any provision of this Order, or the

application of any provisions of this Order to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this Order shall not be affected thereby.

l. APPLICATIONS

Any application submitted by a Copermittee for reissuance or modification of this Order must satisfy all applicable requirements specified in federal regulations as well as any additional requirements for submittal of a Report of Waste Discharge specified in the CWC and the California Code of Regulations.

m. IMPLEMENTATION

All plans, reports and subsequent amendments submitted in compliance with this Order must be implemented immediately (or as otherwise specified). All submittals by Copermittees must be adequate to implement the requirements of this Order.

n. REPORT SUBMITTALS

(1) All report submittals must include an executive summary, introduction, conclusion, recommendations, and signed certified statement.

(2) Each Copermittee must submit a signed certified statement covering its responsibilities for each applicable submittal.

(3) The Principal Watershed Copermittee(s) must submit a signed certified statement covering its responsibilities for each applicable submittal and the sections of the submittals for which it is responsible.

(4) Unless otherwise directed, the Copermittees must submit one hard copy and one electronic copy of each report required under this Order to the San Diego Water Board, and one electronic copy to the USEPA.

(5) The Copermittees must submit reports and provide notifications as required by this Order to the following:

EXECUTIVE OFFICER
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
2375 NORTHSIDE DRIVE~~9174 SKY PARK COURT~~, SUITE 100
SAN DIEGO CA 92108~~23-4340~~
Telephone: ~~(858) 467-2952~~(619) 516-1990~~-~~ Fax: ~~(858) 571-6972~~(619) 516-1994

EUGENE BROMLEY
US ENVIRONMENTAL PROTECTION AGENCY
REGION IX
PERMITS ISSUANCE SECTION (W-5-1)
75 HAWTHORNE STREET
SAN FRANCISCO CA 94105

ATTACHMENT C

ACRONYMS AND ABBREVIATIONS

AMAL	Average Monthly Action Level
ASBS	Area(s) of Special Biological Significance
BMP	Best Management Practice
Basin Plan	Water Quality Control Plan for the San Diego Basin
CEQA	California Environmental Quality Act
CCR	California Code of Regulations
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWC	California Water Code
CZARA	Coastal Zone Act Reauthorization Amendments of 1990
ESAs	Environmentally Sensitive Areas
GIS	Geographic Information System
IBI	Index of Biological Integrity
LID	Low Impact Development
MDAL	Maximum Daily Action Level
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
NAL	Non-Storm Water Action Level
NAICS	North American Industry Classification System
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
ROWD	Report of Waste Discharge (application for NPDES reissuance)
SAL	Storm Water Action Level
San Diego Water Board	California Regional Water Quality Control Board, San Diego Region
SIC	Standard Industrial Classification Code
State Water Board	State Water Resources Control Board
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
WDID	Waste Discharge Identification Number
WLA	Waste Load Allocation
WQBEL	Water Quality Based Effluent Limitation

DEFINITIONS

Active/Passive Sediment Treatment - Using mechanical, electrical or chemical means to flocculate or coagulate suspended sediment for removal from runoff from construction sites prior to discharge.

Anthropogenic Litter – Trash generated from human activities, not including sediment.

Average Monthly Action Level – The highest allowable average of daily discharges over a calendar month.

Beneficial Uses - The uses of water necessary for the survival or wellbeing of man, plants, and wildlife. These uses of water serve to promote tangible and intangible economic, social, and environmental goals. "Beneficial Uses" of the waters of the State that may be protected include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. Existing beneficial uses are uses that were attained in the surface or ground water on or after November 28, 1975; and potential beneficial uses are uses that would probably develop in future years through the implementation of various control measures. "Beneficial Uses" are equivalent to "Designated Uses" under federal law. [California Water Code Section 13050(f)].

Best Management Practices (BMPs) - Defined in 40 CFR 122.2 as schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Bioassessment - The use of biological community information to evaluate the biological integrity of a water body and its watershed. With respect to aquatic ecosystems, bioassessment is the collection and analysis of samples of the benthic macroinvertebrate community together with physical/habitat quality measurements associated with the sampling site and the watershed to evaluate the biological condition (i.e. biotic integrity) of a water body.

Biofiltration - Practices that use vegetation and amended soils to detain and treat runoff from impervious areas. Treatment is through filtration, infiltration, adsorption, ion exchange, and biological uptake of pollutants.

Biological Integrity - Defined in Karr J.R. and D.R. Dudley. 1981. Ecological perspective on water quality goals. *Environmental Management* 5:55-68 as: "A balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitat of the region." Also referred to as ecosystem health.

BMP Design Manual – A plan developed to eliminate, reduce, or mitigate the impacts of runoff from development projects, including Priority Development Projects.

Chronic Toxicity – A measurement of sublethal effect (e.g. reduced growth, reproduction) to experimental test organisms exposed to an effluent or receiving waters compared to that of the

control organisms.

Clean Water Act Section 303(d) Water Body - An impaired water body in which water quality does not meet applicable water quality standards and/or is not expected to meet water quality standards, even after the application of technology based pollution controls required by the CWA. The discharge of runoff to these water bodies by the Copermittees is significant because these discharges can cause or contribute to violations of applicable water quality standards.

Construction Site – Any project, including projects requiring coverage under the Construction General Permit, that involves soil disturbing activities including, but not limited to, clearing, grading, disturbances to ground such as stockpiling, and excavation.

Contamination - As defined in the Porter-Cologne Water Quality Control Act, contamination is "an impairment of the quality of waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste whether or not waters of the State are affected."

Copermittee – A permittee to a NPDES permit that is only responsible for permit conditions relating to the discharge for which it is operator [40 CFR 122.26(b)(1)]. For the purposes of this Order, a Copermittee is one of the individual permittees identified in Tables 1a-1c of this Order.

Copermittees – All of the individual Copermittees, collectively.

Critical Channel Flow (Qc) – The channel flow that produces the critical shear stress that initiates bed movement or that erodes the toe of channel banks. When measuring Qc, it should be based on the weakest boundary material – either bed or bank.

Daily Discharge – Defined as either: (1) the total mass of the constituent discharged over the calendar day or any 24 hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g. concentration.)

The Daily Discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day, or other 24 hour period other than a day), or by the arithmetic mean of analytical results from one or more grab samples taken over the course of a day.

Development Projects - Construction, rehabilitation, redevelopment, or reconstruction of any public or private projects.

Dry Season –May 1 to September 30.

Dry Weather – Weather is considered dry if the preceding 72 hours has been without measurable precipitation (>0.1 inch).

Enclosed Bays – Enclosed bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost bay works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays do not include

inland surface waters or ocean waters.

Erosion – When land is diminished or worn away due to wind, water, or glacial ice. Often the eroded debris (silt or sediment) becomes a pollutant via storm water runoff. Erosion occurs naturally but can be intensified by land clearing activities such as farming, development, road building, and timber harvesting.

Environmentally Sensitive Areas (ESAs) - Areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; areas designated as preserves or their equivalent under the Natural Communities Conservation Program within the Cities and County of Orange; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.

Estuaries – Waters, including coastal lagoons, located at the mouth of streams that serve as areas of mixing fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and ocean water. Estuaries do not include inland surface waters or ocean waters.

Existing Development – Any area that has been developed and exists for municipal, commercial, industrial, or residential purposes, uses, or activities. May include areas that are not actively used for its originally developed purpose, but may be re-purposed or redeveloped for another use or activity.

Flow Duration – The long-term period of time that flows occur above a threshold that causes significant sediment transport and may cause excessive erosion damage to creeks and streams (not a single storm event duration). The simplest way to visualize this is to consider a histogram of pre- and post-project flows using long-term records of hourly data. To maintain pre-development flow duration means that the total number of hours (counts) within each range of flows in a flow-duration histogram cannot increase between the pre- and post-development condition. Flow duration within the range of geomorphologically significant flows is important for managing erosion.

Grading - The cutting and/or filling of the land surface to a desired slope or elevation.

Groundwater – Subsurface water that occurs beneath the water table in soils and geologic formations that are fully saturated.

Hazardous Material – Any substance that poses a threat to human health or the environment due to its toxicity, corrosiveness, ignitability, explosive nature or chemical reactivity. These also include materials named by the USEPA in 40 CFR 116 to be reported if a designated quantity of the material is spilled into the waters of the U.S. or emitted into the environment.

Hazardous Waste - Hazardous waste is defined as “any waste which, under Section 600 of Title 22 of this code, is required to be managed according to Chapter 30 of Division 4.5 of Title 22 of this code” [CCR Title 22, Division 4.5, Chapter 11, Article 1].

Household Hazardous Waste – Paints, cleaning products, and other hazardous wastes generated during home improvement or maintenance activities.

Hydromodification – The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

Illicit Connection – Any man-made conveyance or drainage system through which a non-storm water discharge to the storm water drainage system occurs or may occur. Any connection to the MS4 that conveys an illicit discharge.

Illicit Discharge - Any discharge to the MS4 that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from firefighting activities [40 CFR 122.26(b)(2)].

Inactive Areas – Areas of construction activity that are not active and those that have been active and are not scheduled to be re-disturbed for at least 14 days.

Infiltration – In the context of low impact development, infiltration is defined as the percolation of water into the ground. Infiltration is often expressed as a rate (inches per hour), which is determined through an infiltration test. In the context of non-storm water, infiltration is water other than wastewater that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow [40 CFR 35.2005(20)].

Inland Surface Waters – Includes all surface waters of the State that do not include the ocean, enclosed bays, or estuaries.

Jurisdictional Runoff Management Program Document – A written description of the specific jurisdictional runoff management measures and programs that each Copermittee will implement to comply with this Order and ensure that storm water pollutant discharges in runoff are reduced to the MEP and do not cause or contribute to a violation of water quality standards.

Low Impact Development (LID) – A storm water management and land development strategy that emphasizes conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions.

Low Impact Development Best Management Practices (LID BMPs) – LID BMPs include schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States through storm water management and land development strategies that emphasize conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions. LID BMPs include retention

practices that do not allow runoff, such as infiltration, rain water harvesting and reuse, and evapotranspiration. LID BMPs also include flow-through practices such as biofiltration that may have some discharge of storm water following pollutant reduction.

Major Outfall – As defined in the Code of Federal Regulations, a major outfall is a MS4 outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (i.e. discharge from a single conveyance other than a circular pipe which is associated with a drainage area of more than 50 acres); or, for MS4s that receive storm water from lands zoned for industrial activity (based on comprehensive zoning plans or equivalent), a MS4 outfall that discharges from a single pipe with an inside diameter of 12 inches or more or from its equivalent (i.e. discharge from other than a circular pipe associated with a drainage area of 2 acres or more).

Maximum Daily Action Level (MDAL) –The highest allowable daily discharge of a pollutant, over a calendar day (or 24 hour period). For pollutants with action levels expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with action levels expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

Maximum Extent Practicable (MEP) – The technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) for storm water that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) in combination with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than BAT. A definition for MEP is not provided either in the statute or in the regulations. Instead the definition of MEP is dynamic and will be defined by the following process over time: municipalities propose their definition of MEP by way of their runoff management programs. Their total collective and individual activities conducted pursuant to the runoff management programs becomes their proposal for MEP as it applies both to their overall effort, as well as to specific activities (e.g., MEP for street sweeping, or MEP for MS4 maintenance). In the absence of a proposal acceptable to the San Diego Water Board, the San Diego Water Board defines MEP.

In a memo dated February 11, 1993, entitled "Definition of Maximum Extent Practicable," Elizabeth Jennings, Senior Staff Counsel, SWRCB addressed the achievement of the MEP standard as follows:

> "*To achieve the MEP standard, municipalities must employ whatever Best Management Practices (BMPs) are technically feasible (i.e., are likely to be effective) and are not cost prohibitive. The major emphasis is on technical feasibility. Reducing pollutants to the MEP means choosing effective BMPs, and rejecting applicable BMPs only where other effective BMPs will serve the same purpose, or the BMPs would not be technically feasible, or the cost would be prohibitive. In selecting BMPs to achieve the MEP standard, the following factors may be useful to consider:*
>
> *a. Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?*
> *b. Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?*
> *c. Public Acceptance: Does the BMP have public support?*

d. Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?
e. Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc.?

The final determination regarding whether a municipality has reduced pollutants to the maximum extent practicable can only be made by the Regional or State Water Boards, and not by the municipal discharger. If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit derived, it would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs that would address a pollutant source, or to pick a BMP based solely on cost, which would be clearly less effective. In selecting BMPs the municipality must make a serious attempt to comply and practical solutions may not be lightly rejected. In any case, the burden would be on the municipal discharger to show compliance with its permit. After selecting a menu of BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented."

Monitoring Year – October 1 to September 30

Municipal Separate Storm Sewer System (MS4) – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designated or used for collecting or conveying storm water; (iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.26.

National Pollutant Discharge Elimination System (NPDES) - The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the CWA.

Non-Storm Water - All discharges to and from a MS4 that do not originate from precipitation events (i.e., all discharges from a MS4 other than storm water). Non-storm water includes illicit discharges and NPDES permitted discharges.

Nuisance - As defined in the Porter-Cologne Water Quality Control Act, a nuisance is "anything which meets all of the following requirements: 1) Is injurious to health, or is indecent, or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. 2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or

damage inflicted upon individuals may be unequal. 3) Occurs during, or as a result of, the treatment or disposal of wastes."

Ocean Waters – The territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the State Board's California Ocean Plan.

Order – Unless otherwise specified, refers to this Order, Order No. R9-2013-0001 (NPDES No. CAS0109266)

Outfall - Outfall means a point source as defined by 40 CFR 122.2 at the point where a municipal separate storm sewer discharges to waters of the US and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels or other conveyances which connect segments of the same stream or other waters of the US and are used to convey waters of the US.

Persistent Flow - Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

Person - A person is defined as an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof [40 CFR 122.2].

Point Source - Any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, landfill leachate collection systems, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

Pollutant - Any agent that may cause or contribute to the degradation of water quality such that a condition of pollution or contamination is created or aggravated.

Pollution - As defined in the Porter-Cologne Water Quality Control Act, pollution is "the alteration of the quality of the waters of the State by waste, to a degree which unreasonably affects either of the following: 1) The waters for beneficial uses; or 2) Facilities that serve these beneficial uses." Pollution may include contamination.

Pollution Prevention - Pollution prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control BMPs, treatment control BMPs, or disposal.

Pre-Development Runoff Conditions – Approximate flow rates and durations that exist or existed onsite before land development occurs. For new development projects, this equates to runoff conditions immediately before project construction. For redevelopment projects, this equates to runoff conditions from the project footprint assuming infiltration characteristics of the underlying soil, and existing grade. Runoff coefficients of concrete or asphalt must not be used. A redevelopment Priority Development Project must use available information pertaining to existing underlying soil type and onsite existing grade to estimate pre-development runoff conditions.

Priority Development Projects - New development and redevelopment projects defined under Provision E.3.b of Order No. R9-2013-0001.

Rainy Season (aka Wet Season) –October 1 to April 30

Receiving Waters – Waters of the United States.

Receiving Water Limitations - Waste discharge requirements issued by the San Diego Water Board typically include both: (1) "Effluent Limitations" (or "Discharge Limitations") that specify the technology-based or water-quality-based effluent limitations; and (2) "Receiving Water Limitations" that specify the water quality objectives in the Basin Plan as well as any other limitations necessary to attain those objectives. In summary, the "Receiving Water Limitations" provision is the provision used to implement the requirements of CWA section 402(p)(3)(B).

Redevelopment - The creation and/or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include trenching and resurfacing associated with utility work; resurfacing existing roadways; new sidewalk construction, pedestrian ramps, or bike lane on existing roads; and routine replacement of damaged pavement, such as pothole repair.

Regional Clearinghouse – A central location for the collection and distribution of information developed and maintained by the Copermittees including, but not limited to, plans, reports, manuals, data, contact information, and/or links to such documents and information.

Rehabilitation - Remedial measures or activities for the purpose of improving or restoring the beneficial uses of streams, channels or river systems. Techniques may vary from in-stream restoration techniques to off-line storm water management practices installed in the system corridor or upland areas, or a combination of in-stream and out of stream techniques. Rehabilitation techniques may include, but are not limited to the following: riparian zone restoration, constructed wetlands, channel modifications that improve habitat and stability, and daylighting of drainage systems.

Reporting Period – The period of information that is reported in the Water Quality Improvement Plan Annual Report. The reporting period consists of two components: 1) July 1 to June 30, consistent with the fiscal year, for the implementation of the jurisdictional runoff management programs, and 2) October 1 to September 30, consistent with the monitoring year for the monitoring and assessment programs. Together, these two time periods constitute the reporting year for the Water Quality Improvement Plan Annual Report due January 31 following the end of the monitoring year.

Retain – Keep or hold in a particular place, condition, or position without discharge to surface waters.

Retrofitting – Storm water management practice put into place after development has occurred in watersheds where the practices previously did not exist or are ineffective. Retrofitting of developed areas is intended to improve water quality, protect downstream channels, reduce

flooding, or meet other specific objectives. Retrofitting developed areas may include, but is not limited to replacing roofs with green roofs, disconnecting downspouts or impervious surfaces to drain to pervious surfaces, replacing impervious surfaces with pervious surfaces, installing rain barrels, installing rain gardens, and trash area enclosures.

Runoff - All flows in a storm water conveyance system that consists of the following components: (1) storm water (wet weather flows) and (2) non-storm water including dry weather flows.

San Diego Water Board – As used in this document the term "San Diego Water Board" is synonymous with the term "Regional Board" as defined in Water Code section 13050(b) and is intended to refer to the California Regional Water Quality Control Board for the San Diego Region as specified in Water Code Section 13200.

Sediment - Soil, sand, and minerals washed from land into water. Sediment resulting from anthropogenic sources (i.e. human induced land disturbance activities) is considered a pollutant. This Order regulates only the discharges of sediment from anthropogenic sources and does not regulate naturally occurring sources of sediment. Sediment can destroy fish-nesting areas, clog animal habitats, and cloud waters so that sunlight does not reach aquatic plants.

Source Control BMP – Land use or site planning practices, or structural or nonstructural measures that aim to prevent runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between pollutants and runoff.

Storm Water – Per 40 CFR 122.26(b)(13), means storm water runoff, snowmelt runoff and surface runoff and drainage. Surface runoff and drainage pertains to runoff and drainage resulting from precipitation events.

Structural BMPs - A subset of BMPs which detains, retains, filters, removes, or prevents the release of pollutants to surface waters from development projects in perpetuity, after construction of a project is completed.

Test of Significant Toxicity (TST) - A statistical approach used to analyze toxicity test data. The TST incorporates a restated null hypothesis, Welch's t-test, and biological effect thresholds for chronic and acute toxicity.

Total Maximum Daily Load (TMDL) - The maximum amount of a pollutant that can be discharged into a water body from all sources (point and non-point) and still maintain water quality standards. Under CWA section 303(d), TMDLs must be developed for all water bodies that do not meet water quality standards after application of technology-based controls.

Toxicity - Adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies. The water quality objectives for toxicity provided in the Basin Plan, state in part…"All waters shall be free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life….The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge."

Toxicity Identification Evaluation (TIE) - A set of procedures for identifying the specific

chemical(s) responsible for toxicity. These procedures are performed in three phases (characterization, identification, and confirmation) using aquatic organism toxicity tests.

Toxicity Reduction Evaluation (TRE) - A study conducted in a step-wise process designed to identify the causative agents of effluent or ambient toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in toxicity. The first steps of the TRE consist of the collection of data relevant to the toxicity, including additional toxicity testing, and an evaluation of facility operations and maintenance practices, and best management practices. A Toxicity Identification Evaluation (TIE) may be required as part of the TRE, if appropriate.

Treatment Control BMP – Any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media absorption or any other physical, biological, or chemical process.

Unpaved Road – Any long, narrow stretch without pavement used for traveling by motor passenger vehicles between two or more points. Unpaved roads are generally constructed of dirt, gravel, aggregate or macadam and may be improved or unimproved.

Waste - As defined in CWC Section 13050(d), "waste includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal."

Article 2 of CCR Title 23, Chapter 15 (Chapter 15) contains a waste classification system that applies to solid and semi-solid waste, which cannot be discharged directly or indirectly to water of the state and which therefore must be discharged to land for treatment, storage, or disposal in accordance with Chapter 15. There are four classifications of waste (listed in order of highest to lowest threat to water quality): hazardous waste, designated waste, non-hazardous solid waste, and inert waste.

Water Quality Objective - Numerical or narrative limits on constituents or characteristics of water designated to protect designated beneficial uses of the water. [California Water Code Section 13050 (h)]. California's water quality objectives are established by the State and Regional Water Boards in the Water Quality Control Plans. Numeric or narrative limits for pollutants or characteristics of water designed to protect the beneficial uses of the water. In other words, a water quality objective is the maximum concentration of a pollutant that can exist in a receiving water and still generally ensure that the beneficial uses of the receiving water remain protected (i.e., not impaired). Since water quality objectives are designed specifically to protect the beneficial uses, when the objectives are violated the beneficial uses are, by definition, no longer protected and become impaired. This is a fundamental concept under the Porter Cologne Act. Equally fundamental is Porter Cologne's definition of pollution. A condition of pollution exists when the water quality needed to support designated beneficial uses has become unreasonably affected or impaired; in other words, when the water quality objectives have been violated. These underlying definitions (regarding beneficial use protection) are the reason why all waste discharge requirements implementing the federal NPDES regulations require compliance with water quality objectives. (Water quality objectives are also called water quality criteria in the CWA.)

Water Quality Standards - Water quality standards, as defined in Clean Water Act section 303(c) consist of the beneficial uses (e.g., swimming, fishing, municipal drinking water supply, etc.,) of a water body and criteria (referred to as water quality objectives in the California Water Code) necessary to protect those uses. Under the Water Code, the water boards establish beneficial uses and water quality objectives in water quality control or basin plans. Together with an anti-degradation policy, these beneficial uses and water quality objectives serve as water quality standards under the Clean Water Act. In Clean Water Act parlance, state beneficial uses are called "designated uses" and state water quality objectives are called "criteria." Throughout this Order, the relevant term is used depending on the statutory scheme.

Waters of the State - Any water, surface or underground, including saline waters within the boundaries of the State [CWC section 13050 (e)]. The definition of the Waters of the State is broader than that for the Waters of the United States in that all water in the State is considered to be a Waters of the State regardless of circumstances or condition.

Waters of the United States - As defined in the 40 CFR 122.2, the Waters of the U.S. are defined as: "(a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate "wetlands;" (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters otherwise defined as waters of the United States under this definition: (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial seas; and (g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA."

Watershed - That geographical area which drains to a specified point on a water course, usually a confluence of streams or rivers (also known as drainage area, catchment, or river basin).

Wet Season (aka Rainy Season) – October 1 to April 30

Wet Weather – Weather is considered wet up to 72 hours after a storm event of 0.1 inches and greater, unless otherwise defined by another regulatory mechanism (e.g. a TMDL).

ATTACHMENT D

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM

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JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

FY _____

I. COPERMITTEE INFORMATION			
Copermittee Name:			
Copermittee Primary Contact Name:			
Copermittee Primary Contact Information: Address: City:	County:	State:	Zip:
Telephone:	Fax:	Email:	

II. LEGAL AUTHORITY		
Has the Copermittee established adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 that complies with Order No. R9-2013-0001?	YES NO	☐ ☐
A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority?	YES NO	☐ ☐

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE		
Was an update of the jurisdictional runoff management program document required or recommended by the San Diego Water Board?	YES NO	☐ ☐
If YES to the question above, did the Copermittee update its jurisdictional runoff management program document and make it available on the Regional Clearinghouse?	YES NO	☐ ☐

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM		
Has the Copermittee implemented a program to actively detect and eliminate illicit discharges and connections to its MS4 that complies with Order No. R9-2013-0001?	YES NO	☐ ☐

Number of non-storm water discharges reported by the public	
Number of non-storm water discharges detected by Copermittee staff or contractors	
Number of non-storm water discharges investigated by the Copermittee	
Number of sources of non-storm water discharges identified	
Number of non-storm water discharges eliminated	
Number of sources of illicit discharges or connections identified	
Number of illicit discharges or connections eliminated	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

V. DEVELOPMENT PLANNING PROGRAM		
Has the Copermittee implemented a development planning program that complies with Order No. R9-2013-0001?	YES NO	☐ ☐
Was an update to the BMP Design Manual required or recommended by the San Diego Water Board?	YES NO	☐ ☐
If YES to the question above, did the Copermittee update its BMP Design Manual and make it available on the Regional Clearinghouse?	YES NO	☐ ☐

Number of proposed development projects in review	
Number of Priority Development Projects in review	
Number of Priority Development Projects approved	
Number of approved Priority Development Projects exempt from any BMP requirements	
Number of approved Priority Development Projects allowed alternative compliance	
Number of Priority Development Projects granted occupancy	

Number of completed Priority Development Projects in inventory	
Number of high priority Priority Development Project structural BMP inspections	
Number of Priority Development Project structural BMP violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

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VI. CONSTRUCTION MANAGEMENT PROGRAM

Has the Copermittee implemented a construction management program that complies with Order No. R9-2013-0001?	YES ☐ NO ☐

Number of construction sites in inventory	
Number of active construction sites in inventory	
Number of inactive construction sites in inventory	
Number of construction sites closed/completed during reporting period	
Number of construction site inspections	
Number of construction site violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

Has the Copermittee implemented an existing development management program that complies with Order No. R9-2013-0001?	YES ☐ NO ☐

	Municipal	Commercial	Industrial	Residential
Number of facilities or areas in inventory				
Number of existing development inspections				
Number of follow-up inspections				
Number of violations				
Number of enforcement actions issued				
Number of escalated enforcement actions issued				

VIII. PUBLIC EDUCATION AND PARTICIPATION

Has the Copermittee implemented a public education program component that complies with Order No. R9-2013-0001?	YES ☐ NO ☐
Has the Copermittee implemented a public participation program component that complies with Order No. R9-2013-0001?	YES ☐ NO ☐

IX. FISCAL ANALYSIS

Has the Copermittee attached to this form a summary of its fiscal analysis that complies with Order No. R9-2013-0001?	YES ☐ NO ☐

X. CERTIFICATION

I [☐ Principal Executive Officer ☐ Ranking Elected Official ☐ Duly Authorized Representative] certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature	Date
Print Name	Title
Telephone Number	Email

ATTACHMENT E

SPECIFIC PROVISIONS FOR TOTAL MAXIMUM DAILY LOADS APPLICABLE TO ORDER NO. R9-2013-0001

These provisions implement load allocations (LAs) and wasteload allocations (WLAs) of the Total Maximum Daily Loads (TMDLs) ~~adopted~~ established by the San Diego Water Board or ~~and approved by~~ USEPA under Clean Water Act section 303(c), applicable to discharges regulated under this Order. The provisions and schedules for implementation of the TMDLs described below must be incorporated into the Water Quality Improvement Plans, required pursuant to Provision B of this Order, for the specified Watershed Management Areas.

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed
2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin
3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed
4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek
5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay
6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)
7. Total Maximum Daily Load for Sediment in Los Peñasquitos Lagoon

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2002-0123

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	August 14, 2002
State Water Board Approval Date:	July 16, 2003
Office of Administrative Law Approval Date:	September 11, 2003
US EPA Approval Date:	November 3, 2003

(3) TMDL Effective Date: September 11, 2003

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final diazinon TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must be in compliance with the final TMDL compliance requirements as of December 31, 2010.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations:

Table 1.1
Final Receiving Water Limitations Expressed as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Diazinon	Acute	0.08 µg/L	1 hour
	Chronic	0.05 µg/L	4 days

(b) Final Effluent Limitations

Discharges from the MS4s containing concentrations that do not exceed the following effluent limitations will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 1.b.(2)(a):

Table 1.2
Final Effluent Limitations Expressed as Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation	Averaging Period
Diazinon	Acute	0.072 µg/L	1 hour
	Chronic	0.045 µg/L	4 days

(c) Best Management Practices

The following BMPs for Chollas Creek must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area and implemented by the Responsible Copermittees:

(i) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 1.b.(2)(a) and/or the effluent limitations under Specific Provision 1.b.(2)(b) for Chollas Creek.

(ii) The Responsible Copermittees must implement the Diazinon Toxicity Control Plan and Diazinon Public Outreach/Education Program as described in the report titled, *Technical Report for Total Maximum Daily Load for Diazinon in Chollas Creek Watershed, San Diego County*, dated August 14, 2002, including subsequent modifications, in order to achieve the receiving water limitations under Specific Provision 1.b.(2)(a) and/or the effluent limitations under Specific Provision 1.b.(2)(b).

(iii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 1.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 1.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 1.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 1.b.(2)(c) achieves compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 1.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 1.d, to demonstrate compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The Responsible Copermittees must be in compliance with the final diazinon TMDL compliance requirements as of December 31, 2010.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls for diazinon within the Chollas Creek watershed, and calculate or estimate the annual diazinon loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment

Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 1.b.(2)(b), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0019

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	September 22, 2005
Office of Administrative Law Approval Date:	December 2, 2005
US EPA Approval Date:	February 8, 2006

(3) TMDL Effective Date: December 2, 2005

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Shelter Island Yacht Basin

(6) Responsible Copermittee: City of San Diego

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final dissolved copper TMDL compliance requirements for Shelter Island Yacht Basin consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittee must be in compliance with the final TMDL compliance requirements as of December 2, 2005.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations:

Table 2.1
Final Receiving Water Limitations Expressed as Concentrations in Shelter Island Yacht Basin

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Dissolved Copper	Acute	4.8 µg/L x WER*	1 hour
	Chronic	3.1 µg/L x WER*	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 2.b.(3)(a):

Table 2.2
Final Effluent Limitations as Expressed as Annual Loads in MS4 Discharges to Shelter Island Yacht Basin

Constituent	Effluent Limitation
Dissolved Copper	30 kg/yr*

* If the water quality objectives for dissolved copper in Shelter Island Yacht Basin are changed in the future, then the margin of safety (MOS), TMDL and allocations will be recalculated using the *Method for Recalculation of the Total Maximum Daily Load for Dissolved Copper in the Shelter Island Yacht Basin, San Diego Bay* in the Basin Plan (p. 7-14).

(c) Best Management Practices

The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 2.b.(2)(a) and/or the effluent limitations under Specific Provision 2.b.(2)(b) for Shelter Island Yacht Basin. The BMPs must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 2.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 2.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittee develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 2.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 2.b.(2)(c) achieves compliance with Specific Provisions 2.b.(3)(a), 2.b.(3)(b) and/or 2.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 2.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 2.d, to demonstrate compliance with Specific Provisions 2.b.(3)(a), 2.b.(3)(b) and/or 2.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The Responsible Copermittees must be in compliance with the final dissolved copper TMDL compliance requirements as of December 2, 2005.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

The Responsible Copermittee must monitor the effluent of its MS4 outfalls for dissolved copper, and calculate or estimate the monthly and annual dissolved copper loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.(b)(2)of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0036

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	November 16, 2005
Office of Administrative Law Approval Date:	February 1, 2006
US EPA Approval Date:	March 22, 2006

(3) TMDL Effective Date: February 1, 2006

(4) Watershed Management Area: Santa Margarita River

(5) Water Body: Rainbow Creek

(6) Responsible Copermittee: County of San Diego

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final total nitrogen and total phosphorus TMDL compliance requirements for Rainbow Creek consist of the following

(1) Final TMDL Compliance Date

The Responsible Copermittee must comply with final TMDL compliance requirements by December 31, 2021.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance date under Specific Provision 3.b.(1):

Table 3.1
Final Receiving Water Limitations Expressed as Concentrations in Rainbow Creek

Constituent	Receiving Water Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing concentrations that do not exceed the following effluent limitations by the compliance date under Specific Provision 3.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 3.b.(2)(a):

Table 3.2
Final Effluent Limitations Expressed as Concentrations in MS4 Discharges to Rainbow Creek

Constituent	Effluent Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(ii) Annual pollutant loads from given land uses discharging to and from the MS4s that do not exceed the following annual loads by the compliance date under Specific Provision 3.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 3.b.(2)(a):

Table 3.3
Final Effluent Limitations Expressed as Annual Loads in MS4 Discharges to Rainbow Creek

Land Use	Total N	Total P
Commercial nurseries	116 kg/yr	3 kg/yr
Park	3 kg/yr	0.1 kg/yr
Residential areas	149 kg/yr	12 kg/yr
Urban areas	27 kg/yr	6 kg/yr

(c) Best Management Practices

(i) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 3.b.(2)(a) and/or the effluent limitations under Specific Provision 3.b.(2)(b) for Rainbow Creek.

(ii) The Responsible Copermittee should coordinate any BMPs implemented to address this TMDL with Caltrans and other sources as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under

Specific Provision 3.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 3.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the final effluent limitations under Specific Provision 3.b.(2)(b)(ii); OR

(e) The Responsible Copermittee develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 3.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Specific Provision 3.b.(2)(c) achieves compliance with Specific Provisions 3.b.(3)(a), 3.b.(3)(b), 3.b.(3)(c) and/or 3.b.(3)(d),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 3.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 3.d, to demonstrate compliance with Specific Provisions 3.b.(3)(a), 3.b.(3)(b), 3.b.(3)(c) and/or 3.b.(3)(d).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim total nitrogen and total phosphorus TMDL compliance requirements for Rainbow Creek consist of the following:

(1) Interim Compliance Dates and WQBELs

The Responsible Copermittee must comply with the interim WQBELs, expressed as annual loads, by December 31 of the interim compliance year given in Table 3.4.

Table 3.4
Interim Water Quality Based Effluent Limitations Expressed as Annual Loads in MS4 Discharges from Specific Land Uses to Rainbow Creek

	Total N Interim Effluent Limitations (kg/yr)			Total P Interim Effluent Limitations (kg/yr)		
	Interim Compliance Date			Interim Compliance Date		
Land Use	**2009**	**2013**	**2017**	**2009**	**2013**	**2017**
Commercial nurseries	390	299	196	20	16	10
Park	5	3	3	0.15	0.10	0.10
Residential areas	507	390	260	99	74	47
Urban areas	40	27	27	9	6	6

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 3.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 3.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the final effluent limitations under Specific Provision 3.b.(2)(b)(ii); OR

(e) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the interim effluent limitations under Specific Provision 3.c.(1); OR

(f) The Responsible Copermittee has submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

d. Specific Monitoring and Assessment Requirements

(1) The Responsible Copermittee must incorporate into the Water Quality Improvement Plan and implement the Sampling and Analysis Plan for Rainbow Creek Nutrient Reduction TMDL Implementation Water Quality Monitoring, dated January 2010.

(2) The results of any monitoring conducted during the reporting period, and assessment of whether the interim and final TMDL compliance requirements have been achieved must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 3.b.(2)(b)(i), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2007-0043

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2007
State Water Board Approval Date:	July 15, 2008
Office of Administrative Law Approval Date:	October 22, 2008
US EPA Approval Date:	December 18, 2008

(3) TMDL Effective Date: October 22, 2008

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final dissolved copper, lead, and zinc TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must comply with the final TMDL compliance requirements by October 22, 2028.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance date under Specific Provision 4.b.(1):

Table 4.1
Final Receiving Water Limitations Expressed as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$(0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$(0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$(0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$(0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations by the compliance date under Specific Provision 4.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 4.b.(2)(a):

Table 4.2
Final Effluent Limitations as Expressed Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(c) Best Management Practices

(i) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 4.b.(2)(a) and/or the effluent limitations under Specific Provision 4.b.(2)(b) for Chollas Creek.

(ii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans and the U.S. Navy as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 4.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 4.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 4.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 4.b.(2)(c) achieves compliance with Specific Provisions 4.b.(3)(a), 4.b.(3)(b) and/or 4.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 4.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 4.d, to demonstrate compliance with Specific Provisions 4.b.(3)(a), 4.b.(3)(b) and/or 4.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim dissolved copper, lead, and zinc TMDL compliance requirements for Chollas Creek consist of the following:

(1) Interim Compliance Date and WQBELs

The Responsible Copermittee must comply with the interim WQBELs, expressed as concentrations, by the interim compliance date given in Table 4.3:

Table 4.3
Interim Water Quality Based Effluent Limitations Expressed as Concentrations in MS4 Discharges to Chollas Creek

Interim Compliance Date	Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
October 22, 2018	Dissolved Copper	Acute	$1.2 \times 90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
	Dissolved Lead	Acute	$1.2 \times 90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
	Dissolved Zinc	Acute	$1.2 \times 90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 4.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 4.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) There are no exceedances of the interim effluent limitations under Specific

Provision 4.c.(1) at the Responsible Copermittee's MS4 outfalls; OR

(e) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance date.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*, when it is amended to include monitoring requirements for the Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls discharging to Chollas Creek for dissolved copper, lead, and zinc, and calculate or estimate the monthly and annual dissolved copper, lead, and zinc loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 4.b.(2)(b) or 4.c.(1), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2008-0027

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 11, 2008
State Water Board Approval Date:	June 16, 2009
Office of Administrative Law Approval Date:	September 15, 2009
US EPA Approval Date:	October 26, 2009

(3) TMDL Effective Date: September 15, 2009

(4) Watershed Management Areas: See Table 5.0

(5) Water Bodies: See Table 5.0

(6) Responsible Copermittees: See Table 5.0

Table 5.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County	Dana Point Harbor	Baby Beach	-City of Dana Point -County of Orange
San Diego Bay	San Diego Bay	Shelter Island Shoreline Park	- San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final indicator bacteria TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Final TMDL Compliance Dates

(a) Baby Beach in Dana Point Harbor

The Responsible Copermittees for MS4 discharges to Baby Beach must be in compliance with the final TMDL compliance requirements according to the following compliance dates:

Table 5.1
Compliance Dates to Achieve Final TMDL Compliance Requirements For Baby Beach in Dana Point Harbor

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform	September 15, 2014	September 15, 2009
Fecal Coliform		September 15, 2009
Enterococcus		September 15, 2019

(b) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park must be in compliance with the final TMDL compliance requirements as of December 31, 2012.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance dates under Specific Provision 5.b.(1):

Table 5.2
Final Receiving Water Limitations Expressed as Bacteria Densities in the Water Body

	Receiving Water Limitations	
Constituent	Single Sample Maximum[1,2]	30-Day Geometric Mean[2]
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing indicator bacteria densities that do not exceed the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.3a
Final Effluent Limitations as Expressed as Bacteria Densities in MS4 Discharges to the Water Body

	Effluent Limitations	
Constituent	**Single Sample Maximum[1,2]**	**30-Day Geometric Mean[2]**
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.

(ii) Discharges from the MS4s containing indicator bacteria loads that do not exceed the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.4a
Final Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to the Baby Beach in Dana Point Harbor

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0.86×10^9 MPN/day	$3{,}254 \times 10^9$ MPN/30days
Fecal Coliform	0.17×10^9 MPN/day	112×10^9 MPN/30days
Enterococcus	0.03×10^9 MPN/day	114×10^9 MPN/30days

Table 5.4b
Final Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to the Shelter Island Shoreline Park in San Diego Bay

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0 MPN/day	198×10^9 MPN/30days
Fecal Coliform	0 MPN/day	8×10^9 MPN/30days
Enterococcus	0 MPN/day	26×10^9 MPN/30days

(iii) Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.5a
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to Baby Beach in Dana Point Harbor*

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	90.4%	0%
Fecal Coliform	82.7%	0%
Enterococcus	96.2%	62.2%

Notes:
* The percent load reductions are relative to data collected between 1996-2002. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittees' MS4s must not exceed the loads in Table 5.4a, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the water body.

Table 5.5b
*Final Effluent Limitations Expressed as Percent Load Reductions** in MS4 Discharges to Shelter Island Shoreline Park in San Diego Bay*

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0%	0%
Fecal Coliform	0%	0%
Enterococcus	0%	0%

Notes:
* The percent load reductions are relative to data collected between 1999-2004. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittee's MS4s must not exceed the loads in Table 5.4b, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the water body.

(c) Best Management Practices

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 5.0 must incorporate the Bacteria Load Reduction Plan (BLRP) required to be developed pursuant to Resolution No. R9-2008-0027.

(ii) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 5.b.(2)(a) and/or the effluent limitations under Specific Provision 5.b.(2)(b) for the segments or areas of the water bodies listed in Table 5.0

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.b.(2)(b)(ii); OR

(e) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 5.b.(2)(b)(iii); OR

(f) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(g) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 5.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 5.b.(2)(c) achieves compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 5.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 5.d, to demonstrate compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim indicator bacteria TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Baby Beach in Dana Point Harbor

(a) Interim TMDL Compliance Dates and WQBELs

The Responsible Copermittees for MS4 discharges to Baby Beach must comply with the following interim WQBELs by the interim compliance dates given in Tables 5.6a and/or 5.6b:

Table 5.6a
Interim Water Quality Based Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to Baby Beach in Dana Point Harbor

Constituent	Interim Compliance Dates	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	4.93×10^9 MPN/day	$3{,}254 \times 10^9$ MPN/30days*
Fecal Coliform	September 15, 2012	0.59×10^9 MPN/day	112×10^9 MPN/30days*
Enterococcus	September 15, 2012	0.42×10^9 MPN/day	301×10^9 MPN/30days
	September 15, 2016	0.03×10^9 MPN/day *	207×10^9 MPN/30days

Notes:
* Same as the final effluent limitations in Table 5.4a.

Table 5.6b
Interim Water Quality Based Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to Baby Beach in Dana Point Harbor*

Constituent	Interim Compliance Dates	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	45.2%	0%**
Fecal Coliform	September 15, 2012	41.4%	0%**
Enterococcus	September 15, 2012	48.1%	0%
	September 15, 2016	96.2%**	31.1%

Notes:
* The percent load reductions are relative to data collected between 1996-2002. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittees' MS4s must not exceed the loads in Table 5.6a, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the waterbody.
** Same as the final effluent limitations in Table 5.5a.

(b) Interim Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(i) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(ii) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(iii) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(iv) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.b(2)(b)(ii); OR

(v) The Responsible Copermittees can demonstrate that exceedances of the applicable receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(vi) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the interim effluent limitations under Table 5.6a of Specific Provision 5.c.(1)(a); OR

(vii) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the interim effluent limitations under Table 5.6b of Specific Provision 5.c.(1)(a); OR

(viii) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

(2) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park must be in compliance with the final indicator bacteria TMDL requirements as of December 31, 2012.

d. Specific Monitoring and Assessment Requirements

(1) Monitoring Stations

Monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[34] If discharges of bacteria from the MS4 exceed the applicable interim or final WQBELs, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(2) Monitoring Procedures

(a) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) The Responsible Copermittees must collect wet weather monitoring samples within the first 24 hours of a storm event[35] of the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(c) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

[34] Commonly referred to as AB 411 monitoring
[35] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs have been achieved.

(b) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 5.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(c) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to correlate elevated bacteria levels with known or suspected sewage spills from wastewater collection systems and treatment plants or boats.

(d) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2010-0001

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 10, 2010
State Water Board Approval Date:	December 14, 2010
Office of Administrative Law Approval Date:	April 4, 2011
US EPA Approval Date:	June 22, 2011

(3) TMDL Effective Date: April 4, 2011

(4) Watershed Management Areas: See Table 6.0

(5) Water Bodies: See Table 6.0

(6) Responsible Copermittees: See Table 6.0

Table 6.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	-City of Laguna Beach -County of Orange -Orange County Flood Control District
		at Heisler Park - North	
	Pacific Ocean Shoreline	at Main Laguna Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Woods -County of Orange -Orange County Flood Control District
		Laguna Beach at Ocean Avenue	
		Laguna Beach at Cleo Street	
		Arch Cove at Bluebird Canyon Road	
		Laguna Beach at Dumond Drive	
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Hills -City of Laguna Niguel -City of Laguna Woods -City of Lake Forest -City of Mission Viejo -County of Orange -Orange County Flood Control District
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	
	Aliso Creek Mouth	at mouth	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	-City of Dana Point -City of Laguna Beach -City of Laguna Niguel -County of Orange -Orange County Flood Control District
		Aliso Beach at Table Rock Drive	
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)	
		at Salt Creek (large outlet)	
		Salt Creek Beach at Salt Creek service road	
		Salt Creek Beach at Strand Road	
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	-City of Dana Point -City of Laguna Hills -City of Laguna Niguel -City of Mission Viejo -City of Rancho Santa Margarita -City of San Juan Capistrano -County of Orange -Orange County Flood Control District
	San Juan Creek	lower 1 mile	
	San Juan Creek Mouth	at mouth	
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	-City of Dana Point -City of San Clemente -County of Orange -Orange County Flood Control District
		Ole Hanson Beach Club Beach at Pico Drain	
		San Clemente City Beach at El Portal Street Stairs	
		San Clemente City Beach at Mariposa Street	
		San Clemente City Beach at Linda Lane	
		San Clemente City Beach at South Linda Lane	
		San Clemente City Beach at Lifeguard Headquarters	
		under San Clemente Municipal Pier	
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	
		San Clemente State Beach at Riviera Beach	
		Can Clemente State Beach at Cypress Shores	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	-City of Oceanside -City of Vista -County of San Diego
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	-City of Carlsbad -City of Encinitas -City of Escondido -City of San Marcos -County of San Diego
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	-City of Del Mar -City of Escondido -City of Poway -City of San Diego -City of Solana Beach -County of San Diego
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	-City of Del Mar -City of Poway -City of San Diego -County of San Diego
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	-City of San Diego
		La Jolla Shores Beach at Caminito del Oro	
		La Jolla Shores Beach at Vallecitos	
		La Jolla Shores Beach at Avenida de la Playa	
		at Casa Beach, Children's Pool	
		South Casa Beach at Coast Boulevard	
		Whispering Sands Beach at Ravina Street	
		Windansea Beach at Vista de la Playa	
		Windansea Beach at Bonair Street	
		Windansea Beach at Playa del Norte	
		Windansea Beach at Palomar Avenue	
		at Tourmaline Surf Park	
		Pacific Beach at Grand Avenue	
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I- Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	-City of El Cajon -City of Santee -County of San Diego
	San Diego River	lower 6 miles	-City of El Cajon -City of La Mesa -City of San Diego -City of Santee -County of San Diego
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	-City of La Mesa -City of Lemon Grove -City of San Diego -County of San Diego - San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final indicator bacteria TMDL compliance requirements for the water bodies listed in Table 6.0 consist of the following:

(1) Final TMDL Compliance Dates

The Responsible Copermittees for MS4 discharges to the water bodies listed in Table 6.0 must be in compliance with the final TMDL compliance requirements according to the following compliance dates:

Table 6.1
Compliance Dates to Achieve Final TMDL Compliance Requirements

Constituent	Dry Weather TMDL Compliance Date	Wet Weather TMDL Compliance Date
Total Coliform	April 4, 2021	April 4, 2031
Fecal Coliform		
Enterococcus		

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance dates under Specific Provision 6.b.(1):

Table 6.2a
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Beaches

	Wet Weather Days		Dry Weather Days	
Constituent	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform	10,000	22%	1,000	0%
Fecal Coliform	400	22%	200	0%
Enterococcus	104	22%	35	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan.

Table 6.2b
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Creeks

	Wet Weather Days		Dry Weather Days	
Constituent	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Fecal Coliform	400	22%	200	0%
Enterococcus	61 (104)	22%	33	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Basin Plan.
d. A single sample maximum of 104 MPN/100ml for *Enterococcus* may be applied as a receiving water limitation for creeks, instead of 61 MPN/100mL, if one or more of the creeks addressed by these TMDLs (San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek, San Diego River, and/or Chollas Creek) is designated with a "moderately to lightly used area" or less frequent usage frequency in the Basin Plan. Otherwise, the single sample maximum of 61 MPN/100mL for *Enterococcus* must be used to assess compliance with the allowable exceedance frequency.

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing indicator bacteria densities that do not exceed the following effluent limitations by the compliance dates under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a):

Table 6.2c
Final Effluent Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies in MS4 Discharges to the Water Body

Constituent	Concentration-Based Effluent Limitations			
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform[d]	10,000	22%	1,000	0%
Fecal Coliform	400	22%	200	0%
Enterococcus	104[e] / 61[f]	22%	35[e] / 33[f]	0%

Notes:
a. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan for discharges to beaches, and the Basin Plan for discharges to creeks and creek mouths.
d. Total coliform effluent limitations only apply to MS4 outfalls that discharge to the Pacific Ocean Shorelines and creek mouths listed in Table 6.0.
e. This *Enterococcus* effluent limitation applies to MS4 discharges to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
f. This *Enterococcus* effluent limitation applies to MS4 discharges to segments or areas of creeks or creek mouths listed in Table 6.0.

(ii) Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the compliance dates under Specific Provision 6.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a):

Table 6.3
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	*Watershed and Water Bodies*	*Load-Based Effluent Limitations*					
		Dry Weather			*Wet Weather*		
		Total Coliform	*Fecal Coliform*	*Entero-coccus*	*Total Coliform*	*Fecal Coliform*	*Entero-coccus*
South Orange County	San Joaquin Hills HSA (901.11) and Laguna Hills HSA (901.12) - Pacific Ocean Shoreline	91.78%	91.72%	98.28%	46.85%	52.07%	51.26%
	Aliso HSA (901.13) - Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	95.47%	95.58%	99.13%	25.29%	26.62%	27.52% (27.37%)**
	Dana Point HSA (901.14) - Pacific Ocean Shoreline	95.04%	95.03%	98.98%	13.15%	14.86%	15.16%
	Lower San Juan HSA (901.27) - Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	72.96%	74.21%	94.94%	19.21%	12.82%	27.12% (26.90%)**
	San Clemente HA (901.30) - Pacific Ocean Shoreline	94.28%	94.23%	98.83%	23.85%	24.58%	25.26%
San Luis Rey River	San Luis Rey HU (903.00) - Pacific Ocean Shoreline	38.13%	39.09%	87.38%	5.62%	3.12%	11.69%

Table 6.3 (Cont'd)
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watershed and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
Carlsbad	San Marcos HA (904.50) - Pacific Ocean Shoreline	82.82%	82.55%	96.03%	18.47%	18.98%	20.19%
San Dieguito River	San Dieguito HU (905.00) - Pacific Ocean Shoreline	14.39%	20.72%	83.48%	4.29%	1.46%	7.72%
Penasquitos	Miramar Reservoir HA (906.10) - Pacific Ocean Shoreline	96.50%	96.59%	99.42%	1.61%	1.99%	1.93%
Mission Bay	Scripps HA (906.30) - Pacific Ocean Shoreline	96.44%	96.42%	99.25%	16.32%	21.14%	18.82%
	Tecolote HA (906.50) - Tecolote Creek	94.51%	94.59%	98.94%	16.51%	20.47%	18.15% (18.08%)**
San Diego River	Mission San Diego HSA (907.11) and Santee HSA (907.12) - Pacific Ocean Shoreline - Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles)	74.03%	69.44%	93.96%	38.14%	53.22%	42.74% (42.47%)**
San Diego Bay	Chollas HSA (908.22) - Chollas Creek	92.06%	92.15%	98.46%	17.82%	24.84%	21.46% (21.36%)**

Notes:
* The percent load reductions are based on reducing loads compared to pollutant loads from 2001 to 2002.
** The alternative *Enterococcus* percent load reduction was calculated based on a numeric target of 104 MPN/100mL instead of 61 MPN/100mL, protective of the REC-1 "moderately to lightly used area" usage frequency that is protective of freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative pollutant load reductions can be utilized.

(c) Best Management Practices

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 6.0 must incorporate the Comprehensive Load Reduction Plans (CLRPs) required to be developed pursuant to Resolution No. R9-2010-0001.

(ii) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 6.b.(2)(a) and/or the effluent limitations under Specific Provision 6.b.(2)(b) for the segments or areas of the water bodies listed in Table 6.0.

(iii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans, owners/operators of small MS4s, and agricultural dischargers as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(f) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 6.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 6.b.(2)(c) achieves compliance with Specific Provisions 6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), and/or 6.b.(3)(e),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 6.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 6.d, to demonstrate compliance with Specific Provisions 6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), 6.b.(3)(e) and/or 6.b.(3)(f).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim indicator bacteria TMDL compliance requirements for the water bodies listed in Table 6.0 consist of the following:

(1) Interim TMDL Compliance Dates

The Responsible Copermittees must achieve compliance with the interim TMDL compliance requirements, as determined in accordance with Specific Provision 6.c.(3), by the interim compliance dates given in Table 6.4, unless alternative interim compliance dates are accepted by the San Diego Water Board Executive Officer as part of the Water Quality Improvement Plan.

Table 6.4
Interim Compliance Dates to Achieve Interim TMDL Compliance Requirements

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	April 4, 2016	April 4, 2021
		at Heisler Park - North		
	Pacific Ocean Shoreline	at Main Laguna Beach	April 4, 2016	April 4, 2021
		Laguna Beach at Ocean Avenue		
		Laguna Beach at Cleo Street		
		Arch Cove at Bluebird Canyon Road		
		Laguna Beach at Dumond Drive		
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	April 4, 2016	April 4, 2021
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	April 4, 2018	April 4, 2021
	Aliso Creek Mouth	at mouth	April 4, 2018	April 4, 2021
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	April 4, 2016	April 4, 2021
		Aliso Beach at Table Rock Drive		
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)		
		at Salt Creek (large outlet)		
		Salt Creek Beach at Salt Creek service road	April 4, 2017	April 4, 2021
		Salt Creek Beach at Strand Road	April 4, 2017	April 4, 2021

Table 6.4 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	April 4, 2016	April 4, 2021
	San Juan Creek	lower 1 mile	April 4, 2018	April 4, 2021
	San Juan Creek Mouth	at mouth	April 4, 2016	April 4, 2021
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	April 4, 2016	April 4, 2021
		Ole Hanson Beach Club Beach at Pico Drain	April 4, 2016	April 4, 2021
		San Clemente City Beach at El Portal Street Stairs	April 4, 2017	April 4, 2021
		San Clemente City Beach at Mariposa Street		
		San Clemente City Beach at Linda Lane	April 4, 2016	April 4, 2021
		San Clemente City Beach at South Linda Lane	April 4, 2018	April 4, 2021
		San Clemente City Beach at Lifeguard Headquarters	April 4, 2017	April 4, 2021
		under San Clemente Municipal Pier		
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	April 4, 2018	April 4, 2021
		San Clemente State Beach at Riviera Beach	April 4, 2016	April 4, 2021
		Can Clemente State Beach at Cypress Shores	April 4, 2017	April 4, 2021
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	April 4, 2017	April 4, 2021
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	April 4, 2016	April 4, 2021
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	April 4, 2016	April 4, 2021

Table 6.4 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	April 4, 2016	April 4, 2021
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	April 4, 2016	April 4, 2021
		La Jolla Shores Beach at Caminito del Oro		
		La Jolla Shores Beach at Vallecitos		
		La Jolla Shores Beach at Avenida de la Playa		
		at Casa Beach, Children's Pool		
		South Casa Beach at Coast Boulevard		
		Whispering Sands Beach at Ravina Street		
		Windansea Beach at Vista de la Playa		
		Windansea Beach at Bonair Street		
		Windansea Beach at Playa del Norte		
		Windansea Beach at Palomar Avenue		
		at Tourmaline Surf Park		
		Pacific Beach at Grand Avenue		
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries		
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	April 4, 2018	April 4, 2021
	San Diego River	lower 6 miles		
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach		
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	April 4, 2018	April 4, 2021

(2) Interim Water Quality Based Effluent Limitations

The Responsible Copermittees for discharges to the water bodies in Table 6.0 must comply with the following interim WQBELs by the interim compliance dates given in Specific Provision 6.c.(1):

(a) Interim Receiving Water Limitations

(i) *Interim Dry Weather Receiving Water Limitations*

The Responsible Copermittee must calculate the "existing" exceedance frequencies of the 30-day geometric mean water quality objectives for each of the indicator bacteria by analyzing the available monitoring data collected between January 1, 1996 and December 31, 2002. "Existing" exceedance frequencies may be calculated by water body and/or by Watershed Management Area listed in Table 6.0. Separate "existing" exceedance frequencies must be calculated for beaches and creeks/creek mouths.

The Responsible Copermittees must achieve a 50 percent reduction in the "existing" exceedance frequency of the 30-day geometric mean WQBELs for the water bodies listed in Table 6.0 by the interim compliance dates given in Table 6.4. A 50 percent reduction in the "existing" exceedance frequency is equivalent to half of the "existing" exceedance frequency of the 30-day geometric mean WQBELs.

The "existing" exceedance frequencies and the interim dry weather allowable exceedance frequencies (i.e. interim dry weather receiving water limitations) calculated by the Responsible Copermittees must be included in the Water Quality Improvement Plans for the applicable Watershed Management Areas.

(ii) *Interim Wet Weather Receiving Water Limitations*

The Responsible Copermittees must achieve the interim wet weather receiving water limitations in Table 6.5, expressed as interim wet weather allowable exceedance frequencies, by the interim compliance dates given in Table 6.4.

Table 6.5
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	38%	37%	39%
		at Heisler Park - North			
	Pacific Ocean Shoreline	at Main Laguna Beach			
		Laguna Beach at Ocean Avenue			
		Laguna Beach at Cleo Street			
		Arch Cove at Bluebird Canyon Road			
		Laguna Beach at Dumond Drive			
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	41%	41%	42%
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	41%	41%	42%
	Aliso Creek Mouth	at mouth	41%	41%	42%
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	36%	36%	36%
		Aliso Beach at Table Rock Drive			
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)			
		at Salt Creek (large outlet)			
		Salt Creek Beach at Salt Creek service road			
		Salt Creek Beach at Strand Road			

Table 6.5 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	44%	44%	48%
	San Juan Creek	lower 1 mile	44%	44%	47%
	San Juan Creek Mouth	at mouth	44%	44%	47%
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	35%	35%	36%
		Ole Hanson Beach Club Beach at Pico Drain			
		San Clemente City Beach at El Portal Street Stairs			
		San Clemente City Beach at Mariposa Street			
		San Clemente City Beach at Linda Lane			
		San Clemente City Beach at South Linda Lane			
		San Clemente City Beach at Lifeguard Headquarters			
		under San Clemente Municipal Pier			
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)			
		San Clemente State Beach at Riviera Beach			
		Can Clemente State Beach at Cypress Shores			
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	45%	44%	47%
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	40%	40%	41%
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	33%	33%	36%

Table 6.5 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	26%	26%	26%
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	37%	37%	37%
		La Jolla Shores Beach at Caminito del Oro			
		La Jolla Shores Beach at Vallecitos			
		La Jolla Shores Beach at Avenida de la Playa			
		at Casa Beach, Children's Pool			
		South Casa Beach at Coast Boulevard			
		Whispering Sands Beach at Ravina Street			
		Windansea Beach at Vista de la Playa			
		Windansea Beach at Bonair Street			
		Windansea Beach at Playa del Norte			
		Windansea Beach at Palomar Avenue			
		at Tourmaline Surf Park			
		Pacific Beach at Grand Avenue			
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries	49%	49%	51%
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	46%	43%	49%
	San Diego River	lower 6 miles	46%	43%	49%
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	46%	43%	51%
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	41%	41%	43%

(b) Interim Effluent Limitations

Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the interim compliance dates under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.c.(2)(a):

Table 6.6
Interim Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	*Watersheds and Water Bodies*	*Load-Based Effluent Limitations*					
		Dry Weather			*Wet Weather*		
		Total Coliform	*Fecal Coliform*	*Entero-coccus*	*Total Coliform*	*Fecal Coliform*	*Entero-coccus*
South Orange County	San Joaquin Hills HSA (901.11) and Laguna Hills HSA (901.12) - Pacific Ocean Shoreline	45.89%	45.86%	49.14%	23.43%	26.04%	25.63%
	Aliso HSA (901.13) - Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	47.74%	47.79%	49.57%	12.65%	13.31%	13.76% (13.69%)**
	Dana Point HSA (901.14) - Pacific Ocean Shoreline	47.52%	47.52%	49.49%	6.58%	7.43%	7.58%
	Lower San Juan HSA (901.27) - Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	36.48%	37.11%	47.47%	9.61%	6.41%	13.56% (13.45%)**
	San Clemente HA (901.30) - Pacific Ocean Shoreline	47.14%	47.12%	49.42%	11.93%	12.29%	12.63%
San Luis Rey River	San Luis Rey HU (903.00) - Pacific Ocean Shoreline	19.07%	19.55%	43.69%	2.81%	1.56%	5.85%
Carlsbad	San Marcos HA (904.50) - Pacific Ocean Shoreline	41.41%	41.28%	48.02%	9.24%	9.49%	10.10%

Table 6.6 (Cont'd)
Interim Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watersheds and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
San Dieguito River	San Dieguito HU (905.00) - Pacific Ocean Shoreline	7.20%	10.36%	41.74%	2.15%	0.73%	3.86%
Penasquitos	Miramar Reservoir HA (906.10) - Pacific Ocean Shoreline	48.25%	48.30%	49.71%	0.81%	1.00%	0.97%
Mission Bay	Scripps HA (906.30) - Pacific Ocean Shoreline	48.22%	48.21%	49.63%	8.16%	10.57%	9.41%
	Tecolote HA (906.50) - Tecolote Creek	47.26%	47.30%	49.47%	8.26%	10.24%	9.08% (9.04%)**
San Diego River	Mission San Diego HSA (907.11) and Santee HSA (907.12) - Pacific Ocean Shoreline - Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles)	37.02%	34.72%	46.98%	19.07%	26.61%	21.37% (21.24%)**
San Diego Bay	Chollas HSA (908.22) - Chollas Creek	46.03%	46.08%	49.23%	8.91%	12.42%	10.73% (10.68%)**

Notes:
* The percent load reductions are based on reducing loads compared to pollutant loads from 2001 to 2002.
** The alternative *Enterococcus* percent load reduction was calculated based on a numeric target of 104 MPN/100mL instead of 61 MPN/100mL, protective of the REC-1 "moderately to lightly used area" usage frequency that is protective of freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative pollutant load reductions can be utilized.

(3) Interim TMDL Compliance Determination

Compliance with the interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(f) There are no exceedances of the interim receiving water limitations under Specific Provision 6.c.(2)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(g) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the interim effluent limitations under Specific Provision 6.c.(2)(b); OR

(h) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

d. Specific Monitoring and Assessment Requirements

(1) Monitoring and Assessment Requirements for Beaches

(a) Monitoring Stations

For beaches addressed by the TMDL, monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[36] If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source

[36] Commonly referred to as AB 411 monitoring

identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations at least once within the first 24 hours of the end of a storm event[37] during the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer in exceedance of the allowable exceedance frequencies in the receiving waters.

(iii) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(iv) For Pacific Ocean Shoreline segments or areas listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the dry weather and

[37] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

wet weather monitoring data to assess whether the interim and final WQBELs for the Pacific Ocean Shoreline segments or areas listed in Table 6.0 have been achieved.

(ii) Dry weather exceedance frequencies must be calculated as follows:

[a] 30-day geometric means must be calculated from the results of any dry weather samples collected from the segments or areas for each water body listed in Table 6.0;
[b] The method and number of samples need for calculating the 30-day geometric means must be consistent with the number of samples required by the Ocean Plan;
[c] Where there are multiple segments or areas associated with a water body listed in Table 6.0, the Copermittees may calculate geometric means for each segment or area, or combine the dry weather monitoring data from all the segments or areas to calculate geometric means for the water body;
[d] The exceedance frequency must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the dry season.

(iii) Wet weather exceedance frequencies must be calculated as follows:

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;
[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;
[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria densities reported from each storm event sampled; and
[d] The single sample maximum exceedance frequency must be calculated by dividing the number of wet weather days that exceed the single sample maximum receiving water limitations in Table 6.2 by the total number of wet weather days during the rainy season.
[e] The data collected for dry weather must be used in addition to the data collected for wet weather to calculate the wet weather 30-day geometric means. The exceedance frequency of the wet weather 30-day geometric means must be calculated by dividing the number of geometric means that exceed the geometric mean

receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the wet season.

(iv) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(v) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) Monitoring and Assessment Requirements for Creeks and Creek Mouths

(a) Monitoring Stations

For creeks addressed by the TMDL, monitoring locations should consist of, at a minimum, a location at or near the mouth of the creek (e.g. Mass Loading Station or Mass Emission Station) and one or more locations upstream of the mouth (e.g. Watershed Assessment Station). If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations in accordance with the requirements of Provision D.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations within the first 24 hours of the end of a storm event[38] during the rainy season (i.e. October 1 through April 30).

[38] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(iii) Samples collected from receiving water monitoring stations must be analyzed for fecal coliform and *Enterococcus* indicator bacteria.

(iv) For creeks or creek mouths listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the receiving water monitoring data to assess whether the interim and final receiving water WQBELs for the creeks and creek mouths listed in Table 6.0 have been achieved.

(ii) Dry weather exceedance frequencies must be calculated as follows:

[a] 30-day geometric means must be calculated from the results of any dry weather samples collected from the segment or area for each water body listed in Table 6.0;
[b] The method and number of samples need for calculating the 30-day geometric means must be consistent with the number of samples required by the Basin Plan;
[c] The exceedance frequency must be calculated by dividing the number of 30-day geometric means that exceed the 30-day geometric mean receiving water limitations in Table 6.2 by the total number of 30-day geometric means calculated from samples collected during the dry season.

(iii) Wet weather exceedance frequencies must be calculated as follows:

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;
[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;
[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria densities reported from each of the storm events sampled; and

[d] The exceedance frequency must be calculated by dividing the number of wet weather days that exceed the single sample maximum receiving water limitations in Table 6.2 by the total number of wet weather days during the rainy season.

[e] The data collected for dry weather must be used in addition to the data collected for wet weather to calculate the wet weather 30-day geometric means. The exceedance frequency of the wet weather 30-day geometric means must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the wet season.

(iv) The Responsible Copermittee must identify and incorporate additional MS4 outfall and receiving water monitoring stations and/or adjust monitoring frequencies to identify sources causing exceedances of the receiving water WQBELs.

(v) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(vi) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

7. Total Maximum Daily Loads for Sediment in Los Peñasquitos Lagoon

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2012-0033

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2012
State Water Board Approval Date:	January 21, 2014
Office of Administrative Law Approval Date:	July 14, 2014
US EPA Approval Date:	October 30,2014~~Month XX, Year~~

(3) TMDL Effective Date: July 14, 2014

(4) Watershed Management Area: Los Peñasquitos

(5) Water Body: Los Peñasquitos Lagoon

(6) Responsible Copermittees: County of San Diego, City of San Diego, City of Del Mar, and City of Poway

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final sediment TMDL compliance requirements for Los Peñasquitos Lagoon consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must be in compliance with the final TMDL compliance requirements by December 31, 2034.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not prohibit the sustainable restoration of tidal and non-tidal saltmarsh vegetation of at least 346 acres.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations by the compliance date under Provision 7.b(1) will not cause or contribute to a failure of the receiving water condition specified under Specific Provision 7.b.(2)(a):

Table 7.1
*Final Effluent Limitations as Expressed as ~~Annual~~ Wet Season Loads in MS4 Discharges to Los Peñasquitos Lagoon**

Constituent	Effluent Limitation
Sediment	2,580 tons/~~yr~~ wet season

*Final effluent limitations are to be achieved by the following Responsible Parties: County of San Diego, City of San Diego, City of Del Mar, City of Poway, Phase II MS4 permittees, Caltrans, general construction storm water NPDES permittees, and general industrial storm water NPDES permittees.

(c) Best Management Practices

(i) The Water Quality Improvement Plan for the Los Peñasquitos Watershed Management Area must incorporate the Sediment Load Reduction Plan required to be developed pursuant to Resolution No. R9-2012-0033.

(ii) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 7.b.(2)(a) and/or the Copermittee's portion of the effluent limitations under Specific Provision 7.b.(2)(b) for Los Peñasquitos Lagoon.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) Successful restoration of 80 percent of the 1973 acreage of tidal and non-tidal lagoon salt marsh (346 ~~total~~ acres) ~~of tidal and non-tidal saltmarsh vegetation in Los Peñasquitos Lagoon~~; OR

(b) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 7.b.(2)(c)(ii) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 7.b.(2)(c)(ii) or other implementation actions achieve~~s~~ compliance with Specific Provision 7.b.(3)(a),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 7.b.(2)(c)(ii) or other implementation

actions, AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 7.d to demonstrate compliance with Specific Provision ~~2~~7.b.(3)(a).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim sediment TMDL compliance requirements for Los Penasquitos Lagoon consist of the following:

(1) Interim Compliance Dates and WQBELs

The Responsible Copermittees must comply with the interim WQBELs, expressed as ~~annual~~ wet season loads, by December 31 of the interim compliance year set forth in Table 7.2.

Table 7.2
*Interim Water Quality Based Effluent Limitations Expressed as ~~Annual~~ Wet Season Loads in MS4 Discharges**

Interim Compliance Date	Interim Effluent Limitations (tons/~~yr~~wet season)	~~Associated Percentage of Reduction~~
December 31, 2019	6,691	~~20%~~
December 31, 2023	5,663	~~40%~~
December 31, 2027	4,636	~~60%~~
December 31, 2029	3,608	~~80%~~

*Final effluent limitations are to be achieved by the following Responsible Parties: County of San Diego, City of San Diego, City of Del Mar, City of Poway, Phase II MS4 permittees, Caltrans, general construction storm water NPDES permittees, and general industrial storm water NPDES permittees.

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) The final receiving water limitation under Specific Provision 7.b.(2)(a) is met; OR

(c) There are no exceedances of the Copermittee's portion of interim effluent limitations under Table 7.2 at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the Copermittee's portion of the interim TMDL compliance requirements will be achieved by the interim compliance date.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) Watershed Monitoring

The Responsible Copermittees must conduct suspended sediment, bed load, and flow monitoring to calculate total sediment loading to the Los Peñasquitos Lagoon for each wet season (October 1 thru April 30) as set forth below:

(a) The Responsible Copermittees must monitor enough storm events throughout the season to quantify sediment loading over each wet season, and

(b) The Responsible Copermittees must monitor at least 3 stations to quantify cumulative sediment loading into Los Peñasquitos Lagoon. Stations must be located within the Los Peñasquitos, Carroll Canyon, and Carmel Creek tributaries prior to discharging into Los Peñasquitos Lagoon.

(2) Lagoon Monitoring

The Responsible Copermittees must monitor Los Peñasquitos Lagoon each Fall for changes in the extent of the vegetation types as set forth below:

(a) The Responsible Copermittees must acquire aerial photos of Los Peñasquitos Lagoon and digitize them at an approximate scale of 1:2,500,

(b) The Responsible Copermittees must appropriately interpret the vegetation and classify the various types as saltmarsh, non-tidal saltmarsh, freshwater marsh, non-tidal saltmarsh –*Lolium perrene* infested, southern willow scrub/mulefat scrub, herbaceous wetland, or upland land cover.

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the monitoring data collected under Specific Provision 7.d(1) and 7.d(2) to assess whether the interim and final WQBELs have been achieved.

(b) For assessing and determining compliance with the final receiving water limitations under Specific Provision 7.b.(2)(a), the Responsible Copermittees

must use the data acquired under Specific Provision 7.d.(2) to estimate the acreage of tidal and non-tidal saltmarsh actually restored.

(c) For assessing and determining compliance with the final effluent limitations under Specific Provision 7.b.(2)(b), the Responsible Copermittees must use the data acquired under Specific Provision 7.d.(1) to estimate sediment loading into Los Peñasquitos Lagoon. Sediment loading must be evaluated using a 3-year, weighted rolling average. The first reported average shall be calculated using data collected in the year ~~2014-2015~~, 2015-2016, ~~and~~ 2016-2017, and 2017-2018 wet seasons.

(d) The monitoring and assessment results must be submitted as part of the Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

ATTACHMENT F

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

FACT SHEET / TECHNICAL REPORT

FOR

ORDER NO. R9-2013-0001
AS AMENDED BY ORDER No. R9-2015-0001
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

MAY 8, 2013
Amended on February 11, 2015

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I. FACT SHEET FORMAT

This Fact Sheet briefly sets forth the principal facts and the significant factual, legal, methodological, and policy questions that the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) considered in preparing Order No. R9-2013-0001 (Order) as amended by Order No. R9-2015-0001. In accordance with the Code of Federal Regulations (CFR) Title 40 Parts 124.8 and 124.56 (40 CFR 124.8 and 40 CFR 124.56), this Fact Sheet includes, but is not limited to, the following information:

1. Contact information
2. Public process and notification procedures
3. Background of municipal storm water permits
4. Regional MS4 Permit approach
5. Economic considerations
6. Applicable statutes, regulations, plans and policies
7. Discussion of the provisions in the Order

Tentative Order No. R9-2013-0001 was distributed for public review on October 31, 2012. The San Diego Water Board accepted written comments on the Tentative Order until January 11, 2013. A public hearing was subsequently held on April 10 and 11, 2013, that was continued to May 8, 2013 to receive oral comments from interested persons. The San Diego Water Board adopted Order No. R9-2013-0001 on May 8, 2013.

Order No. R9-2015-0001, an Order amending Order No. R9-2013-0001, was distributed for public review on September 19, 2014. Order No. R9-2015-0001 amended the findings and provisions of Order No. R9-2013-0001 to:

a. Enroll the County of Orange, the Orange County Flood Control District and the south Orange County Cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano as Copermittees responsible for compliance with the terms and conditions of Order No. R9-2013-0001, as amended by Order No. R9-2015-0001;

b. Designate the San Diego Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the Cities of Laguna Woods and Laguna Hills and agree to the designation of the Santa Ana Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the City of Lake Forest, subject to the terms of the agreement between San Diego Water Board and the Santa Ana Water Board described in Finding 29 of this Order, upon the later effective date of Order No. R9-2015-0001 or Order No. R8-2015-0001 (superseding Order No. R8-2009-0030);

c. Establish interim exceptions to land development requirements for those priority development projects that discharge to engineered channels and large river reaches as described in Provision E.3.c(2)(e) of this Order;

d. Incorporate the amended requirements of the State Water Resources Control Board's (State Water Board) General Exception to require that pollutant reductions be achieved within 6 years for storm water and nonpoint source discharges to ASBS within the Region;

e. Incorporate applicable requirements of the Los Peñasquitos Lagoon Sediment TMDL;

f. Require the Orange County Copermittees to implement the "*Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County*," dated ~~September~~ October 2014, made effective in the Monitoring and Reporting Program/Order issued pursuant to California Water Code section~~s 13225, 13267, and~~ 13383 in the December 5, 2014 San Diego Water Board Letter Directive and subject to future revisions by the Executive Officer after appropriate public input;

g. Include additional language that clarifies the term "prior lawful approval" for the implementation of appropriate structural BMP requirements to Priority Development Projects.

A public hearing was held on February 11, 2015, to receive oral comments from Copermittees and interested persons. The San Diego Water Board adopted Order No. R9-2015-0001 amending Order No. R9-2013-0001 on February 11, 2015.

The San Diego Water Board files applicable to the issuance of Order No. R9-2013-0001 and amendments thereto are incorporated into the administrative record in support of the findings and requirements of the Order.

II. CONTACT INFORMATION

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The Order and other related documents can be downloaded from the San Diego Water Board website at

http://www.swrcb.ca.gov/rwqcb9/water_issues/programs/stormwater/index.shtml
http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/oc_stormwater.shtml

The documents referenced in this Fact Sheet and in Order No. R9-2013-0001 and amendments thereto are available for public review at the San Diego Water Board office, located at the address listed above. Public records are available for inspection during regular business hours, from 8:00 am to 5:00 pm Monday through Friday. To schedule an appointment to inspect public records, contact the San Diego Water Board Records Management Officer at 858-467-2952619-516-1990.

COPERMITTEES

Orange County Copermittees

- County of Orange
  - City of Aliso Viejo
  - City of Dana Point
  - City of Laguna Beach
  - City of Laguna Hills
  - City of Laguna Niguel
  - City of Laguna Woods
  - City of Lake Forest*
  - City of Mission Viejo
  - City of Ranch Santa Margarita
  - City of San Clemente
  - City of San Juan Capistrano
  - Orange County Flood Control District

* While not listed in the above table, the City of Lake Forest remains a Copermittee under this Order until the later effective date of this Order or Santa Ana Water Board Tentative Order No. R8-2015-0001. Thereafter, the City of Lake Forest will no longer be considered a Copermittee under this Order because its Phase I MS4 discharges will be regulated by the Santa Ana Water Board pursuant to Water Code section 13328 designation. The requirements of this Order that apply to the City of Lake Forest for the duration of this Order, consistent with the Water Code section 13228 agreement dated January XX, 2015, are described in Finding 29 and Footnote 2 to Table B-1.

Riverside County Copermittees

- County of Riverside
  - City of Murrieta
  - City of Temecula
  - City of Wildomar
  - Riverside County Flood Control and Water Conservation District

San Diego County Copermittees

- County of San Diego
  - City of Carlsbad
  - City of Chula Vista
  - City of Coronado
  - City of Del Mar
  - City of El Cajon
  - City of Encinitas
  - City of Escondido
  - City of Imperial Beach
  - City of La Mesa
  - City of Lemon Grove
  - City of National City
  - City of Oceanside
  - City of Poway
  - City of San Diego
  - City of San Marcos
  - City of Santee
  - City of Solana Beach
  - City of Vista
  - San Diego County Regional Airport Authority
  - San Diego Unified Port District

III. PUBLIC PROCESS AND NOTIFICATION PROCEDURES

The San Diego Water Board followed the schedule listed below for the preparation of Order No. R9-2013-0001:

San Diego County Copermittee Permit Reissuance Process

1. On February 8, 2011, the San Diego Water Board met with the San Diego County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No. R9-2007-0001.

2. Between February and May 2011, the San Diego Water Board met with select San Diego County, Orange County, and Riverside County Copermittees, as well as representatives of the environmental community to discuss concepts and receive recommendations for elements to be incorporated in a Regional Municipal Separate Storm Sewer System Permit (Regional MS4 Permit).

3. On June 27, 2011 the San Diego Water Board received the Report of Waste Discharge from the San Diego County Copermittees for the renewal of their NPDES permit, Order No. R9-2007-0001.

4. On April 9, 2012, the San Diego Water Board released an administrative draft of Tentative Order No. R9-2013-0001 for preliminary informal comments and feedback.

5. On April 25, 2012, the San Diego Water Board held an informal public workshop to present the administrative draft of Tentative Order No. R9-2013-0001 and receive verbal comments.

6. Between June and August 2012, the San Diego Water Board held four (4) focused meetings with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community, and USEPA) to discuss and receive preliminary comments and feedback about specific elements in the administrative draft of Tentative Order No. R9-2013-0001.

7. On September 5, 2012, the San Diego Water Board held an informal public workshop to present the modifications that were expected to be incorporated into the Tentative Order based on the preliminary comments and feedback received during the focused meetings held between June and August 2012.

8. Informal written comments on the administrative draft of Tentative Order No. R9-2013-0001 were accepted until September 14, 2012.

9. On October 12, 2012, the San Diego Water Board released a revised administrative draft of Tentative Order No. R9-2013-0001.

10. On October 24, 2012, the San Diego Water Board held a focused meeting with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community, and USEPA) to discuss modifications incorporated into the administrative draft of Tentative Order No. R9-2013-0001.

11. On October 31, 2012, the San Diego Water Board released Tentative Order No. R9-2013-0001 for formal public review and comment.

12. On November 13, 2012 and December 12, 2012, the San Diego Water Board held a formal public Board workshop to present the public draft of Tentative Order No. R9-2013-0001 and receive verbal comments.

13. Formal written comments on the public draft of Tentative Order No. R9-2013-0001 were accepted until January 11, 2013.

14. A public hearing of Tentative Order No. R9-2013-0001 was conducted on April 10 and 11, 2013, that was continued to May 8, 2013.

Orange County Copermittee Permit Reissuance Process

15. On May 20, 2014 the San Diego Water Board received the Report of Waste Discharge from the Orange County Copermittees for the renewal of their MS4 NPDES permit, Order No. R9-2009-0002.

16. On June 24, 2014, the San Diego Water Board met with the Orange County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No.R9-2009-0002 and the process for enrollment as Copermittees under Regional MS4 Permit Order No. R9-2013-0001.

17. On July 1, 2014, the San Diego Water Board held a public meeting to discuss the Orange County Report of Waste Discharge (RoWD) and receive comments on potential modifications to Order No. R9-2013-0001. Based on comments received from the Orange County Copermittees and other interested persons at this meeting, the San Diego Water Board determined that additional public meetings were not needed prior to release of Tentative Order No. R9-2015-0001, amending Order No. R9-2013-0001 in redlined – strikeout format for public review and comment.

18. On September 19, 2014, the San Diego Water Board released Tentative Order No. R9-2015-0001 for a 60 day public review and comment period.

19. On October 8, 2014, the San Diego Water Board held a formal public workshop at a regular board meeting to receive information and discuss the proposed amendments to Order No. R9-2013-0001 described in Tentative Order No. R9-2015-0001.

20. In accordance with State and federal laws and regulations, the San Diego Water Board notified San Diego County, Orange County and Riverside County Copermittees, and all known interested agencies and persons of its intent to adopt Tentative Order No. R9-2015-0001 and provided them with an opportunity to submit their written comments and recommendations. Written comments and recommendations on Tentative Order No. R9-2015-0001 were accepted until November 19, 2014.

21. The San Diego Water Board held a public workshop on October 8, 2014, and a public hearing on February 11, 2015, and heard and considered all comments pertaining to the adoption of Tentative Order No. R9-2015-0001 on February 11, 2015.

IV. BACKGROUND OF THE SAN DIEGO REGION MUNICIPAL STORM WATER PERMITS

In developed and developing areas, storm water runoff is commonly transported through municipal separate storm sewer systems (MS4s) and discharged into local receiving water bodies. As the storm water runs off and flows over the land or impervious surfaces (e.g., paved streets, parking lots, and building rooftops), it accumulates debris, chemicals, sediment, and other pollutants that can adversely affect receiving water quality if discharged untreated. The United States Environmental Protection Agency (USEPA) recognizes wet weather flows from urban areas as the number one source of estuarine pollution in coastal communities,[1] such as those within the San Diego Region.

The federal Clean Water Act (CWA) was amended in 1987 to address and regulate discharges of storm water associated with industrial activities and from municipal storm sewers. With the amendments, many municipalities throughout the United States were obligated for the first time to obtain National Pollutant Discharge Elimination System (NPDES) permits for discharges of storm water from their MS4s.

In response to the CWA 1987 amendment, as well as the pending federal NPDES regulations which would implement the amendment, the San Diego Water Board issued "early" MS4 permits. The San Diego Water Board adopted and issued Order Nos. 90-38, 90-42, and 90-46 to regulate storm water discharges from the MS4s in Orange County, San Diego County, and Riverside County, respectively, within the San Diego Region on July 16, 1990.

The "early" MS4 permits, or First Term Permits, were issued prior to the November 1990 promulgation of the final federal NPDES storm water regulations. By issuing these First Term Permits before the federal regulations took effect, the San Diego Water Board was able to provide the Copermittees additional flexibility in addressing and managing storm water discharges. The First Term Permits contained the essentials of the 1990 regulations, and required the Copermittees to develop and implement runoff management programs, but provided little specificity about what was required to be included in or actually achieved by those programs.

The flexibility provided in the First Term Permits was generally continued through the Second Term Permits. The combination of the lack of specificity in the First and Second Term Permits, a general lack of meaningful action by the Copermittees and a general lack of corresponding reaction (i.e. enforcement) by the San Diego Water Board during the first ten years of the storm water program, resulted in few substantive steps

[1] US EPA. 1999. 40 CFR Parts 9, 122, 123, and 124. National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. 64 FR 68727.

towards achieving improvements in the quality of receiving waters or storm water discharges from the MS4s.

From 2001, the regulatory approach incorporated into Third Term Permits was a significant departure from the regulatory approach of the First and Second Term Permits. The Third Term Permits issued by the San Diego Water Board included more detailed requirements that outlined the minimum level of implementation required for the Copermittees' programs to meet the maximum extent practicable (MEP) standard for storm water. The Third Term Permits included more detail to emphasize and enhance the jurisdictional runoff management programs developed by the Copermittees and introduced requirements for developing and implementing watershed-based programs.

The Third Term Permits also incorporated two precedent setting decisions by the State Water Board. In Order WQ 99-05, the State Water Board established receiving water limitation language to be included in all MS4 permits. The State Water Board's precedential language clarified that municipal storm water permits must include provisions requiring discharges to be controlled to attain water quality standards in receiving waters. Unlike previously adopted versions of the receiving water limitation language in the First and Second Term Permits, the language no longer stated that "*violations of water quality standards are not violations of the municipal storm water permit under certain conditions*." In addition, the receiving water limitation language no longer indicated that the "*implementation of best management practices is the 'functional equivalent' of meeting water quality standards*." State Water Board Order WQ 99-05 specifically requires language in MS4 permits for the Copermittees to comply with water quality standards based discharge prohibitions and receiving water limitations through timely implementation of control measures and other actions to reduce pollutants in discharges. (See State Water Board Order WQ 99-05 (*Environmental Health Coalition*)).

In Order WQ 2000-11, also a precedential decision, the State Water Board addressed design standards for structural post-construction best management practices (BMPs) for new development and significant redevelopment. The State Water Board found that the design standards, which require that runoff generated by 85 percent of storm events from specific development categories be infiltrated or treated, reflect the MEP standard. State Water Board Order WQ 2000-11 also found that the post-construction BMP provisions, or Standard Storm Water Mitigation Plan (SSMP) provisions, constitute MEP for addressing storm water pollutant discharges resulting from specific development categories.

The Third Term San Diego County and Orange County Permits (Order Nos. 2001-01 and R9-2002-0001, respectively) were appealed to the State Water Board. Minor modifications were made by the State Water Board, but the requirements were largely upheld. In State Water Board Order WQ 2001-15, the State Water Board upheld the Third Term San Diego County Permit requirements with certain modifications. The State Water Board removed the prohibition of storm water discharges *into* the MS4 that cause or contribute to exceedances of water quality objectives. The revision allows for

treatment of pollutants in storm water runoff after the pollutants have entered the MS4. State Water Board Order WQ 2001-15 otherwise upheld all the other requirements of the permit.

In addition to the modification to the discharge prohibition in Order WQ 2001-15, the State Water Board refined Order WQ 99-05 by making clear that the Copermittees may use an iterative approach to achieving compliance with water quality standards that involves ongoing assessments and revisions. Thus, the language for the discharge prohibitions and receiving water limitations was revised to explicitly require the Copermittees to implement an iterative process of assessments and revisions to comply with the discharge prohibitions and receiving water limitations. The San Diego Water Board retained the authority to enforce receiving water limitations and discharge prohibitions even if the Copermittee is engaged in the iterative process.

The Third Term San Diego County Permit was subsequently challenged in the Superior Court of the State of California and the Court of Appeal, Fourth Appellate District. The Court of Appeal, Fourth Appellate District, found that the approach of the Third Term San Diego County Permit to regulating discharges into the MS4 was appropriate (*Building Industry Ass'n. v. State Water Resources Control Bd., et al.,* 124 Cal.App.4th 866 (2004)). The State of California Supreme Court denied review sought by the Building Industry Association in March 2005.

The Fourth Term Permits, or current MS4 permits, began with the adoption of Order No. R9-2007-0001 issued to the Copermittees of San Diego County in January 2007. Order Nos. R9-2009-0002 and R9-2010-0016 were subsequently issued to the Copermittees of Orange County and Riverside County. The Fourth Term Permits continued to include more detailed requirements to be implemented by each Copermittee's jurisdictional runoff management program. The Fourth Term Permits also include requirements to further emphasize a watershed management approach and for more coordination among jurisdictional runoff management programs. In addition, the Fourth Term Permits included more requirements for assessing the effectiveness of the runoff management programs being implemented by the Copermittees. The intent of the inclusion of additional requirements was to enhance and better define elements of the permit that were expected to be incorporated into the iterative process for managing runoff from each Copermittee's jurisdiction and within the watersheds of the San Diego Region.

The Fourth Term Permits include several new and emerging approaches for managing storm water runoff and discharges. Low impact development (LID) requirements are included for development and significant redevelopment to reduce pollutants in storm water runoff from sites through more natural processes such as infiltration and biofiltration closer to the source, rather than utilizing conventional mechanical end-of-pipe treatment systems. Hydrograph modification (hydromodification) management requirements also are included to mitigate the potential for increased erosion in receiving waters due to increased runoff rates and durations often caused by development and increased impervious surfaces. The Fourth Term Orange County and

Riverside County Permits introduced requirements to identify areas of existing development where retrofitting with LID projects would be feasible and could be implemented to reduce storm water runoff and pollutants in storm water discharges.

The Fourth Term Orange County and Riverside County Permits included a clearer distinction between storm water and non-storm water discharges. The term "urban runoff" was completely removed, and a distinction between storm water (wet weather) runoff and non-storm water (dry weather) runoff was emphasized. This clarification was made to prevent any potential misunderstanding that regulation under the MS4 permits is limited only to urbanized areas, and to prevent non-storm water runoff from being managed in the same manner as storm water runoff. The term "urban runoff" is not defined in the Code of Federal Regulations (CFR) or Federal Register (FR) in the regulation of MS4 discharges. According to the CWA 402(p)(3)(B)(ii), MS4 permits must include a requirement to effectively prohibit non-storm water discharges into the MS4s.

Finally, for the Fourth Term Orange County and Riverside County Permits the San Diego Water Board found that non-storm water discharges to the MS4 from over application of irrigation water are sources of pollutants. The San Diego Water Board found that non-storm water discharges resulting from over-irrigation must be prohibited from entering the MS4 in accordance with the requirements of the CWA and pursuant to 40 CFR 122.26(d)(2)(iv)(B)(1).

The requirements of the Fourth Term Permits issued to the Copermittees in each county within the San Diego Region now have substantively the same core requirements such as discharge prohibitions, receiving water limitations, jurisdictional runoff management program components, and monitoring program requirements. There are, however, several inconsistencies that exist among the three Fourth Term Permits which complicate oversight and implementation of the permits by the San Diego Water Board.

The Fourth Term San Diego County Permit expired in January 2012. The Fourth Term Orange County permit ~~and Riverside County Permits will~~ expired in December 2014 and the Fourth Term Riverside County Permit will expire in November 2015. ~~, respectively.~~ Issuing the Fifth Term Permits within five years for three counties under three different permits would require the San Diego Water Board to expend significant time and resources for the issuance of the permits through three separate public proceedings, thereby greatly reducing the time and resources available to oversee implementation and compliance. Multiple permits also create confusion for determining compliance among regulated entities, especially for the land development community.

The San Diego Water Board has acknowledged that issuing a single MS4 permit for all the Copermittees in the San Diego Region can and is expected to result in more consistent implementation, improve communication among agencies within watersheds crossing multiple jurisdictions, and minimize resources spent with each permit renewal process. Within the findings of the Fourth Term Riverside County Permit issued in

November 2010, the San Diego Water Board notified the public of its intent to develop and issue a single Regional MS4 Permit.

V. REGIONAL MS4 PERMIT APPROACH

The Fifth Term Permit, or Regional MS4 Permit, shifts the focus of the permit requirements from a minimum level of actions to be implemented by the Copermittees to identifying outcomes to be achieved by those actions. Order No. R9-2013-0001 represents an important paradigm shift in the approach for MS4 permits within the San Diego Region.

Historical Permitting Approach

The First and Second Term Permits were very broad and provided little specificity about what was required to be developed and implemented by the Copermittees. The Third Term Permits began to become more specific about the minimum level of implementation required by the Copermittees. The Fourth Term Permits~~, or current permits,~~ subsequently increased in specificity. The MS4 permits have progressively become more detailed and focused on specifying the minimum level of actions expected to be implemented by the Copermittees. As detailed and specific as the MS4 permits have become, however, they include very little detail about what the desired outcomes of the required actions are expected to achieve. Compliance with the permit requirements has essentially been tracking numbers of actions and reporting, not tracking progress or actual improvements in the quality of receiving waters or discharges from the MS4s. The result has been an increase in actions being implemented by the Copermittees with little or no ability or expectations to determine whether or not improvements in water quality are being achieved.

The Fourth Term Permits result in significant resource expenditure by the Copermittees to report permit compliance information to the San Diego Water Board in the form of annual jurisdictional runoff management program, watershed program, and monitoring program reports. The San Diego Water Board must then expend much of its limited resources on reviewing more than 50 voluminous reports submitted annually by the Copermittees. The information currently reported by the Copermittees is of limited value when trying to measure progress toward achieving improvements in the quality of receiving waters or discharges from the MS4s. Oversight of the MS4 permits is further complicated by the inconsistencies among the requirements issued to the Orange County, San Diego County, and Riverside County Copermittees under three separate MS4 permits.

Under the Fourth Term Permits, the Copermittees must expend a significant portion of their limited resources collecting data of limited value, and putting together reports to submit that information to the San Diego Water Board. Likewise, the San Diego Water Board must expend most of its limited resources reviewing reports, and developing permits instead of working directly with the Copermittees to identify solutions to problems causing impacts to water quality. This is an unsustainable course that will continue to demand more resources from the Copermittees and the San Diego Water Board, and would continue to result in unknown water quality benefits.

New Permitting Approach

The goal of the Regional MS4 Permit is twofold: 1) bring a consistent set of MS4 permit requirements to all of the Copermittees within the San Diego Region; and, 2) provide an MS4 permit with requirements that will allow the Copermittees to focus their efforts and resources on achieving goals and desired outcomes toward the improvement of water quality rather than completing specific actions.

The overall approach included in the Regional MS4 Permit with respect to the jurisdictional runoff management programs will not differ significantly from the current permits. The general requirements for the jurisdictional runoff management program components and compliance with those requirements will remain and be applied consistently throughout the San Diego Region under the Regional MS4 Permit.

The most significant difference in the new permitting approach is the specific manner of implementation for those jurisdictional runoff management programs. Implementation will be based on decisions made by the Copermittees in accordance with what they have identified as their highest priority water quality conditions. In other words, the Copermittees will have significant control in how to implement the jurisdictional runoff management programs to best utilize their available resources in addressing a specific set of priorities effectively, instead of trying to address all the water quality priorities ineffectively.

The Copermittees are given the responsibility of identifying their highest priority water quality conditions that they intend to address. The Copermittees will develop goals that can be used to measure and demonstrate progress or improvements toward addressing those priorities. In addition to the goals, the Copermittees will provide a schedule for achieving the goals for those highest priorities. The measurement of progress toward achieving the goals for those highest priorities requires a better defined and more focused program of monitoring and assessment than under the Fourth Term Permits.

The monitoring and assessment program must be designed to inform the Copermittees of their progress, and the need for modifications in their jurisdictional runoff management programs and schedules to achieve their goals to improve water quality. The monitoring and assessment program requirements will have a more central role in the Regional MS4 Permit than in earlier permits. The monitoring and assessment requirements must also be designed to enable the Copermittees to focus and direct their efforts in implementing their jurisdictional runoff management programs toward their stated desired outcomes to improve the quality of receiving waters and/or discharges from the MS4s.

By providing an MS4 permit that allows the Copermittees to make more decisions about how to utilize and focus their resources, along with a better defined monitoring and assessment program to inform their water quality management decisions, the Copermittees will have the opportunity to:

1) *Plan strategically*. The Copermittees must have the ability to identify their available resources and develop and implement long term plans that can organize, collect, and use those resources in the most strategically advantageous and efficient manner possible. This ability to develop long term plans will allow the Copermittees to focus and utilize their resources in a more concerted way over the short term and long term to address specific water quality priorities through stated desired outcomes.

2) *Manage adaptively*. The Copermittees must be given the ability to modify their plans as additional information and data are collected from the monitoring and assessment programs. The Copermittees' plans may require modifications to the programs, priorities, goals, strategies, and/or schedules in order for the Copermittees to achieve a stated desired outcome.

3) *Identify synergies*. The Copermittees must be given more flexibility to identify efficiencies within and among their jurisdictional runoff management programs as the strategies are developed and implemented to increase the Copermittees' collective effectiveness. The Copermittees must also be able to identify and utilize resources available from other agencies and entities to further augment and enhance their jurisdictional runoff management programs and/or to collectively work with those other agencies and entities toward achieving a stated desired outcome.

The Regional MS4 Permit requirements will provide the Copermittees the flexibility and responsibility to decide what actions will be necessary to achieve an outcome that is tailored and designed by the Copermittees to improve specific prioritized water quality conditions. The San Diego Water Board expects the approach of the Regional MS4 Permit to give the Copermittees a greater sense of ownership for restoring the quality of receiving waters in the San Diego Region by becoming an integral part of the decision making process in identifying water quality conditions to be addressed, as well as determining the best use of their resources.

VI. ECONOMIC CONSIDERATIONS

Statutory Considerations

California Water Code (CWC) section 13241 requires the San Diego Water Board to consider certain factors, including economic considerations, in the adoption of water quality objectives. CWC section 13263 requires the San Diego Water Board to take into consideration the provisions of CWC section 13241 in adopting waste discharge requirements.

In *City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, the California Supreme Court considered whether Regional Water Boards must comply with CWC section 13241 when issuing waste discharge requirements under CWC section 13263(a) by taking into account the costs a permittee will incur in complying with the permit requirements. The Court concluded that whether it is necessary to consider such cost information "*depends on whether those restrictions meet or exceed the requirements of the federal Clean Water Act.*" (*Id.* at p. 627.) The Court ruled that Regional Water Boards may not consider the factors in CWC section 13241, including economics, to justify imposing pollutant restrictions that are less stringent than applicable federal law requires. (*Id.* At pp. 618, 626-627 ["*[Water Code section 13377 specifies that [] discharge permits issued by California's regional boards must meet the federal standards set by federal law. In effect, section 13377 forbids a regional board's consideration of any economic hardship on the part of the permit holder if doing so would result in the dilution of the requirements set by Congress in the Clean Water Act...Because CWC section 13263 cannot authorize what federal law forbids, it cannot authorize a regional board, when issuing a [] discharge permit, to use compliance costs to justify pollutant restrictions that do not comply with federal clean water standards*."]). However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Regional Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

As discussed in Section VII.F, Unfunded State Mandates, the San Diego Water Board finds that the requirements in this Order are not more stringent than the minimum federal requirements. Among other requirements, federal law requires MS4 permits to include requirements to effectively prohibit non-storm water discharges into the MS4s, in addition to requiring controls to reduce the discharge of pollutants in storm water to the MEP, and other provisions as USEPA or the State determines are appropriate for the control of pollutants in MS4 discharges.

The requirements in this Order may be more specific or detailed than those enumerated in federal regulations under 40 CFR 122.26 or in the USEPA guidance. However, the requirements have been designed to be consistent with and within the federal statutory mandates described in CWA section 402(p)(3)(B)(ii) and (iii) and the related federal regulations and guidance. Consistent with federal law, all of the

conditions in this Order could have been included in a permit adopted by USEPA in the absence of the in lieu authority of California to issue NPDES permits.

Moreover, the inclusion of numeric WQBELs in this Order does not cause this Order to be more stringent than federal law. Federal law authorizes both narrative and numeric effluent limitations to meet state water quality standards. The inclusion of WQBELs as discharge specifications in an NPDES permit in order to achieve compliance with water quality standards is not a more stringent requirement than the inclusion of BMP based permit limitations to achieve water quality standards (State Water Board Order No. WQ 2006-0012 (*Boeing*)). Therefore, consideration of the factors set forth in CWC section 13241 is not required for permit requirements to implement the effective prohibition on the discharge of non-storm water discharges into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determine appropriate to control such pollutants, as those requirements are mandated by federal law.

Included in the provisions of the Order are monitoring and reporting requirements that are designed to demonstrate that the Copermittees are implementing programs to comply with the CWA municipal storm water requirements. CWA section 308(a) and 40 CFR 122.41(h), (j)-(l), 122.44(i) and 122.48 require that all NPDES permits specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s (40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c)) also specify additional monitoring and reporting requirements. In addition to the federal requirements of the CWA, the San Diego Water Board also has the authority in CWC 13383 to establish monitoring, reporting, and recordkeeping requirements that implement federal and state laws and regulations through NPDES permits.

The monitoring and assessment information that will be reported to the San Diego Water Board is necessary to determine if the Copermittees are making progress toward achieving compliance with the discharge prohibitions, receiving water limitations, and effluent limitations under Provision A of the Order. The monitoring and assessment information that will be reported is also expected to be key to the iterative approach and adaptive management process that is required to be implemented by the Copermittees if they cannot meet the discharge prohibitions and receiving water limitations under the present conditions, which is also part of the requirements under Provision A of the Order.

Notwithstanding the above, the San Diego Water Board has considered cost information in issuing this Order, as discussed below. The San Diego Water Board has also considered all of the evidence that has been presented to the San Diego Water Board regarding the CWC section 13241 factors in adopting this Order. The San Diego Water Board finds that the requirements in this Order are reasonably necessary to protect beneficial uses identified in the Basin Plan and the economic information related to costs of compliance and other CWC section 13241 factors are not sufficient to justify failing to protect those beneficial uses. Where appropriate, the

San Diego Water Board has provided or will consider providing the Copermittees with additional time to implement control measures to achieve final WQBELs and/or water quality standards.

Cost Information

Discussions of the financial and economic ramifications of municipal storm water management programs tend to focus on the significant costs incurred by municipalities in developing and implementing the programs. When considering the cost of implementing the programs, however, it is also important to consider the alternative costs that are incurred when programs are not fully implemented, as well as the economic benefits which result from effective program implementation.

The recent financial and economic conditions have amplified the concerns about the costs incurred by the municipalities in developing and implementing their programs. The reduction in resources resulting from the recent financial and economic conditions has been cited by many of the Copermittees as a justification for reducing the requirements that must be met by their programs. While the recent conditions are a cause for concern in the short term, these programs also have an opportunity to identify and implement improvements and efficiencies before the next period of growth and development, resulting in more effective and sustainable programs over the long term.

In addition, it is very difficult to ascertain the true cost of implementation of the Copermittees' management programs because of inconsistencies in reporting by the Copermittees. Reported costs of compliance for the same program element can vary widely from city to city, often by a very wide margin that is not easily explained.[2] Despite these problems, efforts have been made to identify management program costs, which can be helpful in understanding the costs of program implementation.

The San Diego Water Board recognizes that the Copermittees will incur costs in implementing this Order, potentially above and beyond the costs from the Copermittees' prior permits. The San Diego Water Board also recognizes that, due to California's current economic condition, many Copermittees currently have limited staff and resources to implement actions to address its MS4 discharges. Based on the economic considerations below, the San Diego Water Board has provided the Copermittees a significant amount of flexibility to choose how to implement the requirements of the Order.

The Order also allows the Copermittees to customize their plans, programs, and monitoring requirements. In the end, it is up to the Copermittees to determine the effective BMPs and measures necessary to comply with this Order. The Copermittees can choose to implement the least expensive measures that are effective in meeting

[2] LARWQCB, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.

the requirements of this Order. This Order also does not require the Copermittees to fully implement all requirements within a single permit term. Where appropriate, the Board has provided the Copermittees with additional time outside of the permit term to implement control measures to achieve final WQBELs and/or water quality standards.

The San Diego Water Board has considered available cost information associated with compliance with this Order. It is not possible to predict accurately the cost impact of the requirements that involve an unknown level of implementation or that depend on environmental variables that are as yet undefined. Only general conclusions can be drawn from this information.

Estimated Municipal Storm Water Program Implementation Costs

The USEPA, the State Water Board, and the California Regional Water Quality Control Boards (Regional Water Boards) have attempted to evaluate the costs of implementing municipal storm water programs. The assessments have demonstrated that the true costs are difficult to ascertain and reported costs vary widely. In addition, reported fiscal analyses tend to neglect the costs incurred to municipalities when storm water and non-storm water runoff is not effectively managed, which are incurred as a result of pollution, contamination, nuisance, and damage to ecosystems, property, and human health. Nonetheless, they provide a useful context for considering the costs of requirements within Order No. R9-2013-0001.

In 1999, the USEPA reported on multiple studies it conducted to determine the cost of management programs. A study of Phase II municipalities determined that the annual cost of the Phase II program was expected to be $9.16 per household. The USEPA also studied 35 Phase I municipalities, finding costs to be $9.08 per household annually, similar to those anticipated for Phase II municipalities.[3]

The State Water Board commissioned a study by the California State University, Sacramento to assess costs of the Phase I MS4 program. This study includes an assessment of costs incurred by Phase I MS4s throughout the state to implement their programs. Annual cost per household in the study ranged from $18 to $46, with the Fresno-Clovis Metropolitan Area representing the lower end of the range, and the City of Encinitas (in San Diego County) representing the upper end of the range.[4]

A study on Phase I MS4 program costs was also conducted by the California Regional Water Quality Control Board, Los Angeles Region (Los Angeles Water Board), where program costs reported in the municipalities' annual reports were assessed. The Los

[3] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791-68792.
[4] State Water Board, 2005. NPDES Stormwater Cost Survey. P. ii.

Angeles Water Board estimated that average per household cost to implement the MS4 program in Los Angeles County was $12.50. [5]

It is important to note that reported program costs are not all attributable to solely complying with MS4 permits. Many program components, and their associated costs, existed before any MS4 permits were ever issued. For example, street sweeping and trash collection costs cannot be solely or even principally attributable to MS4 permit compliance, since these practices have long been expected from and implemented by municipalities.

Therefore, true program cost resulting from MS4 permit requirements is some fraction of reported costs. The California State University, Sacramento study found that only 38 percent of program costs are new costs fully attributable to MS4 permits. The remainder of the program costs was either pre-existing or resulted from enhancement of pre-existing programs.[6] In 2000, the County of Orange found that even lower amounts of program costs are solely attributable to MS4 permit compliance, reporting that the amount attributable to implement the County or Orange Drainage Area Management Plan (DAMP), was less than 20 percent of the total budget. The remaining 80 percent was attributable to pre-existing programs.[7] More current data from the County of Orange is not used in this discussion because the County of Orange no longer reports such information.

Estimated Value of Healthy Water Quality

Economic considerations of municipal storm water management programs cannot be limited only to program costs. Evaluation of programs must also consider information on the benefits derived from environmental protection and improvement.[8] Attention is often focused on municipal storm water management program costs, but the programs must also be viewed in terms of their value to the public.

Placing a value on healthy receiving waters is very difficult. Often the value of receiving waters with good water quality manifests in other forms, such as tourism, recreational opportunities, and/or increased property values. When surface water bodies are degraded, thereby degrading the habitat within and adjacent to the water bodies, the public loses the value and benefits associated with being able to use the area in and around the water bodies. Surface waters that are able to support the beneficial uses designated in the Basin Plan can sustain plants and wildlife that can attract visitors and residents, providing aesthetic, recreational, as well as monetary value to the public. At this time, however, there have been no studies for the San

[5] Los Angeles Water Board, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.
[6] State Water Board, 2005. NPDES Stormwater Cost Survey. P. 58.
[7] County of Orange, 2000. A NPDES Annual Progress Report. P. 60.
[8] Ribaudo M.O. and D. Heelerstein. 1992, *Estimating Water Quality Benefits: Theoretical and Methodological Issues.* U.S. Department of Agriculture. Technical Bulletin No. 1808.

Diego Region to quantify the added value that surface waters with healthy water quality can provide.

USEPA has estimated that household willingness to pay for improvements in fresh water quality for fishing and boating is approximately $158-$210.[9] This estimate can be considered conservative, since it does not include important considerations such as marine waters benefits, wildlife benefits, or flood control benefits. Another study conducted by California State University, Sacramento reported that the annual household willingness to pay for statewide clean water is approximately $180.[10]

A study conducted by the University of Southern California and University of California, Los Angeles assessed the costs and benefits of implementing various approaches for achieving compliance with the MS4 permits in the Los Angeles region. The study found that non-structural systems would cost $2.8 billion but provide $5.6 billion in benefit. If structural systems were determined to be needed, the study found that total costs would be $5.7 to $7.4 billion, while benefits could reach $18 billion.[11] Costs are anticipated to be borne over many years, probably at least ten years.

As can be seen, the benefits of the municipal storm water management programs are expected to considerably exceed their costs. Such findings are corroborated by USEPA, which found that the benefits of implementation of its Phase II storm water rule would also outweigh the costs.[12]

[9] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68793.
[10] State Water Board, 2005. NPDES Stormwater Cost Survey. P. iv.
[11] Los Angeles Water Board, 2004. Alternative Approaches to Stormwater Control.
[12] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791.

VII. APPLICABLE STATUTES, REGULATIONS, PLANS AND POLICIES

A. Legal Authorities – Federal Clean Water Act and California Water Code

This Order is issued pursuant to section 402 of the CWA and implementing regulations adopted by the USEPA and chapter 5.5, division 7 of the CWC (commencing with section 13370). This Order serves as an NPDES permit for point source discharges to surface waters. This Order also serves as waste discharge requirements pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

The objective of the CWA is "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*." To carry out this objective, the CWA requires the implementation of permit programs to regulate the discharge of pollutants and dredged or fill material to the navigable waters of the U.S. and to regulate the use and disposal of sewage sludge. CWA section 402 provides the legal authority to issue a permit for the discharge of pollutants to waters of the U.S. under the NPDES. The CWA provides that NPDES permits may be issued by states which are authorized to implement the provisions of that act. California became authorized to implement the NPDES permit program on May 14, 1973.

The Porter-Cologne Water Quality Control Act (Division 7, commencing with CWC section 13000) established the State Water Resources Control Board (State Water Board) and nine Regional Water Quality Control Boards (Regional Water Boards) as the principal state agencies with primary responsibility for the coordination and control of water quality. CWC section 13200(f) established the San Diego Water Board, which has the primary responsibility for the coordination and control of water quality in the San Diego Region, which includes all the basins draining into the Pacific Ocean between the southern boundary of the Santa Ana Region and the California-Mexico boundary. The San Diego Water Board implements the CWA through Chapter 5.5 of the CWC, commencing with section 13370. CWC section 13377 provides the San Diego Water Board the legal authority to issue waste discharge requirements to ensure compliance with all applicable provisions of the CWA and acts amendatory thereof or supplementary, thereto, to implement water quality control plans, or for the protection of beneficial uses, or to prevent nuisance.

CWA section 402(p) requires the USEPA or authorized state to issue NPDES permits for storm water discharges from municipal separate storm sewer systems (MS4s) to waters of the U.S. CWA section 402(p)(3)(B)(ii) requires that NPDES permits for storm water discharges from MS4s "*effectively prohibit non-storm water discharges*" into the MS4s. CWA section 402(p)(3)(B)(iii) requires that NPDES permits for storm water discharges from MS4s to "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable* [MEP], *including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control*

of such pollutants."

The USEPA published implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]), which prescribe permit application requirements for storm water discharges from MS4s pursuant to CWA 402(p), on November 16, 1990. The USEPA published an Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems, which provided guidance on permit application requirements for regulated MS4s, on May 17, 1996. The federal regulations in 40 CFR 122 and guidance issued by USEPA serve as the foundation for the provisions of Order No. R9-2013-0001. The legal authorities provided by the above statutes and regulations are included as part of the discussions in Section VIII of this Fact Sheet.

B. Legal Authority for the Permit Issued on a Region-wide Basis

CWA section 402(p)(3)(B) provides the San Diego Water Board the legal authority to issue an NPDES permit for the San Diego Region as compared to separate MS4 permits based upon County- and partial County-wide boundaries as they exist within the San Diego Region. CWA section 402(p)(3)(B) states that "*Permits for discharges from municipal storm sewers- (i) may be issued on a system- or jurisdiction-wide basis ....*" The federal regulations in 40 CFR 122.26(a)(1)(v) also state that the San Diego Water Board "*may designate dischargers from municipal separate storm sewers on a system-wide or jurisdiction-wide basis. In making this determination, the [San Diego Water Board] may consider the following factors: (A) the location of the discharge with respect to waters of the United States; (B) the size of the discharge; (C) the quantity and nature of the pollutants discharged to waters of the United States; and (D) other relevant factors*."

More specifically, the federal regulations provide that for large and medium MS4 systems, the San Diego Water Board may issue a regional permit. Specifically, the federal regulation in 40 CFR 122.26(a)(3) provide:

"*(ii) The Director may either issue one system-wide permit covering all discharges from municipal separate storm sewers within a large or medium municipal storm sewer system or issue distinct permits for appropriate categories of discharges within a large or municipal separate storm sewer system including, but not limited to: all discharges owned or operated by the same municipality; located within the same jurisdiction; all discharges within a system that discharge to the same watershed; discharges within a system that are similar in nature; or for individual discharges from municipal separate storm sewers within the system.*

(iii) The operator of a discharge from a municipal separate storm sewer which is part of a large or medium municipal separate storm sewer system must either: (A) Participate in a permit application (to be a permittee or a co-permittee) with one or more other operator of discharges from the large or medium municipal

storm sewer system which covers all, or a portion of all, discharges from the municipal separate storm sewer system; (B) Submit a distinct permit application which only covers discharges from the municipal separate storm sewers for which the operator is responsible; or (C) A regional authority may be responsible for submitting a permit application under the following guidelines....

(iv) One permit application may be submitted for all or a portion of all municipal separate storm sewers within adjacent or interconnected large or medium municipal separate storm sewer systems. The Director may issue one systemwide permit covering all, or a portion of all municipal separate storm sewers in adjacent or interconnected large or medium municipal separate storm sewer systems.

(v) Permits for all or a portion of all discharges from large or medium municipal separate storm sewer systems that are issued on a system-wide, jurisdiction-wide, watershed or other basis may specify different conditions relating to different discharges covered by the permit, including different management programs for different drainage areas which contribute storm water to the system."

Based on these regulations, the San Diego Water Board may issue a region-wide MS4 permit. The regulations also clarify that the permit may include different conditions for separate discharges covered by the permit. This allows the San Diego Water Board to ensure that suitable water quality conditions and provisions are identified for each watershed.

The USEPA's responses to comments in the Final Rule for the above-mentioned regulations also make it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide, permits. In the Final Rule published in the Federal Register and containing the responses to comments, USEPA notes that 40 CFR 122.26(a)(3)(iv) would allow an entire system in a geographical region under the purview of a State agency to be designated under a permit.[13] USEPA also states that many commenters wanted to allow the permitting authority broad discretion to establish system-wide permits, and that EPA believes that paragraphs 40 CFR 122.26 (a)(1)(v) and (a)(3)(ii) allow for such broad discretion.[14]

This Order creates watershed requirements that apply to multiple counties. The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees. Managing storm water on a regional and watershed basis is expected to result in improved water quality, as the Order focuses on monitoring and management practices necessary to improve each watershed rather than political boundaries. A single permit also allows the San Diego Water Board staff to expend fewer resources developing successive multiple permits and allows more resources to be devoted to working cooperatively with all three

[13] 55 Federal Register 47990-01, 48042
[14] Ibid

current groups of Copermittees to ensure implementation of this Order results in improved water quality.

C. Federal and California Endangered Species Acts

This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2115.5) or the Federal Endangered Species Act (16 United States Code [USC] sections 1531 to 1544). This Order requires compliance with requirements to protect the beneficial uses of waters of the U.S. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

D. California Environmental Quality Act

The action to adopt an NPDES Permit is exempt from the provisions of Chapter 3 of the California Environmental Quality Act (CEQA) (Public Resources Code section 21100, et seq.) pursuant to CWC section 13389. (*County of Los Angeles v. Cal. Water Boards* (2006) 143 Cal.App.4th 985.)

E. State and Federal Regulations, Plans and Policies

The legal authority provided by the following regulations, plans, and policies are also included as part of the discussions in Section VIII of this Fact Sheet.

Water Quality Control Plan for the San Diego Basin

The CWA requires the San Diego Water Board to establish water quality standards for each water body in its region. Water quality standards include beneficial uses, water quality objectives and criteria that are established at levels sufficient to protect beneficial uses, and an antidegradation policy to prevent degrading of waters. On September 8, 1994, the San Diego Water Board adopted the *Water Quality Control Plan for the San Diego Basin (*Basin Plan). The Basin Plan designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters in the San Diego Region. The San Diego Water Board has amended the Basin Plan on multiple occasions since 1994. In addition, the Basin Plan implements State Water Board Resolution No. 88-63, which established state policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply. Beneficial uses applicable to the surface water bodies that receive discharges from the MS4s within the San Diego Region generally include those listed below:

The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region:

- Municipal and Domestic Supply (MUN)
- Agricultural Supply (AGR)
- Industrial Process Supply (PROC)
- Industrial Service Supply (IND)
- Ground Water Recharge (GWR)
- Contact Water Recreation (REC1)
- Non-contact Water Recreation (REC2)
- Warm Freshwater Habitat (WARM)
- Cold Freshwater Habitat (COLD)
- Wildlife Habitat (WILD)
- Rare, Threatened, or Endangered Species (RARE)
- Freshwater Replenishment (FRSH)
- Hydropower Generation (POW)
- Preservation of Biological Habitats of Special Significance (BIOL)

The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region:

- Navigation (NAV)
- Commercial and Sport Fishing (COMM)
- Estuarine Habitat (EST)
- Marine Habitat (MAR)
- Aquaculture (AQUA)
- Migration of Aquatic Organisms (MIGR)
- Spawning, Reproduction, and/or Early Development (SPWN)
- Shellfish Harvesting (SHELL)

Pursuant to Water Code sections 13263 and 13377, the requirements of this Order implement the Basin Plan.

Water Quality Control Plan for Ocean Waters of California, California Ocean Plan

In 1972, the State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan). The State Water Board adopted the most recent amended Ocean Plan on September 15, 2009. The Office of Administrative Law approved it on March 10, 2010. On October 8, 2010, USEPA approved the 2009 Ocean Plan. The Ocean Plan is applicable, in its entirety, to ocean waters of the State. In order to protect beneficial uses, the Ocean Plan establishes water quality objectives and a program of implementation. Pursuant to Water Code sections 13263 and 13377, the requirements of this Order implement the Ocean Plan. The Ocean Plan identifies the beneficial uses of ocean waters of the State to be

protected as summarized below:

- Industrial water supply
- Water contact and non-contact recreation, including aesthetic enjoyment; navigation
- Commercial and sport fishing
- Mariculture
- Preservation and enhancement of designated Areas of Special Biological Significance
- Rare and endangered species
- Marine habitat
- Fish spawning and shellfish harvesting

On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving an exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges. On June 19, 2012, the State Water Board adopted Order No. 2012-0031, amending Order No. 2012-0012 to require pollutant load reductions to be achieved within six years for the ASBS Compliance Plans, section A.2.d(2) and ASBS Pollution Prevention Plans, section B.2.b(2). The State Water Board Resolution No. 2012-0012, as amended requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject terms and conditions of State Water Board Resolution No. 2012-0012, as amended. The Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012, as amended, applicable to these discharges, are ~~hereby~~ incorporated in Attachment A of this Order ~~as if fully set forth herein~~. Requirements of this Order implement the Ocean Plan.

Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality

On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

Antidegradation Policy

Federal regulations (40 CFR 131.12) require that the state water quality standards include an antidegradation policy consistent with the federal antidegradation policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16 ("Statement of Policy with Respect to Maintaining the Quality of the Waters of the State"). State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law.

The San Diego Water Board's Basin Plan implements and incorporates by reference both the State and federal antidegradation policies. State Water Board Resolution No. 68-16 and 40 CFR 131.12 require the San Diego Water Board to maintain high quality waters of the State until it is demonstrated that any change in quality will be consistent with maximum benefit to the people of the State, will not unreasonably affect beneficial uses, and will not result in water quality less than that described in the San Diego Water Boards' policies. State Water Board Resolution No. 68-16 requires that discharges of waste be regulated to meet best practicable treatment or control to assure that pollution or nuisance will not occur and the highest water quality consistent with the maximum benefit to the people of the State be maintained.

The discharges permitted in this Order are consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Board Resolution No. 68-16. Many of the water bodies within the area covered by this Order are of high quality. The Order requires the Copermittees to meet best practicable treatment or control to meet water quality standards. As required by 40 CFR 122.44(a), the Copermittees must comply with the "maximum extent practicable" technology-based standard set forth in CWA section 402(p) for discharges of pollutants in storm water from the MS4s.

Many of the waters within the area covered by this Order are impaired and listed on the State's CWA Section 303(d) List and the San Diego Water Board has established TMDLs to address the impairments. This Order requires the Copermittees to comply with permit provisions to implement the WLAs set forth in the TMDLs in order to restore the beneficial uses of the impaired water bodies consistent with the assumptions and requirements of the TMDLs. This Order includes requirements to develop and implement storm water management programs, achieve WQBELs, and effectively prohibit non-storm water discharges into the MS4. The issuance of this Order does not authorize an increase in the amount of discharge of waste.

Anti-Backsliding Requirements

CWA sections 402(o) and 303(d)(4) and 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations or conditions may be relaxed. All effluent limitations and other conditions in this Order are at least as stringent as the effluent limitations in the previous permits issued to the San Diego County Copermittees, the Orange County Copermittees and the Riverside County Copermittees.

Clean Water Act Section 303(d) List

CWA section 303(d)(1) requires each State to identify specific water bodies within its boundaries where water quality standards are not being met or are not expected to be met after implementation of technology-based effluent limitations on point sources. Water bodies that do not meet water quality standards are considered impaired and are placed on the state's "303(d) List." Periodically, USEPA approves the State's 303(d) List.

Most recently, USEPA approved the State's 2010 303(d) List of impaired water bodies on October 11, 2011, which includes certain receiving waters in the San Diego Region. For each listed water body, the state or USEPA is required to establish a TMDL of each pollutant impairing the water quality standards in that water body. A TMDL is a tool for implementing water quality standards and is based on the relationship between pollution sources and in-stream water quality conditions. The TMDL establishes the allowable pollutant loadings for a water body and thereby provides the basis to establish water quality-based controls. These controls should provide the pollution reduction necessary for a water body to meet water quality standards.

A TMDL is the sum of the allowable pollutant loads of a single pollutant from all contributing point sources (the waste load allocations or WLAs) and non-point sources (load allocations of LAs) plus the contribution from background sources and a margin of safety (40 CFR 130.2(i)). MS4 discharges are considered point source discharges. For 303(d)-listed water bodies and pollutants in the San Diego Region, the San Diego Water Board or USEPA develops and adopts TMDLs that specify these requirements.

Since 2002, the San Diego Water Board has established ~~six (6)~~ seven (7) TMDLs to remedy water quality impairments in various water bodies within the San Diego Region (see Attachment E to the Order). These TMDLs identify MS4 discharges as a source of pollutants to these water bodies, and, as required, establish WLAs for MS4 discharges to reduce the amount of pollutant discharged to receiving waters. CWA section 402(p)(3)(B)(iii) requires the San Diego Water Board to impose permit conditions, including: "management practices, control techniques and system, design and engineering methods, and *such other provisions as the Administrator or the State determines appropriate for the control of such pollutants.*" (Emphasis added.) CWA section 402(a)(1) also requires states to issue permits with conditions necessary to carry out the provisions of the CWA. Federal regulations also require that NDPES permits contain WQBELs consistent with the assumptions and requirements of all available WLAs (40 CFR 122.44(d)(1)(vii)(B)). CWC section 13377 also requires that NPDES permits include limitations necessary to implement water quality control plans. Therefore, this Order includes WQBELs and other provisions to implement the TMDL WLAs assigned to Copermittees regulated by this Order.

Other Regulations, Plans and Policies

This Order implements all other applicable federal regulations and State regulations, plans and policies, including the California Toxics Rule at 40 CFR 131.38 (Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California Rule [California Toxics Rule or CTR]), and State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP).

F. Unfunded State Mandates

Article XIII B, Section 6(a) of the California Constitution provides that whenever "*any state agency mandates a new program or higher level of service on any local government, the state shall provide a subvention of funds to reimburse that local government for the costs of the program or increased level of service*." The requirements of this Order do not constitute state mandates that are subject to a subvention of funds for several reasons, including, but not limited to, the following.

First, the requirements of this Order do not constitute a new program or a higher level of service as compared to the requirements contained in the previous Fourth Term Permits. The overarching requirement to impose controls to reduce the pollutants in discharges from MS4s is dictated by the CWA and is not new to this permit cycle (33 USC section 1342(p)(3)(B)). The inclusion of new and advanced measures as the MS4 programs evolve and mature over time is anticipated under the CWA (55 FR 47990, 48052 (Nov. 16, 1990)), and to the extent requirements in this Order are interpreted as new advanced measures, they do not constitute a new program or higher level of service.

Second, and more broadly, mandates imposed by federal law, rather than by a state agency, are exempt from the requirement that the local agency's expenditures be reimbursed (Cal. Const., art. XIII B, section 9, subd. (b)). This Order implements federally mandated requirements under the CWA and its requirements are therefore not subject to subvention of funds. This includes federal requirements to effectively prohibit non-storm water discharges, to reduce the discharge of pollutants in storm water to the MEP, and to include such other provisions as the Administrator or the State determines appropriate for the control of such pollutants (33 USC section 1342(p)(3)(B)). Federal cases have held these provisions require the development of permits and permit provisions on a case-by-case basis to satisfy federal requirements. (*Natural Resources Defense Council, Inc., v. USEPA* (9th Cir. 1992) 966 F.2d 1292, 1308, fn. 17.)

The authority exercised under this Order is not reserved state authority under the CWA's savings clause (cf. *Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 627-628 [relying on 33 USC section 1370, which allows a state to develop requirements which are not "less stringent" than federal requirements]), but instead is part of a federal mandate to develop pollutant reduction requirements for municipal separate storm sewer systems. To this extent, it is entirely federal authority that forms the legal basis to establish the permit provisions. (See, *City of Rancho Cucamonga v. Regional Water Quality Control Board, Santa Ana Region* (2006) 135 Cal.App.4th 1377, 1389; *Building Industry Ass'n of San Diego Co. v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 882-883.)

The MEP standard is a flexible standard that balances a number of considerations, including technical feasibility, cost, public acceptance, regulatory compliance, and effectiveness. (*Building Ind. Ass'n., supra,* 124 Cal.App.4th at pp. 873-874, 889.) Such

considerations change over time with advances in technology and with experience gained in storm water management (55 FR 47990, 48052 (Nov. 16, 1990)). Accordingly, a determination of whether the conditions contained in this Order exceed the requirements of federal law cannot be based on a point by point comparison of the permit conditions and the minimum control measures that are required "at a minimum" to reduce pollutants to the maximum extent practicable and to protect water quality (40 CFR 122.34). Rather, the appropriate focus is whether the permit conditions, as a whole, exceed the MEP standard.

In recent months, the County of Los Angeles and County of Sacramento Superior Courts have granted writs setting aside decisions of the Commission on State Mandates that held certain requirements in Phase I permits constituted unfunded mandates. In both cases, the courts have found that the correct analysis in determining whether an MS4 permit constituted a state mandate was to evaluate whether the permit as a whole exceeds the MEP standard. (*State of Cal. v. Comm. on State Mandates* (Super. Ct. Sacramento County, 2012, No. 34-2010-80000604), *State of California v. County of Los Angeles* (Super. Ct. Los Angeles County, 2011, No. BS130730.) Both cases are currently pending appeal.

The requirements of the Order, taken as a whole rather than individually, are necessary to reduce the discharge of pollutants to the MEP and to protect water quality. The San Diego Water Board finds that the requirements of the Order are practicable, do not exceed federal law, and thus do not constitute an unfunded mandate. These findings are the expert conclusions of the principal state agency charged with implementing the NPDES program in California (CWC sections 13001, 13370).

It should also be noted that the provisions in this Order to effectively prohibit non-storm water discharges are also mandated by the CWA (33 USC section 1342(p)(3)(B)(ii)). Likewise, the provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state establishes or adopts a TMDL, federal law requires that permits must contain effluent limitations consistent with the assumptions and requirements of any applicable waste load allocation in a TMDL (40 CFR 122.44(d)(1)(vii)(B)).

Third, the local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental dischargers who are issued NPDES permits for storm water discharges. With a few inapplicable exceptions, the CWA regulates the discharge of pollutants from point sources (33 USC section 1342) and the Porter-Cologne Act regulates the discharge of waste (CWC section 13263), both without regard to the source of the pollutant or waste. As a result, the "costs incurred by local agencies" to protect water quality reflect an overarching regulatory scheme that places similar requirements on governmental and non-governmental dischargers. (See *County of Los Angeles v. State of California* (1987) 43 Cal.3d 46, 57-58 [finding comprehensive workers' compensation scheme did not create a cost for local agencies that was subject to state subvention].)

The CWA and the Porter-Cologne Act largely regulate storm water with an even hand, but to the extent there is any relaxation of this even-handed regulation, it is in favor of the local agencies. Generally, the CWA requires point source dischargers, including dischargers of storm water associated with industrial or construction activity, to comply strictly with water quality standards (33 USC section 1311(b)(1)(C); *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159, 1164-1165 [noting that industrial discharges must strictly comply with water quality standards]). As discussed in prior State Water Board decisions, certain provisions of this Order do not require strict compliance with water quality standards (State Water Board Order No. WQ 2001-0015, p. 7). Those provisions of this Order regulate the discharge of waste in municipal storm water under the CWA's MEP standard, not the BAT/BCT standard that applies to other types of discharges. These provisions, therefore, regulate the discharge of waste in municipal storm water more leniently than the discharge of waste from non-governmental sources.

Fourth, the Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)). To the extent that the local agency Copermittees have voluntarily availed themselves of the permit, the program is not a state mandate. (Accord, *County of San Diego v. State of California* (1997) 15 Cal.4th 68, 107-108.)

Fifth, the local agency Copermittees' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under state law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

Finally, even if any of the permit provisions could be considered unfunded mandates, under Government Code section 17556, subdivision (d), a state mandate is not subject to reimbursement if the local agency has the authority to charge a fee. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order, subject to certain voting requirements contained in the California Constitution. (See Cal. Const., Art. XIII D, section 6, subd. (c); see also *Howard Jarvis Taxpayers Ass'n v. City of Salinas* (2002) 98 Cal.App.4th 1351, 1358-1359.) The Fact Sheet demonstrates that numerous activities contribute to the pollutant loading in the MS4. Local agencies can levy service charges, fees, or assessments on these activities, independent of real property ownership. (See, e.g., *Apartment Ass'n of Los Angeles County, Inc., v. City of Los Angeles* (2001(24 Cal.4th 830, 842 [upholding inspection fees associated with renting property].) The authority and ability of a local agency to defray the cost of a program without raising taxes indicates that a program does not entail a cost subject to subvention. (*Clovis Unified School Dist. V. Chiang* (2010) 188 Cal.App.4th 794, 812, citing *Connell v. Sup. Ct.* (1997) 59 Cal.App.4th 382, 401; *County of Fresno v. State of California* (1991) 53 Cal. 3d. 482, 487-488.)

VIII. PROVISIONS

The provisions (i.e. NPDES permit requirements) of the Order are discussed below.

A. Prohibitions and Limitations

Purpose: Provision A includes the prohibitions and limitations requirements that are the foundation of all the subsequent requirements included in the Order. Compliance with the prohibitions and limitations will restore and protect receiving waters from impacts that may be caused by discharges into and from the Copermittees' MS4s and ultimately achieve the objective of the CWA.

In meeting the requirements set forth in the Order, the Copermittees must be cognizant that the prohibitions and limitations exist and will be the standard by which the San Diego Water Board will be measuring the progress and success of their implementation of the NPDES permit requirements.

***Discussion*:** The objective of the CWA is to "*restore and maintain the chemical, physical, and biological integrity of the Nation's waters*." The CWA requires the implementation of NPDES permit programs to regulate discharges of pollutants and dredged or fill material to the navigable waters of the U.S. For discharges into and from MS4s, the CWA requires the NPDES permits to "*effectively prohibit non-stormwater discharges into the storm sewers*" and "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable.*"

Provision A includes limitations, consistent with the requirements of the CWA for discharges from MS4s. Provision A expresses these limitations as discharge prohibitions, receiving water limitations, and effluent limitations. Compliance with the discharge prohibitions and receiving water limitations is also explicitly described, in conformance with precedential State Water Board Orders.

More specific and detailed discussions of the requirements of Provision A are provided below.

Provision A.1 (Discharge Prohibitions) prohibits the discharge of specific types of waste into and/or from the Copermittees' MS4s.

Provision A.1.a restates and reiterates Basin Plan Waste Discharge Prohibition 1, by prohibiting discharges into and from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the

state. The terms pollution,[15] contamination,[16] and nuisance[17] are defined under CWC 13050. Provision A.1.c incorporates all the waste discharge prohibitions of the Basin Plan into the requirements of the Order. The waste discharge prohibitions from the Basin Plan have been reproduced and provided in Attachment A to the Order.

Provision A.1.b requires non-storm water discharges into the MS4s to be effectively prohibited, consistent with the requirements of the CWA for MS4 permits to "*effectively prohibit non-stormwater discharges into the storm sewers*." The effective prohibition is required to be implemented by each Copermittee within its jurisdiction through the illicit discharge detection and elimination requirements under Provision E.2. The prohibition does not apply to NPDES permitted discharges into the Copermittees' MS4s.

The CWA employs the strategy of prohibiting the discharge of any pollutant from a point source into waters of the United States unless the discharger of the pollutant(s) obtains an NPDES permit pursuant to CWA Section 402. The 1987 amendment to the CWA includes provision 402(p) that specifically addresses NPDES permitting requirements for storm water discharges from MS4s. CWA section 402(p) prohibits the discharge of pollutants from specified MS4s to waters of the U.S. except as authorized by an NPDES permit and identifies two substantive standards for MS4 storm water permits. MS4 permits (1) "*shall include a requirement to effectively prohibit nonstormwater discharges into the storm sewers*" and (2) "*shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or State determines appropriate for the control of such pollutants*." (CWA section 402(p)(3)(B)(ii-iii).)

In November 1990, the USEPA published regulations addressing storm water discharges from MS4s (55 FR 47990 and following (Nov. 16, 1990) (Phase I Final Rule)). The regulations establish minimum requirements for MS4 permits, and generally focus on the requirement that MS4s implement programs to reduce the amount of pollutants found in storm water discharges to the MEP. The CWA's municipal storm water MEP standard does not require storm water discharges to strictly meet water quality standards, as is required for other NPDES permitted

[15] CWC 13050(l): "(1) 'Pollution' means an alteration of the quality of waters of the state by waste to a degree which unreasonably affects either of the following: (A) The water for beneficial uses. (B) Facilities which serve beneficial uses. (2) 'Pollution' may include "contamination.
[16] CWC 13050(k): "Contamination' means an impairment of the quality of waters of the state by waste to a degree which creates a hazard to public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste, whether or not waters of the state are affected."
[17] CWC 13050(m): "Nuisance' means anything which meets all of the following requirements: (1) Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. (2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. (3) Occurs during, or as a result of, the treatment or disposal of wastes."

discharges. Compliance is achieved through an iterative approach of continuous implementation of improved BMPs. This distinction reflects Congress's recognition that variability in flow and intensity of storm events render difficult strict compliance with water quality standards by MS4 permittees. In describing the controls that permits must include to reduce pollutants in storm water discharges to the MEP, the statute (CWA section 402(p)(3)(B)(iii)) states that the controls shall include: "*management practices, control techniques and system, design and engineering methods, and such other provisions as the [permit writer] determines appropriate for the control of such pollutants*."

In contrast, non-storm water discharges from the MS4 that are not authorized by separate NPDES permits are subject to requirements under the NPDES program, including discharge prohibitions, technology based effluent limitations and water quality-based effluent limitations (40 CFR 122.44). The regulations also require the Copermittee's program to include an element to detect and remove illicit discharges and improper disposal into the storm sewer (40 CFR 122.26(d)(2)(iv)(B)).

While "non-storm water" is not defined in the CWA or federal regulations, the federal regulations (at 40 CFR 122.26(b)(2)) define "*illicit discharge*" as *"any discharge to a municipal separate storm sewer that is not composed entirely of storm water and that is not covered by an NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer and discharges resulting from fire fighting activities)*." This definition is the most closely applicable definition of "non-storm water" contained in federal law. As stated in the Phase I Final Rule, USEPA added the illicit discharge program requirement to begin implementation of the 'effective prohibition' requirement to detect and control non-storm water discharges to their municipal system.

Thus, federal law mandates that permits issued to MS4s must require management practices that will result in reducing storm water pollutants to the MEP yet at the same time requires that non-storm water discharges be effectively prohibited from entering the MS4. "Effectively" prohibit does not mean that non-storm water discharges are authorized to be discharged into and from the Copermittees' MS4s. The Phase I Final Rule clarifies what "effectively prohibit" means (55 FR 47995):

> "*Section 402(p)(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…<u>Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit</u> (other than the permit for the discharge from the municipal separate storm sewer)*" [Emphasis added].

Consistent with federal law, unless non-storm water discharges to the MS4 are authorized by a separate NPDES permit, non-storm water discharges are

appropriately subject to the effective prohibition requirement in the CWA and Regional Water Boards are not limited by the iterative MEP approach to storm water regulation in crafting appropriate regulations for non-storm water discharges.

The federal regulations (40CFR122.26(d)(2)(i)(B)) require the Copermittees to establish the legal authority which authorizes or enables the Copermittees to prohibit illicit discharges to the MS4s. The federal regulations (40 CFR 122.26(d)(2)(vi)(B)(1)) require the Copermittees to "*implement and enforce an ordinance, order or similar means*" to prevent non-storm water discharges to their MS4s. Thus, the Copermittees are required to "*effectively*" prohibit non-storm water discharges to their MS4s through enforcing their legal authority established under "*ordinance, order or similar means*" and either remove those discharges to their MS4s, or require those discharges to obtain coverage under a separate NPDES permit. More detail about the program that must be implemented to "*effectively*" prohibit non-storm water discharges to the Copermittees' MS4s is provided under the discussion for Provision E.2.

Provision A.1.d was included to be consistent Resolution No. 2012-0012, adopted by the State Water Board on March 20, 2012. Provision A.1.d prohibits discharges from MS4s to Areas of Special Biological Significance (ASBS), except for storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach to the Heisler Park ASBS subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012. The pertinent Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 are provided in Attachment A to the Order.

Provision A.2 (Receiving Water Limitations) specifies the condition of the receiving waters that must be achieved when there are discharges from the Copermittees' MS4s. Receiving water limitations are included in all NPDES permits issued pursuant to the CWA section 402. CWA section 402(p)(3)(B)(iii) authorizes the inclusion of "*such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." This requirement gives USEPA or the State permitting authority, in this case the San Diego Water Board, discretion to determine what permit conditions are necessary to control pollutants.

In its Phase I Final Rule (see 55 FR 47990, 47994 (Nov. 16, 1990)), USEPA elaborated on these requirements, stating that, "*permits for discharges from municipal separate storm sewer systems must require controls to reduce the discharge of pollutants to the maximum extent practicable, and where necessary water quality-based controls*." USEPA reiterated in its Phase II Final Rule (64 FR 68722, 68737), that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL*." CWC section 13377 also requires that NPDES permits include limitations necessary to implement water quality control plans. Both the State Water Board and the San Diego Water Board have previously concluded that discharges from the MS4 contain pollutants that have

the reasonable potential to cause or contribute to excursions above water quality standards. As such, inclusion of receiving water limitations is appropriate to control MS4 discharges.

The inclusion of receiving water limitations is also consistent with the Ninth Circuit Court of Appeals' ruling in *Defenders of Wildlife v. Browner* (191 F.3d 1159, 1166 (1999)) that the permitting authority has discretion regarding the nature and timing of requirements that it includes as MS4 permit conditions to attain water quality standards. The Ninth Circuit Court of Appeals recently explained that, "*[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*" (*Natural Resources Defense Council v. County of Los Angeles* (9th Cir. 2011) 673 F.3d 880, 886 (revd. On other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013)))

The receiving water limitations included in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan or in water quality control plans or policies adopted by the State Water Board, including State Water Board Resolution No. 68-16, or in federal regulations, including but not limited to 40 CFR 131.12 and 131.38. The water quality objectives in the Basin Plan and other State Water Board plans and policies have been approved by USEPA and combined with designated beneficial uses constitute the water quality standards required under federal law.

Provision A.2.a requires that discharges from the Copermittees' MS4s must not cause or contribute to the violation of water quality standards in receiving waters. The water quality standards of the receiving waters must be protected from the impacts that may be caused by the Copermittees' MS4 discharges. Water quality standards applicable to the surface waters in the San Diego Region must be achieved through meeting the technology based standard of MEP through an iterative process of improved management actions. Provision A.2.a is also consistent with State Water Board Order WQ 99-05 precedent-setting language requiring discharges from MS4s to attain receiving water quality standards. The water quality control plans and policies with water quality standards applicable to the waters in the San Diego Region are included under Provision A.2.a.

Provisions A.2.b was included to be consistent with the requirements of State Water Board Resolution No. 2012-0012, adopted on March 20, 2012.

<u>Provision A.3 (Effluent Limitations)</u> specifies the condition of the discharges from the Copermittees' MS4s that must be achieved if and when there are discharges.

Consistent with CWA section 301(b)(1)(A) and 40 CFR 122.44(a), Provision A.3.a includes the technology-based effluent limitations that must be included in the Order. The technology-based effluent limits, representing the minimum level of control that must be imposed in a permit under CWA section 402, requires that pollutants in discharges of storm water from the Copermittees' MS4s be reduced to the MEP. This provision applies specifically to storm water discharges. Non-storm water discharges must be effectively prohibited, as required under Provision A.1.b. Non-storm water (dry weather) discharges from the MS4 are not considered storm water (wet weather) discharges and therefore are not subject to the MEP standard.

The technology-based MEP standard is an ever-evolving, flexible, and advancing concept. Neither Congress nor USEPA has specifically defined the term "maximum extent practicable." Congress established this flexible MEP standard so that the administrative bodies would have "*the tools to meet the fundamental goals of the Clean Water Act in the context of storm water pollution*." (*Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 884.) As knowledge about controlling storm water runoff and discharges continues to evolve, so does the knowledge which constitutes MEP. Reducing the discharge of pollutants in storm water from the MS4 to the MEP requires the Copermittees to assess each program component and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP.

The San Diego Water Board or the State Water Board ultimately define MEP, and may include requirements that provide specific guidance on what is expected to demonstrate MEP. It is the responsibility of the Copermittees to propose actions that implement BMPs to reduce storm water pollution to the MEP. In other words, the Copermittees' runoff management programs developed and implemented under the Order are the Copermittees' proposals for achieving MEP. Their total collective and individual activities conducted pursuant to their runoff management programs become their proposal for achieving MEP as it applies both to their overall effort, as well as to specific activities. Provisions B through E of the Order provides a minimum framework to guide the Copermittees in achieving the MEP standard for discharges of pollutants in storm water.

Provision A.3.b incorporates any water quality based effluent limitations (WQBELs) applicable to the MS4s established for TMDLs adopted and approved for the San Diego Region and requires the Copermittees to comply with those WQBELs. This is consistent with 40 CFR 122.44(d)(1)(vii)(B), which requires that NPDES permits to incorporate WQBELs "*developed to protect a narrative water quality criterion, a numeric water quality criterion, or both…consistent with the assumptions and requirements of any available wasteload allocation for the discharge...*"

Pursuant to CWA section 303(d), for surface water bodies identified as impaired by one or more pollutants, the San Diego Water Board is required to establish TMDLs "*at a level necessary to implement the applicable water quality standards with seasonal*

variations and a margin of safety which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality." The TMDLs identify sources of the pollutants causing the impairments and assign portions of the TMDL as WLAs to point sources, which include MS4s.

WLAs must be expressed in NPDES permits as WQBELs, which may include one or more numeric components such as numeric effluent limits, and/or receiving water limitations, and/or BMP requirements. Because numeric targets for TMDLs typically include a component that will be protective of water quality standards, a TMDL will likely include one or more numeric receiving water limitations and/or effluent limitations as part of the assumptions or requirements of the TMDL. Any numeric receiving water limitations and/or effluent limitations developed as part of the assumptions or requirements of a TMDL must be incorporated and included as part of WQBELs for the MS4s.

Because the development and approval of new TMDLs, or modification of existing TMDLs, may occur during the term of this Order, the specific provisions of those TMDLs, including effluent limitations applicable to MS4s are provided within Attachment E to the Order. Attachment E will be updated with new TMDLs and modifications to existing TMDLs in a timely manner as they occur.

Provision A.4 (Compliance with Discharge Prohibitions and Receiving Water Limitations) describes the process required to be implemented by the Copermittees if compliance with the discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a are not being achieved under current conditions.

In its Phase II Stormwater Regulations, Final Rule, USEPA states that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL.*"[18] In a series of comment letters on MS4 permits issued by various Regional Water Boards, USEPA has also reiterated that MS4 discharges must meet water quality standards.[19] In addition, the Ninth Circuit Court of Appeals explained in a recent ruling that, *"[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*"[20]

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[18] Phase II Stormwater Regulations, Final Rule, 64 Fed. Reg. 68722, 68737.
[19] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.
[20] NRDC v. County of Los Angeles (9th Cir. 2011), 673 F.3d 880, 886 (revd. on other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013))). See also, *Building Industry Ass'n of San Diego County v. State Water Resources*

Water quality standards for the San Diego Region are established in the Basin Plan. The water quality standards of the Basin Plan are incorporated into this Order as the discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a. The discharge prohibitions and receiving water limitations in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations or prohibitions to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan, water quality control plans or policies adopted by the State Water Board, including Resolution No. 68-16, or federal regulations, including but not limited to, 40 CFR 131.12 and 131.38. The waste discharge prohibitions and water quality objectives in the Basin Plan have been approved by USEPA and combined with the designated beneficial uses constitute the water quality standards required under federal law.

Under federal law (CWA section 402(p)(3)(B)(iii)), an MS4 permit must include "*controls to reduce the discharge of pollutants to the maximum extent practicable...and such other provision as...the State determines appropriate for control of such pollutants*." The State Water Board has previously determined that limitations necessary to meet water quality standards are appropriate for the control of pollutants discharged by MS4s and must be included in MS4 permits. (State Water Board Orders WQ 91-03, 98-01, 99-05, 2001-15; see also *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159.) This Order prohibits discharges that cause or contribute to violations of water quality standards.

The discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a are included in this Order to ensure that discharges from the MS4s do not cause or contribute to exceedances of water quality objectives necessary to protect the beneficial uses of the receiving waters.

Provision A.4 is consistent with the precedent-setting language in State Water Board Order WQ 99-05 required to be included in municipal storm water permits. State Water Board Order WQ 2001-15 refined Order WQ 99-05 by requiring an iterative approach to compliance with water quality standards involving ongoing assessments and revisions, as referred to as the "iterative process." The "iterative process" is a fundamental NPDES requirement for municipal storm water permits to achieve the objectives of the CWA.

The State Water Board and Regional Water Boards have stated that the provisions under Provisions A.1.a, A.1.c, A.2.a, and A.4 are independently applicable, meaning that compliance with one provision does not provide a "safe harbor" where there is non-compliance with another provision (i.e., compliance with the Provision A.4 does not shield a Copermittee who may have violated Provision A.1.a, A.1.c, or A.2.a from

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Control Bd. (2004) 124 Cal.App.4th 866, 884-886, citing *Defenders of Wildlife v. Browning,* (9th Cir. 1999) 191 F.3d 1159.)

an enforcement action). The intent of Provision A.4 is to ensure that the Copermittees have the necessary storm water management programs and controls in place, and that they are modified by the Copermittees in a timely fashion when necessary, so that compliance with Provisions A.1.a, A.1.c, and/or A.2.a is achieved as soon as possible. USEPA expressed the importance of this independent applicability in a series of comment letters on MS4 permits proposed by various Regional Water Boards. At that time, USEPA expressly objected to certain MS4 permits that included language stating, *"permittees will not be in violation of this [receiving water limitation] provision … [if certain steps are taken to evaluate and improve the effectiveness of the jurisdictional runoff management programs],"* concluding that this phrase would not comply with the CWA.[21]

The Ninth Circuit held in *Natural Resources Defense Council v. County of Los Angeles* (2011) 673 F3d. 880, 886 (revd. on other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013))) that engagement in the iterative process does not provide a safe harbor from liability for violations of permit terms prohibiting exceedances of water quality standards. The Ninth Circuit holding is consistent with the position of the State and Regional Water Boards that exceedances of water quality standards in an MS4 permit constitute violations of permit terms subject to enforcement by the Water Boards or through a citizen suit. While the Water Boards have generally directed dischargers to achieve compliance by improving control measures through the iterative process, the San Diego Water Board retains the discretion to take other appropriate enforcement and the iterative process does not shield dischargers from citizen suits under the CWA.

The requirements of Provision A.4, therefore, are required to be implemented until the water quality standards expressed under Provisions A.1.a, A.1.c, and A.2.a are achieved. The CWA requires MS4 permits to "*require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." The requirements of this Order have been deemed or determined to be "appropriate" to achieve water quality standards in receiving waters.

Part of the "*controls*" required by the Order is the process described in Provision A.4. Provision A.4 includes the process that is ultimately expected to achieve compliance with the requirement that discharges from the MS4 do not cause or contribute to violations of water quality standards in the receiving waters. The implementation of Provision A.4 is required when the Copermittees or the San Diego Water Board have

[21] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.

determined that discharges from the MS4 are causing or contributing to violations of water quality standards in the receiving waters.

The Copermittees must effectively prohibit non-storm water discharges into the MS4s, reduce the discharge of pollutants in storm water from the MS4s to the MEP, and ensure that their MS4 discharges do not cause or contribute to violations of water quality standards. If the Copermittees have effectively prohibited non-storm water discharges and reduced storm water pollutant discharges to the MEP, but their discharges are still causing or contributing to violations of water quality standards, Provision A.4 provides a clear "iterative process" for the Copermittees to follow.

Provision A.4 essentially requires the Copermittees to implement additional BMPs until MS4 discharges no longer cause or contribute to a violation of water quality standards.

In assessing compliance and potential enforcement actions, the San Diego Water Board looks at the Copermittees' efforts in total to meet the requirements of Provisions A.1.a, A.1.c, A.2.a and Provision A.4. The Copermittees need to demonstrate that they are making improvements to their programs and making progress toward achieving the discharge prohibitions and receiving water limitations in Provisions A.1.a, A.1.c, and A.2.a by implementing the requirements of Provision A.4. The San Diego Water Board would consider these efforts prior to strictly enforcing the requirements of Provisions A.1.a, A.1.c, and A.2.a. Causes of exceedances of the receiving water limitations can often be more difficult to identify and attribute solely to the Copermittees' MS4s. The intent of the Order is to provide the Copermittees more clarity and flexibility in addressing these exceedances through the iterative approach and adaptive management process until the requirements under Provisions A.1.a, A.1.c, and A.2.a are fully achieved.

An exception to the iterative approach and adaptive management process would be in receiving waters subject to adopted and approved TMDLs. For TMDLs that are incorporated into the Order, there is a specific date for compliance to be achieved, after which the iterative approach and adaptive management process required under Provision A.4 no longer provides the flexibility to achieve compliance. Where compliance dates for a TMDL have passed, compliance with the WQBELs incorporated into the Order established by a TMDL in Attachment E to protect water quality standards is required. Thus, after the interim or final compliance dates for a TMDL have passed, if the discharges from the Copermittees' MS4s are causing or contributing to a violation of WQBELs, exceedances of WQBELs must be strictly enforced by the San Diego Water Board. In the meantime, however, the Copermittees are in compliance with the interim or final TMDL requirements in Attachment E as long as the interim or final WQBELs are being achieved in accordance with the interim or final compliance dates.

B. Water Quality Improvement Plans

Purpose: Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges to the MS4s and control pollutants in storm water discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the Clean Water Act.

Provision B includes requirements for the Copermittees to develop and implement Water Quality Improvement Plans to ultimately comply with the prohibitions and limitations under Provision A. The Water Quality Improvement Plans will provide the Copermittees a comprehensive program that can achieve the requirements and further the objectives of the CWA. Implementation of the Water Quality Improvement Plans will also improve the quality of the receiving waters in the San Diego Region.

The Water Quality Improvement Plan is the backbone of the Regional MS4 Permit requirements. Provision B provides the guidance, criteria, and minimum expectations and requirements for the elements of the Water Quality Improvement Plan to be developed and implemented by the Copermittees. The Water Quality Improvement Plans will be implemented in the Watershed Management Area by the Copermittees within their jurisdictions through their jurisdictional runoff management programs.

The Water Quality Improvement Plan also incorporates a program to monitor and assess the progress of the Copermittees' jurisdictional runoff management programs toward improving the quality of discharges from the MS4s, as well as tracking improvements to the quality of receiving waters. A process to adapt and improve the effectiveness of the Water Quality Improvement Plans has also been incorporated into the requirements of Provision B to be consistent with the "iterative approach" required to achieve compliance with discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a, pursuant to the requirements of Provision A.4.

The Water Quality Improvement Plans have also been structured to incorporate the requirements of any TMDLs that have been adopted for the San Diego Region. Incorporating the requirements of the TMDLs into the requirements of Provision B allows the Copermittees to develop a single plan, instead of separate plans, to coordinate their non-storm water and storm water runoff management programs. The Water Quality Improvement Plans allow the Copermittees to meet the requirements of this Order, as well as fulfill the requirements of the TMDLs.

As an added benefit, if the Copermittees demonstrate that impaired water bodies within the Watershed Management Area listed on the 303(d) List will be addressed with their Water Quality Improvement Plans in a reasonable period of time, the San Diego Water Board may be able to remove the water bodies from the 303(d) List, which would greatly reduce the need for the San Diego Water Board to develop additional TMDLs that would have to be incorporated into the Order and implemented by the Copermittees.

***Discussion*:** The federal NPDES regulations require the Copermittees to develop a proposed management program (40 CFR 122.26(d)(2)(iv)). The proposed management program must include "*a comprehensive planning process*" and "*where necessary intergovernmental coordination*" for the "*duration of the permit.*" The Water Quality Improvement Plan is the Copermittees' "*comprehensive planning process*" document for the proposed management program that will be implemented within a Watershed Management Area. Implementation of the Water Quality Improvement Plan requires "*intergovernmental coordination*" among the Copermittees for at least the "*duration of the permit*," and likely into and beyond the next iteration of the permit.

Developing Water Quality Improvement Plans based upon watersheds is consistent with federal regulations that support the development of permit conditions, as well as implementation of storm water management programs, at a watershed scale (40 CFR 122.26(a)(3)(ii), 122.26(a)(3)(v), and 122.26(d)(2)(iv)). In 2003, USEPA issued a Watershed-Based NPDES Permitting Policy Statement (USEPA, 2003) that defines watershed-based permitting as an approach that produces NPDES permits that are issued to point sources on a geographic or watershed basis. In this policy statement, USEPA explains that "*[t]he utility of this tool relies heavily on a detailed, integrated, and inclusive watershed planning process*." USEPA identifies a number of important benefits of watershed permitting, including more environmentally effective results, the ability to emphasize measuring the effectiveness of targeted actions on improvements in water quality, reduced cost of improving the quality of the nation's waters and more effective implementation of watershed plans, including TMDLs, among others.

An emphasis on watersheds is appropriate at this stage in the San Diego Region's MS4 program to shift the focus to more targeted, water quality driven planning and implementation. Addressing discharges on a watershed scale focuses on water quality results by emphasizing the receiving waters in the watershed. The conditions of the receiving waters drive management actions, which in turn focus measures to address pollutant contributions from MS4 discharges.

The Water Quality Improvement Plan gives the Copermittees the responsibility of developing a comprehensive plan to coordinate the efforts of their jurisdictional runoff management programs for addressing the problems related to MS4 discharges causing impacts to water quality in the Watershed Management Area. The development of the plan provides the Copermittees the opportunity to provide

significant input on how to implement their jurisdictional runoff management programs, and how to best utilize their available resources in addressing a focused set of priorities that they believe will result in measureable improvements to water quality within the Watershed Management Area.

The Copermittees are encouraged to separate the Watershed Management Area into subwatersheds, as appropriate. This allows the Copermittees to identify priorities applicable to a subset of the Copermittees or specific water bodies or areas within the Watershed Management Area.

Included in the requirements for the elements to be included in the Water Quality Improvement Plan are monitoring and assessment requirements that are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order. In addition to the federal requirements of the CWA section 308(a) and 40 CFR 122.26(d), the San Diego Water Board has the authority to establish monitoring, reporting, and recordkeeping requirements for NPDES permits under CWC 13383.

More specific and detailed discussions of the requirements of Provision B are provided below.

Provision B.1 (Watershed Management Areas) requires the Copermittees to develop a Water Quality Improvement Plan for each of the Watershed Management Areas defined by the San Diego Water Board.

Pursuant to 40 CFR 122.26(d)(2)(iv), proposed management programs "*may impose controls on a…watershed basis…*" The Water Quality Improvement Plan is the Copermittees' proposed management program. A Water Quality Improvement Plan must be developed for each Watershed Management Area identified in the Order.

The Watershed Management Areas are identified in Table B-1. Table B-1 establishes ten (10) Watershed Management Areas, and identifies the Copermittees that are responsible for developing and implementing the Water Quality Improvement Plan for each Watershed Management Area.

The Copermittees from each of the three counties within the San Diego Region are expected to be phased in as their respective NPDES municipal storm water permits expire. Because Order No. R9-2007-0001 expired in January 2012, the San Diego County Copermittees ~~are~~were covered under the Regional MS4 Permit on June 27, 2013, the effective date of the Order. Because Order No. R9-2009-0002 expired in December 2014, the Orange County Copermittees are covered under the Regional MS4 Permit on April 1, 2015, the effective date of Order No. R9-2013-0001 as amended by Order No. R9-2015-0001.

After the San Diego Water Board receives and considers the Report~~s~~ of Waste

Discharge required to be submitted by the ~~Orange County Copermittees and~~ Riverside County Copermittees pursuant to the requirements of their current permit~~s~~, and makes any necessary changes to the Order, the ~~Orange County Copermittees and~~ Riverside County Copermittees will be covered under the Regional MS4 Permit after ~~Order No. R9-2009-0002 expires in November 2014, and~~ Order No. R9-2010-0016 expires in December 2015~~, respectively~~.

The ~~Orange County Copermittees and~~ Riverside County Copermittees also have the option to obtain coverage under the Regional MS4 Permit earlier than their respective permit expiration dates. The process to apply for early coverage is described Provision F.6.

Because the Santa Margarita River Watershed Management Area includes Copermittees from both San Diego County and Riverside County, a footnote to Table B-1 has been included to specify that the requirements of Provision B are not required to be implemented by the County of San Diego until the Riverside County Copermittees have received a notice of coverage under the Order. Until the Riverside County Copermittees are notified of coverage under the Order, the County of San Diego is subject to the prohibitions and limitations under Provision A, responsible for continuing to implement its existing jurisdictional runoff management program, and responsible for implementing the transitional monitoring and assessment requirements of Provision D, the transitional annual reporting requirements of Provision F.3.b, and the TMDL requirements of Attachment E to the Order.

The City of Laguna Woods and Laguna Hills are located partially within the jurisdictions of both the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board) and the San Diego Water Board. Written requests for designation of a single Regional Water Board to regulate matters pertaining to permitting of Phase I MS4 discharges were submitted to the San Diego Water Board and the Santa Ana Water Board by the City of Laguna Woods by letter dated September 8, 2014, and the City of Laguna Hills by letter dated March 12, 2014. The Cities of Laguna Woods and Laguna Hills requested designation of the San Diego Water Board pursuant to CWC section 13228. The Cities of Laguna Woods and Laguna Hills reported that management and implementation of municipal programs to comply with two different Phase I MS4 permits creates a significant administrative and financial burden and inhibits their ability to contribute to greater overall water quality improvements in either Region. In an effort to address these concerns, the San Diego Water Board and the Santa Ana Water Board have entered into an agreement dated January XX, 2015, whereby the San Diego Water Board is designated to regulate Phase I MS4 discharges within the jurisdiction of the Cities of Laguna Woods and Laguna Hills including areas in the Santa Region upon the later effective date of this Order or Tentative Order No. R8-2015-0001. Under the terms of the agreement, each Regional Water Board retains the authority to enforce provisions of the Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee (Water Code

section 13228 (b)). Also under the terms of the agreement, any TMDL and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Laguna Woods or Laguna Hills as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement of the applicable TMDL would remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Boards' San Diego Creek/Newport Bay TMDL and the San Diego Water Boards indicator Bacteria Project I Beaches and Creeks TMDL. In conformance with this agreement, a footnote to Table B-1 has been included to specify coverage under Order No. R9-2013-0001 for those Phase I MS4 discharges within the jurisdictional boundaries of the Cities of Laguna Woods and Laguna Hills within the Santa Ana Region. The footnote specifies that the City of Laguna Woods and Laguna Hills are identified as responsible Copermittees in the San Diego Creek/Newport Bay TMDL in the Santa Ana Region and remain obligated to comply with the San Diego Creek/Newport Bay TMDL pursuant to section XVIII of ~~Order No. R8-2014-0002~~Tentative Order No. R8-2015-0001 (NPDES No. CAS618030) and any reissuance thereof.

The City of Lake Forest is located partially within the jurisdictions of both the Santa Ana Water Board and the San Diego Water Board. By letters dated January 14, 2013 and April 4, 2014 the City of Lake Forest submitted a written request, pursuant to CWC section 13228, to the San Diego Water Board and the Santa Ana Water Board requesting the Santa Ana Water Board be designated to regulate matters within the City of Lake Forest pertaining to permitting of their Phase I MS4 discharges. The City of Lake Forest reported that management and implementation of municipal programs to comply with two different Phase I MS4 permits creates a significant administrative and financial burden and inhibits their ability to contribute to greater overall water quality improvements in either Region. In an effort to address these concerns, the San Diego Water Board and the Santa Ana Water Board have entered into an agreement dated January XX, 2015, whereby the Santa Ana Water Board is designated to regulate Phase I MS4 discharges within the jurisdiction of the City of Lake Forest within the San Diego Region upon the later date of this Order or Santa Ana Water Board Tentative Order No. R8-2015-0001. Under the terms of the agreement, each Regional Water Board retains the authority to enforce provisions of the Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee (Water Code section 13228 (b)). Also under the terms of the agreement, any TMDL and associated Phase I MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the City of Lake Forest as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement authority for the applicable TMDL would remain with the Regional Water Board which has the jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Boards' San Diego Creek/Newport Bay TMDL and the San Diego Water Boards'

indicator Bacteria Project I Beaches and Creeks TMDL. In conformance with this agreement, a footnote to Table B-1 has been included to specify that Phase I MS4 discharges within the jurisdictional boundaries of the City of Lake Forest located within the San Diego Region will be regulated under Santa Ana Water Board Order No. ~~R8-2014-0002~~R8-2015-0001 (NPDES No. CAS618030) and any reissuance thereof. The footnote specifies that the City of Lake Forest is an identified responsible Copermittee in the Indicator Bacteria Project I Beaches and Creeks TMDL (Bacteria TMDL) in the San Diego Region and remains obligated to comply with the Bacteria TMDL pursuant to Attachment E of Order No. R9-2013-0001 and any reissuance thereto. The City is also identified as a responsible Copermittee in the San Diego Creek/Newport Bay TMDL established by the Santa Ana Water Board. The City remains obligated to comply with the San Diego Creek/New Port Bay TMDL pursuant to the Santa Ana Water Board's Phase I MS4 Permit (Tentative Order No. R8-2015-0001 (NPDES No. CAS618030)~~to section XVIII of Order No. R8-2014-0002 (NPDES No. CAS618030) and any reissuance thereto~~. Under the terms of the agreement, ~~The footnote also provides that~~ the City of Lake Forest must retain and continue implementation of the over irrigation prohibition in Title 15, Chapter 15, Section 14.030, List (b) of the City Municipal Code throughout its jurisdiction. Also under the terms of the agreement, ~~The footnote further provides that~~ the City of Lake Forest must actively participate in the development and implementation of the Aliso Creek Watershed Management Area Water Quality Improvement Plan required pursuant to Order No. R9-2013-0001, and any reissuance thereof.

The bases supporting the Cities of Laguna Woods, Laguna Hills, and Lake Forest requests to designate a specific Regional Water Board for regulatory oversight of Phase I MS4 discharges may change under future conditions and circumstances, therefore the San Diego Water Board will periodically review the effectiveness of the agreement during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate the agreement with the Santa Ana Water Board or otherwise modify the agreement subject to the approval of the Santa Ana Water Board.

Provision B.2 (Priority Water Quality Conditions) requires the Copermittees in each Watershed Management Area to identify the highest priority water quality conditions which will be the focus of the Water Quality Improvement Plan implementation.

Provisions B.2.a and B.2.b provide the criteria that must be assessed when characterizing the receiving water quality and potential impacts from MS4 discharges of the receiving waters within the Watershed Management Area. The criteria are based primarily on the requirements in 40 CFR 122.26(d)(1)(iv)(C) and (C)(1)-(9). Characterizing the receiving water quality and identifying the potential impacts caused by MS4 discharges to receiving waters in the Watershed Management Area is necessary to identify the impacts to receiving waters associated with MS4 discharges that are of the most concern to the Copermittees.

Based on the information required to be considered under Provisions B.2.a and B.2.b, Provision B.2.c requires to Copermittees to identify the highest priority water quality conditions related to discharges from the MS4s that will be the primary focus of the Water Quality Improvement Plan in the Watershed Management Area. Addressing and improving these highest priority water quality conditions will become the focus of each Copermittee's jurisdictional runoff management program as the Water Quality Improvement Plan is implemented in the Watershed Management Area. The highest priority water quality conditions are expected to include source of pollutants and/or stressors, and/or receiving water conditions, that the Copermittees consider the highest threats or most likely to have adverse impacts on the physical, chemical, and biological integrity of receiving waters. Addressing these threats and/or adverse impacts should restore the physical, chemical, and biological integrity of receiving waters, and result in the restoration and protection of the beneficial uses of the receiving waters in the Watershed Management Area.

Provision B.2.d requires the Copermittees to identify known and suspected sources of pollutants and/or stressors contributing to the highest priority water quality conditions. The requirements of Provision B.2.d are based primarily on the requirements in 40 CFR 122.26(d)(1)(iii)(B)(1)-(6). The Copermittees are required to evaluate several factors in the identification of those sources. The Copermittees must consider and evaluate the following: (1) the land uses that may contribute toward impacts to receiving waters, (2) the locations of the Copermittees' MS4s that can convey and discharge runoff and pollutants to receiving waters, (3) other sources that discharge into the Copermittees' MS4s and receiving waters, and (4) other information and data that can help the Copermittees to evaluate the relative importance of or contribution from those sources toward the highest priority water quality conditions. Identifying the known and suspected sources, and their relative contribution toward the highest priority water quality conditions, will help the Copermittees to focus, direct, and prioritize their resources and implementation efforts within their jurisdictions.

Provision B.2.e requires the Copermittees to identify potential strategies that can result in improvements to water quality in MS4 discharges and/or receiving waters within the Watershed Management Area. Potential water quality improvement strategies will not necessarily be implemented by the Copermittees, but provide a "menu" of options that the Copermittees will consider for implementation. The public participation process that will be implemented during the development of the Water Quality Improvement Plan is where the potential water quality improvement strategies will be identified.

Provision B.3 (Water Quality Improvement Goals, Strategies and Schedules) requires the Copermittees in each Watershed Management Area to identify the goals that the Copermittees' jurisdictional runoff management programs will work toward achieving to address and improve the highest priority water quality conditions identified under Provision B.2.c; the strategies that will be implemented by the Copermittees within their jurisdictions and the Watershed Management Area to achieve the goals; and, the schedules for implementing the strategies and achieving the goals. The element of

the Water Quality Improvement Plan required under Provision B.3 is where the "*comprehensive planning*" and "*intergovernmental coordination*" [40 CFR 122.26(d)(2)(iv)] of the Copermittees' actions for the proposed management programs within the Watershed Management Area is required to be described.

Provision B.3.a requires the Copermittees to identify interim and final numeric goals, and schedules to achieve those goals as part of the Water Quality Improvement Plans. Provision B.3.a.(1) requires the Copermittees to identify two types of numeric goals to be achieved:

(1) Final numeric goals in the receiving waters and/or MS4 discharges that will result in the protection of the water quality standards of the receiving waters for the highest priority water quality conditions identified by the Copermittees for Provision B.2.c. These final numeric goals are the ultimate goals for the Water Quality Improvement Plan, and the achievement and maintenance of these final numeric goals will indicate that one or more beneficial uses have been successfully restored and/or protected from MS4 discharges.

(2) Interim numeric goals that can be used by the Copermittees to demonstrate progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges for the highest priority water quality conditions in the Watershed Management Area. Achievement of the interim numeric goals will demonstrate to the San Diego Water Board that the Copermittees' implementation efforts are progressing toward achieving the final numeric goals.

Provision B.3.a.(1) does not specify what the interim and final numeric goals must be based on, but they essentially must be designed to achieve compliance with water quality standards in the receiving waters. To that end, the interim goals must be based on measureable criteria or indicators capable of demonstrating progress toward achieving the numeric goals."

The interim and final numeric goals can be based on the water quality objectives in the Basin Plan. The water quality objectives in the Basin Plan, however, consist of numeric and narrative water quality objectives. Numeric water quality objectives can be directly used as numeric goals. Narrative water quality objectives, on the other hand, will require some interpretation to identify numeric goals. The achievement of multiple numeric goals based on the water quality objectives, used in combination, may be necessary to demonstrate that beneficial uses have been restored and/or protected.

The Copermittees could also propose other numeric goals that are not necessarily water quality objectives from the Basin Plan. For example, the Copermittees could propose a numeric goal that consists of achieving some percent improvement of a measureable indicator, such as acreage of a specific habitat or increase in a specific plant or animal species population. Other examples may include pollutant load

reductions, number of impaired waterbodies delisted from the List of Water Quality Impaired Segments, Index of Biological Integrity (IBI) scores, etc.

The Copermittees may choose to develop interim numeric goals based on the final numeric goals they develop, such as incremental steps toward ultimately achieving the final numeric goals. The Copermittees may also choose to develop interim numeric goals that are based on other measureable indicators that can indirectly indicate improvements and progress toward the final numeric goals.

There are no limits to the types of interim numeric goals that could be proposed by the Copermittees, other than the goals must be based on measureable criteria or indicators capable of demonstrating progress toward achieving the numeric goals. Likewise, there are no limits to the types of final numeric goals that could be proposed by the Copermittees, other than the goals must "*restore and protect the water quality standards of the receiving waters.*"

Finally, Provision B.3.a.(2) also requires the Copermittees to develop schedules for measuring progress and achieving the interim and final numeric goals. Several criteria are included for the development of the schedules, but the Copermittees are required to achieve the numeric goals as soon as possible, consistent with federal NPDES regulations (40 CFR 122.47(a)(1)).

The Copermittees are also required to incorporate any compliance schedules for any applicable ASBS or TMDL requirements. Applicable ASBS and TMDL compliance schedules are set forth in Attachment A and Attachment E to the Order, respectively. The information provided by the Copermittees under Provision B.3.a.(2) will be used by the Copermittees and the San Diego Water Board to gauge and track the progress of the Copermittees' efforts in addressing the highest priority water quality conditions identified in the Water Quality Improvement Plan.

Provision B.3.b requires the Copermittees to identify the strategies and schedules to implement those strategies as part of the Water Quality Improvement Plans. Provision B.3.b requires the Copermittees to identify the water quality improvement strategies that will be and may be implemented within the Watershed Management Area to 1) reduce of pollutants in storm water discharged from the MS4 to the MEP, 2) effectively prohibit non-storm water discharges from entering the MS4, 3) protect water quality standards in receiving waters by controlling MS4 discharges so that they do not cause or contribute to exceedances of receiving water limitations, and 4) achieve applicable WQBELs that implement TMDLs. The Copermittees will select the strategies to be implemented based on the likely effectiveness and efficiency of the potential water quality improvement strategies identified under Provision B.2.e to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, and/or achieve the interim and final numeric goals identified under Provision B.3.a.

Provision B.3.b.(1) requires each Copermittee to identify the strategies that will be or may be implemented within its jurisdiction. Each Copermittee is required to describe the strategies it is committed to implementing as part of its jurisdictional runoff management requirements under Provisions E.2 through E.7, and the optional jurisdictional strategies that the Copermittee will implement, as necessary, to achieve the numeric goals.

Each Copermittee is expected to implement the optional jurisdictional strategies identified under Provisions B.3.b.(1)(b) when the jurisdictional strategies it has committed to implement under Provision B.3.b.(1)(a) are not making adequate progress toward the interim and final numeric goals in accordance with the schedules established under Provision B.3.a. Provision B.3.b.(1)(b)(v) requires each Copermittee to describe the circumstances necessary to trigger implementation of the optional jurisdictional strategies, in addition to the requirements of Provisions B.3.b.(1)(a).

The San Diego Water Board recognizes that there may be optional jurisdictional strategies that will likely require funding and/or resources for planning, permitting, procurement of labor and materials, and implementation. Thus, Provision B.3.b.(1)(b)(iv) requires each Copermittee to describe the funding and/or resources that are necessary to implement these optional jurisdictional strategies. This information may provide interested groups and members of the public an understanding of the resources that they could provide or assist in obtaining to implement these optional jurisdictional strategies.

Provision B.3.b.(2) requires the Copermittees in the Watershed Management Area to identify the regional or multi-jurisdictional strategies that may be implemented, as necessary, to achieve the numeric goals. Similar to the requirements of Provision B.3.b.(1)(b), these regional or multi-jurisdictional strategies will likely require funding and/or resources for planning, permitting, procurement of labor and materials, and implementation, and San Diego Water Board recognizes that these strategies may be difficult to implement with only Copermittee resources. Thus, Provision B.3.b.(2)(d) requires the Copermittees to describe the funding and/or resources necessary to implement these optional regional or multi-jurisdictional strategies. This information may provide interested groups and members of the public an understanding of the resources that they could provide or assist in obtaining to implement these optional regional or multi-jurisdictional strategies.

Provision B.3.b.(3) requires the Copermittees to develop and include schedules in the Water Quality Improvement Plan for implementing the water quality improvement strategies identified under Provisions B.3.b.(1) and B.3.b.(2). The schedule for implementing the water quality improvement strategies will be used by the Copermittees and San Diego Water Board to measure and demonstrate the progress of the Copermittees' implementation efforts toward reducing pollutants in storm water discharged from the MS4 to the MEP, and eliminating illicit non-storm water

discharges from entering the MS4.

Provision B.3.b.(4) provides the Copermittees in each Watershed Management Area the option of implementing watershed-specific structural BMP requirements for Priority Development Projects. Historically, storm water permits have included very specific performance standards for permanent, structural BMPs. These standards describe the expectation for the capture or treatment of pollutants and control of excessive flow before storm water is discharged from a site. The Copermittees were also allowed to develop waiver programs for Priority Development Projects to avoid implementing the structural BMPs; however, the waiver programs were not necessarily tied into any sort of holistic watershed strategy. The result is that implementation of BMP requirements is largely done on a site-by-site basis. This requires proper design on the part of the Priority Development Project and strict oversight on the part of the Copermittee.

Provision B.3.b.(4) promotes the evaluation of multiple strategies for water quality improvement, in addition to the implementation of permanent structural BMPs, on a watershed-scale versus the site-by-site approach. In a report issued by the Southern California Coastal Water Research Project (SCCWRP) and several other research institutions, the report emphasized that a successful hydromodification management program will involve watershed analysis as a first step, and that integrating multiple watershed-based strategies is preferable over a site-by-site approach. Indeed, the report states that the watershed analysis "…*should lead to identification of existing opportunities and constraints that can be used to help prioritize areas of greater concern, areas of restoration potential, infrastructure constraints, and pathways for potential cumulative effects*."[22] Provision B.3.b.(4) promotes the findings and recommendations of the report by providing a pathway for Copermittees to develop an integrated approach to their land development programs.

Under Provision B.3.b.(4), the Copermittees in a Watershed Management Area must first perform an analysis by gathering as much information pertaining to the physical characteristics of the Watershed Management Area as possible. This includes, for example, identifying potential areas of coarse sediment supply, present and anticipated future land uses, and locations of physical structures within receiving streams and upland areas that affect the watershed hydrology (such as bridges, culverts, and flood management basins). Once this information is collected, the Copermittees must produce GIS layers (maps) that include this information.

From there, the Copermittees must use the results of the Watershed Management Area Analysis to identify and compile a list of candidate projects that could potentially be used as alternative compliance options for Priority Development Projects. Such projects include, for example, opportunities for stream or riparian area rehabilitation, opportunities for retrofitting existing infrastructure to incorporate storm water retention

[22] 2012. ED Stein, F Federico, DB Booth, BP Bledsoe, C Bowles, Z Rubin, GM Kondolf, A Sengupta. Technical Report 667. Southern California Coastal Water Research Project. Costa Mesa, CA.

or treatment, and opportunities for regional BMPs, among others. Once these candidate projects are identified, Copermittees may allow Priority Development Projects to fund, partially fund, or completely implement these candidate projects. The Copermittees must first find that implementing such a candidate project would provide greater overall benefit to the watershed than requiring implementation of the structural BMPs onsite, and also enter into a voluntary agreement with the Priority Development Project that authorizes this arrangement. The Copermittees may use Provision B.3.b.(4) as both 1) a mechanism to reach their stated goals of the Water Quality Improvement Plan by using Priority Development Projects to either fund or implement projects that will provide water quality benefit, and 2) an alternative to requiring strict adherence to the structural BMP design standards.

Additionally, Provision B.3.b.(4) allows the Copermittees to use the results of the Watershed Management Area Analysis to identify areas within the Watershed Management Area where it is appropriate to allow Priority Development Projects to be exempt from the hydromodification management BMP performance requirements. Provision E.3.c.(2) already allows exemptions for Priority Development Projects that discharge to a conveyance channel whose bed and bank are concrete lined from the point of discharge to an enclosed embayment or the Pacific Ocean. However, there may be cases where further exemptions are warranted. The Copermittees may identify such cases on a watershed basis and include them in the Watershed Management Area Analysis; however, they must provide the supporting rationale to support all claims for exemptions.

Provision B.3.b.(4) provides an innovative pathway for Copermittees to regulate their land development programs by allowing alternative compliance in lieu of implementing structural BMPs on each and every Priority Development Project. This approach facilitates the integration of watershed-scale solutions for improving overall water quality and assisting Copermittees to achieve their stated goals of the Water Quality Improvement Plan. The San Diego Water Board understands, however, that undertaking this approach, which involves extensive planning, could be resource intensive for the Copermittees. Therefore, the Watershed Management Area Analysis is optional and not a requirement. The Copermittees can choose not to perform the watershed planning and mapping exercise described in Provision B.3.b.(4), and instead choose to require strict implementation of the structural BMPs onsite, pursuant to Provision E.3.b.

<u>Provision B.4 (Water Quality Improvement Monitoring and Assessment)</u> requires the Copermittees to develop an integrated monitoring and assessment program to track the progress of the Water Quality Improvement Plan toward meeting the implementation goals and schedules, and improving the water quality of the Watershed Management Area. Provision B.4 is the part of the Water Quality Improvement Plan where the Copermittees describe the monitoring data that will be collected, which is not only necessary to implement the “iterative approach” required by Provision A.4, but inform the adaptive management and “*comprehensive planning*

process" that allows the Copermittees to make adjustments and modifications to the Water Quality Improvement Plans and the jurisdictional runoff management programs.

Provision B.4 requires the Copermittees, at a minimum, to include the requirements of Provision D as part of the water quality improvement monitoring and assessment program for the Water Quality Improvement Plan. The Copermittees, however, are not limited to the requirements of Provision D and may include additional monitoring and assessment methods to track progress toward improving water quality in the Watershed Management Area.

In addition to incorporating the requirements of Provision D, the water quality improvement monitoring and assessment program must incorporate any monitoring and assessment requirements specified for any applicable TMDLs included in Attachment E to the Order, and the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 for Watershed Management Areas with ASBS.

The monitoring and assessments required to be incorporated into the Water Quality Improvement Plan are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order.

Provision B.5 (Iterative Approach and Adaptive Management Process) requires the Copermittees to implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a.

Provision B.5 requires the Copermittees in each Watershed Management Area to re-evaluate the highest priority water quality conditions and potential water quality improvement strategies, the water quality improvement goals, strategies and schedules, and the water quality improvement monitoring and assessment program and provide recommendations for modifying those elements to improve the effectiveness of the Water Quality Improvement Plan. The re-evaluation of the Water Quality Improvement Plan is part of the assessment requirements of Provision D.

Provision B.6 (Water Quality Improvement Plan Submittal, Updates, and Implementation) requires to Copermittees to submit, update, and implement the Water Quality Improvement Plans.

The requirements for the process to develop and submit the Water Quality Improvement Plans is described in more detail under the discussion for Provision F.1. The process will include several opportunities for the public to provide input during the development of the Water Quality Improvement Plans. The process for updating the Water Quality Improvement Plans is described in more detail under the discussion for Provision F.3.c. Upon acceptance of the Water Quality Improvement Plan and

updates, the Copermittees are required to immediately begin implementing the Water Quality Improvement Plan and subsequent updates.

The Water Quality Improvement Plan is expected to be a dynamic document that will evolve over time. The Water Quality Improvement Plan is also expected to be a long term plan that focuses the Copermittees' efforts and resources on a limited set of priority water quality conditions, with the ultimate goal of protecting all the beneficial uses of the receiving waters within the Watershed Management Area from impacts that may be caused or contributed to by MS4 discharges. As the Copermittees collect data, implement their jurisdictional runoff management programs, and review the results from their water quality improvement monitoring and assessment program, the Water Quality Improvement Plan is expected to be continually reviewed and updated until compliance with Provisions A.1.a, A.1.b, and A.2.a is achieved.

However, in specific cases supported by robust analytical documentation the implementation of the Water Quality Improvement Plans may demonstrate that TMDLs are not necessary for identified impaired water bodies within the Watershed Management Area if the analytical record demonstrates that technology-based effluent limitations required by the CWA, more stringent effluent limitations required by state, local, or federal authority, and/or other pollution control requirements (e.g., best management practices) required by local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time.[23]

The San Diego Water Board submits an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. According to USEPA guidance for the Integrated Report,[24] water bodies are placed in one of five categories. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 are placed on the 303(d) List.

Category 4 in the Integrated Report is for water bodies where available data and/or information indicate that at least one beneficial use is not being supported or is threatened, but a TMDL is not needed. [25] Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

[23] 40 CFR 130.7(b)(1)
[24] USEPA, 2005. Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act
[25] Ibid

Impaired water bodies can be included in Category 4a if a TMDL has been adopted and approved. The TMDLs in Attachment E to the Order implement the requirements of the TMDLs adopted by the San Diego Water Board, and approved by the State Water Board and USEPA. The water bodies in Attachment E will be included in Category 4a in the Integrated Report and removed from the 303(d) List.

Impaired water bodies can be included in Category 4b if there are *acceptable* "pollution control requirements" required by a local, state or federal authority stringent enough to implement applicable water quality standards within a reasonable period of time (e.g., a compliance date is set). When evaluating whether a particular set of pollution controls are "requirements," the USEPA considers a number of factors, including: (1) the authority (local, state, federal) under which the controls are required and will be implemented with respect to sources contributing to the water quality impairment (examples may include: self-executing state or local regulations, permits, and contracts and grant/funding agreements that require implementation of necessary controls), (2) existing commitments made by the sources and completion or soon to be completed implementation of the controls (including an analysis of the amount of actual implementation that has already occurred), (3) the certainty of dedicated funding for the implementation of the controls, and (4) other relevant factors as determined by USEPA depending on case-specific circumstances.[26]

Impaired water bodies can be included in Category 4c if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution. Pollution, as defined by the CWA is "the man-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of water."[27] In other cases, pollution does not result from a pollutant and a TMDL is not required. Examples of circumstances where an impaired segment may be placed in Category 4c include segments impaired solely due to lack of adequate flow, stream channelization, or hydromodification. In these situations, there may be water quality management actions that can address the cause(s) of the impairment, but a TMDL may not be required to implement the actions.

The Water Quality Improvement Plans will require the implementation of pollution controls and water quality management actions (i.e. water quality improvement strategies) which can result in the attainment of water quality standards in water bodies impaired by discharges from the Copermittees' MS4s. The Water Quality Improvement Plans also include requirements that are expected to attain water quality standards in a reasonable period of time. The San Diego Water Board considers the Water Quality Improvement Plans to be a commitment by the Copermittees to develop, plan, budget for, and implement pollution controls that will attain water quality

[26] Ibid
[27] CWA section 502(19)

standards in receiving waters in a reasonable period of time, or as soon as possible. The results of the Copermittees' efforts in implementing the Water Quality Improvement Plans can be used to re-evaluate the condition of the impaired water bodies during the next update to the 303(d) List.

After the Copermittees submit the Water Quality Improvement Plans and demonstrate that water quality standards are being attained or will be attained in a reasonable period of time, the San Diego Water Board may re-evaluate the water bodies on the 303(d) List. These water bodies on the 303(d) List may be re-evaluated and placed into Category 4b or Category 4c in the Integrated Report. The water bodies placed in Category 4b or Category 4c in the Integrated Report must show a record that the water bodies are attaining water quality standards or supporting the identified beneficial uses, or will attain water quality standards or support identified beneficial uses in a reasonable period of time, in order for the water bodies to be appropriately removed from the 303(d) List.

C. Action Levels

Purpose: Provision C includes requirements for the Copermittees to identify and include numeric action levels in the Water Quality Improvement Plan to direct and focus the Copermittees' jurisdictional runoff management program implementation efforts for controlling MS4 discharges to receiving waters.

***Discussion*:** Under Provision C, the numeric action levels required are for non-storm water discharges and storm water discharges. The non-storm water action levels (NALs) are applicable to non-storm water discharges from the Copermittees' MS4s, which can occur year-round. The storm water action levels (SALs) are applicable to storm water discharges from the Copermittees' MS4s, which occur during the rainy season defined as the period between October 1 and April 30.

The action levels required by Provision C are based on the action level requirements that were developed and incorporated into Order Nos. R9-2009-0002 and R9-2010-0016, the Orange County and Riverside County MS4 Permits, respectively. The Fact Sheets for these Orders provide detailed discussions about the development of the numeric NALs and SALs included in this Order.

Order Nos. R9-2009-0002 and R9-2010-0016 required the Copermittees to perform prescribed actions if the NALs or SALs are exceeded. The actions required under Order Nos. R9-2009-0002 and R9-2010-0016 generally included conducting additional monitoring and source investigations when a discharge from the MS4 is observed to exceed one or more NALs and/or SALs.

For this Order, however, the action levels of Provision C are to be used by the Copermittees to prioritize the actions to be implemented as part of the Water Quality Improvement Plan. Monitoring data collected by the Copermittees from MS4 outfalls will be compared with the NALs and SALs. Exceedances of the NALs and SALs will not require the Copermittees to immediately identify sources causing exceedances, but will provide some numeric indicator levels that can give the Copermittees a way to measure the relative severity of a pollutant contributing to receiving water quality impacts.

NALs and SALs must be included in the Water Quality Improvement Plans to be used by the Copermittees in directing and focusing their water quality improvement strategies. The Copermittees are expected to utilize the NALs and SALs to help focus their implementation efforts on addressing pollutants that have the most significant potential or observed impacts to receiving waters. The NALs and SALs will be used as part of the MS4 discharges assessments required under Provision D.4.b. The NALs and SALs may also be used by the Copermittees as the numeric goals to be achieved in MS4 discharges and/or receiving waters as the Water Quality Improvement Plans are implemented.

More specific and detailed discussions of the requirements of Provision C are provided below.

Provision C.1 (Non-storm Water Action Levels) requires the Copermittees to incorporate NALs into the Water Quality Improvement Plan for pollutants and/or constituents that are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions identified in the Water Quality Improvement Plan related to non-storm water discharges from the MS4s. NALs generally must be consistent with the water quality objectives found within the Basin Plan.

The NALs have been included to ensure that the Copermittees are implementing and complying with several requirements of the MS4 permit. The federal CWA requires permits for municipal storm sewer systems to "*effectively prohibit non-storm water discharges into the storm sewers*." The federal NPDES regulations, which were promulgated to implement the CWA requirements for discharges from municipal storm sewers, require a program to address illicit discharges, which are non-storm water discharges. Provision A.1.b prohibits "*[n]on-storm water discharges into MS4s*" unless the non-storm water discharge authorized by a separate NPDES permit. The NALs will be used as part of the illicit discharge detection and elimination program required pursuant to Provision E.2, as well as part of the MS4 discharges assessments required pursuant to Provision D.4.b.

Provision A.1.a prohibits non-storm water discharges from the MS4 from "*causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state.*" In addition, pursuant to Provision A.2.a, non-storm water discharges "*must not cause or contribute to the violation of water quality standards in any receiving waters*."

Ideally, the Copermittees' jurisdictional runoff management programs will eliminate all non-storm water discharges entering the MS4s within their jurisdictions. The complete elimination of non-storm water discharges to the Copermittees' MS4s would be in compliance with the CWA requirements for non-storm water discharges, as well as the prohibitions and limitations of Provisions A.1.a and A.2.a.

The federal regulations, however, also refer to several non-storm water discharge categories that must be addressed as illicit discharges if they are found to be a source of pollutants. The federal regulations thus identify some non-storm water discharges that are not required to be addressed as illicit discharges if they are not a source of pollutants (e.g. non-storm water discharges specified in Provisions E.2.a.(1)-(5)). Thus, these regulations imply that some non-storm water discharges into and from the MS4 may occur even if non-storm water discharges are "effectively" prohibited by the Copermittees.

If the source of a non-storm water discharge is identified as a category of non-storm water specified in Provisions E.2.a.(1)-(5), the NALs can be used to determine the category of non-storm water discharges is a source of pollutants. For other non-storm water discharges not specified in Provisions E.2.a.(1)-(5), the CWA requires those discharges to be "*effectively"* prohibited by removing the discharge to the MS4 through enforcement of the Copermittees' legal authority established under "*ordinance, order or similar means*" to prohibit illicit discharges to the MS4s.

If there are non-storm water discharges that are not required to be addressed as illicit discharges, those discharges must comply, at a minimum, with the discharge prohibitions and receiving water limitations of Provision A. Thus, the non-storm water discharges from the MS4 must be at levels that will not cause or contribute to a condition of pollution, contamination, or nuisance (Provision A.1.a), and must not cause or contribute to a violation of water quality standards in receiving waters (Provision A.2.a) to be consistent with the discharge prohibitions and receiving water limitations of Provisions A.1.a and A.2.a.

Furthermore, the San Diego Region has predominantly intermittent and ephemeral rivers and streams which vary in flow volume and duration at spatial and temporal scales. For most of these river and stream systems, non-storm water discharges from the MS4 are likely to be the most significant or the only source contributing to surface flows present within the receiving water, especially during the dry season.

Therefore, because of the prohibitions and limitations of Provision A.1.a and A.2.a, and the likelihood that non-storm water discharges from the MS4 are the most significant or only source contributing to surface flows present within the receiving water, NALs generally must be consistent with the water quality objectives found within the Basin Plan. Non-storm water discharges that are meeting the NALs would not be expected to cause or contribute to an exceedance of water quality objectives in receiving waters, which would be consistent with the discharge prohibitions and receiving water limitations of Provisions A.1.a and A.2.a.

Exceedances of the NALs would then provide an indication of the relative severity of a pollutant in non-storm water discharges from the MS4 contributing to potential or observed receiving water quality impacts. The relative severity or significance of a pollutant in non-storm water discharges from the MS4 will provide the Copermittees a valuable source of information that can be used to identify priority water quality conditions within a Watershed Management Area and within each Copermittee's jurisdiction.

Tables C-1 through C-4 under Provision C.1.a specify numeric NALs for several parameters or pollutant constituents for non-storm water discharges from the MS4 to several water body types. The NALs for MS4 discharges given under Provision C.1.a are based on the water quality objectives for inland surface waters in the Basin Plan, and the water quality objectives for ocean waters in the Ocean Plan. The NALs for

most of the metals were calculated based on the State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP). The NALs provided in Tables C-1 through C-4 must be included in the Water Quality Improvement Plans required to be developed pursuant to Provision B.

Provision C.1.b requires the Copermittees to identify NALs for pollutants and/or constituents, not specified in Provision C.1.a, which are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions of the Watershed Management Area related to non-storm water discharges from the MS4s. The NALs must be based on the water quality objectives in the Basin Plan. The NALs identified under Provision C.1.b must be included in the Water Quality Improvement Plan.

The San Diego Water Board recognizes that some of the NALs required pursuant to Provisions C.1.a and C.1.b may be exceeded more frequently than not. Thus, Provision C.1.c has been included in the Order to provide the Copermittees the option to develop secondary NALs that are set at levels greater than the levels required pursuant to Provisions C.1.a and C.1.b to further refine the prioritization and assessment of water quality improvement strategies for addressing non-storm water discharges to and from the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and from the MS4.

Provision C.2 (Storm Water Action Levels) requires the Copermittees to incorporate SALs into the Water Quality Improvement Plan for pollutants and/or constituents causing or contributing, or may be causing or contributing, to the highest priority water quality conditions identified in the Water Quality Improvement Plan related to storm water discharges from the MS4s.

The SALs have been included to ensure that the Copermittees are implementing and complying with several requirements of the MS4 permit. Provision A.1.a prohibits storm water discharges from the MS4 from "*causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state.*" In addition, pursuant to Provision A.2.a, storm water discharges "*must not cause or contribute to the violation of water quality standards in any receiving waters*."

Provision A.3.a, however, implicitly acknowledges that compliance with Provisions A.1.a and A.2.a cannot be achieved immediately for discharges of storm water from the MS4 by applying the MEP standard. Thus, Provision A.4 requires the Copermittees to implement an iterative approach to demonstrate that MEP is being achieved. This approach is supported by USEPA.

The federal CWA requires permits for municipal storm sewer systems to "*require controls to reduce the discharge of pollutants [in storm water] to the maximum extent*

practicable, *including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants.*" MEP is an ever-evolving, flexible, and advancing concept. As knowledge about controlling storm water runoff and discharges evolves, so does the knowledge which constitutes MEP. Reducing the discharge of storm water pollutants from the MS4 to the MEP requires the Copermittees to assess their jurisdictional runoff management programs and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP. The SALs provide the Copermittees measureable goals that may be used to demonstrate the achievement of MEP for reducing pollutants in storm water discharges from the MS4. The SALs will be used as part of the MS4 discharges assessments required under Provision D.4.a.

In June of 2006, the State Water Board's Blue Ribbon Storm Water Panel released its report titled "*The Feasibility of Numerical Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities*." In the recommendations, the Blue Ribbon panel proposed storm water effluent limitations which are computed using statistical based population approaches. The SALs specified in Table C-5 under Provision C.2.a were developed from a regional subset of nationwide Phase I MS4 data by using USEPA Rain Zone 6 (arid west) data.[28] Additionally, utilization of regional data is appropriate due to the addition of data into the nationwide Phase I MS4 monitoring dataset in February 2008. This additional data increased the number of USEPA Rain Zone 6 samples to more than 400, and included additional monitoring events within Southern California.

Utilizing data from USEPA Rain Zone 6 resulted in SALs which closely reflect the environmental conditions experienced in the San Diego Region. The localized subset of data includes sampling events from multiple Southern California locations including Orange, San Diego, Riverside, Los Angeles, and San Bernardino Counties. The dataset includes samples taken from highly built-out impervious areas and from storm events representative of Southern California conditions.

The SALs for cadmium, copper, lead and zinc require the measurement of hardness and to provide more specificity in the assessment of samples with SALs for total metal concentrations. While USEPA Rain Zone 6 data include a large sample size for concentrations of total metals, the impact the concentration will have on receiving waters will vary with receiving water hardness. Since it is the goal of the SALs, through the iterative process and MEP standard, to have MS4 storm water discharges meet all applicable water quality objectives, the hardness of the receiving water should be used when assessing the total metal concentration of a sample.

Thus, when there is an exceedance of a SAL for a metal, the Copermittee must determine if that exceedance is above the existing applicable water quality objectives

[28] Data used to develop SAL were obtained from http://rpitt.eng.ua.edu/Research/ms4/mainms4.shtml

based upon the hardness of the receiving water. The water quality objectives Copermittees must use to assess total metal SAL exceedances are the California Toxic Rule (CTR) and USEPA National Recommended Water Quality Criteria for Freshwater Aquatic Life 1 hour maximum concentrations. The 1 hour maximum concentration is to be used for comparison since it is expected to most replicate the impacts to waters of the State from the first flush following a precipitation event.

The statistically calculated SALs given in Table C-5 are at levels greater than the water quality objectives in the Basin Plan or Ocean Plan. Because the objective of the CWA is to "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*", meaning eventually pollutants in storm water discharges must be reduced to a level that cannot cause or contribute to an exceedance of water quality objectives in receiving waters, over time the SALs are expected to be reduced to a level that is based on the water quality objectives rather than statistical calculations. The San Diego Water Board will review the SALs as more data for discharges of storm water from the MS4s are collected, and revise them as conditions improve and the MEP standard advances. For the Water Quality Improvement Plans required under this Order, the SALs identified under Provision C.2.a must be included.

Provision C.2.b requires the Copermittees to identify SALs for pollutants and/or constituents, not specified in Provision C.2.a, which are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions of the Watershed Management Area related to storm water discharges from the MS4s. The SALs identified under Provision C.2.b must be included in the Water Quality Improvement Plan.

The San Diego Water Board recognizes that some of the SALs required pursuant to Provisions C.2.a and C.2.b may be exceeded more frequently than not. Thus, Provision C.2.c has been included in the Order to provide the Copermittees the option to develop secondary SALs that are set at levels greater than the levels required pursuant to Provisions C.2.a and C.2.b to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s.

D. Monitoring and Assessment Program Requirements

Purpose: Provision D includes minimum monitoring and assessment requirements that must be developed and implemented by the Copermittees as part of the Water Quality Improvement Plans. Implementation of the monitoring and assessment requirements of Provision D will allow the Copermittees to demonstrate that the requirements of the CWA to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP are being achieved. Implementation of the monitoring and assessment requirements of Provision D will also allow the Copermittees and the San Diego Water Board to track improvements to the water quality in the San Diego Region. The monitoring and assessment program requirements are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order.

***Discussion*:** The San Diego Water Board recognized that changes to the monitoring and assessment requirements of the Fourth Term Permit were necessary to improve the usefulness and usability of monitoring data collected by the Copermittees to support their jurisdictional storm water programs more efficiently and with increased effectiveness. The data collected are needed to better inform the Copermittees' understanding of the physical, chemical, and biological condition of the receiving waters and the quality of the MS4 discharges. The monitoring program needs to provide opportunities for the Copermittees to integrate regional monitoring efforts into municipal storm water monitoring requirements to provide a cost-effective approach to monitoring and avoid duplication of efforts.

The requirements in Provision D were largely recommended by the Copermittees as an outcome of the San Diego Water Boards Focused Meeting process. The monitoring and assessment program requirements now require collection of more specific information necessary for each Copermittee to adapt its jurisdictional runoff management program in such a way that focuses resources on a watershed's highest priority water quality conditions. The monitoring and assessment program will require the Copermittees to collect data that can be utilized to answer both watershed level management questions (e.g. Are the chemical, physical, and biological conditions of a receiving water protective, or likely protective of beneficial uses?), and specific jurisdictional runoff management program activity questions (e.g. Are the water quality improvement strategies of the jurisdictional program effectively eliminating non-storm water discharges to the MS4?).

The monitoring data collected and assessment information that will be reported to the San Diego Water Board are necessary to determine if the Copermittees are complying with the prohibitions and limitations of Provision A. The required monitoring and assessments that must be reported to the San Diego Water Board will be utilized for three purposes:

(1) Inform the Copermittees, San Diego Water Board, and the public on the progress of the Copermittees' efforts to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP;

(2) Inform the Copermittees, San Diego Water Board, and the public on the condition of water bodies receiving discharges from the Copermittees' MS4, and the progress of the Copermittees' water quality improvement implementation efforts toward improving the receiving water quality; and

(3) Inform the Copermittees, the San Diego Water Board, and the public on the effectiveness of the Water Quality Improvement Plan toward achieving (1) and (2).

The monitoring and assessment information reported pursuant to Provision F is also expected to be key to the iterative approach and adaptive management process required under Provision A.4 and implemented through the Water Quality Improvement Plan required under Provision B. As required by Provision A.4, the iterative approach and adaptive management process is required if the Copermittees cannot meet the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c, and/or A.2.a under the present conditions.

Provision D provides the minimum monitoring and assessment requirements that must be included in each Water Quality Improvement Plan to be developed and implemented by the Copermittees. The Copermittees, however, are not limited to the requirements of Provision D and may include additional methods to track progress toward improving water quality in a Watershed Management Area.

More specific and detailed discussions of the requirements of Provision D are provided below.

Provision D.1 (Receiving Water Monitoring Requirements) specifies the minimum receiving water monitoring that the Copermittees must conduct within the Watershed Management Area and include as part of the Water Quality Improvement Plan.

Provision D.1 establishes minimum monitoring requirements that must be conducted by the Copermittees within each Watershed Management Area. Provision D.1 requires the Copermittees to collect and develop the data and information necessary to determine potential impacts to the beneficial uses in the receiving waters due to discharges from the MS4s. The monitoring required under Provision D.1 will also provide the data that will allow the Copermittees to gauge the effectiveness and progress of its Water Quality Improvement Plan implementation efforts toward improving the quality of receiving waters.

The receiving water monitoring requirements of Provision D.1 are focused primarily on monitoring the conditions and response of the receiving waters to the Copermittees' collective implementation efforts to reduce receiving water impacts that may be caused by the discharges from the MS4s. The preference of the San Diego Water Board is for the Copermittees to spend their resources achieving tangible and observable improvements in receiving water conditions instead of collecting samples and analyzing data that has consistently indicated that receiving water conditions are degraded and require improvement. In general, the ability to measure potential improvements in receiving water conditions due to any actions implemented by the Copermittees as part of the Water Quality Improvement Plan may require several years before a response can be observed. Thus, the frequency of collecting receiving water monitoring data has been kept to a minimum.

During the transitional period between adoption of this Order and San Diego Water Board acceptance of a Water Quality Improvement Plan, the Copermittees must conduct receiving water monitoring in accordance with Provision D.1.a. This approach to collecting receiving water data is different from what was required in the Fourth Term Permits, but one that truly embraces the concept of an integrated, cost-effective, streamlined receiving water monitoring approach.

Provision D.1.a requires Copermittees to continue performing the receiving water monitoring programs required in Order Nos. R-2007-0001, R9-2009-002, and R9-2010-0016; plus participation in: hydromodification management plan monitoring approved by the San Diego Water Board, monitoring plans as part of load reduction plans (either Bacteria Load Reduction Plans or Comprehensive Load Reduction Plans) for TMDLs in Attachment E of the Order, Storm Water Monitoring Coalition Regional Monitoring, Southern California Bight Regional Monitoring, Sediment Quality Monitoring, and ASBS Monitoring as applicable to a Watershed Management Area.

Provision D.1.a also provides an opportunity for the Copermittees to use third party data to meet receiving water monitoring requirements where feasible. Allowing the Copermittees to use the data currently collected through its participation in existing regional receiving water programs and that of third parties provides an efficiency of resources in obtaining the data necessary to inform the Copermittees and the San Diego Water Board about the physical, chemical, and biological conditions of the receiving waters, which can also help to focus the receiving water monitoring during the implementation of the Water Quality Improvement Plan. Once a Water Quality Improvement Plan is developed for a Watershed Management Area in compliance with Provision B of this Order, the transitional period is over and Copermittees are required to conduct receiving water monitoring according to the requirements of Provisions D.1.b-e.

Provision D.1.b requires each Copermittee to identify at least one long term receiving water monitoring station to be representative of receiving water quality within each Watershed Management Area. Long term receiving water monitoring stations can be

located at any existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees. The requirements under Provision D.1.b. are consistent with 40 CFR 122.26(d)(2)(iii)(D), which specifies that a "*monitoring program for representative data collection for the term of the permit*" may include "*instream locations.*" For each Watershed Management Area, at least one long term watershed monitoring station is required to be established and monitored. The Copermittees may choose to establish additional long term monitoring stations where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

Provision D.1.b. requires the Copermittees to locate the long term receiving water monitoring station at one of these existing receiving water monitoring stations to provide the Copermittees an opportunity to experience monitoring cost savings while continuing to collect the necessary data to assess the status and trends of receiving water quality conditions in 1) coastal water, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under both dry weather and wet weather conditions. Ideally these stations will continue to be monitored as part of the receiving water monitoring for each Watershed Management Area to maintain a consistent set of locations and a period of data that can be built upon with the monitoring required under this Order.

The receiving water monitoring requirements are separated into monitoring required during dry weather conditions pursuant to Provision D.1.c, and wet weather conditions pursuant to Provision D.1.d.

At each long term monitoring station the Copermittees must conduct at least three dry weather monitoring events as required pursuant to Provision D.1.c and at least three wet weather monitoring events as required pursuant to Provision D.1.d per permit term. Provisions D.1.c and D.1.d require the Copermittees to monitor priority water quality conditions identified in the Water Quality Improvement Plan, constituents listed as causing impairment of receiving waters in the Watershed Management Area, applicable NALs, toxicity, constituents listed in Tables D-2 and D-3, and constituents for implementation plans (e.g. Bacteria Load Reduction Plans and Comprehensive Load Reduction Plans). Required toxicity monitoring was changed to reflect an updated understanding of the unique challenges associated with sampling storm water for toxicity. Copermittees are required to sample storm water for toxicity during each dry weather and each wet weather event pursuant to Provision D.1.c.(4) and D.1.d.(4). Required toxicity monitoring is now consistent with the State Water Resources Control Board Policy for Toxicity Assessment and Control (Draft June 2012) and recently adopted MS4 permits for Caltrans and Los Angeles Water Board. Receiving water monitoring efforts in this Order have been streamlined to redirect resources to monitoring efforts that better support pollutant reduction solutions with an increasing emphasis on MS4 outfall monitoring, source identification and source abatement activities.

In addition to the receiving water monitoring requirements under Provisions D.1.b-d, Provision D.1.e requires the Copermittees participate in and/or conduct other types of receiving water monitoring. As recommended and requested by the Copermittees, Provision D.1.e.(1) requires the Copermittees to participate in existing regional monitoring, as applicable to each Watershed Management Area. Existing regional monitoring includes monitoring conducted by the Storm Water Monitoring Coalition and for the Southern California Bight. Participation in and use of monitoring data collected from these existing regional water quality monitoring programs provide the Copermittees a greater opportunity for efficiency in the use of their resources to manage their storm water programs and those controllable discharges under their authority. Provision D.1.e.(1)(c) requires the south Orange County MS4 Copermittees to participate in "unified regional beach water quality monitoring." This monitoring replaces requirements to conduct "core monitoring" of beach water quality, as provided for in Appendix III of the 2012 California Ocean Plan.

Several different public agencies currently conduct routine, ongoing beach water quality monitoring in south Orange County in accordance with several different sets of requirements. The monitoring programs implemented to meet those requirements overlap temporally and spatially. These monitoring programs are partially but not fully integrated. In November 2010, the State Water Board adopted Resolution No. 2010-0053, which directed regional water boards to work with dischargers to modify beach water quality monitoring programs required by regional board-issued permits in order to eliminate redundancies and incorporate beach water quality monitoring required by beach water quality statutes, where appropriate.

In April 2012, the San Diego Water Board requested that its staff review beach water quality monitoring conducted in south Orange County. To assist in responding to that request, staff of the Board convened a workgroup that included representatives of the three public agencies that currently conduct almost all of the routine, ongoing beach water quality monitoring in south Orange County, i.e., South Orange County Wastewater Authority (SOCWA), Orange County Public Works, and Orange County Health Care Agency (OCHCA). The workgroup also included other interested parties, including representatives of the Sierra Club and Surfrider Foundation. In December 2012, the San Diego Water Board adopted Resolution No. R9-2012-0069, which endorsed the San Diego Water Board staff report entitled "A Framework for Monitoring and Assessment in the San Diego Region," dated November 2012.

The unified program is consistent with and will meet or exceed the minimum requirements for beach water quality monitoring and related public notification and reporting established by State law, including the California Ocean Plan. The unified program is consistent with State Water Board Resolution No. 2010-0053. The unified program is also consistent with and will help implement, "A Framework for Monitoring and Assessment in the San Diego Region," which emphasizes the need for question-driven, beneficial use-oriented monitoring and assessment. The primary purpose of

the unified program will be to answer the question "Does beach water quality meet standards for the beneficial use of water contact recreation?"

The unified program is intended to be protective; it will help protect the health of swimmers, surfers, and others who use south Orange County beach waters for water contact recreational activities. The unified program is also intended to be reasonable; it will eliminate duplicative monitoring and will include triggers for public notification and additional sampling at all sampling stations year-round. The unified program is intended to be equitable; responsibility for implementation of the unified program will be shared and the responsible agencies will jointly make arrangements to implement the program and will have the flexibility to jointly make short and/or long term changes in those arrangements.

The San Diego Water Board Executive Officer ~~has~~ issued a written directive on December 5, 2014, pursuant to California Water Code section~~s 13225, 13267, and~~ 13383, for SOCWA and the south Orange County MS4 Copermittees to implement the unified program in cooperation with OCHCA. The Executive Officer may make revisions to the unified program, provided that the unified program, as revised, continues to be consistent with and meet the requirements of State law, including the California Ocean Plan, for beach water quality monitoring and related public notification and reporting. Following a thirty day public comment period, and subject to a request for a hearing before the San Diego Water Board, any such revision shall take effect as specified in a written directive issued by the Executive Officer pursuant to California Water Code sections ~~13225, 13267, and/or~~ 13383. The program and any Executive Officer issued revisions to the program are subject to California Water Code section 13320 right of review from the date of issuance.

The unified program will supersede the existing routine, ongoing, beach water quality monitoring programs in south Orange County that are conducted in accordance with the existing requirements of the NPDES permits for discharges from the SOCWA ocean outfalls and the south Orange County MS4s. The requirement to participate in "regional monitoring" of beach water quality replaces requirements to conduct "core monitoring" of beach water quality, as provided for in Appendix III of the 2012 California Ocean Plan.

The State Water Resources Control Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part 1 Sediment Quality which became effective August 25, 2009 (Sediment Quality Monitoring Policy). Provision D.1.e.(2) requires any Copermittees with MS4 discharges to an enclosed bay or estuary to monitoring the sediments in the enclosed bay or estuary receiving water in accordance with the sediment quality monitoring procedures as prescribed in the Sediment Quality Monitoring Policy.

The State Water Board adopted Resolution No. 2012-0012 which approved exceptions to the California Ocean Plan for selected discharges into Areas of Special Biological

Significance (ASBS), including special protections for beneficial uses. State Board Resolution No. 2012-0012 became effective on March 20, 2012, and Attachment B to the Resolution established limitations on point source storm water discharges to ASBS. Copermittees with MS4s that discharge to an ASBS must monitor its discharge to assure compliance with State Board Resolution No. 2012-0012 as required pursuant to Provision D.1.e.(3).

The San Diego Water Board is currently developing a regional monitoring strategy to assess the conditions of receiving waters in the San Diego Region. The monitoring requirements of Provision D.1 are expected to be incorporated or serve as a foundation of this regional monitoring strategy, but may require some modifications. When the San Diego Water Board develops an alternative regional monitoring strategy, the Copermittees will be required to participate in the development and implementation of the alternative regional monitoring program pursuant to Provision D.1.f.

Provision D.2 (MS4 Outfall Discharge Monitoring Requirements) specifies the minimum MS4 outfall discharge monitoring requirements that the Copermittees must incorporate and implement as part of the Water Quality Improvement Plan.

The dry weather MS4 outfall discharge monitoring requirements are included under Provisions D.2.a.(2) and D.2.b. The dry weather MS4 outfall discharge monitoring requirements are part of the "*program, including a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer*" required by 40 CFR 122.26(d)(2)(iv)(B), which is expected to achieve compliance with the CWA section 402(p)(3)(B)(ii) statutory requirement for municipal storm water permits to require the Copermittees to "*effectively prohibit non-storm water discharges into the storm sewers*." The dry weather MS4 outfall discharge monitoring data collection requirements are based on requirements under 40 CFR 122.26(d)(1)(iv)(D) and 122.26(d)(2)(iv)(B)(3).

The dry weather MS4 outfall discharge monitoring requirements are designed to provide wide spatial and temporal coverage of each jurisdiction to better understand the extent and magnitude of non-storm water discharges to receiving waters, and make a distinction between persistent and transient non-storm water flows. This information is expected to allow each Copermittee to focus its resources on eliminating and controlling the highest priority threats to receiving water quality, as well as integrating other elements of the storm water programs (e.g. complaint call response) and third party data to efficiently and effectively assist in efforts to eliminate non-storm water discharges.

The dry weather MS4 outfall discharge monitoring requirements of Provision D.2.a.(2) and D.2.b are separated into monitoring required before and after the San Diego Water Board accepts the Copermittees' Water Quality Improvement Plan. Outfall

monitoring conducted prior to acceptance of the Water Quality Improvement Plan is referred to in the Order as Transitional MS4 Outfall Discharge Monitoring. Provision D.2.a.(2) includes the transitional dry weather MS4 outfall discharge monitoring requirements.

The requirements under Provision D.2.a.(2) are based on the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B), which include the requirements for a monitoring program to identify, detect, and eliminate illicit connections and illegal discharges to the MS4s. The federal regulations (40 CFR 122.26(d)(1)(iv)(D)) require the monitoring program to include "*a field screening analysis for illicit connections and illegal dumping [that]…[a]t a minimum, include[s] a narrative description, for either each field screening point or major outfall, of visual observations made during dry weather periods.*" The federal regulations (40 CFR 122.26(d)(1)(v)(B)) require the monitoring program to include "*inspection procedures and methods for detecting and preventing illicit discharges, and describe areas where this program has been implemented.*" Furthermore, the monitoring program is required by federal regulations (40 CFR 122.26(d)(2)(iv)(B)) to include "*a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer.*"

Dry weather transitional MS4 outfall discharge monitoring requires each Copermittee to field screen (inspect) its major MS4 outfalls to classify the MS4 outfall locations as having persistent dry weather flows, transient dry weather flows, or no dry weather flows. To account for the variance in size of the 39 jurisdictions covered under this Order, the Copermittees recommended a tiered approach to the number of major MS4 outfalls that must be inspected. Provision D.2.a.(2)(a) provides a tiered approach to the number of major MS4 outfalls that must be visually inspected per jurisdiction as well as a minimum frequency each Copermittee must inspect each major MS4 outfall per year. This tiered approach is based on the total number of major MS4 outfalls within a Copermittees jurisdiction within each Watershed Management Area.

Based on the field screening, each Copermittee is required to make a determination whether any observed flowing, pooled, or ponded waters are transient or persistent flows. Based on this field screening information, other jurisdictional program information, and third party information, each Copermittee is required to prioritize the MS4 outfalls within its jurisdiction for follow up investigation and elimination of the non-storm water discharge, as part of its illicit discharge detection and elimination program required pursuant to Provision E.2. In accordance with the requirements of Provision E.2, each Copermittee is required to immediately investigate obvious illicit discharges (e.g. outfall discharges with unusual color, unusual odor, or high flows).

This approach allows a Copermittee to use all of its resources, as well as leverage resources and information provided by third parties, to effectively eliminate non-storm water discharges from its MS4 outfalls. If the source of the non-storm water discharge cannot be immediately eliminated, the Copermittee uses the persistent flow or

transient flow classification along with other programmatic implementation data to prioritize the MS4 outfalls for future investigation. In accordance with the adaptive management approach deployed throughout this Order, Provision D.2.a.(2)(c) requires each Copermittee to update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow. The requirement of Provision D.2.a.(2)(c) assures that each Copermittee is collecting data that can be used to demonstrate compliance with the CWA requirement that each Copermittee must implement a program to "*effectively prohibit non-storm water discharges into the [MS4]*" and with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

Provision D.2.b describes the dry weather MS4 outfall discharge monitoring required to be incorporated and implemented as part of the Water Quality Improvement Plan. Dry weather MS4 outfall discharge monitoring must be performed by each Copermittee to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. The emphasis of the dry weather MS4 outfall discharge monitoring required pursuant to Provision D.2.b is consistent with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

Provision D.2.b.(1) requires each Copermittee to continue field screening its major MS4 outfalls and identifying those with persistent flows and transient flows, as conducted during the transitional period (i.e. before the Water Quality Improvement Plan was developed). However, each Copermittee now has the flexibility to adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of non-storm water persistent flow discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan. In order to ensure a minimum number of outfalls are inspected, Provision D.2.b.(1) requires the number of visual inspections be equal to the number of visual inspections required in the tiered inspection program pursuant to Provision D.2.a.(2)(a).

Provision D.2.b.(2)(b) requires each Copermittee to monitor a minimum of 5 major MS4 outfalls with persistent flows identified as the highest priorities within a Copermittee's jurisdiction, within each Watershed Management Area. In other words, Copermittees located in more than one Watershed Management Area must identify at least 5 major MS4 outfalls with persistent flows in its jurisdiction in each Watershed Management Area. If a Copermittee is located in more than one Watershed Management Area, and they have less than 5 major MS4 outfalls with persistent flows per jurisdictional area per Watershed Management Area, all of the major MS4 outfalls must be identified as high priority dry weather persistent flow MS4 outfalls. The Copermittees identified as Responsible Copermittees by a TMDL in Attachment E of

the Order may need to monitor more than 5 dry weather major MS4 outfall locations to determine compliance with the requirements of the TMDL(s).

Monitoring must occur at the highest priority outfall locations at least semi-annually until the non-storm water discharges have been eliminated for three consecutive dry weather monitoring events; identified to be authorized by a separate NPDES Permit; or reprioritized to a lower priority. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized MS4 major outfall in the Copermittee's jurisdiction within the Watershed Management Area, unless there are no remaining qualifying major MS4 outfalls within the Copermittees jurisdiction. The Copermittees must continually update their dry weather persistent flow MS4 outfall discharge monitoring locations with the next highest priority non-storm water flow that have yet to be eliminated until all persistent and transient flows are eliminated or its threat reduced.

Non-storm water persistent flow MS4 outfall discharge monitoring data collected during each semi-annual monitoring event, must be collected and analyzed according to the requirements of Provision D.2.b.(2)(b)–(e). These monitoring requirements are consistent with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

The wet weather MS4 outfall discharge monitoring requirements are included under Provisions D.2.a.(3) and D.2.c. The wet weather MS4 outfall discharge monitoring requirements are necessary for the Copermittees to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable, using management practices, control techniques and system, design and engineering methods, and such other provisions which are appropriate*" required by 40CFR 122.26(d)(2)(iv), which is expected to achieve compliance with the CWA section 402(p)(3)(B)(iii) statutory requirement for municipal storm water permits to require "*controls to reduce the discharge of pollutants [in storm water] to the maximum extent practicable*." The wet weather MS4 outfall discharge monitoring data collection requirements are based on requirements under 40 CFR 122.26(d)(2)(iii), 122.26(d)(2)(iii)(A) and 122.26(d)(2)(iii)(A)(1)-(4), and 40 CFR 122.21(g)(7)(i)-(ii).

The wet weather MS4 outfall discharge monitoring requirements of Provision D.2.a.(3) and D.2.c are separated into monitoring required before and after the San Diego Water Board accepts the Copermittees' Water Quality Improvement Plan. Outfall monitoring conducted prior to acceptance of the Water Quality Improvement Plan is referred to in the Order as Transitional MS4 Outfall Discharge Monitoring. Provision D.2.a.(3) includes the transitional wet weather MS4 outfall discharge monitoring requirements.

Until the wet weather MS4 outfall discharge monitoring requirements of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board, the Copermittees must comply with the requirements of

transitional wet weather MS4 outfall monitoring requirements pursuant to Provision D.2.a.(3). Provision D.2.a.(3) requires the Copermittees in each Watershed Management Area to sample, at least five of the major MS4 outfalls inventoried pursuant to Provision D.2.a.(1) once per wet season for the monitoring data required to be collected pursuant to Provision D.2.a.(3)(c)-(e). Provision D.2.a.(3) further requires at least one major MS4 outfall monitoring station be located in each Copermittee's jurisdiction within the Watershed Management Area.

At a minimum, the five sampling locations chosen must be representative of storm water discharges from residential, commercial, industrial, and typical mixed-use land uses present within a Watershed Management Area. The San Diego Water Board expects the Copermittees to extrapolate from these data to similar land uses throughout the Watershed Management Area to better inform the Water Quality Improvement Plan development process by prioritizing drainages for implementation of storm water control efforts required pursuant to Provision E.

Provision D.2.c describes the wet weather MS4 outfall discharge monitoring required to be included and implemented as part of the Water Quality Improvement Plan. Provision D.2.c provides the Copermittees the flexibility to adjust the wet weather MS4 outfall discharge monitoring locations and frequencies in the Watershed Management Area, as needed, to identify sources of pollutants in storm water discharges from MS4s in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan.

Although Provision D.2.c.(1) allows the Copermittees to adaptively manage the wet weather MS4 outfall discharge monitoring locations and frequencies, the provision requires a minimum of at least five wet weather outfall stations to be monitored. Provision D.2.c.(2) further allows the Copermittees to modify the monitoring frequency at each wet weather MS4 outfall station to meet the goals of the Water Quality Improvement Plan as long as the monitoring frequency occurs at least once per year and is at an appropriate frequency to identify sources of pollutants in storm water discharges, guide pollutant source identification efforts, or determine compliance with the requirements of the applicable TMDLs in Attachment E to the Order.

The wet weather MS4 outfall discharge monitoring requirements of Provisions D.2.c.(3) and D.2.c.(4) are the same as the transitional wet weather MS4 outfall discharge monitoring. In contrast, the requirements of Provision D.2.c.(5) are focused on collecting analytical data specific to the highest priority water quality conditions in the Watershed Management Area identified in the Water Quality Improvement Plan. The wet weather MS4 outfall discharge monitoring data collection requirements are consistent with the requirements under 40 CFR 122.26(d)(2)(iii), 122.26(d)(2)(iii)(A) and 122.26(d)(2)(iii)(A)(1)-(4), and 40 CFR 122.21(g)(7)(i)-(ii).

Provision D.3 (Special Studies) requires the Copermittees to develop special studies that will be conducted for each Watershed Management Area and the entire San

Diego Region. Data collected pursuant to Provision D.3 is to be used by the Copermittees to improve the effectiveness of the strategies implemented by the jurisdictional runoff management programs toward achieving the numeric goals identified in the Water Quality Improvement Plans and ultimately achieve compliance with the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c, and A.2.a, which is consistent with the requirements of Provision A.4.

Special studies are often necessary to fill data gaps or provide more refined information that allow the Copermittees to better manage the generation or elimination of pollutants and discharges to and from the MS4. In the Fourth Term Permits, the Copermittees have been required to implement special studies as directed by the San Diego Water Board. The special studies required by this Order provide the Copermittees more flexibility to identify and implement special studies that will be most useful to improving the effectiveness of their jurisdictional runoff management programs.

Provision D.3.a.(1) requires the Copermittees to develop and conduct at least two special studies per Watershed Management Area, to be determined by the Copermittees. One of the two special studies may be accomplished through participation in a Regional Special Study required under Provision D.3.a.(2). The requirements provide the Copermittees great latitude in identifying and developing the special studies. Watershed Management Area special studies are required, at a minimum, to: (a) relate in some way to the highest water quality priorities identified by the Copermittees in the Water Quality Improvement Plan, (b) be conducted within the Watershed Management Area, and (c) include some form of participation (e.g. contribution of funds, personnel services, project management) by all the responsible Copermittees within the Watershed Management Area.

Examples of Watershed Management Area special studies might include, but are not limited to: (1) focused pollutant source identification studies, (2) BMP effectiveness and/or comparison studies, (3) pilot tests for new or emerging pollutant control methods, (4) receiving water pollutant or stressor source identification and/or mitigation studies, or (5) pollutant fate and transport studies. The Watershed Management Area special studies are expected to provide data that can be utilized by the Copermittees to improve the Water Quality Improvement Plan or implementation of the Copermittees' jurisdictional runoff management programs to address the highest priority water quality conditions.

Provision D.3.a.(2) requires the Copermittees to develop at least one special study that will be conducted for the entire San Diego region. The regional special study is expected to provide data that can be utilized by the Copermittees to improve the Water Quality Improvement Plan or implementation of the Copermittees' jurisdictional runoff management programs to identify or address regional water quality concerns and priorities.

An example of a regional special study would be to develop and establish allowable exceedance frequencies of the bacteria water quality objectives for several types of water bodies, during different wet and dry weather conditions the San Diego region. The special study would be related to bacteria, which is a priority for the San Diego region due to the adoption of "*Bacteria TMDL Project I – Beaches and Creeks in the San Diego Region*." The study results could be used to inform the Copermittees and the San Diego Water Board about the indictor bacteria water quality objective exceedance frequencies that occur in natural or reference watersheds.

Provision D.4 (Assessment Requirements) specifies the assessments that the Copermittees are required to perform, based on the monitoring data collected, and will be reported as part of the Annual Report for the Water Quality Improvement Plan implementation. Provision D.4 requires the Copermittees assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c, and A.2.a.

Provision D.4 specifies the assessments that Copermittees must perform for each Watershed Management Area to assess the effectiveness of each Copermittee's jurisdictional runoff management program and the Water Quality Improvement Plan. The effectiveness of each Copermittee's jurisdictional runoff management program and Water Quality Improvement Plan is measured through these types of assessments: (a) Receiving Waters Assessments (b) MS4 Outfall Discharges Assessments, (c) Special Studies Assessments, and (d) Integrated Assessment of Water Quality Improvement Plan.

Provision D.4.a requires the Copermittees to assess the status of receiving water conditions annually during the transitional monitoring period (during development of the Water Quality Improvement Plan) and after acceptance of the Water Quality Improvement Plan. The monitoring data collected pursuant to Provision D.1 will be evaluated, among other information, to assess the condition of a Watershed Management Area's streams, coastal waters, enclosed bays, harbors, estuaries, and lagoons. The focus of the receiving waters assessments is to measure progress toward the objective of the CWA to "*restore and maintain the chemical, physical, and biological integrity of the Nation's waters*" as the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program are implemented within a Watershed Management Area. Provision D.4.a is consistent with 40 CFR 122.42(c)(7) which requires the Copermittees to annually report the *"[i]dentification of water quality improvements or degradation."*

Provision D.4.b includes the MS4 outfall discharges assessment requirements. The focus of MS4 outfall discharges assessments is to determine if the Copermittees' are implementing programs that comply with the requirements of the CWA for MS4 permits to "*effectively prohibit non-stormwater discharges into the storm sewers*" and "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable.*" The monitoring data collected pursuant to Provisions D.2 will be

evaluated, among other information, to assess the effectiveness of the transitional MS4 outfall field screening monitoring, the implementation of the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program. The MS4 outfall discharge assessments consist of Non-Storm Water Discharges Reduction Assessments and Storm Water Pollutant Discharges Reduction Assessments.

The Non-Storm Water Discharges Reduction Assessments are how each Copermittee will demonstrate that its jurisdictional runoff management program implementation efforts are achieving the CWA requirement to "*effectively prohibit non-stormwater discharges into the storm sewers.*" Provision D.4.b.(1) requires each Copermittee to assess and report on its illicit discharge detection and elimination program required pursuant to Provision E.2 to reduce and effectively prohibit non-storm water and illicit discharges into the MS4 within its jurisdiction. The Non-Storm Water Discharges Reduction Assessments include specific assessment requirements applicable to each Copermittee.

As each Copermittee collects and analyzes the data collected pursuant to dry weather MS4 outfall discharges monitoring requirements of Provisions D.2.a.(2) and D.2.b, Provision D.4.b.(1) requires each Copermittee to assess the progress, assess the effectiveness of its current actions, and identify modifications necessary to increase the effectiveness of its actions toward reducing and eliminating non-storm water and illicit discharges to its MS4. The findings from these assessments are expected to be utilized by the Copermittee as part of its procedures to prioritize the non-storm water discharges that will be addressed by its Illicit Discharge Detection and Elimination program required pursuant to Provision E.2.

The assessment requirements of Provision D.4.a.(1) are consistent with 40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(3) which require "*procedures…to investigate portions of the separate storm sewer system that, <u>based on the results of the field screen, or other appropriate information</u> [emphasis added], indicate a reasonable potential of contain illicit discharges or other sources of non-storm water*" as part of a "*program…to detect and remove…illicit discharges and improper disposal into the storm sewer.*" The assessment requirements of Provision D.4.a.(1) are also consistent with 40 CFR122.42(c)(1) requires the Copermittees to annually report the "*status of implementing the components of the storm water management program that are established as permit conditions.*"

The Storm Water Pollutant Discharges Reduction Assessment is how the Copermittees in each Watershed Management Area will demonstrate that their jurisdictional runoff management program implementation efforts are achieving the CWA requirement to "*reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable*." Provision D.4.b.(2) requires the Copermittees in each Watershed Management Area to assess and report the progress of the Copermittees' efforts to reduce pollutants in storm water discharges from the MS4s to the MEP. The

Storm Water Pollutant Discharges Reduction Assessments include specific assessment requirements during both the transitional monitoring period and after acceptance of the Water Quality Improvement Plan applicable to the Watershed Management Area and each Copermittee.

As the Copermittees collect and analyze the data collected pursuant to wet weather MS4 outfall discharges monitoring requirements of Provisions D.2.a.(3) and D.2.c, Provision D.4.b.(2) requires the Copermittees to assess runoff conditions during the transitional period, and the progress of the Water Quality Improvement Plan strategies toward reducing pollutants in storm water from the MS4 to the MEP. The findings from these assessments are expected to be utilized by the Copermittees to identify any modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify sources of pollutants in storm water discharges from the MS4s, as well as focus, modify, and improve the water quality improvement strategies implemented by each Copermittee within its jurisdiction to reduce pollutants in storm water discharges to the MEP.

The assessment requirements of Provision D.4.b.(2) are consistent with 40 CFR 122.26(d)(2)(iii)(B) which requires "*[e]stimates of the annual pollutant load of the cumulative discharges to waters of the United States from all identified municipal outfalls…during a storm event…accompanied by a description of the procedures for estimating constituent loads and concentrations, including any modeling, data analysis, and calculation methods.*" The assessment requirements of Provision D.4.a.(2) are consistent with 40 CFR 122.26(d)(2)(v) which requires that each Copermittee assesses the *"estimated reductions in loadings of pollutants from discharges of municipal storm sewer constituents from municipal storm sewer systems expected as the result of the municipal storm water quality management program."* The assessment requirements of Provision D.4.b.(2) are also consistent with 40 CFR122.42(c)(1) requires the Copermittees to annually report the "*status of implementing the components of the storm water management program that are established as permit conditions.*"

Provision D.4.c includes the special studies assessment requirements. Performing special studies are how the Copermittees will address data gaps identified during the development of and updates to the Water Quality Improvement Plan. The relevant findings from the special studies assessments are expected to be incorporated as part of the applicable receiving water assessments, MS4 outfall discharge assessments, and integrated water quality improvement assessments required in Provision D.4.a, D.4.b, and D.4.d, respectively.

The assessment requirements in Provision D.4.d are part of the iterative approach and adaptive management process required by Provision A.4. The Copermittees are required to integrate the data collected pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to re-evaluate the Water Quality Improvement Plan.

The monitoring data collected pursuant to Provisions D.1 and D.2, and the results of the assessment required pursuant to Provisions D.4.a-c, will be used to determine whether the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program are effective, or require modifications or improvements to become more effective to achieve the requirements of the CWA. The assessments required by Provision D.4.d are consistent with 40 CFR 122.42(c)(1) which requires that the Copermittees to report the *"[t]he status of implementing the components of the storm water management program that are established as permit conditions."*

E. Jurisdictional Runoff Management Programs

Purpose: Provision E includes the requirements for the jurisdictional runoff management programs to be implemented by each of the Copermittees. Compliance with the requirements for the jurisdictional runoff management programs will allow the Copermittees to demonstrate that they are implementing programs to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP. The jurisdictional runoff management program document prepared by each Copermittee will also provide the details for implementing the water quality improvement strategies identified in the Water Quality Improvement Plan specifically within its jurisdiction.

***Discussion*:** Implementation of the jurisdictional runoff management program requirements under Provision E is how the Copermittees "*effectively prohibit non-stormwater discharges into the storm sewer,*" and outlines the "*controls to reduce the discharge of pollutants to the maximum extent practicable"* consistent with the federal regulations under 40 CFR 122.26. The jurisdictional runoff management program is part of the "*comprehensive planning process*" that is required pursuant to 40 CFR 122.26(d)(2)(iv). Where the Water Quality Improvement Plan is the "*comprehensive planning process*" on a Watershed Management Area scale, requiring "*intergovernmental coordination,*" the jurisdictional runoff management program document is the "*comprehensive planning process*" on a jurisdictional scale that should be coordinated with the other Copermittees in the Watershed Management Area to achieve the goals of the Water Quality Improvement Plan.

The jurisdictional runoff management program requirements are included to provide each Copermittee criteria that can be used to demonstrate that its storm water management program is implementing the "*comprehensive planning process*" within its jurisdiction to "*effectively prohibit non-stormwater discharges into the storm sewers,*" and to identify and implement the most effective "*controls to reduce the discharge of pollutants to the maximum extent practicable"* in accordance with the performance standards given in the CWA.

Provision E includes the requirements for each of the components that must be included in the Copermittee's jurisdictional runoff management program document that will be implemented by the Copermittee within its jurisdiction. Implementation of the components of each Copermittee's jurisdictional runoff management program must incorporate the water quality improvement strategies identified by each Copermittee in the Water Quality Improvement Plans, described pursuant to Provision B.3.b.(1)(a).

More specific and detailed discussions of the requirements of Provision E are provided below.

Provision E.1 (Legal Authority Establishment and Enforcement) requires each Copermittee to establish and enforce sufficient legal authority to control discharges to the MS4 within its jurisdiction.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system*" and be able to demonstrate that it can "*operate pursuant to legal authority established by statute, ordinance or series of contracts.*" Provision E.1.a describes the minimum legal authorities each Copermittee must establish for itself within its jurisdiction to control discharges to its MS4. The requirements of Provision E.1.a are consistent with the requirements set forth in 40 CFR 122.26(d)(2)(i)(A)-(F).

The certification statement required from each Copermittee by Provision E.1.b is included to provide the San Diego Water Board additional documentation that each Copermittee has established the legal authorities consistent with Provision E.1.a and 40 CFR 122.26(d)(2)(i)(A)-(F), and the Copermittee can "*operate pursuant to legal authority established by statute, ordinance or series of contracts.*"

Provision E.2 (Illicit Discharge Detection and Elimination) requires each Copermittee to implement an illicit discharge detection and elimination program to effectively prohibit non-storm water discharges to the MS4 by actively detecting and eliminating illicit discharges and disposal into its MS4.

Provision E.2 establishes the minimum requirements that each Copermittee must implement within its jurisdiction to effectively prohibit non-storm water discharges from entering its MS4. The federal CWA requires permits for municipal storm sewer systems to "*effectively prohibit non-storm water discharges into the storm sewers*." The federal regulations (40CFR122.26(d)(2)(i)(B)) require each Copermittee to establish the legal authority to prohibit illicit discharges to its MS4s. Under 40 CFR 122.26(d)(2)(iv)(B), each Copermittee must implement a "*program…to detect and remove…illicit discharges and improper disposal into the storm sewer.*" The federal NPDES regulations, under 40 CFR 122.26(b)(2), define illicit discharges as "*any discharge to a municipal separate storm sewer that is not composed entirely of storm water*." Thus, non-storm water discharges are not authorized to enter the MS4 and are considered to be illicit discharges, unless authorized by a separate NPDES permit.

The Phase I Final Rule clarifies that non-storm water discharges through an MS4 are not authorized under the CWA (55 FR 47995):

> "*Today's rule defines the term "illicit discharge" to describe any discharge through a municipal separate storm sewer system that is not composed entirely of storm water and that is not covered by an NPDES permit. Such illicit discharges are not authorized under the Clean Water Act. Section 402(p)(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm*

sewer…Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit."

The federal NPDES requirements for the program to address illicit discharges must include "*inspections, to implement and enforce an ordinance, orders, or other similar means to prevent illicit discharges to the MS4*." The federal NPDES regulations also reference several categories of "*non-storm water discharges or flows* [which] *shall be addressed where such discharges are identified…as sources of pollutants to waters of the United States*." The Phase I Final Rule (55 FR 48037) further clarified the requirements of 40 CFR 122.26(d)(2)(iv)(B)(1) as follows:

"*EPA is clarifying that section 402(p)(3)(B) of the CWA (which requires permits for municipal separate storm sewers to 'effectively' prohibit non-storm water discharges) does not require permits for municipalities to prohibit certain discharges or flows of nonstorm water to waters of the United States through municipal separate storm sewers in all cases*."

In previous iterations of the municipal storm water permits for the San Diego Region, these categories were simply listed and referred to as categories of non-storm water discharges "not prohibited" unless identified as a source of pollutants. The Copermittees have often referred to these categories as "exempt" discharges. In both cases, however, the language is inconsistent with the federal CWA and NPDES regulations. And, the clarification provided in the Phase I Final Rule does not specifically state that such discharges are "not prohibited" or "exempt" or in any way authorized. The federal NPDES regulations do, however, state that specific categories of non-storm water discharges must be "*addressed*" if identified as "*sources of pollutants to waters of the United States*."

The language of Provision E.2.a has been revised to be fully consistent with the language of the CWA and the requirements of the federal regulations under 40 CFR 122.26(d)(2)(iv)(B)(1). Provision E.2.a requires each Copermittee to address <u>all</u> types of non-storm water discharges into its MS4 as illicit discharges, <u>unless</u> the discharge is authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to Provisions E.2.a.(1) through E.2.a.(5). Only non-NPDES-permitted non-storm water discharges identified as a category of non-storm water discharges under Provisions E.2.a.(1) through E.2.a.(5) <u>and</u> *not identified as a source of pollutants* do not have to be addressed as illicit discharges. Categories of non-storm water discharges that meet the requirements of Provisions E.2.a.(1) through E.2.a.(5) do not have to be addressed by the Copermittee as illicit discharges.

Several of the non-storm water categories listed in 40 CFR 122.26(d)(2)(iv)(B)(1) have not been included in Provisions E.2.a.(1) through E.2.a.(5), including: street wash water, landscape irrigation, irrigation water, and lawn watering. Because these are no

longer included within the categories listed under Provisions E.2.a.(1) through E.2.a.(5), the Copermittees must prohibit these types of non-storm water discharges from entering the MS4. This is consistent with the clarification of 40 CFR 122.26(d)(2)(iv)(B)(1) in the Phase I Final Rule (55 FR 48037), which states:

> "*[T]he Director may include permit conditions that either require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*."

Street wash water is a category of non-storm water discharges that was removed when the Third Term Permits were issued. Street wash water is a source of several pollutants (e.g., metals, oil and grease, petroleum hydrocarbons, chlorinated solvents, sediment) which are generated during the street washing process. The removal of this category requires the Copermittees to prohibit this type of non-storm water discharge from entering the MS4.

The landscape irrigation, irrigation water, and lawn watering categories, collectively referred to hereafter as "over-irrigation" discharges, were removed from the list of non-storm water discharge categories in the Fourth Term Orange County and Riverside County Permits. Non-storm water discharges resulting from over-irrigation have been found to be a source of several types of pollutants (e.g., nutrients, bacteria, pesticides, sediment) in receiving waters. The San Diego Water Board and the Copermittees have identified categories of non-storm water discharges associated with over-irrigation as a source of pollutants and conveyance of pollutants to the MS4 and waters of the United States in the following documents:

- **SmartTimer/Edgescape Evaluation Program (SEEP) Grant Application**

  The State Water Board allocated grant funding to the SEEP project grant application submitted in 2006, which targeted irrigation runoff by retrofitting areas of existing development and documenting the conservation and runoff improvements. The basis of this grant project is that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 is a source and conveyance of pollutants. In addition, the grant application indicated that this alteration of natural flows is impacting the beneficial uses of waters of the state and U.S. Results from the study indicate that that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 *is* a source and conveyance of pollutants. The results of this study can be applied broadly to any area where over-irrigation takes place. The grant application included the following statements:

  > "*Irrigation runoff contributes flow & pollutant loads to creeks and beaches that are 303(d) listed for bacteria indicators.*"
  >
  > "*Regional program managers agree that the reduction and/or elimination of irrigation-related urban flows and associated pollutant loads may be key to successful attainment of water quality and beneficial use goals as outlined in*

the San Diego Basin Plan and Bacteria TMDL over the long term."

"*Elevated dry-weather storm drain flows, composed primarily … of landscape irrigation water wasted as runoff, carry pollutants that impair recreational use and aquatic habitats all along Southern California's urbanized coastline. Storm drain systems carry the wasted water, along with landscape derived pollutants such as bacteria, nutrients and pesticides, to local creeks and the ocean. Given the local Mediterranean climate, excessive perennial dry season stream flows are an unnatural hydrologic pattern, causing species shifts in local riparian communities and warm, unseasonal contaminated freshwater plumes in the near-shore marine environment.*"

- **2006-2007 Orange County Watershed Action Plan Annual Reports**

The Watershed Action Plan Annual Reports for the 2006-2007 reporting period were submitted by the County of Orange, Orange County Flood Control District and Copermittees within the San Juan Creek, Laguna Coastal Streams, Aliso Creek, and Dana Point Coastal Streams Watersheds. San Juan Creek, Laguna Coastal Streams, Aliso Creek and Dana Point Coastal Streams are all currently 303(d) listed as impaired for indicator bacteria within their watersheds and/or in the Pacific Ocean at the discharge points of their watersheds. The Orange County Copermittees, within their Watershed Action Strategy Table for fecal indicator bacteria included the following:

"*Support programs to reduce or eliminate the discharge of anthropogenic dry weather nuisance flow throughout the…watershed. Dry weather flow is the transport medium for bacteria and other 303(d) constituents of concern.*"

Additionally, they state that "*conditions in the MS4 contribute to high seasonal bacteria propagation in-pipe during warm weather. Landscape irrigation is a major contributor to dry weather flow, both as surface runoff due to over-irrigation and overspray onto pavements; and as subsurface seepage that finds its way into the MS4*."

- **Fiscal Year 2008 Carlsbad Watershed Urban Runoff Management Program Annual Report**

The Carlsbad Watershed Urban Runoff Management Program Annual Report for Fiscal Year 2008 was submitted by the Carlsbad Watershed Copermittees (Cities of Carlsbad, Encinitas, Escondido, Oceanside, San Marcos, Solana Beach, and Vista, and the County of San Diego). In the Annual Report, the Carlsbad Watershed Copermittees stated the following:

"The Carlsbad Watershed Management Area (WMA) collective watershed

strategy identifies bacteria, sediment, and nutrients as high priority water quality pollutants in the Agua Hedionda (904.3 – bacteria and sediment), Buena Vista (904.2 – bacteria), and San Marcos Creek (904.5 – nutrients) Hydrologic Areas. Bacteria, sediment, and nutrients have been identified as potential discharges from over-irrigation."

- **2007-2008 San Diego Bay Watershed Urban Runoff Management Program Annual Report**

  The San Diego Bay Watershed Urban Runoff Management Program 2007-2008 Annual Report was submitted by the San Diego Bay Watershed Copermittees (Cities of Chula Vista, Coronado, Imperial Beach, La Mesa, Lemon Grove, National City, and San Diego, the County of San Diego, the Port of San Diego, and the San Diego County Airport Authority). In Appendix D of the Annual Report, titled "Likely Sources of Pollutants," the San Diego Bay Watershed Copermittees identified over-irrigation of lawns as a pollutant generating activity from business and/or residential land uses for bacteria, pesticides, and sediment.

- **Copermittee Public Education Materials**

  The Orange County Public Works *Tips for Landscape & Gardening* public education brochure states: "*Fertilizers, pesticides and other chemicals that are left on yards or driveways can be blown or washed into storm drains that flow to the ocean. Overwatering lawns can also send materials into storm drains*."

  The Riverside County Flood Control and Water Conservation District *Landscape and Garden* public education brochure states: *"Soil, yard wastes, over-watering and garden chemicals become part of the urban runoff mix that winds its way through streets, gutters and storm drains before entering lakes, rivers, streams, etc. Urban runoff pollution contaminates water and harms aquatic life!"*

- **Los Peñasquitos Lagoon Sedimentation/Siltation TMDL Technical Report**

  The Los Peñasquitos Lagoon Sedimentation/Siltation TMDL technical report was prepared for the City of San Diego and USEPA in October 2010. The technical report was included as a technical supporting document attached to the Sediment TMDL for Los Peñasquitos Lagoon staff report prepared by the San Diego Water Board, dated June 13, 2012. Under the Source Assessment section, the technical report states the following:

  "*Dry weather loading is dominated by nuisance flows from urban land use activities such as car washing, sidewalk washing, and lawn over-irrigation, which pick up and transport sediment into receiving waters.*"

These documents confirm that non-storm water discharges associated with over-irrigation are a source of pollutants and should be addressed as illicit discharges to the MS4. Prohibiting non-storm water discharges associated with over-irrigation, however, is not a new requirement for the Copermittees because it is also consistent with and required by the Water Conservation in Landscaping Act (AB 1881, Laird).

The Water Conservation in Landscaping Act required the Department of Water Resources (DWR) to prepare a Model Water Efficient Landscape Ordinance for use by local agencies (e.g. the Copermittees). All local agencies were required to adopt a water efficient landscape ordinance by January 1, 2010. Local agencies could adopt the Water Efficient Landscape Ordinance developed by DWR, or an ordinance considered at least as effective as the Model Ordinance. The Water Efficient Landscape Ordinance includes a requirement that local agencies prohibit runoff from irrigation (§ 493.2):

> "*Local agencies shall prevent water waste resulting from inefficient landscape irrigation by* <u>*prohibiting runoff from leaving the target landscape*</u> *[emphasis added] due to low head drainage, overspray, or other similar conditions where water flows onto adjacent property, non-irrigated areas, walks, roadways, parking lots, or structures. Penalties for violation of these prohibitions shall be established locally*."

Furthermore, non-storm water discharges from over-irrigation not only transport and discharge pollutants to receiving waters, but are also a likely source of the dry weather flows causing changes to habitat within and along the receiving water bodies. Examples of habitat changes from the dry weather flows include perennialization of ephemeral streams, and conversion of saltwater and brackish water marsh habitats to freshwater marsh habitats (e.g. Los Peñasquitos Lagoon). Both of these examples have resulted in the promotion of invasive species in several areas of the San Diego Region.

The removal of the over-irrigation discharges categories does not require the Copermittees to strictly prohibit lawn and landscape irrigation, but does require the prohibition of excessive irrigation water that results in non-storm water discharges to the MS4. Non-storm water discharges to the MS4 from over-irrigation must be addressed as illicit discharges by the Copermittees pursuant to the requirements of Provision E.2.

The remaining non-storm water categories listed in 40 CFR 122.26(d)(2)(iv)(B)(1) are listed under Provisions E.2.a.(1) through E.2.a.(5) and generally fall into four categories: (1) non-storm water discharges subject to existing San Diego Water Board waste discharge requirements and NPDES permits; (2) non-storm water discharges generally not expected to be a source of pollutants to receiving waters; (3) non-storm water discharges likely to contain pollutants requiring some form of control to address the pollutants prior to discharging to the MS4; and (4) non-storm water discharges or flows associated with firefighting.

Provisions E.2.a.(1) and E.2.a.(2) include several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) for which the San Diego Water Board already has developed general waste discharge requirements and NPDES permits to address the discharges. The Copermittees are only required to address these types of non-storm water discharges as illicit discharges if the Copermittees or the San Diego Water Board identifies these non-storm water discharges not having coverage under the applicable NPDES permit.

Provision E.2.a.(3) includes several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) which are generally not expected to be a source of pollutants to receiving waters, many of which originate from what are typically natural, uncontrollable sources. The Copermittees are only required to address these types of non-storm water discharges as illicit discharges if the Copermittees or the San Diego Water Board identifies these non-storm water discharges as a source of pollutants to receiving waters. Because many of these sources are generally uncontrollable, enforcing a prohibition may not be a possibility for the Copermittees. The Copermittees would be able to address these non-storm water discharges by preventing these non-storm water discharges from entering the MS4. This could potentially be achieved by sealing their MS4 structures so the discharges cannot enter the MS4.

Provision E.2.a.(4) includes several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) that are likely to contain pollutants requiring some form of control to address the pollutants prior to discharging to the MS4. At this time, an outright prohibition of these types of non-storm water discharges does not yet appear to be warranted. Thus, Provision E.2.a.(4) includes several requirements for the Copermittees to control the pollutants from these types of non-storm water discharges. This is consistent with the clarification of the federal regulations in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board has the authority to require the Copermittees to "*control any of these types of discharges where appropriate*."

Unlike non-storm water discharges from over-irrigation, these types of non-storm water discharges are not expected to occur in close proximity to each other or very frequently. Provided these types of non-storm water discharges are controlled as required in Provision E.2.a.(4), the Copermittees would only be required to address these types of non-storm water discharges as illicit discharges if the Copermittee or the San Diego Water Board identifies these non-storm water discharges as a source of pollutants to receiving waters.

Provision E.2.a.(5) includes specific requirements for fire fighting discharges and flows. The requirements for non-storm water discharges and flows associated with fire fighting have been separated into requirements for: a) non-emergency fire fighting discharges and flows, and b) emergency fire fighting discharges and flows.

The San Diego Water Board has found that discharges from building fire suppression system maintenance (e.g. fire sprinklers) contain waste and potentially a significant source of pollutants to receiving waters. As such, the San Diego Water Board is requiring these discharges be addressed as illicit discharges by the Copermittees. Thus, the discharges to the MS4 are to be prohibited via ordinance, order or similar means. For other non-emergency firefighting discharges and flows (i.e. flows from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems), the Copermittees are required to develop and implement a program to address pollutants in these non-storm water discharges and flows. This is consistent with the clarification of the federal regulations in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board has the authority to require the Copermittees to "*control any of these types of discharges where appropriate*."

For emergency firefighting discharges and flows, the Phase I Final Rule (55 FR 48037) has clarified the requirements of 40 CFR 122.26(d)(2)(iv)(B)(1) pertaining to emergency firefighting flows and discharges, which states:

> "*In the case of firefighting it is not the intention of these rules to prohibit in any circumstances the protection of life and public or private property through the use of water or other fire retardants that flow into separate storm sewers*."

Thus, the requirements have been made to be consistent with the guidance provided by the Phase I Final Rule. The Order recommends that the Copermittees develop and encourage implementation of BMPs to reduce or eliminate the discharge of pollutants from emergency firefighting flows to the MS4s and receiving waters. The Order does not include any requirements that should be interpreted as requiring the implementation of BMPs for emergency firefighting flows to the MS4s and receiving waters.

The Copermittees are expected to review the dry weather MS4 outfall discharge monitoring data they collect to determine if and when there are non-storm water discharges to or from their MS4s that are a source of pollutants to receiving waters. If the Copermittees identify one of the types of non-storm water discharges listed in Provisions E.2.a.(1) through E.2.a.(4) as a source of pollutants to receiving waters based on the review and evaluation of monitoring data, Provision E.2.a.(6) requires the Copermittees to prohibit those categories of discharges from entering the MS4 through ordinance, order or similar means. In addition, Provision E.2.a.(6) clarifies that the San Diego Water Board may identify categories of non-storm water discharges or flows listed under Provisions E.2.a.(1) through E.2.a.(4) that must be prohibited.

Provision E.2.a.(6) also provides the Copermittees an option to propose controls to be implemented for the category of non-storm water discharges as part of the Water Quality Improvement Plan instead of prohibiting the category of non-storm water

discharges. If the Water Quality Improvement Plan is accepted by the San Diego Water Board with the proposed controls, the Copermittees will not be required to prohibit the category of non-storm water discharges to their MS4s as long as the controls are implemented. This is consistent with the clarification of 40 CFR 122.26(d)(2)(iv)(B)(1) in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board may "*require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*."

Finally, Provision E.2.a.(7) has been included in the requirements for non-storm water discharges to clarify that any non-storm water discharges to the Copermittee's MS4, even those identified pursuant to Provisions E.2.a.(1) through E.2.a.(4), must be reduced or eliminated, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit. Provision E.2.a.(7) is consistent with the requirements of CWA section 402(p)(3)(B)(ii) and 40 CFR 122.26(d)(1)(v)(B), as clarified in the Phase I Final Rule (55 FR 47995) that "*[u]ltimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit*." However, the reduction or elimination of those non-storm water discharges are expected to be achieved as feasible, in accordance with the priorities in the Water Quality Improvement Plan and when the resources are available to the Copermittee.

Consistent with 40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(1), each Copermittee must implement a "*program…to prevent illicit discharges to the municipal storm sewer system*" and "*detect…illicit discharges and improper disposal into the storm sewer.*" Provision E.2.b requires each Copermittee to implement measures to prevent and detect illicit discharges and connections to its MS4 as part of its illicit discharge detection and elimination program.

As part of the program to prevent and detect illicit discharges to the MS4, 40 CFR 122.26(d)(2)(iv)(B)(2) requires "*procedures to conduct on-going field screening activities during the life of the permit, including areas or locations that will be evaluated by such field screens*." As part of the procedures, each Copermittee is required to maintain an updated map of its entire MS4 and the corresponding drainage areas within its jurisdiction. Having knowledge about where inlets, access points, connections with other MS4s, and outfalls are located is necessary for each Copermittee to track, identify, and eliminate illicit discharges and connections. Thus, Provision E.2.b.(1) of the Order specifies that the map must include the segments of the storm sewer system owned, operated, and maintained by the Copermittee, and include locations of all known inlets, connections with other MS4s, and outfalls to the Copermittee's MS4. The remaining requirements of Provision E.2.b are consistent with the requirements of 40 CFR 122.26(d)(2)(iv)(B)(3)-(7) related to implementing measures to prevent and detect illicit discharges and connections to the MS4.

Provision E.2.c requires each Copermittee to conduct field screening and monitoring of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm

water and illicit discharges and connections to the MS4. Field screening is a required element of the program to detect and eliminate illicit discharges and connections to the MS4, pursuant to 40 CFR 122.26(d)(2)(iv)(B)(2). The field screening requirement will be implemented through the dry weather MS4 outfall discharge monitoring required under Provisions D.2.a.(2) and D.2.b.(1).

Provision E.2.d specifies the measures each Copermittee must implement to eliminate illicit discharges and connections to its MS4. Elimination of illicit discharges and connections to the MS4 is consistent with the requirement of 40 CFR 122.26(d)(2)(iv)(B) "*to detect and remove [emphasis added]…illicit discharges and improper disposal into the storm sewer*" and will achieve the CWA requirement for MS4 permits to "*effectively prohibit non-storm water discharges into the storm sewers*."

Generally, each Copermittee is responsible for prioritizing its efforts to eliminate non-storm water and illicit discharges or connections to its MS4 based on field screening and monitoring data, NALs, illicit discharge investigation records, and the known or suspected sources. Sources of non-storm water and illicit discharges or connections must be eliminated by enforcing the legal authority established by each Copermittee pursuant to Provision E.1.

Provision E.3 (Development Planning) requires each Copermittee to use its land use and planning authority to implement a development planning program to control and reduce the discharge of pollutants in storm water from new development and significant redevelopment to the MEP. Proper implementation of the development planning program will also contribute toward effectively prohibiting non-storm water discharges from development projects to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." As part of the management program, 40 CFR 122.26(d)(2)(iv)(A)(2) requires "*planning procedures including a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment*."

Land development generally alters the natural conditions of the land by removing vegetative cover, compacting soil, and/or placement of concrete, asphalt, or other impervious surfaces. These impervious surfaces concentrate urban pollutants (such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not found in high concentrations in the natural environment. Pollutants that accumulate on impervious surfaces are not easily biodegraded nor subject to natural treatment processes.

Impervious surfaces greatly affect the natural hydrology of the land because they do not allow natural infiltration and treatment of storm water runoff to take place. Instead, storm water runoff from impervious surfaces is typically directed through pipes, curbs, gutters, and other hardscape into receiving waters, with little treatment, at significantly increased volumes and accelerated flow rates over what would occur naturally. The increased pollutant loads, storm water volume, discharge rates and velocities, and discharge durations from the MS4 adversely impact stream habitat by causing accelerated, unnatural erosion and scouring within creek bed and banks. Placement of impervious surfaces also encapsulates "good" sediment (such as sand, gravel, rocks and cobbles) that would normally replenish creek beds and banks to help stabilize them. Collectively, these changes to natural hydrologic processes are termed hydrograph modification, or hydromodification.

Hydromodification, which is caused by both altered storm water flow and altered sediment flow regimes, is largely responsible for degradation of creeks, streams, and associated habitats in the San Diego Region. In an ongoing study by the Stormwater Monitoring Coalition to assess the health of streams throughout Southern California, researchers found that three of the four highest risk stressors to creeks (percent sands and fines present, channel alteration, and riparian disturbance) were related to physical habitat.[29] Researchers studying flood frequencies in Riverside County have found that increases in watershed imperviousness of only 9-22 percent can result in increases in peak flow rates for the two-year storm event of up to 100 percent.[30] Such changes in runoff have significant impacts on channel morphology.

In addition, a technical report issued by the Southern California Coastal Water Research Project (SCCWRP) stated that "*[r]ecent studies indicate that California's intermittent and ephemeral streams are more susceptible to the effects of hydromodification than streams from other parts of the United States. Physical degradation of stream channels in the central and eastern United States can initially be detected when watershed impervious cover approaches 10 percent, although biological effects (which may be more difficult to detect) may occur at lower levels. In contrast, initial response of streams in the semi-arid portions of California appears to occur between 3 and 5 percent impervious cover*."[31] These studies highlight the extent to which impacts originating from impervious surfaces created by land development are responsible for the degradation of creek and stream habitat.

This is consistent with what USEPA has noted, that "*[m]ost stormwater runoff is the result of the man-made hydrologic modifications that normally accompany development. The addition of impervious surfaces, soil compaction, and tree and*

[29] Assessing the Health of Southern California Streams, Stormwater Monitoring Coalition, Fact Sheet
[30] Schueler and Holland, 2000. Storm Water Strategies for Arid and Semi-Arid Watersheds (Article 66). The Practice of Watershed Protection.
[31] Stein, E. and Zaleski, S., 2005. Technical Report 475, Managing Runoff to Protect Natural Streams: The Latest Development on Investigation and Management of Hydromodification in California. December 30, 2005.

vegetation removal result in alterations to the movement of water through the environment. As interception, evapotranspiration, and infiltration are reduced and precipitation is converted to overland flow, these modifications affect not only the characteristics of the developed site but also the watershed in which the development is located. Stormwater has been identified as one of the leading sources of pollution for all waterbody types in the United States. Furthermore, the impacts of stormwater pollution are not static; they usually increase with more development and urbanization."[32]

Reducing the impact from the increased pollutant loads and flows generated by impervious surfaces within a watershed is essential to protecting and restoring the integrity of the receiving waters. Provision E.3 includes the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment*." The requirements of Provision E.3 will 1) minimize the generation and discharge of pollutants in storm water from the MS4, and 2) minimize the potential of storm water discharges from the MS4 from causing altered flow regimes and excessive downstream erosion in receiving waters.

The requirements of Provision E.3.a include the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment*" applicable to all development projects, regardless of size or purpose of development. In general, all development projects must implement onsite BMPs to remove pollutants from runoff prior to its discharge to any receiving waters, as close to the pollutant generating source as possible, and structural BMPs must not be constructed within waters of the U.S.

Furthermore, the onsite BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors (e.g. mosquitos, rodents, and flies). If not properly designed or maintained, certain BMPs implemented or required by municipalities may create a habitat for vectors. Monitoring studies conducted by the California Department of Public Health (CDPH) have documented that mosquitoes opportunistically breed in structural storm water BMPs, particularly those that hold standing water for over 96 hours. Certain site design features that hold standing water may similarly produce mosquitoes.

Structural BMPs and site design features should incorporate design, construction, and maintenance principles to promote drainage within 96 hours to minimize standing water available to mosquitoes. Nuisances and public health impacts resulting from

[32] USEPA, 2007. Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices, December 2007.

vector breeding can be prevented with close collaboration and cooperative effort between municipalities and local vector control agencies and the CDPH during the development and implementation of storm water runoff management programs. The CDPH also has issued guidance for BMP implementation that will minimize potential nuisances and public health impacts resulting from vector breeding.[33]

All development projects are required to implement source control BMPs that will minimize the generation of pollutants. Additionally, each development project must implement, where applicable and feasible, low impact development (LID) BMPs to mimic the natural hydrology of the site and retain and/or treat pollutants in storm water runoff prior to discharging to and from the MS4.

The LID Center defines LID as "*a comprehensive land planning and engineering design approach with a goal of maintaining and enhancing the pre-development hydrologic regime of urban and developing watersheds.*"[34] LID designs seek to control storm water at the source, using small-scale integrated site design and management practices to mimic the natural hydrology of a site, retain storm water runoff by minimizing soil compaction and impervious surfaces, and disconnect storm water runoff from conveyances to the storm drain system.

LID BMPs may utilize interception, storage, evaporation, evapotranspiration, infiltration, and filtration processes to retain and/or treat pollutants in storm water before it is discharged from a site. Because of these numerous options, the San Diego Water Board expects that every development project will be able to implement some form of LID BMPs. Examples of LID BMPs include using permeable pavements, rain gardens, rain barrels, grassy swales, soil amendments, and native plants.

Provision E.3.a also includes requirements for all development projects to, where feasible, landscape with native and/or low water use plants to minimize the discharge of non-storm water discharges associated with excessive irrigation, as well as harvest (i.e., storage) and use precipitation to promote the concept of utilizing storm water as a resource.

While all development projects are subject to the requirements of Provision E.3.a, Provision E.3.b identifies Priority Development Projects that exceed given size thresholds and/or fit under specific use categories. Priority Development Projects are required to incorporate specific performance criteria for structural BMPs into the project plan to reduce the generation of pollutants, and address potential impacts from hydromodification.

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[33] California Department of Public Health, 2012. Best Management Practices for Mosquito Control in California. (http://www.cdph.ca.gov/HealthInfo/discond/Documents/BMPforMosquitoControl07-12.pdf)
[34] www.lowimpactdevelopment.org

The Priority Development Project categories are based on the requirements of the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), and do not differ significantly from the Fourth Term Permit for San Diego County. Furthermore, the Priority Development Project categories are consistent with Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), and Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit).

Because of the impact of relatively small increases in watershed impervious surfaces to receiving waters, Provision E.3.b.(1)(c)(iv) has been updated to include large driveways that are 5,000 square feet or more. The San Diego Water Board finds that large driveways can exacerbate altered flow regimes if not properly controlled.

Provision E.3.b.(3) describes projects that are exempt from Priority Development Project status. These include new or retrofit paved sidewalks, bicycle lanes, or trails that are designed and constructed to direct runoff to vegetated areas or be hydraulically disconnected from paved areas. The exemptions have been provided to encourage these types of projects because they provide multiple environmental benefits, such as promoting walking rather than driving, which will in turn improve air quality. Additionally, retrofitting of existing alleys, streets, or roads are exempt from Priority Development Project status if they are constructed using USEPA Green Streets guidance.[35] By doing so, retrofitting of these types of projects is encouraged. The San Diego Water Board recognizes that there are spatial constraints associated with these projects, and implementation of structural BMPs are not always feasible.

For development projects identified as Priority Development Projects, the requirements of Provision E.3.c are the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment.*" Provisions E.3.c.(1)-(3) describe the performance criteria for the structural BMPs that must be implemented for each Priority Development Project defined by Provision E.3.b.

Provision E.3.c.(1) describes the storm water pollutant control BMP requirements that must be implemented by all Priority Development Projects. The purpose of Provision E.3.c.(1) is to reduce pollutants in storm water runoff to the MEP from Priority Development Projects before it is discharged to the MS4. Of all the available treatment processes available, retention of storm water, and therefore capture of the pollutants in the storm water, will achieve 100 percent pollutant removal efficiency for the volume of storm water retained. No other method of treatment can achieve 100 percent pollutant removal efficiency. Thus, retention of as much storm water onsite is

[35] "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).

the most effective way to reduce pollutants in storm water discharges to, and consequently from the MS4, and controls pollutants in storm water discharges from a site to the MEP.

Under Provision E.3.c.(1)(a), retention of the pollutants in the runoff produced from the 85th percentile storm event ("design capture volume") is the design standard to which Priority Development Projects must comply. Since the 85th percentile storm event has previously been used as the numeric design standard for treatment control BMPs, this same size storm event is used as the numeric design standard for storm water retention. This is the MEP standard recognized by the San Diego Water Board and is consistent with the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), as well as Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit), and Los Angeles Water Board Order No. R4-2012-0175 (Los Angeles County MS4 Permit).

The 85th percentile storm event is the event that has a precipitation total greater than or equal to 85 percent of all storm events over a given period of record in a specific area or location. For example, to determine what the 85th percentile storm event is in a specific location, all 24 hour storms that have recorded values over a 30 year period would be tabulated and a 85th percentile storm would be determined from this record (i.e. 15 percent of the storms would be greater than the number determined to be the 85th percentile storm). Most jurisdictions in the San Diego Region have already developed isopluvial maps that can provide this type of information. The 85th percentile storm might be determined to be a number such as 1.0 inch, and this would be multiplied by the total area of the project footprint producing runoff to calculate the design capture volume. The Priority Development Project designer would then select a system of BMPs that would retain (i.e. intercept, store, infiltrate, evaporate, or evapotranspire) the pollutants contained in the design capture volume onsite.

Retention BMPs are necessary to capture and retain pollutants generated from a Priority Development Project. In a recent study performed by SCCWRP in the Los Angeles Region, they found "*that the magnitude of constituent load associated with storm water runoff depends, at least in part, on the amount of time available for pollutant build-up on land surfaces. The extended dry period that typically occurs in arid climates such as southern California maximizes the time for constituents to build-up on land surfaces, resulting in proportionally higher concentrations and loads during initial storms of the season*."[36] This implies that the "first flush" of a rainy season and the first storm events after long antecedent dry periods tend to have the highest pollutant loads. Capturing and retaining the pollutant loads of the "first flush" of a rainy

[36] Stein, E.D., Tiefenthaler, L.L., and Schiff, K.C., 2007. Technical Report 510, Sources, Patterns and Mechanisms of Storm Water Pollutant Loading from Watershed and Land Uses of the Greater Los Angeles Area, California, USA. March 20, 2007.

season and the first storm events after long antecedent dry periods will reduce a significant portion of the pollutants in storm water discharged to and from the MS4.

The San Diego Water Board, however, acknowledges that in some situations retention of the full design capture volume onsite may not be technically feasible. In this event, the Copermittee may allow the Priority Development Project to use biofiltration BMPs to treat 1.5 times the design capture volume not reliably retained onsite, or biofiltration BMPs with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite.

The 1.5 multiplier is based on the finding in the Ventura County Technical Guidance Manual that biofiltration of 1.5 times the design capture volume not retained onsite will provide approximately the same pollutant removal as retention of the design capture volume on an annual basis.[37] This standard is consistent with the Los Angeles Water Board's Los Angeles County and Ventura County municipal storm water permits (Order Nos. R4-2012-0175 and R4-2010-0108, respectively). The flow-thru design of 0.75 times the portion of the design capture volume not reliably retained onsite is consistent with the San Diego Water Board's Fourth Term Permits for Orange County and Riverside County ~~municipal storm water permits~~ (Order Nos. R9-2009-0002 and R9-2010-0016, respectively). In either case, the biofiltration BMPs must be designed with an appropriate hydraulic loading rate to maximize storm water retention and pollutant removal, as well as to prevent erosion, scour, and channeling within the BMP. Each Copermittee is required to update its BMP Design Manual to provide guidance for hydraulic loading rates and other biofiltration design criteria necessary to maximize storm water retention and pollutant removal.

The San Diego Water Board further recognizes that, in addition to not being technically feasible, retention of the full design capture storm onsite may be cost prohibitive, or may not provide as much water quality benefit to the Watershed Management Area as would implementing BMPs elsewhere in the watershed. Thus, Provision E.3.c.(1)(b) allows for the use of a combination of onsite retention BMPs, and the implementation of an Alternative Compliance Program described in Provision E.3.c.(3). Provision E.3.c.(3) is discussed in more detail below.

If the full design capture volume is not retained onsite either because biofiltration is not technically feasible, or a Copermittee grants a Priority Development Project permission to utilize the Alternative Compliance Program, then the pollutants in the portion of the design capture volume that are not reliably retained onsite must still be reduced to the MEP. Thus, flow-thru treatment control BMPs are required to be implemented on Priority Development Projects in addition to the retention BMPs. The requirements of Provisions E.3.c.(1)(a)(ii)[a]-[c] include the performance standards for flow-thru

[37] Ventura Countywide Stormwater Management Program. 2011. Ventura Technical Guidance Manual, Manual Update, 2011.

treatment control BMPs, consistent with the Fourth Term Permits in the San Diego Region.

Whereas the purpose of the requirements under Provision E.3.c.(1) is to reduce pollutants in storm water runoff to the MEP, the purpose of the requirements under Provision E.3.c.(2) is to maintain or restore more natural hydrologic flow regimes to prevent accelerated, unnatural erosion in downstream receiving waters, also to the MEP standard. Provision E.3.c.(2) describes hydromodification management BMP requirements that must be implemented by all Priority Development Projects.

The performance criteria for the implementation of hydromodification management BMPs on Priority Development Projects are consistent with the requirements in the Fourth Term Permits for Orange and Riverside Counties (Order Nos. R9-2009-0002 and R9-2010-0016, respectively). Modifications to the Orange County and Riverside County Hydromodification Management Plans (HMPs) will likely be minor, or may not be necessary. The HMP for San Diego County will likely require some minor modifications to incorporate the requirements of Provision E.3.c.(2) and become consistent with the Orange County and Riverside County HMPs. The San Diego Water Board does not, however, expect that it will be necessary for the San Diego County Copermittees to develop a new approach or significantly re-write the San Diego County HMP. This is because the premise of the hydromodification management BMP requirements, which are to control storm water runoff conditions (flow rates and durations) for Copermittee-defined range of flows, is unchanged from all Fourth Term Permits in the San Diego Region.

Provision E.3.c.(2)(a) requires that post-project runoff conditions mimic the *pre-development* runoff conditions, and not the *pre-project* runoff conditions. Fundamentally, the San Diego Water Board believes that using a hydrology baseline that approximates that of an undeveloped, natural watershed is the only way to facilitate the return of more natural hydrological conditions to already built-out watersheds, and ultimately improved stream health. On the other hand, using the *pre-project* hydrology as a baseline for redevelopment projects results in propagating the unnatural hydrology of urbanized areas. Propagating the urbanized flow regime does not support conditions for restoring degraded or channelized stream segments, and would forever sentence such streams to the degraded state. Furthermore, reducing the volume of storm water runoff associated with the urbanized flow regime will also result in reducing the discharge of pollutants into receiving waters, since storm water runoff from impervious surfaces contains untreated pollutants.

The San Diego Water Board understands that approximating the pre-development runoff condition associated with a redevelopment site is not necessarily straightforward because factors such as natural grade and native vegetation for the site cannot be precisely known. Therefore, the San Diego Water Board does not expect project designers to estimate historical conditions associated with redevelopment sites. Rather, the San Diego Water Board expects project designers and the Copermittees to

approximate pre-development runoff conditions using the parameters of a *pervious* area rather than an *impervious* area. This means that for redevelopment sites, approximating pre-development runoff conditions equates to using existing onsite grade and assuming the infiltration characteristics of the underlying soil. A redevelopment Priority Development Project must not use runoff coefficients of concrete or asphalt to estimate pre-development runoff conditions. Rather, redevelopment projects must use available information pertaining to existing underlying soil type (such as soil maps published by the National Resource Conservation Service), onsite existing grade, and any other readily available pertinent information to estimate pre-development runoff conditions.

The San Diego Water Board understands, indeed asserts, that the pre-development hydrology of an area in question can only be roughly estimated and cannot be precisely known. However, using the hydrology of a natural condition, even if not precisely known, will provide significant benefit to receiving waters over using the hydrology associated with impervious (developed) surfaces. Therefore in order to achieve the goals of the Clean Water Act, which are to "*restore and maintain the chemical, physical, and biological integrity of the nation's waters* [emphasis added]," the most appropriate standard to use for hydromodification management is the standard associated with the pre-development condition.

Provision E.3.c.(2)(b) requires Priority Development Projects to avoid known critical sediment yield areas or implement measures that would allow coarse sediment to be discharged to receiving waters, such that the natural sediment supply is unaffected by the project. This is necessary because the availability of coarse sediment supply is as much an issue for causing erosive conditions to receiving streams as are accelerated flows.

The San Diego Water Board recognizes that in some situations implementing the hydromodification management BMP requirements for flow control fully onsite may not be technically feasible, may be cost prohibitive, or may not provide any overall water quality benefits to the Watershed Management Area. Thus, Provision E.3.c.(2)(c) allows for the use of a combination of onsite hydromodification management BMPs for flow control and alternative compliance options described in Provision E.3.c.(3).

Provision E.3.c.(3) allows for alternative compliance in instances where the Copermittee determines that offsite measures will have a greater overall water quality benefit for the Watershed Management Area than if the Priority Development Project were to implement structural BMPs onsite. Consequently, watershed-specific structural BMP requirements are present in this Order in the form of allowable compliance offsite. The Alternative Compliance Program to Onsite Structural BMP Implementation Provision is intended to integrate with the Copermittees' planning efforts in the Water Quality Improvement Plans.

The Alternative Compliance Program is an option for Priority Development Projects where the governing Copermittee has participated in the development of a Watershed Management Area Analysis as part of the Water Quality Improvement Plan (described in Provision B.3.b.(4)). Such an approach is consistent with the latest findings in hydromodification management by the scientific community. In a Technical Report entitled *Hydromodification Assessment and Management in California,*[38] the report states:

> *"An effective [hydromodification] management program will likely include combinations of on-site measures (e.g., low-impact development techniques, flow-control basins), in-stream measures (e.g., stream habitat restoration), floodplain and riparian zone actions, and off-site measures. Off-site measures may include compensatory mitigation measures at upstream locations that are designed to help restore and manage flow and sediment yield in the watershed."*

Consistent with the ideas brought forth in the report, in the Watershed Management Area Analysis of Provision B.3.b.(4), which is optional, the Copermittees will develop watershed maps that include as much detail about factors that affect the hydrology of the watershed as is available. Such factors included identification of areas suitable for infiltration, coarse sediment supply areas, and locating stream channel structures and constrictions. Once these factors are mapped and studied, the Copermittees can identify areas in the watershed where candidate projects may be implemented that are expected to improve water quality in the watershed by providing more opportunity for infiltration, slowing down storm water flows, or attenuation of pollutants naturally via healthy stream habitat. These candidate projects may be in the form of retrofitting existing development, rehabilitating degraded stream segments, identifying regional BMPs, purchasing land to preserve valuable floodplain functions, and any other project(s) that the Copermittees identify.

Under the Alternative Compliance Program, Priority Development Projects may be allowed to fund, partially fund, or implement a candidate project, in lieu of implementing structural BMPs onsite, if they enter into a voluntary agreement with the governing Copermittee permitting this arrangement. Project proponents may also propose an alternative project not previously identified by the Copermittees. In either case, whether a project proponent implements a candidate project identified by the Copermittees or a separate alternative compliance project, the governing Copermittee must determine that implementation of the project will have a greater overall water quality benefit for the Watershed Management Area than fully implementing structural BMPs onsite. Determination of greater overall water quality benefits associated with alternative compliance projects would be accomplished by utilizing Water Quality Equivalency calculations developed pursuant to Provision E.3.c.(3)(a). Water Quality Equivalency calculations are necessary to establish a regional and technical basis for

[38] 2012. ED Stein, F Federico, DB Booth, BP Bledsoe, C Bowles, Z Rubin, GM Kondolf, A Sengupta. Technical Report 667. Southern California Coastal Water Research Project. Costa Mesa, CA.

determining water quality benefits associated with alternative compliance projects, which can be consistently used by all Copermittees in the San Diego Region. Finally, if ~~I~~f alternative compliance involves funding or implementing a project that is outside the jurisdiction of the governing Copermittee, then that Copermittee may enter into an inter-agency agreement with the appropriate jurisdiction.

Finally, Provision E.3.c.(2)(d) allows Priority Development Projects to be exempt from the hydromodification management BMP requirements if there is no threat of erosion to downstream receiving waters (i.e. the receiving stream is concrete lined from the point of discharge all the way to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean). If the Copermittees believe that more exemptions are warranted, then they must perform the optional Watershed Management Area Analysis of Provision B.3.b.(4). Additional exemptions other than those specified in this Order may be established on a watershed basis, provided the Copermittees perform the analysis, provide supporting rationale for the exemptions, and complete the Water Quality Improvement Plan approval process pursuant to Provision F.1.

To facilitate the transition to this Order from the Fourth Term Permits for Orange and Riverside County Copermittees, Provision E.3.c.(2)(e) allows two additional temporary exemptions from hydromodification management BMP implementation. The first temporary exemption allows relief from hydromodification management BMP implementation for Priority Development Projects discharging directly to an engineered channel conveyance system with a capacity to convey peak flows generated by the 10-year storm event all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean. Similar to the exemption allowed for concrete-lined channels, this exemption is premised on the concept that there is little threat of erosion to these types of engineered channel systems.

The second temporary exemption allows relief from hydromodification management BMP implementation for Priority Development Projects discharging directly to large river reaches with drainage areas larger than 100 square miles and a 100-year flow capacity in excess of 20,000 cubic feet per second. If this exemption is claimed, then properly sized energy dissipation is required at all discharge points associated with the Priority Development Project. This exemption is premised on the concept that large river reaches can essentially assimilate the accelerated flow rates associated with individual Priority Development Projects because they are inconsequential compared to the flow rate in the large river reach. Both of these exemptions are included in the Hydromodification Management Plan for San Diego County[39].

These temporary exemptions are allowed as a means to facilitate Orange and Riverside County Copermittees' transition to this Order from the Fourth Term Permits and are not meant to reside as permanent exemptions without additional rigorous

[39] Final Hydromodification Management Plan Prepared for County of San Diego, March 2011

technical analyses specific to each County. Therefore, these exemptions will no longer apply once the Copermittees' land development programs are fully updated to reflect the requirements of this Order, i.e., upon implementation of the BMP Design Manual pursuant to Provision F.2.b. If the Copermittees believe that these or other exemptions are warranted in the context of water quality improvement and stream restoration opportunities, then the Copermittees must perform the optional Watershed Management Area Analysis of Provision B.3.b.(4) and provide supporting rationale for the exemptions. The San Diego County Copermittees are also required to perform the optional Watershed Management Area Analysis to provide supporting rationale to justify use of these and other exemptions. Updated BMP Design Manuals including rationale to justify use of exemptions will be reviewed by the San Diego Water Board pursuant to Provision F.2.b.

Provisions E.3.c.(4) and E.3.c.(5) were included under the BMP requirements applicable to all development projects in the Fourth Term Permits for San Diego, Orange, and Riverside Counties (Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016, respectively). In this Order, the long-term BMP maintenance and infiltration and groundwater protection requirements apply to structural BMPs implemented by Priority Development Projects only.

Provision E.3.d requires the Copermittees to update their BMP Design Manual as needed to incorporate the requirements of Provision E.3. The BMP Design Manual is formerly known as the Standard Storm Water Mitigation Plan, or SSMP, and was renamed so that the title has a more accurate description of the document content. The contents of the BMP Design Manual are largely unchanged from the previous Standard Storm Water Mitigation Plans required under the Fourth Term Permits. The BMP Design Manual fulfills the 40 CFR 122.26(d)(2)(iv)(A)(2) requirement that the Copermittee's development planning program includes "*a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment*."

As part of the "*planning procedures,*" 40 CFR 122.26(d)(2)(iv)(A)(2) requires the procedures to "*address controls to reduce pollutants in discharges from municipal separate storm sewers after construction is completed*." The requirements applicable to the implementation and oversight of structural BMPs at Priority Development Projects are provided under Provision E.3.e.

Proper installation of the structural BMPs approved for a Priority Development Project is necessary to ensure that pollutants in storm water discharges will be reduced to the MEP after the project is completed. In addition to the proper installation of structural BMPs, the maintenance of structural BMPs on Priority Development Projects is necessary to ensure that pollutants in storm water discharges will continue to be reduced to the MEP. Provision E.3.e.(1) includes the minimum requirements that each Copermittee must implement to ensure structural BMPs are properly installed and will

be properly maintained. Provision E.3.e.(1) provides clarification regarding the meaning of the term "prior lawful approval" used in this Order. Clarification about how the San Diego Water Board intends the term to be interpreted is reasonable and appropriate and will provide guidance and certainty about the permit requirement for the Copermittees, the land development community, and the general public.

Provision E.3.e.(1) requires Copermittees to implement the land development requirements of Provision E.3 for projects that have not received prior lawful approval from the Copermittee by the effective date of the BMP Design Manual pursuant to Provision E.3.d. For projects that have received prior lawful approval from the Copermittee by the effective date of the BMP Design Manual, then the Copermittee may allow previous land development requirements to apply. For private development projects, prior lawful approval is a development approval or construction permit that complies with the Priority Development Project requirements of the Fourth Term MS4 permits (Order Nos. R9-2007-0001 for San Diego County, R9-2009-0002 for Orange County, and R9-2010-0016 for Riverside County), and includes the design of the storm water drainage system for the project in its entirety as accepted by the Copermittee. Alternatively, prior lawful approval is a development approval or construction permit that confers a vested right for a Priority Development Project to proceed under storm water structural BMP requirements of prior MS4 permits. If a Copermittee confers prior lawful approval to a Priority Development Project based on one of the two aforementioned conditions, then the Copermittee must ensure that 1) any subsequent project approvals must be issued within 5 years of the effective date of the BMP Design Manual, and 2) BMP installation under subsequent approvals must remain in substantial conformity with the design of the storm water drainage system included in the initial approval.

For public projects, prior approval allowing implementation of Fourth Term MS4 Permit structural BMP requirements in lieu of the requirements of this Order is acceptable if the storm water drainage system for the project, in its entirety, has been stamped by the City or County Engineer by the effective date of the BMP Design Manual.

The San Diego Water Board recognizes that Copermittees will need to determine whether or not a project has prior lawful approval for purposes of implementing the requirements of Provision E.3 of this Order based on the circumstances of each project. Nevertheless, the San Diego Water Board expects each Copermittee to require the implementation of Provision E.3 of this Order wherever it can lawfully do so. Some projects will have received prior lawful approval by the effective date of the BMP Design Manual and hence the requirements of the Fourth Term MS4 permits will apply to those projects. The San Diego Water Board expects that very few Priority Development Projects, if any, will be allowed to implement BMP requirements from earlier term MS4 permits. In cases where BMP requirements from the Fourth Term (or earlier) MS4 permits govern the structural BMP design requirements of a Priority Development Project, the San Diego Water Board expects the Copermittees to be able to demonstrate, in a programmatic audit or other means, that a project has prior lawful

approval within the meaning of Provision E.3.e.(1) of this Order. In any event, the San Diego Water Board expects the Copermittees to only approve Priority Development Projects that have adequate structural BMPs that are protective of water quality.

The requirements under Provision E.3.e.(2)-(3) are necessary to demonstrate each Copermittee is implementing a program that complies with Provisions E.3.b-c and E.3.e.(1), and ensure structural BMPs at Priority Development Project will continue to be able to reduce pollutants in storm water discharges to the MEP.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary for any development projects to compel compliance with the requirements of Provision E.3 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.3.f requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Provision E.4 (Construction Management) requires each Copermittee to implement a construction management program to control and reduce the discharge of pollutants in storm water from construction sites to the MEP. Proper implementation of the construction management program will also contribute toward effectively prohibiting non-storm water discharges from construction sites to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." As part of the management program, 40 CFR 122.26(d)(2)(iv)(D) requires "*a program to implement and maintain structural and non-structural best management practices to reduce pollutants in storm water runoff from construction sites to the municipal storm sewer system.*"

Construction sites can be significant sources of sediment, trash, and other pollutants to receiving waters. Although sediment is naturally occurring in the natural environment, the discharge of sediment under unnatural conditions is problematic to receiving waters. Fine sediment in creeks causes high turbidity that interferes with the functionality of native flora and fauna in local creeks. For example, turbidity interferes with both photosynthesis of water-philic plants, as well as successful foraging and reproduction of benthic macroinvertebrates. Sediment can also make it difficult for fish to breathe because it clogs fish gills. Other pollutants such as heavy metals or pesticides can adhere to sediment and are transported to receiving waters during storm events, where they dissolve in the water column and become bioavailable to aquatic organisms. Sediment is recognized as a major stressor to surface waters and

is responsible for the impairment of several lagoons and creeks in the San Diego Region.

Provision E.4 includes requirements that each Copermittee must implement to minimize the discharge of sediment and other pollutants from construction sites to the MS4 within its jurisdiction. The requirements under Provision E.4 are consistent with the Fourth Term Permits for San Diego, Orange, and Riverside Counties. Therefore, Copermittees are expected to implement the requirements seamlessly, with minimal changes to their existing construction management programs. The Copermittees, however, are given more flexibility to run their programs as needed to maximize efficiency, and also to be consistent with the Water Quality Improvement Plan for the Watershed Management Area.

As part of the construction management program, 40 CFR 122.26(d)(2)(iv)(D)(1) requires "*procedures for site planning which incorporate consideration of potential water quality impacts.*" Provision E.4.a describes the minimum elements each Copermittee is required to include as part of the construction site planning and project approval process. The construction site planning and approval process is based primarily on ensuring each project had an adequate site-specific pollution control, construction BMP, and/or erosion and sediment control plan that will be implemented to minimize the discharge of pollutants in storm water to the MEP, and minimize impacts to receiving waters.

The requirements under Provision E.4.b provide the data and information necessary to identify "*priorities for inspecting sites and enforcing control measures*" required pursuant to 40 CFR 122.26(d)(2)(iv)(D)(3). Under Provision E.4.b, each Copermittee must identify construction sites that are considered a high threat to downstream surface waters. Designation of "high threat to water quality" construction sites will necessitate the Copermittees to develop criteria to identify such sites. Provision E.4.b.(2) describes a list of factors that must be considered when the Copermittee considers threat to water quality. For example, a Copermittee must identify sites as "high threat to water quality" if it is located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions, according to the Water Quality Improvement Plan. This ensures that construction management program implementation is compatible with the Copermittee's identified highest priority water quality conditions.

Pursuant to 40 CFR 122.26(d)(2)(iv)(D)(2) each Copermittee is required describe "*requirements for nonstructural and structural best management practices*" at construction sites. Provision E.4.c includes the types of construction site BMPs that the Copermittees must implement, or require the implementation of, at each construction site to reduce pollutants in storm water discharges to the MEP.

Each Copermittee is expected to require the implementation of appropriate BMPs given specific site conditions, the season and likelihood of rain events, and

construction phase (i.e. grading vs. vertical construction). This means that throughout the life of the project construction, the appropriate BMPs will vary, especially if the construction of the project spans multiple wet seasons. As opposed to describing specific minimum BMPs that must be implemented, the Order describes major BMP categories that should be considered for each site.

Each Copermittee is expected to use its 20 years of storm water experience and knowledge to require implementation of appropriate BMPs from the various categories at each construction site within its jurisdiction. For example, the San Diego Water Board expects that each site will be required to implement erosion control and sediment control. The San Diego Water Board also expects each Copermittee to require implementation of active/passive sediment treatment systems at sites where other BMPs have been tried and are known to be inadequate, and discharges of sediment are causing or contributing to water quality impairment downstream. Each Copermittee is granted flexibility in specifying the minimum level of BMP requirements at each site, but the San Diego Water Board expects each site to be capable of controlling pollutants in storm water discharges to the MEP and preventing illicit discharges.

The requirements under Provision E.4.d are necessary to demonstrate that each Copermittee is implementing a program that complies with Provisions E.4.a and E.4.c and ensure BMPs at construction sites will reduce pollutants in storm water discharges to the MEP.

Provision E.4.d does not include minimum required inspection frequencies for construction sites. Each Copermittee must use its experience and knowledge to specify an appropriate inspection frequency for both high priority and lower priority sites in their jurisdictional runoff management program documents, and in accordance with the Water Quality Improvement Plan. Appropriate inspection frequencies may vary by Copermittee, but the San Diego Water Board expects that the stated frequency will be adequate for each Copermittee to properly oversee the construction sites within its jurisdiction, confirm BMPs are implemented to reduce pollutants in storm water discharges from constructions sites to the MEP, and make needed changes to its program on an ongoing basis as necessary.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary for any development projects to compel compliance with the requirements of Provision E.4 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.4.e requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Provision E.5 (Existing Development Management) requires each Copermittee to implement an existing development management program to control and reduce the discharge of pollutants in storm water from areas of existing development to the MEP. Proper implementation of the existing development management program will also contribute toward effectively prohibiting non-storm water discharges from areas of existing development to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." Within 40 CFR 122.26(d)(2)(iv)(A) and (C), the management program is required to reduce impacts on receiving waters and reduce pollutants in storm water discharges to the MEP from commercial and residential areas, industrial facilities, and municipal facilities.

Commercial and residential areas, industrial facilities, and municipal facilities must be addressed by each Copermittee with the existing development management program required under Provision E.5. All other areas within each Copermittee's jurisdiction should be either undeveloped open space, or areas that are being developed or under construction. Areas being developed or under construction will be addressed by the Copermittee under the requirements of Provision E.3 (Development Planning) or Provision E.4 (Construction Management).

Areas of existing development typically include impervious surfaces such as sidewalks, driveways, roads, and rooftops, which generate and concentrate pollutants (such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not found in high concentrations in the natural environment. Pollutants that accumulate on impervious surfaces are not easily biodegraded or not subject to natural treatment processes. When it rains, these pollutants are transported in storm water runoff from these impervious surfaces into receiving waters, resulting in poor water quality and degradation of beneficial uses.

In addition to the generation of pollutants, areas of existing development have generally altered the natural conditions of the land and removed vegetative cover, reduced the perviousness of the surface, and reduced the capacity of storm water that can be intercepted, captured, stored, infiltrated, evaporated, and/or evapotranspired. The alteration of the natural conditions and the impervious surfaces associated with areas of existing development causes water quality problems due to the alteration of natural flow regimes within the watersheds; resulting in hydromodification of channels, streams, and habitats that exist within or adjacent to the areas of existing development.

Thus, storm water discharges from areas of existing development are responsible for poor water quality, degraded habitats, and hydromodified channels throughout the developed portions of the watersheds in the San Diego Region. To improve the health

and functionality of the receiving waters in a Watershed Management Area, land use practices and the amount of impervious surfaces in areas of existing development must change to reduce the various impacts caused by hydromodification and pollutants from storm water runoff generated in developed areas. Each Copermittee must be aggressive to address pollutant sources and runoff from areas of existing development to be able to reduce pollutants in storm water discharges from the MS4 to the MEP.

There is some overlap in the requirements under Provision E.5 with the requirements under Provisions E.2 (Illicit Discharge Detection and Elimination), E.3 (Development Planning), and E.4 (Construction Management). Illicit discharges frequently originate from areas of existing development. New development projects, when completed will become some type of residential, commercial, industrial or municipal existing development. Redevelopment projects are, by definition, redeveloping areas of existing development. And, redevelopment projects become construction sites located in areas of existing development. Much of the data and information collected, inspections performed, and enforcement actions taken for the requirements under Provisions E.2 to E.4 may also be utilized by the existing development management program. The requirements under Provision E.5, however, are focused primarily on reducing pollutants generated in areas of existing development that can be transported in storm water runoff and discharged to and from the MS4.

The requirements under Provision E.5 build upon existing program elements being implemented by the Copermittees. Provision E.5 is generally consistent with the existing development requirements of the Fourth Term Permits for Orange and Riverside Counties (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), but modified to provide more flexibility to implement the programs so resources can be better focused toward addressing the highest priority water quality conditions identified in the Water Quality Improvement Plans.

For a Copermittee to properly manage areas of existing development, having knowledge of what development exists within its jurisdiction is essential. Provision E.5.a requires each Copermittee to maintain a watershed-based inventory of all the existing development within its jurisdiction. This requirement is necessary for each Copermittee to implement the requirements of Provision E.5.b-e.

As opposed to just maintaining separate inventories based on the type of site, each Copermittee must maintain a watershed-based inventory that includes all types of existing development within its jurisdiction. By utilizing a watershed-based inventory, the Copermittees within a Watershed Management Area can combine their inventories and review the inventories by watershed in addition to by jurisdiction. Pollutant sources and strategies for abatement can then be evaluated on a watershed level, as opposed to evaluating sources and strategies strictly by type of site.

Provision E.5.a includes the information that must be included in the inventory. Provision E.5.a.(1) specifies what facilities or areas must be included in the inventory. A commercial type of existing development may be identified in the inventory as a facility (e.g. individual building, individual business) or an area (e.g. shopping center, commercial zone). An industrial type of existing development must be identified in the inventory by facility (e.g. individual industrial entity). A municipal type of existing development must be identified in the inventory by facility, with a list of specific municipal facilities that must be included in the inventory. A residential type of existing development must be identified by areas to be designated by the Copermittee. For each of the facilities and areas identified in the Copermittee's inventory developed pursuant to Provision E.5.a.(1), Provision E.5.a.(2) specifies the information that must be included in the description for the facility or area.

Provision E.5.a.(3) requires each Copermittee to maintain an updated map showing the location of inventoried existing development, watershed boundaries, and water bodies. This requirement was included because this information is expected to help the Copermittees in a Watershed Management Area identify and prioritize sources of pollutants and/or stressors in areas of existing development that contribute toward the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Knowledge of the existing development that are likely to be sources of pollutants contributing to the highest priority water quality conditions is expected to be a key element in the Copermittees' development of the water quality improvement strategies that will be included in the Water Quality Improvement Plans. The strategies described in the Water Quality Improvement Plans will direct efforts within the existing development management programs implemented by each Copermittee.

Pursuant to 40 CFR 122.26(d)(2)(iv)(A) each Copermittee is required describe "*structural and source control measures to reduce pollutants*" in storm water runoff discharged from areas of existing development. Provision E.5.b includes the BMP implementation and maintenance requirements that the each Copermittee must require at areas of existing development to reduce pollutants in storm water discharges to the MEP. The San Diego Water Board, however, recognizes that BMP implementation and maintenance for residential areas will require much more education and encouragement through less authoritative measures than for commercial, industrial and municipal facilities and areas. Thus, the BMP implementation and maintenance requirements have been separated between requirements under Provision E.5.b.(1) for commercial, industrial and municipal facilities and areas, and Provision E.5.b.(2) for residential areas.

Most of the requirements in Provision E.5.b are consistent with the related requirements in the Fourth Term Permits. The level of specificity, however, has been changed to allow each Copermittee the flexibility to implement its program to achieve

maximum efficiency, and to perform functions that will address the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Each Copermittee is expected to require the implementation of appropriate BMPs to address the expected pollutants from each facility or area. The Third and Fourth Term Permits described specific minimum BMPs that must be implemented at various sites. This Order, however, requires each Copermittee to designate minimum BMPs themselves and require implementation. Consistent with the Fourth Term Permits, each Copermittee is required to maintain, or require the maintenance of, all BMPs as needed.

The BMP implementation and maintenance requirements include a schedule of operation and maintenance activities for the MS4 and related structures (such as catch basins, storm drain inlets, and detention basins), as well as public streets and roads. Public streets and roads specifically include public unpaved roads. The San Diego Water Board identified, through investigations and complaints, sediment discharges from unpaved roads as a significant source of water quality problems in the San Diego Region. Inspection activities conducted by the San Diego Water Board since the Third Term Permits have found a lack of source control for many unpaved roads within the jurisdiction of the Copermittees.

Unpaved roads are a source of sediment that can be discharged in runoff to receiving waters, especially during storm events. Erosion of unpaved roadways occurs when soil particles are loosened and carried away from the roadway base, ditch, or road bank by water, wind, traffic, or other transport means. Exposed soils, high runoff velocities and volumes, sandy or silty soil types, and poor compaction increase the potential for erosion.

Road construction, culvert installation, and other maintenance activities can disturb the soil and drainage patterns to streams in undeveloped areas, causing excess runoff and thereby erosion and the release of sediment. Poorly designed unpaved roads can act as preferential drainage pathways that carry runoff and sediment into natural streams, impacting water quality. In addition, other public works activities along unpaved roads have the potential to significantly affect sediment discharge and transport within streams and other waterways, which can degrade the beneficial uses of those waterways.

USEPA also recognizes that discharges from unpaved roads pose a significant potential threat to water quality. USEPA guidance[40] emphasizes the threat of unpaved roads to water quality:

[40] USEPA, 2006. Environmentally Sensitive Maintenance for Dirt and Gravel Roads. Gesford and Anderson, USEPA-PA-2005.

> "*Dirt and gravel roads are a major potential source of these pollutants [sediment] and pollutants that bind to sediment such as oils, nutrients, pesticides, herbicides, and other toxic substances. Many roads have unstable surfaces and bases. Roads act like dams, concentrating flows that accelerate erosion of road materials and roadsides. Both unstable surfaces and accelerated erosion then lead to sediment and dust.*"

There are several guidance documents, developed by the USEPA,[41] the US Forest Service,[42] the University of California,[43] and others, that include design and construction specifications and BMPs that are readily available for implementation by public entities. Implementing design and other source control BMPs for unpaved roads in the region is necessary to reduce and minimize the impacts of sediment discharged during storm events from unpaved roads to the MS4s and receiving waters.

Provision E.5.c describes existing development site inspection frequency, content, and tracking that each Copermittee must incorporate into their existing development management programs. The requirements under Provision E.5.c are necessary to demonstrate each Copermittee is implementing a program that complies with Provision E.5.b and ensure BMPs implemented in areas of existing development will reduce pollutants in storm water discharges to the MEP. Provision E.5.c has been modified to include a minimum of once every 5 years for all inventoried facilities and areas of existing development, utilizing one or more methods of inspection.

In addition to onsite inspections, the methods of inspection have been expanded to include drive-by inspections. Inspections may be performed by the Copermittee's municipal and contract staff, or by volunteer monitoring or patrol programs. Volunteer monitoring or patrol programs are not expected to enforce the Copermittee's ordinances, or to inspect areas or facilities where members of the public are not allowed access. Volunteer monitoring or patrol programs must be trained by the Copermittee, and are only expected to collect visual observations. By utilizing drive-by inspections and volunteer monitoring or patrol programs, the Copermittees will be able to maximize and efficiently use their resources to identify and address sources of pollutants in areas of existing development.

The municipal and contract staff of each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial, industrial, and municipal facilities and areas in its inventoried existing development pursuant to Provision E.5.c.(1)(a)(iv). An "equivalent" of at least 20 percent means if any commercial, industrial, or municipal facilities or areas require multiple onsite

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[41] Ibid
[42] US Forest Service, 1996. Forest Service Specifications for Construction of Roads & Bridges. EM-7720-100. Revised August 1996.
[43] University of California Division of Agriculture and Natural Resources, 2007. Rural Roads: A Construction and Maintenance Guide of California Landowners. Publication 8262.

inspections during any given year, those additional inspections may count toward the total annual inspection requirement. Linear municipal facilities (i.e. MS4 linear channels, sanitary sewer collection systems, streets, roads and highways) in the Copermittee's existing development inventory are not subject to the inspection frequency requirement of Provision E.5.c.(1)(a)(iv).

The inspection content specified in Provision E.5.c.(2)(a) includes the information required to be collected during an inspection by any method. The inspection content specified in Provision E.5.c.(2)(b) includes additional information that must be collected when a Copermittee's municipal or contract staff perform an onsite inspection. Provision E.5.c.(3) specifies the information that each Copermittee must maintain in its existing development inspection records.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary to compel compliance with the requirements of Provision E.5 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.5.d requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Provisions E.5.e.(1)-(2) specifically require the Copermittee to identify areas of existing development as candidates for retrofitting, and streams, channels, and/or habitats as candidates for rehabilitation. Provisions E.5.e.(1)-(2) are based on the retrofitting requirements of the Fourth Term Permits for Orange and Riverside Counties, but modified to also include identifying projects to rehabilitate channels within areas of existing development. The requirements have also been modified to be more focused on utilizing these types of projects for addressing the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Interest and opportunity to retrofit areas of existing development and rehabilitate channels located in areas of existing development has been observed in several programs the San Diego Water Board oversees (e.g., CWA Section 401 Water Quality Certification program, supplemental environmental projects, and grant programs). Each jurisdiction has miles and miles of streets that could be retrofitted to become green streets. Reshaping landscaped areas from convex to concave configurations can detain storm water instead of directing runoff as quickly as possible to the MS4. Retrofit projects could also include simply replacing impervious surfaces with permeable surfaces.

Retrofitting projects do not necessarily have to be expensive. Retrofitting projects could be as simple as redirecting downspouts from roofs to pervious or landscaped areas instead of to hardscaped areas discharging directly to the MS4, providing rain barrels to harvest storm water from downspouts for use at a later time, or planting

more trees in areas with little vegetation to provide canopy that can intercept storm water. The San Diego Water Board encourages the Copermittees to identify simple, low-cost retrofitting opportunities that can be easily implemented, in addition to other more expensive retrofitting and channel rehabilitation projects.

Rehabilitation of channels, streams, and/or habitat will require more significant planning and resources to implement. There are, however, also abundant opportunities to rehabilitate channels, streams and/or habitats in or adjacent to areas of existing development. Each Watershed Management Area likely has several creeks and stream reaches that have been undergrounded, artificially hardened, or hydromodified that could be rehabilitated to be more sustainably configured, which would slow down storm water flows and potentially have more assimilative capacity for pollutants while still being supportive of designated beneficial uses.

The San Diego Water Board recognizes that it may be infeasible to implement retrofitting or channel rehabilitation projects within certain areas of a Copermittee's jurisdictions. For such areas, the Copermittee must instead identify, develop, and implement regional retrofitting and channel rehabilitation projects (i.e. projects that can retain and/or treat storm water from one or more areas of existing development) adjacent to and/or downstream of the areas of existing development.

Provisions E.5.e.(1)-(2) do not require the implementation of retrofitting and rehabilitation projects, but do require the Copermittee to develop a program with strategies to facilitate the implementation of these types of projects in areas of existing development. The strategies are expected to include allowing and encouraging Priority Development Projects to implement retrofitting types of projects as a means of compliance with the structural BMP performance criteria requirements of Provisions E.3.c.(1) and E.3.c.(2).

Provision E.6 (Enforcement Response Plans) requires each Copermittee to develop an Enforcement Response Plan as part of its jurisdictional runoff management program document. Proper implementation of the Enforcement Response Plans is necessary to effectively prohibit non-storm water discharges to the MS4, and reduce the discharge of pollutants in storm water from the MS4 to the MEP.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system*" and be able to demonstrate that it can "*operate pursuant to legal authority established by statute, ordinance or series of contracts*" to control the discharge of non-storm water and pollutants in storm water to and from its MS4. Pursuant to 40 CFR 122.26(d)(2)(i)(E) each Copermittee is specifically required to have the legal authority to "*[r]equire compliance with conditions in ordinances, permits, contracts or orders*."

The requirements under Provision E.6 are necessary to demonstrate that each Copermittee can enforce its legal authority to *"effectively prohibit non-stormwater discharges"* and "*reduce the discharge of pollutants to the maximum extent practicable*" as well as "*[r]equire compliance with conditions in ordinances, permits, contracts or order*."

The Enforcement Response Plan required under Provision E.6 will serve as a reference for the Copermittee and the San Diego Water Board to determine if consistent enforcement actions are being implemented to achieve timely and effective compliance from all public and private entities that are not in compliance with the Copermittee's ordinances, permits, or other requirements. The Enforcement Response Plan must contain clear direction for the Copermittee to take immediate enforcement action, when appropriate and necessary, in their illicit discharge detection and elimination, development planning, construction management, and existing development management programs.

If the entities subject to the Copermittee's legal authority do not implement appropriate corrective actions in a timely manner, or if violations repeat, the Copermittee must take progressively stricter responses to enforce its legal authority and achieve compliance with its ordinances, permits, or other requirements to *"effectively prohibit non-stormwater discharges"* and "*reduce the discharge of pollutants to the maximum extent practicable.*"

Provision E.7 (Public Education and Participation) requires each Copermittee to implement a public education and participation program. Proper implementation of the public education and participation program as part of its jurisdictional runoff management program will contribute toward effectively prohibiting non-storm water discharges to the MS4, and toward the reduction of pollutants in storm water from the MS4 to the MEP.

Provision E.7 establishes the minimum requirements that each Copermittee must implement to engage members of the public as part of its jurisdictional runoff management program. In the Fourth Term Permits, the public education program requirements and the public participation requirements were included as separate jurisdictional runoff management program components. In this Order, the public education requirements have been consolidated with the public participation requirements, as both sets of requirements are related to the engagement of the public by each Copermittee. Engagement of the public is critical for the success of each Copermittee's jurisdictional runoff management program.

The Copermittees have been implementing public education programs for the last 20 years, which are now well established. The specificity of expected public education program elements of the Fourth Term Permits has been removed. For the most part, the public education program requirements in Provision E.7.a have been reduced to a set of requirements that are specifically included in the federal regulations under 40

CFR 122.26(d)(2)(iv)(A)(6), 122.26(d)(2)(B)(6) and 122.26(d)(2)(D)(4), which should already be incorporated into each Copermittee's existing public education program. Each Copermittee is expected to utilize the information and data collected from the monitoring and assessments conducted within the Watershed Management Area, and from its inventories and inspections to best direct its public education program resources toward addressing the highest priority water quality conditions identified within the Water Quality Improvement Plan.

According to 40 CFR 122.26(d)(2)(iv), public participation is required to be included as part of the "*comprehensive planning process*", which includes the development and implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs. The requirements under Provision E.7.b specify the opportunities that the public must be provided to be involved in the "*comprehensive planning process*", as required by to 40 CFR 122.26(d)(2)(iv).

Provision E.8 (Fiscal Analysis) requires each Copermittee to secure the resources and provide an analysis of the resources that will be necessary to implement the requirements of the Order. Adequate fiscal resources are necessary for a jurisdictional runoff management program to effectively prohibit non-storm water discharges to the MS4, and reduce pollutants in storm water from the MS4 to the MEP.

According to 40 CFR 122.26(d)(2)(vi), each Copermittee is responsible for providing "*a fiscal analysis of the necessary capital and operation and maintenance expenditures necessary to accomplish the activities*" required by this Order, including "*a description of the source of funds that are proposed to meet the necessary expenditures, including legal restrictions on the use of such funds.*" The fiscal analysis requirements of Provision E.8 are consistent with 40 CFR 122.26(d)(2)(vi).

The San Diego Water Board has chosen not to require a description of fiscal benefits realized from implementation of the jurisdictional runoff management programs. This is a recommendation from the National Association of Flood and Stormwater Management Agencies.[44] For instance, the fiscal analysis requirements do not address city-wide fiscal benefits of protection (e.g., public health, tourism, property values, economic activity, beneficial uses, etc.), even though many costs currently reported to the San Diego Water Board are for related activities. This type of assessment may help Copermittees improve the allocation of resources and it may help the Copermittees secure adequate funding for the program. Qualitative assessments, however, could be overly subjective and most Copermittees likely lack the ability to provide accurate quantitative assessments. The San Diego Water Board encourages the Copermittees to consider means for conducting assessments of fiscal benefits derived from the programs. Such assessments could be conducted on a

[44] National Association of Flood and Stormwater Management Agencies. 2006. *Guidance for Municipal Stormwater Funding.* Prepared under a grant provided by the USEPA.

regional scale similar to studies of program costs conducted by the State Water Board.[45]

[45] State Water Board, 2005. NPDES Stormwater Cost Survey.

F. Reporting

Purpose: Provision F includes the requirements for the documents and reports that the Copermittees must prepare and provide to the San Diego Water Board. The documents prepared by the Copermittees and provided to the San Diego Water Board and made available to the public will provide the documentation that the Copermittees are complying with the requirements of the Order.

***Discussion*:** Provision F requires the Copermittees to prepare several documents and reports that must be provided to the San Diego Water Board and made available to the public. The reporting requirements have been significantly reduced compared to the Fourth Term Permit reporting requirements. The reduction in reporting requirements was recommended by the San Diego County Copermittees in the Report of Water Discharge submitted in June 2011.

More specific and detailed discussions of the requirements of Provision F are provided below.

Provision F.1 (Water Quality Improvement Plans) requires the Copermittees in each Watershed Management Area to develop and submit a Water Quality Improvement Plan in accordance with the requirements of Provision B.

Of all the requirements of Provision F, the Water Quality Improvement Plans will likely be the documents requiring the most significant effort to develop. The content of the Water Quality Improvement Plans, however, is expected to include content that should already have been developed for the Watershed Plans and several elements that are included in the Monitoring and Reporting Programs required under the Fourth Term Permits.

Because the Water Quality Improvement Plan is part of the "*comprehensive planning process which involves public participation*," Provision F.1 includes requirements to give multiple opportunities to the public to provide input on the content of the plans.

Provision F.1.a.(1) specifies the elements that the Copermittees must include in the public participation process for the development of the Water Quality Improvement Plans. In order for the public to be aware of the opportunities to provide input, Provision F.1.a.(1)(a) requires the Copermittees to develop a publicly available and noticed schedule of the opportunities for the public to participate and provide comments during the development of the Water Quality Improvement Plan. These opportunities are when the public can provide the data, information, and recommendations that the Copermittees can consider during the development of the Water Quality Improvement Plans.

The San Diego Water Board recognizes, however, that the Copermittees cannot be expected to incorporate all the data, information, and recommendations that the public may provide into the Water Quality Improvement Plans. The Copermittees will have to review the data, information, and recommendations received and make some decisions on what to incorporate into the Water Quality Improvement Plans. Before the Copermittees finalize their decisions, members of the public should be allowed to review the Copermittees' decisions. Thus, Provision F.1.a.(1)(b) requires the Copermittees to form a Water Quality Improvement Consultation Panel (Panel).

The Panel will consist of a member from the environmental community and a member from the development community familiar with the Watershed Management Area. A representative from the San Diego Water Board staff will also be part of the Panel. The Copermittees may choose to include additional members, but the Panel is only required to include three panel members.

The Panel will serve as an additional public participation and input mechanism during the development of the Water Quality Improvement Plans. The knowledge and expertise from these Panel members are expected to provide the Copermittees valuable direction during their decision-making process. The Copermittees will review the content of their planned submittals with the Panel members to receive recommendations. If the Panel provides recommendations, the Copermittees must consider revisions to the Water Quality Improvement Plan submittals.

The San Diego Water Board recognizes that the development of multiple Water Quality Improvement Plans concurrently may limit the ability of the public to review and provide comments to the Copermittees. Thus, Provision F.1.a.(1)(c) requires the Copermittees to coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public time and opportunity to participate during the development of the Water Quality Improvement Plans.

Provision F.1.a.(2) requires the Copermittees to develop and submit the first Water Quality Improvement Plan component, in accordance with the requirements of Provision B.2, which includes the identification of the priority water quality conditions and potential water quality improvement strategies. The public must be provided an opportunity to provide data, information and recommendations to be utilized in the development and identification of the priority water quality conditions and potential water quality improvement strategies for the Watershed Management Area. The Copermittees must consult with the Panel and consider making revisions. The Copermittees may submit the requirements of Provision B.2 as early as 6 months and no later than 12 months after the commencement of coverage under this Order. After the requirements of Provision B.2 are submitted to the San Diego Water Board, the public will be provided another opportunity to provide comments.

Provision F.1.a.(3) requires the Copermittees to develop and submit the second Water Quality Improvement Plan component, in accordance with the requirements of

Provision B.3, which includes the identification of the numeric goals for the highest priority water quality conditions identified for the Watershed Management Area, and the strategies that will be implemented to achieve the potential numeric goals. The Copermittees may also develop the Optional Watershed Management Area Analysis, in accordance with the requirements of Provision B.3.b.(4), as part of this submittal. The public must be provided an opportunity to provide data, information and recommendations to be utilized in the development and identification of the numeric goals and water quality improvement strategies for the Watershed Management Area. The Copermittees must consult with the Panel and consider making revisions. The Copermittees may submit the requirements of Provision B.3 as early as 9 months and no later than 18 months after the commencement of coverage under this Order. After the requirements of Provision B.3 are submitted to the San Diego Water Board, the public will be provided another opportunity to provide comments.

Finally, Provision F.1.b describes the process for the submittal and implementation of the Water Quality Improvement Plans. The complete Water Quality Improvement Plans are required to be submitted by the Copermittees within 24 months after the commencement of coverage under this Order. The San Diego Water Board will provide the public an opportunity to provide comments on each complete Water Quality Improvement Plan.

The San Diego Water Board will review each Water Quality Improvement Plan and the public comments received to determine if the Copermittees have submitted a Water Quality Improvement Plan that meets the requirements of Provision B. If a Water Quality Improvement Plan does not meet the requirements of Provision B, the Copermittees will be considered out of compliance and directed in writing by the San Diego Water Board Executive Officer to correct the deficiencies.

When a Water Quality Improvement Plan meets the requirements of Provision B, the San Diego Water Board will determine whether to hold a public hearing or to limit public input to submittal of written comments before accepting the Water Quality Improvement Plan. Implementation of the Water Quality Improvement Plan must begin within 30 days of acceptance.

The San Diego Water Board expects that any deficiencies in the Water Quality Improvement Plan will be identified either in the public comments or during the review by the San Diego Water Board before implementation begins. In the event any deficiencies are identified after the implementation of the Water Quality Improvement Plan, Provision F.1.b.(7) clarifies that the San Diego Water Board maintains the right to require the Copermittees to correct any deficiencies that may be identified.

Provision F.2 (Updates) requires the Copermittees to update specific documents that the Copermittees will utilize to implement the requirements of this Order.

Each Copermittee is required to continue implementing a jurisdictional runoff management program, as required under Provision E. Implementation of each Copermittee's jurisdictional runoff management program is directed by its jurisdictional runoff management program document. Provision F.2.a requires each Copermittee to update its jurisdictional runoff management program document to be consistent with the requirements of Provision E concurrent with the submittal of the Water Quality Improvement Plan.

Likewise, each Copermittee must continue to require new development and redevelopment projects to implement BMPs to control pollutants in storm water runoff. The control of pollutants in storm water runoff from development and redevelopment projects within each Copermittee's jurisdiction is guided and directed by its BMP Design Manual, formerly known as a Standard Storm Water Mitigation Plan (SSMP). Provision F.2.b requires each Copermittee to update its BMP Design Manual to be consistent with the requirements of Provision E.3 concurrent with the submittal of the Water Quality Improvement Plan.

In general, the requirements of the Order should not necessitate a complete rewrite of each Copermittee's jurisdictional runoff management program document or BMP Design Manual, as was required by the Third Term Permits. The jurisdictional runoff management program and BMP Design Manual requirements of this Order are not significantly different than the requirements of the Fourth Term Permits. Thus, only sections of the Order which are new or have been significantly changed should warrant revisions to specific sections of the Copermittee's jurisdictional runoff management program document and BMP Design Manual.

Finally, the Water Quality Improvement Plans are expected to require updates as the iterative approach and adaptive management process included in the Water Quality Improvement Plan, as required under Provision B.5, is implemented by the Copermittees. Provision F.2.c.(1) requires the Copermittees to implement a public participation process for the proposed updates, review the proposed updates with the Panel, and submit the updates to the Water Quality Improvement Plan as part of the Annual Reports required under Provision F.3.b.

Also, because TMDLs are likely to be developed, adopted and approved during the term of the Order, Provision F.2.c.(2) has been included to expedite the incorporation of TMDLs into the Copermittees' Water Quality Improvement Plans as part of the update process, potentially before the Order is re-opened to incorporated the requirements of the new TMDLs.

Provision F.3 (Progress Reporting) requires the Copermittees to report on the progress of implementing the Water Quality Improvement Plans.

The requirements of Provision F.3 are to report the progress toward improving water quality that the Copermittees are achieving with the implementation of the Water

Quality Improvement Plans and each Copermittee's jurisdictional runoff management program. The Progress Report Presentations required under Provision F.3.a are included to provide the Copermittees an opportunity to communicate directly with the San Diego Water Board and the public. The Progress Report Presentations will also provide the members of the San Diego Water Board and members of the public an opportunity to become more acquainted with the Copermittees and their projects and programs to address non-storm water and storm water discharges into and from their MS4s.

The Annual Report requirements of Provision F.3.b are a consolidation of several reporting requirements from the Fourth Term Permits, including the Jurisdictional Runoff Management Program Annual Reports, the Watershed Annual Reports, and the Monitoring and Reporting Program Annual Reports. Furthermore, the Annual Report requirements are consistent with the requirements under 40 CFR 122.42(c).

Pursuant to 40 CFR 122.42(c), "*[t]he operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the Director…must submit an annual report*", which must include the following:

(1) *The status of implementing the components of the storm water management program that are established as permit conditions* [40 CFR 122.42(c)(1)];

(2) *Proposed changes to the storm water management programs that are established as permit conditions* [40 CFR 122.42(c)(2)];

(3) *Revisions, if necessary, to the assessment of controls and fiscal analysis* [40 CFR 122.42(c)(3)];

(4) *A summary of data, including monitoring data, that is accumulated throughout the reporting year* [40 CFR 122.42(c)(4)];

(5) *Annual expenditures and budget for year following each annual report* [40 CFR 122.42(c)(5)];

(6) *A summary describing the number and nature of enforcement actions, inspections, and public education programs* [40 CFR 122.42(c)(6)];

(7) *Identification of water quality improvements or degradation* [40 CFR 122.42(c)(7)].

Under the Fourth Term Permits, each Copermittee is responsible for submitting a Jurisdictional Runoff Management Program Annual Report; the Copermittees in each designated watershed are responsible for submitting a Watershed Annual Report; and the Copermittees from each county are responsible for submitting a Monitoring and Reporting Program Annual Report.

There are 39 Copermittees in the San Diego Region, each required to prepare and submit a Jurisdictional Runoff Management Program Annual Report. There are 9 designated watersheds in San Diego County, 6 designated watersheds in Orange County, and 1 designated watershed in Riverside County for a total of 16 designated watersheds, each requiring a Watershed Annual Report. There are 3 sets of Copermittees in 3 counties in the San Diego Region, requiring Copermittees from each county to prepare and submit a Monitoring and Reporting Program Annual Report. Thus each Copermittee is currently required to prepare, or participate in the preparation of at least 3 annual reports. In addition, the San Diego County Copermittees are required to prepare and submit a Regional Urban Runoff Management Plan Annual Report.

In total, there are 59 annual reports that are prepared by the Copermittees and submitted to the San Diego Water Board for the Fourth Term Permits. The preparation of these annual reports requires significant time and resources from each Copermittee, which could otherwise be expended on actions that could improve water quality within its jurisdiction. In turn, significant time and resources are required from the San Diego Water Board staff to review these reports, which could otherwise be expended on working directly with the Copermittees to improve their implementation efforts toward restoring and protecting water quality.

Until the Water Quality Improvement Plans are developed, there will be a transitional period during which the Copermittees will continue to implement their existing jurisdictional runoff management programs. There will also be a transitional period during which the Copermittees will implement the transitional monitoring and assessment requirements of Provision D. During the transitional period, the Copermittees will submit annual reports pursuant to the requirements of Provisions F.3.b.(1) and F.3.b.(2).

Provision F.3.b.(1) includes the transitional annual reporting requirements for each Copermittee's jurisdictional runoff management program. The reporting of the jurisdictional runoff management program implementation efforts have been reduced to a single 2-page form. Each Copermittee is required to complete and submit a Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D or a revised form accepted by the San Diego Water Board) no later than October 31 of each year for each jurisdictional runoff management program reporting period (i.e. July 1 to June 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted. The Jurisdictional Runoff Management Program Annual Report Form will certify that each Copermittee has implemented its jurisdictional runoff management program in accordance with the requirements of Provision E. Each Copermittee may choose to continue to utilize and submit the jurisdictional runoff management program annual reporting format of its current Order until the first Water Quality Improvement Plan Annual Report is required to be submitted.

Provision F.3.b.(2) includes the transitional annual reporting requirements for the transitional monitoring and assessment program for each Watershed Management Area. The Copermittees in the Watershed Management Area are required to submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted. The Transitional Monitoring and Assessment Program Annual Report is required to include the transitional period monitoring data collected pursuant to Provisions D.1.a and D.2.a, and the findings from the transitional period findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

Provision F.3.b.(3) includes the Water Quality Improvement Plan Annual Report requirements. Only one Water Quality Improvement Plan Annual Report is required for each of the ten (10) Watershed Management Areas designated under Provision B.1, which is a significant reduction in the number of annual reports required to be prepared and submitted by the Copermittees. The Water Quality Improvement Plan Annual Report will document the Copermittees' efforts to implement the Water Quality Improvement Plan. Each Water Quality Improvement Plan Annual Report will be focused primarily on reporting the analysis of the monitoring data collected pursuant to Provisions D.1-D.3 during the reporting period, and the assessments that are required pursuant to Provision D.4 based on the data. The monitoring data analyses and the assessments that are provided in the Water Quality Improvement Plan Annual Report will be the core of the report. The reporting of the jurisdictional runoff management program implementation efforts have been reduced to a single 2-page form, and will no longer be the primary focus of the reporting requirements as in the Third and Fourth Term Permits.

Each Copermittee will continue to prepare and submit a Jurisdictional Runoff Management Program Annual Report Form as part of the Water Quality Improvement Plan Annual Report to certify that each Copermittee has implemented its jurisdictional runoff management program in accordance with the requirements of Provision E. Instead of reviewing a voluminous report from each Copermittee, as was required under the Third and Fourth Term Permits, the San Diego Water Board will conduct audits of each Copermittee's jurisdictional runoff management program to investigate and confirm the information provided by each Copermittee on its Jurisdictional Runoff Management Program Annual Report Form. The audits will allow the San Diego Water Board to become more familiar with the each Copermittee's jurisdictional runoff management program, and each Copermittee will become more informed about the expectations of the San Diego Water Board.

The reduction in the number and content of the Water Quality Improvement Plan Annual Reports should result in significant time, cost and resource savings for the Copermittees, as well as the San Diego Water Board. Those savings should offset a significant portion of any additional costs that may be incurred to develop the Water

Quality Improvement Plans and to implement the monitoring and assessment program requirements of Provision D.

The reporting period for the Water Quality Improvement Plan Annual Reports consists of two periods. Because the jurisdictional runoff management programs are typically budgeted and implemented during a fiscal year, the information provided on the Jurisdictional Runoff Management Program Annual Report Forms will cover the period from July 1 to June 30 of the following year.

The Water Quality Improvement Plan Annual Reports, however, are focused primarily on the monitoring data and the assessments based on the monitoring data. The monitoring data is collected during the monitoring year, which begins October 1 and ends September 30 of the following year. The monitoring year begins after the beginning of the fiscal year and ends after the end of the fiscal year. Therefore, to accommodate and capture the information collected during the fiscal year and the monitoring year, the Annual Report reporting period incorporates both periods.

Finally, Provision F.3.c requires the Copermittees to develop and submit a Regional Monitoring and Assessment Report. The Regional Monitoring and Assessment Report is similar to the Long Term Effectiveness Assessment required under the Fourth Term San Diego County Permit. The Regional Monitoring and Assessment Report is expected to utilize the entire body of data and information collected by the Copermittees during the term of this Order to assess improvements to water quality on a regional scale.

Provision F.4 (Regional Clearinghouse) requires the Copermittees to develop, update, and maintain an internet-based Regional Clearinghouse that can be used to store, disseminate, and share the Copermittees' documents, monitoring data, special studies, and any other data or information.

Most of the documents and data that are generated by the Copermittees can be provided in electronic format, and made available to the San Diego Water Board and the public on the internet. The San Diego Water Board has been gradually transitioning its document submittal requirements to electronic submittals. Provision F.4 has been included to further these efforts.

Provision F.4 has also been included to improve the exchange and availability of information among the Copermittees, as well as between the Copermittees and the San Diego Water Board. Provision F.4 will also make the information generated during the implementation of the Order more accessible to the public.

Provision F.5 (Report of Waste Discharge) requires the Copermittees to submit a Report of Waste Discharge to reapply for renewal of the Order prior to its expiration, in accordance with 40 CFR 122.21(d)(2) and CWC section 13376.

Because the ~~Orange County and~~ Riverside County Copermittees will not be subject to the requirements of this Order until they are notified of coverage, Provision F.5.a describes the process of submitting a ~~their~~ Report~~s~~ of Waste Discharge pursuant to the requirements of their current permit~~s~~ to obtain coverage under this Order.

For the Copermittees subject to the requirements of this Order, Provision F.5.b requires the Copermittees to submit a Report of Waste Discharge 180 days in advance of the expiration of this Order. Provision F.5.b also describes the minimum information to be included in the Report of Waste Discharge, based on USEPA guidance "Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems," dated May 17, 1996.

Provision F.6 (Application for Early Coverage) describes the process that would allow the Orange County and/or Riverside County Copermittees to obtain coverage under this Order earlier than the expiration of their current Orders.

If the ~~Orange County and/or~~ Riverside County Copermittees choose to obtain coverage under this Order earlier than the expiration of their current Orders, the preparation and submittal of a Report of Waste Discharge, as required by the Fourth Term Permits, will not be necessary. The existing Order for the respective county will be rescinded upon the effective coverage date under this Order, except for enforcement purposes.

G. Principal Watershed Copermittee Responsibilities

Purpose: Provision G includes the requirements for the Principal Watershed Copermittee designated by the Copermittees in each Watershed Management Area.

***Discussion*:** Unlike previous NPDES requirements, there will no longer be a single Principal Copermittee. Provision G.1 requires the Copermittees to designate a Principal Watershed Copermittee for each Watershed Management Area. There are ten (10) Watershed Management Areas in the San Diego Region, as defined in Table B-1 under Provision B.1 of the Order. An individual Copermittee should not be the Principal Watershed Copermittee for more than two (2) Watershed Management Areas. There could be up to ten (10) Principal Water Copermittees designated for the Watershed Management Areas in the San Diego Region.

Provision G.2 describes the minimum responsibilities of each Principal Watershed Copermittee. The primary responsibility of the Principal Watershed Copermittees is to serve as the liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues. Ideally, the Principal Watershed Copermittee can represent the interests of all the Copermittees within a Watershed Management Area during discussions or meetings to facilitate communication with the San Diego Water Board. The Principal Watershed Copermittees are also responsible for facilitating and coordinating the implementation efforts of the Copermittees and submittals of required documents and reports.

The Principal Watershed Copermittee is responsible for facilitating the efforts of the Copermittees within the Watershed Management Area to develop the Water Quality Improvement Plan required under Provision B, and submit it for approval in accordance with Provision F.1. The Principal Watershed Copermittee is also responsible for coordinating the submittal of the document updates, Progress Report Presentations, and Annual Reports required from the Copermittees within each Watershed Management Area under Provisions F.2, F.3.a, and F.3.b. The Principal Watershed Copermittees are responsible for coordinating with each other to develop and submit the Regional Clearinghouse, Regional Monitoring and Assessment Report, and the Report of Waste Discharge required under Provisions F.3.c, F.4, and F.5.

The designated Principal Watershed Copermittee for each Watershed Management Area does not necessarily have to serve as the Principal Watershed Copermittee for the entire term of the Order. If the Copermittees in a Watershed Management Area choose to designate a new Principal Watershed Copermittee, the change may be submitted as part of the Annual Report required under Provision F.3.b, with an update to the Water Quality Improvement Plan in accordance with Provision F.2.c.

Provision G.3 specifies that the Principal Watershed Copermittee is not responsible for ensuring that the other Copermittees within the Watershed Management Area are in compliance with the requirements of this Order

H. Modification of Order

Purpose: Provision H provides the conditions under which modifications to Order No. R9-2013-0001, as amended, may occur.

***Discussion*:** Provision H allows for modifications to Order No. R9-2013-0001, as amended, for bases in addition to modifications (minor and major) allowed under the federal regulations at. Minor modifications may be made by the San Diego Water Board Executive Officer without a public notice or public hearing. Minor modifications are defined under 40 CFR 122.62 and 122.63. Minor modifications under 40 CFR 122.63 potentially applicable to this Order are the following:

Correcting typographical errors;

Requiring more frequent monitoring or reporting by the Copermittees;

Changing an interim compliance date in a schedule of compliance, provided the new date is not more than 120 days after the date specified in the existing permit and does not interfere with attainment of the final compliance date requirement.

Modifications that are not one of the above minor modifications willto the Order require re-opening the Order (see Water Code section 13223), subject to the requirements of 40 CFR 122.44, 122.62 to 122.64, and 124.5, but only for the specific provisions subject to the modification. Proposed mModifications of the Order that are not minor require a draft Order with the proposed modificationswill be made available for public review, a public notice and comment period, and a public hearing if requested. Comments on the provisions not subject to the proposed modifications are not required to be considered in the San Diego Water Board's responses to comments or during the public hearing.

Provision H.4 was included to specify that the Order will be re-opened for modifications if the State Water Board determines revisions to Provision A are warranted, an application for early coverage under the Order is received pursuant to Provision F.6, the Basin Plan is amended to modify an existing TMDL or incorporate a new TMDL, or the monitoring and assessment program requirements need to be updated or revised.

Provision H.5 was included to specify that the San Diego Water Board will re-open and consider modifications to this Order when the Orange County Copermittees or the Riverside County Copermittees submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders

I. Standard Permit Provisions and General Provisions

Purpose: Provision I incorporates the standard permit provisions required to be included in all NPDES permits, as well as several other general provisions.

***Discussion*:** Provision I refers to Attachment B to the Order. Attachment B expressly incorporates the conditions applicable to all NPDES permits as provided under 40 CFR 122.41(a)-(n), as well as the applicable conditions for MS4s and storm water discharges provided under 40 CFR 122.42(c) and 40 CFR 122.42(d), respectively. Attachment B also includes several general provisions that are typically included in or applicable to waste discharge requirements issued by the San Diego Water Board.

IX. ATTACHMENTS

The attachments to the Order are discussed below. The discussions describe the content of the attachments.

Attachment A – Discharge Prohibitions and Special Protections

Section 1 of Attachment A includes the Waste Discharge Prohibitions from the Basin Plan. They have been provided verbatim in their entirety.

Section 2 of Attachment A includes the "*Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges*" applicable to permitted point source discharges of storm water, adopted under State Water Board Resolution No. 2012-0012, as amended by Resolution No. 2012-0031. The terms, prohibitions, and special conditions (collectively referred to as special conditions) are established as limitations on point source storm water discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in ASBS, as required for State Water Quality Protection Areas pursuant to California Public Resources Code sections 36700(f) and 36710(f). These Special Protections were adopted by the State Water Board as part of the Ocean Plan General Exception.

Attachment B – Standard Permit Provisions and General Provisions

Conditions applicable to all NPDES permits, as required under 40 CFR 122.41, and conditions applicable to MS4s and storm water discharges, as required under 40 CFR 122.42(c) and 122.42(d), respectively are provided in Attachment B to the Order. They have been provided expressly in their entirety.

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. These general provisions are typically included in or applicable to waste discharge requirements issued by the San Diego Water Board. Many of the general provisions were developed by the State Water Board. Where a general provision is derived from statute or regulation, a citation of the statute or regulation section is provided. General provisions that do not provide a citation are included under the authority provided CWC 13377.

Attachment C – Acronyms, Abbreviations and Definitions

The acronyms and abbreviations that are used in the Order are provided in Attachment C. Attachment C also includes definitions that may provide an explanation or description of the meaning or intent of specific terms or phrases included in the Order.

Attachment D – Jurisdictional Runoff Management Program Annual Report Form

An example of the Jurisdictional Runoff Management Program Annual Report Form required to be submitted by each Copermittee as part of the Annual Reports required under Provision F.3.b.(1)(e) is provided as Attachment D to the Order. An electronic version of the form will be available from the San Diego Water Board after the adoption of the Order.

The Jurisdictional Runoff Management Program Annual Report Form includes the minimum information necessary to demonstrate that the Copermittee is implementing and in compliance with the requirements of Provision E, and includes much of the information required to be reported pursuant to 40 CFR 122.42(c).

The information that must be provided on the Jurisdictional Runoff Management Program Annual Report Form is limited to the fiscal year, which begins July 1 and ends June 30 of the following year. The information expected to be provided by the Copermittees in each section of the Jurisdictional Runoff Management Program Annual Report Form is discussed below.

I. COPERMITTEE INFORMATION

The name of the Copermittee (e.g. name of city, county, or special district) and the contact information for the storm water program manager are provided under this section.

II. LEGAL AUTHORITY

The Copermittee must confirm whether or not the legal authorities under Provision E.1.a have been established for itself within its jurisdiction.

The Copermittee must also confirm whether or not a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority, as required under Provision E.1.b. The certification statement required by Provision E.1.b is only required to be submitted with the first Annual Report required under Provision F.3.b.

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

The Copermittee must inform the San Diego Water Board whether or not an update to its jurisdictional runoff management program document was required or recommended by the San Diego Water Board during the reporting period. An update to the jurisdictional runoff management program is required under Provision F.2.a. The San Diego Water Board may recommend modifications to the jurisdictional runoff management program as part of the iterative approach and adaptive management process required under Provision B.5, which may result in an update that is necessary for the Copermittee's jurisdictional runoff management document.

If an update was required or recommended, the Copermittee must confirm whether or not the update was completed and made available on the Regional Clearinghouse within the reporting period. If no update was required or recommended, an answer is not required. If the answer is NO, meaning the required or recommended update was not completed and/or made available on the Regional Clearinghouse, the Copermittee must attach a

schedule for the completion of the update and/or posting of the updated document on the Regional Clearinghouse.

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

The Copermittee must confirm whether or not a program was implemented during the fiscal year to actively detect and eliminate illicit discharges and connections in accordance with the requirements under Provision E.2.

In addition to confirming that a program to detect and eliminate illicit discharges was implemented during the reporting period, the Copermittee is also required to report on several items related to the program. The information that must be reported is limited to the fiscal year for the Annual Report.

All non-storm water discharges are considered illicit discharges unless the source is identified as one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5). If a non-storm water discharge is identified as one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5), the discharge is a non-storm water discharge, but not an illicit discharge. If a non-storm water discharge is identified but not in one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5), the discharge is both a non-storm water discharge and an illicit discharge.

V. DEVELOPMENT PLANNING PROGRAM

The Copermittee must confirm whether or not a development planning program was implemented during the fiscal year in accordance with the requirements under Provision E.3.

The Copermittee must also inform the San Diego Water Board whether or not an update to its BMP Design Manual was required or recommended by the San Diego Water Board during the fiscal year. An update to the BMP Design Manual is required under Provision F.2.b. The San Diego Water Board may recommend modifications to the BMP Design Manual, which may result in an update that is necessary for Copermittee's the BMP Design Manual.

If an update was required or recommended, the Copermittee must confirm whether or not the update was completed and made available on the Regional Clearinghouse within the reporting period. If no update was required or recommended, an answer is not required. If the answer is NO, meaning the required or recommended update was not completed and/or made available on the Regional Clearinghouse, the Copermittee must attach a schedule for the completion of the update and/or posting of the updated document on the Regional Clearinghouse.

The Copermittee is also required to report on several items related to the program. For the development and redevelopment projects that are reviewed under the program, the Copermittee must report the total number projects submitted for review during the fiscal year. Of those projects, the Copermittee must report the number that are Priority Development Projects, as defined under Provision E.3.b.(1). The Copermittee must also report the number of Priority Development Projects that were approved and/or granted occupancy during the fiscal year, regardless of when the project was originally submitted for review. Any projects that were approved during the fiscal year and granted any

exemptions from the BMP Design Manual requirements and/or allowed to implement alternative compliance options in accordance with Provision E.3.c.(3) must be reported.

Finally, the Copermittee must also report on several items related to its oversight of permanent BMPs on Priority Development Projects within its jurisdiction, as required under Provision E.3.e. The information that must be reported is limited to the fiscal year for the Annual Report.

VI. CONSTRUCTION MANAGEMENT PROGRAM

The Copermittee must confirm whether or not a construction management program was implemented during the fiscal year in accordance with the requirements under Provision E.4.

The Copermittee is also required to report on several items related to its oversight construction projects within its jurisdiction. The information that must be reported is limited to the fiscal year for the Annual Report.

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

The Copermittee must confirm whether or not an existing development management program was implemented during the fiscal year in accordance with the requirements under Provision E.5.

The Copermittee is also required to report on several items related to its oversight in areas of existing development within its jurisdiction. The information that must be reported is limited to the fiscal year for the Annual Report. The information must also be separated into four categories of existing development: municipal, commercial, industrial, and residential.

VIII. PUBLIC EDUCATION AND PARTICIPATION

The Copermittee must confirm whether or not a public education program component was implemented during the fiscal year in accordance with the requirements under Provision E.7.a.

The Copermittee must also confirm whether or not a public participation program component was implemented during the fiscal year in accordance with the requirements under Provision E.7.b.

IX. FISCAL ANALYSIS

The Copermittee must confirm a summary of its fiscal analysis, conducted in accordance with the requirements under Provision E.8, has been attached to the form.

X. CERTIFICATION

A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative must sign and certify the Jurisdictional Runoff Management Program Annual Report Form. The appropriate box must be checked to indicate the whether a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative is signing the form.

Attachment E – Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2013-0001

Attachment E provides specific provisions for implementing the load allocations (LAs) and wasteload allocations (WLAs) of Total Maximum Daily Loads (TMDLs) adopted by the San Diego Water Board and approved by USEPA in which the Copermittees are identified as responsible for discharges subject to the requirements of the TMDLs. Federal regulations require that NPDES requirements incorporate water quality based effluent limitations (WQBELs) that must be consistent with the requirements and assumptions of any available WLAs,[46] which may be expressed as numeric effluent limitations, when feasible, and/or as a best management practice (BMP) program of expanded or better-tailored BMPs.[47] Where the TMDL includes WLAs that provide numeric pollutant load or pollutant parameter objectives, the WLA has been, where feasible, translated into numeric WQBELs.[48]

For each TMDL in Attachment E, four sections are included:

a. Applicability: This section provides the resolution under which the TMDL Basin Plan amendment was adopted and approved, with the applicable adoption and approval dates. This section also gives the effective date of the TMDL and where the TMDL is applicable (i.e. Watershed Management Area and water body). The Copermittees that are responsible for implementing the specific provisions are also given in this section.

b. Final TMDL Compliance Requirements: For each TMDL, the final TMDL compliance requirements consist of the final TMDL compliance date(s), the final WQBELs, and the final TMDL compliance determination requirements. The final WQBELs are expressed in terms of receiving water limitations, effluent limitations, and/or best management practices (BMPs). The final WQBELs for the TMDLs are incorporated by reference into Provision A of the Order. The final WQBELs become enforceable when the final TMDL compliance dates have passed. Applicable BMPs within the final WQBELs must be incorporated into the Water Quality Improvement Plans. Compliance with the final WQBELs will be determined in accordance with the options provided under the final TMDL compliance determination requirements.

c. Interim TMDL Compliance Requirements: If the final TMDL compliance date has not passed and there are interim TMDL compliance requirements, they are included in this section. If there are interim WQBELs with interim compliance dates, the interim WQBELs become enforceable when the corresponding interim compliance dates have passed. Compliance with the interim WQBELs will be determined in accordance with the options provided under the interim TMDL compliance determination requirements.

d. Specific Monitoring and Assessment Requirements: If there are specific monitoring and assessment requirements that cannot be met with the monitoring and assessment program

[46] 40 CFR 122.44(d)(1)(vii)(B)
[47] 40 CFR 122.44(k)(2) and 40 CFR 122.44(k)(3)
[48] November ~~12, 2010~~26, 2014 Memorandum from the USEPA, Revisions to the November 22, 2002 Memorandum "Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLA""

requirements under Provision D of the Order, the additional requirements are included in this section.

The requirements of the TMDLs are based on and consistent with the assumptions and requirements of any available adopted and approved TMDLs that have been incorporated into the Basin Plan. Modifications to the requirements for the TMDLs in Attachment E cannot be made unless the TMDLs are modified in the Basin Plan.

A modification to any aspect of a TMDL in the Basin Plan requires a Basin Plan amendment. A Basin Plan amendment to modify a TMDL will require the San Diego Water Board to adopt a resolution to amend the Basin Plan, which includes a separate public process. When the San Diego Water Board adopts a Basin Plan amendment, it subsequently requires approval from the State Water Board, the Office of Administrative Law, and the USEPA before it becomes effective.

If and when the TMDLs are a modified in the Basin Plan, the San Diego Water Board will revise the requirements of the Order ~~TMDL~~ in accordance with the Basin Plan amendment. When a Basin Plan amendment to modify a TMDL becomes effective, the San Diego Water Board will modify the requirements of the Order~~TMDL~~ pursuant to the requirements of Provision H.4 of the Order as soon as possible.

San Juan HU (901)

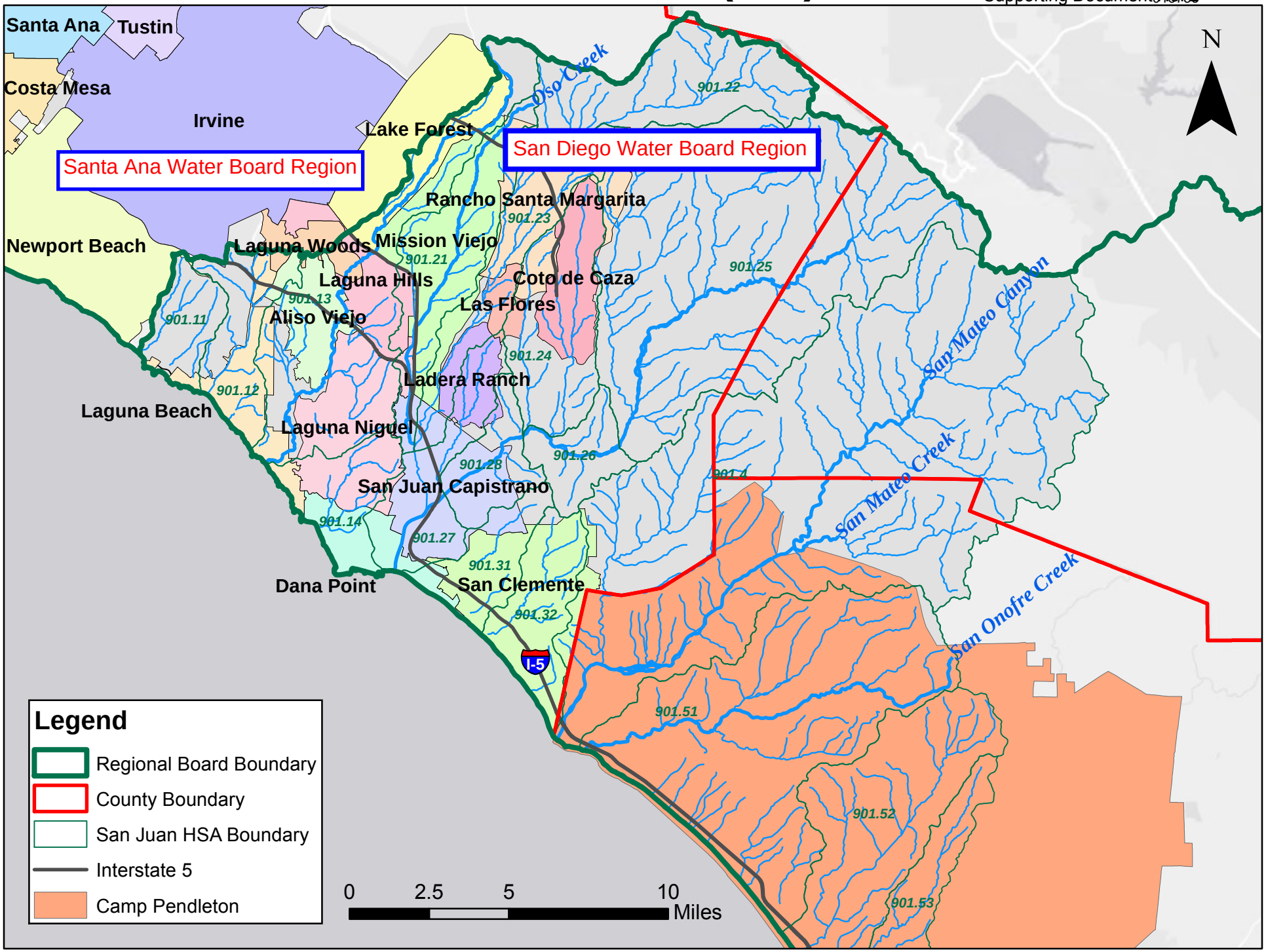

State of California
Regional Water Quality Control Board
San Diego Region

EXECUTIVE OFFICER SUMMARY REPORT
October 8, 2014

ITEM: 7

SUBJECT: Public Workshop: The San Diego Water Board will hold a public workshop to receive and discuss information on proposed amendments to the *Regional NPDES Permit for Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Order No. R9-2013-0001 or Regional MS4 Permit), including but not limited to, the incorporation of the County of Orange, several Incorporated Cities of South Orange County, and the Orange County Flood Control District as Copermittees (Tentative Order No. R9-2015-0001). (*Laurie Walsh and Christina Arias*)

PURPOSE: The San Diego Water Board is now in the process of considering amendments to the Regional MS4 Permit as described in Tentative Order No. R9-2015-0001 to incorporate the Orange County Copermittees and address other issues summarized below. The workshop is intended to provide information to San Diego Water Board members and address questions the Board members, the Copermittees, or the public may have regarding the Tentative Order. The Tentative Order was released for public review and comment on September 18, 2014 (**Supporting Document 1**).

RECOMMENDATION: There is no recommendation as this is a public workshop and the San Diego Water Board will take no action.

KEY ISSUES:

1. On May 20, 2014, the County of Orange, Orange County Flood Control District and the cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Lake Forest, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano (collectively referred to as Orange County Copermittees) jointly submitted a Report of Waste Discharge (RoWD) in application for the reissuance of their MS4 permit. The recommendations set forth in the RoWD for revised permit requirements are largely

consistent with the requirements of the Regional MS4 Permit adopted by the San Diego Water Board on May 8, 2013.

2. The Tentative Order proposes to amend the Regional MS4 Permit to designate the Orange County Copermittees as MS4 dischargers responsible for compliance with the terms and the conditions of the Permit.

PRACTICAL VISION: The Regional MS4 Permit directly implements several chapters of the San Diego Water Board's Practical Vision entitled *Healthy Waters, Healthy People.* Multiple provisions of the Permit pertain to the development and implementation of strategies to achieve healthy waters and recovery of stream, wetlands, and riparian ecosystems. These strategies implement an outcome-based approach, with a focus on achieving measureable reductions in MS4 pollutant discharges and improvements in receiving water quality. The Regional MS4 Permit also includes requirements for monitoring and assessment in order for the Copermittees to evaluate the success of their jurisdictional storm water management programs in a robust and meaningful way.

DISCUSSION: From the inception of the storm water permitting program in 1990 until 2013, the San Diego Water Board issued MS4 permits to Copermittees within its jurisdiction based on San Diego County, Orange County, and Riverside County political boundaries. Under this approach, regulation of MS4 discharges in San Diego, Riverside, and Orange Counties by the San Diego Water Board was accomplished under three separate municipal storm water permits which placed a significant permit administration burden on the Board. In an effort to better advance the storm water program and achieve regulatory consistency and economy of resources, the San Diego Water Board adopted the Regional MS4 Permit on May 8, 2013 to jointly cover municipal Copermittees in San Diego, Riverside, and Orange Counties. The Regional MS4 Permit was issued to Copermittees in San Diego County initially, as their Fourth Term MS4 permit expired.

Provision F.5 of the Regional MS4 Permit outlines a public hearing process to incorporate Copermittees in Orange and Riverside Counties following expiration of their current MS4 permits. Under this process the San Diego Water Board

must first review and consider a RoWD to determine whether the Copermittees should be enrolled under the Regional MS4 Permit and what changes to the Permit (as proposed in the RoWD) are appropriate.

The Orange County Copermittees are currently regulated by MS4 Permit Order No. R9-2009-0002, which will expire on December 16, 2014. The Orange County Copermittees jointly submitted a RoWD in application for MS4 permit reissuance on May 20, 2014. The Tentative Order proposes to amend the Regional MS4 Permit and enroll the Orange County Copermittees under the Permit. If the San Diego Water Board adopts the Tentative Order, the Orange County Copermittees will be the second group of Copermittees to obtain coverage under the Regional MS4 Permit. The last remaining group, the Riverside County Copermittees, will be considered for coverage under the Regional MS4 Permit in a future action following the expiration of their current MS4 Permit in November 2015, and after consideration of their RoWD submittal for MS4 Permit reissuance.

The San Diego Water Board has reviewed the Orange County Copermittees' RoWD, including its recommendations, and finds it to be consistent with the framework and intent of the Regional MS4 Permit. For example, the RoWD recommends a watershed approach to focus Copermittees' limited resources to more effectively improve conditions in receiving waters. This is consistent with the Regional MS4 Permit's emphasis on the implementation of Water Quality Improvement Plans, jointly developed by the Copermittees and stakeholders, to achieve watershed-specific priorities that will yield the greatest water quality improvements. Additionally, the Regional MS4 Permit requirements will provide considerably more flexibility for the Orange County Copermittees to manage their storm water programs to achieve watershed-specific priorities than their current MS4 permit. Based on consideration of the RoWD, the Orange County Copermittees should be incorporated in the Regional MS4 Permit as amended by the modifications described below.

In addition to incorporating the Orange County Copermittees, the Tentative Order also proposes to amend the Regional MS4 Permit to address a variety of other issues including: 1) Regional Water Board designation to consolidate regulation of Phase I MS4 discharges for the

Cities of Laguna Hills, Laguna Woods, and Lake Forest pursuant to Water Code section 13228, 2) incorporation of the Los Peñasquitos Lagoon Sediment Total Maximum Daily Load (TMDL) requirements, 3) the extension of a pollutant reduction deadline for MS4 discharges to Areas of Special Biological Significance, 4) incorporation of interim exemptions for hydromodification management, and 5) implementation of a uniform approach for monitoring beach water quality in south Orange County. All of these amendments are described in the Tentative Order and Attachments 1 and 2 thereto. The specific Permit and Fact Sheet language changes are highlighted in blue underline and red-strikeout text. A summary of each of these amendments is provided below:

Designation of a Regional Water Board

The Tentative Order proposes to amend the Regional MS4 Permit in Provision B.1 to consolidate regulation of MS4 discharges in the Cities of Laguna Hills, Laguna Woods, and Lake Forest under a single Regional Water Board. The political boundaries of these cities are split between the jurisdictions of both the Santa Ana Water Board and the San Diego Water Board, and their MS4 discharges have historically been regulated by both Boards. The map in **Supporting Document 4** shows these cities political boundaries in comparison to the Santa Ana Water Board and the San Diego Water Board regional boundaries. These cities have reported that management and implementation of municipal programs to comply with different MS4 permits administered by two Regional Water Boards presents an excessive administrative and financial burden. In an effort to address these concerns the San Diego Water Board and the Santa Ana Water Board are in the process of entering into an agreement whereby the San Diego Water Board is designated to regulate MS4 discharges within the jurisdiction of the Cities of Laguna Woods and Laguna Hills and the Santa Ana Water Board is designated to regulate MS4 discharges within the jurisdiction of the City of Lake Forest. As the basis for this agreement may change under future conditions, the Tentative Order provides that the San Diego Water Board will periodically review the effectiveness of the agreement during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate the agreement with the Santa Ana Water Board or otherwise modify the agreement subject to the approval of the Santa Ana Water Board.

Los Peñasquitos Sediment TMDL

The Tentative Order proposes to amend the Regional MS4 Permit in Attachment E to add the Los Peñasquitos Sediment TMDL to the Regional MS4 Permit. The Los Peñasquitos Sediment TMDL was adopted by the San Diego Water Board on June 13, 2012, and subsequently approved by the State Water Resources Control Board (State Water Board) on January 21, 2014, and the Office of Administrative Law on July 14, 2014, thereby making it effective. Although the TMDL is now effective, it is not self-implementing and requires incorporation into an NPDES permit in order to be implemented. Therefore the Tentative Order proposes amending the Regional MS4 Permit to include implementation provisions for this TMDL.

Special Conditions for Areas of Special Biological Significance (ASBS)

The Tentative Order also proposes to amend the Regional MS4 Permit in Attachment A.2 to include an extension of a pollutant reduction deadline for MS4 discharges to ASBS from four to six years as provided for by State Water Board Resolution No. 2012-0031. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject to the terms and conditions of State Water Board Resolution No. 2012-0031.

Hydromodification Control Requirement Modifications

In order to facilitate the Orange County Copermittees' transition to the Regional MS4 Permit, the Tentative Order proposes amending the Regional MS4 Permit in Provision E.3.c.(2) to allow two temporary exemptions from hydromodification management BMP implementation. The first exemption is for Priority Development Projects that discharge storm water runoff directly into an engineered channel conveyance system with a capacity to convey peak flows generated by the 10-year storm event from the point of discharge to a reservoir, lake, embayment, or the Pacific Ocean. The second exemption is for Priority Development Projects that discharge storm water runoff directly to a "large" river reach with a drainage area larger than 100 square miles and a 100-year flow capacity in excess of 20,000 cubic feet per second. The exemptions are short-term and will expire upon San Diego Water Board

acceptance of the San Juan Watershed Management Area Water Quality Improvement Plan (there is a mechanism for extending the exemptions based on rigorous, technical, and site specific analysis). The proposed approach is consistent with the approach to hydromodification management currently utilized by the San Diego County Copermittees.

Unified Approach for Beach Water Quality Monitoring
The Tentative Order incorporates a unified approach for beach water quality monitoring to eliminate duplicative monitoring, enable sharing of technical resources, trained personnel, and associated costs and consolidate beach water quality monitoring for fecal indicator bacteria required by various statutes. In 2012 the San Diego Water Board reviewed the various beach water quality monitoring programs conducted in south Orange County and convened a stakeholder workgroup to develop a unified regional beach water quality monitoring and assessment program. The program is outlined in the San Diego Water Board report entitled "*Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County,*" dated September 2014. The unified program is intended to be protective of the health of swimmers, surfers, and others who use south Orange County beach waters for water contact recreational activities. The Tentative Order amends the Regional MS4 permit at Provision D.1.e to require the Orange County Copermittees to participate in implementation of a unified regional beach water quality monitoring and assessment program, along with the South Orange County Wastewater Authority and Orange County Health Care Agency.

Activities to Date
On June 24, 2014, the San Diego Water Board staff met with the Orange County Copermittees to discuss the RoWD and the proposal to incorporate the Orange County Copermittees under the Regional MS4 Permit. On July 1, 2014, the San Diego Water Board held a public stakeholder meeting in the City of San Juan Capistrano to further discuss incorporation of the Orange County Copermittees under the Regional MS4 Permit, potential amendments to the Regional MS4 permit based on the RoWD, and the public review process. On September 18, 2014, the San Diego Water Board released the Tentative Order and Attachments thereto, for public review and comment. The transmittal letter is included as **Supporting Document 2**.

LEGAL CONCERNS: None.

SUPPORTING DOCUMENTS:

1. Tentative Order No. R9-2015-0001 with Attachments:
   Attachment 1 -- Revised Order No. R9-2013-0001
   Attachment 2 -- Revised Fact Sheet to Order No. R9-2013-0001
2. Transmittal Letter Announcing Availability of Tentative Order, dated September 18, 2014
3. Notice of Public Workshop
4. Map – San Juan Hydrologic Unit

PUBLIC NOTICE: Notice of this item was provided to interested persons via e-mail on September 5, 2014 (**Supporting Document 3**). Notice was also provided in the Meeting Notice and Agenda for the October 8, 2014 Board meeting, which is posted on the San Diego Water Board's website.

Response to Coastkeeper Letter Regarding Prior Lawful Approval dated October 8, 2014

On October 8, 2014 the San Diego Regional Water Quality Control Board ("RWQCB") conducted a workshop to accept public testimony regarding possible amendments to the Regional MS4 Permit ("Permit"). During the workshop testimony was presented by the County of San Diego and the Coalition[1] regarding Permit section E.3.e.(1)(a). Coastkeeper and the Coastal Environmental Rights Foundation submitted a comment letter ("Coastkeeper Letter').

After the presentations and questions by various board members, Chairman Abarbanel requested that the Coalition prepare further briefing concerning its views on the Coastkeeper letter and specifically on what issues it agrees with the Coastkeeper Letter. This briefing paper constitutes both that response as well as the Coalition's comments on suggested revisions to the Permit.

Purpose of Workshop

The Coastkeeper Letter states "it would be inappropriate for the Board to take any action on un-agenized matters at the workshop, CERF and Coastkeeper believe interested parties may urge the Board to consider amendments to the MS4 Permit to redefine "prior lawful approval"". The Coalition agrees.

The Coalition understands that the purpose of the workshop was to take testimony from interested parties and, while it failed to do so, direct RWQCB staff to draft revised language where appropriate for insertion into the Draft MS4 permit. The Coalition further understands that any amendments to the current permit would be subject to public review and comment prior to the RWQCB taking any formal action.

[1] The Coalition consists of environmental groups and associations representing various private stakeholders who have a keen interest in achieving water quality objectives within the San Diego region in the most efficient and cost effective manner. Coalition members include: San Diego Building Industry Association, Building Industry Association of Southern California; Associated General Contractors; Associated Builders and Contractors; San Diego Regional Chamber of Commerce; Business Leadership Alliance; San Diego Association of Realtors; San Diego Apartment Association; NAIOP (National Association of Industrial & Office Properties); BOMA (Building Office & Management Association; San Diego Chapter of the American Society of Landscape Architects.

Purpose of the Prior Lawful Approval Provision

Both the MS4 Permit and its associated fact sheet are silent on the rationale behind Permit section E.3.e.(1)(a). The Coastkeeper Letter states "If the Regional Board is interested in specifically defining prior lawful approval, a reconsideration should focus on traditional vested rights doctrines". The Coalition agrees that this is part of the rationale behind the PLA provision but disagrees that this is its entire purpose.

While the provisions that constitute Permit section E.3.e.(1)(a) has been modified over the last several permit cycles, the Coalition believes the purpose of the provision has always remained the same. That is, to allow Copermittees to use their land use authority to appropriately balance their obligation to achieve water quality objectives to the Maximum Extent Practical ("MEP") while honoring the property rights associated with public and private development projects whose entitlement cycles do not coincide with the MS4 permit cycles. The Coalition further believes that section E.3.e.(1)(a) is also intended to recognize that MEP is not a fixed standard but will vary based on the circumstances. The Coalition believes that by clarifying the intent of the Permit section E.3.e.(1)(a) the RWQCB will assist all of the interested parties in understanding the factors that the Copermittees need to balance in applying this provision of the Permit.

Maximum Extent Practical

The Permit explains the concept of Maximum Extent Practical ("MEP") as follows:

> The technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) for storm water that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) in combination with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than BAT. A definition for MEP is not provided either in the statute or in the regulations. Instead the definition of MEP is dynamic and will be defined by the following process over time: municipalities propose their definition of MEP by way of their runoff management programs. Their total collective and individual activities conducted pursuant to the runoff management programs becomes their proposal for MEP as it applies both to their overall effort, as well as to specific activities (e.g., MEP for street sweeping, or MEP for MS4 maintenance). In the absence of a proposal acceptable to the San Diego Water Board, the San Diego Water Board defines MEP.

As described above, the concept of MEP includes consideration of:

- Economic feasibility;
- Technically feasibility of various source controls and treatment controls; and
- The impact that any single project may have on the collective and individual activities to address water quality objectives.

As applied to sectionE.3.e.(1)(a), the Coalition believes that MEP provides an overarching standard of review when considering when and how a Copermittee should use its discretion when allowing previous land development requirements to apply where the project has a recognized PLA. While the Coalition believes that it is the intent of the RWQCB to allow Copermittees to apply these factors on a case by case basis, the Coalition also believes that some additional guidance would be helpful for all parties concerned in two areas. These are:

- What constitutes a PLA?
- How should a Copermittee apply its discretion to projects that have a PLA?

The Coalition does not believe that providing such a clarification is antithetical to the position taken by the Coastkeeper Letter.

What constitutes a PLA

On May 8, 2013 the RWQCB, adopted the Permit. Section E.3.e.(1)(a) of the New MS4 Permit states:

> Each Copermittee must require and confirm that for all Priority Development Project applications **that have not received prior lawful approval** by the Copermittee by the time the BMP Design Manual is updated pursuant to Provision E.3.d, the requirements of Provision E.3 are implemented. For **project applications that have received prior lawful approval** before the BMP Design Manual is updated pursuant to Provision E.3.d, the Copermittee **may** allow previous land development requirements to apply. [Emphasis added.]

The Coalition interprets the intent of section E.3.e.(1)(a) to ensure that projects which have been granted a PLA that incorporates a final, or substantially final, drainage concept and site layout that includes water quality treatment based on the performance criteria set forth in the Copermittee' s storm water ordinances, regulations and manuals at the time the PLA was granted, are not required to redesign their proposed projects for the purposes of complying with the Permit unless doing so is necessary for the Copermittee to remain in compliance with the Maximum Extent Practicable standard as described in the Permit.

The Permit does not define the term "Prior Lawful Approval". Therefore, the Coalition relies on the plain meaning rule of statutory and regulatory interpretation. The plain meaning rule dictates that permit language is to be interpreted using the ordinary meaning of the language. In other words, Section E.3.e.(1)(a) is to be read word for word and is to be interpreted according to the ordinary meaning of the language, unless a statute explicitly defines some of its terms otherwise or unless the result would be cruel or absurd. Ordinary words are given their ordinary meaning, technical terms are given their technical meaning, and local, cultural terms are recognized as applicable. The Coalition relies on Merriam Webster for the plain meaning of each word.

- Prior – existing earlier in time.
- Lawful – constituted, authorized, or established by law
- Approval – an act or instance of approving.

Based on the plain meaning rule and the definitions above the Coalition defines a Prior Lawful Approval as any ministerial or discretionary approval granted to a project by a Copermittee prior to the Effective Date. Thus, PLAs include, but are not limited to, the approval or issuance of, building permits, grading permits, development agreements, tentative maps, vesting tentative maps, CEQA Notices of Determination, and conditional use permits. However, as discussed in further detail below, the Coalition considers a PLA as a necessary, but not determinative criterion, for granting an exemption from the requirements of section E.3 pursuant to section E.3.e.(1)(a). The Coalition believes that there are three situations in which a Copermittee should recognize a project as having a PLA. These are:

- Where the project has a statutory vested right to proceed under the prior permit. These include projects with Development Agreements or Vesting Tentative Maps pursuant to government code section 65864 et seq and 66498.1 et seq.
- Where the project is so far advanced by performing substantial work and incurring substantial liabilities in good faith reliance on the permit prior to the effective date of the new law. (Avco Community Developers, Inc. v. South Coast Reg'l Comm'n, 17 Cal. 3d. 785, 791 (1976)).
- Where the project has received some other form of approval which addresses water quality objectives and where it would be economically or technically infeasible to fully comply with the MS4 permit standard described in section E.3.e and remain in substantial conformity with the previously granted approval.

The Coastkeeper Letter seems to imply that recognizing anything other than common law vested rights as discussed in Avco would constitute "backsliding". The Coalition respectfully

disagrees. The term backsliding refers to an action taken to diminish a water quality objective necessary to achieve a beneficial use.[2] The recognition of other vested rights or discretionary permits is not backsliding where the discretion to do so is balanced against the MEP standard.

How should the Copermittees apply their discretion?

Where a project has a statutorily vested right to proceed under a prior permit, the Copermittee must still use its discretionary authority to determine whether to allow previous land development requirements to apply. However, that discretionary authority is limited to situations in which the imposition of new permit requirements is necessary for reasons of health and safety or where the Copermittee chooses to use its eminent domain powers. As such, the Coalition believes that Copermittees should be provided with guidance that the use of its discretionary authority to allow a project with a statutorily vested right to proceed under previous land development requirements would be presumed to meet the MEP standard.

Where a project is so far advanced by performing substantial work and incurring substantial liabilities in good faith reliance on the permit prior to the effective date of Permit section E.3.e.(1)(a), the Coalition believes that Copermittees should be provided with guidance that the use of its discretionary authority to allow a project with a statutorily vested right to proceed under previous land development requirements would be presumed to meet the MEP standard. The Coalition believes that this suggestion is in harmony with the Coastkeeper Letter.

Where a project has received some other form of approval which addresses water quality objectives and where it would be economically or technically infeasible to fully comply with the MS4 permit standard described in section E.3.e and remain in substantial conformity with the previously granted approval, the Coalition believes that the presumption must shift. That is, the project proponent must demonstrate with substantial evidence the following:

1. The project design complies with the previous land development requirements.
2. It is not economically or technically feasible to fully comply with the new Permit requirements.
3. By allowing the project to comply with less than the new Permit requirements the Copermittee will still be in compliance with the MEP standard as described in the new Permit.

[2] In the Water Quality Act of 1987, Congress statutorily approved the antibacksliding policy adopted by EPA through regulations prohibiting backsliding from water quality based permit limits under sections 301(b)(1)(C) or 303(d) or (e). It is not clear that Congress intended to apply the antibacksliding policy to strategies intended to implement the MEP standard.

Proposed Guidance

The Coalition suggests that in order to provide the Copermittees, RWQCB staff and interested parties with clear guidance on this matter, the following language be incorporated into the draft permit for consideration and comment by all parties. While the Coalition believes that this language should be adopted as proposed, it also recognizes the importance of providing all interested parties with an opportunity to address this issue if they so see fit and, therefore presents this language as a "straw man" and a place to begin the discussions.

Proposed Clarifying Language

(Replaces Section E.3.e(1)(a); does not alter (b) through (d)

(a) Each Copermittee must require and confirm that for all Priority Development Project applications that have not received prior lawful approval by the Copermittee by the time the BMP Design Manual is implemented pursuant to Provision E3.d, the requirements of Provision E.3 are implemented. For project applications that have received prior lawful approval before the BMP Design Manual is implemented pursuant to Provision E.3.d, the Copermittee may allow previous land development requirements to apply.

i. For private development project, "Prior Lawful Approval" means projects that have entered into a development agreement as defined by the California Government Code or have received a first discretionary approval or ministerial permit which incorporates by design or reference the applicable water quality and hydromodification standards prior to the time the BMP Design Manual is implemented. A Prior Lawful Approval shall include any subsequent discretionary or ministerial entitlements necessary to implement the initial Prior Lawful Approval.

ii. For public projects, the Copermittee shall develop and adopt as part of its JURMP an equivalent approach to that for private projects described in Section i above.

iii. For project application that have obtained a Prior Lawful Approval before the BMP Design Manual is implemented pursuant to Provision E.3.d, the Copermittee shall use its discretion to allow previous land development requirements to apply provided that the Copermittee does not determine that to do so would prevent the Copermittee from achieving water quality objectives to the MEP.

iv. Projects with Prior Lawful Approvals that predate the water quality and hydromodification requirements of Order No. R9-2007-0001 for San Diego Copermittees, Order No. R9-2009-0002 for Orange County Copermittees, and Order

No. R9-2010-0016 for Riverside County Copermittees shall be required to incorporate Treatment Control BMPs necessary to achieve water quality standards set forth in the applicable Orders identified above to the Maximum Extent Practicable, as determined by the Copermittee on a case by case basis.

November 19, 2014

Board Chair Henry Abarbanel
San Diego Regional Water Quality Control Board
2375 Northside Drive, Suite 100
San Diego, CA 92108

Re: Response to Workshop Request:Proposed Prior Lawful Approval Language for Regional MS4 Permit

Sent via Email: Laurie.Walsh@waterboards.ca.gov

Dear Chair Abarbanel:

This letter is to follow up on an earlier communication regarding changes in the 2013 MS4 Permit, which removed references to grading from a footnote defining "prior lawful approval." The Coastal Environmental Rights Foundation and San Diego Coastkeeper appreciate the Regional Board taking time to consider the issue.

For the reasons stated below, our organizations do not believe it is necessary to take any action to define "prior lawful approval," or "grandfather" projects into the 2007 MS4 Permit. If, however, the Regional Board does choose to act we urge the Board to reject the straw man language proposed by the Coalition and instead reinsert references to grading in the last iteration of the MS4 permit.

In earlier discussions, the Board indicated the language was changed because "circumstances that legally prevent the imposition of updated requirements" may "differ among jurisdictions." There was concern that either the judicial vested rights doctrine or statutory vested rights could prevent retrospective application. However, it seems clear that correctly applied, neither judicial nor statutory vested rights would prevent the imposition of updated stormwater requirements in any jurisdiction subject to the Regional Board authority.

Avco remains the principal governing case law on the issue of judicial vested rights as applied to development. In *Avco*, the California Supreme Court held that no vested right existed where a plaintiff had not *both* obtained a final building permit *and* begun grading. *Avco Cmty. Developers, Inc. v. S. Coast Reg'l Com*., 17 Cal. 3d 785, 791 (1976). Courts of Appeal continue to follow the *Avco* model, holding that public entities may enforce changes in regulations notwithstanding prior subdivision approval unless the owner or developer "(1) has obtained a building permit for an identifiable structure, and (2) has performed substantial work in reliance thereon." *Hafen v. Cnty. of Orange*, 128 Cal. App. 4th 133, 143 (2005). A leading treatise further explains: "The vested rights rule requires that the government agency exercise its *final discretion* to issue a grant of authority or permit which *specifically describes* a particular approval or work of improvement. Thereafter, *if the developer begins to perform the work described* in the grant or permit, he or she may acquire a vested right to complete the *specific and particular* work that is described. The grant or permit does not give any rights to complete any work not specifically described." (emphasis added) *Miller & Starr, Cal. Real Estate* (3d ed.2001) § 25:70, pp. 324-325, 327-328. Therefore, the Coalition's proposed language would give

developers the right to proceed under an old permit even if they obtained only a preliminary ministerial approval and no work had begun.

If adopted, the proposed language would expand developers' rights beyond what is required by *Avco* and its progeny. Perhaps more importantly, such a provision would be inconsistent with and contrary to federal law. Following *Avco*, the state legislature enacted statutes that allow some development rights to vest earlier when particular conditions are met, such as entry into a development agreement or approval of a subdivision map. These statutory vested rights prevent local governments from applying certain new regulations retroactively. Importantly, however, they do not apply to local actions that are required by state or federal law. Because MS4 requirements are set by a state agency pursuant to the federal Clean Water Act, no statutory vested rights apply.

While Cal. Gov't Code section 65866 provides that, where a development agreement is in place, the regulations and official policies in force at the time of the agreement will be applied, section 65869.5 qualifies the above: "If state or federal laws or regulations, enacted after a development agreement has been entered into, prevent or preclude compliance with one or more provisions of the development agreement, such provisions of the agreement shall be modified or suspended as may be necessary to comply with such state or federal laws or regulations." Thus, even where statutory vested rights are expressly granted, the Legislature has made it clear that compliance with state and federal law is still an overriding concern.

Likewise, pursuant to the Subdivision Map Act, Gov Code section 66498.1(c) limits the scope of vested rights: "Notwithstanding subdivision (b), the local agency may condition or deny a permit, approval, extension, or entitlement" if "required in order to comply with state or federal law."

Thus, where necessary, a copermittee may deny a permit at any stage in the process in order to bring a project into compliance with the state-mandated MS4 requirements. The Coalition's proposed changes thus attempt to create a right where none existed before.

It is important to note that the Coalition/BIA's proposed language would also be inconsistent with other provisions of the MS4 Permit. Section E.1.a of the Permit requires each copermittee to "establish, maintain, and enforce adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4," and adequate legal authority includes, at a minimum, "requiring the use of BMPs to prevent or reduce the discharge of pollutants into MS4s." (*Order No. R9-2013-0001 E.1.a.(7)*). As explained above, it is well within all copermittees' legal authority to apply new BMPs to projects that have not yet begun work. Pursuant to section E.1.a., copermittees are required to use the full extent of that authority to apply updated requirements.

As the Coalition/BIA concedes, it is the municipality that is ultimately responsible for compliance with the MS4 Permit and meeting the MEP standard. As the Regional Board explained in support of its 2007 MS4 Permit, copermittees are responsible for discharges into and out of their MS4s, in part, because they have the legal authority that authorizes the very development and land uses which generate the pollutants and increased flows in the first place. (Fact Sheet, p. 28, Order NO. R9-2007-0001). The copermittees also have the legal authority to ensure all grading activities are protective of water quality – they can withhold issuance of the grading permit. (*Id*.). In the 2007 San Diego MS4 Permit, it was clear that updated SUSMP and hydromodification

requirements would apply to all priority projects which had not begun grading or construction at the time of any update. (Order NO. R9-2007-0001, p. 17, FN 3).

As further noted by the Coalition, MEP is defined in the Permit: “In the absence of a proposal acceptable to the San Diego Water Board, the San Diego Water Board defines MEP.” (Order No. R9-2013-0001, p. C-7). The Regional Board has effectively defined MEP by adopting the 2013 MS4 Permit – over a year ago. The Coalition asks the Regional Board to delay implementation of MEP by grandfathering projects under the guise of consistency. If the Coalition seeks a consistent, bright line rule, the more appropriate route is to track the 2007 MS4 Permit language which is consistent with vested rights doctrine. Rather, the Coalition suggests a more complicated approach which includes applying 2007 MS4 Permit standards to any ministerial approval that merely references the old standards. This is inconsistent with the increased stringency of the Regional MS4 Permit and iterative approach. It also runs contrary to MEP and *Avco*.

For the reasons stated above, CERF and San Diego Coastkeeper request that the Board not adopt a policy or amendment that could allow for vested rights or prior lawful approval that run counter to the widely accepted law. Should the Board decide it is necessary to adopt such a policy or amendment for clarity or conformity, we urge the Board to reinstate the prior footnote language from the previous MS4 permit.

Again, we appreciate your careful consideration of this issue.

Sincerely,

Matt O’Malley, Waterkeeper
San Diego Coastkeeper

Livia Borak, Legal Advisor
Coastal Environmental Rights Foundation

Substantially Prepared By
Kathryn Kriozere, Legal Fellow
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VIA E-MAIL

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January 11, 2013
Mr. Wayne Chiu, P.E.
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, Ca 92123-4340

Re: Comment Letter– Tentative Order No.R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu."

Dear: Mr. Chiu,

On behalf of Building Industry Association of Southern California, Inc. (BIASC), Construction Industry Coalition on Water Quality (CICWQ) and the members of both, we appreciate the opportunity to provide comments on the San Diego Regional Water Quality Control Board Tentative Order No. R9-2013-0001; NPDES No. CAS0109266, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems ("MS4s") Draining the Watersheds within the San Diego Region (the "Tentative Order"). In addition, we respectfully request that our comment letter submitted to the Regional Board on September 14, 2012 be made a part of our overall comments to the Tentative Order and admitted into the formal administrative record, because the constructive suggestions for permit improvement remain relevant at this point in the Tentative Order development.

BIASC is a nonprofit trade association representing nearly 1,000 member companies, which together have nearly 100,000 employees. For decades, BIASC's members have built the majority of the new homes in Ventura, Los Angeles, Orange, Riverside, and San Bernardino Counties in southern California. CICWQ is an education, research, and advocacy water quality coalition comprised of representatives from five industry trade associations (in addition to BIASC) which are involved in the development of public and private building, infrastructure and roads throughout California (Associated General Contractors, Engineering Contractors Association, Southern California Contractors Association, Engineering and General Contractors Association, and United Contractors). All of the above trade associations, their members and the union labor work force are affected by the post-construction runoff control requirements proposed in the Tentative Order, and this letter is meant to provide the San Diego Regional Board with constructive suggestions for improvement.

We appreciate the Regional Board's earlier release of a precursor to the Tentative Order as an Administrative Draft, and the extensive stakeholder involvement process that ensued over the summer and autumn of 2012. Unfortunately, the Tentative Order does not reflect critically important changes to the Tentative Order's Development Planning requirements which we and many other public and private stakeholders recommended, both during the focused stakeholder meetings and in comments submitted to the Regional Board. Moreover, Regional Board staff does not provide sufficient findings of fact to support the priority project water quality and hydromodification control design criteria and performance standards in the Tentative Order. The requirements proposed in the Tentative Order are vastly different from those contained in the 2010 South Orange and South Riverside County MS4 permits, and there is simply insufficient performance data to demonstrate the need for any change.

We are concerned that key water quality and hydromodification control provisions within the Development Planning section (Section C.3) are (i) unsupported by substantial evidence, (ii) very bad public policy, and (iii) not properly considered as legally required. Specifically, certain provisions: (i) lack sufficient auditing or performance data showing the need for or advisability of such requirements, (ii) lack technical or scientific basis, and (iii) depart without any justification from required and approved technical documents that have been issued by the San Diego Regional Board for priority development projects in San Diego, Orange, and Riverside Counties. In addition, the hydromodification control provisions illuminate the Regional Board's failure to consider the factors required by California Water Code section 13241 – especially subsection (b) thereof.

1. There are no findings of fact to support changes in the requirements to evaluate, design and install LID BMPs (Section E.3.c) when comparing the proposed requirements in the Tentative Order with that of the requirements in the 2010 adopted South Orange and South Riverside County MS4 permits.

The Orange and Riverside County permits have been in effect for a short period of time (<2 years); and there is no data (program audits or annual report data, for example) that we can find that would support any changes to priority development project water quality control design criteria (found in Section E.3.C of the Tentative Order). Moreover, in one particular instance concerning which we and others have repeatedly commented to Regional Board staff, there is no technical justification provided by staff for requiring biofiltration LID BMP to be sized at 1.5 times the remaining design capture volume not reliably retained on-site. Section E.3.c.(3)(b)(i)[c] requires that if biofiltration is used as an alternative compliance method the biofiltration BMP is required to be sized to 1.5 times the design capture volume, which is an increase from the existing South Orange County permit. The permit and the fact sheet provide no technical justification for the 1.5 factor and therefore this requirement should be deleted from the permit. BIASC and CICWQ comment letter submitted to the Regional Board on September

14, 2012 and attachments including suggested permit redline remains relevant in this matter. We have provided this here as Attachment1.

2. There are no findings of fact or supporting technical and scientific data indicating the need for changes in hydromodification control requirements for priority development projects.

As we have commented before, there needs to be (i) an in-stream hydromodification control performance standard using the erosion potential (EP) approach; and (ii) the permit must recognize that there are a number of different types of channel hardening that have been used for armoring in stream systems besides concrete. In Attachment 1, we again make suggestions for improving the consistency of hydromodification control standards with those identified and allowed in the South Orange County MS4 permit.

The Tentative Order provides an "on-site" option for addressing hydromodification through flow duration control. This is an important element of the hydromodification control standard. However the Tentative Order is incomplete in that it lacks an option to assess and demonstrate hydromodification control through in-stream metrics. In many cases, significant development within a watershed has already caused hydromodification impacts. Requiring project-by-project flow duration control for each new project may not address the existing issue as effectively as a regionally-coordinated approach that combines upland control with in-stream remedies. Including the EP standard—as BIASC and CICWQ urge--would enable the development of more comprehensive approaches that include both upland controls and stream modifications (i.e., restoration). This option is critical for more effectively and efficiently protecting the region's aquatic resources.

Additionally, the Tentative Order includes an unnecessarily narrow definition of hardened channels that includes only those channels lined with concrete. Other forms of artificial hardening may be comparably resistant to hydromodification impacts, such as channels that are lined with rip rap, armored with soil cement, or armored with other practices. While the co-permittees or the project proponent should be responsible for demonstrating that a specific channel material is sufficiently stable, the narrow definition currently provided by the Tentative Order does not allow the use of sound engineering judgment and does not allow for use of innovative materials.

The comment letter submitted by BIASC and CICWQ to the Regional Board on September 14, 2012 remains relevant here, as the Regional Board staff did not make any changes to the hydromodification control requirements except for minor exemption allowances for using USGB council's LEED for redevelopment program standards. Exemptions, generally, are welcome and appropriate. But, in practice, referencing a voluntary, national green building and

development certification program for use as part of a NPDES permit does not provide a viable pathway for most priority development projects that are located in already urbanized areas that are served by existing MS4 infrastructure. Exemptions identified in the adopted San Diego Hydromodification Management Plan are appropriate and should be cited and referenced in the Tentative Order, and any reference to USGB LEED standards deleted.

3. Preserve the 2010 adopted San Diego County Hydromodification Management Plan elements

The Regional Board staff has provided no technical justification for the new hydromodification provisions. The HMPs for San Diego and South Orange County are based on sound science and should be allowed time to understand if they are adequate for mitigating hydromodification impacts. The Regional Board adopted the San Diego Hydromodification Management Plan (HMP) in July 2010. Significant work, technical analysis and stakeholder input have gone into the development of the HMP and these requirements have been in effect for just 16 months. Rather than providing separate criteria, the permit should acknowledge implementation of the Regional Board approved HMP as a sufficient mechanism for meeting hydromodification requirements. Of particular note and concern is the removal of exemptions for certain priority development projects (projects in urban areas with greater than 70% existing impervious surface, for example) that discharge to an MS4 system that then discharges into a significantly hardened channel system. It is unquestionably bad public policy to require installation of controls (or payment of in-lieu fees to compensate for the inability to install controls) when there is no threat to the receiving water.

To this end--and for sake of brevity, we support and encourage the Regional Board to accept comments from Orange County Public Works which pertain to the hydromodification control requirements. Changes in permit language as indicated in the County's redline of the Tentative Order would sufficiently address our concerns about the tentative hydromodification control requirements, and we urge the Regional Board to accept these changes.

Regional Board staff has publically stated that the proposed hydromodification control requirements in the Tentative Order are consistent with the 2010 adopted HMP and that only minor adaptation is necessary. That assertion is simply not true and in fact adoption of the Tentative Order requirements will render the HMP obsolete and require a total overhaul. According to the County of San Diego and the co-permittees within the County (and private developer stakeholders), more than $1.5 million have been spent to date developing the plan and conducting required monitoring. By changing the performance standards, requiring hydromodification controls at all priority development projects, and removing standard exemptions that are found in all other 4th term MS4 permits in California, the Regional Board is sweeping away years of program development activities and turning program implementation on

its head. The Tentative Order should explicitly recognize the findings of hydromodification management plans (HMPs) that have been previously approved by this Regional Board. The South Orange County HMP and the San Diego County HMPs were both the products of rigorous technical analysis based on the state of the practice, which were reviewed in detail by Regional Board Staff. The findings of these efforts must not be jeopardized under the new terms of the Tentative Order. *S*pecifically, findings regarding exempt water bodies must be appreciated and upheld, and they should be explicitly recognized in the Tentative Order.

4. The Tentative Order's proposed hydromodification control measures betray the Regional Board's failure to take into account the considerations required by California Water Code section 13241

For years, BIASC and CICWQ have been urging the water boards when developing MS4 permit requirements to address and respect their longstanding legal obligation to take into account the six, specified, non-exclusive factors which are set forth in California Government Code section 13241. The water boards have persistently refused. Most recently (just months ago), the Los Angeles Regional Board dismissed its obligation to consider the Section 13241 factors by noting that it had, in fact, more or less considered two of them (economics and some technical considerations). If the Regional Board here were to adhere to such a position, it would act in violation of California law and without justification.

There is perhaps no greater example of a permit condition written pursuant to a failure to consider the Section 13241 factors than the hydromodification control measures in the Tentative Order – particularly those which impose heroic, expensive engineering standards on development that drains into hardened flood control channels. Section 13241, subsection (b), requires consideration of the "[e]nvironmental characteristics of the hydrological unit under consideration…." By imposing expensive hydromodification control measures even where a receiving flood control system is already firmly hardened, the Tentative Order ignores this Section 13241, subsection (b), factor (obviously so, and regrettably consistent with the Regional Board's general refusal to take into account all six Section 13241 considerations).

BIASC and CICWQ believe that the water boards' persistent refusal to take demonstrably and meaningfully into account the Section 13241 required considerations results from a mistaken view of the applicable law. Specifically, the water boards' seemingly hold to the belief that the "maximum extent practicable" standard in federal law absolves the state agencies of any obligation to apply Section 13241when issuing MS4 permits. If indeed the water boards' legal position is thus, then it reflects a mistaken view of the degree of "federalism" reflected in the Clean Water Act and its interplay with the California Water Code. Moreover, such a position would reflect a failure to apply basic "federal preemption principles," which apply any time a party claims that federal law displaces state law.

BIASC and CICWQ urge the Regional Board to reconsider and reverse its refusal to apply meaningfully all six Section 13241 considerations, and to correct the Tentative Order accordingly.

Concluding Remarks:

BIASC and CICWQ have been active participants and contributors to the creation of improved MS4 permits across southern California. We continue to believe that rational, *implementable*, and *effective* permit requirements are critical to achieving great progress concerning water quality and our environment. We hope that these comments are received in the manner in which they are intended – to create a workable permit that improves water quality to the maximum extent practicable. We remain committed to a positive dialog with the Regional Board and its staff – one that will result in an informed, balanced and effective permit.

If you have any questions or want to discuss the content of our comment letter, please feel free to contact me at (951) 781-7310, ext. 213, (909) 525-0623, cell phone, or mgrey@biasc.org.

Sincerely,

Mark Grey, Ph.D.
Director of Environmental Affairs and Technical Director
Building Industry Association of Southern California and
Construction Industry Coalition on Water Quality

Enclosures:
Attachment 1

cc. Andy Henderson, Esq., Building Industry Legal Defense Foundation

VIA E-MAIL

Building Industry Association of Southern California, Inc.

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September 14, 2012
Ms. Laurie Walsh, Senior Engineer
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, Ca 92123-4340

Re: ADMINISTRATIVE DRAFT REGIONAL MUNICIPAL SEPARATE STORM SEWER SYSTEM (Tentative Order No. R9-2012-0011)

Dear: Ms. Walsh

On behalf of the Building Industry Association of Southern California, Inc. (BIA/SC) and the Construction Industry Coalition on Water Quality (CICWQ) and the members of both, we appreciate the opportunity to provide comments on the Administrative Draft of the San Diego County Regional MS4 Permit (Administrative Draft Permit). We submit these comments in addition to and in support of comments made by our affiliate in San Diego County, the Building Industry Association of San Diego and its coalition partners, and comments submitted by Rancho Mission Viejo.

BIA/SC is a nonprofit trade association representing nearly 1,000 member companies, which together have nearly 100,000 employees. BIA/SC's members have, for decades, built the majority of the homes in Ventura, Los Angeles, Orange, Riverside, and San Bernardino Counties in southern California. CICWQ is a water quality coalition comprised of representatives from five industry trade associations (in addition to BIA/SC) involved in the development of public and private building, infrastructure and roads throughout California (Associated General Contractors, Engineering Contractors Association, Southern California Contractors Association, Engineering and General Contractors Association, and United Contractors). All of the above trade associations and their members and the union labor work force are affected by the post-construction runoff control requirements proposed in the Draft Permit, and this letter and supporting attachments are intended to provide the San Diego Regional Board staff with constructive suggestions for improvement.

We appreciate the Regional Board's release of the Administrative Draft Permit in April 2012, and the extensive stakeholder involvement process that ensued over the summer of 2012. The comments provided here are intended to further meet the permit's underlying objective of protecting and improving water quality within the watersheds administered by the San Diego Regional Board. Our comments, supporting attachments, and suggested redline permit language

modifications reflect years of working not only on MS4 permits issued by the San Diego Board, but other MS4 permits administered by the Los Angeles, Santa Ana, and San Francisco Bay Regional Water Quality Control Boards.

We have four primary concerns with the Administrative Draft Permit content and the following discussion summarizes those concerns and provides the technical basis for those concerns including supporting attachments:

1. **Administrative Draft Permit Provision E. 3.c.(2)(c) establishes a zero discharge standard for biofiltration-type LID BMPs that are designed with an outlet/underdrain. This type of LID BMP cannot meet the on-site design capture volume standard as it is written. Such a zero discharge standard is scientifically and technically unsound and unsupported.**

Biofiltration is an established LID BMP for use in attempting to mimic pre-development hydrology. The US EPA, in multiple guidance documents produced since 2006, have recognized the use of biofiltration-type systems such as curb contained biofilters, bioswales, rain gardens, and using landscape areas for impervious area disconnection as essential LID BMP elements to include in land development projects, a few of which are cited below. The inclusion of biofiltration BMPs in US EPA's menu is a reflection of the practical limitations to retention of stormwater – retention practices are not universally feasible or desirable. When appropriately selected and designed, biofiltration BMPs achieve high levels of pollutant removal, which may exceed pollutant removal achieved in retention BMPs, particularly in cases where retention BMPs are inappropriately applied.

The retention requirement is contrary to EPA's definition of LID because it disfavors development strategies designed to appropriately "filter" runoff, such as bioretention cells or other vegetated LID BMPs. There are five principal EPA documents regarding LID; and four of them identify the appropriate roles of biotreatment-type BMP, such as detention (i.e., slow down, treat through vegetation, and then release across property lines), filtration, and surface release of stormwater.

In a compilation of case studies by EPA, most of 17 exemplary projects included biotreatment elements, such as bioretention, swales, and wetlands. *See* U.S. EPA 841-F-07-006. Each of two case studies described in another EPA document (s*ee* Attachment 1 at pp. 1-2, EPA 841-B-00-005) included the use of underdrains, and the example in one of the two specifically fed into the MS4 system at issue. Another EPA document updated in January 2009 refers to the many practices used to adhere to LID principles of promoting a watershed's hydrologic and ecological functions, such as bioretention facilities and rain gardens. *See* Attachment 2 at p. 2, EPA-560-F-07-231 (describing "an under-drain system to release treated stormwater off site," permitting planted areas to "safely allow filtration and evapotranspiration of stormwater");

http://www.epa.gov/owow/nps/lid/ (fact sheet describing under-drains used to release treated stormwater off site and permitting planted areas to safely allow filtration of stormwater). Thus, EPA's literature and guidance clearly recognize the important and even necessary role that biofiltration/biotreatment approaches play in real-world implementation of LID principles.

The National Research Council, in their 2008 Report to Congress titled "Urban Stormwater Management in the United States" cite the use of biofiltration and bioretention systems in improving water quality and in attempting to mimic predevelopment hydrology at many different site contexts and locations across the United States. The 2008 NRC report contains and cites numerous examples of using biofiltration type systems to reduce runoff volume and pollutant loads. The 2008 NRC Report clearly recognizes the role that biofiltration systems play in the LID BMP feasibility and selection process, and in achieving runoff management goals. The report states "In some situations ARCD (Aquatic Resources Conservation Design) practices will not be feasible, at least not entirely, and the SCMs [stormwater control measures] conventionally used now and in the recent past (e.g., retention/detention basins, biofiltration without soil enhancement, and sand filters) should be integrated into the overall system to realize the highest management potential." Note that the NRC report definition of ARCD includes both retention and biofiltration elements.

From a management perspective, a review of 4th Term Phase I MS4 permits within California (San Francisco Bay Area, Sacramento Area, North and South Orange County, Western and Southern Riverside County, and San Bernardino County) shows that the use of biofiltration to meet water quality volume and flow control performance standards is clearly allowed (See matrices submitted by BIA/SC_CICWQ at the August 22, 2012 Stakeholder Meeting and provided to the Regional Board by Mark Grey on August 24, 2012). These Regional Boards in California recognize that biofilter-type LID BMPs are an integral component of applying site design principles which seek to mimic pre-development hydrology. Furthermore, these permits implement a clear LID BMP feasibility and selection process, one that first requires examination of on-site retention systems (infiltration, harvest and use, and evapotranspiration), before moving to the evaluation and potential selection of bioinfiltration (some infiltration achieved) and biofiltration systems. This feasibility evaluation hierarchy, which is clearly explained in the South Orange County and South Riverside County MS4 permits adopted by the San Diego Regional Board in 2009 and 2010, respectively, must be preserved and included in the next version of the Administrative Draft Permit.

In summary, the zero discharge standard established by the Administrative Draft Permit significantly narrows the definition of LID, which is contrary to US EPA guidance, the 2008 NRC Report, and the standards established in recently-adopted Permits by the San Diego Regional Board and other Regional Boards. In essence, the proposed provisions would establish a standard that (i) will be impracticable in a relatively large proportion of sites, and (ii) has not

been demonstrated to be necessary to protect receiving water quality. We provide in Attachment 3 suggested permit language to address the continued use of biofiltration.

2. **A mitigation requirement is established when using flow-thru biofiltration-type LID BMPs to manage that portion of the SWQDv that is not retained on-site. This requirement is inconsistent with all other adopted Phase I MS4 permits in California and nationally. Biofiltration and bioretention BMPs are established LID practices; requiring accompanying mitigation of SWQDv that has already been biofiltered penalizes and dis-incentivizes use of these controls.**

Equally problematic, because it does not allow biofiltration type LID BMPs to meet the on-site storm water quality design volume (SWQDv) standard, is the current requirement in Administrative Draft Permit Provision E. 3.c.(2)(c) to "perform mitigation for the portion of the pollutant load that is not retained on-site." In other words, the draft provisions would require that, if a project proponent cannot retain 100 percent of the SWQDv on-site, and must therefore use biofiltration LID BMPs (with a treated discharge), then the use and installation of these systems will trigger an off-site mitigation or in-lieu fee program participation requirement. This provision in the Administrative Draft Permit is technically unjustified, disfavors the use of all types of recognized biofiltration LID BMPs, and could theoretically require a project proponent to not only pay for the installation and O&M of a biofiltration LID BMP, but also require mitigation or fee payment for that portion of runoff managed by it.

Biofiltration BMPs including natural treatment systems such as those that are part of the Irvine Ranch Water District's Natural Treatment System in Orange County (a regional example) can remove vast quantities of pollutant load, and provide other benefits such as habitat, flood control, and aesthetic, recreational and educational value. To relegate multi-benefit biofiltration or biotreatment BMPs applied at a site scale to a status inferior to on-site retention BMPs is not justified on a water quality basis, and is poor public policy, essentially depriving the region of an extremely important and effective approach to managing water quality.

While we agree that project proponents should be required to retain stormwater where technically and economically feasible, there are numerous conditions beyond a project's control that make retention infeasible, undesirable and/or ineffective. For example, in achieving a zero discharge standard, it is necessary to either maintain pre-project ET (which is generally impracticable) or increase the volume of stormwater that is infiltrated (which is the common result). Over-infiltrating rainwater can have adverse consequences such as altering the natural flow regime of the receiving waters such that riparian habitat changes, mobilizing pre-existing contamination in shallow groundwater, increasing inflow and infiltration to sanitary sewers, causing damage from rising groundwater, and other potential effects. By discouraging the use of biofiltration LID BMPs where there are more appropriate than retention, the Administrative

Draft Permit irresponsibly encourages the use of retention where it may have adverse consequences.

Retention BMPs are not necessarily more effective than biofiltration BMPs as the Administrative Draft Permit implies, especially considering the back-to-back-to-back nature of storm systems that arrive in southern California during winter months and deliver the majority of total rainfall volume. The Administrative Draft Permit establishes a SWQDv that must be retained, but does not specify the time over which this volume must be drawn down (i.e., drained) in order to have capacity for the volume from subsequent storms. The rate at which the SWQDv can be drained is a function of the infiltration rates of soils and the demand for harvested water. Where soils are not sufficiently permeable and/or where harvested water demands are moderate to low, the drawdown time of retention BMPs can be in the range of several days to several weeks.

In comparison, biofiltration BMPs are designed with engineered soils that can generally drain the SWQDv much more quickly, on the order of several hours. In cases where retention opportunities are limited, this results in a higher level of capture and treatment by biofiltration BMPs than retention BMPs, which can more than offset the lower "treatment efficiency" afforded by biofiltration compared to full retention. For example, based on rigorous technical analysis contained in the Orange County Technical Guidance Document (Figure III.2, Page III-11), a hypothetical biofiltration BMP draining in 12 hours would achieve approximately 25 percent greater treatment of average annual stormwater runoff volume than an equivalently sized retention BMP that drains in 72 hours and approximately 60 percent greater treatment than a retention BMP that drains in 10 days.

Because drawdown time is an important factor in (i) assessing BMP effectiveness and (ii) evaluating the site-specific determination of whether retention or biofiltration are preferable, we strongly recommend (in addition to allowing the use of biofiltration or biotreatment systems to meet the retention standard) including a secondary performance metric of managing 80 percent of annual runoff volume using continuous simulation modeling. This provides a means of accounting for the performance of strictly on-site retention BMPs versus the addition of biofiltration or biotreatment BMPs which can be designed to manage a greater volume of average annual runoff volume than retention BMPs of the same size. The total amount of water captured and treated and associated pollutant load reduction should be a primary deciding factor in whether retention or biofiltration BMPs are selected for a given project. As written, the Administrative Draft Permit strongly discourages an entire group of effective practices which have the potential to provide better protection of water quality, when compared to retention, in a wide range of cases. Attachment 3 provides suggestions for permit language which corrects these deficiencies.

3. Hydromodification control measures should allow use of the EP method to meet in stream standards; recognize multiple types of channel hardening when evaluating applications for hydromodification control exemptions

In Attachment 3, we also make suggestions for improving the consistency of hydromodification control standards with those identified and allowed in the South Orange County MS4 permit. Specifically, we recommend providing for an in-stream hydromodification control performance standard using the erosion potential (EP) approach and recognizing that there are a number of different types of channel hardening that have been used for armoring in stream systems besides concrete.

The Administrative Draft Permit provides an "on-site" option for addressing hydromodification through flow duration control. This is an important element of the hydromodification control standard. However the Administrative Draft Permit is incomplete without an option to assess and demonstrate hydromodification control through in-stream metrics. In many cases, significant development within a watershed has already caused hydromodification impacts. Requiring project-by-project flow duration control for each new project may not address the existing issue as effectively as a regionally-coordinated approach that combines upland control with in-stream remedies. Including the EP standard enables the development of more comprehensive approaches that include both upland controls and stream modifications (i.e., restoration). This option is critical for more effectively and efficiently protecting the region's aquatic resources.

Additionally, the Administrative Draft Permit includes an unnecessarily narrow definition of hardened channels that includes only those channels lined with concrete. Other forms of artificial hardening may be comparably resistant to hydromodification impacts, such as channels that are lined with rip rap, armored with soil cement, or armored with other practices. While the Permittees or the project proponent should be responsible for demonstrating that a specific channel material is sufficiently stable, the narrow definition currently provided by the Administrative Draft Permit does not allow the use of sound engineering judgment and does not allow for use of innovative materials.

Finally, the Administrative Draft Permit should explicitly recognize the findings of hydromodification management plans (HMPs) that have been previously approved by this Board. The South Orange County HMP and the San Diego County HMPs were both the products of rigorous technical analysis based on the state of the practice, which were reviewed in detail by Board Staff. The findings of these efforts must not be jeopardized under the new terms of the Administrative Draft Permit. Specifically, findings regarding exempt water bodies must be appreciated and upheld, and they should be explicitly recognized in the Administrative Draft Permit per our suggested redline.

4. The Permit must preserve important provisions for watershed level design and implementation of LID BMPs.

The proposed development project criteria and requirements in the Administrative Draft Permit do not include the language in the current South Orange County Permit that provides for Alternative Compliance for Watershed-Based Planning (See page 40-41 of the 2009 Permit). We ask that the Regional Board continue to recognize the protections to water quality and enhancements to water bodies which are achieved through watershed-based projects such as the Rancho Mission Viejo Ranch Plan, as it has in the current South County MS4 permit, and define Watershed Planning as an alternative and co-equal approach to the project-specific requirements. Attachment 3 to this submittal contains suggested redline language for addition to the Administrative Draft Permit.

Concluding Remarks:

BIA/SC and CICWQ have been active participants and contributors to the creation of improved MS4 permits across southern California. We continue to believe that rational, *implementable*, and *effective* permit requirements are critical to achieving great progress concerning water quality and our environment. We hope that these comments are received in the manner in which they are intended – to continue the discussion of how we can create a workable permit that improves water quality to the maximum extent practicable. We remain committed to a positive dialog with the Board and its staff – one that will result in an informed, balanced and effective permit.

If you have any questions or want to discuss the content of our comment letter, please feel free to contact me at (951) 781-7310, ext. 213, (909) 525-0623, cell phone, or mgrey@biasc.org.

Sincerely,

Mark Grey, Ph.D.
Director of Environmental Affairs and Technical Director
Building Industry Association of Southern California and
Construction Industry Coalition on Water Quality

SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD DRAFT MS4 PERMIT: A CASE STUDY

Dennis Bowling, PE, MS; Mark Grey, Ph.D; Luis Parra, Ph.D, PE, MS, CPSWQ, ToR, D.WRE; Tory Walker, PE, CFM; Shawn Foy Weeden, GE, PE

On March 27, 2013, the San Diego Regional Water Quality Control Board (Region 9) ("RWQCB") released its Revised Tentative Order No. R9-2013-0001 (National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region) (hereafter, "Revised Draft Permit"). This article analyzes four components of the Revised Draft Permit, and identifies concerns with the Revised Draft Permit's treatment of those components based on the evidence that was before the RWQCB during its crafting of the Revised Draft Permit. The four components of the Revised Draft Permit are: hydromodification BMP requirements, the identification of a "pre-development" condition, Low Impact Development and the removal of pollutants in lieu of retaining stormwater onsite, and sediment transport requirements.

I. Hydromodification BMP Requirements

The Revised Draft Permit's Requirements

The Revised Draft Permit mandates that Copermittees require Priority Development Projects[1] to implement onsite Best Management Practices[2] ("BMPs") to manage hydromodification that may be caused by storm water runoff discharged from a project such that post-project runoff conditions must not exceed pre-development runoff conditions by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat downstream of Priority Development Projects). (Revised Draft Permit, Provision E.3.c.(2)(a).)

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[1] Priority Development Projects include: new development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site), or redevelopment projects that create or replace 5,000 square feet or more of impervious surface (collectively over the entire project site); new projects that create 5,000 square feet or more of impervious surface (collectively over the entire project site), and support restaurant, hillside development project, parking lot, or street, road, highway, freeway and driveway uses; new or redevelopment projects that create or replace 2,500 square feet or more of impervious surface (collectively over the entire project site), and discharge directly to an Environmentally Sensitive Area; new development projects that support use of an automotive repair shop or retail gasoline outlet, and new or redevelopment projects that result in the disturbance of one or more acre of land and are expected to generate pollutants post construction. (Revised Draft Permit, Provision E.3.b.(1))

[2] The Revised Draft Permit defines Best Management Practices as "Defined in 40 CFR 122.2 as schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage." (Revised Draft Permit, Attachment C, p. C-2.)

Copermittees have the discretion to exempt a Priority Development Project from Provision E.3.c.(2)(a)'s hydromodification management BMP performance requirements in three limited circumstances: where the project discharges storm water runoff to existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; where the project discharges stormwater runoff to conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific ocean; where the project discharges storm water runoff to an area identified by the Copermitee as appropriate for an exemption by the Watershed Management Area Analysis incorporated into the Water Quality Improvement Plan pursuant to Provision B.3.b.(4). (Revised Draft Permit, Provision E.3.c.(2)(d).) The Fact Sheet in support of the Revised Draft Permit ("Fact Sheet') states that, other than the projects exempted through the Watershed Management Area Analysis, the exemptions are considered appropriative because there is no threat of erosion to downstream receiving waters. (Fact Sheet, page F-102.)

The RWQCB describes its position regarding its ability to include the hydromodification management requirements in the Revised Draft Permit in its Response to Comments on Tentative Order No. R9-2013-0001 ("Response to Comments"). Specifically, the Board states that federal law mandates that MS4 permits require management practices that will result in reducing pollutants to the maximum extent possible. The RWQCB states that the Revised Draft Permit's requirement that Copermittees require Priority Development Projects to control post-project runoff flow rates and durations so that they do not exceed pre-development runoff flow rates and durations by more than ten percent is appropriate and necessary to reduce erosion and the discharge of pollutants into receiving waters. (Response to Comments, pages 43-45.) In response to concerns regarding the potential requirement of hydromodification management BMPs in instances where hydromodification would not take place, the RWQCB included in the Revised Draft Permit the exemption described above for projects that discharge to conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to the receiving waters. (*Id*.) The RWQCB, however, did not identify the extent to which such channels exist and would be a practical response to the challenge presented by complying with the hydromodification requirements in various venues.

In response to comments regarding the RWQCB's ability to regulate storm flow through hydromodification management requirements, the RWQCB states that the hydromodification management BMP requirements are for the control of pollutants in storm water discharges from the MS4. (Response to Comments, pages. 58-60.) While storm flow itself may be regulated as a result of the regulation of the pollutants within those flows, the RWQCB states that the hydromodification management BMP requirements are necessary to control the discharge of pollutants generated by new development and significant redevelopment projects in storm water discharges from the MS4 to the MEP. (*Id*.)

The Revised Draft Permit's Requirements are Unsupported

Both the Fact Sheet in support of the Revised Draft Permit and the RWQCB's Response to Comments cite to certain evidence that the RWQCB claims supports the hydromodification BMP requirements included in the Revised Draft Permit. However, as described below, this evidence

does not support the manner in which the RWQCB has incorporated hydromodification BMP requirements, particularly in regard to the Revised Draft Permit's failure to categorically exempt from compliance with the Hydromodification BMP requirements those projects that will discharge to a hardened channel that is not lined with concrete.

The Fact Sheet cites Assessing the Health of Southern California Streams, Stormwater Monitoring Coalition, Fact Sheet (Fact Sheet page F-89, Footnote 29[3]) ("SWMC Fact Sheet") in support of its claim that hydromodification is largely responsible for stream system degradation in San Diego County and that steam stressors including percent sands and fines present, channel alteration, and riparian disturbance are related to physical habitat changes caused by hydromodification. In the preparation of the SWMC Fact Sheet, more than 120 sites were sampled to provide data to make this determination, and the Southern California index of biotic integrity used to differentiate stream biological condition. The determination of relative degradation of stream (as compared to minimally disturbed reference sites) was made using a statistical method known as relative risk analysis. However, the SWMC Fact Sheet contains no discussion or presentation of the stream channel conditions found at the more than 120 sites used for the risk analysis.

Further, the SWMC Fact Sheet does not provide any data or support for modifying the existing hydromodification control requirements for significantly hardened channels defined in the 2007 version of the San Diego County MS4 Permit, or the process for obtaining a waiver from onsite compliance per the 2009 approved San Diego Hydromodification Management Program. The SWMC Fact Sheet describes an on-going study of Southern California streams and their biological characteristics relative to changes potentially caused by hydromodification. However, the SWMC Fact Sheet makes no distinction in stream susceptibility to hydromodification for those systems that are already significantly hardened. Accordingly, the SWMC Fact Sheet does not support any conclusions regarding the specific effects of or susceptibility to hydromodification on creeks, streams and associated habitats in San Diego County, or limiting the Draft Revised Permit's hydromodification exemption to only concrete lined channels.

The Fact Sheet cites Schueler and Holland, 2000, Storm Water Strategies for Arid and Semi-Arid Watersheds (article 66) The Practice of Watershed Protection (Fact Sheet page F-90, Footnote 30) to support its finding that increases in watershed imperviousness of 9-22% can result in increased peak flow rates and that these increased flow rates have an effect on channel morphology. This article describes climatalogical and hydrological variables that influence stormwater runoff generation in the arid west, in general, and provides recommendations for managing stormwater runoff using best practices to control pollutants in runoff and protect receiving waters from geomorphological changes. It does not include or address any issue related to already hardened channels systems or their susceptibility to the effects of hydromodification as a result of urban development.

[3] All references to footnotes within the Fact Sheet are in reference to the footnotes as they appear in the March 27, 2013 strikeout version of the Fact Sheet, recognizing that footnote references may change in the final version of the Fact Sheet.

The Fact Sheet cites Stein, E. and Zaleski S., 2005. Technical Report 475. Managing Runoff to Protect Natural Streams: The Latest Developments on Investigation and Management of Hydromodification in California. December 30, 2005. (Fact Sheet page F-90, Footnote 31) for the proposition that increases in uncontrolled imperviousness of as little as 3-10% can result in physical degradation of intermittent and ephemeral streams, and that stream systems in California are more susceptible to morphological changes than other areas in the US. However, the technical paper itself contains qualifying findings, not addressed by RWQCB in the Fact Sheet, concerning management of hydromodification effects. Specifically, Stein and Zaleski conclude that "not all streams will respond in the same manner [to the effects of hydromodification]" and that "Certain management strategies need to account for differences in stream type, stage of channel adjustment, current and expected amount of basin impervious cover, and existing or planned BMPs." (*Stein & Zaleski*, at page 15.)

Further, from a planning perspective, the authors of the technical report recommend that hydromodification should be addressed in both General and Specific Plans in terms of the location and design of new development, as site-by-site or project-specific approaches tend to be less effective and more costly to implement. (*Id.*, pages 11-12.) The authors go on to recommend that streams be surveyed and classified in order to identify areas with the greatest risk of impact from hydromodification. (*Id.*, page 15.) Taken collectively, these statements support recognition of the nature of channel condition in establishing the need for protection from hydromodification effects, which the Draft Revised Permit does not do. To rely on this article for support, the RWQCB would need to defer the proposed hydromodification provision to watershed specific implementation under each WQIP rather than the broad implementation proposed in the Draft Revised Permit.

The Fact Sheet further cites the USEPA, Reducing Stormwater Costs through Low Impact Development Strategies and Practices, December 2007 (Fact Sheet, page F-90 Footnote 32) to support the use of water quality and hydromodification control approaches using Low Impact Development ("LID") type controls, applied at a site scale regardless of receiving water or watershed condition. This USEPA study includes conclusions drawn from case studies done throughout the United States. The Fact Sheet cites the study to support and justify the development of hydromodification control requirements for all projects in San Diego County, yet the document does not include citation to specific evidence as to the need for or effectiveness of controls or whether they would be effective in the San Diego region as opposed to the specific case studies. The study highlights seventeen case studies of the implementation of LID principles into urban stormwater runoff management, with an emphasis on comparing the cost of installing LID BMPs to traditional or conventional stormwater management controls. However, there is no data or analysis presented concerning hydromodification; rather, LID principles are emphasized generally.

The Fact Sheet cites the website www.lowimpactdevelopment.org (Fact Sheet, page F-92 Footnote 34) in support of the Revised Draft Permit's use of the definition of Low Impact Development as crafted by the Low Impact Development Center, located in Maryland. However, this general citation offers no specific evidence or support other than to bolster the RWQCB's emphasis on LID BMPs applied at the site scale as a minimum compliance measure with MS4 permit conditions.

The Fact Sheet cites Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets (USEPA 2008) (Fact Sheet, page F-95 Footnote 38) to support the use of USEPA Green Streets Guidance to design and construct new roadways or significant roadway re-construction, which, if followed, allows project proponents to be exempted from Priority Development Project status. (Fact Sheet, pages F-94-F-95.) It is also cited in support of granting exemptions for construction of new or retrofit paved sidewalks, bicycle lanes, or trails that are designed to direct runoff to vegetated pervious areas (biofiltration systems, for example). According to the Fact Sheet, the exemptions are provided to "encourage these types of projects because they provide multiple environmental benefits such as promoting walking rather than driving, which will in turn improve air quality." (Fact Sheet, page F-94.)

However, the data in the publication do not address any specific requirement related to hydromodification control, but highlight the necessary consideration of the nature of the existing built environment encountered when building in urban areas. The publication's intent is clearly stated in its introduction: "This paper will evaluate programs and policies that have been used to successfully integrate green infrastructure into roads and right-of-ways." Integration of runoff controls into the context of the existing built environment is an essential consideration.

In fact, the logic cited by the RWQCB in the Fact Sheet in allowing exemptions for projects in dense urban areas that use green infrastructure techniques to the maximum extent practicable must be considered and extended to exemptions for hydromodification control when the ultimate receiving waters are significantly hardened using concrete or other armoring techniques. The Fact Sheet finds that by retrofitting the urban landscape with roadways using green infrastructure, it "recognizes that there are spatial constraints associated with these projects, and implementation of structural BMPs are not always feasible." (Fact Sheet, page F-95.) This recognition must be made equally with the need to consider or install hydromodification controls, especially when there is no threat to receiving water channel stability, and/or space constraints may preclude installation of large structural controls.

Housing, retail, and commercial development are now regulated to occur primarily in existing urban areas in order to concentrate population and employment in already dense or increasingly dense urban areas. *See* SANDAG 2050 Regional Transportation Plan, p.3-3 ["[The San Diego] region will meet or exceed [the SB 375] targets by, among other means, using land in ways that make developments more compact, conserving open space, and investing in a transportation network…"]; California Gov't Code § 65584.04(d)(2)(B) [California's metropolitan planning organizations are directed by SB 375 to consider the "availability of land suitable for urban development" -- including "opportunities for infill development and increased residential densities."]; California: A Primer on AB 32 and SB 375, Partnership for Sustainable Communities [an "[I]ncreasing the number of people living in cities and compact suburbs where transit and amenities are already in place may have a bigger impact on regional emissions, because those people will tend to walk to stores and take transit to work.".) Projects located in urban areas must comply with water quality LID treatment control requirements to the MEP, which will provide multiple environmental benefits, including improving receiving water quality for those runoff events up to the 85th percentile 24-hour storm. As urban areas are already served by hardened storm drain systems and flood control channels, there will be no effect on beneficial

uses in the receiving water from runoff greater than the water quality design capture volume. In fact, water quality would be expected to improve through the implementation of LID BMPs, and other benefits will be realized including decreases in traffic and associated pollutant load production, improved air quality through a reduction in vehicle traffic, and an overall increase in urban vegetation through the introduction of vegetated bioretention devices and urban street vegetation plantings as recommended in the Green Streets Guidance document.

Both the Fact Sheet and the Response to Comments cite E.D. Stein, F. Federico, D.B. Booth, B.P. Bledsoe, C. Bowles, Z. Rubin, G.M. Kondolf, A. Sengupta. Technical Report 667. Southern California Coastal Water Research Project. Costa Mesa, CA (2012) (Fact Sheet page F-101 Footnote 41; Response to Comments, pages 171, 183-184). The Fact Sheet cites Technical Report 667 in support of the development and use of an Alternative Compliance Program for those Priority Development Projects that cannot manage the applicable hydromodification control volume onsite, and instead require an off-site location in order to provide equivalent control or in-lieu payments to a fund providing resources to upstream or across watershed boundary projects. (Fact Sheet, page 101.) In addition, the RWQCB's Response to Comments cites the Technical Report in response to stakeholder comments in support of the very limited granting of exemptions to Priority Development Projects for installing onsite hydromodification control.

An Alternative Compliance Program is an established element of fourth term Phase I MS4 permits in California. However, with respect to considering and granting limited hydromodification control exemptions as described in the Response to Comments, at pages 171, 183-184, and 190, the RWQCB misinterprets the Technical Report's findings and the findings of an underlying scientific study cited in the report, and it does not consider other important findings and statements made in the report to support consideration of such exemptions.

In responding to comments regarding Hydromodification BMP requirements, the RWQCB cites two of the Technical Report's findings to support the statement that it "disagrees conceptually that blanket exemptions should be granted to all redevelopment projects that discharge to hardened channels." (Response to Comments, pages 183-184). First, the Regional Board incorrectly cites the Technical Report's finding that "the exemption of many small projects from hydromodification controls can result in cumulative impacts to downstream waterbodies...." (Technical Report 667, page 26; see Response to Comments, pages 183 and 190) This finding was made relative to receiving waters that are known to be susceptible to the additive effects of hydromodification, not with specific respect to receiving waters that are already concrete lined or otherwise significantly hardened. Moreover, the quotation's placement in the report is (i) found within a discussion of watershed scale hydromodification management concepts (especially as it applies to known or potentially susceptible receiving waters), not with specific respect to receiving waters that are already significantly hardened, and (ii) within a specific discussion of how current management strategies in municipal stormwater permits apply hydromodification standards; the author's note that requiring LID at all projects is positive measure for hydromodification, but the RWQCB's citation to Technical Report 667 does not appear to acknowledge this point.

The RWQCB cites the Technical Report work done by Booth and Jackson (1997) in King County, Washington to support its position that blanket exemptions not be granted to Priority Development Projects. This peer reviewed article described work done in an area undergoing rapid urbanization in east King County, Washington, where stream hydromodification sensitivity to land development was being recognized and measured. The empirical underpinning of the article was the changes noted in watershed imperviousness as a result of land development and corresponding changes in receiving water geomorphology as a result of development induced hydromodification. The watersheds and streams draining those watersheds were predominately under forest cover (see Booth and Jackson (1997) Table 1), which is unlike any receiving water system in San Diego County, and the specific stream systems were "natural" in channel condition. The article did not mention or address watersheds containing hardened receiving water channels. The conditions described by Booth and Jackson (1997) are much different and not representative of the conditions experienced by projects being developed within urban areas served by already hardened channel systems, and therefore do not support the RWQCB's position.

Technical Report 667 addresses the fact that stormwater permits may offer exemptions "for projects discharging to hardened channels or waterbodies," and cautions that "these exemptions may not be supportive of future stream restoration possibilities." Yet, its authors hedge such statements by stating that "a further limitation of the current permit structure is that there is no consideration of project characteristics such as position within the watershed and sensitivity of the receiving water reach....." (Technical Report 667, page 26.)

Second, the RWQCB repeatedly quotes Technical Report 667's finding that "an effective management program will likely include combinations of onsite measures (e.g., low-impact development techniques), in-stream measures (e.g., stream habitat restoration), and off-site measures. Off-site measures may include compensatory mitigation measures at upstream locations that are designed to help restore and manage flow and sediment yield in the watershed." (Technical Report 667, Page 26; see Response to Comments, pages 171, 184, 190; Fact Sheet, Page F-101).

The RWQCB cites to this quote to (i) support inclusion of the Alternative Compliance Program (Response to Comments, page 171), and (ii) support granting limited exemptions to Priority Development Projects for hydromodification control (Response to Comments, pages 184 and 190). While it is true that alternative compliance options should exist for those projects that drain to receiving waters known or believed to be susceptible to hydromodification effects, it is inappropriate to consider such options for projects that drain to already hardened channel systems because there is no threat, now or in the future, to downstream beneficial uses as a result of redevelopment. There is no scientific or technical nexus between the impact on the receiving water and the need for control. At worst case, any redevelopment project qualifying as a Priority Development Projects will contribute at least the same amount of runoff to the receiving water and likely much less if LID BMPs are feasible for implementation.

In the same section of comprehensive approaches to hydromodification management described in Technical Report 667 from where the quotation is derived, Technical Report 667's authors state that "the variety of types and conditions of receiving waters should result in a range of

requirements. This also means that objectives, and the management strategies employed to reach them, will need to acknowledge pre-existing impacts associated with historical land uses." The RWQCB must also consider this type of information in establishing appropriate exemptions for already hardened channel systems in urban areas within its jurisdiction.

The Revised Draft Permit's treatment of hydromodification management BMPs represents a significant change from the Final Hydromodification Plan for San Diego County, dated March 2011 ("San Diego HMP"). For redevelopment projects, these performance requirements are more stringent than the performance requirements of the San Diego HMP because they require evaluation of pre-development runoff conditions rather than pre-project runoff conditions.[4] Pre-development runoff conditions are defined as approximate flow rates and durations that exist or existed onsite before land development occurs. (Revised Draft Permit, Attachment C, page C-9.) For redevelopment projects, this equates to runoff conditions from the project footprint assuming infiltration characteristics of the underlying soil, and existing grade (i.e., using the parameters of a pervious area rather than an impervious area).

For many redevelopment projects, the difference between pre-development conditions and pre-project conditions is significant. This would require redevelopment projects on sites that are fully built to size hydromodification management BMPs as large as they would have been sized for a new development based on an estimate of the pre-project condition, yet they must be fit within the constraints of an already developed site. Furthermore, the change from a pre-project condition to pre-development condition requirement effectively invalidates some of the potential exemptions that certain redevelopment projects could have applied for under the approved San Diego HMP. Those approved exemptions could have facilitated the redevelopment process, encouraging redevelopment over new development. The exemptions are reasonable and are supported by extensive science and evidence. For example, under the San Diego HMP, projects that reduce impervious areas and reduce 2-year and 10-year peak flows to all outlets would be exempt. This exemption was a simple way to encourage redevelopment by removing the significant burden of hydromodification management BMPs, while achieving a net improvement to the watershed. Under the Revised Draft Permit, if adopted, this exemption would be effectively invalidated by the requirement to consider pre-development condition instead of pre-project condition because no project can reduce imperviousness below a pre-development condition. (Brown and Caldwell, Final Hydromodification Management Plan, prepared for County of San Diego, California, January 13, 2011.)

The other San Diego HMP exemption that may be invalidated or made more difficult to achieve by the Revised Draft Permit requirement to consider pre-development condition is its urban infill exemption. In the case of the urban infill exemption, a considerable effort was expended by the Copermittees, the San Diego HMP consultant, and the Technical Advisory Committee to prepare a cumulative impacts analysis to determine the thresholds and criteria for this exemption, and it was approved by the RWQCB as part of the San Diego HMP.

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[4] The State Water Resources Control Board recently concluded that determining pre-development conditions and using them as the baseline was not feasible at this time. (See e.g. SWRCB California Department of Transportation Municipal Separate Storm Sewer System (MS4) Permit Comment Response Report (April 27, 2012), at page 4.).

The Revised Draft Permit also presents a list of criteria for exemptions from hydromodification management BMP performance requirements. (Provision E.3.c.(2)(d)) This list of criteria omits certain exemptions that were included in the RWQCB's 2007 MS4 permit, pursuant to Order No. R9-2007-0001. Exemptions available under R9-2007-0001 that are not included in the Revised Draft Permit are: channels that are "significantly hardened (e.g., with rip-rap, sackcrete, etc.)" (note this means channels hardened with materials other than concrete – channels that are concrete lined to the Ocean will still be exempt), and projects where "the sub-watersheds below the projects' discharge points are highly impervious (e.g., >70%) and the potential for single-project and/or cumulative impacts is minimal." The list also does not include exempt river reaches that were approved as part of the Final HMP dated March 2011 (portions of Otay River, San Diego River, San Dieguito River, San Luis Rey River, and Sweetwater River). These exemptions were based on extensive studies. (*See* Brown and Caldwell, Final Hydromodification Management Plan, prepared for County of San Diego, California, January 13, 2011.) While the Revised Draft Permit does not preclude these previously exempt channels, rivers, or highly impervious watershed areas from being exempt under a Water Quality Improvement Plan (WQIP), it requires a complete new analysis ("Watershed Management Area Analysis" defined in Provision B.3.b.(4)(a)), and vetting through the public review and approval process of the WQIP in order to re-establish the exemptions through the WQIP. Copermittees, the San Diego HMP consultant, and the Technical Advisory Committee have already expended considerable efforts to identify criteria for exempt river reaches. The Revised Draft Permit does not identify any evidence that supports this change. Copermittees should not have to prepare a new study to maintain these exemptions, as they have already been reviewed and approved during the development of the San Diego HMP.

Finally, pursuant to Provision E.3.(d) of the Revised Draft Permit, the updated performance requirements for hydromodification management BMPs must be incorporated into the BMP Design Manual (formerly Standard Urban Stormwater Mitigation Plan). Based on Provision F.2.b, this will be due three months following approval of the WQIPs. Pursuant to Provision E.3.d, until a Copermittee has updated its BMP Design Manual, the Copermittee must continue implementing its current BMP Design Manual. On this basis, until the BMP Design Manual is updated and implemented, a pre-project condition rather than pre-development condition will be the standard for curve-matching to meet the San Diego HMP criteria, and all exemptions currently available in the approved San Diego HMP will remain available. New HMP exemptions may be created where appropriate through the WQIP process.

II. **Hydromodification Baseline: Pre-Development Runoff Conditions**

The Revised Draft Permit's Requirements

The Revised Draft Order requires that post-project runoff conditions mimic "pre-*development* runoff conditions", as opposed to pre-*project* runoff conditions. (Revised Draft Order, Provision E.3.c.(2)(a); Fact Sheet, p. F-99.) The Revised Draft Order defines Pre-Development Runoff Conditions as "Approximate flow rates and durations that exist or existed onsite before land development occurs. For new development projects, this equates to runoff conditions immediately before project construction. For redevelopment projects, this equates to runoff conditions from the project footprint assuming infiltration characteristics of the underlying soil,

and existing grade. Runoff coefficients of concrete or asphalt must not be used. A redevelopment Priority Development Project must use available information pertaining to existing underlying soil type and onsite existing grade to estimate pre-development runoff conditions." (Revised Draft Permit, p. C-8.)

The RWQCB stated, without evidence, that using a hydrology baseline that approximates that of an undeveloped, natural watershed is the only way to facilitate the return of more natural hydrological conditions to already built-out watersheds, and ultimately improved stream health, and that using pre-*project* hydrology as a baseline for redevelopment projects would result in propagating the unnatural hydrology of urbanized areas, which would not support conditions for restoring degraded or channelized stream segments. Furthermore, reducing the volume of storm water runoff associated with the urbanized flow regime will also result in reducing the discharge of pollutants into receiving waters, since storm water runoff from impervious surfaces contains untreated pollutants. (Fact Sheet, page F-99.)

The Revised Draft Permit indicates that the RWQCB understands that approximating the pre-development runoff condition associated with a redevelopment site is not straightforward because factors such as natural grade and native vegetation for the site cannot be precisely known. (Fact Sheet, page F-99) For this reason, the RWQCB expects project designers and the Copermittees to approximate pre-development runoff conditions using existing onsite grade and assuming the infiltration characteristics of the underlying soil. (Fact Sheet, pages F-99 – F-100). Redevelopment projects are to use available information pertaining to existing underlying soil types (such as soil maps published by the National Resource Conservation Service), onsite existing grade, and any other readily available pertinent information to estimate pre-development runoff conditions. (*Id*.) The RWQCB asserts that an area's pre-development hydrology can only be roughly estimated and cannot be precisely known, but that using the hydrology of a natural condition, even if not precisely known, will provide significant benefit to receiving waters over using the hydrology associated with developed surfaces. The RWQCB finds that in order to achieve the goals of the Clean Water Act to "restore and maintain the chemical, physical, and biological integrity of the nation's waters [emphasis added]," the most appropriate standard to use for hydromodification management is the standard associated with the pre-development condition. (Fact Sheet, pages F-99-F-100.)

The Revised Draft Permit's Requirements are Unsupported

The RWQCB's findings in support of these hydromodification requirements are contradicted, however, by the California State Water Resources Control Board's ("SWRCB") statements as part of the 2012 renewal of the California Department of Transportation's multiple separate storm sewer system permit. In its April 27, 2012 response to comments regarding hydromodification, the SWRCB stated that the use of a "pre-development" standard for hydromodification is not feasible at this time. (See SWRCB California Department of Transportation Municipal Separate Storm Sewer System (MS4) Permit Comment Response Report (April 27, 2012), at page 4.) Specifically, the Board stated:

> It is not possible to develop a mutually agreed-upon standard for pre-development hydrology without a lengthy stakeholder process.

> One of the biggest complicating factors is that our hydrology has been significantly altered by the addition of dry weather flows, sometimes in volumes that are 3-5 times the volume of stormwater flows. Biocriteria need to be developed for the state and the ecological limits of flow alteration that can be tolerated and still have some favorable biological outcome need to be determined. This is still 5-10 years away. The pre-project standard is appropriate at this time.

The RWQCB should not take action to implement an approach that the SWRCB has determined to be infeasible. (See United States v. California (SWRCB) (1986) 182 Cal.App.3d 82, 109.)

III. LID and Onsite Retention of Stormwater

The Revised Draft Permit's Requirements

The Revised Draft Permit modifies its prior provisions relating to structural BMP performance requirements for Priority Development Projects, requiring that those projects implement onsite structural BMPs to control pollutants in storm water that may be discharged from a project. Specifically, under Provision E.3.c.(1)(a) of the Revised Draft Permit, Priority Development Projects are required to implement Low Impact Development (LID) BMPs that are designed to retain onsite 100 percent of the pollutants contained in the volume of storm water runoff produced from a 24-hour 85th percentile storm event.[5] (Revised Draft Permit, p. 93.)

The Fact Sheet for the Revised Draft Permit indicates that the 85th percentile storm event is the design capture volume that has been used for treatment control BMPs previously, and that it is the MEP standard recognized by the RWQCB and is consistent with the Fourth Term MS4 permits for Los Angeles, Orange, Riverside and Ventura Counties. (Fact Sheet, page F-96.)

Under Provision E.3.c.(1)(a)'s onsite retention requirements, the designer of a Priority Development Project would select a system of BMPs that would retain onsite – through interception, storage, infiltration or evaporation – 100 percent of the pollutants in the 85th percentile storm event design capture volume. (See Fact Sheet, page F-97.) The Fact Sheet for the Revised Draft Permit states that such retention BMPs are necessary to capture and retain the pollutants generated from a Priority Development Project. (*Id.*) Pursuant to Provision E.3.c.(1)(b), in the event a Priority Development Project determines that onsite retention is not

[5] The Revised Draft Permit describes a 24-hour 85th percentile storm event as follows: "This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals." (Revised Draft Permit, page. 93, former Footnote 27.)

feasible, it may utilize flow-through treatment control BMPs to achieve the equivalent pollutant load removal that would have been achieved if the design capture volume were fully retained onsite. However, "In any event, no matter what types of BMPs (or combination of BMPs) are chosen, 100 percent of the pollutants contained in the design capture volume must not be allowed to be discharged from the Priority Development Project." (*Id*.)

Finally, if onsite retention is found to be cost prohibitive or not to provide the water quality benefit to the watershed as would implementing BMPs elsewhere in the watershed, Provision E.3.c.(1)(c) allows for the use of a combination of onsite retention BMPs, and the implementation of an Alternative Compliance Program described in Provision E.3.c.(3).

The Revised Draft Permit's Requirements are Infeasible within the Region

As described below, the requirement is infeasible and not supported by evidence cited to in the Revised Draft Permit, the Fact Sheet that supports it, the RWQCB's Response to Comment, or elsewhere.

Infiltration is Largely Infeasible in Region 9

The soil types in Region 9, and particularly San Diego County, are likely infeasible for infiltration where stormwater could eventually reach the underground aquifer. More than 70 percent of the soil types found in San Diego County possess a Soil Hydrologic Group classification of C and D (USDA, 1973). A large majority of the land area possesses a classification of C or D (SANDAG, 2007) and soft/hard rock (CGS, 2007). Using infiltration as a preferred method of stormwater remediation county-wide, therefore, is unsupported. Clearly stated, in the appropriate soil type, infiltration is a preferred alternative. In the wrong soil type the results could be catastrophic. (See photos 1 & 2).

Photo 1 – La Jolla Landslide (Ardath Shale Formation, Claystone, Hydrologic Group D)

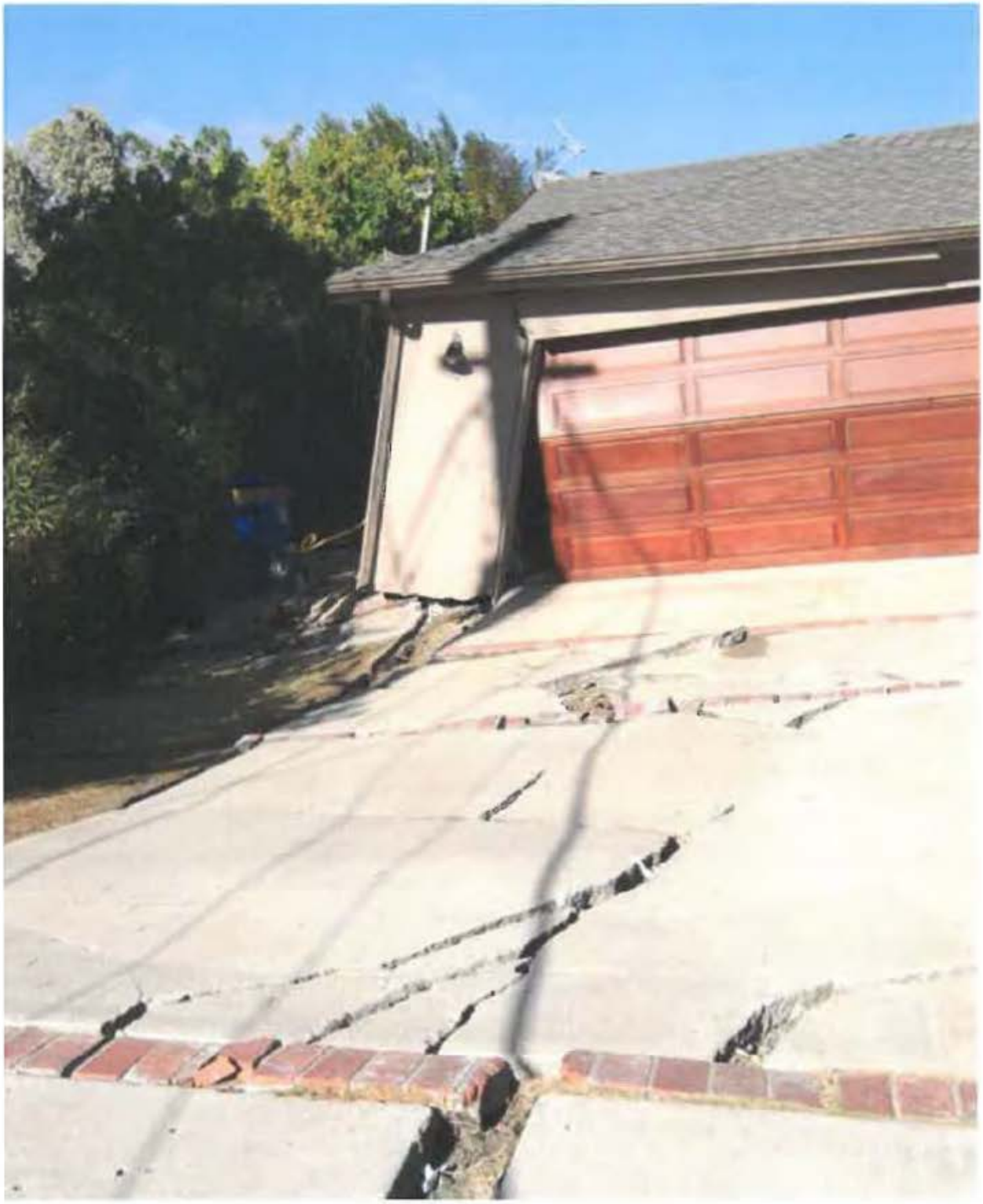

Photo 2 – La Jolla landslide (Ardath Shale Formation, Claystone, Hydrologic D)

For 70 years or more, both geotechnical engineers and civil engineers have designed projects to minimize water infiltration into the soils around and adjacent to buildings. A majority of geotechnical construction litigation is water intrusion related. (See Das, Braja M., Principles of

Geotechnical Engineering, 1994.) Water in clay based soils causes heaving, settling and failure of pavement, retaining walls and buildings. In extreme cases, these soils are prone to slippage, sinkholes or landslides. Additionally, when water enters these soil types it can travel laterally until it finds a utility trench, water or sewer line and then can undermine those systems. (Living with Expansive Soils, Marshall Addison, PhD. http://milliondollarstudent.com/ramjack/PDF/Living_with_Expansive_Soils.pdf; Low Impact Development Handbook, Stormwater Management Strategies, December 31, 2007, Page 39.) The water in these soils cannot infiltrate deep into the ground but moves as it can find voids and areas of better permeability. (Low Impact Development Handbook, Stormwater Management Strategies, December 31, 2007, Page 39.) (See photo 3, below.)

Photo 3 – Perched water visible on lower half of hillside (water migration)

Additionally, there are areas of the County where the soils are hard rock and infiltration cannot occur because water does not easily infiltrate into rock. (United States Department of Agriculture (USDA), Soil Survey, San Diego Area, California, December, 1973; SANDAG, County of San Diego Hydrology Manual Soil Hydrologic Group Map, 2007. California Geologic Survey (CGS), Preliminary Surface Geologic Materials Map, 2007.)

Since much of the construction within San Diego County is slab on grade construction, retaining water onsite through infiltration can even cause minor health and safety problems. Cured

concrete is still a porous material. If water is present in the soil, the slab can wick up water into the building (photos 4, 5 & 6). As buildings are well insulated and energy efficient, this water can lead to mold growth and damage anything placed on the slab (floor coverings, cabinets, furnishings). (Uniform Building Code, Title 24[6].) Water in a warm environment, without sufficient airflow exchange (because of better insulation, windows, etc.) provides the ideal conditions that lead to mold growth. This could create a major construction defect litigation problem for a builder or developer. Again, the geotechnical engineers and civil engineers have stressed the importance of moving water away from building as efficiently and quickly as possible for just this reason. (Building Code Requirements for Structural Concrete (ACI 318-08) and Commentary, American Concrete Institute [requires water barriers below slabs].) While ACI requires this, typically the entire footing doesn't receive a water barrier. Additionally, during construction the water barrier often may be punctured or moved and may not be as effective as called for in the ACI standard.

Photo 4- water migration through slab into cabinetry

[6] This section of the Uniform Building Code includes energy conservation measures, including requirements for better windows, improved weatherstripping, and additional insulation, which all lead to "tighter" and more energy efficient buildings. This is contrasted with older buildings, which "breathe" meaning that they have sufficient air flow to evaporate water wicking up through the slab before it becomes a problem. In newer buildings, water cannot evaporate and problem, such as mold, result.

Photo 5 – water migration through slab (mold under vinyl flooring)

Photo 6 – water migration through slab (white coating is efflorescence)

Retention and Re-use Requirements Raise Additional Concerns

Where onsite infiltration is not feasible, the next option is the capture and storage of stormwater for re-use. If a project will capture water in order to store it, a storage container must be constructed. Since an 85th percentile, 24 hour duration rain event can produce between ½" to ¾" of rainfall in a given area of San Diego (and up to 1-½" in mountainous areas, according to the 85th Percentile Precipitation Isopluvial Map of the San Diego County Hydrology Manual; see also http://www.projectcleanwater.org/html/wg_susmp.html), the amount of water to be stored could be considerable.

The Revised Draft Permit does not effectively address what happens with the retained water or how quickly it needs to be used, since the storage capacity would need to be utilized again for future rain events. Rain barrels are often mentioned as a solution, but care must be taken with regard to water breeding insects. Additionally, most commercially available rain barrels are made of plastic which degrades in the UV from sunlight. After a few years they become brittle and are prone to failure, putting water into the surrounding soils next to the building. Additionally, utilizing the optimum number of rain barrels is impractical, as it is too large to have a significant impact on water usage due to the erratic and clustered nature of the precipitation in San Diego County. According to a continuous simulation study prepared with hourly precipitation data of Lindbergh Airport in San Diego (the best precipitation data set in the County), the optimum rain barrel volume for retention purposes is about 12 – 50 gallon barrels for every 1,000 sq-ft of roof, using the theory of Diminishing Returns. (Parra, StormCon 2010.) Cisterns are another option mentioned as a potentially viable solution. Burying a tank in the ground may not be feasible for infill and redevelopment projects due to various Building Code issues.

Unintended Consequences

Both California AB 32 and SB 375 are landmark environmental laws addressing climate change and land use adaptation to reduce production of greenhouse gases. The intent of this legislation is to:

1. Use the regional transportation planning process to achieve reductions in greenhouse gas emissions consistent with AB 32's goals;
2. Offer California Environmental Quality Act incentives to encourage projects that are consistent with a regional plan that achieves greenhouse gas emission reductions; and
3. Coordinate the regional housing needs allocation process with the regional transportation process while maintaining local authority over land use decisions

The result is to encourage growth to occur inwards into the existing urban footprint. This is defined as "in-fill" development. An unintended consequence of the Revised Draft Permit is that its requirements actually make it more attractive and cost effective to build away from the existing urban footprint because of the land necessary to comply with the new requirements in the Revised Draft Permit. The 100% pollutant capture requirement and the removal of

hydromodification exemptions on infill development render these projects both technically and financially infeasible. (Refer to photograph 7.)

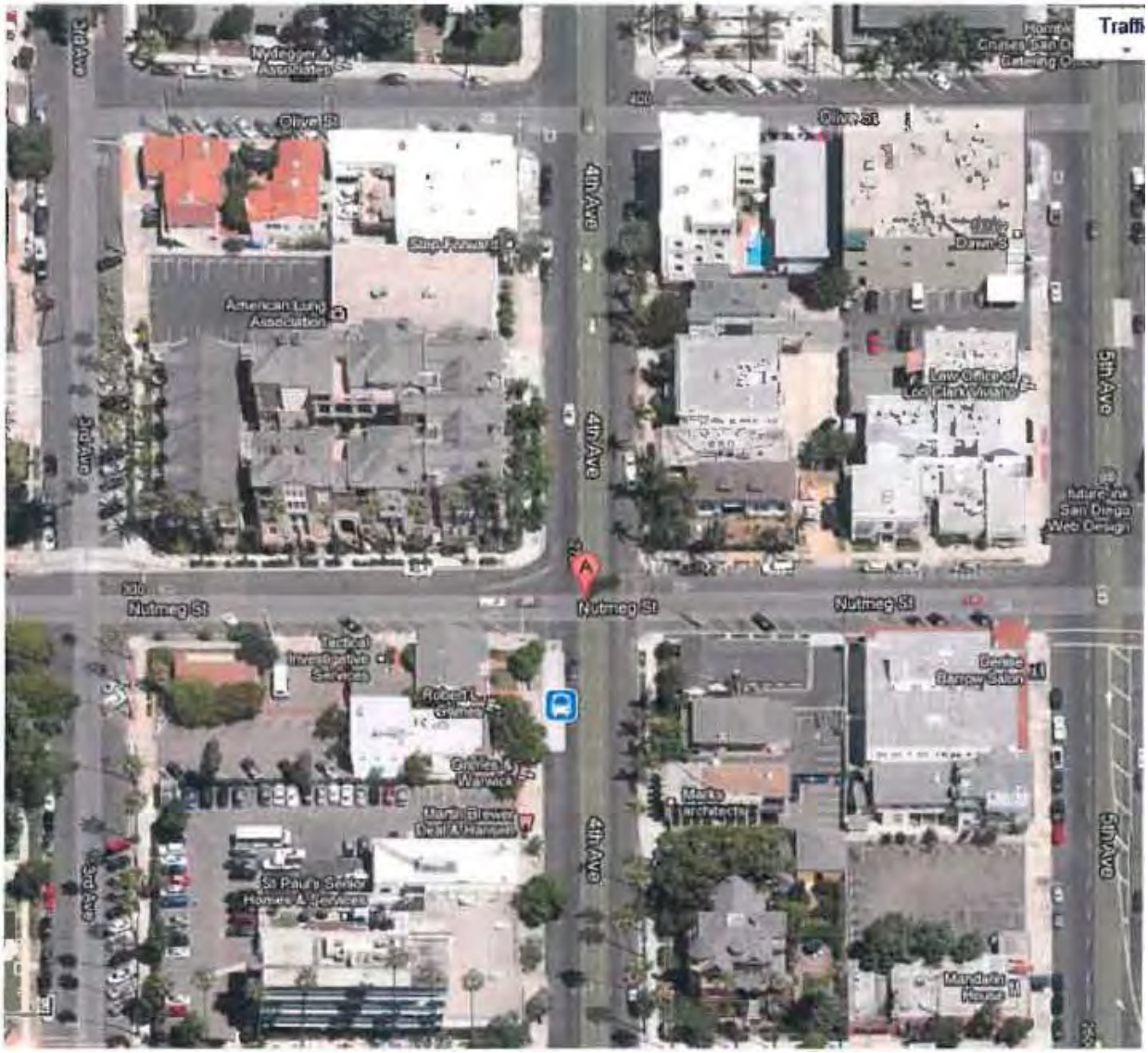

Photo 7 mid-rise condo project at the NW corner of 4th and Nutmeg, San Diego

Photo 7 shows a smart growth project on the northwest corner of 4th & Nutmeg in San Diego's highly urbanized Banker's Hill neighborhood: transit friendly (transit oriented development, TOD); walkable neighborhood; near parks, shopping and recreation (2 blocks from Balboa Park); near San Diego's airport; near Downtown/Hillcrest/Mission Valley work environments; and within the Smart Car (car 2 go) user footprint. Under the Revised Draft Permit, this project would become infeasible because of the 100% pollutant capture (infiltration/reuse) requirement and the loss of the hydromodification exemption previously included in the HMP.

The soil type at this location will not allow for infiltration. Additionally, to achieve the requisite density there is not enough land available to allow for supersizing of BMPs. There is no place to put a retention tank except under the building's parking structure. It may be infeasible to place a

tank under a building for a number of reasons: the difficulty or repairing a tank located below a building; the cost to integrate the tank into the building's foundation; if the tank were to leak, the entire building is subject to settlement issues, or failure, based on the water leaking into the surrounding soils; the added cost to operate and maintain the tank in perpetuity.

Photo 8 (street level) shows the building and that parking is located underneath the building. This is "podium" type construction and next to high-rise development, the most expensive type of construction for "smart growth" infill development. Complying with the Revised Draft Permit means this type of project becomes infeasible, both technically and financially. The Revised Draft Permit is silent on this issue and has not addressed this concern. The current language, whether intended or not, seems to eliminate this type of development project which is mandated and encouraged under SB 375.

Photo 8 – Street view: 4th and Nutmeg, San Diego (notice living units at ground level)

Whether or not water is infiltrated or stored onsite for reuse, the Revised Draft Permit includes no consideration of the fate of the pollutants existent in that water. In a storage tank or cistern, like a septic tank, gravity will cause most of the pollutants to fall to the bottom of the tank where they will remain and build up. Over time, the tank would gather year's worth of pollutants. If the tank owner is drawing the water for re-use, the water typically in any tank is drawn from the bottom, so the pollutants could be redistributed onsite. This raises questions of whether compliance with the Revised Draft Permit requirements would cause a health and safety concern to the person re-using the water, how often such a tank or cistern be emptied for cleaning, whether the mass of pollutants at the bottom of the tank would be considered a regulated waste,

and how and where a property owner could dispose of such a waste. An infiltration trench or basin would have the same pollutant disposal issues. The media (soil, sand gravel, etc.) in the trench or basin would need to be excavated and disposed of.

Another major concern with the new permit standard (infiltration or retention) is that it will deprive watersheds of the water that feeds riparian ecosystems. As the Revised Draft Permit offers creek and stream restoration or rehabilitation as an alternative compliance option to onsite hydromodification management, this raises the question of how can one restore those watercourses without the water that supplies them. (33 U.S.C. §1251(a) [the Clean Water Act was enacted "to restore and maintain the chemical, physical, and biological integrity of Nation's waters"].)

The Revised Draft Permit Includes no Support for the Ability to Comply with its Requirements

As described above, the phrase "retain onsite 100% of the pollutants" was recently added to the water quality management performance standard contained in the Revised Draft Permit (San Diego Regional MS4 permit Section E.3.c.(1)(a)). Unless a Priority Development Project can infiltrate the entire design capture volume, or reliably use the runoff collected in a harvest and use cistern system, retention of 100% of pollutants is impossible, and this is especially true for several pollutants of concern including bacteria or nutrients such as nitrogen or phosphorus.

The Revised Draft Permit offers no technical support for such a standard, including studies or data cited in the Fact Sheet, Response to Comments, or otherwise, that demonstrate 100% of pollutant can be prevented from being discharged from Priority Development Projects into the MS4 and into receiving waters. On the surface, such a requirement is conceptually feasible: no discharge equals no pollutants. However, the selection and application of retention type LID BMPs, principally soil infiltration systems and rainfall harvest and use systems, are subject to a myriad of technical infeasibility constraints, of which the RWQCB and others have identified (See for example, Orange County Model WQMP requirements and supporting Technical Guidance Document--TGD). In the absence of feasible application of infiltration or harvest and use, such a standard is unachievable. Rather, Regional Boards in California use water quality treatment design criteria that require project proponents to demonstrate that it cannot reliably retain 100% of the storm water quality design volume onsite before allowing the proponent to use biofiltration or biotreatment type LID BMPs. Only until the feasibility of these systems is exhausted may the proponent be allowed to use other types of management practices.

In the discussion in the Staff Report regarding justification for using the runoff created by the 24-hr 85th percentile rainfall event as the basis for a project's design capture volume, the RWQCB cites a Southern California Coastal Water Research Project ("SCCWRP") report prepared in 2007. This report includes findings that show the majority of pollutants from urban locations in the Los Angeles area of southern California arrive in receiving waters during the "early" part of storm events, and that the "highest constituent loading was observed early in the storm season, with inter-annual variability driven more by antecedent dry period that amount of rainfall."

The SCCWRP 2007 report also found that the "first flush" effect at land use sites was a function of watershed size. In other words, the smaller the watershed, the more pronounced the first flush

effect. Therefore, the author's note that "capturing constituent loads should focus on more than just the initial portion of the storm at moderate to large catchments". This statement, therefore, supports using the entire suite of LID type BMPs to manage urban runoff, including biofiltration systems, and supports using a secondary metric of sizing LID BMPs for retaining and treating 80% of the annual runoff volume in addition to capturing and treating individual rainfall events. In no case or instance cited in the SCCWRP 2007 report is there a recommendation or finding that supports a retention standard that achieves 100% pollutant containment. The aforementioned Orange County Model WQMP and TGD describe the LID BMP selection process and sizing criteria in detail (using both the 24-hr 85th percentile design storm and 80% annual runoff volume as sizing metrics), and provide several case study examples for support.

Such a restrictive and narrow definition of allowable LID BMPs is inconsistent with U.S. EPA guidance which promotes biofiltration and biotreatment as part of LID. Of five U.S. EPA sources regarding LID, four included biotreatment-type terms, such as detention (i.e., slow down, treat, then release), filtration, and surface release of storm water. In a compilation of case studies by U.S. EPA, most of 17 exemplary projects included biotreatment elements, such as bioretention, swales, wetlands, and green roofs. *See* U.S. EPA 841-F-07-006, discussed in a 2009 submittal from Mr. Eric Strecker, Geosyntec Consultants for the Construction Industry Coalition on Water Quality. In Mr. Strecker's analysis, each of two case studies described in another EPA document, s*ee* EPA 841-B-00-005, included the use of under-drains, and one of them specifically fed into the main storm drain system. A U.S. EPA document updated in January 2009 references additional resources, one of which refers to the many practices used to adhere to LID principles of promoting a watershed's hydrologic and ecological functions, such as bioretention facilities, rain gardens, vegetated rooftops, rain barrels, and permeable pavements. *See* EPA-560-F-07-231. A fact sheet used in conjunction with that document describes under-drains used to release treated storm water off site, permitting planted areas to safely allow filtration of storm water.

The State Water Resources Control Board (SWRCB) identifies LID as a sustainable practice that benefits water supply and contributes to water quality protection, stating that, "The <u>goal</u> of LID is to mimic a site's predevelopment hydrology by using design techniques that infiltrate, <u>filter</u>, store, evaporate, and <u>detain</u> runoff close to the source of rainfall" (emphasis added). SWRCB also states that, "LID practices include; <u>bioretention</u> facilities or rain gardens, grass swales and channels, vegetated rooftops, rain barrels, cisterns, vegetated filter strips, and permeable pavements" (emphasis added). As can be seen, SWRCB defines LID as including filtration, detention, and bioretention, and other practices, each of which produce runoff and would not be part of the LID standard under the tentative order and instead moves a project into "Alternative Compliance". In addition, SWRCB characterizes mimicking pre-development hydrology as a "goal," not an enforceable standard. *Found at*: http://www.waterboards.ca.gov/water_issues/programs/low_impact_development/.

The language in the current tentative Order, while clearly specifying a volume capture approach to sizing LID BMPs, introduces an incorrect definition of LID through restrictive application of BMPs to only those that infiltrate, harvest and use rainwater, and/or evapotranspire all of the captured water. In other words, permit language now requires that projects would be limited to zero discharge of a design storm volume with no runoff whatsoever allowed.

The US EPA defines LID as follows:

> *A comprehensive stormwater management and site-design technique. Within the LID framework, the goal of any construction project is* ***to design a hydrologically functional site that mimics predevelopment conditions.*** *This is achieved by using design techniques that infiltrate,* **filter***, evaporate, and store runoff close to its source.* (emphasis added)

http://cfpub1.epa.gov/npdes/greeninfrastructure/information.cfm#glossary .

Mandating the complete onsite retention of any sizable storm volume (i.e. runoff that never leaves as surface flows) is not a reasonable approach and the tentative Order attempts in places to redefine the allowable site design elements necessary to implement this concept. The tentative Order may implement LID in a way that is contrary to the EPA definition of LID by restricting BMPs to those that only achieve zero discharge—not allowing any BMPs that appropriately "filter" runoff, such as bioretention cells or other vegetated LID BMPs. Total, 100-percent retention remains impractical and unwise in most circumstances, and is not a goal that can be achieved for most projects within reasonable costs, despite best efforts. Moreover, such a mandate abandons the goal to mimic predevelopment conditions to the extent practicable, as EPA encourages.

The retention BMPs of infiltration, harvesting, and evapotranspiration ("ET") may be described as a first tier of LID BMPs, but they should not be universally mandated to the exclusion of all other options. As the EPA definition of LID indicates, biofiltration, bioretention, filter strips, and other BMPs based on using vegetation to promote stormwater treatment via filtration are fundamental to LID implementation. These BMPs may be specified as second tier options (although they best mimic pre-development conditions), but project proponents should have considerable discretion to use these BMPs, and should not be required to apply for a feasibility exception to do so.

The use of conventional BMPs (structural treatment installations) as the principal approach for stormwater management should be a last resort, available only when objective infeasibility criteria are satisfied, and when off-site opportunities are not readily available. When LID BMPs are infeasible, and nearby off-site options are not available, the use of conventional BMPs that have been demonstrated to be effective on the pollutants of concern should be a compliance option.

IV. Sediment Transport Requirements

The Revised Draft Permit's Requirements

The Revised Draft Permit requires Priority Development Projects to avoid known critical sediment yield areas or implement measures that allow coarse sediment to be discharged to receiving waters, such that the sediment supply is unaffected by the project. (Revised Draft Permit, Provision E.3.c.(2)(b).) The Revised Draft Permit does not define "coarse sediment"[7] as

[7] According to the technical literature, the beginning of sediment motion is not defined by the term "coarse sediment" but by more specific terms such as (1) Nearly Uniform Cohesionless

it is used in this section. The Fact Sheet supporting the Revised Draft Permit states that the requirement is necessary because coarse sediment supply is as much an issue for causing erosive conditions to receiving streams as are accelerated flows.[8] (Fact Sheet, page F-100.)

All development involves some loss of sediment. The Revised Draft Permit requires that "critical sediment yield areas" will be identified by studying the watersheds (through the Watershed Management Area Analyses[9]). These analyses would then be incorporated into the Water Quality Improvement Plans for each watershed. Thus, a new category of "Environmentally Sensitive Areas" will be identified and protected. This would be incompatible with development on that property. To understand why introducing a new category of sensitive area into the development planning process is such a concern requires an explanation of hydromodification basics and impacts on receiving waters.

Hydromodification Basics regarding Sediment Transport

Hydromodification is primarily understood within the context of impacts, potential or realized; that is, the effects of changes within a watershed on downstream fluvial systems (i.e., canyons, creeks, streams, rivers, lakes, lagoons, etc.). A change, or a number of changes, can cause or contribute to an imbalance within a fluvial system that has been in a state of dynamic equilibrium (relative stability within a range of erosivity/degradation and sedimentation/aggradation). Related secondary impacts (secondary as a consequence, not necessarily in importance) include habitat degradation, slope failures, infrastructure failures, and increased flooding risks, among others. (ADWR, 1996, 1998; USACOE, 1994).

The most common example of hydromodification is the covering of land with impervious surfaces, which deprives the waterways of naturally occurring sediment yield, while increasing runoff volumes, durations and peaks in those same waterways. Another example is the presence of a flood control dam upstream, which tends to trap sediment but also reduces damaging peak flows and volumes. (Aspen Environmental, 2006.) For the purposes of this paper, hydromodification will be understood as a direct consequence of urbanization, the covering over of land with impervious surfaces.

Sediment (Shields, 1936; Maidment, 1992), (2) Incipient Motion on Ripple and Dune Beds (Chabery et al, 1963; Mantz, 1977) ; Mixture of Nonuniform Cohesionless Sediment Sizes (Egiazoroff, Little and Meyer, Hayashi et al, among many others), and Cohesive Sediment (Mehta, (3 studies, 1986, 1989 and 1989)).

[8] This statement oversimplifies a complex issue, as in some watersheds, fine sands, dunes and ripples, and cohesive sediments can be an important geomorphic factor. (*See* Lane and Carson; Shen and Liu; Task Committee; previous studies).

[9] The Revised Draft Permit is silent as to the method to determine such critical yield areas, which could conceivably be established based upon the USLE equation (Wischmeier et al, 1971), by sediment-delivery ratio equations (Roehl, 1962), by sediment yield empirical formulas based on real measurements (Dendy and Bolton, 1976), or by more complex mathematical formulations (Ponce, 1989).

Understanding Fluvial Processes

Lane's Stream Balance Relationship states that dynamic equilibrium exists between stream power and the discharge of bed material sediment. (Lane, 1947.) It is usually stated as:

$$Q_s * D_{50} \alpha Q_w * S$$

Where Q_s is the sediment discharge, D_{50} is the sediment size, Q_w is the (water) discharge, and S is the bed slope. This proportional relationship is often graphically illustrated with a balance, as shown below, and it is not intended to be used as an equation. Some attempts to convert this relationship into an equation have been carried out. (Ponce, 1999.) The Lane relationship shows that where adjustments or modifications occur in the watershed or in the channel (in terms of Q_w, for example), another adjustment will begin to occur to preserve the equilibrium (in terms of S or Qs, for example).

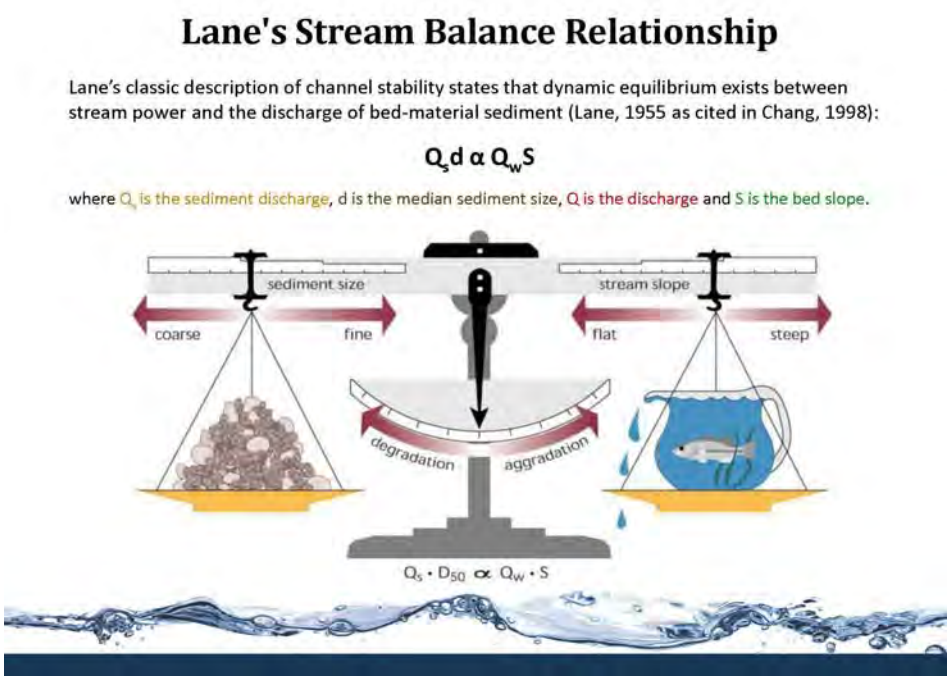

Three Local Examples

Hydromodification impacts vary, sometimes by orders of magnitude. (Hastings, 2005; Hecht, 2000.) The following three examples of fluvial systems within our region illustrate this well. Each is different, and each only represents one reach of the creek. As one travels upstream or downstream each of these creeks, impacts will vary widely.

<u>Oso Creek</u>

The photo below shows a portion of Oso Creek, approximately 1 kilometer (0.7 miles) downstream of a hardened channel. The severe degradation evident in this photo has occurred

within the past 20 years, due to development of a master planned community upstream. The composition of the bed and banks is primarily loose alluvium, so erosion has not been halted. The sediment from this reach is deposited in downstream reaches and has resulted in slope failures, biological degradation and flooding impacts downstream.

Oso Creek, approximately 1 kilometer (0.7 miles) downstream of a hardened channel

Escondido Creek

By contrast, the photo below indicates a creek in dynamic equilibrium 0.7 kilometers downstream of a hardened channel. The City of Escondido, incorporated in 1888, has certainly experienced its share of development, with most of the city draining to this natural channel for more than 100 years. This photo is typical of Escondido Creek for the remaining 23 kilometers (14 miles) to the ocean. That is not to say this creek is not subject to any degradation, only that over the decades the creek has mostly adjusted to a new state of dynamic equilibrium.

Escondido Creek in dynamic equilibrium 0.7 kilometers downstream of a hardened channel

Agua Hedionda Creek

The Agua Hedionda Creek watershed is in portions of several north San Diego jurisdictions. A 2008 Watershed Management Plan (TetraTech, 2008) identified a reach of the creek as a high priority project; Tory R. Walker Engineering, Inc. assembled a multi-disciplined team, which prepared a Preliminary Design Report for the rehabilitation of that reach. (Tory R. Walker Engineering, 2010.) The photo below illustrates the typical impacts of hydromodification within the reach, where an established Oak woodland is threatened.

Agua Hedionda Creek in Buena Vista Park near Melrose Avenue

The figures below illustrate the effects of hydromodification over time on hypothetical stream systems. (TRWE, 2010.)

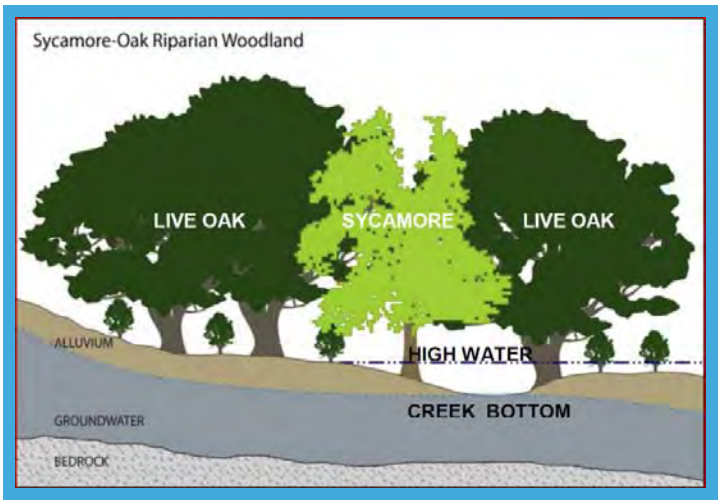

Stable System (circa 1900)

- High Groundwater Recharge
- Equilibrium Sediment Transport
- High Floodplain Function
- Low Discharge Velocities
- Dynamic and Broad Riparian Zone
- Diverse Riparian Habitat
- Sustainable Vegetation Mosaic
- Cool Seasonal Aquatic System

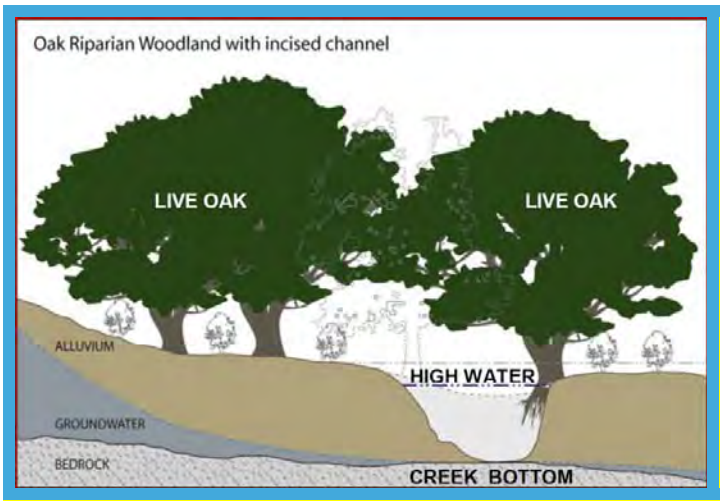

Early Incised System (Present)

- Depressed Groundwater Table
- High Groundwater Export
- Low Groundwater Recharge
- High Channel Bank Erosion
- Confined Low Floodplain Function
- High Discharge Velocities
- Diminishing Riparian Zone Width
- Low Diversity Riparian Habitat
- Poor Riparian Plant Recruitment
- Cool Seasonal/Perennial Aquatic System

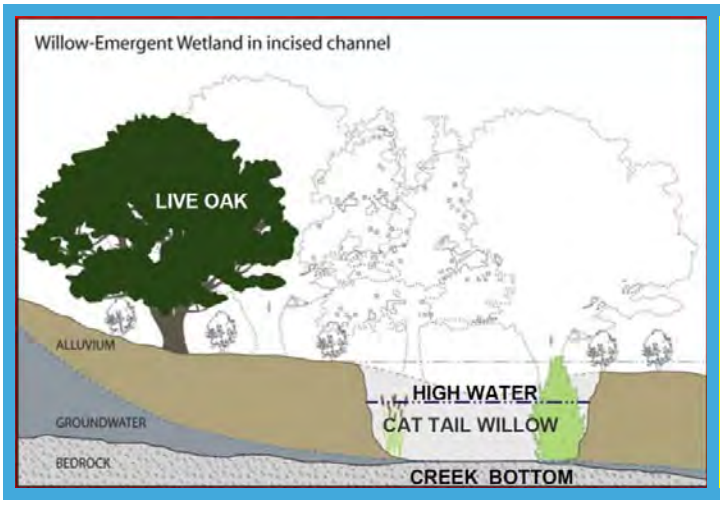

Mature Incised System (circa 2040)

- Groundwater Conditions Same as Now
- High Channel Bank Erosion
- Confined Low Floodplain Function
- High Discharge Velocities
- Diminishing Riparian Zone Width
- Low Diversity, Narrow Riparian Habitat
- High Scour Plant Loss
- Opportunistic Exotic Plant Recruitment
- Warm Seasonal/Perennial Aquatic System

Restoration of ecosystem functions that have been lost due to hydromodification may be accomplished through different mechanisms. The figure below illustrates two paths to the restoration of ecosystem functions over time – with and without human intervention to restore the lost functions. The shorter length of the "blue path" demonstrates the value of restoration/rehabilitation in a creek, whereas the length of the "red path" shows how a much longer period of time is needed for recovery of ecosystem functions when no human restorative action is taken. In the case of Agua Hedionda Creek, those ecosystem functions would be different.

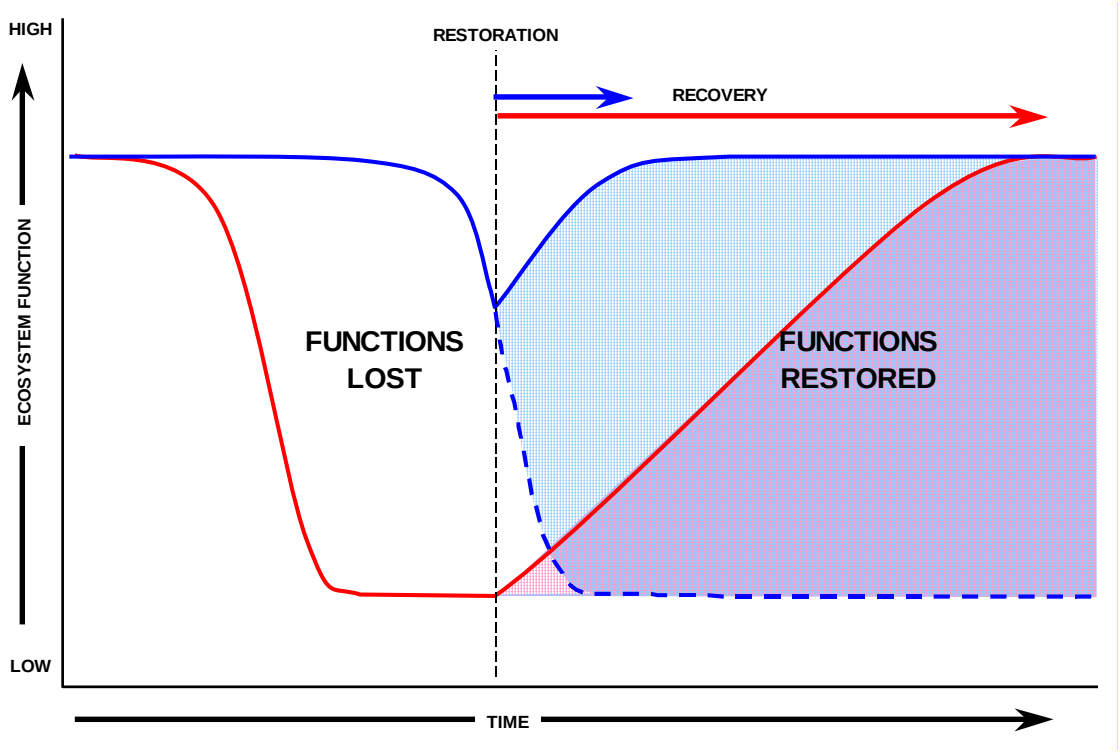

Effects of Ecosystem Trajectory on Restoration Values (TRWE, 2010.)

Stabilization

Stabilization of fluvial systems has generally been considered the typical "fix" to hydromodification. (USACOE, 1994.) Stabilization can be understood very broadly to include everything from concrete lining and piping underground to streambed or bank stabilization utilizing bioengineering techniques exclusively. Between these two "ends of the spectrum" are quite a number of techniques and types of materials, used in combination or separately, to "stabilize" these dynamic systems. Common techniques include grading of new "stable" channels, creating "benches" beside channels (thus increasing flood capacity and stability), constructing drop structures to flatten the longitudinal slopes, or meandering the stream channel to lengthen it. In addition to concrete lining, materials have typically included rock riprap, natural stone, concrete block systems, turf reinforcement mats, vegetation, imported sediment and/or cobbles of a certain gradation, gabion baskets, logs, and root wads. (NRCS, 2002; WSAHGP, 2003.)

Restoration and Rehabilitation

"Restoration" usually refers to attempts to restore a system back to a previous condition, while "rehabilitation" usually refers to attempts to improve a system while accounting for mostly irreversible changes (like a hydromodified watershed). This should not be understood as "giving up" on all efforts to lessen impacts within a watershed; rather, it should be understood within the context of the graph above. Time marches on, as the saying goes, so intervention requires an understanding of where a fluvial system is currently, along with an understanding of the current and future conditions of the watershed. For this reason, most work within fluvial systems is no longer described as "restoration," but rather "rehabilitation."

Onsite Approach Presented in Draft Permit

Attempts to address sediment balance through a directive within a permit will almost always fail; the complexity of the issue defies such an approach. The desire to compensate for the loss of course sediment due to development (even LID), or to avoid sediment yield areas altogether (both of which have been put forth in revisions of the Revised Draft Permit) shows a misunderstanding and a wrong focus on the issue by attempting to address it at the source. The currently proposed language in Section E.3.c.(2)(b) introduces a further complication, in that its implementation must necessarily prohibit the use of land for any compatible use other than allowing erosion to occur so that the downstream system has a supply of coarse sediment. This then becomes a land use decision.

Natural areas have produced sediment as part of a natural cycle of random precipitation events, vegetative cover and burns for millennia. Urbanization introduces a sudden and sometimes dramatic change to an equilibrium that has existed for a very long time (as in Oso Creek). In almost all cases throughout the San Diego Region, the effects of urbanization have already done most of the "work" on the downstream systems, so an onsite approach to the problem is much like closing the barn door after the horse has escaped. With that consideration, attempting to identify critical sediment yield areas within most of the watersheds will be an exercise in futility, as such areas would not typically be able to provide even a fraction of the amount of course sediment required to balance sediment through downstream reaches.

Another unintended consequence of the Revised Draft Permit Provision E.3.c.(2)(b) is that it will create a new land use restriction. The way this will likely proceed is that "critical sediment yield areas" will be identified by studying the watersheds (through the Watershed Management Area Analyses). Specifically, Copermittees will be required to prepare sediment yield studies of watersheds based on watershed-wide models and criteria that will approximately identify these critical sediment yield areas. These analyses would then be incorporated into the Water Quality Improvement Plans for each watershed. Thus, a new category of "Environmentally Sensitive Areas" will be identified and protected. After all, there is no other compatible use of such property, not even roads, so such property will become open space.

Sediment Balance Summary

In summary, sediment balance is very complicated and requires careful study of each watershed and fluvial system to understand how best to approach the issue. Fluvial systems, to transport the same amount of incoming sediment to downstream reaches, and eventually to the ocean, must often be modified. Many such systems are already modified, either as part of a natural process (degradation) or as the result of man-made modification. Attempts to address sediment balance through a directive within a permit will almost always fail; the complexity of the issue defies such an approach. The desire to compensate for the loss of coarse sediment due to development (even LID), or to avoid sediment yield areas altogether (both of which have been put forth in revisions of the Revised Draft Permit) shows a misunderstanding and a wrong focus on the issue by attempting to address it at the source. The currently proposed language in Section E.3.c.(2)(b) of the Revised Draft Permit introduces a further complication, in that its implementation must necessarily prohibit the use of land for any compatible use other than allowing erosion to occur so that the downstream system has a supply of coarse sediment. This

then becomes a land use decision. The best focus for this issue remains the water bodies themselves on a watershed by watershed and reach by reach basis.

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Construction Industry Coalition on Water Quality

November 19, 2014

Ms. Laurie Walsh, Senior Engineer
San Diego Regional Water Quality Control Board
2375 Northside Drive, Suite 100
San Diego, Ca 92108

Via Email: Laurie.Walsh@waterboards.ca.gov

RE: Comment - Tentative Order No. R9-2015-0001, Place ID: 658018LWalsh

Dear Ms. Walsh:

The Construction Industry Coalition on Water Quality (CICWQ) is submitting comments concerning Tentative Order No. R9-2015-0001 (National Pollutant Discharge Elimination System (NPDES) Permit for Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region). We are submitting this letter on behalf of the CICWQ membership, which is described below.

CICWQ is an advocacy, education, and research 501(c)(6) non-profit group of trade associations representing builders and trade contractors, home builders, labor unions, landowners, and project developers. CICWQ membership is comprised of members of four construction and building industry trade associations in southern California: The Associated General Contractors of California, Building Industry Association of Southern California, Engineering Contractors Association, and Southern California Contractors Association, as well as the United Contractors located in San Ramon in northern California. Collectively, members of these associations build a significant portion of the transportation, public and private infrastructure, and commercial and residential land development projects in California.

We present two main points for Regional Board consideration:

I. The Regional Board is requiring increasingly stringent on-site stormwater retention requirements without evidence the existing, 2010 South Orange County MS4 permit water quality requirements are not working to protect water quality and maintain beneficial uses.

With the release of the Draft Regional Permit to incorporate watersheds in South Orange County within the San Diego Regional Water Quality Control Board (Regional Board) jurisdiction, the Regional Board is proposing to enact the most stringent on-site requirements for stormwater runoff anywhere in California. Despite the demonstrable improvements in water quality runoff noted by the Orange County permittees in their

Report of Waste Discharge, and their presentations to the Regional Board in 2014 during stakeholder and Board workshops, Regional Board staff continue to require additional and less flexible on-site prescriptive performance measures for retaining stormwater runoff.

The program changes proposed in the Draft Regional Permit are being made without presenting any factual evidence that the existing low impact development water quality performance standards are not working, which the County of Orange has required since the requirements became effective in 2012. We believe that because the current South Orange County Permit requirements are working well to protect water quality, presenting any evidence to the contrary is not actually possible. We note no Findings in the Draft Regional Permit that would suggest a need for any changes to program implementation and management.

II. The Regional Board is eliminating exemptions for hydromodification control, even when stormwater runoff is conveyed in the MS4 system to significantly hardened or engineered channels.

CICWQ and its membership believe that the regulations are tending, at some point, to require hydromodification control for all priority development projects regardless of receiving water susceptibility to hydromodification effects. This regulatory direction is undoubtedly driven by environmental NGO advocacy for removal of all concrete lined channels and receiving waters and complete restoration of all significantly or completely lined channels to "natural" conditions, regardless of the existing land uses and feasibility. This effort ignores the vital role flood control facilities play in urban infrastructure and the protection of life and property, and it ignores the significant public investment in these systems. Loss of hardened channel exemptions will result undoubtedly in increased costs for new and redevelopment of most public and private properties within the Regional Board's jurisdiction, and require project proponents to engage in a potentially costly and cumbersome bureaucratic process to "mitigate" for the effects (even the lack of) of hydromodification with no environmental benefit.

According to the Regional Board, hydromodification control requirements are being required to maintain geomorphic stability in receiving waters in southern California. However, it is clear that the alignment, grade and cross section of many urban streams has been irrevocably altered. A regulatory requirement to return flows to pre-development conditions will not allow stream restoration to occur. For urban areas, the Permit should support projects that enhance the functions and values of the receiving water within the constraints of the urban environment. Removing exemptions without consideration, or requiring extensive additional study to support exemptions that have been granted for years, appears to be a poor policy decision and one that is not supported technically.

Specifically, nowhere in the Draft Regional Permit is the lack of clear evidence for program changes more evident than the requirements for installing hydromodification controls at priority development sites in Provision E.3.c.(2). In particular, we note the

Regional Board is on a path to remove long-standing exemptions from hydromodification control requirements for certain projects whose discharge is conveyed to receiving waters via significantly or completely hardened and engineered channels. In the Draft Regional MS4 Permit for South Orange County, the Regional Board has provided "interim" exemptions that, while welcome in the interim, should be granted outright and without any additional study or consideration. Nor should additional updates or study be required on the part of the co-permittees to support granting exemptions, as required in the BMP Design Manual update referenced in Provision E.3.c.(2)(e). We would expect that at a minimum, these same conditions are afforded to the Riverside County permittees when their MS4 permit is considered for renewal by the Regional Board in 2015.

And, as we commented on during the adoption process for the San Diego County Regional MS4 permit in 2012 and 2013, new hydromodification control requirements that require a priority project to "avoid critical sediment yield areas" are unnecessarily restrictive, and do not reflect the dynamic and variable nature of the sediment supply that is delivered to stream systems in southern California. Our membership reports several instances where priority development projects are being significantly delayed or stopped all together, because of the inability to comply with the requirement to avoid critical sediment yield areas. The most prevalent reason given is lack of engineering tools and techniques to comply with such a sweeping provision.

In summary, we have commented to the Regional Board about hydromodification control requirements in MS4 permits within its jurisdiction in a number of instances in the recent past, and many of our concerns and comments remain relevant in the current proceedings. While we note many of our suggestions have been ignored or discounted, we incorporate nonetheless those comments by reference here and cite specifically:

1) Administrative Draft Regional Municipal Separate Storm Sewer System (Tentative Order No. R9-2012-0011); submitted September 14, 2012. See Item No. 3, page 6.

2) Comment Letter– Tentative Order No.R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu; submitted January 13, 2013; See Items 3 and 4, pages 4-6.

3) San Diego Regional Water Quality Control Board's Draft MS4 Permit: A case study; submitted May, 2013. See pages 3-8.

These documents are included as attachments to this comment letter.

CICWQ's membership is in the forefront of water quality regulation, providing to water quality regulators practical ideas and solutions that are implementable and that have as their goal clean water outcomes. If you have any questions or want to discuss the content of our comment letter, please feel free to contact me at (951) 781-7310, ext. 210, (909) 525-0623, cell phone, or mgrey@biasc.org.

Construction Industry Coalition on Water Quality (CICWQ)
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Respectfully submitted,

Mark Grey, Ph.D.
Technical Director
Construction Industry Coalition on Water Quality

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November 19, 2014

David Gibson
Executive Officer
C/O Laurie Walsh
Water Resources Control Engineer
California Regional Water Quality Control Board, San Diego Region
2375 Northside Drive, Suite 100
San Diego, CA 92108-2700

Re: Comment – Tentative Order No. R9-2015-0001, Place ID: 658018LWalsh

Dear Mr. Gibson:

Best Best & Krieger LLP serves as City Attorney for the City of Aliso Viejo ("City"). The City has reviewed the comments submitted by the County of Orange on San Diego Regional Water Quality Control Board Tentative Order No. R9-2015-0001 ("Draft Permit"). The City supports the County's comments and has requested that the City be listed as a "concurring entity" on the County's comment letter. Please consider the City's support for the County's comments when considering revisions to the Draft Permit.

If you have any questions on the City's position on the Draft Permit please do not hesitate to contact me, or Mr. Moy Yahya, the stormwater program director for the City.

Sincerely,

J. G. Andre Monette
of BEST BEST & KRIEGER LLP

cc: Moy Yahya, City of Aliso Viejo

City of Del Mar

November 19, 2014

Ms. Laurie Walsh
California Regional Water Quality Control Board, San Diego Region
2375 Northside Drive, Suite 100
San Diego, California 92108

SUBJECT: Comment – Tentative Order No. R9-2015-0001, Place ID:658010LWalsh

Dear Ms. Walsh:

The City of Del Mar (City) appreciates the process and effort the Regional Water Quality Control Board staff has made to facilitate stakeholder participation in the development of the Tentative Order. The City is providing specific comments to ensure Attachment E accurately reflects the Basin Plan Amendment to incorporate the Total Maximum Daily Load (TMDL) for Sedimentation in Los Peñasquitos Lagoon (Resolution No. R9-2012-0033).

The City participated in the three-year collaborative third party effort to develop the TMDL for Sediment in Los Peñasquitos Lagoon. At the request of the Regional Board, the City of San Diego led and funded the effort, with input from other Responsible Parties, and guidance from the Regional Board, US Environmental Protection Agency, and other stakeholders. The Responsible Parties (City of San Diego, County of San Diego, City of Poway, Caltrans, and the City of Del Mar) dedicated staff time to the development of the TMDL by preparing and reviewing documents and attending frequent meetings. The City of Del Mar generally supported the adoption of the Basin Plan Amendment and would like to ensure the language remains consistent.

Attachment E – 7. Total Maximum Daily Loads for Sediment in Los Peñasquitos Lagoon
The City requests the following revisions to make the language in Attachment E consistent with the language in the Basin Plan Amendment to incorporate the TMDL for Sedimentation in the Los Peñasquitos Lagoon and consistent with other TMDLs incorporated into the MS4 Permit Attachment E. The strikethrough text represents recommended deletions and the underlined bolded text represents recommended additions.

The City requests the following language, similar to adopted Resolution No. R9-2012-0033 page 3, be added to Attachment E on page E-53 section 7.b.(2)(a). Final Water Quality Based Effluent Limitations:

(a) Final Receiving Water Limitations

Discharges from the MS4s must not prohibit the sustainable restoration of **80 percent of the 1973 acreage of the lagoon (tidal and non-tidal)** saltmarsh **habitat** ~~vegetation of at least~~ (346 acres**) OR**

(b) Demonstrate that implementation actions are active on and/or affecting 346 acres with continued monitoring to ensure 80 percent target achievement.

The City also requests the following language, similar to adopted Resolution No. R9-2012-0033 page 3 and other TMDLs included in Attachment E, be added to Attachment E on page E-54 section 7.b.(3):

> (a) Successful restoration of **80 percent of the 1973 acreage of lagoon (tidal and non-tidal) salt marsh habitat (346 acres)** ~~346 total acres of tidal and non-tidal saltmarsh vegetation in Los Peñasquitos Lagoon;~~ OR
> **(b) Demonstrate that implementation actions are active on and/or affecting 346 acres with continued monitoring to ensure 80 percent target achievement; OR**
> **(c) There is no direct or indirect discharge from the Responsible Copermittee's MS4 to the receiving water; OR**
> **(d) The final receiving water limitation under Specific Provision 7.b.(2)(a) is met.**

The City also requests the following language for interim compliance options be included to be consistent with other TMDLs incorporated into the MS4 Permit in Attachment E on page E-55 Section 7.c. Interim TMDL Compliance Requirements:

> **(b) There is no direct or indirect discharge from the Responsible Copermittee's MS4 to the receiving water; OR**
> **(c) The final receiving water limitation under Specific Provision 7.b.(2)(a) is met; OR**
> (d) ~~The Responsible Copermittees must comply with the interim WQBELs, expressed as annual loads, by December 31 of the interim compliance year set forth in Table 7.2.~~**There are no exceedances of the Copermittee portion of interim effluent limitations under Table 7.2 at the Responsible Copermittee's MS4 outfalls; OR**
> **(e) The Responsible Copermittee has submitted and is fully implementing a Water Quality Improvement Plan, accepted by the Regional Board, which provides reasonable assurance that the Copermittee portion of interim TMDL compliance requirements will be achieved by the interim compliance date.**

The City requests that the heading on column 2 of Table 7.2 in section 7.c on page E-55 be revised to accurately reflect the TMDL Basin Plan Amendment. It should be changed to "Interim Effluent Limitations (tons/~~year~~ **wet season)**

The City also requests the addition of a footnote to Table 7.2 on page E-55 to acknowledge the sediment load contributions of other Responsible Parties listed in the TMDL Basin Plan Amendment:

> **Responsible Parties include the following: Phase I Municipal Separate Storm Sewer Systems (MS4s) Copermittees (the County of San Diego, City of San Diego, City of Del Mar, and the City of Poway), Phase II MS4 permittees, and general construction storm water NPDES permittees, and general industrial storm water NPDES permittees as presented in Resolution No. R9-2012-0033 Attachment A, page A-5.**

The Assessment and Reporting Requirements on page E-56 Section 7.d(3)(c) needs to be revised to require monitoring to start the first full wet season after the WQIP is accepted by the Regional Board:

(c) For assessing and determining compliance with the final effluent limitations under Specific Provision 7.b.(2)(b), the Responsible Copermittees must use the data acquired under Specific Provision 7.d.(1) to estimate sediment loading into Los Peñasquitos Lagoon. Sediment loading must be evaluated using a 3-year, weighted rolling average. The first reported average shall be calculated using data collected in the **3** years ~~2014-15, 2015-2016, and 2016-2017 wet seasons~~**following Regional Board acceptance of the WQIP.**

The City looks forward to continuing our dialog with Regional Water Quality Control Board staff during the next phases of the permit reissuance process. If you have any questions, please contact me at (619) 994-7074.

Sincerely,

Mikhail Ogawa, P.E.
Clean Water Manager

c: Kathleen A. Garcia, Planning and Community Development Director
File

CITY OF LAKE FOREST

November 19, 2014

Mayor
Dwight Robinson

Mayor Pro Tem
Adam Nick

Council Members
David A. Bass
Kathryn McCullough
Scott Voigts

City Manager
Robert C. Dunek

By email: laurie.walsh@waterboards.ca.gov

Mr. David Gibson
Executive Officer
C/O Laurie Walsh, P.E.
California Regional Water Quality Control Board, San Diego Region
2375 Northside Drive, Suite 100
San Diego, CA 92108-2700

Subject: Comments – Tentative Order No. R9-2015-0001, Place ID: 658018LWalsh

Dear Mr. Gibson:

The City of Lake Forest ("City") submits these comments on the San Diego Regional Water Quality Control Board's Tentative Order No. R9-2015-0001 ("Draft Permit").

As the Regional Board is aware, the City's municipal separate storm sewer system has been subject to regulation by the Santa Ana Regional Water Quality Control Board ("Santa Ana Regional Board") and by the San Diego Regional Water Quality Control Board ("San Diego Regional Board"). Pursuant to Water Code section 13228, the City requested regulation by a single board, the Santa Ana Water Board. The Draft Permit notes that the Santa Ana Water Board and the San Diego Water Board have entered into an agreement allowing the City's stormwater discharges to be subject to the municipal stormwater permit issued by the Santa Ana Board in lieu of regulation under the Draft Permit.

We would like to express our support and appreciation for the efforts of each Regional Board in reaching this agreement. Allowing the City to participate in watershed based programs in the San Diego Region while implementing the Santa Ana Regional Board's permit will reduce costs and administrative burdens currently imposed on the City. The City is grateful for both Boards' efforts in coming to this agreement and supports the proposed change.

In an effort to streamline and clarify regulation of the City by a single water board, the City requests minor revisions to the wording of the Draft Permit. Specifically, the City seeks to conform the Draft Permit language designating the Santa Ana Water Board as the City's regulatory authority with language used in previous permits making a similar designation. This request seeks four changes to the Draft Permit, as follows:

1. Remove "Lake Forest" from Table 1b.

Table 1b. Orange County Copermittees

City of Aliso Viejo	City of Rancho Santa Margarita
City of Dana Point	City of San Clemente
City of Laguna Beach	City of San Juan Capistrano
City of Laguna Hills	City of Laguna Woods
City of Laguna Niguel	County of Orange
~~City of Lake Forest1~~	Orange County Flood Control District
City of Mission Viejo	

2. Remove footnote 1 to Table 1b.

~~1 The MS4 discharges within the jurisdiction of the City of Lake Forest located in the San Diego Region will be regulated by the Santa Ana Water Board Order No. R8-2014-0002 (NPDES No. CAS618030) and any reissuance thereto subject to the terms of the agreement between San Diego Water Board and Santa Ana Water Board.~~

3. Revise footnote 2 to Table B-1 to read as follows:

~~The MS4 discharges within the jurisdiction of~~ The City of Lake Forest ~~located in the San Diego Region will be~~ is wholly regulated by the Santa Ana Water Board under Order No. R8-2014-0002 (NPDES No. CAS618030) ~~and any reissuance thereto.~~ or the most recent iteration thereof, including those portions of the City of Lake Forest within the San Diego Water Board's region. In accordance with the terms of the agreement between San Diego Water Board and Santa Ana Water Board, the City of Lake Forest must ~~also comply with~~ implement the requirements of the Bacteria TMDL in Attachment E of this Order, participate in preparation and implementation of the Water Quality Improvement Plan for the Aliso Creek Watershed Management Area as described in Provision B of this Order and continue implementation of its over-irrigation discharge prohibition in Title 15, Chapter 15, section 14.030, List (b).

4. Revise Finding 29 as follows:

Regional Water Board Designation. The Cities of Laguna Hills, Laguna Woods, and Lake Forest are located partially within the jurisdictions of the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board) and the San Diego Water Board and their ~~dischargers~~ discharges are subject to regulation by both Regional Water Boards. Pursuant to CWC section 13228, the Cities of Laguna Hills, Laguna Woods, and Lake Forest submitted written requests that one Regional Water Board be designated to regulate Phase I MS4 discharges for each of the Cities. The Santa Ana Water Board and the San Diego Water Board have entered into an agreement whereby the Cities of Laguna Woods and Laguna Hills are wholly regulated by the San Diego Water Board ~~is designated to regulate Phase I~~

~~MS4 discharges within the jurisdiction~~ under this Order, including those portions of the Cities of Laguna Woods and Laguna Hills ~~and~~ not within the ~~Santa Ana~~ San Diego Water Board's ~~is designated to regulate Phase I MS4 discharges within the jurisdiction's~~ region. Similarly, the City of Lake Forest, including those portions of the City of Lake Forest ~~pursuant to MS4 permits administered by each Regional Water Board~~ within the San Diego Water Board's region, is wholly regulated by the Santa Ana Water Board under Order No. R8-2014-0002 (NPDES No. CAS618030) or the most recent iteration thereof. The agreement provides that the City of Lake Forest will be required to retain, and continue implementation of, its over-irrigation discharge prohibition in Title 15, Chapter 14.030, List (b) of the City Municipal Code for regulating storm water quality throughout its jurisdiction. The City of Lake Forest will also be required to actively participate during development and implementation of the Aliso Creek Watershed Management Area Water Quality Improvement Plan required pursuant to this Order. Each Regional Water Board retains the authority to enforce provisions of the Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee (Water Code section 13228 (b)). Under the terms of the agreement, any TMDL and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Laguna Woods, Laguna Hills or Lake Forest as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement of the applicable TMDL will remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's San Diego Creek/Newport Bay TMDL and the San Diego Water Board's Indicator Bacteria Project I Beaches and Creeks TMDL. The San Diego Water Board will periodically review the effectiveness of the agreement during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate the agreement with Santa Ana Water Board or otherwise modify the agreement subject to the approval of the Santa Ana Water Board.

In addition to the above, the City is aware that the County of Orange is submitting comments on the Tentative Order. The City supports the County's comments and is listed as a concurring entity on the County's comment letter.

Many of the City's concerns with the Regional Permit issued to the San Diego County permittees (San Diego Regional Board Order R9-2013-0001(NPDES No. CAS0109266)) have not been resolved in the Draft Permit. The City therefore resubmits its prior comments and its petition of the Regional Permit as comments on the Draft Permit. If the City's above requested changes are granted, the City will be largely regulated under the Santa Ana Regional Board's permit for Orange County and many of its existing concerns will be rendered moot. Nonetheless, to ensure the City exhausts all administrative remedies, the City submits the attached additional comments.

The City believes that the changes requested in this letter will ease the regulatory burden consistent with Water Code section 13228. The City is committed to the goal of improving

water quality and to working with the San Diego Regional Board in developing and implementing the Aliso Creek Watershed Management Area Water Quality Improvement Plan.

If you should have any questions, please contact Devin Slaven, Environmental Manager at (949) 461-3436 or me at (949) 461-3481.

Sincerely,

CITY OF LAKE FOREST

Thomas Wheeler, P.E.
Director of Public Work/City Engineer

Attachments: Comment Letter on Tentative Order R9-2013-0001, dated January 11, 2013
Petition for Review of Action Issuing Order R9-2013-0001, dated June 7, 2013

cc: Robert Dunek, City Manager
Devin Slaven, Environmental Manager
Scott Smith, City Attorney
J.G. Andre Monette, Special Counsel
Mary Anne Skorpanich, County of Orange, OC Environmental Resources

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CITY OF LAKE FOREST

January 11, 2013

Via US Mail and E-mail

Mayor
Scott Voigts

Mayor Pro Tem
Kathryn McCullough

Council Members
Peter Herzog
Adam Nick
Dwight Robinson

City Manager
Robert C. Dunek

Mr. David Gibson
Executive Officer
California Regional Water Quality Control Board,
San Diego Region
C/O Mr. Wayne Chiu, P.E.
9174 Sky Park Court, Suite 100
San Diego, CA 92123

Subject: **Comments - Tentative Order No. R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu.**

Dear Mr. Gibson:

The City of Lake Forest ("City") submits this letter to the California Regional Water Quality Control Board, San Diego Region ("SDRWQCB") to convey the City's formal written comments on Tentative Order No. R9-2013-0001/NPDES Permit No. CAS0109266 ("Draft Permit"). The Draft Permit is intended by the SDRWQCB to serve as the basis for stormwater regulation for the City upon the expiration of current Order R9-2009-0002. The City appreciates the efforts of the SDRWQCB staff in the development of the Draft Permit including the most recent revisions from the former Administrative Draft; however, significant concerns remain.

The City is aware that the County of Orange ("County") is submitting a comment letter documenting comprehensive technical and legal concerns identified during the review of the Draft Permit. The County's submittal also includes proposed revisions to the Draft Permit provided via "red line" format per SDRWQCB staff request. City staff have participated closely in the collaborative development of this comprehensive set of comments and the City has requested to be named as a concurring entity in the County's letter. The City would like to express its full support for the County's comments and proposed revisions. While detailed comments are provided within the County's submittal, the City would like to note and specifically highlight several key issues of concern as follows:

- The Receiving Water Limitations provisions in the Tentative Order could expose the City to Clean Water Act liabilities for discharges that cause or contribute to an exceedance of a water quality standard. A clear linkage between the compliance provisions and prohibitions, receiving water limitations, and effluent limitations must be established.

The provisions dealing with land development, Low Impact Development (LID) and hydromodification control are significantly ratcheted up while existing permit programs are only just being implemented and/or pending approval. The City is particularly concerned with the elimination of all exemptions for the hydromodification control requirements, including for discharges to channels that have been engineered to prevent erosion. Exemptions for hydromodification management should include discharges to certain types of receiving waters and certain types of projects. The City additionally questions the Regional Board's authority to impose *any* flow related limitations in an NPDES permit following the District Court's decision in Virgina Dept. of Transportation v. EPA, No. 1:12-CV-775, slip op. (E.D. Va. Jan. 3, 2013).

- The provisions implementing the Beaches and Creeks Total Maximum Daily Load (TMDL) bacteria requirements are inconsistent with the TMDL as it was developed and pose additional significant liabilities. Federal law does not require NPDES permits for municipal discharges to include TMDLs. (*Defenders of Wildlife v. Browner* 191 F.3d 1159 (9th Cir. 1999); 40 C.F.R. § 122.44(d).) Pursuant to state law, permit provisions must be consistent with the corresponding Basin Plan amendments (Cal Water Code § 13263), and may only be included after consideration of "the beneficial uses to be protected, the water quality objectives reasonably required for that purpose, other waste discharges, the need to prevent nuisance, and the provisions of Section 13241." (*Id.*)

- The provisions requiring the development and implementation of a Water Quality Improvement Plan need to be aligned with the Jurisdictional Runoff Management Program requirements so that the programs are complimentary and prioritized instead of additive.

Thank you for your attention to our comments. The City is committed to the goal of water quality improvement and wants to work with the SDRWQCB in developing the most prudent and cost effective permit possible. If you should have any questions, please contact Devin Slaven, Water Quality Administrator, at (949) 461-3436, or dslaven@lakeforestca.gov.

Sincerely,

CITY OF LAKE FOREST

FOR

Thomas Wheeler, P.E.
Director of Public Works/City Engineer

cc: Robert C. Dunek, City Manager
Devin E. Slaven, CPSWQ, QSD/QSP, Water Quality Administrator
Scott Smith, City Attorney, Best Best & Krieger, LLP
Mary Anne Skorpanich, County of Orange, OC Watersheds

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STATE OF CALIFORNIA

STATE WATER RESOURCES CONTROL BOARD

In the matter of the Petition of: THE CITY OF LAKE FOREST FOR REVIEW OF ACTION BY THE CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, SAN DIEGO REGION, IN ISSUING ORDER NO. R9-2013-0001 (NPDES NO. CAS0109266)	PETITION FOR REVIEW [Water Code § 13320(a)]

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I.

INTRODUCTION

Petitioner, the City of Lake Forest, California ("City" or "Petitioner") seeks review and reversal of the California Regional Water Quality Control Board, San Diego Region's ("Regional Board") actions in adopting Order No. R9-2013-0001 (NPDES No. CAS0109266) ("Permit"), on May 8, 2013. A copy of the Permit is attached hereto as Exhibit "A" and incorporated herein by reference.

The City is a municipal corporation organized pursuant to California law and the California Constitution. As of 2011, the City had a population of 77,490 people, and is located in Orange County, approximately 40 miles south of the City of Los Angeles. The City owns and operates a large municipal separate storm sewer system ("MS4") within the Regional Board's jurisdiction and as such is subject to regulation under the Permit. Due to the boundary line between the Santa Ana and San Diego Regional Boards, the City is also subject to regulation under the Large MS4 Permit for North Orange County issued by the Santa Ana Regional Board. At all times mentioned herein, the City has acted pursuant to applicable legal requirements, and with great concern for the impacts that discharges from its MS4 may have on surrounding surface waters, and the environment in general.

II.

BACKGROUND

The City fully supports the Permit's goal of attaining water quality improvement throughout south Orange County. In order to ensure that this goal could be attained with minimal negative repercussions for the City, the City participated in the Permit development process. Although the Regional Board removed or modified some requirements at the request of the City and other dischargers, as adopted the Permit retains many requirements that exceed applicable law.

Although the Regional Board pursued an informal Permit development process beginning in March, 2012, the first "official" draft of the Permit was issued in October 2012 with a comment period open until early January 2013. The City participated in the informal Permit

development process. The City also submitted written comments to the Regional Board on the "official" drafts within the time frame permitted. A second draft was issued on March 27, 2013, but the Regional Board did not allow additional time for written comments. The Regional Board held its adoption hearing on the Permit in April, 2013 and continued the hearing to May 8, 2013. At its May 8, 2013 hearing, the Regional Board approved the Permit, but introduced changes prior to the adoption hearing without sufficient time for comment.

As described more fully below, by adopting the Permit in its current form the Regional Board exceeded state and/or federal law. The Cities therefore submits this Petition pursuant to Water Code section 13320 and Title 23 of the California Code of Regulations, and respectfully requests that the State Board correct the Regional Board's actions.

III.

NAMES AND ADDRESSES OF PETITIONERS

The names and contact information for Petitioners is as follows:

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THE ACTION OR INACTION OF THE REGIONAL WATER BOARD BEING PETITIONED

The Cities seek review and set aside of the Regional Board's actions in adopting Order No. R9-2013-0001 (NPDES No. CAS0109266) on May 8, 2013. A copy of the Permit is attached hereto as Exhibit "A" and incorporated herein by reference.

IV.

DATE THE REGIONAL BOARD ACTED

The Regional Board adopted Order No. R9-2013-0001 (NPDES No. CAS0109266) on May 8, 2013.

V.

STATEMENT OF THE REASONS THE ACTION WAS INAPPROPRIATE OR IMPROPER

The Regional Board exceeded its legal authority, thereby abusing its discretion when issuing the Permit. Among other things, the Regional Board imposed requirements in the Permit that exceed its authority under State and/or Federal law, are not supported by the evidence in the record, and/or exceed the requirements of State and/or Federal law. Specifically, in adopting the Permit in its current form, the Regional Board:

(1) Required strict compliance with Receiving Water Limitations discharge prohibitions without including a BMP-based compliance option in violation of precedential State Board orders;

(2) Imposed infeasible permit conditions on dischargers including the City;

(3) Improperly applied a heightened compliance standard to discharges into and from the MS4;

(4) Imposed post construction, site-design requirements on municipal projects to control the volume of water leaving a completed project site in excess of the Regional Board's (and the City's) authority under State and Federal law including but not limited to the United States Supreme Court's decisions in *Nollan v.*

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California Coastal Commission (1987) 483 U.S. 825 and *Dolan v. City of Tigard* (1994) 512 U.S. 374;

(5) Required dischargers to expend resources and public funds beyond their jurisdictional boundaries or risk violation of the Permit;

(6) Violated State and Federal law by including the Bacterial Indicators TMDL for Beaches and Inland Streams in the Permit without regard to the limitations of Water Code section 13263, the Ninth Circuit Court of Appeals decision in *Defenders of Wildlife v. Browner,* 191 F.3d 1159 (9th Cir. 1999), or the terms and conditions of the TMDL itself;

(7) Included stormwater and non-stormwater "Action Levels" in the Permit that are inconsistent with State and Federal law and could be interpreted as numeric effluent limitations and that otherwise lack findings;

(8) Imposed a regional permit on the City without authority under State or Federal law;

(9) Unlawfully classified natural waters as part of the MS4, and classified natural waters as both a MS4 and Receiving Water;

(10) Violated Due Process requirements in the Permit development process;

(11) Failed to conduct an adequate economic analysis in violation of Water Code sections 13263, and 13241; and

(12) Imposed a federal scheme on the City without an option for compliance in violation of the 10th Amendment to the United States Constitution as defined by Supreme Court's decisions in *Printz v. United States*, 521 U.S. 898, 925 (1997), and *New York v. United States*, 505 U.S. 144, 168 (1992)).

The City, other Permittees and interested parties submitted comment letters to the Regional Board during the Permit renewal process raising these concerns. The City additionally made oral comments at the Permit adoption hearings in support of its comment letters, and the comments of the other Permittees to again raise the above listed concerns. The Regional Board nonetheless adopted the Permit over these objections, in violation of state and federal law.

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VI.

HOW PETITIONER IS AGGRIEVED

Petitioner, City of Lake Forest, owns and operates an MS4 within the Regional Board's jurisdiction and as such is subject to regulation under the Permit. The City, along with other Permittees, is required to implement the Permit's programs, and comply with its technical limitations. The City is aggrieved because the challenged Permit requirements exceed the Regional Board's authority. These requirements will require the City to impose severe restrictions on development within City limits, hinder the Cities' ability to exercise their land use authority in a manner that benefits their residents' economic and environmental interests, and require the Cities to invest significant time and resources complying with arbitrarily selected "WQBELs."

VII.

ACTIONS PETITIONER REQUESTS THE STATE WATER BOARD TAKE

The Cities respectfully requests that the State Board remand the Permit to the Regional Board, and direct the Regional Board to amend the Permit to address the deficiencies raised in Section V, above.

VIII.

MEMORANDUM OF POINTS AND AUTHORITIES IN SUPPORT OF PETITION

The requisite Memorandum of Points and Authorities is attached to this Petition. The City additionally reserve the right to supplement the legal arguments and authorities raised in the attached memorandum of points and authorities if and when such actions is necessary in support of the Petition.

IX.

STATEMENT OF COPIES FURNISHED

In accordance with the requirements of Title 23, Section 2050(a)(8) of the California Code of Regulations, a copy of this Petition has been sent to the California Regional Water Quality Control Board, San Diego Region.

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X.

STATEMENT OF ISSUES RAISED

As illustrated in Exhibit "A" attached hereto and incorporated herein, Petitioner, and/or other interested parties submitted written and oral comments on the Permit outlining the above described issues. Through their written and oral comments, Petitioner requested that the Regional Board revise the Permit to address Petitioner's concerns.

XI.

CONCLUSION

For the reasons set forth in this Petition and in the related documents filed herewith, the City of Lake Forest respectfully requests that the State Water Resources Control Board remand the Permit to the Regional Board with direction to revise it to address the concerns raised herein, and take any other actions that the State Board deems necessary and appropriate to address the City's claims.

Dated: June 7, 2013

BEST BEST & KRIEGER LLP

By: _____

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Attorneys for Petitioners
Cities of Lake Forest and Aliso Viejo

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STATE OF CALIFORNIA

STATE WATER RESOURCES CONTROL BOARD

In the matter of the Petition of: THE CITY OF LAKE FOREST FOR REVIEW OF ACTION BY THE CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, SAN DIEGO REGION, IN ISSUING ORDER NO. R9-2013-0001 (NPDES NO. CAS0109266)	MEMORANDUM OF POINTS AND AUTHORITIES IN SUPPORT OF PETITION FOR REVIEW [Water Code § 13320(a)]

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MEMORANDUM OF POINTS AND AUTHORITIES

Petitioner, the City of Lake Forest ("City" or "Petitioner") submits these points and authorities in support of its Petition to the State Water Resources Control Board ("State Board") requesting that the State Board review and set aside all or portions of Order No. R9-2013-0001, NPDES Permit No. CAS0109266 ("Permit"), as adopted by the California Regional Water Quality Control Board, San Diego Region ("Regional Board") on May 8, 2013. The Regional Board's adoption of the Permit was not supported by sufficient evidence and findings, and is arbitrary, capricious and otherwise contrary to law.

The City respectfully requests that the subject petition be granted, and that the challenged terms of the Permit be voided, as the Permit and the terms have not been adopted in accordance with the requirements of State and/or federal law, and because there is insufficient evidence and findings in the record to support its adoption.[1]

I. THE PERMIT SHOULD BE REVISED TO ALLOW BMP-BASED COMPLIANCE WITH RECEIVING WATER LIMITATIONS.

Permit, section II.A.2. governing "Receiving Water Limitations," provides that "discharges from MS4s must not cause or contribute to the violation of water quality standards and/or receiving waters ..." This blanket prohibition is standard permit language that until 2011, was interpreted as a management practice based compliance target. In 2011, the Ninth Circuit Court of Appeals, in *Natural Resources Defense Counsel v. County of Los Angeles* (9th Cir. 2011) 673 F.3d 880, *rev'd on other grounds* by 133 S.Ct. 710 (2013), interpreted this standard language as a stand- alone prohibition requiring strict compliance with Water Quality Standards.

By retaining the Receiving Water Limitations prohibition in the Permit as it was considered by the Ninth Circuit, the Regional Board is holding the City responsible for compliance with numeric Water Quality Standards as an end of pipe limit. For the reasons set

[1] In order to comply with 23 C.C.R.§2050 (a), the City submits a copy of Order R9-2013-0001 with its petition; however, since the entire administrative record will be lodged by the Regional Board with the State Water Board, most citations to the record herein will not be accompanied by duplicative exhibits. As of this filing, the complete transcripts of the three hearing dates are not believed to be available for specific citations. The City reserves the right to submit supplemental or amended points and authorities with specific transcript citations when available for review.

forth below, the Permit's Receiving Water Limitations prohibition is inconsistent with State and Federal law and must be revised.

A. *Federal law does not require Numeric Effluent Limits or strict compliance with Water Quality Standards*

The Federal Clean Water Act and its implementing regulations do not require municipal stormwater permits to include numeric effluent limits or to strictly adhere to Water Quality Standards. The Ninth Circuit Court of Appeals addressed both issues in *Defenders of Wildlife v. Browner*, 191 F.3d 1159 (9th Cir. 1999).

In *Defenders*, the Ninth Circuit held that the United States Environmental Protection Agency ("US EPA") has the authority to impose numeric effluent limits in MS4 Permits, but that the Clean Water Act does not require numeric effluent limits. The Ninth Circuit additionally held that municipal stormwater permits do not need to comply with Water Quality Standards, stating "industrial discharges must comply strictly with state water-quality standards," while Congress chose "not to include a similar provision for municipal storm-sewer discharges."

The decision highlights the difference between traditional, industrial discharges and municipal stormwater. The Ninth Circuit focused on the approach Congress took to addressing this difference holding that Congress replaced the requirements applicable to industrial discharges "with the requirement that municipal storm-sewer dischargers "reduce the discharge of pollutants to the maximum extent practicable. . ." and that the statute "unambiguously demonstrates" that Congress did not require municipal storm-sewer discharges to comply strictly with Water Quality Standards. (*Defenders of Wildlife v. Browner*, 191 F.3d at 1165.)

The Ninth Circuit's holding that has been adopted by California courts. In *Divers' Environmental Conservation Organization v. State Water Resources Control Board (Divers' Environmental)* (2006) 145 Cal.App.4th 246, the plaintiff brought suit claiming that an NPDES Permit issued to the United States Navy by the San Diego Regional Board was contrary to law because it did not incorporate waste load allocations ("WLAs") from a TMDL as numeric effluent limits.

After discussing the relevant requirements of the Clean Water Act, as well as governing

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case authority, the Court of Appeal acknowledged that in regulating stormwater permits EPA "has repeatedly expressed a preference for doing so by the way of BMPs, rather than by way of imposing either technology-based or water quality-based numerical limitations." (*Id.* at 256.) The Court went on to find that "it is now clear that in implementing numeric water quality standards, such as those set forth in CTR, permitting agencies are not required to do so solely by means of a corresponding numeric WQBEL's [Water Quality Based Effluent Limit]." (Id. at 262.)

Likewise, in *Building Industry Association of San Diego County v. State Water Resources Control Board* (2004) 124 Cal.App.4th 866, 874, the Court of Appeal found that Congress intentionally gave the EPA "the authority to fashion NPDES permit requirements to meet water quality standards without specific numeric effluent limits and instead to impose `controls to reduce the discharge of pollutants to the maximum extent practicable."

Federal law simply does not require numeric effluent limits or direct incorporation of Water Quality Standards into municipal stormwater permits. The Clean Water Act instead establishes a unique regulatory structure to address the unique nature of discharges from MS4s. Recognizing that, because of the open nature of the system and wide variability in flow, municipal stormwater discharges are different than other discharges regulated by the Clean Water Act, Congress expressly exempted municipal stormwater discharges from strict compliance with water quality standards. The Permit's infeasible requirement of strict compliance with water quality standards at all times and in all receiving waters is contrary to the Congressional policy reflected in the CWA related to discharges from municipal stormwater systems. To conform to Congressional policy, the Permit should have included a compliance option.

B. *The Receiving Water Limitations prohibition is inconsistent with precedential State Board Orders.*

Pursuant to Government Code section 11425.60, unless otherwise stated in the decision, all State Board orders are binding precedent on both the State Board itself and the nine Regional Water Quality Control Boards. (State Board Order WR 96-01, fn 11.) Compliance with precedential orders is mandatory. (*See California Assn. of Sanitation Agencies v. State Water*

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Resources Control Board (2012) 208 Cal. App. 4th 1438, 1465, fn 20; *see also* State Board statement on precedential orders: "The State Water Board and the nine Regional Water Quality Control Boards (Regional Water Boards) ordinarily will follow State Water Board precedents, or provide a reasoned analysis for not doing so." http://www.swrcb.ca.gov/board_decisions/adopted_orders/ [as of June 1, 2013, emphasis added].)

The State Board has held on numerous occasions, in multiple precedential orders, that its standard receiving water limitations language "does not require strict compliance with water quality standards." (State Water Board Order WQ 2001-15.) Rather, compliance with water quality standards is "to be achieved over time, through an iterative approach requiring improved BMPs." (State Water Board Order WQ 2001-15.) Because the Permit's Receiving Water Limitations prohibition is inconsistent with these precedential State Board orders, it must be revised.

The State Board's position that Water Quality Standards are to be achieved over time through the iterative process was most recently reiterated in State Board Order WQ 2001-15, *In the Matter of the Petitions of Building Industry Assoc. of San Diego County and Western States Petroleum Assoc.* (2001). The State Board issued Order WQ 2001-15 in response to the building industry's claim that the Ninth Circuit's decision in *Defenders of Wildlife v. Browner* rendered requirements in the 2001 San Diego County MS4 Permit unnecessary and contrary to the MEP standard. While retaining the requirement that the San Diego permit prohibit discharges that cause or contribute to violations of water quality standards, the State Board made clear that compliance with this requirement was to be achieved through the iterative process, and that the Water Quality Standards themselves were not hard compliance targets.

In discussing the propriety of requiring strict compliance with water quality standards, and the applicability of the MEP standard in State Board Order WQ 2001-15, the State Board held:

> While we will continue to address water quality standards in municipal storm water permits, we also continue to believe that the iterative approach, which focuses on timely improvements of BMPs, is appropriate. ***We will generally not require "strict compliance" with water quality standards through numeric effluent limits and we will continue to follow a iterative approach, which seeks compliance over time.*** The iterative

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> approach is protective of water quality, but at the same time considers the difficulties of achieving full compliance through BMPs that must be enforced through large and medium municipal storm sewer systems.
>
> (Order 2001-15, p. 7-8 [emphasis added].)

State Board policy is, and has been, that Water Quality Standards are to be achieved over time through the iterative process. In State Board Order WQ 2001-15, the State Board further explained, in the context of its review of the 2001 San Diego MS4 Permit, that:

> In reviewing the language in this permit, and that in Board Order WQ 99-05, we point out that ***our language, similar to U.S. EPA's permit language discussed in the Browner case, does not require strict compliance with water quality standards***. Our language requires that storm water management plans be designed to achieve compliance with water quality standards. ***Compliance is to be achieved over time, through an iterative approach requiring improved BMPs.***
>
> (*Id.*, at 7 [emphasis added].)

The State Board thus established a "middle ground" position where MS4 permits had to require compliance with water quality standards but where compliance was to be achieved over time in recognition of the unique nature of stormwater discharges:

> We are concerned, however, with the language in Discharge Prohibition A.2, which is challenged by BIA. This discharge prohibition is similar to the Receiving Water Limitation, prohibiting discharges that cause or contribute to exceedance of water quality objectives. ***The difficulty with this language, however, is that it is not modified by the iterative process. To clarify that this prohibition also must be complied with through the iterative process, Receiving Water Limitation C.2 must state that it is also applicable to Discharge Prohibition A.2.*** The permit, in Discharge Prohibition A.5, also incorporates a list of Basin Plan prohibitions, one of which also prohibits discharges that are not in compliance with water quality objectives. (See, Attachment A, prohibition 5.) Language clarifying that the iterative approach applies to that prohibition is also necessary.
>
> (*Id.*, at 8-9 [emphasis added].)

The State Board's position on the receiving water limitations language has been consistent and clear: Water Quality Standards are to be achieved over time through the iterative process. Because the language in the Permit is modeled after the State Board's language, it must be revised to align the language with the State Board's precedential orders.

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II. THE PERMIT NEEDS TO BE REVISED TO GIVE THE CITY A FEASIBLE PATH TO ATTAINING COMPLIANCE WITH PERMIT REQUIREMENTS.

As a matter of law, the Clean Water Act does not require permittees to achieve the impossible. That is nonetheless what the Regional Board has asked the City to do by including the Receiving Water Limitations prohibition (and other requirements including but not limited to the TMDL requirements in Attachment E), in the Permit. Compliance with numeric effluent limits tied directly to Water Quality Standards or TMDLs is simply not feasible.

The State Board has recognized that municipal stormwater discharges are different. In 2006, the State Board convened a "Blue Ribbon Panel" of experts to determine whether compliance with numeric effluent limits in stormwater permits was feasible. The panel found that "[m]ost all existing development rely on non-structural control measures, making it difficult, if not impossible to set numeric effluent limits for these areas" and that "[i]t is not feasible at this time to set enforceable numeric effluent criteria for municipal BMPs and in particular urban discharges." (Storm Water Quality Panel Recommendations to the California State Water Resources Control Board – *The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities*, June 19, 2006, pp. 8, 12.)

In *Hughey v. JMS Dev. Corp.*, 78 F.3d 1523 (11th Cir.) *cert. den.*, 519 U.S. 993 (1996), the plaintiff sued JMS Development Corporation ("JMS") for failing to obtain a storm water permit that would authorize the discharge of storm water from its construction project. The plaintiff argued JMS had no authority to discharge any quantity or type of storm water from the project, *i.e.* a "zero discharge standard," until JMS had first obtained an NPDES permit. (*Id.* at 1527.) JMS did not dispute that storm water was being discharged from its property and that it had not obtained an NPDES permit, but claimed it was not in violation of the Clean Water Act (even though the Act required the permit) because the Georgia Environmental Protection Division, the agency responsible for issuing the permit, was not yet prepared to issue such permits. As a result, it was impossible for JMS to comply. (*Id.*)

The Eleventh Circuit Court of Appeal held that the CWA does not require a permittee to

achieve the impossible, finding that "Congress is presumed not to have intended an absurd (impossible) result." (*Id.* at 1529.) The Court then found that:

> In this case, once JMS began the development, compliance with the zero discharge standard would have been impossible. Congress could not have intended a strict application of the zero discharge standard in section 1311(a) when compliance is factually impossible. The evidence was uncontroverted that whenever it rained in Gwinnett County some discharge was going to occur; nothing JMS could do would prevent all rain water discharge.
>
> (*Id.* at 1530.)

The Court concluded, "*Lex non cogit ad impossibilia*: The law does not compel the doing of impossibilities." (*Id.*) The same rule applies here. (See also *Atl. States Legal Found., Inc. v. Eastman Kodak Co.*, 12 F.3d 353, 357 (2d Cir. 1994) ["it is impossible to identify and rationally limit every chemical or compound present in a discharge of pollutants . . . Compliance with such a permit would be impossible and anybody seeking to harass a permittee need only analyze that permittee's discharge until determining the presence of a substance not identified in the permit"].)

The Clean Water Act does not require municipal permittees to do the impossible. Nor does State law. Because municipal permittees are involuntary permittees, that is, because they have no choice but to obtain a municipal storm water permit, the Permit, as a matter of law, cannot impose terms that are unobtainable. (*Id.*) In this case, as reflected in the numerous comments submitted during the permit adoption process, complying with numeric limits is simply not achievable by the permittees, given the variability of the potential sources of pollutants and urban runoff, as well as the unpredictability of the climate in Southern California.

In fact, as discussed above in *Divers, supra*, 145 Cal.App.4th 246: "In regulating storm water permits the EPA has repeatedly expressed the preference for doing so by way of BMPs, rather than by way of imposing either technology-based or water quality-based numeric limitations." (*Id.* at 256.) According to the *Divers* Court: "EPA has repeatedly noted, storm water consists of a variable stew of pollutants, including toxic pollutants, from a variety of sources which impact the receiving body on a basis which is only as predictable as the weather." (*Id.* at 258.)

Similarly, in *BIA v. State Board, supra*, 124 Cal.App.4th 866, 889-90, after having

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recognized the "practical realities of municipal storm sewer regulation," and the "physical differences between municipal storm water runoff and other pollutant discharges," and finding that the maximum extent practical approach was a "workable enforcement mechanism" (*id.* at 873, 884), the Court concluded that the MEP standard was purposefully intended to be highly flexible concept that balances numerous factors including "technical feasibility, costs, public acceptance, regulatory compliance and effectiveness." (*Id.* at 889-90.)

It is technically and economically infeasible to strictly comply with Water Quality Standards as end of pipe numeric limits. Imposing such requirements goes beyond "the limits of practicability" (*Defenders of Wildlife v. Browner* (1999) 191 F.3d 1159, 1162). Accordingly, the imposition of the Receiving Water Limitations prohibition is not only an attempt to impose an obligation that goes beyond the requirements of State and Federal law, but equally important, represents an attempt to impose provisions that go beyond what is "feasible." These aspects of the Permit must be stricken.

III. THE PERMIT IMPROPERLY APPLIES A HEIGHTENED COMPLIANCE STANDARD TO DISCHARGES INTO AND FROM THE MS4.

Permit, section II.A.1. entitled "Discharge Prohibitions," requires the Permittees to not only "effectively prohibit" non-storm water discharges, but also, through subsection II.E.2 (entitled "Illicit Discharge Retention and Elimination"), to take action to prevent "non-stormwater" from entering the MS4. In effect, all "non-storm water discharges," unless they are otherwise conditionally permitted to be discharged under subsection E.2. of the Permit, are prohibited. The Permit further treats dry weather discharges *from* the MS4 as industrial discharges and applies an end of pipe standard that violates Section 402(p) of the Clean Water Act. Because both Permit requirements violate State and Federal law, they must be revised.

A. *All discharges from the MS4 are subject to the MEP standard.*

The Regional Board has attempted to create a new standard under the Clean Water Act – ***non-stormwater*** discharges ***from*** the MS4. Permit Finding 15 states:

> Non-Storm Water and Storm Water Discharges. Non-storm water discharges from the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard of

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> CWA section 402(p)(3)(B)(iii), which is explicitly for "Municipal ...Stormwater Discharges (emphasis added)"from the MS4s. Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s must be effectively prohibited.

Because all discharges from the MS4 are subject to the Maximum Extent Practicable ("MEP") standard, all Permit requirements based on the false standard referenced in Finding 15 must be removed from the Permit.

Section 402(p)(3)(B) of the Clean Water Act entitled "Municipal Discharge" provides, in its entirety, as follows:

> Permits for discharges from municipal storm sewers –
>
> (i) may be issued on a system– or jurisdictional– wide basis;
>
> (ii) shall include a requirement to ***effectively prohibit non-stormwater discharges into the storm sewers***; and
>
> (iii) shall require controls to reduce ***the discharge of pollutants to the maximum extent practicable***, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants.
>
> (33 U.S.C. § 1342(p)(3)(B) *[emphasis added]*.)

Thus, the plain language of the CWA requires MS4 Permits to "require controls to reduce the discharge of pollutants to the maximum extent practicable." (*Id.*) The CWA applies the MEP standard to the "discharge of pollutants" from the MS4. There is no distinction between the discharge of "stormwater" or "non-stormwater" or dry weather flows and wet weather flows. As such, the Regional Board's attempt to "prohibit non-stormwater discharges through the MS4 to receiving waters" exceeds Federal law.

B. *The Permit prohibits discharges into the MS4 in a manner that is inconsistent with the Federal Clean Water Act and precedential State Board Orders.*

Permit, section II.A.1. entitled "Discharge Prohibitions," requires the Permittees to not only "effectively prohibit," non-storm water discharges, but also, through subsection II.E.2 (entitled "Illicit Discharge Retention and Elimination"), to take action to prevent "non-stormwater" from entering the MS4. In effect, all "non-storm water discharges," unless they are

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otherwise conditionally permitted to be discharged under subsection E.2. of the Permit, are prohibited.

The Clean Water Act requires only a permit condition that says the Co-Permittee shall effectively prohibit discharges of non-stormwater into the MS4. Section 402(p)(3)(B)(ii) provides that permit for discharges from municipal storm sewers "shall include a requirement to effectively prohibit non-stormwater discharges into the storm sewer . . . ." (33 USC § 1342(p)(3)(B)(ii).) (*Id.*) The proposed regional permit uses Section 402(p)(3)(B)(ii) expansively.

"Effectively prohibit" is not the same as prohibit or eliminate. The draft permit appears to strictly prohibit discharges of non-stormwater and holds the Co-Permittees liable for preventing or eliminating such discharges. This exceeds what is required by the CWA.

Federal regulations make clear this only requires the Co-Permittees to prohibit such discharges in their ordinances. (40 C.F.R. § 122.26(d)(2)(i).) Moreover, the State Board addressed this issue in Order WQ-2001-15, expressly stating that discharges into an MS4 are subject to a more flexible standard, holding:

> We find that ***the permit language is overly broad because it applies the MEP standard not only to discharges "from" MS4s, but also to discharges "into" MS4s***. . . the specific language in this prohibition too broadly restricts all discharges "into" an MS4, and does not allow flexibility to use regional solutions, where they could be applied in a manner that fully protects receiving waters.
>
> (*Id.*, at 7 [emphasis added].)

A strict prevention or prohibition of all non-stormwater discharges into the MS4 is not feasible. This requirement therefore exceeds the requirements of Federal Law as well as the State Board's direction on how to manage discharges into the MS4 as set forth in precedential order WQ-2001-015.

IV. THE PERMIT'S NEW DEVELOPMENT AND REDEVELOPMENT REQUIREMENTS ARE UNNECESSARY AND, AS INCORPORATED INTO THE PERMIT, VIOLATE STATE AND FEDERAL LAW.

The Permit imposes site design requirements new development and significant redevelopment projects. The overarching requirement is that the completed project site retain the

runoff from the 85th percentile storm event. If the project site is unable to retain the runoff because of soil conditions or other site restrictions, the Permit will require some projects to provide additional mitigation. Moreover, in the case of redevelopment projects, the Permit will require a return to pre-project hydrologic conditions.

These Permit requirements are regulating the discharge of stormwater as a pollutant, rather than the pollutants in the stormwater, and are void under the Clean Water Act. They additionally exceed both the City's the Regional Board's authority under the United States Supreme Court's decisions in *Nollan v. California Coastal Commission* (1987) 483 U.S. 825 and *Dolan v. City of Tigard* (1994) 512 U.S. 374, and must be removed from the Permit.

A. *The Permit imposes post construction, site-design requirements on municipal projects to control the volume of water leaving a completed project site in excess of the Regional Board's authority under both the Clean Water Act and Porter Cologne.*

Permit section E.3.c imposes BMP requirements for all priority projects as defined in the Permit. Priority projects include areas of new development and redevelopment. Section E.3.c.(1)(a) requires the following:

> Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite the pollutants contained in the volume of storm water runoff produced from a 24-hour 85th percentile storm event (design capture volume)

Section E.3.c.(2) imposes requirements based solely on the volume of stormwater leaving a completed project site:

> Each Copermittee must require each Priority Development Project to implement onsite BMPs to manage hydromodification that may be caused by storm water runoff discharged from a project

Because these Permit requirements regulate the discharge of stormwater alone, rather than pollutants or waste in stormwater, they exceed the Regional Board's authority under both the Clean Water Act and Porter Cologne.

Regulation of stormwater discharges on a volumetric basis was recently rejected in *Virginia Department of Transportation v. EPA* (2013) U.S. Dist. Lexis 981, 43 ELR. 20002 (E.D. Va.), In that case, US EPA established a TMDL for Accotink Creek to limit the flow of stormwater into the creek. The purpose of the TMDL was to regulate the amount of sediment

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into Accotink, based on EPA's belief that the sediment was the primary cause of its impairment. The parties to the case agreed that sediment is a "pollutant" under the CWA, and that stormwater is not. EPA, however, claimed that the storm water flow rate was a "surrogate" for sediment thereby justifying the stormwater flow TMDL.

The Court found that EPA had no authority to regulate the flow of storm water into the creek, holding finding the Clean Water Act did not authorize it to do so. According to the District Court:

> The language of § 1313(d)(1)(C) is clear. EPA is authorized to set TMDLs to regulate pollutants, and pollutants are carefully defined. Stormwater runoff is not a pollutant, so EPA is not authorized to regulate it via TMDL. Claiming that the stormwater maximum load is a surrogate for sediment, which is a pollutant and therefore regulatable, does not bring stormwater within the ambit of EPA's TMDL authority. Whatever reason EPA has for thinking that a stormwater flow rate TMDL is a better way of limiting sediment load than a sediment load TMDL, EPA cannot be allowed to exceed its limited statutory authority.
>
> (Id. at 14-15.)

Accordingly, the Regional Board in this case has no authority under the Clean Water Act to regulate discharges from completed project sites without specifically identifying a particular pollutant of concern. Similar restrictions exist in State law. Porter Cologne prohibits the discharge of "Waste" without a permit. (Cal Water Code §§ 13260; 12363; 13264.) Waste is defined as:

> sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal.
>
> (Cal Water Code § 13050(d).)

Stormwater itself is not Waste, though it may contain Waste. The Water Code only authorizes the Regional Board to regulate the discharge of Waste. Permit terms that seek to regulate stormwater flows without identifying specific pollutants in such flows are beyond the authority of the Regional Board and must be removed from the Permit.

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B. *The Permit requires the City to impose exactions on projects within their jurisdictions in excess of the City's authority.*

As applied to areas of redevelopment, and offsite mitigation where retention of the 85th percentile storm is not feasible, the Permit's hydromodification requirements exceed the scope of both the City's and the Regional Board's authority under State and Federal law. Permit section E.3.c.(2)(a) states:

> Post-project runoff conditions (flow rates and durations) must not exceed pre-development runoff conditions by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat downstream of Priority Development Projects).

Section E.3.c.(1)(a) requires the following:

> Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite the pollutants contained in the volume of storm water runoff produced from a 24-hour 85th percentile storm event (design capture volume)

In areas of redevelopment, compliance with Section E.3.c.(2)(a) will require a project proponent to return the project site to a condition that predates construction of the original project. The Permit will thus require the City to impose mitigation and/or exactions for impacts that are not a result of the redevelopment project itself.

When imposing a condition on a development permit, a local government is required under the federal and state constitutions to establish that the condition bears a reasonable relationship to the impacts of the project. This rule applies to legislatively enacted requirements and impact fees or exactions. *Building Indus. Ass'n v. City of Patterson*, 171 Cal. App. 4th 886, 898 (2009). Moreover, fees imposed on a discretionary ad hoc basis are subject to heightened scrutiny under a two-part test. First, local governments must show that there is a substantial relationship between the burden created by the impact of development and any fee or exaction. *Nollan v. California Coastal Comm'n*, 483 U.S. 825, 837 (1987). Second, a project's impacts must bear a "rough proportionality" to any development fee or exaction. *Dolan v. City of Tigard*, 512 U.S. 374, 391 (1994).

Under California law, the *Nollan/Dolan* heightened scrutiny test also applies to in-lieu

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fees. *Ehrlich v. City of Culver City*, 12 Cal. 4th 854, 876 (1996). The Legislature has memorialized these requirements in the Mitigation Fee Act which establishes procedures that local governments must follow to impose impact fees. Cal. Gov't Code §§ 66000-66025.

By requiring redevelopment projects to mimic pre-development conditions, the City would be requiring a project developer to make changes to the project site that are not related to the project's impacts. Imposing such requirements would exceed the City's (and the State's) authority under *Nollan v. California Coastal Commission* (1987) 483 U.S. 825 and *Dolan v. City of Tigard* (1994) 512 U.S. 374.

Permit conditions requiring mitigation where onsite retention of the 85th percentile storm is not feasible because of local soil or other pre-project conditions also violate the *Nollan/Dolan* limitations. Imposing offsite mitigation requirements when the original project site is incapable of retaining the 85th percentile storm exceeds the impacts of the proposed project. For that reason, as applied to redevelopment projects, and offsite mitigation where retention of the 85th percentile storm is not feasible, Permit section E.3.c. must be revised to reflect the limitations of the City's authority.

C. *The Regional Board failed to make adequate findings on the Permit's new development and redevelopment requirements.*

The Permit requires hydromodification controls in every development and redevelopment project with little to no ability to exempt projects where an HMP is infeasible. These requirements are a one size fits all approach across three large counties with varying climates, soil conditions and topography.

The Regional Board had no evidence before it that an across the board requirement to implement hydromodification controls and LID requirements in every development and redevelopment project improves water quality. In fact, the Regional Board has based its entire Permit requirements on one study produced out of the Pacific Northwest, an area that has more pristine steam and site conditions and whose soils better allow for infiltration that do the clay conditions of south Orange County that do not allow infiltration and the capture of on-site pollutants. To that extent, the HMP and LID requirements lack substantial evidence and are

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arbitrary and capricious under the California Administrative Procedure Act and violate the Clean Water Act in that the requirements do not on their face demonstrate water quality benefits.

There is also no evidence of water quality benefit to support a pre-development run-off reference requirement. A pre-development standard is entirely subjective. While a project proponent would need to review on-site or nearby soil conditions for this reference, evidence was presented at the adoption hearing that this could not be done as easily as using an Internet website, which was the contention of Regional Board staff in advocating for the new standard. Also, in highly developed concrete areas, it would be difficult to find nearby conditions that could be used as this reference, and is thus, arbitrary and must be removed from the Permit.

V. THE PERMIT WILL REQUIRE THE CITY TO EXPEND RESOURCES AND PUBLIC FUNDS BEYOND ITS JURISDICTIONAL BOUNDARIES AND POTENTIALLY HOLDS THE CITY JOINTLY AND SEVERALLY LIABLE FOR COMPLIANCE.

The Permit's Water Quality Improvement Plan ("WQIP") program includes multiple requirements for joint efforts by the City and other dischargers in a watershed management area, irrespective of the City' jurisdictional boundaries. For example, Permit section B.2.b. states:

> The Copermittees must consider the following, at a minimum, to identify the potential impacts to receiving waters that may be caused or contributed to by discharges from the Copermittees' MS4s . . .
>
> (3) Locations of each Copermittee's MS4 outfalls that discharge to receiving waters;
>
> (4) Locations of MS4 outfalls that are known to persistently discharge non-storm water to receiving waters likely causing or contributing to impacts on receiving water beneficial uses;
>
> (5) Locations of MS4 outfalls that are known to discharge pollutants in storm water causing or contributing to impacts on receiving water beneficial uses; and
>
> (6) The potential improvements in the quality of discharges from the MS4 that can be achieved.

Permit section B.2.c. requires the City to use the information gathered to "develop a list of priority water quality conditions as pollutants, stressors and/or receiving water conditions that are the highest threat to receiving water quality or that most adversely affect the quality of receiving

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waters." The Permit then requires the City to develop goals to address the pollutant sources on the priority list. (Permit section B.2.d.) There are no limitations on jurisdictional boundaries or relative contribution to pollutant loading from individual sources.

Requiring the City to expend resources outside its jurisdiction exceeds the authority granted to the Regional Board under Clean Water Act section 402(p) and the California Water Code. Both statutes hold dischargers responsible for only those pollutants that discharge from their point sources. (33 U.S.C. §§ 1311, 1319, 1342(p)(3)(B) and 1362(12); Water Code §§ 13350(a), 13263(f) and 13376.)[2] For example, although stormwater permits may be issued on a system – or jurisdiction – wide basis, Co-Permittees need only comply with permit conditions relating to discharges from the municipal separate sewers for which they are operating. (33 U.S.C. § 1342(p)(3)(B)(i) and 40 CFR § 122.26(a)(3)(vi).). In addition, EPA has defined the term "Co-Permittee" to mean a permittee who "is only responsible for permit conditions relating to the discharge for which it is operator." (40 CFR § 122.26(b)(1).)

Thus, Co-Permittees are only responsible for pollutants discharged from its MS4, and need only comply with permit conditions related to such discharges. (*So. Fla. Water Mgmt. Dist. v. Miccosukee Tribe of Indians* (2004) 541. U.S. 95, 105; *Jones v. E.R. Shell Contractor, Inc.* (N.D. Ga. 2004) 333 F.Supp.2d 1344; In re *City of Irving, Texas*, Mun. Separate Storm Sewer Sys., 10 E.A.D. 111 (EPA July 16, 2001); 40 CFR §§ 122.26(a)(3)(vi).) Mandatory watershed requirements not linked directly to pollutants discharged from a Co-Permittees MS4 are thus, pursuant to the plaint meaning of the CWA, beyond the responsibility of that Co-Permittee.

Similarly, Porter Cologne focuses on individual discharges (*see, e.g.,* Water Code §§ 13263 and 13350(a)) and makes watershed planning an option that NPDES Co-Permittees may

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[2] The Authority acknowledges that EPA and others believe that the watershed approach would result in better water quality results. (*See, e.g.,* EPA's Watershed-Based NPDES Permitting Policy Statement dated January 7, 2003 and the conclusions of the National Research Council's 2009 Report on Urban Stormwater Management in the United States (concluding that the "course of action most likely to check and reverse degradation of the nation's aquatic resources would be to base all stormwater and other wastewater discharge permits on watershed boundaries instead of political boundaries.").) However, it is also acknowledged that structural changes in the CWA and the laws of authorized states would be required to implement such a watershed permitting approach. (*See, e.g.,* National Research Council Report, p 524 (noting that the "national watershed-based approach to stormwater is likely to require legislative amendments . . . .").) In the absence of such structural changes, the CWA must be applied as currently written, and as currently written its focus is on jurisdictional boundaries.

pursue, not a mandatory requirement with which Co-Permittees must comply.. (Water Code § 16101(a).) The purpose of such voluntary watershed planning is to allow permittees to implement existing and future water quality requirements and regulations on a watershed rather than a jurisdictional level. (*Id.*) If the Regional Board incorporates the watershed plan into the waste discharge requirements issued to a permittee, the implementation of the plan by the permittee may represent compliance with waste discharge requirements. (Water Code § 16102(d) and (c).) Thus, the voluntary watershed approach of Water Code §§ 16100 *et seq.* allows permittees to *elect* the pursue a watershed approach and *offers* the permittee a compliance option as an incentive to move from a jurisdictional approach to a watershed approach.

Moreover, the Clean Water Act is not a contribution statute; dischargers are not jointly and severally liable for water quality conditions in a watershed. Nonetheless, under Attachment E of the Permit, the City could potentially be found out of compliance with an interim or final TMDL target based solely on discharges from other dischargers. Joint liability is imposed by each section of the Permit that sets forth how the dischargers are to establish compliance with the six TMDLs incorporated into the Permit.[3] The following provision is an example of unlawful joint liability imposed by the Permit:

> (3) <u>Interim TMDL Compliance Determination</u>
>
> Compliance with the interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:
>
> . . . .
>
> (d) The pollutant load reductions for discharges from the Responsible *Copermittees'* MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR
>
> (e) The Responsible *Copermittees* can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the *Copermittees'* MS4s are not causing or contributing to the exceedances; OR
>
> (f) There are no exceedances of the interim receiving water

[3] The Permit sections that impose joint liability are: Attachment E, Sections 1.b(3)(d); 2.b(3)(d)(iv-v); 3.b(3)(d); 3.b(3)(e)(iv-v); 3.c(2)(d); 3.c(2)(e); 4.b(3)(d); 4.c(2)(e); 5.b(3)(d-g); 5.c(1)(b)(iv-viii); 6.b(3)(d-f); 6.c(3)(d-h).

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> limitations under Specific Provision 6.c.(2)(a) in the receiving water at, or downstream of the Responsible *Copermittees'* MS4 outfalls; OR
>
> (g) The pollutant load reductions for discharges from the Responsible *Copermittees'* MS4 outfalls are greater than or equal to the interim effluent limitations under Specific Provision 6.c.(2)(b); OR
>
> (h) The Responsible *Copermittees* have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.
>
> Permit at E-46 to E-47 § 6(c)(3) (emphasis added).

Under this provision, which applies to interim compliance determinations for the bacteria TMDL covering twenty beaches and creeks in the San Diego Region, the City would be unable to establish compliance based on its pollutant load reductions, receiving water conditions, or Water Quality Improvement Plan activities unless it can show that all other dischargers are also in full compliance. The Regional Board apparently recognized this problem because it changed "Copermittees" to "Copermittee" in other parts of Attachment E in response to comments from the dischargers, but the Regional Board neglected to make the change consistently.[4]

As a matter of law, the Regional Board cannot impose joint liability on the City. Under Clean Water Act section 402, and California Water Code section 13260, the Regional Board's authority is limited to imposing conditions on a discharge that are reasonably related to the discharge. The Permit's WQIP program provide an additional example of how the Permit could be interpreted as imposing joint liability. The Permit's WQIP requirements will force the City to develop goals and strategies to address sources of pollution in the City' watershed regardless of whether they are in the City' jurisdiction. If they are outside the City' jurisdiction, and the permittee who is responsible refuses to act, the City would not be able to comply with the Permit's WQIP requirements. In that instance, the City could be held liable for failure to develop a WQIP as specified in the Permit.

[4] The Permit sections that the Regional Board changed from "Copermittees" (in the March 27, 2013 Tentative Order) to "Copermittee" (in the Permit) are: Attachment E, Sections 1.b(3)(a)-(c); 4.b(3)(a)-(c); 4.c(2)(a)-(d); 5.b(3)(a)-(c); 5.c(1)(b)(i)-(iii); 6.b(3)(a)-(c); 6.c(3)(a)-(c).

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The Regional Board has no authority to impose such liability on the City. (*City of Modesto Redevelopment Agency v. Superior Court*, (2004) 119 Cal.App.4th 28; *In re Alvin Bacharach and Barbara Borsuk* (Order No. WQ 91-07, SWRCB 1991 ["The Water Code provides for the issuance of cleanup and abatement orders to "'dischargers'"].) Any permit conditions that impose responsibility for discharges that do not originate from point sources owned, operated or controlled by the City exceed the Regional Board's authority and must be stricken from the permit.

VI. THE PERMIT'S INCORPORATION OF THE BACTERIAL INDICATORS TMDL FOR BEACHES AND INLAND STREAMS VIOLATES STATE LAW.

A. *Federal Law does not require the TMDL to be incorporated into the Permit.*

As with Water Quality Standards, there is no question that the Federal Clean Water Act and its implementing regulations do not require municipal stormwater permits to include TMDLs. In *Defenders of Wildlife v. Browner*, 191 F.3d 1159 (9th Cir. 1999), the Ninth Circuit held that municipal stormwater do not need to comply with Water Quality Standards, holding "industrial discharges must comply strictly with state water-quality standards," while Congress chose "not to include a similar provision for municipal storm-sewer discharges."

TMDLs are an expression of Water Quality Standards. (*Pronsolino v. Nastri* (9th Cir. 2002) 291 F.3d 1123, 1129 [TMDLs are primarily informational tools that allow the states to proceed from the identification of waters requiring additional planning to the required plans]; *City of Arcadia v. State Water Resources Control Bd.* (2006) 135 Cal.App.4th 1392, 1415 [TMDL does not establish water quality objectives, but merely implements, under Water Code section 13242, the existing narrative water quality objectives].) The Ninth Circuit's holding that the Clean Water Act and its implementing regulations do not require municipal stormwater permits to include Water Quality Standards therefore applies to TMDLs.

Any inclusion of TMDLs in the Permit is purely a function of State law, and at the discretion of the Regional Board. However, as explained more fully below, the manner in which the Regional Board included the Bacterial Indicators TMDL for Beaches and Inland Streams into the Permit represents an abuse of discretion, and the Permit must be revised.

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B. *To the extent that the TMDL is incorporated as a WQBEL, the Regional Board was required to follow Federal Regulations.*

Although Federal law does not require the inclusion of TMDLs in municipal stormwater permits, when issuing NPDES permits, the Regional Board was required to follow Federal Regulations. (23 Cal Code Regs § 2235.2 ["Waste discharge requirements for discharge from point sources to nagivable waters shall be issued and administered in accordance with the currently applicable federal regulations for the National Pollutant Discharge Elimination System (NPDES) program"].) Thus although inclusion of the TMDL is not required by Federal law, if the Regional Board is going to include it in a permit, it must be in accordance with Federal Regulations. In this case, that meant appropriate development of water quality based effluent limits ("WQBELs") that incorporate the TMDL.

Federal Regulations at 40 C.F.R. § 122.44(d) require the Regional Board to incorporate WQBELs into industrial NPDES permits when it finds there is a "reasonable potential" that the discharge of the pollutant to be regulated "has the reasonable potential to cause, or contributes to an in-stream excursion above a narrative or numeric criteria within a State water quality standard." (40 C.F.R. § 122.44(d)(1)(iii).)[5] To determine whether a permitted discharge has the reasonable potential to "cause, or contributes to an in-stream excursion above a narrative or numeric criteria within a State water quality standard" Federal Regulations require the Regional Board to:

> use procedures which account for existing controls on point and nonpoint sources of pollution, the variability of the pollutant or pollutant parameter in the effluent, the sensitivity of the species to toxicity testing (when evaluating whole effluent toxicity), and where appropriate, the dilution of the effluent in the receiving water.
>
> (40 C.F.R. § 122.44(d)(1)(ii).)

The Regional Board must use this information to develop an appropriate WQBEL for the

[5] Pursuant to the *Defenders of Wildlife* decision, 40 CFR § 122.44(d) does not apply to municipal stormwater permits. Section 122.44(d) requires implementation of WQBELs to attain water quality standards. Under the *Defenders* opinion, water quality standards are not required to be incorporated into this MS4 permit; therefore WQBELs necessary to meet water quality standards are not required in this Permit.

regulated discharge. Before a WQBEL can be developed, a need for it must be established. As the Writers' Manual points out:

> The permit writer should always provide justification for the decision to require WQBELs in the permit fact sheet or statement of basis and must do so where required by federal and state regulations. A thorough rationale is particularly important when the decision to include WQBELs is not based on an analysis of effluent data for the pollutant of concern.
>
> (NPDES Permit Writers' Manual, September 2010, page 6-23.)

Basically, if a TMDL has been developed for the pollutant to be regulated, the WQBEL must be "consistent with the assumptions and requirements of any available wasteload allocation for the discharge prepared by the State and approved by EPA." (40 C.F.R. § 122.44(d)(1)(vii)(B).)

There are two generally accepted approaches to conducting reasonable potential analysis. According to US EPA guidance, "A permit writer can conduct a reasonable potential analysis using effluent and receiving water data and modeling techniques, or using a non-quantitative approach." (NPDES Permit Writers' Manual, September 2010, page 6-23.) The first approach would have required end of pipe monitoring data to be evaluated against in-stream generated ambient (dry weather) data. There is no evidence in the Permit or the Fact Sheet that the Regional Board based the Permit's WQBELs on any such data. (Fact Sheet F-126, F-127.)

As for the second, non-quantitative approach, the Regional Board also failed to provide information in the Permit, or the Fact Sheet stating that it had performed a non-quantitative analysis based on recommended criteria described in US EPA guidance. Neither the administrative record nor the Fact Sheet contains any evidence of the Regional Board having performed a reasonable potential analysis in accordance with either of the two foregoing approaches. (Fact Sheet F-126, F-127.)

Instead both the Permit's Findings, and its Fact Sheet merely recite the requirement that WBELs must be "consistent with the assumptions and requirements of any available wasteload allocation" with no analysis as to how the Permit requirements are consistent or how the WQBELs chosen were based on the required reasonable potential analysis. (Fact Sheet, F-126, F-

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127.) Not only is this a violation of Federal Regulations, but it is also renders the Permit infirm under the California Supreme Court's decision in *Topanga Association for a Scenic Community v. County of Los Angeles* (1974) 11 Cal.3d 506, which requires appropriate findings to "facilitate orderly analysis and minimize the likelihood that the agency will randomly leap from evidence to conclusions." (*Id.*, at 514.)

C. *The Permit's TMDL requirements violate State law.*

Under the California Supreme Court's holding in *Burbank v. State Board* (2005) 35 Cal.4th 613 ("*Burbank*"), a regional board must consider the factors set forth in sections 13263, 13241 and 13000 when adopting an NPDES Permit, unless consideration of those factors "would justify including restrictions that do not comply with federal law." (*Id.* at 627.)

As stated in the *Burbank*, "Section 13263 directs Regional Boards, when issuing waste discharge requirements, to take into account various factors including those set forth in Section 13241." (*Id.* at 625, emphasis added.) Specifically, the Court held that to the extent the NPDES Permit provisions in that case were not compelled by federal law, the Regional Boards were required to consider their "economic" impacts on the dischargers themselves, with the Court finding that such a requirement means that the Water Boards must analyze the "discharger's cost of compliance." (Id. at 618.)

As described above, there is no question that Federal Law does not require TMDLs to be included in municipal stormwater permits. (*Defenders of Wildlife v. Browner*, 191 F.3d 1159 (9th Cir. 1999); 40 C.F.R. § 122.44(d).) Consequently, the Regional Board was required to consider the factors listed in Water Code sections 13000, 13263 and 13241 before including the TMDL in the Permit. (*Burbank v. State Board* (2005) 35 Cal.4th 613.)

Water Code sections 13000, 13263, and 13241 require much more than an economic analysis.[6] First and foremost, they require an analysis of whether the proposed Permit terms are "reasonable, considering all demands being made and to be made on [receiving] waters." (Cal

[6] The Regional Board additionally failed to conduct a sufficient economic analysis of the Permit's requirements. A discussion of the reasons the Regional Board's efforts were deficient is presented in Section XI., below.

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Water Code § 13000.) They further require an analysis of whether specific Permit requirements are necessary given "the beneficial uses to be protected, the water quality objectives reasonably required for that purpose, other waste discharges." (Cal Water Code § 13263(a).)

The Regional Board has failed on both fronts. Permit terms that are infeasible to achieve are by definition, not reasonable. As described in Section II., above, compliance with numeric effluent limits tied directly to Water Quality Standards is simply not feasible. While the Regional Board attempted to "soften the blow" by requiring percentage reductions in bacteria levels instead of strict compliance with the TMDL's WLA, the effect is the same. Stormwater is a diffuse source subject to many areas of input. With regard to bacteria, many of those sources are natural. 100% control is not feasible. If a discharger fails to attain the reductions set forth in the TMDL on a numeric basis, they will be in violation of the Permit.

This kind of strict compliance approach fails to consider "the beneficial uses to be protected, the water quality objectives reasonably required for that purpose, other waste discharges" as required by Water Code section 13263(a). Many of the inland streams to which the TMDL (and the Permit conditions implementing the TMDL) apply are either channelized, fenced, or so shallow as to prevent full body contact recreation. Requiring the City to meet a bacteria standard based on an assumption of full body contact recreation in these areas is an unreasonable abuse of discretion that blatantly fails to consider the true beneficial uses of the waters at issue, and the many naturally occurring sources of bacteria discharges to surface waters in the region.[7] Neither the Permit or the Fact Sheet contain any analysis to the contrary.

More importantly for the purposes of this challenge, the Regional Board's decision to include the TMDL in the Permit violates sections 13263, 13241 and 13000, as well as the California Supreme Court's decision in *Topanga Association for a Scenic Community v. County of Los Angeles* (1974) 11 Cal.3d 506. For that reason, the TMDL requirements must be removed from the Permit.

[7] Additionally, to the extent the underlying TMDL is flawed, the Regional Board had an obligation to correct the TMDL before imposing it on the City. (*See California Assn. of Sanitation Agencies v. State Water Resources Control Bd.* 208 Cal. App. 4th 1438, 1461 (2012).)

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VII. THE PERMIT'S ACTION LEVEL REQUIREMENTS ARE INCONSISTENT WITH STATE AND FEDERAL LAW.

Permit, section II.C, entitled "Action Levels," imposes a series of Non-stormwater Action Levels ("NALs") and Stormwater Action Levels ("SALs"), as numeric "goals" to be achieved. To the extent an NAL or SAL is based on an interim or final effluent limitation from a TMDL, then such a NAL or SAL becomes an "enforceable effluent limitations" which must be strictly complied with.

A. *The Permit's Action Levels could be interpreted as numeric effluent limitations.*

The Regional Permit, in Provision II.C, sets forth requirements for the incorporation of Non-Storm Water Action Levels ("NALs") and Storm Water Action Levels ("SALs") into Water Quality Implementation Plans ("WQIPs). The preamble to Provision II.C states that the "goal of the action levels is to guide Water Quality Improvement Plan implementation efforts and measure progress towards the protection of water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges." This language establishes that the NALs and SALs are not intended to be enforceable themselves if not attained by the copermittees.

Unfortunately, the language of the Regional Permit is not entirely clear on this point. Footnotes 7 and 9 of the Regional Permit state that NALs and SALs incorporated into a WQIP "*are not considered* by the San Diego Water Board to be enforceable effluent limitations" (unless based on a water quality based effluent limitation ("WQBEL") expressed as an interim or final effluent limitation for a TMDL and the compliance date for that WQBEL has passed). (emphasis supplied).

Given that the Regional Board has an obligation to make ensure that the provisions of the Regional Permit are clear and unambiguous, the City requests that the State Board either amend the footnotes or text of the Regional Permit to make clear that the NALs and SALs are *not* enforceable effluent limitations or direct the Regional Board to take that action.

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B. *The Permit lacks adequate findings that the Action Levels are necessary, or compliant with Water Code sections 13263 or 13241.*

The Permit's Action Level requirements (both NAL and SAL) include several predetermined Action Levels for, among other things, dissolved oxygen, turbidity, pH, copper, zinc, and lead. (Permit section C.1.a.) These pre-set levels were selected by the Regional Board as necessary to achieve the Maximum Extent Practicable standard required by the Clean Water Act. As an initial matter, neither SALs or NALs are required by the Clean Water Act or the MEP standard for the same reasons that TMDLs and numeric effluent limitations are not required by the Clean Water Act or the MEP standard.

More importantly, the Permit contains no findings explaining why the specific levels were chosen, or how their inclusion in the permit is necessary to achieve the MEP standard. It likewise lacks any findings as to how the chosen standards are compliant with factors set forth in Water Code sections 13263 and 13241.

The Fact Sheet includes a discussion of where the initial Action Level numbers came from but includes no analysis of whether they are reasonable or attainable. (See Fact Sheet pp. F-57, F-58.) The Fact Sheet additionally fails to explain why the each pollutant level chosen is necessary for inclusion in the Permit. (*Id.*) Instead, the Fact Sheet refers back to the 2009 and 2010 municipal permits issued for South Orange County and Riverside County and states that the Permit's Action Levels were developed for those permits.[8] The Fact Sheet additionally cites an EPA study but does not discuss the propriety of each preset limit. This level of analysis is required to provide the City with the opportunity to review the numeric limits chosen and provide evidence refuting the rationale under which they were chosen. It was further required to ensure that the Regional Board did not "randomly leap from evidence to conclusions." (*Topanga Association for a Scenic Community v. County of Los Angeles* (1974) 11 Cal.3d 506, 514.)

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[8] The Fact Sheet fails to note that the dischargers objected to the 2009 South Orange County Permit's Action Levels on the grounds that they were arbitrarily chosen. The Fact Sheet further fails to note that the 2009 South Orange County Permit's Action Levels were appealed via petition to the State Board by several of the permittees. Those petitions are currently in abeyance.

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Lastly, both the Permit and the Fact Sheet fail to assess whether the Action Levels meet the requirements of Water Code sections 13263, and 13241. Because the Action Levels are not required by Federal law, the Regional Board must comply with state law in imposing these requirements. This includes considering the water quality conditions that could be reasonably achieved and economic considerations. A substantial body of evidence exists that suggests the proposed NALs and SALs may not be reasonably achievable. If Permittees are required to respond to and address all exceedances without reasonable prioritization, the cost will be significant. Because some exceedances will not be indicative of impacts to water quality, the cost to implement the SALs and NALs may have little if any commensurate environmental benefit. There is nothing in the record that suggests that the Regional Board has considered these water quality and economic factors. (*See Topanga Association for a Scenic Community v. County of Los Angeles* (1974) 11 Cal.3d 506, 514.) For that reason they must be removed from the Permit until such time as the Regional Board demonstrates that they are feasible, cost effective, and necessary.

VIII. THE REGIONAL BOARD HAS UNLAWFULLY ADOPTED A REGIONAL PERMIT IN VIOLATION OF THE WATER CODE AND FEDERAL REGULATIONS.

The Permit covers permittees in three large metropolitan counties – Orange, Riverside and San Diego. In May 2012, Orange and Riverside Counties ("Counties") sent letters to Staff Counsel for the Regional Board requesting the legal authority to issue a region-wide permit to the Counties.[9] The Counties contended that in accordance with federal regulations there was no system-wide, jurisdiction-wide or watershed basis to issue a regional permit. The Counties also asserted that they did not apply for the Permit and that there was no administrative basis or other evidence that allowed the Regional Board to adopt a Permit with provisions expressly regulating the Counties without considering a Report of Waste Discharge.

On September 7, 2012, Staff Counsel responded to the Counties stating that there was a jurisdiction-wide and watershed basis to impose a regional permit on the Counties, but offered no

[9] Letter from Ryan M. F. Baron, Office of County Counsel, County of Orange, to Catherine Hagan, Office of Chief Counsel, State Water Resources Control Board, San Diego Region (May 10, 2012); Letter from David H. K. Huff, Office of County Counsel, County of Riverside, to Catherine Hagan, Office of Chief Counsel, State Water Resources Control Board, San Diego Region (May 21, 2012).

evidence for these bases. Staff Counsel cited examples in the Bay Area and an Alaskan borough where regional permits had been issued.[10] Despite the Regional Board's contentions to the contrary, no law or regulation gives the Regional Board the authority to issue a regional permit.

A. *There Is No System-wide, Jurisdiction-Wide, Watershed or Other Basis by Which to Legally Impose a Region-wide Permit on the Petitioners.*

Finding 2 in the Permit states that the legal and regulatory authority for implementing a region-wide MS4 Permit stems from Section 402(p)(3)(B) of the Clean Water Act ("CWA") and 40 C.F.R. § 122.26(a)(1)(v). The Permit also cites EPA's Final Rule regarding stormwater discharge permit application procedures that there is flexibility to establish system-wide or region-wide permits. (55 Fed. Reg. 47990, 48039-48042.) In the summer of 2012, the Regional Board staff circulated a draft Permit and conducted Focused Meeting Workshops seeking input on the draft Permit. At workshops held on June 27, 2012 and July 11, 2012, Regional Board staff stated that the only reason for a region-wide Permit was to consolidate the three county permits to lessen the amount of permit writing time and reduce Regional Board costs. Upon adoption of the Permit on May 8, 2013, Finding 2 had been amended to state that the "regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall costs savings for the Copermittees and San Diego Water Board." (Permit section I.2.) There was no evidence presented at the adoption hearing of savings by the Copermittees or Regional Board or that the region-wide permit would ensure consistency of regulation. In any case, neither justification is valid under federal or state law. No other basis was given and no evidence was presented demonstrating why three large, geographically different counties would be covered under one Permit.

In 1987, Congress adopted amendments to the CWA requiring EPA to develop a permitting system for large and medium MS4s. As part of a rulemaking proceeding to adopt regulations implementing the CWA amendments, EPA examined how to define an MS4

[10] Letter from Jessica Jahr, California Regional Water Quality Control Board, San Diego Region, to Ryan M. F. Baron, Office of County Counsel, County of Orange, and David H. K. Huff, Office of County Counsel, County of Riverside (Sept. 7, 2012).

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"system." Under the CWA and EPA rules, a "system," *one system*, would be issued a permit by the EPA or State authority allowing the discharge of stormwater into waters of the U.S. EPA's rulemaking proceeding only examined individual MS4s (*i.e.*, city and county unincorporated area) and MS4s within the same geographic area – defined as the same watershed or the political boundary *of the discharger* (*i.e.*, state owned roads, countywide or regional stormwater management authority).

Multiple smaller systems could be defined as a "system" and issued one permit if there were common physical factors and a unified stormwater management plan. The only instance where a larger geographic area would be covered under one permit is where there was an application by a regional stormwater management authority (*e.g.*, joint powers authority) that was legally empowered to perform all the program functions of smaller MS4s and could apply for such a permit. The EPA did not consider defining a "system" based on cost savings or consistency of regulation, and its final rules do not allow for this interpretation.

In adopting a region-wide Permit, the Regional Board has no basis to define the three counties as "one system" and issue one Permit to 39 different jurisdictions without their application or consent. There are no common physical factors to consider and no unified stormwater management plan between the three counties and 39 permittees. The Petitioners do not operate and are not a member of a regional stormwater management authority. Rather, the Regional Board only considered its internal cost savings and issued the Permit based on the geographic boundary of the Regional Board, and not the dischargers (whereas the Regional Board's political boundary spans across several large distinct and separate MS4 systems).

Federal Regulations look to interconnection and similarities between jurisdictions as the basis by which to issue one permit. (33 U.S.C. § 1342(p)(3)(B)(i); 40 C.F.R. § 122.26(a)(1)(v)).) Federal regulations do not authorize and the EPA Final Rule does not contemplate regional permit issuance based on overall reduced cost savings. (55 Fed. Reg. 47990-01.) Here, overall cost savings have not been demonstrated by the Regional Board, and although it may be administratively convenient to impose a one-size fits all Permit, the EPA Final Rule contemplates such consistency within a watershed and not throughout a geographical area the size of the three

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counties.

There is no factual or technical basis in the Permit that meets this criteria or establishes other bases to regulate Orange County under one unified permit. There is also no statistical basis by which to issue a region-wide Permit, as Orange County is comprised of over three million people and is the sixth largest county by population in the U.S. The U.S. Bureau of Census designates Orange County in a different Metropolitan Statistic Area than San Diego County, designating it in a Combined Statistical Area with Los Angeles, Ventura and San Bernardino Counties.

Lastly, the Regional Board cited examples in the Bay Area and in Alaska where region-wide permits were alleged to have been issued. In the Bay Area MS4 permit, various City and counties under that permit [cite] interconnect with one another and drain into the San Francisco Bay. The Bay Area MS4s agreed to end their existing permits early and applied for and consented to a region-wide permit. The Bay Area is also represented by a joint powers organization or regional watershed management program comprised of 8 municipal stormwater programs that performs common watershed functions for its 94 members. In the case of the Alaska example, a "region-wide" permit was issued to the Fairbanks North Star Borough, City of Fairbanks, City of the North Pole, the Alaska Department of Transportation and the University of Alaska Fairbanks. Further review of that permit and the stormwater program maps demonstrate, however, that the region regulated is a borough, the Alaskan equivalent of a county. All of the regulated Alaska permittees are physically interconnected through a storm drain system and roadways and drain into one watershed. In short, neither the Bay Area nor the Fairbanks Borough permits provide sufficient examples of a region-wide permit comparable to the one being issued to the Petitioners.

B. *There Is No Technical Basis to Regulate the Petitioners Due to the Lack of a Report of Waste Discharge Application.*

In order for an MS4 system to be issued a permit, the operator of the system must apply for it. (40 C.F.R. § 122.21.) The Report of Waste Discharge ("ROWD") is the mechanism by which an MS4 applies to discharge stormwater. Every MS4 permit contains a requirement that a

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ROWD be filed within 180 days of the expiration of the permit so that a new permit can be considered and adopted. A ROWD is a several hundred page application that contains information used to determine provisions of a new permit, including, but not limited to, monitoring, program strengths and other tools that are assessed in the new permit. A ROWD contains quantitative data and other evidence by which to make findings, conclusions of law, establish programs, and approve a permit to a system. In short, a ROWD contains the evidence that a Regional Board uses to regulate the permittee.

The Regional Board has adopted a Permit that expressly covers Orange County water bodies and regulates the actions of the Petitioners, but is not based on any ROWD or other application filed by the City. Thus, there is no technical basis for the Permit or substantial evidence in the record by which to regulate the City under a region-wide Permit, or any permit other than the Petitioners existing permit, (Cal Water Code § 13260; *Topanga Association for a Scenic Community v. County of Los Angeles* (1974) 11 Cal.3d 506) and the terms and conditions of the Permit are arbitrary and capricious.

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IX. THE PERMIT CANNOT CLASSIFY NATURAL WATERS AS PART OF THE MS4, AND THE MS4 CANNOT BE CLASSIFIED AS BOTH A MS4 AND RECEIVING WATER.

The Permit states that development often makes use of natural drainage patterns and features as conveyances for runoff. Finding 11 goes on to state that rivers, streams and creeks in developed areas are part of the Petitioners' MS4 whether the river, stream or creek is natural, anthropogenic or partially modified. It further states that these natural water bodies are both an MS4 and a receiving water.

Finding 11 is expressly contradicted by Federal Regulations defining what qualifies as an MS4. Federal Regulations define a municipal separate storm sewer as:

> a conveyance or system of conveyances including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains:
>
> i. Owned or operated by a state, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to state law) ... including special districts under state law such as a sewer district sewer district, flood control district or drainage district, or similar entity, or an

Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the Clean Water Act that discharges into waters of the United States;

ii. Designed or used for collecting or conveying stormwater;

iii. Which is not a combined sewer; and

iv. Which is not part of a publicly owned treatment works (POTW) as defined at 40 CFR 122.2.

This definition only includes man-made channels and systems and does not encompass natural water bodies simply because an outfall discharges to a receiving water. Improvements to natural rivers, streams and creeks do not make them an MS4, or part of an MS4. They are simply an improved water of the U.S.

Lastly, municipalities do not own, control or operate natural rivers, streams and creeks. Such water bodies are often administrated by the State of California in the public trust for the right of the people to use such waters for certain purposes or are privately owned. The Legislature, acting within the confines of the common law public trust doctrine, is the ultimate administrator of the trust and may often be the final arbiter of permissible uses of trust lands. Such waters are not therefore, part of the City's MS4.

X. THE REGIONAL BOARD VIOLATED DUE PROCESS REQUIREMENTS IN THE PERMIT DEVELOPMENT PROCESS.

The period provided to review and comment on the Permit was unreasonably short given the breadth of the Permit. By denying the Co-Permittees a meaningful opportunity to review and comment on a Permit that so drastically affects their rights and finances, the Regional Board has denied the Co-Permittees due process rights under state and federal law. The United States Constitution, the California Constitution and the California Administrative Procedures Act, as applicable to the Regional Board, all require basic procedural due process. (*See Morongo Band of Mission Indians v. State Water Resources Control Board* (2009) 45 Cal.4th 731; Gov. Code § 11425.10.) The essence of due process is the opportunity to be heard at a meaningful time and in a meaningful manner. (*Mathews v. Eldridge* (1976) 424 U.S. 319, 333; *Spring Valley Water*

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Works v. San Francisco (1890) 82 Cal. 286 (1890) (reasonable notice and opportunity to be heard are essential elements of "due process of law," whatever the nature of the power exercised.); *Arkansas Wildlife Fed'n v. ICI Ams.* (8th Cir. 1994) 29 F.3d 376, 381 ("the overall regulatory scheme affords significant citizen participation, even if the state law does not contain precisely the same public notice and comment provisions as those found in the federal CWA.”))

Two examples illustrate the lack of compliance by the Regional Board with this "essence" of due process. First, the Regional Board released the Draft Tentative Order at the close of business on March 27, 2013, just before Easter weekend and a state holiday on April 1, 2013. (See Draft Tentative Order R9-2013-0001 (March 27, 2013).) This release date provided just a few business days to review the Draft Tentative Order before the adoption hearings that were scheduled for April 11 and 12, 2013. As the Authority and other Co-Permittees informed the Regional Board in writing before and orally at the April 11 and 12 hearings, this short time period was insufficient to allow the Authority to properly prepare for the hearings. The Authority was thus deprived the "essence" of due process prior to the April hearings.

The same holds true regarding the Regional Board's May 8, 2013 hearing process. The Regional Board released two errata sheets shortly before the final adoption hearing on May 8, 2013. These errata sheets proposed major changes to the March 27, 2013 Tentative Order, most notable the proposed deletion of the compliance option in one version of the errata. Again, this short notice provided insufficient time for the Authority to prepare for and comment on the Permit. The Authority was thus deprived of fair notice and a meaningful opportunity to be heard on this important issue.

XI. THE REGIONAL BOARD FAILED TO ADEQUATELY CONSIDER ECONOMIC IMPACTS PURSUANT TO WATER CODE SECTION 13241

Under the California Supreme Court's holding in *Burbank v. State Board* (2005) 35 Cal.4th 613, a regional board must consider the factors set forth in sections 13263, 13241 and 13000 when adopting an NPDES Permit, unless consideration of those factors "would justify including restrictions that do not comply with federal law." (*Id.* at 627.)

As stated in the *Burbank*, "Section 13263 directs Regional Boards, when issuing waste

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discharge requirements, to take into account various factors including those set forth in Section 13241." (*Id.* at 625, emphasis added.) Specifically, the Court held that to the extent the NPDES Permit provisions in that case were not compelled by federal law, the Regional Boards were required to consider their "economic" impacts on the dischargers themselves, with the Court finding that such a requirement means that the Water Boards must analyze the "discharger's cost of compliance." (Id. at 618.)

There has not been a full consideration of the section 13241 factors, which would include an analysis of the economic impacts that would result from compliance with the existing stormwater permit compared to the costs of complying with the proposed stormwater permit (thereby the costs of complying with the new requirements). Instead, the Permit's analysis begins by stating, and without any quantification, that it would more expensive to not fully implement programs. Section 13241 is not satisfied by this inverse analysis.

The Permit states that the Petitioners have a significant amount of flexibility to choose how to implement BMPs and that "least expensive measures" can be chosen. (Fact Sheet, F-17.) This statement, however, conflicts with the Permit's definition of MEP at Permit section C-6 which expressly acknowledges Chief Counsel's 1993 MEP memo that only the Regional and State Boards determine whether BMPs meet MEP, and that selection of the least expensive BMPs will likely not result in meeting the MEP standard. The Fact Sheet also fails to cite any recent cost benefit numbers but relies on inapplicable cost data such as a 1999 EPA study on household costs and a California State University, Sacramento ("CSUS") Cost Survey assessed program costs for Phase I City.

Nothing in the Fact Sheet links any of the actual conditions of the Phase I permits of the Phase I City studied by CSUS with any of the requirements of the Permit. Therefore, the study tells the public nothing about the costs to implement the Permit. The data included in the Fact Sheet is also more than a decade old. In short, the Fact Sheet uses old data from Phase I programs that have no linkage to any conditions of the Permit. The full costs of implementing the entire program required by the Permit in 2013 dollars must be assessed.

In addition to relying on outdated and inapplicable data, the Regional Board's cost analysis is fundamentally flawed because it tells the public nothing at all about the relationship between the cost of any particular BMP and the pollution control benefits to be achieved by implementing that BMP. Under this "generalized" approach, extremely costly requirements that bear little or even no relationship (or even a negative relationship) to the pollution control benefits to be achieved could be "justified" as long as the "overall" program costs are within what the Regional Board deems to be an acceptable range.

This is not a proper way to determine whether a control reduces the discharge of pollutants from the MS4 to the MEP. A more individualized assessment of cost is required. Otherwise, dischargers may be required to implement very costly controls that have no relationship to pollution control benefits, a result inconsistent with MEP. This analytical flaw in the Fact Sheet is compounded by the approach taken to assess the benefits of the Permit. Here again, the assessment approach misses the mark because it tells the public nothing about the pollution control benefits to be achieved by implementation of the controls in the Permit. All the Fact Sheet indicates, in essence, is that people like clean water and in theory may be willing to pay for it, that urban storm water may contribute to beach closures, and that such beach closures have an economic impact. This analysis sheds no light on the relationship between a BMP's costs and the pollution control benefits to be achieved by implementing that BMP.

Finally, stormwater agencies cannot readily establish or raise fees to help pay for the BMPs necessary to comply with either the California Toxics Rule criteria or proposed Site Specific Objectives due to the requirements of Proposition 218, Proposition 26 and the Mitigation Fee Act. For instance, Proposition 218 requires that property-related fees be put to a vote, so City cannot assess fees without the consent of two-thirds of the property owners. Therefore, the costs associated with the implementation and maintenance of the BMPs will almost always be expended using local agency General Funds.

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XII. The Permit unlawfully imposes a Federal scheme on the City with no option for compliance

The Permit violates the Tenth Amendment to the United States Constitution because it compels the City and other copermittees to administer a federal regulatory scheme. The Tenth Amendment states that "[t]he powers not delegated to the United States by the Constitution, nor prohibited by it to the States, are reserved to the States respectively, or to the people." U.S. Const. amend. X. The U.S. Supreme Court has held that under the Tenth Amendment, "the Federal Government may not compel the States to implement, by legislation or executive action, federal regulatory programs." *Printz v. United States*, 521 U.S. 898, 925 (1997). The protection afforded by the Tenth Amendment extends to local governments such as the City. *Id.* at 931 n.15; *Envtl. Defense Ctr., Inc. v. EPA*, 344 F.3d 832, 847 (9th Cir. 2003).

A state or local government may be persuaded to implement a federal regulatory program but "the residents of the State or municipality must retain 'the ultimate decision' as to whether or not the State or municipality will comply with the federal regulatory program." *Envtl. Defense Ctr.*, 344 F.3d at 847 (citing *New York v. United States*, 505 U.S. 144, 168 (1992)). Permissible methods of "persuasion" include federal funding that is contingent on participation in a federal program. *Id.* (citing *South Dakota v. Dole*, 483 U.S. 203, 205-08 (1987)). Offering an alternative to implementing a federal regulatory program may also be constitutionally permissible, so long as the alternative does not "unduly infringe on the sovereignty of the State or local government." *City of Abilene v. EPA*, 325 F.3d 657, 662 (5th Cir. 2003) (citing *New York*, 505 U.S. at 176).

An example of an alternative that crosses the line into compulsion is the "take title" provision of the Low-Level Radioactive Waste Policy, which gave states the choice of either regulating radioactive waste according to federal standards, or taking possession of that waste. *New York*, 505 U.S. at 174-77. The Supreme Court determined this provision violates the Tenth Amendment because, "[e]ither way, 'the Act commandeers the legislative processes of the States by directly compelling them to enact and enforce a federal regulatory program.'" *New York*, 505 U.S. at 176 (quoting *Hodel v. Virginia Surface Mining & Reclamation Ass'n, Inc.*, 452 U.S. 264, 288 (1981)). "A choice between two unconstitutionally coercive regulatory techniques is no

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choice at all." *Id.*

In the storm water context, a Phase I MS4 permit did not violate the Tenth Amendment even though it required the cities to implement storm water management programs regulating new development, construction sites, sanitary sewers, landfills, hazardous waste treatment facilities, and industrial facilities. *City of Abilene*, 325 F.3d at 660, 662. The court reasoned that the cities had a constitutional alternative to implementing this federal program: accept a permit with effluent limitations instead of storm water management requirements. *Id.* at 662. Likewise, the Ninth Circuit Court of Appeals held that the storm water management requirements in EPA's Phase II MS4 permit rule did not run afoul of the Tenth Amendment because cities had the option to enroll in a Phase I MS4 permit instead, and that permit had already been found constitutional in *City of Abilene. Envtl. Defense Ctr.*, 344 F.3d at 848.

Unlike the MS4 permit requirements challenged in *City of Abilene* and *Environmental Defense Center*, the Permit violates the Tenth Amendment because the City and other copermittees have no choice but to implement a federal regulatory program.[11] The Regional Board has taken the management permit and effluent permit alternatives discussed in *City of Abilene* and made them both compulsory in the Permit. The Permit requires the City to implement the storm water management programs such as the Water Quality Improvement Plans in Provision II.B and the Jurisdictional Runoff Management Programs in Provision II.D, *and* to comply with the de facto effluent limitations in Provision II.A. There is no choice here.

The City respectfully requests that the State Board remand the Permit back to the Regional Board with direction to restore the compliance linkage between the Water Quality Improvement Plans in Provision II.B and the receiving water limitations in Provision II.A. This linkage would cure the legal issues addressed here by giving the City and other copermittees a chance to comply with the Permit and providing a constitutional choice instead of compelling

[11] The Regional Board has found that each and every requirement in the Permit is federally mandated under the Clean Water Act. Permit at F-29 to F-30. The City disagrees with this finding, but notes that the Regional Board cannot have it both ways. If the Permit includes only federal requirements, then the Tenth Amendment must be respected. If the Permit includes state law requirements above and beyond what is required under the Clean Water Act, then those requirements are unfunded state mandates.

both implementation of federal storm water management programs and compliance with effluent limitations.

CONCLUSION

For the reasons expressed in the Petition, and this Memorandum of Points and Authorities the City's Petition should be granted.

Dated: June 7, 2013

BEST BEST & KRIEGER LLP

By: _____

Attorneys for Defendant

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Permit Section	Permit Page (Original)	Section Title	Reason for Proposed Changes/Comments	Proposed Changes
General Comment	NA	NA	NA	The proposed amendments do not address any of the issues raised in the City's Petition for Review of San Diego Regional Water Quality Control Board (Regional Board) Order No. R9-2013-0001, filed on June 7, 2013. The City does not waive any of those arguments, and urges the Regional Board to address those issues as part of this permit amendment.
A. Prohibitions and Limitations				
A	13-16	Prohibitions and Limitations	Current permit language lacks linkage between Water Quality Improvement Plans (WQIPs) and compliance. Problems caused by current language: (1) it undermines the stated intent of the Regional Board to encourage prioritization of pollutants; (2) it requires resource-intensive watershed planning efforts that have no benefit to the Copermittees' ability to comply with the Receiving Water Limitations and Discharge Prohibitions; and (3) it calls into question whether WQIPs are properly required under the MS4 Permit. The City envisions WQIPs as the foundation for a BMP-based compliance approach for the Discharge Prohibitions and Receiving Water Limitations. However, the language in Provision A does not clearly link compliance with the iterative process set forth in the WQIPs. In essence, the language suggests that even if Copermittees expend significant resources to develop and fully implement WQIPs that are progressing toward attainment of water quality standards, they may still be found to be out of compliance for single exceedances. The iterative process is a fundamental aspect of MS4 programs, as envisioned by State Water Board Order 99-05 and later reconfirmed in Order WQ 2001-15 (BIA Order), and is the mechanism by which MS4 Copermittees should <u>demonstrate</u> compliance (i.e., implementation of the iterative process equals compliance). The WQIPs now provide a mechanism to "raise the bar" with regard to the detail and quantitative analyses used to identify pollutant sources, implement BMPs to address those sources, and increase the number or size of BMPs until water quality standards are attained. However, as Provision A.4 is written, the envisioned strategic compliance process falls short, and the WQIPs are simply documents that do not appear to have a meaningful linkage to MS4 compliance. An unintended but potentially significant consequence of this compliance uncertainty is that the City and other Copermittees may experience increased difficulty securing program funding because even substantial increases in funding would not lead to achieving	Revise Provision A to allow implementation of WQIPs to demonstrate compliance with Receiving Water Limitations and Discharge Prohibitions.

Attachment 1: City of San Diego Comment Table Regarding September 18, 2014 Revisions to Order No. R9-2013-0001
November 19, 2014

Permit Section	Permit Page (Original)	Section Title	Reason for Proposed Changes/Comments	Proposed Changes
			compliance.	
B. Water Quality Improvement Plans				
B.1	17	Watershed Management Areas	This NPDES Permit is applicable to discharges from Copermittee MS4s as stated in Section A.1. Discharges from other NPDES permits are governed by requirements within those permits.	Modify Section B.1 as follows: The Copermittees must develop a WQIP for their MS4 discharges within each of the Watershed Management Areas in Table B-1.
E. Jurisdictional Runoff Management Programs				
E	93	Structural BMP Approval and Verification Process	A definition of "prior lawful approval" is necessary. Regional Board counsel has indicated that "prior lawful approval" was intended to refer to an approval that conferred a vested right to proceed without complying with the new development requirements of the 2013 MS4 Permit. However, some stakeholders have argued that any approval is sufficient. The current permit language is unclear. A definition is necessary to ensure that the standard the Copermittees will be held to by the Regional Board is expressed in the permit language. Permit language should address the following: 1. Provide a clear, bright line of what constitutes prior lawful approval; 2. Provide a back stop to ensure that projects with older approvals that do not confer vested rights comply with new requirements; 3. Protect vested rights; and, 4. Preserve Copermittees' land use authority.	Define "prior lawful approval." This could be done in a footnote.
E	93	Structural BMP Approval and Verification Process	Including the date the BMP Design Manual will be updated would provide additional clarity and avoid having to read multiple sections of the Permit to determine the referenced date.	(a) Each Copermittee must require and confirm that, for all Priority Development Project applications that have not received prior lawful approval by the Copermittee by ~~the time the BMP Design Manual is implemented updated pursuant to Provision E.3.d~~December 24, 2015, the requirements of Provision E.3 are implemented. For project applications that have received prior lawful approval before ~~the BMP Design Manual is implemented updated pursuant to Provision E.3.d~~December 24, 2015, the Copermittee may allow previous land development requirements to apply.
Attachment A. Discharge Prohibitions and Special Protections				
A	A-5 to A-6	Compliance Plans for Inclusion in Storm Water Management Plans	The redline strikeout version of draft amendment indicates that the entire Area of Special Biological Significance (ASBS) section has been changed, but the proposed resolution indicates that the only change that was made was to reflect State Board Resolution 2012-0031, which changed the deadline for certain provisions from 4 to 6 years.	Support change to Attachment A, section 2.A.2.d.2.

Attachment 1: City of San Diego Comment Table Regarding September 18, 2014 Revisions to Order No. R9-2013-0001
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Permit Section	Permit Page (Original)	Section Title	Reason for Proposed Changes/Comments	Proposed Changes
Attachment E. Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2015-0001				
Attachment E, Sections 1.b(3)(d) 1.b(3)(d)(iv) 1.b(3)(d)(v) 2.b(3)(d)(iv) 2.b(3)(d)(v) 3.b(3)(d)(iv) 3.b(3)(d)(v) 4.b(3)(d) 4.b(3)(d)(iv) 4.b(3)(d)(v) 5.b(1)(a) 5.b(3)(d) 5.b(3)(e) 5.b(3)(f) 4.b(3)(g) 4.b(3)(g)(iv) 4.b(3)(g)(v) 5.c(1)(b)(iv) 5.c(1)(b)(v) 5.c(1)(b)(vi) 5.c(1)(b)(vii) 5.c(1)(b)(viii) 6.b(2)(b)(ii) 6.b(3)(d) 6.b(3)(e) 6.b(3)(f) 6.b(3)(f)(iv) 6.b(3)(f)(v) 6.c(2)(a)(i) 6.c(2)(a)(ii) 6.c(3)(d) 6.c(3)(e) 6.c(3)(f) 6.c(3)(g) 6.c(3)(h)	E-4 E-8 E-11 E-16 E-19 E-23 E-24 E-25 E-34 E-36 E-37 E-41 E-42 E-47	Final TMDL Compliance Determination	Compliance language requires all Copermittees to implement a WQIP for any of the Copermittees to utilize the WQIP based compliance approach for TMDLs. Copermittees have no authority to compel other Copermittees to implement BMPs and should not be held liable for the actions or inactions of others. Under 40 C.F.R. §§ 122.26(a)(3)(vi) and 122.26(b)(1), a Copermittee is responsible only for conditions relating to the discharges for which it is the operator.	Revise Attachment E Provisions to allow independent jurisdictional compliance. For example, revise Provisions E.1.b(3)(d) as follows: (d) The Responsible ~~Copermittees~~ Copermittee ~~develop~~ develops and ~~implement~~ implements the Water Quality Improvement Plan as follows: . . . . (iv) The Responsible ~~Copermittees~~ Copermittee ~~continue~~ continues to implement the BMPs required under Specific Provision 1.b.(2)(c), AND (v) The Responsible ~~Copermittees~~ Copermittee ~~continue~~ continues to perform the specific monitoring and assessments specified in Specific Provision 1.d, to demonstrate compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c).
Attachment E, 7.b.2	N/A	Final Effluent Limitations	The Waste Load Allocation is incorrectly stated as an annual load. Instead, the Waste Load Allocation was calculated as loading from the critical wet period of Oct. 1 to Apr. 30, not the entire year. (TMDL Staff Report, Table 6). This error in the MS4 permit makes the Waste Load Allocation, and consequently, the	Modify Table 7.1 heading as follows: Final Effluent Limitations as Expressed as Wet Season (October 1 to April 30) Loads

Attachment 1: City of San Diego Comment Table Regarding September 18, 2014 Revisions to Order No. R9-2013-0001
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Permit Section	Permit Page (Original)	Section Title	Reason for Proposed Changes/Comments	Proposed Changes
			Final Effluent Limitation, inconsistent with the TMDL. Some sediment loading may occur during the dry season (May 1 to Sept. 30) for Los Penasquitos Creek (historically flows year round) and for other creeks during significant rainfall events.	from Responsible Parties to Los Peñasquitos Lagoon Constituent Effluent Regarding "Responsible Parties" above, see comment below.
Attachment E, 7.b.2	E-53	Final Effluent Limitations	It is not appropriate to express a Waste Load Allocation that applies to all responsible parties under the TMDL as a numeric effluent limitation that applies only to the Copermittees. The result is that the other responsible parties would have **zero** allocation of sediment, but the recently adopted Caltrans, Phase II, and Industrial storm water permits do not subject those responsible parties to any numeric effluent limitations: • The General Industrial Permit adopted by the State Board on April 1, 2014, includes the general statement that "discharges addressed by this General Permit are considered to be point source discharges, and therefore must comply with effluent limitations that are consistent with the assumptions and requirements of any available waste load allocation for the discharge prepared by the state and approved by USEPA." However, the General Industrial Permit has not yet incorporated specific TMDL compliance provisions, let alone effluent limitations. • Similarly, the General Phase II Permit adopted by the State Board on February 5, 2013, states generally that "discharges from Small MS4s are point source discharges subject to TMDLs," and further states that "this Order requires Permittees to comply with all applicable TMDLs." However, the TMDL provisions in Attachment G of the Phase II Permit do not impose any effluent limitations on Phase II MS4s. • The Caltrans storm water permit amendments to incorporate TMDL requirements, dated July 1, 2014, allow for BMP-based compliance instead of imposing numeric effluent limitations. Because of the disparity in the TMDL provisions in these NPDES permits, it is important to separate allocations for Caltrans, Phase II, and Industrial storm water permits so that future revisions of those permits can responsibly address their portion of the Wasteload Allocation.	Two changes are necessary to acknowledge the sediment loading contributions of other Responsible Parties listed in the TMDL: • The sediment loads stated as the final effluent limitation in Table 7.1 should include only the load specific to storm water runoff from Copermittees, and should not include loads associated with runoff from other Responsible Parties with separate NPDES permits (Resolution No. R9-2012-0033, Attachment A, Page 5 lists the other Responsible Parties as Phase II MS4 permittees, Caltrans, and the General Construction and General Industrial Storm Water NPDES permittees). Similar to methods used by Regional Board staff in other TMDLs, this separation of load can be calculated based on land area of each Responsible Party in the watershed. The percentage of the entire watershed area associated each Responsible Party's area can be used as a multiplier times the entire Wasteload Allocation to determine individual sub-allocations. AND • Table 7.1 should include the footnote: "Responsible Parties include the following: Phase I Municipal Separate Storm Sewer Systems (MS4s) Copermittees (the County of San Diego, City of San Diego, City of Del Mar, and the City of Poway), Phase II MS4 permittees, and general construction storm water NPDES permittees, and general industrial storm water NPDES

Permit Section	Permit Page (Original)	Section Title	Reason for Proposed Changes/Comments	Proposed Changes
				permittees as presented in Resolution No. R9-2012-0033 Attachment A, page A-5."" • Modify Section 7.b.(2)(c) as follows: (ii) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 7.b.(2)(a) or the Copermittee portion of effluent limitations under Specific Provision 7.b.(2)(b) for Los Peñasquitos Lagoon.
Attachment E, Section 7.b(3)(a)	E-54	Final TMDL Compliance Determination	This provision is inconsistent with the TMDL for three reasons: (1) It appears to hold the Phase I Copermittees wholly responsible for Lagoon restoration, instead of recognizing that the other Responsible Parties named in the TMDL are also responsible for meeting this goal. R9-2012-0033 and TMDL Staff Report state that all watershed dischargers are responsible for achieving the Lagoon restoration target. (2) Restoration of 346 acres is not required under the TMDL. The requirement is to achieve 346 acres total of tidal and non-tidal salt marsh habitat. Based on the 2010 vegetation survey, there are currently 262 acres of salt marsh vegetation present, so 84 acres would need to be restored to achieve a total of 346 acres. (3) Language for final compliance determination is not consistent with TMDL (see page A-16 and footnote 1 in Resolution. R9-2012-0033, Attachment A).	Modify Provision 7.b.(3) as follows: (3) Final TMDL Compliance Determination Compliance with the final WQBELs, on or after the final TMDL compliance date may be demonstrated via one of the following methods: (a) ~~Successful restoration of~~ Demonstration that there are a combined total of 346 total acres of tidal and non-tidal salt marsh vegetation in Los Peñasquitos Lagoon or demonstration that implementation actions are active and/or affecting 346 acres with continued monitoring to ensure target achievement; OR
Attachment E, Section 7.b(3)(b)	E-54	Final TMDL Compliance Determination	The WQIP-based compliance option appears to reference the wrong section in two places.	Modify Section 7.b(3)(b) as follows: (b) The Responsible Copermittees must develop and implement the Water Quality Improvement Plan as follows: . . . (ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 7.b.(2)(c)(ii) achieves compliance with Specific Provision 7.b.(~~3~~2)(a),

Permit Section	Permit Page (Original)	Section Title	Reason for Proposed Changes/Comments	Proposed Changes
				. . . (v) The Responsible Copermittees must continue to perform the specific monitoring and assessments specified in Specific Provision 7.d to demonstrate compliance with Specific Provision 2.b.(~~3~~2)(a).
Attachment E, Section 7.b(3)(b)	E-54	Final TMDL Compliance Determination	Final compliance options should be consistent with other TMDLs incorporated into the MS4 Permit in Attachment E. The language as currently drafted omits several compliance options that should be included.	Modify Section 7.b.(3) as follows: (b)(v) . . . ; OR (c) There is no direct or indirect discharge from the Responsible Copermittee's MS4 to the receiving water; OR (d) The final receiving water limitation under Specific Provision 7.b.(2)(a) is met.
Attachment E, Section 7.c	E-55	Interim TMDL Compliance Requirements	The interim compliance requirements are inconsistent with the TMDL, which allows MS4 Permittees to "show progress in improving Lagoon conditions consistent with the specified targets" as an alternative to sediment load reductions (see Los Peñasquitos Lagoon Sediment TMDL Implementation Compliance Schedule on pages A-17 to A-19 in Regional Board Resolution R9-2012-0033, Attachment A).	Modify Section 7.c. as follows: c. INTERIM TMDL COMPLIANCE REQUIREMENTS Compliance with the interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods: (a) The Responsible Copermittee shows progress in improving the Lagoon conditions towards Specific Provision 7.b.(2)(a); OR
Attachment E, Section 7.c	E-55	Interim TMDL Compliance Requirements	Interim compliance options should be consistent with other TMDLs incorporated into the MS4 Permit in Attachment E. The language as currently drafted omits several compliance options that should be included.	Further modify Section 7.c. as follows: (b) There is no direct or indirect discharge from the Responsible Copermittee's MS4 to the receiving water; OR (c) The final receiving water limitation under Specific Provision 7.b.(2)(a) is met; OR (d) ~~The Responsible Copermittees must comply with the interim WQBELs, expressed as annual loads, by December 31 of the interim compliance year set forth in Table 7.2.~~There are no exceedances of the

Permit Section	Permit Page (Original)	Section Title	Reason for Proposed Changes/Comments	Proposed Changes
				Copermittee portion of interim effluent limitations under Table 7.2 at the Responsible Copermittee's MS4 outfalls; OR (e) The Responsible Copermittee has submitted and is fully implementing a Water Quality Improvement Plan, accepted by the Regional Board, which provides reasonable assurance that the Copermittee portion of interim TMDL compliance requirements will be achieved by the interim compliance date.
Attachment E, Table 7.2	E-55	Interim TMDL Compliance Requirements	For consistency with the Table 7.1 final effluent limitation expressed as a load, "associated percentage of reduction" should be removed from Table 7.2 for interim WQBELs. The percentages in Table 7.2 are not total percent reductions expected of the existing load, but are instead percentages of attaining the 67% load reduction to meet the waste load allocation. Therefore, the percentages listed in Table 7.2 lack context and are misleading because they indicate that substantial load reductions are required to meet interim compliance dates.	Delete Table 7.2, third column.
Attachment E, Table 7.2	E-55	Interim TMDL Compliance Requirements	The interim WQBELs were incorrectly stated as annual loads. Instead, the Waste Load Allocation and associated interim load reductions were calculated as loading from the critical wet period of Oct. 1 to Apr. 30, not the entire year. (TMDL Staff Report, Table 6). This error in the MS4 permit makes the Waste Load Allocation, and consequently, the Interim Effluent Limitations, inconsistent with the TMDL.	Modify Section 7.c as follows The heading on column 2 of Table 7.2 should be changed to "Interim Effluent Limitations (tons/~~year~~wet season)"
Attachment E, Table 7.2	E-55	Interim TMDL Compliance Requirements	It is not appropriate to express interim loads that apply to all responsible parties under the TMDL as a numeric effluent limitation that applies only to the Phase I Copermittees. The result is that the other responsible parties would have **zero** allocation of sediment, but the recently adopted Caltrans, Phase II, and Industrial storm water permits do not subject those responsible parties to any numeric effluent limitations (see detailed summary of the TMDL provisions of these permits above). It is important to separate loads for Caltrans, Phase II, and the General Construction and Industrial storm water permits so that future revisions of those permits can responsibly address their potion of interim load reductions.	Two changes are necessary to acknowledge the sediment load contributions of other Responsible Parties listed in the TMDL: • The sediment loads stated as interim effluent limitations in Table 7.2 column 2 should include only loads specific to storm water runoff from Copermittees, and should not include loads associated with runoff from other Responsible Parties with separate NPDES permits (Resolution No. R9-2012-0033 lists these Responsible Parties as Phase II MS4 permittees, Caltrans, and the General Construction and General Industrial Storm Water NPDES permittees). Similar to methods used by Regional Board staff

Permit Section	Permit Page (Original)	Section Title	Reason for Proposed Changes/Comments	Proposed Changes
				in other TMDLs, this separation of load can be calculated based on land area of each Responsible Party in the watershed. The percentage of the entire watershed area associated each Responsible Party's area can be used as a multiplier times the entire Waste Load Allocation to determine individual sub-allocations. AND • Table 7.2 should include the footnote: "Responsible Parties include the following: Phase I Municipal Separate Storm Sewer Systems (MS4s) Copermittees (the County of San Diego, City of San Diego, City of Del Mar, and the City of Poway), Phase II MS4 permittees, and general construction storm water NPDES permittees, and general industrial storm water NPDES permittees as presented in Resolution No. R9-2012-0033 Attachment A, page A-5."
Attachment E, Section 7.d(3)(c)	E-56	Assessment and Reporting Requirements	Provision 7.d(3)(c) states that the first reported average shall be calculated using the data collected in years 2014-2015, 2015-2016, and 2016-2017. This would require Copermittees to start Sediment TMDL compliance monitoring before the WQIP is completed and accepted by the Regional Board. The Sediment TMDL Compliance Monitoring is part of the Los Peñasquitos Monitoring and Assessment Program because the WQIP is serving as the Sediment Load Reduction Plan. This provision should be modified to require monitoring to start the first full wet season after the WQIP is accepted by the Regional Board.	(c) For assessing and determining compliance with the final effluent limitations under Specific Provision 7.b.(2)(b), the Responsible Copermittees must use the data acquired under Specific Provision 7.d.(1) to estimate sediment loading into Los Peñasquitos Lagoon. Sediment loading must be evaluated using a 3-year, weighted rolling average. The first reported average shall be calculated using data collected in the 3 years ~~2014-15, 2015-2016, and 2016-2017 wet seasons~~ following Regional Board acceptance of the WQIP.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

RESOLUTION NO. R9-2012-0033

A RESOLUTION AMENDING *THE WATER QUALITY CONTROL PLAN FOR THE SAN DIEGO BASIN (9)* TO INCORPORATE THE TOTAL MAXIMUM DAILY LOAD FOR SEDIMENTATION IN LOS PEÑASQUITOS LAGOON

WHEREAS, The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), finds that:

1. **Water Quality Control Plan:** The federal Clean Water Act[1] (CWA) and state Porter-Cologne Water Quality Control Act[2] require the San Diego Water Board to establish water quality standards for each waterbody within its region. The water quality standards for coastal waters in the San Diego Region are established in the *Water Quality Control Plan for the San Diego Basin (9)* (Basin Plan) and in the *Water Quality Control Plan for Ocean Waters of California* (Ocean Plan). Water quality standards include beneficial uses, water quality objectives (WQOs), and the antidegradation policy. The Basin Plan contains programs of implementation to achieve water quality standards.[3] Waterbodies that do not meet water quality standards are considered impaired.

2. **Clean Water Act Section 303(d) List of Water Quality Limited Segments:** Pursuant to section 303(d) of the Clean Water Act, each state is required to identify impaired waters and establish a total maximum daily load (TMDL) at a level necessary to implement the applicable water quality standards.[4] Each state is required to develop a list that identifies and establishes a priority ranking for those waters requiring TMDLs.[5] The list is known as the CWA section 303(d) List of Water Quality Limited Segments or more commonly, the 303(d) List. For the specific purpose of developing information, states are also required to estimate TMDLs for all other waters that are not identified on the 303(d) List.[6]

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[1] Clean Water Act section 303; U.S. Code section 1313
[2] California Water Code section 13240
[3] See Water Code section 13050(j). A "Water Quality Control Plan" or "Basin Plan" consists of a designation or establishment for the waters within a specified area of all of the following: (1) Beneficial uses to be protected, (2) Water quality objectives and (3) A program of implementation needed for achieving water quality objectives.
[4] Clean Water Act section 303(d)(1)(C); U.S. Code section 1313(d)(1)(C)
[5] Code of Federal Regulations Title 40 section 130.7(b)(1)
[6] Clean Water Act section 303(d)(3) states that "For the specific purpose of developing information, each State shall identify all waters within its boundaries, which it has not identified under paragraph (1)(A) and (1)(B) of this subsection and estimate for such waters the total maximum daily load with seasonal variations and margin of safety..."

Resolution No. R9-2012-0033

3. **Purpose and Definition of Total Maximum Daily Load (TMDL):** The purpose of a TMDL is to restore an impaired waterbody to water quality conditions under which applicable water quality standards can once again be attained. This is done by establishing and implementing a TMDL for the impairing pollutant. Generally, when the TMDL, numeric targets and associated pollutant allocations are attained, water quality standards in the waterbody should be restored. A TMDL is both (1) a calculation of the maximum loading capacity of the impaired waterbody for each impairing pollutant; and (2) an implementation plan to guide actions necessary to cleanup the waterbody and restore water quality standards.

4. **TMDL Basin Plan Amendment:** Upon establishment and approval of TMDLs, the state is required to incorporate TMDLs into the state water quality management plan.[7] Along with various applicable statewide water quality control plans, the Basin Plan for the San Diego Region serves as the water quality management plan for the watersheds under the jurisdiction of the San Diego Water Board. Incorporating TMDLs into the Basin Plan requires an amendment to the Basin Plan and the development of an Implementation Plan. The Implementation Plan must include a description of the actions necessary to achieve the applicable water quality objectives, a time schedule for the actions to be taken, and a description of the monitoring to be undertaken to determine compliance with the objectives.[8]

5. **Water Quality Impairment of Los Peñasquitos Lagoon:** As required by CWA section 303(d), the Los Peñasquitos Lagoon (Lagoon) was placed on the 1996 List of Water Quality Limited Segments due to sedimentation and siltation loads that exceeded water quality objectives. The beneficial uses that are most sensitive to increased sedimentation are estuarine habitat and preservation of biological habitats of special significance. Deposition of watershed sediment contributes to elevation increases within the Lagoon, which is a critical variable that determines the productivity and stability of these uses. Legacy sediments from construction activities within the lagoon (e.g., construction of the railway berms and construction and operation of access roads) also play a role in the Lagoon's sedimentation impairment.

   Other beneficial uses listed in the Basin Plan for the Lagoon include contact water recreation, non-contact water recreation, wildlife habitat, rare, threatened or endangered species, marine habitat, migration of aquatic organisms, spawning, reproduction and/or early development, and shellfish harvesting.

   Other impacts associated with increased and rapid sedimentation include: reduced tidal mixing within Lagoon channels, increased vulnerability to flooding for surrounding urban and industrial developments, increased turbidity associated with siltation in Lagoon channels, and constricted wildlife corridors.

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[7] Code of Federal Regulations Title 40 section 130.6(c)(1)

[8] Pursuant to the requirements of Article 3, commencing with section 13240, of Chapter 4 of the Porter-Cologne Water Quality Control Act, as amended, codified in Division 7, commencing with section 13000, of the Water Code

6. **Water Quality Objective:** The water quality objective for sediment is contained in the Basin Plan. The Basin Plan states, *"The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses."*

7. **Numeric Targets:** One or more quantitative numeric targets must be selected to calculate a TMDL for an impaired waterbody. Numeric targets are derived from and must be able to interpret and implement water quality standards (beneficial uses, water quality objectives, and the antidegradation policy). This means that attainment of the selected numeric targets in the impaired waterbody represents attainment of applicable water quality standards in the waterbody; i.e., when the numeric targets are met, the TMDL should be met, WQOs should be met and the beneficial uses should be restored. While numeric targets and TMDLs are derived from, represent, interpret, and implement water quality standards, they are not water quality standards.

   The narrative sediment water quality objective requires numeric targets to evaluate attainment of the objective. Consideration of various lines of evidence indicates that the Lagoon was likely achieving the water quality standard for sediment in the mid-1970s. Using land-use coverage and Lagoon mapping, a "reference condition" was developed to establish watershed and Lagoon conditions present during the mid-1970s.

   The historic land use distribution was used to calculate the watershed numeric target, which is expressed as 12,360 tons of sediment per wet period (211 days) or 58.6 tons per day. Lagoon mapping was used to establish the Lagoon numeric target, which is expressed as an increasing trend in the total area of tidal saltmarsh and non-tidal saltmarsh toward 346 acres. This target acreage represents 80 percent of the total acreage of tidal and non-tidal saltmarsh present in 1973. As of the year 2010, 262 acres of tidal saltmarsh and non-tidal saltmarsh are present in the Lagoon. The calculation and interpretation of the numeric target as an increasing trend in acreage takes into account other factors impacting the salt marsh habitat in the lagoon, as well as the length of time necessary to successfully restore the biological, physical, chemical, and hydrological structural characteristics of salt marsh habitat. The final lagoon numeric target requires the successful restoration of tidal and non-tidal salt marsh to achieve a lagoon total of 346 acres. This can either mean:
   1. Successful restoration of 80 percent of the 1973 acreage of lagoon salt marsh habitat (346 acres); or
   2. Demonstrate that implementation actions are active on and/or affecting 346 acres with continued monitoring to ensure 80 percent target achievement.

8. **Sources of Sediment:** Sources of sediment to the Lagoon include erosion of canyon banks, bluffs, scouring stream banks, and tidal influx. Some of these processes are exacerbated by anthropogenic disturbances, such as land

development within the watershed. Land development transforms the natural landscape by exposing sediment and converting pervious surfaces to impervious surfaces, which increases the volume and velocity of runoff resulting in scouring of sediment, primarily below storm water outfalls that discharge into canyon areas. Sediment loads are transported downstream to the Lagoon during storm events causing deposits on the salt flats and in Lagoon channels. These sediment deposits have gradually built-up over the years due to increased sediment loading and inadequate flushing, which directly and indirectly affects Lagoon functions and salt marsh characteristics.

9. **Watershed Point and Non-point Sediment Sources:** There are two broad categories of sediment sources to the Lagoon: 1) watershed sources, and 2) the Pacific Ocean. The watershed sources consist of all point and non-point sources of sediment in the watershed area draining to Los Peñasquitos Lagoon. The total sediment contribution from all watershed sources is presented as the total wasteload allocation (WLA). The sediment contributions from the Pacific Ocean are considered a background source and are presented as the Load Allocation (LA). Hence, the responsible parties are assigned the total WLA and are jointly responsible for meeting the wasteload reductions required in this TMDL project.

10. **Responsible Parties Identification:** Responsible parties include the following: Phase I Municipal Separate Storm Sewer Systems (MS4s) copermittees (the County of San Diego, City of San Diego, City of Del Mar, and City of Poway), Phase II MS4 permittees, Caltrans, general construction storm water National Permit Discharge Elimination System (NPDES) permittees, and general industrial storm water NPDES permittees.

11. **Linkage Analysis:** Reducing watershed sediment loads from the year 2000 levels to historic levels is a necessary component for restoring and providing long-term protection of the Lagoon's beneficial uses. Deposition of watershed sediment contributes to elevation increases within the Lagoon, leading to an increase in height relative to mean sea level. Elevation is a critical variable that determines the productivity and stability of saltmarshes. The long-term existence of the saltmarsh depends on the success of the dominant plants, such as *Sarcoconia pacifica* (also referred to as *Salicornia virginica*) and *Frankenia salina*, and their close relationship to sediment supply, sea level change, and tidal range.

    Reduced sediment loading consistent with the watershed numeric target will encourage the establishment of native vegetation in degraded areas. To represent the linkage between source contributions and receiving water response, models were developed to simulate source loadings and transport of sediment into the Lagoon. The models provide an important tool to evaluate year 2000 conditions, to evaluate historic conditions, and to calculate TMDL load reductions.

    The Lagoon was capable of assimilating these historic sediment loads under historic Lagoon conditions. Because the Lagoon has evolved through time and accumulated

over 40 years of watershed sediment loads, it cannot be assumed that the Lagoon, in the year 2010 conditions, can assimilate the same historic sediment loads. Evaluation of the extent of vegetation types in the Lagoon provides the necessary tool to assess how the Lagoon responds to watershed sediment load reductions and to establish a target Lagoon condition under which the Lagoon can again assimilate the historic sediment loads.

12. TMDL Allocations and Reductions:

Wasteload Allocations to Watershed = 2,580 tons/year

As the primary point source to the Lagoon, a wasteload allocation (WLA) of 2,580 tons/year was assigned to the responsible parties. A 67 percent sediment load reduction from the Year 2000 load to the historical (mid-1970s) load is required of the responsible parties.

Load Allocations to Ocean = 9,780 tons/year

The ocean is a nonpoint source of sediment to the Lagoon and was assigned a load allocation (LA) of 9,780 tons/year. Because the ocean is a natural background source, load reductions are not required of the ocean.

Margin of Safety = Implicit

Conservative assumptions were used in selecting the TMDL numeric targets to provide an implicit margin of safety,

13. TMDL Implementation, Monitoring, and Compliance: The Responsible Parties must develop a Load Reduction Plan that will establish a watershed-wide, programmatic, adaptive management approach for implementation. The plan will include a detailed description of implementation actions, as identified and planned by the responsible parties, to meet the requirements of this TMDL. All responsible parties are responsible for reducing their sediment loads to the receiving waterbody or demonstrating that their discharges are not causing exceedances of the wasteload allocation.

Monitoring is required to assess progress towards achieving the wasteload and load allocations and numeric targets. Furthermore, the monitoring program must be capable of monitoring the effectiveness of implementation actions to improve water quality and saltmarsh habitat and remediation actions to remove sediment from the Lagoon.

Full implementation of the TMDL for sediment must be completed within 20 years from the effective date of the Basin Plan amendment. This timeline takes into consideration the planning needs of the responsible parties and other stakeholders to establish a Load Reduction Plan, time needed to address multiple impairments, and provides adequate time to measure temporal disparities between reductions in upland loading and the corresponding Lagoon water quality response.

14. **Scientific Peer Review:** The scientific basis for this TMDL has undergone external peer review pursuant to Health and Safety Code section 57004. The San Diego Water Board has considered and responded to all comments submitted by the peer review panel and has enhanced the Staff Report appropriately. As a result of the peer review process, changes were made to the TMDL including inclusion of the Lagoon numeric target and revision of the adaptive management approach.

15. **California Environmental Quality Act Requirements:** Pursuant to Public Resources Code section 21080.5, the Resources Agency has approved the San Diego Water Board's basin planning process as a "certified regulatory program" that adequately satisfies the California Environmental Quality Act (CEQA) (Public Resources Code, section 21000 et seq.) requirements for preparing environmental documents [14 CCR 15251(g); 23 CCR 3782]. As such, the "substitute environmental documents" that support the San Diego Water Board's proposed basin planning action contain the required environmental documentation under CEQA [23 CCR 3777]. The substitute environmental documents include the environmental checklist, the detailed Staff Report, peer review and public comments and responses to comments, this resolution, and the Basin Plan Amendment. For CEQA purposes, the "project" is the adoption of a Basin Plan amendment establishing a TMDL for sediment in the Lagoon. The CEQA checklist and other portions of the substitute environmental documents contain significant analysis and numerous findings related to impacts.

16. **Program and Project-Level CEQA Analysis:** In preparing the substitute environmental documents, the San Diego Water Board has considered the requirements of Public Resources Code section 21159 and California Code of Regulations, Title 14, section 15187, and intends those documents to serve as a tier 1 environmental review. This analysis is not intended to be an exhaustive analysis of every conceivable impact, but an analysis of the reasonably foreseeable consequences of the adoption of this regulation, from a programmatic perspective. The "Lead" agencies for tier 2 projects will assure compliance with project-level CEQA analysis of this programmatic project. Project level impacts will need to be considered in any subsequent environmental analysis performed by other public agencies, pursuant to Public Resources Code section 21159.2.

17. **CEQA Findings:** The proposed Basin Plan amendment could have a potentially significant adverse effect on historical, archaeological, and paleontological resources. There are feasible mitigation measures that if employed, would substantially lessen the potentially-significant adverse impacts identified in the substitute environmental documents; however such mitigation measures are within the responsibility and jurisdiction of other public agencies, not the San Diego Water Board. When the parties responsible for implementing this TMDL determine how they will proceed, the parties responsible for those parts of the project can and should incorporate such mitigation into any subsequent projects or project approvals as part of the environmental review process. These mitigation measures are described in more detail in the substitute environmental documents included as

Attachment 3 of the Staff Report and incorporated herein to this Resolution (14 CCR 15091(a)(2)). Where any subsequent project requires approval by the San Diego Water Board, the San Diego Water Board will include sufficient mitigation measures to substantially lessen the potentially significant adverse impacts.

18. **Statement of Overriding Consideration:** To the extent significant adverse environmental effects could occur, the San Diego Water Board has balanced the economic, legal, social, technological, and other benefits of the TMDL against the unavoidable environmental risks and finds that specific economic, legal, social, technological, and other benefits of the TMDL outweigh the unavoidable adverse environmental effects, such that those effects are considered acceptable. The basis for this finding is more fully set forth in the substitute environmental documents, included as Attachment 3 of the Staff Report and incorporated herein to this Resolution (14 CCR section 15093).

19. **Economic Analysis:** The San Diego Water Board has considered the costs of the reasonably foreseeable methods of compliance with the load and wasteload allocations specified in this TMDL. The most reasonably foreseeable methods of compliance involve implementation of structural and non-structural controls. Surface water monitoring will be necessary to evaluate the effectiveness of these controls.

20. **Necessity Standard [Government Code section 11353(b)]:** Amendment of the Basin Plan to establish and implement the sediment TMDL for the Lagoon is necessary because the existing water quality in the Lagoon does not meet applicable water quality objectives for sediment. Clean Water Act section 303(d) requires the establishment and implementation of a TMDL under the water quality conditions that exist at the Lagoon. The TMDL for sedimentation is necessary to promote attainment of applicable water quality objectives and restoration of water quality needed to support the beneficial uses designated for the Lagoon.

21. **Stakeholder & Public Participation:** Interested persons and the public have had reasonable opportunity to participate in review of the proposed TMDL. Efforts to solicit public review and comment included a public workshop and CEQA scoping meeting on February 15, 2011, multiple meetings with the Stakeholder Advisory Group, a public review and comment period consisting of 46 days, and a public hearing on June 13, 2012. Notices for all meetings were sent to interested parties including cities and counties with jurisdiction in the Los Peñasquitos watershed. All of the written comments submitted to the San Diego Water Board during the review and comment periods have been considered.

22. **Public Notice:** The San Diego Water Board has notified all known interested parties and the public of its intent to consider adoption of this Basin Plan amendment in accordance with Water Code section 13244.

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NOW, THEREFORE, BE IT RESOLVED THAT

1. **Environmental Documents Certification:** The substitute environmental documents prepared pursuant to Public Resources Code section 21080.5 are hereby certified, and the Executive Officer is directed to file a Notice of Decision with the Resources Agency after State Water Resources Control Board (State Water Board), and Office of Administrative Law (OAL) approval of the Basin Plan amendment, in accordance with section 21080.5(d)(2)(E) of the Public Resources Code and the California Code of Regulations, Title 23, section 3781.

2. **Amendment Adoption:** The San Diego Water Board hereby adopts the attached Basin Plan amendment as set forth in Attachment A hereto to establish a sediment TMDL for the Lagoon.

3. **Agency Approvals:** The Executive Officer is directed to submit this Basin Plan amendment to the State Water Board in accordance with Water Code section 13245.

4. **Non-Substantive Corrections:** If, during the approval process for this amendment, the San Diego Water Board, the State Water Board, or the OAL determines that minor, non-substantive corrections to the language of the amendment are needed for clarity or consistency, the Executive Officer may make such changes, and shall inform the San Diego Water Board of any such changes.

I, David W. Gibson, Executive Officer, do hereby certify the foregoing is a full, true and correct copy of a Resolution adopted by the California Regional Water Quality Control Board, San Diego Region, on June 13, 2012.

David W. Gibson
Executive Officer

ATTACHMENT A
TO RESOLUTION NO. R9-2012-0033

AMENDMENT TO THE *WATER QUALITY CONTROL PLAN FOR THE SAN DIEGO BASIN (9)* TO INCORPORATE THE SEDIMENT TOTAL MAXIMUM DAILY LOAD (TMDL) FOR LOS PEÑASQUITOS LAGOON

This Basin Plan amendment establishes a sediment Total Maximum Daily Load (TMDL) and associated load and wasteload allocations for Los Peñasqutios Lagoon (Lagoon). This amendment includes a program to implement the TMDL and monitor its effectiveness. Chapters 2, 3, and 7 of the Basin Plan are amended as follows:

Chapter 2, *Beneficial Uses*

Table 2-3. *Beneficial Uses of Coastal Waters*
Consecutively number and add the following footnote to Los Peñasqutios Lagoon in Table 2-3:

> Los Peñasquitos Lagoon is designated as a water quality limited segment for sediment pursuant to Clean Water Act section 303(d). A Total Maximum Daily Load has been adopted to address this impairment. See Chapter 3, *Water Quality Objectives*, section entitled "Water Quality Objectives for Sediment." See also Chapter 7, *Total Maximum Daily Loads, section entitled* "Sediment Total Maximum Daily Load for Los Peñasqutios Lagoon."

Renumber any footnotes in Table 2-3 displaced by this new footnote.

Chapter 3, Water Quality Objectives

Water Quality Objectives for Sediment:
Add a second paragraph as follows:

> Los Peñasquitos Lagoon is designated as an impaired water body for sediment pursuant to Clean Water Act section 303(d). A Total Maximum Daily Load has been adopted to address this impairment. See Chapter 2, Beneficial Uses Table 2-3. Beneficial Uses of Coastal Waters, Los Peñasqutios Lagoon, Hydrologic Unit Basin Number 6.10. See also Chapter 7, *Total Maximum Daily Loads, section entitled "Sediment Total Maximum Daily Load for Los Peñasqutios Lagoon."*

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Chapter 7, *Total Maximum Daily Loads*

On June 13, 2012, the San Diego Water Board adopted ***Resolution No. R9-2012-0033, A Resolution Amending the Water Quality Control Plan For The San Diego Basin (9) to Incorporate the Sediment Total Maximum Daily Load for Los Peñasquitos Lagoon.*** The TMDL Basin Plan Amendment was subsequently approved by the State Water Resources Control Board (State Board) on [Insert date], the Office of Administrative Law (OAL) on [Insert date], and the USEPA on [Insert date]. For purposes of state law, Resolution No. R9-2012-0033 became effective following OAL approval on [Insert date],

Technical TMDL Analysis

Component	Key Findings and Regulatory Provisions
Problem Statement	Under section 303(d) of the Clean Water Act (CWA), states are required to identify waters whose beneficial uses have been impaired due to specific constituents. Los Peñasquitos Lagoon was placed on the Section 303(d) list of Water Quality Limited Segments in 1996 for sedimentation and siltation with an estimated 469 acres affected. The Lagoon is subject to the development of a total maximum daily load (TMDL) (US EPA, 2009). The Lagoon is an estuarine system that is part of the Torrey Pines State Natural Reserve. In addition to its marine influence, the Lagoon receives freshwater inputs from an approximately 60,000-acre watershed comprised of three major canyons (Carroll Canyon, Los Peñasquitos Canyon, and Carmel Canyon). Given the status of "Natural Preserve" by the California State Parks, the Lagoon is one of the few remaining native saltmarsh lagoons in southern California, providing a home to several endangered species (California State Parks, 2009). The Lagoon is ecologically diverse, supporting a variety of plant species, and provides nursery grounds and habitat for numerous bird, fish, and small mammal populations. The Lagoon also serves as a stopover for the Pacific Flyway, offering migratory birds a safe place to rest and feed, as well as providing refuge for coastal marine species that use the Lagoon to feed and hide from predators. The San Diego Basin Plan states, "The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses." Beneficial uses listed in the Basin Plan for the Lagoon include contact water recreation; non-contact water recreation (although access is not permitted in

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	some areas per California State Parks); preservation of biological habitats of special significance; estuarine habitat; wildlife habitat; rare, threatened or endangered species; marine habitat; migration of aquatic organisms; spawning, reproduction and/or early development; and shellfish harvesting. The beneficial uses that are most sensitive to increased sedimentation are estuarine habitat (EST) and preservation of biological habitats of special significance (BIOL). Estuarine uses may include preservation or enhancement of estuarine habitats, vegetation, fish, shellfish, or wildlife (such as marine mammals or shorebirds). Impacts associated with increased and rapid sedimentation include: reduced tidal mixing within Lagoon channels, degraded and (in some cases) net loss of saltmarsh vegetation, increased vulnerability to flooding for surrounding urban and industrial developments, increased turbidity associated with siltation in Lagoon channels, and constricted wildlife corridors. The Los Peñasquitos Lagoon Enhancement Plan and Program (1985), San Diego Basin Plan, and Clean Water Act section 303(d) highlight sedimentation as a significant impact associated with urban development and a leading cause in the rapid loss of saltmarsh habitat in the Lagoon. Sediment reduction is a management priority. The Lagoon's 565 acres include 262 acres of tidal saltmarsh (including salt panne, tidal channels, and mudflats) and non-tidal saltmarsh and 132 acres of freshwater marsh, herbaceous wetland, and woody riparian (for example southern willow scrub and mulefat scrub) habitats. The remaining 171 acres of saltmarsh and brackish marsh vegetation are impaired by excessive sedimentation, which converted the coastal saltmarsh to *Lolium perenne* infested non-tidal saltmarsh, freshwater marsh, and woody riparian habitats. (California State Parks, 2011) The environmental processes that support wetland habitats in the Lagoon have been altered by urban development in three ways: 1) Increase in the volume and frequency of freshwater input, 2) Increase in sediment deposition, and 3) Decrease in the tidal prism. These factors have led to decreases in tidal and non-tidal saltmarsh habitats and increases in freshwater habitats and the abundance of non-native species.

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Component	Key Findings and Regulatory Provisions
Numeric Target	**Numeric Target** The sediment water quality standard applies to sediment loading to the Lagoon and the accumulation of sediment in the Lagoon. The minimum protective target would be to reduce watershed sediment loads to non-anthropogenic levels and return the Lagoon to non-anthropogenic conditions with consideration given to background loading and other factors that also lend to impairment of beneficial uses. The numeric targets are calculated upon the historic condition (mid-1970s) when the sediment water quality standard was once met. A historic coverage for the Los Peñasquitos watershed was developed for this period using US Geological Survey topographic maps from the 1970s. This land-use distribution was used to calculate the watershed numeric target using the LSPC watershed model. This historic (mid-1970s) sediment load of 12,360 tons per critical wet period (211 days), or 58.6 tons per day, represents the sediment TMDL watershed numeric target. An analysis of the vegetation types present in the Lagoon was developed for the mid-1970s using historic aerial photographs from which the Lagoon numeric target was calculated. The Lagoon numeric target is expressed as an increasing trend in the total area of tidal and non-tidal saltmarsh toward 346 acres. This target acreage represents 80 percent of the total acreage of tidal and non-tidal saltmarsh present in 1973.
Sources and Responsible Parties	**Watershed Point and Non-point Sediment Sources** Sources of sediment include erosion of canyon banks, exposed soils, bluffs, scouring stream banks, and tidal influx. Some of these processes are exacerbated by anthropogenic disturbances, such as land development within the watershed. Land development transforms the natural landscape by exposing sediment and converting pervious surfaces to impervious surfaces, which increases the volume and velocity of runoff resulting in scouring of sediment, primarily below storm water outfalls that discharge into canyon areas. Sediment loads are transported downstream to the Lagoon during storm events causing deposits on the salt flats and in Lagoon channels. These sediment deposits have gradually built-up over time due to increased sediment loading and inadequate flushing, which directly and indirectly affects Lagoon functions and salt marsh characteristics.

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	There are two broad categories of sediment sources to the Lagoon: 1) watershed sources, and 2) the Pacific Ocean. The watershed sources consist of all of point and non-point sources of sediment in the watershed area draining to Los Peñasquitos Lagoon. The total sediment contribution from all watershed sources, currently, is presented as the total wasteload allocation (WLA). The watershed sources of sediment due to past historical activities that have resulted in accumulated sediment in the Lagoon over time are presented as the Watershed Load Allocation (LA). This source also includes, but is not limited to, in-Lagoon erosion and scouring. Since this loading could not be estimated given the limited data, the Lagoon numeric target is set as the compliance point for meeting this Watershed Load Allocation. The sediment contributions from the Pacific Ocean are considered a background source and are presented as the Load Allocation from the Ocean (LA). Hence, the responsible parties were assigned the total WLA and are jointly responsible for meeting the wasteload reductions required in this TMDL project. **Responsible Parties** Responsible parties include the following: Phase I Municipal Separate Storm Sewer Systems (MS4s) copermittees (the County of San Diego, City of San Diego, City of Del Mar, and City of Poway), Phase II MS4 permittees, Caltrans, general construction storm water NPDES permittees, and general industrial storm water NPDES permittees.
Linkage Analysis	**Linkage Analysis** Reducing watershed sediment loads from the year 2000 levels to historic levels is a necessary component for restoring and providing long-term protection of the Lagoon's beneficial uses. Deposition of watershed sediment contributes to elevation increases within the Lagoon, leading to an increase in height relative to mean sea level. Elevation is a critical variable that determines the productivity, diversity, and stability of saltmarshes. The long-term existence of the saltmarsh depends on the success of the dominant plants, such as *Sarcoconia pacifica* (also referred to as *Salicornia virginica*) and *Frankenia salina*, and their close relationship to sediment supply, soil salinity, sea level change, and tidal range. Reduced sediment loading consistent with the watershed numeric target will encourage the establishment of native vegetation in degraded areas. To represent the linkage between source

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Component	Key Findings and Regulatory Provisions
	contributions and receiving water response, models were developed to simulate source loadings and transport of sediment into the Lagoon. The models provide an important tool to evaluate year 2000 conditions, to evaluate historic conditions, and to calculate TMDL load reductions. The Lagoon was capable of assimilating these historic sediment loads under historic Lagoon conditions. Because the Lagoon has evolved through time and accumulated over 40 years of watershed sediment loads, it cannot be assumed that the Lagoon, in the year 2010 conditions, can assimilate the same historic sediment loads. Evaluation of the extent of vegetation types in the Lagoon provides the necessary tool to assess how the Lagoon responds to watershed sediment load reductions and to establish a target Lagoon condition under which the Lagoon can again assimilate the historic sediment loads.
TMDL, Allocations, and Load Reductions	**TMDL = 12,360 tons of sediment per year** The maximum load of sediment that Los Peñasquitos Lagoon can receive from all sources and still meet the sediment water quality objective is 12,360 tons per year. **Wasteload Allocations to Watershed = 2,580 tons/year** As the primary point source to the Lagoon, a wasteload allocation (WLA) of 2,580 tons/year was assigned to the responsible parties. A 67 percent sediment load reduction from the Year 2000 load to the historical (mid-1970s) load is required of the responsible parties. **Load Allocations to Ocean = 9,780 tons/year** The ocean is a nonpoint source of sediment to the Lagoon and was assigned a load allocation (LA) of 9,780 tons/year. Because the ocean is a natural background source, load reductions are not required of the ocean. **Watershed Load Allocations to Lagoon** Past historical watershed loading has led to accumulated sediment, erosion, and scouring in the Lagoon causing impairment to the Lagoon habitats. The Lagoon numeric target is set as the compliance for this LA: maintain at least 346 acres of tidal and non-tidal saltmarsh, represents 80 percent of the total acreage of tidal and non-tidal saltmarsh present in 1973.

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Component	Key Findings and Regulatory Provisions
	Margin of Safety = Implicit Conservative assumptions were used in selecting the TMDL numeric targets to provide an implicit margin of safety.
Critical Conditions	**Critical Location** Due to the variability and dynamic nature of conditions within the Lagoon (e.g., mouth closures, tidal fluctuations, sediment fate and transport, etc.), the entire modeled Lagoon area was assessed as the critical location. Load reductions for sediment were based on achieving the numeric TMDL target across the Lagoon. **Critical Condition** The wet season that includes the 1993 El Nino storm events (October 1, 1992-April 10, 1993) was selected as the critical condition time period for TMDL development. This is one of the wettest periods on record over the past several decades. Because of the large amount of rainfall, sediment loads were significantly higher during this period than in other years with less rainfall.
Seasonal Considerations	**Seasonal Considerations** Sources of sediment are similar for both dry and wet weather seasons (the two general seasons in the San Diego region). Despite the similarity of wet/dry sources, transport mechanisms can vary between the two seasons. Throughout the TMDL monitoring period, the greatest transport of sediment occurred during rainfall events. It is recognized that dry weather will contribute a de minimis discharge of sediment; however, model calibration and TMDL development focused on wet weather conditions as sediment transport is dramatically higher during wet weather.
Margin of Safety	**Margin of Safety (MOS)** An implicit MOS was incorporated through application of conservative assumptions.

Implementation Plan

Component	Key Findings and Regulatory Provisions
Implementation Actions	**Actions San Diego Water Board May Take** The San Diego Water Board may exercise any of its authorities under the Water Code to compel responsible parties to comply with this TMDL.

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Component	Key Findings and Regulatory Provisions
	Responsible Parties Identification Under this TMDL, the responsible parties are collectively assigned a single WLA, which they are responsible for meeting. An aggregate WLA allows for flexibility in achieving the load reduction required to meet the TMDL and improve Lagoon conditions. Responsible parties include: Phase I MS4 copermittees (the County of San Diego, City of San Diego, City of Del Mar, and the City of Poway), Phase II MS4 permittees, Caltrans, and the General Construction and General Industrial Storm Water NPDES permittees. The San Diego Water Board encourages cooperation among all the responsible parties. All the responsible parties in the Los Peñasquitos watershed must reduce their collective sediment load. Responsible parties include, but are not limited to, specific identification of General construction and industrial stormwater permittees, such as sand and gravel operation facilities in the watershed *that have capacity for long-term potential loadings into the watershed.* The San Diego Water Board recommends all parties enter into a Memorandum of Understanding (MOU), or a similar formal joint effort, to collaboratively and more successfully implement the adaptive management framework. All responsible entities identified must submit a Comprehensive Load Reduction Plan (CLRP) or SWPPP as appropriate and are strongly encouraged to jointly submit a CLRP to the San Diego Water Board within 18 months of the effective date of the TMDL. The San Diego Water Board expects responsible parties to cooperate in TMDL implementation (e.g., load reduction, lagoon monitoring, lagoon restoration) as necessary to achieve compliance with this TMDL. Responsible Parties that have or are likely to cause or contribute to the CWA Section 303(d) listed impairment for sediment, and are not participating in TMDL implementation, shall be compelled to meet their compliance obligations through other regulatory authorities of the San Diego Water Board. Any Responsible Party identified is required to develop pollutant reduction plan that includes description and schedule for implementing BMPs to reduce sediments from being discharged from their facility, property, etc. The plan must describe how the

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	facility plans to meet the water quality objectives and pollutant reductions set forth in the TMDL. Any Responsible Party as identified for this TMDL shall contribute information regarding the amount of sediments/sedimentation from their facility/entity. This may be produced from existing monitoring plans or by developing a monitoring plan for those entities that currently do not have any discharge monitoring on site. The TMDL has identified a "collective" wasteload allocation that includes several sources of sediments into the watershed. By developing individual site/permitee monitoring plans for flow and TSS discharges, it will be feasible to estimate individual site contributions in the future. Monitoring should address, at minimum, representative values of flow rates and TSS concentrations from the individual permittee's site(s) whenever long-term discharges occur. Individual industrial facilities and construction sites are subject to regulation on two levels: (1) The San Diego Water Board is responsible for ensuring MS4 copermittees comply with the MS4 requirements in the MS4 storm water permit; and (2) each local municipality is responsible, under the MS4 storm water permit, for enforcing its own ordinances and permits (for violations of its ordinances/permits by an individual industrial facility or construction site within its jurisdiction). The San Diego Water Board is also responsible for enforcing the statewide General Industrial and Construction Storm Water NPDES Permits within its jurisdiction. The San Diego Water Board relies upon the municipality to enforce its ordinances/permits and then work with the municipality to coordinate information and actions to compel compliance. **<u>Phased Implementation via the Adaptive Management Approach</u>** A common problem in natural resource management involves a temporal sequence of decisions (or implementation actions), in which the best action at each decision point depends on the state of the managed system. Adaptive management is a structured iterative implementation process that offers flexibility for responsible parties to monitor implementation actions, determine the success of such actions and ultimately, base future management decisions upon the measured results of completed implementation actions and the current state of the system. This process enhances the understanding and estimation of predicted

Component	Key Findings and Regulatory Provisions
	outcomes and ensures refinement of necessary activities to better guarantee desirable results. In this way, understanding of the resource can be enhanced over time, and management can be improved. Adaptive management entails applying the scientific method to the TMDL. A National Research Council review of US EPA's TMDL program strongly suggests that the key to improving the application of science in the TMDL program is to apply the scientific method to TMDL implementation (NRC 2001). For a TMDL, applying the scientific method involves 1) taking immediate actions commensurate with available information, 2) defining and implementing a program for refining the information on which the immediate actions are based, and 3) modifying actions as necessary based on new information. This approach allows the Lagoon to make progress toward attaining water quality standards while regulators and stakeholders improve the understanding of the system through research and observation of how it responds to the immediate actions. Implementation actions to achieve the required WLA and improve the specified numeric targets will be implemented via an iterative process, whereby the information collected at each step will be used to inform the implementation of the next phase. The project will be adjusted, as necessary, based on the latest information collected to optimize the efficiency of implementation efforts. Ultimately, the path moving forward is to create the physical conditions related to remediating sediment impacts associated with this TMDL. The implementation effort can be divided into three primary phases for this TMDL, as described below: • Phase I Implementation includes elements to reduce the amount of sediment that is transported from the watershed to the Lagoon. An important component of Phase I will be to secure the relationships and agreements between cooperating parties and to develop a detailed scope of work with priorities. Phase I includes the following elements: o Incorporate interim limits into WDRs and NPDES permits; o Implement structural and nonstructural BMPs throughout the watershed; and o Develop and initiate a comprehensive monitoring program, which includes compliance monitoring and targeted special studies.

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	If appropriate, the TMDL will be reconsidered by the San Diego Water Board at the end of Phase I to consider completed special studies or policy. • Phase II includes the implementation of additional watershed actions that are targeted to reducing sediment loads from high priority areas, as well as lagoon-specific actions that may be needed to facilitate recovery of beneficial uses that have been affected by various complex processes, including sedimentation, nuisance flows, reduced tidal circulation, and other factors. These actions may include Lagoon sediment remediation efforts, re-connecting the Lagoon's historic tidal channels, and maintenance of the Lagoon inlet in collaboration with State Parks, the San Diego Water Board, the Los Angeles-San Diego-San Luis Obispo (LOSSAN) Rail Corridor Agency, US EPA, and the watershed responsible parties. Phase II may also include additional upstream protections and BMP implementation to further reduce watershed sediment contributions. Responsible parties will develop, prioritize, and implement Phase II elements based on data from compliance monitoring and special studies. • Phase III includes implementation of secondary and additional remediation actions, as necessary, to be in compliance with the required WLA allocation by the end of the compliance schedule. **Develop and Submit a Load Reduction Plan** Responsible parties are required to prepare and submit for San Diego Water Board review, comment, and revision, a Load Reduction Plan that demonstrates how they will comply with this TMDL. The San Diego Water Board expects that Load Reduction Plans will be developed collaboratively by the responsible parties within the watershed. The Load Reduction Plan shall be submitted to the San Diego Water Board within 18 months of the TMDL effective date, and reviewed by the San Diego Water Board Executive Officer within six months of submittal (this period will likely include a round of revisions by the responsible parties based on San Diego Water Board staff comments). The Load Reduction Plan shall establish a watershed-wide, programmatic, adaptive management approach for implementation and include a detailed description of

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	implementation actions, identified and planned by the responsible parties, to meet the requirements of this TMDL. Implementation actions identified by the Load Reduction Plan may include source control techniques, structural and/or non-structural storm water BMPs, and/or special studies that refine the understanding of sediment and pollutant sources within the watershed. The Load Reduction Plan shall include a description and objective of each implementation action, potential BMP locations, a timeline for project or BMP completion, and a monitoring plan to measure the effectiveness of implementation actions. Storm Water Pollution Prevention Plans (SWPPPs) prepared by Phase II MS4s, Industrial Permittees, and Construction Permittees pursuant to their respective statewide general NPDES permits fulfill these entities responsibility to prepare a Load Reduction Plan. Permittees within the Los Peñasquitos watershed shall update their SWPPPs within 12 months of the TMDL effective date with any additional BMPs, monitoring, etc. to account for their site's potential to impact the receiving waterbody with respect to sediment. Sites identified through monitoring data or site inspections as posing an increased risk to the receiving water body may be directed to perform additional monitoring by the San Diego Water Board Executive Officer to quantify sediment load contributions to the receiving waterbody. **Comprehensive Approach** The comprehensive approach to the Load Reduction Plan requires that implementation efforts address all current TMDLs, current 303(d) listed waterbody/pollutant combinations, and other targeted impairments within the Los Peñasquitos watershed. A comprehensive approach to the Load Reduction Plan is consistent with implementation planning currently underway to address all of the impaired segments that were included in the approved bacteria TMDLs for San Diego Region Beaches and Creeks (San Diego Water Board, 2010). The comprehensive approach to the Load Reduction Plan allows the responsible parties to proactively address other listed impairments within the watershed, which requires special studies to investigate sources and the water quality improvements needed to address these pollutants. Such special studies may significantly alter current understanding and refine the TMDL loading and/or allocations. This can impact the selection of subsequent implementation actions and how they are prioritized

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	by responsible parties. A comprehensive approach to development of the Load Reduction Plan will provide a more cost effective and efficient approach for TMDL implementation and will have fewer potential environmental impacts associated with construction of structural BMPs (San Diego Water Board, 2010). **Load Reduction Plan Framework** With increased land development and inadequate management of runoff from impervious areas, increasing amounts of sediment are deposited into the Lagoon annually. To minimize the effects of runoff, proper sediment control can be achieved through the execution of implementation actions such as BMPs. Sediment implementation actions can be grouped into the four categories as summarized below. 1) *Preservation and Restoration:* Significant areas of land have been set aside for open space. Such land acquisition and preservation prevents natural areas from being developed and disturbed. Additionally, the restoration of riparian buffers and wetlands can include the stabilization of steep slopes with native riparian vegetation. This not only helps restore the habitat but also the natural function of the stream. 2) *Education & Outreach:* As a source control technique, education and outreach can function as pollution prevention to reduce or eliminate the amount of sediment generated at its source. Education and outreach can be targeted at specific land user groups and/or staff involved with site maintenance. As an example, implementation actions such as municipal incentives can be used to encourage proper irrigation and landscaping and can significantly reduce volumes of runoff. 3) *Retrofitting, New Development, & Site Management:* Land development (MS4 contribution) is the primary source of anthropogenic sediment contribution above historical conditions. Development can expose sediment and contribute excessive amounts of sediment to the Lagoon. Additionally, increased imperviousness associated with development can lead to increased storm water runoff and soil erosion or gullying within the MS4 and receiving waters. Appropriate site management can partially or fully mitigate the effects of development. The Load Reduction Plan must identify and prioritize BMPs based on an analysis of opportunities and cost/benefit considerations. Furthermore, the Load Reduction Plan must detail BMP

Component	Key Findings and Regulatory Provisions
	projects and locations. Storm water BMPs can be implemented to reduce the effects of pollutant loading and increased storm water flows from development. Structural BMPs include incorporation of low impact development (LID) and storm flow hydrograph matching into new projects. The same structural BMPs can be utilized to retrofit existing sites or be applied as regional MS4 BMPs to treat pollutants and/or flows prior to discharge into receiving waters. 4) *Monitoring:* A coordinated monitoring plan is needed to establish existing watershed conditions (baseline conditions) from which future changes and anticipated improvement in water quality can be measured. Additional monitoring could focus on sensitive species, areas of saltmarsh coverage, extent of invasive plant species, BMP effectiveness, and/or reduction in impervious coverage. Additionally, monitoring is crucial in the assessment of implementation actions to gain an understanding of performance for future adaptive management actions. **<u>Load Reduction Plan Implementation</u>** The Load Reduction Plan must be implemented within 90 days upon receipt of San Diego Water Board comments and recommendation, but in any event, no later than 6 months after submittal. **<u>Monitoring</u>** Monitoring is required to measure the progress of pollutant load reductions and improvements in water and saltmarsh habitat acreage. The information presented below is intended to be a brief overview of the goals of the monitoring. Special studies may be planned to improve understanding of key aspects related to achievement of WLAs and LAs, restore the beneficial uses, and to assist in the modification of structural and non-structural BMPs if necessary. The goals of monitoring include: 1) To determine compliance with the assigned wasteload and load allocations. 2) To monitor the effect of implementation actions proposed by responsible parties to improve water and saltmarsh habitat quality including proposed structural and non-structural BMPs to reduce storm water run-off and sediment loading, and remediation actions to remove sediment from the Lagoon.

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	3) To monitor the extent of vegetation habitat acreages in the Lagoon and determine if additional implementation action should be required. 4) To implement the monitoring in a manner consistent with other TMDL implementation plans and regulatory actions within the Los Peñasquitos watershed. The proposed monitoring program shall be included in the Load Reduction Plan submitted to the San Diego Water Board Executive Officer for review. *Watershed Monitoring* Responsible parties must conduct suspended sediment, bedload, and flow monitoring to calculate total sediment loading to the Lagoon for each wet period (October 1 thru April 30) throughout the 20-year compliance period. The responsible parties must monitor enough storm events throughout to quantify sediment loading over each wet period. The compliance point for the WLA shall be the Lagoon as measured through the cumulative sediment loading from Los Peñasquitos, Carroll Canyon, and Carmel Creeks prior to entering the Lagoon. The responsible parties must monitor as many stations as necessary to quantify sediment loading to the Lagoon. Because of the natural variability in sediment delivery rates, sediment loading shall be evaluated using a 3-year, weighted rolling average. The first average must be calculated following the third critical wet period after the TMDL effective date. Responsible parties are encouraged to collaborate or coordinate their efforts with other regional and local monitoring programs to avoid duplication and reduce associated costs. *Lagoon Monitoring* The responsible parties shall monitor the Lagoon annually in the Fall for changes in extent of the vegetation types. Aerial photos of the Lagoon must be acquired, digitized onscreen (at an approximate 1:2,500 scale), interpreted, and mapped into generalized classifications. Vegetation types must be classified as saltmarsh, non-tidal saltmarsh, freshwater marsh, non-tidal saltmarsh – *Lolium perrene* infested, freshwater marsh, southern willow scrub/mulefat scrub, herbaceous wetland, or upland land cover (urban, beach, dune, upland vegetation, etc.). Vegetation

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	type classifications are described in the *Sediment TMDL for Los Peñasquitos Lagoon Staff Report*. Ground truthing may be performed after aerial photo interpretation to distinguish between vegetation types. **Compliance Schedule** The implementation schedule for this TMDL follows the form of an adaptive management strategy, tracks implementation progress with established milestones or interim goals, and sets forth a final compliance date. It is impractical for land managers to actually measure sediment loading on a daily basis; thus, compliance with the TMDL is most appropriately expressed as an average annual load and should be evaluated as a long-term running average to account for natural fluctuations and inaccuracies in estimating sediment loads. Pursuant to State Board Resolution No. 2000-015 and 2000-030 a TMDL compliance schedule must be as short as practicable, but in no case shall it exceed 20 years from the effective date of the Basin Plan amendment. This timeline in Table {Insert Table number} takes into consideration the planning needs of the responsible parties and other stakeholders to establish a Load Reduction Plan, time needed to address multiple impairments, and provides adequate time to measure temporal disparities between reductions in upland loading and the corresponding Lagoon water quality response. Current studies and other implementation actions or projects are underway to reduce sediment loading to the Lagoon and to gain a better understanding of source contributions. A variety of such projects will continue throughout the development of the Load Reduction Plan, ensuring there are no gaps in implementation efforts throughout the process. At the end of the TMDL compliance schedule, as outlined in Table {insert table number}, waters must meet the Lagoon's sediment water quality standard and therefore, the Lagoon numeric target. The final lagoon numeric target requires the successful restoration of tidal and non-tidal salt marsh to achieve a lagoon total of 346 acres. This can either mean: 1. Successful restoration of 80 percent of the 1973 acreage of lagoon salt marsh habitat (346 acres); or 2. Demonstrate that implementation actions are active on and/or affecting 346 acres with continued monitoring to ensure 80 percent target achievement.

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	If at any point during the implementation plan, monitoring data or special studies indicate that WLAs or LAs will be attained but the Lagoon numeric target may not be achieved, the San Diego Water Board shall reconsider the TMDL to modify WLAs and LAs to ensure that the Lagoon numeric target is attained.

Table {Insert table number}. Los Peñasquitos Lagoon Sediment TMDL Implementation Compliance Schedule

Item	Implementation Action	Responsible Party	Date
1	Obtain approval by OAL of Los Peñasquitos Lagoon Sediment TMDL = Establishes effective date of TMDL	San Diego Water Board, San Diego County, City of San Diego, City of Poway, City of Del Mar, Caltrans, General Storm Industrial and Construction permittees	Estimated June 2013
2a	Issue, reissue, or revise general WDRs and NPDES requirements for Phase I MS4s, including Caltrans, to incorporate requirements for complying with TMDL and WLAs	San Diego Water Board and State Water Board	Completed during permit renewal - within 5 years of applicable permit date, and every 5 years thereafter.
2b	Issue, reissue, or revise general WDRs and NPDES requirements for Construction and Industrial NPDES to incorporate requirements for complying with TMDL and WLAs	San Diego Water Board and State Water Board	Completed during permit renewal - within 5 years of applicable permit date, and every 5 years thereafter.
2c	Issue, reissue, or revise general WDRs and NPDES requirements for Phase II NPDES permittees to incorporate requirements for complying with TMDL and WLAs	San Diego Water Board and State Water Board	Completed during permit renewal - within 5 years of applicable permit date, and every 5 years thereafter.
3a	Completion of Load Reduction Plans	Phase 1 MS4s and Caltrans	Within 18 months of OAL effective date

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				for sediment TMDL
	3b	Approval of Load Reduction Plan	San Diego Water Board Executive Officer	Within 6 months of submittal
	3c	Phased, adaptive implementation of Load Reduction Plan	Phase 1 MS4s and Caltrans	In accordance with Load Reduction Strategy – ongoing throughout the implementation
	3d	Revision of SWPPPs	Construction, industrial, and Phase II Permittees	Within 12 months of OAL effective date for sediment TMDL
	4a	Submit annual Progress Report to the San Diego Water Board due January 31 each year	Phase 1 MS4s	Annually after reissuance of NPDES WDR
	4b	Submit annual Progress Report to the San Diego Water Board due April 1 each year	Caltrans	Annually after reissuance of NPDES WDR
	5	Enforcement Actions	San Diego Water Board	As needed
	6	Refine Load Reduction Plan	Phase 1 MS4s and Caltrans	As warranted by completion of special studies, additional monitoring and data compilation.
	7	Reopen and reconsider TMDL	San Diego Water Board	As defensible through the collection of additional data and significant findings by the watershed stakeholders.
	8	Meet Interim Milestone #1: Attain 20 percent required reduction in sediment loading (equivalent to 6691 tons of sediment per year) and/or show progress in improving Lagoon	MS4s and NPDES permittees	Within 5 years of approved TMDL

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		conditions consistent with the specified targets		
	9	Meet Interim Milestone #2: Attain 40 percent required reduction in sediment loading (equivalent to 5663 tons of sediment per year) and/or show progress in improving Lagoon conditions consistent with the specified targets	MS4s and NPDES permittees	Within 9 years of approved TMDL
	10	Meet Interim Milestone #3: Attain 60 percent required reduction in sediment loading (equivalent to 4636 tons of sediment per year) and/or show progress in improving Lagoon conditions consistent with the specified targets	MS4s and NPDES permittees	Within 13 years of approved TMDL
	11	Meet Interim Milestone #4: Attain 80 percent required reduction in sediment loading (equivalent to 3608 tons of sediment per year) and/or show progress in improving Lagoon conditions consistent with the specified targets	MS4s and NPDES permittees	Within 15 years of approved TMDL
	12	Meet Final Milestone: Achieve Lagoon numeric target: the successful restoration of tidal and non-tidal salt marsh to achieve a lagoon total of 346 acres.[1]	All Phase I, Phase II MS4s, Caltrans, and general construction and industrial NPDES enrollees, and other WDR and NPDES	Within 20 years of approved TMDL

[1] This can either mean:
1. Successful restoration of 80 percent of the 1973 acreage of lagoon salt marsh habitat (346 acres); or
2. Demonstrate that implementation actions are active on and/or affecting 346 acres with continued monitoring to ensure 80 percent target achievement.

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	permittees in the watershed[2]
	Note: TMDL implementation schedule may be altered due to TMDL reconsideration; additionally, enforcement actions by the San Diego Water Board will be taken as necessary.

[2] For general construction and industrial permittees and other NPDES/WDR permittees, this applies to those facilities that have potential for long-term loadings into the watershed.

THE CITY OF SAN DIEGO

November 19, 2014

VIA EMAIL TO: Laurie.Walsh@waterboards.ca.gov

Laurie Walsh, Water Resource Control Engineer
San Diego Regional Water Quality Control Board
2375 Northside Drive, Suite 100
San Diego, CA 92108

Subject: Comment Letter –Tentative Order No. R9-2015-0001, Place ID:658018LWalsh

Dear Ms. Walsh:

The City of San Diego (City) appreciates the opportunity to provide comments on the Amendment to the Regional Municipal Separate Storm Sewer System (MS4) Permit for the San Diego Region (Tentative Order No. R9-2015-0001, herein referred to as the "Draft Amendments") to incorporate the County of Orange, several Incorporated Cities of South Orange County, and the Orange County Flood Control District as Copermittees. The City is committed to protecting and improving water quality in the San Diego Region. From this perspective, the City provides the following comments below. More detailed comments are included in Attachment 1.

- *The City supports the proposed changes to the Areas of Special Biological Significance and hydromodification management provisions.*
- *The Draft Amendments should include revisions to Provision A to establish a linkage between the implementation of Water Quality Improvement Plans (WQIPs) and compliance with the Receiving Water Limitations and Discharge Prohibitions.* The City is expending significant resources to develop and implement WQIPs that include timely implementation of strategies, control measures, and other actions to make progress towards attainment of water quality standards. Therefore, the City requests that the Draft Amendments include implementation of a WQIP as a valid mechanism for demonstrating

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compliance with Receiving Water Limitations and Discharge Prohibitions. The disconnect in the MS4 Permit between the WQIPs and compliance with Receiving Water Limitations raises several significant issues: (1) it undermines the stated intent of the Regional Board to encourage prioritization of pollutants; (2) it requires resource-intensive watershed planning efforts that have no benefit to the Copermittees' ability to comply with the Receiving Water Limitations and Discharge Prohibitions; and (3) it calls into question whether WQIPs are properly required under the MS4 Permit.

- *The Draft Amendments should include a definition of Prior Lawful Approval to clarify the Regional Board's intent in allowing some new development projects to comply with prior requirements.* The current language in the MS4 Permit is unclear. A definition of Prior Lawful Approval should: (1) Provide a clear, bright line; (2) Provide a backstop to ensure that projects with older approvals comply with new requirements unless those approvals confer vested rights; (3) Protect vested rights; and (4) preserve Copermittees' land use authority.
- *The Los Penasquitos Sediment TMDL requirements in the Draft Amendments should be modified to ensure consistency with the TMDL.* The City supported and led the third-party TMDL process, and the resulting TMDL was approved by the Regional Board with broad support from all stakeholders. The City is concerned, however, that the Draft Amendments are inconsistent with the TMDL and place a disproportionate burden on Phase I MS4 Copermittees. In the attached table, the City recommends revisions to reconcile incorrect incorporation of interim and final compliance targets, omission of several compliance pathways indentified in the TMDL, and the assignment of the entire compliance obligation to Phase I MS4 Copermittees without acknowledging the requirements of other Responsible Parties named in the TMDL.
- *MS4 Permit Attachment E should be modified to allow individual jurisdictional compliance with the TMDLs.* The City is committed to protecting and improving water quality and achieving compliance with TMDLs via the implementation of Water Quality Improvement Plans. However, language throughout Attachment E appears to preclude any Copermittee from using the WQIP compliance pathway unless all other Copermittees also are in compliance. The City has no authority to compel other Copermittees to comply and cannot be held liable for the actions or inactions of other agencies. Under federal Clean Water Act regulations that have been incorporated into the MS4 Permit, a Copermittee is responsible only for conditions relating to the discharges for which it is an operator.

Thank you for your time and consideration of these comments. If you have questions, please contact Ruth Kolb at (858) 541-4328 or at rkolb@sandiego.gov.

Sincerely,

Drew Kleis
Deputy Director

DK\rk

Attachments: 1. City of San Diego Comment Table Regarding September 18, 2014 Revisions to Order No. R9-2013-0001
2: Resolution No. R9-2012-0033 and Attachment A

cc: Tony Heinrichs, Deputy Chief Operating Officer
Kris McFadden, Transportation & Storm Water Department Director
Heather Stroud, Deputy City Attorney
Ruth Kolb, Program Manager, Transportation & Storm Water Department
Sumer Hasenin, Senior Engineer, Transportation & Storm Water Department
Mike Hansen, Director of Land Use and Environmental Policy, Office of the Mayor

ATTACHMENT A

ORANGE COUNTY DETAILED COMMENTS ON

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD

SAN DIEGO REGION

TENTATIVE ORDER No. R9-2015-0001

NPDES NO. CAS0109266

This document, **Attachment A**, contains the detailed legal and technical comments of the County of Orange and the Orange County Flood Control District (collectively, the "**County**") on Tentative Order No. R9-2015-0001 dated September 18, 2014 ("**Tentative Order**"). These comments are divided into three sections (*General*, *Findings*, and *Permit Provisions*) and address issues relating to specific parts of the Tentative Order. At times, the issues and concerns raised will pertain to more than one section of the Tentative Order. **Attachment B** contains the recommended language changes to the Tentative Order and also includes some minor edits in order to provide additional clarification where necessary.

The County of Orange, as the Principal Permittee, and the cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Lake Forest, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano collectively refer to themselves as "San Diego Region Permittees" or "Permittees." The Tentative Order refers to the County and incorporated cities of South Orange County as the "Copermittees." As such, the comments below use the term "Copermittees" to be consistent with the terminology of the Tentative Order.

GENERAL

1. THE DRAFT ORDER DOES NOT RECOGNIZE THE REPORT OF WASTE DISCHARGE OR THE SIGNIFICANT WATER QUALITY OUTCOMES THAT HAVE BEEN ACHIEVED IN ORANGE COUNTY AND, THEREFORE, LACKS SUBSTANTIAL EVIDENCE TO SUPPORT NEW OR MODIFIED PROGRAM REQUIREMENTS.

The Copermittees submitted a Report of Waste Discharge (ROWD) to the San Diego Regional Water Quality Control Board ("Regional Board") on May 20, 2014. Pursuant to federal law, the Copermittees' ROWD is an application to discharge pollutants from a point source to waters of the United States and be covered by a fifth term municipal separate storm sewer system (MS4) National Pollutant Discharge Elimination System (NPDES) Permit.[1] The ROWD evaluates the fourth term MS4 Permit activities and discusses the accomplishments of the Orange County Stormwater Program. Based on the ROWD's assessment and findings, the application identifies the activities that are proposed for the fifth term Permit and including additional pollutant control initiatives. The ROWD is also the technical basis or substantial evidence for what regulations and activities will be required in the fifth term Permit.

The Copermittees' application for a fifth term Permit is predicated on the assessment of the "State of the Environment" (ROWD, Section 2). This assessment describes the results of the

[1] 40 CFR § 122.21.

long-term monitoring and special studies that are used to examine the condition of the surface water environment in Orange County with an emphasis on recreation and aquatic ecosystem health. The analyses focus on bacteria, nutrients, toxicity and improvements in water quality, as well as recommendations for the fifth term Permit intended to ensure further improvements in surface water quality.

However, despite the comprehensive evaluation of the Orange County Stormwater Program presented in the ROWD, there is no discussion in the Draft Order regarding the "State of the Environment." In fact, the Draft Order Findings and Fact Sheet do not reference the Copermittees' application or cite specific areas in the ROWD to provide a basis for or justify particular fifth term stormwater program modifications. Although Finding 38 states that the Fact Sheet "contains background information, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of this Order," many of the requirements within the Tentative Order lack technical justification. The comments provided herein identify many of the areas where new or modified provisions of the Tentative Order lack factual or technical support in the Findings and/or Fact Sheet. Examples of this include, but are not limited to, the following:

- Basis for including Orange County in the regional municipal stormwater permit;
- Basis for requiring uncontaminated pumped ground water, foundation drains, water from crawl space pumps, and footing drains to obtain coverage under the San Diego Region groundwater extraction permits;
- Basis for requiring conventional BMPs onsite in addition to alternative compliance;
- Basis for biofiltration BMPs required to be sized at 1.5 times the design capture volume;
- Basis for biofiltration BMPs not being an effective LID and treatment measure per the requirement to size them at 1.5 times the design capture volume and also require conventional BMPs when they are used;
- Basis for offsite regional BMPs required to be sized at 1.1 times the design capture volume;
- Basis for verification of coverage under all related permits for construction sites; and
- Basis for establishing Water Quality Based Effluent Limits (WQBELs) expressed as numeric effluent limitations, in lieu of WQBELs expressed as BMPs, for the TMDL provisions.

The Findings (Discharge Characteristics and Runoff Management) only contain generic statements about water quality and excludes the key findings from the ROWD. Although the Findings within Section B of the Draft Order may have been the general factual basis for the Copermittees' first and second term permits, they are not appropriate for an advanced fifth term stormwater program.

The absence of any recognition of the significant water quality outcomes that have been achieved in Orange County *(e.g.*, coastal water quality) creates a false case, in many

instances, for regulatory change. Without support from specific findings and other evidence, the requirements of the Draft Order, in many instances lack substantial evidence and are, arbitrary and capricious, and therefore, cannot be lawfully adopted.[2]

Action: The Draft Order needs to include the key findings from the Report of Waste Discharge (including the State of the Environment) and use this information as the basis for the Draft Order's requirements. The Findings and/or Fact Sheet should be modified to include the technical justification for the requirements listed above.

2. THE NUMBERING IN THE TENTATIVE ORDER SHOULD EXPLICITLY IDENTIFY THE MAJOR SECTIONS TO HELP GUIDE THE READER.

The County is recommending that the Regional Board explicitly identify the numbering system within the Tentative Order subsections in order to assist and orient the reader. For example, within the Provisions (Section II of the Tentative Order):

- The sub-sections within Provision A should be listed as:
  - *A.1 Discharge Prohibitions* instead of *1. Discharge Prohibitions*
  - *A.2 Receiving Water Limitations* instead of *2. Receiving Water Limitations*
- The sub-sections within Provision B should be listed as:
  - *B.1 Watershed Management Areas* instead of *1. Watershed Management Areas*
  - *B.2 Priority Water Quality Conditions* instead of *2. Priority Water Quality Conditions*

Given the styles and formatting currently used within the Tentative Order, these edits were not made within Attachment B.

Action: Incorporate a definitive numbering system.

FINDINGS

3. FINDING 2 (PAGE 1 OF 130) – A REGIONAL PERMIT CANNOT BE ISSUED TO ORANGE COUNTY BECAUSE THERE IS NO SYSTEM-WIDE, JURISDICTION-WIDE, WATERSHED OR OTHER BASIS.

The Tentative Order is intended to cover Copermittees in three large metropolitan counties – Orange, Riverside and San Diego. In May 2012, Orange and Riverside Counties ("**Counties**") sent letters to Staff Counsel for the Regional Board requesting the legal authority to issue a regional permit to the three counties.[3] The Counties contended that, in accordance with federal regulations, there was no system-wide, jurisdiction-wide or watershed basis to issue a regional permit. The Counties also asserted that the lack of a Report of Waste Discharge (ROWD) process for either county prior to the initial adoption of

[2] *City of Rancho Cucamonga v. Regional Water Quality Control Bd.*, 135 Cal. App. 4th 1377, 1384–1385 (2006); Code Civ. Proc. § 1094.5(b).

[3] Letter from Ryan M. F. Baron, Office of County Counsel, County of Orange, to Catherine Hagan, Office of Chief Counsel, State Water Resources Control Board, San Diego Region (May 10, 2012); Letter from David H. K. Huff, Office of County Counsel, County of Riverside, to Catherine Hagan, Office of Chief Counsel, State Water Resources Control Board, San Diego Region (May 21, 2012).

the Tentative Order prevented the issuance of a regional permit on the grounds that there was a conflict with both federal and state law. On September 7, 2012, Staff Counsel responded to the Counties stating that there was a jurisdiction-wide and watershed basis to impose a regional permit on the Counties, and cited legal authority and examples in the Bay Area and an Alaskan borough where regional permits had been issued.[4]

For the following reasons, the County continues to believe that the Regional Board lacks authority to issue a regional permit to Orange County:

1. Orange County's MS4 system does not interconnect with Riverside and San Diego Counties,
2. There is no jurisdictional basis to issue a regional permit to Orange County,
3. Orange County's MS4 does not drain into a shared watershed,
4. Orange County's MS4 is not adjacent to Riverside or San Diego's MS4, and
5. The quantity and nature of pollutants differ between the three counties.

Therefore, the Regional Board cannot under federal and state regulations impose a Regional Permit without the Copermittees expressly consenting to the Board's jurisdiction. The Copermittees therefore enroll in the region-wide permit under protest.

a. There Is No System-wide, Jurisdiction-Wide, Watershed or Other Basis by Which to Legally Impose a Regional Permit on Orange County.

Finding 2 in the Tentative Order states that the legal and regulatory authority for implementing a regional MS4 permit stems from Section 402(p)(3)(B) and 40 CFR 122.26(a)(1)(v). The Tentative Order also cites EPA's Final Rule regarding stormwater discharge permit application procedures that there is flexibility to establish system-wide or region-wide permits.[5] During Focused Meeting Workshops conducted on June 27, 2012 and July 11, 2012, Regional Board staff stated that the reason for a regional permit was to consolidate all three permits into one to lessen the amount of permit writing time for three separate permits and reduce internal costs for writing and issuing permits. The justification at Finding 2 is largely the same although it adds that the "regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall costs savings for the Copermittees and San Diego Water Board."[6]

When EPA established regulations for MS4 permit issuance, the Response to Comments contemplated one permit being issued to a single system. And although it allowed

[4] Letter from Jessica Jahr, California Regional Water Quality Control Board, San Diego Region, to Ryan M. F. Baron, Office of County Counsel, County of Orange, and David H. K. Huff, Office of County Counsel, County of Riverside (Sept. 7, 2012) ("Staff Counsel Letter").

[5] 55 Fed. Reg. 47990, 48039-48042 ("EPA Final Rule").

[6] Part I.2.

discretion to define "system," it did so based on the following criteria – interconnectedness, political jurisdiction, and watershed-based.[7]

Interconnection. Although Orange County geographical boundaries abut San Diego and Riverside Counties, Orange County's MS4 does not interconnect with the counties regulated under the regional permit. There is substantial undeveloped area between the developed jurisdictions of Orange County and Riverside Counties. The Santa Ana Mountains and the Cleveland National Forest separate Orange and Riverside Counties encompassing tens of thousands of acres of total land separating the two counties. Camp Pendleton military base separates Orange and San Diego Counties totaling over 122,000 acres with no adjacent cities or interconnected MS4s. Clean Water Act (CWA) regulations expressly state that a permit can be issued on a system-wide basis covering all discharges from MS4s within a large or medium municipal storm sewer system. One of the primary considerations in defining a "large or medium municipal separate storm sewer system" is one that has physical interconnections with other municipal separate storm sewers.[8] In this case, there are no physical interconnections. A depiction of the County's geographical separation have been entered into the record and is included in Appendix 1.

Jurisdiction. There is no jurisdiction-wide basis to issue a regional permit. 40 CFR 122.26(a)(3)(ii) states that one system-wide permit can cover all discharges from MS4s within a large or medium municipal storm sewer system located within the same jurisdiction. Orange, Riverside and San Diego Counties are separate counties with distinct political and geographical boundaries that do not drain into a common watershed and do not share physical interconnections. The three counties are not within the same political jurisdiction. While Region 9 can be considered one jurisdiction for Regional Water Board purposes, federal regulations state that there has to be one stormwater management regional authority in which to issue a permit, and the Regional Board is not such an authority.[9] Regardless, such a permit can only be issued to a multi-jurisdictional entity upon a permit application and upon there being an interconnected MS4 or adjacent MS4. There is no tri-county stormwater management authority, there is no system-wide interconnection and Orange County is not adjacent to San Diego and Riverside Counties due to the large federal lands that separate the counties.

Watershed. Orange County does not drain into a shared watershed with Riverside and San Diego Counties. The Orange County Copermittees drain into various watersheds that drain into the Pacific Ocean. The Riverside County Copermittees drain into the Santa Margarita watershed. San Diego County drains into various watersheds. Orange County's MS4 does not drain into or share one common watershed with either county, and therefore cannot be regulated on this basis. During the prior adoption hearing for the regional permit, it was asserted by Regional Board staff that one permit can be

[7] 33 USC 1342(p)(3)(B)(i); 40 CFR 122.26(a)(1)(v).

[8] 40 CFR 122.26(b)(4) (defining large systems); 40 CFR 122.26(b)(7) (defining medium systems).

[9] 40 CFR § 122.26(a)(3)(iii)(C).

issued based on adjacency. That is, two or more separate MS4s can be issued one permit for discharges into watersheds adjacent to one another, such that they abut one another. The EPA and Army Corps of Engineers' definition of "adjacent," however, does not include mere proximity, but that one waterbody has a significant effect on the other waterbody. "Adjacent" is a waterbody adjacent to navigable waters or waters of the U.S. because the waterbodies are "inseparably bound up."[10] ''Adjacent waters' are wetlands, ponds, lakes and similar water bodies that provide similar functions which have a significant nexus to traditional navigable waters, interstate waters and the territorial seas. These include waters and wetlands that are adjacent to traditional navigable waters, interstate waters, and the territorial seas as well as waters and wetlands adjacent to other jurisdictional waters such as tributaries and impoundments."[11] In its Proposed Rule, EPA sought comment on clarifying the concept of adjacency as those waters that are ''neighboring.'' "Neighboring" is proposed as possessing "a shallow subsurface or confined surface hydrologic connection to a jurisdictional water," that can exchange water, along with chemicals and organisms within that water, and subsequently have a significant effect, particularly in combination with other adjacent waters in the watershed, on the chemical, physical, or biological integrity of a downstream traditional navigable water, interstate water, and the territorial seas."[12]

Quantity and Nature of Pollutants. Orange, Riverside and San Diego Counties are comprised of different climates, soil types, waterbodies and other notable differences. Based on differing permit requirements for the three counties, such as TMDLs, and data filed in annual reports and past ROWDs, the quantity and nature of pollutants are different between the three counties, and do not serve as a basis or determination by which to lump all three counties into a one-size fits all permit (*e.g.*, hydromodification).

Other Support. In the Staff Counsel Letter, Regional Board staff cited examples in the Bay Area and in Alaska where regional permits have been issued. In the Bay Area, various cities and counties under that permit interconnect in some fashion and drain into the San Francisco Bay. The Bay Area is also represented by a joint powers organization or regional watershed management program comprised of 8 municipal stormwater programs that voluntarily agreed to end their existing permits early and enroll in a regional permit. In the case of the Alaska example, a "regional" permit was issued to the Fairbanks North Star Borough, City of Fairbanks, City of the North Pole, the Alaska Department of Transportation and the University of Alaska Fairbanks. Further examination of that permit and the stormwater program maps demonstrate, though,

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[10] 79 Fed. Reg. 22188, 22191 ("Proposed Rule"). *United States v. Riverside Bayview Homes*, 474 U.S. 121 (1985).

[11] 79 Fed. Reg. 22188, 22195 and 22207 ("Connectivity is a foundational concept in hydrology and freshwater ecology. Connectivity is the degree to which components of a system are joined, or connected, by various transport mechanisms and is determined by the characteristics of both the physical landscape and the biota of the specific system.").

[12] Id. at 22210.

that the region regulated is a borough, the Alaskan equivalent of a county. All of the regulated Copermittees are physically interconnected through its storm drain system and most drain into one watershed. Therefore, neither the Bay Area nor the Fairbanks Borough permits provide sufficient examples of a regional permit comparable to the one being issued to Orange County.

As previously stated, Regional Board staff indicated in the June 27, 2012 and July 11, 2012 workshops that the rationale for implementing a region-wide permit was minimize costs to the Regional Board in preparing permits. Federal regulations, however, do not authorize and the EPA Final Rule does not contemplate regional permit issuance based on overall reduced cost savings. Moreover, cost savings have not been demonstrated in the Tentative Order.[13] Although it may be convenient to ensure consistency of regulation, the EPA Final Rule contemplates such consistency within a watershed and not throughout a geographical area the size of the three counties. And although the EPA Final Rule does use the term "regional" in the Response to Comments, a careful examination of the term shows that EPA was analyzing whether individual permits should be issued to individual cities, a county and its incorporated cities, a set of Copermittees with interconnected sewer systems and other infrastructure, one state entity or a regional stormwater management authority. The largest area by which one permit could be issued under the Final Rule was a state entity that operated a state highway network or one county and its incorporated cities. There is no factual or technical basis in the Tentative Order that meets this criteria or establishes other bases to regulate Orange County under one unified permit. There is also no statistical basis by which to issue a regional permit as Orange County is comprised of over three million people and is the sixth largest county by population in the U.S. In fact, the U.S. Bureau of Census designates Orange County in a different Metropolitan Statistical Area than San Diego County, and is designated in a Combined Statistical Area with Los Angeles, Ventura and San Bernardino Counties.

b. There Is No Technical Basis to Regulate Orange County Due to the Lack of a Report of Waste Discharge Application.

The ROWD is a federally required application that is the technical basis to draft a new permit for a permittee. The information contained in the ROWD is used to determine prospective provisions of the new permit, including but not limited to monitoring, program strengths and other tools that are assessed in the new permit. In other words, the ROWD is the technical basis or substantial evidence for determining what will be required in the new permit. The initial draft of the Regional Permit did not contain a ROWD requirement for Orange County. The Order was subsequently revised to include a ROWD requirement to determine whether modification to the Order upon enrollment by Orange County is necessary, but the Regional Permit was still adopted by the Regional Board with terms and conditions that would also apply to Orange County that were not based on any federally required application or report.

In short, the Regional Permit was adopted by the Regional Board with provisions that regulate Orange County Copermittees, along with specific numeric and other

[13] 55 Fed. Reg. 47990-01.

requirements that only apply to Orange County that were not based on an application process or other documented technical basis. There is no substantial evidence or basis under the Clean Water Act ("CWA") by which to impose certain regulations on the County. Thus, the lack of a ROWD requirement prior to initial adoption of the regional permit is in conflict with the CWA, the Porter Cologne Water Quality Control Act ("Porter Cologne") and the California Administrative Procedure Act.

Action: The County should be issued an individual permit. Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Finding 2 (page 1)*
- *Finding 28 (page 8)*

4. FINDING 7 (PAGE 3 OF 130) - THE IN-STREAM TREATMENT CONTROL SYSTEMS FINDING WILL PRECLUDE THE USE OF REGIONAL BMPS.

In-stream controls must not adversely impact beneficial uses or result in sustained degradation of water quality of the receiving waters. Copermittees and project applicants should have the flexibility to identify creative solutions that meet the alternative compliance goals of mitigating the volume of stormwater not retained onsite or increased potential erosion of downstream receiving waters.

This finding should not prevent the implementation of stream restoration or stream rehabilitation projects and constructed wetlands, or prevent maintenance of reconstruction of existing stream restoration or rehabilitation projects, constructed wetlands, and regional BMPs.

Action: Finding 7 should be modified to allow for the implementation of stream restoration or stream rehabilitation projects and constructed wetlands, or maintenance of reconstruction of existing stream restoration or rehabilitation projects, constructed wetlands, and regional BMPs.

5. FINDING 8 (PAGE 3 OF 130) – IT SHOULD NOT BE PRESUMED THAT DISCHARGES FROM MS4S ALWAYS CONTAIN WASTE OR POLLUTANTS.

Discharges may contain waste or pollutants, but it should not be presumed that they necessarily always contain waste or pollutants.

Under current law, the Regional Board's issuance of the Permit is a quasi-judicial decision.[14] As a quasi-judicial decision, the Regional Board's action must be supported by legally adequate findings, and those findings must be supported by evidence in the record.[15]

Pursuant to the Supreme Court's decision in *Topanga Association for a Scenic Community v. County of Los Angeles* (1974) 11 Cal.3d 506, findings are intended to "facilitate orderly analysis and minimize the likelihood that the agency will randomly leap from evidence to conclusions."[16] Here, there is no cited evidence that stormwater itself is a pollutant or that in

[14] *City of Rancho Cucamonga v. Regional Water Quality Control Board*, 135 Cal.App.4th 1377, 1385 (2006).

[15] T*opanga Association for a Scenic Community v. County of Los Angeles*, 11 Cal.3d 506 (1974).

[16] *Id.*, at 514 (emphasis added).

every instance it contains pollutants or waste as those terms are defined by the CWA and Porter Cologne respectively. Absent evidence demonstrating that this is the case, in all cases, the Regional Board cannot make this finding.

Moreover, as a matter of law, the Regional Board lacks the authority to regulate pure stormwater as a pollutant. The CWA and its implementing regulations define the term "pollutant" to mean:

> dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials (except those regulated under the Atomic Energy Act of 1954, as amended (42 U.S.C. 2011 et seq.)), heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water.[17]

Federal regulations further define the term "stormwater" to mean "storm water runoff, snow melt runoff, and surface runoff and drainage."[18] Notably, the definition of the term "pollutant" does not include "stormwater." Moreover, the text of the CWA requires the discharge of *pollutants* to be reduced to the Maximum Extent Practicable (MEP).[19] There is no prohibition on or comparable authority to regulate the discharge of pure stormwater.

This rationale was recently adopted by the Eastern District of Virginia, when it held that the EPA has no authority under the Clean Water Act to regulate non-pollutants.[20] Specifically, the Court stated:

> "Pollutant is statutorily defined. (33 U.S.C. § 1362(6).) The Court sees no ambiguity in the wording of this statute. EPA is charged with establishing TMDLs for the appropriate pollutants; that does not give them the authority to regulate nonpollutants. The parties agree that sediment is a pollutant under 33 U.S.C. § 1362(6), and stormwater is not. Then how does EPA claim jurisdiction over setting TMDLs for stormwater?"[21]

Likewise, Porter Cologne defines the term "waste" to mean:

> "sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal."[22]

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[17] 33 U.S.C. § 1362(6); 40 C.F.R. § 122.2.

[18] 40 C.F.R. § 122.26(b)(13).

[19] 33 U.S.C. § 1342(p).

[20] Virginia Dept. of Transportation v. EPA, No. 1:12-CV-775, slip op., 2013 WL 53741 (E.D. Va. Jan. 3, 2013).

[21] *Id.*, at 5.

[22] Water Code § 13050(d).

While the definition is certainly different and potentially broader than the definition of "pollutant" under the CWA, the definition of "waste" does not include stormwater or any other discharge that is not created by human activity. As a matter of law, the Regional Board is therefore without authority to regulate all discharges of stormwater as pollutants or waste.

Action: *Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:*

- *Finding 8 (page 3)*
- *Finding 16 (page 5)*
- *Finding 17 (page 5)*

6. FINDING 11 (PAGE 4 OF 130) – NATURAL WATERS CANNOT LEGALLY BE CLASSIFIED AS PART OF THE MS4, AND CANNOT BE CLASSIFIED AS BOTH A MS4 AND RECEIVING WATER.

Rivers, streams, creeks and other natural waterbodies cannot be legally classified as a MS4. The definition of a "municipal separate storm sewer" means "a conveyance or system of conveyances including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains" "owned and operated" by a municipality.[23]

In California, natural waterbodies are not "owned" by the municipality through which they flow. Such water bodies are generally administered by the State of California in the public trust for the right of the people to use such waters for certain purposes.[24] The Legislature, acting within the confines of the common law public trust doctrine, is the ultimate administrator of the trust and may often be the final arbiter of permissible uses of trust lands.

"receiving water" cannot also be an MS4, as is plain from the CWA regulations. An MS4 is itself defined as discharging to waters of the United States.[25] An MS4 cannot, in essence, discharge to itself. Moreover, an "outfall" from an MS4 (the point at which the discharge enters a receiving water) does not, pursuant to 40 C.F.R §122.26 (b)(9), include conveyances connecting "segments of the same stream or other waters of the United States and are used to convey waters of the United States."

In EPA's Preamble to the initial version of the MS4 regulations, the agency expressly determined that "streams, wetlands and other water bodies that are waters of the United States are not storm sewers for the purposes of this rule" and that "stream channelization, and stream bed stabilization, which occur in waters of the United States" were not subject to National Pollutant Discharge Elimination System ("NPDES") permits under Section 402 of

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[23] 40 CFR 122.26(b)(8).

[24] *Marks v. Whitney* 6 Cal. 3d 251, 259, 260 (1971).

[25] 40 C.F.R. §122.26(b)(8).

the CWA.[26] In further support of the point that a MS4 is an artificial, not natural, watercourse, the types of "conveyances" identified in the regulation ("roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains") all refer to anthropogenic structures, not natural streams.[27]

In *South Florida Water Management District v. Miccosukee Tribe of Indians*, the U.S. Supreme Court opined on the issue of whether a NPDES permit was needed when water from a channelized canal was pumped across a levee into a reservoir. The Court held that if the two waterbodies were meaningfully distinct, no permit was needed.[28] Likewise, the Court held in *L.A. County Flood Control District v. NRDC* that the flow of water from an improved portion of a navigable flood control channel into an unimproved portion of the same waterway is not a "discharge of a pollutant" under the CWA.[29] Based on these two holdings, there is no discharge of pollutants under the CWA if a waterbody like a flood control channel is both classified as a MS4 and receiving water.

This issue is currently being considered by U.S. EPA in its Proposed Rule. EPA has indicated in ex parte meetings that it did not seek comment and did not intend that MS4s be characterized as waters of the U.S. Therefore, the Regional Board should refrain from issuing this finding until the Proposed Rule is final and EPA has lawfully established this classification. Otherwise, such a finding is made purely under state law.

Action: Finding 11 should be deleted. Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Finding 11 (page 4)*

7. FINDING 12 (PAGE 4 OF 130) – COPERMITTEES DO NOT ACCEPT FREE AND OPEN ACCESS TO MS4S, AND ARE NOT RESPONSIBLE FOR ALL DISCHARGES NOT PROHIBITED.

The Tentative Order states that MS4s provide free and open access and convey discharges to waters of the U.S., and that MS4 operators then accept all responsibility for such discharges not prohibited or otherwise controlled. This is simply not the case and is legally unsupportable. An MS4 is designed to accept stormwater for flood control purposes and prevent damage to life and property. Although it is true that the Copermittees have an obligation to effectively prohibit non-stormwater discharges, namely illicit connections and unlawful dumping, it is also true that the discharger into the MS4 is ultimately responsible for a condition of pollution or violation of a water quality standard. And, in accordance with California state law, MS4s downstream of upstream flows must accept those flows and

[26] 53 Fed. Reg. 49416, 49442 (Dec. 7, 1988).

[27] 40 CFR § 122.26(b)(8).

[28] 541 U.S. 95, 109-112 (2004) (remanding the case to the Florida District Court to determine the hydrological connection between the two waterbodies).

[29] *L.A. County Flood Control District v. National Resources Defense Council*, 133 S.Ct. 710 (Jan. 8, 2013).

cannot attempt to block or divert such flows.[30] Finding 12 attempts to shift all legal responsibility to the MS4s, which is unsupported by federal and state law.

Action: *Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:*

- *Finding 12 (page 4)*

8. FINDING 15 (PAGE 5 OF 130) – THE TENTATIVE ORDER MUST RECOGNIZE THAT THE DISCHARGE OF ALL POLLUTANTS FROM THE MS4 IS SUBJECT TO THE MEP STANDARD.

Section 402(p)(3)(B)(ii) requires the Copermittees to effectively prohibit non-stormwater discharges into the MS4, namely pollutants generated from illicit connections and unlawful dumping.

The Tentative Order at Finding 15, however, states that "non-stormwater discharges from the MS4s are not considered stormwater discharges and therefore are not subject to the MEP standard….". This finding is not supported by federal law. Although federal law regulates "non-stormwater discharges" into the MS4, Section 402(p)(3)(B)(iii) expressly states that the "discharge of pollutants" shall be reduced to MEP. In drafting this section of the CWA, Congress expressly intended all discharges from MS4s to be subject to MEP as it used the term "pollutant" and did not differentiate between stormwater and nonstormwater, as the Tentative Order attempts to do. Therefore, the duty of the Copermittees to reduce the discharge of pollutants from the MS4 to MEP applies to both stormwater and nonstormwater pollutants.

Furthermore, the focus of the CWA and federal regulations is on a management program that includes a comprehensive planning process to reduce the discharge of pollutants to MEP.[31] One of the elements of the management program is the illicit discharge prevention program.[32] The control and limitation of illicit discharges into the MS4 is intended to achieve the overall MEP standard for discharges from the MS4. This is confirmed by the preamble to EPA regulations that discuss the required elements of the management program. According to EPA:

> [Copermittees are required] to develop management programs for four types of pollutant sources which discharge to large and medium municipal storm sewer systems. Discharges from large and medium municipal storm sewer systems are usually expected to be composed primarily of: (1) Runoff from commercial and residential areas; (2) storm water runoff from industrial areas; (3) runoff from construction sites; and *(4) non-storm water discharges*. Part 2 of the permit application has been designed to allow [Copermittees] the opportunity to propose *MEP control measures for each of these components of the discharge*. 55 Fed Reg at 48052 (emphasis

[30] *Keyes v. Romley*, 64 Cal.2d 396 (1966); *Locklin v. City of Lafayette*, 7 Cal. 4th 327 (1994).

[31] 40 CFR 122.26(d)(2)(iv).

[32] 40 CFR 122.26(d)(2)(iv)(B)(1).

> added). *See also* 55 Fed Reg at 48045 (stating "Part 2 of the proposed permit application [which includes the illicit discharge prevention requirement] is designed to . . . provide municipalities with the opportunity of proposing a comprehensive program of structural and non-structural control measures that will *control the discharge of pollutants, to the maximum extent practicable, from municipal storm sewers*.") (Emphasis added).

EPA's position is consistent with existing State Water Resources Control Board policy which states that discharges into the MS4 are to be controlled through an iterative, BMP based approach that is *less* stringent than the MEP standard.[33] The State Board held:

> An NPDES permit is properly issued for "discharge of a pollutant" to waters of the United States. (Clean Water Act § 402(a).) The Clean Water Act defines "discharge of a pollutant" as an "addition" of a pollutant to waters of the United States from a point source. (Clean Water Act section 502(12).) Section 402(p)(3)(B) authorizes the issuance of permits for discharges "from municipal storm sewers."
>
> We find that the permit language is overly broad because it applies the MEP standard not only to discharges "from" MS4s, but also to discharges "into" MS4s. . . [T]he specific language in this prohibition too broadly restricts all discharges "into" an MS4, and does not allow flexibility to use regional solutions, where they could be applied in a manner that fully protects receiving waters. It is important to emphasize that dischargers into MS4s continue to be required to implement a full range of BMPs, including source control. In particular, dischargers subject to industrial and construction permits must comply with all conditions in those permits prior to discharging storm water into MS4s.[34]

The State Board's decision in the BIA Order makes clear that the CWA does not include a blanket prohibition on discharges of non-stormwater into the MS4. To the extent the Tentative Order would hold the dischargers liable in the event that any discharge into the MS4 occurs, the Tentative Order exceeds the requirements of the CWA and violates existing State Board policy.

It is also technically infeasible in some cases to differentiate between non-stormwater or stormwater pollutants discharged from the MS4. Thus, just as the discharge of non-stormwater into the MS4 is subject to the effective prohibition standard, the discharge of pollutants in non-stormwater from the MS4 is subject to the MEP standard. There are several instances where the specific provisions in the Tentative Order need to be modified in order to reflect this approach.

<u>Action</u>: *Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:*

- *Finding 15 (page 5)*

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[33] Specifically in State Board in Order No. WQ-2001-15, *In the Matter of the Petitions of Building Industry Assoc. of San Diego County and Western States Petroleum Assoc.* (2001) ("BIA Order").

[34] *Id.*, at 9-10.

- *Provisions, A. Prohibitions and Limitations (page 15)*
- *Provisions, E. Jurisdictional Runoff Management Programs (page 78)*
- *Provisions, E.1.a. Legal Authority Establishment and Enforcement (page 78)*
- *Provisions, E.2.a. Illicit Discharge Detection and Elimination (page 80)*

9. FINDING 31 (PAGE 10 OF 130) – THE REQUIREMENTS IN THE TENTATIVE ORDER ARE MORE STRINGENT THAN FEDERAL LAW, REQUIRING AN ECONOMIC ANALYSIS. IN ADDITION, THE CURRENT ECONOMIC ANALYSIS IS INSUFFICIENT.

Finding 31 states that pollutant restrictions are not more stringent than federal law, yet an economic analysis is still conducted pursuant to Water Code § 13241. Despite the finding that the Tentative Order does not exceed federal law requirements, there are a number of requirements that are more stringent.

There has not been a full consideration of the section 13241 factors, which would include an analysis of the economic impacts that would result from compliance with the existing stormwater permit compared to the costs of complying with the proposed stormwater permit (*i.e.*, the costs of complying with the new requirements). Instead, the Order's analysis begins by stating, and without any quantification, that it would more expensive to not fully implement programs. Section 13241 is not satisfied by this inverse analysis.

Additionally, the Tentative Order states that Copermittees have a significant amount of flexibility to choose how to implement BMPs and that "least expensive measures" can be chosen.[35] This statement, however, conflicts with the Order's definition of MEP at C-6 which expressly acknowledges Chief Counsel's 1993 MEP memo that only the Regional and State Boards determine whether BMPs meet MEP, and that selection of the least expensive BMPs will likely not result in meeting the MEP standard.

The Fact Sheet also fails to cite any recent cost benefit numbers but relies on inapplicable cost data such as a 1999 EPA study on household costs.

The analysis of costs contained in the Fact Sheet is deficient in two additional ways. First, the approach to compliance costs is fundamentally deficient because it tells the public nothing at all about the relationship between the cost of any particular control and the pollution control benefits to be achieved by implementing that control. Under this "generalized" approach, extremely costly requirements that bear little or even no relationship (or even a negative relationship) to the pollution control benefits to be achieved could be "justified" as long as the "overall" program costs are within what the Regional Board deems to be an acceptable range. This is not a proper way to determine whether a control reduces the discharge of pollutants from the MS4 to the MEP. A more individualized assessment of cost is required. Otherwise, dischargers may be required to implement very costly controls that have no relationship to pollution control benefits, a result inconsistent with MEP.

This analytical flaw in the Fact Sheet is compounded by the approach taken to assess the benefits of the Tentative Order. Here again, the assessment approach misses the mark

[35] Fact Sheet, Page F-17.

because it tells the public nothing about the pollution control benefits to be achieved by implementation of the controls in the Tentative Order. All the Fact Sheet says, in essence, is that people like clean water and in theory may be willing to pay for it, that urban storm water may contribute to beach closures and that such beach closures have an economic impact. This analysis sheds no light on the relationship between a BMP's costs and the pollution control benefits to be achieved by implementing that BMP.

Second, the Fact Sheet contains faulty assumptions and relies upon outdated or inapplicable data. The California State University, Sacramento (CSUS) Cost Survey assessed program costs for Phase I cities. Nothing in the Fact Sheet links any of the actual conditions of the Phase I permits of the Phase I cities studied by CSUS with any of the requirements of the Tentative Order. Therefore, the study tells the public nothing about the costs to implement the Tentative Order. The data included in the Fact Sheet is also from seven years to more than a decade old. In short, the Fact Sheet uses old data from Phase I programs that have no linkage to any conditions of the Tentative Order. The full costs of implementing the entire program required by the Tentative Order must be assessed.

Lastly, stormwater agencies cannot readily establish or raise fees to help pay for the BMPs necessary to comply with either the California Toxics Rule (CTR) criteria or proposed Site Specific Objectives (SSOs) due to the requirements of Proposition 218, Proposition 26 and the Mitigation Fee Act. For instance, Proposition 218 requires that property-related fees be put to a vote, so cities cannot assess fees without the consent of a majority (two-thirds) of the property owners. Therefore, the costs associated with the implementation and maintenance of the BMPs are more likely to be covered through the stormwater agency General Funds.

Action: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Finding 31 (page 10)*

10. FINDING 32 (PAGE 11 OF 130) – THE REGIONAL BOARD HAS NO LEGAL ABILITY TO DETERMINE WHETHER A PARTICULAR MANDATE IS UNFUNDED.

The Tentative Order finds that none of the requirements therein constitute an unfunded local mandate. This finding, however, should be stricken as the Regional Board has no legal ability to determine whether a particular mandate is unfunded. The Commission on State Mandates is the only State agency that has the jurisdiction and ability to make that determination.

The Fact Sheet's discussion of unfunded state mandates is not consistent with applicable legal authority or the Tentative Order, as discussed below.

Article XIII B, Section 6(a) of the California Constitution ("Section 6") provides that whenever "any state agency mandates a new program or higher level of service on any local government, the state shall provide a subvention of funds to reimburse that local government for the costs of the program or increased level of service . . . ." Section 6 applies to storm water permits issued by the State Board and the Regional Boards.[36] Thus, Section 6 applies to the Tentative Order.

[36] *County of Los Angeles v. Commission on State Mandates* (2007) 150 Cal.App.4th 898, 920.

Section 6 was added to the California Constitution by voter approval in 1979, as part of a larger effort that had as its goal both limiting state and local spending and restricting the ability of local entities to raise revenue. Section 6 must be viewed as a "safety valve" designed to protect local governments from being placed in the untenable position of being required by the state, on the one hand, to implement certain state mandated programs while also, on the other hand, being prohibited from raising the money needed to pay for those state mandated programs.[37] Recognizing that such a situation was neither a fair nor a wise approach to governing, the voters enacted Section 6 to prevent state government from shifting financial responsibility for carrying out governmental functions to local agencies without the state paying for them.

To implement Section 6, the Legislature created the Commission on State Mandates ("Commission"). The Commission has sole and exclusive jurisdiction to determine whether a state law or order of a state agency is an unfunded state mandate.[38] In accordance with Section 6, Government Code section 17500 et seq., and case law, the Commission on State Mandates has determined that an unfunded state mandate exists when: (a) the state imposes a new program or higher level of service that is; (b) mandated by state law, not federal law; and (c) when the local government lacks adequate fee authority to pay for the new program or higher level of service.

Whether and how individual stormwater permit conditions constitute unfunded state mandates is currently the subject of pending litigation. In 2009 and 2010, the Commission on State Mandates determined that parts of the Los Angeles Phase I Permit and major components of the San Diego Phase I Permit constituted unfunded state mandates. The State challenged these two decisions in court, and, in the San Diego matter, the court confirmed that only the Commission on State Mandates could make the ultimate determination of whether a permit condition constituted an unfunded state mandate. Specifically, the court in the San Diego case held that the "Commission has exclusive authority to determine whether the Regional Board has imposed a state mandate." The court in the San Diego case further concluded that the Commission on State Mandates should reconsider its decision to assess whether each of the individual permit conditions were required to achieve the MEP standard. Specifically, the court held that "the Commission must determine whether any of the permit conditions exceed the 'maximum extent practicable' standard." (Emphasis added.) Therefore, contrary to the discussion in the Fact Sheet, each permit condition (control) must be assessed to determine whether it is consistent with MEP.

This issue is currently being addressed by the California Supreme Court in *Department of Finance v. Commission on State Mandates*.[39]

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[37] *Department of Finance v. Commission on State Mandates* (2003) 30 Cal.4th 727, 735; *County of San Diego v. State of California* (1997) 15 Cal.4th 68, 81.

[38] Government Code §§ 17551 and 17552; *Kinlaw v. State of California* (1991) 54 Cal.3d 326, 331-334.

[39] (2013) 220 Cal.App.3th 740.

Action: Finding 32 should be deleted. Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Finding 32 (page 11)*

PERMIT PROVISIONS

GENERAL

11. THE TENTATIVE ORDER INCLUDES LANGUAGE THAT PROVIDES AN OVERLY BROAD INTERPRETATION OF THE STORMWATER REGULATIONS BY REQUIRING MS4S TO "ENHANCE" AND/OR "RESTORE" BENEFICIAL USES OR HABITAT.

The Tentative Order recognizes that the overarching objective of the CWA is "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters" and that, in order to carry out this objective, the CWA utilizes a number permitting programs and regulatory tools to regulate the discharge of pollutants and other materials to Waters of the United States (Waters of the U.S.).

However, CWA section 402(p), that section which governs that permitting for municipal and industrial stormwater discharges, is only one regulatory tool within the CWA. Moreover, it requires the MS4s to focus on the quality and impact of their non-stormwater and stormwater discharges, not on the active enhancement and/or restoration of beneficial uses or habitat.

While the Fact Sheet recognizes that the development and implementation of a WQIP will identify the highest priority water quality conditions and that "addressing these threats and/or adverse impacts should restore the physical, chemical, and biological integrity of receiving waters, and result in the restoration and protection of the beneficial uses of the receiving waters in the Watershed Management Area,"[40] the Tentative Order should not explicitly require the enhancement or restoration of beneficial uses as the CWA only requires that the Copermittees protect beneficial uses and prevent nuisance.[41]

This is important from a prioritization and resource allocation perspective because while the Copermittees must control the discharge of pollutants in order to, ultimately, protect the beneficial uses of the receiving waters, they are not required to actively "enhance" or "restore" the beneficial uses and habitat of the receiving waters. It must be recognized that the actions and resources necessary to "protect" the beneficial uses may, in fact, be different than those that would be required to "enhance" or "restore" the beneficial uses of a particular receiving water.

Action: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Provisions, B. Water Quality Improvement Plans (page 20)*
- *Provisions, E.5.e. Retrofitting and Rehabilitating Areas of Existing Development (page 115)*

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[40] Fact Sheet, Page F-45.

[41] 40 CFR 131.12()(1); CWC 13263(a) and 13050.

12. THE TENTATIVE ORDER INCLUDES LANGUAGE THAT PROVIDES AN OVERLY BROAD USE OF THE TERM "PROHIBIT."

Although some changes were made in the Tentative Order language, the Tentative Order should be reviewed for the correct use of the terminology "effectively prohibit" since it appears that there are a couple of cases where this language was not modified.

The term "prohibit" is broader than CWA requirements and should be changed to "effectively prohibit." CWA section 402(p)(3)(B)(ii) reads as follows:

> (B) Municipal Discharge – Permits for discharges from municipal storm sewers –
>
> (ii) shall include a requirement to effectively prohibit non-stormwater discharges into the storm sewer (Emphasis added)

The Tentative Order shall ensure the County "effectively prohibit non-stormwater discharges" but the Regional Board may exempt certain discharges that are not significant sources of pollutants from the prohibition. The section does not require a full prohibition but rather an effective prohibition. The operative word is "effective," which recognizes the constraints of owning and operating a stormwater drainage system that includes hundreds of miles of open channels. The finding/provision should note that non-stormwater discharges are effectively prohibited.[42]

In addition, discharges that are not significant sources of pollutants are exempted from the prohibition. In a practical sense, the use of word "effective" also provides flexibility to assess the impacts of relatively benign discharges such as air condition condensate, individual car washing, and non-emergency fire-fighting flows or non-anthropogenic sources before instituting a prohibition.

Action: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Provisions, E.1.a. Legal Authority Establishment and Enforcement (page 78)*

PROVISION A – PROHIBITIONS AND LIMITATIONS

13. PROVISION A (ENTIRE PROVISION; BEGINS PAGE 15 OF 130) – A CLEAR LINKAGE BETWEEN THE COMPLIANCE PROVISIONS AND PROHIBITIONS, RECEIVING WATER LIMITATIONS, AND EFFLUENT LIMITATIONS MUST BE ESTABLISHED.

Provision A.2.a states that "[d[ischarges from MS4s must not cause or contribute to the violation of water quality standards in any receiving water." Numerous comments submitted in the 2013 Permit adoption process demonstrated that complying with the receiving water limitations provision is not achievable everywhere, all the time, given the extensive urbanization of Orange County and the variable nature of pollutants. The Tentative Order, however, does not contain any linkage between the compliance provisions of the Permit and the prohibitions, receiving water limitations and effluent limitations. Provision A then can be construed as a standalone provision that holds the Copermittees strictly liable for any exceedance of a water quality standard determined by water quality

[42] CWA § 402(p)(3)(B)(ii).

monitoring results on an outfall-by-outfall basis.[43] Thus, the Copermittees are immediately out of compliance upon enrollment in the Permit.

Historically, this was not the case. MS4 permittees could maintain compliance by implementing the iterative process by diligently and rigorously implementing and increasing best management practices ("BMPs") in response to an exceedance.[44] This approach is not only consistent with prior State Board and Regional Board policy but in accordance with federal law that MS4s be governed by the MEP standard and are not required to adhere to strict numeric standards.[45] This policy allowed MS4s the ability to adjust their programs and utilize the iterative process to meet water quality standards.

The County requests that the Regional Board establish a compliance pathway that allows the County to comply with all numeric limitations consistent with a prior Tentative Order it issued.[46] This is not only consistent with federal law and prior state policy, but allows the Copermittees the true flexibility to design programs and use program funds effectively by prioritizing those funds for pollutants of concern. The iterative process allows Copermittees to implement innovative programs and projects with assurance that those diligent efforts in doing so are helping achieve compliance.[47]

In addition, compliance with Provisions A.1, A.2 and A.3 should be linked to Provision A.4, Provision B, and Attachment E so that it is clear that the compliance mechanism for A.4 is the WQIP (Provision B) and/or the TMDL (Attachment E), as applicable.

Action: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Provisions, A. Prohibitions and Limitations (page 15)*
- *Provisions, A.1. Discharge Prohibitions (page 15)*
- *Provisions, A.2. Receiving Water Limitations (page 16)*

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[43] *Natural Resources Defense Council, Inc. v. County of Los Angeles et al* (9th Cir. 2011), 673 F.3d 880, 883, rev'd on other grounds by *Los Angeles County Flood Control District v. Natural Resources Defense Council, Inc.* (2013) 133 S.Ct. 710.

[44] State Water Resources Control Board, WQ 2001-15 at 7 (Nov. 15, 2001). The State Water Board indicated that the precedential receiving water limitations language in WQ 1999-05 does not require strict compliance with water quality standards.

[45] *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159, 1165; *Divers Environmental Conservation Organization v. State Water Quality Resources Control Board* (2006) 145 Cal. App. 4th 246, 256; *Bldg. Indus. Ass'n v. State Water Quality Resources Control Board* (2004) 124 Cal. App. 4th 866, 889-90; Betsy Jennings, State Board Memorandum, *Definition of Maximum Extent Practicable* (1993).

[46] Draft Tentative Order, R9-2013-0001, § II.B.3.c (March 29, 2013).

[47] A permit that does not contain a compliance pathway is impossible to comply with and is not in accordance with federal and state law. *Atlantic States Legal Fdn., Inc. v Eastman Kodak Co.* (2nd Cir, 1994) 12 F.3d 353, 357; *Hughey v. JMS Development Corp.* (11th Cir. 1996) 78 F.3d 1523, 1530.

14. PROVISION A (ENTIRE PROVISION; BEGINS PAGE 13 OF 130) – THE DISCHARGE PROHIBITIONS MUST ESTABLISH A LINKAGE WITH THE APPROVED COMPLIANCE SCHEDULES FOR TMDLS THAT HAVE BEEN INCORPORATED INTO THE BASIN PLAN.

The Discharge Prohibitions do not establish a sufficient linkage with approved compliance schedules for TMDLs that have been incorporated into the Basin Plan. TMDLs adopted within the region include a schedule to provide MS4 Copermittees the time necessary to develop and implement a plan to achieve water quality standards in impaired waters. The compliance schedules for adopted TMDLs have been incorporated into Attachment E and language is recommended in the Receiving Water Limitations provisions (A.2.c.) and the Effluent Limitations provisions (A.3.b.) pointing to the TMDL compliance schedules.

The Receiving Water Limitations language in the Tentative Order conflicts with TMDL compliance schedules. Language should be included to clarify that in instances where a TMDL is in effect, the Copermittees shall achieve compliance with these provisions as outlined in Attachment E (Specific provisions for TMDLs). Without this change, the Receiving Water Limitations language puts Copermittees in immediate and ongoing non-compliance with the permit, as opposed to incorporating TMDL implementation schedules.

In addition, the footnote to A.2.a.(4)(b) requires Copermittees to not cause or contribute to the more stringent of a water quality objective or a CTR criterion. Instances may exist where it has been determined that one or the other is more appropriate given site specific conditions or analysis (i.e., a TMDL has been established).

Action: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Provisions, A.1. Discharge Prohibitions (page 15)*
- *Provisions, A.2.a. Receiving Water Limitations (page 16)*
- *Provisions, A.2.c. Receiving Water Limitations (page 17)*
- *Footnote #5 to Provision A.2.a(4)(b) (page 17)*

15. PROVISION A (ENTIRE PROVISION; BEGINS PAGE 18 OF 130) – THE RECEIVING WATER LIMITATIONS LANGUAGE IS DISCRETIONARY AND SHOULD BE REVISED TO PROVIDE A CLEAR COMPLIANCE MECHANISM.

WQIPs provide flexibility with a BMP-based compliance approach for the Discharge Prohibitions and Receiving Water Limitations. The language in the Provision A.4 describes the WQIPs as a document trail rather than a compliance mechanism. In essence, the language suggests that Copermittees shall expend significant resources to develop and implement WQIPs, but taking the actions in the WQIPs has no effect on the Regional Board's compliance determination.

The Receiving Water Limitations language should be revised to expressly state that if exceedances of a water quality objective, water quality standard or any effluent limitation persist, or a discharge prohibition stated as an effluent limitation is not complied with, notwithstanding implementation of control measures, BMPs or compliance with the other water quality control program requirements of the Order, the Copermittee shall take actions to further reduce its discharges of such pollutants over time by complying with the iterative

process, and that diligent implementation of the iterative process (i.e., WQIP) constitutes compliance to MEP.

The iterative process is a fundamental aspect of MS4 programs, as envisioned by State Water Board Order 99-05 and later reconfirmed in Order WQ 2001-15 (BIA Order), and is the mechanism by which MS4 Copermittees should demonstrate compliance. The WQIPs now provide a mechanism to provide the detail and quantitative analyses used to identify pollutant sources and implement BMPs to address those sources.

Language in Provision A.4 should be consistent with the California Stormwater Quality Association (CASQA) proposed receiving water limitation language (see **Attachment B**).

Action: Incorporate the specific modifications to Provision A.4, which are provided in Attachment B.

PROVISION B – WATER QUALITY IMPROVEMENT PLANS

16. PROVISION B (ENTIRE PROVISION; BEGINS PAGE 20 OF 130) – THE WATER QUALITY IMPROVEMENT PLANS SHOULD BE THE FOUNDATION FOR A BMP-BASED COMPLIANCE APPROACH.

The Clean Water Act does not require MS4 permits to include watershed planning provisions.[48] Neither does Porter Cologne.[49] The Watershed Improvement Act of 2009 allows, but does not require, MS4 permittees to develop a watershed improvement plan. The County supports a voluntary watershed-based approach that has compliance linkage between the WQIPs in Provision II.b and the receiving water limitations in Provision II.A. This linkage would provide the Copermittees the opportunity to comply with the Permit while allowing for choice.[50] A watershed-based approach is ideal for the implementation of stormwater programs as it allows for the integration of all program elements, focuses efforts on the highest priorities for each watershed through the customization of actions and strategies, and allows for streamlined reporting. This approach also supports the implementation of TMDLs, which are developed and implemented at the watershed scale.

Although the language for the WQIP recognizes the need for the consideration of provisions A.1, A.2, and A.3 as a part of the assessments and identification of water quality priorities, consistent with the intent described in the Fact Sheet, the language within the Tentative Order should explicitly identify that compliance with those provisions is achieved through the development and implementation of the WQIPs and or TMDLs (Attachment E).

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[48] 33 U.S.C. § 1342(p); 40 C.F.R. § 122.26.

[49] Water Code § 1610(e).

[50] Under the Tenth Amendment of the U.S. Constitution, a state or local government must retain the ultimate decision as to implement a federal regulatory program. The Regional Board has found that each and every requirement in the Permit is federally mandated under the CWA. Permit at F-29-30. The Copermittees disagree with this finding. In this case, involuntary WQIP and JURMP requirements in addition to the de facto effluent limitations established due to the lack of a compliance pathway do not allow for regulatory choice. *Printz v. United States* (1997) 521 U.S. 898, 925; *Environmental Defense Ctr., Inc. v EPA* (2003) (2003) 344 F.3d 832, 847; *City of Abilene v. EPA* (2003) 325 F.3d 657, 662.; *New York v. United States* (1997) 505 U.S. 144, 168, 176.

In particular, the Fact Sheet states:[51]

> *Provision B includes requirements for the Copermittees to develop and implement Water Quality Improvement Plans to ultimately comply with the prohibitions and limitations under Provision A*. The Water Quality Improvement Plans will provide the Copermittees a comprehensive program that can achieve the requirements of the CWA. Implementation of the Water Quality Improvement Plans will also improve the quality of the receiving waters in the San Diego Region…..
>
> The Water Quality Improvement Plan also incorporates a program to monitor and assess the progress of the Copermittees' jurisdictional runoff management programs toward improving the quality of discharges from the MS4s, as well as tracking improvements to the quality of receiving waters. *A process to adapt and improve the effectiveness of the Water Quality Improvement Plans has also been incorporated into the requirements of Provision B to be consistent with the "iterative approach" required to achieve compliance with discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a, pursuant to the requirements of Provision A.4.*
>
> [Emphasis added]

In other words, the Water Quality Improvement Plan framework, as outlined within the Tentative Order, is established as the compliance mechanism for Provision A.4. In fact, this would complement the existing language in Provision A.4, which states (as modified below):

> Each Copermittee must achieve compliance with Provisions <u>A.1, A.2, and A.3</u> of this Order through timely implementation of control measures and other actions as specified in Provisions B and E of this Order, including any modifications. The Water Quality Improvement Plans required under Provision B must be designed and adapted to ultimately achieve compliance with Provisions <u>A.1, A2, and A.3</u>.

In addition, the WQIP should identify the high priority water quality issues and conditions and provide direction for the development and implementation of the JRMPs. The goals for the WQIPs should be clearly identified and directly linked to the JURMPs (and the corresponding flexibility provided within the development of the JURMPs) (See also Provision E).

Lastly, although Regional Water Board staff have indicated that the WQIPs, once developed and approved, will functionally replace the CLRPs and BLRPs, the Tentative Order does not formally recognize this. The County recommends that a footnote be added to clarify that this is the case.

<u>Action</u>: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Provisions, B Water Quality Improvement Plans (page 20)*

17. PROVISION B (ENTIRE PROVISION; BEGINS PAGE 20 OF 130) – THE WQIP NUMERIC GOALS ARE USED TO SUPPORT THE WQIP IMPLEMENTATION AND MEASURE PROGRESS, THEY ARE NOT ENFORCEABLE COMPLIANCE STANDARDS.

[51] Fact Sheet, Page F-42.

Similar to the footnotes in Provisions C.1.a and C.2.a, Provision B.2.e should explicitly state that the action levels, interim goals and final goals are not enforceable limitations.

Action: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Provisions, B.3.a.(1), Water Quality Improvement Goals and Schedules (page 26)*

PROVISION C – ACTION LEVELS

18. PROVISION C (ENTIRE PROVISION; BEGINS PAGE 36 OF 130) – THE TENTATIVE ORDER SHOULD ENABLE THE COPERMITTEES TO APPLY NALS/SALS THAT BASED ON THE PRIORITIES OF THE WQIP AND/OR THE IDDE PROGRAM.

Although the Tentative Order states that the Copermittees are to develop and incorporate numeric non-stormwater and numeric stormwater action levels into the Water Quality Improvement Plans (C.1 and C.2, respectively), the Tentative Order appears to contradict this approach by mandating that the Copermittees include all of the numeric actions levels as identified in tables C-1, C-2, C-3, C-4 and C-5.

The mandated action levels are problematic for the following reasons:

1) The NALs for the WQIPs will likely include different constituents and/or values than those values that would be used for the IDDE program.
2) The NALs and SALs will likely include different constituents and/or values between WQIPs depending upon the identified high priority water quality conditions.
3) In Provision B.3 the Copermittees are required to develop and use interim and final numeric goals to measure progress towards the protection of the receiving waters and beneficial uses. The choice of the numeric goals for the watershed may be biological, chemical, or physical based and may include multiple criteria and/or indicators. If the mandated values in Provision C have to be used as action levels within the WQIP, this takes away the flexibility that is should be afforded to the Copermittees. In addition, the NALs may not correspond to the highest priority water quality conditions or the metrics that should be used to measure progress. Thus, the NALs/SALs may direct resources away from the watershed priorities.
4) Source investigations must be focused on the highest priority outfalls, based on the data collected, that are most likely linked to illicit discharges.

It must also be noted that the State's own Blue Ribbon Panel, which was convened specifically to examine the feasibility of incorporating numeric effluent limits in stormwater permits, ultimately concluded that numeric limits were generally infeasible across all three stormwater activities, with few exceptions. However, the Panel did agree that "upset values" or "action levels" could be established to assist Copermittees in identifying "bad actor" catchments which are clearly above the normal observed variability.

The Copermittees had previously developed and implemented an innovative Dry Weather Reconnaissance Program, based upon statistically derived benchmarks to identify illegal discharges and illicit connections during the typically dry summer months of May through

September using a suite of water quality analytes monitored in the field at designated random and targeted drains. A comparison of the probability of an exceedance using the statistical tolerance interval-based approach compared to the NAL-based approach shows that the NALs-based approach can misdirect resources since investigations are triggered at a much higher frequency for many constituents (**Table 1**.).

Table 1. Comparison of 2011-2012 NALs Data Collected in the San Diego Region with the Data from the Dry Weather Reconnaissance Monitoring Program for the 2009-2010 Reporting Period

	NAL Exceedances 2011-2012		Dry Weather Program Action Level Exceedances 2009-2010	
Constituent	**Number**	**%**	**Number**	**%**
pH	1	2	0	0
TDS	42	93	0	0
Dissolved Oxygen	2	4	0	0
Turbidity	3	7	3	1
Surfactants	3	7	14	5
Total Coliform	24	53	0	0
Fecal Coliform	19	42	0	0
Enterococcus	42	93	0	0
Unionized Ammonia	3	7	8	3
Total N / Nitrate	41	91	0	0
Total P / Ortho PO4	38	84	11	4
Cadmium	13	28	0	0
Copper	1	2	0	0
Nickel	7	15	0	0
Zinc	1	2	0	0
Total # of Site Visits	**45**		**274**	

The Dry Weather Reconnaissance Program was specifically designed to detect "abnormal" results that are indicative of illicit discharges, typically short term, transient, non-stormwater discharges. Consequently, the Copermittees perform many more site visits but initiate fewer investigations, as they are able to discern between discharges that are most likely to be illicit and those that are not. In contrast, the NAL-based program is designed to compare urban runoff from an outfall to a water quality objective that has been established

for a receiving water. As demonstrated in the ROWD, aquatic chemistry in many parts of south Orange County results trigger exceedances of the NALs the majority of the time, which does not allow the Copermittees to differentiate between typical site conditions and true illicit discharges.

The Copermittees have monitored water quality for several years and found that naturally derived pollutants in surface waters can often exceed water quality criteria both in undeveloped catchments as well as in developed watersheds. In recent years, efforts led by the County to characterize natural sources related to ambient geology have demonstrated that natural sources in specific areas are the primary contributor for many constituents of concern such as cadmium, nickel, total dissolved solids, chloride, and sulfate. The concentration ranges measured from the natural sources are shown in the table below.

Constituent	Concentration Range	Water Quality Criterion
Arsenic	<1 - 53 ppb	36 ppb[2]
Cadmium	<1 - 200 ppb	7.3 ppb[2]
Copper	1.2 - 23 ppb	18 ppb[2]
Nickel	6.4 - 1300 ppb	169 ppb[2]
Selenium	<1 - 220 ppb	5.0 ppb[2]
Zinc	<1 - 1800 ppb	379 ppb[2]
Chloride	470 - 2400 ppm	250 ppb[1]
Sulfate	1200 - 11000 ppm	250 ppb[1]
Total Dissolved Solids	3700 - 22000 ppm	500 ppb[1]
Total Nitrogen as N	<0.1 - 38 ppm	1.0 ppb[1]

1) Basin Plan Water Quality Objective
2) California Toxics Rule, Criterion Continuous Concentration at hardness of 400 mg/L

The County is currently collaborating with the University of Southern California ("USC") to develop a modeling approach that could "fingerprint" water sources based on isotopic composition. This work will provide a much better understanding about natural and anthropogenic sources of water and contaminants to streams in south Orange County. It is key information since the Copermittees have found strong positive linear relationships between levels of metals associated with runoff and groundwater seepage from the Monterey and Capistrano marine sedimentary formations. Until this work is completed, the Copermittees will be unable to discriminate between instances of illicit discharges and conditions that are essentially artifacts of a constructed storm drain system and/or the local geology.

The conclusions from the implementation of the Orange County NAL-based program to date are:

- The NAL program replaced a previously existing and effective program (the Dry Weather Reconnaissance program);

- The Dry Weather Reconnaissance Program resulted in focused source investigations for key constituents indicative of illicit discharges;
- The NAL program has required increased resources and has resulted in everything being a priority (thus, nothing is a priority). In addition, the NAL-based triggers have, in many cases been the result of constituents attributable to natural sources within the watersheds;
- There have been many exceedances that have been due to non-IDDE factors such as local geology (especially for nickel and cadmium);
- It has been very difficult to determine the endpoints, the sources, of the various non-stormwater discharges since the discharges are so commingled; and
- There is a strong need for a regionally-based prioritization, so that there is not a mis-direction of limited resources.

Regional Board staff needs to evaluate the results of the Orange County program to date and consider the proposed revisions in order to assist with the prioritization of resources and water quality issues. As proposed, the NAL program lacks substantial evidence by which to justify If the Copermittees are required to continue to use the NAL-based program, they will lose the ability to prioritize the water quality issues and discriminate between true instances of IDDE and ambient urban conditions in a storm drain systems draining landscapes underlain by marine sedimentary formations containing phosphorous and a number of metals.

The Copermittees recommend the following in order to address these issues.

- Modify the NALs (Provision C.1) language to recognize that, for the purposes of the IDDE program, the Copermittees should be allowed to develop and/or use previously established NALs, especially if they are shown to be more effective at identifying "true" upset values and allow for a prioritization of resources.
- The mandated NALs should only be considered "default" values if the Copermittees do not develop their own NALs or use previously established values.

Action: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Provisions, B.3.a.(1), Water Quality Improvement Goals and Schedules (page 26)*
- *Provisions, C. Action Levels (page 36-43)*

PROVISION D – MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS

***19.* PROVISION D (ENTIRE PROVISION; BEGINS PAGE 47 OF 130) – THE COPERMITTEES NEED TO HAVE THE FLEXIBILITY TO DEVELOP OR USE ANALYTICAL MONITORING REQUIREMENTS IN THE WATER QUALITY IMPROVEMENT PLANS BASED ON ASSESSMENTS OF CURRENT SOURCES THAT MAY CONTRIBUTE TO THE SECTION 303(D) WATER BODY IMPAIRMENTS.**

The Regional Board should recognize the inherent difficulties associated with monitoring 303(d) constituents such as the legacy pesticides or the monitoring of aquatic toxicity. Many

existing developments were never subjected to the application of legacy pesticides such as DDT and, as such, these constituents are highly unlikely to be found in modern communities. The Regional Board should also recognize that laboratory toxicity tests provide a cumulative perspective of pollutant effects that may or may not be sampled as part of a monitoring program.

The Copermittees should be relieved of analytical monitoring requirements if supporting information can be provided to document the current pollutant concentrations or may provide historic information to support the absence of usage of these constituents in the MS4 drainage area. Additionally, the Copermittees should be allowed to develop an alternate approach for monitoring that allows the Copermittees to evaluate and identify the cause of toxicity currently affecting receiving waters and to iteratively adapt the monitoring program to address these chemical stressors in their MS4 outfall discharges through the WQIPs.

Action: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Provisions, D.2.a.(3)(e) Transitional Wet Weather MS4 Outfall Discharge Analytical Monitoring (page 65)*
- *Provisions, D.2.b.(2)(e) Non-Storm Water Persistent Flow MS4 Outfall Discharge Analytical Monitoring (page 69)*
- *Provisions, D.2.c.(5)(f) Wet Weather MS4 Outfall Discharge Analytical Monitoring (page 72)*
- *Provisions, D – Tables D-3 (page 51), D-6 (page 65), D-7 (page 70)*

PROVISION E – JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS

20. PROVISION E (ENTIRE PROVISION; BEGINS PAGE 79 OF 130) – THE JRMP PROVISIONS MUST BE MODIFIED SO AS NOT TO NEGATE THE VERY INTENT AND PURPOSE OF THE WATERSHED APPROACH AND THE FOCUS ON THE HIGHEST PRIORITIES WITHIN EACH WATERSHED MANAGEMENT AREA.

The Tentative Order states that the purpose of the WQIPs is to guide the Copermittees' jurisdictional runoff management programs towards achieving improved water quality by identifying the highest priority water quality conditions within a watershed and implementing strategies through the jurisdictional runoff management programs (Provision B).

Provision E goes on to state that the jurisdictional runoff management programs will be implemented in accordance with the strategies identified in the WQIPs. In addition, the Fact Sheet states:

> "Where the Water Quality Improvement Plan is the '*comprehensive planning process*' on a Watershed Management Area scale, requiring '*intergovernmental coordination*', the jurisdictional runoff management program document is the '*comprehensive planning process*' on a jurisdictional scale that should be coordinated with the other

> Copermittees in the Watershed Management Area to achieve the goals of the Water Quality Improvement Plan."[52]

The Fact Sheet also states:

> "Based on the economic considerations below, the San Diego Water Board has provided the Copermittees a significant amount of flexibility to choose how to implement the requirements of the Order. This Order also allows the Copermittees to customize their plans, programs, and monitoring requirements. In the end, it is up to the Copermittees to determine the effective BMPs and measures necessary to comply with this Order. The Copermittees can choose to implement the least expensive measures that are effective in meeting the requirements of this Order."[53]

Although the Fact Sheet states that "Implementation of the components of each Copermittee's jurisdictional runoff management program must be consistent with the water quality improvement strategies identified within the Water Quality Improvement Plan,"[54] the Tentative Order requires the Copermittees to incorporate <u>all</u> of the requirements identified within Provision E regardless of the high priority water quality conditions that have been identified within the WQIP. If the Copermittees are required to implement <u>all</u> of the requirements in Provision E instead of prioritizing and implementing those requirements that directly address the highest priority water quality conditions and support watershed strategies, then the program is not prioritized and focused and does not allow Copermittee discretion to tailor its WQIP. The approach in Provision E then negates the prioritized and strategic approach outlined in Provision B.

The Tentative Order should provide a clear linkage between Provision B and Provision E and state that the WQIP should guide the customization of the JRMP to meet the highest water quality priorities and strategies in a given watershed.

(See also the corresponding comments under Provision E.2, E.3. E.4, E.5, and E.7)

<u>Action</u>: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Provisions, E. Jurisdictional Runoff Management Programs (page 79)*

PROVISION E.1 - LEGAL AUTHORITY ESTABLISHMENT AND ENFORCEMENT

21. PROVISION E.1 (PAGE 79 OF 130) – THE COPERMITTEES ARE ONLY RESPONSIBLE FOR ADMINISTERING AND ENFORCING THE CODES AND ORDINANCES APPLICABLE TO THEIR JURISDICTIONS.

Provision E.1.a(2) requires the Copermittees to establish the legal authority to control the contribution of pollutants in discharges of runoff associated with industrial and construction activity within their jurisdictions. Since the Copermittees can only administer and enforce their local codes and ordinances, it is unnecessary to include the language

[52] Fact Sheet, Page F-71.

[53] Fact Sheet, Page F-17.

[54] Fact Sheet, Page F-71.

regarding the Statewide Industrial and Construction General Permits. The sites subject to the Statewide Permits (which are administered and enforced by the State and Regional Boards) are already inspected by state staff and are included within the Copermittee inventories, inspection and enforcement programs.

In addition, language that acknowledges that local codes and ordinances will include the legal authorities identified within the Tentative Order to the extent permitted by the Constitution should be included.

Action: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Provisions, E.1.a.(2) Legal Authority Establishment and Enforcement (page 79)*
- *Provisions, E.1.a.(10) Legal Authority Establishment and Enforcement (page 80)*

22. PROVISION E (ENTIRE PROVISION; BEGINS PAGE 79 OF 130) – THE REQUIREMENT FOR THIRD PARTY BMP EFFECTIVENESS DOCUMENTATION IS DUPLICATIVE.

The Tentative Order includes a provision that requires the Copermittees to demonstrate that they have the legal authority to require documentation on the effectiveness of BMPs.

As it is currently written, this provision broadly applies to any aspect of the stormwater program where BMPs have been implemented – the result is that this provision sets up a process for the establishment of multiple third party monitoring programs and expenditure of significant public funds to monitor the effectiveness of BMPs. If the Regional Board's desire is to document the effectiveness of certain types of BMPs, it would be more effective and scientifically defensible to establish special studies by entities qualified to conduct such sampling instead of requiring potentially hundreds of third parties to conduct a monitoring program for every BMP that is implemented.

This provision is redundant with other requirements in the Tentative Order in that it ignores the fact that the New Development/Significant Redevelopment section of the Drainage Area Management Plan (DAMP) (Section 7.0) establishes a process for the selection, design, and long-term maintenance of permanent BMPs for new development and significant redevelopment projects and requires developers to select BMPs that have been demonstrated as effective for their project category.

This provision also ignores the fact that the Copermittees have already established legal authority for their development standards, so that project proponents have to incorporate and implement the required BMPs.

Action: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Provisions, E.1.a.(8) Legal Authority Establishment and Enforcement (page 80)*

PROVISION E.2 - ILLICIT DISCHARGE DETECTION AND ELIMINATION

23. PROVISION E.2 (PAGE 81 OF 130) – THE ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM PROVISIONS MUST BE MODIFIED SO AS NOT TO NEGATE THE VERY INTENT AND PURPOSE OF THE WATERSHED APPROACH AND THE FOCUS ON THE HIGHEST PRIORITIES WITHIN EACH WATERSHED MANAGEMENT AREA.

(See the corresponding comments under Provision E – Jurisdictional Runoff Management Programs)

Action: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Provisions, E.2 Illicit Discharge Detection and Elimination (page 81)*

24. PROVISION E.2 (PAGE 81 OF 130) – THE COPERMITTEES SHOULD BE ALLOWED THE FLEXIBILITY TO PRIORITIZE THEIR IDDE PROGRAM TO FOCUS ON THOSE NON-STORMWATER DISCHARGES THAT ARE LIKELY TO BE A SOURCE OF POLLUTANTS.

Provision E.2.a identifies several categories of discharges that are to be considered "non-stormwater discharges" (do not need to be addressed as an illicit discharge). The categories include the following:

- E.2.a.(1) and E.2.a.(2) - Those discharges which have coverage under a separate NPDES Permit;
- E.2.a.(3) - Those discharges which are recognized within the federal regulations as acceptable unless they are identified as a source of pollutants to the receiving waters;
- E.2.a.(4) - Those discharges that are addressed by a set of requirements/BMPs; and
- E.2.a.(5) - Firefighting related discharges that are addressed by a set of requirements/BMPs.

In comparison, 40 C.F.R § 122.26(d)(2)(iv)(B)(1) states that, as a part of an illicit discharge program, the Copermittees shall incorporate a series of items including the following:

> A description of a program, including inspections, to implement and enforce an ordinance, orders or similar means to prevent illicit discharges to the municipal separate storm sewer system; this program description shall address all types of illicit discharges, <u>however the following category of non-storm water discharges or flows shall be addressed where such discharges are identified by the municipality as sources of pollutants to waters of the United States</u>: [Emphasis added and items re-ordered based on Tentative Order (TO) structure]
>
> - landscape irrigation, [not included in TO]
> - irrigation water, [not included in TO]
> - lawn watering, [not included in TO]
> - street wash water [not included in TO]
> - *uncontaminated pumped ground water, [E.2.a.(1)]*
> - *foundation drains, [E.2.a.(3)]; [E.2.a.(1)]*
> - *water from crawl space pumps, [E.2.a.(1)]*
> - *footing drains, [E.2.a.(3)]; [E.2.a.(1)]*
> - water line flushing, [E.2.a.(2)]
> - diverted stream flows, [E.2.a.(3)]

- rising ground waters, [E.2.a.(3)]
- springs, [E.2.a.(3)]
- uncontaminated ground water infiltration (as defined at 40 CFR 35.2005(20)) to separate storm sewers, [E.2.a.(3)]
- flows from riparian habitats and wetlands, [E.2.a.(3)]
- discharges from potable water sources, [E.2.a.(3)]
- air conditioning condensation, [E.2.a.(4)]
- individual residential car washing, [E.2.a.(4)]
- dechlorinated swimming pool discharges, and [E.2.a.(4)]

(program descriptions shall address discharges or flows from firefighting [E.2.a.(5)] only where such discharges or flows are identified as significant sources of pollutants to waters of the United States);

Although the discharges listed within the Federal Regulations are generally considered to be conditionally exempt from the illicit discharge program (unless they are found to be sources of pollutants), the Regional Board has determined that the following categories of non-stormwater discharges

- uncontaminated pumped ground water [E.2.a.(1)]
- foundation drains [E.2.a.(3)]; [E.2.a.(1)]
- water from crawl space pumps [E.2.a.(1)]
- footing drains [E.2.a.(3)]; [E.2.a.(1)]

will be considered to be illicit discharges unless the discharge has coverage under the following two NPDES Permits (NPDES Permit No. CAG919001 (Order No. R9-2007-0034 and NPDES Permit No. CAG919002 (Order No. R9-2008-002)

The County would submit, however, that it is unnecessary to move these discharges (uncontaminated pumped groundwater, foundation drains, water from crawl space pumps, and footing drains) from the E.2.a.(3) category to the E.2.a.(1) category and require them to obtain coverage under one of these two permits for the following reasons:

- There is no technical basis or demonstrated water quality concern that justifies the need for these discharges to obtain coverage under these permits;
- The two permits are clearly defined for groundwater extraction activities where there is groundwater containing or potentially containing petroleum hydrocarbons, solvents, or other pollutants (in fact, one of the categories of discharges required to obtain coverage is '<u>uncontaminated</u> pumped groundwater');
- One of the permits is clearly defined for temporary discharges, not permanent discharges; and
- The categories of discharges are non-stormwater discharges that are generally not expected to be a source of pollutants to receiving waters.

Action: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Provisions, E.2 Illicit Discharge Detection and Elimination (page 81)*
- *Provisions, E.2a.(1) Illicit Discharge Detection and Elimination (page 81)*
- *Provisions, E.2a.(3) Illicit Discharge Detection and Elimination (page 82)*
- *Provisions, E.2a.(4) Illicit Discharge Detection and Elimination (page 82)*

25. PROVISION E.2.A.(5) (PAGE 83 OF 130) – THE FIRE FIGHTING BMP PROVISIONS SHOULD REFLECT THE LANGUAGE INCLUDED IN THE CURRENT ORANGE COUNTY PERMIT.

Provision E.2.a includes a requirement for the Copermittees to establish BMPs for both emergency and non-emergency firefighting activities. While the Copermittees already have established guidelines for non-emergency firefighting activities, it is unclear why the approach and language in the Tentative Order regarding the emergency firefighting activities has been modified from Order R9-2009-0002. In fact, the language in the Tentative Order is actually inconsistent with the Phase I Final Rule (55 FR 48037), which states:

> "In the case of firefighting <u>it is not the intention of these rules to prohibit in any circumstances</u> the protection of life and public and private property through the use of water or other fire retardants that flow into separate storm sewers." [Emphasis added]

Thus, there should not be a circumstance in which the Copermittees or the Regional Board would identify emergency firefighting discharges as illicit discharges or a significant source of pollutants to receiving waters. The language previously adopted by the Regional Board in Order R9-2009-0002 regarding emergency firefighting discharges is recommended.

Action: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Provisions, E.2.a.(5) Non-Storm Water Discharges (page 83)*

26. PROVISION E (ENTIRE PROVISION; BEGINS PAGE 81 OF 130) – THE TENTATIVE ORDER SHOULD NOT REQUIRE THE REDUCTION OR ELIMINATION OF ALL NON-STORMWATER DISCHARGES AS A PART OF THE IDDE PROGRAM .

Federal regulations include two provisions designed implement the "effective prohibition"[55] of Clean Water Act Section 402(p)(3)(B)(ii)

- The first provision requires Copermittees to perform a screening analysis, intended to provide sufficient information to develop priorities for a program to detect and remove illicit discharges.[56]

[55] 55 Fed. Reg. 47989, 48037.

[56] 40 CFR § 122.26(d)(1)(iv)(D).

- The second provision requires Copermittees to develop a recommended site-specific management plan to detect and remove illicit discharges (or ensure they are covered by an NPDES permit) and to control improper disposal to MS4s.[57]

Therefore, Provision E.2.a(7) misapplies the federal regulations that require the Copermittees to identify the non-stormwater discharge as an illicit discharge prior to having an obligation to effectively prohibit it. There is not a presumption to reduce or eliminate it otherwise.

Action: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Provisions, A.1. Discharge Prohibitions (page 20)*
- *Provisions, E.1. Legal Authority Establishment and Enforcement (page 79)*
- *Provisions, E.2. Illicit Discharge Detection and Elimination (page 81)*

PROVISION E.3 – DEVELOPMENT PLANNING

The Tentative Order's land development requirements are some of the most challenging requirements in the Tentative Order. Indeed, a number of the land development requirements, particularly hydromodification controls, potentially pose federal constitutional issues as well as conflict with the CWA, the State Administrative Procedure Act, California Environmental Quality Act (CEQA), the Mitigation Fee Act and federal court decisions.

The following discussion examines the overarching legal concerns with the land development requirements, and is followed by specific technical analyses for individual requirements.

a. Land Development Requirements Expose the Copermittees to Significant Litigation Risk And Will Be Largely Unenforceable.

Many of the land development requirements, such as hydromodification, pose constitutional issues either exposing municipalities to litigation and/or will result in municipalities being unable and unwilling to implement such requirements. Specifically, but not limited to, Orange County is most concerned with the provisions: 1) ultimately requiring Copermittees to compel development projects that have no impact on hydromodification to implement on-site or alternative compliance hydromodification mitigation measures, 2) using pre-development (naturally occurring) runoff reference condition as applied to sites that are, in fact, developed, and 3) ***STREAM***, channel and habitat restoration.

The Copermittees are concerned that implementing these requirements has the potential to subject the Copermittees to liability under the Takings Clauses of the U.S. and California Constitutions and violate the Mitigation Fee Act because of the questionable nexus between a project's impacts on hydromodification and the hydromodification management measures in the Tentative Order. When imposing a condition on a development permit, a local government is required to establish that the condition bears a reasonable relationship to the impacts of the project. This rule applies evenly to legislatively enacted requirements and

[57] 40 CFR §§ 122.26(d)(1)(iv)(D) and 122.26(d)(2)(B).

impact fees or exactions.[58] Moreover, fees imposed on a discretionary ad-hoc basis are subject to heightened scrutiny under a two-part test. First, local governments must show that there is a substantial relationship between the burden created by the impact of development and any fee or exaction.[59] Second, a project's impacts must bear a rough proportionality to any development fee or exaction.[60] Under California law and a recent U.S. Supreme Court opinion, the *Nollan/Dolan* heightened scrutiny test also applies to in-lieu fees.[61]

The Legislature has memorialized these requirements in the Mitigation Fee Act, which establishes procedures that local governments must follow to impose impact fees.[62] Irrespective of whether the hydromodification management requirements are implemented by legislative act or on an ad-hoc basis, the Copermittees attempt to enforce them as proposed in the Tentative Order will likely result in claims alleging unconstitutional takings of private property and violations of the Mitigation Fee Act. This is because a developer could argue that limiting hydromodification impacts of already developed property to its naturally occurring state, or requiring hydromodification mitigation measures for impacts not imposed by the project, would not have a legally sufficient nexus to the impact of the development project.

Additionally, CEQA does not allow a local government discretionary approval to require over-mitigation of a project. The CEQA Guidelines provide that "a lead agency for a project has the authority to require feasible changes in any or all activities involved in the project in order to substantially lessen or avoid significant effects on the environment, consistent with applicable constitutional requirements such as the 'nexus' and 'rough proportionality' standards established by case law."[63] Thus, Copermittees would most assuredly be exposed to CEQA challenges, which are the most prevalent lawsuits against projects.

In all likelihood, municipalities will not risk constitutional challenges and the high litigation costs of such challenges, but will instead exempt projects from certain requirements or limit their applicability based on documented technical and legal reasons. Such actions then would only be addressed through a Regional Board audit years after a project has been approved and developed. Therefore, predevelopment runoff reference conditions and stream, channel and habitat restoration requirements should be eliminated in their entirety.

b. Stream, Channel and Habitat Restoration Cannot Be Required Due to Conflicts with Federal and State Laws.

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[58] *Building Ass'n Industry v. City of Patterson*, 171 Cal. App. 4th 886, 898 (2009).

[59] *Nollan v. Calif. Coastal Comm'n*, 483 U.S. 825, 837 (1987).

[60] *Dolan v. City of Tigard*, 512 U.S. 374, 391 (1994).

[61] *Ehrlich v. City of Culver City*, 12 Cal. 4th 854, 876 (1996).

[62] Gov't Code §§ 66000-66025.

[63] Cal. Code Regs. Tit. 14, § 15041 (citing *Nollan/Dolan*).

The Tentative Order requires stream, channel and habitat restoration and/or retrofitting depending on certain land development projects. The prior analysis above discussed the litigation risk to which municipalities will be exposed. The following discussion focuses on the direct conflicts with federal and state laws that also prohibit such requirements.

The objective of the CWA is to restore and maintain the chemical, physical and biological integrity of the Nation's waters.[64] In carrying out this objective, Section 402(p) requires municipalities to reduce the discharge of pollutants from the MS4 to the MEP standard. The Tentative Order, however, goes well beyond the Congressional intent of the CWA to only address pollutants by requiring both Copermittees and the property owners to restore and/or retrofit streams, channels and habitat, with no technical evidence as to how this will reduce the discharge of pollutants to MEP or under what legal authority these requirements can be imposed.

Not only do such requirements go beyond MEP, but go beyond the scope of the CWA's focus on pollutant reduction. First, there is no evidence in the Order for how restoration requirements reduce pollutants from leaving the MS4. Second, in a recent decision in the Eastern District of Virginia, a federal court has held that the EPA has no authority under the Clean Water Act to regulate non-pollutants.[65] Restoration as described in the Tentative Order does not regulate pollutants directly, but requires costly over-mitigation by project proponents to do more than address pollutants by restoring streams, channels and habitat to a subjective, predevelopment standard. Essentially, the Tentative Order uses restoration as a surrogate for pollutants, and tries to unlawfully regulate the flow of water, not pollutants themselves.

Under state law, the Orange County Flood Control District has been delegated authority by the Legislature to construct flood control channels and infrastructure to protect life and property. Under this authority, the Orange County Flood Control District has exclusive authority to control the flow of water in these channels. Although the State and Regional Boards may have some ability to impose conditions that impact volumetric flows (which is now called into question by the VDOT case), this authority does not extend to NPDES permits.[66] Returning channels to natural conditions impinges on municipal flood control authority as removing concrete and performing other restoration efforts would alter the flow of water in those channels.

Engineered channels serve the public health and safety through flood control protection. A significant portion of Orange County lies in a flood plain whereby property owners are required to carry flood insurance. Concrete channels are used to better control the flow of water and minimize flooding and reduce insurance premiums. State courts have long recognized that residents living near flood control improvements have a right to rely on the

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[64] CWA § 101(a).

[65] *Virginia Dept. of Transportation v. EPA*, No. 1:12-CV-775, slip op. (E.D. Va. Jan. 3, 2013) ("VDOT").

[66] *S.D. Warren Co. v. Me. Bd. of Envtl. Prot.*, 547 U.S. 370 (2006); *PUD No.1 v. Washington Dep't of Ecology*, 511 U.S. 700 (1994).

current standards of a particular channel to protect against flooding.[67] Restoring a stream or channel to a natural state would not ensure against flooding as engineering is used to ensure that stormwater is controlled to certain patterns. Many developments are built up to flood control channels, and thus, restoration would expose residents to threats of flood, potential property damage and loss of life and expose municipalities to claims of inverse condemnation and other torts based on relied upon flood control protections by the public. Restoration in some cases would also require use of eminent domain authority, which the State cannot require municipalities to exercise.

27. PROVISION E.3 (PAGE 94 OF 130) – THE DEVELOPMENT PLANNING PROVISIONS MUST BE MODIFIED SO AS NOT TO NEGATE THE VERY INTENT AND PURPOSE OF THE WATERSHED APPROACH AND THE FOCUS ON THE HIGHEST PRIORITIES WITHIN EACH WATERSHED MANAGEMENT AREA.

See the corresponding comments under Provision E – Jurisdictional Runoff Management Programs.

Action: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Provisions, E.3. Development Planning (page 94)*

28. PROVISION E.3 (PAGE 98 OF 130) – PORTIONS OF REDEVELOPMENT PROJECTS THAT ALREADY HAVE WATER QUALITY TREATMENT BMPS SHOULD NOT BE SUBJECT TO THE NEW PDP REQUIREMENTS.

Some redevelopment projects already have portions of the project that were subject to previous permit PDP requirements. These portions of redevelopment that were subject to prior PDP requirements should not be subject to the new PDP requirements as these projects already have water quality treatment. Such an approach is consistent with the Los Angeles and Ventura MS4 permits.

Action: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Provisions, E.3.b.(2) Special Considerations for Redevelopment Projects (page 98)*

29. PROVISION E.3 (PAGE 98 OF 130) – THE REGIONAL PERMIT SHOULD INCLUDE A PRIORITY DEVELOPMENT PROJECT EXEMPTION FOR FLOOD CONTROL AND STREAM RESTORATION PROJECTS.

Exemptions should be added for flood control and stream restoration projects as these projects do not meet the intent of requiring treatment for land development projects as they are not a source of pollutants, and can actually be defined as mitigation projects.

Action: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Provisions, E.3.b.(3) Priority Development Project Exemptions (page 98)*

[67] *Arreola v. County of Monterey*, 99 Cal.App.4th 722 (2002).

30. PROVISION E.3 (PAGE 98 OF 130) – THE REGIONAL PERMIT SHOULD INCLUDE A PRIORITY DEVELOPMENT PROJECT EXEMPTION FOR EMERGENCY PUBLIC SAFETY PROJECTS WHERE A DELAY DUE TO A STANDARD STORMWATER MITIGATION PLAN (SSMP) WOULD COMPROMISE PUBLIC SAFETY, PUBLIC HEALTH AND/OR THE ENVIRONMENT.

An exemption should be added for emergency public safety projects where a delay due to a Standard Stormwater Mitigation Plan (SSMP) would compromise public safety, public health and/or the environment. In reality, emergency projects will be implemented immediately where public safety, public health and/or the environment is threatened. There will be no time for the development, processing and plan check and revisions of a SSMP prior to these projects. Emergency projects are provided exempt status in many other MS4 permits including the OC Santa Ana Region Permit (Order No. R8-2009-0030 – Section XII.B.2.j) and the Los Angeles County MS4 Permit (Order R4-2012-0175 – Section VI.D.7.b.ii.c.(i)).

Action: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Provisions, E.3.b.(3) Priority Development Project Exemptions (page 98)*

31. PROVISION E.3.C (PAGE 98 OF 130) – FLEXIBILITY SHOULD BE PROVIDED TO THE STRUCTURAL BMP PERFORMANCE STANDARDS IF WATERSHED-SPECIFIC PERFORMANCE STANDARDS ARE DEVELOPED IN THE WATER QUALITY IMPROVEMENT PLANS.

Utilizing the watershed approach, it is conceivable that the Water Quality Improvement Plans will identify an alternate performance standard than do the provisions in E.3.c. . To fully realize the watershed approach, the Copermittees should be given the opportunity to develop alternative BMP performance standards consistent with the goals and objectives developed in the Water Quality Improvement Plans.

Action: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Provisions, E.3.c Priority Development Project Structural BMP Performance Requirements (page 98)*

32. PROVISION E.3 (PAGE 98 OF 130) – TERMINOLOGY IS INCONSISTENT ESPECIALLY WITH THE USE OF LOW IMPACT DEVELOPMENT BMPS AND SHOULD BE MODIFIED.

Provision E.3.c. specifies the requirements for structural BMPs. Furthermore, Provision E.3.c.(1) introduces the concepts for onsite structural BMPs and LID BMPs. The County recommends that the Tentative Order be modified to provide more consistency in terminology. The County views LID as a strategy of BMPs that is used to mimic preproject water balance. (See Provision E.3.a(3)). There is also no single definition for LID BMPs that has gained widespread recognition. Although Attachment C includes a definition for LID BMPs, this definition is not widely accepted. LID is rather a concept (the Attachment C definition does adequately capture this concept) made up of various non-structural and structural BMPs. While the onsite BMP requirements should be defined (*e.g.*, retention of the 85% storm) the Tentative Order could be greatly simplified by avoiding multiple terms and uses. The County has provided suggested edits throughout the Development Planning provision to provide better consistency.

33. PROVISION E.3.C (PAGE 100 OF 130) – IF PROJECTS USE ALTERNATIVE COMPLIANCE CONVENTIONAL BMPS SHOULD NOT BE ALSO REQUIRED ONSITE.

Section E.3.c.(1)(c) requires that if projects use alternative compliance, conventional BMPs must also be implemented onsite. Although the Fact Sheet identifies that the intent of this provision is to reduce the pollutants onsite to the MEP there is not adequate technical justification for effectively requiring additional mitigation. This provision requires additional mitigation for projects, and in effect, requires double mitigation that goes well beyond the MEP standard. Providing mitigation offsite for the PDP requirements offsite in itself is adequate to meet the MEP standard.

Action: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Provisions, E.3.c.(1) Storm Water Pollutant Control BMP Requirements (page 100)*

34. PROVISION E (ENTIRE PROVISION; BEGINS PAGE 94 OF 130) – THE HYDROMODIFICATION MANAGEMENT REQUIREMENTS SHOULD BE BASED ON A WATERSHED MANAGEMENT APPROACH, BE CONSISTENT WITH THE WQIPS, AND CONSIDER THE CURRENT COPERMITTEE HMPS.

Hydromodification management should be based on the conditions of receiving waters and on the impacts and potential impacts from development projects. The basis to make hydromodification management decisions needs to be an understanding of the watershed and the receiving waters within a watershed. Understanding a watershed is achieved through watershed analysis and analysis of the susceptibility of the receiving waters to hydromodification impacts. This approach of watershed analysis is identified in the Southern California Coastal Water Research Project ("SCCWRP") Technical Report 667 – *Hydromodification Assessment and Management in California* **(Appendix A-2).** The SCCWRP report identifies that watershed analysis is the first step and most critical step in the development of watershed hydromodification management. The SCCWRP report concluded that hydromodification management is not a one size fits all approach, but needs to consider watershed analysis. This was also concluded by the authors of the SCCWRP report at the Hydromodification Management Meeting in August of 2012 and by State Board staff at the California Stormwater Quality Association (CASQA) General Meeting on January 10, 2012. The Tentative Order hydromodification requirements are, however, a one size fits all approach as the requirements do not allow consideration of watershed analysis or receiving water information.

The County believes the best way to implement the vision of the SCCWRP Report for development of effective hydromodification management is to develop clear hydromodification management objectives that are watershed specific and developed through a stakeholder process. The intent of the WQIPs is to improve water quality in the WMAs based on the highest priorities for water quality in the watershed. Unless more is known about the watersheds and their receiving waters, however, including their susceptibility to hydromodification, the appropriate standards and performance criteria cannot be identified. The WQIPs can build on the current Hydromodification Management Plans (HMPs) that have been developed and can use additional watershed and receiving waters information to develop appropriate watershed specific hydromodification standards

and where they should apply in a specific watershed. Instead of hydromodification requirements that do not consider specific watershed analysis and conditions of receiving waters and that were developed unilaterally by Regional Board staff, the County suggests that watershed specific requirements be developed as part of the WQIPs as part of a watershed stakeholder process.

Matching pre-development (naturally occurring) flow rates and duration is identified as the performance standard for hydromodification management. The purpose of the CWA does is not to restore waters to pre-Columbian (pre-development) conditions. Rather, the objective must be taken in context of section 402(p) and reflect the stormwater compliance standard to reduce pollutants to the maximum extent practicable. The hydromodification standard should reflect the developed urban environment. To do otherwise would negate the engineering efforts done to date to protect life and property from floods and create an impractical solution for municipalities. Furthermore, the current hydromodification standard as provided for in numerous municipal permits in California is to match post development with "pre-project" conditions. The current pre-development standard goes well beyond federal law with no technical justification and can only be adopted under state authority.

Hydromodification effects may also be caused from other sources that are not in the Copermittees' jurisdiction. Initial implementation of the pre-development (naturally occurring) hydromodification performance standard has identified that BMPs to comply with the standard are of significant size even for smaller projects. Implementing the hydromodification requirements can disturb a significant area of land, which has its own environmental impacts, including changing the natural hydrology. This is antithetical to the LID concept. This can also cause a decrease in open space, which is in conflict the Orange County General Plan requiring certain thresholds of open space for developments. For smaller redevelopment projects and other infill projects, it may not be technically or economically feasible to build these projects, and will be a lost opportunity to improve water quality through implementation of LID requirements.

In addition, identifying "naturally occurring" conditions for redevelopment sites is difficult and entirely subjective, as in most cases there are no historical records of the natural condition of the site, raising whether there is a technical question as to how far back a Copermittee goes historically in determining the proper predevelopment timeframe. In cases where natural conditions of a site are not known, the best approach is to use an undeveloped natural site in proximity to the re-development site as a reference site. The vegetative cover, soil type and slope will most affect the hydrology of a site and so approximating these conditions for a redevelopment site using a natural reference site where these parameters can be measured is a way to approximate the natural conditions of a redevelopment site. Locating a natural reference site in proximity to a redevelopment site is difficult, however, as the entire sub-watershed or watershed may be developed. Additionally the conditions of the natural reference site may be much different than the "naturally occurring" conditions of the redevelopment site as vegetative cover, soil type and slope may have been very different. Without historical records, there is no way of knowing the actual "naturally occurring" conditions of a redevelopment site. The subjectivity of the pre-development approach not only puts municipalities in a position to violate the U.S. and California Constitutions on unlawful takings, but it also conflicts with the Mitigation Fee

Act, CEQA and the State Administrative Procedure Act in that the Tentative Order does not contain an adequate record justifying the reasonableness of this standard.

The County is therefore suggesting an approach to hydromodification management that is not a one size fits all approach, is consistent with the watershed approach and the intent of the WQIPs, considers the current Copermittee HMPs, and provides an opportunity to develop watershed specific requirements as part of a watershed stakeholder process that have the best chance of improving water quality.

Action: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Provisions, E.3.c.(2) Hydromodification Management BMP Requirements (page 100)*

35. PROVISION E.3.C (PAGE 99 OF 130) – BIOFILTRATION BMPS SHOULD BE SIZED FOR THE DESIGN CAPTURE VOLUME AND IF USED FOR ALTERNATIVE COMPLIANCE CONVENTIONAL BMPS SHOULD NOT ALSO BE REQUIRED.

Section E.3.c.(3)(b)(i)[c] requires that if biofiltration is used as an alternative compliance method, the biofiltration BMP is required to be sized to 1.5 times the design capture volume. This is an increase from the prior Orange County permit. The Fact Sheet provides no technical justification for the 1.5 factor.

Studies based on work conducted within Orange County by Geosyntec Consultants provide information contrary to the unsupported inclusion of a 1.5 factor. The following documents are submitted for the record at Appendix A-3 & Appendix A-4.

Storage and Reuse Systems for Stormwater Management – Preliminary Cost and Performance Estimates for Residential Use in Irvine, CA, Eric Strecker (2009 presentation to Santa Ana Regional Board). Assessed the costs and modeled the performance of harvest and use retention BMPs and compared average annual total suspended solids (TSS) load removed and annual TSS concentrations with BMPs. In both scenarios presented, biofiltration provided superior TSS results to harvest and use.

The Water Report Issue #65: Stormwater Retention on Site, An Analysis of Feasibility and Desirability.[68] The paper identified significant limitations with all retention BMPs and states, "There needs to be a more technical vetting of "retain on site" and stormwater harvest and use before these approaches are made mandatory." The authors also caution that a "one size fits all" approach requiring retention may not be desirable and "in many cases would lead to undesirable results."

Based on the above information, the requirement to oversize biofiltration BMPs should be deleted from the Tentative Order. Biofiltration should be considered equivalent to other retention BMPs and should remain a full part of the LID toolbox without penalization.

Section E.3.c.(3)(b)(i)(d) requires that PDPs that use biofiltration as an alternative compliance option must also implement conventional BMPs. This provision requires additional mitigation for projects and in effect requires double mitigation when it is not needed. Biofiltration BMPs are more effective than conventional BMPs, and requiring both does not make technical sense . Furthermore the Fact Sheet provides no technical

[68] Eric Strecker and Aaron Poresky (2009).

justification for requiring conventional treatment in addition to biofiltration and this is not the standard in the current Orange County and Riverside permits or any other permits in California.

Action: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Provisions, E.3.c.(1) Storm Water Pollutant Control BMP Requirements (page 99)*

36. PROVISION E.3.C (PAGE 102 OF 130) – THE REGIONAL PERMIT INADVERTENTLY CREATES A TIMING GAP IN COVERAGE FOR EXEMPTIONS TO HYDROMODIFICATION REQUIREMENTS.

A strict reading of the revised permit section E.3.c.(2)(e) suggests that there could be a lapse of the exemptions for engineered channels and the large river even if the WMA Analysis supports keeping the exemptions because once the BMP design manual is submitted with WQIP the interim exemptions appear to expire and it could be some time before the Regional Board approves the WQIP and the WMA Analysis supporting keeping the interim exemptions. We suggest that clarification be provided that notes that the interim timeframe exemptions are in place until the Board approves the BMP Design Manual.

Action: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Provisions, Development Planning E.3.c.(2)(e) - (page 102)*

37. PROVISION E.3.C (PAGE 104 OF 130) – THE COPERMITTEES SHOULD BE ALLOWED THE FLEXIBILITY PROVIDED UNDER EPA POLICY TO DEVELOP A TRADING AND WATER QUALITY CREDIT SYSTEM.

The Copermittees appreciate the flexibility of the Tentative Order to implement a water quality credit system as an alternative compliance schedule. Trading systems create cost-effective, market-based mechanisms for pollutant reduction, and have been successful in other water quality and air quality contexts. The Copermittees note that any water quality trading system should be implemented in accordance with EPA's 2003 Final Water Quality Trading Policy, which allows for flexibility in generating and trading credits and offsets. The Tentative Order appears to limit a trading system to no net impacts caused by projects meeting the onsite structural BMP performance requirements of Provisions E.3.c(1) and E.3.c(2).

The Copermittees request that this language be stricken and that Copermittees be allowed the flexibility provided under the EPA 2003 Policy. Trading systems differ from program to program and are highly robust and complex credit mechanisms. Therefore, no net impact limitations should be addressed on a case-by-case basis subject to Executive Office approval, and should not immediately be limited by permit language, as certain projects may offer other significant environmental benefits.

Action: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Provisions, Development Planning E.3.c.(3)(d) - (page 104)*

PROVISION E.4 – CONSTRUCTION MANAGEMENT

38. PROVISION E.4 (PAGE 104 OF 130) – THE CONSTRUCTION MANAGEMENT PROGRAM PROVISIONS MUST BE MODIFIED SO AS NOT TO NEGATE THE VERY INTENT AND PURPOSE OF THE WATERSHED APPROACH AND THE FOCUS ON THE HIGHEST PRIORITIES WITHIN EACH WATERSHED MANAGEMENT AREA.

See the corresponding comments under Provision E – Jurisdictional Runoff Management Programs.

Action: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Provisions, E.4. Construction Management (page 104)*

PROVISION E.5 – EXISTING DEVELOPMENT MANAGEMENT

39. PROVISION E.5 (PAGE 108 OF 130) –THE EXISTING DEVELOPMENT PROGRAM PROVISIONS MUST BE MODIFIED SO AS NOT TO NEGATE THE VERY INTENT AND PURPOSE OF THE WATERSHED APPROACH AND THE FOCUS ON THE HIGHEST PRIORITIES WITHIN EACH WATERSHED MANAGEMENT AREA.

(See the corresponding comments under Provision E – Jurisdictional Runoff Management Programs)

Action: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Provisions, E.5. Existing Development Management (page 108)*
- *Provisions, E.5.b Existing Development BMP Implementation and Maintenance (page 110)*

40. PROVISION E.5.E (PAGE 116 OF 130) – REMOVE THE REQUIREMENT TO EVALUATE RETROFIT OF STREAM CHANNELS FROM THE TENTATIVE ORDER.

It is not the responsibility of the Copermittees to restore receiving waters, but rather reduce the discharge of pollutants in stormwater and non-stormwater to the maximum extent practicable.

Action: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Provisions, E.5.e.(2) Stream, Channel and/or Habitat Rehabilitation in Areas of Existing Development (page 115)*

PROVISION E.6 – ENFORCEMENT RESPONSE PLANS

41. PROVISION E.6 (PAGE 116 OF 130) – THE COPERMITTEES SHOULD BE ALLOWED TO UTILIZE EXISTING GUIDELINES AND PROCEDURES FOR ENFORCEMENT.

As a part of the development and implementation of a robust Illegal Discharge/Illicit Connection (ID/IC) Program, the Copermittees have developed an *Investigative Guidance Document* and *Enforcement Consistency Guide* ("Guide"). The Tentative Order should be modified to allow the Copermittees to continue to use and implement established, equivalent guidelines and procedures for enforcement.

Action: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Provisions, E.6 Enforcement Response Plans (page 116)*

42. PROVISION E.6.D (PAGE 118 OF 130) – THE TERM AND DEFINITION FOR "ESCALATED ENFORCEMENT" SHOULD BE REDEFINED.

Although Provision E.6.d requires each Copermittee to include "Escalated Enforcement" in the required Enforcement Response Plan, the definition of what is intended by "Escalated Enforcement" is different within the Tentative Order than the Fact Sheet and may not be enforceable.

The Tentative Order defines "Escalated Enforcement" as "any enforcement scenario where a violation or other non-compliance is determined to cause or contribute to the highest water quality conditions identified in the Water Quality Improvement Plan." This definition seems to indicate that a Copermittee may enforce differently in a particular situation if it involves a high priority pollutant of concern. Not only does the County take exception to the notion that they would enforce differently solely based on the constituent involved, the legality of such an enforcement action is questionable. In fact, when selecting enforcement options, the Copermittee must ensure that violations of a similar nature are subjected to similar-types of enforcement remedies in order to avoid any claim of selective enforcement of the Ordinance.

However, the Fact Sheet seems to indicate that "Escalated Enforcement" would instead require the Copermittee to "take progressively stricter response to enforce its legal authority and achieve compliance…." The County supports this approach, especially since this is consistent with other ID/IC programs in California and the established guidance that has been developed and implemented by the Copermittees. In fact, the established guidance recognizes that a more severe enforcement option may be selected when a violator has either a history of noncompliance or has failed to take good faith actions to eliminate continuing violations or to meet a previously imposed compliance schedule. Ultimately, enforcement is in the prosecutorial discretion of the Copermittee.

The Tentative Order should be modified as indicated below so that it reflects a standard progressive response approach.

Action: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Provisions, E.6.d Escalated Enforcement (page 118)*
- *Attachment C*

PROVISION E.7 – PUBLIC EDUCTION AND PARTICIPATION

43. PROVISION E.7 (PAGE 118 OF 130) – THE PUBLIC EDUCATION PROGRAM PROVISIONS MUST BE MODIFIED SO AS NOT TO NEGATE THE VERY INTENT AND PURPOSE OF THE WATERSHED APPROACH AND THE FOCUS ON THE HIGHEST PRIORITIES WITHIN EACH WATERSHED MANAGEMENT AREA.

See the corresponding comments under Provision E – Jurisdictional Runoff Management Programs.

Action: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Provisions, E.7 Public Education and Participation (page 118)*
- *Provisions, E.7.a Public Education (page 119)*

PROVISION F – REPORTING

44. PROVISION F (ENTIRE PROVISION; BEGINS PAGE 121 OF 130) – THE PROCESS FOR THE DEVELOPMENT AND UPDATES OF THE VARIOUS PLANS NEEDS TO BE ALIGNED AND ALLOW FOR THE TIME NECESSARY TO COMPLETE THE WORK AND TO SUBMIT THE ROWD.

Provision F includes requirements for the documents and reports that Copermittees must prepare and provide to the Regional Board. This provision incorporates significantly expanded requirements for public participation and involvement in the development and implementation of the WQIPs and JRMPs.

However, the timeframe outlined in this section links each step of the development of the WQIP and JRMP to the commencement of coverage under the Order instead of to the development step that precedes it. The three steps outlined for the development of the WQIP need to be sequential so that the Copermittees have adequate time to complete each step and build the program based on comments received. In addition, the timeframe needs to explicitly incorporate adequate time for the Copermittees to review and respond to comments received on the current action before moving on to the next step of development. For example, it is unclear how the Copermittees would establish their water quality improvement strategies (step 2 of development) at the same time as the establishment of the priority water quality conditions and numeric goals (step 1 of development).

It should also be noted that this approach appears to establish a heavy workload for the public, the Copermittees and the Regional Board. A more streamlined approach for the development of the WQIPs should be considered that would provide the Copermittees with the necessary time to develop the final WQIP without extending the overall timeframe. For example, instead of requiring a formal public notice and solicitation of comments by the Regional Board for all three (3) steps of each WQIP, the Copermittees could work with stakeholders to solicit comments for the first two steps of the development of the WQIP and only require formal public noticing for the final approval of the WQIP. Although this is one approach to streamline the development of the WQIP, an alternative approach would be to modify the timelines as indicated below.

It should be noted that the preparation of a regional WQIP will require a CEQA determination by the Copermittee acting as lead agency. This should be recognized in setting the timeline as noted within the table below.

A comparison of the current and recommended approach is provided in the table below.

Steps and Timelines	Existing Approach in Tentative Order	Total Time from Effective Date of Order	Recommended Approach (w/ edits provided in Tentative Order)	Total Time from Effective Date of Order
Establish Priority Water Quality	Within 6 months of commencement of	6 months	Within 6 months of	6 months

Steps and Timelines	Existing Approach in Tentative Order	Total Time from Effective Date of Order	Recommended Approach (w/ edits provided in Tentative Order)	Total Time from Effective Date of Order
Conditions and Numeric Goals	coverage		commencement of coverage	
Request Public Comments	60 days from posting	8 months	30 days from posting	7 months
Revise Priority Water Quality Conditions and Numeric Goals	Not specified	? months	30 days from receiving comments	8 months
Establish Water Quality Improvement Strategies and Schedules	Within 9 months of commencement of coverage	9 months	Within 3 months of finalizing Priority Water Quality Conditions and Numeric Goals	11 months
Request Public Comments	60 days from posting	11 months	30 days with stakeholders	12 months
Revise Water Quality Improvement Strategies and Schedules	Not specified	? months	30 days from receiving comments	13 months
Develop WQIP	Within 18 months of commencement of coverage	18 months	Within 18 months of commencement of coverage	**18 months (this allows 5 months for the development of the document)**
Request Public Comments	30 days from posting	19 months	30 days from posting	19 months
If no hearing, Regional Board notify Copermittees that the WQIP is accepted	Within 6 months of the public request for comments	25 months	Within 6 months of the public request for comments	25 months
Finalize WQIP	Not specified	? months	60 days from receiving comments (this assumes	? months

Steps and Timelines	Existing Approach in Tentative Order	Total Time from Effective Date of Order	Recommended Approach (w/ edits provided in Tentative Order)	Total Time from Effective Date of Order
			that it is concurrent with the Regional Board notification above)	
Review for CEQA Requirements	*It should be noted that the preparation of a regional WQIP may trigger local requirements under CEQA. This should be recognized in setting the timeline. This would likely take 30-60 days.*			
Posting on Regional Clearinghouse	Within 30 days of acceptance by Regional Board	26 months	Within 30 days of acceptance by Regional Board	26 months

Action: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The sections include:

- *Provisions, F.1.a.(2)(f) Reporting (page 122)*
- *Provisions, F.1.a.(3)(d) Reporting (page 123)*
- *Provisions, F.2.a.(5) Updates (page 125)*

ATTACHMENT C – ACRONYMS, ABBREVIATIONS AND DEFINITIONS

45. ATTACHMENT C (ENTIRE ATTACHMENT; BEGINS PAGE C-1) – ATTACHMENT C SHOULD CLARIFY THE MEANING OR INTENT OF SPECIFIC TERMS USED WITHIN THE ORDER.

In addition to the acronyms and abbreviations, Attachment C includes definitions that may provide an explanation or description of the meaning or intent of specific terms or phrases that are used within the Order. The County recommends the addition and/or modification of the following definitions in order to assist in describing the meaning or intent of these terms and to avoid unnecessary confusion.

Action: Incorporate the specific modifications to the Tentative Order, which are provided in Attachment B. The terms include:

- This term did not have a definition - *Channel Rehabilitation and Improvement*
- This definition should provide additional clarification – *Illicit Connection*
- This term did not have a definition - *Progressive Enforcement*
- This definition should provide additional clarification - *Redevelopment*
- This definition should remain consistent with the Federal regulations – *Storm Water*

- This definition should remain consistent with the State regulations – *Waters of the State*
- This term should clarify that a wet weather period should be preceded by a minimum dry weather period, unless defined differently in another regulatory mechanism – *Wet Weather*

ATTACHMENT E – SPECIFIC PROVISIONS FOR TOTAL MAXIMUM DAILY LOADS

46. ATTACHMENT E (ENTIRE ATTACHMENT; BEGINS PAGE E-1) – PERMIT PROVISIONS MUST BE CONSISTENT WITH THE CORRESPONDING BASIN PLAN AMENDMENTS.

The Regional Board has adopted two Basin Plan Amendments ("BPAs") to establish Total Maximum Daily Loads ("TMDLs") where the Copermittees are identified as Responsible Parties and assigned wasteload allocations ("WLAs"): (1) Indicator Bacteria in Baby Beach in Dana Point Harbor[69] and (2) Indicator Bacteria, Project I - Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)[70] (Beaches and Creeks Bacteria TMDL).

There are several fundamental and substantive discrepancies, however, between the adopted TMDL BPAs and the provisions of the Tentative Order. These inconsistencies negate the Basin Planning process that occurred to establish the TMDLs and clearly contradict the Board's intent for how the TMDLs would be incorporated into the MS4 Permit. As the TMDLs have been incorporated into the Basin Plan, the TMDLs constitute the "program of implementation needed for achieving water quality objectives"[71] and the provisions in the MS4 Permit must, therefore, be consistent with the Basin Plan.

For example:

- Both the Baby Beach and Beaches and Creeks TMDLs clearly establish mass-based wasteload allocations. These wasteload allocations are entirely absent from the Tentative Order (see additional comments below for further discussion). Instead, the Tentative Order establishes water quality based effluent limits (WQBELs) based upon an effluent concentration (set equal to the numeric targets).
- For the Beaches and Creeks TMDL, the Tentative Order is not consistent with the compliance schedule approach provided for the comprehensive load reduction plans (CLRPs) established in the BPA. The CLRPs that will be submitted by Copermittees will propose interim compliance dates, as allowed by the BPA, to meet the 50% reduction milestone for dry and wet weather. The CLRPs submitted by Copermittees may not all propose the same interim compliance dates and the Tentative Order should acknowledge the flexibility allowed by the TMDL[72]. In fact, this scheduling

[69] Resolution R9-2008-0027.

[70] Resolution R9-2010-0001.

[71] Water Code § 13050(j).

[72] Page 68 of Attachment A of the Basin Plan Amendment.

flexibility was a primary "incentive" for Copermittees to develop CLRPs instead of Bacteria Load Reduction Plans (BLRPs).

- For the Baby Beach TMDL, the BPA includes two paths for the implementation of the TMDL – one where the beach has been delisted from the 303(d) list and one where the beach remains impaired[73]. Where a beach has been delisted, the BPA requires that Responsible Copermittees monitor and continue implementation of existing implementation actions "to ensure REC-1 water quality objectives are maintained" (i.e., the beach is not placed back on the 303(d) list). Only if the beach is placed back on the 303(d), the NPDES permit is to be revised to include "requirements consistent with these TMDLs." As Baby Beach is not on the most recent 303(d) list for REC-1 bacteria objectives, the requirements for Responsible Copermittees must be limited to monitoring and implementation of existing implementation actions. The Tentative Order does not recognize the approach for delisted beaches or recognize that Baby Beach is delisted.
- For the Beaches and Creeks TMDL, the BPA clearly establishes that no additional actions are required for beaches that are delisted[74]. This language is not included in the Tentative Order.
- Monitoring requirements in the Tentative Order must be consistent with the requirements of the BPAs. Both the Baby Beach TMDL and the Beaches and Creeks TMDL provide certain flexibility in monitoring, via the BLRPs and CLRPs, respectively, and this flexibility is not captured in the Tentative Order.
- Both the Baby Beach TMDL and the Beaches and Creeks TMDL clearly acknowledges that exceedances in the receiving water may not be from the MS4 and contains specific compliance language to address such a situation. This language is not provided in the Tentative Order.

These examples are not exhaustive of the inconsistencies between the BPAs and the Tentative Order (additional inconsistencies are identified and modified language is proposed in **Attachment B**).

During the workshops on the Tentative Order, Regional Board members raised the question of feasibility of attaining the TMDLs. The Basin Plan Amendments included many considerations and requirements that cumulatively result in a more feasible program of implementation. If many of the requirements of the BPAs are modified or not included in the MS4 permit, such as the mass-based WLAs, flexible monitoring programs, no further action for delisted beaches, and reconsideration of the TMDLs through reopeners, the Tentative Order establishes requirements that are not only inconsistent with the BPAs, but that make attainment of the TMDLs infeasible.

Action: Modify the requirements in Attachment E to establish provisions that are consistent with the adopted Basin Plan Amendments. Specific modifications to address these inconsistencies are

[73] Basin Plan Amendment, Page A-12.

[74] Basin Plan Amendment, Pages A2, A12, A66.

provided in Attachment B. Certain key inconsistencies are noted in the subsequent comments below. Additional inconsistencies are also captured in the modifications detailed in Attachment B.

47. ATTACHMENT E (ENTIRE ATTACHMENT; BEGINS PAGE E-1) – THE TENTATIVE ORDER'S NUMERIC WQBELS VIOLATE THE REQUIREMENTS OF LAW BECAUSE THEY ARE INFEASIBLE.

Due to the nature of urban runoff and the extensive urbanization of Orange County, the Tentative Order's numeric WQBELs are economically and technically infeasible.[75] The Copermittees transport stormwater for flood control purposes, and do not generate pollutants. The Copermittees are legally and practically unable to control all aspects of the urban landscape and prevent illicit substances, such as copper, from entering the environment. The state and federal government has direct oversight over consumer goods and services and can better regulate these pollutants than can local government which has little jurisdiction over consumer issues due to Commerce Clause in the U.S. Constitution and other limitations. Furthermore, the are insufficient technologies to control and treat all the pollutants that threaten receiving waters, and it is economically infeasible to expend billions of dollars in local government general funds on research and development, particularly when the Permit does not contain a compliance pathway.[76]

Federal law does not require the Copermittees to meet numeric standards.[77] Moreover, meeting numeric standards in all places at all times is technically and economically infeasible and therefore beyond MEP. Any numeric WQBELs that are adopted in the Permit are done under authority of state law.[78]

The State Board has consistently rejected the incorporation of numeric WQBELs as evidenced by its adoption of the Caltrans MS4 Permit, affirming that "it is not feasible at this

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[75] A WQBEL is an enforceable translation in an MS4 permit for attaining compliance with a TMDL WLA, which serves to protect beneficial uses of a receiving water. 40 C.F.R. § 130.2.

[76] For example, in the final technical report prepared by the Regional Board, entitled "Revised Total Maximum Daily Loads for Indicator Bacteria Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)" (including beaches in Orange County), the Board concluded that the cost of implementing the particular TMDL in issue may be as high as $973 million, with annual maintenance running as great as $68 million annually. (See TMDL Report, http://www.swrcb.ca.gov/sandiego/ water_issues/programs/tmdls/bacbacte.shtml, at p. 144 ["The cost estimates for treating 10 percent of the watershed with structural BMPs ranged from $50,000 to $973 million, depending on BMP selection, with yearly maintenance costs estimated from $10,000 to $68 million."]; see also Total Maximum Daily Load for Bacteria in the Los Angeles River Watershed, http://www.waterboards.ca.gov/losangeles/board_decisions/basin_plan_amendments/technical_documents/bpa_80_R10-007_td.shtml, at p. 81[estimating the cost to implement the bacteria TMDL for the LA River at "$5.4 billion."].

[77] *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159, 1167.

[78] *Long Beach Unified School District v. State of California* (1990) 225 Cal.App.3d 155, 173; *National Resources Defense Council, Inc. v. U.S. E.P.A.* (9th Cir. 1992) 966 F.2d 1292, 1308.

time to set enforceable numeric effluent criteria for municipal BMPs and in particular urban discharges."[79]

The Caltrans MS4 permit's fact sheet also supports the use of BMP-based WQBELs as a means of meeting TMDLs and other quality standards. The Caltrans MS4 permit is also subject to TMDLs adopted by the Regional Board and USEPA. If this aspect of the Tentative Order is not corrected, Orange County MS4 Copermittees will be compelled to comply strictly with numeric WQBELs and receiving water limitations while Caltrans need only implement WQBEL BMPs to achieve compliance with the same TMDLs. This inconsistency lacks any justification.

48. ATTACHMENT E (ENTIRE ATTACHMENT; BEGINS PAGE E-1) – THE TENTATIVE ORDER'S WQBELS WERE IMPROPERLY FORMULATED.

The Tentative Order fails to provide adequate justification for incorporating numeric WQBELs in the Tentative Order for each of the incorporated TMDLs to which they apply. Further, the Tentative Order fails to establish that an adequate requisite Reasonable Potential Analysis ("RPA") has been conducted.

The Tentative Order fails to establish if discharges from any individual Copermittee's MS4 have the reasonable potential to cause or contribute to an excursion above any State water quality standard including State narrative criteria for water quality.

There are two generally accepted approaches to conducting an RPA. According to USEPA guidance, "A permit writer can conduct a reasonable potential analysis using effluent and receiving water data and modeling techniques . . . or using a non-quantitative approach."[80]

Neither the administrative record nor the Tentative Order's fact sheet contains any evidence of that an RPA has been performed in accordance with the two foregoing approaches. Regarding the first approach, such an analysis would in any case have been impossible to perform given that no outfall (effluent) monitoring has been required for any prior Orange County MS4 permit. No modeling appears to have been conducted either.

Beyond this, federal regulations not only require that an RPA be performed to determine if an excursion above a water quality standard occurred, but also that the storm water discharge must be measured against an "allowable" ambient concentration.[81]

A WQBEL is a means of attaining a TMDL WLA, a translation of a WLA into prescribed actions or limits which has in the past been typically expressed as a BMP. Before a WQBEL can be developed, however, a need for it must be established. As the Permit Writers' Manual indicates:

> The permit writer should always provide justification for the decision to require WQBELs in the permit fact sheet or statement of basis and must do so where

[79] Fact Sheet for NPDES Permit and Waste Discharges Requirements for State of California Department of Transportation, NPDES Permit No. CAS000003, Order No. 2012-0011-DWQ, page 9 (Sept. 7, 2012).

[80] NPDES Permit Writers' Manual, September 2010, page 6-23.

[81] 40 C.F.R. § 122.44(d)(iii).

> required by federal and state regulations. *A thorough rationale is particularly important when the decision to include WQBELs is not based on an analysis of effluent data for the pollutant of concern*.[82]

No such rationale is provided in the Fact Sheet, which in the absence of effluent data derived from outfall monitoring, would have been absolutely necessary to justify the need for a numeric WQBEL.

49. ATTACHMENT E (ENTIRE ATTACHMENT; BEGINS PAGE E-1) – WQBELS FOR BOTH BABY BEACH BACTERIA TMDL AND BEACHES AND CREEKS TMDLS INAPPROPRIATELY INCLUDE TMDL NUMERIC TARGETS.

Federal regulations require that NPDES permits contain effluent limits consistent with the assumptions and requirements of all available WLAs.[83] As currently established in the Tentative Order, the WQBELs are not consistent with the WLAs and are therefore not consistent with federal regulations. Therefore, any adjustment of the TMDL in the Permit is taken under state authority.

The Tentative Order establishes WQBELs based upon the numeric targets (set equal to water quality objectives) in addition to the mass-based WLAs established by the TMDL. To justify this approach, the Fact Sheet states:

> Because *numeric targets* for TMDLs typically include a component that will be protective of water quality standards, a TMDL will likely include one or more numeric receiving water limitations and/or effluent limitations as part of the assumptions or requirements of the TMDL. *Any numeric receiving water limitations and/or effluent limitations developed as part of the assumptions or requirements of a TMDL must be incorporated and included as part of a WQBELs for the MS4s.*[84].
>
> However, federal regulations require that the WLAs, not the numeric targets, are incorporated into the Tentative Order. Further, federal regulations do not require that any receiving water limitation or effluent limitation developed as part of the TMDL must be incorporated. Rather, federal regulations require that the WQBELs are consistent with the assumptions and requirements of the WLAs. Federal regulations expressly state: When developing water quality based effluent limits under this paragraph the permitting authority shall ensure that: (B) Effluent limits developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, *are consistent with the assumptions and requirements of any available wasteload allocation* for the discharge prepared by the State and approved by EPA pursuant to 40 CFR 130.7.[85]

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[82] *Id.*

[83] 40 CFR § 122.44(d)(1)(vii)(B).

[84] Fact Sheet, pg. F-38 (emphasis added).

[85] 40 CFR § 122.44(d)(1)(vii)(B).

While in most cases the numeric targets are a component of the allocations, there are numerous additional assumptions and requirements of the WLAs that are also a component of the WLAs. Wasteload allocations take into account various considerations, including the multiple sources of a pollutant, flow rates, critical conditions and margin of safety. By only incorporating the numeric target component of the WLAs, the Regional Permit fails to include all other assumptions and requirements of the WLAs as required by federal regulations. Only incorporating the numeric targets negates the entire TMDL analysis and Basin Planning process. Otherwise, TMDLs would be as simple as assigning numeric effluent limitations to MS4 discharges equal to the numeric objectives in the Basin Plan, which is explicitly contrary to the TMDLs that have been established in the Basin Plan.

In fact, simply defining the WQBELs as the numeric targets of the TMDL is contrary to the purpose of the Basin Plan itself, which not only requires the establishment of water quality objectives, but also the program of implementation needed to achieve the water quality objectives.[86] A TMDL, once incorporated into the Basin Plan, is exactly that – a program of implementation needed for achieving water quality objectives.

The following language from the Basin Plan Amendment is controlling:

<u>Beaches and Creeks Bacteria TMDL BPA</u>

> TMDLs must be established at levels necessary to attain and maintain the applicable narrative and numerical water quality standards with seasonal variations and a margin of safety which takes into account any lack of knowledge between effluent limitations and water quality. [87]

<u>Baby Beach Bacteria TMDL BPA</u>:

> The loading capacities are defined as the maximum amount of fecal coliform, total coliform and Enterococcus that the waterbody can receive and still attain water quality objectives necessary for the protection of designated beneficial uses. Each TMDL must accommodate all known sources of a pollutant, whether from natural background, nonpoint sources, or point sources, and must include a margin of safety (MOS) to preclude pollutant loading from exceeding the actual assimilative capacities of the waterbodies. The TMDL calculations also account for seasonal variations and critical conditions and were developed in a manner consistent with guidelines published by USEPA[88]"

In both TMDLs, the WLAs clearly take into consideration factors other than the numeric targets, such as flow rates, as the WLAs are expressed as mass-based limits. If it was the Regional Board's intent to establish a concentration-based TMDL, then the WLAs would be

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[86] See Water Code section 13050(j) and as stated in the Beaches and Creeks Bacteria TMDL (Resolution, Pg.2): "A "Water Quality Control Plan" or "Basin Plan" consists of a designation or establishment for the waters within a specified area of all of the following: (1) Beneficial uses to be protected, (2) Water quality objectives and (3) A program of implementation needed for achieving water quality objectives."

[87] Resolution, Page 2.

[88] Resolution, Page 4.

expressed as a concentration. By establishing mass-based WLAs, however, the TMDL purposefully and explicitly establishes WLAs that incorporate many other factors than just the concentrations of the numeric targets. Therefore, establishing WQBELs that fail to incorporate the mass-based WLAs is inconsistent with the assumptions and requirements of the WLAs as well as inconsistent with the intent of the Basin Plan itself.

Action: Modify the requirements in Attachment E to include:

- *Fact Sheet, (page F-38)*
- *Attachment E*

Baby Beach Bacteria TMDL

In addition to the universal issues identified above, there are additional concerns with the WQBELs specific to the Baby Beach Bacteria TMDL.

Of particular concern are the WQBELs established for wet weather for total coliform (TC) and fecal coliform (FC). The BPA establishes WLAs for those indicators based upon existing conditions as the loading capacity was determined to be greater than the current discharges and clearly states that no further reductions are necessary. The BPA states:

> "According to Tables 7-26 and 7-27, no wet weather wasteload reductions are required for total and fecal coliform indicator bacteria. This means that according to the wet weather models for Baby Beach, REC-1 water quality objectives for total and fecal coliform indicator bacteria are not expected to be exceeded due to discharges from the MS4s. The only wet weather wasteload reductions required for MS4s discharging into the receiving waters along the shoreline at Baby Beach is for Enterococcus indicator bacteria."[89]

These existing conditions WLAs were based upon a *load assessment, not a concentration assessment* (e.g., the numeric targets). The final compliance date for these WLAs was set equal to the effective date of the TMDL, given that the WLAs were set to existing conditions and no further reductions were required. Therefore, not only are the WLAs in the Tentative Order not incorporated properly as mass-based WQBELs, but the Copermittees are not provided any time to attain these new and inappropriately established concentration-based WQBELs as the effective date, and therefore final compliance date, was 2009.

Beaches and Creeks Bacteria TMDL

In addition to the universal issues identified above, there are additional concerns with the WQBELs specific to the Beaches and Creeks Bacteria TMDL.

Attachment E specifies WQBELs for dry weather flows as both receiving water and effluent limitations, in terms of zero allowable exceedances of the single sample maximum and the 30-day geometric mean. However, the dry weather component of the TMDL only considered the 30-day geometric mean and did not consider the single sample maximum within its calculation. Incorporating single sample effluent limitations into the Tentative Order goes beyond the TMDL requirements.

[89] Basin Plan Amendment, Page A-23.

In addition, if the TMDL had included single sample limits, there would have been a corresponding allowable exceedance frequency, just as for wet weather. The 22% allowable exceedance rate for wet weather was based on a reference beach within the Los Angeles Region, and although not used in the technical approach for the San Diego Beaches and Creeks TMDL, the reference beach also exhibits exceedances during dry weather, which is incorporated into beach TMDLs in the Los Angeles region.

Action: Modify the Tentative Order to be consistent with the assumptions and requirements of the WLAs by incorporating the WLAs into the Permit. See Attachment B for the specific modifications.

50. ATTACHMENT E (ENTIRE ATTACHMENT; BEGINS PAGE E-1) – WQBELS SHOULD ONLY BE DEFINED AS EFFLUENT LIMITATIONS.

There is a significant legal distinction between the Receiving Water Limitations established in Provision A (Discharge Prohibitions) and the Receiving Water Limitations established as part of the WQBELs in Attachment E (TMDL provisions). As currently (and inappropriately) defined, WQBELs include receiving water limitations based on the numeric targets (set equal to WQOs) in addition to WLAs.

Ensuring that MS4 discharges do not cause or contribute to exceedances of WQOs is already and more appropriately addressed in Provision A.2. When an exceedance occurs under Provision A (Discharge Prohibitions), there is the potential for an enforcement action at the discretion of the Regional Board (*e.g.*, issuing a Notice of Violation). Where an exceedance occurs for a WQBEL, however, the Copermittees may be subject to Mandatory Minimum Penalties (MMPs) where the Regional Board does not have discretion.

As set forth above, the WQBELs are inappropriately defined to include TMDL numeric targets, and not just the WLAs. Ensuring that discharges do not cause or contribute to exceedances of WQOs is already addressed via Provision A.2. Therefore, the inclusion of receiving water limitations in the definition of the WQBELs is inconsistent with the assumptions and requirements of the WLAs and unnecessarily exposes Copermittees to MMPs without any requisite change to the protection of water quality.

Throughout the Beaches and Creeks Bacteria TMDL, the BPA consistently refers to attaining the numeric targets *(e.g.*, the water quality objectives) via receiving water limitations. Therefore, establishing the mass-based WLAs as the WQBELs and the numeric targets as receiving water limitations is consistent with federal regulations for the incorporation of WLAs and the BPA for establishing the receiving water limitations.

The WQBELs should be defined only as the mass-based effluent limitations, consistent with the WLAs in the BPAs. Although the Copermittees prefer that the receiving water limitations are simply addressed with a cross-reference back to Provision A.2, if the Regional Board prefers to keep the receiving water limitations as part of the TMDL provisions, they must be distinct from and excluded from the definition of the WQBELs.

Action: Modify the Tentative Order to be consistent with the assumptions and requirements of the WLAs by defining the WQBELs as equal to the WLAs. Receiving water limitations should be excluded from the definition of WQBELs as they are not part of the WLAs.

51. ATTACHMENT E (ENTIRE ATTACHMENT; BEGINS PAGE E-1) – COMPLIANCE DETERMINATION FOR FINAL WQBELS SHOULD BE BASED ON THE IMPLEMENTATION OF BMPS AND NOT NUMERIC EFFLUENT LIMITATIONS.

For interim water quality-based effluent limitations and receiving water limitations, A BMP-based path to compliance is provided via the implementation of an approved Water Quality Improvement Plan.[90] A voluntary WQIP acknowledges the inherent challenges unique to stormwater management and provides appropriate flexibility to implement the necessary BMPs. However, the same approach is not applied to the final WQBELs.

a. Regional Board has Discretion to Establish BMP-Based Compliance

State and federal law do not require the use of numeric effluent limitations for MS4 Copermittees, but rather encourage flexible implementation of best management practices through an iterative process. Specifically, the choice to include either management practices or numeric limitations in MS4 permits is within the Regional Board's discretion acting under state law.

Over the last decade, EPA has issued a succession of policy memoranda and guidance documents regarding the incorporation of TMDLs into stormwater permits, including:

1) *Guidance for Developing TMDLs in California* (EPA Region 9). January 7, 2000
2) *Establishing Total Maximum Daily Load (TMDL) WLAs for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs* (Wayland and Hanlon). November 22, 2002
3) *TMDLs to Stormwater Permit Handbook* (Draft) (EPA). November 2008
4) Untitled Letter (Kevin Weiss). March 17, 2011

In each of these EPA documents, EPA allows for discretion on the part of the permitting authority in the use of numeric effluent limitations for stormwater or BMP-based effluent limitations.

Further, it is important to note that the EPA documents did not identify any differences in how interim and final WQBELs may be addressed by effluent limitations. In particular, the guidance did not limit BMP-based effluent limitation approaches to interim WQBELs. EPA guidance does emphasize that NPDES provisions implementing TMDLs be enforceable, objective and measurable.

The Tentative Order provides for enforceable, objective and measurable provisions via the Water Quality Improvement Programs (WQIPs). Establishing an additional compliance path for the final WQBELs would therefore be consistent with the approach already provided in the Tentative Order for interim WQBELs as well as guidance issued by EPA over the last.

b. Compliance Mechanism Matters

The Regional Board has the opportunity to exercise discretion in drafting and approving the compliance language in the Order; however, if the Regional Board continues to opt for

[90] Attachment E.5.e.(1)(f)); Attachment E.6.e.(1)(f)

numeric effluent limitations for final WQBELs, the Regional Board will no longer have discretion for enforcement decisions during implementation of the Order as Copermittees may be subject to Mandatory Minimum Penalties (MMPs).

Take for example a watershed where a group of Copermittees implement a suite of BMPs designed to achieve the final WQBELs. The Copermittees work closely with Regional Board staff and non-governmental organizations in developing and implementing the plan. Implementation of the BMPs achieves a 90% reduction in bacteria loads and results in the delisting of the waterbody from the State's 303(d) list, yet the reductions do not attain the WQBELs. Another Copermittee does little to nothing to address the TMDL and achieves no reductions in bacteria loads, the waterbody continues to be listed as impaired on the State's 303(d) list, and the WQBELs are not attained.

If numeric effluent limitations continue as the compliance mechanism for final WQBELs, both Copermittees (the group that achieved the 90% reduction and the Copermittee that did little to nothing) would equally be out of compliance with the Order and equally subject to MMPs. If a BMP-based compliance option is provided for final WQBELs, the Regional Board would have the ability to exercise discretion. The Regional Board could continue to work with the group or Copermittees that are successfully implementing actions and evaluate appropriate additional actions. For the Copermittee that did little to nothing, the Regional Board would still be able to take appropriate enforcement action.

BMP-based compliance is not a request to decrease accountability or the efforts of the Copermittees or the commitment to water quality, it is a request for the Regional Board to utilize its discretion to establish Permit provisions that will support and reward actions taken by Copermittees that are achieving the intended purposes of the TMDLs.

c. Consistent with Regional Board Approach to Enforcement

A BMP-based compliance mechanism for final WQBELs is consistent with the Regional Board's stated approach to enforcement (as noted in the BPA establishing the Indicator Bacteria TMDL for Baby Beach):

> Regional Board typically implements enforcement through an escalating series of actions to:
>
> > (1) assist cooperative dischargers in achieving compliance; (2) compel compliance for repeat violations and recalcitrant violators; and (3) provide a disincentive for noncompliance.[91]

The Regional Board can structure the final WQBEL compliance options to achieve this escalating approach to enforcement. A BMP-based compliance option can be provided via the implementation of the WQIPs where discrete milestones and actions are identified. For Copermittees that do not implement the WQIPs, this compliance mechanism would no longer be an option and Copermittees would be compelled to comply via the other mechanisms (essentially, no discharge or numeric effluent limitations). Such an approach achieves all three of the escalating compliance approaches identified by the Regional Board in the Baby Beach Bacteria TMDL, while numeric effluent limitations remove the Regional

[91] Baby Beach Bacteria TMDL Basin Plan Amendment, Page A-20.

Board's discretion and will require that the Board treat cooperative dischargers and recalcitrant violators equally.

d. Consistent with Basin Plan Amendments

Establishing a BMP-based compliance path is also consistent with the Basin Plan Amendments for both TMDLs.

Beaches and Creeks TMDL:[92]

> The San Diego Water Board will revise and re-issue the WDRs and NPDES requirements for Phase I MS4s to incorporate the following:
>
> WQBELs consistent with the requirements and assumptions of the Municipal MS4 WLAs. WQBELs may be expressed as numeric effluent limitations, when feasible, and/or as a BMP program of expanded or better-tailored BMPs.

Baby Beach Bacteria TMDL (emphasis added):

> WQBELs consistent with the requirements and assumptions of the bacteria WLAs described in Tables [Insert table numbers] and a schedule of compliance applicable to the MS4 discharges into the impaired shoreline segments described in Tables [Insert table numbers]. *At a minimum, WQBELs shall include a BMP program to attain the WLAs*.[93]
>
> If the WQBELs consist of BMP programs, then the reporting requirements shall consist of annual progress reports on BMP planning, implementation, and effectiveness in attaining the WQOs in impaired shoreline segments, and annual water quality monitoring reports.[94]
>
> The BLRPs are the municipal dischargers' opportunity to propose methods for assessing compliance with WQBELs that implement TMDLs.[95]

Additionally, the compliance schedule anticipates revisions to the TMDL after the final compliance date, potentially through the Natural Sources Exclusion Approach (NSEA).[96] It is inconsistent with the assumptions and requirements of the BPA to require strict compliance via numeric effluent limitations at Year 10 when the TMDL explicitly anticipates revisions occurring after that final date. The intent from the BPA is to have 10 years of implementation, evaluate progress and assess whether additional regulatory options (such as the NSEA) are necessary and/or warranted. This approach can only be accomplished if BMP-based compliance is provided as an option for the final WQBELs.

---

[92] Basin Plan Amendment, Page A-41.

[93] Basin Plan Amendment, Page A-14.

[94] Basin Plan Amendment, Page A-15.

[95] Basin Plan Amendment, Page A-19.

[96] Basin Plan Amendment, Page A-24.

e. BMP-Based Compliance is Not a "Safe Harbor"

BMP-based compliance through the iterative process is not a safe harbor under the law. A safe harbor exists in the law where certain misconduct is deemed not to violate a given rule.[97] For instance, if a purchaser of property conducts a Phase 1 Environmental Assessment of that property prior to purchase, it generally insulates the purchaser from liability related to contamination found to be caused from a prior owner. In this case, BMP-based compliance pathways can be structured to provide accountability and enforceability so long as BMPs are diligently and rigorously being implemented with specific actions and timetables and where progress is being made. This form of BMP implementation is measurable and objective, and can thus be enforced. If BMP-based compliance was a true safe harbor, any BMP-based action would qualify as a safe harbor. This is not what is being recommended by the Copermittees

The concept of "safe harbor" was raised during the hearing for the recently adopted Los Angeles Region MS4 Permit. The Regional Board as well as Executive Officer of the Regional Board directly addressed the question if BMP-based compliance, via the implementation of a Watershed Management Program (equivalent to the WQIPs), constituted a "safe harbor." Both the Board and Executive Officer determined that BMP-based compliance was not a "safe harbor" and the Watershed Management Programs provided objective and measureable elements whereby Copermittees would be required to implement actions and would have clear accountability.

Equating BMP-based compliance as a "safe harbor" is legally inaccurate, as it does not account for the way in which the law defines safe harbors. The Regional Board should frame the issue through accountability, objectivity and enforceability.

f. Numeric Effluent Limitations are Not Feasible

The Regional Board has discretion in how the WLAs are incorporated into the MS4 Permit. The concept of feasibility relates to *achieving* the numeric effluent limitations, not to *calculating* a numeric effluent limitation. As all TMDLs have numeric WLAs, it would be "feasible" for most all TMDLs, from the very first TMDL ever established, to utilize numeric effluent limitations if simply calculating a WQBEL was the intended definition. As Wayland and Hanlon (2002) (EPA's policy memorandum regarding incorporation of TMDLs into stormwater Permits) noted EPA "expects that most WQBELs for NPDES-regulated municipal and small construction storm water discharges will be in the form of BMPs, and that numeric limits will be used only in rare instances." Therefore, in EPA's policy memoranda, the concept of feasibility is not related to the ability to simply calculate the WQBELs. The concept of "feasibility" really relates to whether or not *achieving* numeric effluent limitations are feasible for the stormwater permit.

The State Water Resources Control Board convened a Blue Ribbon Panel in 2006 to investigate this very question – are numeric effluent limitations feasible for stormwater permits? This panel of national experts ultimately concluded that numeric limits were

[97] "Safe Harbor," Black's Law Dictionary, (1996).

generally infeasible across all three stormwater activities (municipal, industrial, and construction), with a few exceptions.[98]

Therefore, without providing the BMP-based compliance option for Copermittees, the Tentative Order directly contradicts the State Water Resources Control Board's finding regarding the feasibility of achieving numeric effluent limitations for municipal stormwater discharges.

Action: Establish a BMP-based compliance path for final WQBELs by adding the following provisions as Attachment E.5.e(2)(f) and as Attachment E.6.e.(2)(e):

> *The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the final compliance requirements will be achieved by the final compliance dates. A Responsible Copermittee that does not implement its WQIP in accordance with the milestones and compliance schedules shall demonstrate compliance with the final WQBELs pursuant to Attachment E.5.e(2)(a - e)/Attachment E.6.e(2)(a-d).*

52. ATTACHMENT E (ENTIRE ATTACHMENT; BEGINS PAGE E-1) – AN EXPLICIT RE-OPENER PROVISION IS NECESSARY.

In both the Baby Beach TMDL and the Beaches and Creeks TMDL, the BPAs have included an implementation schedule that defines a point at which the TMDL will be reconsidered to incorporate new information and potentially modify targets, allocations and/or implementation requirements. The intent of the approach is clear in both BPAs:

- **Beaches and Creeks TMDL:** There is an entire section of the Basin Plan Amendment that details modifications to the TMDL through a future Basin Plan Amendment. The BPA specifically notes (BPA pg. A49):

  > As the implementation of these TMDLs progress, the San Diego Water Board recognizes that revisions to the Basin Plan may be necessary in the future.

- **Baby Beach TMDL:** The intent to reassess this TMDL is built directly into several sections of the implementation plan as well as the compliance schedule (emphasis added):

  - The San Diego Water Board recognizes that there are potential problems associated with using indicator bacteria WQOs to indicate the presence of human pathogens in receiving waters free of sewage discharges. The indicator bacteria WQOs were developed, in part, based on epidemiological studies in waters with sewage inputs. The risk of contracting a water-borne illness from contact with urban runoff devoid of sewage, or human-source bacteria is not known. Some pathogens, such as giardia and cryptosporidium can be contracted from animal hosts. Likewise, domestic animals can pass on human pathogens through their feces. *These and other uncertainties need to be*

[98] *The Feasibility of Numeric Effluent Limits Applicable to Discharges of Stormwater Associated with Municipal, Industrial and Construction Activities, June 19, 2006.*

addressed through special studies and, as a result, revisions to the TMDLs may be appropriate."[99]

- "Ultimately, the San Diego Water Board supports the idea of measuring pathogens (the agents causing impairment of beneficial uses) or an acceptable alternative indicator, rather than indicator bacteria (surrogates for pathogens). However, as stated previously, indicator bacteria have been used to measure water quality historically because measurement of pathogens is both difficult and costly. The San Diego Water Board is supportive of any efforts by the scientific community to perform epidemiological studies and/or investigate the feasibility of measuring pathogens directly. *The San Diego Water Board further supports subsequent modification of WQOs as a result of such studies. Ultimately, TMDLs will be recalculated if WQOs are modified due to results from future studies.*"[100]
- Excerpt from Baby Beach Bacteria TMDL Compliance Schedule. Revisions to the TMDL are anticipated to occur in Year 10+ (after the final compliance date).

Table 1. Excerpt from Baby Beach Bacteria TMDL Compliance Schedule.[101] Revisions to the TMDL are anticipated to occur in Year 10+ (after the final compliance date).

Year (after OAL approval)	Required Wasteload Reduction	TMDL Compliance Action
10	100 percent *Enterococcus* reduction	• Water Quality Monitoring • Implement BMPs • Submit request for removal from 303(d) List • (if not requested and removed earlier)
10+	Same as above	• Water Quality Monitoring • Implement BMPs • *Submit request for TMDL revisions based on Natural Sources Exclusion Approach if supported by data (if not requested and recalculated earlier)* • Submit request for removal from

[99] Basin Plan Amendment, Page A-22.

[100] Basin Plan Amendment, Page A-23.

[101] Basin Plan Amendment, Page A-24.

		303(d) List (if not requested and removed earlier)

Although the County is not advocating for technical revisions to the TMDL as part of the Tentative Order issuance (such revisions would appropriately occur through the Basin Plan Amendment process with any subsequent revisions incorporated into the Permit), there is a well-documented level of uncertainty in the BPAs with the existing TMDLs where revisions to the targets, allocations, and implementation plans and schedules may be warranted. Such uncertainty should be incorporated into the provisions via an explicit re-opener in Provision H (Modifications of Programs) of the Tentative Order.

The explicit re-opener provision for the Tentative Order would serve two purposes:

- Provide a trigger to reconsider the compliance mechanism (BMP-based compliance in lieu of numeric effluent limits) prior to any compliance dates; and
- Ensure that the WQBELs are reconsidered, consistent with the intent of the TMDLs to revisit and revise as necessary the targets, allocations, and implementation actions prior to final compliance being required. This aspect is especially critical as the Beaches and Creeks re-opener would occur during this permit term (request must be made by the Copermittees by 2016) and the Baby Beach TMDL has final WQBELs compliance dates within the permit term (2014 and 2019).

While the Copermittees recognize the authority of the Regional Board to re-open the Permit at any time, the explicit re-opener captures the Regional Board's intent to revisit and revise as necessary the TMDL provisions, consistent with the assumption and requirements of the BPAs. Based upon the first year data summary for the on-going San Diego Regional Stream Reference Study,[102] such revisions may likely be warranted. The first year data show that during dry weather, the reference systems demonstrated a 34.1% exceedance rate of the single sample maximum and a 71% exceedance rate of the 30 day geometric mean for enterococci. The TMDL currently allows for a 0% exceedance rate during dry weather. During storm events, the reference systems had a 71% - 100% exceedance rate of the single sample maximum for enterococci. The TMDL currently only allows for a 22% exceedance rate during storm events. Providing for an explicit reopener in the Permit will ensure that such compelling information, such as the results of the Reference Study, are considered prior to subjecting Copermittees to enforcement actions, such as Mandatory Minimum Penalties.

The explicit re-opener is consistent with the Regional Board's stated approach to enforcement, an escalating enforcement approach that contemplates "cooperative dischargers" as well as "recalcitrant violators." Lastly, such an approach was built into the recently adopted Los Angeles MS4 Permit.[103]

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[102]Southern California Coastal Water Research Project (SCCWRP). *San Diego Regional Stream Reference Study, Monitoring Progress Report #3 and Year 1 Data Summary, October 2011 through November 2012* (Jan. 3, 2013).

[103] Order R4-2012-0175.

Action: Provide an explicit Permit re-opener to capture the Regional Board's intent to revisit and revise as necessary the TMDL provisions prior to final compliance dates. The following additional language is provided as Provision H.6 and H.7:

H.6. Modifications of the Order shall be initiated to incorporate provisions as a result of future amendments to the Basin Plan, such as new or revised water quality objectives or the adoption or reconsideration of a TMDL, including the program of implementation. As soon as practicable, but no later than 6 months of the effective date of a revised TMDL where the revisions warrant a change to the provisions of this Order, the Regional Water Board shall modify this Order consistent with the assumptions and requirements of the revised WLA(s), including the program of implementation.

H.7. Modification to the Order shall be considered 18 months prior to the compliance date for final WQBELs where the compliance mechanism is based upon numeric effluent limitations. The intent of the reconsideration is to include provisions or modifications to WQBELs in Attachment E of this Order prior to the final compliance deadlines, if practicable, that would allow an action-based, BMP compliance demonstration approach with regard to final WQBELs.

53. ATTACHMENT E (ENTIRE ATTACHMENT; BEGINS PAGE E-1) – COMPLIANCE MECHANISM IS NECESSARY PRIOR TO APPROVAL OF THE WATER QUALITY IMPROVEMENT PLANS.

The Tentative Order currently provides for BMP-based compliance with interim WQBELs via the implementation of the WQIPs.[104] However, as the BMP-based compliance mechanism is contingent upon implementation of an approved WQIP, the Copermittees are not provided with a BMP-based compliance mechanism during the development of the WQIPs. Without any modifications to the Tentative Order, the Copermittees would be subject to numeric effluent limitations for during WQIP development, then provided BMP-based compliance for interim WQBELs during WQIP implementation. Prior to the approval of the WQIPs, Copermittees should be provided a similar BMP-based compliance mechanism while resources are devoted to plan development and the continuation with the implementation of the existing programs.

Recognizing that the shift to a watershed approach is an important and necessary shift in the management of stormwater, in the recently adopted Los Angeles MS4 Permit,[105] such compliance was provided during the plan development phase.

Action: Provide BMP-based compliance as a compliance option during the development of the WQIPs through incorporation of the following provisions:

- *Interim WQBELs Compliance (Attachment E.5.e(1) and Attachment E.6.e(1)):*

  Upon the effective date of this Order, a Copermittee's full compliance with all of the following requirements shall constitute a Copermittee's compliance with provisions pertaining to interim WQBELs with compliance deadlines occurring prior to approval of a WQIP.

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[104] Attachment E.5.e.(1)(f)); Attachment E.6.e.(1)(f)

[105] R4-2012-0175.

(1) Meets all interim and final deadlines for development of a WQIP,

(3 Targets implementation of watershed control measures in its existing storm water management program, including watershed control measures to eliminate non-storm water discharges of pollutants through the MS4 to receiving waters, to address known contributions of pollutants from MS4 discharges that cause or contribute to the impairment(s) addressed by the TMDL(s), and

(4) Receives final approval of its WQIP from the Regional Board.

- *If the Regional Board makes modifications to provide for a BMP-based compliance path for final WQBELs, the same revisions are requested to be added to Attachment E.5.e(2) and Attachment E.6.e(2).*

54. ATTACHMENT E (ENTIRE ATTACHMENT; BEGINS PAGE E-1) – CLARIFYING LANGUAGE IS NEEDED IN THE FACT SHEET REGARDING THE ITERATIVE APPROACH AND TMDLS.

The Fact Sheet includes language on pg. F-41 to describe an exception to the iterative approach and adaptive management process for receiving waters with adopted and approved TMDLs. The language notes that for TMDLs incorporated into the Order there is a specific date for compliance to be achieved. After this date, the iterative approach and adaptive management process required under Provision A.4 no longer provides the flexibility to achieve compliance. This language implies that prior to the compliance date for each TMDL, Provision A.4 does provide flexibility to achieve compliance. This point of linkage between Provision A and the TMDL Provisions in Attachment E is significant and it was raised in the County of Orange's comment letter on the Tentative Order for the Regional Permit.

For clarity, the Fact Sheet should also include language that explicitly states that during the implementation of the TMDL, prior to the final compliance date, Provision A.4 provides flexibility to achieve compliance with the applicable Receiving Water Limitations. In addition, the Regional Permit also needs to provide clarity in the permit provisions in Provision A.4.

Further, the Fact Sheet includes the following language on pg. F-41:

> Thus, after interim or final compliance dates for a contributing violation of WQBELs, if the discharges from the Copermittees' MS4s are causing or contributing to a violation of WQBELS, exceedances of WQBELs must be strictly enforced by the San Diego Water Board.

It is unclear what "strictly enforced" means in this context as neither interim or final WQBELs are established strictly as numeric effluent limitations in the Regional Permit. This language is counter to the compliance options provided for both interim and final WQBELs in Attachment E.

55. ATTACHMENT E (ENTIRE ATTACHMENT; BEGINS PAGE E-1) – CLARIFYING LANGUAGE IS NEEDED IN THE FACT SHEET REGARDING INCORPORATION OF NEW TMDLS INTO WQIPS.

The Fact Sheet includes language on pg. F-111 that states the WQIPs can incorporate new TMDLs prior to the Order being re-opened to incorporate the requirements of the new TMDLs. This approach is included as a requirement in the Regional Permit at F.2.c.(2). The

Fact Sheet needs to clarify that while the WQIPs can incorporate fully approved, effective TMDLs, the Regional Permit must be re-opened to incorporate the TMDLs into the Permit. As TMDLs are not self-implementing, the Permit must be reopened to include new TMDL provisions and requirements (e.g., addition WQBELs).

Action: Specific modifications are included in Attachment A (see Fact Sheet, pg. F-111; Regional Permit, Provision F.2.c.(2)).

ATTACHMENT A

**ORANGE COUNTY LEGAL &TECHNICAL COMMENTS ON
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
TENTATIVE ORDER No. R9-2013-0001
NPDES NO. CAS0109266**

Appendix A-1

Regional Map

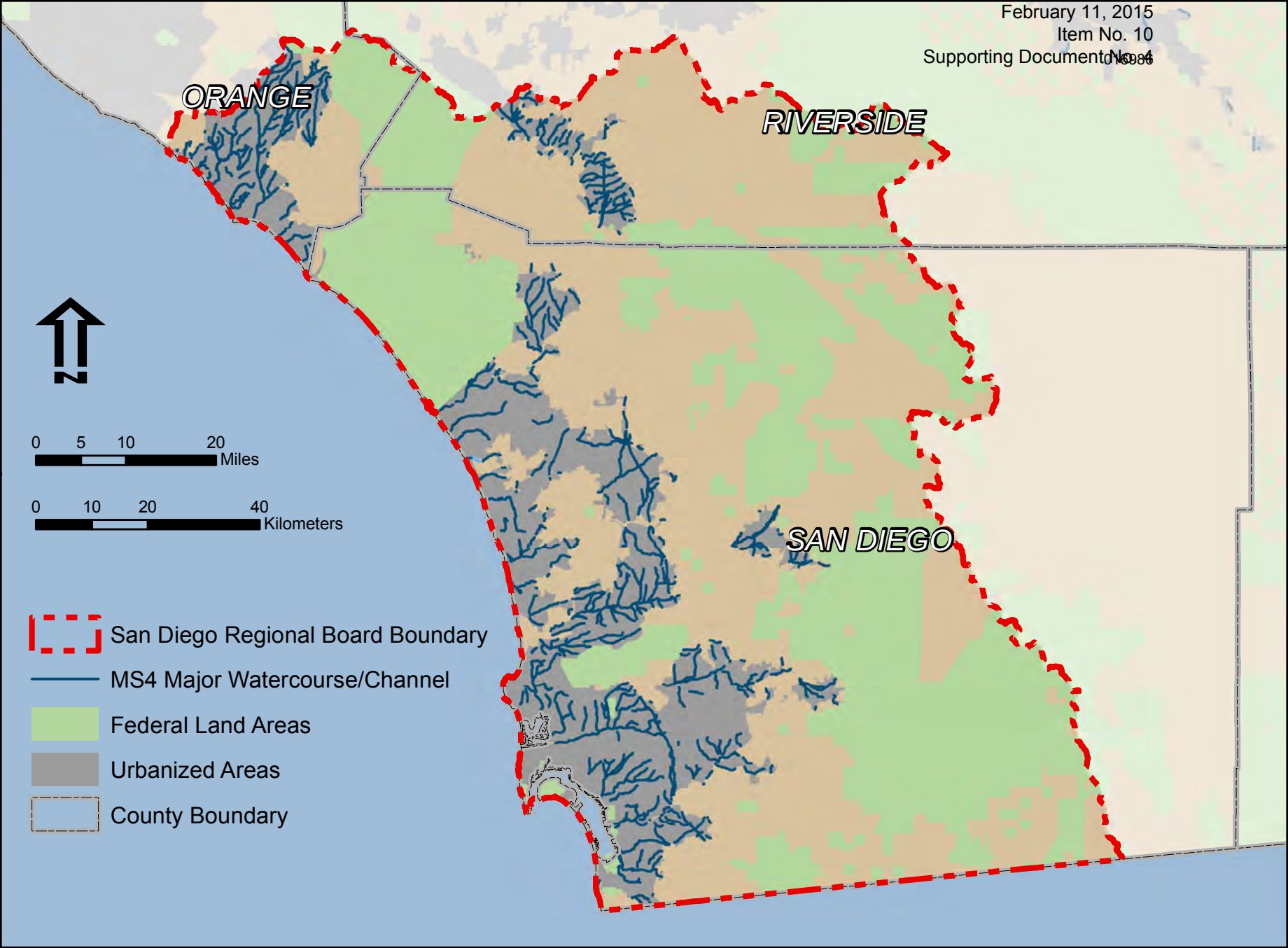
ORANGE
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SAN DIEGO
N
0 5 10 20 Miles
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San Diego Regional Board Boundary
MS4 Major Watercourse/Channel
Federal Land Areas
Urbanized Areas
County Boundary

ATTACHMENT A

**ORANGE COUNTY LEGAL &TECHNICAL COMMENTS ON
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
TENTATIVE ORDER No. R9-2013-0001
NPDES NO. CAS0109266**

Appendix A-2

SCCWRP Report

HYDROMODIFICATION ASSESSMENT AND MANAGEMENT IN CALIFORNIA

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Technical Report 667 - April 2012

Hydromodification Assessment and Management in California

Commissioned and Sponsored by California State Water Resources Control Board Stormwater Program

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April 2012

Technical Report 667

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EXECUTIVE SUMMARY

Most jurisdictions in California are now required to address the effects of *hydromodification* through either a municipal stormwater permit or the statewide construction general permit. Hydromodification is generally defined as changes in channel form associated with alterations in flow and sediment due to past or proposed future land-use alteration. Hydromodification management has emerged as a prominent issue because degradation of the physical structure of a channel is often indicative of and associated with broader impacts to many beneficial uses, including water supply, water quality, habitat, and public safety. Conversely, reducing hydromodification and its effects has the potential to protect and restore those same beneficial uses. Although hydromodification has the potential to affect all water body types, this document focuses on assessing and managing effects to streams because they are the most prevalent, widely studied, and arguably most responsive type of receiving water.

Hydromodification by definition results from alteration of watershed processes; therefore, correcting the root causes of hydromodification ought to be most effective if based on integrated watershed-scale solutions. To date, such a watershed approach has not been adopted in California; most hydromodification management plans simply consist of site-based runoff control with narrow, local objectives and little coordination between projects within a watershed. Furthermore, each municipality is required to develop its own approach to meeting hydromodification management requirements rather than drawing from standard or recommended approaches that facilitate regional or watershed-scale integration. Long-term reversal of hydromodification effects, however, will require movement away from reliance on such site-based approaches to more integrated watershed-based strategies.

This document has two goals, and hence two audiences. The first goal is to describe the elements of effective hydromodification assessment, management and monitoring. The audience for this goal is primarily the State and Regional Water Boards, since meeting this goal will require integration of watershed and site-scale activities that are likely beyond the responsibility or control of any individual municipality. Success will require fundamental changes in the regulatory and management approach to hydromodification that will likely advance only iteratively and potentially require one or more NPDES permit cycles to fully implement. The second goal of this document is to provide near-term technical assistance for implementing current and pending hydromodification management requirements. This goal can be achieved by municipalities within the construct of existing programs and therefore the primary audience for this aspect of the document is local jurisdictions. Achieving this goal will facilitate greater consistency and effectiveness between hydromodification management strategies, giving them a stronger basis in current scientific understanding.

Watershed analysis should be the foundation of all hydromodification management plans (Figure ES-1). This analysis should begin with a documentation of watershed characteristics and processes, and past, current, and expected future land uses. The analysis should lead to identification of existing opportunities and constraints that can be used to help prioritize areas of greater concern, areas of restoration potential, infrastructure constraints, and pathways for potential cumulative effects. The combination of watershed and site-based analyses should be used to establish clear objectives to guide management actions. These objectives should articulate desired and reasonable physical and biological

conditions for various reaches or portions of the watershed and should prioritize areas for protection, restoration, or management. Strategies to achieve these objectives should be customized based on consideration of current and expected future channel and watershed conditions. A one-size-fits-all approach should be avoided. Even where site-based control measures, such as flow-control basins, are judged appropriate, their location and design standards should be determined in the context of the watershed analysis.

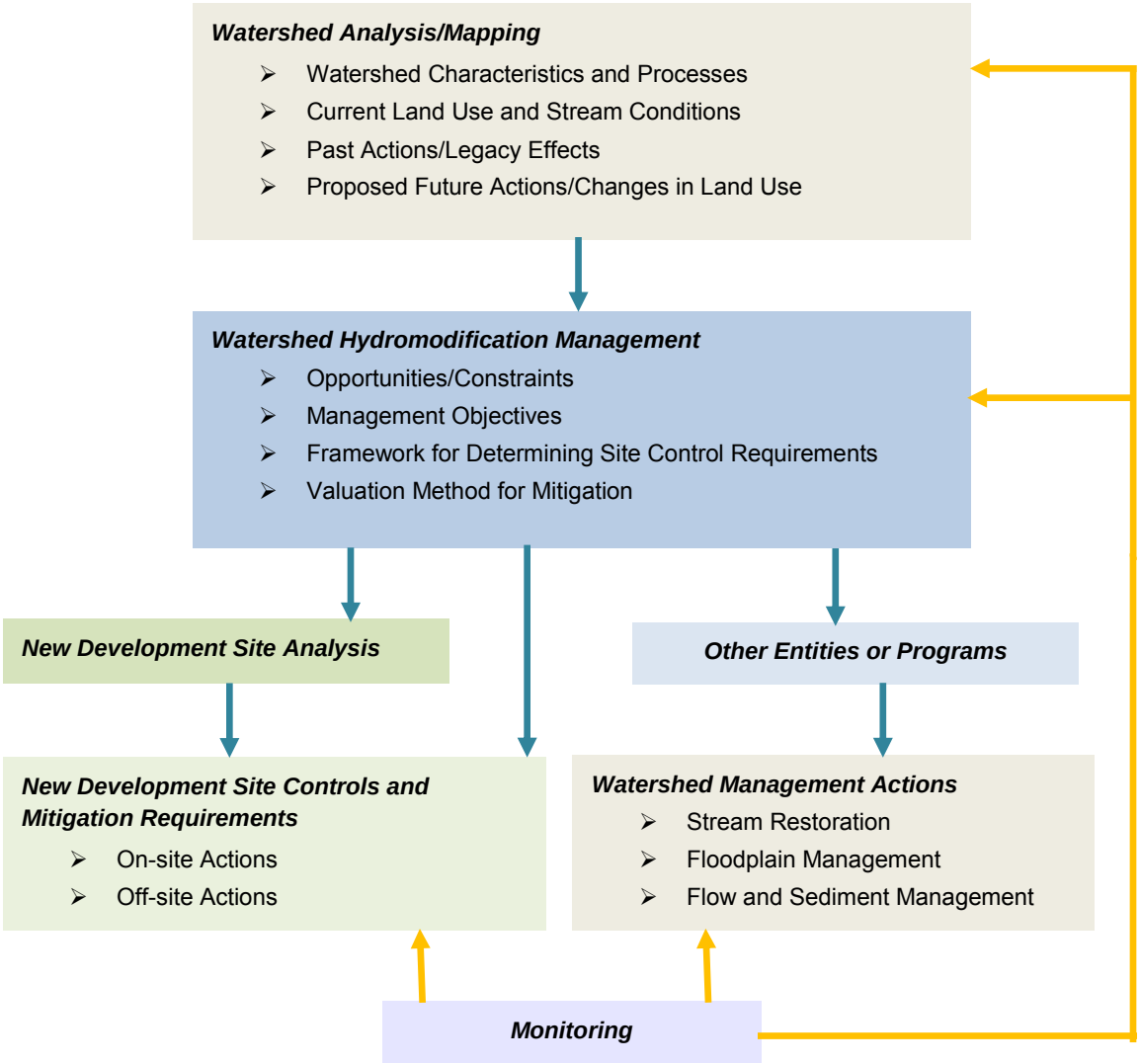

Figure ES-1. Framework for Integrated Hydromodification Management.

An effective management program will likely include combinations of on-site measures (e.g., low-impact development techniques, flow-control basins), in-stream measures (e.g., stream habitat restoration), floodplain and riparian zone actions, and off-site measures. Off-site measures may include compensatory mitigation measures at upstream locations that are designed to help restore and manage flow and sediment yield in the watershed.

Project-specific analysis and design requirements should vary depending on location, discharge point, and size. The range of efforts may include:

- Application of scalable, standardized designs for flow control based on site-specific soil type and drainage design. The assumptions used to develop these scalable designs should be conservative, to account for loss of sediment and uncertainties in the analysis and our understanding of stream impacts.
- Use of an erosion potential metric, based on long-term flow duration analysis and in-stream hydraulic calculations. Guidelines should specify stream reaches where in-stream controls would and would not be allowed to augment on-site flow control.
- Implementation of more detailed hydraulic modeling for projects of significant size or that discharge to reaches of special concern to understand the interaction of sediment supply and flow changes.
- Analysis of the water-balance for projects discharging into streams with sensitive habitat. This may include establishment of requirements for matching metrics such as number of days with flow based on the needs of species present.

Achieving these goals will require that hydromodification management strategies operate across programs beyond those typically regulated by NPDES/MS4 requirements. Successful strategies will need to be developed, coordinated, and implemented through land-use planning, habitat management and restoration, and regulatory programs. Regulatory coordination should include programs administered by the Water Boards, such as non-point source runoff control, Section 401 Water Quality Certifications and Waste Discharge Requirement programs, and traditional stormwater management programs. It should also include other agency programs, such as the Department of Fish and Game Streambed Alteration Program and the Corps of Engineers Section 404 Wetland Regulatory Program. Thus, all levels of the regulatory framework—federal, state, and local—will need to participate in developing and implementing such a program. The integrated watershed-based approach will likely take one or more permit cycles (i.e., at least ten years) to fully implement.

Short- and long-term recommendations for management are summarized in Table ES-1 below.

Table ES-1. Recommendations for implementing watershed-based hydromodification management.

Time Frame	Programmatic: State and Regional Water Boards	Local: City and County Jurisdictions
Short-term (<10 years)	• Establish consistent standards for HMPs • Promote use of watershed approaches in HMPs to move away from reliance on project-based management actions • Develop a valuation method to determine appropriate off-site mitigation • Transition to a broader set of monitoring endpoints including flow, geomorphology, and biology	• Implement watershed analysis of opportunities and constraints related to hydromodification • Implement a broader set of tools to improve on-site management actions • Develop institutional capacity to oversee and review modeling and assessment tools • Develop capacity for information/data management and dissemination
Long-term (1+ decades)	• Develop watershed-based regulatory programs and policies for hydromodification management • Integrate hydromodification management needs into other regulatory programs (e.g. TMDL, 401/WDR)	• Develop institution capacity to implement watershed-based hydromodification programs • Incorporate hydromodification and other water quality management into the land use planning process

To successfully accomplish these various recommendations for implementation, both agencies and private-sector practitioners will need to make use of a range of analytical tools. Such tools generally fall into three categories: descriptive tools, mechanistic models, and empirical/statistical models. Models may be used deterministically and/or in a probabilistic manner. These different types of tools can be selected or combined, depending on the specific objective, such as characterizing stream condition, predicting response, establishing criteria / requirements, or evaluating the effectiveness of management actions. Selection of tools should also consider the type of output, intensity of resource requirements (i.e., data, time, cost), and the extent to which uncertainty is explicitly addressed. It is important to note that deterministic modeling without accompanying probabilistic analysis may mask the uncertainties inherent in predicting hydromodification effects. Short-term and long-term recommendations for the application and improvement of tools to support the management framework are shown in Table ES-2.

Although there is sufficient scientific and engineering understanding of hydromodification causes and effects to begin implementing more effective management approaches now, improvements should be informed and adapted based on subsequent monitoring data. To be useful, monitoring programs should be designed to answer questions and test hypotheses that are implicit in the choice of management actions, such that practices that prove effective can be emphasized in the future (and those that prove ineffective can be abandoned). The focus of monitoring efforts, however, needs to be tailored to the time frame of the questions being addressed and the implementing agency (Table ES-3), reflecting the dual goals and audiences of this document.

Table ES-2. Recommendations for the application and improvement of tools in support of the proposed management framework.

Time Frame	Programmatic: State and Regional Water Boards	Local: City and County Jurisdictions
Short-term (<10 years)	• Develop quality control and standardization for continuous simulation modeling • Perform additional testing and demonstration of probabilistic modeling for geomorphic response • Pursue development of biologically- and physically-based compliance endpoints	• Work cooperatively with adjacent jurisdictions to implement hydromodification risk mapping at the watershed scale • Implement continuous simulation modeling for project impact analysis
Long-term (1+ decades)	• Improve tools for sediment analysis and develop tools for sediment mitigation design • Develop tools for biological response prediction • Improve tools for geomorphic response prediction	• Expand use of probabilistic and statistical modeling for geomorphic response • Apply biological tools for predicting and evaluating waterbody condition

Table ES–3. Recommendations for hydromodification monitoring.

Time Frame	Programmatic: State and Regional Water Boards	Local: City and County Jurisdictions
Short-term (<10 years)	• Define the watershed context for local monitoring (at coarse scale) • Evaluate whether permit requirements are making positive improvements	• Evaluate whether specific projects/ regulations are meeting objectives • Identify the highest priority action(s) to take
Long-term (1+ decades)	• Define watershed context and setting benchmarks for local-scale monitoring (i.e., greater precision, if/as needed) • Demonstrate how permit requirements can improve receiving-water "health," state-wide (and change those requirements, as needed)	• Evaluate and demonstrate whether actions (on-site, instream, and watershed scale) are improving receiving-water conditions • Assess program cost-effectiveness • Identify any critical areas for resource protection

Identifying and, ultimately, achieving the desired conditions in receiving waters requires multiple lines of evidence to characterize condition in an integrative fashion. At their most comprehensive, the chosen metrics should include measures of flow, geomorphic condition, chemistry, and biotic integrity. Biological criteria are key to integrative assessment: in general, biological criteria are more closely related to the designated uses of waterbodies than are physical or chemical measurements. This understanding is reflected in the State's proposed bio-objectives policy, which includes explicit links to hydromodification management.

In summary, transitioning from the current site-based to a more effective watershed-based approach to hydromodification management that addresses both legacy and future impacts will require cooperation between the State and Regional Water Boards and local jurisdictions. Both technical and regulatory/program approaches will need to be updated or revised altogether over the next several permit cycles to realize this long-term goal. Substantial resources will be necessary to realize these goals; therefore, opportunities for joint funding and leveraging of resource should be vigorously pursued from the onset. This cooperative approach should replace the current fragmented efforts among regions and jurisdictions.

1. Overview and Intended Uses of the Document

1.1 Overall Objectives and Intended Audience

Regulation and management of hydromodification is in its infancy in California. As with any new endeavor, initial attempts to meet this need is unproven, inconsistent, and relatively narrow in focus. To improve on existing efforts, the State Water Resources Control Board (SWRCB) has engaged a team of experts to provide technical support to both regulators and permittees for development of Hydromodification Management Plans (HMPs) and their associated permit requirements. This resulting document has two goals and hence two audiences.

The first goal of this document is to provide broad perspectives on what would constitute effective hydromodification assessment, management and monitoring, based on our current best scientific understanding of the topic. The audience for this goal is primarily the State and Regional Water Boards, since meeting this goal will require integration of watershed and site-scale activities that are likely beyond the control or responsibility of any individual municipality. Success will require fundamental changes in the regulatory and management approach to hydromodification that will likely be possible only iteratively and potentially requiring one or more NPDES permit cycles to fully implement. The State and Regional Water Boards will need to provide leadership in implementing these changes, but they will also need to work cooperatively with permittees so that planning, management and monitoring programs can be adapted to operate in a more integrated manner over the broader spatial scales and longer time frames that are necessary to achieve genuine success. Furthermore, hydromodification management plans will need to address preexisting conditions from previous (i.e., legacy) land uses. Clearly, addressing such past effects will require approaches beyond regulation of new development.

This document provides broad perspectives on what would constitute effective hydromodification assessment, management and monitoring, based on our current best scientific understanding of the topic. The document also provides near-term technical assistance for implementing current and pending hydromodification management requirements.

The second goal of this document is to provide near-term technical assistance for implementing current and pending hydromodification management requirements. This goal can be achieved by municipalities within the construct of existing programs, and therefore the primary audience for this aspect of the document is MS4 permittees. Achieving this goal will facilitate greater consistency and effectiveness between HMPs, giving them a stronger basis in current scientific understanding, and will also serve as initial steps toward realizing the broader goal stated above.

1.2 Rationale and Justification

The process of urbanization has the potential to affect stream courses by altering watershed hydrology and geomorphic processes. Development and redevelopment can increase impervious surfaces on formerly undeveloped landscapes and reduce the capacity of remaining pervious surfaces to capture and infiltrate rainfall. The most immediate result is that as a watershed develops, a larger percentage of

rainfall becomes surface runoff during any given storm. In addition, runoff reaches the stream channel much more efficiently, so that the peak discharge rates for floods are higher for an equivalent rainfall than they were prior to development. This process has been termed hydromodification. In some instances, direct channel alteration such as construction of dams and channel armoring has also been termed "hydromodification." Such direct alterations are not the focus of this document. Rather, this document focuses on the geomorphic and biological changes associated with changes in land use in the contributing watershed, which in turn alter patterns and rates of runoff and sediment yield. These changes can result in adverse impacts to channel form, stream habitat, surface water quality, and water supply that can alter habitat and threaten infrastructure, homes, and businesses.

The State and Regional Water Boards have recognized the need to manage and control the effects of hydromodification in order to protect beneficial uses in streams and other receiving water bodies. This recognition has led to the inclusion of requirements for development of "hydromodification management plans" (HMPs) in many Phase 1 and some Phase 2 Municipal Stormwater (MS4) permits. Most HMPs require the permitted municipalities to develop programs and policies to assess the potential effects of hydromodification associated with new development and redevelopment, to require the inclusion of management measures to control the impacts of hydromodification, and to develop monitoring programs to assess the effectiveness of HMP implementation at controlling and/or mitigating the impacts of hydromodification.

Development of HMPs is challenging for several reasons. First, there are few accepted approaches for assessing the impacts of hydromodification. Traditional modeling tools are generally untested and may be difficult to apply or inappropriate for use in some California watersheds and streams. Responses of streams to hydromodification are difficult to assess, given inherent climatic variability and the highly stochastic nature of rainfall and the resulting response of streams to runoff events. There are few local examples or case studies from which to draw experiences or conclusions.

As a result of these challenges, individual HMPs to date have utilized a variety of approaches with little coordination or consistency between them. Little information is available on the relative efficacy of any of these approaches. Furthermore, where approaches and tools developed for HMPs in one region of the State (or even from a different region of the country altogether) have been used in subsequent HMPs elsewhere, there has been little or no consideration of the effect of regional climatological or physiographical differences on the transferability of analytical techniques and tools.

1.3 Need for an Expanded Approach

Current site-based hydromodification management approaches are limited in their ability to address the underlying processes that are responsible for most deleterious impacts of hydromodification. Hydromodification effects, by definition, are watershed-dependent processes that are influenced by water and sediment discharge, movement, and storage patterns that may be occurring up- or downstream of a specific project site. Ideally, then, the first step of any hydromodification management plan (HMP) should be a watershed analysis; management of processes at the site or project scale should be done only in the context of such a watershed analysis. Understanding larger-scale processes

facilitates prioritization of activities in areas of greatest need and allows for management measures to be located where they have the largest potential benefit, even if that is not on or adjacent to the project site where the current impact is occurring. It also allows for expansion of site based management beyond simple flow control and/or channel stabilization toward strategies that consider flow, sediment, and biological conditions as an integrated set of desired endpoints.

Because watershed boundaries are often not the same as geopolitical boundaries of cities or counties, incorporation of watershed analysis will require leadership from the State and Regional Water Boards. Changes to the current regulatory structure may be necessary to accommodate inter-jurisdictional cooperation and regional information sharing. Similarly, program implementation by both large and small municipalities must include mechanisms that allow site-specific decisions to be informed by watershed-scale analysis.

This document is intended to help address some of these challenges and needs by providing technical recommendations, both to state and regional program developers and to local implementing agencies, for assessment, modeling, development of management strategies, and monitoring. This document can support current HMP development and, at the same time, serve as a first step toward achieving the longer term goals of more integrated, watershed-based hydromodification management.

Current site-based approaches are limited in their ability to address the underlying processes that are responsible for hydromodification impacts.

Effective management of hydromodification will require coordinated approaches across programs at the watershed scale that address all aspects of runoff, sediment generation and storage, instream habitat, and floodplain management.

Adopting this broader approach means that managing the effects of hydromodification cannot be the purview of the stormwater (MS4) program alone. Effective management of hydromodification will require coordinated approaches across programs at the watershed scale that address all aspects of runoff, sediment generation and storage, instream habitat, and floodplain management. Various SWRCB programs have the opportunity and ability to contribute to the goals of comprehensive hydromodification management, including the non-point source control program, water quality certifications, waste discharge requirements, basin planning, SWAMP, and the emerging State Wetland Policy and Freshwater Bio-objectives program. Each of these programs can take advantage of the tools and approaches outlined in this paper to contribute to coordinated management of hydromodification in order to protect beneficial uses and meet basin plan objectives. Furthermore, successful control and mitigation of hydromodification effects will support other programs by improving water quality, enhancing groundwater recharge, and protecting habitat. Therefore, hydromodification management can be a unifying element of many programs and support integrated regional watershed planning.

It is important to note that hydromodification has the potential to affect all water body types; therefore, HMPs should address potential effects to all streams and receiving waters. Because streams are most directly affected by hydromodification, they have been the focus of current regulatory requirements and, therefore, most HMPs. Consequently, this document emphasizes tools and approaches applicable

to fluvial systems, which are broadly defined to include wadeable streams, large rivers, headwater streams, intermittent and ephemeral drainages, and alluvial fans (although new specific tools may be necessary for assessment and management of alluvial fans). We recognize, however, that hydromodification can also affect nearshore and coastal environments, including bays, harbors, and estuaries, by altering estuary channel structure, water quality, sand delivery, siltation, and salinity. These effects have been less extensively studied or documented and have received substantially less attention in current hydromodification requirements. Future efforts should more directly address hydromodification effects to all receiving waters, but the information is not presently available to provide equally comprehensive guidance here.

1.4 Scope and Organization

This document is not intended to be prescriptive or to serve as a "cookbook" for development of hydromodification management strategies. Rather, it is a resource to evaluate the utility of existing tools and approaches, and it proposes a framework for integrating multiple approaches for more comprehensive assessment and management. This framework should be used to aid in the development of HMPs that are appropriate for specific regions and settings and take advantage of the best available science. It can also be used to improve consistency in assessment and monitoring approaches so that information collected across regions and programs can be compiled and leveraged to provide more comprehensive assessments of the effectiveness of management actions. Ultimately, such consistency should improve the effectiveness of all programs.

The authors, a team of technical experts, developed the content for this document in consultation with agency staff and regulated entities. The document begins with a brief general discussion of the effects of hydromodification and stream response mechanisms, providing the best available science to support subsequent recommendations. The main body of the document focuses on presenting a proposed new management paradigm where site-based management is nested within an overall watershed assessment that accounts for past, current, and proposed future land use. The body of the document also includes a discussion of existing tools and how they can be used more effectively and appropriately to evaluate potential impacts and guide decisions on selection and design of management practices. The third major section of the document focuses on monitoring that includes evaluation of hydrologic, geomorphic, and biologic conditions with an overriding goal of adaptive management. The document concludes with several technical appendices that offer specific guidance on the appropriate application of tools and models within the existing HMP approaches, and a bibliography of resources.

2. Hydromodification Science

2.1 Introduction

Land-use changes can alter a wide variety of watershed processes, including site water balance, surface and near-surface runoff, groundwater recharge, and sediment delivery and transport. Although alteration to these watershed processes (referred to collectively as hydromodification) can affect many elements of a landscape, the focus of this document is on impacts to stream systems. Furthermore, while this paper will often refer to urbanization, it is recognized that other types of land-use changes (grazing, agricultural, forestry, etc.) can have similar impacts. This section reviews relevant hydrologic processes and summarizes the impact of urbanization on hydrologic, biologic, and geomorphic systems, and it describes our current understanding of the physical mechanisms underlying these impacts. This provides a foundation for establishing assessment tools and predictive models, as well as for developing management and monitoring programs.

Although not addressed by this report, urbanization also has a range of effects on water quality (*Heaney and Huber* 1984, *Brabec et al.* 2002) by increasing pollutant loads (*Owe et al.* 1982), increasing nutrient loads (*Wanielista and Yousef* 1993, *Hubertz and Cahoon* 1999), and diluting dissolved minerals through increased runoff and decreased infiltration and soil contact (*Loucaides et al.* 2007). As a result of both its physical and chemical effects, urbanization also affects the integrity of biota (*Heaney and Huber* 1984) including fishes (*Klein* 1979, *Weaver and Garman* 1994, *Wang et al.* 2000) and invertebrates (*Sonneman et al.* 2001, *Wang and Kanehl* 2003). These impacts are acknowledged and evaluated in the discussion of monitoring Section 4, but the details of their interactions and effects are not otherwise addressed here.

Land-use changes can alter a wide variety of watershed processes, including site water balance, surface and near-surface runoff, groundwater recharge, and sediment delivery and transport. Alteration to these watershed processes are referred to collectively as hydromodification.

2.2 Hydrology Overview

To understand the effects of urbanization, the basic processes of the hydrologic system must be highlighted. A watershed's drainage system consists of all the features of the landscape that water flows over or through (*Booth* 1991). These features include vegetation, soil, underlying bedrock, and stream channels. Urban elements such as roofs, gutters, storm sewers, culverts, pipes, impervious surfaces such as parking lots and roads, and cleared and compacted surfaces fundamentally change the rate and character of hydrologic processes. Generally, the hydrologic changes associated with development and urbanization increases the speed and efficiency with which water enters and moves through the drainage system. In undeveloped watersheds, only a portion of the precipitation that falls ever enters the stream channel. Instead, precipitation may be: 1) evaporated off the ground surface or intercepted by vegetation and evaporated; 2) transpired from the soil; or 3) infiltrated deeply into regional aquifers. For the portion of precipitation that ultimately enters the stream, the rate and processes of delivery vary between watersheds, with important implications for how urbanization will affect runoff.

Flow can be classified as stormflow (or "quickflow") if it enters the stream channel within a day or two of rainfall (*Dunne and Leopold* 1978). Quickflow occurs through 1) infiltration excess (also called "Horton") overland flow, wherever rainfall intensity exceeds the infiltration capacity of the soil and water flows over the ground surface; 2) saturation excess overland flow, where overland flow occurs following filling of all pore space in surface soils; 3) shallow subsurface flow, where water flows relatively quickly through permeable shallow soils (but still more slowly than either Horton or saturation overland flow); and 4) precipitation directly into stream channels. Conversely, water that infiltrates more deeply is classified as delayed flow, because it travels slowly as deep groundwater and emerges into a stream slowly over time.

As a storm progresses, runoff patterns and rates can change, even within the same catchment. For example, surficial soils may become saturated during the course of a storm (or a storm season) as the water table rises, and this can induce a shift in runoff from shallow (or even deep) subsurface flow to the quickflow process of saturation excess overland flow (*Booth* 1991). Even under scenarios in which rainfall intensity exceeds infiltration capacity, Horton overland flow will not be connected to stream channels until surface depressions are filled.

2.3 Impacts of Urbanization

The archetypal model of development involves clearing vegetation; grading, removing, and compacting soils; building roads and stormwater sewers; constructing buildings; and re-landscaping. The specific ways in which these activities alter runoff processes are discussed below. Development may also directly alter stream, such as through channel straightening, levee construction, and flood control reservoirs; however, discussion of the impacts of these alterations is beyond the scope of this document.

2.3.1 Decreased Interception

When rainfall occurs in a watershed, some of the precipitation will be intercepted by vegetation and leaf litter and prevented from entering the stream channel network (Figure 2-1). The percentage of precipitation that can be intercepted varies according to cover type and the character of rainfall (rainfall intensity, storm duration, storm frequency, evaporation conditions) (*Dunne and Leopold* 1978). The effectiveness of interception decreases as a storm progresses because once the surface area of a tree is completely wetted, water will drip off leaves and run down the vegetation as stem flow. Typically, 10-35% of precipitation is intercepted by trees and 5-20% by crops, though these amounts vary widely (*Dunne and Leopold* 1978, *Xiao and McPherson* 2002, *Reid and Lewis* 2009, *Miralles et al.* 2010). In urban environments where vegetative cover is greatly reduced, landscape-scale interception may be lower by an order of magnitude (*Xiao and McPherson* 2002). Precipitation that is not intercepted enters the drainage system. Thus, the mere reduction in interception in urban areas may produce the hydrologic equivalent of a storm that is 10-30% larger.

Figure 2-1. Vegetation reduces runoff by intercepting a portion of the total rainfall and preventing water from entering the drainage system. (Illustration by Jennifer Natali).

The influence of urbanization on climate is complex and varied. For example, urbanization has been shown to increase temperature (*Kalnay and Cai* 2003), increase or decrease wind speeds (*Oke* 1978, *Balling and Brazel* 1987, *Grimmond* 2007), increase pan-evaporation rates (*Balling and Brazel* 1987), and increase shading of the ground surface (*Kalnay and Cai* 2003). In most studies of urban hydrology, the dynamics of evapotranspiration (ET) are typically, explicitly or implicitly, ignored (*Grimmond and Oke* 1999). This exclusion exists because of the widespread assumption that urban ET is negligible compared to rural areas with higher proportions of vegetation-covered soils (*Chandler* 1976, *Oke* 1979). In cases such as urban deforestation in the temperate Eastern United States, it is appropriate to assume a net loss of ET due to urbanization (*Bosch and Hewlett* 1982, *Sun et al.* 2005, *Roy et al.* 2009). However, spatial variability and the site-specific dynamics of climate, vegetation, and land-use should be considered carefully in arid and semi-arid regions where vegetation is limited prior to development. In drier climates (including much of southern California), primary productivity (and ET) may be substantially increased through the irrigation of urban landscaping (*Buyantuyev and Wu* 2008).

2.3.2 Decreased Infiltration

Infiltration in urban areas is decreased due to several factors: impermeable surfaces such as roads, parking lots, and roofs prevent infiltration by blocking water from reaching soils; heavy-equipment construction operations cause soil compaction and degrade soil structures; construction projects may remove surface soils and expose subsurface soils with poorer infiltration capacity; vegetation-clearing and bare-earth construction increase erosion and loss of topsoil (*Pitt et al.* 2008). The effect of impervious surfaces is intuitive, visible, and dramatic (*Booth and Jackson* 1997), but not all impervious areas affect runoff processes equally. For example, if an impervious surface is built over clayey soils with poor infiltration, the overall runoff rates will be less affected than if built over sandy soils with high natural infiltration rates. While the loss of pervious area has received substantial attention within scientific and policy communities, until recent years considerably less attention has been paid to the effects of compaction and the reductions in infiltration capacity of soils (*Pitt et al.* 2008). Commonly, an area of green is assumed to be permeable, but playing fields and even ornamental lawns may have very

low infiltration capacities (*Pitt et al.* 2008). A study of urban runoff in Washington found that impervious areas generated only 20% more runoff than what appeared to be green, pervious areas of lawns (*Wigmosta et al.* 1994). Factors such as excavation and lawn-establishment methods appear to be more significant for infiltration than any other factor including grain size of the original sediments (*Hamilton and Waddington* 1999). Tillage may increase infiltration slightly, while compost or peat soil amendments can increase infiltration by 29 to 50 percent (*Kolsti et al.* 1995).

2.3.3 Increased Connectivity and Efficiency of the Drainage System

Rainfall in urban areas moves quickly as overland flow into storm sewers and the stream channel network (Figure 2-2). The delivery of precipitation into urban stream channels is extremely efficient, transforming essentially all precipitation into stormflow and creating nearly instantaneous runoff. Under natural conditions, in contrast, most runoff to streams is via groundwater paths that typically flow at least one or two orders of magnitude slower than surface water. Thus converting subsurface flow into surface stormflow has dramatic consequences. Furthermore, artificial surfaces such as roofs, pavement, and storm sewers are 1) straight, which shortens the travel distance required for delivery into the channel network; and 2) smooth, which decreases friction and allows flow to travel more quickly than in natural channels (*Hollis* 1975). Storm sewer systems increase the density of "channels," which further shortens runoff travel distances (Figure 2-3). In particular, upland regions that may not have had any surface channels prior to urbanization are frequently fitted with storm sewers, which dramatically increase delivery efficiency into the channel network (*Roy et al.* 2009). In sum, urbanization transforms watershed processes and flow paths that were once slow, circuitous, and disconnected into engineered and non-engineered systems that are highly efficient, direct, and connected.

In contrast to the slow measured runoff to natural streams by surface and subsurface pathways, the delivery of precipitation into urban stream channels is extremely efficient, transforming essentially all precipitation into stormflow and creating nearly instantaneous runoff.

2.3.4 Decreased Infiltration into Stream Beds

Concreting of bed and banks, channel narrowing, and channel straightening limit infiltration from a stream into the ground. Concrete channel margins create infiltration barriers, while channel narrowing and straightening limit the surface area accessible for infiltration and also create a less complex channel. Channel complexity such as pools, riffles, steps, and debris dams create hydraulics that slow flow velocities and also divert water into the subsurface (*Lautz et al.* 2005). In arid and semi-arid watersheds where streams may flow only occasionally, infiltration through bed, banks, and floodplain areas may significantly lower peak flows and may sustain aquifers vital to regional water supplies and natural habitats (*Kresan* 1988, *Dahan et al.* 2008). Increasing recognition is being paid in the scientific literature to the infiltration services provided by natural channels and floodplains (*Macheleidt et al.* 2006, *Schubert* 2006).

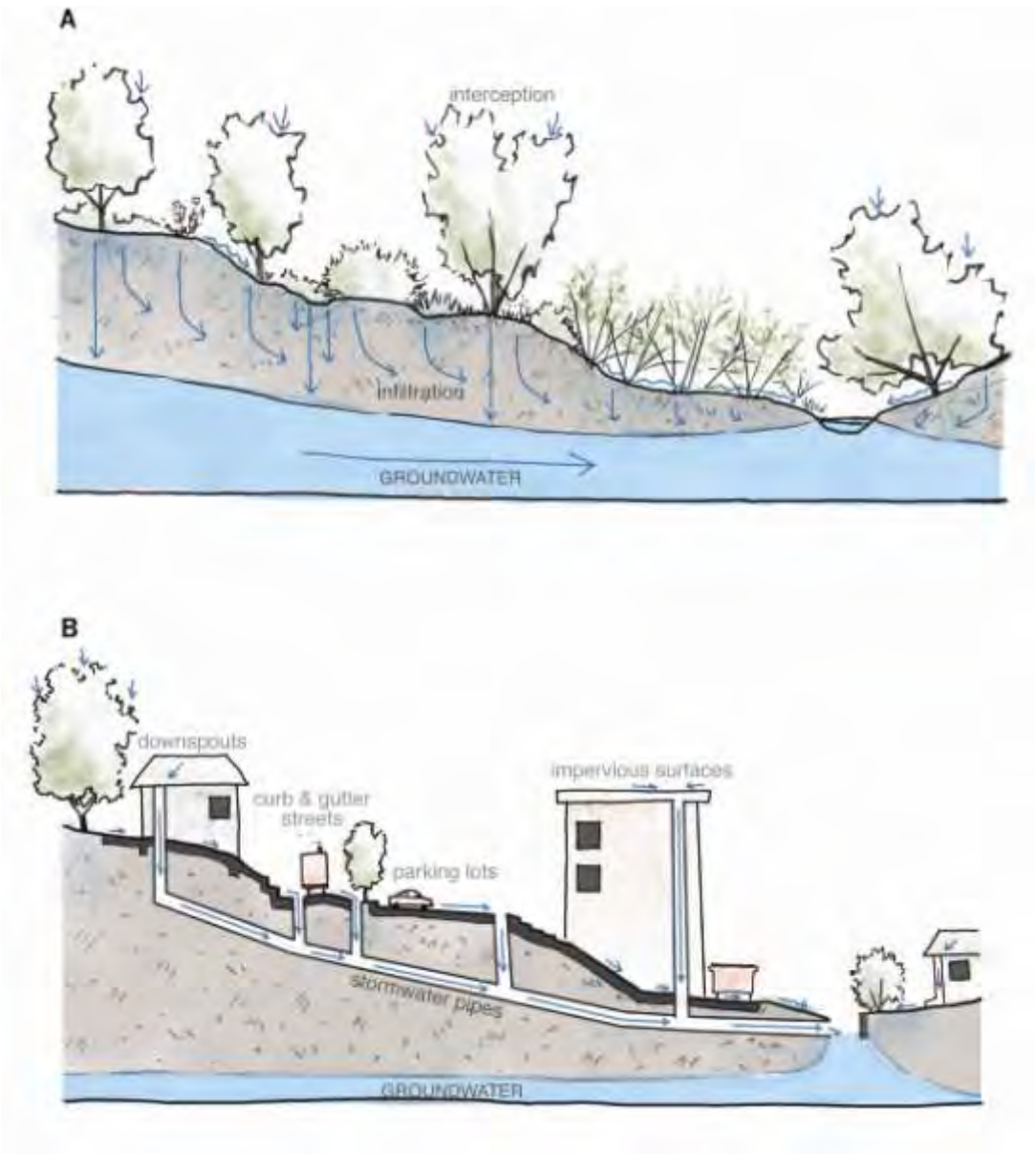

Figure 2-2. Stormwater flowpaths are shortened and quickened through paving, building, soil compaction, and sewer infrastructure. The rapid concentration of streamflow increases storm peaks. Rapid runoff and reduced infiltration prevent groundwater recharge. (Illustration by Jennifer Natali).

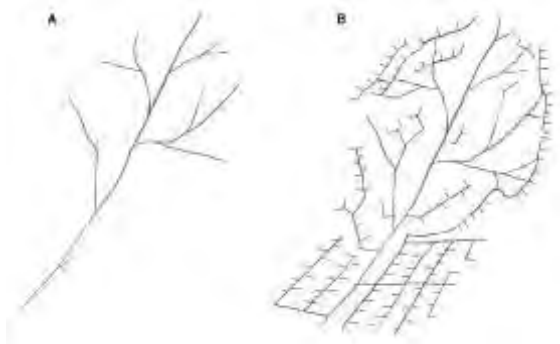

Figure 2-3. Increased surface runoff causes an extension of the channel network. This occurs through increased channel erosion or through constructed networks (to manage increased surface flow). The expanded channel network delivers runoff to downstream reaches much more efficiently. (Illustration by Jennifer Natali).

2.4 Changes in Instream Flow

The instream flow changes resulting from urbanization depend upon site-specific watershed and development characteristics, but typically they include modification of the timing, frequency, magnitude, and duration of both stormflows and baseflow. Urbanization has been shown to increase the magnitude of stormflows, increase the frequency of flood events, decrease the lag time to peak flow, and quicken the flow recession (Figure 2-4; *Hollis* 1975, *Konrad and Booth* 2005, *Walsh et al.* 2005). Because the effects of urbanization manifest differently for different components of the hydrograph, the hydrologic alterations of moderate storms, large storms, and baseflow are discussed individually below.

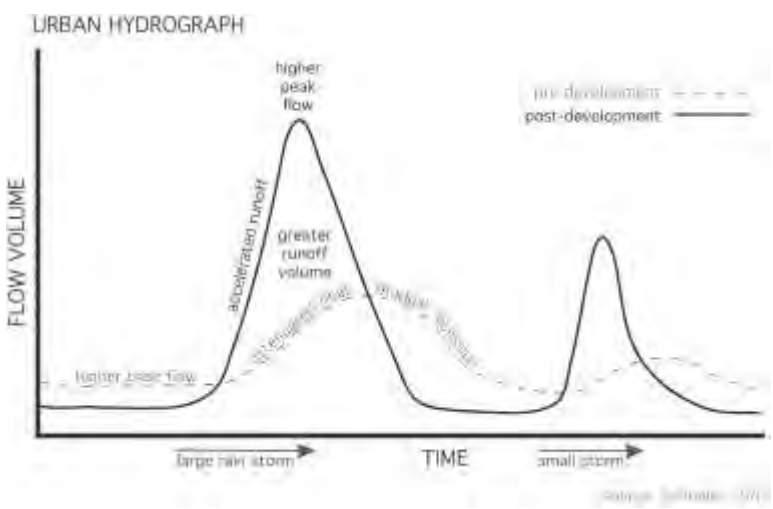

Figure 2-4. Increased runoff efficiency causes higher magnitude peak flows, shorter duration runoff events, decreased baseflow, and dramatic increases in small storms that may have generated little or no runoff under pre-development conditions. (Illustration by Jennifer Natali).

2.4.1 Moderate Stormflow

Urbanization of a watershed can drastically increase the frequency and magnitude of small and moderate flow events (Hawley and Bledsoe 2011). The magnitude of flow amplification increases generally in proportion to the amount of impervious area (*Leopold* 1968, *Hollis* 1975). For example, flows with a return period of one year or longer were shown to be unaffected by paving 5% of the watershed, yet the magnitude of a one-year flow could be more than ten times higher when 20% of a watershed is paved (*Hollis* 1975). In undeveloped watersheds, small storms may not generate any overland flow or streamflow increase at all, because interception, infiltration, soil absorption, and evapotranspiration contain all the precipitation.

Urbanization of a watershed can drastically increase the frequency, duration, and magnitude of small and moderate flow events by factors of 10 or more.

The change to a flashier regime with larger magnitude streamflow generated from small and moderate storms has two primary consequences. First, the stream power and sediment-transport capacity of the stream increase significantly, potentially creating channel erosion and/or stressing instream biota. Second, the season of stormflow is likely to be extended. In undeveloped watersheds, early or late-season storms typically do not generate significant runoff because soils are dry, can effectively absorb most precipitation, and therefore do not generate overland flow or streamflow. Antecedent moisture conditions are less important in urban watersheds where overland flow is generated regardless, and streamflow is generated by even a small storm in a dry watershed. Through magnifying small and moderate storms, urbanization may increase the duration of sediment-transporting and habitat-disturbing flows by factors of 10 or more (*Booth* 1991, *Booth and Jackson* 1997).

2.4.2 Large, Infrequent Storms

In large storms with return intervals of 10 or more years, the influence of urbanization is less pronounced though still present. Whereas a 1-year stormflow may be increased by ten times by paving 20% of the watershed, historical data from humid-region watersheds suggest that the peak magnitude of a 100-year flood would not even be doubled (*Hollis* 1975). The diminishing influence of urbanization on floods of higher recurrence intervals is understood by recognizing that the hydrologic processes of large storms resemble the processes of urban runoff. Essentially, a 100-yr flood is an event that is long in duration, severe in intensity, and likely occurs when soils are already wet. Even in an undeveloped watershed, a storm of this magnitude can typically generate (saturation) overland flow and transport water efficiently into the channel network in a manner more generally comparable to an urban setting.

2.4.3 Baseflow

Urbanization does not affect instream baseflows consistently. Many studies have documented baseflow reductions and/or lowered groundwater levels that have been attributed to decreased infiltration (*Simmons and Reynolds* 1982, *Ferguson and Suckling* 1990) and groundwater extraction (*Postel* 2000). In extreme cases, baseflow in urban watersheds can disappear completely during drought years, dry

seasons, or even between storm events during the wet season. The effect of reducing infiltration may be counteracted in urban and suburban landscapes, however, through irrigation of lawns, parks, golf courses, and other water inputs such as septic systems, leaky pipes, and sewage treatment outflow which typically import water from outside the watershed and contribute to both streamflow and groundwater recharge (*Konrad and Booth* 2005, *Walsh et al.* 2005, *Roy et al.* 2009). Indeed, imported water volumes in very dense cities may be an order of magnitude greater than precipitation. Lerner (2002) judged that leakage in water importation and delivery infrastructure typically ranges from 20-50%, and in general this leakage will increase groundwater recharge in urban areas. Similarly, other studies have found municipal irrigation capable of raising groundwater levels and causing surface flooding (*Rushton and Al-Othman* 1994) and changing ephemeral streams into perennial streams (*Rubin and Hecht* 2006, *Roy et al.* 2009). In summary, the magnitude and direction baseflow and groundwater recharge alteration depends on climate, land use, water use, and the infrastructure system of the watershed. There are no simple "rules."

2.5 Changes in Sediment Yield

The role of watershed sediment yield in the behavior of watersheds was first characterized systematically by Wolman (1967) in a three-part conceptual framework of how rivers respond to urban development, in which 1) pre-development quasi-equilibrium conditions are followed by 2) a period of active construction involving grading, vegetation removal, and bare earth exposed to erosion; and 3) the establishment of an urban landscape consisting of pavement, houses, gutters and sewers etc. The construction period is marked by an increase in sediment (typically 2-10 times pre-development rates) produced from bare surfaces and the disturbances associated with construction (*Chin* 2006). The sediment produced during construction is often deposited within stream channels, initiating aggradation and/or channel widening. Following the construction period, sediment production decreases (Figure 2-5) and runoff increases, resulting in increased transport capacity and the potential for severe channel erosion that can result in channel enlargement of commonly 2-3 (and as much as 15) times the original channel cross-section (*Chin* 2006). Changes in post-construction sediment production rates are not well studied, though case studies have found sediment yields in post-construction watersheds to be somewhat higher than rural, undeveloped basins.

The combination of increased runoff and decreased sediment production can result in channel enlargement of commonly 2-3 (and as much as 15) times the original channel cross-section.

Post-construction sediment loads are typically derived from channel enlargement as a result of increased peak flows and the legacy of construction-phase disturbance (*Trimble* 1997, *Nelson and Booth* 2002). The rate of decline in post-construction sediment yields is therefore predominantly controlled by the degree of channel instability caused by the construction phase and the effect of increased peak flows. If the channel margins are armored, densely vegetated, or otherwise erosion resistant, sediment yields may decline quickly following urbanization. If channel instability ensues, elevated sediment yields may persist for decades or more.

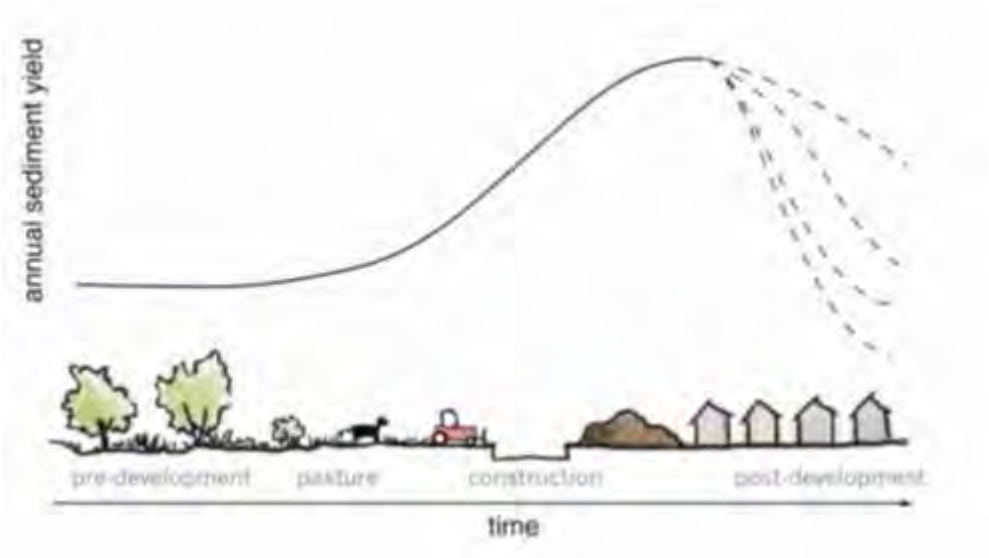

Figure 2-5. Increased sediment yields occur during the land-clearing and construction phases of development. Post-construction sediment yields decrease, though the rate of decrease varies considerably depending on the degree of channel instability caused by the construction phase and by increased runoff. (Illustration by Jennifer Natali).

2.6 Impacts on Channel Form and Stability

Channel form and stability reflect both hydrologic and geomorphic processes. Changes to runoff characteristics and sediment supply can affect all aspects of stream morphology, including planform, cross-sectional geometry, longitudinal profile, bed topography (e.g., pools, riffles), and bed sediment size and mobility. While many factors influence the type and degree of impacts (discussed below), a suite of commonly observed morphological changes due to hydromodification include channel enlargement (incision and widening), decreased bank stability, increased local sediment yield from eroding reaches, overall simplification of stream habitat features such as pools and riffles, changes in bed substrate conditions, loss of connectivity between channel and floodplain (*Segura and Booth* 2010), and changes in sediment delivery to coastal waters (*Jacobson et al.* 2001). Impacts may also propagate upstream as headcuts resulting from reductions in base level due to excess erosion. Likewise, tributaries entering downstream of a developed area may also experience the upstream propagation of headcuts due to base level reductions of the mainstem.

In addition to Jacobson *et al.* (2001), two well-researched literature reviews of morphological impacts (as well impacts to riparian habitat and biota) can be found in: “Impacts of Impervious Cover on Aquatic Systems” by The Center for Watershed Protection (2003) and “Physical Effects of Wet Weather Flows on Aquatic Habitats: Present Knowledge and Research Needs” published by Water Environment Research Foundation (*Roesner and Bledsoe* 2003). Note that these two studies differ significantly in how they

synthesize and interpret the reviewed literature, and the CWP publication acknowledges that it does not necessarily apply to streams in the arid west.

2.6.1 Physical Principles Underlying Channel Impacts

A convenient conceptual framework for the physical impacts of hydromodification on stream morphology is "Lane's Balance" (*Lane* 1955; Figure 2-6). This framework encapsulates a fundamental (albeit qualitative) relationship between the hydrologic and geomorphic processes that balance water flow and sediment in a channel. It expresses the condition of sediment transport capacity, as controlled by water discharge and slope, in broad balance with the supplied load and size of bed sediment for a channel in equilibrium. An increase in streamflow or a decrease in sediment supply (for example) will typically initiate a corresponding decrease in slope and/or increase in grain size in order to reestablish equilibrium. That decrease in slope is expressed by channel incision or degradation. In contrast, an increase in sediment supply or decrease in streamflow will typically result in aggradation and a corresponding increase in slope.

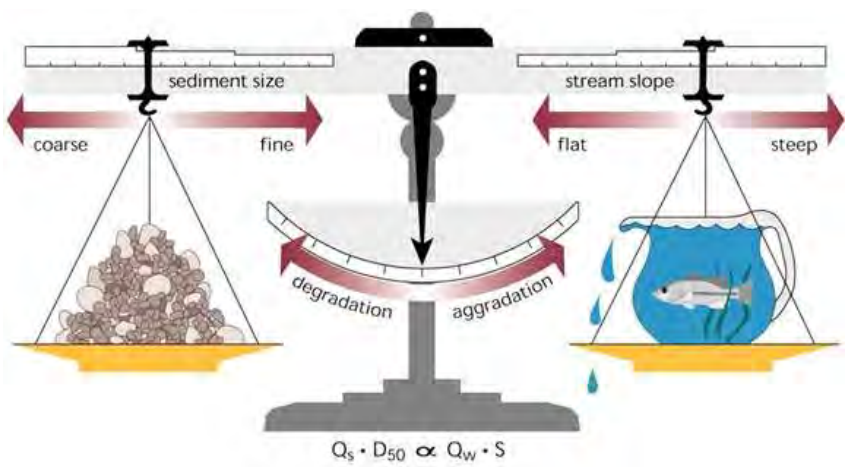

Figure 2-6. Lane's Balance, showing the interrelationship between sediment discharge (Q_s), median bed sediment size (D_{50}), water discharge (Q_w), and channel slope (S).

Slope and grain size are not the only modes of adjustment, as stream channels have many more degrees of freedom in responding to changes in streamflow and sediment supply. For example, Schumm (1969) extended Lane's Balance to include width, depth, sinuosity, and meander wavelength. More quantitatively (and more complexly), adjustments to channel form resulting from hydromodification are controlled by interactions among flow-generated shear stresses (described by hydraulic equations for open channel flow, as a function of channel geometry, roughness, and longitudinal slope), inflowing sediment load, and the shear strength of the bed and bank sediments (a function of their size distribution and cohesiveness).

2.6.2 Natural Variability in Stream Systems

Understanding natural variability in streams is critical to predicting and assessing anthropogenic impacts. A stream may be considered "stable" or "at equilibrium" when its overall planform, cross-section and profile are maintained with no net degradation or aggradation within a range of variance, over extended timeframes (*Mackin* 1948, *Schumm* 1977, *Leopold and Bull* 1979, *Biedenharn et al.* 1997). Such systems can often withstand short-term disturbances without significant change. Even without discrete disturbances, natural streams may be in a state of dynamic equilibrium (*Schumm* 1977), where the channel exhibits stability over the long term even while actively migrating laterally such that erosion of outer banks is accompanied by sediment deposition and bar building on inner banks. Streams may also be fluctuating between aggradation/ degradation/ stability, all within a limited range of conditions. A large-scale event, like a flood or landslide, can cause dramatic changes in channel form, but the channel will often re-established its pre-event planform, geometry and slope over time.

In contrast, a persistent alteration like hydromodification can cause the rate of change to increase. As a result, the channel may begin an evolutionary (or catastrophic) change in morphology, leading to enlargement and instability. A geomorphic threshold is the condition at which there is an abrupt and significant channel adjustment or failure because the channel has evolved to a critical situation. It is the condition at which the proverbial straw breaks the camel's back. Channels that are near a geomorphic threshold can exhibit significant adjustments in response to a relatively small degree of hydromodification. For example, a channel with banks that are near the height and angle for geotechnical failure may widen abruptly due to slight incision.

2.6.3 The Role of Sediment Transport and Flow Frequency in Channel Morphology

Extensive research has been devoted to establishing specific relationships between flow frequency and characteristics of channel morphology. The concept of "effective discharge" was introduced by Wolman and Miller (1960), using a magnitude-frequency analysis to assess the effectiveness of flow events to transport sediment. They concluded that, for the rivers in their analysis, relatively frequent events (occurring on average about 1 times/year) are most effective over the long term in transporting sediment. This concept has formed the basis for a large body of literature (and occasional controversy) over the subsequent five decades relating to the relationships between these flow frequencies and principal channel dimensions (e.g., bankfull stage, width-to-depth ratio), and the application of these relationships to stream design and restoration, as well as prediction and control of hydromodification impacts. Much of the controversy has related to the use of a single event ("dominant discharge" or "bankfull flow") as the basis for such applications, with the implicit assumption that control for that single discharge will result in commensurate channel changes regardless of the distribution of flow frequencies and flow durations over a wider range of discharges.

More recently, the concept of a *range* of moderately frequent, "geomorphically significant" flows that transport the majority of the sediment over the long term (King County 1990, *Bledsoe* 2002, *Roesner and Bledsoe* 2003) was proposed to replace the focus on a single event. The geomorphically significant flow range is considered to be the most influential in determining channel form, as this collective group

of flows typically does the most "work" on the channel boundary over engineering time scales. Controlling changes to the frequency of flows within this range is therefore critical to reducing impacts to stream morphology, and is the scientific basis for the "flow-duration" control criteria discussed in the following sections. A flow-duration criterion aims to match the pre-development volumes, durations, and frequencies of this critical range of sediment transporting flows over a period of many decades. Even this concept, however, relies on the implicit assumption that infrequent large events, no matter how dramatic their effects, typically occur "too infrequently" to reset channel morphology and habitat over the timescales of concern in meeting regulatory requirements. These events are typically managed through traditional flood control practices as opposed to hydromodification management.

A flow-duration management approach aims to match the pre-development volumes, durations, and frequencies of this critical range of sediment transporting flows over a period of many decades.

2.6.4 Applicability to California Streams

The traditional concepts of dynamic equilibrium in streams and geomorphically significant flows, discussed above, derive largely from studies on perennial streams in humid areas. An important question is: to what extent do these concepts apply to managing hydromodification impacts to streams within arid and semi-arid areas (such as large portions of California, and particularly the southern and eastern regions)? In such climate regions, precipitation is highly variable, with low annual totals and episodic, large events. Many streams are ephemeral or intermittent and located in a setting of extremely high sediment production associated with erosive geology resulting from high rates of tectonic uplift, sparse vegetative cover and frequent fires (*Graf* 1988, *Stillwater Sciences* 2007). These streams are often characterized by multi-thread sand-bed channels that are inherently unstable and readily respond to changes in flow conditions. In the ephemeral streams described by Bull (1997), for example, the natural behavior is one of alternating periods and locations of aggradation and degradation, varying both temporally and spatially. In such "episodic" streams, the vast majority of sediment may be moved by extreme, highly infrequent events. The importance of understanding the role of episodic events has been emphasized for semi-arid and arid fluvial systems (e.g., *Wolman and Gerson* 1978, *Brunsden and Thornes* 1979, *Yu and Wolman* 1987). The latter authors reviewed concepts of frequency and magnitude in geomorphology research and noted that episodic behavior hinges on frequency of episodic events relative to the time required to return to an "equilibrium" channel form. Episodic behavior is more prevalent where the average long-term disturbance is low but the year-to-year variability is high, a characteristic of arid and semi-arid climates.

Although the morphology of arid and semi-arid streams may be more strongly influenced by extreme events under natural conditions, hydromodification has nevertheless been shown to cause rapid and significant physical changes in such California streams (*Trimble* 1997, *Coleman et al.* 2005, *Hawley and Bledsoe* 2011). Such dramatic responses to the effects of urbanization on relatively frequent flows, often over periods of a decade or less, have profound implications for aquatic life and physical habitat. Despite the flashy streamflow regimes, high sediment supplies, and steep gradients of many streams in the region, the responses of California streams are controlled by the same physical processes as those in

other regions that have been studied more extensively. As such, the key controls of stream response can be identified and managed to mitigate the chronic effects of hydromodification between infrequent extreme events. However, it is always advisable to ensure that the application of tools and approaches for prediction and assessment should be based on reference data and empirical models (where applicable) drawn from stream types that are similar in both hydrologic and geomorphic characteristics.

2.6.5 Factors Determining Extent of Impacts

The extent and nature of impacts to stream morphology and habitat from a given change in runoff and sediment supply vary widely, depending on the channel geometry, longitudinal slope, channel material type(s) and size(s), and the type and density of channel vegetation (*Center for Watershed Protection* 2003, *Roesner and Bledsoe* 2003). For example, increased flows within a deep, narrow channel may result in significantly higher shear stresses at the bed; this same increase in a wide, shallow channel may become predominantly overbank flow, with less effect on bed shear stress. Where all other factors are equal, fewer impacts would be expected where flows have access to broad overbank areas (i.e., floodplains) during relatively common floods (*Segura and Booth* 2010), channel materials are more resistant, and stabilizing riparian vegetation is present. Conversely, where erosion and bank instability result in the loss of vegetation reinforcement, a positive feedback response may cause erosion to be accelerated. Furthermore, the relative erosive resistance of bed and bank materials will influence the extent of lateral versus vertical channel adjustments (*Simon and Rinaldi* 2006, *Simon et al.* 2007). For example, if bank resistance is lower than bed resistance, then the channel will tend to widen rather than deepen.

The extent of impacts will also depend on the stream's physiographic context and spatial and temporal patterns of urban development within the watershed (Konrad and Booth 2005). Large-scale studies of hydrologic responses to urbanization (Chin 2006, Poff et al. 2006) also highlighted the regional variation in these responses and reinforced the need to understand local watershed and channel characteristics when managing hydromodification impacts. The presence of road crossings and other infrastructure can provide local grade control and create sediment bottlenecks which often translate to exacerbated erosion in the immediately downstream areas.

The extent and nature of impacts to stream morphology and habitat from a given change in runoff and sediment supply vary widely, depending on the channel geometry, longitudinal slope, channel material type(s) and size(s), and the type and density of channel vegetation, and the spatial and temporal patterns of urban development

An additional consideration relates to the pre-development balance between sediment and streamflow, which is dependent on precipitation patterns, the location of a stream reach within the watershed, the associated sediment behavior of that reach (i.e., production, transport or deposition zone), and local rates of sediment production.

While many of these factors may be quantified for a given time and location, stream systems are enormously complex both spatially and temporally. The existence of physical thresholds and feedback systems can cause an incremental change to result in a disproportionately large response (*Schumm* 1977, 1991). Furthermore, there may be significant temporal lags between the point in time at which

land use is altered and when channel impacts are observed (*Trimble* 1995, 1997). In recognition of these effects and the associated uncertainty, predictive models and management tools may present results in terms of probabilities or within the context of a risk-based approach, as discussed further in this document. Such effects also have substantial implications for the design of assessment and monitoring programs.

There may be significant temporal lags between the point in time at which land use is altered and when channel impacts are observed.

2.6.6 Impacts on Other Types of Receiving Waters

Although outside the scope of this document, hydromodification impacts to other water body types are recognizable and should be the subject of additional research and future consideration.

Wetlands, Estuaries, and Coastal Ecosystems. Urbanization can alter water quality, quantity and sediment delivery to wetlands and sensitive coastal ecosystems. Urbanization has led to loss or degradation of wetlands and estuaries as a result of 1) draining and conversion to agriculture (*Dahl*, 1997); 2) upstream alterations to flow and sediment regimes that can change the magnitude, frequency, timing, duration, and rate of change of estuarine salinity, turbidity, freshwater flooding, freshwater baseflow, and groundwater recharge dynamics (*Azous and Horner* 2001); and 3) contaminated runoff from urban areas (*Paul and Meyer* 2001, *J Brown et al.* 2010). Urbanization may also lead to coastal erosion in circumstances where reservoir sediment trapping or post-development decreases in sediment yield reduce the sediment supply to the coast (*Pasternack et al.* 2001, *Syvitski et al.* 2005).

Alluvial Fans. Alluvial fans are dynamic landforms that are under increased development pressure in recent decades, particularly in the expanding cities of the American West. Upstream urbanization, and the resultant flashier flow regime, shortens the time available for infiltration and groundwater recharge in alluvial fans. Furthermore, development on fans themselves results in channel straightening and/or construction of concrete flood conveyance channels that also reduce or eliminate infiltration. The reduction in infiltration amplifies the flood risk further downstream. Additionally, alluvial fans may be more vulnerable than other landscapes to channel instability resulting from hydromodification, because they lack intrinsic geologic controls on channel gradient, and commonly have little vegetation or bank cohesion to provide stability in the purely alluvial deposits (*Chin* 2006).

2.6.7 Influence of Scale

The ability to detect impacts from land-use changes depends upon the spatial and temporal scale at which they are measured. Issues of hydrograph timing and the relative size of the storm system with respect to the watershed area may confound relationships at larger spatial scales. Furthermore, a number of fluvial geomorphic features that are commonly used as metrics of geomorphic condition are scale-dependent. For example, width-depth ratio, tendency toward braiding, and channel depth relative to stable bank height all commonly increase downstream. Other factors, such as the influence of vegetation, depend on protrusion relative to width and rooting depth relative to bank height. The

temporal scale over which channel changes occur will be influenced by precipitation variability, in addition to the many physical factors already discussed.

These scale considerations, as well as previous discussion of factors influencing stream response, are important when determining the choice of both management tools and monitoring approaches. It is generally much easier to predict the direction of response than the magnitude. Accurate, detailed predictions of response are difficult to make, and they are generally only possible when applied to specific locations, using extensive data input, to answer very specific questions; even then they are subject to uncertainty. Policies or assessment methods aimed to address a range of streams and geographic conditions are better suited to probabilistic approaches that explicitly acknowledge uncertainty, as described further in subsequent sections.

2.7 Impacts on Fluvial Riparian Vegetation

Stream channel form and stability is closely linked with the ecology of instream and floodplain habitats (Figure 2-7). Spatial and temporal distributions of plant communities are tied to moisture availability and seasonality. The ability of vegetation to stabilize soils, trap sediments, and reduce flow velocities (*Sandercock et al.* 2007) can create positive feedback that promotes further vegetation establishment and enhancement of these stabilizing features. This can result in a strong influence on channel geometric features, specifically channel narrowing (*Anderson et al.* 2004). The change in frequency of overbank flows resulting from channel incision will also affect riparian processes, including nutrient transfer and seed dispersal. For example, it is believed that *Tamarix* dominance over native species along Western US rivers would be less extensive if not for anthropogenic alteration of streamflow regimes (most recently supported by Merritt and Poff (2010)).

Impacts to stream biota may occur through the alteration of habitat structure and habitat dynamics caused by hydrologic and geomorphic changes, as well as directly from hydrologic alteration.

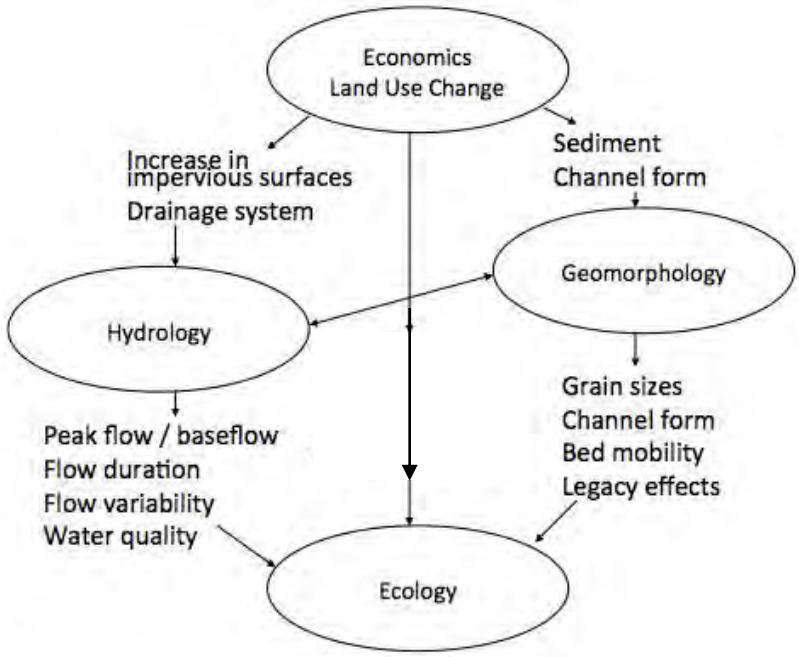

Figure 2-7. Land use changes, hydrology, geomorphology and ecology are closely and complexly interrelated. (Adapted from Palmer *et al.* 2004).

Vegetation changes not only are a result of morphological impacts but also can result directly from changes in streamflow. These findings continue to be supported by recent studies; for example, increases or decreases in baseflow or changes to the seasonal availability of water can determine the extent and type of riparian vegetation capable of thriving in that environment (*White and Greer* 2006). Vegetation changes can have cascading effects on indigenous fauna that require native plants for food or nesting (*Riley et al.* 2005). Channel incision can also result in phreatic draining of adjacent wetland and floodplain habitats and result in loss of key riparian species (*Scott et al.* 2000).

2.8 Impacts on In-Stream Biota

As shown in Figure 2-7, impacts to stream biota may occur through the alteration of habitat structure and habitat dynamics caused by hydrologic and geomorphic changes, as well as directly from hydrologic alteration. (The term biota is used here to refer to a range of non-plant species including algae, macroinvertebrates, amphibians, fishes, etc.) Because of these relationships, the condition of in-stream biota is considered to reflect the effects of all other impacts and has been recommended as an integrative measure of stream health (discussed further in Section 5).

Studies continue to build on Poff *et al.* (1997), who highlighted the importance of the "natural flow regime" and its variability as critical to ecosystem function and native biodiversity. Streamflow pattern or "regime" interacts with the geomorphic context to control the physical and biological response of streams to hydromodification. The basic characteristics of streamflow regimes are typically described in five ways: magnitude, frequency, duration, timing, and rate of change. There is a large body of science

linking one or more of these five elements of flow regimes to geomorphic processes, physical habitat, and ecological structure and function. A few examples of linkages with physical habitat are provided in Table 2-1; these linkages describe the mechanisms by which flow changes can impact stream ecology through morphological alterations.

Table 2-1. Examples of Relationships between Flow Regime Attributes and Physical Habitat Characteristics (adapted from Roesner and Bledsoe 2002).

Flow Attribute	Example Relationships with Physical Habitat
Magnitude	• Determines extent to which erosion/removal thresholds for substrate, banks, vegetation, and structural habitat features are exceeded • Determines whether floodplain inundation/exchange occurs • Habitat refugia may become ineffective during extreme events
Frequency	• Flashiness can affect potential for recovery of quasi-equilibrium channel forms between events, bank stability, and streambank/riparian vegetation assemblages • Frequency of substrate disturbance can act as a major determinant of fish reproductive success and benthic macroinvertebrate abundance and composition
Duration	• Determines the impact of a threshold exceeding event, e.g., scour depths • Urbanization frequently increases the duration of geomorphically effective flows which also affect bank vegetation establishment and maintenance • Extended durations of high suspended sediment concentrations can act as chronic and acute stressors on fish communities
Timing	• The temporal sequence of flow events affects channel form and stability as geomorphic systems may be “primed” for abrupt changes. • Stream biota may use flow timing as a life-cycle cue • Predictability of flow can affect utilization of habitat refugia
Rate of Change	• Affects bank drainage regimes (bank stability) and sedimentation processes, e.g., re-suspended fine sediment concentrations during storm hydrographs, embeddedness, armoring • Rapid drawdown can result in stranding of instream biota • Rise and fall rates control riparian water table dynamics and seedling recruitment

The mechanisms of such impacts are also well detailed by Center for Watershed Protection (2003); for example, increased flows are related to a reduction in habitat diversity and simplification of habitat features such as pools; this in turn reduces the availability of deep-water cover and feeding areas.

Many studies support the conclusion that stream biota are also directly impacted by altered flow regimes, independent of channel instability and erosion. Konrad and Booth (2005) identified four hydrologic changes resulting from urban development that are potentially significant to stream ecosystems: increased frequency of high flows, redistribution of water from baseflow to stormflows,

increased daily variation in streamflow, and reduction in low flow. They caution that ecological benefits of improving physical habitat and water quality may be tempered by persistent effects of altered streamflow and sediment discharge, and that hydrologic effects of urban development must be addressed for restoration of urban streams. Walsh *et al.* (2007) concluded that low-impact watershed drainage design was more important than riparian revegetation with respect to indicators of macroinvertebrate health. Bioengineered bank stabilization can also have positive effects on habitat and macroinvertebrates, but it cannot completely mitigate impacts of urbanization with respect to stream biotic integrity (*Sudduth and Meyer* 2006). Walters and Post (2011) and Brooks *et al.* (2011) found impacts to benthic macroinvertebrates due to upstream water abstractions, including reductions in total biomass of insects and reductions in abundance respectively.

2.9 Conclusions

Alterations in streamflow and sediment transport as a result of land use change can have severe impacts on streams. Common responses include changes in water balance, surface and near-surface runoff timing and magnitude, groundwater recharge, sediment delivery and transport, channel enlargement, widespread incision, and habitat degradation. The extent and consequences of these impacts depend on stream type, watershed context, and local controls on channel adjustment; as such, stream responses to hydromodification are complex and difficult to predict with any precision. Due to the direct impacts of streamflow modification on vegetation and biota, channel morphology cannot be the sole measure of hydromodification impacts. Thus, mitigation efforts that are narrowly focused on channel stability may be insufficient for sustaining key ecological attributes. Likewise, reach-scale stabilization of streams will not necessarily result in the return of comparable habitat quality and complexity (Henshaw and Booth 2000, Roesner and Bledsoe 2003). Hydromodification management should be considered in the context of an overall watershed-scale strategy that targets maintenance and restoration of critical processes in critical locations in the watershed. Furthermore, it is imperative that monitoring and adaptive management be focused on achieving desired objectives for aquatic life and overall stream “health” in addition to simply measures of geomorphic response.

3. Framework for Hydromodification Management

3.1 Introduction and Overview

The current approach to managing hydromodification impacts on a project-by-project basis is not sufficient to protect beneficial uses of streams. This section outlines a comprehensive, alternative framework that begins with watershed analysis and uses the results to guide the site-based management decisions that are the current focus of most hydromodification management strategies. It also recommends the implementation of a compensatory mitigation program in support of hydromodification management objectives identified in the watershed analysis. Figure 3-1 summarizes this approach and illustrates how current site-based management relates to the larger framework.

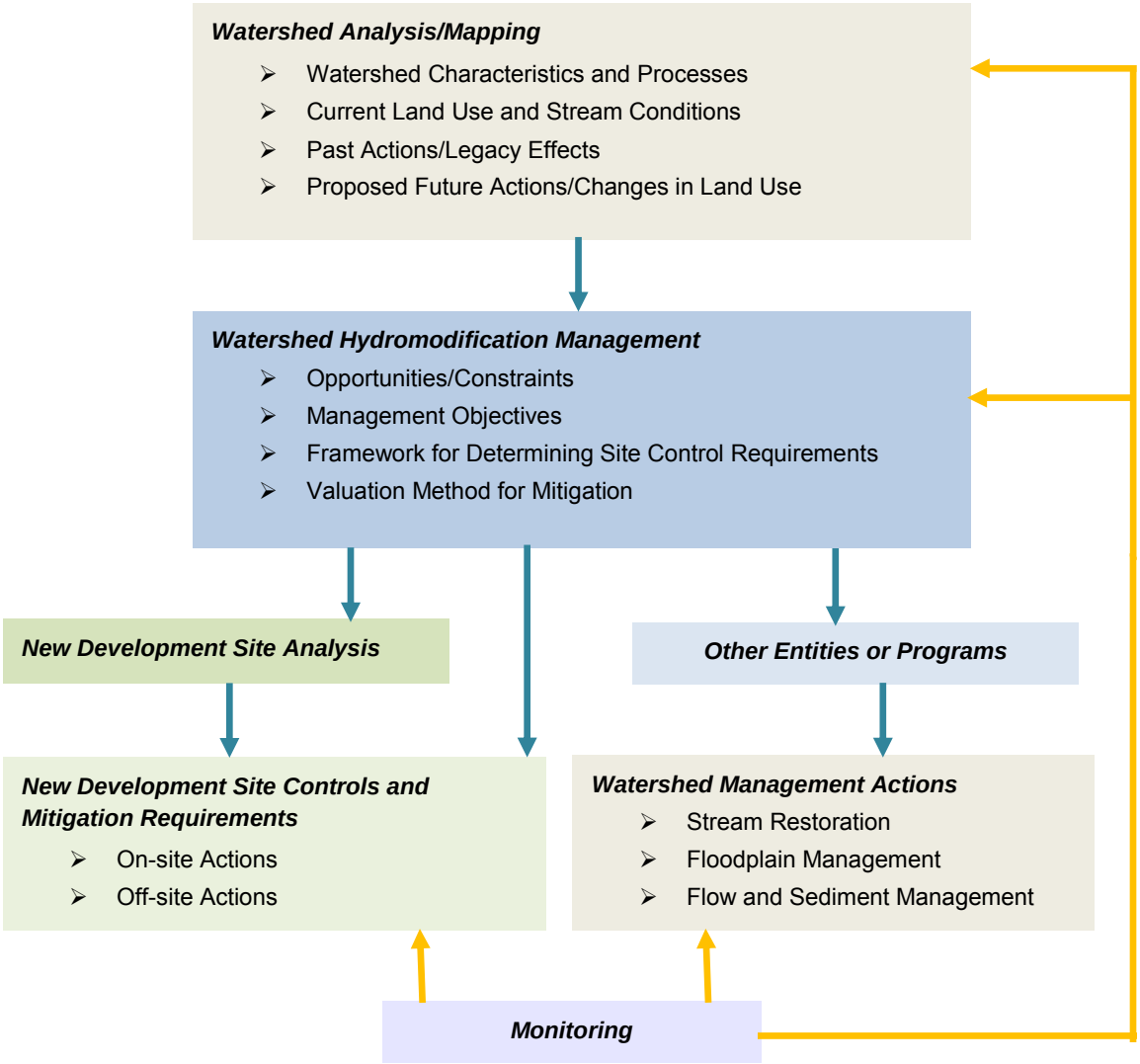

Figure 3-1. Framework for Integrated Hydromodification Management.

This section discusses the details of the integrated framework proposed in Figure 3-1. Key features of this comprehensive approach to hydromodification management are:

- Hydromodification management needs to occur primarily at the watershed scale. The foundation of any hydromodification management approach should be an analysis of existing and proposed future land use and stream conditions that identifies the relative risks, opportunities, and constraints of various portions of the watershed. Site-based control measures should be determined in the context of this analysis.
- Clear objectives should be established to guide management actions. These objectives should articulate desired and reasonable physical and biological conditions for various reaches or portions of the watershed. Management strategies should be customized based on consideration of current and expected future channel and watershed conditions. A one-size-fits-all approach should be avoided.
- An effective management program will likely include combinations of on-site measures (e.g., low-impact development techniques), in-stream measures (e.g., stream habitat restoration), and off-site measures. Off-site measures may include compensatory mitigation measures at upstream locations that are designed to help restore and manage flow and sediment yield in the watershed.
- Management measures should be informed and adapted based on monitoring data. Similarly, monitoring programs should be designed to answer questions and test hypotheses that are implicit in the choice of management measures, such that measures that prove effective can be emphasized in the future (and those that prove ineffective can be abandoned).
- Hydromodification potentially affects all downstream receiving waters; therefore, there generally should be no areas exempted from hydromodification management plans. However, the variety of types and conditions of receiving waters should result in a range of requirements. This also means that objectives, and the management strategies employed to reach them, will need to acknowledge pre-existing impacts associated with historical land uses.

A watershed-based approach to hydromodification management will allow integration of objectives with related programs such as water quality management, groundwater management, and habitat management and restoration through mechanisms such as Integrated Regional Water Resources Management Plans.

Implementation of this approach will likely require changes in the current administration of hydromodification management plans statewide, both in the development and promulgation of regulations by the State and Regional Water Boards and in the administration and execution of those regulations by local jurisdictions (Table 3-1). In the short term, municipalities will need to broaden the approaches to on-site management measures and expand monitoring and adaptive management programs based on the tools described in this document. In the long term, regulatory agencies will need to develop watershed-based programs that allow for implementation of management measures in the locations and manner that will have the greatest impact on controlling hydromodification effects. A

watershed-based approach will also allow the integration of hydromodification management objectives with related programs such as water quality management, groundwater management, and habitat management and restoration through mechanisms such as Integrated Regional Water Resources Management Plans.

Table 3-1. Recommendations for implementation of watershed-based hydromodification management, organized by the scale of implementation and the time frame in which useful results should be anticipated.

Time Frame	Programmatic: State and Regional Water Boards	Local: City and County Jurisdictions
Short-term (<10 years)	• Define the watershed context for local monitoring (at coarse scale) • Evaluate whether permit requirements are making positive improvements	• Evaluate whether specific projects/ regulations are meeting objectives • Identify the highest priority action(s) to take
Long-term (1+ decades)	• Define watershed context and setting benchmarks for local-scale monitoring (i.e., greater precision, if/as needed) • Demonstrate how permit requirements can improve receiving-water "health," state-wide (and change those requirements, as needed)	• Evaluate and demonstrate whether actions (on-site, instream, and watershed scale) are improving receiving-water conditions • Assess program cost-effectiveness • Identify any critical areas for resource protection

3.2 Background on Existing Strategies and Why They are Insufficient

Current hydromodification approaches and strategies, such as flow and sediment-control basins, have been long-recognized as insufficient to fully address hydromodification impacts (e.g., Booth and Jackson 1997, Maxted and Horner 1999). Present understanding of the causes and effects of urbanization suggest that such approaches must be expanded to include integrated flow and sediment management at the watershed scale, along with stream corridor/floodplain restoration (NRC 2009).

Flow management has its origins in flood-control basins intended to reduce peak discharge through stormwater detention (Dunne and Leopold 1978). A key shortcoming of these approaches for hydromodification management is that they do not address (and may exacerbate) cumulative erosive forces on the receiving channel because they trap sediment and release sediment-starved water to downstream areas. Simple detention can increase the frequency and duration with which channels are exposed to erosive effects (McCuen and Moglen 1988, Bledsoe *et al.* 2007), resulting in an increase in the downstream impacts of hydromodification.

Since the late 1980's in parts of the US, hydromodification management plans began to explore "flow-duration" control standards as a way to address this shortcoming. These standards require that the post-project discharge rates *and durations* may not deviate above the pre-project discharge rates and

durations by more than a specific (and typically quite small) percent, across a broad range of discharges at and above the presumed threshold of instream erosion and sediment transport, as averaged over a multi-year period of measured (or simulated) record. This approach is a dramatic improvement over earlier methods, although it does not adequately address the issues of sediment deficit associated with urbanization (Chin 2006). In addition, current flow-duration standards do not fully account for the effects of flow alteration on in-stream habitat and biological functions (e.g., they do not address the seasonality of peak flows, rates of hydrograph rise and recession, low-flow magnitude and duration) and therefore may not be protective of all beneficial uses of downstream waterbodies.

Current strategies are also insufficient with respect to how municipal stormwater permits apply hydromodification standards. Currently, development triggers are established to determine if a project is subject to the standards. These triggers are generally specified by either project land use type in conjunction with size, or by project size alone (e.g., 20 units or more of single family residential housing, or 10,000 square feet or more of new impervious area). The exemption of many small projects from hydromodification controls can result in cumulative impacts to downstream waterbodies (see Booth and Jackson, 1997, for an example from western Washington of the cumulative effects of a small-project exemption); a move to include LID requirements that apply to all projects, regardless of size, is a positive development to begin to address this issue. There is usually also an exemption for projects discharging to hardened channels or waterbodies; however these exemptions may not be supportive of future stream restoration possibilities, and do not address the impacts of hydromodification on lentic and coastal waterbodies (as yet not fully understood). A further limitation of the current permit structure is that there is no consideration of project characteristics such as position within the watershed, sensitivity of the receiving stream reach, or level of coarse sediment production on the proposed project site. Finally, current programs rely solely on regulating new development and re-development to prevent hydromodification impacts without addressing pre-existing conditions which may limit the effectiveness of future management actions.

Shortcoming of current hydromodification standards that may limit their effectiveness include the exemption of many small projects, which can result in cumulative impacts to downstream waterbodies, and the reliance solely on regulating new development and re-development without addressing pre-existing conditions which may limit the effectiveness of future management actions.

When flow-control measures of whatever regulatory standard have failed to protect streams from erosion, hydromodification "management" typically consists of bank or channel armoring, drop structures, and other hard engineering approaches. Although these methods may reduce local hydromodification impacts, it is typically at the expense of other in-stream or riparian functions or beneficial uses. For example, channel armoring can reduce habitat and water conservation functions and services by direct habitat removal, increased bed scour, and decreased connectivity between the channel and its floodplain. In addition to loss of biological and physical stream function, many armoring solutions degrade or fail over time because they address only the localized channel instability rather than the overarching processes that led to the instability (Kondolf and Piegay 2004). For example, drop structures constructed to stabilize a specific channel reach will tend to shift downstream the

consequences of an insufficient sediment load—the reach immediately upstream of the drop structure is "protected," but that immediately downstream is degraded even more severely. In extreme cases, the structure itself can be undermined by downstream erosion and headcutting that is exacerbated by the sudden shift in velocity and associated eddy effects (i.e., hydraulic jump) that often occurs downstream of grade stabilization (Chin 2006). Bank armoring can also fail due to being undermined by erosion at the toe of slope, which can lead to scour (Figure 3-2). In both cases, structural failures often lead to a sequence of incremental increases in the size and extent of the structural solution in an attempt to continually repair increasing channel degradation. In extreme cases, catastrophic failure of bank or grade stabilization can lead to sudden and dramatic changes in channel form, which can be associated with devastating loss of habitat, infrastructure, and property.

Figure 3-2. Undermining of grade control and erosion of banks downstream of structures intended to stabilize a particular stream reach. Left photo is looking upstream at drop structure; right photo is looking downstream from the drop structure.

3.3 Development of Comprehensive Hydromodification Management Approaches

The goal of hydromodification management should be to protect and restore overall receiving water conditions, by maintaining or reestablishing the watershed processes that support those conditions, in the face of urbanization. Achieving these goals will require that hydromodification management strategies operate across programs beyond those typically regulated by NPDES/MS4 requirements. Successful strategies will need to be developed, coordinated, and implemented through land-use planning, non-point source runoff control, and Section 401 Water Quality Certifications and Waste Discharge Requirement programs in addition to traditional stormwater management programs. Thus, all levels of the regulatory framework—federal, state, and local—will need to participate in developing such a program, with program development occurring mainly through regulatory and resource protection agencies and program implementation occurring mainly through local jurisdictions.

As shown in Figure 3-1, watershed-scale hydromodification management should include all of the following key elements:

- Watershed-wide assessment of the condition of key watershed processes, to understand the natural functioning of the watershed and what has been (or is at risk of being) altered by urbanization.
- Watershed-wide assessment of hydromodification risk, to categorize areas based on the likelihood of hydromodification impacts and to identify opportunities for restoration or protection of key reaches or sub-basins.

The goal of hydromodification management should be to protect and restore overall receiving water conditions, by maintaining or reestablishing the watershed processes that support those conditions, in the face of urbanization.

- Appropriate management objectives for various stream reaches and/or portions of the watershed.
- Process for selecting management actions and mitigation measures for project sites and stream reaches.
- Monitoring program that is consistent with the goals of the HMP so that information generated can be used to improve the HMP over time.

3.4 Watershed Mapping and Analysis – Identification of Opportunities and Constraints

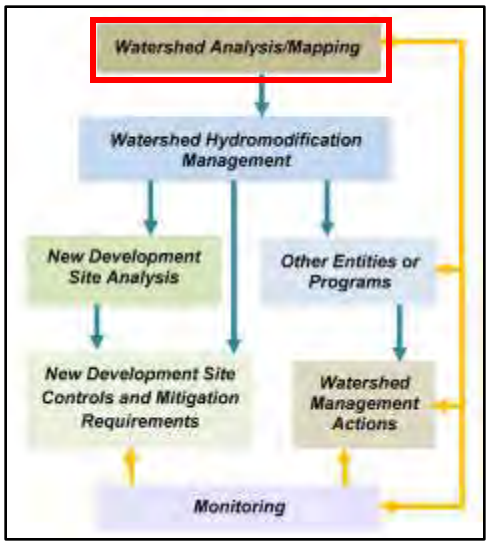

Watershed analysis should be the foundation of all hydromodification management plans. Analysis should identify the nature and distribution of key watershed processes, existing opportunities and constraints in order to help prioritize areas of greater vs. lesser concern, areas.

"Watershed analysis" has several steps, of which the first is mapping. Mapping may occur at the watershed or regional (i.e., multiple watersheds) scale. Mapping should include data layers to facilitate the following analyses. Most of these data layers are freely available as online. Further information on analysis tools is provided in the next section. These maps should be designed for iterative updates over time as new information becomes available:

- Dominant watershed processes – analysis of topography (10-m digital elevation model), hydrology, climate patterns, soil type (NRCS soil classifications) and surficial geology can be used to identify the location and type of dominant watershed processes, such as sediment source areas and areas where infiltration is important or where overland flow likely dominates. This can provide a template for the eventual design of management measures that correspond most

closely to the pre-development conditions, which support processes that promote long-term channel health. The Central Coast Hydromodification Control Program (the "Joint Effort"; see Booth *et al.* 2011) provides an example of this type of analysis.

- Existing stream conditions – At a minimum the National Hydrography Database (NHD) can provide maps of streams and lakes in the watershed. Additional information on stream condition should be included to the extent that it is available. This could include major bed material composition, channel planform, grade control locations and condition, and approximate channel evolution stage. These maps can also be used to conduct general stream power evaluations.
- Current (Past) and anticipated future land use - Current land use and land cover plus proposed changes due to general or specific plans. Historical information on past land use practices or stream conditions should be included if it is readily available. Classified land cover (NLCD 2006) is available from the Multi-Resolution Land Characteristics Consortium (MRLC).
- Potential coarse and fine sediment yield areas – methods such as the Geomorphic Land Use (GLU) approach (Booth *et al.* 2010) can be used that to estimate potential sediment yield areas based on geology, slope and land cover.
- Existing flood control infrastructure and channel structures – maps should include major channels, constrictions, grade control, etc. that affect water and sediment movement through the watershed. Any available information on water quality, flood control or hydromodification management basins should also be included.
- Habitat – both upland and in-stream and riparian habitat should be mapped to help determine areas of focus for both resource protection and restoration. This may be based on readily available maps such as the National Wetlands Inventory and National Land Cover Database, aerial photo interpretation, or detailed local mapping.
- Areas of Particular Management Concern – these may include sensitive biological resources, critical infrastructure, 303(d) listed waterbodies, priority restoration areas or other locations or portions of the watershed that have particular management needs.
- Economic and social opportunities and constraints – comprehensive watershed management includes consideration of opportunities for improving community amenities associated with streams, economic redevelopment zones, etc. Details on this are beyond the scope of this paper, but emphasize the need to include planning agencies in the development of hydromodification management plans.

Substantial resources will be necessary to implement a watershed analysis approach; therefore, opportunities for joint funding and leveraging of resources should be vigorously pursued.

Watershed analysis will be challenging especially for smaller municipalities with limited resources or where their jurisdiction only encompasses a portion of the watershed. Substantial resources will be necessary to implement this approach; therefore, opportunities for joint funding and leveraging of resource should be vigorously pursued. A cooperative approach should replace the current fragmented efforts among regions and jurisdictions. Furthermore, the State and Regional Water Boards should support completion of these maps and common technical tools as the foundation for future hydromodification management actions.

3.5 Defining Management Objectives

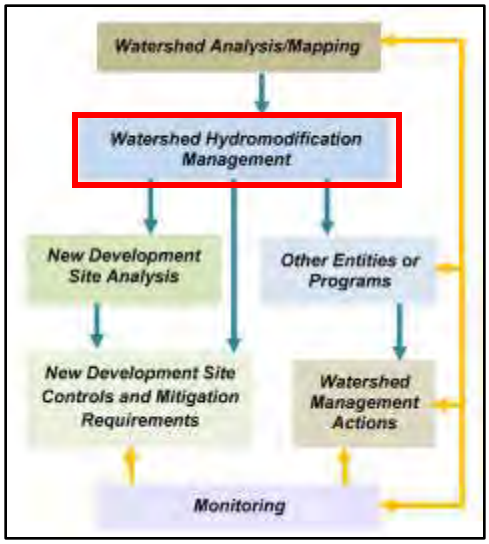

Results of the watershed analysis should be used to determine the most appropriate management actions for specific portions of the watershed. Management strategies should be tailored to meet the objectives, desired future conditions, and constraints of the specific channel reach being addressed.

Decisions should be based on considerations of areas suitable for specific ecosystem services, opportunities, and constraints as described above. Management objectives may be aimed at reducing effects of proposed future land use or mitigating for the effects of past land use, and they may apply to stream reaches or upland areas. Potential management objectives for specific stream reaches may include: protect, restore, or manage as a new channel form.

The specific manifestation of each of these strategies will differ by location, based on constraints of the stream, watershed plan objectives, etc. Decisions about appropriate objectives will need to consider current and future opportunities and constraints in upland, floodplain, and in-stream portions of the watershed. General definitions are provided below as a starting point for case-specific refinement.

Management strategies should be tailored to meet the objectives, desired future conditions, and constraints of the specific channel reach being addressed. Objectives for specific stream reaches may include:

- **Protect**
- **Restore**
- **Manage as a new channel form**

3.5.1 Protect

This approach consists of protecting the functions and services of relatively unimpacted streams in their current form through conservation and anti-degradation programs. This strategy should not be used if streams are degraded, or nearing thresholds of planform adjustment or changes in vegetation community. This strategy may apply following natural disturbances such as floods depending on the condition of the stream reach and the ability for natural rehabilitation to occur (due to how intact

watershed processes are). The goal of this strategy is not to create an artificial preserve (such as a created stream running through an urban park) but rather a naturally function river system. Fully channelized systems are not considered in this framework. Examples of specific actions include:

- Preserving intact channel systems through easements, restrictions, covenants, etc. This should be considered in the watershed context to ensure adequate connectivity with upstream and downstream reaches of similar condition, and to ensure that the watershed processes responsible for creating and maintaining instream conditions will persist.
- Providing appropriate space for channel processes to occur (e.g., floodplain connectivity).
- Establishing transitional riparian and upland buffer zones that are protected from encroachment by infrastructure or development.

3.5.2 Restore

There are many definitions of "restoration". For the purposes of this document, restoration is considered re-establishing the natural processes and characteristics of a stream. The process involves converting an unstable, altered, or degraded stream corridor, including adjacent riparian zone (buffers), uplands, and flood-prone areas, to a natural condition. In most cases, restoration plans should be based on a consideration of watershed processes and their ability to support a desired stream type. The watershed analysis discussed above should be used to determine how and where watershed process should be protected or restored in order to best support stream and stream-corridor restoration. This process should be based on a reference condition/reach for the valley type and includes restoring the appropriate geomorphic dimension (cross-section), pattern (sinuosity), and profile (channel slopes), as well as reestablishing the biological and chemical integrity, including physical processes such as transport of the water and sediment produced by the stream's watershed in order to achieve dynamic equilibrium. Design of restoration structural elements must be based on existing and anticipated upstream land uses, and reflect the modified hydrology resulting from these uses. Restoration should apply to streams that are already on a degradation trajectory where there is a reasonable expectation that a more stable equilibrium condition that reflects previously existing conditions can be recreated and maintained via some intervention. Creating a stream system that differs from "natural conditions" is not considered restoration. All elements of the "protection" strategy should also be included once the restoration actions are complete. Examples of specific actions include:

- Floodplain and in-stream measures that restore natural channel form consistent with current and/or anticipated hydrology and sediment yield. Examples include recontouring, biotechnical slope stabilization, soft-grade control features (e.g., woody debris).
- Revegetation of stream banks and beds, including removal of invasive species.
- Preserving intact channel systems through easements, restrictions, covenants, etc. This should be considered in the watershed context to ensure adequate connectivity with upstream and downstream reaches of similar pristine condition.

- Providing appropriate space for channel processes to occur (e.g. channel migration at allowable levels, floodplain connectivity, and development of self-sustaining riparian vegetation).
- Establishing transitional riparian and upland buffer zones that are protected from encroachment by infrastructure or development.

3.5.3 Manage as New Channel Form

Once a stream channel devolves far enough down the channel evolution sequence, it is extremely difficult to recover and restore without substantial investment of resources. If critical thresholds in key structural elements, such as planform or bank height, are surpassed, streams should be allowed to continue progressing toward a new stable equilibrium condition that is consistent with the current setting and watershed forcing functions, if such progress does not pose a danger to property and infrastructure. Substantial alteration of flow or sediment discharge, slope or floodplain width may make it improbable that a stream can be restored to its previous condition. In such circumstances, it may be preferable to determine appropriate channel form given expected future conditions and "recreate" a new channel to match the appropriate equilibrium state under future conditions. For example, a multi-thread braided system may not be the appropriate planform based on new runoff and sediment pattern; instead, a single-thread channel or step-pool structure may be a more appropriate target. Examples of specific actions include:

- In-channel recontouring or reconstruction of channel form.
- Floodplain recontouring or reconstruction that improves connectivity with the channel.
- In extreme circumstances based on channel condition, position in the watershed, etc. this may involve hardening portions of the channel and focusing "mitigation" measures at off-site measures at a different part of the watershed. Off-site mitigation can be informed by "hydromodification risk mapping".
- Re-establishing longitudinal connectivity for sediment transport and ecological linkages.
- Preserving intact channel systems through easements, restrictions, covenants, etc. This should be considered in the watershed context to ensure adequate connectivity with upstream and downstream reaches of similar pristine condition.
- Providing appropriate space for channel processes to occur (e.g. floodplain connectivity).
- Establishing transitional riparian and upland buffer zones that are protected from encroachment by infrastructure or development.

Several authors have previously noted that in urban systems, natural channel state often can no longer be sustained under changed hydrological conditions. Thus, different management goals are probably appropriate for watersheds at varying stages of development (Booth, 2005) and at varying degrees of adjustment (Chin and Gregory 2005). In this context, identifying which channels are suitable for

protection, restoration, or alternative channel form can be used to guide restoration and management efforts (Booth *et al.* 2004).

Upland objectives should be established to support management objectives for stream reaches. These objectives will have direct implications and will influence site-specific control requirements (discussed below). Potential management objectives for upland areas may include:

- *Conserve open space for infiltration*: Infiltration reduces the magnitude and duration of runoff to the stream channel and allows flow to re-enter the stream through diffuse overland flow, shallow subsurface flow, or groundwater recharge. This in turn reduces the work (energy) on the channel bed and banks and helps promote stability.
- *Conserve open space for stream buffers*: Buffers allow many of the same infiltration processes discussed above to occur. In addition, they provide space for channel migration and overbank flow, both of which function to reduce energy and allow the channel to better withstand potentially erosive forces associated with high flow events.
- *Conserve open space for coarse sediment production*: Course sediment functions to naturally armor the stream bed and reduce the erosive forces associated with high flows. Absence of coarse sediment often results in erosion of in-channel substrate during high flows. In addition, coarse sediment contributes to formation of in-channel habitats necessary to support native flora and fauna.
- *Encourage development on poorly-infiltrating soils*: The difference between pre and post development runoff patterns is less when development occurs on soils that have low infiltration rates and functioned somewhat like paved surfaces. Focusing development on these areas reduces changes in hydrology associated with transition to developed land uses.
- *Encourage urban infill*: Urban infill reduces the effect on watershed processes by concentrating development on previously impacted areas. This reduces disruption of hydrology and sediment process compared to developing on open space or other natural areas.

3.6 Selecting Appropriate Management Objectives

The combination of expected force acting on the stream channel (in terms of higher flow and less sediment) and estimated resistance (in the form of channel and floodplain condition) can be used to inform selection of an appropriate management objective for a specific stream reach, as shown in Figure 3-3. This figure represents a conceptual approach to selecting appropriate management objectives, in which modifications to runoff and sediment are compared against stream reach conditions. By weighing these factors within the context of watershed opportunities, constraints and resources, management objectives and specific actions can be determined. More complete decision support systems or guidance will need to be developed for individual

Selection of appropriate management objectives should consider changes to runoff and sediment, and existing stream reach conditions, within the context of watershed opportunities, constraints and resources.

hydromodification management plans that account for other considerations such as upstream and downstream conditions, cost, infrastructure constraints, availability of floodplain area for restoration, presence of downstream sensitive resources, etc. All decisions should be made in the context of the watershed position of a project site relative to existing opportunities and constraints as discussed above.

A number of tools are available to be used in conjunction with watershed mapping to inform this prioritization process. For example, GLU mapping (Booth *et al.* 2010) and hydromodification risk mapping can be used to assign high, medium or low ratings to watershed resistance (i.e., susceptibility to change). Similarly, field based tools such as the hydromodification screening tool (Bledsoe *et al.* 2010) or European tools such as Fluvial Audit or River Habitat Survey can be used to assign a rating of high, medium or low at the reach scale. In addition to geomorphic assessments, habitat assessments such as the California Rapid Assessment Method (CRAM; Collins *et al.* 2008) or biological evaluations via an index of biotic integrity (IBI; e.g., Ode *et al.* 2005) should be used as measures of biological condition to provide a more complete stream assessment. The next section provides an overview of hydromodification assessment and prediction tools, as well as further details on specific tools to support the selection of management objectives.

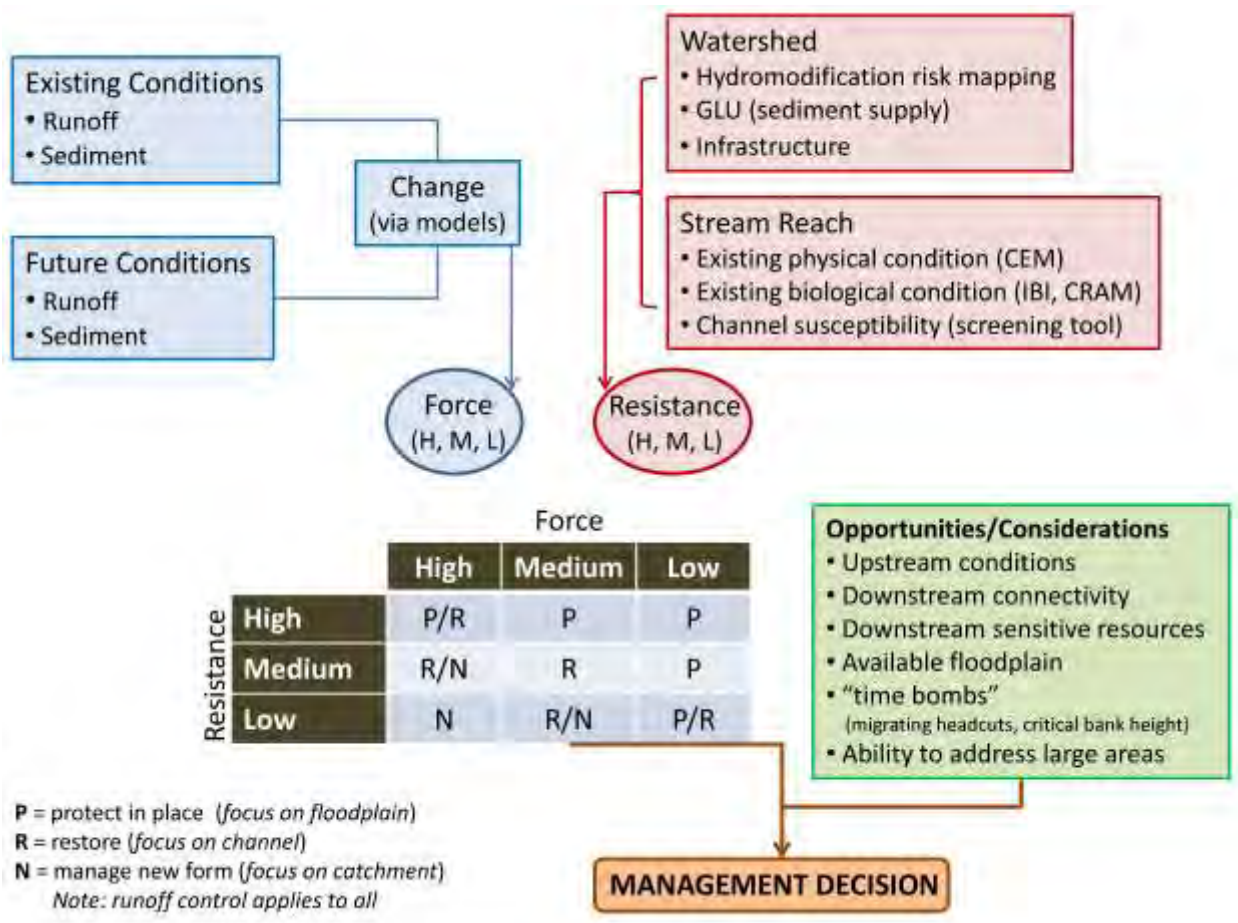

Figure 3-3: Example of a hydromodification management decision-making process.

3.7 Framework for Determining Site-Specific Control Requirements

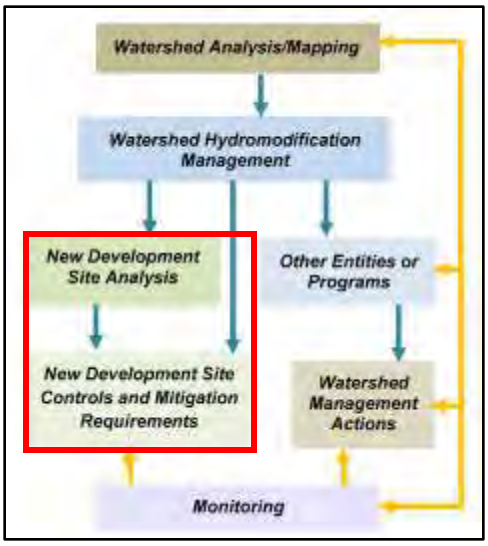

Once the watershed analysis is complete and opportunities, constraints and management objectives have been identified for both upland areas and stream reaches, a framework should be developed for site-specific project analyses and control requirements. The level of detail required for the analysis of proposed projects should be based on a combination of factors including project size, location within the watershed, and point of discharge to receiving waterbody.

The HMP should specify how these factors will be evaluated within the context of the identified management objectives to determine analysis requirements. The HMP should also ideally contain scalable BMP designs (based on conservative assumptions and consistent with prevailing watershed conditions) that can be applied by small projects where appropriate to avoid overly burdensome requirements for site-specific analysis. The framework should include the following components:

- A set of standard on-site management measures/BMPs that should apply to all projects; no projects should be exempted from these measures as they will have broader water quality benefits beyond helping to control the effects of hydromodification. These management actions consist of reducing the effects of urbanization on catchment runoff and sediment yield. On-site management measures should attempt to reduce excess runoff, maintain coarse sediment yield (if possible) and provide for appropriate discharge to receiving streams to support in-stream biological resources. In some cases, common features or facilities may be able to accommodate these objectives. In other cases, separate features or facilities will be necessary to deal with distinct objectives. On-site measures should ***generally be applied in all cases*** as allowed by site-specific geotechnical constraints, with specific management practices informed by the watershed processes most important at particular locations in the watershed, as well as by the nature of downstream receiving waters:
    - Low impact development (LID) practices.
    - Disconnecting impervious cover through infiltration, interception, and diversion.
    - Coarse sediment bypass through avoidance of sediment yield areas or measures that allow coarse sediment to be discharged to the receiving stream.
    - Flow-duration control basins to reduce runoff below a threshold value.

- Specification of the level of analysis detail and design requirements for the project, depending on project location, discharge point, and project size. Levels of analysis and design requirements may include:
    - Application of scalable, standardized designs for flow control based on site-specific soil type and drainage design. The assumptions used to develop these scalable designs should be conservative, to account for loss of sediment and uncertainties in the analysis and our understanding of stream impacts.
    - Use of an erosion potential metric, based on long-term flow duration analysis and in-stream hydraulic calculations. Guidelines should specify stream reaches where in-stream controls would and would not be allowed to augment on-site flow control.
    - Implementation of more detailed hydraulic modeling for projects of significant size or that discharge to reaches of special concern to understand the interaction of sediment supply and flow changes.
    - Analysis of the water-balance for projects discharging into streams with sensitive habitat. This may include establishment of requirements for matching metrics such as number of days with flow based on the needs of species present.
- Guidelines for prioritization of on-site or regional flow and sediment control facilities. Watershed analysis will help identify opportunities for regional flow or sediment control facilities, which may help to mitigate for existing hydromodification impacts.

Appendix A provides detailed guidance on the appropriate application of tools to meet site control requirements.

3.8 Off-site Compensatory Mitigation Measures

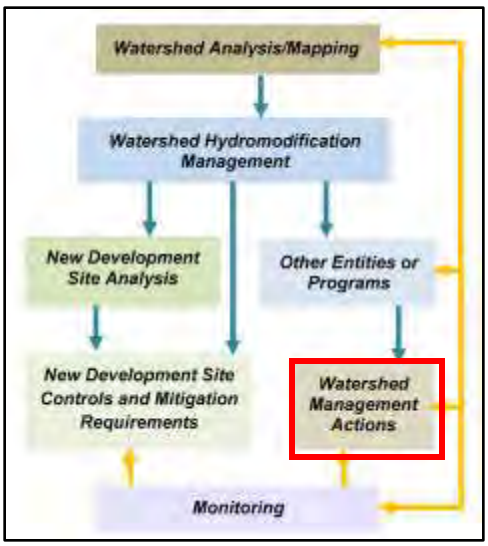

In some cases, on-site control of water and sediment will not be sufficient to offset the effects of hydromodification on receiving waters. In these cases, off-site compensatory mitigation measures will be necessary (similar to the concepts used in the Section 401/404 permitting programs). Off-site measures could be implemented by project proponents or through the use of regional mitigation banks or in-lieu fee programs.

Off-site mitigation may be necessary for several reasons:

- Off-site measures may be more effective at addressing effects or at achieving desired management goals. This may be particularly true for sites near the bottom of a watershed where upstream measures may be preferred

- Off-site measures may be necessary to supply compensation for residual project impacts where on-site measures are limited by site constraints or solutions are beyond the scope of what can be accomplished on an individual site.
- Off-site measures may be necessary where accomplishing specified management objectives is not practical using on-site measures alone. Off-site measures may be desired to remedy legacy effects of prior land use or to achieve desired beneficial uses.

Performance monitoring and adaptive management must be a part of compensatory mitigation given its inherent uncertainty.

The location and type of mitigation should be determined in the context of the watershed analysis and should account for the size and nature of the impact, location in the watershed, pre-existing conditions in the watershed, and uncertainty associated with the success of the proposed mitigation actions. In some cases these measures may be near the project site (e.g., restoring a stream reach downstream of the project site), but in other cases the off-site mitigation may be in the form of in-lieu fee or "mitigation bank" type contributions to a project located in a different portion of the watershed (e.g. upstream grade control, protection of sediment source areas). Such off-site mitigation relatively far from the site will only be possible if conducted in the context of an overall watershed plan, as discussed above. Off-site measures may include:

In cases where on-site control of water and sediment will not be sufficient to offset the effects of hydromodification on receiving waters, off-site compensatory mitigation measures will be necessary. Implementation of this approach will require that the State Water Board develop a valuation method to help determine appropriate off-site mitigation requirements in light of the anticipated impacts of hydromodification on receiving streams.

- Stream corridor restoration
- Purchase, restoration and protection of floodplain/floodway habitat
- Purchase and/or protection of critical sediment source or transport areas
- Regional basins or other retention facilities
- Upstream or downstream natural/bio-engineered grade control
- Retrofit or repair of currently undersized structures (e.g. culverts, bridge crossings)
- Removal or hydrologically disconnecting impervious surfaces

A valuation method will be necessary for assigning appropriate mitigation requirements in light of the anticipated impacts of hydromodification on receiving streams. The valuation method should be developed by the State Water Board.

To support the management approaches discussed above, HMPs should provide general guidance for application of models and other tools based on the questions being asked and the desired outcomes of

the HMP. Models can also be used to help communicate levels of uncertainty in particular management actions and to guide restoration / in-channel management actions. Modeling and other tools are discussed in detail in Section 4 and Appendices A and B.

Finally, management endpoints should articulate the desired physical and biological conditions for various reaches or portions of the watershed. To the extent possible, these desired conditions should be expressed in numeric, quantifiable terms to avoid ambiguity. Additionally, since regulatory strategies will invariably rely on quantifiable measures to determine whether stormwater management actions achieve these desired conditions, identifying appropriate numeric objectives will support determinations of regulatory compliance. As desired physical and biological watershed conditions are expressed in quantifiable terms to the extent possible, a similar need would apply to site control requirements. Control measures should be linked to, a) a desired condition (or goal), b) the parameter(s) that best define that condition, and c) quantifiable measures that serve to evaluate performance of the control measure. Direct measures (e.g., volume of runoff to be retained) as well as indirect or surrogate measures (IBI scores) are appropriate if they are quantifiable.

Management endpoints should articulate the desired physical and biological conditions for various reaches or portions of the watershed. To the extent possible, these desired conditions should be expressed in numeric, quantifiable terms to avoid ambiguity.

4. Overview of Assessment and Prediction Tools

4.1 Introduction

The previous section discussed a number of potential actions for managing hydromodification impacts. These ranged from high-level watershed-scale characterization to the site-specific design of a proposed development. This section provides an overview of the current and emerging assessment and prediction tools available to inform these management actions. An organizing framework helps explain the appropriate application of these tools, as well as their strengths and weaknesses. Specific tools that support the selection of management objectives are also discussed. Examples of "suites" of tools that are commonly used together to predict stream responses and formulate management prescriptions for channels of varying susceptibility are presented in Appendix B. Appendix A provides detailed guidance on the appropriate application of tools to meet site control requirements.

Municipalities are the primary audience for this section, as they select and incorporate these tools into their HMPs. However, the State and Regional Water Boards should be aware of the overall capabilities, appropriate uses, and gaps in our current toolbox. The development of new and improved tools should ideally be coordinated at the State level for optimum cost effectiveness and widest applicability. The table below identifies the key actions necessary at both the programmatic and local level to address the considerations discussed above, within the context of the goals of the framework described in Section 3.

Table 4-1. Recommendations for the application and improvement of tools in support of the proposed management framework.

Time Frame	Programmatic: State and Regional Water Boards	Local: City and County Jurisdictions
Short-term (<10 years)	• Develop quality control and standardization for continuous simulation modeling • Perform additional testing and demonstration of probabilistic modeling for geomorphic response • Pursue development of biologically- and physically-based compliance endpoints	• Work cooperatively with adjacent jurisdictions to implement hydromodification risk mapping at the watershed scale • Implement continuous simulation modeling for project impact analysis
Long-term (1+ decades)	• Improve tools for sediment analysis and develop tools for sediment mitigation design • Develop tools for biological response prediction • Improve tools for geomorphic response prediction	• Expand use of probabilistic and statistical modeling for geomorphic response • Apply biological tools for predicting and evaluating waterbody condition

4.2 Background

In the context of hydromodification, tools and models are typically used to help answer one or more of the following questions involving an assessment of natural and human influences at various spatial and temporal scales:

- How does the stream work in its watershed context?
- Where is the stream going? For example, have past human actions induced channel changes? What are the effects on sediment transport and channel form? What is the magnitude of current and potential channel incision following land use conversion?
- How will the stream likely respond to alterations in runoff and sediment supply?
- How can we manage hydromodification and simultaneously improve the state of the stream?

Previous sections have underscored the variability and complexity of relationships among land use, the hydrologic cycle, and the physical and ecological conditions of stream systems. It follows that the process of assessing stream condition and predicting future conditions is highly challenging and subject to uncertainty. Therefore it is important to understand the inherent strengths and limitations of the available tools, especially with respect to prediction uncertainty and how it is expressed for various tools. Considerable judgment is needed to choose the appropriate model for the question at hand. In addition to prediction uncertainty, considerations in choosing the right model for a particular application include appropriate spatial and temporal detail, cost of calibration and testing, meaningful outputs, and simplicity in application and understanding (NRC 2001; Reckhow 1999a,b).

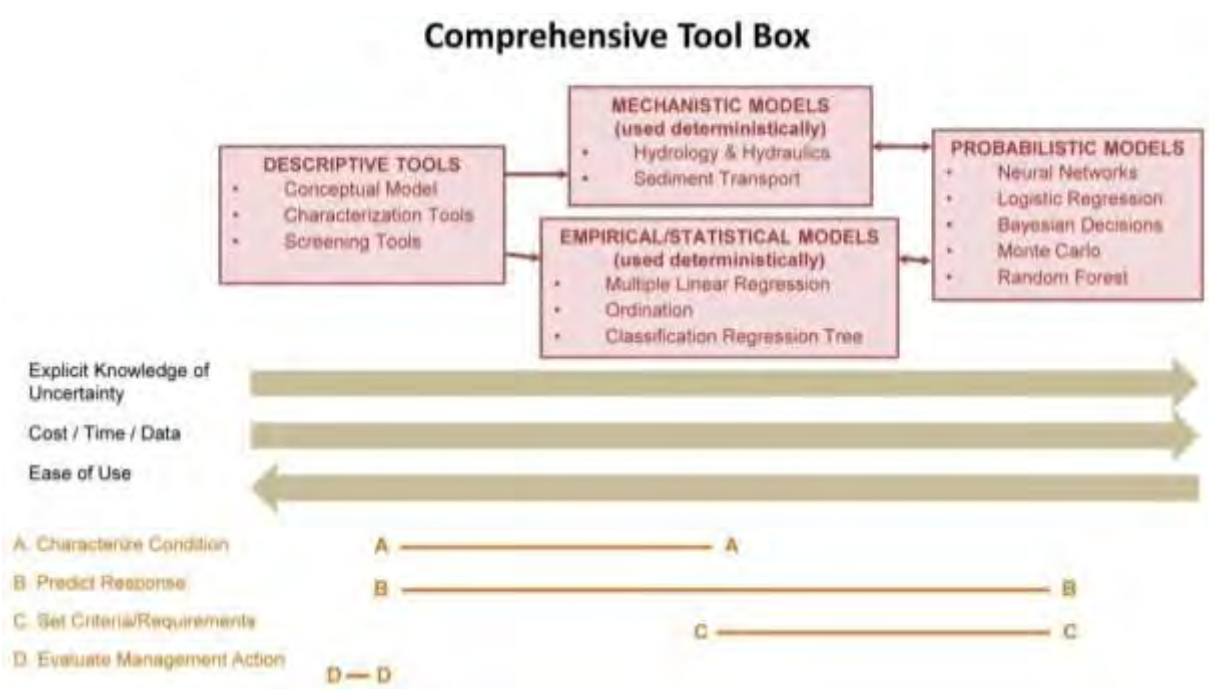

Figure 4-1. Organizing Framework for understanding hydromodification assessment and management tools.

4.3 Organizing Framework

Figure 4-1 presents an organizing framework by which to understand the available tools that may be applied in support of hydromodification management and policy development. Tools fall into three major categories: descriptive tools, mechanistic and empirical/statistical models that are used deterministically, and probabilistic models/predictive assessments with explicitly quantified uncertainty. The organizing framework relates these categories to the types of question the tools are designed to answer, specifically: characterization of stream condition, prediction of response, establishment of criteria/requirements, or evaluation of management actions. The framework also characterizes the tools according to the following features: intensity of resource requirements (i.e., data, time, cost), and the extent to which uncertainty is explicitly addressed. Subsequent sections of this section discuss each of the three major categories in turn, highlighting examples of specific tools within each category.

Given the uncertainty associated with predicting hydromodification impacts, probabilistic models should be incorporated into analysis and design, particularly where resource values or potential consequences of impacts are high.

Tools required to support the management framework presented in Section 3 include watershed characterization and analysis tools and project analysis and design tools. The level of resolution that is required will depend on the point in the planning process. At early stages, descriptive tools will be sufficient, but more precise tools will be required toward the design phase. Currently, most projects rely solely on deterministic models. However, given the uncertainty associated with predicting hydromodification impacts, probabilistic models should be incorporated into analysis and design, particularly where resource values or potential consequences of impacts are high.

4.3.1 Descriptive Tools

Descriptive tools include conceptual models, screening tools, and characterization tools. These tools are used to answer the question: *What is the existing condition of a stream or watershed?* Although descriptive tools are not explicitly predictive, they can be used to assess levels of susceptibility to future stressors by correlation with relationships seen elsewhere. The application of some type of descriptive tool, such as a characterization tool, is almost always necessary before applying a deterministic model. In particular, descriptive tools can aid in understanding the key processes and boundary conditions that may need to be represented in more detailed models.

Conceptual Models. A conceptual model, in the context of river systems, is a written description or a simplified visual representation of the system being examined, such as the relationship between physical or ecological entities, or processes, and the stressors to which they may be exposed. Conceptual models have been used to describe processes in a wide range of physical and ecological fields of study, including stream-channel geomorphology (Bledsoe *et al.* 2008). For example, Channel Evolution Models (CEMs) are conceptual models which describe a series of morphological configurations of a channel, either as a longitudinal progression from the upper to the lower watershed, or as a series at a fixed location over time subsequent to a disturbance. The incised channel CEM developed by

Schumm *et al.* (1984) is one of the most widely known conceptual models within fluvial geomorphology. This CEM documents a sequence of five stages of adjustment and ultimate return to quasi-equilibrium that has been observed and validated in many regions and stream types (ASCE 1998, Simon and Rinaldi 2000). The Schumm *et al.* (1984) CEM has been modified for streams characteristic of southern California, including transitions from single-thread to multi-thread and braided evolutionary endpoints (Hawley et al., in press).

Conceptual models also include planform classifications of braided, meandering and straight, and other general geomorphic classifications, which categorize streams by metrics such as slope, sinuosity, width-to-depth ratio, and bed material size. The qualitative response model described by Lane's diagram (1955), and discussed earlier in this report, is also a conceptual model.

Characterization Tools. Examples of characterization tools include baseline geomorphic assessments, river habitat surveys, and fluvial audits. A fluvial audit uses contemporary field survey, historical map and documentary information and scientific literature resources to gain a comprehensive understanding of the river system and its watershed. Fluvial audits, along with watershed baseline surveys are a standardized basis for monitoring change in fluvial systems. These types of comprehensive assessments are comprised of numerous, more detailed field methodologies, such as morphologic surveys, discharge measurements, and estimates of boundary material critical shear strength through measurements of resistance (for cohesive sediments) or size. Baseline assessments may also draw on empirical relationships such as sediment supply estimation models.

Screening Tools. Screening tools can be used to predict the relative severity of morphologic and physical-habitat changes that may occur due to hydromodification, as a critical first step toward tailoring appropriate management strategies and mitigation measures to different geomorphic settings. However, assessing site-specific stream susceptibility to hydromodification is challenging for several reasons, including the existence of geomorphic thresholds and non-linear responses, spatial and temporal variability in channel boundary materials, time lags, historical legacies, and the large number of interrelated variables that can simultaneously respond to hydromodification (Schumm 1991, Trimble 1995, Richards and Lane 1997).

Screening tools can be used to predict the relative severity of morphologic and physical-habitat changes due to hydromodification, as a critical first step toward tailoring appropriate management strategies and mitigation measures to different geomorphic settings.

Despite the foregoing difficulties, the need for practical tools in stream management have prompted many efforts to develop qualitative or semi-quantitative methods for understanding the potential response trajectories of channels based on their current state. For example, predictors of channel planform can be used to identify pattern thresholds and the potential for planform shifts (e.g., van den Berg 1995, Bledsoe and Watson 2001, Kleinhans and van den Berg 2010).

In addition, regional CEMs (discussed above) can partially address the needs of the hydromodification management community by providing a valuable framework for interpreting past and present response trajectories, identifying the relative severity of potential response sequences, applying appropriate

models in estimating future channel changes, and developing strategies for mitigating the impacts of processes likely to dominate channel response in the future (Simon 1995).

More recent screening-level tools for assessing channel instability and response potential, especially in the context of managing bridge crossings and other infrastructure, have borrowed elements of the CEM approach and combined various descriptors of channel boundary conditions and resisting vs. erosive forces. For example, Simon and Downs (1995) and Johnson *et al.* (1999) developed rapid assessment techniques for alluvial channels based on diverse combinations of metrics describing bed material, CEM stage, existing bank erosion, vegetative resistance, and other controls on channel response. Although based on a strong conceptual foundation of the underlying mechanisms controlling channel form, these specific examples are either overly qualitative with respect to the key processes, or developed with goals and intended applications (e.g., evaluating potential impacts to existing infrastructure such as bridges or culverts) that differ from what is needed by current hydromodification management programs.

SCCWRP has recently proposed a general framework for developing screening-level tools that help assess channel susceptibility to hydromodification, and a new region-specific tool for rapid, field-based assessments in urbanizing watersheds of southern California (Booth *et al.* 2010, Bledsoe *et al.* 2010). The criteria used to assign susceptibility ratings are designed to be repeatable, transparent, and transferable to a wide variety of geomorphic contexts and stream types. The assessment tool is structured as a decision tree with a transparent, process-based flow of logic that yields four categorical susceptibility ratings through a combination of relatively simple but quantitative input parameters derived from both field and GIS data. The screening rating informs the level of data collection, modeling, and ultimate mitigation efforts that can be expected for a particular stream-segment type and geomorphic setting. The screening tool incorporates various measures of stream bed and bank erodibility, probabilistic thresholds of channel instability and bank failure based on regional field data, integration of rapid field assessments with desktop analyses, and separate ratings for channel susceptibility in vertical and lateral dimensions.

An example of a specific analysis component that predicts changes in post-development sediment delivery, and that can be applied within this screening tool framework, is a GIS-based catchment analyses of “Geomorphic Landscape Units” (GLUs). A GLU analysis integrates readily available data on geology, hillslope, and land cover to generate categories of relative sediment production under a watershed’s current configuration of land use. Those areas subject to future development are identified, and corresponding sediment-production levels are determined by substituting developed land cover for the original categories and reassessing the relative sediment production. The resultant maps can be used to aid in planning decisions by indicating areas where changes in land use will likely have the largest (or smallest) effect on sediment yield to receiving channels.

Effective screening tools for assessing the susceptibility of streams to hydromodification necessarily rely on both field and office-based elements to examine local characteristics within their broader watershed context. Proactive mapping of flow energy measures (e.g., specific stream power) throughout drainage networks has the potential to complement field-based assessments in identifying hotspots for channel

instability and sediment discontinuities as streamflows change with land use. Such analyses may partially guide subsequent field reconnaissance; however, this approach also has limitations in that some geomorphic settings are inherently difficult to map using widely available digital elevation data. In particular, maps of stream power in narrow entrenched valleys and low gradient valleys (ca. <1%) with sinuous channels should be carefully field-truthed and used with a level of caution commensurate with the accuracy of the input data.

Moreover, spatial variability in channel boundary materials and form cannot be accurately mapped at present using remotely sensed data. Thus, boundary materials and channel width are typically assumed in watershed-scale mapping efforts, thereby introducing potential inaccuracies. Coupling desktop analysis with a field-based assessment when using such an approach can help resolve variation in site-specific features such as the erodibility of bed and bank materials, channel width, entrenchment, grade control features, and proximity to geomorphic thresholds.

4.3.2 Mechanistic and Empirical/Statistical Models with Deterministic Outputs

Mechanistic/deterministic models are simplified mathematical representations of a system based on physical laws and relationships (*link to next*). Empirical/statistical models use observed input and output data to develop relationships among independent and dependent variables. Statistical analyses determine the extent to which variation in output can be explained by input variables. Both types of models are typically used to generate a single output or answer for a given set of inputs. These tools can be used to help answer such questions as: *What are the expected responses in the stream and watershed given some future conditions? What criteria should be set to prevent future hydromodification impacts?* However, hydromodification modeling embodies substantial uncertainties in terms of both the forcing processes and the stream response. Deterministic representations of processes and responses can therefore mask uncertainties and be misleadingly precise, unless prediction uncertainty is explicitly characterized as described later in this section.

Although valuable, deterministic representations (such as those derived from continuous simulation modeling) of processes and responses can mask uncertainties and be misleadingly precise unless prediction uncertainty is explicitly characterized.

Hydrologic Models are used to simulate watershed hydrologic processes, including runoff and infiltration, using precipitation and other climate variables as inputs. Some models, such as the commonly-used HEC-HMS, can be run for either single-event simulations or in a continuous-simulation mode which tracks soil moisture over months or years. Other hydrologic models that are commonly used for event-based and continuous simulation modeling include HSPF and SWMM. It is widely accepted that continuous simulation modeling, rather than event-based modeling, is required to assess long term changes in geomorphically-significant flow events (Booth and Jackson 1997; Roesner *et al.* 2001).

Several HSPF-based continuous simulation models have been developed specifically for use in hydromodification planning. These include the Western Washington Hydrology Model (WWHM) and

the Bay Area Hydrology Model (BAHM). Hydromodification Management Plans (HMPs) in Contra Costa County, San Diego County and Sacramento County have developed sizing calculators for BMPs based on modeling done using HSPF models. To illustrate the point about uncertainly in mechanistic models, HSPF contains approximately 80 parameters, only about 8 of which are commonly adjusted as part of the calibration process.

Hydraulic Models are used to simulate water-surface profiles, shear stresses, stream power values and other hydraulic characteristics generated by stream flow, using a geometric representation of channel segments. The industry standard hydraulic model is the HEC River Analysis System (HEC-RAS).

Coupled Hydrologic and Hydraulic Models represent a valuable tool in hydromodification management. Because the streamflow regime interacts with its geomorphic context to control physical habitat dynamics and biotic organization, it is often necessary to translate discharge characteristics into hydraulic variables that provide a more accurate physical description of the controls on channel erosion potential, habitat disturbance, and biological response. For example, a sustained discharge of 100 cfs could potentially result in significant incision in a small sand bed channel but have no appreciable effect on the form of a larger channel with a cobble bed. By converting a discharge value into a hydraulic variable (common choices are shear stress, or stream power per unit area of channel relative to bed sediment size), a "common currency" for managing erosion and associated effects can be established and applied across many streams in a region. Such a common currency can improve predictive accuracy across a range of stream types. As opposed to focusing on the shear stress or stream power characteristics of a single discharge, it is usually necessary to integrate the effects of hydromodification on such hydraulic variables over long simulated periods of time (on the order of decades) to fully assess the potential for stream channel changes. By using channel morphology to estimate hydraulic variables across a range of discharges, models like HEC-RAS provides a means of translating hydrologic outputs from continuous simulations in HEC-HMS, SWMM, or HSPF into distributions of shear stress and stream power across the full spectrum of flows.

Sediment Transport Models such as HEC-6T, the sediment transport module in HEC-RAS, CONCEPTS, MIKE 11 and FLUVIAL12, use sediment transport and supply relationships to simulate potential changes in channel morphology (mobile boundary) resulting from imbalances in sediment continuity. This means that hydraulic characteristics are calculated as channel form and cross-section evolve through erosion and deposition over time. Such models have high mechanistic detail but are often difficult to apply effectively. Although it is not a mobile boundary model, the SIAM (Sediment Impact Analysis Method) module in HEC-RAS represents an intermediate complexity model designed to predict sediment imbalances at the stream network scale and to describe likely zones of aggradation and degradation.

Statistical Models use descriptive tools and empirical data to develop relationships that quantify the risk of specific stream behaviors. For example, Hawley (2009) developed a statistical model to explain variance in channel enlargement based on measures of erosive energy and channel features such grade control and median bed sediment size. Such models often include independent variables based on input from the mechanistic models described above; however, a key difference is that statistical models do not explicitly represent actual physical processes in their mathematical structure. Instead, these models

simply express the observed correlations between dependent and independent variables. Like mechanistic models, the output from these models is commonly treated as precise results in management decisions, despite the fact that predictions from most statistical models could be readily (and more accurately) expressed in terms of confidence intervals with a range of uncertainty.

Probabilistic/Risk-based Models integrate many of the tools discussed above, using modeled changes in hydrology as input to hydraulic models, which in turn provide input to various types of statistical models to predict response. However, the predictions are not represented as deterministic outputs, instead, the range of (un)certainty in the likelihood of the predicted response is explicitly quantified. Although not commonly used for hydromodification management at this time, there are well established models based on these principals currently in use in other scientific disciplines. An example of a probabilistic approach that has been used for hydromodification management is a logistic regression analysis that was used to produce a threshold "erosion potential metric" that can be used to quantify the risk of a degraded channel state. More details on this approach are provided in Appendix B.

Risk-based modeling in urbanizing streams provides a more scientifically defensible alternative to standardization of stormwater controls across stream types, and can inform management decisions about acceptable levels of risk.

Risk-based modeling in urbanizing streams provides a more scientifically defensible alternative to standardization of stormwater controls across stream types. A probabilistic representation of possible outcomes also improves understanding of the uncertainty that is inherent in model predictions, and can inform management decisions about acceptable levels of risk.

Predictive Tools for Habitat Quality and Stream Biota. The tools discussed above focus on physical stream impacts; however, as discussed in the preceding chapter, it is recognized that maintenance of stream "stability" does not necessarily conserve habitat quality and biological potential. In general, the knowledge base for biota/habitat associations is not generally adequate to allow for prediction of how whole communities will change in response to environmental alterations associated with urbanization. Making such predictions deterministically requires a thorough knowledge of species-specific environmental responses, as well as an adequate (accurate) characterization of habitat structure and habitat dynamics (both of which are modified by urbanization). However, recent studies have demonstrated that the effects of hydrologic alterations induced by urbanization on selected stream biota can be quantitatively described without a full mechanistic understanding, using stressor-response type relationships and empirical correlations from field-measured conditions (Konrad and Booth 2005, Konrad *et al.* 2008, DeGasperi *et al.* 2009).

In moving beyond a narrow focus on linkages between flow alteration and channel instability, scientific understanding of hydrologic controls on stream ecosystems has recently led to new approaches for assessing the ecological implications of hydromodification. The essential steps in developing quantitative "flow-ecology relationships" have been recently described in the Ecological Limits of Hydrologic Alteration (ELOHA) process (Poff *et al.* 2010), a synthesis of a number of existing hydrologic techniques and environmental flow methods. ELOHA provides a regional framework for elucidating the

key hydrologic influences on biota of interest, and translating that understanding into relationships between hydromodification and biological endpoints that can be used in management decision making. This requires a foundation of hydrologic data provided by modeling and/or monitoring, and sufficient biological data across regional gradients of hydromodification. Although hydrologic–ecological response relationships may be confounded to some extent by factors such as chemical and thermal stressors, there are numerous case studies from the US and abroad in which stakeholders and decision-makers reached consensus in defining regional flow standards for conservation of stream biota and ecological restoration (Poff *et al.* 2010; http://conserveonline.org/workspaces/eloha).

4.3.3 Strengths, Limitations and Uncertainties

The Organizing Framework shown in Figure 4-1 shows the applicability of the three major categories of tools in support of various management actions. This section addresses a range of issues relating to strengths, limitations and uncertainty of the tools discussed above. Detailed analysis of individual models is beyond the scope of this document, but EPA/600/R-05/149 (2005) contains an extensive comparison of functions and features across a wide range of hydrologic and hydraulic models.

Explicit consideration, quantification, and gradual reduction of model uncertainty will be necessary to advance hydromodification management.

The uncertainty inherent to hydromodification modeling underscores the need for carefully designed monitoring and adaptive management programs.

General Considerations. The well-known statistician George Box famously said that "all models are wrong, some are useful." The usefulness of a model for a particular application depends on many factors including prediction accuracy, spatial and temporal detail, cost of calibration and testing, meaningful outputs, and simplicity in application and understanding. There is no cookbook for selecting models with an optimal balance of these characteristics. Models of stream response to land-use change will always be imperfect representations of reality with associated uncertainty in their predictions. In addition to the prediction errors of standard hydrologic models, common limitations and sources of uncertainties include insufficient spatial and/or temporal resolution, and poorly known parameters and boundary conditions. Ultimately, the focus of scientific study in support of decision making should be on the decisions (or objectives) associated with the resource and not on the model or basic science. Each model has limitations in terms of its utility in addressing decisions and objectives of primary concern to stakeholders. Prediction error, not perception of mechanistic correctness, should be the most important criterion reflecting the usefulness of a model (NRC 2001; Reckhow 1999a,b). The predictive models discussed above may be thought of as predictive scientific assessments; that is, a flexible, changeable mix of small mechanistic models, statistical analyses, and expert scientific judgment.

Region-Specific Considerations. Because all models are vulnerable to improper specification and omission of significant processes, caution must be exercised in transferring existing models to new

regional conditions. For example, mobile boundary hydraulic models are mechanistically detailed but not generally well-suited to many southern California streams given the prevalence of near-supercritical flow, braiding and split flow (Dust 2009). In addition, bed armoring and channel widening resulting from both fluvial erosion and mass wasting processes are key influences on channel response in semi-arid environments. These processes are not well-represented and constrained in current mobile boundary models. Accordingly, the appropriateness of existing models for addressing a particular hydromodification management question should be empirically tested and supported with regionally appropriate data from diverse stream settings.

Managing Uncertainty. To date, hydromodification management has generally relied on oversimplified models or deterministic outputs from numerical models that consume considerable resources but yield highly uncertain predictions that can be difficult to apply in management decisions. Numerical models are nevertheless an important part of the hydromodification toolbox, especially in characterizing rainfall-response over decades of land-use change. It is challenging to rigorously quantify the prediction accuracy of these mechanistic numerical models; however, their utility of can be enhanced by addressing prediction uncertainties in number of ways (Cui *et al.* 2011). Candidate models can be subjected to sensitivity analysis to understand their relative efficacy for assessment and prediction of hydromodification effects. Moreover, it should also be demonstrated that selected models can reasonably reproduce background conditions before they are applied in predicting the future. Modeling results that are used in relative comparisons of outcomes are generally much more reliable than predictions of absolute magnitudes of response.

Hydromodification modeling embodies substantial uncertainties in terms of both the forcing processes and stream response. Deterministic representations of processes and responses can mask uncertainties and can be misleading unless prediction uncertainty is explicitly quantified. Errors may be transferred and compounded through coupled hydrologic, geomorphic, and biologic models. Accordingly, explicit consideration, quantification, and gradual reduction of model uncertainty will be necessary to advance hydromodification management. This points to two basic needs. First, there is a need to develop more robust probabilistic modeling approaches that can be systematically updated and refined as knowledge increases over time. Such approaches must be amenable to categorical inputs and outputs, as well as combining data from a mix of sources including mechanistic hydrology models, statistical models based on field surveys of stream characteristics, and expert judgment. Second, the uncertainty inherent to hydromodification modeling underscores the need for carefully designed monitoring and adaptive management programs, as discussed in Section 5.

A risked-based framework can provide a more rational and transparent basis for prediction and decision-making by explicitly recognizing uncertainty in both the reasoning about stream response and the quality of information used to drive the models. Prediction uncertainty can be quantified for any of the types of models described above; however, some types are more amenable to uncertainty analysis than others. For example, performing a Monte Carlo analysis of a coupled hydrologic-hydraulic model is a very demanding task. A simple sensitivity analysis of high, medium, and low values of plausible model parameters is much more tractable and still provides an improved understanding of the potential range of system responses. Such information can be subsequently integrated with other model outputs and

expert judgment into a probabilistic framework. For example, Bayesian probability network approaches can accommodate a mix of inputs from mechanistic and statistical models, and expert judgment to quantify the probability of categorical states of stream response. Such networks also provide an explicit quantification of uncertainty, and lend themselves to continual updating and refinement as information and knowledge increase over time. As such, they have many attractive features for hydromodification management, and are increasingly used in environmental modeling in support of water quality (Reckhow 1999a,b) and stream restoration decision-making (Stewart-Koster *et al.* 2010).

Sediment Supply. As described above, a reduction in sediment supply to a stream may result in instability and impacts, even if pre- and post-land use change flows are perfectly matched. Thus, there is a need to develop management approaches to protect stream channels when sediment supply is reduced, and to refine and simplify tools to support these approaches. This continues to prove challenging because, the effects of urban development on sediment supply in different geologic settings are not well understood and poorly represented in current models. As a starting point, models used to analyze development proposals that reduce sediment supply could be applied with more protective assumptions with respect to parameters and boundary conditions (inflowing sediment loads). Effects of altered sediment supply on stream response could be addressed in a probabilistic framework by adjusting conditional probabilities of stream states to reflect the influence of reductions in important sediment sources due to land use change.

5. MONITORING

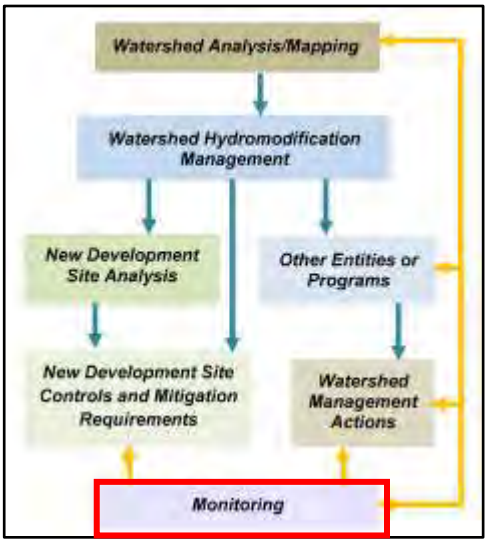

"Monitoring" can cover a tremendous range of activities in the context of stormwater management in general, and of hydromodification in particular. For example, the NPDES Phase 2 general permit for California (SWRCB, 2003 (*www.swrcb.ca.gov/**water**_issues/.../storm**water**/.../final_ms4_**permit**.p...)*, National Pollutant Discharge Elimination System (NPDES) General Permit No. CAS000004, p. 11) notes that the objectives of a monitoring program may include:

- Assessing compliance with the General Permit.
- Measuring and improving the effectiveness of stormwater management plans.
- Assessing the chemical, physical, and biological impacts on receiving waters resulting from urban runoff.
- Characterizing storm water discharges.
- Identifying sources of pollutants.
- Assessing the overall health and evaluating long-term trends in receiving water quality.

These objectives span multiple goals, ranging from verifying of compliance, evaluating effectiveness, characterizing existing conditions, and tracking changes over time. Each would likely require different monitoring methods, duration of measurement, and uses of the resulting data (Table 5-1). This variability emphasizes what we consider the key starting point of any monitoring program: to answer the questions, "What is the purpose of monitoring? How will the data be used?" Even secondary considerations can exert great influence over every aspect of the design of a monitoring program: "How quickly do you need to have an answer?" And, perhaps most influential of all, "What are the resources available to provide that answer?"

Table 5-1. The recommended purpose(s) of monitoring associated with hydromodification control plans, organized by the scale of implementation and the time frame in which useful results should be anticipated.

Time Frame	Programmatic: State and Regional Water Boards	Local: City and County Jurisdictions
Short-term (<10 years)	• Define the watershed context for local monitoring (at coarse scale) • Evaluate whether permit requirements are making positive improvements	• Evaluate whether specific projects/ regulations are meeting objectives • Identify the highest priority action(s) to take
Long-term (1+ decades)	• Define watershed context and setting benchmarks for local-scale monitoring (i.e., greater precision, if/as needed) • Demonstrate how permit requirements can improve receiving-water "health," state-wide (and change those requirements, as needed)	• Evaluate and demonstrate whether actions (on-site, instream, and watershed scale) are improving receiving-water conditions • Assess program cost-effectiveness • Identify any critical areas for resource protection

5.1 The Purpose of Monitoring

In the context of hydromodification assessment and management, we propose three interrelated purposes for monitoring that will guide the discussion and recommendations in this section:

- **Characterizing the conditions** of receiving waters downstream of urban development (including any trends in those conditions over time).
- **Evaluating the effectiveness** of hydromodification controls at protecting or improving the conditions of downstream receiving waters (and modify them, as needed).
- **Setting priorities** on the wide variety of hydromodification control practices, as promulgated by the State and Regional Boards and as implemented by local jurisdictions.

These needs give rise to several interrelated types of monitoring, all common to many watershed and stormwater monitoring programs. They are typically executed at different spatial and temporal scales, and if well-designed and executed they can collectively help guide management actions. We define them here, using terms and definitions that are common to the monitoring literature:

- **Performance monitoring,** by which is normally meant the evaluation of a particular stormwater facility relative to its intended (or designed) performance, but independent of whether that intended design is actually beneficial for downstream receiving waters.
- **Effectiveness monitoring,** by which we mean the assessment of how well specific management actions or suites of actions reduce or eliminate the direct impacts of stormwater on receiving waters. This type of monitoring can answer a question common to stormwater management: does a particular facility actually achieve its intended goal (e.g., flow releases from a stormwater facility protect the stream channel downstream from erosion)? More broadly, monitoring can evaluate the "effectiveness" of a suite of measures or an overall program designed to produce

beneficial outcomes (or avoid negative ones) in downstream receiving waters. In this context, the precise boundaries division between effectiveness monitoring and other types are blurry and unnecessarily artificial.

- **Trends monitoring,** by which we mean an integrative assessment of whether our "endpoint" indicators (physical, chemical, or biological) are showing any consistent, statistically significant change over time. Such monitoring rarely "proves" the direct impacts of a specific stressor on a receiving water, but it is critical to setting and evaluating progress towards integrative assessment endpoints at a regional scale. If well-designed, trend monitoring commonly provides useful information at smaller spatial scales as well, particularly in evaluating response to recent management actions or recovery from a prior disturbance.
- **Characterization monitoring**, by which is commonly meant the identification and (or) the quantification of various parameters in stormwater or a receiving-water body. Characterizing the condition of an outflow discharge or a water body at a particular time and place is always an outcome of the other kinds of monitoring; when it is called out as a goal in-and-of itself, however, it is can be useful to prioritize actions—but only if there is a preexisting standard for what constitutes a "good" or "acceptable" condition (also termed "status monitoring"), and a program to implement (or at least to set the priority for implementing) actions to improve the condition of waterbodies found to be "not good" or "unacceptable."

Without a context for evaluation, characterization monitoring is prone to generate large quantities of rarely used data. We strongly encourage that the purpose of any "characterization" monitoring be clearly articulated in hypothesis testing, priority setting, or systematic trend evaluation. As noted by NRC (2009, p. 508) with respect to this type of monitoring, "…monitoring under all three (NPDES municipal, industrial, and construction) stormwater permits is according to minimum requirements not founded in any particular objective or question. It therefore produces data that cannot be applied to any question that may be of importance to guide management programs, and it is entirely unrelated to the effects being produced in the receiving waters." We seek to proactively avoid this problem.

Monitoring should occur at two scales:

- **Regional or state-wide scale- this will require a time frame of one to several decades**
- **Local scale – this is required to evaluate the performance and effectiveness of specific management measures.**

In this sub-section, we focus our discussion on two interrelated scales at which these various types of monitoring should be applied as outlined in Table 5-1 at the beginning of this section. The first, which here and elsewhere in this document is termed "programmatic," has a regional or state-wide spatial scale; many of its key actions will require a time frame of one to several decades. Monitoring data from this scale should inform the broadly construed "health" of receiving waters to assess whether the range of hydromodification strategies being implemented is maintaining desired conditions across the (state-wide) range of physiography, climate, land-use change, and regulatory approaches of the regional boards. They should be used to identify particularly promising (or particularly ineffective) combinations of control strategies and landscape conditions. Finally, they should provide regionally tailored benchmarks for what constitutes "healthy

watersheds" and "healthy receiving waters" so regulators and permittees alike know what still needs to be done, where it should be done, and how urgently it needs to happen.

The second scale of monitoring data we term "local." It comprises the generation of monitoring data to evaluate the performance and effectiveness of specific management measures (be they structural or nonstructural) at reducing the negative consequences of hydromodification on downstream receiving waters. Useful information at this scale will normally be generated in the time frame of an NPDES permit cycle (i.e., ~5 years) and should provide direct guidance on whether the evaluated management strategies are working, need refinement, or should be abandoned altogether. They should also provide guidance on the degree to which management efforts should be prioritized where regulatory flexibility exists, given the conditions (and, perhaps, the potential responsiveness) of downstream receiving waters. Over longer time frames, monitoring at this scale can also provide public demonstration of the value of regulatory and programmatic efforts, and it can also help identify the most cost-effective mix of publically funded projects and regulatory protection to achieve (or maintain) receiving-water health.

5.2 Programmatic Monitoring at the Regional Scale

5.2.1 Defining Watershed Context

Although not "monitoring" in the strictest sense of this word, establishing a watershed context for the measurement and evaluation of receiving waters is a hallmark of virtually all recommended monitoring strategies (e.g., Beechie *et al.* 2010, Brierley *et al*. 2010). Monitoring programs should be consistent with the watershed perspective that forms the basis for the management framework discussed in Section 3. In California (as in most other states), this can only be executed at a supra-jurisdictional scale, because most watersheds cross one or more city and/or county boundaries. This presents the long-term challenge that many jurisdictions do not have authority over parts of the landscape that can affect the quality of rivers and streams that pass through their boundaries; more immediately, however, it makes an inclusive watershed assessment almost impossible to execute at a local level.

5.2.2 Determining the Effectiveness of Permit Requirements

A second, more challenging contextual need at the regional scale is the definition of thresholds or endpoints against which to compare the results of monitoring or modeling. Both of these "assessment tools" can guide the application of hydromodification control strategies, evaluate their real or likely success, and predict the consequences of hydromodification on downstream receiving waters. However, they provide little insight into the question, "how good is good enough?" Answering this question requires a definition of "assessment endpoints" (borrowing the term from NRC 1994), which in turn requires objective, quantifiable criteria for evaluating progress or outright success.

Most existing HMPs require the permitted municipalities to develop programs and policies to assess the potential effects of hydromodification associated with new development and redevelopment, to include management measures to control the effects of hydromodification, and to implement a monitoring program that assesses the effectiveness of HMP implementation at controlling and/or mitigating the

effects of hydromodification. Yet the appropriate objectives of such management measures, or a basis to evaluate success or failure of the HMP through monitoring data, are rarely provided in consort. Setting these endpoints is beyond the capacity of any but the largest municipalities—and even for those, neither the field of watershed science nor the arena of public policy is so clear that an unequivocally "correct" answer is likely to emerge without much additional work. Any such finding would also lack state-wide applicability; California is far too physically and ecologically diverse for an assessment endpoint developed in one part of the state to transfer everywhere without careful consideration.

For these reasons, we consider this aspect of monitoring at the regional scale to be a long-term, state-wide effort. This reflects the challenge of conducting meaningful characterization (or "status") monitoring: it requires a benchmark against which the measured condition can be compared, and to which an absolute rating ("good," bad," etc.) can be assigned.

In contrast, "trends" monitoring requires no such benchmark, only equivalent measurements undertaken at multiple times coupled with an understanding of what direction of change is desirable. For this reason, evaluating whether permit requirements are making positive improvements is a reasonable (and probably critical) short-term effort, one that can be conducted locally (see below). It should also be integrated and compiled at a regional level, however, the better to inform the continued development of hydromodification requirements.

5.3 Monitoring at the Local Scale

The needs of a monitoring program for local jurisdictions should complement those being satisfied at a regional scale. Showing net improvement is critical to maintaining support for regulatory actions and capital expenditures, but any monitoring program must reflect the typical constraints of showing rapid results while acknowledging constraints on staff resources and expertise (Scholz and Booth 2001). No less urgent is the need to identify what to do "next"—not necessarily establishing a multi-year capital improvement plan, but at least identifying key problems with one or two associated actions that would likely result in significant improvements in receiving-water conditions. Watershed characterization, as discussed above and applied to a specific jurisdiction, can provide useful guidance for such identification; even without it, local knowledge is commonly sufficient in-and-of itself. Targeted monitoring can normally confirm (or refute) such inferences in short order, which is why we place this monitoring application in the "short-term" category.

However, a monitoring program can also provide longer term guidance to local jurisdictions. When supported by the regional context of receiving-water conditions, local monitoring data can demonstrate trends over time that can lend support to (or indicate necessary changes to) hydromodification control plans. In combination with economic data, they can show long-term cost-effectiveness. Finally, site-specific monitoring data, when analyzed in the context of an appropriate scale of watershed characterization, can guide the stratification of less developed and undeveloped watershed areas into those where more assertive protection (or restoration) will be most worthwhile. None of these outcomes depend solely on collecting monitoring data, which is why none of them are presumed to be credible "short-term" applications of monitoring data. However, they have found expression in other

parts of the country having long-term monitoring efforts, and they should provide similar benefits to California as well.

5.4 Developing a Monitoring Plan

"Monitoring" the effects of a management action, whether it is a new regulation, a change in operational procedures, or a constructed project, is commonly included by design or required by regulation. The collection of monitoring data may be seen as a worthwhile activity in its own right, but this discussion uses a more restrictive, implementation-based definition: any "monitoring" needs to demonstrate a direct connection to management actions, such that the results of monitoring are translated into on-the-ground management actions (or changes in management actions). This focus on the *use* of monitoring data requires clear linkages between a management action, the uncertainties associated with that action, the ways in which the effects of that action are expressed (and can be measured) in the world, and the management changes that should be implemented if monitoring results provide unanticipated (or equivocal) resolution to those uncertainties. This is the basis for establishing an "adaptive management" approach to hydromodification monitoring, discussed in more detail in Appendix C. Here, we discuss the design of a monitoring program and outline the variety of measurements that can be made, under the assumption that the intended use(s) of the monitoring data have already been established.

"Stormwater management would benefit most substantially from a well-balanced monitoring program that encompasses chemical, biological, and physical parameters from outfalls to receiving waters" (NRC 2009, p. 257). In pursuit of a comprehensive monitoring program we might also add regular documentation of weather and climate conditions and land-cover changes. As a practical matter, however, monitoring at a site scale is almost never coordinated with other equivalent efforts at other locations, nor placed in a broader spatial context being developed as part of a regional effort. For monitoring data to have greatest value, however, such coordination and context-setting is needed.

Stormwater management would benefit most substantially from a well-balanced monitoring program that encompasses chemical, biological, and physical parameters… (NRC, 2009)

5.4.1 Design of a Monitoring Plan

As noted at the beginning of this section, the overarching question that must be asked and answered at the beginning of any monitoring design effort is "What is its purpose?" The considerations enumerated below cannot be addressed without an explicit answer to this question, because the outcome of those considerations will depend on how the data are to be used. For certain common application of monitoring data we suggest guidance that will be widely appropriate, but there are no recommendations in this section (or any other monitoring guidance document) that apply universally.

Multiple authors have condensed their guidance for designing a monitoring plan into a short list of steps that should precede the first instance of field data collection (e.g., Shaver *et al.* 2007). Although all

differ in details and intended audience, they share significant commonalities that can be distilled as follows:

- Articulate the purpose of the monitoring (the "management question").
- Identify key constraints, in particular the geographic range and scale over which the monitoring can occur, financial/staff resources available, and the time frame in which results must be generated.
- Evaluate existing information, model outputs, and/or regulatory requirements to identify promising metrics and specific sites appropriate to the management question.
- Identify the specifics of the monitoring plan: what parameter(s), where, for how often and for how long. This may include multiple iterations, wherein the guidance of Step 3 must align with the constraints of Step 2.

Most such guidance is written with site-specific, "local" monitoring in mind—the existing literature provides less direction for monitoring that is herein recommended to occur at a regional scale over the next one or more decades. However, the basic principles are the same at all scales: a coherent, explicit purpose needs to be articulated, resource constraints need to be acknowledged, and a credible strategy needs to be developed with its specifics fleshed out. Below we discuss some of the primary considerations in this last step, because they are common across a wide range of monitoring purposes, programmatic constraints, and indicator types.

5.4.2 Constraints (Step 2 of the Monitoring Plan)

Ideally, a monitoring program should be designed to detect trends, assess effectiveness and allow for source identification.

Scale. Ideally, a monitoring program should encompass multiple, nested scales of monitoring that are determined by the question(s) being addressed. For hydromodification applications, the broadest scale of monitoring is that of the integrated effect of stormwater impacts and stormwater management on receiving waters. *Trends monitoring* (and characterization monitoring, if regionally appropriate ranges of quality have been determined) addresses these questions, and it also allows stormwater and resource managers to measure the broad benefits obtained from management investments. Site-specific conditions normally cannot be traced back to specific generators of pollution (NRC 2009), and so monitoring at the broadest scales (i.e., many tens of square miles and larger) should not attempt to do so. Instead, identifying overall conditions and trends requires a broad spatial scale over long time frames (i.e., multiple years), the essence of trends monitoring. This level of effort is recommended as a regional responsibility, because the area(s) of interest will normally far exceed the geographic limits of any single jurisdiction.

If trends monitoring (or long-standing prior knowledge) indicates that there are impacts on beneficial uses, a second (and more site-specific) scale is invoked, that of *effectiveness monitoring:* which of our many stormwater-management actions are achieving the greatest reduction in downstream impacts

(and which are not)? On the whole, such stormwater control measures, both structural and nonstructural, vary by land use—the measures suitable for a residential neighborhood will likely be impractical or ineffective (or both) in an industrial setting. We therefore anticipate that most effectiveness monitoring will be stratified by land use and conducted by individual jurisdictions (see, for example, such an approach in the Nationwide Stormwater Quality Database, which contains water-quality data from more than 8600 events and 100 municipalities throughout the country).

The finest scale of monitoring is that of *source identification*, a form of characterization monitoring: what specific locations and which parts of the landscape generate stormwater of sufficiently deleterious quantity and (or) quality to cause impacts to beneficial uses, be they direct or indirect effects? This question is widely posed in stormwater management programs, and a number of existing monitoring programs seek to provide answers. The science of stormwater already suggests where the greatest attention is probably warranted (NRC 2009), namely a particular focus on areas of well-connected (or "effective") impervious area, high vehicular traffic, and exposure to toxic chemicals. We therefore suggest these categories should define areas of highest priority for this type of targeted investigation, allowing even a resource-constrained jurisdiction to conduct a useful, well-focused monitoring effort with good efficiencies.

Siting. Site selection is most commonly guided by the location of the management action being evaluated while dictated by more mundane considerations of property ownership and access logistics. In general, sites need to meet a few following basic criteria.

- Appropriate scale: the upstream area should be dominated by, or at least significantly affected by, the management action of interest.
- Responsiveness: at the chosen location, the parameters being measured should be amenable to change in response to the management action (e.g., monitoring for geomorphic change in a concrete channel is ill-advised).
- Representativeness: the results at the chosen location should be credibly extrapolated to "similar" sites, and those sites in aggregate should constitute a widespread (or otherwise important) subset of the landscape as a whole.
- Access: the site should be easily reached by the appropriate personnel and equipment, and with a cost of doing so consistent with the frequency of measurements being made. Any equipment left unattended needs to be secure (or well-hidden).

There are institutional considerations in site selection as well. Multiple programs implement monitoring or impose monitoring requirements, and coordination can provide mutual benefits and efficiencies to all. In particular, monitoring driven by management actions at a particular location (i.e., a local scale) will always benefit from information from one or more regional-scale reference sites that can characterize natural or background variability. Local studies will rarely have resources to execute such an effort themselves, again emphasizing the importance of a nested (and coordinated) hierarchy of monitoring programs.

Time and Variability. Evaluating the effectiveness of management actions requires a preliminary judgment of the time frame over which effects can be recognized. For water-quality parameters, storm-specific grab samples or continuous flow-weighted sampling has been most common; for changes in geomorphic form or in the population attributes of benthic macroinvertebrates, one-time annual sampling that presumes to integrate the effects of the past year are typical. Flow metrics are normally extracted from "continuous" (i.e., 5-, 15-, or 60-minute) measurements of discharge. However, every measurement has some degree of variability, a consequence of "natural" variability, measurement errors, and induced change (i.e., the effects of the management action we are trying to perceive). Separating these components is a matter of statistical analysis (see next section) based on repeated measurements, either in time or in space (or both).

We note that many practices common to past monitoring efforts, particularly the use of individual grab samples to characterize stormwater quality, have yielded results with little to no subsequent value: "…to use stormwater data for decision making in a scientifically defensible fashion, grab sampling should be abandoned as a credible stormwater sampling approach for virtually all applications" (NRC 2009, p. 330).

The duration of a monitoring program is commonly determined by the desire for "timely" answers, although normally the ability to generate statistically significant results is a function of the system being evaluated and the indicators being measured. This often creates a conflict between the intended "mission" of the monitoring program and its ability to produce defensible results, a conflict that can only be avoided by a design that identifies meaningful variables to measure, conducts sufficiently frequent measurements to dampen random variability, and must persist~~s~~ for long enough to allow a management "signal" to emerge from the data. This is the essence of the iteration noted above in Step 4 of monitoring-plan design above.

The monitoring program design must persist long enough to a allow management "signal" to emerge from the data. Consequently, long-term records (i.e., one to several decades) will be needed to detect all but the most dramatic of trends in biological indicators.

In one of relatively few quantitative studies of variability in biological indicators, Mazor *et al.* (2009) found that year-to-year variability for the same site sampled in the same season showed a variability (i.e., ±1σ) was typically about 10 points for a benthic IBI. With average scores for their 5 sites ranging from 28–51 (on a 100-point scale), this reflects a coefficient of variation of about 25%. Individual metrics were even more variable. This emphasizes that long-term records (i.e., one to several decades) will be needed to detect all but the most dramatic of trends in biological indicators.

The duration of monitoring also needs to capture the events that are most important to the anticipated responses of the measured system. For evaluating the effects of hydromodification, frequent storms (i.e., those that are normally expected to occur one to several times per year) are commonly judged important and their effects would normally be captured by a monitoring effort of even just one or a few years' duration. Particularly in more semi-arid regions of the state, however, significant channel-altering events may occur only after many decades of relative quiescence and stability, and noticeable (or documentable) response of streams to hydromodification may only occur under certain circumstances or following specific combination of events. Therefore, the lack of channel response on an annual basis

may not necessarily indicate that management actions are effective. Thus a long-term, ongoing monitoring effort is necessary to capture the responses to infrequent, stochastic events, but determining the likely duration of such a program requires some knowledge (or assumptions) of the critical drivers of those responses. It therefore requires a well-posed set of management questions underlying the monitoring effort as well.

For management questions concerning the effectiveness of hydromodification controls, monitoring will almost always benefit from long-term flow monitoring at multiple sites, especially those in the mid to upper watershed (and key tributaries, depending on the scale of the effort). Local rainfall measurements are nearly as essential, since flow data without rainfall data resolved at a similar spatial and temporal scale are useless at best, misleading at worst. Baseline (pre-project) monitoring normally is also invaluable. However, each of these elements will normally require some combination of a multi-scale, long-term, coordinated monitoring program with an investment of at least several years' duration in anticipation of (and follow-up after) a specific management action at a specific location. Despite the value for evaluating the effects of hydromodification (and hydromodification control efforts), such monitoring almost never occurs to this degree. To the extent this remains a practical constraint on implementation, the range of management questions needs to be commensurately narrowed as well.

Statistical Considerations. The statistical design of a monitoring program is beyond the scope of this section, because the range of possible requirements and approaches is tremendously broad. Several general principals are worth articulating, however, because they apply almost universally (and are commonly ignored):

- Although trends can be "suggested" by monitoring data, only statistically rigorous results can be offered as "proof." Thus, ignoring this dimension of monitoring program design severely limits future applicability of the results.
- Most natural parameters display high variability when measured outside a laboratory, and thus the magnitude of change caused by a management action also needs to be great before it can be recognized. There is a trade-off between the relative magnitude of change and the number of samples required to recognize it (i.e., large relative changes require fewer samples), but many monitoring efforts pay little attention to this basic fact. Where sampling can only occur during specified storm conditions or once during the same season each year, the duration of a monitoring campaign sufficient to detect even large changes in naturally variable parameters is likely to be a decade or longer. For many management applications, this is tantamount to generating no useful information at all (but is significantly more costly).
- The level of effort needed can be estimated *a priori* to help guide final monitoring design, but only if the degree of variability and the magnitude of change to be perceived are known or estimated ahead of time. One such example is given below, where the diagonal lines are labeled with the number of independent samples needed to achieve a typical level of statistical power for various combinations of permissible error from the "true" value (x axis), and the intrinsic variability in values across the population being measured (y axis) in Figure 5-1 below.

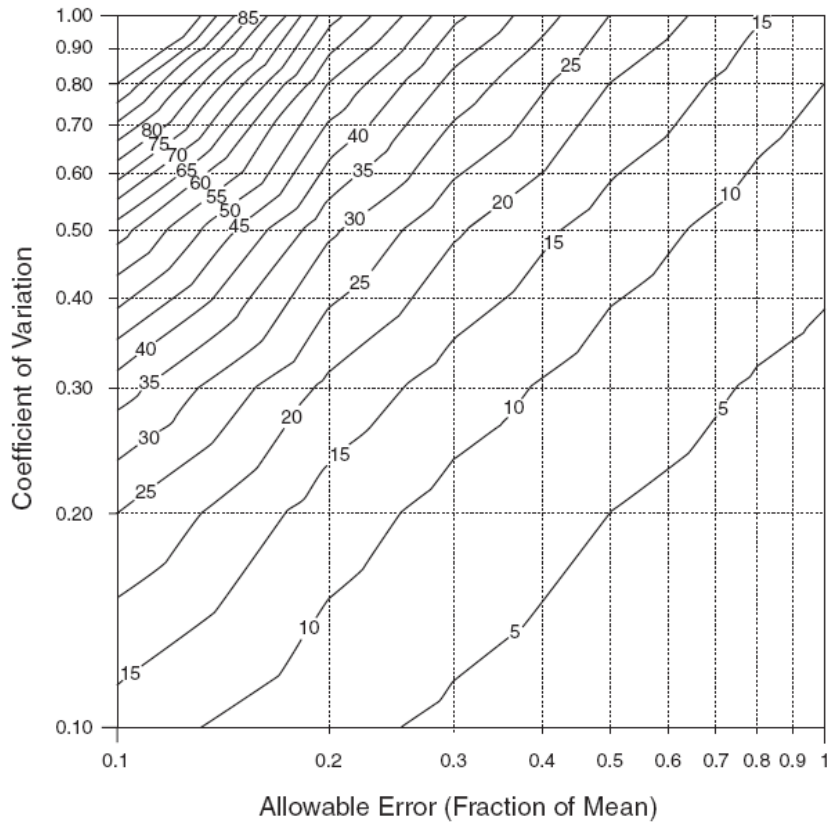

Figure 5-1. Sample requirements for confidence of 95% (α = 0.05) and power of 80% (β = 0.20). Figure from Pitt and Parmer 1995.

5.4.3 What to Monitor (Step 3 of the Monitoring Plan)

The choice of "what to monitor" follows from the choice of assessment endpoints, which in turn depends on the choice of management goals: for example, if "stable stream channels" is the intended outcome of an HMP, then measurement of the physical form of a channel over time would be appropriate. If diagnosing the cause of observed changes is also desired, then some evaluation of potential causal agents (e.g., hydrology, sediment input, or direct disturbance) would also be needed. Because management goals are now commonly (and appropriately) cast more broadly, however, they can embrace less clearly defined endpoints such as "watershed health" or "biological integrity." Many such endpoints fail the test of quantifiable objectivity.

However, these goals invoke a broad scope of concern, embracing not only physical stream conditions but also a range of chemical, hydrologic, and biological attributes. They encompass a broader catalog of receiving waters that may need to be evaluated. Finally, they emphasize the importance of looking more broadly to identify the cause of observed changes—both spatially, to conditions throughout a watershed that may have influence downstream; and temporally, to recognize ongoing adjustments to past disturbance (i.e., legacy effects) and to future environmental changes (e.g., climate change) that commonly lie well beyond the ability of local watershed managers to address. The imprecision of these

goals should not obscure the importance of broadening the scope of stormwater and hydromodification assessments to include not only the traditionally emphasized characterization of selected water-quality constituents and channel stability, but also more integrative measures.

These considerations suggest two broad categories of assessments, which largely but not entirely align with the two scales of implementation (i.e., "programmatic" and "local") defined in Table 4–1:

- Integrative: defining an overall level of "health" of the watershed, as expressed in the condition(s) of its receiving waters. Current scientific consensus suggests that biological indicators are best suited to this scale of evaluation (Karr and Chu 1999), insofar as they integrate the consequences of multiple stressors on aquatic systems and because many management goals (and regulatory requirements) are cast in biological terms. To be meaningful, however, any such indicators need to be suitably chosen and stratified for their particular geo-hydro-climatological region (e.g., "ecoregions"; Omernick and Bailey 1997).
- Targeted: demonstrating the achievement of an established regulatory standard or a designated threshold (typically, a measured or modeled pre-development condition) by a particular parameter, commonly one or more chemical constituents or a specific hydrologic metric of flow. This can be evaluated at the outfall of a single stormwater facility, at the discharge point for a site, or in the receiving water itself. Many of these thresholds are important in their own right—to protect human health, to preserve riparian property from erosion, to avoid flooding of previously non-inundated lands. However, they should be recognized as providing only one-dimensional views of a much broader system. Thus, targeted monitoring can supplement but should not replace more integrative measures.

Integrative assessment endpoints require multiple lines of evidence to characterize receiving-water conditions. At their most comprehensive, they should include measures of flow, geomorphic condition, chemistry, and biotic integrity (Griffith *et al.* 2005, Johnson and Hering 2009). However, biological criteria are generally key to integrative assessment: "In general, biological criteria are more closely related to the designated uses of waterbodies than are physical or chemical measurements" (NRC 2001, p. 8). In most applications, such assessments are compared to one or more reference sites where conditions have been independently judged as "excellent," or where human disturbance is minimal and so best-quality conditions are assumed.

Integrative assessment endpoints require multiple lines of evidence to characterize receiving-water conditions. At their most comprehensive, they should include measures of flow, geomorphic condition, chemistry, and biotic integrity.

The task of identifying and quantifying reference conditions in California streams is presently being carried out by the Reference Condition Management Program (RCMP) of the State Water Board's Surface Water Ambient Monitoring Program (SWAMP; see 2009 Recommendations). About 600 sites have been recognized by this program as "reference" based on having minimal human disturbance, and they have been geographically stratified into the 12 Level III ecoregions mapped for the state of California (by USEPA 2000). The metrics chosen to characterize their biologic conditions should provide an appropriate list for the evaluation of impaired (or potentially impaired) streams.

An equivalent set of reference sites and conditions for other receiving-water types does not presently exist. California also presently lacks a systematic basis for defining relative categories of "poor," "fair," "good," or "excellent" based on numeric values of biological indicators, such as exists in parts of the Pacific Northwest. Several regions, however, now have multimetric biological indicators with defined reference conditions (see below).

Elsewhere, however, there is as yet no context for setting assessment endpoints for biological indicators in California receiving waters. Such an effort is in progress, at least for streams, and its eventual completion to support the management application of more local monitoring results is a key recommendation of this report. Biological assessment endpoints will need to be established region by region on an as-needed basis; in the interim, locally collected data can be very useful for trend monitoring of receiving water but not for defining existing levels of "health."

5.4.3.1 An Example from Washington State

The Puget Sound region of western Washington State provides an instructive example for identifying indicators and establishing desired assessment endpoints. Multiple agencies over the last two decades have sought to measure the overall ecological health of the region and to define targets for recovery. Following the most recent three-year process, the lead agency for the current effort released its set of 20 "dashboard indicators" designed both to express scientific understanding of conditions needed for ecological health and to communicate that understanding in a public-accessible manner (http://www.psp.wa.gov/pm_dashboard.php; accessed September 5, 2011). They cover physical, chemical, and biological indicators: all expressed in terms of relative improvement or quantified conditions to be reached by the year 2020.

This level of target-setting is possible only after extensive study and public discussion; it falls far beyond the scope of the present document. It is instructive for the state of California, however, in several regards as it looks to the future:

- The physiographic scope of the indicators and their target values is well-constrained to a particular geographic region with broadly similar geologic, hydrologic, and climatological attributes. Multiple parallel efforts would almost certainly be needed for a more diverse region (such as the entire state).
- Each indicator has a strong scientific basis for inclusion and at least some scientific basis for specific targets. Their communication value with the public was also an explicit criterion for inclusion.
- The most numerous indicators are biological, and they address multiple levels of the trophic chain from top predators to plants (a planktonic metric, however, was rejected as requiring too much additional scientific study and offering little communication value to the general public).
- Although emphasizing biology, the indicators are broadly distributed amongst biological, chemical, and physical metrics; most are broadly integrative in nature (e.g., reference to "bug populations" (the Puget Sound B-IBI) and a "freshwater quality index").

- The set of physical indicators is most parsimonious for instream conditions, and excluding marine nearshore and estuary conditions is restricted to a single hydrologic metric (chosen for its presumed influence on fish). This stands in stark contrast to most existing hydromodification monitoring plans, which emphasize measures of channel geomorphology and a wider range of hydrologic metrics. Such indicators may provide useful performance measures, but they should not be mistaken for more integrative measures of ecosystem or watershed "health."
- Although each indicator has a specified, numeric goal to be reached by 2020, there are no articulated changes to the current management plan if any of those goals are not reached (or if interim measures suggest that they will not be reached). This is a recognized shortcoming of the present plan but there is no mechanism yet in place to address it. As such, it does not currently meet the test for "adaptive management" (see Appendix C).

In California, such a list of integrative assessment indicators (let alone quantified endpoints for those indicators) cannot presently be defined, except in a few specific localities where data collection and analysis have been ongoing for many years. Thus, we recognize the value of such targets but must guide the present development of monitoring in recognition of their near-complete absence. Rectifying this shortcoming is the central recommendation for long-term program development; in the interim, short-term monitoring at both the regional and local levels need to acknowledge the absence of an integrative context in which to interpret their results.

In California, a list of integrative assessment indicators (let alone quantified endpoints for those indicators) cannot presently be defined, except in a few specific localities. Rectifying this shortcoming is the central recommendation for long-term program development.

Regulatory standards are established on the assumption that "clean water" will result in "healthy streams," but the elements of a watershed are far too complexly interrelated to permit such a simplistic perspective. Although the inverse ("polluted water results in unhealthy streams") is almost always true, the challenge for inferring causality from typical monitoring data is that *many* such stressors can all yield the same, degraded outcome. For this reason, targeted monitoring can provide useful diagnostic information and demonstrate regulatory compliance, but it cannot provide sufficient information to address integrative assessment endpoints.

5.4.3.2 Indicators from Existing Programs

We now turn to some of the most common indicators used in monitoring programs today, recognizing that their suitability in any given application depends on the questions being asked, the characteristics of the natural system being measured, and the practical constraints imposed on the monitoring program.

Hydrologic Indicators. Historically, the effects of urbanization on flow were characterized exclusively in terms of peak flow increases (e.g., Leopold 1968, Hollis 1975). Study since those early works has emphasized the degree to which other attributes of a stream hydrograph are changed by watershed imperviousness, and the importance of assessing the *duration* of moderate flows that are capable of transporting channel sediments and the frequency with which those geomorphically active flows occur

(Section 2). Thus, monitoring relevant to a particular hydromodification management application will likely include a variety of flow metrics (e.g., Konrad and Booth 2005, Degasperi *et al*. 2009).

In moving beyond a narrow focus on linkages between watershed urbanization, flow alteration, and in-stream effects, scientific understanding of hydrologic controls on stream ecosystems has recently led to new approaches for assessing the ecological implications of hydromodification. For example, the ecological limits of hydrologic alteration (ELOHA) framework is a synthesis of a number of existing hydrologic techniques and environmental flow methods that allows water-resource managers and stakeholders to develop socially acceptable goals and standards for streamflow management (Poff *et al.* 2010). The central focus of the ELOHA framework is the development empirically testable relationships between hydrologic alteration and ecological responses for different types of streams. This requires a foundation of hydrologic data provided by gaging and/or monitoring, and sufficient biological data across regional gradients of hydromodification. Although hydrologic–ecological response relationships may be confounded to some extent by factors such as chemical and thermal stressors, there are numerous case studies from the US and abroad in which stakeholders and decision-makers have reached consensus in defining regional flow standards for conservation and ecological restoration of streams and rivers (Poff *et al.* 2010).

Hydrologic monitoring provides essential information needed for establishing flow–geomorphology–ecology relationships, validating conceptual models, and assessing effectiveness of management actions in developing watersheds. Implementing regional flow standards should proceed in an adaptive management context, where collection of monitoring data or targeted field sampling data allows for testing of flow alteration–geomorphic–ecological response relationships. This allows for a fine-tuning of flow management targets based on improved understanding of the actual mechanisms; however, such monitoring can be expensive and it may take many years to adequately characterize the full spectrum of streamflows. Thus, hydrologic monitoring programs should be carefully planned and executed so that they are cost-effective and address the key uncertainties In this paper we primarily focus on indicators that do not require additional, extensive data collection.

Hydrologic indicators provide essential information needed for establishing flow–geomorphology–ecology relationships, validating conceptual models, and assessing effectiveness of management actions in developing watersheds.

Geomorphic indicators have been long-recognized as simple, easy-to-measure, and relatively responsive indicators of changes to the flow regime or sediment supply of a river or stream.

Biological indicators provide an integrative view of river condition, or river health.

Hydrologic monitoring is feasible in the context of a short-term program only if the purpose is to evaluate the engineering performance of a particular facility. For most applications, however, at least two (and commonly many more) years are necessary to measure a range of variable conditions sufficient to capture significant geomorphic and/or biological effects. Measurement of precipitation, generally a less cost-intensive effort than flow monitoring, must occur in consort for the data to be useful. In an effort to minimize the cost of continuous long-term flow modeling, a hydrologic model may be calibrated on one or two years of actual data and then used *in lieu* of further data to predict flow conditions. Whether the level of imprecision so introduced is appropriate will depend on the

management questions being asked, but in general such an approach is normally judged more appropriate for comparative results (e.g., did a specified flow magnitude increase in frequency or duration?) than for absolute results (what is the magnitude of the 2-year discharge?).

Geomorphic Indicators. Geomorphic indicators have been long-recognized as simple, easy-to-measure, and relatively responsive indicators of changes to the flow regime or sediment supply of a river or stream (e.g., Leopold 1968). They require little specialized equipment, many commonly can be measured "in the dry" (or close to it), they typically change little from week-to-week (and so are often measured only once per year), and the morphologic features of interest provide the physical template on which a wide range of biological conditions are expressed.

Scholtz and Booth (2000) recognized five geomorphological "channel features" commonly measured as part of monitoring programs:

- Channel geometry (cross sections, longitudinal profile).
- Channel erosion and bank stability.
- Large woody debris.
- Channel-bed sediment.
- In-stream physical habitat (pools, riffles, etc.).

To this list, others have also added:

- Floodplain connectivity.
- Channel planform (meandering, braiding, rates of channel shifting).

Each metric has well-defined methods for field (or, in some cases, airphoto) measurements that need not be repeated here. However, despite broad agreement on *how* to measure each parameter, there is substantially less agreement on the meaning of particular measurements, or indeed under what circumstances (if any) such measurements should be made at all. Most contentious are the various protocols for assessing instream physical habitat (#5 above)—seemingly the most "relevant" for a host of biological applications and for evaluating restoration success. However, a variety of studies have documented a high level of uncertainty imposed by observer bias:

> "Habitat-unit classification was not designed to quantify or monitor aquatic habitat. At the level necessary for use as a stream habitat monitoring tool, the method is not precise, suffers from poor repeatability, cannot be precisely described or accurately transferred among investigators, can be insensitive to important human land-use activities, is affected by stream characteristics that vary naturally and frequently, and is not based on direct, quantitative measurements of the physical characteristics of interest. Relying on habitat-unit classification as a basis for time-trend monitoring is time-consuming, expensive, and ill-advised." (Poole *et al*. 1997, p. 894)

Other geomorphic metrics, in contrast, can provide a robust, albeit coarse, characterization of the channel boundaries. Some changes, particularly if consistently expressed by multiple adjacent cross-

sections, can provide clear documentation of systematic channel changes over time that can be credibly associated with upstream changes (e.g., increased discharge from urbanization leading to channel enlargement). Other changes, however, may have a more indirect or uncertain association with upstream conditions (e.g., grain-size changes) because of the potential for rapid, ill-described changes over time without a corresponding human "cause." This emphasizes the importance of having a well-crafted purpose for the monitoring program into which the utility of any chosen parameter can be clearly described.

Biological Indicators. Biological indicators have been long-applied in society's evaluation of stream conditions, but historically that application has been rather informal. Observation of major fish kills, for example, is the application of a "biological indicator," but it provides little diagnostic or discriminatory information except in those streams where conditions are so poor that even casual awareness is inescapable. As a more refined assessment tool, however, their application to freshwater streams is only a few decades old. As such, the science is still under construction and some basic principles are still debated.

The rationale behind using biological indicators, however, is relatively undisputed. Karr (1999) has provided a useful summary of that rationale, of which the key elements are:

- Biological monitoring and biological endpoints provide the most integrative view of river condition, or river health.
- Biological monitoring is essential to identify *biological* responses (emphasis added) to human actions.
- Communicating results of biological monitoring to citizens and political leaders is critical if biological monitoring is to influence environmental policies.

Some of the earliest references to biological monitoring are associated with the development of RIVPACS, the River Invertebrate Prediction and Classification System, developed by the Centre for Ecology and Hydrology in the United Kingdom and now applied in a number of countries worldwide to predict instream biological conditions from a suite of watershed and channel variables. Since that beginning, other approaches have been advanced and practiced (e.g., the US Environmental Protection Agency's *Rapid Bioassessment Protocols*) that provide alternative, but likely near-equivalent results (e.g., Herbst and Silldorf 2004).

In this section we compare several biological indicators recently applied in various regions of California. This not intended as a comprehensive comparison of all available approaches potentially applicable to California; rather, it simply provides a few examples that illustrate the differences, and the similarities, of the various approaches. As the comparisons demonstrate, there is no "right" approach—but all share commonalities that are likely to be valuable elements of any biological monitoring program. We focus exclusively on benthic macroinvertebrates (BMI), because these have seen the longest and most widespread application (both in California and worldwide) given their species diversity and their relative geographic immobility. However, a variety of other biological metrics (particularly fish and periphyton) have relevance to biological monitoring and strong advocates in the scientific community. Their

omission here is not a judgment on their value, merely a reflection of the broader applicability and richer scientific development of BMI-based indicators.

Multimetric indices are presently completed for four areas of the state (Eastern Sierra, North Coast, Central Valley, and Southern Coast). They are not standardized or calibrated state-wide (nor should they necessarily be), and they do not provide statewide coverage. In addition, the City of Santa Barbara (Ecology Consultants 2010) has sponsored development of its own BMI index (geographically embedded within the Southern Coast region), with both commonalities and differences between it and the others.

Eastern Sierra Nevada. Herbst and Silldorf (2009) developed an IBI based on streams from the upper Owens River north to the Truckee River. Their purpose was both to provide a region-specific IBI for future use and to evaluate the results of such an approach with others that also make use of BMIs to assess stream conditions. They evaluated the performance of 12-, 10-, and 8-metric indices, recommending the 10-metric index as providing the best overall performance included in the 12-metric index were these 10 and also predator richness and EPT% abundance:

- % tolerant percent richness (% of taxa with TV= 7,8,9,10).
- Richness (total number of taxa).
- Chironomidae Percent Richness (% of taxa that are midges).
- Ephemeroptera (E) Richness (number of mayfly taxa).
- Plecoptera (P) Richness (number of stonefly taxa).
- Trichoptera (T) Richness (number of caddisfly taxa).
- Dominance 3 (proportion of 3 most common taxa)
- Biotic Index (modified Hilsenhoff, composite tolerance).
- Acari richness (number of water mite taxa).
- Percent shredders (% of total number that are shredders).

A statistical analysis suggests that as many as 10 distinct classes can be discriminated using this IBI, although their recommended application uses only five categories of quality.

North Coast. Rehn *et al.* (2005) developed an IBI based on coastal-draining streams from Marin County north to the Oregon border. They evaluated 77 individual metrics, testing them for responsiveness to human disturbance and redundancy, and ultimately settled on eight:

- EPT richness.
- Coleoptera richness.
- Diptera Richness.
- Percent intolerant individuals.

- Percent non-gastropod scraper individuals.
- Percent predator individuals.
- Percent shredder taxa.
- Percent non-insect taxa.

Their statistical analysis indicated that five categories of quality could be discriminated; response was driven most strongly by watershed land cover (natural vs. unnatural) and percent of substrate that was sand-sized or finer. They also suggested a set of thresholds for rejecting potential "reference" sites (Rehn *et al.* 2005; Table 5-2), which was also used in the Southern Coast study (Ode *et al.* 2005; see below):

Table 5-2. Thresholds for rejecting potential "reference" sites.

Stressor	Threshold
Percentage of unnatural land use at the local scale	> 5%
Percentage of urban land use at the local scale	> 3%
Percentage of total agriculture at the local scale	> 5%
Road density at the local scale	> 1.5 km/km^2
Population density (2000 census) at the local scale	> 25 ind./ km^2
Percentage of unnatural land use at the watershed scale	> 5%
Percentage of urban land use at the watershed scale	> 3%
Percentage of total agriculture at the watershed scale	> 5 %
Road density at the watershed scale	> 2.0 km/km^2
Population density (2000 census) at the watershed scale	> 50 ind./ km^2

Central Valley. Rehn *et al.* (2008) also developed an IBI for Central Valley streams, evaluating 80 candidate metrics to yield a final list of five:

- Collector richness.
- Predator richness.
- Percent EPT taxa.
- Percent clinger taxa.
- Shannon diversity (a composite measure of taxonomic richness and evenness of abundance).

They found that reach-scale physical habitat variables were more critical in their data set than water chemistry or land use. They also presented their findings with greater caution than with other regions of the state, noting the difficulty of identifying truly "unimpaired" reference conditions and the geographic concentration of much of their source data.

Southern Coast. Ode *et al.* (2005) developed a BMI index of biological integrity based on 61 potential metrics from reference sites drawn from relatively undisturbed coastal-draining watersheds from Monterey Bay south to the Mexican border. They included seven final metrics:

- Percent tolerant taxa.
- Percent collector-gatherer + collector-filterer individuals.
- Predator richness.
- Percent intolerant individuals.
- EPT richness.
- Percent noninsect taxa.
- Coleoptera richness.

They note that the last two on the list are not common in other multimetric B-IBIs but were statistically appropriate for their data set. They judge that this "SoCal B-IBI" can discriminate 5 categories of condition, using 5 categories evenly divided along a 100-point scale. Particularly strong correlations amongst all seven metrics were displayed in comparison to road density and percent "watershed unnatural."

A portion of the Southern Coast region has also been the subject of independent IBI development over the past decade (Ecology Consultants 2010, 2011). The region of study spans the Santa Barbara coastal streams from the Ventura County line west about 45 miles to Gaviota Creek. Their work led to the development of an IBI using the following 7 metrics:

- # of insect families
- # of EPT families
- % EPT minus Baetidae
- % PT
- Tolerance value average
- % sensitive BMIs
- % predators + shredders

In the course of this work, tolerance values were adjusted for certain taxa based on local observations of presence/absence relative to the level of watershed disturbance. With these changes, they found strong statistical basis for discriminating five categories of biological quality. They also found that considering both watershed-level land use patterns and localized physical habitat conditions were necessary to achieve the best prediction of biological integrity.

Summary. A compilation of the various metrics (Table 5-3) demonstrates only broad commonalities between the various regional IBI's presently available for specific parts of California, suggesting that additional work needs to be done before comprehensive recommendations for biological monitoring can be made. At present, perhaps half(?) of the state's area is covered by existing multimetric indices as noted above, and for these areas they provide the best (indeed, the only) guidance for meaningful collection and interpretation of biological data. Elsewhere, however, only a few general points can be made:

- Biological monitoring in un-assessed regions of the state cannot be used to identify absolute conditions of biological health (i.e., "status" monitoring). However, they will likely be useful for "trends" monitoring, where only the change relative to a prior state is being sought.
- Despite the variability in metric choices amongst the various regions (Table 5-2), some broad commonalities are apparent. In particular, several types of metrics are likely to provide useful indicators of change in a known direction (i.e., an increase or decrease in the metric can be confidently assigned to a change in quality in a known direction):
    - One or more measures of tolerance or intolerance
    - One or more measures of predator prevalence
    - One or more measures of EPT taxa or taxa richness

This list does not purport to describe a true multimetric B-IBI, nor to provide a basis to evaluate instream biological health on an absolute scale (i.e., from "poor" to "excellent"). In the absence of any region-specific guidance, however, changes in one or more of these metrics are each likely to provide some initial, useful indication of temporal trends in biological health until such time as the types of studies referenced above can be conducted.

Table 5-3. Compilation of metrics used in the five regional B-IBI's described in the text.

METRIC	Eastern Sierra	North coast	Central Valley	Southern coast	Santa Barbara
Percent intolerant individuals		X		X	X
% tolerant (% of taxa with TV= 7,8,9,10)	X			X	
Tolerance value average					X
# of insect families					X
Percent non-insect taxa		X		X	
Percent shredders (% of total number that are shredders)	X	X			
Percent predator individuals		X			
% predators + shredders					X
Predator richness			X	X	
Collector richness			X		
Percent non-gastropod scraper individuals		X			
Percent clinger taxa			X		
Percent collector-gatherer + collector-filterer individuals				X	
EPT richness		X		X	X
Percent EPT taxa			X		
% EPT minus Baetidae					X
% PT					X
Ephemeroptera (E) Richness (number of mayfly taxa)	X				
Plecoptera (P) Richness (number of stonefly taxa)	X				
Trichoptera (T) Richness (number of caddisfly taxa)	X				
Coleoptera richness		X		X	
Diptera Richness		X			
Chironomidae Percent Richness (% of taxa that are midges)	X				
Richness (total number of taxa)	X				
Dominance 3 (proportion of 3 most common taxa)	X				
Biotic Index (modified Hilsenhoff, composite tolerance)	X				
Acari richness (number of water mite taxa)	X				
Shannon diversity index			X		

5.5 Recommendations

Based on this review of monitoring theory, current applications, and current needs, the following steps are recommended to advance a state-wide program of monitoring to support the management of hydromodification control plans.

5.5.1 Programmatic Monitoring

Over the next several years, the following actions should be implemented at the state and/or regional level:

- Executing broad-scale, GIS-based watershed characterization;
- Identifying a set of representative indicator watersheds, and a basic suite of regular measurements that are suitable for establishing trends in physical, chemical, and biological indicators;
- Identifying (and multi-metric monitoring within) a relatively small set of watersheds that have implemented recent hydromodification control plans to initiate the long-term evaluation of downstream trends.

Over the course of the next several NPDES permit cycles (i.e., one or more decades), the following actions should also be undertaken as a regional responsibility:

- Setting regionally appropriate endpoints for biological health of receiving waters;
- Identifying particularly promising (or particularly ineffective) combinations of control strategies across a range of different landscape conditions;
- Providing supplemental data collection at reference sites to support trends monitoring by local jurisdictions;
- Compiling local results to guide development and refinement of regionally appropriate hydromodification control strategies.

5.5.2 Local Monitoring

Over the next several years, the following actions should be implemented by local jurisdictions at a local scale:

- Implementing a program of source identification at one or more high-risk locations (e.g., high vehicular traffic, high imperviousness, toxic chemical storage/transport);
- Demonstrating the hydrologic performance of one or more representative hydromodification control facilities;
- Monitoring trends at one or more representative receiving waters, ideally at a regionally identified site (see the second bullet under “Programmatic monitoring,” above);

- Conducting a synoptic evaluation of waterbodies, stratified by watershed type (see the first bullet under "Programmatic monitoring," above), to identify highest priority systems for protection or rehabilitation, if not already known.

Over the course of the next several NPDES permit cycles, the following long-term actions should also be undertaken as a local responsibility:

- Monitoring representative conditions to evaluate whether management actions are improving overall receiving-water health;
- Evaluating cost-effectiveness of implemented hydromodification control measures;
- Identifying critical areas for resource protection by virtue of existing high-quality conditions.

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APPENDIX A: GUIDANCE FOR APPROPRIATE APPLICATION OF HYDROLOGIC AND HYDRAULIC ANALYSES

Information contained in this document is intended solely for guidance purposes only. It is not intended to be an instruction manual and use of any of the guidance provided herein is at the risk of the user. No other person or entity shall be entitled to rely on the services, opinions, recommendations, plans or specifications provided in the document.

1. INTRODUCTION AND PURPOSE

The purpose of this Appendix is to provide technical guidance on hydrologic and hydraulic analyses, including the use of Continuous Simulation (Hydrologic) Modeling (CSM), in support of hydromodification assessment and mitigation. CSM is the industry standard developed since the early 2000s for use in the assessment and mitigation of hydromodification. The fundamental difference between CSM and peak flow hydrologic modeling, is that CSM considers the full range of flow events over a long period of record, typically 30 years or more, to develop flow duration curves, whereas peak flow hydrologic modeling generally considers synthetically (usually calibrated to measured data) produced event-based hydrographs (2-, 10-, 50-, 100- and 200-year return frequency events). CSM allows flow duration curves and other derived hydraulic metrics to be compared between existing and proposed conditions in order to assess hydromodification impact potential and to develop mitigation strategies. The guidance provided in this appendix is the product of the experience gained in the application of hydromodification management strategies to multiple urban development projects. This appendix is not intended to be an instruction manual but to provide guidance to engineers, planners and regulatory staff on specific modeling elements involved with HMPs.

MODELING METOHDOLOGY REVIEW

Modeling Approaches

A common approach to mitigating hydromodification impacts from development projects is to construct best management practices (BMPs) which capture, infiltrate and retain runoff, where possible. In such cases, the water is detained and released over a period of time at rates which more closely mimic pre-project hydrology. Methods commonly used to size hydromodification BMPs include hydrograph matching (matching pre and post-project flow regimes), volume control and flow duration control. Hydrograph matching is most traditionally used to design flood detention facilities for a specific storm recurrence interval, such as the 100-year storm, whereby the outflow hydrograph for a project area matches the pre-project hydrograph for a design storm. Volume control matches pre- and post-project runoff volume for a project site; however, the frequency and duration of the flows are not controlled. This can result in higher erosive forces during storms. Flow duration control matches both the duration and magnitude of a range of storm events for pre- and post-project runoff. The complete hydrologic record is taken into account, and runoff magnitudes and volumes are matched as closely as possible.

It is generally accepted that flow duration control matching is the most appropriate method to be used in the design of hydromodification BMPs. The flow duration control approach has been used in at least half a dozen HMPs in California, all of which used a CSM to match flow durations. However, differences exist in how the continuous simulation modeling is used between programs.

OVERVIEW OF APPENDIX

This appendix covers the following specific topics, addressed in the order in which they would arise as part of a hydromodification analysis for a major development project:

Section 2 addresses calculation of a flow control range, including identification of an acceptable low flow value, based upon critical flow for incipient motion of the channel material. .

Section 3 addresses the development of evaluation criteria to assess the effectiveness of a proposed mitigation design, including a discussion of flow duration matching and the erosion potential metric.

Section 4 addresses CSM, including precipitation data requirements, hydrologic time steps, model calibration and validation, and other modeling considerations and tips.

2. METHOD FOR SELECTION OF A FLOW CONTROL RANGE

INTRODUCTION TO FLOW CONTROL

Most hydromodification plans (HMPs) in California have adopted a flow control approach, which establishes a range of flow magnitudes discharging from the proposed site that must be controlled. The magnitude of the flow range is commonly expressed in terms of a percentage of the return period flow to which it is equivalent; for example: from 10% of the Q2 to 100% of the Q10. Flow magnitudes within the prescribed range must not occur more frequently under the proposed condition than they do in the existing (or pre-project) condition. Another way of expressing this is that the long term (decadal) cumulative duration of these flows must not be longer in the post-project condition compared to the pre-project condition. Generally, a small exceedance tolerance is allowed. For example, the following is a typical criterion that has been used in HMPs:

> For flow rates ranging from 10% of the pre-project 2-year recurrence interval event (XQ2) to the pre-project 10-year runoff event (Q10), the post-project discharge rates and durations shall not deviate above the pre-project rates and durations by more than 10% over and more than 10% of the length of the flow duration curve. The specific lower flow threshold should be influenced by results from the channel susceptibility assessment.

The rationale behind setting an upper limit is the understanding that when less frequent, high intensity/volume precipitation events occur, the watershed reaches a saturation level and responds in a similar manner for undeveloped and developed conditions. Furthermore, while these less frequent, high magnitude events do induce significant geomorphic change, they occur so infrequently that over a long time period, they comprise only a small portion of the work done on a channel. For example GeoSyntec (2007) used a hydro-geomorphic model to assess cumulative sediment transport on Laguna Creek (near Sacramento) and determined that 95% of the total erosion and sediment transport in the creek is accomplished by flow rates less than Q_{10}.

The purpose of determining a low flow range is one of practical design consideration when meeting a requirement for flow duration matching. The requirement to match flow durations between a pre- and post-project condition requires that runoff be detained and infiltrated within a BMP (e.g. open basin or underground vault). If flow matching is required to be achieved for all flows down to zero, the BMP

volume will be significantly larger (and therefore more costly) than if there were some low flow below which runoff could be discharged at durations longer than in the pre-project condition. A key assumption underlying the concept of a low-flow discharge is that the increase in discharge durations below this rate will not increase channel erosion because the flows are too small to initiate movement of channel materials to any significant extent. Another critical assumption in the flow duration matching approach is that a single discharge value is valid across the range of grain sizes and geometries in the streams to which that low flow value applies.

For a specific set of hydraulic conditions (e.g., cross sectional shape, channel slope, bed and bank roughness), the flow rate can be calculated where the critical shear strength value is reached. Thus with an estimate of the critical shear strength of the materials composing a channel's bed or banks, and the hydraulic conditions occurring at the same location, the critical flow rate can be determined at which transport (or erosion) begins. This critical flow rate (Q_c) can then be compared to the magnitude of a flood peak which occurs every two years (Q_2) to establish the estimate of percent Q_2 to be used as the lower flow threshold.

Thus in order to calculate the lower flow threshold as expressed by a percentage of Q_2, three values must be determined for each analysis location (described in further detail below):

- The critical shear strength (τ_c) of bed and bank materials;
- The critical flow rate (Q_c) at which this critical shear strength is reached and exceeded;
- The magnitude of a flood peak which occurs every two years (Q_2).

In contrast, when using an erosion potential (Ep) metric (rather than flow duration matching) for BMP sizing, the Ep analysis incorporates channel geometry to estimate shear stresses generated at various flow rates, and then compares these to estimated critical shear stresses (i.e., shear stress required to initiate transport) for the grain size distribution within the stream. However, for either flow duration matching or for erosion potential analysis, the first step is to determine the critical shear stress for incipient motion of channel materials.

DETERMINATION OF CRITICAL SHEAR STRESS

The composition and condition of the bed and banks of a stream channel are the best indicators of how a channel will react (i.e., its susceptibility) to hydrologic changes resulting from development projects (i.e., hydromodification). Channels composed of materials more resistant to erosion are less susceptible to excessive erosion due to hydromodification than channels composed of less resistant materials. Channel material type can vary widely between, as well as within, watersheds. Figure 2-1 **Error! Reference source not found.**a. and b. illustrate stream incision through (a) relatively loosely consolidated, non-cohesive sand and gravels, and (b) relatively cohesive silty-clays. The resistance of bed and bank materials is quantified by their critical shear strengths, (τ_c) that is, the value where entrainment or transport begins.

Typical stream erosion in a southern California stream (granular, non-cohesive
(Photo courtesy of Eric Stein, SCCWRP)

Typical stream erosion in a northern California stream (generally cohesive silty clays)
(Photo cbec, inc.)

Notes:	cbec	*Guidance on the Use of Continuous Simulation Hydrologic Modeling* **Examples of Stream Erosion in Southern and Northern California**		
		Project: 11-1001	Created By: CBB	**Figure 2-1**

Figure 2-1. a. Example of a loosely consolidated, non-cohesive sand and gravel stream bed. b. Example of a relatively cohesive silty-clay stream bed.

Several methods are available for the estimation of critical shear stress, including laboratory studies (e.g., flume studies) and field measurements, with different methods utilized for cohesive materials and non-cohesive materials.

Estimating Critical Shear Stress for Non-Cohesive Materials

The most common method for determining the critical shear stress of a non-cohesive material is through the application of the Shields relationship. This relationship is applicable to the calculation of critical shear stress for a uniform size mixture of sediment with a known particle size and specific gravity. Since it was originally proposed by Shields in 1936, the relationship has been tested and further investigated by several other researchers, resulting in a variety of modifications, primarily through variation of the Shields parameter. The original value of the Shields parameter proposed by Shields was 0.06, however, values from 0.03-0.06 have been suggested, with 0.045 acknowledged as a good approximation. Recent research has demonstrated that a value of 0.03 may be more appropriate for estimating incipient motion in streams with gravel beds (Neill 1968, Parker et al. 2008, Wilcock et al. 2009), where D50 estimates are based upon data collected via pebble count. The decision of what value of Shields parameter is used can have a large influence on the resulting τ_c estimate. For example, if a value of 0.06 is used, it results in twice as large of an estimate of τ_c than if a value of 0.03 is used.

While the Shields relationship was developed for a mixture of uniform sized sediment, it can be applied to a mixture of sediment with varying sizes as long as the distribution is uni-modal and does not have a high standard deviation of grain sizes (Wilcock 1993). In contrast, for sediment mixtures which are bimodal (e.g., if there is a large amount of sand in addition to gravel), a different approach (e.g., Wilcock and Crowe 2003) is recommended. For a more in depth discussion of sediment transport and incipient motion, the reader is referred to Wilcock et al. (2009).

In order to apply the Shields relationship to determine τ_c, the median grain size (d50) present on the channel surface must be determined. River channels are often armored; meaning that coarser material is present on the surface than is present underneath the armor layer. However to access and transport the finer material beneath, the surface layer must first be mobilized. The median grain size is determined by analysis of a particle size distribution.

A particle size distribution can take the form of: 1) a cumulative *frequency* distribution which is determined by way of a pebble count or photographic analysis, or 2) a cumulative *weight* distribution. For a cumulative frequency distribution a subset of particles present on the surface are measured, and the frequency of particles within different size class bins is used. **Error! Reference source not found.** shows a sample particle size distribution graph developed from a pebble count. For a cumulative weight distribution, a bulk sample of the surface material is collected, and then sorted using a set of sieves with different screen sizes. The amount of material retained by each sieve is weighed and then used to plot the cumulative weight distribution. Both approaches have advantages and disadvantages.

A pebble count is a relatively straightforward field technique that is easily applied in streams which are wadable. **Error! Reference source not found.** shows photographs of pebble counts being conducted in the field. They can be performed relatively quickly, which means more samples can be collected to better characterize the conditions present in a reach. However, there are a variety of ways a pebble count can be conducted, and there is tremendous opportunity to introduce bias to the measurement. Furthermore, while studies often cite Wolman (1954) as the method employed in data collection, strict adherence to this protocol is not always achieved. Rather than the method suggested by Wolman (1954), a refined, more regimented approach has been suggested by Bundte and Abt (2001a), and is recommended. In addition, it should be noted that pebble counts generally do a poor job of characterizing sand and smaller sized material. In addition to pebble counts, software can be used to process a digital image of an area of the bed. The software samples a subset of particles present in the image, and using assumptions regarding the amount of given particle that is visible, is able to provide a cumulative frequency distribution.

Collecting a bulk sample for sieve analysis is another method frequently employed to determine values for typical characteristic indices of a particle size distribution. In this method a sample is collected from the channel surface, and then the sample is segregated into various size classes with sieves. One advantage of this approach is that it utilizes all the data available from the sampled area (as opposed to a pebble count which uses a subset of the entire population, e.g., ~100 particles as opposed to thousands), however the sampled area is typically smaller than the area sampled within one pebble count. One disadvantage is the size of sample that is necessary. Because the resulting particle size distribution is based upon weight, the largest particles present can have a very large influence on the resulting particle size distribution. Research has suggested that the weight of the entire sample must exceed 100x the weight of the largest particle present to escape this possible bias. This means large (volume and weight) samples are often required. Some sieving can occur on site through the use of shaker sieves, but typically some portion of the sample is also taken back to the lab for further analysis. Thus, bulk samples typically require more effort and equipment to establish a particle size distribution, however they provide a much more accurate estimate, especially when a large fraction of the sample is sand sized (2mm) and smaller.

For a more in depth discussion of sampling methods to determine particle size distributions in wadable streams, the reader is referred to Bunte and Abt (2001).

Estimating Critical Shear Stress for Cohesive Materials

The methods described above are not appropriate for cohesive materials, which due to chemical cohesion between particles exhibit larger τ_c values than would be estimated by consideration of particle size/weight in isolation (i.e., cohesive properties not considered). One method that allows for the determination of τ_c *in situ* is the application of a jet test (ASTM 2007). The jet-testing apparatus and analytical methods were developed by researchers at the USDA Agricultural Research Station (Hanson and Cook 1999; Hanson et al. 2002; Hanson and Cook 2004; ASTM 2007). The method uses a submerged impinging jet of water directed perpendicularly at the material surface, in order to erode the material. As erosion occurs, a scour hole is created. The depth of this hole is measured periodically as time

progresses through the test. As the scour hole increases in depth, the strength of the jet is reduced because it is travelling longer distance through water from the jet orifice to the soil surface. Eventually, the energy of the jet is dissipated enough that it no longer has energy in excess of the material's shear strength and erosion stops. **Error! Reference source not found.** shows a photograph of a jet testing rig deployed in a stream bank.

In addition to jet testing, *in situ* testing of shear strength can be obtained through the application of a field vane shear test (ASTM 2008). This method provides τ_c values based upon the assumption that the bed or bank will fail via large blocks (composed of thousands of particles), as opposed to erosion occurring particle by particle. As such, the values measured by a shear vane are often several orders of magnitude larger than those obtained via testing with the jet-device.

Estimating Critical Shear Stress Through the Use of Literature Values

An alternative to the measurement/calculation of τ_c, is the use of values found in the literature. Indeed, several HMPs have several HMPs have been developed through assumption of material resistance properties found in the literature based upon literature based upon a textural description of the material. An often-cited reference is Fischenich (2001), which provides a (2001), which provides a summary (compiled from the relevant literature) for critical shear strength values for various values for various materials. An extract from this reference is provided in

Figure 2-5.

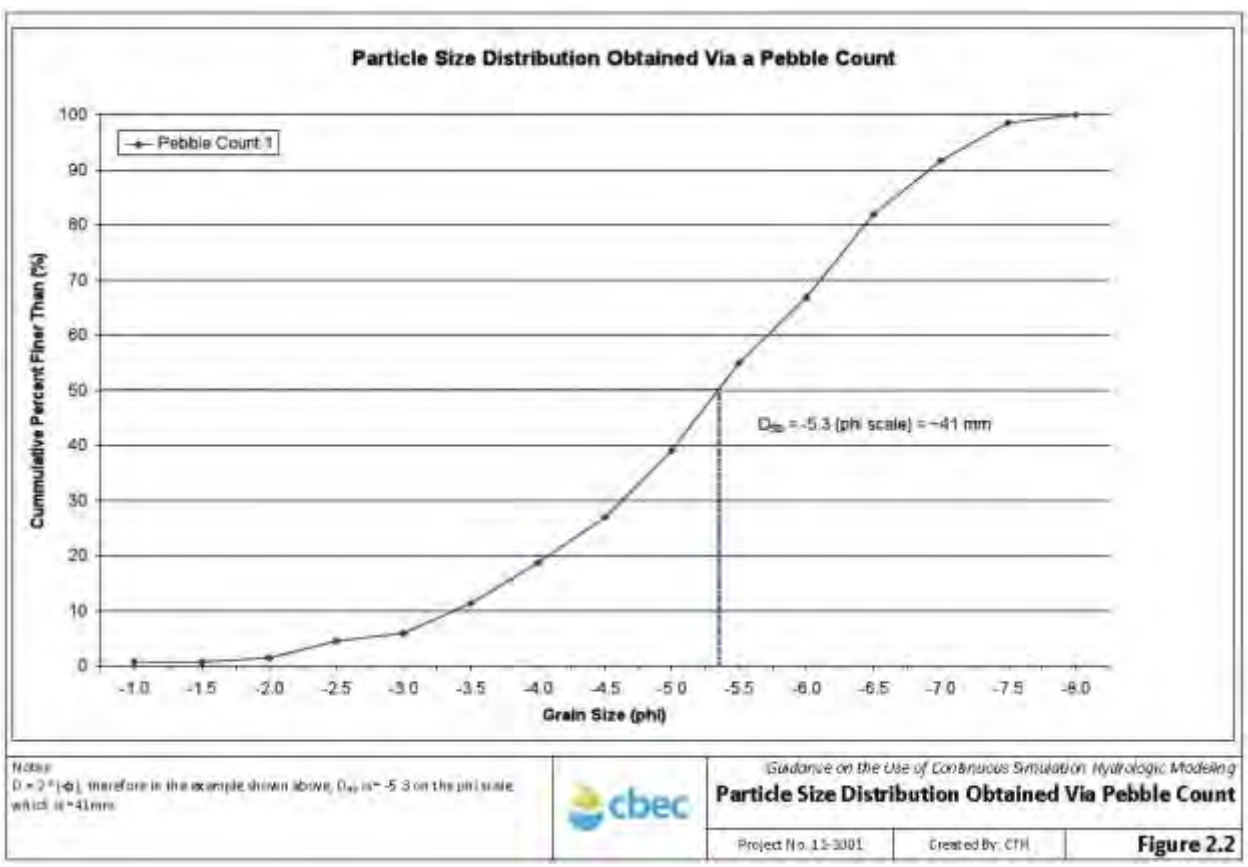

Figure 2-2. Particle Size Distribution Graph Developed from a Pebble Count

Notes:	cbec	*Guidance on the Use of Continuous Simulation Hydrologic Modeling* **Pebble Counts Being Conducted in the Field**		
		Project: 11-1001	Created By: CBB	**Figure 2-3**

Figure 2-3. Pebble Counts Being Conducted in the Field

Typical installation of jet testing equipment in stream bank

Hole created in cohesive bank material by jet impinging on surface

Notes:	cbec	*Guidance on the Use of Continuous Simulation Hydrologic Modeling* **Jet Testing Equipment Deployed in a Stream Bank**		
		Project: 11-1001	Created By: CBB	**Figure 2-4**

Figure 2-4. Jest Testing Equipment Deployed in a Stream

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Table 2. Permissible Shear and Velocity for Selected Lining Materials[1]

Boundary Category	Boundary Type	Permissible Shear Stress (lb/sq ft)	Permissible Velocity (ft/sec)	Citation(s)
Soils	Fine colloidal sand	0.02 - 0.03	1.5	A
	Sandy loam (noncolloidal)	0.03 - 0.04	1.75	A
	Alluvial silt (noncolloidal)	0.045 - 0.05	2	A
	Silty loam (noncolloidal)	0.045 - 0.05	1.75 – 2.25	A
	Firm loam	0.075	2.5	A
	Fine gravels	0.075	2.5	A
	Stiff clay	0.26	3 – 4.5	A, F
	Alluvial silt (colloidal)	0.26	3.75	A
	Graded loam to cobbles	0.38	3.75	A
	Graded silts to cobbles	0.43	4	A
	Shales and hardpan	0.67	6	A
Gravel/Cobble	1-in.	0.33	2.5 – 5	A
	2-in.	0.67	3 – 5	A
	6-in.	2.0	4 – 7.5	A
	12-in.	4.0	5.5 – 12	A
Vegetation	Class A turf	3.7	6 - 8	E, N
	Class B turf	2.1	4 - 7	E, N
	Class C turf	1.0	3.5	E, N
	Long native grasses	1.2 – 1.7	4 - 6	G, H, L, N
	Short native and bunch grass	0.7 - 0.95	3 – 4	G, H, L, N
	Reed plantings	0.1-0.6	N/A	E, N
	Hardwood tree plantings	0.41-2.5	N/A	E, N
Temporary Degradable RECPs	Jute net	0.45	1 – 2.5	E, H, M
	Straw with net	1.5 – 1.65	1 – 3	E, H, M
	Coconut fiber with net	2.25	3 - 4	E, M
	Fiberglass roving	2.00	2.5 - 7	E, H, M
Non-Degradable RECPs	Unvegetated	3.00	5 - 7	E, G, M
	Partially established	4.0-6.0	7.5 – 15	E, G, M
	Fully vegetated	8.00	8 - 21	F, L, M
Riprap	6 – in. d_{50}	2.5	5 – 10	H
	9 – in. d_{50}	3.8	7 – 11	H
	12 – in. d_{50}	5.1	10 – 13	H
	18 – in. d_{50}	7.6	12 – 16	H
	24 – in. d_{50}	10.1	14 – 18	E
Soil Bioengineering	Wattles	0.2 – 1.0	3	C, I, J, N
	Reed fascine	0.6-1.25	5	E
	Coir roll	3 - 5	8	E, M, N
	Vegetated coir mat	4 - 8	9.5	E, M, N
	Live brush mattress (initial)	0.4 – 4.1	4	B, E, I
	Live brush mattress (grown)	3.00-8.2	12	B, C, E, I, N
	Brush layering (initial/grown)	0.4 – 6.25	12	E, I, N
	Live fascine	1.25-3.10	6 – 8	C, E, I, J
	Live willow stakes	2.10-3.10	3 – 10	E, N, O
Hard Surfacing	Gabions	10	14 – 19	D
	Concrete	12.5	>18	H

[1] Ranges of values generally reflect multiple sources of data or different testing conditions

A. Chang, H.H. (1988). F. Julien, P.Y. (1995). K. Sprague, C.J. (1999).
B. Florisith. (1982) G. Kouwen, N., Li, R. M., and Simons, D.B., (1980). L. Temple, D.M. (1980).
C. Gerstgraser, C. (1998) H. Norman, J. N. (1975). M. TXDOT (1999)
D. Goff, K. (1999). I. Schiechtl, H. M. and R. Stern. (1996) N. Data from Author (2001)
E. Gray, D.H., and Sotir, R.B. (1996). J. Schoklitsch, A. (1937) O. USACE (1997)

ERDC TN-EMRRP SR-29 Fischenich, C. 2001. Stability thresholds for stream restoration materials. EMRRP Technical Notes Collection (ERDC TN-EMRRP-SR-29). U.S. Army Engineer Research and Development Center, Vicksburg, MS. 5

Notes:

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Guidance on the Use of Continuous Simulation Hydrologic Modeling

Permissible Shear Strength and Velocity for Selected Lining Materials

Project No:11-1001 | Created By: CBB | **Figure 2-5**

Figure 2-5. Permissible Shear and Velocity for Selected Lining Materials

DETERMINATION OF CRITICAL FLOW (Q_c)

For a specific set of hydraulic conditions at a location (i.e., cross sectional shape, channel slope, bed and bank roughness), the flow rate at which critical shear values are reached can be calculated. These calculations can be made with a programed spreadsheet analysis, or with a hydraulic model (e.g., HEC-RAS, Brunner 2010). Because of their ease of use and the ease at which multiple flow rates can be assessed (in order to determine when τ_c is reached), hydraulic models are typically employed for this part of the analysis. Average boundary shear stress is calculated with the following equation:

$$\tau = \rho g R s$$

where p represents the density of water, g represents the gravitational constant, R represents the hydraulic radius (defined as the wetted area dived by the wetted perimeter), and s represents the slope. For wide channels the value of the hydraulic radius is approximately equal to the average depth of the cross section. The hydraulic model calculates the value for R for a given discharge based on the channel dimensions.

Typically one-dimensional approximations are used for this analysis, which means that the value of Q_c determined is that where the cross sectional average of τ_c is reached, not the highest value which is occurring at the deepest point of the cross section. This is typically considered reasonable because the grain size is determined for the bed of the cross section, not just the shallow or deep area.

Analyses can be conducted at a station, or in other words just looking at one cross section in isolation using normal depth calculations, or within a larger hydraulic model constructed for the entire reach (i.e., multiple distributed cross sections upstream and downstream of the location of interest). The advantage of looking at the cross section of interest within the context of the entire reach is that conditions downstream (e.g. a constriction which causes a backwater condition) may affect the flow depth (or hydraulic radius), yielding different results than would be obtained if the cross-section was analyzed in isolation.

It is important that the determination of τ_c (via pebble count or other means) and the hydraulic calculations to determine Q_c, occur at the same location. Typically the analysis is undertaken at a riffle because these are the high points of a long profile and are what are controlling incision in the system. Bed material characterization in a pool is much more difficult (because of the depth of water), in addition the resulting calculated shear values are typically much higher, because of the added depth.

If HEC-RAS is used (which is typical), the way the bank markers are set can have a dramatic influence on the calculated shear results. The bank markers are used to delineate differences in roughness across the channel and flood plain (typically higher values are used on the lateral margins to include the influence of vegetation roughness in the resulting depth calculations). The shear values calculated by HEC-RAS are segregated by these bank markers, and thus may include values for each of the floodplains as well as the channel. If bank markers are set too wide, and the shear stress calculation may include a portion of the floodplain too, and subsequently the conditions in the actual channel will be greatly underestimated. Remember that the model is essentially using the average depth for the entire cross section (as limited by the bank markers), so including floodplain with shallow depths greatly influences the average depth and thus the resulting calculated shear value.

DETERMINATION OF Q_2

The determination of a value of Q_2 is the third and final piece of the equation used to determine what percent of Q_2 the lower threshold should be. As with the other two pieces, several options are available, and again the decision on what method is used can have a profound influence upon the final results. Q_2 can be determined through the results of a calibrated and validated hydrologic model (e.g., HEC-HMS, HSPF, SWMM, etc.) which uses precipitation, sub basin area, soil conditions, etc. to calculate a runoff hydrograh. This type of model can be used in one of two ways, to simulate a single precipitation event or to simulate a long term (e.g., 50 year) precipitation record. The first approach produces a single runoff hydrograph resulting from a "design" storm, from which the peak magnitude can be determined. As such the results are largely controlled by the precipitation hyetograph, so a good understanding of how that was developed is important. This method has been used considerably less than the approach detailed below. The advantage of this method is that, if any existing model has already been developed (e.g., SacCalc; DFCE 2001), it will be cheaper and easier for an agency to review. However, it can yield different values for Q_2, due to differing assumptions employed in the modeling.

The second method uses a long-term precipitation record for simulation which results in a flow record containing a large number of runoff events of varying magnitudes (i.e., which are subsequently analyzed to determine the magnitude of the 2 year recurrence interval event). This method is more typical for HMP assessments, but again methodical decisions can have a large influence on the results. The rigor of the model calibration and validation has a strong influence. If the model is not representing through simulation what is actually occurring, then the simulation results are questionable.

Assuming the model has been calibrated and satisfactorily validated or verified, the manner in which the simulated runoff record is analyzed is important. The first basic distinction is whether an annual maximum series (AMS) or a partial duration series (PDS) is used. In an AMS analysis, just the single largest flood peak of any given year is used in the analysis, and the second and third largest events of the year are ignored. This is the method typically utilized when analyzing the flood frequency of large, less frequently occurring flood events. In the second approach, PDS, multiple flood events are considered in any given year. This is important when the second or third largest flood events in one year are greater than the annual maximum of another year. Because more large events are included, the resulting estimate of the given return period event (e.g., Q_2) is larger. For example, Langbein (1960) showed that a 1.45 year event determined with PDS is the same magnitude as a 2 year event with an AMS, and a 2 year event determined with PDS is a 2.54 year event with an AMS. Thus the value of Q_2 determined by PDS is larger than the value of Q_2 determined by AMS. While significant differences are apparent for smaller magnitude, more frequently occurring events (e.g., Q_2), for return periods greater than 10 years, there is almost no difference between the results obtained from the AMS and PDS.

When compiling a PDS for a recurrence interval analysis, the manner in which events are identified as independent can also have an effect upon the results. One typical method is to include all flood peaks above a certain base magnitude. This base value is often selected as equal to the lowest annual maximum flood of record, however can also be chosen such that the PDS only contains as many peaks as

there are years of record. Some analysts have established a base value (e.g., 0.002 cfs/acre), and then added a duration below this base value as well (i.e., flow must be below 0.002 cfs/acre for at least 24 hours for events to be considered independent). One additional method is to identify individual events by extracting the highest peak (not just the maximum value) within a moving time window (e.g., 3 days), and therefore determine independence through time, rather than the discharge rate receding to a non-storm condition. With all of these options available, and no prescribed standard, the use of a PDS can have different Q_2 results even if an identical flow time series is used.

SUMMARY

The determination of the lower flow threshold, defined as a percentage of Q_2, is heavily influenced by three primary inputs: τ_c, Q_c, and Q_2. The determination of each of these values is sensitive to a variety of factors determined by the particular methodology. To demonstrate the sensitivity of the lower flow threshold to methodological decisions, a few examples are provided below.

- If 0.06 is used rather than 0.03 for Shields parameter in Shields relationship, τ_c increases, subsequently Q_c increases and ultimately the lower limit increases
- If bank markers are set too wide (including the floodplain and not just the channel) in the hydraulic analysis, a larger value for Q_c is calculated (because of a reduction of the hydraulic radius due to the inclusion of extensive shallow floodplain areas), resulting in an increase of the lower limit.
- If an annual maximum series is used in place of a partial duration series, the calculated Q_2 will be less than that obtained by a PDS analysis, and the ratio of Q_c to Q_2 will be higher if the AMS is used.

3. DEVELOPMENT OF EVALUATION CRITERIA

FLOW DURATION CONTROL AND PEAK FLOW CURVE MATCHING

Flow Duration Control (FDC) and Peak Flow Curve (PFC) matching criteria in their current form for many counties in CA are similar in form to the curve matching criteria from WA (WADOE, 2001). The curve matching criteria typically include a goodness of fit or variance due to the difficulty in achieving a precise match across the range of flows. The criteria are typically applied at the subwatershed scale based on continuous simulation flow results for pre- and post-project conditions to size individual BMP or LID features. In this instance, flow matching at the subwatershed scale assumes that there are no routing or timing effects in the treated runoff when it rejoins the receiving waterbody; however, this may not be true in all cases. For example, if treated runoff is delayed and rejoins the upstream runoff such that there is an increase in flow rates and durations or an increase in the peak flows in the receiving waterbody, then there is the potential to impair the receiving waterbody. To address this potential concern, the FDC and PFC criteria could be applied to the routed flows in the receiving waterbody as a

check.

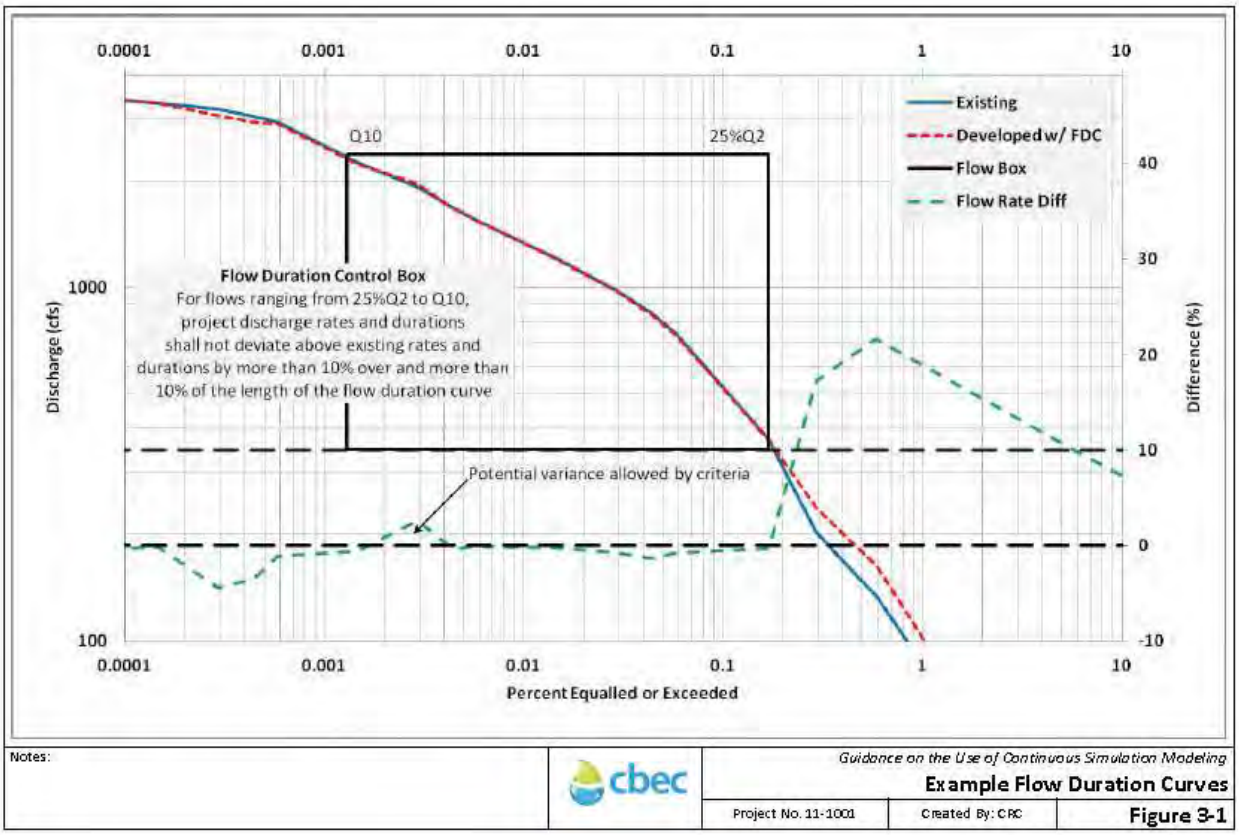

Figure 3-1 shows an example of FDC matching on the routed flows within a receiving waterbody with an example of the variance allowed by the criteria. However, it is cautioned that the FDC variance (e.g., "…by more than 10 percent over and more than 10 percent of the length…") may need to be reduced to something less than 10 percent (perhaps based on a ratio of watershed areas) to account for cumulative effects if there remain the potential for continued development in the watershed.

EROSION POTENTIAL

Erosion Potential (EP) is an index to indicate the impact of increased flows on stream stability and is based on bed mobility and an integration of work (as a function of velocity and excess shear stress in the channel only) over time, expressed as a ratio of post-project work divided by pre-project work in the receiving waterbody. Total work is based on integrating effective stream power as:

$$W = \sum_{i=1}^{n} (\tau_i - \tau_c)^e \cdot V_i \cdot \Delta t_i$$

where W is the total work done (ft-lbf/ft^2), τ is the average channel shear stress, τ_c is the critical shear stress to initiate erosion, e is an exponent varying from 1 to 2.5 to account for the exponential rise in stream power with flow, V is the velocity (ft/sec), and Δt is the numerical time step (sec). The EP index is then calculated as the ratio of W_{dev} / W_{ex} where W_{ex} and W_{dev} is the total work for existing and developed conditions, respectively. EP can be calculated at any location in the waterbody based on

continuous simulation time series of flow, velocity, and excess shear stress in the channel as derived from hydraulic model outputs.

EP criteria are not widely integrated into HMPs. Notably Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP) included EP criteria in their HMP, but in so much as it was used to inform their overall management objective (i.e., post-project runoff shall not exceed estimated pre-project rates and/or durations) and the development of their FDC / PFC criteria. In the SCVURPPP (2005) final HMP, an EP ratio <= 1.0 was recommended as the instream target value to be maintained for stream segments downstream of the point of discharge for HMP management. From a risk management perspective, the chance of a stream becoming unstable at an EP of 1.0 is 9%, meaning that 1 in 11 streams could become unstable even with controls (SCVURPPP, 2005). As such, instream EP must be evaluated considering the effects of the cumulative changes that have or may take place in the watershed.

Even though EP criteria are not widely promoted in county HMPs, that does not preclude analyses based on EP from being used, especially when instream measures permit more robust geomorphic analyses (e.g., SCVURPPP final HMP; SSQP draft HMP). While EP analyses are more time and data intensive, there is the potential outcome to discharge runoff at higher rates and durations than FDC / PFC criteria would allow, thus resulting in possibly smaller onsite measures. The time and data intensiveness of EP analyses stem from the need to evaluate the hydraulic and geomorphic conditions of the receiving waterbody to be protected at multiple locations based on continuous simulation hydraulic model outputs and geomorphic data. Potential hydraulic model considerations when performing EP calculations are addressed below.

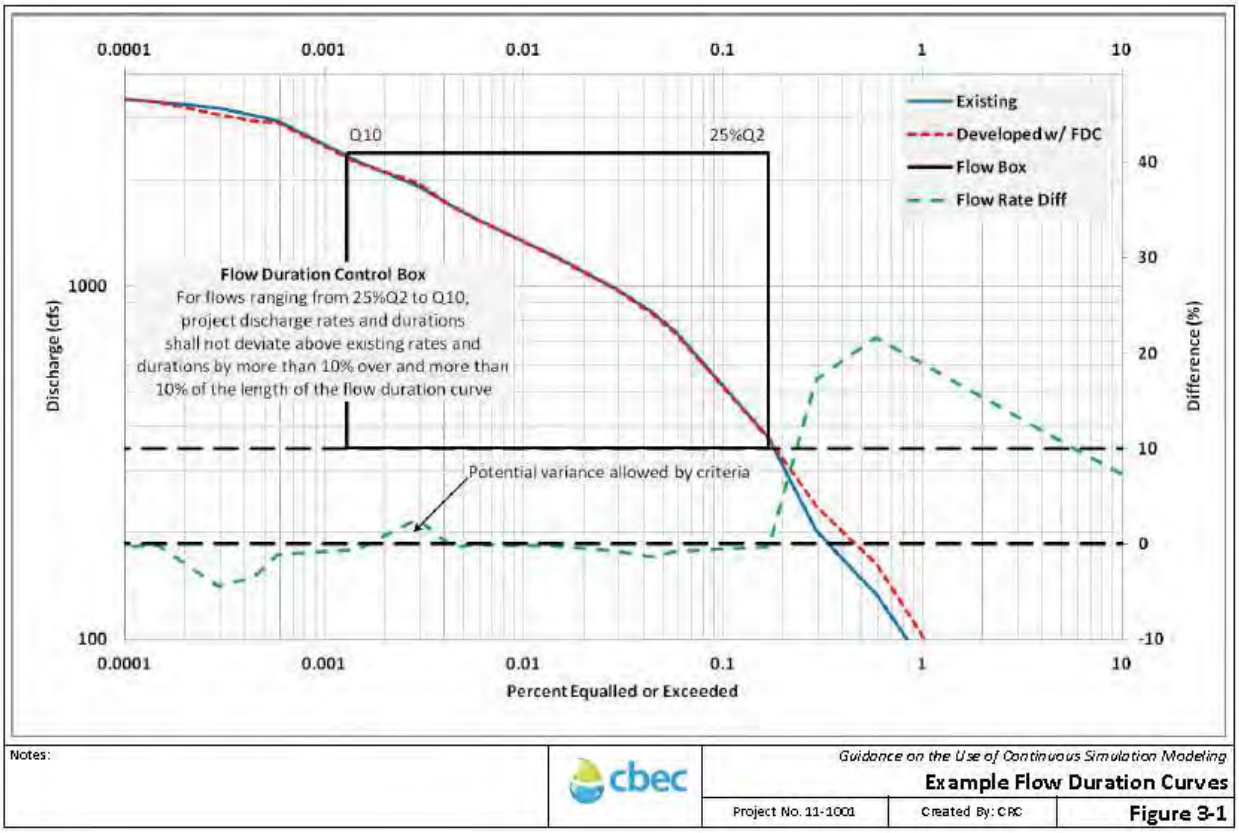

Figure 3-1. Example Flow Duration Curves

4. DATA REQUIREMENTS FOR CSM AND HYDRAULIC ANALYSIS

Hydrologic models capable of performing long-term continuous simulation to support HMPs include, but are not limited to, HSPF, HEC-HMS soil moisture accounting (SMA) method, and other hydrology models, such as the Bay Area Hydrology Model (BAHM). The first two are public domain software models and the third is a proprietary software model customized for specific counties that uses HSPF as its computational engine. A fourth modeling tool based on continuous simulation results, and also using HSPF as its computational engine, are the suite of BMP sizing calculators specifically designed for HMP management for select counties. These have been developed for Contra Costa and San Diego County and Sacramento County (in draft form). All four suites of models use site conditions (i.e., topography, soils, vegetation, and land use) and long-term precipitation data to calculate the various components of the hydrologic cycle (i.e., infiltration, surface runoff, soil moisture, evapotranspiration, percolation, interflow, and groundwater). Specific details about each model and model comparisons (e.g., TetraTech, 2011) are not discussed here, but can be reviewed in available literature.

Following model selection, hydrologic models are created for existing and project conditions based on various considerations, some of which are discussed in subsequent sections. For project conditions, county specific HMP measures need to be specified to manage project runoff to meet the evaluation criteria identified above. The BMP sizing calculators and BAHM-type hydrology models do have optimization routines to size BMP and LID measures. Automatic sizing allows for efficient and quick sizing of such features based on county specific, model specific (e.g., the sizing calculator for San Diego and Contra Costa County is based on pre-defined sizing factors such that site specific continuous simulations do not need to be performed, and is limited to drainage management units of less than 100 acres), and user-defined (e.g., the BAHM-type hydrology models require site specific continuous simulation with a wide selection of measure configurations) assumptions and limitations. As standalone models, HSPF and HEC-HMS offer flexibility as it relates to model configuration, model inputs, and user-defined parameters. However, these models do not have optimization routines to size various BMP and LID measures, thus requiring manual iteration to achieve a satisfactory solution.

PRECIPITATION DATA

Long-term precipitation data in the range of 30 to 50 years is typically needed to generate a sufficiently long flow record from which FDC and PFC analyses and/or subsequent hydraulic analyses can be performed. The precipitation data observation interval should ideally be no coarser than hourly, and if available, can be sub-hourly (e.g., 15 minutes) to coincide with a finer continuous simulation time step.

The precipitation data should ideally be located near the project site, and if needed, scaled to the project site based on a ratio of mean annual precipitation as derived from county specific mapping or regional sources (e.g., PRISM [http://www.prism.oregonstate.edu/]) and reviewed to ensure that it captures key IDF characteristics from county specific mapping or regional sources (e.g., NOAA Atlas 14 [http://www.nws.noaa.gov/oh/hdsc/index.html]). A variety of precipitation data sources exist, and include, but are not limited to:

- ALERT system for individual counties (e.g., Sacramento [http://www.sacflood.org/])
- Western Region Climate Center (WRCC [http://www.wrcc.dri.edu/])
- NOAA National Climatic Data Center (NCDC [http://www.ncdc.noaa.gov/])
- California Irrigation Management Information System (CIMIS [http://wwwcimis.water.ca.gov/])

HYDROLOGIC SIMULATION TIME STEP

The continuous simulation time step and output reporting interval for the four models identified above has traditionally has traditionally been hourly. However, an hourly time step is often significantly larger than the time of concentration for concentration for developed subwatersheds relative to existing subwatersheds, especially those commonly configured commonly configured developed subwatersheds that are limited to less than 100 acres. The sizing calculator and BAHM-type calculator and BAHM-type models are hardwired at hourly, but the public domain software still affords the user to go to a the user to go to a finer time step. As such, a sub-hourly time step and output reporting interval is preferred in order to preferred in order to adequately resolve and sample flow from developed subwatershed elements where time of where time of concentrations are typically less than one hour. As shown by

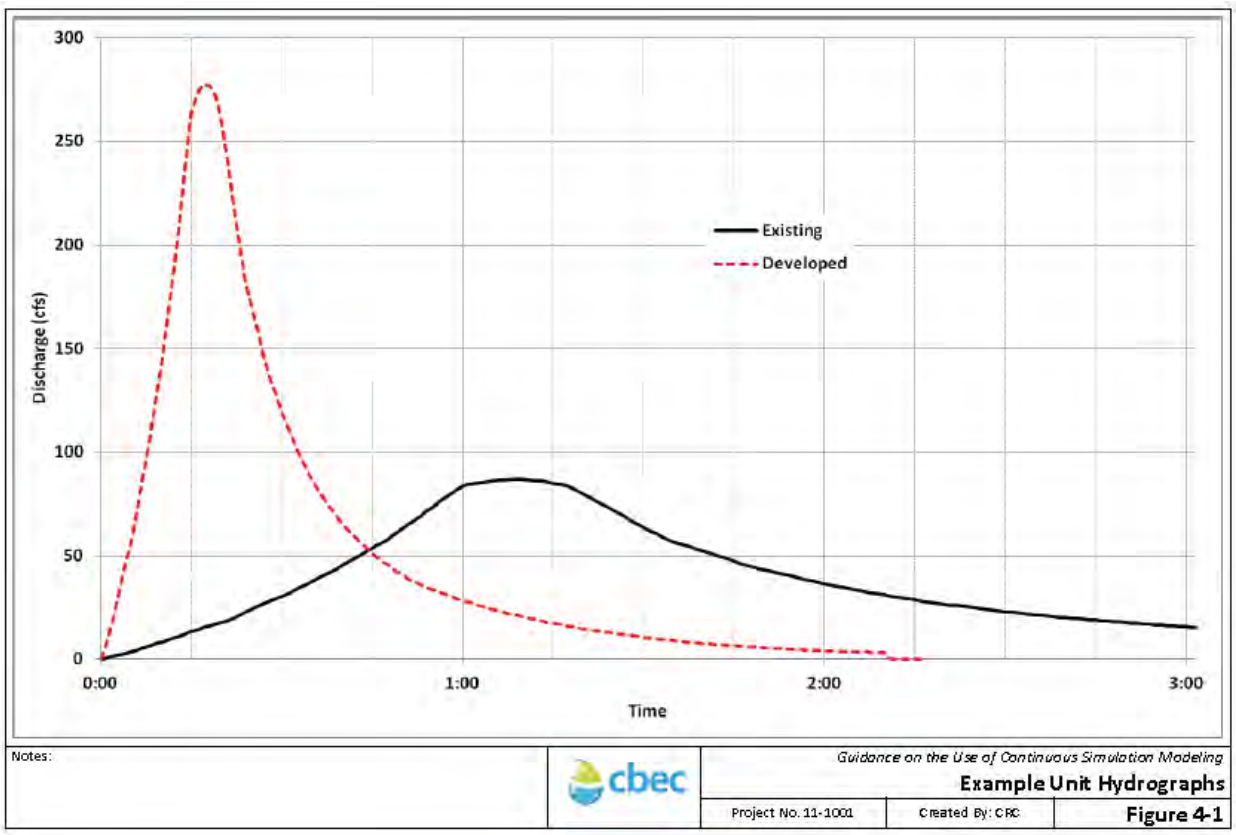

Figure 4-1 for a typical developed subwatershed, the unit hydrograph for developed conditions is flashier, peaks quicker (well within one hour), and the recession limb becomes small quickly. While a sub-hourly time step and output reporting interval may not be desirable due to the volume of model output that will be generated, it is possible to bias the results in favor of the developed condition due to under sampling of the flashier and larger developed flows under an hourly time step.

HYDROLOGIC MODEL CALIBRATION AND VALIDATION

In developing continuous simulation models, the model parameters describing soil characteristics, land use descriptions, and evapotranspiration should be derived from published data (e.g., soil survey, local studies, county standards, etc.). These parameters should be calibrated and validated, where applicable, by comparing modeled flows to measured or observed flows with the receiving waterbody for specific overlapping periods when there is adequate precipitation, evapotranspiration, and flow data. In the absence of site-specific data for calibration and validation, calibrated model parameters from neighboring watersheds within the region could be used so long as proper justification is provided that said parameters are appropriate. However, it is not recommended that local studies rely upon calibrated parameters from other regions where soil characteristics and land use descriptions are markedly different. Rather, when calibration cannot be performed, general review and comparison of continuous simulation model outputs (e.g., hydrograph shape, AMS, etc.) to standardized event-based approaches could be performed to demonstrate that continuous simulation results are generally consistent with local standards and methodologies.

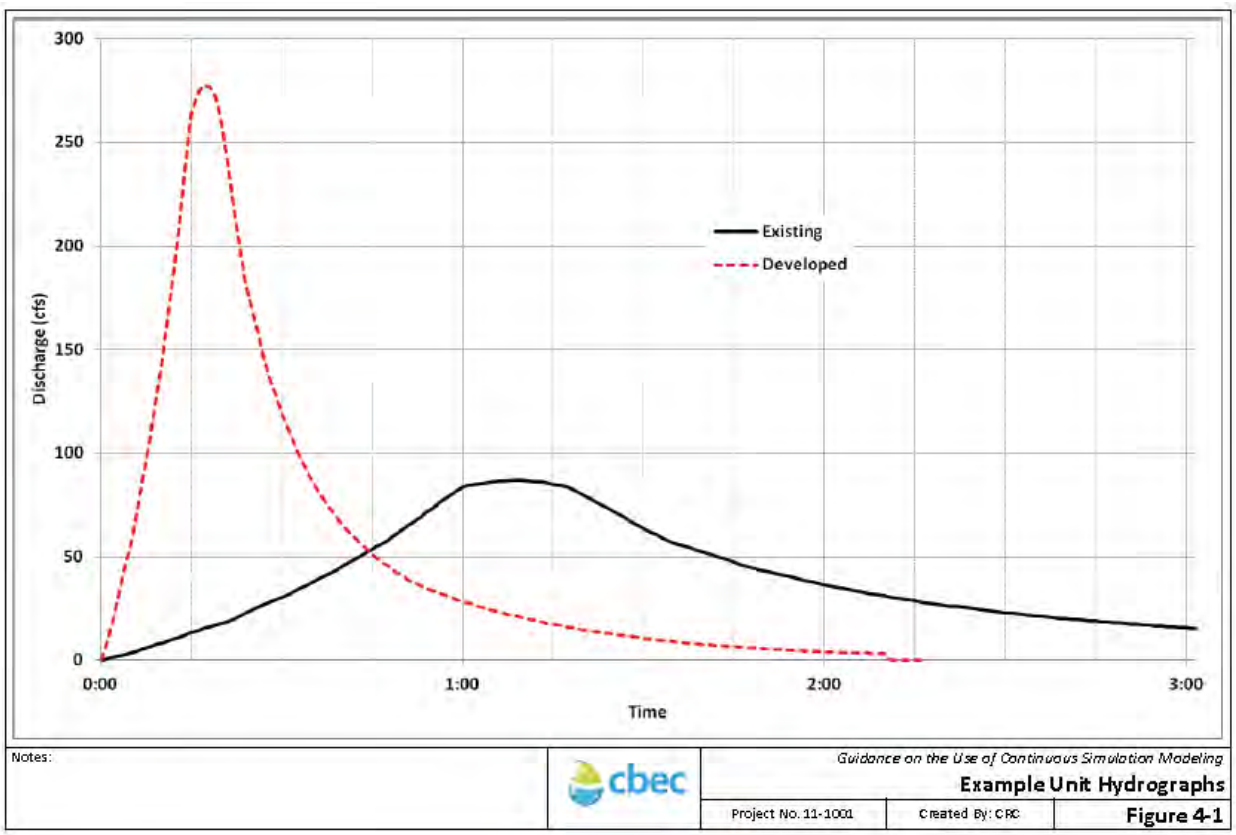

Figure 4-1. Unit Hydrograph Method

For example, continuous simulation modeling in Sacramento County for some developments has relied up conversion of SacCalc (HEC-1 pre- and post-processor) event-based models to the SMA method within HEC-HMS. This conversion often involves retaining the surface infiltration rate determined by SacCalc based on accepted land use descriptions, but parameterizing the subsurface based on soil survey information and local studies, using local potential evapotranspiration data, and reviewing model hydrographs for reasonableness.

HYDRAULIC MODEL CONSIDERATIONS

Sometimes hydraulic models are needed since the basic flow routing within the hydrologic models is not adequate to characterize the potential changes to the hydraulic and geomorphic character of the receiving waterbody, especially when instream measures are suggested or EP is used as the evaluation criteria. Potential considerations and issues encountered when developing and using hydraulic models for continuous simulation include:

1. Low flow instabilities can introduce anomalies into model output (which is commonly encountered in HEC-RAS), so careful hydraulic model selection is important for accuracy and efficiency
2. The sensitivity of the hydraulic model outputs (i.e., velocity and shear stress) to accurate hydraulic description of the receiving waterbody (i.e., cross section geometry (i.e., is it based on LiDAR influenced by vegetation or ground survey), proper definition of channel transitions, proper definition of channel bank markers, appropriate Manning's n-values, etc.)
3. Selection of appropriate compliance points that are representative of the reach and capture flow changes (e.g., downstream of points of discharge and not in backwater areas).

All of these issues have the potential to introduce error and subjectivity into long-term hydraulic analyses and care should be taken to systematically address each source of error.

GENERAL TIPS

A series of general tips are provided as follows. These can be used to increase efficiency and accuracy when performing CSM.

- To shorten the simulation time, the precipitation record can be truncated to only the rainy season (e.g., October through May) by removing the dry summer months from the simulation, especially in ephemeral systems where applicable.
- Hourly precipitation data does not prohibit the continuous simulation model from being run at a sub-hourly time step.
- Subwatershed delineation between existing conditions and developed conditions can often result in relatively large existing subwatersheds compared to relatively small developed subwatersheds. It is commonly known that smaller subwatersheds have flashier flows, so making existing and developed conditions subwatershed sizing consistent is recommended to provide a more meaningful comparison.

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APPENDIX B: APPLICATION OF SUITES OF MODELING AND ASSESSMENT TOOLS

Introduction. This appendix provides a discussion of four example "suites of tools" that can be used to perform predictive scientific assessments and address specific questions related to hydromodification assessment and management. The suites are changeable mixes of mechanistic models, statistical analyses, and expert scientific judgment that incorporate a number of the tools discussed in Chapter 4, combined in various ways. For example, some suites apply a series of cascading models, in which the output from one is used as input to the next; other suites apply a number of models in parallel to develop an assessment based on the weight of evidence. The suites of tools discussed below are used to perform a baseline stability assessment, a channel forming discharge analysis, an erosion potential analysis, and a sediment transport analysis. Most of these standard tools (with the exception of the erosion potential suite) have been widely employed in a variety of stream management activities for decades, and are considered essential components of the broader fluvial geomorphology toolbox. This is far from a comprehensive list of tools, as there are many other important tools (focused on both geomorphic and biologic endpoints) relevant to hydromodification management (Kondolf et al. 2003; Poff et al. 2010); however, the purpose of this appendix is to briefly illustrate how several standard tools can be integrated to answer key questions about stream responses and to provide a stronger technical basis for hydromodification management.

Application of these tools provides basic geomorphic data and knowledge that are typically needed to manage a stream for some desired future state in a watershed with changing land uses. This critical information comes at a cost—the tools require substantially more time and effort to apply than has been the norm in hydromodification management because they involve examining streams within their watershed context with a deeper level of geomorphic analysis. Stormwater management programs typically have made the "practical" assumptions that stream reaches can be managed in isolation from the larger systems of which they are a part, and that effective management prescriptions can be formulated with little or no substantive geomorphic analysis. ***These assumptions are in direct conflict with current understanding in fluvial geomorphology and stream ecology, which indicates that protection of stream integrity is often predicated upon careful assessments of geologic and historical context, performing detailed hydraulic and sedimentation analyses where appropriate, and developing basic understanding of streamflow-ecology linkages***. If hydromodification management policies are to have a reasonable chance of actually achieving their aims, then it will most likely be necessary to reject these simplifying assumptions and instead rely on approaches rooted in current scientific understanding of stream systems.

The suites of tools described below go beyond screening level assessments that are designed, in part, to identify which streams lend themselves to relatively straightforward management prescriptions versus which streams do not. For streams that do not lend themselves to generic management prescriptions, the level of analysis performed with these tools should increase with the level of risk and geomorphic / biologic susceptibility of the streams. This does not mean that every stream will require in-depth analysis by local permitting agencies. It is not possible to carry out sufficient geomorphic analyses with the tools illustrated below on a permit-by-permit basis, and local governments may lack the resources and/or technical capacity to effectively apply these tools. Instead, ***the vital information provided by these tools***

will need to be obtained through proactive regional studies that involve baseline assessments followed by progressively more in-depth analyses as necessary to provide local governments with a sound basis for effective project-by-project decision-making within a broader watershed management framework.

1. **Baseline Stability Assessment**. This suite of tools is designed to answer the following key questions:
   - What is the trajectory of the stream's form over time?
   - How has the channel form responded to changes in water and sediment supply over the years?
   - Is the channel close to a geomorphic threshold that could result in rapid, significant change in response to only minor flow alteration?
   - How can past channel responses provide insight into potential responses to future watershed change, and so aid in prediction of future hydromodification-induced changes?
   - What level of subsequent geomorphic analysis is appropriate given the complexity of the situation and the susceptibility of the streams of interest?

   The goals of a baseline stability assessment are to:
   - Document the historical trends of the system;
   - Establish the present stability status of the system and identify the dominant processes and features within the system;
   - Provide the foundation for projecting future trends with and without proposed project features;
   - Provide critical data for calibration and proper interpretation of models; and
   - Provide a rational basis for identification and design of effective alternatives to meet project goals.

   The key tools that comprise this suite include:
   - GIS mapping of topography, soils, geology, land use/land cover across the contributing watershed (e.g., Thorne 2002)
   - Analysis of hydro-climatic data, e.g. streamflow gauge records, changes in stage-discharge relationships over time (e.g., Thorne 2002)
   - Analysis of aerial photos and historical data (e.g., Thorne 2002)
   - Field reconnaissance (e.g., Thorne 1998)
   - Qualitative response (e.g., Lane 1955b, Schumm 1969, Henderson 1966 relations)
   - Classification systems - (e.g., Thorne 1997; Schumm et al. 1982; and channel evolution model developed for S CA by Hawley et al. in press)
   - Relationships between sediment transport and hydraulic variables
   - Regional hydraulic geometry (e.g., Hawley 2008; Haines in prep)
   - Regional planform and stability predictors (e.g., Hawley et al. in press, Bledsoe et al. in press, Dust and Wohl 2010)

- Bank stability analysis (e.g., BSTEM http://www.ars.usda.gov/Research/docs.htm?docid=5044, Hawley (2009), Bledsoe et al. in press, Osman and Thorne 1988; Thorne et al. 1998)
- Sediment budgets (Booth et al. 2010; Reid and Dunne 1996)
- Fluvial audit (Thorne 2002 – a comprehensive framework for performing baseline assessments)

A baseline assessment is completed by integrating information from all the available data sources and analytical tools. Analysis with each of the individual tools may yield a verdict of aggradation, degradation, or dynamic equilibrium with respect to the channel bed, and stable or unstable with respect to the banks. The individual assessments can produce contradictory results. In this case, one should assign a level of confidence to the various components based on the reliability and availability of the data, and the analyst's own experience level. As is often the case in the management of fluvial systems, there is no "cookbook" answer, and we must always incorporate sound judgment.

A process-based channel evolution model (CEM) is a particularly useful element of the baseline assessment process. A CEM aids in identifying the dominant processes and trends of channel change and provides a framework for subsequent, more detailed modeling (ASCE 2008). In some locations, CEMs have already been developed and calibrated with regional data. For example, the CSU / SCCWRP Screening Tool (Bledsoe et al. 2010) grew out of a regional CEM (Hawley et al. in press) and integrates several baseline assessment tools including regionally-calibrated braiding, incision, and bank stability thresholds, and sediment supply analysis with "Geomorphic Landscape Units" (Booth et al. 2010). In locations where a CEM has not been sufficiently defined, the baseline assessment suite of tools can provide the data and understanding needed to develop a regionally calibrated CEM.

The following are example outputs from a baseline stability assessment, including channel stability and bank stability diagrams associated with key geomorphic thresholds of management concern in the channel evolution sequence (i.e. braiding, incision, and bank failure):

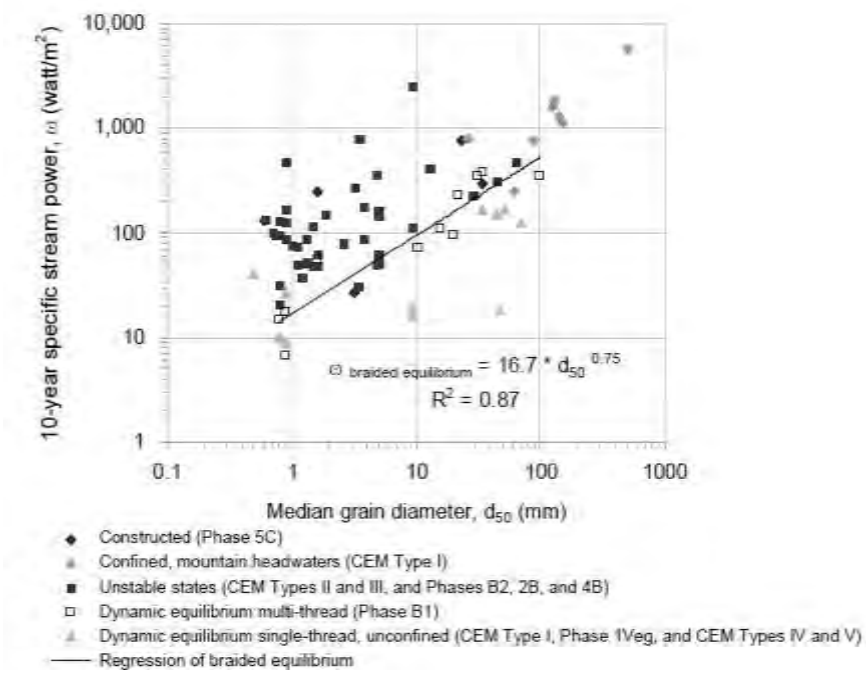

Figure B-1. Stability thresholds for channel types of southern CA, as identified through the development of a regional CEM (Hawley et al., in press).

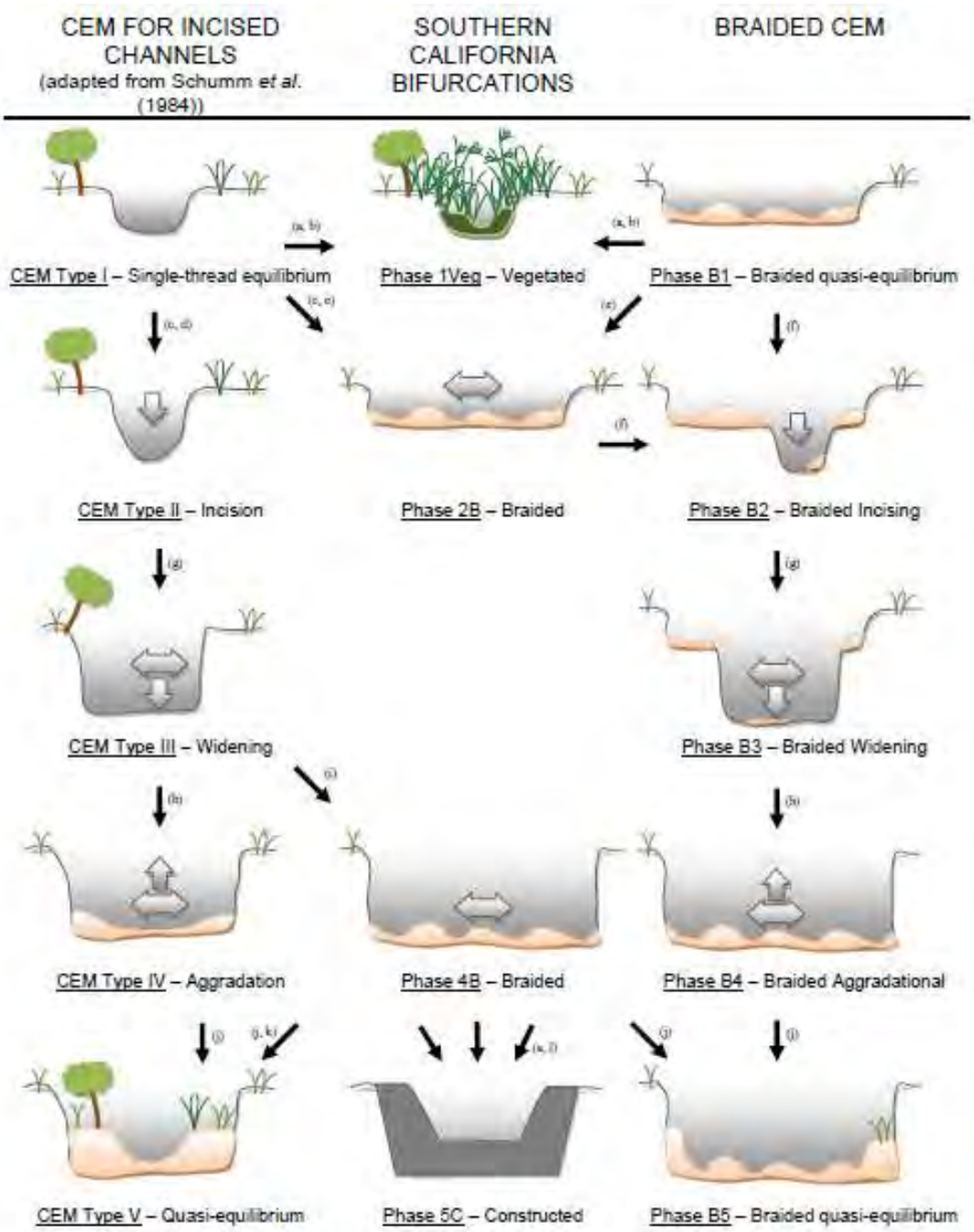

Figure B-2. Channel evolution model of response to hydromodification in southern California (Hawley et al. in press). Red and blue ovals highlight geomorphic thresholds that may be quantified using the baseline assessment suite of tools. By developing a general physical understanding of channel evolution sequences commonly observed in urbanizing watersheds of southern CA, two braiding thresholds and a bank stability threshold of management concern were identified. Channels may shift from single thread to braided planforms if widening is the dominant mode of initial adjustment. Alternatively, single thread channels may become braided after an initial period of incision that triggers geotechnical instability and failure of the banks. Quantitative predictors of these thresholds of braiding, incision, and bank failure can be developed in the baseline assessment process to evaluate the proximity of streams to these critical stages of channel evolution and instability.

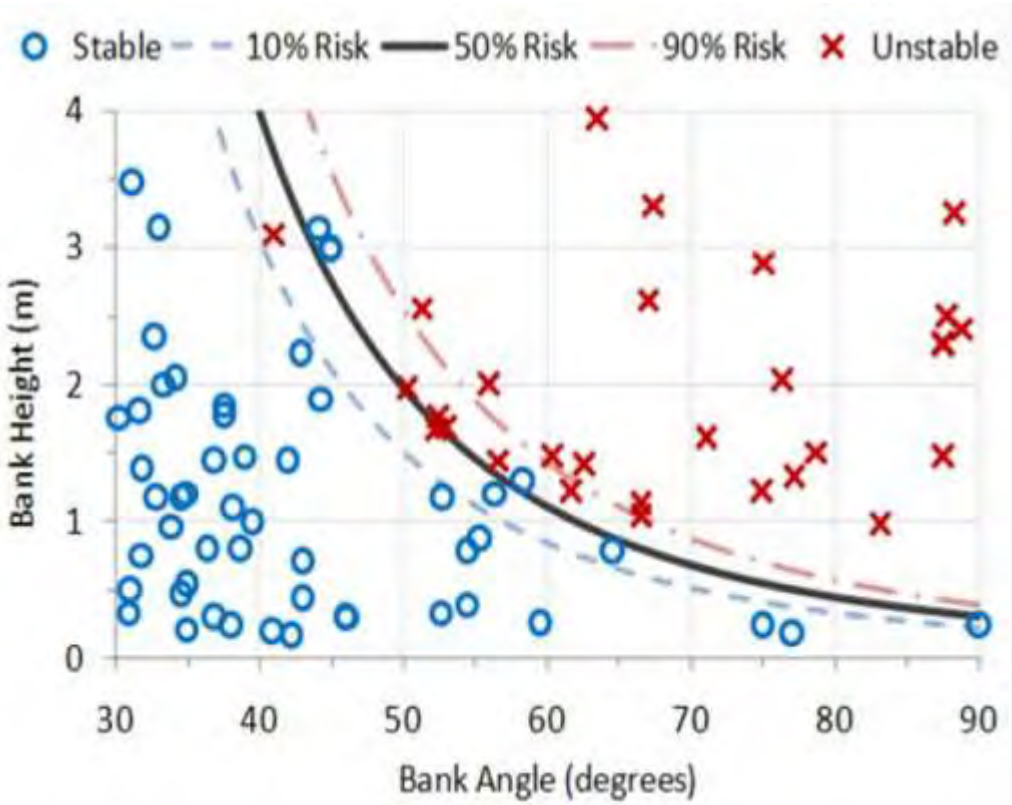

Figure B-3. Bank stability threshold for mass wasting identified through analysis of field data from southern California streams with stable and unstable banks (Bledsoe et al., in press).

2. **Channel-forming discharge suite of tools.** This suite of tools is designed to answer the following key questions:
   - What ranges of discharges are most influential in controlling channel form and processes over decadal time scales?
   - What channel-forming discharge should be used in sediment transport analyses to identify sediment transport capacity, equilibrium slope and geometry, etc.?

   The tools that comprise this suite include the following:
   - Effective discharge computations (e.g., Soar and Thorne 2001; Biedenharn et al. 2000; GeoTools – Bledsoe et al. 2007). An effective discharge analysis directly quantifies the range of discharges that transport the largest portion of the annual sediment yield over a period of many years.
   - Field identification of high water elevations, depositional surfaces, and "bankfull" features
   - Flood frequency analysis
   - Un-gauged site analysis (e.g. USGS StreamStats) http://water.usgs.gov/osw/streamstats/california.html; Hawley and Bledsoe (2011), regional flow duration curve extrapolation – Biedenharn et al. 2000)

This suite incorporates a number of parallel analyses that can be used to establish likely upper and lower bounds to the range of influential discharges, and that can be assessed through a weight-of-evidence evaluation. The following is an example output from the channel forming discharge suite of tools:

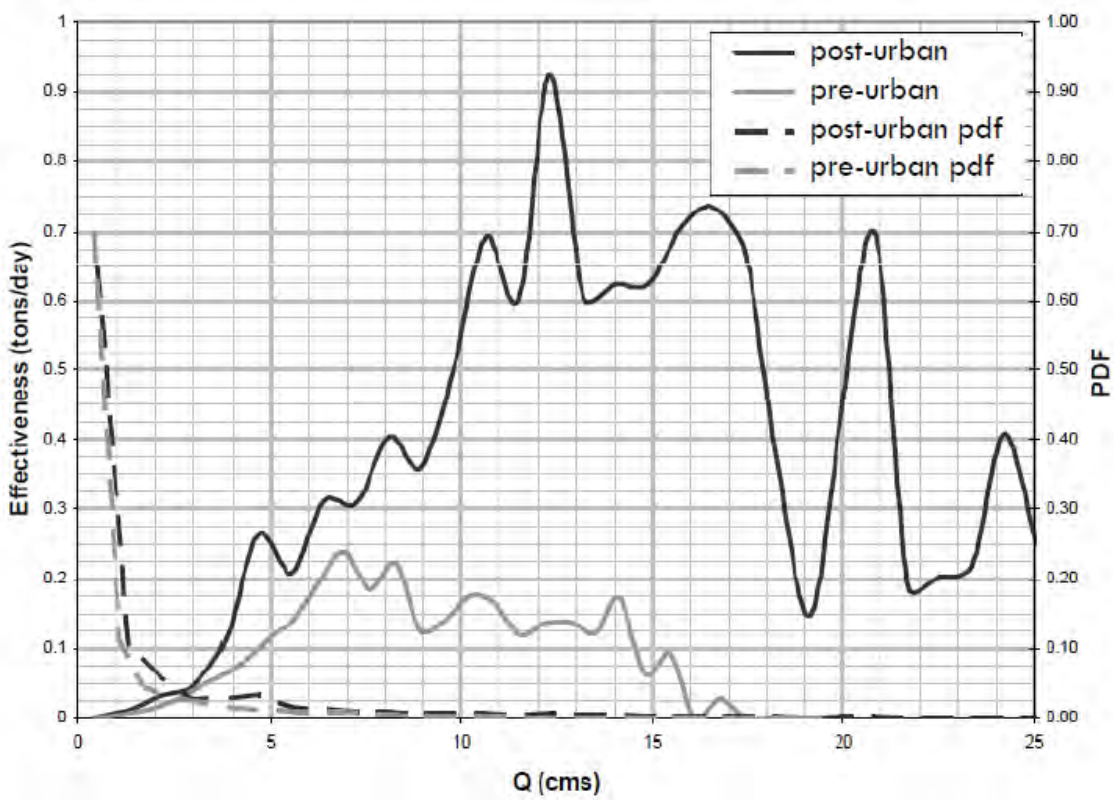

Figure B-4. Flow effectiveness curves for continuous series of pre-urban and post-urban discharges (Biedenharn et al. 2000; Bledsoe et al. 2007). Cumulative sediment yield is approximated by the area under the respective curves. If the stream bed is the most erodible channel boundary, the ratio of areas under these curves would be the erosion potential metric described below in the next suite of tools.

3. **Erosion potential suite of tools.** This suite of tools is designed to answer the following key questions:
   - How do proposed land-use changes or channel alteration affect the capacity of a channel to transport the *most erodible material in its boundary* over a period of many years (erosion potential – Ep)?
   - Do proposed mitigation approaches match the pre- vs. post- development erosion potential over the full spectrum of erosive flows?
   - Do past changes in erosion potential correspond to different states of channel stability and degradation in this region?
   - Does a proposed change in streamflow make it more likely that a channel will enter an alternative / degraded state?

The underlying premise of the erosion potential approach advances the concept of flow duration control (discussed in Chapters 2 and 3) by addressing in-stream processes related to sediment transport. An erosion potential calculation combines flow parameters with stream geometry to assess long term (decadal) changes in the sediment transport capacity. The cumulative distribution of shear stress, specific stream power and sediment transport capacity across the entire range of relevant flows can be calculated and expressed using an erosion potential metric, Ep (e.g., Bledsoe, 2002). This erosion potential metric is a simple ratio of post- vs. pre-development sediment transport capacity over a period of many years. The calculated capacity to transport sediment can be based on the channel bed material or the bank material, depending on which one is more erodible.

This Ep suite of tools has been applied in two primary ways:

a) At a project-level analysis, it has been applied to answer the first two questions above. A municipal stormwater permit may require a project design to achieve an erosion potential (Ep) value of 1.0. This means that a project must be designed so that the long-term erosion potential of the site's stormwater discharge is equal to the erosion potential of the pre-development condition. Section 3.1 below explains the process by which this analysis is conducted.
b) At a regional level, this suite of tools can be applied to answer the third and fourth questions above and to provide further guidance to project-level assessments. For example, practical engineering considerations generally require that a tolerance be permitted around a target design value. It is unlikely that a project design can match an Ep target of 1.0 across all conditions and through all stream reaches, due to variations in a multitude of contributing factors. The selection of an acceptable tolerance or variance from 1.0 is a management decision that should be informed by regional data presented in a risk-based format. Section 3.2 below explains how such a study has been conducted, using the Santa Clara Valley example from northern California.

3.1. *Project-Level Analysis.* As applied to the analysis of project impacts and mitigation design, the steps and associated tools that comprise this suite include the following (Figure B-5):

- Perform continuous simulation of hydrology (e.g. SWMM, HEC-HMS, HSPF) for the project site, for both pre-project condition and post-project condition with the proposed mitigation design.
- Convert discharges and field surveys to hydraulic parameters (shear stress and specific stream power) – e.g., for uniform flow analysis use Manning's equation, GeoTools; for varied flow analysis use HEC-RAS
- Convert hydraulic parameters into sediment transport capacity – e.g., at-a-station hydraulic geometry, HEC-RAS, GeoTools, sediment transport relationships (bedload and total load)
- Integrate Ep over time – e.g., GeoTools

- Compare Ep values for pre-development and post development to determine if the proposed mitigation design is adequate. Adjust stormwater controls as necessary to meet target Ep.

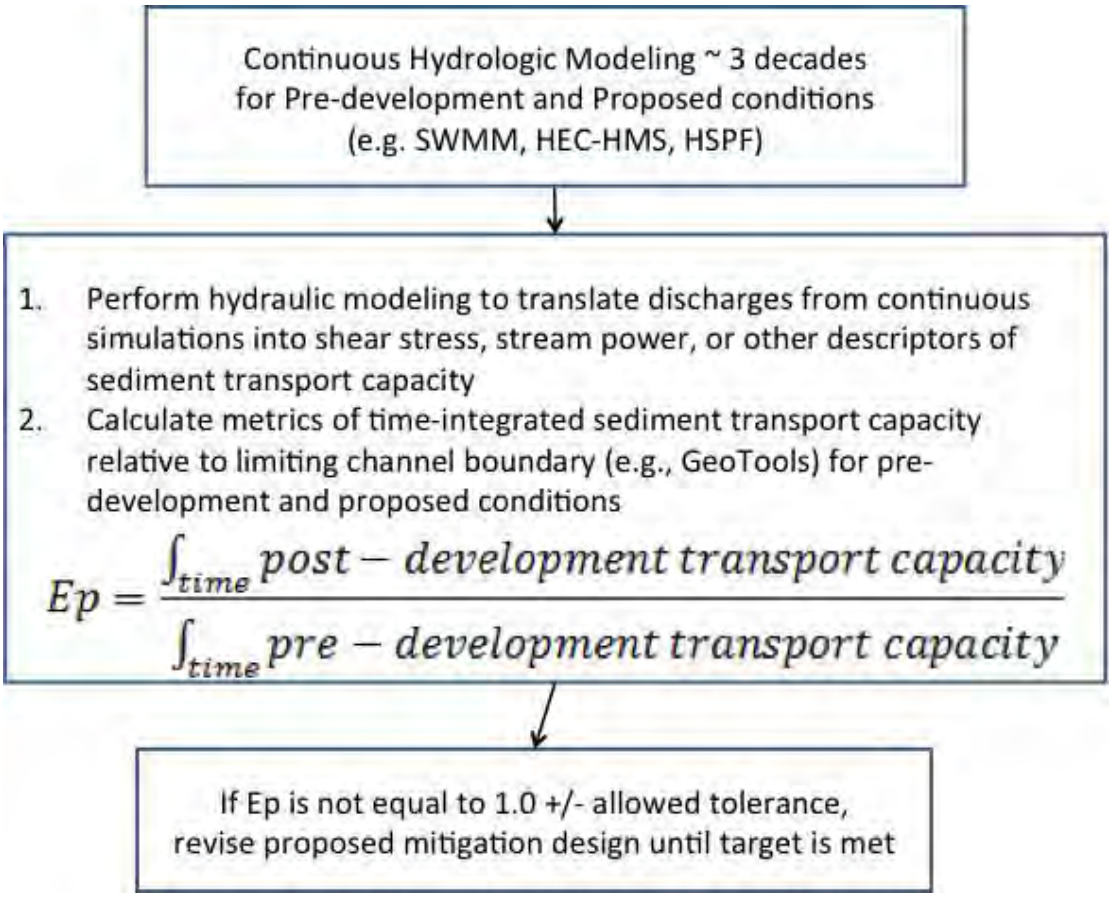

Figure B-5: Steps involved in a project-level Erosion Potential analysis

3.2. *Risk-Based Regional Analysis*. Risk-based modeling estimates the probability of stream geomorphic states. Decision-makers can then choose acceptable risk levels based on an explicit estimate of prediction error. The foundation of risk-based modeling in the context of hydromodification management is the integration of hydrologic and geomorphic data derived from the output of continuous hydrologic simulation models to generate metrics describing expected departures in the most important stream processes. These physical metrics are provided as inputs to probabilistic models that estimate the risk of streams shifting to some undesirable state. Because the decision endpoint is often categorical (e.g., stable, good habitat) the statistical tools of choice

are often logistic regression, classification and regression trees (CART), and/or Bayesian probability networks.

The steps below are used to develop a risk-based framework (Fig. B-6) for assessing how hydromodification may impact streams within a region, and for understanding the relationships between deviation from an Ep of 1.0 and the likelihood of channel instability. Illustrating figures are taken from a risk-based approach was used in the development of the Santa Clara Valley Urban Runoff Program Hydromodification Management Plan (www.SCVURPPP.org). This study demonstrated that a time-integrated index of erosion potential based on continuous hydrologic simulation and an assessment of stream power relative to the erodibility of channel boundary materials could be used to distinguish between channels of a particular regional type that are stable vs. degraded by hydromodification in urban watersheds.

- Perform project-level analysis as described in section 3.1 above for existing developments throughout the study watersheds.
- Perform stream surveys throughout the study watersheds to characterize condition (i.e., stable, unstable)
- Create statistical relationships between Ep and different channel states – e.g., logistic regression in R, SAS, Statistica, Minitab, etc. Note that standard regression techniques are applied when the dependent variable and the explanatory variables are quantitative and continuous. To analyze a binary qualitative variable (e.g., 0 or 1, stable or unstable, healthy or degraded) as a function of a number of explanatory variables, alternative techniques must be used. The regression problem may be revised so that, rather than predicting a binary variable, the regression model predicts a continuous probability of the binary variable that stays within 0–1 bounds. One of the most common regression models that accomplishes this is the logit or logistic regression model (Menard, 1995; Christensen, 1997).

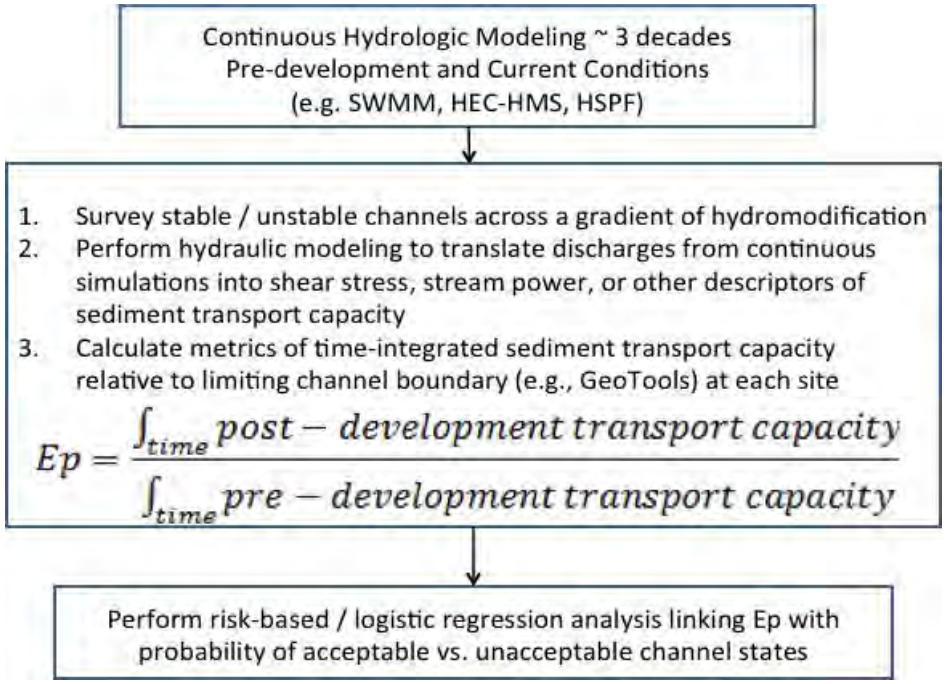

Figure B-6: Steps involved in a Risk-Based Erosion Potential analysis

The variables included in risk-based models of stream response are not limited to erosion potential. Additional multi-scale controls could be included. For example, simple categories of physical habitat condition and ecological integrity could be predicted by augmenting erosion potential metrics with descriptors of the condition of channel banks and riparian zones, geologic influences, floodplain connectedness, hydrologic metrics describing flashiness, proximity to known thresholds of planform change, and BMP types. Furthermore, although most of the emphasis to date has been on predicting geomorphic endpoints, the risk-based approach can be extended to the prediction of biological states in urban streams if the necessary data are available.

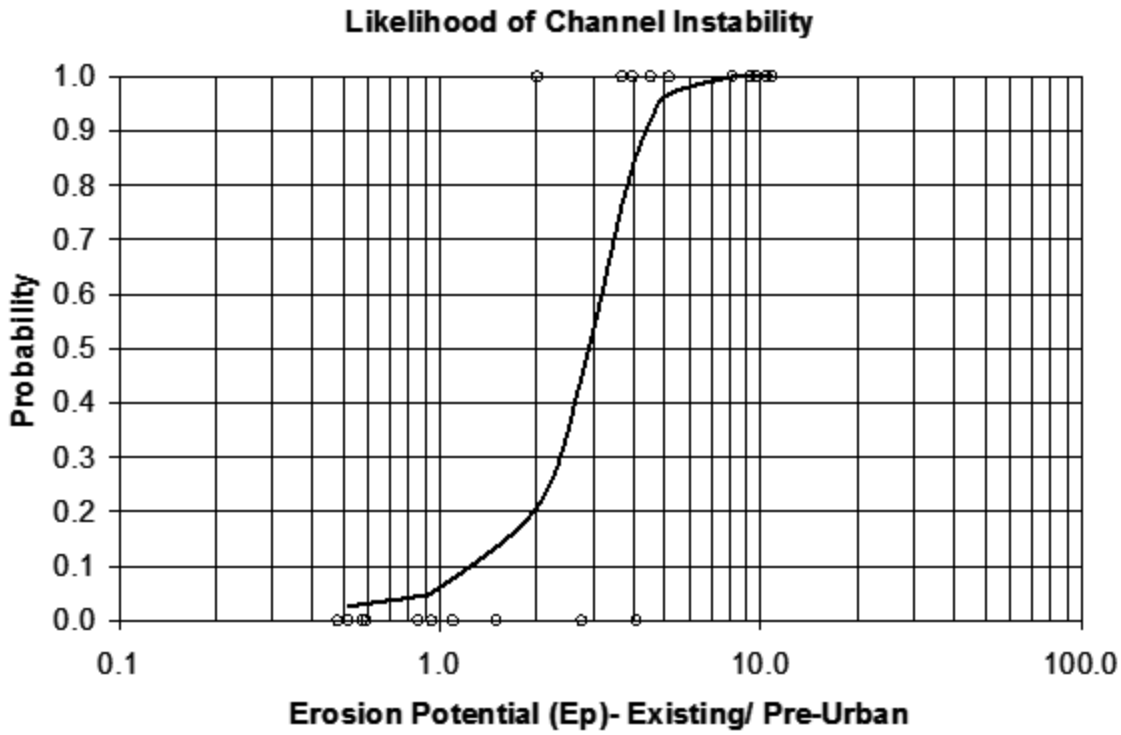

Figure B-7: Example of a logistic regression analysis of stable vs. unstable channels (Bledsoe and Watson, 2001; Bledsoe et al., 2007). The vertical axis represents the probability of stream instability which increases rapidly for channels with sediment transport capacity increased by urban hydromodification (Ep > 1).

3.3. *Strengths and Limitations.* The Erosion Potential approach combines a sound physical basis with probabilistic outputs and requires a substantial modeling effort. Such an effort is necessary to adequately characterize the effects of hydromodification on the stability of streams that are not armored with very coarse material such as large cobbles and boulders. Although policies based on this approach should reduce impacts to channel morphology, they may still fail to protect stream functions and biota. Key simplifying assumptions and prediction uncertainty in the inputs (hydrologic modeling, assumptions of static channel geometry in developing long term series of shear stresses or stream powers, assumptions of stationarity in sediment supply, etc.) have not been rigorously addressed. Its effectiveness also depends on careful stratification of streams in a region such that fundamentally different stream types are not lumped together (e.g. labile sand channels vs. armored threshold channels with grade control) in developing general relationships for instability risk. Endpoints to date have been rather coarse, e.g. stable vs. unstable; as such, they do not provide sufficient resolution for envisioning future stream states. However, the Erosion Potential approach provides

promise as an important tool for hydromodification management; it is recommended that it be refined to address sediment supply changes and to provide more finely resolved endpoints for improved predictive capabilities.

4. **Sediment transport analysis suite of tools.** This suite of tools is designed to answer the following questions:
   - Do I need to incorporate sediment transport analysis in predicting channel response to hydromodification, i.e. what is the sensitivity of channel slope and geometry to inflowing sediment load?
   - At what discharges are different fractions of bed material mobilized in a particular stream segment?
   - What is inflowing sediment load to a stream segment, i.e. what is the water discharge Q(t) and sediment supply rate Qs(t) and grain size D(t) delivered to the upstream end of the channel segment of interest?
   - How will the available flow move the supplied sediment through the segment of interest?
   - What is the new equilibrium slope given some change in streamflow, and how much incision would be necessary to achieve this new slope?
   - What is the sediment transport capacity of the segment of interest *relative to* the inflowing sediment load from *upstream* supply reaches?
   - What is the sediment transport capacity of the segment of interest *relative to* the capacity of *downstream* reaches?
   - At the network scale, where are zones of low vs. high energy, aggradation vs. degradation potential, and coarse sediment constriction located?

   The primary tools that comprise this suite include the following:
   - Tools for estimating watershed sediment supply (Reid and Dunne 1996), including the RUSLE (Renard et al. 1997; http://www.ars.usda.gov/Research/docs.htm?docid=5971) and WEPP (Laflin et al. 1991; http://www.ars.usda.gov/Research/docs.htm?docid=10621) models.
   - Effective discharge analysis (see above)
   - Incipient motion analysis (tractive force, e.g. ASCE 2008; Brown and Caldwell 2011; Buffington and Montgomery 1998; Lane 1955a)
   - Sediment continuity analysis at single dominant discharge with an appropriate sediment transport relation – e.g., HEC-RAS, Bedload Assessment for Gravel-bed Streams (BAGS -Pitlick et al. 2009; GeoTools)
   - Equilibrium slope / geometry analysis e.g., HEC-RAS – Copeland et al. 2001, iSURF-NCED 2011)
   - Sensitivity to inflowing sediment load analysis e.g., Copeland's method in HEC-RAS, iSURF-NCED 2011)
   - Sediment continuity analysis over the entire flow frequency distribution e.g., Capacity-Supply Ratio of Soar and Thorne (2001), BAGS, GeoTools

- Network scale sediment balance – Sediment Impact Analysis Methods (SIAM) module in HEC-RAS

Movable bed / mobile boundary models also provide a mechanistic tool for estimating the trend and magnitude of changes in channel geometry due to hydromodification. However, a recent study evaluated the potential applicability of various movable bed and/or boundary models to streams in southern CA (Dust 2009), including HEC-RAS, CONCEPTS (Langendoen, 2000), and FLUVIAL 12 (Chang, 2006). The results of tests performed on urban streams in southern CA indicate that these models are difficult to apply and have high prediction uncertainty due to flows near critical, split flow conditions, and lack of fidelity to complex widening, bank failure, and armoring processes.

The following figures depict example outputs from an application of the sediment-transport suite of tools:

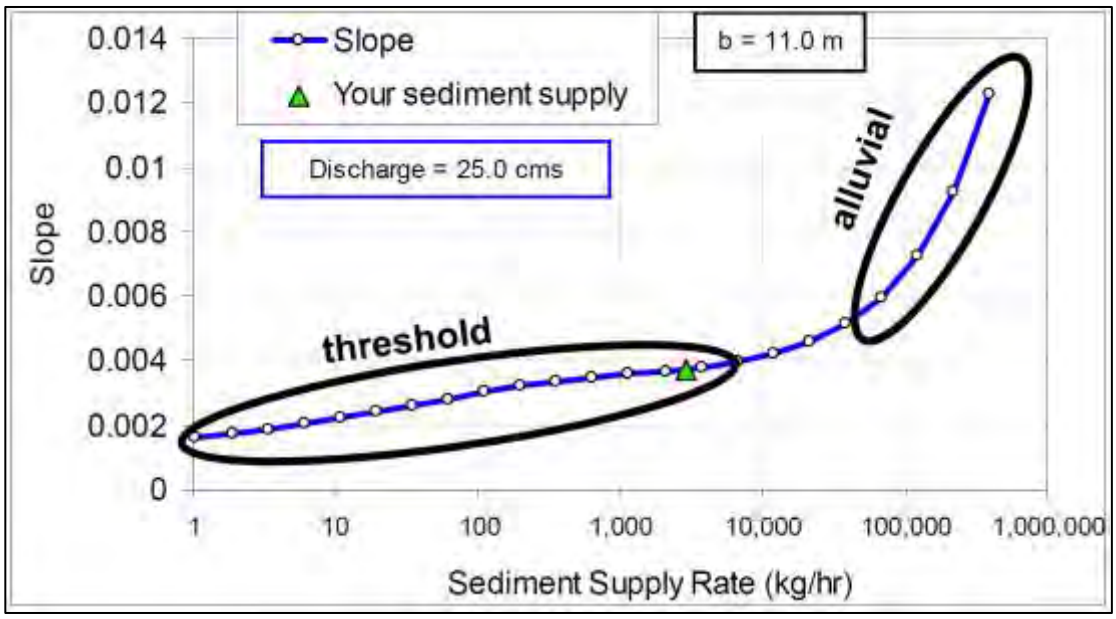

Figure B-8. Sensitivity analysis of equilibrium channel slope to inflowing sediment load (from iSURF, NCED 2011). Slopes of alluvial channels with high sediment supply are much more sensitive than threshold channels with relatively low sediment supply. Channels with beds composed of sand and fine gravels are generally much more geomorphically sensitive to hydromodification than threshold channels in which coarse bed sediments are primarily transported at relatively high flows.

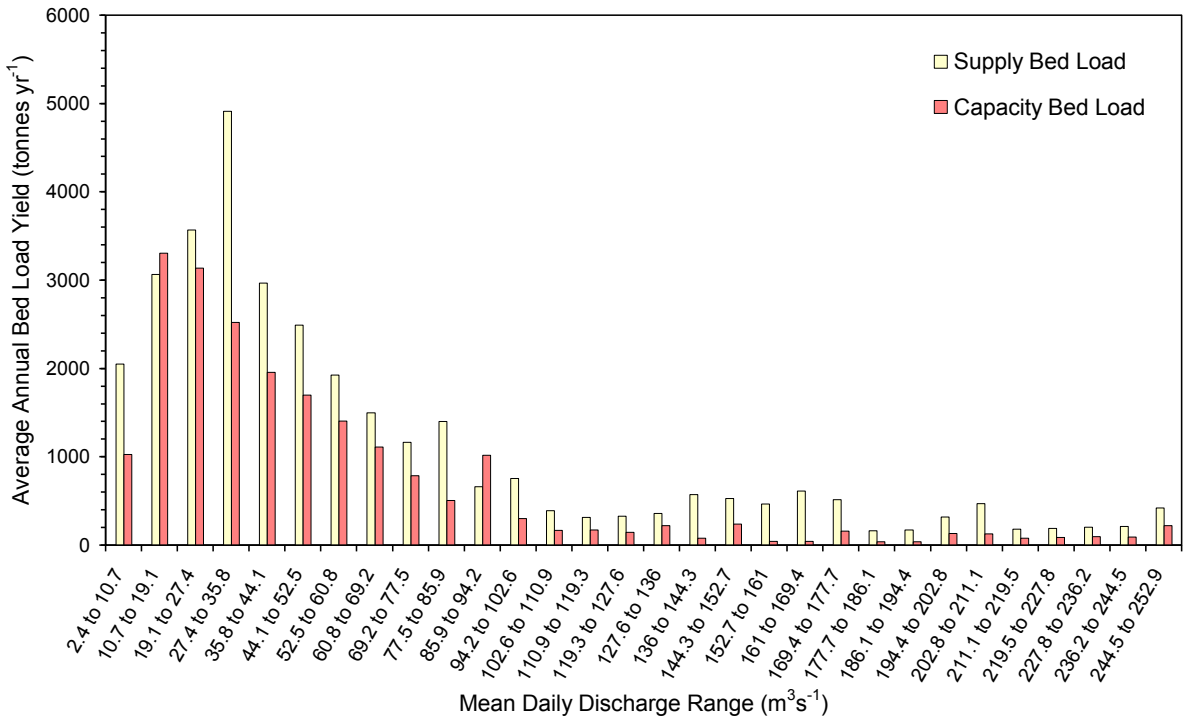

Figure B-9. Analysis of sediment transport capacity vs. inflowing sediment load over the full spectrum of stream discharges (capacity-supply ratio; Soar and Thorne 2001). In this case, the time-integrated capacity to transport bedload is 64% of the supplied bedload and significant aggradation is expected.

5. **Relationship to Management Framework**. These suites of tools could be applied to establish project-specific requirements for hydromodification assessment and mitigation, as recommended in the Management Framework presented in Chapter 3. In the example shown in the diagram below, results of the Baseline Assessment are used as a screening tool to assign high, moderate or low risk levels for stream reaches, in conjunction with the proposed land-use changes. Thus, the Baseline Assessment suite of tools is crucial in determining whether a detailed survey-level assessment and additional suites of tools are necessary for an adequate analysis. The need to apply additional suites of tools in formulating a management approach is commensurate with the level of risk and susceptibility of the stream. More complex and rigorous analysis with multiple suites of tools is necessary in predictive assessments for relatively susceptible stream types such as alluvial channels with sand beds.

   Although a stream may have relatively low susceptibility for overall geomorphic change, it may nevertheless have ecological attributes that are highly susceptible to hydromodification. Thus, suites of tools focused on both geomorphic and biological endpoints must be used to fully assess stream susceptibility to hydromodification. More work will be required to develop tools for prediction of biological response to flow alterations throughout California, as noted in Chapter 3 (see Poff et al., 2010 and http://conserveonline.org/workspaces/eloha).

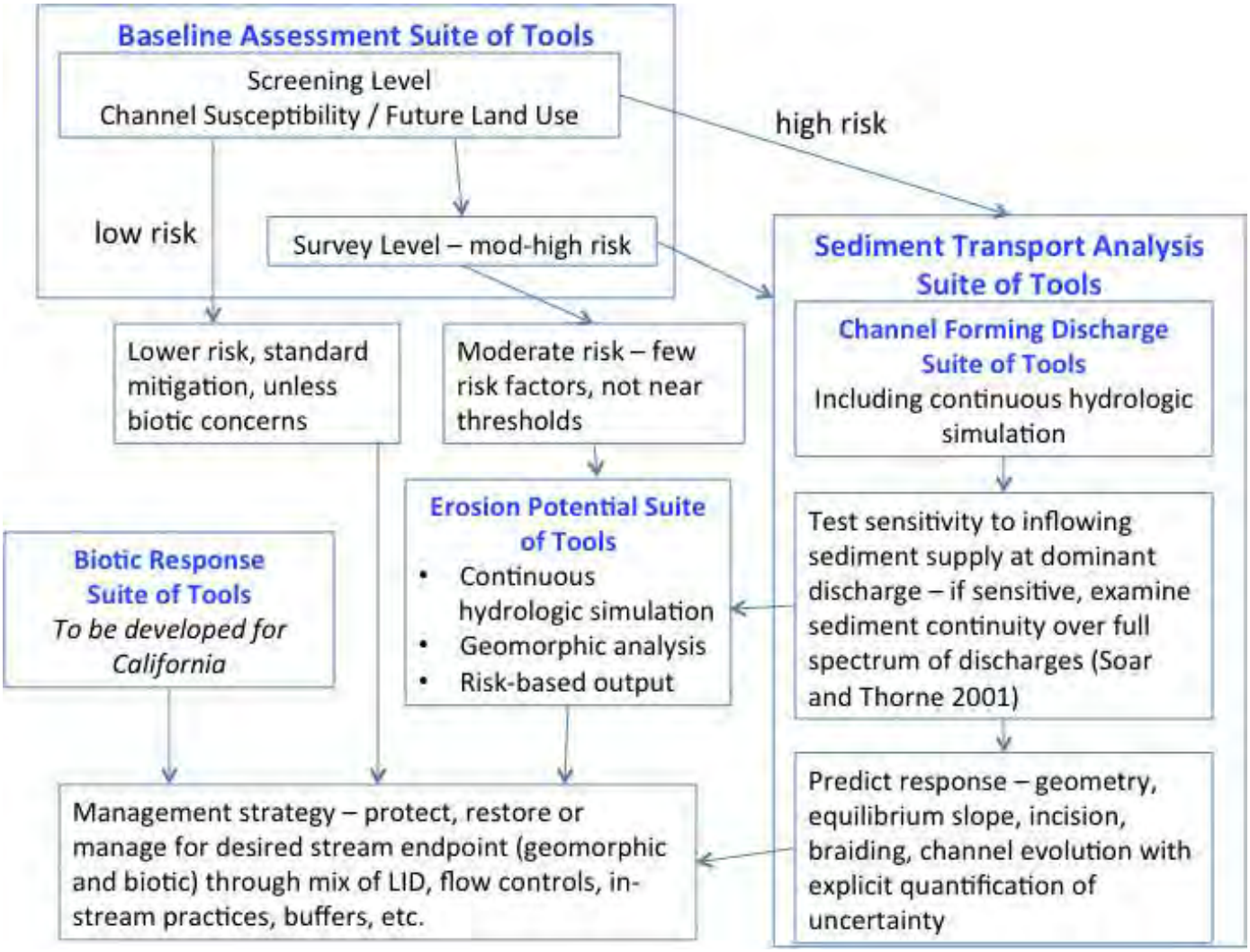

Figure B-10. Conceptual diagram showing relationships among the four suites of existing tools and biotic response tools to be developed in the future. Additional analyses will be required for engineering design.

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APPENDIX C: ADAPTIVE MANAGEMENT

WHAT IS ADAPTIVE MANAGEMENT

Adaptive management is a formalized approach for overcoming the inescapable difficulty in predicting ecological outcomes resulting from natural-resource management actions. It accomplishes this by treating all "management actions" (whether intentional or not) as experimental components within the larger structure of a monitoring program (Holling 1978, Walters 1986, Lee 1999, Ralph and Poole 2003). In other words, specific management actions that may affect ecological processes and functions are systematically evaluated, via "monitoring," to provide the data to affirm or refute the expected outcomes. To the extent that the monitoring results indicate a need to revise the scientific understanding or the management actions built on that understanding, establishing the mechanism to change management actions is a precursor, not an afterthought, of the monitoring program.

Adaptive Management was first articulated over 30 years ago (Holling, 1978) and more recently embraced through various conservation efforts worldwide. Fundamental to this approach is the integration of management and monitoring, recognizing that any management action in the context of a complex ecological system is ultimately experimental, requiring feedback to make progress.

The process of adaptive implementation is iterative and continuous; new knowledge is actively incorporated into revised experiments, a practice best described as "learning while doing" (Lee 1999). The key difference between this approach and other commonly implemented environmental management strategies is the application of scientific principles, such as hypotheses-testing,[is used] to explicitly define the relationships between policy decisions, management actions, and their measured ecological outcomes. Furthermore, this approach provides a means to understand and document these cause-and-effect relationships; it can also point to alternative actions that may produce more desirable outcomes. Uncertainty is embraced and serves as a focal point for defining ever-more specific evaluations.

Scientifically credible and relevant information can only be generated when the management "experiments" are designed with clear hypotheses about the effects of proposed actions or prescriptions. These hypotheses must be testable at multiple scales using available technology and methods (Conquest and Ralph 1998; Currens *et al*. 2000). Hypotheses that cannot be tested, are trivial (e.g., "water flows downhill"), are not credible ("water flows uphill"), or only account for site-specific conditions are not useful in considerations of the singular or cumulative effects of management actions.

In order to retain clear linkages between key questions, hypotheses, and monitoring protocols, the experimental approach must be designed before determining which goals and endpoints are appropriate (Ralph and Poole 2003) since appropriate goals should be *outcomes* of the

effort, not a precondition; and the approach must explicitly tie stated hypotheses to the key ecological questions.

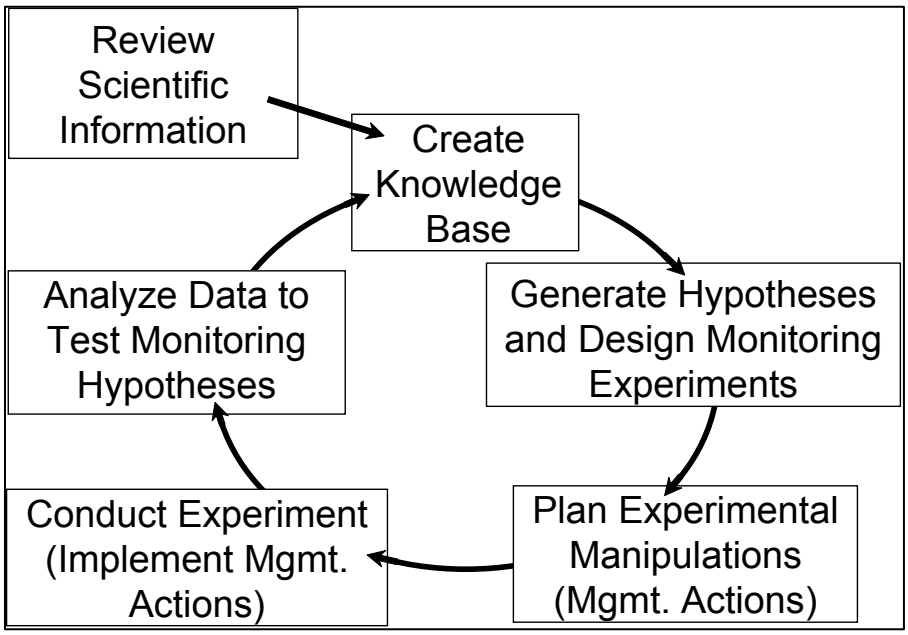

Figure A-1. Framework for an adaptive management program. The key feature of this cycle is the foundation of scientific principles and hypothesis generation; design of the management actions and the monitoring to evaluate their effects are integrated and designed to test assumptions, improve understanding, and reduce uncertainty (modified from Ralph and Poole 2003, Figure 3).

Wagner (2006) asserts that [stormwater] regulatory programs in the past often failed because they were designed in ways that ignored technological and scientific limitations. "Science-based" does not simply mean the monitoring of status and trends followed by responding to imposed benchmarks and goals, but rather that scientific principles must be the foundation of regulatory program design, and that these programs must rely on scientific methods to demonstrate results. Wagner suggests that regulations can still be designed despite incomplete or developing knowledge, but that gaps and limitations must be acknowledged and used to inform ongoing investigations. His argument clearly echoes those of scientists who insist that monitoring experiments and testable hypotheses must frame management decisions and land-use objectives.

WHAT IS *NOT* ADAPTIVE MANAGEMENT, AND WHY IS IT SO PROBLEMATIC?

Unlike the experimental approach embodied by adaptive management, an alternative process traditionally dominates in natural resource management: (1) a problem is identified, but a cause is simultaneously presumed (e.g., "increased sediment inputs into a stream are negatively impacting salmonid survival"); (2) a solution or set of solutions is proposed (e.g., timber harvest is restricted and riparian buffer width is increased), but the prescription is not translated into a testable hypothesis associated with the problem or question; and (3) if the problem is not solved within an arbitrarily reasonable period of time (e.g., a few years) then a different solution is proposed (e.g., "augmented upland and riparian restoration must be implemented"). Although simplified, this outline displays its divergence from adaptive management and from the basic principles of the scientific process—the resulting process is perpetually reactive.

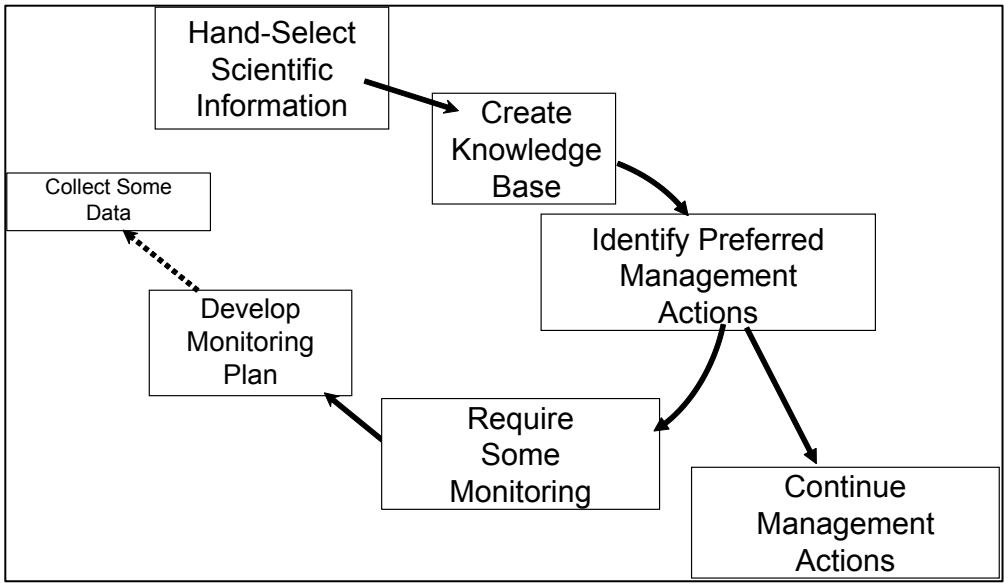

Figure A-2. Common framework for monitoring outside of an adaptive management structure. Management actions are chosen with a presumptive effect on ecological systems, and monitoring is conducted without any feedback to future actions. Even where monitoring is intended to "inform" future management actions, the absence of an explicit experimental design normally limits the utility of any monitoring data to provide meaningful insights.

In its best form, this paradigm has been termed passive adaptive management:

> Restoration planners' current management approach has been described as a "passive" adaptive management approach: science is used to

> develop best-guess predictive models, make policies according to these models, and revise them as data become available. The National Academies advise that every effort be made to take a more "active" adaptive management approach by developing alternative hypotheses for the expected consequences of a particular project and then design the project so the hypotheses can be experimentally tested" (from the summary to *Adaptive Monitoring and Assessment for the Comprehensive Everglades Restoration Plan*, 2003, National Academies Press, 122 pp.).

Ralph and Poole (2003) have aptly named this approach "socio-political adaptive management" (i.e., SPAM).

BARRIERS TO IMPLEMENTING "ACTIVE" ADAPTIVE MANAGEMENT

Although the virtues of active adaptive management are readily articulated, the framework is surprisingly rare in practice. Some of these barriers are practical or logistical, and they include such issues as:

- Longevity and long-term institutionalization of monitoring;
- Effective data management systems that allow managers to readily access data;
- Ability to differentiate effects from natural variability and events, such as flood and fire;
- Cost and technical limitations of necessary data collection.

The most severe impediments, however, are not scientific but social: "We suggest that watershed-scale adaptive management must be recognized as a radical departure from established ways of managing natural resources if it is to achieve its promise... Adaptive management encourages scrutiny of prevailing social and organizational norms and this is unlikely to occur without a change in the culture of natural resource management and research" (Allan et al. 2008).

While science can provide defensible and replicable insights regarding the ecological outcomes of management prescriptions, it cannot offer absolute certainty. Policy can be and should be informed by science but is ultimately based on a variety of considerations that are not always amenable to the spatial, temporal, and technological limitations of the scientific process (Van Cleave et al. 2004). This is an uncomfortable truth for agency managers and elected officials to acknowledge, and it commonly results in funding decisions and public pronouncements using the "language" of science but not its substance.

Although efforts to build large, collaborative programs are commonly characterized by increasing stakeholder involvement and outreach, greater participation does not necessarily

mean that true adaptive management is occurring, or that scientific principals are being applied to either the choice of management actions or their evaluation. These efforts, however, do reflect a movement to extend natural resource management decision-making processes beyond just technical experts in order to reflect evolving social values (Pahl-Wostl *et al*. 2007). If they are successful, this approach can open a path to achieving the best of both realms, namely scientific rigor with a broad base of community support.

ATTRIBUTES OF USEFUL HYPOTHESES FOR AN ADAPTIVE MANAGEMENT PROGRAM

A key element of any adaptive management approach is the set of hypotheses that guide both the management actions and their associated monitoring. Because these management actions are recognized as "experimental" (because in a complex system most outcome(s) cannot be predicted with absolute certainty), their selection must be guided by assumptions about what *might happen,* or what is *expected* to happen. This defines the first attribute of a useful hypothesis: it is **credible**, typically because it is based on prior knowledge or scientific understanding of the system. Indeed, some hypotheses may already be so well evaluated and understood (e.g., "Stormwater runoff from freeways carries measurably elevated concentrations of toxic pollutants") that there is little point in framing them in this structure at all—as new monitoring programs to address such hypotheses are highly unlikely to result in new information or knowledge and might be perceived as an unwise expenditure of scarce monitoring resources.

The second attribute of a useful hypothesis stems from the scientific reality that any experiment, whether conducted in the laboratory or across the landscape, provides value only insofar as its outcomes are measured and the effects are distinguishable from the influence of other, unrelated factors. Thus, the hypothesis that guides the experiment should not only be credible but also **testable**. Otherwise, why bother making measurements at all?

Lastly, these actions and measurements and analyses do not occur in a vacuum. Thus, the final guiding principle for any hypothesis in an adaptive management approach is that it be **actionable**, or that different outcomes, as revealed by monitoring, can (and will) result in different management responses. If no difference occurs, then clearly there is no reason to have made the effort in the first place.

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ATTACHMENT A

**ORANGE COUNTY LEGAL &TECHNICAL COMMENTS ON
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
TENTATIVE ORDER No. R9-2013-0001
NPDES NO. CAS0109266**

Appendix A-3

2009 Presentation to Santa Ana Regional Board

Storage and Reuse Systems for Stormwater Mangement

Preliminary Cost and Performance Estimates for Residential Land Use in Irvine, CA

Eric Strecker, P.E.
Geosyntec consultants

Summary of Study

- Compared hypothetical scenarios for rainwater harvesting and reuse systems (cisterns)
  - single lot scenario
  - 100 ac neighborhood scenario
- Compared resulting costs and for both scenarios
- Performed modeling (long term simulation) analysis for neighborhood scenario
- Evaluated water quality loading differences between rainwater harvesting and reuse systems and typical bioretention installation for single family residential
- Performed preliminary review of applicable codes

Geosyntec consultants

Rainwater harvesting and Reuse Systems

Impervious Area

- Roof tops
- Driveways
- Streets

Stormwater Conveyance and Pretreatment

- Pipes
- Filters

Storage

- Cistern
- Storage Basin
- Underground Vault

Treatment

- UV treatment
- Filtration

Pumping and Piping

- Pipes back to house (purple)

Indoor Use and Irrigation

- Toilet flushing
- Yard and Garden irrigation

Geosyntec consultants

Single Lot Scenario

- Two reuse demands were examined: 1) indoor use only (toilet flushing), and 2) indoor and outdoor use (toilets and irrigation)

- Lot Characteristics:
  - 0.1 acres
  - 69% impervious area
    - Roof area - 2400 ft^2
    - Other (patio) - 600 ft^2
  - 3.5 people/house
  - Toilet use/capita = 18.5

- Method assumptions:
  - Rational Method
    - Impervious Runoff Coeff. (0.9)
    - Precipitation Depth – 0.8 in (85th percentile for large parts of Orange County)
    - Toilet use / house = 65 gal/day
    - Irrigation /house = 77 gal/day (Avg. from Irvine Water District data)

Geosyntec consultants

Single Lot Scenario Results

Water Collected From:	Roof	Roof + Other Impervious area
Demand Scenario	**Average Drawdown Time (days)**	
Toilets only	17	21
Both Toilets & Outdoor uses	7.6	9.5

Note: Outdoor demand assumes that irrigation demand is immediate; more sophisticated modeling would allow more accurate characterize of irrigation demand, but for purposes of this analyses, it was assumed to be immediate. This likely significantly overstates the demand for irrigation.

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Neighborhood Scenario

- Two reuse demands were examined: 1) indoor use only (toilet flushing), and 2) indoor and outdoor use (toilets and irrigation)

- Neighborhood Properties:
  - 100 acres – 60 % impervious
  - 0.1 acre lots at 4.5 du/ac = 450 houses
  - 3.5 people/house
  - Toilet use/capita = 18.5
  - Basin used to store runoff

- Method assumptions:
  - Rational Method
    - Impervious Runoff Coeff. (0.9)
    - Precipitation Depth – 0.8 in (85th percentile for large parts of Orange County)
    - Toilet use / house = 65 gal/day
    - Irrigation /house = 77 gal/day (Avg. from Irvine Water District data)

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Neighborhood Scenario Results

Demand Scenario	Average Drawdown Time (days)
Toilets only	45
Both Toilets & Outdoor uses	10

Note: Outdoor demand assumes that irrigation demand is immediate; more sophisticated modeling would allow more accurate characterize of irrigation demand, but for purposes of this analyses, it was assumed to be immediate. This likely significantly overstates the demand for irrigation.

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General Cost List

Item	Description	Cost	Reference/Source
TANKS			
Galvanized steel	200 gal	$225	Fairfax County, 2005
Polyethylene	165 gal	$160	Fairfax County, 2005
Fiberglass	350 gal	$660	Fairfax County, 2005
Plastic	800 gal	$400	Plastic-mart.com
Plastic	1100 gal	$550	Plastic-mart.com
Plastic	1350	$600	Plastic-mart.com
Plastic cone	1500 gal w/metal stand	$1500	Plastic-mart.com
Plastic	2500 gal	$900	Plastic-mart.com
Plastic	5000 gal	$3000	Plastic-mart.com
Plastic	10000 gal	$6000	Plastic-mart.com
[1] Dry Det. Basin(1997)	$C = 12.4V^{0.760}$: for 1 ac-ft	$41,600	stormwatercenter.net
[2] Below Ground Vault	$C = 38.1 (V / 0.02832)^{0.6816}$	$55,300	fhwa.dot.gov
Concrete	1,000,000 gal above g. (O&P)	$548,000	RSMeans
Steel	1,000,000 gal above g. (O&P)	$467,000	RSMeans
TREATMENT			
UV (house-scale)	Whole system - 12 gpm	$700-$900	rainwatercollection.com
UV bulb	Life: 10,000 hrs or 14 months	$80-$110	rainwatercollection.com
UV (neighborhood-scale)	Whole system - 200 gpm	$10,000	Bigbrandwater.com
Downspout filter	Placed in Gutter	$20 - $500	many online
1st Flush Diverter	Vertical pipe w/ ball float	$50-$100	raintankdepot.com
PUMP	1 hp (all in one package)	$575 - varies	rainwatercollection.com
PIPING (Purple)			
to Tank (lot)	PVC: 2”-6” (O&P)	$2-$12 / LF	RSMeans
to House (lot)	PVC: 2”-6” (O&P)	$2-$12 / LF	RSMeans
to Tank (neighbor.)	Concrete: 6” – 18” (O&P)	$15-$30 /LF	RSMeans
to House (neighbor.)	HDPE- 4” – 10” (O&P)	$11-$27 / LF	RSMeans
to Irrigation	PVC: 2”-6” (O&P)	$2-$12 / LF	RSMeans
Backflow prev. valve	Each	$100-$200	web
STENCILS	Non-potable water	----	
INSTALLATION	Percentage of material cost	40 % – 50%	

[1] This dry detention cost equation - Brown and Schueler, 1997: C is the construction, design and permitting cost and V is the volume (cu-ft) need to control the 10-year design storm. In this case, the 0.8” storm runoff volume was used in place of the 10-yr design storm volume.

[2] This below ground storage vault equation - Weigand et al., 1986:C is the construction cost estimate (1995 dollars), and V is the runoff volume (cubic meters)

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Single Lot Costs

Item	Description	Cost
TANKS		
Plastic	1100 gal and 1350 gal	$550
TREATMENT		
UV	Whole system - 12 gpm	$800
UV bulb	Life: 10,000 hrs or 14 months	$80-$110
Downspout filter	Placed in Gutter	$250
1st FLUSH DIVERTER	Vertical pipe w/ ball float	$100
PUMP	1 hp (all in one package)	$575
PIPING (Purple)		
to Tank (lot)	PVC: 2”-6” (O&P) 20ft	$8 / LF
to House (lot)	PVC: 2”-6” (O&P) 50ft	$8/ LF
to Irrigation	PVC: 2”-6” (O&P) 50ft	$8 / LF
Backflow prev. valve	each	$200
STENCILS	Non-potable water	----
INSTALLATION	40% of material cost	$1400
TOTAL		**$4,900**

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Neighborhood Costs

Item	Description	Cost	Units Assumed
TANKS			
Dry Det. Basin(1997)	$C = 12.4V^{0.760}$	$119,000	174,000ft^3
Below Ground Vault	$C = 38.1 (V / 0.02832)^{0.6816}$	$142,000	174,000ft^3
TREATMENT			
UV - neighborhood	Whole system - 200 gpm	$10000	
Catch basin filters	1 every 2 acres	$2000	50 catch basins
PUMP		$50,000	
PIPING (Purple)			
to Tank (neighbor.)	Concrete: 6” – 18” (O&P)	$15-$30 /LF	$23 - 14000 ft
to House (neighbor.)	HDPE- 4” – 10” (O&P)	$11-$27 / LF	$19 - 14000 ft
to Irrigation	PVC: 2”-6” (O&P)	$2-$12 / LF	$8 - 60 ft /house
Backflow prev. valve	each	$100-$200	$200 per house
STENCILS	Non-potable water	----	
INSTALLATION	40% of material cost	$470,000	
TOTAL		**$1,650,000**	

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SWMM Modeling Analysis

- Long term (40 yr) analysis of the neighborhood scenario was performed using SWMM. Two scenarios analyzed:
  - 0.8 inch design storm
  - 1.6 inch design storm
- Modeling assumptions:
  1. Toilet flushing – same as scenarios and applied as constant rate
  2. Irrigation – monthly values (from the IRWD) applied as constant rates by month (i.e. demand occurs continuously during and after storm event)
  3. Overflow from tanks considered to be untreated bypass
  4. Same total area and impervious areas in both studies

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SWMM Modeling Results

	Units	Scenario			
		A	**B**	**C**	**D**
		Toilet Flushing Only, 0.8" design storm	Toilet Flushing + Irrigation, 0.8" design storm	Toilet Flushing Only, 1.6" design storm	Toilet Flushing + Irrigation, 1.6" design storm
Average Annual Drawdown Time	**days**	**47**	**8.5**	**94**	**17**
Average Stormwater % Capture and Reuse	**%**	**32%**	**55%**	**41%**	**68%**
Avg Annual Volume of Stormwater Reused	MG | CCF	5.2 | 6,950	8.8 | 11,800	6.5 | 8,700	10.9 | 14,620
Avg % of Total Residential Demand Satisfied	**%**	**6.2%**	**11%**	**7.8%**	**13%**

Note: Outdoor demand assumes that irrigation demand is immediate; more sophisticated modeling would allow more accurate characterize of irrigation demand, but for purposes of this analyses, it was assumed to be immediate. This likely significantly overstates the demand for irrigation.

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Pollutant Loading Example

Assumptions

- Median Runoff EMC for TSS for HSFD: **70 mg/L**
- Median Effluent Concentration for TSS for Media Filters from International BMP Database: **15 mg/L**
- % Captured by cistern per SWMM (Scenario B – 0.8" design storm with toilet and irrigation re-use): **55%**
- % Captured by Bioretention with Underdrains per DAMP requirement: **80%** (requires approx 0.4" design storm)
- Bypass from both BMPs assumed to be untreated

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Pollutant Loading Example

Results – Average Annual TSS Load Removed

Cisterns and Re-Use: **55%**

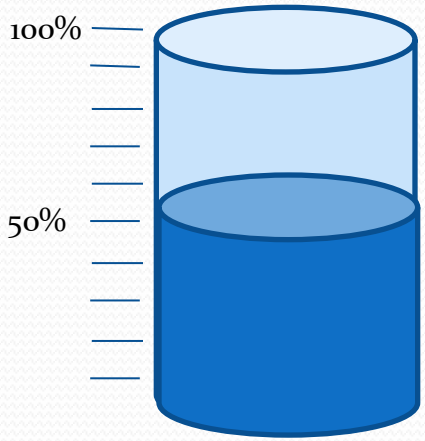

Bioretention with Underdrains: **63%**

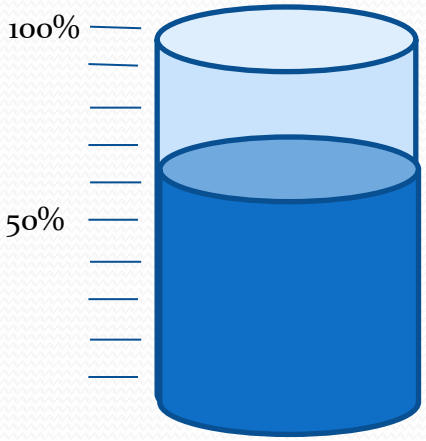

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Pollutant Loading Example

Results – Average Annual TSS Concentration with BMPs

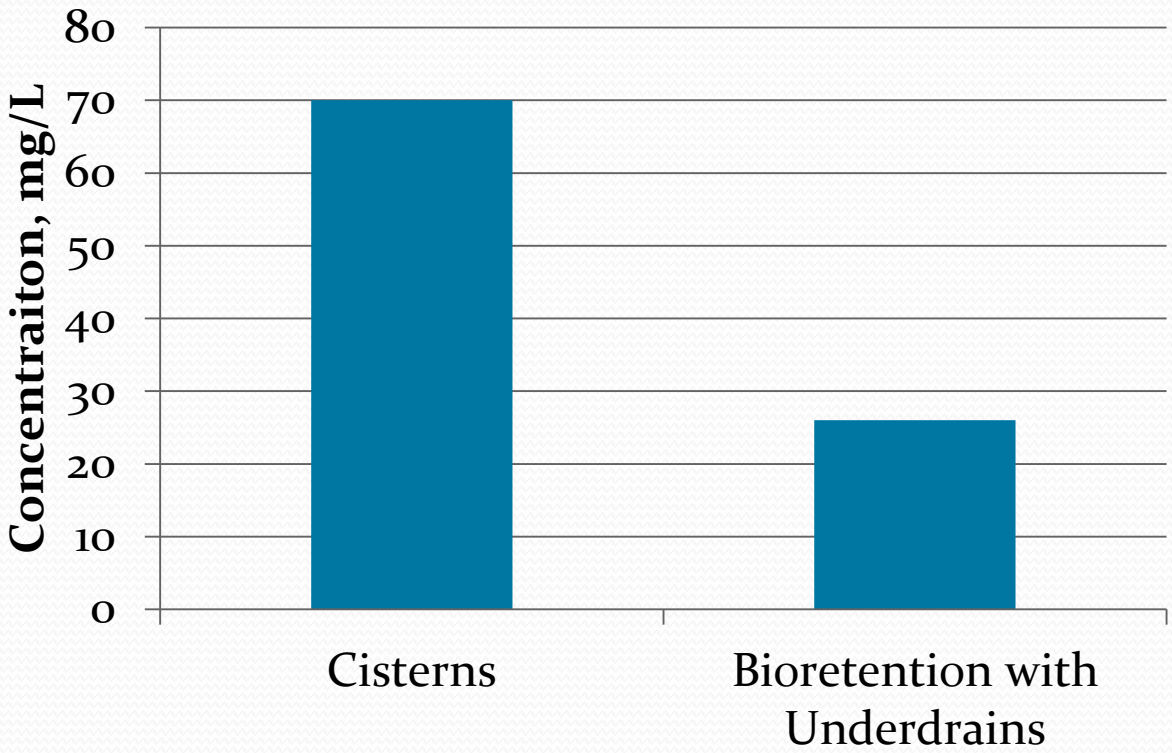

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Rainwater Harvesting - Code and Regulations

Applicable Codes

- Title 24—Building Standards Code (plumbing code)
  - Mechanical design and installation procedures
- Title 22—Social Security (recycled water quality standards)
  - Current technologies can meet this requirement (filtration, UV, and others)
- Title 17—Public Health (public water system cross-connection and backflow prevention)

Preliminary Conclusions

Since state codes do not currently recognize rainwater harvesting and reuse, discretion in approval will likely reside at the county and/or City levels through local codes and ordinances.

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ATTACHMENT A

**ORANGE COUNTY LEGAL &TECHNICAL COMMENTS ON
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
TENTATIVE ORDER No. R9-2013-0001
NPDES NO. CAS0109266**

Appendix A-4

The Water Report Issue #65:
Stormwater Retention on Site, An Analysis Of Feasibility and Desirability, Strecker and Poresky (2009)

The Water Report™

Water Rights, Water Quality & Water Solutions in the West

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Obama Water Policy

Groundwater Decline

Tribal Water Needs

& More!

STORMWATER RETENTION ON SITE

AN ANALYSIS OF FEASIBILITY AND DESIRABILITY

by Eric W. Strecker, PE, and Aaron Poresky, EIT, Geosyntec Consultants (Portland, OR)

INTRODUCTION

Both nationally and in various localities, there is increasing regulatory pressure to maximize or require the retention of stormwater on site with compliance often linked to matching post-development runoff with predevelopment hydrology.

For example, in California the recently adopted Ventura Municipal Separate Storm Sewer System (MS4) NPDES permit requires retention on site — via infiltration, evapotranspiration and/or harvest and "re-use" — of precipitation from storms ranging up in size to the permit-defined "design storm" (Standard Urban Stormwater Mitigation Plan (SUSMP) depth of 3/4 of a inch — "design storms" are events defined in regulation and reflected in stormwater system design). There is an exception allowed where it is not feasible to retain the entire volume: the project may then retain "only" 70 percent of the SUSMP storm on site and mitigate the remaining volume off site. Another example is the North Orange County permit, which requires that infiltration, evapotranspiration, and/or harvest and re-use be employed to manage the water quality design storm, unless infeasible.

Nationally, the recent Energy Independence and Security Act (EISA) Section 438 requires that any Federal project with over 5,000 square feet of impervious area "maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow." Guidance for compliance with this provision allows either retention of the 90th percentile, 24-hour storm event or a model-based evaluation of discharge rates and volumes, matching predevelopment with post-development runoff hydrology. In effect , both of these conditions mandate substantial on site retention.

These permits/regulations have "narrowed" the traditional definition of Low Impact Development (LID) down to only a few elements — i.e., infiltration, evapotranspiration and/or harvest and use. This narrowing precludes management options present in the broader LID definition, such as detention and bio-filtration in vegetation-based facilities that provide incidental infiltration and evapotranspiration, but have a surface discharge point (e.g. bioretention with underdrains).

Nationally, the US Environmental Protection Agency (EPA) has also limited the definition of LID in some of their various guidance documents. For example, *Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices*, December 2007 (EPA 841-F-07-006) includes the definition: "LID comprises a set of approaches and practices that are designed to reduce runoff of water and pollutants from the site at which they are generated. By means of **infiltration, evapotranspiration, and reuse of rainwater**, LID techniques manage water and water pollutants at the source and thereby prevent or reduce the impact of development on rivers, streams, lakes, coastal waters, and ground water." (Emphasis added) It should be noted that other EPA documents include

Stormwater On Site

LID Definitions

Harvested Water

Natural Balance

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definitions with the broader definition of filtration and surface release (see **Table 1**). It also should be noted that even in the guidance that includes the narrowed definition, in most cases the examples and guidance details include filtration and surface release of runoff.

Table 1. Summary of Filtration and Surface Release Inclusion in LID Definitions and associated guidance

Document/Reference	Filtration and Surface Release	
	In Definition	In Guidance/Examples
Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices, December 2007 (EPA 841-F-07-006)	No	Yes
Low Impact Development (LID) Literature Review, October 2000 (EPA-841-B-00-005	Yes	Yes
Low-Impact Development: An Integrated Environmental Design Approach (Prepared by the Prince George's County Maryland Department of Environmental Resources Programs and Planning Division, with assistance from EPA), June 1999	Yes	Yes
Polluted Runoff (Nonpoint Source Pollution) Low Impact Development (LID), Last updated on Thursday, January 15th, 2009 Additional information from linked factsheet: *Design Principles for Stormwater Management on Compacted, Contaminated Soils in Dense Urban Areas*, April 2008 (EPA-560-F-07-231)	Not Clear	Yes
Low Impact Development (LID) and Other Green Design Strategies, Last updated on October 09, 2008	No	Not Clear

To date, the retention of stormwater on site has been primarily been accomplished via infiltration and, to a much more limited extent, evapotranspiration. Only in a few cases has harvest and use (the authors believe that stormwater that is captured and used is not "re-used") been employed on a site scale (typically as a part of a Leadership in Energy and Environmental Design (LEED) rating process). Uses for harvested water typically include non-potable uses such as irrigation and toilet flushing and in some cases process water for industrial uses.

The feasibility and desirability of retaining stormwater on site up to some design storm level has not been vetted technically on a national or regional scale. For example, in the EPA *Reducing Stormwater Costs* Guidance referenced above there is virtually no assessment via monitoring or modeling information of the potential results of the case studies presented. It is primarily a compendium of antidotal information. There has been almost no consideration of the natural water balance (i.e., predevelopment conditions) in technical guidance or whether infiltrating more volume than occurs under natural conditions (as would tend to result from matching runoff hydrology without matching evapotranspiration) could, in many cases, cause problems. This paper attempts to present some of the considerations for retaining on site to determine whether it is feasible and/or desirable. It focuses on Southern California examples, but the factors discussed are applicable to much of the West and beyond.

It should be noted that "retaining stormwater on site" in its contemporary usage typically only refers to not having surface discharges result from specific "design storm" events. This usage ignores the fact that infiltrated or evapotranspirated stormwater is not actually "retained" on site — it either enters a deeper aquifer, flows as shallow interflow which may emerge elsewhere or, in the case of evapotranspiration, escapes to rain another day.

The authors believe that, while one should try to maximize the retention of stormwater on site, such retention should not be mandated, as site specific circumstances often indictate wiser alternatives.

PERFORMANCE OF STORMWATER BEST MANAGEMENT PRACTICES (BMPs)

General Considerations

In order to assess the performance of stormwater treatment Best Management Practices (BMPs), it is important to understand the range of factors which may impact BMP performance. BMP performance is effected by: runoff patterns; pollutant types and forms; the storage volume and/or treatment rate; the ability to recover storage capacity (for BMPs that rely on storage); the treatment processes for released flows (to surface waters or groundwaters); and operations and maintenance issues that affect the ability of the BMP to continue operations (Strecker, et. al., 2006). For storage-based BMPs, methods for recovering storage capacity include: surface discharge; evapotranspiration; deeper infiltration; and putting the stored water to use. For systems which include cisterns (harvest and use), one of the most critical factors is the ability to quickly recover storage capacity before the next storm event arrives. Typically, if storage capacity cannot be recovered within two-to-four days, then the amount of runoff bypassing storage becomes significant due to the cistern being partially to nearly full.

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Stormwater On Site

Storage Capacity Recovery

Weather and Resulting Runoff Patterns

In Southern California and the West Coast in general, precipitation patterns in most urban areas are affected by the presence or absence of a high pressure ridge that in essence blocks-out low pressure storm systems. Typically, once the high pressure ridge is absent a series of storms arrives, delivering "back-to-back" storms until a high pressure ridge re-establishes. Storms arrive about every two to three days during this period. If the storage capacity is not quickly recovered, these back-to-back storms can result in storage-based BMPs that are full or partially full when the next storm arrives, which then causes significant bypass or overflow to occur. In Southern California, most precipitation arrives from December to March. **Figure 1** shows the monthly normal rainfall in Irvine California (and monthly **e**vapo**t**ranspiration (ET)). Monthly normals tend to mask the patterns that occur within specific months in the period of record. **Figure 2** shows a typical precipitation pattern for the same gage, which includes the effect of 'back-to-back" storm events on a weekly timescale in an actual year. These weather patterns indicate that the recovery of storage on a sub-weekly time scale is critical to ensure that sequential storms do not result in excessive bypass or overflow of BMPs. Study of typical storm patterns indicates that storage capacity should be regenerated within two-to-three days to maximize the stormwater management performance when harvesting stormwater.

Precipitation v. "ET"

Figure 1. Monthly Precipitation vs. Monthly Evapotranspiration for Irvine, California.

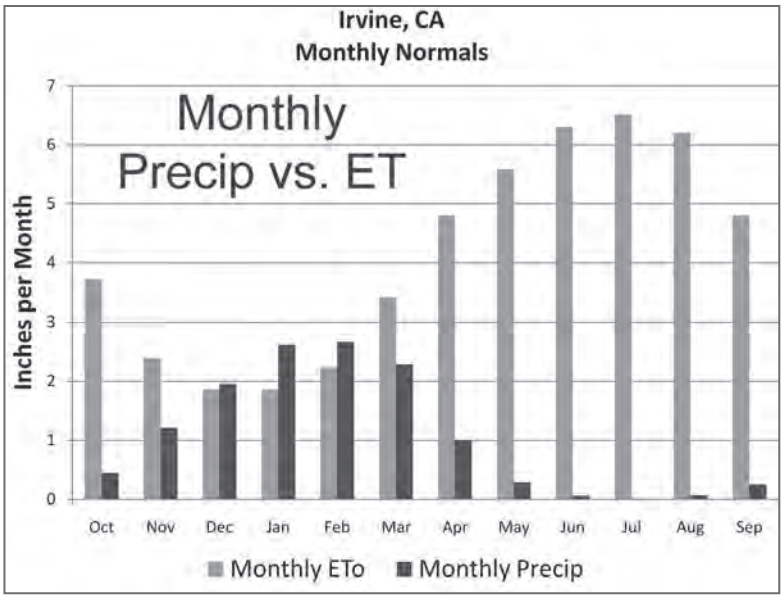

Precipitation Pattern

Figure 2. Typical Precipitation Pattern Showing Back-to-Back Storms at Irvine California for a Near Average Water Year.

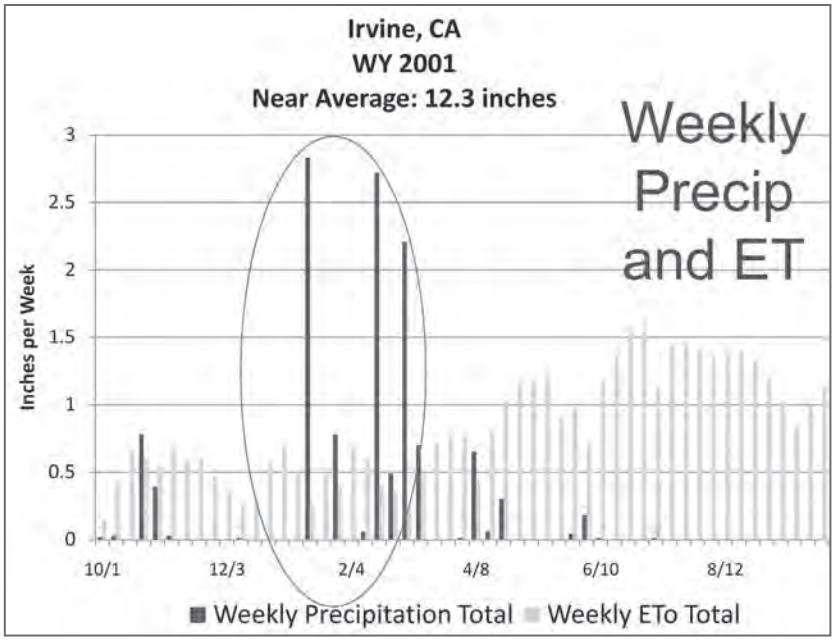

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Stormwater On Site

Infiltration Issues

Infiltration is the primary method that is employed to retain stormwater on site. This is because, when it can be accomplished, infiltration is the method most likely to be successful. However, the authors believe that three key questions/issues need to be addressed when considering infiltration strategies if unintended, problematic consequences are to be avoided.

Key infiltration considerations include:

- Can you do it?
- Should you do it and, if so, to what extent?
- If you do employ infiltration, what factors need to be addressed to insure a desirable outcome?

Soil Factors

Infiltration: Can You Do It?

Underlying soils greatly affect the ability to infiltrate. In much of Southern California (and the West) urban areas are situated atop soils that are difficult for infiltration. Some practitioners have suggested soil amendments as a strategy for increasing infiltration. However, amending soils typically only addresses surface soils, so if underlying soils are still difficult for infiltration, soil amendments may only be increasing the storage available (vs. significantly increasing underlying infiltration rates). **Figure 3** presents a map that shows underling soils for the North Orange County, California permit area. It is expected that, in general, infiltration will only be successful in areas with A and B soil types. Of course, in mapping broader soils groups, there may be pockets where infiltration is more feasible. However, the converse is also true. In this Orange County example, a little over 58% of the permit area has C and D soil types that would be unlikely to promote infiltration at an acceptable rate. Infiltration facilities that ignore low underlying infiltration rates in their design would tend to be full for much of the wet season, resulting in substantial bypass/overflow, thereby greatly reducing retention on site. Infiltration facilities designed with lower infiltration rates in mind would have shallower allowable ponding depths and thus require a greater amount of site area, possibly promoting sprawl. To ascertain feasibility, maps like this should be developed prior to requiring infiltration or on site stormwater retention.

Infiltration Rates & Design

Infiltration: Should You Do It?

The next question is "should you (or how much should you) infiltrate?" In many areas there are unnatural (e.g., solvent) or natural (e.g., selenium) plumes or soil contamination that infiltration could negatively impact by either moving or spreading the contaminants. Infiltration in industrial areas is often not desirable due to general concerns about groundwater contamination resulting from potentially elevated

Figure 3. Soil types for North Orange County MS4 NPDES Permit Area

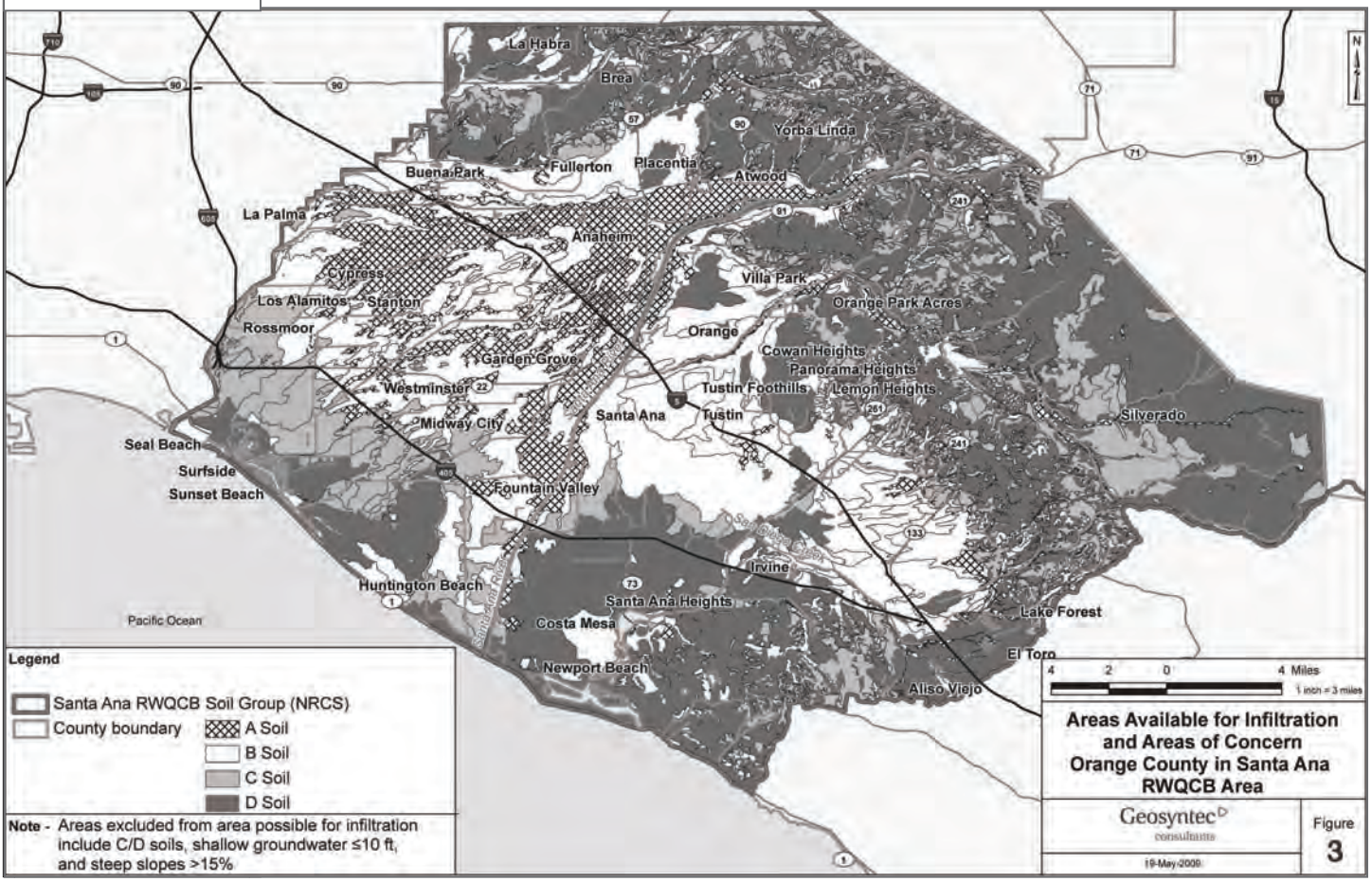

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Stormwater On Site

Water Balance Consequences

pollutant concentrations in industrial stormwater runoff. Geotechnical issues associated with steep slopes or expansive soils may also be an issue for infiltration. Depth to groundwater typically limits infiltration to areas with 10 or more feet of separation from the bottom of infiltration facilities to groundwater. Finally, in some locations upgradient of an ephemeral stream, increased infiltration may cause undesirable habitat type changes downstream of the site due to increased periods of base flows that result in vegetation changes (e.g. conversion of dry wash to a thickly vegetated system). There has been a lack of consideration of the overall water balance consequences that a "retention on site" requirement may have in terms of habitat.

As an example, **Figure 4** presents a map of the North Orange County permit area that shows the areas remaining with good potential for infiltration after consideration of some of the issues covered above. The area remaining within the permit area for consideration of infiltration is less than 23 percent of the permit area, even without considering habitat issues or regulated facilities (small contamination areas shown as dots). There are large urbanized areas where infiltration would not be either feasible or desirable.

Groundwater Quality

Infiltration: Do It Carefully

Finally, infiltration should be done carefully to ensure that groundwater quality is protected and widespread stormwater management facility failure does not occur. Proper treatment of infiltrating water should occur before this water reaches groundwater either via treatment with BMPs or ensuring that soils are adequate to provide treatment while passing infiltrating water. Infiltration facilities have often failed due to poor maintenance and operation of the facilities. One needs to think through how to design infiltration facilities to minimize maintenance issues, including whether widely-distributed infiltration facilities can be maintained as adequately as one centralized facility. Water districts that utilize groundwater should obviously be involved in decisions about where and how to infiltrate stormwater so that groundwater supplies are protected.

Maintenance Issues

Infiltration: Summary

Infiltration must be done carefully to ensure that it can be successful on a long-term basis as well as be protective of water supplies. The best opportunities for successful infiltration are in areas where groundwater is actively managed for water supply. Such areas are unlikely to face as many water balance hindrances or other issues. For example, areas along the Santa Ana River are actively managed for recharge and withdrawals by the Orange County Water District. These localities provide the best opportunity for successful infiltration.

Figure 4. Areas available for infiltration for the North Orange County Permit Area

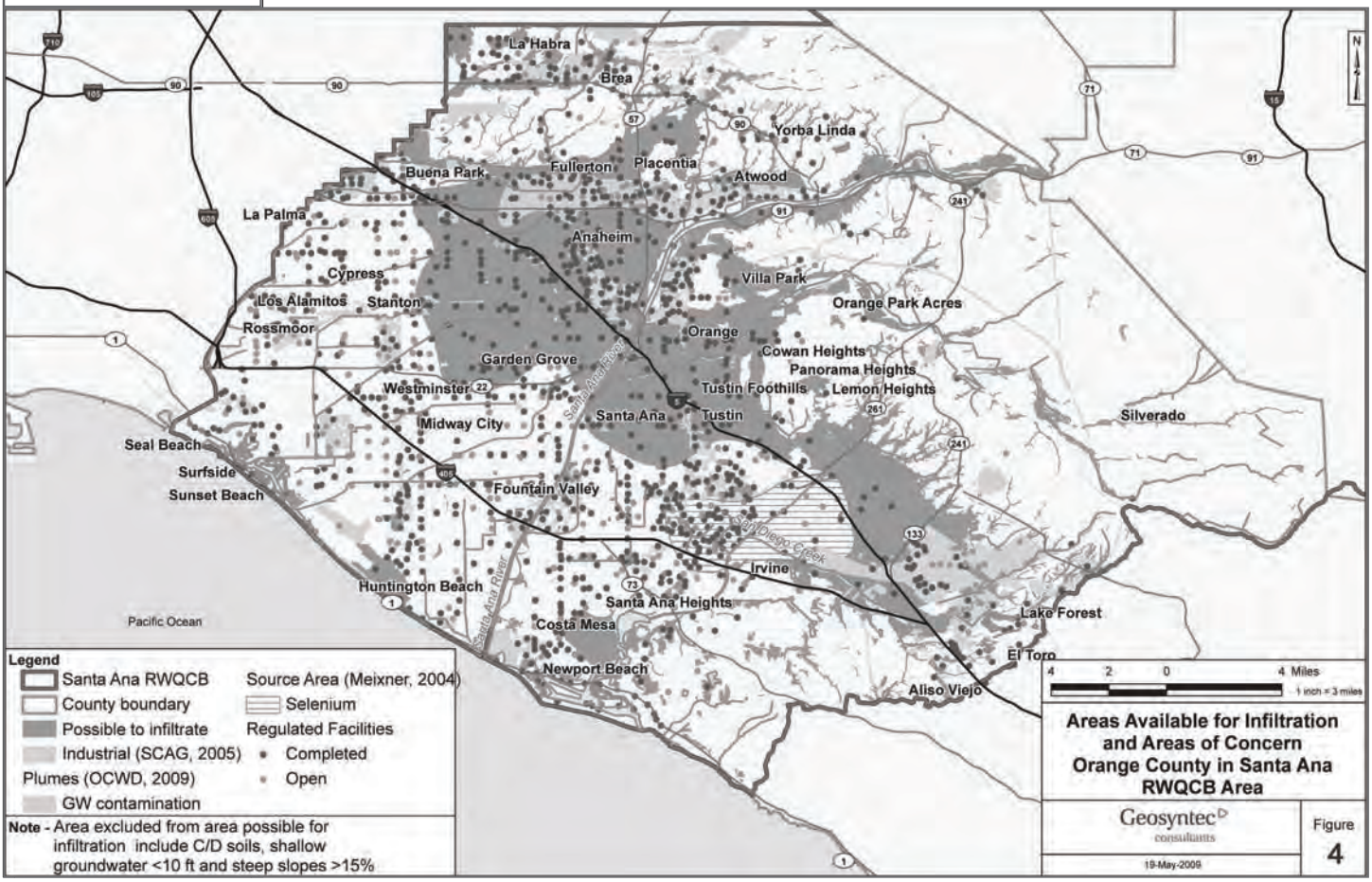

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Stormwater On Site

Development Factors

Precipitation v. ET

In Soil Storage Recovery

Water Balance

EVAPOTRANSPIRATION (ET)

After an area undergoes development there will be less available area for **e**vapo**t**ranspiration (ET)to occur. This holds true even when vegetated roofs, pervious pavements, and other "green" development practices are employed and is especially true for high density projects. Some analysts have compared monthly or seasonal ET to precipitation levels to assess the potential for ET losses as a significant retain-runoff on site measure. This is particularly inappropriate on the West Coast in light of the region's tendency for back-to-back storm events.

Refer again to **Figures 1 and 2** appearing above. **Figure 1** shows monthly normal comparisons of precipitation versus ET, while **Figure 2** shows precipitation and ET as weekly totals for an example year. While the former suggests that ET matches or exceeds precipitation on a monthly normal bases, it does not account for back-to-back storms or the fact that months with higher than normal rainfall would be the same months that correspond to lower than normal ET. **Figure 2** clearly demonstrates that ET cannot keep up with precipitation on a weekly basis in critical periods of the typical back-to-back storms of an average year. During these critical periods, the storage provided in soils would not have recovered in time for subsequent rainfall. While ET of stormwater should be maximized, it almost certainly will not be able to match pre-development levels and is likely a minor component of retaining stormwater on site (without storage and use for irrigation).

ET is a very important consideration when assessing the ability to mimic predevelopment runoff volume. **Figure 5** presents typical arid southwest water balances for: undisturbed areas; areas developed with infiltration facilities (Example Developed with LID – no underdrains); and for areas developed using LID with underdrains. Predevelopment ET can range upwards of 80 to 97 percent of the precipitation on an average annual basis. It is very unlikely that predevelopment ET will be matched by post-development ET due to reduction in vegetated open soils areas. So, the choice for development, particularly high density development, is to either have more runoff than predevelopment or more infiltration, or a combination of the two. This fact and its ramifications have not been considered during the development of on site retention requirements that are focused on surface hydrology versus overall hydrology (including sub-surface).

Figure 5. Typical Water Balance from Precipitation in Arid Southwest Climate

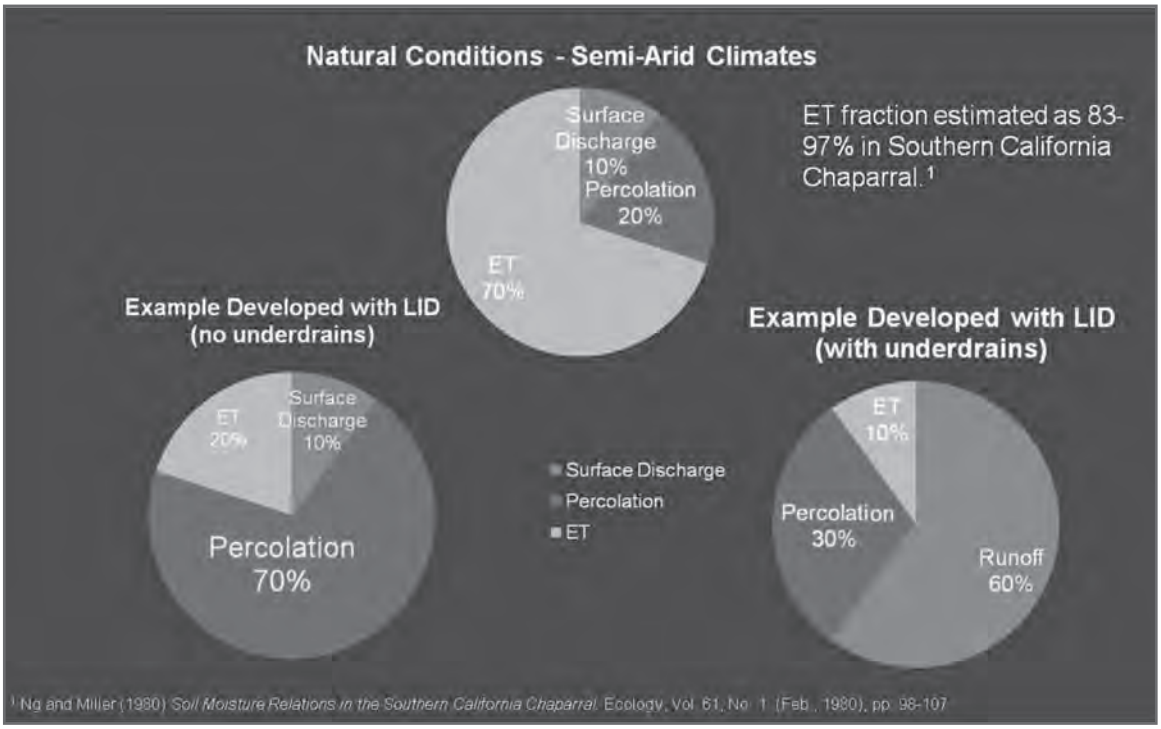

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Stormwater On Site

Harvest Demand

CAPTURE & USE ("RE-USE")

In most all cases where infiltration is not feasible or possible, the only option remaining to meet the retain on site requirements is to capture (harvest) and use the stormwater. In North Orange County, for example, this would be the option in about 77 percent of the permit area or more.

The key factor for success of capture and use of stormwater as a means to retaining water on site is the rate at which storage can be made available for subsequent events. This means having a demand for the captured water that is high enough, especially during the rainy season. The two most obvious uses for captured stormwater are for irrigation and toilet flushing. There are significant code issues with capture and use for internal non-potable demand in many jurisdictions. In addition, there are water rights issues associated with capture of stormwater in some areas (e.g., Colorado and Utah). These limitations are not the focus of this article. Other potential uses include process water for commercial or industrial purposes. A scenario for a residential development was conducted to illustrate the potential for capture and use of stormwater. This scenario is discussed next.

Capture and Use: Residential Scenario

Model Assumptions

Your authors modeled and evaluated a100-acre residential catchment with 60 percent overall impervious area using a continuous simulation model (SWMM) as an example of a capture-and-use scenario. It was assumed that infiltration losses would be minimal (due to shallow groundwater depth, poor soils for infiltration and/or other issues). A tank (above ground storage) of 1.3 million gallons (equivalent to the runoff from the catchment resulting from a 0.8 inch storm event — the water quality design storm) was evaluated with toilet flushing and irrigation uses combined. Toilet flushing assumed 65 gallons per day per dwelling unit at 4.5 units per acre. For simplicity, irrigation demands were assumed to equal the monthly average ET levels for the 30 acres of landscaped areas. It was also assumed that irrigation was always on, even during rainfall (note that irrigation demands during and after rainfall are significantly over-estimated in this analysis). A 21-year hourly long-term simulation model was run to ascertain the potential effectiveness of such a system for retaining runoff on-site. We also evaluated potential pollutant removal results as compared to biofiltration with an underdrain (surface water release).

Capture & Use Levels

Overall the system resulted in an estimated capture and use of stormwater of about 48% of the total runoff volume (52% bypassing with no treatment — though one could treat the bypass as well). The capture and use levels varied annually from less than 30 percent to 100 percent for the 21 water years evaluated (**Figure 6**).

Figure 6. Predicted Annual Runoff and Overflow for Example Cistern System

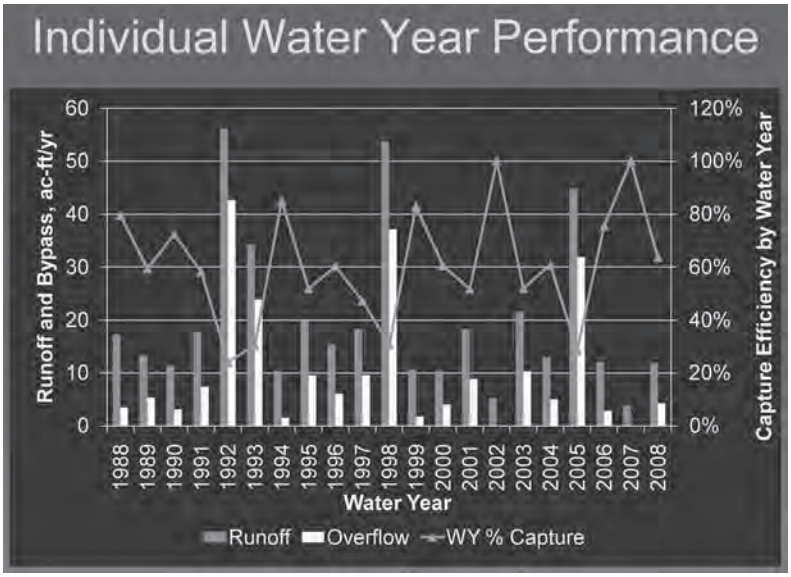

Biofiltration Comparison

Using data from International BMP Database (see: www.bmpdatabase.org), a comparison of total loadings performance to a biofiltration system with underdrains was made. This comparison showed that the biofiltration system reduced **t**otal **s**uspended **s**olids (TSS) loads by about 63% compared to 48% for the cistern scenario for the 21-year simulation. So, in this case the assumption that retain on site is the most effective at reducing pollutant loadings is not valid, unless one also required treatment of the bypassed flows (in essence an additional BMP treatment requirement). Finally, the average annual potable water saved was on the order of about 10 percent of the average annual demand.

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Stormwater On Site

Another scenario was run doubling the size of the cistern tank to 2.6 million gallons (equivalent to a 1.6 inch design storm). Under this scenario, the capture and use level went up to about 57 percent (so doubling the tank size resulted in another nine percent of the runoff being captured and used). Again, this emphasizes the point that being able to drain the cistern relatively rapidly is the key to success for capture and use.

Capture and Use: Limiting Factors

Evaluation Factors

As illustrated in these examples, one should evaluate carefully potential scenarios to help ensure that choices made regarding retention on site requirements actually result in the desired results. Evaluation should consider land use and density assumptions as well as assessment of local precipitation and runoff patterns, irrigation needs, and ability to use water for toilet flushing or other non-potable uses.

Rapid Storage Recovery

For capture and use to work, the storage must be quickly recovered. Irrigation typically is not an effective use for recovering storage quickly as irrigation needs during wet periods are minimal and in some cases (i.e., colder climates) there is no irrigation demand for long periods. In addition, much of the arid southwest is encouraging "xeri-scaping" (drought tolerant plants), which is likely much more effective at reducing potable demand than capture and use for irrigation. Xeriscape plant pallets typically do not like to be saturated for long periods, as would occur via over-irrigation if irrigation use was maximized. Further, use of a water-loving plant palate to maximize the use of captured runoff during normal and wet years could exert an additional demand for potable water during dry years.

Toilet Use Ratio

For toilet flushing to be effective, there needs to be a high enough ratio of Toilet Users To Impervious Area (TUTIA). Perhaps in high-rise condominiums, office buildings, institutional buildings, etc. this ratio would be high enough to drain the tank sufficiently fast and in these cases capture and use should be considered.

However, there would be a "competition" for reclaimed water in much of the arid west. Reclaimed water systems tend to be limited in their ability to distribute water in the wetter and colder periods of the year due to low irrigation demands. In addition, in some locations use of reclaimed water for toilet flushing is required in high density projects. One has to question if the capture and use of stormwater that may result in reclaimed water being discharged is an effective strategy. Under this scenario, the captured stormwater would not be reducing potable water demand.

Infrastructure Needs

Finally, there is significant infrastructure (**Figure 7**) that would be required to employ cistern and use on a site basis, including piping, storage, treatment, pumping, and separate piping (purple pipes). Questions about sustainability for these systems need to be explored and assessed.

Figure 7. Typical Components of a Stormwater Harvest and Use system.

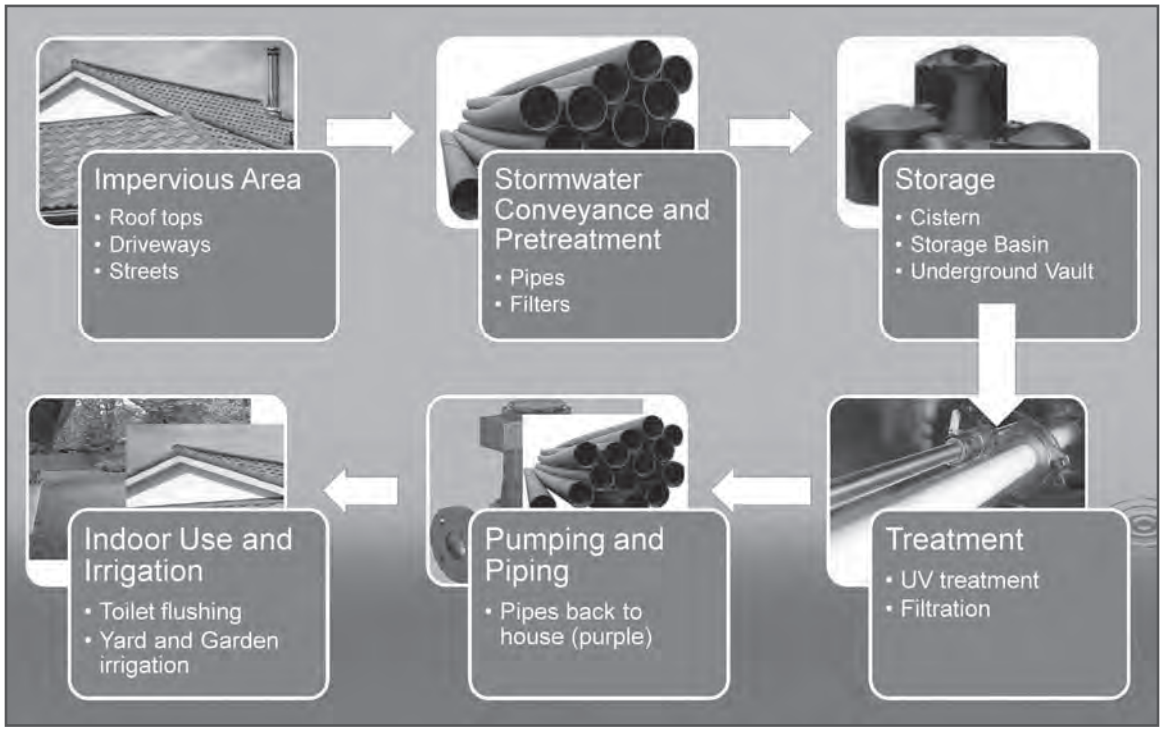

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Stormwater On Site

Key Considerations

Unique Factors

CONCLUSIONS

In Summary:

- Infiltration is often not broadly feasible, effective and/or desirable. While it should be maximized where appropriate, studies are needed to identify suitable areas and also identify areas where infiltration may be feasible but not appropriate.
- Precipitation/runoff patterns in California and much of the West limit the ability of evapotranspiration-based BMPs to achieve retention on site requirements. Evapotranspiration of stormwater should be maximized, but will not be a significant component of retaining stormwater on site in densely developed areas.
- Precipitation/runoff patterns coupled with landscaping and reclaimed water considerations limit the applications where capture and use of runoff can be effective. Generally, only scenarios with high indoor demand and no competing requirements to use reclaimed water can be expected to provide a complete and reliable stormwater solution. Capture and use should be maximized in these cases, but in other cases it should be carefully considered against other options such as biofiltration and discharge to determine which option is most effective in meeting stormwater management goals.
- The overall water balance should be considered when making choices on proper levels of infiltration versus surface runoff.
- There needs to be more technical vetting of "retain on site" and stormwater harvest and use before these approaches are made mandatory.

Each watershed and site has unique soils, topography, groundwater, water quality, land uses, receiving water sensitivities, wastewater strategies, etc. which should be considered when evaluating retention on site as a requirement or strategy. The authors believe that management approaches that are "one size fit all" are not appropriate and in many cases would likely lead to undesirable results.

Proper Stormwater Management Includes:

- Source controls
- Infiltration where feasible and appropriate
- Maximizing ET losses
- Harvest and use where it makes sense
- Capture and treat with effective (i.e. vegetated) BMPs where it makes sense

We believe that significant progress could be made by improving BMP selection and design guidance for all BMPs to better target unit processes (i.e. physical, biological, chemical treatment processes) to the pollutants and parameters of concern for each watershed.

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CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

ORDER NO. R9-2013-0001
NPDES NO. CAS0109266
(AS AMENDED BY ORDER R9-2015-0001)

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The San Diego County Copermittees in Table 1a are subject to waste discharge requirements set forth in this Order.

Table 1a. San Diego County Copermittees

City of Carlsbad	City of Oceanside
City of Chula Vista	City of Poway
City of Coronado	City of San Diego
City of Del Mar	City of San Marcos
City of El Cajon	City of Santee
City of Encinitas	City of Solana Beach
City of Escondido	City of Vista
City of Imperial Beach	County of San Diego
City of La Mesa	San Diego County Regional Airport Authority
City of Lemon Grove	San Diego Unified Port District
City of National City	

~~After the San Diego Water Board receives and considers~~ T~~t~~he Orange County Copermittees~~' Report of Waste Discharge and makes any necessary changes to this Order, the Orange County Copermittees~~ in Table 1b are ~~will become~~ subject to waste discharge requirements set forth in this Order. ~~after expiration of Order No. R9-2009-0002, NPDES No. CAS0108740 on or after December 16, 2014.~~

Table 1b. Orange County Copermittees

City of Aliso Viejo	City of Rancho Santa Margarita
City of Dana Point	City of San Clemente
City of Laguna Beach	City of San Juan Capistrano
City of Laguna Hills	City of Laguna Woods
City of Laguna Niguel	County of Orange
City of Lake Forest[1]	Orange County Flood Control District

[1] The MS4 discharges within the jurisdiction of the City of Lake Forest located in the San Diego Region will be regulated by the Santa Ana Water Board Order No. R8-2014-0002 (NPDES No. CAS618030) and any reissuance thereto subject to the terms of the agreement between San Diego Water Board and Santa Ana Water Board.

City of Mission Viejo	

After the San Diego Water Board receives and considers the Riverside County Copermittees' Report of Waste Discharge and makes any necessary changes to this Order, the Riverside County Copermittees in Table 1c will become subject to waste discharge requirements set forth in this Order after expiration of Order No.R9-2010-0016, NPDES No. CAS0108766 on or after November 10, 2015.

Table 1c. Riverside County Copermittees

City of Murrieta	County of Riverside
City of Temecula	Riverside County Flood Control and Water Conservation District
City of Wildomar	

The ~~Orange County Copermittees and~~ Riverside County Copermittees may become subject to the requirements of this Order at a date earlier than the expiration date of their current Order~~s~~ subject to the conditions described in Provision F.6 of this Order if the Riverside County Copermittees ~~in the respective county~~ receive ~~a~~ notification of coverage from the San Diego Water Board.

The term Copermittee in this Order refers to any San Diego County, Orange County, or Riverside County Copermittee covered under this Order, unless specified otherwise.

This Order provides permit coverage for the Copermittee discharges described in Table 2.

Table 2. Discharge Locations and Receiving Waters

Discharge Points	Locations throughout San Diego Region
Discharge Description	Municipal Separate Storm Sewer System (MS4) Discharges
Receiving Waters	Inland Surface Waters, Enclosed Bays and Estuaries, and Coastal Ocean Waters of the San Diego Region

Table 3. Administrative Information

This Order was adopted by the San Diego Water Board on:	**May 8, 2013**
~~This~~ Order R9-2013-0001 ~~will become~~ became effective on:	**June 27, 2013**
This Order as amended by R9-2015-0001 became effective on:	**April 1, 2015**
This Order will expire on:	**June 27, 2018**
The Copermittees must file a Report of Waste Discharge in accordance with Title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than 180 days in advance of the Order expiration date.	

I, David W. Gibson, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on May 8, 2013, as amended by adoption of Order No. R9-2015-0001 on February 11, 2015.

David W. Gibson
Executive Officer

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Attachment B - Standard Permit Provisions and General Provisions B-1
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I. FINDINGS

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), finds that:

JURISDICTION

1. **MS4 Ownership or Operation.** Each of the Copermittees owns or operates an MS4, through which it discharges storm water and non-storm water into waters of the U.S. within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the U.S.

2. **Legal and Regulatory Authority.** This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]) adopted by the United States Environmental Protection Agency (USEPA), and chapter 5.5, division 7 of the California Water Code (CWC) (commencing with section 13370). This Order serves as an NPDES permit for discharges from MS4s to surface waters. This Order also serves as waste discharge requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

   ~~The San Diego Water Board has the legal authority to issue a regional MS4 permit pursuant to its authority under CWA section 402(p)(3)(B) and 40 CFR 122.26(a)(1)(v). The USEPA also made it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide permits (55 Federal Register [FR] 47990, 48039-48042). The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees and San Diego Water Board.~~

   The federal regulations make it clear that the Copermittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators (40 CFR 122.26(a)(3)(vi)). This Order does not require the Copermittees to manage storm water outside of their jurisdictional boundaries, but rather to work collectively to improve storm water management within watersheds.

3. **CWA NPDES Permit Conditions.** Pursuant to CWA section 402(p)(3)(B), NPDES permits for storm water discharges from MS4s must include requirements to effectively prohibit non-storm water discharges into MS4s, and require controls to reduce the discharge of pollutants in storm water to the maximum extent practicable (MEP), and to require other provisions as the San Diego Water Board determines are appropriate to control such pollutants. This Order prescribes conditions to assure compliance with the CWA requirements for owners and operators of MS4s to

effectively prohibit non-storm water discharges into the MS4s, and require controls to reduce the discharge of pollutants in storm water from the MS4s to the MEP.

4. **CWA and CWC Monitoring Requirements.** CWA section 308(a) and 40 CFR 122.41(h),(j)-(l) and 122.48 require that NPDES permits must specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s also specify additional monitoring and reporting requirements in 40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c). CWC section 13383 authorizes the San Diego Water Board to establish monitoring, inspection, entry, reporting and recordkeeping requirements. This Order establishes monitoring and reporting requirements to implement federal and State requirements. This Order also includes requirements for the Orange County Copermittees to implement a unified approach to beach water quality monitoring and assessment as set forth in Monitoring and Reporting Program No. XX, issued pursuant to CWC sections 13225, 13267, and 13383.

5. **Total Maximum Daily Loads.** CWA section 303(d)(1)(A) requires that "[e]ach state shall identify those waters within its boundaries for which the effluent limitations are not stringent enough to implement any water quality standard applicable to such waters." The CWA also requires states to establish a priority ranking of impaired water bodies known as Water Quality Limited Segments and to establish Total Maximum Daily Loads (TMDLs) for such waters. This priority list of impaired water bodies is called the Clean Water Act Section 303(d) List of Water Quality Limited Segments, commonly referred to as the 303(d) List. The CWA requires the 303(d) List to be updated every two years.

   TMDLs are numerical calculations of the maximum amount of a pollutant that a water body can assimilate and still meet water quality standards. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point sources (waste load allocations or WLAs) and non-point sources (load allocations or LAs), background contribution, plus a margin of safety. Discharges from MS4s are point source discharges. The federal regulations (40 CFR 122.44(d)(1)(vii)(B)) require that NPDES permits incorporate water quality based effluent limitations (WQBELs) developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, consistent with the assumptions and requirements of any available WLA for the discharge. Requirements of this Order implement the TMDLs established ~~adopted~~ by the San Diego Water Board or ~~and~~ ~~approved by~~ USEPA as of the time this Order was ~~is~~ ~~issued~~ amended in 2015. This Order establishes WQBELs consistent with the assumptions and requirements of all available TMDL WLAs assigned to discharges from the Copermittees' MS4s.

6. **Non-Storm Water Discharges.** Pursuant to CWA section 402(p)(3)(B)(ii), this Order requires each Copermittee to effectively prohibit discharges of non-storm water into its MS4. Nevertheless, non-storm water discharges into and from the MS4s continue to be reported to the San Diego Water Board by the Copermittees and other persons. Monitoring conducted by the Copermittees, as well as the 303(d)

List, have identified dry weather, non-storm water discharges from the MS4s as a source of pollutants causing or contributing to receiving water quality impairments in the San Diego Region. The federal regulations (40 CFR 122.26(d)(2)(iv)(B)(1)) require the Copermittees to have a program to prevent illicit discharges to the MS4. The federal regulations, however, allow for specific categories of non-storm water discharges ~~or flows~~ to be addressed as illicit discharges only where such discharges are identified as sources of pollutants to waters of the U.S.

7. ~~**In-Stream Treatment Systems.** Pursuant to federal regulations (40 CFR 131.10(a)), in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S. Authorizing the construction of a runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to accepting waste assimilation as an appropriate use for that water body. Runoff treatment must occur prior to the discharge of runoff into receiving waters. Treatment control best management practices (BMPs) must not be constructed in waters of the U.S. Construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body.~~

DISCHARGE CHARACTERISTICS AND RUNOFF MANAGEMENT

8. **Point Source Discharges of Pollutants.** Discharges from the MS4s may contain waste, as defined in the CWC, and pollutants that adversely affect the quality of the waters of the state. A discharge from an MS4 is a "discharge of pollutants from a point source" into waters of the U.S. as defined in the CWA. Storm water and non-storm water discharges from the MS4s may contain pollutants that cause or threaten to cause a violation of surface water quality standards, as outlined in the Water Quality Control Plan for the San Diego Basin (Basin Plan). Storm water and non-storm water discharges from the MS4s are subject to the conditions and requirements established in the Basin Plan for point source discharges.

9. **Potential Beneficial Use Impairment.** The discharge of pollutants and/or increased flows from MS4s may cause or threaten to cause the concentration of pollutants to exceed applicable receiving water quality objectives and impair or threaten to impair designated beneficial uses resulting in a condition of pollution, contamination, or nuisance.

10. **Pollutants Generated by Land Development.** Land development has created and continues to create new sources of non-storm water discharges and pollutants in storm water discharges as human population density increases. This brings higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash. Pollutants from these sources are dumped or washed off the surface by non-storm water or storm water flows into and from the MS4s. When development converts natural vegetated pervious ground cover to impervious surfaces such as paved highways, streets, rooftops, and parking

lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving a developed area without BMPs that can maintain pre-development runoff conditions will contain greater pollutant loads and have significantly greater runoff volume, velocity, and peak flow rate than pre-development runoff conditions from the same area.

11. **Runoff Discharges to Receiving Waters.** The MS4s discharge runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within the eleven hydrologic units comprising the San Diego Region. Historic and current development makes use of natural drainage patterns and features as conveyances for runoff. Rivers, streams and creeks in developed areas used in this manner are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and receiving water. Numerous receiving water bodies and water body segments have been designated as impaired by the San Diego Water Board pursuant to CWA section 303(d).

12. **Pollutants in Runoff.** The most common pollutants in runoff discharged from the MS4s include total suspended solids, sediment, pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., cadmium, copper, lead, and zinc), petroleum products and polynuclear aromatic hydrocarbons, synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus), oxygen-demanding substances (e.g., decaying vegetation, animal waste), detergents, and trash. As operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not prohibit or otherwise control. These discharges may cause or contribute to a condition of pollution or a violation of water quality standards.

13. **Human Health and Aquatic Life Impairment.** Pollutants in runoff discharged from the MS4s can threaten and adversely affect human health and aquatic organisms. Adverse responses of organisms to chemicals or physical agents in runoff range from physiological responses such as impaired reproduction or growth anomalies to mortality. Increased volume, velocity, rate, and duration of storm water runoff greatly accelerate the erosion of downstream natural channels. This alters stream channels and habitats and can adversely affect aquatic and terrestrial organisms.

14. **Water Quality Effects.** The Copermittees' water quality monitoring data submitted to date documents persistent exceedances of Basin Plan water quality objectives for runoff-related pollutants at various watershed monitoring stations. Persistent toxicity has also been observed at several watershed monitoring stations. In addition, bioassessment data indicate that the majority of the monitored receiving waters have Poor to Very Poor Index of Biological Integrity (IBI) ratings. These findings indicate that runoff discharges are causing or contributing to water quality impairments, and

are a leading cause of such impairments in the San Diego Region. Non-storm water discharges from the MS4s have been shown to contribute significant levels of pollutants and flow in arid, developed Southern California watersheds, and contribute significantly to exceedances of applicable receiving water quality objectives.

15. **Non-Storm Water and Storm Water Discharges.** The discharge of pollutants from the MS4 is subject to the MEP standard notwithstanding whether the pollutants are transported by stormwater or non-stormwater.~~Non-storm water discharges from the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard of CWA section 402(p)(3)(B)(iii), which is explicitly for "Municipal … *Stormwater Discharges* (emphasis added)" from the MS4s.~~ Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s, namely identified illicit discharges and pollutants from unlawful dumping, must be effectively prohibited.

16. **Best Management Practices.** Waste and pollutants which are deposited and accumulate in MS4 drainage structures ~~will~~ may be discharged from these structures to waters of the U.S. unless they are removed. These discharges may cause or contribute to, or threaten to cause or contribute to, a condition of pollution in receiving waters. For this reason, pollutants in storm water discharges from the MS4s can be and must be effectively reduced in runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Pollution prevention is the reduction or elimination of pollutant generation at its source and is the best "first line of defense." Source control BMPs (both structural and non-structural) minimize the contact between pollutants and runoff, therefore keeping pollutants onsite and out of receiving waters. Treatment control BMPs remove pollutants that have been mobilized by storm water or non-storm water flows.

17. **BMP Implementation.** Runoff needs to be addressed during the three major phases of development (planning, construction, and use) in order to reduce the discharge of storm water pollutants to the MEP, effectively prohibit non-storm water discharges, and protect receiving waters. Development which is not guided by water quality planning policies and principles can result in increased pollutant load discharges, flow rates, and flow durations which can negatively affect receiving water beneficial uses. Construction sites without adequate BMP implementation result in sediment runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. Existing development can generate substantial pollutant loads which are discharged in runoff to receiving waters. Retrofitting areas of existing development with storm water pollutant control and hydromodification management BMPs may, in many cases be ~~is~~ necessary to address storm water discharges from existing development that may cause or contribute to a condition of pollution or a violation of water quality standards.

18. **Water Quality Improvements.** Since 1990, the Copermittees have been

developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges to the MS4s and control pollutants in storm water discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the CWA.

19. **Long Term Planning and Implementation.** Federal regulations require municipal storm water permits to expire 5 years from adoption, after which the permit must be renewed and reissued. The San Diego Water Board recognizes that the degradation of water quality and impacts to beneficial uses of the waters in the San Diego Region occurred over several decades. The San Diego Water Board further recognizes that a decade or more may be necessary to realize demonstrable improvement to the quality of waters in the San Diego Region. This Order includes a long term planning and implementation approach that will require more than a single permit term to complete.

WATER QUALITY STANDARDS

20. **Basin Plan.** The San Diego Water Board adopted the Water Quality Control Plan for the San Diego Basin (Basin Plan) on September 8, 1994, that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for receiving waters addressed through the plan. The Basin Plan was subsequently approved by the State Water Resources Control Board (State Water Board) on December 13, 1994. Subsequent revisions to the Basin Plan have also been adopted by the San Diego Water Board and approved by the State Water Board. Requirements of this Order implement the Basin Plan.

    The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Process Supply (PROC), Industrial Service Supply (IND), Ground Water Recharge (GWR), Contact Water Recreation (REC1), Non-contact Water Recreation (REC2), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Freshwater Replenishment (FRSH), Hydropower Generation (POW), and Preservation of Biological Habitats of Special Significance (BIOL). The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region: Navigation (NAV), Commercial and Sport Fishing (COMM), Estuarine Habitat (EST), Marine Habitat (MAR), Aquaculture (AQUA), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN), and Shellfish Harvesting (SHELL).

21. **Ocean Plan.** The State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, and 2005. The State Water Board adopted the latest amendment on April 21, 2005 and it became effective on February 14, 2006. The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean. Requirements of this Order implement the Ocean Plan.

    The Ocean Plan identifies the following beneficial uses of ocean waters of the state to be protected: Industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture; preservation and enhancement of designated Areas of Special Biological Significance; rare and endangered species; marine habitat; fish spawning and shellfish harvesting.

22. **Sediment Quality Control Plan**. On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes: 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

23. **National Toxics Rule and California Toxics Rule.** USEPA adopted the National Toxics Rule (NTR) on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the NTR applied in California. On May 18, 2000, USEPA adopted the California Toxics Rule (CTR). The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants.

24. **Antidegradation Policy.** This Order is in conformance with the federal Antidegradation Policy described in 40 CFR 131.12, and State Water Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality Waters in California*. Federal regulations at 40 CFR 131.12 require that the State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. State Water Board Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies.

25. **Anti-Backsliding Requirements.** Section 402(o)(2) of the CWA and federal regulations at 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations may be relaxed. All effluent limitations in this Order are at least as stringent as effluent limitations in the previous permits.

CONSIDERATIONS UNDER FEDERAL AND STATE LAW

26. **Coastal Zone Act Reauthorization Amendments.** Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states with approved coastal zone management programs to address non-point source pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point source pollution: agriculture, silviculture, urban, marinas, and hydromodification. This Order addresses the management measures required for the urban category, with the exception of septic systems. The runoff management programs developed pursuant to this Order fulfills the need for coastal cities to develop a runoff non-point source plan identified in the Non-Point Source Program Strategy and Implementation Plan. The San Diego Water Board addresses septic systems through the administration of other programs.

27. **Endangered Species Act.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 USC sections 1531 to 1544). This Order requires compliance with receiving water limits, and other requirements to protect the beneficial uses of waters of the State. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

28. **Report of Waste Discharge Process.** The waste discharge requirements set forth in this Order are based upon the Report of Waste Discharge submitted by the San Diego County Copermittees prior to the expiration of Order No. R9-2007-0001 (NPDES No. CAS0109266) and the Report of Waste Discharge submitted by the Orange County Copermittees prior to the expiration of Order No. R9-2009-0002 (CAS0108740). The ~~Orange County and~~ Riverside County Copermittees are not immediately covered by the waste discharge requirements in this Order. The San Diego Water Board understands that each municipality is unique ~~although the Counties share watersheds and/or geographical boundaries~~. The Order will continue to use the Report of Waste Discharge process prior to initially making ~~Orange County or~~ Riverside County Copermittees subject to the requirements of this Order.

The federal regulations (40 CFR 122.21(d)(2)) and CWC section 13376 impose a duty on the Copermittees to reapply for continued coverage through submittal of a Report of Waste Discharge no later than 180 days prior to expiration of a currently

effective permit. This requirement is set forth in the ~~Orange County Copermittees' and~~ Riverside County Copermittees' currently effective permit~~s~~ at Provision~~s K.2.b and~~ K.2.c~~, respectively~~. The ~~Orange County Permit, Order No. R9-2009-0002 (NPDES No. CAS0108740) expires on December 16, 2014 and the~~ Riverside County MS4 Permit, Order No. R9-2010-0016 (NPDES No. CAS0108766) expires on November 10, 2015.

Unless the ~~Orange County or~~ Riverside County Copermittees apply for and receive early coverage under this Order, ~~the Orange County Copermittees' and~~ the Riverside County Copermittees' ~~respective~~ permit~~s~~ will be superseded by this Order upon expiration of their ~~respective~~ permit~~s~~, subject to any necessary revisions to the requirements of this Order made after the San Diego Water Board considers their ~~respective~~ Report~~s~~ of Waste Discharge through the public process provided in 40 CFR Part 124.

29. Regional Water Board Designation. The Cities of Laguna Hills, Laguna Woods, and Lake Forest are located partially within the jurisdictions of the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board) and the San Diego Water Board and their dischargers are subject to regulation by both Regional Water Boards. Pursuant to CWC section13228, the Cities of Laguna Hills, Laguna Woods, and Lake Forest submitted written requests that one Regional Water Board be designated to regulate Phase I MS4 discharges for each of the Cities. The Santa Ana Water Board and the San Diego Water Board have entered into an agreement whereby the San Diego Water Board is designated to regulate Phase I MS4 discharges within the jurisdiction of the Cities of Laguna Woods and Laguna Hills and the Santa Ana Water Board is designated to regulate Phase I MS4 discharges within the jurisdiction of the City of Lake Forest pursuant to MS4 permits administered by each Regional Water Board. The agreement provides that the City of Lake Forest will be required to retain, and continue implementation of, its over-irrigation discharge prohibition in Title 15, Chapter 14.030, List (b) of the City Municipal Code for regulating storm water quality throughout its jurisdiction. The City of Lake Forest will also be required to actively participate during development and implementation of the Aliso Creek Watershed Management Area Water Quality Improvement Plan required pursuant to this Order. Each Regional Water Board retains the authority to enforce provisions of the Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee (Water Code section 13228 (b)). Under the terms of the agreement, any TMDL and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Laguna Woods, Laguna Hills or Lake Forest as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement of the applicable TMDL will remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's San Diego Creek/Newport Bay TMDL and the San Diego Water Board's Indicator Bacteria Project I Beaches and Creeks TMDL. The San

Diego Water Board will periodically review the effectiveness of the agreement during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate the agreement with Santa Ana Water Board or otherwise modify the agreement subject to the approval of the Santa Ana Water Board.

29.30. **Integrated Report and Clean Water Act Section 303(d) List.** The San Diego Water Board and State Water Board submit an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. USEPA issued its *Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act* on July 29, 2005, which advocates the use of a five category approach for classifying the attainment status of water quality standards for water bodies in the Integrated Report. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 in the Integrated Report are placed on the 303(d) List.

Water bodies with available data and/or information that indicate at least one beneficial use is not being supported or is threatened, but a TMDL is not required, are included in Category 4 in the Integrated Report. Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

Implementation of the requirements of this Order may allow the San Diego Water Board to include surface waters impaired by discharges from the Copermittees' MS4s in Category 4 in the Integrated Report for consideration during the next 303(d) List submittal by the State to USEPA.

30.31. **Economic Considerations.** The California Supreme Court has ruled that although CWC section 13263 requires the State and Regional Water Boards (collectively Water Boards) to consider factors set forth in CWC section 13241 when issuing an NPDES permit, the Water Board may not consider the factors to justify imposing pollutant restrictions that are less stringent than the applicable federal regulations require. (*City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 618, 626-627.) However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

As noted in the following finding, the San Diego Water Board finds that the requirements in this Order are not more stringent than the minimum federal requirements. Therefore, a CWC section 13241 analysis is not required for permit requirements that implement the effective prohibition on the discharge of non-storm

water into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determined appropriate to control such pollutants, as those requirements are mandated by federal law. Notwithstanding the above, the San Diego Water Board has developed an economic analysis of the requirements in this Order. The economic analysis is provided in the Fact Sheet.

31.32. **Unfunded Mandates.** This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following:

a. This Order implements federally mandated requirements under CWA section 402 (33 USC section 1342(p)(3)(B)).

b. The local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental and new dischargers who are issued NPDES permits for storm water and non-storm water discharges.

c. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order.

d. The Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)) and in lieu of numeric restrictions on their MS4 discharges (i.e. effluent limitations).

e. The local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under State law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

f. The provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state develops a TMDL, federal law requires that permits must contain water quality based effluent limitations consistent with the assumptions and requirements of any applicable wasteload allocation (40 CFR 122.44(d)(1)(vii)(B)).

See the Fact Sheet for further discussion of unfunded mandates.

32.33. **California Environmental Quality Act.** The issuance of waste discharge requirements and an NPDES permit for the discharge of runoff from MS4s to waters of the U.S. is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 et seq.) in accordance with CWC section 13389.

STATE WATER BOARD DECISIONS

33.34. **Compliance with Prohibitions and Limitations.** The receiving water limitation language specified in this Order is consistent with language recommended by the USEPA and established in State Water Board Order WQ 99-05, *Own Motion Review of the Petition of Environmental Health Coalition to Review Waste Discharge Requirements Order No. 96-03, NPDES Permit No. CAS0108740*, adopted by the State Water Board on June 17, 1999. The receiving water limitation language in this Order requires storm water discharges from MS4s to not cause or contribute to a violation of water quality standards, which is to be achieved through an iterative approach requiring the implementation of improved and better-tailored BMPs over time. Implementation of the iterative approach to comply with receiving water limitations based on applicable water quality standards is necessary to ensure that storm water discharges from the MS4 will not ultimately cause or contribute to violations of water quality standards and will not create conditions of pollution, contamination, or nuisance.

34.35. **Special Conditions for Areas of Special Biological Significance.** On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving an general exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges (General Exception). On June 19, 2012, the State Water Board adopted Order No. 2012-0031, amending the General Exception to require pollutant reductions to be achieved within six years in accordance with ASBS Compliance Plans and ASBS Pollution Prevention Plans. The General Exception State Water Board Resolution No. 2012-0012 requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject to the terms and conditions of the General Exception as amended State Water Board Resolution No. 2012-0012. The Special Protections contained in Attachment B to the General Exception as amendedResolution No. 2012-0012, are applicable to these discharges, and are hereby incorporated into Attachment A of this Order. as if fully set forth herein.

ADMINISTRATIVE FINDINGS

35.36. **Executive Officer Delegation of Authority.** The San Diego Water Board by prior resolution has delegated all matters that may legally be delegated to its Executive Officer to act on its behalf pursuant to CWC section 13223. Therefore, the Executive Officer is authorized to act on the San Diego Water Board's behalf on any matter within this Order unless such delegation is unlawful under CWC section 13223 or this Order explicitly states otherwise.

FINDINGS

36.37. **Standard Provisions.** Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR 122.42, are provided in Attachment B to this Order.

37.38. **Fact Sheet.** The Fact Sheet for this Order contains background information, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of this Order. The Fact Sheet is hereby incorporated into this Order and constitutes part of the Findings of this Order.

38.39. **Public Notice.** In accordance with State and federal laws and regulations, the San Diego Water Board notified the Copermittees, and interested agencies and persons of its intent to prescribe waste discharge requirements for the control of discharges into and from the MS4s to waters of the U.S. and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet.

39.40. **Public Hearings.** The San Diego Water Board held a public hearing on April 10 and 11, 2013, that was continued to May 8, 2013 and heard and considered all comments pertaining to the terms and conditions of this Order. The San Diego Water Board also held a public hearing on February 11, 2015, and heard and considered all comments pertaining to the amendment of this Order through Order No. R9-2015-0001. Details of these public hearing are provided in the Fact Sheet.

40.41. **Effective Date.** This Order serves as an NPDES permit pursuant to CWA section 402 or amendments thereto, and as to the San Diego County Copermittees listed in Table 2.a., became becomes effective fifty (50) days after the date of its adoption, and as to the Orange County Copermittees listed in Table 2.b., becomes effective on April 1, 2015 after the date Order R9-2015-0001 is adopted, provided that the Regional Administrator, USEPA, Region IX, does not object to this Order.

41.42. **Review by the State Water Board.** Any person aggrieved by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with CWC section 13320 and California Code of Regulations, title 23, sections 2050, et seq and following. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date of this Order San Diego Water Board action, except that if the thirtieth day following the actiondate of this Order falls on a Saturday, Sunday or State holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

THEREFORE, IT IS HEREBY ORDERED that the Copermittees, in order to meet the provisions contained in division 7 of the CWC (commencing with section 13000) and regulations adopted thereunder, and the provisions of the CWA and regulations adopted thereunder, must each comply with the requirements of this Order. This action in no way prevents the San Diego Water Board from taking enforcement action for past violations of the previous Order. If any part of this Order is subject to a temporary stay of enforcement, unless otherwise specified, the Copermittees must comply with the analogous portions of the previous Order, which will remain in effect for all purposes during the pendency of the stay.

II. PROVISIONS

A. PROHIBITIONS AND LIMITATIONS

~~The purpose of this provision is to describe the conditions under which storm water and non-storm water discharges into and from MS4s are prohibited or limited.~~ The goal of the prohibitions and limitations is to protect the water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through the implementation of water quality improvement strategies and runoff management programs that effectively prohibit non-storm water discharges into the Copermittees' MS4s, and reduce pollutants in storm water and non-stormwater discharges from the Copermittees' MS4s to the MEP. The process for determining compliance with the Discharge Prohibitions (A.1), Receiving Water Limitations (A.2), and Effluent Limitations (A.3, including effluent limitations derived from the TMDL requirements – Attachment E) is defined in Provision A.4.

1. Discharge Prohibitions

a. Except as provided for in Provisions A.1.e or A.4, d~~D~~ischarges from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the state are prohibited.

b. Non-storm water discharges into MS4s are to be effectively prohibited, through the implementation of Provision E.2, unless such discharges are ~~authorized by a separate NPDES permit~~a category of non-storm water discharges that must be addressed pursuant to Provisions E.2.a.(1) – (5) of this Order.

c. Discharges from MS4s are subject to all waste discharge prohibitions in the Basin Plan, included in Attachment A to this Order.

d. Storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 applicable to these discharges, included in Attachment A to this Order. All other discharges from the Copermittees' MS4s to ASBS are

prohibited.

e. For discharges associated with water body pollutant combinations addressed in a TMDL in Attachment E of this Order, the affected Copermittees shall achieve compliance as outlined in Attachment E.

2. Receiving Water Limitations

a. Discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters, including but not limited to all applicable provisions contained in the list below to the extent that they remain in effect and are operative, unless such discharges are being addressed by the Compermittee(s) through processes set forth in this Order (Provision A.4 and Attachment E). Where a TMDL has been developed and its terms have been incorporated into this Order (in a manner that is consistent with the waste load allocations set forth in the TMDL), a Permittee shall also be considered in compliance with such TMDL-related requirements provided in this Order, if it is timely and in good faith implementing the MEP-compliant control measures otherwise established by this Order.:

(1) The San Diego Water Board's Basin Plan, including beneficial uses, water quality objectives, and implementation plans;

(2) State Water Board plans for water quality control including the following:

(a) Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries (Thermal Plan), and

(b) The Ocean Plan, including beneficial uses, water quality objectives, and implementation plans;

(3) State Water Board policies for water and sediment quality control including the following:

(a) Water Quality Control Policy for the Enclosed Bays and Estuaries of California,

(b) Sediment Quality Control Plan which includes the following narrative objectives for bays and estuaries:

(i) Pollutants in sediments shall not be present in quantities that, alone or in combination, are toxic to benthic communities, and

(ii) Pollutants shall not be present in sediments at levels that will bioaccumulate in aquatic life to levels that are harmful to human health,

(c) The Statement of Policy with Respect to Maintaining High Quality of

Waters in California;[2]

(4) Priority pollutant criteria promulgated by the USEPA through the following:

(a) National Toxics Rule (NTR)[3] (promulgated on December 22, 1992 and amended on May 4, 1995), and

(b) California Toxics Rule (CTR).[4,5]

b. Discharges from MS4s composed of storm water runoff must not alter natural ocean water quality in an ASBS.

c. For receiving water limitations associated with water body pollutant combination addressed in a TMDL in Attachment E of this Order, the affected Copermittees shall achieve compliance as outlined in Attachment E.

[2] State Water Board Resolution No. 68-16
[3] 40 CFR 131.36
[4] 65 Federal Register 31682-31719 (May 18, 2000), adding Section 131.38 to 40 CFR
[5] If a water quality objective and a CTR criterion are in effect for the same priority pollutant, the more stringent of the two applies, unless a previous regulatory action (i.e. TMDL) has specified otherwise.

3. Effluent Limitations

a. Technology Based Effluent Limitations

Pollutants in storm water discharges from MS4s must be reduced to the MEP.[6]

b. Water Quality Based Effluent Limitations

Each Copermittee must comply with applicable WQBELs established for the TMDLs in Attachment E to this Order, pursuant to the applicable TMDL compliance schedules.

4. Compliance with Discharge Prohibitions, ~~and~~ Receiving Water Limitations, and Effluent Limitations

Each Copermittee must achieve compliance with Provisions A.1, A.2, and A.3 ~~A.1.a, A.1.c and A.2.a~~ of this Order through timely implementation of control measures and other actions as specified in Provisions B and E of this Order, including any modifications. The Water Quality Improvement Plans required under Provision B must be designed and adapted to ultimately achieve compliance with Provisions A.1, A.2, and A.3 ~~A.1.a, A.1.c and A.2.a~~.

a. Except as provided in Parts 4.c, 4.d, 4.e, or 4.f below, discharges from the MS4 for which a Copermittee is responsible shall not cause or contribute to an exceedance of any applicable water quality standard.

b. Except as provided in Parts 4.c, 4.d, 4.e, or 4.f below, discharges from the MS4 of storm water, or non-storm water, for which a Copermittee is responsible, shall not cause a condition of nuisance.

~~a.~~c. In instances where discharges from the MS4 for which the Copermittee is responsible (1) causes or contributes to an exceedance of any applicable water quality standard or causes a condition of nuisance in the receiving water; (2) the receiving water is not subject to an approved TMDL that is in effect for the constituent(s) involved; and (3) the constituent(s) associated with the discharge is otherwise not specifically addressed by a provision of this Order (such as specific scheduled actions in a Water Quality Improvement Plan), the Copermittee shall comply with the following iterative procedure:~~If exceedance(s) of water quality standards persist in receiving waters notwithstanding implementation of this Order, the Copermittees must comply with the following procedures~~:

(1) ~~For exceedance(s) of a water quality standard in the process of being~~

[6] This does not apply to MS4 discharges which receive subsequent treatment to reduce pollutants in storm water discharges to the MEP prior to entering receiving waters (e.g., low flow diversions to the sanitary sewer). Runoff treatment must occur prior to the discharge of runoff into receiving waters per Finding 7.

addressed by the Water Quality Improvement Plan, the Copermittee(s) must implement the Water Quality Improvement Plan as accepted by the San Diego Water Board, and update the Water Quality Improvement Plan, as necessary, pursuant to Provision F.2.c;

(2) Upon a determination by either the Copermittees or the San Diego Water Board that discharges from the MS4 are causing or contributing to a new exceedance of an applicable water quality standard not addressed by the Water Quality Improvement Plan, the Copermittees must submit the following updates to the Water Quality Improvement Plan pursuant to Provision F.2.c or as part of the Water Quality Improvement Plan Annual Report required under Provision F.3.b, unless the San Diego Water Board directs an earlier submittal: Submit a report to the Regional Water Board that:

(a) Summarizes and evaluates water quality data associated with the pollutant of concern in the context of applicable water quality objectives including the magnitude and frequency of the exceedances.

(b) Includes a work plan to identify the sources of the constituents of concern (including those not associated with the MS4 such that non-MS4 sources can be pursued).

(c) Describes the strategy and schedule for implementing best management practices (BMPs) and other controls (including those that are currently being implemented) that will address the Permittee's sources of constituents that are causing or contributing to the exceedances of an applicable water quality standard or causing a condition of nuisance, and are reflective of the severity of the exceedances. The strategy shall demonstrate that the selection of BMPs will address the Permittee's sources of constituents and include a mechanism for tracking BMP implementation. The strategy shall provide for future refinement pending the results of the source identification work plan noted in 4.c.(a)(ii) above.

(d) Outlines, if necessary, additional monitoring to evaluate improvement in water quality and, if appropriate, special studies that will be undertaken to support future management decisions.

(e) Includes a methodology (ies) that will assess the effectiveness of the BMPs to address the exceedances.

(f) This report may be submitted in conjunction with the Annual Report unless the Regional Water Board directs an earlier submittal.

(a)(g) The water quality improvement strategies being implemented that are effective and will continue to be implemented,

(b)(h) Water quality improvement strategies (i.e. BMPs, retrofitting

projects, stream and/or habitat rehabilitation projects, adjustments to jurisdictional runoff management programs, etc.) that will be implemented to reduce or eliminate any pollutants or conditions that are causing or contributing to the exceedance of water quality standards,

(c) Updates to the schedule for implementation of the existing and additional water quality improvement strategies, and

(d)(i) Updates to the monitoring and assessment program to track progress toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a of this Order;

(3) The San Diego Water Board may require the incorporation of additional modifications to the Water Quality Improvement Plan required under Provision B. The applicable Copermittees must submit any modifications to the update to the Water Quality Improvement Plan within 90 days of notification that additional modifications are required by the San Diego Water Board, or as otherwise directed Submit any modifications to the report required by the Regional Water Board within 60 days of notification. The Report is deemed approved within 60 days of its submission if no reponse is received from the Regional Water Board;

(4) Implement the actions specified in the report in accordance with the acceptance or approval, including the implementation schedule and any modifications to this Order.

(5) As long as the Permittee has complied with the procedure set forth above and is implementing the actions, the Permittee does not have to repeat the same procedure for continuing or recurring exceedances of the same receiving water limitations unless directed by the Regional Water Board to develop additional BMPs.

(3)(6) The information developed pursuant to A.4.c must be evaluated and incorporated into the Water Quality Improvement Plans and/or the Jurisdictional Runoff Management Plans, as needed.

(4) Within 90 days of the San Diego Water Board determination that the modifications to the Water Quality Improvement Plan required under Provision A.4.a.(3) meet the requirements of this Order, the applicable Copermittees must revise the jurisdictional runoff management program documents to incorporate the modified water quality improvement strategies that have been and will be implemented, the implementation schedule, and any additional monitoring required; and

(5)(7) Each Copermittee must implement the updated Water Quality Improvement Plan.

d. For Receiving Water Limitations associated with waterbody-pollutant combinations addressed in an adopted TMDL that is in effect and that has been incorporated in this Order, a Permittee that is in compliance with Attachment E (Total Maximum Daily Load Provisions) is in compliance with Parts 4.a and 4.b above. For Receiving Water Limitations associated with waterbody-pollutant combinations on the CWA 303(d) list, which are not otherwise addressed by Attachment E or other applicable pollutant-specific provision of this Order, a Permittee that is in compliance with Part 4.c is in compliance with Parts 4.a and 4.b..

e. The procedure set forth above to achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order do not have to be repeated for continuing or recurring exceedances of the same water quality standard(s) following implementation of scheduled actions unless directed to do otherwise by the San Diego Water Board.

b.f. Alternatively, a Permittee that is in compliance with Provision B (Development and Implementation of Water Quality Improvement Plans) is in compliance with Parts 4.a and 4.b above

c.g. If a Permittee is found to have discharges from the MS4 for which it is responsible that causes an exceedance of an applicable water quality standard in the receiving water or causes a condition of nuisance in the receiving water, the Permittee shall be in compliance with Parts 4.a and 4.b above, if the Permittee is in compliance with Parts 4.c, 4.d, or 4.e, or requirements otherwise covered by a provision of this Order specifically addressing the constituent in question, as applicable..Nothing in Provisions A.4.a and A.4.b prevents the San Diego Water Board from enforcing any provision of this Order while the applicable Copermittees prepare and implement the above update to the Water Quality Improvement Plan and jurisdictional runoff management programs.

B. WATER QUALITY IMPROVEMENT PLANS[7]

The purpose of this provision is to develop Water Quality Improvement Plans (WQIPs) that guide the Copermittees' jurisdictional runoff management programs towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plans is to further the Clean Water Act's objective to protect, preserve, enhance, and ~~restore~~ protect the water quality and designated beneficial uses of waters of the state. Therefore, implementation of the WQIPs also provides the basis for complying with Provisions A.1, A.2, and A.3, as described in Provision A.4. This goal will be accomplished through an adaptive planning and management process that identifies the highest priority water quality conditions within a watershed and implements strategies through the jurisdictional runoff management programs to achieve improvements in the quality of discharges from the MS4s and receiving waters. As such, the requirements outlined in Provision E. may be modified for consistency with the WQIP priorities for the applicable Watershed management Area, is appropriate justification is provided.

1. Watershed Management Areas

The Copermittees must develop a Water Quality Improvement Plan for each of the Watershed Management Areas in Table B-1. A total of ten Water Quality Improvement Plans must be developed for the San Diego Region.

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
San Juan (901.00)	South Orange County	- Aliso Creek - San Juan Creek - San Mateo Creek - Pacific Ocean - Heisler Park ASBS	- City of Aliso Viejo[1] - City of Dana Point[1] - City of Laguna Beach[1] - City of Laguna Hills[1] - City of Laguna Niguel[1] - City of Laguna Woods[1] - City of Lake Forest[1~~2~~] - City of Mission Viejo[1] - City of Rancho Santa Margarita[1] - City of San Clemente[1] - City of San Juan Capistrano[1] - County of Orange[1] - Orange County Flood Control District[1]
Santa Margarita (902.00)	Santa Margarita River	- Murrieta Creek - Temecula Creek - Santa Margarita River - Santa Margarita Lagoon - Pacific Ocean	- City of Murrieta[~~2~~3] - City of Temecula[~~2~~3] - City of Wildomar[~~2~~3] - County of Riverside[~~2~~3] - County of San Diego[~~3~~4] - Riverside County Flood Control and Water Conservation District[~~2~~3]

[7] Once developed and approved, the Water Quality Improvement Plan and corresponding Jurisdictional Runoff Management Plan will functionally replace the Load Reduction Plans.

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
San Luis Rey (903.00)	San Luis Rey River	- San Luis Rey River - San Luis Rey Estuary - Pacific Ocean	- City of Oceanside - City of Vista - County of San Diego
Carlsbad (904.00)	Carlsbad	- Loma Alta Slough - Buena Vista Lagoon - Agua Hedionda Lagoon - Batiquitos Lagoon - San Elijo Lagoon - Pacific Ocean	- City of Carlsbad - City of Encinitas - City of Escondido - City of Oceanside - City of San Marcos - City of Solana Beach - City of Vista - County of San Diego
San Dieguito (905.00)	San Dieguito River	- San Dieguito River - San Dieguito Lagoon - Pacific Ocean	- City of Del Mar - City of Escondido - City of Poway - City of San Diego - City of Solana Beach - County of San Diego
Penasquitos (906.00)	Penasquitos	- Los Penasquitos Lagoon - Pacific Ocean	- City of Del Mar - City of Poway - City of San Diego - County of San Diego
	Mission Bay	- Mission Bay - Pacific Ocean - San Diego Marine Life Refuge ASBS	- City of San Diego
San Diego (907.00)	San Diego River	- San Diego River - Pacific Ocean	- City of El Cajon - City of La Mesa - City of San Diego - City of Santee - County of San Diego
Pueblo San Diego (908.00) Sweetwater (909.00) Otay (910.00)	San Diego Bay	- Sweetwater River - Otay River - San Diego Bay - Pacific Ocean	- City of Chula Vista - City of Coronado - City of Imperial Beach - City of La Mesa - City of Lemon Grove - City of National City - City of San Diego - County of San Diego - San Diego County Regional Airport Authority - San Diego Unified Port District
Tijuana (911.00)	Tijuana River	- Tijuana River - Tijuana Estuary - Pacific Ocean	- City of Imperial Beach - City of San Diego - County of San Diego

Notes:

1. The MS4 discharges within the jurisdiction of the City of Laguna Hills and the City of Laguna Woods located in the Santa Ana Region will be regulated by San Diego Water Board Order No. R9-2013-0001. The City of Laguna Hills and Laguna Woods must also comply with the requirements of the San Diego Creek/Newport Bay TMDL in section XVIII of Santa Ana Water Board Order No. R8-2014-0002 and any reissuance thereto.

2. ~~The Orange County Copermittees will be covered under this Order after expiration of Order No. R9-2009-0002, or earlier if the Orange County Copermittees meet the conditions in Provision F.6.~~The MS4 discharges within the jurisdiction of the City of Lake Forest located in the San Diego Region will be regulated by the Santa Ana Water Board Order No. R8-2014-0002 (NPDES No. CAS618030) and any reissuance thereto. The City of Lake Forest must also comply with the requirements of the Bacteria TMDL in Attachment E of this Order, participate in preparation and implementation of the Water Quality Improvement Plan for the Aliso Creek Watershed Management Area as described in Provision B of this Order and continue implementation of its over-irrigation discharge prohibition in Title 15, Chapter 15, section 14.030, List (b).

~~2.~~3. The Riverside County Copermittees will be covered under this Order after expiration of Order No. R9-2010-0016, or earlier if the Riverside County Copermittees meet the conditions in Provision F.6.

~~3~~4.. The County of San Diego is not required to implement the requirements of Provision B for its jurisdiction within the Santa Margarita River Watershed Management Area until the Riverside County Copermittees have been notified of coverage under this

Order. The County of San Diego is required to implement the requirements of Provisions D, F.3.b, and Attachment E until the Riverside County Copermittees have been notified of coverage under this Order.

2. Priority Water Quality Conditions

The Copermittees must identify the water quality priorities within each Watershed Management Area that will be addressed by the Water Quality Improvement Plan. Where appropriate, Watershed Management Areas may be separated into subwatersheds to focus water quality prioritization and jurisdictional runoff management program implementation efforts by receiving water.

a. Assessment of Receiving Water Conditions

The Copermittees must consider the following, at a minimum, to identify water quality priorities based on impacts of MS4 discharges on receiving water beneficial uses:

(1) Receiving waters listed as impaired on the CWA Section 303(d) List of Water Quality Limited Segments (303(d) List);

(2) TMDLs adopted and under development by the San Diego Water Board;

(3) Receiving waters recognized as sensitive or highly valued by the Copermittees, including estuaries designated under the National Estuary Program under CWA section 320, wetlands defined by the State or U.S. Fish and Wildlife Service's National Wetlands Inventory as wetlands, waters having the Preservation of Biological Habitats of Special Significance (BIOL) beneficial use designation, and receiving waters identified as ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(4) The receiving water limitations of Provision A.2;

(5) Known historical versus current physical, chemical, and biological water quality conditions;

(6) Available, relevant, and appropriately collected and analyzed physical, chemical, and biological receiving water monitoring data, including, but not limited to, data describing:

(a) Chemical constituents,

(b) Water quality parameters (i.e. pH, temperature, conductivity, etc.),

(c) Toxicity Identification Evaluations for both receiving water column and sediment,

(d) Trash impacts,

(e) Bioassessments, and

(f) Physical habitat;

(7) Available evidence of erosional impacts in receiving waters due to accelerated flows (i.e. hydromodification);

(8) Available evidence of adverse impacts to the chemical, physical, and biological integrity of receiving waters; and

(9) The potential improvements in the overall condition of the Watershed Management Area that can be achieved.

b. ASSESSMENT OF IMPACTS FROM MS4 DISCHARGES

The Copermittees must consider the following, at a minimum, to identify the potential impacts to receiving waters that may be caused or contributed to by discharges from the Copermittees' MS4s:

(1) The discharge prohibitions of Provision A.1 and effluent limitations of Provision A.3; and

(2) Available, relevant, and appropriately collected and analyzed storm water and non-storm water monitoring data from the Copermittees' MS4 outfalls;

(3) Locations of each Copermittee's MS4 outfalls that discharge to receiving waters;

(4) Locations of MS4 outfalls that are known to persistently discharge non-storm water to receiving waters likely causing or contributing to impacts on receiving water beneficial uses;

(5) Locations of MS4 outfalls that are known to discharge pollutants in storm water causing or contributing to impacts on receiving water beneficial uses; and

(6) The potential improvements in the quality of discharges from the MS4 that can be achieved.

c. IDENTIFICATION OF PRIORITY WATER QUALITY CONDITIONS

(1) The Copermittees must use the information gathered for Provisions B.2.a and B.2.b to develop a list of priority water quality conditions as pollutants, stressors and/or receiving water conditions that are the highest threat to receiving water quality or that most adversely affect the quality of receiving

waters. The list must include the following information for each priority water quality condition:

(a) The beneficial use(s) associated with the priority water quality condition;

(b) The geographic extent of the priority water quality condition within the Watershed Management Area, if known;

(c) The temporal extent of the priority water quality condition (e.g., dry weather and/or wet weather);

(d) The Copermittees with MS4s discharges that may cause or contribute to the priority water quality condition; and

(e) An assessment of the adequacy of and data gaps in the monitoring data to characterize the conditions causing or contributing to the priority water quality condition, including a consideration of spatial and temporal variation.

(2) The Copermittees must identify the highest priority water quality conditions to be addressed by the Water Quality Improvement Plan, and provide a rationale for selecting a subset of the water quality conditions identified pursuant to Provision B.2.c.(1) as the highest priorities.

d. IDENTIFICATION OF MS4 SOURCES OF POLLUTANTS AND/OR STRESSORS

The Copermittees must identify and prioritize known and suspected sources of storm water and non-storm water pollutants and/or other stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c. The identification of known and suspected sources of pollutants and/or stressors that cause or contribute to the highest priority water quality conditions as identified for Provision B.2.c must consider the following:

(1) Pollutant generating facilities, areas, and/or activities within the Watershed Management Area, including:

(a) Each Copermittee's inventory of construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas,

(b) Publicly owned parks and/or recreational areas,

(c) Open space areas,

(d) All currently operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste, and

(e) Areas not within the Copermittees' jurisdictions (e.g., Phase II MS4s, tribal lands, state lands, federal lands) that are known or suspected to be discharging to the Copermittees' MS4s;

(2) Locations of the Copermittees' MS4s, including the following:

(a) All MS4 outfalls that discharge to receiving waters, and

(b) Locations of major structural controls for storm water and non-storm water (e.g., retention basins, detention basins, major infiltration devices, etc.);

(3) Other known and suspected sources of non-storm water or pollutants in storm water discharges to receiving waters within the Watershed Management Area, including the following:

(a) Other MS4 outfalls (e.g., Phase II Municipal and Caltrans),

(b) Other NPDES permitted discharges,

(c) Any other discharges that may be considered point sources (e.g., private outfalls), and

(d) Any other discharges that may be considered non-point sources (e.g., agriculture, wildlife or other natural sources);

(4) Review of available data, including but not limited to:

(a) Findings from the Copermittees' illicit discharge detection and elimination programs,

(b) Findings from the Copermittees' MS4 outfall discharge monitoring,

(c) Findings from the Copermittees' receiving water monitoring,

(d) Findings from the Copermittees' MS4 outfall discharge and receiving water assessments, and

(e) Other available, relevant, and appropriately collected data, information, or studies related to pollutant sources and/or stressors that contribute to the highest priority water quality conditions as identified for Provision B.2.c.

(5) The adequacy of the available data to identify and prioritize sources and/or stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c.

e. IDENTIFICATION OF POTENTIAL WATER QUALITY IMPROVEMENT STRATEGIES

The Copermittees must evaluate the findings identified under Provisions B.2.a-d, and identify potential strategies that can result in improvements to water quality

in MS4 discharges and/or receiving waters within the Watershed Management Area. Potential water quality improvement strategies that may be implemented within the Watershed Management Area must include the following:

(1) Structural BMPs, non-structural BMPs, incentives, or programs that can potentially be implemented to address the highest priority water quality conditions identified under Provision B.2.c, or MS4 sources of pollutants or stressors identified under Provision B.2.d,

(2) Retrofitting projects in areas of existing development within the Watershed Management Area that can potentially be implemented to reduce MS4 sources of pollutants or stressors identified under Provision B.2.d causing or contributing to the highest priority water quality conditions identified under Provision B.2.c, and

(3) Stream, channel, and/or habitat rehabilitation projects within the Watershed Management Area that can potentially be implemented to protect and/or improve conditions in receiving waters from MS4 pollutants and/or stressors identified under Provision B.2.d causing or contributing to the highest priority water quality conditions identified under Provision B.2.c.

3. Water Quality Improvement Goals, Strategies and Schedules

The Copermittees must identify and develop specific water quality improvement goals and strategies to address the highest priority water quality conditions identified within a Watershed Management Area. The water quality improvement goals and strategies must address the highest priority water quality conditions by effectively prohibiting non-storm water discharges to the MS4, reducing pollutants in storm water discharges from the MS4 to the MEP, and protecting the water quality standards of receiving waters.

a. Water Quality Improvement Goals and Schedules

(1) Numeric Goals

The Copermittees must develop and incorporate numeric goals[8] into the Water Quality Improvement Plan. Numeric goals must be used to support Water Quality Improvement Plan implementation and measure reasonable progress towards addressing the highest priority water quality conditions identified under Provision B.2.c. Action levels and numeric goals,

[8] Interim and final numeric goals may take a variety of forms such as TMDL established WQBELs, action levels, pollutant concentration, load reductions, number of impaired water bodies delisted from the List of Water Quality Impaired Segments, Index of Biotic Integrity (IBI) scores, or other appropriate metrics. Interim and final numeric goals are not necessarily limited to one criterion or indicator, but may include multiple criteria and/or indicators. Except for TMDL established WQBELs, interim and final numeric goals and corresponding schedules may be revised through the adaptive management process under Provision B.5.

themselves, are not enforceable compliance standards, effluent limits, or receiving water limitations. The Copermittees must establish and incorporate the following numeric goals in the Water Quality Improvement Plan:

(a) Final numeric goals must be based on measureable criteria or indicators capable of demonstrating one or more of the following:

(i) Discharges from the Copermittees' MS4s will not cause or contribute to exceedances of water quality standards in receiving waters, AND/OR

(ii) The conditions of receiving waters and associated habitat are protected from MS4 discharges, AND/OR

(iii) Beneficial uses of receiving waters are protected from MS4 discharges and will be supported.

(b) Interim numeric goals must be based on measureable criteria or indicators capable of demonstrating reasonable incremental progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges as follows:

(i) One or more interim numeric goals may be established to demonstrate progress toward achieving each final numeric goal,

(ii) For each final numeric goal, at least one interim numeric goal must be expressed as a reasonable increment toward achievement of the final numeric goal,

(iii) For each final numeric goal, reasonable interim numeric goals must be established to be accomplished during each 5 year period between the acceptance of the Water Quality Improvement Plan and the achievement of the final numeric goals.

(2) Schedules for Achieving Numeric Goals

The Copermittees must develop and incorporate schedules for achieving the numeric goals into the Water Quality Improvement Plan. The schedules must demonstrate reasonable progress toward achieving the final numeric goals required for Provision B.3.a.(1). The Copermittees must incorporate the schedules for achieving the numeric goals into the Water Quality Improvement Plan based on the following considerations:

(a) Final dates for achieving all final numeric goals must be established considering the following:

(i) Final compliance dates for any applicable TMDLs in Attachment E to this Order;

(ii) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see

Attachment A);

(iii) Achievement of the final numeric goals for the highest water quality priorities must be as soon as possible;

(iv) Final dates for achieving the final numeric goals must reflect a realistic assessment of the shortest practicable time required based on the temporal and spatial extent and factors associated with the highest priority water quality conditions identified under Provision B.2.c, and taking into account the time reasonably required to implement the water quality improvement strategies required pursuant to Provision B.3.b.

(b) Interim dates for achieving all interim numeric goals must be established considering the following:

(i) Interim compliance dates for any applicable TMDLs in Attachment E to this Order;

(ii) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(iii) Interim dates for achieving the interim numeric goals must reflect a realistic assessment of the shortest practicable time reasonably required, taking into account the time needed to implement new or significantly expanded programs and securing financing, if necessary; and

(iv) ~~(iv)~~ For each final numeric goal, at least one interim numeric goal must be established that the Copermittees will work toward achieving within the term of this Order.

(b) The schedules for achieving the interim and final goals will be evaluated with each annual report and/or as a part of the ROWD development to determine if they should be modified

b. WATER QUALITY IMPROVEMENT STRATEGIES AND SCHEDULES

Based on the likely effectiveness and efficiency of the potential water quality improvement strategies identified under Provision B.2.e to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a, the Copermittees must identify the strategies that will be implemented in each Watershed Management Area as follows:

(1) Jurisdictional Strategies

(a) Each Copermittee in the Watershed Management Area must identify the strategies that will be implemented within its jurisdiction as part of its jurisdictional runoff management program requirements under Provisions E.2 through E.7, including descriptions of the following:

(i) For each of the inventories developed for its jurisdiction, as required under Provisions D.2.a.(1), E.3.e.(2), E.4.b, and E.5.a, each Copermittee must identify the known and suspected areas or sources causing or contributing to the highest priority water quality conditions in the Watershed Management Area that the Copermittee will focus on in its efforts to effectively prohibit non-storm water discharges to its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, and achieve the interim and final numeric goals identified under Provision B.3.a;

(ii) BMPs that each Copermittee will implement, or require to be implemented, as applicable, for those areas or sources within its jurisdiction;

(iii) Education programs that each Copermittee will implement, as applicable, for those areas or sources within its jurisdiction;

(iv) Frequencies that each Copermittee will conduct inspections on those areas or sources within its jurisdiction;

(v) Incentive and enforcement programs that each Copermittee will implement, as applicable, for those areas or sources within its jurisdiction; and

(vi) Any other BMPs, incentives, or programs that each Copermittee will implement for those areas or sources within its jurisdiction.

(b) Identify the optional jurisdictional strategies that each Copermittee will implement within its jurisdiction, as necessary, to effectively prohibit non-storm water discharges to its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. Descriptions of the optional jurisdictional strategies must include:

(i) BMPs, incentives, or programs that may be implemented by the Copermittee within its jurisdiction in addition to the requirements of Provisions B.3.b.(1)(a);

(ii) Incentives or programs that may be implemented by the Copermittee to encourage or implement projects to retrofit areas of existing development within its jurisdiction;

(iii) Incentives or programs that may be implemented by the Copermittee to encourage or implement projects that will rehabilitate the conditions of channels or habitats within its jurisdiction;

(iv) The funds and/or resources that must be secured by the Copermittee to implement the optional strategies described for Provisions B.3.b.(1)(b)(i)-(iii) within its jurisdiction; and

(v) The circumstances necessary to trigger implementation of the optional jurisdictional strategies, in addition to the requirements of Provision B.3.b.(1)(a), to achieve the interim and final numeric goals within the schedules established under Provision B.3.a.

(c) Identify the strategies that will be implemented by the Copermittee in coordination with or with the cooperation of other agencies (e.g. Caltrans, water districts, school districts) and/or entities (e.g. non-governmental organizations) within its jurisdiction.

(2) Watershed Management Area Strategies

The Copermittees must identify the optional regional or multi-jurisdictional strategies that will be implemented in the Watershed Management Area, as necessary, to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. Descriptions of the optional regional or multi-jurisdictional strategies must include:

(a) Regional or multi-jurisdictional BMPs, incentives, or programs that may be implemented by the Copermittees in the Watershed Management Area;

(b) Incentives or programs that may be implemented by the Copermittees in the Watershed Management Area to encourage or implement regional or multi-jurisdictional projects to retrofit areas of existing development;

(c) Incentives or programs that may be implemented by the Copermittees to encourage or implement regional or multi-jurisdictional projects that will rehabilitate the conditions of channels, streams, or habitats within the Watershed Management Area;

(d) The funds and/or resources that must be secured by the Copermittees to implement the optional strategies described for Provisions B.3.b.(2)(a)-(c) within the Watershed Management Area; and

(e) The circumstances necessary to trigger implementation of the optional regional or multi-jurisdictional strategies to achieve the interim and final

numeric goals within the schedules established under Provision B.3.a.

(3) Schedules for Implementing Strategies

The Copermittees must develop reasonable schedules for implementing the water quality improvement strategies identified under Provisions B.3.b.(1) and B.3.b.(2) to achieve the interim and final numeric goals identified and schedules established under Provision B.3.a. The Copermittees must incorporate the schedules to implement the water quality improvement strategies into the Water Quality Improvement Plan as follows:

(a) Each Copermittee must develop schedules for the jurisdictional strategies identified pursuant to Provisions B.3.b.(1)(a)-(b). Each schedule must specify:

(i) If each jurisdictional strategy identified pursuant to Provision B.3.b.(1)(a) will or will not be initiated upon acceptance of the Water Quality Improvement Plan;

(ii) For each jurisdictional strategy identified pursuant to Provision B.3.b.(1)(a) that will not be initiated upon acceptance~~approval~~ of the Water Quality Improvement Plan, the shortest practicable time in which each jurisdictional strategy will be initiated after acceptance of the Water Quality Improvement Plan;

(iii) For each optional jurisdictional strategy identified pursuant to Provision B.3.b.(1)(b), a realistic assessment of the shortest practicable time required to:

[a] Secure the resources needed to fund the optional jurisdictional strategy, and
[b] Procure the resources, materials, labor, and applicable permits necessary to initiate implementation of the optional jurisdictional strategy;

(iv) If each jurisdictional strategy identified pursuant to Provisions B.3.b.(1)(a)-(b) is expected to be continuously implemented (e.g. inspections) or completed within a schedule (e.g. construction of structural BMP); and

(v) If a jurisdictional strategy identified pursuant to Provisions B.3.b.(1)(a)-(b) is expected to be completed within a schedule, the anticipated time to complete based on a realistic assessment of the shortest practicable time required.

(b) The Copermittees in the Watershed Management Area must develop schedules for the regional or multi-jurisdictional strategies identified

pursuant to Provision B.3.b.(2). Each schedule must specify:

(i) A realistic assessment of the shortest practicable time to:

[a] Secure the resources needed to fund the optional regional or multi-jurisdictional strategy, and

[b] Procure the resources, materials, labor, and permits necessary to initiate the implementation of the optional regional or multi-jurisdictional strategy;

(ii) If each regional or multi-jurisdictional strategy identified pursuant to Provision B.3.b.(2) is expected to be continuously implemented (e.g. inspections) or completed within a schedule (e.g. construction of structural BMP); and

(iii) If a regional or multi-jurisdictional strategy and/or activity identified pursuant to Provisions B.3.b.(2) is expected to be completed within a schedule, the anticipated time to complete based on a realistic assessment of the shortest practicable time required.

(4) Optional Watershed Management Area Analysis

(a) For each Watershed Management Area, the Copermittees have the option to perform a Watershed Management Area Analysis for the purpose of developing watershed-specific requirements for structural BMP implementation, as described in Provision E.3.c.(3). The Watershed Management Area Analysis must include GIS layers (maps) as output. The analysis must include the following information, to the extent it is available, in order to characterize the Watershed Management Areas:

(i) A description of dominant hydrologic processes, such as areas where infiltration or overland flow likely dominates;

(ii) A description of existing streams in the watershed, including bed material and composition, and if they are perennial or ephemeral;

(iii) Current and anticipated future land uses;

(iv) Potential coarse sediment yield areas; and

(v) Locations of existing flood control structures and channel structures, such as stream armoring, constrictions, grade control structures, and hydromodification or flood management basins.

(b) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify and compile a list of candidate projects that could potentially be used as alternative compliance options for Priority Development Projects, to be implemented in lieu of onsite structural BMP performance requirements

described in Provisions E.3.c.(1) and E.3.c.(2). Specifically, the Copermittees must identify opportunities to be included in the list of candidate projects in each Watershed Management Area, such as:

(i) Stream or riparian area rehabilitation;

(ii) Retrofitting existing infrastructure to incorporate storm water retention or treatment;

(iii) Regional BMPs;

(iv) Groundwater recharge projects;

(v) Water supply augmentation projects; and

(vi) Land purchases to preserve floodplain functions.

(c) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify areas within the Watershed Management Area where it is appropriate to allow Priority Development Projects to be exempt from the hydromodification management BMP performance requirements described in Provision E.3.c.(2), including supporting rationale.

4. Water Quality Improvement Monitoring and Assessment Program

a. The Copermittees in each Watershed Management Area must develop and incorporate an integrated monitoring and assessment program into the Water Quality Improvement Plan that assesses: 1) the progress toward achieving the numeric goals and schedules, 2) the progress toward addressing the highest priority water quality conditions for each Watershed Management Area, and 3) each Copermittee's overall efforts to implement the Water Quality Improvement Plan.

b. The monitoring and assessment program must incorporate the monitoring and assessment requirements of Provision D, which may allow the Copermittees to modify the program to be consistent with and focus on the highest priority water quality conditions for each Watershed Management Area.

c. For Watershed Management Areas with applicable TMDLs, the monitoring and assessment program must incorporate the specific monitoring and assessment requirements of Attachment E.

d. For Watershed Management Areas with any ASBS, the water quality monitoring and assessment program must incorporate the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

5. Iterative Approach and Adaptive Management Process

The Copermittees in each Watershed Management Area must implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1, A.2, and A.3 ~~A.1.a, A.1.c and A.2.a~~, and must include the following:

a. Re-Evaluation of Priority Water Quality Conditions

The priority water quality conditions and potential water quality improvement strategies included in the Water Quality Improvement Plan pursuant to Provisions B.2.c and B.2.e may be re-evaluated by the Copermittees as needed during the term of this Order as part of the Water Quality Improvement Plan Annual Report. Re-evaluation and recommendations for modifications to the priority water quality conditions and potential water quality improvement strategies must be provided in the Report of Waste Discharge, and must consider the following:

(1) Achieving the outcome of improved water quality in MS4 discharges and receiving waters through implementation of the water quality improvement strategies identified in the Water Quality Improvement Plan;

(2) New information developed when the requirements of Provisions B.2.a-c have been re-evaluated;

(3) Spatial and temporal accuracy of monitoring data collected to inform prioritization of water quality conditions and implementation strategies to address the highest priority water quality conditions;

(4) Availability of new information and data from sources other than the jurisdictional runoff management programs within the Watershed Management Area that informs the effectiveness of the actions implemented by the Copermittees;

(5) San Diego Water Board recommendations; and

(6) Recommendations for modifications solicited through a public participation process.

b. Adaptation of Goals, Strategies and Schedules

The water quality improvement goals, strategies and schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.3, must be re-evaluated and adapted as new information becomes available to result in more effective and efficient measures to address the highest priority water quality

conditions identified pursuant to Provision B.2.c. Re-evaluation of and modifications to the water quality improvement goals, strategies and schedules must be provided in the Water Quality Improvement Plan Annual Report, and must consider the following:

(1) Modifications to the priority water quality conditions based on Provision B.5.a;

(2) Progress toward achieving interim and final numeric goals in receiving waters and MS4 discharges for the highest priority water quality conditions in the Watershed Management Area,

(3) Progress toward achieving outcomes according to established schedules;

(4) New policies or regulations that may affect identified numeric goals;

(5) Measurable or demonstrable reductions of non-storm water discharges to and from each Copermittee's MS4;

(6) Measurable or demonstrable reductions of pollutants in storm water discharges from each Copermittee's MS4 to the MEP;

(7) New information developed when the requirements of Provisions B.2.b and B.2.d have been re-evaluated;

(8) Efficiency in implementing the Water Quality Improvement Plan;

(9) San Diego Water Board recommendations; and

(10) Recommendations for modifications solicited through a public participation process.

c. ADAPTATION OF MONITORING AND ASSESSMENT PROGRAM

The water quality improvement monitoring and assessment program, included in the Water Quality Improvement Plan pursuant to Provision B.4, must be re-evaluated and adapted when new information becomes available. Re-evaluation and recommendations for modifications to the monitoring and assessment program, pursuant to the requirements of Provision D, may be provided in the Water Quality Improvement Plan Annual Report, but must be provided in the Report of Waste Discharge.

6. Water Quality Improvement Plan Submittal, Updates, and Implementation

a. The Copermittees must submit and commence implementation of the Water

Quality Improvement Plans in accordance with the requirements of Provision F.1.

b. The Copermittees must submit proposed updates to the Water Quality Improvement Plan for acceptance by the San Diego Water Board Executive Officer in accordance with the requirements of Provision F.2.c.

C. ACTION LEVELS

The purpose of this provision is for the Copermittees to incorporate numeric non-stormwater action levels (NALs) and stormwater action levels (SALs) in the Water Quality Improvement Plans and numeric non-stormwater action levels (NALs) in the Illicit Discharge Detection and Elimination (IDDE) Program.

- For the purposes of the WQIPs, t~~T~~he goal of the action levels is to guide Water Quality Improvement Plan implementation efforts and measure progress towards the protection of the high priority water quality conditions and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through monitoring and assessing the quality of the MS4 discharges during the implementation of the Water Quality Improvement Plans.

- For the purposes of the IDDE Program, the goal of the action levels is to assist in the effective prohibition of non-stormwater discharges into the MS4.

Action levels will be developed and incorporated into the WQIP (Provision B) and the IDDE Program (Provision E). Depending upon the goals/objectives for the use of the action levels and the priority receiving water conditions, the constituents and values at which they are set may differ between watersheds. Copermittees may:

- Use existing action levels;
- Develop Watershed Management Area specific numeric action levels for non-stormwater and stormwater MS4 discharges using an approach approved by the Regional Board; or
- Use the default non-stormwater and stormwater action levels prescribed in C.1 and C.2 below.

The Copermittees will submit the action levels as a part of the WQIP and JURMP submittals. The action levels currently established will serve as the interim action levels until revised action levels are completed and approved. Exceedances of the action levels are not subject to enforcement or non-compliance actions under this Order.

1. Default Non-Storm Water Action Levels[9]

The following non-stormwater action levels (NALs) must be incorporated in the WQIPs and IDDE program if the Copermittees have not developed their own NALs for the identified high priority constituents using an approach listed above.~~The~~

[9] NALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, unless the NAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed.

~~Copermittees must develop and incorporate numeric non-storm water action levels (NALs) into the Water Quality Improvement Plan to: 1) support the development and prioritization of water quality improvement strategies for effectively prohibiting non-storm water discharges to the MS4s, 2) assess the effectiveness of the water quality improvement strategies toward addressing MS4 non-storm water discharges, required pursuant to Provision D.4.b.(1), and 3) support the detection and elimination of non-storm water and illicit discharges to the MS4, required pursuant to Provision E.2.~~[10]

a. The following NALs must be incorporated:

(1) Non-Storm Water Discharges from MS4s to Ocean Surf Zone

Table C-1. Non-Storm Water Action Levels for Discharges from MS4s to Ocean Surf Zone

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Total Coliform	MPN/100 ml	1,000	-	10,000/1,000[1]	OP
Fecal Coliform	MPN/100 ml	200[2]	-	400	OP
Enterococci	MPN/100 ml	35	-	104[3]	OP

Abbreviations/Acronyms
AMAL – average monthly action level
OP – Ocean Plan water quality objective
MDAL – maximum daily action level
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Total coliform density NAL is 1,000 MPN/100 ml when the fecal/total coliform ratio exceeds 0.1.
2. Fecal coliform density NAL is 200 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas."

(2) Non-Storm Water Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Table C-2. Non-Storm Water Action Levels for Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Turbidity	NTU	75	-	225	OP
pH	Units	Within limit of 6.0 to 9.0 at all times			OP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	35	-	104[3]	BP
Priority Pollutants	µg/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
OP – Ocean Plan water quality objective
NTU – Nephelometric Turbidity Units
µg/L – micrograms per liter
MDAL – maximum daily action level
BP – Basin Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas" and is not applicable to water bodies that are not designated with the water contact recreation (REC-1) beneficial use.

[10] The Copermittees may utilize NALs or other benchmarks currently established by the Copermittees as interim NALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

PROVISION C: ACTION LEVELS
C.1. Non-Storm Water Action Levels

Table C-3. Non-Storm Water Action Levels for Priority Pollutants

Parameter	Units	Freshwater (CTR)		Saltwater (CTR)	
		MDAL	AMAL	MDAL	AMAL
Cadmium	µg/L	**	**	16	8
Copper	µg/L	*	*	5.8	2.9
Chromium III	µg/L	**	**	-	-
Chromium VI	µg/L	16	8.1	83	41
Lead	µg/L	*	*	14	2.9
Nickel	µg/L	**	**	14	6.8
Silver	µg/L	*	*	2.2	1.1
Zinc	µg/L	*	*	95	47

Abbreviations/Acronyms:
CTR – California Toxic Rule
AMAL – average monthly action level
µg/L – micrograms per liter
MDAL – maximum daily action level

Notes:
* Action levels developed on a case-by-case basis (see below)
** Action levels developed on a case-by-case basis (see below), but calculated criteria are not to exceed Maximum Contaminant Levels (MCLs) under the California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64431

The Cadmium, Copper, Chromium (III), Lead, Nickel, Silver and Zinc NALs for MS4 discharges to freshwater receiving waters will be developed on a case-by-case basis based on site-specific water quality data (receiving water hardness). For these priority pollutants, refer to 40 CFR 131.38(b)(2).

(3) Non-Storm Water Discharges from MS4s to Inland Surface Waters

Table C-4. Non-Storm Water Action Levels for Discharges from MS4s to Inland Surface Waters

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Dissolved Oxygen	mg/L	Not less than 5.0 in WARM waters and not less than 6.0 in COLD waters			BP
Turbidity	NTU	-	20	See MDAL	BP
pH	Units	Within limit of 6.5 to 8.5 at all times			BP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	33	-	61[3]	BP
Total Nitrogen	mg/L	-	1.0	See MDAL	BP
Total Phosphorus	mg/L	-	0.1	See MDAL	BP
MBAS	mg/L	-	0.5	See MDAL	BP
Iron	mg/L	-	0.3	See MDAL	BP
Manganese	mg/L	-	0.05	See MDAL	BP
Priority Pollutants	µg/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
BP – Basin Plan water quality objective
COLD – cold freshwater habitat beneficial use
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
MDAL – maximum daily action level
WARM – warm freshwater habitat beneficial use
MBAS – Methylene Blue Active Substances
MPN/100 ml – most probable number per 100 milliliters
µg/L – micrograms per liter

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for freshwater "designated beach areas" and is not applicable to water bodies that are not designated with the water contact recreation (REC-1) beneficial use.

b. If not identified in Provision C.1.a, NALs must be identified, developed and incorporated in the Water Quality Improvement Plan for any pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in receiving waters associated with the highest priority water quality conditions related to non-storm water discharges from the MS4s. NALs must be based on:

(1) Applicable water quality standards which may be dependent upon site-specific or receiving water-specific conditions or assumptions to be identified by the Copermittees; or

(2) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. ~~For the NALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary NALs specific to the Watershed Management Area at levels greater than the NALs required by Provisions C.1.a and C.1.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for effectively prohibiting non-storm water discharges to the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and from the MS4. The~~

~~secondary NALs may be developed using an approach acceptable to the San Diego Water Board.~~

d. Dry weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.b may be utilized to develop or revise NALs based on watershed-specific data, subject to San Diego Water Board Executive Officer approval.

2. Default Storm Water Action Levels[11]

The Copermittees must develop and incorporate numeric storm water action levels (SALs) in the Water Quality Improvement Plans to: 1) support the development and prioritization of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s, and 2) assess the effectiveness of the water quality improvement strategies toward reducing pollutants in storm water discharges, required pursuant to Provision D.4.b.(2).[12]

The following stormwater action levels (SALs) must be incorporated in the WQIPs if the Copermittees have not developed their own SALs for the identified high priority constituents using an approach approved by the Regional Board.

a. The following SALs for discharges of storm water from the MS4 must be incorporated:

Table C-5. Storm Water Action Levels for Discharges from MS4s to Receiving Waters

Parameter	Units	Action Level
Turbidity	NTU	126
Nitrate & Nitrite (Total)	mg/L	2.6
Phosphorus (Total P)	mg/L	1.46
Cadmium (Total Cd)*	µg/L	3.0
Copper (Total Cu)*	µg/L	127
Lead (Total Pb)*	µg/L	250
Zinc (Total Zn)*	µg/L	976

Abbreviations/Acronyms:
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
µg/L – micrograms per liter

Notes:
* The sampling must include a measure of receiving water hardness at each MS4 outfall. If a total metal concentration exceeds the corresponding metals SAL in Table C-5, that concentration must be compared to the California Toxics Rule criteria and the USEPA 1-hour maximum concentration for the detected level of receiving water hardness associated with that sample. If it is determined that the sample's total metal concentration for that specific metal

[11] SALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, unless the SAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed.

[12] The Copermittees may utilize SALs or other benchmarks currently established by the Copermittees as interim SALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

exceeds that SAL, but does not exceed the applicable USEPA 1-hour maximum concentration criterion for the measured level of hardness, then the sample result will not be considered above the SAL for that measurement.

b. If not identified in Provision C.2.a, SALs must be identified, developed and incorporated in the Water Quality Improvement Plan for pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in receiving waters associated with the highest priority water quality conditions related to storm water discharges from the MS4s. SALs must be based on:

(1) Federal and State water quality guidance and/or water quality standards; and

(2) Site-specific or receiving water-specific conditions; or

(3) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. ~~For the SALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary SALs specific to the Watershed Management Area at levels greater than the SALs required by Provisions C.2.a and C.2.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s. The secondary SALs may be developed based on the approaches recommended by the State Water Board's Storm Water Panel[13] or using an approach acceptable to the San Diego Water Board~~.

d. Wet weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.c may be used to develop or revise SALs based upon watershed-specific data, subject to San Diego Water Board Executive Officer approval.

[13] ~~Storm Water Panel Recommendations to the California State Water Resources Control Board: The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities (June 2006)~~

D. MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS

The purpose of this provision is for the Copermittees to monitor and assess the impact on the conditions of receiving waters caused by discharges from the Copermittees' MS4s under wet weather and dry weather conditions. The goal of the monitoring and assessment program is to inform the Copermittees about the nexus between the health of receiving waters and the water quality condition of the discharges from their MS4s. This goal will be accomplished through monitoring and assessing the conditions of the receiving waters, discharges from the MS4s, pollutant sources and/or stressors, and effectiveness of the water quality improvement strategies implemented as part of the Water Quality Improvement Plans.

1. Receiving Water Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the condition of the receiving waters in each Watershed Management Area during dry weather and wet weather. Following San Diego Water Board acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct long-term receiving water monitoring during implementation of the Water Quality Improvement Plan to assess the long term trends and determine if conditions in receiving waters are improving. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following receiving water monitoring procedures:

a. TRANSITIONAL RECEIVING WATER MONITORING

Until the monitoring requirements and schedules of Provisions D.1.b-e are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following receiving water monitoring in the Watershed Management Area:

(1) Continue the receiving water monitoring programs required in Order Nos. R9-2007-0001 (Monitoring and Reporting Program No. R9-2007-0001 Sections II.A.1-A.5), R9-2009-0002, and R9-2010-0016;

(2) Continue the monitoring in the Hydromodification Management Plans approved by the San Diego Water Board;

(3) Participate in the following regional receiving water monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring,

(b) Southern California Bight Regional Monitoring, and

(c) Sediment Quality Monitoring;

(4) Implement the monitoring programs developed as part of any implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) for the TMDLs in Attachment E to this Order; and

(5) For Watershed Management Areas with ASBS, implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

b. LONG-TERM RECEIVING WATER MONITORING STATIONS

The Copermittees must select at least one long-term receiving water monitoring station from among the existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees to be representative of the receiving water quality in the Watershed Management Area. Additional long-term receiving water monitoring stations must be selected where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

c. DRY WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three dry weather monitoring events at each of the long-term receiving water monitoring stations. At least one monitoring event must be conducted during the dry season (May 1 – September 30) and at least one monitoring event must be conducted during a dry weather period during the wet season (October 1 – April 30), after the first wet weather event of the season, with an antecedent dry period of at least 72 hours following a storm event producing measureable rainfall of greater than 0.1 inch.

(1) Dry Weather Receiving Water Field Observations

For each dry weather monitoring event, the Copermittees must record field observations consistent with Table D-1 at each long-term receiving water monitoring station.

Table D-1 Field Observations for Receiving Water Monitoring Stations

Table D-1. Field Observations for Receiving Water Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) • Station description (i.e. deposits or stains, vegetation condition, structural condition, and observable biology) • Presence and assessment of trash in and around station

(2) Dry Weather Receiving Water Field Monitoring

For each dry weather monitoring event, if conditions allow the collection of the data, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

Table D-2 Field Monitoring Parameters for Receiving Water Monitoring Stations

Table D-2. Field Monitoring Parameters for Receiving Water Monitoring Stations

Parameters
• pH • Temperature • Specific conductivity • Dissolved oxygen • Turbidity

(3) Dry Weather Receiving Water Analytical Monitoring

For each dry weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable NAL constituents, and

(v) Constituents listed in Table D-3.

Table D-3 Analytical Monitoring Constituents for Receiving Water Monitoring Stations

Table D-3. Analytical Monitoring Constituents for Receiving Water Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Pesticides	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Mercury • Nickel • Selenium • Thallium • Zinc	• Organophosphate Pesticides • Pyrethroid Pesticides	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for ~~Fecal~~ Total Coliform at inland receiving water monitoring stations.

(4) Dry Weather Receiving Water Toxicity Monitoring

For each dry weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for aquatic toxicity in accordance with Table D-4. When the State Water Board's Policy for Toxicity Assessment and Control (Toxicity Policy) is approved and in effect, the San Diego Water Board Executive Officer may direct the Copermittees to replace current toxicity program elements with standardized procedures in the Toxicity Policy.

Table D-4 Dry Weather Toxicity Testing for Receiving Water Monitoring Stations

Table D-4. Dry Weather Chronic[1] Toxicity Testing for Receiving Water Monitoring Stations

Organism	Units	Test	USEPA Protocol
Freshwater			
Pimephales promelas (Fathead Minnow)	Pass / Fail	Larval Survival and Growth	EPA-821-R-02-013
Ceriodaphnia dubia (*Daphnid*)	Pass / Fail	Survival and Production	EPA-821-R-02-013
Selenastrum capricornutum (Green Algae)	Pass / Fail	Growth	EPA-821-R-02-013
Marine and Estuarine			
Strongylocentrotus purpuratus *(Purple Sea Urchin)*	Pass / Fail	Embryo-Larval Development	EPA-600-R-95-136

Notes:
1. Chronic toxicity testing is not required at receiving water monitoring stations located at mass loading stations if the channel flows are diverted year-round during dry weather conditions to the sanitary sewer for treatment.

(a) Freshwater Test Species and Methods: If samples are collected in receiving waters with salinity less than 1 ppt, the Copermittees must follow the methods for chronic toxicity tests as established in 40 CFR 136.3 using a single-concentration test design for routine monitoring, or a five-concentration test design for additional toxicity testing if the limitation is exceeded. The Copermittees must estimate the critical life stage chronic toxicity on undiluted samples in accordance with species and short term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms (EPA-821-R-02-013; Table IA, 40 CFR 136). Additional test species may be used by the Copermittees if approved by the San Diego Water Board Executive Officer. The Copermittees must conduct:

(i) A static renewal toxicity test with the fathead minnow, *Pimephales promelas* (Larval Survival and Growth Test Method 1000.0);

(ii) A static renewal toxicity test with the daphnid, *Ceriodaphnia dubia* (Survival and Reproduction Test Method 1002.0); and

(iii) A static renewal toxicity test with the green alga, *Selenastrum capricornutum* (also named *Raphidocelis subcapitata*) (Growth Test Method 1003.0).

(b) Marine and Estuarine Test Species and Methods: If samples are collected in receiving waters with salinity greater or equal to 1 ppt, the Copermittees must follow the methods for chronic toxicity tests as established in 40 CFR 136.3 using a single-concentration test design for routine monitoring, or a five-concentration test design for additional toxicity testing if the limitation is exceeded. The Copermittees must conduct the following critical life state chronic toxicity tests on undiluted samples in accordance with species and short term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms (EPA-600-R-95-136; 1995). Artificial sea salts must be used to increase sample salinity. The Copermittees must conduct a static non-renewal toxicity test with the purple sea urchin, *Strongylocentrotus purpuratus* (Embryo-larval Development Test Method). Additional species may be used by the Copermittees if approved by the San Diego Water Board Executive Officer.

(c) Holding Times: All toxicity tests must be conducted as soon as possible following sample collection. The 36-hour sample holding time for test initiation shall be targeted. However, no more than 72 hours shall elapse before the conclusion of sample collection and test initiation.

(d) Test Species Sensitivity Screening: To determine the most sensitive test species for freshwater, the Copermittees must screen 2 wet weather and 2 dry weather toxicity tests with a vertebrate, an invertebrate, and a plant species. After this screening period, subsequent monitoring must be conducted using the most sensitive test species. Alternatively, if a sensitive test species has already been determined, or if there is prior knowledge of potential toxicant(s) and a test species is sensitive to such toxicant(s), then monitoring must be conducted using only that test species. Sensitive test species determinations must also consider the most sensitive test species used for proximal receiving water monitoring. Rescreening must occur once each permit term.

(e) Chronic toxicity test biological endpoint data must be analyzed using the Test of Significant Toxicity t-test approach specified in *National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document* (USEPA, Office of Wastewater Management, Washington, D.C., EPA-833-R-10-003, 2010). For this monitoring program, the critical chronic instream waste concentration (IWC) is set at 100 percent receiving water (i.e. no dilution) for receiving water samples. A 100 percent receiving water and a control must be tested.

(f) Toxicity Identification Evaluation (TIE) / Toxicity Reduction Evaluation (TRE): If chronic toxicity is detected in receiving waters, the Copermittees must discuss the need for conducting a TIE/TRE in the assessments required under Provision D.4.a.(2), and develop a plan for implementing the TIE/TRE to be incorporated in the Water Quality Improvement Plan.

(5) Dry Weather Receiving Water Bioassessment Monitoring

Bioassessment monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must conduct bioassessment monitoring during at least one dry weather monitoring event at each long-term receiving water monitoring station as follows:

(a) The following bioassessment samples and measurements must be collected:

(i) Macroinvertebrate samples must be collected in accordance with the "Reachwide Benthos (Multihabitat) Procedure" in the most current Surface Water Ambient Monitoring Program (SWAMP) Bioassessment Standard Operating Procedures (SOP), and amendments, as applicable;[14]

(ii) The "Full" suite of physical habitat characterization measurements must be collected in accordance with the most current SWAMP Bioassessment SOP, and as summarized in the SWAMP Stream Habitat Characterization Form – Full Version;[15] and

(iii) Freshwater algae samples must be collected in accordance with the SWAMP Standard Operating Procedures for Collecting Algae Samples.[16] Analysis of samples must include algal taxonomic composition (diatoms and soft algae) and algal biomass.

(b) The bioassessment samples, measurements, and appropriate water chemistry data must be used to calculate the following:

(i) An Index of Biological Integrity (IBI) for macroinvertebrates for each monitoring station where bioassessment monitoring was conducted, based on the most current calculation method;[17] and

[14] Ode, P.R.. 2007. Standard operating procedures for collecting macroinvertebrate samples and associated physical and chemical data for ambient bioassessments in California. California State Water Resources Control Board Surface Water Ambient Monitoring Program (SWAMP) Bioassessment SOP 001. http://www.swrcb.ca.gov/water_issues/programs/swamp/tools.shtml#monitoring

[15] Available at: http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/reports/fieldforms_fullversion052908.pdf

[16] Fetscher et al. 2009. Standard Operating Procedures for Collecting Stream Algae Samples and Associated Physical Habitat and Chemical Data for Ambient Bioassessments in California.

[17] The most current calculation method at the time the Order was adopted is outlined in "A Quantitative Tool for Assessing the Integrity of Southern California Coastal Streams" (Ode, et al. 2005. Environmental Management. Vol. 35, No. 1, pp. 1-13). If an updated or new calculation method is developed, either both (i.e. current and updated/new) methods must be used, or historical IBIs must be recalculated with the updated or new calculation method.

(ii) An IBI for algae for each monitoring station where bioassessment monitoring was conducted, when a calculation method is developed.[18]

(c) In lieu of the requirements of Provision D.1.c.(5)(a), the Copermittees may conduct the bioassessment monitoring in accordance with the "Triad" assessment approach[19] to calculate the IBIs required for Provision D.1.c.(5)(b). The Copermittees must conduct sampling, analysis, and reporting of specified in-stream biological and habitat data according to the protocols specified in the SCCWRP Technical Report No. 539, or subsequent protocols, if developed.

(6) Dry Weather Receiving Water Hydromodification Monitoring

In addition to the hydromodification monitoring conducted as part of the Copermittees' Hydromodification Management Plans, hydromodification monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must collect the following hydromodification monitoring observations and measurements within an appropriate domain of analysis during at least one dry weather monitoring event for each long-term receiving water monitoring station:

(a) Channel conditions, including:

(i) Channel dimensions,

(ii) Hydrologic and geomorphic conditions, and

(iii) Presence and condition of vegetation and habitat;

(b) Location of discharge points;

(c) Habitat integrity;

(d) Photo documentation of existing erosion and habitat impacts, with location (i.e. latitude and longitude coordinates) where photos were taken;

(e) Measurement or estimate of dimensions of any existing channel bed or bank eroded areas, including length, width, and depth of any incisions; and

[18] When a calculation method is developed, IBIs must be calculated for all available and appropriate historical data.
[19] Stormwater Monitoring Coalition Model Monitoring Technical Committee, 2004. Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California. Technical Report #419. August 2004.

(f) Known or suspected cause(s) of existing downstream erosion or habitat impact, including flow, soil, slope, and vegetation conditions, as well as upstream land uses and contributing new and existing development.

d. WET WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three wet weather monitoring events at each long-term receiving water monitoring station. At least one wet weather monitoring event must be conducted during the first wet weather event of the wet season (October 1 – April 30), and at least one wet weather monitoring event during a wet weather event that occurs after February 1.

(1) Wet Weather Receiving Water Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each long-term receiving water monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event;

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(d) Presence and assessment of trash in and around station.

(2) Wet Weather Receiving Water Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

(3) Wet Weather Receiving Water Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) Constituents listed in Table D-3.

(4) Wet Weather Receiving Water Toxicity Monitoring

For each wet weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for chronic aquatic toxicity in accordance with Provisions D.1.c.(4)(a)-(f).

e. OTHER RECEIVING WATER MONITORING REQUIREMENTS

(1) Regional Monitoring

The Copermittees must participate in the following regional receiving waters monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring; and

(b) Southern California Bight Regional Monitoring~~.~~ and

(c) Unified Beach Water Quality Monitoring and Assessment Program
The Orange County Copermittees shall participate in and, together with South Orange County Wastewater Authority and Orange County Health Care Agency, shall share responsibility for implementation of a unified regional beach water quality monitoring and assessment program in south Orange County, as set forth in Monitoring and Reporting Program No. XXX, issued pursuant to CWC sections 13225, 13267, and 13383 and subject to future revision.

(2) Sediment Quality Monitoring

The Copermittees must perform sediment monitoring to assess compliance with sediment quality receiving water limits applicable to MS4 discharges to enclosed bays and estuaries. The monitoring may be performed either by individual or multiple Copermittees to assess compliance with receiving water limits, or through participation in a water body monitoring coalition. A Sediment Monitoring Plan which satisfies the requirements of the State Water Board's Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part 1 Sediment Quality (Sediment Control Plan) must be submitted as part of the monitoring and assessment program in the Water Quality Improvement Plan.

(a) The Sediment Monitoring Plan design must include the following:

(i) The elements required under Section VII.D (Receiving Water Limits Monitoring Frequency) and Section VII.E (Sediment Monitoring) of the Sediment Control Plan;

(ii) A Quality Assurance Project Plan (QAPP) describing the project objectives and organization, functional activities, and quality assurance/quality control protocols for the water and sediment monitoring; and

(iii) A schedule for completion of all sample collection and analysis activities and submission of Sediment Monitoring Reports.

(b) The Copermittees must implement the Sediment Monitoring Plan in accordance with the schedule contained in the Sediment Monitoring Plan, unless otherwise directed in writing by the San Diego Water Board Executive Officer.

(c) The Copermittees must incorporate a Sediment Monitoring Report as part of the Water Quality Improvement Plan Annual Report in accordance with the schedule contained in the Sediment Monitoring Plan, unless otherwise directed in writing by the San Diego Water Board Executive Officer. The Sediment Monitoring Report must contain the following information:

(i) Analysis: An evaluation, interpretation and tabulation of the water and sediment monitoring data, including interpretations and conclusions as to whether applicable Receiving Water Limitations in this Order have been attained at each sample station;

(ii) Sample Location Map: The locations, type, and number of samples must be identified and shown on a site map; and

(iii) California Environmental Data Exchange Network: A statement certifying that the monitoring data and results have been uploaded into the California Environmental Data Exchange Network (CEDEN).

(d) Based on the Sediment Monitoring Report conclusions the San Diego Water Board may require a human health risk assessment to determine if the human health objective contained in Receiving Water Limitations in Provision A.2.a.(3)(b)(ii) has been attained at each sample station. In conducting a risk assessment, the Copermittees must consider any applicable and relevant information, including California Environmental Protection Agency's (Cal/EPA) Office of Environmental Health Hazard Assessment (OEHHA) policies for fish consumption and risk assessment, Cal/EPA's Department of Toxic Substances Control (DTSC) Risk Assessment, and USEPA Human Health Risk Assessment policies.

(3) ASBS Monitoring

For Watershed Management Areas with ASBS, the Copermittees must implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

f. ALTERNATIVE WATERSHED MONITORING REQUIREMENTS

The San Diego Water Board may direct the Copermittees to participate in an effort to develop alternative watershed monitoring with other regulated entities, other interested parties, and the San Diego Water Board to refine, coordinate, and implement regional monitoring and assessment programs to determine the status and trends of water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams.

~~In lieu of the Receiving Water Monitoring Program requirements specified in 1.a to 1.d, the Copermittees may participate in the development and implementation of monitoring for the collaborative receiving waters monitoring program. It is expected that a regional monitoring will allow for a more effective and efficient receiving waters monitoring program. The regional monitoring plan must be submitted to the Executive Officer for review and approval. Documentation of participation and monitoring shall be included in the annual report.~~

2. MS4 Outfall Discharge Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the discharges from the MS4 outfalls in each Watershed Management Area during dry weather and wet weather. Following San Diego Water Board acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct MS4 outfall discharge monitoring during implementation of the Water Quality Improvement Plan to assess the effectiveness of their jurisdictional runoff management programs toward effectively prohibiting non-storm water discharges into the MS4 and reducing pollutants in storm water discharges from their MS4s to the MEP. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following MS4 outfall monitoring procedures:

a. TRANSITIONAL MS4 OUTFALL DISCHARGE MONITORING

Until the monitoring requirements and schedules of Provisions D.2.b-c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following MS4 outfall discharge monitoring in the Watershed Management Area:

(1) MS4 Outfall Discharge Monitoring Station Inventory

Each Copermittee must identify all major MS4 outfalls that discharge directly to receiving waters within its jurisdiction and geo-locate those outfalls on a map of the MS4 pursuant to Provision E.2.b.(1). This information must be compiled into a MS4 outfall discharge monitoring station inventory, and must include the following information:

(a) Latitude and longitude of MS4 outfall point of discharge;

(b) Watershed Management Area;

(c) Hydrologic subarea;

(d) Outlet size;

(e) Accessibility (i.e. safety and without disturbance of critical habitat);

(f) Approximate drainage area; and

(g) Classification of whether the MS4 outfall is known to have persistent dry weather flows, transient dry weather flows, no dry weather flows, or unknown dry weather flows.

(2) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Until the monitoring requirements and schedules of Provision D.2.b are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, each Copermittee must perform dry weather MS4 outfall field screening monitoring to identify non-storm water and illicit discharges within its jurisdiction in accordance with Provision E.2.c, to determine which discharges are transient flows and which are persistent flows, and prioritize the dry weather MS4 discharges that will be investigated and eliminated in accordance with Provision E.2.d.

(a) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Frequency

Each Copermittee must field screen the MS4 outfalls in its inventory developed pursuant to Provision D.2.a.(1) as follows:

(i) For Copermittees with less than 125 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 80 percent of the outfalls must be visually inspected two times per year during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv).

(ii) For Copermittees with 125 major MS4 outfalls or more, but less than or equal to 500 that discharge to receiving waters within a Watershed Management Area, all the outfalls must be visually inspected at least annually during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv).

(iii) For Copermittees with more than 500 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 500 outfalls must be visually inspected at least annually during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv).

Copermittees with more than 500 major MS4 outfalls within a Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(iv) For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major MS4 outfalls within its jurisdiction, at least 500 major MS4 outfalls within its inventory must be visually inspected at least annually during dry weather conditions. Copermittees with more than 500 major MS4 outfalls in more than one Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(v) Inspections of major MS4 outfalls conducted in response to public reports and staff or contractor reports and notifications may count toward the required visual inspections of MS4 outfall discharge monitoring stations.

(b) Transitional Dry Weather MS4 Outfall Discharge Field Screening Visual Observations

(i) An antecedent dry period of at least 72 hours following any storm event producing measurable rainfall greater than 0.1 inch is required prior to conducting field screening visual observations during a field screening monitoring event.

(ii) During the field screening monitoring event, each Copermittee must record visual observations consistent with Table D-5 at each MS4 outfall discharge monitoring station inspected.

Table D-5 Field Screening Visual Observations for MS4 Outfall Discharge Monitoring Stations

Table D-5. Field Screening Visual Observations for MS4 Outfall Discharge Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) - Flow source(s) suspected or identified from non-storm water source investigation - Flow source(s) eliminated during non-storm water source identification • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) - Known or suspected source(s) of pooled or ponded water • Station description (i.e. deposits or stains, vegetation condition, structural condition, observable biology) • Presence and assessment of trash in and around station • Evidence or signs of illicit connections or illegal dumping

(iii) Each Copermittee must implement the requirements of Provisions E.2.d.(2)(c)-(e) based on the field observations required pursuant to Provision D.2.a.(2)(b)(ii).

(iv) Each Copermittee must evaluate field observations together with existing information available from prior reports, inspections and monitoring results to determine whether any observed flowing, pooled, or ponded waters are likely to be transient or persistent flow.[20]

(c) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Records

Based upon the results of the transitional dry weather MS4 outfall discharge field screening monitoring conducted pursuant to Provisions D.2.a.(2)(a)-(b), each Copermittee must update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow.

(3) Transitional Wet Weather MS4 Outfall Discharge Monitoring

Until the monitoring requirements and schedules of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the

[20] Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(a) Transitional Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees must select wet weather MS4 outfall discharge monitoring stations from the inventories developed pursuant to Provision D.2.a.(1) for each Watershed Management Area as follows:

(i) At least five wet weather MS4 outfall discharge monitoring stations that are representative of storm water discharges from areas consisting primarily of residential, commercial, industrial, and typical mixed-use land uses present within the Watershed Management Area;

(ii) At least one wet weather MS4 outfall discharge monitoring station for each Copermittee within the Watershed Management Area; and

(iii) The County of San Diego may select at least two (2) wet weather MS4 outfall discharge monitoring stations for the portion of the Santa Margarita River Watershed Management Area within its jurisdiction to be monitored during the transitional period until the Riverside County Copermittees are notified of coverage under this Order. After the Riverside County Copermittees are notified of coverage under this Order, the Copermittees in the Watershed Management Area must select wet weather MS4 outfall discharge monitoring stations consistent with the requirements above.

(b) Transitional Wet Weather MS4 Outfall Discharge Monitoring Frequency

Each wet weather MS4 outfall discharge monitoring station selected pursuant to Provision D.2.a.(3)(a) must be monitored once during the wet season (October 1 – April 30). The wet weather monitoring events must be selected to be representative of the range of hydrological conditions experienced in the region. At least 10 percent of samples must be conducted during the first wet weather event of the wet season, to include at least one such sample in each Watershed Management Area.

~~Transitional wet weather MS4 outfall discharge monitoring may begin in year 2 of the transitional period once the MS4 outfall discharge monitoring stations have been inventoried and evaluated pursuant to Provision D.2.a.(1).~~

(c) Transitional Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative

descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(i) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(ii) The flow rates and volumes measured or estimated from the MS4 outfall (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(d) Transitional Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(e) Transitional Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, and indicator bacteria;

(iv) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

[a] Time-weighted composites collected over the length of the storm event or the first 24 hour period whichever is shorter, composed of discrete samples, which may be collected through the use of automated equipment, or

[b] Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

[c] If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours;

(v) Only one analysis of the composite of aliquots is required;

(vi) The samples must be analyzed for the following constituents:

[a] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List with the exception of toxicity[21],

[b] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and

[c] Constituents listed in Table D-6.

Table D-6 Analytical Monitoring Constituents for Wet Weather MS4 Outfall Discharge Monitoring Stations

Table D-6. Analytical Monitoring Constituents for Wet Weather MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Nickel • Selenium • Thallium • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Total Fecal Coliform for discharges to inland surface waters.

e] The Copermittee may be relieved of analytical monitoring requirements [a] to [c] if supporting information can be provided or

[21] Copermittees may provide an alternate approach to evaluate and identify the cause of toxicity currently affecting receiving waters and to iteratively adapt the monitoring program to address these chemical stressors in their MS4 outfall discharges in the monitoring plan which is subject to Regional Board approval.

has historical data that can demonstrate or provide justification that the analysis of the constituent is not necessary.

(f) Other Transitional Wet Weather MS4 Outfall Discharge Monitoring

The San Diego County Copermittees must continue the wet weather MS4 outfall monitoring program developed under Order No. R9-2007-0001, as approved by the San Diego Water Board, through its planned completion.

b. DRY WEATHER MS4 OUTFALL DISCHARGE MONITORING

Each Copermittee must perform dry weather MS4 outfall monitoring to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. Each Copermittee must conduct the following dry weather MS4 outfall discharge monitoring within its jurisdiction:

(1) Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Each Copermittee must continue to perform the dry weather MS4 outfall discharge field screening monitoring in accordance with the requirements of Provision D.2.a.(2). The Copermittee may adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of persistent flow non-storm water discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of visual inspections performed is equivalent to the number of visual inspections required under Provision D.2.a.(2)(a).

(2) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring

Each Copermittee must perform non-storm water persistent flow MS4 outfall discharge monitoring to determine which persistent non-storm water discharges contain concentrations of pollutants below NALs, and which persistent non-storm water discharges impact receiving water quality during dry weather. Each Copermittee must conduct the following non-storm water persistent flow MS4 outfall discharge monitoring within its jurisdiction:

(a) Prioritization of Non-Storm Water Persistent Flow MS4 Outfalls

Based upon the dry weather MS4 outfall discharge field screening monitoring records developed pursuant to Provision D.2.a.(2)(c), each Copermittee must identify and prioritize the MS4 outfalls with persistent flows based on the highest priority water quality conditions identified in the Water Quality Improvement Plan and any additional criteria developed by

the Copermittee, which may include historical data and data from sources other than what the Copermittee collects.

(b) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring Frequency

(i) Based on the prioritization of major MS4 outfalls developed under Provision D.2.b.(2)(a), each Copermittee must identify, at a minimum, the 5 highest priority major MS4 outfalls with non-storm water persistent flows that the Copermittee will monitor within its jurisdiction in each Watershed Management Area. For Responsible Copermittees identified by a TMDL in Attachment E to this Order, if the 5 chosen outfall locations are not sufficient to determine compliance with the TMDL(s), then each Responsible Copermittee must identify additional MS4 outfall monitoring locations within its jurisdiction sufficient to address compliance with the TMDL(s). If a Copermittee has less than 5 major outfalls within a Watershed Management Area, then the Copermittee must monitor all of its major MS4 outfalls with persistent flows within each Watershed Management Area. The location of the highest priority non-storm water persistent flow MS4 outfall monitoring stations must be identified on the map required pursuant to Provision E.2.b.(1). The map must specify which MS4 outfalls are being monitored for compliance with a TMDL.

(ii) Each of the highest priority non-storm water persistent flow MS4 outfall monitoring stations identified pursuant to Provision D.2.b.(2)(b)(i) must be monitored under dry weather conditions at least semi-annually until one of the following occurs:

[a] The non-storm water discharges have been effectively eliminated (i.e. no flowing, pooled, or ponded water) for three consecutive dry weather monitoring events; or

[b] The source(s) of the persistent flows has been identified as a category of non-storm water discharges that does not require an NPDES permit and does not have to be addressed as an illicit discharge because it was not identified as a source of pollutants (i.e. constituents in non-storm water discharge do not exceed NALs), and the persistent flow can be re-prioritized to a lower priority; or

[c] The constituents in the persistent flow non-storm water discharge do not exceed NALs, and the persistent flow can be re-prioritized to a lower priority; or

[d] The source(s) of the persistent flows has been identified as a non-storm water discharge authorized by a separate NPDES permit.

(iii) Where the criteria under Provision D.2.b.(2)(b)(ii) are not met, but the threat to water quality has been reduced by the Copermittee, the

highest priority persistent flow MS4 outfall monitoring stations may be reprioritized accordingly for continued dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1).

(iv) Each Copermittee must document removal or re-prioritization of the highest priority persistent flow MS4 outfall monitoring stations identified under Provision D.2.b.(2)(a) in the Water Quality Improvement Plan Annual Report. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized major MS4 outfall in the Watershed Management Area within its jurisdiction, unless there are no remaining qualifying major MS4 outfalls within the Copermittee's jurisdiction in the Watershed Management Area.

(c) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Observations

During each semi-annual monitoring event, each Copermittee must record field observations consistent with Table D-5 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(d) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Monitoring

During each semi-annual monitoring event, if conditions allow the collection of the data, each Copermittee must monitor and record the parameters in Table D-2 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(e) Non-Storm Water Persistent Flow MS4 Outfall Discharge Analytical Monitoring

During each semi-annual monitoring event in which measurable flow is present, each Copermittee must collect and analyze samples from each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Collect grab or composite samples to be analyzed at a qualified laboratory for the following constituents:

[a] Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

[b] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List with the exception of toxicity[22],

[c] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

[d] Applicable NAL constituents, and

[e] Constituents listed in Table D-7. The Copermittees may adjust the list of constituents for the Watershed Management Area if historical data or supporting information can be provided that demonstrates or justifies the analysis of a constituent is not necessary.

[f] The Copermittee may be relieved of analytical monitoring requirements if supporting information can be provided or has historical data that can demonstrate or provide justification that the analysis of the constituent is not necessary.

[22] Copermittees may provide an alternate approach to evaluate and identify the cause of toxicity currently affecting receiving waters and to iteratively adapt the monitoring program to address these chemical stressors in their MS4 outfall discharges in the monitoring plan which is subject to Regional Board approval.

Table D-7 Analytical Monitoring Constituents for Persistent Flow MS4 Outfall Discharge Monitoring Stations

Table D-7. Analytical Monitoring Constituents for Persistent Flow MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Total Hardness • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Cadmium • Copper • Lead • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Total ~~Fecal~~ Coliform for discharges to inland surface waters.

(iv) If the Copermittee identifies and eliminates the source of the persistent flow non-storm water discharge, analysis of the sample is not required.

c. WET WEATHER MS4 OUTFALL DISCHARGE MONITORING

The Copermittees must perform wet weather MS4 outfall monitoring to identify pollutants in storm water discharges from the MS4s, to guide pollutant source identification efforts, and to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order. The Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(1) Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees may adjust the wet weather MS4 outfall discharge monitoring locations in the Watershed Management Area, as needed, to identify pollutants in storm water discharges from MS4s, to guide pollutant source identification efforts, and to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of stations is at least equivalent to the number of stations required under Provision D.2.a.(3)(a). Additional outfall monitoring locations, above the minimum per jurisdiction, may be required to demonstrate compliance with the WQBELs associated with the applicable TMDLs in Attachment E.

(2) Wet Weather MS4 Outfall Discharge Monitoring Frequency

The Copermittees must monitor the wet weather MS4 outfall discharge monitoring stations in the Watershed Management Area at least once (1) per year. The Copermittees may need to increase the frequency of monitoring in order to identify pollutants in storm water discharges from the MS4s causing or contributing to the highest priority water quality conditions, to guide pollutant source identification efforts, or to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order.

(3) Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(4) Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(5) Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate

the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites collected over the length of the storm event or the first 24 hour period, whichever is shorter , composed of discrete samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

(iii) If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours.

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List with the exception of toxicity[23],

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) The Copermittees may adjust the analytical monitoring required for the Watershed Management Area, if the Copermittees have historical data or supporting information that can demonstrate or provide justification that the analysis of a constituent is not necessary.

[23] Copermittees may provide an alternate approach to evaluate and identify the cause of toxicity currently affecting receiving waters and to iteratively adapt the monitoring program to address these chemical stressors in their MS4 outfall discharges in the monitoring plan which is subject to Regional Board approval.

3. Special Studies

a. Within the term of this Order, the Copermittees must initiate the following special studies:

(1) At least two special studies in each Watershed Management Area to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that cause or contribute to highest priority water quality conditions identified in the Water Quality Improvement Plan.

(2) At least one special study for the San Diego Region to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that are impacting receiving waters on a regional basis in the San Diego Region.

(3) One of the two special studies in each Watershed Management Area required pursuant to Provision D.3.a.(1) may be replaced by a special study implemented pursuant to Provision D.3.a.(2).

b. The special studies must, at a minimum, be in conformance with the following criteria:

(1) The special studies must be related to the highest priority water quality conditions identified by the Copermittees in the Watershed Management Area and/or for the entire San Diego Region;

(2) The special studies developed pursuant to Provision D.3.a.(1) must:

(a) Be implemented within the applicable Watershed Management Area, and

(b) Require some form of participation by all the Copermittees within the Watershed Management Area;

(3) The special studies developed pursuant to Provision D.3.a.(2) must:

(a) Be implemented within the San Diego Region, and

(b) Require some form of participation by all Copermittees covered under the requirements of this Order.

(4) The Copermittees are encouraged to partner with environmental groups or third parties knowledgeable of watershed conditions to complete the required special studies.

c. Special studies developed to identify sources of pollutants and/or stressors should be pollutant and/or stressor specific and based on historical monitoring

data and monitoring performed pursuant to Provisions D.1 and D.2. Development of source identification special studies should include the following:

(1) A compilation of known information on the specific pollutant and/or stressor, including data on potential sources and movement of the pollutant and/or stressor within the watershed. Data generated by the Copermittees and others, as well as information available from a literature research on the pollutant and/or stressor should be compiled and analyzed as appropriate.

(2) An identification of data gaps, based on the compiled information generated on the specific pollutant and/or stressor identified in Provision D.3.c.(1). Source identification special studies should be developed to fill identified data gaps.

(3) A monitoring plan that will collect and provide data the Copermittees can utilize to do the following:

(a) Quantify the relative loading or impact of a pollutant and/or stressor from a particular source or pollutant generating activity;

(b) Improve understanding of the fate of a pollutant and/or stressor in the environment;

(c) Develop an inventory of known and suspected sources of a pollutant and/or stressor in the Watershed Management Area; and/or

(d) Prioritize known and suspected sources of a pollutant and/or stressor based on relative magnitude in discharges, geographical distribution (i.e., regional or localized), frequency of occurrence in discharges, human health risk, and controllability.

d. Special studies initiated prior to the effective date of this Order that meet the requirements of Provision D.3.b and are implemented during the term of this Order as part of the Water Quality Improvement Plan may be utilized to fulfill the special study requirements of Provision D.3.a. Special studies completed before the effective date of this Order cannot be utilized to fulfill the special study requirements of Provision D.3.a.

e. The Copermittees must submit the monitoring plans for the special studies in the Water Quality Improvement Plans required pursuant to Provision F.1.

f. The Copermittees are encouraged to share the results of the special studies regionally among the Copermittees to provide information useful in improving and adapting the management of non-storm water and storm water runoff through the implementation of the Water Quality Improvement Plans.

4. Assessment Requirements

Each Copermittee must evaluate the data collected pursuant to Provisions D.1, D.2 and D.3, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E, to assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a. Assessments must be performed as described in the following provisions:

a. Receiving Waters Assessments

(1) The Copermittees must assess and report the conditions of the receiving waters in the Watershed Management Area as follows:

(a) Based on data collected pursuant to Provision D.1.a, the assessments under Provision D.4.a.(2) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(b) Based on the data collected pursuant to Provisions D.1.a-e, the assessments required under Provision D.4.a.(2) must be included in the Report of Waste Discharge required pursuant to Provision F.5.b.

(2) The Copermittees must assess the status and trends of receiving water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under dry weather and wet weather conditions. For each of the three types of receiving waters in each Watershed Management Area the Copermittees must:

(a) Determine whether or not the conditions of the receiving waters are meeting the numeric goals established pursuant to Provision B.3.a;

(b) Identify the most critical beneficial uses that must be protected to ensure overall health of the receiving water;

(c) Determine whether or not those critical beneficial uses are being protected;

(d) Identify short-term and/or long-term improvements or degradation of those critical beneficial uses;

(e) Determine whether or not the strategies established in the Water Quality Improvement Plan contribute towards progress in achieving the interim and final numeric goals of the Water Quality Improvement Plan; and

(f) Identify data gaps in the monitoring data necessary to assess Provisions D.4.a.(2)(a)-(e).

b. MS4 OUTFALL DISCHARGES ASSESSMENTS

(1) Non-Storm Water Discharges Reduction Assessments

(a) Each Copermittee must assess and report the progress of its illicit discharge detection and elimination program, required to be implemented pursuant to Provision E.2, toward effectively prohibiting non-storm water and illicit discharges into the MS4 within its jurisdiction as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(2), the assessments under Provision D.4.b.(1)(b) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(ii) Based on the data collected pursuant to Provisions D.2.b, the assessments required under Provision D.4.b.(1)(c) must be included in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

(iii) Based on the data collected pursuant to Provisions D.2.b, the assessment required under Provision D.4.b.(1)(c) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.a.(2), each Copermittee must assess and report the following:

(i) Identify the known and suspected controllable sources (e.g. facilities, areas, land uses, pollutant generating activities) of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area;

(ii) Identify sources of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area that have been reduced or eliminated; and

(iii) Identify modifications to the field screening monitoring locations and frequencies for the MS4 outfalls in its inventory necessary to identify and eliminate sources of persistent flow non-storm water discharges pursuant to Provision D.2.b.

(c) Based on the dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1), each Copermittee must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(1)(b);

(ii) Based on the data collected and applicable NALs in the Water Quality Improvement Plan, rank the MS4 outfalls in the Copermittee's jurisdiction according to potential threat to receiving water quality, and produce a prioritized list of major MS4 outfalls for follow-up action to update the Water Quality Improvement Plan, with the goal of eliminating persistent flow non-storm water discharges and/or pollutant loads in order of the ranked priority list through targeted programmatic actions and source investigations;

(iii) For the highest priority major MS4 outfalls with persistent flows that are in exceedance of NALs, identify the known and suspected sources within the Copermittee's jurisdiction in the Watershed Management Area that may cause or contribute to the NAL exceedances;

(iv) Each Copermittee must analyze the data collected pursuant to Provision D.2.b, and utilize a model or other method, to calculate or estimate the non-storm water volumes and pollutant loads collectively discharged from all the major MS4s outfalls in its jurisdiction identified as having persistent dry weather flows during the monitoring year. These calculations or estimates must be updated annually.

[a] Each Copermittee must calculate or estimate the annual non-storm water volumes and pollutant loads collectively discharged from the Copermittee's major MS4 outfalls to receiving waters within the Copermittee's jurisdiction, with an estimate of the percent contribution from each known source for each MS4 outfall;

[b] Each Copermittee must annually identify and quantify (i.e. volume and pollutant loads) sources of non-storm water not subject to the Copermittee's legal authority that are discharged from the Copermittee's major MS4 outfalls to downstream receiving waters.

(v) Each Copermittee must review the data collected pursuant to Provision D.2.b and findings from the assessments required pursuant to Provision D.4.b.(1)(c)(i)-(iv) at least once during the term of this Order to:

[a] Identify reductions and progress in achieving reductions in non-storm water and illicit discharges to the Copermittee's MS4 in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction, with an estimate, if possible, of the non-storm water volume and/or pollutant load reductions

attributable to specific water quality strategies implemented by the Copermittee; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittee in the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction.

(vi) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(1)(c)(i)-(v).

(2) Storm Water Pollutant Discharges Reduction Assessments

(a) The Copermittees must assess and report the progress of the water quality improvement strategies, required to be implemented pursuant to Provisions B and E, toward reducing pollutants in storm water discharges from the MS4s within the Watershed Management Area as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(3), the assessments under Provision D.4.b.(2)(b) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(ii) Based on the data collected pursuant to Provisions D.2.c, the assessments required under Provision D.4.b.(2)(c) must be included in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

(iii) Based on the data collected pursuant to Provisions D.2.c, the assessment required under Provisions D.4.b.(2)(c)-(d) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.a.(3) the Copermittees must assess and report the following:

(i) The Copermittees must analyze the monitoring data collected pursuant to Provision D.2.a.(3), and utilize a watershed model or other method, to calculate or estimate the following for each monitoring year:

[a] The average storm water runoff coefficient for each land use type within the Watershed Management Area;

[b] The volume of storm water and pollutant loads discharged from ~~each of~~ the Copermittee's monitored MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch;

[c] The total flow volume and pollutant loadings discharged from the Copermittee's jurisdiction within the Watershed Management Area over the course of the wet season, extrapolated from the data produced from the monitored MS4 outfalls; and

[d] The percent contribution of storm water volumes and pollutant loads discharged from each land use type within each hydrologic subarea with a major MS4 outfall to receiving waters or within each major MS4 outfall to receiving waters in the Copermittee's jurisdiction within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch.

(ii) Identify modifications to the wet weather MS4 outfall discharge monitoring locations and/or frequencies necessary to identify pollutants in storm water discharges from the MS4s in the Watershed Management Area pursuant to Provision D.2.c.(1).

(c) Based on the wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.c the Copermittees must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(2)(b);

(ii) Based on the data collected and applicable SALs in the Water Quality Improvement Plan, analyze and compare the monitoring data to the analyses and assumptions used to develop the Water Quality Improvement Plans, including strategies developed pursuant to Provision B.3, and evaluate whether those analyses and assumptions should be updated as a component of the adaptive management efforts pursuant to Provision B.5 for follow-up action to update the Water Quality Improvement Plan;

(iii) The Copermittees must review the data collected pursuant to Provision D.2.c and findings from the assessments required pursuant to Provisions D.4.b.(2)(c)(i)-(ii) at least once during the term of this Order to:

[a] Identify reductions or progress in achieving reductions in pollutant concentrations and/or pollutant loads from different land uses and/or drainage areas discharging from the Copermittees' MS4s in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters within the Watershed Management Area to the MEP, with an estimate, if possible, of the pollutant load reductions attributable to specific water quality strategies implemented by the Copermittees; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittees in the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters in the Watershed Management Area to the MEP.

(iv) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(iii).

(d) The Copermittees must evaluate all the data collected pursuant to Provision D.2.c, and incorporate new outfall monitoring data into time series plots for each long-term monitoring constituent for the Watershed Management Area, and perform statistical trends analysis on the cumulative long-term wet weather MS4 outfall discharge water quality data set.

c. Special Studies Assessments

The Copermittees must annually evaluate the results and findings from the special studies developed and implemented pursuant to Provision D.3, and assess their relevance to the Copermittees' efforts to characterize receiving water conditions, understand sources of pollutants and/or stressors, and control and reduce the discharges of pollutants from the MS4 outfalls to receiving waters in the Watershed Management Area. The Copermittees must report the results of the special studies assessments applicable to the Watershed Management Area, and identify any necessary modifications or updates to the Water Quality Improvement Plan based on the results in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

d. Integrated Assessment of Water Quality Improvement Plan

As part of the iterative approach and adaptive management process required for the Water Quality Improvement Plan pursuant to Provision B.5, the Copermittees in each Watershed Management Area must integrate the data collected pursuant to Provisions D.1-D.3, the findings from the assessments required pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to assess the effectiveness of, and identify necessary modifications to, the Water Quality Improvement Plan as follows:

(1) The Copermittees must re-evaluate the priority water quality conditions and numeric goals for the Watershed Management Area, as needed, during the term of this Order pursuant to Provision B.5.a. The re-evaluation and recommendations for modifications to the priority water quality conditions, and/or numeric goals and corresponding schedules may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to

Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The priority water quality conditions and numeric goals for the Watershed Management Area must be re-evaluated as follows:

(a) Re-evaluate the receiving water conditions in the Watershed Management Area in accordance with Provision B.2.a;

(b) Re-evaluate the impacts on receiving waters in the Watershed Management Area from MS4 discharges in accordance with Provision B.2.b;

(c) Re-evaluate the identification of MS4 sources of pollutants and/or stressors in accordance with Provision B.2.d;

(d) Identify beneficial uses of the receiving waters that are protected in accordance with Provision D.4.a;

(e) Evaluate the progress toward achieving the interim and final numeric goals for protecting impacted beneficial uses in the receiving waters.

(2) The Copermittees must re-evaluate the water quality improvement strategies for the Watershed Management Area during the term of this Order pursuant to Provision B.5.b. The re-evaluation and recommendations for modifications to the water quality improvement strategies and schedules may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The water quality improvement strategies for the Watershed Management Area must be re-evaluated as follows:

(a) Identify the non-storm water and storm water pollutant loads from the Copermittees' MS4 outfalls in the Watershed Management Area, calculated or estimated pursuant to Provisions D.4.b;

(b) Identify the non-storm water and storm water pollutant load reductions, or other improvements to receiving water or water quality conditions, that are necessary to attain the interim and final numeric goals identified in the Water Quality Improvement Plan for protecting beneficial uses in the receiving waters;

(c) Identify the non-storm water and storm water pollutant load reductions, or other improvements to the quality of MS4 discharges, that are necessary for the Copermittees to demonstrate that non-storm water and storm water discharges from their MS4s are not causing or contributing to exceedances of receiving water limitations;

(d) Evaluate the progress of the water quality improvement strategies toward

achieving the interim and final numeric goals identified in the Water Quality Improvement Plan for protecting beneficial uses in the receiving waters.

(3) The Copermittees must re-evaluate and adapt the water quality monitoring and assessment program for the Watershed Management Area when new information becomes available to improve the monitoring and assessment program pursuant to Provision B.5.c. The re-evaluation and recommendations for modifications to the monitoring and assessment program may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. Modifications to the water quality monitoring and assessment program must be consistent with the requirements of Provision D.1-D.3. The re-evaluation of the water quality monitoring and assessment program for the Watershed Management Area must consider the data gaps identified by the assessments required pursuant to Provisions D.4.a-b, and results of the special studies implemented pursuant to Provision D.4.c.

5. Monitoring Provisions

Each Copermittee must comply with all the monitoring, reporting, and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

E. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS

The purpose of this provision is for each Copermittee to implement a program to control non-stormwater discharges the contribution of pollutants into and the discharges from the MS4 within its jurisdiction and to focus and prioritize those implementation actions based on the highest water quality priorities identified within the associated Water Quality Improvement Plan. The goal of the jurisdictional runoff management programs is to implement strategies and actions that effectively prohibit non-storm water discharges into the MS4 and reduce the discharge of pollutants in non-stormwater and storm water from the MS4 to the MEP. This goal will be accomplished through implementing the jurisdictional runoff management programs in accordance with the water quality priorities and strategies identified in the Water Quality Improvement Plans. Each Copermittee shall prioritize the implementation actions based on the highest water quality priorities identified within the applicable Water Quality Improvement Plan.

Each Copermittee must update its jurisdictional runoff management program document, in accordance with Provision F.2.a, to incorporate all the requirements of Provision E consistent with the highest water quality priorities as identified in the corresponding Water Quality Improvement Plan. The requirements outlined below may be modified and prioritized as appropriate for consistency with the Water Quality Improvement Plan. Until the Copermittee has updated its jurisdictional runoff management program document with the requirements of Provision E, the Copermittee must continue implementing its current jurisdictional runoff management program.

1. Legal Authority Establishment and Enforcement

a. Each Copermittee must establish, maintain, and enforce adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 through statute, ordinance, permit, contract, order, or similar means. This legal authority must, at a minimum, authorize the Copermittee to:

(1) Effectively pProhibit and eliminate all illicit discharges and illicit connections into its MS4;

(2) Control the contribution of pollutants in discharges of runoff associated with industrial and construction activity into its MS4 and control the quality of runoff from industrial and construction sites[24]., including industrial and construction sites which have coverage under the statewide General Permit for Discharges of Storm Water Associated with Industrial Activities (Industrial General Permit) or General Permit for Discharges of Storm Water Associated with Construction Activities (Construction General Permit), as well as to those sites which do not;

[24] The Compermittees are only responsible for administering and enforcing the codes and ordinances applicable to their jurisdictions (i.e., a municipality is not responsible for administering and/or enforcing a permit issued by the State of California).

(3) Control the discharge of spills, dumping, or disposal of materials other than storm water into its MS4;

(4) Control through interagency agreements among Copermittees the contribution of pollutants from one portion of the MS4 to another portion of the MS4;

(5) Control, by coordinating and cooperating with other owners of the MS4 such as Caltrans, the U.S. federal government, or sovereign Native American Tribes through interagency agreements, where possible, the contribution of pollutants from their portion of the MS4 to the portion of the MS4 within the Copermittee's jurisdiction;

(6) Require compliance with conditions in its statutes, ordinances, permits, contracts, orders, or similar means to hold dischargers to its MS4 accountable for their contributions of pollutants and flows;

(7) Require the use of BMPs to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

~~(8) Require documentation on the effectiveness of BMPs implemented to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;~~

~~(9)~~(8) Utilize enforcement mechanisms to require compliance with its statutes, ordinances, permits, contracts, orders, or similar means; and

~~(10)~~(9) Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with its statutes, ordinances, permits, contracts, orders, or similar means and with the requirements of this Order, including the effective prohibition of illicit discharges and connections to its MS4. The Copermittees ordinance must include adequate legal authority, to the extent permitted by California and Federal Law and subject to the limitations on municipal action under the constitutions of California and the United States. T~~; t~~he Copermittee must also have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from industrial facilities, including construction sites, discharging into its MS4.

b. With the first Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3), each Copermittee must submit a statement certified by its Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative that the Copermittee has taken the necessary steps to obtain and maintain full legal authority within its jurisdiction to implement and enforce each of the requirements contained in this Order.

2. Illicit Discharge Detection and Elimination

Each Copermittee must implement a program to actively detect and eliminate illicit discharges and improper disposal into the MS4, or otherwise require the discharger to apply for and obtain a separate NPDES permit. The illicit discharge detection and elimination program must be implemented in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1). ~~and include, at a minimum, the following requirements:~~ The requirements of the jurisdictional runoff management programs as outlined below may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality improvement Plan(s).

a. Non-Storm Water Discharges

Each Copermittee must address ~~all~~ non-storm water discharges as illicit discharges, where the likelihood exists that they are a source of pollutants to the waters of the state, unless the~~a~~ ~~non-storm water~~ discharge is either identified as a discharge authorized by a separate NPDES permit, or identified as a category of non-storm water discharges ~~or flows~~ that must be addressed pursuant to the following requirements:

~~(1) Discharges of non-storm water to the MS4 from the following categories must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG919001 (Order No. R9-2007-0034, or subsequent order) for discharges to San Diego Bay, or NPDES Permit No. CAG919002 (Order No. R9-2008-0002, or subsequent order) for discharges to surface waters other than San Diego Bay:~~

~~(1) Uncontaminated pumped ground water;~~

~~(2) Discharges from foundation drains;[25]~~

~~(3) Water from crawl space pumps; and~~

~~(4) Water from footing drains.[25]19~~

~~(2)~~(1) Discharges of non-storm water from water line flushing and water main breaks to the MS4 must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG 679001 (Order No. R9-2010-0003 or subsequent order). This category includes water line flushing and water main break discharges from water purveyors issued a water supply permit by the California Department of Public Health or federal military installations. Discharges from recycled or reclaimed water lines to the

[25] ~~Provision E.2.a.(1) only applies to this category of non-storm water if the system is designed to be located at or below the groundwater table to actively or passively extract groundwater during any part of the year.~~

MS4 must be addressed as illicit discharges, unless the discharges have coverage under a separate NPDES permit.

~~(3)~~(2) Discharges of non-storm water into the MS4 from the following categories must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a source of pollutants to receiving waters:

(a) Diverted stream flows;

(b) Rising ground waters;

(c) Uncontaminated ground water infiltration to MS4s;

(d) Uncontaminated pumped ground water;

~~(c)~~(e) Discharges from foundation drains;[26]

(f) Springs;

(g) Water from crawl space pumps;

~~(d)~~(h) Water from footing drains;[19]

~~(e)~~(i) Flows from riparian habitats and wetlands;

~~(f)~~(j) Discharges from potable water sources;

~~(g)~~(k) Discharges from foundation drains;[27] and

~~(h)~~(l) Discharges from footing drains.[20]

~~(4)~~(3) Discharges of non-storm water into the MS4 from the following categories must be controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means, where there is evidence that those discharges are a source of pollutants to waters of the state. Discharges of non-storm water into the MS4 from the following categories not controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means must be addressed by the Copermittee as illicit discharges.

[26] Provision E.2.a.(1) only applies to this category on non-storm water if the system is designed to be located at or below the highest historical groundwater table to actively or passively extract groundwater during any part of the year.

[27] Provision E.2.a.(3) only applies to this category of non-storm water discharge if the system is designed to be located above the groundwater table at all times of the year, and the system is only expected to discharge non-storm water under unusual circumstances.

(a) Air conditioning condensation

The discharge of air conditioning condensation should be directed to landscaped areas or other pervious surfaces, or to the sanitary sewer, where feasible.

(b) Individual residential vehicle washing

(i) The discharge of wash water should be directed to landscaped areas or other pervious surfaces where feasible; and

(ii) The minimization of water, washing detergent and other vehicle wash products used for residential vehicle washing, and the implementation of other practices or behaviors that will prevent the discharge of pollutants associated with individual residential vehicle washing from entering the MS4 must be encouraged.

(c) Dechlorinated swimming pool discharges

(i) Residual chlorine, algaecide, filter backwash, or other pollutants from swimming pools must be eliminated prior to discharging to the MS4; and

(ii) The discharge of saline swimming pool water must be directed to the sanitary sewer, landscaped areas, or other pervious surfaces that can accommodate the volume of water, unless the saline swimming pool water can be discharged via a pipe or concrete channel directly to a naturally saline water body (e.g. Pacific Ocean).

~~(5)~~(4) Firefighting discharges to the MS4 must continue be addressed by the Copermittees ~~as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a significant source of pollutants to receiving waters. Firefighting discharges to the MS4 not identified as a significant source of pollutants to receiving waters, must be addressed, at a minimum,~~ as follows:

(a) Non-emergency firefighting discharges

(i) Building fire suppression system maintenance discharges (e.g. sprinkler line flushing) to the MS4 must be addressed as illicit discharges unless BMPs are implemented to prevent pollutants associated with such discharges to the MS4.

(ii) Non-emergency firefighting discharges (i.e., discharges from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems) must be addressed by a program, to be developed and implemented by the Copermittee, in conjunction with the local Fire Authority/District, to reduce or eliminate pollutants in such discharges from entering the

MS4.

(b) Emergency firefighting discharges (i.e., flows necessary for the protection of life or property) do not require BMPs and need not be prohibited.

~~Each Copermittee should develop and encourage implementation of BMPs to reduce or eliminate pollutants in emergency firefighting discharges to the MS4s and receiving waters within its jurisdiction. During emergency situations, priority of efforts should be directed toward life, property, and the environment (in descending order). BMPs should not interfere with immediate emergency response operations or impact public health and safety.~~

~~(6)~~(5) If the Copermittee or San Diego Water Board identifies any category of non-storm water discharges listed under Provisions E.2.a.(1)-(4) as a source of pollutants to receiving waters, the category must be prohibited through ordinance, order, or similar means and addressed as an illicit discharge. Alternatively, the Copermittee may propose controls to be implemented for the category of non-storm water discharges as part of the Water Quality Improvement Plan instead of prohibiting the category of non-storm water discharges, and implement the controls if accepted by the San Diego Water Board as part of the Water Quality Improvement Plan.

(7) ~~Each Copermittee must, where feasible and priorities and resources allow, reduce or eliminate non-storm water discharges listed under Provisions E.2.a.(1)-(4) into its MS4, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit.~~

b. PREVENT AND DETECT ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to prevent and detect illicit discharges to the MS4:

(1) Each Copermittee must maintain an updated map of its entire MS4 and the corresponding drainage areas. The accuracy of the MS4 map must be confirmed during the field screening required pursuant to Provision E.2.c. The MS4 map must be included as part of the jurisdictional runoff management program document. Any geographic information system (GIS) layers or files used by the Copermittee to maintain the MS4 map must be made available to the San Diego Water Board upon request. The MS4 map must identify the following:

(a) All segments of the MS4 owned, operated, and maintained by the Copermittee;

(b) All known locations of inlets that discharge and/or collect runoff into the Copermittee's MS4;

(c) All known locations of connections with other MS4s not owned or operated by the Copermittee (e.g. Caltrans MS4s);

(d) All known locations of MS4 outfalls and private outfalls that discharge runoff collected from areas within the Copermittee's jurisdiction;

(e) All segments of receiving waters within the Copermittee's jurisdiction that receive and convey runoff discharged from the Copermittee's MS4 outfalls;

(f) Locations of the MS4 outfalls, identified pursuant to Provision D.2.a.(1), within its jurisdiction; and

(g) Locations of the non-storm water persistent flow MS4 outfall discharge monitoring stations, identified pursuant to Provision D.2.b.(2), within its jurisdiction.

(2) Each Copermittee must use Copermittee personnel and contractors to assist in identifying and reporting illicit discharges and connections during their daily employment activities.

(3) Each Copermittee must promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges into or from the MS4, including the following methods for public reporting:

(a) Operate a public hotline, which can be Copermittee-specific or shared by the Copermittees, and must be capable of receiving reports in both English and Spanish 24 hours per day and seven days per week; and

(b) Designate an e-mail address for receiving electronic reports from the public, which can be Copermittee-specific or shared by the Copermittees, and must be prominently displayed on the Copermittee's webpage and the Regional Clearinghouse required pursuant to Provision F.4.

(4) Each Copermittee must implement practices and procedures (including a notification mechanism) to prevent, respond to, contain, and clean up any spills that may discharge into the MS4 within its jurisdiction from any source. The Copermittee must coordinate, to the extent possible, with spill response teams to prevent entry of spills into the MS4, and prevent contamination of surface water, ground water, and soil. The Copermittee must coordinate spill prevention, containment, and response activities throughout all appropriate Copermittee departments, programs, and agencies.

(5) Each Copermittee must implement practices and procedures to prevent and limit infiltration of seepage from sanitary sewers (including private laterals and failing septic systems) to the MS4.

(6) Each Copermittee must coordinate, when necessary, with upstream Copermittees and/or entities to prevent illicit discharges from upstream sources into the MS4 within its jurisdiction.

c. FIELD SCREENING

Each Copermittee must conduct field screening (i.e. visual observations, field testing, and/or analytical testing) of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect ~~non-storm water and~~ illicit discharges and connections to the MS4 in accordance with the dry weather MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

d. INVESTIGATE AND ELIMINATE ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to investigate and eliminate illicit discharges to the MS4:

(1) Each Copermittee must prioritize and determine when follow-up investigations will be performed in response to visual observations and/or water quality monitoring data collected during an investigation of a detected ~~non-storm water or~~ illicit discharge into or from the MS4. The criteria for prioritizing investigations must consider the following:

(a) Pollutants identified as causing or contributing to the highest water quality priorities identified in the Water Quality Improvement Plan;

(b) Pollutants identified as causing or contributing, or threatening to cause or contribute to impairments in water bodies on the 303(d) List and/or in environmentally sensitive areas (ESAs), located within its jurisdiction;

(c) Pollutants identified from sources or land uses known to exist within the area, drainage basin, or watershed that discharges to the portion of the MS4 within its jurisdiction included in the investigation;

(d) Pollutants identified as causing or contributing to an exceedance of a NAL ~~in the Water Quality Improvement Plan~~described in Provision C.1; and

(e) Pollutants identified as an immediate and significant threat to human health or the environment.

(2) Each Copermittee must implement procedures to investigate and inspect portions of its MS4 that, based on reports or notifications, field screening, or other appropriate information, indicate a reasonable potential of receiving, containing, or discharging pollutants due to illicit discharges or~~,~~ illicit connections~~, or other sources of non-storm water~~. The procedures must

include the following:

(a) Each Copermittee must develop criteria to:

(i) Assess the validity of each report or notification received; and

(ii) Prioritize the response to each report or notification received.

(b) Each Copermittee must prioritize and respond to each valid report or notification (e.g., public reports, staff or contractor reports and notifications, etc.) of an incident in a timely manner.

(c) In accordance with the requirements of Provision E.2.d.(1), each Copermittee must investigate and seek to identify the source(s) of ~~discharges of non-storm water where flows are~~illicit discharges or illicit connections observed ~~in and from the MS4~~ during the field screening required pursuant to Provision D.2.b.(1) as follows:

(i) Obvious illicit discharges must be immediately investigated to identify the source(s)~~ of non-storm water discharges~~;

(ii) The investigation must include field investigations to identify sources or potential sources for the discharge, unless the source or potential source has already been identified during previous investigations; and

(iii) The investigation may include follow-up field investigations and/or reviewing Copermittee inventories and other land use data to identify potential sources of the discharge.

(d) Each Copermittee must maintain records and a database of the following information:

(i) Location of incident, including hydrologic subarea, portion of MS4 receiving the ~~non-storm water or~~ illicit discharge or connection, and point of discharge or potential discharge from MS4 to receiving water;

(ii) Source of information initiating the investigation (e.g., public reports, staff or contractor reports and notifications, field screening, etc.);

(iii) Date the information used to initiate the investigation was received;

(iv) Date the investigation was initiated;

(v) Dates of follow-up investigations;

(vi) Identified or suspected source of the illicit discharge or connection, if determined;

(vii) Known or suspected related incidents, if any;

(viii) Result of the investigation; and

(ix) If a source cannot be identified and the investigation is not continued, document the response pursuant to the requirements of Provision E.2.d.(4).

(e) Each Copermittee must maintain records and, in accordance with the priorities of the Water Quality Improvement Plan, seek to identify the source(s) of ~~non-storm water discharges from the MS4 where there is evidence of non-storm water having been discharged into or from the MS4 (e.g., pooled water~~the illicit discharge or connections~~),~~ in accordance with MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

(3) Each Copermittee must initiate the implementation of procedures, in a timely manner, to eliminate all detected and identified illicit discharges and connections within its jurisdiction. The procedures must include the following responses:

(a) Each Copermittee must enforce its legal authority, as required under Provision E.1, to eliminate illicit discharges and connections to the MS4.

(b) If the Copermittee identifies the source as a controllable source ~~of non-storm water or illicit discharge or connection~~, the Copermittee must implement its Enforcement Response Plan pursuant to Provision E.6 and enforce its legal authority to prohibit and eliminate illicit discharges and connections to its MS4.

(c) If the Copermittee identifies the source of the discharge as a category of non-storm water discharges in Provision E.2.a, and the discharge is in exceedance of the NALs ~~in the Water Quality Improvement Plan~~, then the Copermittee must determine if: (1) this is an isolated incident or set of circumstances that will be addressed through its Enforcement Response Plan pursuant to Provision E.6, or (2) the category of discharge must be addressed through the prohibition of that category of discharge as an illicit discharge pursuant to Provision E.2.a.(6).

(d) If the Copermittee suspects the source illicit discharge or connection ~~of the non-storm water discharge~~ as natural in origin (i.e. non-anthropogenically influenced) and in conveyance into the MS4, then the Copermittee must document and provide the data and evidence necessary to demonstrate to the San Diego Water Board that it is natural in origin and does not require further investigation.

(e) If the Copermittee is unable to identify and document the source of a recurring ~~non-storm water discharge to or from the MS4~~illicit discharge or connection, then the Copermittee must ~~address the discharge as an illicit discharge and~~ update its jurisdictional runoff management program to address the common and suspected sources of the ~~non-storm water~~

discharge within its jurisdiction in accordance with the Copermittee's priorities.

(4) Each Copermittee must submit a summary of the ~~non-storm water discharges and~~ illicit discharges and connections investigated and eliminated within its jurisdiction with each Water Quality Improvement Plan Annual Report required under Provision F.3.b.(3) of this Order.

3. Development Planning

Each Copermittee must use their land use and planning authorities to implement a development planning program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1). The requirements of the jurisdictional runoff management programs as outlined below may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality Improvement Plan(s). ~~and includes, at a minimum, the following requirements~~:

a. BMP Requirements for All Development Projects

Each Copermittee must prescribe the following BMP requirements during the planning process (i.e. prior to project approval and issuance of local permits) for all development projects (regardless of project type or size), where local permits are issued, including unpaved roads and flood management projects:

(3) General Requirements

(a) Onsite BMPs must be located so as to remove pollutants from runoff prior to its discharge to any receiving waters, and as close to the source as possible;

(b) Structural BMPs must not be constructed within waters of the U.S.

(c) Onsite BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors (e.g. mosquitos, rodents, or flies).

(4) Source Control BMP Requirements

The following source control BMPs must be implemented at all development projects where applicable and feasible:

(a) Prevention of illicit discharges into the MS4;

(b) Storm drain system stenciling or signage;

(c) Protect outdoor material storage areas from rainfall, run-on, runoff, and

wind dispersal;

(d) Protect materials stored in outdoor work areas from rainfall, run-on, runoff, and wind dispersal;

(e) Protect trash storage areas from rainfall, run-on, runoff, and wind dispersal; and

(f) Any additional BMPs determined to be necessary by the Copermittee to minimize pollutant generation at each project.

(5) Low Impact Development (LID) BMP Requirements

The following LID BMPs must be implemented at all development projects where applicable and feasible:

(a) Maintenance or restoration of natural storage reservoirs and drainage corridors (including topographic depressions, areas of permeable soils, natural swales, and ephemeral and intermittent streams);[28]

(b) Buffer zones for natural water bodies (where buffer zones are technically infeasible, require project applicant to include other buffers such as trees, access restrictions, etc.);

(c) Conservation of natural areas within the project footprint including existing trees, other vegetation, and soils;

(d) Construction of streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided public safety is not compromised;

(e) Minimization of the impervious footprint of the project;

(f) Minimization of soil compaction to landscaped areas;

(g) Disconnection of impervious surfaces through distributed pervious areas;

[28] Development projects proposing to dredge or fill materials in waters of the U.S. must obtain a CWA Section 401 Water Quality Certification. Projects proposing to dredge or fill waters of the state must obtain waste discharge requirements.

(h) Landscaped or other pervious areas designed and constructed to effectively receive and infiltrate, retain and/or treat runoff from impervious areas, prior to discharging to the MS4;

(i) Small collection strategies located at, or as close as possible to, the source (i.e. the point where storm water initially meets the ground) to minimize the transport of runoff and pollutants to the MS4 and receiving waters;

(j) Use of permeable materials for projects with low traffic areas and appropriate soil conditions;

(k) Landscaping with native or drought tolerant species; and

(l) Harvesting and using precipitation.

b. PRIORITY DEVELOPMENT PROJECTS

Priority Development Projects are land development projects that fall under the planning and building authority of the Copermittee for which the Copermittee must impose specific requirements, in addition to those described in Provision E.3.a, including the implementation of structural BMPs to meet the performance requirements described in Provision E.3.c.

(1) Definition of Priority Development Project

Priority Development Projects include the following:

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(b) Redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site on an existing site of 10,000 square feet or more of impervious surfaces). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(c) New and redevelopment projects that create 5,000 square feet or more of impervious surface (collectively over the entire project site), and support one or more of the following uses:

(i) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812).

(ii) Hillside development projects. This category includes development on any natural slope that is twenty-five percent or greater.

(iii) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce.

(iv) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

(d) New or redevelopment projects that create or replace 2,500 square feet or more of impervious surface (collectively over the entire project site), and discharging directly to an Environmentally Sensitive Area (ESA). "Discharging directly to" includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands).

(e) New development projects that support one or more of the following uses:

(i) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

(ii) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

(f) New or redevelopment projects that result in the disturbance of one or more acres of land and are expected to generate pollutants post construction.

(2) <u>Special Considerations for Redevelopment Projects</u>

The structural BMP performance requirements of Provision E.3.c are applicable to redevelopment Priority Development Projects, as defined in E.3.b.(1), as follows:

(a) Where redevelopment results in the creation or replacement of impervious surface in an amount of less than fifty percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provision E.3.c apply only to the creation or replacement of impervious surface, and not the entire development; or

(b) Where redevelopment results in the creation or replacement of impervious surface in an amount of more than fifty percent of the surface area of the previously existing development, and was not subject to previous Priority Project Development requirements, then the structural BMP performance requirements of Provision E.3.c apply to the entire development.

(3) Priority Development Project Exemptions

Each Copermittee has the discretion to exempt the following projects from being defined as Priority Development Projects:

(a) New or retrofit paved sidewalks, bicycle lanes, or trails that meet the following criteria:

(i) Designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas; OR

(ii) Designed and constructed to be hydraulically disconnected from paved streets or roads; OR

(iii) Designed and constructed with permeable pavements or surfaces in accordance with USEPA Green Streets guidance.[29]

(b) Retrofitting or redevelopment of existing paved alleys, streets or roads that are designed and constructed in accordance with the USEPA Green Streets guidance.[30]

(c) Flood control and stream restoration projects.

(d) Emergency public safety projects in any of the Priority Development Categories may be excluded if the delay caused due to the requirement for a SSMP compromises public safety, public health and/or environmental protection.

c. Priority Development Project Structural BMP Performance Requirements

In addition to the BMP requirements listed for all development projects under Provision E.3.a, Priority Development Projects must also implement structural BMPs that conform to performance requirements described below. If watershed-specific performance requirements are developed as part of a Water Quality Improvement Plan; these requirements would take precedence over the performance requirements below. The watershed-specific requirement must provide at least equal protection as the performance requirements below.

[29] See "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).
[30] Ibid.

(1) Storm Water Pollutant Control BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite structural BMPs to control pollutants in storm water that may be discharged from a project as follows:

(a) Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite, or offsite if the offsite BMP receives discharges from the PDP prior to discharge to the receiving water, the pollutants contained in the volume of storm water runoff produced from a 24-hour 85th percentile storm event (design capture volume);[31]

(i) If a Copermittee determines that implementing BMPs to retain the full design capture volume onsite, or offsite if the offsite BMP receives discharges from the PDP prior to discharge to the receiving water, for a Priority Development Project is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize biofiltration BMPs. Biofiltration BMPs must be designed to have an appropriate hydraulic loading rate to maximize storm water retention and pollutant removal, as well as to prevent erosion, scour, and channeling within the BMP,[32] and must be sized to:

[a] Treat 1.5 times the design capture volume not reliably retained onsite, OR

[b] Treat the design capture volume not reliably retained onsite with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite.

(ii) If a Copermittee determines that biofiltration is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize flow-thru treatment control BMPs to treat runoff leaving the site, AND mitigate for the design capture volume not reliably retained onsite pursuant to Provision E.3.c.(1)(b). Flow thru treatment control BMPs must be sized and designed to:

[31] This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals.

[32] As part of the Copermittee's update to its BMP Design Manual, pursuant to Provision E.3.d, the Copermittee must provide guidance for hydraulic loading rates and other biofiltration design criteria necessary to maximize storm water retention and pollutant removal.

[a] Remove pollutants from storm water to the MEP;

[b] Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;

[c] Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Flow-thru treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of flow-thru treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

(b) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1)(a). The Priority Development Project must mitigate for the portion of the pollutant load in the design capture volume not retained onsite if Provision E.3.c.(3) is utilized. ~~If a Priority Development Project is allowed to utilize alternative compliance, flow-thru treatment control BMPs must be implemented to treat the portion of the design capture volume that is not reliably retained onsite. Flow-thru treatment control BMPs must be sized and designed in accordance with Provisions E.3.c.(1)(a)(ii)[a]-[c].~~

(2) On-site Hydromodification Management Structural BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite BMPs to manage hydromodification to ensure that ~~may be caused by~~ storm water runoff discharged from a project ~~as follows~~does not cause adverse hydromodification impacts in the downstream receiving waters.~~:~~

The Copermittees in each Watershed Management Area may establish, as part of the WQIP, watershed specific requirements that will apply to priority development projects based on the susceptibility of the receiving waters to hydromodification impacts and historic receiving water changes from development. If watershed specific requirements are developed they will supersede requirements in the HMP. The watershed specific requirements must include the following:

(a) Post-project runoff conditions (flow rates and durations) must not exceed the performance standard to be determined as a part of the development of the WQIPs for each watershed Management Area ~~pre-development~~

~~runoff conditions~~ by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat downstream of Priority Development Projects).

(i) In evaluating the range of flows that results in increased potential for erosion of natural (non-hardened) channels, the lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks.

(ii) The Copermittees may use monitoring results collected pursuant to Provision D.1.a.(2) to re-define the range of flows resulting in increased potential for erosion, or degraded instream habitat conditions, as warranted by the data.

(b) Each Priority Development Project must avoid critical sediment yield areas known to the Copermittee or identified by the optional Watershed Management Area Analysis pursuant to Provision B.3.b.(4), or implement measures that allow critical coarse sediment to be discharged to receiving waters, such that there is no net impact to the receiving water.

(c) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the performance requirements of Provision E.3.c.(2)(a). The Priority Development Project must mitigate for the post-project runoff conditions not fully managed onsite if Provision E.3.c.(3) is utilized.

(d) Exemptions

Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provisions E.3.c.(2) where the project discharges storm water runoff to:

(i) Existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;

(ii) Conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; or

(iii) An area identified by the Copermittees as appropriate for an exemption by the optional Watershed Management Area Analysis incorporated into the Water Quality Improvement Plan pursuant to Provision B.3.b.(4).

(e) Interim Timeframe Exemptions

Until the Copermittees have updated their BMP Design Manual and received Regional Board approval in accordance with Provision F.2.b with the requirements of Provision E, the Copermittees have the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provision E.3.c.(2) where the project discharges storm water runoff directly to:

(i) An engineered channel conveyance system with a capacity to convey peak flows generated by the 10-year storm event all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; and

(ii) Large river reaches with a drainage area larger than 100 square miles and a 100-year flow capacity in excess of 20,000 cubic feet per second, provided that properly sized energy dissipation is included at all Priority Development Project discharge points.

(3) Alternative Compliance Program to Onsite Structural BMP Implementation

At the discretion of each Copermittee, Priority Development Projects may be allowed to participate in an alternative compliance program in lieu of implementing the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a), provided that the Water Quality Improvement Plan includes the optional Watershed Management Area Analysis described in Provision B.3.b.(4). The alternative compliance

program is available to a Priority Development Project only if the Priority Development Project applicant enters into a voluntary agreement with the Copermittee authorizing this arrangement. In addition to the voluntary agreement, relief from implementing structural BMPs onsite may be authorized by the Copermittee under the following conditions:

(a) Watershed Management Area Analysis Candidate Projects

The Priority Development Project applicant agrees to fund, contribute funds to, or implement a candidate project identified by the Copermittees in the Watershed Management Area Analysis included in the Water Quality Improvement Plan, pursuant to Provisions B.3.b.(4) subject to the following conditions:

(i) The Copermittee must determine that implementation of the candidate project will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a) onsite;

(ii) If the Priority Development Project applicant chooses to fully or partially fund a candidate project, then the in-lieu fee structure described in Provision E.3.c.(3)(c) must be followed;

(iii) If the Priority Development Project applicant chooses to fully or partially fund a candidate project, then the Copermittee must ensure that the funds to be obtained from the Priority Development Project applicant are sufficient to mitigate for impacts caused by not fully implementing structural BMPs onsite, pursuant to the performance requirements described in Provisions E.3.c.(1) and E.3.c.(2)(a);

(iv) If the Priority Development Project applicant chooses to implement a candidate project, then the Copermittee must ensure that pollutant control and/or hydromodification management within the candidate project are sufficient to mitigate for impacts caused by not implementing structural BMPs fully onsite, pursuant to the performance requirements described in Provisions E.3.c.(1) and E.3.c.(2)(a);

(v) The voluntary agreement to fund, partially fund, or implement a candidate project must include reliable sources of funding for operation and maintenance of the candidate project;

(vi) Design of the candidate project must be conducted under an appropriately qualified engineer, geologist, architect, landscape architect, or other professional, licenses where applicable, and competent and proficient in the fields pertinent to the candidate project design;

(vii) The candidate project must be constructed as soon as possible, but no later than 4 years after the certificate of occupancy is granted for

the first Priority Development Project that contributed funds toward the construction of the candidate project, unless a longer period of time is authorized by the San Diego Water Board Executive Officer; and

(viii) If the candidate project is constructed after the Priority Development Project is constructed, the Copermittee must require temporal mitigation for pollutant loads and altered flows that are discharged from the Priority Development Project.

(b) Project Applicant Proposed Alternative Compliance Projects

The Copermittee may allow a Priority Development Project applicant to propose and fund, contribute funds to, or implement an alternative compliance project not identified by the Watershed Management Area Analysis included in the Water Quality Improvement Plan pursuant to Provisions B.3.b.(4). This option is allowed provided the Copermittee determines that implementation of the alternative compliance project will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a) onsite, and is subject to the requirements described in Provisions E.3.c.(3)(a)(ii)-(viii).

(c) Alternative Compliance In-Lieu Fee Structure

If a Copermittee chooses to allow a Priority Development Project applicant to fund, or partially fund a candidate project or an alternative compliance project, then the Copermittee must develop and implement an in-lieu fee structure. This may be developed individually or with other Copermittees and/or entities, as a means for designing, developing, constructing, operating and maintaining offsite alternative compliance projects. The in-lieu fee must be transferred to the Copermittee (for public projects) or an escrow account (for private projects) prior to the construction of the Priority Development Project.

(d) Alternative Compliance Water Quality Credit System Option

The Copermittee may develop and implement an alternative compliance water quality credit system option, individually or with other Copermittees and/or entities. ~~, provided that such a credit system clearly exhibits that it will not allow discharges from Priority Development Projects to cause or contribute to a net impact over and above the impact caused by projects meeting the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a)~~. Any credit system that a Copermittee chooses to implement must be submitted to the San Diego Water Board Executive Officer for review and acceptance as part of the Water Quality Improvement Plan.

(4) Long-Term Structural BMP Maintenance

Each Copermittee must require the project applicant to submit proof of the mechanism under which ongoing long-term maintenance of all structural BMPs will be conducted.

(5) Infiltration and Groundwater Protection

(a) Structural BMPs designed to primarily function as large, centralized infiltration devices (such as large infiltration trenches and infiltration basins) must not cause or contribute to an exceedance of an applicable groundwater quality objective. At a minimum, such infiltration BMPs must be in conformance with the design criteria listed below, unless the development project applicant demonstrates to the Copermittee that one or more of the specific design criteria listed below are not necessary to protect groundwater quality. The design criteria listed below do not apply to small infiltration systems dispersed throughout a development project.

(i) Runoff must undergo pretreatment such as sedimentation or filtration prior to infiltration;

(ii) Pollution prevention and source control BMPs must be implemented at a level appropriate to protect groundwater quality at sites where infiltration BMPs are to be used;

(iii) Infiltration BMPs must be adequately maintained to remove pollutants in storm water to the MEP;

(iv) The vertical distance from the base of any infiltration BMP to the seasonal high groundwater mark must be at least 10 feet. Where groundwater basins do not support beneficial uses, this vertical distance criteria may be reduced, provided groundwater quality is maintained;

(v) The soil through which infiltration is to occur must have physical and chemical characteristics (e.g., appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses;

(vi) Infiltration BMPs must not be used for areas of industrial or light industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee, unless source control BMPs to prevent exposure of high threat activities are implemented, or runoff from such activities is first treated or filtered to remove pollutants prior to infiltration; and

(vii) Infiltration BMPs must be located a minimum of 100 feet horizontally from any water supply wells.

(b) The Copermittee may develop, individually or with other Copermittees, alternative mandatory design criteria to that listed above for infiltration BMPs which are designed to primarily function as centralized infiltration devices. Before implementing the alternative design criteria in the development planning process the Copermitee(s) must:

(i) Notify the San Diego Water Board of the intent to implement the alternative design criteria submitted; and

(ii) Comply with any conditions set by the San Diego Water Board.

d. BMP DESIGN MANUAL UPDATE

Each Copermittee must update its BMP Design Manual[33] pursuant to Provision F.2.b. Until the Copermittee has updated its BMP Design Manual with the requirements of Provisions E.3.a-c, the Copermittee must continue implementing its current BMP Design Manual. Unless directed otherwise by the San Diego Water Board, the Copermittee must implement the BMP Design Manual within 180 days of completing the update. The update of the BMP Design Manual must include the following:

(1) Updated procedures to determine the nature and extent of storm water requirements applicable to a potential development or redevelopment projects. These procedures must inform project applicants of the storm water management requirements applicable to their project including, but not limited to, general requirements for all development projects, structural BMP design procedures and requirements, hydromodification management requirements, requirements specific to phased projects, and procedures specific to private developments and public improvement projects;

(2) Updated procedures to identify pollutants and conditions of concern for selecting the most appropriate structural BMPs that consider, at a minimum, the following:

(a) Receiving water quality (including pollutants for which receiving waters are listed as impaired under the CWA section 303(d) List);

(b) Pollutants, stressors, and/or receiving water conditions that cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(c) Land use type of the project and pollutants associated with that land use type; and

[33] The BMP Design Manual was formerly known as the Standard Storm Water Mitigation Plan under Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016.

(d) Pollutants expected to be present onsite.

(3) Updated procedures for designing structural BMPs, including any updated performance requirements to be consistent with the requirements of Provision E.3.c for all structural BMPs listed in the BMP Design Manual;

(4) Long-term maintenance criteria for each structural BMP listed in the BMP Design Manual; and

(5) Alternative compliance criteria, in accordance with the requirements under Provision E.3.c.(3), if the Copermittee elects to allow Priority Development Projects within its jurisdiction to utilize alternative compliance.

e. PRIORITY DEVELOPMENT PROJECT BMP IMPLEMENTATION AND OVERSIGHT

Each Copermittee must implement a program that requires and confirms structural BMPs on all Priority Development Projects are designed, constructed, and maintained to remove pollutants in storm water to the MEP.

(1) Structural BMP Approval and Verification Process

(a) Each Copermittee must require and confirm that for all Priority Development Project applications that have not received prior lawful approval by the Copermittee by the time the BMP Design Manual is implemented~~updated~~ pursuant to Provision E.3.d, the requirements of Provision E.3 are implemented. For project applications that have received prior lawful approval before the BMP Design Manual is implemented~~updated~~ pursuant to Provision E.3.d, the Copermittee may allow previous land development requirements to apply.

(b) Each Copermittee must identify the roles and responsibilities of its various municipal departments in implementing the structural BMP requirements, including each stage of a project from application review and approval through BMP maintenance and inspections.

(c) Each Copermittee must require and confirm that appropriate easements and ownerships are properly recorded in public records and the information is conveyed to all appropriate parties when there is a change in project or site ownership.

(d) Each Copermittee must require and confirm that prior to occupancy and/or intended use of any portion of the Priority Development Project, each structural BMP is inspected to verify that it has been constructed and is operating in compliance with all of its specifications, plans, permits, ordinances, and the requirements of this Order.

(2) Priority Development Project Inventory and Prioritization

(a) Each Copermittee must develop, maintain, and update at least annually, a watershed-based database to track and inventory all Priority Development Projects and associated structural BMPs within its jurisdiction. Inventories must be accurate and complete beginning from December 2002 for the San Diego County Copermittees, February 2003 for the Orange County Copermittees, and July 2005 for the Riverside County Copermittees. The use of an automated database system, such as GIS, is highly recommended. The database must include, at a minimum, the following information:

(i) Priority Development Project location (address and hydrologic subarea);

(ii) Descriptions of structural BMP type(s);

(iii) Date(s) of construction;

(iv) Party responsible for structural BMP maintenance;

(v) Dates and findings of structural BMP maintenance verifications; and

(vi) Corrective actions and/or resolutions, when applicable.

(b) Each Copermittee must prioritize the Priority Development Projects with structural BMPs within its jurisdiction. The designation of Priority Development Projects as high priority must consider the following:

(i) The highest water quality priorities identified in the Water Quality Improvement Plan;

(ii) Receiving water quality;

(iii) Number and sizes of structural BMPs;

(iv) Recommended maintenance frequency of structural BMPs;

(v) Likelihood of operation and maintenance issues of structural BMPs;

(vi) Land use and expected pollutants generated; and

(vii) Compliance record.

(3) Structural BMP Maintenance Verifications and Inspections

Each Copermittee is required to verify that structural BMPs on each Priority Development Project are adequately maintained, and continue to operate effectively to remove pollutants in storm water to the MEP through inspections, self-certifications, surveys, or other equally effective approaches.

(a) All (100 percent) of the structural BMPs at Priority Development Projects that are designated as high priority must be inspected directly by the

Copermittee annually prior to each rainy season;

(b) For verifications performed through a means other than direct Copermittee inspection, adequate documentation must be required by the Copermittee to provide assurance that the required maintenance of structural BMPs at each Priority Development Project has been completed; and

(c) Appropriate follow-up measures (including re-inspections, enforcement, etc.) must be conducted to ensure that structural BMPs at each Priority Development Project continue to reduce pollutants in storm water to the MEP as originally designed.

f. Development Project Enforcement

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all development projects, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

4. Construction Management

Each Copermittee must implement a construction management program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1). ~~and includes, at a minimum, the following requirements:~~ The requirements of the jurisdictional runoff management programs as outlined below may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality improvement Plan(s).

a. Project Approval Process

Prior to issuance of any local permit(s) that allows the commencement of construction projects that involve ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff, each Copermittee must:

(1) Require a pollution control plan, construction BMP plan, and/or an erosion and sediment control plan, to be submitted by the project applicant to the Copermittee;

(2) Confirm the pollution control plan, construction BMP plan, and/or erosion and sediment control plan, complies with the local grading ordinance, other applicable local ordinances, and the requirements of this Order;

(3) Confirm the pollution control, construction BMP, and/or erosion and sediment control plan, includes seasonally appropriate and effective BMPs and management measures described in Provision E.4.c, as applicable to the

project; and

(4) Verify that the project applicant has obtained coverage under the statewide Construction General Permit (Order ~~2012-0006~~2009-0009-DWQ or subsequent Order), if applicable.

b. CONSTRUCTION SITE INVENTORY AND TRACKING

(1) Each Copermittee must maintain and update, at least quarterly, a watershed-based inventory of all construction projects issued a local permit that allows ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff. The use of an automated database system, such as GIS, is highly recommended. The inventory must include:

(a) Relevant contact information for each site (e.g., name, address, phone, and email for the owner and contractor);

(b) The basic site information including location (address and hydrologic subarea), Waste Discharge Identification (WDID) number (if applicable), size of the site, and approximate area of disturbance;

(c) Whether or not the site is considered a high threat to water quality, as defined in Provision E.4.b.(2) below;

(d) The project start and completion dates;

(e) The required inspection frequency, as defined in the Copermittee's jurisdictional runoff management program document;

(f) The date the Copermittee accepted or approved the pollution control plan, construction BMP plan, and/or erosion and sediment control plan; and

(g) Whether or not there are ongoing enforcement actions administered to the site.

(2) Each Copermittee must identify all construction sites within its jurisdiction that represent a high threat to downstream surface water quality. The designation of construction sites as high threat to water quality must consider the following:

(a) Sites located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Sites located within the same hydrologic subarea and tributary to a water body segment listed as impaired for sediment on the CWA section 303(d) List;

(c) Sites located within, directly adjacent to, or discharging directly to a receiving water within an ESA; and

(d) Other sites determined by the Copermittees or the San Diego Water Board as a high threat to water quality.

c. CONSTRUCTION SITE BMP IMPLEMENTATION

Each Copermittee must implement, or require the implementation of effective BMPs to reduce discharges of pollutants in storm water from construction sites to the MEP, and effectively prohibit non-storm water discharges from construction sites into the MS4. These BMPs must be site specific, seasonally appropriate, and construction phase appropriate. BMPs must be implemented at each construction site year round. Dry season BMP implementation must plan for and address unseasonal rain events that may occur during the dry season (May 1 through September 30). Copermittees must implement, or require the implementation of, BMPs in the following categories:

(1) Project Planning;

(2) Good Site Management "Housekeeping", including waste management;

(3) Non-storm Water Management;

(4) Erosion Control;

(5) Sediment Control;

(6) Run-on and Run-off Control; and

(7) Active/Passive Sediment Treatment Systems, where applicable.

d. CONSTRUCTION SITE INSPECTIONS

Each Copermittee must conduct construction site inspections to require and confirm compliance with its local permits and applicable local ordinances, and the requirements of this Order. Priority for site inspections must consider threat to water quality pursuant to Provision E.4.b as well as the nature of the construction activity, topography, and the characteristics of soils and receiving water quality.

(1) <u>Inspection Frequency</u>

(a) Each Copermittee must conduct inspections at all inventoried sites, including high threat to water quality sites, at an appropriate frequency for each phase of construction to confirm the site reduces the discharge of pollutants in storm water from construction sites to the MEP, and

effectively prohibits non-storm water discharges from entering the MS4.

(b) Each Copermittee must establish appropriate inspection frequencies for high threat to water quality sites, and all other sites, for each phase of construction. Inspection frequencies appropriate for addressing the highest water quality priorities identified in the Water Quality Improvement Plan, and for complying with the requirements of this Order must be identified in each Copermittee's jurisdictional runoff management program document.

(c) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e., re-inspection, enforcement) necessary to require and confirm site compliance with its local permits and applicable local ordinances, and the requirements of this Order.

(2) Inspection Content

Inspections of construction sites by the Copermittee must include, at a minimum:

(a) Verification of coverage under the Construction General Permit (Notice of Intent (NOI) and/or WDID number) during initial inspections, when applicable;

(b) Assessment of compliance with its local permits and applicable local ordinances related to pollution prevention, including the implementation and maintenance of applicable BMPs;

(c) Assessment of BMP adequacy and effectiveness;

(d) Visual observations of actual non-storm water discharges;

(e) Visual observations of actual or potential discharge of sediment and/or construction related materials from the site;

(f) Visual observations of actual or potential illicit connections; and

(g) If any violations are found and BMP corrections are needed, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried construction sites. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made

available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Site name, location (address and hydrologic subarea), and WDID number (if applicable);

(b) Inspection date;

(c) ~~Approximate amount of rainfall since last~~ Weather conditions during the inspection;

(d) Description of problems observed with BMPs and indication of need for BMP addition/repair/replacement and any scheduled re-inspection, and date of re-inspection;

(e) Descriptions of any other specific inspection comments which must, at a minimum, include rationales for longer compliance time;

(f) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(g) Resolution of problems noted and date problems fixed.

e. CONSTRUCTION SITE ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried construction sites, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

5. Existing Development Management

Each Copermittee must implement an existing development management program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1). ~~and includes, at a minimum, the following requirements:~~ The requirements of the jurisdictional runoff management programs as outlined below may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality improvement Plan(s).

a. EXISTING DEVELOPMENT INVENTORY AND TRACKING

Each Copermittee must maintain, and update at least annually, a watershed-based inventory of the existing development within its jurisdiction that may discharge a high priority pollutant load to and from the MS4. The use of an automated database system, such as GIS, is highly recommended. The

inventory must, at a minimum, evaluate and include the following if identified as a source of a high priority pollutant ~~include~~:

(1) Name, location (hydrological subarea and address, if applicable) of the following types of existing development with its jurisdiction:

(a) Commercial facilities or areas;

(b) Industrial facilities;

(c) Municipal facilities, including:

(i) MS4 and related structures;[34]
(ii) Roads, streets, and highways;
(iii) Parking facilities;
(iv) Municipal airfields;
(v) Parks and recreation facilities;
(vi) Flood management facilities, flood control devices and structures;
(vii) Operating or closed municipal landfills;
(viii) Publicly owned treatment works (including water and wastewater treatment plants) and sanitary sewer collection systems;
(ix) Corporate yards, including maintenance and storage yards for materials, waste, equipment, and vehicles;
(x) Hazardous waste collection facilities;
(xi) Other treatment, storage or disposal facilities for municipal waste; and
(xii) Other municipal facilities that the Copermittee determines may contribute a significant high priority pollutant load to the MS4.

(d) Residential areas, which may be designated by one or more of the following:

(i) Residential management area;
(ii) Drainage basin or area;
(iii) Land use (e.g., single family, multi-family, rural);
(iv) Neighborhood;
(v) Common Interest Area;
(vi) Home Owner Association;
(vii) Mobile home park; and/or
(viii) Other designations accepted by the San Diego Water Board

[34] The inventory may refer to the MS4 map required to be maintained pursuant to Provision E.2.b.(1).

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(2) A description of the facility or area, including the following information:

(a) Classification as commercial, industrial, municipal, or residential;

(b) Status of facility or area as active or inactive;

(c) Identification if a business is a mobile business;

(d) SIC Code or NAICS Code, if applicable;

(e) Industrial General Permit NOI and/or WDID number, if applicable;

(f) Identification if a residential area is or includes a Common Interest Area / Home Owner Association, or mobile home park;

(g) Identification of the high priority pollutants generated and potentially generated by the facility or area;

(h) Whether the facility or area is adjacent to an ESA;

(i) Whether the facility or area is tributary to and within the same hydrologic subarea as a water body segment listed as impaired on the CWA section 303(d) List and generates pollutants for which the water body segment is impaired; and

(3) An annually updated map showing the location of inventoried existing development, watershed boundaries, and water bodies.

b. EXISTING DEVELOPMENT BMP IMPLEMENTATION AND MAINTENANCE

Each Copermittee must designate a ~~minimum~~ set of BMPs required for all inventoried existing development, including special event venues. The designated ~~minimum~~ BMPs must be specific to the identified high priority facility or area types and high priority pollutant generating activities, as appropriate.

(1) Commercial, Industrial, and Municipal Facilities and Areas

(a) Pollution Prevention

Each Copermittee must require the use of pollution prevention methods by the commercial, industrial, and municipal facilities and areas in its inventoried existing development to address the priorities and strategies in the Water Quality Improvement Plan.

(b) BMP Implementation

Each Copermittee must require the implementation of designated BMPs at

commercial facilities and areas, industrial facilities, and implement designated BMPs at municipal facilities in its inventoried existing development.

(c) BMP Operation and Maintenance

(i) Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development.

(ii) Each Copermittee must implement a schedule of operation and maintenance activities for its MS4 and related structures (including but not limited to catch basins, storm drain inlets, detention basins, etc.), and verify proper operation of all its municipal structural treatment controls designed to reduce pollutants (including floatables) in storm water discharges to or from its MS4s and related drainage structures. Operation and maintenance activities may include, but is not limited to, the following:

[a] Inspections of the MS4 and related structures;
[b] Cleaning of the MS4 and related structures; and
[c] Proper disposal of materials removed from cleaning of the MS4 and related structures.

(iii) Each Copermittee must implement a schedule of operation and maintenance for public streets, unpaved roads, paved roads, and paved highways within its jurisdiction to minimize pollutants that can be discharged in storm water.

(iv) Each Copermittee must implement controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers. Copermittees that operate both a municipal sanitary sewer system and a MS4 must implement controls and measures to prevent and eliminate seeping sewage from infiltrating the MS4. Copermittees that do not operate both a municipal sanitary sewer system and a MS4 must coordinate with sewering agencies to keep themselves informed of relevant and appropriate maintenance activities and sanitary sewage projects in their jurisdiction that may cause or contribute to seepage of sewage into the MS4.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must require the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from commercial facilities and areas and industrial facilities, and implement BMPs at municipal facilities in its inventoried existing development. Such BMPs must include,

as appropriate, educational activities, permits, certifications and other measures for applicators and distributors.

(2) Residential Areas

(a) Pollution Prevention

Each Copermittee must promote and encourage the use of pollution prevention methods, where appropriate, by the residential areas in its inventoried existing development.

(b) BMP Implementation

Each Copermittee must promote and encourage the implementation of designated BMPs at residential areas in its inventoried existing development.

(c) BMP Operation and Maintenance

Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at residential areas in its inventoried existing development.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must promote and encourage the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from residential areas in its inventoried existing development.

c. Existing Development Inspections

Each Copermittee must conduct inspections of inventoried existing development to ensure compliance with applicable local ordinances and permits, and the requirements of this Order.

(1) Inspection Frequency

(a) Each Copermittee must establish appropriate inspection frequencies for inventoried existing development in accordance with the following requirements:

(i) At a minimum, inventoried existing development must be inspected once every five years utilizing one or more of the following methods:

[a] Drive-by inspections by Copermittee municipal and contract staff;

[b] Onsite inspections by Copermittee municipal and contract staff; and/or

[c] Visual inspections of publicly accessible inventoried facilities or areas by volunteer monitoring or patrol programs that have been trained by the Copermittee;

(ii) The frequency of inspections must be appropriate to confirm that BMPs are being implemented to reduce the discharge of pollutants in storm water from the MS4 to the MEP and effectively prohibit non-storm water discharges into the MS4;

(iii) The frequency of inspections must be based on the potential for a facility or area to discharge non-storm water and pollutants in storm water, and should reflect the priorities set forth in the Water Quality Improvement Plan;

(iv) Each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development;[35] and

(v) Inventoried existing development must be inspected by the Copermittee, as needed, in response to valid public complaints.

(b) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e. education and outreach, re-inspection, enforcement) necessary to require and confirm compliance with its applicable local ordinances and permits and the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

(2) Inspection Content

(a) Inspections of existing development must include, at a minimum:

(i) Visual inspections for the presence of actual non-storm water discharges;

(ii) Visual inspections for the presence of actual or potential discharge of pollutants;

(iii) Visual inspections for the presence of actual or potential illicit connections; and

(iv) Verification that the description of the facility or area in the inventory, required pursuant to Provision E.5.a.(2), has not changed.

[35] If any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspection may count toward the total annual inspection requirement. This requirement excludes linear municipal facilities (i.e., MS4 linear channels, sanitary sewer collection systems, streets, roads and highways).

(b) Onsite inspections of existing development by the Copermittee must include, at a minimum:

(i) Assessment of compliance with its applicable local ordinances and permits related to non-storm water and storm water discharges and runoff;

(ii) Assessment of the implementation of the designated BMPs;

(iii) Verification of coverage under the Industrial General Permit, when applicable; and

(iv) If any problems or violations are found, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried existing development. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Name and location of the facility or area (address and hydrologic subarea) consistent with the inventory name and location, pursuant to Provision E.5.a.(1);

(b) Inspection and re-inspection date(s);

(c) Inspection method(s) (i.e. drive-by, onsite);

(d) Observations and findings from the inspection(s);

(e) For onsite inspections of existing development by Copermittee municipal or contract staff, the records must also include, as applicable:

(i) Description of any problems or violations found during the inspection(s);

(ii) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(iii) The date problems or violations were resolved.

d. Existing Development Enforcement

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried existing development, as necessary, to

achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

e. RETROFITTING AND REHABILITATING AREAS OF EXISTING DEVELOPMENT

(1) Retrofitting Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to retrofit areas of existing development within its jurisdiction to address identified sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify areas of existing development as candidates for retrofitting, focusing on areas where retrofitting will address pollutants and/or stressors that contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for retrofitting projects may be utilized to reduce pollutants that may be discharged in storm water from areas of existing development, and/or address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of retrofitting projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting projects; and

(e) Where retrofitting projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional retrofitting projects (i.e. projects that can receive and/or treat storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment) adjacent to and/or downstream of the areas of existing development.

(2) Stream, Channel and/or Habitat Rehabilitation in Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management

program document, a program to rehabilitate streams, channels, and/or habitats in areas of existing development within its jurisdiction or just downstream of its jurisdiction to address the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) ~~Each Copermittee must identify streams, channels, and/or habitats in areas of existing development as candidates for rehabilitation, focusing on areas where stream, channel, and/or habitat rehabilitation projects will address the highest priority water quality conditions identified in the Water Quality Improvement Plan~~;

(b) Candidates for stream, channel, and/or habitat rehabilitation projects may be utilized to address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters, rehabilitate channelized or hydromodified streams, ~~restore~~ protect wetland and riparian habitat, ~~restore~~ protect watershed functions, and/or ~~restore~~ protect beneficial uses of receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of stream, channel, and/or habitat rehabilitation projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance stream, channel, and/or habitat rehabilitation projects; and

(e) Where stream, channel, and/or habitat rehabilitation projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional stream, channel, and/or habitat rehabilitation projects (i.e. projects that can receive storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment).

6. Enforcement Response Plans

Each Copermittee must develop and implement an Enforcement Response Plan as part of its jurisdictional runoff management program document. The Enforcement Response Plan must describe the applicable approaches and options to enforce its legal authority established pursuant to Provision E.1, as necessary, to achieve compliance with the requirements of this Order. Copermittees may continue to utilize and implement established, equivalent guidelines and procedures for

enforcement. The Enforcement Response Plan must be in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include the following:

a. ENFORCEMENT RESPONSE PLAN COMPONENTS

The Enforcement Response Plan must include and/or address the following individual components:

(1) Illicit Discharge Detection and Elimination Enforcement Component;

(2) Development Planning Enforcement Component;

(3) Construction Management Enforcement Component; and

(4) Existing Development Enforcement Component.

b. ENFORCEMENT RESPONSE APPROACHES AND OPTIONS

Each component of the Enforcement Response Plan must describe the enforcement response approaches that the Copermittee will implement to compel compliance with its statutes, ordinances, permits, contracts, orders, or similar means, and the requirements of this Order. The description must include the protocols for implementing progressively stricter enforcement responses. The enforcement response approaches must include appropriate sanctions to compel compliance, including, at a minimum, the following tools or their equivalent:

(1) Verbal and written notices of violation;

(2) Cleanup requirements;

(3) Fines;

(4) Bonding requirements;

(5) Administrative and criminal penalties;

(6) Liens;

(7) Stop work orders; and

(8) Permit and occupancy denials.

c. CORRECTION OF VIOLATIONS

(1) Violations must be corrected in a timely manner with the goal of correcting the violations within 30 calendar days after the violations are discovered, or prior

to the next predicted rain event, whichever is sooner.

(2) If more than 30 calendar days are required to achieve compliance, then a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

d. ~~ESCALATED~~ PROGRESSIVE ENFORCEMENT

(1) The Enforcement Response Plan must include a definition of "~~escalated~~ progressive enforcement." ~~Escalated~~ Progressive enforcement must include a series of enforcement actions that match the severity of the violations and include distinct, progressive steps. ~~any enforcement scenario where a violation or other non-compliance is determined to cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan.~~ Progressive ~~Escalated~~ enforcement may be defined differently for development planning, construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and/or residential areas.

(2) Where the Copermittee determines ~~escalated~~ progressive enforcement is not required, a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

(3) ~~Escalated~~ Progressive enforcement actions must continue to increase in severity, as necessary, to compel compliance as soon as possible.

e. REPORTING OF NON-COMPLIANT SITES

(1) Each Copermittee must notify the San Diego Water Board in writing within five (5) calendar days of issuing escalated enforcement (as defined in the Copermittee's Enforcement Response Plan) to a construction site that poses a significant threat to water quality as a result of violations or other non-compliance with its permits and applicable local ordinances, and the requirements of this Order. Written notification may be provided electronically by email to the appropriate San Diego Water Board staff.

(2) Each Copermittee must notify the San Diego Water Board of any persons required to obtain coverage under the statewide Industrial General Permit and Construction General Permit and failing to do so, within five (5) calendar days from the time the Copermittee become aware of the circumstances. Written notification may be provided electronically by email to R9_Nonfilers@waterboards.ca.gov ~~Nonfilers_R9@waterboards.ca.gov~~.

7. Public Education and Participation

Each Copermittee must implement, individually or with other Copermittees, a public education and participation program in accordance with the strategies identified in the Water Quality Improvement Plan to promote and encourage the development of

programs, management practices, and behaviors that reduce the discharge of pollutants in storm water to the MEP, prevent controllable non-storm water discharges from entering the MS4, and protect water quality standards in receiving waters. The public education and participation program must be implemented in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1). The requirements of the jurisdictional runoff management programs as outlined below may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality improvement Plan(s). ~~and include, at a minimum, the following requirements:~~

a. PUBLIC EDUCATION

The public education program component implemented within the Copermittee's jurisdiction ~~must~~ may include~~, at a minimum,~~ the following:

(1) Educational activities, public information activities, and other appropriate outreach activities intended to reduce pollutants associated with the ~~application of pesticides, herbicides and fertilizer and other pollutants of concern in storm water discharges to and from its MS4 to the MEP, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed to address the~~ highest priority water quality conditions identified in the Water Quality Improvement Plan;

(2) Educational activities, public information activities, and other appropriate outreach activities to facilitate the proper management and disposal of used oil and toxic materials; and

(3) Appropriate education and training measures for specific target audiences, such as construction site operators, residents, underserved target audiences and school-aged children, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed, based on high risk behaviors and pollutants of concern.

b. PUBLIC PARTICIPATION

The public participation program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) A process for members of the public to participate in updating the highest priority water quality conditions, numeric goals, and water quality improvement strategies in the Water Quality Improvement Plan;

(2) Opportunities for members of the public to participate in providing the Copermittee recommendations for improving the effectiveness of the water quality improvement strategies implemented within its jurisdiction; and

(3) Opportunities for members of the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or protection of the quality of receiving waters.

8. Fiscal Analysis

a. Each Copermittee must secure the resources necessary to meet all the requirements of this Order.

b. Each Copermittee must conduct an annual fiscal analysis of its jurisdictional runoff management program in its entirety. The fiscal analysis must include the following:

(1) Identification of the various categories of expenditures necessary to implement the requirements of this Order, including a description of the specific capital, operation and maintenance, and other expenditure items to be accounted for in each category of expenditures;

(2) The staff resources needed and allocated to meet the requirements of this Order, including any development, implementation, and enforcement activities required;

(3) The estimated expenditures for Provisions E.8.b.(1) and E.8.b.(2) for the current fiscal year; and

(4) The source(s) of funds that are proposed to meet the necessary expenditures described in Provisions E.8.b.(1) and E.8.b.(2), including legal restrictions on the use of such funds, for the current fiscal year and next fiscal year.

c. Each Copermittee must submit a summary of the annual fiscal analysis with each Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3).

d. Each Copermittee must provide the documentation used to develop the summary of the annual fiscal analysis upon request by the San Diego Water Board.

F. REPORTING

The purpose of this provision is to determine and document compliance with the requirements set forth in this Order. The goal of reporting is to communicate to the San Diego Water Board and the people of the State of California the implementation status of each jurisdictional runoff management program and compliance with the requirements of this Order. This goal is to be accomplished through the submittal of specific deliverables to the San Diego Water Board by the Copermittees.

1. Water Quality Improvement Plans

The Copermittees for each Watershed Management Area must develop and submit the Water Quality Improvement Plan in accordance with the following requirements:

a. WATER QUALITY IMPROVEMENT PLAN DEVELOPMENT

Each Water Quality Improvement Plan must be developed in accordance with the following process:

(1) Public Participation Process

The Copermittees must implement a public participation process to solicit data, information, and recommendations to be utilized in the development of the Water Quality Improvement Plan. The public participation process must include the following:

(a) The Copermittees must develop a publicly available and noticed schedule of the opportunities for the public to participate and provide comments during the development of the Water Quality Improvement Plan. The schedule may be adjusted as necessary by the Copermittees, provided the public is provided timely notification of the changes to the schedule.

(b) The Copermittees must form a Water Quality Improvement Consultation Panel to provide recommendations during the development of the Water Quality Improvement Plan. The Water Quality Improvement Consultation Panel must consist of at least the following members:

(i) A representative of the San Diego Water Board;

(ii) A representative of the environmental community familiar with the water quality conditions of concern of the receiving waters in the Watershed Management Area, preferably from an environmental interest group associated with a water body within the Watershed Management Area; and

(iii) A representative of the development community familiar with the opportunities and constraints for implementing structural BMPs, retrofitting projects, and stream, channel or habitat rehabilitation

projects in the Watershed Management Area, preferably with relevant engineering, hydrology, and/or geomorphology experience in the Watershed Management Area.

(c) The Copermittees must coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public time and opportunity to participate during the development of the Water Quality Improvement Plans.

(2) Priority Water Quality Conditions

(a) The Copermittees must solicit data, information and recommendations from the public to be utilized in the development and identification of the priority water quality conditions and potential water quality improvement strategies for the Watershed Management Area.

(b) The Copermittees must review the priority water quality conditions the Copermittees plan on including in the Water Quality Improvement Plan with the Water Quality Improvement Consultation Panel to receive recommendations or concurrence.

(c) The Copermittees must consider revisions to the priority water quality conditions based on recommendations from the Water Quality Improvement Consultation Panel.

(d) The Copermittees must include all the potential water quality improvement strategies identified by the public and the Water Quality Improvement Consultation Panel with the submittal of the priority water quality conditions to the San Diego Water Board.

(e) The Copermittees must submit the Water Quality Improvement Plan requirements of Provision B.2 to the San Diego Water Board as early as 6 months and no later than 12 months after the commencement of coverage under this Order. Upon receipt, the San Diego Water Board will issue a public notice and release the proposed priority water quality conditions and potential water quality improvement strategies for public review and comment for a minimum of 30 days.

(f) Within 30 days of receiving the public comments, t~~T~~he Copermittees must consider revisions to the priority water quality conditions and potential water quality improvement strategies developed pursuant to Provision B.2 ~~based on public comments received by the close of the comment period~~.

(3) Water Quality Improvement Goals, Strategies and Schedules

(a) The Copermittees must solicit recommendations from the public on potential numeric goals for the highest priority water quality conditions

identified for the Watershed Management Area, and recommendations on the strategies that should be implemented to achieve the potential numeric goals.

(b) The Copermittees must consult with the Water Quality Improvement Consultation Panel and consider revisions to the following items based on the Panel's recommendations:

(i) The numeric goals and schedules the Copermittees propose to include in the Water Quality Improvement Plan;

(ii) The water quality improvement strategies and schedules the Copermittees propose to implement in the Watershed Management Area and include in the Water Quality Improvement Plan; and

(iii) If the Copermittees choose to implement Provision B.3.b.(4), the results of the Watershed Management Area Analysis the Copermittees proposed to incorporate into the Water Quality Improvement Plan.

(c) The Copermittees must submit the Water Quality Improvement Plan requirements of Provision B.3 to the San Diego Water Board as early as 9 months and no later than 18 months after the commencement of coverage under this Order. Upon receipt, the San Diego Water Board will issue a public notice and release the proposed water quality improvement goals, strategies and schedules for public review and comment for a minimum of 30 days.

(d) Within 30 days of receiving the public comments, t~~T~~he Copermittees must consider revisions to the water quality improvement goals, strategies and schedules developed pursuant to Provision B.3 ~~based on public comments received by the close of the comment period~~.

b. WATER QUALITY IMPROVEMENT PLAN SUBMITTAL AND IMPLEMENTATION

(1) Within 24 months after the commencement of coverage under this Order, the Copermittees for each Watershed Management Area must submit a complete Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order to the San Diego Water Board. The San Diego Water Board will issue a public notice and release the Water Quality Improvement Plan for public review and comment for a minimum of 30 days.

(2) The Copermittees must consider revisions to the Water Quality Improvement Plan based on written comments received by the close of the public comment period.

(3) The Copermittees must promptly submit any revisions to the Water Quality Improvement Plan to the San Diego Water Board no later than 60 days after the close of the public comment period.

(4) If issues concerning the Water Quality Improvement Plan are resolved informally through discussions among the Copermittees, the San Diego Water Board and interested parties, the San Diego Water Board Executive Officer may provide written notification of acceptance to the Copermittees that the Water Quality Improvement Plan meets the requirements of Provision B. However, if the Executive Officer determines that significant issues with the Water Quality Improvement Plan remain, the matter will be scheduled for San Diego Water Board consideration at a public meeting.

(5) The Copermittees must commence with implementation of the Water Quality Improvement Plan, in accordance with the water quality improvement strategies and schedules therein, upon written notification of acceptance with the Water Quality Improvement Plan by the San Diego Water Board Executive Officer.

(6) During implementation of the Water Quality Improvement Plan the Copermittees must correct any deficiencies in the Plan identified by the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report following a request by the Board to do so.

(7) The Water Quality Improvement Plan must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of receiving notification of acceptance with the Water Quality Improvement Plan by the San Diego Water Board Executive Officer.

2. Updates

a. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATES

Each Copermittee must update its jurisdictional runoff management program document in accordance with the following requirements:

(1) Each Copermittee is encouraged to seek public and key stakeholder participation and comments, as early and often as possible during the process of developing updates to its jurisdictional runoff management program document;

(2) Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E concurrent with the submittal of the Water Quality Improvement Plan. Each Copermittee must correct any deficiencies in the jurisdictional runoff management program document based on comments received from the San Diego Water Board in

the updates submitted with the Water Quality Improvement Plan Annual Report;

(3) Each Copermittee must submit updates to its jurisdictional runoff management program, with the supporting rationale for the modifications, either in the Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b;

(4) The Copermittee must revise proposed modifications to its jurisdictional runoff management program as directed by the San Diego Water Board Executive Officer; and

(5) Updated jurisdictional runoff management program documents must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of ~~submitting the Water Quality Improvement Plan Annual Report~~completing the updates.

b. BMP DESIGN MANUAL UPDATES

Each Copermittee must update its BMP Design Manual in accordance with the following requirements:

(1) Each Copermittee must update its BMP Design Manual to incorporate the requirements of Provisions E.3.a-d concurrent with the submittal of the Water Quality Improvement Plan. Each Copermittee must correct any deficiencies in the BMP Design Manual based on comments received from the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report;

(2) Subsequent updates to the BMP Design Manual must be consistent with the requirements of Provisions E.3.a-d and must be submitted as part of the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b; and

(3) Updated BMP Design Manuals must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of completing the update.

c. WATER QUALITY IMPROVEMENT PLAN UPDATES

(1) The Water Quality Improvement Plans must be updated in accordance with the following process:

(a) The Copermittees must develop and implement a public participation process to obtain data, information and recommendations for updating the Water Quality Improvement Plan. The public participation process must provide for a publicly available and noticed schedule of opportunities for the public to participate and provide comments during the development of updates to the Water Quality Improvement Plan;

(b) The Copermittees must consult with the Water Quality Improvement Consultation Panel on proposed updates of the Water Quality Improvement Plan, and consider the Water Quality Improvement Consultation Panel's recommendations in finalizing the proposed updates;

(c) The Copermittees for each Watershed Management Area must submit 1) proposed updates to the Water Quality Improvement Plan and supporting rationale, and 2) recommendations received from the public and the Water Quality Improvement Consultation Panel and the rationale for the requested updates, either in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The updates submitted will be deemed accepted for inclusion in the Water Quality Improvement Plan ninety (90) days after submission unless otherwise directed in writing by the San Diego Water Board Executive Officer;

(d) The Copermittees must revise the requested updates as directed by the San Diego Water Board Executive Officer; and

(e) Updated Water Quality Improvement Plans must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance of the requested updates by the San Diego Water Board.

(2) No later than six months following ~~Office of Administrative Law and USEPA approval of~~ the effective date of any TMDL Basin Plan amendment with wasteload allocations (WLAs) assigned to the Copermittees during the term of this Order, the Copermittees must initiate an update to the applicable Water Quality Improvement Plans in accordance with Provision F.1 or Provision F.2.c.(1) to ensure the WQIP includes actions to address the pollutant-waterbody combination. As TMDLs are not self-implementing, the Order must be re-opened to incorporate the TMDL WLAs. ~~incorporate the requirements of the TMDL WLAs~~.

3. Progress Reporting

a. Progress Report Presentations

The Copermittees for each Watershed Management Area must periodically appear before the San Diego Water Board, as requested by the Board, to provide progress reports on the implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs.

b. Annual Reports

(1) Transitional Jurisdictional Runoff Management Program Annual Reports

(a) Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) no later than October 31 of each year for each jurisdictional runoff management program reporting period (i.e. July 1 to June 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted.

(b) Each Copermittee must submit the information on the Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) specific to the area within its jurisdiction in each Watershed Management Area.

(c) In addition to submitting the Jurisdictional Runoff Management Program Annual Report Form during the transitional reporting period, each Copermittee may continue to utilize and submit the jurisdictional runoff management program annual reporting format of its previous NPDES permit until the first Water Quality Improvement Plan Annual Report is required to be submitted.

(2) Transitional Monitoring and Assessment Program Annual Reports

The Copermittees for each Watershed Management Area must submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted under this Order. The Transitional Monitoring and Assessment Program Annual Reports must include:

(a) The receiving water and MS4 outfall discharge monitoring data collected

pursuant to Provisions D.1.a and D.2.a, summarized and presented in tabular and graphical form; and

(b) The findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

(3) Water Quality Improvement Plan Annual Reports

The Copermittees for each Watershed Management Area must submit a Water Quality Improvement Plan Annual Report for each reporting period no later than January 31 of the following year. The annual reporting period consists of two different periods: 1) July 1 to June 30 of the following year for the jurisdictional runoff management programs, 2) October 1 to September 30 of the following year for the monitoring and assessment programs. The Water Quality Improvement Plan Annual Reports must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Each Annual Report must include the following:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, summarized and presented in tabular and graphical form;

(b) The progress of the special studies required pursuant to Provision D.3, and the findings, interpretations and conclusions of a special study, or each phase of a special study, upon its completion;

(c) The findings, interpretations and conclusions from the assessments required pursuant to Provision D.4;

(d) The progress of implementing the Water Quality Improvement Plan, including, but not limited to, the following:

(i) The progress toward achieving the interim and final numeric goals for the highest water quality priorities for the Watershed Management Area;

(ii) The water quality improvement strategies that were implemented and/or no longer implemented by each of the Copermittees during the reporting period and previous reporting periods;

(iii) The water quality improvement strategies planned for implementation during the next reporting period;

(iv) Proposed modifications to the water quality improvement strategies, the public comments received and the supporting rationale for the proposed modifications;

(v) Previous modifications or updates incorporated into the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff

management program document and implemented by the Copermittees in the Watershed Management Area; and

(vi) Proposed modifications or updates to the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document;

(e) A completed Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) for each Copermittee in the Watershed Management Area, certified by a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative; and

(f) Each Copermittee must provide any data or documentation utilized in developing the Water Quality Improvement Plan Annual Report upon request by the San Diego Water Board. Any Copermittee monitoring data utilized in developing the Water Quality Improvement Plan Annual Report must be uploaded to the California Environmental Data Exchange Network (CEDEN).[36] Any Copermittee monitoring and assessment data utilized in developing the Water Quality Improvement Plan Annual Report must be available for access on the Regional Clearinghouse required pursuant to Provision F.4.

C. Regional Monitoring and Assessment Report

(1) The Copermittees must submit a Regional Monitoring and Assessment Report no later than 180 days prior to the expiration date of this Order. The Regional Monitoring and Assessment Report may be submitted as part of the Report of Waste Discharge required pursuant to Provision F.5.b. In preparing the report the Copermittees must consider the receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, and the findings, interpretations, and conclusions from the assessments required pursuant to Provision D.4. Based on these considerations the report must assess the following:

(a) The beneficial uses of the receiving waters within the San Diego Region that are supported and not adversely affected by the Copermittees' MS4 discharges;

(b) The beneficial uses of the receiving waters within the San Diego Region that are adversely impacted by the Copermittees' MS4 discharges;

(c) The progress toward protecting the beneficial uses in the receiving waters

[36] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

within the San Diego Region from the Copermittees' discharges; and

(d) Pollutants or conditions of emerging concern that may impact beneficial uses in the receiving waters within the San Diego Region.

(2) The Regional Monitoring and Assessment Report must include recommendations for improving the implementation and assessment of the Water Quality Improvement Plans and jurisdictional runoff management programs.

(3) Each Copermittee must provide any data or documentation utilized in developing the Regional Monitoring and Assessment Report upon request by the San Diego Water Board. Any Copermittee monitoring and assessment data utilized in developing the Regional Monitoring and Assessment Report must be available for access on the Regional Clearinghouse required pursuant to Provision F.4.

4. Regional Clearinghouse

The Copermittees must develop, update, and maintain an internet-based Regional Clearinghouse that is made available to the public no later than 18 months after the effective date of this Order.[37]

a. The Copermittees, through the Regional Clearinghouse, must make the following documents and data available for access, and organized by Watershed Management Area. The documents and data may be linked to other internet-based data portals and databases where the original documents are stored:

(1) Water Quality Improvement Plan for the Watershed Management Area, and all updated versions with date of update;

(2) Annual Reports for the Watershed Management Area;

(3) Jurisdictional Runoff Management Program document for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(4) BMP Design Manual for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(5) Reports from special studies (e.g. source identification, BMP effectiveness assessment) conducted in the Watershed Management Area;

[37] The Copermittees may develop, update and maintain the clearinghouse(s) of other Copermittees or agencies.

(6) Monitoring data collected pursuant to Provision D for each Watershed Management Area must be uploaded to CEDEN,[38] with links to the uploaded data; and

(7) Available GIS data, layers, and/or shapefiles used to develop the maps generated and maintained by the Copermittees for the Water Quality Improvement Plans, Annual Reports, and jurisdictional runoff management program documents.

b. The Copermittees, through the Regional Clearinghouse, must make the following information and documents available for access:

(1) Contact information (point of contact, phone number, email address, and mailing address) for each Copermittee;

(2) Public hotline number for reporting non-storm water and illicit discharges for each Copermittee;

(3) Email address for reporting non-storm water and illicit discharges for each Copermittee;

(4) Link to each Copermittee's website, if available, where the public may find additional information about the Copermittee's storm water management program and for requesting records for the implementation of its program;

(5) Information about opportunities for the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or protection of the quality of receiving waters; and

(6) Reports from regional monitoring programs in which the Copermittees participate (e.g. Southern California Monitoring Coalition, Southern California Coastal Water Research Project Bight Monitoring);

(7) Regional Monitoring and Assessment Reports; and

(8) Any other information, data, and documents the Copermittees determine as appropriate for making available to the public.

[38] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

5. Report of Waste Discharge

a. The Orange County Copermittees and the Riverside County Copermittees are required to submit a complete Report of Waste Discharge pursuant to the requirements of their current Order. The San Diego Water Board will review and consider the Report of Waste Discharge to determine whether modification to this Order, pursuant to the requirements of Provision H, will be required prior to the Orange County Copermittees and/or Riverside County Copermittees obtaining coverage under this Order. The current Order s for the Orange County Copermittees and Riverside County Copermittees is are rescinded upon the date of effective coverage under this Order except for enforcement purposes.

b. The Copermittees subject to the requirements of this Order must submit to the San Diego Water Board a complete Report of Waste Discharge as an application for the re-issuance of this Order and NPDES permit. The Report of Waste Discharge must be submitted no later than 180 days in advance of the expiration date of this Order. The Report of Waste Discharge must contain the following minimum information:

(1) Names and addresses of the Copermittees;

(2) Names and titles of the primary contacts of the Copermittees;

(3) Proposed changes to the Copermittees' Water Quality Improvement Plans and the supporting justification;

(4) Proposed changes to the Copermittees' jurisdictional runoff management programs and the supporting justification;

(5) Any other information necessary for the re-issuance of this Order;

(6) Any information to be included as part of the Report of Waste Discharge pursuant to the requirements of this Order; and

(7) Any other information required by federal regulations for NPDES permit reissuance.

6. Application for Early Coverage

a. The Orange County Copermittees, collectively, or Riverside County Copermittees, collectively, may apply for early coverage under this Order by submitting a Report of Waste Discharge Form 200, with a written request for early coverage under this Order.

b. The San Diego Water Board will review the application for early coverage. A notification of coverage under this Order will be issued to the Copermittees in the

respective county by the San Diego Water Board upon completion of the early coverage application requirements. The effective coverage date will be specified in the notification of coverage. The Copermittees in the respective county are authorized to have MS4 discharges pursuant to the requirements of this Order starting on the effective coverage date specified in the notification of coverage. The existing Order for the respective county is rescinded upon the effective coverage date specified in the notification of coverage except for enforcement purposes.

7. Reporting Provisions

Each Copermittee must comply with all the reporting and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

G. PRINCIPAL WATERSHED COPERMITTEE RESPONSIBILITIES

1. The Copermittees within each Watershed Management Area must designate a Principal Watershed Copermittee and notify the San Diego Water Board of the name of the Principal Watershed Copermittee. An individual Copermittee should not be designated a Principal Watershed Copermittee for more than two Watershed Management Areas. The notification may be submitted with the Water Quality Improvement Plan required pursuant to Provision F.1 of this Order.

2. The Principal Watershed Copermittee is responsible for, at a minimum, the following:

a. Serving as liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues, and when necessary and appropriate, representing the Copermittees in the Watershed Management Area before the San Diego Water Board;

b. Facilitating the development of the Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order;

c. Coordinating the submittal of the deliverables required by Provisions F.1, F.2, F.3.a, and F.3.b of this Order; and

d. Coordinating and developing, with the other Principal Watershed Copermittees, the requirements of Provisions F.3.c, F.4, and F.5.b of this Order.

3. The Principal Watershed Copermittee is not responsible for ensuring that the other Copermittees within the Watershed Management Area are in compliance with the requirements of this Order. Each Copermittee within the Watershed Management Area is responsible for complying with the requirements of this Order.

H. MODIFICATION OF ORDER

1. Modifications of the Order may be initiated by the San Diego Water Board or by the Copermittees. Requests by Copermittees must be made to the San Diego Water Board.

2. Minor modifications to the Order may be made by the San Diego Water Board where the proposed modification complies with all the prohibitions and limitations, and other requirements of this Order.

3. This Order may also be re-opened and modified, revoked and, reissued or terminated in accordance with the provisions of 40 CFR 122.44, 122.62 to 122.64, and 124.5. Causes for taking such actions include, but are not limited to, failure to comply with any condition of this Order and permit, and endangerment to human health or the environment resulting from the permitted activity.

4. This Order may be re-opened for modification for cause including but not limited to the following:

   a. The State Water Board determines that revisions are warranted, and the San Diego Water Board concurs that revisions are necessary to those provisions of the Order addressing compliance with water quality standards in the receiving water and/or those provisions of the Order establishing an iterative process for implementation of management practices to assure compliance with water quality standards in the receiving water;

   b. An application for early coverage under this Order is received pursuant to Provision F.6;

   c. Any of the TMDLs in Attachment E to this Order are amended in the Basin Plan by San Diego Water Board, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA;

   d. The Basin Plan is amended by the San Diego Water Board to incorporate a new TMDL, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA; or

   e. Updating or revising the monitoring and reporting requirements is determined to be necessary, at the discretion of the San Diego Water Board. Such modification(s) may include, but is (are) not limited to, revision(s) to: (i) implement recommendations from Southern California Coastal Water Research Project (SCCWRP), (ii) develop, refine, implement, and/or coordinate a regional monitoring program, (iii) develop and implement improved monitoring and assessment programs in keeping with San Diego Water Board Resolution No. R9-2012-0069, Resolution in Support of a Regional Monitoring Framework, and/or (iv) add provisions to require the Copermittees to evaluate and provide information on cost and values of the monitoring and reporting program.

5. The San Diego Water Board, after opportunity for public comment and a public hearing, will re-open and consider modifications to this Order when the Orange County Copermittees or the Riverside County Copermittees submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders.

I. STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

Each Copermittee must comply with all the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

ATTACHMENT A

DISCHARGE PROHIBITIONS AND SPECIAL PROTECTIONS

1. Basin Plan Waste Discharge Prohibitions

California Water Code Section 13243 provides that a Regional Water Board, in a water quality control plan, may specify certain conditions or areas where the discharge of waste or certain types of waste is not permitted. The following waste discharge prohibitions in the Water Quality Control Plan for the San Diego Basin (Basin Plan) are applicable to any person, as defined by Section 13050(c) of the California Water Code, who is a citizen, domiciliary, or political agency or entity of California whose activities in California could affect the quality of waters of the state within the boundaries of the San Diego Region.

1. The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in California Water Code Section 13050, is prohibited.

2. The discharge of waste to land, except as authorized by waste discharge requirements or the terms described in California Water Code Section 13264 is prohibited.

3. The discharge of pollutants or dredged or fill material to waters of the United States except as authorized by a National Pollutant Discharge Elimination System (NPDES) permit or a dredged or fill material permit (subject to the exemption described in California Water Code Section 13376) is prohibited.

4. Discharges of recycled water to lakes or reservoirs used for municipal water supply or to inland surface water tributaries thereto are prohibited, unless this San Diego Water Board issues a NPDES permit authorizing such a discharge; the proposed discharge has been approved by the State Department of Health Services (DHS) and the operating agency of the impacted reservoir; and the discharger has an approved fail-safe long-term disposal alternative.

5. The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the San Diego Water Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

6. The discharge of waste in a manner causing flow, ponding, or surfacing on lands not owned or under the control of the discharger is prohibited, unless the discharge is authorized by the San Diego Water Board.

7. The dumping, deposition, or discharge of waste directly into waters of the state, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the San Diego Water Board.

8. Any discharge to a storm water conveyance system that is not composed entirely of "*storm water*" is prohibited unless authorized by the San Diego Water Board. [The federal regulations, 40 CFR 122.26(b)(13), define storm water as storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from firefighting activities.] [§122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

9. The unauthorized discharge of treated or untreated sewage to waters of the state or to a storm water conveyance system is prohibited.

10. The discharge of industrial wastes to conventional septic tank/subsurface disposal systems, except as authorized by the terms described in California Water Code Section 13264, is prohibited.

11. The discharge of radioactive wastes amenable to alternative methods of disposal into the waters of the state is prohibited.

12. The discharge of any radiological, chemical, or biological warfare agent into waters of the state is prohibited.

13. The discharge of waste into a natural or excavated site below historic water levels is prohibited unless the discharge is authorized by the San Diego Water Board.

14. The discharge of sand, silt, clay, or other earthen materials from any activity, including land grading and construction, in quantities which cause deleterious bottom deposits, turbidity or discoloration in waters of the state or which unreasonably affect, or threaten to affect, beneficial uses of such waters is prohibited.

15. The discharge of treated or untreated sewage from vessels to Mission Bay, Oceanside Harbor, Dana Point Harbor, or other small boat harbors is prohibited.

16. The discharge of untreated sewage from vessels to San Diego Bay is prohibited.

17. The discharge of treated sewage from vessels to portions of San Diego Bay that are less than 30 feet deep at mean lower low water (MLLW) is prohibited.

18. The discharge of treated sewage from vessels, which do not have a properly functioning US Coast Guard certified Type I or Type II marine sanitation device, to portions of San Diego Bay that are greater than 30 feet deep at mean lower low water (MLLW) is prohibited.

2. Attachment B to State Water Board Resolution 2012-0012, as amended by State Water Board Resolution No. 2012-0031.

Special Protections for Areas of Special Biological Significance (ASBS), Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges

I. PROVISIONS FOR POINT SOURCE DISCHARGES OF STORM WATER AND NONPOINT SOURCE WASTE DISCHARGES

The following terms, prohibitions, and special conditions (hereafter collectively referred to as special conditions) are established as limitations on point source storm water and nonpoint source discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in Areas of Special Biological Significance (ASBS), as required for State Water Quality Protection Areas pursuant to California Public Resources Code Sections 36700(f) and 36710(f). These Special Protections are adopted by the State Water Board as part of the California Ocean Plan (Ocean Plan) General Exception.

The special conditions are organized by category of discharge. The State Water Resources Control Board (State Water Board) and Regional Water Quality Control Boards (Regional Water Boards) will determine categories and the means of regulation for those categories [e.g., Point Source Storm Water National Pollutant Discharge Elimination System (NPDES) or Nonpoint Source].

A. PERMITTED POINT SOURCE DISCHARGES OF STORM WATER

1. General Provisions for Permitted Point Source Discharges of Storm Water

a. Existing storm water discharges into an ASBS are allowed only under the following conditions:

(1) The discharges are authorized by an NPDES permit issued by the State Water Board or Regional Water Board;

(2) The discharges comply with all of the applicable terms, prohibitions, and special conditions contained in these Special Protections; and

(3) The discharges:

(i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

(ii) Are designed to prevent soil erosion;

(iii) Occur only during wet weather;

(iv) Are composed of only storm water runoff.

b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

c. The discharge of trash is prohibited.

d. Only discharges from existing storm water outfalls are allowed. Any proposed or new storm water runoff discharge shall be routed to existing storm water discharge outfalls and shall not result in any new contribution of waste to an ASBS (i.e., no additional pollutant loading). "Existing storm water outfalls" are those that were constructed or under construction prior to January 1, 2005. "New contribution of waste" is defined as any addition of waste beyond what would have occurred as of January 1, 2005. A change to an existing storm water outfall, in terms of re-location or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges are prohibited except as provided below:

(1) The term "non-storm water discharges" means any waste discharges from a municipal separate storm sewer system (MS4) or other NPDES permitted storm drain system to an ASBS that are not composed entirely of storm water.

(2) (i) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability or occur naturally:

(a) Discharges associated with emergency fire fighting operations.

(b) Foundation and footing drains.

(c) Water from crawl space or basement pumps.

(d) Hillside dewatering.

(e) Naturally occurring groundwater seepage via a storm drain.

(f) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(ii) An NPDES permitting authority may authorize non-storm water discharges to an MS4 with a direct discharge to an ASBS only to the extent the NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

2. Compliance Plans for Inclusion in Storm Water Management Plans (SWMP) and Storm Water Pollution Prevention Plans (SWPPP).

The discharger shall specifically address the prohibition of non-storm water runoff and the requirement to maintain natural water quality for storm water discharges to an ASBS in an ASBS Compliance Plan to be included in its SWMP or a SWPPP, as appropriate to permit

type. If a statewide permit includes a SWMP, then the discharger shall prepare a stand-alone compliance plan for ASBS discharges. The ASBS Compliance Plan is subject to approval by the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (for permits issued by Regional Water Boards).

a. The Compliance Plan shall include a map of surface drainage of storm water runoff, showing areas of sheet runoff, prioritize discharges, and describe any structural Best Management Practices (BMPs) already employed and/or BMPs to be employed in the future. Priority discharges are those that pose the greatest water quality threat and which are identified to require installation of structural BMPs. The map shall also show the storm water conveyances in relation to other features such as service areas, sewage conveyances and treatment facilities, landslides, areas prone to erosion, and waste and hazardous material storage areas, if applicable. The SWMP or SWPPP shall also include a procedure for updating the map and plan when changes are made to the storm water conveyance facilities.

b. The ASBS Compliance Plan shall describe the measures by which all non-authorized non-storm water runoff (e.g., dry weather flows) has been eliminated, how these measures will be maintained over time, and how these measures are monitored and documented.

c. For Municipal Separate Storm Sewer System (MS4s), the ASBS Compliance Plan shall require minimum inspection frequencies as follows:

(1) The minimum inspection frequency for construction sites shall be weekly during rainy season;

(2) The minimum inspection frequency for industrial facilities shall be monthly during the rainy season;

(3) The minimum inspection frequency for commercial facilities (e.g., restaurants) shall be twice during the rainy season; and

(4) Storm water outfall drains equal to or greater than 18 inches (457 mm) in diameter or width shall be inspected once prior to the beginning of the rainy season and once during the rainy season and maintained to remove trash and other anthropogenic debris.

d. The ASBS Compliance Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff, that are necessary to comply with these special conditions, will be achieved through BMPs. Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that such installation would pose a threat to health or safety. BMPs to control storm water runoff discharges (at the end-of-pipe) during a design storm shall be designed to achieve on average the following target levels:

(1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

(2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges.

The baseline for these determinations is the effective date of the Exception, except for those structural BMPs installed between January 1, 2005 and adoption of these Special Protections, and the reductions must be achieved and documented within six (6) years of the effective date.

e. The ASBS Compliance Plan shall address erosion control and the prevention of anthropogenic sedimentation in ASBS. The natural habitat conditions in the ASBS shall not be altered as a result of anthropogenic sedimentation.

f. The ASBS Compliance Plan shall describe the non-structural BMPs currently employed and planned in the future (including those for construction activities), and include an implementation schedule. The ASBS Compliance Plan shall include non-structural BMPs that address public education and outreach. Education and outreach efforts must adequately inform the public that direct discharges of pollutants from private property not entering an MS4 are prohibited. The ASBS Compliance Plan shall also describe the structural BMPs, including any low impact development (LID) measures, currently employed and planned for higher threat discharges and include an implementation schedule. To control storm water runoff discharges (at the end-of-pipe) during a design storm, permittees must first consider, and use where feasible, LID practices to infiltrate, use, or evapotranspirate storm water runoff on-site, if LID practices would be the most effective at reducing pollutants from entering the ASBS.

g. The BMPs and implementation schedule shall be designed to ensure that natural water quality conditions in the receiving water are achieved and maintained by either reducing flows from impervious surfaces or reducing pollutant loading, or some combination thereof.

h. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents in storm water runoff that alter natural ocean water quality and the sources of these constituents.

(2) The report shall describe BMPs that are currently being implemented, BMPs that are identified in the SWMP or SWPPP for future implementation, and any additional BMPs that may be added to the SWMP or SWPPP to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the BMPs.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits), the discharger shall revise its ASBS Compliance Plan to incorporate any new or modified BMPs that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised SWMP or SWPPP, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural ocean water quality conditions due to the same constituent.

(5) The requirements of this section are in addition to the terms, prohibitions, and conditions contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within eighteen (18) months from the effective date of the Exception, the discharger shall submit a draft written ASBS Compliance Plan to the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that describes its strategy to comply with these special conditions, including the requirement to maintain natural water quality in the affected ASBS. The ASBS Compliance Plan shall include a description of appropriate non-structural controls and a time schedule to implement structural controls (implementation schedule) to comply with these special conditions for inclusion in the discharger's SWMP or SWPPP, as appropriate to permit type. The final ASBS Compliance Plan, including a description and final schedule for structural controls based on the results of runoff and receiving water monitoring, must be submitted within thirty (30) months from the effective date of the Exception.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these special conditions shall be implemented.

d. Within six (6) years of the effective date of the Exception, any structural controls identified in the ASBS Compliance Plan that are necessary to comply with these special conditions shall be operational.

e. Within six (6) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water, pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data, and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe

the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. for municipalities, a demonstration of significant hardship to discharger ratepayers, by showing the relationship of storm water fees to annual household income for residents within the discharger's jurisdictional area, and the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or

2. for other governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

B. NONPOINT SOURCE DISCHARGES

1. General Provisions for Nonpoint Sources

a. Existing nonpoint source waste discharges are allowed into an ASBS only under the following conditions:

(1) The discharges are authorized under waste discharge requirements, a conditional waiver of waste discharge requirements, or a conditional prohibition issued by the State Water Board or a Regional Water Board.

(2) The discharges are in compliance with the applicable terms, prohibitions, and special conditions contained in these Special Protections.

(3) The discharges:

(i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

(ii) Are designed to prevent soil erosion;

(iii) Occur only during wet weather;

(iv) Are composed of only storm water runoff.

b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

c. The discharge of trash is prohibited.

d. Only existing nonpoint source waste discharges are allowed. "Existing nonpoint source waste discharges" are discharges that were ongoing prior to January 1, 2005. "New nonpoint source discharges" are defined as those that commenced on or after January 1, 2005. A change to an existing nonpoint source discharge, in terms of relocation or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges from nonpoint sources (those not subject to an NPDES Permit) are prohibited except as provided below:

(1) The term "non-storm water discharges" means any waste discharges that are not composed entirely of storm water.

(2) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability, or occur naturally:

(i) Discharges associated with emergency fire fighting operations.

(ii) Foundation and footing drains.

(iii) Water from crawl space or basement pumps.

(iv) Hillside dewatering.

(v) Naturally occurring groundwater seepage via a storm drain.

(vi) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

f. At the San Clemente Island ASBS, discharges incidental to military training and research, development, test, and evaluation operations are allowed. Discharges incidental to underwater demolition and other in-water explosions are not allowed in the two military closure areas in the vicinity of Wilson Cove and Castle Rock. Discharges must not result in a violation of the water quality objectives, including the protection of the marine aquatic life beneficial use, anywhere in the ASBS.

g. At the San Nicolas Island and Begg Rock ASBS, discharges incidental to military research, development, testing, and evaluation of, and training with, guided missile and other weapons systems, fleet training exercises, small-scale amphibious warfare training, and special warfare training are allowed. Discharges incidental to underwater demolition and other in-water explosions are not allowed. Discharges must not result in a violation of the water quality objectives, including the protection of the marine aquatic life beneficial use, anywhere in the ASBS.

h. All other nonpoint source discharges not specifically authorized above are prohibited.

2. Planning and Reporting

a. The nonpoint source discharger shall develop an ASBS Pollution Prevention Plan, including an implementation schedule, to address storm water runoff and any other nonpoint source discharges from its facilities. The ASBS Pollution Prevention Plan must be equivalent in contents to an ASBS Compliance Plan as described in I (A)(2) in this document. The ASBS Pollution Prevention Plan is subject to approval by the Executive Director of the State Water Board (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements).

b. The ASBS Pollution Prevention Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff that are necessary to comply with these special conditions, will be achieved through Management Measures and associated Management Practices (Management Measures/Practices). Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director or Regional Water Board Executive Officer that such installation would pose a threat to health or safety. Management Measures to control storm water runoff during a design storm shall achieve on average the following target levels:

(1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

(2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges.

The baseline for these determinations is the effective date of the Exception, except for those structural BMPs installed between January 1, 2005 and adoption of these Special Protections, and the reductions must be achieved and documented within six (6) years of the effective date.

c. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff or other nonpoint source pollution is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and the Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents that alter natural water quality and the sources of these constituents.

(2) The report shall describe Management Measures/Practices that are currently being implemented, Management Measures/Practices that are identified in the ASBS Pollution Prevention Plan for future implementation, and any additional Management Measures/Practices that may be added to the Pollution Prevention Plan to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the Management Measures/Practices.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of

the Regional Water Board (Regional Water Board waivers or waste discharge requirements), the discharger shall revise its ASBS Pollution Prevention Plan to incorporate any new or modified Management Measures/Practices that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised ASBS Pollution Prevention Plan, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural water quality conditions due to the same constituent.

(5) The requirements of this section are in addition to the terms, prohibitions, and conditions contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within eighteen (18) months from the effective date of the Exception, the discharger~~s~~ shall submit a draft written ASBS Pollution Prevention Plan to the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) that describes its strategy to comply with these special conditions, including the requirement to maintain natural ocean water quality in the affected ASBS. The Pollution Prevention Plan shall include a description of appropriate non-structural controls and a time schedule to implement structural controls to comply with these special conditions for inclusion in the discharger's Pollution Prevention Plan. The final ASBS Pollution Prevention Plan, including a description and final schedule for structural controls based on the results of runoff and receiving water monitoring, must be submitted within thirty (30) months from the effective date of the Exception.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these Special Protections shall be implemented.

d. Within six (6) years of the effective date of the Exception, any structural controls identified in the ASBS Pollution Prevention Plan that are necessary to comply with these special conditions shall be operational.

e. Within six (6) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board

waivers or waste discharge requirements) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. a demonstration that the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or

2. for governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

II. ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES

In addition to the provisions in Section I (A) or I (B), respectively, a discharger with parks and recreation facilities shall comply with the following:

A. The discharger shall include a section in an ASBS Compliance Plan (for NPDES dischargers) or an ASBS Pollution Prevention Plan (for nonpoint source dischargers) to address storm water runoff from parks and recreation facilities.

1. The plan shall identify all pollutant sources, including sediment sources, which may result in waste entering storm water runoff. Pollutant sources include, but are not limited to, roadside rest areas and vistas, picnic areas, campgrounds, trash receptacles, maintenance facilities, park personnel housing, portable toilets, leach fields, fuel tanks, roads, piers, and boat launch facilities.

2. The plan shall describe BMPs or Management Measures/Practices that will be implemented to control soil erosion (both temporary and permanent erosion controls) and reduce or eliminate pollutants in storm water runoff in order to achieve and maintain natural water quality conditions in the affected ASBS. The plan shall include BMPs or Management Measures/Practices to ensure that trails and culverts are maintained to prevent erosion and minimize waste discharges to ASBS.

3. The plan shall include BMPs or Management Measures/Practices to prevent the discharge of pesticides or other chemicals, including agricultural chemicals, in storm water runoff to the affected ASBS.

4. The plan shall include BMPs or Management Measures/Practices that address public education and outreach. The goal of these BMPs or Management Measures/Practices is to ensure that the public is adequately informed that waste discharges to the affected ASBS are prohibited or limited by special conditions in these Special Protections. The BMPs or Management Measures/Practices shall include signage at camping, picnicking, beach and roadside parking areas, and visitor centers, or other appropriate measures, which notify the public of any applicable requirements of these Special Protections and identify the ASBS boundaries.

5. The plan shall include BMPs or Management Measures/Practices that address the prohibition against the discharge of trash to ASBS. The BMPs or Management Measures/Practices shall include measures to ensure that adequate trash receptacles are available for public use at visitor facilities, including parking areas, and that the receptacles are adequately maintained to prevent trash discharges into the ASBS. Appropriate measures include covering trash receptacles to prevent trash from being wind blown and periodically emptying the receptacles to prevent overflows.

6. The plan shall include BMPs or Management Measures/Practices to address runoff from parking areas and other developed features to ensure that the runoff does not alter natural water quality in the affected ASBS. BMPs or Management Measures/Practices shall include measures to reduce pollutant loading in runoff to the ASBS through installation of natural area buffers (LID), treatment, or other appropriate measures.

B. Maintenance and repair of park and recreation facilities must not result in waste discharges to the ASBS. The practice of road oiling must be minimized or eliminated, and must not result in waste discharges to the ASBS.

III. ADDITIONAL REQUIREMENTS – WATERFRONT AND MARINE OPERATIONS

In addition to the provisions in Section I (A) or I (B), respectively, a discharger with waterfront and marine operations shall comply with the following:

A. For discharges related to waterfront and marine operations, the discharger shall develop a Waterfront and Marine Operations Management Plan (Waterfront Plan). This plan shall contain appropriate Management Measures/Practices to address nonpoint source pollutant discharges to the affected ASBS.

1. The Waterfront Plan shall contain appropriate Management Measures/Practices for any waste discharges associated with the operation and maintenance of vessels, moorings, piers, launch ramps, and cleaning stations in order to ensure that beneficial uses are protected and natural water quality is maintained in the affected ASBS.

2. For discharges from marinas and recreational boating activities, the Waterfront Plan shall include appropriate Management Measures, described in The Plan for California's Nonpoint Source Pollution Control Program, for marinas and recreational boating, or equivalent practices, to ensure that nonpoint source pollutant discharges do not alter natural water quality in the affected ASBS.

3. The Waterfront Plan shall include Management Practices to address public education and outreach to ensure that the public is adequately informed that waste discharges to the affected ASBS are prohibited or limited by special conditions in these Special Protections. The management practices shall include appropriate signage, or similar measures, to inform the public of the ASBS restrictions and to identify the ASBS boundaries.

4. The Waterfront Plan shall include Management Practices to address the prohibition against trash discharges to ASBS. The Management Practices shall include the provision of adequate trash receptacles for marine recreation areas, including parking areas, launch ramps, and docks. The plan shall also include appropriate Management Practices to ensure that the receptacles are adequately maintained and secured in order to prevent trash discharges into the ASBS. Appropriate Management Practices include covering the trash receptacles to prevent trash from being windblown, staking or
securing the trash receptacles so they don't tip over, and periodically emptying the receptacles to prevent overflow.

5. The discharger shall submit its Waterfront Plan to the by the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) within six months of the effective date of these special conditions. The Waterfront Plan is subject to approval by the State Water Board Executive Director or the Regional Water Board Executive Officer, as appropriate. The plan must be fully implemented within 18 months of the effective date of the Exception.

B. The discharge of chlorine, soaps, petroleum, other chemical contaminants, trash, fish offal, or human sewage to ASBS is prohibited. Sinks and fish cleaning stations are point source discharges of wastes and are prohibited from discharging into ASBS. Anthropogenic accumulations of discarded fouling organisms on the sea floor must be minimized.

C. Limited-term activities, such as the repair, renovation, or maintenance of waterfront facilities, including, but not limited to, piers, docks, moorings, and breakwaters, are authorized only in accordance with Chapter III.E.2 of the Ocean Plan.

D. If the discharger anticipates that the discharger will fail to fully implement the approved Waterfront Plan within the 18 month deadline, the discharger shall submit a technical report as soon as practicable to the State Water Board Executive Director or the Regional Water Board Executive Officer, as appropriate. The technical report shall contain reasons for failing to meet the deadline and propose a revised schedule to fully implement the plan.

E. The State Water Board or the Regional Water Board may, for good cause, authorize additional time to comply with the Waterfront Plan. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that

caused or would cause it to fail to meet the deadline in Section III.A.5. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality. The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. a demonstration of significant hardship by showing that the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate.

2. for governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

IV. MONITORING REQUIREMENTS

Monitoring is mandatory for all dischargers to assure compliance with the Ocean Plan. Monitoring requirements include both: (A) core discharge monitoring, and (B) ocean receiving water monitoring. The State and Regional Water Boards must approve sampling site locations and any adjustments to the monitoring programs. All ocean receiving water and reference area monitoring must be comparable with the Water Boards' Surface Water Ambient Monitoring Program (SWAMP).

Safety concerns: Sample locations and sampling periods must be determined considering safety issues. Sampling may be postponed upon notification to the State and Regional Water Boards if hazardous conditions prevail.

Analytical Chemistry Methods: All constituents must be analyzed using the lowest minimum detection limits comparable to the Ocean Plan water quality objectives. For metal analysis, all samples, including storm water effluent, reference samples, and ocean receiving water samples, must be analyzed by the approved analytical method with the lowest minimum detection limits (currently Inductively Coupled Plasma/Mass Spectrometry) described in the Ocean Plan.

A. CORE DISCHARGE MONITORING PROGRAM

1. General sampling requirements for timing and storm size:

Runoff must be collected during a storm event that is greater than 0.1 inch and generates runoff, and at least 72 hours from the previously measurable storm event. Runoff samples shall be collected during the same storm and at approximately the same time when post-storm receiving water is sampled, and analyzed for the same constituents as receiving water and reference site samples (see section IV B) as described below.

2. Runoff flow measurements

a. For municipal/industrial storm water outfalls in existence as of December 31, 2007, 18 inches (457mm) or greater in diameter/width (including multiple outfall pipes in combination having a width of 18 inches, runoff flows must be measured or calculated, using a method acceptable to and approved by the State and Regional Water Boards.

b. This will be reported annually for each precipitation season to the State and Regional Water Boards.

3. Runoff samples – storm events

a. For outfalls equal to or greater than 18 inches (0.46m) in diameter or width:

(1) samples of storm water runoff shall be collected during the same storm as receiving water samples and analyzed for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

(2) samples of storm water runoff shall be collected and analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

(3) If an applicant has no outfall greater than 36 inches, then storm water runoff from the applicant's largest outfall shall be further collected during the same storm as receiving water samples and analyzed for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates).

b. For outfalls equal to or greater than 36 inches (0.91m) in diameter or width:

(1) samples of storm water runoff shall be collected during the same storm as receiving water samples and analyzed for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

(2) samples of storm water runoff shall be further collected during the same storm as receiving water samples and analyzed for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates); and

(3) samples of storm water runoff shall be collected and analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

c. For an applicant not participating in a regional monitoring program [see below in Section IV (B)] in addition to (a.) and (b.) above, a minimum of the two largest outfalls or 20 percent of the larger outfalls, whichever is greater, shall be sampled (flow weighted composite samples) at least three times annually during wet weather (storm event)

and analyzed for all Ocean Plan Table A constituents, Table B constituents for marine aquatic life protection (except for toxicity, only chronic toxicity for three species shall be required), DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, and Ocean Plan indicator bacteria. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one (the largest) such discharge shall be sampled annually in each Region.

4. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may reduce or suspend core monitoring once the storm runoff is fully characterized. This determination may be made at any point after the discharge is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

B. Ocean Receiving Water and Reference Area Monitoring Program

In addition to performing the Core Discharge Monitoring Program in Section II.A above, all applicants having authorized discharges must perform ocean receiving water monitoring. In order to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS, dischargers may choose either (1) an individual monitoring program, or (2) participation in a regional integrated monitoring program.

1. Individual Monitoring Program: The requirements listed below are for those dischargers who elect to perform an individual monitoring program to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within the affected ASBS. In addition to Core Discharge Monitoring, the following additional monitoring requirements shall be met:

   a. Three times annually, during wet weather (storm events), the receiving water at the point of discharge from the outfalls described in section (IV)(A)(3)(c) above shall be sampled and analyzed for Ocean Plan Table A constituents, Table B constituents for marine aquatic life, DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, salinity, chronic toxicity (three species), and Ocean Plan indicator bacteria.

      The sample location for the ocean receiving water shall be in the surf zone at the point of discharges; this must be at the same location where storm water runoff is sampled. Receiving water shall be sampled prior to (pre-storm) and during (or immediately after) the same storm (post storm). Post storm sampling shall be during the same storm and at approximately the same time as when the runoff is sampled. Reference water quality shall also be sampled three times annually and analyzed for the same constituents pre-storm and post-storm, during the same storm seasons when receiving water is sampled. Reference stations will be determined by the State Water Board's Division of Water Quality and the applicable Regional Water Board(s).

   b. Sediment sampling shall occur at least three times during every five (5) year period. The subtidal sediment (sand or finer, if present) at the discharge shall be sampled and analyzed for Ocean Plan Table B constituents for marine aquatic life, DDT, PCBs, PAHs, pyrethroids, and OP pesticides. For sediment toxicity testing, only an acute toxicity test using the amphipod *Eohaustorius estuarius* must be performed.

c. A quantitative survey of intertidal benthic marine life shall be performed at the discharge and at a reference site. The survey shall be performed at least once every five (5) year period. The survey design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The results of the survey shall be completed and submitted to the State Water Board and Regional Water Board at least six months prior to the end of the permit cycle.

d. Once during each five (5) year period, a bioaccumulation study shall be conducted to determine the concentrations of metals and synthetic organic pollutants at representative discharge sites and at representative reference sites. The study design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The bioaccumulation study may include California mussels (*Mytilus californianus*) and/or sand crabs (*Emerita analoga* or *Blepharipoda occidentalis*). Based on the study results, the Regional Water Board and the State Water Board's Division of Water Quality, may adjust the study design in subsequent permits, or add or modify additional test organisms (such as shore crabs or fish), or modify the study design appropriate for the area and best available sensitive measures of contaminant exposure.

e. Marine Debris: Representative quantitative observations for trash by type and source shall be performed along the coast of the ASBS within the influence of the discharger's outfalls. The design, including locations and frequency, of the marine debris observations is subject to approval by the Regional Water Board and State Water Board's Division of Water Quality.

f. The monitoring requirements of the Individual Monitoring Program in this section are minimum requirements. After a minimum of one (1) year of continuous water quality monitoring of the discharges and ocean receiving waters, the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may require additional monitoring, or adjust, reduce or suspend receiving water and reference station monitoring. This determination may be made at any point after the discharge and receiving water is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

2. Regional Integrated Monitoring Program: Dischargers may elect to participate in a regional integrated monitoring program, in lieu of an individual monitoring program, to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS. This regional approach shall characterize natural water quality, pre- and post-storm, in ocean reference areas near the mouths of identified open space watersheds and the effects of the discharges on natural water quality (physical, chemical, and toxicity) in the ASBS receiving waters, and should include benthic marine aquatic life and bioaccumulation components. The design of the ASBS stratum of a regional integrated monitoring program may deviate from the otherwise prescribed individual monitoring approach (in Section IV.B.1) if approved by the State Water Board's Division of Water Quality and the Regional Water Boards.

a. Ocean reference areas shall be located at the drainages of flowing watersheds with minimal development (in no instance more than 10% development), and shall not be located in CWA Section 303(d) listed waterbodies or have tributaries that are 303(d) listed. Reference areas shall be free of wastewater discharges and anthropogenic non- storm water runoff. A minimum of low threat storm runoff discharges (e.g.

stream highway overpasses and campgrounds) may be allowed on a case-by-case basis. Reference areas shall be located in the same region as the ASBS receiving water monitoring occurs. The reference areas for each Region are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean reference water samples must be collected from each station, each from a separate storm during the same storm season that receiving water is sampled. A minimum of one reference location shall be sampled for each ASBS receiving water site sampled per responsible party. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

b. ASBS ocean receiving water must be sampled in the surf zone at the location where the runoff makes contact with ocean water (i.e. at "point zero"). Ocean receiving water stations must be representative of worst-case discharge conditions (i.e. co-located at a large drain greater than 36 inches, or if drains greater than 36 inches are not present in the ASBS then the largest drain greater than18 inches.) Ocean receiving water stations are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean receiving water samples must be collected during each storm season from each station, each from a separate storm. A minimum of one receiving water location shall be sampled in each ASBS per responsible party in that ASBS. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

c. Reference and receiving water sampling shall commence during the first full storm season following the adoption of these special conditions, and post-storm samples shall be collected during the same storm event when storm water runoff is sampled. Sampling shall occur in a minimum of two storm seasons. For those ASBS dischargers that have already participated in the Southern California Bight 2008 ASBS regional monitoring effort, sampling may be limited to only one storm season.

d. Receiving water and reference samples shall be analyzed for the same constituents as storm water runoff samples. At a minimum, constituents to be sampled and analyzed in reference and discharge receiving waters must include oil and grease, total suspended solids, Ocean Plan Table B metals for protection of marine life, Ocean Plan PAHs, pyrethroids, OP pesticides, ammonia, nitrate, phosphates, and critical life stage chronic toxicity for three species. In addition, within the range of the southern sea otter, indicator bacteria or some other measure of fecal contamination shall be analyzed.

3. Waterfront and Marine Operations: In addition to the above requirements for ocean receiving water monitoring, additional monitoring must be performed for marinas and boat launch and pier facilities:

a. For all marina or mooring field operators, in mooring fields with 10 or more occupied moorings, the ocean receiving water must be sampled for Ocean Plan indicator bacteria, residual chlorine, copper, zinc, grease and oil, methylene blue active substances (MBAS), and ammonia nitrogen.

(1) For mooring field operators opting for an individual monitoring program (Section IV.B.1 above), this sampling must occur weekly (on the weekend) from May through October.

(2) For mooring field operators opting to participate in a regional integrated monitoring program (Section IV.B.2 above), this sampling must occur monthly from May through October on a high use weekend in each month. The Water Boards may allow a reduction in the frequency of sampling, through the regional monitoring program, after the first year of monitoring.

b. For all mooring field operators, the subtidal sediment (sand or finer, if present) within mooring fields and below piers shall be sampled and analyzed for Ocean Plan Table B metals (for marine aquatic life beneficial use), acute toxicity, PAHs, and tributyltin. For sediment toxicity testing, only an acute toxicity test using the amphipod *Eohaustorius estuarius* must be performed. This sampling shall occur at least three times during a five (5) year period. For mooring field operators opting to participate in a regional integrated monitoring program, the Water Boards may allow a reduction in the frequency of sampling after the first sampling effort's results are assessed.

Glossary

At the point of discharge(s) – Means in the surf zone immediately where runoff from an outfall meets the ocean water (a.k.a., at point zero).

Areas of Special Biological Significance (ASBS) – Those areas designated by the State Water Board as ocean areas requiring protection of species or biological communities to the extent that alteration of natural water quality is undesirable. All Areas of Special Biological Significance are also classified as a subset of State Water Quality Protection Areas.

Design storm – For purposes of these Special Protections, a design storm is defined as the volume of runoff produced from one inch of precipitation per day or, if this definition is inconsistent with the discharger's applicable storm water permit, then the design storm shall be the definition included in the discharger's applicable storm water permit.

Development – Relevant to reference monitoring sites, means urban, industrial, agricultural, grazing, mining, and timber harvesting land uses.

Higher threat discharges - Permitted storm drains discharging equal to or greater than 18 inches, industrial storm drains, agricultural runoff discharged through an MS4, discharges associated with waterfront and marina operations (e.g., piers, launch ramps, mooring fields, and associated vessel support activities, except for passive discharges defined below), and direct discharges associated with commercial or industrial activities to ASBS.

Low Impact Development (LID) – A sustainable practice that benefits water supply and contributes to water quality protection. Unlike traditional storm water management, which entails collecting and conveying storm water runoff through storm drains, pipes, or other conveyances to a centralized storm water facility, LID focuses on using site design and storm water management to maintain the site's pre-development runoff rates and volumes. The goal of LID is to mimic a site's predevelopment hydrology by using design techniques that infiltrate, filter, store, evaporate, and detain runoff close to the source of rainfall.

Marine Operations – Marinas or mooring fields that contain slips or mooring locations for 10 or more vessels.

Management Measure (MM) - Economically achievable measures for the control of the addition of pollutants from various classes of nonpoint sources of pollution, which reflect the greatest degree of pollutant reduction achievable through the application of the best available nonpoint pollution control practices, technologies, processes, siting criteria, operating methods, or other alternatives. For example, in the "marinas and recreational boating" land- use category specified in the Plan for California's Nonpoint Source Pollution Control Program (NPS Program Plan) (SWRCB, 1999), "boat cleaning and maintenance" is considered a MM or the source of a specific class or type of NPS pollution.

Management Practice (MP) - The practices (e.g., structural, non-structural, operational, or other alternatives) that can be used either individually or in combination to address a specific MM class or classes of NPS pollution. For example, for the "boat cleaning and maintenance" MM, specific MPs can include, but are not limited to, methods for the selection of environmentally sensitive hull paints or methods for cleaning/removal of hull copper anti- fouling paints.

Municipal Separate Storm Sewer System (MS4) – A municipally-owned storm sewer system regulated under the Phase I or Phase II storm water program implemented in compliance with Clean Water Act section 402(p). Note that an MS4 program's boundaries are not necessarily congruent with the permittee's political boundaries.

Natural Ocean Water Quality - The water quality (based on selected physical, chemical and biological characteristics) that is required to sustain marine ecosystems, and which is without apparent human influence, *i.e.*, an absence of significant amounts of: (a) man-made constituents (*e.g.*, DDT); (b) other chemical (*e.g.*, trace metals), physical (temperature/thermal pollution, sediment burial), and biological (*e.g.*, bacteria) constituents at concentrations that have been elevated due to man's activities above those resulting from the naturally occurring processes that affect the area in question; and (c) non-indigenous biota (*e.g.*, invasive algal bloom species) that have been introduced either deliberately or accidentally by man. Discharges "*shall not alter natural ocean water quality*" as determined by a comparison to the range of constituent concentrations in reference areas agreed upon via the regional monitoring program(s). If monitoring information indicates that *natural ocean water quality* is not maintained, but there is sufficient evidence that a discharge is not contributing to the alteration of natural water quality, then the Regional Water Board may make that determination. In this case, sufficient information must include runoff sample data that has equal or lower concentrations for the range of constituents at the applicable reference area(s).

Nonpoint source – Nonpoint pollution sources generally are sources that do not meet the definition of a point source. Nonpoint source pollution typically results from land runoff, precipitation, atmospheric deposition, agricultural drainage, marine/boating operations or hydrologic modification. Nonpoint sources, for purposes of these Special Protections, include discharges that are not required to be regulated under an NPDES permit.

Non-storm water discharge – Any runoff that is not the result of a precipitation event. This is often referred to as "dry weather flow."

Non-structural control – A Best Management Practice that involves operational, maintenance, regulatory (e.g., ordinances) or educational activities designed to reduce or eliminate pollutants in runoff, and that are not structural controls (i.e. there are no physical structures involved).

Physical impossibility - Means any act of God, war, fire, earthquake, windstorm, flood or natural catastrophe; unexpected and unintended accidents not caused by discharger or its employees' negligence; civil disturbance, vandalism, sabotage or terrorism; restrain by court order or public authority or agency; or action or non-action by, or inability to

obtain the necessary authorizations or approvals from any governmental agency other than the permittee.

Representative sites and monitoring procedures – Are to be proposed by the discharger, with appropriate rationale, and subject to approval by Water Board staff.

Sheet-flow – Runoff that flows across land surfaces at a shallow depth relative to the cross- sectional width of the flow. These types of flow may or may not enter a storm drain system before discharge to receiving waters.

Storm Season – Also referred to as rainy season, means the months of the year from the onset of rainfall during autumn until the cessation of rainfall in the spring.

Structural control – A Best Management Practice that involves the installation of engineering solutions to the physical treatment or infiltration of runoff.

Surf Zone - The surf zone is defined as the submerged area between the breaking waves and the shoreline at any one time.

Surface Water Ambient Monitoring Program (SWAMP) comparable – Means that the monitoring program must 1) meet or exceed 2008 SWAMP Quality Assurance Program Management Plan (QAPP) Measurement Quality Objectives, or 2) have a Quality Assurance Project Plan that has been approved by SWAMP; in addition data must be formatted to match the database requirements of the SWAMP Information Management System. Adherence to the measurement quality objectives in the Southern California Bight 2008 ASBS Regional Monitoring Program QAPP and data base management comprises being SWAMP comparable.

Waterfront Operations - Piers, launch ramps, and cleaning stations in the water or on the adjacent shoreline.

Attachment 1
Special Protections Sections I(A)(3)(e) and I(B)(3)(e)
Flowchart to Deteremine Compliance with natural Water Quality

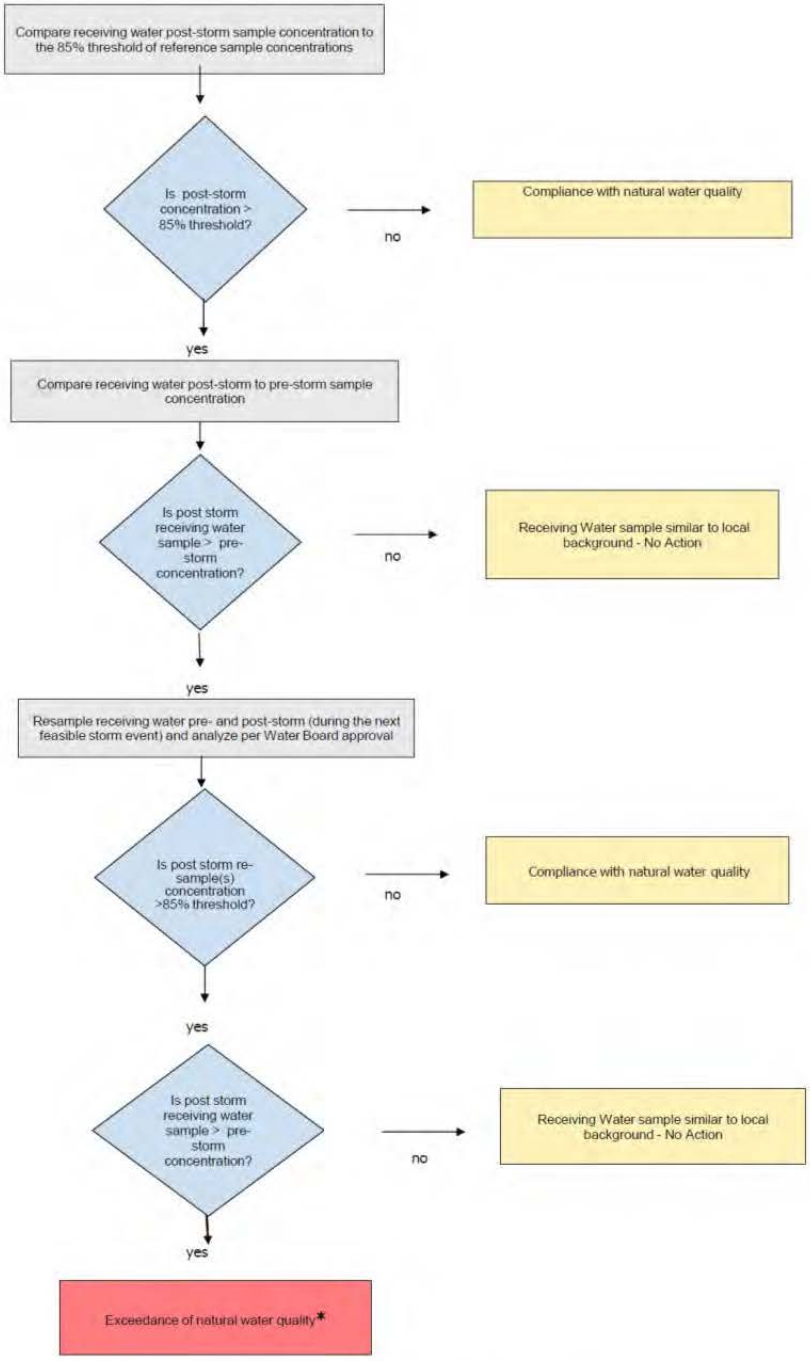

*** When an exceedance of natural water quality occurs, the discharger must comply with section I.A.2.h (for permitted storm water) or section I.B.2.c (for nonpoint sources). Note, when sampling data is available, end-of-pipe effluent concentrations will be considered by the Water Boards in making this determination.**

ATTACHMENT B

STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

1. Standard Permit Provisions

Code of Federal Regulations Title 40 Section 122.41 (40 CFR 122.41) includes conditions, or provisions, that apply to all National Pollutant Discharge Elimination System (NPDES) permits. Additional provisions applicable to NPDES permits are in 40 CFR 122.42. All applicable provisions in 40 CFR 122.41 and 40 CFR 122.42 must be incorporated into this Order and NPDES permit. The applicable 40 CFR 122.41 and 40 CFR 122.42 provisions are as follows:

a. DUTY TO COMPLY [40 CFR 122.41(a)]

The Copermittee must comply with all of the provisions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

(1) The Copermittee must comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement. [40 CFR 122.41(a)(1)]

(2) The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to a civil penalty not to exceed $25,000 per day for each violation. The CWA provides that any person who *negligently* violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than 2 years, or both. Any person who *knowingly* violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both. Any person who knowingly violates Section 301, 302, 303, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, and who knows at that time that he thereby places another person in imminent

danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.
[40 CFR 122.41(a)(2)]

(3) Any person may be assessed an administrative penalty by the San Diego Regional Water Quality Control Board (San Diego Water Board), State Water Resources Control Board (State Water Board), or United States Environmental Protection Agency (USEPA) for violating Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.
[40 CFR 122.41(a)(3)]

b. DUTY TO REAPPLY [40 CFR 122.41(b)]

If a Copermittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Copermittee must apply for and obtain a new permit.

c. NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE [40 CFR 122.41(c)]

It shall not be a defense for a Copermittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

d. DUTY TO MITIGATE [40 CFR 122.41(d)]

The Copermittee must take all reasonable steps to minimize or prevent any discharge or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

e. PROPER OPERATION AND MAINTENANCE [40 CFR 122.41(e)]

The Copermittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Copermittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by a Copermittee only when the operation is necessary to achieve compliance with the conditions of this permit.

f. PERMIT ACTIONS [40 CFR 122.41(f)]

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Copermittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

g. PROPERTY RIGHTS [40 CFR 122.41(g)]

This permit does not convey any property rights of any sort, or any exclusive privilege.

h. DUTY TO PROVIDE INFORMATION [40 CFR 122.41(h)]

The Copermittee must furnish to the San Diego Water Board, State Water Board, or USEPA within a reasonable time, any information which the San Diego Water Board, State Water Board, or USPEA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Copermittee must also furnish to the San Diego Water Board, State Water Board, or USPEA upon request, copies of records required to be kept by this permit.

i. INSPECTION AND ENTRY [40 CFR 122.41(i)]

The Copermittee must allow the San Diego Water Board, State Water Board, USEPA, and/or their authorized representative (including an authorized contractor acting as their representative), upon presentation of credentials and other documents as may be required by law, to:

(1) Enter upon the Copermittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit; [40 CFR 122.41(i)(1)]

(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit; [40 CFR 122.41(i)(2)]

(3) Inspect and photograph at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; [40 CFR 122.41(i)(3)] and

(4) Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location. [40 CFR 122.41(i)(4)]

j. MONITORING AND RECORDS [40 CFR 122.41(j)]

(1) Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity. [40 CFR 122.41(j)(1)]

(2) Except for records of monitoring information required by this permit related to the Copermittee's sewage sludge use and disposal activities, which shall be retained for

a period of at least five (5) years (or longer as required by 40 CFR Part 503), the Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time. [40 CFR 122.41(j)(2)]

(3) Records for monitoring information must include: [40 CFR 122.41(j)(3)]

(a) The date, exact place, and time of sampling or measurements; [40 CFR 122.41(j)(3)(i)]
(b) The individual(s) who performed the sampling or measurements; [40 CFR 122.41(j)(3)(ii)]
(c) The date(s) analyses were performed; [40 CFR 122.41(j)(3)(iii)]
(d) The individual(s) who performed the analyses; [40 CFR 122.41(j)(3)(iv)]
(e) The analytical techniques or methods used; [40 CFR 122.41(j)(3)(v)] and
(f) The results of such analyses. [40 CFR 122.41(j)(3)(vi)]

(4) Monitoring must be conducted according to test procedures under 40 CFR Part 136 unless another method is required under 40 CFR Subchapters N or O. [40 CFR 122.41(j)(4)]

In the case of pollutants for which there are no approved methods under 40 CFR Part 136 or otherwise required under 40 CFR Subchapters N and O, monitoring must be conducted according to a test procedure specified in the permit for such pollutants. [40 CFR 122.44(i)(1)(iv)]

(5) The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. [40 CFR 122.41(j)(5)]

k. SIGNATORY REQUIREMENT [40 CFR 122.41(k)]

(1) All applications, reports, or information submitted to the San Diego Water Board, State Water Board, or USEPA must be signed and certified. (See 40 CFR 122.22) [40 CFR 122.41(k)(1)]

(a) *For a municipality, State, Federal, or other public agency.* [All applications must be signed] by either a principal executive officer or ranking elected official. [40 CFR 122.22(a)(3)]

(b) All reports required by permits, and other information requested by the San Diego Water Board, State Water Board, or USEPA must be signed by a person described in paragraph (a) of this section, or by a duly authorized

representative of that person. A person is a duly authorized representative only if: [40 CFR 122.22(b)]

(i) The authorization is made in writing by a person described in paragraph (a) of this section; [40 CFR 122.22(b)(1)]

(ii) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company, (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) [40 CFR 122.22(b)(2)] and,

(iii) The written authorization is submitted to the San Diego Water Board and State Water Board. [40 CFR 122.22(b)(3)]

(c) *Changes to authorization.* If an authorization under paragraph (b) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (b) of this section must be submitted to the San Diego Water Board prior to or together with any reports, information, or applications to be signed by an authorized representative. [40 CFR 122.22(c)]

(d) *Certification.* Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." [40 CFR 122.22(d)]

(2) The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both. [40 CFR 122.41(k)(2)]

I. REPORTING REQUIREMENTS [40 CFR 122.41(l)]

(1) *Planned changes.* The Copermittee must give notice to the San Diego Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when: [40 CFR 122.41(l)(1)]

(a) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); [40 CFR 122.41(l)(1)(i)] or

(b) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1). [40 CFR 122.41(l)(1)(ii)]

(c) The alteration or addition results in a significant change in the Copermittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. [40 CFR 122.41(l)(1)(iii)]

(2) *Anticipated noncompliance*. The Copermittee must give advance notice to the San Diego Water Board or State Water Board of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements. [40 CFR 122.41(l)(2)]

(3) *Transfers*. This permit is not transferable to any person except after notice to the San Diego Water Board. The San Diego Water Board may require modification or revocation and reissuance of the permit to change the name of the Copermittee and incorporate such other requirements as may be necessary under the CWA. [40 CFR 122.41(l)(3)]

(4) *Monitoring reports.* Monitoring results must be reported at the intervals specified elsewhere in this permit. [40 CFR 122.41(l)(4)]

(a) Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the San Diego Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices. [40 CFR 122.41(l)(4)(i)]

(b) If the Copermittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or another method required for an industry-specific waste stream under 40 CFR Subchapters N or O, the results of this monitoring must be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the San Diego Water Board or State Water Board. [40 CFR 122.41(l)(4)(ii)]

(c) Calculations for all limitations which require averaging of measurements must utilize an arithmetic mean unless otherwise specified in the permit. [40 CFR 122.41(l)(4)(iii)]

(5) *Compliance schedules*. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date. [40 CFR 122.41(l)(5)]

(6) *Twenty-four hour reporting.*

(a) The Copermittee must report any noncompliance that may endanger health or the environment. Any information must be provided orally within 24 hours from the time the Copermittee becomes aware of the circumstances. A written submission must also be provided within five (5) days of the time the Copermittee becomes aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6)(i)]

(b) The following must be included as information which must be reported within 24 hours under this paragraph: [40 CFR 122.41(l)(6)(ii)]

(i) Any unanticipated bypass that exceeds any effluent limitation in the permit (See 40 CFR 122.41(g)). [40 CFR 122.41(l)(6)(ii)(A)]
(ii) Any upset which exceeds any effluent limitation in the permit. [40 CFR 122.41(l)(6)(ii)(B)] and,
(iii) Violation of a maximum daily discharge limitation for any of the pollutants listed by the San Diego Water Board in the permit to be reported within 24 hours. (See 40 CFR 122.44(g)) [40 CFR 122.41(l)(6)(ii)(C)]

(c) The San Diego Water Board may waive the above-required written report on a case-by-case basis if the oral report has been received within 24 hours. [40 CFR 122.41(l)(6)(iii)]

(7) *Other noncompliance.* The Copermittee must report all instances of noncompliance not reported in accordance with the standard provisions required under 40 CFR 122.41(l)(4), (5), and (6), at the time monitoring reports are submitted. The reports must contain the information listed in the standard provisions required under 40 CFR 122.41(l)(6). [40 CFR 122.41(l)(7))]

(8) *Other information.* When the Copermittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the San Diego Water Board, State Water Board, or USEPA, the Copermittee must promptly submit such facts or information. [40 CFR 122.41(l)(8)]

m. BYPASS [40 CFR 122.41(m)]

(1) *Definitions.*

(a) "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. [40 CFR 122.41(m)(1)(i)] or

(b) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or

substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
[40 CFR 122.41(m)(1)(ii)]

(2) *Bypass not exceeding limitations*. The Copermittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the standard provisions required under 40 CFR 122.41(m)(3) and (4).
[40 CFR 122.41(m)(2)]

(3) *Notice.*

(a) *Anticipated bypass*. If the Copermittee knows in advance of the need for a bypass, it must submit a notice, if possible at least ten days before the date of the bypass. [40 CFR 122.41(m)(3)(i)] or

(b) *Unanticipated bypass*. The Copermittee must submit notice of an unanticipated bypass in accordance with the standard provisions required under 40 CFR 122.41(l)(6) (24-hour notice).
[40 CFR 122.41(m)(3)(ii)]

(4) *Prohibition of Bypass.*

(a) Bypass is prohibited, and the San Diego Water Board may take enforcement action against a Copermittee for bypass, unless:
[40 CFR 122.41(m)(4)(i)]

(i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; [40 CFR 122.41(m)(4)(i)(A)]

(ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance;
[40 CFR 122.41(m)(4)(i)(B)] and,

(iii) The Copermittee submitted notice in accordance with the standard provisions required under 40 CFR 122.41(m)(3).
[40 CFR 122.41(m)(4)(i)(C)]

(b) The San Diego Water Board may approve an anticipated bypass, after considering its adverse effects, if the San Diego Water Board determines that it will meet the three conditions listed above.
[40 CFR 122.41(m)(4)(ii)]

n. UPSET [40 CFR 122.41(n)]

(1) *Definition.* "Upset" means an exceptional incident in which there is unintentional and

temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Copermittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. [40 CFR 122.41(n)(1)]

(2) *Effect of an upset*. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the standard provisions required under 40 CFR 122.41(n)(3) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. [40 CFR 122.41(n)(2)]

(3) *Conditions necessary for a demonstration of upset*. A Copermittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that: [40 CFR 122.41(n)(3)]

(a) An upset occurred and that the Copermittee can identify the cause(s) of the upset; [40 CFR 122.41(n)(3)(i)]
(b) The permitted facility was at the time being properly operated; [40 CFR 122.41(n)(3)(ii)] and
(c) The Copermittee submitted notice of the upset in accordance with the standard provisions required under 40 CFR 122.41(l)(6)(ii)(B) (24-hour notice). [40 CFR 122.41(n)(3)(iii)]
(d) The Copermittee complied with any remedial measures pursuant to the standard provisions required under 40 CFR 122.41(d). [40 CFR 122.41(n)(3)(iii)]

(4) *Burden of proof*. In any enforcement proceeding, the Copermittee seeking to establish the occurrence of an upset has the burden of proof. [40 CFR 122.41(n)(4)]

o. STANDARD PERMIT PROVISIONS FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS [40 CFR 122.42(c)]

The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the San Diego Water Board or State Water Board under 40 CFR 122.26(a)(1)(v) must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report must include:

(1) The status of implementing the components of the storm water management program that are established as permit conditions; [40 CFR 122.42(c)(1)]

(2) Proposed changes to the storm water management programs that are established as permit conditions. Such proposed changes must be consistent with 40 CFR 122.26(d)(2)(iii); [40 CFR 122.42(c)(2)] and

(3) Revisions, if necessary, to the assessment of controls and the fiscal analysis

reported in the permit application under 40 CFR 122.26(d)(2)(iv) and (v); [40 CFR 122.42(c)(3)]

(4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; [40 CFR 122.42(c)(4)]

(5) Annual expenditures and budget for year following each annual report; [40 CFR 122.42(c)(5)]

(6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; [40 CFR 122.42(c)(6)]

(7) Identification of water quality improvements or degradation. [40 CFR 122.42(c)(7)]

p. STANDARD PERMIT PROVISIONS FOR STORM WATER DISCHARGES [40 CFR 122.42(d)]

The initial permits for discharges composed entirely of storm water issued pursuant to 40 CFR 122.26(e)(7) must require compliance with the conditions of the permit as expeditiously as practicable, but in no event later than three years after the date of issuance of the permit.

2. General Provisions

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. The general provisions applicable to this Order and NPDES permit are as follows:

a. DISCHARGE OF WASTE IS A PRIVILEGE

No discharge of waste into the waters of the State, whether or not such discharge is made pursuant to waste discharge requirements, shall create a vested right to continue such discharge. All discharges of waste into waters of the State are privileges, not rights. [CWC Section 13263(g)]

b. DURATION OF ORDER AND NPDES PERMIT

(1) *Effective date*. This Order and NPDES permit becomes effective on April 1st, 2015 ~~the 50th day~~ after its adoption provided the USEPA has no objection. If the USEPA objects to its issuance, this Order shall not become effective until such objection is withdrawn. This Order supersedes Order No. R9-2007-0001 for the San Diego County Copermittees listed in Table 2.a and became effective on June 27, 2014.~~upon the effective date of this Order~~. This Order as amended by Order R9-2015-0001~~, and~~ supersedes Order No~~s~~. R9-2009-0002 and becomes effective ~~fifty (50) days~~ April 1, 2015 after the date Order No. R9-2015-0001 is adopted. This Order supersedes Order No. R9-2010-0016 upon its ~~their~~ expiration or earlier notice of coverage.

(2) *Expiration*. This Order and NPDES permit expires five years after its effective date.

[40 CFR 122.46(a)]

(3) *Continuation of expired order*. After this Order and NPDES permit expires, the terms and conditions of this Order and NPDES permit are automatically continued pending issuance of a new permit if all requirements of the federal NPDES regulations on the continuation of expired permits (40 CFR 122.6) are complied with.

c. AVAILABILITY

A copy of this Order must be kept at a readily accessible location and must be available to on-site personnel at all times.

d. CONFIDENTIALITY OF INFORMATION

Except as provided for in 40 CFR 122.7, no information or documents submitted in accordance with or in application for this Order will be considered confidential, and all such information and documents shall be available for review by the public at the San Diego Water Board office.

Claims of confidentiality for the following information will be denied:
[40 CFR 122.7(b)]

(1) The name and address of any permit applicant or Copermittee; [40 CFR 122.7(b)(1)] and

(2) Permit applications and attachments, permits, and effluent data. [40 CFR 122.7(b)(2)]

e. EFFLUENT LIMITATIONS

(1) *Interim effluent limitations*. The Copermittee must comply with any interim effluent limitations as established by addendum, enforcement action, or revised waste discharge requirements which have been, or may be, adopted by the San Diego Water Board.

(2) *Other effluent limitations and standards*. If any applicable toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant and that standard or prohibition is more stringent than any limitation on the pollutant in the permit, the San Diego Water Board shall institute proceedings under these regulations to modify or revoke and reissue the permit to conform to the toxic effluent standard or prohibition. [40 CFR 122.44(b)(1)]

f. DUTY TO MINIMIZE OR CORRECT ADVERSE IMPACTS

The Copermittee must take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this Order, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the noncompliance.

g. PERMIT ACTIONS

The filing of a request by the Copermittee for modification, revocation and reissuance, or termination of this Order, or a notification of planned change in or anticipated noncompliance with this Order does not stay any condition of this Order. (See 40 CFR 122.41(f)) In addition, the following provisions apply to this Order:

(1) Upon application by any affected person, or on its own motion, the San Diego Water Board may review and revise the requirements in this Order. All requirements must be reviewed periodically. [CWC Section 13263(e)]

(2) This Order may be terminated or modified for cause, including, but not limited to, all of the following: [CWC Section 13381]

(a) Violation of any condition contained in the requirements of this Order. [CWC Section 13381(a)]

(b) Obtaining the requirements in this Order by misrepresentation, or failure to disclose fully all relevant facts. [CWC Section 13381(b)]

(c) A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge. [CWC Section 13381(c)]

(3) When this Order is transferred to a new owner or operator, such requirements as may be necessary under the CWC may be incorporated into this Order.

h. NPDES PERMITTED NON-STORM WATER DISCHARGES

The San Diego Water Board has, in prior years, issued a limited number of individual NPDES permits for non-storm water discharges to MS4s. The San Diego Water Board or State Water Board may in the future, upon prior notice to the Copermittee(s), issue an NPDES permit for any non-storm water discharge (or class of non-storm water discharges) to an MS4.

i. MONITORING

In addition to the standard provisions required under 40 CFR 122.41(j) and (l)(4), the following general monitoring provisions apply to this Order:

(1) Where procedures are not otherwise specified in Order, sampling, analysis and quality assurance/quality control must be conducted in accordance with the Quality Assurance Management Plan (QAMP) for the State of California's Surface Water Ambient Monitoring Program (SWAMP), adopted by the State Water Resources Control Board (State Water Board).

(2) Pursuant to 40 CFR 122.41(j)(2) and CWC Section 13383(a), each Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring

instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five (5) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time.

(3) All chemical, bacteriological, and toxicity analyses must be conducted at a laboratory certified for such analyses by the California Department of Public Health or a laboratory approved by the San Diego Water Board.

(4) For priority toxic pollutants that are identified in the California Toxics Rule (CTR) (65 Fed. Reg. 31682), the Copermittees must instruct their laboratories to establish calibration standards that are equivalent to or lower than the Minimum Levels (MLs) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP). If a Copermittee can demonstrate that a particular ML is not attainable, in accordance with procedures set forth in 40 CFR Part 136, the lowest quantifiable concentration of the lowest calibration standard analyzed by a specific analytical procedure (assuming that all the method specified sample weights, volumes, and processing steps have been followed) may be used instead of the ML listed in Appendix 4 of the SIP. The Copermittee must submit documentation from the laboratory to the San Diego Water Board for approval prior to raising the ML for any priority toxic pollutant.

j. ENFORCEMENT

(1) The San Diego Water Board is authorized to enforce the terms of this Order under several provisions of the CWC, including, but not limited to, CWC Sections 13385, 13386, and 13387.

(2) Nothing in this Order shall be construed to protect the Copermittee from its liabilities under federal, state, or local laws.

(3) The CWC provides for civil and criminal penalties comparable to, and in some cases greater than, those provided for under the CWA.

(4) Except as provided in the standard conditions required under 40 CFR 122.41(m) and (n), nothing in this Order shall be construed to relieve the Copermittee from civil or criminal penalties for noncompliance.

(5) Nothing in this Order shall be construed to preclude the institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties to which the Copermittee is or may be subject to under Section 311 of the CWA.

(6) Nothing in this Order shall be construed to preclude institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authoring preserved by Section 510 of the CWA.

k. SEVERABILITY

The provisions of this Order are severable, and if any provision of this Order, or the

application of any provisions of this Order to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this Order shall not be affected thereby.

l. APPLICATIONS

Any application submitted by a Copermittee for reissuance or modification of this Order must satisfy all applicable requirements specified in federal regulations as well as any additional requirements for submittal of a Report of Waste Discharge specified in the CWC and the California Code of Regulations.

m. IMPLEMENTATION

All plans, reports and subsequent amendments submitted in compliance with this Order must be implemented immediately (or as otherwise specified). All submittals by Copermittees must be adequate to implement the requirements of this Order.

n. REPORT SUBMITTALS

(1) All report submittals must include an executive summary, introduction, conclusion, recommendations, and signed certified statement.

(2) Each Copermittee must submit a signed certified statement covering its responsibilities for each applicable submittal.

(3) The Principal Watershed Copermittee(s) must submit a signed certified statement covering its responsibilities for each applicable submittal and the sections of the submittals for which it is responsible.

(4) Unless otherwise directed, the Copermittees must submit one hard copy and one electronic copy of each report required under this Order to the San Diego Water Board, and one electronic copy to the USEPA.

(5) The Copermittees must submit reports and provide notifications as required by this Order to the following:

EXECUTIVE OFFICER
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
2375 NORTHSIDE DRIVE~~9174 SKY PARK COURT~~, SUITE 100
SAN DIEGO CA 9210~~823-4340~~8
Telephone: ~~(858) 467-2952~~(619) 516-1990 Fax: ~~(858) 571-6972~~(619) 516-1994

EUGENE BROMLEY
US ENVIRONMENTAL PROTECTION AGENCY
REGION IX
PERMITS ISSUANCE SECTION (W-5-1)
75 HAWTHORNE STREET
SAN FRANCISCO CA 94105

ATTACHMENT C

ACRONYMS AND ABBREVIATIONS

AMAL	Average Monthly Action Level
ASBS	Area(s) of Special Biological Significance
BMP	Best Management Practice
Basin Plan	Water Quality Control Plan for the San Diego Basin
CEQA	California Environmental Quality Act
CCR	California Code of Regulations
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWC	California Water Code
CZARA	Coastal Zone Act Reauthorization Amendments of 1990
ESAs	Environmentally Sensitive Areas
GIS	Geographic Information System
IBI	Index of Biological Integrity
LID	Low Impact Development
MDAL	Maximum Daily Action Level
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
NAL	Non-Storm Water Action Level
NAICS	North American Industry Classification System
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
ROWD	Report of Waste Discharge (application for NPDES reissuance)
SAL	Storm Water Action Level
San Diego Water Board	California Regional Water Quality Control Board, San Diego Region
SIC	Standard Industrial Classification Code
State Water Board	State Water Resources Control Board
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
WDID	Waste Discharge Identification Number
WLA	Waste Load Allocation
WQBEL	Water Quality Based Effluent Limitation

DEFINITIONS

Active/Passive Sediment Treatment - Using mechanical, electrical or chemical means to flocculate or coagulate suspended sediment for removal from runoff from construction sites prior to discharge.

Anthropogenic Litter – Trash generated from human activities, not including sediment.

Average Monthly Action Level – The highest allowable average of daily discharges over a calendar month.

Beneficial Uses - The uses of water necessary for the survival or wellbeing of man, plants, and wildlife. These uses of water serve to promote tangible and intangible economic, social, and environmental goals. "Beneficial Uses" of the waters of the State that may be protected include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. Existing beneficial uses are uses that were attained in the surface or ground water on or after November 28, 1975; and potential beneficial uses are uses that would probably develop in future years through the implementation of various control measures. "Beneficial Uses" are equivalent to "Designated Uses" under federal law. [California Water Code Section 13050(f)].

Best Management Practices (BMPs) - Defined in 40 CFR 122.2 as schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Bioassessment - The use of biological community information to evaluate the biological integrity of a water body and its watershed. With respect to aquatic ecosystems, bioassessment is the collection and analysis of samples of the benthic macroinvertebrate community together with physical/habitat quality measurements associated with the sampling site and the watershed to evaluate the biological condition (i.e. biotic integrity) of a water body.

Biofiltration - Practices that use vegetation and amended soils to detain and treat runoff from impervious areas. Treatment is through filtration, infiltration, adsorption, ion exchange, and biological uptake of pollutants.

Biological Integrity - Defined in Karr J.R. and D.R. Dudley. 1981. Ecological perspective on water quality goals. *Environmental Management* 5:55-68 as: "A balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitat of the region." Also referred to as ecosystem health.

BMP Design Manual – A plan developed to eliminate, reduce, or mitigate the impacts of runoff from development projects, including Priority Development Projects.

Channel Rehabilitation and Improvement – Remedial measures or activities for the purpose of improving the environmental health of streams, channels, or river systems. Techniques may

vary from in-stream restoration techniques to off-line stormwater management practices installed in the system corridor or upland areas. Rehabilitation techniques may include, but are not limited to the following: riparian zone restoration, constructed wetlands, bank stabilization, channel modifications, and daylighting of drainage systems. Effectiveness may be measured in various manners, including: assessments of habitat, reduced streambank erosion, and/or restoration of water and sediment transport balance.

Chronic Toxicity – A measurement of sublethal effect (e.g. reduced growth, reproduction) to experimental test organisms exposed to an effluent or receiving waters compared to that of the control organisms.

Clean Water Act Section 303(d) Water Body - An impaired water body in which water quality does not meet applicable water quality standards and/or is not expected to meet water quality standards, even after the application of technology based pollution controls required by the CWA. The discharge of runoff to these water bodies by the Copermittees is significant because these discharges can cause or contribute to violations of applicable water quality standards.

Construction Site – Any project, including projects requiring coverage under the Construction General Permit, that involves soil disturbing activities including, but not limited to, clearing, grading, disturbances to ground such as stockpiling, and excavation.

Contamination - As defined in the Porter-Cologne Water Quality Control Act, contamination is "an impairment of the quality of waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste whether or not waters of the State are affected."

Copermittee – A permittee to a NPDES permit that is only responsible for permit conditions relating to the discharge for which it is operator [40 CFR 122.26(b)(1)]. For the purposes of this Order, a Copermittee is one of the individual permittees identified in Tables 1a-1c of this Order.

Copermittees – All of the individual Copermittees, collectively.

Critical Channel Flow (Qc) – The channel flow that produces the critical shear stress that initiates bed movement or that erodes the toe of channel banks. When measuring Qc, it should be based on the weakest boundary material – either bed or bank.

Daily Discharge – Defined as either: (1) the total mass of the constituent discharged over the calendar day or any 24 hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g. concentration.)

The Daily Discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day, or other 24 hour period other than a day), or by the arithmetic mean of analytical results from one or more grab samples taken over the course of a day.

Development Projects - Construction, rehabilitation, redevelopment, or reconstruction of any public or private projects.

Dry Season –May 1 to September 30.

Dry Weather – Weather is considered dry if the preceding 72 hours has been without measurable precipitation (>0.1 inch).

Enclosed Bays – Enclosed bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost bay works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays do not include inland surface waters or ocean waters.

Erosion – When land is diminished or worn away due to wind, water, or glacial ice. Often the eroded debris (silt or sediment) becomes a pollutant via storm water runoff. Erosion occurs naturally but can be intensified by land clearing activities such as farming, development, road building, and timber harvesting.

Environmentally Sensitive Areas (ESAs) - Areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; areas designated as preserves or their equivalent under the Natural Communities Conservation Program within the Cities and County of Orange; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.

Estuaries – Waters, including coastal lagoons, located at the mouth of streams that serve as areas of mixing fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and ocean water. Estuaries do not include inland surface waters or ocean waters.

Existing Development – Any area that has been developed and exists for municipal, commercial, industrial, or residential purposes, uses, or activities. May include areas that are not actively used for its originally developed purpose, but may be re-purposed or redeveloped for another use or activity.

Flow Duration – The long-term period of time that flows occur above a threshold that causes significant sediment transport and may cause excessive erosion damage to creeks and streams (not a single storm event duration). The simplest way to visualize this is to consider a histogram of pre- and post-project flows using long-term records of hourly data. To maintain pre-development flow duration means that the total number of hours (counts) within each range of flows in a flow-duration histogram cannot increase between the pre- and post-development condition. Flow duration within the range of geomorphologically significant flows is important for managing erosion.

Grading - The cutting and/or filling of the land surface to a desired slope or elevation.

Groundwater – Subsurface water that occurs beneath the water table in soils and geologic formations that are fully saturated.

Hazardous Material – Any substance that poses a threat to human health or the environment due to its toxicity, corrosiveness, ignitability, explosive nature or chemical reactivity. These also include materials named by the USEPA in 40 CFR 116 to be reported if a designated quantity of the material is spilled into the waters of the U.S. or emitted into the environment.

Hazardous Waste - Hazardous waste is defined as "any waste which, under Section 600 of Title 22 of this code, is required to be managed according to Chapter 30 of Division 4.5 of Title 22 of this code" [CCR Title 22, Division 4.5, Chapter 11, Article 1].

Household Hazardous Waste – Paints, cleaning products, and other hazardous wastes generated during home improvement or maintenance activities.

Hydromodification – The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

Illicit Connection – Any man-made conveyance or drainage system through which the discharge of any pollutant ~~a non-storm water discharge~~ to the storm water drainage system occurs or may occur. Any connection to the MS4 that conveys an illicit discharge.

Illicit Discharge - Any discharge to the MS4 that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from firefighting activities [40 CFR 122.26(b)(2)].

Inactive Areas – Areas of construction activity that are not active and those that have been active and are not scheduled to be re-disturbed for at least 14 days.

Infiltration – In the context of low impact development, infiltration is defined as the percolation of water into the ground. Infiltration is often expressed as a rate (inches per hour), which is determined through an infiltration test. In the context of non-storm water, infiltration is water other than wastewater that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow [40 CFR 35.2005(20)].

Inland Surface Waters – Includes all surface waters of the State that do not include the ocean, enclosed bays, or estuaries.

Jurisdictional Runoff Management Program Document – A written description of the specific jurisdictional runoff management measures and programs that each Copermittee will implement to comply with this Order and ensure that storm water pollutant discharges in runoff are reduced to the MEP and do not cause or contribute to a violation of water quality standards.

Low Impact Development (LID) – A storm water management and land development strategy that emphasizes conservation and the use of on-site natural features integrated with

engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions.

Low Impact Development Best Management Practices (LID BMPs) – LID BMPs include schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States through storm water management and land development strategies that emphasize conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions. LID BMPs include retention practices that do not allow runoff, such as infiltration, rain water harvesting and reuse, and evapotranspiration. LID BMPs also include flow-through practices such as biofiltration that may have some discharge of storm water following pollutant reduction.

Major Outfall – As defined in the Code of Federal Regulations, a major outfall is a MS4 outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (i.e. discharge from a single conveyance other than a circular pipe which is associated with a drainage area of more than 50 acres); or, for MS4s that receive storm water from lands zoned for industrial activity (based on comprehensive zoning plans or equivalent), a MS4 outfall that discharges from a single pipe with an inside diameter of 12 inches or more or from its equivalent (i.e. discharge from other than a circular pipe associated with a drainage area of 2 acres or more).

Maximum Daily Action Level (MDAL) –The highest allowable daily discharge of a pollutant, over a calendar day (or 24 hour period). For pollutants with action levels expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with action levels expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

Maximum Extent Practicable (MEP) – The technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) for storm water that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) in combination with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than BAT. A definition for MEP is not provided either in the statute or in the regulations. Instead the definition of MEP is dynamic and will be defined by the following process over time: municipalities propose their definition of MEP by way of their runoff management programs. Their total collective and individual activities conducted pursuant to the runoff management programs becomes their proposal for MEP as it applies both to their overall effort, as well as to specific activities (e.g., MEP for street sweeping, or MEP for MS4 maintenance). In the absence of a proposal acceptable to the San Diego Water Board, the San Diego Water Board defines MEP.

In a memo dated February 11, 1993, entitled "Definition of Maximum Extent Practicable," Elizabeth Jennings, Senior Staff Counsel, SWRCB addressed the achievement of the MEP standard as follows:

> "*To achieve the MEP standard, municipalities must employ whatever Best Management Practices (BMPs) are technically feasible (i.e., are likely to be effective) and are not cost prohibitive. The major emphasis is on technical feasibility. Reducing pollutants to the MEP*

means choosing effective BMPs, and rejecting applicable BMPs only where other effective BMPs will serve the same purpose, or the BMPs would not be technically feasible, or the cost would be prohibitive. In selecting BMPs to achieve the MEP standard, the following factors may be useful to consider:

a. Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?
b. Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?
c. Public Acceptance: Does the BMP have public support?
d. Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?
e. Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc.?

The final determination regarding whether a municipality has reduced pollutants to the maximum extent practicable can only be made by the Regional or State Water Boards, and not by the municipal discharger. If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit derived, it would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs that would address a pollutant source, or to pick a BMP based solely on cost, which would be clearly less effective. In selecting BMPs the municipality must make a serious attempt to comply and practical solutions may not be lightly rejected. In any case, the burden would be on the municipal discharger to show compliance with its permit. After selecting a menu of BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented."

Monitoring Year – October 1 to September 30

Municipal Separate Storm Sewer System (MS4) – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designated or used for collecting or conveying storm water; (iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.26.

National Pollutant Discharge Elimination System (NPDES) - The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the CWA.

Non-Storm Water - All discharges to and from a MS4 that do not originate from precipitation

events (i.e., all discharges from a MS4 other than storm water). Non-storm water includes illicit discharges and NPDES permitted discharges.

Nuisance - As defined in the Porter-Cologne Water Quality Control Act, a nuisance is "anything which meets all of the following requirements: 1) Is injurious to health, or is indecent, or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. 2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. 3) Occurs during, or as a result of, the treatment or disposal of wastes."

Ocean Waters – The territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the State Board's California Ocean Plan.

Order – Unless otherwise specified, refers to this Order, Order No. R9-2013-0001 (NPDES No. CAS0109266)

Outfall - Outfall means a point source as defined by 40 CFR 122.2 at the point where a municipal separate storm sewer discharges to waters of the US and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels or other conveyances which connect segments of the same stream or other waters of the US and are used to convey waters of the US.

Persistent Flow - Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

Person - A person is defined as an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof [40 CFR 122.2].

Point Source - Any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, landfill leachate collection systems, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

Pollutant - Any agent that may cause or contribute to the degradation of water quality such that a condition of pollution or contamination is created or aggravated.

Pollution - As defined in the Porter-Cologne Water Quality Control Act, pollution is "the alteration of the quality of the waters of the State by waste, to a degree which unreasonably affects either of the following: 1) The waters for beneficial uses; or 2) Facilities that serve these beneficial uses." Pollution may include contamination.

Pollution Prevention - Pollution prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control BMPs, treatment control BMPs, or disposal.

Pre-Development Runoff Conditions – Approximate flow rates and durations that exist or existed onsite before land development occurs. For new development projects, this equates to runoff conditions immediately before project construction. For redevelopment projects, this equates to runoff conditions from the project footprint assuming infiltration characteristics of the underlying soil, and existing grade. Runoff coefficients of concrete or asphalt must not be used. A redevelopment Priority Development Project must use available information pertaining to existing underlying soil type and onsite existing grade to estimate pre-development runoff conditions.

Priority Development Projects - New development and redevelopment projects defined under Provision E.3.b of Order No. R9-2013-0001.

Progressive Enforcement – A series of enforcement actions that increase in severity commensurate with the violation. Such enforcement actions may include verbal and written notices of violation, fines, stop work orders, administrative penalties, criminal penalties, etc.

Rainy Season (aka Wet Season) –October 1 to April 30

Receiving Waters – Waters of the United States.

Receiving Water Limitations - Waste discharge requirements issued by the San Diego Water Board typically include both: (1) "Effluent Limitations" (or "Discharge Limitations") that specify the technology-based or water-quality-based effluent limitations; and (2) "Receiving Water Limitations" that specify the water quality objectives in the Basin Plan as well as any other limitations necessary to attain those objectives. In summary, the "Receiving Water Limitations" provision is the provision used to implement the requirements of CWA section 402(p)(3)(B).

Redevelopment - The creation and/or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include trenching and resurfacing associated with utility work; parking lots; resurfacing existing roadways; cutting and reconfiguring of surface parking lots; new sidewalk construction, pedestrian ramps, or bike lane on existing roads; and routine replacement of damaged pavement, such as pothole repair.

Regional Clearinghouse – A central location for the collection and distribution of information developed and maintained by the Copermittees including, but not limited to, plans, reports, manuals, data, contact information, and/or links to such documents and information.

Rehabilitation - Remedial measures or activities for the purpose of improving or restoring the beneficial uses of streams, channels or river systems. Techniques may vary from in-stream restoration techniques to off-line storm water management practices installed in the system corridor or upland areas, or a combination of in-stream and out of stream techniques. Rehabilitation techniques may include, but are not limited to the following: riparian zone restoration, constructed wetlands, channel modifications that improve habitat and stability, and daylighting of drainage systems.

Reporting Period – The period of information that is reported in the Water Quality Improvement

Plan Annual Report. The reporting period consists of two components: 1) July 1 to June 30, consistent with the fiscal year, for the implementation of the jurisdictional runoff management programs, and 2) October 1 to September 30, consistent with the monitoring year for the monitoring and assessment programs. Together, these two time periods constitute the reporting year for the Water Quality Improvement Plan Annual Report due January 31 following the end of the monitoring year.

Retain – Keep or hold in a particular place, condition, or position without discharge to surface waters.

Retrofitting – Storm water management practice put into place after development has occurred in watersheds where the practices previously did not exist or are ineffective. Retrofitting of developed areas is intended to improve water quality, protect downstream channels, reduce flooding, or meet other specific objectives. Retrofitting developed areas may include, but is not limited to replacing roofs with green roofs, disconnecting downspouts or impervious surfaces to drain to pervious surfaces, replacing impervious surfaces with pervious surfaces, installing rain barrels, installing rain gardens, and trash area enclosures.

Runoff - All flows in a storm water conveyance system that consists of the following components: (1) storm water (wet weather flows) and (2) non-storm water including dry weather flows.

San Diego Water Board – As used in this document the term "San Diego Water Board" is synonymous with the term "Regional Board" as defined in Water Code section 13050(b) and is intended to refer to the California Regional Water Quality Control Board for the San Diego Region as specified in Water Code Section 13200.

Sediment - Soil, sand, and minerals washed from land into water. Sediment resulting from anthropogenic sources (i.e. human induced land disturbance activities) is considered a pollutant. This Order regulates only the discharges of sediment from anthropogenic sources and does not regulate naturally occurring sources of sediment. Sediment can destroy fish-nesting areas, clog animal habitats, and cloud waters so that sunlight does not reach aquatic plants.

Source Control BMP – Land use or site planning practices, or structural or nonstructural measures that aim to prevent runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between pollutants and runoff.

Storm Water – Per 40 CFR 122.26(b)(13), means storm water runoff, snowmelt runoff and surface runoff and drainage. ~~Surface runoff and drainage pertains to runoff and drainage resulting from precipitation events~~.

Structural BMPs - A subset of BMPs which detains, retains, filters, removes, or prevents the release of pollutants to surface waters from development projects in perpetuity, after construction of a project is completed.

Test of Significant Toxicity (TST) - A statistical approach used to analyze toxicity test data. The TST incorporates a restated null hypothesis, Welch's t-test, and biological effect thresholds for chronic and acute toxicity.

Total Maximum Daily Load (TMDL) - The maximum amount of a pollutant that can be

discharged into a water body from all sources (point and non-point) and still maintain water quality standards. Under CWA section 303(d), TMDLs must be developed for all water bodies that do not meet water quality standards after application of technology-based controls.

Toxicity - Adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies. The water quality objectives for toxicity provided in the Basin Plan, state in part…"All waters shall be free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life….The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge."

Toxicity Identification Evaluation (TIE) - A set of procedures for identifying the specific chemical(s) responsible for toxicity. These procedures are performed in three phases (characterization, identification, and confirmation) using aquatic organism toxicity tests.

Toxicity Reduction Evaluation (TRE) - A study conducted in a step-wise process designed to identify the causative agents of effluent or ambient toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in toxicity. The first steps of the TRE consist of the collection of data relevant to the toxicity, including additional toxicity testing, and an evaluation of facility operations and maintenance practices, and best management practices. A Toxicity Identification Evaluation (TIE) may be required as part of the TRE, if appropriate.

Treatment Control BMP – Any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media absorption or any other physical, biological, or chemical process.

Unpaved Road – Any long, narrow stretch without pavement used for traveling by motor passenger vehicles between two or more points. Unpaved roads are generally constructed of dirt, gravel, aggregate or macadam and may be improved or unimproved.

Waste - As defined in CWC Section 13050(d), "waste includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal."

Article 2 of CCR Title 23, Chapter 15 (Chapter 15) contains a waste classification system that applies to solid and semi-solid waste, which cannot be discharged directly or indirectly to water of the state and which therefore must be discharged to land for treatment, storage, or disposal in accordance with Chapter 15. There are four classifications of waste (listed in order of highest to lowest threat to water quality): hazardous waste, designated waste, non-hazardous solid waste, and inert waste.

Water Quality Objective - Numerical or narrative limits on constituents or characteristics of water designated to protect designated beneficial uses of the water. [California Water Code Section 13050 (h)]. California's water quality objectives are established by the State and Regional Water Boards in the Water Quality Control Plans. Numeric or narrative limits for pollutants or characteristics of water designed to protect the beneficial uses of the water. In other words, a water quality objective is the maximum concentration of a pollutant that can exist

in a receiving water and still generally ensure that the beneficial uses of the receiving water remain protected (i.e., not impaired). Since water quality objectives are designed specifically to protect the beneficial uses, when the objectives are violated the beneficial uses are, by definition, no longer protected and become impaired. This is a fundamental concept under the Porter Cologne Act. Equally fundamental is Porter Cologne's definition of pollution. A condition of pollution exists when the water quality needed to support designated beneficial uses has become unreasonably affected or impaired; in other words, when the water quality objectives have been violated. These underlying definitions (regarding beneficial use protection) are the reason why all waste discharge requirements implementing the federal NPDES regulations require compliance with water quality objectives. (Water quality objectives are also called water quality criteria in the CWA.)

Water Quality Standards - Water quality standards, as defined in Clean Water Act section 303(c) consist of the beneficial uses (e.g., swimming, fishing, municipal drinking water supply, etc.,) of a water body and criteria (referred to as water quality objectives in the California Water Code) necessary to protect those uses. Under the Water Code, the water boards establish beneficial uses and water quality objectives in water quality control or basin plans. Together with an anti-degradation policy, these beneficial uses and water quality objectives serve as water quality standards under the Clean Water Act. In Clean Water Act parlance, state beneficial uses are called "designated uses" and state water quality objectives are called "criteria." Throughout this Order, the relevant term is used depending on the statutory scheme.

Waters of the State - Any ~~water,~~ surface or groundwater ~~underground~~, including saline waters within the boundaries of the State [CWC section 13050 (e)]. The definition of the Waters of the State is broader than that for the Waters of the United States in that all water in the State is considered to be a Waters of the State ~~regardless of circumstances or condition~~.

Waters of the United States - As defined in the 40 CFR 122.2, the Waters of the U.S. are defined as: "(a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate "wetlands;" (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters otherwise defined as waters of the United States under this definition: (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial seas; and (g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA."

Watershed - That geographical area which drains to a specified point on a water course, usually a confluence of streams or rivers (also known as drainage area, catchment, or river basin).

Wet Season (aka Rainy Season) – October 1 to April 30

Wet Weather – Wet weather must be preceded by 72 hours of dry weather and ~~Weather~~ is considered wet up to 72 hours after a storm event of 0.1 inches and greater, unless otherwise defined by another regulatory mechanism (e.g. a TMDL).

ATTACHMENT D

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM

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JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

FY _____

I. COPERMITTEE INFORMATION

Copermittee Name:

Copermittee Primary Contact Name:

Copermittee Primary Contact Information:
Address:
City: County: State: Zip:
Telephone: Fax: Email:

II. LEGAL AUTHORITY

Has the Copermittee established adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 that complies with Order No. R9-2013-0001?	YES NO	☐ ☐
A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority?	YES NO	☐ ☐

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

Was an update of the jurisdictional runoff management program document required or recommended by the San Diego Water Board?	YES NO	☐ ☐
If YES to the question above, did the Copermittee update its jurisdictional runoff management program document and make it available on the Regional Clearinghouse?	YES NO	☐ ☐

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

Has the Copermittee implemented a program to actively detect and eliminate illicit discharges and connections to its MS4 that complies with Order No. R9-2013-0001?	YES NO	☐ ☐

Number of non-storm water discharges reported by the public	
Number of non-storm water discharges detected by Copermittee staff or contractors	
Number of non-storm water discharges investigated by the Copermittee	
Number of sources of non-storm water discharges identified	
Number of non-storm water discharges eliminated	
Number of sources of illicit discharges or connections identified	
Number of illicit discharges or connections eliminated	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

V. DEVELOPMENT PLANNING PROGRAM

Has the Copermittee implemented a development planning program that complies with Order No. R9-2013-0001?	YES NO	☐ ☐
Was an update to the BMP Design Manual required or recommended by the San Diego Water Board?	YES NO	☐ ☐
If YES to the question above, did the Copermittee update its BMP Design Manual and make it available on the Regional Clearinghouse?	YES NO	☐ ☐

Number of proposed development projects in review	
Number of Priority Development Projects in review	
Number of Priority Development Projects approved	
Number of approved Priority Development Projects exempt from any BMP requirements	
Number of approved Priority Development Projects allowed alternative compliance	
Number of Priority Development Projects granted occupancy	

Number of completed Priority Development Projects in inventory	
Number of high priority Priority Development Project structural BMP inspections	
Number of Priority Development Project structural BMP violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM

FY _____

VI. CONSTRUCTION MANAGEMENT PROGRAM

Has the Copermittee implemented a construction management program that complies with Order No. R9-2013-0001?	YES	☐
	NO	☐

Number of construction sites in inventory	
Number of active construction sites in inventory	
Number of inactive construction sites in inventory	
Number of construction sites closed/completed during reporting period	
Number of construction site inspections	
Number of construction site violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

Has the Copermittee implemented an existing development management program that complies with Order No. R9-2013-0001?	YES	☐
	NO	☐

	Municipal	Commercial	Industrial	Residential
Number of facilities or areas in inventory				
Number of existing development inspections				
Number of follow-up inspections				
Number of violations				
Number of enforcement actions issued				
Number of escalated enforcement actions issued				

VIII. PUBLIC EDUCATION AND PARTICIPATION

Has the Copermittee implemented a public education program component that complies with Order No. R9-2013-0001?	YES	☐
	NO	☐
Has the Copermittee implemented a public participation program component that complies with Order No. R9-2013-0001?	YES	☐
	NO	☐

IX. FISCAL ANALYSIS

Has the Copermittee attached to this form a summary of its fiscal analysis that complies with Order No. R9-2013-0001?	YES	☐
	NO	☐

X. CERTIFICATION

I [☐ Principal Executive Officer ☐ Ranking Elected Official ☐ Duly Authorized Representative] certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature	Date
Print Name	Title
Telephone Number	Email

ATTACHMENT E

SPECIFIC PROVISIONS FOR TOTAL MAXIMUM DAILY LOADS APPLICABLE TO ORDER NO. R9-2013-0001

These provisions implement load allocations (LAs) and wasteload allocations (WLAs) of the Total Maximum Daily Loads (TMDLs) adopted established by the San Diego Water Board or and approved by USEPA under Clean Water Act section 303(c), applicable to discharges regulated under this Order. The provisions and schedules for implementation of the TMDLs described below must be incorporated into the Water Quality Improvement Plans, required pursuant to Provision B of this Order, for the specified Watershed Management Areas.

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed
2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin
3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed
4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek
5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay
6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)
7. Total Maximum Daily Load for Sediment in Los Peñasquitos Lagoon

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2002-0123

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	August 14, 2002
State Water Board Approval Date:	July 16, 2003
Office of Administrative Law Approval Date:	September 11, 2003
US EPA Approval Date:	November 3, 2003

(3) TMDL Effective Date: September 11, 2003

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final diazinon TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must be in compliance with the final TMDL compliance requirements as of December 31, 2010.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations:

Table 1.1
Final Receiving Water Limitations Expressed as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Diazinon	Acute	0.08 µg/L	1 hour
	Chronic	0.05 µg/L	4 days

(b) Final Effluent Limitations

Discharges from the MS4s containing concentrations that do not exceed the following effluent limitations will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 1.b.(2)(a):

Table 1.2
Final Effluent Limitations Expressed as Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation	Averaging Period
Diazinon	Acute	0.072 µg/L	1 hour
	Chronic	0.045 µg/L	4 days

(c) Best Management Practices

The following BMPs for Chollas Creek must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area and implemented by the Responsible Copermittees:

(i) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 1.b.(2)(a) and/or the effluent limitations under Specific Provision 1.b.(2)(b) for Chollas Creek.

(ii) The Responsible Copermittees must implement the Diazinon Toxicity Control Plan and Diazinon Public Outreach/Education Program as described in the report titled, *Technical Report for Total Maximum Daily Load for Diazinon in Chollas Creek Watershed, San Diego County*, dated August 14, 2002, including subsequent modifications, in order to achieve the receiving water limitations under Specific Provision 1.b.(2)(a) and/or the effluent limitations under Specific Provision 1.b.(2)(b).

(iii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 1.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 1.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 1.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 1.b.(2)(c) achieves compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 1.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 1.d, to demonstrate compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The Responsible Copermittees must be in compliance with the final diazinon TMDL compliance requirements as of December 31, 2010.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls for diazinon within the Chollas Creek watershed, and calculate or estimate the annual diazinon loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment

Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 1.b.(2)(b), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0019

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	September 22, 2005
Office of Administrative Law Approval Date:	December 2, 2005
US EPA Approval Date:	February 8, 2006

(3) TMDL Effective Date: December 2, 2005

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Shelter Island Yacht Basin

(6) Responsible Copermittee: City of San Diego

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final dissolved copper TMDL compliance requirements for Shelter Island Yacht Basin consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittee must be in compliance with the final TMDL compliance requirements as of December 2, 2005.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations:

Table 2.1
Final Receiving Water Limitations Expressed as Concentrations in Shelter Island Yacht Basin

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Dissolved Copper	Acute	4.8 µg/L x WER*	1 hour
	Chronic	3.1 µg/L x WER*	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 2.b.(3)(a):

Table 2.2
Final Effluent Limitations as Expressed as Annual Loads in MS4 Discharges to Shelter Island Yacht Basin

Constituent	Effluent Limitation
Dissolved Copper	30 kg/yr*

* If the water quality objectives for dissolved copper in Shelter Island Yacht Basin are changed in the future, then the margin of safety (MOS), TMDL and allocations will be recalculated using the *Method for Recalculation of the Total Maximum Daily Load for Dissolved Copper in the Shelter Island Yacht Basin, San Diego Bay* in the Basin Plan (p. 7-14).

(c) Best Management Practices

The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 2.b.(2)(a) and/or the effluent limitations under Specific Provision 2.b.(2)(b) for Shelter Island Yacht Basin. The BMPs must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 2.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 2.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittee develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 2.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 2.b.(2)(c) achieves compliance with Specific Provisions 2.b.(3)(a), 2.b.(3)(b) and/or 2.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 2.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 2.d, to demonstrate compliance with Specific Provisions 2.b.(3)(a), 2.b.(3)(b) and/or 2.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The Responsible Copermittees must be in compliance with the final dissolved copper TMDL compliance requirements as of December 2, 2005.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

The Responsible Copermittee must monitor the effluent of its MS4 outfalls for dissolved copper, and calculate or estimate the monthly and annual dissolved copper loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.(b)(2)of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0036

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	November 16, 2005
Office of Administrative Law Approval Date:	February 1, 2006
US EPA Approval Date:	March 22, 2006

(3) TMDL Effective Date: February 1, 2006

(4) Watershed Management Area: Santa Margarita River

(5) Water Body: Rainbow Creek

(6) Responsible Copermittee: County of San Diego

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final total nitrogen and total phosphorus TMDL compliance requirements for Rainbow Creek consist of the following

(1) Final TMDL Compliance Date

The Responsible Copermittee must comply with final TMDL compliance requirements by December 31, 2021.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance date under Specific Provision 3.b.(1):

Table 3.1
Final Receiving Water Limitations Expressed as Concentrations in Rainbow Creek

Constituent	Receiving Water Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing concentrations that do not exceed the following effluent limitations by the compliance date under Specific Provision 3.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 3.b.(2)(a):

Table 3.2
Final Effluent Limitations Expressed as Concentrations in MS4 Discharges to Rainbow Creek

Constituent	Effluent Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(ii) Annual pollutant loads from given land uses discharging to and from the MS4s that do not exceed the following annual loads by the compliance date under Specific Provision 3.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 3.b.(2)(a):

Table 3.3
Final Effluent Limitations Expressed as Annual Loads in MS4 Discharges to Rainbow Creek

Land Use	Total N	Total P
Commercial nurseries	116 kg/yr	3 kg/yr
Park	3 kg/yr	0.1 kg/yr
Residential areas	149 kg/yr	12 kg/yr
Urban areas	27 kg/yr	6 kg/yr

(c) Best Management Practices

(i) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 3.b.(2)(a) and/or the effluent limitations under Specific Provision 3.b.(2)(b) for Rainbow Creek.

(ii) The Responsible Copermittee should coordinate any BMPs implemented to address this TMDL with Caltrans and other sources as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under

Specific Provision 3.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 3.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the final effluent limitations under Specific Provision 3.b.(2)(b)(ii); OR

(e) The Responsible Copermittee develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 3.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Specific Provision 3.b.(2)(c) achieves compliance with Specific Provisions 3.b.(3)(a), 3.b.(3)(b), 3.b.(3)(c) and/or 3.b.(3)(d),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 3.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 3.d, to demonstrate compliance with Specific Provisions 3.b.(3)(a), 3.b.(3)(b), 3.b.(3)(c) and/or 3.b.(3)(d).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim total nitrogen and total phosphorus TMDL compliance requirements for Rainbow Creek consist of the following:

(1) Interim Compliance Dates and WQBELs

The Responsible Copermittee must comply with the interim WQBELs, expressed as annual loads, by December 31 of the interim compliance year given in Table 3.4.

Table 3.4
Interim Water Quality Based Effluent Limitations Expressed as Annual Loads in MS4 Discharges from Specific Land Uses to Rainbow Creek

	Total N Interim Effluent Limitations (kg/yr)			Total P Interim Effluent Limitations (kg/yr)		
	Interim Compliance Date			Interim Compliance Date		
Land Use	**2009**	**2013**	**2017**	**2009**	**2013**	**2017**
Commercial nurseries	390	299	196	20	16	10
Park	5	3	3	0.15	0.10	0.10
Residential areas	507	390	260	99	74	47
Urban areas	40	27	27	9	6	6

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 3.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 3.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the final effluent limitations under Specific Provision 3.b.(2)(b)(ii); OR

(e) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the interim effluent limitations under Specific Provision 3.c.(1); OR

(f) The Responsible Copermittee has submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

d. Specific Monitoring and Assessment Requirements

(1) The Responsible Copermittee must incorporate into the Water Quality Improvement Plan and implement the Sampling and Analysis Plan for Rainbow Creek Nutrient Reduction TMDL Implementation Water Quality Monitoring, dated January 2010.

(2) The results of any monitoring conducted during the reporting period, and assessment of whether the interim and final TMDL compliance requirements have been achieved must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 3.b.(2)(b)(i), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2007-0043

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2007
State Water Board Approval Date:	July 15, 2008
Office of Administrative Law Approval Date:	October 22, 2008
US EPA Approval Date:	December 18, 2008

(3) TMDL Effective Date: October 22, 2008

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final dissolved copper, lead, and zinc TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must comply with the final TMDL compliance requirements by October 22, 2028.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance date under Specific Provision 4.b.(1):

Table 4.1
Final Receiving Water Limitations Expressed as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$(0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$(0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$(0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$(0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations by the compliance date under Specific Provision 4.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 4.b.(2)(a):

Table 4.2
Final Effluent Limitations as Expressed Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(c) Best Management Practices

(i) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 4.b.(2)(a) and/or the effluent limitations under Specific Provision 4.b.(2)(b) for Chollas Creek.

(ii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans and the U.S. Navy as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 4.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 4.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 4.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 4.b.(2)(c) achieves compliance with Specific Provisions 4.b.(3)(a), 4.b.(3)(b) and/or 4.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 4.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 4.d, to demonstrate compliance with Specific Provisions 4.b.(3)(a), 4.b.(3)(b) and/or 4.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim dissolved copper, lead, and zinc TMDL compliance requirements for Chollas Creek consist of the following:

(1) Interim Compliance Date and WQBELs

The Responsible Copermittee must comply with the interim WQBELs, expressed as concentrations, by the interim compliance date given in Table 4.3:

Table 4.3
Interim Water Quality Based Effluent Limitations Expressed as Concentrations in MS4 Discharges to Chollas Creek

Interim Compliance Date	Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
October 22, 2018	Dissolved Copper	Acute	1.2 x 90% x (0.96) x $e^{[0.9422 \times \ln(\text{hardness}) - 1.700]}$ x WER*	1 hour
		Chronic	1.2 x 90% x (0.96) x $e^{[0.8545 \times \ln(\text{hardness}) - 1.702]}$ x WER*	4 days
	Dissolved Lead	Acute	1.2 x 90% x [1.46203 – 0.145712 x ln(hardness)] x $e^{[1.273 \times \ln(\text{hardness}) - 1.460]}$ x WER*	1 hour
		Chronic	1.2 x 90% x [1.46203 – 0.145712 x ln(hardness)] x $e^{[1.273 \times \ln(\text{hardness}) - 4.705]}$ x WER*	4 days
	Dissolved Zinc	Acute	1.2 x 90% x (0.978) x $e^{[0.8473 \times \ln(\text{hardness}) + 0.884]}$ x WER*	1 hour
		Chronic	1.2 x 90% x (0.986) x $e^{[0.8473 \times \ln(\text{hardness}) + 0.884]}$ x WER*	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 4.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 4.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) There are no exceedances of the interim effluent limitations under Specific

Provision 4.c.(1) at the Responsible Copermittee's MS4 outfalls; OR

(e) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance date.

d. Specific Monitoring and Assessment Requirements

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*, when it is amended to include monitoring requirements for the Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls discharging to Chollas Creek for dissolved copper, lead, and zinc, and calculate or estimate the monthly and annual dissolved copper, lead, and zinc loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 4.b.(2)(b) or 4.c.(1), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2008-0027

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 11, 2008
State Water Board Approval Date:	June 16, 2009
Office of Administrative Law Approval Date:	September 15, 2009
US EPA Approval Date:	October 26, 2009

(3) TMDL Effective Date: September 15, 2009

(4) Watershed Management Areas: See Table 5.0

(5) Water Bodies: See Table 5.0

(6) Responsible Copermittees: See Table 5.0

Table 5.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County	Dana Point Harbor	Baby Beach	-City of Dana Point -County of Orange
San Diego Bay	San Diego Bay	Shelter Island Shoreline Park	- San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final indicator bacteria TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0[39] consist of the following:

(3) Final TMDL Compliance Dates

(a) Baby Beach in Dana Point Harbor

The Responsible Copermittees for MS4 discharges to Baby Beach must be in compliance with the final TMDL compliance requirements according

[39] Per Resolution R9-2008-0027, the interim and final WQBELs only apply to waterbodies that remain on the 303(d) list for REC-1 water quality objectives due to impacts from controllable sources of bacteria. If waterbodies are put back on the list or delisted in subsequent iterations, the San Diego Water Board will revise the current NPDES requirements and/or issue additional waste discharge requirements to be consistent with these TMDLs.

to the following compliance dates:

Table 5.1
Compliance Dates to Achieve Final TMDL Compliance Requirements For Baby Beach in Dana Point Harbor

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform	September 15, 2014	September 15, 2009
Fecal Coliform		September 15, 2009
Enterococcus		September 15, 2019

(b) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park must be in compliance with the final TMDL compliance requirements as of December 31, 2012.

(4) Final Receiving Water ~~Quality Based Effluent Water~~ Limitations

~~(a) Final Receiving Water Limitations~~
The Receiving Water Limitations for segments or areas of the water bodies listed in Table 5.0[40] consist of the following:

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance dates under Specific Provision 5.b.(1):

Table 5.2
Final Receiving Water Limitations Expressed as Bacteria Densities in the Water Body

Constituent	Receiving Water Limitations	
	Single Sample Maximum[1,2]	30-Day Geometric Mean[2]
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.

[40] Per Resolution R9-2008-0027, the Receiving Water Limitations only apply to waterbodies that remain on the 303(d) list for REC-1 water quality objectives due to impacts from controllable sources of bacteria. If waterbodies are put back on the list or delisted in subsequent iterations, the San Diego Water Board will revise the current NPDES requirements and/or issue additional waste discharge requirements to be consistent with these TMDLs.

If the above receiving water limitations are not met in the receiving water, the Responsible Copermittees must demonstrate that the discharges from the MS4s are not causing or contributing to the exceedance of receiving water limitations. Such demonstration may be achieved by demonstrating the attainment of the final WQBELs in Provision 5.b.(2).

(3) Final Water Quality Based Effluent Limitations

(a~~b~~) Final Effluent Limitations

(i) Discharges from the MS4s must not ~~containing indicator bacteria densities that do not~~ exceed the following mass-based effluent limitations by the compliance dates under Specific Provision 5.b.(1) to demonstrate that the discharge is ~~will~~ not causing~~e~~ or contributing~~e~~ to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

~~**Table 5.3a**~~
~~*Final Effluent Limitations as Expressed as Bacteria Densities in MS4 Discharges to the Water Body*~~

~~Constituent~~	~~Effluent Limitations~~ ~~Single Sample Maximum[1,2]~~	~~30-Day Geometric Mean[2]~~
~~Total Coliform~~	~~10,000 MPN/100mL~~	~~1,000 MPN/100mL~~
~~Fecal Coliform~~	~~400 MPN/100mL~~	~~200 MPN/100mL~~
~~*Enterococcus*~~	~~104 MPN/100mL~~	~~35 MPN/100mL~~

~~Notes:~~
~~1. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.~~
~~2. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.~~

~~(ii) Discharges from the MS4s containing indicator bacteria loads that do not exceed the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):~~

Table 5.4a
Final Effluent Limitations as Mass-Based Limits ~~Expressed as Bacteria Loads~~ in MS4 Discharges
to the Baby Beach in Dana Point Harbor

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0.86×10^9 MPN/day	$3{,}254 \times 10^9$ MPN/30days
Fecal Coliform	0.17×10^9 MPN/day	112×10^9 MPN/30days
Enterococcus	0.03×10^9 MPN/day	114×10^9 MPN/30days

Table 5.4b
Final Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to the Shelter Island Shoreline Park in San Diego Bay

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0 MPN/day	198×10^9 MPN/30days
Fecal Coliform	0 MPN/day	8×10^9 MPN/30days
Enterococcus	0 MPN/day	26×10^9 MPN/30days

(iii) Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.5a
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to Baby Beach in Dana Point Harbor*

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	90.4%	0%
Fecal Coliform	82.7%	0%
Enterococcus	96.2%	62.2%

Notes:
* The percent load reductions are relative to data collected between 1996-2002. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittees' MS4s must not exceed the loads in Table 5.4a, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the water body.

Table 5.5b
*Final Effluent Limitations Expressed as Percent Load Reductions** in MS4 Discharges to Shelter Island Shoreline Park in San Diego Bay*

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0%	0%
Fecal Coliform	0%	0%
Enterococcus	0%	0%

Notes:
* The percent load reductions are relative to data collected between 1999-2004. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittee's MS4s must not exceed the loads in Table 5.4b, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the water body.

If the final WQBELs are not met in the MS4 discharges, the Responsible Copermittees must demonstrate that the discharges from the MS4s are not causing or contributing to the exceedance of receiving water limitations. Such demonstration may be achieved by (1) demonstrating the attainment of the Receiving Water Limitations in Provision 5.c.(1), or (2) demonstrating that the natural and background sources appear to be the sole source of the continued impairment. The natural sources exclusion approach (NSEA) may be applied. The Municipal Dischargers are responsible for collection of the data to support the application of the NSEA to recalculate the TMDL.

(b~~c~~) Best Management Practices

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 5.0 must incorporate the Bacteria Load Reduction Plan (BLRP) required to be developed pursuant to Resolution No. R9-2008-0027.

(ii) The Responsible Copermittee must implement BMPs to support the achievement of the ~~receiving water limitations under Specific Provision 5.b.(2)(a) and/or the~~ effluent limitations under Specific Provision 5.b.(2)(b) for the segments or areas of the water bodies listed in Table 5.0

(4) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no ~~direct or indirect~~ discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.b.(2)(b)(ii); OR

(e) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 5.b.(2)(b)(iii); OR

(f) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(g) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 5.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 5.b.(2)(c) achieves compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 5.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 5.d, to demonstrate compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim indicator bacteria TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0[41] consist of the following:

(1) Baby Beach in Dana Point Harbor

(a) Interim TMDL Compliance Dates and WQBELs

The Responsible Copermittees for MS4 discharges to Baby Beach must comply with the following interim WQBELs by the interim compliance dates given in Tables 5.6a and/or 5.6b:

Table 5.6a
Interim Water Quality Based Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to Baby Beach in Dana Point Harbor

Constituent	Interim Compliance Dates	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	4.93×10^9 MPN/day	$3{,}254 \times 10^9$ MPN/30days*
Fecal Coliform	September 15, 2012	0.59×10^9 MPN/day	112×10^9 MPN/30days*
Enterococcus	September 15, 2012	0.42×10^9 MPN/day	301×10^9 MPN/30days
	September 15, 2016	0.03×10^9 MPN/day *	207×10^9 MPN/30days

Notes:
* Same as the final effluent limitations in Table 5.4a.

Table 5.6b
Interim Water Quality Based Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to Baby Beach in Dana Point Harbor*

Constituent	Interim Compliance Dates	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	45.2%	0%**
Fecal Coliform	September 15, 2012	41.4%	0%**
Enterococcus	September 15, 2012	48.1%	0%
	September 15, 2016	96.2%**	31.1%

Notes:
* The percent load reductions are relative to data collected between 1996-2002. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittees' MS4s must not exceed

[41] Per Resolution R9-2008-0027, the interim and final WQBELs only apply to waterbodies that remain on the 303(d) list for REC-1 water quality objectives due to impacts from controllable sources of bacteria. If waterbodies are put back on the list or delisted in subsequent iterations, the San Diego Water Board will revise the current NPDES requirements and/or issue additional waste discharge requirements to be consistent with these TMDLs.

the loads in Table 5.6a, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the waterbody.

** Same as the final effluent limitations in Table 5.5a.

(b) Interim Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(i) There is no ~~direct or indirect~~ discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(ii) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(iii) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(iv) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.b(2)(b)(ii); OR

(v) The Responsible Copermittees can demonstrate that exceedances of the applicable receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(vi) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the interim effluent limitations under Table 5.6a of Specific Provision 5.c.(1)(a); OR

(vii) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the interim effluent limitations under Table 5.6b of Specific Provision 5.c.(1)(a); OR

(viii) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

Upon the effective date of this Order, a Copermittee's full compliance with all of the following requirements shall constitute a Copermittee's compliance with provisions pertaining to interim WQBELs with compliance deadlines occurring prior to approval of a WQIP.

(i) Meets all interim and final deadlines for development of a WQIP,

(ii) Targets implementation of watershed control measures in its existing storm water management program, including watershed control

measures to eliminate non-storm water discharges of pollutants through the MS4 to receiving waters, to address known contributions of pollutants from MS4 discharges that cause or contribute to the impairment(s) addressed by the TMDL(s), and

(iii) Receives final approval of its WQIP from the Regional Board.

~~(viii)~~(ix)

(2) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park must be in compliance with the final indicator bacteria TMDL requirements as of December 31, 2012.

d. Specific Monitoring and Assessment Requirements

The BLRPs to be submitted by the Responsible Copermittees and approved by the Regional Board Executive Officer contain monitoring programs. Implementation of those Regional Board-approved monitoring programs constitutes compliance with the Monitoring Station and Monitoring Procedure requirements described below.

(1) Monitoring Stations

Monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[42] If discharges of bacteria from the MS4 persist at levels that exceed the applicable ~~interim or final WQBELs~~receiving water limitations, additional monitoring locations and/or other source identification methods must be implemented to identify the controllable sources causing the chronic contamination ~~exceedances~~. ~~The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.~~

If natural and background sources appear to be the sole source of the impairment, Responsible Copermittees may collect and provide additional data and the application of the NSEA to revise the TMDLs may be appropriate. Such revisions would be made to the TMDL via a Basin Plan Amendment and then subsequently incorporated into this Order consistent with Provision H.5.

(2) Monitoring Procedures

(a) The Responsible Copermittees must conduct the dry and wet weather monitoring consistent with the monitoring and reporting program developed as part of the BLRP. ~~collect dry weather monitoring samples from the receiving water monitoring stations at least monthly~~. Dry weather samples collected from additional monitoring stations established to support application of the NSEA ~~identify sources~~ must be collected at an appropriate frequency to demonstrate bacteria loads from the identified controllable anthropogenic sources have been addressed and ~~are no longer causing exceedances in the receiving waters~~do not indicate a health risk.

(b) The Responsible Copermittees must collect wet weather monitoring

[42] Commonly referred to as AB 411 monitoring

samples within the first 24 hours of a storm event[43] of the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to ~~identify sources~~support the application of the NSEA must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and ~~are no longer causing exceedances in the receiving waters~~do not indicate a health risk.

(c) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

[43] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs have been achieved.

(b) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 5.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(c) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to correlate elevated bacteria levels with known or suspected sewage spills from wastewater collection systems and treatment plants or boats.

(d) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2010-0001

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 10, 2010
State Water Board Approval Date:	December 14, 2010
Office of Administrative Law Approval Date:	April 4, 2011
US EPA Approval Date:	June 22, 2011

(3) TMDL Effective Date: April 4, 2011

(4) Watershed Management Areas: See Table 6.0

(5) Water Bodies: See Table 6.0

(6) Responsible Copermittees: See Table 6.0

Table 6.0[44]
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	-City of Laguna Beach -County of Orange -Orange County Flood Control District
		at Heisler Park - North	
	Pacific Ocean Shoreline	at Main Laguna Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Woods -County of Orange -Orange County Flood Control District
		Laguna Beach at Ocean Avenue	
		Laguna Beach at Cleo Street	
		Arch Cove at Bluebird Canyon Road	
		Laguna Beach at Dumond Drive	
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Hills -City of Laguna Niguel -City of Laguna Woods -City of Lake Forest
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries:	

[44] These TMDL provisions do not apply to waterbodies, segments, or areas, removed from the 303(d) list for REC-1 indicator bacteria numeric objectives, consistent with the assumptions and requirements of the Basin Plan amendment. If the waterbodies are subsequently placed back on the 303(d) list for exceedances of the REC-1 indicator bacteria numeric objectives, all TMDL provisions will apply to those waterbodies and the Responsible Copermittees for those waterbodies.

		- Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	-City of Mission Viejo -County of Orange -Orange County Flood Control District
	Aliso Creek Mouth	at mouth	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	-City of Dana Point -City of Laguna Beach -City of Laguna Niguel -County of Orange -Orange County Flood Control District
		Aliso Beach at Table Rock Drive	
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)	
		at Salt Creek (large outlet)	
		Salt Creek Beach at Salt Creek service road	
		Salt Creek Beach at Strand Road	
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	-City of Dana Point -City of Laguna Hills -City of Laguna Niguel -City of Mission Viejo -City of Rancho Santa Margarita -City of San Juan Capistrano -County of Orange -Orange County Flood Control District
	San Juan Creek	lower 1 mile	
	San Juan Creek Mouth	at mouth	
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	-City of Dana Point -City of San Clemente -County of Orange -Orange County Flood Control District
		Ole Hanson Beach Club Beach at Pico Drain	
		San Clemente City Beach at El Portal Street Stairs	
		San Clemente City Beach at Mariposa Street	
		San Clemente City Beach at Linda Lane	
		San Clemente City Beach at South Linda Lane	
		San Clemente City Beach at Lifeguard Headquarters	
		under San Clemente Municipal Pier	

		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	
		San Clemente State Beach at Riviera Beach	
		Can Clemente State Beach at Cypress Shores	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	-City of Oceanside -City of Vista -County of San Diego
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	-City of Carlsbad -City of Encinitas -City of Escondido -City of San Marcos -County of San Diego
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	-City of Del Mar -City of Escondido -City of Poway -City of San Diego -City of Solana Beach -County of San Diego
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	-City of Del Mar -City of Poway -City of San Diego -County of San Diego
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	-City of San Diego
		La Jolla Shores Beach at Caminito del Oro	
		La Jolla Shores Beach at Vallecitos	
		La Jolla Shores Beach at Avenida de la Playa	
		at Casa Beach, Children's Pool	
		South Casa Beach at Coast Boulevard	
		Whispering Sands Beach at Ravina Street	
		Windansea Beach at Vista de la Playa	
		Windansea Beach at Bonair Street	
		Windansea Beach at Playa del Norte	
		Windansea Beach at Palomar Avenue	
		at Tourmaline Surf Park	
		Pacific Beach at Grand Avenue	
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I- Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	-City of El Cajon -City of Santee -County of San Diego
	San Diego River	lower 6 miles	-City of El Cajon -City of La Mesa -City of San Diego -City of Santee -County of San Diego
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	-City of La Mesa -City of Lemon Grove -City of San Diego -County of San Diego - San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final indicator bacteria TMDL compliance requirements for the water bodies listed in Table 6.0 consist of the following:

(1) ~~Final TMDL~~WQBELs Compliance Dates

The Responsible Copermittees for MS4 discharges to a segment or area of the water bodies listed in Table 6.0[45] are required to achieve the Wasteload Allocations (WLAs) defined as the WQBELs under Specific Provision 6.b, ~~must be in compliance with the final TMDL compliance requirements~~ according to the following compliance dates:

Table 6.1
Compliance Dates to Achieve ~~Final TMDL Compliance Requirements~~Indicator Bacteria WLAs

Constituent	Dry Weather TMDL Compliance Date	Wet Weather TMDL Compliance Date
Total Coliform	April 4, 2021	April 4, 2031
Fecal Coliform		
Enterococcus		

(1) Final Receiving Water Limitations Compliance Requirements

[45] The WQBELs (WLAs) do not apply to waterbodies that are not on the 303(d) list for exceedances of the REC-1 indicator bacteria numeric objectives. Consistent with the assumptions and requirements of the Basin Plan Amendment, no further action is required for these waterbodies. If the waterbodies are subsequently placed back on the 303(d) list or delisted in subsequent iterations, the San Diego Water Board will revise the current NPDES requirements and/or issue additional waste discharge requirements to be consistent with these TMDLs.

The Responsible Copermittees for MS4 discharges to a segment or area of the water bodies listed in Table 6.0[46] are required to achieve the Final Receiving Water Limitations according to the following compliance schedule:

Table 6.6
Compliance Schedule Dates to Achieve Indicator Bacteria WLAs

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform*	April 4, 2021	April 4, 2031
Fecal Coliform		
Enterococcus		

* Total coliform receiving water limitations only apply to segments or areas of Pacific Ocean Shoreline listed in Table 6.0.

[46] The WQBELs (WLAs) do not apply to waterbodies that are not on the 303(d) list for exceedances of the REC-1 indicator bacteria numeric objectives. Consistent with the assumptions and requirements of the Basin Plan Amendment, no further action is required for these waterbodies. If the waterbodies are subsequently placed back on the 303(d) list for exceedances of the REC-1 indicator bacteria numeric objectives, all TMDL provisions will apply to these waterbodies and the Responsible Copermittees for those waterbodies.

(2) Final Receiving Water ~~Quality Based Effluent~~ Limitations[47]

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance dates under Specific Provision 6.b.(1), unless the responsible Copermittees provide evidence that indicates another controllable or uncontrollable source is responsible for the exceedances in the receiving water (as described in E.6.(3)(b)):

Table 6.2a
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Beaches

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency[c]
Total Coliform[f]	10,000	22%	1,000	0%
Fecal Coliform	400	22%	200	0%
Enterococcus	104[d, e]	22%	35[d]	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved (the geometric mean does not apply to wet weather days).
b. During dry weather days, ~~the single sample maximum and~~ only the 30-day geometric mean receiving water limitations are required to be achieved (the single sample maximum does not apply to dry weather days).
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan.
d. This *Enterococcus* receiving water limitation applies to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
e. A wet weather receiving water limitation for Enterococcus of 104 MPN/100mL may be applied as a receiving water limitation for creeks, instead of 61 MPN/100mL, if one or more of the creeks addressed by these TMDLs (San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek, San Diego River, and/or Chollas Creek) is designated with a "moderately to lightly used area" or less frequent usage frequency in the Basin Plan. Otherwise, the wet weather receiving water limitation of 61 MPN/100mL for Enterococcus will be used to assess compliance with the wet weather allowable exceedance frequency.
f Total Coliform Receiving Water Limitations only apply to the Pacific Ocean Shoreline segments listed in Table 6.0 and do not apply to the creeks or creek mouths listed in Table 6.0.

Table 6.2b
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Creeks

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance

[47] The Final Receiving Water Limitations requirements do not apply to waterbodies that are not on the 303(d) list for exceedances of the REC-1 indicator bacteria numeric objectives. Consistent with the assumptions and requirements of the Basin Plan Amendment, no further action is required for these waterbodies. If the waterbodies are subsequently placed back on the 303(d) list for exceedances of the REC-1 indicator bacteria numeric objectives, all TMDL provisions will apply to these waterbodies and the Responsible Copermittees for those waterbodies.

	Frequency[c]			Frequency
Fecal Coliform	400	22%	200	0%
Enterococcus	61[e] (104)	22%	33[e]	0%

Notes:

a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Basin Plan.
d. A single sample maximum of 104 MPN/100ml for *Enterococcus* may be applied as a receiving water limitation for creeks, instead of 61 MPN/100mL, if one or more of the creeks addressed by these TMDLs (San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek, San Diego River, and/or Chollas Creek) is designated with a "moderately to lightly used area" or less frequent usage frequency in the Basin Plan. Otherwise, the single sample maximum of 61 MPN/100mL for *Enterococcus* must be used to assess compliance with the allowable exceedance frequency.
e. This *Enterococcus* receiving water limitations applies to segments or areas of creeks or creek mouths listed in Table 6.0.

(a) If the above receiving water limitations are not met in the receiving water, the Responsible Copermittees must demonstrate that the discharges from the MS4s are not causing or contributing to the violation of receiving water limitations. Such demonstration may be achieved by (1) demonstrating that the discharges from the MS4s are meeting the effluent limitations under Specific Provision 6.b.(1) for dry weather discharges and Specific Provision 6.b.(2) for wet weather discharges, (2) through. the attainment of the final WQBELs in Specific Provision 6.b.(1) for dry weather discharges and Specific Provision 6.b.(2) for wet weather discharges, (3) by providing data from their discharge points to the receiving waters, (4) by providing data collected at jurisdictional boundaries, and/or (5) by using other methods accepted by the San Diego Water Board, which may include but are not limited to the reference system antidegradation approach (RSAA) or natural sources exclusion approach (NSEA)[48]..

(b) Final Water Quality Based Effluent Limitations [49]

The WQBELs for segments or areas of the water bodies listed in Table 6.0 consist of the following:

Table 6.1
Final Dry Weather WQBELs Expressed as Mass-Based Limits

	Effluent Limitation		
Waterbody	**Total Coliform Billion MPN/month**	**Fecal Coliform Billion MPN/month**	**Enterococcus Billion MPN/month**
San Joaquin Hills/ Laguna Hills HSAs (901.11 and 901.12)	1,134	**227**	40
Aliso HSA (901.13)	1,208	242	40
Dana Point HSA (901.14)	462	92	16
Lower San Juan HSA (901.27)	8,342	1,665	275
San Clemente HA (901.30)		192	

[48] Resolution R9-2008-0028
[49] The Water Quality Based Effluent Limitations, both interim and final, do not apply to the waterbodies and the associated Responsible Copermittees for that waterbody if the waterbody segment in Table 6.0 is not on the 303(d) list for exceedances of the REC-1 numeric objectives for indicator bacteria. If the waterbody is subsequently placed back on the 303(d) for exceedances of the REC-1 numeric objectives for indicator bacteria, the WQBELs, both interim and final, will apply to the associated Responsible Copermittees for that waterbody.

Table 6.2
Final Wet Weather WQBELs Expressed as Mass-Based Limits

Waterbody	Effluent Limitation		
	Total Coliform Billion MPN/year	Fecal Coliform Billion MPN/year	Enterococcus Billion MPN/year
San Joaquin Hills/ Laguna Hills HSAs (901.11 and 901.12)	880,652	37,167	66,417
Aliso HSA (901.13)	8,923,264	477,069	735,490
Dana Point HSA (901.14)	3,404,008	152,446	219,528
Lower San Juan HSA (901.27)	16,093,160	1,156,419	1,385,094
San Clemente HA (901.30)	3,477,739	192,653	295,668

~~(i) Discharges from the MS4s containing indicator bacteria densities that do not exceed the following effluent limitations by the compliance dates under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a):~~

~~**Table 6.2c**~~
~~*Final Effluent Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies in MS4 Discharges to the Water Body*~~

~~Constituent~~	~~Concentration-Based Effluent Limitations~~			
	~~Single Sample Maximum[a,b] (MPN/100mL)~~	~~Single Sample Maximum Allowable Exceedance Frequency[c]~~	~~30-Day Geometric Mean[b] (MPN/100mL)~~	~~30-Day Geometric Mean Allowable Exceedance Frequency~~
~~Total Coliform[d]~~	~~10,000~~	~~22%~~	~~1,000~~	~~0%~~
~~Fecal Coliform~~	~~400~~	~~22%~~	~~200~~	~~0%~~
~~*Enterococcus*~~	~~104[e] / 61[f]~~	~~22%~~	~~35[e] / 33[f]~~	~~0%~~

~~Notes:~~
~~a. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.~~
~~b. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.~~
~~c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan for discharges to beaches, and the Basin Plan for discharges to creeks and creek mouths.~~
~~d. Total coliform effluent limitations only apply to MS4 outfalls that discharge to the Pacific Ocean Shorelines and creek mouths listed in Table 6.0.~~
~~e. This *Enterococcus* effluent limitation applies to MS4 discharges to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.~~
~~f. This *Enterococcus* effluent limitation applies to MS4 discharges to segments or areas of creeks or creek mouths listed in Table 6.0.~~

(3) Final Water Quality Based Effluent Limitations[50]

(ii) Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the compliance dates under Specific Provision 6.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a):

Table 6.3
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	*Watershed and Water Bodies*	*Load-Based Effluent Limitations*					
		Dry Weather			*Wet Weather*		
		Total Coliform	*Fecal Coliform*	*Entero-coccus*	*Total Coliform*	*Fecal Coliform*	*Entero-coccus*
South Orange County	San Joaquin Hills HSA (901.11) and Laguna Hills HSA (901.12) - Pacific Ocean Shoreline	91.78%	91.72%	98.28%	46.85%	52.07%	51.26%
	Aliso HSA (901.13) - Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	95.47%	95.58%	99.13%	25.29%	26.62%	27.52% (27.37%)**
	Dana Point HSA (901.14) - Pacific Ocean Shoreline	95.04%	95.03%	98.98%	13.15%	14.86%	15.16%
	Lower San Juan HSA (901.27) - Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	72.96%	74.21%	94.94%	19.21%	12.82%	27.12% (26.90%)**
	San Clemente HA (901.30) - Pacific Ocean Shoreline	94.28%	94.23%	98.83%	23.85%	24.58%	25.26%

[50] The Water Quality Based Effluent Limitations, both interim and final, do not apply to the waterbodies and the associated Responsible Copermittees for that waterbody if the waterbody segment in Table 6.0 is not on the 303(d) list for exceedances of the REC-1 numeric objectives for indicator bacteria. If the waterbody is subsequently placed back on the 303(d) list for exceedances of the REC-1 numeric objectives for indicator bacteria, the WQBELs, both interim and final, will apply to the associated Responsible Copermittees for that waterbody.

Watershed Management Areas	Watershed and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
San Luis Rey River	San Luis Rey HU (903.00) - Pacific Ocean Shoreline	38.13%	39.09%	87.38%	5.62%	3.12%	11.69%

Table 6.3 (Cont'd)
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watershed and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
Carlsbad	San Marcos HA (904.50) - Pacific Ocean Shoreline	82.82%	82.55%	96.03%	18.47%	18.98%	20.19%
San Dieguito River	San Dieguito HU (905.00) - Pacific Ocean Shoreline	14.39%	20.72%	83.48%	4.29%	1.46%	7.72%
Penasquitos	Miramar Reservoir HA (906.10) - Pacific Ocean Shoreline	96.50%	96.59%	99.42%	1.61%	1.99%	1.93%
Mission Bay	Scripps HA (906.30) - Pacific Ocean Shoreline	96.44%	96.42%	99.25%	16.32%	21.14%	18.82%
	Tecolote HA (906.50) - Tecolote Creek	94.51%	94.59%	98.94%	16.51%	20.47%	18.15% (18.08%)**
San Diego River	Mission San Diego HSA (907.11) and Santee HSA (907.12) - Pacific Ocean Shoreline - Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles)	74.03%	69.44%	93.96%	38.14%	53.22%	42.74% (42.47%)**
San Diego Bay	Chollas HSA (908.22) - Chollas Creek	92.06%	92.15%	98.46%	17.82%	24.84%	21.46% (21.36%)**

Notes:
* The percent load reductions are based on reducing loads compared to pollutant loads from 2001 to 2002.
** The alternative *Enterococcus* percent load reduction was calculated based on a numeric target of 104 MPN/100mL instead of 61 MPN/100mL, protective of the REC-1 "moderately to lightly used area" usage frequency that is protective of freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative pollutant load reductions can be utilized.

(c) Best Management Practices

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 6.0 must incorporate the Bacteria Load Reduction Plans (BLRPs) or Comprehensive Load Reduction Plans (CLRPs) required to be developed pursuant to Resolution No. R9-2010-0001. For segments or areas in Table 6.0 that have been delisted from the Clean Water Act Section 303(d) List of Water Quality Limited Segments, a BLRP and/or CLRP is not required.

(ii) The Responsible Copermittee must implement BMPs to support the achievement of the receiving water limitations under Specific Provision 6.b.(2)(a) and/or the effluent limitations under Specific Provision 6.b.(2)(b) for the segments or areas of the water bodies listed in Table 6.0.

(iii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans, owners/operators of small MS4s, and/or agricultural dischargers as possible.

~~(3)~~(4) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no ~~direct or indirect~~ discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(f) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 6.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 6.b.(2)(c) achieves compliance with Specific Provisions 6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), and/or 6.b.(3)(e),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 6.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 6.d, to demonstrate compliance with Specific Provisions 6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), 6.b.(3)(e) and/or 6.b.(3)(f).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim indicator bacteria TMDL compliance requirements for the water bodies listed in Table 6.0 consist of the following:

(1) Interim Receiving Water Limitations Compliance Requirements
(2)
(3) The Responsible Copermittees must comply with ~~the following interim~~the Interim ~~WQBELs~~ Receiving Water Limitations ~~by the interim compliance dates:~~by the interim compliance dates specified within the Regional Board approved CLRPs or BLRPs.
~~(1) Interim TMDL Compliance Dates~~

~~The Responsible Copermittees must achieve compliance with the interim TMDL compliance requirements, as determined in accordance with Specific Provision 6.c.(3), by the interim compliance dates given in Table 6.4, unless alternative interim compliance dates are accepted by the San Diego Water Board Executive Officer as part of the Water Quality Improvement Plan.~~

Table 6.4
Interim Compliance Dates to Achieve Interim TMDL Compliance Requirements

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	April 4, 2016	April 4, 2021
		at Heisler Park - North		
	Pacific Ocean Shoreline	at Main Laguna Beach	April 4, 2016	April 4, 2021
		Laguna Beach at Ocean Avenue		
		Laguna Beach at Cleo Street		
		Arch Cove at Bluebird Canyon Road		
		Laguna Beach at Dumond Drive		
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	April 4, 2016	April 4, 2021
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	April 4, 2018	April 4, 2021
	Aliso Creek Mouth	at mouth	April 4, 2018	April 4, 2021
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	April 4, 2016	April 4, 2021
		Aliso Beach at Table Rock Drive		
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)		
		at Salt Creek (large outlet)		
		Salt Creek Beach at Salt Creek service road	April 4, 2017	April 4, 2021
		Salt Creek Beach at Strand Road	April 4, 2017	April 4, 2021

Table 6.4 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	April 4, 2016	April 4, 2021
	San Juan Creek	lower 1 mile	April 4, 2018	April 4, 2021
	San Juan Creek Mouth	at mouth	April 4, 2016	April 4, 2021
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	April 4, 2016	April 4, 2021
		Ole Hanson Beach Club Beach at Pico Drain	April 4, 2016	April 4, 2021
		San Clemente City Beach at El Portal Street Stairs	April 4, 2017	April 4, 2021
		San Clemente City Beach at Mariposa Street		
		San Clemente City Beach at Linda Lane	April 4, 2016	April 4, 2021
		San Clemente City Beach at South Linda Lane	April 4, 2018	April 4, 2021
		San Clemente City Beach at Lifeguard Headquarters	April 4, 2017	April 4, 2021
		under San Clemente Municipal Pier		
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	April 4, 2018	April 4, 2021
		San Clemente State Beach at Riviera Beach	April 4, 2016	April 4, 2021
		Can Clemente State Beach at Cypress Shores	April 4, 2017	April 4, 2021
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	April 4, 2017	April 4, 2021
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	April 4, 2016	April 4, 2021
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	April 4, 2016	April 4, 2021

Table 6.4 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	April 4, 2016	April 4, 2021
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	April 4, 2016	April 4, 2021
		La Jolla Shores Beach at Caminito del Oro		
		La Jolla Shores Beach at Vallecitos		
		La Jolla Shores Beach at Avenida de la Playa		
		at Casa Beach, Children's Pool		
		South Casa Beach at Coast Boulevard		
		Whispering Sands Beach at Ravina Street		
		Windansea Beach at Vista de la Playa		
		Windansea Beach at Bonair Street		
		Windansea Beach at Playa del Norte		
		Windansea Beach at Palomar Avenue		
		at Tourmaline Surf Park		
		Pacific Beach at Grand Avenue		
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries		
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	April 4, 2018	April 4, 2021
	San Diego River	lower 6 miles		
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach		
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	April 4, 2018	April 4, 2021

~~(2)~~(4) Interim Water Quality Based Effluent Limitations

The Responsible Copermittees for discharges to the water bodies in Table 6.0 must comply with the following interim WQBELs by the interim compliance dates given in Specific Provision 6.c.(1):

(a) Interim Receiving Water Limitations

(i) *Interim Dry Weather Receiving Water Limitations*

The Responsible Copermittee must calculate the "existing" exceedance frequencies of the 30-day geometric mean water quality objectives for each of the indicator bacteria by analyzing the available monitoring data collected between January 1, 1996 and December 31, 2002. "Existing" exceedance frequencies may be calculated by segment or area of a water body or by waterbody, and/or by Watershed Management Area listed in Table 6.0. Separate "existing" exceedance frequencies must be calculated for beaches and creeks/creek mouths.

The Responsible Copermittees must achieve a 50 percent reduction in the "existing" exceedance frequency of the 30-day geometric mean Receiving Water Limitations ~~WQBELs~~ for the segments or areas of the water bodies listed in Table 6.0 by the interim compliance dates given in Table 6.4. A 50 percent reduction in the "existing" exceedance frequency is equivalent to half of the "existing" exceedance frequency of the 30-day geometric mean final Receiving Water Limitations~~WQBELs~~.

The "existing" exceedance frequencies and the interim dry weather allowable exceedance frequencies (i.e. interim dry weather receiving water limitations) calculated by the Responsible Copermittees must be included in the Water Quality Improvement Plans for the applicable Watershed Management Areas. Consistent with the assumptions and requirements of the Basin Plan Amendment, the Responsible Copermittees may provide evidence that indicates another controllable or uncontrollable source is responsible for the exceedances in the receiving waters. Responsible Copermittees may therefore include such demonstrations (including but not limited to reference system exceedance frequencies, natural source exclusion approach) as part of the "existing" exceedance frequency calculation.

The schedule for attaining the interim Receiving Water Limitations is specified in Provision 6.d.(3).

(ii) *Interim Wet Weather Receiving Water Limitations*

The Responsible Copermittees must achieve the interim wet weather receiving water limitations in Table 6.5, expressed as interim wet weather allowable exceedance frequencies, by the interim compliance dates given in Table 6.4.

The Responsible Copermittees must achieve a 50 percent reduction in the "existing" exceedance frequency of the applicable wet weather Receiving Water Limitation for the segments or areas of the water bodies listed in Table 6.0[40]. A 50 percent reduction in the "existing" exceedance frequency is equivalent to half of the "existing" exceedance frequency of the applicable final Receiving Water Limitations. The exceedance frequency estimated to be equivalent to a 50 percent reduction in the "existing" exceedance frequency is shown in Table 6.4. Unless the Responsible Copermittees calculate a revised "existing" exceedance frequency that is part of an approved WQIP, the allowable existing exceedance frequencies in Table 6.~~4~~3 shall apply.

As the wet weather Receiving Water Limitations include an allowable exceedance frequency, the 50 percent reduction shall not require Responsible Permittees to attain an exceedance frequency less than the final allowable exceedance frequency.

Where Responsible Copermittees elect to calculate a revised "existing" exceedance frequency, the "existing" exceedance frequencies and the interim wet weather allowable exceedance frequencies (i.e. interim wet weather Receiving Water Limitations) calculated by the Responsible Copermittees must be included in the Water Quality Improvement Plans for the applicable Watershed Management Areas. Consistent with the assumptions and requirements of the Basin Plan Amendment, the Responsible Copermittees may provide evidence that indicates another controllable or uncontrollable source is responsible for the exceedances in the receiving waters. Responsible Copermittees may therefore include such demonstrations (including but not limited to reference system antidegradation approach or natural source exclusion approach) as part of the "existing" exceedance frequency calculation.

The schedule for attaining the interim Receiving Water Limitations is specified in Provision 6.d(3).

Table 6.5
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	38%	37%	39%
		at Heisler Park - North			
	Pacific Ocean Shoreline	at Main Laguna Beach			
		Laguna Beach at Ocean Avenue			
		Laguna Beach at Cleo Street			
		Arch Cove at Bluebird Canyon Road			
		Laguna Beach at Dumond Drive			
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	41%	41%	42%
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	41%	41%	42%
	Aliso Creek Mouth	at mouth	41%	41%	42%
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	36%	36%	36%
		Aliso Beach at Table Rock Drive			
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)			
		at Salt Creek (large outlet)			
		Salt Creek Beach at Salt Creek service road			
		Salt Creek Beach at Strand Road			

Table 6.5 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	44%	44%	48%
	San Juan Creek	lower 1 mile	44%	44%	47%
	San Juan Creek Mouth	at mouth	44%	44%	47%
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	35%	35%	36%
		Ole Hanson Beach Club Beach at Pico Drain			
		San Clemente City Beach at El Portal Street Stairs			
		San Clemente City Beach at Mariposa Street			
		San Clemente City Beach at Linda Lane			
		San Clemente City Beach at South Linda Lane			
		San Clemente City Beach at Lifeguard Headquarters			
		under San Clemente Municipal Pier			
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)			
		San Clemente State Beach at Riviera Beach			
		Can Clemente State Beach at Cypress Shores			
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	45%	44%	47%
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	40%	40%	41%
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	33%	33%	36%

Table 6.5 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	26%	26%	26%
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	37%	37%	37%
		La Jolla Shores Beach at Caminito del Oro			
		La Jolla Shores Beach at Vallecitos			
		La Jolla Shores Beach at Avenida de la Playa			
		at Casa Beach, Children's Pool			
		South Casa Beach at Coast Boulevard			
		Whispering Sands Beach at Ravina Street			
		Windansea Beach at Vista de la Playa			
		Windansea Beach at Bonair Street			
		Windansea Beach at Playa del Norte			
		Windansea Beach at Palomar Avenue			
		at Tourmaline Surf Park			
		Pacific Beach at Grand Avenue			
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries	49%	49%	51%
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	46%	43%	49%
	San Diego River	lower 6 miles	46%	43%	49%
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	46%	43%	51%
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	41%	41%	43%

(b) Interim Effluent Limitations

Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the interim compliance dates under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.c.(2)(a):

Table 6.6
Interim Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	*Watersheds and Water Bodies*	*Load-Based Effluent Limitations*					
		Dry Weather			*Wet Weather*		
		Total Coliform	*Fecal Coliform*	*Entero-coccus*	*Total Coliform*	*Fecal Coliform*	*Entero-coccus*
South Orange County	San Joaquin Hills HSA (901.11) and Laguna Hills HSA (901.12) - Pacific Ocean Shoreline	45.89%	45.86%	49.14%	23.43%	26.04%	25.63%
	Aliso HSA (901.13) - Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	47.74%	47.79%	49.57%	12.65%	13.31%	13.76% (13.69%)**
	Dana Point HSA (901.14) - Pacific Ocean Shoreline	47.52%	47.52%	49.49%	6.58%	7.43%	7.58%
	Lower San Juan HSA (901.27) - Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	36.48%	37.11%	47.47%	9.61%	6.41%	13.56% (13.45%)**
	San Clemente HA (901.30) - Pacific Ocean Shoreline	47.14%	47.12%	49.42%	11.93%	12.29%	12.63%
San Luis Rey River	San Luis Rey HU (903.00) - Pacific Ocean Shoreline	19.07%	19.55%	43.69%	2.81%	1.56%	5.85%
Carlsbad	San Marcos HA (904.50) - Pacific Ocean Shoreline	41.41%	41.28%	48.02%	9.24%	9.49%	10.10%

Table 6.6 (Cont'd)
Interim Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watersheds and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
San Dieguito River	San Dieguito HU (905.00) - Pacific Ocean Shoreline	7.20%	10.36%	41.74%	2.15%	0.73%	3.86%
Penasquitos	Miramar Reservoir HA (906.10) - Pacific Ocean Shoreline	48.25%	48.30%	49.71%	0.81%	1.00%	0.97%
Mission Bay	Scripps HA (906.30) - Pacific Ocean Shoreline	48.22%	48.21%	49.63%	8.16%	10.57%	9.41%
	Tecolote HA (906.50) - Tecolote Creek	47.26%	47.30%	49.47%	8.26%	10.24%	9.08% (9.04%)**
San Diego River	Mission San Diego HSA (907.11) and Santee HSA (907.12) - Pacific Ocean Shoreline - Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles)	37.02%	34.72%	46.98%	19.07%	26.61%	21.37% (21.24%)**
San Diego Bay	Chollas HSA (908.22) - Chollas Creek	46.03%	46.08%	49.23%	8.91%	12.42%	10.73% (10.68%)**

Notes:
* The percent load reductions are based on reducing loads compared to pollutant loads from 2001 to 2002.
** The alternative *Enterococcus* percent load reduction was calculated based on a numeric target of 104 MPN/100mL instead of 61 MPN/100mL, protective of the REC-1 "moderately to lightly used area" usage frequency that is protective of freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative pollutant load reductions can be utilized.

~~(3)~~(5) Interim TMDL Compliance Determination

Compliance with the interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no ~~direct or indirect~~ discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(f) There are no exceedances of the interim receiving water limitations under Specific Provision 6.c.(2)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(g) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the interim effluent limitations under Specific Provision 6.c.(2)(b); OR

(h) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates; OR

(i) Upon the effective date of this Order, a Copermittee's full compliance with all of the following requirements shall constitute a Copermittee's compliance with provisions pertaining to interim WQBELs with compliance deadlines occurring prior to approval of a WQIP.

(i) Meets all interim and final deadlines for development of a WQIP,

(ii) Targets implementation of watershed control measures in its existing storm water management program, including watershed control measures to eliminate non-storm water discharges of pollutants through the MS4 to receiving waters, to address known contributions of pollutants from MS4 discharges that cause or contribute to the impairment(s) addressed by the TMDL(s), and

(iii) Receives final approval of its WQIP from the Regional Board.

~~(h)~~(j) ~~.~~

(2) Submittals to Support TMDL Basin Plan Amendment

The Responsible Copermittees are encouraged to submit data to support the TMDL reopener scheduled for April 2016 including but not limited to data related to implementation of the reference system antidegradation approach (RSAA), the natural sources exclusion approach (NSEA), reference watershed monitoring and beneficial use usage frequency.

d. Specific Monitoring and Assessment Requirements

(1) Monitoring and Assessment Requirements for Beaches

The BLRPs and CLRPs to be submitted by the Copermittees and approved by the Regional Board Executive Officer contain monitoring programs. Implementation of those Regional Board-approved monitoring programs constitutes compliance with the Monitoring Station and Monitoring Procedure requirements, described below.

Waterbodies that have been delisted are not required to develop and/or implement a BLRP or CLRP, including additional monitoring. Therefore, the monitoring requirements of this provision do not apply to delisted waterbodies. Delisted waterbodies shall continue monitoring consistent with Provision D.

(a) Monitoring Stations

For beaches addressed by the TMDL, monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[51] If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations at least once within ~~the first~~ 24 hours of the end of a storm event[52] during the rainy

[51] Commonly referred to as AB 411 monitoring

[52] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to

season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer in exceedance of the allowable exceedance frequencies in the receiving waters.

(iii) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(iv) For Pacific Ocean Shoreline segments or areas listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs for the Pacific Ocean Shoreline segments or areas listed in Table 6.0 have been achieved.

(ii) Dry weather exceedance frequencies must be calculated as follows:

[a] 30-day geometric means must be calculated from the results of any dry weather samples collected from the segments or areas for each water body listed in Table 6.0;
[b] The method and number of samples need for calculating the 30-day geometric means must be consistent with the number of samples required by the Ocean Plan;
[c] Where there are multiple segments or areas associated with a water body listed in Table 6.0, the Copermittees may calculate geometric means for each segment or area, or combine the dry weather monitoring data from all the segments or areas to calculate geometric means for the water body;
[d] The exceedance frequency must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of

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storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

geometric means calculated from samples collected during the dry season.

(iii) Wet weather exceedance frequencies must be calculated as follows:

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;

[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;

[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria densities reported from each storm event sampled; and

[d] The single sample maximum exceedance frequency must be calculated by dividing the number of wet weather days that exceed the single sample maximum receiving water limitations in Table 6.2 by the total number of wet weather days during the rainy season.

[e] The data collected for dry weather must be used in addition to the data collected for wet weather to calculate the wet weather 30-day geometric means. The exceedance frequency of the wet weather 30-day geometric means must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the wet season.

(iv) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(v) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) Monitoring and Assessment Requirements for Creeks and Creek Mouths

The BLRPs and CLRPs to be submitted by the Copermittees and approved by

the Regional Board Executive Officer contain monitoring programs. Implementation of those Regional Board-approved monitoring programs constitutes compliance with the Monitoring Station and Monitoring Procedure requirements, described below.

Waterbodies that have been delisted are not required to develop and/or implement a BLRP or CLRP, including additional monitoring. Therefore, the monitoring requirements of this provision do not apply to delisted waterbodies. Delisted waterbodies shall continue monitoring consistent with Provision D.

(a) Monitoring Stations

For creeks addressed by the TMDL, monitoring locations should consist of, at a minimum, a location at or near the mouth of the creek (e.g. Mass Loading Station or Mass Emission Station) and one or more locations upstream of the mouth (e.g. Watershed Assessment Station). If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations in accordance with the requirements of Provision D.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations within ~~the first~~ 24 hours of the end of a storm event[53] during the rainy season (i.e. October 1 through April 30).

(iii) Samples collected from receiving water monitoring stations must be analyzed for fecal coliform and *Enterococcus* indicator bacteria.

(iv) For creeks or creek mouths listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather

[53] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the receiving water monitoring data to assess whether the interim and final receiving water WQBELs for the creeks and creek mouths listed in Table 6.0 have been achieved.

(ii) Dry weather exceedance frequencies must be calculated as follows:

[a] 30-day geometric means must be calculated from the results of any dry weather samples collected from the segment or area for each water body listed in Table 6.0;
[b] The method and number of samples need for calculating the 30-day geometric means must be consistent with the number of samples required by the Basin Plan;
[c] The exceedance frequency must be calculated by dividing the number of 30-day geometric means that exceed the 30-day geometric mean receiving water limitations in Table 6.2 by the total number of 30-day geometric means calculated from samples collected during the dry season.

(iii) Wet weather exceedance frequencies must be calculated as follows:

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;
[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;
[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria densities reported from each of the storm events sampled; and

[d] The exceedance frequency must be calculated by dividing the number of wet weather days that exceed the single sample maximum receiving water limitations in Table 6.2 by the total number of wet weather days during the rainy season.
[e] The data collected for dry weather must be used in addition to the data collected for wet weather to calculate the wet weather 30-day geometric means. The exceedance frequency of the wet

weather 30-day geometric means must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the wet season.

(iv) The Responsible Copermittee must identify and incorporate additional MS4 outfall and receiving water monitoring stations and/or adjust monitoring frequencies to identify sources causing exceedances of the receiving water WQBELs.

(v) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(vi) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

7. Total Maximum Daily Loads for Sediment in Los Peñasquitos Lagoon

a. Applicability

(1) TMDL Basin Plan Amendment: Resolution No. R9-2012-0033

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2012
State Water Board Approval Date:	January 21, 2014
Office of Administrative Law Approval Date:	July 14, 2014
US EPA Approval Date:	Month XX, Year

(3) TMDL Effective Date: July 14, 2014

(4) Watershed Management Area: Los Peñasquitos

(5) Water Body: Los Peñasquitos Lagoon

(6) Responsible Copermittees: County of San Diego, City of San Diego, City of Del Mar, and City of Poway

b. Final TMDL Compliance Requirements

The final sediment TMDL compliance requirements for Los Peñasquitos Lagoon consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must be in compliance with the final TMDL compliance requirements by December 31, 2034.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not prohibit the sustainable restoration of tidal and non-tidal saltmarsh vegetation of at least 346 acres.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations by the compliance date under Provision 7.b(1) will not cause or contribute to a failure of the receiving water condition specified under Specific Provision 7.b.(2)(a):

Table 7.1
Final Effluent Limitations as Expressed as Annual Loads in MS4 Discharges to Los Peñasquitos Lagoon

Constituent	Effluent Limitation
Sediment	2,580 tons/yr

(c) Best Management Practices

(i) The Water Quality Improvement Plan for the Los Peñasquitos Watershed Management Area must incorporate the Sediment Load Reduction Plan required to be developed pursuant to Resolution No. R9-2012-0033.

(ii) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 7.b.(2)(a) and the effluent limitations under Specific Provision 7.b.(2)(b) for Los Peñasquitos Lagoon.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) Successful restoration of 346 total acres of tidal and non-tidal saltmarsh vegetation in Los Peñasquitos Lagoon; OR

(b) The Responsible Copermittees must develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 7.b.(2)(c)(ii) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 7.b.(2)(c)(ii) achieves compliance with Specific Provision 7.b.(3)(a),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees must continue to implement the BMPs required under Specific Provision 7.b.(2)(c)(ii), AND

(v) The Responsible Copermittees must continue to perform the specific monitoring and assessments specified in Specific Provision 7.d to demonstrate compliance with Specific Provision 2.b.(3)(a).

c. Interim TMDL Compliance Requirements

The Responsible Copermittees must comply with the interim WQBELs, expressed as annual loads, by December 31 of the interim compliance year set forth in Table 7.2.

Table 7.2
Interim Water Quality Based Effluent Limitations Expressed as Annual Loads in MS4 Discharges

Interim Compliance Date	Interim Effluent Limitations (tons/yr)	Associated Percentage of Reduction
December 31, 2019	6,691	20%
December 31, 2023	5,663	40%
December 31, 2027	4,636	60%
December 31, 2029	3,608	80%

d. Specific Monitoring and Assessment Requirements

(1) Watershed Monitoring

The Responsible Copermittees must conduct suspended sediment, bed load, and flow monitoring to calculate total sediment loading to the Los Peñasquitos Lagoon for each wet season (October 1 thru April 30) as set forth below:

(a) The Responsible Copermittees must monitor enough storm events throughout the season to quantify sediment loading over each wet season, and

(b) The Responsible Copermittees must monitor at least 3 stations to quantify cumulative sediment loading into Los Peñasquitos Lagoon. Stations must be located within the Los Peñasquitos, Carroll Canyon, and Carmel Creek tributaries prior to discharging into Los Peñasquitos Lagoon.

(2) Lagoon Monitoring

The Responsible Copermittees must monitor Los Peñasquitos Lagoon each Fall for changes in the extent of the vegetation types as set forth below:

(a) The Responsible Copermittees must acquire aerial photos of Los Peñasquitos Lagoon and digitize them at an approximate scale of 1:2,500,

(b) The Responsible Copermittees must appropriately interpret the vegetation and classify the various types as saltmarsh, non-tidal saltmarsh, freshwater marsh, non-tidal saltmarsh –*Lolium perrene* infested, southern willow scrub/mulefat scrub, herbaceous wetland, or upland land cover.

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the monitoring data collected under Specific Provision 7.d(1) and 7.d(2) to assess whether the interim and final WQBELs have been achieved.

(b) For assessing and determining compliance with the final receiving water limitations under Specific Provision 7.b.(2)(a), the Responsible Copermittees must use the data acquired under Specific Provision 7.d.(2) to estimate the acreage of tidal and non-tidal saltmarsh actually restored.

(c) For assessing and determining compliance with the final effluent limitations under Specific Provision 7.b.(2)(b), the Responsible Copermittees must use the data acquired under Specific Provision 7.d.(1) to estimate sediment loading into Los Peñasquitos Lagoon. Sediment loading must be evaluated using a 3-year, weighted rolling average. The first reported average shall be calculated using data collected in the year 2014-2015, 2015-2016, and 2016-2017 wet seasons.

(d) The monitoring and assessment results must be submitted as part of the Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

ATTACHMENT F

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD SAN DIEGO REGION

FACT SHEET / TECHNICAL

REPORT FOR

ORDER NO. R9-2013-0001
NPDES NO.
CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

VIII. PROVISIONS

The provisions (i.e. NPDES permit requirements) of the Order are discussed below.

A. Prohibitions and Limitations

Provision A.3 (Effluent Limitations) specifies the condition of the discharges from the Copermittees' MS4s that must be achieved if and when there are discharges.

Consistent with CWA section 301(b)(1)(A) and 40 CFR 122.44(a), Provision A.3.a includes the technology-based effluent limitations that must be included in the Order. The technology-based effluent limits, representing the minimum level of control that must be imposed in a permit under CWA section 402, requires that pollutants in discharges of storm water from the Copermittees' MS4s be reduced to the MEP. This provision applies specifically to storm water discharges. Non-storm water discharges must be effectively prohibited, as required under Provision A.1.b. Non-storm water (dry weather) discharges from the MS4 are not considered storm water (wet weather) discharges and therefore are not subject to the MEP standard.

The technology-based MEP standard is an ever-evolving, flexible, and advancing concept. Neither Congress nor USEPA has specifically defined the term "maximum extent practicable." Congress established this flexible MEP standard so that the administrative bodies would have "*the tools to meet the fundamental goals of the Clean Water Act in the context of storm water pollution*." (*Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 884.) As knowledge about controlling storm water runoff and discharges continues to evolve, so does the knowledge which constitutes MEP. Reducing the discharge of pollutants in storm water from the MS4 to the MEP requires the Copermittees to assess each program component and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP.

The San Diego Water Board or the State Water Board ultimately define MEP, and may include requirements that provide specific guidance on what is expected to demonstrate MEP. It is the responsibility of the Copermittees to propose actions that implement BMPs to reduce storm water pollution to the MEP. In other words, the Copermittees' runoff management programs developed and implemented under the Order are the Copermittees' proposals for achieving MEP. Their total collective and individual activities conducted pursuant to their runoff management programs become their proposal for achieving MEP as it applies both to their overall effort, as well as to specific activities. Provisions B through E of the Order provides a minimum framework to guide the Copermittees in achieving the MEP standard for discharges of pollutants in storm water.

Provision A.3.b incorporates any water quality based effluent limitations (WQBELs) applicable to the MS4s established for TMDLs adopted and approved for the San

Diego Region and requires the Copermittees to comply with those WQBELs. This is consistent with 40 CFR 122.44(d)(1)(vii)(B), which requires that NPDES permits to incorporate WQBELs "*developed to protect a narrative water quality criterion, a numeric water quality criterion, or both…consistent with the assumptions and requirements of any available wasteload allocation for the discharge...*"

Pursuant to CWA section 303(d), for surface water bodies identified as impaired by one or more pollutants, the San Diego Water Board is required to establish TMDLs "*at a level necessary to implement the applicable water quality standards with seasonal variations and a margin of safety which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality*." The

TMDLs identify sources of the pollutants causing the impairments and assign portions of the TMDL as WLAs to point sources, which include MS4s.
~~WLAs must be expressed in NPDES permits as WQBELs, which may include one or more numeric components such as numeric effluent limits, and/or receiving water limitations, and/or BMP requirements. Because numeric targets for TMDLs typically include a component that will be protective of water quality standards, a TMDL will likely include one or more numeric receiving water limitations and/or effluent limitations as part of the assumptions or requirements of the TMDL. Any numeric receiving water limitations and/or effluent limitations developed as part of the assumptions or requirements of a TMDL must be incorporated and included as part of WQBELs for the MS4s.~~

Because the development and approval of new TMDLs, or modification of existing TMDLs, may occur during the term of this Order, the specific provisions of those TMDLs, including effluent limitations applicable to MS4s are provided within Attachment E to the Order. Attachment E will be updated with new TMDLs and modifications to existing TMDLs in a timely manner as they occur.

Provision A.4 (Compliance with Discharge Prohibitions and Receiving Water Limitations) describes the process required to be implemented by the Copermittees if compliance with the discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a are not being achieved under current conditions.

In its Phase II Stormwater Regulations, Final Rule, USEPA states that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL.*"[18] In a series of comment letters on MS4 permits issued by various Regional Water Boards, USEPA has also reiterated that MS4 discharges must meet water quality standards.[19] In addition, the Ninth Circuit Court of Appeals explained in a recent ruling that, *"[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*"[20]

Water quality standards for the San Diego Region are established in the Basin Plan. The water quality standards of the Basin Plan are incorporated into this Order as the discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a. The discharge prohibitions and receiving water limitations in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations or prohibitions to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan, water quality control plans or policies adopted by the State Water Board, including Resolution No. 68-16, or federal regulations, including but not limited to, 40 CFR 131.12 and 131.38. The waste discharge prohibitions and water quality objectives in the Basin Plan have been approved by USEPA and combined with the designated beneficial uses constitute the water quality standards required under federal law.

[18] Phase II Stormwater Regulations, Final Rule, 64 Fed. Reg. 68722, 68737.
[19] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.
[20] NRDC v. County of Los Angeles (9th Cir. 2011), 673 F.3d 880, 886 (revd. on other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013))). See also, *Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 884-886, citing *Defenders of Wildlife v. Browning,* (9th Cir. 1999) 191 F.3d 1159.)

Under federal law (CWA section 402(p)(3)(B)(iii)), an MS4 permit must include "*controls to reduce the discharge of pollutants to the maximum extent practicable...and such other provision as...the State determines appropriate for control of such pollutants*." The State Water Board has previously determined that limitations necessary to meet water quality standards are appropriate for the control of pollutants discharged by MS4s and must be included in MS4 permits. (State Water Board Orders WQ 91-03, 98-01, 99-05, 2001-15; see also *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159.) This Order prohibits discharges that cause or contribute to violations of water quality standards.
The discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a are included in this Order to ensure that discharges from the MS4s do not cause or contribute to exceedances of water quality objectives necessary to protect the beneficial uses of the receiving waters.

Provision A.4 is consistent with the precedent-setting language in State Water Board Order WQ 99-05 required to be included in municipal storm water permits. State Water Board Order WQ 2001-15 refined Order WQ 99-05 by requiring an iterative approach to compliance with water quality standards involving ongoing assessments and revisions, as referred to as the "iterative process." The "iterative process" is a fundamental NPDES requirement for municipal storm water permits to achieve the objectives of the CWA.

The State Water Board and Regional Water Boards have stated that the provisions under Provisions A.1.a, A.1.c, A.2.a, and A.4 are independently applicable, meaning that compliance with one provision does not provide a "safe harbor" where there is non-compliance with another provision (i.e., compliance with the Provision A.4 does not shield a Copermittee who may have violated Provision A.1.a, A.1.c, or A.2.a from an enforcement action). The intent of Provision A.4 is to ensure that the Copermittees have the necessary storm water management programs and controls in place, and that they are modified by the Copermittees in a timely fashion when necessary, so that compliance with Provisions A.1.a, A.1.c, and/or A.2.a is achieved as soon as possible. USEPA expressed the importance of this independent applicability in a series of comment letters on MS4 permits proposed by various Regional Water Boards. At that time, USEPA expressly objected to certain MS4 permits that included language stating, *"permittees will not be in violation of this [receiving water limitation] provision … [if certain steps are taken to evaluate and improve the effectiveness of the jurisdictional runoff management programs],"* concluding that this phrase would not comply with the CWA.[21]

The Ninth Circuit held in *Natural Resources Defense Council v. County of Los Angeles* (2011) 673 F3d. 880, 886 (revd. on other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013))) that engagement in the iterative process does not provide a safe harbor from liability for violations of permit terms prohibiting exceedances of water quality standards. The Ninth Circuit holding is consistent with the position of the State and

Regional Water Boards that exceedances of water quality standards in an MS4 permit constitute violations of permit terms subject to enforcement by the Water Boards or through a citizen suit. While the Water Boards have generally directed dischargers to achieve compliance by improving control measures through the iterative process, the San Diego Water Board retains the discretion to take other appropriate enforcement and the iterative process does not shield dischargers from citizen suits under the CWA.

The requirements of Provision A.4, therefore, are required to be implemented until the water quality standards expressed under Provisions A.1.a, A.1.c, and A.2.a are achieved. The CWA requires MS4 permits to "*require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." The requirements of this Order have been deemed or determined to be "appropriate" to achieve water quality standards in receiving waters.

Part of the "*controls*" required by the Order is the process described in Provision A.4. Provision A.4 includes the process that is ultimately expected to achieve compliance with the requirement that discharges from the MS4 do not cause or contribute to violations of water quality standards in the receiving waters. The implementation of Provision A.4 is required when the Copermittees or the San Diego Water Board have determined that discharges from the MS4 are causing or contributing to violations of water quality standards in the receiving waters.

The Copermittees must effectively prohibit non-storm water discharges into the MS4s, reduce the discharge of pollutants in storm water from the MS4s to the MEP, and ensure that their MS4 discharges do not cause or contribute to violations of water quality standards. If the Copermittees have effectively prohibited non-storm water discharges and reduced storm water pollutant discharges to the MEP, but their discharges are still causing or contributing to violations of water quality standards, Provision A.4 provides a clear "iterative process" for the Copermittees to follow.

Provision A.4 essentially requires the Copermittees to implement additional BMPs until MS4 discharges no longer cause or contribute to a violation of water quality standards.

[21] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.

In assessing compliance and potential enforcement actions, the San Diego Water Board looks at the Copermittees' efforts in total to meet the requirements of Provisions A.1.a, A.1.c, A.2.a and Provision A.4. The Copermittees need to demonstrate that they are making improvements to their programs and making progress toward achieving the discharge prohibitions and receiving water limitations in Provisions A.1.a, A.1.c, and A.2.a by implementing the requirements of Provision A.4. The San Diego Water Board would consider these efforts prior to strictly enforcing the requirements of Provisions A.1.a, A.1.c, and A.2.a. Causes of exceedances of the receiving water limitations can often be more difficult to identify and attribute solely to the Copermittees' MS4s. The intent of the Order is to provide the Copermittees more clarity and flexibility in addressing these exceedances through the iterative approach and adaptive management process until the requirements under Provisions A.1.a, A.1.c, and A.2.a are fully achieved.

An exception to the iterative approach and adaptive management process would be in receiving waters subject to adopted and approved TMDLs. For TMDLs that are incorporated into the Order, there is a specific date for compliance to be achieved. The Copermittees are in compliance with Provision A.4 as long as the Copermittees demonstrate compliance consistent with one of the methods identified in Attachment E for interim or final WQBELs consistent with the specific compliance dates~~, after which the iterative approach and adaptive management process required under Provision A.4 no longer provides the flexibility to achieve compliance. Where compliance dates for a TMDL have passed, compliance with the WQBELs incorporated into the Order established by a TMDL in Attachment E to protect water quality standards is required. Thus, after the interim or final compliance dates for a TMDL have passed, if the discharges from the Copermittees' MS4s are causing or contributing to a violation of WQBELs, exceedances of WQBELs must be strictly enforced by the San Diego Water Board. In the meantime, however, the Copermittees are in compliance with the interim or final TMDL requirements in Attachment E as long as the interim or final WQBELs are being achieved in accordance with the interim or final compliance dates.~~

Provision F.2 (Updates) requires the Copermittees to update specific documents that the Copermittees will utilize to implement the requirements of this Order.

Each Copermittee is required to continue implementing a jurisdictional runoff management program, as required under Provision E. Implementation of each Copermittee's jurisdictional runoff management program is directed by its jurisdictional runoff management program document. Provision F.2.a requires each Copermittee to update its jurisdictional runoff management program document to be consistent with the requirements of Provision E concurrent with the submittal of the Water Quality Improvement Plan.

Likewise, each Copermittee must continue to require new development and redevelopment projects to implement BMPs to control pollutants in storm water runoff. The control of pollutants in storm water runoff from development and redevelopment projects within each Copermittee's jurisdiction is guided and directed by its BMP Design Manual, formerly known as a Standard Storm Water Mitigation Plan (SSMP). Provision F.2.b requires each Copermittee to update its BMP Design Manual to be consistent with the requirements of Provision E.3 concurrent with the submittal of the Water Quality Improvement Plan.

In general, the requirements of the Order should not necessitate a complete rewrite of each Copermittee's jurisdictional runoff management program document or BMP Design Manual, as was required by the Third Term Permits. The jurisdictional runoff management program and BMP Design Manual requirements of this Order are not significantly different than the requirements of the Fourth Term Permits. Thus, only sections of the Order which are new or have been significantly changed should warrant revisions to specific sections of the Copermittee's jurisdictional runoff management program document and BMP Design Manual.

Finally, the Water Quality Improvement Plans are expected to require updates as the iterative approach and adaptive management process included in the Water Quality Improvement Plan, as required under Provision B.5, is implemented by the Copermittees. Provision F.2.c.(1) requires the Copermittees to implement a public participation process for the proposed updates, review the proposed updates with the Panel, and submit the updates to the Water Quality Improvement Plan as part of the Annual Reports required under Provision F.3.b.

Also, because TMDLs are likely to be developed, adopted and approved during the term of the Order, Provision F.2.c.(2) has been included to expedite the ~~incorporation~~ inclusion of actions to implement TMDLs into the Copermittees' Water Quality Improvement Plans as part of the update process, potentially before the Order is re-opened to incorporated the requirements of the new TMDLs. While WQIPs may be updated to include additional actions, TMDLs are not self-implementing and the Order must be re-opened to incorporate the TMDLs. Therefore TMDL requirements

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November 19, 2014

By E-Mail and Delivery

Laurie Walsh, P.E.
California Regional Water Quality Control Board, San Diego region
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San Diego, CA 92108

Subject: Comment – Tentative Order No. R9-2015-0001, Regional MS4 Permit, Place ID: 658018Lwalsh.

Dear Ms. Walsh:

The County of Orange, as Principal Permittee of the Orange County Stormwater Program, appreciates the opportunity to provide comments on *Tentative Order No. R9-2015-0001, An Order Amending the Regional Municipal Separate Storm Sewer (MS4) Permit for the San Diego Region (Order No. R9-2013-0001)* issued on September 18, 2014. The south Orange County Permittees (hereinafter, Copermittees) were involved in the development of these comments and the Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest and Mission Viejo have directed that they be recognized as concurring entities on this letter.

We acknowledge the significant efforts of Regional Board staff to continue to collaboratively engage with the Copermittees and key stakeholders in the further development of a fifth term permit municipal stormwater permit for south Orange County. We also recognize that Tentative Order No. R9-2015-0001 incorporates a number of changes directly in response to specific recommendations made in our Report of Waste Discharge. The Tentative Order, however, still presents key issues of significant concern including the attainability of the proposed Prohibitions and Limitations provisions.

This letter is a summary of five overarching concerns with the Tentative Order and Regional Permit. Attachment A includes a more detailed discussion of these concerns in addition to providing you with comprehensive technical and legal comments on outstanding issues with the Tentative Order. Attachment B consists of proposed redlines to the Tentative Order consistent with the comments made in Attachment A. In addition to these comments, the Copermittees by this reference incorporate all prior letters, comments, reports, presentations, oral and written testimony, data, communications, and other evidence made by, on behalf of, and in support of the Copermittees during the various workshops, hearings, and meetings relevant to the adoption of Order R9-2013-0001 and Tentative Order R9-2015-0001. The Copermittees reserve the right to provide further comment as applicable.

I. The State of the Environment

The Fact Sheet / Technical Report discuss the statutes, regulations, plans and policies that establish the regulatory and evidentiary basis for the Regional Permit. It omits, however, the numerous environmental quality monitoring programs that have been undertaken over many years, and is silent on the environmental rationale for the stormwater mandate. The Findings include a single paragraph on "Water Quality Effects." In contrast, our Report of Waste Discharge included a comprehensive *State of the Environment* discussion that has since been published as a standalone report, summarizing the results of long term monitoring and special studies related to swimming safety and aquatic ecosystem health. The report's findings have significant implications for the structure of the Tentative Order and the compliance framework for stormwater and its future management in south Orange County. Based on the successes of the Orange County Stormwater Program, there is little justification for much of the Tentative Order.

Bacteria: Bacterial contamination of coastal waters in south Orange County is very low during dry weather, as a direct result of the Copermittees' targeted and comprehensive control actions, and beach report card grades are now consistently high. While contamination is more prevalent in wet weather, the annual percentage of A grades for wet weather on the Heal The Bay Report Card has reached 70 percent in recent years. Achieving further reductions in wet weather contamination will be a challenge as bacterial contamination in wet weather arises from a much wider range of sources compared to dry weather. Also, limitations in current monitoring methods make it difficult to determine if human fecal contamination, a significant health threat, is actually present.

Total Dissolved Solids (TDS) and Nutrients: TDS and Nutrients consistently exceed Basin Plan Objectives in wet and dry weather and create the potential for detrimental impacts on aquatic ecosystems. TDS is suspected as a causal factor in poor macroinvertebrate community condition. Nutrient impacts, such as excessive macroalgal growth, are not prevalent in south Orange County streams in spite of exceedances of regulatory thresholds for bio-stimulatory substances. For both constituents, the principal source is unlikely to be urban in nature and instead can be identified as a consequence of marine sedimentary formations characteristic of the area and their overlying saline soils. The key to effective future management efforts will therefore be to determine the environmental significance, if any, of the urban sources of TDS and nutrients. The permit should recognize this current uncertainty and not mandate on-site retention of runoff in the first instance where it may exacerbate the exfiltration of shallow groundwater with elevated TDS and nutrients.

Toxicity: Toxicity occurs sporadically in streams and creeks in south Orange County. It occurs at low levels and at different locations and different times and varies unpredictability across test species. In dry weather, aquatic toxicity is encountered in open (undeveloped) areas at levels equivalent to those in urban areas. This pattern

suggests that dry weather toxicity is not caused by urban sources of pollutants. There is a greater prevalence of toxicity in wet weather and pesticides are implicated as the principal source of this toxicity. Pesticide use, however, presents a moving target for management efforts due to the continuous introduction of new products. Moreover, the regulation of pesticide use is exclusively within the jurisdiction of state and federal agencies and not the role of MS4s.

II. Prohibitions and Limitations Provisions

The proposed Prohibitions and Limitations provisions in the Tentative Order do not provide the Copermittees with the necessary compliance pathway needed to ensure innovation and progress. Although there is flexibility in the water quality management plans, without some form of compliance path, the Copermittees remain strictly liable for any exceedance. This was not the intent of Congress or the EPA under the Clean Water Act and has not been the intent of the State Water Board under Orders 1999-05 and 2001-15.

The required linkage between implementing control programs and the prohibitions and limitations provisions is created if the Tentative Order is modified to affirm an adaptive management process as the basis for compliance. The adaptive management or iterative process is and has been a fundamental tenet of MS4 programs, as envisioned by USEPA, State Water Board Order 99-05 and later reconfirmed in Order WQ 2001 15 (BIA Order), and is the mechanism by which the Copermittees can and should demonstrate compliance. The County strongly supports this approach which we believe is technically necessary given the major findings both in our *State of the Environment Report* and in the recent American Society of Civil Engineers (ASCE) publication – *Pathogens in Urban Stormwater Systems*. The Regional Board has discretion with receiving water limitations language beyond what is required to be included by Order 99-05, and the County envisions the Water Quality Improvement Plan (WQIPs) being the foundation for the required iterative BMP-based compliance approach for the discharge prohibitions and limitations provisions.

III. TMDL Incorporation

The Regional Board has adopted two Basin Plan Amendments to establish Total Maximum Daily Loads (TMDLs) where the Copermittees are assigned wasteload allocations: (1) Indicator Bacteria in Baby Beach in Dana Point Harbor and (2) Indicator Bacteria, Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek).

There are several fundamental and substantive discrepancies between the adopted TMDL Basin Plan Amendments and the provisions of the Tentative Order. These inconsistencies negate the Basin Plan Amendment process that occurred to establish the TMDLs, and clearly contradict the Board's intent for how the TMDLs would be incorporated into the MS4 Permit. The Tentative Order should be revised to ensure that the TMDLs are properly incorporated as mass-based WLAs and not as concentration-based limits and that BMP-based compliance is established for the TMDL provisions. The Tentative Order should also provide an explicit re-opener provision to ensure that any revision to a TMDL is included in the adopted Order.

IV. Complementary Watershed and Jurisdictional Planning

The WQIP framework allows for the identification and development of a program built around the highest priority water quality conditions and constraints within a specific watershed. The WQIP also allows for the integration of all program elements and focuses the efforts on the highest priorities for each watershed through the customization of actions and strategies. If positioned correctly, the WQIP is the necessary next step in making the Tentative Order and corresponding compliance programs truly strategic, adaptive, and optimally supportive of the *Practical Vision (Resolution No. R9-2013-0153).*

The County believes the Tentative Order provisions—especially Provision E, JRMP—deviate from the strategic and adaptive approach to the "one-size fits all" approach. For example, the Existing Development provisions dictate that specific BMPs that must be implemented, regardless of the high priority water quality concerns within a watershed. These provisions become "additive" instead of "prioritized" and are not supportive of the overarching WQIP. The Tentative Order needs to be modified so that the WQIPs and related Jurisdictional Runoff Management Plans can be streamlined and focus on the highest priorities within each watershed.

V. Regional Permit

The Permittees understand that the regional nature of the permit is one of the defining features of our fifth term permit renewal and that this permitting approach is supported by the members of the Regional Board. Nonetheless, it must also be noted that the Regional Board does not have the legal authority to include Orange County in a Regional Permit because there is no system-wide, jurisdiction-wide, or common watershed basis to do so.

Thank you for your attention to our comments. Please contact me directly if you have any questions. For technical questions, please contact Chris Crompton at (714) 955-0630 or Richard Boon at (714) 955-0670. For legal questions, please contact Ryan Baron at (714) 834-5206.

Sincerely,

Mary Anne Skorpanich
Deputy Director, OC Public Works Department
OC Environmental Resources

Attachments: A – Detailed Comments
B – Redline Version of the Tentative Order

Cc: (Electronic copies only)

David Gibson, San Diego Regional Board
Tony Felix, San Diego Regional Board
South Orange County Permittees
Orange County Technical Advisory Committee
Tony Olmos, Orange County Public Works
Todd Snyder, County of San Diego
Jason Uhley, Riverside County Flood Control and Water Conservation District
Andrew Kleis, City of San Diego

WARREN D. WILLIAMS
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RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

November 19, 2014

sent via email 11/19/14: Laurie.Walsh@waterboards.ca.gov

Ms. Laurie Walsh, P.E., WRC Engineer
CRWQCB - San Diego Region
2375 Northside Drive, Suite 100
San Diego, CA 92108

Dear Ms. Walsh:

Re: Comment - Tentative Order No. R9-2015-0001Place ID:65801LWalsh

This letter is written by the Riverside County Flood Control and Water Conservation District (District), on behalf of itself, the County of Riverside and the Cities of Murrieta, Temecula, and Wildomar (collectively, the Riverside County Co-Permittees) regarding Tentative Order No. R9-2015-0001 (Tentative Order). The Tentative Order proposes to add the County of Orange and other agencies located in South Orange County within the existing San Diego County Municipal Separate Storm Sewer System (MS4) Permit. The Riverside County Co-Permittees appreciate the opportunity provided by the San Diego Regional Water Quality Control Board (Regional Board) to offer its comments on the Tentative Order.

The Riverside County Co-Permittees wish to reiterate their concerns regarding a Regional MS4 Permit for San Diego, Orange, and Riverside Counties. Those concerns are set out more fully in our written comment letter dated January 10, 2013, on Order No. R9-2013-0001. The Riverside County Co-Permittees will be submitting a Report of Waste Discharge prior to the expiration of their current MS4 Permit, seeking either modification to the Regional Permit or an individual permit covering only those Co-Permittees. For your convenience, the January 10, 2013 comments are attached to this letter. The Co-Permittees request that this comment letter and attachments be added to the record for the Tentative Order, since most of the issues raised in those comments still pertain to the Tentative Order. The Co-Permittees also request that the oral testimony of Riverside County Co-Permittees on Order No. R9-2013-0001 be included in the record for the Tentative Order. The Riverside County Co-Permittees support the South Orange County Co-Permittees general approach to the issues raised by the Tentative Order.

Notwithstanding the Riverside County Co-Permittees' concerns to a Regional Permit, and subject to it, the Co-Permittees offer the following observations regarding the Tentative Order.

1. Need for Path to Compliance

As set forth in our written and oral comments on Order No. R9-2013-0001, the Riverside County Co-Permittees continue to believe strongly that every MS4 permit, including the Tentative Order, should

incorporate a clear and achievable path to compliance for Co-Permittees. As the Executive Officer and staff indicated in the hearings on Order No. R9-2013-0001, the San Diego County Co-Permittees will be out of compliance with the Permit's receiving water limitations (RWL) provisions for years. We agree with staff's assessment, and state further, that the lack of a provision to allow Co-Permittees to be considered in compliance with the RWL provisions leaves the Co-Permittees open to possible enforcement by third-parties and, as importantly, threatens the compliance approach that has been successfully employed by the Riverside County Co-Permittees to address water quality impairments in the Santa Margarita Region.

The Riverside County Co-Permittees agree with staff that a MS4 permit which allows the Permittees to adopt a "fail early and fail often" iterative approach to water quality is preferable to a permit which simply mandates certain actions. The Santa Margarita River Watershed Water Quality Workplan in Riverside County follows an iterative, flexible, and priority-setting approach that is intended to enable the Co-Permittees to focus on the most important water quality impairments in the Region, and make real, quantifiable improvements in water quality. As we have previously commented, if the Co-Permittees have no protection from liability for exceedances of water quality standards, they must address each such exceedance, even when that exceedance may be transitory or of minimal environmental or public health consequence. Stretching resources to address such issues diverts limited Co-Permittee resources from the most important threats to water quality and delays overall water quality improvement.

Recognizing this deficiency in the 2001 MS4 Permit for the Los Angeles County Co-Permittees, in its 2012 Permit, the Los Angeles Water Board adopted a path to compliance with RWLs through the development of adaptive and prioritized watershed management plans. The Riverside County Co-Permittees believe that a similar approach to RWL compliance should be included in the Tentative Order.

2. Hydromodification Provisions

While most of the substantive changes in the Tentative Order have specific application only to San Diego and/or South Orange Counties, the Riverside County Co-Permittees support exemptions for engineered channels and large river reaches in Provision E.3.c.(2)(e). This provision also provides an interim timeframe exemption for the implementation of hydromodification management BMP requirements for priority development projects.

The exemptions identified in Provision E.3.c.(2)(e) are appropriate and reasonable, and should be made permanent exemptions moving forward.

3. Basin Planning and Water Quality Improvement Plan (WQIP) General Comments

For the WQIPs to ultimately succeed, they need to be based upon regionally appropriate water quality standards. These water quality standards require review to ensure that they reflect sustainable conditions for beneficial uses, explicitly consider regulatory policy and environmental trade-offs

inherent in the protection of beneficial uses, and address the nature and impact of stormwater upon beneficial uses.

The Riverside County Co-Permittees would like to thank the Regional Board and staff for working with the Santa Margarita River Nutrient Initiative Group on such a review. This group, which includes dischargers, tribal interests, interested non-profits, scientists, and Regional Board staff, is using a scientifically based and rigorous approach to evaluate potential water quality targets for, and sources of, nutrients in the Santa Margarita Watershed. It is our belief that this effort will lead to more considered, effective, and appropriate management of local receiving waters, and thereby promote quicker and more effective environmental outcomes. It may also assist with the identification and development of innovative and alternative programs to manage nutrients within the Region. This effort will inform the development of the Santa Margarita River Watershed Water Quality Workplan and other regulatory programs.

The Co-Permittees request and encourage Regional Board staff to work with other stakeholders to consider, prioritize, and address other perceived constraints and inconsistencies within the San Diego Region Basin Plan. Such efforts will ultimately result in a better focus of local and regional compliance programs, including the WQIPs, on actions that are more likely to effectively and quickly address public health risks and environmental risks to receiving waters. Such an approach is exactly in line with staff's emphasis on workable solutions to these challenges.

The Riverside County Co-Permittees appreciate the opportunity to comment on the Tentative Order. Should you have any questions regarding these comments, please contact David Garcia at 951.955.1330/dhgarcia@rcflood.org.

Very truly yours,

for JASON E. UHLEY
Chief of Watershed Protection Division

Attachment

DHG:cw
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RIVERSIDE COUNTY FLOOD CONTROL
AND WATER CONSERVATION DISTRICT

January 10, 2013

Mr. Wayne Chiu, P.E.
California Regional Water Quality
Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego, California 92123-4340

Dear Mr. Chiu:

Re: Tentative Order No. R9-2013-0001
Regional MS4 Permit
Place ID: 786088Wchiu

The Riverside County Flood Control and Water Conservation District (District) is submitting this comment letter on the above listed Tentative Draft Order on behalf of the Riverside County MS4 Copermittees within the San Diego Region (Riverside County Copermittees) which includes the District, the County of Riverside and the Cities of Murrieta, Temecula and Wildomar. Tentative Draft Order R9-2013-0001 (Draft Permit) was drafted by Board staff to cover Phase I municipal separate storm sewer system (MS4) Copermittees in San Diego County, southern Orange County, and the portion of southwestern Riverside County within the Santa Margarita Hydrologic Unit.

The Riverside County Copermittees have previously commented that the San Diego Water Board lacks authority to adopt a regional permit covering Orange and Riverside Counties, in addition to San Diego County; a comment which is discussed in further detail below and in the attached legal comments. Notwithstanding such objection, and subject to it, the Riverside County Copermittees are providing comments on the Draft Permit.

In the workshop on the Administrative Draft Order held on April 22, 2012 San Diego Water Board staff identified the following desired outcomes for the proposed permit:

- Improving the quality of water discharged from the MS4
- Restoring or enhancing Beneficial Uses and Receiving Water quality

It was further identified by Board staff that to be able to meet those goals, the proposed regional MS4 permit needed to be 1) Strategic, 2) Adaptive, and 3) Synergistic.

Notwithstanding the concerns of the Riverside County Copermittees with regard to the legal authority to issue a regional MS4 permit, the Copermittees agree that being able to adapt and direct resources toward specific water quality priorities in a given watershed, rather than all potential problems simultaneously, is more likely to result in actual and meaningful improvements in water quality. However, to be able to achieve those improvements the MS4 Permit must be crafted to provide the Copermittees with the ability to truly and fully

adaptively manage their programs to focus resources on those BMP strategies and monitoring efforts that are identified as being most effective, consistent with the MEP standard, at addressing watershed priorities.

Unfortunately, many provisions in the Draft Permit, including but not limited to the Receiving Water limitation provisions in Provision A and others discussed in this letter, still do not fully support the achievement of those outcomes. The Draft Permit does not provide the Copermittees with the flexibility to be fully strategic in managing their resources nor the ability to fully adapt their programs to focus on the highest priority water quality needs of the watershed. This comment letter and the other documents submitted herewith (a redline of the Draft Permit and Legal Comments) identify some suggestions which, if adopted by the San Diego Water Board, will help to address these limitations and facilitate the desired improvements.

This comment letter is organized as follows:

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3.15 ATTACHMENT C 33

As noted, the Riverside County Copermittees also are submitting a redline of the Draft Permit ("Redline") that proposes alternative language intended at achieving solutions to the various issues raised in this letter, and a Legal Comment document ("Legal Comments") that provides additional legal context for the various issues raised in this letter. The Riverside County Copermittees reserve their right, in the context of filing a Report of Waste Discharge ("ROWD") prior to the expiration of Order R9-2010-0016 (the 2010 MS4 Permit), to again address these issues and others relevant and appropriate to the SMR.

1 BACKGROUND

The Riverside County Copermittees were issued an extensive and prescriptive MS4 Permit in November 2010 which greatly expanded monitoring obligations, required special studies, a jurisdictional runoff management program, and Watershed Workplan requirements that were very different than the requirements set forth in the previous MS4 Permit issued to the Copermittees. Development and implementation of the 2010 MS4 Permit compliance requirements has been very expensive, especially in comparison to the relatively few demonstrated impairments of Beneficial Uses in the region and the Copermittees' resources. These requirements have left other important societal needs unfulfilled by the Riverside County Copermittees during a period of unprecedented and continuing economic distress. Further, the Riverside County Copermittees are still in the process of developing and implementing these 2010 MS4 Permit requirements, which is a serious concern given the very different compliance approach proposed in the Draft Permit. The Copermittees hope that the compliance efforts under the current MS4 Permit are taken into account when they submit their ROWD at the expiration of the 2010 MS4 Permit.

2 General Comments

2.1 Regional Permit

The Riverside County Copermittees respectfully submit that the San Diego Water Board is not authorized under the Clean Water Act or under its implementing regulations to issue a regional permit to Copermittees in San Diego County, South Orange County and the Santa Margarita Region (SMR) of Riverside County. As discussed more fully in the Legal Comments, the only circumstance under which the San Diego Water Board could issue such a permit would be if the Copermittees in these counties agreed to such a permit. Additionally, while the Draft Permit purports to affect the conduct of the Riverside County Copermittees upon expiration of the 2010 MS4 Permit in November 2015, the Riverside County Copermittees have not submitted a ROWD requesting coverage under a regional permit. Because no application has been made for the regional permit, which is a requirement set forth in the CWA regulations, the San Diego Water Board lacks jurisdiction to name the Riverside County Copermittees on the Draft Permit at this time.

Notwithstanding the above, the Riverside County Copermittees are submitting the comments in this letter based on:

- The San Diego Water Board staff's stated intent to enroll the Riverside County Copermittees in this permit upon expiration of the 2010 MS4 Permit.
- Statements made by San Diego Water Board staff that this comment period would serve as the primary opportunity for the Riverside County Copermittees to influence their next term MS4 Permit. The Riverside County Copermittees are entitled, as part of the ROWD process, to again raise relevant issues regarding permit provisions, but have undertaken in these comments to address major current concerns.

2.2 Outcome Focus

As mentioned above, the Copermittees agree that being able to adapt and direct resources toward addressing the specific water quality priorities in a given watershed, rather than all potential problems simultaneously, is more likely to result in actual/meaningful improvements in water quality. However, to be able to achieve those improvements, the MS4 Permit must fully integrate the following principles:

- **The Jurisdictional Program requirements must be fully flexible:** The Permit must be written in a way that allows the Copermittees to truly and adaptively manage their programs to fully focus their existing resources on those BMP strategies and monitoring efforts that are identified within the Water Quality Improvement Plan (WQIP) as being most effective, consistent with the Maximum Extent Practicable (MEP) standard, at addressing the watershed's priorities. We understand this to be the goal of the San Diego Water Board as well. While some elements of the Draft Permit embody this need, others do not and require dedication of resources to specific pre-defined efforts, regardless of the identified need for that effort in the watershed. The specific program areas that need more work to this end are:

    - The approach to addressing Non-stormwater discharges
    - Development Planning
    - Retrofitting
    - Channel Rehabilitation

These issues and proposed new language to address these issues are included throughout this letter and/or in the attached Redline.

- **Basin Plan updates need to be Prioritized by the San Diego Water Board:** For outcome-based permitting to be successful, the desired outcomes must be achievable by and appropriate to the Copermittee. To do that, the outcomes must take into account the background conditions in the watershed, and be appropriate for the attainment of Beneficial Uses in the specific waterbody, based on the specific conditions within and influencing that waterbody. The values in the Basin Plan should be comprehensively re-evaluated to ensure that water quality standards are scientifically justified to protect Beneficial Uses. Without updating the Basin Plan, the outcomes that the Copermittees target in the WQIPs would be arbitrary and not guaranteed to achieve the desired beneficial use improvements. Such an update should be pursued aggressively, led by and adequately funded by the San Diego Water Board, with participation by the MS4 Copermittees and other dischargers and stakeholders in the watershed.

- **Other Dischargers need to be Similarly Regulated by the San Diego Water Board:** The MS4 Copermittees are not the only dischargers of pollutants in the watershed. For example, the SMR of Riverside County includes State Lands (such as Caltrans), Tribal Lands, Agricultural Operators, Industrial Permit dischargers, Construction Permit dischargers, Phase II entities, Water Districts, and 'De Minimus' dischargers issued general permit coverage; all of which:

- Have separate regulatory programs (such as permits or waivers) implemented by the San Diego Water Board;
- May discharge pollutants, including non-stormwater, that can affect the quantity and quality of runoff, both directly within Receiving Waters, and in runoff discharges that may enter into and be discharged from the MS4; and
- Cannot be regulated by the Copermittees for the quantity and quality of their runoff because of their separate permits or waivers granted by the NPDES Program Administrator.

As such, while MS4 Copermittees can implement programs to reduce pollutants in discharges that are within their legal jurisdiction, no amount of effort by the MS4 Copermittees can be expected to fully attain water quality standards in the Receiving Waters. The only way to achieve that outcome will be for the NPDES Program Administrator (the San Diego Water Board in most cases) to directly regulate each of these entities to similar levels and standards as set forth by this Permit.

2.3 Responsibility for meeting goals of CWA

The CWA requires Copermittees subject to any MS4 permit, including the Draft Permit, only to address discharges from their MS4s. 33 U.S.C. § 1342(p)(3)(B). The Copermittees are not required to restore Beneficial Uses in any Receiving Water, or to address sources of pollution to those Receiving Waters that are not being discharged into or from those MS4s. However, in various provisions in the Draft Permit, there is a suggestion that the Copermittees are solely responsible for attaining water quality standards in their respective Receiving Waters. The San Diego Water Board must make clear in the Draft Permit that the responsibilities of the Copermittees are limited to their MS4s and the requirements of the CWA for municipal stormwater dischargers. Redline changes have been proposed in the above referenced portions of the Draft Permit to address this issue.

3 Specific Comments

The following comments represent specific high level concerns that the Riverside County Copermittees have identified at this time. Additional comments on the Draft Permit can be found in the Redline, as well as in the attached Legal Comments.

3.1 Findings

The Riverside County Copermittees have two separate sets of comments on the Findings. The first addresses the need for additional findings, with respect to aspects of California law and the physical setting of the SMR. The second set of comments focuses on existing Findings in the Draft Permit.

3.1.1 Needed Additional Findings

The Findings in the Draft Permit fail to fully address the context and conditions under which the proposed permit requirements are to be applied. A more complete explanation of this background is necessary to ensure that the Provisions ultimately included in the Draft Permit are credible, appropriate and legally required, and that the Permit Provisions (which must stem from the Findings) reflect the

context of the broader issues that affect MS4s within the region. The Riverside County Copermittees request that San Diego Water Board staff work with the MS4 Copermittees to expand the Findings, including the addition of findings to address the following:

California Water Law

California law requires that downstream entities must accept runoff from up-gradient properties. Owners and operators of MS4s are not exempt from this legal mandate, even if that runoff contains pollutants. Moreover, flood control districts, including the District, are mandated by the California Legislature (Legislature) to protect the lives and property of residents from floodwaters. The Riverside County Copermittees request that a finding, in the form set forth in the Redlines, be added to the Draft Permit.

Flooding

Many areas that would be under the jurisdiction of the Draft Permit are subject to periodic catastrophic flooding, which results from natural conditions, specifically the presence of mountains and hilly areas in close proximity to development, along with the effect of strong Pacific storms. This flooding would occur even in the absence of development. The Legislature recognized the importance of this issue in the early 20th Century, when it established flood control districts across the state, including in Riverside, Orange and San Diego Counties. Such flooding has, and if not controlled, could result in loss of life and widespread property damage. Further, the flooding can mobilize significant amounts of pollutants from industrial, commercial, residential and agricultural lands, damaging watercourses, habitat, and the Beneficial Uses therein. MS4 systems are designed and constructed to mitigate these impacts. The Riverside County Copermittees request that a finding in the form set forth in the Redline be added to the Draft Permit.

Flood Control District Acts

As noted above, the Legislature established Flood Control Districts in Orange, Riverside, and San Diego Counties through a series of Flood Control Acts. The Legislature determined that protection of life and property from the effects of flooding through the implementation of flood control improvements was a priority, and assigned those Districts with the sole responsibility to design, construct and maintain those improvements necessary to manage and contain floodwaters to prevent such negative impacts, as well as to conserve floodwaters for beneficial use. As noted above, these improvements represent fundamental water quality BMPs inasmuch as they reduce the widespread exposure of runoff to pollutants. The Flood Control Districts, while owners and operators of MS4s, have no authority or powers beyond those granted by the Legislature. The Legislature did not provide the Flood Control Districts, for example, the authority to regulate land uses within the municipal jurisdictions of Riverside County, nor to control the volume or quality of runoff discharged by those land uses. Findings describing the legislative priority for flood control and the limitations on the governing power of the Flood Control Districts should be added to set forth the appropriate role of the Flood Control Districts as MS4 Copermittees. The Riverside County Copermittees request that a finding, in the form set forth in the Redline, be added to the Draft Permit.

Limits on Extent of Permittee Legal Authority

The MS4 Copermittees lack the authority to regulate many significant sources of pollutants that may impact Receiving Waters. For example, the Copermittees cannot regulate pollutants discharged from federal and state lands, facilities, tribal lands, special districts, utilities, agricultural lands, or railroads. Moreover, the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) preclude local regulation of pesticides. The Riverside County Copermittees request that a finding in the form set forth in the Redline be added to the Draft Permit.

3.1.2 Comments on Existing Findings

Findings 3 and 15 (and elsewhere in Draft Permit)

In Findings 3 and 15 (and throughout the Draft Permit), it is stated that the CWA requires controls to reduce the discharge of pollutants "in stormwater" to the MEP. Finding 15, moreover, states that non-stormwater discharges from the MS4 are "not considered stormwater discharges and therefore are not subject to the MEP standard, stating that the MEP standard "is explicitly for 'Municipal . . . Stormwater Discharges" from the MS4s.

These conclusions are directly contrary to the plain language of the CWA, as set forth in the November 16, 1990 preamble accompanying the CWA stormwater regulations. Those authorities provide that the MEP standard applies to *all* pollutants discharged from the MS4, notwithstanding that some may be transported by non-stormwater. Additionally, the Redline reflects deletion of the limitation of the MEP standard to stormwater discharges in multiple locations, reflecting federal law. For a further discussion of this issue, please see the Legal Comments. The Riverside County Copermittees also request deletion of Finding 15.

Finding 11

This Finding states that "[r]ivers, streams and creeks in developed areas used [to convey runoff] . . . are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and Receiving Water." This statement is incorrect and must be deleted (as reflected in the Redline). For reasons more fully set forth in the Legal Comments, natural streams cannot be considered MS4; there is no MS4 "outfall" from a channelized river or stream to a natural stream; and, USEPA itself requires a distinction between MS4s and Receiving Waters.

Finding 12

This Finding states that as operators of MS4s, "Copermittees cannot passively receive and discharge pollutants from third parties." By providing free and open access to an MS4 that conveys discharges to Waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not prohibit or otherwise control. This statement is incorrect and must be deleted (as set forth in the Redline). As the discussion in the Legal Comments indicates, municipalities must maintain the MS4 to protect the lives and property of their citizens and to prevent nuisance. Flood Control Districts have a statutory obligation to operate and maintain such MS4, an obligation which is not affected by

either the CWA or the terms of the Draft Permit. While an MS4 operator has the obligation to effectively prohibit the entry of non-stormwater into the MS4, it does not have legal responsibility for such discharges, which are the responsibility of the discharger itself and subject to the jurisdiction of the San Diego Water Board, pursuant to Water Code section 13260 *et seq.*

Finding 28

This Finding recites that the San Diego Water Board finds that the requirements of the Draft Permit "are not more stringent than the minimum federal requirements." The Riverside County Copermittees disagree with this finding, as it is not supported by the evidence, *i.e.*, the many requirements in the Draft Permit which exceed the federal MEP standard. Moreover, any decision by the San Diego Water Board to adopt "other provisions" going beyond MEP is not a federal requirement, but rather a discretionary decision taken by a state agency under authorization in the CWA. *See Defenders of Wildlife v. Browner,* 191 F.3d 1159, 1164-65 (9th Cir. 1999). Please see discussion in the Legal Comments. The Finding also indicates that the San Diego Water Board has developed an economic analysis of the Draft Permit. As set forth in the Legal Comments, the Riverside County Copermittees challenge the adequacy of that analysis.

Finding 29

This finding purports to find that the Draft Permit does not constitute an unfunded state mandate. The Riverside County Copermittees disagree with the conclusions set forth in this finding. More importantly, the finding is without legal effect because exclusive jurisdiction as to whether a state mandate exists, and whether it is unfunded lies with the Commission on State Mandates. Government Code §§ 17751 and 17552; *Lucia Mar Unified School District v. Honig* (1988) 44 Cal.3d 830, 837; *Hayes v. Commission on State Mandates* (1992) 11 Cal.App.4th 1546, 1596-97. The finding of an agency that has no jurisdiction to make that finding is entitled to no weight and should be deleted, as shown in the Redline. For an additional discussion of these issues, please see the Legal Comments.

Finding 31

The Riverside County Copermittees believe that the Receiving Water Limitation ("RWL") language set forth in the Draft Permit renders compliance with the permit impossible, since exceedances of water quality standards occur routinely through no fault of the MS4 Permittees. Thus, unless the RWL is modified to provide the Copermittees with a means to be in compliance, those Copermittees risk the threat of arbitrary San Diego Water Board enforcement or the bringing of citizen suit lawsuits under the CWA, which could nullify compliance with all other terms set forth in the Draft Permit, as discussed more fully in the Legal Comments. The exposure to third party litigation from the proposed RWL language is one of the most significant threats to an otherwise collaborative approach to achieving long term water quality improvement. This threat was emphasized by the recent bringing of a citizen suit lawsuit against the City of Malibu, the County of Los Angeles and the Los Angeles County Flood Control District based on similar language in the 2001 Los Angeles County MS4 Permit. The Riverside County Copermittees have suggested modifications to Provision A in the Redline and as discussed below and in the Legal Comments that are intended to better support the Iterative Process for compliance authorized by the State Water Resources Control Board in Order No.

2001-15, through the WQIP process. The Copermittees also note that the State Board considered the problems with the RWL language at a recent workshop, which may eventually result in modifications which should, if applicable, be reflected in the Draft Permit. Other requested changes to the Findings are set forth in the Redline.

3.2 Provision A, Prohibitions and Limitations

As noted above, the requirements set forth in Provision A are of great concern to the Riverside County Copermittees. The Copermittees generally support an approach to compliance that utilizes WIQPs as the implementing mechanism for the 'Iterative Process' described in Provision A.4, and that by implementing that iterative process in accordance with A.4, that the Copermittee should be in compliance with Provisions A.1 and A.2. The Redline reflects edits of Provision A to clarify the linkage between the prohibitions and limitations in Provisions A.1. through A.3. and Provision A.4 – which is described as the method for complying with the prohibitions and limitations. It must be noted, however, that the Riverside County Copermittees do not agree with the approach suggested, that any WQIP-based compliance approach be necessarily accompanied by a Reasonable Assurance Analysis. Such analyses can be extremely complex, expensive and time-intensive to develop, and similar analyses are commonly developed within TMDL models; taking a number of years to develop and refine. Given that the Santa Margarita Watershed has no adopted TMDLs; thus, comprehensive pollutant transport and BMP models are not available for the suite of constituents that might be considered for prioritization within a WQIP for the Santa Margarita Watershed. In the context of a TMDL, such models would be developed by the combined resources of the San Diego Water Board and a range of stakeholders and dischargers. Undertaking such an exercise solely with the public resources of the 275,000 residents of the SMR is beyond the financial ability of the Copermittees and would shift the responsibility for development of TMDLs from the San Diego Water Board to the Copermittees. Comments on Provision A can be found below, in the Redline and in the Legal Comments.

3.2.1 Overview of Key Issues

As noted above, an overriding issue for the Riverside County Copermittees is having a permit that, while being appropriately proactive and aggressive at addressing the prioritized water quality conditions with the Receiving Waters, is one that all Copermittees can remain in compliance with while implementing those requirements. As presently drafted (and as made clear by statements in the Fact Sheet), Provision A imposes immediate potential liability on every Copermittee if monitoring in the Receiving Waters reflects exceedances of water quality standards that may have been caused or contributed to by MS4 discharges. San Diego Water Board staff has repeatedly indicated in workshop presentations that they expect that Copermittees will not be able to comply with the Receiving Water Limitations and Discharge Prohibitions for some time. Staff has separately indicated that they are interested in having the Copermittees undertake bold initiatives in trying to address urban runoff pollution, and that the Copermittees have actually been encouraged to "fail early and fail often" as this would reflect such progress in refining these initiatives. The iterative, flexible and priority-setting approach reflected in the WQIP is intended to allow the Copermittees to focus on the most important problems in their watershed. The entire approach is endangered, however, by RWL provisions which would allow either the San Diego Water Board or a citizen plaintiff to sue the Copermittees for any individual exceedance of the

RWLs. Under the current version of Provision A, the unmitigated risk of such actions leads not to bold initiatives but rather to attempts to minimize liability.

As set forth in the Legal Comments, this approach is not mandated by the CWA, State Board orders or the opinion of the Ninth Circuit Court of Appeals in *Natural Resources Defense Council v. County of Los Angeles*, 673 F.3d 880 (9th Cir. 2011), *reversed*, 568 U.S. __ (January 8, 2013). As importantly, the threat of immediate potential noncompliance actually interferes with the ability of the Copermittees, including the Riverside County Copermittees, to comply with the Draft Permit. Instead of being able to focus on pollutants of highest concern in the watershed, as called for in the WQIP, the Copermittees will be forced to try to address every pollutant monitored, since the exceedance of any water quality standard leads to immediate potential liability. Moreover, because citizen plaintiffs are entitled to injunctive relief under Section 505(a) of the CWA, a federal judge could order the Copermittees to undertake steps completely independent of the WQIP or other compliance provisions in the Draft Permit.

The Riverside County Copermittees do not object to compliance provisions that will provide a means to achieve real improvement in water quality. The Copermittees are willing to undertake these Provisions, because the success or failure is in their control. Compliance with the requirements of Provision A, however, is beyond the control of the Copermittees. Based on the statements made during the workshop process, the Riverside County Copermittees believe that the San Diego Water Board is serious about working with the Copermittees on a permit that provides flexibility and problem solving approaches. To ensure that this flexibility is not lost, the Draft Permit must tie in compliance with Provisions A.1 through A.3 to a process set forth in Provision A.4. This approach is shown in the Redline and is discussed further below.

3.2.2 Comments in support of specific changes

Provision A, Introduction

The introduction notes that pollutants "in stormwater discharges" from the MS4 must be controlled to the MEP. As discussed above, the CWA does not differentiate between stormwater and non-stormwater discharges from the MS4; both must be controlled to the MEP standard. The Riverside County Copermittees have requested revised language in the Redline. Additionally, the linkage between compliance with Discharge Prohibitions (Provision A.1), Receiving Water Limitations (Provision A.2) and Effluent Limitations (Provision A.3) should be noted as being defined by Provision A.4. This change is reflected in the Redline.

A.1.a

First, language must be added providing that compliance may be addressed through the process set forth in Provision A.4. This language is provided in the Redline. Second, the Provision prohibiting discharges which are "threatening to cause" a condition of pollution, etc., is unenforceable, because it prohibits an action that, with respect to MS4 operators, is beyond their control. Moreover, there is no authority for such provisions in the Porter-Cologne Act. The Riverside County Copermittees request

deletion of this phrase, as shown in the Redline. Additionally, as set forth in the Legal Comments, the Provision improperly expands the Discharge Prohibitions to Waters of the State.

A.1.b

40 CFR § 122.26(d)(2)(iv)(B)(1) clarifies that the requirement for an MS4 Copermittee to "effectively prohibit" the discharge of Non-stormwater/illegal discharges into its MS4s is to be accomplished through "a program, including inspections, to implement and enforce an ordinance, orders or similar means…". The language of this Provision should reflect federal law in this respect. The Redline reflects this change.

A.1.c

First, this Provision requires the Copermittees to comply with the Basin Plan prohibitions listed in Attachment A. This list is over-inclusive, as it contains requirements that are not applicable to some or all of the Copermittees' MS4 discharges, or to the Riverside County Copermittees in particular. The Riverside County Copermittees request that this Provision be amended to read as follows: "Discharges from MS4s are subject to all applicable waste Discharge Prohibitions in the Basin Plan." This change is noted in the Redline. Second, language must be added providing that compliance with this restriction can be obtained through the process set forth in Provision A.4. This language is provided in the Redline.

A.2.a

First, this Provision and Provisions A.1. and A.3 should be linked to the iterative process described in A.4. Please see the Redline.

Second, not all plans, policies, etc. set forth in Provision A.2.a.(1)-(4) may qualify as "water quality standards" or be applicable to all the MS4 Copermittees. These subsections should be deleted, and replaced with a reference to "Water Quality Standards," which is a defined term in the Draft Permit (This change is reflected in the Redline). Otherwise, the MS4 Permit would become over inclusive with respect to what is considered a water quality standard. Such standards must be established in accordance with federal and state law. If this process has not been followed for a particular requirement, it is not a "water quality standard."

A.3.a

As discussed above, this Provision erroneously states that pollutants "in stormwater discharges" from MS4s must be reduced to the MEP. Please see the Redline.

A.3.b

This Provision should also provide that compliance with a TMDL constitutes compliance with Provisions A.1 and A.2, for those pollutants/waterbodies subject to the TMDL.

A.4.a

The Riverside County Copermittees support an approach whereby compliance with Provisions A.1 through A.3 are achieved through a truly iterative approach, one which reflects the intent of the

precedential State Water Board Order Nos. 99-05 and 2001-015. As set forth in the Redline, the Riverside County Copermittees believe that they and the other Copermittees under the Draft Permit should be considered in compliance with Provisions A.1, A.2 and A.3, as applicable, through development of the WQIP, unless the San Diego Water Board denies approval of a WQIP or amendment thereof. This ensures that the Iterative Process which is the focus of the WQIP, is utilized to provide a means to be in compliance for the Copermittees.

A.4.c

This Provision should be deleted, as is reflected in the Redline. Again, this Provision defeats the purpose of an iterative approach to compliance with the Provisions A.1 through A.3, because it allows the San Diego Water Board to enforce any provision of the Draft Permit, including those provisions at any time. The San Diego Water Board obviously retains full ability to enforce the provisions of the Draft Permit, including with respect to the failure of the Copermittees to carry out required provisions. To short circuit the WQIP/JRMP process, however, is to defeat the entire intent of the Draft Permit.

3.3 Provision B, Water Quality Improvement Plans

3.3.1 Overview of Key Issues

- The goals and requirements of the WQIP need to be aligned with the requirements of the CWA that were established specifically for MS4 permits, and not impose the restoration of Receiving Waters entirely upon MS4 Copermittees.
- The WQIP should focus on addressing sources of pollutants within the jurisdiction of the respective Copermittees.
- The BMP strategies identified in the WQIP should fully inform the selection and design of programs identified in the JRMP. Some minor edits were proposed in Provision B, with additional edits as warranted in Provisions D and E.

3.3.2 Comments in support of specific changes

Introductory paragraph

The introductory language implies that the WQIP should be designed to unilaterally protect, preserve, enhance, and restore water quality and Beneficial Uses in waters of the state. As noted in Section 2.3 above, MS4 Copermittees are responsible only for discharges from their MS4s, not the unilateral protection of Beneficial Uses within their watersheds.

Redline edits were provided to:

- Tie the goals of the WQIP to the requirements of the CWA applicable to MS4 Permits.
- Replace 'waters of the state' with 'Receiving Waters' to be consistent with federal law.
- Clarify the linkage between Provision A and Provision B.

Additionally, Redline edits were provided to clarify that the strategies identified in the WQIP are intended to guide the specific actions that will be implemented by the Copermittees pursuant to Provision E.

B.1

The Riverside Copermittees support the redlines of the San Diego County Copermittees with regard to setting forth that the WQIP for the Santa Margarita Watershed Management Area (WMA) would commence upon enrollment of the Riverside County Copermittees into the Order.

B.2.e.

Two changes have been proposed, as shown in the Redline:

- The introductory paragraph includes language that clarifies that the Numeric Goals are not enforceable compliance standards, effluent limitations, or Receiving Water limitations. This clarification is consistent with San Diego Water Board staffs' verbally stated intent.
- Provision B.2.e.(1) as written requires that the final Numeric Goals be "capable of demonstrating the achievement of the restoration and/or protection of water quality standards in Receiving Waters". As discussed in Provision 2.3 above, meeting WQS in Receiving Waters is a goal of the overall NPDES regulatory programs under the CWA and not as a requirement to be accomplished alone by MS4 Copermittees. Redline edits have been provided to clarify that such goals are only required to be for MS4 discharges.

B.3.

In the Redline, edits were made to the introductory paragraph to ensure that the requirements are consistent with federal law. The CWA requires the 'effective prohibition' of non-stormwater discharges, not 'preventing' or 'eliminating' them.

Edits were also made to Provision B.3.a. to link the strategies more clearly to the Numeric Goals developed pursuant to Provision B.2.e, as well as to link them to the JRMP programs in Provision E.

B.5

In the Redline, edits were made to the introductory paragraph to clarify that the WQIP (and by extension the JRMP and Monitoring programs) are intended to meet the requirements of Provisions A.1, A.2, and A.3. The Tentative Order particularly excluded Provision A.1.b. (dealing with non-stormwater discharges). However, as discussed in the attached Legal Comments, the CWA requires that illegal discharges must be addressed via a program (as included in Provision E.2), and it is appropriate that the program be guided by the priorities and strategies included in the WQIP.

Other edits were made to clearly link Provision B.5 to the applicable requirements of Provision F.

3.4 Provision C, Action Levels

3.4.1 Overview of Key Issues

- The Action Levels (non-stormwater, and stormwater) applicable within each watershed should only be those that are associated with the priority water quality conditions in that watershed, or that are 303(d) listed for that watershed. For example, if Zinc is not a priority pollutant for a watershed, and is not 303(d) listed, there should not be a Zinc action level. This change is needed because Provision D requires analysis for all 'action level' parameters. Analysis for pollutants that are not a priority for a watershed is a waste of Copermittee resources.
- The Copermittees should be able to establish alternative action levels that are appropriate to the WMA within their WQIP. Such alternative action levels would be subject to Executive Officer approval as part of the WQIP approval process.
- Footnote 8 and 10 need to clarify that the NALs and SALs are not enforceable limitations.
- Various references to 'waters of the state' need to be changed to Receiving Waters for consistency with the Draft Order and the CWA.

Please see the Redline for further detailed comments and language changes.

3.5 Provision D, Monitoring and Assessment

The Riverside County Copermittees appreciate the changes in the monitoring program reflected in the Draft Permit, as compared to the Administrative Draft. However, elements of the revised requirements are still infeasible for the Riverside County Copermittees. The comments below identify modifications of areas of the monitoring requirement's which can significantly improve the Copermittees' ability to implement and comply with the requirements, while still maintaining appropriate jurisdictional accountability and assessment requirements to guide the implementation of the WQIPs and JRMP programs. The Redline provides further detailed comments and language changes.

3.5.1 Overview of Key Issues

- Dry Weather MS4 Outfall Monitoring
  - The level of effort dedicated to monitoring and addressing outfalls with non-stormwater discharges should be commensurate with the potential impact that discharge has on a Receiving Water. If a discharge, whether persistent or transient, has no or little potential for impacting a flowing Receiving Water, (e.g. due to infiltration, evaporation, or treatment of the flows), the outfall should be de-emphasized relative to other outfalls that have discharges that have connectivity to a flowing Receiving Water.
  - Outfall Dry Weather Field Screening – As currently drafted, the number of required visual inspections of outfalls during dry weather required per Provision D.2.a.(2)(a) and Provision D.2.b.(1) is both excessive and disproportionate. This will particularly impact smaller jurisdictions, which may be required to do more visual inspections of MS4 outfalls than would larger jurisdictions with more outfalls and more resources.
  - Similarly, as written, the Persistent Flow Outfall Monitoring requirements of Provision D.2.b.(2)(b) are excessive and also will disproportionately impact smaller jurisdictions.

Jurisdictions with several hundred outfalls will likely have significantly more resources to perform the required monitoring than smaller jurisdictions with fewer outfalls, yet both are required to implement the same level of persistent flow monitoring.

- Assessment Requirements
  - The assessment requirements require modeled extrapolation of monitored outfall data to non-monitored outfalls for the purposes of calculating loads from each outfall in each jurisdiction. Such extrapolations though modeling or other calculations will not accurately reflect actual jurisdictional loads, and have no benefit that directly analyzing the monitored data cannot more accurately provide.

3.5.2 Other Global Issues

- As currently drafted, MS4s operated by a flood control district within a city or county would be effectively double-counted for identification of outfalls in each jurisdiction and for performance of the load calculations from each jurisdiction. Additionally, Flood Control Districts have no land use or enforcement authorities outside of the MS4 and rely on the local Copermittee to address pollutant sources and discharges to their MS4. Redline edits have been included to clarify the relationship between districts and the municipal jurisdictions they serve for the purposes of outfall monitoring and the assessment requirements.
- Timelines for monitoring and assessments were clarified throughout and linked to specific reporting requirements of Provision F in the Redline.

3.5.3 Comments in support of specific changes

D.1.a.(3) and D.1.e.

The Redline clarifies that the Receiving Water monitoring described in these sections must be conducted as applicable to the WMA and the Copermittees' MS4 discharges, because some of the monitoring requirements only apply to MS4 discharges to certain waterbodies. Not all Copermittees within a WMA will have discharges to that waterbody.

D.1.b.

The Redline proposes language to allow for alternative long-term monitoring stations to be identified. Using the SMR as an example, the Copermittees might wish to utilize a location other than the existing stations due to the influence of groundwater during dry weather and/or the general lack of MS4 contributions in dry weather to those locations.

Table D-1 and D-6

The Redline proposes an addition to the list of field observations, an assessment for flow connectivity of any MS4 discharges to the sampled Receiving Water. It is important to know whether the sampled Receiving Water included a contribution of flows from MS4 discharges, or whether the data reflect conditions in the absence of an apparent MS4 discharge contribution.

D.2.a.(2)

The Redline clarifies that the identification of annual outfall monitoring requirements is based on municipal Copermittee boundaries, inclusive of Flood Control District MS4 outfalls within their jurisdiction.

The Redline clarifies that the field screening requirements apply to those outfalls in the Copermittee's inventory that are 'accessible'. If an outfall is inaccessible for safety reasons or due to habitat restrictions, it would not need to be field screened.

The Redline simplifies the 'tiers' in Provision D.2.a.(2)(a) by removing the lower tier (i), and expanding the second tier (ii) to cover all Copermittees with 500 or less outfalls. This resolves the disproportionality that occurs for Copermittees with a number of outfalls near the current 125 outfall threshold. For example, as currently drafted, a city with 150 outfalls would be required to do 150 visual inspections per year, but a smaller city with 120 outfalls would be required to do 192 visual inspections per year. The Redline also maintains the 80% requirement from the first tier to help smaller Copermittees manage their workload for meeting the field screening requirements while also conducting the additional source identifications that are required under the Draft Permit.

The Redline includes edits to Footnote 19 to clarify that persistent flow should effectively be a discharge that is hydraulically connected to a flowing Receiving Water. Any other discharges that are not affecting a flowing Receiving Water (such as pooled or ponded water) would be addressed as a Transient Discharge, with source IDs any time an obvious illegal discharge (i.e. color or odor) is identified.

D.2.a.(3)

The Redline incorporates edits proposed by the San Diego County Copermittees to require 10% of the samples in each WMA to be from a first storm event. As described in the comments of the San Diego County Copermittees, this will help avoid overly skewing of the data to 'first flush' data, while still incorporating such data into the data and analyses.

D.2.b.(1)

The Redline removes the requirement that the number of visual inspections performed be equivalent to the number of inspections required under Provision D.2.a.(2)(a).

As areas within a jurisdiction are confirmed not to have non-stormwater discharges, inspections of other outfalls would have to be perpetually (and unnecessarily) increased to maintain compliance with this requirement. For example, if a Copermittee had 150 outfalls, but after the transitional period it confirmed that 100 of those outfalls had no evidence of non-stormwater discharges to flowing Receiving Waters, it would have to visit the remaining 50 outfalls for up to three times a year to meet the requirement in this Provision. As the Copermittee got closer to eliminating non-stormwater flows at more outfalls, inspections at the remaining outfalls would quickly become excessive and unreasonable. Removing this requirement will better incentivize the elimination of non-stormwater

flows, as a Copermittee can look forward to reducing its workload in areas confirmed to not have non-stormwater flows.

D.2.b.(2)(b)

While the Riverside County Copermittees support the San Diego County Copermittees' proposal to reduce the number of required outfalls from 10 to 5 persistently flowing outfalls per WMA, the Riverside County Copermittees believe that applying the same minimum bar to all Copermittees is inappropriate and disproportionately affects smaller Copermittees that have commensurately less staff and resources.

The Riverside County Copermittees propose requiring monitoring of the top 10% of the prioritized persistent flow outfalls, with a lower and upper limit of 1 and 5 respectively, as shown in the redlines. With this change, the level of effort required of any individual Copermittee would scale consistent with the number of persistent flow outfalls within each Copermittees' jurisdiction.

Additionally, the Riverside County Copermittees request changing the requirement of Provision D.2.b.(2)(b)(ii) to require annual monitoring rather than semi-annual monitoring. With this change, a Copermittee could focus more of their annual budget on conduction Source ID efforts – which can result in eliminating problematic non-stormwater flows, rather than on a second monitoring event. Copermittees would still have the option to conduct a second monitoring event if they have more resources available and want to remove the outfall from their monitoring list sooner in accordance with Sub-Provisions [a] through [d].

D.2.b.(2)(e)

The Riverside County Copermittees support the San Diego County Copermittees' comments regarding allowing for a tailored list of constituents to be developed for each WMA. The Redline incorporates those edits.

D.3.

The Riverside County Copermittees support the changes recommended by the San Diego County Copermittees to this section, and these changes are reflected in the Redline.

D.4.a.(2)

This Provision as drafted would require the MS4 Copermittees to make comprehensive evaluations of Beneficial Uses that are beyond their expertise or the scope of an MS4 permit. Such evaluations and determinations would require advanced studies and cannot be answered with the monitoring data collected through this permit. This Provision should either be deleted or, alternatively the Riverside County Copermittees request that the assessments be focused on determining the status and progress toward addressing any Numeric Goals established for those Receiving Waters in the WQIP. Please see the Redline.

D.4.b.(1)

The Redline clarifies that outfall assessments are to be done for the area covered by each Municipal Copermittee (consistent with the proposed definition), and that the data to be used by each Municipal Copermittee would include the data collected from any Flood Control District Copermittee operated MS4s within its jurisdiction. This ensures that jurisdictional data is not double reported for Flood Control District MS4s within a city or county.

For Sub-Provision D.4.b.(1)(c)(iv) three key changes are requested in the Redline:

1) Annual volumes and pollutant loads should only be calculated from the monitored outfalls with persistent discharge to a flowing Receiving Water. This is directly applicable to the purpose of the Draft Permit and an important change, because volume and pollutant data extrapolated to non-monitored MS4 outfalls would be inaccurate and potentially misused if taken out of context. It is understood that San Diego Water Board staff want to ensure that jurisdictional accountability is maintained. However, since MS4 outfall monitoring will be conducted within each jurisdiction, inter-jurisdiction comparisons and accountability can be accomplished using the monitoring data directly without such extrapolations.
2) Added language to require a Copermittee to include in its jurisdictional load calculations any discharge that was demonstrated to have entered another Copermittees' MS4 before being discharged into the flowing Receiving Waters. This is important to ensure that each Copermittee maintains accountability for pollutants discharged to flowing Receiving Waters from within its jurisdiction.
3) The Redline proposes that the calculations of pollutant loads be only for the priority water quality constituents identified in the WQIP.

D.4.b.(2)(b)

Two key changes are recommended in the Redline:

1) Annual volumes and pollutant loads should only be calculated from the monitored outfalls for the monitored storm events. This is an important change because volume and pollutant data extrapolated to non-monitored events would be inaccurate and potentially misused if taken out of context. It is understood that San Diego Water Board staff want to ensure that jurisdictional accountability is maintained, so the Redline proposes that data from the monitored outfalls be extrapolated to identify loads for each jurisdiction during each monitored event. With this information, inter-jurisdiction comparisons and the desired 'accountability' can be accomplished using the monitoring data directly without such extrapolations to non-monitored events.
2) The Redline requests that calculations of pollutant loads be performed only for the priority water quality constituents identified in the WQIP.

D.4.b.(2)(c)

The Redline edits are consistent with those proposed by the San Diego County Copermittees, with minor modifications for clarity.

D.4.d.(2)(c)

It would be difficult to proactively determine the pollutant load reductions that *would* be necessary to demonstrate that discharges *are not* causing or contributing to exceedances of Receiving Water Limitations. Instead it would make more sense to calculate the necessary pollutant load reductions where the discharge has been demonstrated to be causing or contributing to such exceedances. In such circumstances, the necessary parameters would be known to calculate the needed load reduction. These changes are set forth in the Redline.

3.6 Provision E.1, Legal Authority

3.6.1 Overview of Key Issues

The Riverside County Copermittees note that Provision E.1, relating to the establishment of adequately legal authority, exceeds the requirements of federal CWA regulations in several respects. The federal regulations at 40 CFR 122.26(d)(2)(i)(A)-(F), provide explicit guidance for the Copermittees in developing the necessary legal authority to control MS4 discharges within its jurisdiction. However, several of the subsections of Provision E.1 go beyond these federal requirements, with respect to areas not within the responsibility of MS4 dischargers, such as negotiating with non-Copermittee entities. The Riverside County Copermittees have provided requested changes in the Redline, which are explained briefly below.

3.6.2 Comments in support of specific changes

E.1.a(1)

Changes in the Redline to accurately reflect the language of 40 CFR 122.26(d)(2)(i)(B).

E.1.a(2)

Changes in the Redline to accurately reflect the language of 40 CFR 122.26(d)(2)(i)(A). In addition, the Provision as written improperly requires the Copermittees to control the quality of runoff from sites covered by the state general permits for industrial activity and construction. These general permits are enforced by the State Board and the regional boards, and it is a state responsibility which cannot be handed off to the Municipal Copermittees.

E.1.a(3)

Changes in the Redline to accurately reflect the language of 40 CFR 122.26(d)(2)(i)(C).

E.1.a(5)

The Redline requests deletion of this Provision, which is not a requirement for municipal stormwater dischargers set forth in the CWA regulations. The Provision also improperly requests the Municipal Copermittees to attempt to negotiate with third parties the contribution of pollutants to the Copermittees' MS4. The Copermittees have no jurisdiction over such parties. The San Diego Water

Board has such jurisdiction, and should take responsibility for addressing non-MS4 sources of pollutants that may ultimately enter the MS4.

E.1.a(6)

Changes in the Redline to reflect accurately the language of 40 CFR 122.26(d)(2)(i)(E).

E.1.a(7)

The Redline requests deletion of this Provision, which is not a requirement for municipal stormwater dischargers set forth in the CWA regulations.

E.1.a(8)

The Redline requests deletion of this Provision, which is not a requirement for municipal stormwater dischargers set forth in the CWA regulations.

E.1.a(9)

The Redline requests deletion of this Provision, which is not a requirement for municipal stormwater dischargers set forth in the CWA regulations.

E.1.a(10)

The Redline requests both correction of the language in this Provision to comport with the federal regulations in 40 CFR 122.26(d)(2)(i)(F) and deletion of the second clause of this Provision, which is not found in 40 CFR 122.26(d)(2)(i)(F). Moreover, the requirement to inspect and monitor in the first clause of this Provision covers the issues set forth in the second clause. It is therefore unnecessary.

3.7 Provision E.2, IDDE

3.7.1 Overview of Key Issues

- The Draft Permit requires the Copermittees to address all non-stormwater discharges from the MS4 as illegal discharges, and then describes certain sources that need not be prohibited. This is effectively a 'guilty until proven innocent' provision, where a Copermittee will be required to expend potentially significant resources conducting source identification efforts any time non-stormwater is observed discharging from the MS4. In addition to the issues discussed in the Legal Comments, the Provision raises two practical and logistical problems:

    - This requirement is entirely independent of the determination that there are in fact any significant pollutants in such a discharge. A Copermittee could be spending substantial sums tracking (and then potentially enforcing upon) the source of a discharge that is not negatively impacting Receiving Waters. This not only is a waste of public resources, but would undermine the credibility of stormwater programs.
    - The San Diego Water Board and the State Water Board do not treat non-stormwater flows in the same manner across all of their regulatory mechanisms. For example, Order

> No. R9-2008-0002 allows non-stormwater discharges to occur, POTWs are issued permits for their discharges and agricultural operators can discharge irrigation water. The Copermittees should not be forced to conduct an expensive source investigation, only to find that the discharge complies with a permit or a waiver granted by the Water Board. The Copermittee would have no ability to address such a discharge as an 'illegal discharge', and further would have no ability to recuperate their costs for the source identification.

The best way to address these issues, is to require the Copermittee to have and enforce an effective prohibition of illegal discharges of *pollutants* (through statutes, ordinances, permits, contracts, orders or similar means), and then allow the Copermittee full discretion to determine which non-stormwater discharges have the potential to negatively impact Receiving Waters, consistent with the WQIP priorities – and address those as illegal discharges.

- Several categories of non-stormwater discharge that were previously conditionally exempt consistent with the CWA, are required by the Draft Permit to be treated as illegal discharges, unless they have coverage under another order issued by the San Diego Water Board. In addition to the problems identified above for conducting enforcement in the absence of a pollutant discharge, the San Diego Water Board, not the Copermittees, is responsible for evaluating coverage, need for coverage, and compliance with other orders issued by the Water Board. The Copermittees have neither authority nor jurisdiction. Please see the Redline.
- Several categories of non-stormwater discharge that were previously conditionally exempt consistent with the CWA, are required by the draft permit to be 'controlled' or otherwise prohibited by the Copermittees. The Fact Sheet further describes that such controls are warranted because they could potentially contain pollutants. However, the CWA only requires controls where the discharges are determined to be a significant source of pollutants. Please see Legal Comments for a further discussion of this issue as well as the Redline.
- The Draft Permit eliminates the conditional exemptions for Landscape Irrigation, Irrigation Water, and Lawn Watering (collectively 'irrigation runoff'). The San Diego Water Board has provided no data demonstrating that these discharge categories have contributed a significant pollutant load to Receiving Waters within Riverside County. Information discussed in the Fact Ssheet focuses on data from other counties. The only data from Riverside County is public educational material referring to irrigation runoff; this material, however, was adapted from public education material from other counties. That public educational material was intended to help prevent such discharges from becoming a significant source of impact on the Receiving Waters, and did not constitute a determination that such discharges are in fact, actually a significant source that needs to be subject to a prohibition. See the discussion in the Legal Comments as well as the Redline.
- The Draft Permit, in Provision E.2.a.(7) requires efforts to minimize or eliminate all non-stormwater flows, including those that are natural, conditionally exempt, or otherwise permitted by the San Diego Water Board, regardless of whether or not such discharges are not contributing pollutants to the MS4. Such a requirement conflicts with the prior Provisions E.2.a.(1) through

(5), which state conditions where such discharges need not be prohibited. The requirement should therefore be removed, as set forth in the Redline.

3.7.2 Comments in support of specific changes

E.2.a.(1) and (3)

The Riverside County Copermittees request that this Provision be deleted (as shown in the Redline) and the categories of non-stormwater discharges be re-incorporated into Provision E.2.a.(3). The apparent premise of Provision E.2.a(1) as drafted is that since the San Diego Water Board requires those discharges to have coverage under a separate order, they are illegal if they lack such coverage. The MS4 Copermittees, however, are not responsible for enforcing discharge coverage under separate San Diego Water Board orders; that is the responsibility of the San Diego Water Board itself. Requiring the Copermittees to enforce such entities for their lack of coverage under a separate San Diego Order shifts that responsibility from the Board to Copermittees. This is not authorized by the CWA or the Porter-Cologne Water Quality Act. The Copermittees are, under the CWA, only required to address such discharges as illegal discharges if the discharge is found to be contributing a significant pollutant load to the MS4. By moving those categories to Provision E.2.a.(3), as shown in the Redline, the Copermittees will still be required to treat such discharges as illegal discharges if and when they are found to be contributing significant pollutants to the MS4. This proposed approach is consistent with other MS4 permits in the state, including prior San Diego Water Board orders, and is further consistent with the approach taken for the WQIP, which is intended to allow the Copermittees to focus resources on addressing the specific impacts that MS4 discharges are having on Receiving Water quality.

E.2.a.(2)

This Provision requires the Copermittees to treat water line breaks as illegal discharges, which in turn requires the Copermittee to conduct enforcement measures. Water main breaks are accidental occurrences, or may be the result of acts of nature. It is no more appropriate to treat accidents as illegal and subject to enforcement than it would be for a city to declare vehicular accidents as illegal, and conduct enforcement against those involved. This language needs to be removed as shown in the Redline. Additionally, as discussed in the Legal Comments, a recent case from the federal district court in Virginia suggests that the regulation of mere flow may exceed the authority of the CWA.

E.2.a.(4)

The Redline clarifies that if the 'statues, ordinances, permits, contracts, orders or similar means' are enacted/adopted by a Copermittee, the categories of non-stormwater discharges listed do not need to be treated as illegal discharges. Otherwise, the language could be read to imply that, for example, if it was infeasible for a particular resident to direct wash water to landscaped areas, that the Copermittee would be required to treat that residents' discharge as illegal and enforce upon them.

E.2.a.(5)

Contrary to the provisions of the CWA regulations, prior MS4 permits issued by the San Diego Water Board and other permits in the state, the Draft Permit requires implementation of BMPs, where

feasible, during emergency firefighting activities. During such emergencies, all focus of public resources must appropriately be dedicated to protecting life and property. Any diversions from that mission would only serve to diminish and potentially compromise that mission. The Redline proposes language consistent with that adopted by the San Diego Water Board in 2010 for the Riverside County MS4 Permit (Order R9-2010-0016).

E.2.a.(7)

Provisions E.2.a.(1) through E.2.a.(6) describe circumstances where non-stormwater discharges need not be prohibited. This Provision then requires the Copermittees to minimize such 'conditionally allowed' flows anyway. This requirement exceeds the scope of the CWA and its implementing regulations and makes no sense. The Redline requests deletion of these Provisions.

E.2.b.(1)(d)

This Provision requires the MS4 Copermittees to map all known private outfalls to Receiving Waters. Such a requirement is beyond the scope of an MS4 permit and should be removed, as shown in the Redline. The Draft Permit does not require a Copermittee to address private outfalls to Receiving Waters; this is the responsibility of the San Diego Water Board, which governs all waste dischargers under the authority of the CWA or the Porter-Cologne Act.

E.2.b.(4)

This Provision requires the Copermittees, in conjunction with a spill, to 'prevent contamination of surface water, groundwater, and soil.'This requirement is clearly beyond the scope of an MS4 permit issued under the CWA (which regulates only discharges of water containing pollutants *from* the MS4 to Receiving Waters) and must be removed, as shown in the Redline. The Draft Permit could more appropriately require the Copermittees to 'coordinate, to the extent possible, with spill response teams to prevent entry of spills into the MS4.'

E.2.d.(2)(e)

The Redline requests edits to clarify that the intent of this Provision is to document and attempt to quantify any obvious sources of non-stormwater illegal discharges in response to the outfall monitoring, and that it is not necessary to conduct a full source identification any time there is evidence of water near an outfall.

New Provisions E.2.d.(3)(e)-(f)

The Redline adds two new provisions to this section to address a gap in potential outcomes from a source identification effort. These Provisions address scenarios where a Copermittee identifies A) the illegal discharge is coming from another upstream Copermittees' MS4, or B) that the discharge has been authorized by the San Diego Water Board, either through an order or waiver of WDRs. In the first scenario, the responsibility to continue the source identification, and conduct enforcement, would be transferred to the upstream Copermittee. In the second scenario, the responsibility for follow-up would fall on the San Diego Water Board, after receiving relevant information from the Copermittee. This Provision also provides for reimbursement to the Copermittee for the cost of the source identification, since the San Diego Water Board required the Copermittee to conduct the investigation,

while not commensurately prohibiting all non-storm water discharges from all other sources regulated by the Water Boards.

3.8 Provision E.3, Development Planning

3.8.1 Overview of Key Issues

- Priority Development Projects - The Tentative Order identifies categories of projects that are to be defined as 'Priority Development Projects' (PDPs), which in turn will be required to comply with specific water quality and Hydromodification mitigation and quantitative requirements. The criteria for PDPs is quite broad and would include the majority of development projects, from small convenience stores and residences, to mega malls and specific plan developments. The Fact Sheet describes that while some smaller project types may not have significant pollutant loads, they may have a hydrologic impact upon Receiving Waters. However, it is important to recognize that pursuant to Provision E.3.a., All projects are required to implement a variety of LID principles such as disconnecting impervious surfaces, draining impervious surfaces to landscaped areas, and minimization of soil compaction in landscaped areas. Since such LID principles will be implemented wherever feasible consistent with the MEP standard, these smaller development projects are unlikely to create a pollutant or hydrologic impact. Additionally, the Fact Sheet advocates incentivizing LID design concepts and green infrastructure and building principles. Accordingly, the Redline requests changes to Provision E.3.b.(3) as described in Provision 3.8.2 below. The Legal Comments further note the potential impact of the Virginia case (*Virginia Dept. of Transp. v. U.S. Environmental Protection* Agency) holding that the CWA does not regulate stormwater as a pollutant.
- Design Capture Volume – There are two problems with how the Draft Permit defines the Design Capture Volume:
    - The Draft Permit changes the 'design capture volume' from previous permits by eliminating the term 'runoff'. Prior permits described that the design capture volume is the volume of stormwater <u>runoff</u> from the 24-hour 85th percentile storm event. This permit changes that to be the volume of stormwater <u>produced</u> from a 24-hour 85th percentile storm event. The elimination of the term 'runoff' means that BMPs would need to be sized potentially much larger than previously. For example, if the 85th percentile storm is 1" and a BMP is designed to treat 1 acre of residential land with a coefficient of runoff of 0.6, then under the current permits the BMP must be sized to hold 2,178 cubic feet of water. However, under the language of the Draft Permit, the BMP treating the same area would be required to hold 3,630 cubic feet of water, a 70% increase in BMP size. Accordingly, the Redline restores the term 'runoff'.
    - Additionally, the Draft Permit defines the Design Capture Volume alternatively as: *"the volume of storm water that would be retained onsite if the site was fully undeveloped and naturally vegetated, as determined using continuous simulation modeling techniques based on site-specific soil conditions and typical native vegetative cover."* In addition, to the problem identified above regarding the volume of storm water <u>runoff</u>, this language does not provide a temporal standard for determining which volume to

calculate from a continuous simulation model. Additionally, such models are not commonly used among general practitioners in the civil engineering community. The Redlines propose an alternative and simpler approach for this second definition: "The volume of stormwater runoff produced from a 24-hour 85th percentile storm event, that would be retained onsite in the pre-project condition." This definition is advantageous for several reasons: 1) it is simple for any civil engineer to understand, calculate, and comply with and is based on the same storm and hydrologic calculations as the first option, 2) it respects natural hydrology for the site, which may have had runoff in the pre-project condition, and as such, is more compatible with the intent of LID to mimic natural hydrology, and 3) as a result it is less likely to result in potential degradation of Beneficial Uses downstream, from reductions in flows beyond the pre-project condition.

- Pre-Project vs Pre-Development – Both the Storm Water Pollutant Control BMP requirements and the Hydromodification Management BMP requirements in the Draft Permit specify a 'pre-development' condition as the mitigation standard for all PDPs. In addition to the legal problems with such a standard as set forth in the Legal Comments, there are practical problems with the standard.
    - The presumption made in the discussions in the Fact Sheet are that all Receiving Waters can, and will, be restored to a fully natural condition - effectively to a natural floodplain. This presumption does not address reality, which is that development has occurred in those floodplains over many generations. The San Diego Water Board obviously lacks the authority to force homeowners and businesses to vacate such floodplains to effectuate restored natural conditions. Such an action would represent an unconstitutional taking. Moreover, the Legislature, in the Flood Control Acts covering all three counties proposed to be covered by the Draft Permit, has specifically authorized Flood Control Districts to construct flood control structures required to protect the lives and properties of the citizens.
    - Mitigation to a pre-development condition also may not be necessary to protect Receiving Waters from the effects of Hydromodification. If, for example a Receiving Water with existing development tributary to it, has not experienced increased erosion due to that existing development, there is no reason to require Hydromodification mitigation to anything more than the existing condition. In the counter-example, if under the existing condition the Receiving Water has experienced increased erosion due to that existing development, then, legal issues aside, there would be technical benefit to mitigating to that pre-development condition.

  The Redline proposes alternative language that requires mitigation to a pre-development standard only where it is legal and technically justified based on the conditions of the Receiving Water.
- Alternative Compliance – The alternative compliance project options as set forth in the Draft Permit pose two key problems:

- Several statements are conflicting and thus confusing as to what the required standard is for the various alternative compliance projects. For example, throughout Provision E.3.c. it is stated that 'a PDP may be allowed to comply with Provision E.3.c.(1)(a) and/or Provision E.3.c.(2) if they …'. This language can be mis-read to imply that the project must comply both with Provisions E.3.c.(1)(a) and E.3.c.(2) *and* implement the alternative compliance project (thus negating the benefit of alternative compliance). The Redline clarifies this language.
- The Biofiltration option set forth in the Draft Permit arbitrarily, and without technical basis or justification, **doubles** the sizing standard for biofiltration BMPs from 0.75 times the design capture volume (as set forth in the 2010 MS4 Permit and the 2009 Orange County Permit) to 1.5 times the design capture volume. The existing 0.75 standard was set due to the fact that 1) the 85th percentile 24-hour storm occurs over a period of time, and 2) such BMPs have outflows and will regain some capacity during the storm event, and as such, do not need to instantaneously hold the entire 'Design Capture Volume' to have fully treated that volume. In fact, studies have shown that in addition to yielding excellent pollutant concentration reductions, LID Biofiltration BMPs are excellent at reducing the volume of runoff similar to retention BMPs. According to the ASCE International BMP database 60% or more of the long-term volume of runoff from a site can be retained within a Bioretention BMP (Bioretention BMPs are the primary 'biofiltration' BMP now allowed in Riverside County). In comparison, a Retention BMP sized to hold the runoff from the 85th percentile storm event (the Design Capture Volume) will end up retaining approximately 80% of the long-term volume of runoff. Thus, by simple proportions, a Bioretention BMP sized to 'hold' 100% of the Design Capture Volume may also be able to retain 80% of the long-term volume of runoff. $\left(\frac{0.75\times DCV}{60\%\ retained}=\frac{1.0\times DCV}{80\%\ retained}\right)$. This is being validated through Bioretention BMPs that have been constructed and are being monitored for such volume reductions at the Riverside County Flood Control District's headquarters in Riverside. Further, Biofiltration BMPs have the added benefit of providing better overall treatment of back to back storms. Where a Retention BMP would be full after the first storm, fully bypassing the second storm without treatment, a Biofiltration BMP will have restored some capacity after the first storm, providing for treatment of some or all of the second of the back to back storms. Thus, the attached redlines propose changing the sizing factor for Biofiltration BMPs to 1.0 times the Design Capture Volume. The Redline proposes changes consistent with these comments.

3.8.2 Comments in support of specific changes

Introduction

Provision E.3.g (Strategies to address the highest priority water quality conditions) was moved to the beginning to support and better integrate the development planning programs in the JRMP with the strategies developed in the WQIP.

E.3.a.(3)

The Redline changes the title of this section (and other appropriate references to this Provision) to refer to LID Principles, as identified in the CASQA LID Manual for Southern California (https://www.casqa.org/LIDDemo/LowImpactDevelopmentManual/tabid/242/Default.aspx)

E.3.b.(1)(c) (New Provision)

This Provision was added to clarify the requirements if a project that was already subjected to SSMP requirements redevelops a portion of the site.

E.3.b.(2)

The Redline edits shown for this Provision are primarily to simplify this Provision, by grouping various categories by their applicable square footage threshold and including some of the specifics in the definitions (Attachment C). Other changes (beyond reorganization) include:

- Removing the addition of 'driveways' from subsection (g) as described in Provision 3.8.1 of this letter.
- Adding a footnote for parking lots, to clarify that the trigger would not include parking lots that are not exposed to runoff, such as subterranean or covered parking lots. It is beneficial to not have parking lots exposed to runoff; excluding such parking lots from being defined as a PDP is a good way to encourage such practices.
- Hillside development projects were not included as it is not believed to be necessary anymore with the relatively low threshold (10,000 square feet) identified for other categories included in this and other recent MS4 permits.
- The definition for "Environmentally Sensitive Areas" from existing MS4 permits was restored to include the language referring to discharges that are not commingled with flows from adjacent or other upstream lands (note that the change is shown in the definitions per the re-organization suggested above).

E.3.b.(3)

- The PDP exemption for sidewalks, bicycle lanes, or trails, [E.3.b.(3)(a)] has been expanded to as shown in the Redline to include driveways and parking lots. If those projects implement criteria already described in that section, they are also unlikely to create an impact to Receiving Waters. Further, including those project types in that exemption will further incentivize developers to utilize those LID Principles.
- The exemption described in Provision E.3.b(3)(b), was modified as shown in the Redline, and as discussed in the comment letter submitted by the Riverside County Transportation Department. Please see that letter for a justification for the requested changes.
- As shown in the Redline, the exemptions for new and redeveloped single family residences [E.3.b.(3)(c) and (d)] were consolidated into a new provision [E.3.b.(3)(c)], covering all single family residential projects (both new and redeveloped). The key difference is that such projects would be considered exempt if they are both 1) not part of a larger common plan of development or planned subdivision, and 2) successfully incorporate each of the applicable source control and LID Principles identified in Provision E.2.a.(2)-(3) to the MEP.

- A new Provision-E.3.b.(3)(d), titled 'Watershed Protection Projects' was added in the Redline. The project types described therein are all projects that are undertaken to rehabilitate or prevent environmental, social, and economic damage within the watershed, including Receiving Waters. These projects, while they may in some cases require some level of impervious surfaces to be constructed, are 1) not designed for human use or activity that would generate pollutants, or are designed specifically to mitigate such pollutants; and 2) will implement each of the applicable source control and LID Principles identified in Provision E.2.a.(2)-(3) to the MEP.

E.3.c.(1)

In addition to the edits discussed in Provision 3.8.1 of this letter, the Redline removed subprovision E.3.c.(1)(c) , for two reasons:

- The requirements that must be met to when implementing an alternative compliance project are more fully described in Provision E.3.c.(3).
- The language, as drafted, appeared to require double-mitigation. It requires that: 1) conventional treatment is required to treat the entire volume not retained onsite, and 2) the pollutant load discharged must also be mitigated with an alternative compliance project. Such a scenario would be requiring double-mitigation. The Redline provides a clearer and more simple mitigation standard.

E.3.c.(2)

The Riverside County Copermittees have two concerns with this Provision:

- The first concern is the universal requirement to mitigate to the 'pre-development' standard, as discussed above in section 3.8.1 of this letter. The Copermittees in the Redline propose that this language be changed to the 'pre-project' condition. For new development projects, the 'pre-project' condition will be equivalent to the 'pre-development' condition. For redevelopment projects, the standard would be the conditions that exist onsite prior to the construction of the project. This is appropriate, because in many areas, particularly in areas of existing development that would be subject to 'redevelopment', Receiving Waters are engineered and maintained to 1) provide flood protection for the public, 2) ensure that floodwaters don't comingle with pollutants on adjacent private properties and 3) to ensure that the existing development draining to that system does not cause erosion. In cases where the Receiving Waters are not engineered and maintained, and erosion problems caused by existing development are observed, language has been added to the Redline to provide for additional standards to be developed in the WQIP, based on the WQIP priorities.
- Additionally, the Redline proposes an additional exemption from HMP requirements for projects that discharge into conveyance channels that are engineered and maintained for the build-out condition all the way from the project to a waterbody that is sufficiently resistant to Hydromodification. This language is consistent with the above discussions, and ensures the PDPs are not required to mitigate for non-existent impacts. Please see the specific language in the Redline. The engineered channel exemption can be found in other recent MS4 permits, including the recently adopted Los Angeles County MS4 Permit.

E.3.c.(3)(a) and (b)

These two Provisions were re-written in the Redline to be simpler and clearer on what BMPs, criteria, sizing standards are required for what type of project. This alternative language still meets the intent of the Draft Permit, while being easier to understand and comply with. Aside from simplifying the language, the following other changes were made in the Redline:

- The alternative compliance options must be determined to provide an equal or greater overall water quality benefit for the WMA.
- Additional options were provided for who can design the alternative compliance projects
- All alternative compliance projects are required to be consistent with the strategies in the WQIP. While the specific alternative compliance project would not be required to be identified in the WQIP, the goal of this language is to ensure that allowing the alternative compliance project would not in any way be detrimental to or contrary to the strategies in the WQIP.
- Requirements E.3.c.(3)(a)(iv) and (v) were removed entirely, as they conflict with E.3.c.(3)(a)(iii) which allowed the projects to be in the same WMA (preferably the same HSA)
- Changed the sizing factor for Biofiltration BMPs to 1.0 as discussed in section 3.8.1 of this letter, and deleted the option [d] which required triple mitigation by requiring Biofiltration + Conventional Treatment + Alternative Compliance projects.
- Added Conventional Treatment Control BMPs as an alternative compliance option, only where it has been shown to be technically infeasible to meet E.3.c.(1) and technically infeasible to implement LID Biofiltration Treatment Control BMPs.

E.3.c.(3)(c)

Redline edits in this section are primarily to simplify and consolidate the requirements. Sub-Provision [C] was removed, as it was duplicative of the mitigation standards for the alternative compliance project are specified in E.3.c.(3)(b) and E.3.c.(3)(c)(i)[a].

3.9 Provision E.4, Construction

3.9.1 Overview of Key Issues

This Riverside County Copermittees' comments and edits are set forth in the Redline.

- One key issue for the Copermittees is the edit shown in the Redline to Provision E.4.c, which clarifies that the Copermittees are responsible for *requiring* BMPs at private construction sites, and *implementing* BMPs at Copermittee construction sites.

3.9.2 Comments in support of specific changes

The Redline edits include comments supporting the requested edits.

3.10 Provision E.5., Existing Development

3.10.1 Overview of Key Issues

The Draft Permit includes requirements for advanced programs to identify opportunities and implement programs to facilitate the construction of Retrofit and Stream/Channel/Habitat Rehabilitation projects on private properties. Such requirements are clearly beyond the requirements of the CWA for a management plan to be implemented by an MS4 Copermittee. The Riverside County Copermittees request deletion of these requirements.

Alternatively, the Riverside County Copermittees have the following comments:

While these retrofitting and rehabilitation approaches can be helpful and/or needed in some circumstances, they are not required in all circumstances, nor are required to address all pollutants that may be identified in a WQIP as the highest priority water quality conditions. For example, some pollutants are best addressed with regulatory source controls at the state or federal level, such as the removal of copper from brake pads, and controls on pesticides, while other pollutants can be adequately addressed through inspections and enforcement. There are several problems with requiring Copermittee resources to be invested in such Retrofit and/or Rehabilitation strategies (collectively referred to as 'retrofit'):

- Land Ownership: The land that could potentially be identified for retrofit would likely not be owned by a Copermittee. The Copermittee therefore has no ability to force the property owner to retrofit their property. Although the Copermittee could potentially implement programs to "facilitate" implementation, such a program would still be limited by the rights of the individual property owner. Even if a Copermittee were to attempt to purchase a privately owned existing development for the purposes of retrofit (a step going far beyond any requirements in the CWA or the Porter-Cologne Act), such a process can take many years, and if the owner is unwilling to sell, the retrofit project could never be realized. In any scenario, the process to facilitate such "retrofits" is extremely costly and lengthy, with no guarantee of a benefit to water quality. Retrofits should only be undertaken where the Copermittee identifies it as a necessary step to addressing the MS4 contributions to Receiving Water problems to the MEP. Otherwise, it forces the Copermittee to utilize resources very ineffectively, which is contrary to the goals of the WQIP and may actually be detrimental to water quality.
- Permitting: Aside from the limitations discussed above, stream/channel/habitat restorations have the additional complexities of requiring other regulatory permits that are not the discretion of the San Diego Water Board nor the Copermittees to issue. Such projects can take many decades to implement, and thus, are not expected to be highly effective at addressing the goals of the WQIP, except in rare circumstances.

Redline edits have been provided to clarify that these strategies and programs should only be used when, and to the extent directed by the strategies developed in the WQIP.

3.10.2 Comments in support of specific changes

E.5.b.(1)(b) and (d)

BMP implementation requirements of Provision E.5.b.(1)(b) and (d) have been clarified in the Redline to require the Copermittee to implement BMPs on their existing development, and require implementation of BMPs on private existing development.

E.5.c.(1)(a)(iv)

The Riverside County Copermittees request deletion of this Provision. The Copermittees should be provided the flexibility to schedule inspections as they see fit, provided that the schedules they establish pursuant to E.5.c.(1)(a), and the minimum frequency in E.5.c.(1)(a)(i) are met. Requiring 20% every year will be difficult to track as businesses may be opened or closed throughout the year and throughout the permit term.

Additionally, the Riverside Copermittees understand that other Copermittees may be recommending that E.5.c.(1)(a)(i) be changed to 'once per permit term'. The Riverside Copermittees believe that the current language of 'once every five years' is more appropriate for two reasons: 1) not all Copermittees (i.e. OC and Riverside) will be enrolled into the permit at the beginning of the 'permit term', and 2) not all businesses will be in existence at the beginning of the permit term. Accordingly it is more appropriate to simply require the minimum to be once every five years, that way a program manager can simply look at the last time a facility was inspected, and use that date to schedule the next inspection.

3.11 Provision E.6, Enforcement Response Plans

3.11.1 Overview of Key Issues

The Riverside County Copermittees' edits and comments are shown in the Redline and discussed below.

3.11.2 Comments in support of specific changes

E.6.d.

The terminology in this Provision was changed in the Redline from 'escalated' enforcement to 'progressive' enforcement. The proposed language better reflects the nature of enforcement actions, which are not simply 'escalated' or 'not escalated', as implied by Provision E.6.d.(2), but are progressive as needed in response to the severity of the violation. Since every violation comes with a unique set of circumstances, it is not reasonable to presume that a single set of 'triggers' will universally result in the same level of enforcement.

3.12 Provision E.7, Public Education

3.12.1 Overview of Key Issues

The Riverside County Copermittees' edits and comments are shown in the Redline.

3.13 Provision, E.8 Fiscal Analysis

3.13.1 Overview of Key Issues

The requirement that the Copermittees "must secure all the resources necessary to comply with this Order" exceeds the requirements of the CWA and illegally intrudes on the home rule authority of municipalities to govern themselves. This must be deleted. Please also see Legal Comments.

With regard to other provisions, the Riverside County Copermittees' edits and comments are shown in the Redline.

3.14 Provision F

3.14.1 Overview of Key Issues

- F.1 – WQIP Submittal
  - Based on the schedule for the initial submittal of the Priority Water Quality Conditions and Numeric Goals, and the subsequent 60-day public review, only one month would be left for the Copermittees to finalize strategies based on those conditions and goals and the public input received. This is an insufficient amount of time. The Redline requests modifications to the schedule that would provide for the submittal of the final WQIP within 24 months (instead of 18), to provide additional time for the development of strategies.
- F.1 and F.2.
  - The schedules for submittals should be linked to the receipt of comments on prior submittals, or the approval of prior submittals, rather than the permit adoption date. If it is tied to the permit adoption date, the submittal dates could become out of sync with the comment periods or San Diego Water Board approvals if any unexpected delays occur (for example if the San Diego Water Board is delayed in approving a document, or posting a document online for public comment). The Redline requests appropriate modifications.
  - Implementation dates for the plans are unclear / undefined. The Redline clarifies this issue.
- F.3. Progress Reports
  - The reporting requirements across the transitional period were unclear. Redlines are provided to clarify and consolidate.
  - The Regional Monitoring and Assessment Report language was revised to be consistent with the requirements of the Integrated Assessment of the Water Quality Improvement Plan, rather than an additional, slightly different report, due at the same time.

3.15 Attachments B and C

Comments and edits to Attachments B and C are shown in the Redline.

Very truly yours,

for JASON E. UHLEY
Chief of Watershed Protection Division

CP:cw
P8/

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

TENTATIVE
ORDER NO. R9-2013-0001
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The San Diego County Copermittees in Table 1a are subject to waste discharge requirements set forth in this Order.

Table 1a. San Diego County Copermittees

Municipal Copermittees	
City of Carlsbad	City of Oceanside
City of Chula Vista	City of Poway
City of Coronado	City of San Diego
City of Del Mar	City of San Marcos
City of El Cajon	City of Santee
City of Encinitas	City of Solana Beach
City of Escondido	City of Vista
City of Imperial Beach	County of San Diego
City of La Mesa	San Diego County Regional Airport Authority
City of Lemon Grove	San Diego Unified Port District
City of National City	

After the San Diego Water Board receives and considers the Orange County Copermittees' Report of Waste Discharge and makes any necessary changes to the Order, the Orange County Copermittees in Table 1b will become subject to waste discharge requirements set forth in this Order after expiration of Order No. R9-2009-0002, NPDES No. CAS0108740 on or after December 16, 2014.

Table 1b. Orange County Copermittees

Municipal Copermittees	
City of Aliso Viejo	City of Rancho Santa Margarita
City of Dana Point	City of San Clemente
City of Laguna Beach	City of San Juan Capistrano
City of Laguna Hills	City of Laguna Woods
City of Laguna Niguel	County of Orange
City of Lake Forest	~~Orange County Flood Control District~~

City of Mission Viejo	
Special District Copermittee	
Orange County Flood Control District	

After the San Diego Water Board receives and considers the Riverside County Copermittees' Report of Waste Discharge and makes any necessary changes to this Order, the Riverside County Copermittees in Table 1c will become subject to waste discharge requirements set forth in this Order after expiration of Order No. R9-2010-0016, NPDES No. CAS0108766 on or after November 10, 2015.

Table 1c. Riverside County Copermittees

Municipal Copermittee	
City of Murrieta	County of Riverside
City of Temecula	~~Riverside County Flood Control and Water Conservation District~~
City of Wildomar	
Special District Copermittee	
Riverside County Flood Control and Water Conservation District	

The Orange County Copermittees and Riverside County Copermittees may become subject to the requirements of this Order at a date earlier than the expiration date of their current Orders subject to the conditions described in Provision F.6 of this Order if the Copermittees in the respective county receive a notification of coverage from the San Diego Water Board.

The term Copermittee in this Order refers to any San Diego County, Orange County, or Riverside County Copermittee covered under this Order, unless specified otherwise.

This Order provides permit coverage for the Copermittee discharges described in Table 2.

Table 2. Discharge Locations and Receiving Waters

Discharge Points	Locations throughout San Diego Region
Discharge Description	Municipal Separate Storm Sewer System (MS4) Discharges
Receiving Waters	Inland Surface Waters, Enclosed Bays and Estuaries, and Coastal Ocean Waters of the San Diego Region

Table 3. Administrative Information

This Order was adopted by the San Diego Water Board on:	**Month Day, 2013**
This Order will become effective on:	**Month Day, 2013**
This Order will expire on:	**Month Day, 2018**
The Copermittees must file a Report of Waste Discharge in accordance with Title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than 180 days in advance of the Order expiration date.	

Riverside Copermittee Redlines

I, David W. Gibson, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on Month Day, 2013.

TENTATIVE

David W. Gibson
Executive Officer

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ATTACHMENTS

Attachment A - Discharge Prohibitions and Special Protections A-1
Attachment B - Standard Permit Provisions and General Provisions B-1
Attachment C - Acronyms, Abbreviations and Definitions C-1
Attachment D - Jurisdictional Runoff Management Program Annual Report Form D-1
Attachment E - Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2013-0001 ..... E-1
Attachment F - Fact Sheet / Technical Report for Order No. R9-2013-0001 ..... F-1

I. FINDINGS

Comment [A1]: See discussions in section 3.1 of the comment letter

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), finds that:

JURISDICTION

1. **MS4 Ownership or Operation.** Each of the Copermittees owns or operates an MS4, through which it discharges storm water and non-storm water into waters of the U.S. within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the U.S.

Many geographical areas subject to this Order are subject to the threat of periodic catastrophic flooding resulting from natural conditions, specifically the presence of mountains and hilly areas in close proximity to urban development and the effect of period strong Pacific Ocean storms. Such flooding would occur in the absence of development. The Legislature recognized the importance of this issue when it established flood control districts across the state, including in Orange, Riverside and San Diego Counties. Such flooding has in the past, and if not controlled, could in the future result in loss of life and property damage. Such flooding can also mobilize significant Pollutants from industrial, commercial, residential and agricultural lands, damaging watercourses and the beneficial uses thereof, including habitat. MS4s are designed and constructed to mitigate such impacts.

2. Riverside County Flood Control and Water Conservation District.

Comment [A2]: See discussion in section 3.1.1 of the comment letter.

In 1945, the California Legislature enacted the Riverside County Flood Control and Water Conservation District Act, establishing the Riverside County Flood Control and Water Conservation District (District). The objects and purposes of the Act are to provide for the control and conservation of flood and storm waters and for the protection of watercourses, watersheds, public highways, life and property within the District from damage or destruction from flood waters. Among its other powers, the District also has the power to conserve, reclaim and save such waters for beneficial use. However the Act does not provide the District with the power to control the volume or quality of discharges that runs off of private property, which may end up in the District's flood control system. The District is governed by the District's Board of Supervisors as a separate legal entity from the County of Riverside.

Many of the flood management systems that the District operates are defined by the Clean Water Act as an MS4, and include many of the larger MS4s within the Santa Margarita watershed region of Riverside County (SMR). District does not however

own or operate streets, catch basins or storm drains smaller than 36 inches that collect runoff from the incorporated and unincorporated jurisdictions within the SMR, and commonly connect into the District's flood management system. Such systems are typically owned and operated by either the County of Riverside or the incorporated Cities within the SMR.

The waters and pollutants that may enter the regional receiving waters and/or the District's flood management systems come from various sources. These sources can include storm water and non-storm water from the Municipal Copermittees under this permit as well as from other NPDES and non-NPDES permittees, including industrial waste water dischargers, waste water treatment facilities, industrial and construction stormwater dischargers, water suppliers, tribal lands, other state and federal government entities, and Caltrans. Sources can also include discharges from Phase II entities such as school districts and discharges from entities that have been granted waste discharge requirements or waivers of waste discharge requirements, including agricultural operations.

The District does not own or operate any municipal sanitary sewer systems, public streets, roads, or highways. The District has no planning, zoning, development permitting or other land use authority, thus, it has no permitting or governing authority over industrial or commercial facilities, residents, new developments or re-development projects, and development construction sites located in any incorporated or unincorporated areas within its service area, including the SMR. The Copermittees that have such authority are responsible for implementing a storm water management program to address pollutants discharged from such industrial and commercial facilities, residential areas, new development and re-development projects, and development construction sites within their jurisdictional boundaries. Nonetheless, as an owner and operator of an MS4, the District is required to control pollutant discharges into and from its MS4, such as through interagency agreements among Copermittees and other owners of a MS4, the contribution of pollutants from one portion of the MS4 to another portion of the MS4 within their jurisdiction.

2. **Legal and Regulatory Authority.** This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]) adopted by the United States Environmental Protection Agency (USEPA), and chapter 5.5, division 7 of the California Water Code (CWC) (commencing with section 13370). This Order serves as an NPDES permit for discharges from MS4s to surface waters. This Order also serves as waste discharge requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

   The San Diego Water Board has the legal authority to issue a regional MS4 permit pursuant to its authority under CWA section 402(p)(3)(B) and 40 CFR 122.26(a)(1)(v). The USEPA also made it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide permits (55 Federal Register [FR] 47990, 48039-48042). The regional nature of this Order will ensure consistency of regulation within watersheds and is expected

to result in overall cost savings for the Copermittees and San Diego Water Board.

The federal regulations make it clear that the Copermittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators (40 CFR 122.26(a)(3)(vi)). This Order does not require the Copermittees to manage storm water outside of their jurisdictional boundaries, but rather to work collectively to improve storm water management within watersheds.

3. **CWA NPDES Permit Conditions.** Pursuant to CWA section 402(p)(3)(B), NPDES permits for storm water discharges from MS4s must include requirements to effectively prohibit non-storm water discharges into MS4s, and require controls to reduce the discharge of pollutants from the MS4s ~~in storm water~~ to the maximum extent practicable (MEP), and to require other provisions as the San Diego Water Board determines are appropriate to control such pollutants. This Order prescribes conditions to assure compliance with the CWA requirements for owners and operators of MS4s to effectively prohibit non-storm water discharges in to the MS4s, and require controls to reduce the discharge of pollutants ~~in storm water~~ from the MS4s to the MEP.

Comment [A3]: See discussion in section 3.1.2 of the comment letter.

4. **CWA and CWC Monitoring Requirements.** CWA section 308(a) and 40 CFR 122.41(h),(j)-(l) and 122.48 require that NPDES permits must specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s also specify additional monitoring and reporting requirements in 40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c). CWC section 13383 authorizes the San Diego Water Board to establish monitoring, inspection, entry, reporting and recordkeeping requirements. This Order establishes monitoring and reporting requirements to implement federal and State requirements.

5. **Total Maximum Daily Loads.** CWA section 303(d)(1)(A) requires that "[e]ach state shall identify those waters within its boundaries for which the effluent limitations…are not stringent enough to implement any water quality standard applicable to such waters." The CWA also requires states to establish a priority ranking of impaired water bodies known as Water Quality Limited Segments and to establish Total Maximum Daily Loads (TMDLs) for such waters. This priority list of impaired water bodies is called the Clean Water Act Section 303(d) List of Water Quality Limited Segments, commonly referred to as the 303(d) List. The CWA requires the 303(d) List to be updated every two years.

   TMDLs are numerical calculations of the maximum amount of a pollutant that a water body can assimilate and still meet water quality standards. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point sources (waste load allocations or WLAs) and non-point sources (load allocations or LAs), background contribution, plus a margin of safety. Discharges from MS4s are point source discharges. The federal regulations (40 CFR 122.44(d)(1)(vii)(B)) require that NPDES permits to incorporate water quality based effluent limitations (WQBELs) developed to protect a narrative water quality criterion, a numeric water

quality criterion, or both, consistent with the assumptions and requirements of any available WLA for the discharge. Requirements of this Order implement the TMDLs adopted by the San Diego Water Board and approved by USEPA.

6. **Non-Storm Water Discharges.** Pursuant to CWA section 402(p)(3)(B)(ii), this Order requires each Copermittee to effectively prohibit discharges of non-storm water into its MS4. Nevertheless, non-storm water discharges into and from the MS4s continue to be reported to the San Diego Water Board by the Copermittees and other persons. Monitoring conducted by the Copermittees, as well as the 303(d) List, have identified dry weather, non-storm water discharges from the MS4s as a source of pollutants causing or contributing to receiving water quality impairments in the San Diego Region. The federal regulations (40 CFR 122.26(d)(2)(iv)(B)(1)) require the Copermittees to have a program to prevent illicit discharges to the MS4. The federal regulations, however, allow for specific categories of non-storm water discharges or flows to be addressed as illicit discharges only where such discharges are identified as sources of pollutants to waters of the U.S.

7. **In-Stream Treatment Systems.** Pursuant to federal regulations (40 CFR 131.10(a)), in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S. Authorizing the construction of a runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to accepting waste assimilation as an appropriate use for that water body. Runoff treatment must occur prior to the discharge of runoff into receiving waters. Treatment control best management practices (BMPs) must not be constructed in waters of the U.S. Construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body.

DISCHARGE CHARACTERISTICS AND RUNOFF MANAGEMENT

8. **Point Source Discharges of Pollutants.** Discharges from the MS4s may contain waste, as defined in the CWC, and pollutants that adversely affect the quality of the waters of the state. A discharge from an MS4 is a "discharge of pollutants from a point source" into waters of the U.S. as defined in the CWA. Storm water and non-storm water discharges from the MS4s may contain pollutants that cause or threaten to cause a violation of surface water quality standards, as outlined in the Water Quality Control Plan for the San Diego Basin (Basin Plan). ~~Storm water and non-storm water discharges from the MS4s are subject to the conditions and requirements established in the Basin Plan for point source discharges.~~

9. **Potential Beneficial Use Impairment.** The discharge of pollutants and/or increased flows from MS4s may cause or threaten to cause the concentration of pollutants to exceed applicable receiving water quality objectives and impair or threaten to impair designated beneficial uses or which may result~~ing~~ in a condition of pollution, contamination, or nuisance. In addition, the reduction of flows below the

existing condition may impact negatively impact beneficial uses.

10. **Pollutants Generated by Land Development.** Land development has created and continues to create new sources of non-storm water discharges and pollutants in storm water discharges as human population density increases. This brings higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash. Pollutants from these sources are dumped or washed off the surface by non-storm water or storm water flows into and from the MS4s. When development converts natural vegetated pervious ground cover to impervious surfaces such as paved highways, streets, rooftops, and parking lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving a developed area without BMPs that can maintain pre-development conditions will contain greater pollutant loads and have significantly greater runoff volume, velocity, and peak flow rate than pre-development runoff from the same area.

11. **Runoff Discharges to Receiving Waters.** The MS4s discharge runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within the eleven hydrologic units comprising the San Diego Region. ~~Historic and current development makes use of natural drainage patterns and features as conveyances for runoff. Rivers, streams and creeks in developed areas used in this manner are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and receiving water.~~ Numerous receiving water bodies and water body segments have been designated as impaired by the San Diego Water Board pursuant to CWA section 303(d).

Comment [A4]: See discussion in section 3.1.2 of the comment letter.

Pollutants in Runoff. The most common pollutants in runoff discharged from the MS4s include total suspended solids, sediment, pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., cadmium, copper, lead, and zinc), petroleum products and polynuclear aromatic hydrocarbons, synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus), oxygen-demanding substances (e.g., decaying vegetation, animal waste), detergents, and trash. ~~As operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not effectively prohibit or otherwise control.~~ These discharges may cause or contribute to a condition of pollution or a violation of water quality standards. California law requires downstream landowners, including owners and operators of MS4, to accept upstream flows, even if that flow contains Pollutants. Failure to do can create conditions.

Comment [A5]: See discussion in section 3.1.2 of the comment letter.

Limitation on Powers of Copermittees. This Order regulates the discharge of non-stormwater into and Pollutants from non-agricultural Anthropogenic sources from the MS4s owned and/or operated by the Copermittees. The Copermittees lack legal

Comment [A6]: This finding is based on Findings I.B and I.C in Order R8-2010-33, applicable to portions of Riverside County within the Santa Ana region.

Riverside Copermittee Redlines

jurisdiction over discharges into their MS4 from agricultural activities, State and federal facilities, public schools and hospitals, utilities, railroads, special districts, Native American tribal lands, wastewater management agencies and other point and non-point source discharges otherwise permitted by the Water Board. The Water Board recognizes that the Copermittees should not be held responsible for discharges from such facilities or Pollutants in those discharges. Also, certain activities and sources that generate pollutants present in urban runoff may be beyond the ability of the Copermittees to prevent or eliminate. Examples of these activities and sources include, but are not limited to: emissions from internal combustion engines, brake pad wear and tear, atmospheric deposition, non-Anthropogenic sources of bacteria (including wildlife and feral cats and dogs), the regulation of pesticides and leaching of naturally occurring nutrients and minerals from local soils. This Order is not intended to address background or naturally occurring Pollutants or flows.

12.

13. **Human Health and Aquatic Life Impairment.** Pollutants in runoff discharged from the MS4s can threaten and adversely affect human health and aquatic organisms. Adverse responses of organisms to chemicals or physical agents in runoff range from physiological responses such as impaired reproduction or growth anomalies to mortality. Increased volume, velocity, rate, and duration of storm water runoff greatly accelerate the erosion of downstream natural channels. This alters stream channels and habitats and can adversely affect aquatic and terrestrial organisms.

14. **Water Quality Effects.** The Copermittees' water quality monitoring data submitted to date documents various persistent exceedances of Basin Plan water quality objectives for runoff-related pollutants at various watershed monitoring stations. Persistent toxicity has also been observed at several watershed monitoring stations. In addition, bioassessment data indicate that the majority of the monitored receiving waters have Poor to Very Poor Index of Biological Integrity (IBI) ratings. ~~These findings indicate that runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in the San Diego Region. Non-storm water discharges from the MS4s have been shown to contribute significant levels of pollutants and flow in arid, developed Southern California watersheds, and contribute significantly to exceedances of applicable receiving water quality objectives.~~

Comment [A7]: These statements are completely unsubstantiated.

15. ~~**Non-Storm Water and Storm Water Discharges.** Non-storm water discharges from the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard of CWA section 402(p)(3)(B)(iii), which is explicitly for "Municipal … *Stormwater Discharges* (emphasis added)" from the MS4s. Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s must be effectively prohibited.~~

Comment [A8]: See discussion in section 3.1.2 of the comment letter.

16. **Best Management Practices.** Waste and pollutants which are deposited and accumulate in MS4 drainage structures may~~will~~ be discharged from these structures

to waters of the U.S. unless they are removed. These discharges may cause or contribute to, or threaten to cause or contribute to, a condition of pollution in receiving waters. For this reason, pollutants in storm water discharges from the MS4s can be and must be effectively reduced in runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Pollution prevention is the reduction or elimination of pollutant generation at its source and is the best "first line of defense". Source control BMPs (both structural and non-structural) minimize the contact between pollutants and runoff, therefore keeping pollutants onsite and out of receiving waters. Treatment control BMPs remove pollutants that have been mobilized by storm water or non-storm water flows.

17. **BMP Implementation.** Runoff needs to be addressed during the three major phases of development (planning, construction, and use) in order to reduce the discharge of storm water pollutants to the MEP, effectively prohibit non-storm water discharges, and protect receiving waters. Development which is not guided by water quality planning policies and principles can result in increased pollutant load discharges, flow rates, and flow durations which can negatively affect receiving water beneficial uses. Construction sites without adequate BMP implementation result in sediment runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. Existing development can generate substantial pollutant loads which are discharged in runoff to receiving waters. Retrofitting areas of existing development with storm water pollutant control and hydromodification management BMPs may in many cases be ~~is~~ necessary to address storm water discharges from existing development that may cause or contribute to a condition of pollution or a violation of water quality standards.

Comment [A9]: It is not necessary in all cases.

18. **Long Term Planning and Implementation.** Federal regulations require municipal storm water permits to expire 5 years from adoption, after which the permit must be renewed and reissued. The San Diego Water Board recognizes that the degradation of water quality and impacts to beneficial uses of the waters in the San Diego Region occurred over several decades. The San Diego Water Board further recognizes that a decade or more may be necessary to realize demonstrable improvement to the quality of waters in the Region. This Order includes a long term planning and implementation approach that will require more than a single permit term to complete.

WATER QUALITY STANDARDS

19. **Basin Plan.** The San Diego Water Board adopted the Water Quality Control Plan for the San Diego Basin (Basin Plan) on September 8, 1994 that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for receiving waters addressed through the plan. The Basin Plan was subsequently approved by the State Water

Resources Control Board (State Water Board) on December 13, 1994. Subsequent revisions to the Basin Plan have also been adopted by the San Diego Water Board and approved by the State Water Board. Requirements of this Order implement the Basin Plan.

The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Process Supply (PROC), Industrial Service Supply (IND), Ground Water Recharge (GWR), Contact Water Recreation (REC1), Non-contact Water Recreation (REC2), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Freshwater Replenishment (FRSH), Hydropower Generation (POW), and Preservation of Biological Habitats of Special Significance (BIOL). The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region: Navigation (NAV), Commercial and Sport Fishing (COMM), Estuarine Habitat (EST), Marine Habitat (MAR), Aquaculture (AQUA), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN), and Shellfish Harvesting (SHELL).

20. **Ocean Plan.** The State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, and 2005. The State Water Board adopted the latest amendment on April 21, 2005 and it became effective on February 14, 2006. The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean. Requirements of this Order implement the Ocean Plan.

    The Ocean Plan identifies the following beneficial uses of ocean waters of the state to be protected: Industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture; preservation and enhancement of designated Areas of Special Biological Significance; rare and endangered species; marine habitat; fish spawning and shellfish harvesting

21. **Sediment Quality Control Plan**. On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes: 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

22. **National Toxics Rule and California Toxics Rule.** USEPA adopted the National Toxics Rule (NTR) on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the NTR applied in California. On May 18, 2000, USEPA adopted the California Toxics Rule (CTR). The CTR promulgated

new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants.

23. **Antidegradation Policy.** This Order is in conformance with the federal Antidegradation Policy described in 40 CFR 131.12, and State Water Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality Waters in California*. Federal regulations at 40 CFR 131.12 require that the State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. State Water Board Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies.

CONSIDERATIONS UNDER FEDERAL AND STATE LAW

24. **Coastal Zone Act Reauthorization Amendments.** Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states with approved coastal zone management programs to address non-point source pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point source pollution: agriculture, silviculture, urban, marinas, and hydromodification. This Order addresses the management measures required for the urban category, with the exception of septic systems. The runoff management programs developed pursuant to this Order fulfills the need for coastal cities to develop a runoff non-point source plan identified in the Non-Point Source Program Strategy and Implementation Plan. The San Diego Water Board addresses septic systems through the administration of other programs.

25. **Endangered Species Act.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 USC sections 1531 to 1544). This Order requires compliance with receiving water limits, and other requirements to protect the beneficial uses of waters of the State. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

26. **Report of Waste Discharge Process.** The waste discharge requirements set forth in this Order are based upon the Report of Waste Discharge submitted by the San Diego County Copermittees prior to the expiration of Order No. R9-2007-0001 (NPDES No. CAS0109266). The Orange County and Riverside County Copermittees are not immediately covered by the waste discharge requirements in this Order. The San Diego Water Board understands that each municipality is

unique although the Counties share watersheds and geographical boundaries. The Order will continue to use the Report of Waste Discharge process prior to initially making Orange County or Riverside County Copermittees subject to the requirements of this Order.

The federal regulations (40 CFR 122.21(d)(2)) and CWC section 13376 impose a duty on the Copermittees to reapply for continued coverage through submittal of a Report of Waste Discharge no later than 180 days prior to expiration of a currently effective permit. This requirement is set forth in the Orange County Copermittees' and Riverside County Copermittees' currently effective permits at Provisions K.2.b and K.2.c, respectively. The Orange County Permit, Order No. R9-2009-0002 (NPDES No. CAS0108740) expires on December 16, 2014 and the Riverside County MS4 Permit, Order No. R9-2010-0016 (NPDES No. CAS0108766) expires on November 10, 2015.

Unless the Orange County or Riverside County Copermittees apply for and receive early coverage under this Order, the Orange County Copermittees' and the Riverside County Copermittees' respective permits will be superseded by this Order upon expiration of their respective permits, subject to any necessary revisions to the requirements of this Order made after the San Diego Water Board considers their respective Reports of Waste Discharge through the public process provided in 40 CFR 124.

Comment [A10]: Please see Comment Letter and Legal Comments regarding regional permit authority,

27. **Integrated Report and Clean Water Act Section 303(d) List.** The San Diego Water Board and State Water Board submit an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. USEPA issued its *Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act* on July 29, 2005, which advocates the use of a five category approach for classifying the attainment status of water quality standards for water bodies in the Integrated Report. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 in the Integrated Report are placed on the 303(d) List.

Water bodies with available data and/or information that indicate at least one beneficial use is not being supported or is threatened, but a TMDL is not required, are included in Category 4 in the Integrated Report. Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

Implementation of the requirements of this Order may allow the San Diego Water Board to include surface waters impaired by discharges from the Copermittees'

MS4s in Category 4 in the Integrated Report for consideration during the next 303(d) List submittal by the State to USEPA.

28. **Economic Considerations.** The California Supreme Court has ruled that although CWC section 13263 requires the State and Regional Water Boards (collectively Water Boards) to consider factors set forth in CWC section 13241 when issuing an NPDES permit, the Water Board may not consider the factors to justify imposing pollutant restrictions that are less stringent than the applicable federal regulations require. (*City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 618, 626-627.) However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

As noted in the following finding, the San Diego Water Board finds that the requirements in this permit are not more stringent than the minimum federal requirements. Therefore, a CWC section 13241 analysis is not required for permit requirements that implement the effective prohibition on the discharge of non-storm water into the MS4 or for controls to reduce the discharge of pollutants ~~in storm water~~ to the MEP, or other provisions that the San Diego Water Board has determined appropriate to control such pollutants, as those requirements are mandated by federal law. Notwithstanding the above, the San Diego Water Board has developed an economic analysis of the requirements in this Order. The economic analysis is provided in the Fact Sheet.

Comment [A11]: See discussion in section 3.1.2 of the Comment Letter and also Legal Comments..

29. ~~**Unfunded Mandates.** This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following:~~

Comment [A12]: See discussion in section 3.1.2 of the comment letter and in the Legal Comments.

~~**a.** This Order implements federally mandated requirements under CWA section 402 (33 USC section 1342(p)(3)(B)).~~

~~**b.** The local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental and new dischargers who are issued NPDES permits for storm water and non-storm water discharges.~~

~~**c.** The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order.~~

~~**d.** The Copermittees have requested permit coverage in lieu of compliance with the complete effective prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)) and in lieu of numeric restrictions on their MS4 discharges (i.e. effluent limitations).~~

~~**e.** The local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under State law predates the enactment of Article XIIIB, Section (6) of the California Constitution.~~

~~f. The provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state develops a TMDL, federal law requires that permits must contain water quality based effluent limitations consistent with the assumptions and requirements of any applicable wasteload allocation (40 CFR 122.44(d)(1)(vii)(B)).~~

~~See the Fact Sheet for further discussion of unfunded mandates.~~

30. **California Environmental Quality Act.** The issuance of waste discharge requirements and an NPDES permit for the discharge of runoff from MS4s to waters of the U.S. is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 et seq.) in accordance with CWC section 13389.

STATE WATER BOARD DECISIONS

31. **Compliance with Prohibitions and Limitations.** The receiving water limitation language specified in this Order is consistent with language recommended by the USEPA and established in State Water Board Order WQ 99-05, *Own Motion Review of the Petition of Environmental Health Coalition to Review Waste Discharge Requirements Order No. 96-03, NPDES Permit No. CAS0108740*, adopted by the State Water Board on June 17, 1999. The receiving water limitation language in this Order requires storm water discharges from MS4s to not cause or contribute to a violation of water quality standards, which is to be achieved through an iterative approach requiring the implementation of improved and better-tailored BMPs over time. Implementation of the iterative approach to comply with receiving water limitations based on applicable water quality standards is necessary to ensure that Pollutant ~~storm water~~ discharges from the MS4 will not ultimately cause or contribute to violations of water quality standards and will not create conditions of pollution, contamination, or nuisance.

Comment [A13]: See discussion in section 3.1.2 of the comment letter.

Comment [A14]: Please see discussion in section 3.1.2 of the Comment Letter and Legal Comments.

32. **Special Conditions for Areas of Special Biological Significance.** On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving an exception to the Ocean Plan effective prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges. State Water Board Resolution No. 2012-0012 requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, effective prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject terms and conditions of State Water Board Resolution No. 2012-0012. The Special

Protections contained in Attachment B to Resolution No. 2012-0012, applicable to these discharges, are hereby incorporated into this Order as if fully set forth herein.

ADMINISTRATIVE FINDINGS

33. **Executive Officer Delegation of Authority.** The San Diego Water Board by prior resolution has delegated all matters that may legally be delegated to its Executive Officer to act on its behalf pursuant to CWC section 13223. Therefore, the Executive Officer is authorized to act on the San Diego Water Board's behalf on any matter within this Order unless such delegation is unlawful under CWC section 13223 or this Order explicitly states otherwise.

34. **Standard Provisions.** Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR 122.42, are provided in Attachment B to this Order.

35. **Fact Sheet.** The Fact Sheet for this Order contains background information, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of this Order. The Fact Sheet is hereby incorporated into this Order and constitutes part of the Findings of this Order.

36. **Public Notice.** In accordance with State and federal laws and regulations, the San Diego Water Board notified the Copermittees, and interested agencies and persons of its intent to prescribe waste discharge requirements for the control of discharges into and from the MS4s to waters of the U.S. and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet.

37. **Public Hearing.** The San Diego Water Board held a public hearing on Month Day, 2013 and heard and considered all comments pertaining to the terms and conditions of this Order. Details of the public hearing are provided in the Fact Sheet.

38. **Effective Date.** This Order serves as an NPDES permit pursuant to CWA section 401 or amendments thereto, and becomes effective fifty (50) days after the date of its adoption, provided that the Regional Administrator, USEPA, Region IX, does not object to this Order.

39. **Review by the State Water Board.** Any person aggrieved by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with CWC section 13320 and California Code of Regulations, title 23, sections 2050, et seq. The State Water Board must receive the petition by 5:00 p.m., 30 days after the San Diego Water Board action, except that if the thirtieth day following the action falls on a Saturday, Sunday or State holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the

Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

THEREFORE, IT IS HEREBY ORDERED that the Copermittees, in order to meet the provisions contained in division 7 of the CWC and regulations adopted thereunder, and the provisions of the CWA and regulations adopted thereunder, must each comply with the following:

II. PROVISIONS

A. PROHIBITIONS AND LIMITATIONS

Comment [A15]: See discussion in section 3.2 of the comment letter.

The purpose of this provision is to describe the conditions under which storm water and non-storm water discharges into and from MS4s are to be effectively prohibited or limited. The goal of the prohibitions and limitations is to protect the water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through the implementation of water quality improvement strategies and runoff management programs that effectively prohibit non-storm water discharges into the Copermittees' MS4s, and reduce pollutants in ~~storm water~~ discharges from the Copermittees' MS4s to the MEP. The process for determination of compliance with the Discharge Prohibitions (A.1), Receiving Water Limitations (A.2), and Effluent Limitations (A.3) is defined in Provisions A.3.b and A.4.

1. Discharge Prohibitions

a. Discharges from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters ~~of the state~~ are to be ~~prohibited.~~ effectively prohibited, unless the Regional Board determines such discharges are addressed by the Copermittee through A.3.b or A.4, including any modifications.~~prohibited.~~

Comment [A16]: See discussion in section 3.2.2 of the comment letter.

b. Non-storm water discharges into MS4s are to be effectively prohibited through a program consistent with the requirements of provision E.2. of this order, including inspections, to implement and enforce an ordinance, orders or similar means to prevent illicit discharges to the MS4, unless such discharges are either authorized by a separate NPDES permit, or the discharge is a category of non-storm water discharges or flows that must be addressed pursuant to Provisions E.2.a.(1)-(5) of this Order.

Comment [A17]: See discussion in section 3.2.2 of the comment letter.

c. Discharges from MS4s are subject to all applicable waste discharge prohibitions in the Basin Plan, included in Attachment A to this Order, unless the Regional Board determines such discharges are addressed by the Copermittee through A.3.b or A.4, including any modifications.

Comment [A18]: See discussion in section 3.2.2 of the comment letter.

d. Storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No.

2012-0012 applicable to these discharges, included in Attachment A to this Order. All other discharges from the Copermittees' MS4s to ASBS are ~~to be effectively~~ prohibited.

2. Receiving Water Limitations

Comment [A19]: See discussion in section 3.2.2 of the comment letter.

a. Discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters, including but not limited to all applicable provisions ~~contained in:~~below, unless the Regional Board determines such discharges are addressed by the Copermittee through A.3.b or A.4::~~contained in:~~

(1) The San Diego Water Board's Basin Plan, including beneficial uses, water quality objectives, and implementation plans;

(2) State Water Board plans for water quality control including the following:

(a) Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries (Thermal Plan), and

(b) The Ocean Plan, including beneficial uses, water quality objectives, and implementation plans;

(3) State Water Board policies for water and sediment quality control including the following:

(a) Water Quality Control Policy for the Enclosed Bays and Estuaries of California,

(b) Sediment Quality Control Plan which includes the following narrative objectives for bays and estuaries:

(i) Pollutants in sediments shall not be present in quantities that, alone or in combination, are toxic to benthic communities, and

(ii) Pollutants shall not be present in sediments at levels that will bioaccumulate in aquatic life to levels that are harmful to human health,

(c) The Statement of Policy with Respect to Maintaining High Quality of Waters in California;[1]

(4) Priority pollutant criteria promulgated by the USEPA through the following:

[1] State Water Board Resolution No. 68-16

(a) National Toxics Rule (NTR)[2] (promulgated on December 22, 1992 and amended on May 4, 1995), and

(b) California Toxics Rule (CTR).[3,4]

b. Discharges from MS4s composed of storm water runoff must not alter natural ocean water quality in an ASBS.

[2] 40 CFR 131.36
[3] 65 Federal Register 31682-31719 (May 18, 2000), adding Section 131.38 to 40 CFR
[4] If a water quality objective and a CTR criterion are in effect for the same priority pollutant, the more stringent of the two applies.

3. Effluent Limitations

a. TECHNOLOGY BASED EFFLUENT LIMITATIONS

Comment [A20]: See discussion in section 3.2.2 of the comment letter.

Pollutants in ~~storm water~~ discharges from MS4s must be reduced to the MEP.[5]

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

This Order establishes water quality based effluent limitations (WQBELs) consistent with the assumptions and requirements of all available TMDL waste load allocations (WLAs) assigned to discharges from the Copermittees' MS4s. Each Copermittee must comply with applicable WQBELs established for the TMDLs in Attachment E to this Order, pursuant to the applicable TMDL compliance schedules.

4. Compliance with Discharge Prohibitions and Receiving Water Limitations

Comment [A21]: See discussion in section 3.2.2 of the comment letter.

Each Copermittee must achieve compliance with Provisions A.1.a~~,~~ through A.1.c and A.2.a of this Order through timely implementation of control measures and other actions as specified in Provisions B and E of this Order, including any modifications. The Water Quality Improvement Plans required under Provision B must be designed and adapted to ultimately achieve compliance with Provisions A.1.a~~,~~ through A.1.c and A.2.a~~.~~, as described in Provision B.2.~~.~~

a. If exceedance(s) of water quality standards persist in receiving waters notwithstanding implementation of this Order, the Copermittees must comply with the following procedures:

(1) For exceedance(s) of a water quality standard in the process of being addressed by the Water Quality Improvement Plan, the Copermittee(s) must implement the Water Quality Improvement Plan as accepted by the San Diego Water Board, and update the Water Quality Improvement Plan, as necessary, pursuant to Provision F.2.c;

(2) Upon a determination by either the Copermittees or the San Diego Water Board that discharges from the MS4 are causing or contributing to a new exceedance of an applicable water quality standard not addressed by the Water Quality Improvement Plan, the Copermittees must submit the following updates to the Water Quality Improvement Plan pursuant to Provision F.2.c or as part of the Annual Report required under Provision F.3.b, unless the San

[5] This does not apply to MS4 discharges which receive subsequent treatment to reduce pollutants in storm water discharges to the MEP prior to entering receiving waters (e.g., low flow diversions to the sanitary sewer). Runoff treatment must occur prior to the discharge of runoff into receiving waters per Finding 7.

Diego Water Board directs an earlier submittal:

(a) The water quality improvement strategies being implemented that are effective and will continue to be implemented,

(b) Water quality improvement strategies (i.e. BMPs, retrofitting projects, stream and/or habitat rehabilitation or restoration projects, adjustments to jurisdictional runoff management programs, etc.) that will be implemented to reduce or eliminate any pollutants or conditions that are causing or contributing to the exceedance of water quality standards,

(c) Updates to the schedule for implementation of the existing and additional water quality improvement strategies, and

(d) Updates to the monitoring and assessment program to track progress toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a of this Order;

(3) The San Diego Water Board may require the incorporation of additional modifications to the Water Quality Improvement Plan required under Provision B. The applicable Copermittees must submit any modifications to the update to the Water Quality Improvement Plan within 90 days of notification that additional modifications are required by the San Diego Water Board, or as otherwise directed;

(4) Within 90 days of the San Diego Water Board determination that the update to the Water Quality Improvement Plan meets the requirements of this Order, the applicable Copermittees must revise the jurisdictional runoff management program documents to incorporate the updated water quality improvement strategies that have been and will be implemented, the implementation schedule, and any additional monitoring required; and

(5) Each Copermittee must implement the updated Water Quality Improvement Plan.

b. The procedure set forth above to achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order do not have to be repeated for continuing or recurring exceedances of the same water quality standard(s) following implementation of scheduled actions unless directed to do otherwise by the San Diego Water Board.

c. Nothing in Provisions A.4.a and A.4.b prevents the San Diego Water Board from enforcing any of provisions B through I of this Order while the applicable Copermittees prepare and implement the above update to the Water Quality Improvement Plan and jurisdictional runoff management programs.

Riverside Copermittee Redlines

B. WATER QUALITY IMPROVEMENT PLANS

The purpose of this provision is to develop Water Quality Improvement Plans (WQIPs) that guide the Copermittees' jurisdictional runoff management programs towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plans is to ~~protect, preserve, enhance, and restorerestore the~~address the impacts of MS4 discharges so that such discharges do not impair water quality and designated beneficial uses of receiving waters~~. of the state.~~ Therefore, implementation of the WQIPs also provides the basis for complying with Provisions II.A.1, II.A.2, and II.A.3, as described in Provision II.A.4. This goal will be accomplished through an adaptive planning and management process that identifies the highest priority water quality conditions within a watershed and implements strategies through the jurisdictional runoff management programs to achieve improvements in the quality of discharges from the MS4s ~~and~~ to receiving waters. As such, the requirements outlined in Provision E may be modified for consistency with the WQIP priorities for the applicable Watershed Management Area, if appropriate justification is provided approved within the WQIP.

Comment [A22]: See section 3.3 of the comment letter for discussions of the changes requested herein.

Comment [A23]: See discussion in section 3.3.2 of the comment letter.

1. Watershed Management Areas

The Copermittees must develop a Water Quality Improvement Plan for each of the Watershed Management Areas in Table B-1. A total of ten Water Quality Improvement Plans must be developed for the San Diego Region.

Development of the Water Quality Improvement Plan for the Santa Margarita River Watershed Management Area shall commence upon notification of coverage of the Riverside County Copermittees under this Order. Until this time, the County of San Diego shall use the water quality priorities in the Santa Margarita River Watershed Urban Runoff Management Plan, developed pursuant to Order No. R9-2007-0001, to guide implementation of Provisions D and E within its jurisdiction

Comment [A24]: See discussion in section 3.3.2 of the comment letter.

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
San Juan (901.00)	South Orange County	- Aliso Creek - San Juan Creek - San Mateo Creek - Pacific Ocean - Heisler Park ASBS	- City of Aliso Viejo[1] - City of Dana Point[1] - City of Laguna Beach[1] - City of Laguna Hills[1] - City of Laguna Niguel[1] - City of Laguna Woods[1] - City of Lake Forest[1] - City of Mission Viejo[1] - City of Rancho Santa Margarita[1] - City of San Clemente[1] - City of San Juan Capistrano[1] - County of Orange[1] - Orange County Flood Control District[1]

Riverside Copermittee Redlines

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
Santa Margarita (902.00)	Santa Margarita River	- Murrieta Creek - Temecula Creek - Santa Margarita River - Santa Margarita Lagoon - Pacific Ocean	- City of Murrieta[2] - City of Temecula[2] - City of Wildomar[2] - County of Riverside[2] - County of San Diego[3] - Riverside County Flood Control and Water Conservation District[2]
San Luis Rey (903.00)	San Luis Rey River	- San Luis Rey River - San Luis Rey Estuary - Pacific Ocean	- City of Oceanside - City of Vista - County of San Diego
Carlsbad (904.00)	Carlsbad	- Loma Alta Slough - Buena Vista Lagoon - Agua Hedionda Lagoon - Batiquitos Lagoon - San Elijo Lagoon - Pacific Ocean	- City of Carlsbad - City of Encinitas - City of Escondido - City of Oceanside - City of San Marcos - City of Solana Beach - City of Vista - County of San Diego
San Dieguito (905.00)	San Dieguito River	- San Dieguito River - San Dieguito Lagoon - Pacific Ocean	- City of Del Mar - City of Escondido - City of Poway - City of San Diego - City of Solana Beach - County of San Diego
Penasquitos (906.00)	Penasquitos	- Los Penasquitos Lagoon - Pacific Ocean	- City of Del Mar - City of Poway - City of San Diego - County of San Diego
	Mission Bay	- Mission Bay - Pacific Ocean - San Diego Marine Life Refuge ASBS	- City of San Diego
San Diego (907.00)	San Diego River	- San Diego River - Pacific Ocean	- City of El Cajon - City of La Mesa - City of San Diego - City of Santee - County of San Diego
Pueblo San Diego (908.00) Sweetwater (909.00) Otay (910.00)	San Diego Bay	- Sweetwater River - Otay River - San Diego Bay - Pacific Ocean	- City of Chula Vista - City of Coronado - City of Imperial Beach - City of La Mesa - City of Lemon Grove - City of National City - City of San Diego - County of San Diego - San Diego County Regional Airport Authority - San Diego Unified Port District
Tijuana (911.00)	Tijuana River	- Tijuana River - Tijuana Estuary - Pacific Ocean	- City of Imperial Beach - City of San Diego - County of San Diego

Notes:
1. The Orange County Copermittees will be covered under this Order after expiration of Order No. R9-2009-0002, or earlier if the Orange County Copermittees meet the conditions in Provision F.6.
2. The Riverside County Copermittees will be covered under this Order after expiration of Order No. R9-2010-0016, or earlier if the Riverside County Copermittees meet the conditions in Provision F.6.
3. The County of San Diego is required to implement the requirements of Provision B for its jurisdiction within the Santa

Margarita River Watershed Management Area until the Riverside County Copermittees have been notified of coverage under this Order.

Riverside Copermittee Redlines

2. Priority Water Quality Conditions

The Copermittees must identify the water quality priorities within each Watershed Management Area that will be addressed by the Water Quality Improvement Plan. Where appropriate, Watershed Management Areas may be separated into subwatersheds to focus water quality prioritization and jurisdictional runoff management program implementation efforts by receiving water.

a. Assessment of Receiving Water Conditions

The Copermittees must consider the following, at a minimum, to identify water quality priorities based on impacts of MS4 discharges on receiving water beneficial uses:

(1) Receiving waters listed as impaired on the CWA Section 303(d) List of Water Quality Limited Segments (303(d) List);

(2) TMDLs adopted and under development by the San Diego Water Board;

(3) Receiving waters recognized as sensitive or highly valued by the Copermittees, including estuaries designated under the National Estuary Program under CWA section 320, wetlands defined by the State or U.S. Fish and Wildlife Service's National Wetlands Inventory as wetlands, and receiving waters identified as ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (Attachment A);

(4) The receiving water limitations of Provision A.2;

(5) Known historical versus current physical, chemical, and biological water quality conditions;

(6) Available, relevant, and appropriately collected and analyzed physical, chemical, and biological receiving water monitoring data, including, but not limited to, data describing:

(a) Chemical constituents,

(b) Water quality parameters (i.e. pH, temperature, conductivity, etc.),

(c) Toxicity Identification Evaluations for both receiving water column and sediment,

(d) Trash impacts,

(e) Bioassessments, and

(f) Physical habitat;

(7) Available evidence of erosional impacts in receiving waters due to accelerated flows (i.e. hydromodification);

(8) Available evidence of adverse impacts to the chemical, physical, and biological integrity of receiving waters; and

(9) The potential improvements in the overall condition of the Watershed Management Area that can be achieved.

b. ASSESSMENT OF IMPACTS FROM MS4 DISCHARGES

The Copermittees must consider the following, at a minimum, to identify the potential impacts to receiving waters that may be caused or contributed to by discharges from the Copermittees' MS4s:

(1) The discharge prohibitions of Provision A.1 and effluent limitations of Provision A.3; and

(2) Available, relevant, and appropriately collected and analyzed storm water and non-storm water monitoring data from the Copermittees' MS4 outfalls;

(3) Locations of each Copermittee's MS4 outfalls that discharge to receiving waters;

(4) Locations of MS4 outfalls that are known to persistently discharge non-storm water to receiving waters likely causing or contributing to impacts on receiving water beneficial uses;

(5) Locations of MS4 outfalls that are known to discharge pollutants in storm water causing or contributing to impacts on receiving water beneficial uses; and

(6) The potential improvements in the quality of discharges from the MS4 that can be achieved.

c. IDENTIFICATION OF PRIORITY WATER QUALITY CONDITIONS

(1) The Copermittees must use the information gathered for Provisions B.2.a and B.2.b to develop a list of priority water quality conditions as pollutants, stressors and/or receiving water conditions that are the highest threat to receiving water quality or that most adversely affect the physical, chemical, and biological integrity of receiving waters. The list must include the following information for each priority water quality condition:

(a) The beneficial use(s) associated with the priority water quality condition;

(b) The geographic extent of the priority water quality condition within the Watershed Management Area, if known;

(c) The temporal extent of the priority water quality condition (e.g., dry weather and/or wet weather);

(d) The Copermittees with MS4s discharges that may cause or contribute to the priority water quality condition; and

(e) An assessment of the adequacy of and data gaps in the monitoring data to characterize the conditions causing or contributing to the priority water quality condition, including a consideration of spatial and temporal variation.

(2) The Copermittees must identify the highest priority water quality conditions to be addressed by the Water Quality Improvement Plan, and provide a rationale for selecting a subset of the water quality conditions identified pursuant to Provision B.2.c.(1) as the highest priorities.

d. IDENTIFICATION OF MS4 SOURCES OF POLLUTANTS AND/OR STRESSORS

The Copermittees must identify and prioritize known and suspected sources of storm water and non-storm water pollutants and/or other stressors within their jurisdiction, associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c. ~~The identification of known and suspected sources of pollutants and/or stressors that cause or contribute to the highest priority water quality conditions as identified for Provision B.2.c must~~ considering the following:

(1) Pollutant generating facilities, areas, and/or activities within the Watershed Management Area, including:

(a) Each Copermittee's inventory of construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas,

(b) Publicly owned parks and/or recreational areas,

(c) Open space areas,

(d) All currently operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste,,, and

(e) Areas not within the Copermittees' jurisdictions (e.g., Phase II MS4s, tribal lands, state lands, federal lands) that are known or suspected to be discharging to the Copermittees' MS4s;

(2) Locations of the Copermittees' MS4s, including the following:

(a) All major MS4 outfalls [per 40CFR 122.26 (b)(5)] that discharge to receiving waters, and

(b) Locations of major structural controls for storm water and non-storm water (e.g., retention basins, detention basins, major infiltration devices, etc.);

(3) Other known and suspected sources of non-storm water or pollutants in storm water discharges to receiving waters within the Watershed Management Area, including the following:

(a) Other MS4 outfalls (e.g., Phase II Municipal and Caltrans),

(b) Other NPDES permitted discharges,

(c) Any other discharges that may be considered point sources (e.g., private outfalls), and

(d) Any other discharges that may be considered non-point sources (e.g., agriculture, wildlife or other natural sources);

(4) Review of available data, including but not limited to:

(a) Findings from the Copermittees' illicit discharge detection and elimination programs,

(b) Findings from the Copermittees' MS4 outfall discharge monitoring,

(c) Findings from the Copermittees' receiving water monitoring,

(d) Findings from the Copermittees' MS4 outfall discharge and receiving water assessments, and

(e) Other available, relevant, and appropriately collected data, information, or studies related to pollutant sources and/or stressors that contribute to the highest priority water quality conditions as identified for Provision B.2.c.

(5) The adequacy of the available data to identify and prioritize sources and/or stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c.

e. NUMERIC GOALS AND SCHEDULES

Comment [A25]: See discussion in section 3.3.2 of the comment letter.

The Copermittees must develop and incorporate action levels, interim and final numeric goals[6] and schedules into the Water Quality Improvement Plan. Numeric goals must be used to support Water Quality Improvement Plan implementation and measure progress towards addressing the highest priority water quality conditions identified under Provision B.2.c. . Action Levels, Numeric goals are not enforceable compliance standards, effluent limitations, or receiving water limitations. When establishing numeric goals and corresponding schedules, the Copermittees must consider the following:

(1) Final numeric goals must be based on measureable criteria or indicators, to be achieved in ~~the receiving waters and/or~~ MS4 discharges for the highest priority water quality conditions which will ~~be capable of demonstrating the achievement of the restoration and/or protection~~ comply with the Receiving Water Limitations (A.2) of this Order; ~~water quality standards in receiving waters;~~

(2) Interim numeric goals must be based on measureable criteria or indicators capable of demonstrating incremental progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges; and

(3) Schedules must be adequate for measuring progress toward achieving the interim and final numeric goals required for Provisions B.2.e.(1) and B.2.e.(2). Schedules must incorporate the following:

(a) Interim dates for achieving the interim numeric goals,

(b) Compliance schedules for any applicable TMDLs in Attachment E to this Order,

(c) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A),

(d) Achievement of the final numeric goals in the receiving waters and/or MS4 discharges for the highest water quality priorities must be as soon as possible, and

[6] Interim and final numeric goals may take a variety of forms such as TMDL established WQBELs, action levels, pollutant concentration, load reductions, number of impaired water bodies delisted from the List of Water Quality Impaired Segments, Index of Biotic Integrity (IBI) scores, or other appropriate metrics. Interim and final numeric goals are not necessarily limited to one criterion or indicator, but may include multiple criteria and/or indicators. Except for TMDL established WQBELs, interim and final numeric goals and corresponding schedules may be revised through the adaptive management process under Provision B.5.

(e) Final dates for achieving the final numeric goals must not initially extend more than 10 years beyond the effective date of this Order, unless a longer period of time is authorized by the San Diego Water Board Executive Officer through an approved WQIP or the schedule includes an applicable TMDL in Attachment E to this Order[7].

Comment [A26]: Clarify that a longer period can be granted through the WQIP process.

[7] Achievement of final numeric goals within 10 years represents progress towards attainment of water quality standards, but is not a requirement to fully attain all applicable water quality standards or all priority receiving water conditions within 10 years.

3. Water Quality Improvement Strategies and Schedules

Comment [A27]: See discussion in section 3.3.2 of the comment letter.

The Copermittees must develop specific water quality improvement strategies to address the highest priority water quality conditions identified within a Watershed Management Area. The water quality improvement strategies must address the highest priority water quality conditions by ensuring the effective prohibition of~~preventing or eliminating~~ non-storm water discharges to and from the MS4, reducing pollutants in ~~storm water~~ discharges from the MS4 to the MEP, as applicable to the priority water quality conditions established per provision B.2. ~~and restoring and/or protecting the water quality standards of receiving waters~~.

a. Water Quality Improvement Strategies

The Copermittees must identify and prioritize water quality improvement strategies based on their likely effectiveness and efficiency, and design the JRMP programs to focus resources on those strategies to~~implement strategies to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, improve the physical, chemical, and biological receiving water conditions, and~~ achieve the interim and final numeric goals in accordance with the schedules required for Provision B.2.e.(3). The following water quality improvement strategies must be included and described in the Water Quality Improvement Plan:

(1) Specific strategies and/or activities that may be implemented by one or more Copermittees within their jurisdictions through the jurisdictional runoff management programs that will address the highest priority water quality conditions within the Watershed Management Area, in accordance with the following requirements:

(a) Strategies and/or activities must, at a minimum, be described for each jurisdictional runoff management program component where strategies to address the highest priority water quality conditions are required under Provision E;

(b) The Water Quality Improvement Plan must describe the circumstances or conditions when and where the strategies or/activities should be or will be implemented, but specific details about how each Copermittee will implement the strategies and/or activities within its jurisdiction are not required; and

(c) Descriptions of strategies and/or activities must include any monitoring, information collection, special studies, and/or data analysis that is necessary to assess the effectiveness of the strategy and/or activity toward addressing the highest priority water quality conditions.

(2) Additional strategies and/or activities that may be implemented within the Watershed Management Area on a jurisdictional, sub-watershed, or watershed scale by one or more Copermittees, not specifically required under

Provision E, which are designed to achieve the interim and final numeric goals identified in Provisions B.2.e.(1) and B.2.e.(2);

b. IMPLEMENTATION SCHEDULES

(1) The Copermittees must develop schedules for implementing the water quality improvement strategies identified under Provision B.3.a to achieve the interim and final numeric goals identified under Provision B.2.e.(1) and B.2.e.(2). Schedules must be developed for both the water quality improvement strategies implemented by each Copermittee within its jurisdiction and for strategies that the Copermittees choose to implement on a collaborative basis.

(2) The Copermittees must incorporate the implementation compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

4. Water Quality Improvement Monitoring and Assessment Program

a. The Copermittees in each Watershed Management Area must develop and incorporate an integrated monitoring and assessment program into the Water Quality Improvement Plan that assesses: 1) the progress toward achieving the numeric goals and schedules, 2) the progress toward addressing the highest priority water quality conditions for each Watershed Management Area, and 3) each Copermittee's overall efforts to implement the Water Quality Improvement Plan.

b. The monitoring and assessment program must incorporate the monitoring and assessment requirements of Provision D, which may allow the Copermittees to modify the program to be consistent with and focus on the highest priority water quality conditions for each Watershed Management Area.

c. For Watershed Management Areas with applicable TMDLs, the monitoring and assessment program must incorporate the specific monitoring and assessment requirements of Attachment E.

d. For Watershed Management Areas with any ASBS, the water quality monitoring and assessment program must incorporate the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

5. Iterative Approach and Adaptive Management Process

Comment [A28]: See discussion in section 3.3.2 of the comment letter.

The Copermittees in each Watershed Management Area must implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management

programs to become more effective toward achieving compliance with Provisions A.1, A.2, and A.3.~~A.1.a, A.1.c and A.2.a~~, and must include the following:

a. RE-EVALUATION OF PRIORITY WATER QUALITY CONDITIONS

The priority receiving water quality conditions, and numeric goals and corresponding schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.2.c and B.2.e, may be re-evaluated by the Copermittees as needed during the term of this Order as part of the Annual Report. Re-evaluation and recommendations for modifications to the priority water quality conditions, and numeric goals and corresponding schedules must be provided in the Regional Monitoring and Assessment Report pursuant to F.3.c~~Report of Waste Discharge~~, and must consider the following:

(1) Achieving the outcome of improved water quality in MS4 discharges and receiving waters through implementation of the water quality improvement strategies identified in the Water Quality Improvement Plan;

(2) Progress toward achieving interim and final numeric goals in receiving waters and/or MS4 discharges for the highest priority water quality conditions in the Watershed Management Area,

(3) Progress toward achieving outcomes according to established schedules;

(4) New information developed when the requirements of Provisions B.2.a-c have been re-evaluated;

(5) New policies or regulations that may affect identified numeric goals;

(6) Spatial and temporal accuracy of monitoring data collected to inform prioritization of water quality conditions and implementation strategies to address the highest priority water quality conditions;

(7) Availability of new information and data from sources other than the jurisdictional runoff management programs within the Watershed Management Area that informs the effectiveness of the actions implemented by the Copermittees;

(8) San Diego Water Board recommendations; and

(9) Recommendations for modifications solicited through a public participation process.

b. ADAPTATION OF STRATEGIES AND SCHEDULES

The water quality improvement strategies and schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.3, must be re-evaluated and adapted as new information becomes available to result in more effective and efficient measures to achieve the numeric goals established pursuant to

Provision B.2.e. Re-evaluation of and modifications to the water quality improvement strategies, if determined to be necessary, must be provided in the applicable Annual Report per F.3.b.(3)., and must consider the following:

(1) Modifications to the priority water quality conditions, and numeric goals and corresponding schedules based on Provision B.5.a;

(2) Measurable or demonstrable reductions of non-storm water discharges to and from each Copermittee's MS4;

(3) Measurable or demonstrable reductions of pollutants in ~~storm water~~ discharges from each Copermittee's MS4 to the MEP;

(4) New information developed when the requirements of Provisions B.2.b and B.2.d have been re-evaluated;

(5) Efficiency in implementing the Water Quality Improvement Plan;

(6) San Diego Water Board recommendations; and

(7) Recommendations for modifications solicited through a public participation process.

c. ADAPTATION OF MONITORING AND ASSESSMENT PROGRAM

The water quality improvement monitoring and assessment program, included in the Water Quality Improvement Plan pursuant to Provisions B.4, must be re-evaluated and adapted when new information becomes available. Re-evaluation and recommendations for modifications to the monitoring and assessment program, pursuant to the requirements of Provision D, may be provided in the Annual Report, but must be provided in the Report of Waste Discharge.

6. Water Quality Improvement Plan Submittal, Updates, and Implementation

a. The Copermittees must submit the Water Quality Improvement Plans in accordance with the requirements of Provision F.1.

b. The Copermittees must submit proposed updates to the Water Quality Improvement Plan for acceptance by the San Diego Water Board Executive Officer in accordance with the requirements of Provision F.2.c.

c. The Copermittees must commence with implementation of the Water Quality Improvement Plans ~~immediately after acceptance by the San Diego Water Board, in accordance with the schedules, or subsequently updated schedules, within the Water Quality Improvement Plan.~~in accordance with Provision F.1.b.(5).

Riverside Copermittee Redlines

C. ACTION LEVELS

Comment [A29]: See comment letter section 3.4 for a discussion of the redlines shown herein.

The purpose of this provision is for the Copermittees to incorporate numeric non-stormwater action levels (NALs) and stormwater action levels (SALs) in the Water Quality Improvement Plans (Provision B), and numeric non-stormwater action levels (NALs) in the Illicit Discharge Detection and Elimination (IDDE) program (Provision E.2.).

- For the purposes of the WQIPs, ~~T~~the goal of the action levels is to guide ~~Water Quality Improvement Plan~~ the implementation efforts and measure progress towards the protection of the identified high priority water quality conditions and associated designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through monitoring and assessing the quality of the MS4 discharges during the implementation of the Water Quality Improvement Plans.

- For the purposes of the IDDE program, the goal of the non-stormwater action levels is to assist in determining whether a persistent non-stormwater discharge into or from the MS4 contains pollutants at levels that have the potential to negatively affect the identified high priority water quality conditions.

Action levels will be developed and incorporated into the WQIP (Provision B) and the IDDE Program (Provision E). Depending upon the goals/objectives for the use of the action levels and the priority receiving water conditions, the constituents and values at which they are set may differ between watersheds. Copermittees may develop Watershed Management Area specific numeric action levels for non-stormwater and stormwater MS4 discharges using an approach approved by the Regional Board or use the default non-stormwater and stormwater action levels prescribed in C.1 and C.2 below.

The Copermittees will submit the action levels as a part of the WQIP and JRMP submittals. The action levels currently established will serve as the interim action levels until revised action levels are completed and approved. Exceedances of the action levels are not subject to enforcement or non-compliance actions under this Order.

1. Default Non-Storm Water Action Levels[8]

~~The Copermittees must develop and incorporate numeric non-storm water action levels (NALs) into the Water Quality Improvement Plan to: 1) support the development and prioritization of water quality improvement strategies for addressing non-storm water discharges to and from the MS4s, 2) assess the effectiveness of the water quality improvement strategies toward addressing MS4~~

Comment [A30]: As discussed in section 2.4 of the Riverside comment letter.

[8] NALs are not ~~considered by the San Diego Water Board to be~~ enforceable limitations under this Order.

~~non-storm water discharges, required pursuant to Provision D.4.b.(1), and 3) support the detection and elimination of non-storm water and illicit discharges to and from the MS4, required pursuant to Provision E.2.~~[9]

a. The following NALs must be incorporated as applicable to the WMA and the Copermittees' MS4 discharges,~~:~~ if the Copermittees do not establish numeric action levels within the WQIP based on watershed priorities:

(1) Non-Storm Water Discharges from MS4s to Ocean Surf Zone

Table C-1. Non-Storm Water Action Levels for Discharges from MS4s to Ocean Surf Zone

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Total Coliform	MPN/100 ml	1,000	-	10,000/1,000[1]	OP
Fecal Coliform	MPN/100 ml	200[2]	-	400	OP
Enterococci	MPN/100 ml	35	-	104[3]	OP

Abbreviations/Acronyms
AMAL – average monthly action level
OP – Ocean Plan water quality objective
MDAL – maximum daily action level
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Total coliform density NAL is 1,000 MPN/100 ml when the fecal/total coliform ratio exceeds 0.1.
2. Fecal coliform density NAL is 200 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas."

[9] ~~The Copermittees may utilize NALs or other benchmarks currently established by the Copermittees as interim NALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.~~

Riverside Copermittee Redlines

(2) Non-Storm Water Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Table C-2. Non-Storm Water Action Levels for Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Turbidity	NTU	75	-	225	OP
pH	Units	Within limit of 6.0 to 9.0 at all times			OP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	35	-	104[3]	BP
Priority Pollutants	ug/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
OP – Ocean Plan water quality objective
NTU – Nephelometric Turbidity Units
ug/L – micrograms per liter
MDAL – maximum daily action level
BP – Basin Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas" and is not applicable to waterbodies that are not designated with the water contact recreation (REC-1) beneficial use.

Table C-3. Non-Storm Water Action Levels for Priority Pollutants

Parameter	Units	Freshwater (CTR)		Saltwater (CTR)	
		MDAL	AMAL	MDAL	AMAL
Cadmium	ug/L	**	**	16	8
Copper	ug/L	*	*	5.8	2.9
Chromium III	ug/L	**	**	-	-
Chromium VI	ug/L	16	8.1	83	41
Lead	ug/L	*	*	14	2.9
Nickel	ug/L	**	**	14	6.8
Silver	ug/L	*	*	2.2	1.1
Zinc	ug/L	*	*	95	47

Abbreviations/Acronyms:
CTR – California Toxic Rule
AMAL – average monthly action level
ug/L – micrograms per liter
MDAL – maximum daily action level

Notes:
* Action levels developed on a case-by-case basis (see below)
** Action levels developed on a case-by-case basis (see below), but calculated criteria are not to exceed Maximum Contaminant Levels (MCLs) under the California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64431

The Cadmium, Copper, Chromium (III), Lead, Nickel, Silver and Zinc NALs for MS4 discharges to freshwater receiving waters will be developed on a case-by-case basis because the freshwater criteria are based on site-specific water quality data (receiving water hardness). For these priority pollutants, refer to ~~the following equations (~~40 CFR 131.38.b.2 ~~for details) will be required~~:

~~Cadmium (Total Recoverable) = exp(0.7852[ln(hardness)] - 2.715)~~
~~Chromium III (Total Recoverable) = exp(0.8190[ln(hardness)] + 0.6848)~~
~~Copper (Total Recoverable) = exp(0.8545[ln(hardness)] - 1.702)~~
~~Lead (Total Recoverable) = exp(1.273[ln(hardness)] - 4.705)~~
~~Nickel (Total Recoverable) = exp(.8460[ln(hardness)] + 0.0584)~~
~~Silver (Total Recoverable) = exp(1.72[ln(hardness)] - 6.52)~~
~~Zinc (Total Recoverable) = exp(0.8473[ln(hardness)] + 0.884)~~

Comment [A31]: Consistent with SD Permittee recommendations.

(3) Non-Storm Water Discharges from MS4s to Inland Surface Waters

Table C-4. Non-Storm Water Action Levels for Discharges from MS4s to Inland Surface Waters

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Dissolved Oxygen	mg/L	Not less than 5.0 in WARM waters and not less than 6.0 in COLD waters			BP
Turbidity	NTU	-	20	See MDAL	BP
pH	Units	Within limit of 6.5 to 8.5 at all times			BP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	33	-	61[3]	BP
Total Nitrogen	mg/L	-	1.0	See MDAL	BP
Total Phosphorus	mg/L	-	0.1	See MDAL	BP
MBAS	mg/L	-	0.5	See MDAL	BP
Iron	mg/L	-	0.3	See MDAL	BP
Manganese	mg/L	-	0.05	See MDAL	BP
Priority Pollutants	ug/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
BP – Basin Plan water quality objective
COLD – cold freshwater habitat beneficial use
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
MDAL – maximum daily action level
WARM – warm freshwater habitat beneficial use
MBAS – Methylene Blue Active Substances
MPN/100 ml – most probable number per 100 milliliters
ug/L – micrograms per liter

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for freshwater "designated beach areas" and is not applicable to waterbodies that are not designated with the water contact recreation (REC-1) beneficial use.

b. NALs must be identified, developed and incorporated in the Water Quality Improvement Plan for any pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in Receiving waters ~~of the state~~ associated with the highest priority water quality conditions related to non-storm water discharges from the MS4s. NALs must be based on:

(1) Applicable water quality standards which may be dependent upon site-specific or receiving water-specific conditions or assumptions to be identified by the Copermittees; or

(2) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. ~~For the NALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary NALs specific to the Watershed Management Area at levels greater than the NALs required by Provisions C.1.a and C.1.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for addressing non-~~

~~storm water discharges to and from the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and from the MS4. The secondary NALs may be developed using an approach acceptable to the San Diego Water Board.~~

d. Dry weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.b may be utilized to develop or revise NALs based on watershed-specific data, subject to San Diego Water Board Executive Officer approval.

2. Default Storm Water Action Levels[10]

The Copermittees must develop and incorporate numeric storm water action levels (SALs) in the Water Quality Improvement Plans to: 1) support the development and prioritization of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s, and 2) assess the effectiveness of the water quality improvement strategies toward reducing pollutants in storm water discharges, required pursuant to Provision D.4.b.(2).[11]

a. The following SALs for discharges of storm water from the MS4 must be incorporated~~:~~ if the Copermittees do not establish stormwater action levels within the WQIP based on watershed priorities::~~:~~

Table C-5. Storm Water Action Levels for Discharges from MS4s to Receiving Waters

Parameter	Units	Action Level
Turbidity	NTU	126
Nitrate & Nitrite (Total)	mg/L	2.6
Phosphorus (Total P)	mg/L	1.46
Cadmium (Total Cd)*	µg/L	3.0
Copper (Total Cu)*	µg/L	127
Lead (Total Pb)*	µg/L	250
Zinc (Total Zn)*	µg/L	976

Abbreviations/Acronyms:
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
ug/L – micrograms per liter

Notes:
* The sampling must include a measure of receiving water hardness at each MS4 outfall. If a total metal concentration exceeds the corresponding metals SAL in Table C-5, that concentration must be compared to the California Toxics Rule criteria and the USEPA 1-hour maximum concentration for the detected level of receiving water hardness associated with that sample. If it is determined that the sample's total metal concentration for that specific metal exceeds that SAL, but does not exceed the applicable USEPA 1-hour maximum concentration criterion for the measured level of hardness, then the sample result will not be considered above the SAL for that measurement.

[10] SALs are not ~~considered by the San Diego Water Board to be~~ enforceable limitations under this Order.
[11] The Copermittees may utilize SALs or other benchmarks currently established by the Copermittees as interim SALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

b. SALs must be identified, developed and incorporated in the Water Quality Improvement Plan for pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in Receiving waters ~~of the state~~ associated with the highest water quality priorities related to storm water discharges from the MS4s. SALs must be based on:

(1) Federal and State water quality guidance and/or water quality standards; and

(2) Site-specific or receiving water-specific conditions; or

(3) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. ~~For the SALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary SALs specific to the Watershed Management Area at levels greater than the SALs required by Provisions C.2.a and C.2.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s. The secondary SALs may be developed based on the approaches recommended by the State Water Board's Storm Water Panel[12] or using an approach acceptable to the San Diego Water Board.~~

d. Wet weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.c may be used to develop or revise SALs based upon watershed-specific data, subject to San Diego Water Board Executive Officer approval.

~~[12] Storm Water Panel Recommendations to the California State Water Resources Control Board: The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities (June 2006)~~

D. MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS

Comment [A32]: See discussion in section 3.5 of the comment letter.

The purpose of this provision is for the Copermittees to monitor and assess the impact on the chemical, physical, and biological conditions of receiving waters caused by discharges from the Copermittees' MS4s under wet weather and dry weather conditions. The goal of the monitoring and assessment program is to inform the Copermittees about the nexus between the health of receiving waters and the water quality condition of the discharges from their MS4s to those receiving waters.~~.~~ This goal will be accomplished through monitoring and assessing the conditions of the receiving waters, discharges from the MS4s to those receiving waters, pollutant sources and/or stressors, and effectiveness of the water quality improvement strategies implemented as part of the Water Quality Improvement Plans.

1. Receiving Water Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the condition of the receiving waters in each Watershed Management Area during dry weather and wet weather. Following acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct long-term receiving water monitoring during implementation of the Water Quality Improvement Plan to assess the long term trends and determine if water quality conditions in receiving waters are improving. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following receiving water monitoring procedures:

a. TRANSITIONAL RECEIVING WATER MONITORING

Beginning October 1st or May 1st (whichever is sooner) following enrollment under this order and until~~Until~~ the monitoring requirements of Provisions D.1.b-e are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following receiving water monitoring in the Watershed Management Area:

(1) Continue the receiving water monitoring programs required in Order Nos. R9-2007-0001~~,~~ (Attachment A, Section II. A. 1-5),~~,~~ R9-2009-0002, and R9-2010-0016;

(2) Continue the monitoring in the Hydromodification Management Plans approved by the San Diego Water Board;

(3) Participate in the following regional receiving water monitoring programs, as applicable to the Watershed Management Area and each Copermittees' MS4 discharges:

Comment [A33]: See discussion in section 3.5.3 of the comment letter.

(a) Storm Water Monitoring Coalition Regional Monitoring,

(b) Southern California Bight Regional Monitoring, and

(c) Sediment Quality Monitoring;

(4) Implement the monitoring programs developed as part of any implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) for the TMDLs in Attachment E to this Order; and

(5) For Watershed Management Areas with ASBS, implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

b. LONG-TERM RECEIVING WATER MONITORING STATIONS

The Copermittees must select at least one long-term receiving water monitoring station from among the existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees to be representative of the receiving water quality in the Watershed Management Area. Additional or alternative long-term receiving water monitoring stations may~~must~~ be selected where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

Comment [A34]: See discussion in section 3.5.3 of the comment letter.

c. DRY WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three dry weather monitoring events at each of the long-term receiving water monitoring stations. At least one monitoring event must be conducted during the dry season (May 1 – September 30) and at least one monitoring event must be conducted during a dry weather period during the wet season (October 1 – April 30), after the first wet weather event of the season, with an antecedent dry period of at least 72 hours following a storm event producing measureable rainfall of greater than 0.1 inch.

(1) Dry Weather Receiving Water Field Observations

For each dry weather monitoring event, the Copermittees must record field observations consistent with Table D-1 at each long-term receiving water monitoring station.

Table D-1. Field Observations for Receiving Water Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) • Assessment of any observed connectivity of MS4 discharges to a flowing receiving water. • Station description (i.e. deposits or stains, vegetation condition, structural condition, and observable biology) • Presence and assessment of trash in and around station

Comment [A35]: See discussion in section 3.5.3 of the comment letter.

(2) Dry Weather Receiving Water Field Monitoring

For each dry weather monitoring event, if conditions allow the collection of the data, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

Table D-2. Field Monitoring Parameters for Receiving Water Monitoring Stations

Parameters
• pH • Temperature • Specific conductivity • Dissolved oxygen • Turbidity

(3) Dry Weather Receiving Water Analytical Monitoring

For each dry weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity,

dissolved oxygen, turbidity, hardness, and indicator bacteria Grab samples may also be collected for the analyses described in (f) where MS4 discharge runoff constitutes less than ten percent of the flow;

Comment [A36]: The receiving water stations in Riverside County either do not receive runoff from MS4 discharges or receive deminimus flows during dry weather conditions. The flow at these stations during dry weather consists virtually entirely of rising groundwater. Background receiving water quality conditions In such cases composite samples of receiving waters not affected by MS4 discharges is not warranted.

(d) For all other constituents where runoff constitutes more than ten percent of the flow, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable NAL constituents, and

(v) Constituents listed in Table D-3.

Table D-3. Analytical Monitoring Constituents for Receiving Water Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Pesticides	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1]	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Mercury • Nickel • Selenium • Thallium • Zinc	• Organophosphate Pesticides • Pyrethroid Pesticides	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

• Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia			

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(4) Dry Weather Receiving Water Toxicity Monitoring

For each dry weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for toxicity in accordance with Table D-4:

Table D-4. Dry Weather Toxicity Testing for Receiving Water Monitoring Stations

Freshwater Organism	Test Approach	USEPA Protocol[2]
Pimephales promelas	1 acute 1 chronic[1]	EPA-821-R-02-012
Hyalella Azteca	1 acute 1 chronic[1]	EPA-821-R-02-012
Psuedokirchneriella subcapitata	1 acute 1 chronic[1]	EPA-821-R-02-013

Notes:
1. Chronic toxicity testing is not required at receiving water monitoring stations located at mass loading stations if the channel flows are diverted year-round during dry weather conditions to the sanitary sewer for treatment.
2. USEPA protocols must be utilized for toxicity testing unless alternate toxicity testing protocols have been approved by the San Diego Water Board.

(5) Dry Weather Receiving Water Bioassessment Monitoring

Bioassessment monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must conduct bioassessment monitoring during at least one dry weather monitoring event at each long-term receiving water monitoring station as follows:

(a) The following bioassessment samples and measurements must be collected:

(i) Macroinvertebrate samples must be collected in accordance with the "Reachwide Benthos (Multihabitat) Procedure" in the most current Surface Water Ambient Monitoring Program (SWAMP) Bioassessment Standard Operating Procedures (SOP), and amendments, as applicable;[13]

(ii) The "Full" suite of physical habitat characterization measurements

[13] Ode, P.R.. 2007. Standard operating procedures for collecting macroinvertebrate samples and associated physical and chemical data for ambient bioassessments in California. California State Water Resources Control Board Surface Water Ambient Monitoring Program (SWAMP) Bioassessment SOP 001. http://www.swrcb.ca.gov/water_issues/programs/swamp/tools.shtml#monitoring

must be collected in accordance with the most current SWAMP Bioassessment SOP, and as summarized in the SWAMP Stream Habitat Characterization Form – Full Version;[14] and

(iii) Freshwater algae samples must be collected in accordance with the SWAMP Standard Operating Procedures for Collecting Algae Samples.[15] Analysis of samples must include algal taxonomic composition (diatoms and soft algae) and algal biomass.

(b) The bioassessment samples, measurements, and appropriate water chemistry data must be used to calculate the following:

(i) An Index of Biological Integrity (IBI) for macroinvertebrates for each monitoring station where bioassessment monitoring was conducted, based on the most current calculation method;[16] and

(ii) An IBI for algae for each monitoring station where bioassessment monitoring was conducted, when a calculation method is developed.[17]

(c) In lieu of the requirements of Provision D.1.c.(5)(a), the Copermittees may conduct the bioassessment monitoring in accordance with the "Triad" assessment approach[18] to calculate the IBIs required for Provision D.1.c.(5)(b). The Copermittees must conduct sampling, analysis, and reporting of specified in-stream biological and habitat data according to the protocols specified in the SCCWRP Technical Report No. 539, or subsequent protocols, if developed.

(6) Dry Weather Receiving Water Hydromodification Monitoring

In addition to the hydromodification monitoring conducted as part of the Copermittees' Hydromodification Management Plans, hydromodification monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must collect the

[14] Available at: http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/reports/fieldforms_fullversion052908.pdf
[15] Fetscher et al. 2009. Standard Operating Procedures for Collecting Stream Algae Samples and Associated Physical Habitat and Chemical Data for Ambient Bioassessments in California.
[16] The most current calculation method at the time the Order was adopted is outlined in "A Quantitative Tool for Assessing the Integrity of Southern California Coastal Streams" (Ode, et al. 2005. Environmental Management. Vol. 35, No. 1, pp. 1-13). If an updated or new calculation method is developed, either both (i.e. current and updated/new) methods must be used, or historical IBIs must be recalculated with the updated or new calculation method.
[17] When a calculation method is developed, IBIs must be calculated for all available and appropriate historical data.
[18] Stormwater Monitoring Coalition Model Monitoring Technical Committee, 2004. Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California. Technical Report #419. August 2004.

following hydromodification monitoring observations and measurements within an appropriate domain of analysis during at least one dry weather monitoring event for each long-term receiving water monitoring station:

(a) Channel conditions, including:

(i) Channel dimensions,

(ii) Hydrologic and geomorphic conditions, and

(iii) Presence and condition of vegetation and habitat;

(b) Location of discharge points;

(c) Habitat integrity;

(d) Photo documentation of existing erosion and habitat impacts, with location (i.e. latitude and longitude coordinates) where photos were taken;

(e) Measurement or estimate of dimensions of any existing channel bed or bank eroded areas, including length, width, and depth of any incisions; and

(f) Known or suspected cause(s) of existing downstream erosion or habitat impact, including flow, soil, slope, and vegetation conditions, as well as upstream land uses and contributing new and existing development.

d. WET WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three wet weather monitoring events at each long-term receiving water monitoring station. At least one wet weather monitoring event must be conducted during the first wet weather event of the wet season (October 1 – April 30), and at least one wet weather monitoring event during a wet weather event that occurs after February 1.

(1) Wet Weather Receiving Water Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each long-term receiving water monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event;

(b) The flow rates and volumes measured or estimated (data from nearby

USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(d) Presence and assessment of trash in and around station.

(2) Wet Weather Receiving Water Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

(3) Wet Weather Receiving Water Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) Constituents listed in Table D-3.

(4) Wet Weather Receiving Water Toxicity Monitoring

For each wet weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for toxicity in accordance with Table D-5:

Table D-5. Wet Weather Toxicity Testing for Receiving Water Monitoring Stations

Freshwater Organism	Test Approach	USEPA Protocol[1]
Pimephales promelas	1 acute	EPA-821-R-02-012
Hyalella Azteca	1 acute	EPA-821-R-02-012
Psuedokirchneriella subcapitata	1 acute	EPA-821-R-02-013

Notes:
1. USEPA protocols must be utilized for toxicity testing unless alternate toxicity testing protocols have been approved by the San Diego Water Board.

e. OTHER RECEIVING WATER MONITORING REQUIREMENTS

(1) Regional Monitoring

The Copermittees must participate in the following regional receiving waters monitoring programs, as applicable to the Watershed Management Area and the Copermittee's MS4 discharges:

(a) Storm Water Monitoring Coalition Regional Monitoring; and

(b) Southern California Bight Regional Monitoring.

(2) Sediment Quality Monitoring

The applicable Copermittees must perform sediment monitoring to assess compliance with sediment quality receiving water limits applicable to MS4

discharges to enclosed bays and estuaries. The monitoring may be performed either by individual or multiple affected Copermittees to assess compliance with receiving water limits, or through participation in a water body monitoring coalition. The Copermittees must identify sediment sampling stations that are spatially representative of the sediment within the water body segment or region of interest. Sediment quality monitoring must be conducted in conformance with the monitoring requirements set forth in the State Water Board Sediment Quality Control Plan.

(3) ASBS Monitoring

For Watershed Management Areas with ASBS, the applicable Copermittees must implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

f. ALTERNATIVE WATERSHED MONITORING REQUIREMENTS

The San Diego Water Board may direct the Copermittees to participate in an effort to develop alternative watershed monitoring with other regulated entities, other interested parties, and the San Diego Water Board to refine, coordinate, and implement regional monitoring and assessment programs to determine the status and trends of water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and/or 3) streams. As directed by the San Diego Water Board, such alternative watershed monitoring would be done in place and stead of the commensurate requirements set forth in Provision D.1.

2. MS4 Outfall Discharge Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the discharges from the major MS4 outfalls to receiving waters in each Watershed Management Area during dry weather and wet weather. Following acceptance of the Water Quality Improvement Plans and schedule for implementation of monitoring for each Watershed Management Area, the Copermittees must conduct MS4 outfall discharge monitoring during implementation of the Water Quality Improvement Plan to assess the effectiveness of their jurisdictional runoff management programs toward effectively prohibiting non-storm water discharges into the MS4 and reducing pollutants in ~~storm water~~ discharges ~~to and~~ from their MS4s to the MEP. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following MS4 outfall monitoring procedures:

Comment [A37]: Suggest same edits for SD and OC.

a. TRANSITIONAL MS4 OUTFALL DISCHARGE MONITORING

Beginning October 1st or May 1st (whichever is sooner) following enrollment under this order and until~~Until~~ the monitoring requirements of Provisions D.2.b-c

are incorporated into a Water Quality Improvement Plan and schedule for implementation of monitoring that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following monitoring of MS4 outfall discharges to flowing receiving waters ~~monitoring~~ in the Watershed Management Area:

(1) MS4 Outfall Discharge Monitoring Station Inventory

Each Municipal Copermittee must identify all major MS4 outfalls (including those operated by a Special District Copermittee) that discharge directly to receiving waters within its jurisdiction and geo-locate those outfalls on a map of the MS4 pursuant to Provision E.2.b.(1). This information must be compiled into a MS4 outfall discharge monitoring station inventory, and must include the following information:

(a) Latitude and longitude of MS4 outfall point of discharge;

(b) Watershed Management Area;

(c) Hydrologic subarea;

(d) Outlet size;

(e) Accessibility (i.e. safety and without disturbance of critical habitat);

(f) Approximate drainage area; and

(g) Classification of whether the MS4 outfall is known to have persistent dry weather flows, transient dry weather flows, no dry weather flows, or unknown dry weather flows.

(2) Transitional Dry Weather MS4 Outfall ~~Discharge~~ Field Screening ~~Monitoring~~

Until the monitoring requirements of Provision D.2.b are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, each Municipal Copermittee must perform the following dry weather MS4 outfall field screening monitoring to identify non-storm water and illicit discharges being discharged from MS4s within its jurisdiction in accordance with Provision E.2.c, to determine which discharges are transient ~~flows~~ and which are persistent discharges to flowing receiving waters~~flows~~, and prioritize the dry weather MS4 discharges that will be investigated and eliminated in accordance with Provision E.2.d. ~~Each Copermittee must conduct the following dry weather MS4 outfall discharge field screening monitoring within its jurisdiction:~~

Comment [A38]: Suggested change of title to better characterize the requirements of this section, compared to that of D.2.b.

Comments in this section are discussed in section 3.5.3 of the comment letter.

Comment [A39]: Duplicative of previous sentence

(a) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Frequency

Each Municipal Copermittee must field screen the accessible MS4 outfalls in its inventory developed pursuant to Provision D.2.a.(1) as follows:

(i) ~~For Copermittees with less than 125 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 80 percent of the outfalls must be visually inspected two times per year during dry weather conditions.~~

(ii) For Municipal Copermittees with ~~125 major MS4 outfalls or more, but~~ less than or equal to 500 MS4 outfalls~~,~~ that discharge to receiving waters within a Watershed Management Area, ~~all~~ at least 80 percent of the accessible outfalls must be visually inspected at least annually during dry weather conditions.

(iii) For Municipal Copermittees with more than 500 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 500 outfalls must be visually inspected at least annually during dry weather conditions. Copermittees with more than 500 major MS4 outfalls within a Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(iv) Municipal Copermittees with more than 500 major MS4 outfalls within its jurisdiction that are located in more than one Watershed Management Area, at least 500 major MS4 outfalls within its inventory must be visually inspected at least annually during dry weather conditions. Copermittees with more than 500 major MS4 outfalls in more than one Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;

[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and

[e] Flow rate.

(v) Inspections of major MS4 outfalls conducted in response to public reports and staff or contractor reports and notifications may count toward the required visual inspections of MS4 outfall discharge monitoring stations.

(b) Transitional Dry Weather MS4 Outfall Discharge Field Screening Visual Observations

(i) An antecedent dry period of at least 72 hours following any storm event producing measurable rainfall greater than 0.1 inch is required prior to conducting field screening visual observations during a field screening monitoring event.

(ii) During the field screening monitoring event, each Municipal Copermittee must record visual observations consistent with Table D-6 at each MS4 outfall discharge monitoring station inspected.

Table D-6. Field Screening Visual Observations for MS4 Outfall Discharge Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) - Flow source(s) suspected or identified from non-storm water source investigation - Flow source(s) eliminated during non-storm water source identification • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) - Known or suspected source(s) of pooled or ponded water • Assessment of any observed MS4 discharge ~~with~~ to a flowing receiving water. • Station description (i.e. deposits or stains, vegetation condition, structural condition, observable biology) • Presence and assessment of trash in and around station • Evidence or signs of illicit connections or illegal dumping

(iii) Each Municipal Copermittee must implement the requirements of Provisions E.2.d.(2)(c)-(e) based on the field observations.

(iv) Each Copermittee must evaluate field observations together with existing information available from prior reports, inspections and monitoring results to determine whether any observed flowing,

pooled, or ponded waters are likely to be transient or persistent flow.[19]

Comment [A40]: See footnote edits

(c) Transitional Dry Weather MS4 Outfall Discharge Field Screening ~~Monitoring~~ Records

Based upon the results of the transitional dry weather MS4 outfall discharge field screening monitoring conducted pursuant to Provisions D.2.a.(2)(a)-(b), each Municipal Copermittee must update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow.

(3) Transitional Wet Weather MS4 Outfall Discharge Monitoring

Comment [A41]: See discussion in section 3.5.3 of the comment letter.

Until the monitoring requirements of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(a) Transitional Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees must select at least five wet weather MS4 outfall discharge monitoring stations from the inventories developed pursuant to Provision D.2.a.(1) that are representative of storm water discharges from areas consisting primarily of residential, commercial, industrial, and typical mixed-use land uses present within the Watershed Management Area.

(b) Transitional Wet Weather MS4 Outfall Discharge Monitoring Frequency

Each wet weather MS4 outfall discharge monitoring station selected pursuant to Provision D.2.a.(3)(a) must be monitored twice during the wet season (October 1 – April 30~~)).~~) in the transitional period. The~~). One~~ wet weather monitoring ~~event~~events shall be selected to be representative of the range of hydrologic conditions experienced in the region. At least 10% of samples~~event~~ must be conducted during the first wet weather event of the wet season, ~~and~~to include~~and one wet weather monitoring event~~ at least one such sample in each Watershed Management Area~~, a month after the first wet weather event of the wet season.~~

[19] Persistent flow, for the purposes of provision II.D.2.b.(2) is defined as the presence of an MS4 discharge that is hydraulically connected to a flowing receiving~~, pooled, or ponded~~ water more than 72 hours after a measureable rainfall event of 0.1 inch or greater, during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

(c) Transitional Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded of the flow from~~at~~ each wet weather MS4 outfall discharge monitoring station:

(i) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(ii) The flow rates and volumes measured or estimated from the outfall (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(iii) ~~Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and~~

(iv) Presence ~~and assessment~~ of trash in and around station.

Comment [A42]: This isn't appropriate for a wet weather event.

Comment [A43]: This isn't appropriate for a wet weather event.

(d) Transitional Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(e) Transitional Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, and indicator bacteria;

(iv) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant

concentrations and runoff flows using one of the following techniques:

[a] Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or
[b] Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or
[c] If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours;

(v) Only one analysis of the composite of aliquots is required;

(vi) The samples must be analyzed for the following constituents:

[a] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,
[b] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and
[c] Constituents listed in in Table D-7.

Table D-7. Analytical Monitoring Constituents for Wet Weather MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Nickel • Selenium • Thallium • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(f) Other Transitional Wet Weather MS4 Outfall Discharge Monitoring

The San Diego County Copermittees must continue the wet weather MS4 outfall monitoring program developed under Order No. R9-2007-0001, as approved by the San Diego Water Board, through its planned completion.

b. DRY WEATHER MS4 OUTFALL DISCHARGE MONITORING

Each Municipal Copermittee must perform the following dry weather MS4 outfall monitoring within its jurisdiction to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. ~~Each Copermittee must conduct the following dry weather MS4 outfall discharge monitoring within its jurisdiction:~~

Comment [A44]: Repetitive of previous sentence

(1) Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Comment [A45]: See discussion in section 3.5.3 of the comment letter.

Each Municipal Copermittee must continue to perform the dry weather MS4 outfall discharge field screening monitoring in accordance with the requirements of Provision D.2.a.(2). ~~The~~ however the Municipal Copermittee may adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of persistent ~~flow~~ non-storm water illegal discharges from the MS4 to flowing receiving waters in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan. ~~, provided the~~

~~number of visual inspections performed is equivalent to the number of visual inspections required under Provision D.2.a.(2)(a).~~

Comment [A46]: See comments in comment letter

(2) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring

Each Municipal Copermittee must perform the following non-storm water monitoring of MS4 outfalls that persistently ~~flow MS4 outfall~~ discharge to flowing receiving waters ~~monitoring~~ to determine which persistent non-storm water discharges contain concentrations of pollutants below NALs, and which persistent non-storm water discharges impact receiving water quality during dry weather. ~~Each Copermittee must conduct the following non-storm water persistent flow MS4 outfall discharge monitoring within its jurisdiction:~~

Comment [A47]: Repetitive of previous sentence.

(a) Prioritization of Non-Storm Water Persistent Flow MS4 Outfalls

Based upon the dry weather MS4 outfall discharge field screening monitoring records developed pursuant to Provision D.2.a.(2)(c), each Municipal Copermittee must identify and prioritize the MS4 outfalls within its jurisdiction that have~~with~~ persistent discharges to flowing receiving waters ~~flows~~ based on the highest priority water quality conditions identified in the Water Quality Improvement Plan and any additional criteria developed by the Copermittee, which may include historical data and data from sources other than what the Copermittee collects.

(b) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring Frequency

Comment [A48]: See comment letter section 3.5.3

(i) Based on the prioritization of major MS4 outfalls developed under Provision D.2.b.(2)(a), each Municipal Copermittee must identify, at a minimum, the top 10 percent of the~~10~~ highest priority major MS4 outfalls with non-storm water persistent flows that the Copermittee will monitor within each Watershed Management Area within its jurisdiction, with a minimum of one persistent ~~flow~~discharge outfall, and a maximum of 5 required per WMA. The location of the selected highest priority non-storm water persistent ~~flow~~ discharge MS4 outfall monitoring stations must be identified on the map required pursuant to Provision E.2.b.(1).

(ii) Each of the highest priority non-storm water persistent flow MS4 outfall monitoring stations identified pursuant to Provision D.2.b.(2)(b)(i) must be monitored under dry weather conditions at least ~~semi~~ annually until one of the following occurs:

[a] The non-storm water discharges have been effectively eliminated (i.e. no flowing, pooled, or ponded water) for three consecutive dry weather monitoring events; or

[b] The source(s) of the persistent flows has been identified as a category of non-storm water discharges that does not require an NPDES permit and does not have to be addressed as an illicit discharge because it was not identified as a source of pollutants (i.e. constituents in non-storm water discharge do not exceed NALs), and the persistent flow can be re-prioritized to a lower priority; or

[c] The constituents in the persistent flow non-storm water discharge do not exceed NALs, and the persistent flow can be re-prioritized to a lower priority; or

[d] The source(s) of the persistent flows has been identified as a non-storm water discharge authorized by a separate NPDES permit.

(iii) Where the criteria under Provision D.2.b.(2)(c)(ii) are not met, but the threat to water quality has been reduced by the Copermittee, the highest priority persistent flow MS4 outfall monitoring stations may be reprioritized accordingly for continued dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1).

(iv) Each Municipal Copermittee must document removal or re-prioritization of the highest priority persistent flow MS4 outfall monitoring stations identified under Provision D.2.b.(2)(b) in the Annual Report. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized MS4 major outfall in the Watershed Management Area within its jurisdiction, unless there are no remaining qualifying major MS4 outfalls within the Copermittee's jurisdiction in the Watershed Management Area.

(c) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Observations

During each semi-annual monitoring event, each Municipal Copermittee must record field observations consistent with Table D-6 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(d) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Monitoring

During each ~~semi-annual~~ monitoring event, if conditions allow the collection of the data, each Municipal Copermittee must monitor and record the parameters in Table D-2 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(e) Non-Storm Water Persistent Flow MS4 Outfall Discharge Analytical Monitoring

Comment [A49]: See discussion in section 3.5.3 of the comment letter.

During each semi-annual monitoring event in which measurable flow from the MS4 outfall to a flowing receiving water is present, each Municipal Copermittee must collect and analyze samples from each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) During development of the WQIP, for each WMA, consider the following sources to select constituents for collection of~~Collect~~ grab or composite samples to be analyzed at a qualified analytical laboratory::~~for the following constituents:~~

[a] Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,
[b] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,
[c] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,
[d] Applicable NAL constituents, and
[e] Constituents listed in Table D-8, unless the Copermittee has historical data that can demonstrate or provide justification that the analysis of the constituent is not necessary.

(iv) Copermittees may adjust the analytical list for a given WMA in successive monitoring events to add or eliminate constituents based on data that can demonstrate or provide justification regarding need or lack of need for the analysis of specific constituents.

Table D-8. Analytical Monitoring Constituents for Persistent Flow MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Total Hardness • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen	• Cadmium • Copper • Lead • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

• Ammonia		

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

~~(iv)~~(v) If the Copermittee identifies and eliminates the source of the persistent flow non-storm water discharge, analysis of the sample is not required.

c. WET WEATHER MS4 OUTFALL DISCHARGE MONITORING

The Copermittees must perform wet weather MS4 outfall monitoring to identify sources areas of pollutants in ~~storm water~~ discharges from the MS4s in the Watershed Management Area. The Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(1) Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees may adjust the wet weather MS4 outfall discharge monitoring locations and frequencies in the Watershed Management Area, as needed, to identify sources of pollutants in storm water discharges from MS4s in the Watershed Management Area in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of stations is at least equivalent to the number of stations required under Provision D.2.a.(3)(a).

(2) Wet Weather MS4 Outfall Discharge Monitoring Frequency

The Copermittees must monitor the wet weather MS4 outfall discharge monitoring stations in the Watershed Management Area at an appropriate frequency to identify source areas of pollutants in ~~storm water~~ discharges from the MS4s causing or contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan.

(3) Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or

estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

~~(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and~~

~~(d) Presence and assessment of trash in and around station.~~

Comment [A50]: These are inappropriate for wet weather observations.

(4) Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(5) Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

(iii) If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours.

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and

(iv) Applicable SAL constituents.

3. Special Studies

Comment [A51]: See discussion in section 3.5.3 of the comment letter.

a. Within the term of this Order, the Copermittees must initiate~~develop and implement~~ the following special studies:

(1) At least two~~three~~ special studies in each Watershed Management Area to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that cause or contribute to highest priority water quality conditions identified in the Water Quality Improvement Plan.

(2) At least one~~two~~ special study~~studies~~ for the San Diego Region to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that are impacting receiving waters on a regional basis in the San Diego Region.

(3) One of the two~~three~~ special studies in each Watershed Management Area may be replaced by a special study implemented pursuant to Provision D.3.a.(2).

b. The special studies must, at a minimum, be in conformance with the following criteria:

(1) The special studies must be related to the highest priority water quality conditions identified by the Copermittees in the Watershed Management Area and/or for the entire San Diego Region;

(2) The special studies developed pursuant to Provision D.3.a.(1) must:

(a) Be implemented within the applicable Watershed Management Area, and

(b) Require some form of participation by all the Copermittees within the Watershed Management Area;

(3) The special studies developed pursuant to Provision D.3.a.(2) must:

(a) Be implemented within the San Diego Region, and

(b) Require some form of participation by all Copermittees covered under the requirements of this Order.

c. Special studies developed to identify sources of pollutants and/or stressors should be pollutant and/or stressor specific and based on historical monitoring data and monitoring performed pursuant to Provisions D.1 and D.2. Development of source identification special studies should include the following:

(1) A compilation of known information on the specific pollutant and/or stressor, including data on potential sources and movement of the pollutant and/or stressor within the watershed. Data generated by the Copermittees and others, as well as information available from a literature research on the pollutant and/or stressor should be compiled and analyzed as appropriate.

(2) An identification of data gaps, based on the compiled information generated on the specific pollutant and/or stressor in Provision D.3.d.(1). Source identification special studies should be developed to fill identified data gaps.

(3) A monitoring plan that will collect and provide data the Copermittees can utilize to do the following:

(a) Quantify the relative loading or impact of a pollutant and/or stressor from a particular source or pollutant generating activity;

(b) Improve understanding of the fate of a pollutant and/or stressor in the environment;

(c) Develop an inventory of known and suspected sources of a pollutant and/or stressor in the Watershed Management Area; and/or

(d) Prioritize known and suspected sources of a pollutant and/or stressor based on relative magnitude in discharges, geographical distribution (i.e.,

regional or localized), frequency of occurrence in discharges, human health risk, and controllability.

d. Special studies initiated prior to the term~~acceptance~~ of ~~the~~this Order~~the Water Quality Improvement Plan~~ that meet the requirements of Provision D.3.b and are implemented~~completed~~ during the term of this Order may be utilized to fulfill the special study requirements of Provision D.3.a.

e. The Copermittees must submit the monitoring plans for the special studies in the Water Quality Improvement Plans required pursuant to Provision F.1.

f. The Copermittees are encouraged to share the results of the special studies regionally among the Copermittees to provide information useful in improving and adapting the management of non-storm water and storm water runoff through the implementation of the Water Quality Improvement Plans.

4. Assessment Requirements

Each Copermittee must evaluate the data collected pursuant to Provisions D.1, D.2 and D.3, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E, to assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a. Assessments must be performed as described in the following provisions:

a. RECEIVING WATERS ASSESSMENTS

(1) The Copermittees must assess and report the conditions of the receiving waters in the Watershed Management Area as follows:

(a) Based on data collected pursuant to Provision D.1.a, the assessments under Provision D.4.a.(2) must be included in the transitional~~first~~ Annual Report required pursuant to Provision F.3.b.(2~~1~~).

Comment [A52]: See our edits to that section

(b) Based on the data collected pursuant to Provisions D.1.a-e, the assessments required under Provision D.4.a.(2) must be included in the Report of Waste Discharge required pursuant to Provision F.5.b.

(2) The Copermittees must assess the status and trends of receiving water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under dry weather and wet weather conditions, as those conditions are affected by discharges from the Copermittees' MS4, to determine the progress towards meeting interim or final goals of the Water Quality Implementation Plan for the Watershed Management Area~~.~~ For each of the three types of receiving waters that are present in each Watershed Management Area the applicable Copermittees must:

Comment [A53]: See discussion in section 3.5.3 of the comment letter.

(a) Determine whether or not the conditions of the receiving waters are meeting any applicable numeric goals established pursuant to provision B.2.e.~~protective of the designated beneficial uses~~;

~~(b) Identify the most critical beneficial uses that must be protected or restored to ensure overall health of the receiving water;~~

~~(c) Determine whether or not those critical beneficial uses are being protected and where those beneficial used must be restored;~~

~~(d)~~(b) Identify short-term and/or long-term improvements or degradation of Receiving Water conditions related to those numeric goals~~those critical beneficial uses~~;

~~(e)~~(c) Identify data gaps in the monitoring data necessary to assess Provisions D.4.a.(2)(a)-(d).

b. MS4 OUTFALL DISCHARGES ASSESSMENTS

(1) Non-Storm Water Discharges Reduction Assessments

Comment [A54]: See discussion in section 3.5.3 of the comment letter for key changes. Other changes are described in comments below.

(a) ~~Each Copermittee must assess and report the progress of its illicit discharge detection and elimination program, required to be implemented pursuant to Provision E.2, toward reducing and effectively prohibiting non-storm water and illicit discharges into the MS4 within its jurisdiction as follows:~~

~~(i) Based on data collected pursuant to Provisions D.2.a.(2), the assessments under Provision D.4.b.(1)(b) must be included when complete in the Annual Report required pursuant to Provision F.3.b.(1).~~

~~(ii) Based on the data collected pursuant to Provisions D.2.b, the assessments required under Provision D.4.b.(1)(c) must be included in the first Annual Report required pursuant to Provision F.3.b.(1), and annually thereafter.~~

~~(iii) Based on the data collected pursuant to Provisions D.2.b, the assessment required under Provision D.4.b.(1)(c) must be included in the Report of Waste Discharge required pursuant to F.5.b.~~

Comment [A55]: For clarity and simplicity, these timelines were integrated into the following sections.

(b) Based on the transitional dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.a.(2), each

Municipal Copermittee must assess and report the following, as applicable to discharges from the MS4 (including Special District Copermittee MS4s) to flowing receiving waters within their jurisdiction, in the Annual Report required pursuant to Provision F.3.b.(2):~~:~~

(i) Identify the known and suspected controllable sources (e.g. facilities, areas, land uses, pollutant generating activities) of transient and persistent flow discharges to flowing receiving waters~~flows~~ within the Copermittee's jurisdiction in the Watershed Management Area;

(ii) Identify sources of transient and persistent flow discharges to flowing receiving waters~~flows~~ within the Copermittee's jurisdiction in the Watershed Management Area that have been reduced or eliminated; and

(iii) Identify modifications to the field screening monitoring locations and frequencies for the MS4 outfalls in its inventory necessary to identify and eliminate sources of persistent flow non-storm water discharges to flowing receiving waters, pursuant to Provision D.2.b.(1).

(c) Based on the dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b, each Municipal Copermittee must assess and report the following, as applicable to discharges from the MS4 (including Special District Copermittee MS4s) within their jurisdiction, in each Annual Report required pursuant to F.3.b.(3) and in the Report of Waste Discharge required pursuant to Provision F.5.b.:~~:~~

(i) The assessments required pursuant to Provision D.4.b.(1)(a~~b~~);

(ii) Based on the data collected and applicable NALs in the Water Quality Improvement Plan, rank the MS4 outfalls in the Copermittee's jurisdiction according to potential threat to receiving water quality, and produce a prioritized list of major MS4 outfalls for follow-up action to update the Water Quality Improvement Plan, with the goal of eliminating persistent flow non-storm water discharges to flowing receiving waters and/or pollutant loads in order of the ranked priority list through targeted programmatic actions and source investigations;

(iii) For the highest priority major MS4 outfalls with persistent flow discharges to a flowing receiving water~~flows~~ that are in exceedance of NALs, identify the known and suspected sources within the Copermittee's jurisdiction in the Watershed Management Area that may cause or contribute to the NAL exceedances;

(iv) Each Copermittee must analyze the data collected pursuant to Provision D.2.b.(2), and: ~~utilize a model or other method, to calculate or estimate the non-storm water volumes and pollutant loads collectively discharged from all the major MS4s outfalls in its jurisdiction identified as having persistent dry weather flows during~~

Comment [A56]: Per edits to that section

Comment [A57]: Per edits to that section

Comment [A58]: Per edits above

Comment [A59]: Edits to this section (and sub-sections) is different than SD edits.

the monitoring year. These calculations or estimates must be updated annually. Each Copermittee must calculate or estimate:

[a] Calculate or estimate annual non-storm water volumes and pollutant loads (associated with the priority constituents identified in the WQIP) collectively discharged from the monitored persistently flowing Copermittee's major MS4 outfalls discharging to flowing receiving waters within the Copermittee's jurisdiction, or discharged into another Copermittee's MS4 as demonstrated through provision E.2.d. with an estimate of the percent contribution from each known and suspected source for each MS4 outfall;

[b] Identify identify and quantify, where feasible, known sources of non-stormwater flows not [b] Annual non-storm water volumes and pollutant loads from areas or facilities subject to the Copermittee's legal authority that are discharged from the Copermittee's major MS4 outfalls to downstream receiving waters.

(v) Each Copermittee must review the data collected pursuant to Provision D.2.b and findings from the assessments required pursuant to Provision D.4.b.(1)(c)(i)-(iv) once per Permit termon an annual basis, and then report within the Regional Monitoring and Assessment Report per Provision F.3.c., the following to:

[a] Identify reductions and progress in achieving reductions in non-storm water and illicit discharges to the Copermittee's MS4 in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction, with an estimate, if possible, of the non-storm water volume and/or pollutant load reductions attributable to specific water quality strategies implemented by the Copermittee; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittee in the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction.

(vi) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(v).

(2) Storm Water Pollutant Discharges Reduction Assessments

(a) The Copermittees must assess and report the progress of the water quality improvement strategies, required to be implemented pursuant to

Comment [A60]: This is to help ensure jurisdictional accountability for what is being discharged from their jurisdiction.

~~Provisions B and E, toward reducing pollutants in storm water discharges from the MS4s within the Watershed Management Area as follows:~~

~~(i) Based on data collected pursuant to Provisions D.2.a.(3), the assessments under Provision D.4.b.(2)(b) must be included in the first Annual Report required pursuant to Provision F.3.b.(1).~~

~~Based on the data collected pursuant to Provisions D.2.c, the assessments required under ProvisionProvision first Annual Report required pursuant to Provision F.3.b.(1), and annually thereafter.~~

~~Based on the data collected pursuant to Provisions D.2.c, the assessment required under Provisions D.4.b.(2)(c)-(d) must be included in the Report of Waste Discharge required pursuant to F.5.b.~~

(b) Based on the transitional wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.a.(3) the Copermittees must assess and report the following in the Transitional Period Monitoring Report required pursuant to Provision F.3.b.(2):

(i) The Copermittees must analyze the monitoring data collected pursuant to Provision D.2.a.(3), and utilize a watershed model or other method, to calculate or estimate: ~~storm water volumes and pollutant loads discharged from the MS4s in each Copermittee's jurisdiction within the Watershed Management Area. The Copermittees must calculate or estimate the following for each monitoring year:~~

[a] The average storm water runoff coefficient for each land use type within the Watershed Management Area;

[b] The volume of storm water and pollutant loads discharged from each of the Copermittee's monitored major MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each monitored storm event with measurable rainfall greater than 0.1 inch, for each of the priority water quality constituents identified in the WQIP;

[c] The total volume and pollutant loads potentially discharged from each Municipal Copermittee's jurisdiction within the watershed management area, for each monitored event, extrapolated from the data produced from the monitored outfalls.

~~The pollutant loads discharged from each of the Copermittee's major MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch; and~~

~~[d] The percent contribution of storm water volumes and pollutant loads discharged from each land use type within the drainage basin to each of the Copermittee's major MS4 outfalls in its~~

Comment [A61]: See discussion in section 3.5.3 of the comment letter.

Comment [A62]: Removed as this was confusing as it was duplicative of the subsections below.

Comment [A63]: There is no need to perform this analysis for other pollutants not identified as priorities in the WQIP.

~~jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch.~~

(ii) Identify modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify ~~sources~~ pollutants in storm water discharges from the MS4s in the Watershed Management Area pursuant to Provision D.2.c.(1).

(c) Based on the wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.c the Copermittees must assess and report (i) and (ii) below in the annual reports required per F.3.b.(3), and (i) through (iv) below in the Regional Monitoring and Assessment Report required per F.3.c. ~~the following~~:

(i) The assessments required pursuant to Provision D.4.b.(2)(a~~b~~);

(ii) Based on the data collected and applicable SALs in the Water Quality Improvement Plan, analyze and compare the monitoring data to the analyses and assumptions used to develop the Water Quality Improvement Plans, including strategies developed per Provision B.3, and evaluate whether ~~,rank the MS4 outfalls in the Watershed Management Area according to potential threat to receiving water quality, and produce a prioritized list of major MS4~~ there is a need to update the Water Quality Improvement Plan;

(iii) The Copermittees must review the data collected pursuant to Provision D.2.c and findings from the assessments required pursuant to Provisions D.4.b.(2)(c)(i)-(ii) ~~on an annual basis~~ to:

[a] Identify reductions and progress in achieving reductions in pollutant concentrations and/or pollutant loads from different land uses and/or drainage areas discharging from the Copermittees' MS4s in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing pollutants in ~~storm water~~ discharges from the MS4s to receiving waters within the Watershed Management Area to the MEP, with an estimate, if possible, of the pollutant load reductions attributable to specific water quality strategies implemented by the Copermittees; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittees in the Watershed Management Area toward reducing pollutants in ~~storm water~~ discharges from the MS4s to receiving waters in the Watershed Management Area to the MEP.

(iv) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(iii).

Comment [A64]: See discussion in section 3.5.3 of the comment letter.

Comment [A65]: Per edits to that section

Comment [A66]: Per edits above

(d) Within the Regional Monitoring and Assessment report required pursuant to F.3.c.~~The~~ Copermittees must evaluate all the data collected pursuant to Provision D.2.c, and incorporate new outfall monitoring data into time series plots for each long-term monitoring constituent for the Watershed Management Area, and perform statistical trends analysis on the cumulative long-term wet weather MS4 outfall discharge water quality data set.

c. SPECIAL STUDIES ASSESSMENTS

The Copermittees must in the applicable annual report required pursuant to F.3.b.,~~annually~~ evaluate the results and findings from the special studies developed and implemented pursuant to Provision D.3, and assess their relevance to the Copermittees' efforts to characterize receiving water conditions, understand sources of pollutants and/or stressors, and control and reduce the discharges of pollutants from the MS4 outfalls to receiving waters in the Watershed Management Area. The Copermittees must report the results of the special studies assessments applicable to the Watershed Management Area, and identify any necessary modifications or updates to the Water Quality Improvement Plan based on the results in the Annual Reports required pursuant to Provision F.3.b.

d. INTEGRATED ASSESSMENT OF WATER QUALITY IMPROVEMENT PLAN

As part of the iterative approach and adaptive management process required for the Water Quality Improvement Plan pursuant to Provision B.5, the Copermittees in each Watershed Management Area must integrate the data collected pursuant to Provisions D.1-D.3, the findings from the assessments required pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to assess the effectiveness of, and identify necessary modifications to, the Water Quality Improvement Plan as follows:

(1) The Copermittees must re-evaluate the priority water quality conditions and numeric goals for the Watershed Management Area, as needed, during the term of this Order pursuant to Provision B.5.a. The re-evaluation and recommendations for modifications to the priority water quality conditions, and/or numeric goals and corresponding schedules may be provided in the Annual Reports required pursuant to Provision F.3.b, but must at least be provided in the Regional Monitoring and Assessment Report ~~of Waste Discharge~~ pursuant to Provision F.3.c~~5.b~~. The priority water quality conditions and numeric goals for the Watershed Management Area must be re-evaluated as follows:

(a) Re-evaluate the receiving water conditions in the Watershed Management Area in accordance with Provision B.2.a;

(b) Re-evaluate the impacts on receiving waters in the Watershed Management Area from MS4 discharges in accordance with Provision B.2.b;

(c) Re-evaluate the identification of MS4 sources of pollutants and/or stressors in accordance with Provision B.2.d;

(d) Identify beneficial uses of the receiving waters that are protected or must be restored in accordance with Provision D.4.a;

(e) Evaluate the progress toward achieving the interim and final numeric goals for restoring impacted beneficial uses in the receiving waters.

(2) The Copermittees must re-evaluate the water quality improvement strategies for the Watershed Management Area during the term of this Order pursuant to Provision B.5.b. The re-evaluation and recommendations for modifications to the water quality improvement strategies and schedules may be provided in the Annual Reports required pursuant to Provision F.3.b, but must at least be provided in the Regional Monitoring and Assessment Report pursuant to Provision F.3.c~~must be provided in the Annual Reports required pursuant to Provision F.3.b, and provided in the Report of Waste Discharge pursuant to Provision F.5.b~~. The water quality improvement strategies for the Watershed Management Area must be re-evaluated as follows:

(a) Identify the non-storm water and storm water pollutant loads from the Copermittees' MS4 outfalls in the Watershed Management Area, calculated or estimated pursuant to Provisions D.4.b;

(b) Identify the non-storm water and storm water pollutant load reductions, or other improvements to receiving water or water quality conditions, that are necessary to attain the interim and final numeric goals identified in the WQIP~~for restoring impacted beneficial uses in the receiving waters~~;

(c) Identify any~~the~~ non-storm water and storm water pollutant load reductions, or other improvements to the quality of MS4 discharges, that are necessary for the Copermittees to ~~demonstrate that non-storm water and storm water~~ reduce discharges of pollutants from their MS4s that have been demonstrated to be~~are not~~ causing or contributing to exceedances of receiving water limitations;

Comment [A67]: See discussion in section 3.5.3 of the comment letter.

(d) Evaluate the progress of the water quality improvement strategies toward achieving the interim and final numeric goals identified in the WQIP~~for restoring impacted beneficial uses in the receiving waters~~.

(3) The Copermittees must re-evaluate and adapt the water quality monitoring and assessment program for the Watershed Management Area when new information becomes available to improve the monitoring and assessment

program pursuant to Provision B.5.c. The re-evaluation and recommendations for modifications to the monitoring and assessment program may be provided in the Annual Reports required pursuant to Provision F.3.b, but must at least be provided in the Regional Monitoring and Assessment Report ~~of Waste Discharge~~ pursuant to Provision F.3.c~~5.b~~. Modifications to the water quality monitoring and assessment program must be consistent with the requirements of Provision D.1-D.3. The re-evaluation of the water quality monitoring and assessment program for the Watershed Management Area must consider the data gaps identified by the assessments required pursuant to Provisions D.4.a-b, and results of the special studies implemented pursuant to Provision D.4.c.

5. Monitoring Provisions

Each Copermittee must comply with all the monitoring, reporting, and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

E. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS

The purpose of this provision is for each Copermittee to implement a program to control the contribution of pollutants to and the discharges from the MS4 within its jurisdiction. The goal of the jurisdictional runoff management programs is to implement strategies that effectively prohibit non-storm water discharges to the MS4 and reduce the discharge of pollutants in ~~storm water~~ to the MEP. This goal will be accomplished through implementing the jurisdictional runoff management programs in accordance with the strategies identified in the Water Quality Improvement Plans.

Each Copermittee must update its jurisdictional runoff management program document, in accordance with Provision F.2.a, to incorporate all the requirements of Provision E, consistent with their legal authority. Until the Copermittee has updated its jurisdictional runoff management program document with the applicable requirements of Provision E, the Copermittee must continue implementing its current jurisdictional runoff management program.

Modification of Jurisdictional Runoff Management Program Requirements

Modifications shall be considered and where selected, proposed according to the process in Provision B.5. Proposed modifications may increase, decrease, and/or replace minimum requirements identified in Provision E.

1. Legal Authority Establishment and Enforcement

Comment [A68]: See discussion in section 3.6 of the comment letter.

a. Each Copermittee must establish, maintain, and enforce adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 through statute, ordinance, permit, or series of contracts, ~~order, or similar means~~ which~~. This legal authority must~~, at a minimum, authorize the Copermittee to:

(1) Effectively prohibit through ordinance, order or other similar means~~Prohibit and eliminate all~~ illicit discharges ~~and illicit connections~~ to its MS4;

(2) Control, through ordinance, permit, contract, order or similar means the contribution of pollutants in discharges to the MS4 by storm water discharges ~~of runoff~~ associated with industrial and construction activity~~ to its MS4~~, and ~~control~~ the quality of storm water discharges ~~runoff~~ from sites of industrial and construction activity~~sites~~, whose discharges have not been separately authorized through~~ that do not, including industrial and construction sites which~~ have coverage under the statewide General Permit for Discharges of Storm Water Associated with Industrial Activities (Industrial General Permit) or General Permit for Discharges of Storm Water Associated with Construction Activities (Construction General Permit)~~, as well as to those sites which do not;~~

Comment [A69]: See discussion in section 3.6.2 of the comment letter.

(3) Control, through ordinance, order or similar means the discharge to the MS4 of spills, dumping, or disposal of materials other than storm water~~ into its~~

Comment [A70]: See discussion in section 3.6.2 of the comment letter.

~~MS4~~;

(4) Control through interagency agreements among Copermittees the contribution of pollutants from one portion of the MS4 to another portion of the MS4;

(5) ~~Control, by coordinating and cooperating with other owners of the MS4 such as Caltrans, the U.S. federal government, or sovereign Native American Tribes through interagency agreements, where possible, the contribution of from their portion of the MS4 to the portion of the MS4 within the Copermittee's jurisdiction;~~

(6) Require compliance with conditions in its ~~statutes,~~ ordinances, permits, contracts, or orders~~, or similar means to hold dischargers to its MS4 accountable for their contributions of pollutants and flows~~;

(7) ~~Require the use of BMPs to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;~~

(8) ~~Require documentation on the effectiveness of BMPs implemented to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;~~

(9) ~~Utilize enforcement mechanisms to require compliance with its statutes, ordinances, permits, contracts, orders, or similar means; and~~

(10) Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with permit conditions~~its statutes, ordinances, permits, contracts, orders, or similar means and with the requirements of this Order~~, including the prohibition of illicit discharges and connections to its MS4; ~~the Copermittee must also have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from industrial facilities, including construction sites, discharging into its MS4.~~

b. With the first Annual Report required pursuant to Provision F.3.b, each Copermittee must submit a statement certified by its Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative that the Copermittee has taken the necessary steps to obtain and maintain full legal authority within its jurisdiction to implement and enforce each of the requirements contained in this Order.

2. Illicit Discharge Detection and Elimination

Each Copermittee must implement a program to actively detect and eliminate illicit discharges and improper disposal into the MS4, or otherwise require the discharger

Comment [A71]: See discussion in section 3.6.2 of the comment letter.

Comment [A72]: See discussion in section 3.6.2 of the comment letter.

Comment [A73]: See discussion in section 3.6.2 of the comment letter.

Comment [A74]: See discussion in section 3.6.2 of the comment letter.

Comment [A75]: See discussion in section 3.7 of the comment letter.

to apply for and obtain a separate NPDES permit. The illicit discharge detection and elimination program must be implemented in accordance with the strategies identified in the Water Quality Improvement Plan and include, at a minimum, the following requirements:

STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the illicit discharge detection and elimination program to address ~~non-storm water and~~ illicit discharges and connections that the Copermittee has identified as potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate ~~additional~~ BMPs, focus education, and/or increase/decrease frequency of inspections in specific areas); and

(2) The strategies and/or activities ~~must~~ may be modified from ~~consistent with~~ the default requirements of Provisions E.2.b-e~~a-d~~ ~~and~~ to be consistent with the strategies identified in the Water Quality Improvement Plan;

(3) The requirements of the programs as outlined in the following sub-provisions may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality improvement Plan(s).

a. NON-STORM WATER DISCHARGES

To the extent allowable by law, each~~Each~~ Copermittee must address all non-storm water discharges ~~from~~into the MS4 as illicit discharges, where the likelihood exists that they are a source of pollutants to the Receiving Waters, unless ~~a non-storm water~~the discharge is either identified as a discharge authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that is consistent with~~must be addressed pursuant to~~ the following requirements:

(1) ~~Discharges of non-storm water to the MS4 from the following categories must be addressed as illicit dischargeunless the discharge has coverage under NPDES Permit No. CAG919001 (Order No. R9-2007-0034, or subsequent order) for discharges to San Diego Bay, or NPDES Permit No. CAG919002 (Order No. R9-2008-0002, or subsequent order) for discharges to surface waters other than San Diego Bay.~~

Comment [A76]: See discussion in section 3.7.2 of the comment letter.

~~(a) Uncontaminated pumped ground water;~~

~~(b) Discharges from foundation drains;~~[20]

~~(c) Water from crawl space pumps; and~~

~~(d) Water from footing drains.~~[19]

(2) Discharges of non-storm water from water line flushing and water main breaks to the MS4 must be addressed as illicit discharges unless the discharge has coverage under a valid NPDES Permit, ~~No. CAG 679001~~ (Order No. R9-2010-0003, or a subsequent order). This category includes potable water line flushing ~~and water main break~~ discharges from water purveyors issued a water supply permit by the California Department of Public Health or federal military installations. Discharges from recycled or reclaimed water lines to the MS4 must be addressed as illicit discharges, unless the discharges have coverage under a separate NPDES permit.

Comment [A77]: See discussion in section 3.7.2 of the comment letter.

(3) Discharges of non-storm water into the MS4 from the following categories must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the individual discharge as a source of pollutants to receiving waters:

Comment [A78]: See discussion in section 3.7.2 of the comment letter.

(a) Diverted stream flows;

(b) Rising ground waters;

(c) Uncontaminated ground water infiltration to MS4s;

(d) Uncontaminated pumped ground water;

(e) Springs;

(f) Water from crawl space pumps;

~~(e)~~(g) Flows from riparian habitats and wetlands;

(h) Landscape irrigation;

(i) Irrigation water;

(j) Lawn watering;

Comment [A79]: See Legal Comments discussion.

~~[20] Provision E.2.a.(1) only applies to this category on non-storm water if the system is designed to be located at or below the highest historical groundwater table to actively or passively extract groundwater during any part of the year.~~

~~(d)~~(k) Discharges from potable water sources;

~~(e)~~(l) Discharges from foundation drains;[21] ~~and~~

(m)Discharges from footing drains. .[21]

(4) Discharges of non-storm water into the MS4 from the following categories must be controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means. ~~Discharges of non-storm water to the MS4 from the following categories not controlled by the requirements given below through~~ If such statutes, ordinances, permits, contracts, orders, or similar means have not been enacted by the Copermittee, the applicable categories below must be addressed by the Copermittee as illicit discharges.

Comment [A80]: See discussion in section 3.7.2 of the comment letter.

(a) Air conditioning condensation

The discharge of air conditioning condensation should~~must~~ be directed to landscaped areas or other pervious surfaces where feasible.

(b) Individual residential vehicle washing

(i) The discharge of wash water ~~must~~ should be directed to landscaped areas or other pervious surfaces where feasible; and

(ii) Minimize the use of water for vehicle washing, use as little washing detergent and other vehicle wash products as possible, wash vehicles at commercial wash facilities, and implement other practices or behaviors that will prevent the discharge of pollutants associated with individual residential vehicle washing from entering the MS4.

(c) Dechlorinated swimming pool discharges

(i) Eliminate residual chlorine, algaecide, filter backwash, or other pollutants from swimming pools prior to discharging to the MS4; and

(ii) The discharge of saline swimming pool water must be directed to the sanitary sewer, landscaped areas, or other pervious surfaces that can accommodate the volume of water, unless the saline swimming pool water can be discharged via a pipe or concrete channel directly to a naturally saline water body (e.g. Pacific Ocean).

(5) Firefighting discharges to the MS4 must be addressed by the Copermittee as

Comment [A81]: See discussion in section 3.7.2 of the comment letter.

~~[21] Provision E.2.a.(3) only applies to this category of non-storm water discharge if the system is designed to be located above the highest historical groundwater table at all times of the year, and the system is only expected to discharge non-storm water under unusual circumstances.~~

follows:illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a significant source of pollutants to receiving waters. Firefighting discharges to the MS4 not identified as a significant source of pollutants to receiving waters, must be addressed, at a minimum, as follows:

(a) Non-emergency firefighting discharges

(i) Building fire suppression system maintenance discharges (e.g.., sprinkler line flushing) to the MS4 must be addressed as illicit discharges unless appropriate BMPs are implemented.

(ii) Non-emergency firefighting discharges (i.e., discharges from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems) must be addressed by a program, to be developed and implemented by the Copermittee in conjunction with the local Fire Authority/District, to reduce or eliminate pollutants in such discharges from entering the MS4.

(b) Emergency firefighting discharges (i.e., flows necessary for the protection of life or property) do not require BMPs and need not be prohibited.

Each Copermittee should develop and encourage implementation of BMPs to reduce or eliminate pollutants in emergency firefighting discharges to the MS4s and receiving waters within its jurisdiction. During emergency situations, priority of efforts should be directed toward life, property, and the environment (in descending order). BMPs should not interfere with immediate emergency response operations or impact public health and safety.

(6) If the Copermittee or San Diego Water Board identifies any category of non-storm water discharges listed under Provisions E.2.a.(1)-(4) as a source of pollutants to receiving waters, the category must be effectively prohibited through ordinance, order, or similar means and addressed as an illicit discharge.

(7) Each Copermittee must, where feasible, reduce or eliminate non-storm water discharges listed under Provisions E.2.a.(1)-(4) into its MS4 whether or not the non-storm water discharge has been identified as an illicit discharge, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit.

Comment [A82]: See discussion in section 3.7.2 of the comment letter.

b. Prevent And Detect Illicit Discharges And Connections

Each Copermittee must include the following measures within its program to prevent and detect illicit discharges to the MS4:

(1) Each Copermittee must maintain an updated map of its entire MS4 and the corresponding drainage areas. The accuracy of the MS4 map must be confirmed during the field screening required pursuant to Provision E.2.c. The MS4 map must be included as part of the jurisdictional runoff management program document. Any geographic information system (GIS) layers or files used by the Copermittee to maintain the MS4 map must be made available to the San Diego Water Board upon request. The MS4 map must identify the following:

(a) All segments of the MS4 owned, operated, and maintained by the Copermittee;

(b) All known locations of inlets that discharge and/or collect runoff into the Copermittee's MS4;

(c) All known locations of connections with other MS4s not owned or operated by the Copermittee (e.g. Caltrans MS4s);

(d) All known locations of major MS4 outfalls as defined by 40 CFR §122.26(b)(5-6) ~~and private outfalls,~~ that discharge runoff collected from areas within the Copermittee's jurisdiction;

Comment [A83]: See discussion in section 3.7.2 of the comment letter.

(e) All segments of receiving waters within the Copermittee's jurisdiction that receive and convey runoff discharged from the Copermittee's MS4 outfalls;

(f) Locations of the MS4 outfalls, identified pursuant to Provision D.2.a.(1), within its jurisdiction; and

(g) Locations of the non-storm water persistent flow MS4 outfall discharge monitoring stations, identified pursuant to Provision D.2.b.(2)(b), within its jurisdiction.

(2) Each Copermittee must use Copermittee personnel and contractors to assist in identifying and reporting illicit discharges and connections during their daily employment activities.

(3) Each Copermittee must promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges to or from the MS4, including the following methods for public reporting:

(a) Operate a public hotline, which can be Copermittee-specific or shared by the Copermittees, and must be capable of receiving reports in both English and Spanish 24 hours per day and seven days per week; and

(b) Designate an e-mail address for receiving electronic reports from the public, which can be Copermittee-specific or shared by the Copermittees, and must be prominently displayed on the Copermittee's webpage and the Regional Clearinghouse required pursuant to Provision F.4.

(4) Each Copermittee must implement practices and procedures (including a notification mechanism) to prevent, respond to, contain, and clean up any spills that may discharge into the MS4 within its jurisdiction from any source. Such practices and procedures may include the coordination with other parties, such as sanitary sewer operators. The Copermittee must coordinate, to the extent possible, with spill response teams to prevent entry of spills into the MS4~~, and prevent contamination of surface water, ground water, and soil.~~ The Copermittee must coordinate spill prevention, containment, and response activities throughout all appropriate internal~~Copermittee~~ departments, programs, and agencies.

Comment [A84]: See discussion in section 3.7.2 of the comment letter.

(5) Each Copermittee must implement practices and procedures to ~~prevent~~ control and limit infiltration of seepage from sanitary sewers owned by a Copermittee agency (including private laterals and failing septic systems) to the MS4.

(6) Each Copermittee shall~~must~~ coordinate, when necessary, with upstream Copermittees and/or entities to prevent illicit discharges from upstream sources into the MS4 within its jurisdiction.

c. FIELD SCREENING

Each Copermittee must conduct field screening (i.e. visual observations, field testing, and/or analytical testing) of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4 in accordance with the dry weather MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

d. INVESTIGATE AND ELIMINATE ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to investigate and eliminate illicit discharges to the MS4 to comply with provision A.1.b:

(1) Each Copermittee must prioritize and determine when follow-up investigations will be performed in response to visual observations and/or water quality monitoring data collected during an investigation of a detected non-storm water ~~or~~ illicit discharge into or from the MS4. The criteria for prioritizing investigations must consider the following:

(a) Pollutants identified as causing or contributing to the highest water quality

priorities identified in the Water Quality Improvement Plan;

(b) Pollutants identified as causing or contributing, or threatening to cause or contribute to impairments in water bodies on the 303(d) List and/or in environmentally sensitive areas (ESAs), located within its jurisdiction;

(c) Pollutants identified from sources or land uses known to exist within the area, drainage basin, or watershed that discharges to the portion of the MS4 within its jurisdiction included in the investigation;

(d) Pollutants identified as causing or contributing to an exceedance of a NAL in the Water Quality Improvement Plan, where the source has not been identified as natural or otherwise permitted; and

(e) Pollutants identified as an immediate and significant threat to human health or the environment.

(2) Each Copermittee must implement procedures to investigate and inspect portions of its MS4 that, based on reports or notifications, field screening, or other appropriate information, indicate a reasonable potential of receiving, containing, or discharging pollutants due to illicit discharges, or illicit connections~~, or other sources of non-storm water~~. The procedures must include the following:

(a) Each Copermittee must develop criteria to:

(i) Assess the validity of each report or notification received; and

(ii) Prioritize the response to each report or notification received.

(b) Each Copermittee must prioritize and respond to each valid report or notification (e.g., public reports, staff or contractor reports and notifications, etc.) of an incident in a timely manner.

(c) ~~Each~~In accordance with the procedures defined in Provision E.2.d.(1), each~~Each~~ Copermittee must investigate and seek to identify the source(s) of discharges of non-storm water illicit discharges or illicit connections ~~where flows are~~ observed into and from the MS4 during the field screening required pursuant to Provision D.2.b.(1) as follows:

(i) Obvious illicit discharges (i.e., unusual color or odor) must be immediately investigated to identify the source(s) of non-storm water illegal discharges;

(ii) The investigation must include field investigations to identify sources or potential sources for the discharge, unless the source or potential source has already been identified during previous investigations; and

(iii) The investigation may include follow-up field investigations and/or reviewing Copermittee inventories and other land use data to identify potential sources of the discharge.

(d) Each Copermittee must maintain records and a database of the following information:

(i) Location of incident, including hydrologic subarea, portion of MS4 receiving the non-storm water ~~or~~ illicit discharge, and point of discharge or potential discharge from MS4 to receiving water;

(ii) Source of information initiating the investigation (e.g., public reports, staff or contractor reports and notifications, field screening, etc.);

(iii) Date the information used to initiate the investigation was received;

(iv) Date the investigation was initiated;

(v) Dates of follow-up investigations;

(vi) Identified or suspected source of the illicit discharge or connection, if determined;

(vii) Known or suspected related incidents, if any;

(viii) Result of the investigation; and

(ix) If a source cannot be identified and the investigation is not continued, a rationale for why a discharge does not pose a threat to water quality and/or does not require additional investigation.

(e) Each Copermittee must ~~track~~ document, and where feasible quantify, any readily~~and seek to~~ identifiable~~y~~ the source(s) of non-storm water illegal discharges from the MS4 where there is evidence of non-storm water ~~having been discharged~~illegal discharges or connections into or from the MS4 (e.g., pooled water), in accordance with MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.

Comment [A85]: See discussion in section 3.7.2 of the comment letter.

(3) Each Copermittee must initiate the implementation of procedures, in a timely manner, to eliminate all detected and identified illicit discharges and connections within its jurisdiction. The procedures must include the following responses:

(a) Each Copermittee must enforce its legal authority, as required under Provision E.1, to eliminate illicit discharges and connections to the MS4.

(b) If the Copermittee identifies the source as a controllable source of non-storm water ~~or~~ illicit discharge or connection, the Copermittee must implement its Enforcement Response Plan pursuant to Provision E.6 and enforce its legal authority to effectively prohibit and with the goal of eliminating~~e~~ illicit discharges and connections to its MS4.

(c) If the Copermittee identifies the source of the discharge as a category of non-storm water discharges in Provision E.2.a, and the discharge is in exceedance of NALs in the Water Quality Improvement Plan, then the Copermittee must determine if: (1) this is an isolated incident or set of circumstances that will be addressed through its Enforcement Response Plan pursuant to Provision E.6, or (2) the category of discharge must be addressed through the effective prohibition of that category of discharge as an illicit discharge pursuant to Provision E.2.a.(6).

(d) If the Copermittee suspects the source of the non-storm water discharge as natural in origin (i.e. non-anthropogenically influenced) and in conveyance into the MS4, then the Copermittee must document and provide the data and evidence necessary to demonstrate to the San Diego Water Board that it is natural in origin and does not require further investigation.

(e) If the Copermittee identifies that the discharge is coming from another Copermittees' jurisdiction, the receiving Copermittee must document and provide the findings to the upstream Copermittee. The obligation to implement the requirements of provision E.2.d.(3) are thenceforth the responsibility of the upstream Copermittee.

(f) If the Copermittee identifies the source as a non-storm water discharge that has been separately authorized by the San Diego Water Board, or that is contributing pollutants to the MS4 and that may require coverage under a WDR from the San Diego Water Board, the Copermittee shall provide all relevant findings to the San Diego Water Board and may back charge the Regional Board for the entire cost of conducting the source investigation.

Comment [A86]: See discussion in section 3.7.2 of the comment letter.

~~(e)~~(g) If the Copermittee is unable to identify and document the source of a recurring non-storm water discharge to or from the MS4, then the Copermittee must ~~address the discharge as an illicit discharge and~~ update its jurisdictional runoff management program to address the common and suspected sources of the non-storm water discharge within its jurisdiction in accordance with the Copermittee's priorities.

(4) Each Copermittee must submit a summary of the non-storm water discharges and illicit discharges and connections investigated and eliminated within its jurisdiction with each Annual Report required under Provision F.3.b of this Order.

3. Development Planning

Comment [A87]: See discussion in section 3.8 of the comment letter.

Each Copermittee must, within their jurisdiction, use their land use and planning

authorities, to the extent that they may lawfully impose requirements, to implement a development planning program in accordance with the strategies identified in the Water Quality Improvement Plan and includes, at a minimum, the following requirements:

STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Comment [A88]: See discussion in section 3.8.2 of the comment letter.

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the development planning program to address development and redevelopment projects that may become sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional or alternative BMPs, focus education, increase frequency of verifications and/or inspections, alternative compliance options);

(2) Each Copermittee must identify areas within its jurisdiction where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting and/or stream, channel, or habitat rehabilitation projects;

(3) Each Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify regional alternative compliance projects that Priority Development Projects may be allowed or should be encouraged to implement or participate in implementing; and

(4) The requirements of the programs as outlined in the following sub-provisions may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality improvement Plan(s).~~The strategies and/or activities must be consistent with the requirements of Provisions E.3.a-c and E.3.e-f and the strategies identified in the Water Quality Improvement Plan.~~

a. BMP REQUIREMENTS FOR ALL DEVELOPMENT PROJECTS

Each Copermittee, as practical and feasible, must prescribe the following BMP requirements during the planning process (i.e. prior to project approval and issuance of local permits) for all development projects (regardless of project type or size), where local permits are issued, including unpaved roads and flood management projects, except emergency / public safety projects implemented for the protection of persons and property:

(1) General Requirements

(a) Onsite BMPs must be located so as to remove pollutants from runoff prior to its discharge to any receiving waters, and as close to the source as possible; and

(b) Structural BMPs must not be constructed within a waters of the U.S.. ~~or waters of the state.~~

(2) Source Control BMP Requirements

The following source control BMPs must be implemented at all development projects where applicable and feasible:

(a) Prevention of illicit discharges into the MS4;

(b) Storm drain system stenciling or signage;

(c) Properly designed outdoor material storage areas;

(d) Properly designed outdoor work areas;

(e) Properly designed trash storage areas; and

(f) Any additional BMPs determined necessary by the Copermittee to minimize pollutant generation at each project.

(3) Low Impact Development (LID) ~~BMP Requirements~~Principles

Comment [A89]: See discussion in section 3.8.2 of the comment letter.

The following LID ~~BMPs~~ Principles must be implemented at all development projects where applicable and feasible:

(a) Maintenance or restoration of natural storage reservoirs and drainage corridors (including topographic depressions, areas of permeable soils, natural swales, and ephemeral and intermittent streams);[22]

(b) Buffer zones for natural water bodies (where buffer zones are technically infeasible, require project applicant to include other buffers such as trees, access restrictions, etc.);

(c) Conservation of natural areas within the project footprint including existing trees, other vegetation, and soils;

[22] Development projects proposing to dredge or fill materials in waters of the U.S. must obtain a CWA Section 401 Water Quality Certification. Projects proposing to dredge or fill waters of the state must obtain waste discharge requirements.

(d) Construction of streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided public safety is not compromised;

(e) Minimization of the impervious footprint of the project;

(f) Minimization of soil compaction to landscaped areas;

(g) Disconnection of impervious surfaces through distributed pervious areas;

(h) Landscaped or other pervious areas designed and constructed to effectively receive and infiltrate, retain and/or treat runoff from impervious areas, prior to discharging to the MS4;

(i) Small collection strategies located at, or as close as possible to, the source (i.e. the point where storm water initially meets the ground) to minimize the transport of runoff and pollutants to the MS4 and receiving waters;

(j) Use of permeable materials for projects with low traffic areas and appropriate soil conditions;

(k) Landscaping with native or drought tolerant species; and

(l) Harvesting and using precipitation.

b. PRIORITY DEVELOPMENT PROJECTS

(1) Definition of Priority Development Project

Priority Development Projects include the following:

(a) All new development projects that fall under the Priority Development Project categories listed under Provision E.3.b.(2) (where a new development project feature, such as a parking lot, falls into a Priority Development Project category, the entire project footprint is subject to Priority Development Project requirements); and

(b) Those redevelopment projects that create, add, or replace at least 5,000 square feet of impervious surfaces on an already developed site, and the redevelopment project is a Priority Development Project category listed under Provision E.3.b.(2) (where redevelopment results in an increase of less than fifty percent of the impervious surfaces of a previously existing development, and the existing development was not subject to Priority Development Project requirements, the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) apply only to the addition or replacement, and not to the entire development; where redevelopment

results in an increase of more than fifty percent of the impervious surfaces of a previously existing development, the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) apply to the entire development).

(c) Projects where redevelopment results in an increase of more than fifty percent of impervious surfaces of a previously existing development, and the existing development *was* subject to previous Priority Project Development Requirements, only the altered portion of development is subject to the new Priority Development Project requirements.

Comment [A90]: See discussion in section 3.8.2 of the comment letter.

(2) Priority Development Project Categories

Comment [A91]: See discussion in section 3.8.2 of the comment letter.

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This category includes commercial, industrial, residential, mixed-use, and public development projects on public or private land which fall under the planning and building authority of the Copermittee.

(b) New development projects that create 5,000 square feet or more of impervious surfaces (collectively over the entire project site), and are designed for support one or more of the following uses (see Appendix for definitions):

(i) Automotive repair shop
(ii) Restaurant
(iii) Parking lot[23]
(iv) Street, road, highway, freeway
(v) Retail gasoline outlet (RGO)

Comment [A92]: See footnote

~~(b) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.~~

~~(c) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812), where the land area for development is 5,000 square feet or more.~~

~~(d) Hillside development projects. This category includes any development which creates 5,000 square feet or more of impervious surface which is~~

[23] Excluding parking lots that are not subject to runoff, such as but not limited to covered or subterranean parking lots

~~located in an area with known erosive soil conditions, where the development will grade on any natural slope that is twenty-five percent or greater.~~

~~(e)~~(c) New development projects that create 2,500 square feet or more of impervious surfaces (collectively over the entire project site), and are ~~Environmentally sensitive areas (ESAs). This category includes any development~~ located within, directly adjacent to, or discharging directly to an ESA, ~~which either creates 2,500 square feet of impervious surface on a proposed project site or increases the area of imperviousness of a proposed project site to 10 percent or more of its naturally occurring condition.~~ "Directly adjacent to" means situated within 200 feet of the ESA. "Discharging directly to" means outflow from a drainage conveyance system that collects runoff from the subject development or redevelopment site and terminates at or in receiving waters within the ESA and is not commingled with flows from adjacent or other upstream lands.

~~(f) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce that has 5,000 square feet or more of impervious surface.~~

~~(g) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface that is 5,000 square feet or more used for the transportation of automobiles, trucks, motorcycles, and other vehicles.~~

~~(h) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.~~

~~(i)~~(d) Large development projects. This category includes any post-construction pollutant-generating new development projects that result in the permanent disturbance of one acre or more of land.

(3) Priority Development Project Exemptions

Comment [A93]: See discussion in section 3.8.2 of the comment letter.

Each Copermittee has the discretion to exempt the following projects from being defined as Priority Development Projects:

(a) New paved sidewalks, driveways, parking lots, bicycle lanes, or trails that meet the following criteria:

(i) Designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas; OR

(ii) Designed and constructed to be hydraulically disconnected from paved streets or roads; OR

(iii) Designed and constructed with permeable pavements or surfaces in accordance with USEPA Green Streets guidance.[24]

(b) Any impervious surface that is 5,000 square feet or more used for the transportation of automobiles, trucks, motorcycles, and other vehicles that is designed and constructed to the Maximum Extent Practicable in accordance with the USEPA Green Streets Guidance "Managing Wet Weather with Green Infrastructure: Green Streets"[25]. ~~Retrofitting of existing paved alleys, streets or roads that meet the following criteria:~~

~~(i) Must be two lanes or less; AND~~

~~(ii) Must be a retrofitting project implemented as part of an alternative compliance project option under Provision E.3.c.(3)(b)(v) to achieve the performance requirements of Provisions E.3.c.(1) and/or E.3.c.(2) for a Priority Development Project; AND~~

~~(iii) Designed and constructed in accordance with the USEPA Green Streets guidance.[26]~~

(c) Single-family residential projects that meet the following criteria:

(i) Must not be constructed as part of a larger development or proposed subdivision;

(ii) Successfully incorporate and document that they have incorporated, each of the applicable Source Control and LID BMP strategies identified in provisions E.3.a.(2)-(3) to the MEP.

~~(c) New single family residences that meet the following criteria:~~

~~(i) Must not be constructed as part of a larger development or proposed subdivision; AND~~

~~(ii) Designed and constructed to be certified under the U.S. Green Building Council (USGCB) Leadership in Energy and Environmental Design (LEED) for Homes green building certification program, receiving at least four (4) Surface Water Management credits under the Sustainable Sites category[27] OR~~

~~Designed and constructed with structural BMPs that will achieve the~~

[24] USEPA. 2008. http://water.epa.gov/infrastructure/greeninfrastructure/upload/gi_munichandbook_green_streets.pdf and http://water.epa.gov/infrastructure/greeninfrastructure/gi_policy.cfm#municipalhandbook ~~See "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).~~

~~[26] Ibid.~~

~~[27] See LEED for Homes rating system at http://www.usgbc.org~~

~~performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite~~

~~(d) Redevelopment of existing single family residences that meet the following criteria:~~

~~(i) Designed and constructed to be certified under the USGCB LEED for Homes green building certification program, receiving at least four (4) Surface Water Management credits under the Sustainable Sites category;[28] OR~~

~~(ii) Designed and constructed with structural BMPs that will achieve the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite.~~

(d) Watershed Protection Projects that meet the following criteria:

(i) Projects undertaken to rehabilitate or prevent environmental, social, and economic damage to the watershed, including receiving waters, by providing one or more of the following:

- Water quality protection by the proper management of stormwater and floodplains
- Flood risk reduction to adjacent land uses, stored matter and stockpiled material
- Elimination of the comingling of stormwater and hazardous materials
- Erosion Mitigation
- Restoration of Rivers and Ecosystems
- Groundwater Recharge
- Creation of new open space and wetlands
- Programs for water conservation, stormwater capture and management
- Retrofit projects constructed to improve water quality or address hydromodification.

(ii) AND are not expected to be pollutant generating or are designed to reduce existing pollutant loads

(iii) AND incorporate and document that they have incorporated, each of the applicable Source Control and LID BMP strategies identified in provisions E.3.a.(2)-(3) to the MEP.

(e) Emergency public safety projects in any of the Priority Development Categories may be excluded if the delay caused due to the requirement for a SSMP compromises public safety, public health and/or environmental protection

[28] ~~See LEED for Homes rating system at http://www.usgbc.org~~

c. Priority Development Project Structural BMP Performance Requirements

In addition to the BMP requirements listed for all development projects under Provision E.3.a, Priority Development Projects must also implement structural BMPs that conform to performance requirements below. If watershed-specific performance requirements are ~~may be~~ developed as part of a Water Quality Improvement Plan; these requirements would take precedence over the general performance requirements below. The watershed-specific requirement must provide at least equal protection as the general performance requirements below.

(1) Storm Water Pollutant Control BMP Requirements

Comment [A94]: See discussion in section 3.8.2 of the comment letter.

Each Copermittee must require each Priority Development Project to implement onsite structural BMPs to control pollutants in storm water that may be discharged from a project as follows:

(a) Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite the pollutants contained in the design capture volume. The design capture volume is equivalent to:

(i) The volume of storm water runoff produced from a 24-hour 85th percentile storm event;[29] OR

(ii) The volume of storm water runoff produced from a 24-hour 85th percentile storm event, that would be retained onsite ~~if~~ in the pre-project condition. ~~site was fully undeveloped and naturally vegetated~~, ~~as determined using continuous simulation modeling techniques based on site-specific soil conditions and typical native vegetative cover.~~

(b) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of~~to~~ complying with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1)(a).

~~(c) If a Priority Development project is allowed to utilize alternative compliance pursuant to Provisions E.3.c.(1)(b), flow-thru conventional~~

[29] This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals. The volume is a single event-based volume that occurs after an extended dry period.

~~treatment control BMPs must be implemented to treat the portion of the design capture volume that is not retained onsite. Additionally, project applicants must mitigate for the portion of the pollutant load in the design capture volume that is not retained onsite through one or more alternative compliance options under Provision E.3.c.(3). Conventional treatment control BMPs must be sized and designed to:~~

~~(i) Remove pollutants from storm water to the MEP;~~

~~(ii) Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;~~

~~(iii) Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Conventional treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of conventional treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.~~

(2) Hydromodification Management BMP Requirements

Comment [A95]: See discussion in section 3.8.2 of the comment letter.

Each Copermittee must require each Priority Development Project disturbing greater than one acre to implement management measures~~onsite structural BMPs~~ to ensure ~~manage hydromodification~~ that ~~may be caused by~~ storm water runoff discharged from the~~a~~ project won't cause adverse Hydromodification impacts in the downstream receiving waters as follows:

The Copermittees in each Watershed Management Area may establish within the WQIP, watershed specific mitigation requirements that will apply to priority development projects, based on the susceptibility of the receiving waters to Hydromodification impacts caused by the project, and consistent with the priorities and strategies identified in the WQIP. Such requirements may be uniform across a Hydrologic Unit, or identified at an appropriate smaller scale to ensure that receiving waters are properly protected.

(a) Post-project runoff flow rates and durations must not exceed pre-project ~~development (naturally occurring)~~ runoff flow rates and durations by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat conditions downstream of Priority Development Projects~~)~~.

(i) In evaluating the range of flows that results in increased potential for

erosion of natural (non-hardened) channels, the lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks.

~~(ii) For artificially hardened channels, analysis to identify the lower boundary must use characteristics of a natural stream segment similar to that found in the watershed. The lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or erodes the toe of the channel banks.~~

~~(iii)~~(ii) The Copermittees may use monitoring results collected pursuant to Provision D.1.a.(2) to re-define the range of flows resulting in increased potential for erosion, or degraded instream habitat conditions, as warranted by the data.

(b) Priority Development Projects ~~Post-project runoff flow rates and durations~~ must implement appropriate measures to minimize the ~~compensate for~~ the loss of sediment supply delivered ~~due~~ to the Receiving Waters, consistent with WQIP priorities, ~~development project,~~ should loss of sediment supply be anticipated to occur as a result of the development project.

(c) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of~~to comply with~~ the performance requirements of Provisions E.3.c.(2)(a)-(b).

(d) Exemptions

Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provisions E.3.c.(2)(a)-(b) where the project:

(i) Discharges storm water runoff into existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;

(ii) Discharges of storm water into conveyance channels whose bed and bank are engineered and maintained for the 10-year ultimate development flow rate all the way from the point of discharge from the project to an water body that is sufficiently resistant to hydromodification (water storage reservoirs, lakes, enclosed embayments, pacific ocean, or other water bodies identified in the WQIP);

~~(ii)~~(iii) Is a redevelopment Priority Development Project that meets the alternative compliance requirements of Provision E.3.c.(3)(b)(ii); or

~~(iii)~~(iv) Discharges storm water runoff into other areas identified by the San Diego Water Board as exempt from the requirements of Provisions E.3.c.(2)(a)-(b), through an approved WQIP.

(3) Alternative Compliance to Onsite Structural BMP Performance Requirements

Comment [A96]: See discussion in section 3.8.2 of the comment letter.

(a) Applicability

At the discretion of each Copermittee, Priority Development Projects may be allowed to implement one or more of the alternative compliance project options described in E.3.c.(3)(b) below, in lieu of complying with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2), under the following conditions:

(i) The Copermittee must determine that implementation of the alternative compliance option will have an equal or greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite;

(ii) The alternative compliance options must be designed by a registered professional engineer, geologist, architect, biologist, hydrologist, landscape architect, or other appropriate certified professional;

(iii) The alternative compliance option must be consistent with the strategies developed within the WQIP, for the highest priority water quality conditions.

(iv) The alternative compliance options must be implemented within the same Watershed Management Area as the Priority Development Project, and preferably within the same hydrologic subarea;

(v) The alternative compliance options must have reliable sources of funding for operation and maintenance.

(b) Alternative Compliance Options

(i) *LID Biofiltration Treatment Control BMPs*

LID biofiltration treatment control BMPs may be used as an alternative compliance option if the BMPs are sized and designed to:

[a] Remove pollutants from storm water to the MEP; AND
[b] Have an appropriate surface loading rate to prevent erosion, scour and channeling; AND
[c] Biofilter at least 1.0 times the design capture volume that is not reliably retained onsite

(ii) *LEED Certified Redevelopment Projects*

Priority Development Projects that are designed and constructed to be certified under the USGCB LEED for New Construction and Major Renovations green building certification program, or other locally accepted certification of equivalent effectiveness, may be considered as an acceptable alternative compliance option if the project meets the following criteria:

[a] The project is designed to receive at least: One (1) Site Design credit, and Two (2) Stormwater Design credits under the Sustainable Sites category.[30] , and

[b] The existing and future configuration of the receiving water must not be unnaturally altered or adversely impacted by the project.

(iii) *Watershed-Based Planned Development Projects*

Priority Development Projects greater than 100 acres in total project size (or smaller than 100 acres in size yet part of a larger common plan of development that is over 100 acres) may be considered as an acceptable alternative compliance option if the project meets the following conditions:

[a] The Priority Development Project was planned utilizing watershed and/or subwatershed based water quality, hydrologic, and fluvial geomorphologic planning principles that implement regional LID BMPs in accordance with the performance and location criteria of this Order and acceptable to the San Diego Water Board;

[b] Regional LID BMPs may be used provided that the BMPs capture and retain the volume of runoff produced from the design capture volume defined in Provision E.3.c.(1)(a)(i) and that such controls are located upstream of receiving waters;

[c] Regional LID BMPs must clearly exhibit that they will not result in a net impact from pollutant loadings over and above the impact caused by capture and retention of the design capture volume;

[d] Any portion of the design capture volume that is not retained by the regional LID BMPs must be treated using biofiltration BMPs; and

[e] Where regional LID BMPs are demonstrated to the Copermittee as technically infeasible to retain the entire design capture volume, any volume up to and including the design capture volume not retained by regional LID BMPs, nor treated by biofiltration BMPs, must be treated using conventional treatment control BMPs and the project applicant must implement additional alternative compliance project, in-lieu fee and/or water quality

[30] See LEED for New Construction and Major Renovations rating system at http://www.usgbc.org

credit system options below.

(iv) *Offsite Projects*

Offsite Projects, such as but not limited to Regional BMPs; Retrofitting Projects; Channel, Stream or Habitat Rehabilitation Projects; Water Supply Augmentation Projects; or other Offsite Projects proposed by a project proponent, may be considered as an acceptable alternative compliance option if the offsite project meets the following requirements:

- The project must provide a net result of at least the same level of pollutant removal, and/or protection from potential downstream and upstream erosion in the receiving water as would be required to meet the performance requirements of Provision E.3.c.(1) and E.3.c.(2), as applicable.
- The project must be consistent with the strategies identified in the WQIP.
- The project must be constructed and operational prior to occupancy being granted for the PDP.

(v) *Conventional Treatment Control BMPs*

Onsite Conventional Treatment Control BMPs may be used as an alternative compliance option, only if the following criteria have been met:

[a] It has been demonstrated to the satisfaction of the Copermittee that it is technically infeasible to comply with the onsite requirements of E.3.c.(1), AND

[b] It has been demonstrated to the satisfaction of the Copermittee that it is technically infeasible to implement onsite Biofiltration Treatment Control BMPs, AND

[c] The Conventional Treatment Control BMPs will remove pollutants from storm water to the MEP; AND

[d] The Conventional Treatment Control BMPs will filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two; AND

[e] The Conventional Treatment Control BMPs are ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Conventional treatment control BMPs with a low removal

efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of conventional treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

~~(a) Applicability~~

~~At the discretion of each Copermittee, Priority Development Projects may be allowed to utilize an alternative option to comply with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) under the following conditions:~~

~~(i) The Copermittee must determine that implementation of the alternative compliance option will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite;~~

~~(ii) The alternative compliance options must be designed by a registered professional engineer, geologist, architector landscape architect;~~

~~(iii) The alternative compliance options must be implemented within the same hydrologichydrologic unit as the Priority Development Project, and preferably within the same hydrologic subarea;~~

~~(iv) Receiving waters must not be utilized to convey storm water runoff to the alternative compliance options;~~

~~(v) The pollutants in storm water runoff from the Priority Development Project must be treated to the MEP by the alternative compliance options prior to being discharged to receiving waters;~~

~~(vi) Unless otherwise allowed by Provision E.3.c.(3)(b), the alternative compliance options must have a net result of at least the same level of pollutant removal as would have been achieved if the Priority Development Project had fully complied with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1) onsite;~~

~~(vii) Unless otherwise allowed by Provision E.3.c.(3)(b), the alternative compliance options must have a net result of at least the same level of protection from potential downstream and upstream erosion in the receiving water as would have been achieved if the Priority Development Project had fully complied with the hydromodification management BMP performance requirements of Provision E.3.c.(2) onsite; and~~

~~(viii) The alternative compliance options utilized by the Priority Development Project must have reliable sources of funding for operation and maintenance.~~

~~(b) Alternative Compliance Project Options~~

~~The Copermittee may allow implementation of one or more of the following project options as part of an alternative approach to complying with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2):~~

~~(i) *Onsite LID Biofiltration Treatment Control BMPs*~~

~~The Copermittee may allow Priority Development Projects to utilize onsite LID biofiltration treatment control BMPs to comply with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1). Onsite LID biofiltration treatment control BMPs must be sized and designed to:~~

~~[a] Remove pollutants from storm water to the MEP; AND~~
~~[b] Have an appropriate surface loading rate to prevent erosion, scour and channeling within the BMP; AND~~
~~[c] Biofilter at least 1.5 times the design capture volume that is not reliably retained onsite; OR~~
~~[d] Biofilter up to the design capture volume that is not reliably retained onsite, AND 1) treat the remaining portion of the design capture volume not retained onsite with conventional treatment control BMPs in accordance with Provision E.3.c.(1)(c), and 2) if necessary, mitigate for the portion of the pollutant load in the design capture volume not retained onsite through one or more alternative compliance project, in-lieu fee and/or water quality credit system options below.~~

~~(ii) *LEED Certified Redevelopment Projects*~~

~~The Copermittee may allow redevelopment Priority Development Projects to comply with designed and constructed to be certified under the USGCB LEED for New Construction and Major Renovations green building certification program. The Priority Development Project must receive at least one (1) Site Design credit and two (2) Stormwater Design credits under the Sustainable Sites category.[31] In addition, the existing and future configuration of the receiving water must not be unnaturally altered or adversely impacted by storm water flow rates and durations discharged from the site.~~

~~(iii) *Watershed Based Planned Development Projects*~~

~~The Copermittee may allow Priority Development Projects greater than 100 acres in total project size (or smaller than 100 acres in size~~

~~[31] See LEED for New Construction and Major Renovations rating system at http://www.usgbc.org~~

~~yet part of a larger common plan of development that is over 100 acres) to comply with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2). The Priority Development Project must comply with the following conditions:~~

~~[a] The Priority Development Project was planned utilizing watershed and/or subwatershed based water quality, hydrologic, and fluvial geomorphologic planning principles that implement regional LID BMPs in accordance with the performance and location criteria of this Order and acceptable to the San Diego Water Board;~~

~~[b] Regional LID BMPs may be used provided that the BMPs capture and retain the volume of runoff produced from the design capture volume defined in Provision E.3.c.(1)(a)(i) and that such controls are located upstream of receiving waters;~~

~~[c] Regional LID BMPs must clearly exhibit that they will not result in a net impact from pollutant loadings over and above the impact caused by capture and retention of the design capture volume;~~

~~[d] Any portion of the design capture volume that is not retained by the regional LID BMPs must be treated using biofiltration BMPs; and~~

~~[e] Where regional LID BMPs are demonstrated to the Copermittee as technically infeasible to retain the entire design capture volume, any volume up to and including the design capture volume not retained by regional LID BMPs, nor treated by biofiltration BMPs, must be treated using conventional treatment control BMPs and the project applicant must implement additional alternative compliance project, in-lieu fee and/or water quality credit system options below.~~

~~(iv) *Offsite Regional BMPs*~~

~~[a] The Copermittee may allow Priority Development Projects to utilize offsite regional BMPs to comply with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1) if the offsite regional BMPs have the capacity to receive and retain at least 1.1 times the design capture volume that is not reliably retained onsite.~~

~~[b] The Copermittee may allow Priority Development Projects to utilize offsite regional BMPs to comply with the hydromodification management BMP performance requirements of Provision E.3.c.(2) if the offsite regional BMPs have the capacity to manage the storm water flows rates and durations from the site such that the receiving waters are protected from the potential for increased erosion that would be caused if the unmanaged portion of the runoff was discharged from the site.~~

~~(v) *Offsite Retrofitting Projects*~~

~~The Copermittee may allow Priority Development Projects to utilize offsite retrofitting projects to comply with the storm water pollutant control and hydromodification management BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) if the retrofitting projects have been identified within the strategies included in the Water Quality Improvement Plan, or identified as potential retrofitting projects by the Copermittee pursuant to Provision E.5.~~

~~(vi) *Offsite Channel, Stream, or Habitat Rehabilitation Projects*~~

~~The Copermittee may allow Priority Development Projects to utilize offsite channel, stream, or habitat rehabilitation projects to comply with the hydromodification management BMP performance requirements of Provision E.3.c.(2) if the rehabilitation projects have been identified within the strategies included in the Water Quality Improvement Plan, or identified as potential channel rehabilitation projects by the Copermittee pursuant to Provision E.5. The channel, stream, or habitat rehabilitation project cannot be utilized for pollutant treatmentexcept where artificial wetlands areand located upstream of receiving waters.~~

~~(vii) *Offsite Regional Water Supply Augmentation Projects*~~

~~The Copermittee may allow Priority Development Projects to utilize offsite regional water supply augmentation projects (i.e. groundwater recharge, recycled water, storm water harvesting) to comply with the storm water pollutant control and hydromodification management BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) if the projects have been identified within the strategies included in the Water Quality Improvement Plan.~~

~~(viii) *Project Applicant Proposed Alternative Compliance Projects*~~

~~The Copermittee may allow one or more Priority Development Project applicant(s) to propose and implement alternative compliance projects to comply with the storm water pollutant control and hydromodification management BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) if the alternative compliance projects are consistent with, and will address the highest water quality priorities of the Water Quality Improvement Plan, and comply with the requirements of Provision E.3.c.(3)(a).~~

(c) Alternative Compliance In-Lieu Fee Option

The Copermittee may develop and implement an alternative compliance in-lieu fee option, individually or with other Copermittees and/or entities, as a means for designing, developing, constructing, operating and/or maintaining offsite alternative compliance projects under Provision E.3.c.(3)(b). Priority Development Projects allowed to utilize the

alternative compliance in-lieu fee option must comply with the following conditions:

(i) The in-lieu fee must be collected and held in accordance with the Mitigation Fee Act and all other applicable development fee laws. ~~transferred to the Copermittee (for public projects) or an escrow account (for private projects) prior to the date construction of the Priority Development Project is initiated~~.

Comment [A97]: Please see Legal Comments.

(ii) If the in-lieu fee is applied to the development, design, ~~and~~ construction, operation and maintenance of offsite alternative compliance projects, the following conditions must be met:

[a] The offsite alternative compliance projects must meet ~~allow~~ the criteria identified within E.3.c.(3)(b)-, for each Priority Development Project relying on~~to comply with~~ the alternative compliance project;~~onsite BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2);~~

[b] The offsite alternative compliance projects must be constructed as soon as possible, but no later than 4 years after the certificate of occupancy is granted for the first Priority Development Project that contributed funds toward the construction of the offsite alternative compliance projects, unless a longer period of time is provided for in an approved WQIP~~authorized by the San Diego Water Board Executive Officer~~;

~~[c] The in-lieu fee for the Priority Development Project must include mitigation of the pollutant loads and increased storm water flow rates and durations that are allowed to discharge from the site before the offsite alternative compliance projects are constructed; and~~

[d] The in-lieu fee must also include the cost to operate and maintain the offsite alternative compliance projects for the anticipated life of the constructed priority development project.

(iii) If the in-lieu fee applies only~~is applied~~ to the operation and maintenance of offsite alternative compliance projects that have already been constructed, the offsite alternative compliance projects must meet~~allow~~ the requirements of E.3.c.(3)(a)(iv) and (v) as applicable, for each Priority Development Project relying on~~to comply with~~ the alternative compliance project..~~onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2).~~

(d) Alternative Compliance Water Quality Credit System Option

The Copermittee may develop and implement an alternative compliance water quality credit system option, individually or with other Copermittees

and/or entities, provided that such a credit system clearly exhibits that it will not allow discharges from Priority Development Projects to cause or contribute to a net impact over and above the impact caused by projects meeting the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2). Any credit system that a Copermittee chooses to implement must be submitted to the San Diego Water Board Executive Officer for review and acceptance as part of the Water Quality Improvement Plan.

(4) Long-Term Structural BMP Maintenance

Each Copermittee must require the project applicant to submit proof of the mechanism under which ongoing long-term maintenance of all structural BMPs will be conducted.

(5) Infiltration and Groundwater Protection

(a) Structural BMPs designed to primarily function as large, centralized infiltration devices (such as large infiltration trenches and infiltration basins) must not cause or contribute to an exceedance of an applicable groundwater quality objective. At a minimum, such infiltration BMPs must be in conformance with the design criteria listed below, unless the development project applicant demonstrates to the Copermittee that one or more of the specific design criteria listed below are not necessary to protect groundwater quality. The design criteria listed below do not apply to small infiltration systems dispersed throughout a development project.

(i) Runoff must undergo pretreatment such as sedimentation or filtration prior to infiltration;

(ii) Pollution prevention and source control BMPs must be implemented at a level appropriate to protect groundwater quality at sites where infiltration BMPs are to be used;

(iii) Infiltration BMPs must be adequately maintained to remove pollutants in storm water to the MEP;

(iv) The vertical distance from the base of any infiltration BMP to the seasonal high groundwater mark must be at least 10 feet. Where groundwater basins do not support beneficial uses, this vertical distance criteria may be reduced, provided groundwater quality is maintained;

(v) The soil through which infiltration is to occur must have physical and chemical characteristics (e.g., appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses;

(vi) Infiltration BMPs must not be used for areas of industrial or light

industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee, unless first treated or filtered to remove pollutants prior to infiltration; and

(vii) Infiltration BMPs must be located a minimum of 100 feet horizontally from any water supply wells.

(b) The Copermittee may develop, individually or with other Copermittees, alternative mandatory design criteria to that listed above for infiltration BMPs which are designed to primarily function as centralized infiltration devices. Before implementing the alternative design criteria in the development planning process the Copermitee(s) must:

(i) Notify the San Diego Water Board of the intent to implement the alternative design criteria submitted; and

(ii) Comply with any conditions set by the San Diego Water Board.

d. BMP DESIGN MANUAL UPDATE

Each Copermittee must update and implement its BMP Design Manual[32] pursuant to Provision F.2.b. ~~Until the Copermittee has updated its BMP Design Manual with the requirements of Provisions E.3.a-c, the Copermittee must continue implementing its current BMP Design Manual. Unless directed otherwise by the San Diego Water Board, the Copermittee must implement the BMP Design Manual within 180 days of completing the update.~~ The update of the BMP Design Manual must include the following:

Comment [A98]: This info was incorporated into F.2.b.

(1) Updated procedures to determine the nature and extent of storm water requirements applicable to a potential development or redevelopment projects. These procedures must inform project applicants of the storm water management requirements applicable to their project including, but not limited to, general requirements for all development projects, structural BMP design procedures and requirements, hydromodification management requirements, requirements specific to phased projects, and procedures specific to private developments and public improvement projects;

(2) Updated procedures to identify ~~pollutants and conditions of concern for selecting~~ the most appropriate structural BMPs that consider, at a minimum, the following:

(a) The requirements of E.3.c.(1) and (2)

~~(a)~~(b) Receiving water quality (including pollutants for which receiving waters are listed as impaired under the CWA section 303(d) List);

[32] The BMP Design Manual was formerly known as the Standard Storm Water Mitigation Plan under Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016.

~~(b)~~(c) Pollutants, stressors, and/or receiving water conditions that cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

~~(c)~~(d) Land use type of the project and pollutants associated with that land use type; and

~~(d)~~(e) Pollutants expected to be present onsite.

(3) Updated procedures for designing structural BMPs, including any updated performance requirements to be consistent with the requirements of Provision E.3.c for all structural BMPs listed in the BMP Design Manual;

(4) Long-term maintenance criteria for each structural BMP listed in the BMP Design Manual; and

(5) Alternative compliance criteria, in accordance with the requirements under Provision E.3.c.(3), if the Copermittee elects to allow Priority Development Projects within its jurisdiction to utilize alternative compliance.

e. PRIORITY DEVELOPMENT PROJECT BMP IMPLEMENTATION AND OVERSIGHT

Each Copermittee must implement a program that requires and confirms structural BMPs on all Priority Development Projects are designed, constructed, and maintained to remove pollutants in storm water to the MEP.

(1) Structural BMP Approval and Verification Process

(a) Each Copermittee must require and confirm that for all Priority Development Project applications that have not received prior lawful approval by the Copermittee by 18 months after the commencement of coverage under this Order, the requirements of Provision E.3 are implemented. For project applications that have received prior lawful approval by 18 months after the commencement of coverage under this Order, the Copermittee may allow previous land development requirements to apply.

(b) Each Copermittee must identify the roles and responsibilities of their various municipal departments in implementing the structural BMP requirements, including each stage of a project from application review and approval through BMP maintenance and inspections.

(c) Each Copermittee must require and confirm that appropriate easements and ownerships are properly recorded in public records and the information is conveyed to all appropriate parties when there is a change in project or site ownership.

(d) Each Copermittee must require and confirm that prior to occupancy and/or intended use of any portion of the Priority Development Project, each structural BMP is inspected to verify that it has been constructed and is operating in compliance with all of its specifications, plans, permits, ordinances, and the requirements of this Order.

(2) Priority Development Project Inventory and Prioritization

(a) Each Copermittee must develop, maintain, and update ~~at~~regularly~~at least annually~~, a watershed-based database to track and inventory all constructed Priority Development Projects and associated structural BMPs within its jurisdiction. Inventories must be accurate and complete beginning from January 2002 for the San Diego County Copermittees, February 2003 for the Orange County Copermittees, and July 2005 for the Riverside County Copermittees~~.~~, where data is available.~~.~~ The use of an automated database system, such as GIS, is highly recommended. The database must include, at a minimum, the following information:

(i) Priority Development Project location (address and hydrologic subarea);

(ii) Descriptions of structural BMP type(s);

(iii) Date(s) of construction;

(iv) Party responsible for structural BMP maintenance;

(v) Dates and findings of structural BMP maintenance verifications; and

(vi) Corrective actions and/or resolutions when applicable.

(b) Each Copermittee must prioritize the Priority Development Projects with structural BMPs within its jurisdiction. The designation of Priority Development Projects as high priority must consider the following:

(i) The highest water quality priorities identified in the Water Quality Improvement Plan;

(ii) Receiving water quality;

(iii) Number and sizes of structural BMPs;

(iv) Recommended maintenance frequency of structural BMPs;

(v) Likelihood of operation and maintenance issues of structural BMPs;

(vi) Land use and expected pollutants generated; and

(vii) Compliance record.

(3) Structural BMP Maintenance Verifications and Inspections

Each Copermittee is required to verify that structural BMPs on each Priority

Development Project are adequately maintained, and continue to operate effectively to remove pollutants in storm water to the MEP through inspections, self-certifications, surveys, or other equally effective approaches.

(a) All (100 percent) of the structural BMPs at Priority Development Projects that are designated as high priority must be inspected directly by the Copermittee annually prior to each rainy season;

(b) For verifications performed through a means other than direct Copermittee inspection, adequate documentation must be required by the Copermittee to provide assurance that the required maintenance of structural BMPs at each Priority Development Project has been completed; and

(c) Appropriate follow-up measures (including re-inspections, enforcement, etc.) must be conducted to ensure that structural BMPs at each Priority Development Project continue to reduce pollutants in storm water to the MEP as originally designed.

f. DEVELOPMENT PROJECT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all development projects, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

g. ~~STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS~~

Comment [A99]: This section was moved to the beginning of provision E.3.

~~Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the development planning program to address development and redevelopment projects that may become sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:~~

~~(5) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, increase frequency of verifications and/or inspections, alternative compliance options);~~

~~(6) Each Copermittee must identify areas within its jurisdiction where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting and/or stream, channel, or habitat rehabilitation projects;~~

~~(7) Each Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify regional alternative compliance projects that Priority Development Projects may be allowed or should be encouraged to implement or participate in implementing; and~~

~~(8) The strategies and/or activities must be consistent with the requirements of Provisions E.3.a-c and E.3.e-f and the strategies identified in the Water Quality Improvement Plan.~~

4. Construction Management

Each Copermittee must implement a construction management program in accordance with the strategies identified in the Water Quality Improvement Plan and includes, at a minimum, the following requirements:

STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Comment [A100]: This section was moved from provision E.4.f, Changes are shown in Redline

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the construction management program to address construction sites that the Copermittee has identified as potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, and/or increase/decrease frequency of inspections for specific types of sites and/or activities); and

(2) The strategies and/or activities must be consistent with the requirements of Provisions E.4.c-e and the strategies identified in the Water Quality Improvement Plan.

(3) The requirements of the programs as outlined in the following sub-provisions may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality improvement Plan(s).

a. PROJECT APPROVAL PROCESS

Prior to issuance of any local permit(s) that allows the commencement of construction projects that involve ground disturbance or soil disturbing activities that has the reasonable potential to discharge a pollutant load to and from the MS4, as defined in each Copermittees' JRMP~~can potentially generate pollutants in storm water runoff~~, each Copermittee must:

(1) Require a ~~site-specific~~ Pollution Control Plan~~pollution control~~, construction BMP, and/or erosion and sediment control plan, to be submitted by the project applicant to the Copermittee;

(2) Confirm the Pollution Control Plan~~pollution control~~, construction BMP, and/or erosion and sediment control plan, complies with the local grading ordinance, other applicable local ordinances, and the requirements of this Order;

(3) Confirm the Pollution Control Plan~~pollution control~~, construction BMP, and/or erosion and sediment control plan, includes seasonally appropriate and effective BMPs and management measures described in Provision E.4.c, as applicable to the project; and

(4) Verify that the project applicant has obtained coverage under ~~applicable permits, including, but not limited to~~ the Construction General Permit~~, Clean Water Act Section 401 Water Quality Certification and Section 404 Permit, and California Department of Fish and Game Streambed Alteration Agreement~~.

b. CONSTRUCTION SITE INVENTORY AND TRACKING

(1) Each Copermittee must maintain, and update ~~at least monthly~~regularly, a watershed-based inventory of all construction projects issued a local permit that allows ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff. The use of an automated database system, such as GIS, is highly recommended. The inventory must include:

(a) Relevant contact information for each site (e.g., name, address, phone, and email for the owner and contractor);

(b) The basic site information including location (address and hydrologic subarea), Waste Discharge Identification (WDID) number (if applicable), size of the site, and approximate area of disturbance;

(c) Whether or not the site is considered a high threat to water quality, as defined in Provision E.4.b.(2) below;

(d) The project start and ~~anticipated~~ completion dates;

~~(e) Current construction phase;~~

~~(f)~~(e) The required inspection frequency, as defined in the Copermittee's jurisdictional runoff management program document;

~~(g)~~(f) The date the Copermittee accepted and/or approved the ~~site-specific~~ pollution control plan, construction BMP, and/or erosion and sediment control plan; and

~~(h)~~(g) Whether or not there are ongoing enforcement actions administered to the site.

Comment [A101]: Some of the info can only be updated based on an inspection, which may or may not be monthly year round for all sites.

Comment [A102]: The anticipated completion date is often unknown and can fluctuate based on unpredictable and unforeseen circumstances. Keeping track of accurate dates in an inventory would be difficult and would not add significant value to the database. Construction Inspectors keep a close eye on the progress of projects and would not need to rely on inventory data to achieve effective stormwater management and oversight. Once a project is completed, the date can be entered into the database,.

(2) Each Copermittee must identify all construction sites within its jurisdiction that represent a high threat to downstream surface water quality. The designation of construction sites as high threat to water quality must consider the following:

(a) Sites located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Sites located within the same hydrologic subarea and tributary to a water body segment listed as impaired for sediment on the CWA section 303(d) List;

(c) Sites located within, directly adjacent to, or discharging directly to a receiving water within an ESA; and

(d) Other sites determined by the Copermittees or the San Diego Water Board as a high threat to water quality.

c. CONSTRUCTION SITE BMP IMPLEMENTATION

Comment [A103]: See discussion in section 3.9.1 of the comment letter.

Each Copermittee must implement, or require the implementation of effective BMPs (for Copermittee construction sites and private construction sites, respectively) to reduce discharges of pollutants in ~~storm water~~ runoff from construction sites to the MEP, and effectively prohibit~~prevent~~ non-storm water discharges from construction sites into the MS4. These BMPs must be site specific, seasonally appropriate, and construction phase appropriate. BMPs must be implemented at each construction site year round. Dry season BMP implementation must plan for and address unseasonal rain events that may occur during the dry season (May 1 through September 30). Copermittees must implement, or require the implementation of, BMPs in the following categories:

(1) Project Planning;

(2) Good Site Management “Housekeeping”, including waste management;

(3) Non-storm Water Management;

(4) Erosion Control;

(5) Sediment Control;

(6) Run-on and Run-off Control; and

(7) Active/Passive Sediment Treatment Systems, where applicable.

d. CONSTRUCTION SITE INSPECTIONS

Each Copermittee must conduct construction site inspections to require and confirm compliance with its local permits and applicable local ordinances, and the requirements of this Order. Priority for site inspections must consider threat to water quality pursuant to Provision E.4.b as well as the nature of the construction activity, topography, and the characteristics of soils and receiving water quality.

(1) Inspection Frequency

(a) Each Copermittee must conduct inspections at all inventoried sites, including high threat to water quality sites, at an appropriate frequency for each phase of construction to confirm~~ensure~~ the site reduces the discharge of pollutants in runoff~~storm water~~ from construction sites to the MEP, and effectively prevents non-storm water discharges from entering the MS4.

(b) Each Copermittee must establish appropriate inspection frequencies for high threat to water quality sites, and all other sites, for each phase of construction. Inspection frequencies appropriate for addressing the highest water quality priorities identified in the Water Quality Improvement Plan, and for complying with the requirements of this Order must be identified in each Copermittee's jurisdictional runoff management program document.

(c) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e., re-inspection, enforcement) necessary to require and confirm site compliance with its local permits and applicable local ordinances, and the requirements of this Order.

(2) Inspection Content

Inspections of construction sites by the Copermittee must include, at a minimum:

(a) Verification of coverage under the Construction General Permit (Notice of Intent (NOI) and/or WDID number) during initial inspections, when applicable;

(b) Assessment of compliance with its local permits and applicable local ordinances related to pollution prevention, including the implementation and maintenance of applicable BMPs;

(c) Assessment of BMP adequacy and effectiveness;

(d) Visual observations of actual non-storm water discharges;

(e) Visual observations of actual or potential discharge of sediment and/or construction related materials from the site;

(f) Visual observations of actual or potential illicit connections; and

(g) If any violations are found and BMP corrections are needed, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried construction sites. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Site name, location (address and hydrologic subarea), and WDID number (if applicable);

(b) Inspection date;

(c) Weather condition during~~Approximate amount of rainfall since last~~ inspection;

(d) Description of problems observed with BMPs and indication of need for BMP addition/repair/replacement and any scheduled re-inspection, and date of re-inspection;

(e) Descriptions of any other specific inspection comments which must, at a minimum, include rationales for longer compliance time;

(f) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(g) Resolution of problems noted and date problems fixed.

e. CONSTRUCTION SITE ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried construction sites, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

5. Existing Development Management

Comment [A104]: See discussion in section 3.10 of the comment letter.

Each Copermittee must implement an existing development management program in accordance with the strategies identified in the Water Quality Improvement Plan. and includes, at a minimum, the following requirements:

STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Comment [A105]: Moved from sub-provision e. Changes shown in redline

Each Copermittee must implement the water quality improvement strategies, where necessary, to address areas of existing development within its jurisdiction that are identified as sources of pollutants and/or stressors contributing to the highest priority water quality conditions in the Watershed Management Area. For the existing development management program, the following strategies must be implemented:

(1) Specific Existing Development Management Program Strategies

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented within its jurisdiction to address areas of existing development that the Copermittee has identified as sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(a) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, and/or increase/decrease frequency of inspections for specific types of facilities, areas and/or activities);

(b) The facilities and/or areas within the Copermittee's jurisdiction where the strategies and/or activities will be implemented; and

(2) The requirements of the programs as outlined in the following sub-provisions may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality improvement Plan(s).~~The strategies and/or activities must be consistent with the requirements of Provisions E.5.b-d and the strategies identified in the Water Quality Improvement Plan.~~

a. EXISTING DEVELOPMENT INVENTORY AND TRACKING

Each Copermittee must maintain, and update at least annually, a watershed-based inventory of the existing development within its jurisdiction that ~~may~~has the reasonable potential to~~may~~ discharge a high priority pollutant load to and from the MS4, as defined in the Copermittee's JRMP. The use of an automated database system, such as GIS, is highly recommended. The inventory must, at a minimum, evaluate and include the following if identified as a source of a high priority pollutant~~include~~:

(1) Name, location (hydrological subarea and address, if applicable) of the following types of existing development with its jurisdiction:

(a) Commercial facilities or areas;

(b) Industrial facilities;

(c) Copermittee owned Municipal facilities, including:

(i) MS4 and related structures,[33]

(ii) Roads, streets, and highways,

(iii) Parking facilities,

(iv) Municipal airfields,

(v) Parks and recreation facilities,

(vi) Flood management projects and flood control devices and structures,

(vii) Operating or closed municipal landfills,

(viii) Publicly owned treatment works (including water and wastewater treatment plants) and sanitary sewer collection systems,

(ix) Corporate yards, including maintenance and storage yards for materials, waste, equipment, and vehicles,

(x) Hazardous waste collection facilities,

(xi) Other treatment, storage or disposal facilities for municipal waste, and

(xii) Other Copermittee owned municipal facilities that the Copermittee determines may contribute a significant high priority pollutant load to the MS4; and

(d) Residential areas, which may be designated by one or more of the following:

(i) Residential management area,

(ii) Drainage basin or area,

(iii) Land use (e.g., single family, multi-family, rural),

(iv) Neighborhood,

[33] The inventory may refer to the MS4 map required to be maintained pursuant to Provision E.2.b.(1).

(v) Common Interest Area,

(vi) Home Owner Association,

(vii) Mobile home park, and/or

(viii) Other designations accepted by the San Diego Water Board Executive Officer.

(2) A description of the facility or area, including the following information:

(a) Classification as commercial, industrial, municipal, or residential;

(b) Status of facility or area as active or inactive;

(c) Identification if a business is a mobile business;

(d) SIC Code or NAICS Code, if applicable;

(e) Industrial General Permit NOI and/or WDID number, if applicable;

(f) Identification if a residential area is or includes a Common Interest Area / Home Owner Association, or mobile home park;

(g) Identification of pollutants generated and potentially generated by the facility or area;

(h) Whether the facility or area is adjacent to an ESA;

(i) Whether the facility or area is tributary to and within the same hydrologic subarea as a water body segment listed as impaired on the CWA section 303(d) List and generates pollutants for which the water body segment is impaired; and

(j) Whether the facility or area contributes or potentially contributes to the highest priority water quality conditions identified in the Water Quality Improvement Plan.

(3) An annually updated map showing the location of inventoried existing development, watershed boundaries, and water bodies.

b. EXISTING DEVELOPMENT BMP IMPLEMENTATION AND MAINTENANCE

Each Copermittee must designate a minimum set of BMPs required for all inventoried existing development, including special event venues. The designated minimum BMPs must be specific to facility or area types and pollutant generating activities, as appropriate.

(1) Commercial, Industrial, and Municipal Facilities and Areas

(a) Pollution Prevention

Each Copermittee must require the use of appropriate pollution prevention methods by the commercial, industrial, and municipal facilities and areas in its inventoried existing development, as determined necessary by the Copermittee to address the priorities and strategies addressed in the WQIP.

(b) BMP Implementation

Comment [A106]: See discussion in section 3.10.2 of the comment letter.

Each Copermittee must ~~implement, or~~ require the implementation of, designated BMPs at commercial facilities and areas, industrial facilities, and implement designated BMPs at municipal facilities in its inventoried existing development, as determined necessary by the Copermittee to address the priorities and strategies addressed in the WQIP.

(c) BMP Operation and Maintenance

(i) Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development.

(ii) Each Copermittee must implement a schedule of operation and maintenance activities for its MS4 and related structures (including but not limited to catch basins, storm drain inlets, detention basins, etc.), and verify proper operation of all its municipal structural treatment controls designed to reduce pollutants (including floatables) in storm water discharges to or from its MS4s and related drainage structures. Operation and maintenance activities may include, but is not limited to, the following:

[a] Inspections of the MS4 and related structures;
[b] Cleaning of the MS4 and related structures; and
[c] Proper disposal of materials removed from cleaning of the MS4 and related structures.

(iii) Each Copermittee must implement a schedule of operation and maintenance for public streets, unpaved roads, paved roads, and paved highways and freeways within its jurisdiction to minimize pollutants that can be discharged in storm water.

(iv) Each Copermittee must implement the following controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers:

[a]~~.~~ Copermittees that operate both a municipal sanitary sewer system and a MS4 must implement controls and measures to

prevent and eliminate seeping sewage from infiltrating the MS4.

[b]- Copermittees that do not operate both a municipal sanitary sewer system and a MS4 must coordinate with sewering agencies to keep themselves informed of relevant and appropriate maintenance activities and sanitary sewage projects in their jurisdiction that may cause or contribute to seepage of sewage into the MS4.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Comment [A107]: See discussion in section 3.10.2 of the comment letter.

Each Copermittee must implement BMPs, or require the implementation of BMPs, to reduce pollutants in runoffstorm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from commercial facilities and areas, industrial facilities;, and implement such BMPs at municipal facilities in its inventoried existing development. Such BMPs must include, as appropriate, educational activities, permits, certifications and other measures for applicators and distributors.

(2) Residential Areas

(a) Pollution Prevention

Each Copermittee must promote and encourage the use of pollution prevention methods, where appropriate, by the residential areas in its inventoried existing development.

(b) BMP Implementation

Each Copermittee must promote and encourage the implementation of designated BMPs at residential areas in its inventoried existing development.

(c) BMP Operation and Maintenance

Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at residential areas in its inventoried existing development.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must promote and encourage the implementation of BMPs to reduce pollutants in runoffstorm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from residential areas in its inventoried existing development.

c. EXISTING DEVELOPMENT INSPECTIONS

Each Copermittee must conduct inspections of inventoried existing development that have been identified by the Copermittee as having the reasonable potential to discharge pollutant loads from their MS4, to ensure compliance with applicable local ordinances and permits, and the requirements of this Order.

(1) Inspection Frequency

(a) Each Copermittee must establish appropriate inspection frequencies for inventoried existing development in accordance with the following requirements:

(i) At a minimum, inventoried existing development must be inspected once every five years utilizing one or more of the following methods:

[a] Drive-by inspections by Copermittee municipal and contract staff,
[b] Onsite inspections by Copermittee municipal and contract staff, and/or
[c] Inspections by volunteer monitoring or patrol programs trained by the Copermittee;

(ii) The frequency of inspections must be appropriate to confirm that BMPs are being implemented to reduce the discharge of pollutants in runoff~~storm water~~ from the MS4 to the MEP and effectively prohibit non-storm water discharges to the MS4;

(iii) The frequency of inspections must be based on the potential for a facility or area to discharge non-storm water and pollutants in storm water, and should reflect the priorities set forth in the Water Quality Improvement Plan;

~~(iv) Each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development;[34] and~~

~~(v)~~(iv) Inventoried existing development must be inspected by the Copermittee, as needed, in response to valid public complaints and findings from the Copermittee's municipal and contract staff or volunteer monitoring or patrol program inspections.

(b) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e. education and outreach, re-inspection, enforcement) necessary to require and confirm compliance with its applicable local

Comment [A108]: Recommend keeping this instead of SD proposed 'during the permit term'. The 'during the permit term' language is problematic for businesses that are added to the inventory during the permit term. For example, if a business is added to the inventory one month before the expiration of the permit, it may not be reasonable to expect it to be immediately inspected. It is also problematic for Riverside (and OC?), who may be added to the permit less than two years before the end of the permit term.

Comment [A109]: See discussion in section 3.10.2 of the comment letter.

~~[34] If any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspection may count toward the total annual inspection requirement. This requirement excludes linear municipal facilities (i.e., MS4, streets, roads and highways).~~

ordinances and permits and the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

(2) Inspection Content

(a) Inspections of existing development by the Copermittee or volunteer monitoring or patrol programs must include, at a minimum:

(i) Visual inspections for actual non-storm water discharges, if present;

(ii) Visual inspections for actual or potential discharge of pollutants, if present;

(iii) Visual inspections for actual or potential illicit connections, if present; and

(iv) Verification that the description of the facility or area in the inventory, required pursuant to Provision E.5.a.(2), has not changed.

(b) Onsite inspections of existing development by the Copermittee must include, at a minimum:

(i) Assessment of compliance with its applicable local ordinances and permits related to non-storm water and storm water discharges and runoff;

(ii) Assessment of the implementation of the designated BMPs;

(iii) Verification of coverage under the Industrial General Permit, when applicable; and

(iv) If any problems or violations are found, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried existing development. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Name and location of facility or area (address and hydrologic subarea) consistent with the inventory name and location, pursuant to Provision E.5.a.(1);

(b) Inspection and re-inspection date(s);

(c) Inspection method(s) (i.e. drive-by, onsite);

(d) Observations and findings from the inspection(s);

(e) For onsite inspections of existing development by Copermittee municipal or contract staff, the records must also include, as applicable:

(i) Description of any problems or violations found during the inspection(s),

(ii) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6, and

(iii) The date problems or violations were resolved.

d. EXISTING DEVELOPMENT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried existing development, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

e. RETROFITTING AND REHABILITATION~~STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS~~

~~Each Copermittee must implement the water quality improvement strategies, where necessary, to address areas of existing development within its jurisdiction that are identified as sources of pollutants and/or stressors contributing to the highest priority water quality conditions in the Watershed Management Area. For the existing development management program, the following strategies must be implemented:~~

~~(3) Specific Existing Development Management Program Strategies~~

~~Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented within its jurisdiction to address areas of existing development that the Copermittee has identified as sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:~~

~~(a) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, and/or increase/decrease frequency of inspections for specific types of facilities, areas and/or activities);~~

~~(b) The facilities and/or areas within the Copermittee's jurisdiction where the strategies and/or activities will be implemented; and~~

~~(c)~~(a) ~~The strategies and/or activities must be consistent with the requirements of Provisions E.5.b-d and the strategies identified in the Water Quality Improvement Plan.~~

~~(4)~~(3) Retrofitting Areas of Existing Development

Where identified in the WQIP as a required strategy to address the highest priority water quality conditions, each~~Each~~ Copermittee must describe in its jurisdictional runoff management program document, a program to retrofit areas of existing development within its jurisdiction to address identified sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must, where necessary pursuant to the strategies identified in the WQIP, identify areas of existing development as candidates for retrofitting, focusing on areas where retrofitting will address pollutants and/or stressors that contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for retrofitting projects may be utilized to reduce pollutants that may be discharged in storm water from areas of existing development, and/or address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of retrofitting projects, where needed in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting projects; and

(e) Where retrofitting projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional retrofitting projects (i.e. projects that can receive and/or treat storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment) adjacent to and/or downstream of the areas of existing development.

~~(5)~~(4) Stream, Channel and/or Habitat Rehabilitation in Areas of Existing Development

Where identified in the WQIP as a required strategy to address the highest priority water quality conditions, each~~Each~~ Copermittee must describe in its jurisdictional runoff management program document, a program to rehabilitate streams, channels, and/or habitats in areas of existing development within its jurisdiction to address the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must, where necessary pursuant to the strategies identified in the WQIP, identify streams, channels, and/or habitats in areas of existing development as candidates for rehabilitation, focusing on areas where stream, channel, and/or habitat rehabilitation projects will address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for stream, channel, and/or habitat rehabilitation projects may be utilized to address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters, rehabilitate channelized or hydromodified streams, restore wetland and riparian habitat, restore watershed functions, and/or ~~restore~~ protect beneficial uses of receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of stream, channel, and/or habitat rehabilitation projects, where needed, in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance stream, channel, and/or habitat rehabilitation projects; and

(e) Where stream, channel, and/or habitat rehabilitation projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional stream, channel, and/or habitat rehabilitation projects (i.e. projects that can receive storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment).

(5) Upon Regional Board Executive Officer approval the Copermittees may reallocate resources in the WQIPs for retrofit and rehabilitation project(s).

6. Enforcement Response Plans

Each Copermittee must develop and implement an Enforcement Response Plan as part of its jurisdictional runoff management program document. The Enforcement Response Plan must describe the applicable approaches and options to enforce its legal authority established pursuant to Provision E.1, as necessary, to achieve compliance with the requirements of this Order. Copermittees may continue to utilize and implement established, equivalent guidelines and procedures for enforcement. If such equivalent guidelines and procedures have not been developed, ~~T~~the Enforcement Response Plan must include the following:

a. ENFORCEMENT RESPONSE PLAN COMPONENTS

The Enforcement Response Plan must include the following individual components:

(1) Illicit Discharge Detection and Elimination Enforcement Component;

(2) Development Planning Enforcement Component;

(3) Construction Management Enforcement Component; and

(4) Existing Development Enforcement Component.

b. ENFORCEMENT RESPONSE APPROACHES AND OPTIONS

Each component of the Enforcement Response Plan must describe the enforcement response approaches that the Copermittee will implement to compel compliance with its statutes, ordinances, permits, contracts, orders, or similar means, and the requirements of this Order. The description must include the protocols for implementing progressively stricter enforcement responses. The enforcement response approaches must include appropriate sanctions, as legally appropriate, to compel compliance, including, at a minimum, the following tools or their equivalent:

(1) Verbal and written notices of violation;

(2) Cleanup requirements;

(3) Fines;

(4) Bonding requirements;

(5) Administrative and criminal (if intentional or criminally negligent) penalties;

(6) Liens;

(7) Stop work orders; and

(8) Permit and occupancy denials.

c. CORRECTION OF VIOLATIONS

(1) Violations must be corrected in a timely manner with the goal of correcting the violations within 30 calendar days after the violations are discovered, or prior to the next predicted rain event, whichever is sooner.

(2) The status of the enforcement actions~~If more than 30 calendar days are required to achieve compliance, then a rationale~~ must be recorded and updated in the applicable electronic database or tabular system used to track violations.

Comment [A110]: This is just asking for paperwork violations if someone forgets to write a specific justification – even if all appropriate steps are being diligently pursued. Request alternatively to simply require that the status be updated as appropriate.

d. ~~ESCALATED~~ PROGRESSIVE ENFORCEMENT

Comment [A111]: See discussion in section 3.11.2 of the comment letter.

(1) The Enforcement Response Plan must include a definition of "~~escalated~~ progressive enforcement." ~~Escalated~~ Progressive enforcement must include a series of enforcement actions that match the severity of the violations and include distinct, progressive steps. ~~any enforcement scenario where a violation or other non-compliance is determined to cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan~~. ~~Escalated~~ Progressive enforcement may be defined differently for development planning, construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and/or residential areas.

(2) Where the Copermittee determines ~~escalated~~ the identified progressive enforcement steps ~~is~~are not required, a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

(3) ~~Escalated~~ Progressive enforcement actions must continue to increase in severity, as necessary, to compel compliance as soon as possible.

e. REPORTING OF NON-COMPLIANT SITES

(1) Each Copermittee must notify the San Diego Water Board in writing within ~~22~~5 calendar~~2 working~~ days of issuing escalated enforcement (as defined in the Copermittee's Enforcement Response Plan) to a construction site that poses a significant threat to water quality as a result of violations or other non-compliance with its permits and applicable local ordinances, and the requirements of this Order. Written notification may be provided electronically by email.

(2) Each Copermittee must notify the San Diego Water Board of non-filers under the Industrial General Permit and Construction General Permit by email to Nonfilers_R9@waterboards.ca.gov.

7. Public Education and Participation

Each Copermittee must implement, individually or with other Copermittees, a public education and participation program in accordance with the strategies identified in the Water Quality Improvement Plan to promote and encourage the development of programs, management practices, and behaviors that reduce the discharge of pollutants in runoff~~storm water~~ to the MEP, prevent controllable non-storm water discharges from entering the MS4, and protect water quality standards in receiving waters.

STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Comment [A112]: Recommended move from (c)

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented within its jurisdiction, as applicable, to educate the public and encourage public participation to address potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) The target audiences and/or areas within the Copermittee's jurisdiction where the strategies and/or activities will be implemented;

(2) Provide specific details about how the strategies and/or activities will be implemented (e.g. educational topics, materials and/or activities, public outreach and participation programs and/or opportunities);

(3) Each Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify and implement regional public education and participation activities, programs and opportunities;

(4) Each Copermittee must incorporate a mechanism for evaluating and assessing educational and other public outreach activities, as needed, to identify progress and incorporate modifications necessary to increase the effectiveness of the public education and participation program.

(5) The requirements of the programs as outlined in the following sub-provisions

may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality improvement Plan(s).

a. PUBLIC EDUCATION

The public education program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) Educational activities, public information activities, and other appropriate outreach activities intended to reduce pollutants associated with the ~~application of pesticides, herbicides and fertilizer- and other pollutants of concern in storm water discharges to and from its MS4 to the MEP, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed to address the~~ highest priority water quality conditions identified in the Water Quality Improvement Plan;

(2) Educational activities, public information activities, and other appropriate outreach activities to facilitate the proper management and disposal of used oil and toxic materials; and

(3) Appropriate education and training measures for specific target audiences, such as construction site operators, residents, underserved target audiences and school-aged children, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed, based on high risk behaviors and pollutants of concern.

b. PUBLIC PARTICIPATION

The public participation program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) A process for members of the public to participate in updating the highest priority water quality conditions, numeric goals, and water quality improvement strategies in the Water Quality Improvement Plan.

(2) Opportunities for members of the public to participate in providing the Copermittee recommendations for improving the effectiveness of the water quality improvement strategies implemented within its jurisdiction.

(3) Opportunities for members of the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in ~~storm wate~~r discharges from

the MS4, and/or ~~restoration and~~ protection of the quality of receiving waters.

8. Fiscal Analysis

a. ~~Each Copermittee must secure the resources necessary to meet all the requirements of this Order~~.

b. Each Copermittee must conduct an annual fiscal analysis of its jurisdictional runoff management program in its entirety. The fiscal analysis must include the following:

(1) Identification of the various categories of expenditures necessary to implement the requirements of this Order, including a description of the specific capital, operation and maintenance, and other expenditure items to be accounted for in each category of expenditures;

(2) The staff resources needed and allocated to meet the requirements of this Order, including any development, implementation, and enforcement activities required;

(3) The estimated expenditures for Provisions E.8.b.(1) and E.8.b.(2) for the current fiscal year; and

(4) The source(s) of funds that are proposed to meet the necessary expenditures described in Provisions E.8.b.(1) and E.8.b.(2), including legal restrictions on the use of such funds, for the current fiscal year and next fiscal year.

c. Each Copermittee must submit a summary of the annual fiscal analysis with each Annual Report required pursuant to Provision F.3.b.

d. Each Copermittee must provide the documentation used to develop the summary of the annual fiscal analysis upon request by the San Diego Water Board.

Comment [A113]: Since the monitoring period is different than a fiscal year, we won't be able to consistently and accurately report monitoring costs incurred by the Copermittees. (which are a big part of overall budgets)

Comment [A114]: Please see Legal Comments.

F. REPORTING

Comment [A115]: See discussion in section 3.14 of the comment letter.

The purpose of this provision is to determine and document compliance with the requirements set forth in this Order. The goal of reporting is to communicate to the San Diego Water Board and the people of the State of California the implementation status of each jurisdictional runoff management program and compliance with the requirements of this Order. This goal is to be accomplished through the submittal of specific deliverables to the San Diego Water Board by the Copermittees.

1. Water Quality Improvement Plans

Comment [A116]: See discussion in section 3.14.1 of the comment letter.

The Copermittees for each Watershed Management Area must develop and submit the Water Quality Improvement Plan in accordance with the following requirements:

a. WATER QUALITY IMPROVEMENT PLAN DEVELOPMENT

Each Water Quality Improvement Plan must be developed in accordance with the following process:

(1) Priority Water Quality Conditions and Numeric Goals

(a) The Copermittees must implement a public participation process to solicit data and information to be utilized in the development and identification of the priority water quality conditions for the Watershed Management Area.

(b) The Copermittees are encouraged to involve the public and key stakeholders as early and often as possible during the development of the priority water quality conditions and numeric goals to be included in the Water Quality Improvement Plan.

(c) Within 6 months after the commencement of coverage under this Order, the Copermittees must develop and submit the Water Quality Improvement Plan requirements of Provision B.2 to the San Diego Water Board. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of 60 days.

(d) The Copermittees must revise the priority water quality conditions and numeric goals based on comments received and/or recommendations or direction from the San Diego Water Board Executive Officer.

(2) Water Quality Improvement Strategies and Schedules

(a) The Copermittees are encouraged to involve the public and key stakeholders as early and often as possible during the development of the water quality improvement strategies and schedules to be included in the Water Quality Improvement Plan.

(b) Within 9 months after receipt~~the commencement~~ of public comments and/or recommendations from the Executive Officer per (1)(c) above~~coverage under this Order~~, the Copermittees must develop and submit the Water Quality Improvement Plan requirements of Provision B.3 to the San Diego Water Board. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of 60 days.

(c) The Copermittees must revise the water quality improvement strategies and schedules based on comments received and/or recommendations or direction from the San Diego Water Board Executive Officer.

b. WATER QUALITY IMPROVEMENT PLAN SUBMITTAL

(1) Within 6~~18~~ months after receipt~~the commencement~~ of public comments and/or recommendations from the Executive Officer per (2)(c) above~~coverage under this Order~~, the Copermittees for each Watershed Management Area must submit a complete Water Quality Improvement Plan in accordance with the requirements of Provision B to the San Diego Water Board. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of 30 days.

(2) Based on the comments received, the San Diego Water Board will determine whether to hold a public hearing or to limit public input to submittal of written comments. If no hearing is held the San Diego Water Board will notify the Copermittees within 6 months that the Water Quality Improvement Plan has been accepted as complete following its review and determination that the Water Quality Improvement Plan meets the requirements of this Order.

(3) The Copermittees must revise the Water Quality Improvement Plan based on comments received and/or recommendations or direction from the San Diego Water Board Executive Officer.

(4) The Water Quality Improvement Plan must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance by the San Diego Water Board.

(5) Copermittees must commence with implementation of the BMP strategies identified in the Water Quality Improvement Plan no later than the fiscal year (July 1) following San Diego Water Board approval of the Water Quality Improvement Plan, and the monitoring strategies identified in the Water Quality Improvement Plan no later than October 1st (or May 1st, whichever is sooner) following the San Diego Water Board approval of the Water Quality Improvement Plan.

2. Updates

Comment [A117]: See discussion in section 3.14.1 of the comment letter.

a. Jurisdictional Runoff Management Program Document Updates

Each Copermittee must update its jurisdictional runoff management program document in accordance with the following requirements:

(1) Each Copermittee is encouraged to involve the public and key stakeholders as early and often as possible to solicit recommendations for updates to its jurisdictional runoff management program document.

(2) Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E and the strategies identified in the applicable WQIPs no later than 6~~18~~ months after approval~~the commencement~~ of the applicable Water Quality Improvement Plans (or updates thereto).~~coverage under this Order.~~

(3) The updated JRMP document must be implemented beginning July 1st following completion of the update, unless directed otherwise by the Executive Officer.

~~(3)~~(4) Each Copermittee must submit any subsequent updates to its jurisdictional runoff management program, with a rationale for the modifications, either in the Annual Report required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge required pursuant to Provision F.5.b.

~~(4)~~(5) The Copermittee must revise the modifications as directed by the San Diego Water Board Executive Officer.

~~(5)~~(6) Updated jurisdictional runoff management program documents must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of submitting the Annual Report.

b. BMP Design Manual Updates

Each Copermittee must update its BMP Design Manual in accordance with the following requirements:

(1) Each Copermittee must update its BMP Design Manual to incorporate the requirements of Provisions E.3.a-d, and E.3.g. no later than 6~~18~~ months after approval~~the commencement~~ of the applicable Water Quality Improvement Plans..

Comment [A118]: This is necessary for the WQIP strategies to inform the Development Planning process

(2) Unless directed otherwise by the San Diego Water Board, the Copermittee must implement the updated BMP Design Manual within 180 days of

Comment [A119]: An implementation date was missing from the Tentative Order

completing updates to the BMP Design Manual.

~~(1)~~(3) Until the Copermittee begins implementation of its updated BMP Design Manual, the Copermittee must continue implementing its current BMP Design Manual~~coverage under this Order~~.

Comment [A120]: This was moved to here

~~(2)~~(4) Subsequent updates must be consistent with the requirements of Provisions E.3.a-d and must be submitted as part of the Annual Reports required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge required pursuant to Provision F.5.b.

~~(3)~~(5) Updated BMP Design Manuals must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of completing the update.

c. WATER QUALITY IMPROVEMENT PLAN UPDATES

The Water Quality Improvement Plans must be updated in accordance with the following process:

(1) The Copermittees must implement a public participation process to solicit data and information to be utilized in updating the Water Quality Improvement Plan.

(2) The Copermittees are encouraged to involve the public and key stakeholders as early and often as possible during the updates to the Water Quality Improvement Plan.

(3) The Copermittees for each Watershed Management Area must submit requested updates to the Water Quality Improvement Plan, with the public input received and the rationale for the requested updates, either in the Annual Reports required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The requested updates are considered accepted by the San Diego Water Board if no response is provided to the Copermittee after 3 months of submitting the request.

(4) The Copermittees must revise the requested updates as directed by the San Diego Water Board Executive Officer.

(5) Updated Water Quality Improvement Plans must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance of the requested updates by the San Diego Water Board.

3. Progress Reporting

Comment [A121]: See discussion in section 3.14.1 of the comment letter.

a. PROGRESS REPORT PRESENTATIONS

The Copermittees for each Watershed Management Area must appear before the San Diego Water Board, as requested by the San Diego Water Board, to provide progress reports on the implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs.

b. ANNUAL REPORTS

Comment [A122]: See discussion in section 3.14.1 of the comment letter.

(1) Transitional Period JRMP Reports: Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (Attachment D or accepted revision) no later than October 31 of each year prior to the implementation of updated JRMP programs pursuant to F.2.a. Each Copermittee must submit the information on the Jurisdictional Runoff Management Program Annual Report Form specific to the area within its jurisdiction in each Watershed Management Area.

(2) Transitional Period Monitoring Report: The transitional period monitoring conducted pursuant to D.1.a and D.2.a. shall be reported in a single report that covers the entire reporting period from the initiation of the transitional period monitoring (as described in D.1.a and D.2.a.), through September 30th following approval of the Water Quality Improvement Plan. The Transitional Period Monitoring Report shall include the assessments required per D.4.a.(1)(a), D.4.b.(1)(a) and D.4.b.(2)(a); and be submitted by January 31st following completion of the above mentioned transitional period.

~~(1)~~(3) Post-Transitional Annual Reports – Following the initial transitional period after enrollment into this Order, the~~The~~ Copermittees for each Watershed Management Area must submit an combined Annual Report for each reporting period no later than January 31 of the following year. The annual reporting period consists of two periods: 1) July 1 to June 30 of the following year for the jurisdictional runoff management programs, 2) October 1 to September 30 of the following year for the monitoring and assessment programs~~. The first Annual Report must be prepared for the reporting period beginning July 1 after commencement of coverage under this Order, and upon San Diego Water Board determination that the Water Quality Improvement Plan meets the requirements of this Order to June 30 in the following year for the jurisdictional runoff management programs, and September 30 in the following year for the monitoring and assessment programs.~~ Annual Reports must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Each Annual Report must include the following:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, summarized and presented in tabular and graphical form;

(b) Progress of the special studies required pursuant to Provision D.3, and the results or findings when a special study, or each phase of a special study, is completed;

(c) The findings from the applicable assessments required pursuant to Provision D.4;

Comment [A123]: Not all are required annually.

(d) The progress of implementing the Water Quality Improvement Plan, including, but not limited to, the following:

(i) The progress toward achieving the interim and final numeric goals for the highest water quality priorities for the Watershed Management Area,

(ii) The water quality improvement strategies that were implemented and/or no longer implemented by each of the Copermittees during the reporting period and previous reporting periods, and are planned to be implemented during the next reporting period,

(iii) Proposed modifications to the water quality improvement strategies, with public input received and rationale for the proposed modifications,

(iv) Previously proposed modifications or updates incorporated into the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document and implemented by the Copermittees in the Watershed Management Area, and

(v) Proposed modifications or updates to the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document;

(e) A completed Jurisdictional Runoff Management Program Annual Report Form (Attachment D or accepted revision) for each Copermittee in the Watershed Management Area, certified by a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative.

~~(2) Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (Attachment D or accepted revision) no later than October 31 of each year until the first Annual Report is required to be submitted. Each Copermittee must submit the information on the Jurisdictional Runoff Management Program Annual Report Form specific to the area within its jurisdiction in each Watershed Management Area.~~

Comment [A124]: Adapted into new section (1)

~~(3)~~(4) Each Copermittee must provide any data or documentation utilized in

developing the Annual Report upon request by the San Diego Water Board. ~~Any~~~~Any~~Copermittee~~Any~~ monitoring data utilized in developing the Annual Report must be uploaded to the California Environmental Data Exchange Network (CEDEN).[35] Any Copermittee monitoring and assessment data utilized in developing the Annual Report must be provided on the Regional Clearinghouse required pursuant to Provision F.4.

C. Regional Monitoring and Assessment Report

(1) The Copermittees must submit a Regional Monitoring and Assessment Report no later than 180 days in advance of the expiration date of this Order. The Regional Monitoring and Assessment Report may be submitted as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The Regional Monitoring and Assessment Report shall incorporate the Integrated Assessment of the Water Quality Improvement Plan per D.4.d.

~~(1) The Copermittees must review the receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, and findings from the assessments required pursuant to Provision D.4, to assess the following:~~

~~(2)~~

~~(3) The beneficial uses of the receiving waters within the San Diego Region that are protected or must be restored;~~

~~(4)~~

~~(5) The progress toward restoring impacted beneficial uses in the receiving waters within the San Diego Region; and~~

~~(6)~~

~~(7) Pollutants or conditions of emerging concern that may impact beneficial uses in the receiving waters within the San Diego Region.~~

~~(8)~~

~~(9) The Regional Monitoring and Assessment Report must include recommendations for improving the implementation and assessment of the Water Quality Improvement Plans and jurisdictional runoff management programs.~~

(2) Each Copermittee must provide any data or documentation utilized in developing the Regional Monitoring and Assessment Report upon request by the San Diego Water Board. Any monitoring and assessment data utilized in developing the Regional Monitoring and Assessment Report must be provided on the Regional Clearinghouse required pursuant to Provision F.4.

[35] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

4. Regional Clearinghouse

The Copermittees must develop, update, and maintain an internet-based Regional Clearinghouse that is made available to the public no later than 18 months after the effective date of this Order.[36]

a. The Copermittees, through the Regional Clearinghouse, must make the following documents and data available, organized by Watershed Management Area, which may be linked to other internet-based data portals and databases where the original documents are stored:

(1) Water Quality Improvement Plan for the Watershed Management Area, and all updated versions with date of update;

(2) Annual Reports for the Watershed Management Area;

(3) Jurisdictional Runoff Management Program document for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(4) BMP Design Manual for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(5) Reports from special studies (e.g. source identification, BMP effectiveness assessment) conducted in the Watershed Management Area;

(6) Monitoring data collected pursuant to Provision D for each Watershed Management Area must be uploaded to CEDEN,[37] with links to the uploaded data; and

(7) Available GIS data, layers, and/or shapefiles used to develop the maps generated and maintained by the Copermittees for the Water Quality Improvement Plans, Annual Reports, and jurisdictional runoff management program documents.

b. The Copermittees, through the Regional Clearinghouse, must make the following information and documents available:

(1) Contact information (point of contact, phone number, email address, and mailing address) for each Copermittee;

[36] The Copermittee may elect to develop and maintain the clearinghouse(s) provided by other Copermittees or agencies.

[37] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

(2) Public hotline number for reporting non-storm water and illicit discharges for each Copermittee;

(3) Email address for reporting non-storm water and illicit discharges for each Copermittee;

(4) Link to each Copermittee's website, if available, where the public may find additional information about the Copermittee's storm water management program and for requesting records for the implementation of its program;

(5) Information about opportunities for the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in ~~storm water~~ discharges from the MS4, and/or restoration and protection of the quality of receiving waters; and

(6) Reports from regional monitoring programs in which the Copermittees participate (e.g. Southern California Monitoring Coalition, Southern California Coastal Water Research Project Bight Monitoring);

(7) Regional Monitoring and Assessment Reports; and

(8) Any other information, data, and documents the Copermittees determine as appropriate for making available to the public.

5. Report of Waste Discharge

a. The Orange County Copermittees and the Riverside County Copermittees are required to submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders. The San Diego Water Board will review and consider the Reports of Waste Discharge to determine whether modification to this Order, pursuant to the requirements of Provision H, will be required prior the Orange County Copermittees and/or Riverside County Copermittees becoming covered under this Order. The current Orders for the Orange County Copermittees and Riverside County Copermittees are rescinded upon notification of coverage under this Order except for enforcement purposes.

b. The Copermittees subject to the requirements of this Order must submit to the San Diego Water Board a complete Report of Waste Discharge as an application for the re-issuance of this Order and NPDES permit. The Report of Waste Discharge must be submitted no later than 180 days in advance of the expiration date of this Order. The Report of Waste Discharge must contain the following minimum information:

(1) Names and addresses of the Copermittees;

(2) Names and titles of the primary contacts of the Copermittees;

(3) Proposed changes to the Copermittees' Water Quality Improvement Plans and the supporting justification;

(4) Proposed changes to the Copermittees' jurisdictional runoff management programs and the supporting justification;

(5) Any other information necessary for the re-issuance of this Order;

(6) Any information to be included as part of the Report of Waste Discharge pursuant to the requirements of this Order; and

(7) Any other information required by federal regulations for NPDES permit reissuance.

6. Application for Early Coverage

a. The Orange County Copermittees, collectively, or Riverside County Copermittees, collectively, may apply for early coverage under this Order by submitting a Report of Waste Discharge Form 200, with a written request for early coverage under this Order.

Comment [A125]: This form requests information that is not applicable to MS4s.

b. The San Diego Water Board will review the application for early coverage. A notification of coverage under this Order will be issued to the Copermittees in the respective county by the San Diego Water Board upon completion of the early coverage application requirements. The effective coverage date will be specified in the notification of coverage. The Copermittees in the respective county are authorized to have MS4 discharges pursuant to the requirements of this Order starting on the effective coverage date specified in the notification of coverage. The existing Order for the respective county is rescinded upon the effective coverage date specified in the notification of coverage except for enforcement purposes.

7. Reporting Provisions

Each Copermittee must comply with all the reporting and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

G. PRINCIPAL WATERSHED COPERMITTEE RESPONSIBILITIES

1. The Copermittees within each Watershed Management Area must designate a Principal Watershed Copermittee and notify the San Diego Water Board of the name of the Principal Watershed Copermittee. ~~An individual Copermittee should not be designated a Principal Watershed Copermittee for more than two Watershed Management Areas.~~ The notification may be submitted with the Water Quality Improvement Plan required pursuant to Provision F.1 of this Order.

2. The Principal Watershed Copermittee is responsible for, at a minimum, the following:

a. Serving as liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues, and when necessary and appropriate, representing the Copermittees in the Watershed Management Area before the San Diego Water Board.

b. Facilitating the development of the Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order

c. Coordinating the submittal of the deliverables required by Provisions F.1, F.2, F.3.a, and F.3.b of this Order.

d. Coordinating the development of~~and developing~~, with the other Principal Watershed Copermittees, the requirements of Provisions F.3.c, F.4, and F.5.b of this Order.

H. MODIFICATION OF PROGRAMS

1. Modifications of the Order may be initiated by the San Diego Water Board or by the Copermittees, including as part of the ROWD process applicable to the Orange County and Riverside County Copermittees. Requests by Copermittees must be made to the San Diego Water Board.

2. Minor modifications to the Order may be made by the San Diego Water Board Executive Officer, where the proposed modification complies with all the effective prohibitions and limitations, and other requirements of this Order.

3. Proposed modifications to the Order outside of the WQIP process that are not minor require amendment of this Order in accordance with this Order's rules, policies, and procedures.

4. The San Diego Water Board may re-open and modify this Order at any time prior to its expiration, after opportunity for public comment and a public hearing, if the State Water Board determines that revisions are warranted to those provisions of the Order addressing compliance with water quality standards in the receiving water and/or those provisions of the Order establishing an iterative process for implementation of management practices to assure compliance with water quality standards in the receiving water.

I. STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

Each Copermittee must comply with all the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

ATTACHMENT A

DISCHARGE PROHIBITIONS AND SPECIAL PROTECTIONS

1. Basin Plan Waste Discharge Prohibitions

California Water Code Section 13243 provides that a Regional Water Board, in a water quality control plan, may specify certain conditions or areas where the discharge of waste or certain types of waste is not permitted. The following waste discharge effective prohibitions in the Water Quality Control Plan for the San Diego Basin (Basin Plan) are applicable to any person, as defined by Section 13050(c) of the California Water Code, who is a citizen, domiciliary, or political agency or entity of California whose activities in California could affect the quality of waters of the state within the boundaries of the San Diego Region.

1. The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in California Water Code Section 13050, is prohibited.

2. The discharge of waste to land, except as authorized by waste discharge requirements or the terms described in California Water Code Section 13264 is prohibited.

3. The discharge of pollutants or dredged or fill material to waters of the United States except as authorized by a National Pollutant Discharge Elimination System (NPDES) permit or a dredged or fill material permit (subject to the exemption described in California Water Code Section 13376) is prohibited.

4. Discharges of recycled water to lakes or reservoirs used for municipal water supply or to inland surface water tributaries thereto are prohibited, unless this San Diego Water Board issues a NPDES permit authorizing such a discharge; the proposed discharge has been approved by the State Department of Health Services (DHS) and the operating agency of the impacted reservoir; and the discharger has an approved fail-safe long-term disposal alternative.

5. The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the San Diego Water Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

6. The discharge of waste in a manner causing flow, ponding, or surfacing on lands not owned or under the control of the discharger is prohibited, unless the discharge is authorized by the San Diego Water Board.

7. The dumping, deposition, or discharge of waste directly into waters of the state, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the San Diego Water Board.

8. Any discharge to a storm water conveyance system that is not composed entirely of "*storm water*" is effectively prohibited unless authorized by the San Diego Water Board. [The federal regulations, 40 CFR 122.26(b)(13), define storm water as storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from fire fighting activities.] [§122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

9. The unauthorized discharge of treated or untreated sewage to waters of the state or to a storm water conveyance system is prohibited.

10. The discharge of industrial wastes to conventional septic tank/subsurface disposal systems, except as authorized by the terms described in California Water Code Section 13264, is prohibited.

11. The discharge of radioactive wastes amenable to alternative methods of disposal into the waters of the state is prohibited.

12. The discharge of any radiological, chemical, or biological warfare agent into waters of the state is prohibited.

13. The discharge of waste into a natural or excavated site below historic water levels is prohibited unless the discharge is authorized by the San Diego Water Board.

14. The discharge of sand, silt, clay, or other earthen materials from any activity, including land grading and construction, in quantities which cause deleterious bottom deposits, turbidity or discoloration in waters of the state or which unreasonably affect, or threaten to affect, beneficial uses of such waters is prohibited.

15. The discharge of treated or untreated sewage from vessels to Mission Bay, Oceanside Harbor, Dana Point Harbor, or other small boat harbors is prohibited.

16. The discharge of untreated sewage from vessels to San Diego Bay is prohibited.

17. The discharge of treated sewage from vessels to portions of San Diego Bay that are less than 30 feet deep at mean lower low water (MLLW) is prohibited.

18. The discharge of treated sewage from vessels, which do not have a properly functioning US Coast Guard certified Type I or Type II marine sanitation device, to portions of San Diego Bay that are greater than 30 feet deep at mean lower low water (MLLW) is prohibited.

2. Attachment B to State Water Board Resolution 2012-0012

Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges

I. PROVISIONS FOR POINT SOURCE DISCHARGES OF STORM WATER AND NONPOINT SOURCE WASTE DISCHARGES

The following terms, effective prohibitions, and special conditions (hereafter collectively referred to as special conditions) are established as limitations on point source storm water and nonpoint source discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in Areas of Special Biological Significance (ASBS), as required for State Water Quality Protection Areas pursuant to California Public Resources Code Sections 36700(f) and 36710(f). These Special Protections are adopted by the State Water Board as part of the California Ocean Plan (Ocean Plan) General Exception.

The special conditions are organized by category of discharge. The State Water Resources Control Board (State Water Board) and Regional Water Quality Control Boards (Regional Water Boards) will determine categories and the means of regulation for those categories [e.g., Point Source Storm Water National Pollutant Discharge Elimination System (NPDES) or Nonpoint Source].

A. PERMITTED POINT SOURCE DISCHARGES OF STORM WATER

1. General Provisions for Permitted Point Source Discharges of Storm Water

   a. Existing storm water discharges into an ASBS are allowed only under the following conditions:

      (1) The discharges are authorized by an NPDES permit issued by the State Water Board or Regional Water Board;

      (2) The discharges comply with all of the applicable terms, effective prohibitions, and special conditions contained in these Special Protections; and

      (3) The discharges:

         (i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

         (ii) Are designed to prevent soil erosion;

         (iii) Occur only during wet weather;

         (iv) Are composed of only storm water runoff.

   b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

   c. The discharge of trash is effectively prohibited.

d. Only discharges from existing storm water outfalls are allowed. Any proposed or new storm water runoff discharge shall be routed to existing storm water discharge outfalls and shall not result in any new contribution of waste to an ASBS (i.e., no additional pollutant loading). "Existing storm water outfalls" are those that were constructed or under construction prior to January 1, 2005. "New contribution of waste" is defined as any addition of waste beyond what would have occurred as of January 1, 2005. A change to an existing storm water outfall, in terms of re-location or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges are effectively prohibited except as provided below:

(1) The term "non-storm water discharges" means any waste discharges from a municipal separate storm sewer system (MS4) or other NPDES permitted storm drain system to an ASBS that are not composed entirely of storm water.

(2) (i) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability or occur naturally:

(a) Discharges associated with emergency fire fighting operations.

(b) Foundation and footing drains.

(c) Water from crawl space or basement pumps.

(d) Hillside dewatering.

(e) Naturally occurring groundwater seepage via a storm drain.

(f) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(ii) An NPDES permitting authority may authorize non-storm water discharges to an MS4 with a direct discharge to an ASBS only to the extent the NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

2. Compliance Plans for Inclusion in Storm Water Management Plans (SWMP) and Storm Water Pollution Prevention Plans (SWPPP).

The discharger shall specifically address the effective prohibition of non-storm water runoff and the requirement to maintain natural water quality for storm water discharges to an ASBS in an ASBS Compliance Plan to be included in its SWMP or a SWPPP, as appropriate to permit type. If a statewide permit includes a SWMP, then the discharger shall prepare a stand-alone compliance plan for ASBS discharges. The ASBS Compliance Plan is subject to approval by the Executive Director of the State Water Board (statewide permits) or

Executive Officer of the Regional Water Board (for permits issued by Regional Water Boards).

a. The Compliance Plan shall include a map of surface drainage of storm water runoff, showing areas of sheet runoff, prioritize discharges, and describe any structural Best Management Practices (BMPs) already employed and/or BMPs to be employed in the future. Priority discharges are those that pose the greatest water quality threat and which are identified to require installation of structural BMPs. The map shall also show the storm water conveyances in relation to other features such as service areas, sewage conveyances and treatment facilities, landslides, areas prone to erosion, and waste and hazardous material storage areas, if applicable. The SWMP or SWPPP shall also include a procedure for updating the map and plan when changes are made to the storm water conveyance facilities.

b. The ASBS Compliance Plan shall describe the measures by which all non-authorized non-storm water runoff (e.g., dry weather flows) has been eliminated, how these measures will be maintained over time, and how these measures are monitored and documented.

c. For Municipal Separate Storm Sewer System (MS4s), the ASBS Compliance Plan shall require minimum inspection frequencies as follows:

   (1) The minimum inspection frequency for construction sites shall be weekly during rainy season;

   (2) The minimum inspection frequency for industrial facilities shall be monthly during the rainy season;

   (3) The minimum inspection frequency for commercial facilities (e.g., restaurants) shall be twice during the rainy season; and

   (4) Storm water outfall drains equal to or greater than 18 inches (457 mm) in diameter or width shall be inspected once prior to the beginning of the rainy season and once during the rainy season and maintained to remove trash and other anthropogenic debris.

d. The ASBS Compliance Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff, that are necessary to comply with these special conditions, will be achieved through BMPs. Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that such installation would pose a threat to health or safety. BMPs to control storm water runoff discharges (at the end-of-pipe) during a design storm shall be designed to achieve on average the following target levels:

   (1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

   (2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges. The baseline for the reduction is the effective date of the Exception. The

baseline for these determinations is the effective date of the Exception, and the reductions must be achieved and documented within four (4) years of the effective date.

e. The ASBS Compliance Plan shall address erosion control and the prevention of anthropogenic sedimentation in ASBS. The natural habitat conditions in the ASBS shall not be altered as a result of anthropogenic sedimentation.

f. The ASBS Compliance Plan shall describe the non-structural BMPs currently employed and planned in the future (including those for construction activities), and include an implementation schedule. The ASBS Compliance Plan shall include non-structural BMPs that address public education and outreach. Education and outreach efforts must adequately inform the public that direct discharges of pollutants from private property not entering an MS4 are effectively prohibited. The ASBS Compliance Plan shall also describe the structural BMPs, including any low impact development (LID) measures, currently employed and planned for higher threat discharges and include an implementation schedule. To control storm water runoff discharges (at the end-of-pipe) during a design storm, permittees must first consider using LID practices to infiltrate, use, or evapotranspirate storm water runoff on-site.

g. The BMPs and implementation schedule shall be designed to ensure that natural water quality conditions in the receiving water are achieved and maintained by either reducing flows from impervious surfaces or reducing pollutant loading, or some combination thereof.

h. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents in storm water runoff that alter natural ocean water quality and the sources of these constituents.

(2) The report shall describe BMPs that are currently being implemented, BMPs that are identified in the SWMP or SWPPP for future implementation, and any additional BMPs that may be added to the SWMP or SWPPP to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the BMPs.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits), the discharger shall revise its ASBS Compliance Plan to incorporate any new or modified BMPs that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised SWMP or SWPPP, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural ocean water quality conditions due to the same constituent.

(5) Compliance with this section does not excuse violations of any term, effective prohibition, or condition contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within one year from the effective date of the Exception, the discharger shall submit a written ASBS Compliance Plan to the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that describes its strategy to comply with these special conditions, including the requirement to maintain natural water quality in the affected ASBS. The ASBS Compliance Plan shall include a time schedule to implement appropriate non-structural and structural controls (implementation schedule) to comply with these special conditions for inclusion in the discharger's SWMP or SWPPP, as appropriate to permit type.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these special conditions shall be implemented.

d. Within four (4) years of the effective date of the Exception, any structural controls identified in the ASBS Compliance Plan that are necessary to comply with these special conditions shall be operational.

e. Within four (4) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water, pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data, and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

(1) for municipalities, a demonstration of significant hardship to discharger ratepayers, by showing the relationship of storm water fees to annual household income for residents within the discharger's jurisdictional area, and the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or
(2) for other governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process.

B. NONPOINT SOURCE DISCHARGES

[NOT INCLUDED]
[PROVISIONS FOR NONPOINT SOURCE DISCHARGES NOT APPLICABLE]

II. ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES

[NOT INCLUDED]
[ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES NOT APPLICABLE]

III. ADDITIONAL REQUIREMENTS – WATERFRONT AND MARINE OPERATIONS

[NOT INCLUDED]
[ADDITIONAL REQUIREMENTS FOR WATERFRONT AND MARINE OPERATIONS NOT APPLICABLE]

IV. MONITORING REQUIREMENTS

Monitoring is mandatory for all dischargers to assure compliance with the Ocean Plan. Monitoring requirements include both: (A) core discharge monitoring, and (B) ocean receiving water monitoring. The State and Regional Water Boards must approve sampling site locations and any adjustments to the monitoring programs. All ocean receiving water and reference area monitoring must be comparable with the Water Boards' Surface Water Ambient Monitoring Program (SWAMP).

Safety concerns: Sample locations and sampling periods must be determined considering safety issues. Sampling may be postponed upon notification to the State and Regional Water Boards if hazardous conditions prevail.

Analytical Chemistry Methods: All constituents must be analyzed using the lowest minimum detection limits comparable to the Ocean Plan water quality objectives. For metal analysis, all samples, including storm water effluent, reference samples, and ocean receiving water samples, must be analyzed by the approved analytical method with the lowest minimum detection limits (currently Inductively Coupled Plasma/Mass Spectrometry) described in the Ocean Plan.

A. CORE DISCHARGE MONITORING PROGRAM

1. General sampling requirements for timing and storm size:

   Runoff must be collected during a storm event that is greater than 0.1 inch and generates runoff, and at least 72 hours from the previously measurable storm event. Runoff samples shall be collected when post-storm receiving water is sampled, and analyzed for the same constituents as receiving water and reference site samples (see section IV B) as described below.

2. Runoff flow measurements

   a. For municipal/industrial storm water outfalls in existence as of December 31, 2007, 18 inches (457mm) or greater in diameter/width (including multiple outfall pipes in combination having a width of 18 inches, runoff flows must be measured or calculated, using a method acceptable to and approved by the State and Regional Water Boards.
   b. This will be reported annually for each precipitation season to the State and Regional Water Boards.

3. Runoff samples – storm events

   a. For outfalls equal to or greater than 18 inches (0.46m) in diameter or width:

      (1) samples of storm water runoff shall be analyzed during the same storm as receiving water samples for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination, ; and

      (2) samples of storm water runoff shall be analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS

      (3) If an applicant has no outfall greater than 36 inches, then storm water runoff from the applicant's largest outfall shall be further analyzed during the same storm as receiving water samples for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates).

   b. For outfalls equal to or greater than 36 inches (0.91m) in diameter or width:

      (1) samples of storm water runoff shall be analyzed during the same storm as receiving water samples for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

      (2) samples of storm water runoff shall be further analyzed during the same storm as receiving water samples for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides

(pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates) and

(3) samples of storm water runoff shall be analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

c. For an applicant not participating in a regional monitoring program [see below in Section IV (B)] in addition to (a.) and (b.) above, a minimum of the two largest outfalls or 20 percent of the larger outfalls, whichever is greater, shall be sampled (flow weighted composite samples) at least three times annually during wet weather (storm event) and analyzed for all Ocean Plan Table A constituents, Table B constituents for marine aquatic life protection (except for toxicity, only chronic toxicity for three species shall be required), DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, and Ocean Plan indicator bacteria. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one (the largest) such discharge shall be sampled annually in each Region.

4. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may reduce or suspend core monitoring once the storm runoff is fully characterized. This determination may be made at any point after the discharge is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

B. OCEAN RECEIVING WATER AND REFERENCE AREA MONITORING PROGRAM

In addition to performing the Core Discharge Monitoring Program in Section II.A above, all applicants having authorized discharges must perform ocean receiving water monitoring. In order to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS, dischargers may choose either (1) an individual monitoring program, or (2) participation in a regional integrated monitoring program.

1. Individual Monitoring Program: The requirements listed below are for those dischargers who elect to perform an individual monitoring program to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within the affected ASBS. In addition to Core Discharge Monitoring, the following additional monitoring requirements shall be met:

   a. Three times annually, during wet weather (storm events), the receiving water at the point of discharge from the outfalls described in section (IV)(A)(3)(c) above shall be sampled and analyzed for Ocean Plan Table A constituents, Table B constituents for marine aquatic life, DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, salinity, chronic toxicity (three species), and Ocean Plan indicator bacteria.

      The sample location for the ocean receiving water shall be in the surf zone at the point of discharges; this must be at the same location where storm water runoff is sampled. Receiving water shall be sampled at approximately the same time prior to (pre-storm) and during (or immediately after) the same storm (post storm). Reference water quality shall also be sampled and analyzed for the same constituents pre-storm and post-storm, during the same storms when receiving water is sampled. Reference stations will be

determined by the State Water Board's Division of Water Quality and the applicable Regional Water Board(s).

b. Sediment sampling shall occur at least three times during every five (5) year period. The subtidal sediment (sand or finer, if present) at the discharge shall be sampled and analyzed for Ocean Plan Table B constituents for marine aquatic life, DDT, PCBs, PAHs, pyrethroids, and OP pesticides. For sediment toxicity testing, only an acute toxicity test using the amphipod Eohaustorius estuarius must be performed.

c. A quantitative survey of intertidal benthic marine life shall be performed at the discharge and at a reference site. The survey shall be performed at least once every five (5) year period. The survey design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The results of the survey shall be completed and submitted to the State Water Board and Regional Water Board at least six months prior to the end of the permit cycle.

d. Once during each five (5) year period, a bioaccumulation study shall be conducted to determine the concentrations of metals and synthetic organic pollutants at representative discharge sites and at representative reference sites. The study design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The bioaccumulation study may include California mussels (Mytilus californianus) and/or sand crabs (Emerita analoga or Blepharipoda occidentalis). Based on the study results, the Regional Water Board and the State Water Board's Division of Water Quality, may adjust the study design in subsequent permits, or add or modify additional test organisms (such as shore crabs or fish), or modify the study design appropriate for the area and best available sensitive measures of contaminant exposure.

e. Marine Debris: Representative quantitative observations for trash by type and source shall be performed along the coast of the ASBS within the influence of the discharger's outfalls. The design, including locations and frequency, of the marine debris observations is subject to approval by the Regional Water Board and State Water Board's Division of Water Quality.

f. The monitoring requirements of the Individual Monitoring Program in this section are minimum requirements. After a minimum of one (1) year of continuous water quality monitoring of the discharges and ocean receiving waters, the Executive Director of the State Water Board (statewide permits) or Executive officer of the Regional Water Board (Regional Water Board permits) may require additional monitoring, or adjust, reduce or suspend receiving water and reference station monitoring. This determination may be made at any point after the discharge and receiving water is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

2. Regional Integrated Monitoring Program: Dischargers may elect to participate in a regional integrated monitoring program, in lieu of an individual monitoring program, to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS. This regional approach shall characterize natural water quality, pre- and post-storm, in ocean reference areas near the mouths of identified open space watersheds and the effects of the discharges on natural water quality (physical, chemical, and toxicity) in the ASBS receiving waters, and should include benthic marine aquatic life and bioaccumulation components. The design of the ASBS stratum of a regional integrated monitoring program may deviate from the otherwise prescribed individual

monitoring approach (in Section IV.B.1) if approved by the State Water Board's Division of Water Quality and the Regional Water Boards.

a. Ocean reference areas shall be located at the drainages of flowing watersheds with minimal development (in no instance more than 10% development), and shall not be located in CWA Section 303(d) listed waterbodies or have tributaries that are 303(d) listed. Reference areas shall be free of wastewater discharges and anthropogenic non-storm water runoff. A minimum of low threat storm runoff discharges (e.g. stream highway overpasses and campgrounds) may be allowed on a case-by-case basis. Reference areas shall be located in the same region as the ASBS receiving water monitoring occurs. The reference areas for each Region are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean reference water samples must be collected from each station, each from a separate storm. A minimum of one reference location shall be sampled for each ASBS receiving water site sampled per responsible party. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

b. ASBS ocean receiving water must be sampled in the surf zone at the location where the runoff makes contact with ocean water (i.e. at "point zero"). Ocean receiving water stations must be representative of worst-case discharge conditions (i.e. co-located at a large drain greater than 36 inches, or if drains greater than 36 inches are not present in the ASBS then the largest drain greater than18 inches.) Ocean receiving water stations are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean receiving water samples must be collected during each storm season from each station, each from a separate storm. A minimum of one receiving water location shall be sampled in each ASBS per responsible party in that ASBS. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

c. Reference and receiving water sampling shall commence during the first full storm season following the adoption of these special conditions, and post-storm samples shall be collected when annual storm water runoff is sampled. Sampling shall occur in a minimum of two storm seasons. For those ASBS dischargers that have already participated in the Southern California Bight 2008 ASBS regional monitoring effort, sampling may be limited to only one storm season.

d. Receiving water and reference samples shall be analyzed for the same constituents as storm water runoff samples. At a minimum, constituents to be sampled and analyzed in reference and discharge receiving waters must include oil and grease, total suspended solids, Ocean Plan Table B metals for protection of marine life, Ocean Plan PAHs, pyrethroids, OP pesticides, ammonia, nitrate, phosphates, and critical life stage chronic toxicity for three species. In addition, within the range of the southern sea otter, indicator bacteria or some other measure of fecal contamination shall be analyzed.

3. Waterfront and Marine Operations: In addition to the above requirements for ocean receiving water monitoring, additional monitoring must be performed for marinas and boat launch and pier facilities:

a. For all marina or mooring field operators, in mooring fields with 10 or more occupied moorings, the ocean receiving water must be sampled for Ocean Plan indicator bacteria, residual chlorine, copper, zinc, grease and oil, methylene blue active substances (MBAS), and ammonia nitrogen.

   (1) For mooring field operators opting for an individual monitoring program (Section IV.B.1 above), this sampling must occur weekly (on the weekend) from May through October.

   (2) For mooring field operators opting to participate in a regional integrated monitoring program (Section IV.B.2 above), this sampling must occur monthly from May through October on a high use weekend in each month. The Water Boards may allow a reduction in the frequency of sampling, through the regional monitoring program, after the first year of monitoring.

b. For all mooring field operators, the subtidal sediment (sand or finer, if present) within mooring fields and below piers shall be sampled and analyzed for Ocean Plan Table B metals (for marine aquatic life beneficial use), acute toxicity, PAHs, and tributyltin. For sediment toxicity testing, only an acute toxicity test using the amphipod Eohaustorius estuarius must be performed. This sampling shall occur at least three times during a five (5) year period. For mooring field operators opting to participate in a regional integrated monitoring program, the Water Boards may allow a reduction in the frequency of sampling after the first sampling effort's results are assessed.

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ATTACHMENT B

STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

1. Standard Permit Provisions

Code of Federal Regulations Title 40 Section 122.41 (40 CFR 122.41) includes conditions, or provisions, that apply to all National Pollutant Discharge Elimination System (NPDES) permits. Additional provisions applicable to NPDES permits are in 40 CFR 122.42. All applicable provisions in 40 CFR 122.41 and 40 CFR 122.42 must be incorporated into this Order and NPDES permit. The applicable 40 CFR 122.41 and 40 CFR 122.42 provisions are as follows:

a. DUTY TO COMPLY [40 CFR 122.41(a)]

The Copermittee must comply with all of the provisions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

(1) The Copermittee must comply with effluent standards or effective prohibitions established under Section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or effective prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement. [40 CFR 122.41(a)(1)]

(2) The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to a civil penalty not to exceed $25,000 per day for each violation. The CWA provides that any person who *negligently* violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than 2 years, or both. Any person who *knowingly* violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both. Any person who knowingly violates Section 301, 302, 303, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, and who knows at that time that he thereby places another person in imminent danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of

not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.
[40 CFR 122.41(a)(2)]

(3) Any person may be assessed an administrative penalty by the San Diego Regional Water Quality Control Board (San Diego Water Board), State Water Resources Control Board (State Water Board), or United States Environmental Protection Agency (USEPA) for violating Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.
[40 CFR 122.41(a)(3)]

b. DUTY TO REAPPLY [40 CFR 122.41(b)]

If a Copermittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Copermittee must apply for and obtain a new permit.

c. NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE [40 CFR 122.41(c)]

It shall not be a defense for a Copermittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

d. DUTY TO MITIGATE [40 CFR 122.41(d)]

The Copermittee must take all reasonable steps to minimize or prevent any discharge or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

e. PROPER OPERATION AND MAINTENANCE [40 CFR 122.41(e)]

The Copermittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Copermittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by a Copermittee only when the operation is necessary to achieve compliance with the conditions of this permit.

f. PERMIT ACTIONS [40 CFR 122.41(f)]

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Copermittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

g. PROPERTY RIGHTS [40 CFR 122.41(g)]

This permit does not convey any property rights of any sort, or any exclusive privilege.

h. DUTY TO PROVIDE INFORMATION [40 CFR 122.41(h)]

The Copermittee must furnish to the San Diego Water Board, State Water Board, or USEPA within a reasonable time, any information which the San Diego Water Board, State Water Board, or USPEA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Copermittee must also furnish to the San Diego Water Board, State Water Board, or USPEA upon request, copies of records required to be kept by this permit.

i. INSPECTION AND ENTRY [40 CFR 122.41(i)]

The Copermittee must allow the San Diego Water Board, State Water Board, USEPA, and/or their authorized representative (including an authorized contractor acting as their representative), upon presentation of credentials and other documents as may be required by law, to:

(1) Enter upon the Copermittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit; [40 CFR 122.41(i)(1)]

(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit; [40 CFR 122.41(i)(2)]

(3) Inspect and photograph at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; [40 CFR 122.41(i)(3)] and

(4) Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location. [40 CFR 122.41(i)(4)]

j. MONITORING AND RECORDS [40 CFR 122.41(j)]

(1) Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity. [40 CFR 122.41(j)(1)]

(2) Except for records of monitoring information required by this permit related to the Copermittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five (5) years (or longer as required by 40 CFR Part 503), the

Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time. [40 CFR 122.41(j)(2)]

(3) Records for monitoring information must include: [40 CFR 122.41(j)(3)]

(a) The date, exact place, and time of sampling or measurements; [40 CFR 122.41(j)(3)(i)]
(b) The individual(s) who performed the sampling or measurements; [40 CFR 122.41(j)(3)(ii)]
(c) The date(s) analyses were performed; [40 CFR 122.41(j)(3)(iii)]
(d) The individual(s) who performed the analyses; [40 CFR 122.41(j)(3)(iv)]
(e) The analytical techniques or methods used; [40 CFR 122.41(j)(3)(v)] and
(f) The results of such analyses. [40 CFR 122.41(j)(3)(vi)]

(4) Monitoring must be conducted according to test procedures under 40 CFR Part 136 unless another method is required under 40 CFR Subchapters N or O. [40 CFR 122.41(j)(4)]

In the case of pollutants for which there are no approved methods under 40 CFR Part 136 or otherwise required under 40 CFR Subchapters N and O, monitoring must be conducted according to a test procedure specified in the permit for such pollutants. [40 CFR 122.44(i)(1)(iv)]

(5) The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. [40 CFR 122.41(j)(5)]

k. SIGNATORY REQUIREMENT [40 CFR 122.41(k)]

(1) All applications, reports, or information submitted to the San Diego Water Board, State Water Board, or USEPA must be signed and certified. (See 40 CFR 122.22) [40 CFR 122.41(k)(1)]

(a) *For a municipality, State, Federal, or other public agency.* [All applications must be signed] [b]y either a principal executive officer or ranking elected official. [40 CFR 122.22(a)(3)]

(b) All reports required by permits, and other information requested by the San Diego Water Board, State Water Board, or USEPA must be signed by a person described in paragraph (a) of this section, or by a duly authorized representative of that person. A person is a duly authorized representative only if: [40 CFR 122.22(b)]

(i) The authorization is made in writing by a person described in paragraph (a) of this section; [40 CFR 122.22(b)(1)]

(ii) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company, (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) [40 CFR 122.22(b)(2)] and,

(iii) The written authorization is submitted to the San Diego Water Board and State Water Board. [40 CFR 122.22(b)(3)]

(c) *Changes to authorization.* If an authorization under paragraph (b) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (b) of this section must be submitted to the San Diego Water Board prior to or together with any reports, information, or applications to be signed by an authorized representative. [40 CFR 122.22(c)]

(d) *Certification.* Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." [40 CFR 122.22(d)]

(2) The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both. [40 CFR 122.41(k)(2)]

I. REPORTING REQUIREMENTS [40 CFR 122.41(l)]

(1) *Planned changes.* The Copermittee must give notice to the San Diego Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when: [40 CFR 122.41(l)(1)]

(a) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); [40 CFR 122.41(l)(1)(i)] or

(b) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which

are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1).
[40 CFR 122.41(l)(1)(ii)]

(c) The alteration or addition results in a significant change in the Copermittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. [40 CFR 122.41(l)(1)(iii)]

(2) *Anticipated noncompliance*. The Copermittee must give advance notice to the San Diego Water Board or State Water Board of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.
[40 CFR 122.41(l)(2)]

(3) *Transfers*. This permit is not transferable to any person except after notice to the San Diego Water Board. The San Diego Water Board may require modification or revocation and reissuance of the permit to change the name of the Copermittee and incorporate such other requirements as may be necessary under the CWA.
[40 CFR 122.41(l)(3)]

(4) *Monitoring reports.* Monitoring results must be reported at the intervals specified elsewhere in this permit. [40 CFR 122.41(l)(4)]

(a) Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the San Diego Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices. [40 CFR 122.41(l)(4)(i)]

(b) If the Copermittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or another method required for an industry-specific waste stream under 40 CFR Subchapters N or O, the results of this monitoring must be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the San Diego Water Board or State Water Board.
[40 CFR 122.41(l)(4)(ii)]

(c) Calculations for all limitations which require averaging of measurements must utilize an arithmetic mean unless otherwise specified in the permit.
[40 CFR 122.41(l)(4)(iii)]

(5) *Compliance schedules*. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date. [40 CFR 122.41(l)(5)]

(6) *Twenty-four hour reporting.*

(a) The Copermittee must report any noncompliance that may endanger health or the environment. Any information must be provided orally within 24 hours from the time the Copermittee becomes aware of the circumstances. A written submission must also be provided within five (5) days of the time the Copermittee becomes aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6)(i)]

(b) The following must be included as information which must be reported within 24 hours under this paragraph: [40 CFR 122.41(l)(6)(ii)]

(i) Any unanticipated bypass that exceeds any effluent limitation in the permit (See 40 CFR 122.41(g)). [40 CFR 122.41(l)(6)(ii)(A)]
(ii) Any upset which exceeds any effluent limitation in the permit. [40 CFR 122.41(l)(6)(ii)(B)] and,
(iii) Violation of a maximum daily discharge limitation for any of the pollutants listed by the San Diego Water Board in the permit to be reported within 24 hours. (See 40 CFR 122.44(g)) [40 CFR 122.41(l)(6)(ii)(C)]

(c) The San Diego Water Board may waive the above-required written report on a case-by-case basis if the oral report has been received within 24 hours. [40 CFR 122.41(l)(6)(iii)]

(7) *Other noncompliance.* The Copermittee must report all instances of noncompliance not reported in accordance with the standard provisions required under 40 CFR 122.41(l)(4), (5), and (6), at the time monitoring reports are submitted. The reports must contain the information listed in the standard provisions required under 40 CFR 122.41(l)(6). [40 CFR 122.41(l)(7))]

(8) *Other information.* When the Copermittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the San Diego Water Board, State Water Board, or USEPA, the Copermittee must promptly submit such facts or information. [40 CFR 122.41(l)(8)]

~~**m. BYPASS** [40 CFR 122.41(m)]~~

~~(1) *Definitions.*~~

~~(a) "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. [40 CFR 122.41(m)(1)(i)] or~~

~~(b) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be~~

Comment [A126]: While this is a standard condition for NPDES permits, it is manifestly inapplicable to MS4 permits. Since BMPs constructed to comply with the Order include bypass provisions to protect their entirety, the Copermittees would have to notify the Regional Board whenever a storm was predicted. This provision should be deleted.

~~expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.~~
~~[40 CFR 122.41(m)(1)(ii)]~~

~~(2) *Bypass not exceeding limitations*. The Copermittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the standard provisions required under 40 CFR 122.41(m)(3) and (4).~~
~~[40 CFR 122.41(m)(2)]~~

~~(3) *Notice*.~~

~~(a) *Anticipated bypass*. If the Copermittee knows in advance of the need for a bypass, it must submit a notice, if possible at least ten days before the date of the bypass. [40 CFR 122.41(m)(3)(i)] or~~

~~(b) *Unanticipated bypass*. The Copermittee must submit notice of an unanticipated bypass in accordance with the standard provisions required under 40 CFR 122.41(l)(6) (24 hour notice).~~
~~[40 CFR 122.41(m)(3)(ii)]~~

~~(4) *Prohibition of Bypass*.~~

~~(a) Bypass is prohibited, and the San Diego Water Board may take enforcement action against a Copermittee for bypass, unless:~~
~~[40 CFR 122.41(m)(4)(i)]~~

~~(i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; [40 CFR 122.41(m)(4)(i)(A)]~~
~~(ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance;~~
~~[40 CFR 122.41(m)(4)(i)(B)] and,~~
~~(iii) The Copermittee submitted notice in accordance with the standard provisions required under 40 CFR 122.41(m)(3).~~
~~[40 CFR 122.41(m)(4)(i)(C)]~~

~~(b) The San Diego Water Board may approve an anticipated bypass, after considering its adverse effects, if the San Diego Water Board determines that it will meet the three conditions listed above.~~
~~[40 CFR 122.41(m)(4)(ii)]~~

~~n.~~m. **UPSET** [40 CFR 122.41(n)]

(1) *Definition.* "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Copermittee. An upset does not

include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. [40 CFR 122.41(n)(1)]

(2) *Effect of an upset*. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the standard provisions required under 40 CFR 122.41(n)(3) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. [40 CFR 122.41(n)(2)]

(3) *Conditions necessary for a demonstration of upset*. A Copermittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that: [40 CFR 122.41(n)(3)]

(a) An upset occurred and that the Copermittee can identify the cause(s) of the upset; [40 CFR 122.41(n)(3)(i)]
(b) The permitted facility was at the time being properly operated; [40 CFR 122.41(n)(3)(ii)] and
(c) The Copermittee submitted notice of the upset in accordance with the standard provisions required under 40 CFR 122.41(l)(6)(ii)(B) (24-hour notice). [40 CFR 122.41(n)(3)(iii)]
(d) The Copermittee complied with any remedial measures pursuant to the standard provisions required under 40 CFR 122.41(d). [40 CFR 122.41(n)(3)(iii)]

(4) *Burden of proof*. In any enforcement proceeding, the Copermittee seeking to establish the occurrence of an upset has the burden of proof. [40 CFR 122.41(n)(4)]

~~o.~~n. STANDARD PERMIT PROVISIONS FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS
[40 CFR 122.42(c)]

The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the San Diego Water Board or State Water Board under 40 CFR 122.26(a)(1)(v) must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report must include:

(1) The status of implementing the components of the storm water management program that are established as permit conditions; [40 CFR 122.42(c)(1)]

(2) Proposed changes to the storm water management programs that are established as permit conditions. Such proposed changes must be consistent with 40 CFR 122.26(d)(2)(iii); [40 CFR 122.42(c)(2)] and

(3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under 40 CFR 122.26(d)(2)(iv) and (v); [40 CFR 122.42(c)(3)]

(4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; [40 CFR 122.42(c)(4)]

(5) Annual expenditures and budget for year following each annual report; [40 CFR 122.42(c)(5)]

(6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; [40 CFR 122.42(c)(6)]

(7) Identification of water quality improvements or degradation. [40 CFR 122.42(c)(7)]

~~p.~~o. **STANDARD PERMIT PROVISIONS FOR STORM WATER DISCHARGES** [40 CFR 122.42(d)]

The initial permits for discharges composed entirely of storm water issued pursuant to 40 CFR 122.26(e)(7) must require compliance with the conditions of the permit as expeditiously as practicable, but in no event later than three years after the date of issuance of the permit.

2. General Provisions

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. The general provisions applicable to this Order and NPDES permit are as follows:

a. DISCHARGE OF WASTE IS A PRIVILEGE

No discharge of waste into the waters of the State, whether or not such discharge is made pursuant to waste discharge requirements, shall create a vested right to continue such discharge. All discharges of waste into waters of the State are privileges, not rights. [CWC Section 13263(g)]

b. DURATION OF ORDER AND NPDES PERMIT

(1) *Effective date*. This Order and NPDES permit becomes effective on the 50th day after its adoption provided the USEPA has no objection. If the USEPA objects to its issuance, this Order shall not become effective until such objection is withdrawn. This Order supersedes Order No. R9-2007-0001 upon the effective date of this Order, and supersedes Order Nos. R9-2009-0002 and R9-2010-0016 upon their expiration or earlier notice of coverage.

(2) *Expiration*. This Order and NPDES permit expires five years after its effective date. [40 CFR 122.46(a)]

(3) *Continuation of expired order*. After this Order and NPDES permit expires, the terms and conditions of this Order and NPDES permit are automatically continued pending issuance of a new permit if all requirements of the federal NPDES regulations on the continuation of expired permits (40 CFR 122.6) are complied with.

c. AVAILABILITY

A copy of this Order must be kept at a readily accessible location and must be available to on-site personnel at all times.

d. CONFIDENTIALITY OF INFORMATION

Except as provided for in 40 CFR 122.7, no information or documents submitted in accordance with or in application for this Order will be considered confidential, and all such information and documents shall be available for review by the public at the San Diego Water Board office.

Claims of confidentiality for the following information will be denied:
[40 CFR 122.7(b)]

(1) The name and address of any permit applicant or Copermittee;
[40 CFR 122.7(b)(1)] and

(2) Permit applications and attachments, permits, and effluent data.
[40 CFR 122.7(b)(2)]

e. EFFLUENT LIMITATIONS

(1) *Interim effluent limitations*. The Copermittee must comply with any interim effluent limitations as established by addendum, enforcement action, or revised waste discharge requirements which have been, or may be, adopted by the San Diego Water Board.

(2) *Other effluent limitations and standards*. If any applicable toxic effluent standard or effective prohibition (including any schedule of compliance specified in such effluent standard or effective prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant and that standard or effective prohibition is more stringent than any limitation on the pollutant in the permit, the San Diego Water Board shall institute proceedings under these regulations to modify or revoke and reissue the permit to conform to the toxic effluent standard or effective prohibition. [40 CFR 122.44(b)(1~~)]}]}].}~~

f. DUTY TO MINIMIZE OR CORRECT ADVERSE IMPACTS

The Copermittee must take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this Order, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the noncompliance.

g. PERMIT ACTIONS

The filing of a request by the Copermittee for modification, revocation and reissuance, or termination of this Order, or a notification of planned change in or anticipated

noncompliance with this Order does not stay any condition of this Order. (See 40 CFR 122.41(f)) In addition, the following provisions apply to this Order:

(1) Upon application by any affected person, or on its own motion, the San Diego Water Board may review and revise the requirements in this Order. All requirements must be reviewed periodically. [CWC Section 13263(e)]

(2) This Order may be terminated or modified for cause, including, but not limited to, all of the following: [CWC Section 13381]

(a) Violation of any condition contained in the requirements of this Order. [CWC Section 13381(a)]

(b) Obtaining the requirements in this Order by misrepresentation, or failure to disclose fully all relevant facts. [CWC Section 13381(b)]

(c) A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge. [CWC Section 13381(c)]

(3) When this Order is transferred to a new owner or operator, such requirements as may be necessary under the CWC may be incorporated into this Order.

h. NPDES PERMITTED NON-STORM WATER DISCHARGES

The San Diego Water Board has, in prior years, issued a limited number of individual NPDES permits for non-storm water discharges to MS4s. The San Diego Water Board or State Water Board may in the future, upon prior notice to the Copermittee(s), issue an NPDES permit for any non-storm water discharge (or class of non-storm water discharges) to an MS4. A Copermittee will not be held responsible for pollutants in its MS4 discharge originating from an NPDES-permitted non-storm water discharge.

Comment [A127]: This comment reflects the appropriate responsibility between NPDES dischargers.

i. MONITORING

In addition to the standard provisions required under 40 CFR 122.41(j) and (l)(4), the following general monitoring provisions apply to this Order:

(1) Where procedures are not otherwise specified in Order, sampling, analysis and quality assurance/quality control must be conducted in accordance with the Quality Assurance Management Plan (QAMP) for the State of California's Surface Water Ambient Monitoring Program (SWAMP), adopted by the State Water Resources Control Board (State Water Board).

(2) Pursuant to 40 CFR 122.41(j)(2) and CWC Section 13383(a), each Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five (5) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time.

Comment [A128]: This provision and the provision in Attachment B 1.j(2) conflict. The Water Board should reconcile these provisions or delete one.

(3) All chemical, bacteriological, and toxicity analyses must be conducted at a laboratory certified for such analyses by the California Department of Public Health or a laboratory approved by the San Diego Water Board.

(4) For priority toxic pollutants that are identified in the California Toxics Rule (CTR) (65 Fed. Reg. 31682), the Copermittees must instruct their laboratories to establish calibration standards that are equivalent to or lower than the Minimum Levels (MLs) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP). If a Copermittee can demonstrate that a particular ML is not attainable, in accordance with procedures set forth in 40 CFR Part 136, the lowest quantifiable concentration of the lowest calibration standard analyzed by a specific analytical procedure (assuming that all the method specified sample weights, volumes, and processing steps have been followed) may be used instead of the ML listed in Appendix 4 of the SIP. The Copermittee must submit documentation from the laboratory to the San Diego Water Board for approval prior to raising the ML for any priority toxic pollutant.

j. ENFORCEMENT

(1) The San Diego Water Board is authorized to enforce the terms of this Order under several provisions of the CWC, including, but not limited to, CWC Sections 13385, 13386, and 13387.

(2) Nothing in this Order shall be construed to protect the Copermittee from its liabilities under federal, state, or local laws.

(3) The CWC provides for civil and criminal penalties comparable to, and in some cases greater than, those provided for under the CWA.

(4) Except as provided in the standard conditions required under 40 CFR 122.41(m) and (n), nothing in this Order shall be construed to relieve the Copermittee from civil or criminal penalties for noncompliance.

(5) Nothing in this Order shall be construed to preclude the institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties to which the Copermittee is or may be subject to under Section 311 of the CWA.

(6) Nothing in this Order shall be construed to preclude institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authoring preserved by Section 510 of the CWA.

k. SEVERABILITY

The provisions of this Order are severable, and if any provision of this Order, or the application of any provisions of this Order to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this Order shall not be affected thereby.

l. APPLICATIONS

Any application submitted by a Copermittee for reissuance or modification of this Order must satisfy all applicable requirements specified in federal regulations as well as any additional requirements for submittal of a Report of Waste Discharge specified in the CWC and the California Code of Regulations.

m. IMPLEMENTATION

All plans, reports and subsequent amendments submitted in compliance with this Order must be implemented immediately (or as otherwise specified). All submittals by Copermittees must be adequate to implement the requirements of this Order.

n. REPORT SUBMITTALS

(1) All report submittals must include an executive summary, introduction, conclusion, recommendations, and signed certified statement.

(2) Each Copermittee must submit a signed certified statement covering its responsibilities for each applicable submittal.

(3) The Principal Watershed Copermittee(s) must submit a signed certified statement covering its responsibilities for each applicable submittal and the sections of the submittals for which it is responsible.

(4) Unless otherwise directed, the Copermittees must submit one hard copy and one electronic copy of each report required under this Order to the San Diego Water Board, and one electronic copy to the USEPA.

(5) The Copermittees must submit reports and provide notifications as required by this Order to the following:

EXECUTIVE OFFICER
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
9174 SKY PARK COURT, SUITE 100
SAN DIEGO CA 92123-4340
Telephone: (858) 467-2952 Fax: (858) 571-6972

EUGENE BROMLEY
US ENVIRONMENTAL PROTECTION AGENCY
REGION IX
PERMITS ISSUANCE SECTION (W-5-1)
75 HAWTHORNE STREET
SAN FRANCISCO CA 94105

ATTACHMENT C

ACRONYMS AND ABBREVIATIONS

AMAL	Average Monthly Action Level
ASBS	Area(s) of Special Biological Significance
BMP	Best Management Practice
Basin Plan	Water Quality Control Plan for the San Diego Basin
CEQA	California Environmental Quality Act
CCR	California Code of Regulations
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWC	California Water Code
CZARA	Coastal Zone Act Reauthorization Amendments of 1990
ESAs	Environmentally Sensitive Areas
GIS	Geographic Information System
IBI	Index of Biological Integrity
LID	Low Impact Development
MDAL	Maximum Daily Action Level
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
NAL	Non-Storm Water Action Level
NAICS	North American Industry Classification System
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
ROWD	Report of Waste Discharge (application for NPDES reissuance)
SAL	Storm Water Action Level
San Diego Water Board	California Regional Water Quality Control Board, San Diego Region
SIC	Standard Industrial Classification Code
State Water Board	State Water Resources Control Board
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
WDID	Waste Discharge Identification Number
WLA	Waste Load Allocation
WQBEL	Water Quality Based Effluent Limitation

DEFINITIONS

Active/Passive Sediment Treatment - Using mechanical, electrical or chemical means to flocculate or coagulate suspended sediment for removal from runoff from construction sites prior to discharge.

Anthropogenic Litter – Trash generated from human activities, not including sediment.

Automotive Repair Shop – a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539 or equivalent NAICS code.

Average Monthly Action Level – The highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month, or the geometric mean for bacteria, as applicable.

Beneficial Uses - The uses of water necessary for the survival or wellbeing of man, plants, and wildlife. These uses of water serve to promote tangible and intangible economic, social, and environmental goals. "Beneficial Uses" ~~of the waters of the State~~ that may be protected include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. Existing beneficial uses are uses that were attained in the surface or ground water on or after November 28, 1975; and potential beneficial uses are uses that would probably develop in future years through the implementation of various control measures. "Beneficial Uses" are equivalent to "Designated Uses" under federal law. [California Water Code Section 13050(f)].

Best Management Practices (BMPs) - Defined in 40 CFR 122.2 as schedules of activities, effective prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. In the case of municipal discharge permits, BMPs may be used in the place of numeric effluent limits.

Bioassessment - The use of biological community information to evaluate the biological integrity of a water body and its watershed. With respect to aquatic ecosystems, bioassessment is the collection and analysis of samples of the benthic macroinvertebrate community together with physical/habitat quality measurements associated with the sampling site and the watershed to evaluate the biological condition (i.e. biotic integrity) of a water body.

Biofiltration - Practices that use vegetation and amended soils to detain and treat runoff from impervious areas. Treatment is through filtration, infiltration, adsorption, ion exchange, and biological uptake of pollutants.

Biological Integrity - Defined in Karr J.R. and D.R. Dudley. 1981. Ecological perspective on water quality goals. *Environmental Management* 5:55-68 as: "A balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitat of the region." Also referred to as ecosystem health.

BMP Design Manual – A plan developed to eliminate, reduce, or mitigate the impacts of runoff from development projects, including Priority Development Projects.

Channel Rehabilitation and Improvement – Remedial measures or activities for the purpose of improving or restoring the environmental health of streams, channels or river systems. Techniques may vary from in-stream restoration techniques to off-line stormwater management practices installed in the system corridor or upland areas. Rehabilitation techniques may include, but are not limited to the following: riparian zone restoration, constructed wetlands, bank stabilization, channel modifications, and day lighting of drainage systems.

Comment [A129]: This term should be defined in Attachment C given its use in the Order.

Clean Water Act Section 303(d) Water Body - An impaired water body in which water quality does not meet applicable water quality standards and/or is not expected to meet water quality standards, even after the application of technology based pollution controls required by the CWA. The discharge of runoff to these water bodies by the Copermittees is significant because these discharges can cause or contribute to violations of applicable water quality standards.

Construction Site – Any project, including projects requiring coverage under the Construction General Permit, that involves soil disturbing activities greater than 10,000 square feet including, but not limited to, clearing, grading, disturbances to ground such as stockpiling, and excavation. This does not include interior construction activities such as interior remodeling, plumbing, electrical, or mechanical work.

Contamination - As defined in the Porter-Cologne Water Quality Control Act, contamination is "an impairment of the quality of waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste whether or not waters of the State are affected."

Copermittee – An incorporated city within the County of Orange, County of Riverside, or County of San Diego in the San Diego Region~~,~~ (Region 9),~~,~~ the County of Orange, the County of Riverside, the County of San Diego, the Orange County Flood Control District, the Riverside County Water Conservation and Flood Control District, the San Diego Regional Airport Authority, or the San Diego Unified Port District. See also "Municipal Copermittee" and "Special District Copermittee".

Comment [A130]: As set forth above, the Riverside County Copermittees make a distinction in these classes of Copermittees based on their respective legal authorities.

Copermittees – All of the individual Copermittees, collectively, unless the obligation in question is directed to one or a sub-group of Copermittees.

Comment [A131]: This clarifies that not all obligations in the Order directed to "Copermittees" are in fact applicable to all Copermittees.

Critical Channel Flow (Qc) – The channel flow that produces the critical shear stress that initiates bed movement or that erodes the toe of channel banks. When measuring Qc, it should be based on the weakest boundary material – either bed or bank.

Daily Discharge – Defined as either: (1) the total mass of the constituent discharged over the calendar day or any 24 hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g. concentration.)

The Daily Discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day, or other 24 hour period other than a day), or by the arithmetic mean of analytical results from one or more grab samples taken over the course of a

day.

Development Projects - Construction, rehabilitation, redevelopment, or reconstruction of any public or private residential project, industrial~~,~~ or commercial facility, or any other projects designed for post-construction human activity or occupation and involving land disturbance activities.

Comment [A132]: This definition clarifies the nature of Development Projects covered under the Order.

Direct Discharge to an Environmentally Sensitive Area – refers to outflow from a drainage conveyance system that collects runoff from the subject development or redevelopment site and terminates at or in receiving waters within the ESA, and is not commingled with flows from adjacent or other upstream lands.

Dry Season –May 1 to September 30.

Dry Weather – Weather is considered dry if the preceding 72 hours has been without measurable precipitation (>0.1 inch).

Enclosed Bays – Enclosed bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost bay works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays do not include inland surface waters or ocean waters.

Erosion – When land is diminished or worn away due to wind, water, or glacial ice. Often the eroded debris (silt or sediment) becomes a pollutant via storm water runoff. Erosion occurs naturally but can be intensified by land clearing activities such as farming, development, road building, and timber harvesting. This permit is concerned particularly with non-naturally occurring Erosion that eventually results in a Sediment discharge from MS4s into Receiving Waters.

Environmentally Sensitive Areas (ESAs) - Areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; areas designated as preserves or their equivalent under the Natural Communities Conservation Program within the Cities and County of Orange; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.

Estuaries – Waters, including coastal lagoons, located at the mouth of streams that serve as areas of mixing fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and ocean water. Estuaries do not include inland surface waters or ocean waters.

Existing Development – Any area that has been developed and exists for municipal, commercial, industrial, or residential purposes, uses, or activities. May include areas that are not actively used for its originally developed purpose, but may be re-purposed or redeveloped

for another use or activity.

Flow Duration – The long-term period of time that flows occur above a threshold that causes significant sediment transport and may cause excessive erosion damage to creeks and streams (not a single storm event duration). The simplest way to visualize this is to consider a histogram of pre- and post-project flows using long-term records of hourly data. To maintain pre-development flow duration means that the total number of hours (counts) within each range of flows in a flow-duration histogram cannot increase between the pre- and post-development condition. Flow duration within the range of geomorphologically significant flows is important for managing erosion.

Grading - The cutting and/or filling of the land surface to a desired slope or elevation.

Hazardous Material – Any substance that poses a threat to human health or the environment due to its toxicity, corrosiveness, ignitability, explosive nature or chemical reactivity. These also include materials named by the USEPA in 40 CFR 116 to be reported if a designated quantity of the material is spilled into the waters of the U.S. or emitted into the environment.

Hazardous Waste - Hazardous waste is defined as "any waste which, under Section 600 of Title 22 of this code, is required to be managed according to Chapter 30 of Division 4.5 of Title 22 of this code" [CCR Title 22, Division 4.5, Chapter 11, Article 1].

Household Hazardous Waste – Paints, cleaning products, and other hazardous wastes generated during home improvement or maintenance activities.

Hydromodification – The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

Illicit Connection – Any connection to the MS4 that conveys an illicit discharge.

Illicit Discharge - Any discharge to the MS4 that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from fire fighting activities [40 CFR 122.26(b)(2)]. Discharges from natural sources or from conditionally exempt sources described in this Order are not considered Illicit Discharges.

Inactive Areas – Areas of construction activity that are not active and those that have been active and are not scheduled to be re-disturbed for at least 14 days.

Infiltration – Water other than wastewater that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow [40 CFR 35.2005(20)].

Comment [A133]: Wrong definition. Should be defining infiltration (of stormwater into soil)

Inland Surface Waters – Includes all surface waters of the U.S.~~State~~ that do not include the ocean, enclosed bays, or estuaries.

Jurisdictional Runoff Management Program Document – A written description of the specific jurisdictional runoff management measures and programs that each Copermittee will implement to comply with this Order and ensure that illicit discharges are effectively prohibited, and storm water pollutant discharges in runoff are reduced to the MEP and do not cause or contribute to a violation of water quality standards.

Low Impact Development (LID) – A storm water management and land development strategy that emphasizes conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions.

Low Impact Development Best Management Practices (LID BMPs) – LID BMPs include schedules of activities, effective prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States through storm water management and land development strategies that emphasize conservation ~~s~~and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions. LID BMPs include retention practices that do not allow runoff, such as infiltration, rain water harvesting and reuse, and evapotranspiration. LID BMPs also include flow-through practices such as biofiltration that may have some discharge of storm water following pollutant reduction.

Major Outfall – As defined in the Code of Federal Regulations, a major outfall is a MS4 outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (i.e. discharge from a single conveyance other than a circular pipe which is associated with a drainage area of more than 50 acres); or, for MS4s that receive storm water from lands zoned for industrial activity (based on comprehensive zoning plans or equivalent), a MS4 outfall that discharges from a single pipe with an inside diameter of 12 inches or more or from its equivalent (i.e. discharge from other than a circular pipe associated with a drainage area of 2 acres or more).

Maximum Daily Action Level (MDAL) –The highest allowable daily discharge of a pollutant, over a calendar day (or 24 hour period). For pollutants with action levels expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with action levels expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

Maximum Extent Practicable (MEP) – The technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) ~~for storm water~~ that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) in combination with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than BAT. A definition for MEP is not provided either in the statute or in the regulations. Instead the definition of MEP is dynamic and will be defined by the following process over time: municipalities propose their definition of MEP by way of their runoff management programs. Their total collective and individual activities conducted pursuant to the runoff management programs becomes their proposal for MEP as it applies both to their overall effort, as well as to specific activities (e.g., MEP for street sweeping, or MEP for MS4 maintenance). In the absence of a proposal acceptable to the San Diego Water Board, the San Diego Water Board

defines MEP.

In a memo dated February 11, 1993, entitled "Definition of Maximum Extent Practicable," Elizabeth Jennings, Senior Staff Counsel, SWRCB addressed the achievement of the MEP standard as follows:

> "*To achieve the MEP standard, municipalities must employ whatever Best Management Practices (BMPs) are technically feasible (i.e., are likely to be effective) and are not cost prohibitive. The major emphasis is on technical feasibility. Reducing pollutants to the MEP means choosing effective BMPs, and rejecting applicable BMPs only where other effective BMPs will serve the same purpose, or the BMPs would not be technically feasible, or the cost would be prohibitive. In selecting BMPs to achieve the MEP standard, the following factors may be useful to consider:*
>
> *a. Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?*
> *b. Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?*
> *c. Public Acceptance: Does the BMP have public support?*
> *d. Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?*
> *e. Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc.?*
>
> *The final determination regarding whether a municipality has reduced pollutants to the maximum extent practicable can only be made by the Regional or State Water Boards, and not by the municipal discharger. If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit derived, it would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs that would address a pollutant source, or to pick a BMP based solely on cost, which would be clearly less effective. In selecting BMPs the municipality must make a serious attempt to comply and practical solutions may not be lightly rejected. In any case, the burden would be on the municipal discharger to show compliance with its permit. After selecting a menu of BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented."*

Monitoring Year – October 1 to September 30

Municipal Copermittee – Any Copermittee, exclusive of Special District Copermittees.

Comment [A134]: This definition clarifies distinction between municipal and special district copermittees.

Municipal Separate Storm Sewer System (MS4) – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designated or used for collecting or conveying storm water;

(iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.2~~26~~. Copermittees need only comply with permit conditions relating to "discharges from the municipal separate storm sewers for which they are operators." 40 CFR 122.26(a)(vi).

Comment [A135]: These changes correct a citation and clarifies the responsibility of the copermittees as to other MS4s.

National Pollutant Discharge Elimination System (NPDES) - The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the CWA.

Non-Storm Water - All discharges to and from a MS4 that do not originate from precipitation events (i.e., all discharges from a MS4 other than storm water). ~~Non-storm water includes illicit discharges and NPDES permitted discharges.~~

Comment [A136]: This is overly limiting, There are other types of Non-storm discharges that do not fit these two categories (e.g. irrigated agriculture, natural flows, conditionally exempt flows, others). Rather than trying to identify all types of non-stormwater discharges, suggest just deleting this sentence.

Nuisance - As defined in the Porter-Cologne Water Quality Control Act, a nuisance is "anything which meets all of the following requirements: 1) Is injurious to health, or is indecent, or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. 2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. 3) Occurs during, or as a result of, the treatment or disposal of wastes."

Ocean Waters – the territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the State Board's California Ocean Plan.

Order – Unless otherwise specified, refers to this Order, Order No. R9-2013-0001 (NPDES No. CAS0109266)

Outfall – *Outfall* means a *point source* as defined by 40 CFR 122.2 at the point where a MS4 discharges to waters of the United States and does not include open conveyances connecting two MS4s, or pipes, tunnels or other conveyances which connect segments of the same stream or other waters of the United States and are used to convey waters of the United. 40 CFR 122.26(b)(9).

Comment [A137]: This federal regulatory definition clarifies the nature of an outfall.

Parking Lot – a land area or facility for the tempraory parking or storage of motor vehicles used personally, for business, or for commerce.

Comment [A138]: Definition placed in Attachment C for consistency.

Persistent Flow - Persistent flow is defined as the presence of an MS4 discharge that is hydraulically connected to a flowing~~, pooled, or ponded~~ receiving water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

Comment [A139]: Changes reflect the necessity of a connection to flowing receiving waters. Discharges that are pooled are not discharges to waters of the United States. Please see Comment Letter section 3.5.3.

Person - A person is defined as an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof [40 CFR 122.2].

Point Source - Any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, landfill leachate collection systems, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return

flows from irrigated agriculture or agricultural storm water runoff.

Pollutant - Any agent that may cause or contribute to the degradation of water quality such that a condition of pollution or contamination is created or aggravated.

Pollution - As defined in the Porter-Cologne Water Quality Control Act, pollution is "the alteration of the quality of the waters of the State by waste, to a degree that unreasonably affects the either of the following: 1) The waters for beneficial uses; or 2) Facilities that serve these beneficial uses." Pollution may include contamination.

Pollution Prevention - Pollution prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control BMPs, treatment control BMPs, or disposal.

Pre-Project~~Development~~ Runoff Conditions – Runoff conditions that exist~~existed~~ onsite immediately before the ~~existing development was constructed, or exists onsite before~~ planned development activities occur. Pre-development is not intended to be interpreted as that period before any human-induced land disturbance has occurred. 64 FR 68761.

Comment [A140]: This definition reflects the exact language used by U.S. EPA in the Federal Register. Moreover, it avoids the constitutional and statutory problems with requiring developers to mitigate for impacts not attributable to their project. It also is consistent with the CEQA standard for project impact mitigation.

Priority Development Projects - New development and redevelopment projects defined under Provision E.3.b of Order No. R9-2012-0011.

Properly Designed – Designed in accordance with the Copermittee's BMP Design Manual and/or any appropriate design requirements set forth by the Copermittee and based on widely accepted design criteria and in accordance with this Order.

Comment [A141]: This definition is required to address this standard, which is mentioned in the Order but not defined.

Rainy Season (aka Wet Season) –October 1 to April 30

Receiving Waters – Waters of the United States.

Receiving Water Limitations - Waste discharge requirements issued by the San Diego Water Board typically include both: (1) "Effluent Limitations" (or "Discharge Limitations") that specify the technology-based or water-quality-based effluent limitations; and (2) "Receiving Water Limitations" that specify the water quality objectives in the Basin Plan as well as any other limitations necessary to attain those objectives. In summary, the "Receiving Water Limitations" provision is the provision used to implement the requirements of CWA section 402(p)(3)(B).

Redevelopment - The creation, addition, and or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include trenching and resurfacing associated with utility work; parking lots; resurfacing existing roadways; cutting and reconfiguring of surface parking lots; new sidewalk construction, pedestrian ramps, or bike lane on existing roads; and routine replacement of damaged pavement, such as pothole repair and emergency restoration and public safety projects.

Comment [A142]: The changes requested in this definition appropriately exempts de minimis or emergency/public safety projects.

Reporting Period – The period of information that is reported in the Annual Report. The reporting period consists of two components: 1) July 1 to June 30, consistent with the fiscal

year, for the implementation of the jurisdictional runoff management programs, and 2) October 1 to September 30, consistent with the monitoring year for the monitoring and assessment programs. Together, these two time periods constitute the reporting year for the Annual Report due January 31 following the end of the monitoring year.

Restaurant – a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812).

Comment [A143]: Relocation of definition to Attachment C.

Retail gasoline outlet (RGO) – a business that sells automotive or truck fuel to the general public with a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

Comment [A144]: Definition added for clarity and consistency with prior redlines

Retain –Keep or hold in a particular place, condition, or position without discharge to ~~surface~~ Receiving W~~w~~aters.

Retrofitting – Storm water management practices put into place after development has occurred in watersheds where the practices previously did not exist~~.~~ or are ineffective.~~.~~ Retrofitting of developed areas is intended to improve water quality, protect downstream channels, reduce flooding, or meet other specific objectives. Retrofitting developed areas may include, but is not limited to replacing roofs with green roofs, disconnecting downspouts or impervious surfaces to drain to pervious surfaces, replacing impervious surfaces with pervious surfaces, installing rain barrels, installing rain gardens, and trash area enclosures.

Comment [A145]: Edit clarifies intent of definition.

Runoff - All flows in a storm water conveyance system that consists of the following components: (1) storm water (wet weather flows) and (2) non-storm water including dry weather flows.

San Diego Water Board – As used in this document the term "San Diego Water Board" is synonymous with the term "Regional Board" as defined in Water Code section 13050(b) and is intended to refer to the California Regional Water Quality Control Board for the San Diego Region as specified in Water Code Section 13200.

Sediment - Soil, sand, and minerals washed from land into water. Sediment resulting from anthropogenic sources (i.e. human induced land disturbance activities) that is discharged into Receiving Waters is considered a pollutant. This Order regulates only the discharges of sediment from anthropogenic sources into Receiving Waters and does not regulate naturally occurring sources of sediment. Sediment can destroy fish-nesting areas, clog animal habitats, and cloud waters so that sunlight does not reach aquatic plants.

Special District Copermittee – A separate legal entity that may own or operate MS4 systems, but has no land use authorities outside of their MS4. The Riverside County Flood Control and Water Conservation District [and Orange County Flood Control District?] is a [are] Special District Copermittee[s].

Source Control BMP – Land use or site planning practices, or structural or nonstructural measures that aim to prevent runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between pollutants and runoff.

Storm Water – Per 40 CFR 122.26(b)(13), means storm water runoff, snowmelt runoff and surface runoff and drainage. ~~Surface runoff and drainage pertains to runoff and drainage resulting from precipitation events.~~

Stream, Channel, or Habitat Rehabilitation – Measures or activities for the purpose of improving or restoring the environmental health (i.e. physical, chemical and biological integrity) of streams, channels, or river systems. Rehabilitation techniques may include, but are not limited to, riparian zone restoration, constructed wetlands, bank stabilization, channel reconfiguration, and daylighting drainage systems.

Street, Road, Highway, Freeway– Any paved impervious surface that is used for the transportation of automobiles, trucks, motorcycles, and other vehicles, with an ADT of at least 100 vehicles per day.

Comment [A146]: Definition relocated to Attachment C.

Comment [A147]: Consistent with RGO definition.

Structural BMPs - A subset of BMPs which detains, retains, filters, removes, or prevents the release of pollutants to surface waters from development projects in perpetuity, after construction of a project is completed.

Total Maximum Daily Load (TMDL) - The maximum amount of a pollutant that can be discharged into a water body from all sources (point and non-point) and still maintain water quality standards. Under CWA section 303(d), TMDLs must be developed for all water bodies that do not meet water quality standards after application of technology-based controls.

Toxicity - Adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies). The water quality objectives for toxicity provided in the Basin Plan, state in part…"All waters shall be free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life….The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge".

Treatment Control BMP – Any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media absorption or any other physical, biological, or chemical process.

Unpaved Road – Any long, narrow stretch without pavement used for traveling by motor passenger vehicles between two or more points. Unpaved roads are generally constructed of dirt, gravel, aggregate or macadam and may be improved or unimproved.

Waste - As defined in CWC Section 13050(d), "waste includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal."

Article 2 of CCR Title 23, Chapter 15 (Chapter 15) contains a waste classification system that applies to solid and semi-solid waste, which cannot be discharged directly or indirectly to water of the state and which therefore must be discharged to land for treatment, storage, or disposal in accordance with Chapter 15. There are four classifications of waste (listed in order of highest to lowest threat to water quality): hazardous waste, designated waste, non-hazardous solid waste, and inert waste.

Water Quality Objective - Numerical or narrative limits on constituents or characteristics of

water designated to protect designated beneficial uses of the water. [California Water Code Section 13050 (h)]. California's water quality objectives are established by the State and Regional Water Boards in the Water Quality Control Plans. Numeric or narrative limits for pollutants or characteristics of water designed to protect the beneficial uses of the water. In other words, a water quality objective is the maximum concentration of a pollutant that can exist in a receiving water and still generally ensure that the beneficial uses of the receiving water remain protected (i.e., not impaired). Since water quality objectives are designed specifically to protect the beneficial uses, when the objectives are violated the beneficial uses are, by definition, no longer protected and become impaired. This is a fundamental concept under the Porter Cologne Act. Equally fundamental is Porter Cologne's definition of pollution. A condition of pollution exists when the water quality needed to support designated beneficial uses has become unreasonably affected or impaired; in other words, when the water quality objectives have been violated. These underlying definitions (regarding beneficial use protection) are the reason why all waste discharge requirements implementing the federal NPDES regulations require compliance with water quality objectives. (Water quality objectives are also called water quality criteria in the CWA.)

Water Quality Standards - Water quality standards, as defined in Clean Water Act section 303(c) consist of the beneficial uses (e.g., swimming, fishing, municipal drinking water supply, etc.,) of a water body and criteria (referred to as water quality objectives in the California Water Code) necessary to protect those uses. Under the Water Code, the water boards establish beneficial uses and water quality objectives in water quality control or basin plans. Together with an anti-degradation policy, these beneficial uses and water quality objectives serve as water quality standards under the Clean Water Act. In Clean Water Act parlance, state beneficial uses are called "designated uses" and state water quality objectives are called "criteria." Throughout this Order, the relevant term is used depending on the statutory scheme.

Waters of the State - Any water, surface or underground, including saline waters within the boundaries of the State [CWC section 13050 (e)]. The definition of the Waters of the State is broader than that for the Waters of the United States in that all water in the State is considered to be a Waters of the State. ~~regardless of circumstances or condition.~~

Comment [A148]: The intent of the definition is to cover natural water sources, and not anthropogenic structures that collect runoff to reduce volume/velocity or pollutants.

Waters of the United States - As defined in the 40 CFR 122.2, the Waters of the U.S. are defined as: "(a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate "wetlands;" (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters otherwise defined as waters of the United States under this definition: (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial seas; and (g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA."

Watershed - That geographical area which drains to a specified point on a water course, usually a confluence of streams or rivers (also known as drainage area, catchment, or river basin).

Wet Season (aka Rainy Season) –October 1 to April 30

Wet Weather – Weather is considered wet if there is a storm event of 0.1 inches and greater and the following 72 hours, unless otherwise defined by the Copermittee for the purposes of monitoring consistent with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), or developed pursuant to another regulatory mechanism.

Comment [A149]: This is important as the monitoring requirements require you to sample the first 'Wet Weather' event. 0.1" of rainfall doesn't result in runoff in all watersheds. Copermittees should be able to define mobilization criteria to identify storms that are likely to produce runoff in that drainage area consistent with this EPA guidance.

LEGAL AND FACT SHEET COMMENTS ON TENTATIVE ORDER R9-2013-0001 MADE ON BEHALF OF THE RIVERSIDE COUNTY COPERMITTEES

This document provides comments on various legal issues raised by Tentative Order No. R9-2013-0001 (the "Draft Permit") and associated attachments, including Attachment F, the Fact Sheet/Technical Report ("Fact Sheet"), and are made on behalf of the Riverside County Flood Control & Water Conservation District ("District"), the County of Riverside and the Cities of Murrieta, Temecula and Wildomar (collectively, the "Riverside County Copermittees").

These legal comments are in addition to the other comments on the Draft Permit and attachments made by the Riverside County Copermittees (including the Comment Letter dated January 10, 2013 and signed by Jason E. Uhley, Chief of the District's Watershed Protection Division) and the redline attachment ("Redline"), as well as any comments or testimony which may be offered at the public hearing(s) on the Draft Permit. The Comment Letter and Redline also discuss legal issues. The Riverside County Copermittees appreciate this opportunity to comment and welcome any questions that Water Board staff may have.

These comments are submitted subject to the same reservations set forth in the Comment Letter regarding the Water Board's lack of authority, in the absence of agreement by the Riverside County Copermittees or the filing of a Report of Waste Discharge ("ROWD"), to issue a regional municipal separate storm sewer system ("MS4") permit to the Riverside County Copermittees. Submission of these comments does not waive this objection.

Request for Additional Public Comment

Before turning to comments on the Draft Permit, the Riverside County Copermittees wish to note that in view of the extensive comments made by them, as well as what we anticipate will be extensive comments by the South Orange County and San Diego County Copermittees, as well as from other stakeholders, it would greatly facilitate the permit adoption process if the Water Board were to release a revised Tentative Order for further review and comment prior to final adoption of the Permit. This will enable the Water Board staff to address the comments in a more orderly fashion and provide all parties with the opportunity to see how staff proposes to incorporate the comments in the Draft Permit.

Comments on Findings

Finding 2 and Fact Sheet Section VII.B: This finding recites that the Water Board "has the legal authority to issue a regional MS4 permit pursuant to its authority under Clean Water Act ("CWA") section 402(p)(3)(B) and 40 CFR 122.26(a)(i)(v)." Section VII.B of the Fact Sheet provides a more detailed rationale for this finding (at pages F-22-23).

The Riverside County Copermittees respectfully disagree with this finding and the analysis provided in the Fact Sheet. We do not believe that a regional MS4 permit is authorized under the CWA or the implementing regulations, absent agreement by the copermittees to be bound by such a MS4 permit (as is the case with the Bay Area MS4 permit covering discharges into the Bay).

The CWA itself does not explicitly authorize MS4 permits that, like the Draft Permit, cross county lines. CWA section 402(p)(3)(B) provides only that "[p]ermits for discharges from municipal storm sewers . . . may be issued on a system- or jurisdiction-wide basis." This language, contrary to the conclusion in Finding 2, indicates that a multi-county permit, covering several distinct non-interconnected municipal stormwater "systems" in multiple watersheds with multiple receiving waters, is not one issued on a "system-wide" basis and that an MS4 permit covering multiple jurisdictions in three different counties is not one issued on a "jurisdiction-wide basis." Because neither "system-wide" nor "jurisdiction-wide" are defined in the CWA, however, the CWA regulations must also be reviewed.

The regulatory provision cited in Finding 2, 40 CFR § 122.26(a)(1)(v), does not add clarity, since it merely repeats the "system-wide" and "jurisdiction-wide" language of the Act and the regulations define neither term. The regulations do, however, suggest that "system-wide" is not intended to cover multiple large MS4s in different jurisdictions. The regulations, at 40 CFR § 122.26(a)(1)(v) state that in making the determination to designate a system-wide or jurisdiction-wide basis" the permitting authority should consider the location of the "discharge" with respect to waters of the United States, the size of the discharge, the quantity and nature of the pollutants discharge and other relevant factors.

The Draft Permit covers multiple "discharges" into receiving waters located in three separate counties and the size, quality and nature of the discharges vary widely, due to varying hydrologic and climatic conditions in the three areas.

The Fact Sheet cites 40 CFR § 122.26(a)(3)(iv), which provides, in relevant part, that the Water Board "may issue one systemwide permit covering all, or a portion of all municipal separate storm systems in adjacent or interconnected large or medium municipal separate storm sewer systems." This provision does not, however, authorize issuance of a regional MS4 permit covering multiple counties and multiple watersheds that are not interconnected and which do not share a common receiving water. In fact, the only common fact uniting the various MS4s in the three counties under the Water Board's jurisdiction is that common jurisdiction.

First, even if the subject MS4 facilities otherwise met the criteria specified in the federal regulations (which, as noted below, they do not), the prospective permittees must apply for such a MS4 permit, as set forth in the first sentence of 40 CFR § 122.26(a)(3)(iv): "*One permit application may be submitted for all or a portion of all* municipal separate storm sewers within adjacent or interconnected large or medium municipal separate storm sewer systems." (emphasis supplied). No such application has been filed with respect to the Draft Permit. Only the San Diego County copermittees submitted a ROWD for MS4 facilities within that county.[1]

[1] Moreover, the fact that permittees have the ability to determine the geographic scope of the permit is reinforced by the language in 40 CFR § 122.26(a)(3)(iii)(B), which allows an individual municipality to submit "a distinct permit application which only covers discharges from the [MS4] for which the owner is responsible . . ." If a permittee can "opt out" of a multi-MS4 permit by submitting a individual permit application, a permitting authority such as a water board cannot impose a multi-MS4 permit on that permittee.

Second, this provision requires that the MS4s to be covered in the permit be "adjacent or interconnected." This is not true with respect to the MS4s proposed to be included within the Draft Permit. For example, the MS4 within the Santa Margarita Region of Riverside County is not "interconnected" with any other MS4s except those within that region. This is true also of the MS4s within South Orange County and San Diego County, which are not interconnected. Additionally, none of the MS4s in the three counties is "adjacent" to each other – each is separated by miles of non-urban area. In the SMR for example, the confluence of Temecula and Murrieta Creeks to form the Santa Margarita River is miles upstream of Rainbow Creek, the first discharge from San Diego County to the River. And, the confluence of Temecula and Murrieta Creeks is over 30 miles from the discharge of the Santa Margarita River to the Pacific Ocean.

The next inquiry is whether the three separate county MS4s could be considered, together, to form a single "large municipal separate storm sewer system." The federal MS4 regulations define this term as follows:

> *Large municipal separate storm sewer system* means all municipal separate storm sewers that are either:
>
> (i) Located in an incorporated place with a population of 250,000 or more . . . ."
>
> (ii) Located in the counties listed in Appendix H, except municipal separate storm sewers that are located in the incorporated places, townships or towns within such counties; or
>
> (iii) Owned or operated by a municipality other than those described [in paragraphs (i) and (ii)] . . . and that are designated by the Director as part of the large or medium municipal separate storm sewer system due to the interrelationship between the discharges of the designated storm sewer and the discharges from municipal separate storm sewers described [in paragraphs (i) and (ii)]. In making this determination the Director may consider the following factors:
>
> (A) Physical interconnections between the municipal separate storm sewers;
>
> (B) The location of discharges from the designated municipal separate storm sewer relative to discharges from municipal separate storm sewers described in [paragraph (i)];
>
> (C) The quantity and nature of pollutants discharged to waters of the United States;
>
> (D) The nature of the receiving waters; and
>
> (E) Other relevant factors, or
>
> (iv) The Director may, upon petition, designate as a large municipal separate storm sewer system, municipal separate storm sewers located within the boundaries of a region

> defined by a storm water management regional authority based on a jurisdictional, watershed, or other appropriate basis that includes one or more of the systems described [in paragraphs (i), (ii) or (iii)].

40 CFR § 122.26(b)(4).

None of paragraphs (i), (ii) or (iii) authorizes a regional MS4 permit such as that envisioned in the Draft Permit. The Draft Permit applies beyond a single incorporated place, County or municipality. Of these paragraphs, only paragraph (iv) could arguably be used to define the MS4s in the three Counties as a single MS4 and thus authorize a regional permit. The key limiting language is, however, "within the boundaries of a region **defined by a storm water management regional authority,** based on a jurisdictional, watershed, or other appropriate basis . . . ." A regional water board is not a stormwater management regional authority. This is clear from the MS4 regulations, which provide that a "**regional authority may be responsible for submitting a permit application"** under certain conditions. 40 CFR § 122.26(a)(3)(iii)(C). Clearly, a Water Board is not responsible for submitting MS4 permit applications.

U.S. EPA, in the Preamble to the final Phase I MS4 regulations (55 Fed Reg. 47990, November 16, 1990), further illuminated the meaning of the regulatory language. The Preamble indicates that commenters proposed eight different MS4 permitting options:

> Option 1 – systems owned or operated by incorporated places augmented by integrated discharges; Option 2 – systems owned or operated by incorporated places augmented with significant other municipal discharges; Option 3 – systems owned or operated by counties; Option 4 – systems owned and operated by States or State departments of transportation; Option 5 – systems within the boundaries of an incorporated place; Option 6 – systems within the boundaries of counties; Option 7 – systems in census designated urbanized areas; and Option 8 – systems defined by watershed boundaries.

55 Fed Reg. at 48039. None of these options encompasses the fact pattern presented by the Draft Permit, which covers multiple counties and multiple watersheds, are not interconnected, do not share common receiving waters and are located in separate census designated urbanized areas.

In explaining the derivation of 40 CFR 122.26(b)(4)(iv), U.S. EPA noted that it was "an outgrowth of comments on all options, especially Option 4 (State owned systems/State highways) and Option 8 (watersheds)." 55 Fed. Reg. at 48040. Thus, the Caltrans MS4 permit (which applies statewide) is authorized under paragraph (iv), since the "storm water management regional authority" defining the region to be covered is Caltrans itself. No such single authority exists for the three-county area proposed to be included in the Draft Permit, which also would encompass multiple watersheds.

Moreover, paragraph (iv) provides that the regional authority must "petition" the U.S. EPA Director to have a single MS4 designated within the boundaries of the region defined by the regional authority. Because California has been delegated NPDES permitting authority, a regional authority would presumably need to petition its Water Board to authorize such a regional permit. Since no such regional authority exists to establish the geographical basis for a

three-county MS4 permit, there is no such entity to "petition" the Water Board to establish a regional permit. This is clear from the Preamble to the Phase I regulations, which indicate that "regional storm water authorities" established by "some States or counties" may "petition the Director [or its state designee] to assume a regional role. 55 Fed. Reg. at 48042. It is clear from the Preamble that it is not the Water Board that has the authority to make such a petition, but rather the "storm water authorities" (i.e., municipalities, districts and Caltrans).

It should be noted that the Bay Area Regional MS4 Permit was a joint Bay Area Water Board and copermittee effort, coordinated by the Bay Area Stormwater Agencies Management Association ("BASMAA"). It is not the case that the Bay Area Water Board imposed this regional MS4 permit. The copermittees, coordinated by BASMAA, themselves determined to develop a regional MS4 permit. Further, all of the copermittees to the Bay Area Regional MS4 Permit discharge to a common receiving water, San Francisco Bay. Also, an Alaska MS4 permit cited in a letter from the Office of Chief Counsel to county counsel for Orange and Riverside Counties was issued to several municipalities and entities within a single "borough," which is equivalent in Alaska to a county.

Additionally, neither the Riverside County Copermittees nor those in South Orange County have filed ROWDs with the San Diego Water Board, which serve as the application for an NPDES MS4 permit in California. Water Code § 13260. The current Riverside County MS4 permit for the Santa Margarita Region provides that the ROWD is not required to be filed until May 2015, 180 days prior to the November 10, 2015 expiration date of that permit. Order R9-2010-0016, Part II.K.2.c.

> This ROWD must include:
>
> (1) Proposed changes to the Copermittees' runoff management programs; (2) Proposed changes to monitoring programs; (3) Justification for proposed changes; (4) Name and mailing addresses of the Copermittees; (5) Names and titles of primary contacts of the Copermittees; (6) Any other information necessary for the reissuance of this Order and (7) Any other information required by federal regulations for permit reapplications.

Id. It should be noted that several items of this ROWD are specifically intended to assist in the formulation of a new, SMR-specific MS4 permit, including proposed changes to the runoff management and monitoring programs, as well as justification for such changes, information necessary for "reissuance" of the SMR MS4 permit and information required by the federal regulations for MS4 permit reapplications.

As a simple jurisdictional matter, the Water Board cannot issue a regional MS4 permit to MS4 dischargers that have not applied for it. Moreover, as noted above, the SMR copermittees are entitled to apply for an MS4 permit applicable to their jurisdiction. Further, each individual copermittee has the right to apply for a MS4 permit covering only its discharges, as has the City of Long Beach in the Los Angeles Region.

Finding 3, Finding 15, in Fact Sheet Section VII.A and in Multiple Locations Throughout Draft Permit: In Finding 3, the Fact Sheet and in multiple locations throughout the Draft Permit (which are identified in the redline of the Draft Permit submitted with these comments by the Riverside County Copermittees ("Redline")), it is stated that the maximum extent practicable ("MEP") applies only to "storm water" discharges from the MS4. This is not correct.[2]

In fact, the Clean Water Act does not distinguish between non-stormwater and stormwater in terms of MS4 discharges which must be controlled to the MEP standard. *See* 33 U.S.C. § 1342(p)(3)(B)(iii)(the MS4 permit "shall require controls to reduce the discharge of pollutants to the maximum extent practicable . . . ." While the heading of 33 U.S.C. § 1342(p) refers to "Municipal and industrial stormwater discharges," this is not dispositive, as 33 U.S.C. § 1342(p)(3)(B)(ii), which requires the effective prohibition of "non-stormwater discharges" into the MS4. Thus, the language of this heading does not in fact support the argument that the MEP standard applies only to pollutants in stormwater discharges.

That both non-stormwater and stormwater must be controlled to the MEP standard was made clear by U.S. EPA itself in the preamble to the final Phase I stormwater regulations. In that preamble, U.S. EPA made it clear that "MEP control measures" would be implemented to address not only pollutants in "storm water" but also from "non-storm water discharges." As the preamble states:

> "Permittees are required to develop management programs for four types of pollutant sources which discharge to large and medium municipal storm sewer systems. Discharges from [such systems] are usually expected to be composed primarily of: (1) Runoff from commercial and residential areas; (2) storm water runoff from industrial areas; (3) runoff from construction sites; and (4) *non-storm water discharges*. Part 2 of the permit application has been designed to allow [permittees] the opportunity to propose *MEP control measures for each* of these components of the discharge."

55 Fed. Reg. at 48052 (emphasis supplied).

This language sets forth USEPA's understanding of the plain language of the CWA: "pollutants" must be controlled to the MEP from any MS4 "discharge," not merely pollutants in stormwater.

Finding 11: This finding, in relevant part, states that "[h]istoric and current development makes use of natural drainage patterns and features as conveyances for runoff. Rivers, streams and creeks in developed areas used in this manner are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and receiving water." This conclusion is legally incorrect.

First, under no circumstance can a natural stream constitute an MS4. The definition of "MS4" in the CWA regulations (a definition found in Attachment C of the Draft Permit) refers to a

[2] Finding 15 also states, erroneously, that the MEP standard "is explicitly for "Municipal . . . *Stormwater Discharges* (emphasis added)" from the MS4.

"conveyance or system of conveyances" "owned or operated" by a municipality. 40 CFR §122.26(b)(8). In California, natural rivers and streams are not "owned" nor "operated" by the municipality through which they flow. Moreover, a municipality obviously cannot "operate" a natural creek or stream. In further support of the point that a MS4 is an artificial, not natural, watercourse, the types of "conveyances" identified in the regulation ("roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains") all refer to anthropogenic structures, not natural streams. 40 CFR § 122.26(b)(8).

Second, a "receiving water" cannot also be an MS4, as is plain from the CWA regulations. An MS4 is itself defined as discharging to waters of the United States. 40 C.F.R. §122.26(b)(8). An MS4 cannot, in essence, discharge to itself. Moreover, an "outfall" from an MS4 (the point at which the discharge enters a receiving water) does not, pursuant to 40 C.F.R §122.26 (b)(9), include conveyances connecting "segments of the same stream or other waters of the United States and are used to convey waters of the United States."

Moreover, U.S. EPA, in the Preamble to the initial version of the MS4 regulations (53 Fed. Reg. 49416 (Dec. 7, 1988)) expressly determined that "streams, wetlands and other water bodies that are waters of the United States are not storm sewers for the purposes of this rule" and that "stream channelization, and stream bed stabilization, which occur in waters of the United States" were not subject to National Pollutant Discharge Elimination System ("NPDES") permits under Section 402 of the CWA. 53 Fed. Reg. at 49442.

Additionally, the United States Supreme Court recently reversed the Ninth Circuit Court of Appeals and ruled that flows from sections of the Los Angeles and San Gabriel Rivers that are comprised of concrete flood control channels are not a "discharge" under the CWA, confirming that such rivers, even if improved, are "receiving waters" along with any natural portions of those rivers. *Los Angeles County Flood Control Dist. v. Natural Resources Defense Council*, 568 U.S. __(January 8, 2013) (slip op.).

The above-cited statement in the finding is incorrect and should be stricken, as recommended in the Redline.

Finding 12: This finding states, in relevant part, that "[a]s operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not prohibit or otherwise control." This statement is legally incorrect, and ignores the salient point that the "discharger" of a pollutant is primarily responsible for controlling/permitting that discharge, under both the CWA and the Porter-Cologne Act. For example, under the Porter-Cologne Act, any persons discharging or proposing to discharge "waste" into waters of the state must file a report of waste discharge and obtain a waste discharge requirement. Water Code §§ 13260, 13263. The operator of the MS4 into which that water eventually flows is not "essentially accepting" responsibility for the discharge. The responsibility of the MS4 operator is established under the CWA, and that is to effectively prohibit non-stormwater discharges into [the MS4] and to control the discharge of pollutants from the MS4 to the MEP.

Moreover, the statement ignores the fact that in California, downstream property owners (including municipalities owning and operating MS4 facilities) must accept the flow of upstream waters. In fact, for a downstream municipality to block such flow would constitute an inverse condemnation or the creation of a nuisance under California law. *See Arreola v. County of Monterey* (2002) 99 Cal.App.4th 722 (obstruction of flood waters by improperly designed highway constituted inverse condemnation and nuisance).

Finding 28 and Fact Sheet Section VI: In the Finding, it is stated that the Water Board "finds that the requirements in this permit are not more stringent than the minimum federal requirements" and that therefore "a CWC section 13241 analysis is not required." The Finding further recites that notwithstanding this fact, "the San Diego Water Board has developed an economic analysis of the requirements in this Order."

For the reasons set forth in the comments of the Riverside County Copermittees, numerous provisions in the Draft Permit are in fact more stringent than the requirements of the CWA and its implementing regulations and therefore require an adequate Water Code § 13241 analysis. Unfortunately, this analysis is not provided in the Fact Sheet.

First, the economic analysis set forth in the Fact Sheet does not meet the requirements of Section 13241, as it does not analyze the six specific factors required to be analyzed under the section. Second, the analysis uses cost data from other sources, only a few of which were from the municipalities proposed to be included under the Draft Permit. These data are also a number of years old; the most recent study referenced in the Fact Sheet, the one done for the State Board by Cal State Sacramento, was dated January 2005 and included decade-old cost data from the City of Encinitas that dated from 2002-2003.

Third, the section of the Fact Sheet discussing the benefits of water quality notes that "there have been no studies for the San Diego Region to quantify the added value that surface waters with healthy water quality can provide." Thus, the Water Board has no evidence with which to compare the costs and benefits of the programs set forth in the Draft Permit. Moreover, the discussion makes the incorrect assumption that the alternative to the programs in the Draft Permit would be no controls on pollutants in urban runoff. As the Fact Sheet correctly notes, the Draft Permit is the fifth term MS4 permit for the copermittees. The previous four permits all contained increasingly complex and expensive control requirements, both structural and non-structural, designed to improve the quality of MS4 discharges. Thus, an appropriate cost analysis must compare the incremental costs of the programs set forth in the Draft Permit and the incremental benefits attributable to that permit. This has not been done in the Fact Sheet. Finally, the analysis does not recognize that the receiving waters provided economic benefits to residents of the San Diego Region long before issuance of the first MS4 permits in 1990. It is thus illogical to suggest that these pre-existing economic benefits would be lost if the Draft Permit is not adopted.

Finding 29 and Fact Sheet Section VII.F: The finding and the supporting argument in the Fact Sheet represents an attempt by Water Board staff to address whether the requirements of the Draft Permit represent an unfunded state mandate. That attempt, however, is beyond the scope of the Water Board's powers, since the *only* agency charged by the Legislature with determining

the presence of a state mandate, and whether that mandate is unfunded, is the Commission on State Mandates. Govt. Code § 17552; *Kinlaw v. State of California* (1991) 54 Cal.3d 326, 333. The Water Board has no jurisdiction to make a legal finding or discuss in the Fact Sheet that the Draft Permit, in whole or in part, does not constitute an unfunded state mandate.

Additionally fact sheets are required, under the CWA regulations, to provide the legal authority and reasons for each substantive permit provision (40 CFR § 124.8(a)(4); 40 CFR § 124.56(a)). *See also City of Rancho Cucamonga v. Regional Water Quality Control Board-Santa Ana Region* (2006), 135 Cal.App.4th 1377, 1382 (stating that fact sheets contains "the legal and factual grounds for the Water Board's recommendation to adopt the . . . permit"). Finding 29 and the discussion in Section VII.F of the Fact Sheet do not relate to any Draft Permit provision, nor provide legal authority or justification for the Draft Permit's adoption. As such, the finding and Fact Sheet discussion are surplussage and should be deleted.

The Riverside County Copermittees disagree with each of the arguments set forth in the Finding and Fact Sheet as to why the Draft Permit does not constitute an unfunded state mandate. Nevertheless, because the exclusive arena for such disagreements is the Commission on State Mandates, whose jurisdiction does not commence unless and until a test claim is filed before the Commission, the Copermittees need not and will not address those arguments.

Comments on Provisions in Draft Permit

Provision A and Fact Sheet Section VIII.A:

Lack of True Iterative Compliance Process

As set forth in the Redline and in the Comment Letter, the Riverside County Copermittees believe that to effectuate the iterative approach to compliance with water quality standards and other discharge prohibitions in the Draft Permit, the copermittees must be provided with the means to be in compliance. Based on monitoring, exceedances of water quality standards are occurring in the receiving waters subject to the Draft Permit, as set forth in Table G-14 to the latest 2011-2012 monitoring report submitted by the Riverside County Copermittees. Thus, if the copermittees are not provided an iterative means to be in compliance, which was contemplated by State Board's Order No. 2001-15, the copermittees will be issued an illegal MS4 permit, since it is a permit with which they cannot comply. This violates the intent of Congress in the CWA, which "is presumed not to have intended absurd (impossible) results." *Hughey v. JMS Development Corp.*, 78 F.3d 1523, 1529 (11th Cir. 1996); *accord, Mississippi River Revival v. City of Minneapolis*, 319 F.3d 1013, 1017-1018 (8th Cir. 2003).

With regard to the iterative process, Water Board staff has indicated numerous times during the workshop process that achievement of water quality standards is expected to take many years. The entire WQIP approach is aimed at the eventual attainment of such standards, as are the TMDLs issued to other copermittees, which have final compliance dates years into the future.

This approach is, however, put into jeopardy by the requirement, as expressed in the Fact Sheet at F-39, that the discharge prohibition and receiving water limitation provisions are

"independently applicable, meaning that compliance with one provision does not provide a 'safe harbor' where there is non-compliance with another provision (i.e., compliance with Provision A.4 does not shield a Copermittee who may have violated Provision A.1.a, A.1.c, or A.2.a from an enforcement action." While the Fact Sheet appropriately notes how this process should work through Provision A.4 (which "essentially requires the Copermittees to implement additional BMPs until MS4 discharges no longer cause or contribute to a violation of water quality standards") it also states that despite this iterative process, "the San Diego Water Board retains the discretion to take other appropriate enforcement and the iterative process does not shield dischargers from citizen suits under the CWA." Fact Sheet at F-40.

The consequences of this approach cannot be overemphasized. Despite the copermittees' good faith undertaking to follow the iterative process outlined in Provision A.4, a Water Board enforcement proceeding or a citizen suit can be brought for violations of water quality standards and, if the citizen plaintiff is successful, a federal judge is empowered to use his/her injunctive powers under Section 505(a) of the CWA to throw out the WQIP, JRMP or other compliance efforts of the copermittees and require other efforts. In such a case, the time and money spent by the copermittees in trying to comply with the Draft Permit, as well as the effort spent by the copermittees and Water Board staff in developing the Draft Permit's terms, are completely wasted.

Thus, the essential conundrum of Provision A, as presently drafted, is clearly exposed. Even though a copermittee may spend significant sums and undertake significant tasks under its WQIP or JRMP, be conducting expensive monitoring and special studies, and be in *full compliance* with all of the programmatic requirements of the Draft Permit, it would still face either a Water Board enforcement action or a citizen suit under Section 505 of the CWA. And, such a suit would allege exceedances of water quality standards (some of which are hardly capable of laboratory detection, much less control) that the Water Board acknowledges cannot be achieved for years.

Provision A is not, however, required by the CWA, as held by the Ninth Circuit in *Defenders of Wildlife v. Browner*, 191 F.3d 1159 (9th Cir. 1999). The holding in *Browner* is further reflected in State Board Order WQ 2001-15 (which the Fact Sheet acknowledges incorporates an "iterative process") which states:

> [O]ur [receiving water limitation] language, similar to the U.S. EPA's permit language discussed in the Browner case, **does not require strict compliance with water quality standards.** Our language requires that **storm water management plans be designed to achieve compliance with water quality standards**. **Compliance is to be achieved over time, through an iterative approach requiring improved BMPs**. As pointed out by the Browner court, there is nothing inconsistent between this approach and the determination that the Clean Water Act does not mandate strict compliance with water quality standards.

Order WQ 2001-15 at 7 (emphasis added). Thus, Provision A is inconsistent with the State Board's own precedential order, which requires the iterative approach effectuated by the suggested Redline changes.[3]

In further support, it may be noted that the U.S. EPA-drafted MS4 permit for the District of Columbia does not contain the type of language found in Provision A, but rather requires "an iterative and an adaptive management process for pollutant reduction and for achieving applicable water quality standard and/or total maximum daily load (TMDL) compliance." DC MS4 Permit Fact Sheet, page 5 (attached as Exhibit A).

Also, despite the assertion in the Fact Sheet that the copermittees are seeking a "safe harbor" from liability, this is incorrect. Every provision of an MS4 permit is subject to enforcement; given the complexity of the Draft Permit, the failure by a copermittee to comply with any provision could lead to such enforcement.

As noted above, MS4 discharges may not be achieving compliance with strict water quality standards, as recognized by the Issue Paper released by State Board staff in preparation for a November 20, 2012 workshop on receiving water limitation issues raised by *NRDC v. County of Los Angeles*. That Issue Paper stated that as "the storm water management programs of municipalities have matured, **an increasing body of monitoring data indicates that water quality standards are in fact not being met by many MS4s.**" (State Board Issue Paper, Page 2, emphasis supplied) (*see* Exhibit B.)

Perhaps most importantly, requiring strict and immediate compliance with discharge prohibition and receiving water limitations inhibits, not supports, the philosophy of the Draft Permit, which is to encourage the copermittees to focus on the most significant problems in their watersheds and to prioritize their resources to address those problems. Provision A, by contrast, discourages innovative approaches or prioritization, since all pollutants exceeding water quality standards create liability. Moreover, as discussed above, in the event of a citizen suit being brought such as that in the *NRDC* case, a federal judge could award injunctive relief to a successful plaintiff that could completely ignore or supplant the WQIP and other permit terms.

For additional discussion of receiving water limitations issues, please see Exhibit C, a letter submitted by the District to the State Board in connection with the recent workshop held by the State Board on receiving water limitations language. The Riverside County Copermittees hereby reference and incorporate this Exhibit into these comments.

The Riverside County Copermittees support a true iterative process that requires refinement and amendment of the WQIP and associated BMPs when receiving water limitation violations are recorded. That is the essence of the iterative process; the identification of problems and the development of BMPs to attempt to address those problems.

[3] While the Fact Sheet cites as authority *Natural Resources Defense Council v. County of Los Angeles*, discussed above, the Ninth Circuit was simply responding to language in the former Los Angeles County MS4 permit, and did not determine that such non-iterative language was required by the CWA.

The Redline proposes a means to achieve compliance using the WQIPs, which are intended to bring the copermittees into compliance with the discharge prohibition and receiving water limitation provisions of the Draft Permit over time. The Redline links compliance with Provisions A.1, A.2 and A.3 to A.4, which indicates that compliance is obtained through the preparation and updating of the WQIPs.

It must be noted, however, that the Riverside County Copermittees do not agree with the approach suggested by others, that any WQIP-based compliance approach be necessarily accompanied by a "Reasonable Assurance Analysis." Such an analysis could be extremely complex, expensive and time intensive to develop. Generally, such analyses are developed in the preparation of TMDLs and take a number of years to develop and refine. Given that the Santa Margarita Watershed has no adopted TMDLs, there are no comprehensive pollutant transport or BMP models available for the suite of constituents that might be considered for prioritization within a WQIP for that watershed. In the context of a TMDL, such models would be developed by the combined resources of the Water Board, stakeholders and dischargers. Requiring such an exercise to be undertaken solely with the public resources of the residents of the SMR is beyond the Copermittees' financial ability and would shift responsibility for development of TMDLs from the Water Board to the Copermittees.

Discussion in Fact Sheet

The Fact Sheet discussion also contains a number of legal and factual errors. First, the statement on page F-34 that non-stormwater discharges from the MS4 are subject to NPDES permitting requirements is unsupported by the plain language of the CWA, which (as noted above) applies the MEP standard to *all* discharges of pollutants from the MS4, not just those in stormwater. Also, such discharges are not subject to separate requirements under the NPDES program, as suggested on F-34, and non-storm water discharges are not the same, legally, as "illicit discharges." Please see discussion below.

Similarly, the Fact Sheet's conclusion that "Regional Water Boards are not limited by the iterative MEP approach to storm water regulation in crafting appropriate regulations for non-storm water discharges" is incorrect. The Fact Sheet correctly states that MEP has not been defined in the CWA or by U.S. EPA in the CWA regulations. However, the Fact Sheet incorrectly concludes that MEP is "ultimately defined" by the Water Boards or the State Board. What constitutes "MEP" is a question of federal law under the CWA, not a matter for definition by agencies which merely have been delegated the authority to enforce the CWA in California. The only source for such a finding is a memorandum from a State Board attorney, not case authority.

Moreover, Provisions B-E of the Draft Permit, far from establishing a "minimum framework" for the copermittees to achieve the MEP standard, sets forth in many cases requirements that far exceed the plain requirements of the CWA, the implementing regulations and in some cases even state law, or which require the copermittees to undertake steps that are not "practicable." These requirements are identified in the comments of the Riverside County Copermittees. In such respects, those requirements do not represent a "minimum framework" for MEP.

Other Issues

The Riverside County Copermittees also object to the provision in A.1.a and other portions of the Draft Permit that prohibit certain discharges into "waters of the state." The CWA regulates discharges into waters of the United States, which are surface waters. Expanding the prohibition to cover waters of the state expands the scope of the Draft Permit to protect groundwater, as a matter of state law. It should be noted that the recent Los Angeles County MS4 Permit appropriately applies this prohibition to waters of the United States.

Provision B.5: As noted in the Comment Letter, the CWA requires that illegal discharges into the MS4 be addressed by a program of steps taken to address such discharges. The Redline emphasizes that this program be guided by WQIP priorities, which is consistent with the overall intent of the Draft Program.

Provision E.2.a and E.2.a.(7): These provisions require the Copermittees to, as a part of their Illicit Discharge Detection and Elimination (IDDE) program, address all non-stormwater discharges as "illicit discharges," thus requiring the copermittees to "reduce or eliminate non-stormwater discharges" whether or not the discharges have been identified as "illicit."

The Fact Sheet asserts that "Provision E.2.a.(7) is consistent with the requirements of the CWA section 402(p)(3)(B)(ii) and 40CFR 122.26(d)(1)(v)(B). That assertion is not correct. Section 402(p)(3)(B)(ii) of the CWA states that MS4 permits "shall include a requirement to *effectively prohibit* non-stormwater discharges into the storm sewers" (emphasis supplied). The CWA regulations include two provisions designed to begin implementation of the "effective prohibition." The first provision requires MS4 permittees to perform a screening analysis, intended to provide sufficient information to develop priorities for a program to detect and remove illicit discharges. 40 CFR 122.26(d)(1)(iv)(D). The second requires MS4 permittees to develop a recommended site-specific management plan to detect and remove illicit discharges (or ensure they are covered by an NPDES permit) and to control improper disposal to MS4s. 40 CFR 122.26(d)(1)(iv)(D) and 122.26(d)(2)(B). The MS4 permittees are required to identify the non-stormwater discharge as an illicit discharge prior to having an obligation to effectively prohibit it. There is not otherwise a presumption to reduce or eliminate it.

40 CFR 122.26(d)(1)(v)(B), cited in the Fact Sheet, requires "[a] description of the existing program to identify illicit connections to the municipal storm sewer system. The description should include inspection procedures and methods for detecting and preventing illicit discharges, and describe areas where this program has been implemented."

The provision and rationale within the Fact Sheet blur the distinction between the copermittees' need to "effectively" prohibit non-stormwater discharges and to detect and eliminate illicit discharges.

- The requirement is "effectively prohibit" non-stormwater discharges, not "reduce or eliminate" non-stormwater discharges.
- Although copermittees are required to have a program to prevent illicit discharges to the MS4, non-stormwater discharges should only be addressed as illicit discharges where

such discharges are identified as sources of pollutants that may cause or contribute to an exceedance of a water quality objective.

- The IDDE program is established to detect and eliminate "illicit discharges", not non-stormwater discharges in general.

Please see the Redline for modifications to Provision E.2 addressing these issues.

Provision E.2.a.(3): In the Redline, the Riverside County Copermittees request that categories of irrigation runoff discharges (landscape irrigation, irrigation water and lawn watering) be considered as conditionally exempt discharges (not subject to treatment as illicit discharges).

The rationale for not including irrigation runoff discharges lacks a legal and factual basis. As noted in the Comment Letter, the only factual basis for this provision with respect to the Riverside County Copermittees is discussion in a public information informational brochure, which was itself based on a similar document from Orange County. Fact Sheet F-76. Despite assertions to the contrary in the Fact Sheet, this brochure does not represent a determination by the Riverside County Copermittees that irrigation runoff is a category of non-stormwater discharge that must be effectively prohibited. The other evidence in support of prohibiting the conditional exemption for irrigation runoff is entirely from different areas of the region, with different urban development patterns, lithology and hydrology. No specific determination has been made by the Copermittees (or the Water Board) that irrigation runoff in the Santa Margarita Region has actually been shown to be significant source of pollutants to receiving waters in the SMR.

EPA, in the preamble to the federal MS4 regulations, required that a *permittee* must make a finding that the "irrigation water" discharges must be a "source of pollutants to waters of the United States . . . ." 55 Fed. Reg. 48037. Moreover, such discharges must represent a "significant" source of pollutants to waters of the United States "under certain conditions." U.S. EPA, *Guidance Manual for the Preparation of Part 2 of the NPDES Permit Application for Discharges from Municipal Separate Storm Sewer Systems,* November 1992 ("EPA Part 2 Guidance Manual"), at p. 6-33. These conditions require a focus not on an entire category of discharges, but rather a discharger-by-discharger examination.

In the MS4 regulatory preamble, EPA stated that "[i]n general, municipalities will not be held responsible for prohibited some specific components of discharges or flows listed below through their [MS4], even though such components may be considered non-storm water discharges, unless such discharges *are specifically identified on a case-by-case basis as needing to be addressed."* 55 Fed. Reg. 47995 (emphasis supplied). In the Guidance Manual, EPA states:

> If an applicant knows . . . that landscape irrigation water from a ***particular site*** flows through and picks up pesticides **or *excess*** nutrients from fertilizer applications, there may be a reasonable potential for a storm water discharge to result in a water quality impact. In such an event, the applicant should contact the NPDES permitting authority to request that the authority order ***the discharger*** . . . to obtain a separate NPDES permit (or in this case, the discharge could be controlled through the storm water management program of the MS4).

EPA Part 2 Guidance Manual, p. 6-33 (emphasis added). Read in this context of this language, the Water Board has no power greater than a municipality in terms of its ability to identify non-stormwater discharges as "illicit" and thus required to be regulated, and must identify specific discharges, and not entire categories of discharges. *See* 55 Fed. Reg. 48037. This has not been done in the Fact Sheet.

Provision E.3(c): This provision requires the Copermittees to compel development projects that may not result in a hydromodification impact to the applicable receiving waters, to implement on-site or "alternative compliance" hydromodification mitigation measures and to use using "pre-development (naturally occurring)" runoff reference condition as applied to sites that are, in fact, developed.

The Riverside County Copermittees are concerned that implementing these requirements would subject the Copermittees to liability under the takings clauses of the U.S. and California Constitutions as well as under the Mitigation Fee Act because of the questionable nexus between such a project's lack of actual hydromodification impacts upon the receiving waters, and the hydromodification management measures required in the Draft Permit.

When imposing a condition on a development permit, a local government is required under the federal and state constitutions to establish that the condition bears a reasonable relationship to the impacts of the development project. This rule applies even to legislatively enacted requirements and impact fees or exactions.[4] Moreover, fees imposed on a discretionary ad hoc basis are subject to heightened scrutiny under a two-part test. First, local governments must show that there is a substantial relationship between the burden created by the impact of development and any fee or exaction.[5] Second, a development project's impacts must bear a "rough proportionality" to any development fee or exaction.[6] Under California law, the *Nollan/Dolan* heightened scrutiny test also applies to in-lieu fees.[7]

The Legislature has memorialized these requirements in the Mitigation Fee Act, which establishes procedures that local governments must follow to impose impact fees.[8] Irrespective of whether the hydromodification management requirements are implemented by legislative act or on an ad hoc basis, the copermittees' attempt to enforce them as proposed in the Draft Permit would likely result in claims by developers and property owners alleging unconstitutional takings of private property and violations of the Mitigation Fee Act. This is because a developer could argue that limiting hydromodification impacts of already developed property to its "naturally occurring" state, or requiring hydromodification mitigation measures for impacts not imposed by the project, would not have a legally sufficient nexus to the impact of the development project.

In addition, the Copermittees wish to bring the Water Board's attention to a recent case, *Virginia Dept. of Transportation v. United States Environmental Protection Agency*, Civ. Action No.

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[4] *Building Indus. Ass'n v. City of Patterson* (2009)171 Cal. App. 4th 886, 898.
[5] *Nollan v. California Coastal Comm'n*, 483 U.S. 825, 837 (1987).
[6] *Dolan v. City of Tigard*, 512 U.S. 374, 391 (1994).
[7] *Ehrlich v. City of Culver City* (1996) 12 Cal. 4th 854, 876.
[8] Cal. Gov't Code §§ 66000-66025.

1:12-CV-775 (E.D. Va. January 3, 2013) (slip op.), which is attached for the Water Board's convenience as Exhibit D. In this case, a federal district judge found that the CWA did not authorize U.S. EPA to regulate stormwater itself as a pollutant. The impact of this case is not known at this time, as it will probably be appealed to the Fourth Circuit Court of Appeals. Still, any approach to hydromodification which focuses on flows *per se*, as opposed to pollutants, may not withstand legal scrutiny.

Provision E.3.c.(3)(c)(i): This provision requires the entire alternative compliance in-lieu fee to be transferred to the copermittee or an escrow account prior to construction of a Priority Development Project (PDP). This provision is problematic, as development fees (which would include the in-lieu fees) are collected at the time of building permit issuance. In large-scale projects, permits may be issued (and development fees collected) in phases. Further, for master-planned developments, fees are generally negotiated through a development agreement to be collected based on certain development milestones. Therefore, collecting and holding the entire in-lieu fee prior to construction interferes with the development practice and may violate the Mitigation Fee Act and local development ordinances. The Redline requests that in-lieu fees be collected in accordance with state and local law.

Provision E.5: In addition to other comments on this provision and others in the Draft Permit relating to retrofitting, any requirements in Draft Permit relating to the retrofitting of engineered channels and other structures employed for flood control purposes must be consistent with the judgment of the flood control districts, to which the Legislature has assigned sole authority for the protection of the lives and property of their citizens from flooding. (Please see Comment Letter and proposed new findings in Redline for further discussion). Due to the urbanization of the counties over the past 150 years, as well as the particular topography and weather conditions found in Southern California, there is a great risk of flooding and hence the need for flood control structures and channels. The flood control districts have both the expertise and the sole legal authority to determine whether retrofitting of flood control structures can be accomplished in light of their statutory obligations, and that expertise and authority must be recognized in the Draft Permit.

Provision E.8: As noted in the Redline, the first requirement under Fiscal Analysis, that each "Copermittee must secure the resources necessary to meet all the requirements of this Order" has been deleted. This requirement is not found in the CWA regulations, which require only the conduct of a fiscal analysis. Moreover, this requirement intrudes on the home rule power of cities and counties by requiring, in essence, that municipal budgets must reflect the priority of compliance with the Order over any competing obligation, including police, fire protection and public health. A key issue in complying with stormwater and MS4 obligations is the ability of municipalities to afford the increasing costs associated with those obligations. In California, of course, the ability to raise taxes to pay for such obligations has been severely curtailed through several voter-approved propositions.

The Riverside County Copermittees request that Provision E.8.a be deleted.

EXHIBIT A

NPDES Permit No. DC0000221

AUTHORIZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM MUNICIPAL SEPARATE STORM SEWER SYSTEM PERMIT

In compliance with the provisions of the Clean Water Act, 33 U.S.C. §§ 1251 *et seq.*

Government of the District of Columbia
The John A. Wilson Building
1350 Pennsylvania Avenue, N.W.
Washington, D.C. 20004

is authorized to discharge from all portions of the municipal separate storm sewer system owned and operated by the District of Columbia to receiving waters named:

Potomac River, Anacostia River, Rock Creek and stream segments tributary to each such water body

in accordance with the Stormwater Management Program(s) dated February 19, 2009, subsequent updates, and related reports, strategies, effluent limitations, monitoring requirements and other conditions set forth in Parts I through IX herein.

The effective issuance date of this permit is: October 7, 2011.

This permit and the authorization to discharge shall expire at midnight, on: October 7, 2016.

Signed this 30th day of September, 2011.

Jon M. Capacasa, Director
Water Protection Division
U.S. Environmental Protection Agency
Region III

1. DISCHARGES AUTHORIZED UNDER THIS PERMIT

1.1 Permit Area

This permit covers all areas within the jurisdictional boundary of the District of Columbia served by, or otherwise contributing to discharges from, the Municipal Separate Storm Sewer System (MS4) owned or operated by the District of Columbia. This permit also covers all areas served by or contributing to discharges from MS4s owned or operated by other entities within the jurisdictional boundaries of the District of Columbia unless those areas have separate NPDES MS4 permit coverage or are specifically excluded herein from authorization under the District's stormwater program. Hereinafter these areas collectively are referred to as "MS4 Permit Area".

1.2 Authorized Discharges

This permit authorizes all stormwater point source discharges to waters of the United States from the District of Columbia's MS4 that comply with the requirements of this permit. This permit also authorizes the discharge of stormwater commingled with flows contributed by process wastewater, non-process wastewater, or stormwater associated with industrial activity provided such discharges are authorized under separate NPDES permits.

This permit authorizes the following non-stormwater discharges to the MS4 when appropriate stormwater activities and controls required through this permit have been applied and which are: (1) discharges resulting from clear water flows, roof drainage, dechlorinated water line flushing, landscape irrigation, ornamental fountains, diverted stream flows, rising ground waters, uncontaminated ground water infiltration to separate storm sewers, uncontaminated pumped ground water, discharges from potable water sources, foundation drains, air conditioning condensation, irrigation waters, springs, footing drains, lawn watering, individual resident car washing, flows from riparian habitats and wetlands, dechlorinated swimming pool discharges, wash water, fire fighting activities, and similar types of activities; and (2) which are managed so that water quality is not further impaired and that the requirements of the federal Clean Water Act, 33 U.S.C. §§ 1251 *et seq.*, and EPA regulations are met.

1.3 Limitations to Coverage

1.3.1 Non-stormwater Discharges

The permittee, as defined herein, shall effectively prohibit non-stormwater discharges into the MS4, except to the extent such discharges are regulated with an NPDES permit.

1.3.2 Waivers and Exemptions

This permit does not authorize the discharge of any pollutant from the MS4 which arises from or is based on any existing waivers and exemptions that may otherwise apply and are not consistent with the Federal Clean Water Act and other pertinent guidance, policies, and regulations. This narrative prohibition on the applicability of such waivers and exemptions extends to any activity that would otherwise be authorized under District law, regulations or

ordinance but which impedes the reduction or control of pollutants through the use of stormwater control measures and/or prevents compliance with the narrative /numeric effluent limits of this permit. Any such discharge not otherwise authorized may constitute a violation of this permit.

1.4 Discharge Limitations

The permittee must manage, implement and enforce a stormwater management program (SWMP) in accordance with the Clean Water Act and corresponding stormwater NPDES regulations, 40 C.F.R. Part 122, to meet the following requirements:

1.4.1. Effectively prohibit pollutants in stormwater discharges or other unauthorized discharges into the MS4 as necessary to comply with existing District of Columbia Water Quality Standards (DCWQS);

1.4.2. Attain applicable wasteload allocations (WLAs) for each established or approved Total Maximum Daily Load (TMDL) for each receiving water body, consistent with 33 U.S.C. § 1342(p)(3)(B)(iii); 40 C.F.R. § 122.44(k)(2) and (3); and

1.4.3. Comply with all other provisions and requirements contained in this permit, and in plans and schedules developed in fulfillment of this permit.

Compliance with the performance standards and provisions contained in Parts 2 through 8 of this permit shall constitute adequate progress toward compliance with DCWQS and WLAs for this permit term.

2. LEGAL AUTHORITY, RESOURCES AND STORMWATER PROGRAM ADMINSTRATION

2.1 Legal Authority

2.1.1 The permittee shall use its existing legal authority to control discharges to and from the Municipal Separate Storm Sewer System in order to prevent or reduce the discharge of pollutants to achieve water quality objectives, including but not limited to applicable water quality standards. To the extent deficiencies can be addressed through regulation or other Executive Branch action, the permittee shall remedy such deficiencies within 120 days. Deficiencies that can only be addressed through legislative action shall be remedied within 2 years of the effective date of this permit, except where otherwise stipulated, in accordance with the District's legislative process. Any changes to or deficiencies in the legal authority shall be explained in each Annual Report.

2.1.2 No later than 18 months following the effective date of this permit, the District shall update and implement Chapter 5 of Title 21 of District of Columbia Municipal Regulations (Water Quality and Pollution) ("updated DC Stormwater Regulations"), to address the control of stormwater throughout the MS4 Permit Area. Such regulations shall be consistent with this

FACT SHEET

National Pollutant Discharge Elimination System (NPDES)
Municipal Separate Storm Sewer System (MS4)
Permit No. DC0000221 (Government of the District of Columbia)

NPDES PERMIT NUMBER: DC0000221 (Reissuance)

FACILITY NAME AND MAILING ADDRESS:

Government of the District of Columbia
The John A. Wilson Building
1350 Pennsylvania Avenue, N.W.
Washington, D.C. 20004

MS4 ADMINISTRATOR NAME AND MAILING ADDRESS:

Director, District Department of the Environment
1200 First Street, N.E., 6th Floor
Washington, D.C. 20002

FACILITY LOCATION:

District of Columbia's Municipal Separate Storm Sewer System (MS4)

RECEIVING WATERS:

Potomac River, Anacostia River, Rock Creek, and Stream Segments Tributary
To Each Such Water Body

INTRODUCTION:

Today's action finalizes reissuance of the District of Columbia Municipal Separate Storm Sewer System (MS4) Permit. In the Final Permit EPA has continued to integrate the adaptive management approach with enhanced control measures to address the complex issues associated with urban stormwater runoff within the corporate boundaries of the District of Columbia, where stormwater discharges via the Municipal Separate Storm Sewer System (MS4).

Since the United States Environmental Protection Agency, Region III (EPA) issued the District of Columbia (the District) its first MS4 Permit in 2000, the Agency has responded to a number of legal challenges involving both that Permit (as well as amendments thereto) and the second-round MS4 Permit issued in 2004. For the better part of ten years, the Agency has worked with various parties in the litigation, including the District and two non-governmental organizations, Defenders of Wildlife and Friends of the Earth, to address the concerns of the various parties. The Agency has engaged in both litigation and negotiation, including formal

mediation.[1] These activities ultimately led to an enhanced stormwater management strategy in the District, consisting of measurable outputs for addressing the issues raised during the litigation and mediation process.

FACILITY BACKGROUND AND DESCRIPTION:

The Government of the District of Columbia owns and operates its own MS4, which discharges stormwater from various outfall locations throughout the District into its waterways.[2]

On April 21, 2010 EPA public noticed the Draft Permit. The Draft Fact Sheet published with that Draft Permit contains more extensive permit background information, and the reader is referred to that document for the history of the District of Columbia MS4 permit.

The public comment period closed on June 4, 2010. EPA received comments from 21 individual commenters and an additional 53 form letters. The Draft Permit, Draft Fact Sheet, and comments received on those documents are all available at: http://www.epa.gov/reg3wapd/npdes/draft_permits.html. The Final Permit reflects many of the comments received. EPA is simultaneously releasing a responsiveness summary responding to these comments.

ACTION TO BE TAKEN:

EPA is today reissuing the District of Columbia NPDES MS4 Permit. The Final Permit replaces the 2004 Permit, which expired on August 18, 2009 and has been administratively extended since that time. The Final Permit incorporates concepts and approaches developed from studies and pilot projects that were planned and implemented by the District under the 2000 and 2004 MS4 permits and modifying Letters of Agreement, and implements Total Maximum Daily Loads (TMDLs) that have been finalized since the prior permit was issued, including the Chesapeake Bay TMDL. A number of applicable measurable performance standards have been incorporated into the Final Permit. These and other changes between the 2004 Permit and today's Final Permit are reflected in a Comparison Document that is part of today's Permit issuance.

WATER QUALITY IN DISTRICT RECEIVING WATERS:

The District's *2008 Integrated Report to the Environmental Protection Agency and U.S. Congress Pursuant to Sections 305(b) and 303(d) Clean Water Act*[3] documents the serious water

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1 A procedural history of Permit appeals can be viewed at the EPA Environmental Appeals Board web: http://yosemite.epa.gov/oa/EAB_Web_Docket.nsf/77355bee1a56a5aa8525711400542d23/b5e5b68e89edabe98525714f00731c6f!OpenDocument&Highlight=2.municipal.

2 Portions of the District are served by a combined sanitary and storm sewer system. The discharges from the combined sewer system are not subject to the MS4 permit, but are covered under NPDES Permit No. xxxx issued to the District of Columbia Water and Sewer Authority.

3 District Department of the Environment, *The District of Columbia Water Quality Assessment, 2008 Integrated Report to the Environmental Protection Agency and U.S. Congress Pursuant to Sections 305(b) and 303(d) Clean Water Act* (hereinafter "2008 Integrated Report").

quality impairments in the surface waters in and around the District. A number of the relevant designated uses are not being met, *e.g.*, aquatic life, fish consumption, and full body contact, and there are a number of specific pollutants of concern that have been identified (for additional discussion on relevant TMDLs *see* Section 4.10 of this Final Fact Sheet).

Commenters on the Draft Permit expressed some frustration over very slow progress or even lack of progress after a decade of implementation of the MS4 program and even longer for other water quality programs. EPA appreciates this concern. Although the District's receiving waters are affected by a range of discharge sources, discharges from the MS4 are a significant contributor of pollutants and cause of stream degradation. EPA also recognizes, however, that stormwater management efforts that achieve a reversal of the ongoing degradation of water quality caused by urban stormwater discharges entail a long term, multi-faceted approach.

Consistent with the federal stormwater regulations for characterizing discharges from the MS4 (40 C.F.R. §122.26(d)(2)(iii)), the first two permit terms for the District's MS4 program required end-of-pipe monitoring to determine the type and severity of pollutants discharging via the system. The monitoring program was not designed to evaluate receiving water quality *per se*, therefore detection of trends or patterns was not reasonably possible. Today's Final Permit includes requirements for a Revised Monitoring Program, and one of the objectives for the program is to use a suite of approaches and indicators to evaluate and track water quality over the long-term (*see* discussion of Section 5.1 in this Final Fact Sheet).
There have been identified improvements in some areas. For example the *2008 Integrated Report* noted improvements in the diversity of submerged aquatic vegetation in the Potomac River, as well as improvements in fish species richness in Rock Creek. Biota metrics are often the best indicators of the integrity of any aquatic system.

EPA also notes that there are a variety of indirect measures indicative of improvement. The federal stormwater regulations foresaw the difficulty, especially in the near-term, of detecting measurable improvement in receiving waters, and relied instead on indirect measures, such as estimates of pollutant load reductions (40 C.F.R. §122.26(d)(2)(v)). The District documents these types of indirect measures in its annual reports, *e.g.*, tons of solids collected from catch basin clean-outs, amount of household hazardous waste collected, number of trees planted, square footage of green roofs installed, and many other measures of success.[4]

EPA believes that documenting trends in water quality, whether improvements, no change, or even further degradation, is an important element of a municipal water quality program. Today's Final Permit recognizes this principle, both in the types of robust measures required as well as the transition to new monitoring paradigms. EPA encourages all interested parties to provide the District with input during the development of these program elements.

THIS FACT SHEET:

(http://ddoe.dc.gov/ddoe/frames.asp?doc=/ddoe/lib/ddoe/information2/water.reg.leg/DC_IR_2008_Revised_9-9-2008.pdf)

4 District MS4 Annual Reports can be found at: http://ddoe.dc.gov/ddoe/cwp/view,a,1209,q,495855.asp

This Final Fact Sheet is organized to correspond with the chronological organization and numbering in today's Final Permit. Where descriptions or discussions may be relevant to more than one element of the Final Permit the reader will be referred to the relevant section(s).

To keep today's Final Fact Sheet of readable length, many of the elements included in the fact sheet published with the Draft Permit (Draft Fact Sheet) on April 21, 2010 have not been repeated, but are referenced. Readers are referred to the Draft Fact Sheet published with the Draft Permit for additional discussion on provisions that have been finalized as proposed.[5] The Final Fact Sheet does discuss significant changes since the 2004 Permit (even if discussed in the Draft Fact Sheet). The Final Fact Sheet also contains additional explanation of the Final Permit where commenters requested additional clarification. In addition, this Final Fact Sheet explains modifications to the Final Permit where provisions were changed in response to comments.

In many cases EPA made a number of very simple modifications to the Final Permit, *e.g.*, a word, phrase, or minor reorganization, simply for purposes of clarification. These modifications were not intended to change the substance of the permit provisions, only to clarify them. Most of those types of edits are not discussed in this Final Fact Sheet, but EPA has provided a Comparison Document of the Draft and Final Permits for readers who would like that level of detail.

Many commenters noted that the Draft Permit was not logically organized. EPA agrees. The major reorganization principles include:

1) There is a new Section 3, Stormwater Management Program (SWMP) Plan consolidating the various plans, strategies and other documents developed in fulfillment of permit requirements.
2) All implementation measures, *i.e.*, those stipulating management measures and implementation policies, are included in Section 4 of today's Final Permit. This includes "Source Identification" elements (Section 3 in the Draft Permit) and "Other Applicable Provisions" elements (Section 8 in the Draft Permit), which included TMDL requirements.
3) All monitoring requirements are consolidated in Section 5 of the Final Permit.
4) All reporting requirements are consolidated in Section 6 of the Final Permit.

EPA also refers readers to the Responsiveness Summary released today along with the Final Permit and Final Fact Sheet, for responses to comments and questions received on the Draft Permit. That document contains additional detailed explanations of the rationale for changes made to the Draft Permit in the Final Permit.

Finally, EPA made significant effort to avoid appending or incorporating by reference other documents containing permit requirements into the Final Permit. In the interest of clarity

5 The Permit and Fact Sheet proposed on April 21, 2010 can be viewed at: http://www.epa.gov/reg3wapd/npdes/draft_permits.html

and transparency EPA, to the extent possible, has included all requirements directly in the permit. Thus, EPA reviewed a variety of documents with relevant implementation measures, *e.g.*, TMDL Implementation Plans and the 2008 Modified Letter of Agreement to the 2004 permit[6], and translated elements of those plans and strategies into specific permit requirements that are now contained in the Final Permit. This Fact Sheet provides an explanation of the sources of provisions that are significant and are a direct result of one of those strategies.

1. DISCHARGES AUTHORIZED UNDER THIS PERMIT

(1.2 Authorized Discharges): The Final Permit authorizes certain non-stormwater discharges, including discharges from water line flushing. One commenter noted that many of these discharges, especially from potable water systems, contain concentrations of chlorine that may exceed water quality standards. EPA agrees, and has therefore clarified that dechlorinated water line flushing is authorized to be discharged under the Final Permit.

(1.4 Discharge Limitations): Comments on the language in Part 1.4 varied widely. Some commenters did not believe it was reasonable to require discharges to meet water quality standards. Other commenters believed this to be an unambiguous requirement of the Clean Water Act.

Today's Final Permit is premised upon EPA's longstanding view that the MS4 NPDES permit program is both an iterative and an adaptive management process for pollutant reduction and for achieving applicable water quality standard and/or total maximum daily load (TMDL) compliance. *See generally,* "National Pollutant Discharge Elimination System Permit Application Regulations for Stormwater Discharges," 55 F.R. 47990 (Nov. 16, 1990).

EPA is aware that many permittees, especially those in highly urbanized areas such as the District, likely will be unable to attain all applicable water quality standards within one or more MS4 permit cycles. Rather the attainment of applicable water quality standards as an incremental process is authorized under section 402(p)(3)(B)(iii) of the Clean Water Act, 33 U.S.C. § 1342(p)(3)(B)(iii), which requires an MS4 permit "to reduce the discharge of pollutants to the maximum extent practicable" (MEP) "and such other provisions" deemed appropriate to control pollutants in municipal stormwater discharges. To be clear, the goal of EPA's stormwater program is attainment of applicable water quality standards, but Congress expected that many municipal stormwater dischargers would need several permit cycles to achieve that goal.

Specifically, the Agency expects that attainment of applicable water quality standards in waters to which the District's MS4 discharges, requires staged implementation and increasingly more stringent requirements over several permitting cycles. During each cycle, EPA will continue to review deliverables from the District to ensure that its activities constitute sufficient progress toward standards attainment. With each permit reissuance EPA will continue to increase

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6 District Department of the Environment, *Modification to the Letter of Agreement dated November 27, 2007 for the NPDES Municipal Separate Storm Sewer (MS4) Permit DC0000222* (2008) http://www.epa.gov/reg3wapd/npdes/pdf/DCMS4/Letter.PDF

stringency until such time as standards are met in all receiving waters. Therefore today's Final Permit is clear that attainment of applicable water quality standards and consistency with the assumptions and requirements of any applicable WLA are requirements of the Permit, but, given the iterative nature of this requirement under CWA Section 402(p)(3)(B)(iii), the Final Permit is also clear that "compliance with all performance standards and provisions contained in the Final Permit shall constitute adequate progress toward compliance with DCWQS and WLAs for this permit term" (Section 1.4).

EPA believes that permitting authorities have the obligation to write permits with clear and enforceable provisions and thus the determination of what is the "maximum extent practicable" under a permit is one that must be made by the permitting authority and translated into provisions that are understandable and measurable. In this Final Permit EPA has carefully evaluated the maturity of the District stormwater program and the water quality status of the receiving waters, including TMDL wasteload allocations. In determining whether certain measures, actions and performance standards are practicable, EPA has also looked at other programs and measures around the country for feasibility of implementation. Therefore today's Final Permit does not qualify any provision with MEP thus leaving this determination to the discretion of the District. Instead each provision has already been determined to be the maximum extent practicable for this permit term for this discharger.

EPA modified the language in the Final Permit to provide clarity on the expectations consistent with the preceding explanation. Specifically Section 1.4.2 of the Final Permit requires that discharges 'attain' applicable wasteload allocations rather than just 'be consistent' with them, since the latter term is somewhat ambiguous.

In addition, the general discharge limitation 'no increase in pollutant loadings from discharges from the MS4 may occur to receiving waters' was removed because of the difficulty in measuring, demonstrating and enforcing this provision. Instead, consistent with EPA's belief that the Final Permit must include all of the enforceable requirements that would achieve this principle, the following discharge limitation is substituted: "comply with all other provisions and requirements contained in this permit, and in plans and schedules developed in fulfillment of this permit."

In addition, EPA made the following modifications: "Compliance with <u>the</u> performance standards and provisions contained in <u>Parts 2 through 8 of</u> this permit shall constitute adequate progress towards compliance with DCWQS <u>and WLAs for this permit term</u>" (*underlined text added*) (Section 1.4 of the Final Permit). EPA eliminated circularity with the addition of "Parts 2 through 8", clarifying that this requirement does not circle back to include the statements in 1.4.1 and 1.4.2, but rather interprets them. Also, although WLAs are a mechanism for attainment of water quality standards, EPA added the specific language "and WLAs" to make this concept explicit rather than just implicit. In addition this revised language emphasizes that the specific measures contained in the Final Permit, while appropriate for this permit term, will not necessarily constitute full compliance in subsequent permit terms. It is the expectation that with each permit reissuance, additional or enhanced requirements will be included with the objective

of ensuring that MS4 discharges do not cause or contribute to an exceedance of applicable water quality standards, including attainment of relevant WLAs.

2. LEGAL AUTHORITY, RESOURCES, AND STORMWATER PROGRAM ADMINISTRATION

(2.1 Legal Authority): Several commenters pointed out that there were a number of requirements in the Draft Permit without clear compliance schedules or deadlines, or with deadlines that did not correspond well to others in the permit. In the Final Permit, EPA has made several revisions to address these comments. For example, EPA changed a requirement that deficiencies in legal authority must be remedied "as soon as possible" to a 120-day requirement for deficiencies that can be addressed through regulation, and two years for deficiencies that require legislative action (Section 2.1.1). Also, EPA increased the compliance schedule for updating the District's stormwater regulation from twelve months to eighteen months, *id.,* so that this action could be adequately coordinated with the development of the District's new offsite mitigation/payment-in-lieu program (for more discussion see Section 4.1.3 below).

(2.2 Fiscal Resources): One commenter suggested eliminating the reference to the District's Enterprise Fund since funding was likely to come from a number of different budgets within the District. EPA agrees with this comment and has removed this reference.

On the other hand, many commenters noted that the implementation costs of the District's stormwater program will be significant. EPA agrees. The federal stormwater regulations identify the importance of adequate financial resources [40 C.F.R. §122.26(d)(1)(vi) and (d)(2)(vi)]. In addition, after seeing notable differences in the caliber of stormwater programs across the country, EPA recognizes that dedicated funding is critical for implementation of effective MS4 programs.[7,8,9] In 2009 the District established, and in 2010 revised, an impervious-based surface area fee for service to provide core funding to the stormwater program[10] (understanding that stormwater-related financing may still come from other sources as they fulfill multiple purposes, *e.g.,* street and public right-of-way retrofits). In conjunction with the 2010 rule-making to revise the fee the District issued a Frequently Asked Questions document[11] that indicates the intent to restrict this fee to its original purpose, *i.e.,* dedicated funding to implement the stormwater program and comply with MS4 permit requirements. EPA believes this action is essential, and he expects that the District will maintain a dedicated source of funding for the stormwater program.

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7 National Research Council, *Urban Stormwater Management in the United States* (2009) National Academy of Sciences http://www.nap.edu/catalog.php?record_id=12465

8 National Association of Flood and Stormwater Agencies, Funded by EPA, *Guidance for Municipal Stormwater Funding* (2006) http://www.nafsma.org/Guidance%20Manual%20Version%202X.pdf

9 EPA, *Funding Stormwater Programs* (2008) http://www.epa.gov/npdes/pubs/region3_factsheet_funding.pdf

10 District of Columbia, Rule 21-566 Stormwater Fees, http://www.dcregs.dc.gov/Gateway/RuleHome.aspx?RuleID=474056

11 District of Columbia, FAQ Document *Changes to the District's Stormwater Fee* (2010) http://ddoe.dc.gov/ddoe/frames.asp?doc=/ddoe/lib/ddoe/information2/water.reg.leg/Stormwater_Fee_FAQ_10-5-10_-final.pdf

EXHIBIT B

CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

State Water Resources Control Board

State Water Resources Control Board

Issue Paper
Municipal Storm Water Permit Receiving Water Limitations
Board Workshop
November 20, 2012

ISSUE:

The State Water Resources Control Board (State Water Board) has been asked, in public comments received on National Pollutant Discharge Elimination System (NPDES) permits for Municipal Separate Storm Sewer Systems (MS4s), to adopt permit provisions that create a partial or complete exemption from enforcement for violations of water quality standards while a discharger engages in an iterative process of improving controls (commonly referred to as a "safe harbor" provision). The State Water Board has scheduled a public workshop to consider the issue.

DISCUSSION:

Background:

The Clean Water Act generally requires NPDES permits to include technology-based effluent limitations and any more stringent limitations necessary to meet water quality standards. In the context of NPDES permits for MS4s, however, the Clean Water Act does not reference the requirement to meet water quality standards. MS4 discharges must meet a technology-based standard of reducing pollutants in the discharge to the Maximum Extent Practicable (MEP), but requirements to meet water quality standards are at the discretion of the permitting agency.[1] Further, under the Porter-Cologne Water Quality Control Act, waste discharge requirements must implement applicable water quality control plans, including water quality objectives; however, the Porter-Cologne Act also affords the State Water Board and regional water quality control boards (collectively, Water Boards) flexibility to consider other factors, such as economics, when establishing any NPDES permit requirements that are more stringent than required by the Clean Water Act.[2]

The State Water Board has exercised its discretion with regard to requiring compliance with water quality standards in MS4 permits by directing, in precedential orders, that MS4 permits contain provisions requiring discharges to be controlled so as not to cause or contribute to exceedances of water quality standards in receiving waters.[3] However, consistent with federal

[1] 33 U.S.C. § 1342(p); *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159.

[2] Wat. Code, §§ 13241, 13263; *City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613.

[3] SWRCB Order WQ 98-01 (*Environmental Health Coalition*), WQ 99-05 (*Environmental Health Coalition)*.

law, the State Water Board has found it appropriate to implement Best Management Practices (BMPs) in lieu of numeric water quality-based effluent limitations to meet water quality standards.[4] Additionally, in lieu of "strict compliance" with water quality standards, the State Water Board has prescribed an iterative process whereby an exceedance of a water quality standard triggers a process of BMP improvements: reporting of the violation, submission of a report describing proposed improvements to BMPs expected to better meet water quality standards, and implementation of these new BMPs.

While the Water Boards have generally directed dischargers to achieve compliance with water quality standards by improving control measures through the iterative process, the iterative process does not provide a "safe harbor" to MS4 permittees: that is, when a discharger is shown to be causing or contributing to an exceedance of water quality standards, that discharger is in violation of the relevant discharge prohibitions and receiving water limitations of the permit and potentially subject to enforcement by the Water Boards or through a citizen suit, even if the discharger is actively engaged in the iterative process. Despite the lack of a safe harbor provision, however, the Water Boards have, as a matter of practice, declined to initiate enforcement actions against MS4 permittees who have been actively engaged in the iterative process. The Water Boards' decisions to decline to include a safe harbor in MS4 permits have been upheld by courts of appeal.[5]

Need for and Purpose of Workshop:

The lack of a safe harbor in the iterative process was recently highlighted by the Ninth Circuit's decision in a citizen suit brought by the Natural Resources Defense Council (NRDC) against the County of Los Angeles and the Los Angeles County Flood Control District for violations of the receiving water limitations of their MS4 permit. The Ninth Circuit confirmed that, as the receiving water limitations of the Water Boards' MS4 permits are currently drafted, engagement in the iterative process does not excuse liability for violations of water quality standards.[6]

As the storm water management programs of municipalities have matured, an increasing body of monitoring data indicates that water quality standards are in fact not being met by many MS4s. MS4s accordingly assert that the receiving water limitations and iterative process provisions of the Water Boards' permits do not afford them with a viable path to compliance for these violations, which may take years of technical efforts to correct, especially for wet weather discharges. MS4s argue that they are increasingly vulnerable to citizen suits and/or Water Board enforcement. This concern has been raised by the California Stormwater Quality Association (CASQA) in comments on the proposed Phase II MS4 permit and by the California Department of Transportation (Caltrans) in comments on the Caltrans MS4 permit adopted

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[4] *See* SWRCB Orders WQ 91-03 (*Citizens for a Better Environment)*, WQ 98-01 (*Environmental Health Coalition*), WQ 2001-15 (*Building Industry Association of San Diego County*); *See also* 40 C.F.R. § 122.44(k); Interim Permitting Approach for Water Quality-Based Effluent Limitations In Storm Water Permits, USEPA, September 1995. In such orders and guidance, the State Water Board and Environmental Protection Agency acknowledge that the storm water program may evolve over time to incorporate stricter limitations, including improved BMPs to meet water quality standards or numeric water quality based effluent limitations.

[5] *Building Industry Assn. of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866; *City of Rancho Cucamonga v. Regional Water Quality Control Bd.* (2006) 135 Cal.App.4th 1377; see also *Natural Resources Defense Council v. County of Los Angeles* (9th Cir. 2011) 673 F.3d 880, 897, n.7.

[6] *Natural Resources Defense Council v. County of Los Angeles, supra*, 673 F.3d at p. 897. On July 13, 2012, the United States Supreme Court granted review of this case on other grounds.

September 19, 2012, as well as by numerous MS4s and interested persons in comments on both permits. The issue is additionally relevant to the Phase I MS4 permits issued by the regional water quality control boards.[7]

At the same time, the environmental community has commented that the iterative process has been underutilized and ineffective to date in bringing MS4 discharges into compliance with water quality standards. Environmental parties argue that direct enforcement of water quality standards is necessary to protect water quality, especially in such second- or third-generation permits where dischargers have already had a number of years to come into compliance.

Because of the broad applicability of any policy decisions regarding the receiving water limitations and iterative process provisions, the State Water Board is holding a public workshop to consider several alternatives in addressing the issue and to seek public input on these alternatives. Following the workshop, the State Water Board may propose revisions to the receiving water limitations in the Caltrans MS4 and Phase II MS4 permits, and as necessary, re-open those permits after public review and comment, to make the revisions.

ALTERNATIVES FOR CONSIDERATION:

The State Water Board may consider the alternatives below, individually or in combination, to address concerns with the receiving water limitations in the Caltrans or Phase II MS4 permits. While the listed alternatives attempt to capture the range of alternatives before the State Water Board, the Board welcomes comments proposing other options and will not be limiting its consideration to the alternatives as listed in this issue paper.

The receiving water limitations language prescribed by State Water Board Order WQ 99-05 is attached as Attachment 1 and forms the basis of Alternative 1. CASQA has submitted specific proposed language for the Receiving Water Limitations provision of the proposed Phase II MS4 permit (CASQA Proposal). The CASQA Proposal is attached as Attachment 2 and is referenced as appropriate in the discussion of the alternatives below.

Alternative 1: Keep the status quo of no safe harbor.

This alternative makes no changes to the existing State Water Board approach or to the current language of the adopted Caltrans MS4 permit or the proposed Phase II MS4 permit. As stated previously, the current MS4 permit provisions laying out the iterative process are based on language set forth in precedential State Water Board orders. (See Attachment 1.) Alternative 1 adheres to the prescribed language. Under this alternative, the Water Boards may choose to exercise their enforcement discretion to refrain from taking action against dischargers engaged in good faith implementation of the iterative process; however, they would not be constrained from enforcing the receiving water limitations when an MS4 causes or contributes to exceedances of water quality standards. As a limitation within an NPDES permit, dischargers who cause or contribute to an exceedance of water quality standards could be subject to citizen suits.

[7] Note that the issue is not relevant to any other NPDES permits, including permits for storm water discharges associated with industrial activity, because all other NPDES permits must include technology-based effluent limitations and any more stringent limitations necessary to meet water quality standards. (33 U.S.C. § 1311(b)(1)(C).)

Alternative 2: No safe harbor, but provide greater clarity and specificity for iterative process implementation and wet weather data analysis.

Greater clarity and specificity in the MS4 permits as to the iterative process requirements may result in increased efforts to improve controls and achieve compliance. Such clarity and specificity may include:

1. Clarification on how compliance with the relevant discharge prohibitions and receiving water limitations is determined, including type and frequency of monitoring;
2. Clarification that dischargers must begin the iterative process after documentation of violations without waiting to be directed to do so by the Water Boards;
3. Specification of the minimum efforts that will constitute meaningful compliance with the iterative process;
4. Specification of the scope of any corrective action, including whether it applies only at the location where exceedances are measured or throughout the relevant watershed;
5. Specification of additional wet weather data analysis to better define and assess the impact of municipal storm water discharges on receiving waters, as well as the efficacy of specific best management practices.

As the MS4 program continues to mature and more data becomes available, this alternative may be enhanced by the development of water quality-based effluent limitations for pollutants, as appropriate, as a means of determining compliance with receiving water limitations. In addition, the enhanced wet weather data could be used to identify surrogates that could be used as a measure of protecting beneficial uses. In time, the data could be used to develop actual wet weather water quality standards or wet weather implementation provisions for existing water quality standards that could be applied consistently on a statewide basis.

Given the nature of storm water discharges and of MS4s, questions such as where and how compliance with water quality standards should be measured and how narrowly or broadly corrective actions should be applied, pose complicated technical issues that require careful study and consideration. These challenges notwithstanding, water quality improvements are more likely to be achieved as the iterative process becomes automatic and dischargers follow clear guidelines for determining and addressing non-compliance with permit terms. Such improvements may dissuade the Water Boards and the public from bringing enforcement actions/citizen suits for all except the most egregious and repeated violations.

In addition to being a stand-alone alternative, Alternative 2 may be considered in combination with Alternatives 3 through 5. The CASQA Proposal incorporates some greater specificity in the iterative process requirements as a component of its proposed receiving water limitations.

Alternative 3: Safe harbor that applies only if a discharger is in compliance with the implementation provisions of an approved TMDL.

Under Alternative 3, the receiving water limitations would be amended to provide a safe harbor for permittees that are in compliance with the implementation provisions of a TMDL. In effect, as long as the permittee is in compliance with the TMDL (including any compliance schedule) the terms of the TMDL would replace the requirement to comply with water quality standards for the pollutants that are covered by the TMDL.

The CASQA Proposal contemplates a safe harbor for dischargers in compliance with a TMDL as a component of the receiving water limitations.

Alternative 4: Safe harbor that applies if a discharger is in compliance with the implementation provisions of an approved TMDL, as in Alternative 3, and, in addition, that applies when the discharger engages in good faith compliance with the iterative process for exceedances caused by wet weather discharges.

In addition to the safe harbor for TMDL implementation, Alternative 4 would provide a safe harbor when dischargers engage in the iterative process in good faith to address violations of permit terms caused by wet weather discharges. Thus, if a storm water discharge from an MS4 is causing or contributing to an exceedance of a water quality standard in the receiving water, the exceedance would not constitute a violation of the permit as long as the discharger was engaged in good faith efforts to address the exceedance through improved controls. Alternative 4 recognizes that wet weather discharges from MS4s frequently cause or contribute to violations of water quality standards and allows the MS4s time to address these violations by improving control measures.

However, the safe harbor would not extend to dry weather discharges. Non-storm water discharges are generally prohibited in MS4 permits and only a few categories of non-storm water discharges are exempted from the prohibition, with the condition that these exempted discharges also be prohibited if they are identified as sources of pollutants to receiving waters.

Alternative 5: Full safe harbor.

This alternative would provide a full safe harbor to dischargers complying with the implementation provisions of a TMDL or engaging in the iterative process to address exceedances caused by wet or dry weather discharges.

The CASQA Proposal attached provides for a full safe harbor.

Attachments Removed

EXHIBIT C

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RIVERSIDE COUNTY FLOOD CONTROL
AND WATER CONSERVATION DISTRICT

November 13, 2012

Honorable Members of the State Water Resources Control Board
Attn: Ms. Jeanine Townsend, Clerk to the Board
State Water Resources Control Board
1001 I Street, 24th Floor
Sacramento, CA 95814

Dear Honorable Board Members and Ms. Townsend:

Re: Comment Letter – Receiving Water Limitations Language Workshop

I am writing on behalf of the Riverside County Flood Control and Water Conservation District ("District") regarding the State Water Resources Control Board's consideration of Receiving Water Limitations ("RWL") language in MS4 permits. This review was triggered by a decision of the Ninth Circuit United States Court of Appeals in *Natural Resources Defense Council v. County of Los Angeles* (9th Cir. 2011) 673 F.3d 880, *cert granted,* __ U.S. __ (June 25, 2012) ("*NRDC*"). This letter is being submitted in advance of the State Board's November 20, 2012 workshop on reform of the RWL language to be incorporated into MS4 permits as a matter of statewide policy.

The District is the Principal Permittee for three Phase I MS4 permits applicable to municipalities across Riverside County: Order R8-2010-0033, issued by the Santa Ana Regional Water Board to municipalities within the Santa Ana River Region of Riverside County; Order R9-2010-016, issued by the San Diego Regional Water Board to municipalities within the Santa Margarita Region of Riverside County; and Order R7-2008-0001, issued by the Colorado River Regional Water Board to municipalities within the Whitewater River Region of Riverside County. Given our unique perspective as the manager of three Phase 1 MS4 permits, the District and its staff thus, have considerable experience and expertise in developing and administering MS4 permits, and a keen understanding of the issues that the above mentioned court case creates.

The District strongly supports reform of the RWL language to make clear the State Board's often-expressed intention that MS4 Permittees' compliance with RWL be effectuated through an iterative process. However, under the Ninth Circuit's interpretation, any MS4 discharge that causes or contributes to an exceedance of a Water Quality Standard subjects the MS4 Permittee to civil penalty liability, injunctive relief and the payment of attorneys' fees in an action brought by a citizen plaintiff, even where the Permittee is fully implementing the programmatic requirements of their MS4 Permit.

The District supports the California Stormwater Quality Association's ("CASQA") efforts to obtain RWL language that ensures that the iterative process favored by the State Board is honored. The District also supports the comments of the California State Association of Counties, and believes the proposed RWL language attached to those comments is a step in the right direction.

This letter contains additional District comments about the RWL language and the iterative process. We believe that they are best expressed in terms of correcting misperceptions regarding the current RWL language, as interpreted by the Ninth Circuit.

Misperception Number One: Strict compliance with Water Quality Standards is required of MS4 Permittees by the Clean Water Act.

The Clean Water Act provides that MS4 discharges must control pollutants in discharges from the MS4 to the "Maximum Extent Practicable" (33 U.S.C. § 1342(p)(3)(B)(iii)). Unlike the case with other NPDES Permittees, the Clean Water Act does not require that municipalities strictly comply with Water Quality Standards, as determined by the Ninth Circuit in *Browner v. Defenders of Wildlife*. The State Board's own precedential Order WQ 2001-15 recognizes this fact and states that the RWL language was intended to be consistent with the *Browner* case. In that Order, which interpreted RWL language similar to that in *NRDC*, the Board stated:

> *[O]ur language, similar to the U.S. EPA's permit language discussed in the Browner case, does not require strict compliance with water quality standards. Our language requires that storm water management plans be designed to achieve compliance with water quality standards. Compliance is to be achieved over time, through an iterative approach requiring improved BMPs. As pointed out by the Browner court, there is nothing inconsistent between this approach and the determination that the Clean Water Act does not mandate strict compliance with water quality standards. [Order WQ 2001-15 at 7 (emphasis added)].*

Unfortunately, the Ninth Circuit completely disregarded this language, and the Order, in holding that strict compliance was required of MS4 Permittees.

USEPA itself has issued MS4 permits (in non-delegated states) that do not contain RWL language requiring strict compliance with Water Quality Standards. Therefore, it is clear that such compliance is not required by the Clean Water Act nor is such compliance established by USEPA policy. The most prominent example of a recent MS4 permit promulgated by USEPA is that for the District of Columbia ("DC Permit") (relevant portions of which are attached as Exhibit A), which was adopted in 2011.

Part 1.4 of the DC Permit contains the requirements relating to Water Quality Standards and provides, in relevant part: "Compliance with the performance standards and provisions contained in Parts 2 through 8 of the permit shall constitute adequate progress towards compliance with DCWQS [water quality standards] and WLAs [established under TMDLs] for this permit term." The DC Permit Fact Sheet explains the rationale for that language as follows [DC Permit Fact Sheet, Pages 5-6, emphasis added, attached as Exhibit B]:

> *Comments on the language in Part 1.4 varied widely. Some commenters did not believe it was reasonable to require discharges to meet water quality standards. Other commenters believed this to be an unambiguous requirement of the Clean Water Act.*

Today's Final Permit is premised upon **EPA's longstanding view that the MS4 NPDES permit program is both an iterative and an adaptive management process for pollutant reduction and for achieving applicable water quality standard and/or total maximum daily load (TMDL) compliance.** *See generally, "National Pollutant Discharge Elimination System Permit Application Regulations for Stormwater Discharges," 55 F.R. 47990 (Nov. 16, 1990).*

EPA is aware that many Permittees, especially those in highly urbanized areas such as the District, likely will be unable to attain all applicable water quality standards within one or more MS4 permit cycles. *Rather the attainment of applicable water quality standards* **as an incremental process** *is authorized under section 402(p)(3)(B)(iii) of the Clean Water Act, 33 U.S.C. § 1342(p)(3)(B)(iii), which requires an MS4 permit "to reduce the discharge of pollutants to the maximum extent practicable" (MEP) "and such other provisions" deemed appropriate to control pollutants in municipal stormwater discharges.* **To be clear, the goal of EPA's stormwater program is attainment of applicable water quality standards, but Congress expected that many municipal stormwater dischargers would need several permit cycles to achieve that goal.**

Specifically, the Agency expects that attainment of applicable water quality standards in waters to which the District's MS4 discharges, requires staged implementation and increasingly more stringent requirements over several permitting cycles. During each cycle, EPA will continue to review deliverables from the District to ensure that its activities constitute sufficient progress toward standards attainment. With each permit reissuance EPA will continue to increase stringency until such time as standards are met in all receiving waters. **Therefore today's Final Permit is clear that attainment of applicable water quality standards and consistency with the assumptions and requirements of any applicable WLA are requirements of the Permit, but, given the iterative nature of this requirement under CWA Section 402(p)(3)(B)(iii), the Final Permit is also clear that "compliance with all performance standards and provisions contained in the Final Permit shall constitute adequate progress toward compliance with DCWQS and WLAs for this permit term" (Section 1.4).**

USEPA is now proposing clarifying changes to this language and to other sections of the DC Permit as the result of a settlement with various parties. However, those changes do not require strict compliance with Water Quality Standards, but rather compliance through the programs developed under the Permit.

The State Board is thus, free to adopt new RWL language that effectuates its previously expressed intent that MS4 permits not require strict compliance with Water Quality Standards with regard to contributions from discharges from MS4s.

Misperception Number Two: The MS4 Permittees are Seeking a "Safe Harbor" that would Insulate them from Responsibility Under the Clean Water Act.

While State Board staff's "Issue Paper" uses the term "safe harbor" in describing the iterative process, the District believes that this is fundamentally misleading. Even a cursory review of the terms of a typical MS4 permit in California reveals that it is full of compliance points. In the three MS4 Permits in which the District serves as Principal Permittee, literally every sentence is a separate point of compliance.

This fact is supported by the language of the Permits themselves. For example, in Order R8-2010-0033 Part XX.G provides: **"The Permittees must comply with all terms, requirements, and conditions of this Order. Any violation of this Order constitutes a violation of the CWA, its regulations and the California Water Code, and is grounds for enforcement action . . . ."** (emphasis added). Similar provisions are contained in the other two Riverside County MS4 Permits. Even without the strict Water Quality Standard language imposed under the Ninth Circuit's opinion, there is no "safe harbor" from liability under the Clean Water Act or, where applicable, the California Water Code, for any Permittee that fails to fully implement each the detailed and prescriptive requirements of its MS4 Permit.

There is a fundamental difference however, between fully complying with activities within the control and responsibility of the Permittees, such as monitoring, implementing BMPs and performing other programmatic requirements of the MS4 Permit; and being forced to guarantee that MS4 discharges will not cause or contribute to exceedances of Water Quality Standards in Receiving Waters, a guarantee that the Permittees' have no ability to make.

What the District and other MS4 Permittees seek is relief from what is essentially "guaranteed non-compliance" where a Permittee can be found in violation of their MS4 Permit even if the exceedance occurs at no fault of or failure by the Permittee, or put another way, even in circumstances where there is nothing a Permittee could have done to prevent that exceedance from occurring. In such a case, the Permittee can be held liable for potentially millions of dollars in legal costs, penalties and other expenses. We note that the City of Malibu, a city of only 13,000 residents, spent more than $2 million in defending against a citizen suit filed with respect to its MS4 Permit and more than $6 million to settle the case, including payment of $750,000 in attorney fees to plaintiffs. Given the tremendous financial challenges faced by every California municipality, including the District, the County of Riverside and the Permittee cities within the County, such a diversion of resources that otherwise would be directed at clean water programs or other vital municipal programs is a poor policy choice. And, as noted, it is not a policy choice that is required by the Clean Water Act, nor is it required by USEPA in their own Permits.

The District recognizes that regulatory enforcement actions and citizen suits are authorized by the Clean Water Act and that such suits may be an appropriate remedy where, for example, a Permittee has failed to comply with the programmatic requirements of its MS4 Permit. Where, however, the Permittees are complying with those requirements in good faith but, due to circumstances beyond

their control, their MS4 discharge causes or contributes to a Water Quality Standard exceedance in Receiving Waters, a citizen suit based on those exceedances potentially throws away the work done by the Permittees and the Water Boards under the MS4 Permit, as discussed below.

Misperception Number Three: MS4 can achieve compliance with strict Water Quality Standards.

MS4 Permittees cannot guarantee that discharges from their MS4s will in fact, not cause or contribute to an exceedance of Water Quality Standards in a Receiving Water. The monitoring conducted under our MS4 Permits reflects exceedances of various Water Quality Standards in Receiving Waters, and we understand that such results are typical for MS4 discharges around the state (please see Pages 2-3 of the CASQA comment letter dated November 2, 2012). The extreme variability of stormwater quality and quantity itself (which, in Southern California, arrives infrequently and from widely varying storm sizes) combined with a multitude of potential pollutant sources beyond a Permittee's ability to truly "control", make it impossible for a municipality to ensure that no discharges from its MS4 will ever cause or contribute to exceedances of Water Quality Standards in Receiving Waters. This was recognized by the Issue Paper released by State Board staff in preparation for the November 20th workshop, which found that as "the storm water management programs of municipalities have matured, **an increasing body of monitoring data indicates that water quality standards are in fact not being met by many MS4s**" (Issue Paper, Page 2 (emphasis supplied)).

Thus, even if municipal Permittees are to be held strictly liable for the ensuring that no discharges from their MS4s cause or contribute to an exceedance of Water Quality Standards, as the Ninth Circuit has interpreted the current RWL language, those Permittees have no ability to attain those standards. The reasons are several-fold and include the following:

1) Unlike an industrial NPDES Permittee, a municipal Permittee is not typically the source of the pollutants in the MS4 discharge (whether wet or dry). The municipality can regulate sources to some degree (through, for example, the operation of structural and non-structural BMPs and implementation of an Illegal Connection/Illicit Discharge program), but the municipality cannot guarantee that pollutants will not enter the MS4 and then be discharged into the Receiving Waters.

2) Municipalities cannot control natural sources of pollutants that are discharged through the MS4. Monitoring has indicated that many pollutants are likely from natural and not anthropogenic sources.

3) While Permittees conduct extensive public education programs as part of their MS4 programs, municipalities cannot "control" human behavior, or "prevent" an individual from taking an action that might cause pollution to enter the MS4. As an example, a resident may, despite all ordinances, regulations, potential penalties or enforcement, public outreach, available BMPs, etc., choose not to pick up after their pets, and

stormwater may, through no fault of the Permittee, pick up animal waste and deposit into the MS4.

4) MS4 Permittees cannot "prevent" flows from entering their MS4. To protect the health and property of their residents, MS4 operators must allow the legitimate flows of water into their drains. This is especially true for the District, which is charged directly by the Legislature [in Water Code App. §48-9] with the task of taking necessary steps to protect the people, properties and watersheds of Riverside County from the negative impacts of flooding. The District cannot, in effect, cause flooding by preventing flows from entering their storm drain, simply because such flows may contain pollutants that cause a violation of the Receiving Waters Limitation provisions of their MS4 Permits. In fact, California law requires downstream property owners (such as MS4 operators) to accept flows from upstream property owners.

5) Further, the authorities granted to flood control districts, such as this District, by the Legislature are narrow and do not include the authority to condition or regulate the quality or nature of stormwater runoff discharged from up gradient properties. This responsibility is appropriately assigned by the Legislature to the Regional Boards.

Similarly, MS4 Permittees cannot guarantee compliance with Water Quality Standards in dry weather. "Alternative 4" in the staff's Issue Paper suggests an alternative RWL approach that would not extend the iterative approach to dry weather discharges. The District submits that this alternative does not reflect the reality of urban runoff. Monitoring conducted under the Riverside County MS4 Permits reflects exceedances of Water Quality Standards during dry weather as well as wet weather. There is no justification for imposition of strict liability for exceedances during such conditions, for the following reasons:

1) During dry weather, other NPDES-permitted discharges continue to flow into the Receiving Waters. For example, much of the flow in the Santa Ana River during dry weather conditions is from non-MS4 sources, such as publicly owned treatment works. Additionally, numerous other separate NPDES-permitted discharges will occur, potentially at concentrations of pollutants that exceed Water Quality Standards. Evidence generated during the *NRDC* case involving the County of Los Angeles, for example, indicated that NPDES permits covering hundreds of these dischargers, including POTWs allowed the discharge of pollutants at concentrations *greater* than Water Quality Standards. Because of these discharges, which are legal and authorized by the Regional Boards, the MS4 Permittees have essentially no more control over compliance with Water Quality Standards in dry weather than they would have during wet weather conditions.

2) Accidental or even intentional illicit discharges by third parties into the MS4 obviously can occur during dry weather as well as wet weather. Such discharges would potentially have an even greater impact on sampling, since they are not diluted by large volumes of stormwater. For example, a vehicular accident recently caused hundreds of gallons of

asphalt tar to enter Sandia Creek, a Receiving Water in Riverside County. While this spill was not discharged through an MS4, if the vehicular accident had occurred in another portion of the watershed, the spill could feasibly have entered into and been discharged from an MS4. Similarly in many places throughout the State, sanitary sewer systems are owned and operated by special districts that have no relation to the MS4 Permittees that own or operate the MS4 systems. Nevertheless, an overflow of such sanitary sewer systems may cause an unavoidable discharge into, and from a Permittee-owned MS4. Such accidental or illicit discharges cannot be "prevented" or "controlled" by the Permittees except to the extent that they can be cleaned up or blocked if promptly reported. However, if the discharge has reached Receiving Waters and caused a measured exceedance of Water Quality Standards, under the Ninth Circuit's interpretation, liability for civil penalties, injunctive relief and attorneys fees will attach to the MS4 Permittee.

3) Enforcing strict Water Quality Standard limits in dry or wet weather is counter-productive to the watershed planning-based MS4 Permits currently being promulgated by many regional water boards. Enforcing such limits will divert Permittee attention and resources from watershed-based, monitoring-heavy compliance programs, as will be discussed in greater detail below.

In essence, under the Ninth Circuit's interpretation of the current RWL language, the District, and potentially every other MS4 Permittee in the state, is in violation of its Permit any time that an exceedance of a Water Quality Standard is recorded and attributed to a discharge from its MS4. This means that the Regional Water Boards have issued, and continue to adopt permits that include RWL language **which cannot be complied with**. The Clean Water Act, however, does not require Permittees to achieve the impossible. *See, e.g., Hughey v. JMS Development Corp.* (11th Cir. 1996) 78 F.3d 1523, 1530 ("In interpreting the liability provisions of the CWA, we realize that Congress is presumed not to have intended absurd (impossible) results.").

Misperception Number Four: The Current RWL Language is more Protective of Receiving Water Quality.

This statement is not only untrue but maintaining the current RWL language actually **impedes** efforts to protect Receiving Water Quality.

We understand that some stakeholders believe that there should be Numeric Effluent Limitations (NELs) contained in the MS4 Permits for purposes of accountability. In response, we note that many MS4 permits now contain numeric Stormwater and Non-stormwater Action Levels ("SALs" and "NALs") or other numeric targets or goals, the exceedance of which trigger specific compliance responses by the Permittees. It is these action levels (which were advocated by the Blue Ribbon Panel established by the State Board to investigate the appropriateness of NELs in MS4 permits) which provide such "numeric" accountability. This is in addition to the numerous other compliance documentation and reporting provisions required of MS4 Permittees that also provide measures of accountability.

More importantly, the current RWL language as interpreted by the Ninth Circuit actually impedes efforts by municipalities to protect water quality. First, by requiring immediate compliance, the language undermines efforts to bring Water Quality Standard-impaired waterbodies into compliance through the Total Maximum Daily Load ("TMDL") program. TMDLs are designed with the recognition that, due to the complexity of the issues causing the waterbody to be impaired in the first place, meeting these requirements cannot be achieved immediately. Therefore, TMDL compliance plans include timelines to achieve such compliance over periods of years and sometimes decades.

Second, most MS4 permits have begun incorporating sophisticated watershed management plans, which prioritize pollutants by waterbody and attempt, through aggressive monitoring and source identification efforts, to identify and address the sources of those prioritized pollutants. Municipalities subject to strict RWL language will have no ability to prioritize pollutants, since they must address any pollutant that exceeds a Water Quality Standard, irrespective of the relative impact that that discharge may have had upon the environment or beneficial uses. Moreover, these watershed management plan approaches employ cooperative monitoring and other watershed-based approaches. Permittees faced with potential liability for any exceedance of Water Quality Standards in Receiving Waters that may be caused or contributed to by discharges of their MS4s, will not likely volunteer to cooperate on any watershed-based approach, if cooperation could subject them to additional unnecessary liability.

Third, in a citizen suit brought under the Clean Water Act, a federal judge is free to impose any appropriate injunctive relief to enforce a permit (33 U.S.C. § 1365(a)). Thus, for example, a court could ignore the provisions of a MS4 permit in ordering municipal defendants to address Water Quality Standard exceedances in Receiving Water. This means that the thousands of people-hours invested in the Permit's development, implementation and oversight by municipalities, the Regional Water Boards and other stakeholders would be wasted. In essence, under the Ninth Circuit's reading of the RWL language, all other language in an MS4 permit appears to be superfluous, since the RWL language would control all compliance efforts. This result, of course, is not required by plain language of the Clean Water Act.

Fourth, if a municipality is in unavoidable and automatic non-compliance with the requirements of its MS4 Permit, it will be unable to justify budgeting for water quality management programs and BMPs otherwise required by the Permit as the municipality will simply receive no benefit from making compliance investments. To gain public support for stormwater programs, a municipality must demonstrate to its residents that such investments will constitute compliance with the Permit.

Discussion of Alternatives

The State Board staff's Issue Paper sets forth five alternatives for consideration. Alternative 1, no change in the current RWL language, is completely unacceptable to the District (and, we believe, to other municipalities across the state) because it fails to address the "guaranteed non-compliance" problem of the current language.

Alternative 2, which proposes to maintain the language that puts the MS4 Permittees in a situation of unavoidable and potentially "guaranteed" non-compliance, but would add greater specification as to how the iterative process might be carried out, is also unacceptable as the MS4 Permittees will still have no viable means to ensure their compliance with the RWL language. While the District does not object in principle to RWL language that spells out clearly, and in achievable terms, what is required of MS4 Permittees when exceedances are recorded, such a change alone does not address the fundamental issues identified in this letter.

Alternative 3, which proposes to provide an iterative process for compliance with the RWL only for pollutants being addressed by dischargers in compliance with an approved TMDL, is better than the first two alternatives, but is still entirely insufficient. By failing to provide a viable means for compliance with the RWL language for non-TMDL pollutants, this alternative language would force Permittees into unavoidable non-compliance, and require them to redirect their efforts and resources away from the TMDL activities, to those other pollutants, due to the strict liability attached to those exceedances. This would be a poor policy choice, as pollutants that are not subject to a TMDL may have significantly less, or even no impact on beneficial uses in the Receiving Waters, as noted in the CASQA comment letter.

Alternative 4, which excludes dry weather discharges from the iterative process to comply with the RWL, is unacceptable for the reasons previously set forth regarding an MS4 Permittees inability to truly "prevent" or "control" accidental or illegal dry weather discharges.

Alternative 5, which provides viable means for compliance with the RWL, for all types of MS4 discharges, is the only viable solution among the alternatives presented by State Board staff. In an era of limited budgets, the only and best way to make progress toward improving the quality our Receiving Waters, is to provide MS4 Permittees the ability to prioritize their efforts, as required in the Watershed Management Plan provisions contained in the most recent MS4 Permits, including the Los Angeles County Permit and the proposed Regional Permit for the San Diego Regional Water Board. As previously discussed, such prioritization cannot occur in the context of strict liability for the exceedance of Water Quality Standards in the Receiving Waters. For all of the reasons set forth in this letter, no other alternative makes policy sense or is congruent with the Maximum Extent Practicable standard in the Clean Water Act.

The District would add that Alternative 5 should additionally incorporate the concept of achieving RWL compliance through watershed management plans, and requests the Board to direct staff to work with stakeholders to ensure that any revised RWL language does not force intermittent or minor exceedances of Water Quality Standards to become de-facto higher priorities than those set by the watershed stakeholders.

In summary, the District supports CASQA, the California State Association of Counties and other municipal stakeholders in advocating for a fully iterative and viable approach to compliance with RWL language in both wet and dry weather conditions. Only when such an approach is in place and endorsed by the State Board will Permittees, including the District, feel confident that they can focus

fully on efforts to address pollutants in discharges into and from their MS4s, and not on preparing for costly and pointless litigation.

The District therefore, respectfully requests the State Board direct its staff to commence development of new language providing for an enforceable, iterative and viable process for MS4 Permittees to comply with the RWL language included in MS4 permits.

We wish to thank you and State Board staff for your consideration of these comments and any further comments, written or oral, that the District may make on these important issues.

Very truly yours,

Steve Thomas

for WARREN D. WILLIAMS
General Manager-Chief Engineer

CP:cw
P8/150189

EXHIBIT D

FILED
JAN - 3 2013
CLERK, U.S. DISTRICT COURT
ALEXANDRIA, VIRGINIA

IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF VIRGINIA
Alexandria Division

VIRGINIA DEPARTMENT OF TRANSPORTATION, ET AL, Plaintiffs,	
-v-	Civil Action No. 1:12-CV-775
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, ET AL, Defendants.	

Memorandum Opinion

Before the Court is the Plaintiffs' motion for judgment on the pleadings under Federal Rule of Civil Procedure 12(c). The Defendants opposed the motion, and the Plaintiffs replied. The Court heard oral arguments on December 14, 2012 and now issues this memorandum opinion and accompanying order granting the Plaintiffs' motion.

Background

The Clean Water Act, 33 U.S.C. § 1251 et seq., establishes the basic structure for regulating discharge of pollutants into the waters of the United States, and provides certain mechanisms to improve and maintain the quality of surface waters.

One such mechanism is the requirement that states identify "designated uses" for each body of water within their borders, as well as "water quality criteria" sufficient to support those uses. 33 U.S.C. § 1313(c)(2)(A). The Environmental Protection Agency ("EPA") evaluates the uses and criteria developed by the states, and either approves them or else proposes and

promulgates its own set of standards. § 1313(c)(3).

Once the standards are in place, each state is required to maintain a list—also subject to approval or modification by EPA—of its waterbodies that are "impaired" because they do not meet their respective water quality criteria. 33 U.S.C. § 1313(d)(1)(A). For each waterbody on the impaired list, the state is required to establish a set of total maximum daily loads ("TMDLs") sufficient to bring the body back into compliance with its water quality criteria. § 1313(d)(1)(C). Each TMDL establishes the maximum amount of a pollutant that may be added to the waterbody daily from all sources (runoff, point sources, etc.). EPA is required to publish a list of pollutants suitable for maximum daily load measurement, § 1314(a)(2)(D), and it has determined that *all* pollutants are suitable for TMDLs, *see* Total Maximum Daily Loads Under Clean Water Act, 43 Fed. Reg. 60,662. Therefore, any pollutant that falls within the relatively broad definition of "pollutant" set forth in § 1362(6) may be regulated via TMDL. EPA can approve or modify as it sees fit TMDLs proposed by the states. § 1313(d)(2).

Here the state in question is Virginia, and the waterbody is a 25-mile long tributary of the Potomac River, located in Fairfax County, called Accotink Creek. The creek has been the subject of litigation in the past that is not relevant to this matter except the result: EPA was required to set TMDLs for Accotink Creek once Virginia failed to do so by a certain date. Specifically, the creek had been identified as having "benthic impairments," which is to say the community of organisms that live on or near the bottom of the creek were not as numerous or healthy as they should be. EPA was to set appropriate TMDLs to improve the health of the benthic community in Accotink Creek.

On April 18, 2011, EPA established a TMDL for Accotink Creek which limited the flow rate of stormwater into Accotink Creek to 681.8 ft^3/acre-day. The TMDL was designed to

regulate the amount of sediment in the Accotink, because EPA believed sediment was a primary cause of the benthic impairment. Both parties agree that sediment is a pollutant, and that stormwater is not. EPA refers to stormwater flow rate as a "surrogate" for sediment.

The Plaintiffs are now challenging the TMDL on multiple grounds, but presently before the Court is a single issue: Does the Clean Water Act authorize the EPA to regulate the level of a pollutant in Accotink Creek by establishing a TMDL for the flow of a nonpollutant into the creek?

Analysis

I. Standard of Review

Count I of the complaint, at issue here, is brought under the Administrative Procedures Act. *See* Comp. ¶ 169. The APA "confines judicial review of executive branch decisions to the administrative record of proceedings before the pertinent agency." *Shipbuilders Council of Am. V. U.S. Dept. of Homeland Sec.*, 770 F. Supp. 2d 793, 802 (E.D. Va. 2011). As such, the district court "sits as an appellate tribunal," and APA claims can be resolved equally well in the context of Rule 12 or Rule 56. *Univ. Med. Ctr. Of S. Nev. V. Shalala*, 173 F.3d 438, 441 n. 3 (D.C. Cir. 1999).

Because Count I presents a question of statutory interpretation, the Court reviews EPA's decision using the two-step analysis set forth in *Chevron, U.S.A., Inc. v. NRDC, Inc.*, 467 U.S. 837 (1984). For a given question of statutory interpretation, the first step under *Chevron* is to determine whether Congress addressed the "precise question at issue." 467 U.S. at 842. "If the intent of Congress is clear, that is the end of the matter . . . ." *Id.* If the Court cannot find that Congress has squarely addressed the question, the Court must move to Chevron's second step. In

the second step of statutory construction under *Chevron*, the Court must determine whether the agency's interpretation of the statute is "permissible." *Id.* at 843. The agency's construction is permissible if it is reasonable, but it need not be what the Court considers the *best* or *most reasonable* construction. *See id.* at 845. The Court is not to simply impose its own construction on the statute, but instead it gives deference to any reasonable statutory construction by the agency. *Id.* at 843.

II. Chevron Step One

Whether statutory ambiguity exists so that the issue cannot be settled at *Chevron's* first step is for the Court to decide, and the Court "owe[s] the agency no deference on the existence of ambiguity." *Am. Bar Ass'n v. FTC*, 430 F.3d 457, 468 (D.C. Cir. 2005). The Court begins the inquiry by "employing traditional tools of statutory construction." *Chevron*, 467 U.S. at 843 n.9. As always, the analysis begins with the text of the statute. *Nat'l Elec. Mfrs. Ass'n v. U.S. Dept'l of Energy*, 654 F.3d 496, 504 (4th Cir. 2011).

The text of the statute that requires states to establish their own TMDLs, 33 U.S.C. § 1313(d)(1)(C), is:

> Each State shall establish for the waters identified in paragraph (1)(A) of this subsection, and in accordance with the priority ranking, **the total maximum daily load, for those pollutants which the Administrator identifies** under section 1314(a)(2) of this title as suitable for such calculation. Such load shall be established at a level necessary to implement the applicable water quality standards with seasonal variations and a margin of safety which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality. (emphasis added)

The next subsection, § 1313(d)(2), grants EPA the authority to set TMDLs when the state

has not done so adequately. "Pollutant" is a statutorily defined term. 33 U.S.C. § 1362(6).

The Court sees no ambiguity in the wording of this statute. EPA is charged with establishing TMDLs for the appropriate pollutants; that does not give them authority to regulate nonpollutants. The parties agree that sediment is a pollutant under 33 U.S.C. § 1362(6), and stormwater is not. Then how does EPA claim jurisdiction over setting TMDLs for stormwater?

EPA frames the stormwater TMDL as a surrogate. EPA's research apparently indicates that the "[sediment] load in Accotink Creek is a function of the amount of stormwater runoff generated within the watershed." Def. Opp. at 8. And EPA believes that framing the TMDL in terms of stormwater flow rate is superior to simply expressing it in terms of maximum sediment load.

The DC Circuit has considered and rejected a similar attempt by EPA to take liberties with the way Congress intended it to express its TMDLs. In *Friends of the Earth, Inc. v. Env. Protection Agency*, EPA had promulgated TMDLs for the Anacostia River that expressed the maximum load of certain pollutants in terms of annual and seasonal amounts. 446 F.3d 140, 143 (D.C. Cir. 2006). The court found that expressing a TMDL in terms of annual or seasonal maximums was not allowed, because the statute granted authority only for daily loads. *Id.* at 148. The court reached its conclusion even though EPA apparently made a strong argument that expressing TMDLs in terms of annual or seasonal loads was an effective and reasonable approach. *See id.* Presumably a daily load could have been derived by simply dividing the annual load by 365, yet the court still required expression in the terms dictated by Congress.

Here too, EPA hopes to express a TMDL in terms other than those contemplated by the statute, arguing that such an expression is the most effective method. But, as *Friends of the Earth* illustrates, EPA may not regulate something over which it has no statutorily granted power—

annual loads or nonpollutants—as a proxy for something over which it *is* granted power—daily loads or pollutants.

EPA's argument that its surrogate approach should be allowed because the statute does not specifically forbid it fails. EPA is not explicitly forbidden from establishing total maximum *annual* loads any more than they are explicitly barred from establishing TMDLs for nonpollutants. The question is whether the statute grants the agency the authority it is claiming, not whether the statute explicitly withholds that authority. And in this case, as in *Friends of the Earth*, the statute simply does not grant EPA the authority it claims.

The dicta in *Weyerhaeuser Co. v. Costle* is not as helpful to EPA's case as it would like. 590 F.2d 1011, 1022 n.6 (D.C. Cir. 1978). It is true that the court said in a footnote "[i]t is well recognized that EPA can use pollution parameters that are not harmful in themselves, but act as indicators of harm." *Id.* But in that case, the non-harmful pollution parameters the EPA sought to regulate were components of the effluent commonly discharged from paper mills, *id.* at 1022, making them effluents themselves. And power to regulate effluents is expressly granted to the EPA in the relevant statutory section. *See* 33 U.S.C. § 1314(b).

EPA would like to create the impression that Congress has given it loose rein to determine exactly what it could and could not regulate. On page 16 of its opposition to this motion, EPA points out that "Congress authorized EPA to determine which pollutants were suitable for TMDL calculation and measurement." (Internal quotes removed). While this may be true, EPA glosses over the fact that 33 U.S.C. § 1314(a)(2)(D) only gives EPA the power to regulate pollutants as that term is defined—by Congress—elsewhere in the statute. And, as discussed above, sediment is a pollutant for these purposes, but stormwater is not.

In a similar vein, EPA regulations which imply that the agency has discretion to set the

TMDL as it sees fit do not bear on the question now before the Court. EPA has promulgated a regulation allowing TMDLs to be "expressed in terms of either mass per time, toxicity, or other appropriate measure," 40 C.F.R. § 130.2(i), and another that allows TMDLs to be expressed as a "property of pollution," 50 Fed. Reg. 1774, 1776 (Jan. 11, 1985). But, EPA citing these regulations to demonstrate that the surrogate TMDL approach is permissible is mere bootstrapping. To the extent the regulations allow EPA to set TMDLs for nonpollutants, they exceed the statutory authority of EPA.

The plain language of the statute trumps all, but legislative history also supports Plaintiffs' argument. Congress's intent to limit EPA's discretion in this context is evidenced by the committee record cited by Plaintiffs, which has also been used by the Ninth Circuit, in which Senator Randolph, Chairman of the Senate committee that amended the act in 1972, explained, "We have written into law precise standards and definite guidelines on how the environment should be protected. We have done more than just provide broad directives [for] administrators to follow." Pl. Mot. 7, *citing Nw. Envtl. Def. Ctr. v. Brown*, 640 F.3d 1063, 1072 (9th Cir. 2011). Congress created a statutory scheme that included a precise definition of the word "pollutant," and then gave EPA authority to set TMDLs for those pollutants. Senator Randolph's comments strongly imply that Congress did not intend anything more or less than what is written in the statute.

The Court considers the language of 33 U.S.C. § 1313(d)(1)(C) to be unambiguous. Congress has spoken directly on the question at issue, and its answer is that EPA's authority does not extend to establishing TMDLs for nonpollutants as surrogates for pollutants. The legislative history of the CWA is consistent with this reading. Therefore, this Court finds EPA's interpretation of § 1313 and the related provisions to be impermissibly broad based on analysis

under the first step of *Chevron* analysis.

III. Chevron Step Two

Because the Court considers Congress's intent to be clear and unambiguously expressed by the language of the statute, it need not move to the second step of *Chevron* analysis. But the Court notes that there is substantial reason to believe EPA's motives go beyond "permissible gap-filling."

Page 9 of EPA's opposition says, "stormwater flow rates as a surrogate would more effectively address the process by which sediment impairs aquatic life in Accontink Creek." If the sediment levels in Accotink Creek have become dangerously high, what better way to address the problem than by limiting the amount of sediment permitted in the creek? If sediment level is truly "a function of" the amount of stormwater runoff, as EPA claims, then the TMDL could just as easily be expressed in terms of sediment load.

In fact, the Board of Supervisors of Fairfax County argued at the December 14th hearing (without objection from EPA) that EPA has approved 3,700 TMDLs for sediment nationwide, and in Virginia has addressed 111 benthic impairments with TMDLs. None of them regulated the flow rate of stormwater. By comparison, EPA has tried out its novel approach of regulating sediment via flow in only four instances nationwide, and all four attempts were challenged in court. One has settled, the other three are still pending.

The Court suspects that the decision to regulate stormwater flow as a surrogate for sediment load would not constitute a permissible construction of § 1313(d)(1)(C), even given the deference due at *Chevron's* second step. This is especially likely because EPA is attempting to increase the extent of its own authority via flow TMDLs, which courts must examine carefully.

See Brown & Williamson Tobacco Corp. v. Food & Drug Admin., 153 F.3d 155, 161-62 (4th Cir. 1998). EPA's attempt to set TMDLs for nonpollutants probably goes beyond "permissible gap-filling" and is instead an impermissible construction of the statute.

Conclusion

The language of § 1313(d)(1)(C) is clear. EPA is authorized to set TMDLs to regulate pollutants, and pollutants are carefully defined. Stormwater runoff is not a pollutant, so EPA is not authorized to regulate it via TMDL. Claiming that the stormwater maximum load is a surrogate for sediment, which is a pollutant and therefore regulable, does not bring stormwater within the ambit of EPA's TMDL authority. Whatever reason EPA has for thinking that a stormwater flow rate TMDL is a better way of limiting sediment load than a sediment load TMDL, EPA cannot be allowed to exceed its clearly limited statutory authority. For these reasons, the Plaintiffs' motion for Rule 12(c) judgment on the pleadings on Count I of their complaint is granted.

January 3, 2013
Alexandria, Virginia

/s/ LOG
Liam O'Grady
United States District Judge

FILED
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CLERK, U.S. DISTRICT COURT
ALEXANDRIA, VIRGINIA

IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF VIRGINIA
Alexandria Division

VIRGINIA DEPARTMENT OF TRANSPORTATION, ET AL, Plaintiffs, -v- UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, ET AL, Defendants.	Civil Action No. 1:12-CV-775

Order

In accordance with the memorandum opinion that accompanies this order, it is now **ORDERED**:

1. Plaintiffs' motion (Dkt. No. 29) for judgment on the pleadings as to Count I of the complaint is **GRANTED**.
2. The clerk shall enter judgment in favor of the Plaintiffs.
3. The Accotink Creek TMDL is remanded to EPA for reconsideration consistent with this order.

January 3, 2013
Alexandria, Virginia

/s/
Liam O'Grady
United States District Judge

November 19, 2014

San Diego Regional Water Quality Control Board
2375 Northside Drive, Ste. 100
San Diego, CA 92108-2700 SENT VIA EMAIL: Laurie.Walsh@waterboards.ca.gov

Attn: Ms. Laurie Walsh

Subject: Comment – Tentative Order No. R9-2015-0001, Place ID:658018LWalsh

Dear Ms. Walsh,

On behalf of the members of the Industrial Environmental Association, thank you for this opportunity to provide the following comment regarding Tentative Order No. R9-2015-001. We believe additional clarification is necessary to help avoid any confusion in the future regarding the Board's intentions for assigning waste load allocations.

Tentative Order No. R9-2015-0001 (An Order Amending the Regional Municipal Separate Storm Sewer (MS4) Permit for the San Diego Region (Order No. R9-2013-0001)) contains new requirements for implementation of the Total Maximum Daily Load (TMDL) for sediment in the Los Penasquitos Lagoon (Attachment E, Section 7). This TMDL was adopted by the San Diego Regional Water Quality Control Board (Resolution R9-2012-0033) on June 13, 2012 and has been approved by the State Water Resources Control Board, the California Office of Administrative Law and the US EPA-Region 9. Its effective date is 7/14/14.

The TMDL establishes a number of "Responsible Parties" including, but not limited to, the County of San Diego and the cities of San Diego, Poway and Del Mar, which are collectively assigned a single waste load allocation (WLA). The responsible parties are collectively responsible for meeting the WLA of 2,580 tons per year.

Table 7.1 in Section 7 (Attachment E) identifies the "Final Effluent Limitations as Expressed as Annual Loads MS4 Discharges to Los Penasquitos Lagoon". The identified limitation is "2,580 tons/yr." of "Sediment". Since this effluent limit is the same as the WLA for all of the TMDL's Responsible Parties, this could be misinterpreted to imply that the Responsible Copermittees have been allocated the entire WLA, leaving no (i.e., "0") WLA to the other Responsible Parties under the approved TMDL.

To clarify in the MS4 permit that the WLA is shared amongst all of the Responsible Parties, we request the following language changes in Attachment 7:

Section 7.b.2.b. - Revise to state:

"(b) Final Effluent Limitations

Discharges from the MS4s (together with the other Responsible Parties in Resolution R9-2012-0033) containing pollutant loads that do not exceed the following effluent limitations…".

Section 7.b.2.b.(Table 7.1) - Revise to state:

"Table 7.1

Final Effluent Limitations as Expressed as Annual Loads in MS4 Discharges (together with the other Responsible Parties in Resolution R9-2012-0033) to Los Penasquitos Lagoon"

Should you have any questions regarding this recommendation, please feel free to contact me directly. In the meantime, thank you for your consideration.

Sincerely,

Jack Monger
Executive Director

SAN DIEGO UNIFIED PORT DISTRICT

OFFICE OF THE GENERAL COUNSEL

November 19, 2014

VIA EMAIL
Laurie.Walsh@waterboards.ca.gov

Ms. Laurie Walsh
San Diego Regional Water Quality Control Board
2375 Northside Drive, Suite 100
San Diego, CA 92108

Re: Comments - Tentative Order No. R9-2015-0001, Place ID: 658018LWalsh

Dear Ms. Walsh:

The San Diego Unified Port District ("Port District") respectfully submits the following comments on Tentative Order R9-2015-0001, *An Order Amending Order No. R9-2013-001, NPDES No. CAS010266 National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* ("Tentative Order").

The Port District appreciates the time, energy, and thoughtfulness devoted by the San Diego Regional Water Quality Control Board ("Regional Board") to regulate MS4 discharges in a manner that protects human and ecological health while also balancing the substantial economic and practicable feasibility constraints faced by fellow public agencies, such as the Port District. The Port District continues to work with the other San Diego County MS4 copermittees to implement the regional MS4 permit and looks forward to working with the Regional Board to accomplish our many shared goals for San Diego Bay.

The Tentative Order amends but repeats verbatim provisions of the MS4 permit previously issued by the Regional Board, Order No. R9-2013-001, regarding which the Port District respectfully submitted comments and a currently pending petition to the California State Water Resources Control Board ("State Board"). The Port District's comments on Order No. R9-2013-001 apply with equal force to the Tentative Order. Accordingly, the Port District repeats and incorporates by reference those previously submitted comments with regard to the Tentative Order, which are set forth in letters

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dated September 14, 2012, and January 11, 2013, and in the transcript from the hearing that took place before the Regional Board on April 10 and 11, and on May 8, 2013. The Port District also incorporates by reference its position on these provisions as set forth in its petition to the State Board, submitted on June 7, 2013 (Petition No. A-2254(o)). Copies of the Port District's previously submitted comment letters are enclosed for your convenience.

Please do not hesitate to contact me should you have any questions.

Sincerely,

John Carter
Deputy General Counsel

cc: Thomas A. Russell, General Counsel
John Bolduc, Acting President/CEO
Randa Coniglio, Executive Vice President
Jason Giffen, Director, ELUM

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Scott E. Patterson, Esq.
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September 14, 2012

VIA EMAIL
lwalsh@waterboards.ca.gov
wchiu@waterboards.ca.gov

Laurie Walsh
Wayne Chiu
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Re: Comments on the Administrative Draft of Permit Requirements for Discharges from the Municipal Separate Storm Sewer System in the San Diego Region (Tentative Order No. R9-2012-0011)

Dear Ms. Walsh and Mr. Chiu:

The San Diego Unified Port District (Port) submits the following comments supplementing other comments by the Port to the Administrative Draft of Permit Requirements for Discharges from the Municipal Separate Storm Sewer System (MS4) in the San Diego Region (the Permit). We note at the outset that the Port supports the objectives of the Permit. We wish simply to address one point regarding the current draft Permit. The Permit should clarify that each Copermittee is responsible only for discharges from that portion of the MS4 which it owns and operates, not for discharges from all MS4 facilities within that Copermittee's jurisdictional boundaries.

The Clean Water Act upon which the MS4 permit is grounded defines "copermittee" as "a permittee to an NPDES permit that is only responsible for permit conditions relating to the discharge *for which it is operator*." (40 Code of Federal Regulations §122.6(b)(1) [emphasis added].) The Regional Board's recent September 7, 2012, letter addressing its authority states that "[t]he federal regulations make it clear that Copermittees need only comply with permit conditions relating to discharges from the MS4s ***for which they are operators***." (Emphasis added, citing 40 CFR Part 122.26(a)(3)(vi).) The Port is unaware of any legal authority that equates operation with jurisdictional location. Nor is such an interpretation consistent with the

common and plain meaning of the word "operate." "Operate" strongly connotes the performance of a function or exertion of physical control or power over the object being operated.

This is a potentially significant distinction for the Port. The Port's jurisdiction overlaps with the jurisdiction of a number of Copermittees. Due to this fact, a significant amount of the MS4 facilities within the Port's geographic jurisdiction are not operated by the Port, but are instead owned and/or operated by others under easements or other forms of ownership and operation. Accordingly, the Permit should include language affirming the intent of the CWA on this point.

This distinction is also not a hypothetical concern, as the Regional Board has previously construed the Port's responsibility for MS4 facilities more broadly than the plain language of the CWA allows. The Port would propose the following clarifying language, which could be placed in the cover for the Permit, just ahead of Table 2 and just following the sentence added by the Copermittees in their proposed redline version of the Permit referencing 40 CFR §122.21(a)(vi):

"The location of an MS4 facility within any Copermittee's jurisdiction boundaries does not, of itself, make the Copermittee an owner or operator of that MS4 facility."

We emphasize that the Port strongly supports the objectives of the Permit. We welcome the opportunity to respond to any questions the Regional Board may have with respect to our comments. Please contact the undersigned or Bill Brown at (760) 633-4485 if you have any questions or would like any clarification of the Port's position.

Very truly yours,

Scott E. Patterson

SEP/jd
cc: William D. McMinn, Esq.

Unified Port
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January 11, 2013

Mr. Wayne Chiu
San Diego Regional Water Quality Control Board
9174 Sky Park Ct., Suite 100
San Diego, CA 92123-4340

Submitted via email: wchiu@waterboards.ca.gov

Subject: Comment – Tentative Order No. R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu

Dear Mr. Chiu,

The San Diego Unified Port District (Port) respectfully submits this comment letter regarding Tentative Order R9-2013-0001 National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) in the San Diego Region (Tentative Order).

The Port has been actively involved in the development process of the Tentative Order and we support the Regional Board's Water Quality Improvement Plan (WQIP) concept in the Tentative Order with its proposed flexibility to focus resources on the priority problems in the watershed. However, the Tentative Order also contains prescriptive requirements that are in addition to the WQIP and would be very costly and at times infeasible to implement. With constrained budgets and staff resources, these additional costs may unintentionally limit the ability to conduct other water quality efforts having greater environmental benefits for the Bay.

The Port has worked alongside the other San Diego County Municipal Copermitees (Copermitees) to collectively submit a red-line strikeout document recommending changes to the permit language. With the exception of the proposed WQIP-based compliance option, the Port fully supports the recommendations provided in the Copermittee red-line strike-out. This document will be submitted through the County of San Diego. The changes help to clarify permit compliance points and provide a more efficient monitoring program to support the end goal of improving water quality. We strongly encourage you to consider the Copermittee's proposal and the Port's comments listed below.

1. Jurisdictional Accountability

The Port is committed to our role as an environmental steward of San Diego Bay. That commitment is reflected in a number of programs both regulatory driven and beyond compliance, that are focused on protecting and rehabilitating the Bay's resources. The

Port's Stormwater Program is an important part of this effort. At the same time we recognize that discharges from upstream jurisdictions impact our efforts to protect bay water quality. San Diego Bay is the receiving water body for a large watershed in which the Port is located at the extreme end. We are aware that most discharges from the MS4 to San Diego Bay are from storm drain easements under the authority of other jurisdictions. With this in mind, we support jurisdictional accountability throughout the watershed and we encourage the Regional Board to incorporate these concepts throughout the Permit.

2. WQIP-based Compliance and Modifications to Provision A

The Regional Board staff has presented the WQIP as an iterative process that allows for adaptive management so that compliance with water quality standards is achieved over time. It is the Port's opinion that the WQIP process, as currently proposed in the Tentative Order, adequately allows for compliance based upon WQIP implementation. However, what is missing is the linkage between the Discharge Prohibitions, Effluent Limitations, and Receiving Water Limitations in Provision A and the iterative process set forth in the WQIPs.

Modifications to Provision A are required to ensure implementation of that iterative process. Without a modification, jurisdictions are potentially open to third-party lawsuits and their resources may be directed to addressing a one-time exceedance. The Port requests that the Permit establishes a clear linkage between compliance with Provision A to compliance with the WQIP and the other Provisions of the Permit.

3. WQIP Development Timeline

The Tentative Order proposes an aggressive schedule for WQIP development and JURMP program updates. The timeline for WQIP development (9 months) does not allow for adequate time between due dates for required deliverables. Concerns with the timeline are as follows:

- Formal agreements such as a Memorandum of Understanding and/or Cost Share agreements will be required within the watershed groups. Although the preliminary work may begin before permit adoption, the process cannot be completed until the Permit is adopted and the requirements are known. These agreements are integral to upholding jurisdictional accountability within the watershed groups. This process will take an estimated three months.

- The water quality priorities and goals are due within the first six months, followed by a two month public comment period. While this first deliverable deadline may be feasible, potential modifications to the priorities and goals may be necessary as a result of the public comments received. Should modifications to the priorities and goals be required, there will be little time to develop the strategies and schedules.

- Time is needed to address comments from the public or Regional Board throughout the process and to obtain management and jurisdictional governing body approvals. Governing body approvals take an average of three months.

The Port requests that the timeframe for permit deliverables is extended as outlined in the Copermittee's revised WQIP development schedule in the red-line strike-out submittal.

4. Illegal Discharges: Air Conditioning Condensation

The Tentative Order requires air conditioning condensation to be directed to landscaped areas or other pervious surfaces where feasible. Substantial structural modifications may be required to meet this requirement and discharges of this type may not be a priority pollutant source that is identified in the WQIP. The Port requests that the requirement to direct air conditioning condensation to landscaping be encouraged and not required.

5. Retention Requirement for Priority Development Projects

As proposed in the Tentative Order, Priority Development Projects are to implement BMPs to retain the volume of runoff equivalent to the design capture volume or the estimated volume that would be retained if the site was fully undeveloped. Due to the Port's location at the headwaters of San Diego Bay, a high groundwater table and existing soils with low infiltration rates, retention is not technically feasible on Port tidelands. The Port is at the bottom of the watershed so consequently retained runoff must be stored for a longer period of time after the peak of a storm. Large underground storage tanks to store the runoff would be infeasible because most tanks would have significant design constraints due to the high groundwater table, flat topography, and high receiving water elevation, making gravity flow drainage systems nearly impossible. Above ground storage tanks would be infeasible because most of Port tidelands are built-out and there is limited room for these facilities. Also, above ground storage tanks pose a vector hazard and a visual nuisance.

Similarly, the proposed alternative compliance options such as an offsite mitigation option or increasing the treatment area onsite also is not feasible for the Port. The land within the Port is largely built-out and area to use for additional treatment is extremely limited. Meeting this requirement would come at a cost to proposed projects that would make them infeasible. Furthermore, mitigation outside of the Port's jurisdiction is also not an option because the Port would not have the authority to enforce the implementation and maintenance of BMPs outside of its jurisdiction. The Port requests that the retention requirement be removed from the permit.

6. Predevelopment Design Reference Used for Hydromodification Controls

The Tentative Order requires the use of "**pre-development** (naturally occurring)" as a runoff reference condition for hydromodification controls. Establishing the

pre-development condition of a site requires a reference start date, which is not outlined in the draft, and also requires accepted and defensible references to the **pre-development** soils, vegetation and topography which are also not identified in the permit. This requirement will also create additional and unnecessary costs to each jurisdiction and to the project without additional water quality benefits. A recommended alternative would be the use of a "**pre-project**" runoff reference. This reference point is already being used by the Copermittees in the current MS4 permit and has been used in other MS4 permits in the State. The Port requests that the **pre-development** design reference in the permit is replaced with **pre-project**.

7. Hydromodification Exemption

An exemption to hydromodification requirements that is in the current MS4 permit has been removed in the Tentative Order. The exemption applies to projects that discharge to conveyance channels that are stabilized (i.e. concrete lined) all the way to the receiving water. Hydromodification requirements are included in the permit to mitigate for potential erosion and channel degradation downstream of a development project. Projects that discharge to a stabilized conveyance channel do not present potential erosive impacts downstream or channel degradation therefore, the imposition of hydromodification requirements on such projects is unnecessary and will not provide water quality benefits. The Port requests that the hydromodification exemption for projects that discharge to stabilized conveyance systems be reinserted in the permit.

On behalf of the Port, I wanted to thank you for providing us the opportunity to engage with you and the other stakeholders through the public workshops, and the ability to submit comments on the Tentative Order. Please contact Allison Vosskuhler at (619) 686-6434 or avosskuhler@portofsandiego.org if you have any questions or would like additional clarification on the information provided.

Sincerely,

Randa Coniglio

Randa Coniglio,
Executive Vice President, Operations
San Diego Unified Port District

cc: Paul Fanfera
Bill McMinn
Karen Holman
Allison Vosskuhler

DM#557567

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January 11, 2013

VIA EMAIL
wchiu@waterboards.ca.gov

Wayne Chiu
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Re: **Comments - Tentative Order No. R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu**

Dear Mr. Chiu:

The San Diego Unified Port District (Port) submits the following comments to the revised Tentative Order No. R9-2013-0001, NPDES No. CAS0109266, *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4) Draining the Watersheds within the San Diego Region* (the Permit). Except to any extent inconsistent with the comments below and other comments submitted directly on behalf of the Port, the Port concurs with the San Diego Copermittees' comments throughout the process. The Port wishes to separately address several issues in the current draft Permit. The Port continues to support the objectives of the Permit and welcomes any opportunity to work with the Regional Board to improve the Permit.

1. Establish Connection between Discharge Prohibitions/Receiving Water Limitations and TMDL Compliance Schedules

The Permit as currently drafted includes specific provisions and schedules for implementation of total maximum daily loads (TMDLs) that have been incorporated into the Water Quality Control Plan for the San Diego Basin. *See* Permit, Attachment E. These compliance schedules have been incorporated into the Effluent Limitations provision of the Permit. Permit, II.A.3.b. ("Each Copermittee must comply with applicable WQBELs established from the TMDLs in Attachment E to this Order, pursuant to the applicable TMDL compliance schedule.").

However, no similar language is included in the Discharge Prohibitions (II.A.1.) or the Receiving Water Limitations (II.A.2.) provisions. The absence of similar language regarding TMDL compliance schedules in these provisions could potentially result in Copermittees being in violation of the Permit even though the TMDL implementation dates have not passed. In order for a Copermittee to be in compliance when the Permit becomes effective, it must also be in compliance with the applicable TMDL compliance schedule. Where a TMDL is in place, the Permit establishes compliance schedules for Discharge Prohibitions and Receiving Water Limitations that are in conflict with the TMDL compliance schedules.

The Port requests that the Discharge Prohibitions and Receiving Water Limitations provisions of the Permit be revised to make clear that the Copermittee shall not be in violation of these provisions when the Copermittee is complying with the applicable TMDL compliance schedule. Provision II.A.2.c., which appeared in the previous permit draft contains appropriate language linking the TMDL compliance schedules with the compliance schedules for Discharge Prohibitions and Receiving Water Limitations. The Port requests that similar language be included in Provisions II.A.1. and II.A.2. of the Permit.

2. Permit Compliance Should be Based on the Iterative Process and Implementing Provisions of TMDL and the WQIP Rather than Numeric Limits

The Permit provides that the Copermittees must be in compliance with numeric limits in order to meet water quality standards and to avoid violating the Permit. *See* Permit, II.A.1.a., II.A.1.c., II.A.2.a. The Permit also provides that each Copermittee must engage in an iterative process to implement water quality improvement strategies should water quality exceedances occur to achieve compliance with the discharge prohibitions and receiving water limitations. Permit, II.A.4. However, the Permit states that these provisions are "independently applicable, meaning that compliance with one provision does not provide a 'safe harbor' where there is no compliance with another provision." Permit, Fact Sheet, F-39.

Currently, the Permit creates a situation where the Copermittees may be in violation of the Permit the moment it goes into effect. There may be non-compliance with the Permit by a Copermittee where it is shown that a Copermittee is causing or contributing to an exceedance of water quality standards, even if that Copermittee is actively engaged in the iterative process.

While the Port acknowledges that the Regional Board may choose not to strictly enforce these permit conditions, the Copermittees remain potentially subject to an enforcement action by the Regional Board or a third-party citizen suit unless this point of compliance is clarified. The Regional Board has clear authority under the CWA and State Board policy to issue an MS4 permit that allows for iterative Best Management Practices (BMPs), rather than requiring strict adherence to water quality standards through numeric effluent limitations. *See* State Water Resources Control Board Order No. 2001-15, at pg. 8; *see also Defenders of Wildlife v. Browner,* 191 F.3d 1159, 1163, 165 (9th Cir. 1999).

Accordingly, the Permit should be revised to allow the Copermittees to achieve compliance by actively engaging in a BMP-based iterative process and by complying with implementation provisions of applicable TMDLs. The Port supports using the Receiving Water Limitations Language proposed by the California Stormwater Quality Association (CASQA), attached as Exhibit 1.

3. The Permit Should Clarify the Limits and Basis for Copermittee Liability for Any Exceedances

As noted, the Permit should clarify that Copermittee compliance is achieved through compliance with iterative approaches as set forth in the WQIP and any applicable BMPs, rather than any numeric limits. However, if numeric limits remain in the Permit, certain modifications should be made to avoid improper imposition of liability on Copermittees, consistent with the CWA. As discussed in the Port's comments to the previous draft of the Permit, dated September 14, 2012, the Permit should be revised to make clear that a Copermittee is only responsible for exceedances introduced into portions of MS4 facilities that it owns or operates, not merely discharges into or from all MS4 facilities within that Copermittee's geographical jurisdictional boundaries. There are numerous MS4 facilities and outfalls within the Port's tidelands jurisdictions which the Port does not own or operate. The language of the CWA, repeated in the Permit, confirms that a Copermittee is only responsible for MS4 facilities that it operates. (40 CFR 122.26(a)(3)(vi).)

For this reason, the Port cannot properly be liable for discharges into or from an MS4 facility merely because it is within the Port's tidelands jurisdiction – it must own or operate that MS4 facility. To clarify this point, the Port proposes adding the following language, which could be placed in the cover for the Permit, immediately preceding Table 2:

"The location of an MS4 facility within any Copermittee's jurisdiction boundaries does not, of itself, make the Copermittee an owner or operator of that MS4 facility."

Furthermore, the Permit must include additional provisions that ensure a Copermittee is not improperly held liable for discharges attributable to other Copermittees' MS4 inputs. Of key concern is the specter of liability for downstream MS4 operators. As one of the farthest downstream jurisdictions, the Port faces greater risk of being downstream of other Copermittees' input and discharges into the upstream MS4 facilities. The Permit should be revised to clarify that each Copermittee is liable for any input and discharges into and from its MS4 that may exceed numeric limits, but not for the input and discharges by other Copermittees, whether upstream or downstream. Unless such provisions are included, Copermittees such as the Port will face the risk of legally improper "end of the pipe" liability, even if it did not contribute any pollutants.

As written, the Permit lacks clarity regarding the appropriate basis for determining that any Copermittee has actually caused or contribute to an exceedance of water quality standards. As the Permit states, "[e]ach of the Copermittees owns or operates an MS4, through which it discharges storm water and non-storm water into water of the U.S. within the San Diego Region." Permit, Findings, I.1. It further states:

> The federal regulations make it clear that the Copermittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators (40 CFR 122.26(a)(3)(vi)). This Order does not require Copermittees to manage storm water outside of their jurisdiction boundaries, but rather to work collectively to improve storm water management within watersheds.

Permit, Findings, I.2. While this language is consistent with the CWA, additional provisions are needed to ensure that one Copermittee does not become liable for input and discharges from other Copermittees. The Port requests that the Permit include language clarifying that each Copermittee is only liable for its share of the excess pollutants that it introduces into its MS4 facilities and which result in exceedances of the receiving water limits.

Such a provision is necessary since a Copermittee on an MS4 permit is only responsible for its own discharges or those over which it has control, not discharges or inputs by other Copermittees. *Jones v. E.R. Shell Contractor, Inc.*, 333 F.Supp.2d 1344, 1348 (N.D. Ga. 2004). Similarly, both the California Water Code and the Clean Water Act contemplates that liability for violations shall fall upon the "person" responsible for the violations. *See* Cal. Water Code §§ 13263(f), 13350(a); 33 U.S.C. § 1319. A Copermittee that does not generate or add pollutants to its MS4 facilities cannot credibly be characterized as having discharged pollutants. Likewise, a Copermittee cannot properly be subject to liability for excess pollutants introduced into segments of the MS4 outside its jurisdiction. Copermittees cannot control such MS4 facilities and the CWA clearly does not require a Copermittee to exert such control.

To alleviate this problem and to ensure compliance with the applicable statutes and case law, the Port requests that the Permit be revised to explicitly state the each Copermittee is only liable for the portion of any excess pollutants that cause or contribute to any violations of the Permit that are introduced into the portion of the MS4 owned or operated by that Copermittee.

a. <u>The Permit Should Include the Appropriate Regional Board Burden of Proof to Establish Liability of a Copermittee for MS4 Discharges</u>

The Permit should also include provisions that will ensure one Copermittee is not held liable for pollutant discharges generated by or introduced into the MS4 facilities by other Copermittees. Without delineating the basis for assigning and/or apportioning liability among the Copermittees, there is an unacceptable risk that "end of pipe" Copermittees may be held liable for violations caused by pollutants generated and introduced into MS4 facilities primarily,

or even exclusively, by "upstream" Copermittees. In particular, as the trustee of the tidelands of the San Diego Bay, the Port is one of the Copermittees located farthest downstream. There is an attendant increased risk that in the event any pollutants are discharged into the San Diego Bay, such pollutants would not have originated from any Port MS4 facilities but from MS4 facilities farther upstream.

To ensure that the Regional Board does not hold Copermittees such as the Port responsible for pollutants introduced into or originating from other Copermittees' MS4 facilities, the Permit must be revised to include and clarify the Regional Board's burden of proof for establishing a particular Copermittees' liability. *See Rapanos v. United States*, 547 U.S. 715, 745 (2006); *see also Sackett v. E.P.A*, 622 F.3d 1139, 1145-1147 (9th Cir. 2010), reversed on other grounds, *Sackett v. E.P.A.* (2012) 132 S. Ct. 1367 ("We further interpret the CWA to require that penalties for noncompliance with a compliance order be assessed only after the EPA proves, in district court, and according to traditional rule of evidence and burdens of proof, that defendants violated the CWA in the manner alleged in the compliance order."). The Regional Board must have the affirmative duty to prove that a Copermittee introduced pollutants into the MS4 that are discharged in the violation of the Permit.

In contrast to this legally required approach, the Permit presently states that the Copermittees must comply with certain procedures to come into compliance in the event an exceedance occurs. *See* Permit, II.A.4.a. The language would effectively impose liability on all Copermittees until a Copermittee could prove that it did not contribute to the excess pollutants in the discharge, even though the Regional Board would not have raised, and would not legally be entitled to, a rebuttable presumption that the exceedance resulted from that particular Copermittee's actions. To prevent a Copermittee being put in the legally untenable position of having to prove its innocence in the first instance, the Regional Board should have an initial burden of proving that the exceedances relate to contribution by a particular Copermittee.

Accordingly, the Port requests that Section II.A.4.a. is revised to read:

> If exceedance(s) of water quality standards persist in receiving waters notwithstanding implementation of this Order, *upon a showing by the Regional Board by a preponderance of the evidence that the discharges of pollutant from the MS4 for which each Copermittee is an owner or operator caused or contributed to the exceedance(s) of the water quality standards, those* Copermittees must comply with the following procedures: (emphasis added).

b. <u>Monitoring Requirements Should be Revised to Include Monitoring that Will Ensure Jurisdiction Accountability</u>

As a further necessary safeguard against improperly broad or joint and several liability for discharges, the Permit must include provisions that will allow the Regional Board and the

Copermittees to determine the sources of any exceedances discharged to receiving waters. Unless the Permit requires such monitoring, there remains the risk that downstream Copermittees will be held liable for upstream discharges. This issue of identifying and establishing a Copermittee's violation of an MS4 permit is critical and has been the subject of recent judicial attention. The Port requests that the Permit include a monitoring program that meets and satisfies the evidentiary standards discussed in *Los Angeles County Flood Control District v. Natural Resources Defense Council, Inc., et al.*, No. 11-460 (U.S. Jan. 8, 2013) and *Natural Resources Defense Council, Inc. v. County of Los Angeles*, 673 F.3d 880 (9th Cir. 2011), necessary to establish a particular Copermittee's discharges and/or violations of the Permit. Without such monitoring, the risk persists that "end of pipe" Copermittees will be held liable for upstream jurisdictional discharges, without proper jurisdictional accountability.

We again emphasize that the Port is dedicated to the protection and enhancement of water quality and that the Port strongly supports the objectives of the Permit. We welcome the opportunity to work with the Regional Board in order to achieve our mutual goals. Please contact us if you have any questions or would like any clarification of the Port's position.

Very truly yours,

Scott E. Patterson

SEP/BPS
cc: William D. McMinn, Esq.

EXHIBIT 1

CASQA Proposal for Receiving Water Limitation Provision

D. RECEIVING WATER LIMITATIONS

1. Except as provided in Parts D.3, D.4, and D.5 below, discharges from the MS4 for which a Permittee is responsible shall not cause or contribute to an exceedance of any applicable water quality standard.

2. Except as provided in Parts D.3, D.4 and D.5, discharges from the MS4 of storm water, or non-storm water, for which a Permittee is responsible, shall not cause a condition of nuisance.

3. In instances where discharges from the MS4 for which the permittee is responsible (1) causes or contributes to an exceedance of any applicable water quality standard or causes a condition of nuisance in the receiving water; (2) the receiving water is not subject to an approved TMDL that is in effect for the constituent(s) involved; and (3) the constituent(s) associated with the discharge is otherwise not specifically addressed by a provision of this Order, the Permittee shall comply with the following iterative procedure:

    a. Submit a report to the State or Regional Water Board (as applicable) that:

        i. Summarizes and evaluates water quality data associated with the pollutant of concern in the context of applicable water quality objectives including the magnitude and frequency of the exceedances.

        ii. Includes a work plan to identify the sources of the constituents of concern (including those not associated with the MS4to help inform Regional or State Water Board efforts to address such sources).

        iii. Describes the strategy and schedule for implementing best management practices (BMPs) and other controls (including those that are currently being implemented) that will address the Permittee's sources of constituents that are causing or contributing to the exceedances of an applicable water quality standard or causing a condition of nuisance, and are reflective of the severity of the exceedances. The strategy shall demonstrate that the selection of BMPs will address the Permittee's sources of constituents and include a mechanism for tracking BMP implementation. The strategy shall provide for future refinement pending the results of the source identification work plan noted in D.3. ii above.

        iv. Outlines, if necessary, additional monitoring to evaluate improvement in water quality and, if appropriate, special studies that will be undertaken to support future management decisions.

        v. Includes a methodology (ies) that will assess the effectiveness of the BMPs to address the exceedances.

        vi. This report may be submitted in conjunction with the Annual Report unless the State or Regional Water Board directs an earlier submittal.

b. Submit any modifications to the report required by the State of Regional Water Board within 60 days of notification. The report is deemed approved within 60 days of its submission if no response is received from the State or Regional Water Board.

c. Implement the actions specified in the report in accordance with the acceptance or approval, including the implementation schedule and any modifications to this Order.

d. As long as the Permittee has complied with the procedure set forth above and is implementing the actions, the Permittee does not have to repeat the same procedure for continuing or recurring exceedances of the same receiving water limitations unless directed by the State Water Board or the Regional Water Board to develop additional BMPs.

4. For Receiving Water Limitations associated with waterbody-pollutant combinations addressed in an adopted TMDL that is in effect and that has been incorporated in this Order, the Permittees shall achieve compliance as outlined in Part XX (Total Maximum Daily Load Provisions) of this Order. For Receiving Water Limitations associated with waterbody-pollutant combinations on the CWA 303(d) list, which are not otherwise addressed by Part XX or other applicable pollutant-specific provision of this Order, the Permittees shall achieve compliance as outlined in Part D.3 of this Order.

5. If a Permittee is found to have discharges from its MS4 causing or contributing to an exceedance of an applicable water quality standard or causing a condition of nuisance in the receiving water, the Permittee shall be deemed in compliance with Parts D.1 and D.2 above, unless it fails to implement the requirements provided in Parts D.3 and D.4 or as otherwise covered by a provision of this order specifically addressing the constituent in question, as applicable.

County of San Diego

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November 10, 2014

Laurie Walsh
San Diego Regional Water Quality Control Board
2375 Northside Drive, Suite 100
San Diego, California 92108

Via Email
Laurie.Walsh@waterboards.ca.gov

Re: Tentative Order R9-2015-0001, Place ID:658019LWalsh

Dear Ms. Walsh:

Please accept this correspondence as the County of San Diego's legal comments on the above Tentative Order. County Public Works staff will also be submitting technical comments on aspects of the Tentative Order prior to the comment deadline.

Because it is not clear at this point what legal impact the anticipated adoption of Order R9-2015-0001 will have upon the pending appeals with the State Water Resources Control Board of the order being amended (R9-2013-0001), the County renews all of its objections to various aspects of the Tentative Order as described in the County's Petition to the SWRCB in that proceeding (State Water Resources Control Board Petition and Request for Stay of County of San Diego designated A-2254 (h)), incorporated by reference to this objection letter.

Further, because the Tentative Order does not incorporate the changes requested by the County of San Diego or other petitioners in proceeding A-2254, the County renews all objections from all petitioners to R9-2013-0001 as applicable to the provisions of R9-2015-0001 when adopted by the RWQCB.

Very truly yours,

THOMAS E. MONTGOMERY, County Counsel

By James R. O'Day, Senior Deputy

JRO/tlm
13-90386

County of San Diego

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November 19, 2014

Ms. Laurie Walsh
San Diego Regional Water Quality Control Board
2375 Northside Drive, Suite 100
San Diego, CA 92108

Tentative Order R9-2015-0001, Place ID: 658018LWalsh

Dear Ms. Walsh:

Please accept this correspondence as the County of San Diego's technical comments on the above Tentative Order. Legal comments will be submitted under separate cover from the Office of County Counsel.

Permit Provision II.E.3.c.(3) enables each Copermittee, at its own discretion, to allow Priority Development Projects (PDPs) to participate in an alternative compliance program in lieu of implementing the onsite structural BMP performance requirements of Provisions II.E.3.c.(1) and II.E.3.c.(2). Alternative compliance is only allowed if the Copermittee determines that implementation of an alternative compliance project will result in a greater overall water quality benefit for the Watershed Management Area than fully complying with the onsite performance requirements.

A regional technical advisory committee (TAC) and stakeholder group have been formed to develop "Water Quality Equivalency" calculations that can be used to establish an objective, science-based method for determining whether an alternative compliance project will result in "greater overall water quality benefit." For example, if a PDP proposes to fund a stream rehabilitation project in lieu of fully implementing the stormwater retention requirements onsite, Water Quality Equivalency calculations would be used to establish an "apples-to-apples" comparison of the relative water quality benefits of each project. TAC members include representatives from various Copermittees, Regional Board staff, industry groups, environmental groups, academia, and regional technical experts, including SCCWRP, SANDAG, and CASQA.

The County of San Diego requests that the Water Quality Equivalency calculations currently under development by the TAC be included as an optional Copermittee deliverable for review and acceptance by the Regional Board Executive Officer. Water Quality Equivalency calculations will provide the scientific basis for Copermittees to create offsite alternative compliance programs via Section II.E.3.c.(3)(b) 'Project Applicant Proposed Alternative Compliance Projects'; Section II.E.3.c.(3)(c) 'Alternative Compliance In-lieu Fee Structure'; and/or Section II.E.3.c.(3)(d) 'Alternative Compliance Water Quality Credit System Option'. Regional Board acceptance of the proposed Water Quality Equivalency calculations would add a much needed measure of validity to the Copermittees' approach. Submittal to the Regional Board would also allow for public comment and participation from those not directly participating through the TAC or stakeholder group. The County requests that the Water Quality Equivalency calculations be accepted by the Regional Board Executive Officer before significant time and resources are expended on developing further offsite alternative compliance implementation strategies within the region.

We request the following language for inclusion at Section II.E.3.c.(3)(b) as follows:

> (b) Water Quality Equivalency
> The Copermittees may develop and submit Water Quality Equivalency calculations to the San Diego Water Board Executive Officer for review and acceptance. The purpose of Water Quality Equivalency calculations is to establish a regional and technical basis for determining the water quality benefits associated with alternative compliance projects as required in Provisions E.3.c.(3)(a)(i). Accepted Water Quality Equivalency calculations must be incorporated as part of any jurisdictional Alternative Compliance Program necessary for processing project applicant proposed projects, in-lieu fee structure, or water quality credit system.

Thank you for your consideration. If you have any questions, please contact Christine Sloan at (858) 495-5257 or by email at Christine.Sloan@sdcounty.ca.gov.

Sincerely,

Todd Snyder

Todd Snyder, Watershed Protection Program Manager
Department of Public Works

Walsh, Laurie@Waterboards

From: Tory Walker <tory@trwengineering.com>
Sent: Wednesday, November 19, 2014 4:25 PM
To: Walsh, Laurie@Waterboards
Subject: Comment - Tentative Order No. R9-2015-0001, Place ID:658018LWalsh

Laurie,

I appreciate the opportunity to comment on the above referenced tentative order. My comments are brief, but substantive, in that they relate to some important foundational assumptions:

1) Hydromodification requirements in the San Diego Region cannot properly be based on one category of stream or channel and treated as either geomorphically "stable" or highly dynamic – there is a wide variety, even within watersheds. This faulty assumption will not lead to good solutions for the streams they are intended to help.
2) Flow rate reductions caused by dams artificially reduces channel degradation – the hydromodification impacts from many of these dams means that runoff from PDPs may actually promote a more natural dynamic condition. The failure to recognize this possibility will also lead to solutions that are foundationally flawed.
3) All of this points to the need for the permit to accommodate more site-specific flexibility to reflect natural conditions.

Thanks,

Tory Walker, PE, CFM, LEED GA

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California Regional Water Quality Control Board
San Diego Region

Response to Comments Report

Tentative Order No. R9-2015-0001

An Order Amending Order No. R9-2013-0001, NPDES No. CAS010266 National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges From the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds Within the San Diego Region

January 21, 2015

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
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San Diego Region

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This report was prepared under the direction of

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By

Laurie Walsh, *P.E., Water Resource Control Engineer*
Christina Arias, *P.E., Water Resource Control Engineer*

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Response to Comments on Tentative Order No. R9-2015-0001
January 21, 2015

Introduction

This report contains responses to written comments timely received on Tentative Order No. R9-2015-0001, *An Order Amending Order No. R9-2013-0001, NPDES No. CAS010266, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region*. The Tentative Order and its attachments were available for public review and comment for 60 days, with the comment period ending on November 19, 2014. Specifically, the San Diego Water Board requested comments on the following three documents:

- Tentative Order No. R9-2015-0001;
- Attachment No. 1 – Revised Order No. R9-2013-0001; and
- Attachment No. 2 – Revised Fact Sheet to Order No. R9-2013-0001.

The phrases "Tentative Order" and "Tentative Order as it amends Order No. R9-2013-0001" in the following response to comments table refers to both Tentative Order No. R9-2015-0001 and the two attachments. Comments and responses are organized by the section of either Attachment 1 or Attachment 2 that is being referenced. Wherever possible, comments are grouped based on content and summarized by the San Diego Water Board. The actual comment letters can be accessed on the San Diego Water Board website at:
http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/oc_stormwater.shtml.

List of Commenters:

Comments were submitted by the following organizations, public agencies, or individuals:

1. City of Aliso Viejo
2. City of Del Mar
3. City of Lake Forest
4. City of San Diego
5. Coalition (San Diego Building Industry Association, Building Industry Association of Southern California, Associated General Contractors, Associated Builders and Contractors, San Diego Regional Chamber of Commerce, Business Leadership Alliance, San Diego Association of Realtors, San Diego Apartment Association, National Association of Industrial & Office Properties, Building Office & Management Association, San Diego Chapter of the American Society of Landscape Architects)
6. Coastal Environmental Rights Foundation
7. Construction Industry Coalition on Water Quality (The Associated General Contractors of California, Building Industry Association of Southern California,

Engineering Contractors Association, Southern California Contractors Association, and the United Contractors located in San Ramon in Northern California)
8. County of Orange
9. County of San Diego
10. County of Riverside
11. Industrial Environmental Association
12. San Diego Coastkeeper
13. San Diego Unified Port District
14. Tory R. Walker Engineering, Inc.

Acronyms and Abbreviations

The following acronyms and abbreviations are used in the response to comments table.

ASBS	Area(s) of Special Biological Significance
BMP	Best Management Practice
Basin Plan	Water Quality Control Plan for the San Diego Basin
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWC	California Water Code
LID	Low Impact Development
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
NAL	Non-Storm Water Action Level
NPDES	National Pollutant Discharge Elimination System
ROWD	Report of Waste Discharge (application for NPDES reissuance)
SAL	Storm Water Action Level
San Diego Water Board	California Regional Water Quality Control Board, San Diego Region
State Water Board	State Water Resources Control Board
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
WLA	Waste Load Allocation
WQBEL	Water Quality Based Effluent Limitation

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AttF-1: Based on the successes of the Orange County Stormwater Program, there is little justification for much of the Tentative Order. 123

AttF-2: Modify Fact Sheet to include language explaining the iterative approach and TMDLs. 125

AttF-3: Modify Fact Sheet to include language explaining the incorporation of New TMDLs into the WQIPs. 126

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 21, 2015

PR- 1	PREVIOUSLY SUBMITTED COMMENT LETTERS	
	COMMENT: *All prior comments, evidence, and objections made during adoption of Order No. R9-2013-0001 are applicable to Tentative Order No. R9-2015-0001 are requested to be incorporated during consideration of Tentative Order No. R9-2015-0001.* Because of the uncertainty of the legal impact the anticipated adoption of Tentative Order No. R9-2015-0001 might have upon pending appeals with the State Water Resources Control Board (State Board) of the Order being amended (Order No. R9-2013-0001), the commenters wish to renew all objections to various aspects of the Tentative Order as described in any petition already before the State Board and further wish to incorporate all evidence pertaining to those objections.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District • County of San Diego Concurring Cities: Petitioners in proceeding A-2254 • San Diego Unified Port District • Riverside County Copermittees • City of San Diego
	RESPONSE: The San Diego Water Board understands the concerns expressed by the commenters. The San Diego Water Board reviewed Tentative Order No. R9-2015-0001 and its Attachments and has determined that the March 27, 2013 responses to comments document prepared during the 2013 adoption process of Order No. R9-2013-0001 and the oral responses to comments during the workshop and hearings during that process address the renewed comments. The San Diego Water Board incorporates its written responses to comments and oral responses to comments raised during the workshops and hearing on Order No. R9-2013-0001 into these responses. To the extent commenters incorporate issues and objections raised in petitions for review of Order No. R9-2013-0001 filed with the State Board in SWRCB/OCC File A-2254(a)-(p), the San Diego Water Board notes that it has not yet had an opportunity to submit written responses to those petitions for review and is not specifically addressing those petitions for review in these responses to comments. The San Diego Water Board will submit written responses to the petitions for review at the appropriate time in the State Board's petition proceeding. No changes to the Tentative Order or its Attachments were made based on the renewed comments.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 21, 2015

PR-2	PREVIOUSLY SUBMITTED COMMENT LETTERS	
	COMMENT: *The Construction Industry Coalition on Water Quality resubmits its comment letters on hydromodification management cited in letters dated September 14, 2012 and January 11, 2013, which were submitted as part of the May 2013 adoption process of Order No. R9-2013-0001.*	Construction Industry Coalition on Water Quality • San Diego Building Industry Association • Building Industry Association of Southern CA • Associated General Contractors • Associated Builders and Contractors • San Diego Regional Chamber of Commerce • Business Leadership Alliance • San Diego Association of Realtors • San Diego Apartment Association • National Association of Industrial & Office Properties • Building Office & Management Association • San Diego Chapter of American Society of Landscape Architects
	RESPONSE: The San Diego Water Board understands the concerns expressed by the commenter. The San Diego Water Board reviewed Tentative Order No. R9-2015-0001 and its Attachments and has determined that the March 27, 2013 responses to comments document prepared during the 2013 adoption process of Order No. R9-2013-0001 and the oral responses to comments during the workshop and hearings during that process address the renewed comments. The San Diego Water Board incorporates its written responses to comments and oral responses to comments raised during the workshops and hearing on Order No. R9-2013-0001 into these responses. To the extent commenters incorporate issues and objections raised in petitions for review of Order No. R9-2013-0001 filed with the State Board in SWRCB/OCC File A-2254(a)-(p), the San Diego Water Board notes that it has not yet had an opportunity to submit written responses to those petitions for review and is not specifically addressing those petitions for review in these responses to comments. The San Diego Water Board will submit written responses to the petitions for review at the appropriate time in the State Board's petition proceeding. No changes to the Tentative Order or its Attachments were made based on the renewed comments.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 21, 2015

Gnl-1	GENERAL COMMENTS	
	COMMENT: *Remove City of Lake Forest from Table 1b and the associated footnote.* The City of Lake Forest requests changes to the Tentative Order to clarify regulation of the City of Lake Forest by a single water board as described in the agreement between the Santa Ana Water Board and the San Diego Water Board.	City of Lake Forest
	RESPONSE: The San Diego Water Board generally agrees with the City's comment. The City of Lake Forest was removed from the list of Copermittees in Table 1b and a footnote to the Table was added to identify the requirements of the Order that apply to the City of Lake Forest.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 21, 2015

GnI-2	GENERAL COMMENTS	
	COMMENT: *The Tentative Order toxicity requirements do not take into account information presented in the Orange County Copermittees ROWD.* The County of Orange and Concurring Cities, and Orange County Flood Control District comment that toxicity occurs sporadically in streams and creeks in south Orange County and toxicity is encountered in open (undeveloped) areas at levels equivalent to those in urban areas. They also comment that there is a greater prevalence of toxicity in wet weather and pesticides are implicated as the principal source of this toxicity. This pattern suggests that dry weather toxicity is not caused by urban sources of pollutants. Moreover pesticide use, presents a moving target for MS4 management efforts due to the continuous introduction of new products. Regulation of pesticide use is exclusively within the jurisdiction of state and federal agencies and not the role of MS4s.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees with the comment. The San Diego Water Board reviewed and considered the information pertaining to toxicity within the Copermittees' ROWD. Generally speaking, numerous sources of potential pollutants in storm water runoff exist, including contributions from urban activities such as industry, transportation, and residential development or from agricultural activities. Runoff from pervious and impervious areas (i.e., streets, parking lots, lawns, golf courses and agricultural land) carries accumulated contaminants (i.e., atmospheric dust, trace metals, street dirt, hydrocarbons, fertilizers and pesticides) into receiving waters. This problem is exacerbated in Southern California, where urbanization dominates most watersheds. In southern California, the runoff from urbanized watersheds contributes substantial loadings of a variety of constituents to receiving water environments. For example, the Southern California Coastal Water Research Project (SCCWRP) has estimated the cumulative loads of lead and zinc from all of the urbanized watersheds in the Southern California Bight to the coastal oceans represent over half of the combined mass emissions from all sources, which include traditional point sources such as publicly owned treatment works, industrial facilities, and power generating stations. Because of the additive and antagonistic interactions of the many chemical constituents found in storm water runoff, there is a strong potential for receiving water quality impacts related to toxicity. Moreover, the varied structural BMPs in use to reduce pollutant levels in urban runoff are not capable of reducing the most toxic fraction of runoff, the dissolved phase. Metals typically associated with fine particles in storm water runoff also have the potential to accumulate in the sediments of downstream receiving waters where they may contribute to the risk of toxicity. Therefore, even when BMPs have been shown to reduce the larger particulates found in runoff, it cannot be assumed that treatment processes are also reducing toxicity. Consequently, direct	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 21, 2015

GnI-2	GENERAL COMMENTS	
	measurement of toxicity in storm water runoff and receiving water sediments is needed. The requirements for toxicity sampling were updated during the adoption of Order No. R9-2013-0001 in response to comments provided by USEPA to make the toxicity requirements more consistent with recently adopted MS4 permits (i.e. Caltrans and Los Angeles County MS4 Permits). The recently adopted Caltrans and Los Angeles County MS4 Permits include updated toxicity data collection procedures and data analysis methods that are consistent with the Draft State Water Resources Control Board Policy for Toxicity Assessment and Control, June 2012 (Draft State Board Toxicity Policy). See also response to comment D-1. Sediment monitoring requirements were also updated in Water Quality Control Plan for Enclosed Bays and Estuaries, Part 1 Sediment Quality (State Plan). Based on these considerations, no revisions to the Tentative Order are needed.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 21, 2015

Gnl-3	GENERAL COMMENTS	
	COMMENT: *Numbering in Tentative Order should explicitly identify the major sections to help the reader.*	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board agrees that the Tentative Order should explicitly identify the major permit sections to increase readability. Footers throughout the Tentative Order indicate the subsections, e.g. A.1, A.2, to orient the reader. Additionally, the electronic PDF version of the Tentative Order has bookmarks for the major provisions to assist in navigating the requirements. Therefore, the San Diego Water Board did not make the requested revisions because existing footers and navigation capabilities address the comment.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 21, 2015

Gnl-4	GENERAL COMMENTS	
	COMMENT: *The Tentative Order provides an overly broad interpretation of the storm water regulations by requiring MS4s to "enhance" and "restore" beneficial uses as the CWA only requires that Copermittees protect beneficial uses and prevent nuisance.*	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees that the Tentative Order provides an overly broad interpretation of the storm water regulations. The San Diego Water Board reviewed and considered this comment during the adoption process of Order No. R9-2013-0001 (Regional MS4 Permit), making changes that replaced language which referred to "restoring water quality standards in receiving water" to language that required protection of water quality standards in receiving water from MS4 discharges. The Fact Sheet, pages 114-115 to Tentative Order No. R9-2015-0001 clearly states that Provisions E.5.e.(1)-(2) do not require the implementation of channel, streams, and/or habitat rehabilitation projects, but do require the Copermittees to develop a program with strategies to facilitate the implementation of these types of projects in areas of existing development. The strategies are expected to include allowing and encouraging Priority Development Projects to implement retrofitting types of projects as a means of compliance with the structural BMP performance criteria requirements of Provisions E.3.c.(1) and E.3.c.(2). Therefore, no revisions were made to Tentative Order No. R9-2015-0001 or its Attachments.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 21, 2015

Gnl-5	GENERAL COMMENTS	
	COMMENT: *The Tentative Order includes language that provides an overly broad use of the term "prohibit."*	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees that the Tentative Order provides an overly board use of the term prohibit. The Clean Water Act requires MS4 permits to include a requirement that non-storm water discharges are to be "effectively prohibited" to the MS4. The Code of Federal Regulations requires each Copermittee to have the legal authority to "prohibit" non-storm water discharges to the MS4. The Phase I Final Rule clarifies what "effectively prohibit" means (55 FR 47995): "Section 402(p)(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit (other than the permit for the discharge from the municipal separate storm sewer.)" During the 2013 adoption process for Order No. R9-2013-0001, where appropriate, the language in Order No. R9-2013-0001 was revised to be consistent with the language of the Clean Water Act to include the term "effectively prohibit" instead of "prohibit" or "reduce and eliminate." In other cases, the language was maintained to be consistent with the requirements of the Code of Federal Regulations requiring the Copermittees to establish the legal authority to "prohibit" non-storm water discharges to their MS4s and enforce that legal authority. The establishment and enforcement of the legal authority to "prohibit" non-storm water discharges to their MS4s is how the Copermittees will "effectively prohibit" non-storm water discharges to their MS4s. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

Gnl-6: Tentative Order's WQBELs were improperly formulated.

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 21, 2015

Gnl-6	GENERAL COMMENTS	
	COMMENT: *The Tentative Order's WQBELs were improperly formulated.*	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: There are TMDLs in the Basin Plan that established wasteload allocations for MS4 discharges causing or contributing to exceedances of water quality standards in specified impaired water bodies. The San Diego Water Board has included WQBELs that are consistent with the requirements and assumptions and requirements of the TMDLs wasteload allocations (WLAs) in accordance with applicable federal regulations at 40 CFR 122.44(d)(1) (vii)(B) and 40 CFR 122.44(k)(2)-(4). TMDLs included in Attachment 1 to the Tentative Order have been approved by USEPA during the TMDL development process and again reviewed by USEPA as part of the Regional MS4 2013 Permit adoption process. NPDES permits must limit and control all pollutants that are or may be discharged at a level that "will cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard including narrative criteria." (See 40 CFR 122.44(d)(1)(i)). The analysis that is performed to determine what pollutants require WQBELs is commonly referred to as the "reasonable potential analysis." NPDES permits must include WQBELs for all pollutants with "reasonable potential." (see 40 CFR 122.44(d)(1)(i)) Where a WLA has been assigned to a discharge in a TMDL, it is concluded that there is reasonable potential for the discharger to cause or contribute to an excursion of water quality standards. Because there are TMDLs in the Basin Plan that have identified the established WLAs for MS4s as discharges causing or contributing to exceedances of water quality standards, demonstration of reasonable potential is presumed for the purposes of establishing a WQBEL based on an applicable WLA. (see 40 CFR 122.44(d)(1)(ii))	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 21, 2015

Gnl-7	GENERAL COMMENTS	
	COMMENT: *WQBELs should only be defined as effluent limitations.*	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board has included WQBELs that are consistent with the assumptions and requirements of TMDL wasteload allocations in accordance with applicable federal regulations at 40 CFR 122.44(d)(1)(vii)(B). WQBELs can be expressed as (1) conditions in receiving waters that are to be attained to restore or protect water quality standards in receiving waters, (2) conditions in discharges that will not cause or contribute to exceedances of water quality standards in receiving waters, (3) BMPs that will ensure discharges will not cause or contribute to exceedances of water quality standards in receiving waters, or (4) a combination of one or more of (1)-(3). This is consistent with 40 CFR 122.44(d)(1)(vii)(B) and 122.44(k)(2)-(4). The San Diego Water Board has incorporated options (1)-(3) under the WQBEL requirements for each of the TMDLs in Attachment E. In most cases, if the WQBEL expressed as a receiving water limitation is achieved, the discharges from the MS4s are assumed to be in compliance with the TMDL requirements. If not, then the Copermittees must demonstrate that discharges from the MS4s are not causing or contributing to the exceedances in the receiving waters by achieving the WQBELs expressed as effluent limitations. In every case, the Copermittees are required to implement BMPs to ensure that discharges from their MS4s do not cause or contribute to exceedances of water quality standards in receiving waters.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 21, 2015

Lgl-1	LEGAL COMMENTS	
	COMMENT: *Land Development requirements expose Copermittees to significant litigation risk and will be largely unenforceable. Therefore, predevelopment runoff reference conditions and stream, channel and habitat restoration requirements should be eliminated in their entirety.* Commenters generally expressed concerns with the Copermittees' legal authority to imposed requirements on development projects where a nexus between impact on the receiving water and the project cannot be established. The Copermittees assert that they would be subject to liability under takings clauses of the US and California Constitutions and the Mitigation Fee Act for requiring hydromodification management BMP requirements on new development or redevelopment projects that discharge to hardened channels where a hydromodification impact would be questionable and difficult to establish.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board recognizes the concerns of the Copermittees' legal authority to impose hydromodification management requirements on development that causes no hydromodification impacts and responded to nearly identical comments during the adoption process for Order No. R9-2013-0001. As stated in response to comment Gnl-1, the San Diego Water Board incorporates those responses into this response to comments document. As stated in the 2013 responses to comments document: Federal law mandates that permits issued to MS4s require management practices that will result in reducing pollutants to the maximum extent practicable. The state is required, by law, to select the BMPs. (See NRDC v. USEPA (9th Cir. 1992) 966 F.2d 1292; Environmental Defense Center v. USEPA (9th Cir. 2002) 344 F.3d 832, 855; Rancho Cucamonga v. Regional Water Quality Control Bd., Santa Ana Region (2006) 135 Cal.App.4th 1377, 1389.) The Tentative Order's requirements for Low Impact Development and hydromodification management controls are authorized by federal law. Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(2) provides that Copermittees develop and implement a management program which is to include "A description of planning procedures including a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal separate storm sewers which receive discharges from areas of new development and significant redevelopment. Such plans shall address controls to reduce pollutants in discharges from municipal separate storm sewers after construction is completed." The Tentative Order does not impose land use regulations, nor does it restrict or control local land-use decision-making authority. Rather, the Tentative Order requires the permittees to fulfill Clean Water Act requirements and protect water quality in their land use decisions. The requirements in the Tentative Order	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 21, 2015

Lgl-1	LEGAL COMMENTS	
	allow for flexibility in compliance options to the extent allowable under the Clean Water Act. The substantive regulatory requirements of the Clean Water Act are a valid exercise of the federal government's enumerated powers and authority over navigable waters. (NRDC v. USEPA (9th Cir. 1998) 863 F.2d 1420, 1436.) Environmental regulation is not land use regulation, and therefore does not infringe upon local authority over land use decisions. (California Coastal Commission v. Granite Rock (1987) 480 U.S. 572. In addition, local land use planning must be consistent with general statewide laws. (County of Los Angeles v. California State Water Resources Control Board (2006) 143 Cal.App.4th 985, 1003.) Article 11, section 7, of the California Constitution states that a county or city may not enact laws that conflict with general laws. The Porter-Cologne Water Quality Control Act contains the California Legislature's finding that water quality is a matter of state-wide concern, requiring a statewide program administered at a regional level. (See, e.g., Wat. Code, § 13000; see also generally Southern California Edison v. State Water Resources Control Board (1981) 116 Cal.App.3d 751, 758.) Section 101 of the CWA has a companion policy statement, where Congress found that water quality is a matter of federal concern. The Tentative Order also does not dictate specific methods of compliance or dictate the manner in which the Copermittees use their land. Where the Tentative Order includes detailed requirements, it is to comply with the Clean Water Act and its regulations. USEPA's regulations mandate that certain requirements be included in MS4 permits in order to achieve the requirements of the Clean Water Act. Thus, federal law mandates that permits issued for MS4s require certain actions that will result in the elimination or reduction of pollutants to receiving waters and the state is required, by federal law, to select the controls necessary to meet this standard. (See NRDC v. USEPA (9th Cir. 1992) 966 F .2d 1292, 1308; City of Rancho Cucamonga v. Regional Water Quality Control Bd., Santa Ana Region (2006) 135 Cal.App.4th 1377, 1389-90.) The requirement that the Copermittees require Priority Development Projects to control post-project runoff flow rates and durations so that they do not exceed pre-development runoff flow rates and durations by more than ten percent is appropriate and necessary to reduce erosion and the discharge of pollutants into receiving waters. It does not require mitigation beyond redevelopment project impacts because the requirement lessens (although does not eliminate) the perpetuating impacts that originated upon initial land alteration (i.e., the project would continue to cause accelerated erosion) absent improved controls of post-project runoff flow rates and durations. The San Diego Water Board maintains that the Copermittees have authority to implement this requirement, and that if implemented it would not rise to the level of a taking of private property. The pre-development condition provision is also consistent with the requirements in both the current Orange County and Riverside County MS4 permits.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

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Lgl-1	LEGAL COMMENTS	
	To remove the question of the nexus between a project's impacts on an already hardened channel, the Tentative Order includes a hydromodification management exemption for projects that discharge to conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 21, 2015

Lgl-2	LEGAL COMMENTS	
	COMMENT: *Tentative Order numeric WQBELs violate the requirements of law because they are infeasible.*	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees that including numeric WQBELs for the TMDLs in the Tentative Order violate the requirements of law. The federal regulations under 40 CFR 122.44(d)(1)(vii)(B) require that NPDES permit requirements incorporate WQBELs that must be consistent with the requirements and assumptions of any available wasteload allocations (WLAs) developed under TMDLs. The federal regulations under 40 CFR 122.44(k) do not require WQBELs to be BMP-based if numeric effluent limitations are infeasible, but only that WQBELs that implement WLAs may be expressed in the form of BMPs. BMP-based WQBELs may be allowed if BMPs alone adequately implement WLAs, and additional controls are not necessary. This is consistent with a 2002 USEPA memorandum for "*Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs*." WQBELs are required for point source discharges that have the reasonable potential to cause or contribute to an excursion of water quality standards and technology based effluent limitations or standards are not sufficient to achieve water quality standards. Where a WLA has been assigned to a discharge in a TMDL, it is concluded that there is reasonable potential for the discharger to cause or contribute to an excursion of water quality standards. The memorandum "*Revisions to the November 22, 2002 Memorandum 'Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs)" issued by USEPA on November 26, 2014 states*, "*Where the NPDES authority determine that MS4 discharges have a reasonable potential to cause or contribute to a water quality standard excursion, EPA recommends that, where feasible, the NPDES permitting authority exercise its discretion to include numeric effluent limitations necessary to meet water quality standards*." The "where feasible" in the memorandum applies to the NPDES permitting authority's discretion to include numeric effluent limitations necessary to meet water quality standards, not to the feasibility of achieving the numeric effluent limitations. The State Water Board, in Order WQ 2006-0012 (Boeing), has made clear that "infeasibility" in the context of numeric effluent limitations refers to "the ability or propriety of establishing" numeric limits, as	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

January 21, 2015

Lgl-2	LEGAL COMMENTS	
	opposed to the feasibility of compliance. The Caltrans MS4 permit is issued by the State Water Board. Even though the Caltrans MS4 permit may allow for BMP-based WQBELs, this does not require the San Diego Water Board to include BMP-based WQBELs in the Tentative Order regardless of any potential or apparent conflict. The San Diego Water Board will issue additional requirements to Caltrans with numeric WQBELs when and where warranted. The San Diego Water Board considered the feasibility of incorporating numeric WQBELs to implement the requirements of each of the TMDLs and has determined that they are feasible, and necessary, to include to meet water quality standards, consistent with the 2014 USEPA memorandum. Numeric WQBELs are also "additional controls" necessary to implement the WLAs, consistent with the 2002 USEPA memorandum. Each of the TMDLs in the Tentative Order, however, includes BMP-based WQBELs which must be implemented to achieve the numeric WQBELs. The Tentative Order requires the Copermittees to implement the BMP-based WQBELs to achieve the numeric WQBELs. This is consistent with the 40 CFR 122.44(d)(1)(vii)(B) and 40 CFR 122.44(k), and the recommendations of the 2014 USEPA memorandum. The Tentative Order has also been revised to include interim and final TMDL compliance determination options that allow the Copermittees to demonstrate that the BMP-based WQBELs will achieve the numeric WQBELs. The numeric WQBELs are necessary for the Copermittees to quantitatively demonstrate that the BMPs implemented are achieving the WLAs of the TMDLs. Thus, the Tentative Order appropriately includes numeric WQBELs and does not violate any requirements of law.	

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January 21, 2015

Lgl-3	LEGAL COMMENTS	
	COMMENT: *San Diego Water Board does not have the legal authority to issue a regional MS4 permit.* The County of Orange and Concurring Cities and Orange County Flood Control District request that they be issued an individual permit. The Commenters claim the San Diego Water Board does not have the legal authority to include Orange County in a Regional Permit because there is no system-wide, jurisdiction-wide, or common watershed basis to do so.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board incorporates its responses to comments for the adoption of Order No. R9-2013-0001 and other documents in the record including the September 7, 2012, legal memorandum prepared by San Diego Water Board counsel. The San Diego Water Board disagrees with the commenters that the federal regulations do not authorize the issuance of a region-wide MS4 permit coextensive with the jurisdictional boundaries of the San Diego Region. The San Diego Water Board reviewed and considered this comment during the adoption process of Order No. R9-2013-0001 (Regional MS4 Permit) and reaffirms its position that despite the geographic separation, the San Diego Water Board has legal authority to issue a regional MS4 permit through its authority in the Clean Water Act. (September 7, 2012 Letter from San Diego Water Board Counsel on Legal Authority Supporting Issuance of a Regional MS4 Permit) Section 402, subpart (p)(3)(B) of the Clean Water Act states that "Permits for discharges from municipal storm sewers – (i) may be issued on a system- or jurisdiction-wide basis . . . ." The federal storm water regulations in 40 CFR at Part 122.26, subdivision (a)(1)(v) also state that the Director (the San Diego Water Board) may designate dischargers from municipal separate storm sewers on a system-wide or jurisdiction-wide basis, taking into consideration the following factors: (A) location of the discharge with respect to waters of the United States; (B) the size of the discharge; (C) the quantity and nature of the pollutants discharged to waters of the United States and (D) other relevant factors. Consideration of these factors provides wide discretion to the San Diego Water Board in issuing MS4 permits. More specifically, the regulations permit issuance of system-wide permits covering all MS4s in "adjacent . . . large or medium separate storm sewer systems." (See 40 CFR sec. 122.26(a)(3)(iv). The regulations also support issuance of MS4 permits on watershed or "other basis" contemplating that such permits may "specify different conditions relating to different discharges covered by the permit, including different management programs for different drainage areas . . . ." (40 CFR Part 122.26(a)(3)(v).) The USEPA responses to comments for the above regulations also make clear that the permitting authority, in	

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Lgl-3	LEGAL COMMENTS	
	this case, the San Diego Water Board, has flexibility to establish system- or region-wide permits. In the Final Rule published in the Federal Register and containing USEPA's responses to comments, USEPA notes that paragraph (iv) of section 122.26(a)(3) would allow an entire system in a geographical region under the purview of a state agency to be designated under a permit. (National Pollutant Discharge Elimination System Permit Application Regulations for Storm Water Discharges, 55 Fed. Reg. 47990, 48030-48042 (Nov. 16, 1990).) It is important to note that a regional MS4 permit does not expand the requirements for each municipality beyond its borders as the federal regulations make clear that MS4 permittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators. (40 CFR Part 122.26(a)(3)(vi).) See also September 7, 2012, memorandum from Jessica Jahr and Catherine Hagan, State Water Board's Office of Chief Counsel, to Ryan Baron and David Huff, counsels for Orange and Riverside Counties, respectively.	

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January 21, 2015

Lgl-4	LEGAL COMMENTS	
	COMMENT: *The Requirements in the Tentative Order are more stringent than federal law, requiring an economic analysis.* The County of Orange and Concurring Cities and Orange County Flood Control District assert that several requirements of Tentative Order go beyond the requirements of Federal law, thus an analysis pursuant to California Water code section 13241 is required. The commenters also make several assertions about deficiencies in the economic considerations discussed in the Fact Sheet, and assert that a cost-benefit analysis needs to be included in the Fact Sheet discussion.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees that "several requirements of Tentative Order go beyond the requirements of Federal law." The San Diego Water Board is charged with construction of and administration of the Clean Water Act in the San Diego Region. In issuing MS4 permits, "[t]he permitting agency has discretion to decide what practices, techniques, methods and other provisions are appropriate and necessary to control the discharge of pollutants." (City of Rancho Cucamonga v. Regional Water Quality Control Board-Santa Ana Region (2006) 135 Cal.App.4th 1377,1389.) However, the "Regional Board must comply with federal law requiring detailed conditions for NPDES permits." (Ibid.) Further, USEPA expects the permitting authority to develop the specific practices that comply with the Clean Water Act on a permit-by-permit basis. (NRDC v. USEPA (9th Cir. 1992) 966 F.2d 1292, 1308.) To the extent the Board is exercising discretion in including certain permit requirements, the Board is exercising discretion required and/or authorized by federal law, not state law. (See City of Rancho Cucamonga, supra, 135 Cal.App.4th at 1389; Building Industry Association of San Diego County v. State Water Resources Control Bd. (2004) 124 Cal.App.4th 866, 882-883.) Further, the MEP standard is a flexible standard that balances a number of considerations, including technical feasibility, cost, public acceptance, regulatory compliance, and effectiveness. (Id. at pp. 873, 874, 889.) Such considerations change over time with advances in technology and with experience gained in storm water management. (55 Fed. Reg. 47990, 48052 (Nov. 16, 1990).) Accordingly, a determination of whether the conditions contained in Tentative Order exceed the requirements of federal law cannot be based on a point by point comparison of the permit conditions with federal law. The appropriate focus is whether the permit conditions as a whole exceed the MEP standard. The commenters assert that provisions of the Tentative Order are more stringent than the requirements of the Clean Water Act and therefore require an analysis of the factors, including economic considerations, in Water Code section	

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Lgl-4	LEGAL COMMENTS	
	13241 before the San Diego Water Board can approve such provisions. As indicated above, the San Diego Water Board disagrees that provisions of the Tentative Order are more stringent than requirements of the Clean Water Act. Because the Tentative Order is not more stringent than federal law, its adoption does not require the San Diego Water Board to consider Water Code section 13241 factors. The California Supreme Court in *City of Burbank v. State Water Resources Control Board, et al.,* ((2005) 35 Cal.4th 613) (*Burbank*), held: [Water Code] section 13377 specifies that wastewater discharge permits must meet the federal standards set by federal law. In effect, section 13377 forbids a regional board's consideration of any economic hardship on the part of the permit holder if doing so would result in the dilution of the requirements set by Congress in the Clean Water Act. That act prohibits the discharge of pollutants into the navigable waters of the United States unless there is compliance with federal law (33 U.S.C. § 1322(a)), and publicly operated wastewater treatment plants such as those before us here must comply with the act's clean water standards, regardless of cost [citations]. Because [Water Code] section 13263 cannot authorize what federal law forbids, it cannot authorize a regional board, when issuing a wastewater discharge permit, to use compliance costs to justify pollutant restrictions that do not comply with federal clean water standards." (*Burbank,* 35 Cal.4th at 625.) While the *Burbank* decision does require an analysis of Water Code section 13241 factors when the state adopts permit conditions that are more stringent than federal law (*id.* at 618) Tentative Order No. R9-2015-0001 reflects that all of the challenged provisions are necessary to implement federal law. Thus, the San Diego Water Board is not required to consider economic information to justify a "dilution of the requirements" established in federal law. Even when applicable, consideration of economic information pursuant to section 13241 does not require a cost-benefit analysis, as some commenters suggest. And section 13241 neither specifies how regional water boards must consider its enumerated factors nor does it require that regional water boards may specific findings documenting consideration of the factors. (See *California Ass'n of Sanitation Agencies, et al. v. State Water Resources Control Board, et al.,* (208 Cal.App.4th 1438, 1464 (2012).) Nonetheless, the Fact Sheet and Response to Comments reflect economic information that has either been developed or gathered by the San Diego Water Board or has been submitted by Copermittees. To the extent that economic information in connection with compliance and other costs associated with challenged permit provisions, the San Diego Water Board has fully considered this information. Under these circumstances, *Burbank* does not require more. See also comment response Fnd-8.	

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Lgl-5	LEGAL COMMENTS	
	COMMENT: *The San Diego Water Board cannot determine whether a particular mandate is unfunded.* The County of Orange and Concurring Cities and the Orange County Flood Control District assert that the San Diego Water Board does not have the legal authority to determine whether any provisions in the Tentative Order constitute a state mandate, and only the Commission on State Mandates can make the determination.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: In proposing Tentative Order No. R9-2015-0001, the San Diego Water Board proposes amendments to Order No. R9-2013-0001 which includes Finding 31 and corresponding discussion in the Fact Sheet setting forth the San Diego Water Board's conclusion and supporting reasoning that Order No. R9-2013-0001 does not constitute an unfunded state mandate requiring subvention. The San Diego Water Board incorporates its responses to comments on the adoption of Order No. R9-2013-0001 into this response. The San Diego Water Board does not dispute that the Commission on State Mandate ultimately has jurisdiction to determine whether the State has imposed a mandate requiring state subvention. However, it remains entirely appropriate for the San Diego Water Board to set forth its legal basis to support its conclusion Order No. R9-2013-0001, as amended by Tentative Order No. R9-2015-0001, contains provisions the Board finds to be necessary and appropriate to meet the federal Clean Water Act standards. While the Commission may be expert in state mandates, it has no expertise in the field of water law. As indicated in response to comment Lgl-5, above, the San Diego Water Board does not agree that Order No. R9-2013-0001 as amended by Tentative Order No. R9-2015-0001 exceed federal requirements of the Clean Water Act. The San Diego Water Board is charged by law with administering and constructing the Clean Water Act's requirements and is entitled to considerable deference in its interpretation of the Act. (See Building Industry Association of San Diego, supra, 124 Cal.App.5th at pp. 873, 879 fn.9; County of Los Angeles v. California State Water Resources Control Bd. (2006) 143 Cal.App.4th 985, 997.) In issuing MS4 permits, "[t]he permitting agency has discretion to decide what practices, techniques, methods and other provisions are appropriate and necessary to control the discharge of pollutants." (City of Rancho Cucamonga v. Regional Water Quality Control Board-Santa Ana Region (2006) 135 Cal.App.4th 1377,1389.) However, the "Regional Board must comply with federal law requiring detailed conditions for NPDES permits." (Ibid.) Further, USEPA expects the permitting authority to develop the specific practices that comply with the Clean Water Act on a permit-by-permit basis. (NRDC v. USEPA (9th Cir. 1992) 966 F.2d 1292, 1308.) To the extent the Board is exercising discretion in including certain permit requirements, the Board is exercising discretion required and/or authorized by federal law, not state law. (See City of Rancho Cucamonga, supra, 135 Cal.App.4th at 1389;	

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Lgl-5	LEGAL COMMENTS	
	Building Industry Association of San Diego County v. State Water Resources Control Bd. (2004) 124 Cal.App.4th 866, 882-883.) Further, the MEP standard is a flexible standard that balances a number of considerations, including technical feasibility, cost, public acceptance, regulatory compliance, and effectiveness. (Id. at pp. 873, 874, 889.) Such considerations change over time with advances in technology and with experience gained in storm water management. (55 Fed. Reg. 47990, 48052 (Nov. 16, 1990).) The San Diego Water Board's findings are the expert conclusions of the principal state agency charged with implementing the NPDES program in California. (Cal. Wat. Code §§ 13001, 13370.) The San Diego Water Board is not precluded from including provisions in Tentative Order No. R9-2015-0001 which commenters may contend are state mandates and it is well within the San Diego Water Board's authority to conclude, based on its expertise in administering the Clean Water Act, Tentative Order No. R9-2015-0001 does not exceed federal law and is therefore not a state mandate subject to subvention.	

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Fnd-1	FINDINGS	
	COMMENT: *Modify findings and/or Fact Sheet to include additional key findings from the Report of Waste Discharge (including the State of the Environment) and use this information as the basis for the Draft Order's requirements.* The County of Orange and Concurring Cities and the Orange County Flood Control District are concerned that the San Diego Water Board did not review and consider the "State of the Environment" discussion in their ROWD based on the Findings and Fact Sheet amendments presented in the Tentative Order and its Attachments.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees with the comment. The San Diego Water Board reviewed and considered all information in the Copermittees ROWD, as is documented in the Findings of Tentative Order No. R9-2015-0001 (i.e. Findings 1 through 4). Based on the ROWD review newly proposed requirements specific to southern Orange County Copermittees (i.e. interim hydromodification exemptions for large rivers and engineered channels) are presented in Attachment No. 1 to the Tentative Order (i.e. Order No. R9-2013-0001 as Amended by Order No. R9-2015-0001). San Diego Water Board reviewed the ROWD, including the "State of the Environment" discussion and the San Diego Water Board concluded that many of the ROWD recommendations could be accommodated by the requirements in Order No. R9-2013-0001 with only a limited number of changes required. The new flexible regulatory approach (described in the Fact Sheet for Order No. 2013-0001) and proposed requirements, puts more control in the hands of the Copermittees to develop a watershed-based planning approach. As described in Finding 2 of the Tentative Order, development of a watershed-based planning approach is portrayed in the ROWD as the most important next step to take in the development of the storm water programs in Orange County. The Tentative Order also provides the Copermittees with the flexibility to continue taking advantage of opportunities to reduce dry weather flows (a repeated recommendation throughout the ROWD).	

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Fnd-2	FINDINGS	
	COMMENT: *Modify Finding 7 - In-Stream Treatment Control Systems to allow for the implementation of stream restoration or stream rehabilitation projects and constructed wetlands, or maintenance of reconstruction of existing stream restoration or rehabilitation projects, constructed wetlands, and regional BMPs.* The County of Orange and Concurring Cities and the Orange County Flood Control District suggest modify the language in Finding 7 to allow for full flexibility to identify creative solutions that meet the Tentative Order's alternative compliance goals through implementation of stream restoration or rehabilitation.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees that the language in Finding 7 of Order No. R9-2013-0001 stifles Copermittee ability to meet the Tentative Order's alternative compliance goals through creative solutions such as implementation of stream restoration or stream rehabilitation projects and constructed wetlands, or prevents maintenance of reconstruction of existing stream restoration or rehabilitation projects, constructed wetlands, and regional BMPs. Finding 7 states that pursuant to federal regulations (40CFR 131.10(a)) states cannot adopt waste transport or waste assimilation as a designated use for any waters of the U.S. Authorizing the construction of a runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to accepting waste assimilation as an appropriate use for that water body. Finding 7 concludes that treatment control best management practices (BMPs) must not be constructed in waters of the U.S. The language of Finding 7 does not impinge upon a Copermittees ability to take full advantage of the flexibility provided in the Tentative Order's alternative compliance option. Permit Provision II.E.3.c.(3) of Order No. R9-2013-0001 enables each Copermittee, at its own discretion, to allow Priority Development Projects (POPs) to participate in an alternative compliance program in lieu of implementing the onsite structural BMP performance requirements of Provisions II.E.3.c.(1) and II.E.3.c.(2). Alternative compliance is only allowed if the Copermittee determines that implementation of an alternative compliance project will result in a greater overall water quality benefit for the Watershed Management Area than fully complying with the onsite performance requirements. This alternative compliance option establishes a mechanism for Copermittees to provide alternative candidate projects for those land development projects that are unable to fully implement controls onsite. Copermittees can develop and make available a variety of candidate alternative compliance projects, including stream restoration and rehabilitation projects within a water body, as long as such projects do not entail placement of a treatment facility or treatment control BMPs within the water body. A vast variety of candidate projects could	

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Fnd-2	FINDINGS	
	be proposed under Permit Provision II.E.3.c.(3) and it is expected that candidate projects will not include projects that entail construction, operation, and maintenance of a pollution treatment control facilities or BMPs in a water body. The placement of structures of this type in a water body is contrary to the intent of 40CFR 131.10(a) and; therefore the Tentative Order does not propose any modifications to Finding 7. Many candidate project options exist that could a) achieve the greater overall water quality benefit envisioned by the alternative noncompliance permit provision, and b) support the physical, chemical, and biological integrity, as well as the beneficial uses of a particular water body, and c) not entail constructing treatment facilities or BMPs within a water body. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

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Fnd-3	FINDINGS	
	COMMENT: *Modify Finding 8, 16, and 17 to remove presumption that discharges from MS4s always contain waste.* The County of Orange and Concurring Cities and the Orange County Flood Control District object to Finding 8 of Order No. R9-2013-0001 stating that discharges from the MS4s contain waste, and that Finding 8 does not acknowledge that there may not be pollutants in the discharges from the MS4s. The commenters requested revisions to Findings 8, 16 and 17 to reflect this position.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees with the commenters that Findings 8, 16, or 17 need revision. The Tentative Order implements the requirements of the California Water Code as well as the requirements of the Clean Water Act. Under California Water Code section 13376, any person discharging waste, or proposing to discharge wastes to waters of the State is not authorized to discharge waste unless issued waste discharge requirements. The requirements of the Clean Water Act, specific to discharges of pollutants to waters of the U.S. are also included in the California Water Code, Chapter 5.5 of Division 7. Thus, under the California Water Code, any person discharging pollutants, or proposing to discharge pollutants to waters of the U.S. is not authorized to discharge pollutants unless issued waste discharge requirements that include NPDES requirements. Waste discharge requirements that include NPDES requirements is also an NPDES permit under the Clean Water Act. The Clean Water Act and the California Water Code requires municipalities to obtain and comply with NPDES permits for authorized discharges of pollutants to waters of the U.S. from their MS4s. Municipalities proposing to discharge pollutants from an MS4 must obtain an NPDES permit before they can lawfully discharge. Comments received assert that the definition of "waste" in California Water Code section 13050 does not include storm water or any discharge that is not created by human activity. Comments received also assert that waste discharge requirements and NPDES permits cannot regulate the discharge of "pure storm water" and that not all discharges from the MS4 contain pollutants. Discharges from the MS4 are not "pure storm water." Storm water that flows over the surface of any developed area, which includes the MS4 itself, do not enter or discharge from the MS4 without coming into contact with pollutants or constituents that alter the storm water such that it is no longer "pure storm water." Thus, storm water discharges from the MS4 contains pollutants and contain waste. It is well-known and documented that urban runoff and storm water contains pollutants. (See, e.g., State Water Board Order WQ	

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Fnd-3	FINDINGS	
	2001-015 ("As we stated in Board Order WQ 95-2, the requirement to adopt permits for urban runoff is undisputed, and Regional Water Boards are not required to obtain any information on the impacts of runoff prior to issuing a permit (citation). It is also undisputed that urban runoff contains 'waste' within the meaning of Water Code section 13050(d), and that the federal regulations define 'discharge of a pollutant' to include 'additions of pollutants into waters of the United States from surface runoff which is collected or channeled by man.' (40 C.F.R. § 122.2.) But it is the waste or pollutants in the runoff that meet these definitions of 'waste' and 'pollutant.' And not the runoff itself. [fn]. (p. 5.)) Tentative Order No. R9-2015-0001 (like the current adopted version of Order No. R9-2013-0001) does not regulate "pure storm water." The Tentative Order regulates the discharge of storm water that is being discharged as a waste and contains pollutants. Finding 8 of Order No. R9-2013-0001 accurately states that discharges from the MS4s contain waste, as defined in the California Water Code. Finding 8 also accurately states that discharges from MS4s contain pollutants that adversely affect the quality of waters of the state. Findings 16 and 17 also accurately conclude that BMPs and implementation of BMPs are necessary to remove waste and pollutants in storm water discharges from MS4s. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

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Fnd-4	FINDINGS	
	COMMENT: *Delete Finding 11. Natural waters cannot legally be classified as part of the MS4, and a part of both MS4 and receiving water.* The County of Orange and Concurring Cities and the Orange County Flood Control District assert that Finding 11 is inaccurate and the San Diego Water Board cannot classify natural waters as part of the MS4.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees with this comment. An MS4 is defined in the federal regulations as a conveyance or system of conveyances owned or operated by a Copermittee, and designed or used for collecting or conveying runoff. Therefore, the San Diego Water Board considers natural drainages that are used by the Copermittees as conveyances of runoff, as both part of the MS4 and as receiving waters. The State Water Board supports this approach. In reviewing a Petition on Order No. R9-2001-0001, the State Water Board stated "*We also agree with the Regional Water Board's concern, as stated in its response, that there may be instances where MS4s use 'waters of the United States as part of their sewer system* [...]" State Water Resources Control Board Order WQ 2001-15. Furthermore, the U.S. Supreme Court's 2006 *Rapanos* decision supports the conclusion that natural streams in developed areas can be both receiving waters and MS4s by confirming that ephemeral and intermittent streams can be waters of the U.S. subject to regulation under Clean Water Act section 404 and also be considered point sources of pollution discharges regulated under Clean Water Act section 402. (See *Rapanos, et al. v. United States and Carabell et al. v. United States Army Corps of Engineers, et al. (2006) 547 U.S. 715, 743-744.)* Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

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Fnd-5	FINDINGS	
	COMMENT: *Modify Finding 12 to more accurately describe that Copermittees do not accept free and open access to MS4s, and are not responsible for all discharges not prohibited.* The County of Orange and Concurring Cities and the Orange County Flood Control District object to Finding 12 stating that the Copermittees provide free and open access to MS4s. The Copermittees assert that they are not responsible for discharges from their MS4s that are from third parties that are subject to the jurisdiction of the San Diego Water Board	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees that Finding 12 is inaccurate. The Copermittees have the option to request the authority to discharge from their MS4s under an NPDES permit or comply with the complete prohibition against the discharge of pollutants pursuant to Clean Water Act section 301(a) (33 U.S.C. § 1311(a)). These choices are provided by the federal Clean Water Act, not state laws. The Copermittees have opted to discharge from their MS4s under an NPDES permit. In doing so, they are responsible for discharges from the MS4s. Thus, Finding 12 correctly establishes that the Copermittees provide free and open access for third party discharges to their MS4s and that in doing so the Copermittees are responsible for discharges into the MS4 that they do not prohibit or otherwise control. Finding 12 also correctly concludes that the Copermittees cannot passively receive and discharge pollutants from third parties. The Copermittees have the responsibility of identifying the sources of discharges and pollutants from their MS4s. If the Copermittees are not actively identifying sources and cannot identify sources of discharges and pollutants to and from their MS4s, then the Copermittees are the source of the MS4s discharges and pollutants to receiving waters, even if they believe third parties are responsible for the discharges and pollutants. If, however, the Copermittees identify the sources of discharges and pollutants to or from the MS4s as outside of their legal authority to prohibit or otherwise control, then they are not passively receiving and discharging pollutants, even if they are providing free and open access to the MS4s. The data and information that the Copermittees collect to identify the third party sources can provide the evidence that the Copermittees are not responsible for the discharges and pollutants from the MS4s that can be attributed to third parties. Until the data and information are provided to identify those third parties, and demonstrate those parties are not subject to the Copermittees' legal authority, then the Copermittees are responsible for all of the discharges to and from their MS4s unless such discharges are authorized by a separate NPDES permit.	

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Fnd-5	FINDINGS	
	Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

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Fnd-6	FINDINGS	
	COMMENT: *Modify Finding 15 to recognize that the discharge of all pollutants from the MS4 is subject to the MEP standard.* The County of Orange and Concurring Cities and the Orange County Flood Control District assert Finding 15 is inaccurate. The Copermittees assert that the Tentative Order is inconsistent with the Clean Water Act and the MEP standard applies to both non-storm and water storm water, not just storm water.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees with the comment and incorporates its responses to comments on this topic from the San Diego Water Board's adoption proceedings on Order No. R9-2013-0001. The San Diego Water Board disagrees that the MEP standard applies to both non-storm water and storm water. The San Diego Water Board also disagrees that Finding 15 of Order No. R9-2013-0001should be revised. Finding 15 accurately states the requirements of the Clean Water Act. The San Diego Water Board maintains that MEP standard only applies to pollutants in storm water. See also, Memorandum from San Diego Water Board Counsel to San Diego Water Board dated 5 November 2009, incorporated by reference herein. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

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Fnd-7	FINDINGS	
	COMMENT: *Modify Finding 29 to clarify single water board regulations of Cities of Lake Forest, Laguna Woods, Laguna Hills.* The City of Lake Forest provided suggested language changes to Finding 29 of the Tentative Order to clarify single water board regulation of the Cities of Lake Forest, Laguna Woods, and Laguna Hills. Suggested language changes were for the most part accepted by the San Diego Water Board.	City of Lake Forest
	RESPONSE: The San Diego Water Board agrees with most of the suggested language changes proposed by the City of Lake Forest. The City of Lake Forest provided suggested language changes to Finding 29 of the Tentative Order to clarify single water board regulation of the Cities of Lake Forest, Laguna Woods, and Laguna Hills. The Tentative Order was modified to reflect, for the most part, the City's recommended changes. The word "wholly" was not added as requested by City of Lake Forest because it is unnecessary to clarify the terms of the Water Code section 13228 agreement. The permit language and the Water Code section 13228 designation agreement specify in detail how the Santa Ana Water Board and the San Diego Water Board will, respectively, regulate the City of Lake Forest as well as the Cities of Laguna Hills and Laguna Woods under each Region's respective MS4 permits. The San Diego Water Board notes that the current Riverside County MS4 permit (Order No. R9-2010-0016) includes the term "wholly" but the San Diego Water Board will consider removing that term when it considers the County of Riverside and Riverside Copermittees' Report of Waste Discharge for the reason set forth above.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

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Fnd-8	FINDINGS	
	COMMENT: *Modify Finding 31 to state the Tentative Order is more stringent than Federal Law, requiring an analysis of the factors pursuant to Water Code Section 13241.* The County of Orange and Concurring Cities and the Orange County Flood Control District assert that several requirements of the Tentative Order go beyond the requirements of Federal law, thus an analysis pursuant to California Water code section 13241 is required. The commenters also make several assertions about the deficiencies they perceive with the economic considerations discussed in the Fact Sheet, and assert that a cost-benefit analysis needs to be included in the Fact Sheet discussion.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees with this comment and incorporates its responses to comments on this topic from the San Diego Water Board's adoption proceedings on Order No. R9-2013-0001. The provisions of the Tentative Order do not go beyond the requirements of the Clean Water Act or Code of Federal Regulations. The San Diego Water Board again considered economic information in developing the Tentative Order No. R9-2015-0001 using the best available information, but did not do so in accordance with an analysis pursuant to California Water code section 13241. The provisions of the Tentative Order No. R9-2015-0001 are based on and fully supported by federal requirements, as demonstrated by the legal authority provided by the Clean Water Act and Code of Federal Regulations sections cited in the Fact Sheet. Thus, the San Diego Water Board maintains that an analysis pursuant to California Water Code section 13241 is not required. Federal NPDES regulations do not require that the San Diego Water Board conduct a cost-benefit analysis. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted. Please also see response to comment Lgl-4 and Lgl-5.	

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Fnd-9	FINDINGS	
	COMMENT: *Delete Finding 32. The San Diego Water Board has no legal ability to determine whether a particular mandate is unfunded.* The County of Orange and Concurring Cities and the Orange County Flood Control District assert that the San Diego Water Board does not have the legal authority to determine whether any provisions in the Tentative Order constitute a state mandate, and only the Commission on State Mandates can make the determination.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: See response to comment Lgl-5.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

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A-1	PROVISION A: PROHIBITIONS AND LIMITATIONS	
	COMMENT: *Tentative Order needs to include language that shows a clear pathway to compliance with the discharge prohibitions, receiving water limitations, and effluent limitations in Provision A.1.* Orange County and Concurring Cities, the Orange County Flood Control District, Riverside County Copermittees and the City of San Diego each submitted comments requesting that the requirements of Provision A be modified to provide a clear linkage between the prohibitions and limitations of Provisions A.1 to A.3 with the iterative process required under Provision A.4 to be demonstrated through the implementation of the Water Quality Improvement Plans. The commenters are concerned that the language of Provision A, if not modified, will be interpreted as requiring strict and immediate compliance with the prohibitions and limitations, and the implementation of the iterative process would not be enough the demonstrate compliance with the prohibitions and limitations. Among the many recommended modifications to the requirements of Provision A, the commenters are generally requesting that the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c and A.2.a specifically state that implementation of Provision A.4 constitutes compliance. Furthermore, the Copermittees have requested that Provision A.4 explicitly state that the implementation of the iterative process constitutes compliance with any of the prohibitions and limitations under Provision A.1 to A.3, including compliance with the effective prohibitions of non-storm water discharges to the MS4s, and the TMDL requirements. During adoption of Order No. R9-2013-0001, commenters from environmental organizations were strongly in support of maintaining the existing language and asserted that modifications to Provision A would "weaken" the requirements, or provide "safe harbor" and would violate federal anti-backsliding requirements.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District • Riverside County Copermittees • City of San Diego
	RESPONSE: The San Diego Water Board understands the concerns that the Copermittees have expressed regarding the requirements of Provision A and the apparent lack of a linkage between the iterative process under Provision A.4 and the strict compliance with the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c and A.2.a. This language, however, is consistent with the precedential language that was issued under State Water Board Order WQ-1999-05 and has been implemented in all MS4 permits issued by the San Diego Water Board since 2001. The State Water Board has not yet issued an order or taken other action to supersede this precedential language. Recently, the State Water Board issued a Draft Order on November 21, 2014 in response to petitions challenging the 2012 Los Angeles MS4 Permit in which compliance with receiving water limitations is a major focus. Although the State Water Board's Draft Order generally upholds the Los Angeles Water Board Order, no final decision has been made. The State Water Board held a December 16, 2014 public workshop to receive comments and discuss the Draft Order with	

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A-1	PROVISION A: PROHIBITIONS AND LIMITATIONS	
	Copermittees and interested persons. No decision was made at the workshop. The State Water Board did not indicate when a final Order might be issued. Under the Porter-Cologne Water Quality Control Act, waste discharge requirements must implement applicable water quality control plans, including water quality objectives. The discharge prohibitions and receiving water limitations of Provision A.1.a, A.1.c and A.2.a are consistent with this requirement, and are included in all NPDES permits and Waste Discharge Requirements issued by the San Diego Water Board. These are the fundamental requirements that protect water quality by ensuring that discharges comply with applicable water quality standards to ensure protection of receiving water beneficial uses. The San Diego Water Board does recognize an increasing body of monitoring data indicates that water quality standards are in fact not being met by many of the Copermittees' MS4 discharges. The San Diego Water Board has as a matter of practice not sought to enforce the discharge prohibitions and receiving water limitations of Provision A.1.a, A.1.c or A.2.a where the Copermittees are actively engaged in implementing the other requirements of the MS4 permit. The focus of the previous MS4 permits and the San Diego Water Board has been on compliance with implementation of the actions required by the permit, rather than the water quality outcomes that are expected to be achieved. As noted by the Copermittees, however, the approach of the Tentative Order is a significant departure from the approach of previous MS4 permits. Previous MS4 permits did not provide the Copermittees enough flexibility to truly implement an iterative process to adaptively manage their programs to identify innovative new ways to improve the quality of discharges from their MS4s or in the receiving waters, because the actions required by the permit were relatively fixed and prescriptive. In contrast, the Tentative Order is structured to allow the Copermittees to take advantage of the iterative process and adaptively manage their programs to focus on achieving outcomes. Since the State Water Board has yet to issue a final decision response to the petitions challenging the 2012 Los Angeles Water Board MS4 Permit, the San Diego Water Board did not revise Provisions A.1.a, A.1.c, A.2.a and A.4, and the language of Provision A remains consistent with the language in precedential State Water Board Order No. WQ 1999-05. However, the San Diego Water Board supports the concept of an alternative compliance option and considered it during the adoption of the Regional MS4 Permit in 2013. The San Diego Water Board will consider incorporation of the Riverside County Copermittees into the Regional MS4 Permit in late 2015 or early 2016. As part of this process, the San Diego Water Board will also consider the incorporation of a well-defined, transparent, and finite alternative compliance option similar to the option	

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A-1	PROVISION A: PROHIBITIONS AND LIMITATIONS	
	proposed in 2013, but also consistent with any decisions/guidance from the State Water Board. A rigorous alternative compliance option would allow the Copermittees that are willing to pursue significant receiving water quality improvements beyond the iterative process to be deemed in compliance with the receiving water limitations. Inclusion of the alternative compliance option during the extensive public process for the Riverside County Copermittees will provide the stakeholders the necessary opportunity to discuss, comment, and suggest changes to any proposed language. An administrative finding documenting the San Diego Water Board's intent to consider incorporation of an alternative compliance option during the MS4 NPDES permit reissuance proceedings for the Riverside County Copermittees has been added to the Tentative Order.	

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B-1	PROVISION B: WATER QUALITY IMPROVEMENT PLANS	
	COMMENT: *Water Quality Improvement Plans should be the foundation for a BMP-based compliance approach.* Orange County and Concurring Cities, the Orange County Flood Control District, Riverside County Copermittees and the City of San Diego request that Copermittees be allowed to utilize the development and implementation of the Water Quality Improvement Plans as a compliance mechanism for the prohibitions and limitations of Provisions A.1 to A.3.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District • Riverside County Copermittees • City of San Diego
	RESPONSE: The San Diego Water Board understands the concerns raised by the comments from the Copermittees. The Tentative Order includes the State Water Board precedential language. At this time the San Diego Water Board has chosen to keep the State Water Board precedential language in Attachment 1 to the Tentative Order until the State Water Board takes action with regards to this issue. Should the State Water Board decide to issue revised precedential language regarding mechanisms for compliance with Provision A.1 to A.3, the San Diego Water Board will then update the Regional MS4 Permit as necessary. Additionally, the discussion in the Fact Sheet under Provision B6 describes the San Diego Water Boards intentions to use the Water Quality Improvement Plans as functionally equivalent documents to TMDL Load Reduction Plans. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted. See also response to comment A-1.	

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B-2	PROVISION B: WATER QUALITY IMPROVEMENT PLANS	
	COMMENT: *Water Quality Improvement Plans need to be based on regionally appropriate water quality standards that reflect sustainable conditions for beneficial uses.*	Riverside County Copermittees
	RESPONSE: The San Diego Water Board understands the concerns raised by the Riverside County Copermittees, however the proceedings on the Tentative Order are not the proper forum for addressing proposals to modify Basin Plan water quality standards. Water quality standards and beneficial uses are established in the San Diego Water Board's Basin Plan and not the Tentative Order /. The San Diego Water Board suggests the Riverside County Copermittees bring the comment forth during the San Diego Water Boards process for conducting the Triennial Review of Basin Plan water quality standards which is currently underway. . It is within the Triennial Review process that the San Diego Water Board reviews the Basin Plan water quality standards and beneficial uses. Information on the Triennial Review process can be accessed on the San Diego Water Board website at: http://www.waterboards.ca.gov/sandiego/water_issues/programs/basin_plan/tri_review.shtml Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

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B1-1	PROVISION B.1: Watershed Management Areas	
	COMMENT: *Revise footnote 2 to Table B-1 to clarify single water regulation of City of Lake Forest.* The City of Lake forest suggests revision to footnote 2 to Table B-1 to clarify single board regulation.	City of Lake Forest
	RESPONSE: The San Diego Water Board understands the City's comment and has modified the footnote language to be consistent with the language in Finding 29. Please see response to Comment Fnd-7.	

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B1-2	PROVISION B.1: Watershed Management Areas	
	COMMENT: *Revise language in Tentative Order to clarify NPDES permit is applicable to discharges from Copermittees MS4s.* The City of San Diego requests that the requirements of the Tentative Order "clarify" the responsibilities of the Copermittees to develop a Water Quality Improvement Plan "for their MS4 discharges within" each of the Watershed Management Areas.	City of San Diego
	RESPONSE: The San Diego Water Board disagrees with the comment that clarification is necessary. The San Diego Water Board did not revise the language with the qualifying phrases requested by the Copermittees. The Copermittees are required to establish the legal authority to implement the requirements of the Tentative Order. The Tentative Order does not require the Copermittees to implement requirements outside of their jurisdictions or outside of their legal authority. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

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B3-1	PROVISION B.3: Water Quality Improvement Goals, Strategies and Schedules	
	COMMENT: *Provision B.3.a should explicitly state that the action levels, interim goals and final goals are not enforceable limitations.*	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees with the comment. After further clarification with the commenters on their references to footnotes in Provision B and C, Footnote 8 to Provision C.1 for Non-Storm Water Action Levels (NALs) and Footnote 10 to Provision C.2 Storm Water Action Levels (SALs) clearly state NALs and SALs incorporated in the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, unless the NAL or SAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

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C-1	PROVISION C: ACTION LEVELS	
	COMMENT: *The Tentative Order should enable the Copermittees to apply NALs/SALs based on the priorities of the Water Quality Improvement Plan and/or the IDDE program.* The County of Orange and Concurring Cities and the Orange County Flood Control District are concerned that the Tentative Order contradicts itself by stating Copermittees must develop and incorporate numeric NALs and SALs into the Water Quality Improvement Plan and/or IDDE program, then mandates Copermittees include all of the numeric action levels identified in tables C-1 to C-5. The Copermittees expressed concern that requiring the prescribed NALs and SALs under Provision C would result in unnecessary analyses for constituents that are not a priority identified in the Water Quality Improvement Plan.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees with the request to modify the requirements as suggested. The NALs and SALs under Provision C have been included to support the development and prioritization of the water quality strategies that will be implemented based on the highest priority water quality conditions identified by the Copermittees in the Water Quality Improvement Plans. The NALs and SALs have been included as a tool that the Copermittees and the San Diego Water Board can utilize to determine if the Copermittees are implementing the requirements of the Clean Water Act for MS4 permits to *effectively prohibit non-storm water discharges to the MS4* and *reduce pollutants in storm water discharges from the MS4 to the MEP*. The NALs and SALs are not new, and are included in both of the current MS4 permits issued to Orange County (Order No. R9-2009-0002) and Riverside County (Order No. R9-2010-0016). The Copermittees are required to effectively prohibit non-storm water discharges to their MS4s, which in turn should result in little to no discharges from their MS4s to receiving waters. If there are non-storm water discharges from the Copermittees' MS4s to receiving waters, those discharges should only be NPDES permitted discharges. Even if those discharges are NPDES permitted discharges, the Copermittees are responsible for demonstrating that those discharges are not illicit discharges by identifying the sources as NPDES permitted discharges. The prescribed NALs in Table C-1 through C-4 are associated with most if not all the pollutants that are known	

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C-1	PROVISION C: ACTION LEVELS	
	or suspected to be causing or contributing to impairments in water bodies on the 303(d) List for the San Diego Region. The NALs are appropriately based on water quality objectives because non-storm water discharges that do not contain pollutants at levels in exceedance of the NALs are not expected to cause or contribute to exceedances of water quality standards in receiving waters. Thus, the prescribed NALs have been included to allow the Copermittees to prioritize their efforts in effectively prohibiting unpermitted non-storm water discharges to their MS4s, demonstrate that they have effectively prohibited non-storm water discharges to their MS4s that could cause or contribute to exceedances of water quality standards, or identify NPDES permitted sources that are resulting in discharges from their MS4s that are causing or contributing to exceedances of water quality standards in receiving waters. In any case, the prescribed NALs are necessary to allow the San Diego Water Board to determine if the Copermittees are effectively prohibiting non-storm water discharges to the MS4. The Tentative Order also allows Copermittees the flexibility to develop and include NALs, for which values are not already included provision C-1, for those pollutants that are causing or contributing, or threatening to cause or contribute to a condition of pollution or nuisance in receiving waters associated with the highest priority water quality conditions related to non-storm water discharges from the MS4s into the Water Quality Improvement Plans and IDDE Program. The Tentative Order does not prohibit the Copermittees from using any "previously established NALs" in addition to those listed in C-1 to C-4. In contrast, the prescribed SALs are not based on water quality objectives, but set at higher levels because the San Diego Water Board recognizes that reducing pollutants in wet weather discharges from the MS4s to water quality objectives is challenging. The prescribed SALs, however, will allow the Copermittees to prioritize their efforts in reducing pollutants in storm water discharges from their MS4s, and allow the San Diego Water Board to determine if the Copermittees are reducing pollutants in storm water discharges from their MS4s to the MEP. The San Diego Water Board disagrees with the concerns about monitoring for constituents that are not associated with the highest priority water quality conditions. Periodically analyzing non-storm water and storm water discharges from the Copermittees' MS4 for pollutants other than those associated with the highest priority water quality conditions is necessary if the Copermittees would like to re-prioritize or identify new priority water quality conditions that will be addressed. The San Diego Water Board does recognize that there is a cost associated with analyzing for additional constituents. Thus, the San Diego Water Board has modified the MS4 outfall monitoring requirements to reduce the number of dry weather MS4 outfall monitoring stations that must be analyzed (see Provision D.2.b.(2)(b) of Order No. R9-2013-0001) and provided the Copermittees some flexibility to modify the analytes for the wet weather MS4 outfall monitoring stations (see Provision	

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C-1	PROVISION C: ACTION LEVELS	
	D.2.c.(5)(f)). As for the concerns about the chemically-based NALs and the biologically- or physically-based numeric goals for receiving waters, the San Diego Water Board disagrees that they cannot be linked or may be incompatible. Biologically- or physically-based numeric goals will likely be measured in the receiving waters. The chemically-based NALs apply to the MS4 outfalls. The quality of the MS4 discharges and the improvement of biological or physical measurements can be linked. Both are likely necessary to demonstrate that MS4 discharges are either not causing or contributing to a biological or physical impairment of the receiving water, or an improvement in MS4 discharges is resulting in improvements in the biological or physical conditions of the receiving water. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

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D-1	PROVISION D: MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS	
	COMMENT: *Copermittees need to have the flexibility to adjust analytical monitoring in the water quality improvement plans based on assessments of current sources that may contribute to the section 303(d) water body impairments*. The County of Orange and Concurring Cities and Orange County Flood Control District requested relief of analytical monitoring requirements if supporting information can be provided to document the current pollutant concentrations or may provide historic information to support the absence of usage of these constituents in the MS4 drainage area.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees with the suggested revisions to the Tentative Order. Monitoring required in Provision D of Attachment No. 1 to the Tentative Order describes the minimum monitoring required to inform the Copermittees, San Diego Water Board, and the public on the progress the Copermittees make within their Phase 1 storm water programs to: 1) effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water from the MS4 to the maximum extent practicable; and 2) implement strategies to control the discharge of pollutants in MS4 discharges and improve receiving water quality. These minimum monitoring requirements do not prohibit the Copermittees from conducting monitoring for which it considers necessary to identify constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan. Each Copermittee is required to achieve compliance with the Basin Plan prohibitions and receiving water limitations (Provision A.1.a, A.1.c, and A.2.a, in Attachment 1 to the Tentative Order) through implementation of control measures and other actions as specified in the Tentative Order. The monitoring and assessment information collected and reported is expected to be key to the iterative approach and adaptive management process required by the Tentative Order (Provision A.4 of Attachment 1). Under the adaptive management provision, Copermittees are expected to change their monitoring programs to collect the necessary data for them to be able to demonstrate that their jurisdictional storm water management programs are making measurable progress towards achieving compliance with Basin Plan prohibitions and receiving water limitations. Changes to the monitoring programs would be presented during the development of or subsequent updates to the Water Quality Improvement Plan. All Copermittees are required to conduct the minimum monitoring described in Provision D, however through the adaptive management approach in Provision A of Attachment 1 to the Tentative Order, Copermittees are allocated sufficient flexibility to make changes to their monitoring program to collect the data most necessary to that their control strategies and other actions are	

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D-1	PROVISION D: MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS	
	making measurable progress towards effectively eliminating non-storm water discharges, and reducing pollutants in storm water to the maximum extent practicable to ultimately achieve compliance with the Basin Plan prohibitions and receiving water limitations (Provision A in Attachment 1 to the Tentative Order). Based on this consideration no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted. See also response to comment Gnl-2.	

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D-2	PROVISION D: MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS	
	COMMENT: *Modify Tentative Order requirements to be consistent with language in the South Orange County Wastewater Authority permit language.* The San Diego Water Board Monitoring and Assessment staff requests the Tentative Order be modified to update the Unified Beach Water Quality Monitoring language.	San Diego Water Board Staff of the Monitoring and Assessment Group
	RESPONSE: The San Diego Water Board agrees with the comment and has made the suggested language changes to the Tentative Order The Tentative Order language was revised to be consistent with the December 5, 2014 Executive Officer's letter directive, issued pursuant to California Water Code section 13383, requiring Copermittee participation in and shared responsibility for implementation of the Unified Beach Water Quality Program. Effective April 1, 2015, the requirements established through issuance of this Water Code section 13383 letter directive will become an enforceable component of the monitoring and reporting requirements in the Tentative Order.	

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E-1	PROVISION E: JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS	
	COMMENT: *Water Quality Improvement Plans and related Jurisdictional Runoff Management Programs should be streamlined and focus on the watershed's highest priorities.* The County of Orange and Concurring Cities and the Orange County Flood Control District commented that the Tentative Order, Attachment 1 at Provision E deviates from the strategic and adaptive approach of the Water Quality Improvement Plan concept, and is instead a "one-size-fits-all" approach. The commenters recommend modifying the Tentative Order so that the Water Quality Improvement Plans and jurisdictional runoff management programs can be streamlined and focus on the highest priorities within the watersheds.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board agrees that the Water Quality Improvement Plan framework allows for the identification and development of a storm water management program built around the highest priority water quality conditions within a specific watershed. The Tentative Order is structured so that the Water Quality Improvement Plan identifies the highest priority conditions of concern for a particular watershed, and also strategies, numeric goals, and schedules for making improvements for those conditions of concern. The jurisdictional runoff management programs are meant to be the implementing mechanism for the Water Quality Improvement Plans, i.e. they must incorporate the strategies identified in the Water Quality Improvement Plans. The San Diego Water Board disagrees that the requirements of Provision E deviate from the strategic and adaptive approach of the Water Quality Improvement Plan concept and that modifications are needed. The commenters should note that the requirements of the Provision E of the Tentative Order are substantially less prescriptive than those of the previous Fourth Term MS4 permits. Whereas the requirements of the Fourth Term MS4 permits were very specific, detailed, and prescriptive, the requirements of the Tentative Order include only basic program elements that meet the minimum requirements of 40 CFR 122.26(d)(2)(iv), but include much more flexibility in how the Copermittees implement their programs. The Copermittees can emphasize or de-emphasize different aspects of their programs to accomplish the overarching goals of the Water Quality Improvement Plans. For example, a Copermittee may choose to emphasize a certain program element by increasing the frequency of BMP inspections for discharges that are likely to contribute to the priority conditions of concern, while maintaining other program elements at the minimum required levels. Unlike the Fourth Term MS4 permits, the Tentative Order allows each Copermittee to specify, for example, the minimum inspection frequency for each specific program element. In this way, Copermittees are allowed to run their programs at minimum baseline levels, but also direct their resources where needed to achieve improvements in water quality and to address the highest priority conditions of concern.	

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E-1	PROVISION E: JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS	
	Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

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E1-1	PROVISION E.1: Legal Authority Establishment and Enforcement	
	COMMENT: *The Copermittees are only responsible for administering and enforcing the codes and ordinances applicable to their jurisdictions.* The County of Orange and Concurring Cities and the Orange County Flood Control District request that the requirements of Provision E.1 be modified to specify that the legal authority established by the Copermittees applies only to discharges within their jurisdictions, and that it is unnecessary to include language pertaining to discharges regulated by the Statewide Industrial and Construction General Permits.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees that it is necessary to specify that the legal authority established by the Copermittees is only applicable to their jurisdictions. The requirements of Provision E.1 are consistent with the requirements under 40 CFR 122.26(d)(2)(i)(A)-(F) and do not go beyond those requirements. The legal authority that each Copermittee is required to establish for its jurisdiction is logically only expected to apply to its jurisdiction. Provision E.1.a.(2) is consistent with 40 CFR 122.26(d)(2)(i)(A), which requires the Copermittee to "*Control through ordinance, permit, contract, order or similar means, the contribution of pollutants to the municipal storm sewer by storm water discharges associated with industrial activity and the quality of storm water discharged from sites of industrial activity*." 40 CFR 122.26(d)(2)(i)(A) does not make a distinction between industrial activity (which includes construction activity according to 40 CFR 122.26(b)(14)(x) that is regulated by an NPDES permit, such as the Statewide Industrial and Construction General Permits, and those that are not. Even if there are industrial and construction sites regulated by the Statewide Industrial or Construction General Permits, those sites are still subject to the Copermittees ordinances and the Copermittee must have the legal authority to control discharges from those sites. Provision E.1.a.(10) is consistent with 40 CFR 122.26(d)(2)(i)(F), which requires the Copermittee to "*Carry out all inspection, surveillance and monitoring procedures necessary to determine compliance and noncompliance with permit conditions including the prohibition on illicit discharges to the municipal separate storm sewer*." Therefore no modifications are warranted, and the San Diego Water Board did not make revisions to the requirements of Provision E.1 requested by the Commenters.	

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E1-2	PROVISION E.1: Legal Authority Establishment and Enforcement	
	COMMENT: *The requirement for third party BMP effectiveness documentation is duplicative.* The County of Orange and Concurring Cities and the Orange County Flood Control District state that Provision E.1.a.(8) of the Tentative Order requires the Copermittees to obtain legal authority to require documentation of the effectiveness of BMPs, and that this requirement sets up a process for the establishment of multiple third party monitoring programs and expenditure of public funds to monitor the effectiveness of BMPs. The commenters state that this requirement ignores the fact that Copermittees have already established legal authority for their development standards, and is therefore redundant.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees that Provision E.1.a.(8) sets up a process for the establishment of multiple third party monitoring programs and expenditure of significant public funds to monitor the effectiveness of BMPs. The Provision simply states that each Copermittee must establish legal authority that authorizes the Copermittee to require documentation on the effectiveness of BMPs from any of its dischargers. The Copermittee is not required to exercise this legal authority, but the legal authority must be established and available to the Copermittees in the event that the Copermittee could benefit from obtaining this type of information. The requirement is not duplicative because the legal authority to impose development standards is separate from the legal authority to require documentation on BMP effectiveness. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

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E2-1	PROVISION E.2: Illicit Discharge Detection and Elimination	
	COMMENT: *Modify the Illicit Discharge Detection and Elimination Program provisions so as not to negate the very intent and purpose of the watershed approach and the focus on the highest priorities within each watershed management area.* The County of Orange and Concurring Cities and the Orange County Flood Control District request modification to the introductory paragraph of the Illicit Discharge Detection and Elimination Provisions to better reflect the watershed approach and program focus on highest priority conditions of concern.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees that modifications to the Illicit Discharge Detection and Elimination Program Provisions are needed for the reasons stated in the Response to Comment E1-1. Copermittees are afforded flexibility in meeting the requirements of Provision E.2. They are required to meet a minimum baseline program (with limited prescriptiveness compared to previous Fourth Term MS4 permits) as stated in the Tentative Order, and within that framework may focus on the highest priority conditions of concern as described in the Water Quality Improvement Plans. All illicit discharges are to be actively detected and eliminated in a prioritized manner. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

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E2a-1	PROVISION E.2.a: Non-Storm Water Discharges	
	COMMENT: *Copermittees should be given flexibility to prioritize their IDDE program to focus on non-storm water discharges likely to be a source of pollutants.* The County of Orange and Concurring Cities and the Orange County Flood Control District request that the requirements under Provision E.2.a be revised to allow the Copermittees to focus on eliminating non-storm water discharges that are a source of pollutants and not require the elimination of all non-storm water discharges.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees with the commenter's' request. Provision E.2 does provide the Copermittees with a mechanism to address illicit discharges regardless of whether or not constituents of concern are present within the flows. The Copermittees are required to prioritize the non-storm water discharges that they will address, and eliminate the highest priority non-storm water discharges first. The Clean Water Act requires NPDES permit for MS4s to effectively prohibit non-storm water discharges to the MS4. As explained in the Fact Sheet, the Phase I Final Rule clarifies that non-storm water discharges through an MS4 are not authorized under the CWA (55 FR 47995): "*Today's rule defines the term "illicit discharge" to describe any discharge through a municipal separate storm sewer system that is not composed entirely of storm water and that is not covered by an NPDES permit. Such illicit discharges are not authorized under the Clean Water Act. Section 402(p(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit*." Thus, all non-storm water discharges that do not have authorization under an NPDES permit or are a category of non-storm water discharges that have been identified as a source of pollutants must ultimately be removed (i.e. prevented or eliminated) from the MS4 or become subject to an NPDES permit. The requirements under Provisions E.2.a.(1) and E.2.a.(3) are consistent with the Clean Water Act, the Code of Federal Regulations and the clarification in the Phase I Final Rule for non-storm water discharges. The non-storm water categories listed under Provision E.2.a.(3) generally are expected to be discharged from natural, uncontrollable, or unanticipated sources. Non-storm water discharges from foundation drains and footing drains designed to be above the groundwater table are not generally expected to occur. If they do occur, the Copermittee is expected to implement its illicit discharge detection and elimination program to	

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E2a-1	PROVISION E.2.a: Non-Storm Water Discharges	
	determine if the discharge is transient or persistent, a source of pollutants or not, and whether the discharge must be eliminated in accordance with its priorities. In general, the requirements under Provision E.2 are focused on the ultimate removal of unauthorized non-storm water discharges to the MS4 to "effectively prohibit" non-storm water discharges to the MS4, as required by the Clean Water Act. The San Diego Water Board is not requiring the Copermittee to enforce any NPDES permits issued by the San Diego Water Board or State Water Board. The Copermittees are only required to use their legal authority to prohibit illicit discharges to their MS4s established pursuant to Provision E.1.a.(1). The San Diego Water Board did not revise Provision E.2 as recommended by the commenters.	

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E2a-2	PROVISION E.2.a: Non-Storm Water Discharges	
	COMMENT: *Modify Provision E.2.a.(5) to reflect the language previously adopted by the Regional Board in Order No. R9-2009-0002 regarding emergency firefighting discharges.* The County of Orange and Concurring Cities and the Orange County Flood Control District request that the Tentative Order be modified to clarify that there should not be a circumstance in which the Copermittees or the San Diego Water Board would identify emergency firefighting discharges as illicit discharges or a significant source of pollutants, and therefore in no instance would require BMP implementation.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees that the language in Provision E.2.a.(5) requires revision. This Provision does not require the implementation of BMPs for emergency firefighting discharges, nor does it prohibit emergency firefighting discharges to the MS4. Provision E.2.a.(5)(b) only requires the Copermittees to "encourage" the implementation of BMPs in emergency situations. Provision E.2.a.(5)(b) is a recommendation for the Copermittees to implement, not a requirement for compliance.	

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E2a-3	PROVISION E.2.a: Non-Storm Water Discharges	
	COMMENT: *The Tentative Order should not require the elimination of non-storm water discharges as a part of the IDDE Program.* The County of Orange and Concurring Cities and the Orange County Flood Control District state that Provision E.2.a.(7) misapplies the federal regulations that require the Copermittees to identify non-storm water discharges as illicit discharges prior to having an obligation to effectively prohibit it, and therefore the Provision should be removed.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees that it is appropriate to remove Provision E.2.a.(7) because it is consistent with Clean Water Act, the Code of Federal Regulations and the clarification in the Phase I Final Rule for non-storm water discharges. Please see the response to comment E2a-1 for further discussion.	

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E3-1	PROVISION E.3: Development Planning	
	COMMENT: *The Development Planning Provisions must be modified so as not to negate the very intent and purpose of the watershed approach and the focus on the highest priorities within each Watershed Management Area.* The County of Orange and Concurring Cities and the Orange County Flood Control District request modification to the introductory paragraph of the Development Planning Provisions to better reflect the watershed approach and program focus on highest priority conditions of concern.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees that modifications to the Development Planning Program Provisions are needed for the reasons stated in the Response to Comment E1-1. Copermittees are afforded flexibility in meeting the requirements of Provision E.3. They are required to meet a minimum baseline program (with limited prescriptiveness compared to Fourth Term MS4 permits) as stated in the Tentative Order, and within that framework may focus on the highest priority conditions of concern as described in the Water Quality Improvement Plans. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

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E3b-1	PROVISION E.3.b: Priority Development Projects	
	COMMENT: *Portions of redevelopment projects that already have water quality treatment BMPS should not be subject to the new PDP requirements.* The County of Orange and Concurring Cities and the Orange County Flood Control District request that language be added to the Tentative Order that would specify structural BMP requirements are not applicable to Priority Development Projects (or portions thereof) if the project already has implemented structural BMPs pursuant to requirements of prior MS4 permits.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees in concept with the Copermittees' request. Although some projects may already have structural BMPs onsite, the performance requirements of those BMPs do not necessarily meet the MEP requirements of the Tentative Order. Priority Development Projects subject to the requirements of older MS4 permits may not have BMPs that meet the numerical storm water pollutant control retention performance standard, or the flow control hydromodification performance standard. Therefore, when redevelopment sites, that were subject to older MS4 permit requirements, want to create and/or replace 5,000 square feet or more of impervious surface on the project site (collectively over the entire project site on an existing site with 10,000 square feet or more of impervious surfaces), the redevelopment site must update the BMPs during the design phase. Furthermore, the commenter should note that the pollutant control and hydromodification management BMP requirements of the Tentative Order are the same as the previous South Orange County MS4 permit, Order No. R9-2009-0002. Therefore Priority Development Projects that were subject to these requirements developed in 2009 should already be in compliance with the requirements of the Tentative Order. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

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January 21, 2015

E3b-2	PROVISION E.3.b: Priority Development Projects	
	COMMENT: *Tentative Order should include a priority development project exemption for flood control and stream restoration projects.* The County of Orange and Concurring Cities and the Orange County Flood Control District request that the Tentative Order should include exemptions for flood control and stream restoration projects from the requirement to implement structural BMPs since they are not a source of pollutants.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board believes that it may be suitable to relax the structural BMP standards for, or exempt flood control projects, but not before projects are evaluated on a case-by-case basis. In many instances, water quality protective measures may be appropriate for implementation in flood control projects, but such options would not be evaluated if the Tentative Order provided a blanket exemption. Furthermore, 40 CFR 122.26(d)(2)(iv)(A)(4) requires Copermittees to include in their applications mechanisms "to assure that flood management projects assess the impacts on the water quality of receiving water bodies and that existing structural flood control devices have been evaluated to determine if retrofitting the device to provide additional pollutant removal from storm water is feasible." Such evaluations would not occur if flood control projects were provided blanket exemption from Priority Development Project status, therefore a blanket exemption is not appropriate. Stream restoration projects do not fit any of the Priority Development Project categories, therefore no exemptions are needed. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

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E3b-3	PROVISION E.3.b: Priority Development Projects	
	COMMENT: *Tentative Order should include a priority development project exemption for emergency public safety projects.* The County of Orange and Concurring Cities and the Orange County Flood Control District request the Tentative Order include exemptions for emergency public safety projects from the requirement to implement structural BMPs because *a delay due to the development and approval of a Standard Stormwater Mitigation Plan (SSMP) would compromise public safety, public health and/or the environment.*	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees that modifications to the Tentative Order to exempt emergency public safety projects from the requirement to implement structural BMPs is necessary. The Commenters state that emergency projects will be implemented immediately where public safety, public health, and/or the environment is threatened, and that there will be no time for the development, processing, and plan check for these projects. The San Diego Water Board agrees. Provision E.3 describes requirements that pertain to development *planning*. Emergency situations, by definition, are not planned projects and therefore do not involve the design, approval, and construction of a building or structure. Therefore an explicit exemption is not needed. Regardless of the conditions (i.e. emergency conditions) under which a public safety project requires installation, if a public safety project meets the Priority Development Project criteria of Provision E.3.b, then the public safety project needs to include the structural BMP controls of Provision E.3.c. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

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E3c-1	PROVISION E.3.c: Priority Development Project Structural BMP Performance Requirements	
	COMMENT: *Modify the Tentative Order to allow flexibility in the structural BMP performance standards if watershed-specific performance standards are developed in the water quality improvement plans.* The County of Orange and Concurring Cities and the Orange County Flood Control District submitted comments stating that the Copermittees should be given the opportunity to develop alternative BMP performance standards consistent with the goals of the Water Quality Improvement Plans.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board agrees that greater improvements to water quality in the watersheds may be realized if Priority Development Projects were allowed to implement some requirements offsite, as opposed to strictly onsite. For this reason, the Attachment No. 1 of the Tentative Order allows for "alternative compliance" in instances where the Copermittee determines that offsite measures will have a greater overall water quality benefit for the Watershed Management Area than if the Priority Development Project were to implement structural BMPs onsite. Consequently, watershed-specific structural BMP requirements are present in Attachment No. 1 to the Tentative Order that provide for allowable compliance offsite. Therefore no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted. The alternative compliance program, which is described in Provision E.3.c.(3), is an option for Priority Development Projects where the Copermittee has participated in the development of a Watershed Management Area Analysis as part of the Water Quality Improvement Plan (described in Provision B.3.b.(4)). Such an approach is consistent with the latest findings in hydromodification management by the scientific community. In the Southern California Coastal Water Research Project (SCCWRP) Technical Report No. 667, the authors state: "*An effective [hydromodification] management program will likely include combinations of on-site measures (e.g., low-impact development techniques, flow-control basins), in-stream measures (e.g., stream habitat restoration), floodplain and riparian zone actions, and off-site measures. Off-site measures may include compensatory mitigation measures at upstream locations that are designed to help restore and manage flow and sediment yield in the watershed.*" Consistent with the ideas brought forth by the SCCWRP report, in the optional Watershed Management Area Analysis of Provision B.3.b.(4), the Copermittees must develop watershed maps that include as much detail about factors that affect the hydrology of the watersheds as is available. Such factors included identification of areas suitable for infiltration, coarse sediment supply areas, and locating stream channel structures and constrictions. Once these factors are mapped and studied, the Copermittees can identify areas in the	

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E3c-1	PROVISION E.3.c: Priority Development Project Structural BMP Performance Requirements	
	watersheds where "candidate projects" may be implemented that are expected to improve water quality in the watershed by providing more opportunity for infiltration, slowing down storm water flows, or attenuation of pollutants naturally via healthy stream habitat. These projects may be in the form of retrofitting existing development, rehabilitating degraded stream segments, identifying regional BMPs, purchasing land to preserve valuable floodplain functions, and any other projects that the Copermittees identify. Under the alternative compliance program, Priority Development Project applicants may be allowed to fund, partially fund, or implement a candidate project, in lieu of implementing structural BMPs onsite, if they enter into a voluntary agreement with the Copermittee permitting this arrangement. If compliance involves funding or implementing a project that is outside the jurisdiction of the Copermittee, then that Copermittee may enter into an inter-agency agreement with the appropriate jurisdiction(s). Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

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E3c1-1	PROVISION E.3.c.(1): Storm Water Pollutant Control BMP Requirements	
	COMMENT: *Terminology is inconsistent with the use of "Low Impact Development" BMPs.* The County of Orange and Concurring Cities and the Orange County Flood Control District request modification to the Provision E.3 to provide consistency with the use of "Low Impact Development" terminology.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board has reviewed the suggested edits to Provision E.3 and did not find any suggestions pertaining to Low Impact Development terminology. Based on this consideration no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

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E3c1-2	PROVISION E.3.c.(1): Storm Water Pollutant Control BMP Requirements	
	COMMENT: *The San Diego Water Board is requiring increasingly stringent onsite storm water retention requirements.* The Construction Industry Coalition on Water Quality (CICWQ) submitted comments stating that the San Diego Water Board is requiring increasingly stringent onsite storm water retention requirements without evidence that existing requirements under Order No. R9-2009-0002 are not working to protect water quality and beneficial uses. The commenter asserts that the San Diego Water Board is proposing to enact the most stringent onsite requirements for storm water runoff anywhere in California, and that the requirements are less flexible than earlier MS4 permits.	Construction Industry Coalition on Water Quality • San Diego Building Industry Association • Building Industry Association of Southern CA • Associated General Contractors • Associated Builders and Contractors • San Diego Regional Chamber of Commerce • Business Leadership Alliance • San Diego Association of Realtors • San Diego Apartment Association • National Association of Industrial & Office Properties • Building Office & Management Association • San Diego Chapter of American Society of Landscape Architects
	RESPONSE: The commenter incorrectly asserts that Attachment No. 1 to Tentative Order requires increasingly stringent onsite storm water retention requirements over and above the requirements of Order No. R9-2009-0002, the Fourth Term MS4 permit for Orange County Copermittees. The purpose of the onsite retention requirement in both the Tentative Order and Order No. R9-2009-0002 is to retain onsite the pollutants contained in the volume of storm water runoff produced from a 24-hour 85th percentile storm event. This requirement has not changed from Order No. R9-2009-0002, and therefore the commenter is incorrect in stating that the San Diego Water Board is requiring additional prescriptive performance measures for retaining storm water runoff. This is the MEP standard recognized by the San Diego Water Board and is consistent with the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), as well as Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit), and Los Angeles Water Board Order No. R4-2012-0175 (Los Angeles County MS4 Permit). Additionally, the San Diego Water Board disagrees with the commenter's assertion that the retention standard	

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E3c1-2	PROVISION E.3.c.(1): Storm Water Pollutant Control BMP Requirements	
	is less flexible in the Tentative Order than in Order No. R9-2009-0002. In fact, the pollutant control and hydromodification management BMP requirements are more flexible in the Tentative Order than in the Fourth Term MS4 permits because the Tentative Order allows Priority Development Projects to comply by mitigating offsite, if doing so would provide greater water quality benefit for the watershed. Please see the response to Comment No. E3c1-2 for a discussion of the Watershed Management Analysis and the ability to perform offsite mitigation.	

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E3c1-3	PROVISION E.3.c.(1): Storm Water Pollutant Control BMP Requirements	
	COMMENT: *The Tentative Order and Fact Sheet ignore the findings of the Copermittee's Report of Waste Discharge.* The County of Orange and Concurring Cities and the Orange County Flood Control District submitted comments stating that there is little justification for the requirements of the Tentative Order based on the successes of the Copermittee's storm water programs, as reported in the Report of Waste Discharge (ROWD). The Copermittees report successes in reducing bacterial contamination in coastal waters during dry weather, and also assert that exceedances of total dissolved solids (TDS) and nutrients are unlikely due to urban sources. The commenters also state that the Tentative Order should recognize this uncertainty and not mandate on-site retention of runoff in the first instance where it may exacerbate the exfiltration of shallow groundwater with elevated TDS and nutrients. Finally, the commenters state that toxicity occurs sporadically in receiving waters in Orange County, indicating that the causes are not urban in nature, and that pesticide regulation is not within the Copermittees' jurisdictions.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board recognizes that the Copermittees have made great strides in improvements in water quality and attainment of beneficial uses through rigorous implementation of their storm water management programs, but disagrees that the requirements of Attachment No. 1 to the Tentative Order should be removed. The Copermittees note that bacterial contamination is low during dry weather, but concede that achieving reductions in bacteria concentrations in wet weather is challenging. The San Diego Water Board is charged with protecting the beneficial uses of receiving waters at all times, regardless of season or weather conditions. The fact that there are still impairments with bacterial contamination in the receiving waters during the rainy season is exactly why the requirements in the Tentative Order are necessary. The San Diego Water Board agrees that it is worthwhile to understand the environmental significance TDS and nutrients and their relationship, or lack thereof, to urban sources. The San Diego Water Board disagrees, however, that the Tentative Order does not recognize the need to protect shallow groundwater from exfiltration of TDS and nutrients. Although the Tentative Order at Provision E.3.c.(1)(a) requires onsite retention of the design capture volume, this can be accomplished via several physical mechanisms such as interception, storage, evaporation, and evapotranspiration, in addition to infiltration. Therefore the Tentative Order does not automatically mandate on-site retention of runoff in the form of infiltration in every instance, as the commenter	

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E3c1-3	PROVISION E.3.c.(1): Storm Water Pollutant Control BMP Requirements	
	asserts. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted. See also response to comment Gnl-2.	

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E3c1-4	PROVISION E.3.c.(1): Storm Water Pollutant Control BMP Requirements	
	COMMENT: *If priority development projects use alternative compliance, onsite conventional BMPs should not also be required.* The County of Orange and Concurring Cities and the Orange County Flood Control District state that there is not adequate technical justification for requiring onsite conventional BMPs when a Priority Development Project is allowed alternative compliance offsite. The commenters state that requiring both is double mitigation that goes well beyond the MEP standard.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees with this comment. Onsite pollutant treatment using conventional BMPs is a minimum general requirement to remove pollutants from runoff prior to its discharge to any receiving water. The storm water pollutant control BMP requirement for Priority Development Projects is to retain, onsite, the pollutants contained in the volume of storm water runoff produced from a 24-hour 85th percentile storm event (design capture volume). If it is not technically feasible to retain pollutants within the design capture volume, onsite, then the Tentative Order provides for an alternative means of compliance. If the Priority Development Project proponent is allowed to implement BMPs offsite, then the portion of the design capture volume that is not reliably retained onsite must be treated prior to discharging pollutants into the receiving water. 40 CFR 131.10(a) prohibits use of the receiving water as a treatment system and therefore, requires treatment of runoff to occur prior to the discharge of runoff to receiving waters (See Finding 7 in Attachment 1 of the Tentative Order). If Priority Development Projects are allowed to forgo onsite conventional treatment of runoff, then the Priority Development Projects would discharge untreated runoff from their site into receiving waters which is prohibited under 40 CFR. Retention of the 85th percentile storm is clearly the MEP standard for storm water pollutant control, as represented by the Tentative Order and its Attachments, recently adopted MS4 permits in the state (R8-2009-0030 and R8-2010-0033; North Orange and Riverside County MS4 permits, R4-2010-0108 and R4-2012-0175; Ventura County and Los Angeles County MS4 permits, and San Diego Water Board Order Nos. R9-2009-0030 and R9-2010-0016; South Orange County and Riverside County MS4 permits), and elsewhere in the United States. Retention of anything less than the design storm volume must be mitigated because the MEP standard has not been met. Therefore, Attachment 1 to the Tentative Order includes a requirement that mitigation is necessary for the portion of the design storm volume that is not retained onsite because, although this remaining volume of storm water would be treated to some level, the MEP standard as represented by the structural BMP performance requirements would not have been met.	

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E3c1-4	PROVISION E.3.c.(1): Storm Water Pollutant Control BMP Requirements	
	Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

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E3c-5	PROVISION E.3.c: Priority Development Project Structural BMP Performance Requirements	
	COMMENT: *Biofiltration BMPs should be sized for the design capture volume.* The County of Orange and Concurring Cities and Orange County Flood Control District assert that the requirement to oversize biofiltration BMPs to treat 1.5 times the design capture volume, if used to meet the pollutant control BMP requirements, is an increase over the prior Orange County MS4 permit. The commenters state that the Fact Sheet provides no technical justification for the sizing factor, and that biofiltration should be considered equivalent to onsite retention. The commenters also assert that Priority Development Projects that use biofiltration BMPs must also implement conventional BMPs, effectively requiring double mitigation when it is not needed.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The commenter incorrectly states that the requirement to size biofiltration BMPs to treat 1.5 times the design capture volume not reliably retained onsite is an increase from the prior Orange County MS4 permit (Order No. R9-2009-0002). This methodology of sizing the BMP was included in the Tentative Order *in addition to*, and not *in replacement of*, the methodology of sizing the BMP in Order No. R9-2009-0002. As a result, Priority Development Projects have two options for sizing biofiltration BMPs: 1.5 times the design capture volume not reliably retained onsite, OR a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite. The 1.5 sizing factor was included in the Tentative Order to offer more than one method of complying with the requirement. As described in the Fact Sheet, the 1.5 multiplier is based on the finding in the Ventura County Technical Guidance Manual that biofiltration of 1.5 times the design capture volume not retained onsite will provide approximately the same pollutant removal as retention of the design capture volume on an annual basis. This standard is consistent with the Los Angeles Water Board's Los Angeles County and Ventura County municipal storm water permits (Order Nos. R4-2012-0175 and R4-2010-0108, respectively). The commenter argues that biofiltration should be considered equivalent to other retention BMPs and therefore the 1.5 sizing factor is not needed. However, biofiltration is a flow-thru system, and therefore is not capable of retaining pollutants onsite (and preventing discharges of pollutants to receiving waters) in the equivalent manner as retention BMPs. The commenter compares the performance of harvest and use BMPs to biofiltration BMPs for the removal of total suspended solids, but fails to evaluate the performance of a range of retention BMPs, such as infiltration or evapotranspiration, which are widely accepted as effective pollutant control strategies.	

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E3c-5	PROVISION E.3.c: Priority Development Project Structural BMP Performance Requirements	
	The commenter incorrectly asserts that Priority Development Projects that use biofiltration as an alternative compliance option must also implement conventional BMPs, and in effect requires double mitigation. Provision E.3.c.(1)(a)(i) of the Tentative Order allows for the use of biofiltration BMPs where retention of the full design capture volume is not technically feasible, but does not also require the use of conventional treat-and-release BMPs. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

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E3c2-1	PROVISION E.3.c.(2): Hydromodification Management BMP Requirements	
	COMMENT: *Hydromodification requirements are based on faulty foundational assumptions.* Tory Walker, PE, submitted comments stating that the hydromodification requirements of the Tentative Order are based on faulty foundational assumptions. The commenter states that 1) the requirements cannot be based on a category of stream being either stable or highly dynamic, 2) flow rate reductions caused by dams reduces channel degradation, and runoff from Priority Development Projects may compensate for this and promote a more natural condition, and 3) as a result, the Tentative Order needs to accommodate more site-specific flexibility.	Tory Walker Engineering
	RESPONSE: The San Diego Water Board disagrees that the hydromodification management requirements in the Tentative Order are based on faulty assumptions that preclude the accommodation of site-specific conditions. In fact, the Tentative Order incorporates the ability to accommodate site-specific conditions much more so than previous Fourth Term MS4 permits. The requirements in the Tentative Order provide that post-project runoff conditions must not exceed pre-development runoff conditions by more than 10 percent (for the range of flows that result in increased potential for erosion or degraded instream habitat downstream of the Priority Development Project). Note that the requirement is not to control *all* flows, but only those flows that are expected to cause erosion downstream. Because the downstream receiving water may or may not be susceptible to erosion, then the BMPs needed upstream, on the Priority Development Project will necessarily vary. In essence, when configuring BMPs for a particular Priority Development Project, the project proponent must evaluate both site-specific conditions and runoff conditions expected from the project, as well as the receiving water's susceptibility to erosion. The requirements in the Tentative Order do not specify that channels are to be treated as either stable or highly dynamic. The commenter states that hydromodification impacts caused by dams could actually be offset by runoff from Priority Development Projects. The San Diego Water Board recognizes this possibility, therefore the Tentative Order allows for offsite compliance in lieu of implementing hydromodification management BMPs onsite, where the Copermittee finds offsite compliance to provide a greater water quality benefit to the watershed. In this example, if the Copermittees in the watershed complete the optional Watershed Management Area Analysis described in Provision B.3.b(4) and find that flows generated from Priority Development Projects would actually help offset the runoff impounded by upstream dams, then the Copermittees could allow the Priority Development Projects located downstream of the dams the ability to comply offsite. For these reasons, the	

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E3c2-1	PROVISION E.3.c.(2): Hydromodification Management BMP Requirements	
	San Diego Water Board disagrees that the hydromodification management requirements of the Tentative Order should be modified. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted	

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E3c2-2	PROVISION E.3.c.(2): Hydromodification Management BMP Requirements	
	COMMENT: *Hydromodification management requirements should be based on a watershed management approach, be consistent with the WQIPs, and consider the current Copermittee HMPs.* The County of Orange and Concurring Cities and the Orange County Flood Control District state that hydromodification management should be based on the conditions of receiving waters and on the impacts and potential impacts from development projects, and the basis for management should be an understanding of the watershed and specific receiving waters. The commenters state that hydromodification management objectives should be watershed specific and developed through a stakeholder process. The commenters assert that the hydromodification management requirements in the Tentative Order are a one-size-fits-all approach that does not allow consideration of watershed analysis or receiving water information. The commenters state that requirement to use the pre-development runoff conditions as the performance standard goes beyond federal law by taking the Clean Water Act's purpose to restore waters out of context of section 402(p). The requirement does not reflect the developed urban environment and negates the engineering efforts to date to protect life and property from floods. The commenters also state that identifying "naturally occurring" conditions for redevelopment sites is difficult; raising the technical question as to how far back a Copermittee goes historically in determining the proper predevelopment timeframe. The commenters conclude by suggesting an approach to hydromodification management that is consistent with the intent of the Water Quality Improvement Plan approach, and considers the Copermittee's current Hydromodification Management Plans.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees that the hydromodification management requirements in the Tentative Order are a one-size-fits all approach and that the requirements do not allow consideration of watershed analysis or receiving water information. The requirements of the Tentative Order provide that post-project runoff conditions must not exceed pre-development runoff conditions by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat downstream of Priority Development Projects). Note that the requirement is not to control *all* post-project flows, but only those that are expected to *cause erosion or degraded habitat* downstream of the Priority Development Project. The performance standards of the Tentative Order are the same as those of the Commenters existing Order No. R9-2009-0002.	

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E3c2-2	PROVISION E.3.c.(2): Hydromodification Management BMP Requirements	
	Since each Priority Development Project is expected to result in a specific post-project runoff condition, and the susceptibility of the receiving water to erosion could vary substantially based on location within a watershed, then the range of flows to control, and hence the specific BMPs required, will necessarily vary and is not a one-size-fits all requirement. In this way, the requirements in the Tentative Order specifically address both watershed and receiving water information. The Tentative Order allows for hydromodification management BMP implementation, and also exemptions, specific to the San Juan Watershed Management Area based on Copermittee's analysis of the watershed. See the response to Comment No. E3c1-1 regarding the Watershed Management Area Analysis as part of Water Quality Improvement Plan development, and how the Copermittees can use the results of the analysis to allow watershed-specific offsite mitigation in lieu of structural BMP implementation onsite, and also allow exemptions from the requirements. The Commenters incorrectly assert that the requirements in the Tentative Order attempt to restore waters to pre-Columbian conditions because of the requirement to use pre-development runoff conditions rather than pre-project runoff conditions in evaluating the need for hydromodification management BMPs. The Tentative Order requires the use of pre-development runoff conditions as a means of restoring a more natural hydrology to allow for stream rehabilitation, but there is no requirement to return the landscape to pre-Columbian conditions, nor is there a need to speculate how far back a Copermittee must go in in determining the appropriate timeframe. Because pre-development runoff conditions cannot be precisely known for a redevelopment project, the Tentative Order allows the use of any readily available information to estimate pre-development runoff conditions. Pre-development runoff conditions for redevelopment projects are defined in Attachment C to the Tentative Order as "runoff conditions from the project footprint assuming infiltration characteristic of the underlying soil, and existing grade." A Priority Development Project must use available information to estimate these parameters, and there is no need to perform extensive historical assessments, as the commenter asserts. The requirement to use pre-development runoff conditions as the performance standard is needed because using a hydrology baseline that approximates that of an undeveloped, natural watershed is the only way to facilitate the return of more natural hydrological conditions to already built-out watersheds. Using the pre-project hydrology as a baseline for redevelopment projects results in propagating the unnatural hydrology of urbanized areas, which is largely made up of impervious surfaces. Flows from impervious surfaces are highly erosive and consequently have detrimental effects on receiving waters in the San Diego Region. Furthermore, propagating the urbanized flow regime does not support conditions for restoring degraded or channelized	

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E3c2-2	PROVISION E.3.c.(2): Hydromodification Management BMP Requirements	
	stream segments, and would forever sentence such streams to the degraded state. Identification of areas suitable for rehabilitating degraded stream segments is a critical component of the Tentative Order and is expected to be incorporated into Copermittee's strategies for improving water quality in the watersheds. Finally, the Copermittees will be allowed to use the Hydromodification Management Plan developed under Order No. R9-2009-0002. The performance standards of the Tentative Order are the same as those of Order No. R9-2009-0002, therefore there is no need for the Copermittees to develop new requirements or methodologies, or otherwise update their Hydromodification Management Plan. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

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E3c2-3	PROVISION E.3.c.(2): Hydromodification Management BMP Requirements	
	COMMENT: *The San Diego Water Board is eliminating exemptions for hydromodification control when storm water runoff is conveyed to significantly hardened or engineered channels.* The Construction Industry Coalition on Water Quality (CICWQ) assert that regulations are tending to require hydromodification controls for Priority Development Projects, regardless of receiving water susceptibility. CICWQ states that this direction is driven by environmental advocacy for removal of all concrete lined channels regardless of existing land uses and feasibility, and that such efforts ignore the vital role that flood control facilities play in urban infrastructure and the protection of life and property. The alignment, grade, and cross section of many urban streams have been irrevocably altered, and a regulatory requirement to return flows to pre-development conditions will not allow stream restoration to occur. CICWQ and the Riverside County Copermittees both submitted comments stating that the interim exemptions from hydromodification controls allowed for engineered channels should be granted outright without further study from the Copermittees.	Construction Industry Coalition on Water Quality • San Diego Building Industry Association • Building Industry Association of Southern CA • Associated General Contractors • Associated Builders and Contractors • San Diego Regional Chamber of Commerce • Business Leadership Alliance • San Diego Association of Realtors • San Diego Apartment Association • National Association of Industrial & Office Properties • Building Office & Management Association • San Diego Chapter of American Society of Landscape Architects Riverside County Copermittees
	RESPONSE: The San Diego Water Board disagrees that the hydromodification management requirements in the Tentative Order mandate controls on Priority Development Projects, regardless of receiving water susceptibility. The requirements of the Tentative Order provide that post-project runoff conditions must not exceed pre-development runoff conditions by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat downstream of Priority Development Projects). Note that the requirement is not to control *all* post-project flows, but only those that are expected to *cause erosion or degraded habitat* downstream of the Priority Development Project. Since each Priority Development Project is expected to result in a specific post-project runoff condition, and the susceptibility of the receiving water to erosion could vary substantially based on location within a watershed, then the range of flows to control, and hence the specific BMPs required, will necessarily vary and is not a one-size-fits all requirement. In this way, the requirements in the Tentative Order specifically address the susceptibility of the receiving water.	

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E3c2-3	PROVISION E.3.c.(2): Hydromodification Management BMP Requirements	
	The commenter correctly asserts that the driver behind the requirement to use the pre-development performance standard is the sustainability of geomorphically stable channels and the ability to return urbanized streams to a more natural state. As explained in the response to Comment No. E.3.c2-2, the requirement to use pre-development runoff conditions as the performance standard is needed because using a hydrology baseline that approximates that of an undeveloped, natural watershed is the only way to facilitate the return of more natural hydrological conditions to already built-out watersheds, which in turn supports conditions for rehabilitating degraded or channelized stream segments. Contrary to what the commenter asserts, the Tentative Order does not require Copermittees to remove concrete from channels that are engineered to relieve flooding and protect life and property. The Tentative Order provides exemptions for Priority Development Projects that discharge to receiving waters where there is little threat of erosion, and subsequently implementing BMPs onsite would do little to protect the beneficial uses of such receiving waters. The commenter correctly states that the exemption for engineered channels is temporary. However, the commenter should note that there is a high likelihood that exemptions for engineered channels will become permanent. The Tentative Order allows for the Copermittees to recommend permanent exemptions based on completion of an optional Watershed Management Area Analysis pursuant to Provision B.3.b.(4). As part of this effort, the Copermittees would identify, for example, areas in the watershed suitable for urban retrofitting, and areas suitable for stream rehabilitation. The Copermittees would also identify areas suitable for exemptions for hydromodification management, such as engineered channels that are needed for the protection of life and property. The interim exemption for engineered channels is not granted outright as permanent exemptions because the areas have not yet been analyzed in the context of stream rehabilitation opportunities. The San Diego Water Board does not anticipate the Watershed Management Area Analysis to be burdensome on the Copermittees because they have already completed a Watershed Management Planning Tool, with similar goals as the Watershed Management Area Analysis, as part of their storm water management programs. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

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E3c2-4	PROVISION E.3.c.(2): Hydromodification Management BMP Requirements	
	COMMENT: *Hydromodification control requirements to avoid critical sediment yield areas are unnecessarily restrictive.* The Construction Industry Coalition on Water Quality (CICWQ) assert that the hydromodification management requirements of the Tentative Order to "avoid critical sediment yield areas" are unnecessarily restrictive. The commenters state that several Priority Development Projects have been significantly delayed or stopped because of the inability to comply with this requirement.	Construction Industry Coalition on Water Quality • San Diego Building Industry Association • Building Industry Association of Southern CA • Associated General Contractors • Associated Builders and Contractors • San Diego Regional Chamber of Commerce • Business Leadership Alliance • San Diego Association of Realtors • San Diego Apartment Association • National Association of Industrial & Office Properties • Building Office & Management Association • San Diego Chapter of American Society of Landscape Architects
	RESPONSE: The San Diego Water Board disagrees that the requirements to avoid critical sediment yield areas are unnecessarily restrictive. The requirements are necessary to protect receiving waters from erosive flows caused by land development. As explained in the Fact Sheet to the Tentative Order, hydromodification, which is caused by both altered storm water flow and altered sediment flow regimes, is largely responsible for degradation of creeks, streams, and associated habitats in the San Diego Region. In an ongoing study by the Stormwater Monitoring Coalition to assess the health of streams throughout Southern California, researchers found that three of the four highest risk stressors to creeks (percent sands and fines present, channel alteration, and riparian disturbance) were related to physical habitat (Assessing the Health of Southern California Streams, Stormwater Monitoring Coalition, Fact Sheet). Researchers studying flood frequencies in Riverside County have found that increases in watershed imperviousness of only 9-22 percent can result in increases in peak flow rates for the two-year storm event of up to 100 percent (Schueler and Holland, 2000. Storm Water Strategies for Arid and Semi-Arid Watersheds, (Article 66). The Practice of Watershed Protection). Such changes in runoff have significant impacts on channel morphology. Placement of impervious surfaces as a result of urbanization is largely responsible for erosional impacts to	

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E3c2-4	PROVISION E.3.c.(2): Hydromodification Management BMP Requirements	
	streams because placement of impervious surfaces encapsulates "good" sediment (such as sand, gravel, rocks and cobbles) that would normally replenish creek beds and banks to help stabilize them. For this reason, the Tentative Order requires Priority Development Projects to avoid critical sediment yield areas, as defined by the Copermittees, or implement measures to allow coarse sediment to be discharged to receiving waters. Such measures are designed to protect receiving waters and avoid impacts experienced by past land development practices. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

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E3c2-5	PROVISION E.3.c.(2): Hydromodification Management BMP Requirements	
	COMMENT: *Modify Tentative Order to clarify that the interim hydromodification exemptions are in place until the San Diego Water Board approves the BMP Design Manual.* The County of Orange and Concurring Cities and the Orange County Flood Control District recommend that the interim timeframe exemptions for engineered channels and large rivers from hydromodification management remain in place until the BMP Design Manual is approved by the San Diego Water Board, as opposed to when the BMP Design Manual has been updated. The commenters have made this request so that there is no timing gap in coverage for the exemptions.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees that any changes are needed to the language in Provision E.3.c.(2)e. The Tentative Order requires the Copermittees to update their BMP Design Manuals in accordance with Provision F.2.b. The Copermittees are required to update their BMP Design Manual, but there is no requirement to seek San Diego Water Board approval before the BMP Design Manual goes into effect 180 days after completing the update. If there is a discrepancy in approving the Water Quality Improvement Plan with recommended exemptions before the BMP Design Manual goes into effect, then the San Diego Water Board could direct the Copermittees to delay implementation of the BMP Design Manual. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

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E3c3-1	PROVISION E.3.c.(3): Alternative Compliance to Onsite Structural BMP Implementation	
	COMMENT: *Requests for the Water Quality Equivalency calculations be included as an optional Copermittee deliverable.* The County of San Diego requests that the Water Quality Equivalency calculations and methodologies currently under development by the Copermittees in support of the Alternative Compliance Program be included in the Tentative Order as an optional deliverable for review and acceptance by the San Diego Water Board's Executive Officer.	County of San Diego
	RESPONSE: The San Diego Water Board agrees with this comment and has modified the Tentative Order at Provision E.3.c.(3) to incorporate the recommendation.	

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E3c3-2	PROVISION E.3.c.(3): Alternative Compliance to Onsite Structural BMP Implementation	
	COMMENT: *Copermittees should be allowed flexibility to develop a trading and water quality credit system.* The County of Orange and Concurring Cities and the Orange County Flood Control District requests that language pertaining to the water quality credit system be revised to remove the no-net impact limitations because certain projects may offer significant environmental benefits that are not necessarily related to water quality, and that any water quality trading system should be implemented in accordance with EPA's 2003 Final Water Quality Trading Policy.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees with the commenters that the no-net impact language should be removed from the Tentative Order. The optional credit system described in Provision E.3.c.(3)(d) is based on meeting the structural BMP performance standards as they pertain to protecting and improving water quality. A credit system that would allow other environmental benefits cannot necessarily ensure that water quality would be protected to the MEP standard, for which the performance standards are structured to achieve. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

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E3e-1	PROVISION E.3.e: Priority Development Project BMP Implementation and Oversight	
	COMMENT: *Include the date the BMP manual will be implemented to provide clarity.* The City of San Diego requests that the date that the BMP Manual will go into effect for the San Diego County Copermittees (December 24, 2015) be explicitly expressed in the Tentative Order.	City of San Diego
	RESPONSE: The San Diego Water Board disagrees that including the date when the BMP Manual will go into effect is appropriate, because this date will be different for the various Copermittees covered under the Tentative Order (i.e. San Diego County Copermittees, South Orange County Copermittees, and eventually Riverside County Copermittees). Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

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E3e-2	PROVISION E.3.e: Priority Development Project BMP Implementation and Oversight	
	COMMENT: *Revise the Tentative Order to define when a priority development project has prior lawful approval.* The City of San Diego requests a definition of prior lawful approval be added to the Tentative Order to clarify when it is appropriate to allow Priority Development Projects to comply with BMP standards of previous MS4 permits. The City of San Diego recommends including a definition that can 1) provide a clear, bright line; 2) provide a backstop to ensure that older projects with approvals comply with new requirements unless those approvals confer vested rights; 3) protect vested rights; and 4) preserve Copermittee's land use authority. Similarly, the Coalition provided comments requesting that the Tentative Order be modified to include a definition of prior lawful approval, stating that clarifying the intent of the San Diego Water Board will assist all interested parties in understanding the factors that the Copermittees need to balance in applying their discretion with Provision E.3.e.(1)(a) of the Tentative Order. In contrast, the Coastal Environmental Rights Foundation and San Diego Coastkeeper submitted comments that it is not necessary to take any action to define prior lawful approval, stating that doing so could allow for vested rights that run counter to widely accepted law.	Construction Industry Coalition on Water Quality • San Diego Building Industry Association • Building Industry Association of Southern CA • Associated General Contractors • Associated Builders and Contractors • San Diego Regional Chamber of Commerce • Business Leadership Alliance • San Diego Association of Realtors • San Diego Apartment Association • National Association of Industrial & Office Properties • Building Office & Management Association • San Diego Chapter of American Society of Landscape Architects San Diego Coastkeeper Coastal Environmental Rights Foundation City of San Diego
	RESPONSE: The San Diego Water Board has carefully considered the comments received regarding prior lawful approval, and whether or not it is appropriate to define this term in the Tentative Order. The San Diego Water Board understands the concerns regarding the difficulty the Copermittees face in applying their discretion to the concept of prior lawful approval in a consistent manner that complies with the intent of Provision E.3.e.(1)(a). Therefore, for the reasons presented by the commenters, the San Diego Water Board agrees that clarification regarding the intent of the Provision and the San Diego Water Board's expectation in how the Copermittees use their discretion, would be helpful to all parties. The Tentative Order has been modified to include a definition for prior lawful approval for both private and public Priority Development Projects that is intended to provide guidance and clarification to Copermittees in	

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E3e-2	PROVISION E.3.e: Priority Development Project BMP Implementation and Oversight	
	exercising their discretion in this matter. For private development projects, prior lawful approval is a development approval or construction permit that complies with the Priority Development Project requirements of the Fourth Term MS4 permits (Order Nos. R9-2007-0001 for San Diego County, R9-2009-0002 for south Orange County, or R9-2010-0016 for Riverside County) and includes the design of the storm water drainage system for the project in its entirety as accepted by the Copermittee. Alternatively, prior lawful approval is a development approval or construction permit that confers a vested right to Priority Development Projects to proceed under storm water structural BMP requirements of prior MS4 permits. If a Copermittee grants prior lawful approval to a Priority Development Project based on one of the two aforementioned conditions, then the Copermittee must ensure that 1) any subsequent project approvals must be issued within 5 years of the effective date of the BMP Design Manual, and 2) BMP installation under subsequent approvals must remain in substantial conformity with the design of the storm water drainage system included in the initial approval. For public projects, prior approval allowing implementation of Fourth Term MS4 Permit structural BMP requirements in lieu of the requirements of the Tentative Order is acceptable if the storm water drainage system for the project, in its entirety, has been stamped by the City or County Engineer by the time the BMP Design Manual goes into effect. The San Diego Water Board recognizes that the Copermittees will need to determine whether or not a project has prior lawful approval under the Order based on the circumstances of each project. Nevertheless, the San Diego Water Board expects each Copermittee to require the implementation of Provision E.3 of the Tentative Order wherever it can lawfully do so. Some projects will have received prior lawful approval by the effective date of the BMP Design Manual and hence the requirements of the Fourth Term MS4 permits will govern. The San Diego Water Board expects that very few Priority Development Projects, if any, will be allowed to implement BMP requirements from prior MS4 permits. In cases where BMP requirements from the Fourth Term (or earlier) MS4 permits govern the structural BMP design requirements of a Priority Development Project, the San Diego Water Board expects the Copermittees to be able to demonstrate, in a programmatic audit or other means, that the project has prior lawful approval within the meaning of Provision E.3 of this Order. The San Diego Water Board has conducted and will continue to conduct programmatic audits of the Copermittee's land development programs to evaluate MS4 permit compliance. In all cases the San Diego Water Board expects the Copermittees to only approve projects with adequate post construction BMPs that are protective of water quality. In summary, Attachment 1 of the Tentative Order has been modified at Provision E.3.e.(1) to include a definition of the term "prior lawful approval." This language is intended to provide clarity on how the term	

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E3e-2	PROVISION E.3.e: Priority Development Project BMP Implementation and Oversight	
	should be interpreted in determining structural BMP requirements for Priority Development Projects, and will also assist the San Diego Water Board in assessing Copermittee compliance with implementing the structural BMP requirements for Priority Development Projects to the maximum extent practicable (MEP) standard.	

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E4-1	PROVISION E.4: Construction Management	
	COMMENT: *Modify Construction Management Program provisions so as not to negate the very intent and purpose of the watershed approach and the focus on the highest priorities within each watershed management area.* The County of Orange and Concurring Cities and Orange County Flood Control District requests the introductory paragraph of the Construction Management Provisions be modified to better reflect the watershed approach and program focus on highest priority conditions of concern.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees that modifications to the Construction Management Program Provisions are needed for the reasons stated in the Response to Comment E1-1. Copermittees are afforded flexibility in meeting the requirements of Provision E.4. They are required to meet a minimum baseline program (with limited prescriptiveness compared to Fourth Term MS4 permits) as stated in the Tentative Order, and within that framework focus on the highest priority conditions of concern as described in the Water Quality Improvement Plans. Based on this consideration no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

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E5-1	PROVISION E.5: Existing Development Management	
	COMMENT: *Modify Existing Development Program provisions so as not to negate the very intent and purpose of the watershed approach and the focus on the highest priorities within each watershed management area.* The County of Orange and Concurring Cities and the Orange County Flood Control District request modification to the introductory paragraph of the Existing Development Provisions to better reflect the watershed approach and program focus on highest priority conditions of concern.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees that modifications to the Existing Development Management Program Provisions are needed for the reasons stated in the Response to Comment E1-1. Copermittees are afforded flexibility in meeting the requirements of Provision E.5. They are required to meet a minimum baseline program (with limited prescriptiveness compared to Fourth Term MS4 permits) as stated in the Tentative Order, and within that framework focus on the highest priority conditions of concern as described in the Water Quality Improvement Plans. Based on this consideration no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

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E5-2	PROVISION E.5: Existing Development Management	
	COMMENT: *Delete the requirement to evaluate retrofit of stream channels.* The County of Orange and Concurring Cities and Orange County Flood Control District requested removal of the requirement to evaluate retrofit of stream channels from the Tentative Order because it is not the Copermittee's responsibility to restore receiving waters.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board agrees that it is not the responsibility of the Copermittees to restore receiving waters. None of the provisions in the Tentative Order requires the Copermittees to perform stream restorations. The Tentative Order at Provision E.5.e.(2) requires the Copermittees to describe a program to rehabilitate streams, channels, and habitats in existing developed areas by first identifying viable candidates, then developing a strategy to facilitate the implementation of the rehabilitations. Rehabilitation of streams, channels, and habitats may also serve as candidates for alternative compliance (to implementation of structural BMPs; see Tentative Order at Provision E.3.c.(3)), and is an important element of the Tentative Order in achieving improvements in water quality and watershed functions. Based on this consideration no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

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E6-1	PROVISION E.6: Enforcement Response Plans	
	COMMENT: *Copermittees should be allowed to utilize existing guidelines and procedures for enforcement.* The County of Orange and Concurring Cities and the Orange County Flood Control District request Provision E.6 be modified to specify that a Copermittee may utilize and implement established, equivalent guidelines and procedures for enforcement.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees that any changes to the Tentative Order are needed. A Copermittee will be able to continue using and implementing existing enforcement guidelines and procedures if the Copermittee demonstrates the procedures and guidelines comply with the requirements of Provision E.6. Provision E.6 requires each Copermittee to document enforcement processes and procedures in an Enforcement Response Plan, as part of its jurisdictional runoff management program document and specifically describes what must be included in the Plan. The Enforcement Response Plan will promote transparency and accountability by ensuring that Copermittee enforcement programs and procedures are clear and accessible to the San Diego Water Board and the public, and can be used to evaluate the adequacy of Copermittee enforcement programs and progress towards meeting enforcement goals. Because the Copermittees already have procedures in place for enforcement, there will likely only be minor modifications needed to the programs to meet the requirements of Provision E.6. The Enforcement Response Plan is expected to be a tool the Copermittee can refer to when issuing enforcement actions to compel compliance with its statutes, ordinances, permits, contracts, order, or similar means, and the requirements of the Tentative Order. The Enforcement Response Plan is also expected to result in more consistent enforcement and enforcement actions by the Copermittee within its jurisdiction. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

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E6-2	PROVISION E.6: Enforcement Response Plans	
	COMMENT: *The definition for "Escalated Enforcement" should be redefined.* The County of Orange and Concurring Cities, and the Orange County Flood Control District request Provision E.6.d be modified to be "Progressive Enforcement" instead of "Escalated Enforcement" because the process should reflect a standard progressive approach.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees with the recommendation to modify the language in Provision E.6.d from "escalated enforcement" to "progressive enforcement". The Copermittees are expected to implement "progressive enforcement" in all cases of enforcement. For enforcement issues that are associated with the highest priority water quality conditions identified by the Copermittees in the Watershed Management Area, the Copermittees are expected to implement enforcement swiftly. "Escalated enforcement" refers to the Copermittee escalating its enforcement measures and resources to a) ensure compliance with local statutes, ordinances, permits, contracts, order, or similar means, and the requirements of the Tentative Order, b) compel prompt correction of violations and the conditions that led to the violations, and c) deter future violations. The term "escalated enforcement" correctly reflects this added level of urgency and focus to compel compliance. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

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E7-1	PROVISION E.7: Public Education and Participation	
	COMMENT: *The Public Education Program provisions must be modified so as not to negate the very intent and purpose of the watershed approach and the focus on the highest priorities within each watershed management area.* The County of Orange and Concurring Cities and the Orange County Flood Control District request modification to the introductory paragraph of the Public Education Program Provisions to better reflect the watershed approach and program focus on highest priority conditions of concern.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees that modifications to the Public Education Program Provisions are needed for the reasons stated in the Response to Comment E1-1. Copermittees are afforded flexibility in meeting the requirements of Provision E.7. The Copermittees are required to meet a minimum baseline program (with limited prescriptiveness compared to Fourth Term MS4 permits) as stated in the Tentative Order, and within that framework focus on the highest priority conditions of concern as described in the Water Quality Improvement Plans. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted .	

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F-1	PROVISION F: REPORTING	
	COMMENT: *Modify Tentative Order to better align reporting requirements with the process for development and updates of the various plans to allow for the time necessary to complete the work and to submit the ROWD.* The County of Orange and Concurring Cities and Orange County Flood Control District suggest the due dates for development of each component of the Water Quality Improvement Plan be linked to the development step that precedes it and not to the commencement of coverage under the Order. The commenters also suggest the timeframe for development of the Water Quality Improvement Plan incorporate adequate time for the Copermittees to review and respond to comments received on the current action before moving on to the next step of development. The Copermittees are also concerned that the schedule proposed in the Tentative Order would impart an overly burdensome schedule on members of the public participating in the Consultation Panels and reviewing documents during the public review periods and do not allow for adequate time to conduct CEQA.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The Tentative Order accommodates the commenters concerns with the amount of time needed to develop the Water Quality Improvement Plan and submit the deliverables by providing a flexible range within which the Copermittees may submit each component of the Water Quality Improvement Plan. Copermittees may submit the requirements of Provision B.2 (i.e. priority water quality conditions, source of conditions, and potential water quality improvement strategies) as early as 6 months and no later than 12 months after commencement of coverage and Provision B.3 (i.e. goals, strategies, and schedules) as early as 9 months, and no later than 18 months after commencement of coverage. By including this range within which the deliverable can be submitted, the San Diego Water Board is allowing adequate time and adequate flexibility for the Copermittees to a) create the deliverable, b) accept and review comments received on the deliverable during development of the Water Quality Improvement Plan, and c) complete any CEQA compliance as the Copermittee determines to be necessary. The San Diego Water Board expects each partial deliverable to be well thought out and complete but also realizes that additional time exists in the process to further incorporate comments and input received during the public comment period and San Diego Water Board staff review. As such the Tentative Order requires the final version of the Water Quality Improvement Plan to be submitted within 24 months after commencement of coverage under the Tentative Order as it amends Order No. R9-2013-0001. By requiring submittal of individual components of the Water Quality Improvement Plan, members of the Consultation Panel, the public, and the San Diego Water Board will be able to provide input early on in the Plan	

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F-1	PROVISION F: REPORTING	
	development. The San Diego Water Board expects that any deficiencies in the Water Quality Improvement Plan will be identified early on either during the public review and comment period or during the review by the San Diego Water Board. The Orange County Copermittees may wish to consult with San Diego County Copermittees to benefit from their experience in developing the Water Quality Improvement Plans. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

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H-1	PROVISION H: MODIFICATION OF PROGRAMS	
	COMMENT: *Modify Tentative Order to include an explicit re-opener provision.*	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees that additional revisions to the explicit re-opener provisions in the Tentative Order are necessary. Provision H.4.c of the Tentative Order already explicitly states that the San Diego Water Board will re-open the Order if any of the TMDLs in Attachment E are amended in the Basin Plan by the San Diego Water Board, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

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AttA-1	ATTACHMENT A: Discharge Prohibitions and Special Protections	
	COMMENT: *The City supports the proposed changes to the Areas of Special Biological Significance.*	City of San Diego
	RESPONSE: The San Diego Water Board acknowledges the City's support of this change.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

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AttC-1	ATTACHMENT C: Acronyms, Abbreviations, and Definitions	
	COMMENT: *Request for additional or modified definitions*. Several comments were submitted requesting modifications to existing definitions and/or the addition of new definitions to Attachment C to the Tentative Order.	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board reviewed and considered the requested modifications to existing definitions and additional definitions. All of the requested additions or modifications were submitted during the 2013 adoption process for Order No. R9-2013-0001. The San Diego Water Board reconsidered the requested additions or modifications and determined, in all cases, that the requested modifications or additions were still not appropriate, not necessary, or both. Therefore, no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

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AttE-1	ATTACHMENT E: Specific Provisions for Total Maximum Daily Loads	
	COMMENT: *Compliance determination for final WQBELs should be based on implementation of BMPs and not numeric effluent limitations.*	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board has already included a compliance determination option for final WQBELs based on implementation of BMPs in the Tentative Order. WQBELs can be expressed as (1) conditions in receiving waters that are to be attained to restore or protect water quality standards in receiving waters, (2) conditions in discharges that will not cause or contribute to exceedances of water quality standards in receiving waters, (3) BMPs that will ensure discharges will not cause or contribute to exceedances of water quality standards in receiving waters, or (4) a combination of one or more of (1)-(3). This is consistent with 40 CFR 122.44(d)(1)(vii)(B) and 122.44(k)(2)-(4). The San Diego Water Board has incorporated options (1)-(3) under the WQBEL requirements for each of the TMDLs in Attachment E. In most cases, if the WQBEL expressed as a receiving water limitation is achieved, the discharges from the MS4s are assumed to be in compliance with the TMDL requirements. If not, then the Copermittees must demonstrate that discharges from the MS4s are not causing or contributing to the exceedances in the receiving waters by achieving the WQBELs expressed as effluent limitations. In every case, the Copermittees are required to implement BMPs to ensure that discharges from their MS4s do not cause or contribute to exceedances of water quality standards in receiving waters. For the interim TMDL compliance determination requirements, the Copermittees are allowed to demonstrate compliance by implementing a Water Quality Improvement Plan that has been accepted by the San Diego Water Board, with a “reasonable assurance” that the implementation of the BMPs will achieve the interim TMDL WQBELs within the interim compliance dates. The Copermittees will be provided considerable flexibility for demonstrating compliance with achieving the interim WQBELs. For the final TMDL compliance determination requirements, the Copermittees are allowed to demonstrate compliance with the final WQBELs by implementing a Water Quality Improvement Plan that includes an	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

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AttE-1	ATTACHMENT E: Specific Provisions for Total Maximum Daily Loads	
	analysis to demonstrate that the implementation of the BMPs required by the TMDL achieves compliance with one or more of the final numeric WQBELs. The Water Quality Improvement Plan must include monitoring and assessments to confirm that the Water Quality Improvement Plan is achieving the final TMDL requirement. The San Diego Water Board must accept and continue to accept the Water Quality Improvement Plan and analysis, and the Copermittees must continue to implement the BMPs and demonstrate through the analysis that the final numeric WQBELs are being achieved. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

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AttE-2	ATTACHMENT E: Specific Provisions for Total Maximum Daily Loads	
	COMMENT: *Modify Tentative Order to include a compliance mechanism prior to approval of the Water Quality Improvement Plans.*	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees that it is necessary to include a compliance mechanism prior to approval of the Water Quality Improvement Plan. If a TMDL in Attachment E includes interim or final compliance dates that have passed, the Copermittees are expected to have data to demonstrate that one or more of the compliance determination options have already been met. If interim or final TMDL compliance dates have not passed, compliance with the interim or final TMDL compliance requirements do not have to be demonstrated yet, thus a compliance determination mechanism is not yet required. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

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AttE5-1	ATTACHMENT E 5: Baby Beach and Shelter Island Shoreline Park Bacteria TMDL	
	COMMENT: *Correct discrepancies between adopted TMDLs in the Basin Plan and provisions in the Tentative Order.*	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees that there are discrepancies between the TMDLs in the Basin Plan and the provisions in the Tentative Order. The TMDLs as developed are all intended to restore the water quality standards in receiving waters impaired by specific pollutants. The WLAs and LAs as developed are all intended to ensure that discharges from point and nonpoint sources to receiving waters will not cause or contribute to exceedances of water quality standards in receiving waters. The TMDL requirements in Attachment E are consistent with the intent of the TMDLs, and the WLAs for MS4s. In other words, the TMDL requirements in Attachment E are intended to ensure that discharges from the Responsible Copermittees' MS4s will not cause or contribute, and will continue to not cause or contribute to exceedances of water quality standards in receiving waters. According to each TMDL, when all point sources and nonpoint sources achieve their WLAs and LAs, including the WLAs for MS4s, the water quality standards in receiving waters will be restored. The San Diego Water Board included TMDL requirements in Attachment E that are entirely consistent with the requirements of the TMDLs as adopted and incorporated into the Basin Plan. The implementation plans of the TMDLs in the Basin Plan are essentially "instructions" for the San Diego Water Board to incorporate the requirements into the regulatory mechanisms that will implement the requirements of the TMDL to attain the water quality standards that are being impaired by a pollutant in a water body. In each case, the "instructions" provide the permit writer considerable flexibility in how to express the WLAs as WQBELs in the permit, but not as much flexibility in the compliance schedules for achieving the WLAs. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

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AttE5-2	ATTACHMENT E 5: Baby Beach and Shelter Island Shoreline Park Bacteria TMDL	
	COMMENT: *WQBELs for Baby Beach TMDL inappropriately include TMDL numeric targets.*	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board has included WQBELs that are consistent with the requirements and assumptions of the TMDLs. The federal regulations under 40 CFR 122.44(d)(1)(vii)(B) require that NPDES permit requirements incorporate WQBELs that must be consistent with the requirements and assumptions of any available WLAs developed under TMDLs. WQBELs can be expressed as (1) conditions in receiving waters that are to be attained to restore or protect water quality standards in receiving waters, (2) conditions in discharges that will not cause or contribute to exceedances of water quality standards in receiving waters, (3) BMPs that will ensure discharges will not cause or contribute to exceedances of water quality standards in receiving waters, or (4) a combination of one or more of (1)-(3). This is consistent with 40 CFR 122.44(d)(1)(vii)(B) and 122.44(k)(2)-(4). The San Diego Water Board has incorporated options (1)-(3) under the WQBEL requirements for each of the TMDLs in Attachment E. In most cases, if the WQBEL expressed as a receiving water limitation is achieved, the discharges from the MS4s are assumed to be in compliance with the TMDL requirements. If not, then the Copermittees must demonstrate that discharges from the MS4s are not causing or contributing to the exceedances in the receiving waters by achieving the WQBELs expressed as effluent limitations. In every case, the Copermittees are required to implement BMPs to ensure that discharges from their MS4s do not cause or contribute to exceedances of water quality standards in receiving waters. The WQBELs are also consistent with the assumptions and requirements of the WLAs. In each case, the WLAs are calculated based on numeric targets that are assumed to be able to restore or protect water quality standards in receiving waters and/or ensure discharges from the Responsible Copermittees' MS4s will not cause or contribute to exceedances of water quality standards in receiving waters. The numeric targets are required to be based on water quality objectives in the Basin Plan. Discharges from the MS4s are required to	

RESPONSE TO COMMENTS ON TENTATIVE ORDER NO. R9-2015-0001

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AttE5-2	ATTACHMENT E 5: Baby Beach and Shelter Island Shoreline Park Bacteria TMDL	
	achieve the numeric targets for their discharges to protect water quality standards in receiving waters to meet the WLAs. The WQBELs for the TMDLs in Attachment E are consistent with the numeric targets, and thus consistent with the underlying assumptions and requirements of the numeric targets that are the basis of the WLAs. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

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AttE6-1	ATTACHMENT E 6: Beaches and Creeks Bacteria TMDL	
	COMMENT: *Correct discrepancies between adopted TMDL Basin Plan and provision in Tentative Order.*	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees that there are discrepancies between the TMDLs in the Basin Plan and the provisions in the Tentative Order. The TMDLs as developed are all intended to restore the water quality standards in receiving waters impaired by specific pollutants. The WLAs and LAs as developed are all intended to ensure that discharges from point and nonpoint sources to receiving waters will not cause or contribute to exceedances of water quality standards in receiving waters. The TMDL requirements in Attachment E are consistent with the intent of the TMDLs, and the WLAs for MS4s. In other words, the TMDL requirements in Attachment E are intended to ensure that discharges from the Responsible Copermittees' MS4s will not cause or contribute, and will continue to not cause or contribute to exceedances of water quality standards in receiving waters. According to each TMDL, when all point sources and nonpoint sources achieve their WLAs and LAs, including the WLAs for MS4s, the water quality standards in receiving waters will be restored. The San Diego Water Board included TMDL requirements in Attachment E that are entirely consistent with the requirements of the TMDLs as adopted and incorporated into the Basin Plan. The implementation plans of the TMDLs in the Basin Plan are essentially "instructions" for the San Diego Water Board to incorporate the requirements into the regulatory mechanisms that will implement the requirements of the TMDL to attain the water quality standards that are being impaired by a pollutant in a water body. In each case, the "instructions" provide the permit writer considerable flexibility in how to express the WLAs as WQBELs in the permit, but not as much flexibility in the compliance schedules for achieving the WLAs. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

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AttE6-2	ATTACHMENT E 6: Beaches and Creeks Bacteria TMDL	
	COMMENT: *Modify Attachment E.5, WQBELs for Beaches and Creeks TMDL inappropriately include TMDL numeric targets.*	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board has included WQBELs that are consistent with the requirements and assumptions of the TMDLs. The federal regulations under 40 CFR 122.44(d)(1)(vii)(B) require that NPDES permit requirements incorporate WQBELs that must be consistent with the requirements and assumptions of any available WLAs developed under TMDLs. WQBELs can be expressed as (1) conditions in receiving waters that are to be attained to restore or protect water quality standards in receiving waters, (2) conditions in discharges that will not cause or contribute to exceedances of water quality standards in receiving waters, (3) BMPs that will ensure discharges will not cause or contribute to exceedances of water quality standards in receiving waters, or (4) a combination of one or more of (1)-(3). This is consistent with 40 CFR 122.44(d)(1)(vii)(B) and 122.44(k)(2)-(4). The San Diego Water Board has incorporated options (1)-(3) under the WQBEL requirements for each of the TMDLs in Attachment E. In most cases, if the WQBEL expressed as a receiving water limitation is achieved, the discharges from the MS4s are assumed to be in compliance with the TMDL requirements. If not, then the Copermittees must demonstrate that discharges from the MS4s are not causing or contributing to the exceedances in the receiving waters by achieving the WQBELs expressed as effluent limitations. In every case, the Copermittees are required to implement BMPs to ensure that discharges from their MS4s do not cause or contribute to exceedances of water quality standards in receiving waters. The WQBELs are also consistent with the assumptions and requirements of the WLAs. In each case, the WLAs are calculated based on numeric targets that are assumed to be able to restore or protect water quality standards in receiving waters and/or ensure discharges from the Responsible Copermittees' MS4s will not cause or contribute to exceedances of water quality standards in receiving waters. The numeric targets are required to be based on water quality objectives in the Basin Plan. Discharges from the MS4s are required to	

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AttE6-2	ATTACHMENT E 6: Beaches and Creeks Bacteria TMDL	
	achieve the numeric targets for their discharges to protect water quality standards in receiving waters to meet the WLAs. The WQBELs for the TMDLs in Attachment E are consistent with the numeric targets, and thus consistent with the underlying assumptions and requirements of the numeric targets that are the basis of the WLAs. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

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AttE7-1	ATTACHMENT E 7: Los Peñasquitos Lagoon Sediment TMDL	
	COMMENT: *Modify the Tentative Order to allow individual jurisdictional compliance with TMDLs.* The City of San Diego requests the Tentative Order be modified so that Final TMDL Compliance Determination using the Water Quality Improvement Plan pathway is based on individual jurisdictional compliance instead of all Copermittees collectively.	City of San Diego
	RESPONSE: The San Diego Water Board disagrees that modifications are needed to the language pertaining to TMDL compliance determination. The commenter correctly asserts that the intent of the language, and in fact, the intent of the Water Quality Improvement Plan concept, is that the Copermittees develop the Water Quality Improvement Plans collectively and evaluate water quality improvement strategies on a watershed basis. The San Diego Water Board recognizes that the Copermittees have no authority over other Copermittees to compel TMDL compliance; therefore, the Tentative Order has multiple compliance pathways available to each Copermittee to achieve compliance. These pathways are presented in each of the 7 Specific (TMDL) Provisions at X.b.(3). These alternative compliance pathways do not rely on actions or inactions of other Copermittees.	

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AttE7-2	ATTACHMENT E 7: Los Peñasquitos Lagoon Sediment TMDL	
	COMMENT: *Clarify that waste load allocations include discharges from other responsible parties in addition to Responsible Copermittees.* The City of San Diego, City of Del Mar, and Industrial Environmental Association submitted comments requesting the final effluent limitations expressed in Table 7.1, which were derived from waste load allocations, recognize the contribution of sediment loading to the Los Penasquitos Watershed from dischargers other than the Copermittees. Without this recognition, the other dischargers would have a zero sediment loading allocation, contrary to the intent of the TMDL.	Industrial Environmental Association City of San Diego City of Del Mar
	RESPONSE: Although the Tentative Order is an NPDES permit specifically issued to the Phase I MS4 Copermittees, the San Diego Water Board has nonetheless modified Table 7.1 to state that the effluent limitation of 2,580 tons/year is shared amongst all dischargers identified in Resolution No. R9-2012-0033. Provision 7.b.(2)(c)(ii) has likewise been modified to clarify that the Responsible Copermittees must implement BMPs to achieve only their portion of the effluent limitations, as opposed to other discharger's contributions. The City of San Diego suggested dividing up the collective load in proportion to land area occupied by each discharger, but the San Diego Water Board cannot impose a TMDL distribution methodology through the permitting process that has not been peer reviewed and vetted through the TMDL development stakeholder process. Assigning a waste load allocation and subsequent effluent limitation applicable to all dischargers within a watershed collectively, is consistent with the San Diego Water Board's approach to TMDL expression for other waterbodies and constituents.	

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AttE7-3	ATTACHMENT E 7: Los Peñasquitos Lagoon Sediment TMDL	
	COMMENT: *Revise the Final TMDL compliance determination to be consistent with the Basin Plan Amendment and other TMDLs.* The City of Del Mar and the City of San Diego submitted comments requesting the language pertaining to final TMDL compliance determination be modified to be consistent with the Basin Plan Amendment adopted by the San Diego Water Board under Resolution No. R9-2012-0033, and offer multiple compliance pathways similar to other TMDLs.	City of Del Mar City of San Diego
	RESPONSE: The San Diego Water Board agrees to modify the language of Provision 7.b.(3)(a) to match the language of the Basin Plan Amendment (page A-16). However, the San Diego Water Board disagrees that the suggested revisions to add additional language to incorporate a compliance pathway related to "implementation actions" is necessary. Specifically, both the City of San Diego and City of Del Mar requested the following language to be added: "Demonstrate that implementation actions are active on and/or affecting 346 acres with continued monitoring to ensure 80 percent target achievement" This language is not needed because Provision 7.b.(3)(b) regarding the development of the Water Quality Improvement Plan as a compliance pathway serves the same purpose as the suggested language. The phrase "implementation actions" has been added to Provision 7.b.(3)(b)(ii) to incorporate all ideas from the Basin Plan Amendment language into the Water Quality Improvement Plan concept. The San Diego Water Board considered the request to add two additional compliance pathways similar to those included in other TMDLs. As this sediment TMDL is different than other adopted TMDLs because the primary focus is lagoon saltmarsh restoration, as opposed to the quality of the MS4 discharges, the San Diego Water Board did not incorporate the suggested modifications. The intent of the TMDL efforts was to facilitate successful restoration of 346 acres of saltmarsh vegetation, and the Tentative Order appropriately uses this metric as the primary compliance pathway. The schedule to achieve compliance is 20 years, as established by the TMDL. In contrast, the NPDES permit as represented by the Tentative Order is on a 5-year cycle. Revisions to the compliance pathways available to the Responsible Parties can be revisited upon reissuance of the NPDES permit at a later date. The San Diego Water Board believes it is more appropriate to offer multiple compliance pathways after data have been collected showing the effects of sediment reduction efforts on lagoon restoration. If a positive linkage can be	

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AttE7-3	ATTACHMENT E 7: Los Peñasquitos Lagoon Sediment TMDL	
	established between the reduction in sediment discharges and the successful restoration of the lagoon, then the Responsible Parties can make this request at subsequent permit reissuance proceedings.	

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January 20, 2015

AttE7-4	ATTACHMENT E 7: Los Peñasquitos Lagoon Sediment TMDL	
	COMMENT: *Correct references in the Los Penasquitos final TMDL compliance determination.* The City of San Diego requested modifications to Specific Provision 7.b(3)(b) to correct errors.	City of San Diego
	RESPONSE: The San Diego Water Board has reviewed the recommendation to change the text to reference 7.b.(2)(a) and has not made changes because the references to Specific Provision 7.b.(3)(a) are correct. The incorrect reference to Specific Provision 2 has been changed to Specific Provision 7	

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AttE7-5	ATTACHMENT E 7: Los Peñasquitos Lagoon Sediment TMDL	
	COMMENT: *Revise the interim TMDL compliance determination to be consistent with the Basin Plan Amendment and other TMDLs.* The City of Del Mar and the City of San Diego submitted comments requesting that the language pertaining to interim TMDL compliance determination be modified to be consistent with the Basin Plan Amendment adopted by the San Diego Water Board under Resolution No. R9-2012-0033, and offer multiple compliance pathways similar to other TMDLs.	City of Del Mar City of San Diego
	RESPONSE: The San Diego Water Board agrees with the recommendation and has added multiple compliance options for interim TMDL compliance at Specific Provision 7.c.(2), as suggested by the commenters. Interim TMDL compliance, on or after the interim compliance dates shown in Table 7.2, may be demonstrated via one of the following methods: (a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR (b) The final receiving water limitation under Specific Provision 7.b.(2)(a) is met; OR (c) There are no exceedances of the Copermittee's portion of interim effluent limitations under Table 7.2 at the Responsible Copermittee's MS4 outfalls; OR (d) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the Copermittee's portion of the interim TMDL compliance requirements will be achieved by the interim compliance date.	

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AttE7-6	ATTACHMENT E 7: Los Peñasquitos Lagoon Sediment TMDL	
	COMMENT: *Revise Tables 7.1 and 7.2 in Specific Provision 7 to Reflect the Basin Plan Amendment.* The City of San Diego and the City of Del Mar submitted comments requesting modifications to Tables 7.1 and 7.2 to 1) change the heading from interim effluent limitations in tons/year to tons/wet season, and 2) add a footnote acknowledging that the effluent limitation is shared by all Responsible Parties identified in Resolution R9-2012-0033.	City of Del Mar City of San Diego
	RESPONSE: The San Diego Water Board reviewed the wasteload allocations in the Basin Plan Amendment and notes that they are reported in tons/year on both page A-6 and the Table on page A-17. Nevertheless, Table 7.2 has been modified to report the effluent limitations in tons per wet season, as the commenters requested. A footnote was also added to acknowledge the other Responsible Parties identified in Resolution R9-2012-0033. The San Diego Water Board agrees that the third column of Table 7.2 is misleading and not useful, therefore it was deleted.	

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AttE7-1	ATTACHMENT E 7: Los Peñasquitos Lagoon Sediment TMDL	
	COMMENT: *Revise monitoring start date to be the first full wet season after the Water Quality Improvement Plan is accepted.* The City of San Diego and the City of Del Mar submitted comments requesting that the Assessment and Reporting Requirements in Specific Provision 7.d.(3) be revised so that the first data collection occurs after the San Diego Water Board acceptance of the Water Quality Improvement Plan.	City of Del Mar City of San Diego
	RESPONSE: The San Diego Water Board agrees that the start date for the monitoring requirements should be delayed, but disagrees that acceptance of the Water Quality Improvement Plan is needed first. The language has been changed so that the start date occurs in the 2015-2016 wet season. The monitoring requirements were developed as part of the TMDL Basin Plan Amendment that was adopted by the San Diego Water Board in 2012. The TMDL became effective, and the compliance timeline started, when it was approved by the Office of Administrative Law in July, 2014. The Responsible Parties need not wait for acceptance of the Water Quality Improvement Plan to begin implementing their required monitoring program under the TMDL.	

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AttF-1	ATTACHMENT F: Fact Sheet / Technical Report	
	COMMENT: *Based on the successes of the Orange County Storm Water Program, there is little justification for much of the Tentative Order.*	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: Attachment F to the Tentative Order includes the Fact Sheet. The Fact Sheet sets forth a brief summary of the basis for the draft permit conditions, the principal facts and the significant factual, legal, methodological, and policy questions the San Diego Water Board considered in preparing the Tentative Order. The Fact Sheet. In accordance with the Code of Federal Regulations (CFR) Title 40 Parts 124.8 and 124.56 (40 CFR 124.8 and 40 CFR 124.56), this Fact Sheet includes, but is not limited to, the following information: 1. Contact information 2. Public process and notification procedures 3. Background of municipal storm water permits 4. Regional MS4 Permit approach 5. Economic considerations 6. Applicable statutes, regulations, plans and policies 7. Discussion of the provisions in the Order The Fact Sheet also references the Permit Reissuance Process specific to Orange County Copermittees, and references the San Diego Water Board receipt and consideration of the Report of Waste Discharge during development of the Tentative Order. Based on San Diego Water Board review of the Report of Waste Discharge and consideration of the State of Environment discussion, very few changes to Order No. R9-2013-0001 (Regional MS4 Permit) were necessary in the Tentative Order to accommodate the recommendations made in the Report of Waste Discharge. The Fact Sheet was modified to include a brief summary of the basis for any change made in the Tentative Order either related to the State of the Environment discussion in the Report of Waste Discharge or the comments included herein. The Tentative Order requirements reflect the progress made by the Orange County Copermittees' programs and provides them with considerably more flexibility to further improve water quality. See also comment E3c-1 and Gnl-2.	

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AttF-1	ATTACHMENT F: Fact Sheet / Technical Report	
	Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

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AttF-2	ATTACHMENT F: Fact Sheet / Technical Report	
	COMMENT: *Modify Fact Sheet to include language explaining the iterative approach and TMDLs.*	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees that additional language is necessary to explain the iterative approach and TMDLs. The iterative approach is for NPDES storm water discharges that are not subject to requirements set forth in TMDLs and are causing or contributing to exceedances of water quality standards in receiving waters. Attachment E to the Tentative Order includes requirements that must be met to be in compliance with the TMDLs. For most of the TMDLs in Attachment E, the requirements also include provisions that provide additional flexibility for determining and achieving compliance with the interim TMDL requirements. The Fact Sheet accurately describes the difference between the iterative approach of the MS4 Permit and compliance with TMDL requirements. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

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AttF-3	ATTACHMENT F: Fact Sheet / Technical Report	
	COMMENT: *Modify Fact Sheet to include language explaining the incorporation of new TMDLs into the Water Quality Improvement Plans.*	• County of Orange Concurring Cities: Cities of Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Lake Forest, and Mission Viejo • Orange County Flood Control District
	RESPONSE: The San Diego Water Board disagrees that additional language is necessary to explain the incorporation of new TMDLs into the Water Quality Improvement Plans. Going forward, the San Diego Water Board is assuming that the Copermittees will be involved as a stakeholder in the development of any new TMDLs that may include the MS4 as a source of pollutants contributing to impairment. As a stakeholder, the Copermittees are expected to work with the San Diego Water Board TMDL development staff to identify appropriate WLAs and implementation measures to address MS4 discharges. Because of this knowledge, the Copermittees will have the background and information that will be useful during the re-opening of the MS4 Permit to include the new TMDL requirements. Provision F.2.c.(2) requires the Copermittees to "initiate" an update to the Water Quality Improvement Plans after Office of Administrative Law (OAL) and USEPA approval. The Copermittees may "initiate" the update by working with San Diego Water Board MS4 permitting staff to re-open the Regional MS4 Permit and concurrently begin the process of incorporating any new water quality improvement strategies that may be necessary to include into the Water Quality Improvement Plan. In addition, the expectation is that the Water Quality Improvement Plans will reduce the need for new TMDLs in the future. Based on these considerations no changes to the Tentative Order as it amends Order No. R9-2013-0001 are needed or warranted.	

CALIFORNIA
Water Boards

California Regional Water Quality Control Board, San Diego Region

TO: Ms. Jeanine Townsend
Clerk to the Board
STATE WATER RESOURCES CONTROL BOARD

In reply refer to / attn:
Place ID:786088:wchiu

FROM: David W. Gibson
Executive Officer
SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD

DATE: January 21, 2015

SUBJECT: Comments to A-2236(a)-(kk)
Draft Order in the Matter of Review of Order No. R4-2012-0175, NPDES Permit No. CAS004001, Waste Discharge Requirements for Municipal Separate Storm Sewer System (MS4) Discharges within the Coastal Watersheds of Los Angeles County, Except Those Discharges Originating from the City of Long Beach MS4

The San Diego Regional Water Quality Control Board (San Diego Water Board) appreciates the opportunity to provide comments on the *Draft Order in the Matter of Review of Order No. R4-2012-0175, NPDES No. CAS004001, Waste Discharge Requirements for Municipal Separate Storm Sewer System (MS4) Discharges within the Coastal Watersheds of Los Angeles County, Except Those Discharges Originating from the City of Long Beach MS4* (Draft Order) released by the State Water Resources Control Board (State Water Board) for public comment on November 21, 2014. The San Diego Water Board supports the clear principles and guidance that the Draft Order provides to the Regional Water Boards for incorporating a receiving water limitations (RWLs) compliance alternative pathway when issuing MS4 Permits going forward, and the flexibility provided for developing an approach that may vary in some respects from the approach taken by the Los Angeles Regional Water Quality Control Board (Los Angeles Water Board). The San Diego Water Board also supports the Draft Order's significant flexibility in not specifying that compliance alternative pathway provisions must be included in MS4 permits and understands that Regional Water Boards remain free under the Draft Order to not include such provisions based on region-specific or permittee-specific considerations.

As you may know, the San Diego Water Board considered a similar RWLs compliance alternative pathway at the May 8, 2013 hearing for *Order No. R9-2013-0001, NPDES No. CAS0109266, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds in the San Diego Region* (San Diego Regional MS4 Permit). At that time, the San Diego Water Board chose not to include the RWLs compliance alternative

pathway as part of the San Diego Regional MS4 Permit and maintained the RWLs language consistent with the precedential language established in State Water Board Order WQ 99-05. The decision to not include the RWLs compliance alternative pathway was made, in part, based on the concern that the State Water Board was early in the process of examining the issue, and the position the State Water Board would take on this issue was not yet clear. The San Diego Water Board also wanted to adhere to the principle that RWLs compliance should begin and end with the ultimate outcome of achieving water quality standards in receiving waters. Maintaining the precedential RWLs language established in State Water Board Order 99-05 in the San Diego Regional MS4 Permit was the strongest approach that was most consistent with this position at the time.

With the release of the Draft Order, the State Water Board has indicated the direction it is inclined to take on the issue. The San Diego Water Board is pleased to see that the Board's compliance alternative pathway recommended in written comments submitted to the State Water Board, dated August 15, 2013, appears to satisfy in all respects the principles set out in the Draft Order as guidance for incorporating a RWLs compliance alternative pathway into MS4 Permits.

Understanding that the State Water Board process to consider the Draft Order will require more deliberation before a final decision can be made, the San Diego Water Board intends to move forward in FY 2015-2016 with incorporating a RWLs compliance alternative pathway into the San Diego Regional MS4 Permit during its proceedings to extend permit coverage to the Riverside County Copermittees under the Board's jurisdiction. Preliminary work on the proceedings is expected to begin in May 2015, and at that time San Diego Water Board staff plan to propose incorporating the RWLs compliance alternative pathway that was previously considered during the May 8, 2013 hearing for the San Diego Regional MS4 Permit. A series of meetings and workshops with stakeholders is planned to determine whether additional modifications to the proposed RWLs compliance alternative pathway may be necessary.

The San Diego Water Board's proposed RWLs compliance alternative pathway is a rigorous, watershed-based, adaptive, and transparent approach with clear and concrete milestones that will provide the Copermittees with ample time to plan for and implement water quality improvement strategies to ultimately achieve compliance with water quality standards in receiving waters. Also, and just as important, the proposed approach includes an informative monitoring and assessment program that will allow the San Diego Water Board and the public to hold the Copermittees accountable for demonstrating progress toward achieving the RWLs. All of these elements appear to be completely consistent with the principles and guidance provided in the Draft Order. The San Diego Water Board will be closely following the State Water Board's proceedings on the Draft Order, and will provide recommendations when needed, to ensure that the proposed compliance alternative pathway approach for the San Diego Regional MS4 Permit continues to be consistent with the Draft Order.

The San Diego Water Board appreciates this opportunity to provide perspective on the RWLs compliance alternative pathway issue. In the subject line of any response, please include the reference number Place ID 786088:wchiu. For questions or comments, please contact Wayne Chiu by phone at 619-521-3354, or by email at wchiu@waterboards.ca.gov.

cc [via email only]:

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cc [via email only]:
(cont'd)

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Mr. David W. Smith, Chief
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CALIFORNIA Water Boards

EDMUND G. BROWN JR. GOVERNOR

MATTHEW RODRIQUEZ SECRETARY FOR ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

NOTICE OF PUBLIC HEARING

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) is scheduled to hold a public hearing to consider adoption of Tentative Order No. R9-2015-0001, *An Order Amending Order No. R9-2013-0001, NPDES No. CAS010266*, *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Tentative Order).

The Tentative Order proposes to amend Order No. R9-2013-0001, the Regional MS4 Permit, to address a variety of issues including coverage for Copermittees in Orange County consisting of the County of Orange, Orange County Flood Control District, and the cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano, and incorporation of limited permit provisions applicable to the City of Lake Forest. If adopted, the Tentative Order will supersede the Orange County Copermittees' current Fourth Term MS4 Permit, Order No. R9-2009-0002.

The public hearing on this matter will be held during the San Diego Water Board meeting scheduled for **February 11, 2015 in the Council Chambers of the City of Mission Viejo, located at 200 Civic Center, Mission Viejo, CA 92691**. The item will be heard during the meeting that starts at 9:00 A.M. The meeting notice and agenda, which will indicate any changes in the meeting location and may provide other specific information concerning this hearing, will be posted at least two weeks prior to the meeting date at http://www.waterboards.ca.gov/sandiego/board_info/agendas/.

Written comments including testimony, technical documentation and factual information pertaining to the terms and conditions of the Tentative Order are no longer being accepted. However, oral testimony at the public hearing will be allowed. The scope of oral testimony at the public hearing will be strictly limited to summarizing the previously submitted written comments, comments on revisions to the Tentative Order made in response to comments, and making policy statements. Oral testimony will be limited in time by the Board Chair.

The procedures governing San Diego Water Board meetings may be found at Title 23, California Code of Regulations, section 647, et seq. and are available upon request. The hearing facilities will be accessible to persons with disabilities. The meeting notice and agenda for this meeting will provide contact information for persons requesting special accommodations.

Information related to this matter, including revisions made to the Tentative Order in response to written comments timely submitted, as well as the San Diego Water Board's responses to written comments timely submitted, will be available at the San Diego Water Board's office and the San Diego Water Board's storm water web page in advance of the public hearing. A separate notice will be sent announcing the availability of the revised Tentative Order and the responses to comments upon website posting of the documents.

Please contact Laurie Walsh at (619) 521-3382 or Laurie.Walsh@waterboards.ca.gov for questions or comments regarding this hearing notice.

Please bring the foregoing to the attention of any person known to you who would be interested in this matter.

DAVID W. GIBSON
Executive Officer
January 9, 2015

017895

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

BOARD MEETING PARTICIPATION SIGN IN SHEET

FEBRUARY 11, 2015 - 9:00 A.M. - MISSION VIEJO

PLEASE PRINT CLEARLY, AS THIS WILL BECOME PART OF THE BOARD'S OFFICIAL RECORD

Please Print Name	Representing	Phone or Email
AL LAU	PDMWD	alau@padre.org
✓ Allen Carlisle	PDMWD	acarlisle@padre.org
✓ ROGER BUTOW	CLEAN WATER NOW	roger@clean-water-now.org
LAURA ROSENBERG	RMV	LROSENBERG@RANCHOMV.com
DAVID GARCIA	RCFC & WCD	951-955-1330
Jenna Voss	County of Orange	jenna.voss@ocpw.ocgov.com
Christy Suppes	County of Orange	christy.suppes@ocpw.ocgov.com
✓ Mike Wehner	OCWD	mwehner@ocwd.com
✓ Tracy Ingebrigsten	City of Laguna Beach	949.497.0781
Nancy Palmer	City of Laguna Niguel	npalmer@cityoflagunaniguel.org
Michael Welch		mwelch1@sgw.com
✓ Sandra Jacobson	Caltrout / S. Coast Coalition	sjacobson@caltrout.org
Mo. Lahsae	City of Oceanside	
Rich Schlesinger	City of Mission Viejo	
Moy Yahya	City of Aliso Viejo and Laguna Woods	
Rae Beimer	City of RSM	
Deborah Carson	City of Mission Viejo	dcarson@cityofmissionviejo.org
Rosemarie Chora	City of Oceanside	rchora@ci.oceanside.ca.us
Megan Schneider	MNWD	mschneider@mnwd.com
Jaone Lopez	MNWD	
JOE AMES	CITY OF MISSION VIEJO	james@cityofmissionviejo.org

017896

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

BOARD MEETING PARTICIPATION SIGN IN SHEET

FEBRUARY 11, 2015 - 9:00 A.M. - MISSION VIEJO

PLEASE PRINT CLEARLY, AS THIS WILL BECOME PART OF THE BOARD'S OFFICIAL RECORD

Please Print Name	Representing	Phone or Email
JC HERRERA	CITY OF LAGUNA NIGUEL	JHERRERA@CITYOFLAGUNANIGUEL.ORG
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✓ Eric Stein	SCWRA	ericS@scwrp.org
✓ Marco Gonzalez	Coast Law Group	marco@coastlaw.com
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Wendy Rogers	Balk Biological	wrogers@balkbiological.com
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✓ DEVIN SLAVEN	CITY OF LAKE FOREST	DSLAVEN@LAKEFORESTCA.GOV
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✓ RAY HIEMSTRA	Orange County Coastkeeper	ray@coastkeeper.org

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

BOARD MEETING PARTICIPATION SIGN IN SHEET

FEBRUARY 11, 2015 - 9:00 A.M. - MISSION VIEJO

PLEASE PRINT CLEARLY, AS THIS WILL BECOME PART OF THE BOARD'S OFFICIAL RECORD

Please Print Name	Representing	Phone or Email
✓ RICHARD GARDNER		949-2404804
June Wheaton	Navy	thelma.wheaton@navy.mil
RICHARD BOON	COUNTY OF ORANGE	
Robin LaMont	OC Parks	robin.lamont@ocparks.com
Betty Burnett	South OC Wastewater	bburnett@socwa.com
Daniel Apt	RBF	dapt@rbf.com
✓ CHRIS CRAMPSON	COUNTY OF ORANGE	CHRIS.CRAMPSON@OCPW.OCGOV.COM
✓ Mike McSweeney	ELA	858-514-7004
✓ S. Wayne Rosenkranz	Opper & Varco	SWR@enviralaw.com
Paul Hartman	Larry Walker Assoc	paulh@lwa.com
✓ CINDY LIN	USEPA	lin.cindy@epa.gov
Mary Vondrak	City of San Clemente	VondrakM@San-Clemente.org
✓ JO Ann Weber	County of San Diego	joann.weber@sdcounty.ca.gov
✓ Ruth Kolb	City of San Diego	rkolb@sandiego.gov
Mikhail Ogawa	City of Del Mar	mikhail@ogawaeng.com
Todd Snyder	County of SD	todd.snyder@sdcounty.ca.gov
Venkat Gummadi	Geosyntec	vgummadi@geosyntec.com
✓ MARY ANNE SKORPANICH	COUNTY OF ORANGE	714-955-0601
✓ Jon Van Rhyn	County of San Diego	858-495-5133
✓ Sumer Hasenin	City of SD	syhasenin@Sandiego.gov
Akram Bassyouni	City of SD	ABASSYOUNI@sandiego.gov
ERIC MOSOLGO	City of SD	EMOSOLGO@sandiego.gov

017898

JONARD TALAMAYAN	CITY OF SAN DIEGO	858 541-4334
Mark Grey	BIASL/CICWQ	909-525-0683
Ben Sez	Brown & Winters/Pelt & SO	760 6334485
Humza JAVED	City of Laguna Hills	949 7072657

017899

NAME: Dr. Cindy Lin 10 min **AGENDA ITEM NO.** 10 ✓

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: USEPA R9 Liaison to San Diego Board

ADDRESS: 600 Wilshire Blvd., Los Angeles CA TELEPHONE: 213-244-1803

State your name and address (spell your last name) for the record prior to beginning your presentation. Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Cindy LIN hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 2/11/15 Signature: Cindy Lin

017900

NAME: MARY ANNE SKORPANICH AGENDA ITEM NO. 10

WITH RYAN BARON & CHRIS CROMPTON

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

9:30 left

TITLE/AFFILIATION: COUNTY OF ORANGE

ADDRESS: 2301 N. GLASSELL ST TELEPHONE: 714 955 0630

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, MARY ANNE SKORPANICH hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 2/11/15 Signature: [illegible]

017901

NAME: Ryan Baron

AGENDA ITEM NO. 10

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: County of Orange

ADDRESS: PO Box 379

TELEPHONE: 714 834 3300

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Ryan Baron hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 2-11/15

Signature:

017902

WITH RYAN BARON & SKORPANICH ✓

NAME: CHRIS CROMPTON (45 min) **AGENDA ITEM NO.** 10

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: COUNTY OF ORANGE

ADDRESS: 2301 N. GLASSELL ST TELEPHONE: 714 955 0630

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, CHRIS CROMPTON hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 2/11/15 Signature: [signature]

017903

NAME: Jo Ann Weber (20 min) AGENDA ITEM NO. 10 ✓

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Planning Program Manager / County of San Diego

ADDRESS: 5510 Overland Ave, ste 410 TELEPHONE: 858-495-5317
San Diego, CA 92123

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Jo Ann Weber hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: Feb 11, 2015 Signature: [signature]

017904

NAME: Jon Van Rhyn

AGENDA ITEM NO. 10

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

20 min

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Water Quality Program Mgr / County of San Diego

ADDRESS: 5510 overland Ave.
San Diego CA 92123

TELEPHONE: 858-495-5133

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Jon Van Rhyn hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 2/11/15

Signature:

017905

NAME: Ruth Kolb - Part of City San Diego Presentation

AGENDA ITEM NO. 10

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

10 min

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: City of San Diego 1st person

ADDRESS: 9370 Chesapeake Dr San Diego, CA

TELEPHONE: 858.541.4385

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Ruth Kolb hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 2.11.15

Signature: [signature]

017906

NAME: Sumer Haserin

AGENDA ITEM NO. #10

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: City of San Diego (#2)

ADDRESS: 9370 Chesapeake Dr., Suite 100
San Diego, CA 92123

TELEPHONE: 858-541-4330

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Sumer Haserin hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 2/11/2015

Signature: Sumer Haserin

017907

NAME: Heather Stroud (part 3 of City of San Diego presentation) AGENDA ITEM NO. 10

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Deputy City Attorney / City of San Diego (3)

ADDRESS: 1200 3rd Ave, Suite 1100, San Diego CA TELEPHONE: 619-533-5872

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Heather Stroud hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 2/11/15 Signature: [illegible]

017908

NAME: DAVID GARCIA Riverside Cnty 5 min AGENDA ITEM NO. 10

REQUEST TO ADDRESS REGIONAL BOARD
DURING PUBLIC FORUMS, STATUS REPORTS, WORKSHOPS, AND OTHER NON-ACTION ITEMS

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: ENGINEERING PROJECT MANAGER – RCFC&WCD

ADDRESS: 1995 Market St. Riverside CA. 92501 TELEPHONE: 951 955-1330

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

Meeting Date: 2/11/15 Signature: [signature]

017909

NAME: ROGER BUTOW (Smith)

AGENDA ITEM NO. 10

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: EXECUTIVE DIRECTOR CLEAN WATER NOW

ADDRESS: 2796 VICTORIA DR B
LAGUNA BEACH CA 92651

TELEPHONE: 949-715-1912

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, ROGER E BUTOW hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 9/11/2015

Signature: [illegible]

017910

NAME: MIKE BEGANAN AGENDA ITEM NO. 10 ✓

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: SOUTH LAGUNA CIVIC ASSOCIATION

ADDRESS: PO. BOX 9668, SOUTH LAGUNA TELEPHONE: 949.887.7911

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, MIKE BEGANAN hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: FEB 11, 2015 Signature: MBEGANAN

017911

NAME: MIKE BEANAN

5 min

AGENDA ITEM NO. 10

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: SOUTH LAGUNA CIVIC ASSOCIATION

ADDRESS: PO P668

TELEPHONE: 949.887.7911

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, MIKE BEANAN hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: FEB 11, 2015

Signature: M. BEANAN

017912

NAME: Matt O'Malley **AGENDA ITEM NO.** 10

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: SAN DIEGO COASTKEEPER - Legal + Policy Dir.

ADDRESS: 2825 Dewey Rd #200, SAN DIEGO TELEPHONE: 619 758-7743

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Matt O'Malley hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 2/11/15 Signature:

017913

NAME: Marco Gonzalez **AGENDA ITEM NO.** 10

organized Presentation

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Attorney for Coastal Env. Rights Foundation

ADDRESS: 1140 S. Coast Hwy 101, Encinitas CA TELEPHONE: 760.942.8505

State your name and address (spell your last name) for the record prior to beginning your presentation. Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Marco Gonzalez hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 2.11.15 Signature: M. Gonzalez

017914

NAME: S. Wayne Rosenbaum San Diego? ~~Coast Indo Coalition~~ BIA 10 min AGENDA ITEM NO. 10 ✓

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Oppenheimer & Varco on behalf of the Coalition

ADDRESS: 225 Broadway Suite 1900 San Diego 92101 TELEPHONE: 619-231-5858

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, S. Wayne Rosenbaum hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 2/11/15 Signature: S. Wayne Rosenbaum

017915

NAME: MICHAEL M SWEENEY

AGENDA ITEM NO. 10

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Sr. Public Policy ADVISOR - BIA SAN DIEGO

ADDRESS: 9201 SPECTRUM Center BLVD # 110 TELEPHONE: 858 450 1221

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Michael M Sweeney hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 2/11/15

Signature:

017916

NAME: MARK GREY Const Ind Coalition O.C. BIA (10 min)

AGENDA ITEM NO. 10

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Director of Environmental Affairs

ADDRESS: 3891 11th St. Riverside, CA 92501 TELEPHONE: 909-525-1623

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, MARK GREY hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 2/11/2015 Signature: [signature]

017917

NAME: DEVIN SLAVEN **AGENDA ITEM NO.** 10

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: ENVIRONMENTAL MANAGER / CITY OF LAKE FOREST

ADDRESS: 25550 COMMERCENTRE DR., LAKE FOREST TELEPHONE: 949-461-3436

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, DEVIN SLAVEN hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: _____ Signature: _____

017918

NAME: TRACY Ingebrigtsen
Inga-brit-sen

AGENDA ITEM NO. 10

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Senior Water Quality Analyst, City of Laguna Beach

ADDRESS: 505 Forest Ave, Laguna Beach TELEPHONE: 949-491-0781

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, TRACY Ingebrigtsen hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 2/11/2015 Signature:

017919

NAME: _____ AGENDA ITEM NO. MS4

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: RICHARD GARDNER

Capastrano

ADDRESS: CAPOBEH, ORANGE CO TELEPHONE: _____

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, RICHARD GARDNER hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 2/11/15 Signature: Richard Gardner

017920

NAME: Ray Hiemstra

AGENDA ITEM NO. 10

Matt Onally
Marco Gonzalez

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION*** 15 min

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Associate Director Orange County Coastkeeper

ADDRESS: _____ TELEPHONE: _____

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Ray Hiemstra hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 2-11-15 Signature: [signature]

017921

NAME: Penny Elia

AGENDA ITEM NO. 10

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Sierra Club

ADDRESS: 30637 Marilyn Laguna Beach

TELEPHONE: 949-499-4499

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Penny Elia hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 2/11/15

Signature: PElia

017922

NAME: Penny Elia **AGENDA ITEM NO.** 10

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Sierra Club

ADDRESS: 30672 Marilem Dr. Laguna Beach TELEPHONE: 949-499-4499

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Penny Elia hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 7/11/15 Signature: P Elia

Tentative Order No. R9-2015-0001

An Order Amending the Regional MS4 Permit to incorporate the Orange County Copermittees

California Regional Water Quality Control Board
San Diego Region

WARNING
OCEAN WATER CONTACT MAY CAUSE ILLNESS
BACTERIA LEVELS EXCEED HEALTH STANDARDS
¡AVISO!
EL CONTACTO CON AGUA DEL OCEANO PUEDE CAUSAR ENFERMEDADES
LOS NIVELES DE BACTERIAS EXCEDEN LOS ESTANDARES DE SALUD

Municipal Separate Storm Sewer System (MS4 Permitting Program)

- NPDES discharge permit
- Began in early 1990s
- 3 counties, 3 permits
- Focused on actions
- Effectiveness unknown

2013 Regional MS4 Permit

Paradigm Shift…

Action oriented

Outcome oriented

San Diego Water Board Practical Vision

Healthy Waters, Healthy People

Region 9 Orange County Copermittees

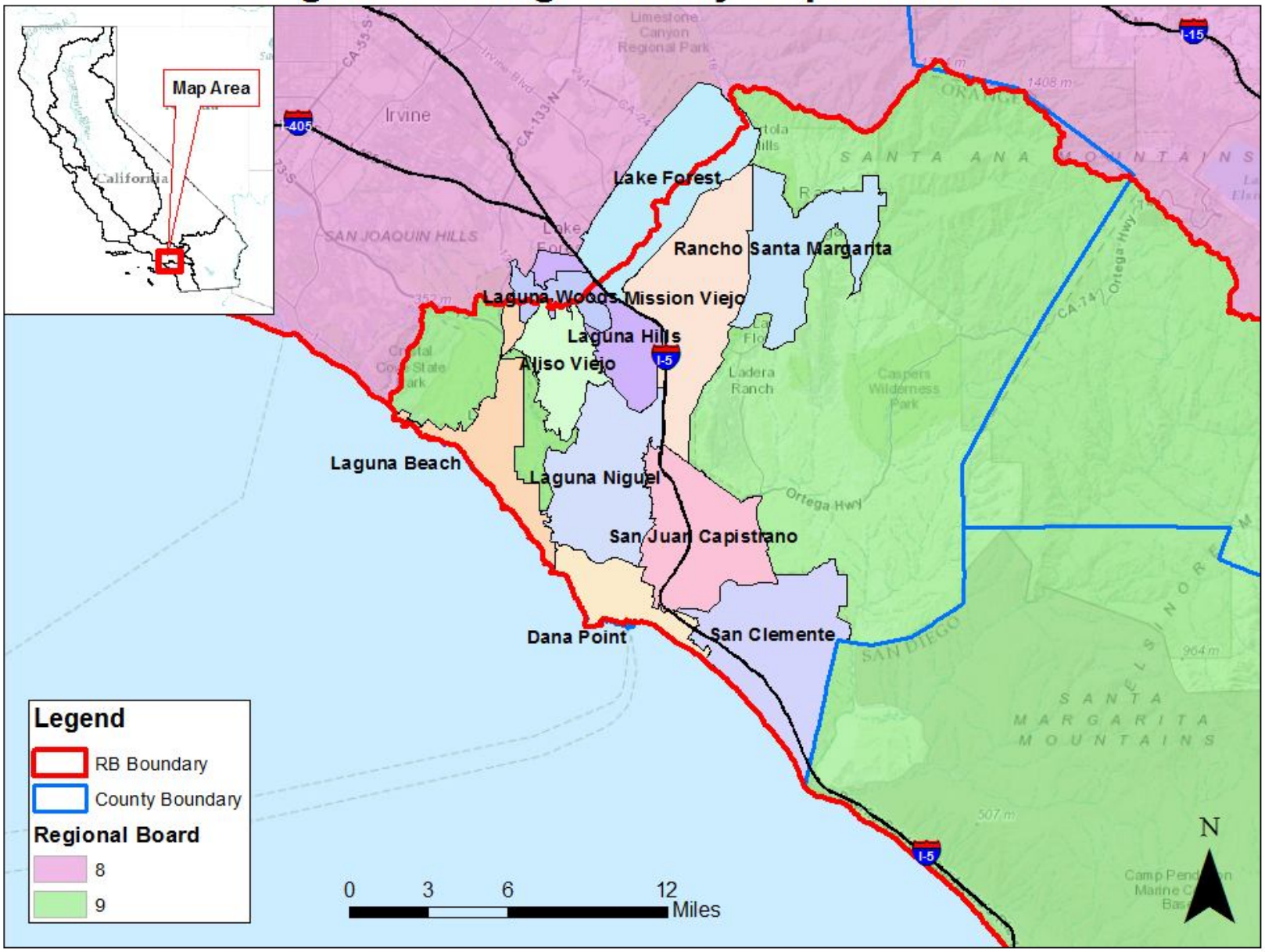

Tentative Order No. R9-2015-0001

Schedule

OC Copermittees submit RoWD	May 20, 2014
Public Meeting	July 1, 2014
Release Tentative Order	September 19, 2014
Public Comment Period	Sept. 19 – Nov. 19, 2014
San Diego Water Board Workshop	October 8, 2014
Release Revised Tentative Order and Response to Comments	January 21, 2015
San Diego Water Board Public Hearing – Consideration of Adoption	February 11, 2015

Initial Modifications to Regional MS4 Permit

1. Incorporation of OC Copermittees
2. Single Water Board regulation of City of Lake Forest, City of Laguna Hills, and City of Laguna Woods
3. Include the Unified Approach for Beach Water Quality Monitoring
4. Add Los Peñasquitos Lagoon Sediment TMDL
5. Correct typographical error (ASBS)
6. Interim requirements – hydromodification management

Modifications to Tentative Order No. R9-2015-0001 and Regional MS4 Permit in Response to Comments

1. Added commitment to consider “alternative compliance option” to Receiving Waters Limitations upon issuance of Regional MS4 Permit to Riverside County Copermittees

2. Added definition of “prior lawful approval”

Recommendation: Adopt Tentative Order No. R9-2015-0001 with Errata

Aliso Creek and Beach

Regional Board Hearing

Presentation of
Orange County Permittees

by

County of Orange

Chris Crompton / Ryan Baron
/ Mary Anne Skorpanich
February 11, 2015

Presentation

- Regional Permit Enrollment
- Key Policy Issues
  - Compliance
  - State of the Environment in South Orange County – Bridging the Analytic Gap
- Pathway Forward

Regional Permit Process

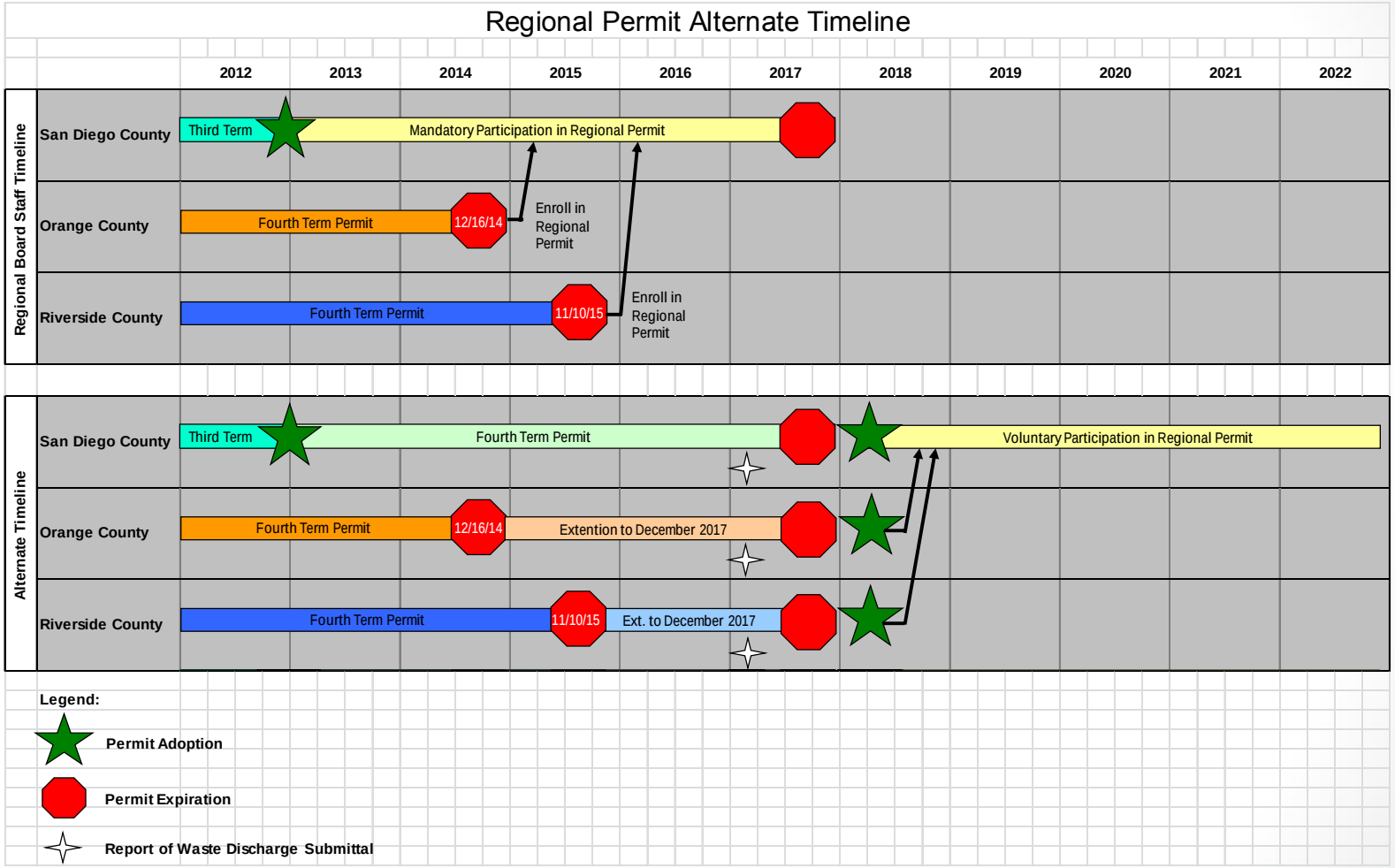

Regional Permit Enrollment

Response to Comments

- **126** pages, most in response to County of Orange
- **58** “disagree” statements
- **53** “no change to Tentative Order” statements
- **17** “agree” statements
- **Zero** changes in response to legal comments

- Regional Permit in 2013 made consideration of the South Orange County ROWD largely irrelevant to the process
- A separate permit for south Orange County, as was requested, could have made the ROWD relevant

- Regional Permit Enrollment
- Key Policy Issues
  - Compliance
  - State of the Environment in South Orange County - the Analytic Gap
- Pathway Forward

Permit Compliance

A.2.a. Discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters

A.4. Each Copermittee must achieve compliance with… A.2.a of this Order through timely implementation of control measures

Impacts

- Reverse process from LA and Santa Ana Regions
- Most agency permits in compliance from Day 1
- System was not setup to make flood control operators adhere to the same standards as other point source dischargers
- Is sky falling? Not in OC but active lawsuits/NOIs in CA/U.S.
- Prioritization at risk
- Material changes to WQIP process if 2015-16 compliance

ASCE - Attaining FIB Compliance in Wet Weather Infeasible

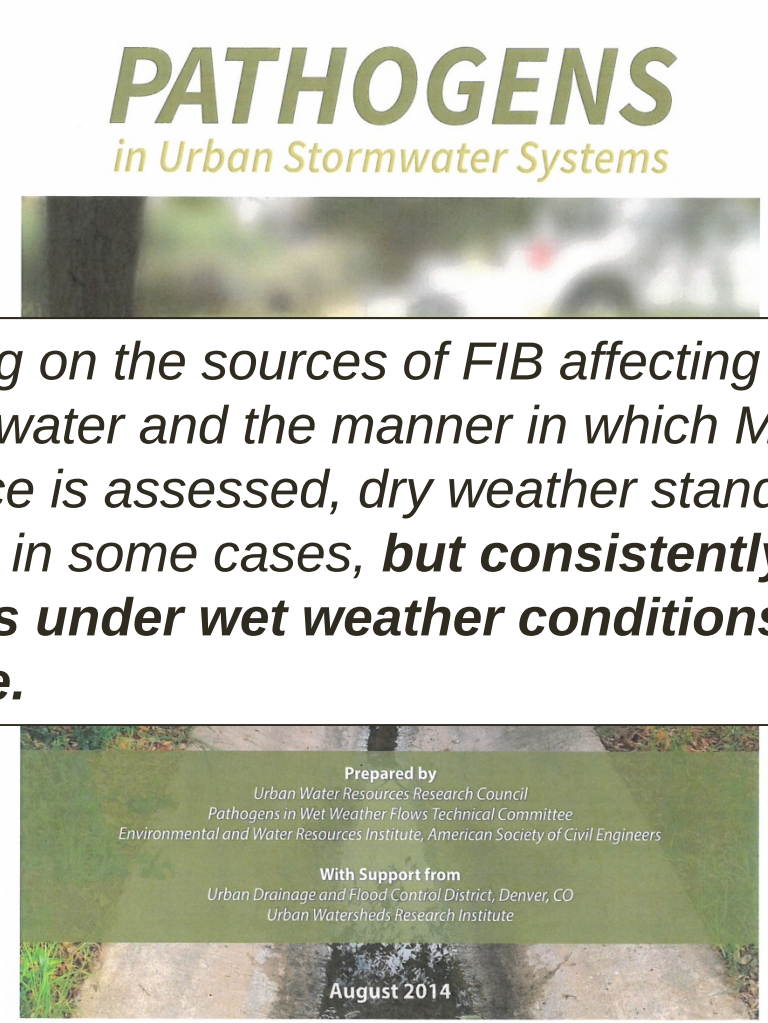

Depending on the sources of FIB affecting a particular receiving water and the manner in which MS4 permit compliance is assessed, dry weather standards may be attainable in some cases, ***but consistently attaining standards under wet weather conditions may be infeasible.***

Pathway to Compliance Needed

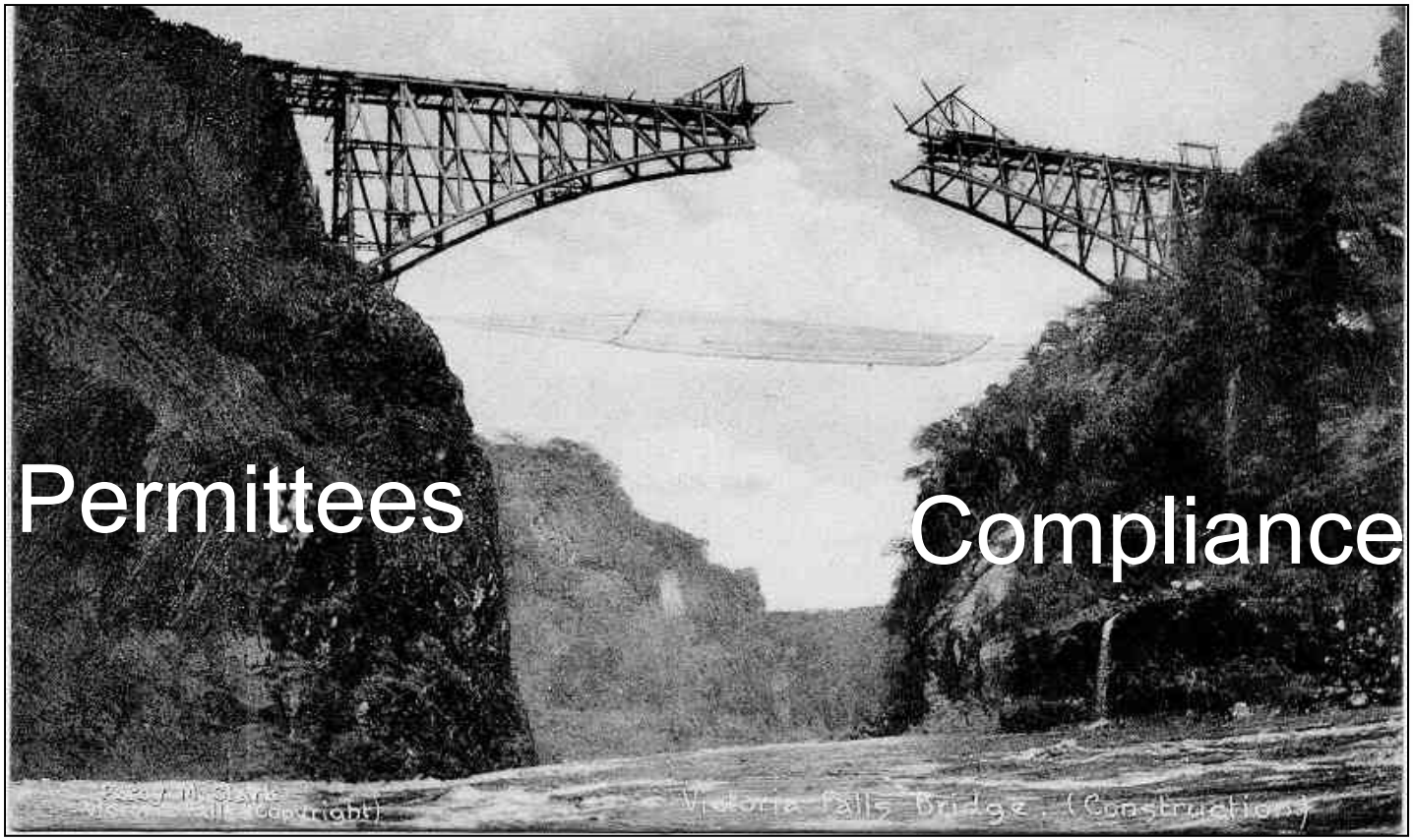

- Regional Permit Enrollment
- Key Policy Issues
  - Compliance
  - State of the Environment in South Orange County – bridging the Analytic Gap
- Pathway Forward

Bridging the Analytic Gap

Findings must "bridge the analytic gap between the raw evidence and ultimate decision or order." WQ Order 95-4

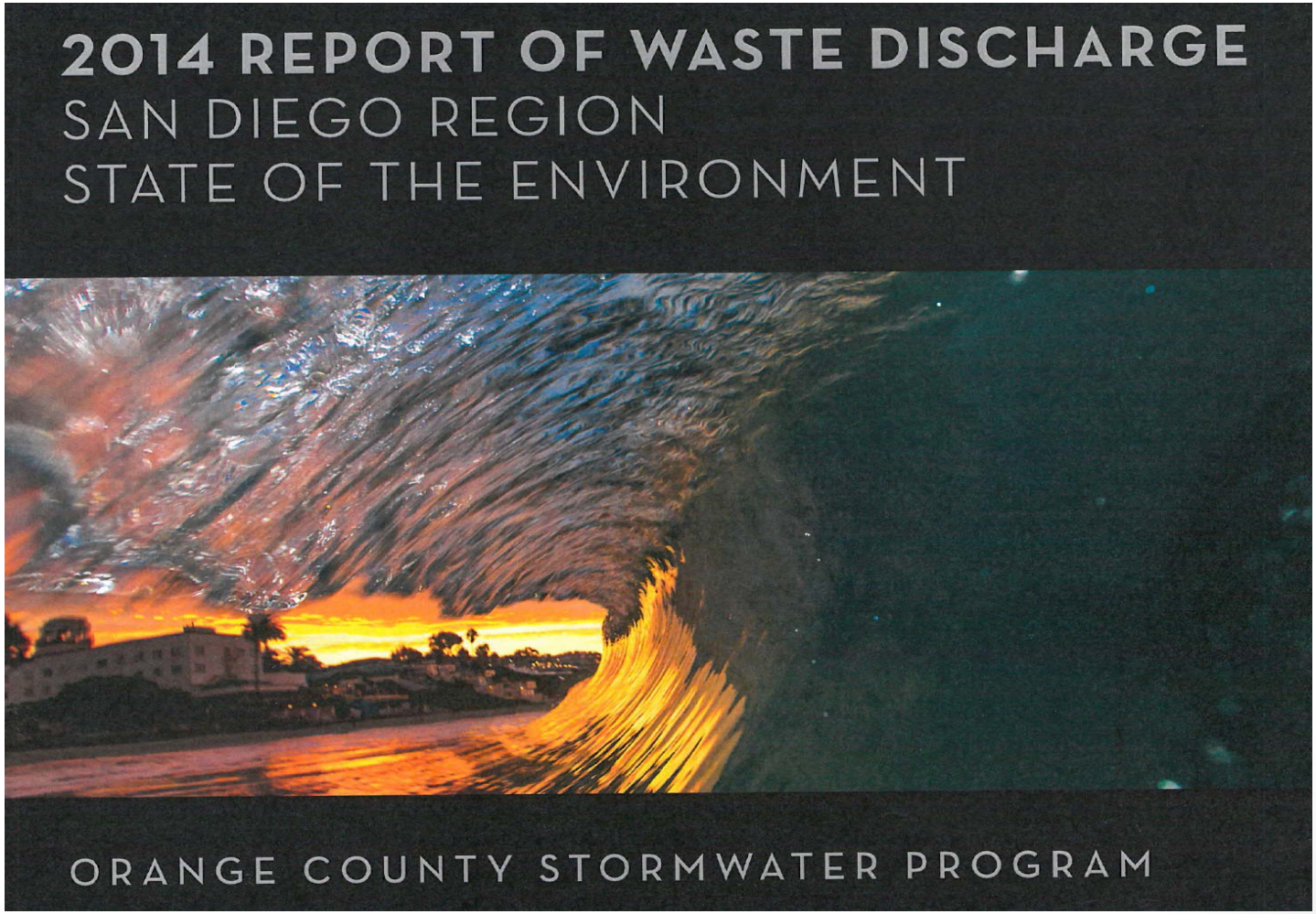

Our Water Quality Priorities

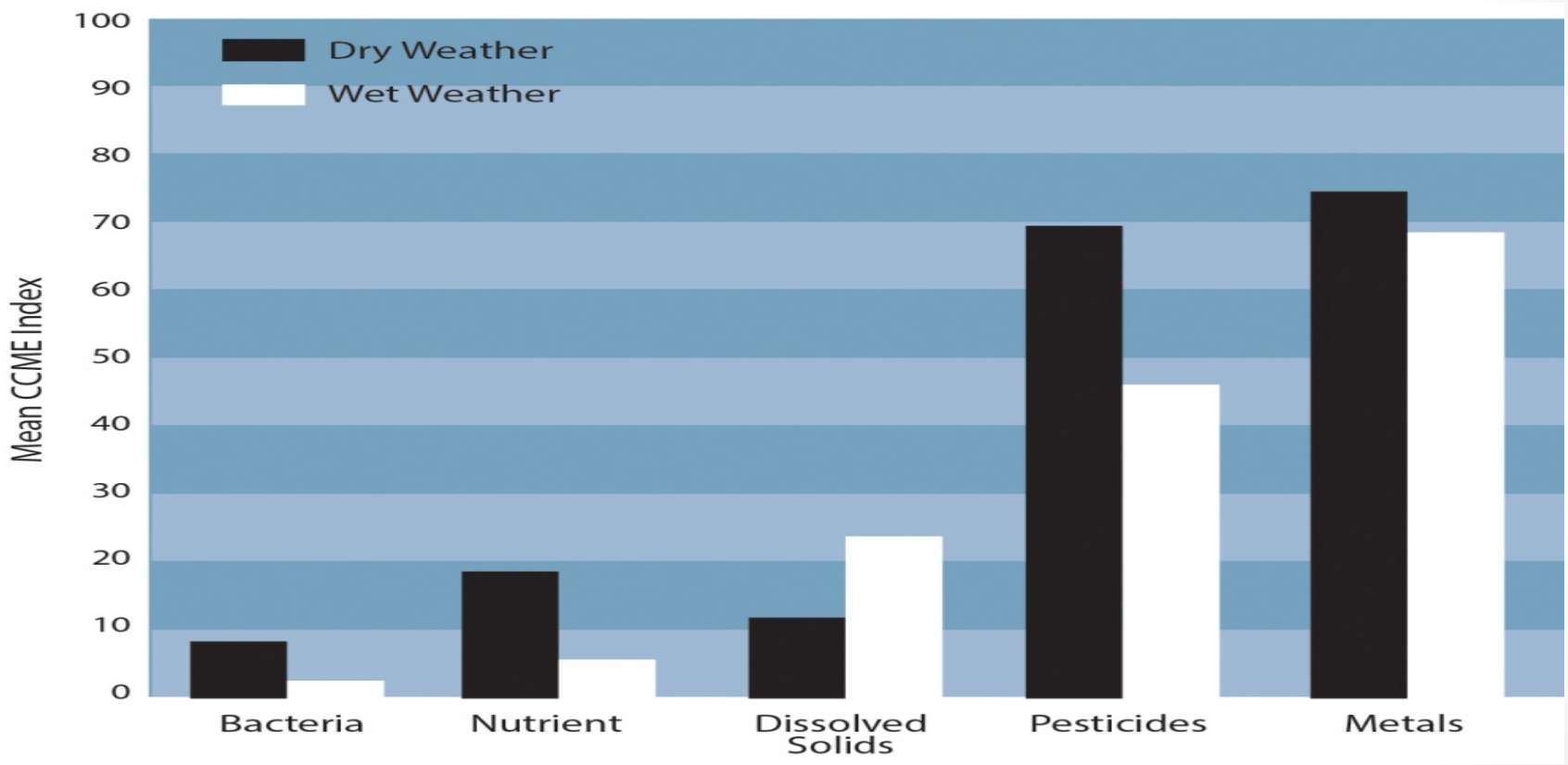

Increasing Concern

FIB: Dry Weather-Beaches

FIB: Dry Weather-Inland Streams

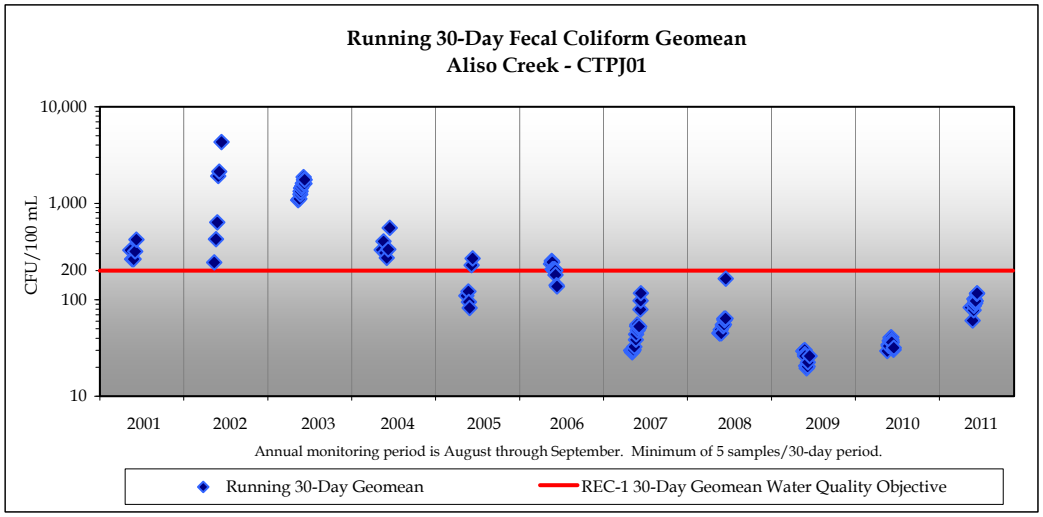

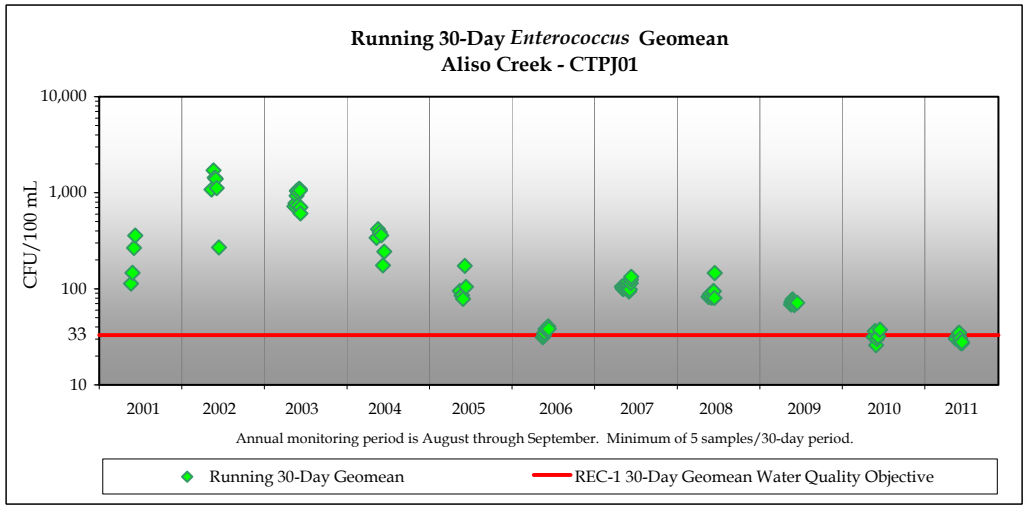

FIB: Model Control Program

- Non Structural BMPs
  - Irrigation Runoff Reduction
  - SSO Reductions
  - LID
  - Pet Waste Management
  - Control of ID/IC
  - Inspection
  - Animal Facility
  - Drain Cleaning
  - **Wildlife Control**
- Structural BMPs
  - **Low Flow Diversion**
  - Low Flow Treatment
  - **Regional Basins**
  - **Channel Restoration**

FIB: Dry Weather Diversions

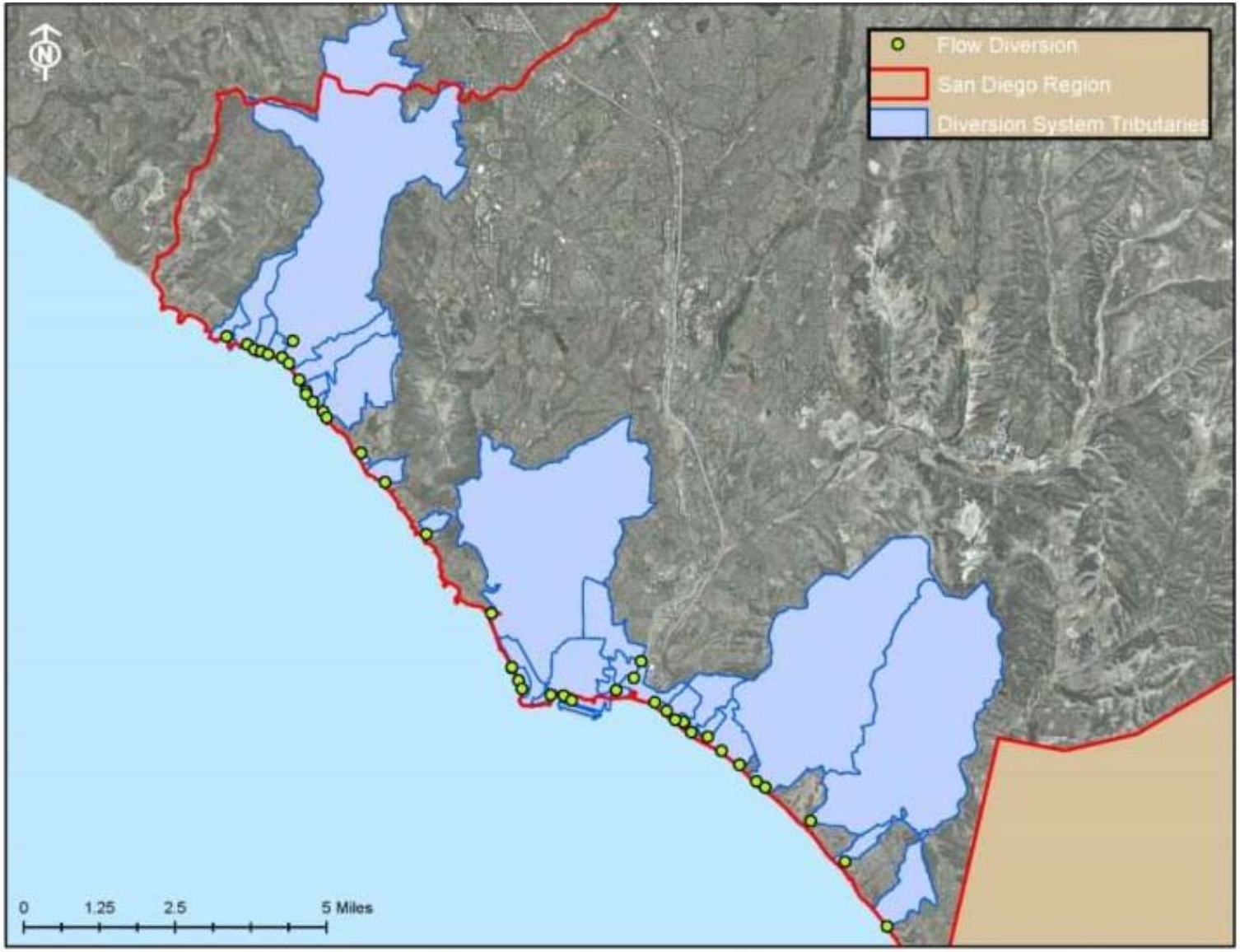

FIB: Wildlife Control

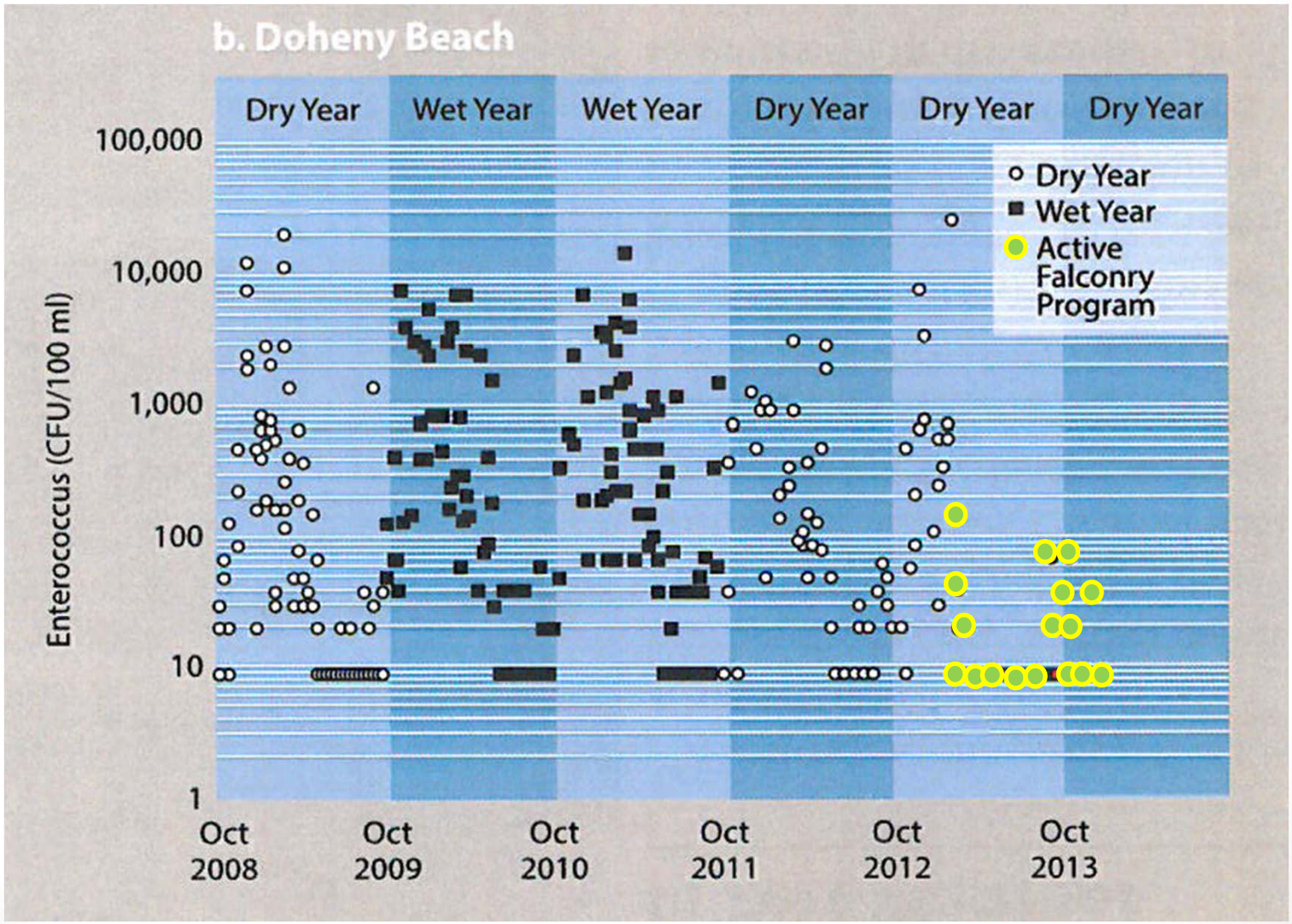

FIB: Wet Weather

FIB: Structural BMPs

- BMP Effectiveness - Enterococci

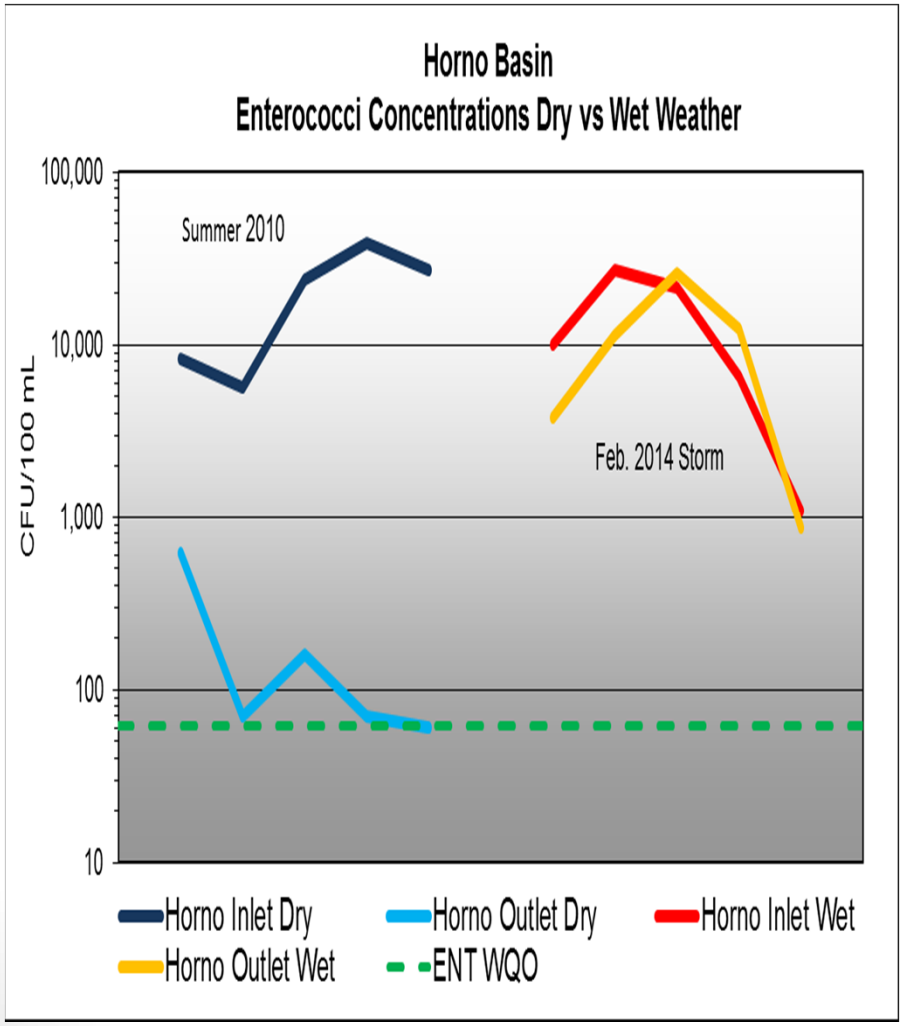

Credit: Kacen Clapper, OCPW

FIB: Channel Restoration

- BMP Effectiveness - Enterococci

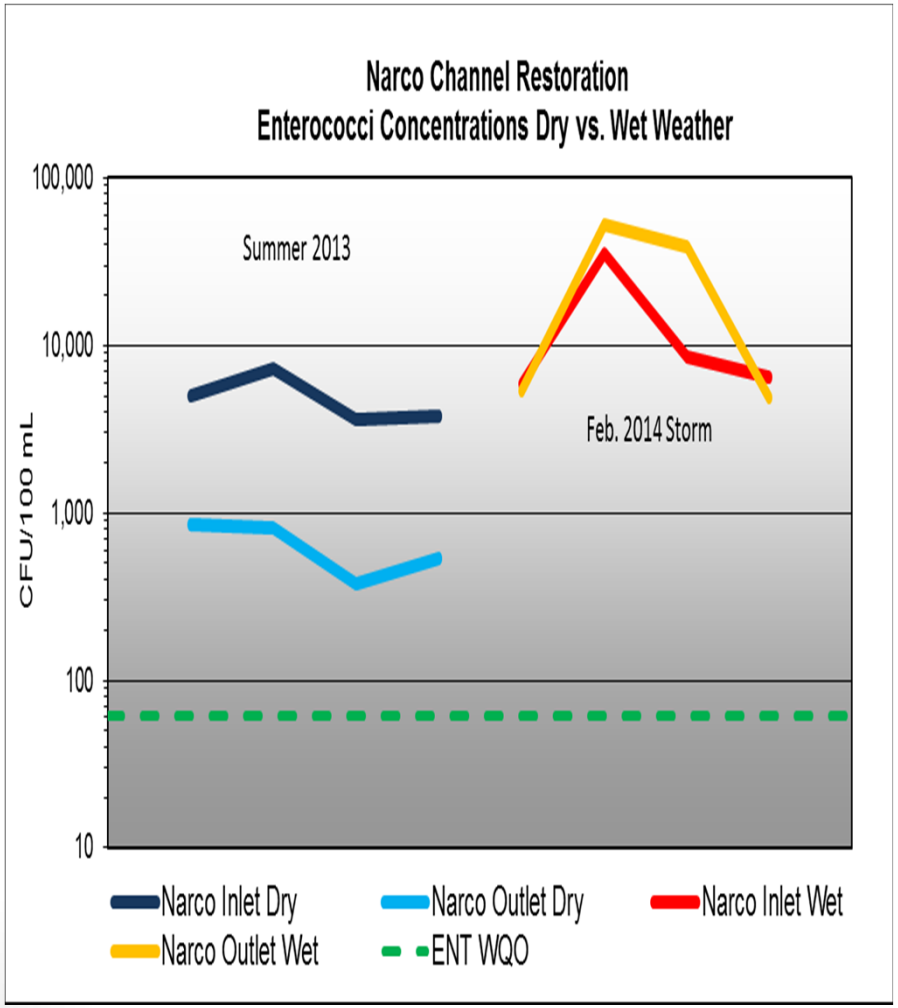

Credit: Kacen Clapper, OCPW

State of the Environment Tells Us

- Compliance with A.2.a is unattainable in wet weather for FIB
- Successful dry weather bacteria BMPs appear ineffective in providing meaningful wet weather reductions
- Successful wet weather BMPs and ecological restoration projects appear to be ineffective for FIB removal in wet weather
- It makes the case for a compliance pathway

- Regional Permit Enrollment
- Key Policy Issues
  - Compliance
  - State of the Environment in South Orange County - the Analytic Gap
- A Pathway Forward

A Pathway Forward

1. A compliance pathway is needed for south Orange County

A.2.a. Discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters

A.4. Each Copermittee must achieve compliance with… A.2.a of this Order through timely implementation of control measures

A Pathway Forward

Findings must "bridge the analytic gap between the raw evidence and ultimate decision or order."

WQ Order 95-4

2. The Permit and Fact Sheet should reflect the "State of The Environment" in south Orange County

Note: See proposed text

A Pathway Forward

3. The Response to Comments and the lack of consideration of the ROWD and the “State of the Environment Report” reaffirm that the Regional Permit process is not responsive to our Program and needs to be re-evaluated

Questions

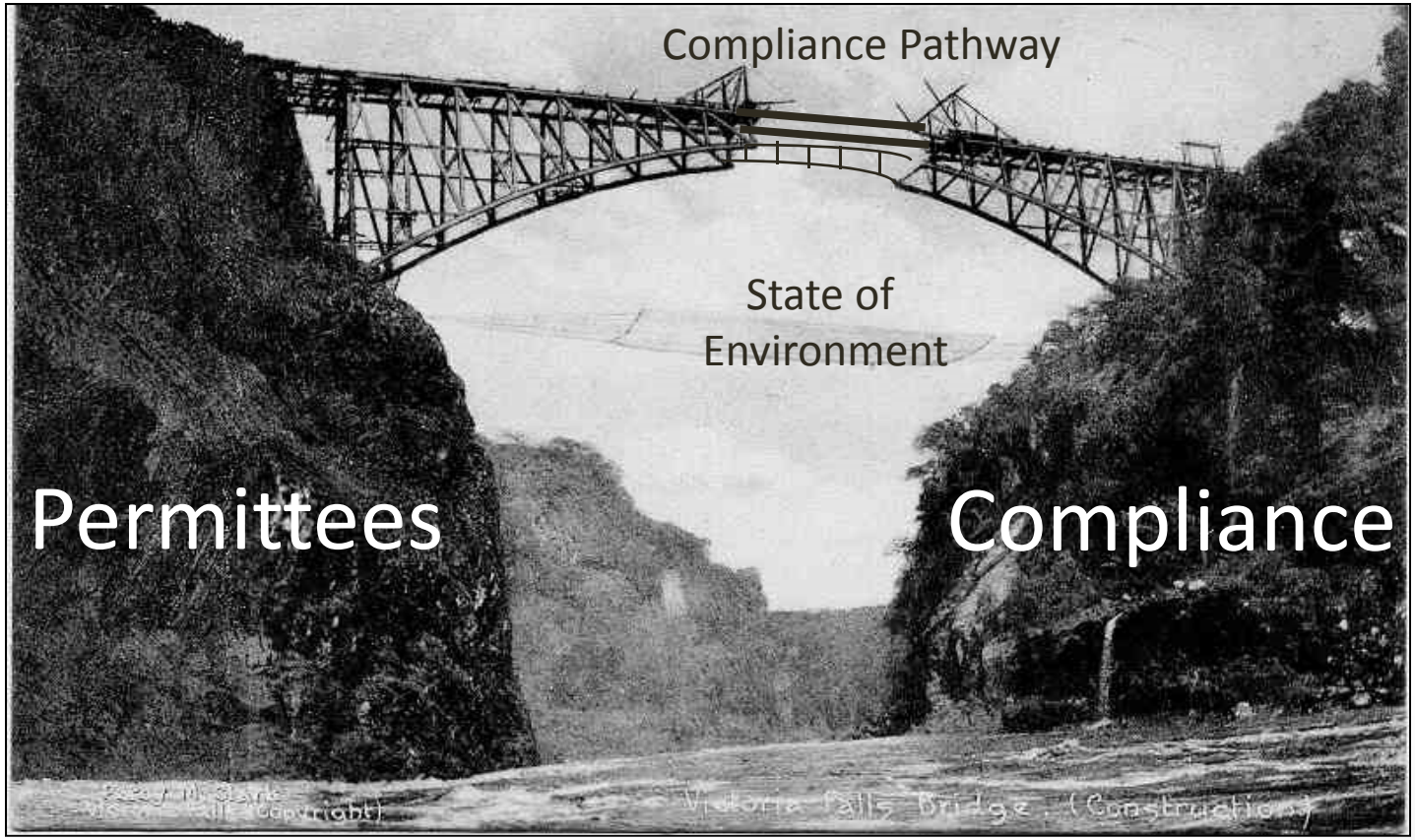

2015 Permit

Southern San Diego Watersheds

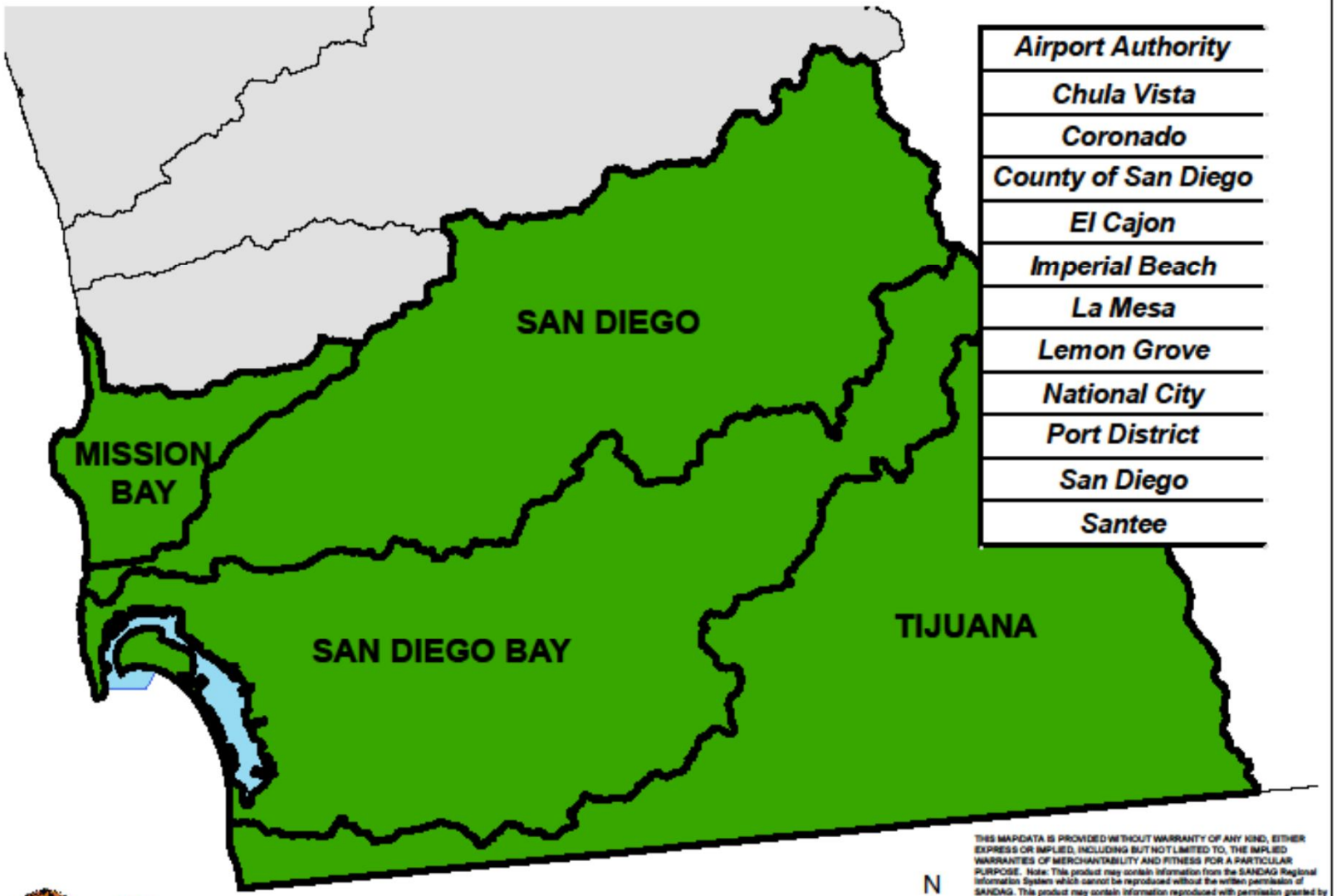

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Transitional Stream Monitoring

Issue:

- Above and beyond 2013 Permit sampling requirements
- No technical benefit from increased frequency
- Over $ 1 million for monitoring instead of implementation

Request:

- Allow EO Gibson the discretion to conditionally approve the stream monitoring proposed in the Water Quality Improvement Plans prior to approval

Stream Monitoring

	Year 1	Year 2	Year 3
2007 Permit	X	X	?
2013 Permit	√	√	X

X - required
√ - added

017963

017964

Stream Monitoring Tasks

- January – Budgeting
- May – Consultant Scopes of Work
- July – Obtain Permits
- August – Install 14 Stations
- September – Collect 24hr Dry Weather Sample
- October – Begin Wet Weather Sampling

Recommended Change to D.1.a

a. Transitional Receiving Water Monitoring

Until the monitoring requirements and schedules of Provisions D.1.b-e are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following receiving water monitoring in the Watershed Management Area:

(1) Continue the receiving water monitoring programs required in Order Nos. R9-2007-0001 (Monitoring and Reporting Program No. R9-2007-0001 Sections II.A.1-A.5), R9-2009-0002, and R9-2010-0016, unless the Executive Officer provides conditional approval for Copermittees to proceed with implementation of the proposed monitoring and assessment program developed in accordance with Provision B.4;

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
San Diego Region

Errata Sheet

Tentative Order No. R9-2015-0001
NPDES No. CAS0109266

AN ORDER AMENDING ORDER R9-2013-0001, NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The following changes are proposed to the revised version of Tentative Order No. R9-2015-0001 and its Attachments included as Supporting Document No.1 for Item No. 10 on the San Diego Water Board February 11, 2015 Board Meeting Agenda.

1. Tentative Order No. R9-2015-0001 Errata

Findings

a) Revise Finding 7. *Regional Water Board Agreement* as follows:

"Both the Santa Ana Water Board and the San Diego Water Board Phase I MS4 permits for Orange County Copermittees, including Cities, require amendments to make the designations effective. To avoid gaps or duplication in regulation for the Cities, the agreement, dated ~~January XX, 2015~~ **February 10, 2015**, is effective on the later effective date of this Order or the Santa Ana Water Board's reissuance (Tentative Order No. R8-2015- 0001)"

b) Delete Finding 15 on Prior Lawful Approval and renumber subsequent findings appropriately.

c) Delete Finding 16.g. language related to Prior Lawful Approval.

2. Attachment No. 1 to Tentative Order No. R9-2015-0001 Errata

Order No. R9-2013-0001, Findings

a) Revise Finding 29. *Regional Water Board Designation* to correct the date of the agreement as follows:

"…The Santa Ana Water Board and the San Diego Water Board have entered into an agreement dated ~~January XX, 2015~~ **February 10, 2015**, whereby the

Cities of Laguna Woods and Laguna Hills are largely regulated by the San Diego Water Board under this Order, including those portions of the Cities of Laguna Woods and Laguna Hills not within the San Diego Water Board's jurisdiction, upon the effective date of this Order or Santa Ana Water Board Order No. R8-2015-0001, whichever is later…"

Order No. R9-2013-0001, Provision B.1 Watershed Management Areas

b) Revise Footnote 1 to Table B.1 to correct the date of the agreement as follows:

"By agreement dated ~~**January XX, 2015**~~ **February 10, 2015**, pursuant to Water Code section 13228, the Phase I MS4 discharges within the jurisdiction of the City of Laguna Hills and the City of Laguna Woods located in the Santa Ana Region are regulated by San Diego Water Board Order No. R9-2013-0001 as amended by Order No. R9-2015-0001, upon the later effective date of Order No. R9-2015-0001 or Santa Ana Water Board Tentative Order No. R8-2015-0001…"

c) Revise Footnote 2 to Table B.1 to correct the date of the agreement as follows:

"…By agreement dated ~~**January XX, 2015**~~ **February 10, 2015**, pursuant to Water Code section 13228, Phase I MS4 discharges within the City of Lake Forest located within the San Diego Water Board Region are regulated by the Santa Ana Water Board Order No. R8-2015-0001 (NPDES No. CAS618030) upon the later effective date of this Order or Santa Ana Water Board Tentative Order No. R8-2015-0001…"

Order No. R9-2013-0001, Provision E.3.e(1)(b)

d) Delete proposed Provision E.3.e(1)(b) language defining Prior Lawful Approval, and renumber subsequent provisions appropriately.

3. Attachment No. 2 to Tentative Order No. R9-2015-0001 Errata

Order No. R9-2013-0001, Attachment F, Fact Sheet, Section I, Fact Sheet Format

a) Revise the following language on page F-3 of the Fact Sheet:

" b. Designate the San Diego Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the Cities of Laguna Woods and Laguna Hills and agree to the designation of the Santa Ana Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the City of Lake Forest, subject to the terms of the **February 10, 2015** agreement between San Diego Water Board and the Santa Ana Water Board described in Finding 29 of this Order, upon the later effective date of Order No. R9-2015-0001 or Order No. R8-2015-0001 (superseding Order No. R8-2009-0030);.."

b) Delete the following proposed language on page F-4 of the Fact Sheet:

~~g. Include additional language that clarifies the term "prior lawful approval" for the implementation of appropriate structural BMP requirements to Priority Development Projects.~~

Order No. R9-2013-0001, Attachment F, Fact Sheet, Section II, Contact Information, Copermittees

c) Revise the language associated with the asterisk on the City of Lake Forest bullet on page F-6 of the Fact Sheet (green highlight) as follows:

Orange County Copermittees

▪ City of Lake Forest*

"* While not listed in the above table, the City of Lake Forest remains a Copermittee under this Order until the later effective date of this Order or Santa Ana Water Board Tentative Order No. R8-2015-0001. Thereafter, the City of Lake Forest will no longer be considered a Copermittee under this Order because its Phase I MS4 discharges will be regulated by the Santa Ana Water Board pursuant to Water Code section 13328 designation. The requirements of this Order that apply to the City of Lake Forest for the duration of this Order, consistent with the Water Code section 13228 agreement dated ~~**January XX, 2015**~~ **February 10, 2015**, are described in Finding 29 and Footnote 2 to Table B-1."

Order No. R9-2013-0001, Attachment F, Fact Sheet, Section VIII, Provision B., Water Quality Improvement Plan, section B.1 Watershed Management Areas

d) Revise language on page F-49 of the Fact Sheet as follows:

"…the San Diego Water Board and the Santa Ana Water Board have entered into an agreement dated ~~**January XX, 2015**~~ **February 10, 2015**, whereby the San Diego Water Board is designated to regulate Phase I MS4 discharges within the jurisdiction of the Cities of Laguna Woods and Laguna Hills including areas in the Santa Region upon the later effective date of this Order or Tentative Order No. R8-2015-0001…"

e) Revise language on page F-50 of the Fact Sheet as follows:

"…In an effort to address these concerns, the San Diego Water Board and the Santa Ana Water Board have entered into an agreement dated ~~**January XX, 2015**~~ **February 10, 2015**, whereby the Santa Ana Water Board is designated to regulate Phase I MS4 discharges within the jurisdiction of the City of Lake Forest within the

San Diego Region upon the later date of this Order or Santa Ana Water Board Tentative Order No. R8-2015-0001…"

Order No. R9-2013-0001, Attachment F, Fact Sheet, Section VIII, Provision E., Jurisdictional Runoff Management Programs, section E.3, Development Planning

f) Delete the following proposed language on Fact Sheet pages F-106 and F-107:

"…~~Provision E.3.e.(1) provides clarification regarding the meaning of the term "prior lawful approval" used in this Order. Clarification about how the San Diego Water Board intends the term to be interpreted is reasonable and appropriate and will provide guidance and certainty about the permit requirement for the Copermittees, the land development community, and the general public.~~

~~Provision E.3.e.(1) requires Copermittees to implement the land development requirements of Provision E.3 for projects that have not received prior lawful approval from the Copermittee by the effective date of the BMP Design Manual pursuant to Provision E.3.d. For projects that have received prior lawful approval from the Copermittee by the effective date of the BMP Design Manual, then the Copermittee may allow previous land development requirements to apply. For private development projects, prior lawful approval is a development approval or construction permit that complies with the Priority Development Project requirements of the Fourth Term MS4 permits (Order Nos. R9-2007-0001 for San Diego County, R9-2009-0002 for Orange County, and R9-2010-0016 for Riverside County), and includes the design of the storm water drainage system for the project in its entirety as accepted by the Copermittee. Alternatively, prior lawful approval is a development approval or construction permit that confers a vested right for a Priority Development Project to proceed under storm water structural BMP requirements of prior MS4 permits. If a Copermittee confers prior lawful approval to a Priority Development Project based on one of the two aforementioned conditions, then the Copermittee must ensure that 1) any subsequent project approvals must be issued within 5 years of the effective date of the BMP Design Manual, and 2) BMP installation under subsequent approvals must remain in substantial conformity with the design of the storm water drainage system included in the initial approval.~~

~~For public projects, prior approval allowing implementation of Fourth Term MS4 Permit structural BMP requirements in lieu of the requirements of this Order is acceptable if the storm water drainage system for the project, in its entirety, has been stamped by the City or County Engineer by the effective date of the BMP Design Manual.~~…"

~~The San Diego Water Board recognizes that Copermittees will need to determine whether or not a project has prior lawful approval for purposes of implementing~~

~~the requirements of Provision E.3 of this Order based on the circumstances of each project. Nevertheless, the San Diego Water Board expects each Copermittee to require the implementation of Provision E.3 of this Order wherever it can lawfully do so. Some projects will have received prior lawful approval by the effective date of the BMP Design Manual and hence the requirements of the Fourth Term MS4 permits will apply to those projects. The San Diego Water Board expects that very few Priority Development Projects, if any, will be allowed to implement BMP requirements from earlier term MS4 permits. In cases where BMP requirements from the Fourth Term (or earlier) MS4 permits govern the structural BMP design requirements of a Priority Development Project, the San Diego Water Board expects the Copermittees to be able to demonstrate, in a programmatic audit or other means, that a project has prior lawful approval within the meaning of Provision E.3.e.(1) of this Order. In any event, the San Diego Water Board expects the Copermittees to only approve Priority Development Projects that have adequate structural BMPs that are protective of water quality.~~

Fact Sheet Technical Report - Errata

ENVIRONMENTAL CONSIDERATIONS

The Orange County Stormwater Program has measured a broad suite of contaminants and other measures of receiving water condition (i.e. toxicity, bioassessment) over many years. Based upon an analysis of the frequency and magnitude of the exceedances of regulatory standards, fecal indicator bacteria, dissolved solids, and nutrients have been identified as the Program's priority water quality constituents of concern.

Bacterial contamination is very low during dry weather and has dropped steadily over time; beach report card grades are consistently high. The sources of bacterial contamination have been reduced through targeted actions such as diversion and disinfection and remaining issues are localized and very likely have wildlife components. Contamination is more widespread during wet weather due to the much wider range of bacterial sources in the landscape, compared to dry weather, and higher flows. The Program has identified that consistently attaining current recreational standards in wet weather may be infeasible.

Total dissolved solids (TDS) consistently exceed the Basin Plan Objective and are at levels that create the potential for detrimental ecosystem impacts. Indeed, TDS is currently implicated as a causal factor in poor benthic macroinvertebrate community condition. Local geology, notably the presence of marine sedimentary formations, is the primary reason south Orange County creeks exhibit elevated level TDS.

Nutrient levels in south Orange County streams and channels frequently exceed regulatory thresholds suggesting a prevalence of nutrient impacts. In contrast, there are much less frequent occurrences of such impacts as nuisance algal growth. Leaching of nutrients from soils overlying marine sedimentary and shallow groundwater exfiltration is considered the major nutrient source.

Toxicity in south Orange County's freshwater channels in all conditions (aquatic, sediment, wet and dry weather) occurs at low levels and is sporadic, occurring at different locations at different times and varying unpredictably across test species. Aquatic toxicity in dry weather occurs in open (undeveloped) areas at levels equivalent to those in urban areas. The primary source of toxicity appears to be pesticides, with evidence that pyrethroids contribute to sediment toxicity. Metals, except for localized instances of elevated copper, are at low levels and do appear to contribute to aquatic toxicity in freshwater.

P. F-69

D. Monitoring and Assessment Program

(4) Inform the Copermittees, the San Diego Water Board and the public on the efficacy of NPDES Permit No. CAS010266 in achieving (1) and (2) during future reauthorizations.

County of San Diego Proposed Modifications to Tentative Order No. R9-2015-0001
February 11, 2015
(With Changes Proposed by RWQCB Staff)

e. Priority Development Project BMP Implementation and Oversight

Each Copermittee must implement a program that requires and confirms structural BMPs on all Priority Development Projects are designed, constructed, and maintained to remove pollutants in stormwater to the MEP.

(1) Structural BMP Approval and Verification Process

(a) Each Copermittee must require and confirm that for all Priority Development Project applications that have not received prior lawful approval by the Copermittee by the effective date of the BMP Design Manual pursuant to Provision E.3.d, the requirements of Provision E.3 must be implemented. For project applications that have received prior lawful approval before the effective date of the BMP Design Manual pursuant to Provision E.3.d, the Copermittee may allow previous land development requirements to apply.

(b) For private development projects, prior lawful approval under this Order is a development approval or construction permit that either:

1) complies with the Priority Development Project requirements of the Fourth Term MS4 permits[1] and includes the design of the storm water drainage system for the project in its entirety as accepted by the Copermittee, or

2) in the case of a development agreement, vesting tentative map or other statutory mechanism established by the State allowing for the vesting of rights, the rights vested shall be deemed to include the right ~~confers a vested right~~ to proceed under the Priority Development Project ~~prior storm water~~ requirements of the Fourth Term MS4 permits.

For public projects, approval means that the design of the storm water drainage system for the project in its entirety complies with the Priority Development Project requirements of the Fourth Term MS4 permits and has been stamped by the City or County Engineer or engineer of record for the project. For public projects completed on a design build or similar basis where project design is completed after construction contract award, the project may be designed in conformance with the Priority Development Project requirements of the Fourth Term MS4 permits if the contract is awarded before the effective date of the BMP Design Manual.

For any applicable portion(s) of ~~the~~ a public or private project, approvals may be extended to any subsequent discretionary or ministerial approvals necessary to implement the initial project approval with the following conditions:

(i) All subsequent development approvals and construction permits, or equivalent approvals for public projects, must be issued within 5 years of the effective date of the BMP Design Manual pursuant to Provision E.3.d; and

(ii) BMP installation under subsequent approvals must remain in substantial conformity with the design of the storm water drainage system included in the initial approval.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
City of Mission Viejo
Council Chambers
200 Civic Center
Mission Viejo, California

MINUTES OF MEETING
FEBRUARY 11, 2015

At 9:15 a.m., Chairman Abarbanel called to order the meeting of the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) at the City of Mission Viejo City Council Chambers, 200 Civic Center, Mission Viejo, California.

Item 1 – Roll Call and Introductions

Board Members present: Henry Abarbanel, Eric Anderson, Tomás Morales, Betty Olson Gary Strawn, and Stefanie Warren. Ms. Warren left the meeting at 1:50 p.m.

Dr. Olson introduced herself and made a few remarks.

Staff Present: David Gibson, James Smith, Chris Blank, David Barker, Julie Chan, Jeremy Haas, Eric Becker, Chiara Clemente, Chad Loflen, John Odermatt, Brandi Outwin-Beals, Christina Arias, Wayne Chiu, Fisayo Osibodu, Laurie Walsh.

Others present on behalf of the San Diego Water Board: State Water Resources Control Board –State Water Board Chair Felicia Marcus, Catherine Hagan, Adriana Nuñez. California Court Reporting – Jaqueline Delinger.

Public Attendance: Sandra Jacobson, South Coast Steelhead Coalition; Roger Butow, Clean Water Now; Mike Beanan, South Laguna Civic Association; Cindy Forbes, Division of Drinking Water; Mike Wehner, Orange County Water District; Shane Trussell, Trussell Technologies; Eric Stein, SCCWRP; Randy Barnard, Division of Drinking Water; John Helminski, City of San Diego; Allen Carlisle, Padre Dam MWD; Andy Webster, Rancho California Water District; Chris McKinney, City of Escondido; Dan Ferons, Santa Margarita Water District; Toby Roy, San Diego County Water Authority; Michael McSweeney, BIA San Diego; S. Wayne Rosenbaum, BIA; Richard Gardner; Dr. Cindy Lin, USEPA; Mary Anne Skorpanich, County of Orange; Ryan Baron, County of Orange; Chris Crompton, County of Orange; Jo Ann Weber, County of San Diego; Jon Van Rhyn, County of San Diego; Ruth Kolb, City of San Diego; Sumer Hasenin, City of San Diego; Heather Stroud, City of San Diego; David Garcia, RCFC & WCD; Matt O'Malley, San Diego Coastkeeper; Marco Gonzalez, Coastal Environmental Rights Foundation; Mark Grey, BIA Orange County; Devin Slaven, City of Lake Forest; Tracy Ingerbrigtsen, City of Laguna Beach; Ray Hiemstra, Orange County Coastkeeper; Penny Elia, Sierra Club; Al Lau, Padre Dam MWD; Laura Eisenberg, RMV; Jenna Voss, County of Orange; Christy Suppes, County of Orange; Nancy Palmer, City of Laguna Niguel; Michael Welch; Mo Lahsaie, City of Oceanside; Rich Schlesinger, City of

Mission Viejo; Moy Yahye, City of Aliso Viejo/Laguna Woods; Rae Beimer, City of Rancho Santa Margarita; Deborah Carson, City of Mission Viejo; Rosemarie Chora, City of Oceanside; Megan Schneider, MNWD; Joone Lopez, MNWD; Joe Ames, City of Mission Viejo; J.C. Herrerra, City of Laguna Niguel; Shelley Lawrence, Balk Biological; Wendy Rogers, Balk Biological; Bryn Evans, Dudek; Lisa Zawaski, Dana Point; Maria Mariscal, San Diego County Water Authority; Tom Roy, San Diego County Water Authority; Matt Tucker, County of Orange; Peter Meier, City of Lake Forest; Kareem Zayed, County of Orange; Christina Stege, County of Orange; Mike Fennessy, County of Orange; Rebecca Andrews, BBK Law; James Fortuna, County of Orange; June Wheaton, U.S. Navy; Richard Boon, County of Orange; Robin LaMont, Orange County Parks; Betty Burnett, South Orange County Wastewater Authority; Daniel Apt, RBF; Paul Hartinger, Larry Walker Associates; Mary Vondrak, City of San Clemente; Mikhail Ogua, City of Del Mar; Todd Snyder, County of San Diego; Venkat Gummadi, Geosyntec; Akram Bassyouni, City of San Diego; Eric Mosulgo, City of San Diego; Jonard Talamayan, City of San Diego; Ben Syz, Brown & Winters; Humza Javed, City of Laguna Hills.

Item 2 – Public Forum

Sandra Jacobson, Coordinator of the South Coast Steelhead Coalition, provided an update of the steelhead monitoring program in the upper San Diego River.

Roger Butow, Executive Director of Clean Water Now, addressed the Board regarding several concerns.

Mike Beanan of the South Laguna Civic Association spoke about water quality issues affecting Laguna Beach and requested maps of the coastal water bodies.

Item 3 – Minutes of Board Meeting: December 11, 2014

Mr. Morales moved to accept the minutes, and Mr. Strawn seconded the motion. The minutes were unanimously approved.

Item 4 – Chairman's, Board Members', State Water Board Liaison's, and Executive Officer's Reports. These items are for Board discussion only. No public testimony will be allowed, and the Board will take no formal action.

Mr. Morales thanked former Board Member Sharon Kalemkiarian for her service on the Board.

Ms. Marcus provided an update on State Board activities.

Mr. Strawn reported on a course he audited at Cal State San Marcos called "Survey of Water Management in Southern California." The university is planning to expand it and offer it as a two-credit course in the Spring, and he encouraged anyone who might be interested to look into it.

Ms. Warren updated the Board and the public regarding community outreach efforts.

Mr. Anderson stated that he had had the opportunity to attend the ground breaking ceremony for the construction of the San Luis Rey Wetland Mitigation Bank.

Item 5 – Future Agenda Items: Board Members may discuss items for possible inclusion on future agendas. No action will be taken. (*David Gibson*)

This item was postponed to the next meeting.

Consent Calendar: Item 6 is considered a non-controversial issue. (NOTE: If there is public interest, concern, or discussion regarding any consent calendar item or a request for a public hearing, then the item(s) will be removed from the consent calendar and considered after all other agenda items have been completed.)

Item 6 – New WDRs: Waste Discharge Requirements for the United States Navy Remote Training Site Wastewater Treatment Plant, Warner Springs, San Diego County (Tentative Order No. R9-2015-0012). (*Fisayo Osibodu*)

Dr. Abarbanel suggested moving Item 9 to the Consent Calendar, and there were no objections.

Item 9 – Tentative Resolution: Tentative Resolution in Support of Funding Projects that Further the Practical Vision with Consideration to Disadvantaged Communities and Recovery of Streams, Wetlands, and Riparian Systems (Tentative Resolution No. R9-2015-0020). (*Chiara Clemente*)

A motion was made by Mr. Strawn and seconded by Mr. Anderson to adopt the Consent Calendar, including Item 9. The Board Members voted "aye." The Consent Calendar, with the addition of Item 9, was adopted unanimously.

Item 8 was taken out of order.

Item 8 – Information Item: Meeting Statewide Recycled Water Goals by 2020—Progress and Challenges in the San Diego Region. (*Julie Chan and Fisayo Osibodu*)

Fisayo Osibodu gave the staff presentation.

Cindy Forbes presented information regarding the Division of Drinking Water program and responded to Board Member questions.

> *Dr. Abarbanel called a recess at 10:45 a.m. and reconvened the meeting at 10:55 a.m.*

The following stakeholders spoke on this matter:

- Michael Wehner
- Shane Trussell
- Eric Stein
- Randy Barnard
- John Helminski
- Andy Webster
- Chris McKinney
- Dan Ferons
- Toby Roy
- Mike McSweeney

Dr. Abarbanel recessed for lunch and Closed Session at 1:04 p.m., and he announced that during Closed Session, the Board would discuss Item 15, Personnel matters. He reconvened the meeting at 1:45 p.m., reporting that based on evaluation of the Executive Officer's performance review, the board authorizes the maximum allowable salary increase for the Executive Officer.

Remainder of the Agenda (Non-Consent Items):

Item 7 – Update on the Implementation of the Practical Vision and Operational Plan for 2015. (*David Gibson*)

This item was postponed to a future meeting.

At the request of Ms. Warren, and with no objections from other Board Members, Item 11 was taken out of order.

Item 11 – Election of Regional Board Chair and Vice Chair for 2015. (*David Gibson*)

Ms. Warren nominated Dr. Abarbanel for another term as Chair, and Mr. Morales seconded the motion. Dr. Abarbanel nominated Mr. Strawn for another term as Vice Chair, and Mr. Anderson seconded the motion. The Board unanimously approved the nominations.

Item 10 – NPDES Permit Amendment: An Order to amend Order R9-2013-0001, NPDES No. CAS0109266, *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region.* The amendment includes, but is not limited to, incorporation of the County of Orange, several incorporated Cities of Orange County, and the Orange County Flood Control District as Copermittees (Tentative Order No. R9-2015-0001). (*Laurie Walsh and Christina Arias*) **Please Note: Elected officials will be invited to speak on this item no sooner than 1:30 p.m.**

Ms. Warren recused herself from this item and left the meeting at this time.

Dr. Abarbanel administered the oath.

Christina Arias gave the staff presentation for this item and responded to Board Member questions.

The following stakeholders commented on the Tentative Order:

- Cindy Lin
- Chris Crompton
- Ryan Baron
- Mary Anne Skorpanich
- Joanne Weber
- Jon Van Rhyn
- Ruth Kolb
- Sumer Hasenin
- Heather Stroud
- David Garcia
- Roger Butow
- Mike Beanan
- Matt O'Malley
- Marco Gonzalez
- Mike McSweeney
- Wayne Rosenbaum
- Mark Grey
- Devon Slaven
- Tracy Ingerbritsen
- Richard Gardner
- Ray Hiemstra

Dr. Abarbanel called recesses at 3:26 p.m. (reconvened at 3:32 p.m.) and at 5:20 p.m. (reconvened at 5:31 p.m.)

Laurie Walsh provided closing remarks and recommended that the Board adopt the Tentative Order with enumerated errata.

Dr. Abarbanel closed the public hearing. After Board discussion, Dr. Abarbanel moved to approve Tentative Order No. R9-2015-0001 with all errata, and Mr. Morales seconded the motion. A roll call vote was taken, and each member present individually voted "aye." Ms. Warren recused herself from participation in this matter and was not present during the item. The motion passed.

Item 12 – *Closed Session* - Discussion of Ongoing Litigation [Authorized under Government Code Section 11126, subd. (e)]. The San Diego Water Board may meet in closed session to discuss ongoing litigation for the following cases:

Civil Actions (Judicial and Administrative, other than Petitions for Review filed with the State Water Board)

a. *In re: Test Claim on California Regional Water Quality Control Board, San Diego Region, Order No. R9-2007-001, (NPDES No. CAS0108758) Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego County, the San Diego Unified Port District, and the San Diego County Regional Airport Authority adopted on January 24, 2007. Test Claim filed by San Diego County, et al., with Commission on State Mandates, No. 07-TC-09* (filed June 2008). *(Catherine George Hagan)*

b. *State of California Department of Finance, State Water Resources Control Board, And California Regional Water Quality Control Board, San Diego Region v. Commission on State Mandates.* Petition for Writ of Administrative Mandamus. Sacramento County Superior Court, Case No. 34-2010-80000604 (filed July 2010). *(Catherine George Hagan)*

c. *In re: Citizens Development Corporation, Debtor and Debtor in Possession*, Case No. 10-15142-LT11. United States Bankruptcy Court, Southern District of California. (San Diego Water Board Claim in Bankruptcy) (filed June 2011). (*Catherine George Hagan*)

d. *Test Claim on California Regional Water Quality Control Board, San Diego Region, Order No. R9-2009-0002, (NPDES No. CAS0108740) Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of Orange, the Incorporated Cities of the County of Orange, and the Orange County Flood Control District adopted on December 16, 2009. Test Claim filed by County of Orange, et al., with Commission on State Mandates, No. 10-TC-11* (filed June 2011). *(Catherine George Hagan)*

e. *Test Claim on California Regional Water Quality Control Board, San Diego Region, Order No. R9-2010-0016 (NPDES No. CAS0108766) adopted November 10, 2010, County of Riverside, Riverside County Flood Control and Water Conservation District, and the Cities of Murrieta, Temecula and Wildomar, Co-Claimants, filed with Commission on State Mandates, No. 11-TC-03 (filed November 2011).* (*Catherine George Hagan*)

f. *City of San Diego v. California Regional Water Quality Control Board, San Diego Division, SFPP, L.P., A Delaware Limited Partnership, and Kinder Morgan Energy Partners, L.P., A Delaware Limited Partnership, Real Parties-*

in-Interest. Petition for Writ of Administrative Mandamus. San Diego County Superior Court, Case No. 37-2013-00047614-CU-WM-CTL (filed May 2013). (*Ben Neill*)

g. *Coastal Environmental Rights Foundation, a CA non-profit public benefit corporation v. California Regional Water Quality Control Board, San Diego Region.* Petition for Writ of Administrative Mandamus. San Diego County Superior Court, Case No. 37-2014-00038672-CU-WM-CTL (filed November 2014). (*Ben Neill*)

Petitions for Review Pending Before State Water Resources Control Board[1]

h. Petition of Citizens Development Corporation (Water Code Section 13267 Investigative Order No. R9-2011-0033 dated September 14, 2011, Requiring Submission of Technical Reports Pertaining to Investigation of Lake San Marcos Nutrient Impairment, San Diego County), SWRCB/OCC File A-2185, filed October 2011. (*Laurie Walsh*)

i. Petition of City of San Diego (Time Schedule Order No. R9-2011-0052 dated September 14, 2011, for the Kinder Morgan Energy Partners, Mission Valley Terminal Remediation Dewatering Discharge to Murphy Canyon Creek, San Diego County), SWRCB/OCC File A-2186, filed October 2011. (*Ben Neill*)

j. Petitions for Review of San Diego Bay Shipyard Sediment Cleanup and Abatement Order No. R9-2012-0024 for Campbell Industries, City of San Diego, San Diego Gas & Electric (SDG&E) and San Diego Unified Port District (Port District) issued March 14, 2012. Petitions for Review and Requests for Stay filed by NASSCO, and City of San Diego. Petitions for Review w/o requests for stay filed by SDG&E, Star & Crescent Boat Company and Port District. SWRCB/OCC File A-2205(c), (d), and (e), filed April 2012. (*Frank Melbourn*)

k. Petition of South Laguna Civic Association for Review of Order No. R9-2012-0013, NPDES No. CA0107611, NPDES Permit Reissuance: South Orange County Waste Authority, Discharges to the Pacific Ocean via Aliso Creek Ocean Outfall, adopted April 11, 2012, SWRCB/OCC File A-2211, filed May 2012. (*Joann Lim*)

l. Petition of City of San Diego for Review of Resolution No. R9-2012-0045, re Authorizing Executive Officer to Increase Daily Average Discharge Flow Rate Limitation under Order No. R9-2008-0002 [NPDES No. CAG919002] for the Kinder Morgan Energy Partner's Mission Valley Terminal Remediation Dewatering Discharge to Murphy Canyon Creek, June 13, 2012, SWRCB/OCC File A-2222, filed July 2012. (*Ben Neill*)

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[1] Petitions for review of San Diego Water Board actions or inactions filed with the State Water Board being held in abeyance by the State Water Board are generally not listed in the agenda. The titles of these matters are available at the San Diego Water Board. Please contact Catherine George Hagan at catherine.hagan@waterboards.ca.gov or 619-521-3012 for more information.

m. Petitions for Review of Regional Municipal Separate Storm Sewer System Order No. R9-2013-0001 (NPDES No. CAS0109266), adopted May 8, 2013, filed by (1) San Diego County Regional Airport Authority (stay requested), (2) City of Lake Forest (abeyance request), (3) City of Aliso Viejo (abeyance request), (4) City of Laguna Hills (abeyance request), (5) City of Rancho Santa Margarita (abeyance request), (6) City of Chula Vista, (7) City of National City, (8) Riverside County Flood Control and Water Conservation District, the County of Riverside, and the Cities of Murrieta, Temecula, and Wildomar (abeyance request), (9) City of Dana Point (abeyance request), (10) City of Mission Viejo (abeyance request), (11) City of San Clemente (abeyance request), (12) County of Orange and Orange County Flood Control District (abeyance request), (13) San Diego Unified Port District, (14) City of San Diego (abeyance request), (15) County of San Diego, and (16) City of Laguna Niguel. SWRCB/OCC File A-2254(a)-(p), filed June 2013. (*Wayne Chiu*)

n. Petition of San Diego United Port District, Waste Discharge Requirements Order No. R9-2013-0093 for San Diego Shipyard Sediment Remediation Project, San Diego Bay, San Diego County, July 10, 2013, SWRCB/OCC File A-2263, filed August 2013 (stay requested). (*Alan Monji*)

o. Petition of Donan Environmental Services, Inc., Cleanup and Abatement Order No. R9-2013-0022 at the Site of the Former Santa Ysabel Chevron Station, 30350 Highway 78, Santa Ysabel, San Diego County, September 18, 2013, SWRCB/OCC File A-2277, filed October 2013. (*Sean McClain*)

p. Petition of Kinder Morgan Energy Partners, L.P., for Review of Denial of Request to Rescind or Modify Time Schedule Order No. R9-2011-0052, November 26, 2014, SWRCB/OCC File A-XXXX, Filed December 23, 2014 (Stay Requested). (*Ben Neill*)

This Closed Session was not held.

Item 13 – *Closed Session* - Consideration of Initiation of Litigation or Discussion of Significant Exposure to Litigation. The San Diego Water Board may meet in closed session to initiate or consider initiating litigation concerning matters within its jurisdiction or to discuss significant exposure to litigation [Authorized under Government Code Section 11126(e)].

This Closed Session was not held.

Item 14 – *Closed Session* - Deliberation on a Decision to be Reached Based on Evidence Introduced in a Hearing. The San Diego Water Board may meet in closed session to consider evidence received in an adjudicative hearing and to deliberate on a decision to be reached based upon that evidence [Authorized under Government Code Section 11126(c)(3)].

This Closed Session was not held.

Item 15 – *Closed Session* – Personnel. The San Diego Water Board may meet in closed session to consider the appointment, employment, evaluation of performance, or dismissal of a public employee or to hear complaints or charges brought against that employee by another person or employee unless the employee requests a public hearing [Authorized under Government Code Section 11126(a)].

In Closed Session, the Board discussed Item 15, Personnel, pursuant to Government Code section 11126(a). The Board reported that based on its performance evaluation, it authorizes the maximum allowable raise for the Executive Officer.

There being no further business, the meeting was adjourned at 5:57 p.m.

These minutes were prepared by:

Christina A. Blank

Chris Blank
Executive Assistant

Signed by:

David W. Gibson

David Gibson
Executive Officer

STATE OF CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD

SAN DEIGO REGION

PUBLIC HEARING

PARTIAL TRANSCRIPT
ITEM 10

In the Matter of:

NPDES Permit Amendment: An Order to amend Order R9-2013-0001, NPDES No. CAS0109266, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region. The amendment includes, but is not limited to, incorporation of the County of Orange, several incorporated Cities of Orange County, and the Orange County Flood Control District as Copermittees (Tentative Order No. R9-2015-0001).

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SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD

CITY OF MISSION VIEJO

COUNCIL CHAMBERS

200 CIVIC CENTER

MISSION VIEJO, CALIFORNIA

WEDNESDAY, FEBRUARY 11, 2015

1:47 P.M.

Reported by:

Jacqueline Denlinger

APPEARANCES

BOARD MEMBERS:

Henry Abarbanel, Chair

Tomas Morales

Eric Anderson

Stefanie Warren

Betty Olson

STAFF:

David Gibson, Executive Officer

Catherine Hagan, Staff Counsel

Laurie Walsh, Water Resource Control Engineer, Stormwater Unit

PRESENTERS:

San Diego Regional Water Quality Control Board
Christina Arias, Water Resources Control Engineer

USEPA - Cindy Lin

Orange County
Chris Crompton
Ryan Baron
Mary Anne Skorpanich

San Diego County
Jo Ann Weber
Jon Van Rhyn

City of San Diego
Ruth Kolb
Summer Hasenin
Heather Stroud

Riverside County
David Garcia

APPEARANCES (CONT.)

PRESENTERS CONT.

Roger Butow, Clean Water Now

Mike Beanan, South Laguna Civic Association

San Diego Coastkeeper
Matt O'Malley

Coastal Environmental Rights Foundations
Marco Gonzalez

Building Industry Association and Construction Industry Coalition on Water Quality
Mike McSweeney
Wayne Rosenbaum
Mark Grey

City of Lake Forest
Devin Slaven

City of Laguna Beach
Tracy Ingerbritsen

Richard Gardner, Capistrano Beach

Ray Hiemstra, Orange County Coastkeeper

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P R O C E E D I N G S

February 11, 2015 1:47 p.m.

CHAIRMAN ABARBANEL: We went into closed session on a personnel matter, discussing the performance of our Executive Officer. We unanimously voted to retain Mr. Gibson and to recommend to the State Water Board that he received, in a year in which there would be increases in salary, the maximum increase that the State Board can produce.

That then is what we can do. It then goes out of our hands. But we have every confidence. Thank you, Dave, for your service.

EXECUTIVE OFFICER GIBSON: Thank you very much, Mr. Chairman and Members of the Board.

CHAIRMAN ABARBANEL: We are -- in the interest of spending as much serious attention time on Item Number 10, let’s handle the other items on the agenda. With the approval of the Board, we are going to defer the Executive Officer report. It is posted on the web. It is available in print. It is available in electrons. It is available any way you want it except verbally, today.

We are going to postpone the request of Board Members for future items. There will be plenty of that in the future.

That leaves us with, effectively, two items. Now, Stephanie, you had a request, you want to change the order of two of the items.

BOARD MEMBER WARREN: I would just ask that we move to reelect -- elect our Board Chair and Vice Chair for 2016.

CHAIRMAN ABARBANEL: Okay, do you have a speech, a motion?

BOARD MEMBER WARREN: Sure, yes. I would move to nominate our Board Chair for another term of service.

VICE-CHAIRMAN STRAWN: All right, I'll second that and then do we need to vote on it?

CHAIRMAN ABARBANEL: It looks like everybody else stepped back, thank you very much. And I would like to nominate Gary Strawn to be Vice Chair again, if you will.

VICE-CHAIRMAN STRAWN: And I'll second that.

CHAIRMAN ABARBANEL: All right, then that is done. Thank you very much.

We will move -- oh, I'm sorry, I forgot to mention we are going to defer Item Number 7 for another meeting, then that we have as much time to spend on Item Number 10, as possible.

MS. HAGAN: And then just for -- to close the loop, if you'd just vote on the nominations?

CHAIRMAN ABARBANEL: Oh.

(Ayes)

CHAIRMAN ABARBANEL: We did.

VICE-CHAIRMAN STRAWN: For both of them we did.

CHAIRMAN ABARBANEL: Okay. So, Steph, you have something to say relative to Item Number 10?

BOARD MEMBER WARREN: Yes. Based on work that my firm does on behalf of one of the copermittees, that's unrelated to Item Number 10, I'm going to recuse from further participation in that item.

CHAIRMAN ABARBANEL: Okay, thank you. Okay, I have some instructions on something to say, from Catherine, but I printed them on one side so that I would have -- would be able just to see them, and I didn't number the pages. So, I have to -- I'm going to start with the one, the administration of the oath and then the order of presentations. Okay. All right, got that right.

Okay, we are going to have a hearing to consider a resolution, which we will hear in a great detail about, which would incorporate the Orange County Copermittees in the overall MS4 Permit that presently include -- they're covered, but they're not included in exactly the same way as the San Diego Copermittees.

So, I would like to ask each person, who will be testifying at this hearing, to stand up and take an oath.

(Whereupon all prospective witnesses were sworn.)

CHAIRMAN ABARBANEL: Thank you all very much.

We will begin with the Staff presentation of the detailed item. After the presentations are concluded, we will ask the Executive Officer for a recommendation. We will have and then close the public hearing. We'll ask for Board discussion, and then the Board will deliberate, make a motion, and then vote.

The order of the hearings, in general, is approximately the following. The staff will begin with a 20-minute presentation. USEPA will have 10 minutes. Orange County Copermittees 45 minutes. San Diego County 20 minutes. The City of San Diego 10 minutes. Riverside County Copermittees 5 minutes. Roger Butow 5 minutes. Michael Beanan 5 minutes. Coastkeeper and the Coastal Environmental Rights Foundation will share 15 minutes. The Building Industry Association 10 minutes. Construction Industry Coalition on Water Quality 10 minutes. Interested persons 3 minutes each. And 10 minutes for the Staff's closing comment.

Mr. Strawn will rigorously enforce this.

VICE-CHAIRMAN STRAWN: I don't have a beeper, so if you see this --

CHAIRMAN ABARBANEL: That's right.

So, Christina, are you going to begin?

MS. ARIAS: Yes.

CHAIRMAN ABARBANEL: Okay, thank you very much.

MS. ARIAS: Thank you. Good afternoon, Mr. Chair and Members of the Board. My name is Christina Arias and I'm a Water Resource Control Engineer in the Stormwater Management Unit.

It is my pleasure to bring before you, today, consideration of adoption of Tentative Order Number R9-2015-0001, which is an order amending the Regional MS4 Permit to incorporate the Orange County Copermittees.

I just want to first briefly acknowledge my team in this process. We have Laurie Walsh, the Project Lead, our Supervisor, Eric Becker, and our Branch Chief, Mr. David Barker.

Today I will talk about the Regional MS4 Permit, what it is, why it's important, then I'll discuss modification made to this permit and when in the order.

So, the Regional MS4 Permit, which stands for Municipal Separate Storm Sewer System, was adopted in May of 2013. It was issued to the San Diego County Copermittees because at that time their prior permit had expired.

Today's action, if you were to adopt the tentative order, would incorporate the following Orange County Copermittees. The County of Orange, the Orange County Flood Control District, the Cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Nigel, Laguna Woods,

Mission Viejo, Rancho Santa Margarita, San Clemente, and the City of San Juan Capistrano.

So, when we embark upon an action of such importance as adoption of the Tentative Order, it is important to remind ourselves why we're doing this, why it's necessary.

First, we want to recognize that the Orange County Copermittees, and in fact all the copermittees in the Region, have gained significant improvements in receiving water quality over the last several years.

In Orange County's Report of Waste Discharge, which is essentially the permit application, they report that water quality at the beaches, during the dry season, has improved dramatically. And the copermittees, over this time, have gained a much better understanding of the sources of persistent pollutants in the urban environment.

But the truth is that stormwater and non-stormwater runoff continue to cause impacts to receiving waters. Monitoring data show that urban creeks continue to score poorly in biological and physical habitat assessments. Surfers continue to get sick when they enter the water during or after a rain event.

For the benefit of our newest Board Members, I just want to give a brief, very brief background on the MS4 Permitting Program to give you a little bit of context.

As I said, MS4 stands for Municipal Separate Storm Sewer System, which is another way of saying the Stormwater Conveyance System. An MS4 permit is a permit to discharge waste, just like any other MPDS permit. It's issued to municipalities because they own and operate the MS4.

So, the program begin in the early 1990s, largely in response to impacts from stormwater and non-stormwater runoff. At that time, despite all the improvements that we had made and the quality of the discharge from other point sources, such as wastewater treatment plants, we were still having a great impact to beneficial uses and receiving waters.

Specifically, the San Diego Water Board has issued three separate permits to the three counties we regulate, San Diego, Orange County, and Riverside County.

Over the last several years, the MS4 Permits have become increasingly more prescriptive and there's been a great focus on actions, completion of actions. What I mean is the number of facility inspections conducted, for example, or the number of street miles swept. The idea was that completion of these actions would result in improved water quality.

Was this approach effective? We're not sure. We can't give a definitive answer. The data is really unclear. We've seen improvements in receiving water quality, but we

can’t definitively tie that back to specific program elements.

In 2013, the San Diego Water Board adopted the Regional MS4 Permit. And we called it “Regional” because the intent was to regulate all the copermittees under one permit. For one thing, we gained some efficiency because these permit proceedings can be rather lengthy.

But more importantly, the permit represented a huge paradigm shift. No longer is the focus on actions, but rather on real, concrete water quality outcomes.

The backbone of the Regional MS4 permit is something called a Watershed Water Quality Improvement Plan. The permit requires that one is developed for each of the major watershed management areas. This plan is developed by the copermittees, in consultation with the Stakeholder Consultation Panel and, really, the public at large. There’s lots of opportunity for comment.

The Water Quality Improvement Plan allows the copermittees to set priorities so that they’re no longer trying to address all of the pollutants all of the time, everywhere. It allows them to develop strategies and schedules to address those priorities, and allows them to spend resources on actions that copermittees know to be effective, and allows them not to waste resources on actions that they know to be ineffective.

It allows the copermittees to engage in a finite and formalized iterative process. The copermittees can test new VMPs and management strategies without the fear of failing to make instantaneous improvements.

The Water Quality Improvement Plan allows the copermittees to fail, as long as they adjust accordingly.

The timing is appropriate for this paradigm shift. The copermittees in our region have developed sophisticated stormwater management programs over the last 25 years. They're ready to move to the prescriptiveness of the prior stormwater permits.

I just want to say a quick word about the practical vision that you'll be hearing about later today. In my opinion, the Regional MS4 Permit really encapsulates the essence of the practical vision. I may be biased because I've been working on it for several years, but I say this because several provisions directly implement the various chapters of the practical vision.

For example, multiple provisions of the permit pertain to the development and implementation of strategies to achieve healthy waters and recovery of streams, wetlands, and riparian areas. Other permit provisions require a robust and targeted monitoring assessment program and, together, these strategies and programs implement an outcome-based approach that is emphasized in the practical

vision.

Okay, so where are we now in the process? As I mentioned, this permit was first issued to San Diego Counties because those Copermittees, their permit expired a couple years ago.

For the Orange County Copermittees, their MS4 Permit expired in December of 2014. So, I'm showing you the math now. Over in this inland area of -- in this upper area, and I don't know if you can see it, but I'm showing you the Region 9 boundaries. And so, what we've done is we're zooming in on the northern portion of our jurisdiction.

This red line here is our jurisdictional boundary. So, everything that's up there that's sort of colored green is Region 9. Everything to the north, colored purple, is Region 8.

So, if you were to take this action today, then the Copermittees, those cities that we highlighted would be incorporated into the Regional MS4 Permit.

The exception is the City of Lake Forest. So, the City of Lake Forest and the City of Laguna Hills and Laguna Woods, submitted letters to us, requesting single Water Board regulation. They've been regulated by both Boards for several years and they claim that the regulatory burden of answering to two Boards is inhibiting their ability to

contribute greater water quality impacts to either region.

So, Mr. Gibson and the Executive Officer of Region 8 have agreed to honor this request, at least on a trial basis.

So, in summary, Lake Forest will now be regulated entirely by Region 8. Laguna Woods and Laguna Hills will be entirely regulated by Region 9.

In case you're wondering how Riverside County fits in, they're MS4 Permit expires in November of 2015. So, we'll be back here in a few months, showing you another map zeroed in on the Riverside County Copermittees.

So, I just wanted to show you the schedule of activities that we've completed before we got to today. The status of the Copermittees submitting their reported waste discharge of 2014. We held a public meeting after that, with stakeholders and the Orange County Copermittees to discuss any modifications that we needed to make to the permit.

We released the Tentative Order in September 2014, and we held a 60-day comment period on the Tentative Order. During the comment period we held a public workshop here, on October 8th, 2014.

On July 21st, we released a revised Tentative Order, which brings us to our public hearing today.

Now, during the 60-day comment period we received

14 comment letters that included more than 80 unique comments. The vast majority, upwards of 80 to 90 percent, were comments that were previously submitted during the 2013 permit proceedings. So, in other words, we've already addressed the vast majority of the comments we received.

And because there were few new comments and virtually no issues brought to our attention by the Orange County Copermittees or other stakeholders, at the public workshop, we didn't make very many changes to the Regional MS4 Permit, and it remains largely unchanged from what we delivered in 2013.

I'd also like to point out that the schedule I'm showing you does not reflect all of the work that we put in to developing the Regional MS4 Permit. That permit development took place over two and a half years, and included 50 meetings, public workshops, two public comment periods. All the Copermittees in the Region, not just the San Diego Copermittees, all of the Copermittees were fully engaged in the public process at that time and submitted extensive comments.

I'm just showing you some initial proposed modifications that we made in our September 9th, our first -- our release of the Tentative Order. I'm not going to discuss these in detail because that was the subject of the public workshop. But just briefly, this is what they

are. First and foremost, incorporation of the Copermittees, single Water Board regulations of those three cities. We included the unified approach for beach water quality monitoring. We added the Los Penasquitos Lagoon sediment deal, we corrected a typo, and we included interim requirements having to do with hydro modification management.

There were some comments on Items Number 2 and Number 4 during the comment period, which we responded to and we feel like -- we amended the Tentative Order and we feel we have addressed those comments.

So in summary, our initial proposal regarding these items is the same.

Now, I want to talk about the two big items, the two modifications that we have proposed in response to the comments that we did receive. First of all, we added a commitment to consider what we call an Alternative Compliance Option to the receiving water limitations of Provision A, upon issuance of the Regional MS4 Permit to the Riverside County Copermittees.

Provision A states that “discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving water; and discharges from MS4s in a manner causing or threatening to cause a condition of pollution, contamination or nuisance in receiving waters are

strictly prohibited".

This language has been included in MS4 Permits throughout the State for several years and it's consistent with precedential language issued by the State Board in 1999.

What it means is that if an MS4 discharge is known to cause or contribute pollutants, then the Copermittees are out of compliance with this provision.

The Copermittees state that this language makes them vulnerable to not only Water Board enforcement, but also citizen lawsuits. Even if they are actively engaged in activities to reduce pollutants in their discharges. Therefore, they have submitted comments asking for an alternative compliance option, meaning that if they engaged in the iterative process through implementation of an improved Water Quality Improvement Plan, this would constitute compliance with the receiving water limitation.

In 2013, the San Diego Water Board deliberated on this issue, but ultimately decided not to include the language and they stuck to the precedential language.

Recently, there's been some activity on this item statewide. In 2012, the Los Angeles Board adopted an MS4 Permit that included an alternative compliance option. After that, a number of petitions were filed.

Now, recognizing that this was really a statewide

issue, the State Board took the lead. In November of 2014, they issued a draft order affirming the concept of an alternative compliance option. In December of 2014, they held a public workshop to discuss the matter.

At this point, we're not sure when the State Board will issue a final order, but based on the direction that they appear to be taking in supporting the inclusion of the alternative compliance option, it is appropriate for the San Diego Water Board to revisit the issue.

Therefore, we've added our commitment to the tentative order to have consideration of the alternative compliance option when we begin the proceedings for the Riverside County Copermittees.

We're not ready to propose or discuss any language today. Should we delay adoption of this Tentative Order because of that? No. Is this a lost opportunity? No.

We need to finish this process. We need to get the rest incorporated into the Regional MS4 Permit so that they can get moving on their Water Quality Improvement Plan.

As for us, following today's public hearing, our plan is to start the discussion on what that alternative compliance option language will look like. This is very controversial and it deserves a robust stakeholder engagement process.

Therefore, we need to reach out to all

stakeholders to hear their concerns and get their input on how we can draft some language. Once we have done that, we will draft some language for your consideration.

If you adopt an alternative compliance option during the adoption proceedings for Riverside County, later this year, then this language will be available to all the Copermittees. This is not a lost opportunity.

Secondly, in response to comments we added a definition for prior lawful approval. You may remember we heard about this at the October 8th workshop.

Specifically, San Diego Copermittees and industry representatives want this firm be defined in the Regional MS4 Permit. The term, “prior lawful approval”, shows up in the provisions dealing with land development requirements. But it states that if a priority development project has prior lawful approval from the Copermittee by the effective date of the BMP Design Manual which, for San Diego County, is December 29th, 2015, then that project is subject to the land development PMP requirements of the previous MS4 Permit.

If the project does not have prior lawful approval by this date, then the project is subject to the PMP requirements of the 2013 Regional MS4 Permit.

There are significant differences between the two sets of requirements, so project want to know by which

standard they will be held. After careful consideration of the issue, we agreed it would be useful for the Copermittees, the land development communities, the public at large, even Water Quality Staff to understand clearly the Water Board's intention and expectation regarding the implementation of this provision.

Therefore, on the Revised Tentative Order we added a definition in hopes of providing that clarity.

So, since then we've talked to a number of different groups and it turns out that interpretation of this language is really all over the map. So, in terms of meeting our goal to provide that clarity, we were unsuccessful.

And for that reason we're actually now recommending that we strike the language altogether, which is included in the errata sheet for you to consider.

We're supportive of the concept of the definition of the "prior lawful approval", we just feel that the language needs more than two weeks' of vetting and public input.

Finally, I'd like to conclude by stating that in the Report of Waste Discharge, the Orange County Copermittees asked for the ability to prioritize their efforts. They asked for a watershed-based planning approach. They asked for more control over their

jurisdictional activities. They asked for a way to establish an off-site PMP compliance program for the land development requires. And they asked for interim requirements for hydro modification management.

All of these elements are included in the Tentative Order and the Regional MS4 Permit. Orange County Permittees are ready to roll straight into the paradigm shift. For these reasons, we recommend adoption of Tentative Order R9-2015-0001, with errata.

CHAIRMAN ABARBANEL: Are there any questions? Gary, you have a question?

VICE-CHAIRMAN STRAWN: Congratulations by the way, you had 30 seconds left. You right under the clock.

CHAIRMAN ABARBANEL: Good, we don’t have to unleash Mr. Strawn?

VICE-CHAIRMAN STRAWN: Yeah, arrrgh. Yeah, the prior lawful approval, where you talk about two weeks not being enough time. Is six or eight months enough time? Could we expect to see some new wording when we get around to doing this with Riverside? And then, would that be retroactive to cover the other activities? Or, is this something that will be a bigger problem?

MS. ARIAS: I hope so. After hearing the concerns, we felt that there’s substantial, good arguments that -- so, yes, we’ll be back with some language. We’ll

look at it and have something -- take a little bit more time and do it right, and have something to propose the next time around.

CHAIRMAN ABARBANEL: If I may, that was also my question. So, we can expect at the time, the consideration of the Riverside inclusion as a Copermittee, which I wrote down here, and tell me if this is approximately right, would be sometime in the late summer of this year, July, August, September?

MS. ARIAS: So, Riverside County Copermittees, their permit expires in November.

CHAIRMAN ABARBANEL: Oh, November.

MS. ARIAS: In November, but they submit a Report of Waste Discharge six months before that. So, we'll actually be getting it shortly. But, you know, we're talking about prior lawful approval?

CHAIRMAN ABARBANEL: Well, I would like to have a time at which people, who want to have a discussion of both the alternative compliance option and the prior lawful approval, can get their thinking done, get their written material in.

Now, I mistakenly wrote down July. So, we are going to have that discussion --

MS. ARIAS: Yes.

CHAIRMAN ABARBANEL: -- in the Riverside County

context --

MS. ARIAS: Yes.

CHAIRMAN ABARBANEL: -- in November, is that right? I'm asking for a date.

MS. ARIAS: Oh, okay. So, they're permit expires November. But we're going to -- we've committed to starting the stakeholder process for both those items pretty much when we wrap this up.

CHAIRMAN ABARBANEL: Okay, soon and there will be plenty of opportunity to discuss it?

MS. ARIAS: Absolutely. So, when we come back here in a few months, our plan is to have language on both those items for your consideration.

CHAIRMAN ABARBANEL: Okay. So, I think that I was simply trying to add a target date to what Gary suggested, which I agree with.

Tomas?

BOARD MEMBER MORALES: Yeah, and on that plan, the plan to have that proposed language, I'm assuming -- you know, the way it works is you all -- we come up with language, we put it out there and then you've got the view of the environmentalists, the BIA, they take a look at what we wrote and they say, we think it says something completely opposite of what they think it says, and it's just a matter of interpretation.

MS. ARIAS: Right.

BOARD MEMBER MORALES: Can we just tell them, hey, can you guys get together, give us language that you both agree on. I know it was easier to do when Joe was here because, the BIA and Joe, they got along and they got to the point where they worked without -- so, isn't that maybe something that we could consider doing so that, really, once they give us the language we're like, okay, you're stuck with it.

MS. ARIAS: Right, that's the idea.

BOARD MEMBER MORALES: Okay.

EXECUTIVE OFFICER GIBSON: Mr. Chairman, if I could interject for a moment?

CHAIRMAN ABARBANEL: Okay.

EXECUTIVE OFFICER GIBSON: I think an element of this prior lawful discussion approval that we want to consider is coordinating with Region 8. Orange County and Riverside County are shared by the two Regions. And I do want to make sure that in our discussions with stakeholders that we go forward with language that's appropriate, that works in both Regions. We would not want to have the same ongoing dilemma of one set of land use approval rules in one part of the county and a completely different set elsewhere. So, we definitely want to bring Region 8 into that discussion.

We'll begin these stakeholder outreach, as Christina Said, almost immediately. We will set up some appointments and we will report to you, in the Executive Officer's report, the schedule of that. And it is optimistic that we could bring the Riverside amendments in, in December perhaps, or very early in 2016. But in the meantime, these two issues will not be languishing for want of time and attention.

CHAIRMAN ABARBANEL: Okay. Oh, I'm sorry, Betty, yes.

BOARD MEMBER OLSON: I just had a --

CHAIRMAN ABARBANEL: Please turn your microphone on.

BOARD MEMBER OLSON: I apologize. So, I just -- my question is, so we're approving this without this language. The language is coming back to us. This is very similar to the last question that was asked, but not I'm confused. It's coming back to us prior to Riverside on just this language portion or it's going to be presented to us at the same time we look at the Riverside?

MS. ARIAS: So, we're going to get started with the stakeholder process. We set up meetings, talk to different groups, you know, flesh through some ideas. But we'll be back here for a Board meeting for, you know, adoption of an order to bring the Riverside County

Copermittees. And at that time we will have proposed -- we will have written some language for your consideration.

But before that point in time, our goal is to meet with the different stakeholder groups to, hopefully, come to some consensus at that point.

BOARD MEMBER OLSON: So, beyond the language, they can continue on the programs that they've initiated -- there's no -- this doesn't stop anything or freeze it in any way?

MS. ARIAS: This does not stop anything.

BOARD MEMBER OLSON: It's just the language.

MS. ARIAS: This is actually pretty much leaving everything status quo.

BOARD MEMBER OLSON: All right, thank you.

CHAIRMAN ABARBANEL: Okay, and you can convey to them Mr. Morales' desire. I don't know that we have the authority to order them to come back in agreement, although I understand that's what President Roosevelt used to do to parties who disagreed. He may have had more authority than this Board.

(Laughter)

CHAIRMAN ABARBANEL: Does that end the --

MS. ARIAS: Yes, I'm finished.

CHAIRMAN ABARBANEL: Okay. I understand that the Orange County group would like to ask questions of the

staff. They have 20 minutes in which to make a presentation and do that. And I hope that will be sufficient.

The next presentation will be given by -- is Cindy Lin here? Yes, from the USEPA. You're also Region 9, right, so you're right at home.

MS. LIN: Yes, I am very much at home.

CHAIRMAN ABARBANEL: It's good to see you, again.

MS. LIN: It's good to see you all. Good afternoon, Mr. Chairman, Members of the Board. My name is Cindy Lin and I'm the EPA Liaison to the San Diego Regional Board. Thank you for allowing me to speak today.

At EPA Region 9, we've worked closely with your staff during the development of your San Diego Regional MS4 Permit adopted on May 8th, 2013.

The MS4 Regional Permit was an important step forward among California's MS4 Permits. It is a very good model, both across California and nationally, particularly in that it's incorporating land development and TMDLs, and they would sort oftentimes refer to this MS4 Permit as a model for others, when I'm actually at national workshops and meetings.

With the implementation of the land impact development requirements in the permit, as this is one of EPA Region 9's priorities, and also one that directly places efforts towards sustainable green infrastructure

development.

Our office supported incorporation of TMDLs in the permit, specifically, providing that consistency between WQLs, water quality-based (inaudible) -- and TMDL waste allocations.

We (inaudible) guidance and result in MS4 programs that are clear, specific, and also show measurable results. EPA strongly supports the receiving water limitations language in the permit and feels the language reflects the State Board's adopted standard for receiving water limits language that was defined in the State Board Water Quality Order 99-04, and that was dated June 17th, 1999.

As you may know, the State Board is currently looking into the question of how receiving water limits are expressed. The State Board has not yet issued a final order, but I would like, today, to tell you that we've reviewed the receiving order limits language and final permit as clarified, also, in the new Finding Number 18, in the Revised Order. That those will both provide the best and efficient way to address the issue.

The Board has expressed plans to consider incorporation of a "well defined, transparent and finite", alternative compliance approach for receiving water limits during proceedings on reissuance of the Riverside County MS4 Permit that is scheduled for fiscal year 2015-2016, which

you guys were just talking about.

EPA agrees that this is a very sound approach, addressing the issue. EPA supports adoption of this kind of order. We strongly support that you move this forward for approval. And we also (inaudible) -- as additional permittees in Orange County as clear progress, and their Regional Permit.

I'd like to comment your staff, specifically, for all the effort and work we've done with this permit and the support of the development of Water Quality Improvement Plans is not an easy task, and your staff has done an exceptional job.

I look forward to working with your staff in the future and I thank you for your time.

CHAIRMAN ABARBANEL: Are there any questions? Thank you very much. Since you came in so quickly, I have one last question to ask the staff. You mentioned that the State Board is discussing the alternative compliance option. Do you think it's plausible that they will have reported out by the time that we're discussing it down here? I know that's a cloudy crystal ball but --

MS. ARIAS: Right. I think it is possible, yes. And they may even provide guidance for us to consider as we're drafting the language.

But in the absence of that, if they haven't

finished by the time we're back here with Riverside, we're going to move forward. We're going to bring something back for you to consider.

CHAIRMAN ABARBANEL: Very good. Thanks.

Okay, next we have the County of Orange. And is it Chris or Mary Anne, who wants to start? Chris?

VICE-CHAIRMAN STRAWN: We have 45 minutes for your presentation. And I don't have a beeper. So, if you see me waiving my hands, you'll know your time is up.

PRESENTATION BY ORANGE COUNTY

MR. CROMPTON: Well, you can tell my optimism. I started by, in my notes I put good morning. Well, it's clearly not good morning.

(Laughter)

VICE-CHAIRMAN STRAWN: Well, it could have gone on until tomorrow.

MR. CROMPTON: You know, it's an important topic. I thought you gave it full justice and more power to you. I think it was a good discussion. It was long, but it was good.

Anyway, good afternoon, Chair Abarbanel and Members of the Board. I'm Chris Crompton, Manager of Water Quality Compliance for the County of Orange. I'm the other Englishman that works for the County of Orange.

Just by way of background, I'd note that I've been

involved, almost since the beginning, with every stormwater permit issued to the County of Orange, which ages me a little bit when Christina puts out how far back the program goes.

I'd also like to mention new Board Member Olson. It's been several years since we last worked together, studying water quality problems, and it's good to see you on the dais here.

And with the Chair's permission, I would like to give a copy of our report, that I gave to all you other members, to Board Member Olson, because she didn't get one last time.

I'm going to have three folks from the County, myself and two others, talking today. And I just wanted to go over what we intend to cover. And I want to start off talking about the process of the permit enrollment. We talked about this back in 2013 and it still resonates.

I want to talk about some key policy issues, as we see them, particularly the issue of attaining compliance. And that's already been touched on and is obviously a very key issue for the County, and the Permittees in South Orange County. And I'm sure, also, the other Permittees in neighboring counties who are subject to this Permit.

I then want to talk about the State of the Environment Report. I think Richard Boone, at the last

meeting, did talk on that, but it still continues to resonate in our thinking on how permit renewal should occur.

And then at the end we're going to talk about the pathway forward. And in general, we're trying to make sure that we're enrolled into a permit that we can comply with. And secondly, to ensure that there's a strong factual foundation for the permit provisions.

Ryan Baron will be talking a little bit about some legal issues, and Mary Anne, as I said, will talk about the pathway forward at the end.

And in some ways, while we talk about the state of the environment and compliance, the two are highly intertwined, so I don't want us to lose sight of that issue that we see as sort of being part of sort of the overall bigger picture.

Back in 2013, and I'm going to take you back. I'm want to start by taking you back to the start of the Regional Permit process. And at the time, we put up some graphics for you to consider. The Regional Board had its idea of how the permit renewal process should work and we offered some alternatives to that process, some suggestions along the way as to how the process should work.

Essentially, we had two lines that we were working on. One was this sort of the up lay, which is what we ended up with, which is sort of the San Diego Permittees coming

in, and then we would all drop into the process.

And the other alternative we had, which was to have three processes going kind of simultaneously, and at point in time we would all produce our Reports of Waste Discharge, and then we would voluntarily come into a Regional Permit.

The main difference between the two processes is the one of the Report of Waste Discharge. And that's kind of one of the main issues I want to talk about here is that particular item.

I think what we found is the current upper process on that graphic has resulted in three permit renewals in three years. A Regional Permit in advance of the Report of Waste Discharge, submitted by both Orange and Riverside Counties, and continued and on alignment of the three permits. It was a decision that was made, and we're not going back on that decision, but clearly there was a point in time that was made that that process was the optimal process. And, you know, we're now indeed at the point of trying to understand how the Report of Waste Discharge fits into this process.

These issues sort of led us to request, when we submitted our Report of Waste Discharge, our own individual permit. We submitted the request for the individual permit because we believed that we had demonstrated progress and

the conditions that warranted separate considerations from the Regional Permit. And, hopefully, we can highlight some of those issues during the course of our presentation.

We've always taken the submittal of the Report of Waste Discharge as the opportunity to present our collective knowledge and recommendations to your Board on the status of our program. In 2014, we took the extra step of providing you with a State of the Environment Report that provide clear direction for the crafting of Orange County's next present. We brought the best available expertise to bear in helping us to do this. Including, for example, Dr. Bronstein, who is participating in key National Research Council reports related to environmental data.

And actually, has gone to such lengths to assess its urban stormwater environment in a single permit renewal document. We're proud of the document. We've given it to you and we've tried to highlight it to you in these hearings.

The Tentative Order contained no mention of the state of the environment or most of our recommendations. We've voiced this issue extensively in our written comments. The recent Response to Comments document is largely a rebuttal of our extensive analysis and recommendations and has resulted in almost no changes to the Regional Permit, as shown on this slide. And if you look at the slide, we've

got a tremendous number of disagrees, and no's, and a few agrees, and the agrees were largely in response to other people's comments.

This is troubling. And I think not part of what we expected when the process was created in 2013, which is why I brought you back to the prior graphic.

In January of 2013, Mr. Gibson, in discussing the Orange County and Riverside routes, states, "these offer us opportunities to provide corrections or clarification in minor ways, as well as change of course in major ways".

Jessica Jow (phonetic), in a written response stated, "The Regional MS4 Permit will continue to rely on the round process to bring perspective changes to the permit".

And I think our problem is we're not seeing this happen. We have the presentation from Ms. Arias and the number of changes made is very slim. There was no recognition in the document at of the State of the Environment, at all.

I want to move on to the next part of the presentation and I'll ask Ryan Baron to come up.

MR. BARON: Good afternoon, Chairman Abarbanel, Honorable Board. My name's Ryan Baron. I'm a Senior Deputy with the County Council's Office, for the County of Orange.

I'm actually going to talk a lot about policy

issues, rather than legal issues. And the first concern of ours being a compliance option offered for the Orange County Permittees at the time we enroll in this permit, and once we enroll into that permit how we can be part of it.

The permit has 350 Copermittees “must” phrase in it. So, there’s 350 times the phrase “the Copermittees must” do something within the permit, in the 130 pages of the permit.

So, our primary concern then, with that, is complying -- I guess you can’t really see it too well -- with such an A.2.a. regarding receiving water limitations.

That provision says, “The discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters”. This is the issue that’s been taken up by the State Board in the L.A. permit, and we’re awaiting a final decision on, although they’ve given us a tentative that they are embracing an alternative compliance pathway.

A.4 says that, “Each Copermittee must achieve compliance with A.2.a. of this order through timely implementation of control measures”.

Now, I admit, not all 350 “musts” follow under A.2.a. and receiving water limitations, but pending the post-9th Circuit NRDC versus L.A. County litigation, those are the pathways to compliance that we look to the most.

1 So, prior to the series of those court decisions,
2 one finalized for the 9th Circuit in 2011, one finalized in
3 2013, prior to that the MS4 community, and even some State
4 officials that I'd spoken with believed that compliance
5 with A.4 or, rather, A.2.a., you were ensured compliance if
6 you were compliant with A.4, you were ensured compliance
7 with A.2.a. if you were diligently and rigorously
8 implementing the Stormwater program through the iterative
9 process.
10 However, after those series of decisions the law
11 became one of strict liability, where any exceedance was,
12 basically, a de facto violation of the Clean Water Act.
13 And just to read to you from that decision, "If
14 the monitoring data shows the level of pollutants in
15 Federally protected water bodies exceeds those allowed under
16 the permit, then as a matter of permit construction the
17 monitoring data conclusively demonstrates that the county
18 defendants are not in compliance with the permit conditions,
19 thus the county defendants are liable for permit
20 violations".
21 So, the issue for us is very significant because
22 we are entering into a permit, and there are also statements
23 on the record from the May 8th, 2013 hearing, that the
24 Permittees are out of compliance on day one. And although
25 we have the ability to prioritize and engage in a watershed

process, there really isn't a pathway to compliance.

So, what are the impacts of that? Well, I'm going to skip the first bullet point because that's more of a practical consideration.

Most permits and licenses that I've dealt with in my career, you file an application, you show that you can comply, that you have the financial or technical wherewithal to have a permit, whether you're getting a license to broadcast over the airwaves, or a permit to discharge from a stationary source you're in compliance on day one. And then you fall out of compliance. Hopefully not, but at some point you fall out of compliance later.

Here, we're sort of in an opposite situation where, as Chris will speak after me about bacteria, there are certain constituents that we are out of compliance now, and it may take 20, 30 years or more to come into compliance with those numeric standards.

So, there's not really any other area in the law, in environmental law, where you have a strict compliance regime post-9th Circuit decision. Even under the Clean Air Act you can file your State Improvement Plan, and if you're in an air quality region that isn't attaining your, you know, National Ambient Air Quality Standards, you can show further progress in your plans to EPA and still be deemed -- and have those plans approved and still be generally deemed

to be in compliance. But here, we don't have that.

The other concern for us, in rolling on this permit today, is that really the system was not set up to make flood control operators adhere to the same standards as other point source dischargers. We don't have any ability to shut off a valve. We can't stop stormwater from entering into receiving waters.

In 1927, the State Legislature delegated authority to the Orange County Flood Control District to form a district and protect life and property. And since that time we've entered into billion, trillion dollar infrastructures improvements that predate the Clean Water Act, that predate the permit. And it's difficult to unwind a lot of that process, to say the least.

Now, in the fact sheet it says that we voluntarily -- actually, I left it over there. It says that we voluntarily apply for a permit. I think it's on page 35, dealing with unfunded mandates. But we really don't have any ability to cease discharging.

Another issue, and this was brought up, I think, by the court, in the May 8th, 2013 proceeding, is that flood control operators are under pipe. We don't have any ability to control, always control what goes into that pipe. We don't have the ability to ban copper in brake pads. We don't have the ability to ban certain types of fertilizer if

the Federal or State government thinks it should be an interstate commerce or it should allow that product within the State.

So, we are in a unique position, by being into pipe, to deal with a lot of the downstream effects, yet still be held strictly liable for them.

One of the questions that permeated throughout the 2008 -- or, I'm sorry, the 2013 hearings, and I think came up at the workshop, was is this, the sky falling. Well, it's probably not falling in Orange County at the moment. If you talk to L.A., they'd say it's falling, maybe in Malibu, or Stockton even.

But there have been a series of cases, since 2013, where there have been a series of lawsuits against municipalities over exceedances in NPDS permits, many of which relate to stormwater.

Currently, in the Federal District Courts there are four cases that cites the NRDC/County of L.A. case as being the standard for per se violations for monitoring data that shows an exceedance in either a stream, dealing with selenium, storm sewer systems to rivers, violations of narrative water quality standards, et cetera.

There's also been a series of cases, since 2012, either lawsuits or Notices of Intent to Sue, against nine different municipalities dealing with exceedances in NPDS

permits, half of which are related to stormwater.

Now, I don't want to say this is apples to apples, because some of these are different cases, they're wastewater treatment facilities and there are times when folks should be meeting their numeric standards.

But in this case, where we can't, the current regime holds us strictly liable. And so, we're looking for a compliance option today.

One of the practical considerations, the practical impacts of having to enroll now, without a compliance option, is that this is a reverse process from what we've seen in L.A. and Santa Ana. The Orange County Permittees are currently going through a Region 8 approval process. Subsequent to the L.A. Board decision, the Santa Ana Region, in their latest iteration of the permit has introduced a compliance option and is seeking comment on that in a second round of comments that's due this Friday. And we hope to see that as the first Board to adopt a compliance option post-L.A.

So, what we're seeing though is enrolling now, and then potentially get a compliance option at the end of this year or sometime next year.

Another practical impact of that is prioritization. How can you prioritize certain pollutants in the watershed if you're held strictly liable for each and

every one of those pollutants at all times in the watershed.

And lastly, before I turn it over to Chris, one of the things the Permittees will have to do to start the WQIP process is to do some sort of CEQA analysis. I think L.A. County's doing a very large, very expensive programmatic EIR. We will go through the EIR process, we will go to our Board of Supervisors, spend potentially hundreds of thousands of dollars getting consultants on board to write these documents, and then potentially have to go back at the end of this year, or the next year, and redo some of that process, either issue an addendum to CEQA, maybe have to redo some of the CEQA. Potentially, you know, figure out if the modeling standards are higher, potentially add scopes of work or additional consultants.

So, we would hope to do that process once. And I do have any questions, if staff could sort of respond to how we, as Permittees, might incorporate that process now, in anticipation of a compliance option? Thank you very much.

CHAIRMAN ABARBANEL: So, are you asking that question of staff?

MR. BARON: Not directly at the moment, just in general if someone could comment on --

CHAIRMAN ABARBANEL: Well, you have it here for a bit.

MR. BARON: I don't want to put anyone on the

spot, but if anyone could comment on how we might incorporate that into our process that would be great. Thank you.

MR. CROMPTON: Yeah, it's not just us that are talking about our ability to comply. Obviously, this is issue has resonated through Los Angeles and the Los Angeles permit. It's also, as you can see on the graphic here, the American Society of Civil Engineers has released a report on pathogens in urban stormwater systems. It was published in August of 2014, which was after the Regional Permit was adopted, so it is new information. And it's intended to be a comprehensive review of the state of the science and practice of fecal indicator bacteria control.

And one of the, I think, the telling conclusions is that depending on the source of FIB affecting a particular receiving water and the manner in which MS4 compliance is assessed, dry weather standards may be attainable in some cases. But consistently attaining standards under wet weather conditions may be infeasible. And this is, obviously, a national report from a national professional organization.

And you probably remember this. My colleague has -- he's keenly trained. So, it may not be a pathway, but maybe it's a railway track to compliance, named after Richard Boone.

But essentially, the key ask here is that there's a real need for a pathway to compliance, a railroad track to compliance. Something that, at the time the permit is issued, that we can be in compliance.

I wanted to just talk some things more about the State of the Environment Report. And the reason I'm really bringing it up is because, obviously, our prior comments on this issue haven't resonated particularly well.

We distributed this report at the Board meeting last year and were quite candid about both our notable accomplishments in dry weather and the continued challenge presented by fecal indicator bacteria control in wet weather, which is backed up by the ASCE Report. It is this information that is half the second issue of concern, which is the State of the Environment not being discussed in the fact sheet or permit.

With its absence, we are not broaching the analytic fact between the finding and the directives and we are omitting the technical rational for a compliance pathway.

And if you look at the top of that slide, there's a quote from the Water Quality Order 95-4 that, "The findings must broach the analytic gap between the raw evidence and the ultimate decision or order". And we think that the permit is missing it.

So, in terms of water quality priorities, in terms of this assessment that we created, you can see along the bottom there's a -- sorry, I don't get the CRI. The increasing concern over the (inaudible) -- over here, that's the least concern down to the greatest concern. And what we find is that we, in South Orange County we have three issues that are predominant concern. Bacteria, which we've already mentioned, nutrients and dissolved solids. (Inaudible) -- is the bacteria indicator.

Nutrients go more on kind of the bacteria side. Let me just say, the nutrients cycling in the aquatic ecosystems is not well understood. Moreover, exceedances of water quality objectives occur disproportionately to the occurrence of adverse impacts, such as nuisance algae growth. It's an area we need to put more effort and emphasis in, and that's where we think we need to put emphasis. A lot of it is within systems to do with groundwater/surface water interfaces.

Total dissolved solids, we don't discharge total dissolve solids. Rainwater has very low total dissolved solids. The problems with total dissolved solids, which may be significant, and you can see that it rates pretty highly, it's almost certainly the result of phenomenon arising from shallow groundwater exfiltration and the area's unique geology. It's not something that we, as urban dischargers,

are discharging, but it's something that gets into the urban system from natural sources.

Again, it's a complicated issue. It's not to do with things necessarily on the surface, but it's to do with the way the internal mechanisms of the infrastructure work.

The conditions we're finding inside Orange County are pointing us in some new directions as to where we should be looking for the real problems.

In terms of beaches, obviously, beaches are of enormous -- we've spent more money, I think, and more effort on our bacteria, fecal indicator bacteria at beaches than almost any other issue. It's important to us, it's important to our citizens, it's important because people recreate there.

And in dry weather, we're beginning to make some progress. you can see, just even with the data, we're beginning to show reductions over a period of time. The data shows that the levels are being reduced.

We do include on the checklist pretty much every conceivable program to control bacteria. Certainly, if there are new ones out there, we probably would be willing to try them. But we got the toolbox and we're using it. And as I said, it's working in dry weather, but not so much in wet weather.

If you look down the first one here, you can

probably see somewhat vaguely, but there's a large number of diversions. Diversions are a -- where you take stormwater, or dry weather flows out of the storm drain system and move it to the sanitaries, so it had been a very effective method of protecting beaches, places where people actively recreate.

We've used State -- Browning has supported a number of these activities. It's been one of their emphases to try to protect those areas. If you get the water away from it, then things will be improved.

We've even, and on this next slide you can see we've even tried to control wildlife. In this last area here, we've used proctoring programs at beaches to try and scare off excess number of birds from congregating on beaches. And so, we're trying to deal with sort of the natural sources there. Because, again, it's important to protect the beaches. You know, we've made significant progress, but we haven't got there.

Wet weather is a different story. We still get an A grade in about 61 percent of the time in wintertime, in wet weather. But the rest of the time, the picture is not as robust. And that's consistent with what we've been telling you.

Even with the -- with some of the BMPs that we're putting into place are -- have different effectiveness in

dry weather and wet weather. This is a basin that was constructed to treat wet and dry weather flows. What is being shown is that on the left-hand side we get some significant reductions in dry weather. But in wet weather, we get almost no change at all.

This is interesting because restoration was brought up by your staff a lot in the kind of restoring the environment. Restoring the environment, again, is pretty good. We restored this channel system, put in a whole bunch more vegetation, removed riprap and did a pretty good job.

The levels of the bacteria in dry weather went down significantly, one or two orders -- probably one order of magnitude. But in wet weather what you actually find is we actually get an increase in the amount of bacteria coming out of it in wet weather. So, while it might be safe during dry weather, it could become a source in wet weather. So, that raises some issues for us to look at as well.

So, what does this sort of tell us about the state of the environment? Firstly, I've given us the priorities that we've had. We've really got three priorities, dissolved solids, nutrients, bacteria. The compliance is not attainable for us at the present time for wet weather, for fecal indicator bacteria. Even, you know, BMPs appear to be effective in dry weather, but not necessarily in wet weather. And even wet weather BMPs seem to be ineffective.

I think this continues to make the case that we really need that compliance pathway because compliance on some of these issues is not easy.

And with that, I will turn it over to Mary Anne Skorpanich.

VICE-CHAIRMAN STRAWN: He left you 16 minutes.

MS. SKORPANICH: Thank you. Good afternoon, I'm Mary Anne Skorpanich from the County of Orange. And a special welcome to Professor Olson.

So, what's our pathway forward? You know, we had intended to comment today and express our support for the permit, but we feel that we have one major stumbling block impeding us in that direction, and that is the lack of this compliance pathway.

The State Resources Control Board has signaled its support of compliance pathways in stormwater permits, although it hasn't taken final action on that precedential order, yet.

Your own Executive Officer, Mr. Gibson, has stated his support, as has USEPA in past proceedings, that it is a reasonable thing to do.

But what we find ourselves faced with today is that we are going into a new permit and we don't have this compliance pathway.

On the left you see Section A.2.a, on the right

Section A.4. A.4, as you'll notice, references A.2.a, but we don't have that linkage coming back. And based on the case that was litigated in Los Angeles County against the Flood Control District there, one of the court rulings was that each and every one of these sentences in the permit is separately enforceable.

So, if we don't have that linkage back, we don't really have that compliance pathway and we don't find that that's all pulling together.

So, our major ask here is that you give us that linkage. As you've heard our other two speakers mention, many of the innovations upon which these Regional Permit is based become meaningless for us without that pathway.

The issue of prioritizing, when we're liable for everything, becomes somewhat moot in terms of really being able to focus our time and resources on those priority problems.

And as Chris pointed out in his presentation, the three most pressing water quality problems in our surface water, in South Orange County, are for the most part things that are out of control of the local permittees. They are things like groundwater inputs. They are things like bacteria and so forth.

Your staff mentioned that they are intending to go forward with the process whereby we'd have stakeholder

discussions and come up with this language that might be appropriate for your consideration on a compliance pathway, but it's been two years since the original permit was adopted. During that period of time the stakeholder process could have transpired. We've been waiting, now, two years. As you may recall, those of you who were on the Board at the time, there was discussion about such language but, ultimately, it was not put into the Regional Permit at that time.

So, we feel like we've waited and we feel like this is our time to come into the permit, but we find that we have this major gap, still, that exists.

So, back to what the State Board ordered about (inaudible) -- you know, with the iterative process on permits, and as with the Scientific Method, itself, we always want to start with what have we done in the past, where does that bring us in the current day. And we think that the permit process, itself, that deliberation, that consideration should follow that same formula.

What have we done in the past? We reported to you in the Report of Waste Discharge. Where are we today? We reported that on the State of the Environment. We feel that those two are the most important pieces that should be under consideration today and that the permit way should be the way forward from that point. And we really don't feel that

that’s been reflected at all.

So, what are the stumbling blocks here? It sounds like we’ve -- or we did that history from the timelines, when the Regional permit was first being launched into consideration and was adopted, that issues were primarily being driven by the San Diego Permittees at that time. We’ve now waited for our permit to expire and when it’s time to enroll us, we’re being told, no, you ought to wait for the Riverside Permittees to be enrolled for us to consider this alternative compliance pathway. And we feel like we’re just sort of being squeezed in between.

So, we see the Regional Permit as sort -- we understand the reason why the Regional Board wants to do that. We understand your rationale for it. But it tends to make a one-size-fits-all.

And coupled with that is the schedule that you’ve put this on. So, you know, you’ve scheduled the adoption hearing for today. Your staff is saying, no, it doesn’t make sense to do this until we can have that stakeholder process and have a compliance pathway, but we’re not so sure that we really see a reason why.

So, harking back to the image about the -- the image of the bridge and a question whether this is the practical vision that you have all conceptualized and are moving toward on, and that compliance pathway is possible

for you to do. It is your policy decision to do and it is -- we'll also ask that you include language in the findings, and I have some suggested language here today that puts in some recognition in the fact sheet. It's very short. That would give some acknowledgement, at least, to the current state of where we are today, as reflected in our Report of Waste Discharge.

And with that, we'd like to reserve any remaining time for questions or comments later on in the process.

CHAIRMAN ABARBANEL: That's fine. I have a question for you as well, after Mr. Morales.

BOARD MEMBER MORALES: Yeah, and this is open to like, I guess staff, but also anyone else from Orange County. You know, today we're here to consider bringing you into the same MS4 that we've got for the San Diego Copermittees.

And when we were going through this process with them, you guys were involved and you heard their complaints. I think, you know, almost every one of them stood up, at least the County, from the governmental agencies, and said, hey, you know, we're going to be sued, we're going to be sued, we're going to be sued.

And I'm not aware of any lawsuits, yet, and it's been two years, or even any NLIs on the same MS4 Permit that we're asking to bring you into.

And, you know, I have to think hard about this because, you know, in a sense you're asking us to insure you against lawsuits. And the only way we can do that is by saying, you know, there are no regulations. You know, there's nothing for you to fall short of. And we can't do that.

So, then I look to the other end and I say, okay, well, how has this harmed the San Diego Copermittees? Have they been subject to citizen lawsuits or any type of lawsuits over these permittees? Are the environmental organizations going after them? And I think the answer is no because, you know, because they see that the agencies and the municipalities are really making efforts to comply. And that's what they cared about and looked for.

So, I don't know that it would be any different for Orange County because you guys do great work here. And I don't think anybody will be able to look at you all and say, you know, they're not trying. So, I'm not taking your concerns with a grain of salt, but I'm looking at them with the benefit of, you know, a two-year history for our San Diego Copermittees. And I'm wondering if you may not have the same, you know, history two years from now.

And that's not to -- I mean, the State Board may tell us you have to have an alternative compliance pathway, and then we'll have it. But, you know, I kind of agree

that -- I don't think we should slow things down because of that, over a concern that, you know, hasn't shown itself to be a problem in San Diego, for the same permit.

BOARD MEMBER OLSON: Well, I'm new to this issue so I don't have the same experience that our Board Member Morales has. But I have a series of questions that I would like to ask, which might help me understand your situation more clearly.

So, as I understand this, there is an A.4 and an A.2.a, and they're not linked together. And so, that puts stormwater or it makes it more, I guess you could say, susceptible to lawsuits. Did I understand that correctly? Because there isn't a linkage back, so you're not on a pathway to progressing to improve things, but you are out of compliance. Is that my -- is that a correct interpretation?

MS. SKORPANICH: Yes, on the one hand we are subject to lawsuits, but at least in our minds, you know, whether we've been sued or not is not the only test.

As I've said to this Board in the past, in these deliberations, you know, I pose the question, is it good public policy? Is it good public policy to issue regulations that you know the Permittees cannot comply with? There's no way on earth that they could comply with on the first day.

And I guess I would just raise that more from the

governance, from what kind of governance signals.

But yes, it does make us liable, as it did with the County of L.A.

BOARD MEMBER OLSON: So, but currently you're not protected from lawsuits? Groups could bring lawsuits against your stormwater?

MR. BARON: Yeah, the Clean Water Act allows for third-party lawsuits. And I don't the suggestion here is to, in any way, shape or form to insulate the lawsuits. In fact, we've always discouraged folks from even bringing up that subject.

I think the point was to respond to this question about is the sky falling? And there is a vulnerability there to our programs, even if they're good programs and we've shown slides, and we have annual reports that show we're succeeding.

And up to two or three years ago, compliance meant the iterative process. Now, it doesn't. Compliance means, hopefully, it means an alternative compliance pathway, where you go through this extensive modeling process, you show that you can meet these numeric limits, or narrative standards in some situations over a time table. And then the Board deems you in compliance.

I don't think it's to get a safe harbor. People should be sued if they're not doing what they should be

doing. And we should meet standards where we can meet standards. But there are places where we can't.

And again, when I cite off that litigation, it's not an apples-to-apples comparison in every situation. That there are, and it may not have hit Orange County, yet, but all it takes is a couple of ones in Malibu, L.A., where now it's hundreds of millions of dollars of litigation. And we shouldn't be in that kind of atmosphere where -- you know, I know attorneys that now review watershed management plans. I don't think attorneys should review watershed management plans. I certainly don't.

But I think it's just that sort of environment where, if we could promote compliance with science an engineering, and not through this litigation path or even, you know, ask for compliance or gear it toward whether we have to be sued now.

It's just that we fundamentally don't have any path to compliance and that's unlike any type of permit or anywhere in the environmental law.

BOARD MEMBER OLSON: So, let me ask a follow-on question, then. Have all of these actions taken place so that other areas, specifically I guess, San Diego, since it's the only Region that you've actually done, did they have an alternative path at the time it was adopted or were they in the same position as these individuals are?

An alternative path?

MS. ARIAS: No, the San Diego Copermittees did not have the alternative compliance option.

And as I mentioned, that our permits that we've been reissuing, issuing and reissuing since 1990 -- well, I take it back. Since 1999, since the State Board put that precedential language, stating the Provision A Receiving Water Limitations, the strict liability, we've included the same language since that order came out in 1999. This is not a new subject.

BOARD MEMBER OLSON: I realize that. I know, actually, quite a bit about indicator organisms and the role of bird populations, and wetlands restorations, and how they sometimes can impact those numbers. I'm well aware of that.

So, I want to make sure that we're sensitive to the efforts here.

Now, my other question goes to the EIR, the CEQA process. Wouldn't've San Diego faced those same dilemmas?

BOARD MEMBER MORALES: Correct me if I'm wrong, anybody, but I think the San Diego Copermittees were sitting in exactly the same position as Orange County is today, almost two years ago, and were making almost exactly the same arguments then.

And I don't think there's anything different about

this MS4 Permit than, fundamentally, than the one that the San Diego Copermittees had us apply to them, when we did. And wasn't it May of 2013?

MS. SKORPANICH: And if I may, but for what happened with the L.A. Permit since then, and the State Board's posture that they've taken since then, signaling that these compliance pathways are useful and have utility in stormwater permits.

BOARD MEMBER OLSON: So, you have concern that certain situations may confront you, but you do not know today that those situations will confront you. Is that correct?

MS. SKORPANICH: Actually, we do know that we will be out of compliance today --

BOARD MEMBER OLSON: Right.

MS. SKORPANICH: -- should you approve this permit today. We'll be out of compliance tomorrow and into the foreseeable future, until such time as there is some means by which we can be in compliance with the permit conditions.

BOARD MEMBER OLSON: All right. And so then I'd like to ask the staff, what is the timeline for alternative pathways to compliance? Are they going to be developed? Are they envisioned?

MS. WALSH: Hi, I'm Laurie Walsh. I'm a Water Resource Control Engineer on the Stormwater Unit. And

Betty, for your benefit, when we brought the Regional Permit before the Board in 2013, we actually had some proposed language for a compliance option in some of the errata sheets. And at that time, the Board decided that, I think like Dave Gibson mentioned, that was kind of the bridge too far, where the Start Board had not made any decision, yet, and we were a little early on in the process.

That particular errata sheet included like an enhanced Water Quality Improvement Plan, which identified any of the constituents that a Copermittee would be out of compliance with. They would have to establish strategies, a schedule, goals in order to take actions in order to bring themselves into compliance with any exceedances that they had at that time. It would be over, and above, and beyond what was in the minimum permit requirements.

So, we had made an attempt to get that compliance pathway. There were Copermittees that were supportive of that. Many of the San Diego County Copermittees were supportive of it. But it was a decision that the Board made at that time, in May of 2013, to not go ahead and include them at that time, and wait for the State Board to fully vet the process a bit more.

We’re a little bit down the road, now. The State Board has taken a look at it. We’ve had some hearings, public comment, that sort of thing. But the State Board has

not made any decision, yet.

And it’s been our recommendation, and Dave, please jump in if you want to add at this point, that we were going to wait until the State Board made a decision, but then we added this commitment to go ahead and have these discussions, and bring language before you when we come to you either later this year, or early next year with the Riverside adoption. If that helps?

BOARD MEMBER OLSON: So, I just have one last question. And that is Riverside -- so, the Orange County Permit has expired and that’s why they have to come into this agreement at this time, why they couldn’t wait to come in at the same time as the Riverside, which might allow you to develop the alternative. Unless, the State Board isn’t going to act on it for a long period of time and then there is no alternative.

EXECUTIVE OFFICER GIBSON: Mr. Chairman, Board Member Olson, if I can just offer a point of view. We are moving forward on a regional, municipal separate storm sewer system permit, which provides a construct, a framework within Watershed Water Quality Improvement Plans are implemented for the constituents of priority concern.

This attempts to put flesh on the iterative process that the State Board gave us in 1999, as precedential language to achieve compliance with water

quality objectives, and also achieve the maximum extent practicable standard.

At that time it was not considered advisable by me that we move forward with that compliance option. And, in fact, we’ve never had that compliance option in 24 years of Stormwater Permits.

When the Board did attempt to include such language in 1997, USEPA actually vetoed the permit for Riverside County and Vallejo on the grounds that the Water Board was establishing a burden of proof that it, itself, would not accept.

Based on those previous findings and the fact that it seemed appropriate to get a watershed approach in place, and then build on that later, it was my recommendation that we not include the compliance option.

Los Angeles County did put one in, okay, and it’s being petitioned and being seriously objected to by the environmental community. And we fully expect that there will be litigation.

We have language that we felt was superior to the Los Angeles approach. We are prepared to bring that language forward again. But we do think that a stakeholder discussion is appropriate. And if we’re going to bring that language to you for consideration, you deserve a full and detailed administrative record to back that up.

It would be precedent setting. Even though Los Angles has their approach, we think ours is different and perhaps more detailed. And it would be timely in terms of allowing the Orange County Copermittees to develop their plan anticipating that. We're not talking about putting it off for 18 months or two years. We're talking about engaging the discussions right away, and bringing it in with perhaps the Riverside Permit Amendments in December.

When we do that, I think we will have a basis and an understanding of the objections of several parties to that approach, and perhaps concurrence from the USEPA, as they have so far, that that's the right approach.

It is a question of more likely of doing it right and doing it once, rather than having a series of repetitions in terms of trying to get this language right.

It is a different approach. So is the Watershed Water Quality Improvement Plan approach that we have in place. That has provided Copermittees, for the first time, the right to choose which priorities are the most important and to work on them.

It builds, in fact, upon the work that Orange County has already done. And it is, in fact, the way we think the practical vision should ultimately be attained.

A few more months, perhaps even a year, is not going to be that much of a cost in terms of process and

time, if the outcome is far superior than rushing something through now.

We could delay this action. And if we were to do that, my recommendation is that we would delay it long enough so we bring in Orange County with Riverside County, at the same time. That we would do it once and do it right in that respect.

But they would not benefit from several other key aspects of the Stormwater Permit that the Regional Permit offers them, like hydro modification, better monitoring reporting requirements, and so on.

So, for those very many reasons, I recommend that we do bring forward this permit, as it is now, and develop that approach for the receiving water compliance option.

Understanding that there are several parties you'll hear from today who vehemently disagree that that safe harbor, or that approach should be offered. And they may have alternatives that you may want to hear about today, as well.

VICE-CHAIRMAN STRAWN: Yeah, in the interest of moving this along, I'd like to remind everybody we have 20 minutes to follow. And I think we'd be happy to add a few minutes to that if Joanne Webber or somebody would like to address the County of San Diego's -- the questions about whether you've seen any of the problems that are being

talked about here. I would like to hear about that and I think I'd be happy, and my Board Members, fellow Board Members would be happy to give you a couple extra minutes if you want to do that.

The other question I have, has to do with Ms. Skorpanich's comment. If we pass this Tentative Order today, I believe you mentioned that from that time you would be in noncompliance.

But to my understanding, that's no change from where you are right now because that noncompliance has, in fact, been in place since '99 or something like that. Is that true or am I not reading this?

MS. SKORPANICH: Yes. Well, the policy form the State Board has been in place since 1999. Up until the time that the case was litigated against the Los Angeles County Flood Control District, the interpretation was always that you would meet those receiving water limitations to the maximum extent practicable, per Section 402 of the Clean Water Act, which specifically was in the amendments related to stormwater, the regulation of stormwater. In recognition that we could not turn off the pipe of what was coming into our system, nor could we turn off the pipe of what was coming out of our system.

And so, it was a different test of compliance, if you will. That legal decision has turned everything on its

head. And we've been asking since then for a manner in which we can be in compliance with the permits that we have.

And if I may, we would appreciate the opportunity for a delay and to have that stakeholder process, first, and get the language in our permit.

The other option just offered, you know, respectfully, that we could also be getting our own permit and that may solve some of the problems with what we're looking for. It may not solve all the problems.

VICE-CHAIRMAN STRAWN: Okay. And here I show that you have 9 minutes and 33 seconds left. So, if you want to come back later and address some of these things, after the others have spoken, yeah.

CHAIRMAN ABARBANEL: Okay. I read the comment letter and I'm not sure if I'm in the Twilight Zone or something, but your Attachment A, with the detailed comments on our permit seemed pretty extensive. And, you know, I thought we had the workshop in September to kind of address all of the big, outstanding issues. And I'm reading through that and -- okay, all right.

And I wasn't too sure, I mean you're saying in your comment letter that we shouldn't do a Regional Permit because we don't have the authority. And you raised several other issues.

Could you comment on this and how it relates to

the process that we've been through and how we got to here?

MS. SKORPANICH: Sure. This was an issue that we raised in both written and oral testimony during the 2012/2013 process. And based on our reading of the criteria for issuing a Regional Permit, Orange County doesn't meet any of those criteria that relates to Southwest Riverside County and San Diego County.

So, that's why I mentioned that another option for you is to issue us a separate permit.

CHAIRMAN ABARBANEL: Okay. I have a comment, but I'd first like to thank the two ex-Brits for bringing us this picture. And I would like to point out to you that under the word "compliance", between the m and the p, is an illegal discharge, which I recommend Orange County clean up ASAP.

(Laughter)

MR. SKORPANICH: Chairman, it may be another Water of the U.S., based on the Tributary Rule.

(Laughter)

MR. BARON: The original slide had the word "lawyers" in the water.

CHAIRMAN ABARBANEL: But that's to the sharks.

MR. BARON: That was pulled out.

MR. SKORPANICH: And we took out the predators that might be lurking.

CHAIRMAN ABARBANEL: I would like to add my comments here that the MS4 Permit that we adopted for San Diego County and are now planning for -- a tentative proposal to enroll you and Riverside, has many, many aspects to it, as our Executive Officer pointed out, which have been argued thoroughly to be enormously beneficial for the Copermittees.

And I am actually rather impressed that the one item that is bothering you is not any of those items which they have found so valuable, and the opportunity to discuss this at some greater length, the issue. It’s not even so much alternative compliance, from what you’ve said, but any compliance at all, in your view.

Along with all of the persons, all of the Copermittees that will be enrolled in a unified permit over the next few months is a really good opportunity, but also offers you the opportunity, if we enroll you today, to follow them any beneficial things that our neighbors in San Diego County have signed, both optimistic and I understand what your issue is.

MS. SKORPANICH: Thank you. As I mentioned when I started my comments, we really did hope to be able to come here today with a full-throated endorsement of the permit. So, thank you for your time.

CHAIRMAN ABARBANEL: All right. Gary, you said

they have 9 minutes and 33 seconds?

VICE-CHAIRMAN STRAWN: Hold on, I wrote it down. Next, we have 20 minutes for the County of San Diego. And, Jo Ann, are you going to go first?

CHAIRMAN ABARBANEL: Well, maybe a bathroom break. We've been here a couple of hours, since we came back and have been here. So, I'd like to have -- it's now 3:26. We'll be back at 3:30. Thank you.

(Off the record at 3:26 p.m.)

(On the record at 3:32 p.m.)

CHAIRMAN ABARBANEL: Okay, the next set of speakers is representatives from San Diego County. You have 20 minutes. Sorry for interrupting your ready-to-go attitude there.

PRESENTATION BY SAN DIEGO COUNTY

MS. WEBER: No problem, still ready to go. I'm Jo Ann Weber, Planning Program Manager for the County of San Diego and today I represent the 12 San Diego Copermittees located in the Southern Watersheds of San Diego County, and I have them listed up there.

Our request for your consideration today is to allow EO Gibson the discretion to conditionally approve the stream water condition proposed as part of the Water Quality Improvement Plans and also the Watershed Plans that are required by our permit.

And so, the benefits of this is essentially approving this request will results in saving about a million dollars that could be diverted to implementation instead of conducting additional monitoring, where there will be some very limited technical benefit.

I will provide some additional detail on this and this is essentially a timing issue.

CHAIRMAN ABARBANEL: I'm sorry, but does this relate to the item on the agenda, which is the enrollment? I don't see the nexus.

MS. WALSH: It does. It relates to not the enrollment of Orange County, but a different part of the permit where Jo Ann's county has recognized a timing issue.

CHAIRMAN ABARBANEL: Oh, okay, I'm not saying I'm opposed to it, I just didn't want to interrupt.

MS. WEBER: And they would also benefit from this in their transitional monitoring, give them a little more flexibility.

CHAIRMAN ABARBANEL: And I guess that they would approve it too, then.

MS. WEBER: During the development of the Water Quality Improvement Plan, during the first two years of the permit, the Regional Board Staff required a mixture of the new monitoring of the 2013 permit, and the old monitoring, stream monitoring of the 2007 permit. This was a reasonable

compromise during the first two years of the permit where it was during transitional monitoring.

Under the 2007 permit, stream monitoring was conducted such that half the watersheds go one year and then the other half go in the subsequent year. To be responsive to the 2013 permit, the San Diego Regional Monitoring Workgroup carefully planned ahead and added additional stream monitoring over and above what was required during the transitional monitoring period to meet the stream monitoring requirements of the 2013 requirement.

The reasons to this is they wanted to be responsive to the 2013 permit, but to allow time for the eight watershed monitoring areas to take on more responsibility of conducting monitoring.

As lead in two watersheds, and to meet our jurisdictional obligations under the 2013 permit, the County of San Diego will no longer commit the additional resources to oversee monitoring activities for the entire County. In short, we planned ahead.

So the timing issue is the high likelihood that the eight Water Quality Improvement Plans that are currently being worked on now will not be approved by the beginning of the 2015 monitoring year, on October 1st. These plans are due in late June and require a minimum of a 30-day public comment period.

Board staff, ELO (phonetic) (inaudible) -- will have average on their stack at that time, not only these plans, but all of the total Jurisdictional Urban Runoff Management Plans. So, the stack is going to be really high for them.

Monitoring recommended under the 2013 permit, the measurement recommended in Water Quality Improvement Plan cannot be implemented unless EO Gibson approves of the entire plan, not just the monitoring element.

So, just to address why this isn't a technical benefit to conduct this additional monitoring, this is essentially a carryover from the 2007 permit and the Board Staff reduced the frequency of our stream monitoring and the (inaudible) of stations based on an analysis of historic data that we, the Copermittees, submitted as part of our Report of Waste Discharge.

The analysis indicated that there was no added benefit to the 2007 permit increased frequency of monitoring. It wasn't necessary in order to track long-term water quality trends.

The Copermittees have, at this point, completed their requirement for stream monitoring of the 2013 permit.

And so, I just wanted to give you sort of just a general idea. So, basically, we did year one, we're in year two now, and year three is the one that's in question. And

we agreed that everything would be accepted and we could do our monitoring that was in the WQIP. But because of this timing issue, we're not so sure we can do it.

Okay, just to give you an idea of what I'm talking about, in the seven watersheds we have to mobilize 13 stations. And these aren't just running out and grabbing a water sample. We have a lot of sophisticated equipment that has to go up in advance of the event, and there's a lot of stuff inside as well. We have weather stations, there's a lot of computerizations. You can talk to the station and get it to collect the sample where you want. It would be both 24-hour dry weather samples, as well as wet weather. So, these are not just simple. They're complex and that's why it's about a million dollars to do this.

Also, there's a lot of tasks that have to happen up front. We're in a budgeting process now. By May, we have to make sure we have our scopes of work ready for the contractors. We have to obtain encroachment permits, generally, to do these. We need to install on the stations, as well as actually, for sure we'd have to collect that first dry weather sample and it does add up.

And so, our request is essentially, instead of requiring a third transitional year of monitoring, we request that you give the discretion to EO Gibson to approve the stream monitoring proposed in the Water Quality

Improvement Plans.

Thank you for your consideration of this request and I'm glad to address any questions.

CHAIRMAN ABARBANEL: So, Catherine, will this require a separate vote from the overall resolution?

MS. HAGAN: No. When you consider the tentative order, you can include it in the -- you would identify it in the motion if you wanted to incorporate the changes.

CHAIRMAN ABARBANEL: Okay. Are there any questions?

MS. WEBER: And I did provide the language here, too, which I did not mention.

CHAIRMAN ABARBANEL: Okay, thank you. Are there any questions? Okay, thank you very much.

Oh, please.

MS. ARIAS: We just would like to add that we support the Copermittees in this request.

CHAIRMAN ABARBANEL: All right. I have a second card from the County of San Diego. Jon.

MR. VAN RHYN: Good afternoon. I'm Jon Van Rhyn and I'm also with the County of San Diego.

To take us back a little bit, I want to talk about prior lawful approval one more time. Hopefully, we've got the presentation queued up on the screen. Do I have to do something? Okay.

If I could, while we're figuring this out, I'm just going to hand out copies of some language we're going to be talking about in the presentation. There should be more than enough there.

All right, well, I'm just going to go ahead and get started.

(Pause in proceeding)

MR. VAN RHYN: It's going to be a little less informative for the audience but, thankfully, you guys have a handout to work off of.

So, I'm going to be referring to the handout that you have in a second. I just want to give you a little bit of background, first.

This is issue, obviously, is not new. We've actually beat it to death pretty well over the last year and a half. I think most of you will recall we were here talking to you about this at the October workshop. We also had a separate meeting or workshop with Board Staff, I think in September. And we've had countless meetings with the different parties up to that point and since that point, as well.

So, you know, when we talk about kind of where we go from here, recognize that there's a lot of language that has been worked out already. And when we talk about where we need to draw the line and where we need to compromise to

find that position that people can support realize that a lot of the compromising already has occurred. And that's primarily between the Copermittees and building industry, or project proponents. Because that's really the two parties who sort of have to balance the risk and have to figure out who's going to carry the risk for a particular project.

So, last time I talked about kind of what the issue was. And just to frame it very, very generally, the issue and why I keep talking about this, and not just accepting that the old standard in the 2007 permit is sufficient, is that project financing for most private projects occurs very, very early. Prior lawful approval is the way that most of us interpret those and most of us, I think, do continue to go forward with the 2007 permit definition. Realize how construction permits, which happen very, very late, and what that does is create a disconnect in timing between when somebody gets their project financing and when they have certainty as to what their final requirements are.

If that happens to span the gap of two different permits, then you're stuck with having to them bring your project up to compliance with newer standards. And that's a really significant issue and that's something that we learned in working with building industry that needs to be resolved. And I think that's why we're all talking about

this because we all believe that it’s worth solving. And that’s, you know, before staff had recommended taking language out of the Staff Report, that was essentially what it said was this is a problem worth solving, and I think we all agree with that.

The issue for us, as jurisdictions, is that we’re balancing risk between whether or not we allow developers to basically get earlier approvals and have a little bit more certainty with their financing. When we do that, we take on the risk that if a project is built to an earlier standard, we’re going to inherit the quality of that discharge because we have strict liability for discharges from our MS4s.

So, if we are easier on a developer or easier on our own projects, then that means that we may be treating that water somewhere else, in some way later. And that’s kind of the balancing act that we’ve been working through with the development community.

So, what you have before you, before staff recommended removing it, is what’s on the sheet that I just handed you. And it’s going to be a little bit more difficult to describe it without the visuals on the screen, but there are essentially three parts to this.

And the first one of those really is recommendations for how to handle private projects. And there’s two pathways that staff had put there. And what

we're seeing in the tracked changes, I should say, is what we did as a County, we're making recommendations on top of what staff had proposed. We accepted all of staff's edits, initially, so this is actually a markup on top of an acceptance of those edits.

So, the first pathway is basically what you see under subparagraph 1.b, there are two pathways, 1 and 2. The first one of those, which we're in complete agreement with and we didn't have any edits for, applies to the majority of projects. And it just essentially says, if somebody has a development approval or a construction permit, and it complies with the PDP requirements of the fourth-term permits -- and, actually, there's a little bit of a problem with the fourth-term permits because San Diego had one really long second-term permit, so we're not actually on the fourth term, so that's a little bit of a language problem.

But the point is that it's pointing back for us to the 2007 permit.

If they define their drainage system in enough detail and they comply with the 2007 permit then, basically, we should be able to grandfather them or consider them to have a prior lawful approval. And then later, in the language, staff added safeguards that basically say under what conditions can you continue to have that approval.

The second and more controversial pathway has been number two there, which deals with the issue of vested rights. And what staff had initially proposed was something that was more or less acknowledging that there will be cases where a jurisdiction will recognize that a project does have a vested right, and normally under a vesting tentative map or under a development agreement. Those are the two -- those are the only two statutory mechanisms for vesting rights.

The problem, from the County's perspective, is that those don't vest rights for stormwater requirements. Stormwater requirements are via a State permit and you can't vest those rights. So, we looked at that language and said, well, if somebody came to us and they wanted to vest rights, they had a VTM already, we would say no. You simply can't do that, it's not a legitimate mechanism to do that.

So, what we did is we suggested edits that essentially said, well, if you mention this permit, that those were going to be a legitimate mechanisms for vesting rights, and just say it. And so, we edited that language to say, now, that if somebody has one of those things, the Copermittee can basically accept that as vesting rights for their stormwater requirements.

So, we're using the permit as the mechanism to basically take away that ambiguity. Now, in doing that, we

obviously didn't want to open it up so much that somebody, a project from 1988 could come back and say I've got a development agreement and now I'm vested. And so, we added the language that staff used in other places for the fourth-term permit, and we basically said, fine, you can have that, but you can't below the 2007 permit. So, we added that back in.

We've had a lot of discussion with Copermittees, we've discussed it with industry. And even though I'm speaking here for the County, today, just so you know, we did a vote of Copermittees to see who was in favor of these language changes. Of the Copermittees here locally, we got 12 that voted for, including the County, two against, and seven didn't reply.

And if you've ever polled our Copermittees, you know that's a really good response rate, so we're pretty happy. We think that that essentially means at 12 and 2 that we're pretty well speaking for the Copermittees as a whole. So, it's a good jurisdictional perspective, at least for this Region.

The other language, and I'll skip over this a little bit more quickly, the next paragraph, down below that one and two that you were just looking at, is really about the public projects. And we didn't really change too much, except to do the same thing with the fourth-term permit

floor. We felt like if we're going to hold developers to the fourth-term permit floor, we should also hold our own projects to that floor. We also added language that deals with design-build contracts, which is a little bit of a special case. In some cases, if you're not familiar with design-build contracts, basically, you can contract with a developer or somebody to do work for you under a design-build, where it includes the design and it includes the construction. In most cases, those are two separate contracts.

All we're trying to rectify with this language is to recognize that in some cases, when you're under a design-build, we should just specify exactly when the PLA would take effect. And that would be with the issuance of the contract is what we're suggesting.

And then the final step, and I won't even labor this at all, on the bottom, the last couple of things deal with how staff dealt with essentially how you can continue with the PLA once it's granted.

And there's really two issues. The first one is that you've got five years. So, you've got to have all your permits or you have to have all your approvals within five years or you're back to the newer standard. We agree with that. That's a really good safeguard to basically not allow these things to go on too long.

And then the final thing was that throughout that period the projects have to remain in substantial conformity with the initial approval. We agree with that, as well.

We think actually, overall, with the changes that the County is suggesting here, which are basically just, you know, not the hugest. You know, they're really, relatively minor changes, but there are some things that we felt needed to be changed to be able to accept it. We think the staff did a really good job. They really framed the issue. They got all the pieces in place correctly. There were just some things that they probably could not have anticipated, not sitting in a jurisdictional seat. And these are the corrections that we're basically asking you to make.

So, we're coming here today, essentially asking you to not throw out the language and to actually include the language that we've handed you, with those changes as well on top, and to adopt that today, as part of the permit.

Understanding, of course, that you may not be inclined to do that. And certainly, there's enough uncertainty here that that may not be the way that you want to go, would also recognize that if that's not the way that you want to go, don't throw this out. Maybe, you could direct staff to at least use this as the straw man for starting discussions. Because we don't, certainly, want to go back to ground zero on this.

And then just the last thing I want to emphasize is schedule. What was talked about earlier was something where there would be significant discussion in the next few months and over this year. The problem with it is, if you assume that the Riverside adoption is going to be on about the same schedule as the Orange adoption is today, then I believe the Riverside permit was 11 months behind the Orange County permit, then you're looking at January of next year as the date when that would be adopted.

The San Diego Copermittees have an effective date for these new requirements in December of this year. So, if that happens we haven't solved anything. It may be good for Orange and it may be good for Riverside, but we're missing a window of opportunity.

So what I would suggest is, if you are going to move forward with that process and we're going to continue this outside, look at ways to get this done sooner than piggy-backing this on to the Riverside permit. Possibly, through a permit deliverable, as some other regions have done. Maybe the BMP Design Manual would be a vehicle for accepting some of these things or, possibly, if there's an opportunity to come back with a separate Board policy, or something that can be done in a shorter-term period, we would really recommend that.

So, that's all I have, unless you have questions.

BOARD MEMBER MORALES: Let me just, hopefully, quick ones. As I understand it, and I could be wrong, this will do two things. One, it will essentially serve to allocate risk between like, say, the County and then the development community, in a way.

MR. VAN RHYN: Correct, yeah.

BOARD MEMBER MORALES: And two, it will affect the number of projects that come under the current MS4 versus the ’07 MS4.

MR. VAN RHYN: Yes.

BOARD MEMBER MORALES: Okay, with that as a background, how many projects, roughly, are we talking about. How many -- and this only like post-’07 DDAs that we’re entering into, correct?

MR. VAN RHYN: I’m sorry, I didn’t understand what was --

BOARD MEMBER MORALES: Well, this would only apply to post-2007 development agreements?

MR. VAN RHYN: Yeah, it would be the effective date of the 2007 permit, yes, the way we have written it.

BOARD MEMBER MORALES: Okay.

MR. VAN RHYN: So, roughly right now, I can only speak for the County, we’ve identified probably between 40 and 50 projects where they might -- there’s a question as to whether they’ll be grandfathered before December of this

year. And whether that's getting the construction permits, as our current policy is, or whether that's something that's revised per this permit or some other mechanism, that's about the -- you know, what we're talking about. And that's the max, that's just those that are still in limbo, that haven't gotten to what we consider grandfathered in.

BOARD MEMBER MORALES: And as you stand here, any sense for the average size of a project? Are these like single-family? Are we talking about 400 --

MR. VAN RHYN: It's hard to say right now. I mean, building is picking up and more permits are coming in. But recognize that the PDP requirements under this newer permit, they have brought those thresholds down. So, you know, potentially, you're talking about a lot of smaller projects as well.

BOARD MEMBER MORALES: Okay.

MR. VAN RHYN: Great, thanks.

VICE-CHAIRMAN STRAWN: Next, we have ten minutes for the City of San Diego. And I think, Ruth Kolb, you're going to lead it off?

PRESENTATION BY CITY OF SAN DIEGO

MS. KOLB: Good afternoon, Esteemed Board Members, thank you for having me here today. My name is Ruth Kolb. I'm with the City of San Diego. I'm a Program Manager in the Transportation and Stormwater Department.

Yesterday, we sent a letter to Dave Gibson, which needs to be read into the record, since you're only accepting verbal comments. So, I will read the letter into the record, which I believe you have copies of, and then I will be followed by Summer Hasenin and Heather Stroud.

"Mr. Gibson, the City of San Diego submitted a comment letter dated November 19th, 2014, on the Draft Amendment to the Regional Municipal Separate Stormwater System, MS4 Permit, for the San Diego Region to incorporate the County of Orange, several incorporated cities of the South Orange County, and the Orange County Flood Control District as the Copermittees, Tentative Order R9-2015-001, herein referred to as the Draft Amendments.

We appreciate the Regional Board Staff addressing several of our comments and incorporating the changes into the Revised Draft Amendments, dated February 11, 2014, in particular. The City supports incorporating the areas of special biological significance update requirements.

The City supports the inclusion of the prior lawful approval definition. The proposed language provides a clear, bright line of what constitutes a prior lawful approval and will provide consistency across jurisdictions in applying the new requirements on development projects.

And, the City supports incorporating the opportunity for alternative receiving water limitation

compliance option.

After reviewing the February 11, 2015 Revised Draft Amendments, the following are remaining changes that the City requests to be addressed:

The City supports corrections that were made to the Las Penasquitos Lagoon TMDL requirements, in Attachment E. To be consistent with the Las Penasquitos Lagoon TMDL, Resolution R9-2012-0033, the following additional changes are necessary. In order to ensure that the MS4 Permit is consistent with the TMDL and Basin Plan, incorporate the following underlined language, taken directly from the TMDL into Section 7.b.3.a.

'Successful restoration of 80 percent of the 1973 acreage of tidal and non-tidal lagoon salt marsh (346 acres) <u>or demonstrate that the implementation actions are active on and/or affecting 346 acres with continued monitoring to ensure 80-percent target achievement</u>.'

In order to ensure that the MS4 Permit is consistent with the TMDL final numeric target, which does not include a sediment-loading reduction requirement, edit Section 7.b.3.b.1 as follows: 'Incorporate the BMPs required under specific Provision 7.b.2.c.2 <u>or other implementation actions to achieve compliance with specific Provision 7.b.3.a.</u> as part of the Water Quality Improvement Plan.'

In order to ensure that the MS4 Permit is consistent with the TMDL interim targets, which are stated as attaining certain sediment load reductions or showing progress in improving lagoon conditions consistent with the specified targets add new Section 7.c.2.d to include the following interim compliance pathway, taken directly from the TMDL, the responsible Copermittee shows progress in improving lagoon conditions consistent with specific provisions in 7.b.3.a or.'

The City requests that each jurisdiction be able to demonstrate compliance with permit independent of other responsible parties. This can be accomplished by changing the references to responsible Copermittees in the Compliance Determination provisions of Attachment E to responsible Copermittee.

Thank you for your time and consideration of these comments. If you have questions, please contact Ruth Kolb at blank, blank, blank."

This last comment about the independent responsibility is important because it's not appropriate to hold one responsible municipality responsible for the elected body's decisions for actions or inactions. So, we're requesting that each municipality be held independently responsible.

And at this time, I'm going to turn it over to

Summer Hasenin.

MS. HASENIN: Good afternoon. My name is Summer Hasenin and I'm with the City of San Diego. I am here to speak to you on the prior lawful approval. But I will make it easier for you, I do not have a (inaudible) --

Our request, at the City of San Diego, is simply to adopt this into order with the proposed language that the Regional Board Staff put forward.

We respectfully request inclusion of the prior lawful approval language in this permit amendment. And the reason we emphasize it on this permit is because of the timing.

The 2013 Permit requirements go into effect for San Diego County Copermittees' projects in December of 2015. So, if you wait for inclusion of a prior lawful approval language at a later date, that would be really too late for our projects.

We do have projects currently in different reviews and different permit review process, and these permits already have an inquiry with the City of San Diego and other Copermittees, already for the past year and a half, as soon as the permit was adopted.

So, if we don't include anything now, this really leaves us with no clear guidance for projects that are in different approval process at this point.

I do appreciate what Christina mentioned, that the interpretation of this language that they are proposing is already all over the board. I totally appreciate that because I've been hearing all these arguments. But I would imagine that wide range of interpretation and inconsistency in the absence of this language. That's really what we have been dealing with for the past year and a half.

So, as a compromise, I think it would be great to move forward with including the language as it. I think it provides a pretty good start for a prior lawful definition. And in the next 10 months or so, if we all agree, all the stakeholders, that revision is needed, then we can bring this forward at that time, or the permit proceeding for Riverside County.

But as of now, we respectfully request inclusion of the language as is, in this option. Thank you.

BOARD MEMBER MORALES: I have a question and this would be for either you, Summer, and staff. If you could, in like bullet point form, what are the top three disagreements about the language as written? I mean --

MS. HASENIN: What constitutes a prior lawful approval.

BOARD MEMBER MORALES: Oh --

MS. HASENIN: Just all the arguments and the crazy thing with these three little three words, if you talk with

three different people in the audience, now, everybody will give you a different understanding. And probably all of the attorneys have the same understanding, but engineers might not be as smart as the attorneys, we don't understand the language unless it's clearly stated in permit language, in all permit language. That's our simple request.

BOARD MEMBER MORALES: Well, I can't tell you I'll give you your request. But I will give you this, engineers are as smart as attorneys, trust me.

(Laughter)

MS. STROUD: Good afternoon, I'm Heather Stroud, I'm a Deputy City Attorney with the City of San Diego. And I'm going to focus on the Los Penasquitos Sediment TMDL Permit provisions.

Ruth walked through the changes we're requesting, but you may not have caught it the first time, so I'll just explain what we're asking for. So, I have a few slides here. On the left side of each side is the permit language either quoted or paraphrased, and on the right side is the TMDL requirement, so you can see them side by side.

The City does appreciate the corrections that were made in the Revised Tentative Order, but still has three major issues of concern where the Compliance Provisions are not consistent with the TMDL. They are required to be consistent with the TMDL under the Clean Water Act

Regulations at 40 CFR 122.44. So, we do have issues here.

In each case, the current language may be permitted to take away a compliance option from the Copermittees that was meant to be available when the TMDL was adopted. And I did have a chance to meet with your staff and with Dr. Lin, from EPA, on this earlier today. And I don't believe the intent was that the permit be inconsistent with the TMDL, so I suspect if revisions aren't made to it today, you're probably going to see it coming back to you in the Riverside reopener. We'd obviously prefer to get it right now, instead of having to go through that again.

So, the first issue we have is that with the Final TMDL Compliance Determination the permit allows final compliance to be shown by successfully restoring the lagoon. However, the TMDL recognized that reaching this target could take more than 20 years, and does not preclude compliance if it does take longer.

So, as you see on the right, the TMDL allows compliance by demonstrating that implementation actions are active on and/or affecting the 346 acres with continued monitoring. So, we would just request that that language be added into the permit as is.

The second issue we have is also regarding the final compliance pathway and the Water Quality Improvement

Plan pathway. The only final compliance target that was included in the TMDL is the lagoon restoration target. We're concerned that the WQIP compliance pathway adds a final compliance requirement that's not in the TMDL, that adds a requirement to meet a sediment load reduction on top of that lagoon restoration target.

So, we have requested a revision to Section 7.b.3.b.1 that just makes clear that we can either incorporate BMPs required to meet WQBELs or other implementation actions to achieve the lagoon target, which is referenced at 7.b.3.a.

And the third and final issue we have is that with the interim TMDL compliance determination, and the TMDL makes clear that compliance can be shown by meeting interim sediment load reductions. And as you can see on the right, and/or showing progress in improving lagoon conditions consistent with the specified targets.

So, we just simply request that that compliance pathway be added to the interim compliance determination.

So, thank you. And the permit language really does need to be clear. We want to get it right the first time. This is the first time this TMDL is being incorporated into the permit. It was adopted by this Board, by the State Board, and approved by EPA with broad stakeholder support, so we're just asking for the permit to

be consistent with that. Thank you.

CHAIRMAN ABARBANEL: Any questions? Thank you.

VICE-CHAIRMAN STRAWN: And we have five minutes here for Riverside County.

CHAIRMAN ABARBANEL: While they're coming up, does staff object to inclusion of the TMDL language? Do you object to the inclusion of that TMDL language?

MS. ARIAS: So, as it turns out, we still object to some of the requests but I think there were three bullets that Ms. Stroud brought up. And we, actually, agree that the TMDL interim target language should be adjusted. And we actually have language. It's not exactly what Ms. Stroud suggested --

CHAIRMAN ABARBANEL: We can save that for later.

MS. ARIAS: We can save that for later, right.

CHAIRMAN ABARBANEL: Yeah, yeah, sorry.

MS. ARIAS: But I just want to add, too, that I think Ms. Stroud made a good point that it's important to be clear. And one of our jobs, as permit writers, is to translate a TMDL from the Basin Plan Amendment into the permit. And it goes from the TMDL Basin Plan Amendment into something enforceable. So, we try our best to translate what the intent of the TMDL staff, into enforceable, clear permit provisions.

And so, we purposely did not include some of the

language that Ms. Stroud referred to because we felt it was not clear and we wrote it -- we simply just wrote it differently. It accomplishes the intent and accomplishes the same thing, but is more clear.

So, and as she mentioned, we did review their comment letter several times and, to be honest, when we spoke this morning, also with Ms. Lin, from EPA, it became clear that we had a misunderstanding. And so, we did tell the City of San Diego that we would -- now that we identified the misunderstanding that we -- if we agree that there’s something still not quite right with the Basin Plan Amendment that we would agree to fix anything that needs to be fixed, when we come back for Riverside County.

BOARD MEMBER MORALES: And I want to make sure we do do that because when we talk about, you know, the permit writer’s responsibility, I think as regulators one of the things that I think this Board wants to do is encourage the type of process that we had with the Los Penasquitos TMDL. And we want the parties that bought into that process and, essentially, wrote your own TMDL to continue to see that as a viable option in the future.

VICE-CHAIRMAN STRAWN: And I show two cards for Riverside County, Mark Grey and David Garcia. Is that correct.

MR. GARCIA: No, just David Garcia.

VICE-CHAIRMAN STRAWN: Oh, okay.

PRESENTATION BY RIVERSIDE COUNTY

MR. GARCIA: All right. Good afternoon, Mr. Chairman, Board Members and participants. I'm David Garcia, the NPDS Program Manager, with the Watershed Protection Division at the Riverside County Flood Control Water Conservation District.

The District serves as the principal permittee under the 2010 MS4 Permit for the Santa Margarita Region. I'm also speaking today on behalf of the other Permittees, which are the County of Riverside, the Cities of Murrieta, Wildomar, and Temecula.

Well, the today the Board's (inaudible) to adopt a permit which applies to us. We appreciate this opportunity to provide some thoughts on the permit.

We commented extensively in 2013, on the permit that was adopted by the Board then. And I believe those comments have been put into the record this time around, and that's appreciated, thank you.

I'd first like to say that we support the comments of the Orange County Copermittees on various aspects of the permit. Most importantly, we join the Orange County Permittees on their request for an alternative compliance option. We do think an alternative compliance option offers the best opportunity for an approach to improving water

quality that is cooperative and collaborative.

The Riverside County Copermittees are strong supporters of this approach. It requires that the Copermittees use good science and engineering practices to identify, prioritize and address complex water quality problems. For this approach to work, however, Permittees can't be looking over their shoulders, worried that any failure might leave them liable for violations. They have to be proactive and not defensive.

Stormwater management staff need the flexibility to determine how best to improve water quality. If Permittees are liable for any exceedance of a water quality standard, then that exceedance could halt or delay major program elements that distract from the goal of proactively managing stormwater.

Therefore, administrative and legal proceedings could be driving the program. It's not the best method for creating effective stormwater and water quality policy.

The Permittees seek a process to reach compliance. While minimizing major program interruptions, we understand that if the Permittees don't follow and agree to an alternative compliance process, they will be held accountable.

So, we look forward to submitting our Water Waste Discharge for consideration in May. We're also continuing

our efforts on adopting partnerships in conjunction with local water agencies to reduce both dry and wet weather and water usage within our watersheds.

Finally, I want to thank the San Diego and Orange County Permittees for their efforts in the San Diego Region, and also Regional Board Staff for their engagement with us in the Santa Margarita Region.

So, I'd be happy to answer any questions. Thank you.

CHAIRMAN ABARBANEL: Betty?

BOARD MEMBER OLSON: I do. I realize that you're not entering into the permit today. But if you were entering into it do you -- I thought I heard from your comments that it would delay program activities because you would be or you could be out of compliance. Did I understand that correctly?

MR. GARCIA: Yes, if we have exceedance in water quality standards and either someone takes us to court or an issue arises like that, that distracts a whole lot of our big program elements that we may be working on to address that issue.

So, looking at the real risk of either an exceedance in our water quality priorities is what we want to stay focused on.

BOARD MEMBER OLSON: All right, thank you very

much.

MR. GARCIA: You're welcome.

CHAIRMAN ABARBANEL: Other questions?

I have a question. There's been a lot of reference today to considering some tricky verbal legal issues at the time that we consider the enrollment of Orange County in the overall permit -- or Riverside County in the overall permit. Your permit extends until November of this year, as I understand it. Is that right?

MR. GARCIA: That's correct.

CHAIRMAN ABARBANEL: Could you possibly consider identifying May as the time that your permit is over, so that we can consider enrolling you in a more timely manner and addressing the issues that have been raised to benefit both the San Diego County Copermittees and the Orange County Copermittees?

MR. GARCIA: Due to resource constraints, I don't think we'd even be able to consider that.

CHAIRMAN ABARBANEL: Well, I thought I should ask.

BOARD MEMBER OLSON: So, is there anything to preclude you from simultaneously preparing for your November entry into the permit and at the same time working on alternative pathways, or is that precluded from anything in our materials as the Board?

EXECUTIVE OFFICER GIBSON: Mr. Chairman and Board

Member Olson, they're certainly not precluded from beginning the development of their watershed approach and the other permit compliant elements. And indeed, Riverside Counties and other Copermittees have, over the last 24 years, routinely developed new programs. Riverside County, in particular, has been a leader in low-impact development.

So, there are opportunities for them to move forward on this, to even propose amendments, or changes, or additions to their programs as part of their Report of Waste Discharge.

But the obligation to implement best management practices, to the maximum extent practicable, is not contingent on a permit cycle. It's a continuous obligation. And, indeed, it's expected to grow, and refine, and improve the program year to year, to year, irrespective of permit renewals.

CHAIRMAN ABARBANEL: So, that might be seen by an optimist, maybe me, as a possibility that we don't have to wait until November to resolve the issues that are troubling the San Diego and Orange County Copermittees. We could get to that pronto and promptly, is that correct?

EXECUTIVE OFFICER GIBSON: It is possible, Mr. Chairman, to do that a couple of different ways. If Riverside County were able, in its Report of Waste Discharge, to identify the key elements that it would want

to have addressed in the Regional Permit, that amendment could come sooner than November, if they were agreeable to that. I believe they do have the option to continue until November before the Board issues that new permit.

Moreover, for a constrained subject like prior lawful approval, if you're not able to come to a decision today on exactly what language you want to have included in the Orange County extension, the staff could work with the stakeholders and bring a targeted amendment back to you at the later date, that's independent of the Riverside amendment.

But I will point out that we'll hear testimony, in a few minutes, from other speakers who have a very decidedly different point of view, than we've heard so far, on prior awful approval. So, I would encourage you to wait and hear what they have to say before suggesting an option, any one of those several I mentioned.

BOARD MEMBER MORALES: One question. Since, you know, you guys will be here in November, one thing that Ms. Skorpanich said was for Orange County, you know, we might want to consider giving them their own permit. That's always one of those careful what you wish for. But is that something that Riverside County will come to us in November and say, hey, you know, how about giving us our own permit that we might take back and say, hey, let's give them

numeric limitations?

(Laughter)

MR. GARCIA: I'd have to talk to the Permittees, but I think the Permittees want a permit that's widely accepted by everyone.

BOARD MEMBER MORALES: Okay.

MR. GARCIA: By everyone, and especially the Permittees.

BOARD MEMBER MORALES: All right.

MR. GARCIA: Thank you.

VICE-CHAIRMAN STRAWN: Roger Butow, five minutes.

PRESENTATION BY ROGER BUTOW

MR. BUTOW: I'm sorry, I've been lulled into sleep.

VICE-CHAIRMAN STRAWN: I didn't mean to wake you up so rudely.

MR. BUTOW: That's okay. We were back there with Jerry Falwell and Jurassic Park and wondering what era we were in. Well, sorry to nod off.

Once again, Roger Butow, Founder and Executive Director of Clean Water Now. The first thing I'd like to do is thank staff and we had a great time working on the task force they developed in 2013. And we support this permit, just to start at the top, we do support this permit. We have several reservations, but we'll set those aside because

we think, basically, we've got a done deal.

We are fascinated with the County's position, the sky is falling. Those of you that, as a child, and your parents told you about the boogie man under the bed, this thing about litigation -- well, since I never mince words, it's asinine. It's obscene for someone state it here. To my knowledge, and Clean Water Now has used this for 17 years, to my knowledge, no one has ever even filed such a thing in Southern Orange County. Not what they're talking about, over a general stormwater permit.

On our watch, starting with the 96-R3, on through today, in fact what the County's done is spent taxpayer's money hiring lawyers to fight every permit. I would submit to you that the County has never been in compliance with any of the permits. So for them to stand up here and disingenuously say to you, well, when we walk out tomorrow we won't be in compliance if you pass this today. Well, dud, as Homer Simpson would say, you've never been in compliance as far as Clean Water Now is concerned. So, why would you be in compliance tomorrow? You'll be filing more paperwork. In fact, you have on your docket, that you'll handle in closed session, existing appeals, whether they're in abeyance or not, for prior permits. So, there's nothing there.

If you want a track record, I wish we could put

the picture back up of the Bridge Over Troubled Waters, the supposed state of the environment for Orange County. That's pretty hysterical.

I was told, and I'm going to try to confirm it, the fact that language, and none other, is even mentioned in the Region 8 permit. So, now they're asking you to include it.

And as I shared, in a jocular manner with your staff, well, maybe we should just let the County of Orange write the permit and you all can sit out here, and they'll sit up there. They'll write the permit and then tell you, and then you can stand here and speak on why that permit is not acceptable. The tail doesn't wag the dog. That's the bottom line, as far as Clean Water Now is concerned.

And this thing about aggrandizing a document, the State of the Environment, I've lived in Orange County since I joined the Marine Corps. That goes back to 1965, except for my tour in Vietnam. And I object to anyone trying to typify the waters of Orange County as being safe and healthy.

In fact, what's made, and I think you have someone here from Department of Water Resources, so we've been in a drought since 2000 and I believe seven, so for eight years we've had drought. We've had tier rinks come into being. We have all kinds of things that have affected the flows.

Of course the dry weather flows show lower fecal indicator bacteria because we don't have any water. That's the bottom line. And any twit could figure that out.

If I seem upset, I am. It's because my County keeps fighting the simplest of environmental improvements, which is the basis for all life, which is water itself, and clean and healthy water, both drinking water and water in our streams.

I would say that, you know, George Bush, mission accomplished on an aircraft carrier, fine. If you want to stand here and say, and I love this quote, and I'm sure it was not intended to be intentionally funny, and I'll finish with this, based on the success of the Orange County Stormwater Program there's little justification for much of the Tentative Order.

Well, I don't know if that's supposed to be funny. I sat at my desk and laughed myself sick, reading that, that my County can actually claim that there's not even much -- was it little justification for much of this order. There's a lot of justification and it goes back to 1972.

So, if someone wants to disinter Richard Nixon and have him take his signature off of the Clean Water Act, he's out there in Yorba Linda. Good luck. Thank you.

CHAIRMAN ABARBANEL: Thank you, Roger.

VICE-CHAIRMAN STRAWN: Mike Beanan, also five

minutes.

PRESENTATION BY MIKE BEANAN

MR. BEANAN: Good afternoon, Mike Beanan, Vice-President, South Laguna Civic Association. And thank you, once again, for coming up to Orange County for the day.

I want to begin by thanking Staff and the Board for working so hard on these permits, I know it's difficult.

But just the last time you were up here, the County got up and argued that there were 10,000 impaired creeks in the United States, so what's the big deal if we just have another couple impaired creeks?

Well, it is a big deal because the impaired creeks in the Aliso Watershed drain into a marine protected area that's on Nightly News as whale habitat. So, that is a big deal. And that's why these permits are so important to us.

Orange County remains out of compliance with the existing permit. They don't enforce water quality in Aliso Creek. The berm is routinely breached, illegally, to discharge into the ocean, and the watershed remains a 303d impaired watershed.

In their own reports, there's noncompliance at a dozen storm drains, specifically J01, P08. J01 and P28 show very high fecal coliforms, and this is in their own reports.

There's no dry weather diversions to control point sources. All the diversions are at the expense of the

people of Laguna Beach and coastal cities, and that's not fair. The Regional Board hasn't issued cleanup and abatement orders to motivate compliance. If we don't get speeding tickets, everybody speeds.

I believe we can manage stormwater better at strategic capture sites inland, and remove the regional nutrient loading that we're enduring at our coastal receiving waters.

The County gets up here and argues what they can't do. I work in the private sector. If I show up at a job and tell people what I can't do, I don't have a job.

So, I would suggest that maybe we need to reach beyond the talent that we have in this room and break the monopoly that these agencies have over stormwater management, and look into offering requests for proposals to private contractors, and ask them to come in and give us some ideas about how they would stop these flows.

Because of litigation and pressure from Coastkeeper, Donald Brand, one of the major developers in Orange County, captures 50 years' of stormwater on the Pelican Hills development. And he did that about 10 years ago. So, if a major developer can do it, I believe there are other people who are out there who can do this. And if the County can't do their job, or won't do their job, or can't see a way forward to do their job we need to find some

1 people that can. And it's too important to let this
2 languish. Thank you.
3 VICE-CHAIRMAN STRAWN: I see someone standing
4 here. At this point, I have 15 minutes set aside for the
5 San Diego Coastkeepers and Coastal Environmental Rights
6 Foundation. But I can't tell which of the speaker cards go
7 under that. So, if you want to come up and help me get the
8 order set or just identify yourself and I'll put the cards.
9 Excuse me, the gentleman that thought he was next,
10 if you can --
11 (Off-mic comment)
12 VICE-CHAIRMAN STRAWN: Oh, okay. Do I have a
13 card?
14 UNIDENTIFIED SPEAKER: On Riverside, or that's it,
15 Riverside is on the address part.
16 VICE-CHAIRMAN STRAWN: Do I have a card for you?
17 UNIDENTIFIED SPEAKER: I submitted a card, yes, I
18 did.
19 VICE-CHAIRMAN STRAWN: Okay.
20 UNIDENTIFIED SPEAKER: And you said when David got
21 up --
22 VICE-CHAIRMAN STRAWN: Okay, I got you.
23 PRESENTATION BY SAN DIEGO COASTKEEPER
24 MR. O'MALLEY: Much to the chagrin of apparently
25 everyone in the room, I'm not Jill Witkowski (phonetic).

I'm Matt O'Malley, from San Diego Coastkeeper.

(Laughter)

MR. O'MALLEY: Just a little bit of background, I think it's a lot easier to reach consensus on higher level issues. The devil is really in the details. So, now that we're kind of getting into the nitty gritty of this stuff, I think that's where, you know, some of our more differences come out. But nonetheless, here I am.

I did want to get up and support the staff's recommendation of taking the prior lawful approval language out. I'm going to talk about that, first, and then a little bit about receiving water limitations.

You know, I get calls I would say fairly regularly from people, and the public members of ours, who are looking at different development projects that are happening around the County. And one of the first questions they ask is why do they say they have to follow the 2007 Permit requirements and not the 2013 Permit requirements? And they're based on the old footnote that was in the permit, based on the understanding of vested rights law.

Based on Regional Board Counsel's letter to the County about this issue, somewhat recently, of last year, my response is when the BMP Manual comes out, if they've basically gotten really far and done some work on the ground, according to the case law, that's just about -- keep

an eye on the -- you know, there's some fluidity there.

You know, the way I look at the Permit, the 2013 Permit, is its set -- it's MEP standards, right, and it set a floor for that. It said here are the new rules, Copermittees, you go out and implement these. You have the legal right to do so because the law obviously lets you do that, but now you have the obligation to do so as well, okay.

So, I think the big question here is that the Board, instead, needs to say or does it want to make a decision, well, we didn't mean that for everything, right, there are some exceptions. And what those exceptions are and what they look like.

I think from a policy perspective, and just speaking on some of the language that was drafted, both the staff's initial language as well as, you know, from the County, I want you to think about what that means from a practical perspective. There could potentially be projects breaking ground in the year 2021, who are following the 2007 Permit requirements, 14 years after that permit was put into place. So, I just wanted you to think about that, if that's what you mean by giving enough flexibility on the PLA definition.

That said, because we do also have people asking me, I have calls all the time, you know, our members about

this. When is this supposed to take effect? I do understand, you know, the call for clarity.

To me it was pretty clear, you know, based on what the Board says, what the permit says, what the existing law says, but apparently not to everyone.

To that extent, if we're going to offer alternative language, you know, I think a lot of this started because of the removal of a footnote in a prior permit, you know, I don't think that we have any problem just reinstating that language. I think it's the most legally defensible definition of prior lawful approval in line with existing case law.

Especially if you meant what you said is these regulations are now going to be in effect going forward.

I want to kind of get off that really quick because I want to leave plenty of time for my colleague to speak, but receiving water limitations, you heard earlier Orange County talking about how this 9th Circuit decision sort of changed the game. It didn't. It really just expressed in case law and said, yeah, the way you guys have been giving the permits all along, that is right. This is not a new obligation. This was the obligation to meet these receiving water limitations from the beginning.

As far as pathways to compliance, I can think of other ways to do it besides cutting the citizens out of the

process. What happens is, if you pass something like a safe harbor, and you're given this protection from this fake fear -- now, on the record, I have no plans to bring any kind of enforcement actions against the City or County at this point. You know, but that's really what the fear is. But I think you're cutting citizens out.

And so what happens is, if you come up with this plan, then really it is on the five of you, or the six of you, or seven of you are essentially the only people who are going to say, yeah, when is good enough, good enough. And then we won't have that say in that, if we're not able to utilize -- and we also hear that we talk about early Clean Water Act allowed citizen suits. It actually encouraged them. I mean, part of the legislative history says we know that the government can't do all of this. There's going to be a lot of things happening out there, so we encourage the citizens to go out and do that. So, just think about that as you go forward in this discussion.

From that perspective, you would essentially be cutting us out of the process.

I want to leave time for Marco to speak, so that's really all I have to say. So, again, I support pulling the language out. But if there's going to be an alternative, I think rather than reinventing this complex system, just put the language in that was in the last permit, because it's a

pretty bright line. It gives the clarity to both Copermittees and to developers as to when those regulations take effect. Thank you.

VICE-CHAIRMAN STRAWN: If I can get a card later from you, and Marco, so --

MR. OMALLEY: They should have been submitted. We did submit cards, pink ones.

PRESENTATION BY COASTAL ENVIRONMENTAL RIGHTS FOUNDATION

MR. GONZALEZ: My name is Marco Gonzalez. I'm a Partner with Coast Law Group and the Executive Director of the Coastal Environmental Rights Foundation.

A lot of you haven't seen me before the Board, but a couple of you, Eric, Gary, a lot of the staff knows I've been involved in these issues at the municipal level, really, since 1996, since I was back in law school. I was part of the team that litigated the '01 challenge by the BIA. I've been involved in so many meetings, at one point I kind of had to take a break and let some other folks carry it.

But coming back around into this round of regional permitting discussion, I'm coming forward with, yes, 17, 18 years of on-the-ground experience. But the last 10 years have given me a new perspective. Because, as an environmental activist, as the former senior attorney at Coastkeeper, as the guy who sued Encinitas under the old

stormwater permit, and was involved in the settlement with the County of San Diego, the only two actions in San Diego under the Stormwater Permit, I've moved on to a place where I represent developers, responsible developers. There are some out there. They want to do the right thing.

And what's interesting is they hire me because I'm a guy who has negotiated kind of the realm of community support for projects and I understand these issues. And so, I get to sit in that proverbial back room and they ask me, how do we do this? How do we possibly get around having to comply with the new stormwater, and the new hydro model, and the new, and let's go all the way back to the SUSUMP (phonetic) requirements. Oh, my God, if we have to comply with SUSUMP we're going to go broke, we're going to go bankrupt, our city budgets can't handle it. Baloney. We've beaten back every Chicken Little complaint, story, the sky is falling that's every come forward on this.

And there's one thing that I've learned in the last number of years, representing developers, is that if you give them clarity, they'll do what they got to do to comply.

And where the problem comes in is where you get lawyers who don't have the environmental perspective, who feel like they do their clients better by pushing hard on a city, who doesn't have the staff resources, either in the

City Attorney's Office or the Engineering Department, to push back. And so, you get those circumstances that I'm sure Wayne Rosenbaum will come up and talk to you about, where there are threats of lawsuit, there's uncertainty, there's oh, my God, we just don't know what constitutes a vested right.

Having litigated this matter, I'll tell you, it is absolutely clear to every lawyer who participates in a land use discussion, a vested right exists when you have an investment and you move ground. That means a grading permit.

The 2007 footnote, as Matt noted, is by far the clearest representation you could have put. And if you couple it with the statements that came forward at the time, it's pretty clear this was intended to apply pretty much as quickly as possible going forward.

And so, the people that I've represented, I've got guys who have had tentative maps that date back 10 years, and they come forward without a grading permit to try to finalize their map and get the grading permit and lo, and behold, they've got to go back and put a bunch of detention basins in the front yards of their prior lots. A little more engineering. They figure it out.

Occasionally, they've got to take a home out and make it a larger detention pond, but they do it. It's not

the end of the world. There aren't so many projects out there that would have to go back to the drawing board.

But what you will see, if you adopt language today, is a whole lot of people scrambling to get a very nebulous project approval, as the original proposed language suggests, that they would then argue constitutes an ability to hold onto that 2007 hydro mod language.

I think having met with staff, my associate, Ludwig Borac (phonetic) and Matt have met with staff, and explained these issues, I think it really does make the most sense to punt for now. And I think to send a message going back that, look, it was pretty clear to begin with. The line of cases established, in the land use context, an extremely bright line. If you really want to get yourself vested, get your grading permit. Take a shovel out, move some dirt, and then you're good to go.

Now, on the issue of alternative compliance, you know, this one hits home for me because back when we brought our lawsuit against the City of Encinitas, in 1999, the argument is you have receiving water limitations in your permit, and you have since at least '96. And there's some language in '91 that suggests those were coming.

And remember, that permit was supposed to be issued many years before that, but for litigation it took a while longer. We've never been in compliance in wet

weather. We spent so much time talking about how we're going to deal with elicit discharges during dry weather flows, we essentially turned to my constituency of surfers, the people who are actually in the water and said, you know what, 72 hours after a rainstorm, sorry, you don't get to go swimming. That was our response to wet weather discharges for the last 25 years.

And I'm here to say that when I heard Orange County stand up and tell you not here's the litany of what we've tried in wet weather but, instead say, we're going to jump to the infeasibility argument, I don't accept that. My constituency doesn't accept that. The State of California doesn't accept that.

And I would be willing to bet that if you brought EPA back up here and asked them how they feel about the notion, nationwide, where problems -- where it rains a lot more than it does here, whether wet weather noncompliance is simple acceptable and feasible, they'd say baloney.

Now, much as Matt represented, I'm here to say flatly, on the record, between now and the time that the permit is reopened to include Riverside and we have a stakeholder process to discuss the alternative compliance issue, until the issue is resolved in L.A., and the appeal to the State Board, and the litigation, I'm not sending out 60-day notice letters to these guys. The same way I didn't

five years ago, and the five years before that.

They've been in noncompliance since the day I first looked into this issue, and I've often wondered why we haven't sued them. But they did in L.A. They brought the issue forward. Someone had to.

What I want to hear them do, what I want to hear from the Copermittees in all three of these regions is we accept that this is a problem and we're not going to stop until it's fixed.

The touchstone of Stormwater Compliance Permits is the iterative process. The iterative process, as I understand it, is you go out and you implement some BMPs. You try to achieve MEP. If you don't achieve receiving water limitations, you take it upon yourself to reassess your plan, to come up with new, more stringent, more costly, more technically advanced BMPs and you keep trying.

But the iterative process, as we've seen in these regions, is you don't do much. You claim Chicken Little, the sky is falling, it all costs too much.

The iterative process in this region is, if the Regional Water Board has a permit renewal, or a permit reopener, or an enforcement action that causes you to have to go back and actually do something new, like a Suisun manual, a hydro mod, then you change your plan. But absent that, there is no Copermittee who can credibly stand before

you and say that they have taken to task the iterative process, in their jurisdiction, and credibly implemented new, more stringent BMPs on their own accord.

It's either me or Matt beating them over the head over some very specific thing, that never really even reaches the Regional Board's attention, or it's you guys having a process.

So, I just find it a little bit disingenuous, after about 20 years of being involved in this, to hear the same story over and over again. I mean, we were sitting before the Court of Appeals. They tried to get us up to the State Supreme Court. We have had this discussion on so many levels, so many times, it's time to just end it. You guys are doing the right thing in doing the Regional Permit.

I think staff has done a phenomenal job and they've evolved so far from where they were 20 years ago, I've got to say.

And I really think that the smart thing to do on the prior lawful approval at this point is to punt it, perhaps at some direction that reaffirms that the grading or construction permits, the APCO (phonetic) line of cases really is the reasonable starting point.

And then, to just kind of hold onto our seats as we get to the alternative compliance discussion and stakeholder process.

I do also want to say that with respect to two issues, one of them was the one that Ruth Kolb presented, regarding the stream monitoring, and also the issues that staff support regarding, I believe it was TMDL discussions. We don't really have any problem with either of those. Thank you.

CHAIRMAN ABARBANEL: Thank you.

VICE-CHAIRMAN STRAWN: Thank you. Next, I think we have Wayne Rosenbaum, the Coalition.

MR. MC SWEENEY: Maybe we go first.

VICE-CHAIRMAN STRAWN: I don't know. Sure, Mike, come on up.

(Laughter)

MR. MC SWEENEY: We had requested a block of time.

VICE-CHAIRMAN STRAWN: Yeah, there's a block of time for you. I just had one card, though. You gave a card earlier. We only have one mic. You'll have to stand real close together and use the single microphone.

MR. MC SWEENEY: I'm going to go first and he'll follow.

VICE-CHAIRMAN STRAWN: Okay.

PRESENTATION BY BUILDING INDUSTRY ASSOCIATION

MR. MC SWEENEY: Before I start my time, I just wanted to bring you some news on my best buddy on Facebook, Jill Witkowski. I believe this Saturday she becomes Jill

something else, she gets married. So, while we miss her, I will say that she is better looking than Matt O'Malley, but Matt O'Malley's a great guy.

I'd like to start out by addressing one thing that Marco just said and --

CHAIRMAN ABARBANEL: Thank you for clarifying that.

(Laughter)

MR. MC SWEENEY: What Marco's just said about, you know, the BMPs and the different things. The problem isn't the BMPs, the problem isn't the regulations. The problem is we have a gigantic County and the regulations have only been applying to new development. But everything we've built for the last 150 years, there's nothing.

So, we've kind of been chasing our tail. And I will give the credit to the staff and the Executive Officer, this new permit takes us in a different direction, to where under alternative compliance we're going to be able to do things that will start to capture pollutants off of existing sites.

Otherwise, we're going to wait 200 years for everything to be redeveloped and then we will finally put a net over everything.

Prior lawful approval is what I wanted to speak about. I believe it was in May, ourselves and some of the

Copermittees, we'd asked for a workshop. We had the Executive Officer, the permit-writing staff, we had members of my industry, we had Matt and some of the environmentalists, and a number of Copermittees.

And one of our members gave a, for lack of a better description, a quick tutorial on land development 101 and project financing. And I think that Jon Van Rhyn touched on it, that both staff and the Copermittees understood some of the challenges the development industry deals with. Because the average project time to get something approved for a housing development is about eight years, because of CEQA, everything else. If there are challenges, legally, to that or the CEQA wasn't done right, it could be 12 to 15 years. The worst case scenario you could -- if you were that unlikely, you could hit three permit cycles.

So, through all this planning it's where, which one do you -- are you covered under?

So, I comment staff for not being land use attorneys, listening to us, and coming up with reasonable language. Was it perfect for us? No. But it was a good start.

This last Wednesday, the County called us up and said, hey, we want to talk to you. We don't like the language. We met with staff yesterday. And we're here to

support the County's -- or your staff's suggestion to pull this back. Our view is we would like to get this right, if it takes a little bit more time to do that. But I think both the City of San Diego and the County identified, for you, the real problem, logistically, with if there isn't a clear definition, and we pass December and it doesn't happen until then, there's that never, never land. And then, how are they going to do their job because they're accountable when your staff comes to audit them.

So, to us, it makes sense to get it right. The problem, one of the problem is, you know, over time, if you're in the eight years and then you do your project in phases, so you've broken ground, you've got a 100-unit subdivision, you build it in four phases. Your final phase starts in year six. Well, you k ow, and then it's -- you k now, you'll hear substantial conformance, there's that gray area. So, we're trying to get this identified so that our members' rights are respected, your regulations are adhered to. We don't want to leave the County or the Cities, the Copermittees hanging out to dry.

And I think that the direction that your staff and your Executive Officer have led the way in the last three years that I've been doing this, is people are collaborating.

So, my request to you is very similar to what you

had said earlier. I would request that you direct your staff to set up a working group, with people from my coalition, the environmental community, some of the Copermittees. We'd like the working group to be small enough so it's effective.

And, as President Roosevelt said, "Lock them in a room" and offer to feed us day-old sushi, if we can't get it done.

CHAIRMAN ABARBANEL: I don't think sushi was all that popular during his regime.

(Laughter)

MR. MC SWEENEY: But I think that having us work together, you know, and for me it was illustrative last Wednesday, because Wayne was talking with Tom Bosworth, from the County, and for a lay person it was like listening to two guys debate how many atoms you can put on the head of a pin.

So, the important thing is to get everybody in the room to work together. So, I would think that that's a reasonable request.

If we can't do that before the Riverside, then it may make sense to do something on a case-by-case basis or have an interim policy.

But we're here to work with anybody. You know, the staff says in two weeks, hey, let's get some folks

together and do this, we're willing to do it.

I'd like to give the rest of the time to Wayne to fill out the rest of our argument.

PRESENTATION BY THE CONSTRUCTION INDUSTRY COALITION ON WATER QUALITY

MR. ROSENBAUM: Good afternoon, Wayne Rosenbaum, on behalf of the Coalition. First of all, yes, we would very much like to thank staff. They have worked hard on this. They have been a pleasure to work with and I think we have made significant progress.

The issue here really is clarity. We can do a lot more when we understand the parameters of our both rights and obligations.

I would also tell you that Marco is correct that under the APCO standard that is one way that rights get vested. I don't know that Marco has -- or Mr. Gonzalez has fully briefed you on other statutory vesting rights which are the problem here.

If you leave out three-quarters of the projects and their vested rights, and only look at APCO, then we really don't have that set of direction that we need.

Examples, and yes, I can give you examples. We have a dialysis unit that would like to build in one of the Copermittees. They don't know what the rules of the road are. So, they kind of sit on the sideline. And it's

(inaudible) -- that everyone will just assume that there are economics involved, and are there are other environmental concerns involved. And what do you do in the case of this dialysis unit, where the entire area's already been built out to the '07 standard, the roads are in, the pads are in, the detention basins are in, everything's complete, we're building a building. And now, we're trying to figure out what standard applies to that building. We need that clarity.

So, what we will ask of you is really two things. Direct your staff to convene a meeting of stakeholders soon, within the next several -- I would prefer within the next several weeks. We all know what the issues are, we all have a starting point. Shouldn't they realize that and pick up the phone, start making some phone calls and find a convenient date. It shouldn't be problematic.

Two, I do not think we're going to come out of that room with 100 percent consensus, but I think we can come out of that room with a pretty reasoned position that staff can support and that at least -- or maybe a large majority of the stakeholders can support to bring back to you, for your consideration.

And three, please do not make us wait until Riverside. We should be able to do a limited reopener because there are just too many important projects,

important social projects that don't know where to go or what the rules of the road are. And when we go into a city and ask them, well, what rules should apply to us, they say, we don't know. And we understand that they said we don't know because the current permit just says if you have a prior lawful approval you, the jurisdiction, may use your discretion.

So, that's our request. We hope that it's not overreaching. Again, we thank your staff. And if there are any questions, we're available. Thanks so much.

CHAIRMAN ABARBANEL: Thank you.

VICE CHAIRMAN STRAWN: Mark, it's your turn now, Mark Grey.

MR. GREY: Good afternoon, Board Members. My name is Mark Grey, with an "e". I'm the Director of Environmental Affairs for the Building Industry Association of Southern California and the Technical Director for the Construction Industry Coalition on Water Quality.

My San Diego brethren just spoke. I represent the territory that the South Orange County MS4 Permit would govern.

I've just got a couple of quick points and, at this late hour, I certainly will not take 10 minutes, and more like one minute.

First off, I wanted to state my support and our

support for the off-site low-impact development BMP Alternative Compliance option that this permit provides, should you choose to adopt it today.

I think the Regional Board has shown some great leadership, and especially your staff on this issue, involvement. Christina and Laurie have been actively involved in the San Diego County Water Quality Equivalency Technical Advisory Group, a committee helping to develop the technical criteria for complying at off-project locations, when you cannot retain stormwater on site. And we're building up a real big database of knowledge on that and how to do it, and that's exciting.

We're working together, cooperatively, the San Diego Copermittees and the Orange County Copermittees, on a cooperative joint scope of work to develop that program. I'm fortunate to be working with Orange County on a cooperative agreement on the second phase of that project, to do case study analysis, benefit cost analysis, do the economics so that appropriate in lieu fees and credit trading programs could be support locally, in the communities.

And over the next several years we'll be looking for pilot projects and opportunities to bring this program to life. So, I just wanted, again, to state our support for that and your Board and staff's support of that process. I

1 think we're really moving somewhere in that regard and it's
2 going to provide flexibility. And we've heard about
3 development today, a number of people representing
4 development and we want -- that flexibility is what we're
5 looking for and we appreciate that.
6 And lastly, I just wanted to support the Orange
7 County and the Copermittees in Orange County with respect to
8 seeking an alternative compliance approach for receiving
9 water limitations. I think the membership that I represent,
10 we're understanding of their argument and their place, and
11 we get that there's -- I think I saw Richard Boone give a
12 presentation where he showed the Loch Ness monster as it
13 related to the receiving water limits, like is it out there
14 or it isn't?
15 But I think, given the 9th Circuit decision, I
16 don't agree with the Coastkeeper point of view that it
17 doesn't do anything. I think it puts a burden of liability
18 onto the Copermittees. And that liability could be placed
19 onto our membership down the line, in terms of approving
20 developments and conditions of discharge.
21 So, I would conclude by saying the State's -- I
22 would urge you all to read the State Draft Order, and I
23 would read it very carefully. It's an excellent order. But
24 I don't necessarily agree with the State's conclusion that
25 there isn't enough evidence to demonstrate that retention of

the 85th percentile storm, the feasible retention of the 85th percentile storm, that they didn't have enough evidence to demonstrate that that wasn't going to lead to compliance.

And I would disagree with that. And I think Board Member Anderson, you were here in 2007, and '06, and I don't know if all the Board Members were here then. Mr. Gibson, you were staff.

But when we look at the evolution of what we've talked about in these hearings, both here and throughout California, we're practicing what EPA asked us to do in 2007 and 2008, in the NGOs. Do watershed planning. Retaining 85th percentile storm. That is the best practice. That's the max, that's the expression of MEP, one of the highest expressions we can have. That's using the iterative process.

And so, I guess I'm sympathetic to that argument that if we're -- if they're undertaking these Watershed Management Plans, WQIP in San Diego, the Watershed Management Plans and Enhanced Plans in Los Angeles, and when you look at what's in those plans, you look at the actions that are being taken to retain the 85th percentile 24-hour storm, to the extent feasible, and you look at the money that's being spent it's astronomical. It's in the hundreds of millions of dollars.

I'm not making this up, this is on the record in

Los Angeles.

So, I would urge you to read that order, look at it. The Board has already come up with an alternative that you discussed in the 2013 San Diego adoption. I would urge you to act on that now and not wait. Move quickly and we're sympathetic to that.

Thank you very much, appreciate your time.

CHAIRMAN ABARBANEL: Mark, I really wanted to thank you for the study that you attached to your comments. That was very helpful as something I think the Board might have been looking for from your industry, for many years. So, that was really helpful and it will help, I think, craft the future, making it easier. There's better understanding of getting things done on the ground.

MR. GREY: Appreciate that. Our mission is advocacy, education and research, and our research needs to support what we do in clean water. And we're really proud of that, so I appreciate that.

VICE-CHAIRMAN STRAWN: Okay, I show four more cards and I think we're down to interested persons. If I skipped any of the groups, let me know. But I'm going to start with Penny Elia, from Sierra Club.

Okay, then I have -- I think I have three city representatives, Devin Slaven, from the City of Lake Forest. And then I'll follow him with a Tracy Ingerbritsen, from

the City of Laguna Beach. And then, Richard Gardner, from Capistrano.

PRESENTATION FROM THE CITY OF LAKE FOREST

MR. SLAVEN: Thank you. I will be very brief. Although I did go from good morning to good afternoon, and I think we're approaching evening now. Good evening, Mr. Chair and Members of the Board.

My name is Devin Slaven. I'm the Environmental Manager for the City of Lake Forest.

And I just wanted to take a brief moment to acknowledge and thank Mr. Gibson, all of your Permit Staff, and your Counsel, Ms. Hagen, for working with the City of Lake Forest and our neighboring cities that have political boundaries that are split between two Regional Boards.

We appreciate staff's willingness to meet with us and develop a plan forward for single MS4 Permit regulation. Over the years it has proved increasingly difficult to implement a cohesive stormwater program for two separate and sometimes disparate MS4 permits.

We support and are thankful for the opportunity, provided in this Permit and Correlating Agreement, to continue to participate in the development and implementation of the Aliso Creek Watershed WQIP, while being principally regulated by the Santa Ana Water Board MS4 Permit for most day-to-day program activities.

And that's it, thank you.

CHAIRMAN ABARBANEL: Thank you.

PRESENTATION BY THE CITY OF LAGUNA BEACH

MS. INGERBRITSEN: I'm just going to say good evening. Good evening, Chair and Board Members. My name is Tracy Ingerbritsen and I'm the Senior Water Quality Analyst from the City of Laguna Beach. Always a lot of people here from my City.

The City of Laguna Beach supports the San Diego Regional Municipal Permit, but would urge the Regional Board to consider including the alternative compliance option.

Laguna Beach has approximately six miles of ocean coastline. Portions of our coastline are designated as State Marine Reserve, a Marine Conservation Area, and an Area of Special Biological Significance.

The City has purchased and is surrounded by permanent open space. We value and embrace our precious environmental resource.

Our beaches and the ocean are important to the City of Laguna Beach. Significant investments have been made to ensure our beaches and ocean waters are clean and protected, not only for our residents and visitors, but also for the animals that live in them.

The City has installed 25 urban water diversion units that divert 67 percent of the developed watershed,

urban nuisance water, to the sanitary system for the majority of the year. We have renovated and/or replaced numerous sewer lift stations, public restrooms and public parks to prevent potential pollutants from reaching the ocean.

We recently spent $4 million cleaning up the historic burn site that trains into a 303d listed creek. We care about our environment.

The City's proximity to the ocean, its designated coastline, and the large amount of visitors each year ensures that we see more monitoring of our waterways than most of the other cities included in this permit. Holding these monitoring results to strict receiving water limits is of concern to the City of Laguna Beach, considering we will have a greater liability based upon current monitoring requirements.

Again, the City of Laguna Beach supports the adoption of the San Diego Regional Municipal Permit and urges the consideration of an alternative compliance option. Thank you.

CHAIRMAN ABARBANEL: Thank you very much.

VICE-CHAIRMAN STRAWN: Richard, you're up.

MR. GARDNER: Waste not, want not.

VICE-CHAIRMAN STRAWN: And I'm sorry for keeping you until the end --

MR. GARDNER: No problem.

VICE-CHAIRMAN STRAWN: -- that's where your card wound up.

PRESENTATION FROM RICHARD GARDNER

MR. GARDNER: I suggested earlier that there may be an advantage to the Regional Board hearing some of the public at some point early on, so that you could weigh some of their thoughts while you're hearing the municipalities, counties, and other interested parties.

I'm Richard Gardner from Capistrano Beach. And I, you know, have been involved in the MS4 Permits. The first one that I was involved in, I think was with Bill Hammer. And then the next one was Jeremy. Jeremy did a great job. Was that the 2007 one?

Anyway, and I was here last year, in May, when you heard conversation at that time supporting the permit. And there was some areas that I was uncertain as to what would come out of it.

One was those treatment plans, those end-of-point treatment plan diversions that discharge back into the creek. And I don't think -- I think we ended up saying we'll just pass that and we'll do it later.

And you may not know, or maybe you do, that some of those that were put in didn't function, and I don't even think they're working anymore. They were put in because

they got grant money from Prop. 50, and it was thought this is going to sterilize the creek water, and we'll just dump all this clean water back in and we'll be fine.

But the results showed that in the case of bacteria, it's a living organism and you may have things that don't always follow rationale. Like the study for Poachee Creek, where levels of bacteria in the upper watershed were higher and then the levels dropped until they got nearer the shore, and then they went into those underground box channels. And then at the pond, the levels again went up.

So that bacteria is a little bit difficult to control and I think there should be the flexibility built in, and even though we all want to see our water clean that way. I think Betty remembers in, I think it was '99, when I first met you at UCI, asking about water quality at that time.

I want to just say one more thing. Besides the fact that those devices that are in the creek beds and they're trying to -- that were, at one time, filtering water and now are doing nothing, they have almost become a pollutant in themselves, they're an unnatural thing.

I was wondering if, in the monitoring part of this, there needs to be a program and it could be just indicated by the Regional Board, there will be the

Implementation Plan. In other words, it's another part that the Permittees will say here's how we plan to implement the permit. And it could be a very straight forward thing. I'm thinking of the 10 CFR 50, part of the Federal Regulations for Nuclear. You know, it can be anything from a new reg guide, where you actually say here's how we want you to do it, to implement the regulation or they can come back and suggest the things. It gives a nice working relationship.

But for instance, we have now said we're not going to have any more discharges, no more urban runoff. Don't run that water off the lawn. We don't want any water running down the driveways. Everybody in this county knows that. But yet, we still have water running down the street.

And my question for you is, how is your Copermittee actually living up to that permit and is it the little book they write and say, Mrs. Brown, we saw water running off? Or, you know, they could tell you they have a plan, but what you really need to do is check and see. Well, how are you implementing our stormwater permit? Thank you.

VICE CHAIRMAN STRAWN: Thank you. And I understand I goofed up earlier. I had a card here for Ray, but I somehow thought you were with the other Coastkeeper group and so I skipped you, I'm sorry.

PRESENTATION BY ORANGE COUNTY COASTKEEPER

MR. HIEMSTRA: No problem. I have a slightly different issue to discuss.

Good evening, Board Members. My name is Ray Hiemstra. I'm the Associate Director for Orange County Coastkeeper.

I just want to start off by urging you to approve the permit today. As a lifelong resident of Orange County, I'm a little disappointed with some of the presentations on kind of a can't do attitude. Orange County's one of the wealthiest counties in the country. We can do whatever we need to do. We'll do whatever we're required to do. So, I'd like you to keep that in mind.

What I'm here specifically to talk about is adding marine protected areas in a section of the permit. We worked on the permit for a long time and, you know, we support what's there. But I did notice that marine protected areas aren't there. They were implemented in 2012, in the South Coast Region. They're a really important aspect to Orange County Coastkeeper.

So, I'm just going to request that in Section B, the Water Quality Improvement Plan, Subsection 2.a.3, and this is on page 21, of 132, of the strikeout version, is revised to include marine protected areas.

They're certainly on a part with ASBS, and

wetlands, and estuaries, so I think they should be added in a priority for clean water. Thank you.

CHAIRMAN ABARBANEL: Thank you. Did you want to comment on that?

MS. WALSH: Laurie Walsh with the San Diego Water Board. I've spoken to Ray about this particular area in the permit and staff could support that recommendation, if you made that for us to make that change, to that particular section.

That section is within the Water Quality Improvement Plan Requirements. It's under the Priority Water Quality Conditions and requires Copermittees to consider the following minimum types of receiving waters, and although marine protected areas could be included in what we call receiving waters recognized as sensitive, or highly valued, I think it could be included in that language, but we would not be opposed to adding the specific "marine protected" words to the permit, if you so desire us to do so.

CHAIRMAN ABARBANEL: Thank you. Any other questions of our staff? A few issues have been raised over the last four hours. Well, I believe, actually, you now have some minutes. I've lost track of the minutes. To address the various questions and suggestions that have come up. And if you had some specific suggestions on what we

should vote on, what is -- I mean, we have your overall recommendation, but we've heard a number of commentaries. Would that be of interest to the rest of the Board? Good.

VICE-CHAIRMAN STRAWN: I think if we give them time, we ought to also -- we still had nine minutes on the County, if they wanted to say something.

CHAIRMAN ABARBANEL: And 33 seconds.

VICE-CHAIRMAN STRAWN: Yes, sir nine minutes and 33 seconds.

CHAIRMAN ABARBANEL: Okay.

BOARD MEMBER MORALES: I think if there are any points that you think we should --

MS. ARIAS: We do have closing remarks. But I have a question. So, there are closing remarks and I don't know if the County would like to use their nine minutes or not. But I think, would you like us to go first or --

VICE-CHAIRMAN STRAWN: Yeah, I don't really care. But it seems to me maybe the County would go first and then you can have your closing remarks.

CHAIRMAN ABARBANEL: That would be appropriate because their nine minutes are remaining.

VICE-CHAIRMAN STRAWN: Is Orange County okay with that?

CLOSING REMARKS BY ORANGE COUNTY

MR. BARON: Good evening.

CHAIRMAN ABARBANEL: We were just debating whether to just give you 33 seconds.

MR. BARON: Please. I have a seven- and a four-year-old to pick up by 6:00 and the daycare has high fees. I have to rush to Central Orange County and potentially break the law to get there.

CHAIRMAN ABARBANEL: No, we don’t want to hear about that.

MR. BARON: I know. I feel the need to clarify some of the statements that we made. It isn’t about -- when Mary Anne Skorpanich and I went up to the State Water Board and spoke, at the Receiving Water Limitations Workshop, we deliberately did not want to talk about litigation. And we thought it did a disservice to the MS4 community to phrase everything in terms of trying to get out of being sued, because it’s never been about that.

It’s been about finding a pathway to compliance and we don’t have that. And under the NRDC case, it reclassifies us as an industrial discharger, essentially. And those cases that I read to you, or just cited briefly, are cases that are going on now, putting us in the same situation where we have to meet numeric standards all places, at all times.

So, yes, I have to touch upon litigation somewhat. And by way of example, Los Angeles County, in that

litigation, in the public record is being alleged that they've violated 213 exceedances over nine years, for a total of $37,500 per exceedance, which is a total of $8 million. So, that's a lot to have to deal with.

And I think the folks that I work with want to do all -- are arguing all they can in their programs, and want to try and find ways to even meet those constituents that we don't think we can meet for 20 or 30 years.

But the point is the reclassification, which was not the intent of the State Board, it was not the intent of Congress. And the other issue is that to find some way to compliance.

And we had a recommendation in front of your body two years ago, the Board did not vote on it. It's been two years. We could come back and, I guess, wait another year for that to happen.

But these issues are ongoing. And so, it takes one lawsuit, it takes -- and I'm not a litigator. I've done regulatory stuff my entire career, going back to Washington D.C. I'm, I guess, a risk management person. I advise clients, you need to go out and meet the requirements of your permits, you need to do this.

But when I open a permit and, Mr. Morales, you mentioned earlier that you can get your own permit and meet strict numbers. We feel that we have that permit. We have

flexible ways, more flexible ways to deal with constituents of concern. We have the ability to prioritize, to take back the program. But there's still that missing link about a pathway to compliance. And we're very, very encouraged that staff is recommending that in the fact sheet, to come back at a later date. And, hopefully, the Board is amendable to that, as well.

But I just wanted to sort of talk about this issue of litigation and sort of that is not what our program is about. Thank you.

MR. CROMPTON: Chris Crompton, with the County of Orange. I appreciate the dialogue today. I appreciate your rapt attention. I think you've been engaged, and we've asked good questions, and we really appreciate it.

I think we, you know, over this process since 2012, we've come a long way and there are some big picture items that are out there, that came to the fore today and really have sort of -- the defining issues of stormwater and they're kind of in your lap.

I did want to just touch on a few items that people brought up along the way, that I thought need to be cleared up.

Everything that's happening now is due to drought. You know, improvements are only due to drought. Well, drought helps. I mean, less water means less pollutants, if

that is true. But there are BMPs as well in place. And I think, you know, we heard this morning, is the drought the new normal? I mean, we're beginning to get into probably what is more a historic normal cycle. What we had before potentially was an adverse cycle.

So, you know, the BMPs are in place. They're increasingly being put in place. Every new development that goes in has the controls. It's rolling on an ongoing basis.

Secondly, with the iterative process, are we following it? Yes. Read our Report of Waste Discharge. We follow the iterative process. We go forward with programs, we reassess programs. We have CLRDs, Comprehensive Load Reduction Programs, in the Aliso and San Juan Creek. We're looking at the BMPs, we're continuing to fine tune them. And I think if you look at the record, we've got a strong history on that.

The State of the Environment Report. We've made it available. We're certainly willing to take comments on it. We prepared one for South Orange County. We also prepared one for North Orange County. They're intended to be the best interpretation of the data that's been collected, and we collect voluminous amounts of data.

I mean, we're always welcome to other people to provide comments and critiques of them, but we think it's a robust start in the process and we think it's a step forward

in the program.

And then we've got sort of these big issues that we talked about, compliance options, you know, local prior approval, inclusion of the State of the Environment Report, which we requested. We've got the Santa Ana Permit, which is doing some stuff with respect to, you know, compliance options as well. They're looking at it. We've got the L.A. Regional Board Permit Appeal which is ongoing. There's an awful lot in play at the present time.

And, you know, while the Regional Permit has some benefits, and your Executive Officer has pointed to those, I think there may be greater benefits by taking a step back and slowing down the process, and allowing some of these bigger issues to be worked through. And sort of the idea of us working in tandem with the Riverside Permit makes a good deal of sense. Thank you.

CLOSING REMARKS BY THE CITY OF SAN DIEGO

MS. KOLB: Since I think we have another minute or two, I just wanted to conclude that, you know, certainly, we're not asking for any kind of legal immunity against any kind of lawsuits. We're not asking for any kind immunity against enforcement actions. We want to be held accountable for what we're supposed to do, what we need to do.

Our problem -- well, we don't have any problem with that. The problem that we have is being held

accountable for things that are beyond our control, either technologically or legally. You know, there are pesticides we cannot control here, in Orange County, because that's given to State and Federal government to do. It's not within our control to do. We'd love to be able to take pesticides off the market, change formulations in products, as the brake pads are a good example of.

We worked long and hard statewide, with other stormwater programs in California to try to change that law. It's extremely difficult for a municipality to do.

And if I could just add a little footnote for the road, one of the things that were said, but while Orange County does have an extremely robust economy, and it has for many years, the County of Orange receives the lowest share of property tax revenues in the State. It gets six cents on the dollar. Nobody else gets -- no other county is that low in terms of what revenues County government does to meet its various missions.

So, I just wanted to add that footnote as well. Thank you very much.

CHAIRMAN ABARBANEL: Okay, thank you.

Let's move on to -- why don't we take three minutes for everyone.

(Off the record at 5:19 p.m.)

(On the record at 5:30 p.m.)

CLOSING REMARKS BY

THE SAN DIEGO REGIONAL QUALITY WATER BOARD

MS. WALSH: Again, Laurie Walsh with the Water Board. I'd like to wrap up some of our recommendations and address some of the things we've heard today.

The Board Water Staff would like to recommend that the Board adopt the Tentative Order today, with the following Errata. The Errata that we provided to you, the Staff Errata, it essentially addresses two items. It updates the date for the Single Water Board Regulation Agreement for Lake Forest, Laguna Woods and Laguna Hills. And it strikes the prior lawful approval language at this point.

Recognizing our commitment to work on this issue as part of focused meetings or focus groups as we go forward. Staff does support the need for some sort of language in the permit, but not at this particular point. We need to go back and do it right.

The County of Orange put forth this fact sheet, Technical Report Errata, and talks about these environmental considerations for our fact sheet. And this information describes priority water quality conditions, conditions of the watershed. It talks about causal factors for the water quality issues in Orange County. And this particular language fits perfectly into their Water Quality Improvement

Plan requirements, and that's where we suggest this language show up, and not necessarily in the fact sheet of the permit. It fits perfectly with that. So, we recommend that Orange County put that forth when they submit their Water Quality Improvement Plan, and we not make a change to the fact sheet.

This fact sheet right here, it says "Fact Sheet, Technical Report/Errata Environmental Considerations". That was handed in by the Orange County Copermittees.

CHAIRMAN ABARBANEL: Right. I don't think we got a copy of that, no.

MS. WALSH: Jimmy will hand it out to you. Coming to you now. Yeah, we recommend we do not put that in our fact sheet for the permit, but it should be part of the County's Water Quality Improvement Plan that they submit to us.

There was suggested language put forth by the County of San Diego regarding the transitional receiving water monitoring. We recommend that you have a copy of that before you. It has D, Monitoring and Assessment Program Requirements. We support that language, along with the County supports it, and we do recommend that that be included as part of the errata today.

The City of an Diego came up and spoke about changes to the Los Penasquitos TMDL language. You have an

additional handout that has Attachment E, specific provisions for total maximum daily load. And that covers one of their requests. In particular, for Provision 7.c.2.d, having to deal with the interim TMDL compliance. We've shared the language with the City. They are acceptable to that language, so we recommend that that be included as part of the errata for your consideration today.

We do not concur with City's suggested language for the final TMDL compliance provisions. We have not given you any language for that. It shows up in the City's language that they read to you today. It deals with Provision 7.b.3.b.i and 7.b.3.a. So, we will discuss that further with the City as we go forward, but we do not have any recommended changes for you regarding that.

The compliance pathway forward, for receiving water limitations, we've heard a lot about that today. We have made a commitment in the Tentative Order to consider that in the future. And at this time, we don't -- you've heard a lot of testimony about there's a lot in play, it's complex, it's a statewide issue. And the State Board proceedings have actually just gotten started on that. We're not sure how long that will take to get a State Board decision. And there's no mandate from the State at this point regarding alternative compliance for receiving water limitations. So, our suggested commitment will be a

commitment in the order going forward.

Okay, we do recommend that you add, as part of the errata, adding the word “marine protected areas” to Provision B.2.a.3. That was brought forth by the Orange County Coastkeeper.

So at this point, staff recommends adoption of Tentative Order R9-2015-001 with the errata, and with the additional errata that I read to you right now.

CHAIRMAN ABARBANEL: And is that also the recommendation of the Executive Officer?

EXECUTIVE OFFICER GIBSON: Yes, Mr. Chairman, I believe Ms. Walsh and staff have summarized it very nicely.

CHAIRMAN ABARBANEL: Okay.

MS. HAGAN: Mr. Chair, I would recommend, if you’ve heard from staff and the parties that you close the public hearing before you have discussion.

CHAIRMAN ABARBANEL: Okay, I thought we closed the public hearing at 9:00 this morning, but apparently not.

So, the public hearing is closed. Anybody still here, hello.

Okay, it’s my understanding from our Counsel that is it on all matters, or some matters we have to have a roll call vote. This one apparently fits in that category and we’ll figure out in a minute what fits in that category.

And I suggest that while we do that, we have

individual statements and then you can explain your position and then vote. Of course, we have to have to have a motion to do that.

MS. HAGAN: Well, you can proceed with discussion before anyone makes a motion, if you want, or someone can make a motion at any time. If you have a motion that's pending --

CHAIRMAN ABARBANEL: Well, the vote has to be by roll call.

MS. HAGAN: No, the roll call is just the final vote. Instead of everyone -- once you have a motion and a second, instead of everyone saying aye or nay, it should be just clear who's voting in which way.

CHAIRMAN ABARBANEL: Good, then that's clear. Let's open this up for discussion.

Betty, would you like to start.

BOARD MEMBER OLSON: Usually, my voice carries. But I'd like to thank everyone who came here today to testify, and for taking the time and you did take a lot of time. But it's a very important matter.

Unfortunately, I do not have the benefit of the earlier k knowledge and exposure that the other Board Members have had. But I do want to thank the staff for the effort that they have put in because I know that the path to anything that is done in the regulatory arena is, indeed,

onerous. So, I thank you very much for that.

I agree with the staff recommendations on the whole, but I would like to make a comment. And that is that I feel that alternative pathways are exceedingly important. As much as it troubles me to hear that we're going back to a permit that was put forward in 2007, I know from the water regulatory side, at the Federal government, when they change a standard they change it in stages. So, it applies after a certain time period to larger agencies and then it works its way down to smaller agencies.

So, perhaps that is the reason for that. I hope, as we go forward, we can work within the confines to get it to the most recent action taken.

I certainly understand the problems that Orange County faces. And I think the alternative compliance measures, as I mentioned, are very important. And we all work today, unfortunately, in a litigious society. I'm hopeful that the Regional Board and its staff can work with both Riverside and Orange County to come up with an alternative compliance limits -- or pathways, and to work toward that.

On the other hand, I feel that the San Diego County faced the same problems, although maybe not as acute because of the 9th Circuit's recent decision. But I don't think that Orange County is put under any greater burden

than San Diego County faced.

I would like though, also to say that I've had the opportunity to work with Chris Crompton, and I do believe he is very committed to improving water quality. I feel that we can all say that things don't move quickly enough. I know I feel that in my own elected position as a Water Board Member. I would like to be able to move much, much faster on issues that we're trying to address in recycled water to meet the drought. That's not always possible.

And so, I realize that this is a difficult -- it will be difficult for Orange County, but I hope that our staff, and in a side conversation with our Executive Officer, he seemed to think that this was possible.

And outside of that, I'd just like to say about one of the issues facing the area that all stormwater permits will deal with our bacteria. I've spent my life working on bacteria. I actually love them. They are very clever. They have one chromosome. Sometimes we contain them and get them to do what we want. Other times, they sit in bird poop, on tree leaves, and exist for a very long time.

And so, as much as I love them, they can certainly cause problems and constraints. So, we will be dealing with them for a long time. Thank you.

VICE-CHAIRMAN STRAWN: You're a hard act to

follow, Betty. I'll be pretty brief, I think. After wading through those hundred and some pages of comments and responses to comments, the last few nights, I was pleased, I think I understood today that the County of Orange's complaints were really in three areas.

One was a desire to stand alone. I'm not sure I understand the rationale for that, but I think I understand the rationale for trying to include you in a Regional Permit. So, I'm going to kind of skip over that one.

The other one, on the compliance alternative, that's obviously a really strong concern and I can't argue against anything you say about it. I think it's important. I think it needs to be in there.

But I also understand our staffs' concern and our Executive Officer's concern that if we jump out right now, ahead of the State Board, we could have -- we could be stepping into a pile of bird poop bacteria.

So, my inclination would be to go ahead, but try to convince you that we are serious about not waiting another two years and then having the same discussion. We need to go forward, but we really are, I think, constrained by some issues in Sacramento, and may be some of the other Boards, liking getting together with Region 8, making sure that we do it all and do it right.

So, that's like a trust-me, I think, that we're

going to push forward on that will all due haste.

The third item, on the prior legal approval, it seems to me that that should be a much easier thing to solve and we saw some really good recommendations today. And it sounds like we could be pretty close to putting something together on that and moving forward. I'm looking for little positive nods from the staff that that should be something that definitely does not have to wait until November. And so, I look forward to moving ahead with that.

And the last thing I would say is basically paraphrase what David said earlier, and that's that there's a lot of good in this permit. I think there's things that all of the Copermittees like and they want to have. At least that's what I think I heard today.

And so, my inclination is to move forward with this, with the promise that we won't let those two important issues, that you bring up, languish. We'll get those tied in. And I really don't think, in either case, this is a step backwards at all. This is, unfortunately, not fixing an existing problem as fast as you would like, but I don't see it as a step backwards in any way.

So with that, and the errata that you presented, and I'm not sure I followed them all, but I think I got them all, I would be in favor with going on with the staff's recommendation.

CHAIRMAN ABARBANEL: Tomas?

BOARD MEMBER MORALES: Yeah, a few points. On the prior lawful approval, I would hope that, you know, at the end of the day our Chair directs staff to set up a working group, with interested parties, sooner rather than later. And I will request that it be a day that I can attend, because I would like to go, because I can read a statute as well as a lot of people, but I want to hear what the interpretations are so that I can make my own judgment, and maybe like share it with folks. Okay. And then, we'll figure out where people stand.

On the alternative path, I believe we'll get direction from State Board as to, you know, what they think should happen across the State. And, you know, we'll take that direction and we won't have an alternative. Until then, I believe it's important to give the folks that we regulate something to aspire to, and that's what I believe our MS4 Permit is.

I was heartened to hear Ms. Lin say that in functions that she attends that she uses our MS4 as a model that other people should aspire to. And I believe that's what we got.

And Orange County, you guys are great. You do good work. You know, I've met with you guys and, you know, I believe you will, after your game, you will rise to the

challenge. Just as, you know, the San Diego Copermittees have. I wouldn't worry so much about the threat of litigation. That's always been there. It will always continue to be there, no matter what the regulatory scheme is, no matter what statutes say.

You should take some heart though, because you're -- no offense, Mr. Rodriguez, but your biggest boogie man stood up and said, look, I'm not going to come after you.

(Laughter)

BOARD MEMBER MORALES: And that would make me a little more comfortable. You know, and I will also say that I do believe, unlike -- I hope you pick up your kids in time, but I don't think so. I am a litigator. And I was also taught in law school that, you know, anybody can get sued. You know, the saying was you can sue the Bishop of Boston for a bastard, but you have to prove it.

But in my practice I've learned that people generally don't get sued if they're doing the right thing or if they're making efforts in the right direction. It's not a simple or easy thing for people to do and it's not as common as most people think, actually.

So, you know, I'm not surprised at all that the San Diego Copermittees haven't been sued, or haven't gotten their NOIs, just like they were telling us that they

expected two years ago. And I won't be surprised, I think, in a few years when we hear the same thing from Orange County.

That said, the final point will be that on the language for the Penasquitos TMDL, incorporating that, I hope that what we have is enough. And if it isn't, I hope that we can in the future do something to revisit it. Because I really do not want people to shy away from that type of process, where they're collaborative, they get together, they come up with their TMDL that they buy into. Because I also think that was a model for the State. And I would like to see more of that. So, that's just something that I'll be looking for in the future.

Thank you.

CHAIRMAN ABARBANEL: Eric?

BOARD MEMBER ANDERSON: Well, I'd like to compliment the staff. This Regional Permit is a step forward and something I really thought I would never support. I support the staff recommendation and I do have three comments.

One, about the prior legal or lawful approval. You know, we don't issue building permits and say when you can grade and when you can't. The local agencies do, that's your responsibility. And, really, if we are able to come up and clarify the language, that would be great. But I think

that's really the local jurisdiction's, really the bottom line, they're responsibility. It always has been, always will. That's why they are what they are. That's one of the key things about having local jurisdictions.

The second thing is while I'm sympathetic to Orange County in wanting a separate permit, especially because of the on-the-ground differences of the Orange County soils, and terrain, and culture with the other counties, I believe that this permit is actually a better, a far better approach than the previous permits that I've voted for. And that I believe will be a vast improvement and easier to go forward. And I really look forward to getting more, better, stronger results in the next interim. And, hopefully, I won't be around for the next permit cycle.

(Laughter)

CHAIRMAN ABARBANEL: I hope you will.

BOARD MEMBER ANDERSON: And finally, I do look forward to the -- moving forward to the alternative compliance in November. I think that's soon enough. And so, that's sort of my thinking, thank you.

Oh, I do have one last --

CHAIRMAN ABARBANEL: Oh, please.

BOARD MEMBER ANDERSON: Your sizing of the LID, in Section E.3.c, of one and a half times, I do think that

makes sense. And maybe when we do the Riverside one if, you know, maybe you could clarity why you came up with one and a half, that would really be helpful. Thank you.

CHAIRMAN ABARBANEL: So, I'm very positive about the MS4 Permit. I did not know that EPA goes around representing us as a symbol of light in MS4 Permits, but I'm glad to hear it.

I live in a very small, Copermittee, and I can tell you that the staff there is delighted with the opportunities to meet water quality standards on their terms, and they feel that with that kind of freedom they have benefited enormously, not only the County of San Diego as a whole, but the City itself. I think Orange County will find that, as well.

I will make a motion and vote for the staff recommendations, supported by the Executive Officer.

I would like to ask the Executive Officer to form what I am going to call the Pronto Clarity Panel, which means we don't have to wait to have serious, thoughtful discussions about compliance pathways and prior lawful approval.

I have learned, maybe even more in the last year, that waiting for the State Board is like waiting for Gadeau (phonetic) at times. I have not yet seen Gadeau. And maybe they can use the inspiration from our thoughtful

considerations of these items in guiding their own decisions. Which, of course, we will be responsible for them following.

And I hope that Tomas will attend the meetings and that they are structured around his being part of it, because I really appreciate him volunteering.

BOARD MEMBER MORALES: I'm looking forward to it.

CHAIRMAN ABARBANEL: Okay. So, I'm going to move that we adopt Tentative Order 2015-0001, plus the errata, adding the item for Section D.1.a. I'm not going to be able to fill in all the words that are there. Section 7.c.(2).(d), and adding the words "marine protected areas" for clarity in Section B.2.8.3.

BOARD MEMBER MORALES: Second.

CHAIRMAN ABARBANEL: Okay, we have -- oh, of course.

BOARD MEMBER OLSON: It takes me a while. So, the Committee that's being formed will not only look at prior legal processes -- prior legal permission -- prior legal approval, but will also look at the alternative pathways. Is that correct?

CHAIRMAN ABARBANEL: Yes. Those are the two major issues that have been discussed this afternoon. And, as everybody has pointed out, endlessly, into the infinite past, and I think that we ought to discuss and focus on

them, and do our very best to come up with something that meets the concerns that we have heard.

BOARD MEMBER OLSON: Then I also vote aye and I'd like to be --

CHAIRMAN ABARBANEL: No, no, you're not allowed to vote aye, there has to be a roll call.

BOARD MEMBER OLSON: Oh, sorry.

CHAIRMAN ABARBANEL: Sorry, this is the first time we've ever --

BOARD MEMBER OLSON: Well, I thought you voted.

CHAIRMAN ABARBANEL: No, no, I just moved and Gary seconded the motion or Tomas did.

MS. HAGAN: Mr. Chairman, may I just make -- I hate to upset the optimistic attitude, but I don't think any Board Members will be able to participate in the discussions because that will be an ex parte communication with these pending matters. But you will be able to consider all of the recommendations that come out and the different language alternatives that come out of those meetings.

CHAIRMAN ABARBANEL: If we send a non-lawyer, who's unlikely to understand what's going on, does that help?

(Laughter)

CHAIRMAN ABARBANEL: Sorry, Tomas, we'll take that up in a higher court, as it were.

All right, so, Chris, are you calling the roll?

MS. ARIAS: Mr. Anderson?

BOARD MEMBER ANDERSON: Aye.

MS. ARIAS: Mr. Morales?

BOARD MEMBER MORALES: Aye.

MS. ARIAS: Dr. Olson?

BOARD MEMBER OLSON: Aye.

MS. ARIAS: Mr. Strawn?

VICE-CHAIRMAN STRAWN: Aye.

MS. ARIAS: Chairman Abarbanel?

CHAIRMAN ABARBANEL: Aye.

Well, I hope you don’t have any more speaker slips. Thank you all for a long, and intensive and very productive day. See you next month. The meeting is adjourned.

(Whereupon, the meeting was adjourned at 5:57 p.m.)

REPORTER'S CERTIFICATE

I do hereby certify that the testimony in the foregoing hearing was taken at the time and place therein stated; that the testimony of said witnesses were reported by me, a certified electronic court reporter and a disinterested person, and was under my supervision thereafter transcribed into typewriting.

And I further certify that I am not of counsel or attorney for either or any of the parties to said hearing nor in any way interested in the outcome of the cause named in said caption.

IN WITNESS WHEREOF, I have hereunto set my hand this 28th day of March, 2016.

Jacqueline Denlinger
AAERT CERT # 747

TRANSCRIBER'S CERTIFICATE

I do hereby certify that the testimony in the foregoing hearing was taken at the time and place therein stated; that the testimony of said witnesses were transcribed by me, a certified transcriber.

And I further certify that I am not of counsel or attorney for either or any of the parties to said hearing nor in any way interested in the outcome of the cause named in said caption.

IN WITNESS WHEREOF, I have hereunto set my hand this 28th day of March, 2016.

Barbara Little
Certified Transcriber
AAERT No. CET**D-520

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

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Phone (619) 516-1990 Fax (619) 516-1994
http://www.waterboards.ca.gov/sandiego

ORDER NO. R9-2015-0001

AN ORDER AMENDING ORDER NO. R9-2013-0001, NPDES NO. CAS010266 NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The California Regional Water Quality Control Board, San Diego Region (hereinafter San Diego Water Board), finds that:

ENROLLMENT OF ORANGE COUNTY COPERMITTEES

1. **Enrollment Process.** On May 8, 2013, the San Diego Water Board adopted Order No. R9-2013-0001, NPDES No. CAS019266, *National Pollutant Discharge Elimination System Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Order No. R9-2013-0001, Order or Regional MS4 Permit). Provision F.5 of that Order outlines a process to designate (enroll) the County of Orange, the Orange County Flood Control District and the south Orange County Cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Lake Forest, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano (collectively Orange County) as Copermittees under Order No. R9-2013-0001, responsible for compliance with the terms and the conditions of the Order. Provision F.5 provides that prior to such enrollment the San Diego Water Board must first review and consider a Report of Waste Discharge (RoWD), submitted by the Orange County Copermittees under their current MS4 NPDES Order No. R9-2009-0002, to determine whether the Copermittees should be enrolled under Order No. R9-2013-0001 and what changes to the Order proposed in the RoWD are appropriate.

2. **Report of Waste Discharge.** By letter dated May 20, 2014, the Orange County Copermittees jointly submitted a RoWD in application for the reissuance of waste discharge requirements, pursuant to the requirements of section K.2.b of Order No. R9-2009-0002, for MS4 discharges draining the San Juan Hydraulic Unit within the San Diego Region. The RoWD discusses the MS4 Permit compliance activities and accomplishments of the Orange County Copermittees over the period June 2009 through June 2013. The RoWD also identifies all of the activities, research, and pilot studies the Copermittees propose to undertake during the next permit term based

upon consideration of the effectiveness of the Orange County Storm Water Program and the need for additional pollutant control initiatives. Development of a watershed-based planning approach is portrayed in the RoWD as the most important next step to take in the development of the storm water programs in Orange County. The RoWD concludes that such a comprehensive approach offers the opportunity to identify the environmental and recreational benefits that can be realized in each watershed and the management strategies that will most effectively ensure their realization. Among several recommendations, the RoWD included a request that permit requirements be amended to provide an initial or time limited exemption from hydromodification control best management practices (BMPs) for conveyance channels that are engineered and regularly maintained with the capacity to convey peak flows generated from the 10-year or greater storm event from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean. The County of Orange also separately requested a second exemption for discharges to “large river” low gradient reaches with a very wide flood plain by letter dated November 22, 2013. The San Diego Water Board has reviewed the RoWD and determined it is complete.

3. **Permit Hydromodification Control Requirement Modifications.** The hydromodification control BMP requirements in Provision E.3.c.(2) of Order No. R9-2013-0001 require modification to address the hydromodification exemption issues identified in the Orange County Copermittees’ RoWD application and November 22, 2013 letter. To facilitate the transition of the Orange County Copermittees (and eventually the Riverside County Copermittees) to the Regional MS4 Permit from the current Phase I MS4 NPDES permit (Order No. R9-2009-0002), two temporary exemptions from hydromodification control BMP requirements should be provided. The first temporary exemption would allow relief from hydromodification control BMP requirements for Priority Development Projects discharging directly to an engineered channel conveyance system with a capacity to convey peak flows generate by the 10-year storm event all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean. The second temporary exemption would allow relief from hydromodification control BMP requirements for Priority Development Projects discharging directly to large river reaches with drainage areas larger than 100 square miles and a 100-year flow capacity in excess of 20,000 cubic feet per second.

4. **Orange County Copermittees Enrollment.** After consideration of the Orange County RoWD and changes needed to Order No. R9-2013-0001, the San Diego Water Board has determined that the County of Orange, the Orange County Flood Control District and the south Orange County Cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano should be enrolled as Copermittees under Order No. R9-2013-0001 (Order) and responsible for compliance with the terms and the conditions of the Order. Enrolling the Orange County Copermittees into Order No. R9-2013-0001 (and the eventual enrollment of Riverside County Copermittees upon expiration of their current MS4 permit) will

provide regulatory consistency in the implementation of MS4 permit requirements throughout the San Diego Region, improve communication and coordination among Copermittees within watersheds crossing multiple jurisdictions, and maximize efficiency and economy of resources for the San Diego Water Board achieved through the redirection of staff permitting resources to better advance the storm water program. The enrollment of the Cities of Laguna Hills, Laguna Woods and Lake Forest is subject to a California Water Code (Water Code) section 13228 agreement as set forth in the findings of this Order.

DESIGNATION OF A REGIONAL WATER BOARD

5. **Regional Water Board Designation.** The Cities of Laguna Woods, Laguna Hills and Lake Forest (Cities) are located partially within the jurisdictions of both the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board) and the San Diego Water Board. Written requests for designation of a single Regional Water Board to regulate matters pertaining to permitting of Phase I MS4 discharges were submitted to the San Diego Water Board by the City of Laguna Woods by letter dated September 8, 2014, the City of Laguna Hills by letter dated March 12, 2014, and the City of Lake Forest by letters dated January 14, 2013, and April 4, 2014. The Cities of Laguna Hills and Laguna Woods requested designation of the San Diego Water Board, and the City of Lake Forest requested designation of the Santa Ana Water Board. Water Code section 13228 specifies the circumstances that allow, and the process for, designation of a Regional Water Board.

6. **Factual Considerations**. The Santa Ana Water Board and San Diego Water Board establish generally consistent requirements for MS4 discharges to meet the technology-based standard of reducing pollutants in the discharge to the maximum extent practicable (MEP), a related iterative process to ensure MS4 discharges meet receiving water quality standards, and non-storm water discharges to be effectively prohibited from entering the MS4. However due to the unique nature of watersheds and water quality issues in the San Diego Region and Santa Ana Region, MS4 permit requirements between the two Regional Water Boards may also vary to address region specific pollutant discharges and watershed conditions. The Cities of Laguna Woods, Laguna Hills, and Lake Forest report that management and implementation of municipal programs to comply with two different MS4 permits creates a significant administrative and financial burden that is not contributing to greater overall water quality improvements in either region.

7. **Regional Water Board Agreement**. In an effort to address the concerns of the Cities, the San Diego Water Board and the Santa Ana Water Board have entered into an agreement whereby the San Diego Water Board is designated to regulate Phase I MS4 discharges within the jurisdiction of the Cities of Laguna Woods and Laguna Hills and the Santa Ana Water Board is designated to regulate Phase I MS4 discharges within the jurisdiction of the City of Lake Forest. Both the Santa Ana Water Board and the San Diego Water Board Phase I MS4 permits for Orange County Copermittees, including Cities, require amendments to make the

designations effective. To avoid gaps or duplication in regulation for the Cities, the agreement, dated February 10, 2015, is effective on the later effective date of this Order or the Santa Ana Water Board's reissuance (Tentative Order No. R8-2015-0001). Under the terms of the agreement the City of Lake Forest will be required to retain and continue implementing the prohibition of over-irrigation discharges identified in Title 15, Chapter 15, Section 14.030 of the City Municipal Code for regulating storm water quality throughout its jurisdiction, which was established during the permit term of Order No. R9-2009-0002. The City of Lake Forest will also be required to actively participate in the development and implementation of the Aliso Creek Watershed Management Area Water Quality Improvement Plan required pursuant to the San Diego Water Board's Regional MS4 Permit, Order No. R9-2013-0001. Under the terms of the agreement, any Total Maximum Daily Load (TMDL) and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Laguna Woods, Laguna Hills or Lake Forest as a responsible party, will be incorporated into the appropriate MS4 permit by reference. Enforcement of the applicable TMDL would remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's San Diego Creek/Newport Bay TMDL and the San Diego Water Board's Indicator Bacteria Project I Beaches and Creeks TMDL.

8. **Periodic Review of Regional Water Board Agreement.** The basis supporting the Cities of Laguna Woods, Laguna Hills, and Lake Forest requests to designate a specific Regional Water Board for regulatory oversight of MS4 discharges may change under future conditions and circumstances. Therefore the San Diego Water Board will periodically review the effectiveness of the agreement during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate the agreement with the Santa Ana Water Board or otherwise modify the agreement subject to the approval of the Santa Ana Water Board.

WATER QUALITY CONTROL PLANS AND POLICIES

9. **Cause for Modification.** Federal NPDES regulations at 40 CFR 122.62(a)(3) provide that NPDES permits may be modified when the standards or regulations on which the permit was based have been changed by promulgation of amended standards or regulations or by judicial decision after the permit was issued. Standard Permit Provision 1.f of Attachment B to Order No. R9-2013-0001 provides in relevant part that the Order may be modified for cause. Section II.H.4.d. of the Order provides that the Order may be reopened during its term for cause including when the *Water Quality Control Plan for the San Diego Basin (9)* (Basin Plan) is amended by the San Diego Water Board to incorporate a new TMDL, and the amendment is approved by the State Water Resources Control Board (State Water Board), Office of Administrative Law, and the United State Environmental Protection Agency (USEPA). The amended changes to water quality control plans and policies set forth in the findings below represent changes to standards on which Order No. R9-2013-0001 was based.

10. **Special Conditions for Areas of Special Biological Significance**. On March 20, 2012, in Resolution No. 2012-0012, the State Water Board adopted a General Exception to the Ocean Plan Areas of Special Biological Significance (ASBS) waste discharge prohibition for storm water and nonpoint source discharges, including Special Protections for Beneficial Uses. On June 19, 2012, in Resolution No. 2012-0031, the State Water Board amended the General Exception to require pollutant load reductions to be achieved over a six year term. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject to the terms and conditions of State Water Board General Exception, as amended.

11. **Total Maximum Daily Loads (TMDLs)**. On June 13 2012 the San Diego Water Board in Resolution No. R9-2012-0033 amended the Basin Plan to incorporate the Los Penasquitos Lagoon Sediment TMDL. This TMDL Basin Plan amendment was approved by the State Water Board on January 21, 2014, by the Office of Administrative Law (OAL) on July 14, 2014, and USEPA on October 30, 2014. The County of San Diego, City of San Diego, City of Del Mar, and the City of Poway are among the responsible parties collectively assigned a single wasteload allocation applicable to MS4 discharges under the terms and conditions of the TMDL.

BEACH WATER QUALITY MONITORING AND ASSESSMENT PROGRAM

12. **Unified Approach Beach Water Quality Monitoring.** In November 2010, the State Water Board adopted Resolution No. 2010-0053, directing regional water boards to work with dischargers to modify beach water quality monitoring programs required by regional water board-issued permits in order to eliminate redundancies and incorporate beach water quality monitoring required by applicable statutes, where appropriate. Beginning in 2012, the San Diego Water Board reviewed the various beach water quality monitoring programs conducted in south Orange County and convened a stakeholder workgroup to develop a unified regional beach water quality monitoring and assessment program (Unified Program). The Unified Program is outlined in the San Diego Water Board report entitled "*Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County,*" dated September 2014. The Unified Program is consistent with and will meet or exceed the minimum requirements for beach water quality monitoring and related public notification and reporting established by State law, including the California Ocean Plan. The Unified Program will help protect the health of swimmers, surfers, and others who use south Orange County beach waters for water contact recreational activities.

13. **Monitoring Framework Consistency**. The Unified Program is consistent with and will help implement "*A Framework for Monitoring and Assessment in the San Diego Region*," which emphasizes the need for question-driven, beneficial use-oriented monitoring and assessment. The primary purpose of the Unified Program will be to answer the question "Does beach water quality meet standards for the beneficial use of water contact recreation?"

14. **Unified Program Implementation**. The San Diego Water Board Executive Officer has issued a written directive, pursuant to California Water Code sections 13225, 13267, and 13383, for the South Orange County Wastewater Authority (SOCWA) and the south Orange County Copermittees to implement the Unified Program, in cooperation with the Orange County Health Care Agency (OCHCA). After appropriate opportunity for public input, the Executive Officer may make revisions to the Unified Program, provided that the Unified Program, as revised, continues to be consistent with and meet the requirements of State law, including the California Ocean Plan, for beach water quality monitoring and related public notification and reporting. The Unified Program will supersede the existing routine, ongoing, beach water quality monitoring programs in south Orange County that are conducted in accordance with the existing requirements of the NPDES permits for discharges from SOCWA ocean outfalls and the south Orange County Copermittees' MS4s. The requirement for the Orange County Copermittees to participate in "regional monitoring" of beach water quality replaces requirements to conduct "core monitoring" of beach water quality, as provided for in Appendix III of the 2012 California Ocean Plan.

ADMINISTRATIVE FINDINGS

15. **Effect of this Order.** This Order amends Order No. R9-2013-0001 to:

    a. Enroll the County of Orange, the Orange County Flood Control District and the south Orange County Cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano as Copermittees responsible for compliance with the terms and conditions of Order No. R9-2013-0001,as amended by this Order;

    b. Designate the San Diego Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the Cities of Laguna Woods and Laguna Hills and the Santa Ana Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the City of Lake Forest, subject to the terms of the agreement between San Diego Water Board and the Santa Ana Water Board described in Finding 7 of this Order;

c. Establish interim exceptions to land development requirements for those Priority Development Projects that discharge to engineered channels and large river reaches described in Finding 3 of this Order;

d. Incorporate the amended requirements of the State Water Board's General Exception to require that pollutant reductions be achieved within 6 years for storm water and nonpoint source discharges to ASBS;

e. Incorporate applicable requirements of the Los Peñasquitos Lagoon Sediment TMDL; *and*

f. Require the Orange County Copermittees to implement the "*Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County,*" dated September 2014, made effective in the Monitoring and Reporting Program/Order issued pursuant to California Water Code sections 13225, 13267, and 13383 and subject to future revisions by the Executive Officer after appropriate public input.

16. **Effect of this Order.** Order No. R9-2013-0001 is not being reopened for any other purpose than the revisions contained herein. Except as contradicted or superseded by the findings and directives set forth in this Order, all of the previous findings and directives of Order No. R9-2013-0001 shall remain in full force and effect.

17. **Future Consideration of Alternative Compliance Option.** San Diego, Orange County, and Riverside County Copermittees have asserted that the prohibitions and receiving water limitations in Provision A.1.a, A.1.c, and A.2 of Order No. R9-2013-0001 may result in many years of noncompliance because years of technical efforts may ultimately be required to achieve compliance with the receiving water limitations, especially for wet weather discharges. To address this issue, the San Diego Water Board plans to consider the incorporation of a well-defined, transparent, and finite alternative path to compliance in Order No. R9-2013-0001, as amended by Order No. R9-2015-0001, during the MS4 NPDES permit reissuance proceedings for the Riverside County Copermittees scheduled for fiscal year 2015-16. This alternative compliance option would allow the Copermittees that are willing to pursue significant receiving water quality improvements beyond the iterative process to be deemed in compliance with the receiving water limitations. An alternative compliance option of this type was previously considered by the San Diego Water Board during the adoption proceedings for Order No. R9-2013-0001.

18. **California Environmental Quality Act**. This action is exempt from the requirement of preparation of environmental documents under the California Environmental Quality Act [Public Resources Code, Division 13, Chapter 3, Section 21000 et seq.] in accordance with California Water Code section 13389.

19. **Public Notice.** In accordance with State and federal laws and regulations, the San Diego Water Board has notified San Diego County, Orange County and Riverside

County Copermittees, and all known interested agencies and persons of its intent to adopt this Order and has provided them with an opportunity to submit their written comments and recommendations.

20. **Public Hearing.** The San Diego Water Board held a public hearing on February 11, 2015 and heard and considered all comments pertaining to the adoption of this Order.

21. **Notification.** Any person aggrieved by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with California Water Code section 13320 and California Code of Regulations, title 23, sections 2050 et seq. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date of this Order. Copies of the law and regulations applicable to filing petitions may be found on the Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

THEREFORE, IT IS HEREBY ORDERED,

1. This Order amends the Regional MS4 Permit, Order No. R9-2013-0001 and the Fact Sheet (Attachment F of the Order) as described in the revised versions of Order No. R9-2013-0001 and Fact Sheet included as Attachments 1 and 2 to this Order. Added text to Order No. R9-2013-0001 and the Fact Sheet is displayed in blue-underline text and deleted text is displayed as red-strikeout text.

2. The amended version of Order No. 2013-0001 and Fact Sheet included as Attachments 1 and 2 to this Order shall become effective on April 1, 2015.

3. Amended Order No. R9-2013-0001 shall supersede Order No. R9-2009-0002 for the Orange County Copermittees except for enforcement purposes.

4. San Diego Water Board staff is directed to prepare and post a conformed copy of Order No. R9-2013-0001 and the Fact Sheet incorporating the revisions made by this Order.

I, David W. Gibson, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on February 11, 2015.

David W. Gibson
Executive Officer

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

ORDER NO. R9-2013-0001, AS AMENDED BY ORDER NO. R9-2015-0001
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The San Diego County Copermittees in Table 1a are subject to waste discharge requirements set forth in this Order.

Table 1a. San Diego County Copermittees

City of Carlsbad	City of Oceanside
City of Chula Vista	City of Poway
City of Coronado	City of San Diego
City of Del Mar	City of San Marcos
City of El Cajon	City of Santee
City of Encinitas	City of Solana Beach
City of Escondido	City of Vista
City of Imperial Beach	County of San Diego
City of La Mesa	San Diego County Regional Airport Authority
City of Lemon Grove	San Diego Unified Port District
City of National City	

~~After the San Diego Water Board receives and considers~~ T~~t~~he Orange County Copermittees' ~~Report of Waste Discharge and makes any necessary changes to this Order, the Orange County Copermittees~~ in Table 1b are ~~will become~~ subject to waste discharge requirements set forth in this Order. ~~after expiration of Order No. R9-2009-0002, NPDES No. CAS0108740 on or after December 16, 2014.~~

Table 1b. Orange County Copermittees[1]

City of Aliso Viejo	City of Rancho Santa Margarita
City of Dana Point	City of San Clemente
City of Laguna Beach	City of San Juan Capistrano
City of Laguna Hills	City of Laguna Woods
City of Laguna Niguel	County of Orange
~~City of Lake Forest[1]~~	Orange County Flood Control District
City of Mission Viejo	

[1] While not listed in Table 1b., the City of Lake Forest remains a Copermittee under this Order until the later effective date of this Order or the effective date of Santa Ana Water Board Tentative Order No. R8-2015-0001. Thereafter, the City of Lake Forest will no longer be considered a Copermittee under this Order because its Phase I MS4 discharges will be regulated by the Santa Ana Water Board pursuant to Water Code section 13228 designation. The requirements of this Order that apply to the City of Lake Forest for the duration of this Order, however, are described in Finding 29 and Footnote 2 to Table B-1.

After the San Diego Water Board receives and considers the Riverside County Copermittees' Report of Waste Discharge and makes any necessary changes to this Order, the Riverside County Copermittees in Table 1c will become subject to waste discharge requirements set forth in this Order after expiration of Order No.R9-2010-0016, NPDES No. CAS0108766 on or after November 10, 2015.

Table 1c. Riverside County Copermittees

City of Murrieta	County of Riverside
City of Temecula	Riverside County Flood Control and Water Conservation District
City of Wildomar	

The ~~Orange County Copermittees and~~ Riverside County Copermittees may become subject to the requirements of this Order at a date earlier than the expiration date of their current Order~~s~~ subject to the conditions described in Provision F.6 of this Order if the Riverside County Copermittees ~~in the respective county~~ receive ~~a~~ notification of coverage from the San Diego Water Board.

The term Copermittee in this Order refers to any San Diego County, Orange County, or Riverside County Copermittee covered under this Order, unless specified otherwise.

This Order provides permit coverage for the Copermittee discharges described in Table 2.

Table 2. Discharge Locations and Receiving Waters

Discharge Points	Locations throughout San Diego Region
Discharge Description	Municipal Separate Storm Sewer System (MS4) Discharges
Receiving Waters	Inland Surface Waters, Enclosed Bays and Estuaries, and Coastal Ocean Waters of the San Diego Region

Table 3. Administrative Information

This Order was adopted by the San Diego Water Board on:	**May 8, 2013**
~~This~~ Order No. R9-2013-0001 ~~will become~~ became effective on:	**June 27, 2013**
This Order as amended by R9-2015-0001 became effective on:	**April 1, 2015**
This Order will expire on:	**June 27, 2018**
The Copermittees must file a Report of Waste Discharge in accordance with Title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than 180 days in advance of the Order expiration date.	

I, David W. Gibson, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on May 8, 2013, as amended by adoption of Order No. R9-2015-0001 on February 11, 2015.

David W. Gibson
Executive Officer

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ATTACHMENTS
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Attachment B - Standard Permit Provisions and General Provisions B-1
Attachment C - Acronyms, Abbreviations and Definitions C-1
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Attachment F - Fact Sheet / Technical Report for Order No. R9-2013-0001 as amended by Order No. R9-2015-0001 ..... F-1

I. FINDINGS

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), finds that:

JURISDICTION

1. **MS4 Ownership or Operation.** Each of the Copermittees owns or operates an MS4, through which it discharges storm water and non-storm water into waters of the U.S. within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the U.S.

2. **Legal and Regulatory Authority.** This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]) adopted by the United States Environmental Protection Agency (USEPA), and chapter 5.5, division 7 of the California Water Code (CWC) (commencing with section 13370). This Order serves as an NPDES permit for discharges from MS4s to surface waters. This Order also serves as waste discharge requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

   The San Diego Water Board has the legal authority to issue a regional MS4 permit pursuant to its authority under CWA section 402(p)(3)(B) and 40 CFR 122.26(a)(1)(v). The USEPA also made it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide permits (55 Federal Register [FR] 47990, 48039-48042). The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees and San Diego Water Board.

   The federal regulations make it clear that the Copermittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators (40 CFR 122.26(a)(3)(vi)). This Order does not require the Copermittees to manage storm water outside of their jurisdictional boundaries, but rather to work collectively to improve storm water management within watersheds.

3. **CWA NPDES Permit Conditions.** Pursuant to CWA section 402(p)(3)(B), NPDES permits for storm water discharges from MS4s must include requirements to effectively prohibit non-storm water discharges into MS4s, and require controls to reduce the discharge of pollutants in storm water to the maximum extent practicable (MEP), and to require other provisions as the San Diego Water Board determines are appropriate to control such pollutants. This Order prescribes conditions to assure

compliance with the CWA requirements for owners and operators of MS4s to effectively prohibit non-storm water discharges into the MS4s, and require controls to reduce the discharge of pollutants in storm water from the MS4s to the MEP.

4. **CWA and CWC Monitoring Requirements.** CWA section 308(a) and 40 CFR 122.41(h),(j)-(l) and 122.48 require that NPDES permits must specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s also specify additional monitoring and reporting requirements in 40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c). CWC section 13383 authorizes the San Diego Water Board to establish monitoring, inspection, entry, reporting and recordkeeping requirements. This Order establishes monitoring and reporting requirements to implement federal and State requirements. This Order also includes requirements for the Orange County Copermittees to participate in, and together with South Orange County Wastewater Authority and Orange County Health Care Agency, share responsibility for implementing the unified approach to beach water quality monitoring and assessment program set forth in the October 2014 report, *Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County*, issued pursuant to CWC section 13383 in the San Diego Water Board December 5, 2014 Letter Directive.

5. **Total Maximum Daily Loads.** CWA section 303(d)(1)(A) requires that "[e]ach state shall identify those waters within its boundaries for which the effluent limitations are not stringent enough to implement any water quality standard applicable to such waters." The CWA also requires states to establish a priority ranking of impaired water bodies known as Water Quality Limited Segments and to establish Total Maximum Daily Loads (TMDLs) for such waters. This priority list of impaired water bodies is called the Clean Water Act Section 303(d) List of Water Quality Limited Segments, commonly referred to as the 303(d) List. The CWA requires the 303(d) List to be updated every two years.

   TMDLs are numerical calculations of the maximum amount of a pollutant that a water body can assimilate and still meet water quality standards. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point sources (waste load allocations or WLAs) and non-point sources (load allocations or LAs), background contribution, plus a margin of safety. Discharges from MS4s are point source discharges. The federal regulations (40 CFR 122.44(d)(1)(vii)(B)) require that NPDES permits incorporate water quality based effluent limitations (WQBELs) developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, consistent with the assumptions and requirements of any available WLA for the discharge. Requirements of this Order implement the TMDLs established ~~adopted~~ by the San Diego Water Board or ~~and~~ ~~approved by~~ USEPA as of the ~~time~~ date this Order was ~~is~~ ~~issued~~ amended in 2015. This Order establishes WQBELs consistent with the assumptions and requirements of all available TMDL WLAs assigned to discharges from the Copermittees' MS4s.

6. **Non-Storm Water Discharges.** Pursuant to CWA section 402(p)(3)(B)(ii), this Order requires each Copermittee to effectively prohibit discharges of non-storm water into its MS4. Nevertheless, non-storm water discharges into and from the MS4s continue to be reported to the San Diego Water Board by the Copermittees and other persons. Monitoring conducted by the Copermittees, as well as the 303(d) List, have identified dry weather, non-storm water discharges from the MS4s as a source of pollutants causing or contributing to receiving water quality impairments in the San Diego Region. The federal regulations (40 CFR 122.26(d)(2)(iv)(B)(1)) require the Copermittees to have a program to prevent illicit discharges to the MS4. The federal regulations, however, allow for specific categories of non-storm water discharges or flows to be addressed as illicit discharges only where such discharges are identified as sources of pollutants to waters of the U.S.

7. **In-Stream Treatment Systems.** Pursuant to federal regulations (40 CFR 131.10(a)), in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S. Authorizing the construction of a runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to accepting waste assimilation as an appropriate use for that water body. Runoff treatment must occur prior to the discharge of runoff into receiving waters. Treatment control best management practices (BMPs) must not be constructed in waters of the U.S. Construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body.

DISCHARGE CHARACTERISTICS AND RUNOFF MANAGEMENT

8. **Point Source Discharges of Pollutants.** Discharges from the MS4s contain waste, as defined in the CWC, and pollutants that adversely affect the quality of the waters of the state. A discharge from an MS4 is a “discharge of pollutants from a point source” into waters of the U.S. as defined in the CWA. Storm water and non-storm water discharges from the MS4s contain pollutants that cause or threaten to cause a violation of surface water quality standards, as outlined in the Water Quality Control Plan for the San Diego Basin (Basin Plan). Storm water and non-storm water discharges from the MS4s are subject to the conditions and requirements established in the Basin Plan for point source discharges.

9. **Potential Beneficial Use Impairment.** The discharge of pollutants and/or increased flows from MS4s may cause or threaten to cause the concentration of pollutants to exceed applicable receiving water quality objectives and impair or threaten to impair designated beneficial uses resulting in a condition of pollution, contamination, or nuisance.

10. **Pollutants Generated by Land Development.** Land development has created and continues to create new sources of non-storm water discharges and pollutants in storm water discharges as human population density increases. This brings higher

levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash. Pollutants from these sources are dumped or washed off the surface by non-storm water or storm water flows into and from the MS4s. When development converts natural vegetated pervious ground cover to impervious surfaces such as paved highways, streets, rooftops, and parking lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving a developed area without BMPs that can maintain pre-development runoff conditions will contain greater pollutant loads and have significantly greater runoff volume, velocity, and peak flow rate than pre-development runoff conditions from the same area.

11. **Runoff Discharges to Receiving Waters.** The MS4s discharge runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within the eleven hydrologic units comprising the San Diego Region. Historic and current development makes use of natural drainage patterns and features as conveyances for runoff. Rivers, streams and creeks in developed areas used in this manner are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and receiving water. Numerous receiving water bodies and water body segments have been designated as impaired by the San Diego Water Board pursuant to CWA section 303(d).

12. **Pollutants in Runoff.** The most common pollutants in runoff discharged from the MS4s include total suspended solids, sediment, pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., cadmium, copper, lead, and zinc), petroleum products and polynuclear aromatic hydrocarbons, synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus), oxygen-demanding substances (e.g., decaying vegetation, animal waste), detergents, and trash. As operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not prohibit or otherwise control. These discharges may cause or contribute to a condition of pollution or a violation of water quality standards.

13. **Human Health and Aquatic Life Impairment.** Pollutants in runoff discharged from the MS4s can threaten and adversely affect human health and aquatic organisms. Adverse responses of organisms to chemicals or physical agents in runoff range from physiological responses such as impaired reproduction or growth anomalies to mortality. Increased volume, velocity, rate, and duration of storm water runoff greatly accelerate the erosion of downstream natural channels. This alters stream channels and habitats and can adversely affect aquatic and terrestrial organisms.

14. **Water Quality Effects.** The Copermittees' water quality monitoring data submitted to date documents persistent exceedances of Basin Plan water quality objectives for

runoff-related pollutants at various watershed monitoring stations. Persistent toxicity has also been observed at several watershed monitoring stations. In addition, bioassessment data indicate that the majority of the monitored receiving waters have Poor to Very Poor Index of Biological Integrity (IBI) ratings. These findings indicate that runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in the San Diego Region. Non-storm water discharges from the MS4s have been shown to contribute significant levels of pollutants and flow in arid, developed Southern California watersheds, and contribute significantly to exceedances of applicable receiving water quality objectives.

15. **Non-Storm Water and Storm Water Discharges.** Non-storm water discharges from the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard of CWA section 402(p)(3)(B)(iii), which is explicitly for "Municipal … *Stormwater Discharges* (emphasis added)" from the MS4s. Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s must be effectively prohibited.

16. **Best Management Practices.** Waste and pollutants which are deposited and accumulate in MS4 drainage structures will be discharged from these structures to waters of the U.S. unless they are removed. These discharges may cause or contribute to, or threaten to cause or contribute to, a condition of pollution in receiving waters. For this reason, pollutants in storm water discharges from the MS4s can be and must be effectively reduced in runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Pollution prevention is the reduction or elimination of pollutant generation at its source and is the best "first line of defense." Source control BMPs (both structural and non-structural) minimize the contact between pollutants and runoff, therefore keeping pollutants onsite and out of receiving waters. Treatment control BMPs remove pollutants that have been mobilized by storm water or non-storm water flows.

17. **BMP Implementation.** Runoff needs to be addressed during the three major phases of development (planning, construction, and use) in order to reduce the discharge of storm water pollutants to the MEP, effectively prohibit non-storm water discharges, and protect receiving waters. Development which is not guided by water quality planning policies and principles can result in increased pollutant load discharges, flow rates, and flow durations which can negatively affect receiving water beneficial uses. Construction sites without adequate BMP implementation result in sediment runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. Existing development can generate substantial pollutant loads which are discharged in runoff to receiving waters. Retrofitting areas of existing development with storm water pollutant control and hydromodification management BMPs is necessary to address storm water discharges from existing development that may cause or contribute to a condition of pollution or a violation of water quality standards.

18. **Water Quality Improvements.** Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges to the MS4s and control pollutants in storm water discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the CWA.

19. **Long Term Planning and Implementation.** Federal regulations require municipal storm water permits to expire 5 years from adoption, after which the permit must be renewed and reissued. The San Diego Water Board recognizes that the degradation of water quality and impacts to beneficial uses of the waters in the San Diego Region occurred over several decades. The San Diego Water Board further recognizes that a decade or more may be necessary to realize demonstrable improvement to the quality of waters in the San Diego Region. This Order includes a long term planning and implementation approach that will require more than a single permit term to complete.

WATER QUALITY STANDARDS

20. **Basin Plan.** The San Diego Water Board adopted the Water Quality Control Plan for the San Diego Basin (Basin Plan) on September 8, 1994, that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for receiving waters addressed through the plan. The Basin Plan was subsequently approved by the State Water Resources Control Board (State Water Board) on December 13, 1994. Subsequent revisions to the Basin Plan have also been adopted by the San Diego Water Board and approved by the State Water Board. Requirements of this Order implement the Basin Plan.

    The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Process Supply (PROC), Industrial Service Supply (IND), Ground Water Recharge (GWR), Contact Water Recreation (REC1), Non-contact Water Recreation (REC2), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Freshwater Replenishment (FRSH), Hydropower Generation (POW), and Preservation of Biological Habitats of Special Significance (BIOL). The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region: Navigation (NAV), Commercial and Sport Fishing (COMM), Estuarine Habitat (EST), Marine Habitat (MAR), Aquaculture (AQUA), Migration of Aquatic Organisms (MIGR), Spawning,

Reproduction, and/or Early Development (SPWN), and Shellfish Harvesting (SHELL).

21. **Ocean Plan.** The State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, and 2005. The State Water Board adopted the latest amendment on April 21, 2005 and it became effective on February 14, 2006. The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean. Requirements of this Order implement the Ocean Plan.

    The Ocean Plan identifies the following beneficial uses of ocean waters of the state to be protected: Industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture; preservation and enhancement of designated Areas of Special Biological Significance; rare and endangered species; marine habitat; fish spawning and shellfish harvesting.

22. **Sediment Quality Control Plan**. On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes: 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

23. **National Toxics Rule and California Toxics Rule.** USEPA adopted the National Toxics Rule (NTR) on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the NTR applied in California. On May 18, 2000, USEPA adopted the California Toxics Rule (CTR). The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants.

24. **Antidegradation Policy.** This Order is in conformance with the federal Antidegradation Policy described in 40 CFR 131.12, and State Water Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality Waters in California*. Federal regulations at 40 CFR 131.12 require that the State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. State Water Board Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies.

25. **Anti-Backsliding Requirements.** Section 402(o)(2) of the CWA and federal regulations at 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations may be relaxed. All effluent limitations in this Order are at least as stringent as effluent limitations in the previous permits.

CONSIDERATIONS UNDER FEDERAL AND STATE LAW

26. **Coastal Zone Act Reauthorization Amendments.** Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states with approved coastal zone management programs to address non-point source pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point source pollution: agriculture, silviculture, urban, marinas, and hydromodification. This Order addresses the management measures required for the urban category, with the exception of septic systems. The runoff management programs developed pursuant to this Order fulfills the need for coastal cities to develop a runoff non-point source plan identified in the Non-Point Source Program Strategy and Implementation Plan. The San Diego Water Board addresses septic systems through the administration of other programs.

27. **Endangered Species Act.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 USC sections 1531 to 1544). This Order requires compliance with receiving water limits, and other requirements to protect the beneficial uses of waters of the State. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

28. **Report of Waste Discharge Process.** The waste discharge requirements set forth in this Order are based upon the Report of Waste Discharge submitted by the San Diego County Copermittees prior to the expiration of Order No. R9-2007-0001 (NPDES No. CAS0109266) and the Report of Waste Discharge submitted by the Orange County Copermittees prior to the expiration of Order No. R9-2009-0002 (CAS0108740). The ~~Orange County and~~ Riverside County Copermittees are not immediately covered by the waste discharge requirements in this Order. The San Diego Water Board understands that each municipality is unique although the Counties share watersheds and/or geographical boundaries. The Order will continue to use the Report of Waste Discharge process prior to initially making ~~Orange County or~~ Riverside County Copermittees subject to the requirements of this Order.

The federal regulations (40 CFR 122.21(d)(2)) and CWC section 13376 impose a duty on the Copermittees to reapply for continued coverage through submittal of a

Report of Waste Discharge no later than 180 days prior to expiration of a currently effective permit. This requirement is set forth in the ~~Orange County Copermittees' and~~ Riverside County Copermittees' currently effective permit~~s~~ at Provision~~s K.2.b and~~ K.2.c~~, respectively~~. The ~~Orange County Permit, Order No. R9-2009-0002 (NPDES No. CAS0108740) expires on December 16, 2014 and the~~ Riverside County MS4 Permit, Order No. R9-2010-0016 (NPDES No. CAS0108766) expires on November 10, 2015.

Unless the ~~Orange County or~~ Riverside County Copermittees apply for and receive early coverage under this Order, ~~the Orange County Copermittees' and~~ the Riverside County Copermittees' ~~respective~~ permit~~s~~ will be superseded by this Order upon expiration of their ~~respective~~ permit~~s~~, subject to any necessary revisions to the requirements of this Order made after the San Diego Water Board considers their ~~respective~~ Report~~s~~ of Waste Discharge through the public process provided in 40 CFR Part 124.

29. Regional Water Board Designation. The Cities of Laguna Hills, Laguna Woods, and Lake Forest are located partially within the jurisdictions of the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board) and the San Diego Water Board and their discharges are subject to regulation by both Regional Water Boards. Pursuant to CWC section 13228, the Cities of Laguna Hills, Laguna Woods, and Lake Forest submitted written requests that one Regional Water Board be designated to regulate Phase I MS4 discharges for each of the Cities. The Santa Ana Water Board and the San Diego Water Board have entered into an agreement dated February 10, 2015, whereby the Cities of Laguna Woods and Laguna Hills are largely regulated by the San Diego Water Board under this Order, including those portions of the Cities of Laguna Woods and Laguna Hills not within the San Diego Water Board's jurisdiction, upon the effective date of this Order or Santa Ana Water Board Order No. R8-2015-0001, whichever is later. Similarly, the City of Lake Forest, including those portions of the City of Lake Forest within the San Diego Water Board's jurisdiction, is largely regulated by the Santa Ana Water Board under Order No. R8-2015-0001 (NPDES No. CAS618030) upon the later effective date of this Order or Order No. R8-2015-0001. The agreement provides that the City of Lake Forest is required to retain, and continue implementation of, its over-irrigation discharge prohibition in Title 15, Chapter 14.030, List (b) of the City Municipal Code for regulating storm water quality throughout its jurisdiction. The agreement also requires the City of Lake Forest to actively participate during development and implementation of the Aliso Creek Watershed Management Area Water Quality Improvement Plan required pursuant to this Order. Each Regional Water Board retains the authority to enforce provisions of its Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee under the terms of the agreement (Water Code section 13228 (b)). Under the terms of the agreement, any TMDL and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Laguna Woods, Laguna Hills or Lake Forest as a responsible party, will be incorporated into the

appropriate Phase I MS4 permit by reference. Enforcement of the applicable TMDL will remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's San Diego Creek/Newport Bay TMDL and the San Diego Water Board's Indicator Bacteria Project I Beaches and Creeks TMDL. The San Diego Water Board will periodically review the effectiveness of the agreement during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate the agreement with Santa Ana Water Board or otherwise modify the agreement subject to the approval of the Santa Ana Water Board.

~~29.~~30. **Integrated Report and Clean Water Act Section 303(d) List.** The San Diego Water Board and State Water Board submit an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. USEPA issued its *Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act* on July 29, 2005, which advocates the use of a five category approach for classifying the attainment status of water quality standards for water bodies in the Integrated Report. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 in the Integrated Report are placed on the 303(d) List.

Water bodies with available data and/or information that indicate at least one beneficial use is not being supported or is threatened, but a TMDL is not required, are included in Category 4 in the Integrated Report. Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

Implementation of the requirements of this Order may allow the San Diego Water Board to include surface waters impaired by discharges from the Copermittees' MS4s in Category 4 in the Integrated Report for consideration during the next 303(d) List submittal by the State to USEPA.

~~30.~~31. **Economic Considerations.** The California Supreme Court has ruled that although CWC section 13263 requires the State and Regional Water Boards (collectively Water Boards) to consider factors set forth in CWC section 13241 when issuing an NPDES permit, the Water Board may not consider the factors to justify imposing pollutant restrictions that are less stringent than the applicable federal regulations require. (*City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 618, 626-627.) However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires

that the Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

As noted in the following finding, the San Diego Water Board finds that the requirements in this Order are not more stringent than the minimum federal requirements. Therefore, a CWC section 13241 analysis is not required for permit requirements that implement the effective prohibition on the discharge of non-storm water into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determined appropriate to control such pollutants, as those requirements are mandated by federal law. Notwithstanding the above, the San Diego Water Board has developed an economic analysis of the requirements in this Order. The economic analysis is provided in the Fact Sheet.

~~31.~~32. **Unfunded Mandates.** This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following:

a. This Order implements federally mandated requirements under CWA section 402 (33 USC section 1342(p)(3)(B)).

b. The local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental and new dischargers who are issued NPDES permits for storm water and non-storm water discharges.

c. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order.

d. The Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)) and in lieu of numeric restrictions on their MS4 discharges (i.e. effluent limitations).

e. The local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under State law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

f. The provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state develops a TMDL, federal law requires that permits must contain water quality based effluent limitations consistent with the assumptions and requirements of any applicable wasteload allocation (40 CFR 122.44(d)(1)(vii)(B)).

See the Fact Sheet for further discussion of unfunded mandates.

32.33. **California Environmental Quality Act.** The issuance of waste discharge requirements and an NPDES permit for the discharge of runoff from MS4s to waters of the U.S. is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 et seq.) in accordance with CWC section 13389.

STATE WATER BOARD DECISIONS

33.34. **Compliance with Prohibitions and Limitations.** The receiving water limitation language specified in this Order is consistent with language recommended by the USEPA and established in State Water Board Order WQ 99-05, *Own Motion Review of the Petition of Environmental Health Coalition to Review Waste Discharge Requirements Order No. 96-03, NPDES Permit No. CAS0108740*, adopted by the State Water Board on June 17, 1999. The receiving water limitation language in this Order requires storm water discharges from MS4s to not cause or contribute to a violation of water quality standards, which is to be achieved through an iterative approach requiring the implementation of improved and better-tailored BMPs over time. Implementation of the iterative approach to comply with receiving water limitations based on applicable water quality standards is necessary to ensure that storm water discharges from the MS4 will not ultimately cause or contribute to violations of water quality standards and will not create conditions of pollution, contamination, or nuisance.

34.35. **Special Conditions for Areas of Special Biological Significance.** On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving an general exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges (General Exception). On June 19, 2012, the State Water Board adopted Order No. 2012-0031, amending the General Exception to require pollutant reductions to be achieved within six years in accordance with ASBS Compliance Plans and ASBS Pollution Prevention Plans. The General Exception State Water Board Resolution No. 2012-0012 requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject to the terms and conditions of the General Exception as amended State Water Board Resolution No. 2012-0012. The Special Protections contained in Attachment B to the General Exception as amendedResolution No. 2012-0012, are applicable to these discharges, and are hereby incorporated into Attachment A of this Order. as if fully set forth herein.

ADMINISTRATIVE FINDINGS

~~35.~~36. **Executive Officer Delegation of Authority.** The San Diego Water Board by prior resolution has delegated all matters that may legally be delegated to its Executive Officer to act on its behalf pursuant to CWC section 13223. Therefore, the Executive Officer is authorized to act on the San Diego Water Board's behalf on any matter within this Order unless such delegation is unlawful under CWC section 13223 or this Order explicitly states otherwise.

~~36.~~37. **Standard Provisions.** Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR 122.42, are provided in Attachment B to this Order.

~~37.~~38. **Fact Sheet.** The Fact Sheet for this Order contains background information, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of this Order. The Fact Sheet is hereby incorporated into this Order and constitutes part of the Findings of this Order.

~~38.~~39. **Public Notice.** In accordance with State and federal laws and regulations, the San Diego Water Board notified the Copermittees, and interested agencies and persons of its intent to prescribe waste discharge requirements for the control of discharges into and from the MS4s to waters of the U.S. and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet.

~~39.~~40. **Public Hearings.** The San Diego Water Board held a public hearing on April 10 and 11, 2013, that was continued to May 8, 2013 and heard and considered all comments pertaining to the terms and conditions of this Order. The San Diego Water Board also held a public workshop on October 8, 2015, and a public hearing on February 11, 2015, and heard and considered all comments pertaining to the amendment of this Order through Order No. R9-2015-0001. Details of these public hearings are provided in the Fact Sheet.

~~40.~~41. **Effective Date.** This Order serves as an NPDES permit pursuant to CWA section 402 or amendments thereto, and as to the San Diego County Copermittees listed in Table 2.a., became ~~becomes~~ effective fifty (50) days after the date of its adoption, and as to the Orange County Copermittees listed in Table 2.b., becomes effective on April 1, 2015, after Order R9-2015-0001 is adopted, provided that the Regional Administrator, USEPA, Region IX, does not object to this Order.

~~41.~~42. **Review by the State Water Board.** Any person aggrieved by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with CWC section 13320 and California Code of Regulations, title 23, sections 2050, ~~et seq~~ and following. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date of this Order ~~San Diego Water Board~~

~~action~~, except that if the thirtieth day following the ~~action~~date of this Order falls on a Saturday, Sunday or State holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

THEREFORE, IT IS HEREBY ORDERED that the Copermittees, in order to meet the provisions contained in division 7 of the CWC (commencing with section 13000) and regulations adopted thereunder, and the provisions of the CWA and regulations adopted thereunder, must each comply with the requirements of this Order. This action in no way prevents the San Diego Water Board from taking enforcement action for past violations of the previous Order. If any part of this Order is subject to a temporary stay of enforcement, unless otherwise specified, the Copermittees must comply with the analogous portions of the previous Order, which will remain in effect for all purposes during the pendency of the stay.

II. PROVISIONS

A. PROHIBITIONS AND LIMITATIONS

The purpose of this provision is to describe the conditions under which storm water and non-storm water discharges into and from MS4s are prohibited or limited. The goal of the prohibitions and limitations is to protect the water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through the implementation of water quality improvement strategies and runoff management programs that effectively prohibit non-storm water discharges into the Copermittees' MS4s, and reduce pollutants in storm water discharges from the Copermittees' MS4s to the MEP.

1. Discharge Prohibitions

a. Discharges from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the state are prohibited.

b. Non-storm water discharges into MS4s are to be effectively prohibited, through the implementation of Provision E.2, unless such discharges are authorized by a separate NPDES permit.

c. Discharges from MS4s are subject to all waste discharge prohibitions in the Basin Plan, included in Attachment A to this Order.

d. Storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 applicable to these discharges, included in Attachment A to this Order. All other discharges from the Copermittees' MS4s to ASBS are prohibited.

2. Receiving Water Limitations

a. Discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters, including but not limited to all applicable provisions contained in:

(1) The San Diego Water Board's Basin Plan, including beneficial uses, water quality objectives, and implementation plans;

(2) State Water Board plans for water quality control including the following:

(a) Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries (Thermal Plan), and

(b) The Ocean Plan, including beneficial uses, water quality objectives, and implementation plans;

(3) State Water Board policies for water and sediment quality control including the following:

(a) Water Quality Control Policy for the Enclosed Bays and Estuaries of California,

(b) Sediment Quality Control Plan which includes the following narrative objectives for bays and estuaries:

(i) Pollutants in sediments shall not be present in quantities that, alone or in combination, are toxic to benthic communities, and

(ii) Pollutants shall not be present in sediments at levels that will bioaccumulate in aquatic life to levels that are harmful to human health,

(c) The Statement of Policy with Respect to Maintaining High Quality of Waters in California;[2]

(4) Priority pollutant criteria promulgated by the USEPA through the following:

(a) National Toxics Rule (NTR)[3] (promulgated on December 22, 1992 and amended on May 4, 1995), and

(b) California Toxics Rule (CTR).[4,5]

b. Discharges from MS4s composed of storm water runoff must not alter natural ocean water quality in an ASBS.

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[2] State Water Board Resolution No. 68-16
[3] 40 CFR 131.36
[4] 65 Federal Register 31682-31719 (May 18, 2000), adding Section 131.38 to 40 CFR
[5] If a water quality objective and a CTR criterion are in effect for the same priority pollutant, the more stringent of the two applies.

3. Effluent Limitations

a. Technology Based Effluent Limitations

Pollutants in storm water discharges from MS4s must be reduced to the MEP.[6]

b. Water Quality Based Effluent Limitations

Each Copermittee must comply with applicable WQBELs established for the TMDLs in Attachment E to this Order, pursuant to the applicable TMDL compliance schedules.

4. Compliance with Discharge Prohibitions and Receiving Water Limitations

Each Copermittee must achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order through timely implementation of control measures and other actions as specified in Provisions B and E of this Order, including any modifications. The Water Quality Improvement Plans required under Provision B must be designed and adapted to ultimately achieve compliance with Provisions A.1.a, A.1.c and A.2.a.

a. If exceedance(s) of water quality standards persist in receiving waters notwithstanding implementation of this Order, the Copermittees must comply with the following procedures:

(1) For exceedance(s) of a water quality standard in the process of being addressed by the Water Quality Improvement Plan, the Copermittee(s) must implement the Water Quality Improvement Plan as accepted by the San Diego Water Board, and update the Water Quality Improvement Plan, as necessary, pursuant to Provision F.2.c;

(2) Upon a determination by either the Copermittees or the San Diego Water Board that discharges from the MS4 are causing or contributing to a new exceedance of an applicable water quality standard not addressed by the Water Quality Improvement Plan, the Copermittees must submit the following updates to the Water Quality Improvement Plan pursuant to Provision F.2.c or as part of the Water Quality Improvement Plan Annual Report required under Provision F.3.b, unless the San Diego Water Board directs an earlier submittal:

(a) The water quality improvement strategies being implemented that are effective and will continue to be implemented,

[6] This does not apply to MS4 discharges which receive subsequent treatment to reduce pollutants in storm water discharges to the MEP prior to entering receiving waters (e.g., low flow diversions to the sanitary sewer). Runoff treatment must occur prior to the discharge of runoff into receiving waters per Finding 7.

(b) Water quality improvement strategies (i.e. BMPs, retrofitting projects, stream and/or habitat rehabilitation projects, adjustments to jurisdictional runoff management programs, etc.) that will be implemented to reduce or eliminate any pollutants or conditions that are causing or contributing to the exceedance of water quality standards,

(c) Updates to the schedule for implementation of the existing and additional water quality improvement strategies, and

(d) Updates to the monitoring and assessment program to track progress toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a of this Order;

(3) The San Diego Water Board may require the incorporation of additional modifications to the Water Quality Improvement Plan required under Provision B. The applicable Copermittees must submit any modifications to the update to the Water Quality Improvement Plan within 90 days of notification that additional modifications are required by the San Diego Water Board, or as otherwise directed;

(4) Within 90 days of the San Diego Water Board determination that the modifications to the Water Quality Improvement Plan required under Provision A.4.a.(3) meet the requirements of this Order, the applicable Copermittees must revise the jurisdictional runoff management program documents to incorporate the modified water quality improvement strategies that have been and will be implemented, the implementation schedule, and any additional monitoring required; and

(5) Each Copermittee must implement the updated Water Quality Improvement Plan.

b. The procedure set forth above to achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order do not have to be repeated for continuing or recurring exceedances of the same water quality standard(s) following implementation of scheduled actions unless directed to do otherwise by the San Diego Water Board.

c. Nothing in Provisions A.4.a and A.4.b prevents the San Diego Water Board from enforcing any provision of this Order while the applicable Copermittees prepare and implement the above update to the Water Quality Improvement Plan and jurisdictional runoff management programs.

B. WATER QUALITY IMPROVEMENT PLANS

The purpose of this provision is to develop Water Quality Improvement Plans that guide the Copermittees' jurisdictional runoff management programs towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plans is to further the Clean Water Act's objective to protect, preserve, enhance, and restore the water quality and designated beneficial uses of waters of the state. This goal will be accomplished through an adaptive planning and management process that identifies the highest priority water quality conditions within a watershed and implements strategies through the jurisdictional runoff management programs to achieve improvements in the quality of discharges from the MS4s and receiving waters.

1. Watershed Management Areas

The Copermittees must develop a Water Quality Improvement Plan for each of the Watershed Management Areas in Table B-1. A total of ten Water Quality Improvement Plans must be developed for the San Diego Region.

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
San Juan (901.00)	South Orange County	- Aliso Creek - San Juan Creek - San Mateo Creek - Pacific Ocean - Heisler Park ASBS	- City of Aliso Viejo[~~1~~] - City of Dana Point[~~1~~] - City of Laguna Beach[~~1~~] - City of Laguna Hills[1] - City of Laguna Niguel[~~1~~] - City of Laguna Woods[1] - City of Lake Forest[~~1~~2] - City of Mission Viejo[~~1~~] - City of Rancho Santa Margarita[~~1~~] - City of San Clemente[~~1~~] - City of San Juan Capistrano[~~1~~] - County of Orange[~~1~~] - Orange County Flood Control District[~~1~~]
Santa Margarita (902.00)	Santa Margarita River	- Murrieta Creek - Temecula Creek - Santa Margarita River - Santa Margarita Lagoon - Pacific Ocean	- City of Murrieta[~~2~~3] - City of Temecula[~~2~~3] - City of Wildomar[~~2~~3] - County of Riverside[~~2~~3] - County of San Diego[~~3~~4] - Riverside County Flood Control and Water Conservation District[~~2~~3]
San Luis Rey (903.00)	San Luis Rey River	- San Luis Rey River - San Luis Rey Estuary - Pacific Ocean	- City of Oceanside - City of Vista - County of San Diego

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
Carlsbad (904.00)	Carlsbad	- Loma Alta Slough - Buena Vista Lagoon - Agua Hedionda Lagoon - Batiquitos Lagoon - San Elijo Lagoon - Pacific Ocean	- City of Carlsbad - City of Encinitas - City of Escondido - City of Oceanside - City of San Marcos - City of Solana Beach - City of Vista - County of San Diego
San Dieguito (905.00)	San Dieguito River	- San Dieguito River - San Dieguito Lagoon - Pacific Ocean	- City of Del Mar - City of Escondido - City of Poway - City of San Diego - City of Solana Beach - County of San Diego
Penasquitos (906.00)	Penasquitos	- Los Penasquitos Lagoon - Pacific Ocean	- City of Del Mar - City of Poway - City of San Diego - County of San Diego
	Mission Bay	- Mission Bay - Pacific Ocean - San Diego Marine Life Refuge ASBS	- City of San Diego
San Diego (907.00)	San Diego River	- San Diego River - Pacific Ocean	- City of El Cajon - City of La Mesa - City of San Diego - City of Santee - County of San Diego
Pueblo San Diego (908.00) Sweetwater (909.00) Otay (910.00)	San Diego Bay	- Sweetwater River - Otay River - San Diego Bay - Pacific Ocean	- City of Chula Vista - City of Coronado - City of Imperial Beach - City of La Mesa - City of Lemon Grove - City of National City - City of San Diego - County of San Diego - San Diego County Regional Airport Authority - San Diego Unified Port District
Tijuana (911.00)	Tijuana River	- Tijuana River - Tijuana Estuary - Pacific Ocean	- City of Imperial Beach - City of San Diego - County of San Diego

Notes:

1. ~~The Orange County Copermittees will be covered under this Order after expiration of Order No. R9-2009-0002, or earlier if the Orange County Copermittees meet the conditions in Provision F.6.~~By agreement dated February 10, 2015, pursuant to Water Code section 13228, the Phase I MS4 discharges within the jurisdiction of the City of Laguna Hills and the City of Laguna Woods located in the Santa Ana Region are regulated by San Diego Water Board Order No. R9-2013-0001 as amended by Order No. R9-2015-0001, upon the later effective date of Order No. R9-2015-0001 or Santa Ana Water Board Tentative Order No. R8-2015-0001. The City of Laguna Hills and Laguna Woods must also comply with the requirements of the San Diego Creek/Newport Bay TMDL in section XVIII of Santa Ana Water Board Order No. R8-2015-0001.
2. ~~The Riverside County Copermittees will be covered under this Order after expiration of Order No. R9-2010-0016, or earlier if the Riverside County Copermittees meet the conditions in Provision F.6.~~ By agreement dated February 10, 2015, pursuant to Water Code section 13228, Phase I MS4 discharges within the City of Lake Forest located within the San Diego Water Board Region are regulated by the Santa Ana Water Board Order No. R8-2015-0001 (NPDES No. CAS618030) upon the later effective date of this Order or Santa Ana Water Board Tentative Order No. R8-2015-0001. In accordance with the terms of the agreement between the San Diego Water Board and the Santa Ana Water Board, the City of Lake Forest must implement the requirements of the Bacteria TMDL in Attachment E of this Order, participate in preparation and implementation of the Water Quality Improvement Plan for the Aliso Creek Watershed Management Area as described in Provision B of this Order and continue implementation of its over-irrigation discharge prohibition in its City Ordinance, Title 15, Chapter 15, section 14.030, List (b).

~~2.~~3. The Riverside County Copermittees will be covered under this Order after expiration of Order No. R9-2010-0016~~,~~ or earlier if the Riverside County Copermittees meet the conditions in Provision F.6, upon further amendment of this Order.

~~3~~4. The County of San Diego is not required to implement the requirements of Provision B for its jurisdiction within the Santa Margarita River Watershed Management Area until the Riverside County Copermittees have been notified of coverage under this Order. The County of San Diego is required to implement the requirements of Provisions D, F.3.b, and Attachment E until the Riverside County Copermittees have been notified of coverage under this Order.

2. Priority Water Quality Conditions

The Copermittees must identify the water quality priorities within each Watershed Management Area that will be addressed by the Water Quality Improvement Plan. Where appropriate, Watershed Management Areas may be separated into subwatersheds to focus water quality prioritization and jurisdictional runoff management program implementation efforts by receiving water.

a. Assessment of Receiving Water Conditions

The Copermittees must consider the following, at a minimum, to identify water quality priorities based on impacts of MS4 discharges on receiving water beneficial uses:

(1) Receiving waters listed as impaired on the CWA Section 303(d) List of Water Quality Limited Segments (303(d) List);

(2) TMDLs adopted and under development by the San Diego Water Board;

(3) Receiving waters recognized as sensitive or highly valued by the Copermittees, including estuaries designated under the National Estuary Program under CWA section 320, marine protected areas, wetlands defined by the State or U.S. Fish and Wildlife Service's National Wetlands Inventory as wetlands, waters having the Preservation of Biological Habitats of Special Significance (BIOL) beneficial use designation, and receiving waters identified as ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(4) The receiving water limitations of Provision A.2;

(5) Known historical versus current physical, chemical, and biological water quality conditions;

(6) Available, relevant, and appropriately collected and analyzed physical, chemical, and biological receiving water monitoring data, including, but not limited to, data describing:

(a) Chemical constituents,

(b) Water quality parameters (i.e. pH, temperature, conductivity, etc.),

(c) Toxicity Identification Evaluations for both receiving water column and sediment,

(d) Trash impacts,

(e) Bioassessments, and

(f) Physical habitat;

(7) Available evidence of erosional impacts in receiving waters due to accelerated flows (i.e. hydromodification);

(8) Available evidence of adverse impacts to the chemical, physical, and biological integrity of receiving waters; and

(9) The potential improvements in the overall condition of the Watershed Management Area that can be achieved.

b. ASSESSMENT OF IMPACTS FROM MS4 DISCHARGES

The Copermittees must consider the following, at a minimum, to identify the potential impacts to receiving waters that may be caused or contributed to by discharges from the Copermittees' MS4s:

(1) The discharge prohibitions of Provision A.1 and effluent limitations of Provision A.3; and

(2) Available, relevant, and appropriately collected and analyzed storm water and non-storm water monitoring data from the Copermittees' MS4 outfalls;

(3) Locations of each Copermittee's MS4 outfalls that discharge to receiving waters;

(4) Locations of MS4 outfalls that are known to persistently discharge non-storm water to receiving waters likely causing or contributing to impacts on receiving water beneficial uses;

(5) Locations of MS4 outfalls that are known to discharge pollutants in storm water causing or contributing to impacts on receiving water beneficial uses; and

(6) The potential improvements in the quality of discharges from the MS4 that can be achieved.

c. IDENTIFICATION OF PRIORITY WATER QUALITY CONDITIONS

(1) The Copermittees must use the information gathered for Provisions B.2.a and B.2.b to develop a list of priority water quality conditions as pollutants, stressors and/or receiving water conditions that are the highest threat to receiving water quality or that most adversely affect the quality of receiving waters. The list must include the following information for each priority water

quality condition:

(a) The beneficial use(s) associated with the priority water quality condition;

(b) The geographic extent of the priority water quality condition within the Watershed Management Area, if known;

(c) The temporal extent of the priority water quality condition (e.g., dry weather and/or wet weather);

(d) The Copermittees with MS4s discharges that may cause or contribute to the priority water quality condition; and

(e) An assessment of the adequacy of and data gaps in the monitoring data to characterize the conditions causing or contributing to the priority water quality condition, including a consideration of spatial and temporal variation.

(2) The Copermittees must identify the highest priority water quality conditions to be addressed by the Water Quality Improvement Plan, and provide a rationale for selecting a subset of the water quality conditions identified pursuant to Provision B.2.c.(1) as the highest priorities.

d. IDENTIFICATION OF MS4 SOURCES OF POLLUTANTS AND/OR STRESSORS

The Copermittees must identify and prioritize known and suspected sources of storm water and non-storm water pollutants and/or other stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c. The identification of known and suspected sources of pollutants and/or stressors that cause or contribute to the highest priority water quality conditions as identified for Provision B.2.c must consider the following:

(1) Pollutant generating facilities, areas, and/or activities within the Watershed Management Area, including:

(a) Each Copermittee's inventory of construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas,

(b) Publicly owned parks and/or recreational areas,

(c) Open space areas,

(d) All currently operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste, and

(e) Areas not within the Copermittees' jurisdictions (e.g., Phase II MS4s, tribal

lands, state lands, federal lands) that are known or suspected to be discharging to the Copermittees' MS4s;

(2) Locations of the Copermittees' MS4s, including the following:

(a) All MS4 outfalls that discharge to receiving waters, and

(b) Locations of major structural controls for storm water and non-storm water (e.g., retention basins, detention basins, major infiltration devices, etc.);

(3) Other known and suspected sources of non-storm water or pollutants in storm water discharges to receiving waters within the Watershed Management Area, including the following:

(a) Other MS4 outfalls (e.g., Phase II Municipal and Caltrans),

(b) Other NPDES permitted discharges,

(c) Any other discharges that may be considered point sources (e.g., private outfalls), and

(d) Any other discharges that may be considered non-point sources (e.g., agriculture, wildlife or other natural sources);

(4) Review of available data, including but not limited to:

(a) Findings from the Copermittees' illicit discharge detection and elimination programs,

(b) Findings from the Copermittees' MS4 outfall discharge monitoring,

(c) Findings from the Copermittees' receiving water monitoring,

(d) Findings from the Copermittees' MS4 outfall discharge and receiving water assessments, and

(e) Other available, relevant, and appropriately collected data, information, or studies related to pollutant sources and/or stressors that contribute to the highest priority water quality conditions as identified for Provision B.2.c.

(5) The adequacy of the available data to identify and prioritize sources and/or stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c.

e. IDENTIFICATION OF POTENTIAL WATER QUALITY IMPROVEMENT STRATEGIES

The Copermittees must evaluate the findings identified under Provisions B.2.a-d, and identify potential strategies that can result in improvements to water quality in MS4 discharges and/or receiving waters within the Watershed Management

Area. Potential water quality improvement strategies that may be implemented within the Watershed Management Area must include the following:

(1) Structural BMPs, non-structural BMPs, incentives, or programs that can potentially be implemented to address the highest priority water quality conditions identified under Provision B.2.c, or MS4 sources of pollutants or stressors identified under Provision B.2.d,

(2) Retrofitting projects in areas of existing development within the Watershed Management Area that can potentially be implemented to reduce MS4 sources of pollutants or stressors identified under Provision B.2.d causing or contributing to the highest priority water quality conditions identified under Provision B.2.c, and

(3) Stream, channel, and/or habitat rehabilitation projects within the Watershed Management Area that can potentially be implemented to protect and/or improve conditions in receiving waters from MS4 pollutants and/or stressors identified under Provision B.2.d causing or contributing to the highest priority water quality conditions identified under Provision B.2.c.

3. Water Quality Improvement Goals, Strategies and Schedules

The Copermittees must identify and develop specific water quality improvement goals and strategies to address the highest priority water quality conditions identified within a Watershed Management Area. The water quality improvement goals and strategies must address the highest priority water quality conditions by effectively prohibiting non-storm water discharges to the MS4, reducing pollutants in storm water discharges from the MS4 to the MEP, and protecting the water quality standards of receiving waters.

a. WATER QUALITY IMPROVEMENT GOALS AND SCHEDULES

(1) Numeric Goals

The Copermittees must develop and incorporate numeric goals[7] into the Water Quality Improvement Plan. Numeric goals must be used to support Water Quality Improvement Plan implementation and measure reasonable progress towards addressing the highest priority water quality conditions identified under Provision B.2.c. The Copermittees must establish and incorporate the following numeric goals in the Water Quality Improvement

[7] Interim and final numeric goals may take a variety of forms such as TMDL established WQBELs, action levels, pollutant concentration, load reductions, number of impaired water bodies delisted from the List of Water Quality Impaired Segments, Index of Biotic Integrity (IBI) scores, or other appropriate metrics. Interim and final numeric goals are not necessarily limited to one criterion or indicator, but may include multiple criteria and/or indicators. Except for TMDL established WQBELs, interim and final numeric goals and corresponding schedules may be revised through the adaptive management process under Provision B.5.

Plan:

(a) Final numeric goals must be based on measureable criteria or indicators capable of demonstrating one or more of the following:

(i) Discharges from the Copermittees' MS4s will not cause or contribute to exceedances of water quality standards in receiving waters, AND/OR

(ii) The conditions of receiving waters and associated habitat are protected from MS4 discharges, AND/OR

(iii) Beneficial uses of receiving waters are protected from MS4 discharges and will be supported.

(b) Interim numeric goals must be based on measureable criteria or indicators capable of demonstrating reasonable incremental progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges as follows:

(i) One or more interim numeric goals may be established to demonstrate progress toward achieving each final numeric goal,

(ii) For each final numeric goal, at least one interim numeric goal must be expressed as a reasonable increment toward achievement of the final numeric goal,

(iii) For each final numeric goal, reasonable interim numeric goals must be established to be accomplished during each 5 year period between the acceptance of the Water Quality Improvement Plan and the achievement of the final numeric goals.

(2) Schedules for Achieving Numeric Goals

The Copermittees must develop and incorporate schedules for achieving the numeric goals into the Water Quality Improvement Plan. The schedules must demonstrate reasonable progress toward achieving the final numeric goals required for Provision B.3.a.(1). The Copermittees must incorporate the schedules for achieving the numeric goals into the Water Quality Improvement Plan based on the following considerations:

(a) Final dates for achieving all final numeric goals must be established considering the following:

(i) Final compliance dates for any applicable TMDLs in Attachment E to this Order;

(ii) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(iii) Achievement of the final numeric goals for the highest water quality priorities must be as soon as possible;

(iv) Final dates for achieving the final numeric goals must reflect a realistic assessment of the shortest practicable time required based on the temporal and spatial extent and factors associated with the highest priority water quality conditions identified under Provision B.2.c, and taking into account the time reasonably required to implement the water quality improvement strategies required pursuant to Provision B.3.b.

(b) Interim dates for achieving all interim numeric goals must be established considering the following:

(i) Interim compliance dates for any applicable TMDLs in Attachment E to this Order;

(ii) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(iii) Interim dates for achieving the interim numeric goals must reflect a realistic assessment of the shortest practicable time reasonably required, taking into account the time needed to implement new or significantly expanded programs and securing financing, if necessary; and

(iv) For each final numeric goal, at least one interim numeric goal must be established that the Copermittees will work toward achieving within the term of this Order.

b. WATER QUALITY IMPROVEMENT STRATEGIES AND SCHEDULES

Based on the likely effectiveness and efficiency of the potential water quality improvement strategies identified under Provision B.2.e to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a, the Copermittees must identify the strategies that will be implemented in each Watershed Management Area as follows:

(1) Jurisdictional Strategies

(a) Each Copermittee in the Watershed Management Area must identify the strategies that will be implemented within its jurisdiction as part of its jurisdictional runoff management program requirements under Provisions E.2 through E.7, including descriptions of the following:

(i) For each of the inventories developed for its jurisdiction, as required

under Provisions D.2.a.(1), E.3.e.(2), E.4.b, and E.5.a, each Copermittee must identify the known and suspected areas or sources causing or contributing to the highest priority water quality conditions in the Watershed Management Area that the Copermittee will focus on in its efforts to effectively prohibit non-storm water discharges to its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, and achieve the interim and final numeric goals identified under Provision B.3.a;

(ii) BMPs that each Copermittee will implement, or require to be implemented, as applicable, for those areas or sources within its jurisdiction;

(iii) Education programs that each Copermittee will implement, as applicable, for those areas or sources within its jurisdiction;

(iv) Frequencies that each Copermittee will conduct inspections on those areas or sources within its jurisdiction;

(v) Incentive and enforcement programs that each Copermittee will implement, as applicable, for those areas or sources within its jurisdiction; and

(vi) Any other BMPs, incentives, or programs that each Copermittee will implement for those areas or sources within its jurisdiction.

(b) Identify the optional jurisdictional strategies that each Copermittee will implement within its jurisdiction, as necessary, to effectively prohibit non-storm water discharges to its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. Descriptions of the optional jurisdictional strategies must include:

(i) BMPs, incentives, or programs that may be implemented by the Copermittee within its jurisdiction in addition to the requirements of Provisions B.3.b.(1)(a);

(ii) Incentives or programs that may be implemented by the Copermittee to encourage or implement projects to retrofit areas of existing development within its jurisdiction;

(iii) Incentives or programs that may be implemented by the Copermittee to encourage or implement projects that will rehabilitate the conditions of channels or habitats within its jurisdiction;

(iv) The funds and/or resources that must be secured by the Copermittee to implement the optional strategies described for Provisions B.3.b.(1)(b)(i)-(iii) within its jurisdiction; and

(v) The circumstances necessary to trigger implementation of the optional jurisdictional strategies, in addition to the requirements of Provision B.3.b.(1)(a), to achieve the interim and final numeric goals within the schedules established under Provision B.3.a.

(c) Identify the strategies that will be implemented by the Copermittee in coordination with or with the cooperation of other agencies (e.g. Caltrans, water districts, school districts) and/or entities (e.g. non-governmental organizations) within its jurisdiction.

(2) Watershed Management Area Strategies

The Copermittees must identify the optional regional or multi-jurisdictional strategies that will be implemented in the Watershed Management Area, as necessary, to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. Descriptions of the optional regional or multi-jurisdictional strategies must include:

(a) Regional or multi-jurisdictional BMPs, incentives, or programs that may be implemented by the Copermittees in the Watershed Management Area;

(b) Incentives or programs that may be implemented by the Copermittees in the Watershed Management Area to encourage or implement regional or multi-jurisdictional projects to retrofit areas of existing development;

(c) Incentives or programs that may be implemented by the Copermittees to encourage or implement regional or multi-jurisdictional projects that will rehabilitate the conditions of channels, streams, or habitats within the Watershed Management Area;

(d) The funds and/or resources that must be secured by the Copermittees to implement the optional strategies described for Provisions B.3.b.(2)(a)-(c) within the Watershed Management Area; and

(e) The circumstances necessary to trigger implementation of the optional regional or multi-jurisdictional strategies to achieve the interim and final numeric goals within the schedules established under Provision B.3.a.

(3) Schedules for Implementing Strategies

The Copermittees must develop reasonable schedules for implementing the water quality improvement strategies identified under Provisions B.3.b.(1) and B.3.b.(2) to achieve the interim and final numeric goals identified and

schedules established under Provision B.3.a. The Copermittees must incorporate the schedules to implement the water quality improvement strategies into the Water Quality Improvement Plan as follows:

(a) Each Copermittee must develop schedules for the jurisdictional strategies identified pursuant to Provisions B.3.b.(1)(a)-(b). Each schedule must specify:

(i) If each jurisdictional strategy identified pursuant to Provision B.3.b.(1)(a) will or will not be initiated upon acceptance of the Water Quality Improvement Plan;

(ii) For each jurisdictional strategy identified pursuant to Provision B.3.b.(1)(a) that will not be initiated upon acceptance~~approval~~ of the Water Quality Improvement Plan, the shortest practicable time in which each jurisdictional strategy will be initiated after acceptance of the Water Quality Improvement Plan;

(iii) For each optional jurisdictional strategy identified pursuant to Provision B.3.b.(1)(b), a realistic assessment of the shortest practicable time required to:

[a] Secure the resources needed to fund the optional jurisdictional strategy, and
[b] Procure the resources, materials, labor, and applicable permits necessary to initiate implementation of the optional jurisdictional strategy;

(iv) If each jurisdictional strategy identified pursuant to Provisions B.3.b.(1)(a)-(b) is expected to be continuously implemented (e.g. inspections) or completed within a schedule (e.g. construction of structural BMP); and

(v) If a jurisdictional strategy identified pursuant to Provisions B.3.b.(1)(a)-(b) is expected to be completed within a schedule, the anticipated time to complete based on a realistic assessment of the shortest practicable time required.

(b) The Copermittees in the Watershed Management Area must develop schedules for the regional or multi-jurisdictional strategies identified pursuant to Provision B.3.b.(2). Each schedule must specify:

(i) A realistic assessment of the shortest practicable time to:

[a] Secure the resources needed to fund the optional regional or multi-jurisdictional strategy, and
[b] Procure the resources, materials, labor, and permits necessary to initiate the implementation of the optional regional or multi-jurisdictional strategy;

(ii) If each regional or multi-jurisdictional strategy identified pursuant to Provision B.3.b.(2) is expected to be continuously implemented (e.g. inspections) or completed within a schedule (e.g. construction of structural BMP); and

(iii) If a regional or multi-jurisdictional strategy and/or activity identified pursuant to Provisions B.3.b.(2) is expected to be completed within a schedule, the anticipated time to complete based on a realistic assessment of the shortest practicable time required.

(4) Optional Watershed Management Area Analysis

(a) For each Watershed Management Area, the Copermittees have the option to perform a Watershed Management Area Analysis for the purpose of developing watershed-specific requirements for structural BMP implementation, as described in Provision E.3.c.(3). The Watershed Management Area Analysis must include GIS layers (maps) as output. The analysis must include the following information, to the extent it is available, in order to characterize the Watershed Management Areas:

(i) A description of dominant hydrologic processes, such as areas where infiltration or overland flow likely dominates;

(ii) A description of existing streams in the watershed, including bed material and composition, and if they are perennial or ephemeral;

(iii) Current and anticipated future land uses;

(iv) Potential coarse sediment yield areas; and

(v) Locations of existing flood control structures and channel structures, such as stream armoring, constrictions, grade control structures, and hydromodification or flood management basins.

(b) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify and compile a list of candidate projects that could potentially be used as alternative compliance options for Priority Development Projects, to be implemented in lieu of onsite structural BMP performance requirements described in Provisions E.3.c.(1) and E.3.c.(2). Specifically, the Copermittees must identify opportunities to be included in the list of candidate projects in each Watershed Management Area, such as:

(i) Stream or riparian area rehabilitation;

(ii) Retrofitting existing infrastructure to incorporate storm water retention or treatment;

(iii) Regional BMPs;

(iv) Groundwater recharge projects;

(v) Water supply augmentation projects; and

(vi) Land purchases to preserve floodplain functions.

(c) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify areas within the Watershed Management Area where it is appropriate to allow Priority Development Projects to be exempt from the hydromodification management BMP performance requirements described in Provision E.3.c.(2), including supporting rationale.

4. Water Quality Improvement Monitoring and Assessment Program

a. The Copermittees in each Watershed Management Area must develop and incorporate an integrated monitoring and assessment program into the Water Quality Improvement Plan that assesses: 1) the progress toward achieving the numeric goals and schedules, 2) the progress toward addressing the highest priority water quality conditions for each Watershed Management Area, and 3) each Copermittee's overall efforts to implement the Water Quality Improvement Plan.

b. The monitoring and assessment program must incorporate the monitoring and assessment requirements of Provision D, which may allow the Copermittees to modify the program to be consistent with and focus on the highest priority water quality conditions for each Watershed Management Area.

c. For Watershed Management Areas with applicable TMDLs, the monitoring and assessment program must incorporate the specific monitoring and assessment requirements of Attachment E.

d. For Watershed Management Areas with any ASBS, the water quality monitoring and assessment program must incorporate the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

5. Iterative Approach and Adaptive Management Process

The Copermittees in each Watershed Management Area must implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a, and must include the following:

a. RE-EVALUATION OF PRIORITY WATER QUALITY CONDITIONS

The priority water quality conditions and potential water quality improvement strategies included in the Water Quality Improvement Plan pursuant to Provisions B.2.c and B.2.e may be re-evaluated by the Copermittees as needed during the term of this Order as part of the Water Quality Improvement Plan Annual Report. Re-evaluation and recommendations for modifications to the priority water quality conditions and potential water quality improvement strategies must be provided in the Report of Waste Discharge, and must consider the following:

(1) Achieving the outcome of improved water quality in MS4 discharges and receiving waters through implementation of the water quality improvement strategies identified in the Water Quality Improvement Plan;

(2) New information developed when the requirements of Provisions B.2.a-c have been re-evaluated;

(3) Spatial and temporal accuracy of monitoring data collected to inform prioritization of water quality conditions and implementation strategies to address the highest priority water quality conditions;

(4) Availability of new information and data from sources other than the jurisdictional runoff management programs within the Watershed Management Area that informs the effectiveness of the actions implemented by the Copermittees;

(5) San Diego Water Board recommendations; and

(6) Recommendations for modifications solicited through a public participation process.

b. ADAPTATION OF GOALS, STRATEGIES AND SCHEDULES

The water quality improvement goals, strategies and schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.3, must be re-evaluated and adapted as new information becomes available to result in more effective and efficient measures to address the highest priority water quality conditions identified pursuant to Provision B.2.c. Re-evaluation of and modifications to the water quality improvement goals, strategies and schedules must be provided in the Water Quality Improvement Plan Annual Report, and must consider the following:

(1) Modifications to the priority water quality conditions based on Provision B.5.a;

(2) Progress toward achieving interim and final numeric goals in receiving waters and MS4 discharges for the highest priority water quality conditions in the Watershed Management Area,

(3) Progress toward achieving outcomes according to established schedules;

(4) New policies or regulations that may affect identified numeric goals;

(5) Measurable or demonstrable reductions of non-storm water discharges to and from each Copermittee's MS4;

(6) Measurable or demonstrable reductions of pollutants in storm water discharges from each Copermittee's MS4 to the MEP;

(7) New information developed when the requirements of Provisions B.2.b and B.2.d have been re-evaluated;

(8) Efficiency in implementing the Water Quality Improvement Plan;

(9) San Diego Water Board recommendations; and

(10) Recommendations for modifications solicited through a public participation process.

c. ADAPTATION OF MONITORING AND ASSESSMENT PROGRAM

The water quality improvement monitoring and assessment program, included in the Water Quality Improvement Plan pursuant to Provision B.4, must be re-evaluated and adapted when new information becomes available. Re-evaluation and recommendations for modifications to the monitoring and assessment program, pursuant to the requirements of Provision D, may be provided in the Water Quality Improvement Plan Annual Report, but must be provided in the Report of Waste Discharge.

6. Water Quality Improvement Plan Submittal, Updates, and Implementation

a. The Copermittees must submit and commence implementation of the Water Quality Improvement Plans in accordance with the requirements of Provision F.1.

b. The Copermittees must submit proposed updates to the Water Quality Improvement Plan for acceptance by the San Diego Water Board Executive Officer in accordance with the requirements of Provision F.2.c.

C. ACTION LEVELS

The purpose of this provision is for the Copermittees to incorporate numeric action levels in the Water Quality Improvement Plans. The goal of the action levels is to guide Water Quality Improvement Plan implementation efforts and measure progress towards the protection of water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through monitoring and assessing the quality of the MS4 discharges during the implementation of the Water Quality Improvement Plans.

1. Non-Storm Water Action Levels[8]

The Copermittees must develop and incorporate numeric non-storm water action levels (NALs) into the Water Quality Improvement Plan to: 1) support the development and prioritization of water quality improvement strategies for effectively prohibiting non-storm water discharges to the MS4s, 2) assess the effectiveness of the water quality improvement strategies toward addressing MS4 non-storm water discharges, required pursuant to Provision D.4.b.(1), and 3) support the detection and elimination of non-storm water and illicit discharges to the MS4, required pursuant to Provision E.2.[9]

a. The following NALs must be incorporated:

(1) Non-Storm Water Discharges from MS4s to Ocean Surf Zone

Table C-1. Non-Storm Water Action Levels for Discharges from MS4s to Ocean Surf Zone

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Total Coliform	MPN/100 ml	1,000	-	10,000/1,000[1]	OP
Fecal Coliform	MPN/100 ml	200[2]	-	400	OP
Enterococci	MPN/100 ml	35	-	104[3]	OP

Abbreviations/Acronyms
AMAL – average monthly action level
MDAL – maximum daily action level
OP – Ocean Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Total coliform density NAL is 1,000 MPN/100 ml when the fecal/total coliform ratio exceeds 0.1.
2. Fecal coliform density NAL is 200 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas."

[8] NALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, unless the NAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed.
[9] The Copermittees may utilize NALs or other benchmarks currently established by the Copermittees as interim NALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

(2) Non-Storm Water Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Table C-2. Non-Storm Water Action Levels for Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Turbidity	NTU	75	-	225	OP
pH	Units	Within limit of 6.0 to 9.0 at all times			OP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	35	-	104[3]	BP
Priority Pollutants	µg/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
OP – Ocean Plan water quality objective
NTU – Nephelometric Turbidity Units
µg/L – micrograms per liter
MDAL – maximum daily action level
BP – Basin Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas" and is not applicable to water bodies that are not designated with the water contact recreation (REC-1) beneficial use.

Table C-3. Non-Storm Water Action Levels for Priority Pollutants

Parameter	Units	Freshwater (CTR)		Saltwater (CTR)	
		MDAL	AMAL	MDAL	AMAL
Cadmium	µg/L	**	**	16	8
Copper	µg/L	*	*	5.8	2.9
Chromium III	µg/L	**	**	-	-
Chromium VI	µg/L	16	8.1	83	41
Lead	µg/L	*	*	14	2.9
Nickel	µg/L	**	**	14	6.8
Silver	µg/L	*	*	2.2	1.1
Zinc	µg/L	*	*	95	47

Abbreviations/Acronyms:
CTR – California Toxic Rule
AMAL – average monthly action level
µg/L – micrograms per liter
MDAL – maximum daily action level

Notes:
* Action levels developed on a case-by-case basis (see below)
** Action levels developed on a case-by-case basis (see below), but calculated criteria are not to exceed Maximum Contaminant Levels (MCLs) under the California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64431

The Cadmium, Copper, Chromium (III), Lead, Nickel, Silver and Zinc NALs for MS4 discharges to freshwater receiving waters will be developed on a case-by-case basis based on site-specific water quality data (receiving water hardness). For these priority pollutants, refer to 40 CFR 131.38(b)(2).

(3) Non-Storm Water Discharges from MS4s to Inland Surface Waters

Table C-4. Non-Storm Water Action Levels for Discharges from MS4s to Inland Surface Waters

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Dissolved Oxygen	mg/L	Not less than 5.0 in WARM waters and not less than 6.0 in COLD waters			BP
Turbidity	NTU	-	20	See MDAL	BP
pH	Units	Within limit of 6.5 to 8.5 at all times			BP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	33	-	61[3]	BP
Total Nitrogen	mg/L	-	1.0	See MDAL	BP
Total Phosphorus	mg/L	-	0.1	See MDAL	BP
MBAS	mg/L	-	0.5	See MDAL	BP
Iron	mg/L	-	0.3	See MDAL	BP
Manganese	mg/L	-	0.05	See MDAL	BP
Priority Pollutants	µg/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
BP – Basin Plan water quality objective
COLD – cold freshwater habitat beneficial use
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
MDAL – maximum daily action level
WARM – warm freshwater habitat beneficial use
MBAS – Methylene Blue Active Substances
MPN/100 ml – most probable number per 100 milliliters
µg/L – micrograms per liter

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for freshwater "designated beach areas" and is not applicable to water bodies that are not designated with the water contact recreation (REC-1) beneficial use.

b. If not identified in Provision C.1.a, NALs must be identified, developed and incorporated in the Water Quality Improvement Plan for any pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in receiving waters associated with the highest priority water quality conditions related to non-storm water discharges from the MS4s. NALs must be based on:

(1) Applicable water quality standards which may be dependent upon site-specific or receiving water-specific conditions or assumptions to be identified by the Copermittees; or

(2) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the NALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary NALs specific to the Watershed Management Area at levels greater than the NALs required by Provisions C.1.a and C.1.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for effectively prohibiting non-storm water discharges to the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and from the MS4. The

secondary NALs may be developed using an approach acceptable to the San Diego Water Board.

d. Dry weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.b may be utilized to develop or revise NALs based on watershed-specific data, subject to San Diego Water Board Executive Officer approval.

2. Storm Water Action Levels[10]

The Copermittees must develop and incorporate numeric storm water action levels (SALs) in the Water Quality Improvement Plans to: 1) support the development and prioritization of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s, and 2) assess the effectiveness of the water quality improvement strategies toward reducing pollutants in storm water discharges, required pursuant to Provision D.4.b.(2).[11]

a. The following SALs for discharges of storm water from the MS4 must be incorporated:

Table C-5. Storm Water Action Levels for Discharges from MS4s to Receiving Waters

Parameter	Units	Action Level
Turbidity	NTU	126
Nitrate & Nitrite (Total)	mg/L	2.6
Phosphorus (Total P)	mg/L	1.46
Cadmium (Total Cd)*	µg/L	3.0
Copper (Total Cu)*	µg/L	127
Lead (Total Pb)*	µg/L	250
Zinc (Total Zn)*	µg/L	976

Abbreviations/Acronyms:
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
µg/L – micrograms per liter

Notes:
* The sampling must include a measure of receiving water hardness at each MS4 outfall. If a total metal concentration exceeds the corresponding metals SAL in Table C-5, that concentration must be compared to the California Toxics Rule criteria and the USEPA 1-hour maximum concentration for the detected level of receiving water hardness associated with that sample. If it is determined that the sample's total metal concentration for that specific metal exceeds that SAL, but does not exceed the applicable USEPA 1-hour maximum concentration criterion for the measured level of hardness, then the sample result will not be considered above the SAL for that measurement.

[10] SALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, unless the SAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed.

[11] The Copermittees may utilize SALs or other benchmarks currently established by the Copermittees as interim SALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

b. If not identified in Provision C.2.a, SALs must be identified, developed and incorporated in the Water Quality Improvement Plan for pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in receiving waters associated with the highest priority water quality conditions related to storm water discharges from the MS4s. SALs must be based on:

(1) Federal and State water quality guidance and/or water quality standards; and

(2) Site-specific or receiving water-specific conditions; or

(3) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the SALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary SALs specific to the Watershed Management Area at levels greater than the SALs required by Provisions C.2.a and C.2.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s. The secondary SALs may be developed based on the approaches recommended by the State Water Board's Storm Water Panel[12] or using an approach acceptable to the San Diego Water Board.

d. Wet weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.c may be used to develop or revise SALs based upon watershed-specific data, subject to San Diego Water Board Executive Officer approval.

[12] Storm Water Panel Recommendations to the California State Water Resources Control Board: The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities (June 2006)

D. MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS

The purpose of this provision is for the Copermittees to monitor and assess the impact on the conditions of receiving waters caused by discharges from the Copermittees' MS4s under wet weather and dry weather conditions. The goal of the monitoring and assessment program is to inform the Copermittees about the nexus between the health of receiving waters and the water quality condition of the discharges from their MS4s. This goal will be accomplished through monitoring and assessing the conditions of the receiving waters, discharges from the MS4s, pollutant sources and/or stressors, and effectiveness of the water quality improvement strategies implemented as part of the Water Quality Improvement Plans.

1. Receiving Water Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the condition of the receiving waters in each Watershed Management Area during dry weather and wet weather. Following San Diego Water Board acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct long-term receiving water monitoring during implementation of the Water Quality Improvement Plan to assess the long term trends and determine if conditions in receiving waters are improving. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following receiving water monitoring procedures:

a. TRANSITIONAL RECEIVING WATER MONITORING

Until the monitoring requirements and schedules of Provisions D.1.b-e are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following receiving water monitoring in the Watershed Management Area:

(1) Continue the receiving water monitoring programs required in Order Nos. R9-2007-0001 (Monitoring and Reporting Program No. R9-2007-0001 Sections II.A.1-A.5), R9-2009-0002, and R9-2010-0016, unless the Executive Officer provides conditional approval for Copermittees to proceed with implementation of the proposed monitoring and assessment program developed in accordance with Provision B.4;

(2) Continue the monitoring in the Hydromodification Management Plans approved by the San Diego Water Board;

(3) Participate in the following regional receiving water monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring,

(b) Southern California Bight Regional Monitoring, and

(c) Sediment Quality Monitoring;

(4) Implement the monitoring programs developed as part of any implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) for the TMDLs in Attachment E to this Order; and

(5) For Watershed Management Areas with ASBS, implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

b. LONG-TERM RECEIVING WATER MONITORING STATIONS

The Copermittees must select at least one long-term receiving water monitoring station from among the existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees to be representative of the receiving water quality in the Watershed Management Area. Additional long-term receiving water monitoring stations must be selected where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

c. DRY WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three dry weather monitoring events at each of the long-term receiving water monitoring stations. At least one monitoring event must be conducted during the dry season (May 1 – September 30) and at least one monitoring event must be conducted during a dry weather period during the wet season (October 1 – April 30), after the first wet weather event of the season, with an antecedent dry period of at least 72 hours following a storm event producing measureable rainfall of greater than 0.1 inch.

(1) Dry Weather Receiving Water Field Observations

For each dry weather monitoring event, the Copermittees must record field observations consistent with Table D-1 at each long-term receiving water monitoring station.

Table D-1. Field Observations for Receiving Water Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) • Station description (i.e. deposits or stains, vegetation condition, structural condition, and observable biology) • Presence and assessment of trash in and around station

(2) Dry Weather Receiving Water Field Monitoring

For each dry weather monitoring event, if conditions allow the collection of the data, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

Table D-2. Field Monitoring Parameters for Receiving Water Monitoring Stations

Parameters
• pH • Temperature • Specific conductivity • Dissolved oxygen • Turbidity

(3) Dry Weather Receiving Water Analytical Monitoring

For each dry weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable NAL constituents, and

(v) Constituents listed in Table D-3.

Table D-3. Analytical Monitoring Constituents for Receiving Water Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Pesticides	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Mercury • Nickel • Selenium • Thallium • Zinc	• Organophosphate Pesticides • Pyrethroid Pesticides	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(4) Dry Weather Receiving Water Toxicity Monitoring

For each dry weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for aquatic toxicity in accordance with Table D-4. When the State Water Board's Policy for Toxicity Assessment and Control (Toxicity Policy) is approved and in effect, the San Diego Water Board Executive Officer may direct the Copermittees to replace current toxicity program elements with standardized procedures in the Toxicity Policy.

Table D-4. Dry Weather Chronic[1] Toxicity Testing for Receiving Water Monitoring Stations

Organism	Units	Test	USEPA Protocol
Freshwater			
Pimephales promelas (Fathead Minnow)	Pass / Fail	Larval Survival and Growth	EPA-821-R-02-013
Ceriodaphnia dubia (*Daphnid*)	Pass / Fail	Survival and Production	EPA-821-R-02-013
Selenastrum capricornutum (Green Algae)	Pass / Fail	Growth	EPA-821-R-02-013
Marine and Estuarine			
Strongylocentrotus purpuratus *(Purple Sea Urchin)*	Pass / Fail	Embryo-Larval Development	EPA-600-R-95-136

Notes:
1. Chronic toxicity testing is not required at receiving water monitoring stations located at mass loading stations if the channel flows are diverted year-round during dry weather conditions to the sanitary sewer for treatment.

(a) Freshwater Test Species and Methods: If samples are collected in receiving waters with salinity less than 1 ppt, the Copermittees must follow the methods for chronic toxicity tests as established in 40 CFR 136.3 using a single-concentration test design for routine monitoring, or a five-concentration test design for additional toxicity testing if the limitation is exceeded. The Copermittees must estimate the critical life stage chronic toxicity on undiluted samples in accordance with species and short term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms (EPA-821-R-02-013; Table IA, 40 CFR 136). Additional test species may be used by the Copermittees if approved by the San Diego Water Board Executive Officer. The Copermittees must conduct:

(i) A static renewal toxicity test with the fathead minnow, *Pimephales promelas* (Larval Survival and Growth Test Method 1000.0);

(ii) A static renewal toxicity test with the daphnid, *Ceriodaphnia dubia* (Survival and Reproduction Test Method 1002.0); and

(iii) A static renewal toxicity test with the green alga, *Selenastrum capricornutum* (also named *Raphidocelis subcapitata*) (Growth Test Method 1003.0).

(b) Marine and Estuarine Test Species and Methods: If samples are collected in receiving waters with salinity greater or equal to 1 ppt, the Copermittees must follow the methods for chronic toxicity tests as established in 40 CFR 136.3 using a single-concentration test design for routine monitoring, or a five-concentration test design for additional toxicity testing if the limitation is exceeded. The Copermittees must conduct the following critical life state chronic toxicity tests on undiluted samples in accordance with species and short term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms (EPA-600-R-95-136; 1995). Artificial sea salts must be used to increase sample salinity. The Copermittees must conduct a static non-renewal toxicity test with the purple sea urchin, *Strongylocentrotus purpuratus* (Embryo-larval Development Test Method). Additional species may be used by the Copermittees if approved by the San Diego Water Board Executive Officer.

(c) Holding Times: All toxicity tests must be conducted as soon as possible following sample collection. The 36-hour sample holding time for test initiation shall be targeted. However, no more than 72 hours shall elapse before the conclusion of sample collection and test initiation.

(d) Test Species Sensitivity Screening: To determine the most sensitive test species for freshwater, the Copermittees must screen 2 wet weather and 2 dry weather toxicity tests with a vertebrate, an invertebrate, and a plant species. After this screening period, subsequent monitoring must be conducted using the most sensitive test species. Alternatively, if a sensitive test species has already been determined, or if there is prior knowledge of potential toxicant(s) and a test species is sensitive to such toxicant(s), then monitoring must be conducted using only that test species. Sensitive test species determinations must also consider the most sensitive test species used for proximal receiving water monitoring. Rescreening must occur once each permit term.

(e) Chronic toxicity test biological endpoint data must be analyzed using the Test of Significant Toxicity t-test approach specified in *National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document* (USEPA, Office of Wastewater Management, Washington, D.C., EPA-833-R-10-003, 2010). For this monitoring program, the critical chronic instream waste concentration (IWC) is set at 100 percent receiving water (i.e. no dilution) for receiving water samples. A 100 percent receiving water and a control must be tested.

(f) Toxicity Identification Evaluation (TIE) / Toxicity Reduction Evaluation (TRE): If chronic toxicity is detected in receiving waters, the Copermittees must discuss the need for conducting a TIE/TRE in the assessments required under Provision D.4.a.(2), and develop a plan for implementing the TIE/TRE to be incorporated in the Water Quality Improvement Plan.

(5) Dry Weather Receiving Water Bioassessment Monitoring

Bioassessment monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must conduct bioassessment monitoring during at least one dry weather monitoring event at each long-term receiving water monitoring station as follows:

(a) The following bioassessment samples and measurements must be collected:

(i) Macroinvertebrate samples must be collected in accordance with the "Reachwide Benthos (Multihabitat) Procedure" in the most current Surface Water Ambient Monitoring Program (SWAMP) Bioassessment Standard Operating Procedures (SOP), and amendments, as applicable;[13]

(ii) The "Full" suite of physical habitat characterization measurements must be collected in accordance with the most current SWAMP Bioassessment SOP, and as summarized in the SWAMP Stream Habitat Characterization Form – Full Version;[14] and

(iii) Freshwater algae samples must be collected in accordance with the SWAMP Standard Operating Procedures for Collecting Algae Samples.[15] Analysis of samples must include algal taxonomic composition (diatoms and soft algae) and algal biomass.

(b) The bioassessment samples, measurements, and appropriate water chemistry data must be used to calculate the following:

(i) An Index of Biological Integrity (IBI) for macroinvertebrates for each monitoring station where bioassessment monitoring was conducted, based on the most current calculation method;[16] and

[13] Ode, P.R.. 2007. Standard operating procedures for collecting macroinvertebrate samples and associated physical and chemical data for ambient bioassessments in California. California State Water Resources Control Board Surface Water Ambient Monitoring Program (SWAMP) Bioassessment SOP 001. http://www.swrcb.ca.gov/water_issues/programs/swamp/tools.shtml#monitoring

[14] Available at: http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/reports/fieldforms_fullversion052908.pdf

[15] Fetscher et al. 2009. Standard Operating Procedures for Collecting Stream Algae Samples and Associated Physical Habitat and Chemical Data for Ambient Bioassessments in California.

[16] The most current calculation method at the time the Order was adopted is outlined in "A Quantitative Tool for Assessing the Integrity of Southern California Coastal Streams" (Ode, et al. 2005. Environmental Management. Vol. 35, No. 1, pp. 1-13). If an updated or new calculation method is developed, either both (i.e. current and updated/new) methods must be used, or historical IBIs must be recalculated with the updated or new calculation method.

(ii) An IBI for algae for each monitoring station where bioassessment monitoring was conducted, when a calculation method is developed.[17]

(c) In lieu of the requirements of Provision D.1.c.(5)(a), the Copermittees may conduct the bioassessment monitoring in accordance with the "Triad" assessment approach[18] to calculate the IBIs required for Provision D.1.c.(5)(b). The Copermittees must conduct sampling, analysis, and reporting of specified in-stream biological and habitat data according to the protocols specified in the SCCWRP Technical Report No. 539, or subsequent protocols, if developed.

(6) Dry Weather Receiving Water Hydromodification Monitoring

In addition to the hydromodification monitoring conducted as part of the Copermittees' Hydromodification Management Plans, hydromodification monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must collect the following hydromodification monitoring observations and measurements within an appropriate domain of analysis during at least one dry weather monitoring event for each long-term receiving water monitoring station:

(a) Channel conditions, including:

(i) Channel dimensions,

(ii) Hydrologic and geomorphic conditions, and

(iii) Presence and condition of vegetation and habitat;

(b) Location of discharge points;

(c) Habitat integrity;

(d) Photo documentation of existing erosion and habitat impacts, with location (i.e. latitude and longitude coordinates) where photos were taken;

(e) Measurement or estimate of dimensions of any existing channel bed or bank eroded areas, including length, width, and depth of any incisions; and

[17] When a calculation method is developed, IBIs must be calculated for all available and appropriate historical data.
[18] Stormwater Monitoring Coalition Model Monitoring Technical Committee, 2004. Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California. Technical Report #419. August 2004.

(f) Known or suspected cause(s) of existing downstream erosion or habitat impact, including flow, soil, slope, and vegetation conditions, as well as upstream land uses and contributing new and existing development.

d. WET WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three wet weather monitoring events at each long-term receiving water monitoring station. At least one wet weather monitoring event must be conducted during the first wet weather event of the wet season (October 1 – April 30), and at least one wet weather monitoring event during a wet weather event that occurs after February 1.

(1) Wet Weather Receiving Water Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each long-term receiving water monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event;

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(d) Presence and assessment of trash in and around station.

(2) Wet Weather Receiving Water Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

(3) Wet Weather Receiving Water Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) Constituents listed in Table D-3.

(4) Wet Weather Receiving Water Toxicity Monitoring

For each wet weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for chronic aquatic toxicity in accordance with Provisions D.1.c.(4)(a)-(f).

e. OTHER RECEIVING WATER MONITORING REQUIREMENTS

(1) Regional Monitoring

The Copermittees must participate in the following regional receiving waters monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring; and

(b) Southern California Bight Regional Monitoring~~.~~ and

(c) Unified Beach Water Quality Monitoring and Assessment Program. The Orange County Copermittees shall participate in and, together with South Orange County Wastewater Authority and Orange County Health Care Agency, shall share responsibility for implementation of a unified regional beach water quality monitoring and assessment program in south Orange County, as set forth in the October 2014 report, *Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County* , issued pursuant to CWC section 13383 and subject to future revision in the San Diego Water Board December 5, 2014 Letter Directive.

(2) Sediment Quality Monitoring

The Copermittees must perform sediment monitoring to assess compliance with sediment quality receiving water limits applicable to MS4 discharges to enclosed bays and estuaries. The monitoring may be performed either by individual or multiple Copermittees to assess compliance with receiving water limits, or through participation in a water body monitoring coalition. A Sediment Monitoring Plan which satisfies the requirements of the State Water Board's Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part 1 Sediment Quality (Sediment Control Plan) must be submitted as part of the monitoring and assessment program in the Water Quality Improvement Plan.

(a) The Sediment Monitoring Plan design must include the following:

(i) The elements required under Section VII.D (Receiving Water Limits Monitoring Frequency) and Section VII.E (Sediment Monitoring) of the Sediment Control Plan;

(ii) A Quality Assurance Project Plan (QAPP) describing the project objectives and organization, functional activities, and quality assurance/quality control protocols for the water and sediment monitoring; and

(iii) A schedule for completion of all sample collection and analysis activities and submission of Sediment Monitoring Reports.

(b) The Copermittees must implement the Sediment Monitoring Plan in accordance with the schedule contained in the Sediment Monitoring Plan, unless otherwise directed in writing by the San Diego Water Board Executive Officer.

(c) The Copermittees must incorporate a Sediment Monitoring Report as part of the Water Quality Improvement Plan Annual Report in accordance with the schedule contained in the Sediment Monitoring Plan, unless otherwise directed in writing by the San Diego Water Board Executive Officer. The Sediment Monitoring Report must contain the following information:

(i) Analysis: An evaluation, interpretation and tabulation of the water and sediment monitoring data, including interpretations and conclusions as to whether applicable Receiving Water Limitations in this Order have been attained at each sample station;

(ii) Sample Location Map: The locations, type, and number of samples must be identified and shown on a site map; and

(iii) California Environmental Data Exchange Network: A statement certifying that the monitoring data and results have been uploaded into the California Environmental Data Exchange Network (CEDEN).

(d) Based on the Sediment Monitoring Report conclusions the San Diego Water Board may require a human health risk assessment to determine if the human health objective contained in Receiving Water Limitations in Provision A.2.a.(3)(b)(ii) has been attained at each sample station. In conducting a risk assessment, the Copermittees must consider any applicable and relevant information, including California Environmental Protection Agency's (Cal/EPA) Office of Environmental Health Hazard Assessment (OEHHA) policies for fish consumption and risk assessment, Cal/EPA's Department of Toxic Substances Control (DTSC) Risk Assessment, and USEPA Human Health Risk Assessment policies.

(3) ASBS Monitoring

For Watershed Management Areas with ASBS, the Copermittees must implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

f. ALTERNATIVE WATERSHED MONITORING REQUIREMENTS

The San Diego Water Board may direct the Copermittees to participate in an effort to develop alternative watershed monitoring with other regulated entities, other interested parties, and the San Diego Water Board to refine, coordinate, and implement regional monitoring and assessment programs to determine the status and trends of water quality conditions in 1) coastal waters, 2) enclosed

bays, harbors, estuaries, and lagoons, and 3) streams.

2. MS4 Outfall Discharge Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the discharges from the MS4 outfalls in each Watershed Management Area during dry weather and wet weather. Following San Diego Water Board acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct MS4 outfall discharge monitoring during implementation of the Water Quality Improvement Plan to assess the effectiveness of their jurisdictional runoff management programs toward effectively prohibiting non-storm water discharges into the MS4 and reducing pollutants in storm water discharges from their MS4s to the MEP. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following MS4 outfall monitoring procedures:

a. TRANSITIONAL MS4 OUTFALL DISCHARGE MONITORING

Until the monitoring requirements and schedules of Provisions D.2.b-c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following MS4 outfall discharge monitoring in the Watershed Management Area:

(1) MS4 Outfall Discharge Monitoring Station Inventory

Each Copermittee must identify all major MS4 outfalls that discharge directly to receiving waters within its jurisdiction and geo-locate those outfalls on a map of the MS4 pursuant to Provision E.2.b.(1). This information must be compiled into a MS4 outfall discharge monitoring station inventory, and must include the following information:

(a) Latitude and longitude of MS4 outfall point of discharge;

(b) Watershed Management Area;

(c) Hydrologic subarea;

(d) Outlet size;

(e) Accessibility (i.e. safety and without disturbance of critical habitat);

(f) Approximate drainage area; and

(g) Classification of whether the MS4 outfall is known to have persistent dry weather flows, transient dry weather flows, no dry weather flows, or unknown dry weather flows.

(2) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Until the monitoring requirements and schedules of Provision D.2.b are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, each Copermittee must perform dry weather MS4 outfall field screening monitoring to identify non-storm water and illicit discharges within its jurisdiction in accordance with Provision E.2.c, to determine which discharges are transient flows and which are persistent flows, and prioritize the dry weather MS4 discharges that will be investigated and eliminated in accordance with Provision E.2.d.

(a) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Frequency

Each Copermittee must field screen the MS4 outfalls in its inventory developed pursuant to Provision D.2.a.(1) as follows:

(i) For Copermittees with less than 125 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 80 percent of the outfalls must be visually inspected two times per year during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv).

(ii) For Copermittees with 125 major MS4 outfalls or more, but less than or equal to 500 that discharge to receiving waters within a Watershed Management Area, all the outfalls must be visually inspected at least annually during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv).

(iii) For Copermittees with more than 500 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 500 outfalls must be visually inspected at least annually during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv). Copermittees with more than 500 major MS4 outfalls within a Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;

[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(iv) For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major MS4 outfalls within its jurisdiction, at least 500 major MS4 outfalls within its inventory must be visually inspected at least annually during dry weather conditions. Copermittees with more than 500 major MS4 outfalls in more than one Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(v) Inspections of major MS4 outfalls conducted in response to public reports and staff or contractor reports and notifications may count toward the required visual inspections of MS4 outfall discharge monitoring stations.

(b) Transitional Dry Weather MS4 Outfall Discharge Field Screening Visual Observations

(i) An antecedent dry period of at least 72 hours following any storm event producing measurable rainfall greater than 0.1 inch is required prior to conducting field screening visual observations during a field screening monitoring event.

(ii) During the field screening monitoring event, each Copermittee must record visual observations consistent with Table D-5 at each MS4 outfall discharge monitoring station inspected.

Table D-5. Field Screening Visual Observations for MS4 Outfall Discharge Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) - Flow source(s) suspected or identified from non-storm water source investigation - Flow source(s) eliminated during non-storm water source identification • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) - Known or suspected source(s) of pooled or ponded water • Station description (i.e. deposits or stains, vegetation condition, structural condition, observable biology) • Presence and assessment of trash in and around station • Evidence or signs of illicit connections or illegal dumping

(iii) Each Copermittee must implement the requirements of Provisions E.2.d.(2)(c)-(e) based on the field observations required pursuant to Provision D.2.a.(2)(b)(ii).

(iv) Each Copermittee must evaluate field observations together with existing information available from prior reports, inspections and monitoring results to determine whether any observed flowing, pooled, or ponded waters are likely to be transient or persistent flow.[19]

(c) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Records

Based upon the results of the transitional dry weather MS4 outfall discharge field screening monitoring conducted pursuant to Provisions D.2.a.(2)(a)-(b), each Copermittee must update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow.

(3) Transitional Wet Weather MS4 Outfall Discharge Monitoring

Until the monitoring requirements and schedules of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the

[19] Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(a) Transitional Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees must select wet weather MS4 outfall discharge monitoring stations from the inventories developed pursuant to Provision D.2.a.(1) for each Watershed Management Area as follows:

(i) At least five wet weather MS4 outfall discharge monitoring stations that are representative of storm water discharges from areas consisting primarily of residential, commercial, industrial, and typical mixed-use land uses present within the Watershed Management Area;

(ii) At least one wet weather MS4 outfall discharge monitoring station for each Copermittee within the Watershed Management Area; and

(iii) The County of San Diego may select at least two (2) wet weather MS4 outfall discharge monitoring stations for the portion of the Santa Margarita River Watershed Management Area within its jurisdiction to be monitored during the transitional period until the Riverside County Copermittees are notified of coverage under this Order. After the Riverside County Copermittees are notified of coverage under this Order, the Copermittees in the Watershed Management Area must select wet weather MS4 outfall discharge monitoring stations consistent with the requirements above.

(b) Transitional Wet Weather MS4 Outfall Discharge Monitoring Frequency

Each wet weather MS4 outfall discharge monitoring station selected pursuant to Provision D.2.a.(3)(a) must be monitored once during the wet season (October 1 – April 30). The wet weather monitoring events must be selected to be representative of the range of hydrological conditions experienced in the region. At least 10 percent of samples must be conducted during the first wet weather event of the wet season, to include at least one such sample in each Watershed Management Area..

(c) Transitional Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(i) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the

storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(ii) The flow rates and volumes measured or estimated from the MS4 outfall (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(d) Transitional Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(e) Transitional Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, and indicator bacteria;

(iv) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

[a] Time-weighted composites collected over the length of the storm event or the first 24 hour period whichever is shorter, composed of discrete samples, which may be collected through the use of automated equipment, or

[b] Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

[c] If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours;

(v) Only one analysis of the composite of aliquots is required;

(vi) The samples must be analyzed for the following constituents:

[a] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

[b] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and

[c] Constituents listed in Table D-6.

Table D-6. Analytical Monitoring Constituents for Wet Weather MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Nickel • Selenium • Thallium • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(f) Other Transitional Wet Weather MS4 Outfall Discharge Monitoring

The San Diego County Copermittees must continue the wet weather MS4 outfall monitoring program developed under Order No. R9-2007-0001, as approved by the San Diego Water Board, through its planned completion.

b. Dry Weather MS4 Outfall Discharge Monitoring

Each Copermittee must perform dry weather MS4 outfall monitoring to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. Each Copermittee must conduct the following dry weather MS4 outfall discharge monitoring within its jurisdiction:

(1) Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Each Copermittee must continue to perform the dry weather MS4 outfall discharge field screening monitoring in accordance with the requirements of Provision D.2.a.(2). The Copermittee may adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of persistent flow non-storm water discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of visual inspections performed is equivalent to the number of visual inspections required under Provision D.2.a.(2)(a).

(2) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring

Each Copermittee must perform non-storm water persistent flow MS4 outfall discharge monitoring to determine which persistent non-storm water discharges contain concentrations of pollutants below NALs, and which persistent non-storm water discharges impact receiving water quality during dry weather. Each Copermittee must conduct the following non-storm water persistent flow MS4 outfall discharge monitoring within its jurisdiction:

(a) Prioritization of Non-Storm Water Persistent Flow MS4 Outfalls

Based upon the dry weather MS4 outfall discharge field screening monitoring records developed pursuant to Provision D.2.a.(2)(c), each Copermittee must identify and prioritize the MS4 outfalls with persistent flows based on the highest priority water quality conditions identified in the Water Quality Improvement Plan and any additional criteria developed by the Copermittee, which may include historical data and data from sources other than what the Copermittee collects.

(b) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring Frequency

(i) Based on the prioritization of major MS4 outfalls developed under Provision D.2.b.(2)(a), each Copermittee must identify, at a minimum, the 5 highest priority major MS4 outfalls with non-storm water persistent flows that the Copermittee will monitor within its jurisdiction in each Watershed Management Area. For Responsible Copermittees identified by a TMDL in Attachment E to this Order, if the 5 chosen outfall locations are not sufficient to determine compliance with the TMDL(s), then each Responsible Copermittee must identify additional MS4 outfall monitoring locations within its jurisdiction sufficient to address compliance with the TMDL(s). If a Copermittee has less than 5 major outfalls within a Watershed

Management Area, then the Copermittee must monitor all of its major MS4 outfalls with persistent flows within each Watershed Management Area. The location of the highest priority non-storm water persistent flow MS4 outfall monitoring stations must be identified on the map required pursuant to Provision E.2.b.(1). The map must specify which MS4 outfalls are being monitored for compliance with a TMDL.

(ii) Each of the highest priority non-storm water persistent flow MS4 outfall monitoring stations identified pursuant to Provision D.2.b.(2)(b)(i) must be monitored under dry weather conditions at least semi-annually until one of the following occurs:

[a] The non-storm water discharges have been effectively eliminated (i.e. no flowing, pooled, or ponded water) for three consecutive dry weather monitoring events; or

[b] The source(s) of the persistent flows has been identified as a category of non-storm water discharges that does not require an NPDES permit and does not have to be addressed as an illicit discharge because it was not identified as a source of pollutants (i.e. constituents in non-storm water discharge do not exceed NALs), and the persistent flow can be re-prioritized to a lower priority; or

[c] The constituents in the persistent flow non-storm water discharge do not exceed NALs, and the persistent flow can be re-prioritized to a lower priority; or

[d] The source(s) of the persistent flows has been identified as a non-storm water discharge authorized by a separate NPDES permit.

(iii) Where the criteria under Provision D.2.b.(2)(b)(ii) are not met, but the threat to water quality has been reduced by the Copermittee, the highest priority persistent flow MS4 outfall monitoring stations may be reprioritized accordingly for continued dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1).

(iv) Each Copermittee must document removal or re-prioritization of the highest priority persistent flow MS4 outfall monitoring stations identified under Provision D.2.b.(2)(a) in the Water Quality Improvement Plan Annual Report. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized major MS4 outfall in the Watershed Management Area within its jurisdiction, unless there are no remaining qualifying major MS4 outfalls within the Copermittee's jurisdiction in the Watershed Management Area.

(c) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Observations

During each semi-annual monitoring event, each Copermittee must record field observations consistent with Table D-5 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(d) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Monitoring

During each semi-annual monitoring event, if conditions allow the collection of the data, each Copermittee must monitor and record the parameters in Table D-2 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(e) Non-Storm Water Persistent Flow MS4 Outfall Discharge Analytical Monitoring

During each semi-annual monitoring event in which measurable flow is present, each Copermittee must collect and analyze samples from each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Collect grab or composite samples to be analyzed at a qualified laboratory for the following constituents:

[a] Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,
[b] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,
[c] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,
[d] Applicable NAL constituents, and
[e] Constituents listed in Table D-7. The Copermittees may adjust the list of constituents for the Watershed Management Area if historical data or supporting information can be provided that demonstrates or justifies the analysis of a constituent is not necessary.

Table D-7. Analytical Monitoring Constituents for Persistent Flow MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Total Hardness • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Cadmium • Copper • Lead • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(iv) If the Copermittee identifies and eliminates the source of the persistent flow non-storm water discharge, analysis of the sample is not required.

c. WET WEATHER MS4 OUTFALL DISCHARGE MONITORING

The Copermittees must perform wet weather MS4 outfall monitoring to identify pollutants in storm water discharges from the MS4s, to guide pollutant source identification efforts, and to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order. The Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(1) Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees may adjust the wet weather MS4 outfall discharge monitoring locations in the Watershed Management Area, as needed, to identify pollutants in storm water discharges from MS4s, to guide pollutant source identification efforts, and to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of stations is at least equivalent to the number of stations required under Provision D.2.a.(3)(a). Additional outfall monitoring locations, above the minimum per jurisdiction, may be required to demonstrate compliance with the WQBELs associated with the applicable TMDLs in Attachment E.

(2) Wet Weather MS4 Outfall Discharge Monitoring Frequency

The Copermittees must monitor the wet weather MS4 outfall discharge monitoring stations in the Watershed Management Area at least once (1) per year. The Copermittees may need to increase the frequency of monitoring in order to identify pollutants in storm water discharges from the MS4s causing or contributing to the highest priority water quality conditions, to guide pollutant source identification efforts, or to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order.

(3) Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(4) Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(5) Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate

the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites collected over the length of the storm event or the first 24 hour period, whichever is shorter , composed of discrete samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

(iii) If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours.

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) The Copermittees may adjust the analytical monitoring required for the Watershed Management Area, if the Copermittees have historical data or supporting information that can demonstrate or provide justification that the analysis of a constituent is not necessary.

3. Special Studies

a. Within the term of this Order, the Copermittees must initiate the following special studies:

(1) At least two special studies in each Watershed Management Area to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that cause or contribute to highest priority water quality conditions identified in the Water Quality Improvement Plan.

(2) At least one special study for the San Diego Region to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that are impacting receiving waters on a regional basis in the San Diego Region.

(3) One of the two special studies in each Watershed Management Area required pursuant to Provision D.3.a.(1) may be replaced by a special study implemented pursuant to Provision D.3.a.(2).

b. The special studies must, at a minimum, be in conformance with the following criteria:

(1) The special studies must be related to the highest priority water quality conditions identified by the Copermittees in the Watershed Management Area and/or for the entire San Diego Region;

(2) The special studies developed pursuant to Provision D.3.a.(1) must:

(a) Be implemented within the applicable Watershed Management Area, and

(b) Require some form of participation by all the Copermittees within the Watershed Management Area;

(3) The special studies developed pursuant to Provision D.3.a.(2) must:

(a) Be implemented within the San Diego Region, and

(b) Require some form of participation by all Copermittees covered under the requirements of this Order.

(4) The Copermittees are encouraged to partner with environmental groups or third parties knowledgeable of watershed conditions to complete the required special studies.

c. Special studies developed to identify sources of pollutants and/or stressors should be pollutant and/or stressor specific and based on historical monitoring data and monitoring performed pursuant to Provisions D.1 and D.2. Development of source identification special studies should include the following:

(1) A compilation of known information on the specific pollutant and/or stressor,

including data on potential sources and movement of the pollutant and/or stressor within the watershed. Data generated by the Copermittees and others, as well as information available from a literature research on the pollutant and/or stressor should be compiled and analyzed as appropriate.

(2) An identification of data gaps, based on the compiled information generated on the specific pollutant and/or stressor identified in Provision D.3.c.(1). Source identification special studies should be developed to fill identified data gaps.

(3) A monitoring plan that will collect and provide data the Copermittees can utilize to do the following:

(a) Quantify the relative loading or impact of a pollutant and/or stressor from a particular source or pollutant generating activity;

(b) Improve understanding of the fate of a pollutant and/or stressor in the environment;

(c) Develop an inventory of known and suspected sources of a pollutant and/or stressor in the Watershed Management Area; and/or

(d) Prioritize known and suspected sources of a pollutant and/or stressor based on relative magnitude in discharges, geographical distribution (i.e., regional or localized), frequency of occurrence in discharges, human health risk, and controllability.

d. Special studies initiated prior to the effective date of this Order that meet the requirements of Provision D.3.b and are implemented during the term of this Order as part of the Water Quality Improvement Plan may be utilized to fulfill the special study requirements of Provision D.3.a. Special studies completed before the effective date of this Order cannot be utilized to fulfill the special study requirements of Provision D.3.a.

e. The Copermittees must submit the monitoring plans for the special studies in the Water Quality Improvement Plans required pursuant to Provision F.1.

f. The Copermittees are encouraged to share the results of the special studies regionally among the Copermittees to provide information useful in improving and adapting the management of non-storm water and storm water runoff through the implementation of the Water Quality Improvement Plans.

4. Assessment Requirements

Each Copermittee must evaluate the data collected pursuant to Provisions D.1, D.2 and D.3, and information collected during the implementation of the jurisdictional

runoff management programs required pursuant to Provision E, to assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a. Assessments must be performed as described in the following provisions:

a. RECEIVING WATERS ASSESSMENTS

(1) The Copermittees must assess and report the conditions of the receiving waters in the Watershed Management Area as follows:

(a) Based on data collected pursuant to Provision D.1.a, the assessments under Provision D.4.a.(2) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(b) Based on the data collected pursuant to Provisions D.1.a-e, the assessments required under Provision D.4.a.(2) must be included in the Report of Waste Discharge required pursuant to Provision F.5.b.

(2) The Copermittees must assess the status and trends of receiving water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under dry weather and wet weather conditions. For each of the three types of receiving waters in each Watershed Management Area the Copermittees must:

(a) Determine whether or not the conditions of the receiving waters are meeting the numeric goals established pursuant to Provision B.3.a;

(b) Identify the most critical beneficial uses that must be protected to ensure overall health of the receiving water;

(c) Determine whether or not those critical beneficial uses are being protected;

(d) Identify short-term and/or long-term improvements or degradation of those critical beneficial uses;

(e) Determine whether or not the strategies established in the Water Quality Improvement Plan contribute towards progress in achieving the interim and final numeric goals of the Water Quality Improvement Plan; and

(f) Identify data gaps in the monitoring data necessary to assess Provisions D.4.a.(2)(a)-(e).

b. MS4 OUTFALL DISCHARGES ASSESSMENTS

(1) Non-Storm Water Discharges Reduction Assessments

(a) Each Copermittee must assess and report the progress of its illicit discharge detection and elimination program, required to be implemented pursuant to Provision E.2, toward effectively prohibiting non-storm water and illicit discharges into the MS4 within its jurisdiction as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(2), the assessments under Provision D.4.b.(1)(b) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(ii) Based on the data collected pursuant to Provisions D.2.b, the assessments required under Provision D.4.b.(1)(c) must be included in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

(iii) Based on the data collected pursuant to Provisions D.2.b, the assessment required under Provision D.4.b.(1)(c) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.a.(2), each Copermittee must assess and report the following:

(i) Identify the known and suspected controllable sources (e.g. facilities, areas, land uses, pollutant generating activities) of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area;

(ii) Identify sources of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area that have been reduced or eliminated; and

(iii) Identify modifications to the field screening monitoring locations and frequencies for the MS4 outfalls in its inventory necessary to identify and eliminate sources of persistent flow non-storm water discharges pursuant to Provision D.2.b.

(c) Based on the dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1), each Copermittee must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(1)(b);

(ii) Based on the data collected and applicable NALs in the Water Quality Improvement Plan, rank the MS4 outfalls in the Copermittee's jurisdiction according to potential threat to receiving water quality, and produce a prioritized list of major MS4 outfalls for follow-up action to update the Water Quality Improvement Plan, with the goal of eliminating persistent flow non-storm water discharges and/or pollutant loads in order of the ranked priority list through targeted programmatic actions and source investigations;

(iii) For the highest priority major MS4 outfalls with persistent flows that are in exceedance of NALs, identify the known and suspected sources within the Copermittee's jurisdiction in the Watershed Management Area that may cause or contribute to the NAL exceedances;

(iv) Each Copermittee must analyze the data collected pursuant to Provision D.2.b, and utilize a model or other method, to calculate or estimate the non-storm water volumes and pollutant loads collectively discharged from all the major MS4s outfalls in its jurisdiction identified as having persistent dry weather flows during the monitoring year. These calculations or estimates must be updated annually.

[a] Each Copermittee must calculate or estimate the annual non-storm water volumes and pollutant loads collectively discharged from the Copermittee's major MS4 outfalls to receiving waters within the Copermittee's jurisdiction, with an estimate of the percent contribution from each known source for each MS4 outfall;

[b] Each Copermittee must annually identify and quantify (i.e. volume and pollutant loads) sources of non-storm water not subject to the Copermittee's legal authority that are discharged from the Copermittee's major MS4 outfalls to downstream receiving waters.

(v) Each Copermittee must review the data collected pursuant to Provision D.2.b and findings from the assessments required pursuant to Provision D.4.b.(1)(c)(i)-(iv) at least once during the term of this Order to:

[a] Identify reductions and progress in achieving reductions in non-storm water and illicit discharges to the Copermittee's MS4 in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction, with an estimate, if possible, of the non-storm water volume and/or pollutant load reductions

attributable to specific water quality strategies implemented by the Copermittee; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittee in the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction.

(vi) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(1)(c)(i)-(v).

(2) Storm Water Pollutant Discharges Reduction Assessments

(a) The Copermittees must assess and report the progress of the water quality improvement strategies, required to be implemented pursuant to Provisions B and E, toward reducing pollutants in storm water discharges from the MS4s within the Watershed Management Area as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(3), the assessments under Provision D.4.b.(2)(b) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(ii) Based on the data collected pursuant to Provisions D.2.c, the assessments required under Provision D.4.b.(2)(c) must be included in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

(iii) Based on the data collected pursuant to Provisions D.2.c, the assessment required under Provisions D.4.b.(2)(c)-(d) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.a.(3) the Copermittees must assess and report the following:

(i) The Copermittees must analyze the monitoring data collected pursuant to Provision D.2.a.(3), and utilize a watershed model or other method, to calculate or estimate the following for each monitoring year:

[a] The average storm water runoff coefficient for each land use type within the Watershed Management Area;

[b] The volume of storm water and pollutant loads discharged from each of the Copermittee's monitored MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch;

[c] The total flow volume and pollutant loadings discharged from the Copermittee's jurisdiction within the Watershed Management Area over the course of the wet season, extrapolated from the data produced from the monitored MS4 outfalls; and

[d] The percent contribution of storm water volumes and pollutant loads discharged from each land use type within each hydrologic subarea with a major MS4 outfall to receiving waters or within each major MS4 outfall to receiving waters in the Copermittee's jurisdiction within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch.

(ii) Identify modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify pollutants in storm water discharges from the MS4s in the Watershed Management Area pursuant to Provision D.2.c.(1).

(c) Based on the wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.c the Copermittees must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(2)(b);

(ii) Based on the data collected and applicable SALs in the Water Quality Improvement Plan, analyze and compare the monitoring data to the analyses and assumptions used to develop the Water Quality Improvement Plans, including strategies developed pursuant to Provision B.3, and evaluate whether those analyses and assumptions should be updated as a component of the adaptive management efforts pursuant to Provision B.5 for follow-up action to update the Water Quality Improvement Plan;

(iii) The Copermittees must review the data collected pursuant to Provision D.2.c and findings from the assessments required pursuant to Provisions D.4.b.(2)(c)(i)-(ii) at least once during the term of this Order to:

[a] Identify reductions or progress in achieving reductions in pollutant concentrations and/or pollutant loads from different land uses and/or drainage areas discharging from the Copermittees' MS4s in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters within the Watershed Management Area to the MEP, with an estimate, if possible, of the pollutant load reductions attributable to specific water quality strategies implemented by the Copermittees; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittees in the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters in the Watershed Management Area to the MEP.

(iv) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(iii).

(d) The Copermittees must evaluate all the data collected pursuant to Provision D.2.c, and incorporate new outfall monitoring data into time series plots for each long-term monitoring constituent for the Watershed Management Area, and perform statistical trends analysis on the cumulative long-term wet weather MS4 outfall discharge water quality data set.

c. Special Studies Assessments

The Copermittees must annually evaluate the results and findings from the special studies developed and implemented pursuant to Provision D.3, and assess their relevance to the Copermittees' efforts to characterize receiving water conditions, understand sources of pollutants and/or stressors, and control and reduce the discharges of pollutants from the MS4 outfalls to receiving waters in the Watershed Management Area. The Copermittees must report the results of the special studies assessments applicable to the Watershed Management Area, and identify any necessary modifications or updates to the Water Quality Improvement Plan based on the results in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

d. Integrated Assessment of Water Quality Improvement Plan

As part of the iterative approach and adaptive management process required for the Water Quality Improvement Plan pursuant to Provision B.5, the Copermittees in each Watershed Management Area must integrate the data collected pursuant to Provisions D.1-D.3, the findings from the assessments required pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to assess the effectiveness of, and identify necessary modifications to, the Water Quality Improvement Plan as follows:

(1) The Copermittees must re-evaluate the priority water quality conditions and numeric goals for the Watershed Management Area, as needed, during the term of this Order pursuant to Provision B.5.a. The re-evaluation and recommendations for modifications to the priority water quality conditions, and/or numeric goals and corresponding schedules may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to

Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The priority water quality conditions and numeric goals for the Watershed Management Area must be re-evaluated as follows:

(a) Re-evaluate the receiving water conditions in the Watershed Management Area in accordance with Provision B.2.a;

(b) Re-evaluate the impacts on receiving waters in the Watershed Management Area from MS4 discharges in accordance with Provision B.2.b;

(c) Re-evaluate the identification of MS4 sources of pollutants and/or stressors in accordance with Provision B.2.d;

(d) Identify beneficial uses of the receiving waters that are protected in accordance with Provision D.4.a;

(e) Evaluate the progress toward achieving the interim and final numeric goals for protecting impacted beneficial uses in the receiving waters.

(2) The Copermittees must re-evaluate the water quality improvement strategies for the Watershed Management Area during the term of this Order pursuant to Provision B.5.b. The re-evaluation and recommendations for modifications to the water quality improvement strategies and schedules may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The water quality improvement strategies for the Watershed Management Area must be re-evaluated as follows:

(a) Identify the non-storm water and storm water pollutant loads from the Copermittees' MS4 outfalls in the Watershed Management Area, calculated or estimated pursuant to Provisions D.4.b;

(b) Identify the non-storm water and storm water pollutant load reductions, or other improvements to receiving water or water quality conditions, that are necessary to attain the interim and final numeric goals identified in the Water Quality Improvement Plan for protecting beneficial uses in the receiving waters;

(c) Identify the non-storm water and storm water pollutant load reductions, or other improvements to the quality of MS4 discharges, that are necessary for the Copermittees to demonstrate that non-storm water and storm water discharges from their MS4s are not causing or contributing to exceedances of receiving water limitations;

(d) Evaluate the progress of the water quality improvement strategies toward

achieving the interim and final numeric goals identified in the Water Quality Improvement Plan for protecting beneficial uses in the receiving waters.

(3) The Copermittees must re-evaluate and adapt the water quality monitoring and assessment program for the Watershed Management Area when new information becomes available to improve the monitoring and assessment program pursuant to Provision B.5.c. The re-evaluation and recommendations for modifications to the monitoring and assessment program may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. Modifications to the water quality monitoring and assessment program must be consistent with the requirements of Provision D.1-D.3. The re-evaluation of the water quality monitoring and assessment program for the Watershed Management Area must consider the data gaps identified by the assessments required pursuant to Provisions D.4.a-b, and results of the special studies implemented pursuant to Provision D.4.c.

5. Monitoring Provisions

Each Copermittee must comply with all the monitoring, reporting, and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

E. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS

The purpose of this provision is for each Copermittee to implement a program to control the contribution of pollutants to and the discharges from the MS4 within its jurisdiction. The goal of the jurisdictional runoff management programs is to implement strategies that effectively prohibit non-storm water discharges to the MS4 and reduce the discharge of pollutants in storm water to the MEP. This goal will be accomplished through implementing the jurisdictional runoff management programs in accordance with the strategies identified in the Water Quality Improvement Plans.

Each Copermittee must update its jurisdictional runoff management program document, in accordance with Provision F.2.a, to incorporate all the requirements of Provision E. Until the Copermittee has updated its jurisdictional runoff management program document with the requirements of Provision E, the Copermittee must continue implementing its current jurisdictional runoff management program.

1. Legal Authority Establishment and Enforcement

a. Each Copermittee must establish, maintain, and enforce adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 through statute, ordinance, permit, contract, order, or similar means. This legal authority must, at a minimum, authorize the Copermittee to:

(1) Prohibit and eliminate all illicit discharges and illicit connections to its MS4;

(2) Control the contribution of pollutants in discharges of runoff associated with industrial and construction activity to its MS4 and control the quality of runoff from industrial and construction sites, including industrial and construction sites which have coverage under the statewide General Permit for Discharges of Storm Water Associated with Industrial Activities (Industrial General Permit) or General Permit for Discharges of Storm Water Associated with Construction Activities (Construction General Permit), as well as to those sites which do not;

(3) Control the discharge of spills, dumping, or disposal of materials other than storm water into its MS4;

(4) Control through interagency agreements among Copermittees the contribution of pollutants from one portion of the MS4 to another portion of the MS4;

(5) Control, by coordinating and cooperating with other owners of the MS4 such as Caltrans, the U.S. federal government, or sovereign Native American Tribes through interagency agreements, where possible, the contribution of pollutants from their portion of the MS4 to the portion of the MS4 within the Copermittee's jurisdiction;

(6) Require compliance with conditions in its statutes, ordinances, permits, contracts, orders, or similar means to hold dischargers to its MS4 accountable for their contributions of pollutants and flows;

(7) Require the use of BMPs to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(8) Require documentation on the effectiveness of BMPs implemented to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(9) Utilize enforcement mechanisms to require compliance with its statutes, ordinances, permits, contracts, orders, or similar means; and

(10) Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with its statutes, ordinances, permits, contracts, orders, or similar means and with the requirements of this Order, including the prohibition of illicit discharges and connections to its MS4; the Copermittee must also have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from industrial facilities, including construction sites, discharging into its MS4.

b. With the first Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3), each Copermittee must submit a statement certified by its Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative that the Copermittee has taken the necessary steps to obtain and maintain full legal authority within its jurisdiction to implement and enforce each of the requirements contained in this Order.

2. Illicit Discharge Detection and Elimination

Each Copermittee must implement a program to actively detect and eliminate illicit discharges and improper disposal into the MS4, or otherwise require the discharger to apply for and obtain a separate NPDES permit. The illicit discharge detection and elimination program must be implemented in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include, at a minimum, the following requirements:

a. NON-STORM WATER DISCHARGES

Each Copermittee must address all non-storm water discharges as illicit discharges unless a non-storm water discharge is either identified as a discharge authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to the following requirements:

(1) Discharges of non-storm water to the MS4 from the following categories must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG919001 (Order No. R9-2007-0034, or subsequent order) for discharges to San Diego Bay, or NPDES Permit No. CAG919002 (Order No. R9-2008-0002, or subsequent order) for discharges to surface waters other than San Diego Bay:

(1) Uncontaminated pumped ground water;

(2) Discharges from foundation drains;[20]

(3) Water from crawl space pumps; and

(4) Water from footing drains.[20]

(2) Discharges of non-storm water from water line flushing and water main breaks to the MS4 must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG 679001 (Order No. R9-2010-0003 or subsequent order). This category includes water line flushing and water main break discharges from water purveyors issued a water supply permit by the California Department of Public Health or federal military installations. Discharges from recycled or reclaimed water lines to the MS4 must be addressed as illicit discharges, unless the discharges have coverage under a separate NPDES permit.

(3) Discharges of non-storm water to the MS4 from the following categories must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a source of pollutants to receiving waters:

(a) Diverted stream flows;

(b) Rising ground waters;

(c) Uncontaminated ground water infiltration to MS4s;

(d) Springs;

(e) Flows from riparian habitats and wetlands;

(f) Discharges from potable water sources;

[20] Provision E.2.a.(1) only applies to this category of non-storm water if the system is designed to be located at or below the groundwater table to actively or passively extract groundwater during any part of the year.

(g) Discharges from foundation drains;[21] and

(h) Discharges from footing drains.[21]

(4) Discharges of non-storm water to the MS4 from the following categories must be controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means. Discharges of non-storm water to the MS4 from the following categories not controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means must be addressed by the Copermittee as illicit discharges.

(a) Air conditioning condensation

The discharge of air conditioning condensation should be directed to landscaped areas or other pervious surfaces, or to the sanitary sewer, where feasible.

(b) Individual residential vehicle washing

(i) The discharge of wash water should be directed to landscaped areas or other pervious surfaces where feasible; and

(ii) The minimization of water, washing detergent and other vehicle wash products used for residential vehicle washing, and the implementation of other practices or behaviors that will prevent the discharge of pollutants associated with individual residential vehicle washing from entering the MS4 must be encouraged.

(c) Dechlorinated swimming pool discharges

(i) Residual chlorine, algaecide, filter backwash, or other pollutants from swimming pools must be eliminated prior to discharging to the MS4; and

(ii) The discharge of saline swimming pool water must be directed to the sanitary sewer, landscaped areas, or other pervious surfaces that can accommodate the volume of water, unless the saline swimming pool water can be discharged via a pipe or concrete channel directly to a naturally saline water body (e.g. Pacific Ocean).

(5) Firefighting discharges to the MS4 must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a significant source of pollutants to receiving waters. Firefighting discharges to the MS4 not identified as a significant source of pollutants to receiving waters, must be addressed, at a minimum, as follows:

[21] Provision E.2.a.(3) only applies to this category of non-storm water discharge if the system is designed to be located above the groundwater table at all times of the year, and the system is only expected to discharge non-storm water under unusual circumstances.

(a) Non-emergency firefighting discharges

(i) Building fire suppression system maintenance discharges (e.g. sprinkler line flushing) to the MS4 must be addressed as illicit discharges unless BMPs are implemented to prevent pollutants associated with such discharges to the MS4.

(ii) Non-emergency firefighting discharges (i.e., discharges from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems) must be addressed by a program, to be developed and implemented by the Copermittee, to reduce or eliminate pollutants in such discharges from entering the MS4.

(b) Emergency firefighting discharges

Each Copermittee should develop and encourage implementation of BMPs to reduce or eliminate pollutants in emergency firefighting discharges to the MS4s and receiving waters within its jurisdiction. During emergency situations, priority of efforts should be directed toward life, property, and the environment (in descending order). BMPs should not interfere with immediate emergency response operations or impact public health and safety.

(6) If the Copermittee or San Diego Water Board identifies any category of non-storm water discharges listed under Provisions E.2.a.(1)-(4) as a source of pollutants to receiving waters, the category must be prohibited through ordinance, order, or similar means and addressed as an illicit discharge. Alternatively, the Copermittee may propose controls to be implemented for the category of non-storm water discharges as part of the Water Quality Improvement Plan instead of prohibiting the category of non-storm water discharges, and implement the controls if accepted by the San Diego Water Board as part of the Water Quality Improvement Plan.

(7) Each Copermittee must, where feasible and priorities and resources allow, reduce or eliminate non-storm water discharges listed under Provisions E.2.a.(1)-(4) into its MS4, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit.

b. PREVENT AND DETECT ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to prevent and detect illicit discharges to the MS4:

(1) Each Copermittee must maintain an updated map of its entire MS4 and the corresponding drainage areas. The accuracy of the MS4 map must be confirmed during the field screening required pursuant to Provision E.2.c.

The MS4 map must be included as part of the jurisdictional runoff management program document. Any geographic information system (GIS) layers or files used by the Copermittee to maintain the MS4 map must be made available to the San Diego Water Board upon request. The MS4 map must identify the following:

(a) All segments of the MS4 owned, operated, and maintained by the Copermittee;

(b) All known locations of inlets that discharge and/or collect runoff into the Copermittee's MS4;

(c) All known locations of connections with other MS4s not owned or operated by the Copermittee (e.g. Caltrans MS4s);

(d) All known locations of MS4 outfalls and private outfalls that discharge runoff collected from areas within the Copermittee's jurisdiction;

(e) All segments of receiving waters within the Copermittee's jurisdiction that receive and convey runoff discharged from the Copermittee's MS4 outfalls;

(f) Locations of the MS4 outfalls, identified pursuant to Provision D.2.a.(1), within its jurisdiction; and

(g) Locations of the non-storm water persistent flow MS4 outfall discharge monitoring stations, identified pursuant to Provision D.2.b.(2), within its jurisdiction.

(2) Each Copermittee must use Copermittee personnel and contractors to assist in identifying and reporting illicit discharges and connections during their daily employment activities.

(3) Each Copermittee must promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges to or from the MS4, including the following methods for public reporting:

(a) Operate a public hotline, which can be Copermittee-specific or shared by the Copermittees, and must be capable of receiving reports in both English and Spanish 24 hours per day and seven days per week; and

(b) Designate an e-mail address for receiving electronic reports from the public, which can be Copermittee-specific or shared by the Copermittees, and must be prominently displayed on the Copermittee's webpage and the Regional Clearinghouse required pursuant to Provision F.4.

(4) Each Copermittee must implement practices and procedures (including a notification mechanism) to prevent, respond to, contain, and clean up any spills that may discharge into the MS4 within its jurisdiction from any source. The Copermittee must coordinate, to the extent possible, with spill response teams to prevent entry of spills into the MS4, and prevent contamination of surface water, ground water, and soil. The Copermittee must coordinate spill prevention, containment, and response activities throughout all appropriate Copermittee departments, programs, and agencies.

(5) Each Copermittee must implement practices and procedures to prevent and limit infiltration of seepage from sanitary sewers (including private laterals and failing septic systems) to the MS4.

(6) Each Copermittee must coordinate, when necessary, with upstream Copermittees and/or entities to prevent illicit discharges from upstream sources into the MS4 within its jurisdiction.

c. FIELD SCREENING

Each Copermittee must conduct field screening (i.e. visual observations, field testing, and/or analytical testing) of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4 in accordance with the dry weather MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

d. INVESTIGATE AND ELIMINATE ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to investigate and eliminate illicit discharges to the MS4:

(1) Each Copermittee must prioritize and determine when follow-up investigations will be performed in response to visual observations and/or water quality monitoring data collected during an investigation of a detected non-storm water or illicit discharge to or from the MS4. The criteria for prioritizing investigations must consider the following:

(a) Pollutants identified as causing or contributing to the highest water quality priorities identified in the Water Quality Improvement Plan;

(b) Pollutants identified as causing or contributing, or threatening to cause or contribute to impairments in water bodies on the 303(d) List and/or in environmentally sensitive areas (ESAs), located within its jurisdiction;

(c) Pollutants identified from sources or land uses known to exist within the area, drainage basin, or watershed that discharges to the portion of the MS4 within its jurisdiction included in the investigation;

(d) Pollutants identified as causing or contributing to an exceedance of a NAL in the Water Quality Improvement Plan; and

(e) Pollutants identified as a threat to human health or the environment.

(2) Each Copermittee must implement procedures to investigate and inspect portions of its MS4 that, based on reports or notifications, field screening, or other appropriate information, indicate a reasonable potential of receiving, containing, or discharging pollutants due to illicit discharges, illicit connections, or other sources of non-storm water. The procedures must include the following:

(a) Each Copermittee must develop criteria to:

(i) Assess the validity of each report or notification received; and

(ii) Prioritize the response to each report or notification received.

(b) Each Copermittee must prioritize and respond to each valid report or notification (e.g., public reports, staff or contractor reports and notifications, etc.) of an incident in a timely manner.

(c) In accordance with the requirements of Provision E.2.d.(1), each Copermittee must investigate and seek to identify the source(s) of discharges of non-storm water where flows are observed in and from the MS4 during the field screening required pursuant to Provision D.2.b.(1) as follows:

(i) Obvious illicit discharges must be immediately investigated to identify the source(s) of non-storm water discharges;

(ii) The investigation must include field investigations to identify sources or potential sources for the discharge, unless the source or potential source has already been identified during previous investigations; and

(iii) The investigation may include follow-up field investigations and/or reviewing Copermittee inventories and other land use data to identify potential sources of the discharge.

(d) Each Copermittee must maintain records and a database of the following information:

(i) Location of incident, including hydrologic subarea, portion of MS4 receiving the non-storm water or illicit discharge, and point of discharge or potential discharge from MS4 to receiving water;

(ii) Source of information initiating the investigation (e.g., public reports, staff or contractor reports and notifications, field screening, etc.);

(iii) Date the information used to initiate the investigation was received;

(iv) Date the investigation was initiated;

(v) Dates of follow-up investigations;

(vi) Identified or suspected source of the illicit discharge or connection, if determined;

(vii) Known or suspected related incidents, if any;

(viii) Result of the investigation; and

(ix) If a source cannot be identified and the investigation is not continued, document the response pursuant to the requirements of Provision E.2.d.(4).

(e) Each Copermittee must maintain records and, in accordance with the priorities of the Water Quality Improvement Plan, seek to identify the source(s) of non-storm water discharges from the MS4 where there is evidence of non-storm water having been discharged into or from the MS4 (e.g., pooled water), in accordance with MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

(3) Each Copermittee must initiate the implementation of procedures, in a timely manner, to eliminate all detected and identified illicit discharges and connections within its jurisdiction. The procedures must include the following responses:

(a) Each Copermittee must enforce its legal authority, as required under Provision E.1, to eliminate illicit discharges and connections to the MS4.

(b) If the Copermittee identifies the source as a controllable source of non-storm water or illicit discharge or connection, the Copermittee must implement its Enforcement Response Plan pursuant to Provision E.6 and enforce its legal authority to prohibit and eliminate illicit discharges and connections to its MS4.

(c) If the Copermittee identifies the source of the discharge as a category of non-storm water discharges in Provision E.2.a, and the discharge is in exceedance of NALs in the Water Quality Improvement Plan, then the Copermittee must determine if: (1) this is an isolated incident or set of circumstances that will be addressed through its Enforcement Response Plan pursuant to Provision E.6, or (2) the category of discharge must be addressed through the prohibition of that category of discharge as an illicit discharge pursuant to Provision E.2.a.(6).

(d) If the Copermittee suspects the source of the non-storm water discharge as natural in origin (i.e. non-anthropogenically influenced) and in conveyance into the MS4, then the Copermittee must document and

provide the data and evidence necessary to demonstrate to the San Diego Water Board that it is natural in origin and does not require further investigation.

(e) If the Copermittee is unable to identify and document the source of a recurring non-storm water discharge to or from the MS4, then the Copermittee must address the discharge as an illicit discharge and update its jurisdictional runoff management program to address the common and suspected sources of the non-storm water discharge within its jurisdiction in accordance with the Copermittee's priorities.

(4) Each Copermittee must submit a summary of the non-storm water discharges and illicit discharges and connections investigated and eliminated within its jurisdiction with each Water Quality Improvement Plan Annual Report required under Provision F.3.b.(3) of this Order.

3. Development Planning

Each Copermittee must use their land use and planning authorities to implement a development planning program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. BMP Requirements for All Development Projects

Each Copermittee must prescribe the following BMP requirements during the planning process (i.e. prior to project approval and issuance of local permits) for all development projects (regardless of project type or size), where local permits are issued, including unpaved roads and flood management projects:

(1) General Requirements

(a) Onsite BMPs must be located so as to remove pollutants from runoff prior to its discharge to any receiving waters, and as close to the source as possible;

(b) Structural BMPs must not be constructed within waters of the U.S.

(c) Onsite BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors (e.g. mosquitos, rodents, or flies).

(2) Source Control BMP Requirements

The following source control BMPs must be implemented at all development projects where applicable and feasible:

(a) Prevention of illicit discharges into the MS4;

(b) Storm drain system stenciling or signage;

(c) Protect outdoor material storage areas from rainfall, run-on, runoff, and wind dispersal;

(d) Protect materials stored in outdoor work areas from rainfall, run-on, runoff, and wind dispersal;

(e) Protect trash storage areas from rainfall, run-on, runoff, and wind dispersal; and

(f) Any additional BMPs determined to be necessary by the Copermittee to minimize pollutant generation at each project.

(3) Low Impact Development (LID) BMP Requirements

The following LID BMPs must be implemented at all development projects where applicable and feasible:

(a) Maintenance or restoration of natural storage reservoirs and drainage corridors (including topographic depressions, areas of permeable soils, natural swales, and ephemeral and intermittent streams);[22]

(b) Buffer zones for natural water bodies (where buffer zones are technically infeasible, require project applicant to include other buffers such as trees, access restrictions, etc.);

(c) Conservation of natural areas within the project footprint including existing trees, other vegetation, and soils;

(d) Construction of streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided public safety is not compromised;

(e) Minimization of the impervious footprint of the project;

(f) Minimization of soil compaction to landscaped areas;

(g) Disconnection of impervious surfaces through distributed pervious areas;

[22] Development projects proposing to dredge or fill materials in waters of the U.S. must obtain a CWA Section 401 Water Quality Certification. Projects proposing to dredge or fill waters of the state must obtain waste discharge requirements.

(h) Landscaped or other pervious areas designed and constructed to effectively receive and infiltrate, retain and/or treat runoff from impervious areas, prior to discharging to the MS4;

(i) Small collection strategies located at, or as close as possible to, the source (i.e. the point where storm water initially meets the ground) to minimize the transport of runoff and pollutants to the MS4 and receiving waters;

(j) Use of permeable materials for projects with low traffic areas and appropriate soil conditions;

(k) Landscaping with native or drought tolerant species; and

(l) Harvesting and using precipitation.

b. PRIORITY DEVELOPMENT PROJECTS

Priority Development Projects are land development projects that fall under the planning and building authority of the Copermittee for which the Copermittee must impose specific requirements, in addition to those described in Provision E.3.a, including the implementation of structural BMPs to meet the performance requirements described in Provision E.3.c.

(1) Definition of Priority Development Project

Priority Development Projects include the following:

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(b) Redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site on an existing site of 10,000 square feet or more of impervious surfaces). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(c) New and redevelopment projects that create 5,000 square feet or more of impervious surface (collectively over the entire project site), and support one or more of the following uses:

(i) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812).

(ii) Hillside development projects. This category includes development on any natural slope that is twenty-five percent or greater.

(iii) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce.

(iv) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

(d) New or redevelopment projects that create or replace 2,500 square feet or more of impervious surface (collectively over the entire project site), and discharging directly to an Environmentally Sensitive Area (ESA). "Discharging directly to" includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands).

(e) New development projects that support one or more of the following uses:

(i) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

(ii) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

(f) New or redevelopment projects that result in the disturbance of one or more acres of land and are expected to generate pollutants post construction.

(2) <u>Special Considerations for Redevelopment Projects</u>

The structural BMP performance requirements of Provision E.3.c are applicable to redevelopment Priority Development Projects, as defined in E.3.b.(1), as follows:

(a) Where redevelopment results in the creation or replacement of impervious surface in an amount of less than fifty percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provision E.3.c apply only to the creation or replacement of impervious surface, and not the entire development; or

(b) Where redevelopment results in the creation or replacement of impervious surface in an amount of more than fifty percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provision E.3.c apply to the entire development.

(3) Priority Development Project Exemptions

Each Copermittee has the discretion to exempt the following projects from being defined as Priority Development Projects:

(a) New or retrofit paved sidewalks, bicycle lanes, or trails that meet the following criteria:

(i) Designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas; OR

(ii) Designed and constructed to be hydraulically disconnected from paved streets or roads; OR

(iii) Designed and constructed with permeable pavements or surfaces in accordance with USEPA Green Streets guidance.[23]

(b) Retrofitting or redevelopment of existing paved alleys, streets or roads that are designed and constructed in accordance with the USEPA Green Streets guidance.[24]

c. Priority Development Project Structural BMP Performance Requirements

In addition to the BMP requirements listed for all development projects under Provision E.3.a, Priority Development Projects must also implement structural BMPs that conform to performance requirements described below.

(1) Storm Water Pollutant Control BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite structural BMPs to control pollutants in storm water that may be discharged from a project as follows:

(a) Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite the pollutants contained in the volume of storm water runoff produced from a 24-hour 85th percentile storm event (design capture volume);[25]

[23] See "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).
[24] Ibid.
[25] This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are

(i) If a Copermittee determines that implementing BMPs to retain the full design capture volume onsite for a Priority Development Project is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize biofiltration BMPs. Biofiltration BMPs must be designed to have an appropriate hydraulic loading rate to maximize storm water retention and pollutant removal, as well as to prevent erosion, scour, and channeling within the BMP,[26] and must be sized to:

[a] Treat 1.5 times the design capture volume not reliably retained onsite, OR

[b] Treat the design capture volume not reliably retained onsite with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite.

(ii) If a Copermittee determines that biofiltration is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize flow-thru treatment control BMPs to treat runoff leaving the site, AND mitigate for the design capture volume not reliably retained onsite pursuant to Provision E.3.c.(1)(b). Flow thru treatment control BMPs must be sized and designed to:

[a] Remove pollutants from storm water to the MEP;

[b] Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;

[c] Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Flow-thru treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of flow-thru treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

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encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals.

[26] As part of the Copermittee's update to its BMP Design Manual, pursuant to Provision E.3.d, the Copermittee must provide guidance for hydraulic loading rates and other biofiltration design criteria necessary to maximize storm water retention and pollutant removal.

(b) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1)(a). The Priority Development Project must mitigate for the portion of the pollutant load in the design capture volume not retained onsite if Provision E.3.c.(3) is utilized. If a Priority Development Project is allowed to utilize alternative compliance, flow-thru treatment control BMPs must be implemented to treat the portion of the design capture volume that is not reliably retained onsite. Flow-thru treatment control BMPs must be sized and designed in accordance with Provisions E.3.c.(1)(a)(ii)[a]-[c].

(2) Hydromodification Management BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite BMPs to manage hydromodification that may be caused by storm water runoff discharged from a project as follows:

(a) Post-project runoff conditions (flow rates and durations) must not exceed pre-development runoff conditions by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat downstream of Priority Development Projects).

(i) In evaluating the range of flows that results in increased potential for erosion of natural (non-hardened) channels, the lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks.

(ii) The Copermittees may use monitoring results collected pursuant to Provision D.1.a.(2) to re-define the range of flows resulting in increased potential for erosion, or degraded instream habitat conditions, as warranted by the data.

(b) Each Priority Development Project must avoid critical sediment yield areas known to the Copermittee or identified by the optional Watershed Management Area Analysis pursuant to Provision B.3.b.(4), or implement measures that allow critical coarse sediment to be discharged to receiving waters, such that there is no net impact to the receiving water.

(c) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the performance requirements of Provision E.3.c.(2)(a). The Priority Development Project must mitigate for the post-project runoff conditions not fully managed onsite if Provision E.3.c.(3) is utilized.

(d) Exemptions

Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provisions E.3.c.(2) where the project discharges storm water runoff to:

(i) Existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;

(ii) Conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; or

(iii) An area identified by the Copermittees as appropriate for an exemption by the optional Watershed Management Area Analysis incorporated into the Water Quality Improvement Plan pursuant to Provision B.3.b.(4).

(e) Interim Timeframe Exemptions

Until the Copermittees have updated their BMP Design Manual in accordance with Provision F.2.b with the requirements of Provision E, the Copermittees have the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provision E.3.c.(2) where the project discharges storm water runoff directly to:

(i) An engineered channel conveyance system with a capacity to convey peak flows generated by the 10-year storm event all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; and

(ii) Large river reaches with a drainage area larger than 100 square miles and a 100-year flow capacity in excess of 20,000 cubic feet per second, provided that properly sized energy dissipation is included at all Priority Development Project discharge points.

(3) Alternative Compliance Program to Onsite Structural BMP Implementation

At the discretion of each Copermittee, Priority Development Projects may be allowed to participate in an alternative compliance program in lieu of implementing the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a), provided that the Water Quality Improvement Plan includes the optional Watershed Management Area Analysis described in Provision B.3.b.(4)~~.~~, and Water Quality Equivalency

calculations have been accepted by the San Diego Water Board's Executive Officer pursuant to Provision E.3.c.(3)(a). The alternative compliance program is available to a Priority Development Project only if the Priority Development Project applicant enters into a voluntary agreement with the Copermittee authorizing this arrangement. In addition to the voluntary agreement, relief from implementing structural BMPs onsite may be authorized by the Copermittee under the following conditions:

(a) Water Quality Equivalency

Copermittees must submit Water Quality Equivalency calculations for acceptance by the San Diego Water Board's Executive Officer prior to administering an alternative compliance program in order to establish a regional and technical basis for determining the water quality benefits associated with alternative compliance projects. Accepted Water Quality Equivalency calculations must be incorporated as part of any Copermittee's alternative compliance program necessary for evaluating Watershed Management Area Analysis candidate projects, project applicant-proposed alternative compliance projects, alternative compliance in lieu fee structures, and alternative compliance water quality credit systems as described in Provisions E.3.c.(3)(b)-(e).

~~(a)~~(b) Watershed Management Area Analysis Candidate Projects

The Priority Development Project applicant agrees to fund, contribute funds to, or implement a candidate project identified by the Copermittees in the Watershed Management Area Analysis included in the Water Quality Improvement Plan, pursuant to Provisions B.3.b.(4) subject to the following conditions:

(i) The Copermittee must determine that implementation of the candidate project will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a) onsite;

(ii) If the Priority Development Project applicant chooses to fully or partially fund a candidate project, then the in-lieu fee structure described in Provision E.3.c.(3)(c) must be followed;

(iii) If the Priority Development Project applicant chooses to fully or partially fund a candidate project, then the Copermittee must ensure that the funds to be obtained from the Priority Development Project applicant are sufficient to mitigate for impacts caused by not fully implementing structural BMPs onsite, pursuant to the performance requirements described in Provisions E.3.c.(1) and E.3.c.(2)(a);

(iv) If the Priority Development Project applicant chooses to implement a candidate project, then the Copermittee must ensure that pollutant

control and/or hydromodification management within the candidate project are sufficient to mitigate for impacts caused by not implementing structural BMPs fully onsite, pursuant to the performance requirements described in Provisions E.3.c.(1) and E.3.c.(2)(a);

(v) The voluntary agreement to fund, partially fund, or implement a candidate project must include reliable sources of funding for operation and maintenance of the candidate project;

(vi) Design of the candidate project must be conducted under an appropriately qualified engineer, geologist, architect, landscape architect, or other professional, licenses where applicable, and competent and proficient in the fields pertinent to the candidate project design;

(vii) The candidate project must be constructed as soon as possible, but no later than 4 years after the certificate of occupancy is granted for the first Priority Development Project that contributed funds toward the construction of the candidate project, unless a longer period of time is authorized by the San Diego Water Board Executive Officer; and

(viii) If the candidate project is constructed after the Priority Development Project is constructed, the Copermittee must require temporal mitigation for pollutant loads and altered flows that are discharged from the Priority Development Project.

~~(b)~~(c) Project Applicant Proposed Alternative Compliance Projects

The Copermittee may allow a Priority Development Project applicant to propose and fund, contribute funds to, or implement an alternative compliance project not identified by the Watershed Management Area Analysis included in the Water Quality Improvement Plan pursuant to Provisions B.3.b.(4). This option is allowed provided the Copermittee determines that implementation of the alternative compliance project will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a) onsite, and is subject to the requirements described in Provisions E.3.c.(3)(a)(ii)-(viii).

~~(c)~~(d) Alternative Compliance In-Lieu Fee Structure

If a Copermittee chooses to allow a Priority Development Project applicant to fund, or partially fund a candidate project or an alternative compliance project, then the Copermittee must develop and implement an in-lieu fee structure. This may be developed individually or with other Copermittees and/or entities, as a means for designing, developing, constructing, operating and maintaining offsite alternative compliance projects. The in-

lieu fee must be transferred to the Copermittee (for public projects) or an escrow account (for private projects) prior to the construction of the Priority Development Project.

~~(d)~~(e) Alternative Compliance Water Quality Credit System Option

The Copermittee may develop and implement an alternative compliance water quality credit system option, individually or with other Copermittees and/or entities, provided that such a credit system clearly exhibits that it will not allow discharges from Priority Development Projects to cause or contribute to a net impact over and above the impact caused by projects meeting the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a). Any credit system that a Copermittee chooses to implement must be submitted to the San Diego Water Board Executive Officer for review and acceptance as part of the Water Quality Improvement Plan.

(4) Long-Term Structural BMP Maintenance

Each Copermittee must require the project applicant to submit proof of the mechanism under which ongoing long-term maintenance of all structural BMPs will be conducted.

(5) Infiltration and Groundwater Protection

(a) Structural BMPs designed to primarily function as large, centralized infiltration devices (such as large infiltration trenches and infiltration basins) must not cause or contribute to an exceedance of an applicable groundwater quality objective. At a minimum, such infiltration BMPs must be in conformance with the design criteria listed below, unless the development project applicant demonstrates to the Copermittee that one or more of the specific design criteria listed below are not necessary to protect groundwater quality. The design criteria listed below do not apply to small infiltration systems dispersed throughout a development project.

(i) Runoff must undergo pretreatment such as sedimentation or filtration prior to infiltration;

(ii) Pollution prevention and source control BMPs must be implemented at a level appropriate to protect groundwater quality at sites where infiltration BMPs are to be used;

(iii) Infiltration BMPs must be adequately maintained to remove pollutants in storm water to the MEP;

(iv) The vertical distance from the base of any infiltration BMP to the seasonal high groundwater mark must be at least 10 feet. Where groundwater basins do not support beneficial uses, this vertical

distance criteria may be reduced, provided groundwater quality is maintained;

(v) The soil through which infiltration is to occur must have physical and chemical characteristics (e.g., appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses;

(vi) Infiltration BMPs must not be used for areas of industrial or light industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee, unless source control BMPs to prevent exposure of high threat activities are implemented, or runoff from such activities is first treated or filtered to remove pollutants prior to infiltration; and

(vii) Infiltration BMPs must be located a minimum of 100 feet horizontally from any water supply wells.

(b) The Copermittee may develop, individually or with other Copermittees, alternative mandatory design criteria to that listed above for infiltration BMPs which are designed to primarily function as centralized infiltration devices. Before implementing the alternative design criteria in the development planning process the Copermitee(s) must:

(i) Notify the San Diego Water Board of the intent to implement the alternative design criteria submitted; and

(ii) Comply with any conditions set by the San Diego Water Board.

d. BMP DESIGN MANUAL UPDATE

Each Copermittee must update its BMP Design Manual[27] pursuant to Provision F.2.b. Until the Copermittee has updated its BMP Design Manual with the requirements of Provisions E.3.a-c, the Copermittee must continue implementing its current BMP Design Manual. Unless directed otherwise by the San Diego Water Board, the Copermittee must implement the BMP Design Manual within 180 days of completing the update. The update of the BMP Design Manual must include the following:

(1) Updated procedures to determine the nature and extent of storm water requirements applicable to a potential development or redevelopment projects. These procedures must inform project applicants of the storm water management requirements applicable to their project including, but not limited to, general requirements for all development projects, structural BMP design procedures and requirements, hydromodification management requirements,

[27] The BMP Design Manual was formerly known as the Standard Storm Water Mitigation Plan under Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016.

requirements specific to phased projects, and procedures specific to private developments and public improvement projects;

(2) Updated procedures to identify pollutants and conditions of concern for selecting the most appropriate structural BMPs that consider, at a minimum, the following:

(a) Receiving water quality (including pollutants for which receiving waters are listed as impaired under the CWA section 303(d) List);

(b) Pollutants, stressors, and/or receiving water conditions that cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(c) Land use type of the project and pollutants associated with that land use type; and

(d) Pollutants expected to be present onsite.

(3) Updated procedures for designing structural BMPs, including any updated performance requirements to be consistent with the requirements of Provision E.3.c for all structural BMPs listed in the BMP Design Manual;

(4) Long-term maintenance criteria for each structural BMP listed in the BMP Design Manual; and

(5) Alternative compliance criteria, in accordance with the requirements under Provision E.3.c.(3), if the Copermittee elects to allow Priority Development Projects within its jurisdiction to utilize alternative compliance.

e. PRIORITY DEVELOPMENT PROJECT BMP IMPLEMENTATION AND OVERSIGHT

Each Copermittee must implement a program that requires and confirms structural BMPs on all Priority Development Projects are designed, constructed, and maintained to remove pollutants in storm water to the MEP.

(1) Structural BMP Approval and Verification Process

(a) Each Copermittee must require and confirm that for all Priority Development Project applications that have not received prior lawful approval by the Copermittee by the ~~time~~ effective date of the BMP Design Manual ~~is updated~~ pursuant to Provision E.3.d, the requirements of Provision E.3 ~~are~~ must be implemented. For project applications that have received prior lawful approval before the effective date of the BMP Design Manual ~~is updated~~ pursuant to Provision E.3.d, the Copermittee may allow previous land development requirements to apply.

(b) Each Copermittee must identify the roles and responsibilities of its various municipal departments in implementing the structural BMP requirements, including each stage of a project from application review and approval through BMP maintenance and inspections.

(c) Each Copermittee must require and confirm that appropriate easements and ownerships are properly recorded in public records and the information is conveyed to all appropriate parties when there is a change in project or site ownership.

(d) Each Copermittee must require and confirm that prior to occupancy and/or intended use of any portion of the Priority Development Project, each structural BMP is inspected to verify that it has been constructed and is operating in compliance with all of its specifications, plans, permits, ordinances, and the requirements of this Order.

(2) Priority Development Project Inventory and Prioritization

(a) Each Copermittee must develop, maintain, and update at least annually, a watershed-based database to track and inventory all Priority Development Projects and associated structural BMPs within its jurisdiction. Inventories must be accurate and complete beginning from December 2002 for the San Diego County Copermittees, February 2003 for the Orange County Copermittees, and July 2005 for the Riverside County Copermittees. The use of an automated database system, such as GIS, is highly recommended. The database must include, at a minimum, the following information:

(i) Priority Development Project location (address and hydrologic subarea);

(ii) Descriptions of structural BMP type(s);

(iii) Date(s) of construction;

(iv) Party responsible for structural BMP maintenance;

(v) Dates and findings of structural BMP maintenance verifications; and

(vi) Corrective actions and/or resolutions, when applicable.

(b) Each Copermittee must prioritize the Priority Development Projects with structural BMPs within its jurisdiction. The designation of Priority Development Projects as high priority must consider the following:

(i) The highest water quality priorities identified in the Water Quality Improvement Plan;

(ii) Receiving water quality;

(iii) Number and sizes of structural BMPs;

(iv) Recommended maintenance frequency of structural BMPs;

(v) Likelihood of operation and maintenance issues of structural BMPs;

(vi) Land use and expected pollutants generated; and

(vii) Compliance record.

(3) Structural BMP Maintenance Verifications and Inspections

Each Copermittee is required to verify that structural BMPs on each Priority Development Project are adequately maintained, and continue to operate effectively to remove pollutants in storm water to the MEP through inspections, self-certifications, surveys, or other equally effective approaches.

(a) All (100 percent) of the structural BMPs at Priority Development Projects that are designated as high priority must be inspected directly by the Copermittee annually prior to each rainy season;

(b) For verifications performed through a means other than direct Copermittee inspection, adequate documentation must be required by the Copermittee to provide assurance that the required maintenance of structural BMPs at each Priority Development Project has been completed; and

(c) Appropriate follow-up measures (including re-inspections, enforcement, etc.) must be conducted to ensure that structural BMPs at each Priority Development Project continue to reduce pollutants in storm water to the MEP as originally designed.

f. Development Project Enforcement

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all development projects, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

4. Construction Management

Each Copermittee must implement a construction management program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. Project Approval Process

Prior to issuance of any local permit(s) that allows the commencement of construction projects that involve ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff, each Copermittee must:

(1) Require a pollution control plan, construction BMP plan, and/or an erosion and sediment control plan, to be submitted by the project applicant to the Copermittee;

(2) Confirm the pollution control plan, construction BMP plan, and/or erosion and sediment control plan, complies with the local grading ordinance, other applicable local ordinances, and the requirements of this Order;

(3) Confirm the pollution control, construction BMP, and/or erosion and sediment control plan, includes seasonally appropriate and effective BMPs and management measures described in Provision E.4.c, as applicable to the project; and

(4) Verify that the project applicant has obtained coverage under the statewide Construction General Permit (Order ~~2012-0006~~2009-0009-DWQ or subsequent Order), if applicable.

b. CONSTRUCTION SITE INVENTORY AND TRACKING

(1) Each Copermittee must maintain and update, at least quarterly, a watershed-based inventory of all construction projects issued a local permit that allows ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff. The use of an automated database system, such as GIS, is highly recommended. The inventory must include:

(a) Relevant contact information for each site (e.g., name, address, phone, and email for the owner and contractor);

(b) The basic site information including location (address and hydrologic subarea), Waste Discharge Identification (WDID) number (if applicable), size of the site, and approximate area of disturbance;

(c) Whether or not the site is considered a high threat to water quality, as defined in Provision E.4.b.(2) below;

(d) The project start and completion dates;

(e) The required inspection frequency, as defined in the Copermittee's jurisdictional runoff management program document;

(f) The date the Copermittee accepted or approved the pollution control plan, construction BMP plan, and/or erosion and sediment control plan; and

(g) Whether or not there are ongoing enforcement actions administered to the site.

(2) Each Copermittee must identify all construction sites within its jurisdiction that represent a high threat to downstream surface water quality. The designation of construction sites as high threat to water quality must consider the following:

(a) Sites located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Sites located within the same hydrologic subarea and tributary to a water body segment listed as impaired for sediment on the CWA section 303(d) List;

(c) Sites located within, directly adjacent to, or discharging directly to a receiving water within an ESA; and

(d) Other sites determined by the Copermittees or the San Diego Water Board as a high threat to water quality.

c. Construction Site BMP Implementation

Each Copermittee must implement, or require the implementation of effective BMPs to reduce discharges of pollutants in storm water from construction sites to the MEP, and effectively prohibit non-storm water discharges from construction sites into the MS4. These BMPs must be site specific, seasonally appropriate, and construction phase appropriate. BMPs must be implemented at each construction site year round. Dry season BMP implementation must plan for and address unseasonal rain events that may occur during the dry season (May 1 through September 30). Copermittees must implement, or require the implementation of, BMPs in the following categories:

(1) Project Planning;

(2) Good Site Management “Housekeeping”, including waste management;

(3) Non-storm Water Management;

(4) Erosion Control;

(5) Sediment Control;

(6) Run-on and Run-off Control; and

(7) Active/Passive Sediment Treatment Systems, where applicable.

d. CONSTRUCTION SITE INSPECTIONS

Each Copermittee must conduct construction site inspections to require and confirm compliance with its local permits and applicable local ordinances, and the requirements of this Order. Priority for site inspections must consider threat to water quality pursuant to Provision E.4.b as well as the nature of the construction activity, topography, and the characteristics of soils and receiving water quality.

(1) Inspection Frequency

(a) Each Copermittee must conduct inspections at all inventoried sites, including high threat to water quality sites, at an appropriate frequency for each phase of construction to confirm the site reduces the discharge of pollutants in storm water from construction sites to the MEP, and effectively prohibits non-storm water discharges from entering the MS4.

(b) Each Copermittee must establish appropriate inspection frequencies for high threat to water quality sites, and all other sites, for each phase of construction. Inspection frequencies appropriate for addressing the highest water quality priorities identified in the Water Quality Improvement Plan, and for complying with the requirements of this Order must be identified in each Copermittee's jurisdictional runoff management program document.

(c) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e., re-inspection, enforcement) necessary to require and confirm site compliance with its local permits and applicable local ordinances, and the requirements of this Order.

(2) Inspection Content

Inspections of construction sites by the Copermittee must include, at a minimum:

(a) Verification of coverage under the Construction General Permit (Notice of Intent (NOI) and/or WDID number) during initial inspections, when applicable;

(b) Assessment of compliance with its local permits and applicable local ordinances related to pollution prevention, including the implementation and maintenance of applicable BMPs;

(c) Assessment of BMP adequacy and effectiveness;

(d) Visual observations of actual non-storm water discharges;

(e) Visual observations of actual or potential discharge of sediment and/or

construction related materials from the site;

(f) Visual observations of actual or potential illicit connections; and

(g) If any violations are found and BMP corrections are needed, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried construction sites. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Site name, location (address and hydrologic subarea), and WDID number (if applicable);

(b) Inspection date;

(c) Approximate amount of rainfall since last inspection;

(d) Description of problems observed with BMPs and indication of need for BMP addition/repair/replacement and any scheduled re-inspection, and date of re-inspection;

(e) Descriptions of any other specific inspection comments which must, at a minimum, include rationales for longer compliance time;

(f) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(g) Resolution of problems noted and date problems fixed.

e. CONSTRUCTION SITE ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried construction sites, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

5. Existing Development Management

Each Copermittee must implement an existing development management program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following

requirements:

a. EXISTING DEVELOPMENT INVENTORY AND TRACKING

Each Copermittee must maintain, and update at least annually, a watershed-based inventory of the existing development within its jurisdiction that may discharge a pollutant load to and from the MS4. The use of an automated database system, such as GIS, is highly recommended. The inventory must, at a minimum, include:

(1) Name, location (hydrological subarea and address, if applicable) of the following types of existing development with its jurisdiction:

(a) Commercial facilities or areas;

(b) Industrial facilities;

(c) Municipal facilities, including:

(i) MS4 and related structures;[28]
(ii) Roads, streets, and highways;
(iii) Parking facilities;
(iv) Municipal airfields;
(v) Parks and recreation facilities;
(vi) Flood management facilities, flood control devices and structures;
(vii) Operating or closed municipal landfills;
(viii) Publicly owned treatment works (including water and wastewater treatment plants) and sanitary sewer collection systems;
(ix) Corporate yards, including maintenance and storage yards for materials, waste, equipment, and vehicles;
(x) Hazardous waste collection facilities;
(xi) Other treatment, storage or disposal facilities for municipal waste; and
(xii) Other municipal facilities that the Copermittee determines may contribute a significant pollutant load to the MS4.

(d) Residential areas, which may be designated by one or more of the following:

(i) Residential management area;
(ii) Drainage basin or area;

[28] The inventory may refer to the MS4 map required to be maintained pursuant to Provision E.2.b.(1).

(iii) Land use (e.g., single family, multi-family, rural);

(iv) Neighborhood;

(v) Common Interest Area;

(vi) Home Owner Association;

(vii) Mobile home park; and/or

(viii) Other designations accepted by the San Diego Water Board Executive Officer.

(2) A description of the facility or area, including the following information:

(a) Classification as commercial, industrial, municipal, or residential;

(b) Status of facility or area as active or inactive;

(c) Identification if a business is a mobile business;

(d) SIC Code or NAICS Code, if applicable;

(e) Industrial General Permit NOI and/or WDID number, if applicable;

(f) Identification if a residential area is or includes a Common Interest Area / Home Owner Association, or mobile home park;

(g) Identification of pollutants generated and potentially generated by the facility or area;

(h) Whether the facility or area is adjacent to an ESA;

(i) Whether the facility or area is tributary to and within the same hydrologic subarea as a water body segment listed as impaired on the CWA section 303(d) List and generates pollutants for which the water body segment is impaired; and

(3) An annually updated map showing the location of inventoried existing development, watershed boundaries, and water bodies.

b. EXISTING DEVELOPMENT BMP IMPLEMENTATION AND MAINTENANCE

Each Copermittee must designate a minimum set of BMPs required for all inventoried existing development, including special event venues. The designated minimum BMPs must be specific to facility or area types and pollutant generating activities, as appropriate.

(1) <u>Commercial, Industrial, and Municipal Facilities and Areas</u>

(a) Pollution Prevention

Each Copermittee must require the use of pollution prevention methods by the commercial, industrial, and municipal facilities and areas in its inventoried existing development to address the priorities and strategies in the Water Quality Improvement Plan.

(b) BMP Implementation

Each Copermittee must require the implementation of designated BMPs at commercial facilities and areas, industrial facilities, and implement designated BMPs at municipal facilities in its inventoried existing development.

(c) BMP Operation and Maintenance

(i) Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development.

(ii) Each Copermittee must implement a schedule of operation and maintenance activities for its MS4 and related structures (including but not limited to catch basins, storm drain inlets, detention basins, etc.), and verify proper operation of all its municipal structural treatment controls designed to reduce pollutants (including floatables) in storm water discharges to or from its MS4s and related drainage structures. Operation and maintenance activities may include, but is not limited to, the following:

[a] Inspections of the MS4 and related structures;
[b] Cleaning of the MS4 and related structures; and
[c] Proper disposal of materials removed from cleaning of the MS4 and related structures.

(iii) Each Copermittee must implement a schedule of operation and maintenance for public streets, unpaved roads, paved roads, and paved highways within its jurisdiction to minimize pollutants that can be discharged in storm water.

(iv) Each Copermittee must implement controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers. Copermittees that operate both a municipal sanitary sewer system and a MS4 must implement controls and measures to prevent and eliminate seeping sewage from infiltrating the MS4. Copermittees that do not operate both a municipal sanitary sewer system and a MS4 must coordinate with sewering agencies to keep themselves informed of relevant and appropriate maintenance activities and sanitary sewage projects in their jurisdiction that may cause or contribute to seepage of sewage into the MS4.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must require the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from commercial facilities and areas and industrial facilities, and implement BMPs at municipal facilities in its inventoried existing development. Such BMPs must include, as appropriate, educational activities, permits, certifications and other measures for applicators and distributors.

(2) Residential Areas

(a) Pollution Prevention

Each Copermittee must promote and encourage the use of pollution prevention methods, where appropriate, by the residential areas in its inventoried existing development.

(b) BMP Implementation

Each Copermittee must promote and encourage the implementation of designated BMPs at residential areas in its inventoried existing development.

(c) BMP Operation and Maintenance

Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at residential areas in its inventoried existing development.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must promote and encourage the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from residential areas in its inventoried existing development.

c. Existing Development Inspections

Each Copermittee must conduct inspections of inventoried existing development to ensure compliance with applicable local ordinances and permits, and the requirements of this Order.

(1) Inspection Frequency

(a) Each Copermittee must establish appropriate inspection frequencies for inventoried existing development in accordance with the following requirements:

(i) At a minimum, inventoried existing development must be inspected once every five years utilizing one or more of the following methods:

[a] Drive-by inspections by Copermittee municipal and contract staff;
[b] Onsite inspections by Copermittee municipal and contract staff; and/or
[c] Visual inspections of publicly accessible inventoried facilities or areas by volunteer monitoring or patrol programs that have been trained by the Copermittee;

(ii) The frequency of inspections must be appropriate to confirm that BMPs are being implemented to reduce the discharge of pollutants in storm water from the MS4 to the MEP and effectively prohibit non-storm water discharges to the MS4;

(iii) The frequency of inspections must be based on the potential for a facility or area to discharge non-storm water and pollutants in storm water, and should reflect the priorities set forth in the Water Quality Improvement Plan;

(iv) Each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development;[29] and

(v) Inventoried existing development must be inspected by the Copermittee, as needed, in response to valid public complaints.

(b) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e. education and outreach, re-inspection, enforcement) necessary to require and confirm compliance with its applicable local ordinances and permits and the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

(2) <u>Inspection Content</u>

(a) Inspections of existing development must include, at a minimum:

(i) Visual inspections for the presence of actual non-storm water discharges;

[29] If any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspection may count toward the total annual inspection requirement. This requirement excludes linear municipal facilities (i.e., MS4 linear channels, sanitary sewer collection systems, streets, roads and highways).

(ii) Visual inspections for the presence of actual or potential discharge of pollutants;

(iii) Visual inspections for the presence of actual or potential illicit connections; and

(iv) Verification that the description of the facility or area in the inventory, required pursuant to Provision E.5.a.(2), has not changed.

(b) Onsite inspections of existing development by the Copermittee must include, at a minimum:

(i) Assessment of compliance with its applicable local ordinances and permits related to non-storm water and storm water discharges and runoff;

(ii) Assessment of the implementation of the designated BMPs;

(iii) Verification of coverage under the Industrial General Permit, when applicable; and

(iv) If any problems or violations are found, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried existing development. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Name and location of the facility or area (address and hydrologic subarea) consistent with the inventory name and location, pursuant to Provision E.5.a.(1);

(b) Inspection and re-inspection date(s);

(c) Inspection method(s) (i.e. drive-by, onsite);

(d) Observations and findings from the inspection(s);

(e) For onsite inspections of existing development by Copermittee municipal or contract staff, the records must also include, as applicable:

(i) Description of any problems or violations found during the inspection(s);

(ii) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(iii) The date problems or violations were resolved.

d. EXISTING DEVELOPMENT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried existing development, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

e. RETROFITTING AND REHABILITATING AREAS OF EXISTING DEVELOPMENT

(1) Retrofitting Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to retrofit areas of existing development within its jurisdiction to address identified sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify areas of existing development as candidates for retrofitting, focusing on areas where retrofitting will address pollutants and/or stressors that contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for retrofitting projects may be utilized to reduce pollutants that may be discharged in storm water from areas of existing development, and/or address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of retrofitting projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting projects; and

(e) Where retrofitting projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement

regional retrofitting projects (i.e. projects that can receive and/or treat storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment) adjacent to and/or downstream of the areas of existing development.

(2) Stream, Channel and/or Habitat Rehabilitation in Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to rehabilitate streams, channels, and/or habitats in areas of existing development within its jurisdiction to address the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify streams, channels, and/or habitats in areas of existing development as candidates for rehabilitation, focusing on areas where stream, channel, and/or habitat rehabilitation projects will address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for stream, channel, and/or habitat rehabilitation projects may be utilized to address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters, rehabilitate channelized or hydromodified streams, restore wetland and riparian habitat, restore watershed functions, and/or restore beneficial uses of receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of stream, channel, and/or habitat rehabilitation projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance stream, channel, and/or habitat rehabilitation projects; and

(e) Where stream, channel, and/or habitat rehabilitation projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional stream, channel, and/or habitat rehabilitation projects (i.e. projects that can receive storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment).

6. Enforcement Response Plans

Each Copermittee must develop and implement an Enforcement Response Plan as part of its jurisdictional runoff management program document. The Enforcement Response Plan must describe the applicable approaches and options to enforce its legal authority established pursuant to Provision E.1, as necessary, to achieve compliance with the requirements of this Order. The Enforcement Response Plan must be in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include the following:

a. Enforcement Response Plan Components

The Enforcement Response Plan must include the following individual components:

(1) Illicit Discharge Detection and Elimination Enforcement Component;

(2) Development Planning Enforcement Component;

(3) Construction Management Enforcement Component; and

(4) Existing Development Enforcement Component.

b. Enforcement Response Approaches and Options

Each component of the Enforcement Response Plan must describe the enforcement response approaches that the Copermittee will implement to compel compliance with its statutes, ordinances, permits, contracts, orders, or similar means, and the requirements of this Order. The description must include the protocols for implementing progressively stricter enforcement responses. The enforcement response approaches must include appropriate sanctions to compel compliance, including, at a minimum, the following tools or their equivalent:

(1) Verbal and written notices of violation;

(2) Cleanup requirements;

(3) Fines;

(4) Bonding requirements;

(5) Administrative and criminal penalties;

(6) Liens;

(7) Stop work orders; and

(8) Permit and occupancy denials.

c. CORRECTION OF VIOLATIONS

(1) Violations must be corrected in a timely manner with the goal of correcting the violations within 30 calendar days after the violations are discovered, or prior to the next predicted rain event, whichever is sooner.

(2) If more than 30 calendar days are required to achieve compliance, then a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

d. ESCALATED ENFORCEMENT

(1) The Enforcement Response Plan must include a definition of "escalated enforcement." Escalated enforcement must include any enforcement scenario where a violation or other non-compliance is determined to cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan. Escalated enforcement may be defined differently for development planning, construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas.

(2) Where the Copermittee determines escalated enforcement is not required, a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

(3) Escalated enforcement actions must continue to increase in severity, as necessary, to compel compliance as soon as possible.

e. REPORTING OF NON-COMPLIANT SITES

(1) Each Copermittee must notify the San Diego Water Board in writing within five (5) calendar days of issuing escalated enforcement (as defined in the Copermittee's Enforcement Response Plan) to a construction site that poses a significant threat to water quality as a result of violations or other non-compliance with its permits and applicable local ordinances, and the requirements of this Order. Written notification may be provided electronically by email to the appropriate San Diego Water Board staff.

(2) Each Copermittee must notify the San Diego Water Board of any persons required to obtain coverage under the statewide Industrial General Permit and Construction General Permit and failing to do so, within five (5) calendar days from the time the Copermittee become aware of the circumstances. Written notification may be provided electronically by email to R9_Nonfilers@waterboards.ca.gov ~~Nonfilers_R9@waterboards.ca.gov~~.

7. Public Education and Participation

Each Copermittee must implement, individually or with other Copermittees, a public education and participation program in accordance with the strategies identified in the Water Quality Improvement Plan to promote and encourage the development of programs, management practices, and behaviors that reduce the discharge of pollutants in storm water to the MEP, prevent controllable non-storm water discharges from entering the MS4, and protect water quality standards in receiving waters. The public education and participation program must be implemented in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include, at a minimum, the following requirements:

a. PUBLIC EDUCATION

The public education program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) Educational activities, public information activities, and other appropriate outreach activities intended to reduce pollutants associated with the application of pesticides, herbicides and fertilizer and other pollutants of concern in storm water discharges to and from its MS4 to the MEP, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed to address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(2) Educational activities, public information activities, and other appropriate outreach activities to facilitate the proper management and disposal of used oil and toxic materials; and

(3) Appropriate education and training measures for specific target audiences, such as construction site operators, residents, underserved target audiences and school-aged children, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed, based on high risk behaviors and pollutants of concern.

b. PUBLIC PARTICIPATION

The public participation program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) A process for members of the public to participate in updating the highest priority water quality conditions, numeric goals, and water quality improvement strategies in the Water Quality Improvement Plan;

(2) Opportunities for members of the public to participate in providing the Copermittee recommendations for improving the effectiveness of the water

quality improvement strategies implemented within its jurisdiction; and

(3) Opportunities for members of the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or protection of the quality of receiving waters.

8. Fiscal Analysis

a. Each Copermittee must secure the resources necessary to meet all the requirements of this Order.

b. Each Copermittee must conduct an annual fiscal analysis of its jurisdictional runoff management program in its entirety. The fiscal analysis must include the following:

(1) Identification of the various categories of expenditures necessary to implement the requirements of this Order, including a description of the specific capital, operation and maintenance, and other expenditure items to be accounted for in each category of expenditures;

(2) The staff resources needed and allocated to meet the requirements of this Order, including any development, implementation, and enforcement activities required;

(3) The estimated expenditures for Provisions E.8.b.(1) and E.8.b.(2) for the current fiscal year; and

(4) The source(s) of funds that are proposed to meet the necessary expenditures described in Provisions E.8.b.(1) and E.8.b.(2), including legal restrictions on the use of such funds, for the current fiscal year and next fiscal year.

c. Each Copermittee must submit a summary of the annual fiscal analysis with each Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3).

d. Each Copermittee must provide the documentation used to develop the summary of the annual fiscal analysis upon request by the San Diego Water Board.

F. REPORTING

The purpose of this provision is to determine and document compliance with the requirements set forth in this Order. The goal of reporting is to communicate to the San Diego Water Board and the people of the State of California the implementation status of each jurisdictional runoff management program and compliance with the requirements of this Order. This goal is to be accomplished through the submittal of specific deliverables to the San Diego Water Board by the Copermittees.

1. Water Quality Improvement Plans

The Copermittees for each Watershed Management Area must develop and submit the Water Quality Improvement Plan in accordance with the following requirements:

a. WATER QUALITY IMPROVEMENT PLAN DEVELOPMENT

Each Water Quality Improvement Plan must be developed in accordance with the following process:

(1) Public Participation Process

The Copermittees must implement a public participation process to solicit data, information, and recommendations to be utilized in the development of the Water Quality Improvement Plan. The public participation process must include the following:

(a) The Copermittees must develop a publicly available and noticed schedule of the opportunities for the public to participate and provide comments during the development of the Water Quality Improvement Plan. The schedule may be adjusted as necessary by the Copermittees, provided the public is provided timely notification of the changes to the schedule.

(b) The Copermittees must form a Water Quality Improvement Consultation Panel to provide recommendations during the development of the Water Quality Improvement Plan. The Water Quality Improvement Consultation Panel must consist of at least the following members:

(i) A representative of the San Diego Water Board;

(ii) A representative of the environmental community familiar with the water quality conditions of concern of the receiving waters in the Watershed Management Area, preferably from an environmental interest group associated with a water body within the Watershed Management Area; and

(iii) A representative of the development community familiar with the opportunities and constraints for implementing structural BMPs, retrofitting projects, and stream, channel or habitat rehabilitation

projects in the Watershed Management Area, preferably with relevant engineering, hydrology, and/or geomorphology experience in the Watershed Management Area.

(c) The Copermittees must coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public time and opportunity to participate during the development of the Water Quality Improvement Plans.

(2) Priority Water Quality Conditions

(a) The Copermittees must solicit data, information and recommendations from the public to be utilized in the development and identification of the priority water quality conditions and potential water quality improvement strategies for the Watershed Management Area.

(b) The Copermittees must review the priority water quality conditions the Copermittees plan on including in the Water Quality Improvement Plan with the Water Quality Improvement Consultation Panel to receive recommendations or concurrence.

(c) The Copermittees must consider revisions to the priority water quality conditions based on recommendations from the Water Quality Improvement Consultation Panel.

(d) The Copermittees must include all the potential water quality improvement strategies identified by the public and the Water Quality Improvement Consultation Panel with the submittal of the priority water quality conditions to the San Diego Water Board.

(e) The Copermittees must submit the Water Quality Improvement Plan requirements of Provision B.2 to the San Diego Water Board as early as 6 months and no later than 12 months after the commencement of coverage under this Order. Upon receipt, the San Diego Water Board will issue a public notice and release the proposed priority water quality conditions and potential water quality improvement strategies for public review and comment for a minimum of 30 days.

(f) The Copermittees must consider revisions to the priority water quality conditions and potential water quality improvement strategies developed pursuant to Provision B.2 based on public comments received by the close of the comment period.

(3) Water Quality Improvement Goals, Strategies and Schedules

(a) The Copermittees must solicit recommendations from the public on potential numeric goals for the highest priority water quality conditions

identified for the Watershed Management Area, and recommendations on the strategies that should be implemented to achieve the potential numeric goals.

(b) The Copermittees must consult with the Water Quality Improvement Consultation Panel and consider revisions to the following items based on the Panel's recommendations:

(i) The numeric goals and schedules the Copermittees propose to include in the Water Quality Improvement Plan;

(ii) The water quality improvement strategies and schedules the Copermittees propose to implement in the Watershed Management Area and include in the Water Quality Improvement Plan; and

(iii) If the Copermittees choose to implement Provision B.3.b.(4), the results of the Watershed Management Area Analysis the Copermittees proposed to incorporate into the Water Quality Improvement Plan.

(c) The Copermittees must submit the Water Quality Improvement Plan requirements of Provision B.3 to the San Diego Water Board as early as 9 months and no later than 18 months after the commencement of coverage under this Order. Upon receipt, the San Diego Water Board will issue a public notice and release the proposed water quality improvement goals, strategies and schedules for public review and comment for a minimum of 30 days.

(d) The Copermittees must consider revisions to the water quality improvement goals, strategies and schedules developed pursuant to Provision B.3 based on public comments received by the close of the comment period.

b. WATER QUALITY IMPROVEMENT PLAN SUBMITTAL AND IMPLEMENTATION

(1) Within 24 months after the commencement of coverage under this Order, the Copermittees for each Watershed Management Area must submit a complete Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order to the San Diego Water Board. The San Diego Water Board will issue a public notice and release the Water Quality Improvement Plan for public review and comment for a minimum of 30 days.

(2) The Copermittees must consider revisions to the Water Quality Improvement Plan based on written comments received by the close of the public comment period.

(3) The Copermittees must promptly submit any revisions to the Water Quality Improvement Plan to the San Diego Water Board no later than 60 days after the close of the public comment period.

(4) If issues concerning the Water Quality Improvement Plan are resolved informally through discussions among the Copermittees, the San Diego Water Board and interested parties, the San Diego Water Board Executive Officer may provide written notification of acceptance to the Copermittees that the Water Quality Improvement Plan meets the requirements of Provision B. However, if the Executive Officer determines that significant issues with the Water Quality Improvement Plan remain, the matter will be scheduled for San Diego Water Board consideration at a public meeting.

(5) The Copermittees must commence with implementation of the Water Quality Improvement Plan, in accordance with the water quality improvement strategies and schedules therein, upon written notification of acceptance with the Water Quality Improvement Plan by the San Diego Water Board Executive Officer.

(6) During implementation of the Water Quality Improvement Plan the Copermittees must correct any deficiencies in the Plan identified by the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report following a request by the Board to do so.

(7) The Water Quality Improvement Plan must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of receiving notification of acceptance with the Water Quality Improvement Plan by the San Diego Water Board Executive Officer.

2. Updates

a. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATES

Each Copermittee must update its jurisdictional runoff management program document in accordance with the following requirements:

(1) Each Copermittee is encouraged to seek public and key stakeholder participation and comments, as early and often as possible during the process of developing updates to its jurisdictional runoff management program document;

(2) Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E concurrent with the submittal of the Water Quality Improvement Plan. Each Copermittee must correct any deficiencies in the jurisdictional runoff management program document based on comments received from the San Diego Water Board in

the updates submitted with the Water Quality Improvement Plan Annual Report;

(3) Each Copermittee must submit updates to its jurisdictional runoff management program, with the supporting rationale for the modifications, either in the Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b;

(4) The Copermittee must revise proposed modifications to its jurisdictional runoff management program as directed by the San Diego Water Board Executive Officer; and

(5) Updated jurisdictional runoff management program documents must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of submitting the Water Quality Improvement Plan Annual Report.

b. BMP DESIGN MANUAL UPDATES

Each Copermittee must update its BMP Design Manual in accordance with the following requirements:

(1) Each Copermittee must update its BMP Design Manual to incorporate the requirements of Provisions E.3.a-d concurrent with the submittal of the Water Quality Improvement Plan. Each Copermittee must correct any deficiencies in the BMP Design Manual based on comments received from the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report;

(2) Subsequent updates to the BMP Design Manual must be consistent with the requirements of Provisions E.3.a-d and must be submitted as part of the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b; and

(3) Updated BMP Design Manuals must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of completing the update.

c. WATER QUALITY IMPROVEMENT PLAN UPDATES

(1) The Water Quality Improvement Plans must be updated in accordance with the following process:

(a) The Copermittees must develop and implement a public participation process to obtain data, information and recommendations for updating the Water Quality Improvement Plan. The public participation process must provide for a publicly available and noticed schedule of opportunities for the public to participate and provide comments during the development of updates to the Water Quality Improvement Plan;

(b) The Copermittees must consult with the Water Quality Improvement Consultation Panel on proposed updates of the Water Quality Improvement Plan, and consider the Water Quality Improvement Consultation Panel's recommendations in finalizing the proposed updates;

(c) The Copermittees for each Watershed Management Area must submit 1) proposed updates to the Water Quality Improvement Plan and supporting rationale, and 2) recommendations received from the public and the Water Quality Improvement Consultation Panel and the rationale for the requested updates, either in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The updates submitted will be deemed accepted for inclusion in the Water Quality Improvement Plan ninety (90) days after submission unless otherwise directed in writing by the San Diego Water Board Executive Officer;

(d) The Copermittees must revise the requested updates as directed by the San Diego Water Board Executive Officer; and

(e) Updated Water Quality Improvement Plans must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance of the requested updates by the San Diego Water Board.

(2) No later than six months following Office of Administrative Law and USEPA approval of any TMDL Basin Plan amendment with wasteload allocations (WLAs) assigned to the Copermittees during the term of this Order, the Copermittees must initiate an update to the applicable Water Quality Improvement Plans in accordance with Provision F.1 or Provision F.2.c.(1) to incorporate the requirements of the TMDL WLAs.

3. Progress Reporting

a. Progress Report Presentations

The Copermittees for each Watershed Management Area must periodically appear before the San Diego Water Board, as requested by the Board, to provide progress reports on the implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs.

b. Annual Reports

(1) Transitional Jurisdictional Runoff Management Program Annual Reports

(a) Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) no later than October 31 of each year for each jurisdictional runoff management program reporting period (i.e. July 1 to June 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted.

(b) Each Copermittee must submit the information on the Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) specific to the area within its jurisdiction in each Watershed Management Area.

(c) In addition to submitting the Jurisdictional Runoff Management Program Annual Report Form during the transitional reporting period, each Copermittee may continue to utilize and submit the jurisdictional runoff management program annual reporting format of its previous NPDES permit until the first Water Quality Improvement Plan Annual Report is required to be submitted.

(2) Transitional Monitoring and Assessment Program Annual Reports

The Copermittees for each Watershed Management Area must submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted under this Order. The Transitional Monitoring and Assessment Program Annual Reports must include:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1.a and D.2.a, summarized and presented in tabular and graphical form; and

(b) The findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

(3) Water Quality Improvement Plan Annual Reports

The Copermittees for each Watershed Management Area must submit a Water Quality Improvement Plan Annual Report for each reporting period no later than January 31 of the following year. The annual reporting period consists of two different periods: 1) July 1 to June 30 of the following year for the jurisdictional runoff management programs, 2) October 1 to September 30 of the following year for the monitoring and assessment programs. The Water Quality Improvement Plan Annual Reports must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Each Annual Report must include the following:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, summarized and presented in tabular and graphical form;

(b) The progress of the special studies required pursuant to Provision D.3, and the findings, interpretations and conclusions of a special study, or each phase of a special study, upon its completion;

(c) The findings, interpretations and conclusions from the assessments required pursuant to Provision D.4;

(d) The progress of implementing the Water Quality Improvement Plan, including, but not limited to, the following:

(i) The progress toward achieving the interim and final numeric goals for the highest water quality priorities for the Watershed Management Area;

(ii) The water quality improvement strategies that were implemented and/or no longer implemented by each of the Copermittees during the reporting period and previous reporting periods;

(iii) The water quality improvement strategies planned for implementation during the next reporting period;

(iv) Proposed modifications to the water quality improvement strategies, the public comments received and the supporting rationale for the proposed modifications;

(v) Previous modifications or updates incorporated into the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document and implemented by the Copermittees in the Watershed Management Area; and

(vi) Proposed modifications or updates to the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document;

(e) A completed Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) for each Copermittee in the Watershed Management Area, certified by a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative; and

(f) Each Copermittee must provide any data or documentation utilized in developing the Water Quality Improvement Plan Annual Report upon request by the San Diego Water Board. Any Copermittee monitoring data utilized in developing the Water Quality Improvement Plan Annual Report must be uploaded to the California Environmental Data Exchange Network (CEDEN).[30] Any Copermittee monitoring and assessment data utilized in developing the Water Quality Improvement Plan Annual Report must be available for access on the Regional Clearinghouse required pursuant to Provision F.4.

C. REGIONAL MONITORING AND ASSESSMENT REPORT

(1) The Copermittees must submit a Regional Monitoring and Assessment Report no later than 180 days prior to the expiration date of this Order. The Regional Monitoring and Assessment Report may be submitted as part of the Report of Waste Discharge required pursuant to Provision F.5.b. In preparing the report the Copermittees must consider the receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, and the findings, interpretations, and conclusions from the assessments required pursuant to Provision D.4. Based on these considerations the report must assess the following:

(a) The beneficial uses of the receiving waters within the San Diego Region that are supported and not adversely affected by the Copermittees' MS4 discharges;

(b) The beneficial uses of the receiving waters within the San Diego Region that are adversely impacted by the Copermittees' MS4 discharges;

(c) The progress toward protecting the beneficial uses in the receiving waters within the San Diego Region from the Copermittees' discharges; and

[30] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

(d) Pollutants or conditions of emerging concern that may impact beneficial uses in the receiving waters within the San Diego Region.

(2) The Regional Monitoring and Assessment Report must include recommendations for improving the implementation and assessment of the Water Quality Improvement Plans and jurisdictional runoff management programs.

(3) Each Copermittee must provide any data or documentation utilized in developing the Regional Monitoring and Assessment Report upon request by the San Diego Water Board. Any Copermittee monitoring and assessment data utilized in developing the Regional Monitoring and Assessment Report must be available for access on the Regional Clearinghouse required pursuant to Provision F.4.

4. Regional Clearinghouse

The Copermittees must develop, update, and maintain an internet-based Regional Clearinghouse that is made available to the public no later than 18 months after the effective date of this Order.[31]

a. The Copermittees, through the Regional Clearinghouse, must make the following documents and data available for access, and organized by Watershed Management Area. The documents and data may be linked to other internet-based data portals and databases where the original documents are stored:

(1) Water Quality Improvement Plan for the Watershed Management Area, and all updated versions with date of update;

(2) Annual Reports for the Watershed Management Area;

(3) Jurisdictional Runoff Management Program document for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(4) BMP Design Manual for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(5) Reports from special studies (e.g. source identification, BMP effectiveness assessment) conducted in the Watershed Management Area;

[31] The Copermittees may develop, update and maintain the clearinghouse(s) of other Copermittees or agencies.

(6) Monitoring data collected pursuant to Provision D for each Watershed Management Area must be uploaded to CEDEN,[32] with links to the uploaded data; and

(7) Available GIS data, layers, and/or shapefiles used to develop the maps generated and maintained by the Copermittees for the Water Quality Improvement Plans, Annual Reports, and jurisdictional runoff management program documents.

b. The Copermittees, through the Regional Clearinghouse, must make the following information and documents available for access:

(1) Contact information (point of contact, phone number, email address, and mailing address) for each Copermittee;

(2) Public hotline number for reporting non-storm water and illicit discharges for each Copermittee;

(3) Email address for reporting non-storm water and illicit discharges for each Copermittee;

(4) Link to each Copermittee's website, if available, where the public may find additional information about the Copermittee's storm water management program and for requesting records for the implementation of its program;

(5) Information about opportunities for the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or protection of the quality of receiving waters; and

(6) Reports from regional monitoring programs in which the Copermittees participate (e.g. Southern California Monitoring Coalition, Southern California Coastal Water Research Project Bight Monitoring);

(7) Regional Monitoring and Assessment Reports; and

(8) Any other information, data, and documents the Copermittees determine as appropriate for making available to the public.

[32] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

5. Report of Waste Discharge

a. The ~~Orange County Copermittees and the~~ Riverside County Copermittees are required to submit a complete Report of Waste Discharge pursuant to the requirements of their current Order~~s~~. The San Diego Water Board will review and consider the Report~~s~~ of Waste Discharge to determine whether modification to this Order, pursuant to the requirements of Provision H, will be required prior to the ~~Orange County Copermittees and/or~~ Riverside County Copermittees obtaining coverage under this Order. The current Order ~~s~~ for ~~the Orange County Copermittees and~~ Riverside County Copermittees is ~~are~~ rescinded upon the date of effective coverage under this Order except for enforcement purposes.

b. The Copermittees subject to the requirements of this Order must submit to the San Diego Water Board a complete Report of Waste Discharge as an application for the re-issuance of this Order and NPDES permit. The Report of Waste Discharge must be submitted no later than 180 days in advance of the expiration date of this Order. The Report of Waste Discharge must contain the following minimum information:

(1) Names and addresses of the Copermittees;

(2) Names and titles of the primary contacts of the Copermittees;

(3) Proposed changes to the Copermittees' Water Quality Improvement Plans and the supporting justification;

(4) Proposed changes to the Copermittees' jurisdictional runoff management programs and the supporting justification;

(5) Any other information necessary for the re-issuance of this Order;

(6) Any information to be included as part of the Report of Waste Discharge pursuant to the requirements of this Order; and

(7) Any other information required by federal regulations for NPDES permit reissuance.

6. Application for Early Coverage

a. The ~~Orange County Copermittees, collectively, or~~ Riverside County Copermittees~~, collectively,~~ may apply for early coverage under this Order by submitting a Report of Waste Discharge Form 200, with a written request for early coverage under this Order.

b. The San Diego Water Board will review the application for early coverage. A notification of coverage under this Order will be issued to the Copermittees in the

respective county by the San Diego Water Board upon completion of the early coverage application requirements. The effective coverage date will be specified in the notification of coverage. The Copermittees in the respective county are authorized to have MS4 discharges pursuant to the requirements of this Order starting on the effective coverage date specified in the notification of coverage. The existing Order for the respective county is rescinded upon the effective coverage date specified in the notification of coverage except for enforcement purposes.

7. Reporting Provisions

Each Copermittee must comply with all the reporting and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

G. PRINCIPAL WATERSHED COPERMITTEE RESPONSIBILITIES

1. The Copermittees within each Watershed Management Area must designate a Principal Watershed Copermittee and notify the San Diego Water Board of the name of the Principal Watershed Copermittee. An individual Copermittee should not be designated a Principal Watershed Copermittee for more than two Watershed Management Areas. The notification may be submitted with the Water Quality Improvement Plan required pursuant to Provision F.1 of this Order.

2. The Principal Watershed Copermittee is responsible for, at a minimum, the following:

a. Serving as liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues, and when necessary and appropriate, representing the Copermittees in the Watershed Management Area before the San Diego Water Board;

b. Facilitating the development of the Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order;

c. Coordinating the submittal of the deliverables required by Provisions F.1, F.2, F.3.a, and F.3.b of this Order; and

d. Coordinating and developing, with the other Principal Watershed Copermittees, the requirements of Provisions F.3.c, F.4, and F.5.b of this Order.

3. The Principal Watershed Copermittee is not responsible for ensuring that the other Copermittees within the Watershed Management Area are in compliance with the requirements of this Order. Each Copermittee within the Watershed Management Area is responsible for complying with the requirements of this Order.

H. MODIFICATION OF ORDER

1. Modifications of the Order may be initiated by the San Diego Water Board or by the Copermittees. Requests by Copermittees must be made to the San Diego Water Board.

2. Minor modifications to the Order may be made by the San Diego Water Board where the proposed modification complies with all the prohibitions and limitations, and other requirements of this Order.

3. This Order may also be re-opened and modified, revoked and, reissued or terminated in accordance with the provisions of 40 CFR 122.44, 122.62 to 122.64, and 124.5. Causes for taking such actions include, but are not limited to, failure to comply with any condition of this Order and permit, and endangerment to human health or the environment resulting from the permitted activity.

4. This Order may be re-opened for modification for cause including but not limited to the following:

   a. The State Water Board determines that revisions are warranted, and the San Diego Water Board concurs that revisions are necessary to those provisions of the Order addressing compliance with water quality standards in the receiving water and/or those provisions of the Order establishing an iterative process for implementation of management practices to assure compliance with water quality standards in the receiving water;

   b. An application for early coverage under this Order is received pursuant to Provision F.6;

   c. Any of the TMDLs in Attachment E to this Order are amended in the Basin Plan by San Diego Water Board, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA;

   d. The Basin Plan is amended by the San Diego Water Board to incorporate a new TMDL, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA; or

   e. Updating or revising the monitoring and reporting requirements is determined to be necessary, at the discretion of the San Diego Water Board. Such modification(s) may include, but is (are) not limited to, revision(s) to: (i) implement recommendations from Southern California Coastal Water Research Project (SCCWRP), (ii) develop, refine, implement, and/or coordinate a regional monitoring program, (iii) develop and implement improved monitoring and assessment programs in keeping with San Diego Water Board Resolution No. R9-2012-0069, Resolution in Support of a Regional Monitoring Framework, and/or (iv) add provisions to require the Copermittees to evaluate and provide information on cost and values of the monitoring and reporting program.

5. The San Diego Water Board, after opportunity for public comment and a public hearing, will re-open and consider modifications to this Order when the ~~Orange County Copermittees or the~~ Riverside County Copermittees submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders.

I. STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

Each Copermittee must comply with all the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

ATTACHMENT A

DISCHARGE PROHIBITIONS AND SPECIAL PROTECTIONS

1. Basin Plan Waste Discharge Prohibitions

California Water Code Section 13243 provides that a Regional Water Board, in a water quality control plan, may specify certain conditions or areas where the discharge of waste or certain types of waste is not permitted. The following waste discharge prohibitions in the Water Quality Control Plan for the San Diego Basin (Basin Plan) are applicable to any person, as defined by Section 13050(c) of the California Water Code, who is a citizen, domiciliary, or political agency or entity of California whose activities in California could affect the quality of waters of the state within the boundaries of the San Diego Region.

1. The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in California Water Code Section 13050, is prohibited.

2. The discharge of waste to land, except as authorized by waste discharge requirements or the terms described in California Water Code Section 13264 is prohibited.

3. The discharge of pollutants or dredged or fill material to waters of the United States except as authorized by a National Pollutant Discharge Elimination System (NPDES) permit or a dredged or fill material permit (subject to the exemption described in California Water Code Section 13376) is prohibited.

4. Discharges of recycled water to lakes or reservoirs used for municipal water supply or to inland surface water tributaries thereto are prohibited, unless this San Diego Water Board issues a NPDES permit authorizing such a discharge; the proposed discharge has been approved by the State Department of Health Services (DHS) and the operating agency of the impacted reservoir; and the discharger has an approved fail-safe long-term disposal alternative.

5. The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the San Diego Water Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

6. The discharge of waste in a manner causing flow, ponding, or surfacing on lands not owned or under the control of the discharger is prohibited, unless the discharge is authorized by the San Diego Water Board.

7. The dumping, deposition, or discharge of waste directly into waters of the state, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the San Diego Water Board.

8. Any discharge to a storm water conveyance system that is not composed entirely of "*storm water*" is prohibited unless authorized by the San Diego Water Board. [The federal regulations, 40 CFR 122.26(b)(13), define storm water as storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from firefighting activities.] [§122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

9. The unauthorized discharge of treated or untreated sewage to waters of the state or to a storm water conveyance system is prohibited.

10. The discharge of industrial wastes to conventional septic tank/subsurface disposal systems, except as authorized by the terms described in California Water Code Section 13264, is prohibited.

11. The discharge of radioactive wastes amenable to alternative methods of disposal into the waters of the state is prohibited.

12. The discharge of any radiological, chemical, or biological warfare agent into waters of the state is prohibited.

13. The discharge of waste into a natural or excavated site below historic water levels is prohibited unless the discharge is authorized by the San Diego Water Board.

14. The discharge of sand, silt, clay, or other earthen materials from any activity, including land grading and construction, in quantities which cause deleterious bottom deposits, turbidity or discoloration in waters of the state or which unreasonably affect, or threaten to affect, beneficial uses of such waters is prohibited.

15. The discharge of treated or untreated sewage from vessels to Mission Bay, Oceanside Harbor, Dana Point Harbor, or other small boat harbors is prohibited.

16. The discharge of untreated sewage from vessels to San Diego Bay is prohibited.

17. The discharge of treated sewage from vessels to portions of San Diego Bay that are less than 30 feet deep at mean lower low water (MLLW) is prohibited.

18. The discharge of treated sewage from vessels, which do not have a properly functioning US Coast Guard certified Type I or Type II marine sanitation device, to portions of San Diego Bay that are greater than 30 feet deep at mean lower low water (MLLW) is prohibited.

2. Attachment B to State Water Board Resolution 2012-0012, as amended by State Water Board Resolution No. 2012-0031.

Special Protections for Areas of Special Biological Significance (ASBS), Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges

I. PROVISIONS FOR POINT SOURCE DISCHARGES OF STORM WATER AND NONPOINT SOURCE WASTE DISCHARGES

The following terms, prohibitions, and special conditions (hereafter collectively referred to as special conditions) are established as limitations on point source storm water and nonpoint source discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in Areas of Special Biological Significance (ASBS), as required for State Water Quality Protection Areas pursuant to California Public Resources Code Sections 36700(f) and 36710(f). These Special Protections are adopted by the State Water Board as part of the California Ocean Plan (Ocean Plan) General Exception.

The special conditions are organized by category of discharge. The State Water Resources Control Board (State Water Board) and Regional Water Quality Control Boards (Regional Water Boards) will determine categories and the means of regulation for those categories [e.g., Point Source Storm Water National Pollutant Discharge Elimination System (NPDES) or Nonpoint Source].

A. PERMITTED POINT SOURCE DISCHARGES OF STORM WATER

1. General Provisions for Permitted Point Source Discharges of Storm Water

a. Existing storm water discharges into an ASBS are allowed only under the following conditions:

(1) The discharges are authorized by an NPDES permit issued by the State Water Board or Regional Water Board;

(2) The discharges comply with all of the applicable terms, prohibitions, and special conditions contained in these Special Protections; and

(3) The discharges:

(i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

(ii) Are designed to prevent soil erosion;

(iii) Occur only during wet weather;

(iv) Are composed of only storm water runoff.

b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

c. The discharge of trash is prohibited.

d. Only discharges from existing storm water outfalls are allowed. Any proposed or new storm water runoff discharge shall be routed to existing storm water discharge outfalls and shall not result in any new contribution of waste to an ASBS (i.e., no additional pollutant loading). "Existing storm water outfalls" are those that were constructed or under construction prior to January 1, 2005. "New contribution of waste" is defined as any addition of waste beyond what would have occurred as of January 1, 2005. A change to an existing storm water outfall, in terms of re-location or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges are prohibited except as provided below:

(1) The term "non-storm water discharges" means any waste discharges from a municipal separate storm sewer system (MS4) or other NPDES permitted storm drain system to an ASBS that are not composed entirely of storm water.

(2) (i) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability or occur naturally:

(a) Discharges associated with emergency fire fighting operations.

(b) Foundation and footing drains.

(c) Water from crawl space or basement pumps.

(d) Hillside dewatering.

(e) Naturally occurring groundwater seepage via a storm drain.

(f) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(ii) An NPDES permitting authority may authorize non-storm water discharges to an MS4 with a direct discharge to an ASBS only to the extent the NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

2. Compliance Plans for Inclusion in Storm Water Management Plans (SWMP) and Storm Water Pollution Prevention Plans (SWPPP).

The discharger shall specifically address the prohibition of non-storm water runoff and the requirement to maintain natural water quality for storm water discharges to an ASBS in an ASBS Compliance Plan to be included in its SWMP or a SWPPP, as appropriate to permit

type. If a statewide permit includes a SWMP, then the discharger shall prepare a stand-alone compliance plan for ASBS discharges. The ASBS Compliance Plan is subject to approval by the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (for permits issued by Regional Water Boards).

a. The Compliance Plan shall include a map of surface drainage of storm water runoff, showing areas of sheet runoff, prioritize discharges, and describe any structural Best Management Practices (BMPs) already employed and/or BMPs to be employed in the future. Priority discharges are those that pose the greatest water quality threat and which are identified to require installation of structural BMPs. The map shall also show the storm water conveyances in relation to other features such as service areas, sewage conveyances and treatment facilities, landslides, areas prone to erosion, and waste and hazardous material storage areas, if applicable. The SWMP or SWPPP shall also include a procedure for updating the map and plan when changes are made to the storm water conveyance facilities.

b. The ASBS Compliance Plan shall describe the measures by which all non-authorized non-storm water runoff (e.g., dry weather flows) has been eliminated, how these measures will be maintained over time, and how these measures are monitored and documented.

c. For Municipal Separate Storm Sewer System (MS4s), the ASBS Compliance Plan shall require minimum inspection frequencies as follows:

(1) The minimum inspection frequency for construction sites shall be weekly during rainy season;

(2) The minimum inspection frequency for industrial facilities shall be monthly during the rainy season;

(3) The minimum inspection frequency for commercial facilities (e.g., restaurants) shall be twice during the rainy season; and

(4) Storm water outfall drains equal to or greater than 18 inches (457 mm) in diameter or width shall be inspected once prior to the beginning of the rainy season and once during the rainy season and maintained to remove trash and other anthropogenic debris.

d. The ASBS Compliance Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff, that are necessary to comply with these special conditions, will be achieved through BMPs. Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that such installation would pose a threat to health or safety. BMPs to control storm water runoff discharges (at the end-of-pipe) during a design storm shall be designed to achieve on average the following target levels:

(1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

(2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges.

The baseline for these determinations is the effective date of the Exception, except for those structural BMPs installed between January 1, 2005 and adoption of these Special Protections, and the reductions must be achieved and documented within six (6) years of the effective date.

e. The ASBS Compliance Plan shall address erosion control and the prevention of anthropogenic sedimentation in ASBS. The natural habitat conditions in the ASBS shall not be altered as a result of anthropogenic sedimentation.

f. The ASBS Compliance Plan shall describe the non-structural BMPs currently employed and planned in the future (including those for construction activities), and include an implementation schedule. The ASBS Compliance Plan shall include non-structural BMPs that address public education and outreach. Education and outreach efforts must adequately inform the public that direct discharges of pollutants from private property not entering an MS4 are prohibited. The ASBS Compliance Plan shall also describe the structural BMPs, including any low impact development (LID) measures, currently employed and planned for higher threat discharges and include an implementation schedule. To control storm water runoff discharges (at the end-of-pipe) during a design storm, permittees must first consider, and use where feasible, LID practices to infiltrate, use, or evapotranspirate storm water runoff on-site, if LID practices would be the most effective at reducing pollutants from entering the ASBS.

g. The BMPs and implementation schedule shall be designed to ensure that natural water quality conditions in the receiving water are achieved and maintained by either reducing flows from impervious surfaces or reducing pollutant loading, or some combination thereof.

h. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents in storm water runoff that alter natural ocean water quality and the sources of these constituents.

(2) The report shall describe BMPs that are currently being implemented, BMPs that are identified in the SWMP or SWPPP for future implementation, and any additional BMPs that may be added to the SWMP or SWPPP to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the BMPs.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits), the discharger shall revise its ASBS Compliance Plan to incorporate any new or modified BMPs that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised SWMP or SWPPP, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural ocean water quality conditions due to the same constituent.

(5) The requirements of this section are in addition to the terms, prohibitions, and conditions contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within eighteen (18) months from the effective date of the Exception, the discharger shall submit a draft written ASBS Compliance Plan to the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that describes its strategy to comply with these special conditions, including the requirement to maintain natural water quality in the affected ASBS. The ASBS Compliance Plan shall include a description of appropriate non-structural controls and a time schedule to implement structural controls (implementation schedule) to comply with these special conditions for inclusion in the discharger's SWMP or SWPPP, as appropriate to permit type. The final ASBS Compliance Plan, including a description and final schedule for structural controls based on the results of runoff and receiving water monitoring, must be submitted within thirty (30) months from the effective date of the Exception.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these special conditions shall be implemented.

d. Within six (6) years of the effective date of the Exception, any structural controls identified in the ASBS Compliance Plan that are necessary to comply with these special conditions shall be operational.

e. Within six (6) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water, pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data, and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe

the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. for municipalities, a demonstration of significant hardship to discharger ratepayers, by showing the relationship of storm water fees to annual household income for residents within the discharger's jurisdictional area, and the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or

2. for other governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

B. NONPOINT SOURCE DISCHARGES

1. General Provisions for Nonpoint Sources

a. Existing nonpoint source waste discharges are allowed into an ASBS only under the following conditions:

(1) The discharges are authorized under waste discharge requirements, a conditional waiver of waste discharge requirements, or a conditional prohibition issued by the State Water Board or a Regional Water Board.

(2) The discharges are in compliance with the applicable terms, prohibitions, and special conditions contained in these Special Protections.

(3) The discharges:

(i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

(ii) Are designed to prevent soil erosion;

(iii) Occur only during wet weather;

(iv) Are composed of only storm water runoff.

b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

c. The discharge of trash is prohibited.

d. Only existing nonpoint source waste discharges are allowed. "Existing nonpoint source waste discharges" are discharges that were ongoing prior to January 1, 2005. "New nonpoint source discharges" are defined as those that commenced on or after January 1, 2005. A change to an existing nonpoint source discharge, in terms of relocation or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges from nonpoint sources (those not subject to an NPDES Permit) are prohibited except as provided below:

(1) The term "non-storm water discharges" means any waste discharges that are not composed entirely of storm water.

(2) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability, or occur naturally:

(i) Discharges associated with emergency fire fighting operations.

(ii) Foundation and footing drains.

(iii) Water from crawl space or basement pumps.

(iv) Hillside dewatering.

(v) Naturally occurring groundwater seepage via a storm drain.

(vi) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

f. At the San Clemente Island ASBS, discharges incidental to military training and research, development, test, and evaluation operations are allowed. Discharges incidental to underwater demolition and other in-water explosions are not allowed in the two military closure areas in the vicinity of Wilson Cove and Castle Rock. Discharges must not result in a violation of the water quality objectives, including the protection of the marine aquatic life beneficial use, anywhere in the ASBS.

g. At the San Nicolas Island and Begg Rock ASBS, discharges incidental to military research, development, testing, and evaluation of, and training with, guided missile and other weapons systems, fleet training exercises, small-scale amphibious warfare training, and special warfare training are allowed. Discharges incidental to underwater demolition and other in-water explosions are not allowed. Discharges must not result in a violation of the water quality objectives, including the protection of the marine aquatic life beneficial use, anywhere in the ASBS.

h. All other nonpoint source discharges not specifically authorized above are prohibited.

2. Planning and Reporting

a. The nonpoint source discharger shall develop an ASBS Pollution Prevention ~~P~~lan, including an implementation schedule, to address storm water runoff and any other nonpoint source discharges from its facilities. The ASBS Pollution Prevention Plan must be equivalent in contents to an ASBS Compliance Plan as described in I (A)(2) in this document. The ASBS Pollution Prevention Plan is subject to approval by the Executive Director of the State Water Board (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements).

b. The ASBS Pollution Prevention Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff that are necessary to comply with these special conditions, will be achieved through Management Measures and associated Management Practices (Management Measures/Practices). Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director or Regional Water Board Executive Officer that such installation would pose a threat to health or safety. Management Measures to control storm water runoff during a design storm shall achieve on average the following target levels:

(1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

(2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges.

The baseline for these determinations is the effective date of the Exception, except for those structural BMPs installed between January 1, 2005 and adoption of these Special Protections, and the reductions must be achieved and documented within six (6) years of the effective date.

c. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff or other nonpoint source pollution is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and the Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents that alter natural water quality and the sources of these constituents.

(2) The report shall describe Management Measures/Practices that are currently being implemented, Management Measures/Practices that are identified in the ASBS Pollution Prevention Plan for future implementation, and any additional Management Measures/Practices that may be added to the Pollution Prevention Plan to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the Management Measures/Practices.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of

the Regional Water Board (Regional Water Board waivers or waste discharge requirements), the discharger shall revise its ASBS Pollution Prevention Plan to incorporate any new or modified Management Measures/Practices that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised ASBS Pollution Prevention Plan, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural water quality conditions due to the same constituent.

(5) The requirements of this section are in addition to the terms, prohibitions, and conditions contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within eighteen (18) months from the effective date of the Exception, the discharger~~s~~ shall submit a draft written ASBS Pollution Prevention Plan to the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) that describes its strategy to comply with these special conditions, including the requirement to maintain natural ocean water quality in the affected ASBS. The Pollution Prevention Plan shall include a description of appropriate non-structural controls and a time schedule to implement structural controls to comply with these special conditions for inclusion in the discharger's Pollution Prevention Plan. The final ASBS Pollution Prevention Plan, including a description and final schedule for structural controls based on the results of runoff and receiving water monitoring, must be submitted within thirty (30) months from the effective date of the Exception.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these Special Protections shall be implemented.

d. Within six (6) years of the effective date of the Exception, any structural controls identified in the ASBS Pollution Prevention Plan that are necessary to comply with these special conditions shall be operational.

e. Within six (6) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board

waivers or waste discharge requirements) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. a demonstration that the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or

2. for governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

II. ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES

In addition to the provisions in Section I (A) or I (B), respectively, a discharger with parks and recreation facilities shall comply with the following:

A. The discharger shall include a section in an ASBS Compliance Plan (for NPDES dischargers) or an ASBS Pollution Prevention Plan (for nonpoint source dischargers) to address storm water runoff from parks and recreation facilities.

1. The plan shall identify all pollutant sources, including sediment sources, which may result in waste entering storm water runoff. Pollutant sources include, but are not limited to, roadside rest areas and vistas, picnic areas, campgrounds, trash receptacles, maintenance facilities, park personnel housing, portable toilets, leach fields, fuel tanks, roads, piers, and boat launch facilities.

2. The plan shall describe BMPs or Management Measures/Practices that will be implemented to control soil erosion (both temporary and permanent erosion controls) and reduce or eliminate pollutants in storm water runoff in order to achieve and maintain natural water quality conditions in the affected ASBS. The plan shall include BMPs or Management Measures/Practices to ensure that trails and culverts are maintained to prevent erosion and minimize waste discharges to ASBS.

3. The plan shall include BMPs or Management Measures/Practices to prevent the discharge of pesticides or other chemicals, including agricultural chemicals, in storm water runoff to the affected ASBS.

4. The plan shall include BMPs or Management Measures/Practices that address public education and outreach. The goal of these BMPs or Management Measures/Practices is to ensure that the public is adequately informed that waste discharges to the affected ASBS are prohibited or limited by special conditions in these Special Protections. The BMPs or Management Measures/Practices shall include signage at camping, picnicking, beach and roadside parking areas, and visitor centers, or other appropriate measures, which notify the public of any applicable requirements of these Special Protections and identify the ASBS boundaries.

5. The plan shall include BMPs or Management Measures/Practices that address the prohibition against the discharge of trash to ASBS. The BMPs or Management Measures/Practices shall include measures to ensure that adequate trash receptacles are available for public use at visitor facilities, including parking areas, and that the receptacles are adequately maintained to prevent trash discharges into the ASBS. Appropriate measures include covering trash receptacles to prevent trash from being wind blown and periodically emptying the receptacles to prevent overflows.

6. The plan shall include BMPs or Management Measures/Practices to address runoff from parking areas and other developed features to ensure that the runoff does not alter natural water quality in the affected ASBS. BMPs or Management Measures/Practices shall include measures to reduce pollutant loading in runoff to the ASBS through installation of natural area buffers (LID), treatment, or other appropriate measures.

B. Maintenance and repair of park and recreation facilities must not result in waste discharges to the ASBS. The practice of road oiling must be minimized or eliminated, and must not result in waste discharges to the ASBS.

III. ADDITIONAL REQUIREMENTS – WATERFRONT AND MARINE OPERATIONS

In addition to the provisions in Section I (A) or I (B), respectively, a discharger with waterfront and marine operations shall comply with the following:

A. For discharges related to waterfront and marine operations, the discharger shall develop a Waterfront and Marine Operations Management Plan (Waterfront Plan). This plan shall contain appropriate Management Measures/Practices to address nonpoint source pollutant discharges to the affected ASBS.

1. The Waterfront Plan shall contain appropriate Management Measures/Practices for any waste discharges associated with the operation and maintenance of vessels, moorings, piers, launch ramps, and cleaning stations in order to ensure that beneficial uses are protected and natural water quality is maintained in the affected ASBS.

2. For discharges from marinas and recreational boating activities, the Waterfront Plan shall include appropriate Management Measures, described in The Plan for California's Nonpoint Source Pollution Control Program, for marinas and recreational boating, or equivalent practices, to ensure that nonpoint source pollutant discharges do not alter natural water quality in the affected ASBS.

3. The Waterfront Plan shall include Management Practices to address public education and outreach to ensure that the public is adequately informed that waste discharges to the affected ASBS are prohibited or limited by special conditions in these Special Protections. The management practices shall include appropriate signage, or similar measures, to inform the public of the ASBS restrictions and to identify the ASBS boundaries.

4. The Waterfront Plan shall include Management Practices to address the prohibition against trash discharges to ASBS. The Management Practices shall include the provision of adequate trash receptacles for marine recreation areas, including parking areas, launch ramps, and docks. The plan shall also include appropriate Management Practices to ensure that the receptacles are adequately maintained and secured in order to prevent trash discharges into the ASBS. Appropriate Management Practices include covering the trash receptacles to prevent trash from being windblown, staking or
securing the trash receptacles so they don't tip over, and periodically emptying the receptacles to prevent overflow.

5. The discharger shall submit its Waterfront Plan to the by the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) within six months of the effective date of these special conditions. The Waterfront Plan is subject to approval by the State Water Board Executive Director or the Regional Water Board Executive Officer, as appropriate. The plan must be fully implemented within 18 months of the effective date of the Exception.

B. The discharge of chlorine, soaps, petroleum, other chemical contaminants, trash, fish offal, or human sewage to ASBS is prohibited. Sinks and fish cleaning stations are point source discharges of wastes and are prohibited from discharging into ASBS. Anthropogenic accumulations of discarded fouling organisms on the sea floor must be minimized.

C. Limited-term activities, such as the repair, renovation, or maintenance of waterfront facilities, including, but not limited to, piers, docks, moorings, and breakwaters, are authorized only in accordance with Chapter III.E.2 of the Ocean Plan.

D. If the discharger anticipates that the discharger will fail to fully implement the approved Waterfront Plan within the 18 month deadline, the discharger shall submit a technical report as soon as practicable to the State Water Board Executive Director or the Regional Water Board Executive Officer, as appropriate. The technical report shall contain reasons for failing to meet the deadline and propose a revised schedule to fully implement the plan.

E. The State Water Board or the Regional Water Board may, for good cause, authorize additional time to comply with the Waterfront Plan. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that

caused or would cause it to fail to meet the deadline in Section III.A.5. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality. The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. a demonstration of significant hardship by showing that the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate.

2. for governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

IV. MONITORING REQUIREMENTS

Monitoring is mandatory for all dischargers to assure compliance with the Ocean Plan. Monitoring requirements include both: (A) core discharge monitoring, and (B) ocean receiving water monitoring. The State and Regional Water Boards must approve sampling site locations and any adjustments to the monitoring programs. All ocean receiving water and reference area monitoring must be comparable with the Water Boards' Surface Water Ambient Monitoring Program (SWAMP).

Safety concerns: Sample locations and sampling periods must be determined considering safety issues. Sampling may be postponed upon notification to the State and Regional Water Boards if hazardous conditions prevail.

Analytical Chemistry Methods: All constituents must be analyzed using the lowest minimum detection limits comparable to the Ocean Plan water quality objectives. For metal analysis, all samples, including storm water effluent, reference samples, and ocean receiving water samples, must be analyzed by the approved analytical method with the lowest minimum detection limits (currently Inductively Coupled Plasma/Mass Spectrometry) described in the Ocean Plan.

A. CORE DISCHARGE MONITORING PROGRAM

1. General sampling requirements for timing and storm size:

Runoff must be collected during a storm event that is greater than 0.1 inch and generates runoff, and at least 72 hours from the previously measurable storm event. Runoff samples shall be collected during the same storm and at approximately the same time when post-storm receiving water is sampled, and analyzed for the same constituents as receiving water and reference site samples (see section IV B) as described below.

2. Runoff flow measurements

a. For municipal/industrial storm water outfalls in existence as of December 31, 2007, 18 inches (457mm) or greater in diameter/width (including multiple outfall pipes in combination having a width of 18 inches, runoff flows must be measured or calculated, using a method acceptable to and approved by the State and Regional Water Boards.

b. This will be reported annually for each precipitation season to the State and Regional Water Boards.

3. Runoff samples – storm events

a. For outfalls equal to or greater than 18 inches (0.46m) in diameter or width:

(1) samples of storm water runoff shall be collected during the same storm as receiving water samples and analyzed for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

(2) samples of storm water runoff shall be collected and analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

(3) If an applicant has no outfall greater than 36 inches, then storm water runoff from the applicant's largest outfall shall be further collected during the same storm as receiving water samples and analyzed for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates).

b. For outfalls equal to or greater than 36 inches (0.91m) in diameter or width:

(1) samples of storm water runoff shall be collected during the same storm as receiving water samples and analyzed for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

(2) samples of storm water runoff shall be further collected during the same storm as receiving water samples and analyzed for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates); and

(3) samples of storm water runoff shall be collected and analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

c. For an applicant not participating in a regional monitoring program [see below in Section IV (B)] in addition to (a.) and (b.) above, a minimum of the two largest outfalls or 20 percent of the larger outfalls, whichever is greater, shall be sampled (flow weighted composite samples) at least three times annually during wet weather (storm event)

and analyzed for all Ocean Plan Table A constituents, Table B constituents for marine aquatic life protection (except for toxicity, only chronic toxicity for three species shall be required), DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, and Ocean Plan indicator bacteria. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one (the largest) such discharge shall be sampled annually in each Region.

4. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may reduce or suspend core monitoring once the storm runoff is fully characterized. This determination may be made at any point after the discharge is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

B. Ocean Receiving Water and Reference Area Monitoring Program

In addition to performing the Core Discharge Monitoring Program in Section II.A above, all applicants having authorized discharges must perform ocean receiving water monitoring. In order to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS, dischargers may choose either (1) an individual monitoring program, or (2) participation in a regional integrated monitoring program.

1. Individual Monitoring Program: The requirements listed below are for those dischargers who elect to perform an individual monitoring program to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within the affected ASBS. In addition to Core Discharge Monitoring, the following additional monitoring requirements shall be met:

   a. Three times annually, during wet weather (storm events), the receiving water at the point of discharge from the outfalls described in section (IV)(A)(3)(c) above shall be sampled and analyzed for Ocean Plan Table A constituents, Table B constituents for marine aquatic life, DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, salinity, chronic toxicity (three species), and Ocean Plan indicator bacteria.

      The sample location for the ocean receiving water shall be in the surf zone at the point of discharges; this must be at the same location where storm water runoff is sampled. Receiving water shall be sampled prior to (pre-storm) and during (or immediately after) the same storm (post storm). Post storm sampling shall be during the same storm and at approximately the same time as when the runoff is sampled. Reference water quality shall also be sampled three times annually and analyzed for the same constituents pre-storm and post-storm, during the same storm seasons when receiving water is sampled. Reference stations will be determined by the State Water Board's Division of Water Quality and the applicable Regional Water Board(s).

   b. Sediment sampling shall occur at least three times during every five (5) year period. The subtidal sediment (sand or finer, if present) at the discharge shall be sampled and analyzed for Ocean Plan Table B constituents for marine aquatic life, DDT, PCBs, PAHs, pyrethroids, and OP pesticides. For sediment toxicity testing, only an acute toxicity test using the amphipod *Eohaustorius estuarius* must be performed.

c. A quantitative survey of intertidal benthic marine life shall be performed at the discharge and at a reference site. The survey shall be performed at least once every five (5) year period. The survey design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The results of the survey shall be completed and submitted to the State Water Board and Regional Water Board at least six months prior to the end of the permit cycle.

d. Once during each five (5) year period, a bioaccumulation study shall be conducted to determine the concentrations of metals and synthetic organic pollutants at representative discharge sites and at representative reference sites. The study design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The bioaccumulation study may include California mussels (*Mytilus californianus*) and/or sand crabs (*Emerita analoga* or *Blepharipoda occidentalis*). Based on the study results, the Regional Water Board and the State Water Board's Division of Water Quality, may adjust the study design in subsequent permits, or add or modify additional test organisms (such as shore crabs or fish), or modify the study design appropriate for the area and best available sensitive measures of contaminant exposure.

e. Marine Debris: Representative quantitative observations for trash by type and source shall be performed along the coast of the ASBS within the influence of the discharger's outfalls. The design, including locations and frequency, of the marine debris observations is subject to approval by the Regional Water Board and State Water Board's Division of Water Quality.

f. The monitoring requirements of the Individual Monitoring Program in this section are minimum requirements. After a minimum of one (1) year of continuous water quality monitoring of the discharges and ocean receiving waters, the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may require additional monitoring, or adjust, reduce or suspend receiving water and reference station monitoring. This determination may be made at any point after the discharge and receiving water is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

2. Regional Integrated Monitoring Program: Dischargers may elect to participate in a regional integrated monitoring program, in lieu of an individual monitoring program, to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS. This regional approach shall characterize natural water quality, pre- and post-storm, in ocean reference areas near the mouths of identified open space watersheds and the effects of the discharges on natural water quality (physical, chemical, and toxicity) in the ASBS receiving waters, and should include benthic marine aquatic life and bioaccumulation components. The design of the ASBS stratum of a regional integrated monitoring program may deviate from the otherwise prescribed individual monitoring approach (in Section IV.B.1) if approved by the State Water Board's Division of Water Quality and the Regional Water Boards.

a. Ocean reference areas shall be located at the drainages of flowing watersheds with minimal development (in no instance more than 10% development), and shall not be located in CWA Section 303(d) listed waterbodies or have tributaries that are 303(d) listed. Reference areas shall be free of wastewater discharges and anthropogenic non- storm water runoff. A minimum of low threat storm runoff discharges (e.g.

stream highway overpasses and campgrounds) may be allowed on a case-by-case basis. Reference areas shall be located in the same region as the ASBS receiving water monitoring occurs. The reference areas for each Region are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean reference water samples must be collected from each station, each from a separate storm during the same storm season that receiving water is sampled. A minimum of one reference location shall be sampled for each ASBS receiving water site sampled per responsible party. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

b. ASBS ocean receiving water must be sampled in the surf zone at the location where the runoff makes contact with ocean water (i.e. at "point zero"). Ocean receiving water stations must be representative of worst-case discharge conditions (i.e. co-located at a large drain greater than 36 inches, or if drains greater than 36 inches are not present in the ASBS then the largest drain greater than18 inches.) Ocean receiving water stations are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean receiving water samples must be collected during each storm season from each station, each from a separate storm. A minimum of one receiving water location shall be sampled in each ASBS per responsible party in that ASBS. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

c. Reference and receiving water sampling shall commence during the first full storm season following the adoption of these special conditions, and post-storm samples shall be collected during the same storm event when storm water runoff is sampled. Sampling shall occur in a minimum of two storm seasons. For those ASBS dischargers that have already participated in the Southern California Bight 2008 ASBS regional monitoring effort, sampling may be limited to only one storm season.

d. Receiving water and reference samples shall be analyzed for the same constituents as storm water runoff samples. At a minimum, constituents to be sampled and analyzed in reference and discharge receiving waters must include oil and grease, total suspended solids, Ocean Plan Table B metals for protection of marine life, Ocean Plan PAHs, pyrethroids, OP pesticides, ammonia, nitrate, phosphates, and critical life stage chronic toxicity for three species. In addition, within the range of the southern sea otter, indicator bacteria or some other measure of fecal contamination shall be analyzed.

3. Waterfront and Marine Operations: In addition to the above requirements for ocean receiving water monitoring, additional monitoring must be performed for marinas and boat launch and pier facilities:

a. For all marina or mooring field operators, in mooring fields with 10 or more occupied moorings, the ocean receiving water must be sampled for Ocean Plan indicator bacteria, residual chlorine, copper, zinc, grease and oil, methylene blue active substances (MBAS), and ammonia nitrogen.

(1) For mooring field operators opting for an individual monitoring program (Section IV.B.1 above), this sampling must occur weekly (on the weekend) from May through October.

(2) For mooring field operators opting to participate in a regional integrated monitoring program (Section IV.B.2 above), this sampling must occur monthly from May through October on a high use weekend in each month. The Water Boards may allow a reduction in the frequency of sampling, through the regional monitoring program, after the first year of monitoring.

b. For all mooring field operators, the subtidal sediment (sand or finer, if present) within mooring fields and below piers shall be sampled and analyzed for Ocean Plan Table B metals (for marine aquatic life beneficial use), acute toxicity, PAHs, and tributyltin. For sediment toxicity testing, only an acute toxicity test using the amphipod *Eohaustorius estuarius* must be performed. This sampling shall occur at least three times during a five (5) year period. For mooring field operators opting to participate in a regional integrated monitoring program, the Water Boards may allow a reduction in the frequency of sampling after the first sampling effort's results are assessed.

Glossary

At the point of discharge(s) – Means in the surf zone immediately where runoff from an outfall meets the ocean water (a.k.a., at point zero).

Areas of Special Biological Significance (ASBS) – Those areas designated by the State Water Board as ocean areas requiring protection of species or biological communities to the extent that alteration of natural water quality is undesirable. All Areas of Special Biological Significance are also classified as a subset of State Water Quality Protection Areas.

Design storm – For purposes of these Special Protections, a design storm is defined as the volume of runoff produced from one inch of precipitation per day or, if this definition is inconsistent with the discharger's applicable storm water permit, then the design storm shall be the definition included in the discharger's applicable storm water permit.

Development – Relevant to reference monitoring sites, means urban, industrial, agricultural, grazing, mining, and timber harvesting land uses.

Higher threat discharges - Permitted storm drains discharging equal to or greater than 18 inches, industrial storm drains, agricultural runoff discharged through an MS4, discharges associated with waterfront and marina operations (e.g., piers, launch ramps, mooring fields, and associated vessel support activities, except for passive discharges defined below), and direct discharges associated with commercial or industrial activities to ASBS.

Low Impact Development (LID) – A sustainable practice that benefits water supply and contributes to water quality protection. Unlike traditional storm water management, which entails collecting and conveying storm water runoff through storm drains, pipes, or other conveyances to a centralized storm water facility, LID focuses on using site design and storm water management to maintain the site's pre-development runoff rates and volumes. The goal of LID is to mimic a site's predevelopment hydrology by using design techniques that infiltrate, filter, store, evaporate, and detain runoff close to the source of rainfall.

Marine Operations – Marinas or mooring fields that contain slips or mooring locations for 10 or more vessels.

Management Measure (MM) - Economically achievable measures for the control of the addition of pollutants from various classes of nonpoint sources of pollution, which reflect the greatest degree of pollutant reduction achievable through the application of the best available nonpoint pollution control practices, technologies, processes, siting criteria, operating methods, or other alternatives. For example, in the "marinas and recreational boating" land- use category specified in the Plan for California's Nonpoint Source Pollution Control Program (NPS Program Plan) (SWRCB, 1999), "boat cleaning and maintenance" is considered a MM or the source of a specific class or type of NPS pollution.

Management Practice (MP) - The practices (e.g., structural, non-structural, operational, or other alternatives) that can be used either individually or in combination to address a specific MM class or classes of NPS pollution. For example, for the "boat cleaning and maintenance" MM, specific MPs can include, but are not limited to, methods for the selection of environmentally sensitive hull paints or methods for cleaning/removal of hull copper anti- fouling paints.

Municipal Separate Storm Sewer System (MS4) – A municipally-owned storm sewer system regulated under the Phase I or Phase II storm water program implemented in compliance with Clean Water Act section 402(p). Note that an MS4 program's boundaries are not necessarily congruent with the permittee's political boundaries.

Natural Ocean Water Quality - The water quality (based on selected physical, chemical and biological characteristics) that is required to sustain marine ecosystems, and which is without apparent human influence, *i.e.*, an absence of significant amounts of: (a) man-made constituents (*e.g.,* DDT); (b) other chemical (*e.g.,* trace metals), physical (temperature/thermal pollution, sediment burial), and biological (*e.g.*, bacteria) constituents at concentrations that have been elevated due to man's activities above those resulting from the naturally occurring processes that affect the area in question; and (c) non-indigenous biota (*e.g.,* invasive algal bloom species) that have been introduced either deliberately or accidentally by man. Discharges "*shall not alter natural ocean water quality*" as determined by a comparison to the range of constituent concentrations in reference areas agreed upon via the regional monitoring program(s). If monitoring information indicates that *natural ocean water quality* is not maintained, but there is sufficient evidence that a discharge is not contributing to the alteration of natural water quality, then the Regional Water Board may make that determination. In this case, sufficient information must include runoff sample data that has equal or lower concentrations for the range of constituents at the applicable reference area(s).

Nonpoint source – Nonpoint pollution sources generally are sources that do not meet the definition of a point source. Nonpoint source pollution typically results from land runoff, precipitation, atmospheric deposition, agricultural drainage, marine/boating operations or hydrologic modification. Nonpoint sources, for purposes of these Special Protections, include discharges that are not required to be regulated under an NPDES permit.

Non-storm water discharge – Any runoff that is not the result of a precipitation event. This is often referred to as "dry weather flow."

Non-structural control – A Best Management Practice that involves operational, maintenance, regulatory (e.g., ordinances) or educational activities designed to reduce or eliminate pollutants in runoff, and that are not structural controls (i.e. there are no physical structures involved).

Physical impossibility - Means any act of God, war, fire, earthquake, windstorm, flood or natural catastrophe; unexpected and unintended accidents not caused by discharger or its employees' negligence; civil disturbance, vandalism, sabotage or terrorism; restrain by court order or public authority or agency; or action or non-action by, or inability to

obtain the necessary authorizations or approvals from any governmental agency other than the permittee.

Representative sites and monitoring procedures – Are to be proposed by the discharger, with appropriate rationale, and subject to approval by Water Board staff.

Sheet-flow – Runoff that flows across land surfaces at a shallow depth relative to the cross- sectional width of the flow. These types of flow may or may not enter a storm drain system before discharge to receiving waters.

Storm Season – Also referred to as rainy season, means the months of the year from the onset of rainfall during autumn until the cessation of rainfall in the spring.

Structural control – A Best Management Practice that involves the installation of engineering solutions to the physical treatment or infiltration of runoff.

Surf Zone - The surf zone is defined as the submerged area between the breaking waves and the shoreline at any one time.

Surface Water Ambient Monitoring Program (SWAMP) comparable – Means that the monitoring program must 1) meet or exceed 2008 SWAMP Quality Assurance Program Management Plan (QAPP) Measurement Quality Objectives, or 2) have a Quality Assurance Project Plan that has been approved by SWAMP; in addition data must be formatted to match the database requirements of the SWAMP Information Management System. Adherence to the measurement quality objectives in the Southern California Bight 2008 ASBS Regional Monitoring Program QAPP and data base management comprises being SWAMP comparable.

Waterfront Operations - Piers, launch ramps, and cleaning stations in the water or on the adjacent shoreline.

Attachment 1
Special Protections Sections I(A)(3)(e) and I(B)(3)(e)
Flowchart to Deteremine Compliance with natural Water Quality

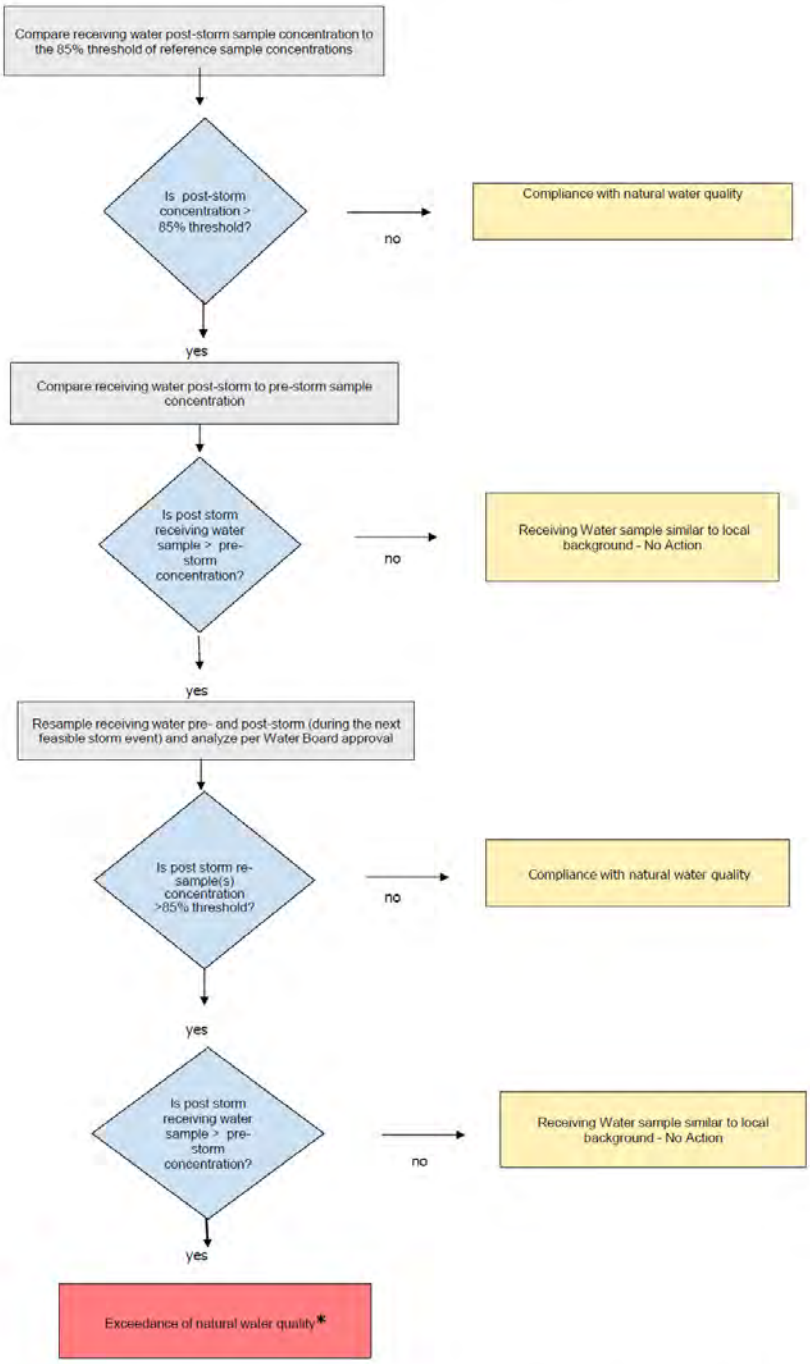

*** When an exceedance of natural water quality occurs, the discharger must comply with section I.A.2.h (for permitted storm water) or section I.B.2.c (for nonpoint sources). Note, when sampling data is available, end-of-pipe effluent concentrations will be considered by the Water Boards in making this determination.**

ATTACHMENT B

STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

1. Standard Permit Provisions

Code of Federal Regulations Title 40 Section 122.41 (40 CFR 122.41) includes conditions, or provisions, that apply to all National Pollutant Discharge Elimination System (NPDES) permits. Additional provisions applicable to NPDES permits are in 40 CFR 122.42. All applicable provisions in 40 CFR 122.41 and 40 CFR 122.42 must be incorporated into this Order and NPDES permit. The applicable 40 CFR 122.41 and 40 CFR 122.42 provisions are as follows:

a. DUTY TO COMPLY [40 CFR 122.41(a)]

The Copermittee must comply with all of the provisions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

(1) The Copermittee must comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement. [40 CFR 122.41(a)(1)]

(2) The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to a civil penalty not to exceed $25,000 per day for each violation. The CWA provides that any person who *negligently* violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than 2 years, or both. Any person who *knowingly* violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both. Any person who knowingly violates Section 301, 302, 303, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, and who knows at that time that he thereby places another person in imminent

danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.
[40 CFR 122.41(a)(2)]

(3) Any person may be assessed an administrative penalty by the San Diego Regional Water Quality Control Board (San Diego Water Board), State Water Resources Control Board (State Water Board), or United States Environmental Protection Agency (USEPA) for violating Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.
[40 CFR 122.41(a)(3)]

b. DUTY TO REAPPLY [40 CFR 122.41(b)]

If a Copermittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Copermittee must apply for and obtain a new permit.

c. NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE [40 CFR 122.41(c)]

It shall not be a defense for a Copermittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

d. DUTY TO MITIGATE [40 CFR 122.41(d)]

The Copermittee must take all reasonable steps to minimize or prevent any discharge or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

e. PROPER OPERATION AND MAINTENANCE [40 CFR 122.41(e)]

The Copermittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Copermittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by a Copermittee only when the operation is necessary to achieve compliance with the conditions of this permit.

f. PERMIT ACTIONS [40 CFR 122.41(f)]

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Copermittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

g. PROPERTY RIGHTS [40 CFR 122.41(g)]

This permit does not convey any property rights of any sort, or any exclusive privilege.

h. DUTY TO PROVIDE INFORMATION [40 CFR 122.41(h)]

The Copermittee must furnish to the San Diego Water Board, State Water Board, or USEPA within a reasonable time, any information which the San Diego Water Board, State Water Board, or USPEA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Copermittee must also furnish to the San Diego Water Board, State Water Board, or USPEA upon request, copies of records required to be kept by this permit.

i. INSPECTION AND ENTRY [40 CFR 122.41(i)]

The Copermittee must allow the San Diego Water Board, State Water Board, USEPA, and/or their authorized representative (including an authorized contractor acting as their representative), upon presentation of credentials and other documents as may be required by law, to:

(1) Enter upon the Copermittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit; [40 CFR 122.41(i)(1)]

(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit; [40 CFR 122.41(i)(2)]

(3) Inspect and photograph at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; [40 CFR 122.41(i)(3)] and

(4) Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location. [40 CFR 122.41(i)(4)]

j. MONITORING AND RECORDS [40 CFR 122.41(j)]

(1) Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity. [40 CFR 122.41(j)(1)]

(2) Except for records of monitoring information required by this permit related to the Copermittee's sewage sludge use and disposal activities, which shall be retained for

a period of at least five (5) years (or longer as required by 40 CFR Part 503), the Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time. [40 CFR 122.41(j)(2)]

(3) Records for monitoring information must include: [40 CFR 122.41(j)(3)]

(a) The date, exact place, and time of sampling or measurements; [40 CFR 122.41(j)(3)(i)]
(b) The individual(s) who performed the sampling or measurements; [40 CFR 122.41(j)(3)(ii)]
(c) The date(s) analyses were performed; [40 CFR 122.41(j)(3)(iii)]
(d) The individual(s) who performed the analyses; [40 CFR 122.41(j)(3)(iv)]
(e) The analytical techniques or methods used; [40 CFR 122.41(j)(3)(v)] and
(f) The results of such analyses. [40 CFR 122.41(j)(3)(vi)]

(4) Monitoring must be conducted according to test procedures under 40 CFR Part 136 unless another method is required under 40 CFR Subchapters N or O. [40 CFR 122.41(j)(4)]

In the case of pollutants for which there are no approved methods under 40 CFR Part 136 or otherwise required under 40 CFR Subchapters N and O, monitoring must be conducted according to a test procedure specified in the permit for such pollutants. [40 CFR 122.44(i)(1)(iv)]

(5) The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. [40 CFR 122.41(j)(5)]

k. SIGNATORY REQUIREMENT [40 CFR 122.41(k)]

(1) All applications, reports, or information submitted to the San Diego Water Board, State Water Board, or USEPA must be signed and certified. (See 40 CFR 122.22) [40 CFR 122.41(k)(1)]

(a) *For a municipality, State, Federal, or other public agency.* [All applications must be signed] by either a principal executive officer or ranking elected official. [40 CFR 122.22(a)(3)]

(b) All reports required by permits, and other information requested by the San Diego Water Board, State Water Board, or USEPA must be signed by a person described in paragraph (a) of this section, or by a duly authorized

representative of that person. A person is a duly authorized representative only if: [40 CFR 122.22(b)]

(i) The authorization is made in writing by a person described in paragraph (a) of this section; [40 CFR 122.22(b)(1)]

(ii) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company, (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) [40 CFR 122.22(b)(2)] and,

(iii) The written authorization is submitted to the San Diego Water Board and State Water Board. [40 CFR 122.22(b)(3)]

(c) *Changes to authorization.* If an authorization under paragraph (b) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (b) of this section must be submitted to the San Diego Water Board prior to or together with any reports, information, or applications to be signed by an authorized representative. [40 CFR 122.22(c)]

(d) *Certification.* Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." [40 CFR 122.22(d)]

(2) The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both. [40 CFR 122.41(k)(2)]

I. REPORTING REQUIREMENTS [40 CFR 122.41(l)]

(1) *Planned changes.* The Copermittee must give notice to the San Diego Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when: [40 CFR 122.41(l)(1)]

(a) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); [40 CFR 122.41(l)(1)(i)] or

(b) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1). [40 CFR 122.41(l)(1)(ii)]

(c) The alteration or addition results in a significant change in the Copermittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. [40 CFR 122.41(l)(1)(iii)]

(2) *Anticipated noncompliance*. The Copermittee must give advance notice to the San Diego Water Board or State Water Board of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements. [40 CFR 122.41(l)(2)]

(3) *Transfers*. This permit is not transferable to any person except after notice to the San Diego Water Board. The San Diego Water Board may require modification or revocation and reissuance of the permit to change the name of the Copermittee and incorporate such other requirements as may be necessary under the CWA. [40 CFR 122.41(l)(3)]

(4) *Monitoring reports.* Monitoring results must be reported at the intervals specified elsewhere in this permit. [40 CFR 122.41(l)(4)]

(a) Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the San Diego Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices. [40 CFR 122.41(l)(4)(i)]

(b) If the Copermittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or another method required for an industry-specific waste stream under 40 CFR Subchapters N or O, the results of this monitoring must be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the San Diego Water Board or State Water Board. [40 CFR 122.41(l)(4)(ii)]

(c) Calculations for all limitations which require averaging of measurements must utilize an arithmetic mean unless otherwise specified in the permit. [40 CFR 122.41(l)(4)(iii)]

(5) *Compliance schedules*. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date. [40 CFR 122.41(l)(5)]

(6) *Twenty-four hour reporting.*

(a) The Copermittee must report any noncompliance that may endanger health or the environment. Any information must be provided orally within 24 hours from the time the Copermittee becomes aware of the circumstances. A written submission must also be provided within five (5) days of the time the Copermittee becomes aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6)(i)]

(b) The following must be included as information which must be reported within 24 hours under this paragraph: [40 CFR 122.41(l)(6)(ii)]

(i) Any unanticipated bypass that exceeds any effluent limitation in the permit (See 40 CFR 122.41(g)). [40 CFR 122.41(l)(6)(ii)(A)]
(ii) Any upset which exceeds any effluent limitation in the permit. [40 CFR 122.41(l)(6)(ii)(B)] and,
(iii) Violation of a maximum daily discharge limitation for any of the pollutants listed by the San Diego Water Board in the permit to be reported within 24 hours. (See 40 CFR 122.44(g)) [40 CFR 122.41(l)(6)(ii)(C)]

(c) The San Diego Water Board may waive the above-required written report on a case-by-case basis if the oral report has been received within 24 hours. [40 CFR 122.41(l)(6)(iii)]

(7) *Other noncompliance.* The Copermittee must report all instances of noncompliance not reported in accordance with the standard provisions required under 40 CFR 122.41(l)(4), (5), and (6), at the time monitoring reports are submitted. The reports must contain the information listed in the standard provisions required under 40 CFR 122.41(l)(6). [40 CFR 122.41(l)(7))]

(8) *Other information.* When the Copermittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the San Diego Water Board, State Water Board, or USEPA, the Copermittee must promptly submit such facts or information. [40 CFR 122.41(l)(8)]

m. BYPASS [40 CFR 122.41(m)]

(1) *Definitions.*

(a) "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. [40 CFR 122.41(m)(1)(i)] or

(b) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or

substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
[40 CFR 122.41(m)(1)(ii)]

(2) *Bypass not exceeding limitations*. The Copermittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the standard provisions required under 40 CFR 122.41(m)(3) and (4).
[40 CFR 122.41(m)(2)]

(3) *Notice.*

(a) *Anticipated bypass*. If the Copermittee knows in advance of the need for a bypass, it must submit a notice, if possible at least ten days before the date of the bypass. [40 CFR 122.41(m)(3)(i)] or

(b) *Unanticipated bypass*. The Copermittee must submit notice of an unanticipated bypass in accordance with the standard provisions required under 40 CFR 122.41(l)(6) (24-hour notice).
[40 CFR 122.41(m)(3)(ii)]

(4) *Prohibition of Bypass.*

(a) Bypass is prohibited, and the San Diego Water Board may take enforcement action against a Copermittee for bypass, unless:
[40 CFR 122.41(m)(4)(i)]

(i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; [40 CFR 122.41(m)(4)(i)(A)]
(ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance;
[40 CFR 122.41(m)(4)(i)(B)] and,
(iii) The Copermittee submitted notice in accordance with the standard provisions required under 40 CFR 122.41(m)(3).
[40 CFR 122.41(m)(4)(i)(C)]

(b) The San Diego Water Board may approve an anticipated bypass, after considering its adverse effects, if the San Diego Water Board determines that it will meet the three conditions listed above.
[40 CFR 122.41(m)(4)(ii)]

n. UPSET [40 CFR 122.41(n)]

(1) *Definition.* "Upset" means an exceptional incident in which there is unintentional and

temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Copermittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. [40 CFR 122.41(n)(1)]

(2) *Effect of an upset*. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the standard provisions required under 40 CFR 122.41(n)(3) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. [40 CFR 122.41(n)(2)]

(3) *Conditions necessary for a demonstration of upset*. A Copermittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that: [40 CFR 122.41(n)(3)]

(a) An upset occurred and that the Copermittee can identify the cause(s) of the upset; [40 CFR 122.41(n)(3)(i)]
(b) The permitted facility was at the time being properly operated; [40 CFR 122.41(n)(3)(ii)] and
(c) The Copermittee submitted notice of the upset in accordance with the standard provisions required under 40 CFR 122.41(l)(6)(ii)(B) (24-hour notice). [40 CFR 122.41(n)(3)(iii)]
(d) The Copermittee complied with any remedial measures pursuant to the standard provisions required under 40 CFR 122.41(d). [40 CFR 122.41(n)(3)(iii)]

(4) *Burden of proof*. In any enforcement proceeding, the Copermittee seeking to establish the occurrence of an upset has the burden of proof. [40 CFR 122.41(n)(4)]

o. STANDARD PERMIT PROVISIONS FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS [40 CFR 122.42(c)]

The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the San Diego Water Board or State Water Board under 40 CFR 122.26(a)(1)(v) must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report must include:

(1) The status of implementing the components of the storm water management program that are established as permit conditions; [40 CFR 122.42(c)(1)]

(2) Proposed changes to the storm water management programs that are established as permit conditions. Such proposed changes must be consistent with 40 CFR 122.26(d)(2)(iii); [40 CFR 122.42(c)(2)] and

(3) Revisions, if necessary, to the assessment of controls and the fiscal analysis

reported in the permit application under 40 CFR 122.26(d)(2)(iv) and (v); [40 CFR 122.42(c)(3)]

(4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; [40 CFR 122.42(c)(4)]

(5) Annual expenditures and budget for year following each annual report; [40 CFR 122.42(c)(5)]

(6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; [40 CFR 122.42(c)(6)]

(7) Identification of water quality improvements or degradation. [40 CFR 122.42(c)(7)]

p. STANDARD PERMIT PROVISIONS FOR STORM WATER DISCHARGES [40 CFR 122.42(d)]

The initial permits for discharges composed entirely of storm water issued pursuant to 40 CFR 122.26(e)(7) must require compliance with the conditions of the permit as expeditiously as practicable, but in no event later than three years after the date of issuance of the permit.

2. General Provisions

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. The general provisions applicable to this Order and NPDES permit are as follows:

a. DISCHARGE OF WASTE IS A PRIVILEGE

No discharge of waste into the waters of the State, whether or not such discharge is made pursuant to waste discharge requirements, shall create a vested right to continue such discharge. All discharges of waste into waters of the State are privileges, not rights. [CWC Section 13263(g)]

b. DURATION OF ORDER AND NPDES PERMIT

(1) *Effective date*. ~~This Order and NPDES permit becomes effective on the 50th day after its adoption provided the USEPA has no objection. If the USEPA objects to its issuance, this Order shall not become effective until such objection is withdrawn.~~ This Order supersedes Order No. R9-2007-0001 for the San Diego County Copermittees listed in Table 2.a and became effective on June 27, 2013 for those Copermittees.~~upon the effective date of this Order~~. This Order as amended by Order R9-2015-0001~~, and~~ supersedes Order No~~s~~. R9-2009-0002 and becomes effective ~~fifty (50) days~~ April 1, 2015, following ~~after~~ the date Order No. R9-2015-0001 is adopted. This Order supersedes Order No. R9-2010-0016 upon ~~their expiration~~further amendment or earlier notice of coverage.

(2) *Expiration*. This Order and NPDES permit expires five years after its effective date.

[40 CFR 122.46(a)]

(3) *Continuation of expired order*. After this Order and NPDES permit expires, the terms and conditions of this Order and NPDES permit are automatically continued pending issuance of a new permit if all requirements of the federal NPDES regulations on the continuation of expired permits (40 CFR 122.6) are complied with.

c. AVAILABILITY

A copy of this Order must be kept at a readily accessible location and must be available to on-site personnel at all times.

d. CONFIDENTIALITY OF INFORMATION

Except as provided for in 40 CFR 122.7, no information or documents submitted in accordance with or in application for this Order will be considered confidential, and all such information and documents shall be available for review by the public at the San Diego Water Board office.

Claims of confidentiality for the following information will be denied:
[40 CFR 122.7(b)]

(1) The name and address of any permit applicant or Copermittee;
[40 CFR 122.7(b)(1)] and

(2) Permit applications and attachments, permits, and effluent data.
[40 CFR 122.7(b)(2)]

e. EFFLUENT LIMITATIONS

(1) *Interim effluent limitations*. The Copermittee must comply with any interim effluent limitations as established by addendum, enforcement action, or revised waste discharge requirements which have been, or may be, adopted by the San Diego Water Board.

(2) *Other effluent limitations and standards*. If any applicable toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant and that standard or prohibition is more stringent than any limitation on the pollutant in the permit, the San Diego Water Board shall institute proceedings under these regulations to modify or revoke and reissue the permit to conform to the toxic effluent standard or prohibition. [40 CFR 122.44(b)(1)]

f. DUTY TO MINIMIZE OR CORRECT ADVERSE IMPACTS

The Copermittee must take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this Order, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the noncompliance.

g. PERMIT ACTIONS

The filing of a request by the Copermittee for modification, revocation and reissuance, or termination of this Order, or a notification of planned change in or anticipated noncompliance with this Order does not stay any condition of this Order. (See 40 CFR 122.41(f)) In addition, the following provisions apply to this Order:

(1) Upon application by any affected person, or on its own motion, the San Diego Water Board may review and revise the requirements in this Order. All requirements must be reviewed periodically. [CWC Section 13263(e)]

(2) This Order may be terminated or modified for cause, including, but not limited to, all of the following: [CWC Section 13381]

(a) Violation of any condition contained in the requirements of this Order. [CWC Section 13381(a)]

(b) Obtaining the requirements in this Order by misrepresentation, or failure to disclose fully all relevant facts. [CWC Section 13381(b)]

(c) A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge. [CWC Section 13381(c)]

(3) When this Order is transferred to a new owner or operator, such requirements as may be necessary under the CWC may be incorporated into this Order.

h. NPDES PERMITTED NON-STORM WATER DISCHARGES

The San Diego Water Board has, in prior years, issued a limited number of individual NPDES permits for non-storm water discharges to MS4s. The San Diego Water Board or State Water Board may in the future, upon prior notice to the Copermittee(s), issue an NPDES permit for any non-storm water discharge (or class of non-storm water discharges) to an MS4.

i. MONITORING

In addition to the standard provisions required under 40 CFR 122.41(j) and (l)(4), the following general monitoring provisions apply to this Order:

(1) Where procedures are not otherwise specified in Order, sampling, analysis and quality assurance/quality control must be conducted in accordance with the Quality Assurance Management Plan (QAMP) for the State of California's Surface Water Ambient Monitoring Program (SWAMP), adopted by the State Water Resources Control Board (State Water Board).

(2) Pursuant to 40 CFR 122.41(j)(2) and CWC Section 13383(a), each Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring

instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five (5) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time.

(3) All chemical, bacteriological, and toxicity analyses must be conducted at a laboratory certified for such analyses by the California Department of Public Health or a laboratory approved by the San Diego Water Board.

(4) For priority toxic pollutants that are identified in the California Toxics Rule (CTR) (65 Fed. Reg. 31682), the Copermittees must instruct their laboratories to establish calibration standards that are equivalent to or lower than the Minimum Levels (MLs) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP). If a Copermittee can demonstrate that a particular ML is not attainable, in accordance with procedures set forth in 40 CFR Part 136, the lowest quantifiable concentration of the lowest calibration standard analyzed by a specific analytical procedure (assuming that all the method specified sample weights, volumes, and processing steps have been followed) may be used instead of the ML listed in Appendix 4 of the SIP. The Copermittee must submit documentation from the laboratory to the San Diego Water Board for approval prior to raising the ML for any priority toxic pollutant.

j. ENFORCEMENT

(1) The San Diego Water Board is authorized to enforce the terms of this Order under several provisions of the CWC, including, but not limited to, CWC Sections 13385, 13386, and 13387.

(2) Nothing in this Order shall be construed to protect the Copermittee from its liabilities under federal, state, or local laws.

(3) The CWC provides for civil and criminal penalties comparable to, and in some cases greater than, those provided for under the CWA.

(4) Except as provided in the standard conditions required under 40 CFR 122.41(m) and (n), nothing in this Order shall be construed to relieve the Copermittee from civil or criminal penalties for noncompliance.

(5) Nothing in this Order shall be construed to preclude the institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties to which the Copermittee is or may be subject to under Section 311 of the CWA.

(6) Nothing in this Order shall be construed to preclude institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authoring preserved by Section 510 of the CWA.

k. SEVERABILITY

The provisions of this Order are severable, and if any provision of this Order, or the

application of any provisions of this Order to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this Order shall not be affected thereby.

l. APPLICATIONS

Any application submitted by a Copermittee for reissuance or modification of this Order must satisfy all applicable requirements specified in federal regulations as well as any additional requirements for submittal of a Report of Waste Discharge specified in the CWC and the California Code of Regulations.

m. IMPLEMENTATION

All plans, reports and subsequent amendments submitted in compliance with this Order must be implemented immediately (or as otherwise specified). All submittals by Copermittees must be adequate to implement the requirements of this Order.

n. REPORT SUBMITTALS

(1) All report submittals must include an executive summary, introduction, conclusion, recommendations, and signed certified statement.

(2) Each Copermittee must submit a signed certified statement covering its responsibilities for each applicable submittal.

(3) The Principal Watershed Copermittee(s) must submit a signed certified statement covering its responsibilities for each applicable submittal and the sections of the submittals for which it is responsible.

(4) Unless otherwise directed, the Copermittees must submit one hard copy and one electronic copy of each report required under this Order to the San Diego Water Board, and one electronic copy to the USEPA.

(5) The Copermittees must submit reports and provide notifications as required by this Order to the following:

EXECUTIVE OFFICER
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
2375 NORTHSIDE DRIVE~~9174 SKY PARK COURT~~, SUITE 100
SAN DIEGO CA 92108~~23-4340~~
Telephone: ~~(858) 467-2952~~(619) 516-1990~~-~~ Fax: ~~(858) 571-6972~~(619) 516-1994

EUGENE BROMLEY
US ENVIRONMENTAL PROTECTION AGENCY
REGION IX
PERMITS ISSUANCE SECTION (W-5-1)
75 HAWTHORNE STREET
SAN FRANCISCO CA 94105

ATTACHMENT C

ACRONYMS AND ABBREVIATIONS

AMAL	Average Monthly Action Level
ASBS	Area(s) of Special Biological Significance
BMP	Best Management Practice
Basin Plan	Water Quality Control Plan for the San Diego Basin
CEQA	California Environmental Quality Act
CCR	California Code of Regulations
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWC	California Water Code
CZARA	Coastal Zone Act Reauthorization Amendments of 1990
ESAs	Environmentally Sensitive Areas
GIS	Geographic Information System
IBI	Index of Biological Integrity
LID	Low Impact Development
MDAL	Maximum Daily Action Level
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
NAL	Non-Storm Water Action Level
NAICS	North American Industry Classification System
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
ROWD	Report of Waste Discharge (application for NPDES reissuance)
SAL	Storm Water Action Level
San Diego Water Board	California Regional Water Quality Control Board, San Diego Region
SIC	Standard Industrial Classification Code
State Water Board	State Water Resources Control Board
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
WDID	Waste Discharge Identification Number
WLA	Waste Load Allocation
WQBEL	Water Quality Based Effluent Limitation

DEFINITIONS

Active/Passive Sediment Treatment - Using mechanical, electrical or chemical means to flocculate or coagulate suspended sediment for removal from runoff from construction sites prior to discharge.

Anthropogenic Litter – Trash generated from human activities, not including sediment.

Average Monthly Action Level – The highest allowable average of daily discharges over a calendar month.

Beneficial Uses - The uses of water necessary for the survival or wellbeing of man, plants, and wildlife. These uses of water serve to promote tangible and intangible economic, social, and environmental goals. "Beneficial Uses" of the waters of the State that may be protected include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. Existing beneficial uses are uses that were attained in the surface or ground water on or after November 28, 1975; and potential beneficial uses are uses that would probably develop in future years through the implementation of various control measures. "Beneficial Uses" are equivalent to "Designated Uses" under federal law. [California Water Code Section 13050(f)].

Best Management Practices (BMPs) - Defined in 40 CFR 122.2 as schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Bioassessment - The use of biological community information to evaluate the biological integrity of a water body and its watershed. With respect to aquatic ecosystems, bioassessment is the collection and analysis of samples of the benthic macroinvertebrate community together with physical/habitat quality measurements associated with the sampling site and the watershed to evaluate the biological condition (i.e. biotic integrity) of a water body.

Biofiltration - Practices that use vegetation and amended soils to detain and treat runoff from impervious areas. Treatment is through filtration, infiltration, adsorption, ion exchange, and biological uptake of pollutants.

Biological Integrity - Defined in Karr J.R. and D.R. Dudley. 1981. Ecological perspective on water quality goals. *Environmental Management* 5:55-68 as: "A balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitat of the region." Also referred to as ecosystem health.

BMP Design Manual – A plan developed to eliminate, reduce, or mitigate the impacts of runoff from development projects, including Priority Development Projects.

Chronic Toxicity – A measurement of sublethal effect (e.g. reduced growth, reproduction) to experimental test organisms exposed to an effluent or receiving waters compared to that of the

control organisms.

Clean Water Act Section 303(d) Water Body - An impaired water body in which water quality does not meet applicable water quality standards and/or is not expected to meet water quality standards, even after the application of technology based pollution controls required by the CWA. The discharge of runoff to these water bodies by the Copermittees is significant because these discharges can cause or contribute to violations of applicable water quality standards.

Construction Site – Any project, including projects requiring coverage under the Construction General Permit, that involves soil disturbing activities including, but not limited to, clearing, grading, disturbances to ground such as stockpiling, and excavation.

Contamination - As defined in the Porter-Cologne Water Quality Control Act, contamination is "an impairment of the quality of waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste whether or not waters of the State are affected."

Copermittee – A permittee to a NPDES permit that is only responsible for permit conditions relating to the discharge for which it is operator [40 CFR 122.26(b)(1)]. For the purposes of this Order, a Copermittee is one of the individual permittees identified in Tables 1a-1c of this Order.

Copermittees – All of the individual Copermittees, collectively.

Critical Channel Flow (Qc) – The channel flow that produces the critical shear stress that initiates bed movement or that erodes the toe of channel banks. When measuring Qc, it should be based on the weakest boundary material – either bed or bank.

Daily Discharge – Defined as either: (1) the total mass of the constituent discharged over the calendar day or any 24 hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g. concentration.)

The Daily Discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day, or other 24 hour period other than a day), or by the arithmetic mean of analytical results from one or more grab samples taken over the course of a day.

Development Projects - Construction, rehabilitation, redevelopment, or reconstruction of any public or private projects.

Dry Season –May 1 to September 30.

Dry Weather – Weather is considered dry if the preceding 72 hours has been without measurable precipitation (>0.1 inch).

Enclosed Bays – Enclosed bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost bay works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays do not include

inland surface waters or ocean waters.

Erosion – When land is diminished or worn away due to wind, water, or glacial ice. Often the eroded debris (silt or sediment) becomes a pollutant via storm water runoff. Erosion occurs naturally but can be intensified by land clearing activities such as farming, development, road building, and timber harvesting.

Environmentally Sensitive Areas (ESAs) - Areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; areas designated as preserves or their equivalent under the Natural Communities Conservation Program within the Cities and County of Orange; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.

Estuaries – Waters, including coastal lagoons, located at the mouth of streams that serve as areas of mixing fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and ocean water. Estuaries do not include inland surface waters or ocean waters.

Existing Development – Any area that has been developed and exists for municipal, commercial, industrial, or residential purposes, uses, or activities. May include areas that are not actively used for its originally developed purpose, but may be re-purposed or redeveloped for another use or activity.

Flow Duration – The long-term period of time that flows occur above a threshold that causes significant sediment transport and may cause excessive erosion damage to creeks and streams (not a single storm event duration). The simplest way to visualize this is to consider a histogram of pre- and post-project flows using long-term records of hourly data. To maintain pre-development flow duration means that the total number of hours (counts) within each range of flows in a flow-duration histogram cannot increase between the pre- and post-development condition. Flow duration within the range of geomorphologically significant flows is important for managing erosion.

Grading - The cutting and/or filling of the land surface to a desired slope or elevation.

Groundwater – Subsurface water that occurs beneath the water table in soils and geologic formations that are fully saturated.

Hazardous Material – Any substance that poses a threat to human health or the environment due to its toxicity, corrosiveness, ignitability, explosive nature or chemical reactivity. These also include materials named by the USEPA in 40 CFR 116 to be reported if a designated quantity of the material is spilled into the waters of the U.S. or emitted into the environment.

Hazardous Waste - Hazardous waste is defined as “any waste which, under Section 600 of Title 22 of this code, is required to be managed according to Chapter 30 of Division 4.5 of Title 22 of this code” [CCR Title 22, Division 4.5, Chapter 11, Article 1].

Household Hazardous Waste – Paints, cleaning products, and other hazardous wastes generated during home improvement or maintenance activities.

Hydromodification – The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

Illicit Connection – Any man-made conveyance or drainage system through which a non-storm water discharge to the storm water drainage system occurs or may occur. Any connection to the MS4 that conveys an illicit discharge.

Illicit Discharge - Any discharge to the MS4 that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from firefighting activities [40 CFR 122.26(b)(2)].

Inactive Areas – Areas of construction activity that are not active and those that have been active and are not scheduled to be re-disturbed for at least 14 days.

Infiltration – In the context of low impact development, infiltration is defined as the percolation of water into the ground. Infiltration is often expressed as a rate (inches per hour), which is determined through an infiltration test. In the context of non-storm water, infiltration is water other than wastewater that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow [40 CFR 35.2005(20)].

Inland Surface Waters – Includes all surface waters of the State that do not include the ocean, enclosed bays, or estuaries.

Jurisdictional Runoff Management Program Document – A written description of the specific jurisdictional runoff management measures and programs that each Copermittee will implement to comply with this Order and ensure that storm water pollutant discharges in runoff are reduced to the MEP and do not cause or contribute to a violation of water quality standards.

Low Impact Development (LID) – A storm water management and land development strategy that emphasizes conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions.

Low Impact Development Best Management Practices (LID BMPs) – LID BMPs include schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States through storm water management and land development strategies that emphasize conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions. LID BMPs include retention

practices that do not allow runoff, such as infiltration, rain water harvesting and reuse, and evapotranspiration. LID BMPs also include flow-through practices such as biofiltration that may have some discharge of storm water following pollutant reduction.

Major Outfall – As defined in the Code of Federal Regulations, a major outfall is a MS4 outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (i.e. discharge from a single conveyance other than a circular pipe which is associated with a drainage area of more than 50 acres); or, for MS4s that receive storm water from lands zoned for industrial activity (based on comprehensive zoning plans or equivalent), a MS4 outfall that discharges from a single pipe with an inside diameter of 12 inches or more or from its equivalent (i.e. discharge from other than a circular pipe associated with a drainage area of 2 acres or more).

Maximum Daily Action Level (MDAL) –The highest allowable daily discharge of a pollutant, over a calendar day (or 24 hour period). For pollutants with action levels expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with action levels expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

Maximum Extent Practicable (MEP) – The technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) for storm water that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) in combination with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than BAT. A definition for MEP is not provided either in the statute or in the regulations. Instead the definition of MEP is dynamic and will be defined by the following process over time: municipalities propose their definition of MEP by way of their runoff management programs. Their total collective and individual activities conducted pursuant to the runoff management programs becomes their proposal for MEP as it applies both to their overall effort, as well as to specific activities (e.g., MEP for street sweeping, or MEP for MS4 maintenance). In the absence of a proposal acceptable to the San Diego Water Board, the San Diego Water Board defines MEP.

In a memo dated February 11, 1993, entitled "Definition of Maximum Extent Practicable," Elizabeth Jennings, Senior Staff Counsel, SWRCB addressed the achievement of the MEP standard as follows:

> "*To achieve the MEP standard, municipalities must employ whatever Best Management Practices (BMPs) are technically feasible (i.e., are likely to be effective) and are not cost prohibitive. The major emphasis is on technical feasibility. Reducing pollutants to the MEP means choosing effective BMPs, and rejecting applicable BMPs only where other effective BMPs will serve the same purpose, or the BMPs would not be technically feasible, or the cost would be prohibitive. In selecting BMPs to achieve the MEP standard, the following factors may be useful to consider:*
>
> *a. Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?*
> *b. Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?*
> *c. Public Acceptance: Does the BMP have public support?*

d. Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?
e. Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc.?

The final determination regarding whether a municipality has reduced pollutants to the maximum extent practicable can only be made by the Regional or State Water Boards, and not by the municipal discharger. If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit derived, it would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs that would address a pollutant source, or to pick a BMP based solely on cost, which would be clearly less effective. In selecting BMPs the municipality must make a serious attempt to comply and practical solutions may not be lightly rejected. In any case, the burden would be on the municipal discharger to show compliance with its permit. After selecting a menu of BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented."

Monitoring Year – October 1 to September 30

Municipal Separate Storm Sewer System (MS4) – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designated or used for collecting or conveying storm water; (iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.26.

National Pollutant Discharge Elimination System (NPDES) - The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the CWA.

Non-Storm Water - All discharges to and from a MS4 that do not originate from precipitation events (i.e., all discharges from a MS4 other than storm water). Non-storm water includes illicit discharges and NPDES permitted discharges.

Nuisance - As defined in the Porter-Cologne Water Quality Control Act, a nuisance is "anything which meets all of the following requirements: 1) Is injurious to health, or is indecent, or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. 2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or

damage inflicted upon individuals may be unequal. 3) Occurs during, or as a result of, the treatment or disposal of wastes."

Ocean Waters – The territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the State Board's California Ocean Plan.

Order – Unless otherwise specified, refers to this Order, Order No. R9-2013-0001 (NPDES No. CAS0109266)

Outfall - Outfall means a point source as defined by 40 CFR 122.2 at the point where a municipal separate storm sewer discharges to waters of the US and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels or other conveyances which connect segments of the same stream or other waters of the US and are used to convey waters of the US.

Persistent Flow - Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

Person - A person is defined as an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof [40 CFR 122.2].

Point Source - Any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, landfill leachate collection systems, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

Pollutant - Any agent that may cause or contribute to the degradation of water quality such that a condition of pollution or contamination is created or aggravated.

Pollution - As defined in the Porter-Cologne Water Quality Control Act, pollution is "the alteration of the quality of the waters of the State by waste, to a degree which unreasonably affects either of the following: 1) The waters for beneficial uses; or 2) Facilities that serve these beneficial uses." Pollution may include contamination.

Pollution Prevention - Pollution prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control BMPs, treatment control BMPs, or disposal.

Pre-Development Runoff Conditions – Approximate flow rates and durations that exist or existed onsite before land development occurs. For new development projects, this equates to runoff conditions immediately before project construction. For redevelopment projects, this equates to runoff conditions from the project footprint assuming infiltration characteristics of the underlying soil, and existing grade. Runoff coefficients of concrete or asphalt must not be used. A redevelopment Priority Development Project must use available information pertaining to existing underlying soil type and onsite existing grade to estimate pre-development runoff conditions.

Priority Development Projects - New development and redevelopment projects defined under Provision E.3.b of Order No. R9-2013-0001.

Rainy Season (aka Wet Season) –October 1 to April 30

Receiving Waters – Waters of the United States.

Receiving Water Limitations - Waste discharge requirements issued by the San Diego Water Board typically include both: (1) "Effluent Limitations" (or "Discharge Limitations") that specify the technology-based or water-quality-based effluent limitations; and (2) "Receiving Water Limitations" that specify the water quality objectives in the Basin Plan as well as any other limitations necessary to attain those objectives. In summary, the "Receiving Water Limitations" provision is the provision used to implement the requirements of CWA section 402(p)(3)(B).

Redevelopment - The creation and/or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include trenching and resurfacing associated with utility work; resurfacing existing roadways; new sidewalk construction, pedestrian ramps, or bike lane on existing roads; and routine replacement of damaged pavement, such as pothole repair.

Regional Clearinghouse – A central location for the collection and distribution of information developed and maintained by the Copermittees including, but not limited to, plans, reports, manuals, data, contact information, and/or links to such documents and information.

Rehabilitation - Remedial measures or activities for the purpose of improving or restoring the beneficial uses of streams, channels or river systems. Techniques may vary from in-stream restoration techniques to off-line storm water management practices installed in the system corridor or upland areas, or a combination of in-stream and out of stream techniques. Rehabilitation techniques may include, but are not limited to the following: riparian zone restoration, constructed wetlands, channel modifications that improve habitat and stability, and daylighting of drainage systems.

Reporting Period – The period of information that is reported in the Water Quality Improvement Plan Annual Report. The reporting period consists of two components: 1) July 1 to June 30, consistent with the fiscal year, for the implementation of the jurisdictional runoff management programs, and 2) October 1 to September 30, consistent with the monitoring year for the monitoring and assessment programs. Together, these two time periods constitute the reporting year for the Water Quality Improvement Plan Annual Report due January 31 following the end of the monitoring year.

Retain – Keep or hold in a particular place, condition, or position without discharge to surface waters.

Retrofitting – Storm water management practice put into place after development has occurred in watersheds where the practices previously did not exist or are ineffective. Retrofitting of developed areas is intended to improve water quality, protect downstream channels, reduce

flooding, or meet other specific objectives. Retrofitting developed areas may include, but is not limited to replacing roofs with green roofs, disconnecting downspouts or impervious surfaces to drain to pervious surfaces, replacing impervious surfaces with pervious surfaces, installing rain barrels, installing rain gardens, and trash area enclosures.

Runoff - All flows in a storm water conveyance system that consists of the following components: (1) storm water (wet weather flows) and (2) non-storm water including dry weather flows.

San Diego Water Board – As used in this document the term "San Diego Water Board" is synonymous with the term "Regional Board" as defined in Water Code section 13050(b) and is intended to refer to the California Regional Water Quality Control Board for the San Diego Region as specified in Water Code Section 13200.

Sediment - Soil, sand, and minerals washed from land into water. Sediment resulting from anthropogenic sources (i.e. human induced land disturbance activities) is considered a pollutant. This Order regulates only the discharges of sediment from anthropogenic sources and does not regulate naturally occurring sources of sediment. Sediment can destroy fish-nesting areas, clog animal habitats, and cloud waters so that sunlight does not reach aquatic plants.

Source Control BMP – Land use or site planning practices, or structural or nonstructural measures that aim to prevent runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between pollutants and runoff.

Storm Water – Per 40 CFR 122.26(b)(13), means storm water runoff, snowmelt runoff and surface runoff and drainage. Surface runoff and drainage pertains to runoff and drainage resulting from precipitation events.

Structural BMPs - A subset of BMPs which detains, retains, filters, removes, or prevents the release of pollutants to surface waters from development projects in perpetuity, after construction of a project is completed.

Test of Significant Toxicity (TST) - A statistical approach used to analyze toxicity test data. The TST incorporates a restated null hypothesis, Welch's t-test, and biological effect thresholds for chronic and acute toxicity.

Total Maximum Daily Load (TMDL) - The maximum amount of a pollutant that can be discharged into a water body from all sources (point and non-point) and still maintain water quality standards. Under CWA section 303(d), TMDLs must be developed for all water bodies that do not meet water quality standards after application of technology-based controls.

Toxicity - Adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies. The water quality objectives for toxicity provided in the Basin Plan, state in part…"All waters shall be free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life….The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge."

Toxicity Identification Evaluation (TIE) - A set of procedures for identifying the specific

chemical(s) responsible for toxicity. These procedures are performed in three phases (characterization, identification, and confirmation) using aquatic organism toxicity tests.

Toxicity Reduction Evaluation (TRE) - A study conducted in a step-wise process designed to identify the causative agents of effluent or ambient toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in toxicity. The first steps of the TRE consist of the collection of data relevant to the toxicity, including additional toxicity testing, and an evaluation of facility operations and maintenance practices, and best management practices. A Toxicity Identification Evaluation (TIE) may be required as part of the TRE, if appropriate.

Treatment Control BMP – Any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media absorption or any other physical, biological, or chemical process.

Unpaved Road – Any long, narrow stretch without pavement used for traveling by motor passenger vehicles between two or more points. Unpaved roads are generally constructed of dirt, gravel, aggregate or macadam and may be improved or unimproved.

Waste - As defined in CWC Section 13050(d), "waste includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal."

Article 2 of CCR Title 23, Chapter 15 (Chapter 15) contains a waste classification system that applies to solid and semi-solid waste, which cannot be discharged directly or indirectly to water of the state and which therefore must be discharged to land for treatment, storage, or disposal in accordance with Chapter 15. There are four classifications of waste (listed in order of highest to lowest threat to water quality): hazardous waste, designated waste, non-hazardous solid waste, and inert waste.

Water Quality Objective - Numerical or narrative limits on constituents or characteristics of water designated to protect designated beneficial uses of the water. [California Water Code Section 13050 (h)]. California's water quality objectives are established by the State and Regional Water Boards in the Water Quality Control Plans. Numeric or narrative limits for pollutants or characteristics of water designed to protect the beneficial uses of the water. In other words, a water quality objective is the maximum concentration of a pollutant that can exist in a receiving water and still generally ensure that the beneficial uses of the receiving water remain protected (i.e., not impaired). Since water quality objectives are designed specifically to protect the beneficial uses, when the objectives are violated the beneficial uses are, by definition, no longer protected and become impaired. This is a fundamental concept under the Porter Cologne Act. Equally fundamental is Porter Cologne's definition of pollution. A condition of pollution exists when the water quality needed to support designated beneficial uses has become unreasonably affected or impaired; in other words, when the water quality objectives have been violated. These underlying definitions (regarding beneficial use protection) are the reason why all waste discharge requirements implementing the federal NPDES regulations require compliance with water quality objectives. (Water quality objectives are also called water quality criteria in the CWA.)

Water Quality Standards - Water quality standards, as defined in Clean Water Act section 303(c) consist of the beneficial uses (e.g., swimming, fishing, municipal drinking water supply, etc.,) of a water body and criteria (referred to as water quality objectives in the California Water Code) necessary to protect those uses. Under the Water Code, the water boards establish beneficial uses and water quality objectives in water quality control or basin plans. Together with an anti-degradation policy, these beneficial uses and water quality objectives serve as water quality standards under the Clean Water Act. In Clean Water Act parlance, state beneficial uses are called "designated uses" and state water quality objectives are called "criteria." Throughout this Order, the relevant term is used depending on the statutory scheme.

Waters of the State - Any water, surface or underground, including saline waters within the boundaries of the State [CWC section 13050 (e)]. The definition of the Waters of the State is broader than that for the Waters of the United States in that all water in the State is considered to be a Waters of the State regardless of circumstances or condition.

Waters of the United States - As defined in the 40 CFR 122.2, the Waters of the U.S. are defined as: "(a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate "wetlands;" (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters otherwise defined as waters of the United States under this definition: (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial seas; and (g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA."

Watershed - That geographical area which drains to a specified point on a water course, usually a confluence of streams or rivers (also known as drainage area, catchment, or river basin).

Wet Season (aka Rainy Season) – October 1 to April 30

Wet Weather – Weather is considered wet up to 72 hours after a storm event of 0.1 inches and greater, unless otherwise defined by another regulatory mechanism (e.g. a TMDL).

ATTACHMENT D

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM

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JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM
FY _____

I. COPERMITTEE INFORMATION

Copermittee Name:

Copermittee Primary Contact Name:

Copermittee Primary Contact Information:
Address:
City: County: State: Zip:
Telephone: Fax: Email:

II. LEGAL AUTHORITY

Has the Copermittee established adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 that complies with Order No. R9-2013-0001?	YES NO	☐ ☐
A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority?	YES NO	☐ ☐

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

Was an update of the jurisdictional runoff management program document required or recommended by the San Diego Water Board?	YES NO	☐ ☐
If YES to the question above, did the Copermittee update its jurisdictional runoff management program document and make it available on the Regional Clearinghouse?	YES NO	☐ ☐

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

Has the Copermittee implemented a program to actively detect and eliminate illicit discharges and connections to its MS4 that complies with Order No. R9-2013-0001?	YES NO	☐ ☐

Number of non-storm water discharges reported by the public	
Number of non-storm water discharges detected by Copermittee staff or contractors	
Number of non-storm water discharges investigated by the Copermittee	
Number of sources of non-storm water discharges identified	
Number of non-storm water discharges eliminated	
Number of sources of illicit discharges or connections identified	
Number of illicit discharges or connections eliminated	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

V. DEVELOPMENT PLANNING PROGRAM

Has the Copermittee implemented a development planning program that complies with Order No. R9-2013-0001?	YES NO	☐ ☐
Was an update to the BMP Design Manual required or recommended by the San Diego Water Board?	YES NO	☐ ☐
If YES to the question above, did the Copermittee update its BMP Design Manual and make it available on the Regional Clearinghouse?	YES NO	☐ ☐

Number of proposed development projects in review	
Number of Priority Development Projects in review	
Number of Priority Development Projects approved	
Number of approved Priority Development Projects exempt from any BMP requirements	
Number of approved Priority Development Projects allowed alternative compliance	
Number of Priority Development Projects granted occupancy	

Number of completed Priority Development Projects in inventory	
Number of high priority Priority Development Project structural BMP inspections	
Number of Priority Development Project structural BMP violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM

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VI. CONSTRUCTION MANAGEMENT PROGRAM

Has the Copermittee implemented a construction management program that complies with Order No. R9-2013-0001?	YES ☐ NO ☐
Number of construction sites in inventory	
Number of active construction sites in inventory	
Number of inactive construction sites in inventory	
Number of construction sites closed/completed during reporting period	
Number of construction site inspections	
Number of construction site violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

Has the Copermittee implemented an existing development management program that complies with Order No. R9-2013-0001?	YES ☐ NO ☐

	Municipal	Commercial	Industrial	Residential
Number of facilities or areas in inventory				
Number of existing development inspections				
Number of follow-up inspections				
Number of violations				
Number of enforcement actions issued				
Number of escalated enforcement actions issued				

VIII. PUBLIC EDUCATION AND PARTICIPATION

Has the Copermittee implemented a public education program component that complies with Order No. R9-2013-0001?	YES ☐ NO ☐
Has the Copermittee implemented a public participation program component that complies with Order No. R9-2013-0001?	YES ☐ NO ☐

IX. FISCAL ANALYSIS

Has the Copermittee attached to this form a summary of its fiscal analysis that complies with Order No. R9-2013-0001?	YES ☐ NO ☐

X. CERTIFICATION

I [☐ Principal Executive Officer ☐ Ranking Elected Official ☐ Duly Authorized Representative] certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature	Date
Print Name	Title
Telephone Number	Email

ATTACHMENT E

SPECIFIC PROVISIONS FOR TOTAL MAXIMUM DAILY LOADS APPLICABLE TO ORDER NO. R9-2013-0001

These provisions implement load allocations (LAs) and wasteload allocations (WLAs) of the Total Maximum Daily Loads (TMDLs) ~~adopted~~ established by the San Diego Water Board or ~~and approved by~~ USEPA under Clean Water Act section 303(c), applicable to discharges regulated under this Order. The provisions and schedules for implementation of the TMDLs described below must be incorporated into the Water Quality Improvement Plans, required pursuant to Provision B of this Order, for the specified Watershed Management Areas.

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed
2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin
3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed
4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek
5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay
6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)
7. Total Maximum Daily Load for Sediment in Los Peñasquitos Lagoon

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2002-0123

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	August 14, 2002
State Water Board Approval Date:	July 16, 2003
Office of Administrative Law Approval Date:	September 11, 2003
US EPA Approval Date:	November 3, 2003

(3) TMDL Effective Date: September 11, 2003

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final diazinon TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must be in compliance with the final TMDL compliance requirements as of December 31, 2010.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations:

Table 1.1
Final Receiving Water Limitations Expressed as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Diazinon	Acute	0.08 µg/L	1 hour
	Chronic	0.05 µg/L	4 days

(b) Final Effluent Limitations

Discharges from the MS4s containing concentrations that do not exceed the following effluent limitations will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 1.b.(2)(a):

Table 1.2
Final Effluent Limitations Expressed as Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation	Averaging Period
Diazinon	Acute	0.072 µg/L	1 hour
	Chronic	0.045 µg/L	4 days

(c) Best Management Practices

The following BMPs for Chollas Creek must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area and implemented by the Responsible Copermittees:

(i) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 1.b.(2)(a) and/or the effluent limitations under Specific Provision 1.b.(2)(b) for Chollas Creek.

(ii) The Responsible Copermittees must implement the Diazinon Toxicity Control Plan and Diazinon Public Outreach/Education Program as described in the report titled, *Technical Report for Total Maximum Daily Load for Diazinon in Chollas Creek Watershed, San Diego County*, dated August 14, 2002, including subsequent modifications, in order to achieve the receiving water limitations under Specific Provision 1.b.(2)(a) and/or the effluent limitations under Specific Provision 1.b.(2)(b).

(iii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 1.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 1.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 1.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 1.b.(2)(c) achieves compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 1.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 1.d, to demonstrate compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The Responsible Copermittees must be in compliance with the final diazinon TMDL compliance requirements as of December 31, 2010.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls for diazinon within the Chollas Creek watershed, and calculate or estimate the annual diazinon loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment

Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 1.b.(2)(b), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0019

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	September 22, 2005
Office of Administrative Law Approval Date:	December 2, 2005
US EPA Approval Date:	February 8, 2006

(3) TMDL Effective Date: December 2, 2005

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Shelter Island Yacht Basin

(6) Responsible Copermittee: City of San Diego

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final dissolved copper TMDL compliance requirements for Shelter Island Yacht Basin consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittee must be in compliance with the final TMDL compliance requirements as of December 2, 2005.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations:

Table 2.1
Final Receiving Water Limitations Expressed as Concentrations in Shelter Island Yacht Basin

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Dissolved Copper	Acute	4.8 µg/L x WER*	1 hour
	Chronic	3.1 µg/L x WER*	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 2.b.(3)(a):

Table 2.2
Final Effluent Limitations as Expressed as Annual Loads in MS4 Discharges to Shelter Island Yacht Basin

Constituent	Effluent Limitation
Dissolved Copper	30 kg/yr*

* If the water quality objectives for dissolved copper in Shelter Island Yacht Basin are changed in the future, then the margin of safety (MOS), TMDL and allocations will be recalculated using the *Method for Recalculation of the Total Maximum Daily Load for Dissolved Copper in the Shelter Island Yacht Basin, San Diego Bay* in the Basin Plan (p. 7-14).

(c) Best Management Practices

The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 2.b.(2)(a) and/or the effluent limitations under Specific Provision 2.b.(2)(b) for Shelter Island Yacht Basin. The BMPs must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 2.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 2.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittee develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 2.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 2.b.(2)(c) achieves compliance with Specific Provisions 2.b.(3)(a), 2.b.(3)(b) and/or 2.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 2.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 2.d, to demonstrate compliance with Specific Provisions 2.b.(3)(a), 2.b.(3)(b) and/or 2.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The Responsible Copermittees must be in compliance with the final dissolved copper TMDL compliance requirements as of December 2, 2005.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

The Responsible Copermittee must monitor the effluent of its MS4 outfalls for dissolved copper, and calculate or estimate the monthly and annual dissolved copper loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.(b)(2)of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0036

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	November 16, 2005
Office of Administrative Law Approval Date:	February 1, 2006
US EPA Approval Date:	March 22, 2006

(3) TMDL Effective Date: February 1, 2006

(4) Watershed Management Area: Santa Margarita River

(5) Water Body: Rainbow Creek

(6) Responsible Copermittee: County of San Diego

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final total nitrogen and total phosphorus TMDL compliance requirements for Rainbow Creek consist of the following

(1) Final TMDL Compliance Date

The Responsible Copermittee must comply with final TMDL compliance requirements by December 31, 2021.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance date under Specific Provision 3.b.(1):

Table 3.1
Final Receiving Water Limitations Expressed as Concentrations in Rainbow Creek

Constituent	Receiving Water Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing concentrations that do not exceed the following effluent limitations by the compliance date under Specific Provision 3.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 3.b.(2)(a):

Table 3.2
Final Effluent Limitations Expressed as Concentrations in MS4 Discharges to Rainbow Creek

Constituent	Effluent Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(ii) Annual pollutant loads from given land uses discharging to and from the MS4s that do not exceed the following annual loads by the compliance date under Specific Provision 3.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 3.b.(2)(a):

Table 3.3
Final Effluent Limitations Expressed as Annual Loads in MS4 Discharges to Rainbow Creek

Land Use	Total N	Total P
Commercial nurseries	116 kg/yr	3 kg/yr
Park	3 kg/yr	0.1 kg/yr
Residential areas	149 kg/yr	12 kg/yr
Urban areas	27 kg/yr	6 kg/yr

(c) Best Management Practices

(i) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 3.b.(2)(a) and/or the effluent limitations under Specific Provision 3.b.(2)(b) for Rainbow Creek.

(ii) The Responsible Copermittee should coordinate any BMPs implemented to address this TMDL with Caltrans and other sources as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under

Specific Provision 3.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 3.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the final effluent limitations under Specific Provision 3.b.(2)(b)(ii); OR

(e) The Responsible Copermittee develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 3.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Specific Provision 3.b.(2)(c) achieves compliance with Specific Provisions 3.b.(3)(a), 3.b.(3)(b), 3.b.(3)(c) and/or 3.b.(3)(d),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 3.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 3.d, to demonstrate compliance with Specific Provisions 3.b.(3)(a), 3.b.(3)(b), 3.b.(3)(c) and/or 3.b.(3)(d).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim total nitrogen and total phosphorus TMDL compliance requirements for Rainbow Creek consist of the following:

(1) Interim Compliance Dates and WQBELs

The Responsible Copermittee must comply with the interim WQBELs, expressed as annual loads, by December 31 of the interim compliance year given in Table 3.4.

Table 3.4
Interim Water Quality Based Effluent Limitations Expressed as Annual Loads in MS4 Discharges from Specific Land Uses to Rainbow Creek

	Total N Interim Effluent Limitations (kg/yr)			Total P Interim Effluent Limitations (kg/yr)		
	Interim Compliance Date			Interim Compliance Date		
Land Use	**2009**	**2013**	**2017**	**2009**	**2013**	**2017**
Commercial nurseries	390	299	196	20	16	10
Park	5	3	3	0.15	0.10	0.10
Residential areas	507	390	260	99	74	47
Urban areas	40	27	27	9	6	6

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 3.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 3.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the final effluent limitations under Specific Provision 3.b.(2)(b)(ii); OR

(e) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the interim effluent limitations under Specific Provision 3.c.(1); OR

(f) The Responsible Copermittee has submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittee must incorporate into the Water Quality Improvement Plan and implement the Sampling and Analysis Plan for Rainbow Creek Nutrient Reduction TMDL Implementation Water Quality Monitoring, dated January 2010.

(2) The results of any monitoring conducted during the reporting period, and assessment of whether the interim and final TMDL compliance requirements have been achieved must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 3.b.(2)(b)(i), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2007-0043

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2007
State Water Board Approval Date:	July 15, 2008
Office of Administrative Law Approval Date:	October 22, 2008
US EPA Approval Date:	December 18, 2008

(3) TMDL Effective Date: October 22, 2008

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final dissolved copper, lead, and zinc TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must comply with the final TMDL compliance requirements by October 22, 2028.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance date under Specific Provision 4.b.(1):

Table 4.1
Final Receiving Water Limitations Expressed as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$(0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$(0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$(0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$(0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations by the compliance date under Specific Provision 4.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 4.b.(2)(a):

Table 4.2
Final Effluent Limitations as Expressed Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(c) Best Management Practices

(i) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 4.b.(2)(a) and/or the effluent limitations under Specific Provision 4.b.(2)(b) for Chollas Creek.

(ii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans and the U.S. Navy as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 4.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 4.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 4.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 4.b.(2)(c) achieves compliance with Specific Provisions 4.b.(3)(a), 4.b.(3)(b) and/or 4.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 4.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 4.d, to demonstrate compliance with Specific Provisions 4.b.(3)(a), 4.b.(3)(b) and/or 4.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim dissolved copper, lead, and zinc TMDL compliance requirements for Chollas Creek consist of the following:

(1) Interim Compliance Date and WQBELs

The Responsible Copermittee must comply with the interim WQBELs, expressed as concentrations, by the interim compliance date given in Table 4.3:

Table 4.3
Interim Water Quality Based Effluent Limitations Expressed as Concentrations in MS4 Discharges to Chollas Creek

Interim Compliance Date	Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
October 22, 2018	Dissolved Copper	Acute	1.2 x 90% x (0.96) x $e^{[0.9422 \times \ln(\text{hardness}) - 1.700]}$ x WER*	1 hour
		Chronic	1.2 x 90% x (0.96) x $e^{[0.8545 \times \ln(\text{hardness}) - 1.702]}$ x WER*	4 days
	Dissolved Lead	Acute	1.2 x 90% x [1.46203 – 0.145712 x ln(hardness)] x $e^{[1.273 \times \ln(\text{hardness}) - 1.460]}$ x WER*	1 hour
		Chronic	1.2 x 90% x [1.46203 – 0.145712 x ln(hardness)] x $e^{[1.273 \times \ln(\text{hardness}) - 4.705]}$ x WER*	4 days
	Dissolved Zinc	Acute	1.2 x 90% x (0.978) x $e^{[0.8473 \times \ln(\text{hardness}) + 0.884]}$ x WER*	1 hour
		Chronic	1.2 x 90% x (0.986) x $e^{[0.8473 \times \ln(\text{hardness}) + 0.884]}$ x WER*	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 4.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 4.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) There are no exceedances of the interim effluent limitations under Specific

Provision 4.c.(1) at the Responsible Copermittee's MS4 outfalls; OR

(e) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance date.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*, when it is amended to include monitoring requirements for the Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls discharging to Chollas Creek for dissolved copper, lead, and zinc, and calculate or estimate the monthly and annual dissolved copper, lead, and zinc loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 4.b.(2)(b) or 4.c.(1), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2008-0027

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 11, 2008
State Water Board Approval Date:	June 16, 2009
Office of Administrative Law Approval Date:	September 15, 2009
US EPA Approval Date:	October 26, 2009

(3) TMDL Effective Date: September 15, 2009

(4) Watershed Management Areas: See Table 5.0

(5) Water Bodies: See Table 5.0

(6) Responsible Copermittees: See Table 5.0

Table 5.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County	Dana Point Harbor	Baby Beach	-City of Dana Point -County of Orange
San Diego Bay	San Diego Bay	Shelter Island Shoreline Park	- San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final indicator bacteria TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Final TMDL Compliance Dates

(a) Baby Beach in Dana Point Harbor

The Responsible Copermittees for MS4 discharges to Baby Beach must be in compliance with the final TMDL compliance requirements according to the following compliance dates:

Table 5.1
Compliance Dates to Achieve Final TMDL Compliance Requirements For Baby Beach in Dana Point Harbor

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform	September 15, 2014	September 15, 2009
Fecal Coliform		September 15, 2009
Enterococcus		September 15, 2019

(b) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park must be in compliance with the final TMDL compliance requirements as of December 31, 2012.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance dates under Specific Provision 5.b.(1):

Table 5.2
Final Receiving Water Limitations Expressed as Bacteria Densities in the Water Body

	Receiving Water Limitations	
Constituent	Single Sample Maximum[1,2]	30-Day Geometric Mean[2]
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing indicator bacteria densities that do not exceed the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.3a
Final Effluent Limitations as Expressed as Bacteria Densities in MS4 Discharges to the Water Body

	Effluent Limitations	
Constituent	**Single Sample Maximum[1,2]**	**30-Day Geometric Mean[2]**
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.

(ii) Discharges from the MS4s containing indicator bacteria loads that do not exceed the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.4a
Final Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to the Baby Beach in Dana Point Harbor

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0.86×10^9 MPN/day	$3{,}254 \times 10^9$ MPN/30days
Fecal Coliform	0.17×10^9 MPN/day	112×10^9 MPN/30days
Enterococcus	0.03×10^9 MPN/day	114×10^9 MPN/30days

Table 5.4b
Final Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to the Shelter Island Shoreline Park in San Diego Bay

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0 MPN/day	198×10^9 MPN/30days
Fecal Coliform	0 MPN/day	8×10^9 MPN/30days
Enterococcus	0 MPN/day	26×10^9 MPN/30days

(iii) Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.5a
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to Baby Beach in Dana Point Harbor*

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	90.4%	0%
Fecal Coliform	82.7%	0%
Enterococcus	96.2%	62.2%

Notes:
* The percent load reductions are relative to data collected between 1996-2002. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittees' MS4s must not exceed the loads in Table 5.4a, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the water body.

Table 5.5b
*Final Effluent Limitations Expressed as Percent Load Reductions** in MS4 Discharges to Shelter Island Shoreline Park in San Diego Bay*

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0%	0%
Fecal Coliform	0%	0%
Enterococcus	0%	0%

Notes:
* The percent load reductions are relative to data collected between 1999-2004. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittee's MS4s must not exceed the loads in Table 5.4b, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the water body.

(c) Best Management Practices

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 5.0 must incorporate the Bacteria Load Reduction Plan (BLRP) required to be developed pursuant to Resolution No. R9-2008-0027.

(ii) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 5.b.(2)(a) and/or the effluent limitations under Specific Provision 5.b.(2)(b) for the segments or areas of the water bodies listed in Table 5.0

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.b.(2)(b)(ii); OR

(e) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 5.b.(2)(b)(iii); OR

(f) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(g) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 5.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 5.b.(2)(c) achieves compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 5.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 5.d, to demonstrate compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim indicator bacteria TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Baby Beach in Dana Point Harbor

(a) Interim TMDL Compliance Dates and WQBELs

The Responsible Copermittees for MS4 discharges to Baby Beach must comply with the following interim WQBELs by the interim compliance dates given in Tables 5.6a and/or 5.6b:

Table 5.6a
Interim Water Quality Based Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to Baby Beach in Dana Point Harbor

Constituent	Interim Compliance Dates	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	4.93×10^9 MPN/day	$3{,}254 \times 10^9$ MPN/30days*
Fecal Coliform	September 15, 2012	0.59×10^9 MPN/day	112×10^9 MPN/30days*
Enterococcus	September 15, 2012	0.42×10^9 MPN/day	301×10^9 MPN/30days
	September 15, 2016	0.03×10^9 MPN/day *	207×10^9 MPN/30days

Notes:
* Same as the final effluent limitations in Table 5.4a.

Table 5.6b
Interim Water Quality Based Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to Baby Beach in Dana Point Harbor*

Constituent	Interim Compliance Dates	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	45.2%	0%**
Fecal Coliform	September 15, 2012	41.4%	0%**
Enterococcus	September 15, 2012	48.1%	0%
	September 15, 2016	96.2%**	31.1%

Notes:
* The percent load reductions are relative to data collected between 1996-2002. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittees' MS4s must not exceed the loads in Table 5.6a, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the waterbody.
** Same as the final effluent limitations in Table 5.5a.

(b) Interim Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(i) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(ii) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(iii) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(iv) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.b(2)(b)(ii); OR

(v) The Responsible Copermittees can demonstrate that exceedances of the applicable receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(vi) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the interim effluent limitations under Table 5.6a of Specific Provision 5.c.(1)(a); OR

(vii) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the interim effluent limitations under Table 5.6b of Specific Provision 5.c.(1)(a); OR

(viii) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

(2) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park must be in compliance with the final indicator bacteria TMDL requirements as of December 31, 2012.

d. Specific Monitoring and Assessment Requirements

(1) Monitoring Stations

Monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[33] If discharges of bacteria from the MS4 exceed the applicable interim or final WQBELs, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(2) Monitoring Procedures

(a) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) The Responsible Copermittees must collect wet weather monitoring samples within the first 24 hours of a storm event[34] of the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(c) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

[33] Commonly referred to as AB 411 monitoring
[34] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs have been achieved.

(b) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 5.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(c) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to correlate elevated bacteria levels with known or suspected sewage spills from wastewater collection systems and treatment plants or boats.

(d) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2010-0001

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 10, 2010
State Water Board Approval Date:	December 14, 2010
Office of Administrative Law Approval Date:	April 4, 2011
US EPA Approval Date:	June 22, 2011

(3) TMDL Effective Date: April 4, 2011

(4) Watershed Management Areas: See Table 6.0

(5) Water Bodies: See Table 6.0

(6) Responsible Copermittees: See Table 6.0

Table 6.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	-City of Laguna Beach -County of Orange -Orange County Flood Control District
		at Heisler Park - North	
	Pacific Ocean Shoreline	at Main Laguna Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Woods -County of Orange -Orange County Flood Control District
		Laguna Beach at Ocean Avenue	
		Laguna Beach at Cleo Street	
		Arch Cove at Bluebird Canyon Road	
		Laguna Beach at Dumond Drive	
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Hills -City of Laguna Niguel -City of Laguna Woods -City of Lake Forest -City of Mission Viejo -County of Orange -Orange County Flood Control District
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	
	Aliso Creek Mouth	at mouth	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	-City of Dana Point -City of Laguna Beach -City of Laguna Niguel -County of Orange -Orange County Flood Control District
		Aliso Beach at Table Rock Drive	
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)	
		at Salt Creek (large outlet)	
		Salt Creek Beach at Salt Creek service road	
		Salt Creek Beach at Strand Road	
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	-City of Dana Point -City of Laguna Hills -City of Laguna Niguel -City of Mission Viejo -City of Rancho Santa Margarita -City of San Juan Capistrano -County of Orange -Orange County Flood Control District
	San Juan Creek	lower 1 mile	
	San Juan Creek Mouth	at mouth	
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	-City of Dana Point -City of San Clemente -County of Orange -Orange County Flood Control District
		Ole Hanson Beach Club Beach at Pico Drain	
		San Clemente City Beach at El Portal Street Stairs	
		San Clemente City Beach at Mariposa Street	
		San Clemente City Beach at Linda Lane	
		San Clemente City Beach at South Linda Lane	
		San Clemente City Beach at Lifeguard Headquarters	
		under San Clemente Municipal Pier	
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	
		San Clemente State Beach at Riviera Beach	
		Can Clemente State Beach at Cypress Shores	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	-City of Oceanside -City of Vista -County of San Diego
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	-City of Carlsbad -City of Encinitas -City of Escondido -City of San Marcos -County of San Diego
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	-City of Del Mar -City of Escondido -City of Poway -City of San Diego -City of Solana Beach -County of San Diego
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	-City of Del Mar -City of Poway -City of San Diego -County of San Diego
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	-City of San Diego
		La Jolla Shores Beach at Caminito del Oro	
		La Jolla Shores Beach at Vallecitos	
		La Jolla Shores Beach at Avenida de la Playa	
		at Casa Beach, Children's Pool	
		South Casa Beach at Coast Boulevard	
		Whispering Sands Beach at Ravina Street	
		Windansea Beach at Vista de la Playa	
		Windansea Beach at Bonair Street	
		Windansea Beach at Playa del Norte	
		Windansea Beach at Palomar Avenue	
		at Tourmaline Surf Park	
		Pacific Beach at Grand Avenue	
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I- Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	-City of El Cajon -City of Santee -County of San Diego
	San Diego River	lower 6 miles	-City of El Cajon -City of La Mesa -City of San Diego -City of Santee -County of San Diego
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	-City of La Mesa -City of Lemon Grove -City of San Diego -County of San Diego - San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final indicator bacteria TMDL compliance requirements for the water bodies listed in Table 6.0 consist of the following:

(1) Final TMDL Compliance Dates

The Responsible Copermittees for MS4 discharges to the water bodies listed in Table 6.0 must be in compliance with the final TMDL compliance requirements according to the following compliance dates:

Table 6.1
Compliance Dates to Achieve Final TMDL Compliance Requirements

Constituent	Dry Weather TMDL Compliance Date	Wet Weather TMDL Compliance Date
Total Coliform	April 4, 2021	April 4, 2031
Fecal Coliform		
Enterococcus		

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance dates under Specific Provision 6.b.(1):

Table 6.2a
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Beaches

	Wet Weather Days		Dry Weather Days	
Constituent	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform	10,000	22%	1,000	0%
Fecal Coliform	400	22%	200	0%
Enterococcus	104	22%	35	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan.

Table 6.2b
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Creeks

	Wet Weather Days		Dry Weather Days	
Constituent	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Fecal Coliform	400	22%	200	0%
Enterococcus	61 (104)	22%	33	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Basin Plan.
d. A single sample maximum of 104 MPN/100ml for *Enterococcus* may be applied as a receiving water limitation for creeks, instead of 61 MPN/100mL, if one or more of the creeks addressed by these TMDLs (San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek, San Diego River, and/or Chollas Creek) is designated with a "moderately to lightly used area" or less frequent usage frequency in the Basin Plan. Otherwise, the single sample maximum of 61 MPN/100mL for *Enterococcus* must be used to assess compliance with the allowable exceedance frequency.

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing indicator bacteria densities that do not exceed the following effluent limitations by the compliance dates under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a):

Table 6.2c
Final Effluent Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies in MS4 Discharges to the Water Body

Constituent	Concentration-Based Effluent Limitations			
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform[d]	10,000	22%	1,000	0%
Fecal Coliform	400	22%	200	0%
Enterococcus	104[e] / 61[f]	22%	35[e] / 33[f]	0%

Notes:
a. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan for discharges to beaches, and the Basin Plan for discharges to creeks and creek mouths.
d. Total coliform effluent limitations only apply to MS4 outfalls that discharge to the Pacific Ocean Shorelines and creek mouths listed in Table 6.0.
e. This *Enterococcus* effluent limitation applies to MS4 discharges to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
f. This *Enterococcus* effluent limitation applies to MS4 discharges to segments or areas of creeks or creek mouths listed in Table 6.0.

(ii) Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the compliance dates under Specific Provision 6.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a):

Table 6.3
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	*Watershed and Water Bodies*	*Load-Based Effluent Limitations*					
		Dry Weather			*Wet Weather*		
		Total Coliform	*Fecal Coliform*	*Entero-coccus*	*Total Coliform*	*Fecal Coliform*	*Entero-coccus*
South Orange County	San Joaquin Hills HSA (901.11) and Laguna Hills HSA (901.12) - Pacific Ocean Shoreline	91.78%	91.72%	98.28%	46.85%	52.07%	51.26%
	Aliso HSA (901.13) - Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	95.47%	95.58%	99.13%	25.29%	26.62%	27.52% (27.37%)**
	Dana Point HSA (901.14) - Pacific Ocean Shoreline	95.04%	95.03%	98.98%	13.15%	14.86%	15.16%
	Lower San Juan HSA (901.27) - Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	72.96%	74.21%	94.94%	19.21%	12.82%	27.12% (26.90%)**
	San Clemente HA (901.30) - Pacific Ocean Shoreline	94.28%	94.23%	98.83%	23.85%	24.58%	25.26%
San Luis Rey River	San Luis Rey HU (903.00) - Pacific Ocean Shoreline	38.13%	39.09%	87.38%	5.62%	3.12%	11.69%

Table 6.3 (Cont'd)
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watershed and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
Carlsbad	San Marcos HA (904.50) - Pacific Ocean Shoreline	82.82%	82.55%	96.03%	18.47%	18.98%	20.19%
San Dieguito River	San Dieguito HU (905.00) - Pacific Ocean Shoreline	14.39%	20.72%	83.48%	4.29%	1.46%	7.72%
Penasquitos	Miramar Reservoir HA (906.10) - Pacific Ocean Shoreline	96.50%	96.59%	99.42%	1.61%	1.99%	1.93%
Mission Bay	Scripps HA (906.30) - Pacific Ocean Shoreline	96.44%	96.42%	99.25%	16.32%	21.14%	18.82%
	Tecolote HA (906.50) - Tecolote Creek	94.51%	94.59%	98.94%	16.51%	20.47%	18.15% (18.08%)**
San Diego River	Mission San Diego HSA (907.11) and Santee HSA (907.12) - Pacific Ocean Shoreline - Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles)	74.03%	69.44%	93.96%	38.14%	53.22%	42.74% (42.47%)**
San Diego Bay	Chollas HSA (908.22) - Chollas Creek	92.06%	92.15%	98.46%	17.82%	24.84%	21.46% (21.36%)**

Notes:
* The percent load reductions are based on reducing loads compared to pollutant loads from 2001 to 2002.
** The alternative *Enterococcus* percent load reduction was calculated based on a numeric target of 104 MPN/100mL instead of 61 MPN/100mL, protective of the REC-1 "moderately to lightly used area" usage frequency that is protective of freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative pollutant load reductions can be utilized.

(c) Best Management Practices

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 6.0 must incorporate the Comprehensive Load Reduction Plans (CLRPs) required to be developed pursuant to Resolution No. R9-2010-0001.

(ii) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 6.b.(2)(a) and/or the effluent limitations under Specific Provision 6.b.(2)(b) for the segments or areas of the water bodies listed in Table 6.0.

(iii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans, owners/operators of small MS4s, and agricultural dischargers as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(f) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 6.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 6.b.(2)(c) achieves compliance with Specific Provisions 6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), and/or 6.b.(3)(e),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 6.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 6.d, to demonstrate compliance with Specific Provisions 6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), 6.b.(3)(e) and/or 6.b.(3)(f).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim indicator bacteria TMDL compliance requirements for the water bodies listed in Table 6.0 consist of the following:

(1) Interim TMDL Compliance Dates

The Responsible Copermittees must achieve compliance with the interim TMDL compliance requirements, as determined in accordance with Specific Provision 6.c.(3), by the interim compliance dates given in Table 6.4, unless alternative interim compliance dates are accepted by the San Diego Water Board Executive Officer as part of the Water Quality Improvement Plan.

Table 6.4
Interim Compliance Dates to Achieve Interim TMDL Compliance Requirements

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	April 4, 2016	April 4, 2021
		at Heisler Park - North		
	Pacific Ocean Shoreline	at Main Laguna Beach	April 4, 2016	April 4, 2021
		Laguna Beach at Ocean Avenue		
		Laguna Beach at Cleo Street		
		Arch Cove at Bluebird Canyon Road		
		Laguna Beach at Dumond Drive		
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	April 4, 2016	April 4, 2021
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	April 4, 2018	April 4, 2021
	Aliso Creek Mouth	at mouth	April 4, 2018	April 4, 2021
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	April 4, 2016	April 4, 2021
		Aliso Beach at Table Rock Drive		
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)		
		at Salt Creek (large outlet)		
		Salt Creek Beach at Salt Creek service road	April 4, 2017	April 4, 2021
		Salt Creek Beach at Strand Road	April 4, 2017	April 4, 2021

Table 6.4 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates	
			Interim Dry Weather WQBELs	Interim Wet Weather WQBELs
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	April 4, 2016	April 4, 2021
	San Juan Creek	lower 1 mile	April 4, 2018	April 4, 2021
	San Juan Creek Mouth	at mouth	April 4, 2016	April 4, 2021
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	April 4, 2016	April 4, 2021
		Ole Hanson Beach Club Beach at Pico Drain	April 4, 2016	April 4, 2021
		San Clemente City Beach at El Portal Street Stairs	April 4, 2017	April 4, 2021
		San Clemente City Beach at Mariposa Street		
		San Clemente City Beach at Linda Lane	April 4, 2016	April 4, 2021
		San Clemente City Beach at South Linda Lane	April 4, 2018	April 4, 2021
		San Clemente City Beach at Lifeguard Headquarters	April 4, 2017	April 4, 2021
		under San Clemente Municipal Pier		
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	April 4, 2018	April 4, 2021
		San Clemente State Beach at Riviera Beach	April 4, 2016	April 4, 2021
		Can Clemente State Beach at Cypress Shores	April 4, 2017	April 4, 2021
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	April 4, 2017	April 4, 2021
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	April 4, 2016	April 4, 2021
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	April 4, 2016	April 4, 2021

Table 6.4 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates	
			Interim Dry Weather WQBELs	Interim Wet Weather WQBELs
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	April 4, 2016	April 4, 2021
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	April 4, 2016	April 4, 2021
		La Jolla Shores Beach at Caminito del Oro		
		La Jolla Shores Beach at Vallecitos		
		La Jolla Shores Beach at Avenida de la Playa		
		at Casa Beach, Children's Pool		
		South Casa Beach at Coast Boulevard		
		Whispering Sands Beach at Ravina Street		
		Windansea Beach at Vista de la Playa		
		Windansea Beach at Bonair Street		
		Windansea Beach at Playa del Norte		
		Windansea Beach at Palomar Avenue		
		at Tourmaline Surf Park		
		Pacific Beach at Grand Avenue		
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries		
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	April 4, 2018	April 4, 2021
	San Diego River	lower 6 miles		
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach		
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	April 4, 2018	April 4, 2021

(2) Interim Water Quality Based Effluent Limitations

The Responsible Copermittees for discharges to the water bodies in Table 6.0 must comply with the following interim WQBELs by the interim compliance dates given in Specific Provision 6.c.(1):

(a) Interim Receiving Water Limitations

(i) *Interim Dry Weather Receiving Water Limitations*

The Responsible Copermittee must calculate the "existing" exceedance frequencies of the 30-day geometric mean water quality objectives for each of the indicator bacteria by analyzing the available monitoring data collected between January 1, 1996 and December 31, 2002. "Existing" exceedance frequencies may be calculated by water body and/or by Watershed Management Area listed in Table 6.0. Separate "existing" exceedance frequencies must be calculated for beaches and creeks/creek mouths.

The Responsible Copermittees must achieve a 50 percent reduction in the "existing" exceedance frequency of the 30-day geometric mean WQBELs for the water bodies listed in Table 6.0 by the interim compliance dates given in Table 6.4. A 50 percent reduction in the "existing" exceedance frequency is equivalent to half of the "existing" exceedance frequency of the 30-day geometric mean WQBELs.

The "existing" exceedance frequencies and the interim dry weather allowable exceedance frequencies (i.e. interim dry weather receiving water limitations) calculated by the Responsible Copermittees must be included in the Water Quality Improvement Plans for the applicable Watershed Management Areas.

(ii) *Interim Wet Weather Receiving Water Limitations*

The Responsible Copermittees must achieve the interim wet weather receiving water limitations in Table 6.5, expressed as interim wet weather allowable exceedance frequencies, by the interim compliance dates given in Table 6.4.

Table 6.5
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	38%	37%	39%
		at Heisler Park - North			
	Pacific Ocean Shoreline	at Main Laguna Beach			
		Laguna Beach at Ocean Avenue			
		Laguna Beach at Cleo Street			
		Arch Cove at Bluebird Canyon Road			
		Laguna Beach at Dumond Drive			
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	41%	41%	42%
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	41%	41%	42%
	Aliso Creek Mouth	at mouth	41%	41%	42%
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	36%	36%	36%
		Aliso Beach at Table Rock Drive			
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)			
		at Salt Creek (large outlet)			
		Salt Creek Beach at Salt Creek service road			
		Salt Creek Beach at Strand Road			

Table 6.5 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	44%	44%	48%
	San Juan Creek	lower 1 mile	44%	44%	47%
	San Juan Creek Mouth	at mouth	44%	44%	47%
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	35%	35%	36%
		Ole Hanson Beach Club Beach at Pico Drain			
		San Clemente City Beach at El Portal Street Stairs			
		San Clemente City Beach at Mariposa Street			
		San Clemente City Beach at Linda Lane			
		San Clemente City Beach at South Linda Lane			
		San Clemente City Beach at Lifeguard Headquarters			
		under San Clemente Municipal Pier			
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)			
		San Clemente State Beach at Riviera Beach			
		Can Clemente State Beach at Cypress Shores			
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	45%	44%	47%
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	40%	40%	41%
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	33%	33%	36%

Table 6.5 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	26%	26%	26%
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	37%	37%	37%
		La Jolla Shores Beach at Caminito del Oro			
		La Jolla Shores Beach at Vallecitos			
		La Jolla Shores Beach at Avenida de la Playa			
		at Casa Beach, Children's Pool			
		South Casa Beach at Coast Boulevard			
		Whispering Sands Beach at Ravina Street			
		Windansea Beach at Vista de la Playa			
		Windansea Beach at Bonair Street			
		Windansea Beach at Playa del Norte			
		Windansea Beach at Palomar Avenue			
		at Tourmaline Surf Park			
		Pacific Beach at Grand Avenue			
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries	49%	49%	51%
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	46%	43%	49%
	San Diego River	lower 6 miles	46%	43%	49%
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	46%	43%	51%
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	41%	41%	43%

(b) Interim Effluent Limitations

Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the interim compliance dates under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.c.(2)(a):

Table 6.6
Interim Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	*Watersheds and Water Bodies*	*Load-Based Effluent Limitations*					
		Dry Weather			*Wet Weather*		
		Total Coliform	*Fecal Coliform*	*Entero-coccus*	*Total Coliform*	*Fecal Coliform*	*Entero-coccus*
South Orange County	San Joaquin Hills HSA (901.11) and Laguna Hills HSA (901.12) - Pacific Ocean Shoreline	45.89%	45.86%	49.14%	23.43%	26.04%	25.63%
	Aliso HSA (901.13) - Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	47.74%	47.79%	49.57%	12.65%	13.31%	13.76% (13.69%)**
	Dana Point HSA (901.14) - Pacific Ocean Shoreline	47.52%	47.52%	49.49%	6.58%	7.43%	7.58%
	Lower San Juan HSA (901.27) - Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	36.48%	37.11%	47.47%	9.61%	6.41%	13.56% (13.45%)**
	San Clemente HA (901.30) - Pacific Ocean Shoreline	47.14%	47.12%	49.42%	11.93%	12.29%	12.63%
San Luis Rey River	San Luis Rey HU (903.00) - Pacific Ocean Shoreline	19.07%	19.55%	43.69%	2.81%	1.56%	5.85%
Carlsbad	San Marcos HA (904.50) - Pacific Ocean Shoreline	41.41%	41.28%	48.02%	9.24%	9.49%	10.10%

Table 6.6 (Cont'd)
Interim Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watersheds and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
San Dieguito River	San Dieguito HU (905.00) - Pacific Ocean Shoreline	7.20%	10.36%	41.74%	2.15%	0.73%	3.86%
Penasquitos	Miramar Reservoir HA (906.10) - Pacific Ocean Shoreline	48.25%	48.30%	49.71%	0.81%	1.00%	0.97%
Mission Bay	Scripps HA (906.30) - Pacific Ocean Shoreline	48.22%	48.21%	49.63%	8.16%	10.57%	9.41%
	Tecolote HA (906.50) - Tecolote Creek	47.26%	47.30%	49.47%	8.26%	10.24%	9.08% (9.04%)**
San Diego River	Mission San Diego HSA (907.11) and Santee HSA (907.12) - Pacific Ocean Shoreline - Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles)	37.02%	34.72%	46.98%	19.07%	26.61%	21.37% (21.24%)**
San Diego Bay	Chollas HSA (908.22) - Chollas Creek	46.03%	46.08%	49.23%	8.91%	12.42%	10.73% (10.68%)**

Notes:
* The percent load reductions are based on reducing loads compared to pollutant loads from 2001 to 2002.
** The alternative *Enterococcus* percent load reduction was calculated based on a numeric target of 104 MPN/100mL instead of 61 MPN/100mL, protective of the REC-1 "moderately to lightly used area" usage frequency that is protective of freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative pollutant load reductions can be utilized.

(3) Interim TMDL Compliance Determination

Compliance with the interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(f) There are no exceedances of the interim receiving water limitations under Specific Provision 6.c.(2)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(g) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the interim effluent limitations under Specific Provision 6.c.(2)(b); OR

(h) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

d. Specific Monitoring and Assessment Requirements

(1) Monitoring and Assessment Requirements for Beaches

(a) Monitoring Stations

For beaches addressed by the TMDL, monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[35] If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source

[35] Commonly referred to as AB 411 monitoring

identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations at least once within the first 24 hours of the end of a storm event[36] during the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer in exceedance of the allowable exceedance frequencies in the receiving waters.

(iii) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(iv) For Pacific Ocean Shoreline segments or areas listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the dry weather and

[36] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

wet weather monitoring data to assess whether the interim and final WQBELs for the Pacific Ocean Shoreline segments or areas listed in Table 6.0 have been achieved.

(ii) Dry weather exceedance frequencies must be calculated as follows:

[a] 30-day geometric means must be calculated from the results of any dry weather samples collected from the segments or areas for each water body listed in Table 6.0;
[b] The method and number of samples need for calculating the 30-day geometric means must be consistent with the number of samples required by the Ocean Plan;
[c] Where there are multiple segments or areas associated with a water body listed in Table 6.0, the Copermittees may calculate geometric means for each segment or area, or combine the dry weather monitoring data from all the segments or areas to calculate geometric means for the water body;
[d] The exceedance frequency must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the dry season.

(iii) Wet weather exceedance frequencies must be calculated as follows:

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;
[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;
[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria densities reported from each storm event sampled; and
[d] The single sample maximum exceedance frequency must be calculated by dividing the number of wet weather days that exceed the single sample maximum receiving water limitations in Table 6.2 by the total number of wet weather days during the rainy season.
[e] The data collected for dry weather must be used in addition to the data collected for wet weather to calculate the wet weather 30-day geometric means. The exceedance frequency of the wet weather 30-day geometric means must be calculated by dividing the number of geometric means that exceed the geometric mean

receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the wet season.

(iv) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(v) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) Monitoring and Assessment Requirements for Creeks and Creek Mouths

(a) Monitoring Stations

For creeks addressed by the TMDL, monitoring locations should consist of, at a minimum, a location at or near the mouth of the creek (e.g. Mass Loading Station or Mass Emission Station) and one or more locations upstream of the mouth (e.g. Watershed Assessment Station). If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations in accordance with the requirements of Provision D.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations within the first 24 hours of the end of a storm event[37] during the rainy season (i.e. October 1 through April 30).

[37] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(iii) Samples collected from receiving water monitoring stations must be analyzed for fecal coliform and *Enterococcus* indicator bacteria.

(iv) For creeks or creek mouths listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the receiving water monitoring data to assess whether the interim and final receiving water WQBELs for the creeks and creek mouths listed in Table 6.0 have been achieved.

(ii) Dry weather exceedance frequencies must be calculated as follows:

[a] 30-day geometric means must be calculated from the results of any dry weather samples collected from the segment or area for each water body listed in Table 6.0;
[b] The method and number of samples need for calculating the 30-day geometric means must be consistent with the number of samples required by the Basin Plan;
[c] The exceedance frequency must be calculated by dividing the number of 30-day geometric means that exceed the 30-day geometric mean receiving water limitations in Table 6.2 by the total number of 30-day geometric means calculated from samples collected during the dry season.

(iii) Wet weather exceedance frequencies must be calculated as follows:

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;
[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;
[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria densities reported from each of the storm events sampled; and

[d] The exceedance frequency must be calculated by dividing the number of wet weather days that exceed the single sample maximum receiving water limitations in Table 6.2 by the total number of wet weather days during the rainy season.

[e] The data collected for dry weather must be used in addition to the data collected for wet weather to calculate the wet weather 30-day geometric means. The exceedance frequency of the wet weather 30-day geometric means must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the wet season.

(iv) The Responsible Copermittee must identify and incorporate additional MS4 outfall and receiving water monitoring stations and/or adjust monitoring frequencies to identify sources causing exceedances of the receiving water WQBELs.

(v) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(vi) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

7. Total Maximum Daily Loads for Sediment in Los Peñasquitos Lagoon

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2012-0033

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2012
State Water Board Approval Date:	January 21, 2014
Office of Administrative Law Approval Date:	July 14, 2014
US EPA Approval Date:	October 30,2014

(3) TMDL Effective Date: July 14, 2014

(4) Watershed Management Area: Los Peñasquitos

(5) Water Body: Los Peñasquitos Lagoon

(6) Responsible Copermittees: County of San Diego, City of San Diego, City of Del Mar, and City of Poway

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final sediment TMDL compliance requirements for Los Peñasquitos Lagoon consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must be in compliance with the final TMDL compliance requirements by December 31, 2034.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not prohibit the sustainable restoration of tidal and non-tidal saltmarsh vegetation of at least 346 acres.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations by the compliance date under Provision 7.b(1) will not cause or contribute to a failure of the receiving water condition specified under Specific Provision 7.b.(2)(a):

Table 7.1
*Final Effluent Limitations as Expressed as Wet Season Loads in MS4 Discharges to Los Peñasquitos Lagoon**

Constituent	Effluent Limitation
Sediment	2,580 tons/wet season

*Final effluent limitations are to be achieved by the following Responsible Parties: County of San Diego, City of San Diego, City of Del Mar, City of Poway, Phase II MS4 permittees, Caltrans, general construction storm water NPDES permittees, and general industrial storm water NPDES permittees.

(c) Best Management Practices

(i) The Water Quality Improvement Plan for the Los Peñasquitos Watershed Management Area must incorporate the Sediment Load Reduction Plan required to be developed pursuant to Resolution No. R9-2012-0033.

(ii) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 7.b.(2)(a) and/or the Copermittee's portion of the effluent limitations under Specific Provision 7.b.(2)(b) for Los Peñasquitos Lagoon.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) Successful restoration of 80 percent of the 1973 acreage of tidal and non-tidal lagoon salt marsh (346 acres); OR

(b) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 7.b.(2)(c)(ii) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 7.b.(2)(c)(ii) or other implementation actions achieve compliance with Specific Provision 7.b.(3)(a),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 7.b.(2)(c)(ii) or other implementation actions, AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 7.d to demonstrate compliance with Specific Provision 7.b.(3)(a).

c. Interim TMDL Compliance Requirements

The interim sediment TMDL compliance requirements for Los Penasquitos Lagoon consist of the following:

(1) Interim Compliance Dates and WQBELs

The Responsible Copermittees must comply with the interim WQBELs, expressed as wet season loads, by December 31 of the interim compliance year set forth in Table 7.2.

Table 7.2
*Interim Water Quality Based Effluent Limitations Expressed as Wet Season Loads in MS4 Discharges**

Interim Compliance Date	Interim Effluent Limitations (tons/wet season)
December 31, 2019	6,691
December 31, 2023	5,663
December 31, 2027	4,636
December 31, 2029	3,608

*Interim effluent limitations are to be achieved by the following Responsible Parties: County of San Diego, City of San Diego, City of Del Mar, City of Poway, Phase II MS4 permittees, Caltrans, general construction storm water NPDES permittees, and general industrial storm water NPDES permittees.

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) The final receiving water limitation under Specific Provision 7.b.(2)(a) is met; OR

(c) There are no exceedances of the Copermittee's portion of interim effluent limitations under Table 7.2 at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the Copermittee's portion of the

interim TMDL compliance requirements described in Attachment A of Resolution No. R9-2010-0033 will be achieved by the interim compliance date.

d. Specific Monitoring and Assessment Requirements

(1) Watershed Monitoring

The Responsible Copermittees must conduct suspended sediment, bed load, and flow monitoring to calculate total sediment loading to the Los Peñasquitos Lagoon for each wet season (October 1 thru April 30) as set forth below:

(a) The Responsible Copermittees must monitor enough storm events throughout the season to quantify sediment loading over each wet season, and

(b) The Responsible Copermittees must monitor at least 3 stations to quantify cumulative sediment loading into Los Peñasquitos Lagoon. Stations must be located within the Los Peñasquitos, Carroll Canyon, and Carmel Creek tributaries prior to discharging into Los Peñasquitos Lagoon.

(2) Lagoon Monitoring

The Responsible Copermittees must monitor Los Peñasquitos Lagoon each Fall for changes in the extent of the vegetation types as set forth below:

(a) The Responsible Copermittees must acquire aerial photos of Los Peñasquitos Lagoon and digitize them at an approximate scale of 1:2,500,

(b) The Responsible Copermittees must appropriately interpret the vegetation and classify the various types as saltmarsh, non-tidal saltmarsh, freshwater marsh, non-tidal saltmarsh –*Lolium perrene* infested, southern willow scrub/mulefat scrub, herbaceous wetland, or upland land cover.

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the monitoring data collected under Specific Provision 7.d(1) and 7.d(2) to assess whether the interim and final WQBELs have been achieved.

(b) For assessing and determining compliance with the final receiving water limitations under Specific Provision 7.b.(2)(a), the Responsible Copermittees must use the data acquired under Specific Provision 7.d.(2) to estimate the acreage of tidal and non-tidal saltmarsh actually restored.

(c) For assessing and determining compliance with the final effluent limitations under Specific Provision 7.b.(2)(b), the Responsible Copermittees must use the data acquired under Specific Provision 7.d.(1) to estimate sediment loading into Los Peñasquitos Lagoon. Sediment loading must be evaluated using a 3-year, weighted rolling average. The first reported average shall be calculated using data collected in the year 2015-2016, 2016-2017, and 2017-2018 wet seasons.

(d) The monitoring and assessment results must be submitted as part of the Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

ATTACHMENT F

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

FACT SHEET / TECHNICAL REPORT

FOR

ORDER NO. R9-2013-0001
AS AMENDED BY ORDER No. R9-2015-0001
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

MAY 8, 2013
Amended on February 11, 2015

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I. FACT SHEET FORMAT

This Fact Sheet briefly sets forth the principal facts and the significant factual, legal, methodological, and policy questions that the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) considered in preparing Order No. R9-2013-0001 (Order) as amended by Order No. R9-2015-0001. In accordance with the Code of Federal Regulations (CFR) Title 40 Parts 124.8 and 124.56 (40 CFR 124.8 and 40 CFR 124.56), this Fact Sheet includes, but is not limited to, the following information:

1. Contact information
2. Public process and notification procedures
3. Background of municipal storm water permits
4. Regional MS4 Permit approach
5. Economic considerations
6. Applicable statutes, regulations, plans and policies
7. Discussion of the provisions in the Order

Tentative Order No. R9-2013-0001 was distributed for public review on October 31, 2012. The San Diego Water Board accepted written comments on the Tentative Order until January 11, 2013. A public hearing was subsequently held on April 10 and 11, 2013, that was continued to May 8, 2013 to receive oral comments from interested persons. The San Diego Water Board adopted Order No. R9-2013-0001 on May 8, 2013.

Order No. R9-2015-0001, an Order amending Order No. R9-2013-0001, was distributed for public review on September 19, 2014. Order No. R9-2015-0001 amended the findings and provisions of Order No. R9-2013-0001 to:

a. Enroll the County of Orange, the Orange County Flood Control District and the south Orange County Cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano as Copermittees responsible for compliance with the terms and conditions of Order No. R9-2013-0001, as amended by Order No. R9-2015-0001;

b. Designate the San Diego Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the Cities of Laguna Woods and Laguna Hills and agree to the designation of the Santa Ana Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the City of Lake Forest, subject to the terms of the February 10, 2015 agreement between San Diego Water Board and the Santa Ana Water Board described in Finding 29 of this Order, upon the later effective date of Order No. R9-2015-0001 or Order No. R8-2015-0001 (superseding Order No. R8-2009-0030);

c. Establish interim exceptions to land development requirements for those priority development projects that discharge to engineered channels and large river reaches as described in Provision E.3.c(2)(e) of this Order;

d. Incorporate the amended requirements of the State Water Resources Control Board's (State Water Board) General Exception to require that pollutant reductions be achieved within 6 years for storm water and nonpoint source discharges to ASBS within the Region;

e. Incorporate applicable requirements of the Los Peñasquitos Lagoon Sediment TMDL;

f. Require the Orange County Copermittees to implement the "*Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County*," dated October 2014, made effective in the Monitoring and Reporting Program/Order issued pursuant to California Water Code section 13383 in the December 5, 2014 San Diego Water Board Letter Directive and subject to future revisions by the Executive Officer after appropriate public input;

A public hearing was held on February 11, 2015, to receive oral comments from Copermittees and interested persons. The San Diego Water Board adopted Order No. R9-2015-0001 amending Order No. R9-2013-0001 on February 11, 2015.

The San Diego Water Board files applicable to the issuance of Order No. R9-2013-0001 and amendments thereto are incorporated into the administrative record in support of the findings and requirements of the Order.

II. CONTACT INFORMATION

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The Order and other related documents can be downloaded from the San Diego Water Board website at

~~http://www.swrcb.ca.gov/rwqcb9/water_issues/programs/stormwater/index.shtml~~
http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/oc_stormwater.shtml

The documents referenced in this Fact Sheet and in Order No. R9-2013-0001 and amendments thereto are available for public review at the San Diego Water Board office, located at the address listed above. Public records are available for inspection during regular business hours, from 8:00 am to 5:00 pm Monday through Friday. To schedule an appointment to inspect public records, contact the San Diego Water Board Records Management Officer at ~~858-467-2952~~619-516-1990.

COPERMITTEES

Orange County Copermittees

- County of Orange
- City of Aliso Viejo
- City of Dana Point
- City of Laguna Beach
- City of Laguna Hills
- City of Laguna Niguel
- City of Laguna Woods
- City of Lake Forest*
- City of Mission Viejo
- City of Ranch Santa Margarita
- City of San Clemente
- City of San Juan Capistrano
- Orange County Flood Control District

* While not listed in the above table, the City of Lake Forest remains a Copermittee under this Order until the later effective date of this Order or Santa Ana Water Board Tentative Order No. R8-2015-0001. Thereafter, the City of Lake Forest will no longer be considered a Copermittee under this Order because its Phase I MS4 discharges will be regulated by the Santa Ana Water Board pursuant to Water Code section 13328 designation. The requirements of this Order that apply to the City of Lake Forest for the duration of this Order, consistent with the Water Code section 13228 agreement dated February 10, 2015, are described in Finding 29 and Footnote 2 to Table B-1.

Riverside County Copermittees

- County of Riverside
- City of Murrieta
- City of Temecula
- City of Wildomar
- Riverside County Flood Control and Water Conservation District

San Diego County Copermittees

- County of San Diego
- City of Carlsbad
- City of Chula Vista
- City of Coronado
- City of Del Mar
- City of El Cajon
- City of Encinitas
- City of Escondido
- City of Imperial Beach
- City of La Mesa
- City of Lemon Grove
- City of National City
- City of Oceanside
- City of Poway
- City of San Diego
- City of San Marcos
- City of Santee
- City of Solana Beach
- City of Vista
- San Diego County Regional Airport Authority
- San Diego Unified Port District

III. PUBLIC PROCESS AND NOTIFICATION PROCEDURES

The San Diego Water Board followed the schedule listed below for the preparation of Order No. R9-2013-0001:

San Diego County Copermittee Permit Reissuance Process

1. On February 8, 2011, the San Diego Water Board met with the San Diego County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No. R9-2007-0001.

2. Between February and May 2011, the San Diego Water Board met with select San Diego County, Orange County, and Riverside County Copermittees, as well as representatives of the environmental community to discuss concepts and receive recommendations for elements to be incorporated in a Regional Municipal Separate Storm Sewer System Permit (Regional MS4 Permit).

3. On June 27, 2011 the San Diego Water Board received the Report of Waste Discharge from the San Diego County Copermittees for the renewal of their NPDES permit, Order No. R9-2007-0001.

4. On April 9, 2012, the San Diego Water Board released an administrative draft of Tentative Order No. R9-2013-0001 for preliminary informal comments and feedback.

5. On April 25, 2012, the San Diego Water Board held an informal public workshop to present the administrative draft of Tentative Order No. R9-2013-0001 and receive verbal comments.

6. Between June and August 2012, the San Diego Water Board held four (4) focused meetings with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community, and USEPA) to discuss and receive preliminary comments and feedback about specific elements in the administrative draft of Tentative Order No. R9-2013-0001.

7. On September 5, 2012, the San Diego Water Board held an informal public workshop to present the modifications that were expected to be incorporated into the Tentative Order based on the preliminary comments and feedback received during the focused meetings held between June and August 2012.

8. Informal written comments on the administrative draft of Tentative Order No. R9-2013-0001 were accepted until September 14, 2012.

9. On October 12, 2012, the San Diego Water Board released a revised administrative draft of Tentative Order No. R9-2013-0001.

10. On October 24, 2012, the San Diego Water Board held a focused meeting with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community, and USEPA) to discuss modifications incorporated into the administrative draft of Tentative Order No. R9-2013-0001.

11. On October 31, 2012, the San Diego Water Board released Tentative Order No. R9-2013-0001 for formal public review and comment.

12. On November 13, 2012 and December 12, 2012, the San Diego Water Board held a formal public Board workshop to present the public draft of Tentative Order No. R9-2013-0001 and receive verbal comments.

13. Formal written comments on the public draft of Tentative Order No. R9-2013-0001 were accepted until January 11, 2013.

14. A public hearing of Tentative Order No. R9-2013-0001 was conducted on April 10 and 11, 2013, that was continued to May 8, 2013.

Orange County Copermittee Permit Reissuance Process

15. On May 20, 2014 the San Diego Water Board received the Report of Waste Discharge from the Orange County Copermittees for the renewal of their MS4 NPDES permit, Order No. R9-2009-0002.

16. On June 24, 2014, the San Diego Water Board met with the Orange County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No.R9-2009-0002 and the process for enrollment as Copermittees under Regional MS4 Permit Order No. R9-2013-0001.

17. On July 1, 2014, the San Diego Water Board held a public meeting to discuss the Orange County Report of Waste Discharge (RoWD) and receive comments on potential modifications to Order No. R9-2013-0001. Based on comments received from the Orange County Copermittees and other interested persons at this meeting, the San Diego Water Board determined that additional public meetings were not needed prior to release of Tentative Order No. R9-2015-0001, amending Order No. R9-2013-0001 in redlined – strikeout format for public review and comment.

18. On September 19, 2014, the San Diego Water Board released Tentative Order No. R9-2015-0001 for a 60 day public review and comment period.

19. On October 8, 2014, the San Diego Water Board held a formal public workshop at a regular board meeting to receive information and discuss the proposed amendments to Order No. R9-2013-0001 described in Tentative Order No. R9-2015-0001.

20. In accordance with State and federal laws and regulations, the San Diego Water Board notified San Diego County, Orange County and Riverside County Copermittees, and all known interested agencies and persons of its intent to adopt Tentative Order No. R9-2015-0001 and provided them with an opportunity to submit their written comments and recommendations. Written comments and recommendations on Tentative Order No. R9-2015-0001 were accepted until November 19, 2014.

21. The San Diego Water Board held a public workshop on October 8, 2014, and a public hearing on February 11, 2015, and heard and considered all comments pertaining to the adoption of Tentative Order No. R9-2015-0001 on February 11, 2015.

IV. BACKGROUND OF THE SAN DIEGO REGION MUNICIPAL STORM WATER PERMITS

In developed and developing areas, storm water runoff is commonly transported through municipal separate storm sewer systems (MS4s) and discharged into local receiving water bodies. As the storm water runs off and flows over the land or impervious surfaces (e.g., paved streets, parking lots, and building rooftops), it accumulates debris, chemicals, sediment, and other pollutants that can adversely affect receiving water quality if discharged untreated. The United States Environmental Protection Agency (USEPA) recognizes wet weather flows from urban areas as the number one source of estuarine pollution in coastal communities,[1] such as those within the San Diego Region.

The federal Clean Water Act (CWA) was amended in 1987 to address and regulate discharges of storm water associated with industrial activities and from municipal storm sewers. With the amendments, many municipalities throughout the United States were obligated for the first time to obtain National Pollutant Discharge Elimination System (NPDES) permits for discharges of storm water from their MS4s.

In response to the CWA 1987 amendment, as well as the pending federal NPDES regulations which would implement the amendment, the San Diego Water Board issued "early" MS4 permits. The San Diego Water Board adopted and issued Order Nos. 90-38, 90-42, and 90-46 to regulate storm water discharges from the MS4s in Orange County, San Diego County, and Riverside County, respectively, within the San Diego Region on July 16, 1990.

The "early" MS4 permits, or First Term Permits, were issued prior to the November 1990 promulgation of the final federal NPDES storm water regulations. By issuing these First Term Permits before the federal regulations took effect, the San Diego Water Board was able to provide the Copermittees additional flexibility in addressing and managing storm water discharges. The First Term Permits contained the essentials of the 1990 regulations, and required the Copermittees to develop and implement runoff management programs, but provided little specificity about what was required to be included in or actually achieved by those programs.

The flexibility provided in the First Term Permits was generally continued through the Second Term Permits. The combination of the lack of specificity in the First and Second Term Permits, a general lack of meaningful action by the Copermittees and a general lack of corresponding reaction (i.e. enforcement) by the San Diego Water Board during the first ten years of the storm water program, resulted in few substantive steps

[1] US EPA. 1999. 40 CFR Parts 9, 122, 123, and 124. National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. 64 FR 68727.

towards achieving improvements in the quality of receiving waters or storm water discharges from the MS4s.

From 2001, the regulatory approach incorporated into Third Term Permits was a significant departure from the regulatory approach of the First and Second Term Permits. The Third Term Permits issued by the San Diego Water Board included more detailed requirements that outlined the minimum level of implementation required for the Copermittees' programs to meet the maximum extent practicable (MEP) standard for storm water. The Third Term Permits included more detail to emphasize and enhance the jurisdictional runoff management programs developed by the Copermittees and introduced requirements for developing and implementing watershed-based programs.

The Third Term Permits also incorporated two precedent setting decisions by the State Water Board. In Order WQ 99-05, the State Water Board established receiving water limitation language to be included in all MS4 permits. The State Water Board's precedential language clarified that municipal storm water permits must include provisions requiring discharges to be controlled to attain water quality standards in receiving waters. Unlike previously adopted versions of the receiving water limitation language in the First and Second Term Permits, the language no longer stated that "*violations of water quality standards are not violations of the municipal storm water permit under certain conditions*." In addition, the receiving water limitation language no longer indicated that the "*implementation of best management practices is the 'functional equivalent' of meeting water quality standards*." State Water Board Order WQ 99-05 specifically requires language in MS4 permits for the Copermittees to comply with water quality standards based discharge prohibitions and receiving water limitations through timely implementation of control measures and other actions to reduce pollutants in discharges. (See State Water Board Order WQ 99-05 (*Environmental Health Coalition*)).

In Order WQ 2000-11, also a precedential decision, the State Water Board addressed design standards for structural post-construction best management practices (BMPs) for new development and significant redevelopment. The State Water Board found that the design standards, which require that runoff generated by 85 percent of storm events from specific development categories be infiltrated or treated, reflect the MEP standard. State Water Board Order WQ 2000-11 also found that the post-construction BMP provisions, or Standard Storm Water Mitigation Plan (SSMP) provisions, constitute MEP for addressing storm water pollutant discharges resulting from specific development categories.

The Third Term San Diego County and Orange County Permits (Order Nos. 2001-01 and R9-2002-0001, respectively) were appealed to the State Water Board. Minor modifications were made by the State Water Board, but the requirements were largely upheld. In State Water Board Order WQ 2001-15, the State Water Board upheld the Third Term San Diego County Permit requirements with certain modifications. The State Water Board removed the prohibition of storm water discharges *into* the MS4 that cause or contribute to exceedances of water quality objectives. The revision allows for

treatment of pollutants in storm water runoff after the pollutants have entered the MS4. State Water Board Order WQ 2001-15 otherwise upheld all the other requirements of the permit.

In addition to the modification to the discharge prohibition in Order WQ 2001-15, the State Water Board refined Order WQ 99-05 by making clear that the Copermittees may use an iterative approach to achieving compliance with water quality standards that involves ongoing assessments and revisions. Thus, the language for the discharge prohibitions and receiving water limitations was revised to explicitly require the Copermittees to implement an iterative process of assessments and revisions to comply with the discharge prohibitions and receiving water limitations. The San Diego Water Board retained the authority to enforce receiving water limitations and discharge prohibitions even if the Copermittee is engaged in the iterative process.

The Third Term San Diego County Permit was subsequently challenged in the Superior Court of the State of California and the Court of Appeal, Fourth Appellate District. The Court of Appeal, Fourth Appellate District, found that the approach of the Third Term San Diego County Permit to regulating discharges into the MS4 was appropriate (*Building Industry Ass'n. v. State Water Resources Control Bd., et al.,* 124 Cal.App.4th 866 (2004)). The State of California Supreme Court denied review sought by the Building Industry Association in March 2005.

The Fourth Term Permits, or current MS4 permits, began with the adoption of Order No. R9-2007-0001 issued to the Copermittees of San Diego County in January 2007. Order Nos. R9-2009-0002 and R9-2010-0016 were subsequently issued to the Copermittees of Orange County and Riverside County. The Fourth Term Permits continued to include more detailed requirements to be implemented by each Copermittee's jurisdictional runoff management program. The Fourth Term Permits also include requirements to further emphasize a watershed management approach and for more coordination among jurisdictional runoff management programs. In addition, the Fourth Term Permits included more requirements for assessing the effectiveness of the runoff management programs being implemented by the Copermittees. The intent of the inclusion of additional requirements was to enhance and better define elements of the permit that were expected to be incorporated into the iterative process for managing runoff from each Copermittee's jurisdiction and within the watersheds of the San Diego Region.

The Fourth Term Permits include several new and emerging approaches for managing storm water runoff and discharges. Low impact development (LID) requirements are included for development and significant redevelopment to reduce pollutants in storm water runoff from sites through more natural processes such as infiltration and biofiltration closer to the source, rather than utilizing conventional mechanical end-of-pipe treatment systems. Hydrograph modification (hydromodification) management requirements also are included to mitigate the potential for increased erosion in receiving waters due to increased runoff rates and durations often caused by development and increased impervious surfaces. The Fourth Term Orange County and

Riverside County Permits introduced requirements to identify areas of existing development where retrofitting with LID projects would be feasible and could be implemented to reduce storm water runoff and pollutants in storm water discharges.

The Fourth Term Orange County and Riverside County Permits included a clearer distinction between storm water and non-storm water discharges. The term "urban runoff" was completely removed, and a distinction between storm water (wet weather) runoff and non-storm water (dry weather) runoff was emphasized. This clarification was made to prevent any potential misunderstanding that regulation under the MS4 permits is limited only to urbanized areas, and to prevent non-storm water runoff from being managed in the same manner as storm water runoff. The term "urban runoff" is not defined in the Code of Federal Regulations (CFR) or Federal Register (FR) in the regulation of MS4 discharges. According to the CWA 402(p)(3)(B)(ii), MS4 permits must include a requirement to effectively prohibit non-storm water discharges into the MS4s.

Finally, for the Fourth Term Orange County and Riverside County Permits the San Diego Water Board found that non-storm water discharges to the MS4 from over application of irrigation water are sources of pollutants. The San Diego Water Board found that non-storm water discharges resulting from over-irrigation must be prohibited from entering the MS4 in accordance with the requirements of the CWA and pursuant to 40 CFR 122.26(d)(2)(iv)(B)(1).

The requirements of the Fourth Term Permits issued to the Copermittees in each county within the San Diego Region now have substantively the same core requirements such as discharge prohibitions, receiving water limitations, jurisdictional runoff management program components, and monitoring program requirements. There are, however, several inconsistencies that exist among the three Fourth Term Permits which complicate oversight and implementation of the permits by the San Diego Water Board.

The Fourth Term San Diego County Permit expired in January 2012. The Fourth Term Orange County permit ~~and Riverside County Permits will~~ expired in December 2014 and the Fourth Term Riverside County Permit will expire in November 2015. ~~, respectively.~~ Issuing the Fifth Term Permits within five years for three counties under three different permits would require the San Diego Water Board to expend significant time and resources for the issuance of the permits through three separate public proceedings, thereby greatly reducing the time and resources available to oversee implementation and compliance. Multiple permits also create confusion for determining compliance among regulated entities, especially for the land development community.

The San Diego Water Board has acknowledged that issuing a single MS4 permit for all the Copermittees in the San Diego Region can and is expected to result in more consistent implementation, improve communication among agencies within watersheds crossing multiple jurisdictions, and minimize resources spent with each permit renewal process. Within the findings of the Fourth Term Riverside County Permit issued in

November 2010, the San Diego Water Board notified the public of its intent to develop and issue a single Regional MS4 Permit.

V. REGIONAL MS4 PERMIT APPROACH

The Fifth Term Permit, or Regional MS4 Permit, shifts the focus of the permit requirements from a minimum level of actions to be implemented by the Copermittees to identifying outcomes to be achieved by those actions. Order No. R9-2013-0001 represents an important paradigm shift in the approach for MS4 permits within the San Diego Region.

Historical Permitting Approach

The First and Second Term Permits were very broad and provided little specificity about what was required to be developed and implemented by the Copermittees. The Third Term Permits began to become more specific about the minimum level of implementation required by the Copermittees. The Fourth Term Permits~~, or current permits,~~ subsequently increased in specificity. The MS4 permits have progressively become more detailed and focused on specifying the minimum level of actions expected to be implemented by the Copermittees. As detailed and specific as the MS4 permits have become, however, they include very little detail about what the desired outcomes of the required actions are expected to achieve. Compliance with the permit requirements has essentially been tracking numbers of actions and reporting, not tracking progress or actual improvements in the quality of receiving waters or discharges from the MS4s. The result has been an increase in actions being implemented by the Copermittees with little or no ability or expectations to determine whether or not improvements in water quality are being achieved.

The Fourth Term Permits result in significant resource expenditure by the Copermittees to report permit compliance information to the San Diego Water Board in the form of annual jurisdictional runoff management program, watershed program, and monitoring program reports. The San Diego Water Board must then expend much of its limited resources on reviewing more than 50 voluminous reports submitted annually by the Copermittees. The information currently reported by the Copermittees is of limited value when trying to measure progress toward achieving improvements in the quality of receiving waters or discharges from the MS4s. Oversight of the MS4 permits is further complicated by the inconsistencies among the requirements issued to the Orange County, San Diego County, and Riverside County Copermittees under three separate MS4 permits.

Under the Fourth Term Permits, the Copermittees must expend a significant portion of their limited resources collecting data of limited value, and putting together reports to submit that information to the San Diego Water Board. Likewise, the San Diego Water Board must expend most of its limited resources reviewing reports, and developing permits instead of working directly with the Copermittees to identify solutions to problems causing impacts to water quality. This is an unsustainable course that will continue to demand more resources from the Copermittees and the San Diego Water Board, and would continue to result in unknown water quality benefits.

New Permitting Approach

The goal of the Regional MS4 Permit is twofold: 1) bring a consistent set of MS4 permit requirements to all of the Copermittees within the San Diego Region; and, 2) provide an MS4 permit with requirements that will allow the Copermittees to focus their efforts and resources on achieving goals and desired outcomes toward the improvement of water quality rather than completing specific actions.

The overall approach included in the Regional MS4 Permit with respect to the jurisdictional runoff management programs will not differ significantly from the current permits. The general requirements for the jurisdictional runoff management program components and compliance with those requirements will remain and be applied consistently throughout the San Diego Region under the Regional MS4 Permit.

The most significant difference in the new permitting approach is the specific manner of implementation for those jurisdictional runoff management programs. Implementation will be based on decisions made by the Copermittees in accordance with what they have identified as their highest priority water quality conditions. In other words, the Copermittees will have significant control in how to implement the jurisdictional runoff management programs to best utilize their available resources in addressing a specific set of priorities effectively, instead of trying to address all the water quality priorities ineffectively.

The Copermittees are given the responsibility of identifying their highest priority water quality conditions that they intend to address. The Copermittees will develop goals that can be used to measure and demonstrate progress or improvements toward addressing those priorities. In addition to the goals, the Copermittees will provide a schedule for achieving the goals for those highest priorities. The measurement of progress toward achieving the goals for those highest priorities requires a better defined and more focused program of monitoring and assessment than under the Fourth Term Permits.

The monitoring and assessment program must be designed to inform the Copermittees of their progress, and the need for modifications in their jurisdictional runoff management programs and schedules to achieve their goals to improve water quality. The monitoring and assessment program requirements will have a more central role in the Regional MS4 Permit than in earlier permits. The monitoring and assessment requirements must also be designed to enable the Copermittees to focus and direct their efforts in implementing their jurisdictional runoff management programs toward their stated desired outcomes to improve the quality of receiving waters and/or discharges from the MS4s.

By providing an MS4 permit that allows the Copermittees to make more decisions about how to utilize and focus their resources, along with a better defined monitoring and assessment program to inform their water quality management decisions, the Copermittees will have the opportunity to:

1) *Plan strategically*. The Copermittees must have the ability to identify their available resources and develop and implement long term plans that can organize, collect, and use those resources in the most strategically advantageous and efficient manner possible. This ability to develop long term plans will allow the Copermittees to focus and utilize their resources in a more concerted way over the short term and long term to address specific water quality priorities through stated desired outcomes.

2) *Manage adaptively*. The Copermittees must be given the ability to modify their plans as additional information and data are collected from the monitoring and assessment programs. The Copermittees' plans may require modifications to the programs, priorities, goals, strategies, and/or schedules in order for the Copermittees to achieve a stated desired outcome.

3) *Identify synergies*. The Copermittees must be given more flexibility to identify efficiencies within and among their jurisdictional runoff management programs as the strategies are developed and implemented to increase the Copermittees' collective effectiveness. The Copermittees must also be able to identify and utilize resources available from other agencies and entities to further augment and enhance their jurisdictional runoff management programs and/or to collectively work with those other agencies and entities toward achieving a stated desired outcome.

The Regional MS4 Permit requirements will provide the Copermittees the flexibility and responsibility to decide what actions will be necessary to achieve an outcome that is tailored and designed by the Copermittees to improve specific prioritized water quality conditions. The San Diego Water Board expects the approach of the Regional MS4 Permit to give the Copermittees a greater sense of ownership for restoring the quality of receiving waters in the San Diego Region by becoming an integral part of the decision making process in identifying water quality conditions to be addressed, as well as determining the best use of their resources.

VI. ECONOMIC CONSIDERATIONS

Statutory Considerations

California Water Code (CWC) section 13241 requires the San Diego Water Board to consider certain factors, including economic considerations, in the adoption of water quality objectives. CWC section 13263 requires the San Diego Water Board to take into consideration the provisions of CWC section 13241 in adopting waste discharge requirements.

In *City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, the California Supreme Court considered whether Regional Water Boards must comply with CWC section 13241 when issuing waste discharge requirements under CWC section 13263(a) by taking into account the costs a permittee will incur in complying with the permit requirements. The Court concluded that whether it is necessary to consider such cost information "*depends on whether those restrictions meet or exceed the requirements of the federal Clean Water Act.*" (*Id.* at p. 627.) The Court ruled that Regional Water Boards may not consider the factors in CWC section 13241, including economics, to justify imposing pollutant restrictions that are less stringent than applicable federal law requires. (*Id.* At pp. 618, 626-627 ["*[Water Code section 13377 specifies that [] discharge permits issued by California's regional boards must meet the federal standards set by federal law. In effect, section 13377 forbids a regional board's consideration of any economic hardship on the part of the permit holder if doing so would result in the dilution of the requirements set by Congress in the Clean Water Act...Because CWC section 13263 cannot authorize what federal law forbids, it cannot authorize a regional board, when issuing a [] discharge permit, to use compliance costs to justify pollutant restrictions that do not comply with federal clean water standards*."]). However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Regional Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

As discussed in Section VII.F, Unfunded State Mandates, the San Diego Water Board finds that the requirements in this Order are not more stringent than the minimum federal requirements. Among other requirements, federal law requires MS4 permits to include requirements to effectively prohibit non-storm water discharges into the MS4s, in addition to requiring controls to reduce the discharge of pollutants in storm water to the MEP, and other provisions as USEPA or the State determines are appropriate for the control of pollutants in MS4 discharges.

The requirements in this Order may be more specific or detailed than those enumerated in federal regulations under 40 CFR 122.26 or in the USEPA guidance. However, the requirements have been designed to be consistent with and within the federal statutory mandates described in CWA section 402(p)(3)(B)(ii) and (iii) and the related federal regulations and guidance. Consistent with federal law, all of the

conditions in this Order could have been included in a permit adopted by USEPA in the absence of the in lieu authority of California to issue NPDES permits.

Moreover, the inclusion of numeric WQBELs in this Order does not cause this Order to be more stringent than federal law. Federal law authorizes both narrative and numeric effluent limitations to meet state water quality standards. The inclusion of WQBELs as discharge specifications in an NPDES permit in order to achieve compliance with water quality standards is not a more stringent requirement than the inclusion of BMP based permit limitations to achieve water quality standards (State Water Board Order No. WQ 2006-0012 (*Boeing*)). Therefore, consideration of the factors set forth in CWC section 13241 is not required for permit requirements to implement the effective prohibition on the discharge of non-storm water discharges into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determine appropriate to control such pollutants, as those requirements are mandated by federal law.

Included in the provisions of the Order are monitoring and reporting requirements that are designed to demonstrate that the Copermittees are implementing programs to comply with the CWA municipal storm water requirements. CWA section 308(a) and 40 CFR 122.41(h), (j)-(l), 122.44(i) and 122.48 require that all NPDES permits specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s (40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c)) also specify additional monitoring and reporting requirements. In addition to the federal requirements of the CWA, the San Diego Water Board also has the authority in CWC 13383 to establish monitoring, reporting, and recordkeeping requirements that implement federal and state laws and regulations through NPDES permits.

The monitoring and assessment information that will be reported to the San Diego Water Board is necessary to determine if the Copermittees are making progress toward achieving compliance with the discharge prohibitions, receiving water limitations, and effluent limitations under Provision A of the Order. The monitoring and assessment information that will be reported is also expected to be key to the iterative approach and adaptive management process that is required to be implemented by the Copermittees if they cannot meet the discharge prohibitions and receiving water limitations under the present conditions, which is also part of the requirements under Provision A of the Order.

Notwithstanding the above, the San Diego Water Board has considered cost information in issuing this Order, as discussed below. The San Diego Water Board has also considered all of the evidence that has been presented to the San Diego Water Board regarding the CWC section 13241 factors in adopting this Order. The San Diego Water Board finds that the requirements in this Order are reasonably necessary to protect beneficial uses identified in the Basin Plan and the economic information related to costs of compliance and other CWC section 13241 factors are not sufficient to justify failing to protect those beneficial uses. Where appropriate, the

San Diego Water Board has provided or will consider providing the Copermittees with additional time to implement control measures to achieve final WQBELs and/or water quality standards.

Cost Information

Discussions of the financial and economic ramifications of municipal storm water management programs tend to focus on the significant costs incurred by municipalities in developing and implementing the programs. When considering the cost of implementing the programs, however, it is also important to consider the alternative costs that are incurred when programs are not fully implemented, as well as the economic benefits which result from effective program implementation.

The recent financial and economic conditions have amplified the concerns about the costs incurred by the municipalities in developing and implementing their programs. The reduction in resources resulting from the recent financial and economic conditions has been cited by many of the Copermittees as a justification for reducing the requirements that must be met by their programs. While the recent conditions are a cause for concern in the short term, these programs also have an opportunity to identify and implement improvements and efficiencies before the next period of growth and development, resulting in more effective and sustainable programs over the long term.

In addition, it is very difficult to ascertain the true cost of implementation of the Copermittees' management programs because of inconsistencies in reporting by the Copermittees. Reported costs of compliance for the same program element can vary widely from city to city, often by a very wide margin that is not easily explained.[2] Despite these problems, efforts have been made to identify management program costs, which can be helpful in understanding the costs of program implementation.

The San Diego Water Board recognizes that the Copermittees will incur costs in implementing this Order, potentially above and beyond the costs from the Copermittees' prior permits. The San Diego Water Board also recognizes that, due to California's current economic condition, many Copermittees currently have limited staff and resources to implement actions to address its MS4 discharges. Based on the economic considerations below, the San Diego Water Board has provided the Copermittees a significant amount of flexibility to choose how to implement the requirements of the Order.

The Order also allows the Copermittees to customize their plans, programs, and monitoring requirements. In the end, it is up to the Copermittees to determine the effective BMPs and measures necessary to comply with this Order. The Copermittees can choose to implement the least expensive measures that are effective in meeting

[2] LARWQCB, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.

the requirements of this Order. This Order also does not require the Copermittees to fully implement all requirements within a single permit term. Where appropriate, the Board has provided the Copermittees with additional time outside of the permit term to implement control measures to achieve final WQBELs and/or water quality standards.

The San Diego Water Board has considered available cost information associated with compliance with this Order. It is not possible to predict accurately the cost impact of the requirements that involve an unknown level of implementation or that depend on environmental variables that are as yet undefined. Only general conclusions can be drawn from this information.

Estimated Municipal Storm Water Program Implementation Costs

The USEPA, the State Water Board, and the California Regional Water Quality Control Boards (Regional Water Boards) have attempted to evaluate the costs of implementing municipal storm water programs. The assessments have demonstrated that the true costs are difficult to ascertain and reported costs vary widely. In addition, reported fiscal analyses tend to neglect the costs incurred to municipalities when storm water and non-storm water runoff is not effectively managed, which are incurred as a result of pollution, contamination, nuisance, and damage to ecosystems, property, and human health. Nonetheless, they provide a useful context for considering the costs of requirements within Order No. R9-2013-0001.

In 1999, the USEPA reported on multiple studies it conducted to determine the cost of management programs. A study of Phase II municipalities determined that the annual cost of the Phase II program was expected to be $9.16 per household. The USEPA also studied 35 Phase I municipalities, finding costs to be $9.08 per household annually, similar to those anticipated for Phase II municipalities.[3]

The State Water Board commissioned a study by the California State University, Sacramento to assess costs of the Phase I MS4 program. This study includes an assessment of costs incurred by Phase I MS4s throughout the state to implement their programs. Annual cost per household in the study ranged from $18 to $46, with the Fresno-Clovis Metropolitan Area representing the lower end of the range, and the City of Encinitas (in San Diego County) representing the upper end of the range.[4]

A study on Phase I MS4 program costs was also conducted by the California Regional Water Quality Control Board, Los Angeles Region (Los Angeles Water Board), where program costs reported in the municipalities' annual reports were assessed. The Los

[3] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791-68792.
[4] State Water Board, 2005. NPDES Stormwater Cost Survey. P. ii.

Angeles Water Board estimated that average per household cost to implement the MS4 program in Los Angeles County was $12.50. [5]

It is important to note that reported program costs are not all attributable to solely complying with MS4 permits. Many program components, and their associated costs, existed before any MS4 permits were ever issued. For example, street sweeping and trash collection costs cannot be solely or even principally attributable to MS4 permit compliance, since these practices have long been expected from and implemented by municipalities.

Therefore, true program cost resulting from MS4 permit requirements is some fraction of reported costs. The California State University, Sacramento study found that only 38 percent of program costs are new costs fully attributable to MS4 permits. The remainder of the program costs was either pre-existing or resulted from enhancement of pre-existing programs.[6] In 2000, the County of Orange found that even lower amounts of program costs are solely attributable to MS4 permit compliance, reporting that the amount attributable to implement the County or Orange Drainage Area Management Plan (DAMP), was less than 20 percent of the total budget. The remaining 80 percent was attributable to pre-existing programs.[7] More current data from the County of Orange is not used in this discussion because the County of Orange no longer reports such information.

Estimated Value of Healthy Water Quality

Economic considerations of municipal storm water management programs cannot be limited only to program costs. Evaluation of programs must also consider information on the benefits derived from environmental protection and improvement.[8] Attention is often focused on municipal storm water management program costs, but the programs must also be viewed in terms of their value to the public.

Placing a value on healthy receiving waters is very difficult. Often the value of receiving waters with good water quality manifests in other forms, such as tourism, recreational opportunities, and/or increased property values. When surface water bodies are degraded, thereby degrading the habitat within and adjacent to the water bodies, the public loses the value and benefits associated with being able to use the area in and around the water bodies. Surface waters that are able to support the beneficial uses designated in the Basin Plan can sustain plants and wildlife that can attract visitors and residents, providing aesthetic, recreational, as well as monetary value to the public. At this time, however, there have been no studies for the San

[5] Los Angeles Water Board, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.
[6] State Water Board, 2005. NPDES Stormwater Cost Survey. P. 58.
[7] County of Orange, 2000. A NPDES Annual Progress Report. P. 60.
[8] Ribaudo M.O. and D. Heelerstein. 1992, *Estimating Water Quality Benefits: Theoretical and Methodological Issues.* U.S. Department of Agriculture. Technical Bulletin No. 1808.

Diego Region to quantify the added value that surface waters with healthy water quality can provide.

USEPA has estimated that household willingness to pay for improvements in fresh water quality for fishing and boating is approximately $158-$210.[9] This estimate can be considered conservative, since it does not include important considerations such as marine waters benefits, wildlife benefits, or flood control benefits. Another study conducted by California State University, Sacramento reported that the annual household willingness to pay for statewide clean water is approximately $180.[10]

A study conducted by the University of Southern California and University of California, Los Angeles assessed the costs and benefits of implementing various approaches for achieving compliance with the MS4 permits in the Los Angeles region. The study found that non-structural systems would cost $2.8 billion but provide $5.6 billion in benefit. If structural systems were determined to be needed, the study found that total costs would be $5.7 to $7.4 billion, while benefits could reach $18 billion.[11] Costs are anticipated to be borne over many years, probably at least ten years.

As can be seen, the benefits of the municipal storm water management programs are expected to considerably exceed their costs. Such findings are corroborated by USEPA, which found that the benefits of implementation of its Phase II storm water rule would also outweigh the costs.[12]

[9] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68793.
[10] State Water Board, 2005. NPDES Stormwater Cost Survey. P. iv.
[11] Los Angeles Water Board, 2004. Alternative Approaches to Stormwater Control.
[12] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791.

VII. APPLICABLE STATUTES, REGULATIONS, PLANS AND POLICIES

A. Legal Authorities – Federal Clean Water Act and California Water Code

This Order is issued pursuant to section 402 of the CWA and implementing regulations adopted by the USEPA and chapter 5.5, division 7 of the CWC (commencing with section 13370). This Order serves as an NPDES permit for point source discharges to surface waters. This Order also serves as waste discharge requirements pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

The objective of the CWA is "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*." To carry out this objective, the CWA requires the implementation of permit programs to regulate the discharge of pollutants and dredged or fill material to the navigable waters of the U.S. and to regulate the use and disposal of sewage sludge. CWA section 402 provides the legal authority to issue a permit for the discharge of pollutants to waters of the U.S. under the NPDES. The CWA provides that NPDES permits may be issued by states which are authorized to implement the provisions of that act. California became authorized to implement the NPDES permit program on May 14, 1973.

The Porter-Cologne Water Quality Control Act (Division 7, commencing with CWC section 13000) established the State Water Resources Control Board (State Water Board) and nine Regional Water Quality Control Boards (Regional Water Boards) as the principal state agencies with primary responsibility for the coordination and control of water quality. CWC section 13200(f) established the San Diego Water Board, which has the primary responsibility for the coordination and control of water quality in the San Diego Region, which includes all the basins draining into the Pacific Ocean between the southern boundary of the Santa Ana Region and the California-Mexico boundary. The San Diego Water Board implements the CWA through Chapter 5.5 of the CWC, commencing with section 13370. CWC section 13377 provides the San Diego Water Board the legal authority to issue waste discharge requirements to ensure compliance with all applicable provisions of the CWA and acts amendatory thereof or supplementary, thereto, to implement water quality control plans, or for the protection of beneficial uses, or to prevent nuisance.

CWA section 402(p) requires the USEPA or authorized state to issue NPDES permits for storm water discharges from municipal separate storm sewer systems (MS4s) to waters of the U.S. CWA section 402(p)(3)(B)(ii) requires that NPDES permits for storm water discharges from MS4s "*effectively prohibit non-storm water discharges*" into the MS4s. CWA section 402(p)(3)(B)(iii) requires that NPDES permits for storm water discharges from MS4s to "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable* [MEP], *including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control*

of such pollutants."

The USEPA published implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]), which prescribe permit application requirements for storm water discharges from MS4s pursuant to CWA 402(p), on November 16, 1990. The USEPA published an Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems, which provided guidance on permit application requirements for regulated MS4s, on May 17, 1996. The federal regulations in 40 CFR 122 and guidance issued by USEPA serve as the foundation for the provisions of Order No. R9-2013-0001. The legal authorities provided by the above statutes and regulations are included as part of the discussions in Section VIII of this Fact Sheet.

B. Legal Authority for the Permit Issued on a Region-wide Basis

CWA section 402(p)(3)(B) provides the San Diego Water Board the legal authority to issue an NPDES permit for the San Diego Region as compared to separate MS4 permits based upon County- and partial County-wide boundaries as they exist within the San Diego Region. CWA section 402(p)(3)(B) states that "*Permits for discharges from municipal storm sewers- (i) may be issued on a system- or jurisdiction-wide basis ....*" The federal regulations in 40 CFR 122.26(a)(1)(v) also state that the San Diego Water Board "*may designate dischargers from municipal separate storm sewers on a system-wide or jurisdiction-wide basis. In making this determination, the [San Diego Water Board] may consider the following factors: (A) the location of the discharge with respect to waters of the United States; (B) the size of the discharge; (C) the quantity and nature of the pollutants discharged to waters of the United States; and (D) other relevant factors*."

More specifically, the federal regulations provide that for large and medium MS4 systems, the San Diego Water Board may issue a regional permit. Specifically, the federal regulation in 40 CFR 122.26(a)(3) provide:

"*(ii) The Director may either issue one system-wide permit covering all discharges from municipal separate storm sewers within a large or medium municipal storm sewer system or issue distinct permits for appropriate categories of discharges within a large or municipal separate storm sewer system including, but not limited to: all discharges owned or operated by the same municipality; located within the same jurisdiction; all discharges within a system that discharge to the same watershed; discharges within a system that are similar in nature; or for individual discharges from municipal separate storm sewers within the system.*

(iii) The operator of a discharge from a municipal separate storm sewer which is part of a large or medium municipal separate storm sewer system must either: (A) Participate in a permit application (to be a permittee or a co-permittee) with one or more other operator of discharges from the large or medium municipal

storm sewer system which covers all, or a portion of all, discharges from the municipal separate storm sewer system; (B) Submit a distinct permit application which only covers discharges from the municipal separate storm sewers for which the operator is responsible; or (C) A regional authority may be responsible for submitting a permit application under the following guidelines....

(iv) One permit application may be submitted for all or a portion of all municipal separate storm sewers within adjacent or interconnected large or medium municipal separate storm sewer systems. The Director may issue one systemwide permit covering all, or a portion of all municipal separate storm sewers in adjacent or interconnected large or medium municipal separate storm sewer systems.

(v) Permits for all or a portion of all discharges from large or medium municipal separate storm sewer systems that are issued on a system-wide, jurisdiction-wide, watershed or other basis may specify different conditions relating to different discharges covered by the permit, including different management programs for different drainage areas which contribute storm water to the system."

Based on these regulations, the San Diego Water Board may issue a region-wide MS4 permit. The regulations also clarify that the permit may include different conditions for separate discharges covered by the permit. This allows the San Diego Water Board to ensure that suitable water quality conditions and provisions are identified for each watershed.

The USEPA's responses to comments in the Final Rule for the above-mentioned regulations also make it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide, permits. In the Final Rule published in the Federal Register and containing the responses to comments, USEPA notes that 40 CFR 122.26(a)(3)(iv) would allow an entire system in a geographical region under the purview of a State agency to be designated under a permit.[13] USEPA also states that many commenters wanted to allow the permitting authority broad discretion to establish system-wide permits, and that EPA believes that paragraphs 40 CFR 122.26 (a)(1)(v) and (a)(3)(ii) allow for such broad discretion.[14]

This Order creates watershed requirements that apply to multiple counties. The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees. Managing storm water on a regional and watershed basis is expected to result in improved water quality, as the Order focuses on monitoring and management practices necessary to improve each watershed rather than political boundaries. A single permit also allows the San Diego Water Board staff to expend fewer resources developing successive multiple permits and allows more resources to be devoted to working cooperatively with all three

[13] 55 Federal Register 47990-01, 48042
[14] Ibid

current groups of Copermittees to ensure implementation of this Order results in improved water quality.

C. Federal and California Endangered Species Acts

This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2115.5) or the Federal Endangered Species Act (16 United States Code [USC] sections 1531 to 1544). This Order requires compliance with requirements to protect the beneficial uses of waters of the U.S. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

D. California Environmental Quality Act

The action to adopt an NPDES Permit is exempt from the provisions of Chapter 3 of the California Environmental Quality Act (CEQA) (Public Resources Code section 21100, et seq.) pursuant to CWC section 13389. (*County of Los Angeles v. Cal. Water Boards* (2006) 143 Cal.App.4th 985.)

E. State and Federal Regulations, Plans and Policies

The legal authority provided by the following regulations, plans, and policies are also included as part of the discussions in Section VIII of this Fact Sheet.

Water Quality Control Plan for the San Diego Basin

The CWA requires the San Diego Water Board to establish water quality standards for each water body in its region. Water quality standards include beneficial uses, water quality objectives and criteria that are established at levels sufficient to protect beneficial uses, and an antidegradation policy to prevent degrading of waters. On September 8, 1994, the San Diego Water Board adopted the *Water Quality Control Plan for the San Diego Basin (*Basin Plan). The Basin Plan designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters in the San Diego Region. The San Diego Water Board has amended the Basin Plan on multiple occasions since 1994. In addition, the Basin Plan implements State Water Board Resolution No. 88-63, which established state policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply. Beneficial uses applicable to the surface water bodies that receive discharges from the MS4s within the San Diego Region generally include those listed below:

The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region:

- Municipal and Domestic Supply (MUN)
- Agricultural Supply (AGR)
- Industrial Process Supply (PROC)
- Industrial Service Supply (IND)
- Ground Water Recharge (GWR)
- Contact Water Recreation (REC1)
- Non-contact Water Recreation (REC2)
- Warm Freshwater Habitat (WARM)
- Cold Freshwater Habitat (COLD)
- Wildlife Habitat (WILD)
- Rare, Threatened, or Endangered Species (RARE)
- Freshwater Replenishment (FRSH)
- Hydropower Generation (POW)
- Preservation of Biological Habitats of Special Significance (BIOL)

The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region:

- Navigation (NAV)
- Commercial and Sport Fishing (COMM)
- Estuarine Habitat (EST)
- Marine Habitat (MAR)
- Aquaculture (AQUA)
- Migration of Aquatic Organisms (MIGR)
- Spawning, Reproduction, and/or Early Development (SPWN)
- Shellfish Harvesting (SHELL)

Pursuant to Water Code sections 13263 and 13377, the requirements of this Order implement the Basin Plan.

Water Quality Control Plan for Ocean Waters of California, California Ocean Plan

In 1972, the State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan). The State Water Board adopted the most recent amended Ocean Plan on September 15, 2009. The Office of Administrative Law approved it on March 10, 2010. On October 8, 2010, USEPA approved the 2009 Ocean Plan. The Ocean Plan is applicable, in its entirety, to ocean waters of the State. In order to protect beneficial uses, the Ocean Plan establishes water quality objectives and a program of implementation. Pursuant to Water Code sections 13263 and 13377, the requirements of this Order implement the Ocean Plan. The Ocean Plan identifies the beneficial uses of ocean waters of the State to be

protected as summarized below:

- Industrial water supply
- Water contact and non-contact recreation, including aesthetic enjoyment; navigation
- Commercial and sport fishing
- Mariculture
- Preservation and enhancement of designated Areas of Special Biological Significance
- Rare and endangered species
- Marine habitat
- Fish spawning and shellfish harvesting

On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving an exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges. On June 19, 2012, the State Water Board adopted Order No. 2012-0031, amending Order No. 2012-0012 to require pollutant load reductions to be achieved within six years for the ASBS Compliance Plans, section A.2.d(2) and ASBS Pollution Prevention Plans, section B.2.b(2). The State Water Board Resolution No. 2012-0012, as amended requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject terms and conditions of State Water Board Resolution No. 2012-0012, as amended. The Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012, as amended, applicable to these discharges, are ~~hereby~~ incorporated in Attachment A of this Order ~~as if fully set forth herein~~. Requirements of this Order implement the Ocean Plan.

Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality

On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

Antidegradation Policy

Federal regulations (40 CFR 131.12) require that the state water quality standards include an antidegradation policy consistent with the federal antidegradation policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16 ("Statement of Policy with Respect to Maintaining the Quality of the Waters of the State"). State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law.

The San Diego Water Board's Basin Plan implements and incorporates by reference both the State and federal antidegradation policies. State Water Board Resolution No. 68-16 and 40 CFR 131.12 require the San Diego Water Board to maintain high quality waters of the State until it is demonstrated that any change in quality will be consistent with maximum benefit to the people of the State, will not unreasonably affect beneficial uses, and will not result in water quality less than that described in the San Diego Water Boards' policies. State Water Board Resolution No. 68-16 requires that discharges of waste be regulated to meet best practicable treatment or control to assure that pollution or nuisance will not occur and the highest water quality consistent with the maximum benefit to the people of the State be maintained.

The discharges permitted in this Order are consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Board Resolution No. 68-16. Many of the water bodies within the area covered by this Order are of high quality. The Order requires the Copermittees to meet best practicable treatment or control to meet water quality standards. As required by 40 CFR 122.44(a), the Copermittees must comply with the "maximum extent practicable" technology-based standard set forth in CWA section 402(p) for discharges of pollutants in storm water from the MS4s.

Many of the waters within the area covered by this Order are impaired and listed on the State's CWA Section 303(d) List and the San Diego Water Board has established TMDLs to address the impairments. This Order requires the Copermittees to comply with permit provisions to implement the WLAs set forth in the TMDLs in order to restore the beneficial uses of the impaired water bodies consistent with the assumptions and requirements of the TMDLs. This Order includes requirements to develop and implement storm water management programs, achieve WQBELs, and effectively prohibit non-storm water discharges into the MS4. The issuance of this Order does not authorize an increase in the amount of discharge of waste.

Anti-Backsliding Requirements

CWA sections 402(o) and 303(d)(4) and 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations or conditions may be relaxed. All effluent limitations and other conditions in this Order are at least as stringent as the effluent limitations in the previous permits issued to the San Diego County Copermittees, the Orange County Copermittees and the Riverside County Copermittees.

Clean Water Act Section 303(d) List

CWA section 303(d)(1) requires each State to identify specific water bodies within its boundaries where water quality standards are not being met or are not expected to be met after implementation of technology-based effluent limitations on point sources. Water bodies that do not meet water quality standards are considered impaired and are placed on the state's "303(d) List." Periodically, USEPA approves the State's 303(d) List.

Most recently, USEPA approved the State's 2010 303(d) List of impaired water bodies on October 11, 2011, which includes certain receiving waters in the San Diego Region. For each listed water body, the state or USEPA is required to establish a TMDL of each pollutant impairing the water quality standards in that water body. A TMDL is a tool for implementing water quality standards and is based on the relationship between pollution sources and in-stream water quality conditions. The TMDL establishes the allowable pollutant loadings for a water body and thereby provides the basis to establish water quality-based controls. These controls should provide the pollution reduction necessary for a water body to meet water quality standards.

A TMDL is the sum of the allowable pollutant loads of a single pollutant from all contributing point sources (the waste load allocations or WLAs) and non-point sources (load allocations of LAs) plus the contribution from background sources and a margin of safety (40 CFR 130.2(i)). MS4 discharges are considered point source discharges. For 303(d)-listed water bodies and pollutants in the San Diego Region, the San Diego Water Board or USEPA develops and adopts TMDLs that specify these requirements.

Since 2002, the San Diego Water Board has established ~~six (6)~~ seven (7) TMDLs to remedy water quality impairments in various water bodies within the San Diego Region (see Attachment E to the Order). These TMDLs identify MS4 discharges as a source of pollutants to these water bodies, and, as required, establish WLAs for MS4 discharges to reduce the amount of pollutant discharged to receiving waters. CWA section 402(p)(3)(B)(iii) requires the San Diego Water Board to impose permit conditions, including: "management practices, control techniques and system, design and engineering methods, and *such other provisions as the Administrator or the State determines appropriate for the control of such pollutants."* (Emphasis added.) CWA section 402(a)(1) also requires states to issue permits with conditions necessary to carry out the provisions of the CWA. Federal regulations also require that NDPES permits contain WQBELs consistent with the assumptions and requirements of all available WLAs (40 CFR 122.44(d)(1)(vii)(B)). CWC section 13377 also requires that NPDES permits include limitations necessary to implement water quality control plans. Therefore, this Order includes WQBELs and other provisions to implement the TMDL WLAs assigned to Copermittees regulated by this Order.

Other Regulations, Plans and Policies

This Order implements all other applicable federal regulations and State regulations, plans and policies, including the California Toxics Rule at 40 CFR 131.38 (Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California Rule [California Toxics Rule or CTR]), and State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP).

F. Unfunded State Mandates

Article XIII B, Section 6(a) of the California Constitution provides that whenever "*any state agency mandates a new program or higher level of service on any local government, the state shall provide a subvention of funds to reimburse that local government for the costs of the program or increased level of service*." The requirements of this Order do not constitute state mandates that are subject to a subvention of funds for several reasons, including, but not limited to, the following.

First, the requirements of this Order do not constitute a new program or a higher level of service as compared to the requirements contained in the previous Fourth Term Permits. The overarching requirement to impose controls to reduce the pollutants in discharges from MS4s is dictated by the CWA and is not new to this permit cycle (33 USC section 1342(p)(3)(B)). The inclusion of new and advanced measures as the MS4 programs evolve and mature over time is anticipated under the CWA (55 FR 47990, 48052 (Nov. 16, 1990)), and to the extent requirements in this Order are interpreted as new advanced measures, they do not constitute a new program or higher level of service.

Second, and more broadly, mandates imposed by federal law, rather than by a state agency, are exempt from the requirement that the local agency's expenditures be reimbursed (Cal. Const., art. XIII B, section 9, subd. (b)). This Order implements federally mandated requirements under the CWA and its requirements are therefore not subject to subvention of funds. This includes federal requirements to effectively prohibit non-storm water discharges, to reduce the discharge of pollutants in storm water to the MEP, and to include such other provisions as the Administrator or the State determines appropriate for the control of such pollutants (33 USC section 1342(p)(3)(B)). Federal cases have held these provisions require the development of permits and permit provisions on a case-by-case basis to satisfy federal requirements. (*Natural Resources Defense Council, Inc., v. USEPA* (9th Cir. 1992) 966 F.2d 1292, 1308, fn. 17.)

The authority exercised under this Order is not reserved state authority under the CWA's savings clause (cf. *Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 627-628 [relying on 33 USC section 1370, which allows a state to develop requirements which are not "less stringent" than federal requirements]), but instead is part of a federal mandate to develop pollutant reduction requirements for municipal separate storm sewer systems. To this extent, it is entirely federal authority that forms the legal basis to establish the permit provisions. (See, *City of Rancho Cucamonga v. Regional Water Quality Control Board, Santa Ana Region* (2006) 135 Cal.App.4th 1377, 1389; *Building Industry Ass'n of San Diego Co. v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 882-883.)

The MEP standard is a flexible standard that balances a number of considerations, including technical feasibility, cost, public acceptance, regulatory compliance, and effectiveness. (*Building Ind. Ass'n., supra,* 124 Cal.App.4th at pp. 873-874, 889.) Such

considerations change over time with advances in technology and with experience gained in storm water management (55 FR 47990, 48052 (Nov. 16, 1990)). Accordingly, a determination of whether the conditions contained in this Order exceed the requirements of federal law cannot be based on a point by point comparison of the permit conditions and the minimum control measures that are required "at a minimum" to reduce pollutants to the maximum extent practicable and to protect water quality (40 CFR 122.34). Rather, the appropriate focus is whether the permit conditions, as a whole, exceed the MEP standard.

In recent months, the County of Los Angeles and County of Sacramento Superior Courts have granted writs setting aside decisions of the Commission on State Mandates that held certain requirements in Phase I permits constituted unfunded mandates. In both cases, the courts have found that the correct analysis in determining whether an MS4 permit constituted a state mandate was to evaluate whether the permit as a whole exceeds the MEP standard. (*State of Cal. v. Comm. on State Mandates* (Super. Ct. Sacramento County, 2012, No. 34-2010-80000604), *State of California v. County of Los Angeles* (Super. Ct. Los Angeles County, 2011, No. BS130730.) Both cases are currently pending appeal.

The requirements of the Order, taken as a whole rather than individually, are necessary to reduce the discharge of pollutants to the MEP and to protect water quality. The San Diego Water Board finds that the requirements of the Order are practicable, do not exceed federal law, and thus do not constitute an unfunded mandate. These findings are the expert conclusions of the principal state agency charged with implementing the NPDES program in California (CWC sections 13001, 13370).

It should also be noted that the provisions in this Order to effectively prohibit non-storm water discharges are also mandated by the CWA (33 USC section 1342(p)(3)(B)(ii)). Likewise, the provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state establishes or adopts a TMDL, federal law requires that permits must contain effluent limitations consistent with the assumptions and requirements of any applicable waste load allocation in a TMDL (40 CFR 122.44(d)(1)(vii)(B)).

Third, the local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental dischargers who are issued NPDES permits for storm water discharges. With a few inapplicable exceptions, the CWA regulates the discharge of pollutants from point sources (33 USC section 1342) and the Porter-Cologne Act regulates the discharge of waste (CWC section 13263), both without regard to the source of the pollutant or waste. As a result, the "costs incurred by local agencies" to protect water quality reflect an overarching regulatory scheme that places similar requirements on governmental and non-governmental dischargers. (See *County of Los Angeles v. State of California* (1987) 43 Cal.3d 46, 57-58 [finding comprehensive workers' compensation scheme did not create a cost for local agencies that was subject to state subvention].)

The CWA and the Porter-Cologne Act largely regulate storm water with an even hand, but to the extent there is any relaxation of this even-handed regulation, it is in favor of the local agencies. Generally, the CWA requires point source dischargers, including dischargers of storm water associated with industrial or construction activity, to comply strictly with water quality standards (33 USC section 1311(b)(1)(C); *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159, 1164-1165 [noting that industrial discharges must strictly comply with water quality standards]). As discussed in prior State Water Board decisions, certain provisions of this Order do not require strict compliance with water quality standards (State Water Board Order No. WQ 2001-0015, p. 7). Those provisions of this Order regulate the discharge of waste in municipal storm water under the CWA's MEP standard, not the BAT/BCT standard that applies to other types of discharges. These provisions, therefore, regulate the discharge of waste in municipal storm water more leniently than the discharge of waste from non-governmental sources.

Fourth, the Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)). To the extent that the local agency Copermittees have voluntarily availed themselves of the permit, the program is not a state mandate. (Accord, *County of San Diego v. State of California* (1997) 15 Cal.4th 68, 107-108.)

Fifth, the local agency Copermittees' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under state law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

Finally, even if any of the permit provisions could be considered unfunded mandates, under Government Code section 17556, subdivision (d), a state mandate is not subject to reimbursement if the local agency has the authority to charge a fee. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order, subject to certain voting requirements contained in the California Constitution. (See Cal. Const., Art. XIII D, section 6, subd. (c); see also *Howard Jarvis Taxpayers Ass'n v. City of Salinas* (2002) 98 Cal.App.4th 1351, 1358-1359.) The Fact Sheet demonstrates that numerous activities contribute to the pollutant loading in the MS4. Local agencies can levy service charges, fees, or assessments on these activities, independent of real property ownership. (See, e.g., *Apartment Ass'n of Los Angeles County, Inc., v. City of Los Angeles* (2001(24 Cal.4th 830, 842 [upholding inspection fees associated with renting property].) The authority and ability of a local agency to defray the cost of a program without raising taxes indicates that a program does not entail a cost subject to subvention. (*Clovis Unified School Dist. V. Chiang* (2010) 188 Cal.App.4th 794, 812, citing *Connell v. Sup. Ct.* (1997) 59 Cal.App.4th 382, 401; *County of Fresno v. State of California* (1991) 53 Cal. 3d. 482, 487-488.)

VIII. PROVISIONS

The provisions (i.e. NPDES permit requirements) of the Order are discussed below.

A. Prohibitions and Limitations

Purpose: Provision A includes the prohibitions and limitations requirements that are the foundation of all the subsequent requirements included in the Order. Compliance with the prohibitions and limitations will restore and protect receiving waters from impacts that may be caused by discharges into and from the Copermittees' MS4s and ultimately achieve the objective of the CWA.

In meeting the requirements set forth in the Order, the Copermittees must be cognizant that the prohibitions and limitations exist and will be the standard by which the San Diego Water Board will be measuring the progress and success of their implementation of the NPDES permit requirements.

***Discussion*:** The objective of the CWA is to "*restore and maintain the chemical, physical, and biological integrity of the Nation's waters*." The CWA requires the implementation of NPDES permit programs to regulate discharges of pollutants and dredged or fill material to the navigable waters of the U.S. For discharges into and from MS4s, the CWA requires the NPDES permits to "*effectively prohibit non-stormwater discharges into the storm sewers*" and "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable.*"

Provision A includes limitations, consistent with the requirements of the CWA for discharges from MS4s. Provision A expresses these limitations as discharge prohibitions, receiving water limitations, and effluent limitations. Compliance with the discharge prohibitions and receiving water limitations is also explicitly described, in conformance with precedential State Water Board Orders.

More specific and detailed discussions of the requirements of Provision A are provided below.

Provision A.1 (Discharge Prohibitions) prohibits the discharge of specific types of waste into and/or from the Copermittees' MS4s.

Provision A.1.a restates and reiterates Basin Plan Waste Discharge Prohibition 1, by prohibiting discharges into and from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the

state. The terms pollution,[15] contamination,[16] and nuisance[17] are defined under CWC 13050. Provision A.1.c incorporates all the waste discharge prohibitions of the Basin Plan into the requirements of the Order. The waste discharge prohibitions from the Basin Plan have been reproduced and provided in Attachment A to the Order.

Provision A.1.b requires non-storm water discharges into the MS4s to be effectively prohibited, consistent with the requirements of the CWA for MS4 permits to "*effectively prohibit non-stormwater discharges into the storm sewers*." The effective prohibition is required to be implemented by each Copermittee within its jurisdiction through the illicit discharge detection and elimination requirements under Provision E.2. The prohibition does not apply to NPDES permitted discharges into the Copermittees' MS4s.

The CWA employs the strategy of prohibiting the discharge of any pollutant from a point source into waters of the United States unless the discharger of the pollutant(s) obtains an NPDES permit pursuant to CWA Section 402. The 1987 amendment to the CWA includes provision 402(p) that specifically addresses NPDES permitting requirements for storm water discharges from MS4s. CWA section 402(p) prohibits the discharge of pollutants from specified MS4s to waters of the U.S. except as authorized by an NPDES permit and identifies two substantive standards for MS4 storm water permits. MS4 permits (1) "*shall include a requirement to effectively prohibit nonstormwater discharges into the storm sewers*" and (2) "*shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or State determines appropriate for the control of such pollutants*." (CWA section 402(p)(3)(B)(ii-iii).)

In November 1990, the USEPA published regulations addressing storm water discharges from MS4s (55 FR 47990 and following (Nov. 16, 1990) (Phase I Final Rule)). The regulations establish minimum requirements for MS4 permits, and generally focus on the requirement that MS4s implement programs to reduce the amount of pollutants found in storm water discharges to the MEP. The CWA's municipal storm water MEP standard does not require storm water discharges to strictly meet water quality standards, as is required for other NPDES permitted

[15] CWC 13050(l): "(1) 'Pollution' means an alteration of the quality of waters of the state by waste to a degree which unreasonably affects either of the following: (A) The water for beneficial uses. (B) Facilities which serve beneficial uses. (2) 'Pollution' may include "contamination.
[16] CWC 13050(k): "Contamination' means an impairment of the quality of waters of the state by waste to a degree which creates a hazard to public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste, whether or not waters of the state are affected."
[17] CWC 13050(m): "Nuisance' means anything which meets all of the following requirements: (1) Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. (2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. (3) Occurs during, or as a result of, the treatment or disposal of wastes."

discharges. Compliance is achieved through an iterative approach of continuous implementation of improved BMPs. This distinction reflects Congress's recognition that variability in flow and intensity of storm events render difficult strict compliance with water quality standards by MS4 permittees. In describing the controls that permits must include to reduce pollutants in storm water discharges to the MEP, the statute (CWA section 402(p)(3)(B)(iii)) states that the controls shall include: "*management practices, control techniques and system, design and engineering methods, and such other provisions as the [permit writer] determines appropriate for the control of such pollutants*."

In contrast, non-storm water discharges from the MS4 that are not authorized by separate NPDES permits are subject to requirements under the NPDES program, including discharge prohibitions, technology based effluent limitations and water quality-based effluent limitations (40 CFR 122.44). The regulations also require the Copermittee's program to include an element to detect and remove illicit discharges and improper disposal into the storm sewer (40 CFR 122.26(d)(2)(iv)(B)).

While "non-storm water" is not defined in the CWA or federal regulations, the federal regulations (at 40 CFR 122.26(b)(2)) define "*illicit discharge*" as *"any discharge to a municipal separate storm sewer that is not composed entirely of storm water and that is not covered by an NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer and discharges resulting from fire fighting activities)*." This definition is the most closely applicable definition of "non-storm water" contained in federal law. As stated in the Phase I Final Rule, USEPA added the illicit discharge program requirement to begin implementation of the 'effective prohibition' requirement to detect and control non-storm water discharges to their municipal system.

Thus, federal law mandates that permits issued to MS4s must require management practices that will result in reducing storm water pollutants to the MEP yet at the same time requires that non-storm water discharges be effectively prohibited from entering the MS4. "Effectively" prohibit does not mean that non-storm water discharges are authorized to be discharged into and from the Copermittees' MS4s. The Phase I Final Rule clarifies what "effectively prohibit" means (55 FR 47995):

> "*Section 402(p)(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…<u>Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit</u> (other than the permit for the discharge from the municipal separate storm sewer)*" [Emphasis added].

Consistent with federal law, unless non-storm water discharges to the MS4 are authorized by a separate NPDES permit, non-storm water discharges are

appropriately subject to the effective prohibition requirement in the CWA and Regional Water Boards are not limited by the iterative MEP approach to storm water regulation in crafting appropriate regulations for non-storm water discharges.

The federal regulations (40CFR122.26(d)(2)(i)(B)) require the Copermittees to establish the legal authority which authorizes or enables the Copermittees to prohibit illicit discharges to the MS4s. The federal regulations (40 CFR 122.26(d)(2)(vi)(B)(1)) require the Copermittees to "*implement and enforce an ordinance, order or similar means*" to prevent non-storm water discharges to their MS4s. Thus, the Copermittees are required to "*effectively*" prohibit non-storm water discharges to their MS4s through enforcing their legal authority established under "*ordinance, order or similar means*" and either remove those discharges to their MS4s, or require those discharges to obtain coverage under a separate NPDES permit. More detail about the program that must be implemented to "*effectively*" prohibit non-storm water discharges to the Copermittees' MS4s is provided under the discussion for Provision E.2.

Provision A.1.d was included to be consistent Resolution No. 2012-0012, adopted by the State Water Board on March 20, 2012. Provision A.1.d prohibits discharges from MS4s to Areas of Special Biological Significance (ASBS), except for storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach to the Heisler Park ASBS subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012. The pertinent Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 are provided in Attachment A to the Order.

Provision A.2 (Receiving Water Limitations) specifies the condition of the receiving waters that must be achieved when there are discharges from the Copermittees' MS4s. Receiving water limitations are included in all NPDES permits issued pursuant to the CWA section 402. CWA section 402(p)(3)(B)(iii) authorizes the inclusion of "*such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." This requirement gives USEPA or the State permitting authority, in this case the San Diego Water Board, discretion to determine what permit conditions are necessary to control pollutants.

In its Phase I Final Rule (see 55 FR 47990, 47994 (Nov. 16, 1990)), USEPA elaborated on these requirements, stating that, "*permits for discharges from municipal separate storm sewer systems must require controls to reduce the discharge of pollutants to the maximum extent practicable, and where necessary water quality-based controls*." USEPA reiterated in its Phase II Final Rule (64 FR 68722, 68737), that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL*." CWC section 13377 also requires that NPDES permits include limitations necessary to implement water quality control plans. Both the State Water Board and the San Diego Water Board have previously concluded that discharges from the MS4 contain pollutants that have

the reasonable potential to cause or contribute to excursions above water quality standards. As such, inclusion of receiving water limitations is appropriate to control MS4 discharges.

The inclusion of receiving water limitations is also consistent with the Ninth Circuit Court of Appeals' ruling in *Defenders of Wildlife v. Browner* (191 F.3d 1159, 1166 (1999)) that the permitting authority has discretion regarding the nature and timing of requirements that it includes as MS4 permit conditions to attain water quality standards. The Ninth Circuit Court of Appeals recently explained that, "*[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*" (*Natural Resources Defense Council v. County of Los Angeles* (9th Cir. 2011) 673 F.3d 880, 886 (revd. On other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013)))

The receiving water limitations included in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan or in water quality control plans or policies adopted by the State Water Board, including State Water Board Resolution No. 68-16, or in federal regulations, including but not limited to 40 CFR 131.12 and 131.38. The water quality objectives in the Basin Plan and other State Water Board plans and policies have been approved by USEPA and combined with designated beneficial uses constitute the water quality standards required under federal law.

Provision A.2.a requires that discharges from the Copermittees' MS4s must not cause or contribute to the violation of water quality standards in receiving waters. The water quality standards of the receiving waters must be protected from the impacts that may be caused by the Copermittees' MS4 discharges. Water quality standards applicable to the surface waters in the San Diego Region must be achieved through meeting the technology based standard of MEP through an iterative process of improved management actions. Provision A.2.a is also consistent with State Water Board Order WQ 99-05 precedent-setting language requiring discharges from MS4s to attain receiving water quality standards. The water quality control plans and policies with water quality standards applicable to the waters in the San Diego Region are included under Provision A.2.a.

Provisions A.2.b was included to be consistent with the requirements of State Water Board Resolution No. 2012-0012, adopted on March 20, 2012.

<u>Provision A.3 (Effluent Limitations)</u> specifies the condition of the discharges from the Copermittees' MS4s that must be achieved if and when there are discharges.

Consistent with CWA section 301(b)(1)(A) and 40 CFR 122.44(a), Provision A.3.a includes the technology-based effluent limitations that must be included in the Order. The technology-based effluent limits, representing the minimum level of control that must be imposed in a permit under CWA section 402, requires that pollutants in discharges of storm water from the Copermittees' MS4s be reduced to the MEP. This provision applies specifically to storm water discharges. Non-storm water discharges must be effectively prohibited, as required under Provision A.1.b. Non-storm water (dry weather) discharges from the MS4 are not considered storm water (wet weather) discharges and therefore are not subject to the MEP standard.

The technology-based MEP standard is an ever-evolving, flexible, and advancing concept. Neither Congress nor USEPA has specifically defined the term "maximum extent practicable." Congress established this flexible MEP standard so that the administrative bodies would have "*the tools to meet the fundamental goals of the Clean Water Act in the context of storm water pollution*." (*Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 884.) As knowledge about controlling storm water runoff and discharges continues to evolve, so does the knowledge which constitutes MEP. Reducing the discharge of pollutants in storm water from the MS4 to the MEP requires the Copermittees to assess each program component and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP.

The San Diego Water Board or the State Water Board ultimately define MEP, and may include requirements that provide specific guidance on what is expected to demonstrate MEP. It is the responsibility of the Copermittees to propose actions that implement BMPs to reduce storm water pollution to the MEP. In other words, the Copermittees' runoff management programs developed and implemented under the Order are the Copermittees' proposals for achieving MEP. Their total collective and individual activities conducted pursuant to their runoff management programs become their proposal for achieving MEP as it applies both to their overall effort, as well as to specific activities. Provisions B through E of the Order provides a minimum framework to guide the Copermittees in achieving the MEP standard for discharges of pollutants in storm water.

Provision A.3.b incorporates any water quality based effluent limitations (WQBELs) applicable to the MS4s established for TMDLs adopted and approved for the San Diego Region and requires the Copermittees to comply with those WQBELs. This is consistent with 40 CFR 122.44(d)(1)(vii)(B), which requires that NPDES permits to incorporate WQBELs "*developed to protect a narrative water quality criterion, a numeric water quality criterion, or both…consistent with the assumptions and requirements of any available wasteload allocation for the discharge...*"

Pursuant to CWA section 303(d), for surface water bodies identified as impaired by one or more pollutants, the San Diego Water Board is required to establish TMDLs "*at a level necessary to implement the applicable water quality standards with seasonal*

variations and a margin of safety which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality." The TMDLs identify sources of the pollutants causing the impairments and assign portions of the TMDL as WLAs to point sources, which include MS4s.

WLAs must be expressed in NPDES permits as WQBELs, which may include one or more numeric components such as numeric effluent limits, and/or receiving water limitations, and/or BMP requirements. Because numeric targets for TMDLs typically include a component that will be protective of water quality standards, a TMDL will likely include one or more numeric receiving water limitations and/or effluent limitations as part of the assumptions or requirements of the TMDL. Any numeric receiving water limitations and/or effluent limitations developed as part of the assumptions or requirements of a TMDL must be incorporated and included as part of WQBELs for the MS4s.

Because the development and approval of new TMDLs, or modification of existing TMDLs, may occur during the term of this Order, the specific provisions of those TMDLs, including effluent limitations applicable to MS4s are provided within Attachment E to the Order. Attachment E will be updated with new TMDLs and modifications to existing TMDLs in a timely manner as they occur.

Provision A.4 (Compliance with Discharge Prohibitions and Receiving Water Limitations) describes the process required to be implemented by the Copermittees if compliance with the discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a are not being achieved under current conditions.

In its Phase II Stormwater Regulations, Final Rule, USEPA states that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL.*"[18] In a series of comment letters on MS4 permits issued by various Regional Water Boards, USEPA has also reiterated that MS4 discharges must meet water quality standards.[19] In addition, the Ninth Circuit Court of Appeals explained in a recent ruling that, *"[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*"[20]

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[18] Phase II Stormwater Regulations, Final Rule, 64 Fed. Reg. 68722, 68737.
[19] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.
[20] NRDC v. County of Los Angeles (9th Cir. 2011), 673 F.3d 880, 886 (revd. on other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013))). See also, *Building Industry Ass'n of San Diego County v. State Water Resources*

Water quality standards for the San Diego Region are established in the Basin Plan. The water quality standards of the Basin Plan are incorporated into this Order as the discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a. The discharge prohibitions and receiving water limitations in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations or prohibitions to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan, water quality control plans or policies adopted by the State Water Board, including Resolution No. 68-16, or federal regulations, including but not limited to, 40 CFR 131.12 and 131.38. The waste discharge prohibitions and water quality objectives in the Basin Plan have been approved by USEPA and combined with the designated beneficial uses constitute the water quality standards required under federal law.

Under federal law (CWA section 402(p)(3)(B)(iii)), an MS4 permit must include "*controls to reduce the discharge of pollutants to the maximum extent practicable...and such other provision as...the State determines appropriate for control of such pollutants*." The State Water Board has previously determined that limitations necessary to meet water quality standards are appropriate for the control of pollutants discharged by MS4s and must be included in MS4 permits. (State Water Board Orders WQ 91-03, 98-01, 99-05, 2001-15; see also *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159.) This Order prohibits discharges that cause or contribute to violations of water quality standards.

The discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a are included in this Order to ensure that discharges from the MS4s do not cause or contribute to exceedances of water quality objectives necessary to protect the beneficial uses of the receiving waters.

Provision A.4 is consistent with the precedent-setting language in State Water Board Order WQ 99-05 required to be included in municipal storm water permits. State Water Board Order WQ 2001-15 refined Order WQ 99-05 by requiring an iterative approach to compliance with water quality standards involving ongoing assessments and revisions, as referred to as the "iterative process." The "iterative process" is a fundamental NPDES requirement for municipal storm water permits to achieve the objectives of the CWA.

The State Water Board and Regional Water Boards have stated that the provisions under Provisions A.1.a, A.1.c, A.2.a, and A.4 are independently applicable, meaning that compliance with one provision does not provide a "safe harbor" where there is non-compliance with another provision (i.e., compliance with the Provision A.4 does not shield a Copermittee who may have violated Provision A.1.a, A.1.c, or A.2.a from

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Control Bd. (2004) 124 Cal.App.4th 866, 884-886, citing *Defenders of Wildlife v. Browning,* (9th Cir. 1999) 191 F.3d 1159.)

an enforcement action). The intent of Provision A.4 is to ensure that the Copermittees have the necessary storm water management programs and controls in place, and that they are modified by the Copermittees in a timely fashion when necessary, so that compliance with Provisions A.1.a, A.1.c, and/or A.2.a is achieved as soon as possible. USEPA expressed the importance of this independent applicability in a series of comment letters on MS4 permits proposed by various Regional Water Boards. At that time, USEPA expressly objected to certain MS4 permits that included language stating, *"permittees will not be in violation of this [receiving water limitation] provision … [if certain steps are taken to evaluate and improve the effectiveness of the jurisdictional runoff management programs],"* concluding that this phrase would not comply with the CWA.[21]

The Ninth Circuit held in *Natural Resources Defense Council v. County of Los Angeles* (2011) 673 F3d. 880, 886 (revd. on other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013))) that engagement in the iterative process does not provide a safe harbor from liability for violations of permit terms prohibiting exceedances of water quality standards. The Ninth Circuit holding is consistent with the position of the State and Regional Water Boards that exceedances of water quality standards in an MS4 permit constitute violations of permit terms subject to enforcement by the Water Boards or through a citizen suit. While the Water Boards have generally directed dischargers to achieve compliance by improving control measures through the iterative process, the San Diego Water Board retains the discretion to take other appropriate enforcement and the iterative process does not shield dischargers from citizen suits under the CWA.

The requirements of Provision A.4, therefore, are required to be implemented until the water quality standards expressed under Provisions A.1.a, A.1.c, and A.2.a are achieved. The CWA requires MS4 permits to "*require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." The requirements of this Order have been deemed or determined to be "appropriate" to achieve water quality standards in receiving waters.

Part of the "*controls*" required by the Order is the process described in Provision A.4. Provision A.4 includes the process that is ultimately expected to achieve compliance with the requirement that discharges from the MS4 do not cause or contribute to violations of water quality standards in the receiving waters. The implementation of Provision A.4 is required when the Copermittees or the San Diego Water Board have

[21] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.

determined that discharges from the MS4 are causing or contributing to violations of water quality standards in the receiving waters.

The Copermittees must effectively prohibit non-storm water discharges into the MS4s, reduce the discharge of pollutants in storm water from the MS4s to the MEP, and ensure that their MS4 discharges do not cause or contribute to violations of water quality standards. If the Copermittees have effectively prohibited non-storm water discharges and reduced storm water pollutant discharges to the MEP, but their discharges are still causing or contributing to violations of water quality standards, Provision A.4 provides a clear "iterative process" for the Copermittees to follow.

Provision A.4 essentially requires the Copermittees to implement additional BMPs until MS4 discharges no longer cause or contribute to a violation of water quality standards.

In assessing compliance and potential enforcement actions, the San Diego Water Board looks at the Copermittees' efforts in total to meet the requirements of Provisions A.1.a, A.1.c, A.2.a and Provision A.4. The Copermittees need to demonstrate that they are making improvements to their programs and making progress toward achieving the discharge prohibitions and receiving water limitations in Provisions A.1.a, A.1.c, and A.2.a by implementing the requirements of Provision A.4. The San Diego Water Board would consider these efforts prior to strictly enforcing the requirements of Provisions A.1.a, A.1.c, and A.2.a. Causes of exceedances of the receiving water limitations can often be more difficult to identify and attribute solely to the Copermittees' MS4s. The intent of the Order is to provide the Copermittees more clarity and flexibility in addressing these exceedances through the iterative approach and adaptive management process until the requirements under Provisions A.1.a, A.1.c, and A.2.a are fully achieved.

An exception to the iterative approach and adaptive management process would be in receiving waters subject to adopted and approved TMDLs. For TMDLs that are incorporated into the Order, there is a specific date for compliance to be achieved, after which the iterative approach and adaptive management process required under Provision A.4 no longer provides the flexibility to achieve compliance. Where compliance dates for a TMDL have passed, compliance with the WQBELs incorporated into the Order established by a TMDL in Attachment E to protect water quality standards is required. Thus, after the interim or final compliance dates for a TMDL have passed, if the discharges from the Copermittees' MS4s are causing or contributing to a violation of WQBELs, exceedances of WQBELs must be strictly enforced by the San Diego Water Board. In the meantime, however, the Copermittees are in compliance with the interim or final TMDL requirements in Attachment E as long as the interim or final WQBELs are being achieved in accordance with the interim or final compliance dates.

B. Water Quality Improvement Plans

Purpose: Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges to the MS4s and control pollutants in storm water discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the Clean Water Act.

Provision B includes requirements for the Copermittees to develop and implement Water Quality Improvement Plans to ultimately comply with the prohibitions and limitations under Provision A. The Water Quality Improvement Plans will provide the Copermittees a comprehensive program that can achieve the requirements and further the objectives of the CWA. Implementation of the Water Quality Improvement Plans will also improve the quality of the receiving waters in the San Diego Region.

The Water Quality Improvement Plan is the backbone of the Regional MS4 Permit requirements. Provision B provides the guidance, criteria, and minimum expectations and requirements for the elements of the Water Quality Improvement Plan to be developed and implemented by the Copermittees. The Water Quality Improvement Plans will be implemented in the Watershed Management Area by the Copermittees within their jurisdictions through their jurisdictional runoff management programs.

The Water Quality Improvement Plan also incorporates a program to monitor and assess the progress of the Copermittees' jurisdictional runoff management programs toward improving the quality of discharges from the MS4s, as well as tracking improvements to the quality of receiving waters. A process to adapt and improve the effectiveness of the Water Quality Improvement Plans has also been incorporated into the requirements of Provision B to be consistent with the "iterative approach" required to achieve compliance with discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a, pursuant to the requirements of Provision A.4.

The Water Quality Improvement Plans have also been structured to incorporate the requirements of any TMDLs that have been adopted for the San Diego Region. Incorporating the requirements of the TMDLs into the requirements of Provision B allows the Copermittees to develop a single plan, instead of separate plans, to coordinate their non-storm water and storm water runoff management programs. The Water Quality Improvement Plans allow the Copermittees to meet the requirements of this Order, as well as fulfill the requirements of the TMDLs.

As an added benefit, if the Copermittees demonstrate that impaired water bodies within the Watershed Management Area listed on the 303(d) List will be addressed with their Water Quality Improvement Plans in a reasonable period of time, the San Diego Water Board may be able to remove the water bodies from the 303(d) List, which would greatly reduce the need for the San Diego Water Board to develop additional TMDLs that would have to be incorporated into the Order and implemented by the Copermittees.

***Discussion*:** The federal NPDES regulations require the Copermittees to develop a proposed management program (40 CFR 122.26(d)(2)(iv)). The proposed management program must include "*a comprehensive planning process*" and "*where necessary intergovernmental coordination*" for the "*duration of the permit.*" The Water Quality Improvement Plan is the Copermittees' "*comprehensive planning process*" document for the proposed management program that will be implemented within a Watershed Management Area. Implementation of the Water Quality Improvement Plan requires "*intergovernmental coordination*" among the Copermittees for at least the "*duration of the permit*," and likely into and beyond the next iteration of the permit.

Developing Water Quality Improvement Plans based upon watersheds is consistent with federal regulations that support the development of permit conditions, as well as implementation of storm water management programs, at a watershed scale (40 CFR 122.26(a)(3)(ii), 122.26(a)(3)(v), and 122.26(d)(2)(iv)). In 2003, USEPA issued a Watershed-Based NPDES Permitting Policy Statement (USEPA, 2003) that defines watershed-based permitting as an approach that produces NPDES permits that are issued to point sources on a geographic or watershed basis. In this policy statement, USEPA explains that "*[t]he utility of this tool relies heavily on a detailed, integrated, and inclusive watershed planning process*." USEPA identifies a number of important benefits of watershed permitting, including more environmentally effective results, the ability to emphasize measuring the effectiveness of targeted actions on improvements in water quality, reduced cost of improving the quality of the nation's waters and more effective implementation of watershed plans, including TMDLs, among others.

An emphasis on watersheds is appropriate at this stage in the San Diego Region's MS4 program to shift the focus to more targeted, water quality driven planning and implementation. Addressing discharges on a watershed scale focuses on water quality results by emphasizing the receiving waters in the watershed. The conditions of the receiving waters drive management actions, which in turn focus measures to address pollutant contributions from MS4 discharges.

The Water Quality Improvement Plan gives the Copermittees the responsibility of developing a comprehensive plan to coordinate the efforts of their jurisdictional runoff management programs for addressing the problems related to MS4 discharges causing impacts to water quality in the Watershed Management Area. The development of the plan provides the Copermittees the opportunity to provide

significant input on how to implement their jurisdictional runoff management programs, and how to best utilize their available resources in addressing a focused set of priorities that they believe will result in measureable improvements to water quality within the Watershed Management Area.

The Copermittees are encouraged to separate the Watershed Management Area into subwatersheds, as appropriate. This allows the Copermittees to identify priorities applicable to a subset of the Copermittees or specific water bodies or areas within the Watershed Management Area.

Included in the requirements for the elements to be included in the Water Quality Improvement Plan are monitoring and assessment requirements that are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order. In addition to the federal requirements of the CWA section 308(a) and 40 CFR 122.26(d), the San Diego Water Board has the authority to establish monitoring, reporting, and recordkeeping requirements for NPDES permits under CWC 13383.

More specific and detailed discussions of the requirements of Provision B are provided below.

Provision B.1 (Watershed Management Areas) requires the Copermittees to develop a Water Quality Improvement Plan for each of the Watershed Management Areas defined by the San Diego Water Board.

Pursuant to 40 CFR 122.26(d)(2)(iv), proposed management programs "*may impose controls on a…watershed basis…*" The Water Quality Improvement Plan is the Copermittees' proposed management program. A Water Quality Improvement Plan must be developed for each Watershed Management Area identified in the Order.

The Watershed Management Areas are identified in Table B-1. Table B-1 establishes ten (10) Watershed Management Areas, and identifies the Copermittees that are responsible for developing and implementing the Water Quality Improvement Plan for each Watershed Management Area.

The Copermittees from each of the three counties within the San Diego Region are expected to be phased in as their respective NPDES municipal storm water permits expire. Because Order No. R9-2007-0001 expired in January 2012, the San Diego County Copermittees ~~are~~were covered under the Regional MS4 Permit on June 27, 2013, the effective date of the Order. Because Order No. R9-2009-0002 expired in December 2014, the Orange County Copermittees are covered under the Regional MS4 Permit on April 1, 2015, the effective date of Order No. R9-2013-0001 as amended by Order No. R9-2015-0001.

After the San Diego Water Board receives and considers the Report~~s~~ of Waste

Discharge required to be submitted by the ~~Orange County Copermittees and~~ Riverside County Copermittees pursuant to the requirements of their current permit~~s~~, and makes any necessary changes to the Order, the ~~Orange County Copermittees and~~ Riverside County Copermittees will be covered under the Regional MS4 Permit after ~~Order No. R9-2009-0002 expires in November 2014, and~~ Order No. R9-2010-0016 expires in December 2015~~, respectively~~.

The ~~Orange County Copermittees and~~ Riverside County Copermittees also have the option to obtain coverage under the Regional MS4 Permit earlier than their respective permit expiration dates. The process to apply for early coverage is described Provision F.6.

Because the Santa Margarita River Watershed Management Area includes Copermittees from both San Diego County and Riverside County, a footnote to Table B-1 has been included to specify that the requirements of Provision B are not required to be implemented by the County of San Diego until the Riverside County Copermittees have received a notice of coverage under the Order. Until the Riverside County Copermittees are notified of coverage under the Order, the County of San Diego is subject to the prohibitions and limitations under Provision A, responsible for continuing to implement its existing jurisdictional runoff management program, and responsible for implementing the transitional monitoring and assessment requirements of Provision D, the transitional annual reporting requirements of Provision F.3.b, and the TMDL requirements of Attachment E to the Order.

The City of Laguna Woods and Laguna Hills are located partially within the jurisdictions of both the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board) and the San Diego Water Board. Written requests for designation of a single Regional Water Board to regulate matters pertaining to permitting of Phase I MS4 discharges were submitted to the San Diego Water Board and the Santa Ana Water Board by the City of Laguna Woods by letter dated September 8, 2014, and the City of Laguna Hills by letter dated March 12, 2014. The Cities of Laguna Woods and Laguna Hills requested designation of the San Diego Water Board pursuant to CWC section 13228. The Cities of Laguna Woods and Laguna Hills reported that management and implementation of municipal programs to comply with two different Phase I MS4 permits creates a significant administrative and financial burden and inhibits their ability to contribute to greater overall water quality improvements in either Region. In an effort to address these concerns, the San Diego Water Board and the Santa Ana Water Board have entered into an agreement dated February 10, 2015, whereby the San Diego Water Board is designated to regulate Phase I MS4 discharges within the jurisdiction of the Cities of Laguna Woods and Laguna Hills including areas in the Santa Region upon the later effective date of this Order or Tentative Order No. R8-2015-0001. Under the terms of the agreement, each Regional Water Board retains the authority to enforce provisions of the Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee (Water

Code section 13228 (b)). Also under the terms of the agreement, any TMDL and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Laguna Woods or Laguna Hills as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement of the applicable TMDL would remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Boards' San Diego Creek/Newport Bay TMDL and the San Diego Water Boards indicator Bacteria Project I Beaches and Creeks TMDL. In conformance with this agreement, a footnote to Table B-1 has been included to specify coverage under Order No. R9-2013-0001 for those Phase I MS4 discharges within the jurisdictional boundaries of the Cities of Laguna Woods and Laguna Hills within the Santa Ana Region. The footnote specifies that the City of Laguna Woods and Laguna Hills are identified as responsible Copermittees in the San Diego Creek/Newport Bay TMDL in the Santa Ana Region and remain obligated to comply with the San Diego Creek/Newport Bay TMDL pursuant to section XVIII of Tentative Order No. R8-2015-0001 (NPDES No. CAS618030) and any reissuance thereof.

The City of Lake Forest is located partially within the jurisdictions of both the Santa Ana Water Board and the San Diego Water Board. By letters dated January 14, 2013 and April 4, 2014 the City of Lake Forest submitted a written request, pursuant to CWC section 13228, to the San Diego Water Board and the Santa Ana Water Board requesting the Santa Ana Water Board be designated to regulate matters within the City of Lake Forest pertaining to permitting of their Phase I MS4 discharges. The City of Lake Forest reported that management and implementation of municipal programs to comply with two different Phase I MS4 permits creates a significant administrative and financial burden and inhibits their ability to contribute to greater overall water quality improvements in either Region. In an effort to address these concerns, the San Diego Water Board and the Santa Ana Water Board have entered into an agreement dated February 10, 2015, whereby the Santa Ana Water Board is designated to regulate Phase I MS4 discharges within the jurisdiction of the City of Lake Forest within the San Diego Region upon the later date of this Order or Santa Ana Water Board Tentative Order No. R8-2015-0001. Under the terms of the agreement, each Regional Water Board retains the authority to enforce provisions of the Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee (Water Code section 13228 (b)). Also under the terms of the agreement, any TMDL and associated Phase I MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the City of Lake Forest as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement authority for the applicable TMDL would remain with the Regional Water Board which has the jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Boards' San Diego Creek/Newport Bay TMDL and the San Diego Water Boards' indicator Bacteria Project I Beaches and Creeks TMDL. In conformance with this

agreement, a footnote to Table B-1 has been included to specify that Phase I MS4 discharges within the jurisdictional boundaries of the City of Lake Forest located within the San Diego Region will be regulated under Santa Ana Water Board Order No. R8-2015-0001 (NPDES No. CAS618030) and any reissuance thereof. The footnote specifies that the City of Lake Forest is an identified responsible Copermittee in the Indicator Bacteria Project I Beaches and Creeks TMDL (Bacteria TMDL) in the San Diego Region and remains obligated to comply with the Bacteria TMDL pursuant to Attachment E of Order No. R9-2013-0001 and any reissuance thereto. The City is also identified as a responsible Copermittee in the San Diego Creek/Newport Bay TMDL established by the Santa Ana Water Board. The City remains obligated to comply with the San Diego Creek/New Port Bay TMDL pursuant to the Santa Ana Water Board's Phase I MS4 Permit (Tentative Order No. R8-2015-0001 (NPDES No. CAS618030). Under the terms of the agreement, the City of Lake Forest must retain and continue implementation of the over irrigation prohibition in Title 15, Chapter 15, Section 14.030, List (b) of the City Municipal Code throughout its jurisdiction. Also under the terms of the agreement, the City of Lake Forest must actively participate in the development and implementation of the Aliso Creek Watershed Management Area Water Quality Improvement Plan required pursuant to Order No. R9-2013-0001, and any reissuance thereof.

The bases supporting the Cities of Laguna Woods, Laguna Hills, and Lake Forest requests to designate a specific Regional Water Board for regulatory oversight of Phase I MS4 discharges may change under future conditions and circumstances, therefore the San Diego Water Board will periodically review the effectiveness of the agreement during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate the agreement with the Santa Ana Water Board or otherwise modify the agreement subject to the approval of the Santa Ana Water Board.

Provision B.2 (Priority Water Quality Conditions) requires the Copermittees in each Watershed Management Area to identify the highest priority water quality conditions which will be the focus of the Water Quality Improvement Plan implementation.

Provisions B.2.a and B.2.b provide the criteria that must be assessed when characterizing the receiving water quality and potential impacts from MS4 discharges of the receiving waters within the Watershed Management Area. The criteria are based primarily on the requirements in 40 CFR 122.26(d)(1)(iv)(C) and (C)(1)-(9). Characterizing the receiving water quality and identifying the potential impacts caused by MS4 discharges to receiving waters in the Watershed Management Area is necessary to identify the impacts to receiving waters associated with MS4 discharges that are of the most concern to the Copermittees.

Based on the information required to be considered under Provisions B.2.a and B.2.b, Provision B.2.c requires to Copermittees to identify the highest priority water quality conditions related to discharges from the MS4s that will be the primary focus of the

Water Quality Improvement Plan in the Watershed Management Area. Addressing and improving these highest priority water quality conditions will become the focus of each Copermittee's jurisdictional runoff management program as the Water Quality Improvement Plan is implemented in the Watershed Management Area. The highest priority water quality conditions are expected to include source of pollutants and/or stressors, and/or receiving water conditions, that the Copermittees consider the highest threats or most likely to have adverse impacts on the physical, chemical, and biological integrity of receiving waters. Addressing these threats and/or adverse impacts should restore the physical, chemical, and biological integrity of receiving waters, and result in the restoration and protection of the beneficial uses of the receiving waters in the Watershed Management Area.

Provision B.2.d requires the Copermittees to identify known and suspected sources of pollutants and/or stressors contributing to the highest priority water quality conditions. The requirements of Provision B.2.d are based primarily on the requirements in 40 CFR 122.26(d)(1)(iii)(B)(1)-(6). The Copermittees are required to evaluate several factors in the identification of those sources. The Copermittees must consider and evaluate the following: (1) the land uses that may contribute toward impacts to receiving waters, (2) the locations of the Copermittees' MS4s that can convey and discharge runoff and pollutants to receiving waters, (3) other sources that discharge into the Copermittees' MS4s and receiving waters, and (4) other information and data that can help the Copermittees to evaluate the relative importance of or contribution from those sources toward the highest priority water quality conditions. Identifying the known and suspected sources, and their relative contribution toward the highest priority water quality conditions, will help the Copermittees to focus, direct, and prioritize their resources and implementation efforts within their jurisdictions.

Provision B.2.e requires the Copermittees to identify potential strategies that can result in improvements to water quality in MS4 discharges and/or receiving waters within the Watershed Management Area. Potential water quality improvement strategies will not necessarily be implemented by the Copermittees, but provide a "menu" of options that the Copermittees will consider for implementation. The public participation process that will be implemented during the development of the Water Quality Improvement Plan is where the potential water quality improvement strategies will be identified.

<u>Provision B.3 (Water Quality Improvement Goals, Strategies and Schedules)</u> requires the Copermittees in each Watershed Management Area to identify the goals that the Copermittees' jurisdictional runoff management programs will work toward achieving to address and improve the highest priority water quality conditions identified under Provision B.2.c; the strategies that will be implemented by the Copermittees within their jurisdictions and the Watershed Management Area to achieve the goals; and, the schedules for implementing the strategies and achieving the goals. The element of the Water Quality Improvement Plan required under Provision B.3 is where the "*comprehensive planning*" and "*intergovernmental coordination*" [40 CFR 122.26(d)(2)(iv)] of the Copermittees' actions for the proposed management programs

within the Watershed Management Area is required to be described.

Provision B.3.a requires the Copermittees to identify interim and final numeric goals, and schedules to achieve those goals as part of the Water Quality Improvement Plans. Provision B.3.a.(1) requires the Copermittees to identify two types of numeric goals to be achieved:

(1) Final numeric goals in the receiving waters and/or MS4 discharges that will result in the protection of the water quality standards of the receiving waters for the highest priority water quality conditions identified by the Copermittees for Provision B.2.c. These final numeric goals are the ultimate goals for the Water Quality Improvement Plan, and the achievement and maintenance of these final numeric goals will indicate that one or more beneficial uses have been successfully restored and/or protected from MS4 discharges.

(2) Interim numeric goals that can be used by the Copermittees to demonstrate progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges for the highest priority water quality conditions in the Watershed Management Area. Achievement of the interim numeric goals will demonstrate to the San Diego Water Board that the Copermittees' implementation efforts are progressing toward achieving the final numeric goals.

Provision B.3.a.(1) does not specify what the interim and final numeric goals must be based on, but they essentially must be designed to achieve compliance with water quality standards in the receiving waters. To that end, the interim goals must be based on measureable criteria or indicators capable of demonstrating progress toward achieving the numeric goals."

The interim and final numeric goals can be based on the water quality objectives in the Basin Plan. The water quality objectives in the Basin Plan, however, consist of numeric and narrative water quality objectives. Numeric water quality objectives can be directly used as numeric goals. Narrative water quality objectives, on the other hand, will require some interpretation to identify numeric goals. The achievement of multiple numeric goals based on the water quality objectives, used in combination, may be necessary to demonstrate that beneficial uses have been restored and/or protected.

The Copermittees could also propose other numeric goals that are not necessarily water quality objectives from the Basin Plan. For example, the Copermittees could propose a numeric goal that consists of achieving some percent improvement of a measureable indicator, such as acreage of a specific habitat or increase in a specific plant or animal species population. Other examples may include pollutant load reductions, number of impaired waterbodies delisted from the List of Water Quality Impaired Segments, Index of Biological Integrity (IBI) scores, etc.

The Copermittees may choose to develop interim numeric goals based on the final numeric goals they develop, such as incremental steps toward ultimately achieving the final numeric goals. The Copermittees may also choose to develop interim numeric goals that are based on other measureable indicators that can indirectly indicate improvements and progress toward the final numeric goals.

There are no limits to the types of interim numeric goals that could be proposed by the Copermittees, other than the goals must be based on measureable criteria or indicators capable of demonstrating progress toward achieving the numeric goals. Likewise, there are no limits to the types of final numeric goals that could be proposed by the Copermittees, other than the goals must "*restore and protect the water quality standards of the receiving waters.*"

Finally, Provision B.3.a.(2) also requires the Copermittees to develop schedules for measuring progress and achieving the interim and final numeric goals. Several criteria are included for the development of the schedules, but the Copermittees are required to achieve the numeric goals as soon as possible, consistent with federal NPDES regulations (40 CFR 122.47(a)(1)).

The Copermittees are also required to incorporate any compliance schedules for any applicable ASBS or TMDL requirements. Applicable ASBS and TMDL compliance schedules are set forth in Attachment A and Attachment E to the Order, respectively. The information provided by the Copermittees under Provision B.3.a.(2) will be used by the Copermittees and the San Diego Water Board to gauge and track the progress of the Copermittees' efforts in addressing the highest priority water quality conditions identified in the Water Quality Improvement Plan.

Provision B.3.b requires the Copermittees to identify the strategies and schedules to implement those strategies as part of the Water Quality Improvement Plans. Provision B.3.b requires the Copermittees to identify the water quality improvement strategies that will be and may be implemented within the Watershed Management Area to 1) reduce of pollutants in storm water discharged from the MS4 to the MEP, 2) effectively prohibit non-storm water discharges from entering the MS4, 3) protect water quality standards in receiving waters by controlling MS4 discharges so that they do not cause or contribute to exceedances of receiving water limitations, and 4) achieve applicable WQBELs that implement TMDLs. The Copermittees will select the strategies to be implemented based on the likely effectiveness and efficiency of the potential water quality improvement strategies identified under Provision B.2.e to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, and/or achieve the interim and final numeric goals identified under Provision B.3.a.

Provision B.3.b.(1) requires each Copermittee to identify the strategies that will be or may be implemented within its jurisdiction. Each Copermittee is required to describe the strategies it is committed to implementing as part of its jurisdictional runoff

management requirements under Provisions E.2 through E.7, and the optional jurisdictional strategies that the Copermittee will implement, as necessary, to achieve the numeric goals.

Each Copermittee is expected to implement the optional jurisdictional strategies identified under Provisions B.3.b.(1)(b) when the jurisdictional strategies it has committed to implement under Provision B.3.b.(1)(a) are not making adequate progress toward the interim and final numeric goals in accordance with the schedules established under Provision B.3.a. Provision B.3.b.(1)(b)(v) requires each Copermittee to describe the circumstances necessary to trigger implementation of the optional jurisdictional strategies, in addition to the requirements of Provisions B.3.b.(1)(a).

The San Diego Water Board recognizes that there may be optional jurisdictional strategies that will likely require funding and/or resources for planning, permitting, procurement of labor and materials, and implementation. Thus, Provision B.3.b.(1)(b)(iv) requires each Copermittee to describe the funding and/or resources that are necessary to implement these optional jurisdictional strategies. This information may provide interested groups and members of the public an understanding of the resources that they could provide or assist in obtaining to implement these optional jurisdictional strategies.

Provision B.3.b.(2) requires the Copermittees in the Watershed Management Area to identify the regional or multi-jurisdictional strategies that may be implemented, as necessary, to achieve the numeric goals. Similar to the requirements of Provision B.3.b.(1)(b), these regional or multi-jurisdictional strategies will likely require funding and/or resources for planning, permitting, procurement of labor and materials, and implementation, and San Diego Water Board recognizes that these strategies may be difficult to implement with only Copermittee resources. Thus, Provision B.3.b.(2)(d) requires the Copermittees to describe the funding and/or resources necessary to implement these optional regional or multi-jurisdictional strategies. This information may provide interested groups and members of the public an understanding of the resources that they could provide or assist in obtaining to implement these optional regional or multi-jurisdictional strategies.

Provision B.3.b.(3) requires the Copermittees to develop and include schedules in the Water Quality Improvement Plan for implementing the water quality improvement strategies identified under Provisions B.3.b.(1) and B.3.b.(2). The schedule for implementing the water quality improvement strategies will be used by the Copermittees and San Diego Water Board to measure and demonstrate the progress of the Copermittees' implementation efforts toward reducing pollutants in storm water discharged from the MS4 to the MEP, and eliminating illicit non-storm water discharges from entering the MS4.

Provision B.3.b.(4) provides the Copermittees in each Watershed Management Area

the option of implementing watershed-specific structural BMP requirements for Priority Development Projects. Historically, storm water permits have included very specific performance standards for permanent, structural BMPs. These standards describe the expectation for the capture or treatment of pollutants and control of excessive flow before storm water is discharged from a site. The Copermittees were also allowed to develop waiver programs for Priority Development Projects to avoid implementing the structural BMPs; however, the waiver programs were not necessarily tied into any sort of holistic watershed strategy. The result is that implementation of BMP requirements is largely done on a site-by-site basis. This requires proper design on the part of the Priority Development Project and strict oversight on the part of the Copermittee.

Provision B.3.b.(4) promotes the evaluation of multiple strategies for water quality improvement, in addition to the implementation of permanent structural BMPs, on a watershed-scale versus the site-by-site approach. In a report issued by the Southern California Coastal Water Research Project (SCCWRP) and several other research institutions, the report emphasized that a successful hydromodification management program will involve watershed analysis as a first step, and that integrating multiple watershed-based strategies is preferable over a site-by-site approach. Indeed, the report states that the watershed analysis "…*should lead to identification of existing opportunities and constraints that can be used to help prioritize areas of greater concern, areas of restoration potential, infrastructure constraints, and pathways for potential cumulative effects*."[22] Provision B.3.b.(4) promotes the findings and recommendations of the report by providing a pathway for Copermittees to develop an integrated approach to their land development programs.

Under Provision B.3.b.(4), the Copermittees in a Watershed Management Area must first perform an analysis by gathering as much information pertaining to the physical characteristics of the Watershed Management Area as possible. This includes, for example, identifying potential areas of coarse sediment supply, present and anticipated future land uses, and locations of physical structures within receiving streams and upland areas that affect the watershed hydrology (such as bridges, culverts, and flood management basins). Once this information is collected, the Copermittees must produce GIS layers (maps) that include this information.

From there, the Copermittees must use the results of the Watershed Management Area Analysis to identify and compile a list of candidate projects that could potentially be used as alternative compliance options for Priority Development Projects. Such projects include, for example, opportunities for stream or riparian area rehabilitation, opportunities for retrofitting existing infrastructure to incorporate storm water retention or treatment, and opportunities for regional BMPs, among others. Once these candidate projects are identified, Copermittees may allow Priority Development Projects to fund, partially fund, or completely implement these candidate projects. The

[22] 2012. ED Stein, F Federico, DB Booth, BP Bledsoe, C Bowles, Z Rubin, GM Kondolf, A Sengupta. Technical Report 667. Southern California Coastal Water Research Project. Costa Mesa, CA.

Copermittees must first find that implementing such a candidate project would provide greater overall benefit to the watershed than requiring implementation of the structural BMPs onsite, and also enter into a voluntary agreement with the Priority Development Project that authorizes this arrangement. The Copermittees may use Provision B.3.b.(4) as both 1) a mechanism to reach their stated goals of the Water Quality Improvement Plan by using Priority Development Projects to either fund or implement projects that will provide water quality benefit, and 2) an alternative to requiring strict adherence to the structural BMP design standards.

Additionally, Provision B.3.b.(4) allows the Copermittees to use the results of the Watershed Management Area Analysis to identify areas within the Watershed Management Area where it is appropriate to allow Priority Development Projects to be exempt from the hydromodification management BMP performance requirements. Provision E.3.c.(2) already allows exemptions for Priority Development Projects that discharge to a conveyance channel whose bed and bank are concrete lined from the point of discharge to an enclosed embayment or the Pacific Ocean. However, there may be cases where further exemptions are warranted. The Copermittees may identify such cases on a watershed basis and include them in the Watershed Management Area Analysis; however, they must provide the supporting rationale to support all claims for exemptions.

Provision B.3.b.(4) provides an innovative pathway for Copermittees to regulate their land development programs by allowing alternative compliance in lieu of implementing structural BMPs on each and every Priority Development Project. This approach facilitates the integration of watershed-scale solutions for improving overall water quality and assisting Copermittees to achieve their stated goals of the Water Quality Improvement Plan. The San Diego Water Board understands, however, that undertaking this approach, which involves extensive planning, could be resource intensive for the Copermittees. Therefore, the Watershed Management Area Analysis is optional and not a requirement. The Copermittees can choose not to perform the watershed planning and mapping exercise described in Provision B.3.b.(4), and instead choose to require strict implementation of the structural BMPs onsite, pursuant to Provision E.3.b.

Provision B.4 (Water Quality Improvement Monitoring and Assessment) requires the Copermittees to develop an integrated monitoring and assessment program to track the progress of the Water Quality Improvement Plan toward meeting the implementation goals and schedules, and improving the water quality of the Watershed Management Area. Provision B.4 is the part of the Water Quality Improvement Plan where the Copermittees describe the monitoring data that will be collected, which is not only necessary to implement the “iterative approach” required by Provision A.4, but inform the adaptive management and “*comprehensive planning process*” that allows the Copermittees to make adjustments and modifications to the Water Quality Improvement Plans and the jurisdictional runoff management programs.

Provision B.4 requires the Copermittees, at a minimum, to include the requirements of Provision D as part of the water quality improvement monitoring and assessment program for the Water Quality Improvement Plan. The Copermittees, however, are not limited to the requirements of Provision D and may include additional monitoring and assessment methods to track progress toward improving water quality in the Watershed Management Area.

In addition to incorporating the requirements of Provision D, the water quality improvement monitoring and assessment program must incorporate any monitoring and assessment requirements specified for any applicable TMDLs included in Attachment E to the Order, and the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 for Watershed Management Areas with ASBS.

The monitoring and assessments required to be incorporated into the Water Quality Improvement Plan are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order.

Provision B.5 (Iterative Approach and Adaptive Management Process) requires the Copermittees to implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a.

Provision B.5 requires the Copermittees in each Watershed Management Area to re-evaluate the highest priority water quality conditions and potential water quality improvement strategies, the water quality improvement goals, strategies and schedules, and the water quality improvement monitoring and assessment program and provide recommendations for modifying those elements to improve the effectiveness of the Water Quality Improvement Plan. The re-evaluation of the Water Quality Improvement Plan is part of the assessment requirements of Provision D.

Provision B.6 (Water Quality Improvement Plan Submittal, Updates, and Implementation) requires to Copermittees to submit, update, and implement the Water Quality Improvement Plans.

The requirements for the process to develop and submit the Water Quality Improvement Plans is described in more detail under the discussion for Provision F.1. The process will include several opportunities for the public to provide input during the development of the Water Quality Improvement Plans. The process for updating the Water Quality Improvement Plans is described in more detail under the discussion for Provision F.3.c. Upon acceptance of the Water Quality Improvement Plan and updates, the Copermittees are required to immediately begin implementing the Water Quality Improvement Plan and subsequent updates.

The Water Quality Improvement Plan is expected to be a dynamic document that will evolve over time. The Water Quality Improvement Plan is also expected to be a long

term plan that focuses the Copermittees' efforts and resources on a limited set of priority water quality conditions, with the ultimate goal of protecting all the beneficial uses of the receiving waters within the Watershed Management Area from impacts that may be caused or contributed to by MS4 discharges. As the Copermittees collect data, implement their jurisdictional runoff management programs, and review the results from their water quality improvement monitoring and assessment program, the Water Quality Improvement Plan is expected to be continually reviewed and updated until compliance with Provisions A.1.a, A.1.b, and A.2.a is achieved.

However, in specific cases supported by robust analytical documentation the implementation of the Water Quality Improvement Plans may demonstrate that TMDLs are not necessary for identified impaired water bodies within the Watershed Management Area if the analytical record demonstrates that technology-based effluent limitations required by the CWA, more stringent effluent limitations required by state, local, or federal authority, and/or other pollution control requirements (e.g., best management practices) required by local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time.[23]

The San Diego Water Board submits an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. According to USEPA guidance for the Integrated Report,[24] water bodies are placed in one of five categories. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 are placed on the 303(d) List.

Category 4 in the Integrated Report is for water bodies where available data and/or information indicate that at least one beneficial use is not being supported or is threatened, but a TMDL is not needed. [25] Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

Impaired water bodies can be included in Category 4a if a TMDL has been adopted and approved. The TMDLs in Attachment E to the Order implement the requirements of the TMDLs adopted by the San Diego Water Board, and approved by the State Water Board and USEPA. The water bodies in Attachment E will be included in

[23] 40 CFR 130.7(b)(1)
[24] USEPA, 2005. Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act
[25] Ibid

Category 4a in the Integrated Report and removed from the 303(d) List.

Impaired water bodies can be included in Category 4b if there are *acceptable* "pollution control requirements" required by a local, state or federal authority stringent enough to implement applicable water quality standards within a reasonable period of time (e.g., a compliance date is set). When evaluating whether a particular set of pollution controls are "requirements," the USEPA considers a number of factors, including: (1) the authority (local, state, federal) under which the controls are required and will be implemented with respect to sources contributing to the water quality impairment (examples may include: self-executing state or local regulations, permits, and contracts and grant/funding agreements that require implementation of necessary controls), (2) existing commitments made by the sources and completion or soon to be completed implementation of the controls (including an analysis of the amount of actual implementation that has already occurred), (3) the certainty of dedicated funding for the implementation of the controls, and (4) other relevant factors as determined by USEPA depending on case-specific circumstances.[26]

Impaired water bodies can be included in Category 4c if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution. Pollution, as defined by the CWA is "the man-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of water."[27] In other cases, pollution does not result from a pollutant and a TMDL is not required. Examples of circumstances where an impaired segment may be placed in Category 4c include segments impaired solely due to lack of adequate flow, stream channelization, or hydromodification. In these situations, there may be water quality management actions that can address the cause(s) of the impairment, but a TMDL may not be required to implement the actions.

The Water Quality Improvement Plans will require the implementation of pollution controls and water quality management actions (i.e. water quality improvement strategies) which can result in the attainment of water quality standards in water bodies impaired by discharges from the Copermittees' MS4s. The Water Quality Improvement Plans also include requirements that are expected to attain water quality standards in a reasonable period of time. The San Diego Water Board considers the Water Quality Improvement Plans to be a commitment by the Copermittees to develop, plan, budget for, and implement pollution controls that will attain water quality standards in receiving waters in a reasonable period of time, or as soon as possible. The results of the Copermittees' efforts in implementing the Water Quality Improvement Plans can be used to re-evaluate the condition of the impaired water bodies during the next update to the 303(d) List.

[26] Ibid
[27] CWA section 502(19)

After the Copermittees submit the Water Quality Improvement Plans and demonstrate that water quality standards are being attained or will be attained in a reasonable period of time, the San Diego Water Board may re-evaluate the water bodies on the 303(d) List. These water bodies on the 303(d) List may be re-evaluated and placed into Category 4b or Category 4c in the Integrated Report. The water bodies placed in Category 4b or Category 4c in the Integrated Report must show a record that the water bodies are attaining water quality standards or supporting the identified beneficial uses, or will attain water quality standards or support identified beneficial uses in a reasonable period of time, in order for the water bodies to be appropriately removed from the 303(d) List.

C. Action Levels

Purpose: Provision C includes requirements for the Copermittees to identify and include numeric action levels in the Water Quality Improvement Plan to direct and focus the Copermittees' jurisdictional runoff management program implementation efforts for controlling MS4 discharges to receiving waters.

***Discussion*:** Under Provision C, the numeric action levels required are for non-storm water discharges and storm water discharges. The non-storm water action levels (NALs) are applicable to non-storm water discharges from the Copermittees' MS4s, which can occur year-round. The storm water action levels (SALs) are applicable to storm water discharges from the Copermittees' MS4s, which occur during the rainy season defined as the period between October 1 and April 30.

The action levels required by Provision C are based on the action level requirements that were developed and incorporated into Order Nos. R9-2009-0002 and R9-2010-0016, the Orange County and Riverside County MS4 Permits, respectively. The Fact Sheets for these Orders provide detailed discussions about the development of the numeric NALs and SALs included in this Order.

Order Nos. R9-2009-0002 and R9-2010-0016 required the Copermittees to perform prescribed actions if the NALs or SALs are exceeded. The actions required under Order Nos. R9-2009-0002 and R9-2010-0016 generally included conducting additional monitoring and source investigations when a discharge from the MS4 is observed to exceed one or more NALs and/or SALs.

For this Order, however, the action levels of Provision C are to be used by the Copermittees to prioritize the actions to be implemented as part of the Water Quality Improvement Plan. Monitoring data collected by the Copermittees from MS4 outfalls will be compared with the NALs and SALs. Exceedances of the NALs and SALs will not require the Copermittees to immediately identify sources causing exceedances, but will provide some numeric indicator levels that can give the Copermittees a way to measure the relative severity of a pollutant contributing to receiving water quality impacts.

NALs and SALs must be included in the Water Quality Improvement Plans to be used by the Copermittees in directing and focusing their water quality improvement strategies. The Copermittees are expected to utilize the NALs and SALs to help focus their implementation efforts on addressing pollutants that have the most significant potential or observed impacts to receiving waters. The NALs and SALs will be used as part of the MS4 discharges assessments required under Provision D.4.b. The NALs and SALs may also be used by the Copermittees as the numeric goals to be achieved in MS4 discharges and/or receiving waters as the Water Quality Improvement Plans are implemented.

More specific and detailed discussions of the requirements of Provision C are provided below.

Provision C.1 (Non-storm Water Action Levels) requires the Copermittees to incorporate NALs into the Water Quality Improvement Plan for pollutants and/or constituents that are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions identified in the Water Quality Improvement Plan related to non-storm water discharges from the MS4s. NALs generally must be consistent with the water quality objectives found within the Basin Plan.

The NALs have been included to ensure that the Copermittees are implementing and complying with several requirements of the MS4 permit. The federal CWA requires permits for municipal storm sewer systems to "*effectively prohibit non-storm water discharges into the storm sewers*." The federal NPDES regulations, which were promulgated to implement the CWA requirements for discharges from municipal storm sewers, require a program to address illicit discharges, which are non-storm water discharges. Provision A.1.b prohibits "*[n]on-storm water discharges into MS4s*" unless the non-storm water discharge authorized by a separate NPDES permit. The NALs will be used as part of the illicit discharge detection and elimination program required pursuant to Provision E.2, as well as part of the MS4 discharges assessments required pursuant to Provision D.4.b.

Provision A.1.a prohibits non-storm water discharges from the MS4 from "*causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state.*" In addition, pursuant to Provision A.2.a, non-storm water discharges "*must not cause or contribute to the violation of water quality standards in any receiving waters*."

Ideally, the Copermittees' jurisdictional runoff management programs will eliminate all non-storm water discharges entering the MS4s within their jurisdictions. The complete elimination of non-storm water discharges to the Copermittees' MS4s would be in compliance with the CWA requirements for non-storm water discharges, as well as the prohibitions and limitations of Provisions A.1.a and A.2.a.

The federal regulations, however, also refer to several non-storm water discharge categories that must be addressed as illicit discharges if they are found to be a source of pollutants. The federal regulations thus identify some non-storm water discharges that are not required to be addressed as illicit discharges if they are not a source of pollutants (e.g. non-storm water discharges specified in Provisions E.2.a.(1)-(5)). Thus, these regulations imply that some non-storm water discharges into and from the MS4 may occur even if non-storm water discharges are "effectively" prohibited by the Copermittees.

If the source of a non-storm water discharge is identified as a category of non-storm water specified in Provisions E.2.a.(1)-(5), the NALs can be used to determine the category of non-storm water discharges is a source of pollutants. For other non-storm water discharges not specified in Provisions E.2.a.(1)-(5), the CWA requires those discharges to be "*effectively"* prohibited by removing the discharge to the MS4 through enforcement of the Copermittees' legal authority established under "*ordinance, order or similar means*" to prohibit illicit discharges to the MS4s.

If there are non-storm water discharges that are not required to be addressed as illicit discharges, those discharges must comply, at a minimum, with the discharge prohibitions and receiving water limitations of Provision A. Thus, the non-storm water discharges from the MS4 must be at levels that will not cause or contribute to a condition of pollution, contamination, or nuisance (Provision A.1.a), and must not cause or contribute to a violation of water quality standards in receiving waters (Provision A.2.a) to be consistent with the discharge prohibitions and receiving water limitations of Provisions A.1.a and A.2.a.

Furthermore, the San Diego Region has predominantly intermittent and ephemeral rivers and streams which vary in flow volume and duration at spatial and temporal scales. For most of these river and stream systems, non-storm water discharges from the MS4 are likely to be the most significant or the only source contributing to surface flows present within the receiving water, especially during the dry season.

Therefore, because of the prohibitions and limitations of Provision A.1.a and A.2.a, and the likelihood that non-storm water discharges from the MS4 are the most significant or only source contributing to surface flows present within the receiving water, NALs generally must be consistent with the water quality objectives found within the Basin Plan. Non-storm water discharges that are meeting the NALs would not be expected to cause or contribute to an exceedance of water quality objectives in receiving waters, which would be consistent with the discharge prohibitions and receiving water limitations of Provisions A.1.a and A.2.a.

Exceedances of the NALs would then provide an indication of the relative severity of a pollutant in non-storm water discharges from the MS4 contributing to potential or observed receiving water quality impacts. The relative severity or significance of a pollutant in non-storm water discharges from the MS4 will provide the Copermittees a valuable source of information that can be used to identify priority water quality conditions within a Watershed Management Area and within each Copermittee's jurisdiction.

Tables C-1 through C-4 under Provision C.1.a specify numeric NALs for several parameters or pollutant constituents for non-storm water discharges from the MS4 to several water body types. The NALs for MS4 discharges given under Provision C.1.a are based on the water quality objectives for inland surface waters in the Basin Plan, and the water quality objectives for ocean waters in the Ocean Plan. The NALs for

most of the metals were calculated based on the State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP). The NALs provided in Tables C-1 through C-4 must be included in the Water Quality Improvement Plans required to be developed pursuant to Provision B.

Provision C.1.b requires the Copermittees to identify NALs for pollutants and/or constituents, not specified in Provision C.1.a, which are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions of the Watershed Management Area related to non-storm water discharges from the MS4s. The NALs must be based on the water quality objectives in the Basin Plan. The NALs identified under Provision C.1.b must be included in the Water Quality Improvement Plan.

The San Diego Water Board recognizes that some of the NALs required pursuant to Provisions C.1.a and C.1.b may be exceeded more frequently than not. Thus, Provision C.1.c has been included in the Order to provide the Copermittees the option to develop secondary NALs that are set at levels greater than the levels required pursuant to Provisions C.1.a and C.1.b to further refine the prioritization and assessment of water quality improvement strategies for addressing non-storm water discharges to and from the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and from the MS4.

Provision C.2 (Storm Water Action Levels) requires the Copermittees to incorporate SALs into the Water Quality Improvement Plan for pollutants and/or constituents causing or contributing, or may be causing or contributing, to the highest priority water quality conditions identified in the Water Quality Improvement Plan related to storm water discharges from the MS4s.

The SALs have been included to ensure that the Copermittees are implementing and complying with several requirements of the MS4 permit. Provision A.1.a prohibits storm water discharges from the MS4 from "*causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state.*" In addition, pursuant to Provision A.2.a, storm water discharges "*must not cause or contribute to the violation of water quality standards in any receiving waters*."

Provision A.3.a, however, implicitly acknowledges that compliance with Provisions A.1.a and A.2.a cannot be achieved immediately for discharges of storm water from the MS4 by applying the MEP standard. Thus, Provision A.4 requires the Copermittees to implement an iterative approach to demonstrate that MEP is being achieved. This approach is supported by USEPA.

The federal CWA requires permits for municipal storm sewer systems to "*require controls to reduce the discharge of pollutants [in storm water] to the maximum extent*

practicable, *including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants.*" MEP is an ever-evolving, flexible, and advancing concept. As knowledge about controlling storm water runoff and discharges evolves, so does the knowledge which constitutes MEP. Reducing the discharge of storm water pollutants from the MS4 to the MEP requires the Copermittees to assess their jurisdictional runoff management programs and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP. The SALs provide the Copermittees measureable goals that may be used to demonstrate the achievement of MEP for reducing pollutants in storm water discharges from the MS4. The SALs will be used as part of the MS4 discharges assessments required under Provision D.4.a.

In June of 2006, the State Water Board's Blue Ribbon Storm Water Panel released its report titled "*The Feasibility of Numerical Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities*." In the recommendations, the Blue Ribbon panel proposed storm water effluent limitations which are computed using statistical based population approaches. The SALs specified in Table C-5 under Provision C.2.a were developed from a regional subset of nationwide Phase I MS4 data by using USEPA Rain Zone 6 (arid west) data.[28] Additionally, utilization of regional data is appropriate due to the addition of data into the nationwide Phase I MS4 monitoring dataset in February 2008. This additional data increased the number of USEPA Rain Zone 6 samples to more than 400, and included additional monitoring events within Southern California.

Utilizing data from USEPA Rain Zone 6 resulted in SALs which closely reflect the environmental conditions experienced in the San Diego Region. The localized subset of data includes sampling events from multiple Southern California locations including Orange, San Diego, Riverside, Los Angeles, and San Bernardino Counties. The dataset includes samples taken from highly built-out impervious areas and from storm events representative of Southern California conditions.

The SALs for cadmium, copper, lead and zinc require the measurement of hardness and to provide more specificity in the assessment of samples with SALs for total metal concentrations. While USEPA Rain Zone 6 data include a large sample size for concentrations of total metals, the impact the concentration will have on receiving waters will vary with receiving water hardness. Since it is the goal of the SALs, through the iterative process and MEP standard, to have MS4 storm water discharges meet all applicable water quality objectives, the hardness of the receiving water should be used when assessing the total metal concentration of a sample.

Thus, when there is an exceedance of a SAL for a metal, the Copermittee must determine if that exceedance is above the existing applicable water quality objectives

[28] Data used to develop SAL were obtained from http://rpitt.eng.ua.edu/Research/ms4/mainms4.shtml

based upon the hardness of the receiving water. The water quality objectives Copermittees must use to assess total metal SAL exceedances are the California Toxic Rule (CTR) and USEPA National Recommended Water Quality Criteria for Freshwater Aquatic Life 1 hour maximum concentrations. The 1 hour maximum concentration is to be used for comparison since it is expected to most replicate the impacts to waters of the State from the first flush following a precipitation event.

The statistically calculated SALs given in Table C-5 are at levels greater than the water quality objectives in the Basin Plan or Ocean Plan. Because the objective of the CWA is to "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*", meaning eventually pollutants in storm water discharges must be reduced to a level that cannot cause or contribute to an exceedance of water quality objectives in receiving waters, over time the SALs are expected to be reduced to a level that is based on the water quality objectives rather than statistical calculations. The San Diego Water Board will review the SALs as more data for discharges of storm water from the MS4s are collected, and revise them as conditions improve and the MEP standard advances. For the Water Quality Improvement Plans required under this Order, the SALs identified under Provision C.2.a must be included.

Provision C.2.b requires the Copermittees to identify SALs for pollutants and/or constituents, not specified in Provision C.2.a, which are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions of the Watershed Management Area related to storm water discharges from the MS4s. The SALs identified under Provision C.2.b must be included in the Water Quality Improvement Plan.

The San Diego Water Board recognizes that some of the SALs required pursuant to Provisions C.2.a and C.2.b may be exceeded more frequently than not. Thus, Provision C.2.c has been included in the Order to provide the Copermittees the option to develop secondary SALs that are set at levels greater than the levels required pursuant to Provisions C.2.a and C.2.b to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s.

D. Monitoring and Assessment Program Requirements

Purpose: Provision D includes minimum monitoring and assessment requirements that must be developed and implemented by the Copermittees as part of the Water Quality Improvement Plans. Implementation of the monitoring and assessment requirements of Provision D will allow the Copermittees to demonstrate that the requirements of the CWA to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP are being achieved. Implementation of the monitoring and assessment requirements of Provision D will also allow the Copermittees and the San Diego Water Board to track improvements to the water quality in the San Diego Region. The monitoring and assessment program requirements are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order.

***Discussion*:** The San Diego Water Board recognized that changes to the monitoring and assessment requirements of the Fourth Term Permit were necessary to improve the usefulness and usability of monitoring data collected by the Copermittees to support their jurisdictional storm water programs more efficiently and with increased effectiveness. The data collected are needed to better inform the Copermittees' understanding of the physical, chemical, and biological condition of the receiving waters and the quality of the MS4 discharges. The monitoring program needs to provide opportunities for the Copermittees to integrate regional monitoring efforts into municipal storm water monitoring requirements to provide a cost-effective approach to monitoring and avoid duplication of efforts.

The requirements in Provision D were largely recommended by the Copermittees as an outcome of the San Diego Water Boards Focused Meeting process. The monitoring and assessment program requirements now require collection of more specific information necessary for each Copermittee to adapt its jurisdictional runoff management program in such a way that focuses resources on a watershed's highest priority water quality conditions. The monitoring and assessment program will require the Copermittees to collect data that can be utilized to answer both watershed level management questions (e.g. Are the chemical, physical, and biological conditions of a receiving water protective, or likely protective of beneficial uses?), and specific jurisdictional runoff management program activity questions (e.g. Are the water quality improvement strategies of the jurisdictional program effectively eliminating non-storm water discharges to the MS4?).

The monitoring data collected and assessment information that will be reported to the San Diego Water Board are necessary to determine if the Copermittees are complying with the prohibitions and limitations of Provision A. The required monitoring and assessments that must be reported to the San Diego Water Board will be utilized for three purposes:

(1) Inform the Copermittees, San Diego Water Board, and the public on the progress of the Copermittees' efforts to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP;

(2) Inform the Copermittees, San Diego Water Board, and the public on the condition of water bodies receiving discharges from the Copermittees' MS4, and the progress of the Copermittees' water quality improvement implementation efforts toward improving the receiving water quality; and

(3) Inform the Copermittees, the San Diego Water Board, and the public on the effectiveness of the Water Quality Improvement Plan toward achieving (1) and (2).

The monitoring and assessment information reported pursuant to Provision F is also expected to be key to the iterative approach and adaptive management process required under Provision A.4 and implemented through the Water Quality Improvement Plan required under Provision B. As required by Provision A.4, the iterative approach and adaptive management process is required if the Copermittees cannot meet the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c, and/or A.2.a under the present conditions.

Provision D provides the minimum monitoring and assessment requirements that must be included in each Water Quality Improvement Plan to be developed and implemented by the Copermittees. The Copermittees, however, are not limited to the requirements of Provision D and may include additional methods to track progress toward improving water quality in a Watershed Management Area.

More specific and detailed discussions of the requirements of Provision D are provided below.

Provision D.1 (Receiving Water Monitoring Requirements) specifies the minimum receiving water monitoring that the Copermittees must conduct within the Watershed Management Area and include as part of the Water Quality Improvement Plan.

Provision D.1 establishes minimum monitoring requirements that must be conducted by the Copermittees within each Watershed Management Area. Provision D.1 requires the Copermittees to collect and develop the data and information necessary to determine potential impacts to the beneficial uses in the receiving waters due to discharges from the MS4s. The monitoring required under Provision D.1 will also provide the data that will allow the Copermittees to gauge the effectiveness and progress of its Water Quality Improvement Plan implementation efforts toward improving the quality of receiving waters.

The receiving water monitoring requirements of Provision D.1 are focused primarily on monitoring the conditions and response of the receiving waters to the Copermittees' collective implementation efforts to reduce receiving water impacts that may be caused by the discharges from the MS4s. The preference of the San Diego Water Board is for the Copermittees to spend their resources achieving tangible and observable improvements in receiving water conditions instead of collecting samples and analyzing data that has consistently indicated that receiving water conditions are degraded and require improvement. In general, the ability to measure potential improvements in receiving water conditions due to any actions implemented by the Copermittees as part of the Water Quality Improvement Plan may require several years before a response can be observed. Thus, the frequency of collecting receiving water monitoring data has been kept to a minimum.

During the transitional period between adoption of this Order and San Diego Water Board acceptance of a Water Quality Improvement Plan, the Copermittees must conduct receiving water monitoring in accordance with Provision D.1.a. This approach to collecting receiving water data is different from what was required in the Fourth Term Permits, but one that truly embraces the concept of an integrated, cost-effective, streamlined receiving water monitoring approach.

Provision D.1.a requires Copermittees to continue performing the receiving water monitoring programs required in Order Nos. R-2007-0001, R9-2009-002, and R9-2010-0016; plus participation in: hydromodification management plan monitoring approved by the San Diego Water Board, monitoring plans as part of load reduction plans (either Bacteria Load Reduction Plans or Comprehensive Load Reduction Plans) for TMDLs in Attachment E of the Order, Storm Water Monitoring Coalition Regional Monitoring, Southern California Bight Regional Monitoring, Sediment Quality Monitoring, and ASBS Monitoring as applicable to a Watershed Management Area.

Provision D.1.a also provides an opportunity for the Copermittees to use third party data to meet receiving water monitoring requirements where feasible. Allowing the Copermittees to use the data currently collected through its participation in existing regional receiving water programs and that of third parties provides an efficiency of resources in obtaining the data necessary to inform the Copermittees and the San Diego Water Board about the physical, chemical, and biological conditions of the receiving waters, which can also help to focus the receiving water monitoring during the implementation of the Water Quality Improvement Plan. Once a Water Quality Improvement Plan is developed for a Watershed Management Area in compliance with Provision B of this Order, the transitional period is over and Copermittees are required to conduct receiving water monitoring according to the requirements of Provisions D.1.b-e.

Provision D.1.b requires each Copermittee to identify at least one long term receiving water monitoring station to be representative of receiving water quality within each Watershed Management Area. Long term receiving water monitoring stations can be

located at any existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees. The requirements under Provision D.1.b. are consistent with 40 CFR 122.26(d)(2)(iii)(D), which specifies that a "*monitoring program for representative data collection for the term of the permit*" may include "*instream locations.*" For each Watershed Management Area, at least one long term watershed monitoring station is required to be established and monitored. The Copermittees may choose to establish additional long term monitoring stations where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

Provision D.1.b. requires the Copermittees to locate the long term receiving water monitoring station at one of these existing receiving water monitoring stations to provide the Copermittees an opportunity to experience monitoring cost savings while continuing to collect the necessary data to assess the status and trends of receiving water quality conditions in 1) coastal water, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under both dry weather and wet weather conditions. Ideally these stations will continue to be monitored as part of the receiving water monitoring for each Watershed Management Area to maintain a consistent set of locations and a period of data that can be built upon with the monitoring required under this Order.

The receiving water monitoring requirements are separated into monitoring required during dry weather conditions pursuant to Provision D.1.c, and wet weather conditions pursuant to Provision D.1.d.

At each long term monitoring station the Copermittees must conduct at least three dry weather monitoring events as required pursuant to Provision D.1.c and at least three wet weather monitoring events as required pursuant to Provision D.1.d per permit term. Provisions D.1.c and D.1.d require the Copermittees to monitor priority water quality conditions identified in the Water Quality Improvement Plan, constituents listed as causing impairment of receiving waters in the Watershed Management Area, applicable NALs, toxicity, constituents listed in Tables D-2 and D-3, and constituents for implementation plans (e.g. Bacteria Load Reduction Plans and Comprehensive Load Reduction Plans). Required toxicity monitoring was changed to reflect an updated understanding of the unique challenges associated with sampling storm water for toxicity. Copermittees are required to sample storm water for toxicity during each dry weather and each wet weather event pursuant to Provision D.1.c.(4) and D.1.d.(4). Required toxicity monitoring is now consistent with the State Water Resources Control Board Policy for Toxicity Assessment and Control (Draft June 2012) and recently adopted MS4 permits for Caltrans and Los Angeles Water Board. Receiving water monitoring efforts in this Order have been streamlined to redirect resources to monitoring efforts that better support pollutant reduction solutions with an increasing emphasis on MS4 outfall monitoring, source identification and source abatement activities.

In addition to the receiving water monitoring requirements under Provisions D.1.b-d, Provision D.1.e requires the Copermittees participate in and/or conduct other types of receiving water monitoring. As recommended and requested by the Copermittees, Provision D.1.e.(1) requires the Copermittees to participate in existing regional monitoring, as applicable to each Watershed Management Area. Existing regional monitoring includes monitoring conducted by the Storm Water Monitoring Coalition and for the Southern California Bight. Participation in and use of monitoring data collected from these existing regional water quality monitoring programs provide the Copermittees a greater opportunity for efficiency in the use of their resources to manage their storm water programs and those controllable discharges under their authority. Provision D.1.e.(1)(c) requires the south Orange County MS4 Copermittees to participate in "unified regional beach water quality monitoring." This monitoring replaces requirements to conduct "core monitoring" of beach water quality, as provided for in Appendix III of the 2012 California Ocean Plan.

Several different public agencies currently conduct routine, ongoing beach water quality monitoring in south Orange County in accordance with several different sets of requirements. The monitoring programs implemented to meet those requirements overlap temporally and spatially. These monitoring programs are partially but not fully integrated. In November 2010, the State Water Board adopted Resolution No. 2010-0053, which directed regional water boards to work with dischargers to modify beach water quality monitoring programs required by regional board-issued permits in order to eliminate redundancies and incorporate beach water quality monitoring required by beach water quality statutes, where appropriate.

In April 2012, the San Diego Water Board requested that its staff review beach water quality monitoring conducted in south Orange County. To assist in responding to that request, staff of the Board convened a workgroup that included representatives of the three public agencies that currently conduct almost all of the routine, ongoing beach water quality monitoring in south Orange County, i.e., South Orange County Wastewater Authority (SOCWA), Orange County Public Works, and Orange County Health Care Agency (OCHCA). The workgroup also included other interested parties, including representatives of the Sierra Club and Surfrider Foundation. In December 2012, the San Diego Water Board adopted Resolution No. R9-2012-0069, which endorsed the San Diego Water Board staff report entitled "A Framework for Monitoring and Assessment in the San Diego Region," dated November 2012.

The unified program is consistent with and will meet or exceed the minimum requirements for beach water quality monitoring and related public notification and reporting established by State law, including the California Ocean Plan. The unified program is consistent with State Water Board Resolution No. 2010-0053. The unified program is also consistent with and will help implement, "A Framework for Monitoring and Assessment in the San Diego Region," which emphasizes the need for question-driven, beneficial use-oriented monitoring and assessment. The primary purpose of

the unified program will be to answer the question "Does beach water quality meet standards for the beneficial use of water contact recreation?"

The unified program is intended to be protective; it will help protect the health of swimmers, surfers, and others who use south Orange County beach waters for water contact recreational activities. The unified program is also intended to be reasonable; it will eliminate duplicative monitoring and will include triggers for public notification and additional sampling at all sampling stations year-round. The unified program is intended to be equitable; responsibility for implementation of the unified program will be shared and the responsible agencies will jointly make arrangements to implement the program and will have the flexibility to jointly make short and/or long term changes in those arrangements.

The San Diego Water Board Executive Officer issued a written directive on December 5, 2014, pursuant to California Water Code section 13383, for SOCWA and the south Orange County MS4 Copermittees to implement the unified program in cooperation with OCHCA. The Executive Officer may make revisions to the unified program, provided that the unified program, as revised, continues to be consistent with and meet the requirements of State law, including the California Ocean Plan, for beach water quality monitoring and related public notification and reporting. Following a thirty day public comment period, and subject to a request for a hearing before the San Diego Water Board, any such revision shall take effect as specified in a written directive issued by the Executive Officer pursuant to California Water Code sections 13383. The program and any Executive Officer issued revisions to the program are subject to California Water Code section 13320 right of review from the date of issuance.

The unified program will supersede the existing routine, ongoing, beach water quality monitoring programs in south Orange County that are conducted in accordance with the existing requirements of the NPDES permits for discharges from the SOCWA ocean outfalls and the south Orange County MS4s. The requirement to participate in "regional monitoring" of beach water quality replaces requirements to conduct "core monitoring" of beach water quality, as provided for in Appendix III of the 2012 California Ocean Plan.

The State Water Resources Control Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part 1 Sediment Quality which became effective August 25, 2009 (Sediment Quality Monitoring Policy). Provision D.1.e.(2) requires any Copermittees with MS4 discharges to an enclosed bay or estuary to monitoring the sediments in the enclosed bay or estuary receiving water in accordance with the sediment quality monitoring procedures as prescribed in the Sediment Quality Monitoring Policy.

The State Water Board adopted Resolution No. 2012-0012 which approved exceptions to the California Ocean Plan for selected discharges into Areas of Special Biological

Significance (ASBS), including special protections for beneficial uses. State Board Resolution No. 2012-0012 became effective on March 20, 2012, and Attachment B to the Resolution established limitations on point source storm water discharges to ASBS. Copermittees with MS4s that discharge to an ASBS must monitor its discharge to assure compliance with State Board Resolution No. 2012-0012 as required pursuant to Provision D.1.e.(3).

The San Diego Water Board is currently developing a regional monitoring strategy to assess the conditions of receiving waters in the San Diego Region. The monitoring requirements of Provision D.1 are expected to be incorporated or serve as a foundation of this regional monitoring strategy, but may require some modifications. When the San Diego Water Board develops an alternative regional monitoring strategy, the Copermittees will be required to participate in the development and implementation of the alternative regional monitoring program pursuant to Provision D.1.f.

Provision D.2 (MS4 Outfall Discharge Monitoring Requirements) specifies the minimum MS4 outfall discharge monitoring requirements that the Copermittees must incorporate and implement as part of the Water Quality Improvement Plan.

The dry weather MS4 outfall discharge monitoring requirements are included under Provisions D.2.a.(2) and D.2.b. The dry weather MS4 outfall discharge monitoring requirements are part of the "*program, including a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer*" required by 40 CFR 122.26(d)(2)(iv)(B), which is expected to achieve compliance with the CWA section 402(p)(3)(B)(ii) statutory requirement for municipal storm water permits to require the Copermittees to "*effectively prohibit non-storm water discharges into the storm sewers*." The dry weather MS4 outfall discharge monitoring data collection requirements are based on requirements under 40 CFR 122.26(d)(1)(iv)(D) and 122.26(d)(2)(iv)(B)(3).

The dry weather MS4 outfall discharge monitoring requirements are designed to provide wide spatial and temporal coverage of each jurisdiction to better understand the extent and magnitude of non-storm water discharges to receiving waters, and make a distinction between persistent and transient non-storm water flows. This information is expected to allow each Copermittee to focus its resources on eliminating and controlling the highest priority threats to receiving water quality, as well as integrating other elements of the storm water programs (e.g. complaint call response) and third party data to efficiently and effectively assist in efforts to eliminate non-storm water discharges.

The dry weather MS4 outfall discharge monitoring requirements of Provision D.2.a.(2) and D.2.b are separated into monitoring required before and after the San Diego Water Board accepts the Copermittees' Water Quality Improvement Plan. Outfall

monitoring conducted prior to acceptance of the Water Quality Improvement Plan is referred to in the Order as Transitional MS4 Outfall Discharge Monitoring. Provision D.2.a.(2) includes the transitional dry weather MS4 outfall discharge monitoring requirements.

The requirements under Provision D.2.a.(2) are based on the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B), which include the requirements for a monitoring program to identify, detect, and eliminate illicit connections and illegal discharges to the MS4s. The federal regulations (40 CFR 122.26(d)(1)(iv)(D)) require the monitoring program to include "*a field screening analysis for illicit connections and illegal dumping [that]…[a]t a minimum, include[s] a narrative description, for either each field screening point or major outfall, of visual observations made during dry weather periods.*" The federal regulations (40 CFR 122.26(d)(1)(v)(B)) require the monitoring program to include "*inspection procedures and methods for detecting and preventing illicit discharges, and describe areas where this program has been implemented.*" Furthermore, the monitoring program is required by federal regulations (40 CFR 122.26(d)(2)(iv)(B)) to include "*a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer.*"

Dry weather transitional MS4 outfall discharge monitoring requires each Copermittee to field screen (inspect) its major MS4 outfalls to classify the MS4 outfall locations as having persistent dry weather flows, transient dry weather flows, or no dry weather flows. To account for the variance in size of the 39 jurisdictions covered under this Order, the Copermittees recommended a tiered approach to the number of major MS4 outfalls that must be inspected. Provision D.2.a.(2)(a) provides a tiered approach to the number of major MS4 outfalls that must be visually inspected per jurisdiction as well as a minimum frequency each Copermittee must inspect each major MS4 outfall per year. This tiered approach is based on the total number of major MS4 outfalls within a Copermittees jurisdiction within each Watershed Management Area.

Based on the field screening, each Copermittee is required to make a determination whether any observed flowing, pooled, or ponded waters are transient or persistent flows. Based on this field screening information, other jurisdictional program information, and third party information, each Copermittee is required to prioritize the MS4 outfalls within its jurisdiction for follow up investigation and elimination of the non-storm water discharge, as part of its illicit discharge detection and elimination program required pursuant to Provision E.2. In accordance with the requirements of Provision E.2, each Copermittee is required to immediately investigate obvious illicit discharges (e.g. outfall discharges with unusual color, unusual odor, or high flows).

This approach allows a Copermittee to use all of its resources, as well as leverage resources and information provided by third parties, to effectively eliminate non-storm water discharges from its MS4 outfalls. If the source of the non-storm water discharge cannot be immediately eliminated, the Copermittee uses the persistent flow or

transient flow classification along with other programmatic implementation data to prioritize the MS4 outfalls for future investigation. In accordance with the adaptive management approach deployed throughout this Order, Provision D.2.a.(2)(c) requires each Copermittee to update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow. The requirement of Provision D.2.a.(2)(c) assures that each Copermittee is collecting data that can be used to demonstrate compliance with the CWA requirement that each Copermittee must implement a program to "*effectively prohibit non-storm water discharges into the [MS4]*" and with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

Provision D.2.b describes the dry weather MS4 outfall discharge monitoring required to be incorporated and implemented as part of the Water Quality Improvement Plan. Dry weather MS4 outfall discharge monitoring must be performed by each Copermittee to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. The emphasis of the dry weather MS4 outfall discharge monitoring required pursuant to Provision D.2.b is consistent with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

Provision D.2.b.(1) requires each Copermittee to continue field screening its major MS4 outfalls and identifying those with persistent flows and transient flows, as conducted during the transitional period (i.e. before the Water Quality Improvement Plan was developed). However, each Copermittee now has the flexibility to adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of non-storm water persistent flow discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan. In order to ensure a minimum number of outfalls are inspected, Provision D.2.b.(1) requires the number of visual inspections be equal to the number of visual inspections required in the tiered inspection program pursuant to Provision D.2.a.(2)(a).

Provision D.2.b.(2)(b) requires each Copermittee to monitor a minimum of 5 major MS4 outfalls with persistent flows identified as the highest priorities within a Copermittee's jurisdiction, within each Watershed Management Area. In other words, Copermittees located in more than one Watershed Management Area must identify at least 5 major MS4 outfalls with persistent flows in its jurisdiction in each Watershed Management Area. If a Copermittee is located in more than one Watershed Management Area, and they have less than 5 major MS4 outfalls with persistent flows per jurisdictional area per Watershed Management Area, all of the major MS4 outfalls must be identified as high priority dry weather persistent flow MS4 outfalls. The Copermittees identified as Responsible Copermittees by a TMDL in Attachment E of

the Order may need to monitor more than 5 dry weather major MS4 outfall locations to determine compliance with the requirements of the TMDL(s).

Monitoring must occur at the highest priority outfall locations at least semi-annually until the non-storm water discharges have been eliminated for three consecutive dry weather monitoring events; identified to be authorized by a separate NPDES Permit; or reprioritized to a lower priority. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized MS4 major outfall in the Copermittee's jurisdiction within the Watershed Management Area, unless there are no remaining qualifying major MS4 outfalls within the Copermittees jurisdiction. The Copermittees must continually update their dry weather persistent flow MS4 outfall discharge monitoring locations with the next highest priority non-storm water flow that have yet to be eliminated until all persistent and transient flows are eliminated or its threat reduced.

Non-storm water persistent flow MS4 outfall discharge monitoring data collected during each semi-annual monitoring event, must be collected and analyzed according to the requirements of Provision D.2.b.(2)(b)–(e). These monitoring requirements are consistent with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

The wet weather MS4 outfall discharge monitoring requirements are included under Provisions D.2.a.(3) and D.2.c. The wet weather MS4 outfall discharge monitoring requirements are necessary for the Copermittees to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable, using management practices, control techniques and system, design and engineering methods, and such other provisions which are appropriate*" required by 40CFR 122.26(d)(2)(iv), which is expected to achieve compliance with the CWA section 402(p)(3)(B)(iii) statutory requirement for municipal storm water permits to require "*controls to reduce the discharge of pollutants [in storm water] to the maximum extent practicable*." The wet weather MS4 outfall discharge monitoring data collection requirements are based on requirements under 40 CFR 122.26(d)(2)(iii), 122.26(d)(2)(iii)(A) and 122.26(d)(2)(iii)(A)(1)-(4), and 40 CFR 122.21(g)(7)(i)-(ii).

The wet weather MS4 outfall discharge monitoring requirements of Provision D.2.a.(3) and D.2.c are separated into monitoring required before and after the San Diego Water Board accepts the Copermittees' Water Quality Improvement Plan. Outfall monitoring conducted prior to acceptance of the Water Quality Improvement Plan is referred to in the Order as Transitional MS4 Outfall Discharge Monitoring. Provision D.2.a.(3) includes the transitional wet weather MS4 outfall discharge monitoring requirements.

Until the wet weather MS4 outfall discharge monitoring requirements of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board, the Copermittees must comply with the requirements of

transitional wet weather MS4 outfall monitoring requirements pursuant to Provision D.2.a.(3). Provision D.2.a.(3) requires the Copermittees in each Watershed Management Area to sample, at least five of the major MS4 outfalls inventoried pursuant to Provision D.2.a.(1) once per wet season for the monitoring data required to be collected pursuant to Provision D.2.a.(3)(c)-(e). Provision D.2.a.(3) further requires at least one major MS4 outfall monitoring station be located in each Copermittee's jurisdiction within the Watershed Management Area.

At a minimum, the five sampling locations chosen must be representative of storm water discharges from residential, commercial, industrial, and typical mixed-use land uses present within a Watershed Management Area. The San Diego Water Board expects the Copermittees to extrapolate from these data to similar land uses throughout the Watershed Management Area to better inform the Water Quality Improvement Plan development process by prioritizing drainages for implementation of storm water control efforts required pursuant to Provision E.

Provision D.2.c describes the wet weather MS4 outfall discharge monitoring required to be included and implemented as part of the Water Quality Improvement Plan. Provision D.2.c provides the Copermittees the flexibility to adjust the wet weather MS4 outfall discharge monitoring locations and frequencies in the Watershed Management Area, as needed, to identify sources of pollutants in storm water discharges from MS4s in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan.

Although Provision D.2.c.(1) allows the Copermittees to adaptively manage the wet weather MS4 outfall discharge monitoring locations and frequencies, the provision requires a minimum of at least five wet weather outfall stations to be monitored. Provision D.2.c.(2) further allows the Copermittees to modify the monitoring frequency at each wet weather MS4 outfall station to meet the goals of the Water Quality Improvement Plan as long as the monitoring frequency occurs at least once per year and is at an appropriate frequency to identify sources of pollutants in storm water discharges, guide pollutant source identification efforts, or determine compliance with the requirements of the applicable TMDLs in Attachment E to the Order.

The wet weather MS4 outfall discharge monitoring requirements of Provisions D.2.c.(3) and D.2.c.(4) are the same as the transitional wet weather MS4 outfall discharge monitoring. In contrast, the requirements of Provision D.2.c.(5) are focused on collecting analytical data specific to the highest priority water quality conditions in the Watershed Management Area identified in the Water Quality Improvement Plan. The wet weather MS4 outfall discharge monitoring data collection requirements are consistent with the requirements under 40 CFR 122.26(d)(2)(iii), 122.26(d)(2)(iii)(A) and 122.26(d)(2)(iii)(A)(1)-(4), and 40 CFR 122.21(g)(7)(i)-(ii).

Provision D.3 (Special Studies) requires the Copermittees to develop special studies that will be conducted for each Watershed Management Area and the entire San

Diego Region. Data collected pursuant to Provision D.3 is to be used by the Copermittees to improve the effectiveness of the strategies implemented by the jurisdictional runoff management programs toward achieving the numeric goals identified in the Water Quality Improvement Plans and ultimately achieve compliance with the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c, and A.2.a, which is consistent with the requirements of Provision A.4.

Special studies are often necessary to fill data gaps or provide more refined information that allow the Copermittees to better manage the generation or elimination of pollutants and discharges to and from the MS4. In the Fourth Term Permits, the Copermittees have been required to implement special studies as directed by the San Diego Water Board. The special studies required by this Order provide the Copermittees more flexibility to identify and implement special studies that will be most useful to improving the effectiveness of their jurisdictional runoff management programs.

Provision D.3.a.(1) requires the Copermittees to develop and conduct at least two special studies per Watershed Management Area, to be determined by the Copermittees. One of the two special studies may be accomplished through participation in a Regional Special Study required under Provision D.3.a.(2). The requirements provide the Copermittees great latitude in identifying and developing the special studies. Watershed Management Area special studies are required, at a minimum, to: (a) relate in some way to the highest water quality priorities identified by the Copermittees in the Water Quality Improvement Plan, (b) be conducted within the Watershed Management Area, and (c) include some form of participation (e.g. contribution of funds, personnel services, project management) by all the responsible Copermittees within the Watershed Management Area.

Examples of Watershed Management Area special studies might include, but are not limited to: (1) focused pollutant source identification studies, (2) BMP effectiveness and/or comparison studies, (3) pilot tests for new or emerging pollutant control methods, (4) receiving water pollutant or stressor source identification and/or mitigation studies, or (5) pollutant fate and transport studies. The Watershed Management Area special studies are expected to provide data that can be utilized by the Copermittees to improve the Water Quality Improvement Plan or implementation of the Copermittees' jurisdictional runoff management programs to address the highest priority water quality conditions.

Provision D.3.a.(2) requires the Copermittees to develop at least one special study that will be conducted for the entire San Diego region. The regional special study is expected to provide data that can be utilized by the Copermittees to improve the Water Quality Improvement Plan or implementation of the Copermittees' jurisdictional runoff management programs to identify or address regional water quality concerns and priorities.

An example of a regional special study would be to develop and establish allowable exceedance frequencies of the bacteria water quality objectives for several types of water bodies, during different wet and dry weather conditions the San Diego region. The special study would be related to bacteria, which is a priority for the San Diego region due to the adoption of "*Bacteria TMDL Project I – Beaches and Creeks in the San Diego Region*." The study results could be used to inform the Copermittees and the San Diego Water Board about the indictor bacteria water quality objective exceedance frequencies that occur in natural or reference watersheds.

Provision D.4 (Assessment Requirements) specifies the assessments that the Copermittees are required to perform, based on the monitoring data collected, and will be reported as part of the Annual Report for the Water Quality Improvement Plan implementation. Provision D.4 requires the Copermittees assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c, and A.2.a.

Provision D.4 specifies the assessments that Copermittees must perform for each Watershed Management Area to assess the effectiveness of each Copermittee's jurisdictional runoff management program and the Water Quality Improvement Plan. The effectiveness of each Copermittee's jurisdictional runoff management program and Water Quality Improvement Plan is measured through these types of assessments: (a) Receiving Waters Assessments (b) MS4 Outfall Discharges Assessments, (c) Special Studies Assessments, and (d) Integrated Assessment of Water Quality Improvement Plan.

Provision D.4.a requires the Copermittees to assess the status of receiving water conditions annually during the transitional monitoring period (during development of the Water Quality Improvement Plan) and after acceptance of the Water Quality Improvement Plan. The monitoring data collected pursuant to Provision D.1 will be evaluated, among other information, to assess the condition of a Watershed Management Area's streams, coastal waters, enclosed bays, harbors, estuaries, and lagoons. The focus of the receiving waters assessments is to measure progress toward the objective of the CWA to "*restore and maintain the chemical, physical, and biological integrity of the Nation's waters*" as the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program are implemented within a Watershed Management Area. Provision D.4.a is consistent with 40 CFR 122.42(c)(7) which requires the Copermittees to annually report the *"[i]dentification of water quality improvements or degradation."*

Provision D.4.b includes the MS4 outfall discharges assessment requirements. The focus of MS4 outfall discharges assessments is to determine if the Copermittees' are implementing programs that comply with the requirements of the CWA for MS4 permits to "*effectively prohibit non-stormwater discharges into the storm sewers*" and "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable.*" The monitoring data collected pursuant to Provisions D.2 will be

evaluated, among other information, to assess the effectiveness of the transitional MS4 outfall field screening monitoring, the implementation of the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program. The MS4 outfall discharge assessments consist of Non-Storm Water Discharges Reduction Assessments and Storm Water Pollutant Discharges Reduction Assessments.

The Non-Storm Water Discharges Reduction Assessments are how each Copermittee will demonstrate that its jurisdictional runoff management program implementation efforts are achieving the CWA requirement to "*effectively prohibit non-stormwater discharges into the storm sewers.*" Provision D.4.b.(1) requires each Copermittee to assess and report on its illicit discharge detection and elimination program required pursuant to Provision E.2 to reduce and effectively prohibit non-storm water and illicit discharges into the MS4 within its jurisdiction. The Non-Storm Water Discharges Reduction Assessments include specific assessment requirements applicable to each Copermittee.

As each Copermittee collects and analyzes the data collected pursuant to dry weather MS4 outfall discharges monitoring requirements of Provisions D.2.a.(2) and D.2.b, Provision D.4.b.(1) requires each Copermittee to assess the progress, assess the effectiveness of its current actions, and identify modifications necessary to increase the effectiveness of its actions toward reducing and eliminating non-storm water and illicit discharges to its MS4. The findings from these assessments are expected to be utilized by the Copermittee as part of its procedures to prioritize the non-storm water discharges that will be addressed by its Illicit Discharge Detection and Elimination program required pursuant to Provision E.2.

The assessment requirements of Provision D.4.a.(1) are consistent with 40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(3) which require "*procedures…to investigate portions of the separate storm sewer system that, <u>based on the results of the field screen, or other appropriate information</u> [emphasis added], indicate a reasonable potential of contain illicit discharges or other sources of non-storm water*" as part of a "*program…to detect and remove…illicit discharges and improper disposal into the storm sewer.*" The assessment requirements of Provision D.4.a.(1) are also consistent with 40 CFR122.42(c)(1) requires the Copermittees to annually report the "*status of implementing the components of the storm water management program that are established as permit conditions.*"

The Storm Water Pollutant Discharges Reduction Assessment is how the Copermittees in each Watershed Management Area will demonstrate that their jurisdictional runoff management program implementation efforts are achieving the CWA requirement to "*reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable*." Provision D.4.b.(2) requires the Copermittees in each Watershed Management Area to assess and report the progress of the Copermittees' efforts to reduce pollutants in storm water discharges from the MS4s to the MEP. The

Storm Water Pollutant Discharges Reduction Assessments include specific assessment requirements during both the transitional monitoring period and after acceptance of the Water Quality Improvement Plan applicable to the Watershed Management Area and each Copermittee.

As the Copermittees collect and analyze the data collected pursuant to wet weather MS4 outfall discharges monitoring requirements of Provisions D.2.a.(3) and D.2.c, Provision D.4.b.(2) requires the Copermittees to assess runoff conditions during the transitional period, and the progress of the Water Quality Improvement Plan strategies toward reducing pollutants in storm water from the MS4 to the MEP. The findings from these assessments are expected to be utilized by the Copermittees to identify any modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify sources of pollutants in storm water discharges from the MS4s, as well as focus, modify, and improve the water quality improvement strategies implemented by each Copermittee within its jurisdiction to reduce pollutants in storm water discharges to the MEP.

The assessment requirements of Provision D.4.b.(2) are consistent with 40 CFR 122.26(d)(2)(iii)(B) which requires "*[e]stimates of the annual pollutant load of the cumulative discharges to waters of the United States from all identified municipal outfalls…during a storm event…accompanied by a description of the procedures for estimating constituent loads and concentrations, including any modeling, data analysis, and calculation methods.*" The assessment requirements of Provision D.4.a.(2) are consistent with 40 CFR 122.26(d)(2)(v) which requires that each Copermittee assesses the *"estimated reductions in loadings of pollutants from discharges of municipal storm sewer constituents from municipal storm sewer systems expected as the result of the municipal storm water quality management program."* The assessment requirements of Provision D.4.b.(2) are also consistent with 40 CFR122.42(c)(1) requires the Copermittees to annually report the "*status of implementing the components of the storm water management program that are established as permit conditions.*"

Provision D.4.c includes the special studies assessment requirements. Performing special studies are how the Copermittees will address data gaps identified during the development of and updates to the Water Quality Improvement Plan. The relevant findings from the special studies assessments are expected to be incorporated as part of the applicable receiving water assessments, MS4 outfall discharge assessments, and integrated water quality improvement assessments required in Provision D.4.a, D.4.b, and D.4.d, respectively.

The assessment requirements in Provision D.4.d are part of the iterative approach and adaptive management process required by Provision A.4. The Copermittees are required to integrate the data collected pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to re-evaluate the Water Quality Improvement Plan.

The monitoring data collected pursuant to Provisions D.1 and D.2, and the results of the assessment required pursuant to Provisions D.4.a-c, will be used to determine whether the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program are effective, or require modifications or improvements to become more effective to achieve the requirements of the CWA. The assessments required by Provision D.4.d are consistent with 40 CFR 122.42(c)(1) which requires that the Copermittees to report the *"[t]he status of implementing the components of the storm water management program that are established as permit conditions."*

E. Jurisdictional Runoff Management Programs

Purpose: Provision E includes the requirements for the jurisdictional runoff management programs to be implemented by each of the Copermittees. Compliance with the requirements for the jurisdictional runoff management programs will allow the Copermittees to demonstrate that they are implementing programs to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP. The jurisdictional runoff management program document prepared by each Copermittee will also provide the details for implementing the water quality improvement strategies identified in the Water Quality Improvement Plan specifically within its jurisdiction.

***Discussion*:** Implementation of the jurisdictional runoff management program requirements under Provision E is how the Copermittees "*effectively prohibit non-stormwater discharges into the storm sewer,*" and outlines the "*controls to reduce the discharge of pollutants to the maximum extent practicable"* consistent with the federal regulations under 40 CFR 122.26. The jurisdictional runoff management program is part of the "*comprehensive planning process*" that is required pursuant to 40 CFR 122.26(d)(2)(iv). Where the Water Quality Improvement Plan is the "*comprehensive planning process*" on a Watershed Management Area scale, requiring "*intergovernmental coordination,*" the jurisdictional runoff management program document is the "*comprehensive planning process*" on a jurisdictional scale that should be coordinated with the other Copermittees in the Watershed Management Area to achieve the goals of the Water Quality Improvement Plan.

The jurisdictional runoff management program requirements are included to provide each Copermittee criteria that can be used to demonstrate that its storm water management program is implementing the "*comprehensive planning process*" within its jurisdiction to "*effectively prohibit non-stormwater discharges into the storm sewers,*" and to identify and implement the most effective "*controls to reduce the discharge of pollutants to the maximum extent practicable"* in accordance with the performance standards given in the CWA.

Provision E includes the requirements for each of the components that must be included in the Copermittee's jurisdictional runoff management program document that will be implemented by the Copermittee within its jurisdiction. Implementation of the components of each Copermittee's jurisdictional runoff management program must incorporate the water quality improvement strategies identified by each Copermittee in the Water Quality Improvement Plans, described pursuant to Provision B.3.b.(1)(a).

More specific and detailed discussions of the requirements of Provision E are provided below.

Provision E.1 (Legal Authority Establishment and Enforcement) requires each Copermittee to establish and enforce sufficient legal authority to control discharges to the MS4 within its jurisdiction.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system*" and be able to demonstrate that it can "*operate pursuant to legal authority established by statute, ordinance or series of contracts.*" Provision E.1.a describes the minimum legal authorities each Copermittee must establish for itself within its jurisdiction to control discharges to its MS4. The requirements of Provision E.1.a are consistent with the requirements set forth in 40 CFR 122.26(d)(2)(i)(A)-(F).

The certification statement required from each Copermittee by Provision E.1.b is included to provide the San Diego Water Board additional documentation that each Copermittee has established the legal authorities consistent with Provision E.1.a and 40 CFR 122.26(d)(2)(i)(A)-(F), and the Copermittee can "*operate pursuant to legal authority established by statute, ordinance or series of contracts.*"

Provision E.2 (Illicit Discharge Detection and Elimination) requires each Copermittee to implement an illicit discharge detection and elimination program to effectively prohibit non-storm water discharges to the MS4 by actively detecting and eliminating illicit discharges and disposal into its MS4.

Provision E.2 establishes the minimum requirements that each Copermittee must implement within its jurisdiction to effectively prohibit non-storm water discharges from entering its MS4. The federal CWA requires permits for municipal storm sewer systems to "*effectively prohibit non-storm water discharges into the storm sewers*." The federal regulations (40CFR122.26(d)(2)(i)(B)) require each Copermittee to establish the legal authority to prohibit illicit discharges to its MS4s. Under 40 CFR 122.26(d)(2)(iv)(B), each Copermittee must implement a "*program…to detect and remove…illicit discharges and improper disposal into the storm sewer.*" The federal NPDES regulations, under 40 CFR 122.26(b)(2), define illicit discharges as "*any discharge to a municipal separate storm sewer that is not composed entirely of storm water*." Thus, non-storm water discharges are not authorized to enter the MS4 and are considered to be illicit discharges, unless authorized by a separate NPDES permit.

The Phase I Final Rule clarifies that non-storm water discharges through an MS4 are not authorized under the CWA (55 FR 47995):

> "*Today's rule defines the term "illicit discharge" to describe any discharge through a municipal separate storm sewer system that is not composed entirely of storm water and that is not covered by an NPDES permit. Such illicit discharges are not authorized under the Clean Water Act. Section 402(p)(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm*

sewer…Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit."

The federal NPDES requirements for the program to address illicit discharges must include "*inspections, to implement and enforce an ordinance, orders, or other similar means to prevent illicit discharges to the MS4*." The federal NPDES regulations also reference several categories of "*non-storm water discharges or flows* [which] *shall be addressed where such discharges are identified…as sources of pollutants to waters of the United States*." The Phase I Final Rule (55 FR 48037) further clarified the requirements of 40 CFR 122.26(d)(2)(iv)(B)(1) as follows:

"*EPA is clarifying that section 402(p)(3)(B) of the CWA (which requires permits for municipal separate storm sewers to 'effectively' prohibit non-storm water discharges) does not require permits for municipalities to prohibit certain discharges or flows of nonstorm water to waters of the United States through municipal separate storm sewers in all cases*."

In previous iterations of the municipal storm water permits for the San Diego Region, these categories were simply listed and referred to as categories of non-storm water discharges "not prohibited" unless identified as a source of pollutants. The Copermittees have often referred to these categories as "exempt" discharges. In both cases, however, the language is inconsistent with the federal CWA and NPDES regulations. And, the clarification provided in the Phase I Final Rule does not specifically state that such discharges are "not prohibited" or "exempt" or in any way authorized. The federal NPDES regulations do, however, state that specific categories of non-storm water discharges must be "*addressed*" if identified as "*sources of pollutants to waters of the United States*."

The language of Provision E.2.a has been revised to be fully consistent with the language of the CWA and the requirements of the federal regulations under 40 CFR 122.26(d)(2)(iv)(B)(1). Provision E.2.a requires each Copermittee to address <u>all</u> types of non-storm water discharges into its MS4 as illicit discharges, <u>unless</u> the discharge is authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to Provisions E.2.a.(1) through E.2.a.(5). Only non-NPDES-permitted non-storm water discharges identified as a category of non-storm water discharges under Provisions E.2.a.(1) through E.2.a.(5) <u>and</u> *not identified as a source of pollutants* do not have to be addressed as illicit discharges. Categories of non-storm water discharges that meet the requirements of Provisions E.2.a.(1) through E.2.a.(5) do not have to be addressed by the Copermittee as illicit discharges.

Several of the non-storm water categories listed in 40 CFR 122.26(d)(2)(iv)(B)(1) have not been included in Provisions E.2.a.(1) through E.2.a.(5), including: street wash water, landscape irrigation, irrigation water, and lawn watering. Because these are no

longer included within the categories listed under Provisions E.2.a.(1) through E.2.a.(5), the Copermittees must prohibit these types of non-storm water discharges from entering the MS4. This is consistent with the clarification of 40 CFR 122.26(d)(2)(iv)(B)(1) in the Phase I Final Rule (55 FR 48037), which states:

> "*[T]he Director may include permit conditions that either require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*."

Street wash water is a category of non-storm water discharges that was removed when the Third Term Permits were issued. Street wash water is a source of several pollutants (e.g., metals, oil and grease, petroleum hydrocarbons, chlorinated solvents, sediment) which are generated during the street washing process. The removal of this category requires the Copermittees to prohibit this type of non-storm water discharge from entering the MS4.

The landscape irrigation, irrigation water, and lawn watering categories, collectively referred to hereafter as "over-irrigation" discharges, were removed from the list of non-storm water discharge categories in the Fourth Term Orange County and Riverside County Permits. Non-storm water discharges resulting from over-irrigation have been found to be a source of several types of pollutants (e.g., nutrients, bacteria, pesticides, sediment) in receiving waters. The San Diego Water Board and the Copermittees have identified categories of non-storm water discharges associated with over-irrigation as a source of pollutants and conveyance of pollutants to the MS4 and waters of the United States in the following documents:

- **SmartTimer/Edgescape Evaluation Program (SEEP) Grant Application**

  The State Water Board allocated grant funding to the SEEP project grant application submitted in 2006, which targeted irrigation runoff by retrofitting areas of existing development and documenting the conservation and runoff improvements. The basis of this grant project is that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 is a source and conveyance of pollutants. In addition, the grant application indicated that this alteration of natural flows is impacting the beneficial uses of waters of the state and U.S. Results from the study indicate that that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 *is* a source and conveyance of pollutants. The results of this study can be applied broadly to any area where over-irrigation takes place. The grant application included the following statements:

  > "*Irrigation runoff contributes flow & pollutant loads to creeks and beaches that are 303(d) listed for bacteria indicators.*"
  >
  > "*Regional program managers agree that the reduction and/or elimination of irrigation-related urban flows and associated pollutant loads may be key to successful attainment of water quality and beneficial use goals as outlined in*

the San Diego Basin Plan and Bacteria TMDL over the long term."

"*Elevated dry-weather storm drain flows, composed primarily … of landscape irrigation water wasted as runoff, carry pollutants that impair recreational use and aquatic habitats all along Southern California's urbanized coastline. Storm drain systems carry the wasted water, along with landscape derived pollutants such as bacteria, nutrients and pesticides, to local creeks and the ocean. Given the local Mediterranean climate, excessive perennial dry season stream flows are an unnatural hydrologic pattern, causing species shifts in local riparian communities and warm, unseasonal contaminated freshwater plumes in the near-shore marine environment.*"

- **2006-2007 Orange County Watershed Action Plan Annual Reports**

The Watershed Action Plan Annual Reports for the 2006-2007 reporting period were submitted by the County of Orange, Orange County Flood Control District and Copermittees within the San Juan Creek, Laguna Coastal Streams, Aliso Creek, and Dana Point Coastal Streams Watersheds. San Juan Creek, Laguna Coastal Streams, Aliso Creek and Dana Point Coastal Streams are all currently 303(d) listed as impaired for indicator bacteria within their watersheds and/or in the Pacific Ocean at the discharge points of their watersheds. The Orange County Copermittees, within their Watershed Action Strategy Table for fecal indicator bacteria included the following:

"*Support programs to reduce or eliminate the discharge of anthropogenic dry weather nuisance flow throughout the…watershed. Dry weather flow is the transport medium for bacteria and other 303(d) constituents of concern.*"

Additionally, they state that "*conditions in the MS4 contribute to high seasonal bacteria propagation in-pipe during warm weather. Landscape irrigation is a major contributor to dry weather flow, both as surface runoff due to over-irrigation and overspray onto pavements; and as subsurface seepage that finds its way into the MS4*."

- **Fiscal Year 2008 Carlsbad Watershed Urban Runoff Management Program Annual Report**

The Carlsbad Watershed Urban Runoff Management Program Annual Report for Fiscal Year 2008 was submitted by the Carlsbad Watershed Copermittees (Cities of Carlsbad, Encinitas, Escondido, Oceanside, San Marcos, Solana Beach, and Vista, and the County of San Diego). In the Annual Report, the Carlsbad Watershed Copermittees stated the following:

"The Carlsbad Watershed Management Area (WMA) collective watershed

strategy identifies bacteria, sediment, and nutrients as high priority water quality pollutants in the Agua Hedionda (904.3 – bacteria and sediment), Buena Vista (904.2 – bacteria), and San Marcos Creek (904.5 – nutrients) Hydrologic Areas. Bacteria, sediment, and nutrients have been identified as potential discharges from over-irrigation."

- **2007-2008 San Diego Bay Watershed Urban Runoff Management Program Annual Report**

  The San Diego Bay Watershed Urban Runoff Management Program 2007-2008 Annual Report was submitted by the San Diego Bay Watershed Copermittees (Cities of Chula Vista, Coronado, Imperial Beach, La Mesa, Lemon Grove, National City, and San Diego, the County of San Diego, the Port of San Diego, and the San Diego County Airport Authority). In Appendix D of the Annual Report, titled "Likely Sources of Pollutants," the San Diego Bay Watershed Copermittees identified over-irrigation of lawns as a pollutant generating activity from business and/or residential land uses for bacteria, pesticides, and sediment.

- **Copermittee Public Education Materials**

  The Orange County Public Works *Tips for Landscape & Gardening* public education brochure states: "*Fertilizers, pesticides and other chemicals that are left on yards or driveways can be blown or washed into storm drains that flow to the ocean. Overwatering lawns can also send materials into storm drains*."

  The Riverside County Flood Control and Water Conservation District *Landscape and Garden* public education brochure states: *"Soil, yard wastes, over-watering and garden chemicals become part of the urban runoff mix that winds its way through streets, gutters and storm drains before entering lakes, rivers, streams, etc. Urban runoff pollution contaminates water and harms aquatic life!"*

- **Los Peñasquitos Lagoon Sedimentation/Siltation TMDL Technical Report**

  The Los Peñasquitos Lagoon Sedimentation/Siltation TMDL technical report was prepared for the City of San Diego and USEPA in October 2010. The technical report was included as a technical supporting document attached to the Sediment TMDL for Los Peñasquitos Lagoon staff report prepared by the San Diego Water Board, dated June 13, 2012. Under the Source Assessment section, the technical report states the following:

  "*Dry weather loading is dominated by nuisance flows from urban land use activities such as car washing, sidewalk washing, and lawn over-irrigation, which pick up and transport sediment into receiving waters.*"

These documents confirm that non-storm water discharges associated with over-irrigation are a source of pollutants and should be addressed as illicit discharges to the MS4. Prohibiting non-storm water discharges associated with over-irrigation, however, is not a new requirement for the Copermittees because it is also consistent with and required by the Water Conservation in Landscaping Act (AB 1881, Laird).

The Water Conservation in Landscaping Act required the Department of Water Resources (DWR) to prepare a Model Water Efficient Landscape Ordinance for use by local agencies (e.g. the Copermittees). All local agencies were required to adopt a water efficient landscape ordinance by January 1, 2010. Local agencies could adopt the Water Efficient Landscape Ordinance developed by DWR, or an ordinance considered at least as effective as the Model Ordinance. The Water Efficient Landscape Ordinance includes a requirement that local agencies prohibit runoff from irrigation (§ 493.2):

> "*Local agencies shall prevent water waste resulting from inefficient landscape irrigation by* <u>*prohibiting runoff from leaving the target landscape*</u> *[emphasis added] due to low head drainage, overspray, or other similar conditions where water flows onto adjacent property, non-irrigated areas, walks, roadways, parking lots, or structures. Penalties for violation of these prohibitions shall be established locally*."

Furthermore, non-storm water discharges from over-irrigation not only transport and discharge pollutants to receiving waters, but are also a likely source of the dry weather flows causing changes to habitat within and along the receiving water bodies. Examples of habitat changes from the dry weather flows include perennialization of ephemeral streams, and conversion of saltwater and brackish water marsh habitats to freshwater marsh habitats (e.g. Los Peñasquitos Lagoon). Both of these examples have resulted in the promotion of invasive species in several areas of the San Diego Region.

The removal of the over-irrigation discharges categories does not require the Copermittees to strictly prohibit lawn and landscape irrigation, but does require the prohibition of excessive irrigation water that results in non-storm water discharges to the MS4. Non-storm water discharges to the MS4 from over-irrigation must be addressed as illicit discharges by the Copermittees pursuant to the requirements of Provision E.2.

The remaining non-storm water categories listed in 40 CFR 122.26(d)(2)(iv)(B)(1) are listed under Provisions E.2.a.(1) through E.2.a.(5) and generally fall into four categories: (1) non-storm water discharges subject to existing San Diego Water Board waste discharge requirements and NPDES permits; (2) non-storm water discharges generally not expected to be a source of pollutants to receiving waters; (3) non-storm water discharges likely to contain pollutants requiring some form of control to address the pollutants prior to discharging to the MS4; and (4) non-storm water discharges or flows associated with firefighting.

Provisions E.2.a.(1) and E.2.a.(2) include several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) for which the San Diego Water Board already has developed general waste discharge requirements and NPDES permits to address the discharges. The Copermittees are only required to address these types of non-storm water discharges as illicit discharges if the Copermittees or the San Diego Water Board identifies these non-storm water discharges not having coverage under the applicable NPDES permit.

Provision E.2.a.(3) includes several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) which are generally not expected to be a source of pollutants to receiving waters, many of which originate from what are typically natural, uncontrollable sources. The Copermittees are only required to address these types of non-storm water discharges as illicit discharges if the Copermittees or the San Diego Water Board identifies these non-storm water discharges as a source of pollutants to receiving waters. Because many of these sources are generally uncontrollable, enforcing a prohibition may not be a possibility for the Copermittees. The Copermittees would be able to address these non-storm water discharges by preventing these non-storm water discharges from entering the MS4. This could potentially be achieved by sealing their MS4 structures so the discharges cannot enter the MS4.

Provision E.2.a.(4) includes several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) that are likely to contain pollutants requiring some form of control to address the pollutants prior to discharging to the MS4. At this time, an outright prohibition of these types of non-storm water discharges does not yet appear to be warranted. Thus, Provision E.2.a.(4) includes several requirements for the Copermittees to control the pollutants from these types of non-storm water discharges. This is consistent with the clarification of the federal regulations in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board has the authority to require the Copermittees to "*control any of these types of discharges where appropriate*."

Unlike non-storm water discharges from over-irrigation, these types of non-storm water discharges are not expected to occur in close proximity to each other or very frequently. Provided these types of non-storm water discharges are controlled as required in Provision E.2.a.(4), the Copermittees would only be required to address these types of non-storm water discharges as illicit discharges if the Copermittee or the San Diego Water Board identifies these non-storm water discharges as a source of pollutants to receiving waters.

Provision E.2.a.(5) includes specific requirements for fire fighting discharges and flows. The requirements for non-storm water discharges and flows associated with fire fighting have been separated into requirements for: a) non-emergency fire fighting discharges and flows, and b) emergency fire fighting discharges and flows.

The San Diego Water Board has found that discharges from building fire suppression system maintenance (e.g. fire sprinklers) contain waste and potentially a significant source of pollutants to receiving waters. As such, the San Diego Water Board is requiring these discharges be addressed as illicit discharges by the Copermittees. Thus, the discharges to the MS4 are to be prohibited via ordinance, order or similar means. For other non-emergency firefighting discharges and flows (i.e. flows from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems), the Copermittees are required to develop and implement a program to address pollutants in these non-storm water discharges and flows. This is consistent with the clarification of the federal regulations in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board has the authority to require the Copermittees to "*control any of these types of discharges where appropriate*."

For emergency firefighting discharges and flows, the Phase I Final Rule (55 FR 48037) has clarified the requirements of 40 CFR 122.26(d)(2)(iv)(B)(1) pertaining to emergency firefighting flows and discharges, which states:

> "*In the case of firefighting it is not the intention of these rules to prohibit in any circumstances the protection of life and public or private property through the use of water or other fire retardants that flow into separate storm sewers*."

Thus, the requirements have been made to be consistent with the guidance provided by the Phase I Final Rule. The Order recommends that the Copermittees develop and encourage implementation of BMPs to reduce or eliminate the discharge of pollutants from emergency firefighting flows to the MS4s and receiving waters. The Order does not include any requirements that should be interpreted as requiring the implementation of BMPs for emergency firefighting flows to the MS4s and receiving waters.

The Copermittees are expected to review the dry weather MS4 outfall discharge monitoring data they collect to determine if and when there are non-storm water discharges to or from their MS4s that are a source of pollutants to receiving waters. If the Copermittees identify one of the types of non-storm water discharges listed in Provisions E.2.a.(1) through E.2.a.(4) as a source of pollutants to receiving waters based on the review and evaluation of monitoring data, Provision E.2.a.(6) requires the Copermittees to prohibit those categories of discharges from entering the MS4 through ordinance, order or similar means. In addition, Provision E.2.a.(6) clarifies that the San Diego Water Board may identify categories of non-storm water discharges or flows listed under Provisions E.2.a.(1) through E.2.a.(4) that must be prohibited.

Provision E.2.a.(6) also provides the Copermittees an option to propose controls to be implemented for the category of non-storm water discharges as part of the Water Quality Improvement Plan instead of prohibiting the category of non-storm water

discharges. If the Water Quality Improvement Plan is accepted by the San Diego Water Board with the proposed controls, the Copermittees will not be required to prohibit the category of non-storm water discharges to their MS4s as long as the controls are implemented. This is consistent with the clarification of 40 CFR 122.26(d)(2)(iv)(B)(1) in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board may "*require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*."

Finally, Provision E.2.a.(7) has been included in the requirements for non-storm water discharges to clarify that any non-storm water discharges to the Copermittee's MS4, even those identified pursuant to Provisions E.2.a.(1) through E.2.a.(4), must be reduced or eliminated, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit. Provision E.2.a.(7) is consistent with the requirements of CWA section 402(p)(3)(B)(ii) and 40 CFR 122.26(d)(1)(v)(B), as clarified in the Phase I Final Rule (55 FR 47995) that "*[u]ltimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit*." However, the reduction or elimination of those non-storm water discharges are expected to be achieved as feasible, in accordance with the priorities in the Water Quality Improvement Plan and when the resources are available to the Copermittee.

Consistent with 40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(1), each Copermittee must implement a "*program…to prevent illicit discharges to the municipal storm sewer system*" and "*detect…illicit discharges and improper disposal into the storm sewer.*" Provision E.2.b requires each Copermittee to implement measures to prevent and detect illicit discharges and connections to its MS4 as part of its illicit discharge detection and elimination program.

As part of the program to prevent and detect illicit discharges to the MS4, 40 CFR 122.26(d)(2)(iv)(B)(2) requires "*procedures to conduct on-going field screening activities during the life of the permit, including areas or locations that will be evaluated by such field screens*." As part of the procedures, each Copermittee is required to maintain an updated map of its entire MS4 and the corresponding drainage areas within its jurisdiction. Having knowledge about where inlets, access points, connections with other MS4s, and outfalls are located is necessary for each Copermittee to track, identify, and eliminate illicit discharges and connections. Thus, Provision E.2.b.(1) of the Order specifies that the map must include the segments of the storm sewer system owned, operated, and maintained by the Copermittee, and include locations of all known inlets, connections with other MS4s, and outfalls to the Copermittee's MS4. The remaining requirements of Provision E.2.b are consistent with the requirements of 40 CFR 122.26(d)(2)(iv)(B)(3)-(7) related to implementing measures to prevent and detect illicit discharges and connections to the MS4.

Provision E.2.c requires each Copermittee to conduct field screening and monitoring of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm

water and illicit discharges and connections to the MS4. Field screening is a required element of the program to detect and eliminate illicit discharges and connections to the MS4, pursuant to 40 CFR 122.26(d)(2)(iv)(B)(2). The field screening requirement will be implemented through the dry weather MS4 outfall discharge monitoring required under Provisions D.2.a.(2) and D.2.b.(1).

Provision E.2.d specifies the measures each Copermittee must implement to eliminate illicit discharges and connections to its MS4. Elimination of illicit discharges and connections to the MS4 is consistent with the requirement of 40 CFR 122.26(d)(2)(iv)(B) "*to detect and remove [emphasis added]…illicit discharges and improper disposal into the storm sewer*" and will achieve the CWA requirement for MS4 permits to "*effectively prohibit non-storm water discharges into the storm sewers*."

Generally, each Copermittee is responsible for prioritizing its efforts to eliminate non-storm water and illicit discharges or connections to its MS4 based on field screening and monitoring data, NALs, illicit discharge investigation records, and the known or suspected sources. Sources of non-storm water and illicit discharges or connections must be eliminated by enforcing the legal authority established by each Copermittee pursuant to Provision E.1.

Provision E.3 (Development Planning) requires each Copermittee to use its land use and planning authority to implement a development planning program to control and reduce the discharge of pollutants in storm water from new development and significant redevelopment to the MEP. Proper implementation of the development planning program will also contribute toward effectively prohibiting non-storm water discharges from development projects to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." As part of the management program, 40 CFR 122.26(d)(2)(iv)(A)(2) requires "*planning procedures including a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment*."

Land development generally alters the natural conditions of the land by removing vegetative cover, compacting soil, and/or placement of concrete, asphalt, or other impervious surfaces. These impervious surfaces concentrate urban pollutants (such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not found in high concentrations in the natural environment. Pollutants that accumulate on impervious surfaces are not easily biodegraded nor subject to natural treatment processes.

Impervious surfaces greatly affect the natural hydrology of the land because they do not allow natural infiltration and treatment of storm water runoff to take place. Instead, storm water runoff from impervious surfaces is typically directed through pipes, curbs, gutters, and other hardscape into receiving waters, with little treatment, at significantly increased volumes and accelerated flow rates over what would occur naturally. The increased pollutant loads, storm water volume, discharge rates and velocities, and discharge durations from the MS4 adversely impact stream habitat by causing accelerated, unnatural erosion and scouring within creek bed and banks. Placement of impervious surfaces also encapsulates "good" sediment (such as sand, gravel, rocks and cobbles) that would normally replenish creek beds and banks to help stabilize them. Collectively, these changes to natural hydrologic processes are termed hydrograph modification, or hydromodification.

Hydromodification, which is caused by both altered storm water flow and altered sediment flow regimes, is largely responsible for degradation of creeks, streams, and associated habitats in the San Diego Region. In an ongoing study by the Stormwater Monitoring Coalition to assess the health of streams throughout Southern California, researchers found that three of the four highest risk stressors to creeks (percent sands and fines present, channel alteration, and riparian disturbance) were related to physical habitat.[29] Researchers studying flood frequencies in Riverside County have found that increases in watershed imperviousness of only 9-22 percent can result in increases in peak flow rates for the two-year storm event of up to 100 percent.[30] Such changes in runoff have significant impacts on channel morphology.

In addition, a technical report issued by the Southern California Coastal Water Research Project (SCCWRP) stated that "*[r]ecent studies indicate that California's intermittent and ephemeral streams are more susceptible to the effects of hydromodification than streams from other parts of the United States. Physical degradation of stream channels in the central and eastern United States can initially be detected when watershed impervious cover approaches 10 percent, although biological effects (which may be more difficult to detect) may occur at lower levels. In contrast, initial response of streams in the semi-arid portions of California appears to occur between 3 and 5 percent impervious cover*."[31] These studies highlight the extent to which impacts originating from impervious surfaces created by land development are responsible for the degradation of creek and stream habitat.

This is consistent with what USEPA has noted, that "*[m]ost stormwater runoff is the result of the man-made hydrologic modifications that normally accompany development. The addition of impervious surfaces, soil compaction, and tree and*

[29] Assessing the Health of Southern California Streams, Stormwater Monitoring Coalition, Fact Sheet
[30] Schueler and Holland, 2000. Storm Water Strategies for Arid and Semi-Arid Watersheds (Article 66). The Practice of Watershed Protection.
[31] Stein, E. and Zaleski, S., 2005. Technical Report 475, Managing Runoff to Protect Natural Streams: The Latest Development on Investigation and Management of Hydromodification in California. December 30, 2005.

vegetation removal result in alterations to the movement of water through the environment. As interception, evapotranspiration, and infiltration are reduced and precipitation is converted to overland flow, these modifications affect not only the characteristics of the developed site but also the watershed in which the development is located. Stormwater has been identified as one of the leading sources of pollution for all waterbody types in the United States. Furthermore, the impacts of stormwater pollution are not static; they usually increase with more development and urbanization."[32]

Reducing the impact from the increased pollutant loads and flows generated by impervious surfaces within a watershed is essential to protecting and restoring the integrity of the receiving waters. Provision E.3 includes the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment*." The requirements of Provision E.3 will 1) minimize the generation and discharge of pollutants in storm water from the MS4, and 2) minimize the potential of storm water discharges from the MS4 from causing altered flow regimes and excessive downstream erosion in receiving waters.

The requirements of Provision E.3.a include the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment*" applicable to all development projects, regardless of size or purpose of development. In general, all development projects must implement onsite BMPs to remove pollutants from runoff prior to its discharge to any receiving waters, as close to the pollutant generating source as possible, and structural BMPs must not be constructed within waters of the U.S.

Furthermore, the onsite BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors (e.g. mosquitos, rodents, and flies). If not properly designed or maintained, certain BMPs implemented or required by municipalities may create a habitat for vectors. Monitoring studies conducted by the California Department of Public Health (CDPH) have documented that mosquitoes opportunistically breed in structural storm water BMPs, particularly those that hold standing water for over 96 hours. Certain site design features that hold standing water may similarly produce mosquitoes.

Structural BMPs and site design features should incorporate design, construction, and maintenance principles to promote drainage within 96 hours to minimize standing water available to mosquitoes. Nuisances and public health impacts resulting from

[32] USEPA, 2007. Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices, December 2007.

vector breeding can be prevented with close collaboration and cooperative effort between municipalities and local vector control agencies and the CDPH during the development and implementation of storm water runoff management programs. The CDPH also has issued guidance for BMP implementation that will minimize potential nuisances and public health impacts resulting from vector breeding.[33]

All development projects are required to implement source control BMPs that will minimize the generation of pollutants. Additionally, each development project must implement, where applicable and feasible, low impact development (LID) BMPs to mimic the natural hydrology of the site and retain and/or treat pollutants in storm water runoff prior to discharging to and from the MS4.

The LID Center defines LID as "*a comprehensive land planning and engineering design approach with a goal of maintaining and enhancing the pre-development hydrologic regime of urban and developing watersheds.*"[34] LID designs seek to control storm water at the source, using small-scale integrated site design and management practices to mimic the natural hydrology of a site, retain storm water runoff by minimizing soil compaction and impervious surfaces, and disconnect storm water runoff from conveyances to the storm drain system.

LID BMPs may utilize interception, storage, evaporation, evapotranspiration, infiltration, and filtration processes to retain and/or treat pollutants in storm water before it is discharged from a site. Because of these numerous options, the San Diego Water Board expects that every development project will be able to implement some form of LID BMPs. Examples of LID BMPs include using permeable pavements, rain gardens, rain barrels, grassy swales, soil amendments, and native plants.

Provision E.3.a also includes requirements for all development projects to, where feasible, landscape with native and/or low water use plants to minimize the discharge of non-storm water discharges associated with excessive irrigation, as well as harvest (i.e., storage) and use precipitation to promote the concept of utilizing storm water as a resource.

While all development projects are subject to the requirements of Provision E.3.a, Provision E.3.b identifies Priority Development Projects that exceed given size thresholds and/or fit under specific use categories. Priority Development Projects are required to incorporate specific performance criteria for structural BMPs into the project plan to reduce the generation of pollutants, and address potential impacts from hydromodification.

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[33] California Department of Public Health, 2012. Best Management Practices for Mosquito Control in California. (http://www.cdph.ca.gov/HealthInfo/discond/Documents/BMPforMosquitoControl07-12.pdf)
[34] www.lowimpactdevelopment.org

The Priority Development Project categories are based on the requirements of the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), and do not differ significantly from the Fourth Term Permit for San Diego County. Furthermore, the Priority Development Project categories are consistent with Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), and Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit).

Because of the impact of relatively small increases in watershed impervious surfaces to receiving waters, Provision E.3.b.(1)(c)(iv) has been updated to include large driveways that are 5,000 square feet or more. The San Diego Water Board finds that large driveways can exacerbate altered flow regimes if not properly controlled.

Provision E.3.b.(3) describes projects that are exempt from Priority Development Project status. These include new or retrofit paved sidewalks, bicycle lanes, or trails that are designed and constructed to direct runoff to vegetated areas or be hydraulically disconnected from paved areas. The exemptions have been provided to encourage these types of projects because they provide multiple environmental benefits, such as promoting walking rather than driving, which will in turn improve air quality. Additionally, retrofitting of existing alleys, streets, or roads are exempt from Priority Development Project status if they are constructed using USEPA Green Streets guidance.[35] By doing so, retrofitting of these types of projects is encouraged. The San Diego Water Board recognizes that there are spatial constraints associated with these projects, and implementation of structural BMPs are not always feasible.

For development projects identified as Priority Development Projects, the requirements of Provision E.3.c are the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment.*" Provisions E.3.c.(1)-(3) describe the performance criteria for the structural BMPs that must be implemented for each Priority Development Project defined by Provision E.3.b.

Provision E.3.c.(1) describes the storm water pollutant control BMP requirements that must be implemented by all Priority Development Projects. The purpose of Provision E.3.c.(1) is to reduce pollutants in storm water runoff to the MEP from Priority Development Projects before it is discharged to the MS4. Of all the available treatment processes available, retention of storm water, and therefore capture of the pollutants in the storm water, will achieve 100 percent pollutant removal efficiency for the volume of storm water retained. No other method of treatment can achieve 100 percent pollutant removal efficiency. Thus, retention of as much storm water onsite is

[35] "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).

the most effective way to reduce pollutants in storm water discharges to, and consequently from the MS4, and controls pollutants in storm water discharges from a site to the MEP.

Under Provision E.3.c.(1)(a), retention of the pollutants in the runoff produced from the 85th percentile storm event ("design capture volume") is the design standard to which Priority Development Projects must comply. Since the 85th percentile storm event has previously been used as the numeric design standard for treatment control BMPs, this same size storm event is used as the numeric design standard for storm water retention. This is the MEP standard recognized by the San Diego Water Board and is consistent with the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), as well as Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit), and Los Angeles Water Board Order No. R4-2012-0175 (Los Angeles County MS4 Permit).

The 85th percentile storm event is the event that has a precipitation total greater than or equal to 85 percent of all storm events over a given period of record in a specific area or location. For example, to determine what the 85th percentile storm event is in a specific location, all 24 hour storms that have recorded values over a 30 year period would be tabulated and a 85th percentile storm would be determined from this record (i.e. 15 percent of the storms would be greater than the number determined to be the 85th percentile storm). Most jurisdictions in the San Diego Region have already developed isopluvial maps that can provide this type of information. The 85th percentile storm might be determined to be a number such as 1.0 inch, and this would be multiplied by the total area of the project footprint producing runoff to calculate the design capture volume. The Priority Development Project designer would then select a system of BMPs that would retain (i.e. intercept, store, infiltrate, evaporate, or evapotranspire) the pollutants contained in the design capture volume onsite.

Retention BMPs are necessary to capture and retain pollutants generated from a Priority Development Project. In a recent study performed by SCCWRP in the Los Angeles Region, they found "*that the magnitude of constituent load associated with storm water runoff depends, at least in part, on the amount of time available for pollutant build-up on land surfaces. The extended dry period that typically occurs in arid climates such as southern California maximizes the time for constituents to build-up on land surfaces, resulting in proportionally higher concentrations and loads during initial storms of the season*."[36] This implies that the "first flush" of a rainy season and the first storm events after long antecedent dry periods tend to have the highest pollutant loads. Capturing and retaining the pollutant loads of the "first flush" of a rainy

[36] Stein, E.D., Tiefenthaler, L.L., and Schiff, K.C., 2007. Technical Report 510, Sources, Patterns and Mechanisms of Storm Water Pollutant Loading from Watershed and Land Uses of the Greater Los Angeles Area, California, USA. March 20, 2007.

season and the first storm events after long antecedent dry periods will reduce a significant portion of the pollutants in storm water discharged to and from the MS4.

The San Diego Water Board, however, acknowledges that in some situations retention of the full design capture volume onsite may not be technically feasible. In this event, the Copermittee may allow the Priority Development Project to use biofiltration BMPs to treat 1.5 times the design capture volume not reliably retained onsite, or biofiltration BMPs with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite.

The 1.5 multiplier is based on the finding in the Ventura County Technical Guidance Manual that biofiltration of 1.5 times the design capture volume not retained onsite will provide approximately the same pollutant removal as retention of the design capture volume on an annual basis.[37] This standard is consistent with the Los Angeles Water Board's Los Angeles County and Ventura County municipal storm water permits (Order Nos. R4-2012-0175 and R4-2010-0108, respectively). The flow-thru design of 0.75 times the portion of the design capture volume not reliably retained onsite is consistent with the San Diego Water Board's Fourth Term Permits for Orange County and Riverside County ~~municipal storm water permits~~ (Order Nos. R9-2009-0002 and R9-2010-0016, respectively). In either case, the biofiltration BMPs must be designed with an appropriate hydraulic loading rate to maximize storm water retention and pollutant removal, as well as to prevent erosion, scour, and channeling within the BMP. Each Copermittee is required to update its BMP Design Manual to provide guidance for hydraulic loading rates and other biofiltration design criteria necessary to maximize storm water retention and pollutant removal.

The San Diego Water Board further recognizes that, in addition to not being technically feasible, retention of the full design capture storm onsite may be cost prohibitive, or may not provide as much water quality benefit to the Watershed Management Area as would implementing BMPs elsewhere in the watershed. Thus, Provision E.3.c.(1)(b) allows for the use of a combination of onsite retention BMPs, and the implementation of an Alternative Compliance Program described in Provision E.3.c.(3). Provision E.3.c.(3) is discussed in more detail below.

If the full design capture volume is not retained onsite either because biofiltration is not technically feasible, or a Copermittee grants a Priority Development Project permission to utilize the Alternative Compliance Program, then the pollutants in the portion of the design capture volume that are not reliably retained onsite must still be reduced to the MEP. Thus, flow-thru treatment control BMPs are required to be implemented on Priority Development Projects in addition to the retention BMPs. The requirements of Provisions E.3.c.(1)(a)(ii)[a]-[c] include the performance standards for flow-thru

[37] Ventura Countywide Stormwater Management Program. 2011. Ventura Technical Guidance Manual, Manual Update, 2011.

treatment control BMPs, consistent with the Fourth Term Permits in the San Diego Region.

Whereas the purpose of the requirements under Provision E.3.c.(1) is to reduce pollutants in storm water runoff to the MEP, the purpose of the requirements under Provision E.3.c.(2) is to maintain or restore more natural hydrologic flow regimes to prevent accelerated, unnatural erosion in downstream receiving waters, also to the MEP standard. Provision E.3.c.(2) describes hydromodification management BMP requirements that must be implemented by all Priority Development Projects.

The performance criteria for the implementation of hydromodification management BMPs on Priority Development Projects are consistent with the requirements in the Fourth Term Permits for Orange and Riverside Counties (Order Nos. R9-2009-0002 and R9-2010-0016, respectively). Modifications to the Orange County and Riverside County Hydromodification Management Plans (HMPs) will likely be minor, or may not be necessary. The HMP for San Diego County will likely require some minor modifications to incorporate the requirements of Provision E.3.c.(2) and become consistent with the Orange County and Riverside County HMPs. The San Diego Water Board does not, however, expect that it will be necessary for the San Diego County Copermittees to develop a new approach or significantly re-write the San Diego County HMP. This is because the premise of the hydromodification management BMP requirements, which are to control storm water runoff conditions (flow rates and durations) for Copermittee-defined range of flows, is unchanged from all Fourth Term Permits in the San Diego Region.

Provision E.3.c.(2)(a) requires that post-project runoff conditions mimic the *pre-development* runoff conditions, and not the *pre-project* runoff conditions. Fundamentally, the San Diego Water Board believes that using a hydrology baseline that approximates that of an undeveloped, natural watershed is the only way to facilitate the return of more natural hydrological conditions to already built-out watersheds, and ultimately improved stream health. On the other hand, using the *pre-project* hydrology as a baseline for redevelopment projects results in propagating the unnatural hydrology of urbanized areas. Propagating the urbanized flow regime does not support conditions for restoring degraded or channelized stream segments, and would forever sentence such streams to the degraded state. Furthermore, reducing the volume of storm water runoff associated with the urbanized flow regime will also result in reducing the discharge of pollutants into receiving waters, since storm water runoff from impervious surfaces contains untreated pollutants.

The San Diego Water Board understands that approximating the pre-development runoff condition associated with a redevelopment site is not necessarily straightforward because factors such as natural grade and native vegetation for the site cannot be precisely known. Therefore, the San Diego Water Board does not expect project designers to estimate historical conditions associated with redevelopment sites. Rather, the San Diego Water Board expects project designers and the Copermittees to

approximate pre-development runoff conditions using the parameters of a *pervious* area rather than an *impervious* area. This means that for redevelopment sites, approximating pre-development runoff conditions equates to using existing onsite grade and assuming the infiltration characteristics of the underlying soil. A redevelopment Priority Development Project must not use runoff coefficients of concrete or asphalt to estimate pre-development runoff conditions. Rather, redevelopment projects must use available information pertaining to existing underlying soil type (such as soil maps published by the National Resource Conservation Service), onsite existing grade, and any other readily available pertinent information to estimate pre-development runoff conditions.

The San Diego Water Board understands, indeed asserts, that the pre-development hydrology of an area in question can only be roughly estimated and cannot be precisely known. However, using the hydrology of a natural condition, even if not precisely known, will provide significant benefit to receiving waters over using the hydrology associated with impervious (developed) surfaces. Therefore in order to achieve the goals of the Clean Water Act, which are to "*restore and maintain the chemical, physical, and biological integrity of the nation's waters* [emphasis added]," the most appropriate standard to use for hydromodification management is the standard associated with the pre-development condition.

Provision E.3.c.(2)(b) requires Priority Development Projects to avoid known critical sediment yield areas or implement measures that would allow coarse sediment to be discharged to receiving waters, such that the natural sediment supply is unaffected by the project. This is necessary because the availability of coarse sediment supply is as much an issue for causing erosive conditions to receiving streams as are accelerated flows.

The San Diego Water Board recognizes that in some situations implementing the hydromodification management BMP requirements for flow control fully onsite may not be technically feasible, may be cost prohibitive, or may not provide any overall water quality benefits to the Watershed Management Area. Thus, Provision E.3.c.(2)(c) allows for the use of a combination of onsite hydromodification management BMPs for flow control and alternative compliance options described in Provision E.3.c.(3).

Provision E.3.c.(3) allows for alternative compliance in instances where the Copermittee determines that offsite measures will have a greater overall water quality benefit for the Watershed Management Area than if the Priority Development Project were to implement structural BMPs onsite. Consequently, watershed-specific structural BMP requirements are present in this Order in the form of allowable compliance offsite. The Alternative Compliance Program to Onsite Structural BMP Implementation Provision is intended to integrate with the Copermittees' planning efforts in the Water Quality Improvement Plans.

The Alternative Compliance Program is an option for Priority Development Projects where the governing Copermittee has participated in the development of a Watershed Management Area Analysis as part of the Water Quality Improvement Plan (described in Provision B.3.b.(4)). Such an approach is consistent with the latest findings in hydromodification management by the scientific community. In a Technical Report entitled *Hydromodification Assessment and Management in California,*[38] the report states:

> *"An effective [hydromodification] management program will likely include combinations of on-site measures (e.g., low-impact development techniques, flow-control basins), in-stream measures (e.g., stream habitat restoration), floodplain and riparian zone actions, and off-site measures. Off-site measures may include compensatory mitigation measures at upstream locations that are designed to help restore and manage flow and sediment yield in the watershed."*

Consistent with the ideas brought forth in the report, in the Watershed Management Area Analysis of Provision B.3.b.(4), which is optional, the Copermittees will develop watershed maps that include as much detail about factors that affect the hydrology of the watershed as is available. Such factors included identification of areas suitable for infiltration, coarse sediment supply areas, and locating stream channel structures and constrictions. Once these factors are mapped and studied, the Copermittees can identify areas in the watershed where candidate projects may be implemented that are expected to improve water quality in the watershed by providing more opportunity for infiltration, slowing down storm water flows, or attenuation of pollutants naturally via healthy stream habitat. These candidate projects may be in the form of retrofitting existing development, rehabilitating degraded stream segments, identifying regional BMPs, purchasing land to preserve valuable floodplain functions, and any other project(s) that the Copermittees identify.

Under the Alternative Compliance Program, Priority Development Projects may be allowed to fund, partially fund, or implement a candidate project, in lieu of implementing structural BMPs onsite, if they enter into a voluntary agreement with the governing Copermittee permitting this arrangement. Project proponents may also propose an alternative project not previously identified by the Copermittees. In either case, whether a project proponent implements a candidate project identified by the Copermittees or a separate alternative compliance project, the governing Copermittee must determine that implementation of the project will have a greater overall water quality benefit for the Watershed Management Area than fully implementing structural BMPs onsite. Determination of greater overall water quality benefits associated with alternative compliance projects would be accomplished by utilizing Water Quality Equivalency calculations developed pursuant to Provision E.3.c.(3)(a). Water Quality Equivalency calculations are necessary to establish a regional and technical basis for

[38] 2012. ED Stein, F Federico, DB Booth, BP Bledsoe, C Bowles, Z Rubin, GM Kondolf, A Sengupta. Technical Report 667. Southern California Coastal Water Research Project. Costa Mesa, CA.

determining water quality benefits associated with alternative compliance projects, which can be consistently used by all Copermittees in the San Diego Region. Finally, if ~~I~~f alternative compliance involves funding or implementing a project that is outside the jurisdiction of the governing Copermittee, then that Copermittee may enter into an inter-agency agreement with the appropriate jurisdiction.

Finally, Provision E.3.c.(2)(d) allows Priority Development Projects to be exempt from the hydromodification management BMP requirements if there is no threat of erosion to downstream receiving waters (i.e. the receiving stream is concrete lined from the point of discharge all the way to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean). If the Copermittees believe that more exemptions are warranted, then they must perform the optional Watershed Management Area Analysis of Provision B.3.b.(4). Additional exemptions other than those specified in this Order may be established on a watershed basis, provided the Copermittees perform the analysis, provide supporting rationale for the exemptions, and complete the Water Quality Improvement Plan approval process pursuant to Provision F.1.

To facilitate the transition to this Order from the Fourth Term Permits for Orange and Riverside County Copermittees, Provision E.3.c.(2)(e) allows two additional temporary exemptions from hydromodification management BMP implementation. The first temporary exemption allows relief from hydromodification management BMP implementation for Priority Development Projects discharging directly to an engineered channel conveyance system with a capacity to convey peak flows generated by the 10-year storm event all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean. Similar to the exemption allowed for concrete-lined channels, this exemption is premised on the concept that there is little threat of erosion to these types of engineered channel systems.

The second temporary exemption allows relief from hydromodification management BMP implementation for Priority Development Projects discharging directly to large river reaches with drainage areas larger than 100 square miles and a 100-year flow capacity in excess of 20,000 cubic feet per second. If this exemption is claimed, then properly sized energy dissipation is required at all discharge points associated with the Priority Development Project. This exemption is premised on the concept that large river reaches can essentially assimilate the accelerated flow rates associated with individual Priority Development Projects because they are inconsequential compared to the flow rate in the large river reach. Both of these exemptions are included in the Hydromodification Management Plan for San Diego County[39].

These temporary exemptions are allowed as a means to facilitate Orange and Riverside County Copermittees' transition to this Order from the Fourth Term Permits and are not meant to reside as permanent exemptions without additional rigorous

[39] Final Hydromodification Management Plan Prepared for County of San Diego, March 2011

technical analyses specific to each County. Therefore, these exemptions will no longer apply once the Copermittees' land development programs are fully updated to reflect the requirements of this Order, i.e., upon implementation of the BMP Design Manual pursuant to Provision F.2.b. If the Copermittees believe that these or other exemptions are warranted in the context of water quality improvement and stream restoration opportunities, then the Copermittees must perform the optional Watershed Management Area Analysis of Provision B.3.b.(4) and provide supporting rationale for the exemptions. The San Diego County Copermittees are also required to perform the optional Watershed Management Area Analysis to provide supporting rationale to justify use of these and other exemptions. Updated BMP Design Manuals including rationale to justify use of exemptions will be reviewed by the San Diego Water Board pursuant to Provision F.2.b.

Provisions E.3.c.(4) and E.3.c.(5) were included under the BMP requirements applicable to all development projects in the Fourth Term Permits for San Diego, Orange, and Riverside Counties (Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016, respectively). In this Order, the long-term BMP maintenance and infiltration and groundwater protection requirements apply to structural BMPs implemented by Priority Development Projects only.

Provision E.3.d requires the Copermittees to update their BMP Design Manual as needed to incorporate the requirements of Provision E.3. The BMP Design Manual is formerly known as the Standard Storm Water Mitigation Plan, or SSMP, and was renamed so that the title has a more accurate description of the document content. The contents of the BMP Design Manual are largely unchanged from the previous Standard Storm Water Mitigation Plans required under the Fourth Term Permits. The BMP Design Manual fulfills the 40 CFR 122.26(d)(2)(iv)(A)(2) requirement that the Copermittee's development planning program includes "*a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment*."

As part of the "*planning procedures,*" 40 CFR 122.26(d)(2)(iv)(A)(2) requires the procedures to "*address controls to reduce pollutants in discharges from municipal separate storm sewers after construction is completed*." The requirements applicable to the implementation and oversight of structural BMPs at Priority Development Projects are provided under Provision E.3.e.

Proper installation of the structural BMPs approved for a Priority Development Project is necessary to ensure that pollutants in storm water discharges will be reduced to the MEP after the project is completed. In addition to the proper installation of structural BMPs, the maintenance of structural BMPs on Priority Development Projects is necessary to ensure that pollutants in storm water discharges will continue to be reduced to the MEP. Provision E.3.e.(1) includes the minimum requirements that each

Copermittee must implement to ensure structural BMPs are properly installed and will be properly maintained.

The requirements under Provision E.3.e.(2)-(3) are necessary to demonstrate each Copermittee is implementing a program that complies with Provisions E.3.b-c and E.3.e.(1), and ensure structural BMPs at Priority Development Project will continue to be able to reduce pollutants in storm water discharges to the MEP.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary for any development projects to compel compliance with the requirements of Provision E.3 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.3.f requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Provision E.4 (Construction Management) requires each Copermittee to implement a construction management program to control and reduce the discharge of pollutants in storm water from construction sites to the MEP. Proper implementation of the construction management program will also contribute toward effectively prohibiting non-storm water discharges from construction sites to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." As part of the management program, 40 CFR 122.26(d)(2)(iv)(D) requires "*a program to implement and maintain structural and non-structural best management practices to reduce pollutants in storm water runoff from construction sites to the municipal storm sewer system.*"

Construction sites can be significant sources of sediment, trash, and other pollutants to receiving waters. Although sediment is naturally occurring in the natural environment, the discharge of sediment under unnatural conditions is problematic to receiving waters. Fine sediment in creeks causes high turbidity that interferes with the functionality of native flora and fauna in local creeks. For example, turbidity interferes with both photosynthesis of water-philic plants, as well as successful foraging and reproduction of benthic macroinvertebrates. Sediment can also make it difficult for fish to breathe because it clogs fish gills. Other pollutants such as heavy metals or pesticides can adhere to sediment and are transported to receiving waters during storm events, where they dissolve in the water column and become bioavailable to aquatic organisms. Sediment is recognized as a major stressor to surface waters and is responsible for the impairment of several lagoons and creeks in the San Diego Region.

Provision E.4 includes requirements that each Copermittee must implement to minimize the discharge of sediment and other pollutants from construction sites to the MS4 within its jurisdiction. The requirements under Provision E.4 are consistent with the Fourth Term Permits for San Diego, Orange, and Riverside Counties. Therefore, Copermittees are expected to implement the requirements seamlessly, with minimal changes to their existing construction management programs. The Copermittees, however, are given more flexibility to run their programs as needed to maximize efficiency, and also to be consistent with the Water Quality Improvement Plan for the Watershed Management Area.

As part of the construction management program, 40 CFR 122.26(d)(2)(iv)(D)(1) requires "*procedures for site planning which incorporate consideration of potential water quality impacts.*" Provision E.4.a describes the minimum elements each Copermittee is required to include as part of the construction site planning and project approval process. The construction site planning and approval process is based primarily on ensuring each project had an adequate site-specific pollution control, construction BMP, and/or erosion and sediment control plan that will be implemented to minimize the discharge of pollutants in storm water to the MEP, and minimize impacts to receiving waters.

The requirements under Provision E.4.b provide the data and information necessary to identify "*priorities for inspecting sites and enforcing control measures*" required pursuant to 40 CFR 122.26(d)(2)(iv)(D)(3). Under Provision E.4.b, each Copermittee must identify construction sites that are considered a high threat to downstream surface waters. Designation of "high threat to water quality" construction sites will necessitate the Copermittees to develop criteria to identify such sites. Provision E.4.b.(2) describes a list of factors that must be considered when the Copermittee considers threat to water quality. For example, a Copermittee must identify sites as "high threat to water quality" if it is located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions, according to the Water Quality Improvement Plan. This ensures that construction management program implementation is compatible with the Copermittee's identified highest priority water quality conditions.

Pursuant to 40 CFR 122.26(d)(2)(iv)(D)(2) each Copermittee is required describe "*requirements for nonstructural and structural best management practices*" at construction sites. Provision E.4.c includes the types of construction site BMPs that the Copermittees must implement, or require the implementation of, at each construction site to reduce pollutants in storm water discharges to the MEP.

Each Copermittee is expected to require the implementation of appropriate BMPs given specific site conditions, the season and likelihood of rain events, and construction phase (i.e. grading vs. vertical construction). This means that throughout the life of the project construction, the appropriate BMPs will vary, especially if the

construction of the project spans multiple wet seasons. As opposed to describing specific minimum BMPs that must be implemented, the Order describes major BMP categories that should be considered for each site.

Each Copermittee is expected to use its 20 years of storm water experience and knowledge to require implementation of appropriate BMPs from the various categories at each construction site within its jurisdiction. For example, the San Diego Water Board expects that each site will be required to implement erosion control and sediment control. The San Diego Water Board also expects each Copermittee to require implementation of active/passive sediment treatment systems at sites where other BMPs have been tried and are known to be inadequate, and discharges of sediment are causing or contributing to water quality impairment downstream. Each Copermittee is granted flexibility in specifying the minimum level of BMP requirements at each site, but the San Diego Water Board expects each site to be capable of controlling pollutants in storm water discharges to the MEP and preventing illicit discharges.

The requirements under Provision E.4.d are necessary to demonstrate that each Copermittee is implementing a program that complies with Provisions E.4.a and E.4.c and ensure BMPs at construction sites will reduce pollutants in storm water discharges to the MEP.

Provision E.4.d does not include minimum required inspection frequencies for construction sites. Each Copermittee must use its experience and knowledge to specify an appropriate inspection frequency for both high priority and lower priority sites in their jurisdictional runoff management program documents, and in accordance with the Water Quality Improvement Plan. Appropriate inspection frequencies may vary by Copermittee, but the San Diego Water Board expects that the stated frequency will be adequate for each Copermittee to properly oversee the construction sites within its jurisdiction, confirm BMPs are implemented to reduce pollutants in storm water discharges from constructions sites to the MEP, and make needed changes to its program on an ongoing basis as necessary.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary for any development projects to compel compliance with the requirements of Provision E.4 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.4.e requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

<u>Provision E.5 (Existing Development Management)</u> requires each Copermittee to implement an existing development management program to control and reduce the discharge of pollutants in storm water from areas of existing development to the MEP.

Proper implementation of the existing development management program will also contribute toward effectively prohibiting non-storm water discharges from areas of existing development to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." Within 40 CFR 122.26(d)(2)(iv)(A) and (C), the management program is required to reduce impacts on receiving waters and reduce pollutants in storm water discharges to the MEP from commercial and residential areas, industrial facilities, and municipal facilities.

Commercial and residential areas, industrial facilities, and municipal facilities must be addressed by each Copermittee with the existing development management program required under Provision E.5. All other areas within each Copermittee's jurisdiction should be either undeveloped open space, or areas that are being developed or under construction. Areas being developed or under construction will be addressed by the Copermittee under the requirements of Provision E.3 (Development Planning) or Provision E.4 (Construction Management).

Areas of existing development typically include impervious surfaces such as sidewalks, driveways, roads, and rooftops, which generate and concentrate pollutants (such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not found in high concentrations in the natural environment. Pollutants that accumulate on impervious surfaces are not easily biodegraded or not subject to natural treatment processes. When it rains, these pollutants are transported in storm water runoff from these impervious surfaces into receiving waters, resulting in poor water quality and degradation of beneficial uses.

In addition to the generation of pollutants, areas of existing development have generally altered the natural conditions of the land and removed vegetative cover, reduced the perviousness of the surface, and reduced the capacity of storm water that can be intercepted, captured, stored, infiltrated, evaporated, and/or evapotranspired. The alteration of the natural conditions and the impervious surfaces associated with areas of existing development causes water quality problems due to the alteration of natural flow regimes within the watersheds; resulting in hydromodification of channels, streams, and habitats that exist within or adjacent to the areas of existing development.

Thus, storm water discharges from areas of existing development are responsible for poor water quality, degraded habitats, and hydromodified channels throughout the developed portions of the watersheds in the San Diego Region. To improve the health and functionality of the receiving waters in a Watershed Management Area, land use practices and the amount of impervious surfaces in areas of existing development must change to reduce the various impacts caused by hydromodification and

pollutants from storm water runoff generated in developed areas. Each Copermittee must be aggressive to address pollutant sources and runoff from areas of existing development to be able to reduce pollutants in storm water discharges from the MS4 to the MEP.

There is some overlap in the requirements under Provision E.5 with the requirements under Provisions E.2 (Illicit Discharge Detection and Elimination), E.3 (Development Planning), and E.4 (Construction Management). Illicit discharges frequently originate from areas of existing development. New development projects, when completed will become some type of residential, commercial, industrial or municipal existing development. Redevelopment projects are, by definition, redeveloping areas of existing development. And, redevelopment projects become construction sites located in areas of existing development. Much of the data and information collected, inspections performed, and enforcement actions taken for the requirements under Provisions E.2 to E.4 may also be utilized by the existing development management program. The requirements under Provision E.5, however, are focused primarily on reducing pollutants generated in areas of existing development that can be transported in storm water runoff and discharged to and from the MS4.

The requirements under Provision E.5 build upon existing program elements being implemented by the Copermittees. Provision E.5 is generally consistent with the existing development requirements of the Fourth Term Permits for Orange and Riverside Counties (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), but modified to provide more flexibility to implement the programs so resources can be better focused toward addressing the highest priority water quality conditions identified in the Water Quality Improvement Plans.

For a Copermittee to properly manage areas of existing development, having knowledge of what development exists within its jurisdiction is essential. Provision E.5.a requires each Copermittee to maintain a watershed-based inventory of all the existing development within its jurisdiction. This requirement is necessary for each Copermittee to implement the requirements of Provision E.5.b-e.

As opposed to just maintaining separate inventories based on the type of site, each Copermittee must maintain a watershed-based inventory that includes all types of existing development within its jurisdiction. By utilizing a watershed-based inventory, the Copermittees within a Watershed Management Area can combine their inventories and review the inventories by watershed in addition to by jurisdiction. Pollutant sources and strategies for abatement can then be evaluated on a watershed level, as opposed to evaluating sources and strategies strictly by type of site.

Provision E.5.a includes the information that must be included in the inventory. Provision E.5.a.(1) specifies what facilities or areas must be included in the inventory. A commercial type of existing development may be identified in the inventory as a facility (e.g. individual building, individual business) or an area (e.g. shopping center,

commercial zone). An industrial type of existing development must be identified in the inventory by facility (e.g. individual industrial entity). A municipal type of existing development must be identified in the inventory by facility, with a list of specific municipal facilities that must be included in the inventory. A residential type of existing development must be identified by areas to be designated by the Copermittee. For each of the facilities and areas identified in the Copermittee's inventory developed pursuant to Provision E.5.a.(1), Provision E.5.a.(2) specifies the information that must be included in the description for the facility or area.

Provision E.5.a.(3) requires each Copermittee to maintain an updated map showing the location of inventoried existing development, watershed boundaries, and water bodies. This requirement was included because this information is expected to help the Copermittees in a Watershed Management Area identify and prioritize sources of pollutants and/or stressors in areas of existing development that contribute toward the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Knowledge of the existing development that are likely to be sources of pollutants contributing to the highest priority water quality conditions is expected to be a key element in the Copermittees' development of the water quality improvement strategies that will be included in the Water Quality Improvement Plans. The strategies described in the Water Quality Improvement Plans will direct efforts within the existing development management programs implemented by each Copermittee.

Pursuant to 40 CFR 122.26(d)(2)(iv)(A) each Copermittee is required describe "*structural and source control measures to reduce pollutants*" in storm water runoff discharged from areas of existing development. Provision E.5.b includes the BMP implementation and maintenance requirements that the each Copermittee must require at areas of existing development to reduce pollutants in storm water discharges to the MEP. The San Diego Water Board, however, recognizes that BMP implementation and maintenance for residential areas will require much more education and encouragement through less authoritative measures than for commercial, industrial and municipal facilities and areas. Thus, the BMP implementation and maintenance requirements have been separated between requirements under Provision E.5.b.(1) for commercial, industrial and municipal facilities and areas, and Provision E.5.b.(2) for residential areas.

Most of the requirements in Provision E.5.b are consistent with the related requirements in the Fourth Term Permits. The level of specificity, however, has been changed to allow each Copermittee the flexibility to implement its program to achieve maximum efficiency, and to perform functions that will address the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Each Copermittee is expected to require the implementation of appropriate BMPs to address the expected pollutants from each facility or area. The Third and Fourth Term

Permits described specific minimum BMPs that must be implemented at various sites. This Order, however, requires each Copermittee to designate minimum BMPs themselves and require implementation. Consistent with the Fourth Term Permits, each Copermittee is required to maintain, or require the maintenance of, all BMPs as needed.

The BMP implementation and maintenance requirements include a schedule of operation and maintenance activities for the MS4 and related structures (such as catch basins, storm drain inlets, and detention basins), as well as public streets and roads. Public streets and roads specifically include public unpaved roads. The San Diego Water Board identified, through investigations and complaints, sediment discharges from unpaved roads as a significant source of water quality problems in the San Diego Region. Inspection activities conducted by the San Diego Water Board since the Third Term Permits have found a lack of source control for many unpaved roads within the jurisdiction of the Copermittees.

Unpaved roads are a source of sediment that can be discharged in runoff to receiving waters, especially during storm events. Erosion of unpaved roadways occurs when soil particles are loosened and carried away from the roadway base, ditch, or road bank by water, wind, traffic, or other transport means. Exposed soils, high runoff velocities and volumes, sandy or silty soil types, and poor compaction increase the potential for erosion.

Road construction, culvert installation, and other maintenance activities can disturb the soil and drainage patterns to streams in undeveloped areas, causing excess runoff and thereby erosion and the release of sediment. Poorly designed unpaved roads can act as preferential drainage pathways that carry runoff and sediment into natural streams, impacting water quality. In addition, other public works activities along unpaved roads have the potential to significantly affect sediment discharge and transport within streams and other waterways, which can degrade the beneficial uses of those waterways.

USEPA also recognizes that discharges from unpaved roads pose a significant potential threat to water quality. USEPA guidance[40] emphasizes the threat of unpaved roads to water quality:

> "*Dirt and gravel roads are a major potential source of these pollutants [sediment] and pollutants that bind to sediment such as oils, nutrients, pesticides, herbicides, and other toxic substances. Many roads have unstable surfaces and bases. Roads act like dams, concentrating flows that accelerate erosion of road materials and roadsides. Both unstable surfaces and accelerated erosion then lead to sediment and dust.*"

[40] USEPA, 2006. Environmentally Sensitive Maintenance for Dirt and Gravel Roads. Gesford and Anderson, USEPA-PA-2005.

There are several guidance documents, developed by the USEPA,[41] the US Forest Service,[42] the University of California,[43] and others, that include design and construction specifications and BMPs that are readily available for implementation by public entities. Implementing design and other source control BMPs for unpaved roads in the region is necessary to reduce and minimize the impacts of sediment discharged during storm events from unpaved roads to the MS4s and receiving waters.

Provision E.5.c describes existing development site inspection frequency, content, and tracking that each Copermittee must incorporate into their existing development management programs. The requirements under Provision E.5.c are necessary to demonstrate each Copermittee is implementing a program that complies with Provision E.5.b and ensure BMPs implemented in areas of existing development will reduce pollutants in storm water discharges to the MEP. Provision E.5.c has been modified to include a minimum of once every 5 years for all inventoried facilities and areas of existing development, utilizing one or more methods of inspection.

In addition to onsite inspections, the methods of inspection have been expanded to include drive-by inspections. Inspections may be performed by the Copermittee's municipal and contract staff, or by volunteer monitoring or patrol programs. Volunteer monitoring or patrol programs are not expected to enforce the Copermittee's ordinances, or to inspect areas or facilities where members of the public are not allowed access. Volunteer monitoring or patrol programs must be trained by the Copermittee, and are only expected to collect visual observations. By utilizing drive-by inspections and volunteer monitoring or patrol programs, the Copermittees will be able to maximize and efficiently use their resources to identify and address sources of pollutants in areas of existing development.

The municipal and contract staff of each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial, industrial, and municipal facilities and areas in its inventoried existing development pursuant to Provision E.5.c.(1)(a)(iv). An "equivalent" of at least 20 percent means if any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspections may count toward the total annual inspection requirement. Linear municipal facilities (i.e. MS4 linear channels, sanitary sewer collection systems, streets, roads and highways) in the Copermittee's existing development inventory are not subject to the inspection frequency requirement of Provision E.5.c.(1)(a)(iv).

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[41] Ibid
[42] US Forest Service, 1996. Forest Service Specifications for Construction of Roads & Bridges. EM-7720-100. Revised August 1996.
[43] University of California Division of Agriculture and Natural Resources, 2007. Rural Roads: A Construction and Maintenance Guide of California Landowners. Publication 8262.

The inspection content specified in Provision E.5.c.(2)(a) includes the information required to be collected during an inspection by any method. The inspection content specified in Provision E.5.c.(2)(b) includes additional information that must be collected when a Copermittee's municipal or contract staff perform an onsite inspection. Provision E.5.c.(3) specifies the information that each Copermittee must maintain in its existing development inspection records.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary to compel compliance with the requirements of Provision E.5 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.5.d requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Provisions E.5.e.(1)-(2) specifically require the Copermittee to identify areas of existing development as candidates for retrofitting, and streams, channels, and/or habitats as candidates for rehabilitation. Provisions E.5.e.(1)-(2) are based on the retrofitting requirements of the Fourth Term Permits for Orange and Riverside Counties, but modified to also include identifying projects to rehabilitate channels within areas of existing development. The requirements have also been modified to be more focused on utilizing these types of projects for addressing the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Interest and opportunity to retrofit areas of existing development and rehabilitate channels located in areas of existing development has been observed in several programs the San Diego Water Board oversees (e.g., CWA Section 401 Water Quality Certification program, supplemental environmental projects, and grant programs). Each jurisdiction has miles and miles of streets that could be retrofitted to become green streets. Reshaping landscaped areas from convex to concave configurations can detain storm water instead of directing runoff as quickly as possible to the MS4. Retrofit projects could also include simply replacing impervious surfaces with permeable surfaces.

Retrofitting projects do not necessarily have to be expensive. Retrofitting projects could be as simple as redirecting downspouts from roofs to pervious or landscaped areas instead of to hardscaped areas discharging directly to the MS4, providing rain barrels to harvest storm water from downspouts for use at a later time, or planting more trees in areas with little vegetation to provide canopy that can intercept storm water. The San Diego Water Board encourages the Copermittees to identify simple, low-cost retrofitting opportunities that can be easily implemented, in addition to other more expensive retrofitting and channel rehabilitation projects.

Rehabilitation of channels, streams, and/or habitat will require more significant planning and resources to implement. There are, however, also abundant opportunities to rehabilitate channels, streams and/or habitats in or adjacent to areas of existing development. Each Watershed Management Area likely has several creeks and stream reaches that have been undergrounded, artificially hardened, or hydromodified that could be rehabilitated to be more sustainably configured, which would slow down storm water flows and potentially have more assimilative capacity for pollutants while still being supportive of designated beneficial uses.

The San Diego Water Board recognizes that it may be infeasible to implement retrofitting or channel rehabilitation projects within certain areas of a Copermittee's jurisdictions. For such areas, the Copermittee must instead identify, develop, and implement regional retrofitting and channel rehabilitation projects (i.e. projects that can retain and/or treat storm water from one or more areas of existing development) adjacent to and/or downstream of the areas of existing development.

Provisions E.5.e.(1)-(2) do not require the implementation of retrofitting and rehabilitation projects, but do require the Copermittee to develop a program with strategies to facilitate the implementation of these types of projects in areas of existing development. The strategies are expected to include allowing and encouraging Priority Development Projects to implement retrofitting types of projects as a means of compliance with the structural BMP performance criteria requirements of Provisions E.3.c.(1) and E.3.c.(2).

Provision E.6 (Enforcement Response Plans) requires each Copermittee to develop an Enforcement Response Plan as part of its jurisdictional runoff management program document. Proper implementation of the Enforcement Response Plans is necessary to effectively prohibit non-storm water discharges to the MS4, and reduce the discharge of pollutants in storm water from the MS4 to the MEP.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system*" and be able to demonstrate that it can "*operate pursuant to legal authority established by statute, ordinance or series of contracts*" to control the discharge of non-storm water and pollutants in storm water to and from its MS4. Pursuant to 40 CFR 122.26(d)(2)(i)(E) each Copermittee is specifically required to have the legal authority to "*[r]equire compliance with conditions in ordinances, permits, contracts or order*s."

The requirements under Provision E.6 are necessary to demonstrate that each Copermittee can enforce its legal authority to *"effectively prohibit non-stormwater discharges"* and "*reduce the discharge of pollutants to the maximum extent practicable*" as well as "*[r]equire compliance with conditions in ordinances, permits, contracts or order*."

The Enforcement Response Plan required under Provision E.6 will serve as a reference for the Copermittee and the San Diego Water Board to determine if consistent enforcement actions are being implemented to achieve timely and effective compliance from all public and private entities that are not in compliance with the Copermittee's ordinances, permits, or other requirements. The Enforcement Response Plan must contain clear direction for the Copermittee to take immediate enforcement action, when appropriate and necessary, in their illicit discharge detection and elimination, development planning, construction management, and existing development management programs.

If the entities subject to the Copermittee's legal authority do not implement appropriate corrective actions in a timely manner, or if violations repeat, the Copermittee must take progressively stricter responses to enforce its legal authority and achieve compliance with its ordinances, permits, or other requirements to *"effectively prohibit non-stormwater discharges"* and "*reduce the discharge of pollutants to the maximum extent practicable.*"

Provision E.7 (Public Education and Participation) requires each Copermittee to implement a public education and participation program. Proper implementation of the public education and participation program as part of its jurisdictional runoff management program will contribute toward effectively prohibiting non-storm water discharges to the MS4, and toward the reduction of pollutants in storm water from the MS4 to the MEP.

Provision E.7 establishes the minimum requirements that each Copermittee must implement to engage members of the public as part of its jurisdictional runoff management program. In the Fourth Term Permits, the public education program requirements and the public participation requirements were included as separate jurisdictional runoff management program components. In this Order, the public education requirements have been consolidated with the public participation requirements, as both sets of requirements are related to the engagement of the public by each Copermittee. Engagement of the public is critical for the success of each Copermittee's jurisdictional runoff management program.

The Copermittees have been implementing public education programs for the last 20 years, which are now well established. The specificity of expected public education program elements of the Fourth Term Permits has been removed. For the most part, the public education program requirements in Provision E.7.a have been reduced to a set of requirements that are specifically included in the federal regulations under 40 CFR 122.26(d)(2)(iv)(A)(6), 122.26(d)(2)(B)(6) and 122.26(d)(2)(D)(4), which should already be incorporated into each Copermittee's existing public education program. Each Copermittee is expected to utilize the information and data collected from the monitoring and assessments conducted within the Watershed Management Area, and from its inventories and inspections to best direct its public education program

resources toward addressing the highest priority water quality conditions identified within the Water Quality Improvement Plan.

According to 40 CFR 122.26(d)(2)(iv), public participation is required to be included as part of the "*comprehensive planning process*", which includes the development and implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs. The requirements under Provision E.7.b specify the opportunities that the public must be provided to be involved in the "*comprehensive planning process*", as required by to 40 CFR 122.26(d)(2)(iv).

Provision E.8 (Fiscal Analysis) requires each Copermittee to secure the resources and provide an analysis of the resources that will be necessary to implement the requirements of the Order. Adequate fiscal resources are necessary for a jurisdictional runoff management program to effectively prohibit non-storm water discharges to the MS4, and reduce pollutants in storm water from the MS4 to the MEP.

According to 40 CFR 122.26(d)(2)(vi), each Copermittee is responsible for providing "*a fiscal analysis of the necessary capital and operation and maintenance expenditures necessary to accomplish the activities*" required by this Order, including "*a description of the source of funds that are proposed to meet the necessary expenditures, including legal restrictions on the use of such funds.*" The fiscal analysis requirements of Provision E.8 are consistent with 40 CFR 122.26(d)(2)(vi).

The San Diego Water Board has chosen not to require a description of fiscal benefits realized from implementation of the jurisdictional runoff management programs. This is a recommendation from the National Association of Flood and Stormwater Management Agencies.[44] For instance, the fiscal analysis requirements do not address city-wide fiscal benefits of protection (e.g., public health, tourism, property values, economic activity, beneficial uses, etc.), even though many costs currently reported to the San Diego Water Board are for related activities. This type of assessment may help Copermittees improve the allocation of resources and it may help the Copermittees secure adequate funding for the program. Qualitative assessments, however, could be overly subjective and most Copermittees likely lack the ability to provide accurate quantitative assessments. The San Diego Water Board encourages the Copermittees to consider means for conducting assessments of fiscal benefits derived from the programs. Such assessments could be conducted on a regional scale similar to studies of program costs conducted by the State Water Board.[45]

[44] National Association of Flood and Stormwater Management Agencies. 2006. *Guidance for Municipal Stormwater Funding.* Prepared under a grant provided by the USEPA.
[45] State Water Board, 2005. NPDES Stormwater Cost Survey.

F. Reporting

Purpose: Provision F includes the requirements for the documents and reports that the Copermittees must prepare and provide to the San Diego Water Board. The documents prepared by the Copermittees and provided to the San Diego Water Board and made available to the public will provide the documentation that the Copermittees are complying with the requirements of the Order.

***Discussion*:** Provision F requires the Copermittees to prepare several documents and reports that must be provided to the San Diego Water Board and made available to the public. The reporting requirements have been significantly reduced compared to the Fourth Term Permit reporting requirements. The reduction in reporting requirements was recommended by the San Diego County Copermittees in the Report of Water Discharge submitted in June 2011.

More specific and detailed discussions of the requirements of Provision F are provided below.

Provision F.1 (Water Quality Improvement Plans) requires the Copermittees in each Watershed Management Area to develop and submit a Water Quality Improvement Plan in accordance with the requirements of Provision B.

Of all the requirements of Provision F, the Water Quality Improvement Plans will likely be the documents requiring the most significant effort to develop. The content of the Water Quality Improvement Plans, however, is expected to include content that should already have been developed for the Watershed Plans and several elements that are included in the Monitoring and Reporting Programs required under the Fourth Term Permits.

Because the Water Quality Improvement Plan is part of the "*comprehensive planning process which involves public participation*," Provision F.1 includes requirements to give multiple opportunities to the public to provide input on the content of the plans.

Provision F.1.a.(1) specifies the elements that the Copermittees must include in the public participation process for the development of the Water Quality Improvement Plans. In order for the public to be aware of the opportunities to provide input, Provision F.1.a.(1)(a) requires the Copermittees to develop a publicly available and noticed schedule of the opportunities for the public to participate and provide comments during the development of the Water Quality Improvement Plan. These opportunities are when the public can provide the data, information, and recommendations that the Copermittees can consider during the development of the Water Quality Improvement Plans.

The San Diego Water Board recognizes, however, that the Copermittees cannot be expected to incorporate all the data, information, and recommendations that the public may provide into the Water Quality Improvement Plans. The Copermittees will have to review the data, information, and recommendations received and make some decisions on what to incorporate into the Water Quality Improvement Plans. Before the Copermittees finalize their decisions, members of the public should be allowed to review the Copermittees' decisions. Thus, Provision F.1.a.(1)(b) requires the Copermittees to form a Water Quality Improvement Consultation Panel (Panel).

The Panel will consist of a member from the environmental community and a member from the development community familiar with the Watershed Management Area. A representative from the San Diego Water Board staff will also be part of the Panel. The Copermittees may choose to include additional members, but the Panel is only required to include three panel members.

The Panel will serve as an additional public participation and input mechanism during the development of the Water Quality Improvement Plans. The knowledge and expertise from these Panel members are expected to provide the Copermittees valuable direction during their decision-making process. The Copermittees will review the content of their planned submittals with the Panel members to receive recommendations. If the Panel provides recommendations, the Copermittees must consider revisions to the Water Quality Improvement Plan submittals.

The San Diego Water Board recognizes that the development of multiple Water Quality Improvement Plans concurrently may limit the ability of the public to review and provide comments to the Copermittees. Thus, Provision F.1.a.(1)(c) requires the Copermittees to coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public time and opportunity to participate during the development of the Water Quality Improvement Plans.

Provision F.1.a.(2) requires the Copermittees to develop and submit the first Water Quality Improvement Plan component, in accordance with the requirements of Provision B.2, which includes the identification of the priority water quality conditions and potential water quality improvement strategies. The public must be provided an opportunity to provide data, information and recommendations to be utilized in the development and identification of the priority water quality conditions and potential water quality improvement strategies for the Watershed Management Area. The Copermittees must consult with the Panel and consider making revisions. The Copermittees may submit the requirements of Provision B.2 as early as 6 months and no later than 12 months after the commencement of coverage under this Order. After the requirements of Provision B.2 are submitted to the San Diego Water Board, the public will be provided another opportunity to provide comments.

Provision F.1.a.(3) requires the Copermittees to develop and submit the second Water Quality Improvement Plan component, in accordance with the requirements of

Provision B.3, which includes the identification of the numeric goals for the highest priority water quality conditions identified for the Watershed Management Area, and the strategies that will be implemented to achieve the potential numeric goals. The Copermittees may also develop the Optional Watershed Management Area Analysis, in accordance with the requirements of Provision B.3.b.(4), as part of this submittal. The public must be provided an opportunity to provide data, information and recommendations to be utilized in the development and identification of the numeric goals and water quality improvement strategies for the Watershed Management Area. The Copermittees must consult with the Panel and consider making revisions. The Copermittees may submit the requirements of Provision B.3 as early as 9 months and no later than 18 months after the commencement of coverage under this Order. After the requirements of Provision B.3 are submitted to the San Diego Water Board, the public will be provided another opportunity to provide comments.

Finally, Provision F.1.b describes the process for the submittal and implementation of the Water Quality Improvement Plans. The complete Water Quality Improvement Plans are required to be submitted by the Copermittees within 24 months after the commencement of coverage under this Order. The San Diego Water Board will provide the public an opportunity to provide comments on each complete Water Quality Improvement Plan.

The San Diego Water Board will review each Water Quality Improvement Plan and the public comments received to determine if the Copermittees have submitted a Water Quality Improvement Plan that meets the requirements of Provision B. If a Water Quality Improvement Plan does not meet the requirements of Provision B, the Copermittees will be considered out of compliance and directed in writing by the San Diego Water Board Executive Officer to correct the deficiencies.

When a Water Quality Improvement Plan meets the requirements of Provision B, the San Diego Water Board will determine whether to hold a public hearing or to limit public input to submittal of written comments before accepting the Water Quality Improvement Plan. Implementation of the Water Quality Improvement Plan must begin within 30 days of acceptance.

The San Diego Water Board expects that any deficiencies in the Water Quality Improvement Plan will be identified either in the public comments or during the review by the San Diego Water Board before implementation begins. In the event any deficiencies are identified after the implementation of the Water Quality Improvement Plan, Provision F.1.b.(7) clarifies that the San Diego Water Board maintains the right to require the Copermittees to correct any deficiencies that may be identified.

Provision F.2 (Updates) requires the Copermittees to update specific documents that the Copermittees will utilize to implement the requirements of this Order.

Each Copermittee is required to continue implementing a jurisdictional runoff management program, as required under Provision E. Implementation of each Copermittee's jurisdictional runoff management program is directed by its jurisdictional runoff management program document. Provision F.2.a requires each Copermittee to update its jurisdictional runoff management program document to be consistent with the requirements of Provision E concurrent with the submittal of the Water Quality Improvement Plan.

Likewise, each Copermittee must continue to require new development and redevelopment projects to implement BMPs to control pollutants in storm water runoff. The control of pollutants in storm water runoff from development and redevelopment projects within each Copermittee's jurisdiction is guided and directed by its BMP Design Manual, formerly known as a Standard Storm Water Mitigation Plan (SSMP). Provision F.2.b requires each Copermittee to update its BMP Design Manual to be consistent with the requirements of Provision E.3 concurrent with the submittal of the Water Quality Improvement Plan.

In general, the requirements of the Order should not necessitate a complete rewrite of each Copermittee's jurisdictional runoff management program document or BMP Design Manual, as was required by the Third Term Permits. The jurisdictional runoff management program and BMP Design Manual requirements of this Order are not significantly different than the requirements of the Fourth Term Permits. Thus, only sections of the Order which are new or have been significantly changed should warrant revisions to specific sections of the Copermittee's jurisdictional runoff management program document and BMP Design Manual.

Finally, the Water Quality Improvement Plans are expected to require updates as the iterative approach and adaptive management process included in the Water Quality Improvement Plan, as required under Provision B.5, is implemented by the Copermittees. Provision F.2.c.(1) requires the Copermittees to implement a public participation process for the proposed updates, review the proposed updates with the Panel, and submit the updates to the Water Quality Improvement Plan as part of the Annual Reports required under Provision F.3.b.

Also, because TMDLs are likely to be developed, adopted and approved during the term of the Order, Provision F.2.c.(2) has been included to expedite the incorporation of TMDLs into the Copermittees' Water Quality Improvement Plans as part of the update process, potentially before the Order is re-opened to incorporated the requirements of the new TMDLs.

Provision F.3 (Progress Reporting) requires the Copermittees to report on the progress of implementing the Water Quality Improvement Plans.

The requirements of Provision F.3 are to report the progress toward improving water quality that the Copermittees are achieving with the implementation of the Water

Quality Improvement Plans and each Copermittee's jurisdictional runoff management program. The Progress Report Presentations required under Provision F.3.a are included to provide the Copermittees an opportunity to communicate directly with the San Diego Water Board and the public. The Progress Report Presentations will also provide the members of the San Diego Water Board and members of the public an opportunity to become more acquainted with the Copermittees and their projects and programs to address non-storm water and storm water discharges into and from their MS4s.

The Annual Report requirements of Provision F.3.b are a consolidation of several reporting requirements from the Fourth Term Permits, including the Jurisdictional Runoff Management Program Annual Reports, the Watershed Annual Reports, and the Monitoring and Reporting Program Annual Reports. Furthermore, the Annual Report requirements are consistent with the requirements under 40 CFR 122.42(c).

Pursuant to 40 CFR 122.42(c), "*[t]he operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the Director…must submit an annual report*", which must include the following:

(1) *The status of implementing the components of the storm water management program that are established as permit conditions* [40 CFR 122.42(c)(1)];

(2) *Proposed changes to the storm water management programs that are established as permit conditions* [40 CFR 122.42(c)(2)];

(3) *Revisions, if necessary, to the assessment of controls and fiscal analysis* [40 CFR 122.42(c)(3)];

(4) *A summary of data, including monitoring data, that is accumulated throughout the reporting year* [40 CFR 122.42(c)(4)];

(5) *Annual expenditures and budget for year following each annual report* [40 CFR 122.42(c)(5)];

(6) *A summary describing the number and nature of enforcement actions, inspections, and public education programs* [40 CFR 122.42(c)(6)];

(7) *Identification of water quality improvements or degradation* [40 CFR 122.42(c)(7)].

Under the Fourth Term Permits, each Copermittee is responsible for submitting a Jurisdictional Runoff Management Program Annual Report; the Copermittees in each designated watershed are responsible for submitting a Watershed Annual Report; and the Copermittees from each county are responsible for submitting a Monitoring and Reporting Program Annual Report.

There are 39 Copermittees in the San Diego Region, each required to prepare and submit a Jurisdictional Runoff Management Program Annual Report. There are 9 designated watersheds in San Diego County, 6 designated watersheds in Orange County, and 1 designated watershed in Riverside County for a total of 16 designated watersheds, each requiring a Watershed Annual Report. There are 3 sets of Copermittees in 3 counties in the San Diego Region, requiring Copermittees from each county to prepare and submit a Monitoring and Reporting Program Annual Report. Thus each Copermittee is currently required to prepare, or participate in the preparation of at least 3 annual reports. In addition, the San Diego County Copermittees are required to prepare and submit a Regional Urban Runoff Management Plan Annual Report.

In total, there are 59 annual reports that are prepared by the Copermittees and submitted to the San Diego Water Board for the Fourth Term Permits. The preparation of these annual reports requires significant time and resources from each Copermittee, which could otherwise be expended on actions that could improve water quality within its jurisdiction. In turn, significant time and resources are required from the San Diego Water Board staff to review these reports, which could otherwise be expended on working directly with the Copermittees to improve their implementation efforts toward restoring and protecting water quality.

Until the Water Quality Improvement Plans are developed, there will be a transitional period during which the Copermittees will continue to implement their existing jurisdictional runoff management programs. There will also be a transitional period during which the Copermittees will implement the transitional monitoring and assessment requirements of Provision D. During the transitional period, the Copermittees will submit annual reports pursuant to the requirements of Provisions F.3.b.(1) and F.3.b.(2).

Provision F.3.b.(1) includes the transitional annual reporting requirements for each Copermittee's jurisdictional runoff management program. The reporting of the jurisdictional runoff management program implementation efforts have been reduced to a single 2-page form. Each Copermittee is required to complete and submit a Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D or a revised form accepted by the San Diego Water Board) no later than October 31 of each year for each jurisdictional runoff management program reporting period (i.e. July 1 to June 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted. The Jurisdictional Runoff Management Program Annual Report Form will certify that each Copermittee has implemented its jurisdictional runoff management program in accordance with the requirements of Provision E. Each Copermittee may choose to continue to utilize and submit the jurisdictional runoff management program annual reporting format of its current Order until the first Water Quality Improvement Plan Annual Report is required to be submitted.

Provision F.3.b.(2) includes the transitional annual reporting requirements for the transitional monitoring and assessment program for each Watershed Management Area. The Copermittees in the Watershed Management Area are required to submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted. The Transitional Monitoring and Assessment Program Annual Report is required to include the transitional period monitoring data collected pursuant to Provisions D.1.a and D.2.a, and the findings from the transitional period findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

Provision F.3.b.(3) includes the Water Quality Improvement Plan Annual Report requirements. Only one Water Quality Improvement Plan Annual Report is required for each of the ten (10) Watershed Management Areas designated under Provision B.1, which is a significant reduction in the number of annual reports required to be prepared and submitted by the Copermittees. The Water Quality Improvement Plan Annual Report will document the Copermittees' efforts to implement the Water Quality Improvement Plan. Each Water Quality Improvement Plan Annual Report will be focused primarily on reporting the analysis of the monitoring data collected pursuant to Provisions D.1-D.3 during the reporting period, and the assessments that are required pursuant to Provision D.4 based on the data. The monitoring data analyses and the assessments that are provided in the Water Quality Improvement Plan Annual Report will be the core of the report. The reporting of the jurisdictional runoff management program implementation efforts have been reduced to a single 2-page form, and will no longer be the primary focus of the reporting requirements as in the Third and Fourth Term Permits.

Each Copermittee will continue to prepare and submit a Jurisdictional Runoff Management Program Annual Report Form as part of the Water Quality Improvement Plan Annual Report to certify that each Copermittee has implemented its jurisdictional runoff management program in accordance with the requirements of Provision E. Instead of reviewing a voluminous report from each Copermittee, as was required under the Third and Fourth Term Permits, the San Diego Water Board will conduct audits of each Copermittee's jurisdictional runoff management program to investigate and confirm the information provided by each Copermittee on its Jurisdictional Runoff Management Program Annual Report Form. The audits will allow the San Diego Water Board to become more familiar with the each Copermittee's jurisdictional runoff management program, and each Copermittee will become more informed about the expectations of the San Diego Water Board.

The reduction in the number and content of the Water Quality Improvement Plan Annual Reports should result in significant time, cost and resource savings for the Copermittees, as well as the San Diego Water Board. Those savings should offset a significant portion of any additional costs that may be incurred to develop the Water

Quality Improvement Plans and to implement the monitoring and assessment program requirements of Provision D.

The reporting period for the Water Quality Improvement Plan Annual Reports consists of two periods. Because the jurisdictional runoff management programs are typically budgeted and implemented during a fiscal year, the information provided on the Jurisdictional Runoff Management Program Annual Report Forms will cover the period from July 1 to June 30 of the following year.

The Water Quality Improvement Plan Annual Reports, however, are focused primarily on the monitoring data and the assessments based on the monitoring data. The monitoring data is collected during the monitoring year, which begins October 1 and ends September 30 of the following year. The monitoring year begins after the beginning of the fiscal year and ends after the end of the fiscal year. Therefore, to accommodate and capture the information collected during the fiscal year and the monitoring year, the Annual Report reporting period incorporates both periods.

Finally, Provision F.3.c requires the Copermittees to develop and submit a Regional Monitoring and Assessment Report. The Regional Monitoring and Assessment Report is similar to the Long Term Effectiveness Assessment required under the Fourth Term San Diego County Permit. The Regional Monitoring and Assessment Report is expected to utilize the entire body of data and information collected by the Copermittees during the term of this Order to assess improvements to water quality on a regional scale.

Provision F.4 (Regional Clearinghouse) requires the Copermittees to develop, update, and maintain an internet-based Regional Clearinghouse that can be used to store, disseminate, and share the Copermittees' documents, monitoring data, special studies, and any other data or information.

Most of the documents and data that are generated by the Copermittees can be provided in electronic format, and made available to the San Diego Water Board and the public on the internet. The San Diego Water Board has been gradually transitioning its document submittal requirements to electronic submittals. Provision F.4 has been included to further these efforts.

Provision F.4 has also been included to improve the exchange and availability of information among the Copermittees, as well as between the Copermittees and the San Diego Water Board. Provision F.4 will also make the information generated during the implementation of the Order more accessible to the public.

Provision F.5 (Report of Waste Discharge) requires the Copermittees to submit a Report of Waste Discharge to reapply for renewal of the Order prior to its expiration, in accordance with 40 CFR 122.21(d)(2) and CWC section 13376.

Because the ~~Orange County and~~ Riverside County Copermittees will not be subject to the requirements of this Order until they are notified of coverage, Provision F.5.a describes the process of submitting a ~~their~~ Report~~s~~ of Waste Discharge pursuant to the requirements of their current permit~~s~~ to obtain coverage under this Order.

For the Copermittees subject to the requirements of this Order, Provision F.5.b requires the Copermittees to submit a Report of Waste Discharge 180 days in advance of the expiration of this Order. Provision F.5.b also describes the minimum information to be included in the Report of Waste Discharge, based on USEPA guidance "Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems," dated May 17, 1996.

Provision F.6 (Application for Early Coverage) describes the process that would allow the Orange County and/or Riverside County Copermittees to obtain coverage under this Order earlier than the expiration of their current Orders.

If the ~~Orange County and/or~~ Riverside County Copermittees choose to obtain coverage under this Order earlier than the expiration of their current Orders, the preparation and submittal of a Report of Waste Discharge, as required by the Fourth Term Permits, will not be necessary. The existing Order for the respective county will be rescinded upon the effective coverage date under this Order, except for enforcement purposes.

G. Principal Watershed Copermittee Responsibilities

Purpose: Provision G includes the requirements for the Principal Watershed Copermittee designated by the Copermittees in each Watershed Management Area.

***Discussion*:** Unlike previous NPDES requirements, there will no longer be a single Principal Copermittee. Provision G.1 requires the Copermittees to designate a Principal Watershed Copermittee for each Watershed Management Area. There are ten (10) Watershed Management Areas in the San Diego Region, as defined in Table B-1 under Provision B.1 of the Order. An individual Copermittee should not be the Principal Watershed Copermittee for more than two (2) Watershed Management Areas. There could be up to ten (10) Principal Water Copermittees designated for the Watershed Management Areas in the San Diego Region.

Provision G.2 describes the minimum responsibilities of each Principal Watershed Copermittee. The primary responsibility of the Principal Watershed Copermittees is to serve as the liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues. Ideally, the Principal Watershed Copermittee can represent the interests of all the Copermittees within a Watershed Management Area during discussions or meetings to facilitate communication with the San Diego Water Board. The Principal Watershed Copermittees are also responsible for facilitating and coordinating the implementation efforts of the Copermittees and submittals of required documents and reports.

The Principal Watershed Copermittee is responsible for facilitating the efforts of the Copermittees within the Watershed Management Area to develop the Water Quality Improvement Plan required under Provision B, and submit it for approval in accordance with Provision F.1. The Principal Watershed Copermittee is also responsible for coordinating the submittal of the document updates, Progress Report Presentations, and Annual Reports required from the Copermittees within each Watershed Management Area under Provisions F.2, F.3.a, and F.3.b. The Principal Watershed Copermittees are responsible for coordinating with each other to develop and submit the Regional Clearinghouse, Regional Monitoring and Assessment Report, and the Report of Waste Discharge required under Provisions F.3.c, F.4, and F.5.

The designated Principal Watershed Copermittee for each Watershed Management Area does not necessarily have to serve as the Principal Watershed Copermittee for the entire term of the Order. If the Copermittees in a Watershed Management Area choose to designate a new Principal Watershed Copermittee, the change may be submitted as part of the Annual Report required under Provision F.3.b, with an update to the Water Quality Improvement Plan in accordance with Provision F.2.c.

Provision G.3 specifies that the Principal Watershed Copermittee is not responsible for ensuring that the other Copermittees within the Watershed Management Area are in compliance with the requirements of this Order

H. Modification of Order

Purpose: Provision H provides the conditions under which modifications to Order No. R9-2013-0001, as amended, may occur.

***Discussion*:** Provision H allows for modifications to Order No. R9-2013-0001, as amended, for bases in addition to modifications (minor and major) allowed under the federal regulations at~~. Minor modifications may be made by the San Diego Water Board Executive Officer without a public notice or public hearing. Minor modifications are defined under~~ 40 CFR 122.62 and 122.63. ~~Minor modifications under 40 CFR 122.63 potentially applicable to this Order are the following:~~

~~Correcting typographical errors;~~

~~Requiring more frequent monitoring or reporting by the Copermittees;~~

~~Changing an interim compliance date in a schedule of compliance, provided the new date is not more than 120 days after the date specified in the existing permit and does not interfere with attainment of the final compliance date requirement.~~

Modifications ~~that are not one of the above minor modifications will~~to the Order require re-opening the Order (see Water Code section 13223), subject to the requirements of 40 CFR 122.44, 122.62 to 122.64, and 124.5, but only for the specific provisions subject to the modification. Proposed m~~M~~odifications of the Order ~~that are not minor require a draft Order with the proposed modifications~~will be made available for public review, a public notice and comment period, and a public hearing if requested. Comments on the provisions not subject to the proposed modifications are not required to be considered in the San Diego Water Board's responses to comments or during the public hearing.

Provision H.4 was included to specify that the Order will be re-opened for modifications if the State Water Board determines revisions to Provision A are warranted, an application for early coverage under the Order is received pursuant to Provision F.6, the Basin Plan is amended to modify an existing TMDL or incorporate a new TMDL, or the monitoring and assessment program requirements need to be updated or revised.

Provision H.5 was included to specify that the San Diego Water Board will re-open and consider modifications to this Order when the Orange County Copermittees or the Riverside County Copermittees submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders

I. Standard Permit Provisions and General Provisions

Purpose: Provision I incorporates the standard permit provisions required to be included in all NPDES permits, as well as several other general provisions.

***Discussion*:** Provision I refers to Attachment B to the Order. Attachment B expressly incorporates the conditions applicable to all NPDES permits as provided under 40 CFR 122.41(a)-(n), as well as the applicable conditions for MS4s and storm water discharges provided under 40 CFR 122.42(c) and 40 CFR 122.42(d), respectively. Attachment B also includes several general provisions that are typically included in or applicable to waste discharge requirements issued by the San Diego Water Board.

IX. ATTACHMENTS

The attachments to the Order are discussed below. The discussions describe the content of the attachments.

Attachment A – Discharge Prohibitions and Special Protections

Section 1 of Attachment A includes the Waste Discharge Prohibitions from the Basin Plan. They have been provided verbatim in their entirety.

Section 2 of Attachment A includes the "*Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges*" applicable to permitted point source discharges of storm water, adopted under State Water Board Resolution No. 2012-0012, as amended by Resolution No. 2012-0031. The terms, prohibitions, and special conditions (collectively referred to as special conditions) are established as limitations on point source storm water discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in ASBS, as required for State Water Quality Protection Areas pursuant to California Public Resources Code sections 36700(f) and 36710(f). These Special Protections were adopted by the State Water Board as part of the Ocean Plan General Exception.

Attachment B – Standard Permit Provisions and General Provisions

Conditions applicable to all NPDES permits, as required under 40 CFR 122.41, and conditions applicable to MS4s and storm water discharges, as required under 40 CFR 122.42(c) and 122.42(d), respectively are provided in Attachment B to the Order. They have been provided expressly in their entirety.

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. These general provisions are typically included in or applicable to waste discharge requirements issued by the San Diego Water Board. Many of the general provisions were developed by the State Water Board. Where a general provision is derived from statute or regulation, a citation of the statute or regulation section is provided. General provisions that do not provide a citation are included under the authority provided CWC 13377.

Attachment C – Acronyms, Abbreviations and Definitions

The acronyms and abbreviations that are used in the Order are provided in Attachment C. Attachment C also includes definitions that may provide an explanation or description of the meaning or intent of specific terms or phrases included in the Order.

Attachment D – Jurisdictional Runoff Management Program Annual Report Form

An example of the Jurisdictional Runoff Management Program Annual Report Form required to be submitted by each Copermittee as part of the Annual Reports required under Provision F.3.b.(1)(e) is provided as Attachment D to the Order. An electronic version of the form will be available from the San Diego Water Board after the adoption of the Order.

The Jurisdictional Runoff Management Program Annual Report Form includes the minimum information necessary to demonstrate that the Copermittee is implementing and in compliance with the requirements of Provision E, and includes much of the information required to be reported pursuant to 40 CFR 122.42(c).

The information that must be provided on the Jurisdictional Runoff Management Program Annual Report Form is limited to the fiscal year, which begins July 1 and ends June 30 of the following year. The information expected to be provided by the Copermittees in each section of the Jurisdictional Runoff Management Program Annual Report Form is discussed below.

I. COPERMITTEE INFORMATION

The name of the Copermittee (e.g. name of city, county, or special district) and the contact information for the storm water program manager are provided under this section.

II. LEGAL AUTHORITY

The Copermittee must confirm whether or not the legal authorities under Provision E.1.a have been established for itself within its jurisdiction.

The Copermittee must also confirm whether or not a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority, as required under Provision E.1.b. The certification statement required by Provision E.1.b is only required to be submitted with the first Annual Report required under Provision F.3.b.

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

The Copermittee must inform the San Diego Water Board whether or not an update to its jurisdictional runoff management program document was required or recommended by the San Diego Water Board during the reporting period. An update to the jurisdictional runoff management program is required under Provision F.2.a. The San Diego Water Board may recommend modifications to the jurisdictional runoff management program as part of the iterative approach and adaptive management process required under Provision B.5, which may result in an update that is necessary for the Copermittee's jurisdictional runoff management document.

If an update was required or recommended, the Copermittee must confirm whether or not the update was completed and made available on the Regional Clearinghouse within the reporting period. If no update was required or recommended, an answer is not required. If the answer is NO, meaning the required or recommended update was not completed and/or made available on the Regional Clearinghouse, the Copermittee must attach a

schedule for the completion of the update and/or posting of the updated document on the Regional Clearinghouse.

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

The Copermittee must confirm whether or not a program was implemented during the fiscal year to actively detect and eliminate illicit discharges and connections in accordance with the requirements under Provision E.2.

In addition to confirming that a program to detect and eliminate illicit discharges was implemented during the reporting period, the Copermittee is also required to report on several items related to the program. The information that must be reported is limited to the fiscal year for the Annual Report.

All non-storm water discharges are considered illicit discharges unless the source is identified as one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5). If a non-storm water discharge is identified as one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5), the discharge is a non-storm water discharge, but not an illicit discharge. If a non-storm water discharge is identified but not in one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5), the discharge is both a non-storm water discharge and an illicit discharge.

V. DEVELOPMENT PLANNING PROGRAM

The Copermittee must confirm whether or not a development planning program was implemented during the fiscal year in accordance with the requirements under Provision E.3.

The Copermittee must also inform the San Diego Water Board whether or not an update to its BMP Design Manual was required or recommended by the San Diego Water Board during the fiscal year. An update to the BMP Design Manual is required under Provision F.2.b. The San Diego Water Board may recommend modifications to the BMP Design Manual, which may result in an update that is necessary for Copermittee's the BMP Design Manual.

If an update was required or recommended, the Copermittee must confirm whether or not the update was completed and made available on the Regional Clearinghouse within the reporting period. If no update was required or recommended, an answer is not required. If the answer is NO, meaning the required or recommended update was not completed and/or made available on the Regional Clearinghouse, the Copermittee must attach a schedule for the completion of the update and/or posting of the updated document on the Regional Clearinghouse.

The Copermittee is also required to report on several items related to the program. For the development and redevelopment projects that are reviewed under the program, the Copermittee must report the total number projects submitted for review during the fiscal year. Of those projects, the Copermittee must report the number that are Priority Development Projects, as defined under Provision E.3.b.(1). The Copermittee must also report the number of Priority Development Projects that were approved and/or granted occupancy during the fiscal year, regardless of when the project was originally submitted for review. Any projects that were approved during the fiscal year and granted any

exemptions from the BMP Design Manual requirements and/or allowed to implement alternative compliance options in accordance with Provision E.3.c.(3) must be reported.

Finally, the Copermittee must also report on several items related to its oversight of permanent BMPs on Priority Development Projects within its jurisdiction, as required under Provision E.3.e. The information that must be reported is limited to the fiscal year for the Annual Report.

VI. CONSTRUCTION MANAGEMENT PROGRAM

The Copermittee must confirm whether or not a construction management program was implemented during the fiscal year in accordance with the requirements under Provision E.4.

The Copermittee is also required to report on several items related to its oversight construction projects within its jurisdiction. The information that must be reported is limited to the fiscal year for the Annual Report.

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

The Copermittee must confirm whether or not an existing development management program was implemented during the fiscal year in accordance with the requirements under Provision E.5.

The Copermittee is also required to report on several items related to its oversight in areas of existing development within its jurisdiction. The information that must be reported is limited to the fiscal year for the Annual Report. The information must also be separated into four categories of existing development: municipal, commercial, industrial, and residential.

VIII. PUBLIC EDUCATION AND PARTICIPATION

The Copermittee must confirm whether or not a public education program component was implemented during the fiscal year in accordance with the requirements under Provision E.7.a.

The Copermittee must also confirm whether or not a public participation program component was implemented during the fiscal year in accordance with the requirements under Provision E.7.b.

IX. FISCAL ANALYSIS

The Copermittee must confirm a summary of its fiscal analysis, conducted in accordance with the requirements under Provision E.8, has been attached to the form.

X. CERTIFICATION

A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative must sign and certify the Jurisdictional Runoff Management Program Annual Report Form. The appropriate box must be checked to indicate the whether a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative is signing the form.

Attachment E – Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2013-0001

Attachment E provides specific provisions for implementing the load allocations (LAs) and wasteload allocations (WLAs) of Total Maximum Daily Loads (TMDLs) adopted by the San Diego Water Board and approved by USEPA in which the Copermittees are identified as responsible for discharges subject to the requirements of the TMDLs. Federal regulations require that NPDES requirements incorporate water quality based effluent limitations (WQBELs) that must be consistent with the requirements and assumptions of any available WLAs,[46] which may be expressed as numeric effluent limitations, when feasible, and/or as a best management practice (BMP) program of expanded or better-tailored BMPs.[47] Where the TMDL includes WLAs that provide numeric pollutant load or pollutant parameter objectives, the WLA has been, where feasible, translated into numeric WQBELs.[48]

For each TMDL in Attachment E, four sections are included:

a. Applicability: This section provides the resolution under which the TMDL Basin Plan amendment was adopted and approved, with the applicable adoption and approval dates. This section also gives the effective date of the TMDL and where the TMDL is applicable (i.e. Watershed Management Area and water body). The Copermittees that are responsible for implementing the specific provisions are also given in this section.

b. Final TMDL Compliance Requirements: For each TMDL, the final TMDL compliance requirements consist of the final TMDL compliance date(s), the final WQBELs, and the final TMDL compliance determination requirements. The final WQBELs are expressed in terms of receiving water limitations, effluent limitations, and/or best management practices (BMPs). The final WQBELs for the TMDLs are incorporated by reference into Provision A of the Order. The final WQBELs become enforceable when the final TMDL compliance dates have passed. Applicable BMPs within the final WQBELs must be incorporated into the Water Quality Improvement Plans. Compliance with the final WQBELs will be determined in accordance with the options provided under the final TMDL compliance determination requirements.

c. Interim TMDL Compliance Requirements: If the final TMDL compliance date has not passed and there are interim TMDL compliance requirements, they are included in this section. If there are interim WQBELs with interim compliance dates, the interim WQBELs become enforceable when the corresponding interim compliance dates have passed. Compliance with the interim WQBELs will be determined in accordance with the options provided under the interim TMDL compliance determination requirements.

d. Specific Monitoring and Assessment Requirements: If there are specific monitoring and assessment requirements that cannot be met with the monitoring and assessment program

[46] 40 CFR 122.44(d)(1)(vii)(B)
[47] 40 CFR 122.44(k)(2) and 40 CFR 122.44(k)(3)
[48] November ~~12, 2010~~26, 2014 Memorandum from the USEPA, Revisions to the November 22, 2002 Memorandum "Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLA""

requirements under Provision D of the Order, the additional requirements are included in this section.

The requirements of the TMDLs are based on and consistent with the assumptions and requirements of any available adopted and approved TMDLs that have been incorporated into the Basin Plan. Modifications to the requirements for the TMDLs in Attachment E cannot be made unless the TMDLs are modified in the Basin Plan.

A modification to any aspect of a TMDL in the Basin Plan requires a Basin Plan amendment. A Basin Plan amendment to modify a TMDL will require the San Diego Water Board to adopt a resolution to amend the Basin Plan, which includes a separate public process. When the San Diego Water Board adopts a Basin Plan amendment, it subsequently requires approval from the State Water Board, the Office of Administrative Law, and the USEPA before it becomes effective.

If and when the TMDLs are a modified in the Basin Plan, the San Diego Water Board will revise the requirements of the Order ~~TMDL~~ in accordance with the Basin Plan amendment. When a Basin Plan amendment to modify a TMDL becomes effective, the San Diego Water Board will modify the requirements of the Order~~TMDL~~ pursuant to the requirements of Provision H.4 of the Order as soon as possible.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

ORDER NO. R9-2013-0001, AS AMENDED BY ORDER NO. R9-2015-0001
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The San Diego County Copermittees in Table 1a are subject to waste discharge requirements set forth in this Order.

Table 1a. San Diego County Copermittees

City of Carlsbad	City of Oceanside
City of Chula Vista	City of Poway
City of Coronado	City of San Diego
City of Del Mar	City of San Marcos
City of El Cajon	City of Santee
City of Encinitas	City of Solana Beach
City of Escondido	City of Vista
City of Imperial Beach	County of San Diego
City of La Mesa	San Diego County Regional Airport Authority
City of Lemon Grove	San Diego Unified Port District
City of National City	

The Orange County Copermittees in Table 1b are subject to waste discharge requirements set forth in this Order.

Table 1b. Orange County Copermittees[1]

City of Aliso Viejo	City of Rancho Santa Margarita
City of Dana Point	City of San Clemente
City of Laguna Beach	City of San Juan Capistrano
City of Laguna Hills	City of Laguna Woods
City of Laguna Niguel	County of Orange
City of Mission Viejo	Orange County Flood Control District

After the San Diego Water Board receives and considers the Riverside County Copermittees' Report of Waste Discharge and makes any necessary changes to this Order, the Riverside County Copermittees in Table 1c will become subject to waste discharge requirements set forth in this Order after expiration of Order No.R9-2010-0016, NPDES No. CAS0108766 on or after November 10, 2015.

[1] While not listed in Table 1b., the City of Lake Forest remains a Copermittee under this Order until the later effective date of this Order or the effective date of Santa Ana Water Board Tentative Order No. R8-2015-0001. Thereafter, the City of Lake Forest will no longer be considered a Copermittee under this Order because its Phase I MS4 discharges will be regulated by the Santa Ana Water Board pursuant to Water Code section 13228 designation. The requirements of this Order that apply to the City of Lake Forest for the duration of this Order, however, are described in Finding 29 and Footnote 2 to Table B-1.

Table 1c. Riverside County Copermittees

City of Murrieta	County of Riverside
City of Temecula	Riverside County Flood Control and Water Conservation District
City of Wildomar	

The Riverside County Copermittees may become subject to the requirements of this Order at a date earlier than the expiration date of their current Order subject to the conditions described in Provision F.6 of this Order if the Riverside County Copermittees receive notification of coverage from the San Diego Water Board.

The term Copermittee in this Order refers to any San Diego County, Orange County, or Riverside County Copermittee covered under this Order, unless specified otherwise.

This Order provides permit coverage for the Copermittee discharges described in Table 2.

Table 2. Discharge Locations and Receiving Waters

Discharge Points	Locations throughout San Diego Region
Discharge Description	Municipal Separate Storm Sewer System (MS4) Discharges
Receiving Waters	Inland Surface Waters, Enclosed Bays and Estuaries, and Coastal Ocean Waters of the San Diego Region

Table 3. Administrative Information

This Order was adopted by the San Diego Water Board on:	**May 8, 2013**
Order No. R9-2013-0001 became effective on:	**June 27, 2013**
This Order as amended by R9-2015-0001 became effective on:	**April 1, 2015**
This Order will expire on:	**June 27, 2018**
The Copermittees must file a Report of Waste Discharge in accordance with Title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than 180 days in advance of the Order expiration date.	

I, David W. Gibson, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on May 8, 2013, as amended by adoption of Order No. R9-2015-0001 on February 11, 2015.

David W. Gibson
Executive Officer

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I. FINDINGS

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), finds that:

JURISDICTION

1. **MS4 Ownership or Operation.** Each of the Copermittees owns or operates an MS4, through which it discharges storm water and non-storm water into waters of the U.S. within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the U.S.

2. **Legal and Regulatory Authority.** This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]) adopted by the United States Environmental Protection Agency (USEPA), and chapter 5.5, division 7 of the California Water Code (CWC) (commencing with section 13370). This Order serves as an NPDES permit for discharges from MS4s to surface waters. This Order also serves as waste discharge requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

   The San Diego Water Board has the legal authority to issue a regional MS4 permit pursuant to its authority under CWA section 402(p)(3)(B) and 40 CFR 122.26(a)(1)(v). The USEPA also made it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide permits (55 Federal Register [FR] 47990, 48039-48042). The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees and San Diego Water Board.

   The federal regulations make it clear that the Copermittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators (40 CFR 122.26(a)(3)(vi)). This Order does not require the Copermittees to manage storm water outside of their jurisdictional boundaries, but rather to work collectively to improve storm water management within watersheds.

3. **CWA NPDES Permit Conditions.** Pursuant to CWA section 402(p)(3)(B), NPDES permits for storm water discharges from MS4s must include requirements to effectively prohibit non-storm water discharges into MS4s, and require controls to reduce the discharge of pollutants in storm water to the maximum extent practicable (MEP), and to require other provisions as the San Diego Water Board determines are appropriate to control such pollutants. This Order prescribes conditions to assure compliance with the CWA requirements for owners and operators of MS4s to effectively prohibit non-storm water discharges into the MS4s, and require controls to reduce the discharge of pollutants in storm water from the MS4s to the MEP.

4. **CWA and CWC Monitoring Requirements.** CWA section 308(a) and 40 CFR 122.41(h),(j)-(l) and 122.48 require that NPDES permits must specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s also specify additional monitoring and reporting requirements in 40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c). CWC section 13383 authorizes the San Diego Water Board to establish monitoring, inspection, entry, reporting and recordkeeping requirements. This Order establishes monitoring and reporting requirements to implement federal and State requirements. This Order also includes requirements for the Orange County Copermittees to participate in, and together with South Orange County Wastewater Authority and Orange County Health Care Agency, share responsibility for implementing the unified approach to beach water quality monitoring and assessment program set forth in the October 2014 report, *Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County*, issued pursuant to CWC section 13383 in the San Diego Water Board December 5, 2014 Letter Directive.

5. **Total Maximum Daily Loads.** CWA section 303(d)(1)(A) requires that "[e]ach state shall identify those waters within its boundaries for which the effluent limitations are not stringent enough to implement any water quality standard applicable to such waters." The CWA also requires states to establish a priority ranking of impaired water bodies known as Water Quality Limited Segments and to establish Total Maximum Daily Loads (TMDLs) for such waters. This priority list of impaired water bodies is called the Clean Water Act Section 303(d) List of Water Quality Limited Segments, commonly referred to as the 303(d) List. The CWA requires the 303(d) List to be updated every two years.

   TMDLs are numerical calculations of the maximum amount of a pollutant that a water body can assimilate and still meet water quality standards. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point sources (waste load allocations or WLAs) and non-point sources (load allocations or LAs), background contribution, plus a margin of safety. Discharges from MS4s are point source discharges. The federal regulations (40 CFR 122.44(d)(1)(vii)(B)) require that NPDES permits incorporate water quality based effluent limitations (WQBELs) developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, consistent with the assumptions and requirements of any available WLA for the discharge. Requirements of this Order implement the TMDLs established by the San Diego Water Board or USEPA as of the date this Order was amended in 2015. This Order establishes WQBELs consistent with the assumptions and requirements of all available TMDL WLAs assigned to discharges from the Copermittees' MS4s.

6. **Non-Storm Water Discharges.** Pursuant to CWA section 402(p)(3)(B)(ii), this Order requires each Copermittee to effectively prohibit discharges of non-storm water into its MS4. Nevertheless, non-storm water discharges into and from the MS4s continue to be reported to the San Diego Water Board by the Copermittees

and other persons. Monitoring conducted by the Copermittees, as well as the 303(d) List, have identified dry weather, non-storm water discharges from the MS4s as a source of pollutants causing or contributing to receiving water quality impairments in the San Diego Region. The federal regulations (40 CFR 122.26(d)(2)(iv)(B)(1)) require the Copermittees to have a program to prevent illicit discharges to the MS4. The federal regulations, however, allow for specific categories of non-storm water discharges or flows to be addressed as illicit discharges only where such discharges are identified as sources of pollutants to waters of the U.S.

7. **In-Stream Treatment Systems.** Pursuant to federal regulations (40 CFR 131.10(a)), in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S. Authorizing the construction of a runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to accepting waste assimilation as an appropriate use for that water body. Runoff treatment must occur prior to the discharge of runoff into receiving waters. Treatment control best management practices (BMPs) must not be constructed in waters of the U.S. Construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body.

DISCHARGE CHARACTERISTICS AND RUNOFF MANAGEMENT

8. **Point Source Discharges of Pollutants.** Discharges from the MS4s contain waste, as defined in the CWC, and pollutants that adversely affect the quality of the waters of the state. A discharge from an MS4 is a “discharge of pollutants from a point source” into waters of the U.S. as defined in the CWA. Storm water and non-storm water discharges from the MS4s contain pollutants that cause or threaten to cause a violation of surface water quality standards, as outlined in the Water Quality Control Plan for the San Diego Basin (Basin Plan). Storm water and non-storm water discharges from the MS4s are subject to the conditions and requirements established in the Basin Plan for point source discharges.

9. **Potential Beneficial Use Impairment.** The discharge of pollutants and/or increased flows from MS4s may cause or threaten to cause the concentration of pollutants to exceed applicable receiving water quality objectives and impair or threaten to impair designated beneficial uses resulting in a condition of pollution, contamination, or nuisance.

10. **Pollutants Generated by Land Development.** Land development has created and continues to create new sources of non-storm water discharges and pollutants in storm water discharges as human population density increases. This brings higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash. Pollutants from these sources are dumped or washed off the surface by non-storm water or storm water flows into and from the MS4s. When development converts natural vegetated pervious ground cover to impervious surfaces such as paved highways, streets, rooftops, and parking

lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving a developed area without BMPs that can maintain pre-development runoff conditions will contain greater pollutant loads and have significantly greater runoff volume, velocity, and peak flow rate than pre-development runoff conditions from the same area.

11. **Runoff Discharges to Receiving Waters.** The MS4s discharge runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within the eleven hydrologic units comprising the San Diego Region. Historic and current development makes use of natural drainage patterns and features as conveyances for runoff. Rivers, streams and creeks in developed areas used in this manner are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and receiving water. Numerous receiving water bodies and water body segments have been designated as impaired by the San Diego Water Board pursuant to CWA section 303(d).

12. **Pollutants in Runoff.** The most common pollutants in runoff discharged from the MS4s include total suspended solids, sediment, pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., cadmium, copper, lead, and zinc), petroleum products and polynuclear aromatic hydrocarbons, synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus), oxygen-demanding substances (e.g., decaying vegetation, animal waste), detergents, and trash. As operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not prohibit or otherwise control. These discharges may cause or contribute to a condition of pollution or a violation of water quality standards.

13. **Human Health and Aquatic Life Impairment.** Pollutants in runoff discharged from the MS4s can threaten and adversely affect human health and aquatic organisms. Adverse responses of organisms to chemicals or physical agents in runoff range from physiological responses such as impaired reproduction or growth anomalies to mortality. Increased volume, velocity, rate, and duration of storm water runoff greatly accelerate the erosion of downstream natural channels. This alters stream channels and habitats and can adversely affect aquatic and terrestrial organisms.

14. **Water Quality Effects.** The Copermittees' water quality monitoring data submitted to date documents persistent exceedances of Basin Plan water quality objectives for runoff-related pollutants at various watershed monitoring stations. Persistent toxicity has also been observed at several watershed monitoring stations. In addition, bioassessment data indicate that the majority of the monitored receiving waters have Poor to Very Poor Index of Biological Integrity (IBI) ratings. These findings indicate that runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in the San Diego Region. Non-storm water

discharges from the MS4s have been shown to contribute significant levels of pollutants and flow in arid, developed Southern California watersheds, and contribute significantly to exceedances of applicable receiving water quality objectives.

15. **Non-Storm Water and Storm Water Discharges.** Non-storm water discharges from the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard of CWA section 402(p)(3)(B)(iii), which is explicitly for "Municipal … *Stormwater Discharges* (emphasis added)" from the MS4s. Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s must be effectively prohibited.

16. **Best Management Practices.** Waste and pollutants which are deposited and accumulate in MS4 drainage structures will be discharged from these structures to waters of the U.S. unless they are removed. These discharges may cause or contribute to, or threaten to cause or contribute to, a condition of pollution in receiving waters. For this reason, pollutants in storm water discharges from the MS4s can be and must be effectively reduced in runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Pollution prevention is the reduction or elimination of pollutant generation at its source and is the best "first line of defense." Source control BMPs (both structural and non-structural) minimize the contact between pollutants and runoff, therefore keeping pollutants onsite and out of receiving waters. Treatment control BMPs remove pollutants that have been mobilized by storm water or non-storm water flows.

17. **BMP Implementation.** Runoff needs to be addressed during the three major phases of development (planning, construction, and use) in order to reduce the discharge of storm water pollutants to the MEP, effectively prohibit non-storm water discharges, and protect receiving waters. Development which is not guided by water quality planning policies and principles can result in increased pollutant load discharges, flow rates, and flow durations which can negatively affect receiving water beneficial uses. Construction sites without adequate BMP implementation result in sediment runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. Existing development can generate substantial pollutant loads which are discharged in runoff to receiving waters. Retrofitting areas of existing development with storm water pollutant control and hydromodification management BMPs is necessary to address storm water discharges from existing development that may cause or contribute to a condition of pollution or a violation of water quality standards.

18. **Water Quality Improvements.** Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges to the MS4s and control pollutants in storm water discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality

issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the CWA.

19. **Long Term Planning and Implementation.** Federal regulations require municipal storm water permits to expire 5 years from adoption, after which the permit must be renewed and reissued. The San Diego Water Board recognizes that the degradation of water quality and impacts to beneficial uses of the waters in the San Diego Region occurred over several decades. The San Diego Water Board further recognizes that a decade or more may be necessary to realize demonstrable improvement to the quality of waters in the San Diego Region. This Order includes a long term planning and implementation approach that will require more than a single permit term to complete.

WATER QUALITY STANDARDS

20. **Basin Plan.** The San Diego Water Board adopted the Water Quality Control Plan for the San Diego Basin (Basin Plan) on September 8, 1994, that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for receiving waters addressed through the plan. The Basin Plan was subsequently approved by the State Water Resources Control Board (State Water Board) on December 13, 1994. Subsequent revisions to the Basin Plan have also been adopted by the San Diego Water Board and approved by the State Water Board. Requirements of this Order implement the Basin Plan.

    The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Process Supply (PROC), Industrial Service Supply (IND), Ground Water Recharge (GWR), Contact Water Recreation (REC1), Non-contact Water Recreation (REC2), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Freshwater Replenishment (FRSH), Hydropower Generation (POW), and Preservation of Biological Habitats of Special Significance (BIOL). The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region: Navigation (NAV), Commercial and Sport Fishing (COMM), Estuarine Habitat (EST), Marine Habitat (MAR), Aquaculture (AQUA), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN), and Shellfish Harvesting (SHELL).

21. **Ocean Plan.** The State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, and 2005. The State Water Board adopted the latest amendment on April 21, 2005 and it became effective on February 14, 2006. The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean. Requirements of this Order implement the Ocean Plan.

The Ocean Plan identifies the following beneficial uses of ocean waters of the state to be protected: Industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture; preservation and enhancement of designated Areas of Special Biological Significance; rare and endangered species; marine habitat; fish spawning and shellfish harvesting.

22. **Sediment Quality Control Plan**. On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes: 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

23. **National Toxics Rule and California Toxics Rule.** USEPA adopted the National Toxics Rule (NTR) on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the NTR applied in California. On May 18, 2000, USEPA adopted the California Toxics Rule (CTR). The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants.

24. **Antidegradation Policy.** This Order is in conformance with the federal Antidegradation Policy described in 40 CFR 131.12, and State Water Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality Waters in California*. Federal regulations at 40 CFR 131.12 require that the State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. State Water Board Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies.

25. **Anti-Backsliding Requirements.** Section 402(o)(2) of the CWA and federal regulations at 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations may be relaxed. All effluent limitations in this Order are at least as stringent as effluent limitations in the previous permits.

CONSIDERATIONS UNDER FEDERAL AND STATE LAW

26. **Coastal Zone Act Reauthorization Amendments.** Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states with approved coastal zone management programs to address non-point source pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point source pollution: agriculture, silviculture, urban, marinas, and hydromodification. This Order addresses the management measures required for the urban category, with the exception of septic systems. The runoff management programs developed pursuant to this Order fulfills the need for coastal cities to develop a runoff non-point source plan identified in the Non-Point Source Program Strategy and Implementation Plan. The San Diego Water Board addresses septic systems through the administration of other programs.

27. **Endangered Species Act.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 USC sections 1531 to 1544). This Order requires compliance with receiving water limits, and other requirements to protect the beneficial uses of waters of the State. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

28. **Report of Waste Discharge Process.** The waste discharge requirements set forth in this Order are based upon the Report of Waste Discharge submitted by the San Diego County Copermittees prior to the expiration of Order No. R9-2007-0001 (NPDES No. CAS0109266) and the Report of Waste Discharge submitted by the Orange County Copermittees prior to the expiration of Order No. R9-2009-0002 (CAS0108740). The Riverside County Copermittees are not immediately covered by the waste discharge requirements in this Order. The San Diego Water Board understands that each municipality is unique although the Counties share watersheds and/or geographical boundaries. The Order will continue to use the Report of Waste Discharge process prior to initially making Riverside County Copermittees subject to the requirements of this Order.

    The federal regulations (40 CFR 122.21(d)(2)) and CWC section 13376 impose a duty on the Copermittees to reapply for continued coverage through submittal of a Report of Waste Discharge no later than 180 days prior to expiration of a currently effective permit. This requirement is set forth in the Riverside County Copermittees' currently effective permit at ProvisionK.2.c. The Riverside County MS4 Permit, Order No. R9-2010-0016 (NPDES No. CAS0108766) expires on November 10, 2015.

    Unless the Riverside County Copermittees apply for and receive early coverage under this Order, the Riverside County Copermittees' permit will be superseded by this Order upon expiration of their permit, subject to any necessary revisions to the

requirements of this Order made after the San Diego Water Board considers their Report of Waste Discharge through the public process provided in 40 CFR Part 124.

29. **Regional Water Board Designation.** The Cities of Laguna Hills, Laguna Woods, and Lake Forest are located partially within the jurisdictions of the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board) and the San Diego Water Board and their discharges are subject to regulation by both Regional Water Boards. Pursuant to CWC section 13228, the Cities of Laguna Hills, Laguna Woods, and Lake Forest submitted written requests that one Regional Water Board be designated to regulate Phase I MS4 discharges for each of the Cities. The Santa Ana Water Board and the San Diego Water Board have entered into an agreement dated February 10, 2015, whereby the Cities of Laguna Woods and Laguna Hills are largely regulated by the San Diego Water Board under this Order, including those portions of the Cities of Laguna Woods and Laguna Hills not within the San Diego Water Board's jurisdiction, upon the effective date of this Order or Santa Ana Water Board Order No. R8-2015-0001, whichever is later. Similarly, the City of Lake Forest, including those portions of the City of Lake Forest within the San Diego Water Board's jurisdiction, is largely regulated by the Santa Ana Water Board under Order No. R8-2015-0001 (NPDES No. CAS618030) upon the later effective date of this Order or Order No. R8-2015-0001. The agreement provides that the City of Lake Forest is required to retain, and continue implementation of, its over-irrigation discharge prohibition in Title 15, Chapter 14.030, List (b) of the City Municipal Code for regulating storm water quality throughout its jurisdiction. The agreement also requires the City of Lake Forest to actively participate during development and implementation of the Aliso Creek Watershed Management Area Water Quality Improvement Plan required pursuant to this Order. Each Regional Water Board retains the authority to enforce provisions of its Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee under the terms of the agreement (Water Code section 13228 (b)). Under the terms of the agreement, any TMDL and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Laguna Woods, Laguna Hills or Lake Forest as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement of the applicable TMDL will remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's San Diego Creek/Newport Bay TMDL and the San Diego Water Board's Indicator Bacteria Project I Beaches and Creeks TMDL. The San Diego Water Board will periodically review the effectiveness of the agreement during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate the agreement with Santa Ana Water Board or otherwise modify the agreement subject to the approval of the Santa Ana Water Board.

30. **Integrated Report and Clean Water Act Section 303(d) List.** The San Diego Water Board and State Water Board submit an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. USEPA issued its *Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act* on July 29, 2005, which advocates the use of a five category approach for classifying the attainment status of water quality standards for water bodies in the Integrated Report. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 in the Integrated Report are placed on the 303(d) List.

    Water bodies with available data and/or information that indicate at least one beneficial use is not being supported or is threatened, but a TMDL is not required, are included in Category 4 in the Integrated Report. Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

    Implementation of the requirements of this Order may allow the San Diego Water Board to include surface waters impaired by discharges from the Copermittees' MS4s in Category 4 in the Integrated Report for consideration during the next 303(d) List submittal by the State to USEPA.

31. **Economic Considerations.** The California Supreme Court has ruled that although CWC section 13263 requires the State and Regional Water Boards (collectively Water Boards) to consider factors set forth in CWC section 13241 when issuing an NPDES permit, the Water Board may not consider the factors to justify imposing pollutant restrictions that are less stringent than the applicable federal regulations require. (*City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 618, 626-627.) However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

    As noted in the following finding, the San Diego Water Board finds that the requirements in this Order are not more stringent than the minimum federal requirements. Therefore, a CWC section 13241 analysis is not required for permit requirements that implement the effective prohibition on the discharge of non-storm water into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determined appropriate to control such pollutants, as those requirements are mandated by federal law. Notwithstanding the above, the San Diego Water Board has developed an economic analysis of the requirements in this Order. The economic analysis is provided in the Fact Sheet.

32. **Unfunded Mandates.** This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following:

    a. This Order implements federally mandated requirements under CWA section 402 (33 USC section 1342(p)(3)(B)).

    b. The local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental and new dischargers who are issued NPDES permits for storm water and non-storm water discharges.

    c. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order.

    d. The Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)) and in lieu of numeric restrictions on their MS4 discharges (i.e. effluent limitations).

    e. The local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under State law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

    f. The provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state develops a TMDL, federal law requires that permits must contain water quality based effluent limitations consistent with the assumptions and requirements of any applicable wasteload allocation (40 CFR 122.44(d)(1)(vii)(B)).

    See the Fact Sheet for further discussion of unfunded mandates.

33. **California Environmental Quality Act.** The issuance of waste discharge requirements and an NPDES permit for the discharge of runoff from MS4s to waters of the U.S. is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 et seq.) in accordance with CWC section 13389.

STATE WATER BOARD DECISIONS

34. **Compliance with Prohibitions and Limitations.** The receiving water limitation language specified in this Order is consistent with language recommended by the USEPA and established in State Water Board Order WQ 99-05, *Own Motion Review of the Petition of Environmental Health Coalition to Review Waste Discharge Requirements Order No. 96-03, NPDES Permit No. CAS0108740*, adopted by the

State Water Board on June 17, 1999. The receiving water limitation language in this Order requires storm water discharges from MS4s to not cause or contribute to a violation of water quality standards, which is to be achieved through an iterative approach requiring the implementation of improved and better-tailored BMPs over time. Implementation of the iterative approach to comply with receiving water limitations based on applicable water quality standards is necessary to ensure that storm water discharges from the MS4 will not ultimately cause or contribute to violations of water quality standards and will not create conditions of pollution, contamination, or nuisance.

35. **Special Conditions for Areas of Special Biological Significance.** On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving a general exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges (General Exception). On June 19, 2012, the State Water Board adopted Order No. 2012-0031, amending the General Exception to require pollutant reductions to be achieved within six years in accordance with ASBS Compliance Plans and ASBS Pollution Prevention Plans. The General Exception requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject to the terms and conditions of the General Exception as amended. The Special Protections contained in Attachment B to the General Exception as amended are applicable to these discharges, and are hereby incorporated into Attachment A of this Order.

ADMINISTRATIVE FINDINGS

36. **Executive Officer Delegation of Authority.** The San Diego Water Board by prior resolution has delegated all matters that may legally be delegated to its Executive Officer to act on its behalf pursuant to CWC section 13223. Therefore, the Executive Officer is authorized to act on the San Diego Water Board's behalf on any matter within this Order unless such delegation is unlawful under CWC section 13223 or this Order explicitly states otherwise.

37. **Standard Provisions.** Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR 122.42, are provided in Attachment B to this Order.

38. **Fact Sheet.** The Fact Sheet for this Order contains background information, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of this Order. The Fact Sheet is hereby incorporated into this Order and constitutes part of the Findings of this Order.

39. **Public Notice.** In accordance with State and federal laws and regulations, the San Diego Water Board notified the Copermittees, and interested agencies and persons of its intent to prescribe waste discharge requirements for the control of discharges into and from the MS4s to waters of the U.S. and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet.

40. **Public Hearings.** The San Diego Water Board held a public hearing on April 10 and 11, 2013, that was continued to May 8, 2013 and heard and considered all comments pertaining to the terms and conditions of this Order. The San Diego Water Board also held a public workshop on October 8, 2015, and a public hearing on February 11, 2015, and heard and considered all comments pertaining to the amendment of this Order through Order No. R9-2015-0001. Details of these public hearings are provided in the Fact Sheet.

41. **Effective Date.** This Order serves as an NPDES permit pursuant to CWA section 402 or amendments thereto, and as to the San Diego County Copermittees listed in Table 2.a., became effective fifty (50) days after the date of its adoption, and as to the Orange County Copermittees listed in Table 2.b., becomes effective on April 1, 2015, after Order R9-2015-0001 is adopted, provided that the Regional Administrator, USEPA, Region IX, does not object to this Order.

42. **Review by the State Water Board.** Any person aggrieved by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with CWC section 13320 and California Code of Regulations, title 23, sections 2050, and following. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date of this Order, except that if the thirtieth day following the date of this Order falls on a Saturday, Sunday or State holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

THEREFORE, IT IS HEREBY ORDERED that the Copermittees, in order to meet the provisions contained in division 7 of the CWC (commencing with section 13000) and regulations adopted thereunder, and the provisions of the CWA and regulations adopted thereunder, must each comply with the requirements of this Order. This action in no way prevents the San Diego Water Board from taking enforcement action for past violations of the previous Order. If any part of this Order is subject to a temporary stay of enforcement, unless otherwise specified, the Copermittees must comply with the analogous portions of the previous Order, which will remain in effect for all purposes during the pendency of the stay.

II. PROVISIONS

A. PROHIBITIONS AND LIMITATIONS

The purpose of this provision is to describe the conditions under which storm water and non-storm water discharges into and from MS4s are prohibited or limited. The goal of the prohibitions and limitations is to protect the water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through the implementation of water quality improvement strategies and runoff management programs that effectively prohibit non-storm water discharges into the Copermittees' MS4s, and reduce pollutants in storm water discharges from the Copermittees' MS4s to the MEP.

1. Discharge Prohibitions

a. Discharges from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the state are prohibited.

b. Non-storm water discharges into MS4s are to be effectively prohibited, through the implementation of Provision E.2, unless such discharges are authorized by a separate NPDES permit.

c. Discharges from MS4s are subject to all waste discharge prohibitions in the Basin Plan, included in Attachment A to this Order.

d. Storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 applicable to these discharges, included in Attachment A to this Order. All other discharges from the Copermittees' MS4s to ASBS are prohibited.

2. Receiving Water Limitations

a. Discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters, including but not limited to all applicable provisions contained in:

(1) The San Diego Water Board's Basin Plan, including beneficial uses, water quality objectives, and implementation plans;

(2) State Water Board plans for water quality control including the following:

(a) Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries (Thermal Plan), and

(b) The Ocean Plan, including beneficial uses, water quality objectives, and implementation plans;

(3) State Water Board policies for water and sediment quality control including the following:

(a) Water Quality Control Policy for the Enclosed Bays and Estuaries of California,

(b) Sediment Quality Control Plan which includes the following narrative objectives for bays and estuaries:

(i) Pollutants in sediments shall not be present in quantities that, alone or in combination, are toxic to benthic communities, and

(ii) Pollutants shall not be present in sediments at levels that will bioaccumulate in aquatic life to levels that are harmful to human health,

(c) The Statement of Policy with Respect to Maintaining High Quality of Waters in California;[2]

(4) Priority pollutant criteria promulgated by the USEPA through the following:

(a) National Toxics Rule (NTR)[3] (promulgated on December 22, 1992 and amended on May 4, 1995), and

(b) California Toxics Rule (CTR).[4,5]

b. Discharges from MS4s composed of storm water runoff must not alter natural ocean water quality in an ASBS.

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[2] State Water Board Resolution No. 68-16
[3] 40 CFR 131.36
[4] 65 Federal Register 31682-31719 (May 18, 2000), adding Section 131.38 to 40 CFR
[5] If a water quality objective and a CTR criterion are in effect for the same priority pollutant, the more stringent of the two applies.

3. Effluent Limitations

a. TECHNOLOGY BASED EFFLUENT LIMITATIONS

Pollutants in storm water discharges from MS4s must be reduced to the MEP.[6]

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

Each Copermittee must comply with applicable WQBELs established for the TMDLs in Attachment E to this Order, pursuant to the applicable TMDL compliance schedules.

4. Compliance with Discharge Prohibitions and Receiving Water Limitations

Each Copermittee must achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order through timely implementation of control measures and other actions as specified in Provisions B and E of this Order, including any modifications. The Water Quality Improvement Plans required under Provision B must be designed and adapted to ultimately achieve compliance with Provisions A.1.a, A.1.c and A.2.a.

a. If exceedance(s) of water quality standards persist in receiving waters notwithstanding implementation of this Order, the Copermittees must comply with the following procedures:

(1) For exceedance(s) of a water quality standard in the process of being addressed by the Water Quality Improvement Plan, the Copermittee(s) must implement the Water Quality Improvement Plan as accepted by the San Diego Water Board, and update the Water Quality Improvement Plan, as necessary, pursuant to Provision F.2.c;

(2) Upon a determination by either the Copermittees or the San Diego Water Board that discharges from the MS4 are causing or contributing to a new exceedance of an applicable water quality standard not addressed by the Water Quality Improvement Plan, the Copermittees must submit the following updates to the Water Quality Improvement Plan pursuant to Provision F.2.c or as part of the Water Quality Improvement Plan Annual Report required under Provision F.3.b, unless the San Diego Water Board directs an earlier submittal:

(a) The water quality improvement strategies being implemented that are effective and will continue to be implemented,

[6] This does not apply to MS4 discharges which receive subsequent treatment to reduce pollutants in storm water discharges to the MEP prior to entering receiving waters (e.g., low flow diversions to the sanitary sewer). Runoff treatment must occur prior to the discharge of runoff into receiving waters per Finding 7.

(b) Water quality improvement strategies (i.e. BMPs, retrofitting projects, stream and/or habitat rehabilitation projects, adjustments to jurisdictional runoff management programs, etc.) that will be implemented to reduce or eliminate any pollutants or conditions that are causing or contributing to the exceedance of water quality standards,

(c) Updates to the schedule for implementation of the existing and additional water quality improvement strategies, and

(d) Updates to the monitoring and assessment program to track progress toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a of this Order;

(3) The San Diego Water Board may require the incorporation of additional modifications to the Water Quality Improvement Plan required under Provision B. The applicable Copermittees must submit any modifications to the update to the Water Quality Improvement Plan within 90 days of notification that additional modifications are required by the San Diego Water Board, or as otherwise directed;

(4) Within 90 days of the San Diego Water Board determination that the modifications to the Water Quality Improvement Plan required under Provision A.4.a.(3) meet the requirements of this Order, the applicable Copermittees must revise the jurisdictional runoff management program documents to incorporate the modified water quality improvement strategies that have been and will be implemented, the implementation schedule, and any additional monitoring required; and

(5) Each Copermittee must implement the updated Water Quality Improvement Plan.

b. The procedure set forth above to achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order do not have to be repeated for continuing or recurring exceedances of the same water quality standard(s) following implementation of scheduled actions unless directed to do otherwise by the San Diego Water Board.

c. Nothing in Provisions A.4.a and A.4.b prevents the San Diego Water Board from enforcing any provision of this Order while the applicable Copermittees prepare and implement the above update to the Water Quality Improvement Plan and jurisdictional runoff management programs.

B. WATER QUALITY IMPROVEMENT PLANS

The purpose of this provision is to develop Water Quality Improvement Plans that guide the Copermittees' jurisdictional runoff management programs towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plans is to further the Clean Water Act's objective to protect, preserve, enhance, and restore the water quality and designated beneficial uses of waters of the state. This goal will be accomplished through an adaptive planning and management process that identifies the highest priority water quality conditions within a watershed and implements strategies through the jurisdictional runoff management programs to achieve improvements in the quality of discharges from the MS4s and receiving waters.

1. Watershed Management Areas

The Copermittees must develop a Water Quality Improvement Plan for each of the Watershed Management Areas in Table B-1. A total of ten Water Quality Improvement Plans must be developed for the San Diego Region.

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
San Juan (901.00)	South Orange County	- Aliso Creek - San Juan Creek - San Mateo Creek - Pacific Ocean - Heisler Park ASBS	- City of Aliso Viejo - City of Dana Point - City of Laguna Beach - City of Laguna Hills[1] - City of Laguna Niguel - City of Laguna Woods[1] - City of Lake Forest[2] - City of Mission Viejo - City of Rancho Santa Margarita - City of San Clemente - City of San Juan Capistrano - County of Orange - Orange County Flood Control District
Santa Margarita (902.00)	Santa Margarita River	- Murrieta Creek - Temecula Creek - Santa Margarita River - Santa Margarita Lagoon - Pacific Ocean	- City of Murrieta[3] - City of Temecula[3] - City of Wildomar[3] - County of Riverside[3] - County of San Diego[4] - Riverside County Flood Control and Water Conservation District[3]
San Luis Rey (903.00)	San Luis Rey River	- San Luis Rey River - San Luis Rey Estuary - Pacific Ocean	- City of Oceanside - City of Vista - County of San Diego

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
Carlsbad (904.00)	Carlsbad	- Loma Alta Slough - Buena Vista Lagoon - Agua Hedionda Lagoon - Batiquitos Lagoon - San Elijo Lagoon - Pacific Ocean	- City of Carlsbad - City of Encinitas - City of Escondido - City of Oceanside - City of San Marcos - City of Solana Beach - City of Vista - County of San Diego
San Dieguito (905.00)	San Dieguito River	- San Dieguito River - San Dieguito Lagoon - Pacific Ocean	- City of Del Mar - City of Escondido - City of Poway - City of San Diego - City of Solana Beach - County of San Diego
Penasquitos (906.00)	Penasquitos	- Los Penasquitos Lagoon - Pacific Ocean	- City of Del Mar - City of Poway - City of San Diego - County of San Diego
	Mission Bay	- Mission Bay - Pacific Ocean - San Diego Marine Life Refuge ASBS	- City of San Diego
San Diego (907.00)	San Diego River	- San Diego River - Pacific Ocean	- City of El Cajon - City of La Mesa - City of San Diego - City of Santee - County of San Diego
Pueblo San Diego (908.00) Sweetwater (909.00) Otay (910.00)	San Diego Bay	- Sweetwater River - Otay River - San Diego Bay - Pacific Ocean	- City of Chula Vista - City of Coronado - City of Imperial Beach - City of La Mesa - City of Lemon Grove - City of National City - City of San Diego - County of San Diego - San Diego County Regional Airport Authority - San Diego Unified Port District
Tijuana (911.00)	Tijuana River	- Tijuana River - Tijuana Estuary - Pacific Ocean	- City of Imperial Beach - City of San Diego - County of San Diego

Notes:

1. By agreement dated February 10, 2015, pursuant to Water Code section 13228, the Phase I MS4 discharges within the jurisdiction of the City of Laguna Hills and the City of Laguna Woods located in the Santa Ana Region are regulated by San Diego Water Board Order No. R9-2013-0001 as amended by Order No. R9-2015-0001, upon the later effective date of Order No. R9-2015-0001 or Santa Ana Water Board Tentative Order No. R8-2015-0001. The City of Laguna Hills and Laguna Woods must also comply with the requirements of the San Diego Creek/Newport Bay TMDL in section XVIII of Santa Ana Water Board Order No. R8-2015-0001.
2. By agreement dated February 10, 2015, pursuant to Water Code section 13228, Phase I MS4 discharges within the City of Lake Forest located within the San Diego Water Board Region are regulated by the Santa Ana Water Board Order No. R8-2015-0001 (NPDES No. CAS618030) upon the later effective date of this Order or Santa Ana Water Board Tentative Order No. R8-2015-0001. In accordance with the terms of the agreement between the San Diego Water Board and the Santa Ana Water Board, the City of Lake Forest must implement the requirements of the Bacteria TMDL in Attachment E of this Order, participate in preparation and implementation of the Water Quality Improvement Plan for the Aliso Creek Watershed Management Area as described in Provision B of this Order and continue implementation of its over-irrigation discharge prohibition in its City Ordinance, Title 15, Chapter 15, section 14.030, List (b).
3. The Riverside County Copermittees will be covered under this Order after expiration of Order No. R9-2010-0016 or earlier if the Riverside County Copermittees meet the conditions in Provision F.6, upon further amendment of this Order.
4. The County of San Diego is not required to implement the requirements of Provision B for its jurisdiction within the Santa Margarita River Watershed Management Area until the Riverside County Copermittees have been notified of coverage under this Order. The County of San Diego is required to implement the requirements of Provisions D, F.3.b, and Attachment E until the Riverside County Copermittees have been notified of coverage under this Order.

2. Priority Water Quality Conditions

The Copermittees must identify the water quality priorities within each Watershed Management Area that will be addressed by the Water Quality Improvement Plan. Where appropriate, Watershed Management Areas may be separated into subwatersheds to focus water quality prioritization and jurisdictional runoff management program implementation efforts by receiving water.

a. Assessment of Receiving Water Conditions

The Copermittees must consider the following, at a minimum, to identify water quality priorities based on impacts of MS4 discharges on receiving water beneficial uses:

(1) Receiving waters listed as impaired on the CWA Section 303(d) List of Water Quality Limited Segments (303(d) List);

(2) TMDLs adopted and under development by the San Diego Water Board;

(3) Receiving waters recognized as sensitive or highly valued by the Copermittees, including estuaries designated under the National Estuary Program under CWA section 320, marine protected areas, wetlands defined by the State or U.S. Fish and Wildlife Service's National Wetlands Inventory as wetlands, waters having the Preservation of Biological Habitats of Special Significance (BIOL) beneficial use designation, and receiving waters identified as ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(4) The receiving water limitations of Provision A.2;

(5) Known historical versus current physical, chemical, and biological water quality conditions;

(6) Available, relevant, and appropriately collected and analyzed physical, chemical, and biological receiving water monitoring data, including, but not limited to, data describing:

(a) Chemical constituents,

(b) Water quality parameters (i.e. pH, temperature, conductivity, etc.),

(c) Toxicity Identification Evaluations for both receiving water column and sediment,

(d) Trash impacts,

(e) Bioassessments, and

(f) Physical habitat;

(7) Available evidence of erosional impacts in receiving waters due to accelerated flows (i.e. hydromodification);

(8) Available evidence of adverse impacts to the chemical, physical, and biological integrity of receiving waters; and

(9) The potential improvements in the overall condition of the Watershed Management Area that can be achieved.

b. ASSESSMENT OF IMPACTS FROM MS4 DISCHARGES

The Copermittees must consider the following, at a minimum, to identify the potential impacts to receiving waters that may be caused or contributed to by discharges from the Copermittees' MS4s:

(1) The discharge prohibitions of Provision A.1 and effluent limitations of Provision A.3; and

(2) Available, relevant, and appropriately collected and analyzed storm water and non-storm water monitoring data from the Copermittees' MS4 outfalls;

(3) Locations of each Copermittee's MS4 outfalls that discharge to receiving waters;

(4) Locations of MS4 outfalls that are known to persistently discharge non-storm water to receiving waters likely causing or contributing to impacts on receiving water beneficial uses;

(5) Locations of MS4 outfalls that are known to discharge pollutants in storm water causing or contributing to impacts on receiving water beneficial uses; and

(6) The potential improvements in the quality of discharges from the MS4 that can be achieved.

c. IDENTIFICATION OF PRIORITY WATER QUALITY CONDITIONS

(1) The Copermittees must use the information gathered for Provisions B.2.a and B.2.b to develop a list of priority water quality conditions as pollutants, stressors and/or receiving water conditions that are the highest threat to receiving water quality or that most adversely affect the quality of receiving waters. The list must include the following information for each priority water quality condition:

(a) The beneficial use(s) associated with the priority water quality condition;

(b) The geographic extent of the priority water quality condition within the Watershed Management Area, if known;

(c) The temporal extent of the priority water quality condition (e.g., dry weather and/or wet weather);

(d) The Copermittees with MS4s discharges that may cause or contribute to the priority water quality condition; and

(e) An assessment of the adequacy of and data gaps in the monitoring data to characterize the conditions causing or contributing to the priority water quality condition, including a consideration of spatial and temporal variation.

(2) The Copermittees must identify the highest priority water quality conditions to be addressed by the Water Quality Improvement Plan, and provide a rationale for selecting a subset of the water quality conditions identified pursuant to Provision B.2.c.(1) as the highest priorities.

d. IDENTIFICATION OF MS4 SOURCES OF POLLUTANTS AND/OR STRESSORS

The Copermittees must identify and prioritize known and suspected sources of storm water and non-storm water pollutants and/or other stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c. The identification of known and suspected sources of pollutants and/or stressors that cause or contribute to the highest priority water quality conditions as identified for Provision B.2.c must consider the following:

(1) Pollutant generating facilities, areas, and/or activities within the Watershed Management Area, including:

(a) Each Copermittee's inventory of construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas,

(b) Publicly owned parks and/or recreational areas,

(c) Open space areas,

(d) All currently operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste, and

(e) Areas not within the Copermittees' jurisdictions (e.g., Phase II MS4s, tribal lands, state lands, federal lands) that are known or suspected to be discharging to the Copermittees' MS4s;

(2) Locations of the Copermittees' MS4s, including the following:

(a) All MS4 outfalls that discharge to receiving waters, and

(b) Locations of major structural controls for storm water and non-storm water (e.g., retention basins, detention basins, major infiltration devices, etc.);

(3) Other known and suspected sources of non-storm water or pollutants in storm water discharges to receiving waters within the Watershed Management Area, including the following:

(a) Other MS4 outfalls (e.g., Phase II Municipal and Caltrans),

(b) Other NPDES permitted discharges,

(c) Any other discharges that may be considered point sources (e.g., private outfalls), and

(d) Any other discharges that may be considered non-point sources (e.g., agriculture, wildlife or other natural sources);

(4) Review of available data, including but not limited to:

(a) Findings from the Copermittees' illicit discharge detection and elimination programs,

(b) Findings from the Copermittees' MS4 outfall discharge monitoring,

(c) Findings from the Copermittees' receiving water monitoring,

(d) Findings from the Copermittees' MS4 outfall discharge and receiving water assessments, and

(e) Other available, relevant, and appropriately collected data, information, or studies related to pollutant sources and/or stressors that contribute to the highest priority water quality conditions as identified for Provision B.2.c.

(5) The adequacy of the available data to identify and prioritize sources and/or stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c.

e. IDENTIFICATION OF POTENTIAL WATER QUALITY IMPROVEMENT STRATEGIES

The Copermittees must evaluate the findings identified under Provisions B.2.a-d, and identify potential strategies that can result in improvements to water quality in MS4 discharges and/or receiving waters within the Watershed Management Area. Potential water quality improvement strategies that may be implemented within the Watershed Management Area must include the following:

(1) Structural BMPs, non-structural BMPs, incentives, or programs that can potentially be implemented to address the highest priority water quality conditions identified under Provision B.2.c, or MS4 sources of pollutants or stressors identified under Provision B.2.d,

(2) Retrofitting projects in areas of existing development within the Watershed Management Area that can potentially be implemented to reduce MS4 sources of pollutants or stressors identified under Provision B.2.d causing or contributing to the highest priority water quality conditions identified under Provision B.2.c, and

(3) Stream, channel, and/or habitat rehabilitation projects within the Watershed Management Area that can potentially be implemented to protect and/or improve conditions in receiving waters from MS4 pollutants and/or stressors identified under Provision B.2.d causing or contributing to the highest priority water quality conditions identified under Provision B.2.c.

3. Water Quality Improvement Goals, Strategies and Schedules

The Copermittees must identify and develop specific water quality improvement goals and strategies to address the highest priority water quality conditions identified within a Watershed Management Area. The water quality improvement goals and strategies must address the highest priority water quality conditions by effectively prohibiting non-storm water discharges to the MS4, reducing pollutants in storm water discharges from the MS4 to the MEP, and protecting the water quality standards of receiving waters.

a. WATER QUALITY IMPROVEMENT GOALS AND SCHEDULES

(1) <u>Numeric Goals</u>

The Copermittees must develop and incorporate numeric goals[7] into the Water Quality Improvement Plan. Numeric goals must be used to support

[7] Interim and final numeric goals may take a variety of forms such as TMDL established WQBELs, action levels, pollutant concentration, load reductions, number of impaired water bodies delisted from the List of Water Quality Impaired Segments, Index of Biotic Integrity (IBI) scores, or other appropriate metrics. Interim and final numeric goals are not necessarily limited to one criterion or indicator, but may include multiple criteria and/or indicators. Except for TMDL established WQBELs, interim and final numeric goals and corresponding schedules may be revised through the adaptive management process under Provision B.5.

Water Quality Improvement Plan implementation and measure reasonable progress towards addressing the highest priority water quality conditions identified under Provision B.2.c. The Copermittees must establish and incorporate the following numeric goals in the Water Quality Improvement Plan:

(a) Final numeric goals must be based on measureable criteria or indicators capable of demonstrating one or more of the following:

(i) Discharges from the Copermittees' MS4s will not cause or contribute to exceedances of water quality standards in receiving waters, AND/OR

(ii) The conditions of receiving waters and associated habitat are protected from MS4 discharges, AND/OR

(iii) Beneficial uses of receiving waters are protected from MS4 discharges and will be supported.

(b) Interim numeric goals must be based on measureable criteria or indicators capable of demonstrating reasonable incremental progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges as follows:

(i) One or more interim numeric goals may be established to demonstrate progress toward achieving each final numeric goal,

(ii) For each final numeric goal, at least one interim numeric goal must be expressed as a reasonable increment toward achievement of the final numeric goal,

(iii) For each final numeric goal, reasonable interim numeric goals must be established to be accomplished during each 5 year period between the acceptance of the Water Quality Improvement Plan and the achievement of the final numeric goals.

(2) <u>Schedules for Achieving Numeric Goals</u>

The Copermittees must develop and incorporate schedules for achieving the numeric goals into the Water Quality Improvement Plan. The schedules must demonstrate reasonable progress toward achieving the final numeric goals required for Provision B.3.a.(1). The Copermittees must incorporate the schedules for achieving the numeric goals into the Water Quality Improvement Plan based on the following considerations:

(a) Final dates for achieving all final numeric goals must be established considering the following:

(i) Final compliance dates for any applicable TMDLs in Attachment E to this Order;

(ii) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(iii) Achievement of the final numeric goals for the highest water quality priorities must be as soon as possible;

(iv) Final dates for achieving the final numeric goals must reflect a realistic assessment of the shortest practicable time required based on the temporal and spatial extent and factors associated with the highest priority water quality conditions identified under Provision B.2.c, and taking into account the time reasonably required to implement the water quality improvement strategies required pursuant to Provision B.3.b.

(b) Interim dates for achieving all interim numeric goals must be established considering the following:

(i) Interim compliance dates for any applicable TMDLs in Attachment E to this Order;

(ii) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(iii) Interim dates for achieving the interim numeric goals must reflect a realistic assessment of the shortest practicable time reasonably required, taking into account the time needed to implement new or significantly expanded programs and securing financing, if necessary; and

(iv) For each final numeric goal, at least one interim numeric goal must be established that the Copermittees will work toward achieving within the term of this Order.

b. WATER QUALITY IMPROVEMENT STRATEGIES AND SCHEDULES

Based on the likely effectiveness and efficiency of the potential water quality improvement strategies identified under Provision B.2.e to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a, the Copermittees must identify the strategies that will be implemented in each Watershed Management Area as follows:

(1) <u>Jurisdictional Strategies</u>

(a) Each Copermittee in the Watershed Management Area must identify the strategies that will be implemented within its jurisdiction as part of its

jurisdictional runoff management program requirements under Provisions E.2 through E.7, including descriptions of the following:

(i) For each of the inventories developed for its jurisdiction, as required under Provisions D.2.a.(1), E.3.e.(2), E.4.b, and E.5.a, each Copermittee must identify the known and suspected areas or sources causing or contributing to the highest priority water quality conditions in the Watershed Management Area that the Copermittee will focus on in its efforts to effectively prohibit non-storm water discharges to its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, and achieve the interim and final numeric goals identified under Provision B.3.a;

(ii) BMPs that each Copermittee will implement, or require to be implemented, as applicable, for those areas or sources within its jurisdiction;

(iii) Education programs that each Copermittee will implement, as applicable, for those areas or sources within its jurisdiction;

(iv) Frequencies that each Copermittee will conduct inspections on those areas or sources within its jurisdiction;

(v) Incentive and enforcement programs that each Copermittee will implement, as applicable, for those areas or sources within its jurisdiction; and

(vi) Any other BMPs, incentives, or programs that each Copermittee will implement for those areas or sources within its jurisdiction.

(b) Identify the optional jurisdictional strategies that each Copermittee will implement within its jurisdiction, as necessary, to effectively prohibit non-storm water discharges to its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. Descriptions of the optional jurisdictional strategies must include:

(i) BMPs, incentives, or programs that may be implemented by the Copermittee within its jurisdiction in addition to the requirements of Provisions B.3.b.(1)(a);

(ii) Incentives or programs that may be implemented by the Copermittee to encourage or implement projects to retrofit areas of existing development within its jurisdiction;

(iii) Incentives or programs that may be implemented by the Copermittee to encourage or implement projects that will rehabilitate the conditions of channels or habitats within its jurisdiction;

(iv) The funds and/or resources that must be secured by the Copermittee to implement the optional strategies described for Provisions B.3.b.(1)(b)(i)-(iii) within its jurisdiction; and

(v) The circumstances necessary to trigger implementation of the optional jurisdictional strategies, in addition to the requirements of Provision B.3.b.(1)(a), to achieve the interim and final numeric goals within the schedules established under Provision B.3.a.

(c) Identify the strategies that will be implemented by the Copermittee in coordination with or with the cooperation of other agencies (e.g. Caltrans, water districts, school districts) and/or entities (e.g. non-governmental organizations) within its jurisdiction.

(2) Watershed Management Area Strategies

The Copermittees must identify the optional regional or multi-jurisdictional strategies that will be implemented in the Watershed Management Area, as necessary, to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. Descriptions of the optional regional or multi-jurisdictional strategies must include:

(a) Regional or multi-jurisdictional BMPs, incentives, or programs that may be implemented by the Copermittees in the Watershed Management Area;

(b) Incentives or programs that may be implemented by the Copermittees in the Watershed Management Area to encourage or implement regional or multi-jurisdictional projects to retrofit areas of existing development;

(c) Incentives or programs that may be implemented by the Copermittees to encourage or implement regional or multi-jurisdictional projects that will rehabilitate the conditions of channels, streams, or habitats within the Watershed Management Area;

(d) The funds and/or resources that must be secured by the Copermittees to implement the optional strategies described for Provisions B.3.b.(2)(a)-(c) within the Watershed Management Area; and

(e) The circumstances necessary to trigger implementation of the optional regional or multi-jurisdictional strategies to achieve the interim and final numeric goals within the schedules established under Provision B.3.a.

(3) Schedules for Implementing Strategies

The Copermittees must develop reasonable schedules for implementing the water quality improvement strategies identified under Provisions B.3.b.(1) and B.3.b.(2) to achieve the interim and final numeric goals identified and schedules established under Provision B.3.a. The Copermittees must incorporate the schedules to implement the water quality improvement strategies into the Water Quality Improvement Plan as follows:

(a) Each Copermittee must develop schedules for the jurisdictional strategies identified pursuant to Provisions B.3.b.(1)(a)-(b). Each schedule must specify:

(i) If each jurisdictional strategy identified pursuant to Provision B.3.b.(1)(a) will or will not be initiated upon acceptance of the Water Quality Improvement Plan;

(ii) For each jurisdictional strategy identified pursuant to Provision B.3.b.(1)(a) that will not be initiated upon acceptance of the Water Quality Improvement Plan, the shortest practicable time in which each jurisdictional strategy will be initiated after acceptance of the Water Quality Improvement Plan;

(iii) For each optional jurisdictional strategy identified pursuant to Provision B.3.b.(1)(b), a realistic assessment of the shortest practicable time required to:

[a] Secure the resources needed to fund the optional jurisdictional strategy, and
[b] Procure the resources, materials, labor, and applicable permits necessary to initiate implementation of the optional jurisdictional strategy;

(iv) If each jurisdictional strategy identified pursuant to Provisions B.3.b.(1)(a)-(b) is expected to be continuously implemented (e.g. inspections) or completed within a schedule (e.g. construction of structural BMP); and

(v) If a jurisdictional strategy identified pursuant to Provisions B.3.b.(1)(a)-(b) is expected to be completed within a schedule, the anticipated time to complete based on a realistic assessment of the shortest practicable time required.

(b) The Copermittees in the Watershed Management Area must develop schedules for the regional or multi-jurisdictional strategies identified pursuant to Provision B.3.b.(2). Each schedule must specify:

(i) A realistic assessment of the shortest practicable time to:

[a] Secure the resources needed to fund the optional regional or multi-jurisdictional strategy, and

[b] Procure the resources, materials, labor, and permits necessary to initiate the implementation of the optional regional or multi-jurisdictional strategy;

(ii) If each regional or multi-jurisdictional strategy identified pursuant to Provision B.3.b.(2) is expected to be continuously implemented (e.g. inspections) or completed within a schedule (e.g. construction of structural BMP); and

(iii) If a regional or multi-jurisdictional strategy and/or activity identified pursuant to Provisions B.3.b.(2) is expected to be completed within a schedule, the anticipated time to complete based on a realistic assessment of the shortest practicable time required.

(4) Optional Watershed Management Area Analysis

(a) For each Watershed Management Area, the Copermittees have the option to perform a Watershed Management Area Analysis for the purpose of developing watershed-specific requirements for structural BMP implementation, as described in Provision E.3.c.(3). The Watershed Management Area Analysis must include GIS layers (maps) as output. The analysis must include the following information, to the extent it is available, in order to characterize the Watershed Management Areas:

(i) A description of dominant hydrologic processes, such as areas where infiltration or overland flow likely dominates;

(ii) A description of existing streams in the watershed, including bed material and composition, and if they are perennial or ephemeral;

(iii) Current and anticipated future land uses;

(iv) Potential coarse sediment yield areas; and

(v) Locations of existing flood control structures and channel structures, such as stream armoring, constrictions, grade control structures, and hydromodification or flood management basins.

(b) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify and compile a list of candidate projects that could potentially be used as alternative compliance options for Priority Development Projects, to be implemented in lieu of onsite structural BMP performance requirements described in Provisions E.3.c.(1) and E.3.c.(2)(a). Specifically, the Copermittees must identify opportunities to be included in the list of candidate projects in each Watershed Management Area, such as:

(i) Stream or riparian area rehabilitation;

(ii) Retrofitting existing infrastructure to incorporate storm water retention or treatment;

(iii) Regional BMPs;

(iv) Groundwater recharge projects;

(v) Water supply augmentation projects; and

(vi) Land purchases to preserve floodplain functions.

(c) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify areas within the Watershed Management Area where it is appropriate to allow Priority Development Projects to be exempt from the hydromodification management BMP performance requirements described in Provision E.3.c.(2), including supporting rationale.

4. Water Quality Improvement Monitoring and Assessment Program

a. The Copermittees in each Watershed Management Area must develop and incorporate an integrated monitoring and assessment program into the Water Quality Improvement Plan that assesses: 1) the progress toward achieving the numeric goals and schedules, 2) the progress toward addressing the highest priority water quality conditions for each Watershed Management Area, and 3) each Copermittee's overall efforts to implement the Water Quality Improvement Plan.

b. The monitoring and assessment program must incorporate the monitoring and assessment requirements of Provision D, which may allow the Copermittees to modify the program to be consistent with and focus on the highest priority water quality conditions for each Watershed Management Area.

c. For Watershed Management Areas with applicable TMDLs, the monitoring and assessment program must incorporate the specific monitoring and assessment requirements of Attachment E.

d. For Watershed Management Areas with any ASBS, the water quality monitoring and assessment program must incorporate the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

5. Iterative Approach and Adaptive Management Process

The Copermittees in each Watershed Management Area must implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a, and must include the following:

a. RE-EVALUATION OF PRIORITY WATER QUALITY CONDITIONS

The priority water quality conditions and potential water quality improvement strategies included in the Water Quality Improvement Plan pursuant to Provisions B.2.c and B.2.e may be re-evaluated by the Copermittees as needed during the term of this Order as part of the Water Quality Improvement Plan Annual Report. Re-evaluation and recommendations for modifications to the priority water quality conditions and potential water quality improvement strategies must be provided in the Report of Waste Discharge, and must consider the following:

(1) Achieving the outcome of improved water quality in MS4 discharges and receiving waters through implementation of the water quality improvement strategies identified in the Water Quality Improvement Plan;

(2) New information developed when the requirements of Provisions B.2.a-c have been re-evaluated;

(3) Spatial and temporal accuracy of monitoring data collected to inform prioritization of water quality conditions and implementation strategies to address the highest priority water quality conditions;

(4) Availability of new information and data from sources other than the jurisdictional runoff management programs within the Watershed Management Area that informs the effectiveness of the actions implemented by the Copermittees;

(5) San Diego Water Board recommendations; and

(6) Recommendations for modifications solicited through a public participation process.

b. ADAPTATION OF GOALS, STRATEGIES AND SCHEDULES

The water quality improvement goals, strategies and schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.3, must be re-evaluated and adapted as new information becomes available to result in more effective and efficient measures to address the highest priority water quality conditions identified pursuant to Provision B.2.c. Re-evaluation of and modifications to the water quality improvement goals, strategies and schedules must be provided in the Water Quality Improvement Plan Annual Report, and must consider the following:

(1) Modifications to the priority water quality conditions based on Provision B.5.a;

(2) Progress toward achieving interim and final numeric goals in receiving waters and MS4 discharges for the highest priority water quality conditions in the Watershed Management Area,

(3) Progress toward achieving outcomes according to established schedules;

(4) New policies or regulations that may affect identified numeric goals;

(5) Measurable or demonstrable reductions of non-storm water discharges to and from each Copermittee's MS4;

(6) Measurable or demonstrable reductions of pollutants in storm water discharges from each Copermittee's MS4 to the MEP;

(7) New information developed when the requirements of Provisions B.2.b and B.2.d have been re-evaluated;

(8) Efficiency in implementing the Water Quality Improvement Plan;

(9) San Diego Water Board recommendations; and

(10) Recommendations for modifications solicited through a public participation process.

c. ADAPTATION OF MONITORING AND ASSESSMENT PROGRAM

The water quality improvement monitoring and assessment program, included in the Water Quality Improvement Plan pursuant to Provision B.4, must be re-evaluated and adapted when new information becomes available. Re-evaluation and recommendations for modifications to the monitoring and assessment program, pursuant to the requirements of Provision D, may be provided in the Water Quality Improvement Plan Annual Report, but must be provided in the Report of Waste Discharge.

6. Water Quality Improvement Plan Submittal, Updates, and Implementation

a. The Copermittees must submit and commence implementation of the Water Quality Improvement Plans in accordance with the requirements of Provision F.1.

b. The Copermittees must submit proposed updates to the Water Quality Improvement Plan for acceptance by the San Diego Water Board Executive Officer in accordance with the requirements of Provision F.2.c.

C. ACTION LEVELS

The purpose of this provision is for the Copermittees to incorporate numeric action levels in the Water Quality Improvement Plans. The goal of the action levels is to guide Water Quality Improvement Plan implementation efforts and measure progress towards the protection of water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through monitoring and assessing the quality of the MS4 discharges during the implementation of the Water Quality Improvement Plans.

1. Non-Storm Water Action Levels[8]

The Copermittees must develop and incorporate numeric non-storm water action levels (NALs) into the Water Quality Improvement Plan to: 1) support the development and prioritization of water quality improvement strategies for effectively prohibiting non-storm water discharges to the MS4s, 2) assess the effectiveness of the water quality improvement strategies toward addressing MS4 non-storm water discharges, required pursuant to Provision D.4.b.(1), and 3) support the detection and elimination of non-storm water and illicit discharges to the MS4, required pursuant to Provision E.2.[9]

a. The following NALs must be incorporated:

(1) Non-Storm Water Discharges from MS4s to Ocean Surf Zone

Table C-1. Non-Storm Water Action Levels for Discharges from MS4s to Ocean Surf Zone

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Total Coliform	MPN/100 ml	1,000	-	10,000/1,000[1]	OP
Fecal Coliform	MPN/100 ml	200[2]	-	400	OP
Enterococci	MPN/100 ml	35	-	104[3]	OP

Abbreviations/Acronyms
AMAL – average monthly action level
MDAL – maximum daily action level
OP – Ocean Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Total coliform density NAL is 1,000 MPN/100 ml when the fecal/total coliform ratio exceeds 0.1.
2. Fecal coliform density NAL is 200 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas."

[8] NALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, unless the NAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed.
[9] The Copermittees may utilize NALs or other benchmarks currently established by the Copermittees as interim NALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

(2) Non-Storm Water Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Table C-2. Non-Storm Water Action Levels for Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Turbidity	NTU	75	-	225	OP
pH	Units	Within limit of 6.0 to 9.0 at all times			OP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	35	-	104[3]	BP
Priority Pollutants	µg/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
OP – Ocean Plan water quality objective
NTU – Nephelometric Turbidity Units
µg/L – micrograms per liter
MDAL – maximum daily action level
BP – Basin Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas" and is not applicable to water bodies that are not designated with the water contact recreation (REC-1) beneficial use.

Table C-3. Non-Storm Water Action Levels for Priority Pollutants

Parameter	Units	Freshwater (CTR)		Saltwater (CTR)	
		MDAL	AMAL	MDAL	AMAL
Cadmium	µg/L	**	**	16	8
Copper	µg/L	*	*	5.8	2.9
Chromium III	µg/L	**	**	-	-
Chromium VI	µg/L	16	8.1	83	41
Lead	µg/L	*	*	14	2.9
Nickel	µg/L	**	**	14	6.8
Silver	µg/L	*	*	2.2	1.1
Zinc	µg/L	*	*	95	47

Abbreviations/Acronyms:
CTR – California Toxic Rule
AMAL – average monthly action level
µg/L – micrograms per liter
MDAL – maximum daily action level

Notes:
* Action levels developed on a case-by-case basis (see below)
** Action levels developed on a case-by-case basis (see below), but calculated criteria are not to exceed Maximum Contaminant Levels (MCLs) under the California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64431

The Cadmium, Copper, Chromium (III), Lead, Nickel, Silver and Zinc NALs for MS4 discharges to freshwater receiving waters will be developed on a case-by-case basis based on site-specific water quality data (receiving water hardness). For these priority pollutants, refer to 40 CFR 131.38(b)(2).

(3) Non-Storm Water Discharges from MS4s to Inland Surface Waters

Table C-4. Non-Storm Water Action Levels for Discharges from MS4s to Inland Surface Waters

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Dissolved Oxygen	mg/L	Not less than 5.0 in WARM waters and not less than 6.0 in COLD waters			BP
Turbidity	NTU	-	20	See MDAL	BP
pH	Units	Within limit of 6.5 to 8.5 at all times			BP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	33	-	61[3]	BP
Total Nitrogen	mg/L	-	1.0	See MDAL	BP
Total Phosphorus	mg/L	-	0.1	See MDAL	BP
MBAS	mg/L	-	0.5	See MDAL	BP
Iron	mg/L	-	0.3	See MDAL	BP
Manganese	mg/L	-	0.05	See MDAL	BP
Priority Pollutants	µg/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
BP – Basin Plan water quality objective
COLD – cold freshwater habitat beneficial use
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
MDAL – maximum daily action level
WARM – warm freshwater habitat beneficial use
MBAS – Methylene Blue Active Substances
MPN/100 ml – most probable number per 100 milliliters
µg/L – micrograms per liter

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for freshwater "designated beach areas" and is not applicable to water bodies that are not designated with the water contact recreation (REC-1) beneficial use.

b. If not identified in Provision C.1.a, NALs must be identified, developed and incorporated in the Water Quality Improvement Plan for any pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in receiving waters associated with the highest priority water quality conditions related to non-storm water discharges from the MS4s. NALs must be based on:

(1) Applicable water quality standards which may be dependent upon site-specific or receiving water-specific conditions or assumptions to be identified by the Copermittees; or

(2) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the NALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary NALs specific to the Watershed Management Area at levels greater than the NALs required by Provisions C.1.a and C.1.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for effectively prohibiting non-storm water discharges to the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and from the MS4. The

secondary NALs may be developed using an approach acceptable to the San Diego Water Board.

d. Dry weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.b may be utilized to develop or revise NALs based on watershed-specific data, subject to San Diego Water Board Executive Officer approval.

2. Storm Water Action Levels[10]

The Copermittees must develop and incorporate numeric storm water action levels (SALs) in the Water Quality Improvement Plans to: 1) support the development and prioritization of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s, and 2) assess the effectiveness of the water quality improvement strategies toward reducing pollutants in storm water discharges, required pursuant to Provision D.4.b.(2).[11]

a. The following SALs for discharges of storm water from the MS4 must be incorporated:

Table C-5. Storm Water Action Levels for Discharges from MS4s to Receiving Waters

Parameter	Units	Action Level
Turbidity	NTU	126
Nitrate & Nitrite (Total)	mg/L	2.6
Phosphorus (Total P)	mg/L	1.46
Cadmium (Total Cd)*	µg/L	3.0
Copper (Total Cu)*	µg/L	127
Lead (Total Pb)*	µg/L	250
Zinc (Total Zn)*	µg/L	976

Abbreviations/Acronyms:
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
µg/L – micrograms per liter

Notes:
* The sampling must include a measure of receiving water hardness at each MS4 outfall. If a total metal concentration exceeds the corresponding metals SAL in Table C-5, that concentration must be compared to the California Toxics Rule criteria and the USEPA 1-hour maximum concentration for the detected level of receiving water hardness associated with that sample. If it is determined that the sample's total metal concentration for that specific metal exceeds that SAL, but does not exceed the applicable USEPA 1-hour maximum concentration criterion for the measured level of hardness, then the sample result will not be considered above the SAL for that measurement.

[10] SALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, unless the SAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed.

[11] The Copermittees may utilize SALs or other benchmarks currently established by the Copermittees as interim SALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

b. If not identified in Provision C.2.a, SALs must be identified, developed and incorporated in the Water Quality Improvement Plan for pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in receiving waters associated with the highest priority water quality conditions related to storm water discharges from the MS4s. SALs must be based on:

(1) Federal and State water quality guidance and/or water quality standards; and

(2) Site-specific or receiving water-specific conditions; or

(3) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the SALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary SALs specific to the Watershed Management Area at levels greater than the SALs required by Provisions C.2.a and C.2.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s. The secondary SALs may be developed based on the approaches recommended by the State Water Board's Storm Water Panel[12] or using an approach acceptable to the San Diego Water Board.

d. Wet weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.c may be used to develop or revise SALs based upon watershed-specific data, subject to San Diego Water Board Executive Officer approval.

[12] Storm Water Panel Recommendations to the California State Water Resources Control Board: The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities (June 2006)

D. MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS

The purpose of this provision is for the Copermittees to monitor and assess the impact on the conditions of receiving waters caused by discharges from the Copermittees' MS4s under wet weather and dry weather conditions. The goal of the monitoring and assessment program is to inform the Copermittees about the nexus between the health of receiving waters and the water quality condition of the discharges from their MS4s. This goal will be accomplished through monitoring and assessing the conditions of the receiving waters, discharges from the MS4s, pollutant sources and/or stressors, and effectiveness of the water quality improvement strategies implemented as part of the Water Quality Improvement Plans.

1. Receiving Water Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the condition of the receiving waters in each Watershed Management Area during dry weather and wet weather. Following San Diego Water Board acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct long-term receiving water monitoring during implementation of the Water Quality Improvement Plan to assess the long term trends and determine if conditions in receiving waters are improving. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following receiving water monitoring procedures:

a. TRANSITIONAL RECEIVING WATER MONITORING

Until the monitoring requirements and schedules of Provisions D.1.b-e are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following receiving water monitoring in the Watershed Management Area:

(1) Continue the receiving water monitoring programs required in Order Nos. R9-2007-0001 (Monitoring and Reporting Program No. R9-2007-0001 Sections II.A.1-A.5), R9-2009-0002, and R9-2010-0016, unless the Executive Officer provides conditional approval for Copermittees to proceed with implementation of the proposed monitoring and assessment program developed in accordance with Provision B.4;

(2) Continue the monitoring in the Hydromodification Management Plans approved by the San Diego Water Board;

(3) Participate in the following regional receiving water monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring,

(b) Southern California Bight Regional Monitoring, and

(c) Sediment Quality Monitoring;

(4) Implement the monitoring programs developed as part of any implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) for the TMDLs in Attachment E to this Order; and

(5) For Watershed Management Areas with ASBS, implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

b. LONG-TERM RECEIVING WATER MONITORING STATIONS

The Copermittees must select at least one long-term receiving water monitoring station from among the existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees to be representative of the receiving water quality in the Watershed Management Area. Additional long-term receiving water monitoring stations must be selected where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

c. DRY WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three dry weather monitoring events at each of the long-term receiving water monitoring stations. At least one monitoring event must be conducted during the dry season (May 1 – September 30) and at least one monitoring event must be conducted during a dry weather period during the wet season (October 1 – April 30), after the first wet weather event of the season, with an antecedent dry period of at least 72 hours following a storm event producing measureable rainfall of greater than 0.1 inch.

(1) <u>Dry Weather Receiving Water Field Observations</u>

For each dry weather monitoring event, the Copermittees must record field observations consistent with Table D-1 at each long-term receiving water monitoring station.

Table D-1. Field Observations for Receiving Water Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) • Station description (i.e. deposits or stains, vegetation condition, structural condition, and observable biology) • Presence and assessment of trash in and around station

(2) Dry Weather Receiving Water Field Monitoring

For each dry weather monitoring event, if conditions allow the collection of the data, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

Table D-2. Field Monitoring Parameters for Receiving Water Monitoring Stations

Parameters
• pH • Temperature • Specific conductivity • Dissolved oxygen • Turbidity

(3) Dry Weather Receiving Water Analytical Monitoring

For each dry weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable NAL constituents, and

(v) Constituents listed in Table D-3.

Table D-3. Analytical Monitoring Constituents for Receiving Water Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Pesticides	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Mercury • Nickel • Selenium • Thallium • Zinc	• Organophosphate Pesticides • Pyrethroid Pesticides	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(4) Dry Weather Receiving Water Toxicity Monitoring

For each dry weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for aquatic toxicity in accordance with Table D-4. When the State Water Board's Policy for Toxicity Assessment and Control (Toxicity Policy) is approved and in effect, the San Diego Water Board Executive Officer may direct the Copermittees to replace current toxicity program elements with standardized procedures in the Toxicity Policy.

Table D-4. Dry Weather Chronic[1] Toxicity Testing for Receiving Water Monitoring Stations

Organism	Units	Test	USEPA Protocol
Freshwater			
Pimephales promelas (Fathead Minnow)	Pass / Fail	Larval Survival and Growth	EPA-821-R-02-013
Ceriodaphnia dubia (*Daphnid*)	Pass / Fail	Survival and Production	EPA-821-R-02-013
Selenastrum capricornutum (Green Algae)	Pass / Fail	Growth	EPA-821-R-02-013
Marine and Estuarine			
Strongylocentrotus purpuratus *(Purple Sea Urchin)*	Pass / Fail	Embryo-Larval Development	EPA-600-R-95-136

Notes:
1. Chronic toxicity testing is not required at receiving water monitoring stations located at mass loading stations if the channel flows are diverted year-round during dry weather conditions to the sanitary sewer for treatment.

(a) Freshwater Test Species and Methods: If samples are collected in receiving waters with salinity less than 1 ppt, the Copermittees must follow the methods for chronic toxicity tests as established in 40 CFR 136.3 using a single-concentration test design for routine monitoring, or a five-concentration test design for additional toxicity testing if the limitation is exceeded. The Copermittees must estimate the critical life stage chronic toxicity on undiluted samples in accordance with species and short term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms (EPA-821-R-02-013; Table IA, 40 CFR 136). Additional test species may be used by the Copermittees if approved by the San Diego Water Board Executive Officer. The Copermittees must conduct:

(i) A static renewal toxicity test with the fathead minnow, *Pimephales promelas* (Larval Survival and Growth Test Method 1000.0);

(ii) A static renewal toxicity test with the daphnid, *Ceriodaphnia dubia* (Survival and Reproduction Test Method 1002.0); and

(iii) A static renewal toxicity test with the green alga, *Selenastrum capricornutum* (also named *Raphidocelis subcapitata*) (Growth Test Method 1003.0).

(b) Marine and Estuarine Test Species and Methods: If samples are collected in receiving waters with salinity greater or equal to 1 ppt, the Copermittees must follow the methods for chronic toxicity tests as established in 40 CFR 136.3 using a single-concentration test design for routine monitoring, or a five-concentration test design for additional toxicity testing if the limitation is exceeded. The Copermittees must conduct the following critical life state chronic toxicity tests on undiluted samples in accordance with species and short term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms (EPA-600-R-95-136; 1995). Artificial sea salts must be used to increase sample salinity. The Copermittees must conduct a static non-renewal toxicity test with the purple sea urchin, *Strongylocentrotus purpuratus* (Embryo-larval Development Test Method). Additional species may be used by the Copermittees if approved by the San Diego Water Board Executive Officer.

(c) Holding Times: All toxicity tests must be conducted as soon as possible following sample collection. The 36-hour sample holding time for test initiation shall be targeted. However, no more than 72 hours shall elapse before the conclusion of sample collection and test initiation.

(d) Test Species Sensitivity Screening: To determine the most sensitive test species for freshwater, the Copermittees must screen 2 wet weather and 2 dry weather toxicity tests with a vertebrate, an invertebrate, and a plant species. After this screening period, subsequent monitoring must be conducted using the most sensitive test species. Alternatively, if a sensitive test species has already been determined, or if there is prior knowledge of potential toxicant(s) and a test species is sensitive to such toxicant(s), then monitoring must be conducted using only that test species. Sensitive test species determinations must also consider the most sensitive test species used for proximal receiving water monitoring. Rescreening must occur once each permit term.

(e) Chronic toxicity test biological endpoint data must be analyzed using the Test of Significant Toxicity t-test approach specified in *National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document* (USEPA, Office of Wastewater Management, Washington, D.C., EPA-833-R-10-003, 2010). For this monitoring program, the critical chronic instream waste concentration (IWC) is set at 100 percent receiving water (i.e. no dilution) for receiving water samples. A 100 percent receiving water and a control must be tested.

(f) Toxicity Identification Evaluation (TIE) / Toxicity Reduction Evaluation (TRE): If chronic toxicity is detected in receiving waters, the Copermittees must discuss the need for conducting a TIE/TRE in the assessments required under Provision D.4.a.(2), and develop a plan for implementing the TIE/TRE to be incorporated in the Water Quality Improvement Plan.

(5) Dry Weather Receiving Water Bioassessment Monitoring

Bioassessment monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must conduct bioassessment monitoring during at least one dry weather monitoring event at each long-term receiving water monitoring station as follows:

(a) The following bioassessment samples and measurements must be collected:

(i) Macroinvertebrate samples must be collected in accordance with the "Reachwide Benthos (Multihabitat) Procedure" in the most current Surface Water Ambient Monitoring Program (SWAMP) Bioassessment Standard Operating Procedures (SOP), and amendments, as applicable;[13]

(ii) The "Full" suite of physical habitat characterization measurements must be collected in accordance with the most current SWAMP Bioassessment SOP, and as summarized in the SWAMP Stream Habitat Characterization Form – Full Version;[14] and

(iii) Freshwater algae samples must be collected in accordance with the SWAMP Standard Operating Procedures for Collecting Algae Samples.[15] Analysis of samples must include algal taxonomic composition (diatoms and soft algae) and algal biomass.

(b) The bioassessment samples, measurements, and appropriate water chemistry data must be used to calculate the following:

(i) An Index of Biological Integrity (IBI) for macroinvertebrates for each monitoring station where bioassessment monitoring was conducted, based on the most current calculation method;[16] and

[13] Ode, P.R.. 2007. Standard operating procedures for collecting macroinvertebrate samples and associated physical and chemical data for ambient bioassessments in California. California State Water Resources Control Board Surface Water Ambient Monitoring Program (SWAMP) Bioassessment SOP 001. http://www.swrcb.ca.gov/water_issues/programs/swamp/tools.shtml#monitoring

[14] Available at: http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/reports/fieldforms_fullversion052908.pdf

[15] Fetscher et al. 2009. Standard Operating Procedures for Collecting Stream Algae Samples and Associated Physical Habitat and Chemical Data for Ambient Bioassessments in California.

[16] The most current calculation method at the time the Order was adopted is outlined in "A Quantitative Tool for Assessing the Integrity of Southern California Coastal Streams" (Ode, et al. 2005. Environmental Management. Vol. 35, No. 1, pp. 1-13). If an updated or new calculation method is developed, either both (i.e. current and updated/new) methods must be used, or historical IBIs must be recalculated with the updated or new calculation method.

(ii) An IBI for algae for each monitoring station where bioassessment monitoring was conducted, when a calculation method is developed.[17]

(c) In lieu of the requirements of Provision D.1.c.(5)(a), the Copermittees may conduct the bioassessment monitoring in accordance with the "Triad" assessment approach[18] to calculate the IBIs required for Provision D.1.c.(5)(b). The Copermittees must conduct sampling, analysis, and reporting of specified in-stream biological and habitat data according to the protocols specified in the SCCWRP Technical Report No. 539, or subsequent protocols, if developed.

(6) Dry Weather Receiving Water Hydromodification Monitoring

In addition to the hydromodification monitoring conducted as part of the Copermittees' Hydromodification Management Plans, hydromodification monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must collect the following hydromodification monitoring observations and measurements within an appropriate domain of analysis during at least one dry weather monitoring event for each long-term receiving water monitoring station:

(a) Channel conditions, including:

(i) Channel dimensions,

(ii) Hydrologic and geomorphic conditions, and

(iii) Presence and condition of vegetation and habitat;

(b) Location of discharge points;

(c) Habitat integrity;

(d) Photo documentation of existing erosion and habitat impacts, with location (i.e. latitude and longitude coordinates) where photos were taken;

(e) Measurement or estimate of dimensions of any existing channel bed or bank eroded areas, including length, width, and depth of any incisions; and

[17] When a calculation method is developed, IBIs must be calculated for all available and appropriate historical data.
[18] Stormwater Monitoring Coalition Model Monitoring Technical Committee, 2004. Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California. Technical Report #419. August 2004.

(f) Known or suspected cause(s) of existing downstream erosion or habitat impact, including flow, soil, slope, and vegetation conditions, as well as upstream land uses and contributing new and existing development.

d. WET WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three wet weather monitoring events at each long-term receiving water monitoring station. At least one wet weather monitoring event must be conducted during the first wet weather event of the wet season (October 1 – April 30), and at least one wet weather monitoring event during a wet weather event that occurs after February 1.

(1) Wet Weather Receiving Water Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each long-term receiving water monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event;

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(d) Presence and assessment of trash in and around station.

(2) Wet Weather Receiving Water Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

(3) Wet Weather Receiving Water Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) Constituents listed in Table D-3.

(4) <u>Wet Weather Receiving Water Toxicity Monitoring</u>

For each wet weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for chronic aquatic toxicity in accordance with Provisions D.1.c.(4)(a)-(f).

e. OTHER RECEIVING WATER MONITORING REQUIREMENTS

(1) Regional Monitoring

The Copermittees must participate in the following regional receiving waters monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring; and

(b) Southern California Bight Regional Monitoring and

(c) Unified Beach Water Quality Monitoring and Assessment Program. The Orange County Copermittees shall participate in and, together with South Orange County Wastewater Authority and Orange County Health Care Agency, shall share responsibility for implementation of a unified regional beach water quality monitoring and assessment program in south Orange County, as set forth in the October 2014 report, *Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County* , issued pursuant to CWC section 13383 and subject to future revision in the San Diego Water Board December 5, 2014 Letter Directive.

(2) Sediment Quality Monitoring

The Copermittees must perform sediment monitoring to assess compliance with sediment quality receiving water limits applicable to MS4 discharges to enclosed bays and estuaries. The monitoring may be performed either by individual or multiple Copermittees to assess compliance with receiving water limits, or through participation in a water body monitoring coalition. A Sediment Monitoring Plan which satisfies the requirements of the State Water Board's Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part 1 Sediment Quality (Sediment Control Plan) must be submitted as part of the monitoring and assessment program in the Water Quality Improvement Plan.

(a) The Sediment Monitoring Plan design must include the following:

(i) The elements required under Section VII.D (Receiving Water Limits Monitoring Frequency) and Section VII.E (Sediment Monitoring) of the Sediment Control Plan;

(ii) A Quality Assurance Project Plan (QAPP) describing the project objectives and organization, functional activities, and quality assurance/quality control protocols for the water and sediment monitoring; and

(iii) A schedule for completion of all sample collection and analysis activities and submission of Sediment Monitoring Reports.

(b) The Copermittees must implement the Sediment Monitoring Plan in accordance with the schedule contained in the Sediment Monitoring Plan, unless otherwise directed in writing by the San Diego Water Board Executive Officer.

(c) The Copermittees must incorporate a Sediment Monitoring Report as part of the Water Quality Improvement Plan Annual Report in accordance with the schedule contained in the Sediment Monitoring Plan, unless otherwise directed in writing by the San Diego Water Board Executive Officer. The Sediment Monitoring Report must contain the following information:

(i) Analysis: An evaluation, interpretation and tabulation of the water and sediment monitoring data, including interpretations and conclusions as to whether applicable Receiving Water Limitations in this Order have been attained at each sample station;

(ii) Sample Location Map: The locations, type, and number of samples must be identified and shown on a site map; and

(iii) California Environmental Data Exchange Network: A statement certifying that the monitoring data and results have been uploaded into the California Environmental Data Exchange Network (CEDEN).

(d) Based on the Sediment Monitoring Report conclusions the San Diego Water Board may require a human health risk assessment to determine if the human health objective contained in Receiving Water Limitations in Provision A.2.a.(3)(b)(ii) has been attained at each sample station. In conducting a risk assessment, the Copermittees must consider any applicable and relevant information, including California Environmental Protection Agency's (Cal/EPA) Office of Environmental Health Hazard Assessment (OEHHA) policies for fish consumption and risk assessment, Cal/EPA's Department of Toxic Substances Control (DTSC) Risk Assessment, and USEPA Human Health Risk Assessment policies.

(3) <u>ASBS Monitoring</u>

For Watershed Management Areas with ASBS, the Copermittees must implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

f. ALTERNATIVE WATERSHED MONITORING REQUIREMENTS

The San Diego Water Board may direct the Copermittees to participate in an effort to develop alternative watershed monitoring with other regulated entities, other interested parties, and the San Diego Water Board to refine, coordinate, and implement regional monitoring and assessment programs to determine the status and trends of water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams.

2. MS4 Outfall Discharge Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the discharges from the MS4 outfalls in each Watershed Management Area during dry weather and wet weather. Following San Diego Water Board acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct MS4 outfall discharge monitoring during implementation of the Water Quality Improvement Plan to assess the effectiveness of their jurisdictional runoff management programs toward effectively prohibiting non-storm water discharges into the MS4 and reducing pollutants in storm water discharges from their MS4s to the MEP. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following MS4 outfall monitoring procedures:

a. TRANSITIONAL MS4 OUTFALL DISCHARGE MONITORING

Until the monitoring requirements and schedules of Provisions D.2.b-c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following MS4 outfall discharge monitoring in the Watershed Management Area:

(1) <u>MS4 Outfall Discharge Monitoring Station Inventory</u>

Each Copermittee must identify all major MS4 outfalls that discharge directly to receiving waters within its jurisdiction and geo-locate those outfalls on a map of the MS4 pursuant to Provision E.2.b.(1). This information must be compiled into a MS4 outfall discharge monitoring station inventory, and must include the following information:

(a) Latitude and longitude of MS4 outfall point of discharge;

(b) Watershed Management Area;

(c) Hydrologic subarea;

(d) Outlet size;

(e) Accessibility (i.e. safety and without disturbance of critical habitat);

(f) Approximate drainage area; and

(g) Classification of whether the MS4 outfall is known to have persistent dry weather flows, transient dry weather flows, no dry weather flows, or unknown dry weather flows.

(2) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Until the monitoring requirements and schedules of Provision D.2.b are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, each Copermittee must perform dry weather MS4 outfall field screening monitoring to identify non-storm water and illicit discharges within its jurisdiction in accordance with Provision E.2.c, to determine which discharges are transient flows and which are persistent flows, and prioritize the dry weather MS4 discharges that will be investigated and eliminated in accordance with Provision E.2.d.

(a) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Frequency

Each Copermittee must field screen the MS4 outfalls in its inventory developed pursuant to Provision D.2.a.(1) as follows:

(i) For Copermittees with less than 125 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 80 percent of the outfalls must be visually inspected two times per year during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv).

(ii) For Copermittees with 125 major MS4 outfalls or more, but less than or equal to 500 that discharge to receiving waters within a Watershed Management Area, all the outfalls must be visually inspected at least annually during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv).

(iii) For Copermittees with more than 500 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 500 outfalls must be visually inspected at least annually during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv). Copermittees with more than 500 major MS4 outfalls within a Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;

[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(iv) For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major MS4 outfalls within its jurisdiction, at least 500 major MS4 outfalls within its inventory must be visually inspected at least annually during dry weather conditions. Copermittees with more than 500 major MS4 outfalls in more than one Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(v) Inspections of major MS4 outfalls conducted in response to public reports and staff or contractor reports and notifications may count toward the required visual inspections of MS4 outfall discharge monitoring stations.

(b) Transitional Dry Weather MS4 Outfall Discharge Field Screening Visual Observations

(i) An antecedent dry period of at least 72 hours following any storm event producing measurable rainfall greater than 0.1 inch is required prior to conducting field screening visual observations during a field screening monitoring event.

(ii) During the field screening monitoring event, each Copermittee must record visual observations consistent with Table D-5 at each MS4 outfall discharge monitoring station inspected.

Table D-5. Field Screening Visual Observations for MS4 Outfall Discharge Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) - Flow source(s) suspected or identified from non-storm water source investigation - Flow source(s) eliminated during non-storm water source identification • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) - Known or suspected source(s) of pooled or ponded water • Station description (i.e. deposits or stains, vegetation condition, structural condition, observable biology) • Presence and assessment of trash in and around station • Evidence or signs of illicit connections or illegal dumping

(iii) Each Copermittee must implement the requirements of Provisions E.2.d.(2)(c)-(e) based on the field observations required pursuant to Provision D.2.a.(2)(b)(ii).

(iv) Each Copermittee must evaluate field observations together with existing information available from prior reports, inspections and monitoring results to determine whether any observed flowing, pooled, or ponded waters are likely to be transient or persistent flow.[19]

(c) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Records

Based upon the results of the transitional dry weather MS4 outfall discharge field screening monitoring conducted pursuant to Provisions D.2.a.(2)(a)-(b), each Copermittee must update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow.

(3) <u>Transitional Wet Weather MS4 Outfall Discharge Monitoring</u>

Until the monitoring requirements and schedules of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the

[19] Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(a) Transitional Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees must select wet weather MS4 outfall discharge monitoring stations from the inventories developed pursuant to Provision D.2.a.(1) for each Watershed Management Area as follows:

(i) At least five wet weather MS4 outfall discharge monitoring stations that are representative of storm water discharges from areas consisting primarily of residential, commercial, industrial, and typical mixed-use land uses present within the Watershed Management Area;

(ii) At least one wet weather MS4 outfall discharge monitoring station for each Copermittee within the Watershed Management Area; and

(iii) The County of San Diego may select at least two (2) wet weather MS4 outfall discharge monitoring stations for the portion of the Santa Margarita River Watershed Management Area within its jurisdiction to be monitored during the transitional period until the Riverside County Copermittees are notified of coverage under this Order. After the Riverside County Copermittees are notified of coverage under this Order, the Copermittees in the Watershed Management Area must select wet weather MS4 outfall discharge monitoring stations consistent with the requirements above.

(b) Transitional Wet Weather MS4 Outfall Discharge Monitoring Frequency

Each wet weather MS4 outfall discharge monitoring station selected pursuant to Provision D.2.a.(3)(a) must be monitored once during the wet season (October 1 – April 30). The wet weather monitoring events must be selected to be representative of the range of hydrological conditions experienced in the region. At least 10 percent of samples must be conducted during the first wet weather event of the wet season, to include at least one such sample in each Watershed Management Area..

(c) Transitional Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(i) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the

storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(ii) The flow rates and volumes measured or estimated from the MS4 outfall (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(d) Transitional Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(e) Transitional Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, and indicator bacteria;

(iv) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

[a] Time-weighted composites collected over the length of the storm event or the first 24 hour period whichever is shorter, composed of discrete samples, which may be collected through the use of automated equipment, or

[b] Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

[c] If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours;

(v) Only one analysis of the composite of aliquots is required;

(vi) The samples must be analyzed for the following constituents:

[a] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

[b] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and

[c] Constituents listed in Table D-6.

Table D-6. Analytical Monitoring Constituents for Wet Weather MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Nickel • Selenium • Thallium • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(f) Other Transitional Wet Weather MS4 Outfall Discharge Monitoring

The San Diego County Copermittees must continue the wet weather MS4 outfall monitoring program developed under Order No. R9-2007-0001, as approved by the San Diego Water Board, through its planned completion.

b. DRY WEATHER MS4 OUTFALL DISCHARGE MONITORING

Each Copermittee must perform dry weather MS4 outfall monitoring to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. Each Copermittee must conduct the following dry weather MS4 outfall discharge monitoring within its jurisdiction:

(1) Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Each Copermittee must continue to perform the dry weather MS4 outfall discharge field screening monitoring in accordance with the requirements of Provision D.2.a.(2). The Copermittee may adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of persistent flow non-storm water discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of visual inspections performed is equivalent to the number of visual inspections required under Provision D.2.a.(2)(a).

(2) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring

Each Copermittee must perform non-storm water persistent flow MS4 outfall discharge monitoring to determine which persistent non-storm water discharges contain concentrations of pollutants below NALs, and which persistent non-storm water discharges impact receiving water quality during dry weather. Each Copermittee must conduct the following non-storm water persistent flow MS4 outfall discharge monitoring within its jurisdiction:

(a) Prioritization of Non-Storm Water Persistent Flow MS4 Outfalls

Based upon the dry weather MS4 outfall discharge field screening monitoring records developed pursuant to Provision D.2.a.(2)(c), each Copermittee must identify and prioritize the MS4 outfalls with persistent flows based on the highest priority water quality conditions identified in the Water Quality Improvement Plan and any additional criteria developed by the Copermittee, which may include historical data and data from sources other than what the Copermittee collects.

(b) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring Frequency

(i) Based on the prioritization of major MS4 outfalls developed under Provision D.2.b.(2)(a), each Copermittee must identify, at a minimum, the 5 highest priority major MS4 outfalls with non-storm water persistent flows that the Copermittee will monitor within its jurisdiction in each Watershed Management Area. For Responsible Copermittees identified by a TMDL in Attachment E to this Order, if the 5 chosen outfall locations are not sufficient to determine compliance with the TMDL(s), then each Responsible Copermittee must identify additional MS4 outfall monitoring locations within its jurisdiction sufficient to address compliance with the TMDL(s). If a Copermittee has less than 5 major outfalls within a Watershed

Management Area, then the Copermittee must monitor all of its major MS4 outfalls with persistent flows within each Watershed Management Area. The location of the highest priority non-storm water persistent flow MS4 outfall monitoring stations must be identified on the map required pursuant to Provision E.2.b.(1). The map must specify which MS4 outfalls are being monitored for compliance with a TMDL.

(ii) Each of the highest priority non-storm water persistent flow MS4 outfall monitoring stations identified pursuant to Provision D.2.b.(2)(b)(i) must be monitored under dry weather conditions at least semi-annually until one of the following occurs:

[a] The non-storm water discharges have been effectively eliminated (i.e. no flowing, pooled, or ponded water) for three consecutive dry weather monitoring events; or

[b] The source(s) of the persistent flows has been identified as a category of non-storm water discharges that does not require an NPDES permit and does not have to be addressed as an illicit discharge because it was not identified as a source of pollutants (i.e. constituents in non-storm water discharge do not exceed NALs), and the persistent flow can be re-prioritized to a lower priority; or

[c] The constituents in the persistent flow non-storm water discharge do not exceed NALs, and the persistent flow can be re-prioritized to a lower priority; or

[d] The source(s) of the persistent flows has been identified as a non-storm water discharge authorized by a separate NPDES permit.

(iii) Where the criteria under Provision D.2.b.(2)(b)(ii) are not met, but the threat to water quality has been reduced by the Copermittee, the highest priority persistent flow MS4 outfall monitoring stations may be reprioritized accordingly for continued dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1).

(iv) Each Copermittee must document removal or re-prioritization of the highest priority persistent flow MS4 outfall monitoring stations identified under Provision D.2.b.(2)(a) in the Water Quality Improvement Plan Annual Report. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized major MS4 outfall in the Watershed Management Area within its jurisdiction, unless there are no remaining qualifying major MS4 outfalls within the Copermittee's jurisdiction in the Watershed Management Area.

(c) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Observations

During each semi-annual monitoring event, each Copermittee must record field observations consistent with Table D-5 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(d) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Monitoring

During each semi-annual monitoring event, if conditions allow the collection of the data, each Copermittee must monitor and record the parameters in Table D-2 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(e) Non-Storm Water Persistent Flow MS4 Outfall Discharge Analytical Monitoring

During each semi-annual monitoring event in which measurable flow is present, each Copermittee must collect and analyze samples from each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Collect grab or composite samples to be analyzed at a qualified laboratory for the following constituents:

[a] Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,
[b] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,
[c] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,
[d] Applicable NAL constituents, and
[e] Constituents listed in Table D-7. The Copermittees may adjust the list of constituents for the Watershed Management Area if historical data or supporting information can be provided that demonstrates or justifies the analysis of a constituent is not necessary.

Table D-7. Analytical Monitoring Constituents for Persistent Flow MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Total Hardness • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Cadmium • Copper • Lead • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(iv) If the Copermittee identifies and eliminates the source of the persistent flow non-storm water discharge, analysis of the sample is not required.

c. WET WEATHER MS4 OUTFALL DISCHARGE MONITORING

The Copermittees must perform wet weather MS4 outfall monitoring to identify pollutants in storm water discharges from the MS4s, to guide pollutant source identification efforts, and to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order. The Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(1) Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees may adjust the wet weather MS4 outfall discharge monitoring locations in the Watershed Management Area, as needed, to identify pollutants in storm water discharges from MS4s, to guide pollutant source identification efforts, and to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of stations is at least equivalent to the number of stations required under Provision D.2.a.(3)(a). Additional outfall monitoring locations, above the minimum per jurisdiction, may be required to demonstrate compliance with the WQBELs associated with the applicable TMDLs in Attachment E.

(2) Wet Weather MS4 Outfall Discharge Monitoring Frequency

The Copermittees must monitor the wet weather MS4 outfall discharge monitoring stations in the Watershed Management Area at least once (1) per year. The Copermittees may need to increase the frequency of monitoring in order to identify pollutants in storm water discharges from the MS4s causing or contributing to the highest priority water quality conditions, to guide pollutant source identification efforts, or to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order.

(3) Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(4) Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(5) Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites collected over the length of the storm event or the first 24 hour period, whichever is shorter , composed of discrete samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

(iii) If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours.

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) The Copermittees may adjust the analytical monitoring required for the Watershed Management Area, if the Copermittees have historical data or supporting information that can demonstrate or provide justification that the analysis of a constituent is not necessary.

3. Special Studies

a. Within the term of this Order, the Copermittees must initiate the following special studies:

(1) At least two special studies in each Watershed Management Area to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that cause or contribute to highest priority water quality conditions identified in the Water Quality Improvement Plan.

(2) At least one special study for the San Diego Region to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that are impacting receiving waters on a regional basis in the San Diego Region.

(3) One of the two special studies in each Watershed Management Area required pursuant to Provision D.3.a.(1) may be replaced by a special study implemented pursuant to Provision D.3.a.(2).

b. The special studies must, at a minimum, be in conformance with the following criteria:

(1) The special studies must be related to the highest priority water quality conditions identified by the Copermittees in the Watershed Management Area and/or for the entire San Diego Region;

(2) The special studies developed pursuant to Provision D.3.a.(1) must:

(a) Be implemented within the applicable Watershed Management Area, and

(b) Require some form of participation by all the Copermittees within the Watershed Management Area;

(3) The special studies developed pursuant to Provision D.3.a.(2) must:

(a) Be implemented within the San Diego Region, and

(b) Require some form of participation by all Copermittees covered under the requirements of this Order.

(4) The Copermittees are encouraged to partner with environmental groups or third parties knowledgeable of watershed conditions to complete the required special studies.

c. Special studies developed to identify sources of pollutants and/or stressors should be pollutant and/or stressor specific and based on historical monitoring data and monitoring performed pursuant to Provisions D.1 and D.2. Development of source identification special studies should include the following:

(1) A compilation of known information on the specific pollutant and/or stressor, including data on potential sources and movement of the pollutant and/or stressor within the watershed. Data generated by the Copermittees and others, as well as information available from a literature research on the pollutant and/or stressor should be compiled and analyzed as appropriate.

(2) An identification of data gaps, based on the compiled information generated on the specific pollutant and/or stressor identified in Provision D.3.c.(1). Source identification special studies should be developed to fill identified data gaps.

(3) A monitoring plan that will collect and provide data the Copermittees can utilize to do the following:

(a) Quantify the relative loading or impact of a pollutant and/or stressor from a particular source or pollutant generating activity;

(b) Improve understanding of the fate of a pollutant and/or stressor in the environment;

(c) Develop an inventory of known and suspected sources of a pollutant and/or stressor in the Watershed Management Area; and/or

(d) Prioritize known and suspected sources of a pollutant and/or stressor based on relative magnitude in discharges, geographical distribution (i.e., regional or localized), frequency of occurrence in discharges, human health risk, and controllability.

d. Special studies initiated prior to the effective date of this Order that meet the requirements of Provision D.3.b and are implemented during the term of this Order as part of the Water Quality Improvement Plan may be utilized to fulfill the special study requirements of Provision D.3.a. Special studies completed before the effective date of this Order cannot be utilized to fulfill the special study requirements of Provision D.3.a.

e. The Copermittees must submit the monitoring plans for the special studies in the Water Quality Improvement Plans required pursuant to Provision F.1.

f. The Copermittees are encouraged to share the results of the special studies regionally among the Copermittees to provide information useful in improving and adapting the management of non-storm water and storm water runoff through the implementation of the Water Quality Improvement Plans.

4. Assessment Requirements

Each Copermittee must evaluate the data collected pursuant to Provisions D.1, D.2 and D.3, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E, to assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a. Assessments must be performed as described in the following provisions:

a. Receiving Waters Assessments

(1) The Copermittees must assess and report the conditions of the receiving waters in the Watershed Management Area as follows:

(a) Based on data collected pursuant to Provision D.1.a, the assessments under Provision D.4.a.(2) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(b) Based on the data collected pursuant to Provisions D.1.a-e, the assessments required under Provision D.4.a.(2) must be included in the Report of Waste Discharge required pursuant to Provision F.5.b.

(2) The Copermittees must assess the status and trends of receiving water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under dry weather and wet weather conditions. For each of the three types of receiving waters in each Watershed Management Area the Copermittees must:

(a) Determine whether or not the conditions of the receiving waters are meeting the numeric goals established pursuant to Provision B.3.a;

(b) Identify the most critical beneficial uses that must be protected to ensure overall health of the receiving water;

(c) Determine whether or not those critical beneficial uses are being protected;

(d) Identify short-term and/or long-term improvements or degradation of those critical beneficial uses;

(e) Determine whether or not the strategies established in the Water Quality Improvement Plan contribute towards progress in achieving the interim and final numeric goals of the Water Quality Improvement Plan; and

(f) Identify data gaps in the monitoring data necessary to assess Provisions D.4.a.(2)(a)-(e).

b. MS4 OUTFALL DISCHARGES ASSESSMENTS

(1) Non-Storm Water Discharges Reduction Assessments

(a) Each Copermittee must assess and report the progress of its illicit discharge detection and elimination program, required to be implemented pursuant to Provision E.2, toward effectively prohibiting non-storm water and illicit discharges into the MS4 within its jurisdiction as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(2), the assessments under Provision D.4.b.(1)(b) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(ii) Based on the data collected pursuant to Provisions D.2.b, the assessments required under Provision D.4.b.(1)(c) must be included in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

(iii) Based on the data collected pursuant to Provisions D.2.b, the assessment required under Provision D.4.b.(1)(c) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.a.(2), each Copermittee must assess and report the following:

(i) Identify the known and suspected controllable sources (e.g. facilities, areas, land uses, pollutant generating activities) of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area;

(ii) Identify sources of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area that have been reduced or eliminated; and

(iii) Identify modifications to the field screening monitoring locations and frequencies for the MS4 outfalls in its inventory necessary to identify and eliminate sources of persistent flow non-storm water discharges pursuant to Provision D.2.b.

(c) Based on the dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1), each Copermittee must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(1)(b);

(ii) Based on the data collected and applicable NALs in the Water Quality Improvement Plan, rank the MS4 outfalls in the Copermittee's jurisdiction according to potential threat to receiving water quality, and produce a prioritized list of major MS4 outfalls for follow-up action to update the Water Quality Improvement Plan, with the goal of eliminating persistent flow non-storm water discharges and/or pollutant loads in order of the ranked priority list through targeted programmatic actions and source investigations;

(iii) For the highest priority major MS4 outfalls with persistent flows that are in exceedance of NALs, identify the known and suspected sources within the Copermittee's jurisdiction in the Watershed Management Area that may cause or contribute to the NAL exceedances;

(iv) Each Copermittee must analyze the data collected pursuant to Provision D.2.b, and utilize a model or other method, to calculate or estimate the non-storm water volumes and pollutant loads collectively discharged from all the major MS4s outfalls in its jurisdiction identified as having persistent dry weather flows during the monitoring year. These calculations or estimates must be updated annually.

[a] Each Copermittee must calculate or estimate the annual non-storm water volumes and pollutant loads collectively discharged from the Copermittee's major MS4 outfalls to receiving waters within the Copermittee's jurisdiction, with an estimate of the percent contribution from each known source for each MS4 outfall;

[b] Each Copermittee must annually identify and quantify (i.e. volume and pollutant loads) sources of non-storm water not subject to the Copermittee's legal authority that are discharged from the Copermittee's major MS4 outfalls to downstream receiving waters.

(v) Each Copermittee must review the data collected pursuant to Provision D.2.b and findings from the assessments required pursuant to Provision D.4.b.(1)(c)(i)-(iv) at least once during the term of this Order to:

[a] Identify reductions and progress in achieving reductions in non-storm water and illicit discharges to the Copermittee's MS4 in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction, with an estimate, if possible, of the non-storm water volume and/or pollutant load reductions attributable to specific water quality strategies implemented by the Copermittee; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittee in the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction.

(vi) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(1)(c)(i)-(v).

(2) <u>Storm Water Pollutant Discharges Reduction Assessments</u>

(a) The Copermittees must assess and report the progress of the water quality improvement strategies, required to be implemented pursuant to Provisions B and E, toward reducing pollutants in storm water discharges from the MS4s within the Watershed Management Area as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(3), the assessments under Provision D.4.b.(2)(b) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(ii) Based on the data collected pursuant to Provisions D.2.c, the assessments required under Provision D.4.b.(2)(c) must be included in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

(iii) Based on the data collected pursuant to Provisions D.2.c, the assessment required under Provisions D.4.b.(2)(c)-(d) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.a.(3) the Copermittees must assess and report the following:

(i) The Copermittees must analyze the monitoring data collected pursuant to Provision D.2.a.(3), and utilize a watershed model or other method, to calculate or estimate the following for each monitoring year:

[a] The average storm water runoff coefficient for each land use type within the Watershed Management Area;
[b] The volume of storm water and pollutant loads discharged from each of the Copermittee's monitored MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch;
[c] The total flow volume and pollutant loadings discharged from the Copermittee's jurisdiction within the Watershed Management Area over the course of the wet season, extrapolated from the data produced from the monitored MS4 outfalls; and
[d] The percent contribution of storm water volumes and pollutant loads discharged from each land use type within each hydrologic subarea with a major MS4 outfall to receiving waters or within each major MS4 outfall to receiving waters in the Copermittee's jurisdiction within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch.

(ii) Identify modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify pollutants in storm water discharges from the MS4s in the Watershed Management Area pursuant to Provision D.2.c.(1).

(c) Based on the wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.c the Copermittees must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(2)(b);

(ii) Based on the data collected and applicable SALs in the Water Quality Improvement Plan, analyze and compare the monitoring data to the analyses and assumptions used to develop the Water Quality Improvement Plans, including strategies developed pursuant to Provision B.3, and evaluate whether those analyses and assumptions should be updated as a component of the adaptive management efforts pursuant to Provision B.5 for follow-up action to update the Water Quality Improvement Plan;

(iii) The Copermittees must review the data collected pursuant to Provision D.2.c and findings from the assessments required pursuant to Provisions D.4.b.(2)(c)(i)-(ii) at least once during the term of this Order to:

[a] Identify reductions or progress in achieving reductions in pollutant concentrations and/or pollutant loads from different land uses and/or drainage areas discharging from the Copermittees' MS4s in the Watershed Management Area;
[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed

Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters within the Watershed Management Area to the MEP, with an estimate, if possible, of the pollutant load reductions attributable to specific water quality strategies implemented by the Copermittees; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittees in the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters in the Watershed Management Area to the MEP.

(iv) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(iii).

(d) The Copermittees must evaluate all the data collected pursuant to Provision D.2.c, and incorporate new outfall monitoring data into time series plots for each long-term monitoring constituent for the Watershed Management Area, and perform statistical trends analysis on the cumulative long-term wet weather MS4 outfall discharge water quality data set.

c. Special Studies Assessments

The Copermittees must annually evaluate the results and findings from the special studies developed and implemented pursuant to Provision D.3, and assess their relevance to the Copermittees' efforts to characterize receiving water conditions, understand sources of pollutants and/or stressors, and control and reduce the discharges of pollutants from the MS4 outfalls to receiving waters in the Watershed Management Area. The Copermittees must report the results of the special studies assessments applicable to the Watershed Management Area, and identify any necessary modifications or updates to the Water Quality Improvement Plan based on the results in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

d. Integrated Assessment of Water Quality Improvement Plan

As part of the iterative approach and adaptive management process required for the Water Quality Improvement Plan pursuant to Provision B.5, the Copermittees in each Watershed Management Area must integrate the data collected pursuant to Provisions D.1-D.3, the findings from the assessments required pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to assess the effectiveness of, and identify necessary modifications to, the Water Quality Improvement Plan as follows:

(1) The Copermittees must re-evaluate the priority water quality conditions and

numeric goals for the Watershed Management Area, as needed, during the term of this Order pursuant to Provision B.5.a. The re-evaluation and recommendations for modifications to the priority water quality conditions, and/or numeric goals and corresponding schedules may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The priority water quality conditions and numeric goals for the Watershed Management Area must be re-evaluated as follows:

(a) Re-evaluate the receiving water conditions in the Watershed Management Area in accordance with Provision B.2.a;

(b) Re-evaluate the impacts on receiving waters in the Watershed Management Area from MS4 discharges in accordance with Provision B.2.b;

(c) Re-evaluate the identification of MS4 sources of pollutants and/or stressors in accordance with Provision B.2.d;

(d) Identify beneficial uses of the receiving waters that are protected in accordance with Provision D.4.a;

(e) Evaluate the progress toward achieving the interim and final numeric goals for protecting impacted beneficial uses in the receiving waters.

(2) The Copermittees must re-evaluate the water quality improvement strategies for the Watershed Management Area during the term of this Order pursuant to Provision B.5.b. The re-evaluation and recommendations for modifications to the water quality improvement strategies and schedules may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The water quality improvement strategies for the Watershed Management Area must be re-evaluated as follows:

(a) Identify the non-storm water and storm water pollutant loads from the Copermittees' MS4 outfalls in the Watershed Management Area, calculated or estimated pursuant to Provisions D.4.b;

(b) Identify the non-storm water and storm water pollutant load reductions, or other improvements to receiving water or water quality conditions, that are necessary to attain the interim and final numeric goals identified in the Water Quality Improvement Plan for protecting beneficial uses in the receiving waters;

(c) Identify the non-storm water and storm water pollutant load reductions, or other improvements to the quality of MS4 discharges, that are necessary

for the Copermittees to demonstrate that non-storm water and storm water discharges from their MS4s are not causing or contributing to exceedances of receiving water limitations;

(d) Evaluate the progress of the water quality improvement strategies toward achieving the interim and final numeric goals identified in the Water Quality Improvement Plan for protecting beneficial uses in the receiving waters.

(3) The Copermittees must re-evaluate and adapt the water quality monitoring and assessment program for the Watershed Management Area when new information becomes available to improve the monitoring and assessment program pursuant to Provision B.5.c. The re-evaluation and recommendations for modifications to the monitoring and assessment program may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. Modifications to the water quality monitoring and assessment program must be consistent with the requirements of Provision D.1-D.3. The re-evaluation of the water quality monitoring and assessment program for the Watershed Management Area must consider the data gaps identified by the assessments required pursuant to Provisions D.4.a-b, and results of the special studies implemented pursuant to Provision D.4.c.

5. Monitoring Provisions

Each Copermittee must comply with all the monitoring, reporting, and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

E. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS

The purpose of this provision is for each Copermittee to implement a program to control the contribution of pollutants to and the discharges from the MS4 within its jurisdiction. The goal of the jurisdictional runoff management programs is to implement strategies that effectively prohibit non-storm water discharges to the MS4 and reduce the discharge of pollutants in storm water to the MEP. This goal will be accomplished through implementing the jurisdictional runoff management programs in accordance with the strategies identified in the Water Quality Improvement Plans.

Each Copermittee must update its jurisdictional runoff management program document, in accordance with Provision F.2.a, to incorporate all the requirements of Provision E. Until the Copermittee has updated its jurisdictional runoff management program document with the requirements of Provision E, the Copermittee must continue implementing its current jurisdictional runoff management program.

1. Legal Authority Establishment and Enforcement

a. Each Copermittee must establish, maintain, and enforce adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 through statute, ordinance, permit, contract, order, or similar means. This legal authority must, at a minimum, authorize the Copermittee to:

(1) Prohibit and eliminate all illicit discharges and illicit connections to its MS4;

(2) Control the contribution of pollutants in discharges of runoff associated with industrial and construction activity to its MS4 and control the quality of runoff from industrial and construction sites, including industrial and construction sites which have coverage under the statewide General Permit for Discharges of Storm Water Associated with Industrial Activities (Industrial General Permit) or General Permit for Discharges of Storm Water Associated with Construction Activities (Construction General Permit), as well as to those sites which do not;

(3) Control the discharge of spills, dumping, or disposal of materials other than storm water into its MS4;

(4) Control through interagency agreements among Copermittees the contribution of pollutants from one portion of the MS4 to another portion of the MS4;

(5) Control, by coordinating and cooperating with other owners of the MS4 such as Caltrans, the U.S. federal government, or sovereign Native American Tribes through interagency agreements, where possible, the contribution of pollutants from their portion of the MS4 to the portion of the MS4 within the Copermittee's jurisdiction;

(6) Require compliance with conditions in its statutes, ordinances, permits, contracts, orders, or similar means to hold dischargers to its MS4 accountable for their contributions of pollutants and flows;

(7) Require the use of BMPs to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(8) Require documentation on the effectiveness of BMPs implemented to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(9) Utilize enforcement mechanisms to require compliance with its statutes, ordinances, permits, contracts, orders, or similar means; and

(10) Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with its statutes, ordinances, permits, contracts, orders, or similar means and with the requirements of this Order, including the prohibition of illicit discharges and connections to its MS4; the Copermittee must also have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from industrial facilities, including construction sites, discharging into its MS4.

b. With the first Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3), each Copermittee must submit a statement certified by its Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative that the Copermittee has taken the necessary steps to obtain and maintain full legal authority within its jurisdiction to implement and enforce each of the requirements contained in this Order.

2. Illicit Discharge Detection and Elimination

Each Copermittee must implement a program to actively detect and eliminate illicit discharges and improper disposal into the MS4, or otherwise require the discharger to apply for and obtain a separate NPDES permit. The illicit discharge detection and elimination program must be implemented in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include, at a minimum, the following requirements:

a. NON-STORM WATER DISCHARGES

Each Copermittee must address all non-storm water discharges as illicit discharges unless a non-storm water discharge is either identified as a discharge authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to the following requirements:

(1) Discharges of non-storm water to the MS4 from the following categories must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG919001 (Order No. R9-2007-0034, or subsequent order) for discharges to San Diego Bay, or NPDES Permit No. CAG919002 (Order No. R9-2008-0002, or subsequent order) for discharges to surface waters other than San Diego Bay:

(1) Uncontaminated pumped ground water;

(2) Discharges from foundation drains;[20]

(3) Water from crawl space pumps; and

(4) Water from footing drains.[20]

(2) Discharges of non-storm water from water line flushing and water main breaks to the MS4 must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG 679001 (Order No. R9-2010-0003 or subsequent order). This category includes water line flushing and water main break discharges from water purveyors issued a water supply permit by the California Department of Public Health or federal military installations. Discharges from recycled or reclaimed water lines to the MS4 must be addressed as illicit discharges, unless the discharges have coverage under a separate NPDES permit.

(3) Discharges of non-storm water to the MS4 from the following categories must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a source of pollutants to receiving waters:

(a) Diverted stream flows;

(b) Rising ground waters;

(c) Uncontaminated ground water infiltration to MS4s;

(d) Springs;

(e) Flows from riparian habitats and wetlands;

(f) Discharges from potable water sources;

[20] Provision E.2.a.(1) only applies to this category of non-storm water if the system is designed to be located at or below the groundwater table to actively or passively extract groundwater during any part of the year.

(g) Discharges from foundation drains;[21] and

(h) Discharges from footing drains.[21]

(4) Discharges of non-storm water to the MS4 from the following categories must be controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means. Discharges of non-storm water to the MS4 from the following categories not controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means must be addressed by the Copermittee as illicit discharges.

(a) Air conditioning condensation

The discharge of air conditioning condensation should be directed to landscaped areas or other pervious surfaces, or to the sanitary sewer, where feasible.

(b) Individual residential vehicle washing

(i) The discharge of wash water should be directed to landscaped areas or other pervious surfaces where feasible; and

(ii) The minimization of water, washing detergent and other vehicle wash products used for residential vehicle washing, and the implementation of other practices or behaviors that will prevent the discharge of pollutants associated with individual residential vehicle washing from entering the MS4 must be encouraged.

(c) Dechlorinated swimming pool discharges

(i) Residual chlorine, algaecide, filter backwash, or other pollutants from swimming pools must be eliminated prior to discharging to the MS4; and

(ii) The discharge of saline swimming pool water must be directed to the sanitary sewer, landscaped areas, or other pervious surfaces that can accommodate the volume of water, unless the saline swimming pool water can be discharged via a pipe or concrete channel directly to a naturally saline water body (e.g. Pacific Ocean).

(5) Firefighting discharges to the MS4 must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a significant source of pollutants to receiving waters. Firefighting discharges to the MS4 not identified as a significant source of pollutants to receiving waters, must be addressed, at a minimum, as follows:

[21] Provision E.2.a.(3) only applies to this category of non-storm water discharge if the system is designed to be located above the groundwater table at all times of the year, and the system is only expected to discharge non-storm water under unusual circumstances.

(a) Non-emergency firefighting discharges

(i) Building fire suppression system maintenance discharges (e.g. sprinkler line flushing) to the MS4 must be addressed as illicit discharges unless BMPs are implemented to prevent pollutants associated with such discharges to the MS4.

(ii) Non-emergency firefighting discharges (i.e., discharges from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems) must be addressed by a program, to be developed and implemented by the Copermittee, to reduce or eliminate pollutants in such discharges from entering the MS4.

(b) Emergency firefighting discharges

Each Copermittee should develop and encourage implementation of BMPs to reduce or eliminate pollutants in emergency firefighting discharges to the MS4s and receiving waters within its jurisdiction. During emergency situations, priority of efforts should be directed toward life, property, and the environment (in descending order). BMPs should not interfere with immediate emergency response operations or impact public health and safety.

(6) If the Copermittee or San Diego Water Board identifies any category of non-storm water discharges listed under Provisions E.2.a.(1)-(4) as a source of pollutants to receiving waters, the category must be prohibited through ordinance, order, or similar means and addressed as an illicit discharge. Alternatively, the Copermittee may propose controls to be implemented for the category of non-storm water discharges as part of the Water Quality Improvement Plan instead of prohibiting the category of non-storm water discharges, and implement the controls if accepted by the San Diego Water Board as part of the Water Quality Improvement Plan.

(7) Each Copermittee must, where feasible and priorities and resources allow, reduce or eliminate non-storm water discharges listed under Provisions E.2.a.(1)-(4) into its MS4, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit.

b. PREVENT AND DETECT ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to prevent and detect illicit discharges to the MS4:

(1) Each Copermittee must maintain an updated map of its entire MS4 and the corresponding drainage areas. The accuracy of the MS4 map must be confirmed during the field screening required pursuant to Provision E.2.c.

The MS4 map must be included as part of the jurisdictional runoff management program document. Any geographic information system (GIS) layers or files used by the Copermittee to maintain the MS4 map must be made available to the San Diego Water Board upon request. The MS4 map must identify the following:

(a) All segments of the MS4 owned, operated, and maintained by the Copermittee;

(b) All known locations of inlets that discharge and/or collect runoff into the Copermittee's MS4;

(c) All known locations of connections with other MS4s not owned or operated by the Copermittee (e.g. Caltrans MS4s);

(d) All known locations of MS4 outfalls and private outfalls that discharge runoff collected from areas within the Copermittee's jurisdiction;

(e) All segments of receiving waters within the Copermittee's jurisdiction that receive and convey runoff discharged from the Copermittee's MS4 outfalls;

(f) Locations of the MS4 outfalls, identified pursuant to Provision D.2.a.(1), within its jurisdiction; and

(g) Locations of the non-storm water persistent flow MS4 outfall discharge monitoring stations, identified pursuant to Provision D.2.b.(2), within its jurisdiction.

(2) Each Copermittee must use Copermittee personnel and contractors to assist in identifying and reporting illicit discharges and connections during their daily employment activities.

(3) Each Copermittee must promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges to or from the MS4, including the following methods for public reporting:

(a) Operate a public hotline, which can be Copermittee-specific or shared by the Copermittees, and must be capable of receiving reports in both English and Spanish 24 hours per day and seven days per week; and

(b) Designate an e-mail address for receiving electronic reports from the public, which can be Copermittee-specific or shared by the Copermittees, and must be prominently displayed on the Copermittee's webpage and the Regional Clearinghouse required pursuant to Provision F.4.

(4) Each Copermittee must implement practices and procedures (including a notification mechanism) to prevent, respond to, contain, and clean up any spills that may discharge into the MS4 within its jurisdiction from any source. The Copermittee must coordinate, to the extent possible, with spill response teams to prevent entry of spills into the MS4, and prevent contamination of surface water, ground water, and soil. The Copermittee must coordinate spill prevention, containment, and response activities throughout all appropriate Copermittee departments, programs, and agencies.

(5) Each Copermittee must implement practices and procedures to prevent and limit infiltration of seepage from sanitary sewers (including private laterals and failing septic systems) to the MS4.

(6) Each Copermittee must coordinate, when necessary, with upstream Copermittees and/or entities to prevent illicit discharges from upstream sources into the MS4 within its jurisdiction.

c. FIELD SCREENING

Each Copermittee must conduct field screening (i.e. visual observations, field testing, and/or analytical testing) of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4 in accordance with the dry weather MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

d. INVESTIGATE AND ELIMINATE ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to investigate and eliminate illicit discharges to the MS4:

(1) Each Copermittee must prioritize and determine when follow-up investigations will be performed in response to visual observations and/or water quality monitoring data collected during an investigation of a detected non-storm water or illicit discharge to or from the MS4. The criteria for prioritizing investigations must consider the following:

(a) Pollutants identified as causing or contributing to the highest water quality priorities identified in the Water Quality Improvement Plan;

(b) Pollutants identified as causing or contributing, or threatening to cause or contribute to impairments in water bodies on the 303(d) List and/or in environmentally sensitive areas (ESAs), located within its jurisdiction;

(c) Pollutants identified from sources or land uses known to exist within the area, drainage basin, or watershed that discharges to the portion of the MS4 within its jurisdiction included in the investigation;

(d) Pollutants identified as causing or contributing to an exceedance of a NAL in the Water Quality Improvement Plan; and

(e) Pollutants identified as a threat to human health or the environment.

(2) Each Copermittee must implement procedures to investigate and inspect portions of its MS4 that, based on reports or notifications, field screening, or other appropriate information, indicate a reasonable potential of receiving, containing, or discharging pollutants due to illicit discharges, illicit connections, or other sources of non-storm water. The procedures must include the following:

(a) Each Copermittee must develop criteria to:

(i) Assess the validity of each report or notification received; and

(ii) Prioritize the response to each report or notification received.

(b) Each Copermittee must prioritize and respond to each valid report or notification (e.g., public reports, staff or contractor reports and notifications, etc.) of an incident in a timely manner.

(c) In accordance with the requirements of Provision E.2.d.(1), each Copermittee must investigate and seek to identify the source(s) of discharges of non-storm water where flows are observed in and from the MS4 during the field screening required pursuant to Provision D.2.b.(1) as follows:

(i) Obvious illicit discharges must be immediately investigated to identify the source(s) of non-storm water discharges;

(ii) The investigation must include field investigations to identify sources or potential sources for the discharge, unless the source or potential source has already been identified during previous investigations; and

(iii) The investigation may include follow-up field investigations and/or reviewing Copermittee inventories and other land use data to identify potential sources of the discharge.

(d) Each Copermittee must maintain records and a database of the following information:

(i) Location of incident, including hydrologic subarea, portion of MS4 receiving the non-storm water or illicit discharge, and point of discharge or potential discharge from MS4 to receiving water;

(ii) Source of information initiating the investigation (e.g., public reports, staff or contractor reports and notifications, field screening, etc.);

(iii) Date the information used to initiate the investigation was received;

(iv) Date the investigation was initiated;

(v) Dates of follow-up investigations;

(vi) Identified or suspected source of the illicit discharge or connection, if determined;

(vii) Known or suspected related incidents, if any;

(viii) Result of the investigation; and

(ix) If a source cannot be identified and the investigation is not continued, document the response pursuant to the requirements of Provision E.2.d.(4).

(e) Each Copermittee must maintain records and, in accordance with the priorities of the Water Quality Improvement Plan, seek to identify the source(s) of non-storm water discharges from the MS4 where there is evidence of non-storm water having been discharged into or from the MS4 (e.g., pooled water), in accordance with MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

(3) Each Copermittee must initiate the implementation of procedures, in a timely manner, to eliminate all detected and identified illicit discharges and connections within its jurisdiction. The procedures must include the following responses:

(a) Each Copermittee must enforce its legal authority, as required under Provision E.1, to eliminate illicit discharges and connections to the MS4.

(b) If the Copermittee identifies the source as a controllable source of non-storm water or illicit discharge or connection, the Copermittee must implement its Enforcement Response Plan pursuant to Provision E.6 and enforce its legal authority to prohibit and eliminate illicit discharges and connections to its MS4.

(c) If the Copermittee identifies the source of the discharge as a category of non-storm water discharges in Provision E.2.a, and the discharge is in exceedance of NALs in the Water Quality Improvement Plan, then the Copermittee must determine if: (1) this is an isolated incident or set of circumstances that will be addressed through its Enforcement Response Plan pursuant to Provision E.6, or (2) the category of discharge must be addressed through the prohibition of that category of discharge as an illicit discharge pursuant to Provision E.2.a.(6).

(d) If the Copermittee suspects the source of the non-storm water discharge as natural in origin (i.e. non-anthropogenically influenced) and in conveyance into the MS4, then the Copermittee must document and

provide the data and evidence necessary to demonstrate to the San Diego Water Board that it is natural in origin and does not require further investigation.

(e) If the Copermittee is unable to identify and document the source of a recurring non-storm water discharge to or from the MS4, then the Copermittee must address the discharge as an illicit discharge and update its jurisdictional runoff management program to address the common and suspected sources of the non-storm water discharge within its jurisdiction in accordance with the Copermittee's priorities.

(4) Each Copermittee must submit a summary of the non-storm water discharges and illicit discharges and connections investigated and eliminated within its jurisdiction with each Water Quality Improvement Plan Annual Report required under Provision F.3.b.(3) of this Order.

3. Development Planning

Each Copermittee must use their land use and planning authorities to implement a development planning program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. BMP Requirements for All Development Projects

Each Copermittee must prescribe the following BMP requirements during the planning process (i.e. prior to project approval and issuance of local permits) for all development projects (regardless of project type or size), where local permits are issued, including unpaved roads and flood management projects:

(1) General Requirements

(a) Onsite BMPs must be located so as to remove pollutants from runoff prior to its discharge to any receiving waters, and as close to the source as possible;

(b) Structural BMPs must not be constructed within waters of the U.S.

(c) Onsite BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors (e.g. mosquitos, rodents, or flies).

(2) Source Control BMP Requirements

The following source control BMPs must be implemented at all development projects where applicable and feasible:

(a) Prevention of illicit discharges into the MS4;

(b) Storm drain system stenciling or signage;

(c) Protect outdoor material storage areas from rainfall, run-on, runoff, and wind dispersal;

(d) Protect materials stored in outdoor work areas from rainfall, run-on, runoff, and wind dispersal;

(e) Protect trash storage areas from rainfall, run-on, runoff, and wind dispersal; and

(f) Any additional BMPs determined to be necessary by the Copermittee to minimize pollutant generation at each project.

(3) Low Impact Development (LID) BMP Requirements

The following LID BMPs must be implemented at all development projects where applicable and feasible:

(a) Maintenance or restoration of natural storage reservoirs and drainage corridors (including topographic depressions, areas of permeable soils, natural swales, and ephemeral and intermittent streams);[22]

(b) Buffer zones for natural water bodies (where buffer zones are technically infeasible, require project applicant to include other buffers such as trees, access restrictions, etc.);

(c) Conservation of natural areas within the project footprint including existing trees, other vegetation, and soils;

(d) Construction of streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided public safety is not compromised;

(e) Minimization of the impervious footprint of the project;

(f) Minimization of soil compaction to landscaped areas;

(g) Disconnection of impervious surfaces through distributed pervious areas;

[22] Development projects proposing to dredge or fill materials in waters of the U.S. must obtain a CWA Section 401 Water Quality Certification. Projects proposing to dredge or fill waters of the state must obtain waste discharge requirements.

(h) Landscaped or other pervious areas designed and constructed to effectively receive and infiltrate, retain and/or treat runoff from impervious areas, prior to discharging to the MS4;

(i) Small collection strategies located at, or as close as possible to, the source (i.e. the point where storm water initially meets the ground) to minimize the transport of runoff and pollutants to the MS4 and receiving waters;

(j) Use of permeable materials for projects with low traffic areas and appropriate soil conditions;

(k) Landscaping with native or drought tolerant species; and

(l) Harvesting and using precipitation.

b. PRIORITY DEVELOPMENT PROJECTS

Priority Development Projects are land development projects that fall under the planning and building authority of the Copermittee for which the Copermittee must impose specific requirements, in addition to those described in Provision E.3.a, including the implementation of structural BMPs to meet the performance requirements described in Provision E.3.c.

(1) Definition of Priority Development Project

Priority Development Projects include the following:

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(b) Redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site on an existing site of 10,000 square feet or more of impervious surfaces). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(c) New and redevelopment projects that create 5,000 square feet or more of impervious surface (collectively over the entire project site), and support one or more of the following uses:

(i) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812).

(ii) Hillside development projects. This category includes development on any natural slope that is twenty-five percent or greater.

(iii) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce.

(iv) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

(d) New or redevelopment projects that create or replace 2,500 square feet or more of impervious surface (collectively over the entire project site), and discharging directly to an Environmentally Sensitive Area (ESA). "Discharging directly to" includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands).

(e) New development projects that support one or more of the following uses:

(i) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

(ii) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

(f) New or redevelopment projects that result in the disturbance of one or more acres of land and are expected to generate pollutants post construction.

(2) <u>Special Considerations for Redevelopment Projects</u>

The structural BMP performance requirements of Provision E.3.c are applicable to redevelopment Priority Development Projects, as defined in E.3.b.(1), as follows:

(a) Where redevelopment results in the creation or replacement of impervious surface in an amount of less than fifty percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provision E.3.c apply only to the creation or replacement of impervious surface, and not the entire development; or

(b) Where redevelopment results in the creation or replacement of impervious surface in an amount of more than fifty percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provision E.3.c apply to the entire development.

(3) Priority Development Project Exemptions

Each Copermittee has the discretion to exempt the following projects from being defined as Priority Development Projects:

(a) New or retrofit paved sidewalks, bicycle lanes, or trails that meet the following criteria:

(i) Designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas; OR

(ii) Designed and constructed to be hydraulically disconnected from paved streets or roads; OR

(iii) Designed and constructed with permeable pavements or surfaces in accordance with USEPA Green Streets guidance.[23]

(b) Retrofitting or redevelopment of existing paved alleys, streets or roads that are designed and constructed in accordance with the USEPA Green Streets guidance.[24]

c. Priority Development Project Structural BMP Performance Requirements

In addition to the BMP requirements listed for all development projects under Provision E.3.a, Priority Development Projects must also implement structural BMPs that conform to performance requirements described below.

(1) Storm Water Pollutant Control BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite structural BMPs to control pollutants in storm water that may be discharged from a project as follows:

(a) Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite the pollutants contained in the volume of storm water runoff produced from a 24-hour 85th percentile storm event (design capture volume);[25]

[23] See "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).
[24] Ibid.
[25] This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are

(i) If a Copermittee determines that implementing BMPs to retain the full design capture volume onsite for a Priority Development Project is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize biofiltration BMPs. Biofiltration BMPs must be designed to have an appropriate hydraulic loading rate to maximize storm water retention and pollutant removal, as well as to prevent erosion, scour, and channeling within the BMP,[26] and must be sized to:

[a] Treat 1.5 times the design capture volume not reliably retained onsite, OR

[b] Treat the design capture volume not reliably retained onsite with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite.

(ii) If a Copermittee determines that biofiltration is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize flow-thru treatment control BMPs to treat runoff leaving the site, AND mitigate for the design capture volume not reliably retained onsite pursuant to Provision E.3.c.(1)(b). Flow thru treatment control BMPs must be sized and designed to:

[a] Remove pollutants from storm water to the MEP;

[b] Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;

[c] Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Flow-thru treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of flow-thru treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

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encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals.

[26] As part of the Copermittee's update to its BMP Design Manual, pursuant to Provision E.3.d, the Copermittee must provide guidance for hydraulic loading rates and other biofiltration design criteria necessary to maximize storm water retention and pollutant removal.

(b) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1)(a). The Priority Development Project must mitigate for the portion of the pollutant load in the design capture volume not retained onsite if Provision E.3.c.(3) is utilized. If a Priority Development Project is allowed to utilize alternative compliance, flow-thru treatment control BMPs must be implemented to treat the portion of the design capture volume that is not reliably retained onsite. Flow-thru treatment control BMPs must be sized and designed in accordance with Provisions E.3.c.(1)(a)(ii)[a]-[c].

(2) Hydromodification Management BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite BMPs to manage hydromodification that may be caused by storm water runoff discharged from a project as follows:

(a) Post-project runoff conditions (flow rates and durations) must not exceed pre-development runoff conditions by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat downstream of Priority Development Projects).

(i) In evaluating the range of flows that results in increased potential for erosion of natural (non-hardened) channels, the lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks.

(ii) The Copermittees may use monitoring results collected pursuant to Provision D.1.a.(2) to re-define the range of flows resulting in increased potential for erosion, or degraded instream habitat conditions, as warranted by the data.

(b) Each Priority Development Project must avoid critical sediment yield areas known to the Copermittee or identified by the optional Watershed Management Area Analysis pursuant to Provision B.3.b.(4), or implement measures that allow critical coarse sediment to be discharged to receiving waters, such that there is no net impact to the receiving water.

(c) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the performance requirements of Provision E.3.c.(2)(a). The Priority Development Project must mitigate for the post-project runoff conditions not fully managed onsite if Provision E.3.c.(3) is utilized.

(d) Exemptions

Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provisions E.3.c.(2) where the project discharges storm water runoff to:

(i) Existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;

(ii) Conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; or

(iii) An area identified by the Copermittees as appropriate for an exemption by the optional Watershed Management Area Analysis incorporated into the Water Quality Improvement Plan pursuant to Provision B.3.b.(4).

(e) Interim Timeframe Exemptions

Until the Copermittees have updated their BMP Design Manual in accordance with Provision F.2.b with the requirements of Provision E, the Copermittees have the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provision E.3.c.(2) where the project discharges storm water runoff directly to:

(i) An engineered channel conveyance system with a capacity to convey peak flows generated by the 10-year storm event all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; and

(ii) Large river reaches with a drainage area larger than 100 square miles and a 100-year flow capacity in excess of 20,000 cubic feet per second, provided that properly sized energy dissipation is included at all Priority Development Project discharge points.

(3) <u>Alternative Compliance Program to Onsite Structural BMP Implementation</u>

At the discretion of each Copermittee, Priority Development Projects may be allowed to participate in an alternative compliance program in lieu of implementing the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a), provided that the Water Quality Improvement Plan includes the optional Watershed Management Area Analysis described in Provision B.3.b.(4), and Water Quality Equivalency

calculations have been accepted by the San Diego Water Board's Executive Officer pursuant to Provision E.3.c.(3)(a). The alternative compliance program is available to a Priority Development Project only if the Priority Development Project applicant enters into a voluntary agreement with the Copermittee authorizing this arrangement. In addition to the voluntary agreement, relief from implementing structural BMPs onsite may be authorized by the Copermittee under the following conditions:

(a) Water Quality Equivalency

Copermittees must submit Water Quality Equivalency calculations for acceptance by the San Diego Water Board's Executive Officer prior to administering an alternative compliance program in order to establish a regional and technical basis for determining the water quality benefits associated with alternative compliance projects. Accepted Water Quality Equivalency calculations must be incorporated as part of any Copermittee's alternative compliance program necessary for evaluating Watershed Management Area Analysis candidate projects, project applicant-proposed alternative compliance projects, alternative compliance in lieu fee structures, and alternative compliance water quality credit systems as described in Provisions E.3.c.(3)(b)-(e).

(b) Watershed Management Area Analysis Candidate Projects

The Priority Development Project applicant agrees to fund, contribute funds to, or implement a candidate project identified by the Copermittees in the Watershed Management Area Analysis included in the Water Quality Improvement Plan, pursuant to Provisions B.3.b.(4) subject to the following conditions:

(i) The Copermittee must determine that implementation of the candidate project will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a) onsite;

(ii) If the Priority Development Project applicant chooses to fully or partially fund a candidate project, then the in-lieu fee structure described in Provision E.3.c.(3)(c) must be followed;

(iii) If the Priority Development Project applicant chooses to fully or partially fund a candidate project, then the Copermittee must ensure that the funds to be obtained from the Priority Development Project applicant are sufficient to mitigate for impacts caused by not fully implementing structural BMPs onsite, pursuant to the performance requirements described in Provisions E.3.c.(1) and E.3.c.(2)(a);

(iv) If the Priority Development Project applicant chooses to implement a candidate project, then the Copermittee must ensure that pollutant

control and/or hydromodification management within the candidate project are sufficient to mitigate for impacts caused by not implementing structural BMPs fully onsite, pursuant to the performance requirements described in Provisions E.3.c.(1) and E.3.c.(2)(a);

(v) The voluntary agreement to fund, partially fund, or implement a candidate project must include reliable sources of funding for operation and maintenance of the candidate project;

(vi) Design of the candidate project must be conducted under an appropriately qualified engineer, geologist, architect, landscape architect, or other professional, licenses where applicable, and competent and proficient in the fields pertinent to the candidate project design;

(vii) The candidate project must be constructed as soon as possible, but no later than 4 years after the certificate of occupancy is granted for the first Priority Development Project that contributed funds toward the construction of the candidate project, unless a longer period of time is authorized by the San Diego Water Board Executive Officer; and

(viii) If the candidate project is constructed after the Priority Development Project is constructed, the Copermittee must require temporal mitigation for pollutant loads and altered flows that are discharged from the Priority Development Project.

(c) Project Applicant Proposed Alternative Compliance Projects

The Copermittee may allow a Priority Development Project applicant to propose and fund, contribute funds to, or implement an alternative compliance project not identified by the Watershed Management Area Analysis included in the Water Quality Improvement Plan pursuant to Provisions B.3.b.(4). This option is allowed provided the Copermittee determines that implementation of the alternative compliance project will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a) onsite, and is subject to the requirements described in Provisions E.3.c.(3)(a)(ii)-(viii).

(d) Alternative Compliance In-Lieu Fee Structure

If a Copermittee chooses to allow a Priority Development Project applicant to fund, or partially fund a candidate project or an alternative compliance project, then the Copermittee must develop and implement an in-lieu fee structure. This may be developed individually or with other Copermittees and/or entities, as a means for designing, developing, constructing, operating and maintaining offsite alternative compliance projects. The in-

lieu fee must be transferred to the Copermittee (for public projects) or an escrow account (for private projects) prior to the construction of the Priority Development Project.

(e) Alternative Compliance Water Quality Credit System Option

The Copermittee may develop and implement an alternative compliance water quality credit system option, individually or with other Copermittees and/or entities, provided that such a credit system clearly exhibits that it will not allow discharges from Priority Development Projects to cause or contribute to a net impact over and above the impact caused by projects meeting the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a). Any credit system that a Copermittee chooses to implement must be submitted to the San Diego Water Board Executive Officer for review and acceptance as part of the Water Quality Improvement Plan.

(4) Long-Term Structural BMP Maintenance

Each Copermittee must require the project applicant to submit proof of the mechanism under which ongoing long-term maintenance of all structural BMPs will be conducted.

(5) Infiltration and Groundwater Protection

(a) Structural BMPs designed to primarily function as large, centralized infiltration devices (such as large infiltration trenches and infiltration basins) must not cause or contribute to an exceedance of an applicable groundwater quality objective. At a minimum, such infiltration BMPs must be in conformance with the design criteria listed below, unless the development project applicant demonstrates to the Copermittee that one or more of the specific design criteria listed below are not necessary to protect groundwater quality. The design criteria listed below do not apply to small infiltration systems dispersed throughout a development project.

(i) Runoff must undergo pretreatment such as sedimentation or filtration prior to infiltration;

(ii) Pollution prevention and source control BMPs must be implemented at a level appropriate to protect groundwater quality at sites where infiltration BMPs are to be used;

(iii) Infiltration BMPs must be adequately maintained to remove pollutants in storm water to the MEP;

(iv) The vertical distance from the base of any infiltration BMP to the seasonal high groundwater mark must be at least 10 feet. Where groundwater basins do not support beneficial uses, this vertical

distance criteria may be reduced, provided groundwater quality is maintained;

(v) The soil through which infiltration is to occur must have physical and chemical characteristics (e.g., appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses;

(vi) Infiltration BMPs must not be used for areas of industrial or light industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee, unless source control BMPs to prevent exposure of high threat activities are implemented, or runoff from such activities is first treated or filtered to remove pollutants prior to infiltration; and

(vii) Infiltration BMPs must be located a minimum of 100 feet horizontally from any water supply wells.

(b) The Copermittee may develop, individually or with other Copermittees, alternative mandatory design criteria to that listed above for infiltration BMPs which are designed to primarily function as centralized infiltration devices. Before implementing the alternative design criteria in the development planning process the Copermitee(s) must:

(i) Notify the San Diego Water Board of the intent to implement the alternative design criteria submitted; and

(ii) Comply with any conditions set by the San Diego Water Board.

d. BMP DESIGN MANUAL UPDATE

Each Copermittee must update its BMP Design Manual[27] pursuant to Provision F.2.b. Until the Copermittee has updated its BMP Design Manual with the requirements of Provisions E.3.a-c, the Copermittee must continue implementing its current BMP Design Manual. Unless directed otherwise by the San Diego Water Board, the Copermittee must implement the BMP Design Manual within 180 days of completing the update. The update of the BMP Design Manual must include the following:

(1) Updated procedures to determine the nature and extent of storm water requirements applicable to a potential development or redevelopment projects. These procedures must inform project applicants of the storm water management requirements applicable to their project including, but not limited to, general requirements for all development projects, structural BMP design procedures and requirements, hydromodification management requirements,

[27] The BMP Design Manual was formerly known as the Standard Storm Water Mitigation Plan under Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016.

requirements specific to phased projects, and procedures specific to private developments and public improvement projects;

(2) Updated procedures to identify pollutants and conditions of concern for selecting the most appropriate structural BMPs that consider, at a minimum, the following:

(a) Receiving water quality (including pollutants for which receiving waters are listed as impaired under the CWA section 303(d) List);

(b) Pollutants, stressors, and/or receiving water conditions that cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(c) Land use type of the project and pollutants associated with that land use type; and

(d) Pollutants expected to be present onsite.

(3) Updated procedures for designing structural BMPs, including any updated performance requirements to be consistent with the requirements of Provision E.3.c for all structural BMPs listed in the BMP Design Manual;

(4) Long-term maintenance criteria for each structural BMP listed in the BMP Design Manual; and

(5) Alternative compliance criteria, in accordance with the requirements under Provision E.3.c.(3), if the Copermittee elects to allow Priority Development Projects within its jurisdiction to utilize alternative compliance.

e. PRIORITY DEVELOPMENT PROJECT BMP IMPLEMENTATION AND OVERSIGHT

Each Copermittee must implement a program that requires and confirms structural BMPs on all Priority Development Projects are designed, constructed, and maintained to remove pollutants in storm water to the MEP.

(1) <u>Structural BMP Approval and Verification Process</u>

(a) Each Copermittee must require and confirm that for all Priority Development Project applications that have not received prior lawful approval by the Copermittee by the effective date of the BMP Design Manual pursuant to Provision E.3.d, the requirements of Provision E.3 must be implemented. For project applications that have received prior lawful approval before the effective date of the BMP Design Manual pursuant to Provision E.3.d, the Copermittee may allow previous land development requirements to apply.

(b) Each Copermittee must identify the roles and responsibilities of its various municipal departments in implementing the structural BMP requirements, including each stage of a project from application review and approval through BMP maintenance and inspections.

(c) Each Copermittee must require and confirm that appropriate easements and ownerships are properly recorded in public records and the information is conveyed to all appropriate parties when there is a change in project or site ownership.

(d) Each Copermittee must require and confirm that prior to occupancy and/or intended use of any portion of the Priority Development Project, each structural BMP is inspected to verify that it has been constructed and is operating in compliance with all of its specifications, plans, permits, ordinances, and the requirements of this Order.

(2) Priority Development Project Inventory and Prioritization

(a) Each Copermittee must develop, maintain, and update at least annually, a watershed-based database to track and inventory all Priority Development Projects and associated structural BMPs within its jurisdiction. Inventories must be accurate and complete beginning from December 2002 for the San Diego County Copermittees, February 2003 for the Orange County Copermittees, and July 2005 for the Riverside County Copermittees. The use of an automated database system, such as GIS, is highly recommended. The database must include, at a minimum, the following information:

(i) Priority Development Project location (address and hydrologic subarea);

(ii) Descriptions of structural BMP type(s);

(iii) Date(s) of construction;

(iv) Party responsible for structural BMP maintenance;

(v) Dates and findings of structural BMP maintenance verifications; and

(vi) Corrective actions and/or resolutions, when applicable.

(b) Each Copermittee must prioritize the Priority Development Projects with structural BMPs within its jurisdiction. The designation of Priority Development Projects as high priority must consider the following:

(i) The highest water quality priorities identified in the Water Quality Improvement Plan;

(ii) Receiving water quality;

(iii) Number and sizes of structural BMPs;

(iv) Recommended maintenance frequency of structural BMPs;

(v) Likelihood of operation and maintenance issues of structural BMPs;

(vi) Land use and expected pollutants generated; and

(vii) Compliance record.

(3) Structural BMP Maintenance Verifications and Inspections

Each Copermittee is required to verify that structural BMPs on each Priority Development Project are adequately maintained, and continue to operate effectively to remove pollutants in storm water to the MEP through inspections, self-certifications, surveys, or other equally effective approaches.

(a) All (100 percent) of the structural BMPs at Priority Development Projects that are designated as high priority must be inspected directly by the Copermittee annually prior to each rainy season;

(b) For verifications performed through a means other than direct Copermittee inspection, adequate documentation must be required by the Copermittee to provide assurance that the required maintenance of structural BMPs at each Priority Development Project has been completed; and

(c) Appropriate follow-up measures (including re-inspections, enforcement, etc.) must be conducted to ensure that structural BMPs at each Priority Development Project continue to reduce pollutants in storm water to the MEP as originally designed.

f. DEVELOPMENT PROJECT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all development projects, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

4. Construction Management

Each Copermittee must implement a construction management program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. PROJECT APPROVAL PROCESS

Prior to issuance of any local permit(s) that allows the commencement of construction projects that involve ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff, each Copermittee must:

(1) Require a pollution control plan, construction BMP plan, and/or an erosion and sediment control plan, to be submitted by the project applicant to the Copermittee;

(2) Confirm the pollution control plan, construction BMP plan, and/or erosion and sediment control plan, complies with the local grading ordinance, other applicable local ordinances, and the requirements of this Order;

(3) Confirm the pollution control, construction BMP, and/or erosion and sediment control plan, includes seasonally appropriate and effective BMPs and management measures described in Provision E.4.c, as applicable to the project; and

(4) Verify that the project applicant has obtained coverage under the statewide Construction General Permit (Order 2009-0009-DWQ or subsequent Order), if applicable.

b. CONSTRUCTION SITE INVENTORY AND TRACKING

(1) Each Copermittee must maintain and update, at least quarterly, a watershed-based inventory of all construction projects issued a local permit that allows ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff. The use of an automated database system, such as GIS, is highly recommended. The inventory must include:

(a) Relevant contact information for each site (e.g., name, address, phone, and email for the owner and contractor);

(b) The basic site information including location (address and hydrologic subarea), Waste Discharge Identification (WDID) number (if applicable), size of the site, and approximate area of disturbance;

(c) Whether or not the site is considered a high threat to water quality, as defined in Provision E.4.b.(2) below;

(d) The project start and completion dates;

(e) The required inspection frequency, as defined in the Copermittee's jurisdictional runoff management program document;

(f) The date the Copermittee accepted or approved the pollution control plan, construction BMP plan, and/or erosion and sediment control plan; and

(g) Whether or not there are ongoing enforcement actions administered to the site.

(2) Each Copermittee must identify all construction sites within its jurisdiction that represent a high threat to downstream surface water quality. The designation of construction sites as high threat to water quality must consider the following:

(a) Sites located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Sites located within the same hydrologic subarea and tributary to a water body segment listed as impaired for sediment on the CWA section 303(d) List;

(c) Sites located within, directly adjacent to, or discharging directly to a receiving water within an ESA; and

(d) Other sites determined by the Copermittees or the San Diego Water Board as a high threat to water quality.

c. Construction Site BMP Implementation

Each Copermittee must implement, or require the implementation of effective BMPs to reduce discharges of pollutants in storm water from construction sites to the MEP, and effectively prohibit non-storm water discharges from construction sites into the MS4. These BMPs must be site specific, seasonally appropriate, and construction phase appropriate. BMPs must be implemented at each construction site year round. Dry season BMP implementation must plan for and address unseasonal rain events that may occur during the dry season (May 1 through September 30). Copermittees must implement, or require the implementation of, BMPs in the following categories:

(1) Project Planning;

(2) Good Site Management “Housekeeping”, including waste management;

(3) Non-storm Water Management;

(4) Erosion Control;

(5) Sediment Control;

(6) Run-on and Run-off Control; and

(7) Active/Passive Sediment Treatment Systems, where applicable.

d. CONSTRUCTION SITE INSPECTIONS

Each Copermittee must conduct construction site inspections to require and confirm compliance with its local permits and applicable local ordinances, and the requirements of this Order. Priority for site inspections must consider threat to water quality pursuant to Provision E.4.b as well as the nature of the construction activity, topography, and the characteristics of soils and receiving water quality.

(1) Inspection Frequency

(a) Each Copermittee must conduct inspections at all inventoried sites, including high threat to water quality sites, at an appropriate frequency for each phase of construction to confirm the site reduces the discharge of pollutants in storm water from construction sites to the MEP, and effectively prohibits non-storm water discharges from entering the MS4.

(b) Each Copermittee must establish appropriate inspection frequencies for high threat to water quality sites, and all other sites, for each phase of construction. Inspection frequencies appropriate for addressing the highest water quality priorities identified in the Water Quality Improvement Plan, and for complying with the requirements of this Order must be identified in each Copermittee's jurisdictional runoff management program document.

(c) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e., re-inspection, enforcement) necessary to require and confirm site compliance with its local permits and applicable local ordinances, and the requirements of this Order.

(2) Inspection Content

Inspections of construction sites by the Copermittee must include, at a minimum:

(a) Verification of coverage under the Construction General Permit (Notice of Intent (NOI) and/or WDID number) during initial inspections, when applicable;

(b) Assessment of compliance with its local permits and applicable local ordinances related to pollution prevention, including the implementation and maintenance of applicable BMPs;

(c) Assessment of BMP adequacy and effectiveness;

(d) Visual observations of actual non-storm water discharges;

(e) Visual observations of actual or potential discharge of sediment and/or

construction related materials from the site;

(f) Visual observations of actual or potential illicit connections; and

(g) If any violations are found and BMP corrections are needed, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried construction sites. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Site name, location (address and hydrologic subarea), and WDID number (if applicable);

(b) Inspection date;

(c) Approximate amount of rainfall since last inspection;

(d) Description of problems observed with BMPs and indication of need for BMP addition/repair/replacement and any scheduled re-inspection, and date of re-inspection;

(e) Descriptions of any other specific inspection comments which must, at a minimum, include rationales for longer compliance time;

(f) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(g) Resolution of problems noted and date problems fixed.

e. CONSTRUCTION SITE ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried construction sites, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

5. Existing Development Management

Each Copermittee must implement an existing development management program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. EXISTING DEVELOPMENT INVENTORY AND TRACKING

Each Copermittee must maintain, and update at least annually, a watershed-based inventory of the existing development within its jurisdiction that may discharge a pollutant load to and from the MS4. The use of an automated database system, such as GIS, is highly recommended. The inventory must, at a minimum, include:

(1) Name, location (hydrological subarea and address, if applicable) of the following types of existing development with its jurisdiction:

(a) Commercial facilities or areas;

(b) Industrial facilities;

(c) Municipal facilities, including:

(i) MS4 and related structures;[28]
(ii) Roads, streets, and highways;
(iii) Parking facilities;
(iv) Municipal airfields;
(v) Parks and recreation facilities;
(vi) Flood management facilities, flood control devices and structures;
(vii) Operating or closed municipal landfills;
(viii) Publicly owned treatment works (including water and wastewater treatment plants) and sanitary sewer collection systems;
(ix) Corporate yards, including maintenance and storage yards for materials, waste, equipment, and vehicles;
(x) Hazardous waste collection facilities;
(xi) Other treatment, storage or disposal facilities for municipal waste; and
(xii) Other municipal facilities that the Copermittee determines may contribute a significant pollutant load to the MS4.

[28] The inventory may refer to the MS4 map required to be maintained pursuant to Provision E.2.b.(1).

(d) Residential areas, which may be designated by one or more of the following:

(i) Residential management area;

(ii) Drainage basin or area;

(iii) Land use (e.g., single family, multi-family, rural);

(iv) Neighborhood;

(v) Common Interest Area;

(vi) Home Owner Association;

(vii) Mobile home park; and/or

(viii) Other designations accepted by the San Diego Water Board Executive Officer.

(2) A description of the facility or area, including the following information:

(a) Classification as commercial, industrial, municipal, or residential;

(b) Status of facility or area as active or inactive;

(c) Identification if a business is a mobile business;

(d) SIC Code or NAICS Code, if applicable;

(e) Industrial General Permit NOI and/or WDID number, if applicable;

(f) Identification if a residential area is or includes a Common Interest Area / Home Owner Association, or mobile home park;

(g) Identification of pollutants generated and potentially generated by the facility or area;

(h) Whether the facility or area is adjacent to an ESA;

(i) Whether the facility or area is tributary to and within the same hydrologic subarea as a water body segment listed as impaired on the CWA section 303(d) List and generates pollutants for which the water body segment is impaired; and

(3) An annually updated map showing the location of inventoried existing development, watershed boundaries, and water bodies.

b. EXISTING DEVELOPMENT BMP IMPLEMENTATION AND MAINTENANCE

Each Copermittee must designate a minimum set of BMPs required for all inventoried existing development, including special event venues. The designated minimum BMPs must be specific to facility or area types and pollutant generating activities, as appropriate.

(1) Commercial, Industrial, and Municipal Facilities and Areas

(a) Pollution Prevention

Each Copermittee must require the use of pollution prevention methods by the commercial, industrial, and municipal facilities and areas in its inventoried existing development to address the priorities and strategies in the Water Quality Improvement Plan.

(b) BMP Implementation

Each Copermittee must require the implementation of designated BMPs at commercial facilities and areas, industrial facilities, and implement designated BMPs at municipal facilities in its inventoried existing development.

(c) BMP Operation and Maintenance

(i) Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development.

(ii) Each Copermittee must implement a schedule of operation and maintenance activities for its MS4 and related structures (including but not limited to catch basins, storm drain inlets, detention basins, etc.), and verify proper operation of all its municipal structural treatment controls designed to reduce pollutants (including floatables) in storm water discharges to or from its MS4s and related drainage structures. Operation and maintenance activities may include, but is not limited to, the following:

[a] Inspections of the MS4 and related structures;
[b] Cleaning of the MS4 and related structures; and
[c] Proper disposal of materials removed from cleaning of the MS4 and related structures.

(iii) Each Copermittee must implement a schedule of operation and maintenance for public streets, unpaved roads, paved roads, and paved highways within its jurisdiction to minimize pollutants that can be discharged in storm water.

(iv) Each Copermittee must implement controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers. Copermittees that operate both a municipal sanitary sewer system and a MS4 must implement controls and measures to prevent and eliminate seeping sewage from infiltrating the MS4. Copermittees that do not operate both a municipal sanitary sewer system and a MS4 must coordinate with sewering agencies to keep themselves informed of relevant and appropriate maintenance activities and sanitary sewage projects in their jurisdiction that may cause or contribute to seepage of sewage into the MS4.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must require the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from commercial facilities and areas and industrial facilities, and implement BMPs at municipal facilities in its inventoried existing development. Such BMPs must include, as appropriate, educational activities, permits, certifications and other measures for applicators and distributors.

(2) <u>Residential Areas</u>

(a) Pollution Prevention

Each Copermittee must promote and encourage the use of pollution prevention methods, where appropriate, by the residential areas in its inventoried existing development.

(b) BMP Implementation

Each Copermittee must promote and encourage the implementation of designated BMPs at residential areas in its inventoried existing development.

(c) BMP Operation and Maintenance

Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at residential areas in its inventoried existing development.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must promote and encourage the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the

application, storage, and disposal of pesticides, herbicides and fertilizers from residential areas in its inventoried existing development.

c. Existing Development Inspections

Each Copermittee must conduct inspections of inventoried existing development to ensure compliance with applicable local ordinances and permits, and the requirements of this Order.

(1) Inspection Frequency

(a) Each Copermittee must establish appropriate inspection frequencies for inventoried existing development in accordance with the following requirements:

(i) At a minimum, inventoried existing development must be inspected once every five years utilizing one or more of the following methods:

[a] Drive-by inspections by Copermittee municipal and contract staff;
[b] Onsite inspections by Copermittee municipal and contract staff; and/or
[c] Visual inspections of publicly accessible inventoried facilities or areas by volunteer monitoring or patrol programs that have been trained by the Copermittee;

(ii) The frequency of inspections must be appropriate to confirm that BMPs are being implemented to reduce the discharge of pollutants in storm water from the MS4 to the MEP and effectively prohibit non-storm water discharges to the MS4;

(iii) The frequency of inspections must be based on the potential for a facility or area to discharge non-storm water and pollutants in storm water, and should reflect the priorities set forth in the Water Quality Improvement Plan;

(iv) Each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development;[29] and

(v) Inventoried existing development must be inspected by the Copermittee, as needed, in response to valid public complaints.

(b) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e. education and outreach, re-inspection, enforcement)

[29] If any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspection may count toward the total annual inspection requirement. This requirement excludes linear municipal facilities (i.e., MS4 linear channels, sanitary sewer collection systems, streets, roads and highways).

necessary to require and confirm compliance with its applicable local ordinances and permits and the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

(2) Inspection Content

(a) Inspections of existing development must include, at a minimum:

(i) Visual inspections for the presence of actual non-storm water discharges;

(ii) Visual inspections for the presence of actual or potential discharge of pollutants;

(iii) Visual inspections for the presence of actual or potential illicit connections; and

(iv) Verification that the description of the facility or area in the inventory, required pursuant to Provision E.5.a.(2), has not changed.

(b) Onsite inspections of existing development by the Copermittee must include, at a minimum:

(i) Assessment of compliance with its applicable local ordinances and permits related to non-storm water and storm water discharges and runoff;

(ii) Assessment of the implementation of the designated BMPs;

(iii) Verification of coverage under the Industrial General Permit, when applicable; and

(iv) If any problems or violations are found, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried existing development. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Name and location of the facility or area (address and hydrologic subarea) consistent with the inventory name and location, pursuant to Provision E.5.a.(1);

(b) Inspection and re-inspection date(s);

(c) Inspection method(s) (i.e. drive-by, onsite);

(d) Observations and findings from the inspection(s);

(e) For onsite inspections of existing development by Copermittee municipal or contract staff, the records must also include, as applicable:

(i) Description of any problems or violations found during the inspection(s);

(ii) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(iii) The date problems or violations were resolved.

d. EXISTING DEVELOPMENT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried existing development, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

e. RETROFITTING AND REHABILITATING AREAS OF EXISTING DEVELOPMENT

(1) Retrofitting Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to retrofit areas of existing development within its jurisdiction to address identified sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify areas of existing development as candidates for retrofitting, focusing on areas where retrofitting will address pollutants and/or stressors that contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for retrofitting projects may be utilized to reduce pollutants that may be discharged in storm water from areas of existing development, and/or address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of retrofitting projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting projects; and

(e) Where retrofitting projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional retrofitting projects (i.e. projects that can receive and/or treat storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment) adjacent to and/or downstream of the areas of existing development.

(2) Stream, Channel and/or Habitat Rehabilitation in Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to rehabilitate streams, channels, and/or habitats in areas of existing development within its jurisdiction to address the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify streams, channels, and/or habitats in areas of existing development as candidates for rehabilitation, focusing on areas where stream, channel, and/or habitat rehabilitation projects will address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for stream, channel, and/or habitat rehabilitation projects may be utilized to address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters, rehabilitate channelized or hydromodified streams, restore wetland and riparian habitat, restore watershed functions, and/or restore beneficial uses of receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of stream, channel, and/or habitat rehabilitation projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance stream, channel, and/or habitat rehabilitation projects; and

(e) Where stream, channel, and/or habitat rehabilitation projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional stream, channel, and/or habitat rehabilitation projects (i.e. projects that can receive storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment).

6. Enforcement Response Plans

Each Copermittee must develop and implement an Enforcement Response Plan as part of its jurisdictional runoff management program document. The Enforcement Response Plan must describe the applicable approaches and options to enforce its legal authority established pursuant to Provision E.1, as necessary, to achieve compliance with the requirements of this Order. The Enforcement Response Plan must be in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include the following:

a. Enforcement Response Plan Components

The Enforcement Response Plan must include the following individual components:

(1) Illicit Discharge Detection and Elimination Enforcement Component;

(2) Development Planning Enforcement Component;

(3) Construction Management Enforcement Component; and

(4) Existing Development Enforcement Component.

b. Enforcement Response Approaches and Options

Each component of the Enforcement Response Plan must describe the enforcement response approaches that the Copermittee will implement to compel compliance with its statutes, ordinances, permits, contracts, orders, or similar means, and the requirements of this Order. The description must include the protocols for implementing progressively stricter enforcement responses. The enforcement response approaches must include appropriate sanctions to compel compliance, including, at a minimum, the following tools or their equivalent:

(1) Verbal and written notices of violation;

(2) Cleanup requirements;

(3) Fines;

(4) Bonding requirements;

(5) Administrative and criminal penalties;

(6) Liens;

(7) Stop work orders; and

(8) Permit and occupancy denials.

c. CORRECTION OF VIOLATIONS

(1) Violations must be corrected in a timely manner with the goal of correcting the violations within 30 calendar days after the violations are discovered, or prior to the next predicted rain event, whichever is sooner.

(2) If more than 30 calendar days are required to achieve compliance, then a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

d. ESCALATED ENFORCEMENT

(1) The Enforcement Response Plan must include a definition of "escalated enforcement." Escalated enforcement must include any enforcement scenario where a violation or other non-compliance is determined to cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan. Escalated enforcement may be defined differently for development planning, construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas.

(2) Where the Copermittee determines escalated enforcement is not required, a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

(3) Escalated enforcement actions must continue to increase in severity, as necessary, to compel compliance as soon as possible.

e. REPORTING OF NON-COMPLIANT SITES

(1) Each Copermittee must notify the San Diego Water Board in writing within five (5) calendar days of issuing escalated enforcement (as defined in the Copermittee's Enforcement Response Plan) to a construction site that poses a significant threat to water quality as a result of violations or other non-compliance with its permits and applicable local ordinances, and the

requirements of this Order. Written notification may be provided electronically by email to the appropriate San Diego Water Board staff.

(2) Each Copermittee must notify the San Diego Water Board of any persons required to obtain coverage under the statewide Industrial General Permit and Construction General Permit and failing to do so, within five (5) calendar days from the time the Copermittee become aware of the circumstances. Written notification may be provided electronically by email to R9_Nonfilers@waterboards.ca.gov.

7. Public Education and Participation

Each Copermittee must implement, individually or with other Copermittees, a public education and participation program in accordance with the strategies identified in the Water Quality Improvement Plan to promote and encourage the development of programs, management practices, and behaviors that reduce the discharge of pollutants in storm water to the MEP, prevent controllable non-storm water discharges from entering the MS4, and protect water quality standards in receiving waters. The public education and participation program must be implemented in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include, at a minimum, the following requirements:

a. PUBLIC EDUCATION

The public education program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) Educational activities, public information activities, and other appropriate outreach activities intended to reduce pollutants associated with the application of pesticides, herbicides and fertilizer and other pollutants of concern in storm water discharges to and from its MS4 to the MEP, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed to address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(2) Educational activities, public information activities, and other appropriate outreach activities to facilitate the proper management and disposal of used oil and toxic materials; and

(3) Appropriate education and training measures for specific target audiences, such as construction site operators, residents, underserved target audiences and school-aged children, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed, based on high risk behaviors and pollutants of concern.

b. PUBLIC PARTICIPATION

The public participation program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) A process for members of the public to participate in updating the highest priority water quality conditions, numeric goals, and water quality improvement strategies in the Water Quality Improvement Plan;

(2) Opportunities for members of the public to participate in providing the Copermittee recommendations for improving the effectiveness of the water quality improvement strategies implemented within its jurisdiction; and

(3) Opportunities for members of the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or protection of the quality of receiving waters.

8. Fiscal Analysis

a. Each Copermittee must secure the resources necessary to meet all the requirements of this Order.

b. Each Copermittee must conduct an annual fiscal analysis of its jurisdictional runoff management program in its entirety. The fiscal analysis must include the following:

(1) Identification of the various categories of expenditures necessary to implement the requirements of this Order, including a description of the specific capital, operation and maintenance, and other expenditure items to be accounted for in each category of expenditures;

(2) The staff resources needed and allocated to meet the requirements of this Order, including any development, implementation, and enforcement activities required;

(3) The estimated expenditures for Provisions E.8.b.(1) and E.8.b.(2) for the current fiscal year; and

(4) The source(s) of funds that are proposed to meet the necessary expenditures described in Provisions E.8.b.(1) and E.8.b.(2), including legal restrictions on the use of such funds, for the current fiscal year and next fiscal year.

c. Each Copermittee must submit a summary of the annual fiscal analysis with each Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3).

d. Each Copermittee must provide the documentation used to develop the summary of the annual fiscal analysis upon request by the San Diego Water Board.

F. REPORTING

The purpose of this provision is to determine and document compliance with the requirements set forth in this Order. The goal of reporting is to communicate to the San Diego Water Board and the people of the State of California the implementation status of each jurisdictional runoff management program and compliance with the requirements of this Order. This goal is to be accomplished through the submittal of specific deliverables to the San Diego Water Board by the Copermittees.

1. Water Quality Improvement Plans

The Copermittees for each Watershed Management Area must develop and submit the Water Quality Improvement Plan in accordance with the following requirements:

a. WATER QUALITY IMPROVEMENT PLAN DEVELOPMENT

Each Water Quality Improvement Plan must be developed in accordance with the following process:

(1) Public Participation Process

The Copermittees must implement a public participation process to solicit data, information, and recommendations to be utilized in the development of the Water Quality Improvement Plan. The public participation process must include the following:

(a) The Copermittees must develop a publicly available and noticed schedule of the opportunities for the public to participate and provide comments during the development of the Water Quality Improvement Plan. The schedule may be adjusted as necessary by the Copermittees, provided the public is provided timely notification of the changes to the schedule.

(b) The Copermittees must form a Water Quality Improvement Consultation Panel to provide recommendations during the development of the Water Quality Improvement Plan. The Water Quality Improvement Consultation Panel must consist of at least the following members:

(i) A representative of the San Diego Water Board;

(ii) A representative of the environmental community familiar with the water quality conditions of concern of the receiving waters in the Watershed Management Area, preferably from an environmental interest group associated with a water body within the Watershed Management Area; and

(iii) A representative of the development community familiar with the opportunities and constraints for implementing structural BMPs, retrofitting projects, and stream, channel or habitat rehabilitation

projects in the Watershed Management Area, preferably with relevant engineering, hydrology, and/or geomorphology experience in the Watershed Management Area.

(c) The Copermittees must coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public time and opportunity to participate during the development of the Water Quality Improvement Plans.

(2) Priority Water Quality Conditions

(a) The Copermittees must solicit data, information and recommendations from the public to be utilized in the development and identification of the priority water quality conditions and potential water quality improvement strategies for the Watershed Management Area.

(b) The Copermittees must review the priority water quality conditions the Copermittees plan on including in the Water Quality Improvement Plan with the Water Quality Improvement Consultation Panel to receive recommendations or concurrence.

(c) The Copermittees must consider revisions to the priority water quality conditions based on recommendations from the Water Quality Improvement Consultation Panel.

(d) The Copermittees must include all the potential water quality improvement strategies identified by the public and the Water Quality Improvement Consultation Panel with the submittal of the priority water quality conditions to the San Diego Water Board.

(e) The Copermittees must submit the Water Quality Improvement Plan requirements of Provision B.2 to the San Diego Water Board as early as 6 months and no later than 12 months after the commencement of coverage under this Order. Upon receipt, the San Diego Water Board will issue a public notice and release the proposed priority water quality conditions and potential water quality improvement strategies for public review and comment for a minimum of 30 days.

(f) The Copermittees must consider revisions to the priority water quality conditions and potential water quality improvement strategies developed pursuant to Provision B.2 based on public comments received by the close of the comment period.

(3) Water Quality Improvement Goals, Strategies and Schedules

(a) The Copermittees must solicit recommendations from the public on potential numeric goals for the highest priority water quality conditions identified for the Watershed Management Area, and recommendations on the strategies that should be implemented to achieve the potential numeric goals.

(b) The Copermittees must consult with the Water Quality Improvement Consultation Panel and consider revisions to the following items based on the Panel's recommendations:

(i) The numeric goals and schedules the Copermittees propose to include in the Water Quality Improvement Plan;

(ii) The water quality improvement strategies and schedules the Copermittees propose to implement in the Watershed Management Area and include in the Water Quality Improvement Plan; and

(iii) If the Copermittees choose to implement Provision B.3.b.(4), the results of the Watershed Management Area Analysis the Copermittees proposed to incorporate into the Water Quality Improvement Plan.

(c) The Copermittees must submit the Water Quality Improvement Plan requirements of Provision B.3 to the San Diego Water Board as early as 9 months and no later than 18 months after the commencement of coverage under this Order. Upon receipt, the San Diego Water Board will issue a public notice and release the proposed water quality improvement goals, strategies and schedules for public review and comment for a minimum of 30 days.

(d) The Copermittees must consider revisions to the water quality improvement goals, strategies and schedules developed pursuant to Provision B.3 based on public comments received by the close of the comment period.

b. WATER QUALITY IMPROVEMENT PLAN SUBMITTAL AND IMPLEMENTATION

(1) Within 24 months after the commencement of coverage under this Order, the Copermittees for each Watershed Management Area must submit a complete Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order to the San Diego Water Board. The San Diego Water Board will issue a public notice and release the Water Quality Improvement Plan for public review and comment for a minimum of 30 days.

(2) The Copermittees must consider revisions to the Water Quality Improvement Plan based on written comments received by the close of the public comment period.

(3) The Copermittees must promptly submit any revisions to the Water Quality Improvement Plan to the San Diego Water Board no later than 60 days after the close of the public comment period.

(4) If issues concerning the Water Quality Improvement Plan are resolved informally through discussions among the Copermittees, the San Diego Water Board and interested parties, the San Diego Water Board Executive Officer may provide written notification of acceptance to the Copermittees that the Water Quality Improvement Plan meets the requirements of Provision B. However, if the Executive Officer determines that significant issues with the Water Quality Improvement Plan remain, the matter will be scheduled for San Diego Water Board consideration at a public meeting.

(5) The Copermittees must commence with implementation of the Water Quality Improvement Plan, in accordance with the water quality improvement strategies and schedules therein, upon written notification of acceptance with the Water Quality Improvement Plan by the San Diego Water Board Executive Officer.

(6) During implementation of the Water Quality Improvement Plan the Copermittees must correct any deficiencies in the Plan identified by the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report following a request by the Board to do so.

(7) The Water Quality Improvement Plan must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of receiving notification of acceptance with the Water Quality Improvement Plan by the San Diego Water Board Executive Officer.

2. Updates

a. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATES

Each Copermittee must update its jurisdictional runoff management program document in accordance with the following requirements:

(1) Each Copermittee is encouraged to seek public and key stakeholder participation and comments, as early and often as possible during the process of developing updates to its jurisdictional runoff management program document;

(2) Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E concurrent with the submittal of the Water Quality Improvement Plan. Each Copermittee must correct any deficiencies in the jurisdictional runoff management program document based on comments received from the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report;

(3) Each Copermittee must submit updates to its jurisdictional runoff management program, with the supporting rationale for the modifications, either in the Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b;

(4) The Copermittee must revise proposed modifications to its jurisdictional runoff management program as directed by the San Diego Water Board Executive Officer; and

(5) Updated jurisdictional runoff management program documents must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of submitting the Water Quality Improvement Plan Annual Report.

b. BMP DESIGN MANUAL UPDATES

Each Copermittee must update its BMP Design Manual in accordance with the following requirements:

(1) Each Copermittee must update its BMP Design Manual to incorporate the requirements of Provisions E.3.a-d concurrent with the submittal of the Water Quality Improvement Plan. Each Copermittee must correct any deficiencies in the BMP Design Manual based on comments received from the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report;

(2) Subsequent updates to the BMP Design Manual must be consistent with the requirements of Provisions E.3.a-d and must be submitted as part of the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b; and

(3) Updated BMP Design Manuals must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of completing the update.

c. WATER QUALITY IMPROVEMENT PLAN UPDATES

(1) The Water Quality Improvement Plans must be updated in accordance with the following process:

(a) The Copermittees must develop and implement a public participation process to obtain data, information and recommendations for updating the Water Quality Improvement Plan. The public participation process must provide for a publicly available and noticed schedule of opportunities for the public to participate and provide comments during the development of updates to the Water Quality Improvement Plan;

(b) The Copermittees must consult with the Water Quality Improvement Consultation Panel on proposed updates of the Water Quality Improvement Plan, and consider the Water Quality Improvement Consultation Panel's recommendations in finalizing the proposed updates;

(c) The Copermittees for each Watershed Management Area must submit 1) proposed updates to the Water Quality Improvement Plan and supporting rationale, and 2) recommendations received from the public and the Water Quality Improvement Consultation Panel and the rationale for the requested updates, either in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The updates submitted will be deemed accepted for inclusion in the Water Quality Improvement Plan ninety (90) days after submission unless otherwise directed in writing by the San Diego Water Board Executive Officer;

(d) The Copermittees must revise the requested updates as directed by the San Diego Water Board Executive Officer; and

(e) Updated Water Quality Improvement Plans must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance of the requested updates by the San Diego Water Board.

(2) No later than six months following Office of Administrative Law and USEPA approval of any TMDL Basin Plan amendment with wasteload allocations (WLAs) assigned to the Copermittees during the term of this Order, the Copermittees must initiate an update to the applicable Water Quality Improvement Plans in accordance with Provision F.1 or Provision F.2.c.(1) to incorporate the requirements of the TMDL WLAs.

3. Progress Reporting

a. Progress Report Presentations

The Copermittees for each Watershed Management Area must periodically appear before the San Diego Water Board, as requested by the Board, to provide progress reports on the implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs.

b. Annual Reports

(1) Transitional Jurisdictional Runoff Management Program Annual Reports

(a) Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) no later than October 31 of each year for each jurisdictional runoff management program reporting period (i.e. July 1 to June 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted.

(b) Each Copermittee must submit the information on the Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) specific to the area within its jurisdiction in each Watershed Management Area.

(c) In addition to submitting the Jurisdictional Runoff Management Program Annual Report Form during the transitional reporting period, each Copermittee may continue to utilize and submit the jurisdictional runoff management program annual reporting format of its previous NPDES permit until the first Water Quality Improvement Plan Annual Report is required to be submitted.

(2) Transitional Monitoring and Assessment Program Annual Reports

The Copermittees for each Watershed Management Area must submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted under this Order. The Transitional Monitoring and Assessment Program Annual Reports must include:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1.a and D.2.a, summarized and presented in tabular and graphical form; and

(b) The findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

(3) Water Quality Improvement Plan Annual Reports

The Copermittees for each Watershed Management Area must submit a Water Quality Improvement Plan Annual Report for each reporting period no later than January 31 of the following year. The annual reporting period consists of two different periods: 1) July 1 to June 30 of the following year for the jurisdictional runoff management programs, 2) October 1 to September 30 of the following year for the monitoring and assessment programs. The Water Quality Improvement Plan Annual Reports must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Each Annual Report must include the following:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, summarized and presented in tabular and graphical form;

(b) The progress of the special studies required pursuant to Provision D.3, and the findings, interpretations and conclusions of a special study, or each phase of a special study, upon its completion;

(c) The findings, interpretations and conclusions from the assessments required pursuant to Provision D.4;

(d) The progress of implementing the Water Quality Improvement Plan, including, but not limited to, the following:

(i) The progress toward achieving the interim and final numeric goals for the highest water quality priorities for the Watershed Management Area;

(ii) The water quality improvement strategies that were implemented and/or no longer implemented by each of the Copermittees during the reporting period and previous reporting periods;

(iii) The water quality improvement strategies planned for implementation during the next reporting period;

(iv) Proposed modifications to the water quality improvement strategies, the public comments received and the supporting rationale for the proposed modifications;

(v) Previous modifications or updates incorporated into the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document and implemented by the Copermittees in the Watershed Management Area; and

(vi) Proposed modifications or updates to the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document;

(e) A completed Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) for each Copermittee in the Watershed Management Area, certified by a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative; and

(f) Each Copermittee must provide any data or documentation utilized in developing the Water Quality Improvement Plan Annual Report upon request by the San Diego Water Board. Any Copermittee monitoring data utilized in developing the Water Quality Improvement Plan Annual Report must be uploaded to the California Environmental Data Exchange Network (CEDEN).[30] Any Copermittee monitoring and assessment data utilized in developing the Water Quality Improvement Plan Annual Report must be available for access on the Regional Clearinghouse required pursuant to Provision F.4.

C. REGIONAL MONITORING AND ASSESSMENT REPORT

(1) The Copermittees must submit a Regional Monitoring and Assessment Report no later than 180 days prior to the expiration date of this Order. The Regional Monitoring and Assessment Report may be submitted as part of the Report of Waste Discharge required pursuant to Provision F.5.b. In preparing the report the Copermittees must consider the receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, and the findings, interpretations, and conclusions from the assessments required pursuant to Provision D.4. Based on these considerations the report must assess the following:

(a) The beneficial uses of the receiving waters within the San Diego Region that are supported and not adversely affected by the Copermittees' MS4 discharges;

(b) The beneficial uses of the receiving waters within the San Diego Region that are adversely impacted by the Copermittees' MS4 discharges;

(c) The progress toward protecting the beneficial uses in the receiving waters within the San Diego Region from the Copermittees' discharges; and

[30] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

(d) Pollutants or conditions of emerging concern that may impact beneficial uses in the receiving waters within the San Diego Region.

(2) The Regional Monitoring and Assessment Report must include recommendations for improving the implementation and assessment of the Water Quality Improvement Plans and jurisdictional runoff management programs.

(3) Each Copermittee must provide any data or documentation utilized in developing the Regional Monitoring and Assessment Report upon request by the San Diego Water Board. Any Copermittee monitoring and assessment data utilized in developing the Regional Monitoring and Assessment Report must be available for access on the Regional Clearinghouse required pursuant to Provision F.4.

4. Regional Clearinghouse

The Copermittees must develop, update, and maintain an internet-based Regional Clearinghouse that is made available to the public no later than 18 months after the effective date of this Order.[31]

a. The Copermittees, through the Regional Clearinghouse, must make the following documents and data available for access, and organized by Watershed Management Area. The documents and data may be linked to other internet-based data portals and databases where the original documents are stored:

(1) Water Quality Improvement Plan for the Watershed Management Area, and all updated versions with date of update;

(2) Annual Reports for the Watershed Management Area;

(3) Jurisdictional Runoff Management Program document for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(4) BMP Design Manual for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(5) Reports from special studies (e.g. source identification, BMP effectiveness assessment) conducted in the Watershed Management Area;

[31] The Copermittees may develop, update and maintain the clearinghouse(s) of other Copermittees or agencies.

(6) Monitoring data collected pursuant to Provision D for each Watershed Management Area must be uploaded to CEDEN,[32] with links to the uploaded data; and

(7) Available GIS data, layers, and/or shapefiles used to develop the maps generated and maintained by the Copermittees for the Water Quality Improvement Plans, Annual Reports, and jurisdictional runoff management program documents.

b. The Copermittees, through the Regional Clearinghouse, must make the following information and documents available for access:

(1) Contact information (point of contact, phone number, email address, and mailing address) for each Copermittee;

(2) Public hotline number for reporting non-storm water and illicit discharges for each Copermittee;

(3) Email address for reporting non-storm water and illicit discharges for each Copermittee;

(4) Link to each Copermittee's website, if available, where the public may find additional information about the Copermittee's storm water management program and for requesting records for the implementation of its program;

(5) Information about opportunities for the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or protection of the quality of receiving waters; and

(6) Reports from regional monitoring programs in which the Copermittees participate (e.g. Southern California Monitoring Coalition, Southern California Coastal Water Research Project Bight Monitoring);

(7) Regional Monitoring and Assessment Reports; and

(8) Any other information, data, and documents the Copermittees determine as appropriate for making available to the public.

[32] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

5. Report of Waste Discharge

a. The Riverside County Copermittees are required to submit a complete Report of Waste Discharge pursuant to the requirements of their current Order. The San Diego Water Board will review and consider the Report of Waste Discharge to determine whether modification to this Order, pursuant to the requirements of Provision H, will be required prior to the Riverside County Copermittees obtaining coverage under this Order. The current Order for Riverside County Copermittees is rescinded upon the date of effective coverage under this Order except for enforcement purposes.

b. The Copermittees subject to the requirements of this Order must submit to the San Diego Water Board a complete Report of Waste Discharge as an application for the re-issuance of this Order and NPDES permit. The Report of Waste Discharge must be submitted no later than 180 days in advance of the expiration date of this Order. The Report of Waste Discharge must contain the following minimum information:

(1) Names and addresses of the Copermittees;

(2) Names and titles of the primary contacts of the Copermittees;

(3) Proposed changes to the Copermittees' Water Quality Improvement Plans and the supporting justification;

(4) Proposed changes to the Copermittees' jurisdictional runoff management programs and the supporting justification;

(5) Any other information necessary for the re-issuance of this Order;

(6) Any information to be included as part of the Report of Waste Discharge pursuant to the requirements of this Order; and

(7) Any other information required by federal regulations for NPDES permit reissuance.

6. Application for Early Coverage

a. The Riverside County Copermittees may apply for early coverage under this Order by submitting a Report of Waste Discharge Form 200, with a written request for early coverage under this Order.

b. The San Diego Water Board will review the application for early coverage. A notification of coverage under this Order will be issued to the Copermittees in the respective county by the San Diego Water Board upon completion of the early coverage application requirements. The effective coverage date will be specified in the notification of coverage. The Copermittees in the respective county are authorized to have MS4 discharges pursuant to the requirements of this Order starting on the effective coverage date specified in the notification of coverage. The existing Order for the respective county is rescinded upon the effective coverage date specified in the notification of coverage except for enforcement purposes.

7. Reporting Provisions

Each Copermittee must comply with all the reporting and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

G. PRINCIPAL WATERSHED COPERMITTEE RESPONSIBILITIES

1. The Copermittees within each Watershed Management Area must designate a Principal Watershed Copermittee and notify the San Diego Water Board of the name of the Principal Watershed Copermittee. An individual Copermittee should not be designated a Principal Watershed Copermittee for more than two Watershed Management Areas. The notification may be submitted with the Water Quality Improvement Plan required pursuant to Provision F.1 of this Order.

2. The Principal Watershed Copermittee is responsible for, at a minimum, the following:

a. Serving as liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues, and when necessary and appropriate, representing the Copermittees in the Watershed Management Area before the San Diego Water Board;

b. Facilitating the development of the Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order;

c. Coordinating the submittal of the deliverables required by Provisions F.1, F.2, F.3.a, and F.3.b of this Order; and

d. Coordinating and developing, with the other Principal Watershed Copermittees, the requirements of Provisions F.3.c, F.4, and F.5.b of this Order.

3. The Principal Watershed Copermittee is not responsible for ensuring that the other Copermittees within the Watershed Management Area are in compliance with the requirements of this Order. Each Copermittee within the Watershed Management Area is responsible for complying with the requirements of this Order.

H. MODIFICATION OF ORDER

1. Modifications of the Order may be initiated by the San Diego Water Board or by the Copermittees. Requests by Copermittees must be made to the San Diego Water Board.

2. Minor modifications to the Order may be made by the San Diego Water Board where the proposed modification complies with all the prohibitions and limitations, and other requirements of this Order.

3. This Order may also be re-opened and modified, revoked and, reissued or terminated in accordance with the provisions of 40 CFR 122.44, 122.62 to 122.64, and 124.5. Causes for taking such actions include, but are not limited to, failure to comply with any condition of this Order and permit, and endangerment to human health or the environment resulting from the permitted activity.

4. This Order may be re-opened for modification for cause including but not limited to the following:

a. The State Water Board determines that revisions are warranted, and the San Diego Water Board concurs that revisions are necessary to those provisions of the Order addressing compliance with water quality standards in the receiving water and/or those provisions of the Order establishing an iterative process for implementation of management practices to assure compliance with water quality standards in the receiving water;

b. An application for early coverage under this Order is received pursuant to Provision F.6;

c. Any of the TMDLs in Attachment E to this Order are amended in the Basin Plan by San Diego Water Board, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA;

d. The Basin Plan is amended by the San Diego Water Board to incorporate a new TMDL, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA; or

e. Updating or revising the monitoring and reporting requirements is determined to be necessary, at the discretion of the San Diego Water Board. Such modification(s) may include, but is (are) not limited to, revision(s) to: (i) implement recommendations from Southern California Coastal Water Research Project (SCCWRP), (ii) develop, refine, implement, and/or coordinate a regional monitoring program, (iii) develop and implement improved monitoring and assessment programs in keeping with San Diego Water Board Resolution No. R9-2012-0069, Resolution in Support of a Regional Monitoring Framework, and/or (iv) add provisions to require the Copermittees to evaluate and provide information on cost and values of the monitoring and reporting program.

5. The San Diego Water Board, after opportunity for public comment and a public hearing, will re-open and consider modifications to this Order when the Riverside County Copermittees submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders.

I. STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

Each Copermittee must comply with all the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

ATTACHMENT A

DISCHARGE PROHIBITIONS AND SPECIAL PROTECTIONS

1. Basin Plan Waste Discharge Prohibitions

California Water Code Section 13243 provides that a Regional Water Board, in a water quality control plan, may specify certain conditions or areas where the discharge of waste or certain types of waste is not permitted. The following waste discharge prohibitions in the Water Quality Control Plan for the San Diego Basin (Basin Plan) are applicable to any person, as defined by Section 13050(c) of the California Water Code, who is a citizen, domiciliary, or political agency or entity of California whose activities in California could affect the quality of waters of the state within the boundaries of the San Diego Region.

1. The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in California Water Code Section 13050, is prohibited.

2. The discharge of waste to land, except as authorized by waste discharge requirements or the terms described in California Water Code Section 13264 is prohibited.

3. The discharge of pollutants or dredged or fill material to waters of the United States except as authorized by a National Pollutant Discharge Elimination System (NPDES) permit or a dredged or fill material permit (subject to the exemption described in California Water Code Section 13376) is prohibited.

4. Discharges of recycled water to lakes or reservoirs used for municipal water supply or to inland surface water tributaries thereto are prohibited, unless this San Diego Water Board issues a NPDES permit authorizing such a discharge; the proposed discharge has been approved by the State Department of Health Services (DHS) and the operating agency of the impacted reservoir; and the discharger has an approved fail-safe long-term disposal alternative.

5. The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the San Diego Water Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

6. The discharge of waste in a manner causing flow, ponding, or surfacing on lands not owned or under the control of the discharger is prohibited, unless the discharge is authorized by the San Diego Water Board.

7. The dumping, deposition, or discharge of waste directly into waters of the state, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the San Diego Water Board.

8. Any discharge to a storm water conveyance system that is not composed entirely of "*storm water*" is prohibited unless authorized by the San Diego Water Board. [The federal regulations, 40 CFR 122.26(b)(13), define storm water as storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from firefighting activities.] [§122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

9. The unauthorized discharge of treated or untreated sewage to waters of the state or to a storm water conveyance system is prohibited.

10. The discharge of industrial wastes to conventional septic tank/subsurface disposal systems, except as authorized by the terms described in California Water Code Section 13264, is prohibited.

11. The discharge of radioactive wastes amenable to alternative methods of disposal into the waters of the state is prohibited.

12. The discharge of any radiological, chemical, or biological warfare agent into waters of the state is prohibited.

13. The discharge of waste into a natural or excavated site below historic water levels is prohibited unless the discharge is authorized by the San Diego Water Board.

14. The discharge of sand, silt, clay, or other earthen materials from any activity, including land grading and construction, in quantities which cause deleterious bottom deposits, turbidity or discoloration in waters of the state or which unreasonably affect, or threaten to affect, beneficial uses of such waters is prohibited.

15. The discharge of treated or untreated sewage from vessels to Mission Bay, Oceanside Harbor, Dana Point Harbor, or other small boat harbors is prohibited.

16. The discharge of untreated sewage from vessels to San Diego Bay is prohibited.

17. The discharge of treated sewage from vessels to portions of San Diego Bay that are less than 30 feet deep at mean lower low water (MLLW) is prohibited.

18. The discharge of treated sewage from vessels, which do not have a properly functioning US Coast Guard certified Type I or Type II marine sanitation device, to portions of San Diego Bay that are greater than 30 feet deep at mean lower low water (MLLW) is prohibited.

2. Attachment B to State Water Board Resolution 2012-0012, as amended by State Water Board Resolution No. 2012-0031.

Special Protections for Areas of Special Biological Significance (ASBS), Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges

I. PROVISIONS FOR POINT SOURCE DISCHARGES OF STORM WATER AND NONPOINT SOURCE WASTE DISCHARGES

The following terms, prohibitions, and special conditions (hereafter collectively referred to as special conditions) are established as limitations on point source storm water and nonpoint source discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in Areas of Special Biological Significance (ASBS), as required for State Water Quality Protection Areas pursuant to California Public Resources Code Sections 36700(f) and 36710(f). These Special Protections are adopted by the State Water Board as part of the California Ocean Plan (Ocean Plan) General Exception.

The special conditions are organized by category of discharge. The State Water Resources Control Board (State Water Board) and Regional Water Quality Control Boards (Regional Water Boards) will determine categories and the means of regulation for those categories [e.g., Point Source Storm Water National Pollutant Discharge Elimination System (NPDES) or Nonpoint Source].

A. PERMITTED POINT SOURCE DISCHARGES OF STORM WATER

1. General Provisions for Permitted Point Source Discharges of Storm Water

   a. Existing storm water discharges into an ASBS are allowed only under the following conditions:

      (1) The discharges are authorized by an NPDES permit issued by the State Water Board or Regional Water Board;

      (2) The discharges comply with all of the applicable terms, prohibitions, and special conditions contained in these Special Protections; and

      (3) The discharges:

         (i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

         (ii) Are designed to prevent soil erosion;

         (iii) Occur only during wet weather;

         (iv) Are composed of only storm water runoff.

   b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

   c. The discharge of trash is prohibited.

d. Only discharges from existing storm water outfalls are allowed. Any proposed or new storm water runoff discharge shall be routed to existing storm water discharge outfalls and shall not result in any new contribution of waste to an ASBS (i.e., no additional pollutant loading). "Existing storm water outfalls" are those that were constructed or under construction prior to January 1, 2005. "New contribution of waste" is defined as any addition of waste beyond what would have occurred as of January 1, 2005. A change to an existing storm water outfall, in terms of re-location or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges are prohibited except as provided below:

(1) The term "non-storm water discharges" means any waste discharges from a municipal separate storm sewer system (MS4) or other NPDES permitted storm drain system to an ASBS that are not composed entirely of storm water.

(2) (i) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability or occur naturally:

(a) Discharges associated with emergency fire fighting operations.

(b) Foundation and footing drains.

(c) Water from crawl space or basement pumps.

(d) Hillside dewatering.

(e) Naturally occurring groundwater seepage via a storm drain.

(f) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(ii) An NPDES permitting authority may authorize non-storm water discharges to an MS4 with a direct discharge to an ASBS only to the extent the NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

2. Compliance Plans for Inclusion in Storm Water Management Plans (SWMP) and Storm Water Pollution Prevention Plans (SWPPP).

The discharger shall specifically address the prohibition of non-storm water runoff and the requirement to maintain natural water quality for storm water discharges to an ASBS in an ASBS Compliance Plan to be included in its SWMP or a SWPPP, as appropriate to permit type. If a statewide permit includes a SWMP, then the discharger shall prepare a stand-alone compliance plan for ASBS discharges. The ASBS Compliance Plan is subject to approval by the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (for permits issued by Regional Water Boards).

a. The Compliance Plan shall include a map of surface drainage of storm water runoff, showing areas of sheet runoff, prioritize discharges, and describe any structural Best Management Practices (BMPs) already employed and/or BMPs to be employed in the future. Priority discharges are those that pose the greatest water quality threat and which are identified to require installation of structural BMPs. The map shall also show the storm water conveyances in relation to other features such as service areas, sewage conveyances and treatment facilities, landslides, areas prone to erosion, and waste and hazardous material storage areas, if applicable. The SWMP or SWPPP shall also include a procedure for updating the map and plan when changes are made to the storm water conveyance facilities.

b. The ASBS Compliance Plan shall describe the measures by which all non-authorized non-storm water runoff (e.g., dry weather flows) has been eliminated, how these measures will be maintained over time, and how these measures are monitored and documented.

c. For Municipal Separate Storm Sewer System (MS4s), the ASBS Compliance Plan shall require minimum inspection frequencies as follows:

(1) The minimum inspection frequency for construction sites shall be weekly during rainy season;

(2) The minimum inspection frequency for industrial facilities shall be monthly during the rainy season;

(3) The minimum inspection frequency for commercial facilities (e.g., restaurants) shall be twice during the rainy season; and

(4) Storm water outfall drains equal to or greater than 18 inches (457 mm) in diameter or width shall be inspected once prior to the beginning of the rainy season and once during the rainy season and maintained to remove trash and other anthropogenic debris.

d. The ASBS Compliance Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff, that are necessary to comply with these special conditions, will be achieved through BMPs. Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that such installation would pose a threat to health or safety. BMPs to control storm water runoff discharges (at the end-of-pipe) during a design storm shall be designed to achieve on average the following target levels:

(1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

(2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges.

The baseline for these determinations is the effective date of the Exception, except for those structural BMPs installed between January 1, 2005 and adoption of these

Special Protections, and the reductions must be achieved and documented within six (6) years of the effective date.

e. The ASBS Compliance Plan shall address erosion control and the prevention of anthropogenic sedimentation in ASBS. The natural habitat conditions in the ASBS shall not be altered as a result of anthropogenic sedimentation.

f. The ASBS Compliance Plan shall describe the non-structural BMPs currently employed and planned in the future (including those for construction activities), and include an implementation schedule. The ASBS Compliance Plan shall include non-structural BMPs that address public education and outreach. Education and outreach efforts must adequately inform the public that direct discharges of pollutants from private property not entering an MS4 are prohibited. The ASBS Compliance Plan shall also describe the structural BMPs, including any low impact development (LID) measures, currently employed and planned for higher threat discharges and include an implementation schedule. To control storm water runoff discharges (at the end-of-pipe) during a design storm, permittees must first consider, and use where feasible, LID practices to infiltrate, use, or evapotranspirate storm water runoff on-site, if LID practices would be the most effective at reducing pollutants from entering the ASBS.

g. The BMPs and implementation schedule shall be designed to ensure that natural water quality conditions in the receiving water are achieved and maintained by either reducing flows from impervious surfaces or reducing pollutant loading, or some combination thereof.

h. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents in storm water runoff that alter natural ocean water quality and the sources of these constituents.

(2) The report shall describe BMPs that are currently being implemented, BMPs that are identified in the SWMP or SWPPP for future implementation, and any additional BMPs that may be added to the SWMP or SWPPP to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the BMPs.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits), the discharger shall revise its ASBS Compliance Plan to incorporate any new or modified BMPs that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised SWMP or SWPPP, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural ocean water quality conditions due to the same constituent.

(5) The requirements of this section are in addition to the terms, prohibitions, and conditions contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within eighteen (18) months from the effective date of the Exception, the discharger shall submit a draft written ASBS Compliance Plan to the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that describes its strategy to comply with these special conditions, including the requirement to maintain natural water quality in the affected ASBS. The ASBS Compliance Plan shall include a description of appropriate non-structural controls and a time schedule to implement structural controls (implementation schedule) to comply with these special conditions for inclusion in the discharger's SWMP or SWPPP, as appropriate to permit type. The final ASBS Compliance Plan, including a description and final schedule for structural controls based on the results of runoff and receiving water monitoring, must be submitted within thirty (30) months from the effective date of the Exception.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these special conditions shall be implemented.

d. Within six (6) years of the effective date of the Exception, any structural controls identified in the ASBS Compliance Plan that are necessary to comply with these special conditions shall be operational.

e. Within six (6) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water, pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data, and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. for municipalities, a demonstration of significant hardship to discharger ratepayers, by showing the relationship of storm water fees to annual household income for residents within the discharger's jurisdictional area, and the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or

2. for other governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

B. NONPOINT SOURCE DISCHARGES

1. General Provisions for Nonpoint Sources

a. Existing nonpoint source waste discharges are allowed into an ASBS only under the following conditions:

(1) The discharges are authorized under waste discharge requirements, a conditional waiver of waste discharge requirements, or a conditional prohibition issued by the State Water Board or a Regional Water Board.

(2) The discharges are in compliance with the applicable terms, prohibitions, and special conditions contained in these Special Protections.

(3) The discharges:

(i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

(ii) Are designed to prevent soil erosion;

(iii) Occur only during wet weather;

(iv) Are composed of only storm water runoff.

b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

c. The discharge of trash is prohibited.

d. Only existing nonpoint source waste discharges are allowed. "Existing nonpoint source waste discharges" are discharges that were ongoing prior to January 1, 2005. "New nonpoint source discharges" are defined as those that commenced on or after January 1, 2005. A change to an existing nonpoint source discharge, in terms of relocation or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges from nonpoint sources (those not subject to an NPDES Permit) are prohibited except as provided below:

(1) The term "non-storm water discharges" means any waste discharges that are not composed entirely of storm water.

(2) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability, or occur naturally:

(i) Discharges associated with emergency fire fighting operations.

(ii) Foundation and footing drains.

(iii) Water from crawl space or basement pumps.

(iv) Hillside dewatering.

(v) Naturally occurring groundwater seepage via a storm drain.

(vi) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

f. At the San Clemente Island ASBS, discharges incidental to military training and research, development, test, and evaluation operations are allowed. Discharges incidental to underwater demolition and other in-water explosions are not allowed in the two military closure areas in the vicinity of Wilson Cove and Castle Rock. Discharges must not result in a violation of the water quality objectives, including the protection of the marine aquatic life beneficial use, anywhere in the ASBS.

g. At the San Nicolas Island and Begg Rock ASBS, discharges incidental to military research, development, testing, and evaluation of, and training with, guided missile and other weapons systems, fleet training exercises, small-scale amphibious warfare training, and special warfare training are allowed. Discharges incidental to underwater demolition and other in-water explosions are not allowed. Discharges must not result in a violation of the water quality objectives, including the protection of the marine aquatic life beneficial use, anywhere in the ASBS.

h. All other nonpoint source discharges not specifically authorized above are prohibited.

2. Planning and Reporting

a. The nonpoint source discharger shall develop an ASBS Pollution Prevention Plan, including an implementation schedule, to address storm water runoff and any other nonpoint source discharges from its facilities. The ASBS Pollution Prevention Plan must be equivalent in contents to an ASBS Compliance Plan as described in I (A)(2) in this document. The ASBS Pollution Prevention Plan is subject to approval by the Executive Director of the State Water Board (statewide waivers or waste discharge requirements) or Executive

Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements).

b. The ASBS Pollution Prevention Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff that are necessary to comply with these special conditions, will be achieved through Management Measures and associated Management Practices (Management Measures/Practices). Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director or Regional Water Board Executive Officer that such installation would pose a threat to health or safety. Management Measures to control storm water runoff during a design storm shall achieve on average the following target levels:

(1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

(2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges.

The baseline for these determinations is the effective date of the Exception, except for those structural BMPs installed between January 1, 2005 and adoption of these Special Protections, and the reductions must be achieved and documented within six (6) years of the effective date.

c. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff or other nonpoint source pollution is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and the Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents that alter natural water quality and the sources of these constituents.

(2) The report shall describe Management Measures/Practices that are currently being implemented, Management Measures/Practices that are identified in the ASBS Pollution Prevention Plan for future implementation, and any additional Management Measures/Practices that may be added to the Pollution Prevention Plan to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the Management Measures/Practices.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements), the discharger shall revise its ASBS Pollution Prevention Plan to incorporate any new or modified Management Measures/Practices that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised ASBS Pollution Prevention Plan, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural water quality conditions due to the same constituent.

(5) The requirements of this section are in addition to the terms, prohibitions, and conditions contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within eighteen (18) months from the effective date of the Exception, the discharger~~s~~ shall submit a draft written ASBS Pollution Prevention Plan to the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) that describes its strategy to comply with these special conditions, including the requirement to maintain natural ocean water quality in the affected ASBS. The Pollution Prevention Plan shall include a description of appropriate non-structural controls and a time schedule to implement structural controls to comply with these special conditions for inclusion in the discharger's Pollution Prevention Plan. The final ASBS Pollution Prevention Plan, including a description and final schedule for structural controls based on the results of runoff and receiving water monitoring, must be submitted within thirty (30) months from the effective date of the Exception.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these Special Protections shall be implemented.

d. Within six (6) years of the effective date of the Exception, any structural controls identified in the ASBS Pollution Prevention Plan that are necessary to comply with these special conditions shall be operational.

e. Within six (6) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in (d.) or (e.). The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures

taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. a demonstration that the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or

2. for governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

II. ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES

In addition to the provisions in Section I (A) or I (B), respectively, a discharger with parks and recreation facilities shall comply with the following:

A. The discharger shall include a section in an ASBS Compliance Plan (for NPDES dischargers) or an ASBS Pollution Prevention Plan (for nonpoint source dischargers) to address storm water runoff from parks and recreation facilities.

1. The plan shall identify all pollutant sources, including sediment sources, which may result in waste entering storm water runoff. Pollutant sources include, but are not limited to, roadside rest areas and vistas, picnic areas, campgrounds, trash receptacles, maintenance facilities, park personnel housing, portable toilets, leach fields, fuel tanks, roads, piers, and boat launch facilities.

2. The plan shall describe BMPs or Management Measures/Practices that will be implemented to control soil erosion (both temporary and permanent erosion controls) and reduce or eliminate pollutants in storm water runoff in order to achieve and maintain natural water quality conditions in the affected ASBS. The plan shall include BMPs or Management Measures/Practices to ensure that trails and culverts are maintained to prevent erosion and minimize waste discharges to ASBS.

3. The plan shall include BMPs or Management Measures/Practices to prevent the discharge of pesticides or other chemicals, including agricultural chemicals, in storm water runoff to the affected ASBS.

4. The plan shall include BMPs or Management Measures/Practices that address public education and outreach. The goal of these BMPs or Management Measures/Practices is to ensure that the public is adequately informed that waste discharges to the affected ASBS are prohibited or limited by special conditions in these Special Protections. The BMPs or Management Measures/Practices shall include signage at camping, picnicking, beach and roadside parking areas, and visitor centers, or other appropriate measures, which notify the public of any applicable requirements of these Special Protections and identify the ASBS boundaries.

5. The plan shall include BMPs or Management Measures/Practices that address the prohibition against the discharge of trash to ASBS. The BMPs or Management Measures/Practices shall include measures to ensure that adequate trash receptacles are available for public use at visitor facilities, including parking areas, and that the receptacles are adequately maintained to prevent trash discharges into the ASBS. Appropriate measures include covering trash receptacles to prevent trash from being wind blown and periodically emptying the receptacles to prevent overflows.

6. The plan shall include BMPs or Management Measures/Practices to address runoff from parking areas and other developed features to ensure that the runoff does not alter natural water quality in the affected ASBS. BMPs or Management Measures/Practices shall include measures to reduce pollutant loading in runoff to the ASBS through installation of natural area buffers (LID), treatment, or other appropriate measures.

B. Maintenance and repair of park and recreation facilities must not result in waste discharges to the ASBS. The practice of road oiling must be minimized or eliminated, and must not result in waste discharges to the ASBS.

III. ADDITIONAL REQUIREMENTS – WATERFRONT AND MARINE OPERATIONS

In addition to the provisions in Section I (A) or I (B), respectively, a discharger with waterfront and marine operations shall comply with the following:

A. For discharges related to waterfront and marine operations, the discharger shall develop a Waterfront and Marine Operations Management Plan (Waterfront Plan). This plan shall contain appropriate Management Measures/Practices to address nonpoint source pollutant discharges to the affected ASBS.

1. The Waterfront Plan shall contain appropriate Management Measures/Practices for any waste discharges associated with the operation and maintenance of vessels, moorings, piers, launch ramps, and cleaning stations in order to ensure that beneficial uses are protected and natural water quality is maintained in the affected ASBS.

2. For discharges from marinas and recreational boating activities, the Waterfront Plan shall include appropriate Management Measures, described in The Plan for California's Nonpoint Source Pollution Control Program, for marinas and recreational boating, or equivalent practices, to ensure that nonpoint source pollutant discharges do not alter natural water quality in the affected ASBS.

3. The Waterfront Plan shall include Management Practices to address public education and outreach to ensure that the public is adequately informed that waste discharges to the affected ASBS are prohibited or limited by special conditions in these Special Protections. The management practices shall include appropriate signage, or similar measures, to inform the public of the ASBS restrictions and to identify the ASBS boundaries.

4. The Waterfront Plan shall include Management Practices to address the prohibition against trash discharges to ASBS. The Management Practices shall include the provision of adequate trash receptacles for marine recreation areas, including parking areas, launch ramps, and docks. The plan shall also include appropriate Management Practices to ensure that the receptacles are adequately maintained and secured in order to prevent trash discharges into the ASBS. Appropriate Management Practices

include covering the trash receptacles to prevent trash from being windblown, staking or securing the trash receptacles so they don't tip over, and periodically emptying the receptacles to prevent overflow.

5. The discharger shall submit its Waterfront Plan to the by the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) within six months of the effective date of these special conditions. The Waterfront Plan is subject to approval by the State Water Board Executive Director or the Regional Water Board Executive Officer, as appropriate. The plan must be fully implemented within 18 months of the effective date of the Exception.

B. The discharge of chlorine, soaps, petroleum, other chemical contaminants, trash, fish offal, or human sewage to ASBS is prohibited. Sinks and fish cleaning stations are point source discharges of wastes and are prohibited from discharging into ASBS. Anthropogenic accumulations of discarded fouling organisms on the sea floor must be minimized.

C. Limited-term activities, such as the repair, renovation, or maintenance of waterfront facilities, including, but not limited to, piers, docks, moorings, and breakwaters, are authorized only in accordance with Chapter III.E.2 of the Ocean Plan.

D. If the discharger anticipates that the discharger will fail to fully implement the approved Waterfront Plan within the 18 month deadline, the discharger shall submit a technical report as soon as practicable to the State Water Board Executive Director or the Regional Water Board Executive Officer, as appropriate. The technical report shall contain reasons for failing to meet the deadline and propose a revised schedule to fully implement the plan.

E. The State Water Board or the Regional Water Board may, for good cause, authorize additional time to comply with the Waterfront Plan. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in Section III.A.5. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality. The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. a demonstration of significant hardship by showing that the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate.

2. for governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

IV. MONITORING REQUIREMENTS

Monitoring is mandatory for all dischargers to assure compliance with the Ocean Plan. Monitoring requirements include both: (A) core discharge monitoring, and (B) ocean receiving water monitoring. The State and Regional Water Boards must approve sampling site locations and any adjustments to the monitoring programs. All ocean receiving water and reference area monitoring must be comparable with the Water Boards' Surface Water Ambient Monitoring Program (SWAMP).

Safety concerns: Sample locations and sampling periods must be determined considering safety issues. Sampling may be postponed upon notification to the State and Regional Water Boards if hazardous conditions prevail.

Analytical Chemistry Methods: All constituents must be analyzed using the lowest minimum detection limits comparable to the Ocean Plan water quality objectives. For metal analysis, all samples, including storm water effluent, reference samples, and ocean receiving water samples, must be analyzed by the approved analytical method with the lowest minimum detection limits (currently Inductively Coupled Plasma/Mass Spectrometry) described in the Ocean Plan.

A. CORE DISCHARGE MONITORING PROGRAM

1. General sampling requirements for timing and storm size:

   Runoff must be collected during a storm event that is greater than 0.1 inch and generates runoff, and at least 72 hours from the previously measurable storm event. Runoff samples shall be collected during the same storm and at approximately the same time when post-storm receiving water is sampled, and analyzed for the same constituents as receiving water and reference site samples (see section IV B) as described below.

2. Runoff flow measurements

   a. For municipal/industrial storm water outfalls in existence as of December 31, 2007, 18 inches (457mm) or greater in diameter/width (including multiple outfall pipes in combination having a width of 18 inches, runoff flows must be measured or calculated, using a method acceptable to and approved by the State and Regional Water Boards.

   b. This will be reported annually for each precipitation season to the State and Regional Water Boards.

3. Runoff samples – storm events

   a. For outfalls equal to or greater than 18 inches (0.46m) in diameter or width:

      (1) samples of storm water runoff shall be collected during the same storm as receiving water samples and analyzed for oil and grease, total suspended solids,

and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

(2) samples of storm water runoff shall be collected and analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

(3) If an applicant has no outfall greater than 36 inches, then storm water runoff from the applicant's largest outfall shall be further collected during the same storm as receiving water samples and analyzed for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates).

b. For outfalls equal to or greater than 36 inches (0.91m) in diameter or width:

(1) samples of storm water runoff shall be collected during the same storm as receiving water samples and analyzed for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

(2) samples of storm water runoff shall be further collected during the same storm as receiving water samples and analyzed for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates); and

(3) samples of storm water runoff shall be collected and analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

c. For an applicant not participating in a regional monitoring program [see below in Section IV (B)] in addition to (a.) and (b.) above, a minimum of the two largest outfalls or 20 percent of the larger outfalls, whichever is greater, shall be sampled (flow weighted composite samples) at least three times annually during wet weather (storm event) and analyzed for all Ocean Plan Table A constituents, Table B constituents for marine aquatic life protection (except for toxicity, only chronic toxicity for three species shall be required), DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, and Ocean Plan indicator bacteria. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one (the largest) such discharge shall be sampled annually in each Region.

4. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may reduce or suspend core monitoring once the storm runoff is fully characterized. This determination may be made at any point after the discharge is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

B. Ocean Receiving Water and Reference Area Monitoring Program

In addition to performing the Core Discharge Monitoring Program in Section II.A above, all applicants having authorized discharges must perform ocean receiving water monitoring. In order to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS, dischargers may choose either (1) an individual monitoring program, or (2) participation in a regional integrated monitoring program.

1. Individual Monitoring Program: The requirements listed below are for those dischargers who elect to perform an individual monitoring program to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within the affected ASBS. In addition to Core Discharge Monitoring, the following additional monitoring requirements shall be met:

   a. Three times annually, during wet weather (storm events), the receiving water at the point of discharge from the outfalls described in section (IV)(A)(3)(c) above shall be sampled and analyzed for Ocean Plan Table A constituents, Table B constituents for marine aquatic life, DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, salinity, chronic toxicity (three species), and Ocean Plan indicator bacteria.

      The sample location for the ocean receiving water shall be in the surf zone at the point of discharges; this must be at the same location where storm water runoff is sampled. Receiving water shall be sampled prior to (pre-storm) and during (or immediately after) the same storm (post storm). Post storm sampling shall be during the same storm and at approximately the same time as when the runoff is sampled. Reference water quality shall also be sampled three times annually and analyzed for the same constituents pre-storm and post-storm, during the same storm seasons when receiving water is sampled. Reference stations will be determined by the State Water Board's Division of Water Quality and the applicable Regional Water Board(s).

   b. Sediment sampling shall occur at least three times during every five (5) year period. The subtidal sediment (sand or finer, if present) at the discharge shall be sampled and analyzed for Ocean Plan Table B constituents for marine aquatic life, DDT, PCBs, PAHs, pyrethroids, and OP pesticides. For sediment toxicity testing, only an acute toxicity test using the amphipod *Eohaustorius estuarius* must be performed.

   c. A quantitative survey of intertidal benthic marine life shall be performed at the discharge and at a reference site. The survey shall be performed at least once every five (5) year period. The survey design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The results of the survey shall be completed and submitted to the State Water Board and Regional Water Board at least six months prior to the end of the permit cycle.

   d. Once during each five (5) year period, a bioaccumulation study shall be conducted to determine the concentrations of metals and synthetic organic pollutants at representative discharge sites and at representative reference sites. The study design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The bioaccumulation study may include California mussels (*Mytilus californianus*) and/or sand crabs (*Emerita analoga* or *Blepharipoda occidentalis*). Based

on the study results, the Regional Water Board and the State Water Board's Division of Water Quality, may adjust the study design in subsequent permits, or add or modify additional test organisms (such as shore crabs or fish), or modify the study design appropriate for the area and best available sensitive measures of contaminant exposure.

e. Marine Debris: Representative quantitative observations for trash by type and source shall be performed along the coast of the ASBS within the influence of the discharger's outfalls. The design, including locations and frequency, of the marine debris observations is subject to approval by the Regional Water Board and State Water Board's Division of Water Quality.

f. The monitoring requirements of the Individual Monitoring Program in this section are minimum requirements. After a minimum of one (1) year of continuous water quality monitoring of the discharges and ocean receiving waters, the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may require additional monitoring, or adjust, reduce or suspend receiving water and reference station monitoring. This determination may be made at any point after the discharge and receiving water is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

2. Regional Integrated Monitoring Program: Dischargers may elect to participate in a regional integrated monitoring program, in lieu of an individual monitoring program, to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS. This regional approach shall characterize natural water quality, pre- and post-storm, in ocean reference areas near the mouths of identified open space watersheds and the effects of the discharges on natural water quality (physical, chemical, and toxicity) in the ASBS receiving waters, and should include benthic marine aquatic life and bioaccumulation components. The design of the ASBS stratum of a regional integrated monitoring program may deviate from the otherwise prescribed individual monitoring approach (in Section IV.B.1) if approved by the State Water Board's Division of Water Quality and the Regional Water Boards.

a. Ocean reference areas shall be located at the drainages of flowing watersheds with minimal development (in no instance more than 10% development), and shall not be located in CWA Section 303(d) listed waterbodies or have tributaries that are 303(d) listed. Reference areas shall be free of wastewater discharges and anthropogenic non- storm water runoff. A minimum of low threat storm runoff discharges (e.g. stream highway overpasses and campgrounds) may be allowed on a case-by-case basis. Reference areas shall be located in the same region as the ASBS receiving water monitoring occurs. The reference areas for each Region are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean reference water samples must be collected from each station, each from a separate storm during the same storm season that receiving water is sampled. A minimum of one reference location shall be sampled for each ASBS receiving water site sampled per responsible party. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

b. ASBS ocean receiving water must be sampled in the surf zone at the location where the runoff makes contact with ocean water (i.e. at "point zero"). Ocean receiving water

stations must be representative of worst-case discharge conditions (i.e. co-located at a large drain greater than 36 inches, or if drains greater than 36 inches are not present in the ASBS then the largest drain greater than18 inches.) Ocean receiving water stations are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean receiving water samples must be collected during each storm season from each station, each from a separate storm. A minimum of one receiving water location shall be sampled in each ASBS per responsible party in that ASBS. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

c. Reference and receiving water sampling shall commence during the first full storm season following the adoption of these special conditions, and post-storm samples shall be collected during the same storm event when storm water runoff is sampled. Sampling shall occur in a minimum of two storm seasons. For those ASBS dischargers that have already participated in the Southern California Bight 2008 ASBS regional monitoring effort, sampling may be limited to only one storm season.

d. Receiving water and reference samples shall be analyzed for the same constituents as storm water runoff samples. At a minimum, constituents to be sampled and analyzed in reference and discharge receiving waters must include oil and grease, total suspended solids, Ocean Plan Table B metals for protection of marine life, Ocean Plan PAHs, pyrethroids, OP pesticides, ammonia, nitrate, phosphates, and critical life stage chronic toxicity for three species. In addition, within the range of the southern sea otter, indicator bacteria or some other measure of fecal contamination shall be analyzed.

3. Waterfront and Marine Operations: In addition to the above requirements for ocean receiving water monitoring, additional monitoring must be performed for marinas and boat launch and pier facilities:

a. For all marina or mooring field operators, in mooring fields with 10 or more occupied moorings, the ocean receiving water must be sampled for Ocean Plan indicator bacteria, residual chlorine, copper, zinc, grease and oil, methylene blue active substances (MBAS), and ammonia nitrogen.

(1) For mooring field operators opting for an individual monitoring program (Section IV.B.1 above), this sampling must occur weekly (on the weekend) from May through October.

(2) For mooring field operators opting to participate in a regional integrated monitoring program (Section IV.B.2 above), this sampling must occur monthly from May through October on a high use weekend in each month. The Water Boards may allow a reduction in the frequency of sampling, through the regional monitoring program, after the first year of monitoring.

b. For all mooring field operators, the subtidal sediment (sand or finer, if present) within mooring fields and below piers shall be sampled and analyzed for Ocean Plan Table B metals (for marine aquatic life beneficial use), acute toxicity, PAHs, and tributyltin. For sediment toxicity testing, only an acute toxicity test using the amphipod *Eohaustorius*

estuarius must be performed. This sampling shall occur at least three times during a five (5) year period. For mooring field operators opting to participate in a regional integrated monitoring program, the Water Boards may allow a reduction in the frequency of sampling after the first sampling effort's results are assessed.

Glossary

At the point of discharge(s) – Means in the surf zone immediately where runoff from an outfall meets the ocean water (a.k.a., at point zero).

Areas of Special Biological Significance (ASBS) – Those areas designated by the State Water Board as ocean areas requiring protection of species or biological communities to the extent that alteration of natural water quality is undesirable. All Areas of Special Biological Significance are also classified as a subset of State Water Quality Protection Areas.

Design storm – For purposes of these Special Protections, a design storm is defined as the volume of runoff produced from one inch of precipitation per day or, if this definition is inconsistent with the discharger's applicable storm water permit, then the design storm shall be the definition included in the discharger's applicable storm water permit.

Development – Relevant to reference monitoring sites, means urban, industrial, agricultural, grazing, mining, and timber harvesting land uses.

Higher threat discharges - Permitted storm drains discharging equal to or greater than 18 inches, industrial storm drains, agricultural runoff discharged through an MS4, discharges associated with waterfront and marina operations (e.g., piers, launch ramps, mooring fields, and associated vessel support activities, except for passive discharges defined below), and direct discharges associated with commercial or industrial activities to ASBS.

Low Impact Development (LID) – A sustainable practice that benefits water supply and contributes to water quality protection. Unlike traditional storm water management, which entails collecting and conveying storm water runoff through storm drains, pipes, or other conveyances to a centralized storm water facility, LID focuses on using site design and storm water management to maintain the site's pre-development runoff rates and volumes. The goal of LID is to mimic a site's predevelopment hydrology by using design techniques that infiltrate, filter, store, evaporate, and detain runoff close to the source of rainfall.

Marine Operations – Marinas or mooring fields that contain slips or mooring locations for 10 or more vessels.

Management Measure (MM) - Economically achievable measures for the control of the addition of pollutants from various classes of nonpoint sources of pollution, which reflect the greatest degree of pollutant reduction achievable through the application of the best available nonpoint pollution control practices, technologies, processes, siting criteria, operating methods, or other alternatives. For example, in the "marinas and recreational boating" land- use category specified in the Plan for California's Nonpoint Source Pollution Control Program (NPS Program Plan) (SWRCB, 1999), "boat cleaning and maintenance" is considered a MM or the source of a specific class or type of NPS pollution.

Management Practice (MP) - The practices (e.g., structural, non-structural, operational, or other alternatives) that can be used either individually or in combination to address a

specific MM class or classes of NPS pollution. For example, for the "boat cleaning and maintenance" MM, specific MPs can include, but are not limited to, methods for the selection of environmentally sensitive hull paints or methods for cleaning/removal of hull copper anti- fouling paints.

Municipal Separate Storm Sewer System (MS4) – A municipally-owned storm sewer system regulated under the Phase I or Phase II storm water program implemented in compliance with Clean Water Act section 402(p). Note that an MS4 program's boundaries are not necessarily congruent with the permittee's political boundaries.

Natural Ocean Water Quality - The water quality (based on selected physical, chemical and biological characteristics) that is required to sustain marine ecosystems, and which is without apparent human influence, *i.e.*, an absence of significant amounts of: (a) man-made constituents (*e.g.,* DDT); (b) other chemical (*e.g.,* trace metals), physical (temperature/thermal pollution, sediment burial), and biological (*e.g.*, bacteria) constituents at concentrations that have been elevated due to man's activities above those resulting from the naturally occurring processes that affect the area in question; and (c) non-indigenous biota (*e.g.,* invasive algal bloom species) that have been introduced either deliberately or accidentally by man. Discharges "*shall not alter natural ocean water quality*" as determined by a comparison to the range of constituent concentrations in reference areas agreed upon via the regional monitoring program(s). If monitoring information indicates that *natural ocean water quality* is not maintained, but there is sufficient evidence that a discharge is not contributing to the alteration of natural water quality, then the Regional Water Board may make that determination. In this case, sufficient information must include runoff sample data that has equal or lower concentrations for the range of constituents at the applicable reference area(s).

Nonpoint source – Nonpoint pollution sources generally are sources that do not meet the definition of a point source. Nonpoint source pollution typically results from land runoff, precipitation, atmospheric deposition, agricultural drainage, marine/boating operations or hydrologic modification. Nonpoint sources, for purposes of these Special Protections, include discharges that are not required to be regulated under an NPDES permit.

Non-storm water discharge – Any runoff that is not the result of a precipitation event. This is often referred to as "dry weather flow."

Non-structural control – A Best Management Practice that involves operational, maintenance, regulatory (e.g., ordinances) or educational activities designed to reduce or eliminate pollutants in runoff, and that are not structural controls (i.e. there are no physical structures involved).

Physical impossibility - Means any act of God, war, fire, earthquake, windstorm, flood or natural catastrophe; unexpected and unintended accidents not caused by discharger or its employees' negligence; civil disturbance, vandalism, sabotage or terrorism; restrain by court order or public authority or agency; or action or non-action by, or inability to obtain the necessary authorizations or approvals from any governmental agency other than the permittee.

Representative sites and monitoring procedures – Are to be proposed by the discharger, with appropriate rationale, and subject to approval by Water Board staff.

Sheet-flow – Runoff that flows across land surfaces at a shallow depth relative to the cross- sectional width of the flow. These types of flow may or may not enter a storm drain system before discharge to receiving waters.

Storm Season – Also referred to as rainy season, means the months of the year from the onset of rainfall during autumn until the cessation of rainfall in the spring.

Structural control – A Best Management Practice that involves the installation of engineering solutions to the physical treatment or infiltration of runoff.

Surf Zone - The surf zone is defined as the submerged area between the breaking waves and the shoreline at any one time.

Surface Water Ambient Monitoring Program (SWAMP) comparable – Means that the monitoring program must 1) meet or exceed 2008 SWAMP Quality Assurance Program Management Plan (QAPP) Measurement Quality Objectives, or 2) have a Quality Assurance Project Plan that has been approved by SWAMP; in addition data must be formatted to match the database requirements of the SWAMP Information Management System. Adherence to the measurement quality objectives in the Southern California Bight 2008 ASBS Regional Monitoring Program QAPP and data base management comprises being SWAMP comparable.

Waterfront Operations - Piers, launch ramps, and cleaning stations in the water or on the adjacent shoreline.

Attachment 1
Special Protections Sections I(A)(3)(e) and I(B)(3)(e)
Flowchart to Deteremine Compliance with natural Water Quality

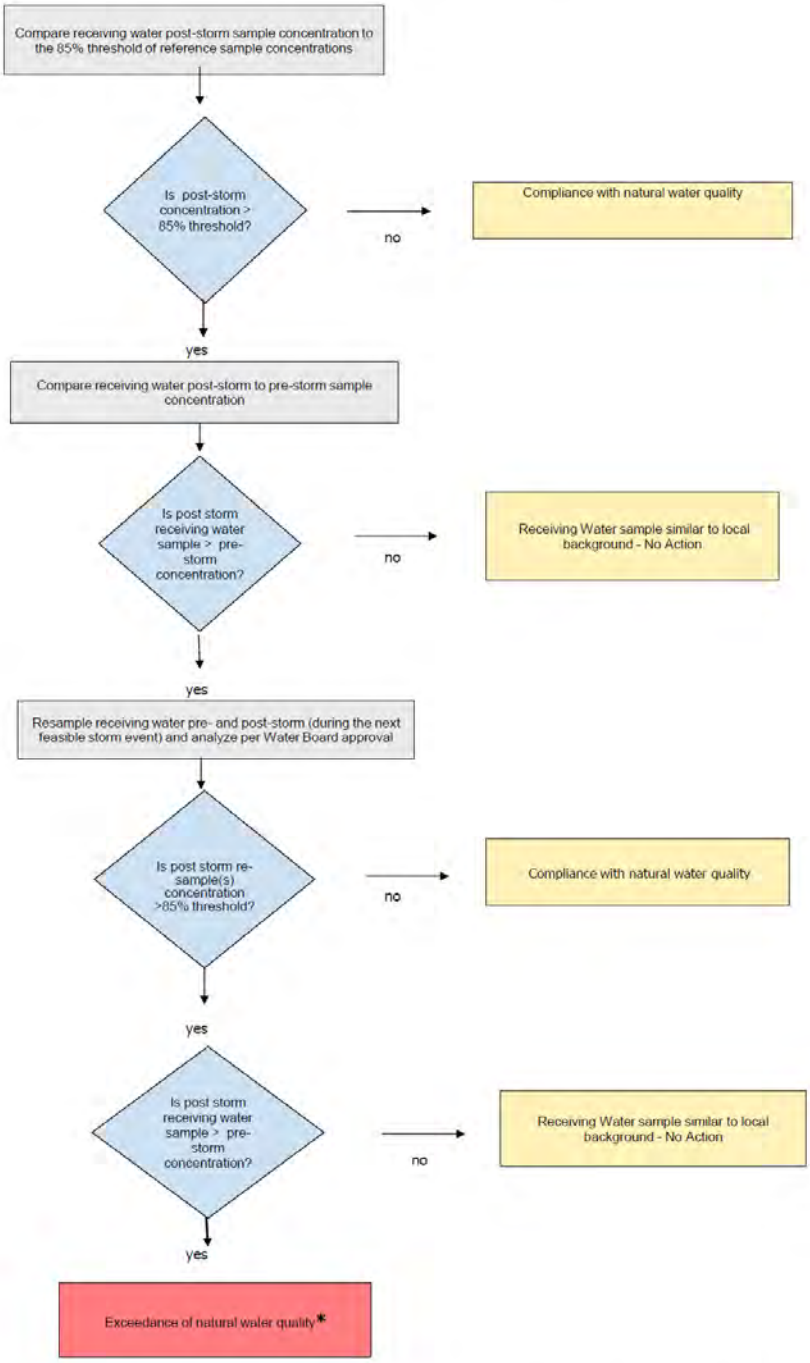

*** When an exceedance of natural water quality occurs, the discharger must comply with section I.A.2.h (for permitted storm water) or section I.B.2.c (for nonpoint sources). Note, when sampling data is available, end-of-pipe effluent concentrations will be considered by the Water Boards in making this determination.**

ATTACHMENT B

STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

1. Standard Permit Provisions

Code of Federal Regulations Title 40 Section 122.41 (40 CFR 122.41) includes conditions, or provisions, that apply to all National Pollutant Discharge Elimination System (NPDES) permits. Additional provisions applicable to NPDES permits are in 40 CFR 122.42. All applicable provisions in 40 CFR 122.41 and 40 CFR 122.42 must be incorporated into this Order and NPDES permit. The applicable 40 CFR 122.41 and 40 CFR 122.42 provisions are as follows:

a. DUTY TO COMPLY [40 CFR 122.41(a)]

The Copermittee must comply with all of the provisions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

(1) The Copermittee must comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement. [40 CFR 122.41(a)(1)]

(2) The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to a civil penalty not to exceed $25,000 per day for each violation. The CWA provides that any person who *negligently* violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than 2 years, or both. Any person who *knowingly* violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both. Any person who knowingly violates Section 301, 302, 303, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, and who knows at that time that he thereby places another person in imminent danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of

not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.
[40 CFR 122.41(a)(2)]

(3) Any person may be assessed an administrative penalty by the San Diego Regional Water Quality Control Board (San Diego Water Board), State Water Resources Control Board (State Water Board), or United States Environmental Protection Agency (USEPA) for violating Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.
[40 CFR 122.41(a)(3)]

b. DUTY TO REAPPLY [40 CFR 122.41(b)]

If a Copermittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Copermittee must apply for and obtain a new permit.

c. NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE [40 CFR 122.41(c)]

It shall not be a defense for a Copermittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

d. DUTY TO MITIGATE [40 CFR 122.41(d)]

The Copermittee must take all reasonable steps to minimize or prevent any discharge or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

e. PROPER OPERATION AND MAINTENANCE [40 CFR 122.41(e)]

The Copermittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Copermittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by a Copermittee only when the operation is necessary to achieve compliance with the conditions of this permit.

f. PERMIT ACTIONS [40 CFR 122.41(f)]

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Copermittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

g. PROPERTY RIGHTS [40 CFR 122.41(g)]

This permit does not convey any property rights of any sort, or any exclusive privilege.

h. DUTY TO PROVIDE INFORMATION [40 CFR 122.41(h)]

The Copermittee must furnish to the San Diego Water Board, State Water Board, or USEPA within a reasonable time, any information which the San Diego Water Board, State Water Board, or USPEA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Copermittee must also furnish to the San Diego Water Board, State Water Board, or USPEA upon request, copies of records required to be kept by this permit.

i. INSPECTION AND ENTRY [40 CFR 122.41(i)]

The Copermittee must allow the San Diego Water Board, State Water Board, USEPA, and/or their authorized representative (including an authorized contractor acting as their representative), upon presentation of credentials and other documents as may be required by law, to:

(1) Enter upon the Copermittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit; [40 CFR 122.41(i)(1)]

(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit; [40 CFR 122.41(i)(2)]

(3) Inspect and photograph at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; [40 CFR 122.41(i)(3)] and

(4) Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location. [40 CFR 122.41(i)(4)]

j. MONITORING AND RECORDS [40 CFR 122.41(j)]

(1) Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity. [40 CFR 122.41(j)(1)]

(2) Except for records of monitoring information required by this permit related to the Copermittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five (5) years (or longer as required by 40 CFR Part 503), the

Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time. [40 CFR 122.41(j)(2)]

(3) Records for monitoring information must include: [40 CFR 122.41(j)(3)]

(a) The date, exact place, and time of sampling or measurements; [40 CFR 122.41(j)(3)(i)]
(b) The individual(s) who performed the sampling or measurements; [40 CFR 122.41(j)(3)(ii)]
(c) The date(s) analyses were performed; [40 CFR 122.41(j)(3)(iii)]
(d) The individual(s) who performed the analyses; [40 CFR 122.41(j)(3)(iv)]
(e) The analytical techniques or methods used; [40 CFR 122.41(j)(3)(v)] and
(f) The results of such analyses. [40 CFR 122.41(j)(3)(vi)]

(4) Monitoring must be conducted according to test procedures under 40 CFR Part 136 unless another method is required under 40 CFR Subchapters N or O. [40 CFR 122.41(j)(4)]

In the case of pollutants for which there are no approved methods under 40 CFR Part 136 or otherwise required under 40 CFR Subchapters N and O, monitoring must be conducted according to a test procedure specified in the permit for such pollutants. [40 CFR 122.44(i)(1)(iv)]

(5) The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. [40 CFR 122.41(j)(5)]

k. SIGNATORY REQUIREMENT [40 CFR 122.41(k)]

(1) All applications, reports, or information submitted to the San Diego Water Board, State Water Board, or USEPA must be signed and certified. (See 40 CFR 122.22) [40 CFR 122.41(k)(1)]

(a) *For a municipality, State, Federal, or other public agency.* [All applications must be signed] by either a principal executive officer or ranking elected official. [40 CFR 122.22(a)(3)]

(b) All reports required by permits, and other information requested by the San Diego Water Board, State Water Board, or USEPA must be signed by a person described in paragraph (a) of this section, or by a duly authorized representative of that person. A person is a duly authorized representative only if: [40 CFR 122.22(b)]

(i) The authorization is made in writing by a person described in paragraph (a) of this section; [40 CFR 122.22(b)(1)]

(ii) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company, (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) [40 CFR 122.22(b)(2)] and,

(iii) The written authorization is submitted to the San Diego Water Board and State Water Board. [40 CFR 122.22(b)(3)]

(c) *Changes to authorization.* If an authorization under paragraph (b) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (b) of this section must be submitted to the San Diego Water Board prior to or together with any reports, information, or applications to be signed by an authorized representative. [40 CFR 122.22(c)]

(d) *Certification.* Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." [40 CFR 122.22(d)]

(2) The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both. [40 CFR 122.41(k)(2)]

I. REPORTING REQUIREMENTS [40 CFR 122.41(l)]

(1) *Planned changes.* The Copermittee must give notice to the San Diego Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when: [40 CFR 122.41(l)(1)]

(a) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); [40 CFR 122.41(l)(1)(i)] or

(b) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which

are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1).
[40 CFR 122.41(l)(1)(ii)]

(c) The alteration or addition results in a significant change in the Copermittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. [40 CFR 122.41(l)(1)(iii)]

(2) *Anticipated noncompliance*. The Copermittee must give advance notice to the San Diego Water Board or State Water Board of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.
[40 CFR 122.41(l)(2)]

(3) *Transfers*. This permit is not transferable to any person except after notice to the San Diego Water Board. The San Diego Water Board may require modification or revocation and reissuance of the permit to change the name of the Copermittee and incorporate such other requirements as may be necessary under the CWA.
[40 CFR 122.41(l)(3)]

(4) *Monitoring reports.* Monitoring results must be reported at the intervals specified elsewhere in this permit. [40 CFR 122.41(l)(4)]

(a) Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the San Diego Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices. [40 CFR 122.41(l)(4)(i)]

(b) If the Copermittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or another method required for an industry-specific waste stream under 40 CFR Subchapters N or O, the results of this monitoring must be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the San Diego Water Board or State Water Board.
[40 CFR 122.41(l)(4)(ii)]

(c) Calculations for all limitations which require averaging of measurements must utilize an arithmetic mean unless otherwise specified in the permit.
[40 CFR 122.41(l)(4)(iii)]

(5) *Compliance schedules*. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date. [40 CFR 122.41(l)(5)]

(6) *Twenty-four hour reporting.*

(a) The Copermittee must report any noncompliance that may endanger health or the environment. Any information must be provided orally within 24 hours from the time the Copermittee becomes aware of the circumstances. A written submission must also be provided within five (5) days of the time the Copermittee becomes aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6)(i)]

(b) The following must be included as information which must be reported within 24 hours under this paragraph: [40 CFR 122.41(l)(6)(ii)]

(i) Any unanticipated bypass that exceeds any effluent limitation in the permit (See 40 CFR 122.41(g)). [40 CFR 122.41(l)(6)(ii)(A)]
(ii) Any upset which exceeds any effluent limitation in the permit. [40 CFR 122.41(l)(6)(ii)(B)] and,
(iii) Violation of a maximum daily discharge limitation for any of the pollutants listed by the San Diego Water Board in the permit to be reported within 24 hours. (See 40 CFR 122.44(g)) [40 CFR 122.41(l)(6)(ii)(C)]

(c) The San Diego Water Board may waive the above-required written report on a case-by-case basis if the oral report has been received within 24 hours. [40 CFR 122.41(l)(6)(iii)]

(7) *Other noncompliance.* The Copermittee must report all instances of noncompliance not reported in accordance with the standard provisions required under 40 CFR 122.41(l)(4), (5), and (6), at the time monitoring reports are submitted. The reports must contain the information listed in the standard provisions required under 40 CFR 122.41(l)(6). [40 CFR 122.41(l)(7))]

(8) *Other information.* When the Copermittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the San Diego Water Board, State Water Board, or USEPA, the Copermittee must promptly submit such facts or information. [40 CFR 122.41(l)(8)]

m. BYPASS [40 CFR 122.41(m)]

(1) *Definitions.*

(a) "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. [40 CFR 122.41(m)(1)(i)] or

(b) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be

expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
[40 CFR 122.41(m)(1)(ii)]

(2) *Bypass not exceeding limitations*. The Copermittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the standard provisions required under 40 CFR 122.41(m)(3) and (4).
[40 CFR 122.41(m)(2)]

(3) *Notice.*

(a) *Anticipated bypass*. If the Copermittee knows in advance of the need for a bypass, it must submit a notice, if possible at least ten days before the date of the bypass. [40 CFR 122.41(m)(3)(i)] or

(b) *Unanticipated bypass*. The Copermittee must submit notice of an unanticipated bypass in accordance with the standard provisions required under 40 CFR 122.41(l)(6) (24-hour notice).
[40 CFR 122.41(m)(3)(ii)]

(4) *Prohibition of Bypass.*

(a) Bypass is prohibited, and the San Diego Water Board may take enforcement action against a Copermittee for bypass, unless:
[40 CFR 122.41(m)(4)(i)]

(i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; [40 CFR 122.41(m)(4)(i)(A)]
(ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance;
[40 CFR 122.41(m)(4)(i)(B)] and,
(iii) The Copermittee submitted notice in accordance with the standard provisions required under 40 CFR 122.41(m)(3).
[40 CFR 122.41(m)(4)(i)(C)]

(b) The San Diego Water Board may approve an anticipated bypass, after considering its adverse effects, if the San Diego Water Board determines that it will meet the three conditions listed above.
[40 CFR 122.41(m)(4)(ii)]

n. UPSET [40 CFR 122.41(n)]

(1) *Definition.* "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Copermittee. An upset does not

include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. [40 CFR 122.41(n)(1)]

(2) *Effect of an upset*. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the standard provisions required under 40 CFR 122.41(n)(3) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. [40 CFR 122.41(n)(2)]

(3) *Conditions necessary for a demonstration of upset*. A Copermittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that: [40 CFR 122.41(n)(3)]

(a) An upset occurred and that the Copermittee can identify the cause(s) of the upset; [40 CFR 122.41(n)(3)(i)]
(b) The permitted facility was at the time being properly operated; [40 CFR 122.41(n)(3)(ii)] and
(c) The Copermittee submitted notice of the upset in accordance with the standard provisions required under 40 CFR 122.41(l)(6)(ii)(B) (24-hour notice). [40 CFR 122.41(n)(3)(iii)]
(d) The Copermittee complied with any remedial measures pursuant to the standard provisions required under 40 CFR 122.41(d). [40 CFR 122.41(n)(3)(iii)]

(4) *Burden of proof*. In any enforcement proceeding, the Copermittee seeking to establish the occurrence of an upset has the burden of proof. [40 CFR 122.41(n)(4)]

o. STANDARD PERMIT PROVISIONS FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS [40 CFR 122.42(c)]

The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the San Diego Water Board or State Water Board under 40 CFR 122.26(a)(1)(v) must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report must include:

(1) The status of implementing the components of the storm water management program that are established as permit conditions; [40 CFR 122.42(c)(1)]

(2) Proposed changes to the storm water management programs that are established as permit conditions. Such proposed changes must be consistent with 40 CFR 122.26(d)(2)(iii); [40 CFR 122.42(c)(2)] and

(3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under 40 CFR 122.26(d)(2)(iv) and (v); [40 CFR 122.42(c)(3)]

(4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; [40 CFR 122.42(c)(4)]

(5) Annual expenditures and budget for year following each annual report; [40 CFR 122.42(c)(5)]

(6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; [40 CFR 122.42(c)(6)]

(7) Identification of water quality improvements or degradation. [40 CFR 122.42(c)(7)]

p. STANDARD PERMIT PROVISIONS FOR STORM WATER DISCHARGES [40 CFR 122.42(d)]

The initial permits for discharges composed entirely of storm water issued pursuant to 40 CFR 122.26(e)(7) must require compliance with the conditions of the permit as expeditiously as practicable, but in no event later than three years after the date of issuance of the permit.

2. General Provisions

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. The general provisions applicable to this Order and NPDES permit are as follows:

a. DISCHARGE OF WASTE IS A PRIVILEGE

No discharge of waste into the waters of the State, whether or not such discharge is made pursuant to waste discharge requirements, shall create a vested right to continue such discharge. All discharges of waste into waters of the State are privileges, not rights. [CWC Section 13263(g)]

b. DURATION OF ORDER AND NPDES PERMIT

(1) *Effective date*. This Order supersedes Order No. R9-2007-0001 for the San Diego County Copermittees listed in Table 2.a and became effective on June 27, 2013 for those Copermittees. This Order as amended by Order R9-2015-0001supersedes Order No. R9-2009-0002 and becomes effective April 1, 2015, following the date Order No. R9-2015-0001 is adopted. This Order supersedes Order No. R9-2010-0016 upon further amendment or earlier notice of coverage.

(2) *Expiration*. This Order and NPDES permit expires five years after its effective date. [40 CFR 122.46(a)]

(3) *Continuation of expired order*. After this Order and NPDES permit expires, the terms and conditions of this Order and NPDES permit are automatically continued pending issuance of a new permit if all requirements of the federal NPDES regulations on the continuation of expired permits (40 CFR 122.6) are complied with.

c. AVAILABILITY

A copy of this Order must be kept at a readily accessible location and must be available to on-site personnel at all times.

d. CONFIDENTIALITY OF INFORMATION

Except as provided for in 40 CFR 122.7, no information or documents submitted in accordance with or in application for this Order will be considered confidential, and all such information and documents shall be available for review by the public at the San Diego Water Board office.

Claims of confidentiality for the following information will be denied:
[40 CFR 122.7(b)]

(1) The name and address of any permit applicant or Copermittee; [40 CFR 122.7(b)(1)] and

(2) Permit applications and attachments, permits, and effluent data. [40 CFR 122.7(b)(2)]

e. EFFLUENT LIMITATIONS

(1) *Interim effluent limitations*. The Copermittee must comply with any interim effluent limitations as established by addendum, enforcement action, or revised waste discharge requirements which have been, or may be, adopted by the San Diego Water Board.

(2) *Other effluent limitations and standards*. If any applicable toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant and that standard or prohibition is more stringent than any limitation on the pollutant in the permit, the San Diego Water Board shall institute proceedings under these regulations to modify or revoke and reissue the permit to conform to the toxic effluent standard or prohibition. [40 CFR 122.44(b)(1)]

f. DUTY TO MINIMIZE OR CORRECT ADVERSE IMPACTS

The Copermittee must take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this Order, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the noncompliance.

g. PERMIT ACTIONS

The filing of a request by the Copermittee for modification, revocation and reissuance, or termination of this Order, or a notification of planned change in or anticipated noncompliance with this Order does not stay any condition of this Order. (See 40 CFR 122.41(f)) In addition, the following provisions apply to this Order:

(1) Upon application by any affected person, or on its own motion, the San Diego Water

Board may review and revise the requirements in this Order. All requirements must be reviewed periodically. [CWC Section 13263(e)]

(2) This Order may be terminated or modified for cause, including, but not limited to, all of the following: [CWC Section 13381]

(a) Violation of any condition contained in the requirements of this Order. [CWC Section 13381(a)]

(b) Obtaining the requirements in this Order by misrepresentation, or failure to disclose fully all relevant facts. [CWC Section 13381(b)]

(c) A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge. [CWC Section 13381(c)]

(3) When this Order is transferred to a new owner or operator, such requirements as may be necessary under the CWC may be incorporated into this Order.

h. NPDES PERMITTED NON-STORM WATER DISCHARGES

The San Diego Water Board has, in prior years, issued a limited number of individual NPDES permits for non-storm water discharges to MS4s. The San Diego Water Board or State Water Board may in the future, upon prior notice to the Copermittee(s), issue an NPDES permit for any non-storm water discharge (or class of non-storm water discharges) to an MS4.

i. MONITORING

In addition to the standard provisions required under 40 CFR 122.41(j) and (l)(4), the following general monitoring provisions apply to this Order:

(1) Where procedures are not otherwise specified in Order, sampling, analysis and quality assurance/quality control must be conducted in accordance with the Quality Assurance Management Plan (QAMP) for the State of California's Surface Water Ambient Monitoring Program (SWAMP), adopted by the State Water Resources Control Board (State Water Board).

(2) Pursuant to 40 CFR 122.41(j)(2) and CWC Section 13383(a), each Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five (5) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time.

(3) All chemical, bacteriological, and toxicity analyses must be conducted at a laboratory certified for such analyses by the California Department of Public Health or a laboratory approved by the San Diego Water Board.

(4) For priority toxic pollutants that are identified in the California Toxics Rule (CTR) (65

Fed. Reg. 31682), the Copermittees must instruct their laboratories to establish calibration standards that are equivalent to or lower than the Minimum Levels (MLs) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP). If a Copermittee can demonstrate that a particular ML is not attainable, in accordance with procedures set forth in 40 CFR Part 136, the lowest quantifiable concentration of the lowest calibration standard analyzed by a specific analytical procedure (assuming that all the method specified sample weights, volumes, and processing steps have been followed) may be used instead of the ML listed in Appendix 4 of the SIP. The Copermittee must submit documentation from the laboratory to the San Diego Water Board for approval prior to raising the ML for any priority toxic pollutant.

j. ENFORCEMENT

(1) The San Diego Water Board is authorized to enforce the terms of this Order under several provisions of the CWC, including, but not limited to, CWC Sections 13385, 13386, and 13387.

(2) Nothing in this Order shall be construed to protect the Copermittee from its liabilities under federal, state, or local laws.

(3) The CWC provides for civil and criminal penalties comparable to, and in some cases greater than, those provided for under the CWA.

(4) Except as provided in the standard conditions required under 40 CFR 122.41(m) and (n), nothing in this Order shall be construed to relieve the Copermittee from civil or criminal penalties for noncompliance.

(5) Nothing in this Order shall be construed to preclude the institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties to which the Copermittee is or may be subject to under Section 311 of the CWA.

(6) Nothing in this Order shall be construed to preclude institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authoring preserved by Section 510 of the CWA.

k. SEVERABILITY

The provisions of this Order are severable, and if any provision of this Order, or the application of any provisions of this Order to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this Order shall not be affected thereby.

l. APPLICATIONS

Any application submitted by a Copermittee for reissuance or modification of this Order must satisfy all applicable requirements specified in federal regulations as well as any additional requirements for submittal of a Report of Waste Discharge specified in the CWC and the California Code of Regulations.

m. IMPLEMENTATION

All plans, reports and subsequent amendments submitted in compliance with this Order must be implemented immediately (or as otherwise specified). All submittals by Copermittees must be adequate to implement the requirements of this Order.

n. REPORT SUBMITTALS

(1) All report submittals must include an executive summary, introduction, conclusion, recommendations, and signed certified statement.

(2) Each Copermittee must submit a signed certified statement covering its responsibilities for each applicable submittal.

(3) The Principal Watershed Copermittee(s) must submit a signed certified statement covering its responsibilities for each applicable submittal and the sections of the submittals for which it is responsible.

(4) Unless otherwise directed, the Copermittees must submit one hard copy and one electronic copy of each report required under this Order to the San Diego Water Board, and one electronic copy to the USEPA.

(5) The Copermittees must submit reports and provide notifications as required by this Order to the following:

EXECUTIVE OFFICER
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
2375 NORTHSIDE DRIVE, SUITE 100
SAN DIEGO CA 92108
Telephone: (619) 516-1990 Fax: (619) 516-1994

EUGENE BROMLEY
US ENVIRONMENTAL PROTECTION AGENCY
REGION IX
PERMITS ISSUANCE SECTION (W-5-1)
75 HAWTHORNE STREET
SAN FRANCISCO CA 94105

ATTACHMENT C

ACRONYMS AND ABBREVIATIONS

AMAL	Average Monthly Action Level
ASBS	Area(s) of Special Biological Significance
BMP	Best Management Practice
Basin Plan	Water Quality Control Plan for the San Diego Basin
CEQA	California Environmental Quality Act
CCR	California Code of Regulations
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWC	California Water Code
CZARA	Coastal Zone Act Reauthorization Amendments of 1990
ESAs	Environmentally Sensitive Areas
GIS	Geographic Information System
IBI	Index of Biological Integrity
LID	Low Impact Development
MDAL	Maximum Daily Action Level
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
NAL	Non-Storm Water Action Level
NAICS	North American Industry Classification System
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
ROWD	Report of Waste Discharge (application for NPDES reissuance)
SAL	Storm Water Action Level
San Diego Water Board	California Regional Water Quality Control Board, San Diego Region
SIC	Standard Industrial Classification Code
State Water Board	State Water Resources Control Board
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
WDID	Waste Discharge Identification Number
WLA	Waste Load Allocation
WQBEL	Water Quality Based Effluent Limitation

DEFINITIONS

Active/Passive Sediment Treatment - Using mechanical, electrical or chemical means to flocculate or coagulate suspended sediment for removal from runoff from construction sites prior to discharge.

Anthropogenic Litter – Trash generated from human activities, not including sediment.

Average Monthly Action Level – The highest allowable average of daily discharges over a calendar month.

Beneficial Uses - The uses of water necessary for the survival or wellbeing of man, plants, and wildlife. These uses of water serve to promote tangible and intangible economic, social, and environmental goals. "Beneficial Uses" of the waters of the State that may be protected include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. Existing beneficial uses are uses that were attained in the surface or ground water on or after November 28, 1975; and potential beneficial uses are uses that would probably develop in future years through the implementation of various control measures. "Beneficial Uses" are equivalent to "Designated Uses" under federal law. [California Water Code Section 13050(f)].

Best Management Practices (BMPs) - Defined in 40 CFR 122.2 as schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Bioassessment - The use of biological community information to evaluate the biological integrity of a water body and its watershed. With respect to aquatic ecosystems, bioassessment is the collection and analysis of samples of the benthic macroinvertebrate community together with physical/habitat quality measurements associated with the sampling site and the watershed to evaluate the biological condition (i.e. biotic integrity) of a water body.

Biofiltration - Practices that use vegetation and amended soils to detain and treat runoff from impervious areas. Treatment is through filtration, infiltration, adsorption, ion exchange, and biological uptake of pollutants.

Biological Integrity - Defined in Karr J.R. and D.R. Dudley. 1981. Ecological perspective on water quality goals. *Environmental Management* 5:55-68 as: "A balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitat of the region." Also referred to as ecosystem health.

BMP Design Manual – A plan developed to eliminate, reduce, or mitigate the impacts of runoff from development projects, including Priority Development Projects.

Chronic Toxicity – A measurement of sublethal effect (e.g. reduced growth, reproduction) to experimental test organisms exposed to an effluent or receiving waters compared to that of the control organisms.

Clean Water Act Section 303(d) Water Body - An impaired water body in which water quality does not meet applicable water quality standards and/or is not expected to meet water quality standards, even after the application of technology based pollution controls required by the CWA. The discharge of runoff to these water bodies by the Copermittees is significant because these discharges can cause or contribute to violations of applicable water quality standards.

Construction Site – Any project, including projects requiring coverage under the Construction General Permit, that involves soil disturbing activities including, but not limited to, clearing, grading, disturbances to ground such as stockpiling, and excavation.

Contamination - As defined in the Porter-Cologne Water Quality Control Act, contamination is "an impairment of the quality of waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste whether or not waters of the State are affected."

Copermittee – A permittee to a NPDES permit that is only responsible for permit conditions relating to the discharge for which it is operator [40 CFR 122.26(b)(1)]. For the purposes of this Order, a Copermittee is one of the individual permittees identified in Tables 1a-1c of this Order.

Copermittees – All of the individual Copermittees, collectively.

Critical Channel Flow (Qc) – The channel flow that produces the critical shear stress that initiates bed movement or that erodes the toe of channel banks. When measuring Qc, it should be based on the weakest boundary material – either bed or bank.

Daily Discharge – Defined as either: (1) the total mass of the constituent discharged over the calendar day or any 24 hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g. concentration.)

The Daily Discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day, or other 24 hour period other than a day), or by the arithmetic mean of analytical results from one or more grab samples taken over the course of a day.

Development Projects - Construction, rehabilitation, redevelopment, or reconstruction of any public or private projects.

Dry Season –May 1 to September 30.

Dry Weather – Weather is considered dry if the preceding 72 hours has been without measurable precipitation (>0.1 inch).

Enclosed Bays – Enclosed bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost bay works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays do not include inland surface waters or ocean waters.

Erosion – When land is diminished or worn away due to wind, water, or glacial ice. Often the eroded debris (silt or sediment) becomes a pollutant via storm water runoff. Erosion occurs naturally but can be intensified by land clearing activities such as farming, development, road building, and timber harvesting.

Environmentally Sensitive Areas (ESAs) - Areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; areas designated as preserves or their equivalent under the Natural Communities Conservation Program within the Cities and County of Orange; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.

Estuaries – Waters, including coastal lagoons, located at the mouth of streams that serve as areas of mixing fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and ocean water. Estuaries do not include inland surface waters or ocean waters.

Existing Development – Any area that has been developed and exists for municipal, commercial, industrial, or residential purposes, uses, or activities. May include areas that are not actively used for its originally developed purpose, but may be re-purposed or redeveloped for another use or activity.

Flow Duration – The long-term period of time that flows occur above a threshold that causes significant sediment transport and may cause excessive erosion damage to creeks and streams (not a single storm event duration). The simplest way to visualize this is to consider a histogram of pre- and post-project flows using long-term records of hourly data. To maintain pre-development flow duration means that the total number of hours (counts) within each range of flows in a flow-duration histogram cannot increase between the pre- and post-development condition. Flow duration within the range of geomorphologically significant flows is important for managing erosion.

Grading - The cutting and/or filling of the land surface to a desired slope or elevation.

Groundwater – Subsurface water that occurs beneath the water table in soils and geologic formations that are fully saturated.

Hazardous Material – Any substance that poses a threat to human health or the environment due to its toxicity, corrosiveness, ignitability, explosive nature or chemical reactivity. These also include materials named by the USEPA in 40 CFR 116 to be reported if a designated quantity of the material is spilled into the waters of the U.S. or emitted into the environment.

Hazardous Waste - Hazardous waste is defined as “any waste which, under Section 600 of Title 22 of this code, is required to be managed according to Chapter 30 of Division 4.5 of Title 22 of this code” [CCR Title 22, Division 4.5, Chapter 11, Article 1].

Household Hazardous Waste – Paints, cleaning products, and other hazardous wastes generated during home improvement or maintenance activities.

Hydromodification – The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

Illicit Connection – Any man-made conveyance or drainage system through which a non-storm water discharge to the storm water drainage system occurs or may occur. Any connection to the MS4 that conveys an illicit discharge.

Illicit Discharge - Any discharge to the MS4 that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from firefighting activities [40 CFR 122.26(b)(2)].

Inactive Areas – Areas of construction activity that are not active and those that have been active and are not scheduled to be re-disturbed for at least 14 days.

Infiltration – In the context of low impact development, infiltration is defined as the percolation of water into the ground. Infiltration is often expressed as a rate (inches per hour), which is determined through an infiltration test. In the context of non-storm water, infiltration is water other than wastewater that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow [40 CFR 35.2005(20)].

Inland Surface Waters – Includes all surface waters of the State that do not include the ocean, enclosed bays, or estuaries.

Jurisdictional Runoff Management Program Document – A written description of the specific jurisdictional runoff management measures and programs that each Copermittee will implement to comply with this Order and ensure that storm water pollutant discharges in runoff are reduced to the MEP and do not cause or contribute to a violation of water quality standards.

Low Impact Development (LID) – A storm water management and land development strategy that emphasizes conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions.

Low Impact Development Best Management Practices (LID BMPs) – LID BMPs include schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States through storm water management and land development strategies that emphasize conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions. LID BMPs include retention practices that do not allow runoff, such as infiltration, rain water harvesting and reuse, and evapotranspiration. LID BMPs also include flow-through practices such as biofiltration that may have some discharge of storm water following pollutant reduction.

Major Outfall – As defined in the Code of Federal Regulations, a major outfall is a MS4 outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (i.e. discharge from a single conveyance other than a circular pipe which is associated with a drainage area of more than 50 acres); or, for MS4s that receive storm water from lands zoned for industrial activity (based on comprehensive zoning plans or equivalent), a MS4 outfall that discharges from a single pipe with an inside diameter of 12 inches or more or from its equivalent (i.e. discharge from other than a circular pipe associated with a drainage area of 2 acres or more).

Maximum Daily Action Level (MDAL) –The highest allowable daily discharge of a pollutant, over a calendar day (or 24 hour period). For pollutants with action levels expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with action levels expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

Maximum Extent Practicable (MEP) – The technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) for storm water that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) in combination with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than BAT. A definition for MEP is not provided either in the statute or in the regulations. Instead the definition of MEP is dynamic and will be defined by the following process over time: municipalities propose their definition of MEP by way of their runoff management programs. Their total collective and individual activities conducted pursuant to the runoff management programs becomes their proposal for MEP as it applies both to their overall effort, as well as to specific activities (e.g., MEP for street sweeping, or MEP for MS4 maintenance). In the absence of a proposal acceptable to the San Diego Water Board, the San Diego Water Board defines MEP.

In a memo dated February 11, 1993, entitled "Definition of Maximum Extent Practicable," Elizabeth Jennings, Senior Staff Counsel, SWRCB addressed the achievement of the MEP standard as follows:

> "*To achieve the MEP standard, municipalities must employ whatever Best Management Practices (BMPs) are technically feasible (i.e., are likely to be effective) and are not cost prohibitive. The major emphasis is on technical feasibility. Reducing pollutants to the MEP means choosing effective BMPs, and rejecting applicable BMPs only where other effective BMPs will serve the same purpose, or the BMPs would not be technically feasible, or the cost would be prohibitive. In selecting BMPs to achieve the MEP standard, the following factors may be useful to consider:*
>
> *a. Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?*
> *b. Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?*
> *c. Public Acceptance: Does the BMP have public support?*
> *d. Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?*
> *e. Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc.?*

The final determination regarding whether a municipality has reduced pollutants to the maximum extent practicable can only be made by the Regional or State Water Boards, and not by the municipal discharger. If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit derived, it would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs that would address a pollutant source, or to pick a BMP based solely on cost, which would be clearly less effective. In selecting BMPs the municipality must make a serious attempt to comply and practical solutions may not be lightly rejected. In any case, the burden would be on the municipal discharger to show compliance with its permit. After selecting a menu of BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented."

Monitoring Year – October 1 to September 30

Municipal Separate Storm Sewer System (MS4) – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designated or used for collecting or conveying storm water; (iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.26.

National Pollutant Discharge Elimination System (NPDES) - The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the CWA.

Non-Storm Water - All discharges to and from a MS4 that do not originate from precipitation events (i.e., all discharges from a MS4 other than storm water). Non-storm water includes illicit discharges and NPDES permitted discharges.

Nuisance - As defined in the Porter-Cologne Water Quality Control Act, a nuisance is "anything which meets all of the following requirements: 1) Is injurious to health, or is indecent, or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. 2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. 3) Occurs during, or as a result of, the treatment or disposal of wastes."

Ocean Waters – The territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the State Board's California Ocean Plan.

Order – Unless otherwise specified, refers to this Order, Order No. R9-2013-0001 (NPDES No. CAS0109266)

Outfall - Outfall means a point source as defined by 40 CFR 122.2 at the point where a municipal separate storm sewer discharges to waters of the US and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels or other conveyances which connect segments of the same stream or other waters of the US and are used to convey waters of the US.

Persistent Flow - Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

Person - A person is defined as an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof [40 CFR 122.2].

Point Source - Any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, landfill leachate collection systems, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

Pollutant - Any agent that may cause or contribute to the degradation of water quality such that a condition of pollution or contamination is created or aggravated.

Pollution - As defined in the Porter-Cologne Water Quality Control Act, pollution is "the alteration of the quality of the waters of the State by waste, to a degree which unreasonably affects either of the following: 1) The waters for beneficial uses; or 2) Facilities that serve these beneficial uses." Pollution may include contamination.

Pollution Prevention - Pollution prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control BMPs, treatment control BMPs, or disposal.

Pre-Development Runoff Conditions – Approximate flow rates and durations that exist or existed onsite before land development occurs. For new development projects, this equates to runoff conditions immediately before project construction. For redevelopment projects, this equates to runoff conditions from the project footprint assuming infiltration characteristics of the underlying soil, and existing grade. Runoff coefficients of concrete or asphalt must not be used. A redevelopment Priority Development Project must use available information pertaining to existing underlying soil type and onsite existing grade to estimate pre-development runoff conditions.

Priority Development Projects - New development and redevelopment projects defined under Provision E.3.b of Order No. R9-2013-0001.

Rainy Season (aka Wet Season) –October 1 to April 30

Receiving Waters – Waters of the United States.

Receiving Water Limitations - Waste discharge requirements issued by the San Diego Water Board typically include both: (1) "Effluent Limitations" (or "Discharge Limitations") that specify the technology-based or water-quality-based effluent limitations; and (2) "Receiving Water Limitations" that specify the water quality objectives in the Basin Plan as well as any other limitations necessary to attain those objectives. In summary, the "Receiving Water Limitations" provision is the provision used to implement the requirements of CWA section 402(p)(3)(B).

Redevelopment - The creation and/or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include trenching and resurfacing associated with utility work; resurfacing existing roadways; new sidewalk construction, pedestrian ramps, or bike lane on existing roads; and routine replacement of damaged pavement, such as pothole repair.

Regional Clearinghouse – A central location for the collection and distribution of information developed and maintained by the Copermittees including, but not limited to, plans, reports, manuals, data, contact information, and/or links to such documents and information.

Rehabilitation - Remedial measures or activities for the purpose of improving or restoring the beneficial uses of streams, channels or river systems. Techniques may vary from in-stream restoration techniques to off-line storm water management practices installed in the system corridor or upland areas, or a combination of in-stream and out of stream techniques. Rehabilitation techniques may include, but are not limited to the following: riparian zone restoration, constructed wetlands, channel modifications that improve habitat and stability, and daylighting of drainage systems.

Reporting Period – The period of information that is reported in the Water Quality Improvement Plan Annual Report. The reporting period consists of two components: 1) July 1 to June 30, consistent with the fiscal year, for the implementation of the jurisdictional runoff management programs, and 2) October 1 to September 30, consistent with the monitoring year for the monitoring and assessment programs. Together, these two time periods constitute the reporting year for the Water Quality Improvement Plan Annual Report due January 31 following the end of the monitoring year.

Retain – Keep or hold in a particular place, condition, or position without discharge to surface waters.

Retrofitting – Storm water management practice put into place after development has occurred in watersheds where the practices previously did not exist or are ineffective. Retrofitting of developed areas is intended to improve water quality, protect downstream channels, reduce flooding, or meet other specific objectives. Retrofitting developed areas may include, but is not limited to replacing roofs with green roofs, disconnecting downspouts or impervious surfaces to drain to pervious surfaces, replacing impervious surfaces with pervious surfaces, installing rain barrels, installing rain gardens, and trash area enclosures.

Runoff - All flows in a storm water conveyance system that consists of the following components: (1) storm water (wet weather flows) and (2) non-storm water including dry weather flows.

San Diego Water Board – As used in this document the term "San Diego Water Board" is synonymous with the term "Regional Board" as defined in Water Code section 13050(b) and is intended to refer to the California Regional Water Quality Control Board for the San Diego Region as specified in Water Code Section 13200.

Sediment - Soil, sand, and minerals washed from land into water. Sediment resulting from anthropogenic sources (i.e. human induced land disturbance activities) is considered a pollutant. This Order regulates only the discharges of sediment from anthropogenic sources and does not regulate naturally occurring sources of sediment. Sediment can destroy fish-nesting areas, clog animal habitats, and cloud waters so that sunlight does not reach aquatic plants.

Source Control BMP – Land use or site planning practices, or structural or nonstructural measures that aim to prevent runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between pollutants and runoff.

Storm Water – Per 40 CFR 122.26(b)(13), means storm water runoff, snowmelt runoff and surface runoff and drainage. Surface runoff and drainage pertains to runoff and drainage resulting from precipitation events.

Structural BMPs - A subset of BMPs which detains, retains, filters, removes, or prevents the release of pollutants to surface waters from development projects in perpetuity, after construction of a project is completed.

Test of Significant Toxicity (TST) - A statistical approach used to analyze toxicity test data. The TST incorporates a restated null hypothesis, Welch's t-test, and biological effect thresholds for chronic and acute toxicity.

Total Maximum Daily Load (TMDL) - The maximum amount of a pollutant that can be discharged into a water body from all sources (point and non-point) and still maintain water quality standards. Under CWA section 303(d), TMDLs must be developed for all water bodies that do not meet water quality standards after application of technology-based controls.

Toxicity - Adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies. The water quality objectives for toxicity provided in the Basin Plan, state in part…"All waters shall be free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life….The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge."

Toxicity Identification Evaluation (TIE) - A set of procedures for identifying the specific chemical(s) responsible for toxicity. These procedures are performed in three phases (characterization, identification, and confirmation) using aquatic organism toxicity tests.

Toxicity Reduction Evaluation (TRE) - A study conducted in a step-wise process designed to identify the causative agents of effluent or ambient toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in toxicity. The first steps of the TRE consist of the collection of data relevant to the toxicity, including additional toxicity testing, and an evaluation of facility operations and maintenance practices, and best management practices. A Toxicity Identification Evaluation (TIE) may be required as

part of the TRE, if appropriate.

Treatment Control BMP – Any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media absorption or any other physical, biological, or chemical process.

Unpaved Road – Any long, narrow stretch without pavement used for traveling by motor passenger vehicles between two or more points. Unpaved roads are generally constructed of dirt, gravel, aggregate or macadam and may be improved or unimproved.

Waste - As defined in CWC Section 13050(d), "waste includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal."

Article 2 of CCR Title 23, Chapter 15 (Chapter 15) contains a waste classification system that applies to solid and semi-solid waste, which cannot be discharged directly or indirectly to water of the state and which therefore must be discharged to land for treatment, storage, or disposal in accordance with Chapter 15. There are four classifications of waste (listed in order of highest to lowest threat to water quality): hazardous waste, designated waste, non-hazardous solid waste, and inert waste.

Water Quality Objective - Numerical or narrative limits on constituents or characteristics of water designated to protect designated beneficial uses of the water. [California Water Code Section 13050 (h)]. California's water quality objectives are established by the State and Regional Water Boards in the Water Quality Control Plans. Numeric or narrative limits for pollutants or characteristics of water designed to protect the beneficial uses of the water. In other words, a water quality objective is the maximum concentration of a pollutant that can exist in a receiving water and still generally ensure that the beneficial uses of the receiving water remain protected (i.e., not impaired). Since water quality objectives are designed specifically to protect the beneficial uses, when the objectives are violated the beneficial uses are, by definition, no longer protected and become impaired. This is a fundamental concept under the Porter Cologne Act. Equally fundamental is Porter Cologne's definition of pollution. A condition of pollution exists when the water quality needed to support designated beneficial uses has become unreasonably affected or impaired; in other words, when the water quality objectives have been violated. These underlying definitions (regarding beneficial use protection) are the reason why all waste discharge requirements implementing the federal NPDES regulations require compliance with water quality objectives. (Water quality objectives are also called water quality criteria in the CWA.)

Water Quality Standards - Water quality standards, as defined in Clean Water Act section 303(c) consist of the beneficial uses (e.g., swimming, fishing, municipal drinking water supply, etc.,) of a water body and criteria (referred to as water quality objectives in the California Water Code) necessary to protect those uses. Under the Water Code, the water boards establish beneficial uses and water quality objectives in water quality control or basin plans. Together with an anti-degradation policy, these beneficial uses and water quality objectives serve as water quality standards under the Clean Water Act. In Clean Water Act parlance, state beneficial uses are called "designated uses" and state water quality objectives are called "criteria." Throughout this Order, the relevant term is used depending on the statutory scheme.

Waters of the State - Any water, surface or underground, including saline waters within the boundaries of the State [CWC section 13050 (e)]. The definition of the Waters of the State is broader than that for the Waters of the United States in that all water in the State is considered to be a Waters of the State regardless of circumstances or condition.

Waters of the United States - As defined in the 40 CFR 122.2, the Waters of the U.S. are defined as: "(a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate "wetlands;" (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters otherwise defined as waters of the United States under this definition: (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial seas; and (g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA."

Watershed - That geographical area which drains to a specified point on a water course, usually a confluence of streams or rivers (also known as drainage area, catchment, or river basin).

Wet Season (aka Rainy Season) – October 1 to April 30

Wet Weather – Weather is considered wet up to 72 hours after a storm event of 0.1 inches and greater, unless otherwise defined by another regulatory mechanism (e.g. a TMDL).

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM

ATTACHMENT D

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM

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JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

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I. COPERMITTEE INFORMATION

Copermittee Name:

Copermittee Primary Contact Name:

Copermittee Primary Contact Information:
Address:
City: County: State: Zip:
Telephone: Fax: Email:

II. LEGAL AUTHORITY

Has the Copermittee established adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 that complies with Order No. R9-2013-0001?	YES NO	☐ ☐
A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority?	YES NO	☐ ☐

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

Was an update of the jurisdictional runoff management program document required or recommended by the San Diego Water Board?	YES NO	☐ ☐
If YES to the question above, did the Copermittee update its jurisdictional runoff management program document and make it available on the Regional Clearinghouse?	YES NO	☐ ☐

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

Has the Copermittee implemented a program to actively detect and eliminate illicit discharges and connections to its MS4 that complies with Order No. R9-2013-0001?	YES NO	☐ ☐

Number of non-storm water discharges reported by the public	
Number of non-storm water discharges detected by Copermittee staff or contractors	
Number of non-storm water discharges investigated by the Copermittee	
Number of sources of non-storm water discharges identified	
Number of non-storm water discharges eliminated	
Number of sources of illicit discharges or connections identified	
Number of illicit discharges or connections eliminated	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

V. DEVELOPMENT PLANNING PROGRAM

Has the Copermittee implemented a development planning program that complies with Order No. R9-2013-0001?	YES NO	☐ ☐
Was an update to the BMP Design Manual required or recommended by the San Diego Water Board?	YES NO	☐ ☐
If YES to the question above, did the Copermittee update its BMP Design Manual and make it available on the Regional Clearinghouse?	YES NO	☐ ☐

Number of proposed development projects in review	
Number of Priority Development Projects in review	
Number of Priority Development Projects approved	
Number of approved Priority Development Projects exempt from any BMP requirements	
Number of approved Priority Development Projects allowed alternative compliance	
Number of Priority Development Projects granted occupancy	

Number of completed Priority Development Projects in inventory	
Number of high priority Priority Development Project structural BMP inspections	
Number of Priority Development Project structural BMP violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

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VI. CONSTRUCTION MANAGEMENT PROGRAM

Has the Copermittee implemented a construction management program that complies with Order No. R9-2013-0001?	YES	☐
	NO	☐

Number of construction sites in inventory	
Number of active construction sites in inventory	
Number of inactive construction sites in inventory	
Number of construction sites closed/completed during reporting period	
Number of construction site inspections	
Number of construction site violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

Has the Copermittee implemented an existing development management program that complies with Order No. R9-2013-0001?	YES	☐
	NO	☐

	Municipal	Commercial	Industrial	Residential
Number of facilities or areas in inventory				
Number of existing development inspections				
Number of follow-up inspections				
Number of violations				
Number of enforcement actions issued				
Number of escalated enforcement actions issued				

VIII. PUBLIC EDUCATION AND PARTICIPATION

Has the Copermittee implemented a public education program component that complies with Order No. R9-2013-0001?	YES	☐
	NO	☐
Has the Copermittee implemented a public participation program component that complies with Order No. R9-2013-0001?	YES	☐
	NO	☐

IX. FISCAL ANALYSIS

Has the Copermittee attached to this form a summary of its fiscal analysis that complies with Order No. R9-2013-0001?	YES	☐
	NO	☐

X. CERTIFICATION

I [☐ Principal Executive Officer ☐ Ranking Elected Official ☐ Duly Authorized Representative] certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature	Date
Print Name	Title
Telephone Number	Email

ATTACHMENT E

SPECIFIC PROVISIONS FOR TOTAL MAXIMUM DAILY LOADS APPLICABLE TO ORDER NO. R9-2013-0001

These provisions implement load allocations (LAs) and wasteload allocations (WLAs) of the Total Maximum Daily Loads (TMDLs) established by the San Diego Water Board or USEPA under Clean Water Act section 303(c), applicable to discharges regulated under this Order. The provisions and schedules for implementation of the TMDLs described below must be incorporated into the Water Quality Improvement Plans, required pursuant to Provision B of this Order, for the specified Watershed Management Areas.

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed
2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin
3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed
4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek
5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay
6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)
7. Total Maximum Daily Load for Sediment in Los Peñasquitos Lagoon

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2002-0123

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	August 14, 2002
State Water Board Approval Date:	July 16, 2003
Office of Administrative Law Approval Date:	September 11, 2003
US EPA Approval Date:	November 3, 2003

(3) TMDL Effective Date: September 11, 2003

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final diazinon TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must be in compliance with the final TMDL compliance requirements as of December 31, 2010.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations:

Table 1.1
Final Receiving Water Limitations Expressed as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Diazinon	Acute	0.08 µg/L	1 hour
	Chronic	0.05 µg/L	4 days

(b) Final Effluent Limitations

Discharges from the MS4s containing concentrations that do not exceed the following effluent limitations will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 1.b.(2)(a):

Table 1.2
Final Effluent Limitations Expressed as Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation	Averaging Period
Diazinon	Acute	0.072 µg/L	1 hour
	Chronic	0.045 µg/L	4 days

(c) Best Management Practices

The following BMPs for Chollas Creek must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area and implemented by the Responsible Copermittees:

(i) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 1.b.(2)(a) and/or the effluent limitations under Specific Provision 1.b.(2)(b) for Chollas Creek.

(ii) The Responsible Copermittees must implement the Diazinon Toxicity Control Plan and Diazinon Public Outreach/Education Program as described in the report titled, *Technical Report for Total Maximum Daily Load for Diazinon in Chollas Creek Watershed, San Diego County*, dated August 14, 2002, including subsequent modifications, in order to achieve the receiving water limitations under Specific Provision 1.b.(2)(a) and/or the effluent limitations under Specific Provision 1.b.(2)(b).

(iii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 1.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 1.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 1.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 1.b.(2)(c) achieves compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 1.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 1.d, to demonstrate compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The Responsible Copermittees must be in compliance with the final diazinon TMDL compliance requirements as of December 31, 2010.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls for diazinon within the Chollas Creek watershed, and calculate or estimate the annual diazinon loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 1.b.(2)(b), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0019

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	September 22, 2005
Office of Administrative Law Approval Date:	December 2, 2005
US EPA Approval Date:	February 8, 2006

(3) TMDL Effective Date: December 2, 2005

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Shelter Island Yacht Basin

(6) Responsible Copermittee: City of San Diego

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final dissolved copper TMDL compliance requirements for Shelter Island Yacht Basin consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittee must be in compliance with the final TMDL compliance requirements as of December 2, 2005.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations:

Table 2.1
Final Receiving Water Limitations Expressed as Concentrations in Shelter Island Yacht Basin

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Dissolved Copper	Acute	4.8 µg/L x WER*	1 hour
	Chronic	3.1 µg/L x WER*	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 2.b.(3)(a):

Table 2.2
Final Effluent Limitations as Expressed as Annual Loads in MS4 Discharges to Shelter Island Yacht Basin

Constituent	Effluent Limitation
Dissolved Copper	30 kg/yr*

* If the water quality objectives for dissolved copper in Shelter Island Yacht Basin are changed in the future, then the margin of safety (MOS), TMDL and allocations will be recalculated using the *Method for Recalculation of the Total Maximum Daily Load for Dissolved Copper in the Shelter Island Yacht Basin, San Diego Bay* in the Basin Plan (p. 7-14).

(c) Best Management Practices

The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 2.b.(2)(a) and/or the effluent limitations under Specific Provision 2.b.(2)(b) for Shelter Island Yacht Basin. The BMPs must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 2.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 2.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittee develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 2.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a

watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 2.b.(2)(c) achieves compliance with Specific Provisions 2.b.(3)(a), 2.b.(3)(b) and/or 2.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 2.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 2.d, to demonstrate compliance with Specific Provisions 2.b.(3)(a), 2.b.(3)(b) and/or 2.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The Responsible Copermittees must be in compliance with the final dissolved copper TMDL compliance requirements as of December 2, 2005.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

The Responsible Copermittee must monitor the effluent of its MS4 outfalls for dissolved copper, and calculate or estimate the monthly and annual dissolved copper loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.(b)(2)of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0036

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	November 16, 2005
Office of Administrative Law Approval Date:	February 1, 2006
US EPA Approval Date:	March 22, 2006

(3) TMDL Effective Date: February 1, 2006

(4) Watershed Management Area: Santa Margarita River

(5) Water Body: Rainbow Creek

(6) Responsible Copermittee: County of San Diego

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final total nitrogen and total phosphorus TMDL compliance requirements for Rainbow Creek consist of the following

(1) Final TMDL Compliance Date

The Responsible Copermittee must comply with final TMDL compliance requirements by December 31, 2021.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance date under Specific Provision 3.b.(1):

Table 3.1
Final Receiving Water Limitations Expressed as Concentrations in Rainbow Creek

Constituent	Receiving Water Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing concentrations that do not exceed the following effluent limitations by the compliance date under Specific Provision 3.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 3.b.(2)(a):

Table 3.2
Final Effluent Limitations Expressed as Concentrations in MS4 Discharges to Rainbow Creek

Constituent	Effluent Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(ii) Annual pollutant loads from given land uses discharging to and from the MS4s that do not exceed the following annual loads by the compliance date under Specific Provision 3.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 3.b.(2)(a):

Table 3.3
Final Effluent Limitations Expressed as Annual Loads in MS4 Discharges to Rainbow Creek

Land Use	Total N	Total P
Commercial nurseries	116 kg/yr	3 kg/yr
Park	3 kg/yr	0.1 kg/yr
Residential areas	149 kg/yr	12 kg/yr
Urban areas	27 kg/yr	6 kg/yr

(c) Best Management Practices

(i) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 3.b.(2)(a) and/or the effluent limitations under Specific Provision 3.b.(2)(b) for Rainbow Creek.

(ii) The Responsible Copermittee should coordinate any BMPs implemented to address this TMDL with Caltrans and other sources as possible.

(3) <u>Final TMDL Compliance Determination</u>

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 3.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 3.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the final effluent limitations under Specific Provision 3.b.(2)(b)(ii); OR

(e) The Responsible Copermittee develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 3.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Specific Provision 3.b.(2)(c) achieves compliance with Specific Provisions 3.b.(3)(a), 3.b.(3)(b), 3.b.(3)(c) and/or 3.b.(3)(d),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 3.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 3.d, to demonstrate compliance with Specific Provisions 3.b.(3)(a), 3.b.(3)(b), 3.b.(3)(c) and/or 3.b.(3)(d).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim total nitrogen and total phosphorus TMDL compliance requirements for Rainbow Creek consist of the following:

(1) Interim Compliance Dates and WQBELs

The Responsible Copermittee must comply with the interim WQBELs, expressed as annual loads, by December 31 of the interim compliance year given in Table 3.4.

Table 3.4
Interim Water Quality Based Effluent Limitations Expressed as Annual Loads in MS4 Discharges from Specific Land Uses to Rainbow Creek

	Total N Interim Effluent Limitations (kg/yr)			Total P Interim Effluent Limitations (kg/yr)		
	Interim Compliance Date			Interim Compliance Date		
Land Use	**2009**	**2013**	**2017**	**2009**	**2013**	**2017**
Commercial nurseries	390	299	196	20	16	10
Park	5	3	3	0.15	0.10	0.10
Residential areas	507	390	260	99	74	47
Urban areas	40	27	27	9	6	6

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 3.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 3.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the final effluent limitations under Specific Provision 3.b.(2)(b)(ii); OR

(e) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the interim effluent limitations under Specific Provision 3.c.(1); OR

(f) The Responsible Copermittee has submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

d. Specific Monitoring and Assessment Requirements

(1) The Responsible Copermittee must incorporate into the Water Quality Improvement Plan and implement the Sampling and Analysis Plan for Rainbow Creek Nutrient Reduction TMDL Implementation Water Quality Monitoring, dated January 2010.

(2) The results of any monitoring conducted during the reporting period, and assessment of whether the interim and final TMDL compliance requirements have been achieved must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 3.b.(2)(b)(i), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2007-0043

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2007
State Water Board Approval Date:	July 15, 2008
Office of Administrative Law Approval Date:	October 22, 2008
US EPA Approval Date:	December 18, 2008

(3) TMDL Effective Date: October 22, 2008

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final dissolved copper, lead, and zinc TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must comply with the final TMDL compliance requirements by October 22, 2028.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance date under Specific Provision 4.b.(1):

Table 4.1
Final Receiving Water Limitations Expressed as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$(0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$(0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$(0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$(0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations by the compliance date under Specific Provision 4.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 4.b.(2)(a):

Table 4.2
Final Effluent Limitations as Expressed Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(c) Best Management Practices

(i) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 4.b.(2)(a) and/or the effluent limitations under Specific Provision 4.b.(2)(b) for Chollas Creek.

(ii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans and the U.S. Navy as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 4.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 4.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 4.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 4.b.(2)(c) achieves compliance with Specific Provisions 4.b.(3)(a), 4.b.(3)(b) and/or 4.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 4.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 4.d, to demonstrate compliance with Specific Provisions 4.b.(3)(a), 4.b.(3)(b) and/or 4.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim dissolved copper, lead, and zinc TMDL compliance requirements for Chollas Creek consist of the following:

(1) Interim Compliance Date and WQBELs

The Responsible Copermittee must comply with the interim WQBELs, expressed as concentrations, by the interim compliance date given in Table 4.3:

Table 4.3
Interim Water Quality Based Effluent Limitations Expressed as Concentrations in MS4 Discharges to Chollas Creek

Interim Compliance Date	Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
October 22, 2018	Dissolved Copper	Acute	$1.2 \times 90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
	Dissolved Lead	Acute	$1.2 \times 90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
	Dissolved Zinc	Acute	$1.2 \times 90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 4.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 4.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) There are no exceedances of the interim effluent limitations under Specific Provision 4.c.(1) at the Responsible Copermittee's MS4 outfalls; OR

(e) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance date.

d. Specific Monitoring and Assessment Requirements

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*, when it is amended to include monitoring requirements for the Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls discharging to Chollas Creek for dissolved copper, lead, and zinc, and calculate or estimate the monthly and annual dissolved copper, lead, and zinc loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 4.b.(2)(b) or 4.c.(1), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2008-0027

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 11, 2008
State Water Board Approval Date:	June 16, 2009
Office of Administrative Law Approval Date:	September 15, 2009
US EPA Approval Date:	October 26, 2009

(3) TMDL Effective Date: September 15, 2009

(4) Watershed Management Areas: See Table 5.0

(5) Water Bodies: See Table 5.0

(6) Responsible Copermittees: See Table 5.0

Table 5.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County	Dana Point Harbor	Baby Beach	-City of Dana Point -County of Orange
San Diego Bay	San Diego Bay	Shelter Island Shoreline Park	- San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final indicator bacteria TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Final TMDL Compliance Dates

(a) Baby Beach in Dana Point Harbor

The Responsible Copermittees for MS4 discharges to Baby Beach must be in compliance with the final TMDL compliance requirements according to the following compliance dates:

Table 5.1
Compliance Dates to Achieve Final TMDL Compliance Requirements For Baby Beach in Dana Point Harbor

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform	September 15, 2014	September 15, 2009
Fecal Coliform		September 15, 2009
Enterococcus		September 15, 2019

(b) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park must be in compliance with the final TMDL compliance requirements as of December 31, 2012.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance dates under Specific Provision 5.b.(1):

Table 5.2
Final Receiving Water Limitations Expressed as Bacteria Densities in the Water Body

	Receiving Water Limitations	
Constituent	Single Sample Maximum[1,2]	30-Day Geometric Mean[2]
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing indicator bacteria densities that do not exceed the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.3a
Final Effluent Limitations as Expressed as Bacteria Densities in MS4 Discharges to the Water Body

	Effluent Limitations	
Constituent	**Single Sample Maximum[1,2]**	**30-Day Geometric Mean[2]**
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.

(ii) Discharges from the MS4s containing indicator bacteria loads that do not exceed the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.4a
Final Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to the Baby Beach in Dana Point Harbor

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0.86×10^9 MPN/day	$3{,}254 \times 10^9$ MPN/30days
Fecal Coliform	0.17×10^9 MPN/day	112×10^9 MPN/30days
Enterococcus	0.03×10^9 MPN/day	114×10^9 MPN/30days

Table 5.4b
Final Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to the Shelter Island Shoreline Park in San Diego Bay

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0 MPN/day	198×10^9 MPN/30days
Fecal Coliform	0 MPN/day	8×10^9 MPN/30days
Enterococcus	0 MPN/day	26×10^9 MPN/30days

(iii) Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.5a
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to Baby Beach in Dana Point Harbor*

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	90.4%	0%
Fecal Coliform	82.7%	0%
Enterococcus	96.2%	62.2%

Notes:
* The percent load reductions are relative to data collected between 1996-2002. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittees' MS4s must not exceed the loads in Table 5.4a, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the water body.

Table 5.5b
*Final Effluent Limitations Expressed as Percent Load Reductions** in MS4 Discharges to Shelter Island Shoreline Park in San Diego Bay*

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0%	0%
Fecal Coliform	0%	0%
Enterococcus	0%	0%

Notes:
* The percent load reductions are relative to data collected between 1999-2004. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittee's MS4s must not exceed the loads in Table 5.4b, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the water body.

(c) Best Management Practices

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 5.0 must incorporate the Bacteria Load Reduction Plan (BLRP) required to be developed pursuant to Resolution No. R9-2008-0027.

(ii) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 5.b.(2)(a) and/or the effluent limitations under Specific Provision 5.b.(2)(b) for the segments or areas of the water bodies listed in Table 5.0

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.b.(2)(b)(ii); OR

(e) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 5.b.(2)(b)(iii); OR

(f) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(g) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 5.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 5.b.(2)(c) achieves compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 5.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 5.d, to demonstrate compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim indicator bacteria TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Baby Beach in Dana Point Harbor

(a) Interim TMDL Compliance Dates and WQBELs

The Responsible Copermittees for MS4 discharges to Baby Beach must comply with the following interim WQBELs by the interim compliance dates given in Tables 5.6a and/or 5.6b:

Table 5.6a
Interim Water Quality Based Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to Baby Beach in Dana Point Harbor

Constituent	Interim Compliance Dates	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	4.93×10^9 MPN/day	$3{,}254 \times 10^9$ MPN/30days*
Fecal Coliform	September 15, 2012	0.59×10^9 MPN/day	112×10^9 MPN/30days*
Enterococcus	September 15, 2012	0.42×10^9 MPN/day	301×10^9 MPN/30days
	September 15, 2016	0.03×10^9 MPN/day *	207×10^9 MPN/30days

Notes:
* Same as the final effluent limitations in Table 5.4a.

Table 5.6b
Interim Water Quality Based Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to Baby Beach in Dana Point Harbor*

Constituent	Interim Compliance Dates	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	45.2%	0%**
Fecal Coliform	September 15, 2012	41.4%	0%**
Enterococcus	September 15, 2012	48.1%	0%
	September 15, 2016	96.2%**	31.1%

Notes:
* The percent load reductions are relative to data collected between 1996-2002. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittees' MS4s must not exceed the loads in Table 5.6a, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the waterbody.
** Same as the final effluent limitations in Table 5.5a.

(b) Interim Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(i) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(ii) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(iii) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(iv) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.b(2)(b)(ii); OR

(v) The Responsible Copermittees can demonstrate that exceedances of the applicable receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(vi) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the interim effluent limitations under Table 5.6a of Specific Provision 5.c.(1)(a); OR

(vii) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the interim effluent limitations under Table 5.6b of Specific Provision 5.c.(1)(a); OR

(viii) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

(2) <u>Shelter Island Shoreline Park in San Diego Bay</u>

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park must be in compliance with the final indicator bacteria TMDL requirements as of December 31, 2012.

d. Specific Monitoring and Assessment Requirements

(1) Monitoring Stations

Monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[33] If discharges of bacteria from the MS4 exceed the applicable interim or final WQBELs, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(2) Monitoring Procedures

(a) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) The Responsible Copermittees must collect wet weather monitoring samples within the first 24 hours of a storm event[34] of the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(c) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

[33] Commonly referred to as AB 411 monitoring
[34] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs have been achieved.

(b) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 5.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(c) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to correlate elevated bacteria levels with known or suspected sewage spills from wastewater collection systems and treatment plants or boats.

(d) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2010-0001

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date: February 10, 2010
State Water Board Approval Date: December 14, 2010
Office of Administrative Law Approval Date: April 4, 2011
US EPA Approval Date: June 22, 2011

(3) TMDL Effective Date: April 4, 2011

(4) Watershed Management Areas: See Table 6.0

(5) Water Bodies: See Table 6.0

(6) Responsible Copermittees: See Table 6.0

Table 6.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	-City of Laguna Beach -County of Orange -Orange County Flood Control District
		at Heisler Park - North	
	Pacific Ocean Shoreline	at Main Laguna Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Woods -County of Orange -Orange County Flood Control District
		Laguna Beach at Ocean Avenue	
		Laguna Beach at Cleo Street	
		Arch Cove at Bluebird Canyon Road	
		Laguna Beach at Dumond Drive	
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Hills -City of Laguna Niguel -City of Laguna Woods -City of Lake Forest -City of Mission Viejo -County of Orange -Orange County Flood Control District
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	
	Aliso Creek Mouth	at mouth	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	-City of Dana Point -City of Laguna Beach -City of Laguna Niguel -County of Orange -Orange County Flood Control District
		Aliso Beach at Table Rock Drive	
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)	
		at Salt Creek (large outlet)	
		Salt Creek Beach at Salt Creek service road	
		Salt Creek Beach at Strand Road	
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	-City of Dana Point -City of Laguna Hills -City of Laguna Niguel -City of Mission Viejo -City of Rancho Santa Margarita -City of San Juan Capistrano -County of Orange -Orange County Flood Control District
	San Juan Creek	lower 1 mile	
	San Juan Creek Mouth	at mouth	
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	-City of Dana Point -City of San Clemente -County of Orange -Orange County Flood Control District
		Ole Hanson Beach Club Beach at Pico Drain	
		San Clemente City Beach at El Portal Street Stairs	
		San Clemente City Beach at Mariposa Street	
		San Clemente City Beach at Linda Lane	
		San Clemente City Beach at South Linda Lane	
		San Clemente City Beach at Lifeguard Headquarters	
		under San Clemente Municipal Pier	
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	
		San Clemente State Beach at Riviera Beach	
		Can Clemente State Beach at Cypress Shores	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	-City of Oceanside -City of Vista -County of San Diego
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	-City of Carlsbad -City of Encinitas -City of Escondido -City of San Marcos -County of San Diego
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	-City of Del Mar -City of Escondido -City of Poway -City of San Diego -City of Solana Beach -County of San Diego
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	-City of Del Mar -City of Poway -City of San Diego -County of San Diego
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	-City of San Diego
		La Jolla Shores Beach at Caminito del Oro	
		La Jolla Shores Beach at Vallecitos	
		La Jolla Shores Beach at Avenida de la Playa	
		at Casa Beach, Children's Pool	
		South Casa Beach at Coast Boulevard	
		Whispering Sands Beach at Ravina Street	
		Windansea Beach at Vista de la Playa	
		Windansea Beach at Bonair Street	
		Windansea Beach at Playa del Norte	
		Windansea Beach at Palomar Avenue	
		at Tourmaline Surf Park	
		Pacific Beach at Grand Avenue	
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I- Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	-City of El Cajon -City of Santee -County of San Diego
	San Diego River	lower 6 miles	-City of El Cajon -City of La Mesa -City of San Diego -City of Santee -County of San Diego
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	-City of La Mesa -City of Lemon Grove -City of San Diego -County of San Diego - San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final indicator bacteria TMDL compliance requirements for the water bodies listed in Table 6.0 consist of the following:

(1) Final TMDL Compliance Dates

The Responsible Copermittees for MS4 discharges to the water bodies listed in Table 6.0 must be in compliance with the final TMDL compliance requirements according to the following compliance dates:

Table 6.1
Compliance Dates to Achieve Final TMDL Compliance Requirements

Constituent	Dry Weather TMDL Compliance Date	Wet Weather TMDL Compliance Date
Total Coliform	April 4, 2021	April 4, 2031
Fecal Coliform		
Enterococcus		

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance dates under Specific Provision 6.b.(1):

Table 6.2a
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Beaches

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform	10,000	22%	1,000	0%
Fecal Coliform	400	22%	200	0%
Enterococcus	104	22%	35	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan.

Table 6.2b
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Creeks

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Fecal Coliform	400	22%	200	0%
Enterococcus	61 (104)	22%	33	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Basin Plan.
d. A single sample maximum of 104 MPN/100ml for *Enterococcus* may be applied as a receiving water limitation for creeks, instead of 61 MPN/100mL, if one or more of the creeks addressed by these TMDLs (San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek, San Diego River, and/or Chollas Creek) is designated with a "moderately to lightly used area" or less frequent usage frequency in the Basin Plan. Otherwise, the single sample maximum of 61 MPN/100mL for *Enterococcus* must be used to assess compliance with the allowable exceedance frequency.

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing indicator bacteria densities that do not exceed the following effluent limitations by the compliance dates under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a):

Table 6.2c
Final Effluent Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies in MS4 Discharges to the Water Body

Constituent	Concentration-Based Effluent Limitations			
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform[d]	10,000	22%	1,000	0%
Fecal Coliform	400	22%	200	0%
Enterococcus	104[e] / 61[f]	22%	35[e] / 33[f]	0%

Notes:
a. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan for discharges to beaches, and the Basin Plan for discharges to creeks and creek mouths.
d. Total coliform effluent limitations only apply to MS4 outfalls that discharge to the Pacific Ocean Shorelines and creek mouths listed in Table 6.0.
e. This *Enterococcus* effluent limitation applies to MS4 discharges to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
f. This *Enterococcus* effluent limitation applies to MS4 discharges to segments or areas of creeks or creek mouths listed in Table 6.0.

(ii) Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the compliance dates under Specific Provision 6.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a):

Table 6.3
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	*Watershed and Water Bodies*	*Load-Based Effluent Limitations*					
		Dry Weather			*Wet Weather*		
		Total Coliform	*Fecal Coliform*	*Entero-coccus*	*Total Coliform*	*Fecal Coliform*	*Entero-coccus*
South Orange County	San Joaquin Hills HSA (901.11) and Laguna Hills HSA (901.12) - Pacific Ocean Shoreline	91.78%	91.72%	98.28%	46.85%	52.07%	51.26%
	Aliso HSA (901.13) - Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	95.47%	95.58%	99.13%	25.29%	26.62%	27.52% (27.37%)**
	Dana Point HSA (901.14) - Pacific Ocean Shoreline	95.04%	95.03%	98.98%	13.15%	14.86%	15.16%
	Lower San Juan HSA (901.27) - Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	72.96%	74.21%	94.94%	19.21%	12.82%	27.12% (26.90%)**
	San Clemente HA (901.30) - Pacific Ocean Shoreline	94.28%	94.23%	98.83%	23.85%	24.58%	25.26%
San Luis Rey River	San Luis Rey HU (903.00) - Pacific Ocean Shoreline	38.13%	39.09%	87.38%	5.62%	3.12%	11.69%

Table 6.3 (Cont'd)
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watershed and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
Carlsbad	San Marcos HA (904.50) - Pacific Ocean Shoreline	82.82%	82.55%	96.03%	18.47%	18.98%	20.19%
San Dieguito River	San Dieguito HU (905.00) - Pacific Ocean Shoreline	14.39%	20.72%	83.48%	4.29%	1.46%	7.72%
Penasquitos	Miramar Reservoir HA (906.10) - Pacific Ocean Shoreline	96.50%	96.59%	99.42%	1.61%	1.99%	1.93%
Mission Bay	Scripps HA (906.30) - Pacific Ocean Shoreline	96.44%	96.42%	99.25%	16.32%	21.14%	18.82%
	Tecolote HA (906.50) - Tecolote Creek	94.51%	94.59%	98.94%	16.51%	20.47%	18.15% (18.08%)**
San Diego River	Mission San Diego HSA (907.11) and Santee HSA (907.12) - Pacific Ocean Shoreline - Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles)	74.03%	69.44%	93.96%	38.14%	53.22%	42.74% (42.47%)**
San Diego Bay	Chollas HSA (908.22) - Chollas Creek	92.06%	92.15%	98.46%	17.82%	24.84%	21.46% (21.36%)**

Notes:
* The percent load reductions are based on reducing loads compared to pollutant loads from 2001 to 2002.
** The alternative *Enterococcus* percent load reduction was calculated based on a numeric target of 104 MPN/100mL instead of 61 MPN/100mL, protective of the REC-1 "moderately to lightly used area" usage frequency that is protective of freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative pollutant load reductions can be utilized.

(c) Best Management Practices

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 6.0 must incorporate the Comprehensive Load Reduction Plans (CLRPs) required to be developed pursuant to Resolution No. R9-2010-0001.

(ii) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 6.b.(2)(a) and/or the effluent limitations under Specific Provision 6.b.(2)(b) for the segments or areas of the water bodies listed in Table 6.0.

(iii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans, owners/operators of small MS4s, and agricultural dischargers as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(f) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 6.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 6.b.(2)(c) achieves compliance with Specific Provisions 6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), and/or 6.b.(3)(e),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 6.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 6.d, to demonstrate compliance with Specific Provisions 6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), 6.b.(3)(e) and/or 6.b.(3)(f).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim indicator bacteria TMDL compliance requirements for the water bodies listed in Table 6.0 consist of the following:

(1) Interim TMDL Compliance Dates

The Responsible Copermittees must achieve compliance with the interim TMDL compliance requirements, as determined in accordance with Specific Provision 6.c.(3), by the interim compliance dates given in Table 6.4, unless alternative interim compliance dates are accepted by the San Diego Water Board Executive Officer as part of the Water Quality Improvement Plan.

Table 6.4
Interim Compliance Dates to Achieve Interim TMDL Compliance Requirements

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	April 4, 2016	April 4, 2021
		at Heisler Park - North		
	Pacific Ocean Shoreline	at Main Laguna Beach	April 4, 2016	April 4, 2021
		Laguna Beach at Ocean Avenue		
		Laguna Beach at Cleo Street		
		Arch Cove at Bluebird Canyon Road		
		Laguna Beach at Dumond Drive		
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	April 4, 2016	April 4, 2021
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	April 4, 2018	April 4, 2021
	Aliso Creek Mouth	at mouth	April 4, 2018	April 4, 2021
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	April 4, 2016	April 4, 2021
		Aliso Beach at Table Rock Drive		
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)		
		at Salt Creek (large outlet)		
		Salt Creek Beach at Salt Creek service road	April 4, 2017	April 4, 2021
		Salt Creek Beach at Strand Road	April 4, 2017	April 4, 2021

Table 6.4 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates	
			Interim Dry Weather WQBELs	Interim Wet Weather WQBELs
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	April 4, 2016	April 4, 2021
	San Juan Creek	lower 1 mile	April 4, 2018	April 4, 2021
	San Juan Creek Mouth	at mouth	April 4, 2016	April 4, 2021
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	April 4, 2016	April 4, 2021
		Ole Hanson Beach Club Beach at Pico Drain	April 4, 2016	April 4, 2021
		San Clemente City Beach at El Portal Street Stairs	April 4, 2017	April 4, 2021
		San Clemente City Beach at Mariposa Street		
		San Clemente City Beach at Linda Lane	April 4, 2016	April 4, 2021
		San Clemente City Beach at South Linda Lane	April 4, 2018	April 4, 2021
		San Clemente City Beach at Lifeguard Headquarters	April 4, 2017	April 4, 2021
		under San Clemente Municipal Pier		
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	April 4, 2018	April 4, 2021
		San Clemente State Beach at Riviera Beach	April 4, 2016	April 4, 2021
		Can Clemente State Beach at Cypress Shores	April 4, 2017	April 4, 2021
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	April 4, 2017	April 4, 2021
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	April 4, 2016	April 4, 2021
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	April 4, 2016	April 4, 2021

Table 6.4 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates	
			Interim Dry Weather WQBELs	Interim Wet Weather WQBELs
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	April 4, 2016	April 4, 2021
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	April 4, 2016	April 4, 2021
		La Jolla Shores Beach at Caminito del Oro		
		La Jolla Shores Beach at Vallecitos		
		La Jolla Shores Beach at Avenida de la Playa		
		at Casa Beach, Children's Pool		
		South Casa Beach at Coast Boulevard		
		Whispering Sands Beach at Ravina Street		
		Windansea Beach at Vista de la Playa		
		Windansea Beach at Bonair Street		
		Windansea Beach at Playa del Norte		
		Windansea Beach at Palomar Avenue		
		at Tourmaline Surf Park		
		Pacific Beach at Grand Avenue		
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries		
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	April 4, 2018	April 4, 2021
	San Diego River	lower 6 miles		
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach		
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	April 4, 2018	April 4, 2021

(2) Interim Water Quality Based Effluent Limitations

The Responsible Copermittees for discharges to the water bodies in Table 6.0 must comply with the following interim WQBELs by the interim compliance dates given in Specific Provision 6.c.(1):

(a) Interim Receiving Water Limitations

(i) *Interim Dry Weather Receiving Water Limitations*

The Responsible Copermittee must calculate the "existing" exceedance frequencies of the 30-day geometric mean water quality objectives for each of the indicator bacteria by analyzing the available monitoring data collected between January 1, 1996 and December 31, 2002. "Existing" exceedance frequencies may be calculated by water body and/or by Watershed Management Area listed in Table 6.0. Separate "existing" exceedance frequencies must be calculated for beaches and creeks/creek mouths.

The Responsible Copermittees must achieve a 50 percent reduction in the "existing" exceedance frequency of the 30-day geometric mean WQBELs for the water bodies listed in Table 6.0 by the interim compliance dates given in Table 6.4. A 50 percent reduction in the "existing" exceedance frequency is equivalent to half of the "existing" exceedance frequency of the 30-day geometric mean WQBELs.

The "existing" exceedance frequencies and the interim dry weather allowable exceedance frequencies (i.e. interim dry weather receiving water limitations) calculated by the Responsible Copermittees must be included in the Water Quality Improvement Plans for the applicable Watershed Management Areas.

(ii) *Interim Wet Weather Receiving Water Limitations*

The Responsible Copermittees must achieve the interim wet weather receiving water limitations in Table 6.5, expressed as interim wet weather allowable exceedance frequencies, by the interim compliance dates given in Table 6.4.

Table 6.5
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	38%	37%	39%
		at Heisler Park - North			
	Pacific Ocean Shoreline	at Main Laguna Beach			
		Laguna Beach at Ocean Avenue			
		Laguna Beach at Cleo Street			
		Arch Cove at Bluebird Canyon Road			
		Laguna Beach at Dumond Drive			
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	41%	41%	42%
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	41%	41%	42%
	Aliso Creek Mouth	at mouth	41%	41%	42%
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	36%	36%	36%
		Aliso Beach at Table Rock Drive			
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)			
		at Salt Creek (large outlet)			
		Salt Creek Beach at Salt Creek service road			
		Salt Creek Beach at Strand Road			

Table 6.5 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	44%	44%	48%
	San Juan Creek	lower 1 mile	44%	44%	47%
	San Juan Creek Mouth	at mouth	44%	44%	47%
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	35%	35%	36%
		Ole Hanson Beach Club Beach at Pico Drain			
		San Clemente City Beach at El Portal Street Stairs			
		San Clemente City Beach at Mariposa Street			
		San Clemente City Beach at Linda Lane			
		San Clemente City Beach at South Linda Lane			
		San Clemente City Beach at Lifeguard Headquarters			
		under San Clemente Municipal Pier			
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)			
		San Clemente State Beach at Riviera Beach			
		Can Clemente State Beach at Cypress Shores			
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	45%	44%	47%
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	40%	40%	41%
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	33%	33%	36%

Table 6.5 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	26%	26%	26%
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	37%	37%	37%
		La Jolla Shores Beach at Caminito del Oro			
		La Jolla Shores Beach at Vallecitos			
		La Jolla Shores Beach at Avenida de la Playa			
		at Casa Beach, Children's Pool			
		South Casa Beach at Coast Boulevard			
		Whispering Sands Beach at Ravina Street			
		Windansea Beach at Vista de la Playa			
		Windansea Beach at Bonair Street			
		Windansea Beach at Playa del Norte			
		Windansea Beach at Palomar Avenue			
		at Tourmaline Surf Park			
		Pacific Beach at Grand Avenue			
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries	49%	49%	51%
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	46%	43%	49%
	San Diego River	lower 6 miles	46%	43%	49%
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	46%	43%	51%
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	41%	41%	43%

(b) Interim Effluent Limitations

Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the interim compliance dates under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.c.(2)(a):

Table 6.6
Interim Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	*Watersheds and Water Bodies*	*Load-Based Effluent Limitations*					
		Dry Weather			*Wet Weather*		
		Total Coliform	*Fecal Coliform*	*Entero-coccus*	*Total Coliform*	*Fecal Coliform*	*Entero-coccus*
South Orange County	San Joaquin Hills HSA (901.11) and Laguna Hills HSA (901.12) - Pacific Ocean Shoreline	45.89%	45.86%	49.14%	23.43%	26.04%	25.63%
	Aliso HSA (901.13) - Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	47.74%	47.79%	49.57%	12.65%	13.31%	13.76% (13.69%)**
	Dana Point HSA (901.14) - Pacific Ocean Shoreline	47.52%	47.52%	49.49%	6.58%	7.43%	7.58%
	Lower San Juan HSA (901.27) - Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	36.48%	37.11%	47.47%	9.61%	6.41%	13.56% (13.45%)**
	San Clemente HA (901.30) - Pacific Ocean Shoreline	47.14%	47.12%	49.42%	11.93%	12.29%	12.63%
San Luis Rey River	San Luis Rey HU (903.00) - Pacific Ocean Shoreline	19.07%	19.55%	43.69%	2.81%	1.56%	5.85%
Carlsbad	San Marcos HA (904.50) - Pacific Ocean Shoreline	41.41%	41.28%	48.02%	9.24%	9.49%	10.10%

Table 6.6 (Cont'd)
Interim Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watersheds and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
San Dieguito River	San Dieguito HU (905.00) - Pacific Ocean Shoreline	7.20%	10.36%	41.74%	2.15%	0.73%	3.86%
Penasquitos	Miramar Reservoir HA (906.10) - Pacific Ocean Shoreline	48.25%	48.30%	49.71%	0.81%	1.00%	0.97%
Mission Bay	Scripps HA (906.30) - Pacific Ocean Shoreline	48.22%	48.21%	49.63%	8.16%	10.57%	9.41%
	Tecolote HA (906.50) - Tecolote Creek	47.26%	47.30%	49.47%	8.26%	10.24%	9.08% (9.04%)**
San Diego River	Mission San Diego HSA (907.11) and Santee HSA (907.12) - Pacific Ocean Shoreline - Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles)	37.02%	34.72%	46.98%	19.07%	26.61%	21.37% (21.24%)**
San Diego Bay	Chollas HSA (908.22) - Chollas Creek	46.03%	46.08%	49.23%	8.91%	12.42%	10.73% (10.68%)**

Notes:
* The percent load reductions are based on reducing loads compared to pollutant loads from 2001 to 2002.
** The alternative *Enterococcus* percent load reduction was calculated based on a numeric target of 104 MPN/100mL instead of 61 MPN/100mL, protective of the REC-1 "moderately to lightly used area" usage frequency that is protective of freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative pollutant load reductions can be utilized.

(3) <u>Interim TMDL Compliance Determination</u>

Compliance with the interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(f) There are no exceedances of the interim receiving water limitations under Specific Provision 6.c.(2)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(g) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the interim effluent limitations under Specific Provision 6.c.(2)(b); OR

(h) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

d. Specific Monitoring and Assessment Requirements

(1) Monitoring and Assessment Requirements for Beaches

(a) Monitoring Stations

For beaches addressed by the TMDL, monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[35] If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources

[35] Commonly referred to as AB 411 monitoring

causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations at least once within the first 24 hours of the end of a storm event[36] during the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer in exceedance of the allowable exceedance frequencies in the receiving waters.

(iii) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(iv) For Pacific Ocean Shoreline segments or areas listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final

[36] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

WQBELs for the Pacific Ocean Shoreline segments or areas listed in Table 6.0 have been achieved.

(ii) Dry weather exceedance frequencies must be calculated as follows:

[a] 30-day geometric means must be calculated from the results of any dry weather samples collected from the segments or areas for each water body listed in Table 6.0;
[b] The method and number of samples need for calculating the 30-day geometric means must be consistent with the number of samples required by the Ocean Plan;
[c] Where there are multiple segments or areas associated with a water body listed in Table 6.0, the Copermittees may calculate geometric means for each segment or area, or combine the dry weather monitoring data from all the segments or areas to calculate geometric means for the water body;
[d] The exceedance frequency must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the dry season.

(iii) Wet weather exceedance frequencies must be calculated as follows:

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;
[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;
[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria densities reported from each storm event sampled; and
[d] The single sample maximum exceedance frequency must be calculated by dividing the number of wet weather days that exceed the single sample maximum receiving water limitations in Table 6.2 by the total number of wet weather days during the rainy season.
[e] The data collected for dry weather must be used in addition to the data collected for wet weather to calculate the wet weather 30-day geometric means. The exceedance frequency of the wet weather 30-day geometric means must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of

geometric means calculated from samples collected during the wet season.

(iv) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(v) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) Monitoring and Assessment Requirements for Creeks and Creek Mouths

(a) Monitoring Stations

For creeks addressed by the TMDL, monitoring locations should consist of, at a minimum, a location at or near the mouth of the creek (e.g. Mass Loading Station or Mass Emission Station) and one or more locations upstream of the mouth (e.g. Watershed Assessment Station). If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations in accordance with the requirements of Provision D.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations within the first 24 hours of the end of a storm event[37] during the rainy season (i.e. October 1 through April 30).

(iii) Samples collected from receiving water monitoring stations must be analyzed for fecal coliform and *Enterococcus* indicator bacteria.

[37] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(iv) For creeks or creek mouths listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the receiving water monitoring data to assess whether the interim and final receiving water WQBELs for the creeks and creek mouths listed in Table 6.0 have been achieved.

(ii) Dry weather exceedance frequencies must be calculated as follows:

[a] 30-day geometric means must be calculated from the results of any dry weather samples collected from the segment or area for each water body listed in Table 6.0;
[b] The method and number of samples need for calculating the 30-day geometric means must be consistent with the number of samples required by the Basin Plan;
[c] The exceedance frequency must be calculated by dividing the number of 30-day geometric means that exceed the 30-day geometric mean receiving water limitations in Table 6.2 by the total number of 30-day geometric means calculated from samples collected during the dry season.

(iii) Wet weather exceedance frequencies must be calculated as follows:

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;
[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;
[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria densities reported from each of the storm events sampled; and

[d] The exceedance frequency must be calculated by dividing the number of wet weather days that exceed the single sample

maximum receiving water limitations in Table 6.2 by the total number of wet weather days during the rainy season.

[e] The data collected for dry weather must be used in addition to the data collected for wet weather to calculate the wet weather 30-day geometric means. The exceedance frequency of the wet weather 30-day geometric means must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the wet season.

(iv) The Responsible Copermittee must identify and incorporate additional MS4 outfall and receiving water monitoring stations and/or adjust monitoring frequencies to identify sources causing exceedances of the receiving water WQBELs.

(v) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(vi) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

7. Total Maximum Daily Loads for Sediment in Los Peñasquitos Lagoon

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2012-0033

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2012
State Water Board Approval Date:	January 21, 2014
Office of Administrative Law Approval Date:	July 14, 2014
US EPA Approval Date:	October 30, 2014

(3) TMDL Effective Date: July 14, 2014

(4) Watershed Management Area: Los Peñasquitos

(5) Water Body: Los Peñasquitos Lagoon

(6) Responsible Copermittees: County of San Diego, City of San Diego, City of Del Mar, and City of Poway

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final sediment TMDL compliance requirements for Los Peñasquitos Lagoon consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must be in compliance with the final TMDL compliance requirements by December 31, 2034.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not prohibit the sustainable restoration of tidal and non-tidal saltmarsh vegetation of at least 346 acres.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations by the compliance date under Provision 7.b(1) will not cause or contribute to a failure of the receiving water condition specified under Specific Provision 7.b.(2)(a):

Table 7.1
*Final Effluent Limitations as Expressed as Wet Season Loads in MS4 Discharges to Los Peñasquitos Lagoon**

Constituent	Effluent Limitation
Sediment	2,580 tons/wet season

*Final effluent limitations are to be achieved by the following Responsible Parties: County of San Diego, City of San Diego, City of Del Mar, City of Poway, Phase II MS4 permittees, Caltrans, general construction storm water NPDES permittees, and general industrial storm water NPDES permittees.

(c) Best Management Practices

(i) The Water Quality Improvement Plan for the Los Peñasquitos Watershed Management Area must incorporate the Sediment Load Reduction Plan required to be developed pursuant to Resolution No. R9-2012-0033.

(ii) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 7.b.(2)(a) and/or the Copermittee's portion of the effluent limitations under Specific Provision 7.b.(2)(b) for Los Peñasquitos Lagoon.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) Successful restoration of 80 percent of the 1973 acreage of tidal and non-tidal lagoon salt marsh (346 acres); OR

(b) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 7.b.(2)(c)(ii) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 7.b.(2)(c)(ii) or other implementation actions achieve compliance with Specific Provision 7.b.(3)(a),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 7.b.(2)(c)(ii) or other implementation actions, AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 7.d to demonstrate compliance with Specific Provision 7.b.(3)(a).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim sediment TMDL compliance requirements for Los Penasquitos Lagoon consist of the following:

(1) Interim Compliance Dates and WQBELs

The Responsible Copermittees must comply with the interim WQBELs, expressed as wet season loads, by December 31 of the interim compliance year set forth in Table 7.2.

Table 7.2
*Interim Water Quality Based Effluent Limitations Expressed as Wet Season Loads in MS4 Discharges**

Interim Compliance Date	Interim Effluent Limitations (tons/wet season)
December 31, 2019	6,691
December 31, 2023	5,663
December 31, 2027	4,636
December 31, 2029	3,608

*Interim effluent limitations are to be achieved by the following Responsible Parties: County of San Diego, City of San Diego, City of Del Mar, City of Poway, Phase II MS4 permittees, Caltrans, general construction storm water NPDES permittees, and general industrial storm water NPDES permittees.

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) The final receiving water limitation under Specific Provision 7.b.(2)(a) is met; OR

(c) There are no exceedances of the Copermittee's portion of interim effluent limitations under Table 7.2 at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the Copermittee's portion of the interim TMDL compliance requirements described in Attachment A of

Resolution No. R9-2010-0033 will be achieved by the interim compliance date.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) Watershed Monitoring

The Responsible Copermittees must conduct suspended sediment, bed load, and flow monitoring to calculate total sediment loading to the Los Peñasquitos Lagoon for each wet season (October 1 thru April 30) as set forth below:

(a) The Responsible Copermittees must monitor enough storm events throughout the season to quantify sediment loading over each wet season, and

(b) The Responsible Copermittees must monitor at least 3 stations to quantify cumulative sediment loading into Los Peñasquitos Lagoon. Stations must be located within the Los Peñasquitos, Carroll Canyon, and Carmel Creek tributaries prior to discharging into Los Peñasquitos Lagoon.

(2) Lagoon Monitoring

The Responsible Copermittees must monitor Los Peñasquitos Lagoon each Fall for changes in the extent of the vegetation types as set forth below:

(a) The Responsible Copermittees must acquire aerial photos of Los Peñasquitos Lagoon and digitize them at an approximate scale of 1:2,500,

(b) The Responsible Copermittees must appropriately interpret the vegetation and classify the various types as saltmarsh, non-tidal saltmarsh, freshwater marsh, non-tidal saltmarsh –*Lolium perrene* infested, southern willow scrub/mulefat scrub, herbaceous wetland, or upland land cover.

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the monitoring data collected under Specific Provision 7.d(1) and 7.d(2) to assess whether the interim and final WQBELs have been achieved.

(b) For assessing and determining compliance with the final receiving water limitations under Specific Provision 7.b.(2)(a), the Responsible Copermittees must use the data acquired under Specific Provision 7.d.(2) to estimate the acreage of tidal and non-tidal saltmarsh actually restored.

(c) For assessing and determining compliance with the final effluent limitations under Specific Provision 7.b.(2)(b), the Responsible Copermittees must use the data acquired under Specific Provision 7.d.(1) to estimate sediment loading into Los Peñasquitos Lagoon. Sediment loading must be evaluated using a 3-year, weighted rolling average. The first reported average shall be calculated using data collected in the year, 2015-2016, 2016-2017, and 2017-2018 wet seasons.

(d) The monitoring and assessment results must be submitted as part of the Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

ATTACHMENT F

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

FACT SHEET / TECHNICAL REPORT

FOR

ORDER NO. R9-2013-0001
AS AMENDED BY ORDER No. R9-2015-0001
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

May 8, 2013
Amended on February 11, 2015

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I. FACT SHEET FORMAT

This Fact Sheet briefly sets forth the principal facts and the significant factual, legal, methodological, and policy questions that the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) considered in preparing Order No. R9-2013-0001 (Order) as amended by Order No. R9-2015-0001. In accordance with the Code of Federal Regulations (CFR) Title 40 Parts 124.8 and 124.56 (40 CFR 124.8 and 40 CFR 124.56), this Fact Sheet includes, but is not limited to, the following information:

1. Contact information
2. Public process and notification procedures
3. Background of municipal storm water permits
4. Regional MS4 Permit approach
5. Economic considerations
6. Applicable statutes, regulations, plans and policies
7. Discussion of the provisions in the Order

Tentative Order No. R9-2013-0001 was distributed for public review on October 31, 2012. The San Diego Water Board accepted written comments on the Tentative Order until January 11, 2013. A public hearing was subsequently held on April 10 and 11, 2013, that was continued to May 8, 2013 to receive oral comments from interested persons. The San Diego Water Board adopted Order No. R9-2013-0001 on May 8, 2013.

Order No. R9-2015-0001, an Order amending Order No. R9-2013-0001, was distributed for public review on September 19, 2014. Order No. R9-2015-0001 amended the findings and provisions of Order No. R9-2013-0001 to:

a. Enroll the County of Orange, the Orange County Flood Control District and the south Orange County Cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano as Copermittees responsible for compliance with the terms and conditions of Order No. R9-2013-0001, as amended by Order No. R9-2015-0001;

b. Designate the San Diego Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the Cities of Laguna Woods and Laguna Hills and agree to the designation of the Santa Ana Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the City of Lake Forest, subject to the terms of the February 10, 2015 agreement between San Diego Water Board and the Santa Ana Water Board described in Finding 29 of this Order, upon the later effective date of Order No. R9-2015-0001 or Order No. R8-2015-0001 (superseding Order No. R8-2009-0030);

c. Establish interim exceptions to land development requirements for those priority development projects that discharge to engineered channels and large river reaches as described in Provision E.3.c(2)(e) of this Order;

d. Incorporate the amended requirements of the State Water Resources Control Board's (State Water Board) General Exception to require that pollutant reductions be achieved within 6 years for storm water and nonpoint source discharges to ASBS within the Region;

e. Incorporate applicable requirements of the Los Peñasquitos Lagoon Sediment TMDL;

f. Require the Orange County Copermittees to implement the "*Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County*," dated October 2014, made effective in the Monitoring and Reporting Program/Order issued pursuant to California Water Code section 13383 in the December 5, 2014 San Diego Water Board Letter Directive and subject to future revisions by the Executive Officer after appropriate public input;

A public hearing was held on February 11, 2015, to receive oral comments from Copermittees and interested persons. The San Diego Water Board adopted Order No. R9-2015-0001 amending Order No. R9-2013-0001 on February 11, 2015.

The San Diego Water Board files applicable to the issuance of Order No. R9-2013-0001 and amendments thereto are incorporated into the administrative record in support of the findings and requirements of the Order.

II. CONTACT INFORMATION

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The Order and other related documents can be downloaded from the San Diego Water Board website at

http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/oc_stormwater.shtml

The documents referenced in this Fact Sheet and in Order No. R9-2013-0001 and amendments thereto are available for public review at the San Diego Water Board office, located at the address listed above. Public records are available for inspection during regular business hours, from 8:00 am to 5:00 pm Monday through Friday. To schedule an appointment to inspect public records, contact the San Diego Water Board Records Management Officer at 619-516-1990.

COPERMITTEES

Orange County Copermittees

- County of Orange
  - City of Aliso Viejo
  - City of Dana Point
  - City of Laguna Beach
  - City of Laguna Hills
  - City of Laguna Niguel
  - City of Laguna Woods
  - City of Lake Forest *
  - City of Mission Viejo
  - City of Ranch Santa Margarita
  - City of San Clemente
  - City of San Juan Capistrano
  - Orange County Flood Control District

* While not listed in the above table, the City of Lake Forest remains a Copermittee under this Order until the later effective date of this Order or Santa Ana Water Board Tentative Order No. R8-2015-0001. Thereafter, the City of Lake Forest will no longer be considered a Copermittee under this Order because its Phase I MS4 discharges will be regulated by the Santa Ana Water Board pursuant to Water Code section 13328 designation. The requirements of this Order that apply to the City of Lake Forest for the duration of this Order, consistent with the Water Code section 13228 agreement dated February 10, 2015, are described in Finding 29 and Footnote 2 to Table B-1.

Riverside County Copermittees

- County of Riverside
  - City of Murrieta
  - City of Temecula
  - City of Wildomar
  - Riverside County Flood Control and Water Conservation District

San Diego County Copermittees

- County of San Diego
  - City of Carlsbad
  - City of Chula Vista
  - City of Coronado
  - City of Del Mar
  - City of El Cajon
  - City of Encinitas
  - City of Escondido
  - City of Imperial Beach
  - City of La Mesa
  - City of Lemon Grove
  - City of National City
  - City of Oceanside
  - City of Poway
  - City of San Diego
  - City of San Marcos
  - City of Santee
  - City of Solana Beach
  - City of Vista
  - San Diego County Regional Airport Authority
  - San Diego Unified Port District

III. PUBLIC PROCESS AND NOTIFICATION PROCEDURES

The San Diego Water Board followed the schedule listed below for the preparation of Order No. R9-2013-0001:

San Diego County Copermittee Permit Reissuance Process

1. On February 8, 2011, the San Diego Water Board met with the San Diego County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No. R9-2007-0001.

2. Between February and May 2011, the San Diego Water Board met with select San Diego County, Orange County, and Riverside County Copermittees, as well as representatives of the environmental community to discuss concepts and receive recommendations for elements to be incorporated in a Regional Municipal Separate Storm Sewer System Permit (Regional MS4 Permit).

3. On June 27, 2011 the San Diego Water Board received the Report of Waste Discharge from the San Diego County Copermittees for the renewal of their NPDES permit, Order No. R9-2007-0001.

4. On April 9, 2012, the San Diego Water Board released an administrative draft of Tentative Order No. R9-2013-0001 for preliminary informal comments and feedback.

5. On April 25, 2012, the San Diego Water Board held an informal public workshop to present the administrative draft of Tentative Order No. R9-2013-0001 and receive verbal comments.

6. Between June and August 2012, the San Diego Water Board held four (4) focused meetings with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community, and USEPA) to discuss and receive preliminary comments and feedback about specific elements in the administrative draft of Tentative Order No. R9-2013-0001.

7. On September 5, 2012, the San Diego Water Board held an informal public workshop to present the modifications that were expected to be incorporated into the Tentative Order based on the preliminary comments and feedback received during the focused meetings held between June and August 2012.

8. Informal written comments on the administrative draft of Tentative Order No. R9-2013-0001 were accepted until September 14, 2012.

9. On October 12, 2012, the San Diego Water Board released a revised administrative draft of Tentative Order No. R9-2013-0001.

10. On October 24, 2012, the San Diego Water Board held a focused meeting with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community, and USEPA) to discuss modifications incorporated into the administrative draft of Tentative Order No. R9-2013-0001.

11. On October 31, 2012, the San Diego Water Board released Tentative Order No. R9-2013-0001 for formal public review and comment.

12. On November 13, 2012 and December 12, 2012, the San Diego Water Board held a formal public Board workshop to present the public draft of Tentative Order No. R9-2013-0001 and receive verbal comments.

13. Formal written comments on the public draft of Tentative Order No. R9-2013-0001 were accepted until January 11, 2013.

14. A public hearing of Tentative Order No. R9-2013-0001 was conducted on April 10 and 11, 2013, that was continued to May 8, 2013.

Orange County Copermittee Permit Reissuance Process

15. On May 20, 2014 the San Diego Water Board received the Report of Waste Discharge from the Orange County Copermittees for the renewal of their MS4 NPDES permit, Order No. R9-2009-0002.

16. On June 24, 2014, the San Diego Water Board met with the Orange County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No.R9-2009-0002 and the process for enrollment as Copermittees under Regional MS4 Permit Order No. R9-2013-0001.

17. On July 1, 2014, the San Diego Water Board held a public meeting to discuss the Orange County Report of Waste Discharge (RoWD) and receive comments on potential modifications to Order No. R9-2013-0001. Based on comments received from the Orange County Copermittees and other interested persons at this meeting, the San Diego Water Board determined that additional public meetings were not needed prior to release of Tentative Order No. R9-2015-0001, amending Order No. R9-2013-0001 in redlined – strikeout format for public review and comment.

18. On September 19, 2014, the San Diego Water Board released Tentative Order No. R9-2015-0001 for a 60 day public review and comment period.

19. On October 8, 2014, the San Diego Water Board held a formal public workshop at a regular board meeting to receive information and discuss the proposed amendments to Order No. R9-2013-0001 described in Tentative Order No. R9-2015-0001.

20. In accordance with State and federal laws and regulations, the San Diego Water Board notified San Diego County, Orange County and Riverside County Copermittees, and all known interested agencies and persons of its intent to adopt Tentative Order No. R9-2015-0001 and provided them with an opportunity to submit their written comments and recommendations. Written comments and recommendations on Tentative Order No. R9-2015-0001 were accepted until November 19, 2014.

21. The San Diego Water Board held a public workshop on October 8, 2014, and a public hearing on February 11, 2015, and heard and considered all comments pertaining to the adoption of Tentative Order No. R9-2015-0001 on February 11, 2015.

IV. BACKGROUND OF THE SAN DIEGO REGION MUNICIPAL STORM WATER PERMITS

In developed and developing areas, storm water runoff is commonly transported through municipal separate storm sewer systems (MS4s) and discharged into local receiving water bodies. As the storm water runs off and flows over the land or impervious surfaces (e.g., paved streets, parking lots, and building rooftops), it accumulates debris, chemicals, sediment, and other pollutants that can adversely affect receiving water quality if discharged untreated. The United States Environmental Protection Agency (USEPA) recognizes wet weather flows from urban areas as the number one source of estuarine pollution in coastal communities,[1] such as those within the San Diego Region.

The federal Clean Water Act (CWA) was amended in 1987 to address and regulate discharges of storm water associated with industrial activities and from municipal storm sewers. With the amendments, many municipalities throughout the United States were obligated for the first time to obtain National Pollutant Discharge Elimination System (NPDES) permits for discharges of storm water from their MS4s.

In response to the CWA 1987 amendment, as well as the pending federal NPDES regulations which would implement the amendment, the San Diego Water Board issued "early" MS4 permits. The San Diego Water Board adopted and issued Order Nos. 90-38, 90-42, and 90-46 to regulate storm water discharges from the MS4s in Orange County, San Diego County, and Riverside County, respectively, within the San Diego Region on July 16, 1990.

The "early" MS4 permits, or First Term Permits, were issued prior to the November 1990 promulgation of the final federal NPDES storm water regulations. By issuing these First Term Permits before the federal regulations took effect, the San Diego Water Board was able to provide the Copermittees additional flexibility in addressing and managing storm water discharges. The First Term Permits contained the essentials of the 1990 regulations, and required the Copermittees to develop and implement runoff management programs, but provided little specificity about what was required to be included in or actually achieved by those programs.

The flexibility provided in the First Term Permits was generally continued through the Second Term Permits. The combination of the lack of specificity in the First and Second Term Permits, a general lack of meaningful action by the Copermittees and a general lack of corresponding reaction (i.e. enforcement) by the San Diego Water Board during the first ten years of the storm water program, resulted in few substantive steps towards achieving improvements in the quality of receiving waters or storm water discharges from the MS4s.

[1] US EPA. 1999. 40 CFR Parts 9, 122, 123, and 124. National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. 64 FR 68727.

From 2001, the regulatory approach incorporated into Third Term Permits was a significant departure from the regulatory approach of the First and Second Term Permits. The Third Term Permits issued by the San Diego Water Board included more detailed requirements that outlined the minimum level of implementation required for the Copermittees' programs to meet the maximum extent practicable (MEP) standard for storm water. The Third Term Permits included more detail to emphasize and enhance the jurisdictional runoff management programs developed by the Copermittees and introduced requirements for developing and implementing watershed-based programs.

The Third Term Permits also incorporated two precedent setting decisions by the State Water Board. In Order WQ 99-05, the State Water Board established receiving water limitation language to be included in all MS4 permits. The State Water Board's precedential language clarified that municipal storm water permits must include provisions requiring discharges to be controlled to attain water quality standards in receiving waters. Unlike previously adopted versions of the receiving water limitation language in the First and Second Term Permits, the language no longer stated that "*violations of water quality standards are not violations of the municipal storm water permit under certain conditions*." In addition, the receiving water limitation language no longer indicated that the "*implementation of best management practices is the 'functional equivalent' of meeting water quality standards*." State Water Board Order WQ 99-05 specifically requires language in MS4 permits for the Copermittees to comply with water quality standards based discharge prohibitions and receiving water limitations through timely implementation of control measures and other actions to reduce pollutants in discharges. (See State Water Board Order WQ 99-05 (*Environmental Health Coalition*)).

In Order WQ 2000-11, also a precedential decision, the State Water Board addressed design standards for structural post-construction best management practices (BMPs) for new development and significant redevelopment. The State Water Board found that the design standards, which require that runoff generated by 85 percent of storm events from specific development categories be infiltrated or treated, reflect the MEP standard. State Water Board Order WQ 2000-11 also found that the post-construction BMP provisions, or Standard Storm Water Mitigation Plan (SSMP) provisions, constitute MEP for addressing storm water pollutant discharges resulting from specific development categories.

The Third Term San Diego County and Orange County Permits (Order Nos. 2001-01 and R9-2002-0001, respectively) were appealed to the State Water Board. Minor modifications were made by the State Water Board, but the requirements were largely upheld. In State Water Board Order WQ 2001-15, the State Water Board upheld the Third Term San Diego County Permit requirements with certain modifications. The State Water Board removed the prohibition of storm water discharges *into* the MS4 that cause or contribute to exceedances of water quality objectives. The revision allows for treatment of pollutants in storm water runoff after the pollutants have entered the MS4. State Water Board Order WQ 2001-15 otherwise upheld all the other requirements of the permit.

In addition to the modification to the discharge prohibition in Order WQ 2001-15, the State Water Board refined Order WQ 99-05 by making clear that the Copermittees may use an iterative approach to achieving compliance with water quality standards that involves ongoing assessments and revisions. Thus, the language for the discharge prohibitions and receiving water limitations was revised to explicitly require the Copermittees to implement an iterative process of assessments and revisions to comply with the discharge prohibitions and receiving water limitations. The San Diego Water Board retained the authority to enforce receiving water limitations and discharge prohibitions even if the Copermittee is engaged in the iterative process.

The Third Term San Diego County Permit was subsequently challenged in the Superior Court of the State of California and the Court of Appeal, Fourth Appellate District. The Court of Appeal, Fourth Appellate District, found that the approach of the Third Term San Diego County Permit to regulating discharges into the MS4 was appropriate (*Building Industry Ass'n. v. State Water Resources Control Bd., et al.,* 124 Cal.App.4th 866 (2004)). The State of California Supreme Court denied review sought by the Building Industry Association in March 2005.

The Fourth Term Permits, or current MS4 permits, began with the adoption of Order No. R9-2007-0001 issued to the Copermittees of San Diego County in January 2007. Order Nos. R9-2009-0002 and R9-2010-0016 were subsequently issued to the Copermittees of Orange County and Riverside County. The Fourth Term Permits continued to include more detailed requirements to be implemented by each Copermittee's jurisdictional runoff management program. The Fourth Term Permits also include requirements to further emphasize a watershed management approach and for more coordination among jurisdictional runoff management programs. In addition, the Fourth Term Permits included more requirements for assessing the effectiveness of the runoff management programs being implemented by the Copermittees. The intent of the inclusion of additional requirements was to enhance and better define elements of the permit that were expected to be incorporated into the iterative process for managing runoff from each Copermittee's jurisdiction and within the watersheds of the San Diego Region.

The Fourth Term Permits include several new and emerging approaches for managing storm water runoff and discharges. Low impact development (LID) requirements are included for development and significant redevelopment to reduce pollutants in storm water runoff from sites through more natural processes such as infiltration and biofiltration closer to the source, rather than utilizing conventional mechanical end-of-pipe treatment systems. Hydrograph modification (hydromodification) management requirements also are included to mitigate the potential for increased erosion in receiving waters due to increased runoff rates and durations often caused by development and increased impervious surfaces. The Fourth Term Orange County and Riverside County Permits introduced requirements to identify areas of existing development where retrofitting with LID projects would be feasible and could be implemented to reduce storm water runoff and pollutants in storm water discharges.

The Fourth Term Orange County and Riverside County Permits included a clearer distinction between storm water and non-storm water discharges. The term “urban runoff” was completely removed, and a distinction between storm water (wet weather) runoff and non-storm water (dry weather) runoff was emphasized. This clarification was made to prevent any potential misunderstanding that regulation under the MS4 permits is limited only to urbanized areas, and to prevent non-storm water runoff from being managed in the same manner as storm water runoff. The term “urban runoff” is not defined in the Code of Federal Regulations (CFR) or Federal Register (FR) in the regulation of MS4 discharges. According to the CWA 402(p)(3)(B)(ii), MS4 permits must include a requirement to effectively prohibit non-storm water discharges into the MS4s.

Finally, for the Fourth Term Orange County and Riverside County Permits the San Diego Water Board found that non-storm water discharges to the MS4 from over application of irrigation water are sources of pollutants. The San Diego Water Board found that non-storm water discharges resulting from over-irrigation must be prohibited from entering the MS4 in accordance with the requirements of the CWA and pursuant to 40 CFR 122.26(d)(2)(iv)(B)(1).

The requirements of the Fourth Term Permits issued to the Copermittees in each county within the San Diego Region now have substantively the same core requirements such as discharge prohibitions, receiving water limitations, jurisdictional runoff management program components, and monitoring program requirements. There are, however, several inconsistencies that exist among the three Fourth Term Permits which complicate oversight and implementation of the permits by the San Diego Water Board.

The Fourth Term San Diego County Permit expired in January 2012. The Fourth Term Orange County permit expired in December 2014 and the Fourth Term Riverside County Permit will expire in November 2015. Issuing the Fifth Term Permits within five years for three counties under three different permits would require the San Diego Water Board to expend significant time and resources for the issuance of the permits through three separate public proceedings, thereby greatly reducing the time and resources available to oversee implementation and compliance. Multiple permits also create confusion for determining compliance among regulated entities, especially for the land development community.

The San Diego Water Board has acknowledged that issuing a single MS4 permit for all the Copermittees in the San Diego Region can and is expected to result in more consistent implementation, improve communication among agencies within watersheds crossing multiple jurisdictions, and minimize resources spent with each permit renewal process. Within the findings of the Fourth Term Riverside County Permit issued in November 2010, the San Diego Water Board notified the public of its intent to develop and issue a single Regional MS4 Permit.

V. REGIONAL MS4 PERMIT APPROACH

The Fifth Term Permit, or Regional MS4 Permit, shifts the focus of the permit requirements from a minimum level of actions to be implemented by the Copermittees to identifying outcomes to be achieved by those actions. Order No. R9-2013-0001 represents an important paradigm shift in the approach for MS4 permits within the San Diego Region.

Historical Permitting Approach

The First and Second Term Permits were very broad and provided little specificity about what was required to be developed and implemented by the Copermittees. The Third Term Permits began to become more specific about the minimum level of implementation required by the Copermittees. The Fourth Term Permits subsequently increased in specificity. The MS4 permits have progressively become more detailed and focused on specifying the minimum level of actions expected to be implemented by the Copermittees. As detailed and specific as the MS4 permits have become, however, they include very little detail about what the desired outcomes of the required actions are expected to achieve. Compliance with the permit requirements has essentially been tracking numbers of actions and reporting, not tracking progress or actual improvements in the quality of receiving waters or discharges from the MS4s. The result has been an increase in actions being implemented by the Copermittees with little or no ability or expectations to determine whether or not improvements in water quality are being achieved.

The Fourth Term Permits result in significant resource expenditure by the Copermittees to report permit compliance information to the San Diego Water Board in the form of annual jurisdictional runoff management program, watershed program, and monitoring program reports. The San Diego Water Board must then expend much of its limited resources on reviewing more than 50 voluminous reports submitted annually by the Copermittees. The information currently reported by the Copermittees is of limited value when trying to measure progress toward achieving improvements in the quality of receiving waters or discharges from the MS4s. Oversight of the MS4 permits is further complicated by the inconsistencies among the requirements issued to the Orange County, San Diego County, and Riverside County Copermittees under three separate MS4 permits.

Under the Fourth Term Permits, the Copermittees must expend a significant portion of their limited resources collecting data of limited value, and putting together reports to submit that information to the San Diego Water Board. Likewise, the San Diego Water Board must expend most of its limited resources reviewing reports, and developing permits instead of working directly with the Copermittees to identify solutions to problems causing impacts to water quality. This is an unsustainable course that will continue to demand more resources from the Copermittees and the San Diego Water Board, and would continue to result in unknown water quality benefits.

New Permitting Approach

The goal of the Regional MS4 Permit is twofold: 1) bring a consistent set of MS4 permit requirements to all of the Copermittees within the San Diego Region; and, 2) provide an MS4 permit with requirements that will allow the Copermittees to focus their efforts and resources on achieving goals and desired outcomes toward the improvement of water quality rather than completing specific actions.

The overall approach included in the Regional MS4 Permit with respect to the jurisdictional runoff management programs will not differ significantly from the current permits. The general requirements for the jurisdictional runoff management program components and compliance with those requirements will remain and be applied consistently throughout the San Diego Region under the Regional MS4 Permit.

The most significant difference in the new permitting approach is the specific manner of implementation for those jurisdictional runoff management programs. Implementation will be based on decisions made by the Copermittees in accordance with what they have identified as their highest priority water quality conditions. In other words, the Copermittees will have significant control in how to implement the jurisdictional runoff management programs to best utilize their available resources in addressing a specific set of priorities effectively, instead of trying to address all the water quality priorities ineffectively.

The Copermittees are given the responsibility of identifying their highest priority water quality conditions that they intend to address. The Copermittees will develop goals that can be used to measure and demonstrate progress or improvements toward addressing those priorities. In addition to the goals, the Copermittees will provide a schedule for achieving the goals for those highest priorities. The measurement of progress toward achieving the goals for those highest priorities requires a better defined and more focused program of monitoring and assessment than under the Fourth Term Permits.

The monitoring and assessment program must be designed to inform the Copermittees of their progress, and the need for modifications in their jurisdictional runoff management programs and schedules to achieve their goals to improve water quality. The monitoring and assessment program requirements will have a more central role in the Regional MS4 Permit than in earlier permits. The monitoring and assessment requirements must also be designed to enable the Copermittees to focus and direct their efforts in implementing their jurisdictional runoff management programs toward their stated desired outcomes to improve the quality of receiving waters and/or discharges from the MS4s.

By providing an MS4 permit that allows the Copermittees to make more decisions about how to utilize and focus their resources, along with a better defined monitoring and assessment program to inform their water quality management decisions, the Copermittees will have the opportunity to:

1) *Plan strategically*. The Copermittees must have the ability to identify their available resources and develop and implement long term plans that can organize, collect, and use those resources in the most strategically advantageous and efficient manner possible. This ability to develop long term plans will allow the Copermittees to focus and utilize their resources in a more concerted way over the short term and long term to address specific water quality priorities through stated desired outcomes.

2) *Manage adaptively*. The Copermittees must be given the ability to modify their plans as additional information and data are collected from the monitoring and assessment programs. The Copermittees' plans may require modifications to the programs, priorities, goals, strategies, and/or schedules in order for the Copermittees to achieve a stated desired outcome.

3) *Identify synergies*. The Copermittees must be given more flexibility to identify efficiencies within and among their jurisdictional runoff management programs as the strategies are developed and implemented to increase the Copermittees' collective effectiveness. The Copermittees must also be able to identify and utilize resources available from other agencies and entities to further augment and enhance their jurisdictional runoff management programs and/or to collectively work with those other agencies and entities toward achieving a stated desired outcome.

The Regional MS4 Permit requirements will provide the Copermittees the flexibility and responsibility to decide what actions will be necessary to achieve an outcome that is tailored and designed by the Copermittees to improve specific prioritized water quality conditions. The San Diego Water Board expects the approach of the Regional MS4 Permit to give the Copermittees a greater sense of ownership for restoring the quality of receiving waters in the San Diego Region by becoming an integral part of the decision making process in identifying water quality conditions to be addressed, as well as determining the best use of their resources.

VI. ECONOMIC CONSIDERATIONS

Statutory Considerations

California Water Code (CWC) section 13241 requires the San Diego Water Board to consider certain factors, including economic considerations, in the adoption of water quality objectives. CWC section 13263 requires the San Diego Water Board to take into consideration the provisions of CWC section 13241 in adopting waste discharge requirements.

In *City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, the California Supreme Court considered whether Regional Water Boards must comply with CWC section 13241 when issuing waste discharge requirements under CWC section 13263(a) by taking into account the costs a permittee will incur in complying with the permit requirements. The Court concluded that whether it is necessary to consider such cost information "*depends on whether those restrictions meet or exceed the requirements of the federal Clean Water Act.*" (*Id.* at p. 627.) The Court ruled that Regional Water Boards may not consider the factors in CWC section 13241, including economics, to justify imposing pollutant restrictions that are less stringent than applicable federal law requires. (*Id.* At pp. 618, 626-627 ["*[Water Code section 13377 specifies that [] discharge permits issued by California's regional boards must meet the federal standards set by federal law. In effect, section 13377 forbids a regional board's consideration of any economic hardship on the part of the permit holder if doing so would result in the dilution of the requirements set by Congress in the Clean Water Act...Because CWC section 13263 cannot authorize what federal law forbids, it cannot authorize a regional board, when issuing a [] discharge permit, to use compliance costs to justify pollutant restrictions that do not comply with federal clean water standards*."]). However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Regional Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

As discussed in Section VII.F, Unfunded State Mandates, the San Diego Water Board finds that the requirements in this Order are not more stringent than the minimum federal requirements. Among other requirements, federal law requires MS4 permits to include requirements to effectively prohibit non-storm water discharges into the MS4s, in addition to requiring controls to reduce the discharge of pollutants in storm water to the MEP, and other provisions as USEPA or the State determines are appropriate for the control of pollutants in MS4 discharges.

The requirements in this Order may be more specific or detailed than those enumerated in federal regulations under 40 CFR 122.26 or in the USEPA guidance. However, the requirements have been designed to be consistent with and within the federal statutory mandates described in CWA section 402(p)(3)(B)(ii) and (iii) and the related federal regulations and guidance. Consistent with federal law, all of the

conditions in this Order could have been included in a permit adopted by USEPA in the absence of the in lieu authority of California to issue NPDES permits.

Moreover, the inclusion of numeric WQBELs in this Order does not cause this Order to be more stringent than federal law. Federal law authorizes both narrative and numeric effluent limitations to meet state water quality standards. The inclusion of WQBELs as discharge specifications in an NPDES permit in order to achieve compliance with water quality standards is not a more stringent requirement than the inclusion of BMP based permit limitations to achieve water quality standards (State Water Board Order No. WQ 2006-0012 (*Boeing*)). Therefore, consideration of the factors set forth in CWC section 13241 is not required for permit requirements to implement the effective prohibition on the discharge of non-storm water discharges into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determine appropriate to control such pollutants, as those requirements are mandated by federal law.

Included in the provisions of the Order are monitoring and reporting requirements that are designed to demonstrate that the Copermittees are implementing programs to comply with the CWA municipal storm water requirements. CWA section 308(a) and 40 CFR 122.41(h), (j)-(l), 122.44(i) and 122.48 require that all NPDES permits specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s (40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c)) also specify additional monitoring and reporting requirements. In addition to the federal requirements of the CWA, the San Diego Water Board also has the authority in CWC 13383 to establish monitoring, reporting, and recordkeeping requirements that implement federal and state laws and regulations through NPDES permits.

The monitoring and assessment information that will be reported to the San Diego Water Board is necessary to determine if the Copermittees are making progress toward achieving compliance with the discharge prohibitions, receiving water limitations, and effluent limitations under Provision A of the Order. The monitoring and assessment information that will be reported is also expected to be key to the iterative approach and adaptive management process that is required to be implemented by the Copermittees if they cannot meet the discharge prohibitions and receiving water limitations under the present conditions, which is also part of the requirements under Provision A of the Order.

Notwithstanding the above, the San Diego Water Board has considered cost information in issuing this Order, as discussed below. The San Diego Water Board has also considered all of the evidence that has been presented to the San Diego Water Board regarding the CWC section 13241 factors in adopting this Order. The San Diego Water Board finds that the requirements in this Order are reasonably necessary to protect beneficial uses identified in the Basin Plan and the economic information related to costs of compliance and other CWC section 13241 factors are not sufficient to justify failing to protect those beneficial uses. Where appropriate, the

San Diego Water Board has provided or will consider providing the Copermittees with additional time to implement control measures to achieve final WQBELs and/or water quality standards.

Cost Information

Discussions of the financial and economic ramifications of municipal storm water management programs tend to focus on the significant costs incurred by municipalities in developing and implementing the programs. When considering the cost of implementing the programs, however, it is also important to consider the alternative costs that are incurred when programs are not fully implemented, as well as the economic benefits which result from effective program implementation.

The recent financial and economic conditions have amplified the concerns about the costs incurred by the municipalities in developing and implementing their programs. The reduction in resources resulting from the recent financial and economic conditions has been cited by many of the Copermittees as a justification for reducing the requirements that must be met by their programs. While the recent conditions are a cause for concern in the short term, these programs also have an opportunity to identify and implement improvements and efficiencies before the next period of growth and development, resulting in more effective and sustainable programs over the long term.

In addition, it is very difficult to ascertain the true cost of implementation of the Copermittees' management programs because of inconsistencies in reporting by the Copermittees. Reported costs of compliance for the same program element can vary widely from city to city, often by a very wide margin that is not easily explained.[2] Despite these problems, efforts have been made to identify management program costs, which can be helpful in understanding the costs of program implementation.

The San Diego Water Board recognizes that the Copermittees will incur costs in implementing this Order, potentially above and beyond the costs from the Copermittees' prior permits. The San Diego Water Board also recognizes that, due to California's current economic condition, many Copermittees currently have limited staff and resources to implement actions to address its MS4 discharges. Based on the economic considerations below, the San Diego Water Board has provided the Copermittees a significant amount of flexibility to choose how to implement the requirements of the Order.

The Order also allows the Copermittees to customize their plans, programs, and monitoring requirements. In the end, it is up to the Copermittees to determine the effective BMPs and measures necessary to comply with this Order. The Copermittees can choose to implement the least expensive measures that are effective in meeting the requirements of this Order. This Order also does not require the Copermittees to

[2] LARWQCB, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.

fully implement all requirements within a single permit term. Where appropriate, the Board has provided the Copermittees with additional time outside of the permit term to implement control measures to achieve final WQBELs and/or water quality standards.

The San Diego Water Board has considered available cost information associated with compliance with this Order. It is not possible to predict accurately the cost impact of the requirements that involve an unknown level of implementation or that depend on environmental variables that are as yet undefined. Only general conclusions can be drawn from this information.

Estimated Municipal Storm Water Program Implementation Costs

The USEPA, the State Water Board, and the California Regional Water Quality Control Boards (Regional Water Boards) have attempted to evaluate the costs of implementing municipal storm water programs. The assessments have demonstrated that the true costs are difficult to ascertain and reported costs vary widely. In addition, reported fiscal analyses tend to neglect the costs incurred to municipalities when storm water and non-storm water runoff is not effectively managed, which are incurred as a result of pollution, contamination, nuisance, and damage to ecosystems, property, and human health. Nonetheless, they provide a useful context for considering the costs of requirements within Order No. R9-2013-0001.

In 1999, the USEPA reported on multiple studies it conducted to determine the cost of management programs. A study of Phase II municipalities determined that the annual cost of the Phase II program was expected to be $9.16 per household. The USEPA also studied 35 Phase I municipalities, finding costs to be $9.08 per household annually, similar to those anticipated for Phase II municipalities.[3]

The State Water Board commissioned a study by the California State University, Sacramento to assess costs of the Phase I MS4 program. This study includes an assessment of costs incurred by Phase I MS4s throughout the state to implement their programs. Annual cost per household in the study ranged from $18 to $46, with the Fresno-Clovis Metropolitan Area representing the lower end of the range, and the City of Encinitas (in San Diego County) representing the upper end of the range.[4]

A study on Phase I MS4 program costs was also conducted by the California Regional Water Quality Control Board, Los Angeles Region (Los Angeles Water Board), where program costs reported in the municipalities' annual reports were assessed. The Los Angeles Water Board estimated that average per household cost to implement the MS4 program in Los Angeles County was $12.50. [5]

[3] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791-68792.
[4] State Water Board, 2005. NPDES Stormwater Cost Survey. P. ii.
[5] Los Angeles Water Board, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.

It is important to note that reported program costs are not all attributable to solely complying with MS4 permits. Many program components, and their associated costs, existed before any MS4 permits were ever issued. For example, street sweeping and trash collection costs cannot be solely or even principally attributable to MS4 permit compliance, since these practices have long been expected from and implemented by municipalities.

Therefore, true program cost resulting from MS4 permit requirements is some fraction of reported costs. The California State University, Sacramento study found that only 38 percent of program costs are new costs fully attributable to MS4 permits. The remainder of the program costs was either pre-existing or resulted from enhancement of pre-existing programs.[6] In 2000, the County of Orange found that even lower amounts of program costs are solely attributable to MS4 permit compliance, reporting that the amount attributable to implement the County or Orange Drainage Area Management Plan (DAMP), was less than 20 percent of the total budget. The remaining 80 percent was attributable to pre-existing programs.[7] More current data from the County of Orange is not used in this discussion because the County of Orange no longer reports such information.

Estimated Value of Healthy Water Quality

Economic considerations of municipal storm water management programs cannot be limited only to program costs. Evaluation of programs must also consider information on the benefits derived from environmental protection and improvement.[8] Attention is often focused on municipal storm water management program costs, but the programs must also be viewed in terms of their value to the public.

Placing a value on healthy receiving waters is very difficult. Often the value of receiving waters with good water quality manifests in other forms, such as tourism, recreational opportunities, and/or increased property values. When surface water bodies are degraded, thereby degrading the habitat within and adjacent to the water bodies, the public loses the value and benefits associated with being able to use the area in and around the water bodies. Surface waters that are able to support the beneficial uses designated in the Basin Plan can sustain plants and wildlife that can attract visitors and residents, providing aesthetic, recreational, as well as monetary value to the public. At this time, however, there have been no studies for the San Diego Region to quantify the added value that surface waters with healthy water quality can provide.

[6] State Water Board, 2005. NPDES Stormwater Cost Survey. P. 58.
[7] County of Orange, 2000. A NPDES Annual Progress Report. P. 60.
[8] Ribaudo M.O. and D. Heelerstein. 1992, *Estimating Water Quality Benefits: Theoretical and Methodological Issues.* U.S. Department of Agriculture. Technical Bulletin No. 1808.

USEPA has estimated that household willingness to pay for improvements in fresh water quality for fishing and boating is approximately $158-$210.[9] This estimate can be considered conservative, since it does not include important considerations such as marine waters benefits, wildlife benefits, or flood control benefits. Another study conducted by California State University, Sacramento reported that the annual household willingness to pay for statewide clean water is approximately $180.[10]

A study conducted by the University of Southern California and University of California, Los Angeles assessed the costs and benefits of implementing various approaches for achieving compliance with the MS4 permits in the Los Angeles region. The study found that non-structural systems would cost $2.8 billion but provide $5.6 billion in benefit. If structural systems were determined to be needed, the study found that total costs would be $5.7 to $7.4 billion, while benefits could reach $18 billion.[11] Costs are anticipated to be borne over many years, probably at least ten years.

As can be seen, the benefits of the municipal storm water management programs are expected to considerably exceed their costs. Such findings are corroborated by USEPA, which found that the benefits of implementation of its Phase II storm water rule would also outweigh the costs.[12]

[9] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68793.
[10] State Water Board, 2005. NPDES Stormwater Cost Survey. P. iv.
[11] Los Angeles Water Board, 2004. Alternative Approaches to Stormwater Control.
[12] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791.

VII. APPLICABLE STATUTES, REGULATIONS, PLANS AND POLICIES

A. Legal Authorities – Federal Clean Water Act and California Water Code

This Order is issued pursuant to section 402 of the CWA and implementing regulations adopted by the USEPA and chapter 5.5, division 7 of the CWC (commencing with section 13370). This Order serves as an NPDES permit for point source discharges to surface waters. This Order also serves as waste discharge requirements pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

The objective of the CWA is "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*." To carry out this objective, the CWA requires the implementation of permit programs to regulate the discharge of pollutants and dredged or fill material to the navigable waters of the U.S. and to regulate the use and disposal of sewage sludge. CWA section 402 provides the legal authority to issue a permit for the discharge of pollutants to waters of the U.S. under the NPDES. The CWA provides that NPDES permits may be issued by states which are authorized to implement the provisions of that act. California became authorized to implement the NPDES permit program on May 14, 1973.

The Porter-Cologne Water Quality Control Act (Division 7, commencing with CWC section 13000) established the State Water Resources Control Board (State Water Board) and nine Regional Water Quality Control Boards (Regional Water Boards) as the principal state agencies with primary responsibility for the coordination and control of water quality. CWC section 13200(f) established the San Diego Water Board, which has the primary responsibility for the coordination and control of water quality in the San Diego Region, which includes all the basins draining into the Pacific Ocean between the southern boundary of the Santa Ana Region and the California-Mexico boundary. The San Diego Water Board implements the CWA through Chapter 5.5 of the CWC, commencing with section 13370. CWC section 13377 provides the San Diego Water Board the legal authority to issue waste discharge requirements to ensure compliance with all applicable provisions of the CWA and acts amendatory thereof or supplementary, thereto, to implement water quality control plans, or for the protection of beneficial uses, or to prevent nuisance.

CWA section 402(p) requires the USEPA or authorized state to issue NPDES permits for storm water discharges from municipal separate storm sewer systems (MS4s) to waters of the U.S. CWA section 402(p)(3)(B)(ii) requires that NPDES permits for storm water discharges from MS4s "*effectively prohibit non-storm water discharges*" into the MS4s. CWA section 402(p)(3)(B)(iii) requires that NPDES permits for storm water discharges from MS4s to "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable* [MEP], *including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*."

The USEPA published implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]), which prescribe permit application requirements for storm water discharges from MS4s pursuant to CWA 402(p), on November 16, 1990. The USEPA published an Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems, which provided guidance on permit application requirements for regulated MS4s, on May 17, 1996. The federal regulations in 40 CFR 122 and guidance issued by USEPA serve as the foundation for the provisions of Order No. R9-2013-0001. The legal authorities provided by the above statutes and regulations are included as part of the discussions in Section VIII of this Fact Sheet.

B. Legal Authority for the Permit Issued on a Region-wide Basis

CWA section 402(p)(3)(B) provides the San Diego Water Board the legal authority to issue an NPDES permit for the San Diego Region as compared to separate MS4 permits based upon County- and partial County-wide boundaries as they exist within the San Diego Region. CWA section 402(p)(3)(B) states that "*Permits for discharges from municipal storm sewers- (i) may be issued on a system- or jurisdiction-wide basis ....*" The federal regulations in 40 CFR 122.26(a)(1)(v) also state that the San Diego Water Board "*may designate dischargers from municipal separate storm sewers on a system-wide or jurisdiction-wide basis. In making this determination, the [San Diego Water Board] may consider the following factors: (A) the location of the discharge with respect to waters of the United States; (B) the size of the discharge; (C) the quantity and nature of the pollutants discharged to waters of the United States; and (D) other relevant factors*."

More specifically, the federal regulations provide that for large and medium MS4 systems, the San Diego Water Board may issue a regional permit. Specifically, the federal regulation in 40 CFR 122.26(a)(3) provide:

"*(ii) The Director may either issue one system-wide permit covering all discharges from municipal separate storm sewers within a large or medium municipal storm sewer system or issue distinct permits for appropriate categories of discharges within a large or municipal separate storm sewer system including, but not limited to: all discharges owned or operated by the same municipality; located within the same jurisdiction; all discharges within a system that discharge to the same watershed; discharges within a system that are similar in nature; or for individual discharges from municipal separate storm sewers within the system.*

(iii) The operator of a discharge from a municipal separate storm sewer which is part of a large or medium municipal separate storm sewer system must either: (A) Participate in a permit application (to be a permittee or a co-permittee) with one or more other operator of discharges from the large or medium municipal storm sewer system which covers all, or a portion of all, discharges from the municipal separate storm sewer system; (B) Submit a distinct permit application

which only covers discharges from the municipal separate storm sewers for which the operator is responsible; or (C) A regional authority may be responsible for submitting a permit application under the following guidelines....

(iv) One permit application may be submitted for all or a portion of all municipal separate storm sewers within adjacent or interconnected large or medium municipal separate storm sewer systems. The Director may issue one systemwide permit covering all, or a portion of all municipal separate storm sewers in adjacent or interconnected large or medium municipal separate storm sewer systems.

(v) Permits for all or a portion of all discharges from large or medium municipal separate storm sewer systems that are issued on a system-wide, jurisdiction-wide, watershed or other basis may specify different conditions relating to different discharges covered by the permit, including different management programs for different drainage areas which contribute storm water to the system."

Based on these regulations, the San Diego Water Board may issue a region-wide MS4 permit. The regulations also clarify that the permit may include different conditions for separate discharges covered by the permit. This allows the San Diego Water Board to ensure that suitable water quality conditions and provisions are identified for each watershed.

The USEPA's responses to comments in the Final Rule for the above-mentioned regulations also make it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide, permits. In the Final Rule published in the Federal Register and containing the responses to comments, USEPA notes that 40 CFR 122.26(a)(3)(iv) would allow an entire system in a geographical region under the purview of a State agency to be designated under a permit.[13] USEPA also states that many commenters wanted to allow the permitting authority broad discretion to establish system-wide permits, and that EPA believes that paragraphs 40 CFR 122.26 (a)(1)(v) and (a)(3)(ii) allow for such broad discretion.[14]

This Order creates watershed requirements that apply to multiple counties. The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees. Managing storm water on a regional and watershed basis is expected to result in improved water quality, as the Order focuses on monitoring and management practices necessary to improve each watershed rather than political boundaries. A single permit also allows the San Diego Water Board staff to expend fewer resources developing successive multiple permits and allows more resources to be devoted to working cooperatively with all three current groups of Copermittees to ensure implementation of this Order results in improved water quality.

[13] 55 Federal Register 47990-01, 48042
[14] Ibid

C. Federal and California Endangered Species Acts

This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2115.5) or the Federal Endangered Species Act (16 United States Code [USC] sections 1531 to 1544). This Order requires compliance with requirements to protect the beneficial uses of waters of the U.S. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

D. California Environmental Quality Act

The action to adopt an NPDES Permit is exempt from the provisions of Chapter 3 of the California Environmental Quality Act (CEQA) (Public Resources Code section 21100, et seq.) pursuant to CWC section 13389. (*County of Los Angeles v. Cal. Water Boards* (2006) 143 Cal.App.4th 985.)

E. State and Federal Regulations, Plans and Policies

The legal authority provided by the following regulations, plans, and policies are also included as part of the discussions in Section VIII of this Fact Sheet.

<u>Water Quality Control Plan for the San Diego Basin</u>

The CWA requires the San Diego Water Board to establish water quality standards for each water body in its region. Water quality standards include beneficial uses, water quality objectives and criteria that are established at levels sufficient to protect beneficial uses, and an antidegradation policy to prevent degrading of waters. On September 8, 1994, the San Diego Water Board adopted the *Water Quality Control Plan for the San Diego Basin (*Basin Plan). The Basin Plan designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters in the San Diego Region. The San Diego Water Board has amended the Basin Plan on multiple occasions since 1994. In addition, the Basin Plan implements State Water Board Resolution No. 88-63, which established state policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply. Beneficial uses applicable to the surface water bodies that receive discharges from the MS4s within the San Diego Region generally include those listed below:

The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region:

- Municipal and Domestic Supply (MUN)
- Agricultural Supply (AGR)

- Industrial Process Supply (PROC)
- Industrial Service Supply (IND)
- Ground Water Recharge (GWR)
- Contact Water Recreation (REC1)
- Non-contact Water Recreation (REC2)
- Warm Freshwater Habitat (WARM)
- Cold Freshwater Habitat (COLD)
- Wildlife Habitat (WILD)
- Rare, Threatened, or Endangered Species (RARE)
- Freshwater Replenishment (FRSH)
- Hydropower Generation (POW)
- Preservation of Biological Habitats of Special Significance (BIOL)

The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region:

- Navigation (NAV)
- Commercial and Sport Fishing (COMM)
- Estuarine Habitat (EST)
- Marine Habitat (MAR)
- Aquaculture (AQUA)
- Migration of Aquatic Organisms (MIGR)
- Spawning, Reproduction, and/or Early Development (SPWN)
- Shellfish Harvesting (SHELL)

Pursuant to Water Code sections 13263 and 13377, the requirements of this Order implement the Basin Plan.

Water Quality Control Plan for Ocean Waters of California, California Ocean Plan

In 1972, the State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan). The State Water Board adopted the most recent amended Ocean Plan on September 15, 2009. The Office of Administrative Law approved it on March 10, 2010. On October 8, 2010, USEPA approved the 2009 Ocean Plan. The Ocean Plan is applicable, in its entirety, to ocean waters of the State. In order to protect beneficial uses, the Ocean Plan establishes water quality objectives and a program of implementation. Pursuant to Water Code sections 13263 and 13377, the requirements of this Order implement the Ocean Plan. The Ocean Plan identifies the beneficial uses of ocean waters of the State to be protected as summarized below:

- Industrial water supply
- Water contact and non-contact recreation, including aesthetic enjoyment; navigation
- Commercial and sport fishing

- Mariculture
- Preservation and enhancement of designated Areas of Special Biological Significance
- Rare and endangered species
- Marine habitat
- Fish spawning and shellfish harvesting

On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving an exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges. On June 19, 2012, the State Water Board adopted Order No. 2012-0031, amending Order No. 2012-0012 to require pollutant load reductions to be achieved within six years for the ASBS Compliance Plans, section A.2.d(2) and ASBS Pollution Prevention Plans, section B.2.b(2). The State Water Board Resolution No. 2012-0012, as amended requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject terms and conditions of State Water Board Resolution No. 2012-0012, as amended. The Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012, as amended, applicable to these discharges, are incorporated in Attachment A of this Order. Requirements of this Order implement the Ocean Plan.

Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality

On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

Antidegradation Policy

Federal regulations (40 CFR 131.12) require that the state water quality standards include an antidegradation policy consistent with the federal antidegradation policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16 ("Statement of Policy with Respect to Maintaining the Quality of the Waters of the State"). State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law.

The San Diego Water Board's Basin Plan implements and incorporates by reference both the State and federal antidegradation policies. State Water Board Resolution No. 68-16 and 40 CFR 131.12 require the San Diego Water Board to maintain high quality waters of the State until it is demonstrated that any change in quality will be consistent with maximum benefit to the people of the State, will not unreasonably affect beneficial uses, and will not result in water quality less than that described in the San Diego Water Boards' policies. State Water Board Resolution No. 68-16 requires that discharges of waste be regulated to meet best practicable treatment or control to assure that pollution or nuisance will not occur and the highest water quality consistent with the maximum benefit to the people of the State be maintained.

The discharges permitted in this Order are consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Board Resolution No. 68-16. Many of the water bodies within the area covered by this Order are of high quality. The Order requires the Copermittees to meet best practicable treatment or control to meet water quality standards. As required by 40 CFR 122.44(a), the Copermittees must comply with the "maximum extent practicable" technology-based standard set forth in CWA section 402(p) for discharges of pollutants in storm water from the MS4s.

Many of the waters within the area covered by this Order are impaired and listed on the State's CWA Section 303(d) List and the San Diego Water Board has established TMDLs to address the impairments. This Order requires the Copermittees to comply with permit provisions to implement the WLAs set forth in the TMDLs in order to restore the beneficial uses of the impaired water bodies consistent with the assumptions and requirements of the TMDLs. This Order includes requirements to develop and implement storm water management programs, achieve WQBELs, and effectively prohibit non-storm water discharges into the MS4. The issuance of this Order does not authorize an increase in the amount of discharge of waste.

Anti-Backsliding Requirements

CWA sections 402(o) and 303(d)(4) and 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations or conditions may be relaxed. All effluent limitations and other conditions in this Order are at least as stringent as the effluent limitations in the previous permits issued to the San Diego County Copermittees, the Orange County Copermittees and the Riverside County Copermittees.

Clean Water Act Section 303(d) List

CWA section 303(d)(1) requires each State to identify specific water bodies within its boundaries where water quality standards are not being met or are not expected to be

met after implementation of technology-based effluent limitations on point sources. Water bodies that do not meet water quality standards are considered impaired and are placed on the state's "303(d) List." Periodically, USEPA approves the State's 303(d) List.

Most recently, USEPA approved the State's 2010 303(d) List of impaired water bodies on October 11, 2011, which includes certain receiving waters in the San Diego Region. For each listed water body, the state or USEPA is required to establish a TMDL of each pollutant impairing the water quality standards in that water body. A TMDL is a tool for implementing water quality standards and is based on the relationship between pollution sources and in-stream water quality conditions. The TMDL establishes the allowable pollutant loadings for a water body and thereby provides the basis to establish water quality-based controls. These controls should provide the pollution reduction necessary for a water body to meet water quality standards.

A TMDL is the sum of the allowable pollutant loads of a single pollutant from all contributing point sources (the waste load allocations or WLAs) and non-point sources (load allocations of LAs) plus the contribution from background sources and a margin of safety (40 CFR 130.2(i)). MS4 discharges are considered point source discharges. For 303(d)-listed water bodies and pollutants in the San Diego Region, the San Diego Water Board or USEPA develops and adopts TMDLs that specify these requirements.

Since 2002, the San Diego Water Board has established seven (7) TMDLs to remedy water quality impairments in various water bodies within the San Diego Region (see Attachment E to the Order). These TMDLs identify MS4 discharges as a source of pollutants to these water bodies, and, as required, establish WLAs for MS4 discharges to reduce the amount of pollutant discharged to receiving waters. CWA section 402(p)(3)(B)(iii) requires the San Diego Water Board to impose permit conditions, including: "management practices, control techniques and system, design and engineering methods, and *such other provisions as the Administrator or the State determines appropriate for the control of such pollutants."* (Emphasis added.) CWA section 402(a)(1) also requires states to issue permits with conditions necessary to carry out the provisions of the CWA. Federal regulations also require that NDPES permits contain WQBELs consistent with the assumptions and requirements of all available WLAs (40 CFR 122.44(d)(1)(vii)(B)). CWC section 13377 also requires that NPDES permits include limitations necessary to implement water quality control plans. Therefore, this Order includes WQBELs and other provisions to implement the TMDL WLAs assigned to Copermittees regulated by this Order.

<u>Other Regulations, Plans and Policies</u>

This Order implements all other applicable federal regulations and State regulations, plans and policies, including the California Toxics Rule at 40 CFR 131.38 (Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California Rule [California Toxics Rule or CTR]), and State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP).

F. Unfunded State Mandates

Article XIII B, Section 6(a) of the California Constitution provides that whenever "*any state agency mandates a new program or higher level of service on any local government, the state shall provide a subvention of funds to reimburse that local government for the costs of the program or increased level of service*." The requirements of this Order do not constitute state mandates that are subject to a subvention of funds for several reasons, including, but not limited to, the following.

First, the requirements of this Order do not constitute a new program or a higher level of service as compared to the requirements contained in the previous Fourth Term Permits. The overarching requirement to impose controls to reduce the pollutants in discharges from MS4s is dictated by the CWA and is not new to this permit cycle (33 USC section 1342(p)(3)(B)). The inclusion of new and advanced measures as the MS4 programs evolve and mature over time is anticipated under the CWA (55 FR 47990, 48052 (Nov. 16, 1990)), and to the extent requirements in this Order are interpreted as new advanced measures, they do not constitute a new program or higher level of service.

Second, and more broadly, mandates imposed by federal law, rather than by a state agency, are exempt from the requirement that the local agency's expenditures be reimbursed (Cal. Const., art. XIII B, section 9, subd. (b)). This Order implements federally mandated requirements under the CWA and its requirements are therefore not subject to subvention of funds. This includes federal requirements to effectively prohibit non-storm water discharges, to reduce the discharge of pollutants in storm water to the MEP, and to include such other provisions as the Administrator or the State determines appropriate for the control of such pollutants (33 USC section 1342(p)(3)(B)). Federal cases have held these provisions require the development of permits and permit provisions on a case-by-case basis to satisfy federal requirements. (*Natural Resources Defense Council, Inc., v. USEPA* (9th Cir. 1992) 966 F.2d 1292, 1308, fn. 17.)

The authority exercised under this Order is not reserved state authority under the CWA's savings clause (cf. *Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 627-628 [relying on 33 USC section 1370, which allows a state to develop requirements which are not "less stringent" than federal requirements]), but instead is part of a federal mandate to develop pollutant reduction requirements for municipal separate storm sewer systems. To this extent, it is entirely federal authority that forms the legal basis to establish the permit provisions. (See, *City of Rancho Cucamonga v. Regional Water Quality Control Board, Santa Ana Region* (2006) 135 Cal.App.4th 1377, 1389; *Building Industry Ass'n of San Diego Co. v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 882-883.)

The MEP standard is a flexible standard that balances a number of considerations, including technical feasibility, cost, public acceptance, regulatory compliance, and effectiveness. (*Building Ind. Ass'n., supra,* 124 Cal.App.4th at pp. 873-874, 889.) Such considerations change over time with advances in technology and with experience

gained in storm water management (55 FR 47990, 48052 (Nov. 16, 1990)). Accordingly, a determination of whether the conditions contained in this Order exceed the requirements of federal law cannot be based on a point by point comparison of the permit conditions and the minimum control measures that are required "at a minimum" to reduce pollutants to the maximum extent practicable and to protect water quality (40 CFR 122.34). Rather, the appropriate focus is whether the permit conditions, as a whole, exceed the MEP standard.

In recent months, the County of Los Angeles and County of Sacramento Superior Courts have granted writs setting aside decisions of the Commission on State Mandates that held certain requirements in Phase I permits constituted unfunded mandates. In both cases, the courts have found that the correct analysis in determining whether an MS4 permit constituted a state mandate was to evaluate whether the permit as a whole exceeds the MEP standard. (*State of Cal. v. Comm. on State Mandates* (Super. Ct. Sacramento County, 2012, No. 34-2010-80000604), *State of California v. County of Los Angeles* (Super. Ct. Los Angeles County, 2011, No. BS130730.) Both cases are currently pending appeal.

The requirements of the Order, taken as a whole rather than individually, are necessary to reduce the discharge of pollutants to the MEP and to protect water quality. The San Diego Water Board finds that the requirements of the Order are practicable, do not exceed federal law, and thus do not constitute an unfunded mandate. These findings are the expert conclusions of the principal state agency charged with implementing the NPDES program in California (CWC sections 13001, 13370).

It should also be noted that the provisions in this Order to effectively prohibit non-storm water discharges are also mandated by the CWA (33 USC section 1342(p)(3)(B)(ii)). Likewise, the provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state establishes or adopts a TMDL, federal law requires that permits must contain effluent limitations consistent with the assumptions and requirements of any applicable waste load allocation in a TMDL (40 CFR 122.44(d)(1)(vii)(B)).

Third, the local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental dischargers who are issued NPDES permits for storm water discharges. With a few inapplicable exceptions, the CWA regulates the discharge of pollutants from point sources (33 USC section 1342) and the Porter-Cologne Act regulates the discharge of waste (CWC section 13263), both without regard to the source of the pollutant or waste. As a result, the "costs incurred by local agencies" to protect water quality reflect an overarching regulatory scheme that places similar requirements on governmental and non-governmental dischargers. (See *County of Los Angeles v. State of California* (1987) 43 Cal.3d 46, 57-58 [finding comprehensive workers' compensation scheme did not create a cost for local agencies that was subject to state subvention].)

The CWA and the Porter-Cologne Act largely regulate storm water with an even hand, but to the extent there is any relaxation of this even-handed regulation, it is in favor of the local agencies. Generally, the CWA requires point source dischargers, including dischargers of storm water associated with industrial or construction activity, to comply strictly with water quality standards (33 USC section 1311(b)(1)(C); *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159, 1164-1165 [noting that industrial discharges must strictly comply with water quality standards]). As discussed in prior State Water Board decisions, certain provisions of this Order do not require strict compliance with water quality standards (State Water Board Order No. WQ 2001-0015, p. 7). Those provisions of this Order regulate the discharge of waste in municipal storm water under the CWA's MEP standard, not the BAT/BCT standard that applies to other types of discharges. These provisions, therefore, regulate the discharge of waste in municipal storm water more leniently than the discharge of waste from non-governmental sources.

Fourth, the Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)). To the extent that the local agency Copermittees have voluntarily availed themselves of the permit, the program is not a state mandate. (Accord, *County of San Diego v. State of California* (1997) 15 Cal.4th 68, 107-108.)

Fifth, the local agency Copermittees' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under state law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

Finally, even if any of the permit provisions could be considered unfunded mandates, under Government Code section 17556, subdivision (d), a state mandate is not subject to reimbursement if the local agency has the authority to charge a fee. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order, subject to certain voting requirements contained in the California Constitution. (See Cal. Const., Art. XIII D, section 6, subd. (c); see also *Howard Jarvis Taxpayers Ass'n v. City of Salinas* (2002) 98 Cal.App.4th 1351, 1358-1359.) The Fact Sheet demonstrates that numerous activities contribute to the pollutant loading in the MS4. Local agencies can levy service charges, fees, or assessments on these activities, independent of real property ownership. (See, e.g., *Apartment Ass'n of Los Angeles County, Inc., v. City of Los Angeles* (2001(24 Cal.4th 830, 842 [upholding inspection fees associated with renting property].) The authority and ability of a local agency to defray the cost of a program without raising taxes indicates that a program does not entail a cost subject to subvention. (*Clovis Unified School Dist. V. Chiang* (2010) 188 Cal.App.4th 794, 812, citing *Connell v. Sup. Ct.* (1997) 59 Cal.App.4th 382, 401; *County of Fresno v. State of California* (1991) 53 Cal. 3d. 482, 487-488.)

VIII. PROVISIONS

The provisions (i.e. NPDES permit requirements) of the Order are discussed below.

A. Prohibitions and Limitations

Purpose: Provision A includes the prohibitions and limitations requirements that are the foundation of all the subsequent requirements included in the Order. Compliance with the prohibitions and limitations will restore and protect receiving waters from impacts that may be caused by discharges into and from the Copermittees' MS4s and ultimately achieve the objective of the CWA.

In meeting the requirements set forth in the Order, the Copermittees must be cognizant that the prohibitions and limitations exist and will be the standard by which the San Diego Water Board will be measuring the progress and success of their implementation of the NPDES permit requirements.

***Discussion*:** The objective of the CWA is to "*restore and maintain the chemical, physical, and biological integrity of the Nation's waters*." The CWA requires the implementation of NPDES permit programs to regulate discharges of pollutants and dredged or fill material to the navigable waters of the U.S. For discharges into and from MS4s, the CWA requires the NPDES permits to "*effectively prohibit non-stormwater discharges into the storm sewers*" and "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable.*"

Provision A includes limitations, consistent with the requirements of the CWA for discharges from MS4s. Provision A expresses these limitations as discharge prohibitions, receiving water limitations, and effluent limitations. Compliance with the discharge prohibitions and receiving water limitations is also explicitly described, in conformance with precedential State Water Board Orders.

More specific and detailed discussions of the requirements of Provision A are provided below.

Provision A.1 (Discharge Prohibitions) prohibits the discharge of specific types of waste into and/or from the Copermittees' MS4s.

Provision A.1.a restates and reiterates Basin Plan Waste Discharge Prohibition 1, by prohibiting discharges into and from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the

state. The terms pollution,[15] contamination,[16] and nuisance[17] are defined under CWC 13050. Provision A.1.c incorporates all the waste discharge prohibitions of the Basin Plan into the requirements of the Order. The waste discharge prohibitions from the Basin Plan have been reproduced and provided in Attachment A to the Order.

Provision A.1.b requires non-storm water discharges into the MS4s to be effectively prohibited, consistent with the requirements of the CWA for MS4 permits to "*effectively prohibit non-stormwater discharges into the storm sewers*." The effective prohibition is required to be implemented by each Copermittee within its jurisdiction through the illicit discharge detection and elimination requirements under Provision E.2. The prohibition does not apply to NPDES permitted discharges into the Copermittees' MS4s.

The CWA employs the strategy of prohibiting the discharge of any pollutant from a point source into waters of the United States unless the discharger of the pollutant(s) obtains an NPDES permit pursuant to CWA Section 402. The 1987 amendment to the CWA includes provision 402(p) that specifically addresses NPDES permitting requirements for storm water discharges from MS4s. CWA section 402(p) prohibits the discharge of pollutants from specified MS4s to waters of the U.S. except as authorized by an NPDES permit and identifies two substantive standards for MS4 storm water permits. MS4 permits (1) "*shall include a requirement to effectively prohibit nonstormwater discharges into the storm sewers*" and (2) "*shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or State determines appropriate for the control of such pollutants*." (CWA section 402(p)(3)(B)(ii-iii).)

In November 1990, the USEPA published regulations addressing storm water discharges from MS4s (55 FR 47990 and following (Nov. 16, 1990) (Phase I Final Rule)). The regulations establish minimum requirements for MS4 permits, and generally focus on the requirement that MS4s implement programs to reduce the amount of pollutants found in storm water discharges to the MEP. The CWA's municipal storm water MEP standard does not require storm water discharges to strictly meet water quality standards, as is required for other NPDES permitted discharges. Compliance is achieved through an iterative approach of continuous

[15] CWC 13050(l): "(1) 'Pollution' means an alteration of the quality of waters of the state by waste to a degree which unreasonably affects either of the following: (A) The water for beneficial uses. (B) Facilities which serve beneficial uses. (2) 'Pollution' may include "contamination.

[16] CWC 13050(k): "Contamination' means an impairment of the quality of waters of the state by waste to a degree which creates a hazard to public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste, whether or not waters of the state are affected."

[17] CWC 13050(m): "Nuisance' means anything which meets all of the following requirements: (1) Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. (2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. (3) Occurs during, or as a result of, the treatment or disposal of wastes."

implementation of improved BMPs. This distinction reflects Congress's recognition that variability in flow and intensity of storm events render difficult strict compliance with water quality standards by MS4 permittees. In describing the controls that permits must include to reduce pollutants in storm water discharges to the MEP, the statute (CWA section 402(p)(3)(B)(iii)) states that the controls shall include: "*management practices, control techniques and system, design and engineering methods, and such other provisions as the [permit writer] determines appropriate for the control of such pollutants*."

In contrast, non-storm water discharges from the MS4 that are not authorized by separate NPDES permits are subject to requirements under the NPDES program, including discharge prohibitions, technology based effluent limitations and water quality-based effluent limitations (40 CFR 122.44). The regulations also require the Copermittee's program to include an element to detect and remove illicit discharges and improper disposal into the storm sewer (40 CFR 122.26(d)(2)(iv)(B)).

While "non-storm water" is not defined in the CWA or federal regulations, the federal regulations (at 40 CFR 122.26(b)(2)) define "*illicit discharge*" as *"any discharge to a municipal separate storm sewer that is not composed entirely of storm water and that is not covered by an NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer and discharges resulting from fire fighting activities)*." This definition is the most closely applicable definition of "non-storm water" contained in federal law. As stated in the Phase I Final Rule, USEPA added the illicit discharge program requirement to begin implementation of the 'effective prohibition' requirement to detect and control non-storm water discharges to their municipal system.

Thus, federal law mandates that permits issued to MS4s must require management practices that will result in reducing storm water pollutants to the MEP yet at the same time requires that non-storm water discharges be effectively prohibited from entering the MS4. "Effectively" prohibit does not mean that non-storm water discharges are authorized to be discharged into and from the Copermittees' MS4s. The Phase I Final Rule clarifies what "effectively prohibit" means (55 FR 47995):

> "*Section 402(p)(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…<u>Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit</u> (other than the permit for the discharge from the municipal separate storm sewer)*" [Emphasis added].

Consistent with federal law, unless non-storm water discharges to the MS4 are authorized by a separate NPDES permit, non-storm water discharges are appropriately subject to the effective prohibition requirement in the CWA and Regional

Water Boards are not limited by the iterative MEP approach to storm water regulation in crafting appropriate regulations for non-storm water discharges.

The federal regulations (40CFR122.26(d)(2)(i)(B)) require the Copermittees to establish the legal authority which authorizes or enables the Copermittees to prohibit illicit discharges to the MS4s. The federal regulations (40 CFR 122.26(d)(2)(vi)(B)(1)) require the Copermittees to "*implement and enforce an ordinance, order or similar means*" to prevent non-storm water discharges to their MS4s. Thus, the Copermittees are required to "*effectively*" prohibit non-storm water discharges to their MS4s through enforcing their legal authority established under "*ordinance, order or similar means*" and either remove those discharges to their MS4s, or require those discharges to obtain coverage under a separate NPDES permit. More detail about the program that must be implemented to "*effectively*" prohibit non-storm water discharges to the Copermittees' MS4s is provided under the discussion for Provision E.2.

Provision A.1.d was included to be consistent Resolution No. 2012-0012, adopted by the State Water Board on March 20, 2012. Provision A.1.d prohibits discharges from MS4s to Areas of Special Biological Significance (ASBS), except for storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach to the Heisler Park ASBS subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012. The pertinent Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 are provided in Attachment A to the Order.

<u>Provision A.2 (Receiving Water Limitations)</u> specifies the condition of the receiving waters that must be achieved when there are discharges from the Copermittees' MS4s. Receiving water limitations are included in all NPDES permits issued pursuant to the CWA section 402. CWA section 402(p)(3)(B)(iii) authorizes the inclusion of "*such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." This requirement gives USEPA or the State permitting authority, in this case the San Diego Water Board, discretion to determine what permit conditions are necessary to control pollutants.

In its Phase I Final Rule (see 55 FR 47990, 47994 (Nov. 16, 1990)), USEPA elaborated on these requirements, stating that, "*permits for discharges from municipal separate storm sewer systems must require controls to reduce the discharge of pollutants to the maximum extent practicable, and where necessary water quality-based controls*." USEPA reiterated in its Phase II Final Rule (64 FR 68722, 68737), that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL*." CWC section 13377 also requires that NPDES permits include limitations necessary to implement water quality control plans. Both the State Water Board and the San Diego Water Board have previously concluded that discharges from the MS4 contain pollutants that have the reasonable potential to cause or contribute to excursions above water quality

standards. As such, inclusion of receiving water limitations is appropriate to control MS4 discharges.

The inclusion of receiving water limitations is also consistent with the Ninth Circuit Court of Appeals' ruling in *Defenders of Wildlife v. Browner* (191 F.3d 1159, 1166 (1999)) that the permitting authority has discretion regarding the nature and timing of requirements that it includes as MS4 permit conditions to attain water quality standards. The Ninth Circuit Court of Appeals recently explained that, "*[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*" (*Natural Resources Defense Council v. County of Los Angeles* (9th Cir. 2011) 673 F.3d 880, 886 (revd. On other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013)))

The receiving water limitations included in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan or in water quality control plans or policies adopted by the State Water Board, including State Water Board Resolution No. 68-16, or in federal regulations, including but not limited to 40 CFR 131.12 and 131.38. The water quality objectives in the Basin Plan and other State Water Board plans and policies have been approved by USEPA and combined with designated beneficial uses constitute the water quality standards required under federal law.

Provision A.2.a requires that discharges from the Copermittees' MS4s must not cause or contribute to the violation of water quality standards in receiving waters. The water quality standards of the receiving waters must be protected from the impacts that may be caused by the Copermittees' MS4 discharges. Water quality standards applicable to the surface waters in the San Diego Region must be achieved through meeting the technology based standard of MEP through an iterative process of improved management actions. Provision A.2.a is also consistent with State Water Board Order WQ 99-05 precedent-setting language requiring discharges from MS4s to attain receiving water quality standards. The water quality control plans and policies with water quality standards applicable to the waters in the San Diego Region are included under Provision A.2.a.

Provisions A.2.b was included to be consistent with the requirements of State Water Board Resolution No. 2012-0012, adopted on March 20, 2012.

<u>Provision A.3 (Effluent Limitations)</u> specifies the condition of the discharges from the Copermittees' MS4s that must be achieved if and when there are discharges.

Consistent with CWA section 301(b)(1)(A) and 40 CFR 122.44(a), Provision A.3.a includes the technology-based effluent limitations that must be included in the Order.

The technology-based effluent limits, representing the minimum level of control that must be imposed in a permit under CWA section 402, requires that pollutants in discharges of storm water from the Copermittees' MS4s be reduced to the MEP. This provision applies specifically to storm water discharges. Non-storm water discharges must be effectively prohibited, as required under Provision A.1.b. Non-storm water (dry weather) discharges from the MS4 are not considered storm water (wet weather) discharges and therefore are not subject to the MEP standard.

The technology-based MEP standard is an ever-evolving, flexible, and advancing concept. Neither Congress nor USEPA has specifically defined the term "maximum extent practicable." Congress established this flexible MEP standard so that the administrative bodies would have "*the tools to meet the fundamental goals of the Clean Water Act in the context of storm water pollution*." (*Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 884.) As knowledge about controlling storm water runoff and discharges continues to evolve, so does the knowledge which constitutes MEP. Reducing the discharge of pollutants in storm water from the MS4 to the MEP requires the Copermittees to assess each program component and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP.

The San Diego Water Board or the State Water Board ultimately define MEP, and may include requirements that provide specific guidance on what is expected to demonstrate MEP. It is the responsibility of the Copermittees to propose actions that implement BMPs to reduce storm water pollution to the MEP. In other words, the Copermittees' runoff management programs developed and implemented under the Order are the Copermittees' proposals for achieving MEP. Their total collective and individual activities conducted pursuant to their runoff management programs become their proposal for achieving MEP as it applies both to their overall effort, as well as to specific activities. Provisions B through E of the Order provides a minimum framework to guide the Copermittees in achieving the MEP standard for discharges of pollutants in storm water.

Provision A.3.b incorporates any water quality based effluent limitations (WQBELs) applicable to the MS4s established for TMDLs adopted and approved for the San Diego Region and requires the Copermittees to comply with those WQBELs. This is consistent with 40 CFR 122.44(d)(1)(vii)(B), which requires that NPDES permits to incorporate WQBELs "*developed to protect a narrative water quality criterion, a numeric water quality criterion, or both…consistent with the assumptions and requirements of any available wasteload allocation for the discharge...*"

Pursuant to CWA section 303(d), for surface water bodies identified as impaired by one or more pollutants, the San Diego Water Board is required to establish TMDLs "*at a level necessary to implement the applicable water quality standards with seasonal variations and a margin of safety which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality*." The

TMDLs identify sources of the pollutants causing the impairments and assign portions of the TMDL as WLAs to point sources, which include MS4s.

WLAs must be expressed in NPDES permits as WQBELs, which may include one or more numeric components such as numeric effluent limits, and/or receiving water limitations, and/or BMP requirements. Because numeric targets for TMDLs typically include a component that will be protective of water quality standards, a TMDL will likely include one or more numeric receiving water limitations and/or effluent limitations as part of the assumptions or requirements of the TMDL. Any numeric receiving water limitations and/or effluent limitations developed as part of the assumptions or requirements of a TMDL must be incorporated and included as part of WQBELs for the MS4s.

Because the development and approval of new TMDLs, or modification of existing TMDLs, may occur during the term of this Order, the specific provisions of those TMDLs, including effluent limitations applicable to MS4s are provided within Attachment E to the Order. Attachment E will be updated with new TMDLs and modifications to existing TMDLs in a timely manner as they occur.

Provision A.4 (Compliance with Discharge Prohibitions and Receiving Water Limitations) describes the process required to be implemented by the Copermittees if compliance with the discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a are not being achieved under current conditions.

In its Phase II Stormwater Regulations, Final Rule, USEPA states that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL.*"[18] In a series of comment letters on MS4 permits issued by various Regional Water Boards, USEPA has also reiterated that MS4 discharges must meet water quality standards.[19] In addition, the Ninth Circuit Court of Appeals explained in a recent ruling that, *"[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*"[20]

[18] Phase II Stormwater Regulations, Final Rule, 64 Fed. Reg. 68722, 68737.
[19] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.
[20] NRDC v. County of Los Angeles (9th Cir. 2011), 673 F.3d 880, 886 (revd. on other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013))). See also, *Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 884-886, citing *Defenders of Wildlife v. Browning,* (9th Cir. 1999) 191 F.3d 1159.)

Water quality standards for the San Diego Region are established in the Basin Plan. The water quality standards of the Basin Plan are incorporated into this Order as the discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a. The discharge prohibitions and receiving water limitations in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations or prohibitions to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan, water quality control plans or policies adopted by the State Water Board, including Resolution No. 68-16, or federal regulations, including but not limited to, 40 CFR 131.12 and 131.38. The waste discharge prohibitions and water quality objectives in the Basin Plan have been approved by USEPA and combined with the designated beneficial uses constitute the water quality standards required under federal law.

Under federal law (CWA section 402(p)(3)(B)(iii)), an MS4 permit must include "*controls to reduce the discharge of pollutants to the maximum extent practicable...and such other provision as...the State determines appropriate for control of such pollutants*." The State Water Board has previously determined that limitations necessary to meet water quality standards are appropriate for the control of pollutants discharged by MS4s and must be included in MS4 permits. (State Water Board Orders WQ 91-03, 98-01, 99-05, 2001-15; see also *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159.) This Order prohibits discharges that cause or contribute to violations of water quality standards.

The discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a are included in this Order to ensure that discharges from the MS4s do not cause or contribute to exceedances of water quality objectives necessary to protect the beneficial uses of the receiving waters.

Provision A.4 is consistent with the precedent-setting language in State Water Board Order WQ 99-05 required to be included in municipal storm water permits. State Water Board Order WQ 2001-15 refined Order WQ 99-05 by requiring an iterative approach to compliance with water quality standards involving ongoing assessments and revisions, as referred to as the "iterative process." The "iterative process" is a fundamental NPDES requirement for municipal storm water permits to achieve the objectives of the CWA.

The State Water Board and Regional Water Boards have stated that the provisions under Provisions A.1.a, A.1.c, A.2.a, and A.4 are independently applicable, meaning that compliance with one provision does not provide a "safe harbor" where there is non-compliance with another provision (i.e., compliance with the Provision A.4 does not shield a Copermittee who may have violated Provision A.1.a, A.1.c, or A.2.a from an enforcement action). The intent of Provision A.4 is to ensure that the Copermittees have the necessary storm water management programs and controls in place, and that they are modified by the Copermittees in a timely fashion when necessary, so that compliance with Provisions A.1.a, A.1.c, and/or A.2.a is achieved as soon as possible. USEPA expressed the importance of this independent applicability in a series of

comment letters on MS4 permits proposed by various Regional Water Boards. At that time, USEPA expressly objected to certain MS4 permits that included language stating, *"permittees will not be in violation of this [receiving water limitation] provision … [if certain steps are taken to evaluate and improve the effectiveness of the jurisdictional runoff management programs],"* concluding that this phrase would not comply with the CWA.[21]

The Ninth Circuit held in *Natural Resources Defense Council v. County of Los Angeles* (2011) 673 F3d. 880, 886 (revd. on other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013))) that engagement in the iterative process does not provide a safe harbor from liability for violations of permit terms prohibiting exceedances of water quality standards. The Ninth Circuit holding is consistent with the position of the State and Regional Water Boards that exceedances of water quality standards in an MS4 permit constitute violations of permit terms subject to enforcement by the Water Boards or through a citizen suit. While the Water Boards have generally directed dischargers to achieve compliance by improving control measures through the iterative process, the San Diego Water Board retains the discretion to take other appropriate enforcement and the iterative process does not shield dischargers from citizen suits under the CWA.

The requirements of Provision A.4, therefore, are required to be implemented until the water quality standards expressed under Provisions A.1.a, A.1.c, and A.2.a are achieved. The CWA requires MS4 permits to "*require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." The requirements of this Order have been deemed or determined to be "appropriate" to achieve water quality standards in receiving waters.

Part of the "*controls*" required by the Order is the process described in Provision A.4. Provision A.4 includes the process that is ultimately expected to achieve compliance with the requirement that discharges from the MS4 do not cause or contribute to violations of water quality standards in the receiving waters. The implementation of Provision A.4 is required when the Copermittees or the San Diego Water Board have determined that discharges from the MS4 are causing or contributing to violations of water quality standards in the receiving waters.

The Copermittees must effectively prohibit non-storm water discharges into the MS4s, reduce the discharge of pollutants in storm water from the MS4s to the MEP, and ensure that their MS4 discharges do not cause or contribute to violations of water quality standards. If the Copermittees have effectively prohibited non-storm water

[21] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.

discharges and reduced storm water pollutant discharges to the MEP, but their discharges are still causing or contributing to violations of water quality standards, Provision A.4 provides a clear “iterative process” for the Copermittees to follow.

Provision A.4 essentially requires the Copermittees to implement additional BMPs until MS4 discharges no longer cause or contribute to a violation of water quality standards.

In assessing compliance and potential enforcement actions, the San Diego Water Board looks at the Copermittees’ efforts in total to meet the requirements of Provisions A.1.a, A.1.c, A.2.a and Provision A.4. The Copermittees need to demonstrate that they are making improvements to their programs and making progress toward achieving the discharge prohibitions and receiving water limitations in Provisions A.1.a, A.1.c, and A.2.a by implementing the requirements of Provision A.4. The San Diego Water Board would consider these efforts prior to strictly enforcing the requirements of Provisions A.1.a, A.1.c, and A.2.a. Causes of exceedances of the receiving water limitations can often be more difficult to identify and attribute solely to the Copermittees’ MS4s. The intent of the Order is to provide the Copermittees more clarity and flexibility in addressing these exceedances through the iterative approach and adaptive management process until the requirements under Provisions A.1.a, A.1.c, and A.2.a are fully achieved.

An exception to the iterative approach and adaptive management process would be in receiving waters subject to adopted and approved TMDLs. For TMDLs that are incorporated into the Order, there is a specific date for compliance to be achieved, after which the iterative approach and adaptive management process required under Provision A.4 no longer provides the flexibility to achieve compliance. Where compliance dates for a TMDL have passed, compliance with the WQBELs incorporated into the Order established by a TMDL in Attachment E to protect water quality standards is required. Thus, after the interim or final compliance dates for a TMDL have passed, if the discharges from the Copermittees’ MS4s are causing or contributing to a violation of WQBELs, exceedances of WQBELs must be strictly enforced by the San Diego Water Board. In the meantime, however, the Copermittees are in compliance with the interim or final TMDL requirements in Attachment E as long as the interim or final WQBELs are being achieved in accordance with the interim or final compliance dates.

B. Water Quality Improvement Plans

Purpose: Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges to the MS4s and control pollutants in storm water discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the Clean Water Act.

Provision B includes requirements for the Copermittees to develop and implement Water Quality Improvement Plans to ultimately comply with the prohibitions and limitations under Provision A. The Water Quality Improvement Plans will provide the Copermittees a comprehensive program that can achieve the requirements and further the objectives of the CWA. Implementation of the Water Quality Improvement Plans will also improve the quality of the receiving waters in the San Diego Region.

The Water Quality Improvement Plan is the backbone of the Regional MS4 Permit requirements. Provision B provides the guidance, criteria, and minimum expectations and requirements for the elements of the Water Quality Improvement Plan to be developed and implemented by the Copermittees. The Water Quality Improvement Plans will be implemented in the Watershed Management Area by the Copermittees within their jurisdictions through their jurisdictional runoff management programs.

The Water Quality Improvement Plan also incorporates a program to monitor and assess the progress of the Copermittees' jurisdictional runoff management programs toward improving the quality of discharges from the MS4s, as well as tracking improvements to the quality of receiving waters. A process to adapt and improve the effectiveness of the Water Quality Improvement Plans has also been incorporated into the requirements of Provision B to be consistent with the "iterative approach" required to achieve compliance with discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a, pursuant to the requirements of Provision A.4.

The Water Quality Improvement Plans have also been structured to incorporate the requirements of any TMDLs that have been adopted for the San Diego Region. Incorporating the requirements of the TMDLs into the requirements of Provision B allows the Copermittees to develop a single plan, instead of separate plans, to coordinate their non-storm water and storm water runoff management programs. The Water Quality Improvement Plans allow the Copermittees to meet the requirements of this Order, as well as fulfill the requirements of the TMDLs.

As an added benefit, if the Copermittees demonstrate that impaired water bodies within the Watershed Management Area listed on the 303(d) List will be addressed with their Water Quality Improvement Plans in a reasonable period of time, the San Diego Water Board may be able to remove the water bodies from the 303(d) List, which would greatly reduce the need for the San Diego Water Board to develop additional TMDLs that would have to be incorporated into the Order and implemented by the Copermittees.

***Discussion*:** The federal NPDES regulations require the Copermittees to develop a proposed management program (40 CFR 122.26(d)(2)(iv)). The proposed management program must include "*a comprehensive planning process*" and "*where necessary intergovernmental coordination*" for the "*duration of the permit.*" The Water Quality Improvement Plan is the Copermittees' "*comprehensive planning process*" document for the proposed management program that will be implemented within a Watershed Management Area. Implementation of the Water Quality Improvement Plan requires "*intergovernmental coordination*" among the Copermittees for at least the "*duration of the permit*," and likely into and beyond the next iteration of the permit.

Developing Water Quality Improvement Plans based upon watersheds is consistent with federal regulations that support the development of permit conditions, as well as implementation of storm water management programs, at a watershed scale (40 CFR 122.26(a)(3)(ii), 122.26(a)(3)(v), and 122.26(d)(2)(iv)). In 2003, USEPA issued a Watershed-Based NPDES Permitting Policy Statement (USEPA, 2003) that defines watershed-based permitting as an approach that produces NPDES permits that are issued to point sources on a geographic or watershed basis. In this policy statement, USEPA explains that "*[t]he utility of this tool relies heavily on a detailed, integrated, and inclusive watershed planning process*." USEPA identifies a number of important benefits of watershed permitting, including more environmentally effective results, the ability to emphasize measuring the effectiveness of targeted actions on improvements in water quality, reduced cost of improving the quality of the nation's waters and more effective implementation of watershed plans, including TMDLs, among others.

An emphasis on watersheds is appropriate at this stage in the San Diego Region's MS4 program to shift the focus to more targeted, water quality driven planning and implementation. Addressing discharges on a watershed scale focuses on water quality results by emphasizing the receiving waters in the watershed. The conditions of the receiving waters drive management actions, which in turn focus measures to address pollutant contributions from MS4 discharges.

The Water Quality Improvement Plan gives the Copermittees the responsibility of developing a comprehensive plan to coordinate the efforts of their jurisdictional runoff management programs for addressing the problems related to MS4 discharges causing impacts to water quality in the Watershed Management Area. The development of the plan provides the Copermittees the opportunity to provide significant input on how to implement their jurisdictional runoff management programs, and how to best utilize their available resources in addressing a focused set of

priorities that they believe will result in measureable improvements to water quality within the Watershed Management Area.

The Copermittees are encouraged to separate the Watershed Management Area into subwatersheds, as appropriate. This allows the Copermittees to identify priorities applicable to a subset of the Copermittees or specific water bodies or areas within the Watershed Management Area.

Included in the requirements for the elements to be included in the Water Quality Improvement Plan are monitoring and assessment requirements that are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order. In addition to the federal requirements of the CWA section 308(a) and 40 CFR 122.26(d), the San Diego Water Board has the authority to establish monitoring, reporting, and recordkeeping requirements for NPDES permits under CWC 13383.

More specific and detailed discussions of the requirements of Provision B are provided below.

Provision B.1 (Watershed Management Areas) requires the Copermittees to develop a Water Quality Improvement Plan for each of the Watershed Management Areas defined by the San Diego Water Board.

Pursuant to 40 CFR 122.26(d)(2)(iv), proposed management programs "*may impose controls on a…watershed basis…*" The Water Quality Improvement Plan is the Copermittees' proposed management program. A Water Quality Improvement Plan must be developed for each Watershed Management Area identified in the Order.

The Watershed Management Areas are identified in Table B-1. Table B-1 establishes ten (10) Watershed Management Areas, and identifies the Copermittees that are responsible for developing and implementing the Water Quality Improvement Plan for each Watershed Management Area.

The Copermittees from each of the three counties within the San Diego Region are expected to be phased in as their respective NPDES municipal storm water permits expire. Because Order No. R9-2007-0001 expired in January 2012, the San Diego County Copermittees were covered under the Regional MS4 Permit on June 27, 2013, the effective date of the Order. Because Order No. R9-2009-0002 expired in December 2014, the Orange County Copermittees are covered under the Regional MS4 Permit on April 1, 2015, the effective date of Order No. R9-2013-0001 as amended by Order No. R9-2015-0001.

After the San Diego Water Board receives and considers the Report of Waste Discharge required to be submitted by the Riverside County Copermittees pursuant to the requirements of their current permit, and makes any necessary changes to the Order, the Riverside County Copermittees will be covered under the Regional MS4

Permit after Order No. R9-2010-0016 expires in December 2015.

The Riverside County Copermittees also have the option to obtain coverage under the Regional MS4 Permit earlier than their respective permit expiration dates. The process to apply for early coverage is described Provision F.6.

Because the Santa Margarita River Watershed Management Area includes Copermittees from both San Diego County and Riverside County, a footnote to Table B-1 has been included to specify that the requirements of Provision B are not required to be implemented by the County of San Diego until the Riverside County Copermittees have received a notice of coverage under the Order. Until the Riverside County Copermittees are notified of coverage under the Order, the County of San Diego is subject to the prohibitions and limitations under Provision A, responsible for continuing to implement its existing jurisdictional runoff management program, and responsible for implementing the transitional monitoring and assessment requirements of Provision D, the transitional annual reporting requirements of Provision F.3.b, and the TMDL requirements of Attachment E to the Order.

The City of Laguna Woods and Laguna Hills are located partially within the jurisdictions of both the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board) and the San Diego Water Board. Written requests for designation of a single Regional Water Board to regulate matters pertaining to permitting of Phase I MS4 discharges were submitted to the San Diego Water Board and the Santa Ana Water Board by the City of Laguna Woods by letter dated September 8, 2014, and the City of Laguna Hills by letter dated March 12, 2014. The Cities of Laguna Woods and Laguna Hills requested designation of the San Diego Water Board pursuant to CWC section 13228. The Cities of Laguna Woods and Laguna Hills reported that management and implementation of municipal programs to comply with two different Phase I MS4 permits creates a significant administrative and financial burden and inhibits their ability to contribute to greater overall water quality improvements in either Region. In an effort to address these concerns, the San Diego Water Board and the Santa Ana Water Board have entered into an agreement dated February 10, 2015, whereby the San Diego Water Board is designated to regulate Phase I MS4 discharges within the jurisdiction of the Cities of Laguna Woods and Laguna Hills including areas in the Santa Region upon the later effective date of this Order or Tentative Order No. R8-2015-0001. Under the terms of the agreement, each Regional Water Board retains the authority to enforce provisions of the Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee (Water Code section 13228 (b)). Also under the terms of the agreement, any TMDL and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Laguna Woods or Laguna Hills as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement of the applicable TMDL would remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa

Ana Water Boards' San Diego Creek/Newport Bay TMDL and the San Diego Water Boards indicator Bacteria Project I Beaches and Creeks TMDL. In conformance with this agreement, a footnote to Table B-1 has been included to specify coverage under Order No. R9-2013-0001 for those Phase I MS4 discharges within the jurisdictional boundaries of the Cities of Laguna Woods and Laguna Hills within the Santa Ana Region. The footnote specifies that the City of Laguna Woods and Laguna Hills are identified as responsible Copermittees in the San Diego Creek/Newport Bay TMDL in the Santa Ana Region and remain obligated to comply with the San Diego Creek/Newport Bay TMDL pursuant to section XVIII of Tentative Order No. R8-2015-0001 (NPDES No. CAS618030) and any reissuance thereof.

The City of Lake Forest is located partially within the jurisdictions of both the Santa Ana Water Board and the San Diego Water Board. By letters dated January 14, 2013 and April 4, 2014 the City of Lake Forest submitted a written request, pursuant to CWC section 13228, to the San Diego Water Board and the Santa Ana Water Board requesting the Santa Ana Water Board be designated to regulate matters within the City of Lake Forest pertaining to permitting of their Phase I MS4 discharges. The City of Lake Forest reported that management and implementation of municipal programs to comply with two different Phase I MS4 permits creates a significant administrative and financial burden and inhibits their ability to contribute to greater overall water quality improvements in either Region. In an effort to address these concerns, the San Diego Water Board and the Santa Ana Water Board have entered into an agreement dated February 10, 2015, whereby the Santa Ana Water Board is designated to regulate Phase I MS4 discharges within the jurisdiction of the City of Lake Forest within the San Diego Region upon the later date of this Order or Santa Ana Water Board Tentative Order No. R8-2015-0001. Under the terms of the agreement, each Regional Water Board retains the authority to enforce provisions of the Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee (Water Code section 13228 (b)). Also under the terms of the agreement, any TMDL and associated Phase I MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the City of Lake Forest as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement authority for the applicable TMDL would remain with the Regional Water Board which has the jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Boards' San Diego Creek/Newport Bay TMDL and the San Diego Water Boards' indicator Bacteria Project I Beaches and Creeks TMDL. In conformance with this agreement, a footnote to Table B-1 has been included to specify that Phase I MS4 discharges within the jurisdictional boundaries of the City of Lake Forest located within the San Diego Region will be regulated under Santa Ana Water Board Order No. R8-2015-0001 (NPDES No. CAS618030) and any reissuance thereof. The footnote specifies that the City of Lake Forest is an identified responsible Copermittee in the Indicator Bacteria Project I Beaches and Creeks TMDL (Bacteria TMDL) in the San Diego Region and remains obligated to comply with the Bacteria TMDL pursuant to Attachment E of Order No. R9-2013-0001 and any reissuance thereto. The City is

also identified as a responsible Copermittee in the San Diego Creek/Newport Bay TMDL established by the Santa Ana Water Board. The City remains obligated to comply with the San Diego Creek/New Port Bay TMDL pursuant to the Santa Ana Water Board's Phase I MS4 Permit (Tentative Order No. R8-2015-0001 (NPDES No. CAS618030). Under the terms of the agreement, the City of Lake Forest must retain and continue implementation of the over irrigation prohibition in Title 15, Chapter 15, Section 14.030, List (b) of the City Municipal Code throughout its jurisdiction. Also under the terms of the agreement, the City of Lake Forest must actively participate in the development and implementation of the Aliso Creek Watershed Management Area Water Quality Improvement Plan required pursuant to Order No. R9-2013-0001, and any reissuance thereof.

The bases supporting the Cities of Laguna Woods, Laguna Hills, and Lake Forest requests to designate a specific Regional Water Board for regulatory oversight of Phase I MS4 discharges may change under future conditions and circumstances, therefore the San Diego Water Board will periodically review the effectiveness of the agreement during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate the agreement with the Santa Ana Water Board or otherwise modify the agreement subject to the approval of the Santa Ana Water Board.

Provision B.2 (Priority Water Quality Conditions) requires the Copermittees in each Watershed Management Area to identify the highest priority water quality conditions which will be the focus of the Water Quality Improvement Plan implementation.

Provisions B.2.a and B.2.b provide the criteria that must be assessed when characterizing the receiving water quality and potential impacts from MS4 discharges of the receiving waters within the Watershed Management Area. The criteria are based primarily on the requirements in 40 CFR 122.26(d)(1)(iv)(C) and (C)(1)-(9). Characterizing the receiving water quality and identifying the potential impacts caused by MS4 discharges to receiving waters in the Watershed Management Area is necessary to identify the impacts to receiving waters associated with MS4 discharges that are of the most concern to the Copermittees.

Based on the information required to be considered under Provisions B.2.a and B.2.b, Provision B.2.c requires to Copermittees to identify the highest priority water quality conditions related to discharges from the MS4s that will be the primary focus of the Water Quality Improvement Plan in the Watershed Management Area. Addressing and improving these highest priority water quality conditions will become the focus of each Copermittee's jurisdictional runoff management program as the Water Quality Improvement Plan is implemented in the Watershed Management Area. The highest priority water quality conditions are expected to include source of pollutants and/or stressors, and/or receiving water conditions, that the Copermittees consider the highest threats or most likely to have adverse impacts on the physical, chemical, and biological integrity of receiving waters. Addressing these threats and/or adverse impacts should restore the physical, chemical, and biological integrity of receiving

waters, and result in the restoration and protection of the beneficial uses of the receiving waters in the Watershed Management Area.

Provision B.2.d requires the Copermittees to identify known and suspected sources of pollutants and/or stressors contributing to the highest priority water quality conditions. The requirements of Provision B.2.d are based primarily on the requirements in 40 CFR 122.26(d)(1)(iii)(B)(1)-(6). The Copermittees are required to evaluate several factors in the identification of those sources. The Copermittees must consider and evaluate the following: (1) the land uses that may contribute toward impacts to receiving waters, (2) the locations of the Copermittees' MS4s that can convey and discharge runoff and pollutants to receiving waters, (3) other sources that discharge into the Copermittees' MS4s and receiving waters, and (4) other information and data that can help the Copermittees to evaluate the relative importance of or contribution from those sources toward the highest priority water quality conditions. Identifying the known and suspected sources, and their relative contribution toward the highest priority water quality conditions, will help the Copermittees to focus, direct, and prioritize their resources and implementation efforts within their jurisdictions.

Provision B.2.e requires the Copermittees to identify potential strategies that can result in improvements to water quality in MS4 discharges and/or receiving waters within the Watershed Management Area. Potential water quality improvement strategies will not necessarily be implemented by the Copermittees, but provide a "menu" of options that the Copermittees will consider for implementation. The public participation process that will be implemented during the development of the Water Quality Improvement Plan is where the potential water quality improvement strategies will be identified.

<u>Provision B.3 (Water Quality Improvement Goals, Strategies and Schedules)</u> requires the Copermittees in each Watershed Management Area to identify the goals that the Copermittees' jurisdictional runoff management programs will work toward achieving to address and improve the highest priority water quality conditions identified under Provision B.2.c; the strategies that will be implemented by the Copermittees within their jurisdictions and the Watershed Management Area to achieve the goals; and, the schedules for implementing the strategies and achieving the goals. The element of the Water Quality Improvement Plan required under Provision B.3 is where the "*comprehensive planning*" and "*intergovernmental coordination*" [40 CFR 122.26(d)(2)(iv)] of the Copermittees' actions for the proposed management programs within the Watershed Management Area is required to be described.

Provision B.3.a requires the Copermittees to identify interim and final numeric goals, and schedules to achieve those goals as part of the Water Quality Improvement Plans. Provision B.3.a.(1) requires the Copermittees to identify two types of numeric goals to be achieved:

(1) Final numeric goals in the receiving waters and/or MS4 discharges that will result in the protection of the water quality standards of the receiving waters for the highest priority water quality conditions identified by the Copermittees for Provision B.2.c. These final numeric goals are the ultimate goals for the Water Quality Improvement

Plan, and the achievement and maintenance of these final numeric goals will indicate that one or more beneficial uses have been successfully restored and/or protected from MS4 discharges.

(2) Interim numeric goals that can be used by the Copermittees to demonstrate progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges for the highest priority water quality conditions in the Watershed Management Area. Achievement of the interim numeric goals will demonstrate to the San Diego Water Board that the Copermittees' implementation efforts are progressing toward achieving the final numeric goals.

Provision B.3.a.(1) does not specify what the interim and final numeric goals must be based on, but they essentially must be designed to achieve compliance with water quality standards in the receiving waters. To that end, the interim goals must be based on measureable criteria or indicators capable of demonstrating progress toward achieving the numeric goals."

The interim and final numeric goals can be based on the water quality objectives in the Basin Plan. The water quality objectives in the Basin Plan, however, consist of numeric and narrative water quality objectives. Numeric water quality objectives can be directly used as numeric goals. Narrative water quality objectives, on the other hand, will require some interpretation to identify numeric goals. The achievement of multiple numeric goals based on the water quality objectives, used in combination, may be necessary to demonstrate that beneficial uses have been restored and/or protected.

The Copermittees could also propose other numeric goals that are not necessarily water quality objectives from the Basin Plan. For example, the Copermittees could propose a numeric goal that consists of achieving some percent improvement of a measureable indicator, such as acreage of a specific habitat or increase in a specific plant or animal species population. Other examples may include pollutant load reductions, number of impaired waterbodies delisted from the List of Water Quality Impaired Segments, Index of Biological Integrity (IBI) scores, etc.

The Copermittees may choose to develop interim numeric goals based on the final numeric goals they develop, such as incremental steps toward ultimately achieving the final numeric goals. The Copermittees may also choose to develop interim numeric goals that are based on other measureable indicators that can indirectly indicate improvements and progress toward the final numeric goals.

There are no limits to the types of interim numeric goals that could be proposed by the Copermittees, other than the goals must be based on measureable criteria or indicators capable of demonstrating progress toward achieving the numeric goals. Likewise, there are no limits to the types of final numeric goals that could be proposed by the Copermittees, other than the goals must "*restore and protect the water quality standards of the receiving waters.*"

Finally, Provision B.3.a.(2) also requires the Copermittees to develop schedules for measuring progress and achieving the interim and final numeric goals. Several criteria are included for the development of the schedules, but the Copermittees are required to achieve the numeric goals as soon as possible, consistent with federal NPDES regulations (40 CFR 122.47(a)(1)).

The Copermittees are also required to incorporate any compliance schedules for any applicable ASBS or TMDL requirements. Applicable ASBS and TMDL compliance schedules are set forth in Attachment A and Attachment E to the Order, respectively. The information provided by the Copermittees under Provision B.3.a.(2) will be used by the Copermittees and the San Diego Water Board to gauge and track the progress of the Copermittees' efforts in addressing the highest priority water quality conditions identified in the Water Quality Improvement Plan.

Provision B.3.b requires the Copermittees to identify the strategies and schedules to implement those strategies as part of the Water Quality Improvement Plans. Provision B.3.b requires the Copermittees to identify the water quality improvement strategies that will be and may be implemented within the Watershed Management Area to 1) reduce of pollutants in storm water discharged from the MS4 to the MEP, 2) effectively prohibit non-storm water discharges from entering the MS4, 3) protect water quality standards in receiving waters by controlling MS4 discharges so that they do not cause or contribute to exceedances of receiving water limitations, and 4) achieve applicable WQBELs that implement TMDLs. The Copermittees will select the strategies to be implemented based on the likely effectiveness and efficiency of the potential water quality improvement strategies identified under Provision B.2.e to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, and/or achieve the interim and final numeric goals identified under Provision B.3.a.

Provision B.3.b.(1) requires each Copermittee to identify the strategies that will be or may be implemented within its jurisdiction. Each Copermittee is required to describe the strategies it is committed to implementing as part of its jurisdictional runoff management requirements under Provisions E.2 through E.7, and the optional jurisdictional strategies that the Copermittee will implement, as necessary, to achieve the numeric goals.

Each Copermittee is expected to implement the optional jurisdictional strategies identified under Provisions B.3.b.(1)(b) when the jurisdictional strategies it has committed to implement under Provision B.3.b.(1)(a) are not making adequate progress toward the interim and final numeric goals in accordance with the schedules established under Provision B.3.a. Provision B.3.b.(1)(b)(v) requires each Copermittee to describe the circumstances necessary to trigger implementation of the optional jurisdictional strategies, in addition to the requirements of Provisions B.3.b.(1)(a).

The San Diego Water Board recognizes that there may be optional jurisdictional strategies that will likely require funding and/or resources for planning, permitting, procurement of labor and materials, and implementation. Thus, Provision B.3.b.(1)(b)(iv) requires each Copermittee to describe the funding and/or resources that are necessary to implement these optional jurisdictional strategies. This information may provide interested groups and members of the public an understanding of the resources that they could provide or assist in obtaining to implement these optional jurisdictional strategies.

Provision B.3.b.(2) requires the Copermittees in the Watershed Management Area to identify the regional or multi-jurisdictional strategies that may be implemented, as necessary, to achieve the numeric goals. Similar to the requirements of Provision B.3.b.(1)(b), these regional or multi-jurisdictional strategies will likely require funding and/or resources for planning, permitting, procurement of labor and materials, and implementation, and San Diego Water Board recognizes that these strategies may be difficult to implement with only Copermittee resources. Thus, Provision B.3.b.(2)(d) requires the Copermittees to describe the funding and/or resources necessary to implement these optional regional or multi-jurisdictional strategies. This information may provide interested groups and members of the public an understanding of the resources that they could provide or assist in obtaining to implement these optional regional or multi-jurisdictional strategies.

Provision B.3.b.(3) requires the Copermittees to develop and include schedules in the Water Quality Improvement Plan for implementing the water quality improvement strategies identified under Provisions B.3.b.(1) and B.3.b.(2). The schedule for implementing the water quality improvement strategies will be used by the Copermittees and San Diego Water Board to measure and demonstrate the progress of the Copermittees' implementation efforts toward reducing pollutants in storm water discharged from the MS4 to the MEP, and eliminating illicit non-storm water discharges from entering the MS4.

Provision B.3.b.(4) provides the Copermittees in each Watershed Management Area the option of implementing watershed-specific structural BMP requirements for Priority Development Projects. Historically, storm water permits have included very specific performance standards for permanent, structural BMPs. These standards describe the expectation for the capture or treatment of pollutants and control of excessive flow before storm water is discharged from a site. The Copermittees were also allowed to develop waiver programs for Priority Development Projects to avoid implementing the structural BMPs; however, the waiver programs were not necessarily tied into any sort of holistic watershed strategy. The result is that implementation of BMP requirements is largely done on a site-by-site basis. This requires proper design on the part of the Priority Development Project and strict oversight on the part of the Copermittee.

Provision B.3.b.(4) promotes the evaluation of multiple strategies for water quality improvement, in addition to the implementation of permanent structural BMPs, on a watershed-scale versus the site-by-site approach. In a report issued by the Southern

California Coastal Water Research Project (SCCWRP) and several other research institutions, the report emphasized that a successful hydromodification management program will involve watershed analysis as a first step, and that integrating multiple watershed-based strategies is preferable over a site-by-site approach. Indeed, the report states that the watershed analysis "…*should lead to identification of existing opportunities and constraints that can be used to help prioritize areas of greater concern, areas of restoration potential, infrastructure constraints, and pathways for potential cumulative effects*."[22] Provision B.3.b.(4) promotes the findings and recommendations of the report by providing a pathway for Copermittees to develop an integrated approach to their land development programs.

Under Provision B.3.b.(4), the Copermittees in a Watershed Management Area must first perform an analysis by gathering as much information pertaining to the physical characteristics of the Watershed Management Area as possible. This includes, for example, identifying potential areas of coarse sediment supply, present and anticipated future land uses, and locations of physical structures within receiving streams and upland areas that affect the watershed hydrology (such as bridges, culverts, and flood management basins). Once this information is collected, the Copermittees must produce GIS layers (maps) that include this information.

From there, the Copermittees must use the results of the Watershed Management Area Analysis to identify and compile a list of candidate projects that could potentially be used as alternative compliance options for Priority Development Projects. Such projects include, for example, opportunities for stream or riparian area rehabilitation, opportunities for retrofitting existing infrastructure to incorporate storm water retention or treatment, and opportunities for regional BMPs, among others. Once these candidate projects are identified, Copermittees may allow Priority Development Projects to fund, partially fund, or completely implement these candidate projects. The Copermittees must first find that implementing such a candidate project would provide greater overall benefit to the watershed than requiring implementation of the structural BMPs onsite, and also enter into a voluntary agreement with the Priority Development Project that authorizes this arrangement. The Copermittees may use Provision B.3.b.(4) as both 1) a mechanism to reach their stated goals of the Water Quality Improvement Plan by using Priority Development Projects to either fund or implement projects that will provide water quality benefit, and 2) an alternative to requiring strict adherence to the structural BMP design standards.

Additionally, Provision B.3.b.(4) allows the Copermittees to use the results of the Watershed Management Area Analysis to identify areas within the Watershed Management Area where it is appropriate to allow Priority Development Projects to be exempt from the hydromodification management BMP performance requirements. Provision E.3.c.(2) already allows exemptions for Priority Development Projects that discharge to a conveyance channel whose bed and bank are concrete lined from the

[22] 2012. ED Stein, F Federico, DB Booth, BP Bledsoe, C Bowles, Z Rubin, GM Kondolf, A Sengupta. Technical Report 667. Southern California Coastal Water Research Project. Costa Mesa, CA.

point of discharge to an enclosed embayment or the Pacific Ocean. However, there may be cases where further exemptions are warranted. The Copermittees may identify such cases on a watershed basis and include them in the Watershed Management Area Analysis; however, they must provide the supporting rationale to support all claims for exemptions.

Provision B.3.b.(4) provides an innovative pathway for Copermittees to regulate their land development programs by allowing alternative compliance in lieu of implementing structural BMPs on each and every Priority Development Project. This approach facilitates the integration of watershed-scale solutions for improving overall water quality and assisting Copermittees to achieve their stated goals of the Water Quality Improvement Plan. The San Diego Water Board understands, however, that undertaking this approach, which involves extensive planning, could be resource intensive for the Copermittees. Therefore, the Watershed Management Area Analysis is optional and not a requirement. The Copermittees can choose not to perform the watershed planning and mapping exercise described in Provision B.3.b.(4), and instead choose to require strict implementation of the structural BMPs onsite, pursuant to Provision E.3.b.

Provision B.4 (Water Quality Improvement Monitoring and Assessment) requires the Copermittees to develop an integrated monitoring and assessment program to track the progress of the Water Quality Improvement Plan toward meeting the implementation goals and schedules, and improving the water quality of the Watershed Management Area. Provision B.4 is the part of the Water Quality Improvement Plan where the Copermittees describe the monitoring data that will be collected, which is not only necessary to implement the "iterative approach" required by Provision A.4, but inform the adaptive management and "*comprehensive planning process*" that allows the Copermittees to make adjustments and modifications to the Water Quality Improvement Plans and the jurisdictional runoff management programs.

Provision B.4 requires the Copermittees, at a minimum, to include the requirements of Provision D as part of the water quality improvement monitoring and assessment program for the Water Quality Improvement Plan. The Copermittees, however, are not limited to the requirements of Provision D and may include additional monitoring and assessment methods to track progress toward improving water quality in the Watershed Management Area.

In addition to incorporating the requirements of Provision D, the water quality improvement monitoring and assessment program must incorporate any monitoring and assessment requirements specified for any applicable TMDLs included in Attachment E to the Order, and the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 for Watershed Management Areas with ASBS.

The monitoring and assessments required to be incorporated into the Water Quality Improvement Plan are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order.

Provision B.5 (Iterative Approach and Adaptive Management Process) requires the Copermittees to implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a.

Provision B.5 requires the Copermittees in each Watershed Management Area to re-evaluate the highest priority water quality conditions and potential water quality improvement strategies, the water quality improvement goals, strategies and schedules, and the water quality improvement monitoring and assessment program and provide recommendations for modifying those elements to improve the effectiveness of the Water Quality Improvement Plan. The re-evaluation of the Water Quality Improvement Plan is part of the assessment requirements of Provision D.

Provision B.6 (Water Quality Improvement Plan Submittal, Updates, and Implementation) requires to Copermittees to submit, update, and implement the Water Quality Improvement Plans.

The requirements for the process to develop and submit the Water Quality Improvement Plans is described in more detail under the discussion for Provision F.1. The process will include several opportunities for the public to provide input during the development of the Water Quality Improvement Plans. The process for updating the Water Quality Improvement Plans is described in more detail under the discussion for Provision F.3.c. Upon acceptance of the Water Quality Improvement Plan and updates, the Copermittees are required to immediately begin implementing the Water Quality Improvement Plan and subsequent updates.

The Water Quality Improvement Plan is expected to be a dynamic document that will evolve over time. The Water Quality Improvement Plan is also expected to be a long term plan that focuses the Copermittees' efforts and resources on a limited set of priority water quality conditions, with the ultimate goal of protecting all the beneficial uses of the receiving waters within the Watershed Management Area from impacts that may be caused or contributed to by MS4 discharges. As the Copermittees collect data, implement their jurisdictional runoff management programs, and review the results from their water quality improvement monitoring and assessment program, the Water Quality Improvement Plan is expected to be continually reviewed and updated until compliance with Provisions A.1.a, A.1.b, and A.2.a is achieved.

However, in specific cases supported by robust analytical documentation the implementation of the Water Quality Improvement Plans may demonstrate that TMDLs are not necessary for identified impaired water bodies within the Watershed Management Area if the analytical record demonstrates that technology-based effluent limitations required by the CWA, more stringent effluent limitations required by state, local, or federal authority, and/or other pollution control requirements (e.g., best management practices) required by local, state or federal authority are stringent enough to implement applicable

water quality standards within a reasonable period of time.[23]

The San Diego Water Board submits an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. According to USEPA guidance for the Integrated Report,[24] water bodies are placed in one of five categories. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 are placed on the 303(d) List.

Category 4 in the Integrated Report is for water bodies where available data and/or information indicate that at least one beneficial use is not being supported or is threatened, but a TMDL is not needed. [25] Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

Impaired water bodies can be included in Category 4a if a TMDL has been adopted and approved. The TMDLs in Attachment E to the Order implement the requirements of the TMDLs adopted by the San Diego Water Board, and approved by the State Water Board and USEPA. The water bodies in Attachment E will be included in Category 4a in the Integrated Report and removed from the 303(d) List.

Impaired water bodies can be included in Category 4b if there are *acceptable* "pollution control requirements" required by a local, state or federal authority stringent enough to implement applicable water quality standards within a reasonable period of time (e.g., a compliance date is set). When evaluating whether a particular set of pollution controls are "requirements," the USEPA considers a number of factors, including: (1) the authority (local, state, federal) under which the controls are required and will be implemented with respect to sources contributing to the water quality impairment (examples may include: self-executing state or local regulations, permits, and contracts and grant/funding agreements that require implementation of necessary controls), (2) existing commitments made by the sources and completion or soon to be completed implementation of the controls (including an analysis of the amount of actual implementation that has already occurred), (3) the certainty of dedicated funding for the implementation of the controls, and (4) other relevant factors as determined by USEPA depending on case-specific circumstances.[26]

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[23] 40 CFR 130.7(b)(1)
[24] USEPA, 2005. Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act
[25] Ibid
[26] Ibid

Impaired water bodies can be included in Category 4c if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution. Pollution, as defined by the CWA is "the man-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of water."[27] In other cases, pollution does not result from a pollutant and a TMDL is not required. Examples of circumstances where an impaired segment may be placed in Category 4c include segments impaired solely due to lack of adequate flow, stream channelization, or hydromodification. In these situations, there may be water quality management actions that can address the cause(s) of the impairment, but a TMDL may not be required to implement the actions.

The Water Quality Improvement Plans will require the implementation of pollution controls and water quality management actions (i.e. water quality improvement strategies) which can result in the attainment of water quality standards in water bodies impaired by discharges from the Copermittees' MS4s. The Water Quality Improvement Plans also include requirements that are expected to attain water quality standards in a reasonable period of time. The San Diego Water Board considers the Water Quality Improvement Plans to be a commitment by the Copermittees to develop, plan, budget for, and implement pollution controls that will attain water quality standards in receiving waters in a reasonable period of time, or as soon as possible. The results of the Copermittees' efforts in implementing the Water Quality Improvement Plans can be used to re-evaluate the condition of the impaired water bodies during the next update to the 303(d) List.

After the Copermittees submit the Water Quality Improvement Plans and demonstrate that water quality standards are being attained or will be attained in a reasonable period of time, the San Diego Water Board may re-evaluate the water bodies on the 303(d) List. These water bodies on the 303(d) List may be re-evaluated and placed into Category 4b or Category 4c in the Integrated Report. The water bodies placed in Category 4b or Category 4c in the Integrated Report must show a record that the water bodies are attaining water quality standards or supporting the identified beneficial uses, or will attain water quality standards or support identified beneficial uses in a reasonable period of time, in order for the water bodies to be appropriately removed from the 303(d) List.

[27] CWA section 502(19)

C. Action Levels

Purpose: Provision C includes requirements for the Copermittees to identify and include numeric action levels in the Water Quality Improvement Plan to direct and focus the Copermittees' jurisdictional runoff management program implementation efforts for controlling MS4 discharges to receiving waters.

***Discussion*:** Under Provision C, the numeric action levels required are for non-storm water discharges and storm water discharges. The non-storm water action levels (NALs) are applicable to non-storm water discharges from the Copermittees' MS4s, which can occur year-round. The storm water action levels (SALs) are applicable to storm water discharges from the Copermittees' MS4s, which occur during the rainy season defined as the period between October 1 and April 30.

The action levels required by Provision C are based on the action level requirements that were developed and incorporated into Order Nos. R9-2009-0002 and R9-2010-0016, the Orange County and Riverside County MS4 Permits, respectively. The Fact Sheets for these Orders provide detailed discussions about the development of the numeric NALs and SALs included in this Order.

Order Nos. R9-2009-0002 and R9-2010-0016 required the Copermittees to perform prescribed actions if the NALs or SALs are exceeded. The actions required under Order Nos. R9-2009-0002 and R9-2010-0016 generally included conducting additional monitoring and source investigations when a discharge from the MS4 is observed to exceed one or more NALs and/or SALs.

For this Order, however, the action levels of Provision C are to be used by the Copermittees to prioritize the actions to be implemented as part of the Water Quality Improvement Plan. Monitoring data collected by the Copermittees from MS4 outfalls will be compared with the NALs and SALs. Exceedances of the NALs and SALs will not require the Copermittees to immediately identify sources causing exceedances, but will provide some numeric indicator levels that can give the Copermittees a way to measure the relative severity of a pollutant contributing to receiving water quality impacts.

NALs and SALs must be included in the Water Quality Improvement Plans to be used by the Copermittees in directing and focusing their water quality improvement strategies. The Copermittees are expected to utilize the NALs and SALs to help focus their implementation efforts on addressing pollutants that have the most significant potential or observed impacts to receiving waters. The NALs and SALs will be used as part of the MS4 discharges assessments required under Provision D.4.b. The NALs and SALs may also be used by the Copermittees as the numeric goals to be achieved in MS4 discharges and/or receiving waters as the Water Quality Improvement Plans are implemented.

More specific and detailed discussions of the requirements of Provision C are provided below.

Provision C.1 (Non-storm Water Action Levels) requires the Copermittees to incorporate NALs into the Water Quality Improvement Plan for pollutants and/or constituents that are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions identified in the Water Quality Improvement Plan related to non-storm water discharges from the MS4s. NALs generally must be consistent with the water quality objectives found within the Basin Plan.

The NALs have been included to ensure that the Copermittees are implementing and complying with several requirements of the MS4 permit. The federal CWA requires permits for municipal storm sewer systems to "*effectively prohibit non-storm water discharges into the storm sewers*." The federal NPDES regulations, which were promulgated to implement the CWA requirements for discharges from municipal storm sewers, require a program to address illicit discharges, which are non-storm water discharges. Provision A.1.b prohibits "*[n]on-storm water discharges into MS4s*" unless the non-storm water discharge authorized by a separate NPDES permit. The NALs will be used as part of the illicit discharge detection and elimination program required pursuant to Provision E.2, as well as part of the MS4 discharges assessments required pursuant to Provision D.4.b.

Provision A.1.a prohibits non-storm water discharges from the MS4 from "*causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state.*" In addition, pursuant to Provision A.2.a, non-storm water discharges "*must not cause or contribute to the violation of water quality standards in any receiving waters*."

Ideally, the Copermittees' jurisdictional runoff management programs will eliminate all non-storm water discharges entering the MS4s within their jurisdictions. The complete elimination of non-storm water discharges to the Copermittees' MS4s would be in compliance with the CWA requirements for non-storm water discharges, as well as the prohibitions and limitations of Provisions A.1.a and A.2.a.

The federal regulations, however, also refer to several non-storm water discharge categories that must be addressed as illicit discharges if they are found to be a source of pollutants. The federal regulations thus identify some non-storm water discharges that are not required to be addressed as illicit discharges if they are not a source of pollutants (e.g. non-storm water discharges specified in Provisions E.2.a.(1)-(5)). Thus, these regulations imply that some non-storm water discharges into and from the MS4 may occur even if non-storm water discharges are "effectively" prohibited by the Copermittees.

If the source of a non-storm water discharge is identified as a category of non-storm water specified in Provisions E.2.a.(1)-(5), the NALs can be used to determine the category of non-storm water discharges is a source of pollutants. For other non-storm

water discharges not specified in Provisions E.2.a.(1)-(5), the CWA requires those discharges to be "*effectively"* prohibited by removing the discharge to the MS4 through enforcement of the Copermittees' legal authority established under "*ordinance, order or similar means*" to prohibit illicit discharges to the MS4s.

If there are non-storm water discharges that are not required to be addressed as illicit discharges, those discharges must comply, at a minimum, with the discharge prohibitions and receiving water limitations of Provision A. Thus, the non-storm water discharges from the MS4 must be at levels that will not cause or contribute to a condition of pollution, contamination, or nuisance (Provision A.1.a), and must not cause or contribute to a violation of water quality standards in receiving waters (Provision A.2.a) to be consistent with the discharge prohibitions and receiving water limitations of Provisions A.1.a and A.2.a.

Furthermore, the San Diego Region has predominantly intermittent and ephemeral rivers and streams which vary in flow volume and duration at spatial and temporal scales. For most of these river and stream systems, non-storm water discharges from the MS4 are likely to be the most significant or the only source contributing to surface flows present within the receiving water, especially during the dry season.

Therefore, because of the prohibitions and limitations of Provision A.1.a and A.2.a, and the likelihood that non-storm water discharges from the MS4 are the most significant or only source contributing to surface flows present within the receiving water, NALs generally must be consistent with the water quality objectives found within the Basin Plan. Non-storm water discharges that are meeting the NALs would not be expected to cause or contribute to an exceedance of water quality objectives in receiving waters, which would be consistent with the discharge prohibitions and receiving water limitations of Provisions A.1.a and A.2.a.

Exceedances of the NALs would then provide an indication of the relative severity of a pollutant in non-storm water discharges from the MS4 contributing to potential or observed receiving water quality impacts. The relative severity or significance of a pollutant in non-storm water discharges from the MS4 will provide the Copermittees a valuable source of information that can be used to identify priority water quality conditions within a Watershed Management Area and within each Copermittee's jurisdiction.

Tables C-1 through C-4 under Provision C.1.a specify numeric NALs for several parameters or pollutant constituents for non-storm water discharges from the MS4 to several water body types. The NALs for MS4 discharges given under Provision C.1.a are based on the water quality objectives for inland surface waters in the Basin Plan, and the water quality objectives for ocean waters in the Ocean Plan. The NALs for most of the metals were calculated based on the State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP). The NALs provided in Tables C-1

through C-4 must be included in the Water Quality Improvement Plans required to be developed pursuant to Provision B.

Provision C.1.b requires the Copermittees to identify NALs for pollutants and/or constituents, not specified in Provision C.1.a, which are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions of the Watershed Management Area related to non-storm water discharges from the MS4s. The NALs must be based on the water quality objectives in the Basin Plan. The NALs identified under Provision C.1.b must be included in the Water Quality Improvement Plan.

The San Diego Water Board recognizes that some of the NALs required pursuant to Provisions C.1.a and C.1.b may be exceeded more frequently than not. Thus, Provision C.1.c has been included in the Order to provide the Copermittees the option to develop secondary NALs that are set at levels greater than the levels required pursuant to Provisions C.1.a and C.1.b to further refine the prioritization and assessment of water quality improvement strategies for addressing non-storm water discharges to and from the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and from the MS4.

Provision C.2 (Storm Water Action Levels) requires the Copermittees to incorporate SALs into the Water Quality Improvement Plan for pollutants and/or constituents causing or contributing, or may be causing or contributing, to the highest priority water quality conditions identified in the Water Quality Improvement Plan related to storm water discharges from the MS4s.

The SALs have been included to ensure that the Copermittees are implementing and complying with several requirements of the MS4 permit. Provision A.1.a prohibits storm water discharges from the MS4 from "*causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state.*" In addition, pursuant to Provision A.2.a, storm water discharges "*must not cause or contribute to the violation of water quality standards in any receiving waters*."

Provision A.3.a, however, implicitly acknowledges that compliance with Provisions A.1.a and A.2.a cannot be achieved immediately for discharges of storm water from the MS4 by applying the MEP standard. Thus, Provision A.4 requires the Copermittees to implement an iterative approach to demonstrate that MEP is being achieved. This approach is supported by USEPA.

The federal CWA requires permits for municipal storm sewer systems to "*require controls to reduce the discharge of pollutants [in storm water] to the maximum extent practicable*, *including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants.*" MEP is an ever-evolving, flexible, and advancing concept. As knowledge about controlling storm water runoff

and discharges evolves, so does the knowledge which constitutes MEP. Reducing the discharge of storm water pollutants from the MS4 to the MEP requires the Copermittees to assess their jurisdictional runoff management programs and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP. The SALs provide the Copermittees measureable goals that may be used to demonstrate the achievement of MEP for reducing pollutants in storm water discharges from the MS4. The SALs will be used as part of the MS4 discharges assessments required under Provision D.4.a.

In June of 2006, the State Water Board's Blue Ribbon Storm Water Panel released its report titled "*The Feasibility of Numerical Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities*." In the recommendations, the Blue Ribbon panel proposed storm water effluent limitations which are computed using statistical based population approaches. The SALs specified in Table C-5 under Provision C.2.a were developed from a regional subset of nationwide Phase I MS4 data by using USEPA Rain Zone 6 (arid west) data.[28] Additionally, utilization of regional data is appropriate due to the addition of data into the nationwide Phase I MS4 monitoring dataset in February 2008. This additional data increased the number of USEPA Rain Zone 6 samples to more than 400, and included additional monitoring events within Southern California.

Utilizing data from USEPA Rain Zone 6 resulted in SALs which closely reflect the environmental conditions experienced in the San Diego Region. The localized subset of data includes sampling events from multiple Southern California locations including Orange, San Diego, Riverside, Los Angeles, and San Bernardino Counties. The dataset includes samples taken from highly built-out impervious areas and from storm events representative of Southern California conditions.

The SALs for cadmium, copper, lead and zinc require the measurement of hardness and to provide more specificity in the assessment of samples with SALs for total metal concentrations. While USEPA Rain Zone 6 data include a large sample size for concentrations of total metals, the impact the concentration will have on receiving waters will vary with receiving water hardness. Since it is the goal of the SALs, through the iterative process and MEP standard, to have MS4 storm water discharges meet all applicable water quality objectives, the hardness of the receiving water should be used when assessing the total metal concentration of a sample.

Thus, when there is an exceedance of a SAL for a metal, the Copermittee must determine if that exceedance is above the existing applicable water quality objectives based upon the hardness of the receiving water. The water quality objectives Copermittees must use to assess total metal SAL exceedances are the California Toxic Rule (CTR) and USEPA National Recommended Water Quality Criteria for Freshwater Aquatic Life 1 hour maximum concentrations. The 1 hour maximum

[28] Data used to develop SAL were obtained from http://rpitt.eng.ua.edu/Research/ms4/mainms4.shtml

concentration is to be used for comparison since it is expected to most replicate the impacts to waters of the State from the first flush following a precipitation event.

The statistically calculated SALs given in Table C-5 are at levels greater than the water quality objectives in the Basin Plan or Ocean Plan. Because the objective of the CWA is to "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*", meaning eventually pollutants in storm water discharges must be reduced to a level that cannot cause or contribute to an exceedance of water quality objectives in receiving waters, over time the SALs are expected to be reduced to a level that is based on the water quality objectives rather than statistical calculations. The San Diego Water Board will review the SALs as more data for discharges of storm water from the MS4s are collected, and revise them as conditions improve and the MEP standard advances. For the Water Quality Improvement Plans required under this Order, the SALs identified under Provision C.2.a must be included.

Provision C.2.b requires the Copermittees to identify SALs for pollutants and/or constituents, not specified in Provision C.2.a, which are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions of the Watershed Management Area related to storm water discharges from the MS4s. The SALs identified under Provision C.2.b must be included in the Water Quality Improvement Plan.

The San Diego Water Board recognizes that some of the SALs required pursuant to Provisions C.2.a and C.2.b may be exceeded more frequently than not. Thus, Provision C.2.c has been included in the Order to provide the Copermittees the option to develop secondary SALs that are set at levels greater than the levels required pursuant to Provisions C.2.a and C.2.b to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s.

D. Monitoring and Assessment Program Requirements

Purpose: Provision D includes minimum monitoring and assessment requirements that must be developed and implemented by the Copermittees as part of the Water Quality Improvement Plans. Implementation of the monitoring and assessment requirements of Provision D will allow the Copermittees to demonstrate that the requirements of the CWA to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP are being achieved. Implementation of the monitoring and assessment requirements of Provision D will also allow the Copermittees and the San Diego Water Board to track improvements to the water quality in the San Diego Region. The monitoring and assessment program requirements are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order.

***Discussion*:** The San Diego Water Board recognized that changes to the monitoring and assessment requirements of the Fourth Term Permit were necessary to improve the usefulness and usability of monitoring data collected by the Copermittees to support their jurisdictional storm water programs more efficiently and with increased effectiveness. The data collected are needed to better inform the Copermittees' understanding of the physical, chemical, and biological condition of the receiving waters and the quality of the MS4 discharges. The monitoring program needs to provide opportunities for the Copermittees to integrate regional monitoring efforts into municipal storm water monitoring requirements to provide a cost-effective approach to monitoring and avoid duplication of efforts.

The requirements in Provision D were largely recommended by the Copermittees as an outcome of the San Diego Water Boards Focused Meeting process. The monitoring and assessment program requirements now require collection of more specific information necessary for each Copermittee to adapt its jurisdictional runoff management program in such a way that focuses resources on a watershed's highest priority water quality conditions. The monitoring and assessment program will require the Copermittees to collect data that can be utilized to answer both watershed level management questions (e.g. Are the chemical, physical, and biological conditions of a receiving water protective, or likely protective of beneficial uses?), and specific jurisdictional runoff management program activity questions (e.g. Are the water quality improvement strategies of the jurisdictional program effectively eliminating non-storm water discharges to the MS4?).

The monitoring data collected and assessment information that will be reported to the San Diego Water Board are necessary to determine if the Copermittees are complying with the prohibitions and limitations of Provision A. The required monitoring and assessments that must be reported to the San Diego Water Board will be utilized for three purposes:

(1) Inform the Copermittees, San Diego Water Board, and the public on the progress of the Copermittees' efforts to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP;

(2) Inform the Copermittees, San Diego Water Board, and the public on the condition of water bodies receiving discharges from the Copermittees' MS4, and the progress of the Copermittees' water quality improvement implementation efforts toward improving the receiving water quality; and

(3) Inform the Copermittees, the San Diego Water Board, and the public on the effectiveness of the Water Quality Improvement Plan toward achieving (1) and (2).

The monitoring and assessment information reported pursuant to Provision F is also expected to be key to the iterative approach and adaptive management process required under Provision A.4 and implemented through the Water Quality Improvement Plan required under Provision B. As required by Provision A.4, the iterative approach and adaptive management process is required if the Copermittees cannot meet the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c, and/or A.2.a under the present conditions.

Provision D provides the minimum monitoring and assessment requirements that must be included in each Water Quality Improvement Plan to be developed and implemented by the Copermittees. The Copermittees, however, are not limited to the requirements of Provision D and may include additional methods to track progress toward improving water quality in a Watershed Management Area.

More specific and detailed discussions of the requirements of Provision D are provided below.

<u>Provision D.1 (Receiving Water Monitoring Requirements)</u> specifies the minimum receiving water monitoring that the Copermittees must conduct within the Watershed Management Area and include as part of the Water Quality Improvement Plan.

Provision D.1 establishes minimum monitoring requirements that must be conducted by the Copermittees within each Watershed Management Area. Provision D.1 requires the Copermittees to collect and develop the data and information necessary to determine potential impacts to the beneficial uses in the receiving waters due to discharges from the MS4s. The monitoring required under Provision D.1 will also provide the data that will allow the Copermittees to gauge the effectiveness and progress of its Water Quality Improvement Plan implementation efforts toward improving the quality of receiving waters.

The receiving water monitoring requirements of Provision D.1 are focused primarily on monitoring the conditions and response of the receiving waters to the Copermittees'

collective implementation efforts to reduce receiving water impacts that may be caused by the discharges from the MS4s. The preference of the San Diego Water Board is for the Copermittees to spend their resources achieving tangible and observable improvements in receiving water conditions instead of collecting samples and analyzing data that has consistently indicated that receiving water conditions are degraded and require improvement. In general, the ability to measure potential improvements in receiving water conditions due to any actions implemented by the Copermittees as part of the Water Quality Improvement Plan may require several years before a response can be observed. Thus, the frequency of collecting receiving water monitoring data has been kept to a minimum.

During the transitional period between adoption of this Order and San Diego Water Board acceptance of a Water Quality Improvement Plan, the Copermittees must conduct receiving water monitoring in accordance with Provision D.1.a. This approach to collecting receiving water data is different from what was required in the Fourth Term Permits, but one that truly embraces the concept of an integrated, cost-effective, streamlined receiving water monitoring approach.

Provision D.1.a requires Copermittees to continue performing the receiving water monitoring programs required in Order Nos. R-2007-0001, R9-2009-002, and R9-2010-0016; plus participation in: hydromodification management plan monitoring approved by the San Diego Water Board, monitoring plans as part of load reduction plans (either Bacteria Load Reduction Plans or Comprehensive Load Reduction Plans) for TMDLs in Attachment E of the Order, Storm Water Monitoring Coalition Regional Monitoring, Southern California Bight Regional Monitoring, Sediment Quality Monitoring, and ASBS Monitoring as applicable to a Watershed Management Area.

Provision D.1.a also provides an opportunity for the Copermittees to use third party data to meet receiving water monitoring requirements where feasible. Allowing the Copermittees to use the data currently collected through its participation in existing regional receiving water programs and that of third parties provides an efficiency of resources in obtaining the data necessary to inform the Copermittees and the San Diego Water Board about the physical, chemical, and biological conditions of the receiving waters, which can also help to focus the receiving water monitoring during the implementation of the Water Quality Improvement Plan. Once a Water Quality Improvement Plan is developed for a Watershed Management Area in compliance with Provision B of this Order, the transitional period is over and Copermittees are required to conduct receiving water monitoring according to the requirements of Provisions D.1.b-e.

Provision D.1.b requires each Copermittee to identify at least one long term receiving water monitoring station to be representative of receiving water quality within each Watershed Management Area. Long term receiving water monitoring stations can be located at any existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees. The requirements under Provision D.1.b. are

consistent with 40 CFR 122.26(d)(2)(iii)(D), which specifies that a "*monitoring program for representative data collection for the term of the permit*" may include "*instream locations.*" For each Watershed Management Area, at least one long term watershed monitoring station is required to be established and monitored. The Copermittees may choose to establish additional long term monitoring stations where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

Provision D.1.b. requires the Copermittees to locate the long term receiving water monitoring station at one of these existing receiving water monitoring stations to provide the Copermittees an opportunity to experience monitoring cost savings while continuing to collect the necessary data to assess the status and trends of receiving water quality conditions in 1) coastal water, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under both dry weather and wet weather conditions. Ideally these stations will continue to be monitored as part of the receiving water monitoring for each Watershed Management Area to maintain a consistent set of locations and a period of data that can be built upon with the monitoring required under this Order.

The receiving water monitoring requirements are separated into monitoring required during dry weather conditions pursuant to Provision D.1.c, and wet weather conditions pursuant to Provision D.1.d.

At each long term monitoring station the Copermittees must conduct at least three dry weather monitoring events as required pursuant to Provision D.1.c and at least three wet weather monitoring events as required pursuant to Provision D.1.d per permit term. Provisions D.1.c and D.1.d require the Copermittees to monitor priority water quality conditions identified in the Water Quality Improvement Plan, constituents listed as causing impairment of receiving waters in the Watershed Management Area, applicable NALs, toxicity, constituents listed in Tables D-2 and D-3, and constituents for implementation plans (e.g. Bacteria Load Reduction Plans and Comprehensive Load Reduction Plans). Required toxicity monitoring was changed to reflect an updated understanding of the unique challenges associated with sampling storm water for toxicity. Copermittees are required to sample storm water for toxicity during each dry weather and each wet weather event pursuant to Provision D.1.c.(4) and D.1.d.(4). Required toxicity monitoring is now consistent with the State Water Resources Control Board Policy for Toxicity Assessment and Control (Draft June 2012) and recently adopted MS4 permits for Caltrans and Los Angeles Water Board. Receiving water monitoring efforts in this Order have been streamlined to redirect resources to monitoring efforts that better support pollutant reduction solutions with an increasing emphasis on MS4 outfall monitoring, source identification and source abatement activities.

In addition to the receiving water monitoring requirements under Provisions D.1.b-d, Provision D.1.e requires the Copermittees participate in and/or conduct other types of receiving water monitoring. As recommended and requested by the Copermittees, Provision D.1.e.(1) requires the Copermittees to participate in existing regional monitoring, as applicable to each Watershed Management Area. Existing regional

monitoring includes monitoring conducted by the Storm Water Monitoring Coalition and for the Southern California Bight. Participation in and use of monitoring data collected from these existing regional water quality monitoring programs provide the Copermittees a greater opportunity for efficiency in the use of their resources to manage their storm water programs and those controllable discharges under their authority. Provision D.1.e.(1)(c) requires the south Orange County MS4 Copermittees to participate in "unified regional beach water quality monitoring." This monitoring replaces requirements to conduct "core monitoring" of beach water quality, as provided for in Appendix III of the 2012 California Ocean Plan.

Several different public agencies currently conduct routine, ongoing beach water quality monitoring in south Orange County in accordance with several different sets of requirements. The monitoring programs implemented to meet those requirements overlap temporally and spatially. These monitoring programs are partially but not fully integrated. In November 2010, the State Water Board adopted Resolution No. 2010-0053, which directed regional water boards to work with dischargers to modify beach water quality monitoring programs required by regional board-issued permits in order to eliminate redundancies and incorporate beach water quality monitoring required by beach water quality statutes, where appropriate.

In April 2012, the San Diego Water Board requested that its staff review beach water quality monitoring conducted in south Orange County. To assist in responding to that request, staff of the Board convened a workgroup that included representatives of the three public agencies that currently conduct almost all of the routine, ongoing beach water quality monitoring in south Orange County, i.e., South Orange County Wastewater Authority (SOCWA), Orange County Public Works, and Orange County Health Care Agency (OCHCA). The workgroup also included other interested parties, including representatives of the Sierra Club and Surfrider Foundation. In December 2012, the San Diego Water Board adopted Resolution No. R9-2012-0069, which endorsed the San Diego Water Board staff report entitled "A Framework for Monitoring and Assessment in the San Diego Region," dated November 2012.

The unified program is consistent with and will meet or exceed the minimum requirements for beach water quality monitoring and related public notification and reporting established by State law, including the California Ocean Plan. The unified program is consistent with State Water Board Resolution No. 2010-0053. The unified program is also consistent with and will help implement, "A Framework for Monitoring and Assessment in the San Diego Region," which emphasizes the need for question-driven, beneficial use-oriented monitoring and assessment. The primary purpose of the unified program will be to answer the question "Does beach water quality meet standards for the beneficial use of water contact recreation?"

The unified program is intended to be protective; it will help protect the health of swimmers, surfers, and others who use south Orange County beach waters for water contact recreational activities. The unified program is also intended to be reasonable; it will eliminate duplicative monitoring and will include triggers for public notification

and additional sampling at all sampling stations year-round. The unified program is intended to be equitable; responsibility for implementation of the unified program will be shared and the responsible agencies will jointly make arrangements to implement the program and will have the flexibility to jointly make short and/or long term changes in those arrangements.

The San Diego Water Board Executive Officer issued a written directive on December 5, 2014, pursuant to California Water Code section 13383, for SOCWA and the south Orange County MS4 Copermittees to implement the unified program in cooperation with OCHCA. The Executive Officer may make revisions to the unified program, provided that the unified program, as revised, continues to be consistent with and meet the requirements of State law, including the California Ocean Plan, for beach water quality monitoring and related public notification and reporting. Following a thirty day public comment period, and subject to a request for a hearing before the San Diego Water Board, any such revision shall take effect as specified in a written directive issued by the Executive Officer pursuant to California Water Code sections 13383. The program and any Executive Officer issued revisions to the program are subject to California Water Code section 13320 right of review from the date of issuance.

The unified program will supersede the existing routine, ongoing, beach water quality monitoring programs in south Orange County that are conducted in accordance with the existing requirements of the NPDES permits for discharges from the SOCWA ocean outfalls and the south Orange County MS4s. The requirement to participate in "regional monitoring" of beach water quality replaces requirements to conduct "core monitoring" of beach water quality, as provided for in Appendix III of the 2012 California Ocean Plan.

The State Water Resources Control Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part 1 Sediment Quality which became effective August 25, 2009 (Sediment Quality Monitoring Policy). Provision D.1.e.(2) requires any Copermittees with MS4 discharges to an enclosed bay or estuary to monitoring the sediments in the enclosed bay or estuary receiving water in accordance with the sediment quality monitoring procedures as prescribed in the Sediment Quality Monitoring Policy.

The State Water Board adopted Resolution No. 2012-0012 which approved exceptions to the California Ocean Plan for selected discharges into Areas of Special Biological Significance (ASBS), including special protections for beneficial uses. State Board Resolution No. 2012-0012 became effective on March 20, 2012, and Attachment B to the Resolution established limitations on point source storm water discharges to ASBS. Copermittees with MS4s that discharge to an ASBS must monitor its discharge to assure compliance with State Board Resolution No. 2012-0012 as required pursuant to Provision D.1.e.(3).

The San Diego Water Board is currently developing a regional monitoring strategy to assess the conditions of receiving waters in the San Diego Region. The monitoring requirements of Provision D.1 are expected to be incorporated or serve as a foundation of this regional monitoring strategy, but may require some modifications. When the San Diego Water Board develops an alternative regional monitoring strategy, the Copermittees will be required to participate in the development and implementation of the alternative regional monitoring program pursuant to Provision D.1.f.

Provision D.2 (MS4 Outfall Discharge Monitoring Requirements) specifies the minimum MS4 outfall discharge monitoring requirements that the Copermittees must incorporate and implement as part of the Water Quality Improvement Plan.

The dry weather MS4 outfall discharge monitoring requirements are included under Provisions D.2.a.(2) and D.2.b. The dry weather MS4 outfall discharge monitoring requirements are part of the "*program, including a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer*" required by 40 CFR 122.26(d)(2)(iv)(B), which is expected to achieve compliance with the CWA section 402(p)(3)(B)(ii) statutory requirement for municipal storm water permits to require the Copermittees to "*effectively prohibit non-storm water discharges into the storm sewers*." The dry weather MS4 outfall discharge monitoring data collection requirements are based on requirements under 40 CFR 122.26(d)(1)(iv)(D) and 122.26(d)(2)(iv)(B)(3).

The dry weather MS4 outfall discharge monitoring requirements are designed to provide wide spatial and temporal coverage of each jurisdiction to better understand the extent and magnitude of non-storm water discharges to receiving waters, and make a distinction between persistent and transient non-storm water flows. This information is expected to allow each Copermittee to focus its resources on eliminating and controlling the highest priority threats to receiving water quality, as well as integrating other elements of the storm water programs (e.g. complaint call response) and third party data to efficiently and effectively assist in efforts to eliminate non-storm water discharges.

The dry weather MS4 outfall discharge monitoring requirements of Provision D.2.a.(2) and D.2.b are separated into monitoring required before and after the San Diego Water Board accepts the Copermittees' Water Quality Improvement Plan. Outfall monitoring conducted prior to acceptance of the Water Quality Improvement Plan is referred to in the Order as Transitional MS4 Outfall Discharge Monitoring. Provision D.2.a.(2) includes the transitional dry weather MS4 outfall discharge monitoring requirements.

The requirements under Provision D.2.a.(2) are based on the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B), which include the requirements for a monitoring program to identify, detect, and eliminate illicit connections and illegal

discharges to the MS4s. The federal regulations (40 CFR 122.26(d)(1)(iv)(D)) require the monitoring program to include "*a field screening analysis for illicit connections and illegal dumping [that]…[a]t a minimum, include[s] a narrative description, for either each field screening point or major outfall, of visual observations made during dry weather periods.*" The federal regulations (40 CFR 122.26(d)(1)(v)(B)) require the monitoring program to include "*inspection procedures and methods for detecting and preventing illicit discharges, and describe areas where this program has been implemented.*" Furthermore, the monitoring program is required by federal regulations (40 CFR 122.26(d)(2)(iv)(B)) to include "*a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer.*"

Dry weather transitional MS4 outfall discharge monitoring requires each Copermittee to field screen (inspect) its major MS4 outfalls to classify the MS4 outfall locations as having persistent dry weather flows, transient dry weather flows, or no dry weather flows. To account for the variance in size of the 39 jurisdictions covered under this Order, the Copermittees recommended a tiered approach to the number of major MS4 outfalls that must be inspected. Provision D.2.a.(2)(a) provides a tiered approach to the number of major MS4 outfalls that must be visually inspected per jurisdiction as well as a minimum frequency each Copermittee must inspect each major MS4 outfall per year. This tiered approach is based on the total number of major MS4 outfalls within a Copermittees jurisdiction within each Watershed Management Area.

Based on the field screening, each Copermittee is required to make a determination whether any observed flowing, pooled, or ponded waters are transient or persistent flows. Based on this field screening information, other jurisdictional program information, and third party information, each Copermittee is required to prioritize the MS4 outfalls within its jurisdiction for follow up investigation and elimination of the non-storm water discharge, as part of its illicit discharge detection and elimination program required pursuant to Provision E.2. In accordance with the requirements of Provision E.2, each Copermittee is required to immediately investigate obvious illicit discharges (e.g. outfall discharges with unusual color, unusual odor, or high flows).

This approach allows a Copermittee to use all of its resources, as well as leverage resources and information provided by third parties, to effectively eliminate non-storm water discharges from its MS4 outfalls. If the source of the non-storm water discharge cannot be immediately eliminated, the Copermittee uses the persistent flow or transient flow classification along with other programmatic implementation data to prioritize the MS4 outfalls for future investigation. In accordance with the adaptive management approach deployed throughout this Order, Provision D.2.a.(2)(c) requires each Copermittee to update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow. The requirement of Provision D.2.a.(2)(c) assures that each Copermittee is collecting data that can be used to demonstrate compliance with the CWA requirement that each Copermittee must implement a program to "*effectively*

prohibit non-storm water discharges into the [MS4]" and with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

Provision D.2.b describes the dry weather MS4 outfall discharge monitoring required to be incorporated and implemented as part of the Water Quality Improvement Plan. Dry weather MS4 outfall discharge monitoring must be performed by each Copermittee to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. The emphasis of the dry weather MS4 outfall discharge monitoring required pursuant to Provision D.2.b is consistent with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

Provision D.2.b.(1) requires each Copermittee to continue field screening its major MS4 outfalls and identifying those with persistent flows and transient flows, as conducted during the transitional period (i.e. before the Water Quality Improvement Plan was developed). However, each Copermittee now has the flexibility to adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of non-storm water persistent flow discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan. In order to ensure a minimum number of outfalls are inspected, Provision D.2.b.(1) requires the number of visual inspections be equal to the number of visual inspections required in the tiered inspection program pursuant to Provision D.2.a.(2)(a).

Provision D.2.b.(2)(b) requires each Copermittee to monitor a minimum of 5 major MS4 outfalls with persistent flows identified as the highest priorities within a Copermittee's jurisdiction, within each Watershed Management Area. In other words, Copermittees located in more than one Watershed Management Area must identify at least 5 major MS4 outfalls with persistent flows in its jurisdiction in each Watershed Management Area. If a Copermittee is located in more than one Watershed Management Area, and they have less than 5 major MS4 outfalls with persistent flows per jurisdictional area per Watershed Management Area, all of the major MS4 outfalls must be identified as high priority dry weather persistent flow MS4 outfalls. The Copermittees identified as Responsible Copermittees by a TMDL in Attachment E of the Order may need to monitor more than 5 dry weather major MS4 outfall locations to determine compliance with the requirements of the TMDL(s).

Monitoring must occur at the highest priority outfall locations at least semi-annually until the non-storm water discharges have been eliminated for three consecutive dry weather monitoring events; identified to be authorized by a separate NPDES Permit; or reprioritized to a lower priority. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized MS4 major outfall in the Copermittee's jurisdiction within the Watershed Management Area, unless there are no remaining qualifying major MS4 outfalls within the Copermittees jurisdiction. The Copermittees must continually update their dry weather persistent

flow MS4 outfall discharge monitoring locations with the next highest priority non-storm water flow that have yet to be eliminated until all persistent and transient flows are eliminated or its threat reduced.

Non-storm water persistent flow MS4 outfall discharge monitoring data collected during each semi-annual monitoring event, must be collected and analyzed according to the requirements of Provision D.2.b.(2)(b)–(e). These monitoring requirements are consistent with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

The wet weather MS4 outfall discharge monitoring requirements are included under Provisions D.2.a.(3) and D.2.c. The wet weather MS4 outfall discharge monitoring requirements are necessary for the Copermittees to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable, using management practices, control techniques and system, design and engineering methods, and such other provisions which are appropriate*" required by 40CFR 122.26(d)(2)(iv), which is expected to achieve compliance with the CWA section 402(p)(3)(B)(iii) statutory requirement for municipal storm water permits to require "*controls to reduce the discharge of pollutants [in storm water] to the maximum extent practicable*." The wet weather MS4 outfall discharge monitoring data collection requirements are based on requirements under 40 CFR 122.26(d)(2)(iii), 122.26(d)(2)(iii)(A) and 122.26(d)(2)(iii)(A)(1)-(4), and 40 CFR 122.21(g)(7)(i)-(ii).

The wet weather MS4 outfall discharge monitoring requirements of Provision D.2.a.(3) and D.2.c are separated into monitoring required before and after the San Diego Water Board accepts the Copermittees' Water Quality Improvement Plan. Outfall monitoring conducted prior to acceptance of the Water Quality Improvement Plan is referred to in the Order as Transitional MS4 Outfall Discharge Monitoring. Provision D.2.a.(3) includes the transitional wet weather MS4 outfall discharge monitoring requirements.

Until the wet weather MS4 outfall discharge monitoring requirements of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board, the Copermittees must comply with the requirements of transitional wet weather MS4 outfall monitoring requirements pursuant to Provision D.2.a.(3). Provision D.2.a.(3) requires the Copermittees in each Watershed Management Area to sample, at least five of the major MS4 outfalls inventoried pursuant to Provision D.2.a.(1) once per wet season for the monitoring data required to be collected pursuant to Provision D.2.a.(3)(c)-(e). Provision D.2.a.(3) further requires at least one major MS4 outfall monitoring station be located in each Copermittee's jurisdiction within the Watershed Management Area.

At a minimum, the five sampling locations chosen must be representative of storm water discharges from residential, commercial, industrial, and typical mixed-use land uses present within a Watershed Management Area. The San Diego Water Board expects the Copermittees to extrapolate from these data to similar land uses

throughout the Watershed Management Area to better inform the Water Quality Improvement Plan development process by prioritizing drainages for implementation of storm water control efforts required pursuant to Provision E.

Provision D.2.c describes the wet weather MS4 outfall discharge monitoring required to be included and implemented as part of the Water Quality Improvement Plan. Provision D.2.c provides the Copermittees the flexibility to adjust the wet weather MS4 outfall discharge monitoring locations and frequencies in the Watershed Management Area, as needed, to identify sources of pollutants in storm water discharges from MS4s in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan.

Although Provision D.2.c.(1) allows the Copermittees to adaptively manage the wet weather MS4 outfall discharge monitoring locations and frequencies, the provision requires a minimum of at least five wet weather outfall stations to be monitored. Provision D.2.c.(2) further allows the Copermittees to modify the monitoring frequency at each wet weather MS4 outfall station to meet the goals of the Water Quality Improvement Plan as long as the monitoring frequency occurs at least once per year and is at an appropriate frequency to identify sources of pollutants in storm water discharges, guide pollutant source identification efforts, or determine compliance with the requirements of the applicable TMDLs in Attachment E to the Order.

The wet weather MS4 outfall discharge monitoring requirements of Provisions D.2.c.(3) and D.2.c.(4) are the same as the transitional wet weather MS4 outfall discharge monitoring. In contrast, the requirements of Provision D.2.c.(5) are focused on collecting analytical data specific to the highest priority water quality conditions in the Watershed Management Area identified in the Water Quality Improvement Plan. The wet weather MS4 outfall discharge monitoring data collection requirements are consistent with the requirements under 40 CFR 122.26(d)(2)(iii), 122.26(d)(2)(iii)(A) and 122.26(d)(2)(iii)(A)(1)-(4), and 40 CFR 122.21(g)(7)(i)-(ii).

<u>Provision D.3 (Special Studies)</u> requires the Copermittees to develop special studies that will be conducted for each Watershed Management Area and the entire San Diego Region. Data collected pursuant to Provision D.3 is to be used by the Copermittees to improve the effectiveness of the strategies implemented by the jurisdictional runoff management programs toward achieving the numeric goals identified in the Water Quality Improvement Plans and ultimately achieve compliance with the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c, and A.2.a, which is consistent with the requirements of Provision A.4.

Special studies are often necessary to fill data gaps or provide more refined information that allow the Copermittees to better manage the generation or elimination of pollutants and discharges to and from the MS4. In the Fourth Term Permits, the Copermittees have been required to implement special studies as directed by the San Diego Water Board. The special studies required by this Order provide the Copermittees more flexibility to identify and implement special studies that will be most

useful to improving the effectiveness of their jurisdictional runoff management programs.

Provision D.3.a.(1) requires the Copermittees to develop and conduct at least two special studies per Watershed Management Area, to be determined by the Copermittees. One of the two special studies may be accomplished through participation in a Regional Special Study required under Provision D.3.a.(2). The requirements provide the Copermittees great latitude in identifying and developing the special studies. Watershed Management Area special studies are required, at a minimum, to: (a) relate in some way to the highest water quality priorities identified by the Copermittees in the Water Quality Improvement Plan, (b) be conducted within the Watershed Management Area, and (c) include some form of participation (e.g. contribution of funds, personnel services, project management) by all the responsible Copermittees within the Watershed Management Area.

Examples of Watershed Management Area special studies might include, but are not limited to: (1) focused pollutant source identification studies, (2) BMP effectiveness and/or comparison studies, (3) pilot tests for new or emerging pollutant control methods, (4) receiving water pollutant or stressor source identification and/or mitigation studies, or (5) pollutant fate and transport studies. The Watershed Management Area special studies are expected to provide data that can be utilized by the Copermittees to improve the Water Quality Improvement Plan or implementation of the Copermittees' jurisdictional runoff management programs to address the highest priority water quality conditions.

Provision D.3.a.(2) requires the Copermittees to develop at least one special study that will be conducted for the entire San Diego region. The regional special study is expected to provide data that can be utilized by the Copermittees to improve the Water Quality Improvement Plan or implementation of the Copermittees' jurisdictional runoff management programs to identify or address regional water quality concerns and priorities.

An example of a regional special study would be to develop and establish allowable exceedance frequencies of the bacteria water quality objectives for several types of water bodies, during different wet and dry weather conditions the San Diego region. The special study would be related to bacteria, which is a priority for the San Diego region due to the adoption of "*Bacteria TMDL Project I – Beaches and Creeks in the San Diego Region*." The study results could be used to inform the Copermittees and the San Diego Water Board about the indictor bacteria water quality objective exceedance frequencies that occur in natural or reference watersheds.

<u>Provision D.4 (Assessment Requirements)</u> specifies the assessments that the Copermittees are required to perform, based on the monitoring data collected, and will be reported as part of the Annual Report for the Water Quality Improvement Plan implementation. Provision D.4 requires the Copermittees assess the progress of the

water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c, and A.2.a.

Provision D.4 specifies the assessments that Copermittees must perform for each Watershed Management Area to assess the effectiveness of each Copermittee's jurisdictional runoff management program and the Water Quality Improvement Plan. The effectiveness of each Copermittee's jurisdictional runoff management program and Water Quality Improvement Plan is measured through these types of assessments: (a) Receiving Waters Assessments (b) MS4 Outfall Discharges Assessments, (c) Special Studies Assessments, and (d) Integrated Assessment of Water Quality Improvement Plan.

Provision D.4.a requires the Copermittees to assess the status of receiving water conditions annually during the transitional monitoring period (during development of the Water Quality Improvement Plan) and after acceptance of the Water Quality Improvement Plan. The monitoring data collected pursuant to Provision D.1 will be evaluated, among other information, to assess the condition of a Watershed Management Area's streams, coastal waters, enclosed bays, harbors, estuaries, and lagoons. The focus of the receiving waters assessments is to measure progress toward the objective of the CWA to "*restore and maintain the chemical, physical, and biological integrity of the Nation's waters*" as the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program are implemented within a Watershed Management Area. Provision D.4.a is consistent with 40 CFR 122.42(c)(7) which requires the Copermittees to annually report the *"[i]dentification of water quality improvements or degradation."*

Provision D.4.b includes the MS4 outfall discharges assessment requirements. The focus of MS4 outfall discharges assessments is to determine if the Copermittees' are implementing programs that comply with the requirements of the CWA for MS4 permits to "*effectively prohibit non-stormwater discharges into the storm sewers*" and "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable.*" The monitoring data collected pursuant to Provisions D.2 will be evaluated, among other information, to assess the effectiveness of the transitional MS4 outfall field screening monitoring, the implementation of the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program. The MS4 outfall discharge assessments consist of Non-Storm Water Discharges Reduction Assessments and Storm Water Pollutant Discharges Reduction Assessments.

The Non-Storm Water Discharges Reduction Assessments are how each Copermittee will demonstrate that its jurisdictional runoff management program implementation efforts are achieving the CWA requirement to "*effectively prohibit non-stormwater discharges into the storm sewers.*" Provision D.4.b.(1) requires each Copermittee to assess and report on its illicit discharge detection and elimination program required pursuant to Provision E.2 to reduce and effectively prohibit non-storm water and illicit discharges into the MS4 within its jurisdiction. The Non-Storm Water Discharges

Reduction Assessments include specific assessment requirements applicable to each Copermittee.

As each Copermittee collects and analyzes the data collected pursuant to dry weather MS4 outfall discharges monitoring requirements of Provisions D.2.a.(2) and D.2.b, Provision D.4.b.(1) requires each Copermittee to assess the progress, assess the effectiveness of its current actions, and identify modifications necessary to increase the effectiveness of its actions toward reducing and eliminating non-storm water and illicit discharges to its MS4. The findings from these assessments are expected to be utilized by the Copermittee as part of its procedures to prioritize the non-storm water discharges that will be addressed by its Illicit Discharge Detection and Elimination program required pursuant to Provision E.2.

The assessment requirements of Provision D.4.a.(1) are consistent with 40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(3) which require "*procedures…to investigate portions of the separate storm sewer system that, <u>based on the results of the field screen, or other appropriate information</u> [emphasis added], indicate a reasonable potential of contain illicit discharges or other sources of non-storm water*" as part of a "*program…to detect and remove…illicit discharges and improper disposal into the storm sewer.*" The assessment requirements of Provision D.4.a.(1) are also consistent with 40 CFR122.42(c)(1) requires the Copermittees to annually report the "*status of implementing the components of the storm water management program that are established as permit conditions.*"

The Storm Water Pollutant Discharges Reduction Assessment is how the Copermittees in each Watershed Management Area will demonstrate that their jurisdictional runoff management program implementation efforts are achieving the CWA requirement to "*reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable*." Provision D.4.b.(2) requires the Copermittees in each Watershed Management Area to assess and report the progress of the Copermittees' efforts to reduce pollutants in storm water discharges from the MS4s to the MEP. The Storm Water Pollutant Discharges Reduction Assessments include specific assessment requirements during both the transitional monitoring period and after acceptance of the Water Quality Improvement Plan applicable to the Watershed Management Area and each Copermittee.

As the Copermittees collect and analyze the data collected pursuant to wet weather MS4 outfall discharges monitoring requirements of Provisions D.2.a.(3) and D.2.c, Provision D.4.b.(2) requires the Copermittees to assess runoff conditions during the transitional period, and the progress of the Water Quality Improvement Plan strategies toward reducing pollutants in storm water from the MS4 to the MEP. The findings from these assessments are expected to be utilized by the Copermittees to identify any modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify sources of pollutants in storm water discharges from the MS4s, as well as focus, modify, and improve the water quality improvement

strategies implemented by each Copermittee within its jurisdiction to reduce pollutants in storm water discharges to the MEP.

The assessment requirements of Provision D.4.b.(2) are consistent with 40 CFR 122.26(d)(2)(iii)(B) which requires "*[e]stimates of the annual pollutant load of the cumulative discharges to waters of the United States from all identified municipal outfalls…during a storm event…accompanied by a description of the procedures for estimating constituent loads and concentrations, including any modeling, data analysis, and calculation methods.*" The assessment requirements of Provision D.4.a.(2) are consistent with 40 CFR 122.26(d)(2)(v) which requires that each Copermittee assesses the *"estimated reductions in loadings of pollutants from discharges of municipal storm sewer constituents from municipal storm sewer systems expected as the result of the municipal storm water quality management program."* The assessment requirements of Provision D.4.b.(2) are also consistent with 40 CFR122.42(c)(1) requires the Copermittees to annually report the "*status of implementing the components of the storm water management program that are established as permit conditions.*"

Provision D.4.c includes the special studies assessment requirements. Performing special studies are how the Copermittees will address data gaps identified during the development of and updates to the Water Quality Improvement Plan. The relevant findings from the special studies assessments are expected to be incorporated as part of the applicable receiving water assessments, MS4 outfall discharge assessments, and integrated water quality improvement assessments required in Provision D.4.a, D.4.b, and D.4.d, respectively.

The assessment requirements in Provision D.4.d are part of the iterative approach and adaptive management process required by Provision A.4. The Copermittees are required to integrate the data collected pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to re-evaluate the Water Quality Improvement Plan.

The monitoring data collected pursuant to Provisions D.1 and D.2, and the results of the assessment required pursuant to Provisions D.4.a-c, will be used to determine whether the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program are effective, or require modifications or improvements to become more effective to achieve the requirements of the CWA. The assessments required by Provision D.4.d are consistent with 40 CFR 122.42(c)(1) which requires that the Copermittees to report the *"[t]he status of implementing the components of the storm water management program that are established as permit conditions."*

E. Jurisdictional Runoff Management Programs

Purpose: Provision E includes the requirements for the jurisdictional runoff management programs to be implemented by each of the Copermittees. Compliance with the requirements for the jurisdictional runoff management programs will allow the Copermittees to demonstrate that they are implementing programs to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP. The jurisdictional runoff management program document prepared by each Copermittee will also provide the details for implementing the water quality improvement strategies identified in the Water Quality Improvement Plan specifically within its jurisdiction.

***Discussion*:** Implementation of the jurisdictional runoff management program requirements under Provision E is how the Copermittees "*effectively prohibit non-stormwater discharges into the storm sewer,*" and outlines the "*controls to reduce the discharge of pollutants to the maximum extent practicable"* consistent with the federal regulations under 40 CFR 122.26. The jurisdictional runoff management program is part of the "*comprehensive planning process*" that is required pursuant to 40 CFR 122.26(d)(2)(iv). Where the Water Quality Improvement Plan is the "*comprehensive planning process*" on a Watershed Management Area scale, requiring "*intergovernmental coordination,*" the jurisdictional runoff management program document is the "*comprehensive planning process*" on a jurisdictional scale that should be coordinated with the other Copermittees in the Watershed Management Area to achieve the goals of the Water Quality Improvement Plan.

The jurisdictional runoff management program requirements are included to provide each Copermittee criteria that can be used to demonstrate that its storm water management program is implementing the "*comprehensive planning process*" within its jurisdiction to "*effectively prohibit non-stormwater discharges into the storm sewers,*" and to identify and implement the most effective "*controls to reduce the discharge of pollutants to the maximum extent practicable"* in accordance with the performance standards given in the CWA.

Provision E includes the requirements for each of the components that must be included in the Copermittee's jurisdictional runoff management program document that will be implemented by the Copermittee within its jurisdiction. Implementation of the components of each Copermittee's jurisdictional runoff management program must incorporate the water quality improvement strategies identified by each Copermittee in the Water Quality Improvement Plans, described pursuant to Provision B.3.b.(1)(a).

More specific and detailed discussions of the requirements of Provision E are provided below.

Provision E.1 (Legal Authority Establishment and Enforcement) requires each Copermittee to establish and enforce sufficient legal authority to control discharges to the MS4 within its jurisdiction.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system*" and be able to demonstrate that it can "*operate pursuant to legal authority established by statute, ordinance or series of contracts.*" Provision E.1.a describes the minimum legal authorities each Copermittee must establish for itself within its jurisdiction to control discharges to its MS4. The requirements of Provision E.1.a are consistent with the requirements set forth in 40 CFR 122.26(d)(2)(i)(A)-(F).

The certification statement required from each Copermittee by Provision E.1.b is included to provide the San Diego Water Board additional documentation that each Copermittee has established the legal authorities consistent with Provision E.1.a and 40 CFR 122.26(d)(2)(i)(A)-(F), and the Copermittee can "*operate pursuant to legal authority established by statute, ordinance or series of contracts.*"

Provision E.2 (Illicit Discharge Detection and Elimination) requires each Copermittee to implement an illicit discharge detection and elimination program to effectively prohibit non-storm water discharges to the MS4 by actively detecting and eliminating illicit discharges and disposal into its MS4.

Provision E.2 establishes the minimum requirements that each Copermittee must implement within its jurisdiction to effectively prohibit non-storm water discharges from entering its MS4. The federal CWA requires permits for municipal storm sewer systems to "*effectively prohibit non-storm water discharges into the storm sewers*." The federal regulations (40CFR122.26(d)(2)(i)(B)) require each Copermittee to establish the legal authority to prohibit illicit discharges to its MS4s. Under 40 CFR 122.26(d)(2)(iv)(B), each Copermittee must implement a "*program…to detect and remove…illicit discharges and improper disposal into the storm sewer.*" The federal NPDES regulations, under 40 CFR 122.26(b)(2), define illicit discharges as "*any discharge to a municipal separate storm sewer that is not composed entirely of storm water*." Thus, non-storm water discharges are not authorized to enter the MS4 and are considered to be illicit discharges, unless authorized by a separate NPDES permit.

The Phase I Final Rule clarifies that non-storm water discharges through an MS4 are not authorized under the CWA (55 FR 47995):

> "*Today's rule defines the term "illicit discharge" to describe any discharge through a municipal separate storm sewer system that is not composed entirely of storm water and that is not covered by an NPDES permit. Such illicit discharges are not authorized under the Clean Water Act. Section 402(p)(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…Ultimately, such non-storm water discharges through a municipal separate*

storm sewer must either be removed from the system or become subject to an NPDES permit."

The federal NPDES requirements for the program to address illicit discharges must include "*inspections, to implement and enforce an ordinance, orders, or other similar means to prevent illicit discharges to the MS4*." The federal NPDES regulations also reference several categories of "*non-storm water discharges or flows* [which] *shall be addressed where such discharges are identified…as sources of pollutants to waters of the United States*." The Phase I Final Rule (55 FR 48037) further clarified the requirements of 40 CFR 122.26(d)(2)(iv)(B)(1) as follows:

"*EPA is clarifying that section 402(p)(3)(B) of the CWA (which requires permits for municipal separate storm sewers to 'effectively' prohibit non-storm water discharges) does not require permits for municipalities to prohibit certain discharges or flows of nonstorm water to waters of the United States through municipal separate storm sewers in all cases*."

In previous iterations of the municipal storm water permits for the San Diego Region, these categories were simply listed and referred to as categories of non-storm water discharges "not prohibited" unless identified as a source of pollutants. The Copermittees have often referred to these categories as "exempt" discharges. In both cases, however, the language is inconsistent with the federal CWA and NPDES regulations. And, the clarification provided in the Phase I Final Rule does not specifically state that such discharges are "not prohibited" or "exempt" or in any way authorized. The federal NPDES regulations do, however, state that specific categories of non-storm water discharges must be "*addressed*" if identified as "*sources of pollutants to waters of the United States*."

The language of Provision E.2.a has been revised to be fully consistent with the language of the CWA and the requirements of the federal regulations under 40 CFR 122.26(d)(2)(iv)(B)(1). Provision E.2.a requires each Copermittee to address <u>all</u> types of non-storm water discharges into its MS4 as illicit discharges, <u>unless</u> the discharge is authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to Provisions E.2.a.(1) through E.2.a.(5). Only non-NPDES-permitted non-storm water discharges identified as a category of non-storm water discharges under Provisions E.2.a.(1) through E.2.a.(5) <u>and</u> *not identified as a source of pollutants* do not have to be addressed as illicit discharges. Categories of non-storm water discharges that meet the requirements of Provisions E.2.a.(1) through E.2.a.(5) do not have to be addressed by the Copermittee as illicit discharges.

Several of the non-storm water categories listed in 40 CFR 122.26(d)(2)(iv)(B)(1) have not been included in Provisions E.2.a.(1) through E.2.a.(5), including: street wash water, landscape irrigation, irrigation water, and lawn watering. Because these are no longer included within the categories listed under Provisions E.2.a.(1) through E.2.a.(5), the Copermittees must prohibit these types of non-storm water discharges

from entering the MS4. This is consistent with the clarification of 40 CFR 122.26(d)(2)(iv)(B)(1) in the Phase I Final Rule (55 FR 48037), which states:

> "*[T]he Director may include permit conditions that either require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*."

Street wash water is a category of non-storm water discharges that was removed when the Third Term Permits were issued. Street wash water is a source of several pollutants (e.g., metals, oil and grease, petroleum hydrocarbons, chlorinated solvents, sediment) which are generated during the street washing process. The removal of this category requires the Copermittees to prohibit this type of non-storm water discharge from entering the MS4.

The landscape irrigation, irrigation water, and lawn watering categories, collectively referred to hereafter as "over-irrigation" discharges, were removed from the list of non-storm water discharge categories in the Fourth Term Orange County and Riverside County Permits. Non-storm water discharges resulting from over-irrigation have been found to be a source of several types of pollutants (e.g., nutrients, bacteria, pesticides, sediment) in receiving waters. The San Diego Water Board and the Copermittees have identified categories of non-storm water discharges associated with over-irrigation as a source of pollutants and conveyance of pollutants to the MS4 and waters of the United States in the following documents:

- **SmartTimer/Edgescape Evaluation Program (SEEP) Grant Application**

  The State Water Board allocated grant funding to the SEEP project grant application submitted in 2006, which targeted irrigation runoff by retrofitting areas of existing development and documenting the conservation and runoff improvements. The basis of this grant project is that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 is a source and conveyance of pollutants. In addition, the grant application indicated that this alteration of natural flows is impacting the beneficial uses of waters of the state and U.S. Results from the study indicate that that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 *is* a source and conveyance of pollutants. The results of this study can be applied broadly to any area where over-irrigation takes place. The grant application included the following statements:

  > "*Irrigation runoff contributes flow & pollutant loads to creeks and beaches that are 303(d) listed for bacteria indicators.*"
  >
  > "*Regional program managers agree that the reduction and/or elimination of irrigation-related urban flows and associated pollutant loads may be key to successful attainment of water quality and beneficial use goals as outlined in the San Diego Basin Plan and Bacteria TMDL over the long term.*"

"*Elevated dry-weather storm drain flows, composed primarily … of landscape irrigation water wasted as runoff, carry pollutants that impair recreational use and aquatic habitats all along Southern California's urbanized coastline. Storm drain systems carry the wasted water, along with landscape derived pollutants such as bacteria, nutrients and pesticides, to local creeks and the ocean. Given the local Mediterranean climate, excessive perennial dry season stream flows are an unnatural hydrologic pattern, causing species shifts in local riparian communities and warm, unseasonal contaminated freshwater plumes in the near-shore marine environment.*"

- **2006-2007 Orange County Watershed Action Plan Annual Reports**

The Watershed Action Plan Annual Reports for the 2006-2007 reporting period were submitted by the County of Orange, Orange County Flood Control District and Copermittees within the San Juan Creek, Laguna Coastal Streams, Aliso Creek, and Dana Point Coastal Streams Watersheds. San Juan Creek, Laguna Coastal Streams, Aliso Creek and Dana Point Coastal Streams are all currently 303(d) listed as impaired for indicator bacteria within their watersheds and/or in the Pacific Ocean at the discharge points of their watersheds. The Orange County Copermittees, within their Watershed Action Strategy Table for fecal indicator bacteria included the following:

"*Support programs to reduce or eliminate the discharge of anthropogenic dry weather nuisance flow throughout the…watershed. Dry weather flow is the transport medium for bacteria and other 303(d) constituents of concern.*"

Additionally, they state that "*conditions in the MS4 contribute to high seasonal bacteria propagation in-pipe during warm weather. Landscape irrigation is a major contributor to dry weather flow, both as surface runoff due to over-irrigation and overspray onto pavements; and as subsurface seepage that finds its way into the MS4*."

- **Fiscal Year 2008 Carlsbad Watershed Urban Runoff Management Program Annual Report**

The Carlsbad Watershed Urban Runoff Management Program Annual Report for Fiscal Year 2008 was submitted by the Carlsbad Watershed Copermittees (Cities of Carlsbad, Encinitas, Escondido, Oceanside, San Marcos, Solana Beach, and Vista, and the County of San Diego). In the Annual Report, the Carlsbad Watershed Copermittees stated the following:

"The Carlsbad Watershed Management Area (WMA) collective watershed strategy identifies bacteria, sediment, and nutrients as high priority water quality pollutants in the Agua Hedionda (904.3 – bacteria and sediment), Buena Vista (904.2 – bacteria), and San Marcos Creek (904.5 – nutrients) Hydrologic Areas. Bacteria, sediment, and nutrients have been identified as potential discharges from over-irrigation."

- **2007-2008 San Diego Bay Watershed Urban Runoff Management Program Annual Report**

  The San Diego Bay Watershed Urban Runoff Management Program 2007-2008 Annual Report was submitted by the San Diego Bay Watershed Copermittees (Cities of Chula Vista, Coronado, Imperial Beach, La Mesa, Lemon Grove, National City, and San Diego, the County of San Diego, the Port of San Diego, and the San Diego County Airport Authority). In Appendix D of the Annual Report, titled "Likely Sources of Pollutants," the San Diego Bay Watershed Copermittees identified over-irrigation of lawns as a pollutant generating activity from business and/or residential land uses for bacteria, pesticides, and sediment.

- **Copermittee Public Education Materials**

  The Orange County Public Works *Tips for Landscape & Gardening* public education brochure states: "*Fertilizers, pesticides and other chemicals that are left on yards or driveways can be blown or washed into storm drains that flow to the ocean. Overwatering lawns can also send materials into storm drains*."

  The Riverside County Flood Control and Water Conservation District *Landscape and Garden* public education brochure states: *"Soil, yard wastes, over-watering and garden chemicals become part of the urban runoff mix that winds its way through streets, gutters and storm drains before entering lakes, rivers, streams, etc. Urban runoff pollution contaminates water and harms aquatic life!"*

- **Los Peñasquitos Lagoon Sedimentation/Siltation TMDL Technical Report**

  The Los Peñasquitos Lagoon Sedimentation/Siltation TMDL technical report was prepared for the City of San Diego and USEPA in October 2010. The technical report was included as a technical supporting document attached to the Sediment TMDL for Los Peñasquitos Lagoon staff report prepared by the San Diego Water Board, dated June 13, 2012. Under the Source Assessment section, the technical report states the following:

  > "*Dry weather loading is dominated by nuisance flows from urban land use activities such as car washing, sidewalk washing, and lawn over-irrigation, which pick up and transport sediment into receiving waters.*"

These documents confirm that non-storm water discharges associated with over-irrigation are a source of pollutants and should be addressed as illicit discharges to the MS4. Prohibiting non-storm water discharges associated with over-irrigation, however, is not a new requirement for the Copermittees because it is also consistent with and required by the Water Conservation in Landscaping Act (AB 1881, Laird).

The Water Conservation in Landscaping Act required the Department of Water Resources (DWR) to prepare a Model Water Efficient Landscape Ordinance for use by local agencies (e.g. the Copermittees). All local agencies were required to adopt a water efficient landscape ordinance by January 1, 2010. Local agencies could adopt the Water Efficient Landscape Ordinance developed by DWR, or an ordinance considered at least as effective as the Model Ordinance. The Water Efficient Landscape Ordinance includes a requirement that local agencies prohibit runoff from irrigation (§ 493.2):

> "*Local agencies shall prevent water waste resulting from inefficient landscape irrigation by* <u>*prohibiting runoff from leaving the target landscape*</u> *[emphasis added] due to low head drainage, overspray, or other similar conditions where water flows onto adjacent property, non-irrigated areas, walks, roadways, parking lots, or structures. Penalties for violation of these prohibitions shall be established locally*."

Furthermore, non-storm water discharges from over-irrigation not only transport and discharge pollutants to receiving waters, but are also a likely source of the dry weather flows causing changes to habitat within and along the receiving water bodies. Examples of habitat changes from the dry weather flows include perennialization of ephemeral streams, and conversion of saltwater and brackish water marsh habitats to freshwater marsh habitats (e.g. Los Peñasquitos Lagoon). Both of these examples have resulted in the promotion of invasive species in several areas of the San Diego Region.

The removal of the over-irrigation discharges categories does not require the Copermittees to strictly prohibit lawn and landscape irrigation, but does require the prohibition of excessive irrigation water that results in non-storm water discharges to the MS4. Non-storm water discharges to the MS4 from over-irrigation must be addressed as illicit discharges by the Copermittees pursuant to the requirements of Provision E.2.

The remaining non-storm water categories listed in 40 CFR 122.26(d)(2)(iv)(B)(1) are listed under Provisions E.2.a.(1) through E.2.a.(5) and generally fall into four categories: (1) non-storm water discharges subject to existing San Diego Water Board waste discharge requirements and NPDES permits; (2) non-storm water discharges generally not expected to be a source of pollutants to receiving waters; (3) non-storm water discharges likely to contain pollutants requiring some form of control to address the pollutants prior to discharging to the MS4; and (4) non-storm water discharges or flows associated with firefighting.

Provisions E.2.a.(1) and E.2.a.(2) include several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) for which the San Diego Water Board already has developed general waste discharge requirements and NPDES permits to address the discharges. The Copermittees are only required to address these types of non-storm water discharges as illicit discharges if the Copermittees or

the San Diego Water Board identifies these non-storm water discharges not having coverage under the applicable NPDES permit.

Provision E.2.a.(3) includes several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) which are generally not expected to be a source of pollutants to receiving waters, many of which originate from what are typically natural, uncontrollable sources. The Copermittees are only required to address these types of non-storm water discharges as illicit discharges if the Copermittees or the San Diego Water Board identifies these non-storm water discharges as a source of pollutants to receiving waters. Because many of these sources are generally uncontrollable, enforcing a prohibition may not be a possibility for the Copermittees. The Copermittees would be able to address these non-storm water discharges by preventing these non-storm water discharges from entering the MS4. This could potentially be achieved by sealing their MS4 structures so the discharges cannot enter the MS4.

Provision E.2.a.(4) includes several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) that are likely to contain pollutants requiring some form of control to address the pollutants prior to discharging to the MS4. At this time, an outright prohibition of these types of non-storm water discharges does not yet appear to be warranted. Thus, Provision E.2.a.(4) includes several requirements for the Copermittees to control the pollutants from these types of non-storm water discharges. This is consistent with the clarification of the federal regulations in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board has the authority to require the Copermittees to "*control any of these types of discharges where appropriate*."

Unlike non-storm water discharges from over-irrigation, these types of non-storm water discharges are not expected to occur in close proximity to each other or very frequently. Provided these types of non-storm water discharges are controlled as required in Provision E.2.a.(4), the Copermittees would only be required to address these types of non-storm water discharges as illicit discharges if the Copermittee or the San Diego Water Board identifies these non-storm water discharges as a source of pollutants to receiving waters.

Provision E.2.a.(5) includes specific requirements for fire fighting discharges and flows. The requirements for non-storm water discharges and flows associated with fire fighting have been separated into requirements for: a) non-emergency fire fighting discharges and flows, and b) emergency fire fighting discharges and flows.

The San Diego Water Board has found that discharges from building fire suppression system maintenance (e.g. fire sprinklers) contain waste and potentially a significant source of pollutants to receiving waters. As such, the San Diego Water Board is requiring these discharges be addressed as illicit discharges by the Copermittees. Thus, the discharges to the MS4 are to be prohibited via ordinance, order or similar means. For other non-emergency firefighting discharges and flows (i.e. flows from

controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems), the Copermittees are required to develop and implement a program to address pollutants in these non-storm water discharges and flows. This is consistent with the clarification of the federal regulations in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board has the authority to require the Copermittees to "*control any of these types of discharges where appropriate*."

For emergency firefighting discharges and flows, the Phase I Final Rule (55 FR 48037) has clarified the requirements of 40 CFR 122.26(d)(2)(iv)(B)(1) pertaining to emergency firefighting flows and discharges, which states:

> "*In the case of firefighting it is not the intention of these rules to prohibit in any circumstances the protection of life and public or private property through the use of water or other fire retardants that flow into separate storm sewers*."

Thus, the requirements have been made to be consistent with the guidance provided by the Phase I Final Rule. The Order recommends that the Copermittees develop and encourage implementation of BMPs to reduce or eliminate the discharge of pollutants from emergency firefighting flows to the MS4s and receiving waters. The Order does not include any requirements that should be interpreted as requiring the implementation of BMPs for emergency firefighting flows to the MS4s and receiving waters.

The Copermittees are expected to review the dry weather MS4 outfall discharge monitoring data they collect to determine if and when there are non-storm water discharges to or from their MS4s that are a source of pollutants to receiving waters. If the Copermittees identify one of the types of non-storm water discharges listed in Provisions E.2.a.(1) through E.2.a.(4) as a source of pollutants to receiving waters based on the review and evaluation of monitoring data, Provision E.2.a.(6) requires the Copermittees to prohibit those categories of discharges from entering the MS4 through ordinance, order or similar means. In addition, Provision E.2.a.(6) clarifies that the San Diego Water Board may identify categories of non-storm water discharges or flows listed under Provisions E.2.a.(1) through E.2.a.(4) that must be prohibited.

Provision E.2.a.(6) also provides the Copermittees an option to propose controls to be implemented for the category of non-storm water discharges as part of the Water Quality Improvement Plan instead of prohibiting the category of non-storm water discharges. If the Water Quality Improvement Plan is accepted by the San Diego Water Board with the proposed controls, the Copermittees will not be required to prohibit the category of non-storm water discharges to their MS4s as long as the controls are implemented. This is consistent with the clarification of 40 CFR 122.26(d)(2)(iv)(B)(1) in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board may "*require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*."

Finally, Provision E.2.a.(7) has been included in the requirements for non-storm water discharges to clarify that any non-storm water discharges to the Copermittee's MS4, even those identified pursuant to Provisions E.2.a.(1) through E.2.a.(4), must be reduced or eliminated, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit. Provision E.2.a.(7) is consistent with the requirements of CWA section 402(p)(3)(B)(ii) and 40 CFR 122.26(d)(1)(v)(B), as clarified in the Phase I Final Rule (55 FR 47995) that "*[u]ltimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit*." However, the reduction or elimination of those non-storm water discharges are expected to be achieved as feasible, in accordance with the priorities in the Water Quality Improvement Plan and when the resources are available to the Copermittee.

Consistent with 40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(1), each Copermittee must implement a "*program…to prevent illicit discharges to the municipal storm sewer system*" and "*detect…illicit discharges and improper disposal into the storm sewer.*" Provision E.2.b requires each Copermittee to implement measures to prevent and detect illicit discharges and connections to its MS4 as part of its illicit discharge detection and elimination program.

As part of the program to prevent and detect illicit discharges to the MS4, 40 CFR 122.26(d)(2)(iv)(B)(2) requires "*procedures to conduct on-going field screening activities during the life of the permit, including areas or locations that will be evaluated by such field screens*." As part of the procedures, each Copermittee is required to maintain an updated map of its entire MS4 and the corresponding drainage areas within its jurisdiction. Having knowledge about where inlets, access points, connections with other MS4s, and outfalls are located is necessary for each Copermittee to track, identify, and eliminate illicit discharges and connections. Thus, Provision E.2.b.(1) of the Order specifies that the map must include the segments of the storm sewer system owned, operated, and maintained by the Copermittee, and include locations of all known inlets, connections with other MS4s, and outfalls to the Copermittee's MS4. The remaining requirements of Provision E.2.b are consistent with the requirements of 40 CFR 122.26(d)(2)(iv)(B)(3)-(7) related to implementing measures to prevent and detect illicit discharges and connections to the MS4.

Provision E.2.c requires each Copermittee to conduct field screening and monitoring of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4. Field screening is a required element of the program to detect and eliminate illicit discharges and connections to the MS4, pursuant to 40 CFR 122.26(d)(2)(iv)(B)(2). The field screening requirement will be implemented through the dry weather MS4 outfall discharge monitoring required under Provisions D.2.a.(2) and D.2.b.(1).

Provision E.2.d specifies the measures each Copermittee must implement to eliminate illicit discharges and connections to its MS4. Elimination of illicit discharges and connections to the MS4 is consistent with the requirement of 40 CFR

122.26(d)(2)(iv)(B) "*to detect and remove [emphasis added]…illicit discharges and improper disposal into the storm sewer*" and will achieve the CWA requirement for MS4 permits to "*effectively prohibit non-storm water discharges into the storm sewers*."

Generally, each Copermittee is responsible for prioritizing its efforts to eliminate non-storm water and illicit discharges or connections to its MS4 based on field screening and monitoring data, NALs, illicit discharge investigation records, and the known or suspected sources. Sources of non-storm water and illicit discharges or connections must be eliminated by enforcing the legal authority established by each Copermittee pursuant to Provision E.1.

Provision E.3 (Development Planning) requires each Copermittee to use its land use and planning authority to implement a development planning program to control and reduce the discharge of pollutants in storm water from new development and significant redevelopment to the MEP. Proper implementation of the development planning program will also contribute toward effectively prohibiting non-storm water discharges from development projects to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." As part of the management program, 40 CFR 122.26(d)(2)(iv)(A)(2) requires "*planning procedures including a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment*."

Land development generally alters the natural conditions of the land by removing vegetative cover, compacting soil, and/or placement of concrete, asphalt, or other impervious surfaces. These impervious surfaces concentrate urban pollutants (such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not found in high concentrations in the natural environment. Pollutants that accumulate on impervious surfaces are not easily biodegraded nor subject to natural treatment processes.

Impervious surfaces greatly affect the natural hydrology of the land because they do not allow natural infiltration and treatment of storm water runoff to take place. Instead, storm water runoff from impervious surfaces is typically directed through pipes, curbs, gutters, and other hardscape into receiving waters, with little treatment, at significantly increased volumes and accelerated flow rates over what would occur naturally. The increased pollutant loads, storm water volume, discharge rates and velocities, and discharge durations from the MS4 adversely impact stream habitat by causing accelerated, unnatural erosion and scouring within creek bed and banks. Placement of impervious surfaces also encapsulates "good" sediment (such as sand, gravel, rocks and cobbles) that would normally replenish creek beds and banks to help

stabilize them. Collectively, these changes to natural hydrologic processes are termed hydrograph modification, or hydromodification.

Hydromodification, which is caused by both altered storm water flow and altered sediment flow regimes, is largely responsible for degradation of creeks, streams, and associated habitats in the San Diego Region. In an ongoing study by the Stormwater Monitoring Coalition to assess the health of streams throughout Southern California, researchers found that three of the four highest risk stressors to creeks (percent sands and fines present, channel alteration, and riparian disturbance) were related to physical habitat.[29] Researchers studying flood frequencies in Riverside County have found that increases in watershed imperviousness of only 9-22 percent can result in increases in peak flow rates for the two-year storm event of up to 100 percent.[30] Such changes in runoff have significant impacts on channel morphology.

In addition, a technical report issued by the Southern California Coastal Water Research Project (SCCWRP) stated that "*[r]ecent studies indicate that California's intermittent and ephemeral streams are more susceptible to the effects of hydromodification than streams from other parts of the United States. Physical degradation of stream channels in the central and eastern United States can initially be detected when watershed impervious cover approaches 10 percent, although biological effects (which may be more difficult to detect) may occur at lower levels. In contrast, initial response of streams in the semi-arid portions of California appears to occur between 3 and 5 percent impervious cover*."[31] These studies highlight the extent to which impacts originating from impervious surfaces created by land development are responsible for the degradation of creek and stream habitat.

This is consistent with what USEPA has noted, that "*[m]ost stormwater runoff is the result of the man-made hydrologic modifications that normally accompany development. The addition of impervious surfaces, soil compaction, and tree and vegetation removal result in alterations to the movement of water through the environment. As interception, evapotranspiration, and infiltration are reduced and precipitation is converted to overland flow, these modifications affect not only the characteristics of the developed site but also the watershed in which the development is located. Stormwater has been identified as one of the leading sources of pollution for all waterbody types in the United States. Furthermore, the impacts of stormwater pollution are not static; they usually increase with more development and urbanization*."[32]

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[29] Assessing the Health of Southern California Streams, Stormwater Monitoring Coalition, Fact Sheet
[30] Schueler and Holland, 2000. Storm Water Strategies for Arid and Semi-Arid Watersheds (Article 66). The Practice of Watershed Protection.
[31] Stein, E. and Zaleski, S., 2005. Technical Report 475, Managing Runoff to Protect Natural Streams: The Latest Development on Investigation and Management of Hydromodification in California. December 30, 2005.
[32] USEPA, 2007. Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices, December 2007.

Reducing the impact from the increased pollutant loads and flows generated by impervious surfaces within a watershed is essential to protecting and restoring the integrity of the receiving waters. Provision E.3 includes the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment*." The requirements of Provision E.3 will 1) minimize the generation and discharge of pollutants in storm water from the MS4, and 2) minimize the potential of storm water discharges from the MS4 from causing altered flow regimes and excessive downstream erosion in receiving waters.

The requirements of Provision E.3.a include the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment*" applicable to all development projects, regardless of size or purpose of development. In general, all development projects must implement onsite BMPs to remove pollutants from runoff prior to its discharge to any receiving waters, as close to the pollutant generating source as possible, and structural BMPs must not be constructed within waters of the U.S.

Furthermore, the onsite BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors (e.g. mosquitos, rodents, and flies). If not properly designed or maintained, certain BMPs implemented or required by municipalities may create a habitat for vectors. Monitoring studies conducted by the California Department of Public Health (CDPH) have documented that mosquitoes opportunistically breed in structural storm water BMPs, particularly those that hold standing water for over 96 hours. Certain site design features that hold standing water may similarly produce mosquitoes.

Structural BMPs and site design features should incorporate design, construction, and maintenance principles to promote drainage within 96 hours to minimize standing water available to mosquitoes. Nuisances and public health impacts resulting from vector breeding can be prevented with close collaboration and cooperative effort between municipalities and local vector control agencies and the CDPH during the development and implementation of storm water runoff management programs. The CDPH also has issued guidance for BMP implementation that will minimize potential nuisances and public health impacts resulting from vector breeding.[33]

All development projects are required to implement source control BMPs that will minimize the generation of pollutants. Additionally, each development project must implement, where applicable and feasible, low impact development (LID) BMPs to

[33] California Department of Public Health, 2012. Best Management Practices for Mosquito Control in California. (http://www.cdph.ca.gov/HealthInfo/discond/Documents/BMPforMosquitoControl07-12.pdf)

mimic the natural hydrology of the site and retain and/or treat pollutants in storm water runoff prior to discharging to and from the MS4.

The LID Center defines LID as "*a comprehensive land planning and engineering design approach with a goal of maintaining and enhancing the pre-development hydrologic regime of urban and developing watersheds.*"[34] LID designs seek to control storm water at the source, using small-scale integrated site design and management practices to mimic the natural hydrology of a site, retain storm water runoff by minimizing soil compaction and impervious surfaces, and disconnect storm water runoff from conveyances to the storm drain system.

LID BMPs may utilize interception, storage, evaporation, evapotranspiration, infiltration, and filtration processes to retain and/or treat pollutants in storm water before it is discharged from a site. Because of these numerous options, the San Diego Water Board expects that every development project will be able to implement some form of LID BMPs. Examples of LID BMPs include using permeable pavements, rain gardens, rain barrels, grassy swales, soil amendments, and native plants.

Provision E.3.a also includes requirements for all development projects to, where feasible, landscape with native and/or low water use plants to minimize the discharge of non-storm water discharges associated with excessive irrigation, as well as harvest (i.e., storage) and use precipitation to promote the concept of utilizing storm water as a resource.

While all development projects are subject to the requirements of Provision E.3.a, Provision E.3.b identifies Priority Development Projects that exceed given size thresholds and/or fit under specific use categories. Priority Development Projects are required to incorporate specific performance criteria for structural BMPs into the project plan to reduce the generation of pollutants, and address potential impacts from hydromodification.

The Priority Development Project categories are based on the requirements of the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), and do not differ significantly from the Fourth Term Permit for San Diego County. Furthermore, the Priority Development Project categories are consistent with Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), and Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit).

Because of the impact of relatively small increases in watershed impervious surfaces to receiving waters, Provision E.3.b.(1)(c)(iv) has been updated to include large driveways that are 5,000 square feet or more. The San Diego Water Board finds that large driveways can exacerbate altered flow regimes if not properly controlled.

[34] www.lowimpactdevelopment.org

Provision E.3.b.(3) describes projects that are exempt from Priority Development Project status. These include new or retrofit paved sidewalks, bicycle lanes, or trails that are designed and constructed to direct runoff to vegetated areas or be hydraulically disconnected from paved areas. The exemptions have been provided to encourage these types of projects because they provide multiple environmental benefits, such as promoting walking rather than driving, which will in turn improve air quality. Additionally, retrofitting of existing alleys, streets, or roads are exempt from Priority Development Project status if they are constructed using USEPA Green Streets guidance.[35] By doing so, retrofitting of these types of projects is encouraged. The San Diego Water Board recognizes that there are spatial constraints associated with these projects, and implementation of structural BMPs are not always feasible.

For development projects identified as Priority Development Projects, the requirements of Provision E.3.c are the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment.*" Provisions E.3.c.(1)-(3) describe the performance criteria for the structural BMPs that must be implemented for each Priority Development Project defined by Provision E.3.b.

Provision E.3.c.(1) describes the storm water pollutant control BMP requirements that must be implemented by all Priority Development Projects. The purpose of Provision E.3.c.(1) is to reduce pollutants in storm water runoff to the MEP from Priority Development Projects before it is discharged to the MS4. Of all the available treatment processes available, retention of storm water, and therefore capture of the pollutants in the storm water, will achieve 100 percent pollutant removal efficiency for the volume of storm water retained. No other method of treatment can achieve 100 percent pollutant removal efficiency. Thus, retention of as much storm water onsite is the most effective way to reduce pollutants in storm water discharges to, and consequently from the MS4, and controls pollutants in storm water discharges from a site to the MEP.

Under Provision E.3.c.(1)(a), retention of the pollutants in the runoff produced from the 85th percentile storm event ("design capture volume") is the design standard to which Priority Development Projects must comply. Since the 85th percentile storm event has previously been used as the numeric design standard for treatment control BMPs, this same size storm event is used as the numeric design standard for storm water retention. This is the MEP standard recognized by the San Diego Water Board and is consistent with the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), as well as Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and

[35] "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).

Riverside County MS4 Permits, respectively), Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit), and Los Angeles Water Board Order No. R4-2012-0175 (Los Angeles County MS4 Permit).

The 85th percentile storm event is the event that has a precipitation total greater than or equal to 85 percent of all storm events over a given period of record in a specific area or location. For example, to determine what the 85th percentile storm event is in a specific location, all 24 hour storms that have recorded values over a 30 year period would be tabulated and a 85th percentile storm would be determined from this record (i.e. 15 percent of the storms would be greater than the number determined to be the 85th percentile storm). Most jurisdictions in the San Diego Region have already developed isopluvial maps that can provide this type of information. The 85th percentile storm might be determined to be a number such as 1.0 inch, and this would be multiplied by the total area of the project footprint producing runoff to calculate the design capture volume. The Priority Development Project designer would then select a system of BMPs that would retain (i.e. intercept, store, infiltrate, evaporate, or evapotranspire) the pollutants contained in the design capture volume onsite.

Retention BMPs are necessary to capture and retain pollutants generated from a Priority Development Project. In a recent study performed by SCCWRP in the Los Angeles Region, they found "*that the magnitude of constituent load associated with storm water runoff depends, at least in part, on the amount of time available for pollutant build-up on land surfaces. The extended dry period that typically occurs in arid climates such as southern California maximizes the time for constituents to build-up on land surfaces, resulting in proportionally higher concentrations and loads during initial storms of the season*."[36] This implies that the "first flush" of a rainy season and the first storm events after long antecedent dry periods tend to have the highest pollutant loads. Capturing and retaining the pollutant loads of the "first flush" of a rainy season and the first storm events after long antecedent dry periods will reduce a significant portion of the pollutants in storm water discharged to and from the MS4.

The San Diego Water Board, however, acknowledges that in some situations retention of the full design capture volume onsite may not be technically feasible. In this event, the Copermittee may allow the Priority Development Project to use biofiltration BMPs to treat 1.5 times the design capture volume not reliably retained onsite, or biofiltration BMPs with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite.

The 1.5 multiplier is based on the finding in the Ventura County Technical Guidance Manual that biofiltration of 1.5 times the design capture volume not retained onsite will provide approximately the same pollutant removal as retention of the design capture

[36] Stein, E.D., Tiefenthaler, L.L., and Schiff, K.C., 2007. Technical Report 510, Sources, Patterns and Mechanisms of Storm Water Pollutant Loading from Watershed and Land Uses of the Greater Los Angeles Area, California, USA. March 20, 2007.

volume on an annual basis.[37] This standard is consistent with the Los Angeles Water Board's Los Angeles County and Ventura County municipal storm water permits (Order Nos. R4-2012-0175 and R4-2010-0108, respectively). The flow-thru design of 0.75 times the portion of the design capture volume not reliably retained onsite is consistent with the San Diego Water Board's Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively). In either case, the biofiltration BMPs must be designed with an appropriate hydraulic loading rate to maximize storm water retention and pollutant removal, as well as to prevent erosion, scour, and channeling within the BMP. Each Copermittee is required to update its BMP Design Manual to provide guidance for hydraulic loading rates and other biofiltration design criteria necessary to maximize storm water retention and pollutant removal.

The San Diego Water Board further recognizes that, in addition to not being technically feasible, retention of the full design capture storm onsite may be cost prohibitive, or may not provide as much water quality benefit to the Watershed Management Area as would implementing BMPs elsewhere in the watershed. Thus, Provision E.3.c.(1)(b) allows for the use of a combination of onsite retention BMPs, and the implementation of an Alternative Compliance Program described in Provision E.3.c.(3). Provision E.3.c.(3) is discussed in more detail below.

If the full design capture volume is not retained onsite either because biofiltration is not technically feasible, or a Copermittee grants a Priority Development Project permission to utilize the Alternative Compliance Program, then the pollutants in the portion of the design capture volume that are not reliably retained onsite must still be reduced to the MEP. Thus, flow-thru treatment control BMPs are required to be implemented on Priority Development Projects in addition to the retention BMPs. The requirements of Provisions E.3.c.(1)(a)(ii)[a]-[c] include the performance standards for flow-thru treatment control BMPs, consistent with the Fourth Term Permits in the San Diego Region.

Whereas the purpose of the requirements under Provision E.3.c.(1) is to reduce pollutants in storm water runoff to the MEP, the purpose of the requirements under Provision E.3.c.(2) is to maintain or restore more natural hydrologic flow regimes to prevent accelerated, unnatural erosion in downstream receiving waters, also to the MEP standard. Provision E.3.c.(2) describes hydromodification management BMP requirements that must be implemented by all Priority Development Projects.

The performance criteria for the implementation of hydromodification management BMPs on Priority Development Projects are consistent with the requirements in the Fourth Term Permits for Orange and Riverside Counties (Order Nos. R9-2009-0002 and R9-2010-0016, respectively). Modifications to the Orange County and Riverside County Hydromodification Management Plans (HMPs) will likely be minor, or may not

[37] Ventura Countywide Stormwater Management Program. 2011. Ventura Technical Guidance Manual, Manual Update, 2011.

be necessary. The HMP for San Diego County will likely require some minor modifications to incorporate the requirements of Provision E.3.c.(2) and become consistent with the Orange County and Riverside County HMPs. The San Diego Water Board does not, however, expect that it will be necessary for the San Diego County Copermittees to develop a new approach or significantly re-write the San Diego County HMP. This is because the premise of the hydromodification management BMP requirements, which are to control storm water runoff conditions (flow rates and durations) for Copermittee-defined range of flows, is unchanged from all Fourth Term Permits in the San Diego Region.

Provision E.3.c.(2)(a) requires that post-project runoff conditions mimic the *pre-development* runoff conditions, and not the *pre-project* runoff conditions. Fundamentally, the San Diego Water Board believes that using a hydrology baseline that approximates that of an undeveloped, natural watershed is the only way to facilitate the return of more natural hydrological conditions to already built-out watersheds, and ultimately improved stream health. On the other hand, using the *pre-project* hydrology as a baseline for redevelopment projects results in propagating the unnatural hydrology of urbanized areas. Propagating the urbanized flow regime does not support conditions for restoring degraded or channelized stream segments, and would forever sentence such streams to the degraded state. Furthermore, reducing the volume of storm water runoff associated with the urbanized flow regime will also result in reducing the discharge of pollutants into receiving waters, since storm water runoff from impervious surfaces contains untreated pollutants.

The San Diego Water Board understands that approximating the pre-development runoff condition associated with a redevelopment site is not necessarily straightforward because factors such as natural grade and native vegetation for the site cannot be precisely known. Therefore, the San Diego Water Board does not expect project designers to estimate historical conditions associated with redevelopment sites. Rather, the San Diego Water Board expects project designers and the Copermittees to approximate pre-development runoff conditions using the parameters of a *pervious* area rather than an *impervious* area. This means that for redevelopment sites, approximating pre-development runoff conditions equates to using existing onsite grade and assuming the infiltration characteristics of the underlying soil. A redevelopment Priority Development Project must not use runoff coefficients of concrete or asphalt to estimate pre-development runoff conditions. Rather, redevelopment projects must use available information pertaining to existing underlying soil type (such as soil maps published by the National Resource Conservation Service), onsite existing grade, and any other readily available pertinent information to estimate pre-development runoff conditions.

The San Diego Water Board understands, indeed asserts, that the pre-development hydrology of an area in question can only be roughly estimated and cannot be precisely known. However, using the hydrology of a natural condition, even if not precisely known, will provide significant benefit to receiving waters over using the hydrology associated with impervious (developed) surfaces. Therefore in order to

achieve the goals of the Clean Water Act, which are to "*restore and maintain the chemical, physical, and biological integrity of the nation's waters* [emphasis added]," the most appropriate standard to use for hydromodification management is the standard associated with the pre-development condition.

Provision E.3.c.(2)(b) requires Priority Development Projects to avoid known critical sediment yield areas or implement measures that would allow coarse sediment to be discharged to receiving waters, such that the natural sediment supply is unaffected by the project. This is necessary because the availability of coarse sediment supply is as much an issue for causing erosive conditions to receiving streams as are accelerated flows.

The San Diego Water Board recognizes that in some situations implementing the hydromodification management BMP requirements for flow control fully onsite may not be technically feasible, may be cost prohibitive, or may not provide any overall water quality benefits to the Watershed Management Area. Thus, Provision E.3.c.(2)(c) allows for the use of a combination of onsite hydromodification management BMPs for flow control and alternative compliance options described in Provision E.3.c.(3).

Provision E.3.c.(3) allows for alternative compliance in instances where the Copermittee determines that offsite measures will have a greater overall water quality benefit for the Watershed Management Area than if the Priority Development Project were to implement structural BMPs onsite. Consequently, watershed-specific structural BMP requirements are present in this Order in the form of allowable compliance offsite. The Alternative Compliance Program to Onsite Structural BMP Implementation Provision is intended to integrate with the Copermittees' planning efforts in the Water Quality Improvement Plans.

The Alternative Compliance Program is an option for Priority Development Projects where the governing Copermittee has participated in the development of a Watershed Management Area Analysis as part of the Water Quality Improvement Plan (described in Provision B.3.b.(4)). Such an approach is consistent with the latest findings in hydromodification management by the scientific community. In a Technical Report entitled *Hydromodification Assessment and Management in California,*[38] the report states:

> *"An effective [hydromodification] management program will likely include combinations of on-site measures (e.g., low-impact development techniques, flow-control basins), in-stream measures (e.g., stream habitat restoration), floodplain and riparian zone actions, and off-site measures. Off-site measures may include compensatory mitigation measures at upstream locations that are designed to help restore and manage flow and sediment yield in the watershed."*

[38] 2012. ED Stein, F Federico, DB Booth, BP Bledsoe, C Bowles, Z Rubin, GM Kondolf, A Sengupta. Technical Report 667. Southern California Coastal Water Research Project. Costa Mesa, CA.

Consistent with the ideas brought forth in the report, in the Watershed Management Area Analysis of Provision B.3.b.(4), which is optional, the Copermittees will develop watershed maps that include as much detail about factors that affect the hydrology of the watershed as is available. Such factors included identification of areas suitable for infiltration, coarse sediment supply areas, and locating stream channel structures and constrictions. Once these factors are mapped and studied, the Copermittees can identify areas in the watershed where candidate projects may be implemented that are expected to improve water quality in the watershed by providing more opportunity for infiltration, slowing down storm water flows, or attenuation of pollutants naturally via healthy stream habitat. These candidate projects may be in the form of retrofitting existing development, rehabilitating degraded stream segments, identifying regional BMPs, purchasing land to preserve valuable floodplain functions, and any other project(s) that the Copermittees identify.

Under the Alternative Compliance Program, Priority Development Projects may be allowed to fund, partially fund, or implement a candidate project, in lieu of implementing structural BMPs onsite, if they enter into a voluntary agreement with the governing Copermittee permitting this arrangement. Project proponents may also propose an alternative project not previously identified by the Copermittees. In either case, whether a project proponent implements a candidate project identified by the Copermittees or a separate alternative compliance project, the governing Copermittee must determine that implementation of the project will have a greater overall water quality benefit for the Watershed Management Area than fully implementing structural BMPs onsite. Determination of greater overall water quality benefits associated with alternative compliance projects would be accomplished by utilizing Water Quality Equivalency calculations developed pursuant to Provision E.3.c.(3)(a). Water Quality Equivalency calculations are necessary to establish a regional and technical basis for determining water quality benefits associated with alternative compliance projects, which can be consistently used by all Copermittees in the San Diego Region. Finally, if ~~If~~ alternative compliance involves funding or implementing a project that is outside the jurisdiction of the governing Copermittee, then that Copermittee may enter into an inter-agency agreement with the appropriate jurisdiction.

Finally, Provision E.3.c.(2)(d) allows Priority Development Projects to be exempt from the hydromodification management BMP requirements if there is no threat of erosion to downstream receiving waters (i.e. the receiving stream is concrete lined from the point of discharge all the way to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean). If the Copermittees believe that more exemptions are warranted, then they must perform the optional Watershed Management Area Analysis of Provision B.3.b.(4). Additional exemptions other than those specified in this Order may be established on a watershed basis, provided the Copermittees perform the analysis, provide supporting rationale for the exemptions, and complete the Water Quality Improvement Plan approval process pursuant to Provision F.1.

To facilitate the transition to this Order from the Fourth Term Permits for Orange and Riverside County Copermittees, Provision E.3.c.(2)(e) allows two additional temporary

exemptions from hydromodification management BMP implementation. The first temporary exemption allows relief from hydromodification management BMP implementation for Priority Development Projects discharging directly to an engineered channel conveyance system with a capacity to convey peak flows generated by the 10-year storm event all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean. Similar to the exemption allowed for concrete-lined channels, this exemption is premised on the concept that there is little threat of erosion to these types of engineered channel systems.

The second temporary exemption allows relief from hydromodification management BMP implementation for Priority Development Projects discharging directly to large river reaches with drainage areas larger than 100 square miles and a 100-year flow capacity in excess of 20,000 cubic feet per second. If this exemption is claimed, then properly sized energy dissipation is required at all discharge points associated with the Priority Development Project. This exemption is premised on the concept that large river reaches can essentially assimilate the accelerated flow rates associated with individual Priority Development Projects because they are inconsequential compared to the flow rate in the large river reach. Both of these exemptions are included in the Hydromodification Management Plan for San Diego County[39].

These temporary exemptions are allowed as a means to facilitate Orange and Riverside County Copermittees' transition to this Order from the Fourth Term Permits and are not meant to reside as permanent exemptions without additional rigorous technical analyses specific to each County. Therefore, these exemptions will no longer apply once the Copermittees' land development programs are fully updated to reflect the requirements of this Order, i.e., upon implementation of the BMP Design Manual pursuant to Provision F.2.b. If the Copermittees believe that these or other exemptions are warranted in the context of water quality improvement and stream restoration opportunities, then the Copermittees must perform the optional Watershed Management Area Analysis of Provision B.3.b.(4) and provide supporting rationale for the exemptions. The San Diego County Copermittees are also required to perform the optional Watershed Management Area Analysis to provide supporting rationale to justify use of these and other exemptions. Updated BMP Design Manuals including rationale to justify use of exemptions will be reviewed by the San Diego Water Board pursuant to Provision F.2.b.

Provisions E.3.c.(4) and E.3.c.(5) were included under the BMP requirements applicable to all development projects in the Fourth Term Permits for San Diego, Orange, and Riverside Counties (Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016, respectively). In this Order, the long-term BMP maintenance and infiltration and groundwater protection requirements apply to structural BMPs implemented by Priority Development Projects only.

[39] Final Hydromodification Management Plan Prepared for County of San Diego, March 2011

Provision E.3.d requires the Copermittees to update their BMP Design Manual as needed to incorporate the requirements of Provision E.3. The BMP Design Manual is formerly known as the Standard Storm Water Mitigation Plan, or SSMP, and was renamed so that the title has a more accurate description of the document content. The contents of the BMP Design Manual are largely unchanged from the previous Standard Storm Water Mitigation Plans required under the Fourth Term Permits. The BMP Design Manual fulfills the 40 CFR 122.26(d)(2)(iv)(A)(2) requirement that the Copermittee's development planning program includes "*a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment*."

As part of the "*planning procedures,*" 40 CFR 122.26(d)(2)(iv)(A)(2) requires the procedures to "*address controls to reduce pollutants in discharges from municipal separate storm sewers after construction is completed*." The requirements applicable to the implementation and oversight of structural BMPs at Priority Development Projects are provided under Provision E.3.e.

Proper installation of the structural BMPs approved for a Priority Development Project is necessary to ensure that pollutants in storm water discharges will be reduced to the MEP after the project is completed. In addition to the proper installation of structural BMPs, the maintenance of structural BMPs on Priority Development Projects is necessary to ensure that pollutants in storm water discharges will continue to be reduced to the MEP. Provision E.3.e.(1) includes the minimum requirements that each Copermittee must implement to ensure structural BMPs are properly installed and will be properly maintained.

The requirements under Provision E.3.e.(2)-(3) are necessary to demonstrate each Copermittee is implementing a program that complies with Provisions E.3.b-c and E.3.e.(1), and ensure structural BMPs at Priority Development Project will continue to be able to reduce pollutants in storm water discharges to the MEP.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary for any development projects to compel compliance with the requirements of Provision E.3 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.3.f requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

<u>Provision E.4 (Construction Management)</u> requires each Copermittee to implement a construction management program to control and reduce the discharge of pollutants in storm water from construction sites to the MEP. Proper implementation of the construction management program will also contribute toward effectively prohibiting non-storm water discharges from construction sites to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." As part of the management program, 40 CFR 122.26(d)(2)(iv)(D) requires "*a program to implement and maintain structural and non-structural best management practices to reduce pollutants in storm water runoff from construction sites to the municipal storm sewer system.*"

Construction sites can be significant sources of sediment, trash, and other pollutants to receiving waters. Although sediment is naturally occurring in the natural environment, the discharge of sediment under unnatural conditions is problematic to receiving waters. Fine sediment in creeks causes high turbidity that interferes with the functionality of native flora and fauna in local creeks. For example, turbidity interferes with both photosynthesis of water-philic plants, as well as successful foraging and reproduction of benthic macroinvertebrates. Sediment can also make it difficult for fish to breathe because it clogs fish gills. Other pollutants such as heavy metals or pesticides can adhere to sediment and are transported to receiving waters during storm events, where they dissolve in the water column and become bioavailable to aquatic organisms. Sediment is recognized as a major stressor to surface waters and is responsible for the impairment of several lagoons and creeks in the San Diego Region.

Provision E.4 includes requirements that each Copermittee must implement to minimize the discharge of sediment and other pollutants from construction sites to the MS4 within its jurisdiction. The requirements under Provision E.4 are consistent with the Fourth Term Permits for San Diego, Orange, and Riverside Counties. Therefore, Copermittees are expected to implement the requirements seamlessly, with minimal changes to their existing construction management programs. The Copermittees, however, are given more flexibility to run their programs as needed to maximize efficiency, and also to be consistent with the Water Quality Improvement Plan for the Watershed Management Area.

As part of the construction management program, 40 CFR 122.26(d)(2)(iv)(D)(1) requires "*procedures for site planning which incorporate consideration of potential water quality impacts.*" Provision E.4.a describes the minimum elements each Copermittee is required to include as part of the construction site planning and project approval process. The construction site planning and approval process is based primarily on ensuring each project had an adequate site-specific pollution control, construction BMP, and/or erosion and sediment control plan that will be implemented to minimize the discharge of pollutants in storm water to the MEP, and minimize impacts to receiving waters.

The requirements under Provision E.4.b provide the data and information necessary to identify "*priorities for inspecting sites and enforcing control measures*" required

pursuant to 40 CFR 122.26(d)(2)(iv)(D)(3). Under Provision E.4.b, each Copermittee must identify construction sites that are considered a high threat to downstream surface waters. Designation of "high threat to water quality" construction sites will necessitate the Copermittees to develop criteria to identify such sites. Provision E.4.b.(2) describes a list of factors that must be considered when the Copermittee considers threat to water quality. For example, a Copermittee must identify sites as "high threat to water quality" if it is located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions, according to the Water Quality Improvement Plan. This ensures that construction management program implementation is compatible with the Copermittee's identified highest priority water quality conditions.

Pursuant to 40 CFR 122.26(d)(2)(iv)(D)(2) each Copermittee is required describe "*requirements for nonstructural and structural best management practices*" at construction sites. Provision E.4.c includes the types of construction site BMPs that the Copermittees must implement, or require the implementation of, at each construction site to reduce pollutants in storm water discharges to the MEP.

Each Copermittee is expected to require the implementation of appropriate BMPs given specific site conditions, the season and likelihood of rain events, and construction phase (i.e. grading vs. vertical construction). This means that throughout the life of the project construction, the appropriate BMPs will vary, especially if the construction of the project spans multiple wet seasons. As opposed to describing specific minimum BMPs that must be implemented, the Order describes major BMP categories that should be considered for each site.

Each Copermittee is expected to use its 20 years of storm water experience and knowledge to require implementation of appropriate BMPs from the various categories at each construction site within its jurisdiction. For example, the San Diego Water Board expects that each site will be required to implement erosion control and sediment control. The San Diego Water Board also expects each Copermittee to require implementation of active/passive sediment treatment systems at sites where other BMPs have been tried and are known to be inadequate, and discharges of sediment are causing or contributing to water quality impairment downstream. Each Copermittee is granted flexibility in specifying the minimum level of BMP requirements at each site, but the San Diego Water Board expects each site to be capable of controlling pollutants in storm water discharges to the MEP and preventing illicit discharges.

The requirements under Provision E.4.d are necessary to demonstrate that each Copermittee is implementing a program that complies with Provisions E.4.a and E.4.c and ensure BMPs at construction sites will reduce pollutants in storm water discharges to the MEP.

Provision E.4.d does not include minimum required inspection frequencies for construction sites. Each Copermittee must use its experience and knowledge to

specify an appropriate inspection frequency for both high priority and lower priority sites in their jurisdictional runoff management program documents, and in accordance with the Water Quality Improvement Plan. Appropriate inspection frequencies may vary by Copermittee, but the San Diego Water Board expects that the stated frequency will be adequate for each Copermittee to properly oversee the construction sites within its jurisdiction, confirm BMPs are implemented to reduce pollutants in storm water discharges from constructions sites to the MEP, and make needed changes to its program on an ongoing basis as necessary.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary for any development projects to compel compliance with the requirements of Provision E.4 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.4.e requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

<u>Provision E.5 (Existing Development Management)</u> requires each Copermittee to implement an existing development management program to control and reduce the discharge of pollutants in storm water from areas of existing development to the MEP. Proper implementation of the existing development management program will also contribute toward effectively prohibiting non-storm water discharges from areas of existing development to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." Within 40 CFR 122.26(d)(2)(iv)(A) and (C), the management program is required to reduce impacts on receiving waters and reduce pollutants in storm water discharges to the MEP from commercial and residential areas, industrial facilities, and municipal facilities.

Commercial and residential areas, industrial facilities, and municipal facilities must be addressed by each Copermittee with the existing development management program required under Provision E.5. All other areas within each Copermittee's jurisdiction should be either undeveloped open space, or areas that are being developed or under construction. Areas being developed or under construction will be addressed by the Copermittee under the requirements of Provision E.3 (Development Planning) or Provision E.4 (Construction Management).

Areas of existing development typically include impervious surfaces such as sidewalks, driveways, roads, and rooftops, which generate and concentrate pollutants (such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not found in high concentrations in the natural environment. Pollutants that accumulate on impervious surfaces are not easily biodegraded or not subject to

natural treatment processes. When it rains, these pollutants are transported in storm water runoff from these impervious surfaces into receiving waters, resulting in poor water quality and degradation of beneficial uses.

In addition to the generation of pollutants, areas of existing development have generally altered the natural conditions of the land and removed vegetative cover, reduced the perviousness of the surface, and reduced the capacity of storm water that can be intercepted, captured, stored, infiltrated, evaporated, and/or evapotranspired. The alteration of the natural conditions and the impervious surfaces associated with areas of existing development causes water quality problems due to the alteration of natural flow regimes within the watersheds; resulting in hydromodification of channels, streams, and habitats that exist within or adjacent to the areas of existing development.

Thus, storm water discharges from areas of existing development are responsible for poor water quality, degraded habitats, and hydromodified channels throughout the developed portions of the watersheds in the San Diego Region. To improve the health and functionality of the receiving waters in a Watershed Management Area, land use practices and the amount of impervious surfaces in areas of existing development must change to reduce the various impacts caused by hydromodification and pollutants from storm water runoff generated in developed areas. Each Copermittee must be aggressive to address pollutant sources and runoff from areas of existing development to be able to reduce pollutants in storm water discharges from the MS4 to the MEP.

There is some overlap in the requirements under Provision E.5 with the requirements under Provisions E.2 (Illicit Discharge Detection and Elimination), E.3 (Development Planning), and E.4 (Construction Management). Illicit discharges frequently originate from areas of existing development. New development projects, when completed will become some type of residential, commercial, industrial or municipal existing development. Redevelopment projects are, by definition, redeveloping areas of existing development. And, redevelopment projects become construction sites located in areas of existing development. Much of the data and information collected, inspections performed, and enforcement actions taken for the requirements under Provisions E.2 to E.4 may also be utilized by the existing development management program. The requirements under Provision E.5, however, are focused primarily on reducing pollutants generated in areas of existing development that can be transported in storm water runoff and discharged to and from the MS4.

The requirements under Provision E.5 build upon existing program elements being implemented by the Copermittees. Provision E.5 is generally consistent with the existing development requirements of the Fourth Term Permits for Orange and Riverside Counties (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), but modified to provide more flexibility to implement the programs so resources can be better focused toward addressing the highest priority water quality conditions identified in the Water Quality Improvement Plans.

For a Copermittee to properly manage areas of existing development, having knowledge of what development exists within its jurisdiction is essential. Provision E.5.a requires each Copermittee to maintain a watershed-based inventory of all the existing development within its jurisdiction. This requirement is necessary for each Copermittee to implement the requirements of Provision E.5.b-e.

As opposed to just maintaining separate inventories based on the type of site, each Copermittee must maintain a watershed-based inventory that includes all types of existing development within its jurisdiction. By utilizing a watershed-based inventory, the Copermittees within a Watershed Management Area can combine their inventories and review the inventories by watershed in addition to by jurisdiction. Pollutant sources and strategies for abatement can then be evaluated on a watershed level, as opposed to evaluating sources and strategies strictly by type of site.

Provision E.5.a includes the information that must be included in the inventory. Provision E.5.a.(1) specifies what facilities or areas must be included in the inventory. A commercial type of existing development may be identified in the inventory as a facility (e.g. individual building, individual business) or an area (e.g. shopping center, commercial zone). An industrial type of existing development must be identified in the inventory by facility (e.g. individual industrial entity). A municipal type of existing development must be identified in the inventory by facility, with a list of specific municipal facilities that must be included in the inventory. A residential type of existing development must be identified by areas to be designated by the Copermittee. For each of the facilities and areas identified in the Copermittee's inventory developed pursuant to Provision E.5.a.(1), Provision E.5.a.(2) specifies the information that must be included in the description for the facility or area.

Provision E.5.a.(3) requires each Copermittee to maintain an updated map showing the location of inventoried existing development, watershed boundaries, and water bodies. This requirement was included because this information is expected to help the Copermittees in a Watershed Management Area identify and prioritize sources of pollutants and/or stressors in areas of existing development that contribute toward the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Knowledge of the existing development that are likely to be sources of pollutants contributing to the highest priority water quality conditions is expected to be a key element in the Copermittees' development of the water quality improvement strategies that will be included in the Water Quality Improvement Plans. The strategies described in the Water Quality Improvement Plans will direct efforts within the existing development management programs implemented by each Copermittee.

Pursuant to 40 CFR 122.26(d)(2)(iv)(A) each Copermittee is required describe "*structural and source control measures to reduce pollutants*" in storm water runoff discharged from areas of existing development. Provision E.5.b includes the BMP

implementation and maintenance requirements that the each Copermittee must require at areas of existing development to reduce pollutants in storm water discharges to the MEP. The San Diego Water Board, however, recognizes that BMP implementation and maintenance for residential areas will require much more education and encouragement through less authoritative measures than for commercial, industrial and municipal facilities and areas. Thus, the BMP implementation and maintenance requirements have been separated between requirements under Provision E.5.b.(1) for commercial, industrial and municipal facilities and areas, and Provision E.5.b.(2) for residential areas.

Most of the requirements in Provision E.5.b are consistent with the related requirements in the Fourth Term Permits. The level of specificity, however, has been changed to allow each Copermittee the flexibility to implement its program to achieve maximum efficiency, and to perform functions that will address the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Each Copermittee is expected to require the implementation of appropriate BMPs to address the expected pollutants from each facility or area. The Third and Fourth Term Permits described specific minimum BMPs that must be implemented at various sites. This Order, however, requires each Copermittee to designate minimum BMPs themselves and require implementation. Consistent with the Fourth Term Permits, each Copermittee is required to maintain, or require the maintenance of, all BMPs as needed.

The BMP implementation and maintenance requirements include a schedule of operation and maintenance activities for the MS4 and related structures (such as catch basins, storm drain inlets, and detention basins), as well as public streets and roads. Public streets and roads specifically include public unpaved roads. The San Diego Water Board identified, through investigations and complaints, sediment discharges from unpaved roads as a significant source of water quality problems in the San Diego Region. Inspection activities conducted by the San Diego Water Board since the Third Term Permits have found a lack of source control for many unpaved roads within the jurisdiction of the Copermittees.

Unpaved roads are a source of sediment that can be discharged in runoff to receiving waters, especially during storm events. Erosion of unpaved roadways occurs when soil particles are loosened and carried away from the roadway base, ditch, or road bank by water, wind, traffic, or other transport means. Exposed soils, high runoff velocities and volumes, sandy or silty soil types, and poor compaction increase the potential for erosion.

Road construction, culvert installation, and other maintenance activities can disturb the soil and drainage patterns to streams in undeveloped areas, causing excess runoff and thereby erosion and the release of sediment. Poorly designed unpaved roads can act as preferential drainage pathways that carry runoff and sediment into natural streams, impacting water quality. In addition, other public works activities along

unpaved roads have the potential to significantly affect sediment discharge and transport within streams and other waterways, which can degrade the beneficial uses of those waterways.

USEPA also recognizes that discharges from unpaved roads pose a significant potential threat to water quality. USEPA guidance[40] emphasizes the threat of unpaved roads to water quality:

> "*Dirt and gravel roads are a major potential source of these pollutants [sediment] and pollutants that bind to sediment such as oils, nutrients, pesticides, herbicides, and other toxic substances. Many roads have unstable surfaces and bases. Roads act like dams, concentrating flows that accelerate erosion of road materials and roadsides. Both unstable surfaces and accelerated erosion then lead to sediment and dust.*"

There are several guidance documents, developed by the USEPA,[41] the US Forest Service,[42] the University of California,[43] and others, that include design and construction specifications and BMPs that are readily available for implementation by public entities. Implementing design and other source control BMPs for unpaved roads in the region is necessary to reduce and minimize the impacts of sediment discharged during storm events from unpaved roads to the MS4s and receiving waters.

Provision E.5.c describes existing development site inspection frequency, content, and tracking that each Copermittee must incorporate into their existing development management programs. The requirements under Provision E.5.c are necessary to demonstrate each Copermittee is implementing a program that complies with Provision E.5.b and ensure BMPs implemented in areas of existing development will reduce pollutants in storm water discharges to the MEP. Provision E.5.c has been modified to include a minimum of once every 5 years for all inventoried facilities and areas of existing development, utilizing one or more methods of inspection.

In addition to onsite inspections, the methods of inspection have been expanded to include drive-by inspections. Inspections may be performed by the Copermittee's municipal and contract staff, or by volunteer monitoring or patrol programs. Volunteer monitoring or patrol programs are not expected to enforce the Copermittee's ordinances, or to inspect areas or facilities where members of the public are not allowed access. Volunteer monitoring or patrol programs must be trained by the Copermittee, and are only expected to collect visual observations. By utilizing drive-by

[40] USEPA, 2006. Environmentally Sensitive Maintenance for Dirt and Gravel Roads. Gesford and Anderson, USEPA-PA-2005.
[41] Ibid
[42] US Forest Service, 1996. Forest Service Specifications for Construction of Roads & Bridges. EM-7720-100. Revised August 1996.
[43] University of California Division of Agriculture and Natural Resources, 2007. Rural Roads: A Construction and Maintenance Guide of California Landowners. Publication 8262.

inspections and volunteer monitoring or patrol programs, the Copermittees will be able to maximize and efficiently use their resources to identify and address sources of pollutants in areas of existing development.

The municipal and contract staff of each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial, industrial, and municipal facilities and areas in its inventoried existing development pursuant to Provision E.5.c.(1)(a)(iv). An "equivalent" of at least 20 percent means if any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspections may count toward the total annual inspection requirement. Linear municipal facilities (i.e. MS4 linear channels, sanitary sewer collection systems, streets, roads and highways) in the Copermittee's existing development inventory are not subject to the inspection frequency requirement of Provision E.5.c.(1)(a)(iv).

The inspection content specified in Provision E.5.c.(2)(a) includes the information required to be collected during an inspection by any method. The inspection content specified in Provision E.5.c.(2)(b) includes additional information that must be collected when a Copermittee's municipal or contract staff perform an onsite inspection. Provision E.5.c.(3) specifies the information that each Copermittee must maintain in its existing development inspection records.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary to compel compliance with the requirements of Provision E.5 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.5.d requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Provisions E.5.e.(1)-(2) specifically require the Copermittee to identify areas of existing development as candidates for retrofitting, and streams, channels, and/or habitats as candidates for rehabilitation. Provisions E.5.e.(1)-(2) are based on the retrofitting requirements of the Fourth Term Permits for Orange and Riverside Counties, but modified to also include identifying projects to rehabilitate channels within areas of existing development. The requirements have also been modified to be more focused on utilizing these types of projects for addressing the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Interest and opportunity to retrofit areas of existing development and rehabilitate channels located in areas of existing development has been observed in several programs the San Diego Water Board oversees (e.g., CWA Section 401 Water Quality Certification program, supplemental environmental projects, and grant programs). Each jurisdiction has miles and miles of streets that could be retrofitted to become green streets. Reshaping landscaped areas from convex to concave configurations

can detain storm water instead of directing runoff as quickly as possible to the MS4. Retrofit projects could also include simply replacing impervious surfaces with permeable surfaces.

Retrofitting projects do not necessarily have to be expensive. Retrofitting projects could be as simple as redirecting downspouts from roofs to pervious or landscaped areas instead of to hardscaped areas discharging directly to the MS4, providing rain barrels to harvest storm water from downspouts for use at a later time, or planting more trees in areas with little vegetation to provide canopy that can intercept storm water. The San Diego Water Board encourages the Copermittees to identify simple, low-cost retrofitting opportunities that can be easily implemented, in addition to other more expensive retrofitting and channel rehabilitation projects.

Rehabilitation of channels, streams, and/or habitat will require more significant planning and resources to implement. There are, however, also abundant opportunities to rehabilitate channels, streams and/or habitats in or adjacent to areas of existing development. Each Watershed Management Area likely has several creeks and stream reaches that have been undergrounded, artificially hardened, or hydromodified that could be rehabilitated to be more sustainably configured, which would slow down storm water flows and potentially have more assimilative capacity for pollutants while still being supportive of designated beneficial uses.

The San Diego Water Board recognizes that it may be infeasible to implement retrofitting or channel rehabilitation projects within certain areas of a Copermittee's jurisdictions. For such areas, the Copermittee must instead identify, develop, and implement regional retrofitting and channel rehabilitation projects (i.e. projects that can retain and/or treat storm water from one or more areas of existing development) adjacent to and/or downstream of the areas of existing development.

Provisions E.5.e.(1)-(2) do not require the implementation of retrofitting and rehabilitation projects, but do require the Copermittee to develop a program with strategies to facilitate the implementation of these types of projects in areas of existing development. The strategies are expected to include allowing and encouraging Priority Development Projects to implement retrofitting types of projects as a means of compliance with the structural BMP performance criteria requirements of Provisions E.3.c.(1) and E.3.c.(2).

<u>Provision E.6 (Enforcement Response Plans)</u> requires each Copermittee to develop an Enforcement Response Plan as part of its jurisdictional runoff management program document. Proper implementation of the Enforcement Response Plans is necessary to effectively prohibit non-storm water discharges to the MS4, and reduce the discharge of pollutants in storm water from the MS4 to the MEP.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system*" and be able to demonstrate that it can "*operate pursuant to legal*

authority established by statute, ordinance or series of contracts" to control the discharge of non-storm water and pollutants in storm water to and from its MS4. Pursuant to 40 CFR 122.26(d)(2)(i)(E) each Copermittee is specifically required to have the legal authority to "*[r]equire compliance with conditions in ordinances, permits, contracts or order*s."

The requirements under Provision E.6 are necessary to demonstrate that each Copermittee can enforce its legal authority to *"effectively prohibit non-stormwater discharges"* and "*reduce the discharge of pollutants to the maximum extent practicable*" as well as "*[r]equire compliance with conditions in ordinances, permits, contracts or order*."

The Enforcement Response Plan required under Provision E.6 will serve as a reference for the Copermittee and the San Diego Water Board to determine if consistent enforcement actions are being implemented to achieve timely and effective compliance from all public and private entities that are not in compliance with the Copermittee's ordinances, permits, or other requirements. The Enforcement Response Plan must contain clear direction for the Copermittee to take immediate enforcement action, when appropriate and necessary, in their illicit discharge detection and elimination, development planning, construction management, and existing development management programs.

If the entities subject to the Copermittee's legal authority do not implement appropriate corrective actions in a timely manner, or if violations repeat, the Copermittee must take progressively stricter responses to enforce its legal authority and achieve compliance with its ordinances, permits, or other requirements to *"effectively prohibit non-stormwater discharges"* and "*reduce the discharge of pollutants to the maximum extent practicable.*"

<u>Provision E.7 (Public Education and Participation)</u> requires each Copermittee to implement a public education and participation program. Proper implementation of the public education and participation program as part of its jurisdictional runoff management program will contribute toward effectively prohibiting non-storm water discharges to the MS4, and toward the reduction of pollutants in storm water from the MS4 to the MEP.

Provision E.7 establishes the minimum requirements that each Copermittee must implement to engage members of the public as part of its jurisdictional runoff management program. In the Fourth Term Permits, the public education program requirements and the public participation requirements were included as separate jurisdictional runoff management program components. In this Order, the public education requirements have been consolidated with the public participation requirements, as both sets of requirements are related to the engagement of the public by each Copermittee. Engagement of the public is critical for the success of each Copermittee's jurisdictional runoff management program.

The Copermittees have been implementing public education programs for the last 20 years, which are now well established. The specificity of expected public education program elements of the Fourth Term Permits has been removed. For the most part, the public education program requirements in Provision E.7.a have been reduced to a set of requirements that are specifically included in the federal regulations under 40 CFR 122.26(d)(2)(iv)(A)(6), 122.26(d)(2)(B)(6) and 122.26(d)(2)(D)(4), which should already be incorporated into each Copermittee's existing public education program. Each Copermittee is expected to utilize the information and data collected from the monitoring and assessments conducted within the Watershed Management Area, and from its inventories and inspections to best direct its public education program resources toward addressing the highest priority water quality conditions identified within the Water Quality Improvement Plan.

According to 40 CFR 122.26(d)(2)(iv), public participation is required to be included as part of the "*comprehensive planning process*", which includes the development and implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs. The requirements under Provision E.7.b specify the opportunities that the public must be provided to be involved in the "*comprehensive planning process*", as required by to 40 CFR 122.26(d)(2)(iv).

Provision E.8 (Fiscal Analysis) requires each Copermittee to secure the resources and provide an analysis of the resources that will be necessary to implement the requirements of the Order. Adequate fiscal resources are necessary for a jurisdictional runoff management program to effectively prohibit non-storm water discharges to the MS4, and reduce pollutants in storm water from the MS4 to the MEP.

According to 40 CFR 122.26(d)(2)(vi), each Copermittee is responsible for providing "*a fiscal analysis of the necessary capital and operation and maintenance expenditures necessary to accomplish the activities*" required by this Order, including "*a description of the source of funds that are proposed to meet the necessary expenditures, including legal restrictions on the use of such funds.*" The fiscal analysis requirements of Provision E.8 are consistent with 40 CFR 122.26(d)(2)(vi).

The San Diego Water Board has chosen not to require a description of fiscal benefits realized from implementation of the jurisdictional runoff management programs. This is a recommendation from the National Association of Flood and Stormwater Management Agencies.[44] For instance, the fiscal analysis requirements do not address city-wide fiscal benefits of protection (e.g., public health, tourism, property values, economic activity, beneficial uses, etc.), even though many costs currently reported to the San Diego Water Board are for related activities. This type of assessment may help Copermittees improve the allocation of resources and it may help the Copermittees secure adequate funding for the program. Qualitative

[44] National Association of Flood and Stormwater Management Agencies. 2006. *Guidance for Municipal Stormwater Funding.* Prepared under a grant provided by the USEPA.

assessments, however, could be overly subjective and most Copermittees likely lack the ability to provide accurate quantitative assessments. The San Diego Water Board encourages the Copermittees to consider means for conducting assessments of fiscal benefits derived from the programs. Such assessments could be conducted on a regional scale similar to studies of program costs conducted by the State Water Board.[45]

[45] State Water Board, 2005. NPDES Stormwater Cost Survey.

F. Reporting

Purpose: Provision F includes the requirements for the documents and reports that the Copermittees must prepare and provide to the San Diego Water Board. The documents prepared by the Copermittees and provided to the San Diego Water Board and made available to the public will provide the documentation that the Copermittees are complying with the requirements of the Order.

***Discussion*:** Provision F requires the Copermittees to prepare several documents and reports that must be provided to the San Diego Water Board and made available to the public. The reporting requirements have been significantly reduced compared to the Fourth Term Permit reporting requirements. The reduction in reporting requirements was recommended by the San Diego County Copermittees in the Report of Water Discharge submitted in June 2011.

More specific and detailed discussions of the requirements of Provision F are provided below.

Provision F.1 (Water Quality Improvement Plans) requires the Copermittees in each Watershed Management Area to develop and submit a Water Quality Improvement Plan in accordance with the requirements of Provision B.

Of all the requirements of Provision F, the Water Quality Improvement Plans will likely be the documents requiring the most significant effort to develop. The content of the Water Quality Improvement Plans, however, is expected to include content that should already have been developed for the Watershed Plans and several elements that are included in the Monitoring and Reporting Programs required under the Fourth Term Permits.

Because the Water Quality Improvement Plan is part of the "*comprehensive planning process which involves public participation*," Provision F.1 includes requirements to give multiple opportunities to the public to provide input on the content of the plans.

Provision F.1.a.(1) specifies the elements that the Copermittees must include in the public participation process for the development of the Water Quality Improvement Plans. In order for the public to be aware of the opportunities to provide input, Provision F.1.a.(1)(a) requires the Copermittees to develop a publicly available and noticed schedule of the opportunities for the public to participate and provide comments during the development of the Water Quality Improvement Plan. These opportunities are when the public can provide the data, information, and recommendations that the Copermittees can consider during the development of the Water Quality Improvement Plans.

The San Diego Water Board recognizes, however, that the Copermittees cannot be expected to incorporate all the data, information, and recommendations that the public

may provide into the Water Quality Improvement Plans. The Copermittees will have to review the data, information, and recommendations received and make some decisions on what to incorporate into the Water Quality Improvement Plans. Before the Copermittees finalize their decisions, members of the public should be allowed to review the Copermittees' decisions. Thus, Provision F.1.a.(1)(b) requires the Copermittees to form a Water Quality Improvement Consultation Panel (Panel).

The Panel will consist of a member from the environmental community and a member from the development community familiar with the Watershed Management Area. A representative from the San Diego Water Board staff will also be part of the Panel. The Copermittees may choose to include additional members, but the Panel is only required to include three panel members.

The Panel will serve as an additional public participation and input mechanism during the development of the Water Quality Improvement Plans. The knowledge and expertise from these Panel members are expected to provide the Copermittees valuable direction during their decision-making process. The Copermittees will review the content of their planned submittals with the Panel members to receive recommendations. If the Panel provides recommendations, the Copermittees must consider revisions to the Water Quality Improvement Plan submittals.

The San Diego Water Board recognizes that the development of multiple Water Quality Improvement Plans concurrently may limit the ability of the public to review and provide comments to the Copermittees. Thus, Provision F.1.a.(1)(c) requires the Copermittees to coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public time and opportunity to participate during the development of the Water Quality Improvement Plans.

Provision F.1.a.(2) requires the Copermittees to develop and submit the first Water Quality Improvement Plan component, in accordance with the requirements of Provision B.2, which includes the identification of the priority water quality conditions and potential water quality improvement strategies. The public must be provided an opportunity to provide data, information and recommendations to be utilized in the development and identification of the priority water quality conditions and potential water quality improvement strategies for the Watershed Management Area. The Copermittees must consult with the Panel and consider making revisions. The Copermittees may submit the requirements of Provision B.2 as early as 6 months and no later than 12 months after the commencement of coverage under this Order. After the requirements of Provision B.2 are submitted to the San Diego Water Board, the public will be provided another opportunity to provide comments.

Provision F.1.a.(3) requires the Copermittees to develop and submit the second Water Quality Improvement Plan component, in accordance with the requirements of Provision B.3, which includes the identification of the numeric goals for the highest priority water quality conditions identified for the Watershed Management Area, and the strategies that will be implemented to achieve the potential numeric goals. The

Copermittees may also develop the Optional Watershed Management Area Analysis, in accordance with the requirements of Provision B.3.b.(4), as part of this submittal. The public must be provided an opportunity to provide data, information and recommendations to be utilized in the development and identification of the numeric goals and water quality improvement strategies for the Watershed Management Area. The Copermittees must consult with the Panel and consider making revisions. The Copermittees may submit the requirements of Provision B.3 as early as 9 months and no later than 18 months after the commencement of coverage under this Order. After the requirements of Provision B.3 are submitted to the San Diego Water Board, the public will be provided another opportunity to provide comments.

Finally, Provision F.1.b describes the process for the submittal and implementation of the Water Quality Improvement Plans. The complete Water Quality Improvement Plans are required to be submitted by the Copermittees within 24 months after the commencement of coverage under this Order. The San Diego Water Board will provide the public an opportunity to provide comments on each complete Water Quality Improvement Plan.

The San Diego Water Board will review each Water Quality Improvement Plan and the public comments received to determine if the Copermittees have submitted a Water Quality Improvement Plan that meets the requirements of Provision B. If a Water Quality Improvement Plan does not meet the requirements of Provision B, the Copermittees will be considered out of compliance and directed in writing by the San Diego Water Board Executive Officer to correct the deficiencies.

When a Water Quality Improvement Plan meets the requirements of Provision B, the San Diego Water Board will determine whether to hold a public hearing or to limit public input to submittal of written comments before accepting the Water Quality Improvement Plan. Implementation of the Water Quality Improvement Plan must begin within 30 days of acceptance.

The San Diego Water Board expects that any deficiencies in the Water Quality Improvement Plan will be identified either in the public comments or during the review by the San Diego Water Board before implementation begins. In the event any deficiencies are identified after the implementation of the Water Quality Improvement Plan, Provision F.1.b.(7) clarifies that the San Diego Water Board maintains the right to require the Copermittees to correct any deficiencies that may be identified.

<u>Provision F.2 (Updates)</u> requires the Copermittees to update specific documents that the Copermittees will utilize to implement the requirements of this Order.

Each Copermittee is required to continue implementing a jurisdictional runoff management program, as required under Provision E. Implementation of each Copermittee's jurisdictional runoff management program is directed by its jurisdictional runoff management program document. Provision F.2.a requires each Copermittee to update its jurisdictional runoff management program document to be consistent with

the requirements of Provision E concurrent with the submittal of the Water Quality Improvement Plan.

Likewise, each Copermittee must continue to require new development and redevelopment projects to implement BMPs to control pollutants in storm water runoff. The control of pollutants in storm water runoff from development and redevelopment projects within each Copermittee's jurisdiction is guided and directed by its BMP Design Manual, formerly known as a Standard Storm Water Mitigation Plan (SSMP). Provision F.2.b requires each Copermittee to update its BMP Design Manual to be consistent with the requirements of Provision E.3 concurrent with the submittal of the Water Quality Improvement Plan.

In general, the requirements of the Order should not necessitate a complete rewrite of each Copermittee's jurisdictional runoff management program document or BMP Design Manual, as was required by the Third Term Permits. The jurisdictional runoff management program and BMP Design Manual requirements of this Order are not significantly different than the requirements of the Fourth Term Permits. Thus, only sections of the Order which are new or have been significantly changed should warrant revisions to specific sections of the Copermittee's jurisdictional runoff management program document and BMP Design Manual.

Finally, the Water Quality Improvement Plans are expected to require updates as the iterative approach and adaptive management process included in the Water Quality Improvement Plan, as required under Provision B.5, is implemented by the Copermittees. Provision F.2.c.(1) requires the Copermittees to implement a public participation process for the proposed updates, review the proposed updates with the Panel, and submit the updates to the Water Quality Improvement Plan as part of the Annual Reports required under Provision F.3.b.

Also, because TMDLs are likely to be developed, adopted and approved during the term of the Order, Provision F.2.c.(2) has been included to expedite the incorporation of TMDLs into the Copermittees' Water Quality Improvement Plans as part of the update process, potentially before the Order is re-opened to incorporated the requirements of the new TMDLs.

<u>Provision F.3 (Progress Reporting)</u> requires the Copermittees to report on the progress of implementing the Water Quality Improvement Plans.

The requirements of Provision F.3 are to report the progress toward improving water quality that the Copermittees are achieving with the implementation of the Water Quality Improvement Plans and each Copermittee's jurisdictional runoff management program. The Progress Report Presentations required under Provision F.3.a are included to provide the Copermittees an opportunity to communicate directly with the San Diego Water Board and the public. The Progress Report Presentations will also provide the members of the San Diego Water Board and members of the public an opportunity to become more acquainted with the Copermittees and their projects and

programs to address non-storm water and storm water discharges into and from their MS4s.

The Annual Report requirements of Provision F.3.b are a consolidation of several reporting requirements from the Fourth Term Permits, including the Jurisdictional Runoff Management Program Annual Reports, the Watershed Annual Reports, and the Monitoring and Reporting Program Annual Reports. Furthermore, the Annual Report requirements are consistent with the requirements under 40 CFR 122.42(c).

Pursuant to 40 CFR 122.42(c), "*[t]he operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the Director…must submit an annual report*", which must include the following:

(1) *The status of implementing the components of the storm water management program that are established as permit conditions* [40 CFR 122.42(c)(1)];

(2) *Proposed changes to the storm water management programs that are established as permit conditions* [40 CFR 122.42(c)(2)];

(3) *Revisions, if necessary, to the assessment of controls and fiscal analysis* [40 CFR 122.42(c)(3)];

(4) *A summary of data, including monitoring data, that is accumulated throughout the reporting year* [40 CFR 122.42(c)(4)];

(5) *Annual expenditures and budget for year following each annual report* [40 CFR 122.42(c)(5)];

(6) *A summary describing the number and nature of enforcement actions, inspections, and public education programs* [40 CFR 122.42(c)(6)];

(7) *Identification of water quality improvements or degradation* [40 CFR 122.42(c)(7)].

Under the Fourth Term Permits, each Copermittee is responsible for submitting a Jurisdictional Runoff Management Program Annual Report; the Copermittees in each designated watershed are responsible for submitting a Watershed Annual Report; and the Copermittees from each county are responsible for submitting a Monitoring and Reporting Program Annual Report.

There are 39 Copermittees in the San Diego Region, each required to prepare and submit a Jurisdictional Runoff Management Program Annual Report. There are 9 designated watersheds in San Diego County, 6 designated watersheds in Orange County, and 1 designated watershed in Riverside County for a total of 16 designated watersheds, each requiring a Watershed Annual Report. There are 3 sets of Copermittees in 3 counties in the San Diego Region, requiring Copermittees from each county to prepare and submit a Monitoring and Reporting Program Annual Report.

Thus each Copermittee is currently required to prepare, or participate in the preparation of at least 3 annual reports. In addition, the San Diego County Copermittees are required to prepare and submit a Regional Urban Runoff Management Plan Annual Report.

In total, there are 59 annual reports that are prepared by the Copermittees and submitted to the San Diego Water Board for the Fourth Term Permits. The preparation of these annual reports requires significant time and resources from each Copermittee, which could otherwise be expended on actions that could improve water quality within its jurisdiction. In turn, significant time and resources are required from the San Diego Water Board staff to review these reports, which could otherwise be expended on working directly with the Copermittees to improve their implementation efforts toward restoring and protecting water quality.

Until the Water Quality Improvement Plans are developed, there will be a transitional period during which the Copermittees will continue to implement their existing jurisdictional runoff management programs. There will also be a transitional period during which the Copermittees will implement the transitional monitoring and assessment requirements of Provision D. During the transitional period, the Copermittees will submit annual reports pursuant to the requirements of Provisions F.3.b.(1) and F.3.b.(2).

Provision F.3.b.(1) includes the transitional annual reporting requirements for each Copermittee's jurisdictional runoff management program. The reporting of the jurisdictional runoff management program implementation efforts have been reduced to a single 2-page form. Each Copermittee is required to complete and submit a Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D or a revised form accepted by the San Diego Water Board) no later than October 31 of each year for each jurisdictional runoff management program reporting period (i.e. July 1 to June 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted. The Jurisdictional Runoff Management Program Annual Report Form will certify that each Copermittee has implemented its jurisdictional runoff management program in accordance with the requirements of Provision E. Each Copermittee may choose to continue to utilize and submit the jurisdictional runoff management program annual reporting format of its current Order until the first Water Quality Improvement Plan Annual Report is required to be submitted.

Provision F.3.b.(2) includes the transitional annual reporting requirements for the transitional monitoring and assessment program for each Watershed Management Area. The Copermittees in the Watershed Management Area are required to submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted. The Transitional Monitoring and Assessment Program Annual Report is required to include

the transitional period monitoring data collected pursuant to Provisions D.1.a and D.2.a, and the findings from the transitional period findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

Provision F.3.b.(3) includes the Water Quality Improvement Plan Annual Report requirements. Only one Water Quality Improvement Plan Annual Report is required for each of the ten (10) Watershed Management Areas designated under Provision B.1, which is a significant reduction in the number of annual reports required to be prepared and submitted by the Copermittees. The Water Quality Improvement Plan Annual Report will document the Copermittees' efforts to implement the Water Quality Improvement Plan. Each Water Quality Improvement Plan Annual Report will be focused primarily on reporting the analysis of the monitoring data collected pursuant to Provisions D.1-D.3 during the reporting period, and the assessments that are required pursuant to Provision D.4 based on the data. The monitoring data analyses and the assessments that are provided in the Water Quality Improvement Plan Annual Report will be the core of the report. The reporting of the jurisdictional runoff management program implementation efforts have been reduced to a single 2-page form, and will no longer be the primary focus of the reporting requirements as in the Third and Fourth Term Permits.

Each Copermittee will continue to prepare and submit a Jurisdictional Runoff Management Program Annual Report Form as part of the Water Quality Improvement Plan Annual Report to certify that each Copermittee has implemented its jurisdictional runoff management program in accordance with the requirements of Provision E. Instead of reviewing a voluminous report from each Copermittee, as was required under the Third and Fourth Term Permits, the San Diego Water Board will conduct audits of each Copermittee's jurisdictional runoff management program to investigate and confirm the information provided by each Copermittee on its Jurisdictional Runoff Management Program Annual Report Form. The audits will allow the San Diego Water Board to become more familiar with the each Copermittee's jurisdictional runoff management program, and each Copermittee will become more informed about the expectations of the San Diego Water Board.

The reduction in the number and content of the Water Quality Improvement Plan Annual Reports should result in significant time, cost and resource savings for the Copermittees, as well as the San Diego Water Board. Those savings should offset a significant portion of any additional costs that may be incurred to develop the Water Quality Improvement Plans and to implement the monitoring and assessment program requirements of Provision D.

The reporting period for the Water Quality Improvement Plan Annual Reports consists of two periods. Because the jurisdictional runoff management programs are typically budgeted and implemented during a fiscal year, the information provided on the Jurisdictional Runoff Management Program Annual Report Forms will cover the period from July 1 to June 30 of the following year.

The Water Quality Improvement Plan Annual Reports, however, are focused primarily on the monitoring data and the assessments based on the monitoring data. The monitoring data is collected during the monitoring year, which begins October 1 and ends September 30 of the following year. The monitoring year begins after the beginning of the fiscal year and ends after the end of the fiscal year. Therefore, to accommodate and capture the information collected during the fiscal year and the monitoring year, the Annual Report reporting period incorporates both periods.

Finally, Provision F.3.c requires the Copermittees to develop and submit a Regional Monitoring and Assessment Report. The Regional Monitoring and Assessment Report is similar to the Long Term Effectiveness Assessment required under the Fourth Term San Diego County Permit. The Regional Monitoring and Assessment Report is expected to utilize the entire body of data and information collected by the Copermittees during the term of this Order to assess improvements to water quality on a regional scale.

Provision F.4 (Regional Clearinghouse) requires the Copermittees to develop, update, and maintain an internet-based Regional Clearinghouse that can be used to store, disseminate, and share the Copermittees' documents, monitoring data, special studies, and any other data or information.

Most of the documents and data that are generated by the Copermittees can be provided in electronic format, and made available to the San Diego Water Board and the public on the internet. The San Diego Water Board has been gradually transitioning its document submittal requirements to electronic submittals. Provision F.4 has been included to further these efforts.

Provision F.4 has also been included to improve the exchange and availability of information among the Copermittees, as well as between the Copermittees and the San Diego Water Board. Provision F.4 will also make the information generated during the implementation of the Order more accessible to the public.

Provision F.5 (Report of Waste Discharge) requires the Copermittees to submit a Report of Waste Discharge to reapply for renewal of the Order prior to its expiration, in accordance with 40 CFR 122.21(d)(2) and CWC section 13376.

Because the Riverside County Copermittees will not be subject to the requirements of this Order until they are notified of coverage, Provision F.5.a describes the process of submitting a Report of Waste Discharge pursuant to the requirements of their current permit to obtain coverage under this Order.

For the Copermittees subject to the requirements of this Order, Provision F.5.b requires the Copermittees to submit a Report of Waste Discharge 180 days in advance of the expiration of this Order. Provision F.5.b also describes the minimum information to be included in the Report of Waste Discharge, based on USEPA

guidance “Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems,” dated May 17, 1996.

Provision F.6 (Application for Early Coverage) describes the process that would allow the Orange County and/or Riverside County Copermittees to obtain coverage under this Order earlier than the expiration of their current Orders.

If the Riverside County Copermittees choose to obtain coverage under this Order earlier than the expiration of their current Orders, the preparation and submittal of a Report of Waste Discharge, as required by the Fourth Term Permits, will not be necessary. The existing Order for the respective county will be rescinded upon the effective coverage date under this Order, except for enforcement purposes.

G. Principal Watershed Copermittee Responsibilities

Purpose: Provision G includes the requirements for the Principal Watershed Copermittee designated by the Copermittees in each Watershed Management Area.

***Discussion*:** Unlike previous NPDES requirements, there will no longer be a single Principal Copermittee. Provision G.1 requires the Copermittees to designate a Principal Watershed Copermittee for each Watershed Management Area. There are ten (10) Watershed Management Areas in the San Diego Region, as defined in Table B-1 under Provision B.1 of the Order. An individual Copermittee should not be the Principal Watershed Copermittee for more than two (2) Watershed Management Areas. There could be up to ten (10) Principal Water Copermittees designated for the Watershed Management Areas in the San Diego Region.

Provision G.2 describes the minimum responsibilities of each Principal Watershed Copermittee. The primary responsibility of the Principal Watershed Copermittees is to serve as the liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues. Ideally, the Principal Watershed Copermittee can represent the interests of all the Copermittees within a Watershed Management Area during discussions or meetings to facilitate communication with the San Diego Water Board. The Principal Watershed Copermittees are also responsible for facilitating and coordinating the implementation efforts of the Copermittees and submittals of required documents and reports.

The Principal Watershed Copermittee is responsible for facilitating the efforts of the Copermittees within the Watershed Management Area to develop the Water Quality Improvement Plan required under Provision B, and submit it for approval in accordance with Provision F.1. The Principal Watershed Copermittee is also responsible for coordinating the submittal of the document updates, Progress Report Presentations, and Annual Reports required from the Copermittees within each Watershed Management Area under Provisions F.2, F.3.a, and F.3.b. The Principal Watershed Copermittees are responsible for coordinating with each other to develop and submit the Regional Clearinghouse, Regional Monitoring and Assessment Report, and the Report of Waste Discharge required under Provisions F.3.c, F.4, and F.5.

The designated Principal Watershed Copermittee for each Watershed Management Area does not necessarily have to serve as the Principal Watershed Copermittee for the entire term of the Order. If the Copermittees in a Watershed Management Area choose to designate a new Principal Watershed Copermittee, the change may be submitted as part of the Annual Report required under Provision F.3.b, with an update to the Water Quality Improvement Plan in accordance with Provision F.2.c.

Provision G.3 specifies that the Principal Watershed Copermittee is not responsible for ensuring that the other Copermittees within the Watershed Management Area are in compliance with the requirements of this Order

H. Modification of Order

Purpose: Provision H provides the conditions under which modifications to Order No. R9-2013-0001, as amended, may occur.

***Discussion*:** Provision H allows for modifications to Order No. R9-2013-0001, as amended, for bases in addition to modifications (minor and major) allowed under the federal regulations at 40 CFR 122.62 and 122.63.

Modifications to the Order require re-opening the Order (see Water Code section 13223), subject to the requirements of 40 CFR 122.44, 122.62 to 122.64, and 124.5, but only for the specific provisions subject to the modification. Proposed modifications of the Order will be made available for public review, a public notice and comment period, and a public hearing if requested. Comments on the provisions not subject to the proposed modifications are not required to be considered in the San Diego Water Board's responses to comments or during the public hearing.

Provision H.4 was included to specify that the Order will be re-opened for modifications if the State Water Board determines revisions to Provision A are warranted, an application for early coverage under the Order is received pursuant to Provision F.6, the Basin Plan is amended to modify an existing TMDL or incorporate a new TMDL, or the monitoring and assessment program requirements need to be updated or revised.

Provision H.5 was included to specify that the San Diego Water Board will re-open and consider modifications to this Order when the Orange County Copermittees or the Riverside County Copermittees submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders

I. Standard Permit Provisions and General Provisions

Purpose: Provision I incorporates the standard permit provisions required to be included in all NPDES permits, as well as several other general provisions.

***Discussion*:** Provision I refers to Attachment B to the Order. Attachment B expressly incorporates the conditions applicable to all NPDES permits as provided under 40 CFR 122.41(a)-(n), as well as the applicable conditions for MS4s and storm water discharges provided under 40 CFR 122.42(c) and 40 CFR 122.42(d), respectively. Attachment B also includes several general provisions that are typically included in or applicable to waste discharge requirements issued by the San Diego Water Board.

IX. ATTACHMENTS

The attachments to the Order are discussed below. The discussions describe the content of the attachments.

Attachment A – Discharge Prohibitions and Special Protections

Section 1 of Attachment A includes the Waste Discharge Prohibitions from the Basin Plan. They have been provided verbatim in their entirety.

Section 2 of Attachment A includes the "*Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges*" applicable to permitted point source discharges of storm water, adopted under State Water Board Resolution No. 2012-0012, as amended by Resolution No. 2012-0031. The terms, prohibitions, and special conditions (collectively referred to as special conditions) are established as limitations on point source storm water discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in ASBS, as required for State Water Quality Protection Areas pursuant to California Public Resources Code sections 36700(f) and 36710(f). These Special Protections were adopted by the State Water Board as part of the Ocean Plan General Exception.

Attachment B – Standard Permit Provisions and General Provisions

Conditions applicable to all NPDES permits, as required under 40 CFR 122.41, and conditions applicable to MS4s and storm water discharges, as required under 40 CFR 122.42(c) and 122.42(d), respectively are provided in Attachment B to the Order. They have been provided expressly in their entirety.

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. These general provisions are typically included in or applicable to waste discharge requirements issued by the San Diego Water Board. Many of the general provisions were developed by the State Water Board. Where a general provision is derived from statute or regulation, a citation of the statute or regulation section is provided. General provisions that do not provide a citation are included under the authority provided CWC 13377.

Attachment C – Acronyms, Abbreviations and Definitions

The acronyms and abbreviations that are used in the Order are provided in Attachment C. Attachment C also includes definitions that may provide an explanation or description of the meaning or intent of specific terms or phrases included in the Order.

Attachment D – Jurisdictional Runoff Management Program Annual Report Form

An example of the Jurisdictional Runoff Management Program Annual Report Form required to be submitted by each Copermittee as part of the Annual Reports required under Provision F.3.b.(1)(e) is provided as Attachment D to the Order. An electronic version of the form will be available from the San Diego Water Board after the adoption of the Order.

The Jurisdictional Runoff Management Program Annual Report Form includes the minimum information necessary to demonstrate that the Copermittee is implementing and in compliance with the requirements of Provision E, and includes much of the information required to be reported pursuant to 40 CFR 122.42(c).

The information that must be provided on the Jurisdictional Runoff Management Program Annual Report Form is limited to the fiscal year, which begins July 1 and ends June 30 of the following year. The information expected to be provided by the Copermittees in each section of the Jurisdictional Runoff Management Program Annual Report Form is discussed below.

I. COPERMITTEE INFORMATION

The name of the Copermittee (e.g. name of city, county, or special district) and the contact information for the storm water program manager are provided under this section.

II. LEGAL AUTHORITY

The Copermittee must confirm whether or not the legal authorities under Provision E.1.a have been established for itself within its jurisdiction.

The Copermittee must also confirm whether or not a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority, as required under Provision E.1.b. The certification statement required by Provision E.1.b is only required to be submitted with the first Annual Report required under Provision F.3.b.

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

The Copermittee must inform the San Diego Water Board whether or not an update to its jurisdictional runoff management program document was required or recommended by the San Diego Water Board during the reporting period. An update to the jurisdictional runoff management program is required under Provision F.2.a. The San Diego Water Board may recommend modifications to the jurisdictional runoff management program as part of the iterative approach and adaptive management process required under Provision B.5, which may result in an update that is necessary for the Copermittee's jurisdictional runoff management document.

If an update was required or recommended, the Copermittee must confirm whether or not the update was completed and made available on the Regional Clearinghouse within the reporting period. If no update was required or recommended, an answer is not required. If the answer is NO, meaning the required or recommended update was not completed and/or made available on the Regional Clearinghouse, the Copermittee must attach a schedule for the completion of the update and/or posting of the updated document on the Regional Clearinghouse.

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

The Copermittee must confirm whether or not a program was implemented during the fiscal year to actively detect and eliminate illicit discharges and connections in accordance with the requirements under Provision E.2.

In addition to confirming that a program to detect and eliminate illicit discharges was implemented during the reporting period, the Copermittee is also required to report on several items related to the program. The information that must be reported is limited to the fiscal year for the Annual Report.

All non-storm water discharges are considered illicit discharges unless the source is identified as one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5). If a non-storm water discharge is identified as one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5), the discharge is a non-storm water discharge, but not an illicit discharge. If a non-storm water discharge is identified but not in one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5), the discharge is both a non-storm water discharge and an illicit discharge.

V. DEVELOPMENT PLANNING PROGRAM

The Copermittee must confirm whether or not a development planning program was implemented during the fiscal year in accordance with the requirements under Provision E.3.

The Copermittee must also inform the San Diego Water Board whether or not an update to its BMP Design Manual was required or recommended by the San Diego Water Board during the fiscal year. An update to the BMP Design Manual is required under Provision F.2.b. The San Diego Water Board may recommend modifications to the BMP Design Manual, which may result in an update that is necessary for Copermittee's the BMP Design Manual.

If an update was required or recommended, the Copermittee must confirm whether or not the update was completed and made available on the Regional Clearinghouse within the reporting period. If no update was required or recommended, an answer is not required. If the answer is NO, meaning the required or recommended update was not completed and/or made available on the Regional Clearinghouse, the Copermittee must attach a schedule for the completion of the update and/or posting of the updated document on the Regional Clearinghouse.

The Copermittee is also required to report on several items related to the program. For the development and redevelopment projects that are reviewed under the program, the Copermittee must report the total number projects submitted for review during the fiscal year. Of those projects, the Copermittee must report the number that are Priority Development Projects, as defined under Provision E.3.b.(1). The Copermittee must also report the number of Priority Development Projects that were approved and/or granted occupancy during the fiscal year, regardless of when the project was originally submitted for review. Any projects that were approved during the fiscal year and granted any exemptions from the BMP Design Manual requirements and/or allowed to implement alternative compliance options in accordance with Provision E.3.c.(3) must be reported.

Finally, the Copermittee must also report on several items related to its oversight of permanent BMPs on Priority Development Projects within its jurisdiction, as required

under Provision E.3.e. The information that must be reported is limited to the fiscal year for the Annual Report.

VI. CONSTRUCTION MANAGEMENT PROGRAM

The Copermittee must confirm whether or not a construction management program was implemented during the fiscal year in accordance with the requirements under Provision E.4.

The Copermittee is also required to report on several items related to its oversight construction projects within its jurisdiction. The information that must be reported is limited to the fiscal year for the Annual Report.

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

The Copermittee must confirm whether or not an existing development management program was implemented during the fiscal year in accordance with the requirements under Provision E.5.

The Copermittee is also required to report on several items related to its oversight in areas of existing development within its jurisdiction. The information that must be reported is limited to the fiscal year for the Annual Report. The information must also be separated into four categories of existing development: municipal, commercial, industrial, and residential.

VIII. PUBLIC EDUCATION AND PARTICIPATION

The Copermittee must confirm whether or not a public education program component was implemented during the fiscal year in accordance with the requirements under Provision E.7.a.

The Copermittee must also confirm whether or not a public participation program component was implemented during the fiscal year in accordance with the requirements under Provision E.7.b.

IX. FISCAL ANALYSIS

The Copermittee must confirm a summary of its fiscal analysis, conducted in accordance with the requirements under Provision E.8, has been attached to the form.

X. CERTIFICATION

A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative must sign and certify the Jurisdictional Runoff Management Program Annual Report Form. The appropriate box must be checked to indicate the whether a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative is signing the form.

Attachment E – Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2013-0001

Attachment E provides specific provisions for implementing the load allocations (LAs) and wasteload allocations (WLAs) of Total Maximum Daily Loads (TMDLs) adopted by the San Diego Water Board and approved by USEPA in which the Copermittees are identified as responsible for discharges subject to the requirements of the TMDLs. Federal regulations require that NPDES requirements incorporate water quality based effluent limitations (WQBELs) that must be consistent with the requirements and assumptions of any available WLAs,[46] which may be expressed as numeric effluent limitations, when feasible, and/or as a best management practice (BMP) program of expanded or better-tailored BMPs.[47] Where the TMDL includes WLAs that provide numeric pollutant load or pollutant parameter objectives, the WLA has been, where feasible, translated into numeric WQBELs.[48]

For each TMDL in Attachment E, four sections are included:

a. Applicability: This section provides the resolution under which the TMDL Basin Plan amendment was adopted and approved, with the applicable adoption and approval dates. This section also gives the effective date of the TMDL and where the TMDL is applicable (i.e. Watershed Management Area and water body). The Copermittees that are responsible for implementing the specific provisions are also given in this section.

b. Final TMDL Compliance Requirements: For each TMDL, the final TMDL compliance requirements consist of the final TMDL compliance date(s), the final WQBELs, and the final TMDL compliance determination requirements. The final WQBELs are expressed in terms of receiving water limitations, effluent limitations, and/or best management practices (BMPs). The final WQBELs for the TMDLs are incorporated by reference into Provision A of the Order. The final WQBELs become enforceable when the final TMDL compliance dates have passed. Applicable BMPs within the final WQBELs must be incorporated into the Water Quality Improvement Plans. Compliance with the final WQBELs will be determined in accordance with the options provided under the final TMDL compliance determination requirements.

c. Interim TMDL Compliance Requirements: If the final TMDL compliance date has not passed and there are interim TMDL compliance requirements, they are included in this section. If there are interim WQBELs with interim compliance dates, the interim WQBELs become enforceable when the corresponding interim compliance dates have passed. Compliance with the interim WQBELs will be determined in accordance with the options provided under the interim TMDL compliance determination requirements.

d. Specific Monitoring and Assessment Requirements: If there are specific monitoring and assessment requirements that cannot be met with the monitoring and assessment program

[46] 40 CFR 122.44(d)(1)(vii)(B)
[47] 40 CFR 122.44(k)(2) and 40 CFR 122.44(k)(3)
[48] November 26, 2014 Memorandum from the USEPA, Revisions to the November 22, 2002 Memorandum "Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLA""

requirements under Provision D of the Order, the additional requirements are included in this section.

The requirements of the TMDLs are based on and consistent with the assumptions and requirements of any available adopted and approved TMDLs that have been incorporated into the Basin Plan. Modifications to the requirements for the TMDLs in Attachment E cannot be made unless the TMDLs are modified in the Basin Plan.

A modification to any aspect of a TMDL in the Basin Plan requires a Basin Plan amendment. A Basin Plan amendment to modify a TMDL will require the San Diego Water Board to adopt a resolution to amend the Basin Plan, which includes a separate public process. When the San Diego Water Board adopts a Basin Plan amendment, it subsequently requires approval from the State Water Board, the Office of Administrative Law, and the USEPA before it becomes effective.

If and when the TMDLs are a modified in the Basin Plan, the San Diego Water Board will revise the requirements of the Order in accordance with the Basin Plan amendment. When a Basin Plan amendment to modify a TMDL becomes effective, the San Diego Water Board will modify the requirements of the Order pursuant to the requirements of Provision H.4 of the Order as soon as possible.

CALIFORNIA Water Boards

EDMUND G. BROWN JR. GOVERNOR

MATTHEW RODRIQUEZ SECRETARY FOR ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

March 3, 2015

Sent via E-mail

San Diego County Copermittees
Orange County Copermittees
Riverside County Copermittees

In reply refer to / attn:
Place ID: 786088:Lwalsh

Subject: Order No. R9-2015-0001, An Order Amending Order No. R9-2013-0001, NPDES No. CAS010266 National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) is pleased to transmit to you the enclosed finalized copy of Order No. R9-2015-0001, NPDES No. CAS010266, *An Order Amending Order No. R9-2013-0001, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Amending Order), as adopted by the San Diego Water Board February 11, 2015. This Order identifies specific changes made to Order R9-2013-0001 and Attachments in blue underline and red-strikeout text. Also enclosed is a conformed copy of Order R9-2013-0001 and Attachments which incorporates all adopted changes.

An electronic copy of both the Amending Order and a conformed copy of Order R9-2013-0001 and Attachments are available from the San Diego Water Board website at: http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml If a Copermittee or other interested person would like to receive a hard copy of either the Amending Order or a conformed copy of Order No. R9-2013-0001 with Attachments, please contact Laurie Walsh at (619) 521-3373 or Laurie.Walsh@waterboards.ca.gov or visit the San Diego Water Board's office at 2375 Northside Drive, Suite 100, San Diego, California 92108, weekdays between 8:00 a.m. and 5:00 p.m.

Please submit any written correspondence in response to this letter to SanDiego@waterboards.ca.gov. Electronic documents must be submitted as a single file, in Portable Document Format (PDF) format, and converted to text searchable format using Optical Character Recognition (OCR). All electronic documents must also include scanned copies of all signature pages; electronic signatures will not be accepted. Electronic documents submitted to the San Diego Water Board must include the following identification numbers in the header or subject line: **PIN: CW-786088:lwalsh.**

Respectfully,

David T. Barker P.E.
Supervising WRC Engineer
San Diego Regional Water Quality Control Board

DTB:esb:law

Enclosure: Order No. R9-2015-0001 with Attachments
Conformed Copy of Order No. R9-2013-0001 with Attachments

cc:

Distribution via US Mail and email:
(see attached address list)

San Diego County Copermittees
Orange County Copermittees
Riverside County Copermittees
Natural Resources Agencies

Distribution list via email:

San Diego County MS4 Permit E-mail Service List
Orange County MS4 Permit E-mail Service List
Riverside County MS4 Permit E-mail Service List

Tech Staff Info & Use	
Order No.	R9-2015-0001 (An Order Amending Order R9-2013-0001 and Fact Sheet)
NPDES No.	CAS0109266
Place ID	786088

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SAN DIEGO REGION

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ORDER NO. R9-2015-0001

AN ORDER AMENDING ORDER NO. R9-2013-0001, NPDES NO. CAS010266 NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The California Regional Water Quality Control Board, San Diego Region (hereinafter San Diego Water Board), finds that:

ENROLLMENT OF ORANGE COUNTY COPERMITTEES

1. **Enrollment Process.** On May 8, 2013, the San Diego Water Board adopted Order No. R9-2013-0001, NPDES No. CAS019266, *National Pollutant Discharge Elimination System Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Order No. R9-2013-0001, Order or Regional MS4 Permit). Provision F.5 of that Order outlines a process to designate (enroll) the County of Orange, the Orange County Flood Control District and the south Orange County Cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Lake Forest, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano (collectively Orange County) as Copermittees under Order No. R9-2013-0001, responsible for compliance with the terms and the conditions of the Order. Provision F.5 provides that prior to such enrollment the San Diego Water Board must first review and consider a Report of Waste Discharge (RoWD), submitted by the Orange County Copermittees under their current MS4 NPDES Order No. R9-2009-0002, to determine whether the Copermittees should be enrolled under Order No. R9-2013-0001 and what changes to the Order proposed in the RoWD are appropriate.

2. **Report of Waste Discharge.** By letter dated May 20, 2014, the Orange County Copermittees jointly submitted a RoWD in application for the reissuance of waste discharge requirements, pursuant to the requirements of section K.2.b of Order No. R9-2009-0002, for MS4 discharges draining the San Juan Hydraulic Unit within the San Diego Region. The RoWD discusses the MS4 Permit compliance activities and accomplishments of the Orange County Copermittees over the period June 2009 through June 2013. The RoWD also identifies all of the activities, research, and pilot studies the Copermittees propose to undertake during the next permit term based

upon consideration of the effectiveness of the Orange County Storm Water Program and the need for additional pollutant control initiatives. Development of a watershed-based planning approach is portrayed in the RoWD as the most important next step to take in the development of the storm water programs in Orange County. The RoWD concludes that such a comprehensive approach offers the opportunity to identify the environmental and recreational benefits that can be realized in each watershed and the management strategies that will most effectively ensure their realization. Among several recommendations, the RoWD included a request that permit requirements be amended to provide an initial or time limited exemption from hydromodification control best management practices (BMPs) for conveyance channels that are engineered and regularly maintained with the capacity to convey peak flows generated from the 10-year or greater storm event from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean. The County of Orange also separately requested a second exemption for discharges to “large river” low gradient reaches with a very wide flood plain by letter dated November 22, 2013. The San Diego Water Board has reviewed the RoWD and determined it is complete.

3. **Permit Hydromodification Control Requirement Modifications.** The hydromodification control BMP requirements in Provision E.3.c.(2) of Order No. R9-2013-0001 require modification to address the hydromodification exemption issues identified in the Orange County Copermittees’ RoWD application and November 22, 2013 letter. To facilitate the transition of the Orange County Copermittees (and eventually the Riverside County Copermittees) to the Regional MS4 Permit from the current Phase I MS4 NPDES permit (Order No. R9-2009-0002), two temporary exemptions from hydromodification control BMP requirements should be provided. The first temporary exemption would allow relief from hydromodification control BMP requirements for Priority Development Projects discharging directly to an engineered channel conveyance system with a capacity to convey peak flows generate by the 10-year storm event all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean. The second temporary exemption would allow relief from hydromodification control BMP requirements for Priority Development Projects discharging directly to large river reaches with drainage areas larger than 100 square miles and a 100-year flow capacity in excess of 20,000 cubic feet per second.

4. **Orange County Copermittees Enrollment.** After consideration of the Orange County RoWD and changes needed to Order No. R9-2013-0001, the San Diego Water Board has determined that the County of Orange, the Orange County Flood Control District and the south Orange County Cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano should be enrolled as Copermittees under Order No. R9-2013-0001 (Order) and responsible for compliance with the terms and the conditions of the Order. Enrolling the Orange County Copermittees into Order No. R9-2013-0001 (and the eventual enrollment of Riverside County Copermittees upon expiration of their current MS4 permit) will

provide regulatory consistency in the implementation of MS4 permit requirements throughout the San Diego Region, improve communication and coordination among Copermittees within watersheds crossing multiple jurisdictions, and maximize efficiency and economy of resources for the San Diego Water Board achieved through the redirection of staff permitting resources to better advance the storm water program. The enrollment of the Cities of Laguna Hills, Laguna Woods and Lake Forest is subject to a California Water Code (Water Code) section 13228 agreement as set forth in the findings of this Order.

DESIGNATION OF A REGIONAL WATER BOARD

5. **Regional Water Board Designation.** The Cities of Laguna Woods, Laguna Hills and Lake Forest (Cities) are located partially within the jurisdictions of both the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board) and the San Diego Water Board. Written requests for designation of a single Regional Water Board to regulate matters pertaining to permitting of Phase I MS4 discharges were submitted to the San Diego Water Board by the City of Laguna Woods by letter dated September 8, 2014, the City of Laguna Hills by letter dated March 12, 2014, and the City of Lake Forest by letters dated January 14, 2013, and April 4, 2014. The Cities of Laguna Hills and Laguna Woods requested designation of the San Diego Water Board, and the City of Lake Forest requested designation of the Santa Ana Water Board. Water Code section 13228 specifies the circumstances that allow, and the process for, designation of a Regional Water Board.

6. **Factual Considerations**. The Santa Ana Water Board and San Diego Water Board establish generally consistent requirements for MS4 discharges to meet the technology-based standard of reducing pollutants in the discharge to the maximum extent practicable (MEP), a related iterative process to ensure MS4 discharges meet receiving water quality standards, and non-storm water discharges to be effectively prohibited from entering the MS4. However due to the unique nature of watersheds and water quality issues in the San Diego Region and Santa Ana Region, MS4 permit requirements between the two Regional Water Boards may also vary to address region specific pollutant discharges and watershed conditions. The Cities of Laguna Woods, Laguna Hills, and Lake Forest report that management and implementation of municipal programs to comply with two different MS4 permits creates a significant administrative and financial burden that is not contributing to greater overall water quality improvements in either region.

7. **Regional Water Board Agreement**. In an effort to address the concerns of the Cities, the San Diego Water Board and the Santa Ana Water Board have entered into an agreement whereby the San Diego Water Board is designated to regulate Phase I MS4 discharges within the jurisdiction of the Cities of Laguna Woods and Laguna Hills and the Santa Ana Water Board is designated to regulate Phase I MS4 discharges within the jurisdiction of the City of Lake Forest. Both the Santa Ana Water Board and the San Diego Water Board Phase I MS4 permits for Orange County Copermittees, including Cities, require amendments to make the

designations effective. To avoid gaps or duplication in regulation for the Cities, the agreement, dated February 10, 2015, is effective on the later effective date of this Order or the Santa Ana Water Board's reissuance (Tentative Order No. R8-2015-0001). Under the terms of the agreement the City of Lake Forest will be required to retain and continue implementing the prohibition of over-irrigation discharges identified in Title 15, Chapter 15, Section 14.030 of the City Municipal Code for regulating storm water quality throughout its jurisdiction, which was established during the permit term of Order No. R9-2009-0002. The City of Lake Forest will also be required to actively participate in the development and implementation of the Aliso Creek Watershed Management Area Water Quality Improvement Plan required pursuant to the San Diego Water Board's Regional MS4 Permit, Order No. R9-2013-0001. Under the terms of the agreement, any Total Maximum Daily Load (TMDL) and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Laguna Woods, Laguna Hills or Lake Forest as a responsible party, will be incorporated into the appropriate MS4 permit by reference. Enforcement of the applicable TMDL would remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's San Diego Creek/Newport Bay TMDL and the San Diego Water Board's Indicator Bacteria Project I Beaches and Creeks TMDL.

8. **Periodic Review of Regional Water Board Agreement.** The basis supporting the Cities of Laguna Woods, Laguna Hills, and Lake Forest requests to designate a specific Regional Water Board for regulatory oversight of MS4 discharges may change under future conditions and circumstances. Therefore the San Diego Water Board will periodically review the effectiveness of the agreement during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate the agreement with the Santa Ana Water Board or otherwise modify the agreement subject to the approval of the Santa Ana Water Board.

WATER QUALITY CONTROL PLANS AND POLICIES

9. **Cause for Modification.** Federal NPDES regulations at 40 CFR 122.62(a)(3) provide that NPDES permits may be modified when the standards or regulations on which the permit was based have been changed by promulgation of amended standards or regulations or by judicial decision after the permit was issued. Standard Permit Provision 1.f of Attachment B to Order No. R9-2013-0001 provides in relevant part that the Order may be modified for cause. Section II.H.4.d. of the Order provides that the Order may be reopened during its term for cause including when the *Water Quality Control Plan for the San Diego Basin (9)* (Basin Plan) is amended by the San Diego Water Board to incorporate a new TMDL, and the amendment is approved by the State Water Resources Control Board (State Water Board), Office of Administrative Law, and the United State Environmental Protection Agency (USEPA). The amended changes to water quality control plans and policies set forth in the findings below represent changes to standards on which Order No. R9-2013-0001 was based.

10. **Special Conditions for Areas of Special Biological Significance**. On March 20, 2012, in Resolution No. 2012-0012, the State Water Board adopted a General Exception to the Ocean Plan Areas of Special Biological Significance (ASBS) waste discharge prohibition for storm water and nonpoint source discharges, including Special Protections for Beneficial Uses. On June 19, 2012, in Resolution No. 2012-0031, the State Water Board amended the General Exception to require pollutant load reductions to be achieved over a six year term. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject to the terms and conditions of State Water Board General Exception, as amended.

11. **Total Maximum Daily Loads (TMDLs)**. On June 13 2012 the San Diego Water Board in Resolution No. R9-2012-0033 amended the Basin Plan to incorporate the Los Penasquitos Lagoon Sediment TMDL. This TMDL Basin Plan amendment was approved by the State Water Board on January 21, 2014, by the Office of Administrative Law (OAL) on July 14, 2014, and USEPA on October 30, 2014. The County of San Diego, City of San Diego, City of Del Mar, and the City of Poway are among the responsible parties collectively assigned a single wasteload allocation applicable to MS4 discharges under the terms and conditions of the TMDL.

BEACH WATER QUALITY MONITORING AND ASSESSMENT PROGRAM

12. **Unified Approach Beach Water Quality Monitoring.** In November 2010, the State Water Board adopted Resolution No. 2010-0053, directing regional water boards to work with dischargers to modify beach water quality monitoring programs required by regional water board-issued permits in order to eliminate redundancies and incorporate beach water quality monitoring required by applicable statutes, where appropriate. Beginning in 2012, the San Diego Water Board reviewed the various beach water quality monitoring programs conducted in south Orange County and convened a stakeholder workgroup to develop a unified regional beach water quality monitoring and assessment program (Unified Program). The Unified Program is outlined in the San Diego Water Board report entitled "*Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County,*" dated September 2014. The Unified Program is consistent with and will meet or exceed the minimum requirements for beach water quality monitoring and related public notification and reporting established by State law, including the California Ocean Plan. The Unified Program will help protect the health of swimmers, surfers, and others who use south Orange County beach waters for water contact recreational activities.

13. **Monitoring Framework Consistency**. The Unified Program is consistent with and will help implement "*A Framework for Monitoring and Assessment in the San Diego Region*," which emphasizes the need for question-driven, beneficial use-oriented monitoring and assessment. The primary purpose of the Unified Program will be to answer the question "Does beach water quality meet standards for the beneficial use of water contact recreation?"

14. **Unified Program Implementation**. The San Diego Water Board Executive Officer has issued a written directive, pursuant to California Water Code sections 13225, 13267, and 13383, for the South Orange County Wastewater Authority (SOCWA) and the south Orange County Copermittees to implement the Unified Program, in cooperation with the Orange County Health Care Agency (OCHCA). After appropriate opportunity for public input, the Executive Officer may make revisions to the Unified Program, provided that the Unified Program, as revised, continues to be consistent with and meet the requirements of State law, including the California Ocean Plan, for beach water quality monitoring and related public notification and reporting. The Unified Program will supersede the existing routine, ongoing, beach water quality monitoring programs in south Orange County that are conducted in accordance with the existing requirements of the NPDES permits for discharges from SOCWA ocean outfalls and the south Orange County Copermittees' MS4s. The requirement for the Orange County Copermittees to participate in "regional monitoring" of beach water quality replaces requirements to conduct "core monitoring" of beach water quality, as provided for in Appendix III of the 2012 California Ocean Plan.

ADMINISTRATIVE FINDINGS

15. **Effect of this Order.** This Order amends Order No. R9-2013-0001 to:

    a. Enroll the County of Orange, the Orange County Flood Control District and the south Orange County Cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano as Copermittees responsible for compliance with the terms and conditions of Order No. R9-2013-0001,as amended by this Order;

    b. Designate the San Diego Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the Cities of Laguna Woods and Laguna Hills and the Santa Ana Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the City of Lake Forest, subject to the terms of the agreement between San Diego Water Board and the Santa Ana Water Board described in Finding 7 of this Order;

c. Establish interim exceptions to land development requirements for those Priority Development Projects that discharge to engineered channels and large river reaches described in Finding 3 of this Order;

d. Incorporate the amended requirements of the State Water Board's General Exception to require that pollutant reductions be achieved within 6 years for storm water and nonpoint source discharges to ASBS;

e. Incorporate applicable requirements of the Los Peñasquitos Lagoon Sediment TMDL; *and*

f. Require the Orange County Copermittees to implement the "*Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County,*" dated September 2014, made effective in the Monitoring and Reporting Program/Order issued pursuant to California Water Code sections 13225, 13267, and 13383 and subject to future revisions by the Executive Officer after appropriate public input.

16. **Effect of this Order.** Order No. R9-2013-0001 is not being reopened for any other purpose than the revisions contained herein. Except as contradicted or superseded by the findings and directives set forth in this Order, all of the previous findings and directives of Order No. R9-2013-0001 shall remain in full force and effect.

17. **Future Consideration of Alternative Compliance Option.** San Diego, Orange County, and Riverside County Copermittees have asserted that the prohibitions and receiving water limitations in Provision A.1.a, A.1.c, and A.2 of Order No. R9-2013-0001 may result in many years of noncompliance because years of technical efforts may ultimately be required to achieve compliance with the receiving water limitations, especially for wet weather discharges. To address this issue, the San Diego Water Board plans to consider the incorporation of a well-defined, transparent, and finite alternative path to compliance in Order No. R9-2013-0001, as amended by Order No. R9-2015-0001, during the MS4 NPDES permit reissuance proceedings for the Riverside County Copermittees scheduled for fiscal year 2015-16. This alternative compliance option would allow the Copermittees that are willing to pursue significant receiving water quality improvements beyond the iterative process to be deemed in compliance with the receiving water limitations. An alternative compliance option of this type was previously considered by the San Diego Water Board during the adoption proceedings for Order No. R9-2013-0001.

18. **California Environmental Quality Act**. This action is exempt from the requirement of preparation of environmental documents under the California Environmental Quality Act [Public Resources Code, Division 13, Chapter 3, Section 21000 et seq.] in accordance with California Water Code section 13389.

19. **Public Notice.** In accordance with State and federal laws and regulations, the San Diego Water Board has notified San Diego County, Orange County and Riverside

County Copermittees, and all known interested agencies and persons of its intent to adopt this Order and has provided them with an opportunity to submit their written comments and recommendations.

20. **Public Hearing.** The San Diego Water Board held a public hearing on February 11, 2015 and heard and considered all comments pertaining to the adoption of this Order.

21. **Notification.** Any person aggrieved by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with California Water Code section 13320 and California Code of Regulations, title 23, sections 2050 et seq. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date of this Order. Copies of the law and regulations applicable to filing petitions may be found on the Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

THEREFORE, IT IS HEREBY ORDERED,

1. This Order amends the Regional MS4 Permit, Order No. R9-2013-0001 and the Fact Sheet (Attachment F of the Order) as described in the revised versions of Order No. R9-2013-0001 and Fact Sheet included as Attachments 1 and 2 to this Order. Added text to Order No. R9-2013-0001 and the Fact Sheet is displayed in blue-underline text and deleted text is displayed as red-strikeout text.

2. The amended version of Order No. 2013-0001 and Fact Sheet included as Attachments 1 and 2 to this Order shall become effective on April 1, 2015.

3. Amended Order No. R9-2013-0001 shall supersede Order No. R9-2009-0002 for the Orange County Copermittees except for enforcement purposes.

4. San Diego Water Board staff is directed to prepare and post a conformed copy of Order No. R9-2013-0001 and the Fact Sheet incorporating the revisions made by this Order.

I, David W. Gibson, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on February 11, 2015.

David W. Gibson
Executive Officer

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

ORDER NO. R9-2013-0001, AS AMENDED BY ORDER NO. R9-2015-0001
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The San Diego County Copermittees in Table 1a are subject to waste discharge requirements set forth in this Order.

Table 1a. San Diego County Copermittees

City of Carlsbad	City of Oceanside
City of Chula Vista	City of Poway
City of Coronado	City of San Diego
City of Del Mar	City of San Marcos
City of El Cajon	City of Santee
City of Encinitas	City of Solana Beach
City of Escondido	City of Vista
City of Imperial Beach	County of San Diego
City of La Mesa	San Diego County Regional Airport Authority
City of Lemon Grove	San Diego Unified Port District
City of National City	

~~After the San Diego Water Board receives and considers~~ T~~t~~he Orange County Copermittees' ~~Report of Waste Discharge and makes any necessary changes to this Order, the Orange County Copermittees~~ in Table 1b are ~~will become~~ subject to waste discharge requirements set forth in this Order. ~~after expiration of Order No. R9-2009-0002, NPDES No. CAS0108740 on or after December 16, 2014.~~

Table 1b. Orange County Copermittees[1]

City of Aliso Viejo	City of Rancho Santa Margarita
City of Dana Point	City of San Clemente
City of Laguna Beach	City of San Juan Capistrano
City of Laguna Hills	City of Laguna Woods
City of Laguna Niguel	County of Orange
~~City of Lake Forest[1]~~	Orange County Flood Control District
City of Mission Viejo	

[1] While not listed in Table 1b., the City of Lake Forest remains a Copermittee under this Order until the later effective date of this Order or the effective date of Santa Ana Water Board Tentative Order No. R8-2015-0001. Thereafter, the City of Lake Forest will no longer be considered a Copermittee under this Order because its Phase I MS4 discharges will be regulated by the Santa Ana Water Board pursuant to Water Code section 13228 designation. The requirements of this Order that apply to the City of Lake Forest for the duration of this Order, however, are described in Finding 29 and Footnote 2 to Table B-1.

After the San Diego Water Board receives and considers the Riverside County Copermittees' Report of Waste Discharge and makes any necessary changes to this Order, the Riverside County Copermittees in Table 1c will become subject to waste discharge requirements set forth in this Order after expiration of Order No.R9-2010-0016, NPDES No. CAS0108766 on or after November 10, 2015.

Table 1c. Riverside County Copermittees

City of Murrieta	County of Riverside
City of Temecula	Riverside County Flood Control and Water Conservation District
City of Wildomar	

The ~~Orange County Copermittees and~~ Riverside County Copermittees may become subject to the requirements of this Order at a date earlier than the expiration date of their current Order~~s~~ subject to the conditions described in Provision F.6 of this Order if the Riverside County Copermittees ~~in the respective county~~ receive ~~a~~ notification of coverage from the San Diego Water Board.

The term Copermittee in this Order refers to any San Diego County, Orange County, or Riverside County Copermittee covered under this Order, unless specified otherwise.

This Order provides permit coverage for the Copermittee discharges described in Table 2.

Table 2. Discharge Locations and Receiving Waters

Discharge Points	Locations throughout San Diego Region
Discharge Description	Municipal Separate Storm Sewer System (MS4) Discharges
Receiving Waters	Inland Surface Waters, Enclosed Bays and Estuaries, and Coastal Ocean Waters of the San Diego Region

Table 3. Administrative Information

This Order was adopted by the San Diego Water Board on:	**May 8, 2013**
~~This~~ Order No. R9-2013-0001 ~~will become~~ became effective on:	**June 27, 2013**
This Order as amended by R9-2015-0001 became effective on:	**April 1, 2015**
This Order will expire on:	**June 27, 2018**
The Copermittees must file a Report of Waste Discharge in accordance with Title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than 180 days in advance of the Order expiration date.	

I, David W. Gibson, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on May 8, 2013, as amended by adoption of Order No. R9-2015-0001 on February 11, 2015.

David W. Gibson
Executive Officer

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ATTACHMENTS
Attachment A - Discharge Prohibitions and Special Protections A-1
Attachment B - Standard Permit Provisions and General Provisions B-1
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Attachment F - Fact Sheet / Technical Report for Order No. R9-2013-0001 as amended by Order No. R9-2015-0001 ..... F-1

I. FINDINGS

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), finds that:

JURISDICTION

1. **MS4 Ownership or Operation.** Each of the Copermittees owns or operates an MS4, through which it discharges storm water and non-storm water into waters of the U.S. within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the U.S.

2. **Legal and Regulatory Authority.** This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]) adopted by the United States Environmental Protection Agency (USEPA), and chapter 5.5, division 7 of the California Water Code (CWC) (commencing with section 13370). This Order serves as an NPDES permit for discharges from MS4s to surface waters. This Order also serves as waste discharge requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

   The San Diego Water Board has the legal authority to issue a regional MS4 permit pursuant to its authority under CWA section 402(p)(3)(B) and 40 CFR 122.26(a)(1)(v). The USEPA also made it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide permits (55 Federal Register [FR] 47990, 48039-48042). The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees and San Diego Water Board.

   The federal regulations make it clear that the Copermittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators (40 CFR 122.26(a)(3)(vi)). This Order does not require the Copermittees to manage storm water outside of their jurisdictional boundaries, but rather to work collectively to improve storm water management within watersheds.

3. **CWA NPDES Permit Conditions.** Pursuant to CWA section 402(p)(3)(B), NPDES permits for storm water discharges from MS4s must include requirements to effectively prohibit non-storm water discharges into MS4s, and require controls to reduce the discharge of pollutants in storm water to the maximum extent practicable (MEP), and to require other provisions as the San Diego Water Board determines are appropriate to control such pollutants. This Order prescribes conditions to assure

compliance with the CWA requirements for owners and operators of MS4s to effectively prohibit non-storm water discharges into the MS4s, and require controls to reduce the discharge of pollutants in storm water from the MS4s to the MEP.

4. **CWA and CWC Monitoring Requirements.** CWA section 308(a) and 40 CFR 122.41(h),(j)-(l) and 122.48 require that NPDES permits must specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s also specify additional monitoring and reporting requirements in 40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c). CWC section 13383 authorizes the San Diego Water Board to establish monitoring, inspection, entry, reporting and recordkeeping requirements. This Order establishes monitoring and reporting requirements to implement federal and State requirements. This Order also includes requirements for the Orange County Copermittees to participate in, and together with South Orange County Wastewater Authority and Orange County Health Care Agency, share responsibility for implementing the unified approach to beach water quality monitoring and assessment program set forth in the October 2014 report, *Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County*, issued pursuant to CWC section 13383 in the San Diego Water Board December 5, 2014 Letter Directive.

5. **Total Maximum Daily Loads.** CWA section 303(d)(1)(A) requires that "[e]ach state shall identify those waters within its boundaries for which the effluent limitations are not stringent enough to implement any water quality standard applicable to such waters." The CWA also requires states to establish a priority ranking of impaired water bodies known as Water Quality Limited Segments and to establish Total Maximum Daily Loads (TMDLs) for such waters. This priority list of impaired water bodies is called the Clean Water Act Section 303(d) List of Water Quality Limited Segments, commonly referred to as the 303(d) List. The CWA requires the 303(d) List to be updated every two years.

   TMDLs are numerical calculations of the maximum amount of a pollutant that a water body can assimilate and still meet water quality standards. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point sources (waste load allocations or WLAs) and non-point sources (load allocations or LAs), background contribution, plus a margin of safety. Discharges from MS4s are point source discharges. The federal regulations (40 CFR 122.44(d)(1)(vii)(B)) require that NPDES permits incorporate water quality based effluent limitations (WQBELs) developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, consistent with the assumptions and requirements of any available WLA for the discharge. Requirements of this Order implement the TMDLs established ~~adopted~~ by the San Diego Water Board or ~~and~~ ~~approved by~~ USEPA as of the ~~time~~ date this Order was ~~is~~ ~~issued~~ amended in 2015. This Order establishes WQBELs consistent with the assumptions and requirements of all available TMDL WLAs assigned to discharges from the Copermittees' MS4s.

6. **Non-Storm Water Discharges.** Pursuant to CWA section 402(p)(3)(B)(ii), this Order requires each Copermittee to effectively prohibit discharges of non-storm water into its MS4. Nevertheless, non-storm water discharges into and from the MS4s continue to be reported to the San Diego Water Board by the Copermittees and other persons. Monitoring conducted by the Copermittees, as well as the 303(d) List, have identified dry weather, non-storm water discharges from the MS4s as a source of pollutants causing or contributing to receiving water quality impairments in the San Diego Region. The federal regulations (40 CFR 122.26(d)(2)(iv)(B)(1)) require the Copermittees to have a program to prevent illicit discharges to the MS4. The federal regulations, however, allow for specific categories of non-storm water discharges or flows to be addressed as illicit discharges only where such discharges are identified as sources of pollutants to waters of the U.S.

7. **In-Stream Treatment Systems.** Pursuant to federal regulations (40 CFR 131.10(a)), in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S. Authorizing the construction of a runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to accepting waste assimilation as an appropriate use for that water body. Runoff treatment must occur prior to the discharge of runoff into receiving waters. Treatment control best management practices (BMPs) must not be constructed in waters of the U.S. Construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body.

DISCHARGE CHARACTERISTICS AND RUNOFF MANAGEMENT

8. **Point Source Discharges of Pollutants.** Discharges from the MS4s contain waste, as defined in the CWC, and pollutants that adversely affect the quality of the waters of the state. A discharge from an MS4 is a “discharge of pollutants from a point source” into waters of the U.S. as defined in the CWA. Storm water and non-storm water discharges from the MS4s contain pollutants that cause or threaten to cause a violation of surface water quality standards, as outlined in the Water Quality Control Plan for the San Diego Basin (Basin Plan). Storm water and non-storm water discharges from the MS4s are subject to the conditions and requirements established in the Basin Plan for point source discharges.

9. **Potential Beneficial Use Impairment.** The discharge of pollutants and/or increased flows from MS4s may cause or threaten to cause the concentration of pollutants to exceed applicable receiving water quality objectives and impair or threaten to impair designated beneficial uses resulting in a condition of pollution, contamination, or nuisance.

10. **Pollutants Generated by Land Development.** Land development has created and continues to create new sources of non-storm water discharges and pollutants in storm water discharges as human population density increases. This brings higher

levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash. Pollutants from these sources are dumped or washed off the surface by non-storm water or storm water flows into and from the MS4s. When development converts natural vegetated pervious ground cover to impervious surfaces such as paved highways, streets, rooftops, and parking lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving a developed area without BMPs that can maintain pre-development runoff conditions will contain greater pollutant loads and have significantly greater runoff volume, velocity, and peak flow rate than pre-development runoff conditions from the same area.

11. **Runoff Discharges to Receiving Waters.** The MS4s discharge runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within the eleven hydrologic units comprising the San Diego Region. Historic and current development makes use of natural drainage patterns and features as conveyances for runoff. Rivers, streams and creeks in developed areas used in this manner are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and receiving water. Numerous receiving water bodies and water body segments have been designated as impaired by the San Diego Water Board pursuant to CWA section 303(d).

12. **Pollutants in Runoff.** The most common pollutants in runoff discharged from the MS4s include total suspended solids, sediment, pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., cadmium, copper, lead, and zinc), petroleum products and polynuclear aromatic hydrocarbons, synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus), oxygen-demanding substances (e.g., decaying vegetation, animal waste), detergents, and trash. As operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not prohibit or otherwise control. These discharges may cause or contribute to a condition of pollution or a violation of water quality standards.

13. **Human Health and Aquatic Life Impairment.** Pollutants in runoff discharged from the MS4s can threaten and adversely affect human health and aquatic organisms. Adverse responses of organisms to chemicals or physical agents in runoff range from physiological responses such as impaired reproduction or growth anomalies to mortality. Increased volume, velocity, rate, and duration of storm water runoff greatly accelerate the erosion of downstream natural channels. This alters stream channels and habitats and can adversely affect aquatic and terrestrial organisms.

14. **Water Quality Effects.** The Copermittees' water quality monitoring data submitted to date documents persistent exceedances of Basin Plan water quality objectives for

runoff-related pollutants at various watershed monitoring stations. Persistent toxicity has also been observed at several watershed monitoring stations. In addition, bioassessment data indicate that the majority of the monitored receiving waters have Poor to Very Poor Index of Biological Integrity (IBI) ratings. These findings indicate that runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in the San Diego Region. Non-storm water discharges from the MS4s have been shown to contribute significant levels of pollutants and flow in arid, developed Southern California watersheds, and contribute significantly to exceedances of applicable receiving water quality objectives.

15. **Non-Storm Water and Storm Water Discharges.** Non-storm water discharges from the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard of CWA section 402(p)(3)(B)(iii), which is explicitly for "Municipal … *Stormwater Discharges* (emphasis added)" from the MS4s. Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s must be effectively prohibited.

16. **Best Management Practices.** Waste and pollutants which are deposited and accumulate in MS4 drainage structures will be discharged from these structures to waters of the U.S. unless they are removed. These discharges may cause or contribute to, or threaten to cause or contribute to, a condition of pollution in receiving waters. For this reason, pollutants in storm water discharges from the MS4s can be and must be effectively reduced in runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Pollution prevention is the reduction or elimination of pollutant generation at its source and is the best "first line of defense." Source control BMPs (both structural and non-structural) minimize the contact between pollutants and runoff, therefore keeping pollutants onsite and out of receiving waters. Treatment control BMPs remove pollutants that have been mobilized by storm water or non-storm water flows.

17. **BMP Implementation.** Runoff needs to be addressed during the three major phases of development (planning, construction, and use) in order to reduce the discharge of storm water pollutants to the MEP, effectively prohibit non-storm water discharges, and protect receiving waters. Development which is not guided by water quality planning policies and principles can result in increased pollutant load discharges, flow rates, and flow durations which can negatively affect receiving water beneficial uses. Construction sites without adequate BMP implementation result in sediment runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. Existing development can generate substantial pollutant loads which are discharged in runoff to receiving waters. Retrofitting areas of existing development with storm water pollutant control and hydromodification management BMPs is necessary to address storm water discharges from existing development that may cause or contribute to a condition of pollution or a violation of water quality standards.

18. **Water Quality Improvements.** Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges to the MS4s and control pollutants in storm water discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the CWA.

19. **Long Term Planning and Implementation.** Federal regulations require municipal storm water permits to expire 5 years from adoption, after which the permit must be renewed and reissued. The San Diego Water Board recognizes that the degradation of water quality and impacts to beneficial uses of the waters in the San Diego Region occurred over several decades. The San Diego Water Board further recognizes that a decade or more may be necessary to realize demonstrable improvement to the quality of waters in the San Diego Region. This Order includes a long term planning and implementation approach that will require more than a single permit term to complete.

WATER QUALITY STANDARDS

20. **Basin Plan.** The San Diego Water Board adopted the Water Quality Control Plan for the San Diego Basin (Basin Plan) on September 8, 1994, that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for receiving waters addressed through the plan. The Basin Plan was subsequently approved by the State Water Resources Control Board (State Water Board) on December 13, 1994. Subsequent revisions to the Basin Plan have also been adopted by the San Diego Water Board and approved by the State Water Board. Requirements of this Order implement the Basin Plan.

    The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Process Supply (PROC), Industrial Service Supply (IND), Ground Water Recharge (GWR), Contact Water Recreation (REC1), Non-contact Water Recreation (REC2), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Freshwater Replenishment (FRSH), Hydropower Generation (POW), and Preservation of Biological Habitats of Special Significance (BIOL). The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region: Navigation (NAV), Commercial and Sport Fishing (COMM), Estuarine Habitat (EST), Marine Habitat (MAR), Aquaculture (AQUA), Migration of Aquatic Organisms (MIGR), Spawning,

Reproduction, and/or Early Development (SPWN), and Shellfish Harvesting (SHELL).

21. **Ocean Plan.** The State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, and 2005. The State Water Board adopted the latest amendment on April 21, 2005 and it became effective on February 14, 2006. The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean. Requirements of this Order implement the Ocean Plan.

    The Ocean Plan identifies the following beneficial uses of ocean waters of the state to be protected: Industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture; preservation and enhancement of designated Areas of Special Biological Significance; rare and endangered species; marine habitat; fish spawning and shellfish harvesting.

22. **Sediment Quality Control Plan**. On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes: 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

23. **National Toxics Rule and California Toxics Rule.** USEPA adopted the National Toxics Rule (NTR) on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the NTR applied in California. On May 18, 2000, USEPA adopted the California Toxics Rule (CTR). The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants.

24. **Antidegradation Policy.** This Order is in conformance with the federal Antidegradation Policy described in 40 CFR 131.12, and State Water Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality Waters in California*. Federal regulations at 40 CFR 131.12 require that the State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. State Water Board Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies.

25. **Anti-Backsliding Requirements.** Section 402(o)(2) of the CWA and federal regulations at 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations may be relaxed. All effluent limitations in this Order are at least as stringent as effluent limitations in the previous permits.

CONSIDERATIONS UNDER FEDERAL AND STATE LAW

26. **Coastal Zone Act Reauthorization Amendments.** Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states with approved coastal zone management programs to address non-point source pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point source pollution: agriculture, silviculture, urban, marinas, and hydromodification. This Order addresses the management measures required for the urban category, with the exception of septic systems. The runoff management programs developed pursuant to this Order fulfills the need for coastal cities to develop a runoff non-point source plan identified in the Non-Point Source Program Strategy and Implementation Plan. The San Diego Water Board addresses septic systems through the administration of other programs.

27. **Endangered Species Act.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 USC sections 1531 to 1544). This Order requires compliance with receiving water limits, and other requirements to protect the beneficial uses of waters of the State. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

28. **Report of Waste Discharge Process.** The waste discharge requirements set forth in this Order are based upon the Report of Waste Discharge submitted by the San Diego County Copermittees prior to the expiration of Order No. R9-2007-0001 (NPDES No. CAS0109266) and the Report of Waste Discharge submitted by the Orange County Copermittees prior to the expiration of Order No. R9-2009-0002 (CAS0108740). The ~~Orange County and~~ Riverside County Copermittees are not immediately covered by the waste discharge requirements in this Order. The San Diego Water Board understands that each municipality is unique although the Counties share watersheds and/or geographical boundaries. The Order will continue to use the Report of Waste Discharge process prior to initially making ~~Orange County or~~ Riverside County Copermittees subject to the requirements of this Order.

The federal regulations (40 CFR 122.21(d)(2)) and CWC section 13376 impose a duty on the Copermittees to reapply for continued coverage through submittal of a

Report of Waste Discharge no later than 180 days prior to expiration of a currently effective permit. This requirement is set forth in the ~~Orange County Copermittees' and~~ Riverside County Copermittees' currently effective permit~~s~~ at Provision~~s K.2.b and~~ K.2.c~~, respectively~~. The ~~Orange County Permit, Order No. R9-2009-0002 (NPDES No. CAS0108740) expires on December 16, 2014 and the~~ Riverside County MS4 Permit, Order No. R9-2010-0016 (NPDES No. CAS0108766) expires on November 10, 2015.

Unless the ~~Orange County or~~ Riverside County Copermittees apply for and receive early coverage under this Order, ~~the Orange County Copermittees' and~~ the Riverside County Copermittees' ~~respective~~ permit~~s~~ will be superseded by this Order upon expiration of their ~~respective~~ permit~~s~~, subject to any necessary revisions to the requirements of this Order made after the San Diego Water Board considers their ~~respective~~ Report~~s~~ of Waste Discharge through the public process provided in 40 CFR Part 124.

29. Regional Water Board Designation. The Cities of Laguna Hills, Laguna Woods, and Lake Forest are located partially within the jurisdictions of the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board) and the San Diego Water Board and their discharges are subject to regulation by both Regional Water Boards. Pursuant to CWC section 13228, the Cities of Laguna Hills, Laguna Woods, and Lake Forest submitted written requests that one Regional Water Board be designated to regulate Phase I MS4 discharges for each of the Cities. The Santa Ana Water Board and the San Diego Water Board have entered into an agreement dated February 10, 2015, whereby the Cities of Laguna Woods and Laguna Hills are largely regulated by the San Diego Water Board under this Order, including those portions of the Cities of Laguna Woods and Laguna Hills not within the San Diego Water Board's jurisdiction, upon the effective date of this Order or Santa Ana Water Board Order No. R8-2015-0001, whichever is later. Similarly, the City of Lake Forest, including those portions of the City of Lake Forest within the San Diego Water Board's jurisdiction, is largely regulated by the Santa Ana Water Board under Order No. R8-2015-0001 (NPDES No. CAS618030) upon the later effective date of this Order or Order No. R8-2015-0001. The agreement provides that the City of Lake Forest is required to retain, and continue implementation of, its over-irrigation discharge prohibition in Title 15, Chapter 14.030, List (b) of the City Municipal Code for regulating storm water quality throughout its jurisdiction. The agreement also requires the City of Lake Forest to actively participate during development and implementation of the Aliso Creek Watershed Management Area Water Quality Improvement Plan required pursuant to this Order. Each Regional Water Board retains the authority to enforce provisions of its Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee under the terms of the agreement (Water Code section 13228 (b)). Under the terms of the agreement, any TMDL and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Laguna Woods, Laguna Hills or Lake Forest as a responsible party, will be incorporated into the

appropriate Phase I MS4 permit by reference. Enforcement of the applicable TMDL will remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's San Diego Creek/Newport Bay TMDL and the San Diego Water Board's Indicator Bacteria Project I Beaches and Creeks TMDL. The San Diego Water Board will periodically review the effectiveness of the agreement during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate the agreement with Santa Ana Water Board or otherwise modify the agreement subject to the approval of the Santa Ana Water Board.

~~29.~~30. **Integrated Report and Clean Water Act Section 303(d) List.** The San Diego Water Board and State Water Board submit an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. USEPA issued its *Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act* on July 29, 2005, which advocates the use of a five category approach for classifying the attainment status of water quality standards for water bodies in the Integrated Report. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 in the Integrated Report are placed on the 303(d) List.

Water bodies with available data and/or information that indicate at least one beneficial use is not being supported or is threatened, but a TMDL is not required, are included in Category 4 in the Integrated Report. Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

Implementation of the requirements of this Order may allow the San Diego Water Board to include surface waters impaired by discharges from the Copermittees' MS4s in Category 4 in the Integrated Report for consideration during the next 303(d) List submittal by the State to USEPA.

~~30.~~31. **Economic Considerations.** The California Supreme Court has ruled that although CWC section 13263 requires the State and Regional Water Boards (collectively Water Boards) to consider factors set forth in CWC section 13241 when issuing an NPDES permit, the Water Board may not consider the factors to justify imposing pollutant restrictions that are less stringent than the applicable federal regulations require. (*City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 618, 626-627.) However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires

that the Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

As noted in the following finding, the San Diego Water Board finds that the requirements in this Order are not more stringent than the minimum federal requirements. Therefore, a CWC section 13241 analysis is not required for permit requirements that implement the effective prohibition on the discharge of non-storm water into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determined appropriate to control such pollutants, as those requirements are mandated by federal law. Notwithstanding the above, the San Diego Water Board has developed an economic analysis of the requirements in this Order. The economic analysis is provided in the Fact Sheet.

~~31.~~32. **Unfunded Mandates.** This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following:

a. This Order implements federally mandated requirements under CWA section 402 (33 USC section 1342(p)(3)(B)).

b. The local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental and new dischargers who are issued NPDES permits for storm water and non-storm water discharges.

c. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order.

d. The Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)) and in lieu of numeric restrictions on their MS4 discharges (i.e. effluent limitations).

e. The local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under State law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

f. The provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state develops a TMDL, federal law requires that permits must contain water quality based effluent limitations consistent with the assumptions and requirements of any applicable wasteload allocation (40 CFR 122.44(d)(1)(vii)(B)).

See the Fact Sheet for further discussion of unfunded mandates.

~~32.~~33. **California Environmental Quality Act.** The issuance of waste discharge requirements and an NPDES permit for the discharge of runoff from MS4s to waters of the U.S. is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 et seq.) in accordance with CWC section 13389.

STATE WATER BOARD DECISIONS

~~33.~~34. **Compliance with Prohibitions and Limitations.** The receiving water limitation language specified in this Order is consistent with language recommended by the USEPA and established in State Water Board Order WQ 99-05, *Own Motion Review of the Petition of Environmental Health Coalition to Review Waste Discharge Requirements Order No. 96-03, NPDES Permit No. CAS0108740*, adopted by the State Water Board on June 17, 1999. The receiving water limitation language in this Order requires storm water discharges from MS4s to not cause or contribute to a violation of water quality standards, which is to be achieved through an iterative approach requiring the implementation of improved and better-tailored BMPs over time. Implementation of the iterative approach to comply with receiving water limitations based on applicable water quality standards is necessary to ensure that storm water discharges from the MS4 will not ultimately cause or contribute to violations of water quality standards and will not create conditions of pollution, contamination, or nuisance.

~~34.~~35. **Special Conditions for Areas of Special Biological Significance.** On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving a~~n~~ general exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges (General Exception). On June 19, 2012, the State Water Board adopted Order No. 2012-0031, amending the General Exception to require pollutant reductions to be achieved within six years in accordance with ASBS Compliance Plans and ASBS Pollution Prevention Plans. The General Exception ~~State Water Board Resolution No. 2012-0012~~ requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject to the terms and conditions of the General Exception as amended ~~State Water Board Resolution No. 2012-0012~~. The Special Protections contained in Attachment B to the General Exception as amended~~Resolution No. 2012-0012,~~ are applicable to these discharges, and are hereby incorporated into Attachment A of this Order. ~~as if fully set forth herein.~~

ADMINISTRATIVE FINDINGS

~~35.~~36. **Executive Officer Delegation of Authority.** The San Diego Water Board by prior resolution has delegated all matters that may legally be delegated to its Executive Officer to act on its behalf pursuant to CWC section 13223. Therefore, the Executive Officer is authorized to act on the San Diego Water Board's behalf on any matter within this Order unless such delegation is unlawful under CWC section 13223 or this Order explicitly states otherwise.

~~36.~~37. **Standard Provisions.** Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR 122.42, are provided in Attachment B to this Order.

~~37.~~38. **Fact Sheet.** The Fact Sheet for this Order contains background information, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of this Order. The Fact Sheet is hereby incorporated into this Order and constitutes part of the Findings of this Order.

~~38.~~39. **Public Notice.** In accordance with State and federal laws and regulations, the San Diego Water Board notified the Copermittees, and interested agencies and persons of its intent to prescribe waste discharge requirements for the control of discharges into and from the MS4s to waters of the U.S. and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet.

~~39.~~40. **Public Hearings.** The San Diego Water Board held a public hearing on April 10 and 11, 2013, that was continued to May 8, 2013 and heard and considered all comments pertaining to the terms and conditions of this Order. The San Diego Water Board also held a public workshop on October 8, 2015, and a public hearing on February 11, 2015, and heard and considered all comments pertaining to the amendment of this Order through Order No. R9-2015-0001. Details of these public hearings are provided in the Fact Sheet.

~~40.~~41. **Effective Date.** This Order serves as an NPDES permit pursuant to CWA section 402 or amendments thereto, and as to the San Diego County Copermittees listed in Table 2.a., became ~~becomes~~ effective fifty (50) days after the date of its adoption, and as to the Orange County Copermittees listed in Table 2.b., becomes effective on April 1, 2015, after Order R9-2015-0001 is adopted, provided that the Regional Administrator, USEPA, Region IX, does not object to this Order.

~~41.~~42. **Review by the State Water Board.** Any person aggrieved by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with CWC section 13320 and California Code of Regulations, title 23, sections 2050, ~~et seq~~ and following. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date of this Order ~~San Diego Water Board~~

~~action~~, except that if the thirtieth day following the ~~action~~date of this Order falls on a Saturday, Sunday or State holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

THEREFORE, IT IS HEREBY ORDERED that the Copermittees, in order to meet the provisions contained in division 7 of the CWC (commencing with section 13000) and regulations adopted thereunder, and the provisions of the CWA and regulations adopted thereunder, must each comply with the requirements of this Order. This action in no way prevents the San Diego Water Board from taking enforcement action for past violations of the previous Order. If any part of this Order is subject to a temporary stay of enforcement, unless otherwise specified, the Copermittees must comply with the analogous portions of the previous Order, which will remain in effect for all purposes during the pendency of the stay.

II. PROVISIONS

A. PROHIBITIONS AND LIMITATIONS

The purpose of this provision is to describe the conditions under which storm water and non-storm water discharges into and from MS4s are prohibited or limited. The goal of the prohibitions and limitations is to protect the water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through the implementation of water quality improvement strategies and runoff management programs that effectively prohibit non-storm water discharges into the Copermittees' MS4s, and reduce pollutants in storm water discharges from the Copermittees' MS4s to the MEP.

1. Discharge Prohibitions

a. Discharges from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the state are prohibited.

b. Non-storm water discharges into MS4s are to be effectively prohibited, through the implementation of Provision E.2, unless such discharges are authorized by a separate NPDES permit.

c. Discharges from MS4s are subject to all waste discharge prohibitions in the Basin Plan, included in Attachment A to this Order.

d. Storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 applicable to these discharges, included in Attachment A to this Order. All other discharges from the Copermittees' MS4s to ASBS are prohibited.

2. Receiving Water Limitations

a. Discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters, including but not limited to all applicable provisions contained in:

(1) The San Diego Water Board's Basin Plan, including beneficial uses, water quality objectives, and implementation plans;

(2) State Water Board plans for water quality control including the following:

(a) Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries (Thermal Plan), and

(b) The Ocean Plan, including beneficial uses, water quality objectives, and implementation plans;

(3) State Water Board policies for water and sediment quality control including the following:

(a) Water Quality Control Policy for the Enclosed Bays and Estuaries of California,

(b) Sediment Quality Control Plan which includes the following narrative objectives for bays and estuaries:

(i) Pollutants in sediments shall not be present in quantities that, alone or in combination, are toxic to benthic communities, and

(ii) Pollutants shall not be present in sediments at levels that will bioaccumulate in aquatic life to levels that are harmful to human health,

(c) The Statement of Policy with Respect to Maintaining High Quality of Waters in California;[2]

(4) Priority pollutant criteria promulgated by the USEPA through the following:

(a) National Toxics Rule (NTR)[3] (promulgated on December 22, 1992 and amended on May 4, 1995), and

(b) California Toxics Rule (CTR).[4,5]

b. Discharges from MS4s composed of storm water runoff must not alter natural ocean water quality in an ASBS.

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[2] State Water Board Resolution No. 68-16
[3] 40 CFR 131.36
[4] 65 Federal Register 31682-31719 (May 18, 2000), adding Section 131.38 to 40 CFR
[5] If a water quality objective and a CTR criterion are in effect for the same priority pollutant, the more stringent of the two applies.

3. Effluent Limitations

a. Technology Based Effluent Limitations

Pollutants in storm water discharges from MS4s must be reduced to the MEP.[6]

b. Water Quality Based Effluent Limitations

Each Copermittee must comply with applicable WQBELs established for the TMDLs in Attachment E to this Order, pursuant to the applicable TMDL compliance schedules.

4. Compliance with Discharge Prohibitions and Receiving Water Limitations

Each Copermittee must achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order through timely implementation of control measures and other actions as specified in Provisions B and E of this Order, including any modifications. The Water Quality Improvement Plans required under Provision B must be designed and adapted to ultimately achieve compliance with Provisions A.1.a, A.1.c and A.2.a.

a. If exceedance(s) of water quality standards persist in receiving waters notwithstanding implementation of this Order, the Copermittees must comply with the following procedures:

(1) For exceedance(s) of a water quality standard in the process of being addressed by the Water Quality Improvement Plan, the Copermittee(s) must implement the Water Quality Improvement Plan as accepted by the San Diego Water Board, and update the Water Quality Improvement Plan, as necessary, pursuant to Provision F.2.c;

(2) Upon a determination by either the Copermittees or the San Diego Water Board that discharges from the MS4 are causing or contributing to a new exceedance of an applicable water quality standard not addressed by the Water Quality Improvement Plan, the Copermittees must submit the following updates to the Water Quality Improvement Plan pursuant to Provision F.2.c or as part of the Water Quality Improvement Plan Annual Report required under Provision F.3.b, unless the San Diego Water Board directs an earlier submittal:

(a) The water quality improvement strategies being implemented that are effective and will continue to be implemented,

[6] This does not apply to MS4 discharges which receive subsequent treatment to reduce pollutants in storm water discharges to the MEP prior to entering receiving waters (e.g., low flow diversions to the sanitary sewer). Runoff treatment must occur prior to the discharge of runoff into receiving waters per Finding 7.

(b) Water quality improvement strategies (i.e. BMPs, retrofitting projects, stream and/or habitat rehabilitation projects, adjustments to jurisdictional runoff management programs, etc.) that will be implemented to reduce or eliminate any pollutants or conditions that are causing or contributing to the exceedance of water quality standards,

(c) Updates to the schedule for implementation of the existing and additional water quality improvement strategies, and

(d) Updates to the monitoring and assessment program to track progress toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a of this Order;

(3) The San Diego Water Board may require the incorporation of additional modifications to the Water Quality Improvement Plan required under Provision B. The applicable Copermittees must submit any modifications to the update to the Water Quality Improvement Plan within 90 days of notification that additional modifications are required by the San Diego Water Board, or as otherwise directed;

(4) Within 90 days of the San Diego Water Board determination that the modifications to the Water Quality Improvement Plan required under Provision A.4.a.(3) meet the requirements of this Order, the applicable Copermittees must revise the jurisdictional runoff management program documents to incorporate the modified water quality improvement strategies that have been and will be implemented, the implementation schedule, and any additional monitoring required; and

(5) Each Copermittee must implement the updated Water Quality Improvement Plan.

b. The procedure set forth above to achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order do not have to be repeated for continuing or recurring exceedances of the same water quality standard(s) following implementation of scheduled actions unless directed to do otherwise by the San Diego Water Board.

c. Nothing in Provisions A.4.a and A.4.b prevents the San Diego Water Board from enforcing any provision of this Order while the applicable Copermittees prepare and implement the above update to the Water Quality Improvement Plan and jurisdictional runoff management programs.

B. WATER QUALITY IMPROVEMENT PLANS

The purpose of this provision is to develop Water Quality Improvement Plans that guide the Copermittees' jurisdictional runoff management programs towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plans is to further the Clean Water Act's objective to protect, preserve, enhance, and restore the water quality and designated beneficial uses of waters of the state. This goal will be accomplished through an adaptive planning and management process that identifies the highest priority water quality conditions within a watershed and implements strategies through the jurisdictional runoff management programs to achieve improvements in the quality of discharges from the MS4s and receiving waters.

1. Watershed Management Areas

The Copermittees must develop a Water Quality Improvement Plan for each of the Watershed Management Areas in Table B-1. A total of ten Water Quality Improvement Plans must be developed for the San Diego Region.

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
San Juan (901.00)	South Orange County	- Aliso Creek - San Juan Creek - San Mateo Creek - Pacific Ocean - Heisler Park ASBS	- City of Aliso Viejo[~~1~~] - City of Dana Point[~~1~~] - City of Laguna Beach[~~1~~] - City of Laguna Hills[1] - City of Laguna Niguel[~~1~~] - City of Laguna Woods[1] - City of Lake Forest[~~1~~2] - City of Mission Viejo[~~1~~] - City of Rancho Santa Margarita[~~1~~] - City of San Clemente[~~1~~] - City of San Juan Capistrano[~~1~~] - County of Orange[~~1~~] - Orange County Flood Control District[~~1~~]
Santa Margarita (902.00)	Santa Margarita River	- Murrieta Creek - Temecula Creek - Santa Margarita River - Santa Margarita Lagoon - Pacific Ocean	- City of Murrieta[~~2~~3] - City of Temecula[~~2~~3] - City of Wildomar[~~2~~3] - County of Riverside[~~2~~3] - County of San Diego[~~3~~4] - Riverside County Flood Control and Water Conservation District[~~2~~3]
San Luis Rey (903.00)	San Luis Rey River	- San Luis Rey River - San Luis Rey Estuary - Pacific Ocean	- City of Oceanside - City of Vista - County of San Diego

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
Carlsbad (904.00)	Carlsbad	- Loma Alta Slough - Buena Vista Lagoon - Agua Hedionda Lagoon - Batiquitos Lagoon - San Elijo Lagoon - Pacific Ocean	- City of Carlsbad - City of Encinitas - City of Escondido - City of Oceanside - City of San Marcos - City of Solana Beach - City of Vista - County of San Diego
San Dieguito (905.00)	San Dieguito River	- San Dieguito River - San Dieguito Lagoon - Pacific Ocean	- City of Del Mar - City of Escondido - City of Poway - City of San Diego - City of Solana Beach - County of San Diego
Penasquitos (906.00)	Penasquitos	- Los Penasquitos Lagoon - Pacific Ocean	- City of Del Mar - City of Poway - City of San Diego - County of San Diego
	Mission Bay	- Mission Bay - Pacific Ocean - San Diego Marine Life Refuge ASBS	- City of San Diego
San Diego (907.00)	San Diego River	- San Diego River - Pacific Ocean	- City of El Cajon - City of La Mesa - City of San Diego - City of Santee - County of San Diego
Pueblo San Diego (908.00) Sweetwater (909.00) Otay (910.00)	San Diego Bay	- Sweetwater River - Otay River - San Diego Bay - Pacific Ocean	- City of Chula Vista - City of Coronado - City of Imperial Beach - City of La Mesa - City of Lemon Grove - City of National City - City of San Diego - County of San Diego - San Diego County Regional Airport Authority - San Diego Unified Port District
Tijuana (911.00)	Tijuana River	- Tijuana River - Tijuana Estuary - Pacific Ocean	- City of Imperial Beach - City of San Diego - County of San Diego

Notes:

1. ~~The Orange County Copermittees will be covered under this Order after expiration of Order No. R9-2009-0002, or earlier if the Orange County Copermittees meet the conditions in Provision F.6.~~By agreement dated February 10, 2015, pursuant to Water Code section 13228, the Phase I MS4 discharges within the jurisdiction of the City of Laguna Hills and the City of Laguna Woods located in the Santa Ana Region are regulated by San Diego Water Board Order No. R9-2013-0001 as amended by Order No. R9-2015-0001, upon the later effective date of Order No. R9-2015-0001 or Santa Ana Water Board Tentative Order No. R8-2015-0001. The City of Laguna Hills and Laguna Woods must also comply with the requirements of the San Diego Creek/Newport Bay TMDL in section XVIII of Santa Ana Water Board Order No. R8-2015-0001.
2. ~~The Riverside County Copermittees will be covered under this Order after expiration of Order No. R9-2010-0016, or earlier if the Riverside County Copermittees meet the conditions in Provision F.6.~~ By agreement dated February 10, 2015, pursuant to Water Code section 13228, Phase I MS4 discharges within the City of Lake Forest located within the San Diego Water Board Region are regulated by the Santa Ana Water Board Order No. R8-2015-0001 (NPDES No. CAS618030) upon the later effective date of this Order or Santa Ana Water Board Tentative Order No. R8-2015-0001. In accordance with the terms of the agreement between the San Diego Water Board and the Santa Ana Water Board, the City of Lake Forest must implement the requirements of the Bacteria TMDL in Attachment E of this Order, participate in preparation and implementation of the Water Quality Improvement Plan for the Aliso Creek Watershed Management Area as described in Provision B of this Order and continue implementation of its over-irrigation discharge prohibition in its City Ordinance, Title 15, Chapter 15, section 14.030, List (b).

~~2.~~3. The Riverside County Copermittees will be covered under this Order after expiration of Order No. R9-2010-0016~~,~~ or earlier if the Riverside County Copermittees meet the conditions in Provision F.6, upon further amendment of this Order.

~~3~~4. The County of San Diego is not required to implement the requirements of Provision B for its jurisdiction within the Santa Margarita River Watershed Management Area until the Riverside County Copermittees have been notified of coverage under this Order. The County of San Diego is required to implement the requirements of Provisions D, F.3.b, and Attachment E until the Riverside County Copermittees have been notified of coverage under this Order.

2. Priority Water Quality Conditions

The Copermittees must identify the water quality priorities within each Watershed Management Area that will be addressed by the Water Quality Improvement Plan. Where appropriate, Watershed Management Areas may be separated into subwatersheds to focus water quality prioritization and jurisdictional runoff management program implementation efforts by receiving water.

a. Assessment of Receiving Water Conditions

The Copermittees must consider the following, at a minimum, to identify water quality priorities based on impacts of MS4 discharges on receiving water beneficial uses:

(1) Receiving waters listed as impaired on the CWA Section 303(d) List of Water Quality Limited Segments (303(d) List);

(2) TMDLs adopted and under development by the San Diego Water Board;

(3) Receiving waters recognized as sensitive or highly valued by the Copermittees, including estuaries designated under the National Estuary Program under CWA section 320, marine protected areas, wetlands defined by the State or U.S. Fish and Wildlife Service's National Wetlands Inventory as wetlands, waters having the Preservation of Biological Habitats of Special Significance (BIOL) beneficial use designation, and receiving waters identified as ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(4) The receiving water limitations of Provision A.2;

(5) Known historical versus current physical, chemical, and biological water quality conditions;

(6) Available, relevant, and appropriately collected and analyzed physical, chemical, and biological receiving water monitoring data, including, but not limited to, data describing:

(a) Chemical constituents,

(b) Water quality parameters (i.e. pH, temperature, conductivity, etc.),

(c) Toxicity Identification Evaluations for both receiving water column and sediment,

(d) Trash impacts,

(e) Bioassessments, and

(f) Physical habitat;

(7) Available evidence of erosional impacts in receiving waters due to accelerated flows (i.e. hydromodification);

(8) Available evidence of adverse impacts to the chemical, physical, and biological integrity of receiving waters; and

(9) The potential improvements in the overall condition of the Watershed Management Area that can be achieved.

b. ASSESSMENT OF IMPACTS FROM MS4 DISCHARGES

The Copermittees must consider the following, at a minimum, to identify the potential impacts to receiving waters that may be caused or contributed to by discharges from the Copermittees' MS4s:

(1) The discharge prohibitions of Provision A.1 and effluent limitations of Provision A.3; and

(2) Available, relevant, and appropriately collected and analyzed storm water and non-storm water monitoring data from the Copermittees' MS4 outfalls;

(3) Locations of each Copermittee's MS4 outfalls that discharge to receiving waters;

(4) Locations of MS4 outfalls that are known to persistently discharge non-storm water to receiving waters likely causing or contributing to impacts on receiving water beneficial uses;

(5) Locations of MS4 outfalls that are known to discharge pollutants in storm water causing or contributing to impacts on receiving water beneficial uses; and

(6) The potential improvements in the quality of discharges from the MS4 that can be achieved.

c. IDENTIFICATION OF PRIORITY WATER QUALITY CONDITIONS

(1) The Copermittees must use the information gathered for Provisions B.2.a and B.2.b to develop a list of priority water quality conditions as pollutants, stressors and/or receiving water conditions that are the highest threat to receiving water quality or that most adversely affect the quality of receiving waters. The list must include the following information for each priority water

quality condition:

(a) The beneficial use(s) associated with the priority water quality condition;

(b) The geographic extent of the priority water quality condition within the Watershed Management Area, if known;

(c) The temporal extent of the priority water quality condition (e.g., dry weather and/or wet weather);

(d) The Copermittees with MS4s discharges that may cause or contribute to the priority water quality condition; and

(e) An assessment of the adequacy of and data gaps in the monitoring data to characterize the conditions causing or contributing to the priority water quality condition, including a consideration of spatial and temporal variation.

(2) The Copermittees must identify the highest priority water quality conditions to be addressed by the Water Quality Improvement Plan, and provide a rationale for selecting a subset of the water quality conditions identified pursuant to Provision B.2.c.(1) as the highest priorities.

d. IDENTIFICATION OF MS4 SOURCES OF POLLUTANTS AND/OR STRESSORS

The Copermittees must identify and prioritize known and suspected sources of storm water and non-storm water pollutants and/or other stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c. The identification of known and suspected sources of pollutants and/or stressors that cause or contribute to the highest priority water quality conditions as identified for Provision B.2.c must consider the following:

(1) Pollutant generating facilities, areas, and/or activities within the Watershed Management Area, including:

(a) Each Copermittee's inventory of construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas,

(b) Publicly owned parks and/or recreational areas,

(c) Open space areas,

(d) All currently operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste, and

(e) Areas not within the Copermittees' jurisdictions (e.g., Phase II MS4s, tribal

lands, state lands, federal lands) that are known or suspected to be discharging to the Copermittees' MS4s;

(2) Locations of the Copermittees' MS4s, including the following:

(a) All MS4 outfalls that discharge to receiving waters, and

(b) Locations of major structural controls for storm water and non-storm water (e.g., retention basins, detention basins, major infiltration devices, etc.);

(3) Other known and suspected sources of non-storm water or pollutants in storm water discharges to receiving waters within the Watershed Management Area, including the following:

(a) Other MS4 outfalls (e.g., Phase II Municipal and Caltrans),

(b) Other NPDES permitted discharges,

(c) Any other discharges that may be considered point sources (e.g., private outfalls), and

(d) Any other discharges that may be considered non-point sources (e.g., agriculture, wildlife or other natural sources);

(4) Review of available data, including but not limited to:

(a) Findings from the Copermittees' illicit discharge detection and elimination programs,

(b) Findings from the Copermittees' MS4 outfall discharge monitoring,

(c) Findings from the Copermittees' receiving water monitoring,

(d) Findings from the Copermittees' MS4 outfall discharge and receiving water assessments, and

(e) Other available, relevant, and appropriately collected data, information, or studies related to pollutant sources and/or stressors that contribute to the highest priority water quality conditions as identified for Provision B.2.c.

(5) The adequacy of the available data to identify and prioritize sources and/or stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c.

e. IDENTIFICATION OF POTENTIAL WATER QUALITY IMPROVEMENT STRATEGIES

The Copermittees must evaluate the findings identified under Provisions B.2.a-d, and identify potential strategies that can result in improvements to water quality in MS4 discharges and/or receiving waters within the Watershed Management

Area. Potential water quality improvement strategies that may be implemented within the Watershed Management Area must include the following:

(1) Structural BMPs, non-structural BMPs, incentives, or programs that can potentially be implemented to address the highest priority water quality conditions identified under Provision B.2.c, or MS4 sources of pollutants or stressors identified under Provision B.2.d,

(2) Retrofitting projects in areas of existing development within the Watershed Management Area that can potentially be implemented to reduce MS4 sources of pollutants or stressors identified under Provision B.2.d causing or contributing to the highest priority water quality conditions identified under Provision B.2.c, and

(3) Stream, channel, and/or habitat rehabilitation projects within the Watershed Management Area that can potentially be implemented to protect and/or improve conditions in receiving waters from MS4 pollutants and/or stressors identified under Provision B.2.d causing or contributing to the highest priority water quality conditions identified under Provision B.2.c.

3. Water Quality Improvement Goals, Strategies and Schedules

The Copermittees must identify and develop specific water quality improvement goals and strategies to address the highest priority water quality conditions identified within a Watershed Management Area. The water quality improvement goals and strategies must address the highest priority water quality conditions by effectively prohibiting non-storm water discharges to the MS4, reducing pollutants in storm water discharges from the MS4 to the MEP, and protecting the water quality standards of receiving waters.

a. WATER QUALITY IMPROVEMENT GOALS AND SCHEDULES

(1) Numeric Goals

The Copermittees must develop and incorporate numeric goals[7] into the Water Quality Improvement Plan. Numeric goals must be used to support Water Quality Improvement Plan implementation and measure reasonable progress towards addressing the highest priority water quality conditions identified under Provision B.2.c. The Copermittees must establish and incorporate the following numeric goals in the Water Quality Improvement

[7] Interim and final numeric goals may take a variety of forms such as TMDL established WQBELs, action levels, pollutant concentration, load reductions, number of impaired water bodies delisted from the List of Water Quality Impaired Segments, Index of Biotic Integrity (IBI) scores, or other appropriate metrics. Interim and final numeric goals are not necessarily limited to one criterion or indicator, but may include multiple criteria and/or indicators. Except for TMDL established WQBELs, interim and final numeric goals and corresponding schedules may be revised through the adaptive management process under Provision B.5.

Plan:

(a) Final numeric goals must be based on measureable criteria or indicators capable of demonstrating one or more of the following:

(i) Discharges from the Copermittees' MS4s will not cause or contribute to exceedances of water quality standards in receiving waters, AND/OR

(ii) The conditions of receiving waters and associated habitat are protected from MS4 discharges, AND/OR

(iii) Beneficial uses of receiving waters are protected from MS4 discharges and will be supported.

(b) Interim numeric goals must be based on measureable criteria or indicators capable of demonstrating reasonable incremental progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges as follows:

(i) One or more interim numeric goals may be established to demonstrate progress toward achieving each final numeric goal,

(ii) For each final numeric goal, at least one interim numeric goal must be expressed as a reasonable increment toward achievement of the final numeric goal,

(iii) For each final numeric goal, reasonable interim numeric goals must be established to be accomplished during each 5 year period between the acceptance of the Water Quality Improvement Plan and the achievement of the final numeric goals.

(2) Schedules for Achieving Numeric Goals

The Copermittees must develop and incorporate schedules for achieving the numeric goals into the Water Quality Improvement Plan. The schedules must demonstrate reasonable progress toward achieving the final numeric goals required for Provision B.3.a.(1). The Copermittees must incorporate the schedules for achieving the numeric goals into the Water Quality Improvement Plan based on the following considerations:

(a) Final dates for achieving all final numeric goals must be established considering the following:

(i) Final compliance dates for any applicable TMDLs in Attachment E to this Order;

(ii) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(iii) Achievement of the final numeric goals for the highest water quality priorities must be as soon as possible;

(iv) Final dates for achieving the final numeric goals must reflect a realistic assessment of the shortest practicable time required based on the temporal and spatial extent and factors associated with the highest priority water quality conditions identified under Provision B.2.c, and taking into account the time reasonably required to implement the water quality improvement strategies required pursuant to Provision B.3.b.

(b) Interim dates for achieving all interim numeric goals must be established considering the following:

(i) Interim compliance dates for any applicable TMDLs in Attachment E to this Order;

(ii) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(iii) Interim dates for achieving the interim numeric goals must reflect a realistic assessment of the shortest practicable time reasonably required, taking into account the time needed to implement new or significantly expanded programs and securing financing, if necessary; and

(iv) For each final numeric goal, at least one interim numeric goal must be established that the Copermittees will work toward achieving within the term of this Order.

b. WATER QUALITY IMPROVEMENT STRATEGIES AND SCHEDULES

Based on the likely effectiveness and efficiency of the potential water quality improvement strategies identified under Provision B.2.e to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a, the Copermittees must identify the strategies that will be implemented in each Watershed Management Area as follows:

(1) Jurisdictional Strategies

(a) Each Copermittee in the Watershed Management Area must identify the strategies that will be implemented within its jurisdiction as part of its jurisdictional runoff management program requirements under Provisions E.2 through E.7, including descriptions of the following:

(i) For each of the inventories developed for its jurisdiction, as required

under Provisions D.2.a.(1), E.3.e.(2), E.4.b, and E.5.a, each Copermittee must identify the known and suspected areas or sources causing or contributing to the highest priority water quality conditions in the Watershed Management Area that the Copermittee will focus on in its efforts to effectively prohibit non-storm water discharges to its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, and achieve the interim and final numeric goals identified under Provision B.3.a;

(ii) BMPs that each Copermittee will implement, or require to be implemented, as applicable, for those areas or sources within its jurisdiction;

(iii) Education programs that each Copermittee will implement, as applicable, for those areas or sources within its jurisdiction;

(iv) Frequencies that each Copermittee will conduct inspections on those areas or sources within its jurisdiction;

(v) Incentive and enforcement programs that each Copermittee will implement, as applicable, for those areas or sources within its jurisdiction; and

(vi) Any other BMPs, incentives, or programs that each Copermittee will implement for those areas or sources within its jurisdiction.

(b) Identify the optional jurisdictional strategies that each Copermittee will implement within its jurisdiction, as necessary, to effectively prohibit non-storm water discharges to its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. Descriptions of the optional jurisdictional strategies must include:

(i) BMPs, incentives, or programs that may be implemented by the Copermittee within its jurisdiction in addition to the requirements of Provisions B.3.b.(1)(a);

(ii) Incentives or programs that may be implemented by the Copermittee to encourage or implement projects to retrofit areas of existing development within its jurisdiction;

(iii) Incentives or programs that may be implemented by the Copermittee to encourage or implement projects that will rehabilitate the conditions of channels or habitats within its jurisdiction;

(iv) The funds and/or resources that must be secured by the Copermittee to implement the optional strategies described for Provisions B.3.b.(1)(b)(i)-(iii) within its jurisdiction; and

(v) The circumstances necessary to trigger implementation of the optional jurisdictional strategies, in addition to the requirements of Provision B.3.b.(1)(a), to achieve the interim and final numeric goals within the schedules established under Provision B.3.a.

(c) Identify the strategies that will be implemented by the Copermittee in coordination with or with the cooperation of other agencies (e.g. Caltrans, water districts, school districts) and/or entities (e.g. non-governmental organizations) within its jurisdiction.

(2) Watershed Management Area Strategies

The Copermittees must identify the optional regional or multi-jurisdictional strategies that will be implemented in the Watershed Management Area, as necessary, to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. Descriptions of the optional regional or multi-jurisdictional strategies must include:

(a) Regional or multi-jurisdictional BMPs, incentives, or programs that may be implemented by the Copermittees in the Watershed Management Area;

(b) Incentives or programs that may be implemented by the Copermittees in the Watershed Management Area to encourage or implement regional or multi-jurisdictional projects to retrofit areas of existing development;

(c) Incentives or programs that may be implemented by the Copermittees to encourage or implement regional or multi-jurisdictional projects that will rehabilitate the conditions of channels, streams, or habitats within the Watershed Management Area;

(d) The funds and/or resources that must be secured by the Copermittees to implement the optional strategies described for Provisions B.3.b.(2)(a)-(c) within the Watershed Management Area; and

(e) The circumstances necessary to trigger implementation of the optional regional or multi-jurisdictional strategies to achieve the interim and final numeric goals within the schedules established under Provision B.3.a.

(3) Schedules for Implementing Strategies

The Copermittees must develop reasonable schedules for implementing the water quality improvement strategies identified under Provisions B.3.b.(1) and B.3.b.(2) to achieve the interim and final numeric goals identified and

schedules established under Provision B.3.a. The Copermittees must incorporate the schedules to implement the water quality improvement strategies into the Water Quality Improvement Plan as follows:

(a) Each Copermittee must develop schedules for the jurisdictional strategies identified pursuant to Provisions B.3.b.(1)(a)-(b). Each schedule must specify:

(i) If each jurisdictional strategy identified pursuant to Provision B.3.b.(1)(a) will or will not be initiated upon acceptance of the Water Quality Improvement Plan;

(ii) For each jurisdictional strategy identified pursuant to Provision B.3.b.(1)(a) that will not be initiated upon acceptance~~approval~~ of the Water Quality Improvement Plan, the shortest practicable time in which each jurisdictional strategy will be initiated after acceptance of the Water Quality Improvement Plan;

(iii) For each optional jurisdictional strategy identified pursuant to Provision B.3.b.(1)(b), a realistic assessment of the shortest practicable time required to:

[a] Secure the resources needed to fund the optional jurisdictional strategy, and
[b] Procure the resources, materials, labor, and applicable permits necessary to initiate implementation of the optional jurisdictional strategy;

(iv) If each jurisdictional strategy identified pursuant to Provisions B.3.b.(1)(a)-(b) is expected to be continuously implemented (e.g. inspections) or completed within a schedule (e.g. construction of structural BMP); and

(v) If a jurisdictional strategy identified pursuant to Provisions B.3.b.(1)(a)-(b) is expected to be completed within a schedule, the anticipated time to complete based on a realistic assessment of the shortest practicable time required.

(b) The Copermittees in the Watershed Management Area must develop schedules for the regional or multi-jurisdictional strategies identified pursuant to Provision B.3.b.(2). Each schedule must specify:

(i) A realistic assessment of the shortest practicable time to:

[a] Secure the resources needed to fund the optional regional or multi-jurisdictional strategy, and
[b] Procure the resources, materials, labor, and permits necessary to initiate the implementation of the optional regional or multi-jurisdictional strategy;

(ii) If each regional or multi-jurisdictional strategy identified pursuant to Provision B.3.b.(2) is expected to be continuously implemented (e.g. inspections) or completed within a schedule (e.g. construction of structural BMP); and

(iii) If a regional or multi-jurisdictional strategy and/or activity identified pursuant to Provisions B.3.b.(2) is expected to be completed within a schedule, the anticipated time to complete based on a realistic assessment of the shortest practicable time required.

(4) Optional Watershed Management Area Analysis

(a) For each Watershed Management Area, the Copermittees have the option to perform a Watershed Management Area Analysis for the purpose of developing watershed-specific requirements for structural BMP implementation, as described in Provision E.3.c.(3). The Watershed Management Area Analysis must include GIS layers (maps) as output. The analysis must include the following information, to the extent it is available, in order to characterize the Watershed Management Areas:

(i) A description of dominant hydrologic processes, such as areas where infiltration or overland flow likely dominates;

(ii) A description of existing streams in the watershed, including bed material and composition, and if they are perennial or ephemeral;

(iii) Current and anticipated future land uses;

(iv) Potential coarse sediment yield areas; and

(v) Locations of existing flood control structures and channel structures, such as stream armoring, constrictions, grade control structures, and hydromodification or flood management basins.

(b) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify and compile a list of candidate projects that could potentially be used as alternative compliance options for Priority Development Projects, to be implemented in lieu of onsite structural BMP performance requirements described in Provisions E.3.c.(1) and E.3.c.(2). Specifically, the Copermittees must identify opportunities to be included in the list of candidate projects in each Watershed Management Area, such as:

(i) Stream or riparian area rehabilitation;

(ii) Retrofitting existing infrastructure to incorporate storm water retention or treatment;

(iii) Regional BMPs;

(iv) Groundwater recharge projects;

(v) Water supply augmentation projects; and

(vi) Land purchases to preserve floodplain functions.

(c) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify areas within the Watershed Management Area where it is appropriate to allow Priority Development Projects to be exempt from the hydromodification management BMP performance requirements described in Provision E.3.c.(2), including supporting rationale.

4. Water Quality Improvement Monitoring and Assessment Program

a. The Copermittees in each Watershed Management Area must develop and incorporate an integrated monitoring and assessment program into the Water Quality Improvement Plan that assesses: 1) the progress toward achieving the numeric goals and schedules, 2) the progress toward addressing the highest priority water quality conditions for each Watershed Management Area, and 3) each Copermittee's overall efforts to implement the Water Quality Improvement Plan.

b. The monitoring and assessment program must incorporate the monitoring and assessment requirements of Provision D, which may allow the Copermittees to modify the program to be consistent with and focus on the highest priority water quality conditions for each Watershed Management Area.

c. For Watershed Management Areas with applicable TMDLs, the monitoring and assessment program must incorporate the specific monitoring and assessment requirements of Attachment E.

d. For Watershed Management Areas with any ASBS, the water quality monitoring and assessment program must incorporate the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

5. Iterative Approach and Adaptive Management Process

The Copermittees in each Watershed Management Area must implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a, and must include the following:

a. RE-EVALUATION OF PRIORITY WATER QUALITY CONDITIONS

The priority water quality conditions and potential water quality improvement strategies included in the Water Quality Improvement Plan pursuant to Provisions B.2.c and B.2.e may be re-evaluated by the Copermittees as needed during the term of this Order as part of the Water Quality Improvement Plan Annual Report. Re-evaluation and recommendations for modifications to the priority water quality conditions and potential water quality improvement strategies must be provided in the Report of Waste Discharge, and must consider the following:

(1) Achieving the outcome of improved water quality in MS4 discharges and receiving waters through implementation of the water quality improvement strategies identified in the Water Quality Improvement Plan;

(2) New information developed when the requirements of Provisions B.2.a-c have been re-evaluated;

(3) Spatial and temporal accuracy of monitoring data collected to inform prioritization of water quality conditions and implementation strategies to address the highest priority water quality conditions;

(4) Availability of new information and data from sources other than the jurisdictional runoff management programs within the Watershed Management Area that informs the effectiveness of the actions implemented by the Copermittees;

(5) San Diego Water Board recommendations; and

(6) Recommendations for modifications solicited through a public participation process.

b. ADAPTATION OF GOALS, STRATEGIES AND SCHEDULES

The water quality improvement goals, strategies and schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.3, must be re-evaluated and adapted as new information becomes available to result in more effective and efficient measures to address the highest priority water quality conditions identified pursuant to Provision B.2.c. Re-evaluation of and modifications to the water quality improvement goals, strategies and schedules must be provided in the Water Quality Improvement Plan Annual Report, and must consider the following:

(1) Modifications to the priority water quality conditions based on Provision B.5.a;

(2) Progress toward achieving interim and final numeric goals in receiving waters and MS4 discharges for the highest priority water quality conditions in the Watershed Management Area,

(3) Progress toward achieving outcomes according to established schedules;

(4) New policies or regulations that may affect identified numeric goals;

(5) Measurable or demonstrable reductions of non-storm water discharges to and from each Copermittee's MS4;

(6) Measurable or demonstrable reductions of pollutants in storm water discharges from each Copermittee's MS4 to the MEP;

(7) New information developed when the requirements of Provisions B.2.b and B.2.d have been re-evaluated;

(8) Efficiency in implementing the Water Quality Improvement Plan;

(9) San Diego Water Board recommendations; and

(10) Recommendations for modifications solicited through a public participation process.

c. ADAPTATION OF MONITORING AND ASSESSMENT PROGRAM

The water quality improvement monitoring and assessment program, included in the Water Quality Improvement Plan pursuant to Provision B.4, must be re-evaluated and adapted when new information becomes available. Re-evaluation and recommendations for modifications to the monitoring and assessment program, pursuant to the requirements of Provision D, may be provided in the Water Quality Improvement Plan Annual Report, but must be provided in the Report of Waste Discharge.

6. Water Quality Improvement Plan Submittal, Updates, and Implementation

a. The Copermittees must submit and commence implementation of the Water Quality Improvement Plans in accordance with the requirements of Provision F.1.

b. The Copermittees must submit proposed updates to the Water Quality Improvement Plan for acceptance by the San Diego Water Board Executive Officer in accordance with the requirements of Provision F.2.c.

C. ACTION LEVELS

The purpose of this provision is for the Copermittees to incorporate numeric action levels in the Water Quality Improvement Plans. The goal of the action levels is to guide Water Quality Improvement Plan implementation efforts and measure progress towards the protection of water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through monitoring and assessing the quality of the MS4 discharges during the implementation of the Water Quality Improvement Plans.

1. Non-Storm Water Action Levels[8]

The Copermittees must develop and incorporate numeric non-storm water action levels (NALs) into the Water Quality Improvement Plan to: 1) support the development and prioritization of water quality improvement strategies for effectively prohibiting non-storm water discharges to the MS4s, 2) assess the effectiveness of the water quality improvement strategies toward addressing MS4 non-storm water discharges, required pursuant to Provision D.4.b.(1), and 3) support the detection and elimination of non-storm water and illicit discharges to the MS4, required pursuant to Provision E.2.[9]

a. The following NALs must be incorporated:

(1) Non-Storm Water Discharges from MS4s to Ocean Surf Zone

Table C-1. Non-Storm Water Action Levels for Discharges from MS4s to Ocean Surf Zone

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Total Coliform	MPN/100 ml	1,000	-	10,000/1,000[1]	OP
Fecal Coliform	MPN/100 ml	200[2]	-	400	OP
Enterococci	MPN/100 ml	35	-	104[3]	OP

Abbreviations/Acronyms
AMAL – average monthly action level
MDAL – maximum daily action level
OP – Ocean Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Total coliform density NAL is 1,000 MPN/100 ml when the fecal/total coliform ratio exceeds 0.1.
2. Fecal coliform density NAL is 200 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas."

[8] NALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, unless the NAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed.
[9] The Copermittees may utilize NALs or other benchmarks currently established by the Copermittees as interim NALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

(2) Non-Storm Water Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Table C-2. Non-Storm Water Action Levels for Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Turbidity	NTU	75	-	225	OP
pH	Units	Within limit of 6.0 to 9.0 at all times			OP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	35	-	104[3]	BP
Priority Pollutants	µg/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
OP – Ocean Plan water quality objective
NTU – Nephelometric Turbidity Units
µg/L – micrograms per liter
MDAL – maximum daily action level
BP – Basin Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas" and is not applicable to water bodies that are not designated with the water contact recreation (REC-1) beneficial use.

Table C-3. Non-Storm Water Action Levels for Priority Pollutants

Parameter	Units	Freshwater (CTR)		Saltwater (CTR)	
		MDAL	AMAL	MDAL	AMAL
Cadmium	µg/L	**	**	16	8
Copper	µg/L	*	*	5.8	2.9
Chromium III	µg/L	**	**	-	-
Chromium VI	µg/L	16	8.1	83	41
Lead	µg/L	*	*	14	2.9
Nickel	µg/L	**	**	14	6.8
Silver	µg/L	*	*	2.2	1.1
Zinc	µg/L	*	*	95	47

Abbreviations/Acronyms:
CTR – California Toxic Rule
AMAL – average monthly action level
µg/L – micrograms per liter
MDAL – maximum daily action level

Notes:
* Action levels developed on a case-by-case basis (see below)
** Action levels developed on a case-by-case basis (see below), but calculated criteria are not to exceed Maximum Contaminant Levels (MCLs) under the California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64431

The Cadmium, Copper, Chromium (III), Lead, Nickel, Silver and Zinc NALs for MS4 discharges to freshwater receiving waters will be developed on a case-by-case basis based on site-specific water quality data (receiving water hardness). For these priority pollutants, refer to 40 CFR 131.38(b)(2).

(3) Non-Storm Water Discharges from MS4s to Inland Surface Waters

Table C-4. Non-Storm Water Action Levels for Discharges from MS4s to Inland Surface Waters

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Dissolved Oxygen	mg/L	Not less than 5.0 in WARM waters and not less than 6.0 in COLD waters			BP
Turbidity	NTU	-	20	See MDAL	BP
pH	Units	Within limit of 6.5 to 8.5 at all times			BP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	33	-	61[3]	BP
Total Nitrogen	mg/L	-	1.0	See MDAL	BP
Total Phosphorus	mg/L	-	0.1	See MDAL	BP
MBAS	mg/L	-	0.5	See MDAL	BP
Iron	mg/L	-	0.3	See MDAL	BP
Manganese	mg/L	-	0.05	See MDAL	BP
Priority Pollutants	µg/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
BP – Basin Plan water quality objective
COLD – cold freshwater habitat beneficial use
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
MDAL – maximum daily action level
WARM – warm freshwater habitat beneficial use
MBAS – Methylene Blue Active Substances
MPN/100 ml – most probable number per 100 milliliters
µg/L – micrograms per liter

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for freshwater "designated beach areas" and is not applicable to water bodies that are not designated with the water contact recreation (REC-1) beneficial use.

b. If not identified in Provision C.1.a, NALs must be identified, developed and incorporated in the Water Quality Improvement Plan for any pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in receiving waters associated with the highest priority water quality conditions related to non-storm water discharges from the MS4s. NALs must be based on:

(1) Applicable water quality standards which may be dependent upon site-specific or receiving water-specific conditions or assumptions to be identified by the Copermittees; or

(2) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the NALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary NALs specific to the Watershed Management Area at levels greater than the NALs required by Provisions C.1.a and C.1.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for effectively prohibiting non-storm water discharges to the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and from the MS4. The

secondary NALs may be developed using an approach acceptable to the San Diego Water Board.

d. Dry weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.b may be utilized to develop or revise NALs based on watershed-specific data, subject to San Diego Water Board Executive Officer approval.

2. Storm Water Action Levels[10]

The Copermittees must develop and incorporate numeric storm water action levels (SALs) in the Water Quality Improvement Plans to: 1) support the development and prioritization of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s, and 2) assess the effectiveness of the water quality improvement strategies toward reducing pollutants in storm water discharges, required pursuant to Provision D.4.b.(2).[11]

a. The following SALs for discharges of storm water from the MS4 must be incorporated:

Table C-5. Storm Water Action Levels for Discharges from MS4s to Receiving Waters

Parameter	Units	Action Level
Turbidity	NTU	126
Nitrate & Nitrite (Total)	mg/L	2.6
Phosphorus (Total P)	mg/L	1.46
Cadmium (Total Cd)*	µg/L	3.0
Copper (Total Cu)*	µg/L	127
Lead (Total Pb)*	µg/L	250
Zinc (Total Zn)*	µg/L	976

Abbreviations/Acronyms:
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
µg/L – micrograms per liter

Notes:
* The sampling must include a measure of receiving water hardness at each MS4 outfall. If a total metal concentration exceeds the corresponding metals SAL in Table C-5, that concentration must be compared to the California Toxics Rule criteria and the USEPA 1-hour maximum concentration for the detected level of receiving water hardness associated with that sample. If it is determined that the sample's total metal concentration for that specific metal exceeds that SAL, but does not exceed the applicable USEPA 1-hour maximum concentration criterion for the measured level of hardness, then the sample result will not be considered above the SAL for that measurement.

[10] SALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, unless the SAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed.

[11] The Copermittees may utilize SALs or other benchmarks currently established by the Copermittees as interim SALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

b. If not identified in Provision C.2.a, SALs must be identified, developed and incorporated in the Water Quality Improvement Plan for pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in receiving waters associated with the highest priority water quality conditions related to storm water discharges from the MS4s. SALs must be based on:

(1) Federal and State water quality guidance and/or water quality standards; and

(2) Site-specific or receiving water-specific conditions; or

(3) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the SALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary SALs specific to the Watershed Management Area at levels greater than the SALs required by Provisions C.2.a and C.2.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s. The secondary SALs may be developed based on the approaches recommended by the State Water Board's Storm Water Panel[12] or using an approach acceptable to the San Diego Water Board.

d. Wet weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.c may be used to develop or revise SALs based upon watershed-specific data, subject to San Diego Water Board Executive Officer approval.

[12] Storm Water Panel Recommendations to the California State Water Resources Control Board: The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities (June 2006)

D. MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS

The purpose of this provision is for the Copermittees to monitor and assess the impact on the conditions of receiving waters caused by discharges from the Copermittees' MS4s under wet weather and dry weather conditions. The goal of the monitoring and assessment program is to inform the Copermittees about the nexus between the health of receiving waters and the water quality condition of the discharges from their MS4s. This goal will be accomplished through monitoring and assessing the conditions of the receiving waters, discharges from the MS4s, pollutant sources and/or stressors, and effectiveness of the water quality improvement strategies implemented as part of the Water Quality Improvement Plans.

1. Receiving Water Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the condition of the receiving waters in each Watershed Management Area during dry weather and wet weather. Following San Diego Water Board acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct long-term receiving water monitoring during implementation of the Water Quality Improvement Plan to assess the long term trends and determine if conditions in receiving waters are improving. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following receiving water monitoring procedures:

a. TRANSITIONAL RECEIVING WATER MONITORING

Until the monitoring requirements and schedules of Provisions D.1.b-e are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following receiving water monitoring in the Watershed Management Area:

(1) Continue the receiving water monitoring programs required in Order Nos. R9-2007-0001 (Monitoring and Reporting Program No. R9-2007-0001 Sections II.A.1-A.5), R9-2009-0002, and R9-2010-0016, unless the Executive Officer provides conditional approval for Copermittees to proceed with implementation of the proposed monitoring and assessment program developed in accordance with Provision B.4;

(2) Continue the monitoring in the Hydromodification Management Plans approved by the San Diego Water Board;

(3) Participate in the following regional receiving water monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring,

(b) Southern California Bight Regional Monitoring, and

(c) Sediment Quality Monitoring;

(4) Implement the monitoring programs developed as part of any implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) for the TMDLs in Attachment E to this Order; and

(5) For Watershed Management Areas with ASBS, implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

b. LONG-TERM RECEIVING WATER MONITORING STATIONS

The Copermittees must select at least one long-term receiving water monitoring station from among the existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees to be representative of the receiving water quality in the Watershed Management Area. Additional long-term receiving water monitoring stations must be selected where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

c. DRY WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three dry weather monitoring events at each of the long-term receiving water monitoring stations. At least one monitoring event must be conducted during the dry season (May 1 – September 30) and at least one monitoring event must be conducted during a dry weather period during the wet season (October 1 – April 30), after the first wet weather event of the season, with an antecedent dry period of at least 72 hours following a storm event producing measureable rainfall of greater than 0.1 inch.

(1) Dry Weather Receiving Water Field Observations

For each dry weather monitoring event, the Copermittees must record field observations consistent with Table D-1 at each long-term receiving water monitoring station.

Table D-1. Field Observations for Receiving Water Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) • Station description (i.e. deposits or stains, vegetation condition, structural condition, and observable biology) • Presence and assessment of trash in and around station

(2) Dry Weather Receiving Water Field Monitoring

For each dry weather monitoring event, if conditions allow the collection of the data, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

Table D-2. Field Monitoring Parameters for Receiving Water Monitoring Stations

Parameters
• pH • Temperature • Specific conductivity • Dissolved oxygen • Turbidity

(3) Dry Weather Receiving Water Analytical Monitoring

For each dry weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable NAL constituents, and

(v) Constituents listed in Table D-3.

Table D-3. Analytical Monitoring Constituents for Receiving Water Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Pesticides	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Mercury • Nickel • Selenium • Thallium • Zinc	• Organophosphate Pesticides • Pyrethroid Pesticides	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(4) Dry Weather Receiving Water Toxicity Monitoring

For each dry weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for aquatic toxicity in accordance with Table D-4. When the State Water Board's Policy for Toxicity Assessment and Control (Toxicity Policy) is approved and in effect, the San Diego Water Board Executive Officer may direct the Copermittees to replace current toxicity program elements with standardized procedures in the Toxicity Policy.

Table D-4. Dry Weather Chronic[1] Toxicity Testing for Receiving Water Monitoring Stations

Organism	Units	Test	USEPA Protocol
Freshwater			
Pimephales promelas (Fathead Minnow)	Pass / Fail	Larval Survival and Growth	EPA-821-R-02-013
Ceriodaphnia dubia (*Daphnid*)	Pass / Fail	Survival and Production	EPA-821-R-02-013
Selenastrum capricornutum (Green Algae)	Pass / Fail	Growth	EPA-821-R-02-013
Marine and Estuarine			
Strongylocentrotus purpuratus *(Purple Sea Urchin)*	Pass / Fail	Embryo-Larval Development	EPA-600-R-95-136

Notes:
1. Chronic toxicity testing is not required at receiving water monitoring stations located at mass loading stations if the channel flows are diverted year-round during dry weather conditions to the sanitary sewer for treatment.

(a) Freshwater Test Species and Methods: If samples are collected in receiving waters with salinity less than 1 ppt, the Copermittees must follow the methods for chronic toxicity tests as established in 40 CFR 136.3 using a single-concentration test design for routine monitoring, or a five-concentration test design for additional toxicity testing if the limitation is exceeded. The Copermittees must estimate the critical life stage chronic toxicity on undiluted samples in accordance with species and short term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms (EPA-821-R-02-013; Table IA, 40 CFR 136). Additional test species may be used by the Copermittees if approved by the San Diego Water Board Executive Officer. The Copermittees must conduct:

(i) A static renewal toxicity test with the fathead minnow, *Pimephales promelas* (Larval Survival and Growth Test Method 1000.0);

(ii) A static renewal toxicity test with the daphnid, *Ceriodaphnia dubia* (Survival and Reproduction Test Method 1002.0); and

(iii) A static renewal toxicity test with the green alga, *Selenastrum capricornutum* (also named *Raphidocelis subcapitata*) (Growth Test Method 1003.0).

(b) Marine and Estuarine Test Species and Methods: If samples are collected in receiving waters with salinity greater or equal to 1 ppt, the Copermittees must follow the methods for chronic toxicity tests as established in 40 CFR 136.3 using a single-concentration test design for routine monitoring, or a five-concentration test design for additional toxicity testing if the limitation is exceeded. The Copermittees must conduct the following critical life state chronic toxicity tests on undiluted samples in accordance with species and short term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms (EPA-600-R-95-136; 1995). Artificial sea salts must be used to increase sample salinity. The Copermittees must conduct a static non-renewal toxicity test with the purple sea urchin, *Strongylocentrotus purpuratus* (Embryo-larval Development Test Method). Additional species may be used by the Copermittees if approved by the San Diego Water Board Executive Officer.

(c) Holding Times: All toxicity tests must be conducted as soon as possible following sample collection. The 36-hour sample holding time for test initiation shall be targeted. However, no more than 72 hours shall elapse before the conclusion of sample collection and test initiation.

(d) Test Species Sensitivity Screening: To determine the most sensitive test species for freshwater, the Copermittees must screen 2 wet weather and 2 dry weather toxicity tests with a vertebrate, an invertebrate, and a plant species. After this screening period, subsequent monitoring must be conducted using the most sensitive test species. Alternatively, if a sensitive test species has already been determined, or if there is prior knowledge of potential toxicant(s) and a test species is sensitive to such toxicant(s), then monitoring must be conducted using only that test species. Sensitive test species determinations must also consider the most sensitive test species used for proximal receiving water monitoring. Rescreening must occur once each permit term.

(e) Chronic toxicity test biological endpoint data must be analyzed using the Test of Significant Toxicity t-test approach specified in *National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document* (USEPA, Office of Wastewater Management, Washington, D.C., EPA-833-R-10-003, 2010). For this monitoring program, the critical chronic instream waste concentration (IWC) is set at 100 percent receiving water (i.e. no dilution) for receiving water samples. A 100 percent receiving water and a control must be tested.

(f) Toxicity Identification Evaluation (TIE) / Toxicity Reduction Evaluation (TRE): If chronic toxicity is detected in receiving waters, the Copermittees must discuss the need for conducting a TIE/TRE in the assessments required under Provision D.4.a.(2), and develop a plan for implementing the TIE/TRE to be incorporated in the Water Quality Improvement Plan.

(5) Dry Weather Receiving Water Bioassessment Monitoring

Bioassessment monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must conduct bioassessment monitoring during at least one dry weather monitoring event at each long-term receiving water monitoring station as follows:

(a) The following bioassessment samples and measurements must be collected:

(i) Macroinvertebrate samples must be collected in accordance with the "Reachwide Benthos (Multihabitat) Procedure" in the most current Surface Water Ambient Monitoring Program (SWAMP) Bioassessment Standard Operating Procedures (SOP), and amendments, as applicable;[13]

(ii) The "Full" suite of physical habitat characterization measurements must be collected in accordance with the most current SWAMP Bioassessment SOP, and as summarized in the SWAMP Stream Habitat Characterization Form – Full Version;[14] and

(iii) Freshwater algae samples must be collected in accordance with the SWAMP Standard Operating Procedures for Collecting Algae Samples.[15] Analysis of samples must include algal taxonomic composition (diatoms and soft algae) and algal biomass.

(b) The bioassessment samples, measurements, and appropriate water chemistry data must be used to calculate the following:

(i) An Index of Biological Integrity (IBI) for macroinvertebrates for each monitoring station where bioassessment monitoring was conducted, based on the most current calculation method;[16] and

[13] Ode, P.R.. 2007. Standard operating procedures for collecting macroinvertebrate samples and associated physical and chemical data for ambient bioassessments in California. California State Water Resources Control Board Surface Water Ambient Monitoring Program (SWAMP) Bioassessment SOP 001. http://www.swrcb.ca.gov/water_issues/programs/swamp/tools.shtml#monitoring

[14] Available at: http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/reports/fieldforms_fullversion052908.pdf

[15] Fetscher et al. 2009. Standard Operating Procedures for Collecting Stream Algae Samples and Associated Physical Habitat and Chemical Data for Ambient Bioassessments in California.

[16] The most current calculation method at the time the Order was adopted is outlined in "A Quantitative Tool for Assessing the Integrity of Southern California Coastal Streams" (Ode, et al. 2005. Environmental Management. Vol. 35, No. 1, pp. 1-13). If an updated or new calculation method is developed, either both (i.e. current and updated/new) methods must be used, or historical IBIs must be recalculated with the updated or new calculation method.

(ii) An IBI for algae for each monitoring station where bioassessment monitoring was conducted, when a calculation method is developed.[17]

(c) In lieu of the requirements of Provision D.1.c.(5)(a), the Copermittees may conduct the bioassessment monitoring in accordance with the "Triad" assessment approach[18] to calculate the IBIs required for Provision D.1.c.(5)(b). The Copermittees must conduct sampling, analysis, and reporting of specified in-stream biological and habitat data according to the protocols specified in the SCCWRP Technical Report No. 539, or subsequent protocols, if developed.

(6) Dry Weather Receiving Water Hydromodification Monitoring

In addition to the hydromodification monitoring conducted as part of the Copermittees' Hydromodification Management Plans, hydromodification monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must collect the following hydromodification monitoring observations and measurements within an appropriate domain of analysis during at least one dry weather monitoring event for each long-term receiving water monitoring station:

(a) Channel conditions, including:

(i) Channel dimensions,

(ii) Hydrologic and geomorphic conditions, and

(iii) Presence and condition of vegetation and habitat;

(b) Location of discharge points;

(c) Habitat integrity;

(d) Photo documentation of existing erosion and habitat impacts, with location (i.e. latitude and longitude coordinates) where photos were taken;

(e) Measurement or estimate of dimensions of any existing channel bed or bank eroded areas, including length, width, and depth of any incisions; and

[17] When a calculation method is developed, IBIs must be calculated for all available and appropriate historical data.
[18] Stormwater Monitoring Coalition Model Monitoring Technical Committee, 2004. Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California. Technical Report #419. August 2004.

(f) Known or suspected cause(s) of existing downstream erosion or habitat impact, including flow, soil, slope, and vegetation conditions, as well as upstream land uses and contributing new and existing development.

d. WET WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three wet weather monitoring events at each long-term receiving water monitoring station. At least one wet weather monitoring event must be conducted during the first wet weather event of the wet season (October 1 – April 30), and at least one wet weather monitoring event during a wet weather event that occurs after February 1.

(1) Wet Weather Receiving Water Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each long-term receiving water monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event;

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(d) Presence and assessment of trash in and around station.

(2) Wet Weather Receiving Water Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

(3) Wet Weather Receiving Water Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) Constituents listed in Table D-3.

(4) Wet Weather Receiving Water Toxicity Monitoring

For each wet weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for chronic aquatic toxicity in accordance with Provisions D.1.c.(4)(a)-(f).

e. OTHER RECEIVING WATER MONITORING REQUIREMENTS

(1) Regional Monitoring

The Copermittees must participate in the following regional receiving waters monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring; and

(b) Southern California Bight Regional Monitoring~~.~~ and

(c) Unified Beach Water Quality Monitoring and Assessment Program. The Orange County Copermittees shall participate in and, together with South Orange County Wastewater Authority and Orange County Health Care Agency, shall share responsibility for implementation of a unified regional beach water quality monitoring and assessment program in south Orange County, as set forth in the October 2014 report, *Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County* , issued pursuant to CWC section 13383 and subject to future revision in the San Diego Water Board December 5, 2014 Letter Directive.

(2) Sediment Quality Monitoring

The Copermittees must perform sediment monitoring to assess compliance with sediment quality receiving water limits applicable to MS4 discharges to enclosed bays and estuaries. The monitoring may be performed either by individual or multiple Copermittees to assess compliance with receiving water limits, or through participation in a water body monitoring coalition. A Sediment Monitoring Plan which satisfies the requirements of the State Water Board's Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part 1 Sediment Quality (Sediment Control Plan) must be submitted as part of the monitoring and assessment program in the Water Quality Improvement Plan.

(a) The Sediment Monitoring Plan design must include the following:

(i) The elements required under Section VII.D (Receiving Water Limits Monitoring Frequency) and Section VII.E (Sediment Monitoring) of the Sediment Control Plan;

(ii) A Quality Assurance Project Plan (QAPP) describing the project objectives and organization, functional activities, and quality assurance/quality control protocols for the water and sediment monitoring; and

(iii) A schedule for completion of all sample collection and analysis activities and submission of Sediment Monitoring Reports.

(b) The Copermittees must implement the Sediment Monitoring Plan in accordance with the schedule contained in the Sediment Monitoring Plan, unless otherwise directed in writing by the San Diego Water Board Executive Officer.

(c) The Copermittees must incorporate a Sediment Monitoring Report as part of the Water Quality Improvement Plan Annual Report in accordance with the schedule contained in the Sediment Monitoring Plan, unless otherwise directed in writing by the San Diego Water Board Executive Officer. The Sediment Monitoring Report must contain the following information:

(i) Analysis: An evaluation, interpretation and tabulation of the water and sediment monitoring data, including interpretations and conclusions as to whether applicable Receiving Water Limitations in this Order have been attained at each sample station;

(ii) Sample Location Map: The locations, type, and number of samples must be identified and shown on a site map; and

(iii) California Environmental Data Exchange Network: A statement certifying that the monitoring data and results have been uploaded into the California Environmental Data Exchange Network (CEDEN).

(d) Based on the Sediment Monitoring Report conclusions the San Diego Water Board may require a human health risk assessment to determine if the human health objective contained in Receiving Water Limitations in Provision A.2.a.(3)(b)(ii) has been attained at each sample station. In conducting a risk assessment, the Copermittees must consider any applicable and relevant information, including California Environmental Protection Agency's (Cal/EPA) Office of Environmental Health Hazard Assessment (OEHHA) policies for fish consumption and risk assessment, Cal/EPA's Department of Toxic Substances Control (DTSC) Risk Assessment, and USEPA Human Health Risk Assessment policies.

(3) ASBS Monitoring

For Watershed Management Areas with ASBS, the Copermittees must implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

f. ALTERNATIVE WATERSHED MONITORING REQUIREMENTS

The San Diego Water Board may direct the Copermittees to participate in an effort to develop alternative watershed monitoring with other regulated entities, other interested parties, and the San Diego Water Board to refine, coordinate, and implement regional monitoring and assessment programs to determine the status and trends of water quality conditions in 1) coastal waters, 2) enclosed

bays, harbors, estuaries, and lagoons, and 3) streams.

2. MS4 Outfall Discharge Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the discharges from the MS4 outfalls in each Watershed Management Area during dry weather and wet weather. Following San Diego Water Board acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct MS4 outfall discharge monitoring during implementation of the Water Quality Improvement Plan to assess the effectiveness of their jurisdictional runoff management programs toward effectively prohibiting non-storm water discharges into the MS4 and reducing pollutants in storm water discharges from their MS4s to the MEP. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following MS4 outfall monitoring procedures:

a. TRANSITIONAL MS4 OUTFALL DISCHARGE MONITORING

Until the monitoring requirements and schedules of Provisions D.2.b-c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following MS4 outfall discharge monitoring in the Watershed Management Area:

(1) MS4 Outfall Discharge Monitoring Station Inventory

Each Copermittee must identify all major MS4 outfalls that discharge directly to receiving waters within its jurisdiction and geo-locate those outfalls on a map of the MS4 pursuant to Provision E.2.b.(1). This information must be compiled into a MS4 outfall discharge monitoring station inventory, and must include the following information:

(a) Latitude and longitude of MS4 outfall point of discharge;

(b) Watershed Management Area;

(c) Hydrologic subarea;

(d) Outlet size;

(e) Accessibility (i.e. safety and without disturbance of critical habitat);

(f) Approximate drainage area; and

(g) Classification of whether the MS4 outfall is known to have persistent dry weather flows, transient dry weather flows, no dry weather flows, or unknown dry weather flows.

(2) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Until the monitoring requirements and schedules of Provision D.2.b are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, each Copermittee must perform dry weather MS4 outfall field screening monitoring to identify non-storm water and illicit discharges within its jurisdiction in accordance with Provision E.2.c, to determine which discharges are transient flows and which are persistent flows, and prioritize the dry weather MS4 discharges that will be investigated and eliminated in accordance with Provision E.2.d.

(a) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Frequency

Each Copermittee must field screen the MS4 outfalls in its inventory developed pursuant to Provision D.2.a.(1) as follows:

(i) For Copermittees with less than 125 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 80 percent of the outfalls must be visually inspected two times per year during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv).

(ii) For Copermittees with 125 major MS4 outfalls or more, but less than or equal to 500 that discharge to receiving waters within a Watershed Management Area, all the outfalls must be visually inspected at least annually during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv).

(iii) For Copermittees with more than 500 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 500 outfalls must be visually inspected at least annually during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv). Copermittees with more than 500 major MS4 outfalls within a Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;

[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(iv) For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major MS4 outfalls within its jurisdiction, at least 500 major MS4 outfalls within its inventory must be visually inspected at least annually during dry weather conditions. Copermittees with more than 500 major MS4 outfalls in more than one Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(v) Inspections of major MS4 outfalls conducted in response to public reports and staff or contractor reports and notifications may count toward the required visual inspections of MS4 outfall discharge monitoring stations.

(b) Transitional Dry Weather MS4 Outfall Discharge Field Screening Visual Observations

(i) An antecedent dry period of at least 72 hours following any storm event producing measurable rainfall greater than 0.1 inch is required prior to conducting field screening visual observations during a field screening monitoring event.

(ii) During the field screening monitoring event, each Copermittee must record visual observations consistent with Table D-5 at each MS4 outfall discharge monitoring station inspected.

Table D-5. Field Screening Visual Observations for MS4 Outfall Discharge Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) - Flow source(s) suspected or identified from non-storm water source investigation - Flow source(s) eliminated during non-storm water source identification • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) - Known or suspected source(s) of pooled or ponded water • Station description (i.e. deposits or stains, vegetation condition, structural condition, observable biology) • Presence and assessment of trash in and around station • Evidence or signs of illicit connections or illegal dumping

(iii) Each Copermittee must implement the requirements of Provisions E.2.d.(2)(c)-(e) based on the field observations required pursuant to Provision D.2.a.(2)(b)(ii).

(iv) Each Copermittee must evaluate field observations together with existing information available from prior reports, inspections and monitoring results to determine whether any observed flowing, pooled, or ponded waters are likely to be transient or persistent flow.[19]

(c) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Records

Based upon the results of the transitional dry weather MS4 outfall discharge field screening monitoring conducted pursuant to Provisions D.2.a.(2)(a)-(b), each Copermittee must update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow.

(3) Transitional Wet Weather MS4 Outfall Discharge Monitoring

Until the monitoring requirements and schedules of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the

[19] Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(a) Transitional Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees must select wet weather MS4 outfall discharge monitoring stations from the inventories developed pursuant to Provision D.2.a.(1) for each Watershed Management Area as follows:

(i) At least five wet weather MS4 outfall discharge monitoring stations that are representative of storm water discharges from areas consisting primarily of residential, commercial, industrial, and typical mixed-use land uses present within the Watershed Management Area;

(ii) At least one wet weather MS4 outfall discharge monitoring station for each Copermittee within the Watershed Management Area; and

(iii) The County of San Diego may select at least two (2) wet weather MS4 outfall discharge monitoring stations for the portion of the Santa Margarita River Watershed Management Area within its jurisdiction to be monitored during the transitional period until the Riverside County Copermittees are notified of coverage under this Order. After the Riverside County Copermittees are notified of coverage under this Order, the Copermittees in the Watershed Management Area must select wet weather MS4 outfall discharge monitoring stations consistent with the requirements above.

(b) Transitional Wet Weather MS4 Outfall Discharge Monitoring Frequency

Each wet weather MS4 outfall discharge monitoring station selected pursuant to Provision D.2.a.(3)(a) must be monitored once during the wet season (October 1 – April 30). The wet weather monitoring events must be selected to be representative of the range of hydrological conditions experienced in the region. At least 10 percent of samples must be conducted during the first wet weather event of the wet season, to include at least one such sample in each Watershed Management Area..

(c) Transitional Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(i) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the

storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(ii) The flow rates and volumes measured or estimated from the MS4 outfall (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(d) Transitional Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(e) Transitional Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, and indicator bacteria;

(iv) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

[a] Time-weighted composites collected over the length of the storm event or the first 24 hour period whichever is shorter, composed of discrete samples, which may be collected through the use of automated equipment, or

[b] Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

[c] If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours;

(v) Only one analysis of the composite of aliquots is required;

(vi) The samples must be analyzed for the following constituents:

[a] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

[b] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and

[c] Constituents listed in Table D-6.

Table D-6. Analytical Monitoring Constituents for Wet Weather MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Nickel • Selenium • Thallium • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(f) Other Transitional Wet Weather MS4 Outfall Discharge Monitoring

The San Diego County Copermittees must continue the wet weather MS4 outfall monitoring program developed under Order No. R9-2007-0001, as approved by the San Diego Water Board, through its planned completion.

b. Dry Weather MS4 Outfall Discharge Monitoring

Each Copermittee must perform dry weather MS4 outfall monitoring to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. Each Copermittee must conduct the following dry weather MS4 outfall discharge monitoring within its jurisdiction:

(1) Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Each Copermittee must continue to perform the dry weather MS4 outfall discharge field screening monitoring in accordance with the requirements of Provision D.2.a.(2). The Copermittee may adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of persistent flow non-storm water discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of visual inspections performed is equivalent to the number of visual inspections required under Provision D.2.a.(2)(a).

(2) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring

Each Copermittee must perform non-storm water persistent flow MS4 outfall discharge monitoring to determine which persistent non-storm water discharges contain concentrations of pollutants below NALs, and which persistent non-storm water discharges impact receiving water quality during dry weather. Each Copermittee must conduct the following non-storm water persistent flow MS4 outfall discharge monitoring within its jurisdiction:

(a) Prioritization of Non-Storm Water Persistent Flow MS4 Outfalls

Based upon the dry weather MS4 outfall discharge field screening monitoring records developed pursuant to Provision D.2.a.(2)(c), each Copermittee must identify and prioritize the MS4 outfalls with persistent flows based on the highest priority water quality conditions identified in the Water Quality Improvement Plan and any additional criteria developed by the Copermittee, which may include historical data and data from sources other than what the Copermittee collects.

(b) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring Frequency

(i) Based on the prioritization of major MS4 outfalls developed under Provision D.2.b.(2)(a), each Copermittee must identify, at a minimum, the 5 highest priority major MS4 outfalls with non-storm water persistent flows that the Copermittee will monitor within its jurisdiction in each Watershed Management Area. For Responsible Copermittees identified by a TMDL in Attachment E to this Order, if the 5 chosen outfall locations are not sufficient to determine compliance with the TMDL(s), then each Responsible Copermittee must identify additional MS4 outfall monitoring locations within its jurisdiction sufficient to address compliance with the TMDL(s). If a Copermittee has less than 5 major outfalls within a Watershed

Management Area, then the Copermittee must monitor all of its major MS4 outfalls with persistent flows within each Watershed Management Area. The location of the highest priority non-storm water persistent flow MS4 outfall monitoring stations must be identified on the map required pursuant to Provision E.2.b.(1). The map must specify which MS4 outfalls are being monitored for compliance with a TMDL.

(ii) Each of the highest priority non-storm water persistent flow MS4 outfall monitoring stations identified pursuant to Provision D.2.b.(2)(b)(i) must be monitored under dry weather conditions at least semi-annually until one of the following occurs:

[a] The non-storm water discharges have been effectively eliminated (i.e. no flowing, pooled, or ponded water) for three consecutive dry weather monitoring events; or

[b] The source(s) of the persistent flows has been identified as a category of non-storm water discharges that does not require an NPDES permit and does not have to be addressed as an illicit discharge because it was not identified as a source of pollutants (i.e. constituents in non-storm water discharge do not exceed NALs), and the persistent flow can be re-prioritized to a lower priority; or

[c] The constituents in the persistent flow non-storm water discharge do not exceed NALs, and the persistent flow can be re-prioritized to a lower priority; or

[d] The source(s) of the persistent flows has been identified as a non-storm water discharge authorized by a separate NPDES permit.

(iii) Where the criteria under Provision D.2.b.(2)(b)(ii) are not met, but the threat to water quality has been reduced by the Copermittee, the highest priority persistent flow MS4 outfall monitoring stations may be reprioritized accordingly for continued dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1).

(iv) Each Copermittee must document removal or re-prioritization of the highest priority persistent flow MS4 outfall monitoring stations identified under Provision D.2.b.(2)(a) in the Water Quality Improvement Plan Annual Report. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized major MS4 outfall in the Watershed Management Area within its jurisdiction, unless there are no remaining qualifying major MS4 outfalls within the Copermittee's jurisdiction in the Watershed Management Area.

(c) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Observations

During each semi-annual monitoring event, each Copermittee must record field observations consistent with Table D-5 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(d) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Monitoring

During each semi-annual monitoring event, if conditions allow the collection of the data, each Copermittee must monitor and record the parameters in Table D-2 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(e) Non-Storm Water Persistent Flow MS4 Outfall Discharge Analytical Monitoring

During each semi-annual monitoring event in which measurable flow is present, each Copermittee must collect and analyze samples from each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Collect grab or composite samples to be analyzed at a qualified laboratory for the following constituents:

[a] Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,
[b] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,
[c] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,
[d] Applicable NAL constituents, and
[e] Constituents listed in Table D-7. The Copermittees may adjust the list of constituents for the Watershed Management Area if historical data or supporting information can be provided that demonstrates or justifies the analysis of a constituent is not necessary.

Table D-7. Analytical Monitoring Constituents for Persistent Flow MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Total Hardness • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Cadmium • Copper • Lead • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(iv) If the Copermittee identifies and eliminates the source of the persistent flow non-storm water discharge, analysis of the sample is not required.

c. WET WEATHER MS4 OUTFALL DISCHARGE MONITORING

The Copermittees must perform wet weather MS4 outfall monitoring to identify pollutants in storm water discharges from the MS4s, to guide pollutant source identification efforts, and to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order. The Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(1) Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees may adjust the wet weather MS4 outfall discharge monitoring locations in the Watershed Management Area, as needed, to identify pollutants in storm water discharges from MS4s, to guide pollutant source identification efforts, and to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of stations is at least equivalent to the number of stations required under Provision D.2.a.(3)(a). Additional outfall monitoring locations, above the minimum per jurisdiction, may be required to demonstrate compliance with the WQBELs associated with the applicable TMDLs in Attachment E.

(2) Wet Weather MS4 Outfall Discharge Monitoring Frequency

The Copermittees must monitor the wet weather MS4 outfall discharge monitoring stations in the Watershed Management Area at least once (1) per year. The Copermittees may need to increase the frequency of monitoring in order to identify pollutants in storm water discharges from the MS4s causing or contributing to the highest priority water quality conditions, to guide pollutant source identification efforts, or to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order.

(3) Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(4) Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(5) Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate

the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites collected over the length of the storm event or the first 24 hour period, whichever is shorter , composed of discrete samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

(iii) If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours.

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) The Copermittees may adjust the analytical monitoring required for the Watershed Management Area, if the Copermittees have historical data or supporting information that can demonstrate or provide justification that the analysis of a constituent is not necessary.

3. Special Studies

a. Within the term of this Order, the Copermittees must initiate the following special studies:

(1) At least two special studies in each Watershed Management Area to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that cause or contribute to highest priority water quality conditions identified in the Water Quality Improvement Plan.

(2) At least one special study for the San Diego Region to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that are impacting receiving waters on a regional basis in the San Diego Region.

(3) One of the two special studies in each Watershed Management Area required pursuant to Provision D.3.a.(1) may be replaced by a special study implemented pursuant to Provision D.3.a.(2).

b. The special studies must, at a minimum, be in conformance with the following criteria:

(1) The special studies must be related to the highest priority water quality conditions identified by the Copermittees in the Watershed Management Area and/or for the entire San Diego Region;

(2) The special studies developed pursuant to Provision D.3.a.(1) must:

(a) Be implemented within the applicable Watershed Management Area, and

(b) Require some form of participation by all the Copermittees within the Watershed Management Area;

(3) The special studies developed pursuant to Provision D.3.a.(2) must:

(a) Be implemented within the San Diego Region, and

(b) Require some form of participation by all Copermittees covered under the requirements of this Order.

(4) The Copermittees are encouraged to partner with environmental groups or third parties knowledgeable of watershed conditions to complete the required special studies.

c. Special studies developed to identify sources of pollutants and/or stressors should be pollutant and/or stressor specific and based on historical monitoring data and monitoring performed pursuant to Provisions D.1 and D.2. Development of source identification special studies should include the following:

(1) A compilation of known information on the specific pollutant and/or stressor,

including data on potential sources and movement of the pollutant and/or stressor within the watershed. Data generated by the Copermittees and others, as well as information available from a literature research on the pollutant and/or stressor should be compiled and analyzed as appropriate.

(2) An identification of data gaps, based on the compiled information generated on the specific pollutant and/or stressor identified in Provision D.3.c.(1). Source identification special studies should be developed to fill identified data gaps.

(3) A monitoring plan that will collect and provide data the Copermittees can utilize to do the following:

(a) Quantify the relative loading or impact of a pollutant and/or stressor from a particular source or pollutant generating activity;

(b) Improve understanding of the fate of a pollutant and/or stressor in the environment;

(c) Develop an inventory of known and suspected sources of a pollutant and/or stressor in the Watershed Management Area; and/or

(d) Prioritize known and suspected sources of a pollutant and/or stressor based on relative magnitude in discharges, geographical distribution (i.e., regional or localized), frequency of occurrence in discharges, human health risk, and controllability.

d. Special studies initiated prior to the effective date of this Order that meet the requirements of Provision D.3.b and are implemented during the term of this Order as part of the Water Quality Improvement Plan may be utilized to fulfill the special study requirements of Provision D.3.a. Special studies completed before the effective date of this Order cannot be utilized to fulfill the special study requirements of Provision D.3.a.

e. The Copermittees must submit the monitoring plans for the special studies in the Water Quality Improvement Plans required pursuant to Provision F.1.

f. The Copermittees are encouraged to share the results of the special studies regionally among the Copermittees to provide information useful in improving and adapting the management of non-storm water and storm water runoff through the implementation of the Water Quality Improvement Plans.

4. Assessment Requirements

Each Copermittee must evaluate the data collected pursuant to Provisions D.1, D.2 and D.3, and information collected during the implementation of the jurisdictional

runoff management programs required pursuant to Provision E, to assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a. Assessments must be performed as described in the following provisions:

a. RECEIVING WATERS ASSESSMENTS

(1) The Copermittees must assess and report the conditions of the receiving waters in the Watershed Management Area as follows:

(a) Based on data collected pursuant to Provision D.1.a, the assessments under Provision D.4.a.(2) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(b) Based on the data collected pursuant to Provisions D.1.a-e, the assessments required under Provision D.4.a.(2) must be included in the Report of Waste Discharge required pursuant to Provision F.5.b.

(2) The Copermittees must assess the status and trends of receiving water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under dry weather and wet weather conditions. For each of the three types of receiving waters in each Watershed Management Area the Copermittees must:

(a) Determine whether or not the conditions of the receiving waters are meeting the numeric goals established pursuant to Provision B.3.a;

(b) Identify the most critical beneficial uses that must be protected to ensure overall health of the receiving water;

(c) Determine whether or not those critical beneficial uses are being protected;

(d) Identify short-term and/or long-term improvements or degradation of those critical beneficial uses;

(e) Determine whether or not the strategies established in the Water Quality Improvement Plan contribute towards progress in achieving the interim and final numeric goals of the Water Quality Improvement Plan; and

(f) Identify data gaps in the monitoring data necessary to assess Provisions D.4.a.(2)(a)-(e).

b. MS4 OUTFALL DISCHARGES ASSESSMENTS

(1) Non-Storm Water Discharges Reduction Assessments

(a) Each Copermittee must assess and report the progress of its illicit discharge detection and elimination program, required to be implemented pursuant to Provision E.2, toward effectively prohibiting non-storm water and illicit discharges into the MS4 within its jurisdiction as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(2), the assessments under Provision D.4.b.(1)(b) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(ii) Based on the data collected pursuant to Provisions D.2.b, the assessments required under Provision D.4.b.(1)(c) must be included in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

(iii) Based on the data collected pursuant to Provisions D.2.b, the assessment required under Provision D.4.b.(1)(c) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.a.(2), each Copermittee must assess and report the following:

(i) Identify the known and suspected controllable sources (e.g. facilities, areas, land uses, pollutant generating activities) of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area;

(ii) Identify sources of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area that have been reduced or eliminated; and

(iii) Identify modifications to the field screening monitoring locations and frequencies for the MS4 outfalls in its inventory necessary to identify and eliminate sources of persistent flow non-storm water discharges pursuant to Provision D.2.b.

(c) Based on the dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1), each Copermittee must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(1)(b);

(ii) Based on the data collected and applicable NALs in the Water Quality Improvement Plan, rank the MS4 outfalls in the Copermittee's jurisdiction according to potential threat to receiving water quality, and produce a prioritized list of major MS4 outfalls for follow-up action to update the Water Quality Improvement Plan, with the goal of eliminating persistent flow non-storm water discharges and/or pollutant loads in order of the ranked priority list through targeted programmatic actions and source investigations;

(iii) For the highest priority major MS4 outfalls with persistent flows that are in exceedance of NALs, identify the known and suspected sources within the Copermittee's jurisdiction in the Watershed Management Area that may cause or contribute to the NAL exceedances;

(iv) Each Copermittee must analyze the data collected pursuant to Provision D.2.b, and utilize a model or other method, to calculate or estimate the non-storm water volumes and pollutant loads collectively discharged from all the major MS4s outfalls in its jurisdiction identified as having persistent dry weather flows during the monitoring year. These calculations or estimates must be updated annually.

[a] Each Copermittee must calculate or estimate the annual non-storm water volumes and pollutant loads collectively discharged from the Copermittee's major MS4 outfalls to receiving waters within the Copermittee's jurisdiction, with an estimate of the percent contribution from each known source for each MS4 outfall;

[b] Each Copermittee must annually identify and quantify (i.e. volume and pollutant loads) sources of non-storm water not subject to the Copermittee's legal authority that are discharged from the Copermittee's major MS4 outfalls to downstream receiving waters.

(v) Each Copermittee must review the data collected pursuant to Provision D.2.b and findings from the assessments required pursuant to Provision D.4.b.(1)(c)(i)-(iv) at least once during the term of this Order to:

[a] Identify reductions and progress in achieving reductions in non-storm water and illicit discharges to the Copermittee's MS4 in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction, with an estimate, if possible, of the non-storm water volume and/or pollutant load reductions

attributable to specific water quality strategies implemented by the Copermittee; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittee in the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction.

(vi) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(1)(c)(i)-(v).

(2) Storm Water Pollutant Discharges Reduction Assessments

(a) The Copermittees must assess and report the progress of the water quality improvement strategies, required to be implemented pursuant to Provisions B and E, toward reducing pollutants in storm water discharges from the MS4s within the Watershed Management Area as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(3), the assessments under Provision D.4.b.(2)(b) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(ii) Based on the data collected pursuant to Provisions D.2.c, the assessments required under Provision D.4.b.(2)(c) must be included in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

(iii) Based on the data collected pursuant to Provisions D.2.c, the assessment required under Provisions D.4.b.(2)(c)-(d) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.a.(3) the Copermittees must assess and report the following:

(i) The Copermittees must analyze the monitoring data collected pursuant to Provision D.2.a.(3), and utilize a watershed model or other method, to calculate or estimate the following for each monitoring year:

[a] The average storm water runoff coefficient for each land use type within the Watershed Management Area;

[b] The volume of storm water and pollutant loads discharged from each of the Copermittee's monitored MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch;

[c] The total flow volume and pollutant loadings discharged from the Copermittee's jurisdiction within the Watershed Management Area over the course of the wet season, extrapolated from the data produced from the monitored MS4 outfalls; and

[d] The percent contribution of storm water volumes and pollutant loads discharged from each land use type within each hydrologic subarea with a major MS4 outfall to receiving waters or within each major MS4 outfall to receiving waters in the Copermittee's jurisdiction within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch.

(ii) Identify modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify pollutants in storm water discharges from the MS4s in the Watershed Management Area pursuant to Provision D.2.c.(1).

(c) Based on the wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.c the Copermittees must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(2)(b);

(ii) Based on the data collected and applicable SALs in the Water Quality Improvement Plan, analyze and compare the monitoring data to the analyses and assumptions used to develop the Water Quality Improvement Plans, including strategies developed pursuant to Provision B.3, and evaluate whether those analyses and assumptions should be updated as a component of the adaptive management efforts pursuant to Provision B.5 for follow-up action to update the Water Quality Improvement Plan;

(iii) The Copermittees must review the data collected pursuant to Provision D.2.c and findings from the assessments required pursuant to Provisions D.4.b.(2)(c)(i)-(ii) at least once during the term of this Order to:

[a] Identify reductions or progress in achieving reductions in pollutant concentrations and/or pollutant loads from different land uses and/or drainage areas discharging from the Copermittees' MS4s in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters within the Watershed Management Area to the MEP, with an estimate, if possible, of the pollutant load reductions attributable to specific water quality strategies implemented by the Copermittees; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittees in the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters in the Watershed Management Area to the MEP.

(iv) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(iii).

(d) The Copermittees must evaluate all the data collected pursuant to Provision D.2.c, and incorporate new outfall monitoring data into time series plots for each long-term monitoring constituent for the Watershed Management Area, and perform statistical trends analysis on the cumulative long-term wet weather MS4 outfall discharge water quality data set.

c. Special Studies Assessments

The Copermittees must annually evaluate the results and findings from the special studies developed and implemented pursuant to Provision D.3, and assess their relevance to the Copermittees' efforts to characterize receiving water conditions, understand sources of pollutants and/or stressors, and control and reduce the discharges of pollutants from the MS4 outfalls to receiving waters in the Watershed Management Area. The Copermittees must report the results of the special studies assessments applicable to the Watershed Management Area, and identify any necessary modifications or updates to the Water Quality Improvement Plan based on the results in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

d. Integrated Assessment of Water Quality Improvement Plan

As part of the iterative approach and adaptive management process required for the Water Quality Improvement Plan pursuant to Provision B.5, the Copermittees in each Watershed Management Area must integrate the data collected pursuant to Provisions D.1-D.3, the findings from the assessments required pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to assess the effectiveness of, and identify necessary modifications to, the Water Quality Improvement Plan as follows:

(1) The Copermittees must re-evaluate the priority water quality conditions and numeric goals for the Watershed Management Area, as needed, during the term of this Order pursuant to Provision B.5.a. The re-evaluation and recommendations for modifications to the priority water quality conditions, and/or numeric goals and corresponding schedules may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to

Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The priority water quality conditions and numeric goals for the Watershed Management Area must be re-evaluated as follows:

(a) Re-evaluate the receiving water conditions in the Watershed Management Area in accordance with Provision B.2.a;

(b) Re-evaluate the impacts on receiving waters in the Watershed Management Area from MS4 discharges in accordance with Provision B.2.b;

(c) Re-evaluate the identification of MS4 sources of pollutants and/or stressors in accordance with Provision B.2.d;

(d) Identify beneficial uses of the receiving waters that are protected in accordance with Provision D.4.a;

(e) Evaluate the progress toward achieving the interim and final numeric goals for protecting impacted beneficial uses in the receiving waters.

(2) The Copermittees must re-evaluate the water quality improvement strategies for the Watershed Management Area during the term of this Order pursuant to Provision B.5.b. The re-evaluation and recommendations for modifications to the water quality improvement strategies and schedules may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The water quality improvement strategies for the Watershed Management Area must be re-evaluated as follows:

(a) Identify the non-storm water and storm water pollutant loads from the Copermittees' MS4 outfalls in the Watershed Management Area, calculated or estimated pursuant to Provisions D.4.b;

(b) Identify the non-storm water and storm water pollutant load reductions, or other improvements to receiving water or water quality conditions, that are necessary to attain the interim and final numeric goals identified in the Water Quality Improvement Plan for protecting beneficial uses in the receiving waters;

(c) Identify the non-storm water and storm water pollutant load reductions, or other improvements to the quality of MS4 discharges, that are necessary for the Copermittees to demonstrate that non-storm water and storm water discharges from their MS4s are not causing or contributing to exceedances of receiving water limitations;

(d) Evaluate the progress of the water quality improvement strategies toward

achieving the interim and final numeric goals identified in the Water Quality Improvement Plan for protecting beneficial uses in the receiving waters.

(3) The Copermittees must re-evaluate and adapt the water quality monitoring and assessment program for the Watershed Management Area when new information becomes available to improve the monitoring and assessment program pursuant to Provision B.5.c. The re-evaluation and recommendations for modifications to the monitoring and assessment program may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. Modifications to the water quality monitoring and assessment program must be consistent with the requirements of Provision D.1-D.3. The re-evaluation of the water quality monitoring and assessment program for the Watershed Management Area must consider the data gaps identified by the assessments required pursuant to Provisions D.4.a-b, and results of the special studies implemented pursuant to Provision D.4.c.

5. Monitoring Provisions

Each Copermittee must comply with all the monitoring, reporting, and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

E. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS

The purpose of this provision is for each Copermittee to implement a program to control the contribution of pollutants to and the discharges from the MS4 within its jurisdiction. The goal of the jurisdictional runoff management programs is to implement strategies that effectively prohibit non-storm water discharges to the MS4 and reduce the discharge of pollutants in storm water to the MEP. This goal will be accomplished through implementing the jurisdictional runoff management programs in accordance with the strategies identified in the Water Quality Improvement Plans.

Each Copermittee must update its jurisdictional runoff management program document, in accordance with Provision F.2.a, to incorporate all the requirements of Provision E. Until the Copermittee has updated its jurisdictional runoff management program document with the requirements of Provision E, the Copermittee must continue implementing its current jurisdictional runoff management program.

1. Legal Authority Establishment and Enforcement

a. Each Copermittee must establish, maintain, and enforce adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 through statute, ordinance, permit, contract, order, or similar means. This legal authority must, at a minimum, authorize the Copermittee to:

(1) Prohibit and eliminate all illicit discharges and illicit connections to its MS4;

(2) Control the contribution of pollutants in discharges of runoff associated with industrial and construction activity to its MS4 and control the quality of runoff from industrial and construction sites, including industrial and construction sites which have coverage under the statewide General Permit for Discharges of Storm Water Associated with Industrial Activities (Industrial General Permit) or General Permit for Discharges of Storm Water Associated with Construction Activities (Construction General Permit), as well as to those sites which do not;

(3) Control the discharge of spills, dumping, or disposal of materials other than storm water into its MS4;

(4) Control through interagency agreements among Copermittees the contribution of pollutants from one portion of the MS4 to another portion of the MS4;

(5) Control, by coordinating and cooperating with other owners of the MS4 such as Caltrans, the U.S. federal government, or sovereign Native American Tribes through interagency agreements, where possible, the contribution of pollutants from their portion of the MS4 to the portion of the MS4 within the Copermittee's jurisdiction;

(6) Require compliance with conditions in its statutes, ordinances, permits, contracts, orders, or similar means to hold dischargers to its MS4 accountable for their contributions of pollutants and flows;

(7) Require the use of BMPs to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(8) Require documentation on the effectiveness of BMPs implemented to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(9) Utilize enforcement mechanisms to require compliance with its statutes, ordinances, permits, contracts, orders, or similar means; and

(10) Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with its statutes, ordinances, permits, contracts, orders, or similar means and with the requirements of this Order, including the prohibition of illicit discharges and connections to its MS4; the Copermittee must also have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from industrial facilities, including construction sites, discharging into its MS4.

b. With the first Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3), each Copermittee must submit a statement certified by its Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative that the Copermittee has taken the necessary steps to obtain and maintain full legal authority within its jurisdiction to implement and enforce each of the requirements contained in this Order.

2. Illicit Discharge Detection and Elimination

Each Copermittee must implement a program to actively detect and eliminate illicit discharges and improper disposal into the MS4, or otherwise require the discharger to apply for and obtain a separate NPDES permit. The illicit discharge detection and elimination program must be implemented in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include, at a minimum, the following requirements:

a. Non-Storm Water Discharges

Each Copermittee must address all non-storm water discharges as illicit discharges unless a non-storm water discharge is either identified as a discharge authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to the following requirements:

(1) Discharges of non-storm water to the MS4 from the following categories must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG919001 (Order No. R9-2007-0034, or subsequent order) for discharges to San Diego Bay, or NPDES Permit No. CAG919002 (Order No. R9-2008-0002, or subsequent order) for discharges to surface waters other than San Diego Bay:

(1) Uncontaminated pumped ground water;

(2) Discharges from foundation drains;[20]

(3) Water from crawl space pumps; and

(4) Water from footing drains.[20]

(2) Discharges of non-storm water from water line flushing and water main breaks to the MS4 must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG 679001 (Order No. R9-2010-0003 or subsequent order). This category includes water line flushing and water main break discharges from water purveyors issued a water supply permit by the California Department of Public Health or federal military installations. Discharges from recycled or reclaimed water lines to the MS4 must be addressed as illicit discharges, unless the discharges have coverage under a separate NPDES permit.

(3) Discharges of non-storm water to the MS4 from the following categories must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a source of pollutants to receiving waters:

(a) Diverted stream flows;

(b) Rising ground waters;

(c) Uncontaminated ground water infiltration to MS4s;

(d) Springs;

(e) Flows from riparian habitats and wetlands;

(f) Discharges from potable water sources;

[20] Provision E.2.a.(1) only applies to this category of non-storm water if the system is designed to be located at or below the groundwater table to actively or passively extract groundwater during any part of the year.

(g) Discharges from foundation drains;[21] and

(h) Discharges from footing drains.[21]

(4) Discharges of non-storm water to the MS4 from the following categories must be controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means. Discharges of non-storm water to the MS4 from the following categories not controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means must be addressed by the Copermittee as illicit discharges.

(a) Air conditioning condensation

The discharge of air conditioning condensation should be directed to landscaped areas or other pervious surfaces, or to the sanitary sewer, where feasible.

(b) Individual residential vehicle washing

(i) The discharge of wash water should be directed to landscaped areas or other pervious surfaces where feasible; and

(ii) The minimization of water, washing detergent and other vehicle wash products used for residential vehicle washing, and the implementation of other practices or behaviors that will prevent the discharge of pollutants associated with individual residential vehicle washing from entering the MS4 must be encouraged.

(c) Dechlorinated swimming pool discharges

(i) Residual chlorine, algaecide, filter backwash, or other pollutants from swimming pools must be eliminated prior to discharging to the MS4; and

(ii) The discharge of saline swimming pool water must be directed to the sanitary sewer, landscaped areas, or other pervious surfaces that can accommodate the volume of water, unless the saline swimming pool water can be discharged via a pipe or concrete channel directly to a naturally saline water body (e.g. Pacific Ocean).

(5) Firefighting discharges to the MS4 must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a significant source of pollutants to receiving waters. Firefighting discharges to the MS4 not identified as a significant source of pollutants to receiving waters, must be addressed, at a minimum, as follows:

[21] Provision E.2.a.(3) only applies to this category of non-storm water discharge if the system is designed to be located above the groundwater table at all times of the year, and the system is only expected to discharge non-storm water under unusual circumstances.

(a) Non-emergency firefighting discharges

(i) Building fire suppression system maintenance discharges (e.g. sprinkler line flushing) to the MS4 must be addressed as illicit discharges unless BMPs are implemented to prevent pollutants associated with such discharges to the MS4.

(ii) Non-emergency firefighting discharges (i.e., discharges from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems) must be addressed by a program, to be developed and implemented by the Copermittee, to reduce or eliminate pollutants in such discharges from entering the MS4.

(b) Emergency firefighting discharges

Each Copermittee should develop and encourage implementation of BMPs to reduce or eliminate pollutants in emergency firefighting discharges to the MS4s and receiving waters within its jurisdiction. During emergency situations, priority of efforts should be directed toward life, property, and the environment (in descending order). BMPs should not interfere with immediate emergency response operations or impact public health and safety.

(6) If the Copermittee or San Diego Water Board identifies any category of non-storm water discharges listed under Provisions E.2.a.(1)-(4) as a source of pollutants to receiving waters, the category must be prohibited through ordinance, order, or similar means and addressed as an illicit discharge. Alternatively, the Copermittee may propose controls to be implemented for the category of non-storm water discharges as part of the Water Quality Improvement Plan instead of prohibiting the category of non-storm water discharges, and implement the controls if accepted by the San Diego Water Board as part of the Water Quality Improvement Plan.

(7) Each Copermittee must, where feasible and priorities and resources allow, reduce or eliminate non-storm water discharges listed under Provisions E.2.a.(1)-(4) into its MS4, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit.

b. PREVENT AND DETECT ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to prevent and detect illicit discharges to the MS4:

(1) Each Copermittee must maintain an updated map of its entire MS4 and the corresponding drainage areas. The accuracy of the MS4 map must be confirmed during the field screening required pursuant to Provision E.2.c.

The MS4 map must be included as part of the jurisdictional runoff management program document. Any geographic information system (GIS) layers or files used by the Copermittee to maintain the MS4 map must be made available to the San Diego Water Board upon request. The MS4 map must identify the following:

(a) All segments of the MS4 owned, operated, and maintained by the Copermittee;

(b) All known locations of inlets that discharge and/or collect runoff into the Copermittee's MS4;

(c) All known locations of connections with other MS4s not owned or operated by the Copermittee (e.g. Caltrans MS4s);

(d) All known locations of MS4 outfalls and private outfalls that discharge runoff collected from areas within the Copermittee's jurisdiction;

(e) All segments of receiving waters within the Copermittee's jurisdiction that receive and convey runoff discharged from the Copermittee's MS4 outfalls;

(f) Locations of the MS4 outfalls, identified pursuant to Provision D.2.a.(1), within its jurisdiction; and

(g) Locations of the non-storm water persistent flow MS4 outfall discharge monitoring stations, identified pursuant to Provision D.2.b.(2), within its jurisdiction.

(2) Each Copermittee must use Copermittee personnel and contractors to assist in identifying and reporting illicit discharges and connections during their daily employment activities.

(3) Each Copermittee must promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges to or from the MS4, including the following methods for public reporting:

(a) Operate a public hotline, which can be Copermittee-specific or shared by the Copermittees, and must be capable of receiving reports in both English and Spanish 24 hours per day and seven days per week; and

(b) Designate an e-mail address for receiving electronic reports from the public, which can be Copermittee-specific or shared by the Copermittees, and must be prominently displayed on the Copermittee's webpage and the Regional Clearinghouse required pursuant to Provision F.4.

(4) Each Copermittee must implement practices and procedures (including a notification mechanism) to prevent, respond to, contain, and clean up any spills that may discharge into the MS4 within its jurisdiction from any source. The Copermittee must coordinate, to the extent possible, with spill response teams to prevent entry of spills into the MS4, and prevent contamination of surface water, ground water, and soil. The Copermittee must coordinate spill prevention, containment, and response activities throughout all appropriate Copermittee departments, programs, and agencies.

(5) Each Copermittee must implement practices and procedures to prevent and limit infiltration of seepage from sanitary sewers (including private laterals and failing septic systems) to the MS4.

(6) Each Copermittee must coordinate, when necessary, with upstream Copermittees and/or entities to prevent illicit discharges from upstream sources into the MS4 within its jurisdiction.

c. FIELD SCREENING

Each Copermittee must conduct field screening (i.e. visual observations, field testing, and/or analytical testing) of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4 in accordance with the dry weather MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

d. INVESTIGATE AND ELIMINATE ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to investigate and eliminate illicit discharges to the MS4:

(1) Each Copermittee must prioritize and determine when follow-up investigations will be performed in response to visual observations and/or water quality monitoring data collected during an investigation of a detected non-storm water or illicit discharge to or from the MS4. The criteria for prioritizing investigations must consider the following:

(a) Pollutants identified as causing or contributing to the highest water quality priorities identified in the Water Quality Improvement Plan;

(b) Pollutants identified as causing or contributing, or threatening to cause or contribute to impairments in water bodies on the 303(d) List and/or in environmentally sensitive areas (ESAs), located within its jurisdiction;

(c) Pollutants identified from sources or land uses known to exist within the area, drainage basin, or watershed that discharges to the portion of the MS4 within its jurisdiction included in the investigation;

(d) Pollutants identified as causing or contributing to an exceedance of a NAL in the Water Quality Improvement Plan; and

(e) Pollutants identified as a threat to human health or the environment.

(2) Each Copermittee must implement procedures to investigate and inspect portions of its MS4 that, based on reports or notifications, field screening, or other appropriate information, indicate a reasonable potential of receiving, containing, or discharging pollutants due to illicit discharges, illicit connections, or other sources of non-storm water. The procedures must include the following:

(a) Each Copermittee must develop criteria to:

(i) Assess the validity of each report or notification received; and

(ii) Prioritize the response to each report or notification received.

(b) Each Copermittee must prioritize and respond to each valid report or notification (e.g., public reports, staff or contractor reports and notifications, etc.) of an incident in a timely manner.

(c) In accordance with the requirements of Provision E.2.d.(1), each Copermittee must investigate and seek to identify the source(s) of discharges of non-storm water where flows are observed in and from the MS4 during the field screening required pursuant to Provision D.2.b.(1) as follows:

(i) Obvious illicit discharges must be immediately investigated to identify the source(s) of non-storm water discharges;

(ii) The investigation must include field investigations to identify sources or potential sources for the discharge, unless the source or potential source has already been identified during previous investigations; and

(iii) The investigation may include follow-up field investigations and/or reviewing Copermittee inventories and other land use data to identify potential sources of the discharge.

(d) Each Copermittee must maintain records and a database of the following information:

(i) Location of incident, including hydrologic subarea, portion of MS4 receiving the non-storm water or illicit discharge, and point of discharge or potential discharge from MS4 to receiving water;

(ii) Source of information initiating the investigation (e.g., public reports, staff or contractor reports and notifications, field screening, etc.);

(iii) Date the information used to initiate the investigation was received;

(iv) Date the investigation was initiated;

(v) Dates of follow-up investigations;

(vi) Identified or suspected source of the illicit discharge or connection, if determined;

(vii) Known or suspected related incidents, if any;

(viii) Result of the investigation; and

(ix) If a source cannot be identified and the investigation is not continued, document the response pursuant to the requirements of Provision E.2.d.(4).

(e) Each Copermittee must maintain records and, in accordance with the priorities of the Water Quality Improvement Plan, seek to identify the source(s) of non-storm water discharges from the MS4 where there is evidence of non-storm water having been discharged into or from the MS4 (e.g., pooled water), in accordance with MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

(3) Each Copermittee must initiate the implementation of procedures, in a timely manner, to eliminate all detected and identified illicit discharges and connections within its jurisdiction. The procedures must include the following responses:

(a) Each Copermittee must enforce its legal authority, as required under Provision E.1, to eliminate illicit discharges and connections to the MS4.

(b) If the Copermittee identifies the source as a controllable source of non-storm water or illicit discharge or connection, the Copermittee must implement its Enforcement Response Plan pursuant to Provision E.6 and enforce its legal authority to prohibit and eliminate illicit discharges and connections to its MS4.

(c) If the Copermittee identifies the source of the discharge as a category of non-storm water discharges in Provision E.2.a, and the discharge is in exceedance of NALs in the Water Quality Improvement Plan, then the Copermittee must determine if: (1) this is an isolated incident or set of circumstances that will be addressed through its Enforcement Response Plan pursuant to Provision E.6, or (2) the category of discharge must be addressed through the prohibition of that category of discharge as an illicit discharge pursuant to Provision E.2.a.(6).

(d) If the Copermittee suspects the source of the non-storm water discharge as natural in origin (i.e. non-anthropogenically influenced) and in conveyance into the MS4, then the Copermittee must document and

provide the data and evidence necessary to demonstrate to the San Diego Water Board that it is natural in origin and does not require further investigation.

(e) If the Copermittee is unable to identify and document the source of a recurring non-storm water discharge to or from the MS4, then the Copermittee must address the discharge as an illicit discharge and update its jurisdictional runoff management program to address the common and suspected sources of the non-storm water discharge within its jurisdiction in accordance with the Copermittee's priorities.

(4) Each Copermittee must submit a summary of the non-storm water discharges and illicit discharges and connections investigated and eliminated within its jurisdiction with each Water Quality Improvement Plan Annual Report required under Provision F.3.b.(3) of this Order.

3. Development Planning

Each Copermittee must use their land use and planning authorities to implement a development planning program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. BMP Requirements for All Development Projects

Each Copermittee must prescribe the following BMP requirements during the planning process (i.e. prior to project approval and issuance of local permits) for all development projects (regardless of project type or size), where local permits are issued, including unpaved roads and flood management projects:

(1) General Requirements

(a) Onsite BMPs must be located so as to remove pollutants from runoff prior to its discharge to any receiving waters, and as close to the source as possible;

(b) Structural BMPs must not be constructed within waters of the U.S.

(c) Onsite BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors (e.g. mosquitos, rodents, or flies).

(2) Source Control BMP Requirements

The following source control BMPs must be implemented at all development projects where applicable and feasible:

(a) Prevention of illicit discharges into the MS4;

(b) Storm drain system stenciling or signage;

(c) Protect outdoor material storage areas from rainfall, run-on, runoff, and wind dispersal;

(d) Protect materials stored in outdoor work areas from rainfall, run-on, runoff, and wind dispersal;

(e) Protect trash storage areas from rainfall, run-on, runoff, and wind dispersal; and

(f) Any additional BMPs determined to be necessary by the Copermittee to minimize pollutant generation at each project.

(3) Low Impact Development (LID) BMP Requirements

The following LID BMPs must be implemented at all development projects where applicable and feasible:

(a) Maintenance or restoration of natural storage reservoirs and drainage corridors (including topographic depressions, areas of permeable soils, natural swales, and ephemeral and intermittent streams);[22]

(b) Buffer zones for natural water bodies (where buffer zones are technically infeasible, require project applicant to include other buffers such as trees, access restrictions, etc.);

(c) Conservation of natural areas within the project footprint including existing trees, other vegetation, and soils;

(d) Construction of streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided public safety is not compromised;

(e) Minimization of the impervious footprint of the project;

(f) Minimization of soil compaction to landscaped areas;

(g) Disconnection of impervious surfaces through distributed pervious areas;

[22] Development projects proposing to dredge or fill materials in waters of the U.S. must obtain a CWA Section 401 Water Quality Certification. Projects proposing to dredge or fill waters of the state must obtain waste discharge requirements.

(h) Landscaped or other pervious areas designed and constructed to effectively receive and infiltrate, retain and/or treat runoff from impervious areas, prior to discharging to the MS4;

(i) Small collection strategies located at, or as close as possible to, the source (i.e. the point where storm water initially meets the ground) to minimize the transport of runoff and pollutants to the MS4 and receiving waters;

(j) Use of permeable materials for projects with low traffic areas and appropriate soil conditions;

(k) Landscaping with native or drought tolerant species; and

(l) Harvesting and using precipitation.

b. PRIORITY DEVELOPMENT PROJECTS

Priority Development Projects are land development projects that fall under the planning and building authority of the Copermittee for which the Copermittee must impose specific requirements, in addition to those described in Provision E.3.a, including the implementation of structural BMPs to meet the performance requirements described in Provision E.3.c.

(1) Definition of Priority Development Project

Priority Development Projects include the following:

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(b) Redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site on an existing site of 10,000 square feet or more of impervious surfaces). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(c) New and redevelopment projects that create 5,000 square feet or more of impervious surface (collectively over the entire project site), and support one or more of the following uses:

(i) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812).

(ii) Hillside development projects. This category includes development on any natural slope that is twenty-five percent or greater.

(iii) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce.

(iv) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

(d) New or redevelopment projects that create or replace 2,500 square feet or more of impervious surface (collectively over the entire project site), and discharging directly to an Environmentally Sensitive Area (ESA). "Discharging directly to" includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands).

(e) New development projects that support one or more of the following uses:

(i) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

(ii) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

(f) New or redevelopment projects that result in the disturbance of one or more acres of land and are expected to generate pollutants post construction.

(2) <u>Special Considerations for Redevelopment Projects</u>

The structural BMP performance requirements of Provision E.3.c are applicable to redevelopment Priority Development Projects, as defined in E.3.b.(1), as follows:

(a) Where redevelopment results in the creation or replacement of impervious surface in an amount of less than fifty percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provision E.3.c apply only to the creation or replacement of impervious surface, and not the entire development; or

(b) Where redevelopment results in the creation or replacement of impervious surface in an amount of more than fifty percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provision E.3.c apply to the entire development.

(3) Priority Development Project Exemptions

Each Copermittee has the discretion to exempt the following projects from being defined as Priority Development Projects:

(a) New or retrofit paved sidewalks, bicycle lanes, or trails that meet the following criteria:

(i) Designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas; OR

(ii) Designed and constructed to be hydraulically disconnected from paved streets or roads; OR

(iii) Designed and constructed with permeable pavements or surfaces in accordance with USEPA Green Streets guidance.[23]

(b) Retrofitting or redevelopment of existing paved alleys, streets or roads that are designed and constructed in accordance with the USEPA Green Streets guidance.[24]

c. Priority Development Project Structural BMP Performance Requirements

In addition to the BMP requirements listed for all development projects under Provision E.3.a, Priority Development Projects must also implement structural BMPs that conform to performance requirements described below.

(1) Storm Water Pollutant Control BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite structural BMPs to control pollutants in storm water that may be discharged from a project as follows:

(a) Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite the pollutants contained in the volume of storm water runoff produced from a 24-hour 85th percentile storm event (design capture volume);[25]

[23] See "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).
[24] Ibid.
[25] This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are

(i) If a Copermittee determines that implementing BMPs to retain the full design capture volume onsite for a Priority Development Project is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize biofiltration BMPs. Biofiltration BMPs must be designed to have an appropriate hydraulic loading rate to maximize storm water retention and pollutant removal, as well as to prevent erosion, scour, and channeling within the BMP,[26] and must be sized to:

[a] Treat 1.5 times the design capture volume not reliably retained onsite, OR

[b] Treat the design capture volume not reliably retained onsite with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite.

(ii) If a Copermittee determines that biofiltration is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize flow-thru treatment control BMPs to treat runoff leaving the site, AND mitigate for the design capture volume not reliably retained onsite pursuant to Provision E.3.c.(1)(b). Flow thru treatment control BMPs must be sized and designed to:

[a] Remove pollutants from storm water to the MEP;

[b] Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;

[c] Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Flow-thru treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of flow-thru treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

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encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals.

[26] As part of the Copermittee's update to its BMP Design Manual, pursuant to Provision E.3.d, the Copermittee must provide guidance for hydraulic loading rates and other biofiltration design criteria necessary to maximize storm water retention and pollutant removal.

(b) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1)(a). The Priority Development Project must mitigate for the portion of the pollutant load in the design capture volume not retained onsite if Provision E.3.c.(3) is utilized. If a Priority Development Project is allowed to utilize alternative compliance, flow-thru treatment control BMPs must be implemented to treat the portion of the design capture volume that is not reliably retained onsite. Flow-thru treatment control BMPs must be sized and designed in accordance with Provisions E.3.c.(1)(a)(ii)[a]-[c].

(2) Hydromodification Management BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite BMPs to manage hydromodification that may be caused by storm water runoff discharged from a project as follows:

(a) Post-project runoff conditions (flow rates and durations) must not exceed pre-development runoff conditions by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat downstream of Priority Development Projects).

(i) In evaluating the range of flows that results in increased potential for erosion of natural (non-hardened) channels, the lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks.

(ii) The Copermittees may use monitoring results collected pursuant to Provision D.1.a.(2) to re-define the range of flows resulting in increased potential for erosion, or degraded instream habitat conditions, as warranted by the data.

(b) Each Priority Development Project must avoid critical sediment yield areas known to the Copermittee or identified by the optional Watershed Management Area Analysis pursuant to Provision B.3.b.(4), or implement measures that allow critical coarse sediment to be discharged to receiving waters, such that there is no net impact to the receiving water.

(c) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the performance requirements of Provision E.3.c.(2)(a). The Priority Development Project must mitigate for the post-project runoff conditions not fully managed onsite if Provision E.3.c.(3) is utilized.

(d) Exemptions

Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provisions E.3.c.(2) where the project discharges storm water runoff to:

(i) Existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;

(ii) Conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; or

(iii) An area identified by the Copermittees as appropriate for an exemption by the optional Watershed Management Area Analysis incorporated into the Water Quality Improvement Plan pursuant to Provision B.3.b.(4).

(e) Interim Timeframe Exemptions

Until the Copermittees have updated their BMP Design Manual in accordance with Provision F.2.b with the requirements of Provision E, the Copermittees have the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provision E.3.c.(2) where the project discharges storm water runoff directly to:

(i) An engineered channel conveyance system with a capacity to convey peak flows generated by the 10-year storm event all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; and

(ii) Large river reaches with a drainage area larger than 100 square miles and a 100-year flow capacity in excess of 20,000 cubic feet per second, provided that properly sized energy dissipation is included at all Priority Development Project discharge points.

(3) Alternative Compliance Program to Onsite Structural BMP Implementation

At the discretion of each Copermittee, Priority Development Projects may be allowed to participate in an alternative compliance program in lieu of implementing the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a), provided that the Water Quality Improvement Plan includes the optional Watershed Management Area Analysis described in Provision B.3.b.(4)~~.~~, and Water Quality Equivalency

calculations have been accepted by the San Diego Water Board's Executive Officer pursuant to Provision E.3.c.(3)(a). The alternative compliance program is available to a Priority Development Project only if the Priority Development Project applicant enters into a voluntary agreement with the Copermittee authorizing this arrangement. In addition to the voluntary agreement, relief from implementing structural BMPs onsite may be authorized by the Copermittee under the following conditions:

(a) Water Quality Equivalency

Copermittees must submit Water Quality Equivalency calculations for acceptance by the San Diego Water Board's Executive Officer prior to administering an alternative compliance program in order to establish a regional and technical basis for determining the water quality benefits associated with alternative compliance projects. Accepted Water Quality Equivalency calculations must be incorporated as part of any Copermittee's alternative compliance program necessary for evaluating Watershed Management Area Analysis candidate projects, project applicant-proposed alternative compliance projects, alternative compliance in lieu fee structures, and alternative compliance water quality credit systems as described in Provisions E.3.c.(3)(b)-(e).

~~(a)~~(b) Watershed Management Area Analysis Candidate Projects

The Priority Development Project applicant agrees to fund, contribute funds to, or implement a candidate project identified by the Copermittees in the Watershed Management Area Analysis included in the Water Quality Improvement Plan, pursuant to Provisions B.3.b.(4) subject to the following conditions:

(i) The Copermittee must determine that implementation of the candidate project will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a) onsite;

(ii) If the Priority Development Project applicant chooses to fully or partially fund a candidate project, then the in-lieu fee structure described in Provision E.3.c.(3)(c) must be followed;

(iii) If the Priority Development Project applicant chooses to fully or partially fund a candidate project, then the Copermittee must ensure that the funds to be obtained from the Priority Development Project applicant are sufficient to mitigate for impacts caused by not fully implementing structural BMPs onsite, pursuant to the performance requirements described in Provisions E.3.c.(1) and E.3.c.(2)(a);

(iv) If the Priority Development Project applicant chooses to implement a candidate project, then the Copermittee must ensure that pollutant

control and/or hydromodification management within the candidate project are sufficient to mitigate for impacts caused by not implementing structural BMPs fully onsite, pursuant to the performance requirements described in Provisions E.3.c.(1) and E.3.c.(2)(a);

(v) The voluntary agreement to fund, partially fund, or implement a candidate project must include reliable sources of funding for operation and maintenance of the candidate project;

(vi) Design of the candidate project must be conducted under an appropriately qualified engineer, geologist, architect, landscape architect, or other professional, licenses where applicable, and competent and proficient in the fields pertinent to the candidate project design;

(vii) The candidate project must be constructed as soon as possible, but no later than 4 years after the certificate of occupancy is granted for the first Priority Development Project that contributed funds toward the construction of the candidate project, unless a longer period of time is authorized by the San Diego Water Board Executive Officer; and

(viii) If the candidate project is constructed after the Priority Development Project is constructed, the Copermittee must require temporal mitigation for pollutant loads and altered flows that are discharged from the Priority Development Project.

~~(b)~~(c) Project Applicant Proposed Alternative Compliance Projects

The Copermittee may allow a Priority Development Project applicant to propose and fund, contribute funds to, or implement an alternative compliance project not identified by the Watershed Management Area Analysis included in the Water Quality Improvement Plan pursuant to Provisions B.3.b.(4). This option is allowed provided the Copermittee determines that implementation of the alternative compliance project will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a) onsite, and is subject to the requirements described in Provisions E.3.c.(3)(a)(ii)-(viii).

~~(c)~~(d) Alternative Compliance In-Lieu Fee Structure

If a Copermittee chooses to allow a Priority Development Project applicant to fund, or partially fund a candidate project or an alternative compliance project, then the Copermittee must develop and implement an in-lieu fee structure. This may be developed individually or with other Copermittees and/or entities, as a means for designing, developing, constructing, operating and maintaining offsite alternative compliance projects. The in-

lieu fee must be transferred to the Copermittee (for public projects) or an escrow account (for private projects) prior to the construction of the Priority Development Project.

~~(d)~~(e) Alternative Compliance Water Quality Credit System Option

The Copermittee may develop and implement an alternative compliance water quality credit system option, individually or with other Copermittees and/or entities, provided that such a credit system clearly exhibits that it will not allow discharges from Priority Development Projects to cause or contribute to a net impact over and above the impact caused by projects meeting the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a). Any credit system that a Copermittee chooses to implement must be submitted to the San Diego Water Board Executive Officer for review and acceptance as part of the Water Quality Improvement Plan.

(4) Long-Term Structural BMP Maintenance

Each Copermittee must require the project applicant to submit proof of the mechanism under which ongoing long-term maintenance of all structural BMPs will be conducted.

(5) Infiltration and Groundwater Protection

(a) Structural BMPs designed to primarily function as large, centralized infiltration devices (such as large infiltration trenches and infiltration basins) must not cause or contribute to an exceedance of an applicable groundwater quality objective. At a minimum, such infiltration BMPs must be in conformance with the design criteria listed below, unless the development project applicant demonstrates to the Copermittee that one or more of the specific design criteria listed below are not necessary to protect groundwater quality. The design criteria listed below do not apply to small infiltration systems dispersed throughout a development project.

(i) Runoff must undergo pretreatment such as sedimentation or filtration prior to infiltration;

(ii) Pollution prevention and source control BMPs must be implemented at a level appropriate to protect groundwater quality at sites where infiltration BMPs are to be used;

(iii) Infiltration BMPs must be adequately maintained to remove pollutants in storm water to the MEP;

(iv) The vertical distance from the base of any infiltration BMP to the seasonal high groundwater mark must be at least 10 feet. Where groundwater basins do not support beneficial uses, this vertical

distance criteria may be reduced, provided groundwater quality is maintained;

(v) The soil through which infiltration is to occur must have physical and chemical characteristics (e.g., appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses;

(vi) Infiltration BMPs must not be used for areas of industrial or light industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee, unless source control BMPs to prevent exposure of high threat activities are implemented, or runoff from such activities is first treated or filtered to remove pollutants prior to infiltration; and

(vii) Infiltration BMPs must be located a minimum of 100 feet horizontally from any water supply wells.

(b) The Copermittee may develop, individually or with other Copermittees, alternative mandatory design criteria to that listed above for infiltration BMPs which are designed to primarily function as centralized infiltration devices. Before implementing the alternative design criteria in the development planning process the Copermitee(s) must:

(i) Notify the San Diego Water Board of the intent to implement the alternative design criteria submitted; and

(ii) Comply with any conditions set by the San Diego Water Board.

d. BMP DESIGN MANUAL UPDATE

Each Copermittee must update its BMP Design Manual[27] pursuant to Provision F.2.b. Until the Copermittee has updated its BMP Design Manual with the requirements of Provisions E.3.a-c, the Copermittee must continue implementing its current BMP Design Manual. Unless directed otherwise by the San Diego Water Board, the Copermittee must implement the BMP Design Manual within 180 days of completing the update. The update of the BMP Design Manual must include the following:

(1) Updated procedures to determine the nature and extent of storm water requirements applicable to a potential development or redevelopment projects. These procedures must inform project applicants of the storm water management requirements applicable to their project including, but not limited to, general requirements for all development projects, structural BMP design procedures and requirements, hydromodification management requirements,

[27] The BMP Design Manual was formerly known as the Standard Storm Water Mitigation Plan under Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016.

requirements specific to phased projects, and procedures specific to private developments and public improvement projects;

(2) Updated procedures to identify pollutants and conditions of concern for selecting the most appropriate structural BMPs that consider, at a minimum, the following:

(a) Receiving water quality (including pollutants for which receiving waters are listed as impaired under the CWA section 303(d) List);

(b) Pollutants, stressors, and/or receiving water conditions that cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(c) Land use type of the project and pollutants associated with that land use type; and

(d) Pollutants expected to be present onsite.

(3) Updated procedures for designing structural BMPs, including any updated performance requirements to be consistent with the requirements of Provision E.3.c for all structural BMPs listed in the BMP Design Manual;

(4) Long-term maintenance criteria for each structural BMP listed in the BMP Design Manual; and

(5) Alternative compliance criteria, in accordance with the requirements under Provision E.3.c.(3), if the Copermittee elects to allow Priority Development Projects within its jurisdiction to utilize alternative compliance.

e. PRIORITY DEVELOPMENT PROJECT BMP IMPLEMENTATION AND OVERSIGHT

Each Copermittee must implement a program that requires and confirms structural BMPs on all Priority Development Projects are designed, constructed, and maintained to remove pollutants in storm water to the MEP.

(1) Structural BMP Approval and Verification Process

(a) Each Copermittee must require and confirm that for all Priority Development Project applications that have not received prior lawful approval by the Copermittee by the ~~time~~ effective date of the BMP Design Manual ~~is updated~~ pursuant to Provision E.3.d, the requirements of Provision E.3 ~~are~~ must be implemented. For project applications that have received prior lawful approval before the effective date of the BMP Design Manual ~~is updated~~ pursuant to Provision E.3.d, the Copermittee may allow previous land development requirements to apply.

(b) Each Copermittee must identify the roles and responsibilities of its various municipal departments in implementing the structural BMP requirements, including each stage of a project from application review and approval through BMP maintenance and inspections.

(c) Each Copermittee must require and confirm that appropriate easements and ownerships are properly recorded in public records and the information is conveyed to all appropriate parties when there is a change in project or site ownership.

(d) Each Copermittee must require and confirm that prior to occupancy and/or intended use of any portion of the Priority Development Project, each structural BMP is inspected to verify that it has been constructed and is operating in compliance with all of its specifications, plans, permits, ordinances, and the requirements of this Order.

(2) Priority Development Project Inventory and Prioritization

(a) Each Copermittee must develop, maintain, and update at least annually, a watershed-based database to track and inventory all Priority Development Projects and associated structural BMPs within its jurisdiction. Inventories must be accurate and complete beginning from December 2002 for the San Diego County Copermittees, February 2003 for the Orange County Copermittees, and July 2005 for the Riverside County Copermittees. The use of an automated database system, such as GIS, is highly recommended. The database must include, at a minimum, the following information:

(i) Priority Development Project location (address and hydrologic subarea);

(ii) Descriptions of structural BMP type(s);

(iii) Date(s) of construction;

(iv) Party responsible for structural BMP maintenance;

(v) Dates and findings of structural BMP maintenance verifications; and

(vi) Corrective actions and/or resolutions, when applicable.

(b) Each Copermittee must prioritize the Priority Development Projects with structural BMPs within its jurisdiction. The designation of Priority Development Projects as high priority must consider the following:

(i) The highest water quality priorities identified in the Water Quality Improvement Plan;

(ii) Receiving water quality;

(iii) Number and sizes of structural BMPs;

(iv) Recommended maintenance frequency of structural BMPs;

(v) Likelihood of operation and maintenance issues of structural BMPs;

(vi) Land use and expected pollutants generated; and

(vii) Compliance record.

(3) Structural BMP Maintenance Verifications and Inspections

Each Copermittee is required to verify that structural BMPs on each Priority Development Project are adequately maintained, and continue to operate effectively to remove pollutants in storm water to the MEP through inspections, self-certifications, surveys, or other equally effective approaches.

(a) All (100 percent) of the structural BMPs at Priority Development Projects that are designated as high priority must be inspected directly by the Copermittee annually prior to each rainy season;

(b) For verifications performed through a means other than direct Copermittee inspection, adequate documentation must be required by the Copermittee to provide assurance that the required maintenance of structural BMPs at each Priority Development Project has been completed; and

(c) Appropriate follow-up measures (including re-inspections, enforcement, etc.) must be conducted to ensure that structural BMPs at each Priority Development Project continue to reduce pollutants in storm water to the MEP as originally designed.

f. Development Project Enforcement

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all development projects, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

4. Construction Management

Each Copermittee must implement a construction management program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. Project Approval Process

Prior to issuance of any local permit(s) that allows the commencement of construction projects that involve ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff, each Copermittee must:

(1) Require a pollution control plan, construction BMP plan, and/or an erosion and sediment control plan, to be submitted by the project applicant to the Copermittee;

(2) Confirm the pollution control plan, construction BMP plan, and/or erosion and sediment control plan, complies with the local grading ordinance, other applicable local ordinances, and the requirements of this Order;

(3) Confirm the pollution control, construction BMP, and/or erosion and sediment control plan, includes seasonally appropriate and effective BMPs and management measures described in Provision E.4.c, as applicable to the project; and

(4) Verify that the project applicant has obtained coverage under the statewide Construction General Permit (Order ~~2012-0006~~2009-0009-DWQ or subsequent Order), if applicable.

b. CONSTRUCTION SITE INVENTORY AND TRACKING

(1) Each Copermittee must maintain and update, at least quarterly, a watershed-based inventory of all construction projects issued a local permit that allows ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff. The use of an automated database system, such as GIS, is highly recommended. The inventory must include:

(a) Relevant contact information for each site (e.g., name, address, phone, and email for the owner and contractor);

(b) The basic site information including location (address and hydrologic subarea), Waste Discharge Identification (WDID) number (if applicable), size of the site, and approximate area of disturbance;

(c) Whether or not the site is considered a high threat to water quality, as defined in Provision E.4.b.(2) below;

(d) The project start and completion dates;

(e) The required inspection frequency, as defined in the Copermittee's jurisdictional runoff management program document;

(f) The date the Copermittee accepted or approved the pollution control plan, construction BMP plan, and/or erosion and sediment control plan; and

(g) Whether or not there are ongoing enforcement actions administered to the site.

(2) Each Copermittee must identify all construction sites within its jurisdiction that represent a high threat to downstream surface water quality. The designation of construction sites as high threat to water quality must consider the following:

(a) Sites located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Sites located within the same hydrologic subarea and tributary to a water body segment listed as impaired for sediment on the CWA section 303(d) List;

(c) Sites located within, directly adjacent to, or discharging directly to a receiving water within an ESA; and

(d) Other sites determined by the Copermittees or the San Diego Water Board as a high threat to water quality.

c. CONSTRUCTION SITE BMP IMPLEMENTATION

Each Copermittee must implement, or require the implementation of effective BMPs to reduce discharges of pollutants in storm water from construction sites to the MEP, and effectively prohibit non-storm water discharges from construction sites into the MS4. These BMPs must be site specific, seasonally appropriate, and construction phase appropriate. BMPs must be implemented at each construction site year round. Dry season BMP implementation must plan for and address unseasonal rain events that may occur during the dry season (May 1 through September 30). Copermittees must implement, or require the implementation of, BMPs in the following categories:

(1) Project Planning;

(2) Good Site Management “Housekeeping”, including waste management;

(3) Non-storm Water Management;

(4) Erosion Control;

(5) Sediment Control;

(6) Run-on and Run-off Control; and

(7) Active/Passive Sediment Treatment Systems, where applicable.

d. CONSTRUCTION SITE INSPECTIONS

Each Copermittee must conduct construction site inspections to require and confirm compliance with its local permits and applicable local ordinances, and the requirements of this Order. Priority for site inspections must consider threat to water quality pursuant to Provision E.4.b as well as the nature of the construction activity, topography, and the characteristics of soils and receiving water quality.

(1) Inspection Frequency

(a) Each Copermittee must conduct inspections at all inventoried sites, including high threat to water quality sites, at an appropriate frequency for each phase of construction to confirm the site reduces the discharge of pollutants in storm water from construction sites to the MEP, and effectively prohibits non-storm water discharges from entering the MS4.

(b) Each Copermittee must establish appropriate inspection frequencies for high threat to water quality sites, and all other sites, for each phase of construction. Inspection frequencies appropriate for addressing the highest water quality priorities identified in the Water Quality Improvement Plan, and for complying with the requirements of this Order must be identified in each Copermittee's jurisdictional runoff management program document.

(c) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e., re-inspection, enforcement) necessary to require and confirm site compliance with its local permits and applicable local ordinances, and the requirements of this Order.

(2) Inspection Content

Inspections of construction sites by the Copermittee must include, at a minimum:

(a) Verification of coverage under the Construction General Permit (Notice of Intent (NOI) and/or WDID number) during initial inspections, when applicable;

(b) Assessment of compliance with its local permits and applicable local ordinances related to pollution prevention, including the implementation and maintenance of applicable BMPs;

(c) Assessment of BMP adequacy and effectiveness;

(d) Visual observations of actual non-storm water discharges;

(e) Visual observations of actual or potential discharge of sediment and/or

construction related materials from the site;

(f) Visual observations of actual or potential illicit connections; and

(g) If any violations are found and BMP corrections are needed, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried construction sites. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Site name, location (address and hydrologic subarea), and WDID number (if applicable);

(b) Inspection date;

(c) Approximate amount of rainfall since last inspection;

(d) Description of problems observed with BMPs and indication of need for BMP addition/repair/replacement and any scheduled re-inspection, and date of re-inspection;

(e) Descriptions of any other specific inspection comments which must, at a minimum, include rationales for longer compliance time;

(f) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(g) Resolution of problems noted and date problems fixed.

e. CONSTRUCTION SITE ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried construction sites, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

5. Existing Development Management

Each Copermittee must implement an existing development management program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following

requirements:

a. EXISTING DEVELOPMENT INVENTORY AND TRACKING

Each Copermittee must maintain, and update at least annually, a watershed-based inventory of the existing development within its jurisdiction that may discharge a pollutant load to and from the MS4. The use of an automated database system, such as GIS, is highly recommended. The inventory must, at a minimum, include:

(1) Name, location (hydrological subarea and address, if applicable) of the following types of existing development with its jurisdiction:

(a) Commercial facilities or areas;

(b) Industrial facilities;

(c) Municipal facilities, including:

(i) MS4 and related structures;[28]
(ii) Roads, streets, and highways;
(iii) Parking facilities;
(iv) Municipal airfields;
(v) Parks and recreation facilities;
(vi) Flood management facilities, flood control devices and structures;
(vii) Operating or closed municipal landfills;
(viii) Publicly owned treatment works (including water and wastewater treatment plants) and sanitary sewer collection systems;
(ix) Corporate yards, including maintenance and storage yards for materials, waste, equipment, and vehicles;
(x) Hazardous waste collection facilities;
(xi) Other treatment, storage or disposal facilities for municipal waste; and
(xii) Other municipal facilities that the Copermittee determines may contribute a significant pollutant load to the MS4.

(d) Residential areas, which may be designated by one or more of the following:

(i) Residential management area;
(ii) Drainage basin or area;

[28] The inventory may refer to the MS4 map required to be maintained pursuant to Provision E.2.b.(1).

(iii) Land use (e.g., single family, multi-family, rural);

(iv) Neighborhood;

(v) Common Interest Area;

(vi) Home Owner Association;

(vii) Mobile home park; and/or

(viii) Other designations accepted by the San Diego Water Board Executive Officer.

(2) A description of the facility or area, including the following information:

(a) Classification as commercial, industrial, municipal, or residential;

(b) Status of facility or area as active or inactive;

(c) Identification if a business is a mobile business;

(d) SIC Code or NAICS Code, if applicable;

(e) Industrial General Permit NOI and/or WDID number, if applicable;

(f) Identification if a residential area is or includes a Common Interest Area / Home Owner Association, or mobile home park;

(g) Identification of pollutants generated and potentially generated by the facility or area;

(h) Whether the facility or area is adjacent to an ESA;

(i) Whether the facility or area is tributary to and within the same hydrologic subarea as a water body segment listed as impaired on the CWA section 303(d) List and generates pollutants for which the water body segment is impaired; and

(3) An annually updated map showing the location of inventoried existing development, watershed boundaries, and water bodies.

b. EXISTING DEVELOPMENT BMP IMPLEMENTATION AND MAINTENANCE

Each Copermittee must designate a minimum set of BMPs required for all inventoried existing development, including special event venues. The designated minimum BMPs must be specific to facility or area types and pollutant generating activities, as appropriate.

(1) <u>Commercial, Industrial, and Municipal Facilities and Areas</u>

(a) Pollution Prevention

Each Copermittee must require the use of pollution prevention methods by the commercial, industrial, and municipal facilities and areas in its inventoried existing development to address the priorities and strategies in the Water Quality Improvement Plan.

(b) BMP Implementation

Each Copermittee must require the implementation of designated BMPs at commercial facilities and areas, industrial facilities, and implement designated BMPs at municipal facilities in its inventoried existing development.

(c) BMP Operation and Maintenance

(i) Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development.

(ii) Each Copermittee must implement a schedule of operation and maintenance activities for its MS4 and related structures (including but not limited to catch basins, storm drain inlets, detention basins, etc.), and verify proper operation of all its municipal structural treatment controls designed to reduce pollutants (including floatables) in storm water discharges to or from its MS4s and related drainage structures. Operation and maintenance activities may include, but is not limited to, the following:

[a] Inspections of the MS4 and related structures;
[b] Cleaning of the MS4 and related structures; and
[c] Proper disposal of materials removed from cleaning of the MS4 and related structures.

(iii) Each Copermittee must implement a schedule of operation and maintenance for public streets, unpaved roads, paved roads, and paved highways within its jurisdiction to minimize pollutants that can be discharged in storm water.

(iv) Each Copermittee must implement controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers. Copermittees that operate both a municipal sanitary sewer system and a MS4 must implement controls and measures to prevent and eliminate seeping sewage from infiltrating the MS4. Copermittees that do not operate both a municipal sanitary sewer system and a MS4 must coordinate with sewering agencies to keep themselves informed of relevant and appropriate maintenance activities and sanitary sewage projects in their jurisdiction that may cause or contribute to seepage of sewage into the MS4.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must require the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from commercial facilities and areas and industrial facilities, and implement BMPs at municipal facilities in its inventoried existing development. Such BMPs must include, as appropriate, educational activities, permits, certifications and other measures for applicators and distributors.

(2) Residential Areas

(a) Pollution Prevention

Each Copermittee must promote and encourage the use of pollution prevention methods, where appropriate, by the residential areas in its inventoried existing development.

(b) BMP Implementation

Each Copermittee must promote and encourage the implementation of designated BMPs at residential areas in its inventoried existing development.

(c) BMP Operation and Maintenance

Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at residential areas in its inventoried existing development.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must promote and encourage the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from residential areas in its inventoried existing development.

c. Existing Development Inspections

Each Copermittee must conduct inspections of inventoried existing development to ensure compliance with applicable local ordinances and permits, and the requirements of this Order.

(1) Inspection Frequency

(a) Each Copermittee must establish appropriate inspection frequencies for inventoried existing development in accordance with the following requirements:

(i) At a minimum, inventoried existing development must be inspected once every five years utilizing one or more of the following methods:

[a] Drive-by inspections by Copermittee municipal and contract staff;
[b] Onsite inspections by Copermittee municipal and contract staff; and/or
[c] Visual inspections of publicly accessible inventoried facilities or areas by volunteer monitoring or patrol programs that have been trained by the Copermittee;

(ii) The frequency of inspections must be appropriate to confirm that BMPs are being implemented to reduce the discharge of pollutants in storm water from the MS4 to the MEP and effectively prohibit non-storm water discharges to the MS4;

(iii) The frequency of inspections must be based on the potential for a facility or area to discharge non-storm water and pollutants in storm water, and should reflect the priorities set forth in the Water Quality Improvement Plan;

(iv) Each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development;[29] and

(v) Inventoried existing development must be inspected by the Copermittee, as needed, in response to valid public complaints.

(b) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e. education and outreach, re-inspection, enforcement) necessary to require and confirm compliance with its applicable local ordinances and permits and the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

(2) <u>Inspection Content</u>

(a) Inspections of existing development must include, at a minimum:

(i) Visual inspections for the presence of actual non-storm water discharges;

[29] If any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspection may count toward the total annual inspection requirement. This requirement excludes linear municipal facilities (i.e., MS4 linear channels, sanitary sewer collection systems, streets, roads and highways).

(ii) Visual inspections for the presence of actual or potential discharge of pollutants;

(iii) Visual inspections for the presence of actual or potential illicit connections; and

(iv) Verification that the description of the facility or area in the inventory, required pursuant to Provision E.5.a.(2), has not changed.

(b) Onsite inspections of existing development by the Copermittee must include, at a minimum:

(i) Assessment of compliance with its applicable local ordinances and permits related to non-storm water and storm water discharges and runoff;

(ii) Assessment of the implementation of the designated BMPs;

(iii) Verification of coverage under the Industrial General Permit, when applicable; and

(iv) If any problems or violations are found, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried existing development. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Name and location of the facility or area (address and hydrologic subarea) consistent with the inventory name and location, pursuant to Provision E.5.a.(1);

(b) Inspection and re-inspection date(s);

(c) Inspection method(s) (i.e. drive-by, onsite);

(d) Observations and findings from the inspection(s);

(e) For onsite inspections of existing development by Copermittee municipal or contract staff, the records must also include, as applicable:

(i) Description of any problems or violations found during the inspection(s);

(ii) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(iii) The date problems or violations were resolved.

d. EXISTING DEVELOPMENT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried existing development, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

e. RETROFITTING AND REHABILITATING AREAS OF EXISTING DEVELOPMENT

(1) Retrofitting Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to retrofit areas of existing development within its jurisdiction to address identified sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify areas of existing development as candidates for retrofitting, focusing on areas where retrofitting will address pollutants and/or stressors that contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for retrofitting projects may be utilized to reduce pollutants that may be discharged in storm water from areas of existing development, and/or address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of retrofitting projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting projects; and

(e) Where retrofitting projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement

regional retrofitting projects (i.e. projects that can receive and/or treat storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment) adjacent to and/or downstream of the areas of existing development.

(2) Stream, Channel and/or Habitat Rehabilitation in Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to rehabilitate streams, channels, and/or habitats in areas of existing development within its jurisdiction to address the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify streams, channels, and/or habitats in areas of existing development as candidates for rehabilitation, focusing on areas where stream, channel, and/or habitat rehabilitation projects will address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for stream, channel, and/or habitat rehabilitation projects may be utilized to address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters, rehabilitate channelized or hydromodified streams, restore wetland and riparian habitat, restore watershed functions, and/or restore beneficial uses of receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of stream, channel, and/or habitat rehabilitation projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance stream, channel, and/or habitat rehabilitation projects; and

(e) Where stream, channel, and/or habitat rehabilitation projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional stream, channel, and/or habitat rehabilitation projects (i.e. projects that can receive storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment).

6. Enforcement Response Plans

Each Copermittee must develop and implement an Enforcement Response Plan as part of its jurisdictional runoff management program document. The Enforcement Response Plan must describe the applicable approaches and options to enforce its legal authority established pursuant to Provision E.1, as necessary, to achieve compliance with the requirements of this Order. The Enforcement Response Plan must be in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include the following:

a. Enforcement Response Plan Components

The Enforcement Response Plan must include the following individual components:

(1) Illicit Discharge Detection and Elimination Enforcement Component;

(2) Development Planning Enforcement Component;

(3) Construction Management Enforcement Component; and

(4) Existing Development Enforcement Component.

b. Enforcement Response Approaches and Options

Each component of the Enforcement Response Plan must describe the enforcement response approaches that the Copermittee will implement to compel compliance with its statutes, ordinances, permits, contracts, orders, or similar means, and the requirements of this Order. The description must include the protocols for implementing progressively stricter enforcement responses. The enforcement response approaches must include appropriate sanctions to compel compliance, including, at a minimum, the following tools or their equivalent:

(1) Verbal and written notices of violation;

(2) Cleanup requirements;

(3) Fines;

(4) Bonding requirements;

(5) Administrative and criminal penalties;

(6) Liens;

(7) Stop work orders; and

(8) Permit and occupancy denials.

c. CORRECTION OF VIOLATIONS

(1) Violations must be corrected in a timely manner with the goal of correcting the violations within 30 calendar days after the violations are discovered, or prior to the next predicted rain event, whichever is sooner.

(2) If more than 30 calendar days are required to achieve compliance, then a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

d. ESCALATED ENFORCEMENT

(1) The Enforcement Response Plan must include a definition of "escalated enforcement." Escalated enforcement must include any enforcement scenario where a violation or other non-compliance is determined to cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan. Escalated enforcement may be defined differently for development planning, construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas.

(2) Where the Copermittee determines escalated enforcement is not required, a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

(3) Escalated enforcement actions must continue to increase in severity, as necessary, to compel compliance as soon as possible.

e. REPORTING OF NON-COMPLIANT SITES

(1) Each Copermittee must notify the San Diego Water Board in writing within five (5) calendar days of issuing escalated enforcement (as defined in the Copermittee's Enforcement Response Plan) to a construction site that poses a significant threat to water quality as a result of violations or other non-compliance with its permits and applicable local ordinances, and the requirements of this Order. Written notification may be provided electronically by email to the appropriate San Diego Water Board staff.

(2) Each Copermittee must notify the San Diego Water Board of any persons required to obtain coverage under the statewide Industrial General Permit and Construction General Permit and failing to do so, within five (5) calendar days from the time the Copermittee become aware of the circumstances. Written notification may be provided electronically by email to R9_Nonfilers@waterboards.ca.gov ~~Nonfilers_R9@waterboards.ca.gov~~.

7. Public Education and Participation

Each Copermittee must implement, individually or with other Copermittees, a public education and participation program in accordance with the strategies identified in the Water Quality Improvement Plan to promote and encourage the development of programs, management practices, and behaviors that reduce the discharge of pollutants in storm water to the MEP, prevent controllable non-storm water discharges from entering the MS4, and protect water quality standards in receiving waters. The public education and participation program must be implemented in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include, at a minimum, the following requirements:

a. PUBLIC EDUCATION

The public education program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) Educational activities, public information activities, and other appropriate outreach activities intended to reduce pollutants associated with the application of pesticides, herbicides and fertilizer and other pollutants of concern in storm water discharges to and from its MS4 to the MEP, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed to address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(2) Educational activities, public information activities, and other appropriate outreach activities to facilitate the proper management and disposal of used oil and toxic materials; and

(3) Appropriate education and training measures for specific target audiences, such as construction site operators, residents, underserved target audiences and school-aged children, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed, based on high risk behaviors and pollutants of concern.

b. PUBLIC PARTICIPATION

The public participation program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) A process for members of the public to participate in updating the highest priority water quality conditions, numeric goals, and water quality improvement strategies in the Water Quality Improvement Plan;

(2) Opportunities for members of the public to participate in providing the Copermittee recommendations for improving the effectiveness of the water

quality improvement strategies implemented within its jurisdiction; and

(3) Opportunities for members of the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or protection of the quality of receiving waters.

8. Fiscal Analysis

a. Each Copermittee must secure the resources necessary to meet all the requirements of this Order.

b. Each Copermittee must conduct an annual fiscal analysis of its jurisdictional runoff management program in its entirety. The fiscal analysis must include the following:

(1) Identification of the various categories of expenditures necessary to implement the requirements of this Order, including a description of the specific capital, operation and maintenance, and other expenditure items to be accounted for in each category of expenditures;

(2) The staff resources needed and allocated to meet the requirements of this Order, including any development, implementation, and enforcement activities required;

(3) The estimated expenditures for Provisions E.8.b.(1) and E.8.b.(2) for the current fiscal year; and

(4) The source(s) of funds that are proposed to meet the necessary expenditures described in Provisions E.8.b.(1) and E.8.b.(2), including legal restrictions on the use of such funds, for the current fiscal year and next fiscal year.

c. Each Copermittee must submit a summary of the annual fiscal analysis with each Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3).

d. Each Copermittee must provide the documentation used to develop the summary of the annual fiscal analysis upon request by the San Diego Water Board.

F. REPORTING

The purpose of this provision is to determine and document compliance with the requirements set forth in this Order. The goal of reporting is to communicate to the San Diego Water Board and the people of the State of California the implementation status of each jurisdictional runoff management program and compliance with the requirements of this Order. This goal is to be accomplished through the submittal of specific deliverables to the San Diego Water Board by the Copermittees.

1. Water Quality Improvement Plans

The Copermittees for each Watershed Management Area must develop and submit the Water Quality Improvement Plan in accordance with the following requirements:

a. WATER QUALITY IMPROVEMENT PLAN DEVELOPMENT

Each Water Quality Improvement Plan must be developed in accordance with the following process:

(1) Public Participation Process

The Copermittees must implement a public participation process to solicit data, information, and recommendations to be utilized in the development of the Water Quality Improvement Plan. The public participation process must include the following:

(a) The Copermittees must develop a publicly available and noticed schedule of the opportunities for the public to participate and provide comments during the development of the Water Quality Improvement Plan. The schedule may be adjusted as necessary by the Copermittees, provided the public is provided timely notification of the changes to the schedule.

(b) The Copermittees must form a Water Quality Improvement Consultation Panel to provide recommendations during the development of the Water Quality Improvement Plan. The Water Quality Improvement Consultation Panel must consist of at least the following members:

(i) A representative of the San Diego Water Board;

(ii) A representative of the environmental community familiar with the water quality conditions of concern of the receiving waters in the Watershed Management Area, preferably from an environmental interest group associated with a water body within the Watershed Management Area; and

(iii) A representative of the development community familiar with the opportunities and constraints for implementing structural BMPs, retrofitting projects, and stream, channel or habitat rehabilitation

projects in the Watershed Management Area, preferably with relevant engineering, hydrology, and/or geomorphology experience in the Watershed Management Area.

(c) The Copermittees must coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public time and opportunity to participate during the development of the Water Quality Improvement Plans.

(2) Priority Water Quality Conditions

(a) The Copermittees must solicit data, information and recommendations from the public to be utilized in the development and identification of the priority water quality conditions and potential water quality improvement strategies for the Watershed Management Area.

(b) The Copermittees must review the priority water quality conditions the Copermittees plan on including in the Water Quality Improvement Plan with the Water Quality Improvement Consultation Panel to receive recommendations or concurrence.

(c) The Copermittees must consider revisions to the priority water quality conditions based on recommendations from the Water Quality Improvement Consultation Panel.

(d) The Copermittees must include all the potential water quality improvement strategies identified by the public and the Water Quality Improvement Consultation Panel with the submittal of the priority water quality conditions to the San Diego Water Board.

(e) The Copermittees must submit the Water Quality Improvement Plan requirements of Provision B.2 to the San Diego Water Board as early as 6 months and no later than 12 months after the commencement of coverage under this Order. Upon receipt, the San Diego Water Board will issue a public notice and release the proposed priority water quality conditions and potential water quality improvement strategies for public review and comment for a minimum of 30 days.

(f) The Copermittees must consider revisions to the priority water quality conditions and potential water quality improvement strategies developed pursuant to Provision B.2 based on public comments received by the close of the comment period.

(3) Water Quality Improvement Goals, Strategies and Schedules

(a) The Copermittees must solicit recommendations from the public on potential numeric goals for the highest priority water quality conditions

identified for the Watershed Management Area, and recommendations on the strategies that should be implemented to achieve the potential numeric goals.

(b) The Copermittees must consult with the Water Quality Improvement Consultation Panel and consider revisions to the following items based on the Panel's recommendations:

(i) The numeric goals and schedules the Copermittees propose to include in the Water Quality Improvement Plan;

(ii) The water quality improvement strategies and schedules the Copermittees propose to implement in the Watershed Management Area and include in the Water Quality Improvement Plan; and

(iii) If the Copermittees choose to implement Provision B.3.b.(4), the results of the Watershed Management Area Analysis the Copermittees proposed to incorporate into the Water Quality Improvement Plan.

(c) The Copermittees must submit the Water Quality Improvement Plan requirements of Provision B.3 to the San Diego Water Board as early as 9 months and no later than 18 months after the commencement of coverage under this Order. Upon receipt, the San Diego Water Board will issue a public notice and release the proposed water quality improvement goals, strategies and schedules for public review and comment for a minimum of 30 days.

(d) The Copermittees must consider revisions to the water quality improvement goals, strategies and schedules developed pursuant to Provision B.3 based on public comments received by the close of the comment period.

b. WATER QUALITY IMPROVEMENT PLAN SUBMITTAL AND IMPLEMENTATION

(1) Within 24 months after the commencement of coverage under this Order, the Copermittees for each Watershed Management Area must submit a complete Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order to the San Diego Water Board. The San Diego Water Board will issue a public notice and release the Water Quality Improvement Plan for public review and comment for a minimum of 30 days.

(2) The Copermittees must consider revisions to the Water Quality Improvement Plan based on written comments received by the close of the public comment period.

(3) The Copermittees must promptly submit any revisions to the Water Quality Improvement Plan to the San Diego Water Board no later than 60 days after the close of the public comment period.

(4) If issues concerning the Water Quality Improvement Plan are resolved informally through discussions among the Copermittees, the San Diego Water Board and interested parties, the San Diego Water Board Executive Officer may provide written notification of acceptance to the Copermittees that the Water Quality Improvement Plan meets the requirements of Provision B. However, if the Executive Officer determines that significant issues with the Water Quality Improvement Plan remain, the matter will be scheduled for San Diego Water Board consideration at a public meeting.

(5) The Copermittees must commence with implementation of the Water Quality Improvement Plan, in accordance with the water quality improvement strategies and schedules therein, upon written notification of acceptance with the Water Quality Improvement Plan by the San Diego Water Board Executive Officer.

(6) During implementation of the Water Quality Improvement Plan the Copermittees must correct any deficiencies in the Plan identified by the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report following a request by the Board to do so.

(7) The Water Quality Improvement Plan must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of receiving notification of acceptance with the Water Quality Improvement Plan by the San Diego Water Board Executive Officer.

2. Updates

a. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATES

Each Copermittee must update its jurisdictional runoff management program document in accordance with the following requirements:

(1) Each Copermittee is encouraged to seek public and key stakeholder participation and comments, as early and often as possible during the process of developing updates to its jurisdictional runoff management program document;

(2) Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E concurrent with the submittal of the Water Quality Improvement Plan. Each Copermittee must correct any deficiencies in the jurisdictional runoff management program document based on comments received from the San Diego Water Board in

the updates submitted with the Water Quality Improvement Plan Annual Report;

(3) Each Copermittee must submit updates to its jurisdictional runoff management program, with the supporting rationale for the modifications, either in the Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b;

(4) The Copermittee must revise proposed modifications to its jurisdictional runoff management program as directed by the San Diego Water Board Executive Officer; and

(5) Updated jurisdictional runoff management program documents must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of submitting the Water Quality Improvement Plan Annual Report.

b. BMP DESIGN MANUAL UPDATES

Each Copermittee must update its BMP Design Manual in accordance with the following requirements:

(1) Each Copermittee must update its BMP Design Manual to incorporate the requirements of Provisions E.3.a-d concurrent with the submittal of the Water Quality Improvement Plan. Each Copermittee must correct any deficiencies in the BMP Design Manual based on comments received from the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report;

(2) Subsequent updates to the BMP Design Manual must be consistent with the requirements of Provisions E.3.a-d and must be submitted as part of the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b; and

(3) Updated BMP Design Manuals must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of completing the update.

c. WATER QUALITY IMPROVEMENT PLAN UPDATES

(1) The Water Quality Improvement Plans must be updated in accordance with the following process:

(a) The Copermittees must develop and implement a public participation process to obtain data, information and recommendations for updating the Water Quality Improvement Plan. The public participation process must provide for a publicly available and noticed schedule of opportunities for the public to participate and provide comments during the development of updates to the Water Quality Improvement Plan;

(b) The Copermittees must consult with the Water Quality Improvement Consultation Panel on proposed updates of the Water Quality Improvement Plan, and consider the Water Quality Improvement Consultation Panel's recommendations in finalizing the proposed updates;

(c) The Copermittees for each Watershed Management Area must submit 1) proposed updates to the Water Quality Improvement Plan and supporting rationale, and 2) recommendations received from the public and the Water Quality Improvement Consultation Panel and the rationale for the requested updates, either in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The updates submitted will be deemed accepted for inclusion in the Water Quality Improvement Plan ninety (90) days after submission unless otherwise directed in writing by the San Diego Water Board Executive Officer;

(d) The Copermittees must revise the requested updates as directed by the San Diego Water Board Executive Officer; and

(e) Updated Water Quality Improvement Plans must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance of the requested updates by the San Diego Water Board.

(2) No later than six months following Office of Administrative Law and USEPA approval of any TMDL Basin Plan amendment with wasteload allocations (WLAs) assigned to the Copermittees during the term of this Order, the Copermittees must initiate an update to the applicable Water Quality Improvement Plans in accordance with Provision F.1 or Provision F.2.c.(1) to incorporate the requirements of the TMDL WLAs.

3. Progress Reporting

a. Progress Report Presentations

The Copermittees for each Watershed Management Area must periodically appear before the San Diego Water Board, as requested by the Board, to provide progress reports on the implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs.

b. Annual Reports

(1) Transitional Jurisdictional Runoff Management Program Annual Reports

(a) Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) no later than October 31 of each year for each jurisdictional runoff management program reporting period (i.e. July 1 to June 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted.

(b) Each Copermittee must submit the information on the Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) specific to the area within its jurisdiction in each Watershed Management Area.

(c) In addition to submitting the Jurisdictional Runoff Management Program Annual Report Form during the transitional reporting period, each Copermittee may continue to utilize and submit the jurisdictional runoff management program annual reporting format of its previous NPDES permit until the first Water Quality Improvement Plan Annual Report is required to be submitted.

(2) Transitional Monitoring and Assessment Program Annual Reports

The Copermittees for each Watershed Management Area must submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted under this Order. The Transitional Monitoring and Assessment Program Annual Reports must include:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1.a and D.2.a, summarized and presented in tabular and graphical form; and

(b) The findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

(3) Water Quality Improvement Plan Annual Reports

The Copermittees for each Watershed Management Area must submit a Water Quality Improvement Plan Annual Report for each reporting period no later than January 31 of the following year. The annual reporting period consists of two different periods: 1) July 1 to June 30 of the following year for the jurisdictional runoff management programs, 2) October 1 to September 30 of the following year for the monitoring and assessment programs. The Water Quality Improvement Plan Annual Reports must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Each Annual Report must include the following:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, summarized and presented in tabular and graphical form;

(b) The progress of the special studies required pursuant to Provision D.3, and the findings, interpretations and conclusions of a special study, or each phase of a special study, upon its completion;

(c) The findings, interpretations and conclusions from the assessments required pursuant to Provision D.4;

(d) The progress of implementing the Water Quality Improvement Plan, including, but not limited to, the following:

(i) The progress toward achieving the interim and final numeric goals for the highest water quality priorities for the Watershed Management Area;

(ii) The water quality improvement strategies that were implemented and/or no longer implemented by each of the Copermittees during the reporting period and previous reporting periods;

(iii) The water quality improvement strategies planned for implementation during the next reporting period;

(iv) Proposed modifications to the water quality improvement strategies, the public comments received and the supporting rationale for the proposed modifications;

(v) Previous modifications or updates incorporated into the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document and implemented by the Copermittees in the Watershed Management Area; and

(vi) Proposed modifications or updates to the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document;

(e) A completed Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) for each Copermittee in the Watershed Management Area, certified by a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative; and

(f) Each Copermittee must provide any data or documentation utilized in developing the Water Quality Improvement Plan Annual Report upon request by the San Diego Water Board. Any Copermittee monitoring data utilized in developing the Water Quality Improvement Plan Annual Report must be uploaded to the California Environmental Data Exchange Network (CEDEN).[30] Any Copermittee monitoring and assessment data utilized in developing the Water Quality Improvement Plan Annual Report must be available for access on the Regional Clearinghouse required pursuant to Provision F.4.

c. Regional Monitoring and Assessment Report

(1) The Copermittees must submit a Regional Monitoring and Assessment Report no later than 180 days prior to the expiration date of this Order. The Regional Monitoring and Assessment Report may be submitted as part of the Report of Waste Discharge required pursuant to Provision F.5.b. In preparing the report the Copermittees must consider the receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, and the findings, interpretations, and conclusions from the assessments required pursuant to Provision D.4. Based on these considerations the report must assess the following:

(a) The beneficial uses of the receiving waters within the San Diego Region that are supported and not adversely affected by the Copermittees' MS4 discharges;

(b) The beneficial uses of the receiving waters within the San Diego Region that are adversely impacted by the Copermittees' MS4 discharges;

(c) The progress toward protecting the beneficial uses in the receiving waters within the San Diego Region from the Copermittees' discharges; and

[30] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

(d) Pollutants or conditions of emerging concern that may impact beneficial uses in the receiving waters within the San Diego Region.

(2) The Regional Monitoring and Assessment Report must include recommendations for improving the implementation and assessment of the Water Quality Improvement Plans and jurisdictional runoff management programs.

(3) Each Copermittee must provide any data or documentation utilized in developing the Regional Monitoring and Assessment Report upon request by the San Diego Water Board. Any Copermittee monitoring and assessment data utilized in developing the Regional Monitoring and Assessment Report must be available for access on the Regional Clearinghouse required pursuant to Provision F.4.

4. Regional Clearinghouse

The Copermittees must develop, update, and maintain an internet-based Regional Clearinghouse that is made available to the public no later than 18 months after the effective date of this Order.[31]

a. The Copermittees, through the Regional Clearinghouse, must make the following documents and data available for access, and organized by Watershed Management Area. The documents and data may be linked to other internet-based data portals and databases where the original documents are stored:

(1) Water Quality Improvement Plan for the Watershed Management Area, and all updated versions with date of update;

(2) Annual Reports for the Watershed Management Area;

(3) Jurisdictional Runoff Management Program document for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(4) BMP Design Manual for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(5) Reports from special studies (e.g. source identification, BMP effectiveness assessment) conducted in the Watershed Management Area;

[31] The Copermittees may develop, update and maintain the clearinghouse(s) of other Copermittees or agencies.

(6) Monitoring data collected pursuant to Provision D for each Watershed Management Area must be uploaded to CEDEN,[32] with links to the uploaded data; and

(7) Available GIS data, layers, and/or shapefiles used to develop the maps generated and maintained by the Copermittees for the Water Quality Improvement Plans, Annual Reports, and jurisdictional runoff management program documents.

b. The Copermittees, through the Regional Clearinghouse, must make the following information and documents available for access:

(1) Contact information (point of contact, phone number, email address, and mailing address) for each Copermittee;

(2) Public hotline number for reporting non-storm water and illicit discharges for each Copermittee;

(3) Email address for reporting non-storm water and illicit discharges for each Copermittee;

(4) Link to each Copermittee's website, if available, where the public may find additional information about the Copermittee's storm water management program and for requesting records for the implementation of its program;

(5) Information about opportunities for the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or protection of the quality of receiving waters; and

(6) Reports from regional monitoring programs in which the Copermittees participate (e.g. Southern California Monitoring Coalition, Southern California Coastal Water Research Project Bight Monitoring);

(7) Regional Monitoring and Assessment Reports; and

(8) Any other information, data, and documents the Copermittees determine as appropriate for making available to the public.

[32] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

5. Report of Waste Discharge

a. The ~~Orange County Copermittees and the~~ Riverside County Copermittees are required to submit a complete Report of Waste Discharge pursuant to the requirements of their current Order~~s~~. The San Diego Water Board will review and consider the Report~~s~~ of Waste Discharge to determine whether modification to this Order, pursuant to the requirements of Provision H, will be required prior to the ~~Orange County Copermittees and/or~~ Riverside County Copermittees obtaining coverage under this Order. The current Order ~~s~~ for ~~the Orange County Copermittees and~~ Riverside County Copermittees is ~~are~~ rescinded upon the date of effective coverage under this Order except for enforcement purposes.

b. The Copermittees subject to the requirements of this Order must submit to the San Diego Water Board a complete Report of Waste Discharge as an application for the re-issuance of this Order and NPDES permit. The Report of Waste Discharge must be submitted no later than 180 days in advance of the expiration date of this Order. The Report of Waste Discharge must contain the following minimum information:

(1) Names and addresses of the Copermittees;

(2) Names and titles of the primary contacts of the Copermittees;

(3) Proposed changes to the Copermittees' Water Quality Improvement Plans and the supporting justification;

(4) Proposed changes to the Copermittees' jurisdictional runoff management programs and the supporting justification;

(5) Any other information necessary for the re-issuance of this Order;

(6) Any information to be included as part of the Report of Waste Discharge pursuant to the requirements of this Order; and

(7) Any other information required by federal regulations for NPDES permit reissuance.

6. Application for Early Coverage

a. The ~~Orange County Copermittees, collectively, or~~ Riverside County Copermittees~~, collectively,~~ may apply for early coverage under this Order by submitting a Report of Waste Discharge Form 200, with a written request for early coverage under this Order.

b. The San Diego Water Board will review the application for early coverage. A notification of coverage under this Order will be issued to the Copermittees in the

respective county by the San Diego Water Board upon completion of the early coverage application requirements. The effective coverage date will be specified in the notification of coverage. The Copermittees in the respective county are authorized to have MS4 discharges pursuant to the requirements of this Order starting on the effective coverage date specified in the notification of coverage. The existing Order for the respective county is rescinded upon the effective coverage date specified in the notification of coverage except for enforcement purposes.

7. Reporting Provisions

Each Copermittee must comply with all the reporting and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

G. PRINCIPAL WATERSHED COPERMITTEE RESPONSIBILITIES

1. The Copermittees within each Watershed Management Area must designate a Principal Watershed Copermittee and notify the San Diego Water Board of the name of the Principal Watershed Copermittee. An individual Copermittee should not be designated a Principal Watershed Copermittee for more than two Watershed Management Areas. The notification may be submitted with the Water Quality Improvement Plan required pursuant to Provision F.1 of this Order.

2. The Principal Watershed Copermittee is responsible for, at a minimum, the following:

a. Serving as liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues, and when necessary and appropriate, representing the Copermittees in the Watershed Management Area before the San Diego Water Board;

b. Facilitating the development of the Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order;

c. Coordinating the submittal of the deliverables required by Provisions F.1, F.2, F.3.a, and F.3.b of this Order; and

d. Coordinating and developing, with the other Principal Watershed Copermittees, the requirements of Provisions F.3.c, F.4, and F.5.b of this Order.

3. The Principal Watershed Copermittee is not responsible for ensuring that the other Copermittees within the Watershed Management Area are in compliance with the requirements of this Order. Each Copermittee within the Watershed Management Area is responsible for complying with the requirements of this Order.

H. MODIFICATION OF ORDER

1. Modifications of the Order may be initiated by the San Diego Water Board or by the Copermittees. Requests by Copermittees must be made to the San Diego Water Board.

2. Minor modifications to the Order may be made by the San Diego Water Board where the proposed modification complies with all the prohibitions and limitations, and other requirements of this Order.

3. This Order may also be re-opened and modified, revoked and, reissued or terminated in accordance with the provisions of 40 CFR 122.44, 122.62 to 122.64, and 124.5. Causes for taking such actions include, but are not limited to, failure to comply with any condition of this Order and permit, and endangerment to human health or the environment resulting from the permitted activity.

4. This Order may be re-opened for modification for cause including but not limited to the following:

a. The State Water Board determines that revisions are warranted, and the San Diego Water Board concurs that revisions are necessary to those provisions of the Order addressing compliance with water quality standards in the receiving water and/or those provisions of the Order establishing an iterative process for implementation of management practices to assure compliance with water quality standards in the receiving water;

b. An application for early coverage under this Order is received pursuant to Provision F.6;

c. Any of the TMDLs in Attachment E to this Order are amended in the Basin Plan by San Diego Water Board, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA;

d. The Basin Plan is amended by the San Diego Water Board to incorporate a new TMDL, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA; or

e. Updating or revising the monitoring and reporting requirements is determined to be necessary, at the discretion of the San Diego Water Board. Such modification(s) may include, but is (are) not limited to, revision(s) to: (i) implement recommendations from Southern California Coastal Water Research Project (SCCWRP), (ii) develop, refine, implement, and/or coordinate a regional monitoring program, (iii) develop and implement improved monitoring and assessment programs in keeping with San Diego Water Board Resolution No. R9-2012-0069, Resolution in Support of a Regional Monitoring Framework, and/or (iv) add provisions to require the Copermittees to evaluate and provide information on cost and values of the monitoring and reporting program.

5. The San Diego Water Board, after opportunity for public comment and a public hearing, will re-open and consider modifications to this Order when the ~~Orange County Copermittees or the~~ Riverside County Copermittees submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders.

I. STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

Each Copermittee must comply with all the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

ATTACHMENT A

DISCHARGE PROHIBITIONS AND SPECIAL PROTECTIONS

1. Basin Plan Waste Discharge Prohibitions

California Water Code Section 13243 provides that a Regional Water Board, in a water quality control plan, may specify certain conditions or areas where the discharge of waste or certain types of waste is not permitted. The following waste discharge prohibitions in the Water Quality Control Plan for the San Diego Basin (Basin Plan) are applicable to any person, as defined by Section 13050(c) of the California Water Code, who is a citizen, domiciliary, or political agency or entity of California whose activities in California could affect the quality of waters of the state within the boundaries of the San Diego Region.

1. The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in California Water Code Section 13050, is prohibited.

2. The discharge of waste to land, except as authorized by waste discharge requirements or the terms described in California Water Code Section 13264 is prohibited.

3. The discharge of pollutants or dredged or fill material to waters of the United States except as authorized by a National Pollutant Discharge Elimination System (NPDES) permit or a dredged or fill material permit (subject to the exemption described in California Water Code Section 13376) is prohibited.

4. Discharges of recycled water to lakes or reservoirs used for municipal water supply or to inland surface water tributaries thereto are prohibited, unless this San Diego Water Board issues a NPDES permit authorizing such a discharge; the proposed discharge has been approved by the State Department of Health Services (DHS) and the operating agency of the impacted reservoir; and the discharger has an approved fail-safe long-term disposal alternative.

5. The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the San Diego Water Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

6. The discharge of waste in a manner causing flow, ponding, or surfacing on lands not owned or under the control of the discharger is prohibited, unless the discharge is authorized by the San Diego Water Board.

7. The dumping, deposition, or discharge of waste directly into waters of the state, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the San Diego Water Board.

8. Any discharge to a storm water conveyance system that is not composed entirely of "*storm water*" is prohibited unless authorized by the San Diego Water Board. [The federal regulations, 40 CFR 122.26(b)(13), define storm water as storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from firefighting activities.] [§122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

9. The unauthorized discharge of treated or untreated sewage to waters of the state or to a storm water conveyance system is prohibited.

10. The discharge of industrial wastes to conventional septic tank/subsurface disposal systems, except as authorized by the terms described in California Water Code Section 13264, is prohibited.

11. The discharge of radioactive wastes amenable to alternative methods of disposal into the waters of the state is prohibited.

12. The discharge of any radiological, chemical, or biological warfare agent into waters of the state is prohibited.

13. The discharge of waste into a natural or excavated site below historic water levels is prohibited unless the discharge is authorized by the San Diego Water Board.

14. The discharge of sand, silt, clay, or other earthen materials from any activity, including land grading and construction, in quantities which cause deleterious bottom deposits, turbidity or discoloration in waters of the state or which unreasonably affect, or threaten to affect, beneficial uses of such waters is prohibited.

15. The discharge of treated or untreated sewage from vessels to Mission Bay, Oceanside Harbor, Dana Point Harbor, or other small boat harbors is prohibited.

16. The discharge of untreated sewage from vessels to San Diego Bay is prohibited.

17. The discharge of treated sewage from vessels to portions of San Diego Bay that are less than 30 feet deep at mean lower low water (MLLW) is prohibited.

18. The discharge of treated sewage from vessels, which do not have a properly functioning US Coast Guard certified Type I or Type II marine sanitation device, to portions of San Diego Bay that are greater than 30 feet deep at mean lower low water (MLLW) is prohibited.

2. Attachment B to State Water Board Resolution 2012-0012, as amended by State Water Board Resolution No. 2012-0031.

Special Protections for Areas of Special Biological Significance (ASBS), Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges

I. PROVISIONS FOR POINT SOURCE DISCHARGES OF STORM WATER AND NONPOINT SOURCE WASTE DISCHARGES

The following terms, prohibitions, and special conditions (hereafter collectively referred to as special conditions) are established as limitations on point source storm water and nonpoint source discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in Areas of Special Biological Significance (ASBS), as required for State Water Quality Protection Areas pursuant to California Public Resources Code Sections 36700(f) and 36710(f). These Special Protections are adopted by the State Water Board as part of the California Ocean Plan (Ocean Plan) General Exception.

The special conditions are organized by category of discharge. The State Water Resources Control Board (State Water Board) and Regional Water Quality Control Boards (Regional Water Boards) will determine categories and the means of regulation for those categories [e.g., Point Source Storm Water National Pollutant Discharge Elimination System (NPDES) or Nonpoint Source].

A. PERMITTED POINT SOURCE DISCHARGES OF STORM WATER

1. General Provisions for Permitted Point Source Discharges of Storm Water

a. Existing storm water discharges into an ASBS are allowed only under the following conditions:

(1) The discharges are authorized by an NPDES permit issued by the State Water Board or Regional Water Board;

(2) The discharges comply with all of the applicable terms, prohibitions, and special conditions contained in these Special Protections; and

(3) The discharges:

(i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

(ii) Are designed to prevent soil erosion;

(iii) Occur only during wet weather;

(iv) Are composed of only storm water runoff.

b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

c. The discharge of trash is prohibited.

d. Only discharges from existing storm water outfalls are allowed. Any proposed or new storm water runoff discharge shall be routed to existing storm water discharge outfalls and shall not result in any new contribution of waste to an ASBS (i.e., no additional pollutant loading). "Existing storm water outfalls" are those that were constructed or under construction prior to January 1, 2005. "New contribution of waste" is defined as any addition of waste beyond what would have occurred as of January 1, 2005. A change to an existing storm water outfall, in terms of re-location or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges are prohibited except as provided below:

(1) The term "non-storm water discharges" means any waste discharges from a municipal separate storm sewer system (MS4) or other NPDES permitted storm drain system to an ASBS that are not composed entirely of storm water.

(2) (i) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability or occur naturally:

(a) Discharges associated with emergency fire fighting operations.

(b) Foundation and footing drains.

(c) Water from crawl space or basement pumps.

(d) Hillside dewatering.

(e) Naturally occurring groundwater seepage via a storm drain.

(f) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(ii) An NPDES permitting authority may authorize non-storm water discharges to an MS4 with a direct discharge to an ASBS only to the extent the NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

2. Compliance Plans for Inclusion in Storm Water Management Plans (SWMP) and Storm Water Pollution Prevention Plans (SWPPP).

The discharger shall specifically address the prohibition of non-storm water runoff and the requirement to maintain natural water quality for storm water discharges to an ASBS in an ASBS Compliance Plan to be included in its SWMP or a SWPPP, as appropriate to permit

type. If a statewide permit includes a SWMP, then the discharger shall prepare a stand-alone compliance plan for ASBS discharges. The ASBS Compliance Plan is subject to approval by the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (for permits issued by Regional Water Boards).

a. The Compliance Plan shall include a map of surface drainage of storm water runoff, showing areas of sheet runoff, prioritize discharges, and describe any structural Best Management Practices (BMPs) already employed and/or BMPs to be employed in the future. Priority discharges are those that pose the greatest water quality threat and which are identified to require installation of structural BMPs. The map shall also show the storm water conveyances in relation to other features such as service areas, sewage conveyances and treatment facilities, landslides, areas prone to erosion, and waste and hazardous material storage areas, if applicable. The SWMP or SWPPP shall also include a procedure for updating the map and plan when changes are made to the storm water conveyance facilities.

b. The ASBS Compliance Plan shall describe the measures by which all non-authorized non-storm water runoff (e.g., dry weather flows) has been eliminated, how these measures will be maintained over time, and how these measures are monitored and documented.

c. For Municipal Separate Storm Sewer System (MS4s), the ASBS Compliance Plan shall require minimum inspection frequencies as follows:

(1) The minimum inspection frequency for construction sites shall be weekly during rainy season;

(2) The minimum inspection frequency for industrial facilities shall be monthly during the rainy season;

(3) The minimum inspection frequency for commercial facilities (e.g., restaurants) shall be twice during the rainy season; and

(4) Storm water outfall drains equal to or greater than 18 inches (457 mm) in diameter or width shall be inspected once prior to the beginning of the rainy season and once during the rainy season and maintained to remove trash and other anthropogenic debris.

d. The ASBS Compliance Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff, that are necessary to comply with these special conditions, will be achieved through BMPs. Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that such installation would pose a threat to health or safety. BMPs to control storm water runoff discharges (at the end-of-pipe) during a design storm shall be designed to achieve on average the following target levels:

(1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

(2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges.

The baseline for these determinations is the effective date of the Exception, except for those structural BMPs installed between January 1, 2005 and adoption of these Special Protections, and the reductions must be achieved and documented within six (6) years of the effective date.

e. The ASBS Compliance Plan shall address erosion control and the prevention of anthropogenic sedimentation in ASBS. The natural habitat conditions in the ASBS shall not be altered as a result of anthropogenic sedimentation.

f. The ASBS Compliance Plan shall describe the non-structural BMPs currently employed and planned in the future (including those for construction activities), and include an implementation schedule. The ASBS Compliance Plan shall include non-structural BMPs that address public education and outreach. Education and outreach efforts must adequately inform the public that direct discharges of pollutants from private property not entering an MS4 are prohibited. The ASBS Compliance Plan shall also describe the structural BMPs, including any low impact development (LID) measures, currently employed and planned for higher threat discharges and include an implementation schedule. To control storm water runoff discharges (at the end-of-pipe) during a design storm, permittees must first consider, and use where feasible, LID practices to infiltrate, use, or evapotranspirate storm water runoff on-site, if LID practices would be the most effective at reducing pollutants from entering the ASBS.

g. The BMPs and implementation schedule shall be designed to ensure that natural water quality conditions in the receiving water are achieved and maintained by either reducing flows from impervious surfaces or reducing pollutant loading, or some combination thereof.

h. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents in storm water runoff that alter natural ocean water quality and the sources of these constituents.

(2) The report shall describe BMPs that are currently being implemented, BMPs that are identified in the SWMP or SWPPP for future implementation, and any additional BMPs that may be added to the SWMP or SWPPP to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the BMPs.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits), the discharger shall revise its ASBS Compliance Plan to incorporate any new or modified BMPs that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised SWMP or SWPPP, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural ocean water quality conditions due to the same constituent.

(5) The requirements of this section are in addition to the terms, prohibitions, and conditions contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within eighteen (18) months from the effective date of the Exception, the discharger shall submit a draft written ASBS Compliance Plan to the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that describes its strategy to comply with these special conditions, including the requirement to maintain natural water quality in the affected ASBS. The ASBS Compliance Plan shall include a description of appropriate non-structural controls and a time schedule to implement structural controls (implementation schedule) to comply with these special conditions for inclusion in the discharger's SWMP or SWPPP, as appropriate to permit type. The final ASBS Compliance Plan, including a description and final schedule for structural controls based on the results of runoff and receiving water monitoring, must be submitted within thirty (30) months from the effective date of the Exception.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these special conditions shall be implemented.

d. Within six (6) years of the effective date of the Exception, any structural controls identified in the ASBS Compliance Plan that are necessary to comply with these special conditions shall be operational.

e. Within six (6) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water, pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data, and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe

the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. for municipalities, a demonstration of significant hardship to discharger ratepayers, by showing the relationship of storm water fees to annual household income for residents within the discharger's jurisdictional area, and the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or

2. for other governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

B. NONPOINT SOURCE DISCHARGES

1. General Provisions for Nonpoint Sources

a. Existing nonpoint source waste discharges are allowed into an ASBS only under the following conditions:

(1) The discharges are authorized under waste discharge requirements, a conditional waiver of waste discharge requirements, or a conditional prohibition issued by the State Water Board or a Regional Water Board.

(2) The discharges are in compliance with the applicable terms, prohibitions, and special conditions contained in these Special Protections.

(3) The discharges:

(i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

(ii) Are designed to prevent soil erosion;

(iii) Occur only during wet weather;

(iv) Are composed of only storm water runoff.

b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

c. The discharge of trash is prohibited.

d. Only existing nonpoint source waste discharges are allowed. "Existing nonpoint source waste discharges" are discharges that were ongoing prior to January 1, 2005. "New nonpoint source discharges" are defined as those that commenced on or after January 1, 2005. A change to an existing nonpoint source discharge, in terms of relocation or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges from nonpoint sources (those not subject to an NPDES Permit) are prohibited except as provided below:

(1) The term "non-storm water discharges" means any waste discharges that are not composed entirely of storm water.

(2) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability, or occur naturally:

(i) Discharges associated with emergency fire fighting operations.

(ii) Foundation and footing drains.

(iii) Water from crawl space or basement pumps.

(iv) Hillside dewatering.

(v) Naturally occurring groundwater seepage via a storm drain.

(vi) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

f. At the San Clemente Island ASBS, discharges incidental to military training and research, development, test, and evaluation operations are allowed. Discharges incidental to underwater demolition and other in-water explosions are not allowed in the two military closure areas in the vicinity of Wilson Cove and Castle Rock. Discharges must not result in a violation of the water quality objectives, including the protection of the marine aquatic life beneficial use, anywhere in the ASBS.

g. At the San Nicolas Island and Begg Rock ASBS, discharges incidental to military research, development, testing, and evaluation of, and training with, guided missile and other weapons systems, fleet training exercises, small-scale amphibious warfare training, and special warfare training are allowed. Discharges incidental to underwater demolition and other in-water explosions are not allowed. Discharges must not result in a violation of the water quality objectives, including the protection of the marine aquatic life beneficial use, anywhere in the ASBS.

h. All other nonpoint source discharges not specifically authorized above are prohibited.

2. Planning and Reporting

a. The nonpoint source discharger shall develop an ASBS Pollution Prevention Plan, including an implementation schedule, to address storm water runoff and any other nonpoint source discharges from its facilities. The ASBS Pollution Prevention Plan must be equivalent in contents to an ASBS Compliance Plan as described in I (A)(2) in this document. The ASBS Pollution Prevention Plan is subject to approval by the Executive Director of the State Water Board (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements).

b. The ASBS Pollution Prevention Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff that are necessary to comply with these special conditions, will be achieved through Management Measures and associated Management Practices (Management Measures/Practices). Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director or Regional Water Board Executive Officer that such installation would pose a threat to health or safety. Management Measures to control storm water runoff during a design storm shall achieve on average the following target levels:

(1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

(2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges.

The baseline for these determinations is the effective date of the Exception, except for those structural BMPs installed between January 1, 2005 and adoption of these Special Protections, and the reductions must be achieved and documented within six (6) years of the effective date.

c. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff or other nonpoint source pollution is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and the Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents that alter natural water quality and the sources of these constituents.

(2) The report shall describe Management Measures/Practices that are currently being implemented, Management Measures/Practices that are identified in the ASBS Pollution Prevention Plan for future implementation, and any additional Management Measures/Practices that may be added to the Pollution Prevention Plan to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the Management Measures/Practices.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of

the Regional Water Board (Regional Water Board waivers or waste discharge requirements), the discharger shall revise its ASBS Pollution Prevention Plan to incorporate any new or modified Management Measures/Practices that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised ASBS Pollution Prevention Plan, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural water quality conditions due to the same constituent.

(5) The requirements of this section are in addition to the terms, prohibitions, and conditions contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within eighteen (18) months from the effective date of the Exception, the discharger~~s~~ shall submit a draft written ASBS Pollution Prevention Plan to the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) that describes its strategy to comply with these special conditions, including the requirement to maintain natural ocean water quality in the affected ASBS. The Pollution Prevention Plan shall include a description of appropriate non-structural controls and a time schedule to implement structural controls to comply with these special conditions for inclusion in the discharger's Pollution Prevention Plan. The final ASBS Pollution Prevention Plan, including a description and final schedule for structural controls based on the results of runoff and receiving water monitoring, must be submitted within thirty (30) months from the effective date of the Exception.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these Special Protections shall be implemented.

d. Within six (6) years of the effective date of the Exception, any structural controls identified in the ASBS Pollution Prevention Plan that are necessary to comply with these special conditions shall be operational.

e. Within six (6) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board

waivers or waste discharge requirements) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. a demonstration that the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or

2. for governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

II. ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES

In addition to the provisions in Section I (A) or I (B), respectively, a discharger with parks and recreation facilities shall comply with the following:

A. The discharger shall include a section in an ASBS Compliance Plan (for NPDES dischargers) or an ASBS Pollution Prevention Plan (for nonpoint source dischargers) to address storm water runoff from parks and recreation facilities.

1. The plan shall identify all pollutant sources, including sediment sources, which may result in waste entering storm water runoff. Pollutant sources include, but are not limited to, roadside rest areas and vistas, picnic areas, campgrounds, trash receptacles, maintenance facilities, park personnel housing, portable toilets, leach fields, fuel tanks, roads, piers, and boat launch facilities.

2. The plan shall describe BMPs or Management Measures/Practices that will be implemented to control soil erosion (both temporary and permanent erosion controls) and reduce or eliminate pollutants in storm water runoff in order to achieve and maintain natural water quality conditions in the affected ASBS. The plan shall include BMPs or Management Measures/Practices to ensure that trails and culverts are maintained to prevent erosion and minimize waste discharges to ASBS.

3. The plan shall include BMPs or Management Measures/Practices to prevent the discharge of pesticides or other chemicals, including agricultural chemicals, in storm water runoff to the affected ASBS.

4. The plan shall include BMPs or Management Measures/Practices that address public education and outreach. The goal of these BMPs or Management Measures/Practices is to ensure that the public is adequately informed that waste discharges to the affected ASBS are prohibited or limited by special conditions in these Special Protections. The BMPs or Management Measures/Practices shall include signage at camping, picnicking, beach and roadside parking areas, and visitor centers, or other appropriate measures, which notify the public of any applicable requirements of these Special Protections and identify the ASBS boundaries.

5. The plan shall include BMPs or Management Measures/Practices that address the prohibition against the discharge of trash to ASBS. The BMPs or Management Measures/Practices shall include measures to ensure that adequate trash receptacles are available for public use at visitor facilities, including parking areas, and that the receptacles are adequately maintained to prevent trash discharges into the ASBS. Appropriate measures include covering trash receptacles to prevent trash from being wind blown and periodically emptying the receptacles to prevent overflows.

6. The plan shall include BMPs or Management Measures/Practices to address runoff from parking areas and other developed features to ensure that the runoff does not alter natural water quality in the affected ASBS. BMPs or Management Measures/Practices shall include measures to reduce pollutant loading in runoff to the ASBS through installation of natural area buffers (LID), treatment, or other appropriate measures.

B. Maintenance and repair of park and recreation facilities must not result in waste discharges to the ASBS. The practice of road oiling must be minimized or eliminated, and must not result in waste discharges to the ASBS.

III. ADDITIONAL REQUIREMENTS – WATERFRONT AND MARINE OPERATIONS

In addition to the provisions in Section I (A) or I (B), respectively, a discharger with waterfront and marine operations shall comply with the following:

A. For discharges related to waterfront and marine operations, the discharger shall develop a Waterfront and Marine Operations Management Plan (Waterfront Plan). This plan shall contain appropriate Management Measures/Practices to address nonpoint source pollutant discharges to the affected ASBS.

1. The Waterfront Plan shall contain appropriate Management Measures/Practices for any waste discharges associated with the operation and maintenance of vessels, moorings, piers, launch ramps, and cleaning stations in order to ensure that beneficial uses are protected and natural water quality is maintained in the affected ASBS.

2. For discharges from marinas and recreational boating activities, the Waterfront Plan shall include appropriate Management Measures, described in The Plan for California's Nonpoint Source Pollution Control Program, for marinas and recreational boating, or equivalent practices, to ensure that nonpoint source pollutant discharges do not alter natural water quality in the affected ASBS.

3. The Waterfront Plan shall include Management Practices to address public education and outreach to ensure that the public is adequately informed that waste discharges to the affected ASBS are prohibited or limited by special conditions in these Special Protections. The management practices shall include appropriate signage, or similar measures, to inform the public of the ASBS restrictions and to identify the ASBS boundaries.

4. The Waterfront Plan shall include Management Practices to address the prohibition against trash discharges to ASBS. The Management Practices shall include the provision of adequate trash receptacles for marine recreation areas, including parking areas, launch ramps, and docks. The plan shall also include appropriate Management Practices to ensure that the receptacles are adequately maintained and secured in order to prevent trash discharges into the ASBS. Appropriate Management Practices include covering the trash receptacles to prevent trash from being windblown, staking or
securing the trash receptacles so they don't tip over, and periodically emptying the receptacles to prevent overflow.

5. The discharger shall submit its Waterfront Plan to the by the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) within six months of the effective date of these special conditions. The Waterfront Plan is subject to approval by the State Water Board Executive Director or the Regional Water Board Executive Officer, as appropriate. The plan must be fully implemented within 18 months of the effective date of the Exception.

B. The discharge of chlorine, soaps, petroleum, other chemical contaminants, trash, fish offal, or human sewage to ASBS is prohibited. Sinks and fish cleaning stations are point source discharges of wastes and are prohibited from discharging into ASBS. Anthropogenic accumulations of discarded fouling organisms on the sea floor must be minimized.

C. Limited-term activities, such as the repair, renovation, or maintenance of waterfront facilities, including, but not limited to, piers, docks, moorings, and breakwaters, are authorized only in accordance with Chapter III.E.2 of the Ocean Plan.

D. If the discharger anticipates that the discharger will fail to fully implement the approved Waterfront Plan within the 18 month deadline, the discharger shall submit a technical report as soon as practicable to the State Water Board Executive Director or the Regional Water Board Executive Officer, as appropriate. The technical report shall contain reasons for failing to meet the deadline and propose a revised schedule to fully implement the plan.

E. The State Water Board or the Regional Water Board may, for good cause, authorize additional time to comply with the Waterfront Plan. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that

caused or would cause it to fail to meet the deadline in Section III.A.5. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality. The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. a demonstration of significant hardship by showing that the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate.

2. for governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

IV. MONITORING REQUIREMENTS

Monitoring is mandatory for all dischargers to assure compliance with the Ocean Plan. Monitoring requirements include both: (A) core discharge monitoring, and (B) ocean receiving water monitoring. The State and Regional Water Boards must approve sampling site locations and any adjustments to the monitoring programs. All ocean receiving water and reference area monitoring must be comparable with the Water Boards' Surface Water Ambient Monitoring Program (SWAMP).

Safety concerns: Sample locations and sampling periods must be determined considering safety issues. Sampling may be postponed upon notification to the State and Regional Water Boards if hazardous conditions prevail.

Analytical Chemistry Methods: All constituents must be analyzed using the lowest minimum detection limits comparable to the Ocean Plan water quality objectives. For metal analysis, all samples, including storm water effluent, reference samples, and ocean receiving water samples, must be analyzed by the approved analytical method with the lowest minimum detection limits (currently Inductively Coupled Plasma/Mass Spectrometry) described in the Ocean Plan.

A. CORE DISCHARGE MONITORING PROGRAM

1. General sampling requirements for timing and storm size:

Runoff must be collected during a storm event that is greater than 0.1 inch and generates runoff, and at least 72 hours from the previously measurable storm event. Runoff samples shall be collected during the same storm and at approximately the same time when post-storm receiving water is sampled, and analyzed for the same constituents as receiving water and reference site samples (see section IV B) as described below.

2. Runoff flow measurements

a. For municipal/industrial storm water outfalls in existence as of December 31, 2007, 18 inches (457mm) or greater in diameter/width (including multiple outfall pipes in combination having a width of 18 inches, runoff flows must be measured or calculated, using a method acceptable to and approved by the State and Regional Water Boards.

b. This will be reported annually for each precipitation season to the State and Regional Water Boards.

3. Runoff samples – storm events

a. For outfalls equal to or greater than 18 inches (0.46m) in diameter or width:

(1) samples of storm water runoff shall be collected during the same storm as receiving water samples and analyzed for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

(2) samples of storm water runoff shall be collected and analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

(3) If an applicant has no outfall greater than 36 inches, then storm water runoff from the applicant's largest outfall shall be further collected during the same storm as receiving water samples and analyzed for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates).

b. For outfalls equal to or greater than 36 inches (0.91m) in diameter or width:

(1) samples of storm water runoff shall be collected during the same storm as receiving water samples and analyzed for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

(2) samples of storm water runoff shall be further collected during the same storm as receiving water samples and analyzed for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates); and

(3) samples of storm water runoff shall be collected and analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

c. For an applicant not participating in a regional monitoring program [see below in Section IV (B)] in addition to (a.) and (b.) above, a minimum of the two largest outfalls or 20 percent of the larger outfalls, whichever is greater, shall be sampled (flow weighted composite samples) at least three times annually during wet weather (storm event)

and analyzed for all Ocean Plan Table A constituents, Table B constituents for marine aquatic life protection (except for toxicity, only chronic toxicity for three species shall be required), DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, and Ocean Plan indicator bacteria. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one (the largest) such discharge shall be sampled annually in each Region.

4. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may reduce or suspend core monitoring once the storm runoff is fully characterized. This determination may be made at any point after the discharge is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

B. Ocean Receiving Water and Reference Area Monitoring Program

In addition to performing the Core Discharge Monitoring Program in Section II.A above, all applicants having authorized discharges must perform ocean receiving water monitoring. In order to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS, dischargers may choose either (1) an individual monitoring program, or (2) participation in a regional integrated monitoring program.

1. Individual Monitoring Program: The requirements listed below are for those dischargers who elect to perform an individual monitoring program to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within the affected ASBS. In addition to Core Discharge Monitoring, the following additional monitoring requirements shall be met:

   a. Three times annually, during wet weather (storm events), the receiving water at the point of discharge from the outfalls described in section (IV)(A)(3)(c) above shall be sampled and analyzed for Ocean Plan Table A constituents, Table B constituents for marine aquatic life, DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, salinity, chronic toxicity (three species), and Ocean Plan indicator bacteria.

      The sample location for the ocean receiving water shall be in the surf zone at the point of discharges; this must be at the same location where storm water runoff is sampled. Receiving water shall be sampled prior to (pre-storm) and during (or immediately after) the same storm (post storm). Post storm sampling shall be during the same storm and at approximately the same time as when the runoff is sampled. Reference water quality shall also be sampled three times annually and analyzed for the same constituents pre-storm and post-storm, during the same storm seasons when receiving water is sampled. Reference stations will be determined by the State Water Board's Division of Water Quality and the applicable Regional Water Board(s).

   b. Sediment sampling shall occur at least three times during every five (5) year period. The subtidal sediment (sand or finer, if present) at the discharge shall be sampled and analyzed for Ocean Plan Table B constituents for marine aquatic life, DDT, PCBs, PAHs, pyrethroids, and OP pesticides. For sediment toxicity testing, only an acute toxicity test using the amphipod *Eohaustorius estuarius* must be performed.

c. A quantitative survey of intertidal benthic marine life shall be performed at the discharge and at a reference site. The survey shall be performed at least once every five (5) year period. The survey design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The results of the survey shall be completed and submitted to the State Water Board and Regional Water Board at least six months prior to the end of the permit cycle.

d. Once during each five (5) year period, a bioaccumulation study shall be conducted to determine the concentrations of metals and synthetic organic pollutants at representative discharge sites and at representative reference sites. The study design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The bioaccumulation study may include California mussels (*Mytilus californianus*) and/or sand crabs (*Emerita analoga* or *Blepharipoda occidentalis*). Based on the study results, the Regional Water Board and the State Water Board's Division of Water Quality, may adjust the study design in subsequent permits, or add or modify additional test organisms (such as shore crabs or fish), or modify the study design appropriate for the area and best available sensitive measures of contaminant exposure.

e. Marine Debris: Representative quantitative observations for trash by type and source shall be performed along the coast of the ASBS within the influence of the discharger's outfalls. The design, including locations and frequency, of the marine debris observations is subject to approval by the Regional Water Board and State Water Board's Division of Water Quality.

f. The monitoring requirements of the Individual Monitoring Program in this section are minimum requirements. After a minimum of one (1) year of continuous water quality monitoring of the discharges and ocean receiving waters, the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may require additional monitoring, or adjust, reduce or suspend receiving water and reference station monitoring. This determination may be made at any point after the discharge and receiving water is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

2. Regional Integrated Monitoring Program: Dischargers may elect to participate in a regional integrated monitoring program, in lieu of an individual monitoring program, to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS. This regional approach shall characterize natural water quality, pre- and post-storm, in ocean reference areas near the mouths of identified open space watersheds and the effects of the discharges on natural water quality (physical, chemical, and toxicity) in the ASBS receiving waters, and should include benthic marine aquatic life and bioaccumulation components. The design of the ASBS stratum of a regional integrated monitoring program may deviate from the otherwise prescribed individual monitoring approach (in Section IV.B.1) if approved by the State Water Board's Division of Water Quality and the Regional Water Boards.

a. Ocean reference areas shall be located at the drainages of flowing watersheds with minimal development (in no instance more than 10% development), and shall not be located in CWA Section 303(d) listed waterbodies or have tributaries that are 303(d) listed. Reference areas shall be free of wastewater discharges and anthropogenic non- storm water runoff. A minimum of low threat storm runoff discharges (e.g.

stream highway overpasses and campgrounds) may be allowed on a case-by-case basis. Reference areas shall be located in the same region as the ASBS receiving water monitoring occurs. The reference areas for each Region are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean reference water samples must be collected from each station, each from a separate storm during the same storm season that receiving water is sampled. A minimum of one reference location shall be sampled for each ASBS receiving water site sampled per responsible party. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

b. ASBS ocean receiving water must be sampled in the surf zone at the location where the runoff makes contact with ocean water (i.e. at "point zero"). Ocean receiving water stations must be representative of worst-case discharge conditions (i.e. co-located at a large drain greater than 36 inches, or if drains greater than 36 inches are not present in the ASBS then the largest drain greater than18 inches.) Ocean receiving water stations are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean receiving water samples must be collected during each storm season from each station, each from a separate storm. A minimum of one receiving water location shall be sampled in each ASBS per responsible party in that ASBS. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

c. Reference and receiving water sampling shall commence during the first full storm season following the adoption of these special conditions, and post-storm samples shall be collected during the same storm event when storm water runoff is sampled. Sampling shall occur in a minimum of two storm seasons. For those ASBS dischargers that have already participated in the Southern California Bight 2008 ASBS regional monitoring effort, sampling may be limited to only one storm season.

d. Receiving water and reference samples shall be analyzed for the same constituents as storm water runoff samples. At a minimum, constituents to be sampled and analyzed in reference and discharge receiving waters must include oil and grease, total suspended solids, Ocean Plan Table B metals for protection of marine life, Ocean Plan PAHs, pyrethroids, OP pesticides, ammonia, nitrate, phosphates, and critical life stage chronic toxicity for three species. In addition, within the range of the southern sea otter, indicator bacteria or some other measure of fecal contamination shall be analyzed.

3. Waterfront and Marine Operations: In addition to the above requirements for ocean receiving water monitoring, additional monitoring must be performed for marinas and boat launch and pier facilities:

a. For all marina or mooring field operators, in mooring fields with 10 or more occupied moorings, the ocean receiving water must be sampled for Ocean Plan indicator bacteria, residual chlorine, copper, zinc, grease and oil, methylene blue active substances (MBAS), and ammonia nitrogen.

(1) For mooring field operators opting for an individual monitoring program (Section IV.B.1 above), this sampling must occur weekly (on the weekend) from May through October.

(2) For mooring field operators opting to participate in a regional integrated monitoring program (Section IV.B.2 above), this sampling must occur monthly from May through October on a high use weekend in each month. The Water Boards may allow a reduction in the frequency of sampling, through the regional monitoring program, after the first year of monitoring.

b. For all mooring field operators, the subtidal sediment (sand or finer, if present) within mooring fields and below piers shall be sampled and analyzed for Ocean Plan Table B metals (for marine aquatic life beneficial use), acute toxicity, PAHs, and tributyltin. For sediment toxicity testing, only an acute toxicity test using the amphipod *Eohaustorius estuarius* must be performed. This sampling shall occur at least three times during a five (5) year period. For mooring field operators opting to participate in a regional integrated monitoring program, the Water Boards may allow a reduction in the frequency of sampling after the first sampling effort's results are assessed.

Glossary

At the point of discharge(s) – Means in the surf zone immediately where runoff from an outfall meets the ocean water (a.k.a., at point zero).

Areas of Special Biological Significance (ASBS) – Those areas designated by the State Water Board as ocean areas requiring protection of species or biological communities to the extent that alteration of natural water quality is undesirable. All Areas of Special Biological Significance are also classified as a subset of State Water Quality Protection Areas.

Design storm – For purposes of these Special Protections, a design storm is defined as the volume of runoff produced from one inch of precipitation per day or, if this definition is inconsistent with the discharger's applicable storm water permit, then the design storm shall be the definition included in the discharger's applicable storm water permit.

Development – Relevant to reference monitoring sites, means urban, industrial, agricultural, grazing, mining, and timber harvesting land uses.

Higher threat discharges - Permitted storm drains discharging equal to or greater than 18 inches, industrial storm drains, agricultural runoff discharged through an MS4, discharges associated with waterfront and marina operations (e.g., piers, launch ramps, mooring fields, and associated vessel support activities, except for passive discharges defined below), and direct discharges associated with commercial or industrial activities to ASBS.

Low Impact Development (LID) – A sustainable practice that benefits water supply and contributes to water quality protection. Unlike traditional storm water management, which entails collecting and conveying storm water runoff through storm drains, pipes, or other conveyances to a centralized storm water facility, LID focuses on using site design and storm water management to maintain the site's pre-development runoff rates and volumes. The goal of LID is to mimic a site's predevelopment hydrology by using design techniques that infiltrate, filter, store, evaporate, and detain runoff close to the source of rainfall.

Marine Operations – Marinas or mooring fields that contain slips or mooring locations for 10 or more vessels.

Management Measure (MM) - Economically achievable measures for the control of the addition of pollutants from various classes of nonpoint sources of pollution, which reflect the greatest degree of pollutant reduction achievable through the application of the best available nonpoint pollution control practices, technologies, processes, siting criteria, operating methods, or other alternatives. For example, in the "marinas and recreational boating" land- use category specified in the Plan for California's Nonpoint Source Pollution Control Program (NPS Program Plan) (SWRCB, 1999), "boat cleaning and maintenance" is considered a MM or the source of a specific class or type of NPS pollution.

Management Practice (MP) - The practices (e.g., structural, non-structural, operational, or other alternatives) that can be used either individually or in combination to address a specific MM class or classes of NPS pollution. For example, for the "boat cleaning and maintenance" MM, specific MPs can include, but are not limited to, methods for the selection of environmentally sensitive hull paints or methods for cleaning/removal of hull copper anti- fouling paints.

Municipal Separate Storm Sewer System (MS4) – A municipally-owned storm sewer system regulated under the Phase I or Phase II storm water program implemented in compliance with Clean Water Act section 402(p). Note that an MS4 program's boundaries are not necessarily congruent with the permittee's political boundaries.

Natural Ocean Water Quality - The water quality (based on selected physical, chemical and biological characteristics) that is required to sustain marine ecosystems, and which is without apparent human influence, *i.e.*, an absence of significant amounts of: (a) man-made constituents (*e.g.,* DDT); (b) other chemical (*e.g.,* trace metals), physical (temperature/thermal pollution, sediment burial), and biological (*e.g.*, bacteria) constituents at concentrations that have been elevated due to man's activities above those resulting from the naturally occurring processes that affect the area in question; and (c) non-indigenous biota (*e.g.,* invasive algal bloom species) that have been introduced either deliberately or accidentally by man. Discharges "*shall not alter natural ocean water quality*" as determined by a comparison to the range of constituent concentrations in reference areas agreed upon via the regional monitoring program(s). If monitoring information indicates that *natural ocean water quality* is not maintained, but there is sufficient evidence that a discharge is not contributing to the alteration of natural water quality, then the Regional Water Board may make that determination. In this case, sufficient information must include runoff sample data that has equal or lower concentrations for the range of constituents at the applicable reference area(s).

Nonpoint source – Nonpoint pollution sources generally are sources that do not meet the definition of a point source. Nonpoint source pollution typically results from land runoff, precipitation, atmospheric deposition, agricultural drainage, marine/boating operations or hydrologic modification. Nonpoint sources, for purposes of these Special Protections, include discharges that are not required to be regulated under an NPDES permit.

Non-storm water discharge – Any runoff that is not the result of a precipitation event. This is often referred to as "dry weather flow."

Non-structural control – A Best Management Practice that involves operational, maintenance, regulatory (e.g., ordinances) or educational activities designed to reduce or eliminate pollutants in runoff, and that are not structural controls (i.e. there are no physical structures involved).

Physical impossibility - Means any act of God, war, fire, earthquake, windstorm, flood or natural catastrophe; unexpected and unintended accidents not caused by discharger or its employees' negligence; civil disturbance, vandalism, sabotage or terrorism; restrain by court order or public authority or agency; or action or non-action by, or inability to

obtain the necessary authorizations or approvals from any governmental agency other than the permittee.

Representative sites and monitoring procedures – Are to be proposed by the discharger, with appropriate rationale, and subject to approval by Water Board staff.

Sheet-flow – Runoff that flows across land surfaces at a shallow depth relative to the cross- sectional width of the flow. These types of flow may or may not enter a storm drain system before discharge to receiving waters.

Storm Season – Also referred to as rainy season, means the months of the year from the onset of rainfall during autumn until the cessation of rainfall in the spring.

Structural control – A Best Management Practice that involves the installation of engineering solutions to the physical treatment or infiltration of runoff.

Surf Zone - The surf zone is defined as the submerged area between the breaking waves and the shoreline at any one time.

Surface Water Ambient Monitoring Program (SWAMP) comparable – Means that the monitoring program must 1) meet or exceed 2008 SWAMP Quality Assurance Program Management Plan (QAPP) Measurement Quality Objectives, or 2) have a Quality Assurance Project Plan that has been approved by SWAMP; in addition data must be formatted to match the database requirements of the SWAMP Information Management System. Adherence to the measurement quality objectives in the Southern California Bight 2008 ASBS Regional Monitoring Program QAPP and data base management comprises being SWAMP comparable.

Waterfront Operations - Piers, launch ramps, and cleaning stations in the water or on the adjacent shoreline.

Attachment 1
Special Protections Sections I(A)(3)(e) and I(B)(3)(e)
Flowchart to Deteremine Compliance with natural Water Quality

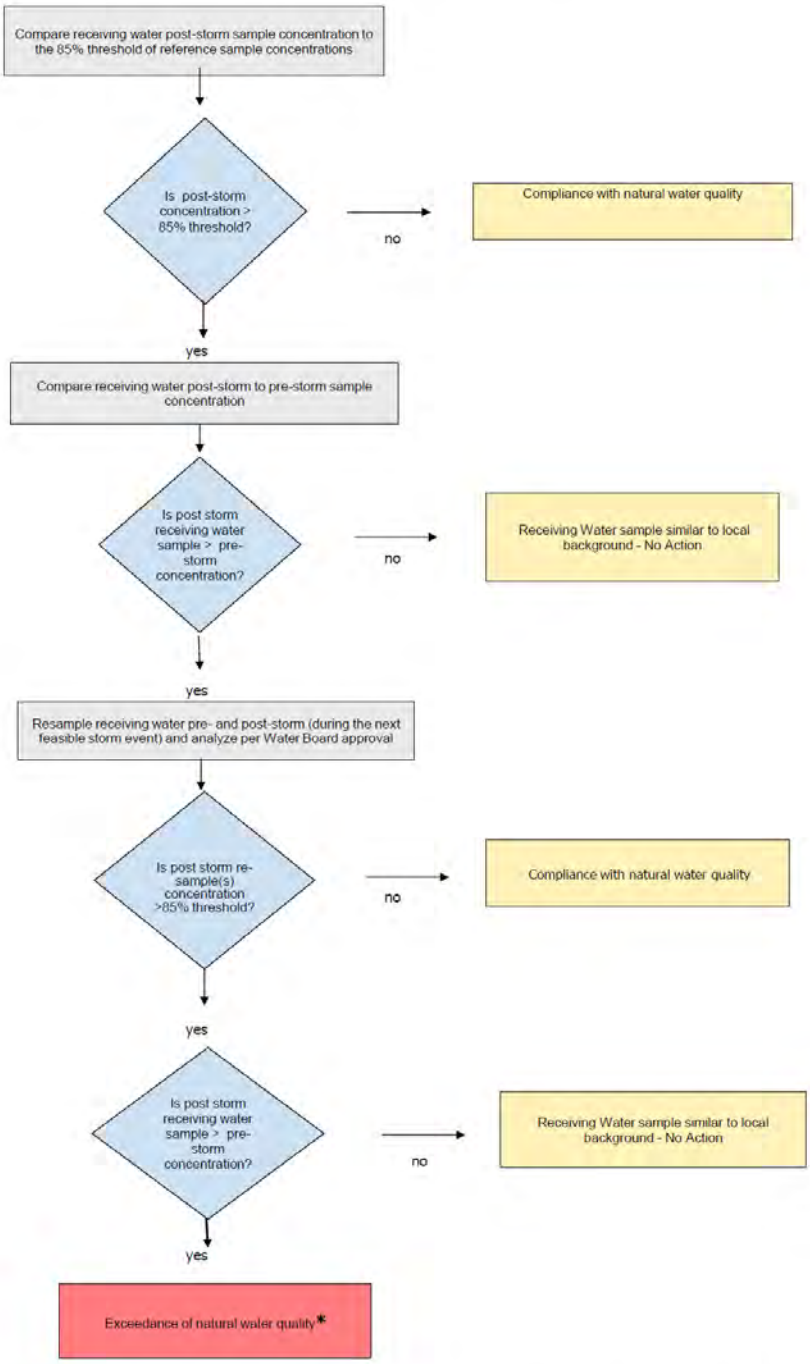

*** When an exceedance of natural water quality occurs, the discharger must comply with section I.A.2.h (for permitted storm water) or section I.B.2.c (for nonpoint sources). Note, when sampling data is available, end-of-pipe effluent concentrations will be considered by the Water Boards in making this determination.**

ATTACHMENT B

STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

1. Standard Permit Provisions

Code of Federal Regulations Title 40 Section 122.41 (40 CFR 122.41) includes conditions, or provisions, that apply to all National Pollutant Discharge Elimination System (NPDES) permits. Additional provisions applicable to NPDES permits are in 40 CFR 122.42. All applicable provisions in 40 CFR 122.41 and 40 CFR 122.42 must be incorporated into this Order and NPDES permit. The applicable 40 CFR 122.41 and 40 CFR 122.42 provisions are as follows:

a. DUTY TO COMPLY [40 CFR 122.41(a)]

The Copermittee must comply with all of the provisions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

(1) The Copermittee must comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement. [40 CFR 122.41(a)(1)]

(2) The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to a civil penalty not to exceed $25,000 per day for each violation. The CWA provides that any person who *negligently* violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than 2 years, or both. Any person who *knowingly* violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both. Any person who knowingly violates Section 301, 302, 303, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, and who knows at that time that he thereby places another person in imminent

danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.
[40 CFR 122.41(a)(2)]

(3) Any person may be assessed an administrative penalty by the San Diego Regional Water Quality Control Board (San Diego Water Board), State Water Resources Control Board (State Water Board), or United States Environmental Protection Agency (USEPA) for violating Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.
[40 CFR 122.41(a)(3)]

b. DUTY TO REAPPLY [40 CFR 122.41(b)]

If a Copermittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Copermittee must apply for and obtain a new permit.

c. NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE [40 CFR 122.41(c)]

It shall not be a defense for a Copermittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

d. DUTY TO MITIGATE [40 CFR 122.41(d)]

The Copermittee must take all reasonable steps to minimize or prevent any discharge or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

e. PROPER OPERATION AND MAINTENANCE [40 CFR 122.41(e)]

The Copermittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Copermittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by a Copermittee only when the operation is necessary to achieve compliance with the conditions of this permit.

f. PERMIT ACTIONS [40 CFR 122.41(f)]

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Copermittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

g. PROPERTY RIGHTS [40 CFR 122.41(g)]

This permit does not convey any property rights of any sort, or any exclusive privilege.

h. DUTY TO PROVIDE INFORMATION [40 CFR 122.41(h)]

The Copermittee must furnish to the San Diego Water Board, State Water Board, or USEPA within a reasonable time, any information which the San Diego Water Board, State Water Board, or USPEA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Copermittee must also furnish to the San Diego Water Board, State Water Board, or USPEA upon request, copies of records required to be kept by this permit.

i. INSPECTION AND ENTRY [40 CFR 122.41(i)]

The Copermittee must allow the San Diego Water Board, State Water Board, USEPA, and/or their authorized representative (including an authorized contractor acting as their representative), upon presentation of credentials and other documents as may be required by law, to:

(1) Enter upon the Copermittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit; [40 CFR 122.41(i)(1)]

(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit; [40 CFR 122.41(i)(2)]

(3) Inspect and photograph at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; [40 CFR 122.41(i)(3)] and

(4) Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location. [40 CFR 122.41(i)(4)]

j. MONITORING AND RECORDS [40 CFR 122.41(j)]

(1) Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity. [40 CFR 122.41(j)(1)]

(2) Except for records of monitoring information required by this permit related to the Copermittee's sewage sludge use and disposal activities, which shall be retained for

a period of at least five (5) years (or longer as required by 40 CFR Part 503), the Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time. [40 CFR 122.41(j)(2)]

(3) Records for monitoring information must include: [40 CFR 122.41(j)(3)]

(a) The date, exact place, and time of sampling or measurements; [40 CFR 122.41(j)(3)(i)]
(b) The individual(s) who performed the sampling or measurements; [40 CFR 122.41(j)(3)(ii)]
(c) The date(s) analyses were performed; [40 CFR 122.41(j)(3)(iii)]
(d) The individual(s) who performed the analyses; [40 CFR 122.41(j)(3)(iv)]
(e) The analytical techniques or methods used; [40 CFR 122.41(j)(3)(v)] and
(f) The results of such analyses. [40 CFR 122.41(j)(3)(vi)]

(4) Monitoring must be conducted according to test procedures under 40 CFR Part 136 unless another method is required under 40 CFR Subchapters N or O. [40 CFR 122.41(j)(4)]

In the case of pollutants for which there are no approved methods under 40 CFR Part 136 or otherwise required under 40 CFR Subchapters N and O, monitoring must be conducted according to a test procedure specified in the permit for such pollutants. [40 CFR 122.44(i)(1)(iv)]

(5) The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. [40 CFR 122.41(j)(5)]

k. SIGNATORY REQUIREMENT [40 CFR 122.41(k)]

(1) All applications, reports, or information submitted to the San Diego Water Board, State Water Board, or USEPA must be signed and certified. (See 40 CFR 122.22) [40 CFR 122.41(k)(1)]

(a) *For a municipality, State, Federal, or other public agency.* [All applications must be signed] by either a principal executive officer or ranking elected official. [40 CFR 122.22(a)(3)]

(b) All reports required by permits, and other information requested by the San Diego Water Board, State Water Board, or USEPA must be signed by a person described in paragraph (a) of this section, or by a duly authorized

representative of that person. A person is a duly authorized representative only if: [40 CFR 122.22(b)]

(i) The authorization is made in writing by a person described in paragraph (a) of this section; [40 CFR 122.22(b)(1)]

(ii) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company, (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) [40 CFR 122.22(b)(2)] and,

(iii) The written authorization is submitted to the San Diego Water Board and State Water Board. [40 CFR 122.22(b)(3)]

(c) *Changes to authorization.* If an authorization under paragraph (b) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (b) of this section must be submitted to the San Diego Water Board prior to or together with any reports, information, or applications to be signed by an authorized representative. [40 CFR 122.22(c)]

(d) *Certification.* Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." [40 CFR 122.22(d)]

(2) The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both. [40 CFR 122.41(k)(2)]

I. REPORTING REQUIREMENTS [40 CFR 122.41(l)]

(1) *Planned changes.* The Copermittee must give notice to the San Diego Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when: [40 CFR 122.41(l)(1)]

(a) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); [40 CFR 122.41(l)(1)(i)] or

(b) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1). [40 CFR 122.41(l)(1)(ii)]

(c) The alteration or addition results in a significant change in the Copermittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. [40 CFR 122.41(l)(1)(iii)]

(2) *Anticipated noncompliance*. The Copermittee must give advance notice to the San Diego Water Board or State Water Board of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements. [40 CFR 122.41(l)(2)]

(3) *Transfers*. This permit is not transferable to any person except after notice to the San Diego Water Board. The San Diego Water Board may require modification or revocation and reissuance of the permit to change the name of the Copermittee and incorporate such other requirements as may be necessary under the CWA. [40 CFR 122.41(l)(3)]

(4) *Monitoring reports.* Monitoring results must be reported at the intervals specified elsewhere in this permit. [40 CFR 122.41(l)(4)]

(a) Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the San Diego Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices. [40 CFR 122.41(l)(4)(i)]

(b) If the Copermittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or another method required for an industry-specific waste stream under 40 CFR Subchapters N or O, the results of this monitoring must be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the San Diego Water Board or State Water Board. [40 CFR 122.41(l)(4)(ii)]

(c) Calculations for all limitations which require averaging of measurements must utilize an arithmetic mean unless otherwise specified in the permit. [40 CFR 122.41(l)(4)(iii)]

(5) *Compliance schedules*. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date. [40 CFR 122.41(l)(5)]

(6) *Twenty-four hour reporting.*

(a) The Copermittee must report any noncompliance that may endanger health or the environment. Any information must be provided orally within 24 hours from the time the Copermittee becomes aware of the circumstances. A written submission must also be provided within five (5) days of the time the Copermittee becomes aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6)(i)]

(b) The following must be included as information which must be reported within 24 hours under this paragraph: [40 CFR 122.41(l)(6)(ii)]

(i) Any unanticipated bypass that exceeds any effluent limitation in the permit (See 40 CFR 122.41(g)). [40 CFR 122.41(l)(6)(ii)(A)]
(ii) Any upset which exceeds any effluent limitation in the permit. [40 CFR 122.41(l)(6)(ii)(B)] and,
(iii) Violation of a maximum daily discharge limitation for any of the pollutants listed by the San Diego Water Board in the permit to be reported within 24 hours. (See 40 CFR 122.44(g)) [40 CFR 122.41(l)(6)(ii)(C)]

(c) The San Diego Water Board may waive the above-required written report on a case-by-case basis if the oral report has been received within 24 hours. [40 CFR 122.41(l)(6)(iii)]

(7) *Other noncompliance.* The Copermittee must report all instances of noncompliance not reported in accordance with the standard provisions required under 40 CFR 122.41(l)(4), (5), and (6), at the time monitoring reports are submitted. The reports must contain the information listed in the standard provisions required under 40 CFR 122.41(l)(6). [40 CFR 122.41(l)(7))]

(8) *Other information.* When the Copermittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the San Diego Water Board, State Water Board, or USEPA, the Copermittee must promptly submit such facts or information. [40 CFR 122.41(l)(8)]

m. BYPASS [40 CFR 122.41(m)]

(1) *Definitions.*

(a) "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. [40 CFR 122.41(m)(1)(i)] or

(b) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or

substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
[40 CFR 122.41(m)(1)(ii)]

(2) *Bypass not exceeding limitations*. The Copermittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the standard provisions required under 40 CFR 122.41(m)(3) and (4).
[40 CFR 122.41(m)(2)]

(3) *Notice.*

(a) *Anticipated bypass*. If the Copermittee knows in advance of the need for a bypass, it must submit a notice, if possible at least ten days before the date of the bypass. [40 CFR 122.41(m)(3)(i)] or

(b) *Unanticipated bypass*. The Copermittee must submit notice of an unanticipated bypass in accordance with the standard provisions required under 40 CFR 122.41(l)(6) (24-hour notice).
[40 CFR 122.41(m)(3)(ii)]

(4) *Prohibition of Bypass.*

(a) Bypass is prohibited, and the San Diego Water Board may take enforcement action against a Copermittee for bypass, unless:
[40 CFR 122.41(m)(4)(i)]

(i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; [40 CFR 122.41(m)(4)(i)(A)]

(ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance;
[40 CFR 122.41(m)(4)(i)(B)] and,

(iii) The Copermittee submitted notice in accordance with the standard provisions required under 40 CFR 122.41(m)(3).
[40 CFR 122.41(m)(4)(i)(C)]

(b) The San Diego Water Board may approve an anticipated bypass, after considering its adverse effects, if the San Diego Water Board determines that it will meet the three conditions listed above.
[40 CFR 122.41(m)(4)(ii)]

n. UPSET [40 CFR 122.41(n)]

(1) *Definition.* "Upset" means an exceptional incident in which there is unintentional and

temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Copermittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. [40 CFR 122.41(n)(1)]

(2) *Effect of an upset*. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the standard provisions required under 40 CFR 122.41(n)(3) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. [40 CFR 122.41(n)(2)]

(3) *Conditions necessary for a demonstration of upset*. A Copermittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that: [40 CFR 122.41(n)(3)]

(a) An upset occurred and that the Copermittee can identify the cause(s) of the upset; [40 CFR 122.41(n)(3)(i)]
(b) The permitted facility was at the time being properly operated; [40 CFR 122.41(n)(3)(ii)] and
(c) The Copermittee submitted notice of the upset in accordance with the standard provisions required under 40 CFR 122.41(l)(6)(ii)(B) (24-hour notice). [40 CFR 122.41(n)(3)(iii)]
(d) The Copermittee complied with any remedial measures pursuant to the standard provisions required under 40 CFR 122.41(d). [40 CFR 122.41(n)(3)(iii)]

(4) *Burden of proof*. In any enforcement proceeding, the Copermittee seeking to establish the occurrence of an upset has the burden of proof. [40 CFR 122.41(n)(4)]

o. STANDARD PERMIT PROVISIONS FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS [40 CFR 122.42(c)]

The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the San Diego Water Board or State Water Board under 40 CFR 122.26(a)(1)(v) must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report must include:

(1) The status of implementing the components of the storm water management program that are established as permit conditions; [40 CFR 122.42(c)(1)]

(2) Proposed changes to the storm water management programs that are established as permit conditions. Such proposed changes must be consistent with 40 CFR 122.26(d)(2)(iii); [40 CFR 122.42(c)(2)] and

(3) Revisions, if necessary, to the assessment of controls and the fiscal analysis

reported in the permit application under 40 CFR 122.26(d)(2)(iv) and (v); [40 CFR 122.42(c)(3)]

(4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; [40 CFR 122.42(c)(4)]

(5) Annual expenditures and budget for year following each annual report; [40 CFR 122.42(c)(5)]

(6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; [40 CFR 122.42(c)(6)]

(7) Identification of water quality improvements or degradation. [40 CFR 122.42(c)(7)]

p. STANDARD PERMIT PROVISIONS FOR STORM WATER DISCHARGES [40 CFR 122.42(d)]

The initial permits for discharges composed entirely of storm water issued pursuant to 40 CFR 122.26(e)(7) must require compliance with the conditions of the permit as expeditiously as practicable, but in no event later than three years after the date of issuance of the permit.

2. General Provisions

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. The general provisions applicable to this Order and NPDES permit are as follows:

a. DISCHARGE OF WASTE IS A PRIVILEGE

No discharge of waste into the waters of the State, whether or not such discharge is made pursuant to waste discharge requirements, shall create a vested right to continue such discharge. All discharges of waste into waters of the State are privileges, not rights. [CWC Section 13263(g)]

b. DURATION OF ORDER AND NPDES PERMIT

(1) *Effective date*. ~~This Order and NPDES permit becomes effective on the 50th day after its adoption provided the USEPA has no objection. If the USEPA objects to its issuance, this Order shall not become effective until such objection is withdrawn.~~ This Order supersedes Order No. R9-2007-0001 for the San Diego County Copermittees listed in Table 2.a and became effective on June 27, 2013 for those Copermittees.~~upon the effective date of this Order~~. This Order as amended by Order R9-2015-0001~~, and~~ supersedes Order No~~s~~. R9-2009-0002 and becomes effective ~~fifty (50) days~~ April 1, 2015, following ~~after~~ the date Order No. R9-2015-0001 is adopted. This Order supersedes Order No. R9-2010-0016 upon ~~their expiration~~further amendment or earlier notice of coverage.

(2) *Expiration*. This Order and NPDES permit expires five years after its effective date.

[40 CFR 122.46(a)]

(3) *Continuation of expired order*. After this Order and NPDES permit expires, the terms and conditions of this Order and NPDES permit are automatically continued pending issuance of a new permit if all requirements of the federal NPDES regulations on the continuation of expired permits (40 CFR 122.6) are complied with.

c. AVAILABILITY

A copy of this Order must be kept at a readily accessible location and must be available to on-site personnel at all times.

d. CONFIDENTIALITY OF INFORMATION

Except as provided for in 40 CFR 122.7, no information or documents submitted in accordance with or in application for this Order will be considered confidential, and all such information and documents shall be available for review by the public at the San Diego Water Board office.

Claims of confidentiality for the following information will be denied:
[40 CFR 122.7(b)]

(1) The name and address of any permit applicant or Copermittee;
[40 CFR 122.7(b)(1)] and

(2) Permit applications and attachments, permits, and effluent data.
[40 CFR 122.7(b)(2)]

e. EFFLUENT LIMITATIONS

(1) *Interim effluent limitations*. The Copermittee must comply with any interim effluent limitations as established by addendum, enforcement action, or revised waste discharge requirements which have been, or may be, adopted by the San Diego Water Board.

(2) *Other effluent limitations and standards*. If any applicable toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant and that standard or prohibition is more stringent than any limitation on the pollutant in the permit, the San Diego Water Board shall institute proceedings under these regulations to modify or revoke and reissue the permit to conform to the toxic effluent standard or prohibition. [40 CFR 122.44(b)(1)]

f. DUTY TO MINIMIZE OR CORRECT ADVERSE IMPACTS

The Copermittee must take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this Order, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the noncompliance.

g. PERMIT ACTIONS

The filing of a request by the Copermittee for modification, revocation and reissuance, or termination of this Order, or a notification of planned change in or anticipated noncompliance with this Order does not stay any condition of this Order. (See 40 CFR 122.41(f)) In addition, the following provisions apply to this Order:

(1) Upon application by any affected person, or on its own motion, the San Diego Water Board may review and revise the requirements in this Order. All requirements must be reviewed periodically. [CWC Section 13263(e)]

(2) This Order may be terminated or modified for cause, including, but not limited to, all of the following: [CWC Section 13381]

(a) Violation of any condition contained in the requirements of this Order. [CWC Section 13381(a)]

(b) Obtaining the requirements in this Order by misrepresentation, or failure to disclose fully all relevant facts. [CWC Section 13381(b)]

(c) A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge. [CWC Section 13381(c)]

(3) When this Order is transferred to a new owner or operator, such requirements as may be necessary under the CWC may be incorporated into this Order.

h. NPDES PERMITTED NON-STORM WATER DISCHARGES

The San Diego Water Board has, in prior years, issued a limited number of individual NPDES permits for non-storm water discharges to MS4s. The San Diego Water Board or State Water Board may in the future, upon prior notice to the Copermittee(s), issue an NPDES permit for any non-storm water discharge (or class of non-storm water discharges) to an MS4.

i. MONITORING

In addition to the standard provisions required under 40 CFR 122.41(j) and (l)(4), the following general monitoring provisions apply to this Order:

(1) Where procedures are not otherwise specified in Order, sampling, analysis and quality assurance/quality control must be conducted in accordance with the Quality Assurance Management Plan (QAMP) for the State of California's Surface Water Ambient Monitoring Program (SWAMP), adopted by the State Water Resources Control Board (State Water Board).

(2) Pursuant to 40 CFR 122.41(j)(2) and CWC Section 13383(a), each Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring

instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five (5) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time.

(3) All chemical, bacteriological, and toxicity analyses must be conducted at a laboratory certified for such analyses by the California Department of Public Health or a laboratory approved by the San Diego Water Board.

(4) For priority toxic pollutants that are identified in the California Toxics Rule (CTR) (65 Fed. Reg. 31682), the Copermittees must instruct their laboratories to establish calibration standards that are equivalent to or lower than the Minimum Levels (MLs) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP). If a Copermittee can demonstrate that a particular ML is not attainable, in accordance with procedures set forth in 40 CFR Part 136, the lowest quantifiable concentration of the lowest calibration standard analyzed by a specific analytical procedure (assuming that all the method specified sample weights, volumes, and processing steps have been followed) may be used instead of the ML listed in Appendix 4 of the SIP. The Copermittee must submit documentation from the laboratory to the San Diego Water Board for approval prior to raising the ML for any priority toxic pollutant.

j. ENFORCEMENT

(1) The San Diego Water Board is authorized to enforce the terms of this Order under several provisions of the CWC, including, but not limited to, CWC Sections 13385, 13386, and 13387.

(2) Nothing in this Order shall be construed to protect the Copermittee from its liabilities under federal, state, or local laws.

(3) The CWC provides for civil and criminal penalties comparable to, and in some cases greater than, those provided for under the CWA.

(4) Except as provided in the standard conditions required under 40 CFR 122.41(m) and (n), nothing in this Order shall be construed to relieve the Copermittee from civil or criminal penalties for noncompliance.

(5) Nothing in this Order shall be construed to preclude the institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties to which the Copermittee is or may be subject to under Section 311 of the CWA.

(6) Nothing in this Order shall be construed to preclude institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authoring preserved by Section 510 of the CWA.

k. SEVERABILITY

The provisions of this Order are severable, and if any provision of this Order, or the

application of any provisions of this Order to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this Order shall not be affected thereby.

l. APPLICATIONS

Any application submitted by a Copermittee for reissuance or modification of this Order must satisfy all applicable requirements specified in federal regulations as well as any additional requirements for submittal of a Report of Waste Discharge specified in the CWC and the California Code of Regulations.

m. IMPLEMENTATION

All plans, reports and subsequent amendments submitted in compliance with this Order must be implemented immediately (or as otherwise specified). All submittals by Copermittees must be adequate to implement the requirements of this Order.

n. REPORT SUBMITTALS

(1) All report submittals must include an executive summary, introduction, conclusion, recommendations, and signed certified statement.

(2) Each Copermittee must submit a signed certified statement covering its responsibilities for each applicable submittal.

(3) The Principal Watershed Copermittee(s) must submit a signed certified statement covering its responsibilities for each applicable submittal and the sections of the submittals for which it is responsible.

(4) Unless otherwise directed, the Copermittees must submit one hard copy and one electronic copy of each report required under this Order to the San Diego Water Board, and one electronic copy to the USEPA.

(5) The Copermittees must submit reports and provide notifications as required by this Order to the following:

EXECUTIVE OFFICER
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
2375 NORTHSIDE DRIVE~~9174 SKY PARK COURT~~, SUITE 100
SAN DIEGO CA 92108~~23-4340~~
Telephone: ~~(858) 467-2952~~(619) 516-1990~~-~~ Fax: ~~(858) 571-6972~~(619) 516-1994

EUGENE BROMLEY
US ENVIRONMENTAL PROTECTION AGENCY
REGION IX
PERMITS ISSUANCE SECTION (W-5-1)
75 HAWTHORNE STREET
SAN FRANCISCO CA 94105

ATTACHMENT C

ACRONYMS AND ABBREVIATIONS

AMAL	Average Monthly Action Level
ASBS	Area(s) of Special Biological Significance
BMP	Best Management Practice
Basin Plan	Water Quality Control Plan for the San Diego Basin
CEQA	California Environmental Quality Act
CCR	California Code of Regulations
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWC	California Water Code
CZARA	Coastal Zone Act Reauthorization Amendments of 1990
ESAs	Environmentally Sensitive Areas
GIS	Geographic Information System
IBI	Index of Biological Integrity
LID	Low Impact Development
MDAL	Maximum Daily Action Level
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
NAL	Non-Storm Water Action Level
NAICS	North American Industry Classification System
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
ROWD	Report of Waste Discharge (application for NPDES reissuance)
SAL	Storm Water Action Level
San Diego Water Board	California Regional Water Quality Control Board, San Diego Region
SIC	Standard Industrial Classification Code
State Water Board	State Water Resources Control Board
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
WDID	Waste Discharge Identification Number
WLA	Waste Load Allocation
WQBEL	Water Quality Based Effluent Limitation

DEFINITIONS

Active/Passive Sediment Treatment - Using mechanical, electrical or chemical means to flocculate or coagulate suspended sediment for removal from runoff from construction sites prior to discharge.

Anthropogenic Litter – Trash generated from human activities, not including sediment.

Average Monthly Action Level – The highest allowable average of daily discharges over a calendar month.

Beneficial Uses - The uses of water necessary for the survival or wellbeing of man, plants, and wildlife. These uses of water serve to promote tangible and intangible economic, social, and environmental goals. "Beneficial Uses" of the waters of the State that may be protected include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. Existing beneficial uses are uses that were attained in the surface or ground water on or after November 28, 1975; and potential beneficial uses are uses that would probably develop in future years through the implementation of various control measures. "Beneficial Uses" are equivalent to "Designated Uses" under federal law. [California Water Code Section 13050(f)].

Best Management Practices (BMPs) - Defined in 40 CFR 122.2 as schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Bioassessment - The use of biological community information to evaluate the biological integrity of a water body and its watershed. With respect to aquatic ecosystems, bioassessment is the collection and analysis of samples of the benthic macroinvertebrate community together with physical/habitat quality measurements associated with the sampling site and the watershed to evaluate the biological condition (i.e. biotic integrity) of a water body.

Biofiltration - Practices that use vegetation and amended soils to detain and treat runoff from impervious areas. Treatment is through filtration, infiltration, adsorption, ion exchange, and biological uptake of pollutants.

Biological Integrity - Defined in Karr J.R. and D.R. Dudley. 1981. Ecological perspective on water quality goals. *Environmental Management* 5:55-68 as: "A balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitat of the region." Also referred to as ecosystem health.

BMP Design Manual – A plan developed to eliminate, reduce, or mitigate the impacts of runoff from development projects, including Priority Development Projects.

Chronic Toxicity – A measurement of sublethal effect (e.g. reduced growth, reproduction) to experimental test organisms exposed to an effluent or receiving waters compared to that of the

control organisms.

Clean Water Act Section 303(d) Water Body - An impaired water body in which water quality does not meet applicable water quality standards and/or is not expected to meet water quality standards, even after the application of technology based pollution controls required by the CWA. The discharge of runoff to these water bodies by the Copermittees is significant because these discharges can cause or contribute to violations of applicable water quality standards.

Construction Site – Any project, including projects requiring coverage under the Construction General Permit, that involves soil disturbing activities including, but not limited to, clearing, grading, disturbances to ground such as stockpiling, and excavation.

Contamination - As defined in the Porter-Cologne Water Quality Control Act, contamination is "an impairment of the quality of waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste whether or not waters of the State are affected."

Copermittee – A permittee to a NPDES permit that is only responsible for permit conditions relating to the discharge for which it is operator [40 CFR 122.26(b)(1)]. For the purposes of this Order, a Copermittee is one of the individual permittees identified in Tables 1a-1c of this Order.

Copermittees – All of the individual Copermittees, collectively.

Critical Channel Flow (Qc) – The channel flow that produces the critical shear stress that initiates bed movement or that erodes the toe of channel banks. When measuring Qc, it should be based on the weakest boundary material – either bed or bank.

Daily Discharge – Defined as either: (1) the total mass of the constituent discharged over the calendar day or any 24 hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g. concentration.)

The Daily Discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day, or other 24 hour period other than a day), or by the arithmetic mean of analytical results from one or more grab samples taken over the course of a day.

Development Projects - Construction, rehabilitation, redevelopment, or reconstruction of any public or private projects.

Dry Season –May 1 to September 30.

Dry Weather – Weather is considered dry if the preceding 72 hours has been without measurable precipitation (>0.1 inch).

Enclosed Bays – Enclosed bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost bay works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays do not include

inland surface waters or ocean waters.

Erosion – When land is diminished or worn away due to wind, water, or glacial ice. Often the eroded debris (silt or sediment) becomes a pollutant via storm water runoff. Erosion occurs naturally but can be intensified by land clearing activities such as farming, development, road building, and timber harvesting.

Environmentally Sensitive Areas (ESAs) - Areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; areas designated as preserves or their equivalent under the Natural Communities Conservation Program within the Cities and County of Orange; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.

Estuaries – Waters, including coastal lagoons, located at the mouth of streams that serve as areas of mixing fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and ocean water. Estuaries do not include inland surface waters or ocean waters.

Existing Development – Any area that has been developed and exists for municipal, commercial, industrial, or residential purposes, uses, or activities. May include areas that are not actively used for its originally developed purpose, but may be re-purposed or redeveloped for another use or activity.

Flow Duration – The long-term period of time that flows occur above a threshold that causes significant sediment transport and may cause excessive erosion damage to creeks and streams (not a single storm event duration). The simplest way to visualize this is to consider a histogram of pre- and post-project flows using long-term records of hourly data. To maintain pre-development flow duration means that the total number of hours (counts) within each range of flows in a flow-duration histogram cannot increase between the pre- and post-development condition. Flow duration within the range of geomorphologically significant flows is important for managing erosion.

Grading - The cutting and/or filling of the land surface to a desired slope or elevation.

Groundwater – Subsurface water that occurs beneath the water table in soils and geologic formations that are fully saturated.

Hazardous Material – Any substance that poses a threat to human health or the environment due to its toxicity, corrosiveness, ignitability, explosive nature or chemical reactivity. These also include materials named by the USEPA in 40 CFR 116 to be reported if a designated quantity of the material is spilled into the waters of the U.S. or emitted into the environment.

Hazardous Waste - Hazardous waste is defined as “any waste which, under Section 600 of Title 22 of this code, is required to be managed according to Chapter 30 of Division 4.5 of Title 22 of this code” [CCR Title 22, Division 4.5, Chapter 11, Article 1].

Household Hazardous Waste – Paints, cleaning products, and other hazardous wastes generated during home improvement or maintenance activities.

Hydromodification – The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

Illicit Connection – Any man-made conveyance or drainage system through which a non-storm water discharge to the storm water drainage system occurs or may occur. Any connection to the MS4 that conveys an illicit discharge.

Illicit Discharge - Any discharge to the MS4 that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from firefighting activities [40 CFR 122.26(b)(2)].

Inactive Areas – Areas of construction activity that are not active and those that have been active and are not scheduled to be re-disturbed for at least 14 days.

Infiltration – In the context of low impact development, infiltration is defined as the percolation of water into the ground. Infiltration is often expressed as a rate (inches per hour), which is determined through an infiltration test. In the context of non-storm water, infiltration is water other than wastewater that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow [40 CFR 35.2005(20)].

Inland Surface Waters – Includes all surface waters of the State that do not include the ocean, enclosed bays, or estuaries.

Jurisdictional Runoff Management Program Document – A written description of the specific jurisdictional runoff management measures and programs that each Copermittee will implement to comply with this Order and ensure that storm water pollutant discharges in runoff are reduced to the MEP and do not cause or contribute to a violation of water quality standards.

Low Impact Development (LID) – A storm water management and land development strategy that emphasizes conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions.

Low Impact Development Best Management Practices (LID BMPs) – LID BMPs include schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States through storm water management and land development strategies that emphasize conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions. LID BMPs include retention

practices that do not allow runoff, such as infiltration, rain water harvesting and reuse, and evapotranspiration. LID BMPs also include flow-through practices such as biofiltration that may have some discharge of storm water following pollutant reduction.

Major Outfall – As defined in the Code of Federal Regulations, a major outfall is a MS4 outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (i.e. discharge from a single conveyance other than a circular pipe which is associated with a drainage area of more than 50 acres); or, for MS4s that receive storm water from lands zoned for industrial activity (based on comprehensive zoning plans or equivalent), a MS4 outfall that discharges from a single pipe with an inside diameter of 12 inches or more or from its equivalent (i.e. discharge from other than a circular pipe associated with a drainage area of 2 acres or more).

Maximum Daily Action Level (MDAL) –The highest allowable daily discharge of a pollutant, over a calendar day (or 24 hour period). For pollutants with action levels expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with action levels expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

Maximum Extent Practicable (MEP) – The technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) for storm water that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) in combination with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than BAT. A definition for MEP is not provided either in the statute or in the regulations. Instead the definition of MEP is dynamic and will be defined by the following process over time: municipalities propose their definition of MEP by way of their runoff management programs. Their total collective and individual activities conducted pursuant to the runoff management programs becomes their proposal for MEP as it applies both to their overall effort, as well as to specific activities (e.g., MEP for street sweeping, or MEP for MS4 maintenance). In the absence of a proposal acceptable to the San Diego Water Board, the San Diego Water Board defines MEP.

In a memo dated February 11, 1993, entitled "Definition of Maximum Extent Practicable," Elizabeth Jennings, Senior Staff Counsel, SWRCB addressed the achievement of the MEP standard as follows:

> "*To achieve the MEP standard, municipalities must employ whatever Best Management Practices (BMPs) are technically feasible (i.e., are likely to be effective) and are not cost prohibitive. The major emphasis is on technical feasibility. Reducing pollutants to the MEP means choosing effective BMPs, and rejecting applicable BMPs only where other effective BMPs will serve the same purpose, or the BMPs would not be technically feasible, or the cost would be prohibitive. In selecting BMPs to achieve the MEP standard, the following factors may be useful to consider:*
>
> *a. Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?*
> *b. Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?*
> *c. Public Acceptance: Does the BMP have public support?*

d. Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?
e. Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc.?

The final determination regarding whether a municipality has reduced pollutants to the maximum extent practicable can only be made by the Regional or State Water Boards, and not by the municipal discharger. If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit derived, it would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs that would address a pollutant source, or to pick a BMP based solely on cost, which would be clearly less effective. In selecting BMPs the municipality must make a serious attempt to comply and practical solutions may not be lightly rejected. In any case, the burden would be on the municipal discharger to show compliance with its permit. After selecting a menu of BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented."

Monitoring Year – October 1 to September 30

Municipal Separate Storm Sewer System (MS4) – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designated or used for collecting or conveying storm water; (iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.26.

National Pollutant Discharge Elimination System (NPDES) - The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the CWA.

Non-Storm Water - All discharges to and from a MS4 that do not originate from precipitation events (i.e., all discharges from a MS4 other than storm water). Non-storm water includes illicit discharges and NPDES permitted discharges.

Nuisance - As defined in the Porter-Cologne Water Quality Control Act, a nuisance is "anything which meets all of the following requirements: 1) Is injurious to health, or is indecent, or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. 2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or

damage inflicted upon individuals may be unequal. 3) Occurs during, or as a result of, the treatment or disposal of wastes."

Ocean Waters – The territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the State Board's California Ocean Plan.

Order – Unless otherwise specified, refers to this Order, Order No. R9-2013-0001 (NPDES No. CAS0109266)

Outfall - Outfall means a point source as defined by 40 CFR 122.2 at the point where a municipal separate storm sewer discharges to waters of the US and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels or other conveyances which connect segments of the same stream or other waters of the US and are used to convey waters of the US.

Persistent Flow - Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

Person - A person is defined as an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof [40 CFR 122.2].

Point Source - Any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, landfill leachate collection systems, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

Pollutant - Any agent that may cause or contribute to the degradation of water quality such that a condition of pollution or contamination is created or aggravated.

Pollution - As defined in the Porter-Cologne Water Quality Control Act, pollution is "the alteration of the quality of the waters of the State by waste, to a degree which unreasonably affects either of the following: 1) The waters for beneficial uses; or 2) Facilities that serve these beneficial uses." Pollution may include contamination.

Pollution Prevention - Pollution prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control BMPs, treatment control BMPs, or disposal.

Pre-Development Runoff Conditions – Approximate flow rates and durations that exist or existed onsite before land development occurs. For new development projects, this equates to runoff conditions immediately before project construction. For redevelopment projects, this equates to runoff conditions from the project footprint assuming infiltration characteristics of the underlying soil, and existing grade. Runoff coefficients of concrete or asphalt must not be used. A redevelopment Priority Development Project must use available information pertaining to existing underlying soil type and onsite existing grade to estimate pre-development runoff conditions.

Priority Development Projects - New development and redevelopment projects defined under Provision E.3.b of Order No. R9-2013-0001.

Rainy Season (aka Wet Season) –October 1 to April 30

Receiving Waters – Waters of the United States.

Receiving Water Limitations - Waste discharge requirements issued by the San Diego Water Board typically include both: (1) "Effluent Limitations" (or "Discharge Limitations") that specify the technology-based or water-quality-based effluent limitations; and (2) "Receiving Water Limitations" that specify the water quality objectives in the Basin Plan as well as any other limitations necessary to attain those objectives. In summary, the "Receiving Water Limitations" provision is the provision used to implement the requirements of CWA section 402(p)(3)(B).

Redevelopment - The creation and/or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include trenching and resurfacing associated with utility work; resurfacing existing roadways; new sidewalk construction, pedestrian ramps, or bike lane on existing roads; and routine replacement of damaged pavement, such as pothole repair.

Regional Clearinghouse – A central location for the collection and distribution of information developed and maintained by the Copermittees including, but not limited to, plans, reports, manuals, data, contact information, and/or links to such documents and information.

Rehabilitation - Remedial measures or activities for the purpose of improving or restoring the beneficial uses of streams, channels or river systems. Techniques may vary from in-stream restoration techniques to off-line storm water management practices installed in the system corridor or upland areas, or a combination of in-stream and out of stream techniques. Rehabilitation techniques may include, but are not limited to the following: riparian zone restoration, constructed wetlands, channel modifications that improve habitat and stability, and daylighting of drainage systems.

Reporting Period – The period of information that is reported in the Water Quality Improvement Plan Annual Report. The reporting period consists of two components: 1) July 1 to June 30, consistent with the fiscal year, for the implementation of the jurisdictional runoff management programs, and 2) October 1 to September 30, consistent with the monitoring year for the monitoring and assessment programs. Together, these two time periods constitute the reporting year for the Water Quality Improvement Plan Annual Report due January 31 following the end of the monitoring year.

Retain – Keep or hold in a particular place, condition, or position without discharge to surface waters.

Retrofitting – Storm water management practice put into place after development has occurred in watersheds where the practices previously did not exist or are ineffective. Retrofitting of developed areas is intended to improve water quality, protect downstream channels, reduce

flooding, or meet other specific objectives. Retrofitting developed areas may include, but is not limited to replacing roofs with green roofs, disconnecting downspouts or impervious surfaces to drain to pervious surfaces, replacing impervious surfaces with pervious surfaces, installing rain barrels, installing rain gardens, and trash area enclosures.

Runoff - All flows in a storm water conveyance system that consists of the following components: (1) storm water (wet weather flows) and (2) non-storm water including dry weather flows.

San Diego Water Board – As used in this document the term "San Diego Water Board" is synonymous with the term "Regional Board" as defined in Water Code section 13050(b) and is intended to refer to the California Regional Water Quality Control Board for the San Diego Region as specified in Water Code Section 13200.

Sediment - Soil, sand, and minerals washed from land into water. Sediment resulting from anthropogenic sources (i.e. human induced land disturbance activities) is considered a pollutant. This Order regulates only the discharges of sediment from anthropogenic sources and does not regulate naturally occurring sources of sediment. Sediment can destroy fish-nesting areas, clog animal habitats, and cloud waters so that sunlight does not reach aquatic plants.

Source Control BMP – Land use or site planning practices, or structural or nonstructural measures that aim to prevent runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between pollutants and runoff.

Storm Water – Per 40 CFR 122.26(b)(13), means storm water runoff, snowmelt runoff and surface runoff and drainage. Surface runoff and drainage pertains to runoff and drainage resulting from precipitation events.

Structural BMPs - A subset of BMPs which detains, retains, filters, removes, or prevents the release of pollutants to surface waters from development projects in perpetuity, after construction of a project is completed.

Test of Significant Toxicity (TST) - A statistical approach used to analyze toxicity test data. The TST incorporates a restated null hypothesis, Welch's t-test, and biological effect thresholds for chronic and acute toxicity.

Total Maximum Daily Load (TMDL) - The maximum amount of a pollutant that can be discharged into a water body from all sources (point and non-point) and still maintain water quality standards. Under CWA section 303(d), TMDLs must be developed for all water bodies that do not meet water quality standards after application of technology-based controls.

Toxicity - Adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies. The water quality objectives for toxicity provided in the Basin Plan, state in part…"All waters shall be free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life….The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge."

Toxicity Identification Evaluation (TIE) - A set of procedures for identifying the specific

chemical(s) responsible for toxicity. These procedures are performed in three phases (characterization, identification, and confirmation) using aquatic organism toxicity tests.

Toxicity Reduction Evaluation (TRE) - A study conducted in a step-wise process designed to identify the causative agents of effluent or ambient toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in toxicity. The first steps of the TRE consist of the collection of data relevant to the toxicity, including additional toxicity testing, and an evaluation of facility operations and maintenance practices, and best management practices. A Toxicity Identification Evaluation (TIE) may be required as part of the TRE, if appropriate.

Treatment Control BMP – Any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media absorption or any other physical, biological, or chemical process.

Unpaved Road – Any long, narrow stretch without pavement used for traveling by motor passenger vehicles between two or more points. Unpaved roads are generally constructed of dirt, gravel, aggregate or macadam and may be improved or unimproved.

Waste - As defined in CWC Section 13050(d), "waste includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal."

Article 2 of CCR Title 23, Chapter 15 (Chapter 15) contains a waste classification system that applies to solid and semi-solid waste, which cannot be discharged directly or indirectly to water of the state and which therefore must be discharged to land for treatment, storage, or disposal in accordance with Chapter 15. There are four classifications of waste (listed in order of highest to lowest threat to water quality): hazardous waste, designated waste, non-hazardous solid waste, and inert waste.

Water Quality Objective - Numerical or narrative limits on constituents or characteristics of water designated to protect designated beneficial uses of the water. [California Water Code Section 13050 (h)]. California's water quality objectives are established by the State and Regional Water Boards in the Water Quality Control Plans. Numeric or narrative limits for pollutants or characteristics of water designed to protect the beneficial uses of the water. In other words, a water quality objective is the maximum concentration of a pollutant that can exist in a receiving water and still generally ensure that the beneficial uses of the receiving water remain protected (i.e., not impaired). Since water quality objectives are designed specifically to protect the beneficial uses, when the objectives are violated the beneficial uses are, by definition, no longer protected and become impaired. This is a fundamental concept under the Porter Cologne Act. Equally fundamental is Porter Cologne's definition of pollution. A condition of pollution exists when the water quality needed to support designated beneficial uses has become unreasonably affected or impaired; in other words, when the water quality objectives have been violated. These underlying definitions (regarding beneficial use protection) are the reason why all waste discharge requirements implementing the federal NPDES regulations require compliance with water quality objectives. (Water quality objectives are also called water quality criteria in the CWA.)

Water Quality Standards - Water quality standards, as defined in Clean Water Act section 303(c) consist of the beneficial uses (e.g., swimming, fishing, municipal drinking water supply, etc.,) of a water body and criteria (referred to as water quality objectives in the California Water Code) necessary to protect those uses. Under the Water Code, the water boards establish beneficial uses and water quality objectives in water quality control or basin plans. Together with an anti-degradation policy, these beneficial uses and water quality objectives serve as water quality standards under the Clean Water Act. In Clean Water Act parlance, state beneficial uses are called "designated uses" and state water quality objectives are called "criteria." Throughout this Order, the relevant term is used depending on the statutory scheme.

Waters of the State - Any water, surface or underground, including saline waters within the boundaries of the State [CWC section 13050 (e)]. The definition of the Waters of the State is broader than that for the Waters of the United States in that all water in the State is considered to be a Waters of the State regardless of circumstances or condition.

Waters of the United States - As defined in the 40 CFR 122.2, the Waters of the U.S. are defined as: "(a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate "wetlands;" (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters otherwise defined as waters of the United States under this definition: (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial seas; and (g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA."

Watershed - That geographical area which drains to a specified point on a water course, usually a confluence of streams or rivers (also known as drainage area, catchment, or river basin).

Wet Season (aka Rainy Season) – October 1 to April 30

Wet Weather – Weather is considered wet up to 72 hours after a storm event of 0.1 inches and greater, unless otherwise defined by another regulatory mechanism (e.g. a TMDL).

ATTACHMENT D

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM

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JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM
FY _____

I. COPERMITTEE INFORMATION			
Copermittee Name:			
Copermittee Primary Contact Name:			
Copermittee Primary Contact Information: Address: City:	County:	State:	Zip:
Telephone:	Fax:	Email:	

II. LEGAL AUTHORITY		
Has the Copermittee established adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 that complies with Order No. R9-2013-0001?	YES NO	☐ ☐
A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority?	YES NO	☐ ☐

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE		
Was an update of the jurisdictional runoff management program document required or recommended by the San Diego Water Board?	YES NO	☐ ☐
If YES to the question above, did the Copermittee update its jurisdictional runoff management program document and make it available on the Regional Clearinghouse?	YES NO	☐ ☐

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM		
Has the Copermittee implemented a program to actively detect and eliminate illicit discharges and connections to its MS4 that complies with Order No. R9-2013-0001?	YES NO	☐ ☐

Number of non-storm water discharges reported by the public	
Number of non-storm water discharges detected by Copermittee staff or contractors	
Number of non-storm water discharges investigated by the Copermittee	
Number of sources of non-storm water discharges identified	
Number of non-storm water discharges eliminated	
Number of sources of illicit discharges or connections identified	
Number of illicit discharges or connections eliminated	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

V. DEVELOPMENT PLANNING PROGRAM		
Has the Copermittee implemented a development planning program that complies with Order No. R9-2013-0001?	YES NO	☐ ☐
Was an update to the BMP Design Manual required or recommended by the San Diego Water Board?	YES NO	☐ ☐
If YES to the question above, did the Copermittee update its BMP Design Manual and make it available on the Regional Clearinghouse?	YES NO	☐ ☐

Number of proposed development projects in review	
Number of Priority Development Projects in review	
Number of Priority Development Projects approved	
Number of approved Priority Development Projects exempt from any BMP requirements	
Number of approved Priority Development Projects allowed alternative compliance	
Number of Priority Development Projects granted occupancy	

Number of completed Priority Development Projects in inventory	
Number of high priority Priority Development Project structural BMP inspections	
Number of Priority Development Project structural BMP violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM

FY _____

VI. CONSTRUCTION MANAGEMENT PROGRAM

Has the Copermittee implemented a construction management program that complies with Order No. R9-2013-0001?	YES	☐
	NO	☐

Number of construction sites in inventory	
Number of active construction sites in inventory	
Number of inactive construction sites in inventory	
Number of construction sites closed/completed during reporting period	
Number of construction site inspections	
Number of construction site violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

Has the Copermittee implemented an existing development management program that complies with Order No. R9-2013-0001?	YES	☐
	NO	☐

	Municipal	Commercial	Industrial	Residential
Number of facilities or areas in inventory				
Number of existing development inspections				
Number of follow-up inspections				
Number of violations				
Number of enforcement actions issued				
Number of escalated enforcement actions issued				

VIII. PUBLIC EDUCATION AND PARTICIPATION

Has the Copermittee implemented a public education program component that complies with Order No. R9-2013-0001?	YES	☐
	NO	☐
Has the Copermittee implemented a public participation program component that complies with Order No. R9-2013-0001?	YES	☐
	NO	☐

IX. FISCAL ANALYSIS

Has the Copermittee attached to this form a summary of its fiscal analysis that complies with Order No. R9-2013-0001?	YES	☐
	NO	☐

X. CERTIFICATION

I [☐ Principal Executive Officer ☐ Ranking Elected Official ☐ Duly Authorized Representative] certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature	Date
Print Name	Title
Telephone Number	Email

ATTACHMENT E

SPECIFIC PROVISIONS FOR TOTAL MAXIMUM DAILY LOADS APPLICABLE TO ORDER NO. R9-2013-0001

These provisions implement load allocations (LAs) and wasteload allocations (WLAs) of the Total Maximum Daily Loads (TMDLs) ~~adopted~~ established by the San Diego Water Board or ~~and approved by~~ USEPA under Clean Water Act section 303(c), applicable to discharges regulated under this Order. The provisions and schedules for implementation of the TMDLs described below must be incorporated into the Water Quality Improvement Plans, required pursuant to Provision B of this Order, for the specified Watershed Management Areas.

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed
2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin
3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed
4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek
5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay
6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)
7. Total Maximum Daily Load for Sediment in Los Peñasquitos Lagoon

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2002-0123

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	August 14, 2002
State Water Board Approval Date:	July 16, 2003
Office of Administrative Law Approval Date:	September 11, 2003
US EPA Approval Date:	November 3, 2003

(3) TMDL Effective Date: September 11, 2003

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final diazinon TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must be in compliance with the final TMDL compliance requirements as of December 31, 2010.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations:

Table 1.1
Final Receiving Water Limitations Expressed as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Diazinon	Acute	0.08 µg/L	1 hour
	Chronic	0.05 µg/L	4 days

(b) Final Effluent Limitations

Discharges from the MS4s containing concentrations that do not exceed the following effluent limitations will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 1.b.(2)(a):

Table 1.2
Final Effluent Limitations Expressed as Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation	Averaging Period
Diazinon	Acute	0.072 µg/L	1 hour
	Chronic	0.045 µg/L	4 days

(c) Best Management Practices

The following BMPs for Chollas Creek must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area and implemented by the Responsible Copermittees:

(i) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 1.b.(2)(a) and/or the effluent limitations under Specific Provision 1.b.(2)(b) for Chollas Creek.

(ii) The Responsible Copermittees must implement the Diazinon Toxicity Control Plan and Diazinon Public Outreach/Education Program as described in the report titled, *Technical Report for Total Maximum Daily Load for Diazinon in Chollas Creek Watershed, San Diego County*, dated August 14, 2002, including subsequent modifications, in order to achieve the receiving water limitations under Specific Provision 1.b.(2)(a) and/or the effluent limitations under Specific Provision 1.b.(2)(b).

(iii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 1.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 1.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 1.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 1.b.(2)(c) achieves compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 1.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 1.d, to demonstrate compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The Responsible Copermittees must be in compliance with the final diazinon TMDL compliance requirements as of December 31, 2010.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls for diazinon within the Chollas Creek watershed, and calculate or estimate the annual diazinon loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment

Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 1.b.(2)(b), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0019

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	September 22, 2005
Office of Administrative Law Approval Date:	December 2, 2005
US EPA Approval Date:	February 8, 2006

(3) TMDL Effective Date: December 2, 2005

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Shelter Island Yacht Basin

(6) Responsible Copermittee: City of San Diego

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final dissolved copper TMDL compliance requirements for Shelter Island Yacht Basin consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittee must be in compliance with the final TMDL compliance requirements as of December 2, 2005.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations:

Table 2.1
Final Receiving Water Limitations Expressed as Concentrations in Shelter Island Yacht Basin

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Dissolved Copper	Acute	4.8 µg/L x WER*	1 hour
	Chronic	3.1 µg/L x WER*	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 2.b.(3)(a):

Table 2.2
Final Effluent Limitations as Expressed as Annual Loads in MS4 Discharges to Shelter Island Yacht Basin

Constituent	Effluent Limitation
Dissolved Copper	30 kg/yr*

* If the water quality objectives for dissolved copper in Shelter Island Yacht Basin are changed in the future, then the margin of safety (MOS), TMDL and allocations will be recalculated using the *Method for Recalculation of the Total Maximum Daily Load for Dissolved Copper in the Shelter Island Yacht Basin, San Diego Bay* in the Basin Plan (p. 7-14).

(c) Best Management Practices

The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 2.b.(2)(a) and/or the effluent limitations under Specific Provision 2.b.(2)(b) for Shelter Island Yacht Basin. The BMPs must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 2.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 2.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittee develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 2.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 2.b.(2)(c) achieves compliance with Specific Provisions 2.b.(3)(a), 2.b.(3)(b) and/or 2.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 2.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 2.d, to demonstrate compliance with Specific Provisions 2.b.(3)(a), 2.b.(3)(b) and/or 2.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The Responsible Copermittees must be in compliance with the final dissolved copper TMDL compliance requirements as of December 2, 2005.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

The Responsible Copermittee must monitor the effluent of its MS4 outfalls for dissolved copper, and calculate or estimate the monthly and annual dissolved copper loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.(b)(2)of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0036

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	November 16, 2005
Office of Administrative Law Approval Date:	February 1, 2006
US EPA Approval Date:	March 22, 2006

(3) TMDL Effective Date: February 1, 2006

(4) Watershed Management Area: Santa Margarita River

(5) Water Body: Rainbow Creek

(6) Responsible Copermittee: County of San Diego

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final total nitrogen and total phosphorus TMDL compliance requirements for Rainbow Creek consist of the following

(1) Final TMDL Compliance Date

The Responsible Copermittee must comply with final TMDL compliance requirements by December 31, 2021.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance date under Specific Provision 3.b.(1):

Table 3.1
Final Receiving Water Limitations Expressed as Concentrations in Rainbow Creek

Constituent	Receiving Water Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing concentrations that do not exceed the following effluent limitations by the compliance date under Specific Provision 3.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 3.b.(2)(a):

Table 3.2
Final Effluent Limitations Expressed as Concentrations in MS4 Discharges to Rainbow Creek

Constituent	Effluent Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(ii) Annual pollutant loads from given land uses discharging to and from the MS4s that do not exceed the following annual loads by the compliance date under Specific Provision 3.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 3.b.(2)(a):

Table 3.3
Final Effluent Limitations Expressed as Annual Loads in MS4 Discharges to Rainbow Creek

Land Use	Total N	Total P
Commercial nurseries	116 kg/yr	3 kg/yr
Park	3 kg/yr	0.1 kg/yr
Residential areas	149 kg/yr	12 kg/yr
Urban areas	27 kg/yr	6 kg/yr

(c) Best Management Practices

(i) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 3.b.(2)(a) and/or the effluent limitations under Specific Provision 3.b.(2)(b) for Rainbow Creek.

(ii) The Responsible Copermittee should coordinate any BMPs implemented to address this TMDL with Caltrans and other sources as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under

Specific Provision 3.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 3.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the final effluent limitations under Specific Provision 3.b.(2)(b)(ii); OR

(e) The Responsible Copermittee develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 3.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Specific Provision 3.b.(2)(c) achieves compliance with Specific Provisions 3.b.(3)(a), 3.b.(3)(b), 3.b.(3)(c) and/or 3.b.(3)(d),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 3.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 3.d, to demonstrate compliance with Specific Provisions 3.b.(3)(a), 3.b.(3)(b), 3.b.(3)(c) and/or 3.b.(3)(d).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim total nitrogen and total phosphorus TMDL compliance requirements for Rainbow Creek consist of the following:

(1) Interim Compliance Dates and WQBELs

The Responsible Copermittee must comply with the interim WQBELs, expressed as annual loads, by December 31 of the interim compliance year given in Table 3.4.

Table 3.4
Interim Water Quality Based Effluent Limitations Expressed as Annual Loads in MS4 Discharges from Specific Land Uses to Rainbow Creek

	Total N Interim Effluent Limitations (kg/yr)			Total P Interim Effluent Limitations (kg/yr)		
	Interim Compliance Date			Interim Compliance Date		
Land Use	**2009**	**2013**	**2017**	**2009**	**2013**	**2017**
Commercial nurseries	390	299	196	20	16	10
Park	5	3	3	0.15	0.10	0.10
Residential areas	507	390	260	99	74	47
Urban areas	40	27	27	9	6	6

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 3.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 3.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the final effluent limitations under Specific Provision 3.b.(2)(b)(ii); OR

(e) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the interim effluent limitations under Specific Provision 3.c.(1); OR

(f) The Responsible Copermittee has submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittee must incorporate into the Water Quality Improvement Plan and implement the Sampling and Analysis Plan for Rainbow Creek Nutrient Reduction TMDL Implementation Water Quality Monitoring, dated January 2010.

(2) The results of any monitoring conducted during the reporting period, and assessment of whether the interim and final TMDL compliance requirements have been achieved must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 3.b.(2)(b)(i), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2007-0043

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2007
State Water Board Approval Date:	July 15, 2008
Office of Administrative Law Approval Date:	October 22, 2008
US EPA Approval Date:	December 18, 2008

(3) TMDL Effective Date: October 22, 2008

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final dissolved copper, lead, and zinc TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must comply with the final TMDL compliance requirements by October 22, 2028.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance date under Specific Provision 4.b.(1):

Table 4.1
Final Receiving Water Limitations Expressed as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$(0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$(0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$(0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$(0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations by the compliance date under Specific Provision 4.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 4.b.(2)(a):

Table 4.2
Final Effluent Limitations as Expressed Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(c) Best Management Practices

(i) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 4.b.(2)(a) and/or the effluent limitations under Specific Provision 4.b.(2)(b) for Chollas Creek.

(ii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans and the U.S. Navy as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 4.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 4.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 4.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 4.b.(2)(c) achieves compliance with Specific Provisions 4.b.(3)(a), 4.b.(3)(b) and/or 4.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 4.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 4.d, to demonstrate compliance with Specific Provisions 4.b.(3)(a), 4.b.(3)(b) and/or 4.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim dissolved copper, lead, and zinc TMDL compliance requirements for Chollas Creek consist of the following:

(1) Interim Compliance Date and WQBELs

The Responsible Copermittee must comply with the interim WQBELs, expressed as concentrations, by the interim compliance date given in Table 4.3:

Table 4.3
Interim Water Quality Based Effluent Limitations Expressed as Concentrations in MS4 Discharges to Chollas Creek

Interim Compliance Date	Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
October 22, 2018	Dissolved Copper	Acute	1.2 x 90% x (0.96) x $e^{[0.9422 \times \ln(\text{hardness}) - 1.700]}$ x WER*	1 hour
		Chronic	1.2 x 90% x (0.96) x $e^{[0.8545 \times \ln(\text{hardness}) - 1.702]}$ x WER*	4 days
	Dissolved Lead	Acute	1.2 x 90% x [1.46203 – 0.145712 x ln(hardness)] x $e^{[1.273 \times \ln(\text{hardness}) - 1.460]}$ x WER*	1 hour
		Chronic	1.2 x 90% x [1.46203 – 0.145712 x ln(hardness)] x $e^{[1.273 \times \ln(\text{hardness}) - 4.705]}$ x WER*	4 days
	Dissolved Zinc	Acute	1.2 x 90% x (0.978) x $e^{[0.8473 \times \ln(\text{hardness}) + 0.884]}$ x WER*	1 hour
		Chronic	1.2 x 90% x (0.986) x $e^{[0.8473 \times \ln(\text{hardness}) + 0.884]}$ x WER*	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 4.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 4.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) There are no exceedances of the interim effluent limitations under Specific

Provision 4.c.(1) at the Responsible Copermittee's MS4 outfalls; OR

(e) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance date.

d. Specific Monitoring and Assessment Requirements

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*, when it is amended to include monitoring requirements for the Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls discharging to Chollas Creek for dissolved copper, lead, and zinc, and calculate or estimate the monthly and annual dissolved copper, lead, and zinc loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 4.b.(2)(b) or 4.c.(1), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2008-0027

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 11, 2008
State Water Board Approval Date:	June 16, 2009
Office of Administrative Law Approval Date:	September 15, 2009
US EPA Approval Date:	October 26, 2009

(3) TMDL Effective Date: September 15, 2009

(4) Watershed Management Areas: See Table 5.0

(5) Water Bodies: See Table 5.0

(6) Responsible Copermittees: See Table 5.0

Table 5.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County	Dana Point Harbor	Baby Beach	-City of Dana Point -County of Orange
San Diego Bay	San Diego Bay	Shelter Island Shoreline Park	- San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final indicator bacteria TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Final TMDL Compliance Dates

(a) Baby Beach in Dana Point Harbor

The Responsible Copermittees for MS4 discharges to Baby Beach must be in compliance with the final TMDL compliance requirements according to the following compliance dates:

Table 5.1
Compliance Dates to Achieve Final TMDL Compliance Requirements For Baby Beach in Dana Point Harbor

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform	September 15, 2014	September 15, 2009
Fecal Coliform		September 15, 2009
Enterococcus		September 15, 2019

(b) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park must be in compliance with the final TMDL compliance requirements as of December 31, 2012.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance dates under Specific Provision 5.b.(1):

Table 5.2
Final Receiving Water Limitations Expressed as Bacteria Densities in the Water Body

	Receiving Water Limitations	
Constituent	Single Sample Maximum[1,2]	30-Day Geometric Mean[2]
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing indicator bacteria densities that do not exceed the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.3a
Final Effluent Limitations as Expressed as Bacteria Densities in MS4 Discharges to the Water Body

	Effluent Limitations	
Constituent	**Single Sample Maximum[1,2]**	**30-Day Geometric Mean[2]**
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.

(ii) Discharges from the MS4s containing indicator bacteria loads that do not exceed the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.4a
Final Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to the Baby Beach in Dana Point Harbor

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0.86×10^9 MPN/day	$3{,}254 \times 10^9$ MPN/30days
Fecal Coliform	0.17×10^9 MPN/day	112×10^9 MPN/30days
Enterococcus	0.03×10^9 MPN/day	114×10^9 MPN/30days

Table 5.4b
Final Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to the Shelter Island Shoreline Park in San Diego Bay

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0 MPN/day	198×10^9 MPN/30days
Fecal Coliform	0 MPN/day	8×10^9 MPN/30days
Enterococcus	0 MPN/day	26×10^9 MPN/30days

(iii) Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.5a
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to Baby Beach in Dana Point Harbor*

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	90.4%	0%
Fecal Coliform	82.7%	0%
Enterococcus	96.2%	62.2%

Notes:
* The percent load reductions are relative to data collected between 1996-2002. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittees' MS4s must not exceed the loads in Table 5.4a, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the water body.

Table 5.5b
*Final Effluent Limitations Expressed as Percent Load Reductions** in MS4 Discharges to Shelter Island Shoreline Park in San Diego Bay*

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0%	0%
Fecal Coliform	0%	0%
Enterococcus	0%	0%

Notes:
* The percent load reductions are relative to data collected between 1999-2004. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittee's MS4s must not exceed the loads in Table 5.4b, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the water body.

(c) Best Management Practices

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 5.0 must incorporate the Bacteria Load Reduction Plan (BLRP) required to be developed pursuant to Resolution No. R9-2008-0027.

(ii) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 5.b.(2)(a) and/or the effluent limitations under Specific Provision 5.b.(2)(b) for the segments or areas of the water bodies listed in Table 5.0

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.b.(2)(b)(ii); OR

(e) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 5.b.(2)(b)(iii); OR

(f) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(g) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 5.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 5.b.(2)(c) achieves compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 5.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 5.d, to demonstrate compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim indicator bacteria TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Baby Beach in Dana Point Harbor

(a) Interim TMDL Compliance Dates and WQBELs

The Responsible Copermittees for MS4 discharges to Baby Beach must comply with the following interim WQBELs by the interim compliance dates given in Tables 5.6a and/or 5.6b:

Table 5.6a
Interim Water Quality Based Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to Baby Beach in Dana Point Harbor

Constituent	Interim Compliance Dates	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	4.93×10^9 MPN/day	$3{,}254 \times 10^9$ MPN/30days*
Fecal Coliform	September 15, 2012	0.59×10^9 MPN/day	112×10^9 MPN/30days*
Enterococcus	September 15, 2012	0.42×10^9 MPN/day	301×10^9 MPN/30days
	September 15, 2016	0.03×10^9 MPN/day *	207×10^9 MPN/30days

Notes:
* Same as the final effluent limitations in Table 5.4a.

Table 5.6b
Interim Water Quality Based Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to Baby Beach in Dana Point Harbor*

Constituent	Interim Compliance Dates	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	45.2%	0%**
Fecal Coliform	September 15, 2012	41.4%	0%**
Enterococcus	September 15, 2012	48.1%	0%
	September 15, 2016	96.2%**	31.1%

Notes:
* The percent load reductions are relative to data collected between 1996-2002. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittees' MS4s must not exceed the loads in Table 5.6a, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the waterbody.
** Same as the final effluent limitations in Table 5.5a.

(b) Interim Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(i) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(ii) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(iii) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(iv) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.b(2)(b)(ii); OR

(v) The Responsible Copermittees can demonstrate that exceedances of the applicable receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(vi) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the interim effluent limitations under Table 5.6a of Specific Provision 5.c.(1)(a); OR

(vii) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the interim effluent limitations under Table 5.6b of Specific Provision 5.c.(1)(a); OR

(viii) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

(2) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park must be in compliance with the final indicator bacteria TMDL requirements as of December 31, 2012.

d. Specific Monitoring and Assessment Requirements

(1) Monitoring Stations

Monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[33] If discharges of bacteria from the MS4 exceed the applicable interim or final WQBELs, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(2) Monitoring Procedures

(a) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) The Responsible Copermittees must collect wet weather monitoring samples within the first 24 hours of a storm event[34] of the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(c) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

[33] Commonly referred to as AB 411 monitoring
[34] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs have been achieved.

(b) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 5.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(c) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to correlate elevated bacteria levels with known or suspected sewage spills from wastewater collection systems and treatment plants or boats.

(d) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2010-0001

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 10, 2010
State Water Board Approval Date:	December 14, 2010
Office of Administrative Law Approval Date:	April 4, 2011
US EPA Approval Date:	June 22, 2011

(3) TMDL Effective Date: April 4, 2011

(4) Watershed Management Areas: See Table 6.0

(5) Water Bodies: See Table 6.0

(6) Responsible Copermittees: See Table 6.0

Table 6.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	-City of Laguna Beach -County of Orange -Orange County Flood Control District
		at Heisler Park - North	
	Pacific Ocean Shoreline	at Main Laguna Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Woods -County of Orange -Orange County Flood Control District
		Laguna Beach at Ocean Avenue	
		Laguna Beach at Cleo Street	
		Arch Cove at Bluebird Canyon Road	
		Laguna Beach at Dumond Drive	
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Hills -City of Laguna Niguel -City of Laguna Woods -City of Lake Forest -City of Mission Viejo -County of Orange -Orange County Flood Control District
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	
	Aliso Creek Mouth	at mouth	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	-City of Dana Point -City of Laguna Beach -City of Laguna Niguel -County of Orange -Orange County Flood Control District
		Aliso Beach at Table Rock Drive	
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)	
		at Salt Creek (large outlet)	
		Salt Creek Beach at Salt Creek service road	
		Salt Creek Beach at Strand Road	
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	-City of Dana Point -City of Laguna Hills -City of Laguna Niguel -City of Mission Viejo -City of Rancho Santa Margarita -City of San Juan Capistrano -County of Orange -Orange County Flood Control District
	San Juan Creek	lower 1 mile	
	San Juan Creek Mouth	at mouth	
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	-City of Dana Point -City of San Clemente -County of Orange -Orange County Flood Control District
		Ole Hanson Beach Club Beach at Pico Drain	
		San Clemente City Beach at El Portal Street Stairs	
		San Clemente City Beach at Mariposa Street	
		San Clemente City Beach at Linda Lane	
		San Clemente City Beach at South Linda Lane	
		San Clemente City Beach at Lifeguard Headquarters	
		under San Clemente Municipal Pier	
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	
		San Clemente State Beach at Riviera Beach	
		Can Clemente State Beach at Cypress Shores	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	-City of Oceanside -City of Vista -County of San Diego
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	-City of Carlsbad -City of Encinitas -City of Escondido -City of San Marcos -County of San Diego
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	-City of Del Mar -City of Escondido -City of Poway -City of San Diego -City of Solana Beach -County of San Diego
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	-City of Del Mar -City of Poway -City of San Diego -County of San Diego
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	-City of San Diego
		La Jolla Shores Beach at Caminito del Oro	
		La Jolla Shores Beach at Vallecitos	
		La Jolla Shores Beach at Avenida de la Playa	
		at Casa Beach, Children's Pool	
		South Casa Beach at Coast Boulevard	
		Whispering Sands Beach at Ravina Street	
		Windansea Beach at Vista de la Playa	
		Windansea Beach at Bonair Street	
		Windansea Beach at Playa del Norte	
		Windansea Beach at Palomar Avenue	
		at Tourmaline Surf Park	
		Pacific Beach at Grand Avenue	
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I- Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	-City of El Cajon -City of Santee -County of San Diego
	San Diego River	lower 6 miles	-City of El Cajon -City of La Mesa -City of San Diego -City of Santee -County of San Diego
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	-City of La Mesa -City of Lemon Grove -City of San Diego -County of San Diego - San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final indicator bacteria TMDL compliance requirements for the water bodies listed in Table 6.0 consist of the following:

(1) Final TMDL Compliance Dates

The Responsible Copermittees for MS4 discharges to the water bodies listed in Table 6.0 must be in compliance with the final TMDL compliance requirements according to the following compliance dates:

Table 6.1
Compliance Dates to Achieve Final TMDL Compliance Requirements

Constituent	Dry Weather TMDL Compliance Date	Wet Weather TMDL Compliance Date
Total Coliform	April 4, 2021	April 4, 2031
Fecal Coliform		
Enterococcus		

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance dates under Specific Provision 6.b.(1):

Table 6.2a
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Beaches

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform	10,000	22%	1,000	0%
Fecal Coliform	400	22%	200	0%
Enterococcus	104	22%	35	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan.

Table 6.2b
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Creeks

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Fecal Coliform	400	22%	200	0%
Enterococcus	61 (104)	22%	33	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Basin Plan.
d. A single sample maximum of 104 MPN/100ml for *Enterococcus* may be applied as a receiving water limitation for creeks, instead of 61 MPN/100mL, if one or more of the creeks addressed by these TMDLs (San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek, San Diego River, and/or Chollas Creek) is designated with a "moderately to lightly used area" or less frequent usage frequency in the Basin Plan. Otherwise, the single sample maximum of 61 MPN/100mL for *Enterococcus* must be used to assess compliance with the allowable exceedance frequency.

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing indicator bacteria densities that do not exceed the following effluent limitations by the compliance dates under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a):

Table 6.2c
Final Effluent Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies in MS4 Discharges to the Water Body

Constituent	Concentration-Based Effluent Limitations			
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform[d]	10,000	22%	1,000	0%
Fecal Coliform	400	22%	200	0%
Enterococcus	104[e] / 61[f]	22%	35[e] / 33[f]	0%

Notes:
a. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan for discharges to beaches, and the Basin Plan for discharges to creeks and creek mouths.
d. Total coliform effluent limitations only apply to MS4 outfalls that discharge to the Pacific Ocean Shorelines and creek mouths listed in Table 6.0.
e. This *Enterococcus* effluent limitation applies to MS4 discharges to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
f. This *Enterococcus* effluent limitation applies to MS4 discharges to segments or areas of creeks or creek mouths listed in Table 6.0.

(ii) Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the compliance dates under Specific Provision 6.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a):

Table 6.3
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	*Watershed and Water Bodies*	*Load-Based Effluent Limitations*					
		Dry Weather			*Wet Weather*		
		Total Coliform	*Fecal Coliform*	*Entero-coccus*	*Total Coliform*	*Fecal Coliform*	*Entero-coccus*
South Orange County	San Joaquin Hills HSA (901.11) and Laguna Hills HSA (901.12) - Pacific Ocean Shoreline	91.78%	91.72%	98.28%	46.85%	52.07%	51.26%
	Aliso HSA (901.13) - Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	95.47%	95.58%	99.13%	25.29%	26.62%	27.52% (27.37%)**
	Dana Point HSA (901.14) - Pacific Ocean Shoreline	95.04%	95.03%	98.98%	13.15%	14.86%	15.16%
	Lower San Juan HSA (901.27) - Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	72.96%	74.21%	94.94%	19.21%	12.82%	27.12% (26.90%)**
	San Clemente HA (901.30) - Pacific Ocean Shoreline	94.28%	94.23%	98.83%	23.85%	24.58%	25.26%
San Luis Rey River	San Luis Rey HU (903.00) - Pacific Ocean Shoreline	38.13%	39.09%	87.38%	5.62%	3.12%	11.69%

Table 6.3 (Cont'd)
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watershed and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
Carlsbad	San Marcos HA (904.50) - Pacific Ocean Shoreline	82.82%	82.55%	96.03%	18.47%	18.98%	20.19%
San Dieguito River	San Dieguito HU (905.00) - Pacific Ocean Shoreline	14.39%	20.72%	83.48%	4.29%	1.46%	7.72%
Penasquitos	Miramar Reservoir HA (906.10) - Pacific Ocean Shoreline	96.50%	96.59%	99.42%	1.61%	1.99%	1.93%
Mission Bay	Scripps HA (906.30) - Pacific Ocean Shoreline	96.44%	96.42%	99.25%	16.32%	21.14%	18.82%
	Tecolote HA (906.50) - Tecolote Creek	94.51%	94.59%	98.94%	16.51%	20.47%	18.15% (18.08%)**
San Diego River	Mission San Diego HSA (907.11) and Santee HSA (907.12) - Pacific Ocean Shoreline - Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles)	74.03%	69.44%	93.96%	38.14%	53.22%	42.74% (42.47%)**
San Diego Bay	Chollas HSA (908.22) - Chollas Creek	92.06%	92.15%	98.46%	17.82%	24.84%	21.46% (21.36%)**

Notes:
* The percent load reductions are based on reducing loads compared to pollutant loads from 2001 to 2002.
** The alternative *Enterococcus* percent load reduction was calculated based on a numeric target of 104 MPN/100mL instead of 61 MPN/100mL, protective of the REC-1 "moderately to lightly used area" usage frequency that is protective of freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative pollutant load reductions can be utilized.

(c) Best Management Practices

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 6.0 must incorporate the Comprehensive Load Reduction Plans (CLRPs) required to be developed pursuant to Resolution No. R9-2010-0001.

(ii) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 6.b.(2)(a) and/or the effluent limitations under Specific Provision 6.b.(2)(b) for the segments or areas of the water bodies listed in Table 6.0.

(iii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans, owners/operators of small MS4s, and agricultural dischargers as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(f) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 6.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 6.b.(2)(c) achieves compliance with Specific Provisions 6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), and/or 6.b.(3)(e),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 6.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 6.d, to demonstrate compliance with Specific Provisions 6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), 6.b.(3)(e) and/or 6.b.(3)(f).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim indicator bacteria TMDL compliance requirements for the water bodies listed in Table 6.0 consist of the following:

(1) Interim TMDL Compliance Dates

The Responsible Copermittees must achieve compliance with the interim TMDL compliance requirements, as determined in accordance with Specific Provision 6.c.(3), by the interim compliance dates given in Table 6.4, unless alternative interim compliance dates are accepted by the San Diego Water Board Executive Officer as part of the Water Quality Improvement Plan.

Table 6.4
Interim Compliance Dates to Achieve Interim TMDL Compliance Requirements

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	April 4, 2016	April 4, 2021
		at Heisler Park - North		
	Pacific Ocean Shoreline	at Main Laguna Beach	April 4, 2016	April 4, 2021
		Laguna Beach at Ocean Avenue		
		Laguna Beach at Cleo Street		
		Arch Cove at Bluebird Canyon Road		
		Laguna Beach at Dumond Drive		
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	April 4, 2016	April 4, 2021
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	April 4, 2018	April 4, 2021
	Aliso Creek Mouth	at mouth	April 4, 2018	April 4, 2021
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	April 4, 2016	April 4, 2021
		Aliso Beach at Table Rock Drive		
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)		
		at Salt Creek (large outlet)		
		Salt Creek Beach at Salt Creek service road	April 4, 2017	April 4, 2021
		Salt Creek Beach at Strand Road	April 4, 2017	April 4, 2021

Table 6.4 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates	
			Interim Dry Weather WQBELs	Interim Wet Weather WQBELs
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	April 4, 2016	April 4, 2021
	San Juan Creek	lower 1 mile	April 4, 2018	April 4, 2021
	San Juan Creek Mouth	at mouth	April 4, 2016	April 4, 2021
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	April 4, 2016	April 4, 2021
		Ole Hanson Beach Club Beach at Pico Drain	April 4, 2016	April 4, 2021
		San Clemente City Beach at El Portal Street Stairs	April 4, 2017	April 4, 2021
		San Clemente City Beach at Mariposa Street		
		San Clemente City Beach at Linda Lane	April 4, 2016	April 4, 2021
		San Clemente City Beach at South Linda Lane	April 4, 2018	April 4, 2021
		San Clemente City Beach at Lifeguard Headquarters	April 4, 2017	April 4, 2021
		under San Clemente Municipal Pier		
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	April 4, 2018	April 4, 2021
		San Clemente State Beach at Riviera Beach	April 4, 2016	April 4, 2021
		Can Clemente State Beach at Cypress Shores	April 4, 2017	April 4, 2021
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	April 4, 2017	April 4, 2021
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	April 4, 2016	April 4, 2021
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	April 4, 2016	April 4, 2021

Table 6.4 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates	
			Interim Dry Weather WQBELs	Interim Wet Weather WQBELs
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	April 4, 2016	April 4, 2021
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	April 4, 2016	April 4, 2021
		La Jolla Shores Beach at Caminito del Oro		
		La Jolla Shores Beach at Vallecitos		
		La Jolla Shores Beach at Avenida de la Playa		
		at Casa Beach, Children's Pool		
		South Casa Beach at Coast Boulevard		
		Whispering Sands Beach at Ravina Street		
		Windansea Beach at Vista de la Playa		
		Windansea Beach at Bonair Street		
		Windansea Beach at Playa del Norte		
		Windansea Beach at Palomar Avenue		
		at Tourmaline Surf Park		
		Pacific Beach at Grand Avenue		
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries		
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	April 4, 2018	April 4, 2021
	San Diego River	lower 6 miles		
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach		
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	April 4, 2018	April 4, 2021

(2) Interim Water Quality Based Effluent Limitations

The Responsible Copermittees for discharges to the water bodies in Table 6.0 must comply with the following interim WQBELs by the interim compliance dates given in Specific Provision 6.c.(1):

(a) Interim Receiving Water Limitations

(i) *Interim Dry Weather Receiving Water Limitations*

The Responsible Copermittee must calculate the "existing" exceedance frequencies of the 30-day geometric mean water quality objectives for each of the indicator bacteria by analyzing the available monitoring data collected between January 1, 1996 and December 31, 2002. "Existing" exceedance frequencies may be calculated by water body and/or by Watershed Management Area listed in Table 6.0. Separate "existing" exceedance frequencies must be calculated for beaches and creeks/creek mouths.

The Responsible Copermittees must achieve a 50 percent reduction in the "existing" exceedance frequency of the 30-day geometric mean WQBELs for the water bodies listed in Table 6.0 by the interim compliance dates given in Table 6.4. A 50 percent reduction in the "existing" exceedance frequency is equivalent to half of the "existing" exceedance frequency of the 30-day geometric mean WQBELs.

The "existing" exceedance frequencies and the interim dry weather allowable exceedance frequencies (i.e. interim dry weather receiving water limitations) calculated by the Responsible Copermittees must be included in the Water Quality Improvement Plans for the applicable Watershed Management Areas.

(ii) *Interim Wet Weather Receiving Water Limitations*

The Responsible Copermittees must achieve the interim wet weather receiving water limitations in Table 6.5, expressed as interim wet weather allowable exceedance frequencies, by the interim compliance dates given in Table 6.4.

Table 6.5
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	38%	37%	39%
		at Heisler Park - North			
	Pacific Ocean Shoreline	at Main Laguna Beach			
		Laguna Beach at Ocean Avenue			
		Laguna Beach at Cleo Street			
		Arch Cove at Bluebird Canyon Road			
		Laguna Beach at Dumond Drive			
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	41%	41%	42%
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	41%	41%	42%
	Aliso Creek Mouth	at mouth	41%	41%	42%
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	36%	36%	36%
		Aliso Beach at Table Rock Drive			
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)			
		at Salt Creek (large outlet)			
		Salt Creek Beach at Salt Creek service road			
		Salt Creek Beach at Strand Road			

Table 6.5 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	44%	44%	48%
	San Juan Creek	lower 1 mile	44%	44%	47%
	San Juan Creek Mouth	at mouth	44%	44%	47%
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	35%	35%	36%
		Ole Hanson Beach Club Beach at Pico Drain			
		San Clemente City Beach at El Portal Street Stairs			
		San Clemente City Beach at Mariposa Street			
		San Clemente City Beach at Linda Lane			
		San Clemente City Beach at South Linda Lane			
		San Clemente City Beach at Lifeguard Headquarters			
		under San Clemente Municipal Pier			
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)			
		San Clemente State Beach at Riviera Beach			
		Can Clemente State Beach at Cypress Shores			
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	45%	44%	47%
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	40%	40%	41%
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	33%	33%	36%

Table 6.5 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	26%	26%	26%
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	37%	37%	37%
		La Jolla Shores Beach at Caminito del Oro			
		La Jolla Shores Beach at Vallecitos			
		La Jolla Shores Beach at Avenida de la Playa			
		at Casa Beach, Children's Pool			
		South Casa Beach at Coast Boulevard			
		Whispering Sands Beach at Ravina Street			
		Windansea Beach at Vista de la Playa			
		Windansea Beach at Bonair Street			
		Windansea Beach at Playa del Norte			
		Windansea Beach at Palomar Avenue			
		at Tourmaline Surf Park			
		Pacific Beach at Grand Avenue			
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries	49%	49%	51%
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	46%	43%	49%
	San Diego River	lower 6 miles	46%	43%	49%
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	46%	43%	51%
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	41%	41%	43%

(b) Interim Effluent Limitations

Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the interim compliance dates under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.c.(2)(a):

Table 6.6
Interim Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	*Watersheds and Water Bodies*	*Load-Based Effluent Limitations*					
		Dry Weather			*Wet Weather*		
		Total Coliform	*Fecal Coliform*	*Entero-coccus*	*Total Coliform*	*Fecal Coliform*	*Entero-coccus*
South Orange County	San Joaquin Hills HSA (901.11) and Laguna Hills HSA (901.12) - Pacific Ocean Shoreline	45.89%	45.86%	49.14%	23.43%	26.04%	25.63%
	Aliso HSA (901.13) - Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	47.74%	47.79%	49.57%	12.65%	13.31%	13.76% (13.69%)**
	Dana Point HSA (901.14) - Pacific Ocean Shoreline	47.52%	47.52%	49.49%	6.58%	7.43%	7.58%
	Lower San Juan HSA (901.27) - Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	36.48%	37.11%	47.47%	9.61%	6.41%	13.56% (13.45%)**
	San Clemente HA (901.30) - Pacific Ocean Shoreline	47.14%	47.12%	49.42%	11.93%	12.29%	12.63%
San Luis Rey River	San Luis Rey HU (903.00) - Pacific Ocean Shoreline	19.07%	19.55%	43.69%	2.81%	1.56%	5.85%
Carlsbad	San Marcos HA (904.50) - Pacific Ocean Shoreline	41.41%	41.28%	48.02%	9.24%	9.49%	10.10%

Table 6.6 (Cont'd)
Interim Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watersheds and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
San Dieguito River	San Dieguito HU (905.00) - Pacific Ocean Shoreline	7.20%	10.36%	41.74%	2.15%	0.73%	3.86%
Penasquitos	Miramar Reservoir HA (906.10) - Pacific Ocean Shoreline	48.25%	48.30%	49.71%	0.81%	1.00%	0.97%
Mission Bay	Scripps HA (906.30) - Pacific Ocean Shoreline	48.22%	48.21%	49.63%	8.16%	10.57%	9.41%
	Tecolote HA (906.50) - Tecolote Creek	47.26%	47.30%	49.47%	8.26%	10.24%	9.08% (9.04%)**
San Diego River	Mission San Diego HSA (907.11) and Santee HSA (907.12) - Pacific Ocean Shoreline - Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles)	37.02%	34.72%	46.98%	19.07%	26.61%	21.37% (21.24%)**
San Diego Bay	Chollas HSA (908.22) - Chollas Creek	46.03%	46.08%	49.23%	8.91%	12.42%	10.73% (10.68%)**

Notes:
* The percent load reductions are based on reducing loads compared to pollutant loads from 2001 to 2002.
** The alternative *Enterococcus* percent load reduction was calculated based on a numeric target of 104 MPN/100mL instead of 61 MPN/100mL, protective of the REC-1 "moderately to lightly used area" usage frequency that is protective of freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative pollutant load reductions can be utilized.

(3) Interim TMDL Compliance Determination

Compliance with the interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(f) There are no exceedances of the interim receiving water limitations under Specific Provision 6.c.(2)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(g) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the interim effluent limitations under Specific Provision 6.c.(2)(b); OR

(h) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

d. Specific Monitoring and Assessment Requirements

(1) Monitoring and Assessment Requirements for Beaches

(a) Monitoring Stations

For beaches addressed by the TMDL, monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[35] If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source

[35] Commonly referred to as AB 411 monitoring

identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations at least once within the first 24 hours of the end of a storm event[36] during the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer in exceedance of the allowable exceedance frequencies in the receiving waters.

(iii) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(iv) For Pacific Ocean Shoreline segments or areas listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the dry weather and

[36] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

wet weather monitoring data to assess whether the interim and final WQBELs for the Pacific Ocean Shoreline segments or areas listed in Table 6.0 have been achieved.

(ii) Dry weather exceedance frequencies must be calculated as follows:

[a] 30-day geometric means must be calculated from the results of any dry weather samples collected from the segments or areas for each water body listed in Table 6.0;
[b] The method and number of samples need for calculating the 30-day geometric means must be consistent with the number of samples required by the Ocean Plan;
[c] Where there are multiple segments or areas associated with a water body listed in Table 6.0, the Copermittees may calculate geometric means for each segment or area, or combine the dry weather monitoring data from all the segments or areas to calculate geometric means for the water body;
[d] The exceedance frequency must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the dry season.

(iii) Wet weather exceedance frequencies must be calculated as follows:

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;
[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;
[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria densities reported from each storm event sampled; and
[d] The single sample maximum exceedance frequency must be calculated by dividing the number of wet weather days that exceed the single sample maximum receiving water limitations in Table 6.2 by the total number of wet weather days during the rainy season.
[e] The data collected for dry weather must be used in addition to the data collected for wet weather to calculate the wet weather 30-day geometric means. The exceedance frequency of the wet weather 30-day geometric means must be calculated by dividing the number of geometric means that exceed the geometric mean

receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the wet season.

(iv) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(v) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) Monitoring and Assessment Requirements for Creeks and Creek Mouths

(a) Monitoring Stations

For creeks addressed by the TMDL, monitoring locations should consist of, at a minimum, a location at or near the mouth of the creek (e.g. Mass Loading Station or Mass Emission Station) and one or more locations upstream of the mouth (e.g. Watershed Assessment Station). If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations in accordance with the requirements of Provision D.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations within the first 24 hours of the end of a storm event[37] during the rainy season (i.e. October 1 through April 30).

[37] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(iii) Samples collected from receiving water monitoring stations must be analyzed for fecal coliform and *Enterococcus* indicator bacteria.

(iv) For creeks or creek mouths listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the receiving water monitoring data to assess whether the interim and final receiving water WQBELs for the creeks and creek mouths listed in Table 6.0 have been achieved.

(ii) Dry weather exceedance frequencies must be calculated as follows:

[a] 30-day geometric means must be calculated from the results of any dry weather samples collected from the segment or area for each water body listed in Table 6.0;
[b] The method and number of samples need for calculating the 30-day geometric means must be consistent with the number of samples required by the Basin Plan;
[c] The exceedance frequency must be calculated by dividing the number of 30-day geometric means that exceed the 30-day geometric mean receiving water limitations in Table 6.2 by the total number of 30-day geometric means calculated from samples collected during the dry season.

(iii) Wet weather exceedance frequencies must be calculated as follows:

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;
[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;
[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria densities reported from each of the storm events sampled; and

[d] The exceedance frequency must be calculated by dividing the number of wet weather days that exceed the single sample maximum receiving water limitations in Table 6.2 by the total number of wet weather days during the rainy season.

[e] The data collected for dry weather must be used in addition to the data collected for wet weather to calculate the wet weather 30-day geometric means. The exceedance frequency of the wet weather 30-day geometric means must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the wet season.

(iv) The Responsible Copermittee must identify and incorporate additional MS4 outfall and receiving water monitoring stations and/or adjust monitoring frequencies to identify sources causing exceedances of the receiving water WQBELs.

(v) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(vi) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

7. Total Maximum Daily Loads for Sediment in Los Peñasquitos Lagoon

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2012-0033

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2012
State Water Board Approval Date:	January 21, 2014
Office of Administrative Law Approval Date:	July 14, 2014
US EPA Approval Date:	October 30,2014

(3) TMDL Effective Date: July 14, 2014

(4) Watershed Management Area: Los Peñasquitos

(5) Water Body: Los Peñasquitos Lagoon

(6) Responsible Copermittees: County of San Diego, City of San Diego, City of Del Mar, and City of Poway

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final sediment TMDL compliance requirements for Los Peñasquitos Lagoon consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must be in compliance with the final TMDL compliance requirements by December 31, 2034.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not prohibit the sustainable restoration of tidal and non-tidal saltmarsh vegetation of at least 346 acres.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations by the compliance date under Provision 7.b(1) will not cause or contribute to a failure of the receiving water condition specified under Specific Provision 7.b.(2)(a):

Table 7.1
*Final Effluent Limitations as Expressed as Wet Season Loads in MS4 Discharges to Los Peñasquitos Lagoon**

Constituent	Effluent Limitation
Sediment	2,580 tons/wet season

*Final effluent limitations are to be achieved by the following Responsible Parties: County of San Diego, City of San Diego, City of Del Mar, City of Poway, Phase II MS4 permittees, Caltrans, general construction storm water NPDES permittees, and general industrial storm water NPDES permittees.

(c) Best Management Practices

(i) The Water Quality Improvement Plan for the Los Peñasquitos Watershed Management Area must incorporate the Sediment Load Reduction Plan required to be developed pursuant to Resolution No. R9-2012-0033.

(ii) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 7.b.(2)(a) and/or the Copermittee's portion of the effluent limitations under Specific Provision 7.b.(2)(b) for Los Peñasquitos Lagoon.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) Successful restoration of 80 percent of the 1973 acreage of tidal and non-tidal lagoon salt marsh (346 acres); OR

(b) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 7.b.(2)(c)(ii) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 7.b.(2)(c)(ii) or other implementation actions achieve compliance with Specific Provision 7.b.(3)(a),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 7.b.(2)(c)(ii) or other implementation actions, AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 7.d to demonstrate compliance with Specific Provision 7.b.(3)(a).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim sediment TMDL compliance requirements for Los Penasquitos Lagoon consist of the following:

(1) Interim Compliance Dates and WQBELs

The Responsible Copermittees must comply with the interim WQBELs, expressed as wet season loads, by December 31 of the interim compliance year set forth in Table 7.2.

Table 7.2
*Interim Water Quality Based Effluent Limitations Expressed as Wet Season Loads in MS4 Discharges**

Interim Compliance Date	Interim Effluent Limitations (tons/wet season)
December 31, 2019	6,691
December 31, 2023	5,663
December 31, 2027	4,636
December 31, 2029	3,608

*Interim effluent limitations are to be achieved by the following Responsible Parties: County of San Diego, City of San Diego, City of Del Mar, City of Poway, Phase II MS4 permittees, Caltrans, general construction storm water NPDES permittees, and general industrial storm water NPDES permittees.

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) The final receiving water limitation under Specific Provision 7.b.(2)(a) is met; OR

(c) There are no exceedances of the Copermittee's portion of interim effluent limitations under Table 7.2 at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the Copermittee's portion of the

interim TMDL compliance requirements described in Attachment A of Resolution No. R9-2010-0033 will be achieved by the interim compliance date.

d. Specific Monitoring and Assessment Requirements

(1) Watershed Monitoring

The Responsible Copermittees must conduct suspended sediment, bed load, and flow monitoring to calculate total sediment loading to the Los Peñasquitos Lagoon for each wet season (October 1 thru April 30) as set forth below:

(a) The Responsible Copermittees must monitor enough storm events throughout the season to quantify sediment loading over each wet season, and

(b) The Responsible Copermittees must monitor at least 3 stations to quantify cumulative sediment loading into Los Peñasquitos Lagoon. Stations must be located within the Los Peñasquitos, Carroll Canyon, and Carmel Creek tributaries prior to discharging into Los Peñasquitos Lagoon.

(2) Lagoon Monitoring

The Responsible Copermittees must monitor Los Peñasquitos Lagoon each Fall for changes in the extent of the vegetation types as set forth below:

(a) The Responsible Copermittees must acquire aerial photos of Los Peñasquitos Lagoon and digitize them at an approximate scale of 1:2,500,

(b) The Responsible Copermittees must appropriately interpret the vegetation and classify the various types as saltmarsh, non-tidal saltmarsh, freshwater marsh, non-tidal saltmarsh –*Lolium perrene* infested, southern willow scrub/mulefat scrub, herbaceous wetland, or upland land cover.

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the monitoring data collected under Specific Provision 7.d(1) and 7.d(2) to assess whether the interim and final WQBELs have been achieved.

(b) For assessing and determining compliance with the final receiving water limitations under Specific Provision 7.b.(2)(a), the Responsible Copermittees must use the data acquired under Specific Provision 7.d.(2) to estimate the acreage of tidal and non-tidal saltmarsh actually restored.

(c) For assessing and determining compliance with the final effluent limitations under Specific Provision 7.b.(2)(b), the Responsible Copermittees must use the data acquired under Specific Provision 7.d.(1) to estimate sediment loading into Los Peñasquitos Lagoon. Sediment loading must be evaluated using a 3-year, weighted rolling average. The first reported average shall be calculated using data collected in the year 2015-2016, 2016-2017, and 2017-2018 wet seasons.

(d) The monitoring and assessment results must be submitted as part of the Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

ATTACHMENT F

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

FACT SHEET / TECHNICAL REPORT

FOR

ORDER NO. R9-2013-0001
AS AMENDED BY ORDER No. R9-2015-0001
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

MAY 8, 2013
Amended on February 11, 2015

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I. FACT SHEET FORMAT

This Fact Sheet briefly sets forth the principal facts and the significant factual, legal, methodological, and policy questions that the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) considered in preparing Order No. R9-2013-0001 (Order) as amended by Order No. R9-2015-0001. In accordance with the Code of Federal Regulations (CFR) Title 40 Parts 124.8 and 124.56 (40 CFR 124.8 and 40 CFR 124.56), this Fact Sheet includes, but is not limited to, the following information:

1. Contact information
2. Public process and notification procedures
3. Background of municipal storm water permits
4. Regional MS4 Permit approach
5. Economic considerations
6. Applicable statutes, regulations, plans and policies
7. Discussion of the provisions in the Order

Tentative Order No. R9-2013-0001 was distributed for public review on October 31, 2012. The San Diego Water Board accepted written comments on the Tentative Order until January 11, 2013. A public hearing was subsequently held on April 10 and 11, 2013, that was continued to May 8, 2013 to receive oral comments from interested persons. The San Diego Water Board adopted Order No. R9-2013-0001 on May 8, 2013.

Order No. R9-2015-0001, an Order amending Order No. R9-2013-0001, was distributed for public review on September 19, 2014. Order No. R9-2015-0001 amended the findings and provisions of Order No. R9-2013-0001 to:

a. Enroll the County of Orange, the Orange County Flood Control District and the south Orange County Cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano as Copermittees responsible for compliance with the terms and conditions of Order No. R9-2013-0001, as amended by Order No. R9-2015-0001;

b. Designate the San Diego Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the Cities of Laguna Woods and Laguna Hills and agree to the designation of the Santa Ana Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the City of Lake Forest, subject to the terms of the February 10, 2015 agreement between San Diego Water Board and the Santa Ana Water Board described in Finding 29 of this Order, upon the later effective date of Order No. R9-2015-0001 or Order No. R8-2015-0001 (superseding Order No. R8-2009-0030);

c. Establish interim exceptions to land development requirements for those priority development projects that discharge to engineered channels and large river reaches as described in Provision E.3.c(2)(e) of this Order;

d. Incorporate the amended requirements of the State Water Resources Control Board's (State Water Board) General Exception to require that pollutant reductions be achieved within 6 years for storm water and nonpoint source discharges to ASBS within the Region;

e. Incorporate applicable requirements of the Los Peñasquitos Lagoon Sediment TMDL;

f. Require the Orange County Copermittees to implement the "*Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County*," dated October 2014, made effective in the Monitoring and Reporting Program/Order issued pursuant to California Water Code section 13383 in the December 5, 2014 San Diego Water Board Letter Directive and subject to future revisions by the Executive Officer after appropriate public input;

A public hearing was held on February 11, 2015, to receive oral comments from Copermittees and interested persons. The San Diego Water Board adopted Order No. R9-2015-0001 amending Order No. R9-2013-0001 on February 11, 2015.

The San Diego Water Board files applicable to the issuance of Order No. R9-2013-0001 and amendments thereto are incorporated into the administrative record in support of the findings and requirements of the Order.

II. CONTACT INFORMATION

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The Order and other related documents can be downloaded from the San Diego Water Board website at

~~http://www.swrcb.ca.gov/rwqcb9/water_issues/programs/stormwater/index.shtml~~
http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/oc_stormwater.shtml

The documents referenced in this Fact Sheet and in Order No. R9-2013-0001 and amendments thereto are available for public review at the San Diego Water Board office, located at the address listed above. Public records are available for inspection during regular business hours, from 8:00 am to 5:00 pm Monday through Friday. To schedule an appointment to inspect public records, contact the San Diego Water Board Records Management Officer at ~~858-467-2952~~619-516-1990.

COPERMITTEES

Orange County Copermittees

- County of Orange
- City of Aliso Viejo
- City of Dana Point
- City of Laguna Beach
- City of Laguna Hills
- City of Laguna Niguel
- City of Laguna Woods
- City of Lake Forest*
- City of Mission Viejo
- City of Ranch Santa Margarita
- City of San Clemente
- City of San Juan Capistrano
- Orange County Flood Control District

* While not listed in the above table, the City of Lake Forest remains a Copermittee under this Order until the later effective date of this Order or Santa Ana Water Board Tentative Order No. R8-2015-0001. Thereafter, the City of Lake Forest will no longer be considered a Copermittee under this Order because its Phase I MS4 discharges will be regulated by the Santa Ana Water Board pursuant to Water Code section 13328 designation. The requirements of this Order that apply to the City of Lake Forest for the duration of this Order, consistent with the Water Code section 13228 agreement dated February 10, 2015, are described in Finding 29 and Footnote 2 to Table B-1.

Riverside County Copermittees

- County of Riverside
- City of Murrieta
- City of Temecula
- City of Wildomar
- Riverside County Flood Control and Water Conservation District

San Diego County Copermittees

- County of San Diego
- City of Carlsbad
- City of Chula Vista
- City of Coronado
- City of Del Mar
- City of El Cajon
- City of Encinitas
- City of Escondido
- City of Imperial Beach
- City of La Mesa
- City of Lemon Grove
- City of National City
- City of Oceanside
- City of Poway
- City of San Diego
- City of San Marcos
- City of Santee
- City of Solana Beach
- City of Vista
- San Diego County Regional Airport Authority
- San Diego Unified Port District

III. PUBLIC PROCESS AND NOTIFICATION PROCEDURES

The San Diego Water Board followed the schedule listed below for the preparation of Order No. R9-2013-0001:

San Diego County Copermittee Permit Reissuance Process

1. On February 8, 2011, the San Diego Water Board met with the San Diego County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No. R9-2007-0001.

2. Between February and May 2011, the San Diego Water Board met with select San Diego County, Orange County, and Riverside County Copermittees, as well as representatives of the environmental community to discuss concepts and receive recommendations for elements to be incorporated in a Regional Municipal Separate Storm Sewer System Permit (Regional MS4 Permit).

3. On June 27, 2011 the San Diego Water Board received the Report of Waste Discharge from the San Diego County Copermittees for the renewal of their NPDES permit, Order No. R9-2007-0001.

4. On April 9, 2012, the San Diego Water Board released an administrative draft of Tentative Order No. R9-2013-0001 for preliminary informal comments and feedback.

5. On April 25, 2012, the San Diego Water Board held an informal public workshop to present the administrative draft of Tentative Order No. R9-2013-0001 and receive verbal comments.

6. Between June and August 2012, the San Diego Water Board held four (4) focused meetings with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community, and USEPA) to discuss and receive preliminary comments and feedback about specific elements in the administrative draft of Tentative Order No. R9-2013-0001.

7. On September 5, 2012, the San Diego Water Board held an informal public workshop to present the modifications that were expected to be incorporated into the Tentative Order based on the preliminary comments and feedback received during the focused meetings held between June and August 2012.

8. Informal written comments on the administrative draft of Tentative Order No. R9-2013-0001 were accepted until September 14, 2012.

9. On October 12, 2012, the San Diego Water Board released a revised administrative draft of Tentative Order No. R9-2013-0001.

10. On October 24, 2012, the San Diego Water Board held a focused meeting with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community, and USEPA) to discuss modifications incorporated into the administrative draft of Tentative Order No. R9-2013-0001.

11. On October 31, 2012, the San Diego Water Board released Tentative Order No. R9-2013-0001 for formal public review and comment.

12. On November 13, 2012 and December 12, 2012, the San Diego Water Board held a formal public Board workshop to present the public draft of Tentative Order No. R9-2013-0001 and receive verbal comments.

13. Formal written comments on the public draft of Tentative Order No. R9-2013-0001 were accepted until January 11, 2013.

14. A public hearing of Tentative Order No. R9-2013-0001 was conducted on April 10 and 11, 2013, that was continued to May 8, 2013.

Orange County Copermittee Permit Reissuance Process

15. On May 20, 2014 the San Diego Water Board received the Report of Waste Discharge from the Orange County Copermittees for the renewal of their MS4 NPDES permit, Order No. R9-2009-0002.

16. On June 24, 2014, the San Diego Water Board met with the Orange County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No.R9-2009-0002 and the process for enrollment as Copermittees under Regional MS4 Permit Order No. R9-2013-0001.

17. On July 1, 2014, the San Diego Water Board held a public meeting to discuss the Orange County Report of Waste Discharge (RoWD) and receive comments on potential modifications to Order No. R9-2013-0001. Based on comments received from the Orange County Copermittees and other interested persons at this meeting, the San Diego Water Board determined that additional public meetings were not needed prior to release of Tentative Order No. R9-2015-0001, amending Order No. R9-2013-0001 in redlined – strikeout format for public review and comment.

18. On September 19, 2014, the San Diego Water Board released Tentative Order No. R9-2015-0001 for a 60 day public review and comment period.

19. On October 8, 2014, the San Diego Water Board held a formal public workshop at a regular board meeting to receive information and discuss the proposed amendments to Order No. R9-2013-0001 described in Tentative Order No. R9-2015-0001.

20. In accordance with State and federal laws and regulations, the San Diego Water Board notified San Diego County, Orange County and Riverside County Copermittees, and all known interested agencies and persons of its intent to adopt Tentative Order No. R9-2015-0001 and provided them with an opportunity to submit their written comments and recommendations. Written comments and recommendations on Tentative Order No. R9-2015-0001 were accepted until November 19, 2014.

21. The San Diego Water Board held a public workshop on October 8, 2014, and a public hearing on February 11, 2015, and heard and considered all comments pertaining to the adoption of Tentative Order No. R9-2015-0001 on February 11, 2015.

IV. BACKGROUND OF THE SAN DIEGO REGION MUNICIPAL STORM WATER PERMITS

In developed and developing areas, storm water runoff is commonly transported through municipal separate storm sewer systems (MS4s) and discharged into local receiving water bodies. As the storm water runs off and flows over the land or impervious surfaces (e.g., paved streets, parking lots, and building rooftops), it accumulates debris, chemicals, sediment, and other pollutants that can adversely affect receiving water quality if discharged untreated. The United States Environmental Protection Agency (USEPA) recognizes wet weather flows from urban areas as the number one source of estuarine pollution in coastal communities,[1] such as those within the San Diego Region.

The federal Clean Water Act (CWA) was amended in 1987 to address and regulate discharges of storm water associated with industrial activities and from municipal storm sewers. With the amendments, many municipalities throughout the United States were obligated for the first time to obtain National Pollutant Discharge Elimination System (NPDES) permits for discharges of storm water from their MS4s.

In response to the CWA 1987 amendment, as well as the pending federal NPDES regulations which would implement the amendment, the San Diego Water Board issued "early" MS4 permits. The San Diego Water Board adopted and issued Order Nos. 90-38, 90-42, and 90-46 to regulate storm water discharges from the MS4s in Orange County, San Diego County, and Riverside County, respectively, within the San Diego Region on July 16, 1990.

The "early" MS4 permits, or First Term Permits, were issued prior to the November 1990 promulgation of the final federal NPDES storm water regulations. By issuing these First Term Permits before the federal regulations took effect, the San Diego Water Board was able to provide the Copermittees additional flexibility in addressing and managing storm water discharges. The First Term Permits contained the essentials of the 1990 regulations, and required the Copermittees to develop and implement runoff management programs, but provided little specificity about what was required to be included in or actually achieved by those programs.

The flexibility provided in the First Term Permits was generally continued through the Second Term Permits. The combination of the lack of specificity in the First and Second Term Permits, a general lack of meaningful action by the Copermittees and a general lack of corresponding reaction (i.e. enforcement) by the San Diego Water Board during the first ten years of the storm water program, resulted in few substantive steps

[1] US EPA. 1999. 40 CFR Parts 9, 122, 123, and 124. National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. 64 FR 68727.

towards achieving improvements in the quality of receiving waters or storm water discharges from the MS4s.

From 2001, the regulatory approach incorporated into Third Term Permits was a significant departure from the regulatory approach of the First and Second Term Permits. The Third Term Permits issued by the San Diego Water Board included more detailed requirements that outlined the minimum level of implementation required for the Copermittees' programs to meet the maximum extent practicable (MEP) standard for storm water. The Third Term Permits included more detail to emphasize and enhance the jurisdictional runoff management programs developed by the Copermittees and introduced requirements for developing and implementing watershed-based programs.

The Third Term Permits also incorporated two precedent setting decisions by the State Water Board. In Order WQ 99-05, the State Water Board established receiving water limitation language to be included in all MS4 permits. The State Water Board's precedential language clarified that municipal storm water permits must include provisions requiring discharges to be controlled to attain water quality standards in receiving waters. Unlike previously adopted versions of the receiving water limitation language in the First and Second Term Permits, the language no longer stated that "*violations of water quality standards are not violations of the municipal storm water permit under certain conditions*." In addition, the receiving water limitation language no longer indicated that the "*implementation of best management practices is the 'functional equivalent' of meeting water quality standards*." State Water Board Order WQ 99-05 specifically requires language in MS4 permits for the Copermittees to comply with water quality standards based discharge prohibitions and receiving water limitations through timely implementation of control measures and other actions to reduce pollutants in discharges. (See State Water Board Order WQ 99-05 (*Environmental Health Coalition*)).

In Order WQ 2000-11, also a precedential decision, the State Water Board addressed design standards for structural post-construction best management practices (BMPs) for new development and significant redevelopment. The State Water Board found that the design standards, which require that runoff generated by 85 percent of storm events from specific development categories be infiltrated or treated, reflect the MEP standard. State Water Board Order WQ 2000-11 also found that the post-construction BMP provisions, or Standard Storm Water Mitigation Plan (SSMP) provisions, constitute MEP for addressing storm water pollutant discharges resulting from specific development categories.

The Third Term San Diego County and Orange County Permits (Order Nos. 2001-01 and R9-2002-0001, respectively) were appealed to the State Water Board. Minor modifications were made by the State Water Board, but the requirements were largely upheld. In State Water Board Order WQ 2001-15, the State Water Board upheld the Third Term San Diego County Permit requirements with certain modifications. The State Water Board removed the prohibition of storm water discharges *into* the MS4 that cause or contribute to exceedances of water quality objectives. The revision allows for

treatment of pollutants in storm water runoff after the pollutants have entered the MS4. State Water Board Order WQ 2001-15 otherwise upheld all the other requirements of the permit.

In addition to the modification to the discharge prohibition in Order WQ 2001-15, the State Water Board refined Order WQ 99-05 by making clear that the Copermittees may use an iterative approach to achieving compliance with water quality standards that involves ongoing assessments and revisions. Thus, the language for the discharge prohibitions and receiving water limitations was revised to explicitly require the Copermittees to implement an iterative process of assessments and revisions to comply with the discharge prohibitions and receiving water limitations. The San Diego Water Board retained the authority to enforce receiving water limitations and discharge prohibitions even if the Copermittee is engaged in the iterative process.

The Third Term San Diego County Permit was subsequently challenged in the Superior Court of the State of California and the Court of Appeal, Fourth Appellate District. The Court of Appeal, Fourth Appellate District, found that the approach of the Third Term San Diego County Permit to regulating discharges into the MS4 was appropriate (*Building Industry Ass'n. v. State Water Resources Control Bd., et al.,* 124 Cal.App.4th 866 (2004)). The State of California Supreme Court denied review sought by the Building Industry Association in March 2005.

The Fourth Term Permits, or current MS4 permits, began with the adoption of Order No. R9-2007-0001 issued to the Copermittees of San Diego County in January 2007. Order Nos. R9-2009-0002 and R9-2010-0016 were subsequently issued to the Copermittees of Orange County and Riverside County. The Fourth Term Permits continued to include more detailed requirements to be implemented by each Copermittee's jurisdictional runoff management program. The Fourth Term Permits also include requirements to further emphasize a watershed management approach and for more coordination among jurisdictional runoff management programs. In addition, the Fourth Term Permits included more requirements for assessing the effectiveness of the runoff management programs being implemented by the Copermittees. The intent of the inclusion of additional requirements was to enhance and better define elements of the permit that were expected to be incorporated into the iterative process for managing runoff from each Copermittee's jurisdiction and within the watersheds of the San Diego Region.

The Fourth Term Permits include several new and emerging approaches for managing storm water runoff and discharges. Low impact development (LID) requirements are included for development and significant redevelopment to reduce pollutants in storm water runoff from sites through more natural processes such as infiltration and biofiltration closer to the source, rather than utilizing conventional mechanical end-of-pipe treatment systems. Hydrograph modification (hydromodification) management requirements also are included to mitigate the potential for increased erosion in receiving waters due to increased runoff rates and durations often caused by development and increased impervious surfaces. The Fourth Term Orange County and

Riverside County Permits introduced requirements to identify areas of existing development where retrofitting with LID projects would be feasible and could be implemented to reduce storm water runoff and pollutants in storm water discharges.

The Fourth Term Orange County and Riverside County Permits included a clearer distinction between storm water and non-storm water discharges. The term "urban runoff" was completely removed, and a distinction between storm water (wet weather) runoff and non-storm water (dry weather) runoff was emphasized. This clarification was made to prevent any potential misunderstanding that regulation under the MS4 permits is limited only to urbanized areas, and to prevent non-storm water runoff from being managed in the same manner as storm water runoff. The term "urban runoff" is not defined in the Code of Federal Regulations (CFR) or Federal Register (FR) in the regulation of MS4 discharges. According to the CWA 402(p)(3)(B)(ii), MS4 permits must include a requirement to effectively prohibit non-storm water discharges into the MS4s.

Finally, for the Fourth Term Orange County and Riverside County Permits the San Diego Water Board found that non-storm water discharges to the MS4 from over application of irrigation water are sources of pollutants. The San Diego Water Board found that non-storm water discharges resulting from over-irrigation must be prohibited from entering the MS4 in accordance with the requirements of the CWA and pursuant to 40 CFR 122.26(d)(2)(iv)(B)(1).

The requirements of the Fourth Term Permits issued to the Copermittees in each county within the San Diego Region now have substantively the same core requirements such as discharge prohibitions, receiving water limitations, jurisdictional runoff management program components, and monitoring program requirements. There are, however, several inconsistencies that exist among the three Fourth Term Permits which complicate oversight and implementation of the permits by the San Diego Water Board.

The Fourth Term San Diego County Permit expired in January 2012. The Fourth Term Orange County permit ~~and Riverside County Permits will~~ expired in December 2014 and the Fourth Term Riverside County Permit will expire in November 2015. ~~, respectively.~~ Issuing the Fifth Term Permits within five years for three counties under three different permits would require the San Diego Water Board to expend significant time and resources for the issuance of the permits through three separate public proceedings, thereby greatly reducing the time and resources available to oversee implementation and compliance. Multiple permits also create confusion for determining compliance among regulated entities, especially for the land development community.

The San Diego Water Board has acknowledged that issuing a single MS4 permit for all the Copermittees in the San Diego Region can and is expected to result in more consistent implementation, improve communication among agencies within watersheds crossing multiple jurisdictions, and minimize resources spent with each permit renewal process. Within the findings of the Fourth Term Riverside County Permit issued in

November 2010, the San Diego Water Board notified the public of its intent to develop and issue a single Regional MS4 Permit.

V. REGIONAL MS4 PERMIT APPROACH

The Fifth Term Permit, or Regional MS4 Permit, shifts the focus of the permit requirements from a minimum level of actions to be implemented by the Copermittees to identifying outcomes to be achieved by those actions. Order No. R9-2013-0001 represents an important paradigm shift in the approach for MS4 permits within the San Diego Region.

Historical Permitting Approach

The First and Second Term Permits were very broad and provided little specificity about what was required to be developed and implemented by the Copermittees. The Third Term Permits began to become more specific about the minimum level of implementation required by the Copermittees. The Fourth Term Permits~~, or current permits,~~ subsequently increased in specificity. The MS4 permits have progressively become more detailed and focused on specifying the minimum level of actions expected to be implemented by the Copermittees. As detailed and specific as the MS4 permits have become, however, they include very little detail about what the desired outcomes of the required actions are expected to achieve. Compliance with the permit requirements has essentially been tracking numbers of actions and reporting, not tracking progress or actual improvements in the quality of receiving waters or discharges from the MS4s. The result has been an increase in actions being implemented by the Copermittees with little or no ability or expectations to determine whether or not improvements in water quality are being achieved.

The Fourth Term Permits result in significant resource expenditure by the Copermittees to report permit compliance information to the San Diego Water Board in the form of annual jurisdictional runoff management program, watershed program, and monitoring program reports. The San Diego Water Board must then expend much of its limited resources on reviewing more than 50 voluminous reports submitted annually by the Copermittees. The information currently reported by the Copermittees is of limited value when trying to measure progress toward achieving improvements in the quality of receiving waters or discharges from the MS4s. Oversight of the MS4 permits is further complicated by the inconsistencies among the requirements issued to the Orange County, San Diego County, and Riverside County Copermittees under three separate MS4 permits.

Under the Fourth Term Permits, the Copermittees must expend a significant portion of their limited resources collecting data of limited value, and putting together reports to submit that information to the San Diego Water Board. Likewise, the San Diego Water Board must expend most of its limited resources reviewing reports, and developing permits instead of working directly with the Copermittees to identify solutions to problems causing impacts to water quality. This is an unsustainable course that will continue to demand more resources from the Copermittees and the San Diego Water Board, and would continue to result in unknown water quality benefits.

New Permitting Approach

The goal of the Regional MS4 Permit is twofold: 1) bring a consistent set of MS4 permit requirements to all of the Copermittees within the San Diego Region; and, 2) provide an MS4 permit with requirements that will allow the Copermittees to focus their efforts and resources on achieving goals and desired outcomes toward the improvement of water quality rather than completing specific actions.

The overall approach included in the Regional MS4 Permit with respect to the jurisdictional runoff management programs will not differ significantly from the current permits. The general requirements for the jurisdictional runoff management program components and compliance with those requirements will remain and be applied consistently throughout the San Diego Region under the Regional MS4 Permit.

The most significant difference in the new permitting approach is the specific manner of implementation for those jurisdictional runoff management programs. Implementation will be based on decisions made by the Copermittees in accordance with what they have identified as their highest priority water quality conditions. In other words, the Copermittees will have significant control in how to implement the jurisdictional runoff management programs to best utilize their available resources in addressing a specific set of priorities effectively, instead of trying to address all the water quality priorities ineffectively.

The Copermittees are given the responsibility of identifying their highest priority water quality conditions that they intend to address. The Copermittees will develop goals that can be used to measure and demonstrate progress or improvements toward addressing those priorities. In addition to the goals, the Copermittees will provide a schedule for achieving the goals for those highest priorities. The measurement of progress toward achieving the goals for those highest priorities requires a better defined and more focused program of monitoring and assessment than under the Fourth Term Permits.

The monitoring and assessment program must be designed to inform the Copermittees of their progress, and the need for modifications in their jurisdictional runoff management programs and schedules to achieve their goals to improve water quality. The monitoring and assessment program requirements will have a more central role in the Regional MS4 Permit than in earlier permits. The monitoring and assessment requirements must also be designed to enable the Copermittees to focus and direct their efforts in implementing their jurisdictional runoff management programs toward their stated desired outcomes to improve the quality of receiving waters and/or discharges from the MS4s.

By providing an MS4 permit that allows the Copermittees to make more decisions about how to utilize and focus their resources, along with a better defined monitoring and assessment program to inform their water quality management decisions, the Copermittees will have the opportunity to:

1) *Plan strategically*. The Copermittees must have the ability to identify their available resources and develop and implement long term plans that can organize, collect, and use those resources in the most strategically advantageous and efficient manner possible. This ability to develop long term plans will allow the Copermittees to focus and utilize their resources in a more concerted way over the short term and long term to address specific water quality priorities through stated desired outcomes.

2) *Manage adaptively*. The Copermittees must be given the ability to modify their plans as additional information and data are collected from the monitoring and assessment programs. The Copermittees' plans may require modifications to the programs, priorities, goals, strategies, and/or schedules in order for the Copermittees to achieve a stated desired outcome.

3) *Identify synergies*. The Copermittees must be given more flexibility to identify efficiencies within and among their jurisdictional runoff management programs as the strategies are developed and implemented to increase the Copermittees' collective effectiveness. The Copermittees must also be able to identify and utilize resources available from other agencies and entities to further augment and enhance their jurisdictional runoff management programs and/or to collectively work with those other agencies and entities toward achieving a stated desired outcome.

The Regional MS4 Permit requirements will provide the Copermittees the flexibility and responsibility to decide what actions will be necessary to achieve an outcome that is tailored and designed by the Copermittees to improve specific prioritized water quality conditions. The San Diego Water Board expects the approach of the Regional MS4 Permit to give the Copermittees a greater sense of ownership for restoring the quality of receiving waters in the San Diego Region by becoming an integral part of the decision making process in identifying water quality conditions to be addressed, as well as determining the best use of their resources.

VI. ECONOMIC CONSIDERATIONS

Statutory Considerations

California Water Code (CWC) section 13241 requires the San Diego Water Board to consider certain factors, including economic considerations, in the adoption of water quality objectives. CWC section 13263 requires the San Diego Water Board to take into consideration the provisions of CWC section 13241 in adopting waste discharge requirements.

In *City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, the California Supreme Court considered whether Regional Water Boards must comply with CWC section 13241 when issuing waste discharge requirements under CWC section 13263(a) by taking into account the costs a permittee will incur in complying with the permit requirements. The Court concluded that whether it is necessary to consider such cost information "*depends on whether those restrictions meet or exceed the requirements of the federal Clean Water Act.*" (*Id.* at p. 627.) The Court ruled that Regional Water Boards may not consider the factors in CWC section 13241, including economics, to justify imposing pollutant restrictions that are less stringent than applicable federal law requires. (*Id.* At pp. 618, 626-627 ["*[Water Code section 13377 specifies that [] discharge permits issued by California's regional boards must meet the federal standards set by federal law. In effect, section 13377 forbids a regional board's consideration of any economic hardship on the part of the permit holder if doing so would result in the dilution of the requirements set by Congress in the Clean Water Act...Because CWC section 13263 cannot authorize what federal law forbids, it cannot authorize a regional board, when issuing a [] discharge permit, to use compliance costs to justify pollutant restrictions that do not comply with federal clean water standards*."]). However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Regional Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

As discussed in Section VII.F, Unfunded State Mandates, the San Diego Water Board finds that the requirements in this Order are not more stringent than the minimum federal requirements. Among other requirements, federal law requires MS4 permits to include requirements to effectively prohibit non-storm water discharges into the MS4s, in addition to requiring controls to reduce the discharge of pollutants in storm water to the MEP, and other provisions as USEPA or the State determines are appropriate for the control of pollutants in MS4 discharges.

The requirements in this Order may be more specific or detailed than those enumerated in federal regulations under 40 CFR 122.26 or in the USEPA guidance. However, the requirements have been designed to be consistent with and within the federal statutory mandates described in CWA section 402(p)(3)(B)(ii) and (iii) and the related federal regulations and guidance. Consistent with federal law, all of the

conditions in this Order could have been included in a permit adopted by USEPA in the absence of the in lieu authority of California to issue NPDES permits.

Moreover, the inclusion of numeric WQBELs in this Order does not cause this Order to be more stringent than federal law. Federal law authorizes both narrative and numeric effluent limitations to meet state water quality standards. The inclusion of WQBELs as discharge specifications in an NPDES permit in order to achieve compliance with water quality standards is not a more stringent requirement than the inclusion of BMP based permit limitations to achieve water quality standards (State Water Board Order No. WQ 2006-0012 (*Boeing*)). Therefore, consideration of the factors set forth in CWC section 13241 is not required for permit requirements to implement the effective prohibition on the discharge of non-storm water discharges into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determine appropriate to control such pollutants, as those requirements are mandated by federal law.

Included in the provisions of the Order are monitoring and reporting requirements that are designed to demonstrate that the Copermittees are implementing programs to comply with the CWA municipal storm water requirements. CWA section 308(a) and 40 CFR 122.41(h), (j)-(l), 122.44(i) and 122.48 require that all NPDES permits specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s (40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c)) also specify additional monitoring and reporting requirements. In addition to the federal requirements of the CWA, the San Diego Water Board also has the authority in CWC 13383 to establish monitoring, reporting, and recordkeeping requirements that implement federal and state laws and regulations through NPDES permits.

The monitoring and assessment information that will be reported to the San Diego Water Board is necessary to determine if the Copermittees are making progress toward achieving compliance with the discharge prohibitions, receiving water limitations, and effluent limitations under Provision A of the Order. The monitoring and assessment information that will be reported is also expected to be key to the iterative approach and adaptive management process that is required to be implemented by the Copermittees if they cannot meet the discharge prohibitions and receiving water limitations under the present conditions, which is also part of the requirements under Provision A of the Order.

Notwithstanding the above, the San Diego Water Board has considered cost information in issuing this Order, as discussed below. The San Diego Water Board has also considered all of the evidence that has been presented to the San Diego Water Board regarding the CWC section 13241 factors in adopting this Order. The San Diego Water Board finds that the requirements in this Order are reasonably necessary to protect beneficial uses identified in the Basin Plan and the economic information related to costs of compliance and other CWC section 13241 factors are not sufficient to justify failing to protect those beneficial uses. Where appropriate, the

San Diego Water Board has provided or will consider providing the Copermittees with additional time to implement control measures to achieve final WQBELs and/or water quality standards.

Cost Information

Discussions of the financial and economic ramifications of municipal storm water management programs tend to focus on the significant costs incurred by municipalities in developing and implementing the programs. When considering the cost of implementing the programs, however, it is also important to consider the alternative costs that are incurred when programs are not fully implemented, as well as the economic benefits which result from effective program implementation.

The recent financial and economic conditions have amplified the concerns about the costs incurred by the municipalities in developing and implementing their programs. The reduction in resources resulting from the recent financial and economic conditions has been cited by many of the Copermittees as a justification for reducing the requirements that must be met by their programs. While the recent conditions are a cause for concern in the short term, these programs also have an opportunity to identify and implement improvements and efficiencies before the next period of growth and development, resulting in more effective and sustainable programs over the long term.

In addition, it is very difficult to ascertain the true cost of implementation of the Copermittees' management programs because of inconsistencies in reporting by the Copermittees. Reported costs of compliance for the same program element can vary widely from city to city, often by a very wide margin that is not easily explained.[2] Despite these problems, efforts have been made to identify management program costs, which can be helpful in understanding the costs of program implementation.

The San Diego Water Board recognizes that the Copermittees will incur costs in implementing this Order, potentially above and beyond the costs from the Copermittees' prior permits. The San Diego Water Board also recognizes that, due to California's current economic condition, many Copermittees currently have limited staff and resources to implement actions to address its MS4 discharges. Based on the economic considerations below, the San Diego Water Board has provided the Copermittees a significant amount of flexibility to choose how to implement the requirements of the Order.

The Order also allows the Copermittees to customize their plans, programs, and monitoring requirements. In the end, it is up to the Copermittees to determine the effective BMPs and measures necessary to comply with this Order. The Copermittees can choose to implement the least expensive measures that are effective in meeting

[2] LARWQCB, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.

the requirements of this Order. This Order also does not require the Copermittees to fully implement all requirements within a single permit term. Where appropriate, the Board has provided the Copermittees with additional time outside of the permit term to implement control measures to achieve final WQBELs and/or water quality standards.

The San Diego Water Board has considered available cost information associated with compliance with this Order. It is not possible to predict accurately the cost impact of the requirements that involve an unknown level of implementation or that depend on environmental variables that are as yet undefined. Only general conclusions can be drawn from this information.

Estimated Municipal Storm Water Program Implementation Costs

The USEPA, the State Water Board, and the California Regional Water Quality Control Boards (Regional Water Boards) have attempted to evaluate the costs of implementing municipal storm water programs. The assessments have demonstrated that the true costs are difficult to ascertain and reported costs vary widely. In addition, reported fiscal analyses tend to neglect the costs incurred to municipalities when storm water and non-storm water runoff is not effectively managed, which are incurred as a result of pollution, contamination, nuisance, and damage to ecosystems, property, and human health. Nonetheless, they provide a useful context for considering the costs of requirements within Order No. R9-2013-0001.

In 1999, the USEPA reported on multiple studies it conducted to determine the cost of management programs. A study of Phase II municipalities determined that the annual cost of the Phase II program was expected to be $9.16 per household. The USEPA also studied 35 Phase I municipalities, finding costs to be $9.08 per household annually, similar to those anticipated for Phase II municipalities.[3]

The State Water Board commissioned a study by the California State University, Sacramento to assess costs of the Phase I MS4 program. This study includes an assessment of costs incurred by Phase I MS4s throughout the state to implement their programs. Annual cost per household in the study ranged from $18 to $46, with the Fresno-Clovis Metropolitan Area representing the lower end of the range, and the City of Encinitas (in San Diego County) representing the upper end of the range.[4]

A study on Phase I MS4 program costs was also conducted by the California Regional Water Quality Control Board, Los Angeles Region (Los Angeles Water Board), where program costs reported in the municipalities' annual reports were assessed. The Los

[3] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791-68792.
[4] State Water Board, 2005. NPDES Stormwater Cost Survey. P. ii.

Angeles Water Board estimated that average per household cost to implement the MS4 program in Los Angeles County was $12.50. [5]

It is important to note that reported program costs are not all attributable to solely complying with MS4 permits. Many program components, and their associated costs, existed before any MS4 permits were ever issued. For example, street sweeping and trash collection costs cannot be solely or even principally attributable to MS4 permit compliance, since these practices have long been expected from and implemented by municipalities.

Therefore, true program cost resulting from MS4 permit requirements is some fraction of reported costs. The California State University, Sacramento study found that only 38 percent of program costs are new costs fully attributable to MS4 permits. The remainder of the program costs was either pre-existing or resulted from enhancement of pre-existing programs.[6] In 2000, the County of Orange found that even lower amounts of program costs are solely attributable to MS4 permit compliance, reporting that the amount attributable to implement the County or Orange Drainage Area Management Plan (DAMP), was less than 20 percent of the total budget. The remaining 80 percent was attributable to pre-existing programs.[7] More current data from the County of Orange is not used in this discussion because the County of Orange no longer reports such information.

Estimated Value of Healthy Water Quality

Economic considerations of municipal storm water management programs cannot be limited only to program costs. Evaluation of programs must also consider information on the benefits derived from environmental protection and improvement.[8] Attention is often focused on municipal storm water management program costs, but the programs must also be viewed in terms of their value to the public.

Placing a value on healthy receiving waters is very difficult. Often the value of receiving waters with good water quality manifests in other forms, such as tourism, recreational opportunities, and/or increased property values. When surface water bodies are degraded, thereby degrading the habitat within and adjacent to the water bodies, the public loses the value and benefits associated with being able to use the area in and around the water bodies. Surface waters that are able to support the beneficial uses designated in the Basin Plan can sustain plants and wildlife that can attract visitors and residents, providing aesthetic, recreational, as well as monetary value to the public. At this time, however, there have been no studies for the San

[5] Los Angeles Water Board, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.
[6] State Water Board, 2005. NPDES Stormwater Cost Survey. P. 58.
[7] County of Orange, 2000. A NPDES Annual Progress Report. P. 60.
[8] Ribaudo M.O. and D. Heelerstein. 1992, *Estimating Water Quality Benefits: Theoretical and Methodological Issues.* U.S. Department of Agriculture. Technical Bulletin No. 1808.

Diego Region to quantify the added value that surface waters with healthy water quality can provide.

USEPA has estimated that household willingness to pay for improvements in fresh water quality for fishing and boating is approximately $158-$210.[9] This estimate can be considered conservative, since it does not include important considerations such as marine waters benefits, wildlife benefits, or flood control benefits. Another study conducted by California State University, Sacramento reported that the annual household willingness to pay for statewide clean water is approximately $180.[10]

A study conducted by the University of Southern California and University of California, Los Angeles assessed the costs and benefits of implementing various approaches for achieving compliance with the MS4 permits in the Los Angeles region. The study found that non-structural systems would cost $2.8 billion but provide $5.6 billion in benefit. If structural systems were determined to be needed, the study found that total costs would be $5.7 to $7.4 billion, while benefits could reach $18 billion.[11] Costs are anticipated to be borne over many years, probably at least ten years.

As can be seen, the benefits of the municipal storm water management programs are expected to considerably exceed their costs. Such findings are corroborated by USEPA, which found that the benefits of implementation of its Phase II storm water rule would also outweigh the costs.[12]

[9] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68793.
[10] State Water Board, 2005. NPDES Stormwater Cost Survey. P. iv.
[11] Los Angeles Water Board, 2004. Alternative Approaches to Stormwater Control.
[12] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791.

VII. APPLICABLE STATUTES, REGULATIONS, PLANS AND POLICIES

A. Legal Authorities – Federal Clean Water Act and California Water Code

This Order is issued pursuant to section 402 of the CWA and implementing regulations adopted by the USEPA and chapter 5.5, division 7 of the CWC (commencing with section 13370). This Order serves as an NPDES permit for point source discharges to surface waters. This Order also serves as waste discharge requirements pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

The objective of the CWA is "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*." To carry out this objective, the CWA requires the implementation of permit programs to regulate the discharge of pollutants and dredged or fill material to the navigable waters of the U.S. and to regulate the use and disposal of sewage sludge. CWA section 402 provides the legal authority to issue a permit for the discharge of pollutants to waters of the U.S. under the NPDES. The CWA provides that NPDES permits may be issued by states which are authorized to implement the provisions of that act. California became authorized to implement the NPDES permit program on May 14, 1973.

The Porter-Cologne Water Quality Control Act (Division 7, commencing with CWC section 13000) established the State Water Resources Control Board (State Water Board) and nine Regional Water Quality Control Boards (Regional Water Boards) as the principal state agencies with primary responsibility for the coordination and control of water quality. CWC section 13200(f) established the San Diego Water Board, which has the primary responsibility for the coordination and control of water quality in the San Diego Region, which includes all the basins draining into the Pacific Ocean between the southern boundary of the Santa Ana Region and the California-Mexico boundary. The San Diego Water Board implements the CWA through Chapter 5.5 of the CWC, commencing with section 13370. CWC section 13377 provides the San Diego Water Board the legal authority to issue waste discharge requirements to ensure compliance with all applicable provisions of the CWA and acts amendatory thereof or supplementary, thereto, to implement water quality control plans, or for the protection of beneficial uses, or to prevent nuisance.

CWA section 402(p) requires the USEPA or authorized state to issue NPDES permits for storm water discharges from municipal separate storm sewer systems (MS4s) to waters of the U.S. CWA section 402(p)(3)(B)(ii) requires that NPDES permits for storm water discharges from MS4s "*effectively prohibit non-storm water discharges*" into the MS4s. CWA section 402(p)(3)(B)(iii) requires that NPDES permits for storm water discharges from MS4s to "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable* [MEP], *including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control*

of such pollutants."

The USEPA published implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]), which prescribe permit application requirements for storm water discharges from MS4s pursuant to CWA 402(p), on November 16, 1990. The USEPA published an Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems, which provided guidance on permit application requirements for regulated MS4s, on May 17, 1996. The federal regulations in 40 CFR 122 and guidance issued by USEPA serve as the foundation for the provisions of Order No. R9-2013-0001. The legal authorities provided by the above statutes and regulations are included as part of the discussions in Section VIII of this Fact Sheet.

B. Legal Authority for the Permit Issued on a Region-wide Basis

CWA section 402(p)(3)(B) provides the San Diego Water Board the legal authority to issue an NPDES permit for the San Diego Region as compared to separate MS4 permits based upon County- and partial County-wide boundaries as they exist within the San Diego Region. CWA section 402(p)(3)(B) states that "*Permits for discharges from municipal storm sewers- (i) may be issued on a system- or jurisdiction-wide basis ....*" The federal regulations in 40 CFR 122.26(a)(1)(v) also state that the San Diego Water Board "*may designate dischargers from municipal separate storm sewers on a system-wide or jurisdiction-wide basis. In making this determination, the [San Diego Water Board] may consider the following factors: (A) the location of the discharge with respect to waters of the United States; (B) the size of the discharge; (C) the quantity and nature of the pollutants discharged to waters of the United States; and (D) other relevant factors*."

More specifically, the federal regulations provide that for large and medium MS4 systems, the San Diego Water Board may issue a regional permit. Specifically, the federal regulation in 40 CFR 122.26(a)(3) provide:

"*(ii) The Director may either issue one system-wide permit covering all discharges from municipal separate storm sewers within a large or medium municipal storm sewer system or issue distinct permits for appropriate categories of discharges within a large or municipal separate storm sewer system including, but not limited to: all discharges owned or operated by the same municipality; located within the same jurisdiction; all discharges within a system that discharge to the same watershed; discharges within a system that are similar in nature; or for individual discharges from municipal separate storm sewers within the system.*

(iii) The operator of a discharge from a municipal separate storm sewer which is part of a large or medium municipal separate storm sewer system must either: (A) Participate in a permit application (to be a permittee or a co-permittee) with one or more other operator of discharges from the large or medium municipal

storm sewer system which covers all, or a portion of all, discharges from the municipal separate storm sewer system; (B) Submit a distinct permit application which only covers discharges from the municipal separate storm sewers for which the operator is responsible; or (C) A regional authority may be responsible for submitting a permit application under the following guidelines....

(iv) One permit application may be submitted for all or a portion of all municipal separate storm sewers within adjacent or interconnected large or medium municipal separate storm sewer systems. The Director may issue one systemwide permit covering all, or a portion of all municipal separate storm sewers in adjacent or interconnected large or medium municipal separate storm sewer systems.

(v) Permits for all or a portion of all discharges from large or medium municipal separate storm sewer systems that are issued on a system-wide, jurisdiction-wide, watershed or other basis may specify different conditions relating to different discharges covered by the permit, including different management programs for different drainage areas which contribute storm water to the system."

Based on these regulations, the San Diego Water Board may issue a region-wide MS4 permit. The regulations also clarify that the permit may include different conditions for separate discharges covered by the permit. This allows the San Diego Water Board to ensure that suitable water quality conditions and provisions are identified for each watershed.

The USEPA's responses to comments in the Final Rule for the above-mentioned regulations also make it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide, permits. In the Final Rule published in the Federal Register and containing the responses to comments, USEPA notes that 40 CFR 122.26(a)(3)(iv) would allow an entire system in a geographical region under the purview of a State agency to be designated under a permit.[13] USEPA also states that many commenters wanted to allow the permitting authority broad discretion to establish system-wide permits, and that EPA believes that paragraphs 40 CFR 122.26 (a)(1)(v) and (a)(3)(ii) allow for such broad discretion.[14]

This Order creates watershed requirements that apply to multiple counties. The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees. Managing storm water on a regional and watershed basis is expected to result in improved water quality, as the Order focuses on monitoring and management practices necessary to improve each watershed rather than political boundaries. A single permit also allows the San Diego Water Board staff to expend fewer resources developing successive multiple permits and allows more resources to be devoted to working cooperatively with all three

[13] 55 Federal Register 47990-01, 48042
[14] Ibid

current groups of Copermittees to ensure implementation of this Order results in improved water quality.

C. Federal and California Endangered Species Acts

This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2115.5) or the Federal Endangered Species Act (16 United States Code [USC] sections 1531 to 1544). This Order requires compliance with requirements to protect the beneficial uses of waters of the U.S. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

D. California Environmental Quality Act

The action to adopt an NPDES Permit is exempt from the provisions of Chapter 3 of the California Environmental Quality Act (CEQA) (Public Resources Code section 21100, et seq.) pursuant to CWC section 13389. (*County of Los Angeles v. Cal. Water Boards* (2006) 143 Cal.App.4th 985.)

E. State and Federal Regulations, Plans and Policies

The legal authority provided by the following regulations, plans, and policies are also included as part of the discussions in Section VIII of this Fact Sheet.

Water Quality Control Plan for the San Diego Basin

The CWA requires the San Diego Water Board to establish water quality standards for each water body in its region. Water quality standards include beneficial uses, water quality objectives and criteria that are established at levels sufficient to protect beneficial uses, and an antidegradation policy to prevent degrading of waters. On September 8, 1994, the San Diego Water Board adopted the *Water Quality Control Plan for the San Diego Basin (*Basin Plan). The Basin Plan designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters in the San Diego Region. The San Diego Water Board has amended the Basin Plan on multiple occasions since 1994. In addition, the Basin Plan implements State Water Board Resolution No. 88-63, which established state policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply. Beneficial uses applicable to the surface water bodies that receive discharges from the MS4s within the San Diego Region generally include those listed below:

The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region:

- Municipal and Domestic Supply (MUN)
- Agricultural Supply (AGR)
- Industrial Process Supply (PROC)
- Industrial Service Supply (IND)
- Ground Water Recharge (GWR)
- Contact Water Recreation (REC1)
- Non-contact Water Recreation (REC2)
- Warm Freshwater Habitat (WARM)
- Cold Freshwater Habitat (COLD)
- Wildlife Habitat (WILD)
- Rare, Threatened, or Endangered Species (RARE)
- Freshwater Replenishment (FRSH)
- Hydropower Generation (POW)
- Preservation of Biological Habitats of Special Significance (BIOL)

The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region:

- Navigation (NAV)
- Commercial and Sport Fishing (COMM)
- Estuarine Habitat (EST)
- Marine Habitat (MAR)
- Aquaculture (AQUA)
- Migration of Aquatic Organisms (MIGR)
- Spawning, Reproduction, and/or Early Development (SPWN)
- Shellfish Harvesting (SHELL)

Pursuant to Water Code sections 13263 and 13377, the requirements of this Order implement the Basin Plan.

Water Quality Control Plan for Ocean Waters of California, California Ocean Plan

In 1972, the State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan). The State Water Board adopted the most recent amended Ocean Plan on September 15, 2009. The Office of Administrative Law approved it on March 10, 2010. On October 8, 2010, USEPA approved the 2009 Ocean Plan. The Ocean Plan is applicable, in its entirety, to ocean waters of the State. In order to protect beneficial uses, the Ocean Plan establishes water quality objectives and a program of implementation. Pursuant to Water Code sections 13263 and 13377, the requirements of this Order implement the Ocean Plan. The Ocean Plan identifies the beneficial uses of ocean waters of the State to be

protected as summarized below:

- Industrial water supply
- Water contact and non-contact recreation, including aesthetic enjoyment; navigation
- Commercial and sport fishing
- Mariculture
- Preservation and enhancement of designated Areas of Special Biological Significance
- Rare and endangered species
- Marine habitat
- Fish spawning and shellfish harvesting

On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving an exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges. On June 19, 2012, the State Water Board adopted Order No. 2012-0031, amending Order No. 2012-0012 to require pollutant load reductions to be achieved within six years for the ASBS Compliance Plans, section A.2.d(2) and ASBS Pollution Prevention Plans, section B.2.b(2). The State Water Board Resolution No. 2012-0012, as amended requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject terms and conditions of State Water Board Resolution No. 2012-0012, as amended. The Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012, as amended, applicable to these discharges, are ~~hereby~~ incorporated in Attachment A of this Order ~~as if fully set forth herein~~. Requirements of this Order implement the Ocean Plan.

Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality

On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

Antidegradation Policy

Federal regulations (40 CFR 131.12) require that the state water quality standards include an antidegradation policy consistent with the federal antidegradation policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16 ("Statement of Policy with Respect to Maintaining the Quality of the Waters of the State"). State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law.

The San Diego Water Board's Basin Plan implements and incorporates by reference both the State and federal antidegradation policies. State Water Board Resolution No. 68-16 and 40 CFR 131.12 require the San Diego Water Board to maintain high quality waters of the State until it is demonstrated that any change in quality will be consistent with maximum benefit to the people of the State, will not unreasonably affect beneficial uses, and will not result in water quality less than that described in the San Diego Water Boards' policies. State Water Board Resolution No. 68-16 requires that discharges of waste be regulated to meet best practicable treatment or control to assure that pollution or nuisance will not occur and the highest water quality consistent with the maximum benefit to the people of the State be maintained.

The discharges permitted in this Order are consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Board Resolution No. 68-16. Many of the water bodies within the area covered by this Order are of high quality. The Order requires the Copermittees to meet best practicable treatment or control to meet water quality standards. As required by 40 CFR 122.44(a), the Copermittees must comply with the "maximum extent practicable" technology-based standard set forth in CWA section 402(p) for discharges of pollutants in storm water from the MS4s.

Many of the waters within the area covered by this Order are impaired and listed on the State's CWA Section 303(d) List and the San Diego Water Board has established TMDLs to address the impairments. This Order requires the Copermittees to comply with permit provisions to implement the WLAs set forth in the TMDLs in order to restore the beneficial uses of the impaired water bodies consistent with the assumptions and requirements of the TMDLs. This Order includes requirements to develop and implement storm water management programs, achieve WQBELs, and effectively prohibit non-storm water discharges into the MS4. The issuance of this Order does not authorize an increase in the amount of discharge of waste.

Anti-Backsliding Requirements

CWA sections 402(o) and 303(d)(4) and 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations or conditions may be relaxed. All effluent limitations and other conditions in this Order are at least as stringent as the effluent limitations in the previous permits issued to the San Diego County Copermittees, the Orange County Copermittees and the Riverside County Copermittees.

Clean Water Act Section 303(d) List

CWA section 303(d)(1) requires each State to identify specific water bodies within its boundaries where water quality standards are not being met or are not expected to be met after implementation of technology-based effluent limitations on point sources. Water bodies that do not meet water quality standards are considered impaired and are placed on the state's "303(d) List." Periodically, USEPA approves the State's 303(d) List.

Most recently, USEPA approved the State's 2010 303(d) List of impaired water bodies on October 11, 2011, which includes certain receiving waters in the San Diego Region. For each listed water body, the state or USEPA is required to establish a TMDL of each pollutant impairing the water quality standards in that water body. A TMDL is a tool for implementing water quality standards and is based on the relationship between pollution sources and in-stream water quality conditions. The TMDL establishes the allowable pollutant loadings for a water body and thereby provides the basis to establish water quality-based controls. These controls should provide the pollution reduction necessary for a water body to meet water quality standards.

A TMDL is the sum of the allowable pollutant loads of a single pollutant from all contributing point sources (the waste load allocations or WLAs) and non-point sources (load allocations of LAs) plus the contribution from background sources and a margin of safety (40 CFR 130.2(i)). MS4 discharges are considered point source discharges. For 303(d)-listed water bodies and pollutants in the San Diego Region, the San Diego Water Board or USEPA develops and adopts TMDLs that specify these requirements.

Since 2002, the San Diego Water Board has established ~~six (6)~~ seven (7) TMDLs to remedy water quality impairments in various water bodies within the San Diego Region (see Attachment E to the Order). These TMDLs identify MS4 discharges as a source of pollutants to these water bodies, and, as required, establish WLAs for MS4 discharges to reduce the amount of pollutant discharged to receiving waters. CWA section 402(p)(3)(B)(iii) requires the San Diego Water Board to impose permit conditions, including: "management practices, control techniques and system, design and engineering methods, and *such other provisions as the Administrator or the State determines appropriate for the control of such pollutants."* (Emphasis added.) CWA section 402(a)(1) also requires states to issue permits with conditions necessary to carry out the provisions of the CWA. Federal regulations also require that NDPES permits contain WQBELs consistent with the assumptions and requirements of all available WLAs (40 CFR 122.44(d)(1)(vii)(B)). CWC section 13377 also requires that NPDES permits include limitations necessary to implement water quality control plans. Therefore, this Order includes WQBELs and other provisions to implement the TMDL WLAs assigned to Copermittees regulated by this Order.

Other Regulations, Plans and Policies

This Order implements all other applicable federal regulations and State regulations, plans and policies, including the California Toxics Rule at 40 CFR 131.38 (Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California Rule [California Toxics Rule or CTR]), and State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP).

F. Unfunded State Mandates

Article XIII B, Section 6(a) of the California Constitution provides that whenever "*any state agency mandates a new program or higher level of service on any local government, the state shall provide a subvention of funds to reimburse that local government for the costs of the program or increased level of service*." The requirements of this Order do not constitute state mandates that are subject to a subvention of funds for several reasons, including, but not limited to, the following.

First, the requirements of this Order do not constitute a new program or a higher level of service as compared to the requirements contained in the previous Fourth Term Permits. The overarching requirement to impose controls to reduce the pollutants in discharges from MS4s is dictated by the CWA and is not new to this permit cycle (33 USC section 1342(p)(3)(B)). The inclusion of new and advanced measures as the MS4 programs evolve and mature over time is anticipated under the CWA (55 FR 47990, 48052 (Nov. 16, 1990)), and to the extent requirements in this Order are interpreted as new advanced measures, they do not constitute a new program or higher level of service.

Second, and more broadly, mandates imposed by federal law, rather than by a state agency, are exempt from the requirement that the local agency's expenditures be reimbursed (Cal. Const., art. XIII B, section 9, subd. (b)). This Order implements federally mandated requirements under the CWA and its requirements are therefore not subject to subvention of funds. This includes federal requirements to effectively prohibit non-storm water discharges, to reduce the discharge of pollutants in storm water to the MEP, and to include such other provisions as the Administrator or the State determines appropriate for the control of such pollutants (33 USC section 1342(p)(3)(B)). Federal cases have held these provisions require the development of permits and permit provisions on a case-by-case basis to satisfy federal requirements. (*Natural Resources Defense Council, Inc., v. USEPA* (9th Cir. 1992) 966 F.2d 1292, 1308, fn. 17.)

The authority exercised under this Order is not reserved state authority under the CWA's savings clause (cf. *Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 627-628 [relying on 33 USC section 1370, which allows a state to develop requirements which are not "less stringent" than federal requirements]), but instead is part of a federal mandate to develop pollutant reduction requirements for municipal separate storm sewer systems. To this extent, it is entirely federal authority that forms the legal basis to establish the permit provisions. (See, *City of Rancho Cucamonga v. Regional Water Quality Control Board, Santa Ana Region* (2006) 135 Cal.App.4th 1377, 1389; *Building Industry Ass'n of San Diego Co. v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 882-883.)

The MEP standard is a flexible standard that balances a number of considerations, including technical feasibility, cost, public acceptance, regulatory compliance, and effectiveness. (*Building Ind. Ass'n., supra,* 124 Cal.App.4th at pp. 873-874, 889.) Such

considerations change over time with advances in technology and with experience gained in storm water management (55 FR 47990, 48052 (Nov. 16, 1990)). Accordingly, a determination of whether the conditions contained in this Order exceed the requirements of federal law cannot be based on a point by point comparison of the permit conditions and the minimum control measures that are required "at a minimum" to reduce pollutants to the maximum extent practicable and to protect water quality (40 CFR 122.34). Rather, the appropriate focus is whether the permit conditions, as a whole, exceed the MEP standard.

In recent months, the County of Los Angeles and County of Sacramento Superior Courts have granted writs setting aside decisions of the Commission on State Mandates that held certain requirements in Phase I permits constituted unfunded mandates. In both cases, the courts have found that the correct analysis in determining whether an MS4 permit constituted a state mandate was to evaluate whether the permit as a whole exceeds the MEP standard. (*State of Cal. v. Comm. on State Mandates* (Super. Ct. Sacramento County, 2012, No. 34-2010-80000604), *State of California v. County of Los Angeles* (Super. Ct. Los Angeles County, 2011, No. BS130730.) Both cases are currently pending appeal.

The requirements of the Order, taken as a whole rather than individually, are necessary to reduce the discharge of pollutants to the MEP and to protect water quality. The San Diego Water Board finds that the requirements of the Order are practicable, do not exceed federal law, and thus do not constitute an unfunded mandate. These findings are the expert conclusions of the principal state agency charged with implementing the NPDES program in California (CWC sections 13001, 13370).

It should also be noted that the provisions in this Order to effectively prohibit non-storm water discharges are also mandated by the CWA (33 USC section 1342(p)(3)(B)(ii)). Likewise, the provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state establishes or adopts a TMDL, federal law requires that permits must contain effluent limitations consistent with the assumptions and requirements of any applicable waste load allocation in a TMDL (40 CFR 122.44(d)(1)(vii)(B)).

Third, the local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental dischargers who are issued NPDES permits for storm water discharges. With a few inapplicable exceptions, the CWA regulates the discharge of pollutants from point sources (33 USC section 1342) and the Porter-Cologne Act regulates the discharge of waste (CWC section 13263), both without regard to the source of the pollutant or waste. As a result, the "costs incurred by local agencies" to protect water quality reflect an overarching regulatory scheme that places similar requirements on governmental and non-governmental dischargers. (See *County of Los Angeles v. State of California* (1987) 43 Cal.3d 46, 57-58 [finding comprehensive workers' compensation scheme did not create a cost for local agencies that was subject to state subvention].)

The CWA and the Porter-Cologne Act largely regulate storm water with an even hand, but to the extent there is any relaxation of this even-handed regulation, it is in favor of the local agencies. Generally, the CWA requires point source dischargers, including dischargers of storm water associated with industrial or construction activity, to comply strictly with water quality standards (33 USC section 1311(b)(1)(C); *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159, 1164-1165 [noting that industrial discharges must strictly comply with water quality standards]). As discussed in prior State Water Board decisions, certain provisions of this Order do not require strict compliance with water quality standards (State Water Board Order No. WQ 2001-0015, p. 7). Those provisions of this Order regulate the discharge of waste in municipal storm water under the CWA's MEP standard, not the BAT/BCT standard that applies to other types of discharges. These provisions, therefore, regulate the discharge of waste in municipal storm water more leniently than the discharge of waste from non-governmental sources.

Fourth, the Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)). To the extent that the local agency Copermittees have voluntarily availed themselves of the permit, the program is not a state mandate. (Accord, *County of San Diego v. State of California* (1997) 15 Cal.4th 68, 107-108.)

Fifth, the local agency Copermittees' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under state law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

Finally, even if any of the permit provisions could be considered unfunded mandates, under Government Code section 17556, subdivision (d), a state mandate is not subject to reimbursement if the local agency has the authority to charge a fee. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order, subject to certain voting requirements contained in the California Constitution. (See Cal. Const., Art. XIII D, section 6, subd. (c); see also *Howard Jarvis Taxpayers Ass'n v. City of Salinas* (2002) 98 Cal.App.4th 1351, 1358-1359.) The Fact Sheet demonstrates that numerous activities contribute to the pollutant loading in the MS4. Local agencies can levy service charges, fees, or assessments on these activities, independent of real property ownership. (See, e.g., *Apartment Ass'n of Los Angeles County, Inc., v. City of Los Angeles* (2001(24 Cal.4th 830, 842 [upholding inspection fees associated with renting property].) The authority and ability of a local agency to defray the cost of a program without raising taxes indicates that a program does not entail a cost subject to subvention. (*Clovis Unified School Dist. V. Chiang* (2010) 188 Cal.App.4th 794, 812, citing *Connell v. Sup. Ct.* (1997) 59 Cal.App.4th 382, 401; *County of Fresno v. State of California* (1991) 53 Cal. 3d. 482, 487-488.)

VIII. PROVISIONS

The provisions (i.e. NPDES permit requirements) of the Order are discussed below.

A. Prohibitions and Limitations

Purpose: Provision A includes the prohibitions and limitations requirements that are the foundation of all the subsequent requirements included in the Order. Compliance with the prohibitions and limitations will restore and protect receiving waters from impacts that may be caused by discharges into and from the Copermittees' MS4s and ultimately achieve the objective of the CWA.

In meeting the requirements set forth in the Order, the Copermittees must be cognizant that the prohibitions and limitations exist and will be the standard by which the San Diego Water Board will be measuring the progress and success of their implementation of the NPDES permit requirements.

***Discussion*:** The objective of the CWA is to "*restore and maintain the chemical, physical, and biological integrity of the Nation's waters*." The CWA requires the implementation of NPDES permit programs to regulate discharges of pollutants and dredged or fill material to the navigable waters of the U.S. For discharges into and from MS4s, the CWA requires the NPDES permits to "*effectively prohibit non-stormwater discharges into the storm sewers*" and "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable.*"

Provision A includes limitations, consistent with the requirements of the CWA for discharges from MS4s. Provision A expresses these limitations as discharge prohibitions, receiving water limitations, and effluent limitations. Compliance with the discharge prohibitions and receiving water limitations is also explicitly described, in conformance with precedential State Water Board Orders.

More specific and detailed discussions of the requirements of Provision A are provided below.

Provision A.1 (Discharge Prohibitions) prohibits the discharge of specific types of waste into and/or from the Copermittees' MS4s.

Provision A.1.a restates and reiterates Basin Plan Waste Discharge Prohibition 1, by prohibiting discharges into and from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the

state. The terms pollution,[15] contamination,[16] and nuisance[17] are defined under CWC 13050. Provision A.1.c incorporates all the waste discharge prohibitions of the Basin Plan into the requirements of the Order. The waste discharge prohibitions from the Basin Plan have been reproduced and provided in Attachment A to the Order.

Provision A.1.b requires non-storm water discharges into the MS4s to be effectively prohibited, consistent with the requirements of the CWA for MS4 permits to "*effectively prohibit non-stormwater discharges into the storm sewers*." The effective prohibition is required to be implemented by each Copermittee within its jurisdiction through the illicit discharge detection and elimination requirements under Provision E.2. The prohibition does not apply to NPDES permitted discharges into the Copermittees' MS4s.

The CWA employs the strategy of prohibiting the discharge of any pollutant from a point source into waters of the United States unless the discharger of the pollutant(s) obtains an NPDES permit pursuant to CWA Section 402. The 1987 amendment to the CWA includes provision 402(p) that specifically addresses NPDES permitting requirements for storm water discharges from MS4s. CWA section 402(p) prohibits the discharge of pollutants from specified MS4s to waters of the U.S. except as authorized by an NPDES permit and identifies two substantive standards for MS4 storm water permits. MS4 permits (1) "*shall include a requirement to effectively prohibit nonstormwater discharges into the storm sewers*" and (2) "*shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or State determines appropriate for the control of such pollutants*." (CWA section 402(p)(3)(B)(ii-iii).)

In November 1990, the USEPA published regulations addressing storm water discharges from MS4s (55 FR 47990 and following (Nov. 16, 1990) (Phase I Final Rule)). The regulations establish minimum requirements for MS4 permits, and generally focus on the requirement that MS4s implement programs to reduce the amount of pollutants found in storm water discharges to the MEP. The CWA's municipal storm water MEP standard does not require storm water discharges to strictly meet water quality standards, as is required for other NPDES permitted

[15] CWC 13050(l): "(1) 'Pollution' means an alteration of the quality of waters of the state by waste to a degree which unreasonably affects either of the following: (A) The water for beneficial uses. (B) Facilities which serve beneficial uses. (2) 'Pollution' may include "contamination.
[16] CWC 13050(k): "Contamination' means an impairment of the quality of waters of the state by waste to a degree which creates a hazard to public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste, whether or not waters of the state are affected."
[17] CWC 13050(m): "Nuisance' means anything which meets all of the following requirements: (1) Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. (2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. (3) Occurs during, or as a result of, the treatment or disposal of wastes."

discharges. Compliance is achieved through an iterative approach of continuous implementation of improved BMPs. This distinction reflects Congress's recognition that variability in flow and intensity of storm events render difficult strict compliance with water quality standards by MS4 permittees. In describing the controls that permits must include to reduce pollutants in storm water discharges to the MEP, the statute (CWA section 402(p)(3)(B)(iii)) states that the controls shall include: "*management practices, control techniques and system, design and engineering methods, and such other provisions as the [permit writer] determines appropriate for the control of such pollutants*."

In contrast, non-storm water discharges from the MS4 that are not authorized by separate NPDES permits are subject to requirements under the NPDES program, including discharge prohibitions, technology based effluent limitations and water quality-based effluent limitations (40 CFR 122.44). The regulations also require the Copermittee's program to include an element to detect and remove illicit discharges and improper disposal into the storm sewer (40 CFR 122.26(d)(2)(iv)(B)).

While "non-storm water" is not defined in the CWA or federal regulations, the federal regulations (at 40 CFR 122.26(b)(2)) define "*illicit discharge*" as *"any discharge to a municipal separate storm sewer that is not composed entirely of storm water and that is not covered by an NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer and discharges resulting from fire fighting activities)*." This definition is the most closely applicable definition of "non-storm water" contained in federal law. As stated in the Phase I Final Rule, USEPA added the illicit discharge program requirement to begin implementation of the 'effective prohibition' requirement to detect and control non-storm water discharges to their municipal system.

Thus, federal law mandates that permits issued to MS4s must require management practices that will result in reducing storm water pollutants to the MEP yet at the same time requires that non-storm water discharges be effectively prohibited from entering the MS4. "Effectively" prohibit does not mean that non-storm water discharges are authorized to be discharged into and from the Copermittees' MS4s. The Phase I Final Rule clarifies what "effectively prohibit" means (55 FR 47995):

> "*Section 402(p)(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…<u>Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit</u> (other than the permit for the discharge from the municipal separate storm sewer)*" [Emphasis added].

Consistent with federal law, unless non-storm water discharges to the MS4 are authorized by a separate NPDES permit, non-storm water discharges are

appropriately subject to the effective prohibition requirement in the CWA and Regional Water Boards are not limited by the iterative MEP approach to storm water regulation in crafting appropriate regulations for non-storm water discharges.

The federal regulations (40CFR122.26(d)(2)(i)(B)) require the Copermittees to establish the legal authority which authorizes or enables the Copermittees to prohibit illicit discharges to the MS4s. The federal regulations (40 CFR 122.26(d)(2)(vi)(B)(1)) require the Copermittees to "*implement and enforce an ordinance, order or similar means*" to prevent non-storm water discharges to their MS4s. Thus, the Copermittees are required to "*effectively*" prohibit non-storm water discharges to their MS4s through enforcing their legal authority established under "*ordinance, order or similar means*" and either remove those discharges to their MS4s, or require those discharges to obtain coverage under a separate NPDES permit. More detail about the program that must be implemented to "*effectively*" prohibit non-storm water discharges to the Copermittees' MS4s is provided under the discussion for Provision E.2.

Provision A.1.d was included to be consistent Resolution No. 2012-0012, adopted by the State Water Board on March 20, 2012. Provision A.1.d prohibits discharges from MS4s to Areas of Special Biological Significance (ASBS), except for storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach to the Heisler Park ASBS subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012. The pertinent Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 are provided in Attachment A to the Order.

<u>Provision A.2 (Receiving Water Limitations)</u> specifies the condition of the receiving waters that must be achieved when there are discharges from the Copermittees' MS4s. Receiving water limitations are included in all NPDES permits issued pursuant to the CWA section 402. CWA section 402(p)(3)(B)(iii) authorizes the inclusion of "*such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." This requirement gives USEPA or the State permitting authority, in this case the San Diego Water Board, discretion to determine what permit conditions are necessary to control pollutants.

In its Phase I Final Rule (see 55 FR 47990, 47994 (Nov. 16, 1990)), USEPA elaborated on these requirements, stating that, "*permits for discharges from municipal separate storm sewer systems must require controls to reduce the discharge of pollutants to the maximum extent practicable, and where necessary water quality-based controls*." USEPA reiterated in its Phase II Final Rule (64 FR 68722, 68737), that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL*." CWC section 13377 also requires that NPDES permits include limitations necessary to implement water quality control plans. Both the State Water Board and the San Diego Water Board have previously concluded that discharges from the MS4 contain pollutants that have

the reasonable potential to cause or contribute to excursions above water quality standards. As such, inclusion of receiving water limitations is appropriate to control MS4 discharges.

The inclusion of receiving water limitations is also consistent with the Ninth Circuit Court of Appeals' ruling in *Defenders of Wildlife v. Browner* (191 F.3d 1159, 1166 (1999)) that the permitting authority has discretion regarding the nature and timing of requirements that it includes as MS4 permit conditions to attain water quality standards. The Ninth Circuit Court of Appeals recently explained that, "*[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*" (*Natural Resources Defense Council v. County of Los Angeles* (9th Cir. 2011) 673 F.3d 880, 886 (revd. On other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013)))

The receiving water limitations included in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan or in water quality control plans or policies adopted by the State Water Board, including State Water Board Resolution No. 68-16, or in federal regulations, including but not limited to 40 CFR 131.12 and 131.38. The water quality objectives in the Basin Plan and other State Water Board plans and policies have been approved by USEPA and combined with designated beneficial uses constitute the water quality standards required under federal law.

Provision A.2.a requires that discharges from the Copermittees' MS4s must not cause or contribute to the violation of water quality standards in receiving waters. The water quality standards of the receiving waters must be protected from the impacts that may be caused by the Copermittees' MS4 discharges. Water quality standards applicable to the surface waters in the San Diego Region must be achieved through meeting the technology based standard of MEP through an iterative process of improved management actions. Provision A.2.a is also consistent with State Water Board Order WQ 99-05 precedent-setting language requiring discharges from MS4s to attain receiving water quality standards. The water quality control plans and policies with water quality standards applicable to the waters in the San Diego Region are included under Provision A.2.a.

Provisions A.2.b was included to be consistent with the requirements of State Water Board Resolution No. 2012-0012, adopted on March 20, 2012.

<u>Provision A.3 (Effluent Limitations)</u> specifies the condition of the discharges from the Copermittees' MS4s that must be achieved if and when there are discharges.

Consistent with CWA section 301(b)(1)(A) and 40 CFR 122.44(a), Provision A.3.a includes the technology-based effluent limitations that must be included in the Order. The technology-based effluent limits, representing the minimum level of control that must be imposed in a permit under CWA section 402, requires that pollutants in discharges of storm water from the Copermittees' MS4s be reduced to the MEP. This provision applies specifically to storm water discharges. Non-storm water discharges must be effectively prohibited, as required under Provision A.1.b. Non-storm water (dry weather) discharges from the MS4 are not considered storm water (wet weather) discharges and therefore are not subject to the MEP standard.

The technology-based MEP standard is an ever-evolving, flexible, and advancing concept. Neither Congress nor USEPA has specifically defined the term "maximum extent practicable." Congress established this flexible MEP standard so that the administrative bodies would have "*the tools to meet the fundamental goals of the Clean Water Act in the context of storm water pollution*." (*Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 884.) As knowledge about controlling storm water runoff and discharges continues to evolve, so does the knowledge which constitutes MEP. Reducing the discharge of pollutants in storm water from the MS4 to the MEP requires the Copermittees to assess each program component and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP.

The San Diego Water Board or the State Water Board ultimately define MEP, and may include requirements that provide specific guidance on what is expected to demonstrate MEP. It is the responsibility of the Copermittees to propose actions that implement BMPs to reduce storm water pollution to the MEP. In other words, the Copermittees' runoff management programs developed and implemented under the Order are the Copermittees' proposals for achieving MEP. Their total collective and individual activities conducted pursuant to their runoff management programs become their proposal for achieving MEP as it applies both to their overall effort, as well as to specific activities. Provisions B through E of the Order provides a minimum framework to guide the Copermittees in achieving the MEP standard for discharges of pollutants in storm water.

Provision A.3.b incorporates any water quality based effluent limitations (WQBELs) applicable to the MS4s established for TMDLs adopted and approved for the San Diego Region and requires the Copermittees to comply with those WQBELs. This is consistent with 40 CFR 122.44(d)(1)(vii)(B), which requires that NPDES permits to incorporate WQBELs "*developed to protect a narrative water quality criterion, a numeric water quality criterion, or both…consistent with the assumptions and requirements of any available wasteload allocation for the discharge...*"

Pursuant to CWA section 303(d), for surface water bodies identified as impaired by one or more pollutants, the San Diego Water Board is required to establish TMDLs "*at a level necessary to implement the applicable water quality standards with seasonal*

variations and a margin of safety which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality." The TMDLs identify sources of the pollutants causing the impairments and assign portions of the TMDL as WLAs to point sources, which include MS4s.

WLAs must be expressed in NPDES permits as WQBELs, which may include one or more numeric components such as numeric effluent limits, and/or receiving water limitations, and/or BMP requirements. Because numeric targets for TMDLs typically include a component that will be protective of water quality standards, a TMDL will likely include one or more numeric receiving water limitations and/or effluent limitations as part of the assumptions or requirements of the TMDL. Any numeric receiving water limitations and/or effluent limitations developed as part of the assumptions or requirements of a TMDL must be incorporated and included as part of WQBELs for the MS4s.

Because the development and approval of new TMDLs, or modification of existing TMDLs, may occur during the term of this Order, the specific provisions of those TMDLs, including effluent limitations applicable to MS4s are provided within Attachment E to the Order. Attachment E will be updated with new TMDLs and modifications to existing TMDLs in a timely manner as they occur.

Provision A.4 (Compliance with Discharge Prohibitions and Receiving Water Limitations) describes the process required to be implemented by the Copermittees if compliance with the discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a are not being achieved under current conditions.

In its Phase II Stormwater Regulations, Final Rule, USEPA states that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL.*"[18] In a series of comment letters on MS4 permits issued by various Regional Water Boards, USEPA has also reiterated that MS4 discharges must meet water quality standards.[19] In addition, the Ninth Circuit Court of Appeals explained in a recent ruling that, *"[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*"[20]

[18] Phase II Stormwater Regulations, Final Rule, 64 Fed. Reg. 68722, 68737.
[19] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.
[20] NRDC v. County of Los Angeles (9th Cir. 2011), 673 F.3d 880, 886 (revd. on other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013))). See also, *Building Industry Ass'n of San Diego County v. State Water Resources*

Water quality standards for the San Diego Region are established in the Basin Plan. The water quality standards of the Basin Plan are incorporated into this Order as the discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a. The discharge prohibitions and receiving water limitations in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations or prohibitions to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan, water quality control plans or policies adopted by the State Water Board, including Resolution No. 68-16, or federal regulations, including but not limited to, 40 CFR 131.12 and 131.38. The waste discharge prohibitions and water quality objectives in the Basin Plan have been approved by USEPA and combined with the designated beneficial uses constitute the water quality standards required under federal law.

Under federal law (CWA section 402(p)(3)(B)(iii)), an MS4 permit must include "*controls to reduce the discharge of pollutants to the maximum extent practicable...and such other provision as...the State determines appropriate for control of such pollutants*." The State Water Board has previously determined that limitations necessary to meet water quality standards are appropriate for the control of pollutants discharged by MS4s and must be included in MS4 permits. (State Water Board Orders WQ 91-03, 98-01, 99-05, 2001-15; see also *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159.) This Order prohibits discharges that cause or contribute to violations of water quality standards.

The discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a are included in this Order to ensure that discharges from the MS4s do not cause or contribute to exceedances of water quality objectives necessary to protect the beneficial uses of the receiving waters.

Provision A.4 is consistent with the precedent-setting language in State Water Board Order WQ 99-05 required to be included in municipal storm water permits. State Water Board Order WQ 2001-15 refined Order WQ 99-05 by requiring an iterative approach to compliance with water quality standards involving ongoing assessments and revisions, as referred to as the "iterative process." The "iterative process" is a fundamental NPDES requirement for municipal storm water permits to achieve the objectives of the CWA.

The State Water Board and Regional Water Boards have stated that the provisions under Provisions A.1.a, A.1.c, A.2.a, and A.4 are independently applicable, meaning that compliance with one provision does not provide a "safe harbor" where there is non-compliance with another provision (i.e., compliance with the Provision A.4 does not shield a Copermittee who may have violated Provision A.1.a, A.1.c, or A.2.a from

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Control Bd. (2004) 124 Cal.App.4th 866, 884-886, citing *Defenders of Wildlife v. Browning,* (9th Cir. 1999) 191 F.3d 1159.)

an enforcement action). The intent of Provision A.4 is to ensure that the Copermittees have the necessary storm water management programs and controls in place, and that they are modified by the Copermittees in a timely fashion when necessary, so that compliance with Provisions A.1.a, A.1.c, and/or A.2.a is achieved as soon as possible. USEPA expressed the importance of this independent applicability in a series of comment letters on MS4 permits proposed by various Regional Water Boards. At that time, USEPA expressly objected to certain MS4 permits that included language stating, *"permittees will not be in violation of this [receiving water limitation] provision … [if certain steps are taken to evaluate and improve the effectiveness of the jurisdictional runoff management programs],"* concluding that this phrase would not comply with the CWA.[21]

The Ninth Circuit held in *Natural Resources Defense Council v. County of Los Angeles* (2011) 673 F3d. 880, 886 (revd. on other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013))) that engagement in the iterative process does not provide a safe harbor from liability for violations of permit terms prohibiting exceedances of water quality standards. The Ninth Circuit holding is consistent with the position of the State and Regional Water Boards that exceedances of water quality standards in an MS4 permit constitute violations of permit terms subject to enforcement by the Water Boards or through a citizen suit. While the Water Boards have generally directed dischargers to achieve compliance by improving control measures through the iterative process, the San Diego Water Board retains the discretion to take other appropriate enforcement and the iterative process does not shield dischargers from citizen suits under the CWA.

The requirements of Provision A.4, therefore, are required to be implemented until the water quality standards expressed under Provisions A.1.a, A.1.c, and A.2.a are achieved. The CWA requires MS4 permits to "*require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." The requirements of this Order have been deemed or determined to be "appropriate" to achieve water quality standards in receiving waters.

Part of the "*controls*" required by the Order is the process described in Provision A.4. Provision A.4 includes the process that is ultimately expected to achieve compliance with the requirement that discharges from the MS4 do not cause or contribute to violations of water quality standards in the receiving waters. The implementation of Provision A.4 is required when the Copermittees or the San Diego Water Board have

[21] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.

determined that discharges from the MS4 are causing or contributing to violations of water quality standards in the receiving waters.

The Copermittees must effectively prohibit non-storm water discharges into the MS4s, reduce the discharge of pollutants in storm water from the MS4s to the MEP, and ensure that their MS4 discharges do not cause or contribute to violations of water quality standards. If the Copermittees have effectively prohibited non-storm water discharges and reduced storm water pollutant discharges to the MEP, but their discharges are still causing or contributing to violations of water quality standards, Provision A.4 provides a clear "iterative process" for the Copermittees to follow.

Provision A.4 essentially requires the Copermittees to implement additional BMPs until MS4 discharges no longer cause or contribute to a violation of water quality standards.

In assessing compliance and potential enforcement actions, the San Diego Water Board looks at the Copermittees' efforts in total to meet the requirements of Provisions A.1.a, A.1.c, A.2.a and Provision A.4. The Copermittees need to demonstrate that they are making improvements to their programs and making progress toward achieving the discharge prohibitions and receiving water limitations in Provisions A.1.a, A.1.c, and A.2.a by implementing the requirements of Provision A.4. The San Diego Water Board would consider these efforts prior to strictly enforcing the requirements of Provisions A.1.a, A.1.c, and A.2.a. Causes of exceedances of the receiving water limitations can often be more difficult to identify and attribute solely to the Copermittees' MS4s. The intent of the Order is to provide the Copermittees more clarity and flexibility in addressing these exceedances through the iterative approach and adaptive management process until the requirements under Provisions A.1.a, A.1.c, and A.2.a are fully achieved.

An exception to the iterative approach and adaptive management process would be in receiving waters subject to adopted and approved TMDLs. For TMDLs that are incorporated into the Order, there is a specific date for compliance to be achieved, after which the iterative approach and adaptive management process required under Provision A.4 no longer provides the flexibility to achieve compliance. Where compliance dates for a TMDL have passed, compliance with the WQBELs incorporated into the Order established by a TMDL in Attachment E to protect water quality standards is required. Thus, after the interim or final compliance dates for a TMDL have passed, if the discharges from the Copermittees' MS4s are causing or contributing to a violation of WQBELs, exceedances of WQBELs must be strictly enforced by the San Diego Water Board. In the meantime, however, the Copermittees are in compliance with the interim or final TMDL requirements in Attachment E as long as the interim or final WQBELs are being achieved in accordance with the interim or final compliance dates.

B. Water Quality Improvement Plans

Purpose: Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges to the MS4s and control pollutants in storm water discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the Clean Water Act.

Provision B includes requirements for the Copermittees to develop and implement Water Quality Improvement Plans to ultimately comply with the prohibitions and limitations under Provision A. The Water Quality Improvement Plans will provide the Copermittees a comprehensive program that can achieve the requirements and further the objectives of the CWA. Implementation of the Water Quality Improvement Plans will also improve the quality of the receiving waters in the San Diego Region.

The Water Quality Improvement Plan is the backbone of the Regional MS4 Permit requirements. Provision B provides the guidance, criteria, and minimum expectations and requirements for the elements of the Water Quality Improvement Plan to be developed and implemented by the Copermittees. The Water Quality Improvement Plans will be implemented in the Watershed Management Area by the Copermittees within their jurisdictions through their jurisdictional runoff management programs.

The Water Quality Improvement Plan also incorporates a program to monitor and assess the progress of the Copermittees' jurisdictional runoff management programs toward improving the quality of discharges from the MS4s, as well as tracking improvements to the quality of receiving waters. A process to adapt and improve the effectiveness of the Water Quality Improvement Plans has also been incorporated into the requirements of Provision B to be consistent with the "iterative approach" required to achieve compliance with discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a, pursuant to the requirements of Provision A.4.

The Water Quality Improvement Plans have also been structured to incorporate the requirements of any TMDLs that have been adopted for the San Diego Region. Incorporating the requirements of the TMDLs into the requirements of Provision B allows the Copermittees to develop a single plan, instead of separate plans, to coordinate their non-storm water and storm water runoff management programs. The Water Quality Improvement Plans allow the Copermittees to meet the requirements of this Order, as well as fulfill the requirements of the TMDLs.

As an added benefit, if the Copermittees demonstrate that impaired water bodies within the Watershed Management Area listed on the 303(d) List will be addressed with their Water Quality Improvement Plans in a reasonable period of time, the San Diego Water Board may be able to remove the water bodies from the 303(d) List, which would greatly reduce the need for the San Diego Water Board to develop additional TMDLs that would have to be incorporated into the Order and implemented by the Copermittees.

***Discussion*:** The federal NPDES regulations require the Copermittees to develop a proposed management program (40 CFR 122.26(d)(2)(iv)). The proposed management program must include "*a comprehensive planning process*" and "*where necessary intergovernmental coordination*" for the "*duration of the permit.*" The Water Quality Improvement Plan is the Copermittees' "*comprehensive planning process*" document for the proposed management program that will be implemented within a Watershed Management Area. Implementation of the Water Quality Improvement Plan requires "*intergovernmental coordination*" among the Copermittees for at least the "*duration of the permit*," and likely into and beyond the next iteration of the permit.

Developing Water Quality Improvement Plans based upon watersheds is consistent with federal regulations that support the development of permit conditions, as well as implementation of storm water management programs, at a watershed scale (40 CFR 122.26(a)(3)(ii), 122.26(a)(3)(v), and 122.26(d)(2)(iv)). In 2003, USEPA issued a Watershed-Based NPDES Permitting Policy Statement (USEPA, 2003) that defines watershed-based permitting as an approach that produces NPDES permits that are issued to point sources on a geographic or watershed basis. In this policy statement, USEPA explains that "*[t]he utility of this tool relies heavily on a detailed, integrated, and inclusive watershed planning process*." USEPA identifies a number of important benefits of watershed permitting, including more environmentally effective results, the ability to emphasize measuring the effectiveness of targeted actions on improvements in water quality, reduced cost of improving the quality of the nation's waters and more effective implementation of watershed plans, including TMDLs, among others.

An emphasis on watersheds is appropriate at this stage in the San Diego Region's MS4 program to shift the focus to more targeted, water quality driven planning and implementation. Addressing discharges on a watershed scale focuses on water quality results by emphasizing the receiving waters in the watershed. The conditions of the receiving waters drive management actions, which in turn focus measures to address pollutant contributions from MS4 discharges.

The Water Quality Improvement Plan gives the Copermittees the responsibility of developing a comprehensive plan to coordinate the efforts of their jurisdictional runoff management programs for addressing the problems related to MS4 discharges causing impacts to water quality in the Watershed Management Area. The development of the plan provides the Copermittees the opportunity to provide

significant input on how to implement their jurisdictional runoff management programs, and how to best utilize their available resources in addressing a focused set of priorities that they believe will result in measureable improvements to water quality within the Watershed Management Area.

The Copermittees are encouraged to separate the Watershed Management Area into subwatersheds, as appropriate. This allows the Copermittees to identify priorities applicable to a subset of the Copermittees or specific water bodies or areas within the Watershed Management Area.

Included in the requirements for the elements to be included in the Water Quality Improvement Plan are monitoring and assessment requirements that are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order. In addition to the federal requirements of the CWA section 308(a) and 40 CFR 122.26(d), the San Diego Water Board has the authority to establish monitoring, reporting, and recordkeeping requirements for NPDES permits under CWC 13383.

More specific and detailed discussions of the requirements of Provision B are provided below.

Provision B.1 (Watershed Management Areas) requires the Copermittees to develop a Water Quality Improvement Plan for each of the Watershed Management Areas defined by the San Diego Water Board.

Pursuant to 40 CFR 122.26(d)(2)(iv), proposed management programs "*may impose controls on a…watershed basis…*" The Water Quality Improvement Plan is the Copermittees' proposed management program. A Water Quality Improvement Plan must be developed for each Watershed Management Area identified in the Order.

The Watershed Management Areas are identified in Table B-1. Table B-1 establishes ten (10) Watershed Management Areas, and identifies the Copermittees that are responsible for developing and implementing the Water Quality Improvement Plan for each Watershed Management Area.

The Copermittees from each of the three counties within the San Diego Region are expected to be phased in as their respective NPDES municipal storm water permits expire. Because Order No. R9-2007-0001 expired in January 2012, the San Diego County Copermittees ~~are~~were covered under the Regional MS4 Permit on June 27, 2013, the effective date of the Order. Because Order No. R9-2009-0002 expired in December 2014, the Orange County Copermittees are covered under the Regional MS4 Permit on April 1, 2015, the effective date of Order No. R9-2013-0001 as amended by Order No. R9-2015-0001.

After the San Diego Water Board receives and considers the Report~~s~~ of Waste

Discharge required to be submitted by the ~~Orange County Copermittees and~~ Riverside County Copermittees pursuant to the requirements of their current permit~~s~~, and makes any necessary changes to the Order, the ~~Orange County Copermittees and~~ Riverside County Copermittees will be covered under the Regional MS4 Permit after ~~Order No. R9-2009-0002 expires in November 2014, and~~ Order No. R9-2010-0016 expires in December 2015~~, respectively~~.

The ~~Orange County Copermittees and~~ Riverside County Copermittees also have the option to obtain coverage under the Regional MS4 Permit earlier than their respective permit expiration dates. The process to apply for early coverage is described Provision F.6.

Because the Santa Margarita River Watershed Management Area includes Copermittees from both San Diego County and Riverside County, a footnote to Table B-1 has been included to specify that the requirements of Provision B are not required to be implemented by the County of San Diego until the Riverside County Copermittees have received a notice of coverage under the Order. Until the Riverside County Copermittees are notified of coverage under the Order, the County of San Diego is subject to the prohibitions and limitations under Provision A, responsible for continuing to implement its existing jurisdictional runoff management program, and responsible for implementing the transitional monitoring and assessment requirements of Provision D, the transitional annual reporting requirements of Provision F.3.b, and the TMDL requirements of Attachment E to the Order.

The City of Laguna Woods and Laguna Hills are located partially within the jurisdictions of both the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board) and the San Diego Water Board. Written requests for designation of a single Regional Water Board to regulate matters pertaining to permitting of Phase I MS4 discharges were submitted to the San Diego Water Board and the Santa Ana Water Board by the City of Laguna Woods by letter dated September 8, 2014, and the City of Laguna Hills by letter dated March 12, 2014. The Cities of Laguna Woods and Laguna Hills requested designation of the San Diego Water Board pursuant to CWC section 13228. The Cities of Laguna Woods and Laguna Hills reported that management and implementation of municipal programs to comply with two different Phase I MS4 permits creates a significant administrative and financial burden and inhibits their ability to contribute to greater overall water quality improvements in either Region. In an effort to address these concerns, the San Diego Water Board and the Santa Ana Water Board have entered into an agreement dated February 10, 2015, whereby the San Diego Water Board is designated to regulate Phase I MS4 discharges within the jurisdiction of the Cities of Laguna Woods and Laguna Hills including areas in the Santa Region upon the later effective date of this Order or Tentative Order No. R8-2015-0001. Under the terms of the agreement, each Regional Water Board retains the authority to enforce provisions of the Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee (Water

Code section 13228 (b)). Also under the terms of the agreement, any TMDL and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Laguna Woods or Laguna Hills as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement of the applicable TMDL would remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Boards' San Diego Creek/Newport Bay TMDL and the San Diego Water Boards indicator Bacteria Project I Beaches and Creeks TMDL. In conformance with this agreement, a footnote to Table B-1 has been included to specify coverage under Order No. R9-2013-0001 for those Phase I MS4 discharges within the jurisdictional boundaries of the Cities of Laguna Woods and Laguna Hills within the Santa Ana Region. The footnote specifies that the City of Laguna Woods and Laguna Hills are identified as responsible Copermittees in the San Diego Creek/Newport Bay TMDL in the Santa Ana Region and remain obligated to comply with the San Diego Creek/Newport Bay TMDL pursuant to section XVIII of Tentative Order No. R8-2015-0001 (NPDES No. CAS618030) and any reissuance thereof.

The City of Lake Forest is located partially within the jurisdictions of both the Santa Ana Water Board and the San Diego Water Board. By letters dated January 14, 2013 and April 4, 2014 the City of Lake Forest submitted a written request, pursuant to CWC section 13228, to the San Diego Water Board and the Santa Ana Water Board requesting the Santa Ana Water Board be designated to regulate matters within the City of Lake Forest pertaining to permitting of their Phase I MS4 discharges. The City of Lake Forest reported that management and implementation of municipal programs to comply with two different Phase I MS4 permits creates a significant administrative and financial burden and inhibits their ability to contribute to greater overall water quality improvements in either Region. In an effort to address these concerns, the San Diego Water Board and the Santa Ana Water Board have entered into an agreement dated February 10, 2015, whereby the Santa Ana Water Board is designated to regulate Phase I MS4 discharges within the jurisdiction of the City of Lake Forest within the San Diego Region upon the later date of this Order or Santa Ana Water Board Tentative Order No. R8-2015-0001. Under the terms of the agreement, each Regional Water Board retains the authority to enforce provisions of the Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee (Water Code section 13228 (b)). Also under the terms of the agreement, any TMDL and associated Phase I MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the City of Lake Forest as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement authority for the applicable TMDL would remain with the Regional Water Board which has the jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Boards' San Diego Creek/Newport Bay TMDL and the San Diego Water Boards' indicator Bacteria Project I Beaches and Creeks TMDL. In conformance with this

agreement, a footnote to Table B-1 has been included to specify that Phase I MS4 discharges within the jurisdictional boundaries of the City of Lake Forest located within the San Diego Region will be regulated under Santa Ana Water Board Order No. R8-2015-0001 (NPDES No. CAS618030) and any reissuance thereof. The footnote specifies that the City of Lake Forest is an identified responsible Copermittee in the Indicator Bacteria Project I Beaches and Creeks TMDL (Bacteria TMDL) in the San Diego Region and remains obligated to comply with the Bacteria TMDL pursuant to Attachment E of Order No. R9-2013-0001 and any reissuance thereto. The City is also identified as a responsible Copermittee in the San Diego Creek/Newport Bay TMDL established by the Santa Ana Water Board. The City remains obligated to comply with the San Diego Creek/New Port Bay TMDL pursuant to the Santa Ana Water Board's Phase I MS4 Permit (Tentative Order No. R8-2015-0001 (NPDES No. CAS618030). Under the terms of the agreement, the City of Lake Forest must retain and continue implementation of the over irrigation prohibition in Title 15, Chapter 15, Section 14.030, List (b) of the City Municipal Code throughout its jurisdiction. Also under the terms of the agreement, the City of Lake Forest must actively participate in the development and implementation of the Aliso Creek Watershed Management Area Water Quality Improvement Plan required pursuant to Order No. R9-2013-0001, and any reissuance thereof.

The bases supporting the Cities of Laguna Woods, Laguna Hills, and Lake Forest requests to designate a specific Regional Water Board for regulatory oversight of Phase I MS4 discharges may change under future conditions and circumstances, therefore the San Diego Water Board will periodically review the effectiveness of the agreement during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate the agreement with the Santa Ana Water Board or otherwise modify the agreement subject to the approval of the Santa Ana Water Board.

Provision B.2 (Priority Water Quality Conditions) requires the Copermittees in each Watershed Management Area to identify the highest priority water quality conditions which will be the focus of the Water Quality Improvement Plan implementation.

Provisions B.2.a and B.2.b provide the criteria that must be assessed when characterizing the receiving water quality and potential impacts from MS4 discharges of the receiving waters within the Watershed Management Area. The criteria are based primarily on the requirements in 40 CFR 122.26(d)(1)(iv)(C) and (C)(1)-(9). Characterizing the receiving water quality and identifying the potential impacts caused by MS4 discharges to receiving waters in the Watershed Management Area is necessary to identify the impacts to receiving waters associated with MS4 discharges that are of the most concern to the Copermittees.

Based on the information required to be considered under Provisions B.2.a and B.2.b, Provision B.2.c requires to Copermittees to identify the highest priority water quality conditions related to discharges from the MS4s that will be the primary focus of the

Water Quality Improvement Plan in the Watershed Management Area. Addressing and improving these highest priority water quality conditions will become the focus of each Copermittee's jurisdictional runoff management program as the Water Quality Improvement Plan is implemented in the Watershed Management Area. The highest priority water quality conditions are expected to include source of pollutants and/or stressors, and/or receiving water conditions, that the Copermittees consider the highest threats or most likely to have adverse impacts on the physical, chemical, and biological integrity of receiving waters. Addressing these threats and/or adverse impacts should restore the physical, chemical, and biological integrity of receiving waters, and result in the restoration and protection of the beneficial uses of the receiving waters in the Watershed Management Area.

Provision B.2.d requires the Copermittees to identify known and suspected sources of pollutants and/or stressors contributing to the highest priority water quality conditions. The requirements of Provision B.2.d are based primarily on the requirements in 40 CFR 122.26(d)(1)(iii)(B)(1)-(6). The Copermittees are required to evaluate several factors in the identification of those sources. The Copermittees must consider and evaluate the following: (1) the land uses that may contribute toward impacts to receiving waters, (2) the locations of the Copermittees' MS4s that can convey and discharge runoff and pollutants to receiving waters, (3) other sources that discharge into the Copermittees' MS4s and receiving waters, and (4) other information and data that can help the Copermittees to evaluate the relative importance of or contribution from those sources toward the highest priority water quality conditions. Identifying the known and suspected sources, and their relative contribution toward the highest priority water quality conditions, will help the Copermittees to focus, direct, and prioritize their resources and implementation efforts within their jurisdictions.

Provision B.2.e requires the Copermittees to identify potential strategies that can result in improvements to water quality in MS4 discharges and/or receiving waters within the Watershed Management Area. Potential water quality improvement strategies will not necessarily be implemented by the Copermittees, but provide a "menu" of options that the Copermittees will consider for implementation. The public participation process that will be implemented during the development of the Water Quality Improvement Plan is where the potential water quality improvement strategies will be identified.

<u>Provision B.3 (Water Quality Improvement Goals, Strategies and Schedules)</u> requires the Copermittees in each Watershed Management Area to identify the goals that the Copermittees' jurisdictional runoff management programs will work toward achieving to address and improve the highest priority water quality conditions identified under Provision B.2.c; the strategies that will be implemented by the Copermittees within their jurisdictions and the Watershed Management Area to achieve the goals; and, the schedules for implementing the strategies and achieving the goals. The element of the Water Quality Improvement Plan required under Provision B.3 is where the "*comprehensive planning*" and "*intergovernmental coordination*" [40 CFR 122.26(d)(2)(iv)] of the Copermittees' actions for the proposed management programs

within the Watershed Management Area is required to be described.

Provision B.3.a requires the Copermittees to identify interim and final numeric goals, and schedules to achieve those goals as part of the Water Quality Improvement Plans. Provision B.3.a.(1) requires the Copermittees to identify two types of numeric goals to be achieved:

(1) Final numeric goals in the receiving waters and/or MS4 discharges that will result in the protection of the water quality standards of the receiving waters for the highest priority water quality conditions identified by the Copermittees for Provision B.2.c. These final numeric goals are the ultimate goals for the Water Quality Improvement Plan, and the achievement and maintenance of these final numeric goals will indicate that one or more beneficial uses have been successfully restored and/or protected from MS4 discharges.

(2) Interim numeric goals that can be used by the Copermittees to demonstrate progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges for the highest priority water quality conditions in the Watershed Management Area. Achievement of the interim numeric goals will demonstrate to the San Diego Water Board that the Copermittees' implementation efforts are progressing toward achieving the final numeric goals.

Provision B.3.a.(1) does not specify what the interim and final numeric goals must be based on, but they essentially must be designed to achieve compliance with water quality standards in the receiving waters. To that end, the interim goals must be based on measureable criteria or indicators capable of demonstrating progress toward achieving the numeric goals."

The interim and final numeric goals can be based on the water quality objectives in the Basin Plan. The water quality objectives in the Basin Plan, however, consist of numeric and narrative water quality objectives. Numeric water quality objectives can be directly used as numeric goals. Narrative water quality objectives, on the other hand, will require some interpretation to identify numeric goals. The achievement of multiple numeric goals based on the water quality objectives, used in combination, may be necessary to demonstrate that beneficial uses have been restored and/or protected.

The Copermittees could also propose other numeric goals that are not necessarily water quality objectives from the Basin Plan. For example, the Copermittees could propose a numeric goal that consists of achieving some percent improvement of a measureable indicator, such as acreage of a specific habitat or increase in a specific plant or animal species population. Other examples may include pollutant load reductions, number of impaired waterbodies delisted from the List of Water Quality Impaired Segments, Index of Biological Integrity (IBI) scores, etc.

The Copermittees may choose to develop interim numeric goals based on the final numeric goals they develop, such as incremental steps toward ultimately achieving the final numeric goals. The Copermittees may also choose to develop interim numeric goals that are based on other measureable indicators that can indirectly indicate improvements and progress toward the final numeric goals.

There are no limits to the types of interim numeric goals that could be proposed by the Copermittees, other than the goals must be based on measureable criteria or indicators capable of demonstrating progress toward achieving the numeric goals. Likewise, there are no limits to the types of final numeric goals that could be proposed by the Copermittees, other than the goals must "*restore and protect the water quality standards of the receiving waters.*"

Finally, Provision B.3.a.(2) also requires the Copermittees to develop schedules for measuring progress and achieving the interim and final numeric goals. Several criteria are included for the development of the schedules, but the Copermittees are required to achieve the numeric goals as soon as possible, consistent with federal NPDES regulations (40 CFR 122.47(a)(1)).

The Copermittees are also required to incorporate any compliance schedules for any applicable ASBS or TMDL requirements. Applicable ASBS and TMDL compliance schedules are set forth in Attachment A and Attachment E to the Order, respectively. The information provided by the Copermittees under Provision B.3.a.(2) will be used by the Copermittees and the San Diego Water Board to gauge and track the progress of the Copermittees' efforts in addressing the highest priority water quality conditions identified in the Water Quality Improvement Plan.

Provision B.3.b requires the Copermittees to identify the strategies and schedules to implement those strategies as part of the Water Quality Improvement Plans. Provision B.3.b requires the Copermittees to identify the water quality improvement strategies that will be and may be implemented within the Watershed Management Area to 1) reduce of pollutants in storm water discharged from the MS4 to the MEP, 2) effectively prohibit non-storm water discharges from entering the MS4, 3) protect water quality standards in receiving waters by controlling MS4 discharges so that they do not cause or contribute to exceedances of receiving water limitations, and 4) achieve applicable WQBELs that implement TMDLs. The Copermittees will select the strategies to be implemented based on the likely effectiveness and efficiency of the potential water quality improvement strategies identified under Provision B.2.e to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, and/or achieve the interim and final numeric goals identified under Provision B.3.a.

Provision B.3.b.(1) requires each Copermittee to identify the strategies that will be or may be implemented within its jurisdiction. Each Copermittee is required to describe the strategies it is committed to implementing as part of its jurisdictional runoff

management requirements under Provisions E.2 through E.7, and the optional jurisdictional strategies that the Copermittee will implement, as necessary, to achieve the numeric goals.

Each Copermittee is expected to implement the optional jurisdictional strategies identified under Provisions B.3.b.(1)(b) when the jurisdictional strategies it has committed to implement under Provision B.3.b.(1)(a) are not making adequate progress toward the interim and final numeric goals in accordance with the schedules established under Provision B.3.a. Provision B.3.b.(1)(b)(v) requires each Copermittee to describe the circumstances necessary to trigger implementation of the optional jurisdictional strategies, in addition to the requirements of Provisions B.3.b.(1)(a).

The San Diego Water Board recognizes that there may be optional jurisdictional strategies that will likely require funding and/or resources for planning, permitting, procurement of labor and materials, and implementation. Thus, Provision B.3.b.(1)(b)(iv) requires each Copermittee to describe the funding and/or resources that are necessary to implement these optional jurisdictional strategies. This information may provide interested groups and members of the public an understanding of the resources that they could provide or assist in obtaining to implement these optional jurisdictional strategies.

Provision B.3.b.(2) requires the Copermittees in the Watershed Management Area to identify the regional or multi-jurisdictional strategies that may be implemented, as necessary, to achieve the numeric goals. Similar to the requirements of Provision B.3.b.(1)(b), these regional or multi-jurisdictional strategies will likely require funding and/or resources for planning, permitting, procurement of labor and materials, and implementation, and San Diego Water Board recognizes that these strategies may be difficult to implement with only Copermittee resources. Thus, Provision B.3.b.(2)(d) requires the Copermittees to describe the funding and/or resources necessary to implement these optional regional or multi-jurisdictional strategies. This information may provide interested groups and members of the public an understanding of the resources that they could provide or assist in obtaining to implement these optional regional or multi-jurisdictional strategies.

Provision B.3.b.(3) requires the Copermittees to develop and include schedules in the Water Quality Improvement Plan for implementing the water quality improvement strategies identified under Provisions B.3.b.(1) and B.3.b.(2). The schedule for implementing the water quality improvement strategies will be used by the Copermittees and San Diego Water Board to measure and demonstrate the progress of the Copermittees' implementation efforts toward reducing pollutants in storm water discharged from the MS4 to the MEP, and eliminating illicit non-storm water discharges from entering the MS4.

Provision B.3.b.(4) provides the Copermittees in each Watershed Management Area

the option of implementing watershed-specific structural BMP requirements for Priority Development Projects. Historically, storm water permits have included very specific performance standards for permanent, structural BMPs. These standards describe the expectation for the capture or treatment of pollutants and control of excessive flow before storm water is discharged from a site. The Copermittees were also allowed to develop waiver programs for Priority Development Projects to avoid implementing the structural BMPs; however, the waiver programs were not necessarily tied into any sort of holistic watershed strategy. The result is that implementation of BMP requirements is largely done on a site-by-site basis. This requires proper design on the part of the Priority Development Project and strict oversight on the part of the Copermittee.

Provision B.3.b.(4) promotes the evaluation of multiple strategies for water quality improvement, in addition to the implementation of permanent structural BMPs, on a watershed-scale versus the site-by-site approach. In a report issued by the Southern California Coastal Water Research Project (SCCWRP) and several other research institutions, the report emphasized that a successful hydromodification management program will involve watershed analysis as a first step, and that integrating multiple watershed-based strategies is preferable over a site-by-site approach. Indeed, the report states that the watershed analysis "…*should lead to identification of existing opportunities and constraints that can be used to help prioritize areas of greater concern, areas of restoration potential, infrastructure constraints, and pathways for potential cumulative effects*."[22] Provision B.3.b.(4) promotes the findings and recommendations of the report by providing a pathway for Copermittees to develop an integrated approach to their land development programs.

Under Provision B.3.b.(4), the Copermittees in a Watershed Management Area must first perform an analysis by gathering as much information pertaining to the physical characteristics of the Watershed Management Area as possible. This includes, for example, identifying potential areas of coarse sediment supply, present and anticipated future land uses, and locations of physical structures within receiving streams and upland areas that affect the watershed hydrology (such as bridges, culverts, and flood management basins). Once this information is collected, the Copermittees must produce GIS layers (maps) that include this information.

From there, the Copermittees must use the results of the Watershed Management Area Analysis to identify and compile a list of candidate projects that could potentially be used as alternative compliance options for Priority Development Projects. Such projects include, for example, opportunities for stream or riparian area rehabilitation, opportunities for retrofitting existing infrastructure to incorporate storm water retention or treatment, and opportunities for regional BMPs, among others. Once these candidate projects are identified, Copermittees may allow Priority Development Projects to fund, partially fund, or completely implement these candidate projects. The

[22] 2012. ED Stein, F Federico, DB Booth, BP Bledsoe, C Bowles, Z Rubin, GM Kondolf, A Sengupta. Technical Report 667. Southern California Coastal Water Research Project. Costa Mesa, CA.

Copermittees must first find that implementing such a candidate project would provide greater overall benefit to the watershed than requiring implementation of the structural BMPs onsite, and also enter into a voluntary agreement with the Priority Development Project that authorizes this arrangement. The Copermittees may use Provision B.3.b.(4) as both 1) a mechanism to reach their stated goals of the Water Quality Improvement Plan by using Priority Development Projects to either fund or implement projects that will provide water quality benefit, and 2) an alternative to requiring strict adherence to the structural BMP design standards.

Additionally, Provision B.3.b.(4) allows the Copermittees to use the results of the Watershed Management Area Analysis to identify areas within the Watershed Management Area where it is appropriate to allow Priority Development Projects to be exempt from the hydromodification management BMP performance requirements. Provision E.3.c.(2) already allows exemptions for Priority Development Projects that discharge to a conveyance channel whose bed and bank are concrete lined from the point of discharge to an enclosed embayment or the Pacific Ocean. However, there may be cases where further exemptions are warranted. The Copermittees may identify such cases on a watershed basis and include them in the Watershed Management Area Analysis; however, they must provide the supporting rationale to support all claims for exemptions.

Provision B.3.b.(4) provides an innovative pathway for Copermittees to regulate their land development programs by allowing alternative compliance in lieu of implementing structural BMPs on each and every Priority Development Project. This approach facilitates the integration of watershed-scale solutions for improving overall water quality and assisting Copermittees to achieve their stated goals of the Water Quality Improvement Plan. The San Diego Water Board understands, however, that undertaking this approach, which involves extensive planning, could be resource intensive for the Copermittees. Therefore, the Watershed Management Area Analysis is optional and not a requirement. The Copermittees can choose not to perform the watershed planning and mapping exercise described in Provision B.3.b.(4), and instead choose to require strict implementation of the structural BMPs onsite, pursuant to Provision E.3.b.

Provision B.4 (Water Quality Improvement Monitoring and Assessment) requires the Copermittees to develop an integrated monitoring and assessment program to track the progress of the Water Quality Improvement Plan toward meeting the implementation goals and schedules, and improving the water quality of the Watershed Management Area. Provision B.4 is the part of the Water Quality Improvement Plan where the Copermittees describe the monitoring data that will be collected, which is not only necessary to implement the “iterative approach” required by Provision A.4, but inform the adaptive management and “*comprehensive planning process*” that allows the Copermittees to make adjustments and modifications to the Water Quality Improvement Plans and the jurisdictional runoff management programs.

Provision B.4 requires the Copermittees, at a minimum, to include the requirements of Provision D as part of the water quality improvement monitoring and assessment program for the Water Quality Improvement Plan. The Copermittees, however, are not limited to the requirements of Provision D and may include additional monitoring and assessment methods to track progress toward improving water quality in the Watershed Management Area.

In addition to incorporating the requirements of Provision D, the water quality improvement monitoring and assessment program must incorporate any monitoring and assessment requirements specified for any applicable TMDLs included in Attachment E to the Order, and the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 for Watershed Management Areas with ASBS.

The monitoring and assessments required to be incorporated into the Water Quality Improvement Plan are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order.

Provision B.5 (Iterative Approach and Adaptive Management Process) requires the Copermittees to implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a.

Provision B.5 requires the Copermittees in each Watershed Management Area to re-evaluate the highest priority water quality conditions and potential water quality improvement strategies, the water quality improvement goals, strategies and schedules, and the water quality improvement monitoring and assessment program and provide recommendations for modifying those elements to improve the effectiveness of the Water Quality Improvement Plan. The re-evaluation of the Water Quality Improvement Plan is part of the assessment requirements of Provision D.

Provision B.6 (Water Quality Improvement Plan Submittal, Updates, and Implementation) requires to Copermittees to submit, update, and implement the Water Quality Improvement Plans.

The requirements for the process to develop and submit the Water Quality Improvement Plans is described in more detail under the discussion for Provision F.1. The process will include several opportunities for the public to provide input during the development of the Water Quality Improvement Plans. The process for updating the Water Quality Improvement Plans is described in more detail under the discussion for Provision F.3.c. Upon acceptance of the Water Quality Improvement Plan and updates, the Copermittees are required to immediately begin implementing the Water Quality Improvement Plan and subsequent updates.

The Water Quality Improvement Plan is expected to be a dynamic document that will evolve over time. The Water Quality Improvement Plan is also expected to be a long

term plan that focuses the Copermittees' efforts and resources on a limited set of priority water quality conditions, with the ultimate goal of protecting all the beneficial uses of the receiving waters within the Watershed Management Area from impacts that may be caused or contributed to by MS4 discharges. As the Copermittees collect data, implement their jurisdictional runoff management programs, and review the results from their water quality improvement monitoring and assessment program, the Water Quality Improvement Plan is expected to be continually reviewed and updated until compliance with Provisions A.1.a, A.1.b, and A.2.a is achieved.

However, in specific cases supported by robust analytical documentation the implementation of the Water Quality Improvement Plans may demonstrate that TMDLs are not necessary for identified impaired water bodies within the Watershed Management Area if the analytical record demonstrates that technology-based effluent limitations required by the CWA, more stringent effluent limitations required by state, local, or federal authority, and/or other pollution control requirements (e.g., best management practices) required by local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time.[23]

The San Diego Water Board submits an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. According to USEPA guidance for the Integrated Report,[24] water bodies are placed in one of five categories. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 are placed on the 303(d) List.

Category 4 in the Integrated Report is for water bodies where available data and/or information indicate that at least one beneficial use is not being supported or is threatened, but a TMDL is not needed. [25] Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

Impaired water bodies can be included in Category 4a if a TMDL has been adopted and approved. The TMDLs in Attachment E to the Order implement the requirements of the TMDLs adopted by the San Diego Water Board, and approved by the State Water Board and USEPA. The water bodies in Attachment E will be included in

[23] 40 CFR 130.7(b)(1)
[24] USEPA, 2005. Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act
[25] Ibid

Category 4a in the Integrated Report and removed from the 303(d) List.

Impaired water bodies can be included in Category 4b if there are *acceptable* "pollution control requirements" required by a local, state or federal authority stringent enough to implement applicable water quality standards within a reasonable period of time (e.g., a compliance date is set). When evaluating whether a particular set of pollution controls are "requirements," the USEPA considers a number of factors, including: (1) the authority (local, state, federal) under which the controls are required and will be implemented with respect to sources contributing to the water quality impairment (examples may include: self-executing state or local regulations, permits, and contracts and grant/funding agreements that require implementation of necessary controls), (2) existing commitments made by the sources and completion or soon to be completed implementation of the controls (including an analysis of the amount of actual implementation that has already occurred), (3) the certainty of dedicated funding for the implementation of the controls, and (4) other relevant factors as determined by USEPA depending on case-specific circumstances.[26]

Impaired water bodies can be included in Category 4c if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution. Pollution, as defined by the CWA is "the man-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of water."[27] In other cases, pollution does not result from a pollutant and a TMDL is not required. Examples of circumstances where an impaired segment may be placed in Category 4c include segments impaired solely due to lack of adequate flow, stream channelization, or hydromodification. In these situations, there may be water quality management actions that can address the cause(s) of the impairment, but a TMDL may not be required to implement the actions.

The Water Quality Improvement Plans will require the implementation of pollution controls and water quality management actions (i.e. water quality improvement strategies) which can result in the attainment of water quality standards in water bodies impaired by discharges from the Copermittees' MS4s. The Water Quality Improvement Plans also include requirements that are expected to attain water quality standards in a reasonable period of time. The San Diego Water Board considers the Water Quality Improvement Plans to be a commitment by the Copermittees to develop, plan, budget for, and implement pollution controls that will attain water quality standards in receiving waters in a reasonable period of time, or as soon as possible. The results of the Copermittees' efforts in implementing the Water Quality Improvement Plans can be used to re-evaluate the condition of the impaired water bodies during the next update to the 303(d) List.

[26] Ibid
[27] CWA section 502(19)

After the Copermittees submit the Water Quality Improvement Plans and demonstrate that water quality standards are being attained or will be attained in a reasonable period of time, the San Diego Water Board may re-evaluate the water bodies on the 303(d) List. These water bodies on the 303(d) List may be re-evaluated and placed into Category 4b or Category 4c in the Integrated Report. The water bodies placed in Category 4b or Category 4c in the Integrated Report must show a record that the water bodies are attaining water quality standards or supporting the identified beneficial uses, or will attain water quality standards or support identified beneficial uses in a reasonable period of time, in order for the water bodies to be appropriately removed from the 303(d) List.

C. Action Levels

Purpose: Provision C includes requirements for the Copermittees to identify and include numeric action levels in the Water Quality Improvement Plan to direct and focus the Copermittees' jurisdictional runoff management program implementation efforts for controlling MS4 discharges to receiving waters.

***Discussion*:** Under Provision C, the numeric action levels required are for non-storm water discharges and storm water discharges. The non-storm water action levels (NALs) are applicable to non-storm water discharges from the Copermittees' MS4s, which can occur year-round. The storm water action levels (SALs) are applicable to storm water discharges from the Copermittees' MS4s, which occur during the rainy season defined as the period between October 1 and April 30.

The action levels required by Provision C are based on the action level requirements that were developed and incorporated into Order Nos. R9-2009-0002 and R9-2010-0016, the Orange County and Riverside County MS4 Permits, respectively. The Fact Sheets for these Orders provide detailed discussions about the development of the numeric NALs and SALs included in this Order.

Order Nos. R9-2009-0002 and R9-2010-0016 required the Copermittees to perform prescribed actions if the NALs or SALs are exceeded. The actions required under Order Nos. R9-2009-0002 and R9-2010-0016 generally included conducting additional monitoring and source investigations when a discharge from the MS4 is observed to exceed one or more NALs and/or SALs.

For this Order, however, the action levels of Provision C are to be used by the Copermittees to prioritize the actions to be implemented as part of the Water Quality Improvement Plan. Monitoring data collected by the Copermittees from MS4 outfalls will be compared with the NALs and SALs. Exceedances of the NALs and SALs will not require the Copermittees to immediately identify sources causing exceedances, but will provide some numeric indicator levels that can give the Copermittees a way to measure the relative severity of a pollutant contributing to receiving water quality impacts.

NALs and SALs must be included in the Water Quality Improvement Plans to be used by the Copermittees in directing and focusing their water quality improvement strategies. The Copermittees are expected to utilize the NALs and SALs to help focus their implementation efforts on addressing pollutants that have the most significant potential or observed impacts to receiving waters. The NALs and SALs will be used as part of the MS4 discharges assessments required under Provision D.4.b. The NALs and SALs may also be used by the Copermittees as the numeric goals to be achieved in MS4 discharges and/or receiving waters as the Water Quality Improvement Plans are implemented.

More specific and detailed discussions of the requirements of Provision C are provided below.

Provision C.1 (Non-storm Water Action Levels) requires the Copermittees to incorporate NALs into the Water Quality Improvement Plan for pollutants and/or constituents that are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions identified in the Water Quality Improvement Plan related to non-storm water discharges from the MS4s. NALs generally must be consistent with the water quality objectives found within the Basin Plan.

The NALs have been included to ensure that the Copermittees are implementing and complying with several requirements of the MS4 permit. The federal CWA requires permits for municipal storm sewer systems to "*effectively prohibit non-storm water discharges into the storm sewers*." The federal NPDES regulations, which were promulgated to implement the CWA requirements for discharges from municipal storm sewers, require a program to address illicit discharges, which are non-storm water discharges. Provision A.1.b prohibits "*[n]on-storm water discharges into MS4s*" unless the non-storm water discharge authorized by a separate NPDES permit. The NALs will be used as part of the illicit discharge detection and elimination program required pursuant to Provision E.2, as well as part of the MS4 discharges assessments required pursuant to Provision D.4.b.

Provision A.1.a prohibits non-storm water discharges from the MS4 from "*causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state.*" In addition, pursuant to Provision A.2.a, non-storm water discharges "*must not cause or contribute to the violation of water quality standards in any receiving waters*."

Ideally, the Copermittees' jurisdictional runoff management programs will eliminate all non-storm water discharges entering the MS4s within their jurisdictions. The complete elimination of non-storm water discharges to the Copermittees' MS4s would be in compliance with the CWA requirements for non-storm water discharges, as well as the prohibitions and limitations of Provisions A.1.a and A.2.a.

The federal regulations, however, also refer to several non-storm water discharge categories that must be addressed as illicit discharges if they are found to be a source of pollutants. The federal regulations thus identify some non-storm water discharges that are not required to be addressed as illicit discharges if they are not a source of pollutants (e.g. non-storm water discharges specified in Provisions E.2.a.(1)-(5)). Thus, these regulations imply that some non-storm water discharges into and from the MS4 may occur even if non-storm water discharges are "effectively" prohibited by the Copermittees.

If the source of a non-storm water discharge is identified as a category of non-storm water specified in Provisions E.2.a.(1)-(5), the NALs can be used to determine the category of non-storm water discharges is a source of pollutants. For other non-storm water discharges not specified in Provisions E.2.a.(1)-(5), the CWA requires those discharges to be "*effectively"* prohibited by removing the discharge to the MS4 through enforcement of the Copermittees' legal authority established under "*ordinance, order or similar means*" to prohibit illicit discharges to the MS4s.

If there are non-storm water discharges that are not required to be addressed as illicit discharges, those discharges must comply, at a minimum, with the discharge prohibitions and receiving water limitations of Provision A. Thus, the non-storm water discharges from the MS4 must be at levels that will not cause or contribute to a condition of pollution, contamination, or nuisance (Provision A.1.a), and must not cause or contribute to a violation of water quality standards in receiving waters (Provision A.2.a) to be consistent with the discharge prohibitions and receiving water limitations of Provisions A.1.a and A.2.a.

Furthermore, the San Diego Region has predominantly intermittent and ephemeral rivers and streams which vary in flow volume and duration at spatial and temporal scales. For most of these river and stream systems, non-storm water discharges from the MS4 are likely to be the most significant or the only source contributing to surface flows present within the receiving water, especially during the dry season.

Therefore, because of the prohibitions and limitations of Provision A.1.a and A.2.a, and the likelihood that non-storm water discharges from the MS4 are the most significant or only source contributing to surface flows present within the receiving water, NALs generally must be consistent with the water quality objectives found within the Basin Plan. Non-storm water discharges that are meeting the NALs would not be expected to cause or contribute to an exceedance of water quality objectives in receiving waters, which would be consistent with the discharge prohibitions and receiving water limitations of Provisions A.1.a and A.2.a.

Exceedances of the NALs would then provide an indication of the relative severity of a pollutant in non-storm water discharges from the MS4 contributing to potential or observed receiving water quality impacts. The relative severity or significance of a pollutant in non-storm water discharges from the MS4 will provide the Copermittees a valuable source of information that can be used to identify priority water quality conditions within a Watershed Management Area and within each Copermittee's jurisdiction.

Tables C-1 through C-4 under Provision C.1.a specify numeric NALs for several parameters or pollutant constituents for non-storm water discharges from the MS4 to several water body types. The NALs for MS4 discharges given under Provision C.1.a are based on the water quality objectives for inland surface waters in the Basin Plan, and the water quality objectives for ocean waters in the Ocean Plan. The NALs for

most of the metals were calculated based on the State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP). The NALs provided in Tables C-1 through C-4 must be included in the Water Quality Improvement Plans required to be developed pursuant to Provision B.

Provision C.1.b requires the Copermittees to identify NALs for pollutants and/or constituents, not specified in Provision C.1.a, which are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions of the Watershed Management Area related to non-storm water discharges from the MS4s. The NALs must be based on the water quality objectives in the Basin Plan. The NALs identified under Provision C.1.b must be included in the Water Quality Improvement Plan.

The San Diego Water Board recognizes that some of the NALs required pursuant to Provisions C.1.a and C.1.b may be exceeded more frequently than not. Thus, Provision C.1.c has been included in the Order to provide the Copermittees the option to develop secondary NALs that are set at levels greater than the levels required pursuant to Provisions C.1.a and C.1.b to further refine the prioritization and assessment of water quality improvement strategies for addressing non-storm water discharges to and from the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and from the MS4.

Provision C.2 (Storm Water Action Levels) requires the Copermittees to incorporate SALs into the Water Quality Improvement Plan for pollutants and/or constituents causing or contributing, or may be causing or contributing, to the highest priority water quality conditions identified in the Water Quality Improvement Plan related to storm water discharges from the MS4s.

The SALs have been included to ensure that the Copermittees are implementing and complying with several requirements of the MS4 permit. Provision A.1.a prohibits storm water discharges from the MS4 from "*causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state.*" In addition, pursuant to Provision A.2.a, storm water discharges "*must not cause or contribute to the violation of water quality standards in any receiving waters*."

Provision A.3.a, however, implicitly acknowledges that compliance with Provisions A.1.a and A.2.a cannot be achieved immediately for discharges of storm water from the MS4 by applying the MEP standard. Thus, Provision A.4 requires the Copermittees to implement an iterative approach to demonstrate that MEP is being achieved. This approach is supported by USEPA.

The federal CWA requires permits for municipal storm sewer systems to "*require controls to reduce the discharge of pollutants [in storm water] to the maximum extent*

practicable, *including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants.*" MEP is an ever-evolving, flexible, and advancing concept. As knowledge about controlling storm water runoff and discharges evolves, so does the knowledge which constitutes MEP. Reducing the discharge of storm water pollutants from the MS4 to the MEP requires the Copermittees to assess their jurisdictional runoff management programs and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP. The SALs provide the Copermittees measureable goals that may be used to demonstrate the achievement of MEP for reducing pollutants in storm water discharges from the MS4. The SALs will be used as part of the MS4 discharges assessments required under Provision D.4.a.

In June of 2006, the State Water Board's Blue Ribbon Storm Water Panel released its report titled "*The Feasibility of Numerical Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities*." In the recommendations, the Blue Ribbon panel proposed storm water effluent limitations which are computed using statistical based population approaches. The SALs specified in Table C-5 under Provision C.2.a were developed from a regional subset of nationwide Phase I MS4 data by using USEPA Rain Zone 6 (arid west) data.[28] Additionally, utilization of regional data is appropriate due to the addition of data into the nationwide Phase I MS4 monitoring dataset in February 2008. This additional data increased the number of USEPA Rain Zone 6 samples to more than 400, and included additional monitoring events within Southern California.

Utilizing data from USEPA Rain Zone 6 resulted in SALs which closely reflect the environmental conditions experienced in the San Diego Region. The localized subset of data includes sampling events from multiple Southern California locations including Orange, San Diego, Riverside, Los Angeles, and San Bernardino Counties. The dataset includes samples taken from highly built-out impervious areas and from storm events representative of Southern California conditions.

The SALs for cadmium, copper, lead and zinc require the measurement of hardness and to provide more specificity in the assessment of samples with SALs for total metal concentrations. While USEPA Rain Zone 6 data include a large sample size for concentrations of total metals, the impact the concentration will have on receiving waters will vary with receiving water hardness. Since it is the goal of the SALs, through the iterative process and MEP standard, to have MS4 storm water discharges meet all applicable water quality objectives, the hardness of the receiving water should be used when assessing the total metal concentration of a sample.

Thus, when there is an exceedance of a SAL for a metal, the Copermittee must determine if that exceedance is above the existing applicable water quality objectives

[28] Data used to develop SAL were obtained from http://rpitt.eng.ua.edu/Research/ms4/mainms4.shtml

based upon the hardness of the receiving water. The water quality objectives Copermittees must use to assess total metal SAL exceedances are the California Toxic Rule (CTR) and USEPA National Recommended Water Quality Criteria for Freshwater Aquatic Life 1 hour maximum concentrations. The 1 hour maximum concentration is to be used for comparison since it is expected to most replicate the impacts to waters of the State from the first flush following a precipitation event.

The statistically calculated SALs given in Table C-5 are at levels greater than the water quality objectives in the Basin Plan or Ocean Plan. Because the objective of the CWA is to "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*", meaning eventually pollutants in storm water discharges must be reduced to a level that cannot cause or contribute to an exceedance of water quality objectives in receiving waters, over time the SALs are expected to be reduced to a level that is based on the water quality objectives rather than statistical calculations. The San Diego Water Board will review the SALs as more data for discharges of storm water from the MS4s are collected, and revise them as conditions improve and the MEP standard advances. For the Water Quality Improvement Plans required under this Order, the SALs identified under Provision C.2.a must be included.

Provision C.2.b requires the Copermittees to identify SALs for pollutants and/or constituents, not specified in Provision C.2.a, which are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions of the Watershed Management Area related to storm water discharges from the MS4s. The SALs identified under Provision C.2.b must be included in the Water Quality Improvement Plan.

The San Diego Water Board recognizes that some of the SALs required pursuant to Provisions C.2.a and C.2.b may be exceeded more frequently than not. Thus, Provision C.2.c has been included in the Order to provide the Copermittees the option to develop secondary SALs that are set at levels greater than the levels required pursuant to Provisions C.2.a and C.2.b to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s.

D. Monitoring and Assessment Program Requirements

Purpose: Provision D includes minimum monitoring and assessment requirements that must be developed and implemented by the Copermittees as part of the Water Quality Improvement Plans. Implementation of the monitoring and assessment requirements of Provision D will allow the Copermittees to demonstrate that the requirements of the CWA to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP are being achieved. Implementation of the monitoring and assessment requirements of Provision D will also allow the Copermittees and the San Diego Water Board to track improvements to the water quality in the San Diego Region. The monitoring and assessment program requirements are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order.

***Discussion*:** The San Diego Water Board recognized that changes to the monitoring and assessment requirements of the Fourth Term Permit were necessary to improve the usefulness and usability of monitoring data collected by the Copermittees to support their jurisdictional storm water programs more efficiently and with increased effectiveness. The data collected are needed to better inform the Copermittees' understanding of the physical, chemical, and biological condition of the receiving waters and the quality of the MS4 discharges. The monitoring program needs to provide opportunities for the Copermittees to integrate regional monitoring efforts into municipal storm water monitoring requirements to provide a cost-effective approach to monitoring and avoid duplication of efforts.

The requirements in Provision D were largely recommended by the Copermittees as an outcome of the San Diego Water Boards Focused Meeting process. The monitoring and assessment program requirements now require collection of more specific information necessary for each Copermittee to adapt its jurisdictional runoff management program in such a way that focuses resources on a watershed's highest priority water quality conditions. The monitoring and assessment program will require the Copermittees to collect data that can be utilized to answer both watershed level management questions (e.g. Are the chemical, physical, and biological conditions of a receiving water protective, or likely protective of beneficial uses?), and specific jurisdictional runoff management program activity questions (e.g. Are the water quality improvement strategies of the jurisdictional program effectively eliminating non-storm water discharges to the MS4?).

The monitoring data collected and assessment information that will be reported to the San Diego Water Board are necessary to determine if the Copermittees are complying with the prohibitions and limitations of Provision A. The required monitoring and assessments that must be reported to the San Diego Water Board will be utilized for three purposes:

(1) Inform the Copermittees, San Diego Water Board, and the public on the progress of the Copermittees' efforts to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP;

(2) Inform the Copermittees, San Diego Water Board, and the public on the condition of water bodies receiving discharges from the Copermittees' MS4, and the progress of the Copermittees' water quality improvement implementation efforts toward improving the receiving water quality; and

(3) Inform the Copermittees, the San Diego Water Board, and the public on the effectiveness of the Water Quality Improvement Plan toward achieving (1) and (2).

The monitoring and assessment information reported pursuant to Provision F is also expected to be key to the iterative approach and adaptive management process required under Provision A.4 and implemented through the Water Quality Improvement Plan required under Provision B. As required by Provision A.4, the iterative approach and adaptive management process is required if the Copermittees cannot meet the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c, and/or A.2.a under the present conditions.

Provision D provides the minimum monitoring and assessment requirements that must be included in each Water Quality Improvement Plan to be developed and implemented by the Copermittees. The Copermittees, however, are not limited to the requirements of Provision D and may include additional methods to track progress toward improving water quality in a Watershed Management Area.

More specific and detailed discussions of the requirements of Provision D are provided below.

Provision D.1 (Receiving Water Monitoring Requirements) specifies the minimum receiving water monitoring that the Copermittees must conduct within the Watershed Management Area and include as part of the Water Quality Improvement Plan.

Provision D.1 establishes minimum monitoring requirements that must be conducted by the Copermittees within each Watershed Management Area. Provision D.1 requires the Copermittees to collect and develop the data and information necessary to determine potential impacts to the beneficial uses in the receiving waters due to discharges from the MS4s. The monitoring required under Provision D.1 will also provide the data that will allow the Copermittees to gauge the effectiveness and progress of its Water Quality Improvement Plan implementation efforts toward improving the quality of receiving waters.

The receiving water monitoring requirements of Provision D.1 are focused primarily on monitoring the conditions and response of the receiving waters to the Copermittees' collective implementation efforts to reduce receiving water impacts that may be caused by the discharges from the MS4s. The preference of the San Diego Water Board is for the Copermittees to spend their resources achieving tangible and observable improvements in receiving water conditions instead of collecting samples and analyzing data that has consistently indicated that receiving water conditions are degraded and require improvement. In general, the ability to measure potential improvements in receiving water conditions due to any actions implemented by the Copermittees as part of the Water Quality Improvement Plan may require several years before a response can be observed. Thus, the frequency of collecting receiving water monitoring data has been kept to a minimum.

During the transitional period between adoption of this Order and San Diego Water Board acceptance of a Water Quality Improvement Plan, the Copermittees must conduct receiving water monitoring in accordance with Provision D.1.a. This approach to collecting receiving water data is different from what was required in the Fourth Term Permits, but one that truly embraces the concept of an integrated, cost-effective, streamlined receiving water monitoring approach.

Provision D.1.a requires Copermittees to continue performing the receiving water monitoring programs required in Order Nos. R-2007-0001, R9-2009-002, and R9-2010-0016; plus participation in: hydromodification management plan monitoring approved by the San Diego Water Board, monitoring plans as part of load reduction plans (either Bacteria Load Reduction Plans or Comprehensive Load Reduction Plans) for TMDLs in Attachment E of the Order, Storm Water Monitoring Coalition Regional Monitoring, Southern California Bight Regional Monitoring, Sediment Quality Monitoring, and ASBS Monitoring as applicable to a Watershed Management Area.

Provision D.1.a also provides an opportunity for the Copermittees to use third party data to meet receiving water monitoring requirements where feasible. Allowing the Copermittees to use the data currently collected through its participation in existing regional receiving water programs and that of third parties provides an efficiency of resources in obtaining the data necessary to inform the Copermittees and the San Diego Water Board about the physical, chemical, and biological conditions of the receiving waters, which can also help to focus the receiving water monitoring during the implementation of the Water Quality Improvement Plan. Once a Water Quality Improvement Plan is developed for a Watershed Management Area in compliance with Provision B of this Order, the transitional period is over and Copermittees are required to conduct receiving water monitoring according to the requirements of Provisions D.1.b-e.

Provision D.1.b requires each Copermittee to identify at least one long term receiving water monitoring station to be representative of receiving water quality within each Watershed Management Area. Long term receiving water monitoring stations can be

located at any existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees. The requirements under Provision D.1.b. are consistent with 40 CFR 122.26(d)(2)(iii)(D), which specifies that a "*monitoring program for representative data collection for the term of the permit*" may include "*instream locations.*" For each Watershed Management Area, at least one long term watershed monitoring station is required to be established and monitored. The Copermittees may choose to establish additional long term monitoring stations where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

Provision D.1.b. requires the Copermittees to locate the long term receiving water monitoring station at one of these existing receiving water monitoring stations to provide the Copermittees an opportunity to experience monitoring cost savings while continuing to collect the necessary data to assess the status and trends of receiving water quality conditions in 1) coastal water, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under both dry weather and wet weather conditions. Ideally these stations will continue to be monitored as part of the receiving water monitoring for each Watershed Management Area to maintain a consistent set of locations and a period of data that can be built upon with the monitoring required under this Order.

The receiving water monitoring requirements are separated into monitoring required during dry weather conditions pursuant to Provision D.1.c, and wet weather conditions pursuant to Provision D.1.d.

At each long term monitoring station the Copermittees must conduct at least three dry weather monitoring events as required pursuant to Provision D.1.c and at least three wet weather monitoring events as required pursuant to Provision D.1.d per permit term. Provisions D.1.c and D.1.d require the Copermittees to monitor priority water quality conditions identified in the Water Quality Improvement Plan, constituents listed as causing impairment of receiving waters in the Watershed Management Area, applicable NALs, toxicity, constituents listed in Tables D-2 and D-3, and constituents for implementation plans (e.g. Bacteria Load Reduction Plans and Comprehensive Load Reduction Plans). Required toxicity monitoring was changed to reflect an updated understanding of the unique challenges associated with sampling storm water for toxicity. Copermittees are required to sample storm water for toxicity during each dry weather and each wet weather event pursuant to Provision D.1.c.(4) and D.1.d.(4). Required toxicity monitoring is now consistent with the State Water Resources Control Board Policy for Toxicity Assessment and Control (Draft June 2012) and recently adopted MS4 permits for Caltrans and Los Angeles Water Board. Receiving water monitoring efforts in this Order have been streamlined to redirect resources to monitoring efforts that better support pollutant reduction solutions with an increasing emphasis on MS4 outfall monitoring, source identification and source abatement activities.

In addition to the receiving water monitoring requirements under Provisions D.1.b-d, Provision D.1.e requires the Copermittees participate in and/or conduct other types of receiving water monitoring. As recommended and requested by the Copermittees, Provision D.1.e.(1) requires the Copermittees to participate in existing regional monitoring, as applicable to each Watershed Management Area. Existing regional monitoring includes monitoring conducted by the Storm Water Monitoring Coalition and for the Southern California Bight. Participation in and use of monitoring data collected from these existing regional water quality monitoring programs provide the Copermittees a greater opportunity for efficiency in the use of their resources to manage their storm water programs and those controllable discharges under their authority. Provision D.1.e.(1)(c) requires the south Orange County MS4 Copermittees to participate in "unified regional beach water quality monitoring." This monitoring replaces requirements to conduct "core monitoring" of beach water quality, as provided for in Appendix III of the 2012 California Ocean Plan.

Several different public agencies currently conduct routine, ongoing beach water quality monitoring in south Orange County in accordance with several different sets of requirements. The monitoring programs implemented to meet those requirements overlap temporally and spatially. These monitoring programs are partially but not fully integrated. In November 2010, the State Water Board adopted Resolution No. 2010-0053, which directed regional water boards to work with dischargers to modify beach water quality monitoring programs required by regional board-issued permits in order to eliminate redundancies and incorporate beach water quality monitoring required by beach water quality statutes, where appropriate.

In April 2012, the San Diego Water Board requested that its staff review beach water quality monitoring conducted in south Orange County. To assist in responding to that request, staff of the Board convened a workgroup that included representatives of the three public agencies that currently conduct almost all of the routine, ongoing beach water quality monitoring in south Orange County, i.e., South Orange County Wastewater Authority (SOCWA), Orange County Public Works, and Orange County Health Care Agency (OCHCA). The workgroup also included other interested parties, including representatives of the Sierra Club and Surfrider Foundation. In December 2012, the San Diego Water Board adopted Resolution No. R9-2012-0069, which endorsed the San Diego Water Board staff report entitled "A Framework for Monitoring and Assessment in the San Diego Region," dated November 2012.

The unified program is consistent with and will meet or exceed the minimum requirements for beach water quality monitoring and related public notification and reporting established by State law, including the California Ocean Plan. The unified program is consistent with State Water Board Resolution No. 2010-0053. The unified program is also consistent with and will help implement, "A Framework for Monitoring and Assessment in the San Diego Region," which emphasizes the need for question-driven, beneficial use-oriented monitoring and assessment. The primary purpose of

the unified program will be to answer the question "Does beach water quality meet standards for the beneficial use of water contact recreation?"

The unified program is intended to be protective; it will help protect the health of swimmers, surfers, and others who use south Orange County beach waters for water contact recreational activities. The unified program is also intended to be reasonable; it will eliminate duplicative monitoring and will include triggers for public notification and additional sampling at all sampling stations year-round. The unified program is intended to be equitable; responsibility for implementation of the unified program will be shared and the responsible agencies will jointly make arrangements to implement the program and will have the flexibility to jointly make short and/or long term changes in those arrangements.

The San Diego Water Board Executive Officer issued a written directive on December 5, 2014, pursuant to California Water Code section 13383, for SOCWA and the south Orange County MS4 Copermittees to implement the unified program in cooperation with OCHCA. The Executive Officer may make revisions to the unified program, provided that the unified program, as revised, continues to be consistent with and meet the requirements of State law, including the California Ocean Plan, for beach water quality monitoring and related public notification and reporting. Following a thirty day public comment period, and subject to a request for a hearing before the San Diego Water Board, any such revision shall take effect as specified in a written directive issued by the Executive Officer pursuant to California Water Code sections 13383. The program and any Executive Officer issued revisions to the program are subject to California Water Code section 13320 right of review from the date of issuance.

The unified program will supersede the existing routine, ongoing, beach water quality monitoring programs in south Orange County that are conducted in accordance with the existing requirements of the NPDES permits for discharges from the SOCWA ocean outfalls and the south Orange County MS4s. The requirement to participate in "regional monitoring" of beach water quality replaces requirements to conduct "core monitoring" of beach water quality, as provided for in Appendix III of the 2012 California Ocean Plan.

The State Water Resources Control Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part 1 Sediment Quality which became effective August 25, 2009 (Sediment Quality Monitoring Policy). Provision D.1.e.(2) requires any Copermittees with MS4 discharges to an enclosed bay or estuary to monitoring the sediments in the enclosed bay or estuary receiving water in accordance with the sediment quality monitoring procedures as prescribed in the Sediment Quality Monitoring Policy.

The State Water Board adopted Resolution No. 2012-0012 which approved exceptions to the California Ocean Plan for selected discharges into Areas of Special Biological

Significance (ASBS), including special protections for beneficial uses. State Board Resolution No. 2012-0012 became effective on March 20, 2012, and Attachment B to the Resolution established limitations on point source storm water discharges to ASBS. Copermittees with MS4s that discharge to an ASBS must monitor its discharge to assure compliance with State Board Resolution No. 2012-0012 as required pursuant to Provision D.1.e.(3).

The San Diego Water Board is currently developing a regional monitoring strategy to assess the conditions of receiving waters in the San Diego Region. The monitoring requirements of Provision D.1 are expected to be incorporated or serve as a foundation of this regional monitoring strategy, but may require some modifications. When the San Diego Water Board develops an alternative regional monitoring strategy, the Copermittees will be required to participate in the development and implementation of the alternative regional monitoring program pursuant to Provision D.1.f.

Provision D.2 (MS4 Outfall Discharge Monitoring Requirements) specifies the minimum MS4 outfall discharge monitoring requirements that the Copermittees must incorporate and implement as part of the Water Quality Improvement Plan.

The dry weather MS4 outfall discharge monitoring requirements are included under Provisions D.2.a.(2) and D.2.b. The dry weather MS4 outfall discharge monitoring requirements are part of the "*program, including a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer*" required by 40 CFR 122.26(d)(2)(iv)(B), which is expected to achieve compliance with the CWA section 402(p)(3)(B)(ii) statutory requirement for municipal storm water permits to require the Copermittees to "*effectively prohibit non-storm water discharges into the storm sewers*." The dry weather MS4 outfall discharge monitoring data collection requirements are based on requirements under 40 CFR 122.26(d)(1)(iv)(D) and 122.26(d)(2)(iv)(B)(3).

The dry weather MS4 outfall discharge monitoring requirements are designed to provide wide spatial and temporal coverage of each jurisdiction to better understand the extent and magnitude of non-storm water discharges to receiving waters, and make a distinction between persistent and transient non-storm water flows. This information is expected to allow each Copermittee to focus its resources on eliminating and controlling the highest priority threats to receiving water quality, as well as integrating other elements of the storm water programs (e.g. complaint call response) and third party data to efficiently and effectively assist in efforts to eliminate non-storm water discharges.

The dry weather MS4 outfall discharge monitoring requirements of Provision D.2.a.(2) and D.2.b are separated into monitoring required before and after the San Diego Water Board accepts the Copermittees' Water Quality Improvement Plan. Outfall

monitoring conducted prior to acceptance of the Water Quality Improvement Plan is referred to in the Order as Transitional MS4 Outfall Discharge Monitoring. Provision D.2.a.(2) includes the transitional dry weather MS4 outfall discharge monitoring requirements.

The requirements under Provision D.2.a.(2) are based on the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B), which include the requirements for a monitoring program to identify, detect, and eliminate illicit connections and illegal discharges to the MS4s. The federal regulations (40 CFR 122.26(d)(1)(iv)(D)) require the monitoring program to include "*a field screening analysis for illicit connections and illegal dumping [that]…[a]t a minimum, include[s] a narrative description, for either each field screening point or major outfall, of visual observations made during dry weather periods.*" The federal regulations (40 CFR 122.26(d)(1)(v)(B)) require the monitoring program to include "*inspection procedures and methods for detecting and preventing illicit discharges, and describe areas where this program has been implemented.*" Furthermore, the monitoring program is required by federal regulations (40 CFR 122.26(d)(2)(iv)(B)) to include "*a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer.*"

Dry weather transitional MS4 outfall discharge monitoring requires each Copermittee to field screen (inspect) its major MS4 outfalls to classify the MS4 outfall locations as having persistent dry weather flows, transient dry weather flows, or no dry weather flows. To account for the variance in size of the 39 jurisdictions covered under this Order, the Copermittees recommended a tiered approach to the number of major MS4 outfalls that must be inspected. Provision D.2.a.(2)(a) provides a tiered approach to the number of major MS4 outfalls that must be visually inspected per jurisdiction as well as a minimum frequency each Copermittee must inspect each major MS4 outfall per year. This tiered approach is based on the total number of major MS4 outfalls within a Copermittees jurisdiction within each Watershed Management Area.

Based on the field screening, each Copermittee is required to make a determination whether any observed flowing, pooled, or ponded waters are transient or persistent flows. Based on this field screening information, other jurisdictional program information, and third party information, each Copermittee is required to prioritize the MS4 outfalls within its jurisdiction for follow up investigation and elimination of the non-storm water discharge, as part of its illicit discharge detection and elimination program required pursuant to Provision E.2. In accordance with the requirements of Provision E.2, each Copermittee is required to immediately investigate obvious illicit discharges (e.g. outfall discharges with unusual color, unusual odor, or high flows).

This approach allows a Copermittee to use all of its resources, as well as leverage resources and information provided by third parties, to effectively eliminate non-storm water discharges from its MS4 outfalls. If the source of the non-storm water discharge cannot be immediately eliminated, the Copermittee uses the persistent flow or

transient flow classification along with other programmatic implementation data to prioritize the MS4 outfalls for future investigation. In accordance with the adaptive management approach deployed throughout this Order, Provision D.2.a.(2)(c) requires each Copermittee to update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow. The requirement of Provision D.2.a.(2)(c) assures that each Copermittee is collecting data that can be used to demonstrate compliance with the CWA requirement that each Copermittee must implement a program to "*effectively prohibit non-storm water discharges into the [MS4]*" and with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

Provision D.2.b describes the dry weather MS4 outfall discharge monitoring required to be incorporated and implemented as part of the Water Quality Improvement Plan. Dry weather MS4 outfall discharge monitoring must be performed by each Copermittee to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. The emphasis of the dry weather MS4 outfall discharge monitoring required pursuant to Provision D.2.b is consistent with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

Provision D.2.b.(1) requires each Copermittee to continue field screening its major MS4 outfalls and identifying those with persistent flows and transient flows, as conducted during the transitional period (i.e. before the Water Quality Improvement Plan was developed). However, each Copermittee now has the flexibility to adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of non-storm water persistent flow discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan. In order to ensure a minimum number of outfalls are inspected, Provision D.2.b.(1) requires the number of visual inspections be equal to the number of visual inspections required in the tiered inspection program pursuant to Provision D.2.a.(2)(a).

Provision D.2.b.(2)(b) requires each Copermittee to monitor a minimum of 5 major MS4 outfalls with persistent flows identified as the highest priorities within a Copermittee's jurisdiction, within each Watershed Management Area. In other words, Copermittees located in more than one Watershed Management Area must identify at least 5 major MS4 outfalls with persistent flows in its jurisdiction in each Watershed Management Area. If a Copermittee is located in more than one Watershed Management Area, and they have less than 5 major MS4 outfalls with persistent flows per jurisdictional area per Watershed Management Area, all of the major MS4 outfalls must be identified as high priority dry weather persistent flow MS4 outfalls. The Copermittees identified as Responsible Copermittees by a TMDL in Attachment E of

the Order may need to monitor more than 5 dry weather major MS4 outfall locations to determine compliance with the requirements of the TMDL(s).

Monitoring must occur at the highest priority outfall locations at least semi-annually until the non-storm water discharges have been eliminated for three consecutive dry weather monitoring events; identified to be authorized by a separate NPDES Permit; or reprioritized to a lower priority. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized MS4 major outfall in the Copermittee's jurisdiction within the Watershed Management Area, unless there are no remaining qualifying major MS4 outfalls within the Copermittees jurisdiction. The Copermittees must continually update their dry weather persistent flow MS4 outfall discharge monitoring locations with the next highest priority non-storm water flow that have yet to be eliminated until all persistent and transient flows are eliminated or its threat reduced.

Non-storm water persistent flow MS4 outfall discharge monitoring data collected during each semi-annual monitoring event, must be collected and analyzed according to the requirements of Provision D.2.b.(2)(b)–(e). These monitoring requirements are consistent with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

The wet weather MS4 outfall discharge monitoring requirements are included under Provisions D.2.a.(3) and D.2.c. The wet weather MS4 outfall discharge monitoring requirements are necessary for the Copermittees to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable, using management practices, control techniques and system, design and engineering methods, and such other provisions which are appropriate*" required by 40CFR 122.26(d)(2)(iv), which is expected to achieve compliance with the CWA section 402(p)(3)(B)(iii) statutory requirement for municipal storm water permits to require "*controls to reduce the discharge of pollutants [in storm water] to the maximum extent practicable*." The wet weather MS4 outfall discharge monitoring data collection requirements are based on requirements under 40 CFR 122.26(d)(2)(iii), 122.26(d)(2)(iii)(A) and 122.26(d)(2)(iii)(A)(1)-(4), and 40 CFR 122.21(g)(7)(i)-(ii).

The wet weather MS4 outfall discharge monitoring requirements of Provision D.2.a.(3) and D.2.c are separated into monitoring required before and after the San Diego Water Board accepts the Copermittees' Water Quality Improvement Plan. Outfall monitoring conducted prior to acceptance of the Water Quality Improvement Plan is referred to in the Order as Transitional MS4 Outfall Discharge Monitoring. Provision D.2.a.(3) includes the transitional wet weather MS4 outfall discharge monitoring requirements.

Until the wet weather MS4 outfall discharge monitoring requirements of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board, the Copermittees must comply with the requirements of

transitional wet weather MS4 outfall monitoring requirements pursuant to Provision D.2.a.(3). Provision D.2.a.(3) requires the Copermittees in each Watershed Management Area to sample, at least five of the major MS4 outfalls inventoried pursuant to Provision D.2.a.(1) once per wet season for the monitoring data required to be collected pursuant to Provision D.2.a.(3)(c)-(e). Provision D.2.a.(3) further requires at least one major MS4 outfall monitoring station be located in each Copermittee's jurisdiction within the Watershed Management Area.

At a minimum, the five sampling locations chosen must be representative of storm water discharges from residential, commercial, industrial, and typical mixed-use land uses present within a Watershed Management Area. The San Diego Water Board expects the Copermittees to extrapolate from these data to similar land uses throughout the Watershed Management Area to better inform the Water Quality Improvement Plan development process by prioritizing drainages for implementation of storm water control efforts required pursuant to Provision E.

Provision D.2.c describes the wet weather MS4 outfall discharge monitoring required to be included and implemented as part of the Water Quality Improvement Plan. Provision D.2.c provides the Copermittees the flexibility to adjust the wet weather MS4 outfall discharge monitoring locations and frequencies in the Watershed Management Area, as needed, to identify sources of pollutants in storm water discharges from MS4s in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan.

Although Provision D.2.c.(1) allows the Copermittees to adaptively manage the wet weather MS4 outfall discharge monitoring locations and frequencies, the provision requires a minimum of at least five wet weather outfall stations to be monitored. Provision D.2.c.(2) further allows the Copermittees to modify the monitoring frequency at each wet weather MS4 outfall station to meet the goals of the Water Quality Improvement Plan as long as the monitoring frequency occurs at least once per year and is at an appropriate frequency to identify sources of pollutants in storm water discharges, guide pollutant source identification efforts, or determine compliance with the requirements of the applicable TMDLs in Attachment E to the Order.

The wet weather MS4 outfall discharge monitoring requirements of Provisions D.2.c.(3) and D.2.c.(4) are the same as the transitional wet weather MS4 outfall discharge monitoring. In contrast, the requirements of Provision D.2.c.(5) are focused on collecting analytical data specific to the highest priority water quality conditions in the Watershed Management Area identified in the Water Quality Improvement Plan. The wet weather MS4 outfall discharge monitoring data collection requirements are consistent with the requirements under 40 CFR 122.26(d)(2)(iii), 122.26(d)(2)(iii)(A) and 122.26(d)(2)(iii)(A)(1)-(4), and 40 CFR 122.21(g)(7)(i)-(ii).

<u>Provision D.3 (Special Studies)</u> requires the Copermittees to develop special studies that will be conducted for each Watershed Management Area and the entire San

Diego Region. Data collected pursuant to Provision D.3 is to be used by the Copermittees to improve the effectiveness of the strategies implemented by the jurisdictional runoff management programs toward achieving the numeric goals identified in the Water Quality Improvement Plans and ultimately achieve compliance with the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c, and A.2.a, which is consistent with the requirements of Provision A.4.

Special studies are often necessary to fill data gaps or provide more refined information that allow the Copermittees to better manage the generation or elimination of pollutants and discharges to and from the MS4. In the Fourth Term Permits, the Copermittees have been required to implement special studies as directed by the San Diego Water Board. The special studies required by this Order provide the Copermittees more flexibility to identify and implement special studies that will be most useful to improving the effectiveness of their jurisdictional runoff management programs.

Provision D.3.a.(1) requires the Copermittees to develop and conduct at least two special studies per Watershed Management Area, to be determined by the Copermittees. One of the two special studies may be accomplished through participation in a Regional Special Study required under Provision D.3.a.(2). The requirements provide the Copermittees great latitude in identifying and developing the special studies. Watershed Management Area special studies are required, at a minimum, to: (a) relate in some way to the highest water quality priorities identified by the Copermittees in the Water Quality Improvement Plan, (b) be conducted within the Watershed Management Area, and (c) include some form of participation (e.g. contribution of funds, personnel services, project management) by all the responsible Copermittees within the Watershed Management Area.

Examples of Watershed Management Area special studies might include, but are not limited to: (1) focused pollutant source identification studies, (2) BMP effectiveness and/or comparison studies, (3) pilot tests for new or emerging pollutant control methods, (4) receiving water pollutant or stressor source identification and/or mitigation studies, or (5) pollutant fate and transport studies. The Watershed Management Area special studies are expected to provide data that can be utilized by the Copermittees to improve the Water Quality Improvement Plan or implementation of the Copermittees' jurisdictional runoff management programs to address the highest priority water quality conditions.

Provision D.3.a.(2) requires the Copermittees to develop at least one special study that will be conducted for the entire San Diego region. The regional special study is expected to provide data that can be utilized by the Copermittees to improve the Water Quality Improvement Plan or implementation of the Copermittees' jurisdictional runoff management programs to identify or address regional water quality concerns and priorities.

An example of a regional special study would be to develop and establish allowable exceedance frequencies of the bacteria water quality objectives for several types of water bodies, during different wet and dry weather conditions the San Diego region. The special study would be related to bacteria, which is a priority for the San Diego region due to the adoption of "*Bacteria TMDL Project I – Beaches and Creeks in the San Diego Region*." The study results could be used to inform the Copermittees and the San Diego Water Board about the indictor bacteria water quality objective exceedance frequencies that occur in natural or reference watersheds.

Provision D.4 (Assessment Requirements) specifies the assessments that the Copermittees are required to perform, based on the monitoring data collected, and will be reported as part of the Annual Report for the Water Quality Improvement Plan implementation. Provision D.4 requires the Copermittees assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c, and A.2.a.

Provision D.4 specifies the assessments that Copermittees must perform for each Watershed Management Area to assess the effectiveness of each Copermittee's jurisdictional runoff management program and the Water Quality Improvement Plan. The effectiveness of each Copermittee's jurisdictional runoff management program and Water Quality Improvement Plan is measured through these types of assessments: (a) Receiving Waters Assessments (b) MS4 Outfall Discharges Assessments, (c) Special Studies Assessments, and (d) Integrated Assessment of Water Quality Improvement Plan.

Provision D.4.a requires the Copermittees to assess the status of receiving water conditions annually during the transitional monitoring period (during development of the Water Quality Improvement Plan) and after acceptance of the Water Quality Improvement Plan. The monitoring data collected pursuant to Provision D.1 will be evaluated, among other information, to assess the condition of a Watershed Management Area's streams, coastal waters, enclosed bays, harbors, estuaries, and lagoons. The focus of the receiving waters assessments is to measure progress toward the objective of the CWA to "*restore and maintain the chemical, physical, and biological integrity of the Nation's waters*" as the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program are implemented within a Watershed Management Area. Provision D.4.a is consistent with 40 CFR 122.42(c)(7) which requires the Copermittees to annually report the *"[i]dentification of water quality improvements or degradation."*

Provision D.4.b includes the MS4 outfall discharges assessment requirements. The focus of MS4 outfall discharges assessments is to determine if the Copermittees' are implementing programs that comply with the requirements of the CWA for MS4 permits to "*effectively prohibit non-stormwater discharges into the storm sewers*" and "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable.*" The monitoring data collected pursuant to Provisions D.2 will be

evaluated, among other information, to assess the effectiveness of the transitional MS4 outfall field screening monitoring, the implementation of the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program. The MS4 outfall discharge assessments consist of Non-Storm Water Discharges Reduction Assessments and Storm Water Pollutant Discharges Reduction Assessments.

The Non-Storm Water Discharges Reduction Assessments are how each Copermittee will demonstrate that its jurisdictional runoff management program implementation efforts are achieving the CWA requirement to "*effectively prohibit non-stormwater discharges into the storm sewers.*" Provision D.4.b.(1) requires each Copermittee to assess and report on its illicit discharge detection and elimination program required pursuant to Provision E.2 to reduce and effectively prohibit non-storm water and illicit discharges into the MS4 within its jurisdiction. The Non-Storm Water Discharges Reduction Assessments include specific assessment requirements applicable to each Copermittee.

As each Copermittee collects and analyzes the data collected pursuant to dry weather MS4 outfall discharges monitoring requirements of Provisions D.2.a.(2) and D.2.b, Provision D.4.b.(1) requires each Copermittee to assess the progress, assess the effectiveness of its current actions, and identify modifications necessary to increase the effectiveness of its actions toward reducing and eliminating non-storm water and illicit discharges to its MS4. The findings from these assessments are expected to be utilized by the Copermittee as part of its procedures to prioritize the non-storm water discharges that will be addressed by its Illicit Discharge Detection and Elimination program required pursuant to Provision E.2.

The assessment requirements of Provision D.4.a.(1) are consistent with 40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(3) which require "*procedures…to investigate portions of the separate storm sewer system that, <u>based on the results of the field screen, or other appropriate information</u> [emphasis added], indicate a reasonable potential of contain illicit discharges or other sources of non-storm water*" as part of a "*program…to detect and remove…illicit discharges and improper disposal into the storm sewer.*" The assessment requirements of Provision D.4.a.(1) are also consistent with 40 CFR122.42(c)(1) requires the Copermittees to annually report the "*status of implementing the components of the storm water management program that are established as permit conditions.*"

The Storm Water Pollutant Discharges Reduction Assessment is how the Copermittees in each Watershed Management Area will demonstrate that their jurisdictional runoff management program implementation efforts are achieving the CWA requirement to "*reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable*." Provision D.4.b.(2) requires the Copermittees in each Watershed Management Area to assess and report the progress of the Copermittees' efforts to reduce pollutants in storm water discharges from the MS4s to the MEP. The

Storm Water Pollutant Discharges Reduction Assessments include specific assessment requirements during both the transitional monitoring period and after acceptance of the Water Quality Improvement Plan applicable to the Watershed Management Area and each Copermittee.

As the Copermittees collect and analyze the data collected pursuant to wet weather MS4 outfall discharges monitoring requirements of Provisions D.2.a.(3) and D.2.c, Provision D.4.b.(2) requires the Copermittees to assess runoff conditions during the transitional period, and the progress of the Water Quality Improvement Plan strategies toward reducing pollutants in storm water from the MS4 to the MEP. The findings from these assessments are expected to be utilized by the Copermittees to identify any modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify sources of pollutants in storm water discharges from the MS4s, as well as focus, modify, and improve the water quality improvement strategies implemented by each Copermittee within its jurisdiction to reduce pollutants in storm water discharges to the MEP.

The assessment requirements of Provision D.4.b.(2) are consistent with 40 CFR 122.26(d)(2)(iii)(B) which requires "*[e]stimates of the annual pollutant load of the cumulative discharges to waters of the United States from all identified municipal outfalls…during a storm event…accompanied by a description of the procedures for estimating constituent loads and concentrations, including any modeling, data analysis, and calculation methods.*" The assessment requirements of Provision D.4.a.(2) are consistent with 40 CFR 122.26(d)(2)(v) which requires that each Copermittee assesses the *"estimated reductions in loadings of pollutants from discharges of municipal storm sewer constituents from municipal storm sewer systems expected as the result of the municipal storm water quality management program."* The assessment requirements of Provision D.4.b.(2) are also consistent with 40 CFR122.42(c)(1) requires the Copermittees to annually report the "*status of implementing the components of the storm water management program that are established as permit conditions.*"

Provision D.4.c includes the special studies assessment requirements. Performing special studies are how the Copermittees will address data gaps identified during the development of and updates to the Water Quality Improvement Plan. The relevant findings from the special studies assessments are expected to be incorporated as part of the applicable receiving water assessments, MS4 outfall discharge assessments, and integrated water quality improvement assessments required in Provision D.4.a, D.4.b, and D.4.d, respectively.

The assessment requirements in Provision D.4.d are part of the iterative approach and adaptive management process required by Provision A.4. The Copermittees are required to integrate the data collected pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to re-evaluate the Water Quality Improvement Plan.

The monitoring data collected pursuant to Provisions D.1 and D.2, and the results of the assessment required pursuant to Provisions D.4.a-c, will be used to determine whether the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program are effective, or require modifications or improvements to become more effective to achieve the requirements of the CWA. The assessments required by Provision D.4.d are consistent with 40 CFR 122.42(c)(1) which requires that the Copermittees to report the *"[t]he status of implementing the components of the storm water management program that are established as permit conditions."*

E. Jurisdictional Runoff Management Programs

Purpose: Provision E includes the requirements for the jurisdictional runoff management programs to be implemented by each of the Copermittees. Compliance with the requirements for the jurisdictional runoff management programs will allow the Copermittees to demonstrate that they are implementing programs to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP. The jurisdictional runoff management program document prepared by each Copermittee will also provide the details for implementing the water quality improvement strategies identified in the Water Quality Improvement Plan specifically within its jurisdiction.

***Discussion*:** Implementation of the jurisdictional runoff management program requirements under Provision E is how the Copermittees "*effectively prohibit non-stormwater discharges into the storm sewer,*" and outlines the "*controls to reduce the discharge of pollutants to the maximum extent practicable"* consistent with the federal regulations under 40 CFR 122.26. The jurisdictional runoff management program is part of the "*comprehensive planning process*" that is required pursuant to 40 CFR 122.26(d)(2)(iv). Where the Water Quality Improvement Plan is the "*comprehensive planning process*" on a Watershed Management Area scale, requiring "*intergovernmental coordination,*" the jurisdictional runoff management program document is the "*comprehensive planning process*" on a jurisdictional scale that should be coordinated with the other Copermittees in the Watershed Management Area to achieve the goals of the Water Quality Improvement Plan.

The jurisdictional runoff management program requirements are included to provide each Copermittee criteria that can be used to demonstrate that its storm water management program is implementing the "*comprehensive planning process*" within its jurisdiction to "*effectively prohibit non-stormwater discharges into the storm sewers,*" and to identify and implement the most effective "*controls to reduce the discharge of pollutants to the maximum extent practicable"* in accordance with the performance standards given in the CWA.

Provision E includes the requirements for each of the components that must be included in the Copermittee's jurisdictional runoff management program document that will be implemented by the Copermittee within its jurisdiction. Implementation of the components of each Copermittee's jurisdictional runoff management program must incorporate the water quality improvement strategies identified by each Copermittee in the Water Quality Improvement Plans, described pursuant to Provision B.3.b.(1)(a).

More specific and detailed discussions of the requirements of Provision E are provided below.

Provision E.1 (Legal Authority Establishment and Enforcement) requires each Copermittee to establish and enforce sufficient legal authority to control discharges to the MS4 within its jurisdiction.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system*" and be able to demonstrate that it can "*operate pursuant to legal authority established by statute, ordinance or series of contracts.*" Provision E.1.a describes the minimum legal authorities each Copermittee must establish for itself within its jurisdiction to control discharges to its MS4. The requirements of Provision E.1.a are consistent with the requirements set forth in 40 CFR 122.26(d)(2)(i)(A)-(F).

The certification statement required from each Copermittee by Provision E.1.b is included to provide the San Diego Water Board additional documentation that each Copermittee has established the legal authorities consistent with Provision E.1.a and 40 CFR 122.26(d)(2)(i)(A)-(F), and the Copermittee can "*operate pursuant to legal authority established by statute, ordinance or series of contracts.*"

Provision E.2 (Illicit Discharge Detection and Elimination) requires each Copermittee to implement an illicit discharge detection and elimination program to effectively prohibit non-storm water discharges to the MS4 by actively detecting and eliminating illicit discharges and disposal into its MS4.

Provision E.2 establishes the minimum requirements that each Copermittee must implement within its jurisdiction to effectively prohibit non-storm water discharges from entering its MS4. The federal CWA requires permits for municipal storm sewer systems to "*effectively prohibit non-storm water discharges into the storm sewers*." The federal regulations (40CFR122.26(d)(2)(i)(B)) require each Copermittee to establish the legal authority to prohibit illicit discharges to its MS4s. Under 40 CFR 122.26(d)(2)(iv)(B), each Copermittee must implement a "*program…to detect and remove…illicit discharges and improper disposal into the storm sewer.*" The federal NPDES regulations, under 40 CFR 122.26(b)(2), define illicit discharges as "*any discharge to a municipal separate storm sewer that is not composed entirely of storm water*." Thus, non-storm water discharges are not authorized to enter the MS4 and are considered to be illicit discharges, unless authorized by a separate NPDES permit.

The Phase I Final Rule clarifies that non-storm water discharges through an MS4 are not authorized under the CWA (55 FR 47995):

> "*Today's rule defines the term "illicit discharge" to describe any discharge through a municipal separate storm sewer system that is not composed entirely of storm water and that is not covered by an NPDES permit. Such illicit discharges are not authorized under the Clean Water Act. Section 402(p)(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm*

sewer…Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit."

The federal NPDES requirements for the program to address illicit discharges must include "*inspections, to implement and enforce an ordinance, orders, or other similar means to prevent illicit discharges to the MS4*." The federal NPDES regulations also reference several categories of "*non-storm water discharges or flows* [which] *shall be addressed where such discharges are identified…as sources of pollutants to waters of the United States*." The Phase I Final Rule (55 FR 48037) further clarified the requirements of 40 CFR 122.26(d)(2)(iv)(B)(1) as follows:

"*EPA is clarifying that section 402(p)(3)(B) of the CWA (which requires permits for municipal separate storm sewers to 'effectively' prohibit non-storm water discharges) does not require permits for municipalities to prohibit certain discharges or flows of nonstorm water to waters of the United States through municipal separate storm sewers in all cases*."

In previous iterations of the municipal storm water permits for the San Diego Region, these categories were simply listed and referred to as categories of non-storm water discharges "not prohibited" unless identified as a source of pollutants. The Copermittees have often referred to these categories as "exempt" discharges. In both cases, however, the language is inconsistent with the federal CWA and NPDES regulations. And, the clarification provided in the Phase I Final Rule does not specifically state that such discharges are "not prohibited" or "exempt" or in any way authorized. The federal NPDES regulations do, however, state that specific categories of non-storm water discharges must be "*addressed*" if identified as "*sources of pollutants to waters of the United States*."

The language of Provision E.2.a has been revised to be fully consistent with the language of the CWA and the requirements of the federal regulations under 40 CFR 122.26(d)(2)(iv)(B)(1). Provision E.2.a requires each Copermittee to address <u>all</u> types of non-storm water discharges into its MS4 as illicit discharges, <u>unless</u> the discharge is authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to Provisions E.2.a.(1) through E.2.a.(5). Only non-NPDES-permitted non-storm water discharges identified as a category of non-storm water discharges under Provisions E.2.a.(1) through E.2.a.(5) <u>and</u> *not identified as a source of pollutants* do not have to be addressed as illicit discharges. Categories of non-storm water discharges that meet the requirements of Provisions E.2.a.(1) through E.2.a.(5) do not have to be addressed by the Copermittee as illicit discharges.

Several of the non-storm water categories listed in 40 CFR 122.26(d)(2)(iv)(B)(1) have not been included in Provisions E.2.a.(1) through E.2.a.(5), including: street wash water, landscape irrigation, irrigation water, and lawn watering. Because these are no

longer included within the categories listed under Provisions E.2.a.(1) through E.2.a.(5), the Copermittees must prohibit these types of non-storm water discharges from entering the MS4. This is consistent with the clarification of 40 CFR 122.26(d)(2)(iv)(B)(1) in the Phase I Final Rule (55 FR 48037), which states:

> "*[T]he Director may include permit conditions that either require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*."

Street wash water is a category of non-storm water discharges that was removed when the Third Term Permits were issued. Street wash water is a source of several pollutants (e.g., metals, oil and grease, petroleum hydrocarbons, chlorinated solvents, sediment) which are generated during the street washing process. The removal of this category requires the Copermittees to prohibit this type of non-storm water discharge from entering the MS4.

The landscape irrigation, irrigation water, and lawn watering categories, collectively referred to hereafter as "over-irrigation" discharges, were removed from the list of non-storm water discharge categories in the Fourth Term Orange County and Riverside County Permits. Non-storm water discharges resulting from over-irrigation have been found to be a source of several types of pollutants (e.g., nutrients, bacteria, pesticides, sediment) in receiving waters. The San Diego Water Board and the Copermittees have identified categories of non-storm water discharges associated with over-irrigation as a source of pollutants and conveyance of pollutants to the MS4 and waters of the United States in the following documents:

- **SmartTimer/Edgescape Evaluation Program (SEEP) Grant Application**

  The State Water Board allocated grant funding to the SEEP project grant application submitted in 2006, which targeted irrigation runoff by retrofitting areas of existing development and documenting the conservation and runoff improvements. The basis of this grant project is that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 is a source and conveyance of pollutants. In addition, the grant application indicated that this alteration of natural flows is impacting the beneficial uses of waters of the state and U.S. Results from the study indicate that that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 *is* a source and conveyance of pollutants. The results of this study can be applied broadly to any area where over-irrigation takes place. The grant application included the following statements:

  > "*Irrigation runoff contributes flow & pollutant loads to creeks and beaches that are 303(d) listed for bacteria indicators.*"
  >
  > "*Regional program managers agree that the reduction and/or elimination of irrigation-related urban flows and associated pollutant loads may be key to successful attainment of water quality and beneficial use goals as outlined in*

the San Diego Basin Plan and Bacteria TMDL over the long term."

"*Elevated dry-weather storm drain flows, composed primarily … of landscape irrigation water wasted as runoff, carry pollutants that impair recreational use and aquatic habitats all along Southern California's urbanized coastline. Storm drain systems carry the wasted water, along with landscape derived pollutants such as bacteria, nutrients and pesticides, to local creeks and the ocean. Given the local Mediterranean climate, excessive perennial dry season stream flows are an unnatural hydrologic pattern, causing species shifts in local riparian communities and warm, unseasonal contaminated freshwater plumes in the near-shore marine environment.*"

- **2006-2007 Orange County Watershed Action Plan Annual Reports**

The Watershed Action Plan Annual Reports for the 2006-2007 reporting period were submitted by the County of Orange, Orange County Flood Control District and Copermittees within the San Juan Creek, Laguna Coastal Streams, Aliso Creek, and Dana Point Coastal Streams Watersheds. San Juan Creek, Laguna Coastal Streams, Aliso Creek and Dana Point Coastal Streams are all currently 303(d) listed as impaired for indicator bacteria within their watersheds and/or in the Pacific Ocean at the discharge points of their watersheds. The Orange County Copermittees, within their Watershed Action Strategy Table for fecal indicator bacteria included the following:

"*Support programs to reduce or eliminate the discharge of anthropogenic dry weather nuisance flow throughout the…watershed. Dry weather flow is the transport medium for bacteria and other 303(d) constituents of concern.*"

Additionally, they state that "*conditions in the MS4 contribute to high seasonal bacteria propagation in-pipe during warm weather. Landscape irrigation is a major contributor to dry weather flow, both as surface runoff due to over-irrigation and overspray onto pavements; and as subsurface seepage that finds its way into the MS4*."

- **Fiscal Year 2008 Carlsbad Watershed Urban Runoff Management Program Annual Report**

The Carlsbad Watershed Urban Runoff Management Program Annual Report for Fiscal Year 2008 was submitted by the Carlsbad Watershed Copermittees (Cities of Carlsbad, Encinitas, Escondido, Oceanside, San Marcos, Solana Beach, and Vista, and the County of San Diego). In the Annual Report, the Carlsbad Watershed Copermittees stated the following:

"The Carlsbad Watershed Management Area (WMA) collective watershed

strategy identifies bacteria, sediment, and nutrients as high priority water quality pollutants in the Agua Hedionda (904.3 – bacteria and sediment), Buena Vista (904.2 – bacteria), and San Marcos Creek (904.5 – nutrients) Hydrologic Areas. Bacteria, sediment, and nutrients have been identified as potential discharges from over-irrigation."

- **2007-2008 San Diego Bay Watershed Urban Runoff Management Program Annual Report**

  The San Diego Bay Watershed Urban Runoff Management Program 2007-2008 Annual Report was submitted by the San Diego Bay Watershed Copermittees (Cities of Chula Vista, Coronado, Imperial Beach, La Mesa, Lemon Grove, National City, and San Diego, the County of San Diego, the Port of San Diego, and the San Diego County Airport Authority). In Appendix D of the Annual Report, titled "Likely Sources of Pollutants," the San Diego Bay Watershed Copermittees identified over-irrigation of lawns as a pollutant generating activity from business and/or residential land uses for bacteria, pesticides, and sediment.

- **Copermittee Public Education Materials**

  The Orange County Public Works *Tips for Landscape & Gardening* public education brochure states: "*Fertilizers, pesticides and other chemicals that are left on yards or driveways can be blown or washed into storm drains that flow to the ocean. Overwatering lawns can also send materials into storm drains*."

  The Riverside County Flood Control and Water Conservation District *Landscape and Garden* public education brochure states: *"Soil, yard wastes, over-watering and garden chemicals become part of the urban runoff mix that winds its way through streets, gutters and storm drains before entering lakes, rivers, streams, etc. Urban runoff pollution contaminates water and harms aquatic life!"*

- **Los Peñasquitos Lagoon Sedimentation/Siltation TMDL Technical Report**

  The Los Peñasquitos Lagoon Sedimentation/Siltation TMDL technical report was prepared for the City of San Diego and USEPA in October 2010. The technical report was included as a technical supporting document attached to the Sediment TMDL for Los Peñasquitos Lagoon staff report prepared by the San Diego Water Board, dated June 13, 2012. Under the Source Assessment section, the technical report states the following:

  "*Dry weather loading is dominated by nuisance flows from urban land use activities such as car washing, sidewalk washing, and lawn over-irrigation, which pick up and transport sediment into receiving waters.*"

These documents confirm that non-storm water discharges associated with over-irrigation are a source of pollutants and should be addressed as illicit discharges to the MS4. Prohibiting non-storm water discharges associated with over-irrigation, however, is not a new requirement for the Copermittees because it is also consistent with and required by the Water Conservation in Landscaping Act (AB 1881, Laird).

The Water Conservation in Landscaping Act required the Department of Water Resources (DWR) to prepare a Model Water Efficient Landscape Ordinance for use by local agencies (e.g. the Copermittees). All local agencies were required to adopt a water efficient landscape ordinance by January 1, 2010. Local agencies could adopt the Water Efficient Landscape Ordinance developed by DWR, or an ordinance considered at least as effective as the Model Ordinance. The Water Efficient Landscape Ordinance includes a requirement that local agencies prohibit runoff from irrigation (§ 493.2):

> "*Local agencies shall prevent water waste resulting from inefficient landscape irrigation by* <u>*prohibiting runoff from leaving the target landscape*</u> *[emphasis added] due to low head drainage, overspray, or other similar conditions where water flows onto adjacent property, non-irrigated areas, walks, roadways, parking lots, or structures. Penalties for violation of these prohibitions shall be established locally*."

Furthermore, non-storm water discharges from over-irrigation not only transport and discharge pollutants to receiving waters, but are also a likely source of the dry weather flows causing changes to habitat within and along the receiving water bodies. Examples of habitat changes from the dry weather flows include perennialization of ephemeral streams, and conversion of saltwater and brackish water marsh habitats to freshwater marsh habitats (e.g. Los Peñasquitos Lagoon). Both of these examples have resulted in the promotion of invasive species in several areas of the San Diego Region.

The removal of the over-irrigation discharges categories does not require the Copermittees to strictly prohibit lawn and landscape irrigation, but does require the prohibition of excessive irrigation water that results in non-storm water discharges to the MS4. Non-storm water discharges to the MS4 from over-irrigation must be addressed as illicit discharges by the Copermittees pursuant to the requirements of Provision E.2.

The remaining non-storm water categories listed in 40 CFR 122.26(d)(2)(iv)(B)(1) are listed under Provisions E.2.a.(1) through E.2.a.(5) and generally fall into four categories: (1) non-storm water discharges subject to existing San Diego Water Board waste discharge requirements and NPDES permits; (2) non-storm water discharges generally not expected to be a source of pollutants to receiving waters; (3) non-storm water discharges likely to contain pollutants requiring some form of control to address the pollutants prior to discharging to the MS4; and (4) non-storm water discharges or flows associated with firefighting.

Provisions E.2.a.(1) and E.2.a.(2) include several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) for which the San Diego Water Board already has developed general waste discharge requirements and NPDES permits to address the discharges. The Copermittees are only required to address these types of non-storm water discharges as illicit discharges if the Copermittees or the San Diego Water Board identifies these non-storm water discharges not having coverage under the applicable NPDES permit.

Provision E.2.a.(3) includes several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) which are generally not expected to be a source of pollutants to receiving waters, many of which originate from what are typically natural, uncontrollable sources. The Copermittees are only required to address these types of non-storm water discharges as illicit discharges if the Copermittees or the San Diego Water Board identifies these non-storm water discharges as a source of pollutants to receiving waters. Because many of these sources are generally uncontrollable, enforcing a prohibition may not be a possibility for the Copermittees. The Copermittees would be able to address these non-storm water discharges by preventing these non-storm water discharges from entering the MS4. This could potentially be achieved by sealing their MS4 structures so the discharges cannot enter the MS4.

Provision E.2.a.(4) includes several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) that are likely to contain pollutants requiring some form of control to address the pollutants prior to discharging to the MS4. At this time, an outright prohibition of these types of non-storm water discharges does not yet appear to be warranted. Thus, Provision E.2.a.(4) includes several requirements for the Copermittees to control the pollutants from these types of non-storm water discharges. This is consistent with the clarification of the federal regulations in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board has the authority to require the Copermittees to "*control any of these types of discharges where appropriate*."

Unlike non-storm water discharges from over-irrigation, these types of non-storm water discharges are not expected to occur in close proximity to each other or very frequently. Provided these types of non-storm water discharges are controlled as required in Provision E.2.a.(4), the Copermittees would only be required to address these types of non-storm water discharges as illicit discharges if the Copermittee or the San Diego Water Board identifies these non-storm water discharges as a source of pollutants to receiving waters.

Provision E.2.a.(5) includes specific requirements for fire fighting discharges and flows. The requirements for non-storm water discharges and flows associated with fire fighting have been separated into requirements for: a) non-emergency fire fighting discharges and flows, and b) emergency fire fighting discharges and flows.

The San Diego Water Board has found that discharges from building fire suppression system maintenance (e.g. fire sprinklers) contain waste and potentially a significant source of pollutants to receiving waters. As such, the San Diego Water Board is requiring these discharges be addressed as illicit discharges by the Copermittees. Thus, the discharges to the MS4 are to be prohibited via ordinance, order or similar means. For other non-emergency firefighting discharges and flows (i.e. flows from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems), the Copermittees are required to develop and implement a program to address pollutants in these non-storm water discharges and flows. This is consistent with the clarification of the federal regulations in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board has the authority to require the Copermittees to "*control any of these types of discharges where appropriate*."

For emergency firefighting discharges and flows, the Phase I Final Rule (55 FR 48037) has clarified the requirements of 40 CFR 122.26(d)(2)(iv)(B)(1) pertaining to emergency firefighting flows and discharges, which states:

> "*In the case of firefighting it is not the intention of these rules to prohibit in any circumstances the protection of life and public or private property through the use of water or other fire retardants that flow into separate storm sewers*."

Thus, the requirements have been made to be consistent with the guidance provided by the Phase I Final Rule. The Order recommends that the Copermittees develop and encourage implementation of BMPs to reduce or eliminate the discharge of pollutants from emergency firefighting flows to the MS4s and receiving waters. The Order does not include any requirements that should be interpreted as requiring the implementation of BMPs for emergency firefighting flows to the MS4s and receiving waters.

The Copermittees are expected to review the dry weather MS4 outfall discharge monitoring data they collect to determine if and when there are non-storm water discharges to or from their MS4s that are a source of pollutants to receiving waters. If the Copermittees identify one of the types of non-storm water discharges listed in Provisions E.2.a.(1) through E.2.a.(4) as a source of pollutants to receiving waters based on the review and evaluation of monitoring data, Provision E.2.a.(6) requires the Copermittees to prohibit those categories of discharges from entering the MS4 through ordinance, order or similar means. In addition, Provision E.2.a.(6) clarifies that the San Diego Water Board may identify categories of non-storm water discharges or flows listed under Provisions E.2.a.(1) through E.2.a.(4) that must be prohibited.

Provision E.2.a.(6) also provides the Copermittees an option to propose controls to be implemented for the category of non-storm water discharges as part of the Water Quality Improvement Plan instead of prohibiting the category of non-storm water

discharges. If the Water Quality Improvement Plan is accepted by the San Diego Water Board with the proposed controls, the Copermittees will not be required to prohibit the category of non-storm water discharges to their MS4s as long as the controls are implemented. This is consistent with the clarification of 40 CFR 122.26(d)(2)(iv)(B)(1) in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board may "*require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*."

Finally, Provision E.2.a.(7) has been included in the requirements for non-storm water discharges to clarify that any non-storm water discharges to the Copermittee's MS4, even those identified pursuant to Provisions E.2.a.(1) through E.2.a.(4), must be reduced or eliminated, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit. Provision E.2.a.(7) is consistent with the requirements of CWA section 402(p)(3)(B)(ii) and 40 CFR 122.26(d)(1)(v)(B), as clarified in the Phase I Final Rule (55 FR 47995) that "*[u]ltimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit*." However, the reduction or elimination of those non-storm water discharges are expected to be achieved as feasible, in accordance with the priorities in the Water Quality Improvement Plan and when the resources are available to the Copermittee.

Consistent with 40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(1), each Copermittee must implement a "*program…to prevent illicit discharges to the municipal storm sewer system*" and "*detect…illicit discharges and improper disposal into the storm sewer.*" Provision E.2.b requires each Copermittee to implement measures to prevent and detect illicit discharges and connections to its MS4 as part of its illicit discharge detection and elimination program.

As part of the program to prevent and detect illicit discharges to the MS4, 40 CFR 122.26(d)(2)(iv)(B)(2) requires "*procedures to conduct on-going field screening activities during the life of the permit, including areas or locations that will be evaluated by such field screens*." As part of the procedures, each Copermittee is required to maintain an updated map of its entire MS4 and the corresponding drainage areas within its jurisdiction. Having knowledge about where inlets, access points, connections with other MS4s, and outfalls are located is necessary for each Copermittee to track, identify, and eliminate illicit discharges and connections. Thus, Provision E.2.b.(1) of the Order specifies that the map must include the segments of the storm sewer system owned, operated, and maintained by the Copermittee, and include locations of all known inlets, connections with other MS4s, and outfalls to the Copermittee's MS4. The remaining requirements of Provision E.2.b are consistent with the requirements of 40 CFR 122.26(d)(2)(iv)(B)(3)-(7) related to implementing measures to prevent and detect illicit discharges and connections to the MS4.

Provision E.2.c requires each Copermittee to conduct field screening and monitoring of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm

water and illicit discharges and connections to the MS4. Field screening is a required element of the program to detect and eliminate illicit discharges and connections to the MS4, pursuant to 40 CFR 122.26(d)(2)(iv)(B)(2). The field screening requirement will be implemented through the dry weather MS4 outfall discharge monitoring required under Provisions D.2.a.(2) and D.2.b.(1).

Provision E.2.d specifies the measures each Copermittee must implement to eliminate illicit discharges and connections to its MS4. Elimination of illicit discharges and connections to the MS4 is consistent with the requirement of 40 CFR 122.26(d)(2)(iv)(B) "*to detect and remove [emphasis added]…illicit discharges and improper disposal into the storm sewer*" and will achieve the CWA requirement for MS4 permits to "*effectively prohibit non-storm water discharges into the storm sewers*."

Generally, each Copermittee is responsible for prioritizing its efforts to eliminate non-storm water and illicit discharges or connections to its MS4 based on field screening and monitoring data, NALs, illicit discharge investigation records, and the known or suspected sources. Sources of non-storm water and illicit discharges or connections must be eliminated by enforcing the legal authority established by each Copermittee pursuant to Provision E.1.

Provision E.3 (Development Planning) requires each Copermittee to use its land use and planning authority to implement a development planning program to control and reduce the discharge of pollutants in storm water from new development and significant redevelopment to the MEP. Proper implementation of the development planning program will also contribute toward effectively prohibiting non-storm water discharges from development projects to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." As part of the management program, 40 CFR 122.26(d)(2)(iv)(A)(2) requires "*planning procedures including a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment*."

Land development generally alters the natural conditions of the land by removing vegetative cover, compacting soil, and/or placement of concrete, asphalt, or other impervious surfaces. These impervious surfaces concentrate urban pollutants (such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not found in high concentrations in the natural environment. Pollutants that accumulate on impervious surfaces are not easily biodegraded nor subject to natural treatment processes.

Impervious surfaces greatly affect the natural hydrology of the land because they do not allow natural infiltration and treatment of storm water runoff to take place. Instead, storm water runoff from impervious surfaces is typically directed through pipes, curbs, gutters, and other hardscape into receiving waters, with little treatment, at significantly increased volumes and accelerated flow rates over what would occur naturally. The increased pollutant loads, storm water volume, discharge rates and velocities, and discharge durations from the MS4 adversely impact stream habitat by causing accelerated, unnatural erosion and scouring within creek bed and banks. Placement of impervious surfaces also encapsulates "good" sediment (such as sand, gravel, rocks and cobbles) that would normally replenish creek beds and banks to help stabilize them. Collectively, these changes to natural hydrologic processes are termed hydrograph modification, or hydromodification.

Hydromodification, which is caused by both altered storm water flow and altered sediment flow regimes, is largely responsible for degradation of creeks, streams, and associated habitats in the San Diego Region. In an ongoing study by the Stormwater Monitoring Coalition to assess the health of streams throughout Southern California, researchers found that three of the four highest risk stressors to creeks (percent sands and fines present, channel alteration, and riparian disturbance) were related to physical habitat.[29] Researchers studying flood frequencies in Riverside County have found that increases in watershed imperviousness of only 9-22 percent can result in increases in peak flow rates for the two-year storm event of up to 100 percent.[30] Such changes in runoff have significant impacts on channel morphology.

In addition, a technical report issued by the Southern California Coastal Water Research Project (SCCWRP) stated that "*[r]ecent studies indicate that California's intermittent and ephemeral streams are more susceptible to the effects of hydromodification than streams from other parts of the United States. Physical degradation of stream channels in the central and eastern United States can initially be detected when watershed impervious cover approaches 10 percent, although biological effects (which may be more difficult to detect) may occur at lower levels. In contrast, initial response of streams in the semi-arid portions of California appears to occur between 3 and 5 percent impervious cover*."[31] These studies highlight the extent to which impacts originating from impervious surfaces created by land development are responsible for the degradation of creek and stream habitat.

This is consistent with what USEPA has noted, that "*[m]ost stormwater runoff is the result of the man-made hydrologic modifications that normally accompany development. The addition of impervious surfaces, soil compaction, and tree and*

[29] Assessing the Health of Southern California Streams, Stormwater Monitoring Coalition, Fact Sheet
[30] Schueler and Holland, 2000. Storm Water Strategies for Arid and Semi-Arid Watersheds (Article 66). The Practice of Watershed Protection.
[31] Stein, E. and Zaleski, S., 2005. Technical Report 475, Managing Runoff to Protect Natural Streams: The Latest Development on Investigation and Management of Hydromodification in California. December 30, 2005.

vegetation removal result in alterations to the movement of water through the environment. As interception, evapotranspiration, and infiltration are reduced and precipitation is converted to overland flow, these modifications affect not only the characteristics of the developed site but also the watershed in which the development is located. Stormwater has been identified as one of the leading sources of pollution for all waterbody types in the United States. Furthermore, the impacts of stormwater pollution are not static; they usually increase with more development and urbanization."[32]

Reducing the impact from the increased pollutant loads and flows generated by impervious surfaces within a watershed is essential to protecting and restoring the integrity of the receiving waters. Provision E.3 includes the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment*." The requirements of Provision E.3 will 1) minimize the generation and discharge of pollutants in storm water from the MS4, and 2) minimize the potential of storm water discharges from the MS4 from causing altered flow regimes and excessive downstream erosion in receiving waters.

The requirements of Provision E.3.a include the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment*" applicable to all development projects, regardless of size or purpose of development. In general, all development projects must implement onsite BMPs to remove pollutants from runoff prior to its discharge to any receiving waters, as close to the pollutant generating source as possible, and structural BMPs must not be constructed within waters of the U.S.

Furthermore, the onsite BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors (e.g. mosquitos, rodents, and flies). If not properly designed or maintained, certain BMPs implemented or required by municipalities may create a habitat for vectors. Monitoring studies conducted by the California Department of Public Health (CDPH) have documented that mosquitoes opportunistically breed in structural storm water BMPs, particularly those that hold standing water for over 96 hours. Certain site design features that hold standing water may similarly produce mosquitoes.

Structural BMPs and site design features should incorporate design, construction, and maintenance principles to promote drainage within 96 hours to minimize standing water available to mosquitoes. Nuisances and public health impacts resulting from

[32] USEPA, 2007. Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices, December 2007.

vector breeding can be prevented with close collaboration and cooperative effort between municipalities and local vector control agencies and the CDPH during the development and implementation of storm water runoff management programs. The CDPH also has issued guidance for BMP implementation that will minimize potential nuisances and public health impacts resulting from vector breeding.[33]

All development projects are required to implement source control BMPs that will minimize the generation of pollutants. Additionally, each development project must implement, where applicable and feasible, low impact development (LID) BMPs to mimic the natural hydrology of the site and retain and/or treat pollutants in storm water runoff prior to discharging to and from the MS4.

The LID Center defines LID as "*a comprehensive land planning and engineering design approach with a goal of maintaining and enhancing the pre-development hydrologic regime of urban and developing watersheds.*"[34] LID designs seek to control storm water at the source, using small-scale integrated site design and management practices to mimic the natural hydrology of a site, retain storm water runoff by minimizing soil compaction and impervious surfaces, and disconnect storm water runoff from conveyances to the storm drain system.

LID BMPs may utilize interception, storage, evaporation, evapotranspiration, infiltration, and filtration processes to retain and/or treat pollutants in storm water before it is discharged from a site. Because of these numerous options, the San Diego Water Board expects that every development project will be able to implement some form of LID BMPs. Examples of LID BMPs include using permeable pavements, rain gardens, rain barrels, grassy swales, soil amendments, and native plants.

Provision E.3.a also includes requirements for all development projects to, where feasible, landscape with native and/or low water use plants to minimize the discharge of non-storm water discharges associated with excessive irrigation, as well as harvest (i.e., storage) and use precipitation to promote the concept of utilizing storm water as a resource.

While all development projects are subject to the requirements of Provision E.3.a, Provision E.3.b identifies Priority Development Projects that exceed given size thresholds and/or fit under specific use categories. Priority Development Projects are required to incorporate specific performance criteria for structural BMPs into the project plan to reduce the generation of pollutants, and address potential impacts from hydromodification.

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[33] California Department of Public Health, 2012. Best Management Practices for Mosquito Control in California. (http://www.cdph.ca.gov/HealthInfo/discond/Documents/BMPforMosquitoControl07-12.pdf)
[34] www.lowimpactdevelopment.org

The Priority Development Project categories are based on the requirements of the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), and do not differ significantly from the Fourth Term Permit for San Diego County. Furthermore, the Priority Development Project categories are consistent with Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), and Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit).

Because of the impact of relatively small increases in watershed impervious surfaces to receiving waters, Provision E.3.b.(1)(c)(iv) has been updated to include large driveways that are 5,000 square feet or more. The San Diego Water Board finds that large driveways can exacerbate altered flow regimes if not properly controlled.

Provision E.3.b.(3) describes projects that are exempt from Priority Development Project status. These include new or retrofit paved sidewalks, bicycle lanes, or trails that are designed and constructed to direct runoff to vegetated areas or be hydraulically disconnected from paved areas. The exemptions have been provided to encourage these types of projects because they provide multiple environmental benefits, such as promoting walking rather than driving, which will in turn improve air quality. Additionally, retrofitting of existing alleys, streets, or roads are exempt from Priority Development Project status if they are constructed using USEPA Green Streets guidance.[35] By doing so, retrofitting of these types of projects is encouraged. The San Diego Water Board recognizes that there are spatial constraints associated with these projects, and implementation of structural BMPs are not always feasible.

For development projects identified as Priority Development Projects, the requirements of Provision E.3.c are the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment.*" Provisions E.3.c.(1)-(3) describe the performance criteria for the structural BMPs that must be implemented for each Priority Development Project defined by Provision E.3.b.

Provision E.3.c.(1) describes the storm water pollutant control BMP requirements that must be implemented by all Priority Development Projects. The purpose of Provision E.3.c.(1) is to reduce pollutants in storm water runoff to the MEP from Priority Development Projects before it is discharged to the MS4. Of all the available treatment processes available, retention of storm water, and therefore capture of the pollutants in the storm water, will achieve 100 percent pollutant removal efficiency for the volume of storm water retained. No other method of treatment can achieve 100 percent pollutant removal efficiency. Thus, retention of as much storm water onsite is

[35] "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).

the most effective way to reduce pollutants in storm water discharges to, and consequently from the MS4, and controls pollutants in storm water discharges from a site to the MEP.

Under Provision E.3.c.(1)(a), retention of the pollutants in the runoff produced from the 85th percentile storm event ("design capture volume") is the design standard to which Priority Development Projects must comply. Since the 85th percentile storm event has previously been used as the numeric design standard for treatment control BMPs, this same size storm event is used as the numeric design standard for storm water retention. This is the MEP standard recognized by the San Diego Water Board and is consistent with the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), as well as Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit), and Los Angeles Water Board Order No. R4-2012-0175 (Los Angeles County MS4 Permit).

The 85th percentile storm event is the event that has a precipitation total greater than or equal to 85 percent of all storm events over a given period of record in a specific area or location. For example, to determine what the 85th percentile storm event is in a specific location, all 24 hour storms that have recorded values over a 30 year period would be tabulated and a 85th percentile storm would be determined from this record (i.e. 15 percent of the storms would be greater than the number determined to be the 85th percentile storm). Most jurisdictions in the San Diego Region have already developed isopluvial maps that can provide this type of information. The 85th percentile storm might be determined to be a number such as 1.0 inch, and this would be multiplied by the total area of the project footprint producing runoff to calculate the design capture volume. The Priority Development Project designer would then select a system of BMPs that would retain (i.e. intercept, store, infiltrate, evaporate, or evapotranspire) the pollutants contained in the design capture volume onsite.

Retention BMPs are necessary to capture and retain pollutants generated from a Priority Development Project. In a recent study performed by SCCWRP in the Los Angeles Region, they found "*that the magnitude of constituent load associated with storm water runoff depends, at least in part, on the amount of time available for pollutant build-up on land surfaces. The extended dry period that typically occurs in arid climates such as southern California maximizes the time for constituents to build-up on land surfaces, resulting in proportionally higher concentrations and loads during initial storms of the season*."[36] This implies that the "first flush" of a rainy season and the first storm events after long antecedent dry periods tend to have the highest pollutant loads. Capturing and retaining the pollutant loads of the "first flush" of a rainy

[36] Stein, E.D., Tiefenthaler, L.L., and Schiff, K.C., 2007. Technical Report 510, Sources, Patterns and Mechanisms of Storm Water Pollutant Loading from Watershed and Land Uses of the Greater Los Angeles Area, California, USA. March 20, 2007.

season and the first storm events after long antecedent dry periods will reduce a significant portion of the pollutants in storm water discharged to and from the MS4.

The San Diego Water Board, however, acknowledges that in some situations retention of the full design capture volume onsite may not be technically feasible. In this event, the Copermittee may allow the Priority Development Project to use biofiltration BMPs to treat 1.5 times the design capture volume not reliably retained onsite, or biofiltration BMPs with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite.

The 1.5 multiplier is based on the finding in the Ventura County Technical Guidance Manual that biofiltration of 1.5 times the design capture volume not retained onsite will provide approximately the same pollutant removal as retention of the design capture volume on an annual basis.[37] This standard is consistent with the Los Angeles Water Board's Los Angeles County and Ventura County municipal storm water permits (Order Nos. R4-2012-0175 and R4-2010-0108, respectively). The flow-thru design of 0.75 times the portion of the design capture volume not reliably retained onsite is consistent with the San Diego Water Board's Fourth Term Permits for Orange County and Riverside County ~~municipal storm water permits~~ (Order Nos. R9-2009-0002 and R9-2010-0016, respectively). In either case, the biofiltration BMPs must be designed with an appropriate hydraulic loading rate to maximize storm water retention and pollutant removal, as well as to prevent erosion, scour, and channeling within the BMP. Each Copermittee is required to update its BMP Design Manual to provide guidance for hydraulic loading rates and other biofiltration design criteria necessary to maximize storm water retention and pollutant removal.

The San Diego Water Board further recognizes that, in addition to not being technically feasible, retention of the full design capture storm onsite may be cost prohibitive, or may not provide as much water quality benefit to the Watershed Management Area as would implementing BMPs elsewhere in the watershed. Thus, Provision E.3.c.(1)(b) allows for the use of a combination of onsite retention BMPs, and the implementation of an Alternative Compliance Program described in Provision E.3.c.(3). Provision E.3.c.(3) is discussed in more detail below.

If the full design capture volume is not retained onsite either because biofiltration is not technically feasible, or a Copermittee grants a Priority Development Project permission to utilize the Alternative Compliance Program, then the pollutants in the portion of the design capture volume that are not reliably retained onsite must still be reduced to the MEP. Thus, flow-thru treatment control BMPs are required to be implemented on Priority Development Projects in addition to the retention BMPs. The requirements of Provisions E.3.c.(1)(a)(ii)[a]-[c] include the performance standards for flow-thru

[37] Ventura Countywide Stormwater Management Program. 2011. Ventura Technical Guidance Manual, Manual Update, 2011.

treatment control BMPs, consistent with the Fourth Term Permits in the San Diego Region.

Whereas the purpose of the requirements under Provision E.3.c.(1) is to reduce pollutants in storm water runoff to the MEP, the purpose of the requirements under Provision E.3.c.(2) is to maintain or restore more natural hydrologic flow regimes to prevent accelerated, unnatural erosion in downstream receiving waters, also to the MEP standard. Provision E.3.c.(2) describes hydromodification management BMP requirements that must be implemented by all Priority Development Projects.

The performance criteria for the implementation of hydromodification management BMPs on Priority Development Projects are consistent with the requirements in the Fourth Term Permits for Orange and Riverside Counties (Order Nos. R9-2009-0002 and R9-2010-0016, respectively). Modifications to the Orange County and Riverside County Hydromodification Management Plans (HMPs) will likely be minor, or may not be necessary. The HMP for San Diego County will likely require some minor modifications to incorporate the requirements of Provision E.3.c.(2) and become consistent with the Orange County and Riverside County HMPs. The San Diego Water Board does not, however, expect that it will be necessary for the San Diego County Copermittees to develop a new approach or significantly re-write the San Diego County HMP. This is because the premise of the hydromodification management BMP requirements, which are to control storm water runoff conditions (flow rates and durations) for Copermittee-defined range of flows, is unchanged from all Fourth Term Permits in the San Diego Region.

Provision E.3.c.(2)(a) requires that post-project runoff conditions mimic the *pre-development* runoff conditions, and not the *pre-project* runoff conditions. Fundamentally, the San Diego Water Board believes that using a hydrology baseline that approximates that of an undeveloped, natural watershed is the only way to facilitate the return of more natural hydrological conditions to already built-out watersheds, and ultimately improved stream health. On the other hand, using the *pre-project* hydrology as a baseline for redevelopment projects results in propagating the unnatural hydrology of urbanized areas. Propagating the urbanized flow regime does not support conditions for restoring degraded or channelized stream segments, and would forever sentence such streams to the degraded state. Furthermore, reducing the volume of storm water runoff associated with the urbanized flow regime will also result in reducing the discharge of pollutants into receiving waters, since storm water runoff from impervious surfaces contains untreated pollutants.

The San Diego Water Board understands that approximating the pre-development runoff condition associated with a redevelopment site is not necessarily straightforward because factors such as natural grade and native vegetation for the site cannot be precisely known. Therefore, the San Diego Water Board does not expect project designers to estimate historical conditions associated with redevelopment sites. Rather, the San Diego Water Board expects project designers and the Copermittees to

approximate pre-development runoff conditions using the parameters of a *pervious* area rather than an *impervious* area. This means that for redevelopment sites, approximating pre-development runoff conditions equates to using existing onsite grade and assuming the infiltration characteristics of the underlying soil. A redevelopment Priority Development Project must not use runoff coefficients of concrete or asphalt to estimate pre-development runoff conditions. Rather, redevelopment projects must use available information pertaining to existing underlying soil type (such as soil maps published by the National Resource Conservation Service), onsite existing grade, and any other readily available pertinent information to estimate pre-development runoff conditions.

The San Diego Water Board understands, indeed asserts, that the pre-development hydrology of an area in question can only be roughly estimated and cannot be precisely known. However, using the hydrology of a natural condition, even if not precisely known, will provide significant benefit to receiving waters over using the hydrology associated with impervious (developed) surfaces. Therefore in order to achieve the goals of the Clean Water Act, which are to "*restore and maintain the chemical, physical, and biological integrity of the nation's waters* [emphasis added]," the most appropriate standard to use for hydromodification management is the standard associated with the pre-development condition.

Provision E.3.c.(2)(b) requires Priority Development Projects to avoid known critical sediment yield areas or implement measures that would allow coarse sediment to be discharged to receiving waters, such that the natural sediment supply is unaffected by the project. This is necessary because the availability of coarse sediment supply is as much an issue for causing erosive conditions to receiving streams as are accelerated flows.

The San Diego Water Board recognizes that in some situations implementing the hydromodification management BMP requirements for flow control fully onsite may not be technically feasible, may be cost prohibitive, or may not provide any overall water quality benefits to the Watershed Management Area. Thus, Provision E.3.c.(2)(c) allows for the use of a combination of onsite hydromodification management BMPs for flow control and alternative compliance options described in Provision E.3.c.(3).

Provision E.3.c.(3) allows for alternative compliance in instances where the Copermittee determines that offsite measures will have a greater overall water quality benefit for the Watershed Management Area than if the Priority Development Project were to implement structural BMPs onsite. Consequently, watershed-specific structural BMP requirements are present in this Order in the form of allowable compliance offsite. The Alternative Compliance Program to Onsite Structural BMP Implementation Provision is intended to integrate with the Copermittees' planning efforts in the Water Quality Improvement Plans.

The Alternative Compliance Program is an option for Priority Development Projects where the governing Copermittee has participated in the development of a Watershed Management Area Analysis as part of the Water Quality Improvement Plan (described in Provision B.3.b.(4)). Such an approach is consistent with the latest findings in hydromodification management by the scientific community. In a Technical Report entitled *Hydromodification Assessment and Management in California,*[38] the report states:

> *"An effective [hydromodification] management program will likely include combinations of on-site measures (e.g., low-impact development techniques, flow-control basins), in-stream measures (e.g., stream habitat restoration), floodplain and riparian zone actions, and off-site measures. Off-site measures may include compensatory mitigation measures at upstream locations that are designed to help restore and manage flow and sediment yield in the watershed."*

Consistent with the ideas brought forth in the report, in the Watershed Management Area Analysis of Provision B.3.b.(4), which is optional, the Copermittees will develop watershed maps that include as much detail about factors that affect the hydrology of the watershed as is available. Such factors included identification of areas suitable for infiltration, coarse sediment supply areas, and locating stream channel structures and constrictions. Once these factors are mapped and studied, the Copermittees can identify areas in the watershed where candidate projects may be implemented that are expected to improve water quality in the watershed by providing more opportunity for infiltration, slowing down storm water flows, or attenuation of pollutants naturally via healthy stream habitat. These candidate projects may be in the form of retrofitting existing development, rehabilitating degraded stream segments, identifying regional BMPs, purchasing land to preserve valuable floodplain functions, and any other project(s) that the Copermittees identify.

Under the Alternative Compliance Program, Priority Development Projects may be allowed to fund, partially fund, or implement a candidate project, in lieu of implementing structural BMPs onsite, if they enter into a voluntary agreement with the governing Copermittee permitting this arrangement. Project proponents may also propose an alternative project not previously identified by the Copermittees. In either case, whether a project proponent implements a candidate project identified by the Copermittees or a separate alternative compliance project, the governing Copermittee must determine that implementation of the project will have a greater overall water quality benefit for the Watershed Management Area than fully implementing structural BMPs onsite. Determination of greater overall water quality benefits associated with alternative compliance projects would be accomplished by utilizing Water Quality Equivalency calculations developed pursuant to Provision E.3.c.(3)(a). Water Quality Equivalency calculations are necessary to establish a regional and technical basis for

[38] 2012. ED Stein, F Federico, DB Booth, BP Bledsoe, C Bowles, Z Rubin, GM Kondolf, A Sengupta. Technical Report 667. Southern California Coastal Water Research Project. Costa Mesa, CA.

determining water quality benefits associated with alternative compliance projects, which can be consistently used by all Copermittees in the San Diego Region. Finally, if ~~I~~f alternative compliance involves funding or implementing a project that is outside the jurisdiction of the governing Copermittee, then that Copermittee may enter into an inter-agency agreement with the appropriate jurisdiction.

Finally, Provision E.3.c.(2)(d) allows Priority Development Projects to be exempt from the hydromodification management BMP requirements if there is no threat of erosion to downstream receiving waters (i.e. the receiving stream is concrete lined from the point of discharge all the way to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean). If the Copermittees believe that more exemptions are warranted, then they must perform the optional Watershed Management Area Analysis of Provision B.3.b.(4). Additional exemptions other than those specified in this Order may be established on a watershed basis, provided the Copermittees perform the analysis, provide supporting rationale for the exemptions, and complete the Water Quality Improvement Plan approval process pursuant to Provision F.1.

To facilitate the transition to this Order from the Fourth Term Permits for Orange and Riverside County Copermittees, Provision E.3.c.(2)(e) allows two additional temporary exemptions from hydromodification management BMP implementation. The first temporary exemption allows relief from hydromodification management BMP implementation for Priority Development Projects discharging directly to an engineered channel conveyance system with a capacity to convey peak flows generated by the 10-year storm event all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean. Similar to the exemption allowed for concrete-lined channels, this exemption is premised on the concept that there is little threat of erosion to these types of engineered channel systems.

The second temporary exemption allows relief from hydromodification management BMP implementation for Priority Development Projects discharging directly to large river reaches with drainage areas larger than 100 square miles and a 100-year flow capacity in excess of 20,000 cubic feet per second. If this exemption is claimed, then properly sized energy dissipation is required at all discharge points associated with the Priority Development Project. This exemption is premised on the concept that large river reaches can essentially assimilate the accelerated flow rates associated with individual Priority Development Projects because they are inconsequential compared to the flow rate in the large river reach. Both of these exemptions are included in the Hydromodification Management Plan for San Diego County[39].

These temporary exemptions are allowed as a means to facilitate Orange and Riverside County Copermittees' transition to this Order from the Fourth Term Permits and are not meant to reside as permanent exemptions without additional rigorous

[39] Final Hydromodification Management Plan Prepared for County of San Diego, March 2011

technical analyses specific to each County. Therefore, these exemptions will no longer apply once the Copermittees' land development programs are fully updated to reflect the requirements of this Order, i.e., upon implementation of the BMP Design Manual pursuant to Provision F.2.b. If the Copermittees believe that these or other exemptions are warranted in the context of water quality improvement and stream restoration opportunities, then the Copermittees must perform the optional Watershed Management Area Analysis of Provision B.3.b.(4) and provide supporting rationale for the exemptions. The San Diego County Copermittees are also required to perform the optional Watershed Management Area Analysis to provide supporting rationale to justify use of these and other exemptions. Updated BMP Design Manuals including rationale to justify use of exemptions will be reviewed by the San Diego Water Board pursuant to Provision F.2.b.

Provisions E.3.c.(4) and E.3.c.(5) were included under the BMP requirements applicable to all development projects in the Fourth Term Permits for San Diego, Orange, and Riverside Counties (Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016, respectively). In this Order, the long-term BMP maintenance and infiltration and groundwater protection requirements apply to structural BMPs implemented by Priority Development Projects only.

Provision E.3.d requires the Copermittees to update their BMP Design Manual as needed to incorporate the requirements of Provision E.3. The BMP Design Manual is formerly known as the Standard Storm Water Mitigation Plan, or SSMP, and was renamed so that the title has a more accurate description of the document content. The contents of the BMP Design Manual are largely unchanged from the previous Standard Storm Water Mitigation Plans required under the Fourth Term Permits. The BMP Design Manual fulfills the 40 CFR 122.26(d)(2)(iv)(A)(2) requirement that the Copermittee's development planning program includes "*a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment*."

As part of the "*planning procedures,*" 40 CFR 122.26(d)(2)(iv)(A)(2) requires the procedures to "*address controls to reduce pollutants in discharges from municipal separate storm sewers after construction is completed*." The requirements applicable to the implementation and oversight of structural BMPs at Priority Development Projects are provided under Provision E.3.e.

Proper installation of the structural BMPs approved for a Priority Development Project is necessary to ensure that pollutants in storm water discharges will be reduced to the MEP after the project is completed. In addition to the proper installation of structural BMPs, the maintenance of structural BMPs on Priority Development Projects is necessary to ensure that pollutants in storm water discharges will continue to be reduced to the MEP. Provision E.3.e.(1) includes the minimum requirements that each

Copermittee must implement to ensure structural BMPs are properly installed and will be properly maintained.

The requirements under Provision E.3.e.(2)-(3) are necessary to demonstrate each Copermittee is implementing a program that complies with Provisions E.3.b-c and E.3.e.(1), and ensure structural BMPs at Priority Development Project will continue to be able to reduce pollutants in storm water discharges to the MEP.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary for any development projects to compel compliance with the requirements of Provision E.3 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.3.f requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Provision E.4 (Construction Management) requires each Copermittee to implement a construction management program to control and reduce the discharge of pollutants in storm water from construction sites to the MEP. Proper implementation of the construction management program will also contribute toward effectively prohibiting non-storm water discharges from construction sites to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." As part of the management program, 40 CFR 122.26(d)(2)(iv)(D) requires "*a program to implement and maintain structural and non-structural best management practices to reduce pollutants in storm water runoff from construction sites to the municipal storm sewer system.*"

Construction sites can be significant sources of sediment, trash, and other pollutants to receiving waters. Although sediment is naturally occurring in the natural environment, the discharge of sediment under unnatural conditions is problematic to receiving waters. Fine sediment in creeks causes high turbidity that interferes with the functionality of native flora and fauna in local creeks. For example, turbidity interferes with both photosynthesis of water-philic plants, as well as successful foraging and reproduction of benthic macroinvertebrates. Sediment can also make it difficult for fish to breathe because it clogs fish gills. Other pollutants such as heavy metals or pesticides can adhere to sediment and are transported to receiving waters during storm events, where they dissolve in the water column and become bioavailable to aquatic organisms. Sediment is recognized as a major stressor to surface waters and is responsible for the impairment of several lagoons and creeks in the San Diego Region.

Provision E.4 includes requirements that each Copermittee must implement to minimize the discharge of sediment and other pollutants from construction sites to the MS4 within its jurisdiction. The requirements under Provision E.4 are consistent with the Fourth Term Permits for San Diego, Orange, and Riverside Counties. Therefore, Copermittees are expected to implement the requirements seamlessly, with minimal changes to their existing construction management programs. The Copermittees, however, are given more flexibility to run their programs as needed to maximize efficiency, and also to be consistent with the Water Quality Improvement Plan for the Watershed Management Area.

As part of the construction management program, 40 CFR 122.26(d)(2)(iv)(D)(1) requires "*procedures for site planning which incorporate consideration of potential water quality impacts.*" Provision E.4.a describes the minimum elements each Copermittee is required to include as part of the construction site planning and project approval process. The construction site planning and approval process is based primarily on ensuring each project had an adequate site-specific pollution control, construction BMP, and/or erosion and sediment control plan that will be implemented to minimize the discharge of pollutants in storm water to the MEP, and minimize impacts to receiving waters.

The requirements under Provision E.4.b provide the data and information necessary to identify "*priorities for inspecting sites and enforcing control measures*" required pursuant to 40 CFR 122.26(d)(2)(iv)(D)(3). Under Provision E.4.b, each Copermittee must identify construction sites that are considered a high threat to downstream surface waters. Designation of "high threat to water quality" construction sites will necessitate the Copermittees to develop criteria to identify such sites. Provision E.4.b.(2) describes a list of factors that must be considered when the Copermittee considers threat to water quality. For example, a Copermittee must identify sites as "high threat to water quality" if it is located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions, according to the Water Quality Improvement Plan. This ensures that construction management program implementation is compatible with the Copermittee's identified highest priority water quality conditions.

Pursuant to 40 CFR 122.26(d)(2)(iv)(D)(2) each Copermittee is required describe "*requirements for nonstructural and structural best management practices*" at construction sites. Provision E.4.c includes the types of construction site BMPs that the Copermittees must implement, or require the implementation of, at each construction site to reduce pollutants in storm water discharges to the MEP.

Each Copermittee is expected to require the implementation of appropriate BMPs given specific site conditions, the season and likelihood of rain events, and construction phase (i.e. grading vs. vertical construction). This means that throughout the life of the project construction, the appropriate BMPs will vary, especially if the

construction of the project spans multiple wet seasons. As opposed to describing specific minimum BMPs that must be implemented, the Order describes major BMP categories that should be considered for each site.

Each Copermittee is expected to use its 20 years of storm water experience and knowledge to require implementation of appropriate BMPs from the various categories at each construction site within its jurisdiction. For example, the San Diego Water Board expects that each site will be required to implement erosion control and sediment control. The San Diego Water Board also expects each Copermittee to require implementation of active/passive sediment treatment systems at sites where other BMPs have been tried and are known to be inadequate, and discharges of sediment are causing or contributing to water quality impairment downstream. Each Copermittee is granted flexibility in specifying the minimum level of BMP requirements at each site, but the San Diego Water Board expects each site to be capable of controlling pollutants in storm water discharges to the MEP and preventing illicit discharges.

The requirements under Provision E.4.d are necessary to demonstrate that each Copermittee is implementing a program that complies with Provisions E.4.a and E.4.c and ensure BMPs at construction sites will reduce pollutants in storm water discharges to the MEP.

Provision E.4.d does not include minimum required inspection frequencies for construction sites. Each Copermittee must use its experience and knowledge to specify an appropriate inspection frequency for both high priority and lower priority sites in their jurisdictional runoff management program documents, and in accordance with the Water Quality Improvement Plan. Appropriate inspection frequencies may vary by Copermittee, but the San Diego Water Board expects that the stated frequency will be adequate for each Copermittee to properly oversee the construction sites within its jurisdiction, confirm BMPs are implemented to reduce pollutants in storm water discharges from constructions sites to the MEP, and make needed changes to its program on an ongoing basis as necessary.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary for any development projects to compel compliance with the requirements of Provision E.4 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.4.e requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

<u>Provision E.5 (Existing Development Management)</u> requires each Copermittee to implement an existing development management program to control and reduce the discharge of pollutants in storm water from areas of existing development to the MEP.

Proper implementation of the existing development management program will also contribute toward effectively prohibiting non-storm water discharges from areas of existing development to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." Within 40 CFR 122.26(d)(2)(iv)(A) and (C), the management program is required to reduce impacts on receiving waters and reduce pollutants in storm water discharges to the MEP from commercial and residential areas, industrial facilities, and municipal facilities.

Commercial and residential areas, industrial facilities, and municipal facilities must be addressed by each Copermittee with the existing development management program required under Provision E.5. All other areas within each Copermittee's jurisdiction should be either undeveloped open space, or areas that are being developed or under construction. Areas being developed or under construction will be addressed by the Copermittee under the requirements of Provision E.3 (Development Planning) or Provision E.4 (Construction Management).

Areas of existing development typically include impervious surfaces such as sidewalks, driveways, roads, and rooftops, which generate and concentrate pollutants (such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not found in high concentrations in the natural environment. Pollutants that accumulate on impervious surfaces are not easily biodegraded or not subject to natural treatment processes. When it rains, these pollutants are transported in storm water runoff from these impervious surfaces into receiving waters, resulting in poor water quality and degradation of beneficial uses.

In addition to the generation of pollutants, areas of existing development have generally altered the natural conditions of the land and removed vegetative cover, reduced the perviousness of the surface, and reduced the capacity of storm water that can be intercepted, captured, stored, infiltrated, evaporated, and/or evapotranspired. The alteration of the natural conditions and the impervious surfaces associated with areas of existing development causes water quality problems due to the alteration of natural flow regimes within the watersheds; resulting in hydromodification of channels, streams, and habitats that exist within or adjacent to the areas of existing development.

Thus, storm water discharges from areas of existing development are responsible for poor water quality, degraded habitats, and hydromodified channels throughout the developed portions of the watersheds in the San Diego Region. To improve the health and functionality of the receiving waters in a Watershed Management Area, land use practices and the amount of impervious surfaces in areas of existing development must change to reduce the various impacts caused by hydromodification and

pollutants from storm water runoff generated in developed areas. Each Copermittee must be aggressive to address pollutant sources and runoff from areas of existing development to be able to reduce pollutants in storm water discharges from the MS4 to the MEP.

There is some overlap in the requirements under Provision E.5 with the requirements under Provisions E.2 (Illicit Discharge Detection and Elimination), E.3 (Development Planning), and E.4 (Construction Management). Illicit discharges frequently originate from areas of existing development. New development projects, when completed will become some type of residential, commercial, industrial or municipal existing development. Redevelopment projects are, by definition, redeveloping areas of existing development. And, redevelopment projects become construction sites located in areas of existing development. Much of the data and information collected, inspections performed, and enforcement actions taken for the requirements under Provisions E.2 to E.4 may also be utilized by the existing development management program. The requirements under Provision E.5, however, are focused primarily on reducing pollutants generated in areas of existing development that can be transported in storm water runoff and discharged to and from the MS4.

The requirements under Provision E.5 build upon existing program elements being implemented by the Copermittees. Provision E.5 is generally consistent with the existing development requirements of the Fourth Term Permits for Orange and Riverside Counties (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), but modified to provide more flexibility to implement the programs so resources can be better focused toward addressing the highest priority water quality conditions identified in the Water Quality Improvement Plans.

For a Copermittee to properly manage areas of existing development, having knowledge of what development exists within its jurisdiction is essential. Provision E.5.a requires each Copermittee to maintain a watershed-based inventory of all the existing development within its jurisdiction. This requirement is necessary for each Copermittee to implement the requirements of Provision E.5.b-e.

As opposed to just maintaining separate inventories based on the type of site, each Copermittee must maintain a watershed-based inventory that includes all types of existing development within its jurisdiction. By utilizing a watershed-based inventory, the Copermittees within a Watershed Management Area can combine their inventories and review the inventories by watershed in addition to by jurisdiction. Pollutant sources and strategies for abatement can then be evaluated on a watershed level, as opposed to evaluating sources and strategies strictly by type of site.

Provision E.5.a includes the information that must be included in the inventory. Provision E.5.a.(1) specifies what facilities or areas must be included in the inventory. A commercial type of existing development may be identified in the inventory as a facility (e.g. individual building, individual business) or an area (e.g. shopping center,

commercial zone). An industrial type of existing development must be identified in the inventory by facility (e.g. individual industrial entity). A municipal type of existing development must be identified in the inventory by facility, with a list of specific municipal facilities that must be included in the inventory. A residential type of existing development must be identified by areas to be designated by the Copermittee. For each of the facilities and areas identified in the Copermittee's inventory developed pursuant to Provision E.5.a.(1), Provision E.5.a.(2) specifies the information that must be included in the description for the facility or area.

Provision E.5.a.(3) requires each Copermittee to maintain an updated map showing the location of inventoried existing development, watershed boundaries, and water bodies. This requirement was included because this information is expected to help the Copermittees in a Watershed Management Area identify and prioritize sources of pollutants and/or stressors in areas of existing development that contribute toward the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Knowledge of the existing development that are likely to be sources of pollutants contributing to the highest priority water quality conditions is expected to be a key element in the Copermittees' development of the water quality improvement strategies that will be included in the Water Quality Improvement Plans. The strategies described in the Water Quality Improvement Plans will direct efforts within the existing development management programs implemented by each Copermittee.

Pursuant to 40 CFR 122.26(d)(2)(iv)(A) each Copermittee is required describe "*structural and source control measures to reduce pollutants*" in storm water runoff discharged from areas of existing development. Provision E.5.b includes the BMP implementation and maintenance requirements that the each Copermittee must require at areas of existing development to reduce pollutants in storm water discharges to the MEP. The San Diego Water Board, however, recognizes that BMP implementation and maintenance for residential areas will require much more education and encouragement through less authoritative measures than for commercial, industrial and municipal facilities and areas. Thus, the BMP implementation and maintenance requirements have been separated between requirements under Provision E.5.b.(1) for commercial, industrial and municipal facilities and areas, and Provision E.5.b.(2) for residential areas.

Most of the requirements in Provision E.5.b are consistent with the related requirements in the Fourth Term Permits. The level of specificity, however, has been changed to allow each Copermittee the flexibility to implement its program to achieve maximum efficiency, and to perform functions that will address the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Each Copermittee is expected to require the implementation of appropriate BMPs to address the expected pollutants from each facility or area. The Third and Fourth Term

Permits described specific minimum BMPs that must be implemented at various sites. This Order, however, requires each Copermittee to designate minimum BMPs themselves and require implementation. Consistent with the Fourth Term Permits, each Copermittee is required to maintain, or require the maintenance of, all BMPs as needed.

The BMP implementation and maintenance requirements include a schedule of operation and maintenance activities for the MS4 and related structures (such as catch basins, storm drain inlets, and detention basins), as well as public streets and roads. Public streets and roads specifically include public unpaved roads. The San Diego Water Board identified, through investigations and complaints, sediment discharges from unpaved roads as a significant source of water quality problems in the San Diego Region. Inspection activities conducted by the San Diego Water Board since the Third Term Permits have found a lack of source control for many unpaved roads within the jurisdiction of the Copermittees.

Unpaved roads are a source of sediment that can be discharged in runoff to receiving waters, especially during storm events. Erosion of unpaved roadways occurs when soil particles are loosened and carried away from the roadway base, ditch, or road bank by water, wind, traffic, or other transport means. Exposed soils, high runoff velocities and volumes, sandy or silty soil types, and poor compaction increase the potential for erosion.

Road construction, culvert installation, and other maintenance activities can disturb the soil and drainage patterns to streams in undeveloped areas, causing excess runoff and thereby erosion and the release of sediment. Poorly designed unpaved roads can act as preferential drainage pathways that carry runoff and sediment into natural streams, impacting water quality. In addition, other public works activities along unpaved roads have the potential to significantly affect sediment discharge and transport within streams and other waterways, which can degrade the beneficial uses of those waterways.

USEPA also recognizes that discharges from unpaved roads pose a significant potential threat to water quality. USEPA guidance[40] emphasizes the threat of unpaved roads to water quality:

> "*Dirt and gravel roads are a major potential source of these pollutants [sediment] and pollutants that bind to sediment such as oils, nutrients, pesticides, herbicides, and other toxic substances. Many roads have unstable surfaces and bases. Roads act like dams, concentrating flows that accelerate erosion of road materials and roadsides. Both unstable surfaces and accelerated erosion then lead to sediment and dust.*"

[40] USEPA, 2006. Environmentally Sensitive Maintenance for Dirt and Gravel Roads. Gesford and Anderson, USEPA-PA-2005.

There are several guidance documents, developed by the USEPA,[41] the US Forest Service,[42] the University of California,[43] and others, that include design and construction specifications and BMPs that are readily available for implementation by public entities. Implementing design and other source control BMPs for unpaved roads in the region is necessary to reduce and minimize the impacts of sediment discharged during storm events from unpaved roads to the MS4s and receiving waters.

Provision E.5.c describes existing development site inspection frequency, content, and tracking that each Copermittee must incorporate into their existing development management programs. The requirements under Provision E.5.c are necessary to demonstrate each Copermittee is implementing a program that complies with Provision E.5.b and ensure BMPs implemented in areas of existing development will reduce pollutants in storm water discharges to the MEP. Provision E.5.c has been modified to include a minimum of once every 5 years for all inventoried facilities and areas of existing development, utilizing one or more methods of inspection.

In addition to onsite inspections, the methods of inspection have been expanded to include drive-by inspections. Inspections may be performed by the Copermittee's municipal and contract staff, or by volunteer monitoring or patrol programs. Volunteer monitoring or patrol programs are not expected to enforce the Copermittee's ordinances, or to inspect areas or facilities where members of the public are not allowed access. Volunteer monitoring or patrol programs must be trained by the Copermittee, and are only expected to collect visual observations. By utilizing drive-by inspections and volunteer monitoring or patrol programs, the Copermittees will be able to maximize and efficiently use their resources to identify and address sources of pollutants in areas of existing development.

The municipal and contract staff of each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial, industrial, and municipal facilities and areas in its inventoried existing development pursuant to Provision E.5.c.(1)(a)(iv). An "equivalent" of at least 20 percent means if any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspections may count toward the total annual inspection requirement. Linear municipal facilities (i.e. MS4 linear channels, sanitary sewer collection systems, streets, roads and highways) in the Copermittee's existing development inventory are not subject to the inspection frequency requirement of Provision E.5.c.(1)(a)(iv).

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[41] Ibid
[42] US Forest Service, 1996. Forest Service Specifications for Construction of Roads & Bridges. EM-7720-100. Revised August 1996.
[43] University of California Division of Agriculture and Natural Resources, 2007. Rural Roads: A Construction and Maintenance Guide of California Landowners. Publication 8262.

The inspection content specified in Provision E.5.c.(2)(a) includes the information required to be collected during an inspection by any method. The inspection content specified in Provision E.5.c.(2)(b) includes additional information that must be collected when a Copermittee's municipal or contract staff perform an onsite inspection. Provision E.5.c.(3) specifies the information that each Copermittee must maintain in its existing development inspection records.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary to compel compliance with the requirements of Provision E.5 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.5.d requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Provisions E.5.e.(1)-(2) specifically require the Copermittee to identify areas of existing development as candidates for retrofitting, and streams, channels, and/or habitats as candidates for rehabilitation. Provisions E.5.e.(1)-(2) are based on the retrofitting requirements of the Fourth Term Permits for Orange and Riverside Counties, but modified to also include identifying projects to rehabilitate channels within areas of existing development. The requirements have also been modified to be more focused on utilizing these types of projects for addressing the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Interest and opportunity to retrofit areas of existing development and rehabilitate channels located in areas of existing development has been observed in several programs the San Diego Water Board oversees (e.g., CWA Section 401 Water Quality Certification program, supplemental environmental projects, and grant programs). Each jurisdiction has miles and miles of streets that could be retrofitted to become green streets. Reshaping landscaped areas from convex to concave configurations can detain storm water instead of directing runoff as quickly as possible to the MS4. Retrofit projects could also include simply replacing impervious surfaces with permeable surfaces.

Retrofitting projects do not necessarily have to be expensive. Retrofitting projects could be as simple as redirecting downspouts from roofs to pervious or landscaped areas instead of to hardscaped areas discharging directly to the MS4, providing rain barrels to harvest storm water from downspouts for use at a later time, or planting more trees in areas with little vegetation to provide canopy that can intercept storm water. The San Diego Water Board encourages the Copermittees to identify simple, low-cost retrofitting opportunities that can be easily implemented, in addition to other more expensive retrofitting and channel rehabilitation projects.

Rehabilitation of channels, streams, and/or habitat will require more significant planning and resources to implement. There are, however, also abundant opportunities to rehabilitate channels, streams and/or habitats in or adjacent to areas of existing development. Each Watershed Management Area likely has several creeks and stream reaches that have been undergrounded, artificially hardened, or hydromodified that could be rehabilitated to be more sustainably configured, which would slow down storm water flows and potentially have more assimilative capacity for pollutants while still being supportive of designated beneficial uses.

The San Diego Water Board recognizes that it may be infeasible to implement retrofitting or channel rehabilitation projects within certain areas of a Copermittee's jurisdictions. For such areas, the Copermittee must instead identify, develop, and implement regional retrofitting and channel rehabilitation projects (i.e. projects that can retain and/or treat storm water from one or more areas of existing development) adjacent to and/or downstream of the areas of existing development.

Provisions E.5.e.(1)-(2) do not require the implementation of retrofitting and rehabilitation projects, but do require the Copermittee to develop a program with strategies to facilitate the implementation of these types of projects in areas of existing development. The strategies are expected to include allowing and encouraging Priority Development Projects to implement retrofitting types of projects as a means of compliance with the structural BMP performance criteria requirements of Provisions E.3.c.(1) and E.3.c.(2).

Provision E.6 (Enforcement Response Plans) requires each Copermittee to develop an Enforcement Response Plan as part of its jurisdictional runoff management program document. Proper implementation of the Enforcement Response Plans is necessary to effectively prohibit non-storm water discharges to the MS4, and reduce the discharge of pollutants in storm water from the MS4 to the MEP.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system*" and be able to demonstrate that it can "*operate pursuant to legal authority established by statute, ordinance or series of contracts*" to control the discharge of non-storm water and pollutants in storm water to and from its MS4. Pursuant to 40 CFR 122.26(d)(2)(i)(E) each Copermittee is specifically required to have the legal authority to "*[r]equire compliance with conditions in ordinances, permits, contracts or order*s."

The requirements under Provision E.6 are necessary to demonstrate that each Copermittee can enforce its legal authority to *"effectively prohibit non-stormwater discharges"* and "*reduce the discharge of pollutants to the maximum extent practicable*" as well as "*[r]equire compliance with conditions in ordinances, permits, contracts or order*."

The Enforcement Response Plan required under Provision E.6 will serve as a reference for the Copermittee and the San Diego Water Board to determine if consistent enforcement actions are being implemented to achieve timely and effective compliance from all public and private entities that are not in compliance with the Copermittee's ordinances, permits, or other requirements. The Enforcement Response Plan must contain clear direction for the Copermittee to take immediate enforcement action, when appropriate and necessary, in their illicit discharge detection and elimination, development planning, construction management, and existing development management programs.

If the entities subject to the Copermittee's legal authority do not implement appropriate corrective actions in a timely manner, or if violations repeat, the Copermittee must take progressively stricter responses to enforce its legal authority and achieve compliance with its ordinances, permits, or other requirements to *"effectively prohibit non-stormwater discharges"* and "*reduce the discharge of pollutants to the maximum extent practicable.*"

Provision E.7 (Public Education and Participation) requires each Copermittee to implement a public education and participation program. Proper implementation of the public education and participation program as part of its jurisdictional runoff management program will contribute toward effectively prohibiting non-storm water discharges to the MS4, and toward the reduction of pollutants in storm water from the MS4 to the MEP.

Provision E.7 establishes the minimum requirements that each Copermittee must implement to engage members of the public as part of its jurisdictional runoff management program. In the Fourth Term Permits, the public education program requirements and the public participation requirements were included as separate jurisdictional runoff management program components. In this Order, the public education requirements have been consolidated with the public participation requirements, as both sets of requirements are related to the engagement of the public by each Copermittee. Engagement of the public is critical for the success of each Copermittee's jurisdictional runoff management program.

The Copermittees have been implementing public education programs for the last 20 years, which are now well established. The specificity of expected public education program elements of the Fourth Term Permits has been removed. For the most part, the public education program requirements in Provision E.7.a have been reduced to a set of requirements that are specifically included in the federal regulations under 40 CFR 122.26(d)(2)(iv)(A)(6), 122.26(d)(2)(B)(6) and 122.26(d)(2)(D)(4), which should already be incorporated into each Copermittee's existing public education program. Each Copermittee is expected to utilize the information and data collected from the monitoring and assessments conducted within the Watershed Management Area, and from its inventories and inspections to best direct its public education program

resources toward addressing the highest priority water quality conditions identified within the Water Quality Improvement Plan.

According to 40 CFR 122.26(d)(2)(iv), public participation is required to be included as part of the "*comprehensive planning process*", which includes the development and implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs. The requirements under Provision E.7.b specify the opportunities that the public must be provided to be involved in the "*comprehensive planning process*", as required by to 40 CFR 122.26(d)(2)(iv).

Provision E.8 (Fiscal Analysis) requires each Copermittee to secure the resources and provide an analysis of the resources that will be necessary to implement the requirements of the Order. Adequate fiscal resources are necessary for a jurisdictional runoff management program to effectively prohibit non-storm water discharges to the MS4, and reduce pollutants in storm water from the MS4 to the MEP.

According to 40 CFR 122.26(d)(2)(vi), each Copermittee is responsible for providing "*a fiscal analysis of the necessary capital and operation and maintenance expenditures necessary to accomplish the activities*" required by this Order, including "*a description of the source of funds that are proposed to meet the necessary expenditures, including legal restrictions on the use of such funds.*" The fiscal analysis requirements of Provision E.8 are consistent with 40 CFR 122.26(d)(2)(vi).

The San Diego Water Board has chosen not to require a description of fiscal benefits realized from implementation of the jurisdictional runoff management programs. This is a recommendation from the National Association of Flood and Stormwater Management Agencies.[44] For instance, the fiscal analysis requirements do not address city-wide fiscal benefits of protection (e.g., public health, tourism, property values, economic activity, beneficial uses, etc.), even though many costs currently reported to the San Diego Water Board are for related activities. This type of assessment may help Copermittees improve the allocation of resources and it may help the Copermittees secure adequate funding for the program. Qualitative assessments, however, could be overly subjective and most Copermittees likely lack the ability to provide accurate quantitative assessments. The San Diego Water Board encourages the Copermittees to consider means for conducting assessments of fiscal benefits derived from the programs. Such assessments could be conducted on a regional scale similar to studies of program costs conducted by the State Water Board.[45]

[44] National Association of Flood and Stormwater Management Agencies. 2006. *Guidance for Municipal Stormwater Funding.* Prepared under a grant provided by the USEPA.
[45] State Water Board, 2005. NPDES Stormwater Cost Survey.

F. Reporting

Purpose: Provision F includes the requirements for the documents and reports that the Copermittees must prepare and provide to the San Diego Water Board. The documents prepared by the Copermittees and provided to the San Diego Water Board and made available to the public will provide the documentation that the Copermittees are complying with the requirements of the Order.

***Discussion*:** Provision F requires the Copermittees to prepare several documents and reports that must be provided to the San Diego Water Board and made available to the public. The reporting requirements have been significantly reduced compared to the Fourth Term Permit reporting requirements. The reduction in reporting requirements was recommended by the San Diego County Copermittees in the Report of Water Discharge submitted in June 2011.

More specific and detailed discussions of the requirements of Provision F are provided below.

Provision F.1 (Water Quality Improvement Plans) requires the Copermittees in each Watershed Management Area to develop and submit a Water Quality Improvement Plan in accordance with the requirements of Provision B.

Of all the requirements of Provision F, the Water Quality Improvement Plans will likely be the documents requiring the most significant effort to develop. The content of the Water Quality Improvement Plans, however, is expected to include content that should already have been developed for the Watershed Plans and several elements that are included in the Monitoring and Reporting Programs required under the Fourth Term Permits.

Because the Water Quality Improvement Plan is part of the "*comprehensive planning process which involves public participation*," Provision F.1 includes requirements to give multiple opportunities to the public to provide input on the content of the plans.

Provision F.1.a.(1) specifies the elements that the Copermittees must include in the public participation process for the development of the Water Quality Improvement Plans. In order for the public to be aware of the opportunities to provide input, Provision F.1.a.(1)(a) requires the Copermittees to develop a publicly available and noticed schedule of the opportunities for the public to participate and provide comments during the development of the Water Quality Improvement Plan. These opportunities are when the public can provide the data, information, and recommendations that the Copermittees can consider during the development of the Water Quality Improvement Plans.

The San Diego Water Board recognizes, however, that the Copermittees cannot be expected to incorporate all the data, information, and recommendations that the public may provide into the Water Quality Improvement Plans. The Copermittees will have to review the data, information, and recommendations received and make some decisions on what to incorporate into the Water Quality Improvement Plans. Before the Copermittees finalize their decisions, members of the public should be allowed to review the Copermittees' decisions. Thus, Provision F.1.a.(1)(b) requires the Copermittees to form a Water Quality Improvement Consultation Panel (Panel).

The Panel will consist of a member from the environmental community and a member from the development community familiar with the Watershed Management Area. A representative from the San Diego Water Board staff will also be part of the Panel. The Copermittees may choose to include additional members, but the Panel is only required to include three panel members.

The Panel will serve as an additional public participation and input mechanism during the development of the Water Quality Improvement Plans. The knowledge and expertise from these Panel members are expected to provide the Copermittees valuable direction during their decision-making process. The Copermittees will review the content of their planned submittals with the Panel members to receive recommendations. If the Panel provides recommendations, the Copermittees must consider revisions to the Water Quality Improvement Plan submittals.

The San Diego Water Board recognizes that the development of multiple Water Quality Improvement Plans concurrently may limit the ability of the public to review and provide comments to the Copermittees. Thus, Provision F.1.a.(1)(c) requires the Copermittees to coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public time and opportunity to participate during the development of the Water Quality Improvement Plans.

Provision F.1.a.(2) requires the Copermittees to develop and submit the first Water Quality Improvement Plan component, in accordance with the requirements of Provision B.2, which includes the identification of the priority water quality conditions and potential water quality improvement strategies. The public must be provided an opportunity to provide data, information and recommendations to be utilized in the development and identification of the priority water quality conditions and potential water quality improvement strategies for the Watershed Management Area. The Copermittees must consult with the Panel and consider making revisions. The Copermittees may submit the requirements of Provision B.2 as early as 6 months and no later than 12 months after the commencement of coverage under this Order. After the requirements of Provision B.2 are submitted to the San Diego Water Board, the public will be provided another opportunity to provide comments.

Provision F.1.a.(3) requires the Copermittees to develop and submit the second Water Quality Improvement Plan component, in accordance with the requirements of

Provision B.3, which includes the identification of the numeric goals for the highest priority water quality conditions identified for the Watershed Management Area, and the strategies that will be implemented to achieve the potential numeric goals. The Copermittees may also develop the Optional Watershed Management Area Analysis, in accordance with the requirements of Provision B.3.b.(4), as part of this submittal. The public must be provided an opportunity to provide data, information and recommendations to be utilized in the development and identification of the numeric goals and water quality improvement strategies for the Watershed Management Area. The Copermittees must consult with the Panel and consider making revisions. The Copermittees may submit the requirements of Provision B.3 as early as 9 months and no later than 18 months after the commencement of coverage under this Order. After the requirements of Provision B.3 are submitted to the San Diego Water Board, the public will be provided another opportunity to provide comments.

Finally, Provision F.1.b describes the process for the submittal and implementation of the Water Quality Improvement Plans. The complete Water Quality Improvement Plans are required to be submitted by the Copermittees within 24 months after the commencement of coverage under this Order. The San Diego Water Board will provide the public an opportunity to provide comments on each complete Water Quality Improvement Plan.

The San Diego Water Board will review each Water Quality Improvement Plan and the public comments received to determine if the Copermittees have submitted a Water Quality Improvement Plan that meets the requirements of Provision B. If a Water Quality Improvement Plan does not meet the requirements of Provision B, the Copermittees will be considered out of compliance and directed in writing by the San Diego Water Board Executive Officer to correct the deficiencies.

When a Water Quality Improvement Plan meets the requirements of Provision B, the San Diego Water Board will determine whether to hold a public hearing or to limit public input to submittal of written comments before accepting the Water Quality Improvement Plan. Implementation of the Water Quality Improvement Plan must begin within 30 days of acceptance.

The San Diego Water Board expects that any deficiencies in the Water Quality Improvement Plan will be identified either in the public comments or during the review by the San Diego Water Board before implementation begins. In the event any deficiencies are identified after the implementation of the Water Quality Improvement Plan, Provision F.1.b.(7) clarifies that the San Diego Water Board maintains the right to require the Copermittees to correct any deficiencies that may be identified.

Provision F.2 (Updates) requires the Copermittees to update specific documents that the Copermittees will utilize to implement the requirements of this Order.

Each Copermittee is required to continue implementing a jurisdictional runoff management program, as required under Provision E. Implementation of each Copermittee's jurisdictional runoff management program is directed by its jurisdictional runoff management program document. Provision F.2.a requires each Copermittee to update its jurisdictional runoff management program document to be consistent with the requirements of Provision E concurrent with the submittal of the Water Quality Improvement Plan.

Likewise, each Copermittee must continue to require new development and redevelopment projects to implement BMPs to control pollutants in storm water runoff. The control of pollutants in storm water runoff from development and redevelopment projects within each Copermittee's jurisdiction is guided and directed by its BMP Design Manual, formerly known as a Standard Storm Water Mitigation Plan (SSMP). Provision F.2.b requires each Copermittee to update its BMP Design Manual to be consistent with the requirements of Provision E.3 concurrent with the submittal of the Water Quality Improvement Plan.

In general, the requirements of the Order should not necessitate a complete rewrite of each Copermittee's jurisdictional runoff management program document or BMP Design Manual, as was required by the Third Term Permits. The jurisdictional runoff management program and BMP Design Manual requirements of this Order are not significantly different than the requirements of the Fourth Term Permits. Thus, only sections of the Order which are new or have been significantly changed should warrant revisions to specific sections of the Copermittee's jurisdictional runoff management program document and BMP Design Manual.

Finally, the Water Quality Improvement Plans are expected to require updates as the iterative approach and adaptive management process included in the Water Quality Improvement Plan, as required under Provision B.5, is implemented by the Copermittees. Provision F.2.c.(1) requires the Copermittees to implement a public participation process for the proposed updates, review the proposed updates with the Panel, and submit the updates to the Water Quality Improvement Plan as part of the Annual Reports required under Provision F.3.b.

Also, because TMDLs are likely to be developed, adopted and approved during the term of the Order, Provision F.2.c.(2) has been included to expedite the incorporation of TMDLs into the Copermittees' Water Quality Improvement Plans as part of the update process, potentially before the Order is re-opened to incorporated the requirements of the new TMDLs.

Provision F.3 (Progress Reporting) requires the Copermittees to report on the progress of implementing the Water Quality Improvement Plans.

The requirements of Provision F.3 are to report the progress toward improving water quality that the Copermittees are achieving with the implementation of the Water

Quality Improvement Plans and each Copermittee's jurisdictional runoff management program. The Progress Report Presentations required under Provision F.3.a are included to provide the Copermittees an opportunity to communicate directly with the San Diego Water Board and the public. The Progress Report Presentations will also provide the members of the San Diego Water Board and members of the public an opportunity to become more acquainted with the Copermittees and their projects and programs to address non-storm water and storm water discharges into and from their MS4s.

The Annual Report requirements of Provision F.3.b are a consolidation of several reporting requirements from the Fourth Term Permits, including the Jurisdictional Runoff Management Program Annual Reports, the Watershed Annual Reports, and the Monitoring and Reporting Program Annual Reports. Furthermore, the Annual Report requirements are consistent with the requirements under 40 CFR 122.42(c).

Pursuant to 40 CFR 122.42(c), "*[t]he operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the Director…must submit an annual report*", which must include the following:

(1) *The status of implementing the components of the storm water management program that are established as permit conditions* [40 CFR 122.42(c)(1)];

(2) *Proposed changes to the storm water management programs that are established as permit conditions* [40 CFR 122.42(c)(2)];

(3) *Revisions, if necessary, to the assessment of controls and fiscal analysis* [40 CFR 122.42(c)(3)];

(4) *A summary of data, including monitoring data, that is accumulated throughout the reporting year* [40 CFR 122.42(c)(4)];

(5) *Annual expenditures and budget for year following each annual report* [40 CFR 122.42(c)(5)];

(6) *A summary describing the number and nature of enforcement actions, inspections, and public education programs* [40 CFR 122.42(c)(6)];

(7) *Identification of water quality improvements or degradation* [40 CFR 122.42(c)(7)].

Under the Fourth Term Permits, each Copermittee is responsible for submitting a Jurisdictional Runoff Management Program Annual Report; the Copermittees in each designated watershed are responsible for submitting a Watershed Annual Report; and the Copermittees from each county are responsible for submitting a Monitoring and Reporting Program Annual Report.

There are 39 Copermittees in the San Diego Region, each required to prepare and submit a Jurisdictional Runoff Management Program Annual Report. There are 9 designated watersheds in San Diego County, 6 designated watersheds in Orange County, and 1 designated watershed in Riverside County for a total of 16 designated watersheds, each requiring a Watershed Annual Report. There are 3 sets of Copermittees in 3 counties in the San Diego Region, requiring Copermittees from each county to prepare and submit a Monitoring and Reporting Program Annual Report. Thus each Copermittee is currently required to prepare, or participate in the preparation of at least 3 annual reports. In addition, the San Diego County Copermittees are required to prepare and submit a Regional Urban Runoff Management Plan Annual Report.

In total, there are 59 annual reports that are prepared by the Copermittees and submitted to the San Diego Water Board for the Fourth Term Permits. The preparation of these annual reports requires significant time and resources from each Copermittee, which could otherwise be expended on actions that could improve water quality within its jurisdiction. In turn, significant time and resources are required from the San Diego Water Board staff to review these reports, which could otherwise be expended on working directly with the Copermittees to improve their implementation efforts toward restoring and protecting water quality.

Until the Water Quality Improvement Plans are developed, there will be a transitional period during which the Copermittees will continue to implement their existing jurisdictional runoff management programs. There will also be a transitional period during which the Copermittees will implement the transitional monitoring and assessment requirements of Provision D. During the transitional period, the Copermittees will submit annual reports pursuant to the requirements of Provisions F.3.b.(1) and F.3.b.(2).

Provision F.3.b.(1) includes the transitional annual reporting requirements for each Copermittee's jurisdictional runoff management program. The reporting of the jurisdictional runoff management program implementation efforts have been reduced to a single 2-page form. Each Copermittee is required to complete and submit a Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D or a revised form accepted by the San Diego Water Board) no later than October 31 of each year for each jurisdictional runoff management program reporting period (i.e. July 1 to June 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted. The Jurisdictional Runoff Management Program Annual Report Form will certify that each Copermittee has implemented its jurisdictional runoff management program in accordance with the requirements of Provision E. Each Copermittee may choose to continue to utilize and submit the jurisdictional runoff management program annual reporting format of its current Order until the first Water Quality Improvement Plan Annual Report is required to be submitted.

Provision F.3.b.(2) includes the transitional annual reporting requirements for the transitional monitoring and assessment program for each Watershed Management Area. The Copermittees in the Watershed Management Area are required to submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted. The Transitional Monitoring and Assessment Program Annual Report is required to include the transitional period monitoring data collected pursuant to Provisions D.1.a and D.2.a, and the findings from the transitional period findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

Provision F.3.b.(3) includes the Water Quality Improvement Plan Annual Report requirements. Only one Water Quality Improvement Plan Annual Report is required for each of the ten (10) Watershed Management Areas designated under Provision B.1, which is a significant reduction in the number of annual reports required to be prepared and submitted by the Copermittees. The Water Quality Improvement Plan Annual Report will document the Copermittees' efforts to implement the Water Quality Improvement Plan. Each Water Quality Improvement Plan Annual Report will be focused primarily on reporting the analysis of the monitoring data collected pursuant to Provisions D.1-D.3 during the reporting period, and the assessments that are required pursuant to Provision D.4 based on the data. The monitoring data analyses and the assessments that are provided in the Water Quality Improvement Plan Annual Report will be the core of the report. The reporting of the jurisdictional runoff management program implementation efforts have been reduced to a single 2-page form, and will no longer be the primary focus of the reporting requirements as in the Third and Fourth Term Permits.

Each Copermittee will continue to prepare and submit a Jurisdictional Runoff Management Program Annual Report Form as part of the Water Quality Improvement Plan Annual Report to certify that each Copermittee has implemented its jurisdictional runoff management program in accordance with the requirements of Provision E. Instead of reviewing a voluminous report from each Copermittee, as was required under the Third and Fourth Term Permits, the San Diego Water Board will conduct audits of each Copermittee's jurisdictional runoff management program to investigate and confirm the information provided by each Copermittee on its Jurisdictional Runoff Management Program Annual Report Form. The audits will allow the San Diego Water Board to become more familiar with the each Copermittee's jurisdictional runoff management program, and each Copermittee will become more informed about the expectations of the San Diego Water Board.

The reduction in the number and content of the Water Quality Improvement Plan Annual Reports should result in significant time, cost and resource savings for the Copermittees, as well as the San Diego Water Board. Those savings should offset a significant portion of any additional costs that may be incurred to develop the Water

Quality Improvement Plans and to implement the monitoring and assessment program requirements of Provision D.

The reporting period for the Water Quality Improvement Plan Annual Reports consists of two periods. Because the jurisdictional runoff management programs are typically budgeted and implemented during a fiscal year, the information provided on the Jurisdictional Runoff Management Program Annual Report Forms will cover the period from July 1 to June 30 of the following year.

The Water Quality Improvement Plan Annual Reports, however, are focused primarily on the monitoring data and the assessments based on the monitoring data. The monitoring data is collected during the monitoring year, which begins October 1 and ends September 30 of the following year. The monitoring year begins after the beginning of the fiscal year and ends after the end of the fiscal year. Therefore, to accommodate and capture the information collected during the fiscal year and the monitoring year, the Annual Report reporting period incorporates both periods.

Finally, Provision F.3.c requires the Copermittees to develop and submit a Regional Monitoring and Assessment Report. The Regional Monitoring and Assessment Report is similar to the Long Term Effectiveness Assessment required under the Fourth Term San Diego County Permit. The Regional Monitoring and Assessment Report is expected to utilize the entire body of data and information collected by the Copermittees during the term of this Order to assess improvements to water quality on a regional scale.

Provision F.4 (Regional Clearinghouse) requires the Copermittees to develop, update, and maintain an internet-based Regional Clearinghouse that can be used to store, disseminate, and share the Copermittees' documents, monitoring data, special studies, and any other data or information.

Most of the documents and data that are generated by the Copermittees can be provided in electronic format, and made available to the San Diego Water Board and the public on the internet. The San Diego Water Board has been gradually transitioning its document submittal requirements to electronic submittals. Provision F.4 has been included to further these efforts.

Provision F.4 has also been included to improve the exchange and availability of information among the Copermittees, as well as between the Copermittees and the San Diego Water Board. Provision F.4 will also make the information generated during the implementation of the Order more accessible to the public.

Provision F.5 (Report of Waste Discharge) requires the Copermittees to submit a Report of Waste Discharge to reapply for renewal of the Order prior to its expiration, in accordance with 40 CFR 122.21(d)(2) and CWC section 13376.

Because the ~~Orange County and~~ Riverside County Copermittees will not be subject to the requirements of this Order until they are notified of coverage, Provision F.5.a describes the process of submitting a ~~their~~ Report~~s~~ of Waste Discharge pursuant to the requirements of their current permit~~s~~ to obtain coverage under this Order.

For the Copermittees subject to the requirements of this Order, Provision F.5.b requires the Copermittees to submit a Report of Waste Discharge 180 days in advance of the expiration of this Order. Provision F.5.b also describes the minimum information to be included in the Report of Waste Discharge, based on USEPA guidance "Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems," dated May 17, 1996.

Provision F.6 (Application for Early Coverage) describes the process that would allow the Orange County and/or Riverside County Copermittees to obtain coverage under this Order earlier than the expiration of their current Orders.

If the ~~Orange County and/or~~ Riverside County Copermittees choose to obtain coverage under this Order earlier than the expiration of their current Orders, the preparation and submittal of a Report of Waste Discharge, as required by the Fourth Term Permits, will not be necessary. The existing Order for the respective county will be rescinded upon the effective coverage date under this Order, except for enforcement purposes.

G. Principal Watershed Copermittee Responsibilities

Purpose: Provision G includes the requirements for the Principal Watershed Copermittee designated by the Copermittees in each Watershed Management Area.

***Discussion*:** Unlike previous NPDES requirements, there will no longer be a single Principal Copermittee. Provision G.1 requires the Copermittees to designate a Principal Watershed Copermittee for each Watershed Management Area. There are ten (10) Watershed Management Areas in the San Diego Region, as defined in Table B-1 under Provision B.1 of the Order. An individual Copermittee should not be the Principal Watershed Copermittee for more than two (2) Watershed Management Areas. There could be up to ten (10) Principal Water Copermittees designated for the Watershed Management Areas in the San Diego Region.

Provision G.2 describes the minimum responsibilities of each Principal Watershed Copermittee. The primary responsibility of the Principal Watershed Copermittees is to serve as the liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues. Ideally, the Principal Watershed Copermittee can represent the interests of all the Copermittees within a Watershed Management Area during discussions or meetings to facilitate communication with the San Diego Water Board. The Principal Watershed Copermittees are also responsible for facilitating and coordinating the implementation efforts of the Copermittees and submittals of required documents and reports.

The Principal Watershed Copermittee is responsible for facilitating the efforts of the Copermittees within the Watershed Management Area to develop the Water Quality Improvement Plan required under Provision B, and submit it for approval in accordance with Provision F.1. The Principal Watershed Copermittee is also responsible for coordinating the submittal of the document updates, Progress Report Presentations, and Annual Reports required from the Copermittees within each Watershed Management Area under Provisions F.2, F.3.a, and F.3.b. The Principal Watershed Copermittees are responsible for coordinating with each other to develop and submit the Regional Clearinghouse, Regional Monitoring and Assessment Report, and the Report of Waste Discharge required under Provisions F.3.c, F.4, and F.5.

The designated Principal Watershed Copermittee for each Watershed Management Area does not necessarily have to serve as the Principal Watershed Copermittee for the entire term of the Order. If the Copermittees in a Watershed Management Area choose to designate a new Principal Watershed Copermittee, the change may be submitted as part of the Annual Report required under Provision F.3.b, with an update to the Water Quality Improvement Plan in accordance with Provision F.2.c.

Provision G.3 specifies that the Principal Watershed Copermittee is not responsible for ensuring that the other Copermittees within the Watershed Management Area are in compliance with the requirements of this Order

H. Modification of Order

Purpose: Provision H provides the conditions under which modifications to Order No. R9-2013-0001, as amended, may occur.

***Discussion*:** Provision H allows for modifications to Order No. R9-2013-0001, as amended, for bases in addition to modifications (minor and major) allowed under the federal regulations at~~. Minor modifications may be made by the San Diego Water Board Executive Officer without a public notice or public hearing. Minor modifications are defined under~~ 40 CFR 122.62 and 122.63. ~~Minor modifications under 40 CFR 122.63 potentially applicable to this Order are the following:~~

~~Correcting typographical errors;~~

~~Requiring more frequent monitoring or reporting by the Copermittees;~~

~~Changing an interim compliance date in a schedule of compliance, provided the new date is not more than 120 days after the date specified in the existing permit and does not interfere with attainment of the final compliance date requirement.~~

Modifications ~~that are not one of the above minor modifications will~~to the Order require re-opening the Order (see Water Code section 13223), subject to the requirements of 40 CFR 122.44, 122.62 to 122.64, and 124.5, but only for the specific provisions subject to the modification. Proposed m~~M~~odifications of the Order ~~that are not minor require a draft Order with the proposed modifications~~will be made available for public review, a public notice and comment period, and a public hearing if requested. Comments on the provisions not subject to the proposed modifications are not required to be considered in the San Diego Water Board's responses to comments or during the public hearing.

Provision H.4 was included to specify that the Order will be re-opened for modifications if the State Water Board determines revisions to Provision A are warranted, an application for early coverage under the Order is received pursuant to Provision F.6, the Basin Plan is amended to modify an existing TMDL or incorporate a new TMDL, or the monitoring and assessment program requirements need to be updated or revised.

Provision H.5 was included to specify that the San Diego Water Board will re-open and consider modifications to this Order when the Orange County Copermittees or the Riverside County Copermittees submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders

I. Standard Permit Provisions and General Provisions

Purpose: Provision I incorporates the standard permit provisions required to be included in all NPDES permits, as well as several other general provisions.

***Discussion*:** Provision I refers to Attachment B to the Order. Attachment B expressly incorporates the conditions applicable to all NPDES permits as provided under 40 CFR 122.41(a)-(n), as well as the applicable conditions for MS4s and storm water discharges provided under 40 CFR 122.42(c) and 40 CFR 122.42(d), respectively. Attachment B also includes several general provisions that are typically included in or applicable to waste discharge requirements issued by the San Diego Water Board.

IX. ATTACHMENTS

The attachments to the Order are discussed below. The discussions describe the content of the attachments.

Attachment A – Discharge Prohibitions and Special Protections

Section 1 of Attachment A includes the Waste Discharge Prohibitions from the Basin Plan. They have been provided verbatim in their entirety.

Section 2 of Attachment A includes the "*Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges*" applicable to permitted point source discharges of storm water, adopted under State Water Board Resolution No. 2012-0012, as amended by Resolution No. 2012-0031. The terms, prohibitions, and special conditions (collectively referred to as special conditions) are established as limitations on point source storm water discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in ASBS, as required for State Water Quality Protection Areas pursuant to California Public Resources Code sections 36700(f) and 36710(f). These Special Protections were adopted by the State Water Board as part of the Ocean Plan General Exception.

Attachment B – Standard Permit Provisions and General Provisions

Conditions applicable to all NPDES permits, as required under 40 CFR 122.41, and conditions applicable to MS4s and storm water discharges, as required under 40 CFR 122.42(c) and 122.42(d), respectively are provided in Attachment B to the Order. They have been provided expressly in their entirety.

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. These general provisions are typically included in or applicable to waste discharge requirements issued by the San Diego Water Board. Many of the general provisions were developed by the State Water Board. Where a general provision is derived from statute or regulation, a citation of the statute or regulation section is provided. General provisions that do not provide a citation are included under the authority provided CWC 13377.

Attachment C – Acronyms, Abbreviations and Definitions

The acronyms and abbreviations that are used in the Order are provided in Attachment C. Attachment C also includes definitions that may provide an explanation or description of the meaning or intent of specific terms or phrases included in the Order.

Attachment D – Jurisdictional Runoff Management Program Annual Report Form

An example of the Jurisdictional Runoff Management Program Annual Report Form required to be submitted by each Copermittee as part of the Annual Reports required under Provision F.3.b.(1)(e) is provided as Attachment D to the Order. An electronic version of the form will be available from the San Diego Water Board after the adoption of the Order.

The Jurisdictional Runoff Management Program Annual Report Form includes the minimum information necessary to demonstrate that the Copermittee is implementing and in compliance with the requirements of Provision E, and includes much of the information required to be reported pursuant to 40 CFR 122.42(c).

The information that must be provided on the Jurisdictional Runoff Management Program Annual Report Form is limited to the fiscal year, which begins July 1 and ends June 30 of the following year. The information expected to be provided by the Copermittees in each section of the Jurisdictional Runoff Management Program Annual Report Form is discussed below.

I. COPERMITTEE INFORMATION

The name of the Copermittee (e.g. name of city, county, or special district) and the contact information for the storm water program manager are provided under this section.

II. LEGAL AUTHORITY

The Copermittee must confirm whether or not the legal authorities under Provision E.1.a have been established for itself within its jurisdiction.

The Copermittee must also confirm whether or not a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority, as required under Provision E.1.b. The certification statement required by Provision E.1.b is only required to be submitted with the first Annual Report required under Provision F.3.b.

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

The Copermittee must inform the San Diego Water Board whether or not an update to its jurisdictional runoff management program document was required or recommended by the San Diego Water Board during the reporting period. An update to the jurisdictional runoff management program is required under Provision F.2.a. The San Diego Water Board may recommend modifications to the jurisdictional runoff management program as part of the iterative approach and adaptive management process required under Provision B.5, which may result in an update that is necessary for the Copermittee's jurisdictional runoff management document.

If an update was required or recommended, the Copermittee must confirm whether or not the update was completed and made available on the Regional Clearinghouse within the reporting period. If no update was required or recommended, an answer is not required. If the answer is NO, meaning the required or recommended update was not completed and/or made available on the Regional Clearinghouse, the Copermittee must attach a

schedule for the completion of the update and/or posting of the updated document on the Regional Clearinghouse.

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

The Copermittee must confirm whether or not a program was implemented during the fiscal year to actively detect and eliminate illicit discharges and connections in accordance with the requirements under Provision E.2.

In addition to confirming that a program to detect and eliminate illicit discharges was implemented during the reporting period, the Copermittee is also required to report on several items related to the program. The information that must be reported is limited to the fiscal year for the Annual Report.

All non-storm water discharges are considered illicit discharges unless the source is identified as one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5). If a non-storm water discharge is identified as one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5), the discharge is a non-storm water discharge, but not an illicit discharge. If a non-storm water discharge is identified but not in one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5), the discharge is both a non-storm water discharge and an illicit discharge.

V. DEVELOPMENT PLANNING PROGRAM

The Copermittee must confirm whether or not a development planning program was implemented during the fiscal year in accordance with the requirements under Provision E.3.

The Copermittee must also inform the San Diego Water Board whether or not an update to its BMP Design Manual was required or recommended by the San Diego Water Board during the fiscal year. An update to the BMP Design Manual is required under Provision F.2.b. The San Diego Water Board may recommend modifications to the BMP Design Manual, which may result in an update that is necessary for Copermittee's the BMP Design Manual.

If an update was required or recommended, the Copermittee must confirm whether or not the update was completed and made available on the Regional Clearinghouse within the reporting period. If no update was required or recommended, an answer is not required. If the answer is NO, meaning the required or recommended update was not completed and/or made available on the Regional Clearinghouse, the Copermittee must attach a schedule for the completion of the update and/or posting of the updated document on the Regional Clearinghouse.

The Copermittee is also required to report on several items related to the program. For the development and redevelopment projects that are reviewed under the program, the Copermittee must report the total number projects submitted for review during the fiscal year. Of those projects, the Copermittee must report the number that are Priority Development Projects, as defined under Provision E.3.b.(1). The Copermittee must also report the number of Priority Development Projects that were approved and/or granted occupancy during the fiscal year, regardless of when the project was originally submitted for review. Any projects that were approved during the fiscal year and granted any

exemptions from the BMP Design Manual requirements and/or allowed to implement alternative compliance options in accordance with Provision E.3.c.(3) must be reported.

Finally, the Copermittee must also report on several items related to its oversight of permanent BMPs on Priority Development Projects within its jurisdiction, as required under Provision E.3.e. The information that must be reported is limited to the fiscal year for the Annual Report.

VI. CONSTRUCTION MANAGEMENT PROGRAM

The Copermittee must confirm whether or not a construction management program was implemented during the fiscal year in accordance with the requirements under Provision E.4.

The Copermittee is also required to report on several items related to its oversight construction projects within its jurisdiction. The information that must be reported is limited to the fiscal year for the Annual Report.

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

The Copermittee must confirm whether or not an existing development management program was implemented during the fiscal year in accordance with the requirements under Provision E.5.

The Copermittee is also required to report on several items related to its oversight in areas of existing development within its jurisdiction. The information that must be reported is limited to the fiscal year for the Annual Report. The information must also be separated into four categories of existing development: municipal, commercial, industrial, and residential.

VIII. PUBLIC EDUCATION AND PARTICIPATION

The Copermittee must confirm whether or not a public education program component was implemented during the fiscal year in accordance with the requirements under Provision E.7.a.

The Copermittee must also confirm whether or not a public participation program component was implemented during the fiscal year in accordance with the requirements under Provision E.7.b.

IX. FISCAL ANALYSIS

The Copermittee must confirm a summary of its fiscal analysis, conducted in accordance with the requirements under Provision E.8, has been attached to the form.

X. CERTIFICATION

A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative must sign and certify the Jurisdictional Runoff Management Program Annual Report Form. The appropriate box must be checked to indicate the whether a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative is signing the form.

Attachment E – Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2013-0001

Attachment E provides specific provisions for implementing the load allocations (LAs) and wasteload allocations (WLAs) of Total Maximum Daily Loads (TMDLs) adopted by the San Diego Water Board and approved by USEPA in which the Copermittees are identified as responsible for discharges subject to the requirements of the TMDLs. Federal regulations require that NPDES requirements incorporate water quality based effluent limitations (WQBELs) that must be consistent with the requirements and assumptions of any available WLAs,[46] which may be expressed as numeric effluent limitations, when feasible, and/or as a best management practice (BMP) program of expanded or better-tailored BMPs.[47] Where the TMDL includes WLAs that provide numeric pollutant load or pollutant parameter objectives, the WLA has been, where feasible, translated into numeric WQBELs.[48]

For each TMDL in Attachment E, four sections are included:

a. Applicability: This section provides the resolution under which the TMDL Basin Plan amendment was adopted and approved, with the applicable adoption and approval dates. This section also gives the effective date of the TMDL and where the TMDL is applicable (i.e. Watershed Management Area and water body). The Copermittees that are responsible for implementing the specific provisions are also given in this section.

b. Final TMDL Compliance Requirements: For each TMDL, the final TMDL compliance requirements consist of the final TMDL compliance date(s), the final WQBELs, and the final TMDL compliance determination requirements. The final WQBELs are expressed in terms of receiving water limitations, effluent limitations, and/or best management practices (BMPs). The final WQBELs for the TMDLs are incorporated by reference into Provision A of the Order. The final WQBELs become enforceable when the final TMDL compliance dates have passed. Applicable BMPs within the final WQBELs must be incorporated into the Water Quality Improvement Plans. Compliance with the final WQBELs will be determined in accordance with the options provided under the final TMDL compliance determination requirements.

c. Interim TMDL Compliance Requirements: If the final TMDL compliance date has not passed and there are interim TMDL compliance requirements, they are included in this section. If there are interim WQBELs with interim compliance dates, the interim WQBELs become enforceable when the corresponding interim compliance dates have passed. Compliance with the interim WQBELs will be determined in accordance with the options provided under the interim TMDL compliance determination requirements.

d. Specific Monitoring and Assessment Requirements: If there are specific monitoring and assessment requirements that cannot be met with the monitoring and assessment program

[46] 40 CFR 122.44(d)(1)(vii)(B)
[47] 40 CFR 122.44(k)(2) and 40 CFR 122.44(k)(3)
[48] November ~~12, 2010~~26, 2014 Memorandum from the USEPA, Revisions to the November 22, 2002 Memorandum "Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLA""

requirements under Provision D of the Order, the additional requirements are included in this section.

The requirements of the TMDLs are based on and consistent with the assumptions and requirements of any available adopted and approved TMDLs that have been incorporated into the Basin Plan. Modifications to the requirements for the TMDLs in Attachment E cannot be made unless the TMDLs are modified in the Basin Plan.

A modification to any aspect of a TMDL in the Basin Plan requires a Basin Plan amendment. A Basin Plan amendment to modify a TMDL will require the San Diego Water Board to adopt a resolution to amend the Basin Plan, which includes a separate public process. When the San Diego Water Board adopts a Basin Plan amendment, it subsequently requires approval from the State Water Board, the Office of Administrative Law, and the USEPA before it becomes effective.

If and when the TMDLs are a modified in the Basin Plan, the San Diego Water Board will revise the requirements of the Order ~~TMDL~~ in accordance with the Basin Plan amendment. When a Basin Plan amendment to modify a TMDL becomes effective, the San Diego Water Board will modify the requirements of the Order~~TMDL~~ pursuant to the requirements of Provision H.4 of the Order as soon as possible.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

ORDER NO. R9-2013-0001, AS AMENDED BY ORDER NO. R9-2015-0001
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The San Diego County Copermittees in Table 1a are subject to waste discharge requirements set forth in this Order.

Table 1a. San Diego County Copermittees

City of Carlsbad	City of Oceanside
City of Chula Vista	City of Poway
City of Coronado	City of San Diego
City of Del Mar	City of San Marcos
City of El Cajon	City of Santee
City of Encinitas	City of Solana Beach
City of Escondido	City of Vista
City of Imperial Beach	County of San Diego
City of La Mesa	San Diego County Regional Airport Authority
City of Lemon Grove	San Diego Unified Port District
City of National City	

The Orange County Copermittees in Table 1b are subject to waste discharge requirements set forth in this Order.

Table 1b. Orange County Copermittees[1]

City of Aliso Viejo	City of Rancho Santa Margarita
City of Dana Point	City of San Clemente
City of Laguna Beach	City of San Juan Capistrano
City of Laguna Hills	City of Laguna Woods
City of Laguna Niguel	County of Orange
City of Mission Viejo	Orange County Flood Control District

After the San Diego Water Board receives and considers the Riverside County Copermittees' Report of Waste Discharge and makes any necessary changes to this Order, the Riverside County Copermittees in Table 1c will become subject to waste discharge requirements set forth in this Order after expiration of Order No.R9-2010-0016, NPDES No. CAS0108766 on or after November 10, 2015.

[1] While not listed in Table 1b., the City of Lake Forest remains a Copermittee under this Order until the later effective date of this Order or the effective date of Santa Ana Water Board Tentative Order No. R8-2015-0001. Thereafter, the City of Lake Forest will no longer be considered a Copermittee under this Order because its Phase I MS4 discharges will be regulated by the Santa Ana Water Board pursuant to Water Code section 13228 designation. The requirements of this Order that apply to the City of Lake Forest for the duration of this Order, however, are described in Finding 29 and Footnote 2 to Table B-1.

Table 1c. Riverside County Copermittees

City of Murrieta	County of Riverside
City of Temecula	Riverside County Flood Control and Water Conservation District
City of Wildomar	

The Riverside County Copermittees may become subject to the requirements of this Order at a date earlier than the expiration date of their current Order subject to the conditions described in Provision F.6 of this Order if the Riverside County Copermittees receive notification of coverage from the San Diego Water Board.

The term Copermittee in this Order refers to any San Diego County, Orange County, or Riverside County Copermittee covered under this Order, unless specified otherwise.

This Order provides permit coverage for the Copermittee discharges described in Table 2.

Table 2. Discharge Locations and Receiving Waters

Discharge Points	Locations throughout San Diego Region
Discharge Description	Municipal Separate Storm Sewer System (MS4) Discharges
Receiving Waters	Inland Surface Waters, Enclosed Bays and Estuaries, and Coastal Ocean Waters of the San Diego Region

Table 3. Administrative Information

This Order was adopted by the San Diego Water Board on:	**May 8, 2013**
Order No. R9-2013-0001 became effective on:	**June 27, 2013**
This Order as amended by R9-2015-0001 became effective on:	**April 1, 2015**
This Order will expire on:	**June 27, 2018**
The Copermittees must file a Report of Waste Discharge in accordance with Title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than 180 days in advance of the Order expiration date.	

I, David W. Gibson, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on May 8, 2013, as amended by adoption of Order No. R9-2015-0001 on February 11, 2015.

David W. Gibson
Executive Officer

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I. FINDINGS

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), finds that:

JURISDICTION

1. **MS4 Ownership or Operation.** Each of the Copermittees owns or operates an MS4, through which it discharges storm water and non-storm water into waters of the U.S. within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the U.S.

2. **Legal and Regulatory Authority.** This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]) adopted by the United States Environmental Protection Agency (USEPA), and chapter 5.5, division 7 of the California Water Code (CWC) (commencing with section 13370). This Order serves as an NPDES permit for discharges from MS4s to surface waters. This Order also serves as waste discharge requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

   The San Diego Water Board has the legal authority to issue a regional MS4 permit pursuant to its authority under CWA section 402(p)(3)(B) and 40 CFR 122.26(a)(1)(v). The USEPA also made it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide permits (55 Federal Register [FR] 47990, 48039-48042). The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees and San Diego Water Board.

   The federal regulations make it clear that the Copermittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators (40 CFR 122.26(a)(3)(vi)). This Order does not require the Copermittees to manage storm water outside of their jurisdictional boundaries, but rather to work collectively to improve storm water management within watersheds.

3. **CWA NPDES Permit Conditions.** Pursuant to CWA section 402(p)(3)(B), NPDES permits for storm water discharges from MS4s must include requirements to effectively prohibit non-storm water discharges into MS4s, and require controls to reduce the discharge of pollutants in storm water to the maximum extent practicable (MEP), and to require other provisions as the San Diego Water Board determines are appropriate to control such pollutants. This Order prescribes conditions to assure compliance with the CWA requirements for owners and operators of MS4s to effectively prohibit non-storm water discharges into the MS4s, and require controls to reduce the discharge of pollutants in storm water from the MS4s to the MEP.

4. **CWA and CWC Monitoring Requirements.** CWA section 308(a) and 40 CFR 122.41(h),(j)-(l) and 122.48 require that NPDES permits must specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s also specify additional monitoring and reporting requirements in 40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c). CWC section 13383 authorizes the San Diego Water Board to establish monitoring, inspection, entry, reporting and recordkeeping requirements. This Order establishes monitoring and reporting requirements to implement federal and State requirements. This Order also includes requirements for the Orange County Copermittees to participate in, and together with South Orange County Wastewater Authority and Orange County Health Care Agency, share responsibility for implementing the unified approach to beach water quality monitoring and assessment program set forth in the October 2014 report, *Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County*, issued pursuant to CWC section 13383 in the San Diego Water Board December 5, 2014 Letter Directive.

5. **Total Maximum Daily Loads.** CWA section 303(d)(1)(A) requires that "[e]ach state shall identify those waters within its boundaries for which the effluent limitations are not stringent enough to implement any water quality standard applicable to such waters." The CWA also requires states to establish a priority ranking of impaired water bodies known as Water Quality Limited Segments and to establish Total Maximum Daily Loads (TMDLs) for such waters. This priority list of impaired water bodies is called the Clean Water Act Section 303(d) List of Water Quality Limited Segments, commonly referred to as the 303(d) List. The CWA requires the 303(d) List to be updated every two years.

   TMDLs are numerical calculations of the maximum amount of a pollutant that a water body can assimilate and still meet water quality standards. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point sources (waste load allocations or WLAs) and non-point sources (load allocations or LAs), background contribution, plus a margin of safety. Discharges from MS4s are point source discharges. The federal regulations (40 CFR 122.44(d)(1)(vii)(B)) require that NPDES permits incorporate water quality based effluent limitations (WQBELs) developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, consistent with the assumptions and requirements of any available WLA for the discharge. Requirements of this Order implement the TMDLs established by the San Diego Water Board or USEPA as of the date this Order was amended in 2015. This Order establishes WQBELs consistent with the assumptions and requirements of all available TMDL WLAs assigned to discharges from the Copermittees' MS4s.

6. **Non-Storm Water Discharges.** Pursuant to CWA section 402(p)(3)(B)(ii), this Order requires each Copermittee to effectively prohibit discharges of non-storm water into its MS4. Nevertheless, non-storm water discharges into and from the MS4s continue to be reported to the San Diego Water Board by the Copermittees

and other persons. Monitoring conducted by the Copermittees, as well as the 303(d) List, have identified dry weather, non-storm water discharges from the MS4s as a source of pollutants causing or contributing to receiving water quality impairments in the San Diego Region. The federal regulations (40 CFR 122.26(d)(2)(iv)(B)(1)) require the Copermittees to have a program to prevent illicit discharges to the MS4. The federal regulations, however, allow for specific categories of non-storm water discharges or flows to be addressed as illicit discharges only where such discharges are identified as sources of pollutants to waters of the U.S.

7. **In-Stream Treatment Systems.** Pursuant to federal regulations (40 CFR 131.10(a)), in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S. Authorizing the construction of a runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to accepting waste assimilation as an appropriate use for that water body. Runoff treatment must occur prior to the discharge of runoff into receiving waters. Treatment control best management practices (BMPs) must not be constructed in waters of the U.S. Construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body.

DISCHARGE CHARACTERISTICS AND RUNOFF MANAGEMENT

8. **Point Source Discharges of Pollutants.** Discharges from the MS4s contain waste, as defined in the CWC, and pollutants that adversely affect the quality of the waters of the state. A discharge from an MS4 is a “discharge of pollutants from a point source” into waters of the U.S. as defined in the CWA. Storm water and non-storm water discharges from the MS4s contain pollutants that cause or threaten to cause a violation of surface water quality standards, as outlined in the Water Quality Control Plan for the San Diego Basin (Basin Plan). Storm water and non-storm water discharges from the MS4s are subject to the conditions and requirements established in the Basin Plan for point source discharges.

9. **Potential Beneficial Use Impairment.** The discharge of pollutants and/or increased flows from MS4s may cause or threaten to cause the concentration of pollutants to exceed applicable receiving water quality objectives and impair or threaten to impair designated beneficial uses resulting in a condition of pollution, contamination, or nuisance.

10. **Pollutants Generated by Land Development.** Land development has created and continues to create new sources of non-storm water discharges and pollutants in storm water discharges as human population density increases. This brings higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash. Pollutants from these sources are dumped or washed off the surface by non-storm water or storm water flows into and from the MS4s. When development converts natural vegetated pervious ground cover to impervious surfaces such as paved highways, streets, rooftops, and parking

lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving a developed area without BMPs that can maintain pre-development runoff conditions will contain greater pollutant loads and have significantly greater runoff volume, velocity, and peak flow rate than pre-development runoff conditions from the same area.

11. **Runoff Discharges to Receiving Waters.** The MS4s discharge runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within the eleven hydrologic units comprising the San Diego Region. Historic and current development makes use of natural drainage patterns and features as conveyances for runoff. Rivers, streams and creeks in developed areas used in this manner are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and receiving water. Numerous receiving water bodies and water body segments have been designated as impaired by the San Diego Water Board pursuant to CWA section 303(d).

12. **Pollutants in Runoff.** The most common pollutants in runoff discharged from the MS4s include total suspended solids, sediment, pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., cadmium, copper, lead, and zinc), petroleum products and polynuclear aromatic hydrocarbons, synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus), oxygen-demanding substances (e.g., decaying vegetation, animal waste), detergents, and trash. As operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not prohibit or otherwise control. These discharges may cause or contribute to a condition of pollution or a violation of water quality standards.

13. **Human Health and Aquatic Life Impairment.** Pollutants in runoff discharged from the MS4s can threaten and adversely affect human health and aquatic organisms. Adverse responses of organisms to chemicals or physical agents in runoff range from physiological responses such as impaired reproduction or growth anomalies to mortality. Increased volume, velocity, rate, and duration of storm water runoff greatly accelerate the erosion of downstream natural channels. This alters stream channels and habitats and can adversely affect aquatic and terrestrial organisms.

14. **Water Quality Effects.** The Copermittees' water quality monitoring data submitted to date documents persistent exceedances of Basin Plan water quality objectives for runoff-related pollutants at various watershed monitoring stations. Persistent toxicity has also been observed at several watershed monitoring stations. In addition, bioassessment data indicate that the majority of the monitored receiving waters have Poor to Very Poor Index of Biological Integrity (IBI) ratings. These findings indicate that runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in the San Diego Region. Non-storm water

discharges from the MS4s have been shown to contribute significant levels of pollutants and flow in arid, developed Southern California watersheds, and contribute significantly to exceedances of applicable receiving water quality objectives.

15. **Non-Storm Water and Storm Water Discharges.** Non-storm water discharges from the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard of CWA section 402(p)(3)(B)(iii), which is explicitly for "Municipal … *Stormwater Discharges* (emphasis added)" from the MS4s. Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s must be effectively prohibited.

16. **Best Management Practices.** Waste and pollutants which are deposited and accumulate in MS4 drainage structures will be discharged from these structures to waters of the U.S. unless they are removed. These discharges may cause or contribute to, or threaten to cause or contribute to, a condition of pollution in receiving waters. For this reason, pollutants in storm water discharges from the MS4s can be and must be effectively reduced in runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Pollution prevention is the reduction or elimination of pollutant generation at its source and is the best "first line of defense." Source control BMPs (both structural and non-structural) minimize the contact between pollutants and runoff, therefore keeping pollutants onsite and out of receiving waters. Treatment control BMPs remove pollutants that have been mobilized by storm water or non-storm water flows.

17. **BMP Implementation.** Runoff needs to be addressed during the three major phases of development (planning, construction, and use) in order to reduce the discharge of storm water pollutants to the MEP, effectively prohibit non-storm water discharges, and protect receiving waters. Development which is not guided by water quality planning policies and principles can result in increased pollutant load discharges, flow rates, and flow durations which can negatively affect receiving water beneficial uses. Construction sites without adequate BMP implementation result in sediment runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. Existing development can generate substantial pollutant loads which are discharged in runoff to receiving waters. Retrofitting areas of existing development with storm water pollutant control and hydromodification management BMPs is necessary to address storm water discharges from existing development that may cause or contribute to a condition of pollution or a violation of water quality standards.

18. **Water Quality Improvements.** Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges to the MS4s and control pollutants in storm water discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality

issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the CWA.

19. **Long Term Planning and Implementation.** Federal regulations require municipal storm water permits to expire 5 years from adoption, after which the permit must be renewed and reissued. The San Diego Water Board recognizes that the degradation of water quality and impacts to beneficial uses of the waters in the San Diego Region occurred over several decades. The San Diego Water Board further recognizes that a decade or more may be necessary to realize demonstrable improvement to the quality of waters in the San Diego Region. This Order includes a long term planning and implementation approach that will require more than a single permit term to complete.

WATER QUALITY STANDARDS

20. **Basin Plan.** The San Diego Water Board adopted the Water Quality Control Plan for the San Diego Basin (Basin Plan) on September 8, 1994, that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for receiving waters addressed through the plan. The Basin Plan was subsequently approved by the State Water Resources Control Board (State Water Board) on December 13, 1994. Subsequent revisions to the Basin Plan have also been adopted by the San Diego Water Board and approved by the State Water Board. Requirements of this Order implement the Basin Plan.

    The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Process Supply (PROC), Industrial Service Supply (IND), Ground Water Recharge (GWR), Contact Water Recreation (REC1), Non-contact Water Recreation (REC2), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Freshwater Replenishment (FRSH), Hydropower Generation (POW), and Preservation of Biological Habitats of Special Significance (BIOL). The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region: Navigation (NAV), Commercial and Sport Fishing (COMM), Estuarine Habitat (EST), Marine Habitat (MAR), Aquaculture (AQUA), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN), and Shellfish Harvesting (SHELL).

21. **Ocean Plan.** The State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, and 2005. The State Water Board adopted the latest amendment on April 21, 2005 and it became effective on February 14, 2006. The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean. Requirements of this Order implement the Ocean Plan.

The Ocean Plan identifies the following beneficial uses of ocean waters of the state to be protected: Industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture; preservation and enhancement of designated Areas of Special Biological Significance; rare and endangered species; marine habitat; fish spawning and shellfish harvesting.

22. **Sediment Quality Control Plan**. On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes: 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

23. **National Toxics Rule and California Toxics Rule.** USEPA adopted the National Toxics Rule (NTR) on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the NTR applied in California. On May 18, 2000, USEPA adopted the California Toxics Rule (CTR). The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants.

24. **Antidegradation Policy.** This Order is in conformance with the federal Antidegradation Policy described in 40 CFR 131.12, and State Water Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality Waters in California*. Federal regulations at 40 CFR 131.12 require that the State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. State Water Board Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies.

25. **Anti-Backsliding Requirements.** Section 402(o)(2) of the CWA and federal regulations at 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations may be relaxed. All effluent limitations in this Order are at least as stringent as effluent limitations in the previous permits.

CONSIDERATIONS UNDER FEDERAL AND STATE LAW

26. **Coastal Zone Act Reauthorization Amendments.** Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states with approved coastal zone management programs to address non-point source pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point source pollution: agriculture, silviculture, urban, marinas, and hydromodification. This Order addresses the management measures required for the urban category, with the exception of septic systems. The runoff management programs developed pursuant to this Order fulfills the need for coastal cities to develop a runoff non-point source plan identified in the Non-Point Source Program Strategy and Implementation Plan. The San Diego Water Board addresses septic systems through the administration of other programs.

27. **Endangered Species Act.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 USC sections 1531 to 1544). This Order requires compliance with receiving water limits, and other requirements to protect the beneficial uses of waters of the State. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

28. **Report of Waste Discharge Process.** The waste discharge requirements set forth in this Order are based upon the Report of Waste Discharge submitted by the San Diego County Copermittees prior to the expiration of Order No. R9-2007-0001 (NPDES No. CAS0109266) and the Report of Waste Discharge submitted by the Orange County Copermittees prior to the expiration of Order No. R9-2009-0002 (CAS0108740). The Riverside County Copermittees are not immediately covered by the waste discharge requirements in this Order. The San Diego Water Board understands that each municipality is unique although the Counties share watersheds and/or geographical boundaries. The Order will continue to use the Report of Waste Discharge process prior to initially making Riverside County Copermittees subject to the requirements of this Order.

    The federal regulations (40 CFR 122.21(d)(2)) and CWC section 13376 impose a duty on the Copermittees to reapply for continued coverage through submittal of a Report of Waste Discharge no later than 180 days prior to expiration of a currently effective permit. This requirement is set forth in the Riverside County Copermittees' currently effective permit at ProvisionK.2.c. The Riverside County MS4 Permit, Order No. R9-2010-0016 (NPDES No. CAS0108766) expires on November 10, 2015.

    Unless the Riverside County Copermittees apply for and receive early coverage under this Order, the Riverside County Copermittees' permit will be superseded by this Order upon expiration of their permit, subject to any necessary revisions to the

requirements of this Order made after the San Diego Water Board considers their Report of Waste Discharge through the public process provided in 40 CFR Part 124.

29. **Regional Water Board Designation.** The Cities of Laguna Hills, Laguna Woods, and Lake Forest are located partially within the jurisdictions of the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board) and the San Diego Water Board and their discharges are subject to regulation by both Regional Water Boards. Pursuant to CWC section 13228, the Cities of Laguna Hills, Laguna Woods, and Lake Forest submitted written requests that one Regional Water Board be designated to regulate Phase I MS4 discharges for each of the Cities. The Santa Ana Water Board and the San Diego Water Board have entered into an agreement dated February 10, 2015, whereby the Cities of Laguna Woods and Laguna Hills are largely regulated by the San Diego Water Board under this Order, including those portions of the Cities of Laguna Woods and Laguna Hills not within the San Diego Water Board's jurisdiction, upon the effective date of this Order or Santa Ana Water Board Order No. R8-2015-0001, whichever is later. Similarly, the City of Lake Forest, including those portions of the City of Lake Forest within the San Diego Water Board's jurisdiction, is largely regulated by the Santa Ana Water Board under Order No. R8-2015-0001 (NPDES No. CAS618030) upon the later effective date of this Order or Order No. R8-2015-0001. The agreement provides that the City of Lake Forest is required to retain, and continue implementation of, its over-irrigation discharge prohibition in Title 15, Chapter 14.030, List (b) of the City Municipal Code for regulating storm water quality throughout its jurisdiction. The agreement also requires the City of Lake Forest to actively participate during development and implementation of the Aliso Creek Watershed Management Area Water Quality Improvement Plan required pursuant to this Order. Each Regional Water Board retains the authority to enforce provisions of its Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee under the terms of the agreement (Water Code section 13228 (b)). Under the terms of the agreement, any TMDL and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Laguna Woods, Laguna Hills or Lake Forest as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement of the applicable TMDL will remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's San Diego Creek/Newport Bay TMDL and the San Diego Water Board's Indicator Bacteria Project I Beaches and Creeks TMDL. The San Diego Water Board will periodically review the effectiveness of the agreement during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate the agreement with Santa Ana Water Board or otherwise modify the agreement subject to the approval of the Santa Ana Water Board.

30. **Integrated Report and Clean Water Act Section 303(d) List.** The San Diego Water Board and State Water Board submit an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. USEPA issued its *Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act* on July 29, 2005, which advocates the use of a five category approach for classifying the attainment status of water quality standards for water bodies in the Integrated Report. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 in the Integrated Report are placed on the 303(d) List.

    Water bodies with available data and/or information that indicate at least one beneficial use is not being supported or is threatened, but a TMDL is not required, are included in Category 4 in the Integrated Report. Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

    Implementation of the requirements of this Order may allow the San Diego Water Board to include surface waters impaired by discharges from the Copermittees' MS4s in Category 4 in the Integrated Report for consideration during the next 303(d) List submittal by the State to USEPA.

31. **Economic Considerations.** The California Supreme Court has ruled that although CWC section 13263 requires the State and Regional Water Boards (collectively Water Boards) to consider factors set forth in CWC section 13241 when issuing an NPDES permit, the Water Board may not consider the factors to justify imposing pollutant restrictions that are less stringent than the applicable federal regulations require. (*City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 618, 626-627.) However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

    As noted in the following finding, the San Diego Water Board finds that the requirements in this Order are not more stringent than the minimum federal requirements. Therefore, a CWC section 13241 analysis is not required for permit requirements that implement the effective prohibition on the discharge of non-storm water into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determined appropriate to control such pollutants, as those requirements are mandated by federal law. Notwithstanding the above, the San Diego Water Board has developed an economic analysis of the requirements in this Order. The economic analysis is provided in the Fact Sheet.

32. **Unfunded Mandates.** This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following:

    a. This Order implements federally mandated requirements under CWA section 402 (33 USC section 1342(p)(3)(B)).

    b. The local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental and new dischargers who are issued NPDES permits for storm water and non-storm water discharges.

    c. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order.

    d. The Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)) and in lieu of numeric restrictions on their MS4 discharges (i.e. effluent limitations).

    e. The local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under State law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

    f. The provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state develops a TMDL, federal law requires that permits must contain water quality based effluent limitations consistent with the assumptions and requirements of any applicable wasteload allocation (40 CFR 122.44(d)(1)(vii)(B)).

    See the Fact Sheet for further discussion of unfunded mandates.

33. **California Environmental Quality Act.** The issuance of waste discharge requirements and an NPDES permit for the discharge of runoff from MS4s to waters of the U.S. is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 et seq.) in accordance with CWC section 13389.

STATE WATER BOARD DECISIONS

34. **Compliance with Prohibitions and Limitations.** The receiving water limitation language specified in this Order is consistent with language recommended by the USEPA and established in State Water Board Order WQ 99-05, *Own Motion Review of the Petition of Environmental Health Coalition to Review Waste Discharge Requirements Order No. 96-03, NPDES Permit No. CAS0108740*, adopted by the

State Water Board on June 17, 1999. The receiving water limitation language in this Order requires storm water discharges from MS4s to not cause or contribute to a violation of water quality standards, which is to be achieved through an iterative approach requiring the implementation of improved and better-tailored BMPs over time. Implementation of the iterative approach to comply with receiving water limitations based on applicable water quality standards is necessary to ensure that storm water discharges from the MS4 will not ultimately cause or contribute to violations of water quality standards and will not create conditions of pollution, contamination, or nuisance.

35. **Special Conditions for Areas of Special Biological Significance.** On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving a general exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges (General Exception). On June 19, 2012, the State Water Board adopted Order No. 2012-0031, amending the General Exception to require pollutant reductions to be achieved within six years in accordance with ASBS Compliance Plans and ASBS Pollution Prevention Plans. The General Exception requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject to the terms and conditions of the General Exception as amended. The Special Protections contained in Attachment B to the General Exception as amended are applicable to these discharges, and are hereby incorporated into Attachment A of this Order.

ADMINISTRATIVE FINDINGS

36. **Executive Officer Delegation of Authority.** The San Diego Water Board by prior resolution has delegated all matters that may legally be delegated to its Executive Officer to act on its behalf pursuant to CWC section 13223. Therefore, the Executive Officer is authorized to act on the San Diego Water Board's behalf on any matter within this Order unless such delegation is unlawful under CWC section 13223 or this Order explicitly states otherwise.

37. **Standard Provisions.** Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR 122.42, are provided in Attachment B to this Order.

38. **Fact Sheet.** The Fact Sheet for this Order contains background information, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of this Order. The Fact Sheet is hereby incorporated into this Order and constitutes part of the Findings of this Order.

39. **Public Notice.** In accordance with State and federal laws and regulations, the San Diego Water Board notified the Copermittees, and interested agencies and persons of its intent to prescribe waste discharge requirements for the control of discharges into and from the MS4s to waters of the U.S. and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet.

40. **Public Hearings.** The San Diego Water Board held a public hearing on April 10 and 11, 2013, that was continued to May 8, 2013 and heard and considered all comments pertaining to the terms and conditions of this Order. The San Diego Water Board also held a public workshop on October 8, 2015, and a public hearing on February 11, 2015, and heard and considered all comments pertaining to the amendment of this Order through Order No. R9-2015-0001. Details of these public hearings are provided in the Fact Sheet.

41. **Effective Date.** This Order serves as an NPDES permit pursuant to CWA section 402 or amendments thereto, and as to the San Diego County Copermittees listed in Table 2.a., became effective fifty (50) days after the date of its adoption, and as to the Orange County Copermittees listed in Table 2.b., becomes effective on April 1, 2015, after Order R9-2015-0001 is adopted, provided that the Regional Administrator, USEPA, Region IX, does not object to this Order.

42. **Review by the State Water Board.** Any person aggrieved by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with CWC section 13320 and California Code of Regulations, title 23, sections 2050, and following. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date of this Order, except that if the thirtieth day following the date of this Order falls on a Saturday, Sunday or State holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

THEREFORE, IT IS HEREBY ORDERED that the Copermittees, in order to meet the provisions contained in division 7 of the CWC (commencing with section 13000) and regulations adopted thereunder, and the provisions of the CWA and regulations adopted thereunder, must each comply with the requirements of this Order. This action in no way prevents the San Diego Water Board from taking enforcement action for past violations of the previous Order. If any part of this Order is subject to a temporary stay of enforcement, unless otherwise specified, the Copermittees must comply with the analogous portions of the previous Order, which will remain in effect for all purposes during the pendency of the stay.

II. PROVISIONS

A. PROHIBITIONS AND LIMITATIONS

The purpose of this provision is to describe the conditions under which storm water and non-storm water discharges into and from MS4s are prohibited or limited. The goal of the prohibitions and limitations is to protect the water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through the implementation of water quality improvement strategies and runoff management programs that effectively prohibit non-storm water discharges into the Copermittees' MS4s, and reduce pollutants in storm water discharges from the Copermittees' MS4s to the MEP.

1. Discharge Prohibitions

a. Discharges from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the state are prohibited.

b. Non-storm water discharges into MS4s are to be effectively prohibited, through the implementation of Provision E.2, unless such discharges are authorized by a separate NPDES permit.

c. Discharges from MS4s are subject to all waste discharge prohibitions in the Basin Plan, included in Attachment A to this Order.

d. Storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 applicable to these discharges, included in Attachment A to this Order. All other discharges from the Copermittees' MS4s to ASBS are prohibited.

2. Receiving Water Limitations

a. Discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters, including but not limited to all applicable provisions contained in:

(1) The San Diego Water Board's Basin Plan, including beneficial uses, water quality objectives, and implementation plans;

(2) State Water Board plans for water quality control including the following:

(a) Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries (Thermal Plan), and

(b) The Ocean Plan, including beneficial uses, water quality objectives, and implementation plans;

(3) State Water Board policies for water and sediment quality control including the following:

(a) Water Quality Control Policy for the Enclosed Bays and Estuaries of California,

(b) Sediment Quality Control Plan which includes the following narrative objectives for bays and estuaries:

(i) Pollutants in sediments shall not be present in quantities that, alone or in combination, are toxic to benthic communities, and

(ii) Pollutants shall not be present in sediments at levels that will bioaccumulate in aquatic life to levels that are harmful to human health,

(c) The Statement of Policy with Respect to Maintaining High Quality of Waters in California;[2]

(4) Priority pollutant criteria promulgated by the USEPA through the following:

(a) National Toxics Rule (NTR)[3] (promulgated on December 22, 1992 and amended on May 4, 1995), and

(b) California Toxics Rule (CTR).[4,5]

b. Discharges from MS4s composed of storm water runoff must not alter natural ocean water quality in an ASBS.

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[2] State Water Board Resolution No. 68-16
[3] 40 CFR 131.36
[4] 65 Federal Register 31682-31719 (May 18, 2000), adding Section 131.38 to 40 CFR
[5] If a water quality objective and a CTR criterion are in effect for the same priority pollutant, the more stringent of the two applies.

3. Effluent Limitations

a. TECHNOLOGY BASED EFFLUENT LIMITATIONS

Pollutants in storm water discharges from MS4s must be reduced to the MEP.[6]

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

Each Copermittee must comply with applicable WQBELs established for the TMDLs in Attachment E to this Order, pursuant to the applicable TMDL compliance schedules.

4. Compliance with Discharge Prohibitions and Receiving Water Limitations

Each Copermittee must achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order through timely implementation of control measures and other actions as specified in Provisions B and E of this Order, including any modifications. The Water Quality Improvement Plans required under Provision B must be designed and adapted to ultimately achieve compliance with Provisions A.1.a, A.1.c and A.2.a.

a. If exceedance(s) of water quality standards persist in receiving waters notwithstanding implementation of this Order, the Copermittees must comply with the following procedures:

(1) For exceedance(s) of a water quality standard in the process of being addressed by the Water Quality Improvement Plan, the Copermittee(s) must implement the Water Quality Improvement Plan as accepted by the San Diego Water Board, and update the Water Quality Improvement Plan, as necessary, pursuant to Provision F.2.c;

(2) Upon a determination by either the Copermittees or the San Diego Water Board that discharges from the MS4 are causing or contributing to a new exceedance of an applicable water quality standard not addressed by the Water Quality Improvement Plan, the Copermittees must submit the following updates to the Water Quality Improvement Plan pursuant to Provision F.2.c or as part of the Water Quality Improvement Plan Annual Report required under Provision F.3.b, unless the San Diego Water Board directs an earlier submittal:

(a) The water quality improvement strategies being implemented that are effective and will continue to be implemented,

[6] This does not apply to MS4 discharges which receive subsequent treatment to reduce pollutants in storm water discharges to the MEP prior to entering receiving waters (e.g., low flow diversions to the sanitary sewer). Runoff treatment must occur prior to the discharge of runoff into receiving waters per Finding 7.

(b) Water quality improvement strategies (i.e. BMPs, retrofitting projects, stream and/or habitat rehabilitation projects, adjustments to jurisdictional runoff management programs, etc.) that will be implemented to reduce or eliminate any pollutants or conditions that are causing or contributing to the exceedance of water quality standards,

(c) Updates to the schedule for implementation of the existing and additional water quality improvement strategies, and

(d) Updates to the monitoring and assessment program to track progress toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a of this Order;

(3) The San Diego Water Board may require the incorporation of additional modifications to the Water Quality Improvement Plan required under Provision B. The applicable Copermittees must submit any modifications to the update to the Water Quality Improvement Plan within 90 days of notification that additional modifications are required by the San Diego Water Board, or as otherwise directed;

(4) Within 90 days of the San Diego Water Board determination that the modifications to the Water Quality Improvement Plan required under Provision A.4.a.(3) meet the requirements of this Order, the applicable Copermittees must revise the jurisdictional runoff management program documents to incorporate the modified water quality improvement strategies that have been and will be implemented, the implementation schedule, and any additional monitoring required; and

(5) Each Copermittee must implement the updated Water Quality Improvement Plan.

b. The procedure set forth above to achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order do not have to be repeated for continuing or recurring exceedances of the same water quality standard(s) following implementation of scheduled actions unless directed to do otherwise by the San Diego Water Board.

c. Nothing in Provisions A.4.a and A.4.b prevents the San Diego Water Board from enforcing any provision of this Order while the applicable Copermittees prepare and implement the above update to the Water Quality Improvement Plan and jurisdictional runoff management programs.

B. WATER QUALITY IMPROVEMENT PLANS

The purpose of this provision is to develop Water Quality Improvement Plans that guide the Copermittees' jurisdictional runoff management programs towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plans is to further the Clean Water Act's objective to protect, preserve, enhance, and restore the water quality and designated beneficial uses of waters of the state. This goal will be accomplished through an adaptive planning and management process that identifies the highest priority water quality conditions within a watershed and implements strategies through the jurisdictional runoff management programs to achieve improvements in the quality of discharges from the MS4s and receiving waters.

1. Watershed Management Areas

The Copermittees must develop a Water Quality Improvement Plan for each of the Watershed Management Areas in Table B-1. A total of ten Water Quality Improvement Plans must be developed for the San Diego Region.

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
San Juan (901.00)	South Orange County	- Aliso Creek - San Juan Creek - San Mateo Creek - Pacific Ocean - Heisler Park ASBS	- City of Aliso Viejo - City of Dana Point - City of Laguna Beach - City of Laguna Hills[1] - City of Laguna Niguel - City of Laguna Woods[1] - City of Lake Forest[2] - City of Mission Viejo - City of Rancho Santa Margarita - City of San Clemente - City of San Juan Capistrano - County of Orange - Orange County Flood Control District
Santa Margarita (902.00)	Santa Margarita River	- Murrieta Creek - Temecula Creek - Santa Margarita River - Santa Margarita Lagoon - Pacific Ocean	- City of Murrieta[3] - City of Temecula[3] - City of Wildomar[3] - County of Riverside[3] - County of San Diego[4] - Riverside County Flood Control and Water Conservation District[3]
San Luis Rey (903.00)	San Luis Rey River	- San Luis Rey River - San Luis Rey Estuary - Pacific Ocean	- City of Oceanside - City of Vista - County of San Diego

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
Carlsbad (904.00)	Carlsbad	- Loma Alta Slough - Buena Vista Lagoon - Agua Hedionda Lagoon - Batiquitos Lagoon - San Elijo Lagoon - Pacific Ocean	- City of Carlsbad - City of Encinitas - City of Escondido - City of Oceanside - City of San Marcos - City of Solana Beach - City of Vista - County of San Diego
San Dieguito (905.00)	San Dieguito River	- San Dieguito River - San Dieguito Lagoon - Pacific Ocean	- City of Del Mar - City of Escondido - City of Poway - City of San Diego - City of Solana Beach - County of San Diego
Penasquitos (906.00)	Penasquitos	- Los Penasquitos Lagoon - Pacific Ocean	- City of Del Mar - City of Poway - City of San Diego - County of San Diego
	Mission Bay	- Mission Bay - Pacific Ocean - San Diego Marine Life Refuge ASBS	- City of San Diego
San Diego (907.00)	San Diego River	- San Diego River - Pacific Ocean	- City of El Cajon - City of La Mesa - City of San Diego - City of Santee - County of San Diego
Pueblo San Diego (908.00) Sweetwater (909.00) Otay (910.00)	San Diego Bay	- Sweetwater River - Otay River - San Diego Bay - Pacific Ocean	- City of Chula Vista - City of Coronado - City of Imperial Beach - City of La Mesa - City of Lemon Grove - City of National City - City of San Diego - County of San Diego - San Diego County Regional Airport Authority - San Diego Unified Port District
Tijuana (911.00)	Tijuana River	- Tijuana River - Tijuana Estuary - Pacific Ocean	- City of Imperial Beach - City of San Diego - County of San Diego

Notes:

1. By agreement dated February 10, 2015, pursuant to Water Code section 13228, the Phase I MS4 discharges within the jurisdiction of the City of Laguna Hills and the City of Laguna Woods located in the Santa Ana Region are regulated by San Diego Water Board Order No. R9-2013-0001 as amended by Order No. R9-2015-0001, upon the later effective date of Order No. R9-2015-0001 or Santa Ana Water Board Tentative Order No. R8-2015-0001. The City of Laguna Hills and Laguna Woods must also comply with the requirements of the San Diego Creek/Newport Bay TMDL in section XVIII of Santa Ana Water Board Order No. R8-2015-0001.
2. By agreement dated February 10, 2015, pursuant to Water Code section 13228, Phase I MS4 discharges within the City of Lake Forest located within the San Diego Water Board Region are regulated by the Santa Ana Water Board Order No. R8-2015-0001 (NPDES No. CAS618030) upon the later effective date of this Order or Santa Ana Water Board Tentative Order No. R8-2015-0001. In accordance with the terms of the agreement between the San Diego Water Board and the Santa Ana Water Board, the City of Lake Forest must implement the requirements of the Bacteria TMDL in Attachment E of this Order, participate in preparation and implementation of the Water Quality Improvement Plan for the Aliso Creek Watershed Management Area as described in Provision B of this Order and continue implementation of its over-irrigation discharge prohibition in its City Ordinance, Title 15, Chapter 15, section 14.030, List (b).
3. The Riverside County Copermittees will be covered under this Order after expiration of Order No. R9-2010-0016 or earlier if the Riverside County Copermittees meet the conditions in Provision F.6, upon further amendment of this Order.
4. The County of San Diego is not required to implement the requirements of Provision B for its jurisdiction within the Santa Margarita River Watershed Management Area until the Riverside County Copermittees have been notified of coverage under this Order. The County of San Diego is required to implement the requirements of Provisions D, F.3.b, and Attachment E until the Riverside County Copermittees have been notified of coverage under this Order.

2. Priority Water Quality Conditions

The Copermittees must identify the water quality priorities within each Watershed Management Area that will be addressed by the Water Quality Improvement Plan. Where appropriate, Watershed Management Areas may be separated into subwatersheds to focus water quality prioritization and jurisdictional runoff management program implementation efforts by receiving water.

a. Assessment of Receiving Water Conditions

The Copermittees must consider the following, at a minimum, to identify water quality priorities based on impacts of MS4 discharges on receiving water beneficial uses:

(1) Receiving waters listed as impaired on the CWA Section 303(d) List of Water Quality Limited Segments (303(d) List);

(2) TMDLs adopted and under development by the San Diego Water Board;

(3) Receiving waters recognized as sensitive or highly valued by the Copermittees, including estuaries designated under the National Estuary Program under CWA section 320, marine protected areas, wetlands defined by the State or U.S. Fish and Wildlife Service's National Wetlands Inventory as wetlands, waters having the Preservation of Biological Habitats of Special Significance (BIOL) beneficial use designation, and receiving waters identified as ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(4) The receiving water limitations of Provision A.2;

(5) Known historical versus current physical, chemical, and biological water quality conditions;

(6) Available, relevant, and appropriately collected and analyzed physical, chemical, and biological receiving water monitoring data, including, but not limited to, data describing:

(a) Chemical constituents,

(b) Water quality parameters (i.e. pH, temperature, conductivity, etc.),

(c) Toxicity Identification Evaluations for both receiving water column and sediment,

(d) Trash impacts,

(e) Bioassessments, and

(f) Physical habitat;

(7) Available evidence of erosional impacts in receiving waters due to accelerated flows (i.e. hydromodification);

(8) Available evidence of adverse impacts to the chemical, physical, and biological integrity of receiving waters; and

(9) The potential improvements in the overall condition of the Watershed Management Area that can be achieved.

b. ASSESSMENT OF IMPACTS FROM MS4 DISCHARGES

The Copermittees must consider the following, at a minimum, to identify the potential impacts to receiving waters that may be caused or contributed to by discharges from the Copermittees' MS4s:

(1) The discharge prohibitions of Provision A.1 and effluent limitations of Provision A.3; and

(2) Available, relevant, and appropriately collected and analyzed storm water and non-storm water monitoring data from the Copermittees' MS4 outfalls;

(3) Locations of each Copermittee's MS4 outfalls that discharge to receiving waters;

(4) Locations of MS4 outfalls that are known to persistently discharge non-storm water to receiving waters likely causing or contributing to impacts on receiving water beneficial uses;

(5) Locations of MS4 outfalls that are known to discharge pollutants in storm water causing or contributing to impacts on receiving water beneficial uses; and

(6) The potential improvements in the quality of discharges from the MS4 that can be achieved.

c. IDENTIFICATION OF PRIORITY WATER QUALITY CONDITIONS

(1) The Copermittees must use the information gathered for Provisions B.2.a and B.2.b to develop a list of priority water quality conditions as pollutants, stressors and/or receiving water conditions that are the highest threat to receiving water quality or that most adversely affect the quality of receiving waters. The list must include the following information for each priority water quality condition:

(a) The beneficial use(s) associated with the priority water quality condition;

(b) The geographic extent of the priority water quality condition within the Watershed Management Area, if known;

(c) The temporal extent of the priority water quality condition (e.g., dry weather and/or wet weather);

(d) The Copermittees with MS4s discharges that may cause or contribute to the priority water quality condition; and

(e) An assessment of the adequacy of and data gaps in the monitoring data to characterize the conditions causing or contributing to the priority water quality condition, including a consideration of spatial and temporal variation.

(2) The Copermittees must identify the highest priority water quality conditions to be addressed by the Water Quality Improvement Plan, and provide a rationale for selecting a subset of the water quality conditions identified pursuant to Provision B.2.c.(1) as the highest priorities.

d. IDENTIFICATION OF MS4 SOURCES OF POLLUTANTS AND/OR STRESSORS

The Copermittees must identify and prioritize known and suspected sources of storm water and non-storm water pollutants and/or other stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c. The identification of known and suspected sources of pollutants and/or stressors that cause or contribute to the highest priority water quality conditions as identified for Provision B.2.c must consider the following:

(1) Pollutant generating facilities, areas, and/or activities within the Watershed Management Area, including:

(a) Each Copermittee's inventory of construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas,

(b) Publicly owned parks and/or recreational areas,

(c) Open space areas,

(d) All currently operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste, and

(e) Areas not within the Copermittees' jurisdictions (e.g., Phase II MS4s, tribal lands, state lands, federal lands) that are known or suspected to be discharging to the Copermittees' MS4s;

(2) Locations of the Copermittees' MS4s, including the following:

(a) All MS4 outfalls that discharge to receiving waters, and

(b) Locations of major structural controls for storm water and non-storm water (e.g., retention basins, detention basins, major infiltration devices, etc.);

(3) Other known and suspected sources of non-storm water or pollutants in storm water discharges to receiving waters within the Watershed Management Area, including the following:

(a) Other MS4 outfalls (e.g., Phase II Municipal and Caltrans),

(b) Other NPDES permitted discharges,

(c) Any other discharges that may be considered point sources (e.g., private outfalls), and

(d) Any other discharges that may be considered non-point sources (e.g., agriculture, wildlife or other natural sources);

(4) Review of available data, including but not limited to:

(a) Findings from the Copermittees' illicit discharge detection and elimination programs,

(b) Findings from the Copermittees' MS4 outfall discharge monitoring,

(c) Findings from the Copermittees' receiving water monitoring,

(d) Findings from the Copermittees' MS4 outfall discharge and receiving water assessments, and

(e) Other available, relevant, and appropriately collected data, information, or studies related to pollutant sources and/or stressors that contribute to the highest priority water quality conditions as identified for Provision B.2.c.

(5) The adequacy of the available data to identify and prioritize sources and/or stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c.

e. IDENTIFICATION OF POTENTIAL WATER QUALITY IMPROVEMENT STRATEGIES

The Copermittees must evaluate the findings identified under Provisions B.2.a-d, and identify potential strategies that can result in improvements to water quality in MS4 discharges and/or receiving waters within the Watershed Management Area. Potential water quality improvement strategies that may be implemented within the Watershed Management Area must include the following:

(1) Structural BMPs, non-structural BMPs, incentives, or programs that can potentially be implemented to address the highest priority water quality conditions identified under Provision B.2.c, or MS4 sources of pollutants or stressors identified under Provision B.2.d,

(2) Retrofitting projects in areas of existing development within the Watershed Management Area that can potentially be implemented to reduce MS4 sources of pollutants or stressors identified under Provision B.2.d causing or contributing to the highest priority water quality conditions identified under Provision B.2.c, and

(3) Stream, channel, and/or habitat rehabilitation projects within the Watershed Management Area that can potentially be implemented to protect and/or improve conditions in receiving waters from MS4 pollutants and/or stressors identified under Provision B.2.d causing or contributing to the highest priority water quality conditions identified under Provision B.2.c.

3. Water Quality Improvement Goals, Strategies and Schedules

The Copermittees must identify and develop specific water quality improvement goals and strategies to address the highest priority water quality conditions identified within a Watershed Management Area. The water quality improvement goals and strategies must address the highest priority water quality conditions by effectively prohibiting non-storm water discharges to the MS4, reducing pollutants in storm water discharges from the MS4 to the MEP, and protecting the water quality standards of receiving waters.

a. WATER QUALITY IMPROVEMENT GOALS AND SCHEDULES

(1) <u>Numeric Goals</u>

The Copermittees must develop and incorporate numeric goals[7] into the Water Quality Improvement Plan. Numeric goals must be used to support

[7] Interim and final numeric goals may take a variety of forms such as TMDL established WQBELs, action levels, pollutant concentration, load reductions, number of impaired water bodies delisted from the List of Water Quality Impaired Segments, Index of Biotic Integrity (IBI) scores, or other appropriate metrics. Interim and final numeric goals are not necessarily limited to one criterion or indicator, but may include multiple criteria and/or indicators. Except for TMDL established WQBELs, interim and final numeric goals and corresponding schedules may be revised through the adaptive management process under Provision B.5.

Water Quality Improvement Plan implementation and measure reasonable progress towards addressing the highest priority water quality conditions identified under Provision B.2.c. The Copermittees must establish and incorporate the following numeric goals in the Water Quality Improvement Plan:

(a) Final numeric goals must be based on measureable criteria or indicators capable of demonstrating one or more of the following:

(i) Discharges from the Copermittees' MS4s will not cause or contribute to exceedances of water quality standards in receiving waters, AND/OR

(ii) The conditions of receiving waters and associated habitat are protected from MS4 discharges, AND/OR

(iii) Beneficial uses of receiving waters are protected from MS4 discharges and will be supported.

(b) Interim numeric goals must be based on measureable criteria or indicators capable of demonstrating reasonable incremental progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges as follows:

(i) One or more interim numeric goals may be established to demonstrate progress toward achieving each final numeric goal,

(ii) For each final numeric goal, at least one interim numeric goal must be expressed as a reasonable increment toward achievement of the final numeric goal,

(iii) For each final numeric goal, reasonable interim numeric goals must be established to be accomplished during each 5 year period between the acceptance of the Water Quality Improvement Plan and the achievement of the final numeric goals.

(2) <u>Schedules for Achieving Numeric Goals</u>

The Copermittees must develop and incorporate schedules for achieving the numeric goals into the Water Quality Improvement Plan. The schedules must demonstrate reasonable progress toward achieving the final numeric goals required for Provision B.3.a.(1). The Copermittees must incorporate the schedules for achieving the numeric goals into the Water Quality Improvement Plan based on the following considerations:

(a) Final dates for achieving all final numeric goals must be established considering the following:

(i) Final compliance dates for any applicable TMDLs in Attachment E to this Order;

(ii) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(iii) Achievement of the final numeric goals for the highest water quality priorities must be as soon as possible;

(iv) Final dates for achieving the final numeric goals must reflect a realistic assessment of the shortest practicable time required based on the temporal and spatial extent and factors associated with the highest priority water quality conditions identified under Provision B.2.c, and taking into account the time reasonably required to implement the water quality improvement strategies required pursuant to Provision B.3.b.

(b) Interim dates for achieving all interim numeric goals must be established considering the following:

(i) Interim compliance dates for any applicable TMDLs in Attachment E to this Order;

(ii) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(iii) Interim dates for achieving the interim numeric goals must reflect a realistic assessment of the shortest practicable time reasonably required, taking into account the time needed to implement new or significantly expanded programs and securing financing, if necessary; and

(iv) For each final numeric goal, at least one interim numeric goal must be established that the Copermittees will work toward achieving within the term of this Order.

b. WATER QUALITY IMPROVEMENT STRATEGIES AND SCHEDULES

Based on the likely effectiveness and efficiency of the potential water quality improvement strategies identified under Provision B.2.e to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a, the Copermittees must identify the strategies that will be implemented in each Watershed Management Area as follows:

(1) <u>Jurisdictional Strategies</u>

(a) Each Copermittee in the Watershed Management Area must identify the strategies that will be implemented within its jurisdiction as part of its

jurisdictional runoff management program requirements under Provisions E.2 through E.7, including descriptions of the following:

(i) For each of the inventories developed for its jurisdiction, as required under Provisions D.2.a.(1), E.3.e.(2), E.4.b, and E.5.a, each Copermittee must identify the known and suspected areas or sources causing or contributing to the highest priority water quality conditions in the Watershed Management Area that the Copermittee will focus on in its efforts to effectively prohibit non-storm water discharges to its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, and achieve the interim and final numeric goals identified under Provision B.3.a;

(ii) BMPs that each Copermittee will implement, or require to be implemented, as applicable, for those areas or sources within its jurisdiction;

(iii) Education programs that each Copermittee will implement, as applicable, for those areas or sources within its jurisdiction;

(iv) Frequencies that each Copermittee will conduct inspections on those areas or sources within its jurisdiction;

(v) Incentive and enforcement programs that each Copermittee will implement, as applicable, for those areas or sources within its jurisdiction; and

(vi) Any other BMPs, incentives, or programs that each Copermittee will implement for those areas or sources within its jurisdiction.

(b) Identify the optional jurisdictional strategies that each Copermittee will implement within its jurisdiction, as necessary, to effectively prohibit non-storm water discharges to its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. Descriptions of the optional jurisdictional strategies must include:

(i) BMPs, incentives, or programs that may be implemented by the Copermittee within its jurisdiction in addition to the requirements of Provisions B.3.b.(1)(a);

(ii) Incentives or programs that may be implemented by the Copermittee to encourage or implement projects to retrofit areas of existing development within its jurisdiction;

(iii) Incentives or programs that may be implemented by the Copermittee to encourage or implement projects that will rehabilitate the conditions of channels or habitats within its jurisdiction;

(iv) The funds and/or resources that must be secured by the Copermittee to implement the optional strategies described for Provisions B.3.b.(1)(b)(i)-(iii) within its jurisdiction; and

(v) The circumstances necessary to trigger implementation of the optional jurisdictional strategies, in addition to the requirements of Provision B.3.b.(1)(a), to achieve the interim and final numeric goals within the schedules established under Provision B.3.a.

(c) Identify the strategies that will be implemented by the Copermittee in coordination with or with the cooperation of other agencies (e.g. Caltrans, water districts, school districts) and/or entities (e.g. non-governmental organizations) within its jurisdiction.

(2) Watershed Management Area Strategies

The Copermittees must identify the optional regional or multi-jurisdictional strategies that will be implemented in the Watershed Management Area, as necessary, to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. Descriptions of the optional regional or multi-jurisdictional strategies must include:

(a) Regional or multi-jurisdictional BMPs, incentives, or programs that may be implemented by the Copermittees in the Watershed Management Area;

(b) Incentives or programs that may be implemented by the Copermittees in the Watershed Management Area to encourage or implement regional or multi-jurisdictional projects to retrofit areas of existing development;

(c) Incentives or programs that may be implemented by the Copermittees to encourage or implement regional or multi-jurisdictional projects that will rehabilitate the conditions of channels, streams, or habitats within the Watershed Management Area;

(d) The funds and/or resources that must be secured by the Copermittees to implement the optional strategies described for Provisions B.3.b.(2)(a)-(c) within the Watershed Management Area; and

(e) The circumstances necessary to trigger implementation of the optional regional or multi-jurisdictional strategies to achieve the interim and final numeric goals within the schedules established under Provision B.3.a.

(3) Schedules for Implementing Strategies

The Copermittees must develop reasonable schedules for implementing the water quality improvement strategies identified under Provisions B.3.b.(1) and B.3.b.(2) to achieve the interim and final numeric goals identified and schedules established under Provision B.3.a. The Copermittees must incorporate the schedules to implement the water quality improvement strategies into the Water Quality Improvement Plan as follows:

(a) Each Copermittee must develop schedules for the jurisdictional strategies identified pursuant to Provisions B.3.b.(1)(a)-(b). Each schedule must specify:

(i) If each jurisdictional strategy identified pursuant to Provision B.3.b.(1)(a) will or will not be initiated upon acceptance of the Water Quality Improvement Plan;

(ii) For each jurisdictional strategy identified pursuant to Provision B.3.b.(1)(a) that will not be initiated upon acceptance of the Water Quality Improvement Plan, the shortest practicable time in which each jurisdictional strategy will be initiated after acceptance of the Water Quality Improvement Plan;

(iii) For each optional jurisdictional strategy identified pursuant to Provision B.3.b.(1)(b), a realistic assessment of the shortest practicable time required to:

[a] Secure the resources needed to fund the optional jurisdictional strategy, and
[b] Procure the resources, materials, labor, and applicable permits necessary to initiate implementation of the optional jurisdictional strategy;

(iv) If each jurisdictional strategy identified pursuant to Provisions B.3.b.(1)(a)-(b) is expected to be continuously implemented (e.g. inspections) or completed within a schedule (e.g. construction of structural BMP); and

(v) If a jurisdictional strategy identified pursuant to Provisions B.3.b.(1)(a)-(b) is expected to be completed within a schedule, the anticipated time to complete based on a realistic assessment of the shortest practicable time required.

(b) The Copermittees in the Watershed Management Area must develop schedules for the regional or multi-jurisdictional strategies identified pursuant to Provision B.3.b.(2). Each schedule must specify:

(i) A realistic assessment of the shortest practicable time to:

[a] Secure the resources needed to fund the optional regional or multi-jurisdictional strategy, and

[b] Procure the resources, materials, labor, and permits necessary to initiate the implementation of the optional regional or multi-jurisdictional strategy;

(ii) If each regional or multi-jurisdictional strategy identified pursuant to Provision B.3.b.(2) is expected to be continuously implemented (e.g. inspections) or completed within a schedule (e.g. construction of structural BMP); and

(iii) If a regional or multi-jurisdictional strategy and/or activity identified pursuant to Provisions B.3.b.(2) is expected to be completed within a schedule, the anticipated time to complete based on a realistic assessment of the shortest practicable time required.

(4) Optional Watershed Management Area Analysis

(a) For each Watershed Management Area, the Copermittees have the option to perform a Watershed Management Area Analysis for the purpose of developing watershed-specific requirements for structural BMP implementation, as described in Provision E.3.c.(3). The Watershed Management Area Analysis must include GIS layers (maps) as output. The analysis must include the following information, to the extent it is available, in order to characterize the Watershed Management Areas:

(i) A description of dominant hydrologic processes, such as areas where infiltration or overland flow likely dominates;

(ii) A description of existing streams in the watershed, including bed material and composition, and if they are perennial or ephemeral;

(iii) Current and anticipated future land uses;

(iv) Potential coarse sediment yield areas; and

(v) Locations of existing flood control structures and channel structures, such as stream armoring, constrictions, grade control structures, and hydromodification or flood management basins.

(b) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify and compile a list of candidate projects that could potentially be used as alternative compliance options for Priority Development Projects, to be implemented in lieu of onsite structural BMP performance requirements described in Provisions E.3.c.(1) and E.3.c.(2)(a). Specifically, the Copermittees must identify opportunities to be included in the list of candidate projects in each Watershed Management Area, such as:

(i) Stream or riparian area rehabilitation;

(ii) Retrofitting existing infrastructure to incorporate storm water retention or treatment;

(iii) Regional BMPs;

(iv) Groundwater recharge projects;

(v) Water supply augmentation projects; and

(vi) Land purchases to preserve floodplain functions.

(c) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify areas within the Watershed Management Area where it is appropriate to allow Priority Development Projects to be exempt from the hydromodification management BMP performance requirements described in Provision E.3.c.(2), including supporting rationale.

4. Water Quality Improvement Monitoring and Assessment Program

a. The Copermittees in each Watershed Management Area must develop and incorporate an integrated monitoring and assessment program into the Water Quality Improvement Plan that assesses: 1) the progress toward achieving the numeric goals and schedules, 2) the progress toward addressing the highest priority water quality conditions for each Watershed Management Area, and 3) each Copermittee's overall efforts to implement the Water Quality Improvement Plan.

b. The monitoring and assessment program must incorporate the monitoring and assessment requirements of Provision D, which may allow the Copermittees to modify the program to be consistent with and focus on the highest priority water quality conditions for each Watershed Management Area.

c. For Watershed Management Areas with applicable TMDLs, the monitoring and assessment program must incorporate the specific monitoring and assessment requirements of Attachment E.

d. For Watershed Management Areas with any ASBS, the water quality monitoring and assessment program must incorporate the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

5. Iterative Approach and Adaptive Management Process

The Copermittees in each Watershed Management Area must implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a, and must include the following:

a. RE-EVALUATION OF PRIORITY WATER QUALITY CONDITIONS

The priority water quality conditions and potential water quality improvement strategies included in the Water Quality Improvement Plan pursuant to Provisions B.2.c and B.2.e may be re-evaluated by the Copermittees as needed during the term of this Order as part of the Water Quality Improvement Plan Annual Report. Re-evaluation and recommendations for modifications to the priority water quality conditions and potential water quality improvement strategies must be provided in the Report of Waste Discharge, and must consider the following:

(1) Achieving the outcome of improved water quality in MS4 discharges and receiving waters through implementation of the water quality improvement strategies identified in the Water Quality Improvement Plan;

(2) New information developed when the requirements of Provisions B.2.a-c have been re-evaluated;

(3) Spatial and temporal accuracy of monitoring data collected to inform prioritization of water quality conditions and implementation strategies to address the highest priority water quality conditions;

(4) Availability of new information and data from sources other than the jurisdictional runoff management programs within the Watershed Management Area that informs the effectiveness of the actions implemented by the Copermittees;

(5) San Diego Water Board recommendations; and

(6) Recommendations for modifications solicited through a public participation process.

b. ADAPTATION OF GOALS, STRATEGIES AND SCHEDULES

The water quality improvement goals, strategies and schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.3, must be re-evaluated and adapted as new information becomes available to result in more effective and efficient measures to address the highest priority water quality conditions identified pursuant to Provision B.2.c. Re-evaluation of and modifications to the water quality improvement goals, strategies and schedules must be provided in the Water Quality Improvement Plan Annual Report, and must consider the following:

(1) Modifications to the priority water quality conditions based on Provision B.5.a;

(2) Progress toward achieving interim and final numeric goals in receiving waters and MS4 discharges for the highest priority water quality conditions in the Watershed Management Area,

(3) Progress toward achieving outcomes according to established schedules;

(4) New policies or regulations that may affect identified numeric goals;

(5) Measurable or demonstrable reductions of non-storm water discharges to and from each Copermittee's MS4;

(6) Measurable or demonstrable reductions of pollutants in storm water discharges from each Copermittee's MS4 to the MEP;

(7) New information developed when the requirements of Provisions B.2.b and B.2.d have been re-evaluated;

(8) Efficiency in implementing the Water Quality Improvement Plan;

(9) San Diego Water Board recommendations; and

(10) Recommendations for modifications solicited through a public participation process.

c. ADAPTATION OF MONITORING AND ASSESSMENT PROGRAM

The water quality improvement monitoring and assessment program, included in the Water Quality Improvement Plan pursuant to Provision B.4, must be re-evaluated and adapted when new information becomes available. Re-evaluation and recommendations for modifications to the monitoring and assessment program, pursuant to the requirements of Provision D, may be provided in the Water Quality Improvement Plan Annual Report, but must be provided in the Report of Waste Discharge.

6. Water Quality Improvement Plan Submittal, Updates, and Implementation

a. The Copermittees must submit and commence implementation of the Water Quality Improvement Plans in accordance with the requirements of Provision F.1.

b. The Copermittees must submit proposed updates to the Water Quality Improvement Plan for acceptance by the San Diego Water Board Executive Officer in accordance with the requirements of Provision F.2.c.

C. ACTION LEVELS

The purpose of this provision is for the Copermittees to incorporate numeric action levels in the Water Quality Improvement Plans. The goal of the action levels is to guide Water Quality Improvement Plan implementation efforts and measure progress towards the protection of water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through monitoring and assessing the quality of the MS4 discharges during the implementation of the Water Quality Improvement Plans.

1. Non-Storm Water Action Levels[8]

The Copermittees must develop and incorporate numeric non-storm water action levels (NALs) into the Water Quality Improvement Plan to: 1) support the development and prioritization of water quality improvement strategies for effectively prohibiting non-storm water discharges to the MS4s, 2) assess the effectiveness of the water quality improvement strategies toward addressing MS4 non-storm water discharges, required pursuant to Provision D.4.b.(1), and 3) support the detection and elimination of non-storm water and illicit discharges to the MS4, required pursuant to Provision E.2.[9]

a. The following NALs must be incorporated:

(1) Non-Storm Water Discharges from MS4s to Ocean Surf Zone

Table C-1. Non-Storm Water Action Levels for Discharges from MS4s to Ocean Surf Zone

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Total Coliform	MPN/100 ml	1,000	-	10,000/1,000[1]	OP
Fecal Coliform	MPN/100 ml	200[2]	-	400	OP
Enterococci	MPN/100 ml	35	-	104[3]	OP

Abbreviations/Acronyms
AMAL – average monthly action level
MDAL – maximum daily action level
OP – Ocean Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Total coliform density NAL is 1,000 MPN/100 ml when the fecal/total coliform ratio exceeds 0.1.
2. Fecal coliform density NAL is 200 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas."

[8] NALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, unless the NAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed.
[9] The Copermittees may utilize NALs or other benchmarks currently established by the Copermittees as interim NALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

(2) Non-Storm Water Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Table C-2. Non-Storm Water Action Levels for Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Turbidity	NTU	75	-	225	OP
pH	Units	Within limit of 6.0 to 9.0 at all times			OP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	35	-	104[3]	BP
Priority Pollutants	µg/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
OP – Ocean Plan water quality objective
NTU – Nephelometric Turbidity Units
µg/L – micrograms per liter
MDAL – maximum daily action level
BP – Basin Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas" and is not applicable to water bodies that are not designated with the water contact recreation (REC-1) beneficial use.

Table C-3. Non-Storm Water Action Levels for Priority Pollutants

Parameter	Units	Freshwater (CTR)		Saltwater (CTR)	
		MDAL	AMAL	MDAL	AMAL
Cadmium	µg/L	**	**	16	8
Copper	µg/L	*	*	5.8	2.9
Chromium III	µg/L	**	**	-	-
Chromium VI	µg/L	16	8.1	83	41
Lead	µg/L	*	*	14	2.9
Nickel	µg/L	**	**	14	6.8
Silver	µg/L	*	*	2.2	1.1
Zinc	µg/L	*	*	95	47

Abbreviations/Acronyms:
CTR – California Toxic Rule
AMAL – average monthly action level
µg/L – micrograms per liter
MDAL – maximum daily action level

Notes:
* Action levels developed on a case-by-case basis (see below)
** Action levels developed on a case-by-case basis (see below), but calculated criteria are not to exceed Maximum Contaminant Levels (MCLs) under the California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64431

The Cadmium, Copper, Chromium (III), Lead, Nickel, Silver and Zinc NALs for MS4 discharges to freshwater receiving waters will be developed on a case-by-case basis based on site-specific water quality data (receiving water hardness). For these priority pollutants, refer to 40 CFR 131.38(b)(2).

(3) Non-Storm Water Discharges from MS4s to Inland Surface Waters

Table C-4. Non-Storm Water Action Levels for Discharges from MS4s to Inland Surface Waters

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Dissolved Oxygen	mg/L	Not less than 5.0 in WARM waters and not less than 6.0 in COLD waters			BP
Turbidity	NTU	-	20	See MDAL	BP
pH	Units	Within limit of 6.5 to 8.5 at all times			BP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	33	-	61[3]	BP
Total Nitrogen	mg/L	-	1.0	See MDAL	BP
Total Phosphorus	mg/L	-	0.1	See MDAL	BP
MBAS	mg/L	-	0.5	See MDAL	BP
Iron	mg/L	-	0.3	See MDAL	BP
Manganese	mg/L	-	0.05	See MDAL	BP
Priority Pollutants	µg/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
BP – Basin Plan water quality objective
COLD – cold freshwater habitat beneficial use
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
MDAL – maximum daily action level
WARM – warm freshwater habitat beneficial use
MBAS – Methylene Blue Active Substances
MPN/100 ml – most probable number per 100 milliliters
µg/L – micrograms per liter

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for freshwater "designated beach areas" and is not applicable to water bodies that are not designated with the water contact recreation (REC-1) beneficial use.

b. If not identified in Provision C.1.a, NALs must be identified, developed and incorporated in the Water Quality Improvement Plan for any pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in receiving waters associated with the highest priority water quality conditions related to non-storm water discharges from the MS4s. NALs must be based on:

(1) Applicable water quality standards which may be dependent upon site-specific or receiving water-specific conditions or assumptions to be identified by the Copermittees; or

(2) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the NALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary NALs specific to the Watershed Management Area at levels greater than the NALs required by Provisions C.1.a and C.1.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for effectively prohibiting non-storm water discharges to the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and from the MS4. The

secondary NALs may be developed using an approach acceptable to the San Diego Water Board.

d. Dry weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.b may be utilized to develop or revise NALs based on watershed-specific data, subject to San Diego Water Board Executive Officer approval.

2. Storm Water Action Levels[10]

The Copermittees must develop and incorporate numeric storm water action levels (SALs) in the Water Quality Improvement Plans to: 1) support the development and prioritization of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s, and 2) assess the effectiveness of the water quality improvement strategies toward reducing pollutants in storm water discharges, required pursuant to Provision D.4.b.(2).[11]

a. The following SALs for discharges of storm water from the MS4 must be incorporated:

Table C-5. Storm Water Action Levels for Discharges from MS4s to Receiving Waters

Parameter	Units	Action Level
Turbidity	NTU	126
Nitrate & Nitrite (Total)	mg/L	2.6
Phosphorus (Total P)	mg/L	1.46
Cadmium (Total Cd)*	µg/L	3.0
Copper (Total Cu)*	µg/L	127
Lead (Total Pb)*	µg/L	250
Zinc (Total Zn)*	µg/L	976

Abbreviations/Acronyms:
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
µg/L – micrograms per liter

Notes:
* The sampling must include a measure of receiving water hardness at each MS4 outfall. If a total metal concentration exceeds the corresponding metals SAL in Table C-5, that concentration must be compared to the California Toxics Rule criteria and the USEPA 1-hour maximum concentration for the detected level of receiving water hardness associated with that sample. If it is determined that the sample's total metal concentration for that specific metal exceeds that SAL, but does not exceed the applicable USEPA 1-hour maximum concentration criterion for the measured level of hardness, then the sample result will not be considered above the SAL for that measurement.

[10] SALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, unless the SAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed.

[11] The Copermittees may utilize SALs or other benchmarks currently established by the Copermittees as interim SALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

b. If not identified in Provision C.2.a, SALs must be identified, developed and incorporated in the Water Quality Improvement Plan for pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in receiving waters associated with the highest priority water quality conditions related to storm water discharges from the MS4s. SALs must be based on:

(1) Federal and State water quality guidance and/or water quality standards; and

(2) Site-specific or receiving water-specific conditions; or

(3) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the SALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary SALs specific to the Watershed Management Area at levels greater than the SALs required by Provisions C.2.a and C.2.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s. The secondary SALs may be developed based on the approaches recommended by the State Water Board's Storm Water Panel[12] or using an approach acceptable to the San Diego Water Board.

d. Wet weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.c may be used to develop or revise SALs based upon watershed-specific data, subject to San Diego Water Board Executive Officer approval.

[12] Storm Water Panel Recommendations to the California State Water Resources Control Board: The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities (June 2006)

D. MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS

The purpose of this provision is for the Copermittees to monitor and assess the impact on the conditions of receiving waters caused by discharges from the Copermittees' MS4s under wet weather and dry weather conditions. The goal of the monitoring and assessment program is to inform the Copermittees about the nexus between the health of receiving waters and the water quality condition of the discharges from their MS4s. This goal will be accomplished through monitoring and assessing the conditions of the receiving waters, discharges from the MS4s, pollutant sources and/or stressors, and effectiveness of the water quality improvement strategies implemented as part of the Water Quality Improvement Plans.

1. Receiving Water Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the condition of the receiving waters in each Watershed Management Area during dry weather and wet weather. Following San Diego Water Board acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct long-term receiving water monitoring during implementation of the Water Quality Improvement Plan to assess the long term trends and determine if conditions in receiving waters are improving. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following receiving water monitoring procedures:

a. TRANSITIONAL RECEIVING WATER MONITORING

Until the monitoring requirements and schedules of Provisions D.1.b-e are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following receiving water monitoring in the Watershed Management Area:

(1) Continue the receiving water monitoring programs required in Order Nos. R9-2007-0001 (Monitoring and Reporting Program No. R9-2007-0001 Sections II.A.1-A.5), R9-2009-0002, and R9-2010-0016, unless the Executive Officer provides conditional approval for Copermittees to proceed with implementation of the proposed monitoring and assessment program developed in accordance with Provision B.4;

(2) Continue the monitoring in the Hydromodification Management Plans approved by the San Diego Water Board;

(3) Participate in the following regional receiving water monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring,

(b) Southern California Bight Regional Monitoring, and

(c) Sediment Quality Monitoring;

(4) Implement the monitoring programs developed as part of any implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) for the TMDLs in Attachment E to this Order; and

(5) For Watershed Management Areas with ASBS, implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

b. LONG-TERM RECEIVING WATER MONITORING STATIONS

The Copermittees must select at least one long-term receiving water monitoring station from among the existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees to be representative of the receiving water quality in the Watershed Management Area. Additional long-term receiving water monitoring stations must be selected where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

c. DRY WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three dry weather monitoring events at each of the long-term receiving water monitoring stations. At least one monitoring event must be conducted during the dry season (May 1 – September 30) and at least one monitoring event must be conducted during a dry weather period during the wet season (October 1 – April 30), after the first wet weather event of the season, with an antecedent dry period of at least 72 hours following a storm event producing measureable rainfall of greater than 0.1 inch.

(1) <u>Dry Weather Receiving Water Field Observations</u>

For each dry weather monitoring event, the Copermittees must record field observations consistent with Table D-1 at each long-term receiving water monitoring station.

Table D-1. Field Observations for Receiving Water Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) • Station description (i.e. deposits or stains, vegetation condition, structural condition, and observable biology) • Presence and assessment of trash in and around station

(2) Dry Weather Receiving Water Field Monitoring

For each dry weather monitoring event, if conditions allow the collection of the data, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

Table D-2. Field Monitoring Parameters for Receiving Water Monitoring Stations

Parameters
• pH • Temperature • Specific conductivity • Dissolved oxygen • Turbidity

(3) Dry Weather Receiving Water Analytical Monitoring

For each dry weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable NAL constituents, and

(v) Constituents listed in Table D-3.

Table D-3. Analytical Monitoring Constituents for Receiving Water Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Pesticides	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Mercury • Nickel • Selenium • Thallium • Zinc	• Organophosphate Pesticides • Pyrethroid Pesticides	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(4) Dry Weather Receiving Water Toxicity Monitoring

For each dry weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for aquatic toxicity in accordance with Table D-4. When the State Water Board's Policy for Toxicity Assessment and Control (Toxicity Policy) is approved and in effect, the San Diego Water Board Executive Officer may direct the Copermittees to replace current toxicity program elements with standardized procedures in the Toxicity Policy.

Table D-4. Dry Weather Chronic[1] Toxicity Testing for Receiving Water Monitoring Stations

Organism	Units	Test	USEPA Protocol
Freshwater			
Pimephales promelas (Fathead Minnow)	Pass / Fail	Larval Survival and Growth	EPA-821-R-02-013
Ceriodaphnia dubia (*Daphnid*)	Pass / Fail	Survival and Production	EPA-821-R-02-013
Selenastrum capricornutum (Green Algae)	Pass / Fail	Growth	EPA-821-R-02-013
Marine and Estuarine			
Strongylocentrotus purpuratus *(Purple Sea Urchin)*	Pass / Fail	Embryo-Larval Development	EPA-600-R-95-136

Notes:
1. Chronic toxicity testing is not required at receiving water monitoring stations located at mass loading stations if the channel flows are diverted year-round during dry weather conditions to the sanitary sewer for treatment.

(a) Freshwater Test Species and Methods: If samples are collected in receiving waters with salinity less than 1 ppt, the Copermittees must follow the methods for chronic toxicity tests as established in 40 CFR 136.3 using a single-concentration test design for routine monitoring, or a five-concentration test design for additional toxicity testing if the limitation is exceeded. The Copermittees must estimate the critical life stage chronic toxicity on undiluted samples in accordance with species and short term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms (EPA-821-R-02-013; Table IA, 40 CFR 136). Additional test species may be used by the Copermittees if approved by the San Diego Water Board Executive Officer. The Copermittees must conduct:

(i) A static renewal toxicity test with the fathead minnow, *Pimephales promelas* (Larval Survival and Growth Test Method 1000.0);

(ii) A static renewal toxicity test with the daphnid, *Ceriodaphnia dubia* (Survival and Reproduction Test Method 1002.0); and

(iii) A static renewal toxicity test with the green alga, *Selenastrum capricornutum* (also named *Raphidocelis subcapitata*) (Growth Test Method 1003.0).

(b) Marine and Estuarine Test Species and Methods: If samples are collected in receiving waters with salinity greater or equal to 1 ppt, the Copermittees must follow the methods for chronic toxicity tests as established in 40 CFR 136.3 using a single-concentration test design for routine monitoring, or a five-concentration test design for additional toxicity testing if the limitation is exceeded. The Copermittees must conduct the following critical life state chronic toxicity tests on undiluted samples in accordance with species and short term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms (EPA-600-R-95-136; 1995). Artificial sea salts must be used to increase sample salinity. The Copermittees must conduct a static non-renewal toxicity test with the purple sea urchin, *Strongylocentrotus purpuratus* (Embryo-larval Development Test Method). Additional species may be used by the Copermittees if approved by the San Diego Water Board Executive Officer.

(c) Holding Times: All toxicity tests must be conducted as soon as possible following sample collection. The 36-hour sample holding time for test initiation shall be targeted. However, no more than 72 hours shall elapse before the conclusion of sample collection and test initiation.

(d) Test Species Sensitivity Screening: To determine the most sensitive test species for freshwater, the Copermittees must screen 2 wet weather and 2 dry weather toxicity tests with a vertebrate, an invertebrate, and a plant species. After this screening period, subsequent monitoring must be conducted using the most sensitive test species. Alternatively, if a sensitive test species has already been determined, or if there is prior knowledge of potential toxicant(s) and a test species is sensitive to such toxicant(s), then monitoring must be conducted using only that test species. Sensitive test species determinations must also consider the most sensitive test species used for proximal receiving water monitoring. Rescreening must occur once each permit term.

(e) Chronic toxicity test biological endpoint data must be analyzed using the Test of Significant Toxicity t-test approach specified in *National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document* (USEPA, Office of Wastewater Management, Washington, D.C., EPA-833-R-10-003, 2010). For this monitoring program, the critical chronic instream waste concentration (IWC) is set at 100 percent receiving water (i.e. no dilution) for receiving water samples. A 100 percent receiving water and a control must be tested.

(f) Toxicity Identification Evaluation (TIE) / Toxicity Reduction Evaluation (TRE): If chronic toxicity is detected in receiving waters, the Copermittees must discuss the need for conducting a TIE/TRE in the assessments required under Provision D.4.a.(2), and develop a plan for implementing the TIE/TRE to be incorporated in the Water Quality Improvement Plan.

(5) Dry Weather Receiving Water Bioassessment Monitoring

Bioassessment monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must conduct bioassessment monitoring during at least one dry weather monitoring event at each long-term receiving water monitoring station as follows:

(a) The following bioassessment samples and measurements must be collected:

(i) Macroinvertebrate samples must be collected in accordance with the "Reachwide Benthos (Multihabitat) Procedure" in the most current Surface Water Ambient Monitoring Program (SWAMP) Bioassessment Standard Operating Procedures (SOP), and amendments, as applicable;[13]

(ii) The "Full" suite of physical habitat characterization measurements must be collected in accordance with the most current SWAMP Bioassessment SOP, and as summarized in the SWAMP Stream Habitat Characterization Form – Full Version;[14] and

(iii) Freshwater algae samples must be collected in accordance with the SWAMP Standard Operating Procedures for Collecting Algae Samples.[15] Analysis of samples must include algal taxonomic composition (diatoms and soft algae) and algal biomass.

(b) The bioassessment samples, measurements, and appropriate water chemistry data must be used to calculate the following:

(i) An Index of Biological Integrity (IBI) for macroinvertebrates for each monitoring station where bioassessment monitoring was conducted, based on the most current calculation method;[16] and

[13] Ode, P.R.. 2007. Standard operating procedures for collecting macroinvertebrate samples and associated physical and chemical data for ambient bioassessments in California. California State Water Resources Control Board Surface Water Ambient Monitoring Program (SWAMP) Bioassessment SOP 001. http://www.swrcb.ca.gov/water_issues/programs/swamp/tools.shtml#monitoring

[14] Available at: http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/reports/fieldforms_fullversion052908.pdf

[15] Fetscher et al. 2009. Standard Operating Procedures for Collecting Stream Algae Samples and Associated Physical Habitat and Chemical Data for Ambient Bioassessments in California.

[16] The most current calculation method at the time the Order was adopted is outlined in "A Quantitative Tool for Assessing the Integrity of Southern California Coastal Streams" (Ode, et al. 2005. Environmental Management. Vol. 35, No. 1, pp. 1-13). If an updated or new calculation method is developed, either both (i.e. current and updated/new) methods must be used, or historical IBIs must be recalculated with the updated or new calculation method.

(ii) An IBI for algae for each monitoring station where bioassessment monitoring was conducted, when a calculation method is developed.[17]

(c) In lieu of the requirements of Provision D.1.c.(5)(a), the Copermittees may conduct the bioassessment monitoring in accordance with the "Triad" assessment approach[18] to calculate the IBIs required for Provision D.1.c.(5)(b). The Copermittees must conduct sampling, analysis, and reporting of specified in-stream biological and habitat data according to the protocols specified in the SCCWRP Technical Report No. 539, or subsequent protocols, if developed.

(6) Dry Weather Receiving Water Hydromodification Monitoring

In addition to the hydromodification monitoring conducted as part of the Copermittees' Hydromodification Management Plans, hydromodification monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must collect the following hydromodification monitoring observations and measurements within an appropriate domain of analysis during at least one dry weather monitoring event for each long-term receiving water monitoring station:

(a) Channel conditions, including:

(i) Channel dimensions,

(ii) Hydrologic and geomorphic conditions, and

(iii) Presence and condition of vegetation and habitat;

(b) Location of discharge points;

(c) Habitat integrity;

(d) Photo documentation of existing erosion and habitat impacts, with location (i.e. latitude and longitude coordinates) where photos were taken;

(e) Measurement or estimate of dimensions of any existing channel bed or bank eroded areas, including length, width, and depth of any incisions; and

[17] When a calculation method is developed, IBIs must be calculated for all available and appropriate historical data.
[18] Stormwater Monitoring Coalition Model Monitoring Technical Committee, 2004. Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California. Technical Report #419. August 2004.

(f) Known or suspected cause(s) of existing downstream erosion or habitat impact, including flow, soil, slope, and vegetation conditions, as well as upstream land uses and contributing new and existing development.

d. WET WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three wet weather monitoring events at each long-term receiving water monitoring station. At least one wet weather monitoring event must be conducted during the first wet weather event of the wet season (October 1 – April 30), and at least one wet weather monitoring event during a wet weather event that occurs after February 1.

(1) Wet Weather Receiving Water Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each long-term receiving water monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event;

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(d) Presence and assessment of trash in and around station.

(2) Wet Weather Receiving Water Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

(3) Wet Weather Receiving Water Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) Constituents listed in Table D-3.

(4) <u>Wet Weather Receiving Water Toxicity Monitoring</u>

For each wet weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for chronic aquatic toxicity in accordance with Provisions D.1.c.(4)(a)-(f).

e. OTHER RECEIVING WATER MONITORING REQUIREMENTS

(1) Regional Monitoring

The Copermittees must participate in the following regional receiving waters monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring; and

(b) Southern California Bight Regional Monitoring and

(c) Unified Beach Water Quality Monitoring and Assessment Program. The Orange County Copermittees shall participate in and, together with South Orange County Wastewater Authority and Orange County Health Care Agency, shall share responsibility for implementation of a unified regional beach water quality monitoring and assessment program in south Orange County, as set forth in the October 2014 report, *Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County* , issued pursuant to CWC section 13383 and subject to future revision in the San Diego Water Board December 5, 2014 Letter Directive.

(2) Sediment Quality Monitoring

The Copermittees must perform sediment monitoring to assess compliance with sediment quality receiving water limits applicable to MS4 discharges to enclosed bays and estuaries. The monitoring may be performed either by individual or multiple Copermittees to assess compliance with receiving water limits, or through participation in a water body monitoring coalition. A Sediment Monitoring Plan which satisfies the requirements of the State Water Board's Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part 1 Sediment Quality (Sediment Control Plan) must be submitted as part of the monitoring and assessment program in the Water Quality Improvement Plan.

(a) The Sediment Monitoring Plan design must include the following:

(i) The elements required under Section VII.D (Receiving Water Limits Monitoring Frequency) and Section VII.E (Sediment Monitoring) of the Sediment Control Plan;

(ii) A Quality Assurance Project Plan (QAPP) describing the project objectives and organization, functional activities, and quality assurance/quality control protocols for the water and sediment monitoring; and

(iii) A schedule for completion of all sample collection and analysis activities and submission of Sediment Monitoring Reports.

(b) The Copermittees must implement the Sediment Monitoring Plan in accordance with the schedule contained in the Sediment Monitoring Plan, unless otherwise directed in writing by the San Diego Water Board Executive Officer.

(c) The Copermittees must incorporate a Sediment Monitoring Report as part of the Water Quality Improvement Plan Annual Report in accordance with the schedule contained in the Sediment Monitoring Plan, unless otherwise directed in writing by the San Diego Water Board Executive Officer. The Sediment Monitoring Report must contain the following information:

(i) Analysis: An evaluation, interpretation and tabulation of the water and sediment monitoring data, including interpretations and conclusions as to whether applicable Receiving Water Limitations in this Order have been attained at each sample station;

(ii) Sample Location Map: The locations, type, and number of samples must be identified and shown on a site map; and

(iii) California Environmental Data Exchange Network: A statement certifying that the monitoring data and results have been uploaded into the California Environmental Data Exchange Network (CEDEN).

(d) Based on the Sediment Monitoring Report conclusions the San Diego Water Board may require a human health risk assessment to determine if the human health objective contained in Receiving Water Limitations in Provision A.2.a.(3)(b)(ii) has been attained at each sample station. In conducting a risk assessment, the Copermittees must consider any applicable and relevant information, including California Environmental Protection Agency's (Cal/EPA) Office of Environmental Health Hazard Assessment (OEHHA) policies for fish consumption and risk assessment, Cal/EPA's Department of Toxic Substances Control (DTSC) Risk Assessment, and USEPA Human Health Risk Assessment policies.

(3) <u>ASBS Monitoring</u>

For Watershed Management Areas with ASBS, the Copermittees must implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

f. ALTERNATIVE WATERSHED MONITORING REQUIREMENTS

The San Diego Water Board may direct the Copermittees to participate in an effort to develop alternative watershed monitoring with other regulated entities, other interested parties, and the San Diego Water Board to refine, coordinate, and implement regional monitoring and assessment programs to determine the status and trends of water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams.

2. MS4 Outfall Discharge Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the discharges from the MS4 outfalls in each Watershed Management Area during dry weather and wet weather. Following San Diego Water Board acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct MS4 outfall discharge monitoring during implementation of the Water Quality Improvement Plan to assess the effectiveness of their jurisdictional runoff management programs toward effectively prohibiting non-storm water discharges into the MS4 and reducing pollutants in storm water discharges from their MS4s to the MEP. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following MS4 outfall monitoring procedures:

a. TRANSITIONAL MS4 OUTFALL DISCHARGE MONITORING

Until the monitoring requirements and schedules of Provisions D.2.b-c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following MS4 outfall discharge monitoring in the Watershed Management Area:

(1) <u>MS4 Outfall Discharge Monitoring Station Inventory</u>

Each Copermittee must identify all major MS4 outfalls that discharge directly to receiving waters within its jurisdiction and geo-locate those outfalls on a map of the MS4 pursuant to Provision E.2.b.(1). This information must be compiled into a MS4 outfall discharge monitoring station inventory, and must include the following information:

(a) Latitude and longitude of MS4 outfall point of discharge;

(b) Watershed Management Area;

(c) Hydrologic subarea;

(d) Outlet size;

(e) Accessibility (i.e. safety and without disturbance of critical habitat);

(f) Approximate drainage area; and

(g) Classification of whether the MS4 outfall is known to have persistent dry weather flows, transient dry weather flows, no dry weather flows, or unknown dry weather flows.

(2) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Until the monitoring requirements and schedules of Provision D.2.b are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, each Copermittee must perform dry weather MS4 outfall field screening monitoring to identify non-storm water and illicit discharges within its jurisdiction in accordance with Provision E.2.c, to determine which discharges are transient flows and which are persistent flows, and prioritize the dry weather MS4 discharges that will be investigated and eliminated in accordance with Provision E.2.d.

(a) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Frequency

Each Copermittee must field screen the MS4 outfalls in its inventory developed pursuant to Provision D.2.a.(1) as follows:

(i) For Copermittees with less than 125 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 80 percent of the outfalls must be visually inspected two times per year during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv).

(ii) For Copermittees with 125 major MS4 outfalls or more, but less than or equal to 500 that discharge to receiving waters within a Watershed Management Area, all the outfalls must be visually inspected at least annually during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv).

(iii) For Copermittees with more than 500 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 500 outfalls must be visually inspected at least annually during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv). Copermittees with more than 500 major MS4 outfalls within a Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;

[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(iv) For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major MS4 outfalls within its jurisdiction, at least 500 major MS4 outfalls within its inventory must be visually inspected at least annually during dry weather conditions. Copermittees with more than 500 major MS4 outfalls in more than one Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(v) Inspections of major MS4 outfalls conducted in response to public reports and staff or contractor reports and notifications may count toward the required visual inspections of MS4 outfall discharge monitoring stations.

(b) Transitional Dry Weather MS4 Outfall Discharge Field Screening Visual Observations

(i) An antecedent dry period of at least 72 hours following any storm event producing measurable rainfall greater than 0.1 inch is required prior to conducting field screening visual observations during a field screening monitoring event.

(ii) During the field screening monitoring event, each Copermittee must record visual observations consistent with Table D-5 at each MS4 outfall discharge monitoring station inspected.

Table D-5. Field Screening Visual Observations for MS4 Outfall Discharge Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) - Flow source(s) suspected or identified from non-storm water source investigation - Flow source(s) eliminated during non-storm water source identification • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) - Known or suspected source(s) of pooled or ponded water • Station description (i.e. deposits or stains, vegetation condition, structural condition, observable biology) • Presence and assessment of trash in and around station • Evidence or signs of illicit connections or illegal dumping

(iii) Each Copermittee must implement the requirements of Provisions E.2.d.(2)(c)-(e) based on the field observations required pursuant to Provision D.2.a.(2)(b)(ii).

(iv) Each Copermittee must evaluate field observations together with existing information available from prior reports, inspections and monitoring results to determine whether any observed flowing, pooled, or ponded waters are likely to be transient or persistent flow.[19]

(c) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Records

Based upon the results of the transitional dry weather MS4 outfall discharge field screening monitoring conducted pursuant to Provisions D.2.a.(2)(a)-(b), each Copermittee must update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow.

(3) <u>Transitional Wet Weather MS4 Outfall Discharge Monitoring</u>

Until the monitoring requirements and schedules of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the

[19] Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(a) Transitional Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees must select wet weather MS4 outfall discharge monitoring stations from the inventories developed pursuant to Provision D.2.a.(1) for each Watershed Management Area as follows:

(i) At least five wet weather MS4 outfall discharge monitoring stations that are representative of storm water discharges from areas consisting primarily of residential, commercial, industrial, and typical mixed-use land uses present within the Watershed Management Area;

(ii) At least one wet weather MS4 outfall discharge monitoring station for each Copermittee within the Watershed Management Area; and

(iii) The County of San Diego may select at least two (2) wet weather MS4 outfall discharge monitoring stations for the portion of the Santa Margarita River Watershed Management Area within its jurisdiction to be monitored during the transitional period until the Riverside County Copermittees are notified of coverage under this Order. After the Riverside County Copermittees are notified of coverage under this Order, the Copermittees in the Watershed Management Area must select wet weather MS4 outfall discharge monitoring stations consistent with the requirements above.

(b) Transitional Wet Weather MS4 Outfall Discharge Monitoring Frequency

Each wet weather MS4 outfall discharge monitoring station selected pursuant to Provision D.2.a.(3)(a) must be monitored once during the wet season (October 1 – April 30). The wet weather monitoring events must be selected to be representative of the range of hydrological conditions experienced in the region. At least 10 percent of samples must be conducted during the first wet weather event of the wet season, to include at least one such sample in each Watershed Management Area..

(c) Transitional Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(i) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the

storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(ii) The flow rates and volumes measured or estimated from the MS4 outfall (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(d) Transitional Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(e) Transitional Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, and indicator bacteria;

(iv) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

[a] Time-weighted composites collected over the length of the storm event or the first 24 hour period whichever is shorter, composed of discrete samples, which may be collected through the use of automated equipment, or

[b] Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

[c] If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours;

(v) Only one analysis of the composite of aliquots is required;

(vi) The samples must be analyzed for the following constituents:

[a] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

[b] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and

[c] Constituents listed in Table D-6.

Table D-6. Analytical Monitoring Constituents for Wet Weather MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Nickel • Selenium • Thallium • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(f) Other Transitional Wet Weather MS4 Outfall Discharge Monitoring

The San Diego County Copermittees must continue the wet weather MS4 outfall monitoring program developed under Order No. R9-2007-0001, as approved by the San Diego Water Board, through its planned completion.

b. DRY WEATHER MS4 OUTFALL DISCHARGE MONITORING

Each Copermittee must perform dry weather MS4 outfall monitoring to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. Each Copermittee must conduct the following dry weather MS4 outfall discharge monitoring within its jurisdiction:

(1) Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Each Copermittee must continue to perform the dry weather MS4 outfall discharge field screening monitoring in accordance with the requirements of Provision D.2.a.(2). The Copermittee may adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of persistent flow non-storm water discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of visual inspections performed is equivalent to the number of visual inspections required under Provision D.2.a.(2)(a).

(2) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring

Each Copermittee must perform non-storm water persistent flow MS4 outfall discharge monitoring to determine which persistent non-storm water discharges contain concentrations of pollutants below NALs, and which persistent non-storm water discharges impact receiving water quality during dry weather. Each Copermittee must conduct the following non-storm water persistent flow MS4 outfall discharge monitoring within its jurisdiction:

(a) Prioritization of Non-Storm Water Persistent Flow MS4 Outfalls

Based upon the dry weather MS4 outfall discharge field screening monitoring records developed pursuant to Provision D.2.a.(2)(c), each Copermittee must identify and prioritize the MS4 outfalls with persistent flows based on the highest priority water quality conditions identified in the Water Quality Improvement Plan and any additional criteria developed by the Copermittee, which may include historical data and data from sources other than what the Copermittee collects.

(b) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring Frequency

(i) Based on the prioritization of major MS4 outfalls developed under Provision D.2.b.(2)(a), each Copermittee must identify, at a minimum, the 5 highest priority major MS4 outfalls with non-storm water persistent flows that the Copermittee will monitor within its jurisdiction in each Watershed Management Area. For Responsible Copermittees identified by a TMDL in Attachment E to this Order, if the 5 chosen outfall locations are not sufficient to determine compliance with the TMDL(s), then each Responsible Copermittee must identify additional MS4 outfall monitoring locations within its jurisdiction sufficient to address compliance with the TMDL(s). If a Copermittee has less than 5 major outfalls within a Watershed

Management Area, then the Copermittee must monitor all of its major MS4 outfalls with persistent flows within each Watershed Management Area. The location of the highest priority non-storm water persistent flow MS4 outfall monitoring stations must be identified on the map required pursuant to Provision E.2.b.(1). The map must specify which MS4 outfalls are being monitored for compliance with a TMDL.

(ii) Each of the highest priority non-storm water persistent flow MS4 outfall monitoring stations identified pursuant to Provision D.2.b.(2)(b)(i) must be monitored under dry weather conditions at least semi-annually until one of the following occurs:

[a] The non-storm water discharges have been effectively eliminated (i.e. no flowing, pooled, or ponded water) for three consecutive dry weather monitoring events; or

[b] The source(s) of the persistent flows has been identified as a category of non-storm water discharges that does not require an NPDES permit and does not have to be addressed as an illicit discharge because it was not identified as a source of pollutants (i.e. constituents in non-storm water discharge do not exceed NALs), and the persistent flow can be re-prioritized to a lower priority; or

[c] The constituents in the persistent flow non-storm water discharge do not exceed NALs, and the persistent flow can be re-prioritized to a lower priority; or

[d] The source(s) of the persistent flows has been identified as a non-storm water discharge authorized by a separate NPDES permit.

(iii) Where the criteria under Provision D.2.b.(2)(b)(ii) are not met, but the threat to water quality has been reduced by the Copermittee, the highest priority persistent flow MS4 outfall monitoring stations may be reprioritized accordingly for continued dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1).

(iv) Each Copermittee must document removal or re-prioritization of the highest priority persistent flow MS4 outfall monitoring stations identified under Provision D.2.b.(2)(a) in the Water Quality Improvement Plan Annual Report. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized major MS4 outfall in the Watershed Management Area within its jurisdiction, unless there are no remaining qualifying major MS4 outfalls within the Copermittee's jurisdiction in the Watershed Management Area.

(c) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Observations

During each semi-annual monitoring event, each Copermittee must record field observations consistent with Table D-5 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(d) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Monitoring

During each semi-annual monitoring event, if conditions allow the collection of the data, each Copermittee must monitor and record the parameters in Table D-2 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(e) Non-Storm Water Persistent Flow MS4 Outfall Discharge Analytical Monitoring

During each semi-annual monitoring event in which measurable flow is present, each Copermittee must collect and analyze samples from each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Collect grab or composite samples to be analyzed at a qualified laboratory for the following constituents:

[a] Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,
[b] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,
[c] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,
[d] Applicable NAL constituents, and
[e] Constituents listed in Table D-7. The Copermittees may adjust the list of constituents for the Watershed Management Area if historical data or supporting information can be provided that demonstrates or justifies the analysis of a constituent is not necessary.

Table D-7. Analytical Monitoring Constituents for Persistent Flow MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Total Hardness • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Cadmium • Copper • Lead • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(iv) If the Copermittee identifies and eliminates the source of the persistent flow non-storm water discharge, analysis of the sample is not required.

c. WET WEATHER MS4 OUTFALL DISCHARGE MONITORING

The Copermittees must perform wet weather MS4 outfall monitoring to identify pollutants in storm water discharges from the MS4s, to guide pollutant source identification efforts, and to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order. The Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(1) Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees may adjust the wet weather MS4 outfall discharge monitoring locations in the Watershed Management Area, as needed, to identify pollutants in storm water discharges from MS4s, to guide pollutant source identification efforts, and to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of stations is at least equivalent to the number of stations required under Provision D.2.a.(3)(a). Additional outfall monitoring locations, above the minimum per jurisdiction, may be required to demonstrate compliance with the WQBELs associated with the applicable TMDLs in Attachment E.

(2) Wet Weather MS4 Outfall Discharge Monitoring Frequency

The Copermittees must monitor the wet weather MS4 outfall discharge monitoring stations in the Watershed Management Area at least once (1) per year. The Copermittees may need to increase the frequency of monitoring in order to identify pollutants in storm water discharges from the MS4s causing or contributing to the highest priority water quality conditions, to guide pollutant source identification efforts, or to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order.

(3) Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(4) Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(5) Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites collected over the length of the storm event or the first 24 hour period, whichever is shorter , composed of discrete samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

(iii) If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours.

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) The Copermittees may adjust the analytical monitoring required for the Watershed Management Area, if the Copermittees have historical data or supporting information that can demonstrate or provide justification that the analysis of a constituent is not necessary.

3. Special Studies

a. Within the term of this Order, the Copermittees must initiate the following special studies:

(1) At least two special studies in each Watershed Management Area to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that cause or contribute to highest priority water quality conditions identified in the Water Quality Improvement Plan.

(2) At least one special study for the San Diego Region to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that are impacting receiving waters on a regional basis in the San Diego Region.

(3) One of the two special studies in each Watershed Management Area required pursuant to Provision D.3.a.(1) may be replaced by a special study implemented pursuant to Provision D.3.a.(2).

b. The special studies must, at a minimum, be in conformance with the following criteria:

(1) The special studies must be related to the highest priority water quality conditions identified by the Copermittees in the Watershed Management Area and/or for the entire San Diego Region;

(2) The special studies developed pursuant to Provision D.3.a.(1) must:

(a) Be implemented within the applicable Watershed Management Area, and

(b) Require some form of participation by all the Copermittees within the Watershed Management Area;

(3) The special studies developed pursuant to Provision D.3.a.(2) must:

(a) Be implemented within the San Diego Region, and

(b) Require some form of participation by all Copermittees covered under the requirements of this Order.

(4) The Copermittees are encouraged to partner with environmental groups or third parties knowledgeable of watershed conditions to complete the required special studies.

c. Special studies developed to identify sources of pollutants and/or stressors should be pollutant and/or stressor specific and based on historical monitoring data and monitoring performed pursuant to Provisions D.1 and D.2. Development of source identification special studies should include the following:

(1) A compilation of known information on the specific pollutant and/or stressor, including data on potential sources and movement of the pollutant and/or stressor within the watershed. Data generated by the Copermittees and others, as well as information available from a literature research on the pollutant and/or stressor should be compiled and analyzed as appropriate.

(2) An identification of data gaps, based on the compiled information generated on the specific pollutant and/or stressor identified in Provision D.3.c.(1). Source identification special studies should be developed to fill identified data gaps.

(3) A monitoring plan that will collect and provide data the Copermittees can utilize to do the following:

(a) Quantify the relative loading or impact of a pollutant and/or stressor from a particular source or pollutant generating activity;

(b) Improve understanding of the fate of a pollutant and/or stressor in the environment;

(c) Develop an inventory of known and suspected sources of a pollutant and/or stressor in the Watershed Management Area; and/or

(d) Prioritize known and suspected sources of a pollutant and/or stressor based on relative magnitude in discharges, geographical distribution (i.e., regional or localized), frequency of occurrence in discharges, human health risk, and controllability.

d. Special studies initiated prior to the effective date of this Order that meet the requirements of Provision D.3.b and are implemented during the term of this Order as part of the Water Quality Improvement Plan may be utilized to fulfill the special study requirements of Provision D.3.a. Special studies completed before the effective date of this Order cannot be utilized to fulfill the special study requirements of Provision D.3.a.

e. The Copermittees must submit the monitoring plans for the special studies in the Water Quality Improvement Plans required pursuant to Provision F.1.

f. The Copermittees are encouraged to share the results of the special studies regionally among the Copermittees to provide information useful in improving and adapting the management of non-storm water and storm water runoff through the implementation of the Water Quality Improvement Plans.

4. Assessment Requirements

Each Copermittee must evaluate the data collected pursuant to Provisions D.1, D.2 and D.3, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E, to assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a. Assessments must be performed as described in the following provisions:

a. Receiving Waters Assessments

(1) The Copermittees must assess and report the conditions of the receiving waters in the Watershed Management Area as follows:

(a) Based on data collected pursuant to Provision D.1.a, the assessments under Provision D.4.a.(2) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(b) Based on the data collected pursuant to Provisions D.1.a-e, the assessments required under Provision D.4.a.(2) must be included in the Report of Waste Discharge required pursuant to Provision F.5.b.

(2) The Copermittees must assess the status and trends of receiving water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under dry weather and wet weather conditions. For each of the three types of receiving waters in each Watershed Management Area the Copermittees must:

(a) Determine whether or not the conditions of the receiving waters are meeting the numeric goals established pursuant to Provision B.3.a;

(b) Identify the most critical beneficial uses that must be protected to ensure overall health of the receiving water;

(c) Determine whether or not those critical beneficial uses are being protected;

(d) Identify short-term and/or long-term improvements or degradation of those critical beneficial uses;

(e) Determine whether or not the strategies established in the Water Quality Improvement Plan contribute towards progress in achieving the interim and final numeric goals of the Water Quality Improvement Plan; and

(f) Identify data gaps in the monitoring data necessary to assess Provisions D.4.a.(2)(a)-(e).

b. MS4 OUTFALL DISCHARGES ASSESSMENTS

(1) Non-Storm Water Discharges Reduction Assessments

(a) Each Copermittee must assess and report the progress of its illicit discharge detection and elimination program, required to be implemented pursuant to Provision E.2, toward effectively prohibiting non-storm water and illicit discharges into the MS4 within its jurisdiction as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(2), the assessments under Provision D.4.b.(1)(b) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(ii) Based on the data collected pursuant to Provisions D.2.b, the assessments required under Provision D.4.b.(1)(c) must be included in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

(iii) Based on the data collected pursuant to Provisions D.2.b, the assessment required under Provision D.4.b.(1)(c) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.a.(2), each Copermittee must assess and report the following:

(i) Identify the known and suspected controllable sources (e.g. facilities, areas, land uses, pollutant generating activities) of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area;

(ii) Identify sources of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area that have been reduced or eliminated; and

(iii) Identify modifications to the field screening monitoring locations and frequencies for the MS4 outfalls in its inventory necessary to identify and eliminate sources of persistent flow non-storm water discharges pursuant to Provision D.2.b.

(c) Based on the dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1), each Copermittee must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(1)(b);

(ii) Based on the data collected and applicable NALs in the Water Quality Improvement Plan, rank the MS4 outfalls in the Copermittee's jurisdiction according to potential threat to receiving water quality, and produce a prioritized list of major MS4 outfalls for follow-up action to update the Water Quality Improvement Plan, with the goal of eliminating persistent flow non-storm water discharges and/or pollutant loads in order of the ranked priority list through targeted programmatic actions and source investigations;

(iii) For the highest priority major MS4 outfalls with persistent flows that are in exceedance of NALs, identify the known and suspected sources within the Copermittee's jurisdiction in the Watershed Management Area that may cause or contribute to the NAL exceedances;

(iv) Each Copermittee must analyze the data collected pursuant to Provision D.2.b, and utilize a model or other method, to calculate or estimate the non-storm water volumes and pollutant loads collectively discharged from all the major MS4s outfalls in its jurisdiction identified as having persistent dry weather flows during the monitoring year. These calculations or estimates must be updated annually.

[a] Each Copermittee must calculate or estimate the annual non-storm water volumes and pollutant loads collectively discharged from the Copermittee's major MS4 outfalls to receiving waters within the Copermittee's jurisdiction, with an estimate of the percent contribution from each known source for each MS4 outfall;

[b] Each Copermittee must annually identify and quantify (i.e. volume and pollutant loads) sources of non-storm water not subject to the Copermittee's legal authority that are discharged from the Copermittee's major MS4 outfalls to downstream receiving waters.

(v) Each Copermittee must review the data collected pursuant to Provision D.2.b and findings from the assessments required pursuant to Provision D.4.b.(1)(c)(i)-(iv) at least once during the term of this Order to:

[a] Identify reductions and progress in achieving reductions in non-storm water and illicit discharges to the Copermittee's MS4 in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction, with an estimate, if possible, of the non-storm water volume and/or pollutant load reductions attributable to specific water quality strategies implemented by the Copermittee; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittee in the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction.

(vi) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(1)(c)(i)-(v).

(2) Storm Water Pollutant Discharges Reduction Assessments

(a) The Copermittees must assess and report the progress of the water quality improvement strategies, required to be implemented pursuant to Provisions B and E, toward reducing pollutants in storm water discharges from the MS4s within the Watershed Management Area as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(3), the assessments under Provision D.4.b.(2)(b) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(ii) Based on the data collected pursuant to Provisions D.2.c, the assessments required under Provision D.4.b.(2)(c) must be included in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

(iii) Based on the data collected pursuant to Provisions D.2.c, the assessment required under Provisions D.4.b.(2)(c)-(d) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.a.(3) the Copermittees must assess and report the following:

(i) The Copermittees must analyze the monitoring data collected pursuant to Provision D.2.a.(3), and utilize a watershed model or other method, to calculate or estimate the following for each monitoring year:

[a] The average storm water runoff coefficient for each land use type within the Watershed Management Area;
[b] The volume of storm water and pollutant loads discharged from each of the Copermittee's monitored MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch;
[c] The total flow volume and pollutant loadings discharged from the Copermittee's jurisdiction within the Watershed Management Area over the course of the wet season, extrapolated from the data produced from the monitored MS4 outfalls; and
[d] The percent contribution of storm water volumes and pollutant loads discharged from each land use type within each hydrologic subarea with a major MS4 outfall to receiving waters or within each major MS4 outfall to receiving waters in the Copermittee's jurisdiction within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch.

(ii) Identify modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify pollutants in storm water discharges from the MS4s in the Watershed Management Area pursuant to Provision D.2.c.(1).

(c) Based on the wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.c the Copermittees must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(2)(b);

(ii) Based on the data collected and applicable SALs in the Water Quality Improvement Plan, analyze and compare the monitoring data to the analyses and assumptions used to develop the Water Quality Improvement Plans, including strategies developed pursuant to Provision B.3, and evaluate whether those analyses and assumptions should be updated as a component of the adaptive management efforts pursuant to Provision B.5 for follow-up action to update the Water Quality Improvement Plan;

(iii) The Copermittees must review the data collected pursuant to Provision D.2.c and findings from the assessments required pursuant to Provisions D.4.b.(2)(c)(i)-(ii) at least once during the term of this Order to:

[a] Identify reductions or progress in achieving reductions in pollutant concentrations and/or pollutant loads from different land uses and/or drainage areas discharging from the Copermittees' MS4s in the Watershed Management Area;
[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed

Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters within the Watershed Management Area to the MEP, with an estimate, if possible, of the pollutant load reductions attributable to specific water quality strategies implemented by the Copermittees; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittees in the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters in the Watershed Management Area to the MEP.

(iv) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(iii).

(d) The Copermittees must evaluate all the data collected pursuant to Provision D.2.c, and incorporate new outfall monitoring data into time series plots for each long-term monitoring constituent for the Watershed Management Area, and perform statistical trends analysis on the cumulative long-term wet weather MS4 outfall discharge water quality data set.

c. Special Studies Assessments

The Copermittees must annually evaluate the results and findings from the special studies developed and implemented pursuant to Provision D.3, and assess their relevance to the Copermittees' efforts to characterize receiving water conditions, understand sources of pollutants and/or stressors, and control and reduce the discharges of pollutants from the MS4 outfalls to receiving waters in the Watershed Management Area. The Copermittees must report the results of the special studies assessments applicable to the Watershed Management Area, and identify any necessary modifications or updates to the Water Quality Improvement Plan based on the results in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

d. Integrated Assessment of Water Quality Improvement Plan

As part of the iterative approach and adaptive management process required for the Water Quality Improvement Plan pursuant to Provision B.5, the Copermittees in each Watershed Management Area must integrate the data collected pursuant to Provisions D.1-D.3, the findings from the assessments required pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to assess the effectiveness of, and identify necessary modifications to, the Water Quality Improvement Plan as follows:

(1) The Copermittees must re-evaluate the priority water quality conditions and

numeric goals for the Watershed Management Area, as needed, during the term of this Order pursuant to Provision B.5.a. The re-evaluation and recommendations for modifications to the priority water quality conditions, and/or numeric goals and corresponding schedules may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The priority water quality conditions and numeric goals for the Watershed Management Area must be re-evaluated as follows:

(a) Re-evaluate the receiving water conditions in the Watershed Management Area in accordance with Provision B.2.a;

(b) Re-evaluate the impacts on receiving waters in the Watershed Management Area from MS4 discharges in accordance with Provision B.2.b;

(c) Re-evaluate the identification of MS4 sources of pollutants and/or stressors in accordance with Provision B.2.d;

(d) Identify beneficial uses of the receiving waters that are protected in accordance with Provision D.4.a;

(e) Evaluate the progress toward achieving the interim and final numeric goals for protecting impacted beneficial uses in the receiving waters.

(2) The Copermittees must re-evaluate the water quality improvement strategies for the Watershed Management Area during the term of this Order pursuant to Provision B.5.b. The re-evaluation and recommendations for modifications to the water quality improvement strategies and schedules may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The water quality improvement strategies for the Watershed Management Area must be re-evaluated as follows:

(a) Identify the non-storm water and storm water pollutant loads from the Copermittees' MS4 outfalls in the Watershed Management Area, calculated or estimated pursuant to Provisions D.4.b;

(b) Identify the non-storm water and storm water pollutant load reductions, or other improvements to receiving water or water quality conditions, that are necessary to attain the interim and final numeric goals identified in the Water Quality Improvement Plan for protecting beneficial uses in the receiving waters;

(c) Identify the non-storm water and storm water pollutant load reductions, or other improvements to the quality of MS4 discharges, that are necessary

for the Copermittees to demonstrate that non-storm water and storm water discharges from their MS4s are not causing or contributing to exceedances of receiving water limitations;

(d) Evaluate the progress of the water quality improvement strategies toward achieving the interim and final numeric goals identified in the Water Quality Improvement Plan for protecting beneficial uses in the receiving waters.

(3) The Copermittees must re-evaluate and adapt the water quality monitoring and assessment program for the Watershed Management Area when new information becomes available to improve the monitoring and assessment program pursuant to Provision B.5.c. The re-evaluation and recommendations for modifications to the monitoring and assessment program may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. Modifications to the water quality monitoring and assessment program must be consistent with the requirements of Provision D.1-D.3. The re-evaluation of the water quality monitoring and assessment program for the Watershed Management Area must consider the data gaps identified by the assessments required pursuant to Provisions D.4.a-b, and results of the special studies implemented pursuant to Provision D.4.c.

5. Monitoring Provisions

Each Copermittee must comply with all the monitoring, reporting, and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

E. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS

The purpose of this provision is for each Copermittee to implement a program to control the contribution of pollutants to and the discharges from the MS4 within its jurisdiction. The goal of the jurisdictional runoff management programs is to implement strategies that effectively prohibit non-storm water discharges to the MS4 and reduce the discharge of pollutants in storm water to the MEP. This goal will be accomplished through implementing the jurisdictional runoff management programs in accordance with the strategies identified in the Water Quality Improvement Plans.

Each Copermittee must update its jurisdictional runoff management program document, in accordance with Provision F.2.a, to incorporate all the requirements of Provision E. Until the Copermittee has updated its jurisdictional runoff management program document with the requirements of Provision E, the Copermittee must continue implementing its current jurisdictional runoff management program.

1. Legal Authority Establishment and Enforcement

a. Each Copermittee must establish, maintain, and enforce adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 through statute, ordinance, permit, contract, order, or similar means. This legal authority must, at a minimum, authorize the Copermittee to:

(1) Prohibit and eliminate all illicit discharges and illicit connections to its MS4;

(2) Control the contribution of pollutants in discharges of runoff associated with industrial and construction activity to its MS4 and control the quality of runoff from industrial and construction sites, including industrial and construction sites which have coverage under the statewide General Permit for Discharges of Storm Water Associated with Industrial Activities (Industrial General Permit) or General Permit for Discharges of Storm Water Associated with Construction Activities (Construction General Permit), as well as to those sites which do not;

(3) Control the discharge of spills, dumping, or disposal of materials other than storm water into its MS4;

(4) Control through interagency agreements among Copermittees the contribution of pollutants from one portion of the MS4 to another portion of the MS4;

(5) Control, by coordinating and cooperating with other owners of the MS4 such as Caltrans, the U.S. federal government, or sovereign Native American Tribes through interagency agreements, where possible, the contribution of pollutants from their portion of the MS4 to the portion of the MS4 within the Copermittee's jurisdiction;

(6) Require compliance with conditions in its statutes, ordinances, permits, contracts, orders, or similar means to hold dischargers to its MS4 accountable for their contributions of pollutants and flows;

(7) Require the use of BMPs to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(8) Require documentation on the effectiveness of BMPs implemented to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(9) Utilize enforcement mechanisms to require compliance with its statutes, ordinances, permits, contracts, orders, or similar means; and

(10) Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with its statutes, ordinances, permits, contracts, orders, or similar means and with the requirements of this Order, including the prohibition of illicit discharges and connections to its MS4; the Copermittee must also have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from industrial facilities, including construction sites, discharging into its MS4.

b. With the first Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3), each Copermittee must submit a statement certified by its Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative that the Copermittee has taken the necessary steps to obtain and maintain full legal authority within its jurisdiction to implement and enforce each of the requirements contained in this Order.

2. Illicit Discharge Detection and Elimination

Each Copermittee must implement a program to actively detect and eliminate illicit discharges and improper disposal into the MS4, or otherwise require the discharger to apply for and obtain a separate NPDES permit. The illicit discharge detection and elimination program must be implemented in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include, at a minimum, the following requirements:

a. NON-STORM WATER DISCHARGES

Each Copermittee must address all non-storm water discharges as illicit discharges unless a non-storm water discharge is either identified as a discharge authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to the following requirements:

(1) Discharges of non-storm water to the MS4 from the following categories must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG919001 (Order No. R9-2007-0034, or subsequent order) for discharges to San Diego Bay, or NPDES Permit No. CAG919002 (Order No. R9-2008-0002, or subsequent order) for discharges to surface waters other than San Diego Bay:

(1) Uncontaminated pumped ground water;

(2) Discharges from foundation drains;[20]

(3) Water from crawl space pumps; and

(4) Water from footing drains.[20]

(2) Discharges of non-storm water from water line flushing and water main breaks to the MS4 must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG 679001 (Order No. R9-2010-0003 or subsequent order). This category includes water line flushing and water main break discharges from water purveyors issued a water supply permit by the California Department of Public Health or federal military installations. Discharges from recycled or reclaimed water lines to the MS4 must be addressed as illicit discharges, unless the discharges have coverage under a separate NPDES permit.

(3) Discharges of non-storm water to the MS4 from the following categories must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a source of pollutants to receiving waters:

(a) Diverted stream flows;

(b) Rising ground waters;

(c) Uncontaminated ground water infiltration to MS4s;

(d) Springs;

(e) Flows from riparian habitats and wetlands;

(f) Discharges from potable water sources;

[20] Provision E.2.a.(1) only applies to this category of non-storm water if the system is designed to be located at or below the groundwater table to actively or passively extract groundwater during any part of the year.

(g) Discharges from foundation drains;[21] and

(h) Discharges from footing drains.[21]

(4) Discharges of non-storm water to the MS4 from the following categories must be controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means. Discharges of non-storm water to the MS4 from the following categories not controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means must be addressed by the Copermittee as illicit discharges.

(a) Air conditioning condensation

The discharge of air conditioning condensation should be directed to landscaped areas or other pervious surfaces, or to the sanitary sewer, where feasible.

(b) Individual residential vehicle washing

(i) The discharge of wash water should be directed to landscaped areas or other pervious surfaces where feasible; and

(ii) The minimization of water, washing detergent and other vehicle wash products used for residential vehicle washing, and the implementation of other practices or behaviors that will prevent the discharge of pollutants associated with individual residential vehicle washing from entering the MS4 must be encouraged.

(c) Dechlorinated swimming pool discharges

(i) Residual chlorine, algaecide, filter backwash, or other pollutants from swimming pools must be eliminated prior to discharging to the MS4; and

(ii) The discharge of saline swimming pool water must be directed to the sanitary sewer, landscaped areas, or other pervious surfaces that can accommodate the volume of water, unless the saline swimming pool water can be discharged via a pipe or concrete channel directly to a naturally saline water body (e.g. Pacific Ocean).

(5) Firefighting discharges to the MS4 must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a significant source of pollutants to receiving waters. Firefighting discharges to the MS4 not identified as a significant source of pollutants to receiving waters, must be addressed, at a minimum, as follows:

[21] Provision E.2.a.(3) only applies to this category of non-storm water discharge if the system is designed to be located above the groundwater table at all times of the year, and the system is only expected to discharge non-storm water under unusual circumstances.

(a) Non-emergency firefighting discharges

(i) Building fire suppression system maintenance discharges (e.g. sprinkler line flushing) to the MS4 must be addressed as illicit discharges unless BMPs are implemented to prevent pollutants associated with such discharges to the MS4.

(ii) Non-emergency firefighting discharges (i.e., discharges from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems) must be addressed by a program, to be developed and implemented by the Copermittee, to reduce or eliminate pollutants in such discharges from entering the MS4.

(b) Emergency firefighting discharges

Each Copermittee should develop and encourage implementation of BMPs to reduce or eliminate pollutants in emergency firefighting discharges to the MS4s and receiving waters within its jurisdiction. During emergency situations, priority of efforts should be directed toward life, property, and the environment (in descending order). BMPs should not interfere with immediate emergency response operations or impact public health and safety.

(6) If the Copermittee or San Diego Water Board identifies any category of non-storm water discharges listed under Provisions E.2.a.(1)-(4) as a source of pollutants to receiving waters, the category must be prohibited through ordinance, order, or similar means and addressed as an illicit discharge. Alternatively, the Copermittee may propose controls to be implemented for the category of non-storm water discharges as part of the Water Quality Improvement Plan instead of prohibiting the category of non-storm water discharges, and implement the controls if accepted by the San Diego Water Board as part of the Water Quality Improvement Plan.

(7) Each Copermittee must, where feasible and priorities and resources allow, reduce or eliminate non-storm water discharges listed under Provisions E.2.a.(1)-(4) into its MS4, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit.

b. PREVENT AND DETECT ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to prevent and detect illicit discharges to the MS4:

(1) Each Copermittee must maintain an updated map of its entire MS4 and the corresponding drainage areas. The accuracy of the MS4 map must be confirmed during the field screening required pursuant to Provision E.2.c.

The MS4 map must be included as part of the jurisdictional runoff management program document. Any geographic information system (GIS) layers or files used by the Copermittee to maintain the MS4 map must be made available to the San Diego Water Board upon request. The MS4 map must identify the following:

(a) All segments of the MS4 owned, operated, and maintained by the Copermittee;

(b) All known locations of inlets that discharge and/or collect runoff into the Copermittee's MS4;

(c) All known locations of connections with other MS4s not owned or operated by the Copermittee (e.g. Caltrans MS4s);

(d) All known locations of MS4 outfalls and private outfalls that discharge runoff collected from areas within the Copermittee's jurisdiction;

(e) All segments of receiving waters within the Copermittee's jurisdiction that receive and convey runoff discharged from the Copermittee's MS4 outfalls;

(f) Locations of the MS4 outfalls, identified pursuant to Provision D.2.a.(1), within its jurisdiction; and

(g) Locations of the non-storm water persistent flow MS4 outfall discharge monitoring stations, identified pursuant to Provision D.2.b.(2), within its jurisdiction.

(2) Each Copermittee must use Copermittee personnel and contractors to assist in identifying and reporting illicit discharges and connections during their daily employment activities.

(3) Each Copermittee must promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges to or from the MS4, including the following methods for public reporting:

(a) Operate a public hotline, which can be Copermittee-specific or shared by the Copermittees, and must be capable of receiving reports in both English and Spanish 24 hours per day and seven days per week; and

(b) Designate an e-mail address for receiving electronic reports from the public, which can be Copermittee-specific or shared by the Copermittees, and must be prominently displayed on the Copermittee's webpage and the Regional Clearinghouse required pursuant to Provision F.4.

(4) Each Copermittee must implement practices and procedures (including a notification mechanism) to prevent, respond to, contain, and clean up any spills that may discharge into the MS4 within its jurisdiction from any source. The Copermittee must coordinate, to the extent possible, with spill response teams to prevent entry of spills into the MS4, and prevent contamination of surface water, ground water, and soil. The Copermittee must coordinate spill prevention, containment, and response activities throughout all appropriate Copermittee departments, programs, and agencies.

(5) Each Copermittee must implement practices and procedures to prevent and limit infiltration of seepage from sanitary sewers (including private laterals and failing septic systems) to the MS4.

(6) Each Copermittee must coordinate, when necessary, with upstream Copermittees and/or entities to prevent illicit discharges from upstream sources into the MS4 within its jurisdiction.

c. FIELD SCREENING

Each Copermittee must conduct field screening (i.e. visual observations, field testing, and/or analytical testing) of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4 in accordance with the dry weather MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

d. INVESTIGATE AND ELIMINATE ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to investigate and eliminate illicit discharges to the MS4:

(1) Each Copermittee must prioritize and determine when follow-up investigations will be performed in response to visual observations and/or water quality monitoring data collected during an investigation of a detected non-storm water or illicit discharge to or from the MS4. The criteria for prioritizing investigations must consider the following:

(a) Pollutants identified as causing or contributing to the highest water quality priorities identified in the Water Quality Improvement Plan;

(b) Pollutants identified as causing or contributing, or threatening to cause or contribute to impairments in water bodies on the 303(d) List and/or in environmentally sensitive areas (ESAs), located within its jurisdiction;

(c) Pollutants identified from sources or land uses known to exist within the area, drainage basin, or watershed that discharges to the portion of the MS4 within its jurisdiction included in the investigation;

(d) Pollutants identified as causing or contributing to an exceedance of a NAL in the Water Quality Improvement Plan; and

(e) Pollutants identified as a threat to human health or the environment.

(2) Each Copermittee must implement procedures to investigate and inspect portions of its MS4 that, based on reports or notifications, field screening, or other appropriate information, indicate a reasonable potential of receiving, containing, or discharging pollutants due to illicit discharges, illicit connections, or other sources of non-storm water. The procedures must include the following:

(a) Each Copermittee must develop criteria to:

(i) Assess the validity of each report or notification received; and

(ii) Prioritize the response to each report or notification received.

(b) Each Copermittee must prioritize and respond to each valid report or notification (e.g., public reports, staff or contractor reports and notifications, etc.) of an incident in a timely manner.

(c) In accordance with the requirements of Provision E.2.d.(1), each Copermittee must investigate and seek to identify the source(s) of discharges of non-storm water where flows are observed in and from the MS4 during the field screening required pursuant to Provision D.2.b.(1) as follows:

(i) Obvious illicit discharges must be immediately investigated to identify the source(s) of non-storm water discharges;

(ii) The investigation must include field investigations to identify sources or potential sources for the discharge, unless the source or potential source has already been identified during previous investigations; and

(iii) The investigation may include follow-up field investigations and/or reviewing Copermittee inventories and other land use data to identify potential sources of the discharge.

(d) Each Copermittee must maintain records and a database of the following information:

(i) Location of incident, including hydrologic subarea, portion of MS4 receiving the non-storm water or illicit discharge, and point of discharge or potential discharge from MS4 to receiving water;

(ii) Source of information initiating the investigation (e.g., public reports, staff or contractor reports and notifications, field screening, etc.);

(iii) Date the information used to initiate the investigation was received;

(iv) Date the investigation was initiated;

(v) Dates of follow-up investigations;

(vi) Identified or suspected source of the illicit discharge or connection, if determined;

(vii) Known or suspected related incidents, if any;

(viii) Result of the investigation; and

(ix) If a source cannot be identified and the investigation is not continued, document the response pursuant to the requirements of Provision E.2.d.(4).

(e) Each Copermittee must maintain records and, in accordance with the priorities of the Water Quality Improvement Plan, seek to identify the source(s) of non-storm water discharges from the MS4 where there is evidence of non-storm water having been discharged into or from the MS4 (e.g., pooled water), in accordance with MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

(3) Each Copermittee must initiate the implementation of procedures, in a timely manner, to eliminate all detected and identified illicit discharges and connections within its jurisdiction. The procedures must include the following responses:

(a) Each Copermittee must enforce its legal authority, as required under Provision E.1, to eliminate illicit discharges and connections to the MS4.

(b) If the Copermittee identifies the source as a controllable source of non-storm water or illicit discharge or connection, the Copermittee must implement its Enforcement Response Plan pursuant to Provision E.6 and enforce its legal authority to prohibit and eliminate illicit discharges and connections to its MS4.

(c) If the Copermittee identifies the source of the discharge as a category of non-storm water discharges in Provision E.2.a, and the discharge is in exceedance of NALs in the Water Quality Improvement Plan, then the Copermittee must determine if: (1) this is an isolated incident or set of circumstances that will be addressed through its Enforcement Response Plan pursuant to Provision E.6, or (2) the category of discharge must be addressed through the prohibition of that category of discharge as an illicit discharge pursuant to Provision E.2.a.(6).

(d) If the Copermittee suspects the source of the non-storm water discharge as natural in origin (i.e. non-anthropogenically influenced) and in conveyance into the MS4, then the Copermittee must document and

provide the data and evidence necessary to demonstrate to the San Diego Water Board that it is natural in origin and does not require further investigation.

(e) If the Copermittee is unable to identify and document the source of a recurring non-storm water discharge to or from the MS4, then the Copermittee must address the discharge as an illicit discharge and update its jurisdictional runoff management program to address the common and suspected sources of the non-storm water discharge within its jurisdiction in accordance with the Copermittee's priorities.

(4) Each Copermittee must submit a summary of the non-storm water discharges and illicit discharges and connections investigated and eliminated within its jurisdiction with each Water Quality Improvement Plan Annual Report required under Provision F.3.b.(3) of this Order.

3. Development Planning

Each Copermittee must use their land use and planning authorities to implement a development planning program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. BMP Requirements for All Development Projects

Each Copermittee must prescribe the following BMP requirements during the planning process (i.e. prior to project approval and issuance of local permits) for all development projects (regardless of project type or size), where local permits are issued, including unpaved roads and flood management projects:

(1) General Requirements

(a) Onsite BMPs must be located so as to remove pollutants from runoff prior to its discharge to any receiving waters, and as close to the source as possible;

(b) Structural BMPs must not be constructed within waters of the U.S.

(c) Onsite BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors (e.g. mosquitos, rodents, or flies).

(2) Source Control BMP Requirements

The following source control BMPs must be implemented at all development projects where applicable and feasible:

(a) Prevention of illicit discharges into the MS4;

(b) Storm drain system stenciling or signage;

(c) Protect outdoor material storage areas from rainfall, run-on, runoff, and wind dispersal;

(d) Protect materials stored in outdoor work areas from rainfall, run-on, runoff, and wind dispersal;

(e) Protect trash storage areas from rainfall, run-on, runoff, and wind dispersal; and

(f) Any additional BMPs determined to be necessary by the Copermittee to minimize pollutant generation at each project.

(3) Low Impact Development (LID) BMP Requirements

The following LID BMPs must be implemented at all development projects where applicable and feasible:

(a) Maintenance or restoration of natural storage reservoirs and drainage corridors (including topographic depressions, areas of permeable soils, natural swales, and ephemeral and intermittent streams);[22]

(b) Buffer zones for natural water bodies (where buffer zones are technically infeasible, require project applicant to include other buffers such as trees, access restrictions, etc.);

(c) Conservation of natural areas within the project footprint including existing trees, other vegetation, and soils;

(d) Construction of streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided public safety is not compromised;

(e) Minimization of the impervious footprint of the project;

(f) Minimization of soil compaction to landscaped areas;

(g) Disconnection of impervious surfaces through distributed pervious areas;

[22] Development projects proposing to dredge or fill materials in waters of the U.S. must obtain a CWA Section 401 Water Quality Certification. Projects proposing to dredge or fill waters of the state must obtain waste discharge requirements.

(h) Landscaped or other pervious areas designed and constructed to effectively receive and infiltrate, retain and/or treat runoff from impervious areas, prior to discharging to the MS4;

(i) Small collection strategies located at, or as close as possible to, the source (i.e. the point where storm water initially meets the ground) to minimize the transport of runoff and pollutants to the MS4 and receiving waters;

(j) Use of permeable materials for projects with low traffic areas and appropriate soil conditions;

(k) Landscaping with native or drought tolerant species; and

(l) Harvesting and using precipitation.

b. PRIORITY DEVELOPMENT PROJECTS

Priority Development Projects are land development projects that fall under the planning and building authority of the Copermittee for which the Copermittee must impose specific requirements, in addition to those described in Provision E.3.a, including the implementation of structural BMPs to meet the performance requirements described in Provision E.3.c.

(1) Definition of Priority Development Project

Priority Development Projects include the following:

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(b) Redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site on an existing site of 10,000 square feet or more of impervious surfaces). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(c) New and redevelopment projects that create 5,000 square feet or more of impervious surface (collectively over the entire project site), and support one or more of the following uses:

(i) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812).

(ii) Hillside development projects. This category includes development on any natural slope that is twenty-five percent or greater.

(iii) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce.

(iv) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

(d) New or redevelopment projects that create or replace 2,500 square feet or more of impervious surface (collectively over the entire project site), and discharging directly to an Environmentally Sensitive Area (ESA). "Discharging directly to" includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands).

(e) New development projects that support one or more of the following uses:

(i) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

(ii) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

(f) New or redevelopment projects that result in the disturbance of one or more acres of land and are expected to generate pollutants post construction.

(2) <u>Special Considerations for Redevelopment Projects</u>

The structural BMP performance requirements of Provision E.3.c are applicable to redevelopment Priority Development Projects, as defined in E.3.b.(1), as follows:

(a) Where redevelopment results in the creation or replacement of impervious surface in an amount of less than fifty percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provision E.3.c apply only to the creation or replacement of impervious surface, and not the entire development; or

(b) Where redevelopment results in the creation or replacement of impervious surface in an amount of more than fifty percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provision E.3.c apply to the entire development.

(3) Priority Development Project Exemptions

Each Copermittee has the discretion to exempt the following projects from being defined as Priority Development Projects:

(a) New or retrofit paved sidewalks, bicycle lanes, or trails that meet the following criteria:

(i) Designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas; OR

(ii) Designed and constructed to be hydraulically disconnected from paved streets or roads; OR

(iii) Designed and constructed with permeable pavements or surfaces in accordance with USEPA Green Streets guidance.[23]

(b) Retrofitting or redevelopment of existing paved alleys, streets or roads that are designed and constructed in accordance with the USEPA Green Streets guidance.[24]

c. Priority Development Project Structural BMP Performance Requirements

In addition to the BMP requirements listed for all development projects under Provision E.3.a, Priority Development Projects must also implement structural BMPs that conform to performance requirements described below.

(1) Storm Water Pollutant Control BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite structural BMPs to control pollutants in storm water that may be discharged from a project as follows:

(a) Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite the pollutants contained in the volume of storm water runoff produced from a 24-hour 85th percentile storm event (design capture volume);[25]

[23] See "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).
[24] Ibid.
[25] This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are

(i) If a Copermittee determines that implementing BMPs to retain the full design capture volume onsite for a Priority Development Project is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize biofiltration BMPs. Biofiltration BMPs must be designed to have an appropriate hydraulic loading rate to maximize storm water retention and pollutant removal, as well as to prevent erosion, scour, and channeling within the BMP,[26] and must be sized to:

[a] Treat 1.5 times the design capture volume not reliably retained onsite, OR

[b] Treat the design capture volume not reliably retained onsite with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite.

(ii) If a Copermittee determines that biofiltration is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize flow-thru treatment control BMPs to treat runoff leaving the site, AND mitigate for the design capture volume not reliably retained onsite pursuant to Provision E.3.c.(1)(b). Flow thru treatment control BMPs must be sized and designed to:

[a] Remove pollutants from storm water to the MEP;

[b] Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;

[c] Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Flow-thru treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of flow-thru treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

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encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals.

[26] As part of the Copermittee's update to its BMP Design Manual, pursuant to Provision E.3.d, the Copermittee must provide guidance for hydraulic loading rates and other biofiltration design criteria necessary to maximize storm water retention and pollutant removal.

(b) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1)(a). The Priority Development Project must mitigate for the portion of the pollutant load in the design capture volume not retained onsite if Provision E.3.c.(3) is utilized. If a Priority Development Project is allowed to utilize alternative compliance, flow-thru treatment control BMPs must be implemented to treat the portion of the design capture volume that is not reliably retained onsite. Flow-thru treatment control BMPs must be sized and designed in accordance with Provisions E.3.c.(1)(a)(ii)[a]-[c].

(2) Hydromodification Management BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite BMPs to manage hydromodification that may be caused by storm water runoff discharged from a project as follows:

(a) Post-project runoff conditions (flow rates and durations) must not exceed pre-development runoff conditions by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat downstream of Priority Development Projects).

(i) In evaluating the range of flows that results in increased potential for erosion of natural (non-hardened) channels, the lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks.

(ii) The Copermittees may use monitoring results collected pursuant to Provision D.1.a.(2) to re-define the range of flows resulting in increased potential for erosion, or degraded instream habitat conditions, as warranted by the data.

(b) Each Priority Development Project must avoid critical sediment yield areas known to the Copermittee or identified by the optional Watershed Management Area Analysis pursuant to Provision B.3.b.(4), or implement measures that allow critical coarse sediment to be discharged to receiving waters, such that there is no net impact to the receiving water.

(c) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the performance requirements of Provision E.3.c.(2)(a). The Priority Development Project must mitigate for the post-project runoff conditions not fully managed onsite if Provision E.3.c.(3) is utilized.

(d) Exemptions

Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provisions E.3.c.(2) where the project discharges storm water runoff to:

(i) Existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;

(ii) Conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; or

(iii) An area identified by the Copermittees as appropriate for an exemption by the optional Watershed Management Area Analysis incorporated into the Water Quality Improvement Plan pursuant to Provision B.3.b.(4).

(e) Interim Timeframe Exemptions

Until the Copermittees have updated their BMP Design Manual in accordance with Provision F.2.b with the requirements of Provision E, the Copermittees have the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provision E.3.c.(2) where the project discharges storm water runoff directly to:

(i) An engineered channel conveyance system with a capacity to convey peak flows generated by the 10-year storm event all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; and

(ii) Large river reaches with a drainage area larger than 100 square miles and a 100-year flow capacity in excess of 20,000 cubic feet per second, provided that properly sized energy dissipation is included at all Priority Development Project discharge points.

(3) <u>Alternative Compliance Program to Onsite Structural BMP Implementation</u>

At the discretion of each Copermittee, Priority Development Projects may be allowed to participate in an alternative compliance program in lieu of implementing the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a), provided that the Water Quality Improvement Plan includes the optional Watershed Management Area Analysis described in Provision B.3.b.(4), and Water Quality Equivalency

calculations have been accepted by the San Diego Water Board's Executive Officer pursuant to Provision E.3.c.(3)(a). The alternative compliance program is available to a Priority Development Project only if the Priority Development Project applicant enters into a voluntary agreement with the Copermittee authorizing this arrangement. In addition to the voluntary agreement, relief from implementing structural BMPs onsite may be authorized by the Copermittee under the following conditions:

(a) Water Quality Equivalency

Copermittees must submit Water Quality Equivalency calculations for acceptance by the San Diego Water Board's Executive Officer prior to administering an alternative compliance program in order to establish a regional and technical basis for determining the water quality benefits associated with alternative compliance projects. Accepted Water Quality Equivalency calculations must be incorporated as part of any Copermittee's alternative compliance program necessary for evaluating Watershed Management Area Analysis candidate projects, project applicant-proposed alternative compliance projects, alternative compliance in lieu fee structures, and alternative compliance water quality credit systems as described in Provisions E.3.c.(3)(b)-(e).

(b) Watershed Management Area Analysis Candidate Projects

The Priority Development Project applicant agrees to fund, contribute funds to, or implement a candidate project identified by the Copermittees in the Watershed Management Area Analysis included in the Water Quality Improvement Plan, pursuant to Provisions B.3.b.(4) subject to the following conditions:

(i) The Copermittee must determine that implementation of the candidate project will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a) onsite;

(ii) If the Priority Development Project applicant chooses to fully or partially fund a candidate project, then the in-lieu fee structure described in Provision E.3.c.(3)(c) must be followed;

(iii) If the Priority Development Project applicant chooses to fully or partially fund a candidate project, then the Copermittee must ensure that the funds to be obtained from the Priority Development Project applicant are sufficient to mitigate for impacts caused by not fully implementing structural BMPs onsite, pursuant to the performance requirements described in Provisions E.3.c.(1) and E.3.c.(2)(a);

(iv) If the Priority Development Project applicant chooses to implement a candidate project, then the Copermittee must ensure that pollutant

control and/or hydromodification management within the candidate project are sufficient to mitigate for impacts caused by not implementing structural BMPs fully onsite, pursuant to the performance requirements described in Provisions E.3.c.(1) and E.3.c.(2)(a);

(v) The voluntary agreement to fund, partially fund, or implement a candidate project must include reliable sources of funding for operation and maintenance of the candidate project;

(vi) Design of the candidate project must be conducted under an appropriately qualified engineer, geologist, architect, landscape architect, or other professional, licenses where applicable, and competent and proficient in the fields pertinent to the candidate project design;

(vii) The candidate project must be constructed as soon as possible, but no later than 4 years after the certificate of occupancy is granted for the first Priority Development Project that contributed funds toward the construction of the candidate project, unless a longer period of time is authorized by the San Diego Water Board Executive Officer; and

(viii) If the candidate project is constructed after the Priority Development Project is constructed, the Copermittee must require temporal mitigation for pollutant loads and altered flows that are discharged from the Priority Development Project.

(c) Project Applicant Proposed Alternative Compliance Projects

The Copermittee may allow a Priority Development Project applicant to propose and fund, contribute funds to, or implement an alternative compliance project not identified by the Watershed Management Area Analysis included in the Water Quality Improvement Plan pursuant to Provisions B.3.b.(4). This option is allowed provided the Copermittee determines that implementation of the alternative compliance project will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a) onsite, and is subject to the requirements described in Provisions E.3.c.(3)(a)(ii)-(viii).

(d) Alternative Compliance In-Lieu Fee Structure

If a Copermittee chooses to allow a Priority Development Project applicant to fund, or partially fund a candidate project or an alternative compliance project, then the Copermittee must develop and implement an in-lieu fee structure. This may be developed individually or with other Copermittees and/or entities, as a means for designing, developing, constructing, operating and maintaining offsite alternative compliance projects. The in-

lieu fee must be transferred to the Copermittee (for public projects) or an escrow account (for private projects) prior to the construction of the Priority Development Project.

(e) Alternative Compliance Water Quality Credit System Option

The Copermittee may develop and implement an alternative compliance water quality credit system option, individually or with other Copermittees and/or entities, provided that such a credit system clearly exhibits that it will not allow discharges from Priority Development Projects to cause or contribute to a net impact over and above the impact caused by projects meeting the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a). Any credit system that a Copermittee chooses to implement must be submitted to the San Diego Water Board Executive Officer for review and acceptance as part of the Water Quality Improvement Plan.

(4) Long-Term Structural BMP Maintenance

Each Copermittee must require the project applicant to submit proof of the mechanism under which ongoing long-term maintenance of all structural BMPs will be conducted.

(5) Infiltration and Groundwater Protection

(a) Structural BMPs designed to primarily function as large, centralized infiltration devices (such as large infiltration trenches and infiltration basins) must not cause or contribute to an exceedance of an applicable groundwater quality objective. At a minimum, such infiltration BMPs must be in conformance with the design criteria listed below, unless the development project applicant demonstrates to the Copermittee that one or more of the specific design criteria listed below are not necessary to protect groundwater quality. The design criteria listed below do not apply to small infiltration systems dispersed throughout a development project.

(i) Runoff must undergo pretreatment such as sedimentation or filtration prior to infiltration;

(ii) Pollution prevention and source control BMPs must be implemented at a level appropriate to protect groundwater quality at sites where infiltration BMPs are to be used;

(iii) Infiltration BMPs must be adequately maintained to remove pollutants in storm water to the MEP;

(iv) The vertical distance from the base of any infiltration BMP to the seasonal high groundwater mark must be at least 10 feet. Where groundwater basins do not support beneficial uses, this vertical

distance criteria may be reduced, provided groundwater quality is maintained;

(v) The soil through which infiltration is to occur must have physical and chemical characteristics (e.g., appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses;

(vi) Infiltration BMPs must not be used for areas of industrial or light industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee, unless source control BMPs to prevent exposure of high threat activities are implemented, or runoff from such activities is first treated or filtered to remove pollutants prior to infiltration; and

(vii) Infiltration BMPs must be located a minimum of 100 feet horizontally from any water supply wells.

(b) The Copermittee may develop, individually or with other Copermittees, alternative mandatory design criteria to that listed above for infiltration BMPs which are designed to primarily function as centralized infiltration devices. Before implementing the alternative design criteria in the development planning process the Copermitee(s) must:

(i) Notify the San Diego Water Board of the intent to implement the alternative design criteria submitted; and

(ii) Comply with any conditions set by the San Diego Water Board.

d. BMP DESIGN MANUAL UPDATE

Each Copermittee must update its BMP Design Manual[27] pursuant to Provision F.2.b. Until the Copermittee has updated its BMP Design Manual with the requirements of Provisions E.3.a-c, the Copermittee must continue implementing its current BMP Design Manual. Unless directed otherwise by the San Diego Water Board, the Copermittee must implement the BMP Design Manual within 180 days of completing the update. The update of the BMP Design Manual must include the following:

(1) Updated procedures to determine the nature and extent of storm water requirements applicable to a potential development or redevelopment projects. These procedures must inform project applicants of the storm water management requirements applicable to their project including, but not limited to, general requirements for all development projects, structural BMP design procedures and requirements, hydromodification management requirements,

[27] The BMP Design Manual was formerly known as the Standard Storm Water Mitigation Plan under Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016.

requirements specific to phased projects, and procedures specific to private developments and public improvement projects;

(2) Updated procedures to identify pollutants and conditions of concern for selecting the most appropriate structural BMPs that consider, at a minimum, the following:

(a) Receiving water quality (including pollutants for which receiving waters are listed as impaired under the CWA section 303(d) List);

(b) Pollutants, stressors, and/or receiving water conditions that cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(c) Land use type of the project and pollutants associated with that land use type; and

(d) Pollutants expected to be present onsite.

(3) Updated procedures for designing structural BMPs, including any updated performance requirements to be consistent with the requirements of Provision E.3.c for all structural BMPs listed in the BMP Design Manual;

(4) Long-term maintenance criteria for each structural BMP listed in the BMP Design Manual; and

(5) Alternative compliance criteria, in accordance with the requirements under Provision E.3.c.(3), if the Copermittee elects to allow Priority Development Projects within its jurisdiction to utilize alternative compliance.

e. PRIORITY DEVELOPMENT PROJECT BMP IMPLEMENTATION AND OVERSIGHT

Each Copermittee must implement a program that requires and confirms structural BMPs on all Priority Development Projects are designed, constructed, and maintained to remove pollutants in storm water to the MEP.

(1) <u>Structural BMP Approval and Verification Process</u>

(a) Each Copermittee must require and confirm that for all Priority Development Project applications that have not received prior lawful approval by the Copermittee by the effective date of the BMP Design Manual pursuant to Provision E.3.d, the requirements of Provision E.3 must be implemented. For project applications that have received prior lawful approval before the effective date of the BMP Design Manual pursuant to Provision E.3.d, the Copermittee may allow previous land development requirements to apply.

(b) Each Copermittee must identify the roles and responsibilities of its various municipal departments in implementing the structural BMP requirements, including each stage of a project from application review and approval through BMP maintenance and inspections.

(c) Each Copermittee must require and confirm that appropriate easements and ownerships are properly recorded in public records and the information is conveyed to all appropriate parties when there is a change in project or site ownership.

(d) Each Copermittee must require and confirm that prior to occupancy and/or intended use of any portion of the Priority Development Project, each structural BMP is inspected to verify that it has been constructed and is operating in compliance with all of its specifications, plans, permits, ordinances, and the requirements of this Order.

(2) Priority Development Project Inventory and Prioritization

(a) Each Copermittee must develop, maintain, and update at least annually, a watershed-based database to track and inventory all Priority Development Projects and associated structural BMPs within its jurisdiction. Inventories must be accurate and complete beginning from December 2002 for the San Diego County Copermittees, February 2003 for the Orange County Copermittees, and July 2005 for the Riverside County Copermittees. The use of an automated database system, such as GIS, is highly recommended. The database must include, at a minimum, the following information:

(i) Priority Development Project location (address and hydrologic subarea);

(ii) Descriptions of structural BMP type(s);

(iii) Date(s) of construction;

(iv) Party responsible for structural BMP maintenance;

(v) Dates and findings of structural BMP maintenance verifications; and

(vi) Corrective actions and/or resolutions, when applicable.

(b) Each Copermittee must prioritize the Priority Development Projects with structural BMPs within its jurisdiction. The designation of Priority Development Projects as high priority must consider the following:

(i) The highest water quality priorities identified in the Water Quality Improvement Plan;

(ii) Receiving water quality;

(iii) Number and sizes of structural BMPs;

(iv) Recommended maintenance frequency of structural BMPs;

(v) Likelihood of operation and maintenance issues of structural BMPs;

(vi) Land use and expected pollutants generated; and

(vii) Compliance record.

(3) Structural BMP Maintenance Verifications and Inspections

Each Copermittee is required to verify that structural BMPs on each Priority Development Project are adequately maintained, and continue to operate effectively to remove pollutants in storm water to the MEP through inspections, self-certifications, surveys, or other equally effective approaches.

(a) All (100 percent) of the structural BMPs at Priority Development Projects that are designated as high priority must be inspected directly by the Copermittee annually prior to each rainy season;

(b) For verifications performed through a means other than direct Copermittee inspection, adequate documentation must be required by the Copermittee to provide assurance that the required maintenance of structural BMPs at each Priority Development Project has been completed; and

(c) Appropriate follow-up measures (including re-inspections, enforcement, etc.) must be conducted to ensure that structural BMPs at each Priority Development Project continue to reduce pollutants in storm water to the MEP as originally designed.

f. Development Project Enforcement

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all development projects, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

4. Construction Management

Each Copermittee must implement a construction management program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. Project Approval Process

Prior to issuance of any local permit(s) that allows the commencement of construction projects that involve ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff, each Copermittee must:

(1) Require a pollution control plan, construction BMP plan, and/or an erosion and sediment control plan, to be submitted by the project applicant to the Copermittee;

(2) Confirm the pollution control plan, construction BMP plan, and/or erosion and sediment control plan, complies with the local grading ordinance, other applicable local ordinances, and the requirements of this Order;

(3) Confirm the pollution control, construction BMP, and/or erosion and sediment control plan, includes seasonally appropriate and effective BMPs and management measures described in Provision E.4.c, as applicable to the project; and

(4) Verify that the project applicant has obtained coverage under the statewide Construction General Permit (Order 2009-0009-DWQ or subsequent Order), if applicable.

b. CONSTRUCTION SITE INVENTORY AND TRACKING

(1) Each Copermittee must maintain and update, at least quarterly, a watershed-based inventory of all construction projects issued a local permit that allows ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff. The use of an automated database system, such as GIS, is highly recommended. The inventory must include:

(a) Relevant contact information for each site (e.g., name, address, phone, and email for the owner and contractor);

(b) The basic site information including location (address and hydrologic subarea), Waste Discharge Identification (WDID) number (if applicable), size of the site, and approximate area of disturbance;

(c) Whether or not the site is considered a high threat to water quality, as defined in Provision E.4.b.(2) below;

(d) The project start and completion dates;

(e) The required inspection frequency, as defined in the Copermittee's jurisdictional runoff management program document;

(f) The date the Copermittee accepted or approved the pollution control plan, construction BMP plan, and/or erosion and sediment control plan; and

(g) Whether or not there are ongoing enforcement actions administered to the site.

(2) Each Copermittee must identify all construction sites within its jurisdiction that represent a high threat to downstream surface water quality. The designation of construction sites as high threat to water quality must consider the following:

(a) Sites located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Sites located within the same hydrologic subarea and tributary to a water body segment listed as impaired for sediment on the CWA section 303(d) List;

(c) Sites located within, directly adjacent to, or discharging directly to a receiving water within an ESA; and

(d) Other sites determined by the Copermittees or the San Diego Water Board as a high threat to water quality.

c. Construction Site BMP Implementation

Each Copermittee must implement, or require the implementation of effective BMPs to reduce discharges of pollutants in storm water from construction sites to the MEP, and effectively prohibit non-storm water discharges from construction sites into the MS4. These BMPs must be site specific, seasonally appropriate, and construction phase appropriate. BMPs must be implemented at each construction site year round. Dry season BMP implementation must plan for and address unseasonal rain events that may occur during the dry season (May 1 through September 30). Copermittees must implement, or require the implementation of, BMPs in the following categories:

(1) Project Planning;

(2) Good Site Management “Housekeeping”, including waste management;

(3) Non-storm Water Management;

(4) Erosion Control;

(5) Sediment Control;

(6) Run-on and Run-off Control; and

(7) Active/Passive Sediment Treatment Systems, where applicable.

d. CONSTRUCTION SITE INSPECTIONS

Each Copermittee must conduct construction site inspections to require and confirm compliance with its local permits and applicable local ordinances, and the requirements of this Order. Priority for site inspections must consider threat to water quality pursuant to Provision E.4.b as well as the nature of the construction activity, topography, and the characteristics of soils and receiving water quality.

(1) Inspection Frequency

(a) Each Copermittee must conduct inspections at all inventoried sites, including high threat to water quality sites, at an appropriate frequency for each phase of construction to confirm the site reduces the discharge of pollutants in storm water from construction sites to the MEP, and effectively prohibits non-storm water discharges from entering the MS4.

(b) Each Copermittee must establish appropriate inspection frequencies for high threat to water quality sites, and all other sites, for each phase of construction. Inspection frequencies appropriate for addressing the highest water quality priorities identified in the Water Quality Improvement Plan, and for complying with the requirements of this Order must be identified in each Copermittee's jurisdictional runoff management program document.

(c) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e., re-inspection, enforcement) necessary to require and confirm site compliance with its local permits and applicable local ordinances, and the requirements of this Order.

(2) Inspection Content

Inspections of construction sites by the Copermittee must include, at a minimum:

(a) Verification of coverage under the Construction General Permit (Notice of Intent (NOI) and/or WDID number) during initial inspections, when applicable;

(b) Assessment of compliance with its local permits and applicable local ordinances related to pollution prevention, including the implementation and maintenance of applicable BMPs;

(c) Assessment of BMP adequacy and effectiveness;

(d) Visual observations of actual non-storm water discharges;

(e) Visual observations of actual or potential discharge of sediment and/or

construction related materials from the site;

(f) Visual observations of actual or potential illicit connections; and

(g) If any violations are found and BMP corrections are needed, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried construction sites. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Site name, location (address and hydrologic subarea), and WDID number (if applicable);

(b) Inspection date;

(c) Approximate amount of rainfall since last inspection;

(d) Description of problems observed with BMPs and indication of need for BMP addition/repair/replacement and any scheduled re-inspection, and date of re-inspection;

(e) Descriptions of any other specific inspection comments which must, at a minimum, include rationales for longer compliance time;

(f) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(g) Resolution of problems noted and date problems fixed.

e. CONSTRUCTION SITE ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried construction sites, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

5. Existing Development Management

Each Copermittee must implement an existing development management program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. EXISTING DEVELOPMENT INVENTORY AND TRACKING

Each Copermittee must maintain, and update at least annually, a watershed-based inventory of the existing development within its jurisdiction that may discharge a pollutant load to and from the MS4. The use of an automated database system, such as GIS, is highly recommended. The inventory must, at a minimum, include:

(1) Name, location (hydrological subarea and address, if applicable) of the following types of existing development with its jurisdiction:

(a) Commercial facilities or areas;

(b) Industrial facilities;

(c) Municipal facilities, including:

(i) MS4 and related structures;[28]
(ii) Roads, streets, and highways;
(iii) Parking facilities;
(iv) Municipal airfields;
(v) Parks and recreation facilities;
(vi) Flood management facilities, flood control devices and structures;
(vii) Operating or closed municipal landfills;
(viii) Publicly owned treatment works (including water and wastewater treatment plants) and sanitary sewer collection systems;
(ix) Corporate yards, including maintenance and storage yards for materials, waste, equipment, and vehicles;
(x) Hazardous waste collection facilities;
(xi) Other treatment, storage or disposal facilities for municipal waste; and
(xii) Other municipal facilities that the Copermittee determines may contribute a significant pollutant load to the MS4.

[28] The inventory may refer to the MS4 map required to be maintained pursuant to Provision E.2.b.(1).

(d) Residential areas, which may be designated by one or more of the following:

(i) Residential management area;

(ii) Drainage basin or area;

(iii) Land use (e.g., single family, multi-family, rural);

(iv) Neighborhood;

(v) Common Interest Area;

(vi) Home Owner Association;

(vii) Mobile home park; and/or

(viii) Other designations accepted by the San Diego Water Board Executive Officer.

(2) A description of the facility or area, including the following information:

(a) Classification as commercial, industrial, municipal, or residential;

(b) Status of facility or area as active or inactive;

(c) Identification if a business is a mobile business;

(d) SIC Code or NAICS Code, if applicable;

(e) Industrial General Permit NOI and/or WDID number, if applicable;

(f) Identification if a residential area is or includes a Common Interest Area / Home Owner Association, or mobile home park;

(g) Identification of pollutants generated and potentially generated by the facility or area;

(h) Whether the facility or area is adjacent to an ESA;

(i) Whether the facility or area is tributary to and within the same hydrologic subarea as a water body segment listed as impaired on the CWA section 303(d) List and generates pollutants for which the water body segment is impaired; and

(3) An annually updated map showing the location of inventoried existing development, watershed boundaries, and water bodies.

b. EXISTING DEVELOPMENT BMP IMPLEMENTATION AND MAINTENANCE

Each Copermittee must designate a minimum set of BMPs required for all inventoried existing development, including special event venues. The designated minimum BMPs must be specific to facility or area types and pollutant generating activities, as appropriate.

(1) Commercial, Industrial, and Municipal Facilities and Areas

(a) Pollution Prevention

Each Copermittee must require the use of pollution prevention methods by the commercial, industrial, and municipal facilities and areas in its inventoried existing development to address the priorities and strategies in the Water Quality Improvement Plan.

(b) BMP Implementation

Each Copermittee must require the implementation of designated BMPs at commercial facilities and areas, industrial facilities, and implement designated BMPs at municipal facilities in its inventoried existing development.

(c) BMP Operation and Maintenance

(i) Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development.

(ii) Each Copermittee must implement a schedule of operation and maintenance activities for its MS4 and related structures (including but not limited to catch basins, storm drain inlets, detention basins, etc.), and verify proper operation of all its municipal structural treatment controls designed to reduce pollutants (including floatables) in storm water discharges to or from its MS4s and related drainage structures. Operation and maintenance activities may include, but is not limited to, the following:

[a] Inspections of the MS4 and related structures;
[b] Cleaning of the MS4 and related structures; and
[c] Proper disposal of materials removed from cleaning of the MS4 and related structures.

(iii) Each Copermittee must implement a schedule of operation and maintenance for public streets, unpaved roads, paved roads, and paved highways within its jurisdiction to minimize pollutants that can be discharged in storm water.

(iv) Each Copermittee must implement controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers. Copermittees that operate both a municipal sanitary sewer system and a MS4 must implement controls and measures to prevent and eliminate seeping sewage from infiltrating the MS4. Copermittees that do not operate both a municipal sanitary sewer system and a MS4 must coordinate with sewering agencies to keep themselves informed of relevant and appropriate maintenance activities and sanitary sewage projects in their jurisdiction that may cause or contribute to seepage of sewage into the MS4.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must require the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from commercial facilities and areas and industrial facilities, and implement BMPs at municipal facilities in its inventoried existing development. Such BMPs must include, as appropriate, educational activities, permits, certifications and other measures for applicators and distributors.

(2) <u>Residential Areas</u>

(a) Pollution Prevention

Each Copermittee must promote and encourage the use of pollution prevention methods, where appropriate, by the residential areas in its inventoried existing development.

(b) BMP Implementation

Each Copermittee must promote and encourage the implementation of designated BMPs at residential areas in its inventoried existing development.

(c) BMP Operation and Maintenance

Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at residential areas in its inventoried existing development.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must promote and encourage the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the

application, storage, and disposal of pesticides, herbicides and fertilizers from residential areas in its inventoried existing development.

c. Existing Development Inspections

Each Copermittee must conduct inspections of inventoried existing development to ensure compliance with applicable local ordinances and permits, and the requirements of this Order.

(1) Inspection Frequency

(a) Each Copermittee must establish appropriate inspection frequencies for inventoried existing development in accordance with the following requirements:

(i) At a minimum, inventoried existing development must be inspected once every five years utilizing one or more of the following methods:

[a] Drive-by inspections by Copermittee municipal and contract staff;
[b] Onsite inspections by Copermittee municipal and contract staff; and/or
[c] Visual inspections of publicly accessible inventoried facilities or areas by volunteer monitoring or patrol programs that have been trained by the Copermittee;

(ii) The frequency of inspections must be appropriate to confirm that BMPs are being implemented to reduce the discharge of pollutants in storm water from the MS4 to the MEP and effectively prohibit non-storm water discharges to the MS4;

(iii) The frequency of inspections must be based on the potential for a facility or area to discharge non-storm water and pollutants in storm water, and should reflect the priorities set forth in the Water Quality Improvement Plan;

(iv) Each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development;[29] and

(v) Inventoried existing development must be inspected by the Copermittee, as needed, in response to valid public complaints.

(b) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e. education and outreach, re-inspection, enforcement)

[29] If any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspection may count toward the total annual inspection requirement. This requirement excludes linear municipal facilities (i.e., MS4 linear channels, sanitary sewer collection systems, streets, roads and highways).

necessary to require and confirm compliance with its applicable local ordinances and permits and the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

(2) Inspection Content

(a) Inspections of existing development must include, at a minimum:

(i) Visual inspections for the presence of actual non-storm water discharges;

(ii) Visual inspections for the presence of actual or potential discharge of pollutants;

(iii) Visual inspections for the presence of actual or potential illicit connections; and

(iv) Verification that the description of the facility or area in the inventory, required pursuant to Provision E.5.a.(2), has not changed.

(b) Onsite inspections of existing development by the Copermittee must include, at a minimum:

(i) Assessment of compliance with its applicable local ordinances and permits related to non-storm water and storm water discharges and runoff;

(ii) Assessment of the implementation of the designated BMPs;

(iii) Verification of coverage under the Industrial General Permit, when applicable; and

(iv) If any problems or violations are found, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried existing development. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Name and location of the facility or area (address and hydrologic subarea) consistent with the inventory name and location, pursuant to Provision E.5.a.(1);

(b) Inspection and re-inspection date(s);

(c) Inspection method(s) (i.e. drive-by, onsite);

(d) Observations and findings from the inspection(s);

(e) For onsite inspections of existing development by Copermittee municipal or contract staff, the records must also include, as applicable:

(i) Description of any problems or violations found during the inspection(s);

(ii) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(iii) The date problems or violations were resolved.

d. EXISTING DEVELOPMENT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried existing development, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

e. RETROFITTING AND REHABILITATING AREAS OF EXISTING DEVELOPMENT

(1) Retrofitting Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to retrofit areas of existing development within its jurisdiction to address identified sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify areas of existing development as candidates for retrofitting, focusing on areas where retrofitting will address pollutants and/or stressors that contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for retrofitting projects may be utilized to reduce pollutants that may be discharged in storm water from areas of existing development, and/or address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of retrofitting projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting projects; and

(e) Where retrofitting projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional retrofitting projects (i.e. projects that can receive and/or treat storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment) adjacent to and/or downstream of the areas of existing development.

(2) Stream, Channel and/or Habitat Rehabilitation in Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to rehabilitate streams, channels, and/or habitats in areas of existing development within its jurisdiction to address the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify streams, channels, and/or habitats in areas of existing development as candidates for rehabilitation, focusing on areas where stream, channel, and/or habitat rehabilitation projects will address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for stream, channel, and/or habitat rehabilitation projects may be utilized to address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters, rehabilitate channelized or hydromodified streams, restore wetland and riparian habitat, restore watershed functions, and/or restore beneficial uses of receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of stream, channel, and/or habitat rehabilitation projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance stream, channel, and/or habitat rehabilitation projects; and

(e) Where stream, channel, and/or habitat rehabilitation projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional stream, channel, and/or habitat rehabilitation projects (i.e. projects that can receive storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment).

6. Enforcement Response Plans

Each Copermittee must develop and implement an Enforcement Response Plan as part of its jurisdictional runoff management program document. The Enforcement Response Plan must describe the applicable approaches and options to enforce its legal authority established pursuant to Provision E.1, as necessary, to achieve compliance with the requirements of this Order. The Enforcement Response Plan must be in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include the following:

a. Enforcement Response Plan Components

The Enforcement Response Plan must include the following individual components:

(1) Illicit Discharge Detection and Elimination Enforcement Component;

(2) Development Planning Enforcement Component;

(3) Construction Management Enforcement Component; and

(4) Existing Development Enforcement Component.

b. Enforcement Response Approaches and Options

Each component of the Enforcement Response Plan must describe the enforcement response approaches that the Copermittee will implement to compel compliance with its statutes, ordinances, permits, contracts, orders, or similar means, and the requirements of this Order. The description must include the protocols for implementing progressively stricter enforcement responses. The enforcement response approaches must include appropriate sanctions to compel compliance, including, at a minimum, the following tools or their equivalent:

(1) Verbal and written notices of violation;

(2) Cleanup requirements;

(3) Fines;

(4) Bonding requirements;

(5) Administrative and criminal penalties;

(6) Liens;

(7) Stop work orders; and

(8) Permit and occupancy denials.

c. CORRECTION OF VIOLATIONS

(1) Violations must be corrected in a timely manner with the goal of correcting the violations within 30 calendar days after the violations are discovered, or prior to the next predicted rain event, whichever is sooner.

(2) If more than 30 calendar days are required to achieve compliance, then a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

d. ESCALATED ENFORCEMENT

(1) The Enforcement Response Plan must include a definition of "escalated enforcement." Escalated enforcement must include any enforcement scenario where a violation or other non-compliance is determined to cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan. Escalated enforcement may be defined differently for development planning, construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas.

(2) Where the Copermittee determines escalated enforcement is not required, a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

(3) Escalated enforcement actions must continue to increase in severity, as necessary, to compel compliance as soon as possible.

e. REPORTING OF NON-COMPLIANT SITES

(1) Each Copermittee must notify the San Diego Water Board in writing within five (5) calendar days of issuing escalated enforcement (as defined in the Copermittee's Enforcement Response Plan) to a construction site that poses a significant threat to water quality as a result of violations or other non-compliance with its permits and applicable local ordinances, and the

requirements of this Order. Written notification may be provided electronically by email to the appropriate San Diego Water Board staff.

(2) Each Copermittee must notify the San Diego Water Board of any persons required to obtain coverage under the statewide Industrial General Permit and Construction General Permit and failing to do so, within five (5) calendar days from the time the Copermittee become aware of the circumstances. Written notification may be provided electronically by email to R9_Nonfilers@waterboards.ca.gov.

7. Public Education and Participation

Each Copermittee must implement, individually or with other Copermittees, a public education and participation program in accordance with the strategies identified in the Water Quality Improvement Plan to promote and encourage the development of programs, management practices, and behaviors that reduce the discharge of pollutants in storm water to the MEP, prevent controllable non-storm water discharges from entering the MS4, and protect water quality standards in receiving waters. The public education and participation program must be implemented in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include, at a minimum, the following requirements:

a. PUBLIC EDUCATION

The public education program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) Educational activities, public information activities, and other appropriate outreach activities intended to reduce pollutants associated with the application of pesticides, herbicides and fertilizer and other pollutants of concern in storm water discharges to and from its MS4 to the MEP, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed to address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(2) Educational activities, public information activities, and other appropriate outreach activities to facilitate the proper management and disposal of used oil and toxic materials; and

(3) Appropriate education and training measures for specific target audiences, such as construction site operators, residents, underserved target audiences and school-aged children, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed, based on high risk behaviors and pollutants of concern.

b. PUBLIC PARTICIPATION

The public participation program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) A process for members of the public to participate in updating the highest priority water quality conditions, numeric goals, and water quality improvement strategies in the Water Quality Improvement Plan;

(2) Opportunities for members of the public to participate in providing the Copermittee recommendations for improving the effectiveness of the water quality improvement strategies implemented within its jurisdiction; and

(3) Opportunities for members of the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or protection of the quality of receiving waters.

8. Fiscal Analysis

a. Each Copermittee must secure the resources necessary to meet all the requirements of this Order.

b. Each Copermittee must conduct an annual fiscal analysis of its jurisdictional runoff management program in its entirety. The fiscal analysis must include the following:

(1) Identification of the various categories of expenditures necessary to implement the requirements of this Order, including a description of the specific capital, operation and maintenance, and other expenditure items to be accounted for in each category of expenditures;

(2) The staff resources needed and allocated to meet the requirements of this Order, including any development, implementation, and enforcement activities required;

(3) The estimated expenditures for Provisions E.8.b.(1) and E.8.b.(2) for the current fiscal year; and

(4) The source(s) of funds that are proposed to meet the necessary expenditures described in Provisions E.8.b.(1) and E.8.b.(2), including legal restrictions on the use of such funds, for the current fiscal year and next fiscal year.

c. Each Copermittee must submit a summary of the annual fiscal analysis with each Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3).

d. Each Copermittee must provide the documentation used to develop the summary of the annual fiscal analysis upon request by the San Diego Water Board.

F. REPORTING

The purpose of this provision is to determine and document compliance with the requirements set forth in this Order. The goal of reporting is to communicate to the San Diego Water Board and the people of the State of California the implementation status of each jurisdictional runoff management program and compliance with the requirements of this Order. This goal is to be accomplished through the submittal of specific deliverables to the San Diego Water Board by the Copermittees.

1. Water Quality Improvement Plans

The Copermittees for each Watershed Management Area must develop and submit the Water Quality Improvement Plan in accordance with the following requirements:

a. WATER QUALITY IMPROVEMENT PLAN DEVELOPMENT

Each Water Quality Improvement Plan must be developed in accordance with the following process:

(1) Public Participation Process

The Copermittees must implement a public participation process to solicit data, information, and recommendations to be utilized in the development of the Water Quality Improvement Plan. The public participation process must include the following:

(a) The Copermittees must develop a publicly available and noticed schedule of the opportunities for the public to participate and provide comments during the development of the Water Quality Improvement Plan. The schedule may be adjusted as necessary by the Copermittees, provided the public is provided timely notification of the changes to the schedule.

(b) The Copermittees must form a Water Quality Improvement Consultation Panel to provide recommendations during the development of the Water Quality Improvement Plan. The Water Quality Improvement Consultation Panel must consist of at least the following members:

(i) A representative of the San Diego Water Board;

(ii) A representative of the environmental community familiar with the water quality conditions of concern of the receiving waters in the Watershed Management Area, preferably from an environmental interest group associated with a water body within the Watershed Management Area; and

(iii) A representative of the development community familiar with the opportunities and constraints for implementing structural BMPs, retrofitting projects, and stream, channel or habitat rehabilitation

projects in the Watershed Management Area, preferably with relevant engineering, hydrology, and/or geomorphology experience in the Watershed Management Area.

(c) The Copermittees must coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public time and opportunity to participate during the development of the Water Quality Improvement Plans.

(2) Priority Water Quality Conditions

(a) The Copermittees must solicit data, information and recommendations from the public to be utilized in the development and identification of the priority water quality conditions and potential water quality improvement strategies for the Watershed Management Area.

(b) The Copermittees must review the priority water quality conditions the Copermittees plan on including in the Water Quality Improvement Plan with the Water Quality Improvement Consultation Panel to receive recommendations or concurrence.

(c) The Copermittees must consider revisions to the priority water quality conditions based on recommendations from the Water Quality Improvement Consultation Panel.

(d) The Copermittees must include all the potential water quality improvement strategies identified by the public and the Water Quality Improvement Consultation Panel with the submittal of the priority water quality conditions to the San Diego Water Board.

(e) The Copermittees must submit the Water Quality Improvement Plan requirements of Provision B.2 to the San Diego Water Board as early as 6 months and no later than 12 months after the commencement of coverage under this Order. Upon receipt, the San Diego Water Board will issue a public notice and release the proposed priority water quality conditions and potential water quality improvement strategies for public review and comment for a minimum of 30 days.

(f) The Copermittees must consider revisions to the priority water quality conditions and potential water quality improvement strategies developed pursuant to Provision B.2 based on public comments received by the close of the comment period.

(3) Water Quality Improvement Goals, Strategies and Schedules

(a) The Copermittees must solicit recommendations from the public on potential numeric goals for the highest priority water quality conditions identified for the Watershed Management Area, and recommendations on the strategies that should be implemented to achieve the potential numeric goals.

(b) The Copermittees must consult with the Water Quality Improvement Consultation Panel and consider revisions to the following items based on the Panel's recommendations:

(i) The numeric goals and schedules the Copermittees propose to include in the Water Quality Improvement Plan;

(ii) The water quality improvement strategies and schedules the Copermittees propose to implement in the Watershed Management Area and include in the Water Quality Improvement Plan; and

(iii) If the Copermittees choose to implement Provision B.3.b.(4), the results of the Watershed Management Area Analysis the Copermittees proposed to incorporate into the Water Quality Improvement Plan.

(c) The Copermittees must submit the Water Quality Improvement Plan requirements of Provision B.3 to the San Diego Water Board as early as 9 months and no later than 18 months after the commencement of coverage under this Order. Upon receipt, the San Diego Water Board will issue a public notice and release the proposed water quality improvement goals, strategies and schedules for public review and comment for a minimum of 30 days.

(d) The Copermittees must consider revisions to the water quality improvement goals, strategies and schedules developed pursuant to Provision B.3 based on public comments received by the close of the comment period.

b. WATER QUALITY IMPROVEMENT PLAN SUBMITTAL AND IMPLEMENTATION

(1) Within 24 months after the commencement of coverage under this Order, the Copermittees for each Watershed Management Area must submit a complete Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order to the San Diego Water Board. The San Diego Water Board will issue a public notice and release the Water Quality Improvement Plan for public review and comment for a minimum of 30 days.

(2) The Copermittees must consider revisions to the Water Quality Improvement Plan based on written comments received by the close of the public comment period.

(3) The Copermittees must promptly submit any revisions to the Water Quality Improvement Plan to the San Diego Water Board no later than 60 days after the close of the public comment period.

(4) If issues concerning the Water Quality Improvement Plan are resolved informally through discussions among the Copermittees, the San Diego Water Board and interested parties, the San Diego Water Board Executive Officer may provide written notification of acceptance to the Copermittees that the Water Quality Improvement Plan meets the requirements of Provision B. However, if the Executive Officer determines that significant issues with the Water Quality Improvement Plan remain, the matter will be scheduled for San Diego Water Board consideration at a public meeting.

(5) The Copermittees must commence with implementation of the Water Quality Improvement Plan, in accordance with the water quality improvement strategies and schedules therein, upon written notification of acceptance with the Water Quality Improvement Plan by the San Diego Water Board Executive Officer.

(6) During implementation of the Water Quality Improvement Plan the Copermittees must correct any deficiencies in the Plan identified by the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report following a request by the Board to do so.

(7) The Water Quality Improvement Plan must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of receiving notification of acceptance with the Water Quality Improvement Plan by the San Diego Water Board Executive Officer.

2. Updates

a. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATES

Each Copermittee must update its jurisdictional runoff management program document in accordance with the following requirements:

(1) Each Copermittee is encouraged to seek public and key stakeholder participation and comments, as early and often as possible during the process of developing updates to its jurisdictional runoff management program document;

(2) Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E concurrent with the submittal of the Water Quality Improvement Plan. Each Copermittee must correct any deficiencies in the jurisdictional runoff management program document based on comments received from the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report;

(3) Each Copermittee must submit updates to its jurisdictional runoff management program, with the supporting rationale for the modifications, either in the Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b;

(4) The Copermittee must revise proposed modifications to its jurisdictional runoff management program as directed by the San Diego Water Board Executive Officer; and

(5) Updated jurisdictional runoff management program documents must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of submitting the Water Quality Improvement Plan Annual Report.

b. BMP DESIGN MANUAL UPDATES

Each Copermittee must update its BMP Design Manual in accordance with the following requirements:

(1) Each Copermittee must update its BMP Design Manual to incorporate the requirements of Provisions E.3.a-d concurrent with the submittal of the Water Quality Improvement Plan. Each Copermittee must correct any deficiencies in the BMP Design Manual based on comments received from the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report;

(2) Subsequent updates to the BMP Design Manual must be consistent with the requirements of Provisions E.3.a-d and must be submitted as part of the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b; and

(3) Updated BMP Design Manuals must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of completing the update.

c. WATER QUALITY IMPROVEMENT PLAN UPDATES

(1) The Water Quality Improvement Plans must be updated in accordance with the following process:

(a) The Copermittees must develop and implement a public participation process to obtain data, information and recommendations for updating the Water Quality Improvement Plan. The public participation process must provide for a publicly available and noticed schedule of opportunities for the public to participate and provide comments during the development of updates to the Water Quality Improvement Plan;

(b) The Copermittees must consult with the Water Quality Improvement Consultation Panel on proposed updates of the Water Quality Improvement Plan, and consider the Water Quality Improvement Consultation Panel's recommendations in finalizing the proposed updates;

(c) The Copermittees for each Watershed Management Area must submit 1) proposed updates to the Water Quality Improvement Plan and supporting rationale, and 2) recommendations received from the public and the Water Quality Improvement Consultation Panel and the rationale for the requested updates, either in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The updates submitted will be deemed accepted for inclusion in the Water Quality Improvement Plan ninety (90) days after submission unless otherwise directed in writing by the San Diego Water Board Executive Officer;

(d) The Copermittees must revise the requested updates as directed by the San Diego Water Board Executive Officer; and

(e) Updated Water Quality Improvement Plans must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance of the requested updates by the San Diego Water Board.

(2) No later than six months following Office of Administrative Law and USEPA approval of any TMDL Basin Plan amendment with wasteload allocations (WLAs) assigned to the Copermittees during the term of this Order, the Copermittees must initiate an update to the applicable Water Quality Improvement Plans in accordance with Provision F.1 or Provision F.2.c.(1) to incorporate the requirements of the TMDL WLAs.

3. Progress Reporting

a. Progress Report Presentations

The Copermittees for each Watershed Management Area must periodically appear before the San Diego Water Board, as requested by the Board, to provide progress reports on the implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs.

b. Annual Reports

(1) Transitional Jurisdictional Runoff Management Program Annual Reports

(a) Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) no later than October 31 of each year for each jurisdictional runoff management program reporting period (i.e. July 1 to June 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted.

(b) Each Copermittee must submit the information on the Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) specific to the area within its jurisdiction in each Watershed Management Area.

(c) In addition to submitting the Jurisdictional Runoff Management Program Annual Report Form during the transitional reporting period, each Copermittee may continue to utilize and submit the jurisdictional runoff management program annual reporting format of its previous NPDES permit until the first Water Quality Improvement Plan Annual Report is required to be submitted.

(2) Transitional Monitoring and Assessment Program Annual Reports

The Copermittees for each Watershed Management Area must submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted under this Order. The Transitional Monitoring and Assessment Program Annual Reports must include:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1.a and D.2.a, summarized and presented in tabular and graphical form; and

(b) The findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

(3) Water Quality Improvement Plan Annual Reports

The Copermittees for each Watershed Management Area must submit a Water Quality Improvement Plan Annual Report for each reporting period no later than January 31 of the following year. The annual reporting period consists of two different periods: 1) July 1 to June 30 of the following year for the jurisdictional runoff management programs, 2) October 1 to September 30 of the following year for the monitoring and assessment programs. The Water Quality Improvement Plan Annual Reports must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Each Annual Report must include the following:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, summarized and presented in tabular and graphical form;

(b) The progress of the special studies required pursuant to Provision D.3, and the findings, interpretations and conclusions of a special study, or each phase of a special study, upon its completion;

(c) The findings, interpretations and conclusions from the assessments required pursuant to Provision D.4;

(d) The progress of implementing the Water Quality Improvement Plan, including, but not limited to, the following:

(i) The progress toward achieving the interim and final numeric goals for the highest water quality priorities for the Watershed Management Area;

(ii) The water quality improvement strategies that were implemented and/or no longer implemented by each of the Copermittees during the reporting period and previous reporting periods;

(iii) The water quality improvement strategies planned for implementation during the next reporting period;

(iv) Proposed modifications to the water quality improvement strategies, the public comments received and the supporting rationale for the proposed modifications;

(v) Previous modifications or updates incorporated into the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document and implemented by the Copermittees in the Watershed Management Area; and

(vi) Proposed modifications or updates to the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document;

(e) A completed Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) for each Copermittee in the Watershed Management Area, certified by a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative; and

(f) Each Copermittee must provide any data or documentation utilized in developing the Water Quality Improvement Plan Annual Report upon request by the San Diego Water Board. Any Copermittee monitoring data utilized in developing the Water Quality Improvement Plan Annual Report must be uploaded to the California Environmental Data Exchange Network (CEDEN).[30] Any Copermittee monitoring and assessment data utilized in developing the Water Quality Improvement Plan Annual Report must be available for access on the Regional Clearinghouse required pursuant to Provision F.4.

C. REGIONAL MONITORING AND ASSESSMENT REPORT

(1) The Copermittees must submit a Regional Monitoring and Assessment Report no later than 180 days prior to the expiration date of this Order. The Regional Monitoring and Assessment Report may be submitted as part of the Report of Waste Discharge required pursuant to Provision F.5.b. In preparing the report the Copermittees must consider the receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, and the findings, interpretations, and conclusions from the assessments required pursuant to Provision D.4. Based on these considerations the report must assess the following:

(a) The beneficial uses of the receiving waters within the San Diego Region that are supported and not adversely affected by the Copermittees' MS4 discharges;

(b) The beneficial uses of the receiving waters within the San Diego Region that are adversely impacted by the Copermittees' MS4 discharges;

(c) The progress toward protecting the beneficial uses in the receiving waters within the San Diego Region from the Copermittees' discharges; and

[30] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

(d) Pollutants or conditions of emerging concern that may impact beneficial uses in the receiving waters within the San Diego Region.

(2) The Regional Monitoring and Assessment Report must include recommendations for improving the implementation and assessment of the Water Quality Improvement Plans and jurisdictional runoff management programs.

(3) Each Copermittee must provide any data or documentation utilized in developing the Regional Monitoring and Assessment Report upon request by the San Diego Water Board. Any Copermittee monitoring and assessment data utilized in developing the Regional Monitoring and Assessment Report must be available for access on the Regional Clearinghouse required pursuant to Provision F.4.

4. Regional Clearinghouse

The Copermittees must develop, update, and maintain an internet-based Regional Clearinghouse that is made available to the public no later than 18 months after the effective date of this Order.[31]

a. The Copermittees, through the Regional Clearinghouse, must make the following documents and data available for access, and organized by Watershed Management Area. The documents and data may be linked to other internet-based data portals and databases where the original documents are stored:

(1) Water Quality Improvement Plan for the Watershed Management Area, and all updated versions with date of update;

(2) Annual Reports for the Watershed Management Area;

(3) Jurisdictional Runoff Management Program document for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(4) BMP Design Manual for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(5) Reports from special studies (e.g. source identification, BMP effectiveness assessment) conducted in the Watershed Management Area;

[31] The Copermittees may develop, update and maintain the clearinghouse(s) of other Copermittees or agencies.

(6) Monitoring data collected pursuant to Provision D for each Watershed Management Area must be uploaded to CEDEN,[32] with links to the uploaded data; and

(7) Available GIS data, layers, and/or shapefiles used to develop the maps generated and maintained by the Copermittees for the Water Quality Improvement Plans, Annual Reports, and jurisdictional runoff management program documents.

b. The Copermittees, through the Regional Clearinghouse, must make the following information and documents available for access:

(1) Contact information (point of contact, phone number, email address, and mailing address) for each Copermittee;

(2) Public hotline number for reporting non-storm water and illicit discharges for each Copermittee;

(3) Email address for reporting non-storm water and illicit discharges for each Copermittee;

(4) Link to each Copermittee's website, if available, where the public may find additional information about the Copermittee's storm water management program and for requesting records for the implementation of its program;

(5) Information about opportunities for the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or protection of the quality of receiving waters; and

(6) Reports from regional monitoring programs in which the Copermittees participate (e.g. Southern California Monitoring Coalition, Southern California Coastal Water Research Project Bight Monitoring);

(7) Regional Monitoring and Assessment Reports; and

(8) Any other information, data, and documents the Copermittees determine as appropriate for making available to the public.

[32] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

5. Report of Waste Discharge

a. The Riverside County Copermittees are required to submit a complete Report of Waste Discharge pursuant to the requirements of their current Order. The San Diego Water Board will review and consider the Report of Waste Discharge to determine whether modification to this Order, pursuant to the requirements of Provision H, will be required prior to the Riverside County Copermittees obtaining coverage under this Order. The current Order for Riverside County Copermittees is rescinded upon the date of effective coverage under this Order except for enforcement purposes.

b. The Copermittees subject to the requirements of this Order must submit to the San Diego Water Board a complete Report of Waste Discharge as an application for the re-issuance of this Order and NPDES permit. The Report of Waste Discharge must be submitted no later than 180 days in advance of the expiration date of this Order. The Report of Waste Discharge must contain the following minimum information:

(1) Names and addresses of the Copermittees;

(2) Names and titles of the primary contacts of the Copermittees;

(3) Proposed changes to the Copermittees' Water Quality Improvement Plans and the supporting justification;

(4) Proposed changes to the Copermittees' jurisdictional runoff management programs and the supporting justification;

(5) Any other information necessary for the re-issuance of this Order;

(6) Any information to be included as part of the Report of Waste Discharge pursuant to the requirements of this Order; and

(7) Any other information required by federal regulations for NPDES permit reissuance.

6. Application for Early Coverage

a. The Riverside County Copermittees may apply for early coverage under this Order by submitting a Report of Waste Discharge Form 200, with a written request for early coverage under this Order.

b. The San Diego Water Board will review the application for early coverage. A notification of coverage under this Order will be issued to the Copermittees in the respective county by the San Diego Water Board upon completion of the early coverage application requirements. The effective coverage date will be specified in the notification of coverage. The Copermittees in the respective county are authorized to have MS4 discharges pursuant to the requirements of this Order starting on the effective coverage date specified in the notification of coverage. The existing Order for the respective county is rescinded upon the effective coverage date specified in the notification of coverage except for enforcement purposes.

7. Reporting Provisions

Each Copermittee must comply with all the reporting and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

G. PRINCIPAL WATERSHED COPERMITTEE RESPONSIBILITIES

1. The Copermittees within each Watershed Management Area must designate a Principal Watershed Copermittee and notify the San Diego Water Board of the name of the Principal Watershed Copermittee. An individual Copermittee should not be designated a Principal Watershed Copermittee for more than two Watershed Management Areas. The notification may be submitted with the Water Quality Improvement Plan required pursuant to Provision F.1 of this Order.

2. The Principal Watershed Copermittee is responsible for, at a minimum, the following:

a. Serving as liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues, and when necessary and appropriate, representing the Copermittees in the Watershed Management Area before the San Diego Water Board;

b. Facilitating the development of the Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order;

c. Coordinating the submittal of the deliverables required by Provisions F.1, F.2, F.3.a, and F.3.b of this Order; and

d. Coordinating and developing, with the other Principal Watershed Copermittees, the requirements of Provisions F.3.c, F.4, and F.5.b of this Order.

3. The Principal Watershed Copermittee is not responsible for ensuring that the other Copermittees within the Watershed Management Area are in compliance with the requirements of this Order. Each Copermittee within the Watershed Management Area is responsible for complying with the requirements of this Order.

H. MODIFICATION OF ORDER

1. Modifications of the Order may be initiated by the San Diego Water Board or by the Copermittees. Requests by Copermittees must be made to the San Diego Water Board.

2. Minor modifications to the Order may be made by the San Diego Water Board where the proposed modification complies with all the prohibitions and limitations, and other requirements of this Order.

3. This Order may also be re-opened and modified, revoked and, reissued or terminated in accordance with the provisions of 40 CFR 122.44, 122.62 to 122.64, and 124.5. Causes for taking such actions include, but are not limited to, failure to comply with any condition of this Order and permit, and endangerment to human health or the environment resulting from the permitted activity.

4. This Order may be re-opened for modification for cause including but not limited to the following:

a. The State Water Board determines that revisions are warranted, and the San Diego Water Board concurs that revisions are necessary to those provisions of the Order addressing compliance with water quality standards in the receiving water and/or those provisions of the Order establishing an iterative process for implementation of management practices to assure compliance with water quality standards in the receiving water;

b. An application for early coverage under this Order is received pursuant to Provision F.6;

c. Any of the TMDLs in Attachment E to this Order are amended in the Basin Plan by San Diego Water Board, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA;

d. The Basin Plan is amended by the San Diego Water Board to incorporate a new TMDL, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA; or

e. Updating or revising the monitoring and reporting requirements is determined to be necessary, at the discretion of the San Diego Water Board. Such modification(s) may include, but is (are) not limited to, revision(s) to: (i) implement recommendations from Southern California Coastal Water Research Project (SCCWRP), (ii) develop, refine, implement, and/or coordinate a regional monitoring program, (iii) develop and implement improved monitoring and assessment programs in keeping with San Diego Water Board Resolution No. R9-2012-0069, Resolution in Support of a Regional Monitoring Framework, and/or (iv) add provisions to require the Copermittees to evaluate and provide information on cost and values of the monitoring and reporting program.

5. The San Diego Water Board, after opportunity for public comment and a public hearing, will re-open and consider modifications to this Order when the Riverside County Copermittees submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders.

I. STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

Each Copermittee must comply with all the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

ATTACHMENT A

DISCHARGE PROHIBITIONS AND SPECIAL PROTECTIONS

1. Basin Plan Waste Discharge Prohibitions

California Water Code Section 13243 provides that a Regional Water Board, in a water quality control plan, may specify certain conditions or areas where the discharge of waste or certain types of waste is not permitted. The following waste discharge prohibitions in the Water Quality Control Plan for the San Diego Basin (Basin Plan) are applicable to any person, as defined by Section 13050(c) of the California Water Code, who is a citizen, domiciliary, or political agency or entity of California whose activities in California could affect the quality of waters of the state within the boundaries of the San Diego Region.

1. The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in California Water Code Section 13050, is prohibited.

2. The discharge of waste to land, except as authorized by waste discharge requirements or the terms described in California Water Code Section 13264 is prohibited.

3. The discharge of pollutants or dredged or fill material to waters of the United States except as authorized by a National Pollutant Discharge Elimination System (NPDES) permit or a dredged or fill material permit (subject to the exemption described in California Water Code Section 13376) is prohibited.

4. Discharges of recycled water to lakes or reservoirs used for municipal water supply or to inland surface water tributaries thereto are prohibited, unless this San Diego Water Board issues a NPDES permit authorizing such a discharge; the proposed discharge has been approved by the State Department of Health Services (DHS) and the operating agency of the impacted reservoir; and the discharger has an approved fail-safe long-term disposal alternative.

5. The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the San Diego Water Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

6. The discharge of waste in a manner causing flow, ponding, or surfacing on lands not owned or under the control of the discharger is prohibited, unless the discharge is authorized by the San Diego Water Board.

7. The dumping, deposition, or discharge of waste directly into waters of the state, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the San Diego Water Board.

8. Any discharge to a storm water conveyance system that is not composed entirely of "*storm water*" is prohibited unless authorized by the San Diego Water Board. [The federal regulations, 40 CFR 122.26(b)(13), define storm water as storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from firefighting activities.] [§122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

9. The unauthorized discharge of treated or untreated sewage to waters of the state or to a storm water conveyance system is prohibited.

10. The discharge of industrial wastes to conventional septic tank/subsurface disposal systems, except as authorized by the terms described in California Water Code Section 13264, is prohibited.

11. The discharge of radioactive wastes amenable to alternative methods of disposal into the waters of the state is prohibited.

12. The discharge of any radiological, chemical, or biological warfare agent into waters of the state is prohibited.

13. The discharge of waste into a natural or excavated site below historic water levels is prohibited unless the discharge is authorized by the San Diego Water Board.

14. The discharge of sand, silt, clay, or other earthen materials from any activity, including land grading and construction, in quantities which cause deleterious bottom deposits, turbidity or discoloration in waters of the state or which unreasonably affect, or threaten to affect, beneficial uses of such waters is prohibited.

15. The discharge of treated or untreated sewage from vessels to Mission Bay, Oceanside Harbor, Dana Point Harbor, or other small boat harbors is prohibited.

16. The discharge of untreated sewage from vessels to San Diego Bay is prohibited.

17. The discharge of treated sewage from vessels to portions of San Diego Bay that are less than 30 feet deep at mean lower low water (MLLW) is prohibited.

18. The discharge of treated sewage from vessels, which do not have a properly functioning US Coast Guard certified Type I or Type II marine sanitation device, to portions of San Diego Bay that are greater than 30 feet deep at mean lower low water (MLLW) is prohibited.

2. Attachment B to State Water Board Resolution 2012-0012, as amended by State Water Board Resolution No. 2012-0031.

Special Protections for Areas of Special Biological Significance (ASBS), Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges

I. PROVISIONS FOR POINT SOURCE DISCHARGES OF STORM WATER AND NONPOINT SOURCE WASTE DISCHARGES

The following terms, prohibitions, and special conditions (hereafter collectively referred to as special conditions) are established as limitations on point source storm water and nonpoint source discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in Areas of Special Biological Significance (ASBS), as required for State Water Quality Protection Areas pursuant to California Public Resources Code Sections 36700(f) and 36710(f). These Special Protections are adopted by the State Water Board as part of the California Ocean Plan (Ocean Plan) General Exception.

The special conditions are organized by category of discharge. The State Water Resources Control Board (State Water Board) and Regional Water Quality Control Boards (Regional Water Boards) will determine categories and the means of regulation for those categories [e.g., Point Source Storm Water National Pollutant Discharge Elimination System (NPDES) or Nonpoint Source].

A. PERMITTED POINT SOURCE DISCHARGES OF STORM WATER

1. General Provisions for Permitted Point Source Discharges of Storm Water

   a. Existing storm water discharges into an ASBS are allowed only under the following conditions:

      (1) The discharges are authorized by an NPDES permit issued by the State Water Board or Regional Water Board;

      (2) The discharges comply with all of the applicable terms, prohibitions, and special conditions contained in these Special Protections; and

      (3) The discharges:

         (i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

         (ii) Are designed to prevent soil erosion;

         (iii) Occur only during wet weather;

         (iv) Are composed of only storm water runoff.

   b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

   c. The discharge of trash is prohibited.

d. Only discharges from existing storm water outfalls are allowed. Any proposed or new storm water runoff discharge shall be routed to existing storm water discharge outfalls and shall not result in any new contribution of waste to an ASBS (i.e., no additional pollutant loading). "Existing storm water outfalls" are those that were constructed or under construction prior to January 1, 2005. "New contribution of waste" is defined as any addition of waste beyond what would have occurred as of January 1, 2005. A change to an existing storm water outfall, in terms of re-location or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges are prohibited except as provided below:

(1) The term "non-storm water discharges" means any waste discharges from a municipal separate storm sewer system (MS4) or other NPDES permitted storm drain system to an ASBS that are not composed entirely of storm water.

(2) (i) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability or occur naturally:

(a) Discharges associated with emergency fire fighting operations.

(b) Foundation and footing drains.

(c) Water from crawl space or basement pumps.

(d) Hillside dewatering.

(e) Naturally occurring groundwater seepage via a storm drain.

(f) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(ii) An NPDES permitting authority may authorize non-storm water discharges to an MS4 with a direct discharge to an ASBS only to the extent the NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

2. Compliance Plans for Inclusion in Storm Water Management Plans (SWMP) and Storm Water Pollution Prevention Plans (SWPPP).

The discharger shall specifically address the prohibition of non-storm water runoff and the requirement to maintain natural water quality for storm water discharges to an ASBS in an ASBS Compliance Plan to be included in its SWMP or a SWPPP, as appropriate to permit type. If a statewide permit includes a SWMP, then the discharger shall prepare a stand-alone compliance plan for ASBS discharges. The ASBS Compliance Plan is subject to approval by the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (for permits issued by Regional Water Boards).

a. The Compliance Plan shall include a map of surface drainage of storm water runoff, showing areas of sheet runoff, prioritize discharges, and describe any structural Best Management Practices (BMPs) already employed and/or BMPs to be employed in the future. Priority discharges are those that pose the greatest water quality threat and which are identified to require installation of structural BMPs. The map shall also show the storm water conveyances in relation to other features such as service areas, sewage conveyances and treatment facilities, landslides, areas prone to erosion, and waste and hazardous material storage areas, if applicable. The SWMP or SWPPP shall also include a procedure for updating the map and plan when changes are made to the storm water conveyance facilities.

b. The ASBS Compliance Plan shall describe the measures by which all non-authorized non-storm water runoff (e.g., dry weather flows) has been eliminated, how these measures will be maintained over time, and how these measures are monitored and documented.

c. For Municipal Separate Storm Sewer System (MS4s), the ASBS Compliance Plan shall require minimum inspection frequencies as follows:

(1) The minimum inspection frequency for construction sites shall be weekly during rainy season;

(2) The minimum inspection frequency for industrial facilities shall be monthly during the rainy season;

(3) The minimum inspection frequency for commercial facilities (e.g., restaurants) shall be twice during the rainy season; and

(4) Storm water outfall drains equal to or greater than 18 inches (457 mm) in diameter or width shall be inspected once prior to the beginning of the rainy season and once during the rainy season and maintained to remove trash and other anthropogenic debris.

d. The ASBS Compliance Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff, that are necessary to comply with these special conditions, will be achieved through BMPs. Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that such installation would pose a threat to health or safety. BMPs to control storm water runoff discharges (at the end-of-pipe) during a design storm shall be designed to achieve on average the following target levels:

(1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

(2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges.

The baseline for these determinations is the effective date of the Exception, except for those structural BMPs installed between January 1, 2005 and adoption of these

Special Protections, and the reductions must be achieved and documented within six (6) years of the effective date.

e. The ASBS Compliance Plan shall address erosion control and the prevention of anthropogenic sedimentation in ASBS. The natural habitat conditions in the ASBS shall not be altered as a result of anthropogenic sedimentation.

f. The ASBS Compliance Plan shall describe the non-structural BMPs currently employed and planned in the future (including those for construction activities), and include an implementation schedule. The ASBS Compliance Plan shall include non-structural BMPs that address public education and outreach. Education and outreach efforts must adequately inform the public that direct discharges of pollutants from private property not entering an MS4 are prohibited. The ASBS Compliance Plan shall also describe the structural BMPs, including any low impact development (LID) measures, currently employed and planned for higher threat discharges and include an implementation schedule. To control storm water runoff discharges (at the end-of-pipe) during a design storm, permittees must first consider, and use where feasible, LID practices to infiltrate, use, or evapotranspirate storm water runoff on-site, if LID practices would be the most effective at reducing pollutants from entering the ASBS.

g. The BMPs and implementation schedule shall be designed to ensure that natural water quality conditions in the receiving water are achieved and maintained by either reducing flows from impervious surfaces or reducing pollutant loading, or some combination thereof.

h. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents in storm water runoff that alter natural ocean water quality and the sources of these constituents.

(2) The report shall describe BMPs that are currently being implemented, BMPs that are identified in the SWMP or SWPPP for future implementation, and any additional BMPs that may be added to the SWMP or SWPPP to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the BMPs.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits), the discharger shall revise its ASBS Compliance Plan to incorporate any new or modified BMPs that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised SWMP or SWPPP, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural ocean water quality conditions due to the same constituent.

(5) The requirements of this section are in addition to the terms, prohibitions, and conditions contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within eighteen (18) months from the effective date of the Exception, the discharger shall submit a draft written ASBS Compliance Plan to the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that describes its strategy to comply with these special conditions, including the requirement to maintain natural water quality in the affected ASBS. The ASBS Compliance Plan shall include a description of appropriate non-structural controls and a time schedule to implement structural controls (implementation schedule) to comply with these special conditions for inclusion in the discharger's SWMP or SWPPP, as appropriate to permit type. The final ASBS Compliance Plan, including a description and final schedule for structural controls based on the results of runoff and receiving water monitoring, must be submitted within thirty (30) months from the effective date of the Exception.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these special conditions shall be implemented.

d. Within six (6) years of the effective date of the Exception, any structural controls identified in the ASBS Compliance Plan that are necessary to comply with these special conditions shall be operational.

e. Within six (6) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water, pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data, and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. for municipalities, a demonstration of significant hardship to discharger ratepayers, by showing the relationship of storm water fees to annual household income for residents within the discharger's jurisdictional area, and the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or

2. for other governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

B. NONPOINT SOURCE DISCHARGES

1. General Provisions for Nonpoint Sources

a. Existing nonpoint source waste discharges are allowed into an ASBS only under the following conditions:

(1) The discharges are authorized under waste discharge requirements, a conditional waiver of waste discharge requirements, or a conditional prohibition issued by the State Water Board or a Regional Water Board.

(2) The discharges are in compliance with the applicable terms, prohibitions, and special conditions contained in these Special Protections.

(3) The discharges:

(i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

(ii) Are designed to prevent soil erosion;

(iii) Occur only during wet weather;

(iv) Are composed of only storm water runoff.

b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

c. The discharge of trash is prohibited.

d. Only existing nonpoint source waste discharges are allowed. "Existing nonpoint source waste discharges" are discharges that were ongoing prior to January 1, 2005. "New nonpoint source discharges" are defined as those that commenced on or after January 1, 2005. A change to an existing nonpoint source discharge, in terms of relocation or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges from nonpoint sources (those not subject to an NPDES Permit) are prohibited except as provided below:

(1) The term "non-storm water discharges" means any waste discharges that are not composed entirely of storm water.

(2) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability, or occur naturally:

(i) Discharges associated with emergency fire fighting operations.

(ii) Foundation and footing drains.

(iii) Water from crawl space or basement pumps.

(iv) Hillside dewatering.

(v) Naturally occurring groundwater seepage via a storm drain.

(vi) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

f. At the San Clemente Island ASBS, discharges incidental to military training and research, development, test, and evaluation operations are allowed. Discharges incidental to underwater demolition and other in-water explosions are not allowed in the two military closure areas in the vicinity of Wilson Cove and Castle Rock. Discharges must not result in a violation of the water quality objectives, including the protection of the marine aquatic life beneficial use, anywhere in the ASBS.

g. At the San Nicolas Island and Begg Rock ASBS, discharges incidental to military research, development, testing, and evaluation of, and training with, guided missile and other weapons systems, fleet training exercises, small-scale amphibious warfare training, and special warfare training are allowed. Discharges incidental to underwater demolition and other in-water explosions are not allowed. Discharges must not result in a violation of the water quality objectives, including the protection of the marine aquatic life beneficial use, anywhere in the ASBS.

h. All other nonpoint source discharges not specifically authorized above are prohibited.

2. Planning and Reporting

a. The nonpoint source discharger shall develop an ASBS Pollution Prevention Plan, including an implementation schedule, to address storm water runoff and any other nonpoint source discharges from its facilities. The ASBS Pollution Prevention Plan must be equivalent in contents to an ASBS Compliance Plan as described in I (A)(2) in this document. The ASBS Pollution Prevention Plan is subject to approval by the Executive Director of the State Water Board (statewide waivers or waste discharge requirements) or Executive

Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements).

b. The ASBS Pollution Prevention Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff that are necessary to comply with these special conditions, will be achieved through Management Measures and associated Management Practices (Management Measures/Practices). Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director or Regional Water Board Executive Officer that such installation would pose a threat to health or safety. Management Measures to control storm water runoff during a design storm shall achieve on average the following target levels:

(1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

(2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges.

The baseline for these determinations is the effective date of the Exception, except for those structural BMPs installed between January 1, 2005 and adoption of these Special Protections, and the reductions must be achieved and documented within six (6) years of the effective date.

c. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff or other nonpoint source pollution is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and the Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents that alter natural water quality and the sources of these constituents.

(2) The report shall describe Management Measures/Practices that are currently being implemented, Management Measures/Practices that are identified in the ASBS Pollution Prevention Plan for future implementation, and any additional Management Measures/Practices that may be added to the Pollution Prevention Plan to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the Management Measures/Practices.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements), the discharger shall revise its ASBS Pollution Prevention Plan to incorporate any new or modified Management Measures/Practices that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised ASBS Pollution Prevention Plan, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural water quality conditions due to the same constituent.

(5) The requirements of this section are in addition to the terms, prohibitions, and conditions contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within eighteen (18) months from the effective date of the Exception, the discharger~~s~~ shall submit a draft written ASBS Pollution Prevention Plan to the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) that describes its strategy to comply with these special conditions, including the requirement to maintain natural ocean water quality in the affected ASBS. The Pollution Prevention Plan shall include a description of appropriate non-structural controls and a time schedule to implement structural controls to comply with these special conditions for inclusion in the discharger's Pollution Prevention Plan. The final ASBS Pollution Prevention Plan, including a description and final schedule for structural controls based on the results of runoff and receiving water monitoring, must be submitted within thirty (30) months from the effective date of the Exception.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these Special Protections shall be implemented.

d. Within six (6) years of the effective date of the Exception, any structural controls identified in the ASBS Pollution Prevention Plan that are necessary to comply with these special conditions shall be operational.

e. Within six (6) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in (d.) or (e.). The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures

taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. a demonstration that the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or

2. for governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

II. ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES

In addition to the provisions in Section I (A) or I (B), respectively, a discharger with parks and recreation facilities shall comply with the following:

A. The discharger shall include a section in an ASBS Compliance Plan (for NPDES dischargers) or an ASBS Pollution Prevention Plan (for nonpoint source dischargers) to address storm water runoff from parks and recreation facilities.

1. The plan shall identify all pollutant sources, including sediment sources, which may result in waste entering storm water runoff. Pollutant sources include, but are not limited to, roadside rest areas and vistas, picnic areas, campgrounds, trash receptacles, maintenance facilities, park personnel housing, portable toilets, leach fields, fuel tanks, roads, piers, and boat launch facilities.

2. The plan shall describe BMPs or Management Measures/Practices that will be implemented to control soil erosion (both temporary and permanent erosion controls) and reduce or eliminate pollutants in storm water runoff in order to achieve and maintain natural water quality conditions in the affected ASBS. The plan shall include BMPs or Management Measures/Practices to ensure that trails and culverts are maintained to prevent erosion and minimize waste discharges to ASBS.

3. The plan shall include BMPs or Management Measures/Practices to prevent the discharge of pesticides or other chemicals, including agricultural chemicals, in storm water runoff to the affected ASBS.

4. The plan shall include BMPs or Management Measures/Practices that address public education and outreach. The goal of these BMPs or Management Measures/Practices is to ensure that the public is adequately informed that waste discharges to the affected ASBS are prohibited or limited by special conditions in these Special Protections. The BMPs or Management Measures/Practices shall include signage at camping, picnicking, beach and roadside parking areas, and visitor centers, or other appropriate measures, which notify the public of any applicable requirements of these Special Protections and identify the ASBS boundaries.

5. The plan shall include BMPs or Management Measures/Practices that address the prohibition against the discharge of trash to ASBS. The BMPs or Management Measures/Practices shall include measures to ensure that adequate trash receptacles are available for public use at visitor facilities, including parking areas, and that the receptacles are adequately maintained to prevent trash discharges into the ASBS. Appropriate measures include covering trash receptacles to prevent trash from being wind blown and periodically emptying the receptacles to prevent overflows.

6. The plan shall include BMPs or Management Measures/Practices to address runoff from parking areas and other developed features to ensure that the runoff does not alter natural water quality in the affected ASBS. BMPs or Management Measures/Practices shall include measures to reduce pollutant loading in runoff to the ASBS through installation of natural area buffers (LID), treatment, or other appropriate measures.

B. Maintenance and repair of park and recreation facilities must not result in waste discharges to the ASBS. The practice of road oiling must be minimized or eliminated, and must not result in waste discharges to the ASBS.

III. ADDITIONAL REQUIREMENTS – WATERFRONT AND MARINE OPERATIONS

In addition to the provisions in Section I (A) or I (B), respectively, a discharger with waterfront and marine operations shall comply with the following:

A. For discharges related to waterfront and marine operations, the discharger shall develop a Waterfront and Marine Operations Management Plan (Waterfront Plan). This plan shall contain appropriate Management Measures/Practices to address nonpoint source pollutant discharges to the affected ASBS.

1. The Waterfront Plan shall contain appropriate Management Measures/Practices for any waste discharges associated with the operation and maintenance of vessels, moorings, piers, launch ramps, and cleaning stations in order to ensure that beneficial uses are protected and natural water quality is maintained in the affected ASBS.

2. For discharges from marinas and recreational boating activities, the Waterfront Plan shall include appropriate Management Measures, described in The Plan for California's Nonpoint Source Pollution Control Program, for marinas and recreational boating, or equivalent practices, to ensure that nonpoint source pollutant discharges do not alter natural water quality in the affected ASBS.

3. The Waterfront Plan shall include Management Practices to address public education and outreach to ensure that the public is adequately informed that waste discharges to the affected ASBS are prohibited or limited by special conditions in these Special Protections. The management practices shall include appropriate signage, or similar measures, to inform the public of the ASBS restrictions and to identify the ASBS boundaries.

4. The Waterfront Plan shall include Management Practices to address the prohibition against trash discharges to ASBS. The Management Practices shall include the provision of adequate trash receptacles for marine recreation areas, including parking areas, launch ramps, and docks. The plan shall also include appropriate Management Practices to ensure that the receptacles are adequately maintained and secured in order to prevent trash discharges into the ASBS. Appropriate Management Practices

include covering the trash receptacles to prevent trash from being windblown, staking or securing the trash receptacles so they don't tip over, and periodically emptying the receptacles to prevent overflow.

5. The discharger shall submit its Waterfront Plan to the by the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) within six months of the effective date of these special conditions. The Waterfront Plan is subject to approval by the State Water Board Executive Director or the Regional Water Board Executive Officer, as appropriate. The plan must be fully implemented within 18 months of the effective date of the Exception.

B. The discharge of chlorine, soaps, petroleum, other chemical contaminants, trash, fish offal, or human sewage to ASBS is prohibited. Sinks and fish cleaning stations are point source discharges of wastes and are prohibited from discharging into ASBS. Anthropogenic accumulations of discarded fouling organisms on the sea floor must be minimized.

C. Limited-term activities, such as the repair, renovation, or maintenance of waterfront facilities, including, but not limited to, piers, docks, moorings, and breakwaters, are authorized only in accordance with Chapter III.E.2 of the Ocean Plan.

D. If the discharger anticipates that the discharger will fail to fully implement the approved Waterfront Plan within the 18 month deadline, the discharger shall submit a technical report as soon as practicable to the State Water Board Executive Director or the Regional Water Board Executive Officer, as appropriate. The technical report shall contain reasons for failing to meet the deadline and propose a revised schedule to fully implement the plan.

E. The State Water Board or the Regional Water Board may, for good cause, authorize additional time to comply with the Waterfront Plan. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in Section III.A.5. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality. The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. a demonstration of significant hardship by showing that the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate.

2. for governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

IV. MONITORING REQUIREMENTS

Monitoring is mandatory for all dischargers to assure compliance with the Ocean Plan. Monitoring requirements include both: (A) core discharge monitoring, and (B) ocean receiving water monitoring. The State and Regional Water Boards must approve sampling site locations and any adjustments to the monitoring programs. All ocean receiving water and reference area monitoring must be comparable with the Water Boards' Surface Water Ambient Monitoring Program (SWAMP).

Safety concerns: Sample locations and sampling periods must be determined considering safety issues. Sampling may be postponed upon notification to the State and Regional Water Boards if hazardous conditions prevail.

Analytical Chemistry Methods: All constituents must be analyzed using the lowest minimum detection limits comparable to the Ocean Plan water quality objectives. For metal analysis, all samples, including storm water effluent, reference samples, and ocean receiving water samples, must be analyzed by the approved analytical method with the lowest minimum detection limits (currently Inductively Coupled Plasma/Mass Spectrometry) described in the Ocean Plan.

A. CORE DISCHARGE MONITORING PROGRAM

1. General sampling requirements for timing and storm size:

   Runoff must be collected during a storm event that is greater than 0.1 inch and generates runoff, and at least 72 hours from the previously measurable storm event. Runoff samples shall be collected during the same storm and at approximately the same time when post-storm receiving water is sampled, and analyzed for the same constituents as receiving water and reference site samples (see section IV B) as described below.

2. Runoff flow measurements

   a. For municipal/industrial storm water outfalls in existence as of December 31, 2007, 18 inches (457mm) or greater in diameter/width (including multiple outfall pipes in combination having a width of 18 inches, runoff flows must be measured or calculated, using a method acceptable to and approved by the State and Regional Water Boards.

   b. This will be reported annually for each precipitation season to the State and Regional Water Boards.

3. Runoff samples – storm events

   a. For outfalls equal to or greater than 18 inches (0.46m) in diameter or width:

      (1) samples of storm water runoff shall be collected during the same storm as receiving water samples and analyzed for oil and grease, total suspended solids,

and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

(2) samples of storm water runoff shall be collected and analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

(3) If an applicant has no outfall greater than 36 inches, then storm water runoff from the applicant's largest outfall shall be further collected during the same storm as receiving water samples and analyzed for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates).

b. For outfalls equal to or greater than 36 inches (0.91m) in diameter or width:

(1) samples of storm water runoff shall be collected during the same storm as receiving water samples and analyzed for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

(2) samples of storm water runoff shall be further collected during the same storm as receiving water samples and analyzed for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates); and

(3) samples of storm water runoff shall be collected and analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

c. For an applicant not participating in a regional monitoring program [see below in Section IV (B)] in addition to (a.) and (b.) above, a minimum of the two largest outfalls or 20 percent of the larger outfalls, whichever is greater, shall be sampled (flow weighted composite samples) at least three times annually during wet weather (storm event) and analyzed for all Ocean Plan Table A constituents, Table B constituents for marine aquatic life protection (except for toxicity, only chronic toxicity for three species shall be required), DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, and Ocean Plan indicator bacteria. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one (the largest) such discharge shall be sampled annually in each Region.

4. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may reduce or suspend core monitoring once the storm runoff is fully characterized. This determination may be made at any point after the discharge is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

B. Ocean Receiving Water and Reference Area Monitoring Program

In addition to performing the Core Discharge Monitoring Program in Section II.A above, all applicants having authorized discharges must perform ocean receiving water monitoring. In order to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS, dischargers may choose either (1) an individual monitoring program, or (2) participation in a regional integrated monitoring program.

1. Individual Monitoring Program: The requirements listed below are for those dischargers who elect to perform an individual monitoring program to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within the affected ASBS. In addition to Core Discharge Monitoring, the following additional monitoring requirements shall be met:

   a. Three times annually, during wet weather (storm events), the receiving water at the point of discharge from the outfalls described in section (IV)(A)(3)(c) above shall be sampled and analyzed for Ocean Plan Table A constituents, Table B constituents for marine aquatic life, DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, salinity, chronic toxicity (three species), and Ocean Plan indicator bacteria.

      The sample location for the ocean receiving water shall be in the surf zone at the point of discharges; this must be at the same location where storm water runoff is sampled. Receiving water shall be sampled prior to (pre-storm) and during (or immediately after) the same storm (post storm). Post storm sampling shall be during the same storm and at approximately the same time as when the runoff is sampled. Reference water quality shall also be sampled three times annually and analyzed for the same constituents pre-storm and post-storm, during the same storm seasons when receiving water is sampled. Reference stations will be determined by the State Water Board's Division of Water Quality and the applicable Regional Water Board(s).

   b. Sediment sampling shall occur at least three times during every five (5) year period. The subtidal sediment (sand or finer, if present) at the discharge shall be sampled and analyzed for Ocean Plan Table B constituents for marine aquatic life, DDT, PCBs, PAHs, pyrethroids, and OP pesticides. For sediment toxicity testing, only an acute toxicity test using the amphipod *Eohaustorius estuarius* must be performed.

   c. A quantitative survey of intertidal benthic marine life shall be performed at the discharge and at a reference site. The survey shall be performed at least once every five (5) year period. The survey design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The results of the survey shall be completed and submitted to the State Water Board and Regional Water Board at least six months prior to the end of the permit cycle.

   d. Once during each five (5) year period, a bioaccumulation study shall be conducted to determine the concentrations of metals and synthetic organic pollutants at representative discharge sites and at representative reference sites. The study design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The bioaccumulation study may include California mussels (*Mytilus californianus*) and/or sand crabs (*Emerita analoga* or *Blepharipoda occidentalis*). Based

on the study results, the Regional Water Board and the State Water Board's Division of Water Quality, may adjust the study design in subsequent permits, or add or modify additional test organisms (such as shore crabs or fish), or modify the study design appropriate for the area and best available sensitive measures of contaminant exposure.

e. Marine Debris: Representative quantitative observations for trash by type and source shall be performed along the coast of the ASBS within the influence of the discharger's outfalls. The design, including locations and frequency, of the marine debris observations is subject to approval by the Regional Water Board and State Water Board's Division of Water Quality.

f. The monitoring requirements of the Individual Monitoring Program in this section are minimum requirements. After a minimum of one (1) year of continuous water quality monitoring of the discharges and ocean receiving waters, the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may require additional monitoring, or adjust, reduce or suspend receiving water and reference station monitoring. This determination may be made at any point after the discharge and receiving water is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

2. Regional Integrated Monitoring Program: Dischargers may elect to participate in a regional integrated monitoring program, in lieu of an individual monitoring program, to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS. This regional approach shall characterize natural water quality, pre- and post-storm, in ocean reference areas near the mouths of identified open space watersheds and the effects of the discharges on natural water quality (physical, chemical, and toxicity) in the ASBS receiving waters, and should include benthic marine aquatic life and bioaccumulation components. The design of the ASBS stratum of a regional integrated monitoring program may deviate from the otherwise prescribed individual monitoring approach (in Section IV.B.1) if approved by the State Water Board's Division of Water Quality and the Regional Water Boards.

a. Ocean reference areas shall be located at the drainages of flowing watersheds with minimal development (in no instance more than 10% development), and shall not be located in CWA Section 303(d) listed waterbodies or have tributaries that are 303(d) listed. Reference areas shall be free of wastewater discharges and anthropogenic non- storm water runoff. A minimum of low threat storm runoff discharges (e.g. stream highway overpasses and campgrounds) may be allowed on a case-by-case basis. Reference areas shall be located in the same region as the ASBS receiving water monitoring occurs. The reference areas for each Region are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean reference water samples must be collected from each station, each from a separate storm during the same storm season that receiving water is sampled. A minimum of one reference location shall be sampled for each ASBS receiving water site sampled per responsible party. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

b. ASBS ocean receiving water must be sampled in the surf zone at the location where the runoff makes contact with ocean water (i.e. at "point zero"). Ocean receiving water

stations must be representative of worst-case discharge conditions (i.e. co-located at a large drain greater than 36 inches, or if drains greater than 36 inches are not present in the ASBS then the largest drain greater than18 inches.) Ocean receiving water stations are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean receiving water samples must be collected during each storm season from each station, each from a separate storm. A minimum of one receiving water location shall be sampled in each ASBS per responsible party in that ASBS. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

c. Reference and receiving water sampling shall commence during the first full storm season following the adoption of these special conditions, and post-storm samples shall be collected during the same storm event when storm water runoff is sampled. Sampling shall occur in a minimum of two storm seasons. For those ASBS dischargers that have already participated in the Southern California Bight 2008 ASBS regional monitoring effort, sampling may be limited to only one storm season.

d. Receiving water and reference samples shall be analyzed for the same constituents as storm water runoff samples. At a minimum, constituents to be sampled and analyzed in reference and discharge receiving waters must include oil and grease, total suspended solids, Ocean Plan Table B metals for protection of marine life, Ocean Plan PAHs, pyrethroids, OP pesticides, ammonia, nitrate, phosphates, and critical life stage chronic toxicity for three species. In addition, within the range of the southern sea otter, indicator bacteria or some other measure of fecal contamination shall be analyzed.

3. Waterfront and Marine Operations: In addition to the above requirements for ocean receiving water monitoring, additional monitoring must be performed for marinas and boat launch and pier facilities:

a. For all marina or mooring field operators, in mooring fields with 10 or more occupied moorings, the ocean receiving water must be sampled for Ocean Plan indicator bacteria, residual chlorine, copper, zinc, grease and oil, methylene blue active substances (MBAS), and ammonia nitrogen.

(1) For mooring field operators opting for an individual monitoring program (Section IV.B.1 above), this sampling must occur weekly (on the weekend) from May through October.

(2) For mooring field operators opting to participate in a regional integrated monitoring program (Section IV.B.2 above), this sampling must occur monthly from May through October on a high use weekend in each month. The Water Boards may allow a reduction in the frequency of sampling, through the regional monitoring program, after the first year of monitoring.

b. For all mooring field operators, the subtidal sediment (sand or finer, if present) within mooring fields and below piers shall be sampled and analyzed for Ocean Plan Table B metals (for marine aquatic life beneficial use), acute toxicity, PAHs, and tributyltin. For sediment toxicity testing, only an acute toxicity test using the amphipod *Eohaustorius*

estuarius must be performed. This sampling shall occur at least three times during a five (5) year period. For mooring field operators opting to participate in a regional integrated monitoring program, the Water Boards may allow a reduction in the frequency of sampling after the first sampling effort's results are assessed.

Glossary

At the point of discharge(s) – Means in the surf zone immediately where runoff from an outfall meets the ocean water (a.k.a., at point zero).

Areas of Special Biological Significance (ASBS) – Those areas designated by the State Water Board as ocean areas requiring protection of species or biological communities to the extent that alteration of natural water quality is undesirable. All Areas of Special Biological Significance are also classified as a subset of State Water Quality Protection Areas.

Design storm – For purposes of these Special Protections, a design storm is defined as the volume of runoff produced from one inch of precipitation per day or, if this definition is inconsistent with the discharger's applicable storm water permit, then the design storm shall be the definition included in the discharger's applicable storm water permit.

Development – Relevant to reference monitoring sites, means urban, industrial, agricultural, grazing, mining, and timber harvesting land uses.

Higher threat discharges - Permitted storm drains discharging equal to or greater than 18 inches, industrial storm drains, agricultural runoff discharged through an MS4, discharges associated with waterfront and marina operations (e.g., piers, launch ramps, mooring fields, and associated vessel support activities, except for passive discharges defined below), and direct discharges associated with commercial or industrial activities to ASBS.

Low Impact Development (LID) – A sustainable practice that benefits water supply and contributes to water quality protection. Unlike traditional storm water management, which entails collecting and conveying storm water runoff through storm drains, pipes, or other conveyances to a centralized storm water facility, LID focuses on using site design and storm water management to maintain the site's pre-development runoff rates and volumes. The goal of LID is to mimic a site's predevelopment hydrology by using design techniques that infiltrate, filter, store, evaporate, and detain runoff close to the source of rainfall.

Marine Operations – Marinas or mooring fields that contain slips or mooring locations for 10 or more vessels.

Management Measure (MM) - Economically achievable measures for the control of the addition of pollutants from various classes of nonpoint sources of pollution, which reflect the greatest degree of pollutant reduction achievable through the application of the best available nonpoint pollution control practices, technologies, processes, siting criteria, operating methods, or other alternatives. For example, in the "marinas and recreational boating" land- use category specified in the Plan for California's Nonpoint Source Pollution Control Program (NPS Program Plan) (SWRCB, 1999), "boat cleaning and maintenance" is considered a MM or the source of a specific class or type of NPS pollution.

Management Practice (MP) - The practices (e.g., structural, non-structural, operational, or other alternatives) that can be used either individually or in combination to address a

specific MM class or classes of NPS pollution. For example, for the "boat cleaning and maintenance" MM, specific MPs can include, but are not limited to, methods for the selection of environmentally sensitive hull paints or methods for cleaning/removal of hull copper anti- fouling paints.

Municipal Separate Storm Sewer System (MS4) – A municipally-owned storm sewer system regulated under the Phase I or Phase II storm water program implemented in compliance with Clean Water Act section 402(p). Note that an MS4 program's boundaries are not necessarily congruent with the permittee's political boundaries.

Natural Ocean Water Quality - The water quality (based on selected physical, chemical and biological characteristics) that is required to sustain marine ecosystems, and which is without apparent human influence, *i.e.*, an absence of significant amounts of: (a) man-made constituents (*e.g.,* DDT); (b) other chemical (*e.g.,* trace metals), physical (temperature/thermal pollution, sediment burial), and biological (*e.g.*, bacteria) constituents at concentrations that have been elevated due to man's activities above those resulting from the naturally occurring processes that affect the area in question; and (c) non-indigenous biota (*e.g.,* invasive algal bloom species) that have been introduced either deliberately or accidentally by man. Discharges "*shall not alter natural ocean water quality*" as determined by a comparison to the range of constituent concentrations in reference areas agreed upon via the regional monitoring program(s). If monitoring information indicates that *natural ocean water quality* is not maintained, but there is sufficient evidence that a discharge is not contributing to the alteration of natural water quality, then the Regional Water Board may make that determination. In this case, sufficient information must include runoff sample data that has equal or lower concentrations for the range of constituents at the applicable reference area(s).

Nonpoint source – Nonpoint pollution sources generally are sources that do not meet the definition of a point source. Nonpoint source pollution typically results from land runoff, precipitation, atmospheric deposition, agricultural drainage, marine/boating operations or hydrologic modification. Nonpoint sources, for purposes of these Special Protections, include discharges that are not required to be regulated under an NPDES permit.

Non-storm water discharge – Any runoff that is not the result of a precipitation event. This is often referred to as "dry weather flow."

Non-structural control – A Best Management Practice that involves operational, maintenance, regulatory (e.g., ordinances) or educational activities designed to reduce or eliminate pollutants in runoff, and that are not structural controls (i.e. there are no physical structures involved).

Physical impossibility - Means any act of God, war, fire, earthquake, windstorm, flood or natural catastrophe; unexpected and unintended accidents not caused by discharger or its employees' negligence; civil disturbance, vandalism, sabotage or terrorism; restrain by court order or public authority or agency; or action or non-action by, or inability to obtain the necessary authorizations or approvals from any governmental agency other than the permittee.

Representative sites and monitoring procedures – Are to be proposed by the discharger, with appropriate rationale, and subject to approval by Water Board staff.

Sheet-flow – Runoff that flows across land surfaces at a shallow depth relative to the cross- sectional width of the flow. These types of flow may or may not enter a storm drain system before discharge to receiving waters.

Storm Season – Also referred to as rainy season, means the months of the year from the onset of rainfall during autumn until the cessation of rainfall in the spring.

Structural control – A Best Management Practice that involves the installation of engineering solutions to the physical treatment or infiltration of runoff.

Surf Zone - The surf zone is defined as the submerged area between the breaking waves and the shoreline at any one time.

Surface Water Ambient Monitoring Program (SWAMP) comparable – Means that the monitoring program must 1) meet or exceed 2008 SWAMP Quality Assurance Program Management Plan (QAPP) Measurement Quality Objectives, or 2) have a Quality Assurance Project Plan that has been approved by SWAMP; in addition data must be formatted to match the database requirements of the SWAMP Information Management System. Adherence to the measurement quality objectives in the Southern California Bight 2008 ASBS Regional Monitoring Program QAPP and data base management comprises being SWAMP comparable.

Waterfront Operations - Piers, launch ramps, and cleaning stations in the water or on the adjacent shoreline.

Attachment 1
Special Protections Sections I(A)(3)(e) and I(B)(3)(e)
Flowchart to Deteremine Compliance with natural Water Quality

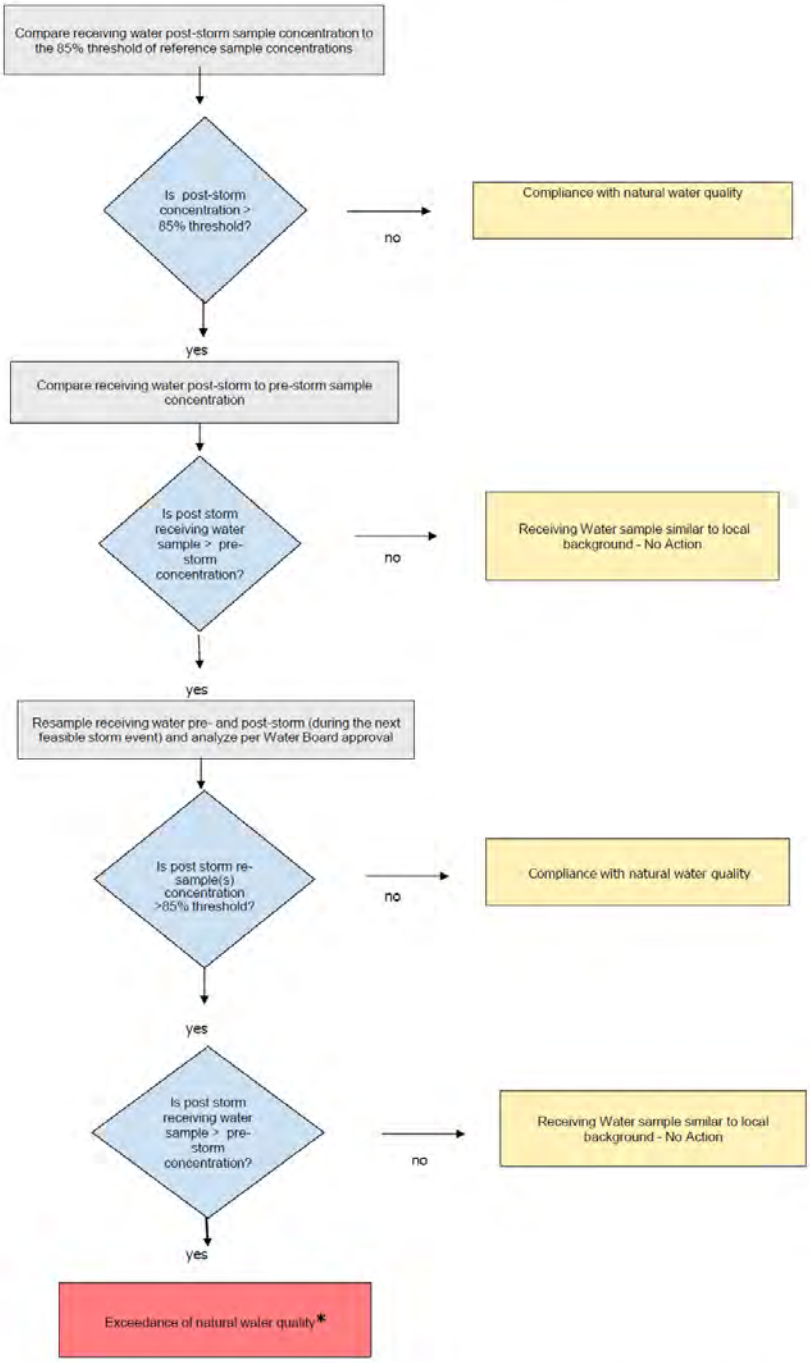

*** When an exceedance of natural water quality occurs, the discharger must comply with section I.A.2.h (for permitted storm water) or section I.B.2.c (for nonpoint sources). Note, when sampling data is available, end-of-pipe effluent concentrations will be considered by the Water Boards in making this determination.**

ATTACHMENT B

STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

1. Standard Permit Provisions

Code of Federal Regulations Title 40 Section 122.41 (40 CFR 122.41) includes conditions, or provisions, that apply to all National Pollutant Discharge Elimination System (NPDES) permits. Additional provisions applicable to NPDES permits are in 40 CFR 122.42. All applicable provisions in 40 CFR 122.41 and 40 CFR 122.42 must be incorporated into this Order and NPDES permit. The applicable 40 CFR 122.41 and 40 CFR 122.42 provisions are as follows:

a. DUTY TO COMPLY [40 CFR 122.41(a)]

The Copermittee must comply with all of the provisions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

(1) The Copermittee must comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement. [40 CFR 122.41(a)(1)]

(2) The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to a civil penalty not to exceed $25,000 per day for each violation. The CWA provides that any person who *negligently* violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than 2 years, or both. Any person who *knowingly* violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both. Any person who knowingly violates Section 301, 302, 303, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, and who knows at that time that he thereby places another person in imminent danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of

not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.
[40 CFR 122.41(a)(2)]

(3) Any person may be assessed an administrative penalty by the San Diego Regional Water Quality Control Board (San Diego Water Board), State Water Resources Control Board (State Water Board), or United States Environmental Protection Agency (USEPA) for violating Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.
[40 CFR 122.41(a)(3)]

b. DUTY TO REAPPLY [40 CFR 122.41(b)]

If a Copermittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Copermittee must apply for and obtain a new permit.

c. NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE [40 CFR 122.41(c)]

It shall not be a defense for a Copermittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

d. DUTY TO MITIGATE [40 CFR 122.41(d)]

The Copermittee must take all reasonable steps to minimize or prevent any discharge or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

e. PROPER OPERATION AND MAINTENANCE [40 CFR 122.41(e)]

The Copermittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Copermittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by a Copermittee only when the operation is necessary to achieve compliance with the conditions of this permit.

f. PERMIT ACTIONS [40 CFR 122.41(f)]

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Copermittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

g. PROPERTY RIGHTS [40 CFR 122.41(g)]

This permit does not convey any property rights of any sort, or any exclusive privilege.

h. DUTY TO PROVIDE INFORMATION [40 CFR 122.41(h)]

The Copermittee must furnish to the San Diego Water Board, State Water Board, or USEPA within a reasonable time, any information which the San Diego Water Board, State Water Board, or USPEA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Copermittee must also furnish to the San Diego Water Board, State Water Board, or USPEA upon request, copies of records required to be kept by this permit.

i. INSPECTION AND ENTRY [40 CFR 122.41(i)]

The Copermittee must allow the San Diego Water Board, State Water Board, USEPA, and/or their authorized representative (including an authorized contractor acting as their representative), upon presentation of credentials and other documents as may be required by law, to:

(1) Enter upon the Copermittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit; [40 CFR 122.41(i)(1)]

(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit; [40 CFR 122.41(i)(2)]

(3) Inspect and photograph at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; [40 CFR 122.41(i)(3)] and

(4) Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location. [40 CFR 122.41(i)(4)]

j. MONITORING AND RECORDS [40 CFR 122.41(j)]

(1) Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity. [40 CFR 122.41(j)(1)]

(2) Except for records of monitoring information required by this permit related to the Copermittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five (5) years (or longer as required by 40 CFR Part 503), the

Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time. [40 CFR 122.41(j)(2)]

(3) Records for monitoring information must include: [40 CFR 122.41(j)(3)]

(a) The date, exact place, and time of sampling or measurements; [40 CFR 122.41(j)(3)(i)]
(b) The individual(s) who performed the sampling or measurements; [40 CFR 122.41(j)(3)(ii)]
(c) The date(s) analyses were performed; [40 CFR 122.41(j)(3)(iii)]
(d) The individual(s) who performed the analyses; [40 CFR 122.41(j)(3)(iv)]
(e) The analytical techniques or methods used; [40 CFR 122.41(j)(3)(v)] and
(f) The results of such analyses. [40 CFR 122.41(j)(3)(vi)]

(4) Monitoring must be conducted according to test procedures under 40 CFR Part 136 unless another method is required under 40 CFR Subchapters N or O. [40 CFR 122.41(j)(4)]

In the case of pollutants for which there are no approved methods under 40 CFR Part 136 or otherwise required under 40 CFR Subchapters N and O, monitoring must be conducted according to a test procedure specified in the permit for such pollutants. [40 CFR 122.44(i)(1)(iv)]

(5) The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. [40 CFR 122.41(j)(5)]

k. SIGNATORY REQUIREMENT [40 CFR 122.41(k)]

(1) All applications, reports, or information submitted to the San Diego Water Board, State Water Board, or USEPA must be signed and certified. (See 40 CFR 122.22) [40 CFR 122.41(k)(1)]

(a) *For a municipality, State, Federal, or other public agency.* [All applications must be signed] by either a principal executive officer or ranking elected official. [40 CFR 122.22(a)(3)]

(b) All reports required by permits, and other information requested by the San Diego Water Board, State Water Board, or USEPA must be signed by a person described in paragraph (a) of this section, or by a duly authorized representative of that person. A person is a duly authorized representative only if: [40 CFR 122.22(b)]

(i) The authorization is made in writing by a person described in paragraph (a) of this section; [40 CFR 122.22(b)(1)]

(ii) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company, (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) [40 CFR 122.22(b)(2)] and,

(iii) The written authorization is submitted to the San Diego Water Board and State Water Board. [40 CFR 122.22(b)(3)]

(c) *Changes to authorization.* If an authorization under paragraph (b) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (b) of this section must be submitted to the San Diego Water Board prior to or together with any reports, information, or applications to be signed by an authorized representative. [40 CFR 122.22(c)]

(d) *Certification.* Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." [40 CFR 122.22(d)]

(2) The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both. [40 CFR 122.41(k)(2)]

I. REPORTING REQUIREMENTS [40 CFR 122.41(l)]

(1) *Planned changes.* The Copermittee must give notice to the San Diego Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when: [40 CFR 122.41(l)(1)]

(a) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); [40 CFR 122.41(l)(1)(i)] or

(b) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which

are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1).
[40 CFR 122.41(l)(1)(ii)]

(c) The alteration or addition results in a significant change in the Copermittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. [40 CFR 122.41(l)(1)(iii)]

(2) *Anticipated noncompliance*. The Copermittee must give advance notice to the San Diego Water Board or State Water Board of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.
[40 CFR 122.41(l)(2)]

(3) *Transfers*. This permit is not transferable to any person except after notice to the San Diego Water Board. The San Diego Water Board may require modification or revocation and reissuance of the permit to change the name of the Copermittee and incorporate such other requirements as may be necessary under the CWA.
[40 CFR 122.41(l)(3)]

(4) *Monitoring reports.* Monitoring results must be reported at the intervals specified elsewhere in this permit. [40 CFR 122.41(l)(4)]

(a) Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the San Diego Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices. [40 CFR 122.41(l)(4)(i)]

(b) If the Copermittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or another method required for an industry-specific waste stream under 40 CFR Subchapters N or O, the results of this monitoring must be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the San Diego Water Board or State Water Board.
[40 CFR 122.41(l)(4)(ii)]

(c) Calculations for all limitations which require averaging of measurements must utilize an arithmetic mean unless otherwise specified in the permit.
[40 CFR 122.41(l)(4)(iii)]

(5) *Compliance schedules*. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date. [40 CFR 122.41(l)(5)]

(6) *Twenty-four hour reporting.*

(a) The Copermittee must report any noncompliance that may endanger health or the environment. Any information must be provided orally within 24 hours from the time the Copermittee becomes aware of the circumstances. A written submission must also be provided within five (5) days of the time the Copermittee becomes aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6)(i)]

(b) The following must be included as information which must be reported within 24 hours under this paragraph: [40 CFR 122.41(l)(6)(ii)]

(i) Any unanticipated bypass that exceeds any effluent limitation in the permit (See 40 CFR 122.41(g)). [40 CFR 122.41(l)(6)(ii)(A)]
(ii) Any upset which exceeds any effluent limitation in the permit. [40 CFR 122.41(l)(6)(ii)(B)] and,
(iii) Violation of a maximum daily discharge limitation for any of the pollutants listed by the San Diego Water Board in the permit to be reported within 24 hours. (See 40 CFR 122.44(g)) [40 CFR 122.41(l)(6)(ii)(C)]

(c) The San Diego Water Board may waive the above-required written report on a case-by-case basis if the oral report has been received within 24 hours. [40 CFR 122.41(l)(6)(iii)]

(7) *Other noncompliance.* The Copermittee must report all instances of noncompliance not reported in accordance with the standard provisions required under 40 CFR 122.41(l)(4), (5), and (6), at the time monitoring reports are submitted. The reports must contain the information listed in the standard provisions required under 40 CFR 122.41(l)(6). [40 CFR 122.41(l)(7))]

(8) *Other information.* When the Copermittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the San Diego Water Board, State Water Board, or USEPA, the Copermittee must promptly submit such facts or information. [40 CFR 122.41(l)(8)]

m. BYPASS [40 CFR 122.41(m)]

(1) *Definitions.*

(a) "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. [40 CFR 122.41(m)(1)(i)] or

(b) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be

expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
[40 CFR 122.41(m)(1)(ii)]

(2) *Bypass not exceeding limitations*. The Copermittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the standard provisions required under 40 CFR 122.41(m)(3) and (4).
[40 CFR 122.41(m)(2)]

(3) *Notice.*

(a) *Anticipated bypass*. If the Copermittee knows in advance of the need for a bypass, it must submit a notice, if possible at least ten days before the date of the bypass. [40 CFR 122.41(m)(3)(i)] or

(b) *Unanticipated bypass*. The Copermittee must submit notice of an unanticipated bypass in accordance with the standard provisions required under 40 CFR 122.41(l)(6) (24-hour notice).
[40 CFR 122.41(m)(3)(ii)]

(4) *Prohibition of Bypass.*

(a) Bypass is prohibited, and the San Diego Water Board may take enforcement action against a Copermittee for bypass, unless:
[40 CFR 122.41(m)(4)(i)]

(i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; [40 CFR 122.41(m)(4)(i)(A)]
(ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance;
[40 CFR 122.41(m)(4)(i)(B)] and,
(iii) The Copermittee submitted notice in accordance with the standard provisions required under 40 CFR 122.41(m)(3).
[40 CFR 122.41(m)(4)(i)(C)]

(b) The San Diego Water Board may approve an anticipated bypass, after considering its adverse effects, if the San Diego Water Board determines that it will meet the three conditions listed above.
[40 CFR 122.41(m)(4)(ii)]

n. UPSET [40 CFR 122.41(n)]

(1) *Definition.* "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Copermittee. An upset does not

include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. [40 CFR 122.41(n)(1)]

(2) *Effect of an upset*. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the standard provisions required under 40 CFR 122.41(n)(3) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. [40 CFR 122.41(n)(2)]

(3) *Conditions necessary for a demonstration of upset*. A Copermittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that: [40 CFR 122.41(n)(3)]

(a) An upset occurred and that the Copermittee can identify the cause(s) of the upset; [40 CFR 122.41(n)(3)(i)]
(b) The permitted facility was at the time being properly operated; [40 CFR 122.41(n)(3)(ii)] and
(c) The Copermittee submitted notice of the upset in accordance with the standard provisions required under 40 CFR 122.41(l)(6)(ii)(B) (24-hour notice). [40 CFR 122.41(n)(3)(iii)]
(d) The Copermittee complied with any remedial measures pursuant to the standard provisions required under 40 CFR 122.41(d). [40 CFR 122.41(n)(3)(iii)]

(4) *Burden of proof*. In any enforcement proceeding, the Copermittee seeking to establish the occurrence of an upset has the burden of proof. [40 CFR 122.41(n)(4)]

o. STANDARD PERMIT PROVISIONS FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS [40 CFR 122.42(c)]

The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the San Diego Water Board or State Water Board under 40 CFR 122.26(a)(1)(v) must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report must include:

(1) The status of implementing the components of the storm water management program that are established as permit conditions; [40 CFR 122.42(c)(1)]

(2) Proposed changes to the storm water management programs that are established as permit conditions. Such proposed changes must be consistent with 40 CFR 122.26(d)(2)(iii); [40 CFR 122.42(c)(2)] and

(3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under 40 CFR 122.26(d)(2)(iv) and (v); [40 CFR 122.42(c)(3)]

(4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; [40 CFR 122.42(c)(4)]

(5) Annual expenditures and budget for year following each annual report; [40 CFR 122.42(c)(5)]

(6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; [40 CFR 122.42(c)(6)]

(7) Identification of water quality improvements or degradation. [40 CFR 122.42(c)(7)]

p. STANDARD PERMIT PROVISIONS FOR STORM WATER DISCHARGES [40 CFR 122.42(d)]

The initial permits for discharges composed entirely of storm water issued pursuant to 40 CFR 122.26(e)(7) must require compliance with the conditions of the permit as expeditiously as practicable, but in no event later than three years after the date of issuance of the permit.

2. General Provisions

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. The general provisions applicable to this Order and NPDES permit are as follows:

a. DISCHARGE OF WASTE IS A PRIVILEGE

No discharge of waste into the waters of the State, whether or not such discharge is made pursuant to waste discharge requirements, shall create a vested right to continue such discharge. All discharges of waste into waters of the State are privileges, not rights. [CWC Section 13263(g)]

b. DURATION OF ORDER AND NPDES PERMIT

(1) *Effective date*. This Order supersedes Order No. R9-2007-0001 for the San Diego County Copermittees listed in Table 2.a and became effective on June 27, 2013 for those Copermittees. This Order as amended by Order R9-2015-0001supersedes Order No. R9-2009-0002 and becomes effective April 1, 2015, following the date Order No. R9-2015-0001 is adopted. This Order supersedes Order No. R9-2010-0016 upon further amendment or earlier notice of coverage.

(2) *Expiration*. This Order and NPDES permit expires five years after its effective date. [40 CFR 122.46(a)]

(3) *Continuation of expired order*. After this Order and NPDES permit expires, the terms and conditions of this Order and NPDES permit are automatically continued pending issuance of a new permit if all requirements of the federal NPDES regulations on the continuation of expired permits (40 CFR 122.6) are complied with.

c. AVAILABILITY

A copy of this Order must be kept at a readily accessible location and must be available to on-site personnel at all times.

d. CONFIDENTIALITY OF INFORMATION

Except as provided for in 40 CFR 122.7, no information or documents submitted in accordance with or in application for this Order will be considered confidential, and all such information and documents shall be available for review by the public at the San Diego Water Board office.

Claims of confidentiality for the following information will be denied:
[40 CFR 122.7(b)]

(1) The name and address of any permit applicant or Copermittee; [40 CFR 122.7(b)(1)] and

(2) Permit applications and attachments, permits, and effluent data. [40 CFR 122.7(b)(2)]

e. EFFLUENT LIMITATIONS

(1) *Interim effluent limitations*. The Copermittee must comply with any interim effluent limitations as established by addendum, enforcement action, or revised waste discharge requirements which have been, or may be, adopted by the San Diego Water Board.

(2) *Other effluent limitations and standards*. If any applicable toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant and that standard or prohibition is more stringent than any limitation on the pollutant in the permit, the San Diego Water Board shall institute proceedings under these regulations to modify or revoke and reissue the permit to conform to the toxic effluent standard or prohibition. [40 CFR 122.44(b)(1)]

f. DUTY TO MINIMIZE OR CORRECT ADVERSE IMPACTS

The Copermittee must take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this Order, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the noncompliance.

g. PERMIT ACTIONS

The filing of a request by the Copermittee for modification, revocation and reissuance, or termination of this Order, or a notification of planned change in or anticipated noncompliance with this Order does not stay any condition of this Order. (See 40 CFR 122.41(f)) In addition, the following provisions apply to this Order:

(1) Upon application by any affected person, or on its own motion, the San Diego Water

Board may review and revise the requirements in this Order. All requirements must be reviewed periodically. [CWC Section 13263(e)]

(2) This Order may be terminated or modified for cause, including, but not limited to, all of the following: [CWC Section 13381]

(a) Violation of any condition contained in the requirements of this Order. [CWC Section 13381(a)]

(b) Obtaining the requirements in this Order by misrepresentation, or failure to disclose fully all relevant facts. [CWC Section 13381(b)]

(c) A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge. [CWC Section 13381(c)]

(3) When this Order is transferred to a new owner or operator, such requirements as may be necessary under the CWC may be incorporated into this Order.

h. NPDES PERMITTED NON-STORM WATER DISCHARGES

The San Diego Water Board has, in prior years, issued a limited number of individual NPDES permits for non-storm water discharges to MS4s. The San Diego Water Board or State Water Board may in the future, upon prior notice to the Copermittee(s), issue an NPDES permit for any non-storm water discharge (or class of non-storm water discharges) to an MS4.

i. MONITORING

In addition to the standard provisions required under 40 CFR 122.41(j) and (l)(4), the following general monitoring provisions apply to this Order:

(1) Where procedures are not otherwise specified in Order, sampling, analysis and quality assurance/quality control must be conducted in accordance with the Quality Assurance Management Plan (QAMP) for the State of California's Surface Water Ambient Monitoring Program (SWAMP), adopted by the State Water Resources Control Board (State Water Board).

(2) Pursuant to 40 CFR 122.41(j)(2) and CWC Section 13383(a), each Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five (5) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time.

(3) All chemical, bacteriological, and toxicity analyses must be conducted at a laboratory certified for such analyses by the California Department of Public Health or a laboratory approved by the San Diego Water Board.

(4) For priority toxic pollutants that are identified in the California Toxics Rule (CTR) (65

Fed. Reg. 31682), the Copermittees must instruct their laboratories to establish calibration standards that are equivalent to or lower than the Minimum Levels (MLs) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP). If a Copermittee can demonstrate that a particular ML is not attainable, in accordance with procedures set forth in 40 CFR Part 136, the lowest quantifiable concentration of the lowest calibration standard analyzed by a specific analytical procedure (assuming that all the method specified sample weights, volumes, and processing steps have been followed) may be used instead of the ML listed in Appendix 4 of the SIP. The Copermittee must submit documentation from the laboratory to the San Diego Water Board for approval prior to raising the ML for any priority toxic pollutant.

j. ENFORCEMENT

(1) The San Diego Water Board is authorized to enforce the terms of this Order under several provisions of the CWC, including, but not limited to, CWC Sections 13385, 13386, and 13387.

(2) Nothing in this Order shall be construed to protect the Copermittee from its liabilities under federal, state, or local laws.

(3) The CWC provides for civil and criminal penalties comparable to, and in some cases greater than, those provided for under the CWA.

(4) Except as provided in the standard conditions required under 40 CFR 122.41(m) and (n), nothing in this Order shall be construed to relieve the Copermittee from civil or criminal penalties for noncompliance.

(5) Nothing in this Order shall be construed to preclude the institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties to which the Copermittee is or may be subject to under Section 311 of the CWA.

(6) Nothing in this Order shall be construed to preclude institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authoring preserved by Section 510 of the CWA.

k. SEVERABILITY

The provisions of this Order are severable, and if any provision of this Order, or the application of any provisions of this Order to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this Order shall not be affected thereby.

l. APPLICATIONS

Any application submitted by a Copermittee for reissuance or modification of this Order must satisfy all applicable requirements specified in federal regulations as well as any additional requirements for submittal of a Report of Waste Discharge specified in the CWC and the California Code of Regulations.

m. IMPLEMENTATION

All plans, reports and subsequent amendments submitted in compliance with this Order must be implemented immediately (or as otherwise specified). All submittals by Copermittees must be adequate to implement the requirements of this Order.

n. REPORT SUBMITTALS

(1) All report submittals must include an executive summary, introduction, conclusion, recommendations, and signed certified statement.

(2) Each Copermittee must submit a signed certified statement covering its responsibilities for each applicable submittal.

(3) The Principal Watershed Copermittee(s) must submit a signed certified statement covering its responsibilities for each applicable submittal and the sections of the submittals for which it is responsible.

(4) Unless otherwise directed, the Copermittees must submit one hard copy and one electronic copy of each report required under this Order to the San Diego Water Board, and one electronic copy to the USEPA.

(5) The Copermittees must submit reports and provide notifications as required by this Order to the following:

EXECUTIVE OFFICER
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
2375 NORTHSIDE DRIVE, SUITE 100
SAN DIEGO CA 92108
Telephone: (619) 516-1990 Fax: (619) 516-1994

EUGENE BROMLEY
US ENVIRONMENTAL PROTECTION AGENCY
REGION IX
PERMITS ISSUANCE SECTION (W-5-1)
75 HAWTHORNE STREET
SAN FRANCISCO CA 94105

ATTACHMENT C

ACRONYMS AND ABBREVIATIONS

AMAL	Average Monthly Action Level
ASBS	Area(s) of Special Biological Significance
BMP	Best Management Practice
Basin Plan	Water Quality Control Plan for the San Diego Basin
CEQA	California Environmental Quality Act
CCR	California Code of Regulations
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWC	California Water Code
CZARA	Coastal Zone Act Reauthorization Amendments of 1990
ESAs	Environmentally Sensitive Areas
GIS	Geographic Information System
IBI	Index of Biological Integrity
LID	Low Impact Development
MDAL	Maximum Daily Action Level
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
NAL	Non-Storm Water Action Level
NAICS	North American Industry Classification System
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
ROWD	Report of Waste Discharge (application for NPDES reissuance)
SAL	Storm Water Action Level
San Diego Water Board	California Regional Water Quality Control Board, San Diego Region
SIC	Standard Industrial Classification Code
State Water Board	State Water Resources Control Board
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
WDID	Waste Discharge Identification Number
WLA	Waste Load Allocation
WQBEL	Water Quality Based Effluent Limitation

DEFINITIONS

Active/Passive Sediment Treatment - Using mechanical, electrical or chemical means to flocculate or coagulate suspended sediment for removal from runoff from construction sites prior to discharge.

Anthropogenic Litter – Trash generated from human activities, not including sediment.

Average Monthly Action Level – The highest allowable average of daily discharges over a calendar month.

Beneficial Uses - The uses of water necessary for the survival or wellbeing of man, plants, and wildlife. These uses of water serve to promote tangible and intangible economic, social, and environmental goals. "Beneficial Uses" of the waters of the State that may be protected include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. Existing beneficial uses are uses that were attained in the surface or ground water on or after November 28, 1975; and potential beneficial uses are uses that would probably develop in future years through the implementation of various control measures. "Beneficial Uses" are equivalent to "Designated Uses" under federal law. [California Water Code Section 13050(f)].

Best Management Practices (BMPs) - Defined in 40 CFR 122.2 as schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Bioassessment - The use of biological community information to evaluate the biological integrity of a water body and its watershed. With respect to aquatic ecosystems, bioassessment is the collection and analysis of samples of the benthic macroinvertebrate community together with physical/habitat quality measurements associated with the sampling site and the watershed to evaluate the biological condition (i.e. biotic integrity) of a water body.

Biofiltration - Practices that use vegetation and amended soils to detain and treat runoff from impervious areas. Treatment is through filtration, infiltration, adsorption, ion exchange, and biological uptake of pollutants.

Biological Integrity - Defined in Karr J.R. and D.R. Dudley. 1981. Ecological perspective on water quality goals. *Environmental Management* 5:55-68 as: "A balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitat of the region." Also referred to as ecosystem health.

BMP Design Manual – A plan developed to eliminate, reduce, or mitigate the impacts of runoff from development projects, including Priority Development Projects.

Chronic Toxicity – A measurement of sublethal effect (e.g. reduced growth, reproduction) to experimental test organisms exposed to an effluent or receiving waters compared to that of the control organisms.

Clean Water Act Section 303(d) Water Body - An impaired water body in which water quality does not meet applicable water quality standards and/or is not expected to meet water quality standards, even after the application of technology based pollution controls required by the CWA. The discharge of runoff to these water bodies by the Copermittees is significant because these discharges can cause or contribute to violations of applicable water quality standards.

Construction Site – Any project, including projects requiring coverage under the Construction General Permit, that involves soil disturbing activities including, but not limited to, clearing, grading, disturbances to ground such as stockpiling, and excavation.

Contamination - As defined in the Porter-Cologne Water Quality Control Act, contamination is "an impairment of the quality of waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste whether or not waters of the State are affected."

Copermittee – A permittee to a NPDES permit that is only responsible for permit conditions relating to the discharge for which it is operator [40 CFR 122.26(b)(1)]. For the purposes of this Order, a Copermittee is one of the individual permittees identified in Tables 1a-1c of this Order.

Copermittees – All of the individual Copermittees, collectively.

Critical Channel Flow (Qc) – The channel flow that produces the critical shear stress that initiates bed movement or that erodes the toe of channel banks. When measuring Qc, it should be based on the weakest boundary material – either bed or bank.

Daily Discharge – Defined as either: (1) the total mass of the constituent discharged over the calendar day or any 24 hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g. concentration.)

The Daily Discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day, or other 24 hour period other than a day), or by the arithmetic mean of analytical results from one or more grab samples taken over the course of a day.

Development Projects - Construction, rehabilitation, redevelopment, or reconstruction of any public or private projects.

Dry Season –May 1 to September 30.

Dry Weather – Weather is considered dry if the preceding 72 hours has been without measurable precipitation (>0.1 inch).

Enclosed Bays – Enclosed bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost bay works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays do not include inland surface waters or ocean waters.

Erosion – When land is diminished or worn away due to wind, water, or glacial ice. Often the eroded debris (silt or sediment) becomes a pollutant via storm water runoff. Erosion occurs naturally but can be intensified by land clearing activities such as farming, development, road building, and timber harvesting.

Environmentally Sensitive Areas (ESAs) - Areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; areas designated as preserves or their equivalent under the Natural Communities Conservation Program within the Cities and County of Orange; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.

Estuaries – Waters, including coastal lagoons, located at the mouth of streams that serve as areas of mixing fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and ocean water. Estuaries do not include inland surface waters or ocean waters.

Existing Development – Any area that has been developed and exists for municipal, commercial, industrial, or residential purposes, uses, or activities. May include areas that are not actively used for its originally developed purpose, but may be re-purposed or redeveloped for another use or activity.

Flow Duration – The long-term period of time that flows occur above a threshold that causes significant sediment transport and may cause excessive erosion damage to creeks and streams (not a single storm event duration). The simplest way to visualize this is to consider a histogram of pre- and post-project flows using long-term records of hourly data. To maintain pre-development flow duration means that the total number of hours (counts) within each range of flows in a flow-duration histogram cannot increase between the pre- and post-development condition. Flow duration within the range of geomorphologically significant flows is important for managing erosion.

Grading - The cutting and/or filling of the land surface to a desired slope or elevation.

Groundwater – Subsurface water that occurs beneath the water table in soils and geologic formations that are fully saturated.

Hazardous Material – Any substance that poses a threat to human health or the environment due to its toxicity, corrosiveness, ignitability, explosive nature or chemical reactivity. These also include materials named by the USEPA in 40 CFR 116 to be reported if a designated quantity of the material is spilled into the waters of the U.S. or emitted into the environment.

Hazardous Waste - Hazardous waste is defined as “any waste which, under Section 600 of Title 22 of this code, is required to be managed according to Chapter 30 of Division 4.5 of Title 22 of this code” [CCR Title 22, Division 4.5, Chapter 11, Article 1].

Household Hazardous Waste – Paints, cleaning products, and other hazardous wastes generated during home improvement or maintenance activities.

Hydromodification – The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

Illicit Connection – Any man-made conveyance or drainage system through which a non-storm water discharge to the storm water drainage system occurs or may occur. Any connection to the MS4 that conveys an illicit discharge.

Illicit Discharge - Any discharge to the MS4 that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from firefighting activities [40 CFR 122.26(b)(2)].

Inactive Areas – Areas of construction activity that are not active and those that have been active and are not scheduled to be re-disturbed for at least 14 days.

Infiltration – In the context of low impact development, infiltration is defined as the percolation of water into the ground. Infiltration is often expressed as a rate (inches per hour), which is determined through an infiltration test. In the context of non-storm water, infiltration is water other than wastewater that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow [40 CFR 35.2005(20)].

Inland Surface Waters – Includes all surface waters of the State that do not include the ocean, enclosed bays, or estuaries.

Jurisdictional Runoff Management Program Document – A written description of the specific jurisdictional runoff management measures and programs that each Copermittee will implement to comply with this Order and ensure that storm water pollutant discharges in runoff are reduced to the MEP and do not cause or contribute to a violation of water quality standards.

Low Impact Development (LID) – A storm water management and land development strategy that emphasizes conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions.

Low Impact Development Best Management Practices (LID BMPs) – LID BMPs include schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States through storm water management and land development strategies that emphasize conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions. LID BMPs include retention practices that do not allow runoff, such as infiltration, rain water harvesting and reuse, and evapotranspiration. LID BMPs also include flow-through practices such as biofiltration that may have some discharge of storm water following pollutant reduction.

Major Outfall – As defined in the Code of Federal Regulations, a major outfall is a MS4 outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (i.e. discharge from a single conveyance other than a circular pipe which is associated with a drainage area of more than 50 acres); or, for MS4s that receive storm water from lands zoned for industrial activity (based on comprehensive zoning plans or equivalent), a MS4 outfall that discharges from a single pipe with an inside diameter of 12 inches or more or from its equivalent (i.e. discharge from other than a circular pipe associated with a drainage area of 2 acres or more).

Maximum Daily Action Level (MDAL) –The highest allowable daily discharge of a pollutant, over a calendar day (or 24 hour period). For pollutants with action levels expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with action levels expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

Maximum Extent Practicable (MEP) – The technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) for storm water that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) in combination with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than BAT. A definition for MEP is not provided either in the statute or in the regulations. Instead the definition of MEP is dynamic and will be defined by the following process over time: municipalities propose their definition of MEP by way of their runoff management programs. Their total collective and individual activities conducted pursuant to the runoff management programs becomes their proposal for MEP as it applies both to their overall effort, as well as to specific activities (e.g., MEP for street sweeping, or MEP for MS4 maintenance). In the absence of a proposal acceptable to the San Diego Water Board, the San Diego Water Board defines MEP.

In a memo dated February 11, 1993, entitled "Definition of Maximum Extent Practicable," Elizabeth Jennings, Senior Staff Counsel, SWRCB addressed the achievement of the MEP standard as follows:

> "*To achieve the MEP standard, municipalities must employ whatever Best Management Practices (BMPs) are technically feasible (i.e., are likely to be effective) and are not cost prohibitive. The major emphasis is on technical feasibility. Reducing pollutants to the MEP means choosing effective BMPs, and rejecting applicable BMPs only where other effective BMPs will serve the same purpose, or the BMPs would not be technically feasible, or the cost would be prohibitive. In selecting BMPs to achieve the MEP standard, the following factors may be useful to consider:*
>
> *a. Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?*
> *b. Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?*
> *c. Public Acceptance: Does the BMP have public support?*
> *d. Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?*
> *e. Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc.?*

The final determination regarding whether a municipality has reduced pollutants to the maximum extent practicable can only be made by the Regional or State Water Boards, and not by the municipal discharger. If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit derived, it would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs that would address a pollutant source, or to pick a BMP based solely on cost, which would be clearly less effective. In selecting BMPs the municipality must make a serious attempt to comply and practical solutions may not be lightly rejected. In any case, the burden would be on the municipal discharger to show compliance with its permit. After selecting a menu of BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented."

Monitoring Year – October 1 to September 30

Municipal Separate Storm Sewer System (MS4) – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designated or used for collecting or conveying storm water; (iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.26.

National Pollutant Discharge Elimination System (NPDES) - The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the CWA.

Non-Storm Water - All discharges to and from a MS4 that do not originate from precipitation events (i.e., all discharges from a MS4 other than storm water). Non-storm water includes illicit discharges and NPDES permitted discharges.

Nuisance - As defined in the Porter-Cologne Water Quality Control Act, a nuisance is "anything which meets all of the following requirements: 1) Is injurious to health, or is indecent, or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. 2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. 3) Occurs during, or as a result of, the treatment or disposal of wastes."

Ocean Waters – The territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the State Board's California Ocean Plan.

Order – Unless otherwise specified, refers to this Order, Order No. R9-2013-0001 (NPDES No. CAS0109266)

Outfall - Outfall means a point source as defined by 40 CFR 122.2 at the point where a municipal separate storm sewer discharges to waters of the US and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels or other conveyances which connect segments of the same stream or other waters of the US and are used to convey waters of the US.

Persistent Flow - Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

Person - A person is defined as an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof [40 CFR 122.2].

Point Source - Any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, landfill leachate collection systems, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

Pollutant - Any agent that may cause or contribute to the degradation of water quality such that a condition of pollution or contamination is created or aggravated.

Pollution - As defined in the Porter-Cologne Water Quality Control Act, pollution is "the alteration of the quality of the waters of the State by waste, to a degree which unreasonably affects either of the following: 1) The waters for beneficial uses; or 2) Facilities that serve these beneficial uses." Pollution may include contamination.

Pollution Prevention - Pollution prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control BMPs, treatment control BMPs, or disposal.

Pre-Development Runoff Conditions – Approximate flow rates and durations that exist or existed onsite before land development occurs. For new development projects, this equates to runoff conditions immediately before project construction. For redevelopment projects, this equates to runoff conditions from the project footprint assuming infiltration characteristics of the underlying soil, and existing grade. Runoff coefficients of concrete or asphalt must not be used. A redevelopment Priority Development Project must use available information pertaining to existing underlying soil type and onsite existing grade to estimate pre-development runoff conditions.

Priority Development Projects - New development and redevelopment projects defined under Provision E.3.b of Order No. R9-2013-0001.

Rainy Season (aka Wet Season) –October 1 to April 30

Receiving Waters – Waters of the United States.

Receiving Water Limitations - Waste discharge requirements issued by the San Diego Water Board typically include both: (1) "Effluent Limitations" (or "Discharge Limitations") that specify the technology-based or water-quality-based effluent limitations; and (2) "Receiving Water Limitations" that specify the water quality objectives in the Basin Plan as well as any other limitations necessary to attain those objectives. In summary, the "Receiving Water Limitations" provision is the provision used to implement the requirements of CWA section 402(p)(3)(B).

Redevelopment - The creation and/or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include trenching and resurfacing associated with utility work; resurfacing existing roadways; new sidewalk construction, pedestrian ramps, or bike lane on existing roads; and routine replacement of damaged pavement, such as pothole repair.

Regional Clearinghouse – A central location for the collection and distribution of information developed and maintained by the Copermittees including, but not limited to, plans, reports, manuals, data, contact information, and/or links to such documents and information.

Rehabilitation - Remedial measures or activities for the purpose of improving or restoring the beneficial uses of streams, channels or river systems. Techniques may vary from in-stream restoration techniques to off-line storm water management practices installed in the system corridor or upland areas, or a combination of in-stream and out of stream techniques. Rehabilitation techniques may include, but are not limited to the following: riparian zone restoration, constructed wetlands, channel modifications that improve habitat and stability, and daylighting of drainage systems.

Reporting Period – The period of information that is reported in the Water Quality Improvement Plan Annual Report. The reporting period consists of two components: 1) July 1 to June 30, consistent with the fiscal year, for the implementation of the jurisdictional runoff management programs, and 2) October 1 to September 30, consistent with the monitoring year for the monitoring and assessment programs. Together, these two time periods constitute the reporting year for the Water Quality Improvement Plan Annual Report due January 31 following the end of the monitoring year.

Retain – Keep or hold in a particular place, condition, or position without discharge to surface waters.

Retrofitting – Storm water management practice put into place after development has occurred in watersheds where the practices previously did not exist or are ineffective. Retrofitting of developed areas is intended to improve water quality, protect downstream channels, reduce flooding, or meet other specific objectives. Retrofitting developed areas may include, but is not limited to replacing roofs with green roofs, disconnecting downspouts or impervious surfaces to drain to pervious surfaces, replacing impervious surfaces with pervious surfaces, installing rain barrels, installing rain gardens, and trash area enclosures.

Runoff - All flows in a storm water conveyance system that consists of the following components: (1) storm water (wet weather flows) and (2) non-storm water including dry weather flows.

San Diego Water Board – As used in this document the term "San Diego Water Board" is synonymous with the term "Regional Board" as defined in Water Code section 13050(b) and is intended to refer to the California Regional Water Quality Control Board for the San Diego Region as specified in Water Code Section 13200.

Sediment - Soil, sand, and minerals washed from land into water. Sediment resulting from anthropogenic sources (i.e. human induced land disturbance activities) is considered a pollutant. This Order regulates only the discharges of sediment from anthropogenic sources and does not regulate naturally occurring sources of sediment. Sediment can destroy fish-nesting areas, clog animal habitats, and cloud waters so that sunlight does not reach aquatic plants.

Source Control BMP – Land use or site planning practices, or structural or nonstructural measures that aim to prevent runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between pollutants and runoff.

Storm Water – Per 40 CFR 122.26(b)(13), means storm water runoff, snowmelt runoff and surface runoff and drainage. Surface runoff and drainage pertains to runoff and drainage resulting from precipitation events.

Structural BMPs - A subset of BMPs which detains, retains, filters, removes, or prevents the release of pollutants to surface waters from development projects in perpetuity, after construction of a project is completed.

Test of Significant Toxicity (TST) - A statistical approach used to analyze toxicity test data. The TST incorporates a restated null hypothesis, Welch's t-test, and biological effect thresholds for chronic and acute toxicity.

Total Maximum Daily Load (TMDL) - The maximum amount of a pollutant that can be discharged into a water body from all sources (point and non-point) and still maintain water quality standards. Under CWA section 303(d), TMDLs must be developed for all water bodies that do not meet water quality standards after application of technology-based controls.

Toxicity - Adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies. The water quality objectives for toxicity provided in the Basin Plan, state in part…"All waters shall be free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life….The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge."

Toxicity Identification Evaluation (TIE) - A set of procedures for identifying the specific chemical(s) responsible for toxicity. These procedures are performed in three phases (characterization, identification, and confirmation) using aquatic organism toxicity tests.

Toxicity Reduction Evaluation (TRE) - A study conducted in a step-wise process designed to identify the causative agents of effluent or ambient toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in toxicity. The first steps of the TRE consist of the collection of data relevant to the toxicity, including additional toxicity testing, and an evaluation of facility operations and maintenance practices, and best management practices. A Toxicity Identification Evaluation (TIE) may be required as

part of the TRE, if appropriate.

Treatment Control BMP – Any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media absorption or any other physical, biological, or chemical process.

Unpaved Road – Any long, narrow stretch without pavement used for traveling by motor passenger vehicles between two or more points. Unpaved roads are generally constructed of dirt, gravel, aggregate or macadam and may be improved or unimproved.

Waste - As defined in CWC Section 13050(d), "waste includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal."

Article 2 of CCR Title 23, Chapter 15 (Chapter 15) contains a waste classification system that applies to solid and semi-solid waste, which cannot be discharged directly or indirectly to water of the state and which therefore must be discharged to land for treatment, storage, or disposal in accordance with Chapter 15. There are four classifications of waste (listed in order of highest to lowest threat to water quality): hazardous waste, designated waste, non-hazardous solid waste, and inert waste.

Water Quality Objective - Numerical or narrative limits on constituents or characteristics of water designated to protect designated beneficial uses of the water. [California Water Code Section 13050 (h)]. California's water quality objectives are established by the State and Regional Water Boards in the Water Quality Control Plans. Numeric or narrative limits for pollutants or characteristics of water designed to protect the beneficial uses of the water. In other words, a water quality objective is the maximum concentration of a pollutant that can exist in a receiving water and still generally ensure that the beneficial uses of the receiving water remain protected (i.e., not impaired). Since water quality objectives are designed specifically to protect the beneficial uses, when the objectives are violated the beneficial uses are, by definition, no longer protected and become impaired. This is a fundamental concept under the Porter Cologne Act. Equally fundamental is Porter Cologne's definition of pollution. A condition of pollution exists when the water quality needed to support designated beneficial uses has become unreasonably affected or impaired; in other words, when the water quality objectives have been violated. These underlying definitions (regarding beneficial use protection) are the reason why all waste discharge requirements implementing the federal NPDES regulations require compliance with water quality objectives. (Water quality objectives are also called water quality criteria in the CWA.)

Water Quality Standards - Water quality standards, as defined in Clean Water Act section 303(c) consist of the beneficial uses (e.g., swimming, fishing, municipal drinking water supply, etc.,) of a water body and criteria (referred to as water quality objectives in the California Water Code) necessary to protect those uses. Under the Water Code, the water boards establish beneficial uses and water quality objectives in water quality control or basin plans. Together with an anti-degradation policy, these beneficial uses and water quality objectives serve as water quality standards under the Clean Water Act. In Clean Water Act parlance, state beneficial uses are called "designated uses" and state water quality objectives are called "criteria." Throughout this Order, the relevant term is used depending on the statutory scheme.

Waters of the State - Any water, surface or underground, including saline waters within the boundaries of the State [CWC section 13050 (e)]. The definition of the Waters of the State is broader than that for the Waters of the United States in that all water in the State is considered to be a Waters of the State regardless of circumstances or condition.

Waters of the United States - As defined in the 40 CFR 122.2, the Waters of the U.S. are defined as: "(a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate "wetlands;" (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters otherwise defined as waters of the United States under this definition: (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial seas; and (g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA."

Watershed - That geographical area which drains to a specified point on a water course, usually a confluence of streams or rivers (also known as drainage area, catchment, or river basin).

Wet Season (aka Rainy Season) – October 1 to April 30

Wet Weather – Weather is considered wet up to 72 hours after a storm event of 0.1 inches and greater, unless otherwise defined by another regulatory mechanism (e.g. a TMDL).

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM

ATTACHMENT D

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM

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JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

FY _____

I. COPERMITTEE INFORMATION			
Copermittee Name:			
Copermittee Primary Contact Name:			
Copermittee Primary Contact Information: Address: City:	County:	State:	Zip:
Telephone:	Fax:	Email:	

II. LEGAL AUTHORITY		
Has the Copermittee established adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 that complies with Order No. R9-2013-0001?	YES NO	☐ ☐
A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority?	YES NO	☐ ☐

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE		
Was an update of the jurisdictional runoff management program document required or recommended by the San Diego Water Board?	YES NO	☐ ☐
If YES to the question above, did the Copermittee update its jurisdictional runoff management program document and make it available on the Regional Clearinghouse?	YES NO	☐ ☐

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM		
Has the Copermittee implemented a program to actively detect and eliminate illicit discharges and connections to its MS4 that complies with Order No. R9-2013-0001?	YES NO	☐ ☐

Number of non-storm water discharges reported by the public	
Number of non-storm water discharges detected by Copermittee staff or contractors	
Number of non-storm water discharges investigated by the Copermittee	
Number of sources of non-storm water discharges identified	
Number of non-storm water discharges eliminated	
Number of sources of illicit discharges or connections identified	
Number of illicit discharges or connections eliminated	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

V. DEVELOPMENT PLANNING PROGRAM		
Has the Copermittee implemented a development planning program that complies with Order No. R9-2013-0001?	YES NO	☐ ☐
Was an update to the BMP Design Manual required or recommended by the San Diego Water Board?	YES NO	☐ ☐
If YES to the question above, did the Copermittee update its BMP Design Manual and make it available on the Regional Clearinghouse?	YES NO	☐ ☐

Number of proposed development projects in review	
Number of Priority Development Projects in review	
Number of Priority Development Projects approved	
Number of approved Priority Development Projects exempt from any BMP requirements	
Number of approved Priority Development Projects allowed alternative compliance	
Number of Priority Development Projects granted occupancy	

Number of completed Priority Development Projects in inventory	
Number of high priority Priority Development Project structural BMP inspections	
Number of Priority Development Project structural BMP violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM
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VI. CONSTRUCTION MANAGEMENT PROGRAM

Has the Copermittee implemented a construction management program that complies with Order No. R9-2013-0001?	YES ☐ NO ☐
Number of construction sites in inventory	
Number of active construction sites in inventory	
Number of inactive construction sites in inventory	
Number of construction sites closed/completed during reporting period	
Number of construction site inspections	
Number of construction site violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

Has the Copermittee implemented an existing development management program that complies with Order No. R9-2013-0001?	YES ☐ NO ☐

	Municipal	Commercial	Industrial	Residential
Number of facilities or areas in inventory				
Number of existing development inspections				
Number of follow-up inspections				
Number of violations				
Number of enforcement actions issued				
Number of escalated enforcement actions issued				

VIII. PUBLIC EDUCATION AND PARTICIPATION

Has the Copermittee implemented a public education program component that complies with Order No. R9-2013-0001?	YES ☐ NO ☐
Has the Copermittee implemented a public participation program component that complies with Order No. R9-2013-0001?	YES ☐ NO ☐

IX. FISCAL ANALYSIS

Has the Copermittee attached to this form a summary of its fiscal analysis that complies with Order No. R9-2013-0001?	YES ☐ NO ☐

X. CERTIFICATION

I [☐ Principal Executive Officer ☐ Ranking Elected Official ☐ Duly Authorized Representative] certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature	Date
Print Name	Title
Telephone Number	Email

ATTACHMENT E

SPECIFIC PROVISIONS FOR TOTAL MAXIMUM DAILY LOADS APPLICABLE TO ORDER NO. R9-2013-0001

These provisions implement load allocations (LAs) and wasteload allocations (WLAs) of the Total Maximum Daily Loads (TMDLs) established by the San Diego Water Board or USEPA under Clean Water Act section 303(c), applicable to discharges regulated under this Order. The provisions and schedules for implementation of the TMDLs described below must be incorporated into the Water Quality Improvement Plans, required pursuant to Provision B of this Order, for the specified Watershed Management Areas.

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed
2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin
3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed
4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek
5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay
6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)
7. Total Maximum Daily Load for Sediment in Los Peñasquitos Lagoon

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2002-0123

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	August 14, 2002
State Water Board Approval Date:	July 16, 2003
Office of Administrative Law Approval Date:	September 11, 2003
US EPA Approval Date:	November 3, 2003

(3) TMDL Effective Date: September 11, 2003

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final diazinon TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must be in compliance with the final TMDL compliance requirements as of December 31, 2010.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations:

Table 1.1
Final Receiving Water Limitations Expressed as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Diazinon	Acute	0.08 µg/L	1 hour
	Chronic	0.05 µg/L	4 days

(b) Final Effluent Limitations

Discharges from the MS4s containing concentrations that do not exceed the following effluent limitations will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 1.b.(2)(a):

Table 1.2
Final Effluent Limitations Expressed as Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation	Averaging Period
Diazinon	Acute	0.072 µg/L	1 hour
	Chronic	0.045 µg/L	4 days

(c) Best Management Practices

The following BMPs for Chollas Creek must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area and implemented by the Responsible Copermittees:

(i) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 1.b.(2)(a) and/or the effluent limitations under Specific Provision 1.b.(2)(b) for Chollas Creek.

(ii) The Responsible Copermittees must implement the Diazinon Toxicity Control Plan and Diazinon Public Outreach/Education Program as described in the report titled, *Technical Report for Total Maximum Daily Load for Diazinon in Chollas Creek Watershed, San Diego County*, dated August 14, 2002, including subsequent modifications, in order to achieve the receiving water limitations under Specific Provision 1.b.(2)(a) and/or the effluent limitations under Specific Provision 1.b.(2)(b).

(iii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 1.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 1.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 1.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 1.b.(2)(c) achieves compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 1.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 1.d, to demonstrate compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The Responsible Copermittees must be in compliance with the final diazinon TMDL compliance requirements as of December 31, 2010.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls for diazinon within the Chollas Creek watershed, and calculate or estimate the annual diazinon loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 1.b.(2)(b), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0019

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	September 22, 2005
Office of Administrative Law Approval Date:	December 2, 2005
US EPA Approval Date:	February 8, 2006

(3) TMDL Effective Date: December 2, 2005

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Shelter Island Yacht Basin

(6) Responsible Copermittee: City of San Diego

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final dissolved copper TMDL compliance requirements for Shelter Island Yacht Basin consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittee must be in compliance with the final TMDL compliance requirements as of December 2, 2005.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations:

Table 2.1
Final Receiving Water Limitations Expressed as Concentrations in Shelter Island Yacht Basin

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Dissolved Copper	Acute	4.8 µg/L x WER*	1 hour
	Chronic	3.1 µg/L x WER*	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 2.b.(3)(a):

Table 2.2
Final Effluent Limitations as Expressed as Annual Loads in MS4 Discharges to Shelter Island Yacht Basin

Constituent	Effluent Limitation
Dissolved Copper	30 kg/yr*

* If the water quality objectives for dissolved copper in Shelter Island Yacht Basin are changed in the future, then the margin of safety (MOS), TMDL and allocations will be recalculated using the *Method for Recalculation of the Total Maximum Daily Load for Dissolved Copper in the Shelter Island Yacht Basin, San Diego Bay* in the Basin Plan (p. 7-14).

(c) Best Management Practices

The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 2.b.(2)(a) and/or the effluent limitations under Specific Provision 2.b.(2)(b) for Shelter Island Yacht Basin. The BMPs must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 2.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 2.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittee develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 2.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a

watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 2.b.(2)(c) achieves compliance with Specific Provisions 2.b.(3)(a), 2.b.(3)(b) and/or 2.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 2.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 2.d, to demonstrate compliance with Specific Provisions 2.b.(3)(a), 2.b.(3)(b) and/or 2.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The Responsible Copermittees must be in compliance with the final dissolved copper TMDL compliance requirements as of December 2, 2005.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

The Responsible Copermittee must monitor the effluent of its MS4 outfalls for dissolved copper, and calculate or estimate the monthly and annual dissolved copper loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.(b)(2)of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0036

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	November 16, 2005
Office of Administrative Law Approval Date:	February 1, 2006
US EPA Approval Date:	March 22, 2006

(3) TMDL Effective Date: February 1, 2006

(4) Watershed Management Area: Santa Margarita River

(5) Water Body: Rainbow Creek

(6) Responsible Copermittee: County of San Diego

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final total nitrogen and total phosphorus TMDL compliance requirements for Rainbow Creek consist of the following

(1) Final TMDL Compliance Date

The Responsible Copermittee must comply with final TMDL compliance requirements by December 31, 2021.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance date under Specific Provision 3.b.(1):

Table 3.1
Final Receiving Water Limitations Expressed as Concentrations in Rainbow Creek

Constituent	Receiving Water Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing concentrations that do not exceed the following effluent limitations by the compliance date under Specific Provision 3.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 3.b.(2)(a):

Table 3.2
Final Effluent Limitations Expressed as Concentrations in MS4 Discharges to Rainbow Creek

Constituent	Effluent Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(ii) Annual pollutant loads from given land uses discharging to and from the MS4s that do not exceed the following annual loads by the compliance date under Specific Provision 3.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 3.b.(2)(a):

Table 3.3
Final Effluent Limitations Expressed as Annual Loads in MS4 Discharges to Rainbow Creek

Land Use	Total N	Total P
Commercial nurseries	116 kg/yr	3 kg/yr
Park	3 kg/yr	0.1 kg/yr
Residential areas	149 kg/yr	12 kg/yr
Urban areas	27 kg/yr	6 kg/yr

(c) Best Management Practices

(i) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 3.b.(2)(a) and/or the effluent limitations under Specific Provision 3.b.(2)(b) for Rainbow Creek.

(ii) The Responsible Copermittee should coordinate any BMPs implemented to address this TMDL with Caltrans and other sources as possible.

(3) <u>Final TMDL Compliance Determination</u>

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 3.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 3.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the final effluent limitations under Specific Provision 3.b.(2)(b)(ii); OR

(e) The Responsible Copermittee develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 3.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Specific Provision 3.b.(2)(c) achieves compliance with Specific Provisions 3.b.(3)(a), 3.b.(3)(b), 3.b.(3)(c) and/or 3.b.(3)(d),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 3.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 3.d, to demonstrate compliance with Specific Provisions 3.b.(3)(a), 3.b.(3)(b), 3.b.(3)(c) and/or 3.b.(3)(d).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim total nitrogen and total phosphorus TMDL compliance requirements for Rainbow Creek consist of the following:

(1) Interim Compliance Dates and WQBELs

The Responsible Copermittee must comply with the interim WQBELs, expressed as annual loads, by December 31 of the interim compliance year given in Table 3.4.

Table 3.4
Interim Water Quality Based Effluent Limitations Expressed as Annual Loads in MS4 Discharges from Specific Land Uses to Rainbow Creek

	Total N Interim Effluent Limitations (kg/yr)			Total P Interim Effluent Limitations (kg/yr)		
	Interim Compliance Date			Interim Compliance Date		
Land Use	**2009**	**2013**	**2017**	**2009**	**2013**	**2017**
Commercial nurseries	390	299	196	20	16	10
Park	5	3	3	0.15	0.10	0.10
Residential areas	507	390	260	99	74	47
Urban areas	40	27	27	9	6	6

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 3.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 3.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the final effluent limitations under Specific Provision 3.b.(2)(b)(ii); OR

(e) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the interim effluent limitations under Specific Provision 3.c.(1); OR

(f) The Responsible Copermittee has submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

d. Specific Monitoring and Assessment Requirements

(1) The Responsible Copermittee must incorporate into the Water Quality Improvement Plan and implement the Sampling and Analysis Plan for Rainbow Creek Nutrient Reduction TMDL Implementation Water Quality Monitoring, dated January 2010.

(2) The results of any monitoring conducted during the reporting period, and assessment of whether the interim and final TMDL compliance requirements have been achieved must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 3.b.(2)(b)(i), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2007-0043

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2007
State Water Board Approval Date:	July 15, 2008
Office of Administrative Law Approval Date:	October 22, 2008
US EPA Approval Date:	December 18, 2008

(3) TMDL Effective Date: October 22, 2008

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final dissolved copper, lead, and zinc TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must comply with the final TMDL compliance requirements by October 22, 2028.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance date under Specific Provision 4.b.(1):

Table 4.1
Final Receiving Water Limitations Expressed as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$(0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$(0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$(0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$(0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations by the compliance date under Specific Provision 4.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 4.b.(2)(a):

Table 4.2
Final Effluent Limitations as Expressed Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(c) Best Management Practices

(i) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 4.b.(2)(a) and/or the effluent limitations under Specific Provision 4.b.(2)(b) for Chollas Creek.

(ii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans and the U.S. Navy as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 4.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 4.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 4.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 4.b.(2)(c) achieves compliance with Specific Provisions 4.b.(3)(a), 4.b.(3)(b) and/or 4.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 4.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 4.d, to demonstrate compliance with Specific Provisions 4.b.(3)(a), 4.b.(3)(b) and/or 4.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim dissolved copper, lead, and zinc TMDL compliance requirements for Chollas Creek consist of the following:

(1) Interim Compliance Date and WQBELs

The Responsible Copermittee must comply with the interim WQBELs, expressed as concentrations, by the interim compliance date given in Table 4.3:

Table 4.3
Interim Water Quality Based Effluent Limitations Expressed as Concentrations in MS4 Discharges to Chollas Creek

Interim Compliance Date	Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
October 22, 2018	Dissolved Copper	Acute	$1.2 \times 90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
	Dissolved Lead	Acute	$1.2 \times 90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
	Dissolved Zinc	Acute	$1.2 \times 90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 4.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 4.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) There are no exceedances of the interim effluent limitations under Specific Provision 4.c.(1) at the Responsible Copermittee's MS4 outfalls; OR

(e) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance date.

d. Specific Monitoring and Assessment Requirements

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*, when it is amended to include monitoring requirements for the Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls discharging to Chollas Creek for dissolved copper, lead, and zinc, and calculate or estimate the monthly and annual dissolved copper, lead, and zinc loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 4.b.(2)(b) or 4.c.(1), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2008-0027

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 11, 2008
State Water Board Approval Date:	June 16, 2009
Office of Administrative Law Approval Date:	September 15, 2009
US EPA Approval Date:	October 26, 2009

(3) TMDL Effective Date: September 15, 2009

(4) Watershed Management Areas: See Table 5.0

(5) Water Bodies: See Table 5.0

(6) Responsible Copermittees: See Table 5.0

Table 5.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County	Dana Point Harbor	Baby Beach	-City of Dana Point -County of Orange
San Diego Bay	San Diego Bay	Shelter Island Shoreline Park	- San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final indicator bacteria TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Final TMDL Compliance Dates

(a) Baby Beach in Dana Point Harbor

The Responsible Copermittees for MS4 discharges to Baby Beach must be in compliance with the final TMDL compliance requirements according to the following compliance dates:

Table 5.1
Compliance Dates to Achieve Final TMDL Compliance Requirements For Baby Beach in Dana Point Harbor

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform	September 15, 2014	September 15, 2009
Fecal Coliform		September 15, 2009
Enterococcus		September 15, 2019

(b) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park must be in compliance with the final TMDL compliance requirements as of December 31, 2012.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance dates under Specific Provision 5.b.(1):

Table 5.2
Final Receiving Water Limitations Expressed as Bacteria Densities in the Water Body

	Receiving Water Limitations	
Constituent	Single Sample Maximum[1,2]	30-Day Geometric Mean[2]
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing indicator bacteria densities that do not exceed the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.3a
Final Effluent Limitations as Expressed as Bacteria Densities in MS4 Discharges to the Water Body

	Effluent Limitations	
Constituent	**Single Sample Maximum[1,2]**	**30-Day Geometric Mean[2]**
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.

(ii) Discharges from the MS4s containing indicator bacteria loads that do not exceed the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.4a
Final Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to the Baby Beach in Dana Point Harbor

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0.86×10^9 MPN/day	$3{,}254 \times 10^9$ MPN/30days
Fecal Coliform	0.17×10^9 MPN/day	112×10^9 MPN/30days
Enterococcus	0.03×10^9 MPN/day	114×10^9 MPN/30days

Table 5.4b
Final Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to the Shelter Island Shoreline Park in San Diego Bay

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0 MPN/day	198×10^9 MPN/30days
Fecal Coliform	0 MPN/day	8×10^9 MPN/30days
Enterococcus	0 MPN/day	26×10^9 MPN/30days

(iii) Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.5a
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to Baby Beach in Dana Point Harbor*

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	90.4%	0%
Fecal Coliform	82.7%	0%
Enterococcus	96.2%	62.2%

Notes:
* The percent load reductions are relative to data collected between 1996-2002. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittees' MS4s must not exceed the loads in Table 5.4a, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the water body.

Table 5.5b
*Final Effluent Limitations Expressed as Percent Load Reductions** in MS4 Discharges to Shelter Island Shoreline Park in San Diego Bay*

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0%	0%
Fecal Coliform	0%	0%
Enterococcus	0%	0%

Notes:
* The percent load reductions are relative to data collected between 1999-2004. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittee's MS4s must not exceed the loads in Table 5.4b, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the water body.

(c) Best Management Practices

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 5.0 must incorporate the Bacteria Load Reduction Plan (BLRP) required to be developed pursuant to Resolution No. R9-2008-0027.

(ii) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 5.b.(2)(a) and/or the effluent limitations under Specific Provision 5.b.(2)(b) for the segments or areas of the water bodies listed in Table 5.0

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.b.(2)(b)(ii); OR

(e) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 5.b.(2)(b)(iii); OR

(f) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(g) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 5.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 5.b.(2)(c) achieves compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 5.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 5.d, to demonstrate compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim indicator bacteria TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Baby Beach in Dana Point Harbor

(a) Interim TMDL Compliance Dates and WQBELs

The Responsible Copermittees for MS4 discharges to Baby Beach must comply with the following interim WQBELs by the interim compliance dates given in Tables 5.6a and/or 5.6b:

Table 5.6a
Interim Water Quality Based Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to Baby Beach in Dana Point Harbor

Constituent	Interim Compliance Dates	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	4.93×10^9 MPN/day	$3{,}254 \times 10^9$ MPN/30days*
Fecal Coliform	September 15, 2012	0.59×10^9 MPN/day	112×10^9 MPN/30days*
Enterococcus	September 15, 2012	0.42×10^9 MPN/day	301×10^9 MPN/30days
	September 15, 2016	0.03×10^9 MPN/day *	207×10^9 MPN/30days

Notes:
* Same as the final effluent limitations in Table 5.4a.

Table 5.6b
Interim Water Quality Based Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to Baby Beach in Dana Point Harbor*

Constituent	Interim Compliance Dates	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	45.2%	0%**
Fecal Coliform	September 15, 2012	41.4%	0%**
Enterococcus	September 15, 2012	48.1%	0%
	September 15, 2016	96.2%**	31.1%

Notes:
* The percent load reductions are relative to data collected between 1996-2002. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittees' MS4s must not exceed the loads in Table 5.6a, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the waterbody.
** Same as the final effluent limitations in Table 5.5a.

(b) Interim Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(i) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(ii) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(iii) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(iv) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.b(2)(b)(ii); OR

(v) The Responsible Copermittees can demonstrate that exceedances of the applicable receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(vi) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the interim effluent limitations under Table 5.6a of Specific Provision 5.c.(1)(a); OR

(vii) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the interim effluent limitations under Table 5.6b of Specific Provision 5.c.(1)(a); OR

(viii) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

(2) <u>Shelter Island Shoreline Park in San Diego Bay</u>

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park must be in compliance with the final indicator bacteria TMDL requirements as of December 31, 2012.

d. Specific Monitoring and Assessment Requirements

(1) Monitoring Stations

Monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[33] If discharges of bacteria from the MS4 exceed the applicable interim or final WQBELs, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(2) Monitoring Procedures

(a) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) The Responsible Copermittees must collect wet weather monitoring samples within the first 24 hours of a storm event[34] of the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(c) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

[33] Commonly referred to as AB 411 monitoring
[34] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs have been achieved.

(b) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 5.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(c) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to correlate elevated bacteria levels with known or suspected sewage spills from wastewater collection systems and treatment plants or boats.

(d) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2010-0001

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date: February 10, 2010
State Water Board Approval Date: December 14, 2010
Office of Administrative Law Approval Date: April 4, 2011
US EPA Approval Date: June 22, 2011

(3) TMDL Effective Date: April 4, 2011

(4) Watershed Management Areas: See Table 6.0

(5) Water Bodies: See Table 6.0

(6) Responsible Copermittees: See Table 6.0

Table 6.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	-City of Laguna Beach -County of Orange -Orange County Flood Control District
		at Heisler Park - North	
	Pacific Ocean Shoreline	at Main Laguna Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Woods -County of Orange -Orange County Flood Control District
		Laguna Beach at Ocean Avenue	
		Laguna Beach at Cleo Street	
		Arch Cove at Bluebird Canyon Road	
		Laguna Beach at Dumond Drive	
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Hills -City of Laguna Niguel -City of Laguna Woods -City of Lake Forest -City of Mission Viejo -County of Orange -Orange County Flood Control District
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	
	Aliso Creek Mouth	at mouth	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	-City of Dana Point -City of Laguna Beach -City of Laguna Niguel -County of Orange -Orange County Flood Control District
		Aliso Beach at Table Rock Drive	
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)	
		at Salt Creek (large outlet)	
		Salt Creek Beach at Salt Creek service road	
		Salt Creek Beach at Strand Road	
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	-City of Dana Point -City of Laguna Hills -City of Laguna Niguel -City of Mission Viejo -City of Rancho Santa Margarita -City of San Juan Capistrano -County of Orange -Orange County Flood Control District
	San Juan Creek	lower 1 mile	
	San Juan Creek Mouth	at mouth	
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	-City of Dana Point -City of San Clemente -County of Orange -Orange County Flood Control District
		Ole Hanson Beach Club Beach at Pico Drain	
		San Clemente City Beach at El Portal Street Stairs	
		San Clemente City Beach at Mariposa Street	
		San Clemente City Beach at Linda Lane	
		San Clemente City Beach at South Linda Lane	
		San Clemente City Beach at Lifeguard Headquarters	
		under San Clemente Municipal Pier	
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	
		San Clemente State Beach at Riviera Beach	
		Can Clemente State Beach at Cypress Shores	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	-City of Oceanside -City of Vista -County of San Diego
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	-City of Carlsbad -City of Encinitas -City of Escondido -City of San Marcos -County of San Diego
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	-City of Del Mar -City of Escondido -City of Poway -City of San Diego -City of Solana Beach -County of San Diego
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	-City of Del Mar -City of Poway -City of San Diego -County of San Diego
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	-City of San Diego
		La Jolla Shores Beach at Caminito del Oro	
		La Jolla Shores Beach at Vallecitos	
		La Jolla Shores Beach at Avenida de la Playa	
		at Casa Beach, Children's Pool	
		South Casa Beach at Coast Boulevard	
		Whispering Sands Beach at Ravina Street	
		Windansea Beach at Vista de la Playa	
		Windansea Beach at Bonair Street	
		Windansea Beach at Playa del Norte	
		Windansea Beach at Palomar Avenue	
		at Tourmaline Surf Park	
		Pacific Beach at Grand Avenue	
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I- Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	-City of El Cajon -City of Santee -County of San Diego
	San Diego River	lower 6 miles	-City of El Cajon -City of La Mesa -City of San Diego -City of Santee -County of San Diego
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	-City of La Mesa -City of Lemon Grove -City of San Diego -County of San Diego - San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final indicator bacteria TMDL compliance requirements for the water bodies listed in Table 6.0 consist of the following:

(1) Final TMDL Compliance Dates

The Responsible Copermittees for MS4 discharges to the water bodies listed in Table 6.0 must be in compliance with the final TMDL compliance requirements according to the following compliance dates:

Table 6.1
Compliance Dates to Achieve Final TMDL Compliance Requirements

Constituent	Dry Weather TMDL Compliance Date	Wet Weather TMDL Compliance Date
Total Coliform	April 4, 2021	April 4, 2031
Fecal Coliform		
Enterococcus		

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance dates under Specific Provision 6.b.(1):

Table 6.2a
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Beaches

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform	10,000	22%	1,000	0%
Fecal Coliform	400	22%	200	0%
Enterococcus	104	22%	35	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan.

Table 6.2b
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Creeks

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Fecal Coliform	400	22%	200	0%
Enterococcus	61 (104)	22%	33	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Basin Plan.
d. A single sample maximum of 104 MPN/100ml for *Enterococcus* may be applied as a receiving water limitation for creeks, instead of 61 MPN/100mL, if one or more of the creeks addressed by these TMDLs (San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek, San Diego River, and/or Chollas Creek) is designated with a "moderately to lightly used area" or less frequent usage frequency in the Basin Plan. Otherwise, the single sample maximum of 61 MPN/100mL for *Enterococcus* must be used to assess compliance with the allowable exceedance frequency.

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing indicator bacteria densities that do not exceed the following effluent limitations by the compliance dates under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a):

Table 6.2c
Final Effluent Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies in MS4 Discharges to the Water Body

Constituent	Concentration-Based Effluent Limitations			
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform[d]	10,000	22%	1,000	0%
Fecal Coliform	400	22%	200	0%
Enterococcus	104[e] / 61[f]	22%	35[e] / 33[f]	0%

Notes:
a. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan for discharges to beaches, and the Basin Plan for discharges to creeks and creek mouths.
d. Total coliform effluent limitations only apply to MS4 outfalls that discharge to the Pacific Ocean Shorelines and creek mouths listed in Table 6.0.
e. This *Enterococcus* effluent limitation applies to MS4 discharges to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
f. This *Enterococcus* effluent limitation applies to MS4 discharges to segments or areas of creeks or creek mouths listed in Table 6.0.

(ii) Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the compliance dates under Specific Provision 6.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a):

Table 6.3
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	*Watershed and Water Bodies*	*Load-Based Effluent Limitations*					
		Dry Weather			*Wet Weather*		
		Total Coliform	*Fecal Coliform*	*Entero-coccus*	*Total Coliform*	*Fecal Coliform*	*Entero-coccus*
South Orange County	San Joaquin Hills HSA (901.11) and Laguna Hills HSA (901.12) - Pacific Ocean Shoreline	91.78%	91.72%	98.28%	46.85%	52.07%	51.26%
	Aliso HSA (901.13) - Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	95.47%	95.58%	99.13%	25.29%	26.62%	27.52% (27.37%)**
	Dana Point HSA (901.14) - Pacific Ocean Shoreline	95.04%	95.03%	98.98%	13.15%	14.86%	15.16%
	Lower San Juan HSA (901.27) - Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	72.96%	74.21%	94.94%	19.21%	12.82%	27.12% (26.90%)**
	San Clemente HA (901.30) - Pacific Ocean Shoreline	94.28%	94.23%	98.83%	23.85%	24.58%	25.26%
San Luis Rey River	San Luis Rey HU (903.00) - Pacific Ocean Shoreline	38.13%	39.09%	87.38%	5.62%	3.12%	11.69%

Table 6.3 (Cont'd)
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watershed and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
Carlsbad	San Marcos HA (904.50) - Pacific Ocean Shoreline	82.82%	82.55%	96.03%	18.47%	18.98%	20.19%
San Dieguito River	San Dieguito HU (905.00) - Pacific Ocean Shoreline	14.39%	20.72%	83.48%	4.29%	1.46%	7.72%
Penasquitos	Miramar Reservoir HA (906.10) - Pacific Ocean Shoreline	96.50%	96.59%	99.42%	1.61%	1.99%	1.93%
Mission Bay	Scripps HA (906.30) - Pacific Ocean Shoreline	96.44%	96.42%	99.25%	16.32%	21.14%	18.82%
	Tecolote HA (906.50) - Tecolote Creek	94.51%	94.59%	98.94%	16.51%	20.47%	18.15% (18.08%)**
San Diego River	Mission San Diego HSA (907.11) and Santee HSA (907.12) - Pacific Ocean Shoreline - Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles)	74.03%	69.44%	93.96%	38.14%	53.22%	42.74% (42.47%)**
San Diego Bay	Chollas HSA (908.22) - Chollas Creek	92.06%	92.15%	98.46%	17.82%	24.84%	21.46% (21.36%)**

Notes:
* The percent load reductions are based on reducing loads compared to pollutant loads from 2001 to 2002.
** The alternative *Enterococcus* percent load reduction was calculated based on a numeric target of 104 MPN/100mL instead of 61 MPN/100mL, protective of the REC-1 "moderately to lightly used area" usage frequency that is protective of freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative pollutant load reductions can be utilized.

(c) Best Management Practices

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 6.0 must incorporate the Comprehensive Load Reduction Plans (CLRPs) required to be developed pursuant to Resolution No. R9-2010-0001.

(ii) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 6.b.(2)(a) and/or the effluent limitations under Specific Provision 6.b.(2)(b) for the segments or areas of the water bodies listed in Table 6.0.

(iii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans, owners/operators of small MS4s, and agricultural dischargers as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(f) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 6.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 6.b.(2)(c) achieves compliance with Specific Provisions 6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), and/or 6.b.(3)(e),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 6.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 6.d, to demonstrate compliance with Specific Provisions 6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), 6.b.(3)(e) and/or 6.b.(3)(f).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim indicator bacteria TMDL compliance requirements for the water bodies listed in Table 6.0 consist of the following:

(1) Interim TMDL Compliance Dates

The Responsible Copermittees must achieve compliance with the interim TMDL compliance requirements, as determined in accordance with Specific Provision 6.c.(3), by the interim compliance dates given in Table 6.4, unless alternative interim compliance dates are accepted by the San Diego Water Board Executive Officer as part of the Water Quality Improvement Plan.

Table 6.4
Interim Compliance Dates to Achieve Interim TMDL Compliance Requirements

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	April 4, 2016	April 4, 2021
		at Heisler Park - North		
	Pacific Ocean Shoreline	at Main Laguna Beach	April 4, 2016	April 4, 2021
		Laguna Beach at Ocean Avenue		
		Laguna Beach at Cleo Street		
		Arch Cove at Bluebird Canyon Road		
		Laguna Beach at Dumond Drive		
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	April 4, 2016	April 4, 2021
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	April 4, 2018	April 4, 2021
	Aliso Creek Mouth	at mouth	April 4, 2018	April 4, 2021
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	April 4, 2016	April 4, 2021
		Aliso Beach at Table Rock Drive		
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)		
		at Salt Creek (large outlet)		
		Salt Creek Beach at Salt Creek service road	April 4, 2017	April 4, 2021
		Salt Creek Beach at Strand Road	April 4, 2017	April 4, 2021

Table 6.4 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates	
			Interim Dry Weather WQBELs	Interim Wet Weather WQBELs
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	April 4, 2016	April 4, 2021
	San Juan Creek	lower 1 mile	April 4, 2018	April 4, 2021
	San Juan Creek Mouth	at mouth	April 4, 2016	April 4, 2021
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	April 4, 2016	April 4, 2021
		Ole Hanson Beach Club Beach at Pico Drain	April 4, 2016	April 4, 2021
		San Clemente City Beach at El Portal Street Stairs	April 4, 2017	April 4, 2021
		San Clemente City Beach at Mariposa Street		
		San Clemente City Beach at Linda Lane	April 4, 2016	April 4, 2021
		San Clemente City Beach at South Linda Lane	April 4, 2018	April 4, 2021
		San Clemente City Beach at Lifeguard Headquarters	April 4, 2017	April 4, 2021
		under San Clemente Municipal Pier		
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	April 4, 2018	April 4, 2021
		San Clemente State Beach at Riviera Beach	April 4, 2016	April 4, 2021
		Can Clemente State Beach at Cypress Shores	April 4, 2017	April 4, 2021
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	April 4, 2017	April 4, 2021
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	April 4, 2016	April 4, 2021
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	April 4, 2016	April 4, 2021

Table 6.4 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates	
			Interim Dry Weather WQBELs	Interim Wet Weather WQBELs
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	April 4, 2016	April 4, 2021
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	April 4, 2016	April 4, 2021
		La Jolla Shores Beach at Caminito del Oro		
		La Jolla Shores Beach at Vallecitos		
		La Jolla Shores Beach at Avenida de la Playa		
		at Casa Beach, Children's Pool		
		South Casa Beach at Coast Boulevard		
		Whispering Sands Beach at Ravina Street		
		Windansea Beach at Vista de la Playa		
		Windansea Beach at Bonair Street		
		Windansea Beach at Playa del Norte		
		Windansea Beach at Palomar Avenue		
		at Tourmaline Surf Park		
		Pacific Beach at Grand Avenue		
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries		
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	April 4, 2018	April 4, 2021
	San Diego River	lower 6 miles		
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach		
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	April 4, 2018	April 4, 2021

(2) Interim Water Quality Based Effluent Limitations

The Responsible Copermittees for discharges to the water bodies in Table 6.0 must comply with the following interim WQBELs by the interim compliance dates given in Specific Provision 6.c.(1):

(a) Interim Receiving Water Limitations

(i) *Interim Dry Weather Receiving Water Limitations*

The Responsible Copermittee must calculate the "existing" exceedance frequencies of the 30-day geometric mean water quality objectives for each of the indicator bacteria by analyzing the available monitoring data collected between January 1, 1996 and December 31, 2002. "Existing" exceedance frequencies may be calculated by water body and/or by Watershed Management Area listed in Table 6.0. Separate "existing" exceedance frequencies must be calculated for beaches and creeks/creek mouths.

The Responsible Copermittees must achieve a 50 percent reduction in the "existing" exceedance frequency of the 30-day geometric mean WQBELs for the water bodies listed in Table 6.0 by the interim compliance dates given in Table 6.4. A 50 percent reduction in the "existing" exceedance frequency is equivalent to half of the "existing" exceedance frequency of the 30-day geometric mean WQBELs.

The "existing" exceedance frequencies and the interim dry weather allowable exceedance frequencies (i.e. interim dry weather receiving water limitations) calculated by the Responsible Copermittees must be included in the Water Quality Improvement Plans for the applicable Watershed Management Areas.

(ii) *Interim Wet Weather Receiving Water Limitations*

The Responsible Copermittees must achieve the interim wet weather receiving water limitations in Table 6.5, expressed as interim wet weather allowable exceedance frequencies, by the interim compliance dates given in Table 6.4.

Table 6.5
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	38%	37%	39%
		at Heisler Park - North			
	Pacific Ocean Shoreline	at Main Laguna Beach			
		Laguna Beach at Ocean Avenue			
		Laguna Beach at Cleo Street			
		Arch Cove at Bluebird Canyon Road			
		Laguna Beach at Dumond Drive			
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	41%	41%	42%
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	41%	41%	42%
	Aliso Creek Mouth	at mouth	41%	41%	42%
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	36%	36%	36%
		Aliso Beach at Table Rock Drive			
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)			
		at Salt Creek (large outlet)			
		Salt Creek Beach at Salt Creek service road			
		Salt Creek Beach at Strand Road			

Table 6.5 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	44%	44%	48%
	San Juan Creek	lower 1 mile	44%	44%	47%
	San Juan Creek Mouth	at mouth	44%	44%	47%
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	35%	35%	36%
		Ole Hanson Beach Club Beach at Pico Drain			
		San Clemente City Beach at El Portal Street Stairs			
		San Clemente City Beach at Mariposa Street			
		San Clemente City Beach at Linda Lane			
		San Clemente City Beach at South Linda Lane			
		San Clemente City Beach at Lifeguard Headquarters			
		under San Clemente Municipal Pier			
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)			
		San Clemente State Beach at Riviera Beach			
		Can Clemente State Beach at Cypress Shores			
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	45%	44%	47%
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	40%	40%	41%
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	33%	33%	36%

Table 6.5 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	26%	26%	26%
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	37%	37%	37%
		La Jolla Shores Beach at Caminito del Oro			
		La Jolla Shores Beach at Vallecitos			
		La Jolla Shores Beach at Avenida de la Playa			
		at Casa Beach, Children's Pool			
		South Casa Beach at Coast Boulevard			
		Whispering Sands Beach at Ravina Street			
		Windansea Beach at Vista de la Playa			
		Windansea Beach at Bonair Street			
		Windansea Beach at Playa del Norte			
		Windansea Beach at Palomar Avenue			
		at Tourmaline Surf Park			
		Pacific Beach at Grand Avenue			
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries	49%	49%	51%
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	46%	43%	49%
	San Diego River	lower 6 miles	46%	43%	49%
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	46%	43%	51%
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	41%	41%	43%

(b) Interim Effluent Limitations

Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the interim compliance dates under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.c.(2)(a):

Table 6.6
Interim Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	*Watersheds and Water Bodies*	*Load-Based Effluent Limitations*					
		Dry Weather			*Wet Weather*		
		Total Coliform	*Fecal Coliform*	*Entero-coccus*	*Total Coliform*	*Fecal Coliform*	*Entero-coccus*
South Orange County	San Joaquin Hills HSA (901.11) and Laguna Hills HSA (901.12) - Pacific Ocean Shoreline	45.89%	45.86%	49.14%	23.43%	26.04%	25.63%
	Aliso HSA (901.13) - Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	47.74%	47.79%	49.57%	12.65%	13.31%	13.76% (13.69%)**
	Dana Point HSA (901.14) - Pacific Ocean Shoreline	47.52%	47.52%	49.49%	6.58%	7.43%	7.58%
	Lower San Juan HSA (901.27) - Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	36.48%	37.11%	47.47%	9.61%	6.41%	13.56% (13.45%)**
	San Clemente HA (901.30) - Pacific Ocean Shoreline	47.14%	47.12%	49.42%	11.93%	12.29%	12.63%
San Luis Rey River	San Luis Rey HU (903.00) - Pacific Ocean Shoreline	19.07%	19.55%	43.69%	2.81%	1.56%	5.85%
Carlsbad	San Marcos HA (904.50) - Pacific Ocean Shoreline	41.41%	41.28%	48.02%	9.24%	9.49%	10.10%

Table 6.6 (Cont'd)
Interim Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watersheds and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
San Dieguito River	San Dieguito HU (905.00) - Pacific Ocean Shoreline	7.20%	10.36%	41.74%	2.15%	0.73%	3.86%
Penasquitos	Miramar Reservoir HA (906.10) - Pacific Ocean Shoreline	48.25%	48.30%	49.71%	0.81%	1.00%	0.97%
Mission Bay	Scripps HA (906.30) - Pacific Ocean Shoreline	48.22%	48.21%	49.63%	8.16%	10.57%	9.41%
	Tecolote HA (906.50) - Tecolote Creek	47.26%	47.30%	49.47%	8.26%	10.24%	9.08% (9.04%)**
San Diego River	Mission San Diego HSA (907.11) and Santee HSA (907.12) - Pacific Ocean Shoreline - Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles)	37.02%	34.72%	46.98%	19.07%	26.61%	21.37% (21.24%)**
San Diego Bay	Chollas HSA (908.22) - Chollas Creek	46.03%	46.08%	49.23%	8.91%	12.42%	10.73% (10.68%)**

Notes:
* The percent load reductions are based on reducing loads compared to pollutant loads from 2001 to 2002.
** The alternative *Enterococcus* percent load reduction was calculated based on a numeric target of 104 MPN/100mL instead of 61 MPN/100mL, protective of the REC-1 "moderately to lightly used area" usage frequency that is protective of freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative pollutant load reductions can be utilized.

(3) <u>Interim TMDL Compliance Determination</u>

Compliance with the interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(f) There are no exceedances of the interim receiving water limitations under Specific Provision 6.c.(2)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(g) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the interim effluent limitations under Specific Provision 6.c.(2)(b); OR

(h) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

d. Specific Monitoring and Assessment Requirements

(1) Monitoring and Assessment Requirements for Beaches

(a) Monitoring Stations

For beaches addressed by the TMDL, monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[35] If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources

[35] Commonly referred to as AB 411 monitoring

causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations at least once within the first 24 hours of the end of a storm event[36] during the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer in exceedance of the allowable exceedance frequencies in the receiving waters.

(iii) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(iv) For Pacific Ocean Shoreline segments or areas listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final

[36] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

WQBELs for the Pacific Ocean Shoreline segments or areas listed in Table 6.0 have been achieved.

(ii) Dry weather exceedance frequencies must be calculated as follows:

[a] 30-day geometric means must be calculated from the results of any dry weather samples collected from the segments or areas for each water body listed in Table 6.0;
[b] The method and number of samples need for calculating the 30-day geometric means must be consistent with the number of samples required by the Ocean Plan;
[c] Where there are multiple segments or areas associated with a water body listed in Table 6.0, the Copermittees may calculate geometric means for each segment or area, or combine the dry weather monitoring data from all the segments or areas to calculate geometric means for the water body;
[d] The exceedance frequency must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the dry season.

(iii) Wet weather exceedance frequencies must be calculated as follows:

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;
[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;
[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria densities reported from each storm event sampled; and
[d] The single sample maximum exceedance frequency must be calculated by dividing the number of wet weather days that exceed the single sample maximum receiving water limitations in Table 6.2 by the total number of wet weather days during the rainy season.
[e] The data collected for dry weather must be used in addition to the data collected for wet weather to calculate the wet weather 30-day geometric means. The exceedance frequency of the wet weather 30-day geometric means must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of

geometric means calculated from samples collected during the wet season.

(iv) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(v) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) Monitoring and Assessment Requirements for Creeks and Creek Mouths

(a) Monitoring Stations

For creeks addressed by the TMDL, monitoring locations should consist of, at a minimum, a location at or near the mouth of the creek (e.g. Mass Loading Station or Mass Emission Station) and one or more locations upstream of the mouth (e.g. Watershed Assessment Station). If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations in accordance with the requirements of Provision D.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations within the first 24 hours of the end of a storm event[37] during the rainy season (i.e. October 1 through April 30).

(iii) Samples collected from receiving water monitoring stations must be analyzed for fecal coliform and *Enterococcus* indicator bacteria.

[37] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(iv) For creeks or creek mouths listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the receiving water monitoring data to assess whether the interim and final receiving water WQBELs for the creeks and creek mouths listed in Table 6.0 have been achieved.

(ii) Dry weather exceedance frequencies must be calculated as follows:

[a] 30-day geometric means must be calculated from the results of any dry weather samples collected from the segment or area for each water body listed in Table 6.0;
[b] The method and number of samples need for calculating the 30-day geometric means must be consistent with the number of samples required by the Basin Plan;
[c] The exceedance frequency must be calculated by dividing the number of 30-day geometric means that exceed the 30-day geometric mean receiving water limitations in Table 6.2 by the total number of 30-day geometric means calculated from samples collected during the dry season.

(iii) Wet weather exceedance frequencies must be calculated as follows:

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;
[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;
[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria densities reported from each of the storm events sampled; and

[d] The exceedance frequency must be calculated by dividing the number of wet weather days that exceed the single sample

maximum receiving water limitations in Table 6.2 by the total number of wet weather days during the rainy season.

[e] The data collected for dry weather must be used in addition to the data collected for wet weather to calculate the wet weather 30-day geometric means. The exceedance frequency of the wet weather 30-day geometric means must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the wet season.

(iv) The Responsible Copermittee must identify and incorporate additional MS4 outfall and receiving water monitoring stations and/or adjust monitoring frequencies to identify sources causing exceedances of the receiving water WQBELs.

(v) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(vi) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

7. Total Maximum Daily Loads for Sediment in Los Peñasquitos Lagoon

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2012-0033

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2012
State Water Board Approval Date:	January 21, 2014
Office of Administrative Law Approval Date:	July 14, 2014
US EPA Approval Date:	October 30, 2014

(3) TMDL Effective Date: July 14, 2014

(4) Watershed Management Area: Los Peñasquitos

(5) Water Body: Los Peñasquitos Lagoon

(6) Responsible Copermittees: County of San Diego, City of San Diego, City of Del Mar, and City of Poway

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final sediment TMDL compliance requirements for Los Peñasquitos Lagoon consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must be in compliance with the final TMDL compliance requirements by December 31, 2034.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not prohibit the sustainable restoration of tidal and non-tidal saltmarsh vegetation of at least 346 acres.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations by the compliance date under Provision 7.b(1) will not cause or contribute to a failure of the receiving water condition specified under Specific Provision 7.b.(2)(a):

Table 7.1
*Final Effluent Limitations as Expressed as Wet Season Loads in MS4 Discharges to Los Peñasquitos Lagoon**

Constituent	Effluent Limitation
Sediment	2,580 tons/wet season

*Final effluent limitations are to be achieved by the following Responsible Parties: County of San Diego, City of San Diego, City of Del Mar, City of Poway, Phase II MS4 permittees, Caltrans, general construction storm water NPDES permittees, and general industrial storm water NPDES permittees.

(c) Best Management Practices

(i) The Water Quality Improvement Plan for the Los Peñasquitos Watershed Management Area must incorporate the Sediment Load Reduction Plan required to be developed pursuant to Resolution No. R9-2012-0033.

(ii) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 7.b.(2)(a) and/or the Copermittee's portion of the effluent limitations under Specific Provision 7.b.(2)(b) for Los Peñasquitos Lagoon.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) Successful restoration of 80 percent of the 1973 acreage of tidal and non-tidal lagoon salt marsh (346 acres); OR

(b) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 7.b.(2)(c)(ii) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 7.b.(2)(c)(ii) or other implementation actions achieve compliance with Specific Provision 7.b.(3)(a),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 7.b.(2)(c)(ii) or other implementation actions, AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 7.d to demonstrate compliance with Specific Provision 7.b.(3)(a).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim sediment TMDL compliance requirements for Los Penasquitos Lagoon consist of the following:

(1) Interim Compliance Dates and WQBELs

The Responsible Copermittees must comply with the interim WQBELs, expressed as wet season loads, by December 31 of the interim compliance year set forth in Table 7.2.

Table 7.2
*Interim Water Quality Based Effluent Limitations Expressed as Wet Season Loads in MS4 Discharges**

Interim Compliance Date	Interim Effluent Limitations (tons/wet season)
December 31, 2019	6,691
December 31, 2023	5,663
December 31, 2027	4,636
December 31, 2029	3,608

*Interim effluent limitations are to be achieved by the following Responsible Parties: County of San Diego, City of San Diego, City of Del Mar, City of Poway, Phase II MS4 permittees, Caltrans, general construction storm water NPDES permittees, and general industrial storm water NPDES permittees.

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) The final receiving water limitation under Specific Provision 7.b.(2)(a) is met; OR

(c) There are no exceedances of the Copermittee's portion of interim effluent limitations under Table 7.2 at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the Copermittee's portion of the interim TMDL compliance requirements described in Attachment A of

Resolution No. R9-2010-0033 will be achieved by the interim compliance date.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) Watershed Monitoring

The Responsible Copermittees must conduct suspended sediment, bed load, and flow monitoring to calculate total sediment loading to the Los Peñasquitos Lagoon for each wet season (October 1 thru April 30) as set forth below:

(a) The Responsible Copermittees must monitor enough storm events throughout the season to quantify sediment loading over each wet season, and

(b) The Responsible Copermittees must monitor at least 3 stations to quantify cumulative sediment loading into Los Peñasquitos Lagoon. Stations must be located within the Los Peñasquitos, Carroll Canyon, and Carmel Creek tributaries prior to discharging into Los Peñasquitos Lagoon.

(2) Lagoon Monitoring

The Responsible Copermittees must monitor Los Peñasquitos Lagoon each Fall for changes in the extent of the vegetation types as set forth below:

(a) The Responsible Copermittees must acquire aerial photos of Los Peñasquitos Lagoon and digitize them at an approximate scale of 1:2,500,

(b) The Responsible Copermittees must appropriately interpret the vegetation and classify the various types as saltmarsh, non-tidal saltmarsh, freshwater marsh, non-tidal saltmarsh –*Lolium perrene* infested, southern willow scrub/mulefat scrub, herbaceous wetland, or upland land cover.

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the monitoring data collected under Specific Provision 7.d(1) and 7.d(2) to assess whether the interim and final WQBELs have been achieved.

(b) For assessing and determining compliance with the final receiving water limitations under Specific Provision 7.b.(2)(a), the Responsible Copermittees must use the data acquired under Specific Provision 7.d.(2) to estimate the acreage of tidal and non-tidal saltmarsh actually restored.

(c) For assessing and determining compliance with the final effluent limitations under Specific Provision 7.b.(2)(b), the Responsible Copermittees must use the data acquired under Specific Provision 7.d.(1) to estimate sediment loading into Los Peñasquitos Lagoon. Sediment loading must be evaluated using a 3-year, weighted rolling average. The first reported average shall be calculated using data collected in the year, 2015-2016, 2016-2017, and 2017-2018 wet seasons.

(d) The monitoring and assessment results must be submitted as part of the Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

ATTACHMENT F

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

FACT SHEET / TECHNICAL REPORT

FOR

ORDER NO. R9-2013-0001
AS AMENDED BY ORDER No. R9-2015-0001
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

May 8, 2013
Amended on February 11, 2015

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I. FACT SHEET FORMAT

This Fact Sheet briefly sets forth the principal facts and the significant factual, legal, methodological, and policy questions that the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) considered in preparing Order No. R9-2013-0001 (Order) as amended by Order No. R9-2015-0001. In accordance with the Code of Federal Regulations (CFR) Title 40 Parts 124.8 and 124.56 (40 CFR 124.8 and 40 CFR 124.56), this Fact Sheet includes, but is not limited to, the following information:

1. Contact information
2. Public process and notification procedures
3. Background of municipal storm water permits
4. Regional MS4 Permit approach
5. Economic considerations
6. Applicable statutes, regulations, plans and policies
7. Discussion of the provisions in the Order

Tentative Order No. R9-2013-0001 was distributed for public review on October 31, 2012. The San Diego Water Board accepted written comments on the Tentative Order until January 11, 2013. A public hearing was subsequently held on April 10 and 11, 2013, that was continued to May 8, 2013 to receive oral comments from interested persons. The San Diego Water Board adopted Order No. R9-2013-0001 on May 8, 2013.

Order No. R9-2015-0001, an Order amending Order No. R9-2013-0001, was distributed for public review on September 19, 2014. Order No. R9-2015-0001 amended the findings and provisions of Order No. R9-2013-0001 to:

a. Enroll the County of Orange, the Orange County Flood Control District and the south Orange County Cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano as Copermittees responsible for compliance with the terms and conditions of Order No. R9-2013-0001, as amended by Order No. R9-2015-0001;

b. Designate the San Diego Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the Cities of Laguna Woods and Laguna Hills and agree to the designation of the Santa Ana Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the City of Lake Forest, subject to the terms of the February 10, 2015 agreement between San Diego Water Board and the Santa Ana Water Board described in Finding 29 of this Order, upon the later effective date of Order No. R9-2015-0001 or Order No. R8-2015-0001 (superseding Order No. R8-2009-0030);

c. Establish interim exceptions to land development requirements for those priority development projects that discharge to engineered channels and large river reaches as described in Provision E.3.c(2)(e) of this Order;

d. Incorporate the amended requirements of the State Water Resources Control Board's (State Water Board) General Exception to require that pollutant reductions be achieved within 6 years for storm water and nonpoint source discharges to ASBS within the Region;

e. Incorporate applicable requirements of the Los Peñasquitos Lagoon Sediment TMDL;

f. Require the Orange County Copermittees to implement the "*Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County*," dated October 2014, made effective in the Monitoring and Reporting Program/Order issued pursuant to California Water Code section 13383 in the December 5, 2014 San Diego Water Board Letter Directive and subject to future revisions by the Executive Officer after appropriate public input;

A public hearing was held on February 11, 2015, to receive oral comments from Copermittees and interested persons. The San Diego Water Board adopted Order No. R9-2015-0001 amending Order No. R9-2013-0001 on February 11, 2015.

The San Diego Water Board files applicable to the issuance of Order No. R9-2013-0001 and amendments thereto are incorporated into the administrative record in support of the findings and requirements of the Order.

II. CONTACT INFORMATION

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The Order and other related documents can be downloaded from the San Diego Water Board website at

http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/oc_stormwater.shtml

The documents referenced in this Fact Sheet and in Order No. R9-2013-0001 and amendments thereto are available for public review at the San Diego Water Board office, located at the address listed above. Public records are available for inspection during regular business hours, from 8:00 am to 5:00 pm Monday through Friday. To schedule an appointment to inspect public records, contact the San Diego Water Board Records Management Officer at 619-516-1990.

COPERMITTEES

Orange County Copermittees

- County of Orange
  - City of Aliso Viejo
  - City of Dana Point
  - City of Laguna Beach
  - City of Laguna Hills
  - City of Laguna Niguel
  - City of Laguna Woods
  - City of Lake Forest *
  - City of Mission Viejo
  - City of Ranch Santa Margarita
  - City of San Clemente
  - City of San Juan Capistrano
  - Orange County Flood Control District

* While not listed in the above table, the City of Lake Forest remains a Copermittee under this Order until the later effective date of this Order or Santa Ana Water Board Tentative Order No. R8-2015-0001. Thereafter, the City of Lake Forest will no longer be considered a Copermittee under this Order because its Phase I MS4 discharges will be regulated by the Santa Ana Water Board pursuant to Water Code section 13328 designation. The requirements of this Order that apply to the City of Lake Forest for the duration of this Order, consistent with the Water Code section 13228 agreement dated February 10, 2015, are described in Finding 29 and Footnote 2 to Table B-1.

Riverside County Copermittees

- County of Riverside
  - City of Murrieta
  - City of Temecula
  - City of Wildomar
  - Riverside County Flood Control and Water Conservation District

San Diego County Copermittees

- County of San Diego
  - City of Carlsbad
  - City of Chula Vista
  - City of Coronado
  - City of Del Mar
  - City of El Cajon
  - City of Encinitas
  - City of Escondido
  - City of Imperial Beach
  - City of La Mesa
  - City of Lemon Grove
  - City of National City
  - City of Oceanside
  - City of Poway
  - City of San Diego
  - City of San Marcos
  - City of Santee
  - City of Solana Beach
  - City of Vista
  - San Diego County Regional Airport Authority
  - San Diego Unified Port District

III. PUBLIC PROCESS AND NOTIFICATION PROCEDURES

The San Diego Water Board followed the schedule listed below for the preparation of Order No. R9-2013-0001:

San Diego County Copermittee Permit Reissuance Process

1. On February 8, 2011, the San Diego Water Board met with the San Diego County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No. R9-2007-0001.

2. Between February and May 2011, the San Diego Water Board met with select San Diego County, Orange County, and Riverside County Copermittees, as well as representatives of the environmental community to discuss concepts and receive recommendations for elements to be incorporated in a Regional Municipal Separate Storm Sewer System Permit (Regional MS4 Permit).

3. On June 27, 2011 the San Diego Water Board received the Report of Waste Discharge from the San Diego County Copermittees for the renewal of their NPDES permit, Order No. R9-2007-0001.

4. On April 9, 2012, the San Diego Water Board released an administrative draft of Tentative Order No. R9-2013-0001 for preliminary informal comments and feedback.

5. On April 25, 2012, the San Diego Water Board held an informal public workshop to present the administrative draft of Tentative Order No. R9-2013-0001 and receive verbal comments.

6. Between June and August 2012, the San Diego Water Board held four (4) focused meetings with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community, and USEPA) to discuss and receive preliminary comments and feedback about specific elements in the administrative draft of Tentative Order No. R9-2013-0001.

7. On September 5, 2012, the San Diego Water Board held an informal public workshop to present the modifications that were expected to be incorporated into the Tentative Order based on the preliminary comments and feedback received during the focused meetings held between June and August 2012.

8. Informal written comments on the administrative draft of Tentative Order No. R9-2013-0001 were accepted until September 14, 2012.

9. On October 12, 2012, the San Diego Water Board released a revised administrative draft of Tentative Order No. R9-2013-0001.

10. On October 24, 2012, the San Diego Water Board held a focused meeting with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community, and USEPA) to discuss modifications incorporated into the administrative draft of Tentative Order No. R9-2013-0001.

11. On October 31, 2012, the San Diego Water Board released Tentative Order No. R9-2013-0001 for formal public review and comment.

12. On November 13, 2012 and December 12, 2012, the San Diego Water Board held a formal public Board workshop to present the public draft of Tentative Order No. R9-2013-0001 and receive verbal comments.

13. Formal written comments on the public draft of Tentative Order No. R9-2013-0001 were accepted until January 11, 2013.

14. A public hearing of Tentative Order No. R9-2013-0001 was conducted on April 10 and 11, 2013, that was continued to May 8, 2013.

Orange County Copermittee Permit Reissuance Process

15. On May 20, 2014 the San Diego Water Board received the Report of Waste Discharge from the Orange County Copermittees for the renewal of their MS4 NPDES permit, Order No. R9-2009-0002.

16. On June 24, 2014, the San Diego Water Board met with the Orange County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No.R9-2009-0002 and the process for enrollment as Copermittees under Regional MS4 Permit Order No. R9-2013-0001.

17. On July 1, 2014, the San Diego Water Board held a public meeting to discuss the Orange County Report of Waste Discharge (RoWD) and receive comments on potential modifications to Order No. R9-2013-0001. Based on comments received from the Orange County Copermittees and other interested persons at this meeting, the San Diego Water Board determined that additional public meetings were not needed prior to release of Tentative Order No. R9-2015-0001, amending Order No. R9-2013-0001 in redlined – strikeout format for public review and comment.

18. On September 19, 2014, the San Diego Water Board released Tentative Order No. R9-2015-0001 for a 60 day public review and comment period.

19. On October 8, 2014, the San Diego Water Board held a formal public workshop at a regular board meeting to receive information and discuss the proposed amendments to Order No. R9-2013-0001 described in Tentative Order No. R9-2015-0001.

20. In accordance with State and federal laws and regulations, the San Diego Water Board notified San Diego County, Orange County and Riverside County Copermittees, and all known interested agencies and persons of its intent to adopt Tentative Order No. R9-2015-0001 and provided them with an opportunity to submit their written comments and recommendations. Written comments and recommendations on Tentative Order No. R9-2015-0001 were accepted until November 19, 2014.

21. The San Diego Water Board held a public workshop on October 8, 2014, and a public hearing on February 11, 2015, and heard and considered all comments pertaining to the adoption of Tentative Order No. R9-2015-0001 on February 11, 2015.

IV. BACKGROUND OF THE SAN DIEGO REGION MUNICIPAL STORM WATER PERMITS

In developed and developing areas, storm water runoff is commonly transported through municipal separate storm sewer systems (MS4s) and discharged into local receiving water bodies. As the storm water runs off and flows over the land or impervious surfaces (e.g., paved streets, parking lots, and building rooftops), it accumulates debris, chemicals, sediment, and other pollutants that can adversely affect receiving water quality if discharged untreated. The United States Environmental Protection Agency (USEPA) recognizes wet weather flows from urban areas as the number one source of estuarine pollution in coastal communities,[1] such as those within the San Diego Region.

The federal Clean Water Act (CWA) was amended in 1987 to address and regulate discharges of storm water associated with industrial activities and from municipal storm sewers. With the amendments, many municipalities throughout the United States were obligated for the first time to obtain National Pollutant Discharge Elimination System (NPDES) permits for discharges of storm water from their MS4s.

In response to the CWA 1987 amendment, as well as the pending federal NPDES regulations which would implement the amendment, the San Diego Water Board issued "early" MS4 permits. The San Diego Water Board adopted and issued Order Nos. 90-38, 90-42, and 90-46 to regulate storm water discharges from the MS4s in Orange County, San Diego County, and Riverside County, respectively, within the San Diego Region on July 16, 1990.

The "early" MS4 permits, or First Term Permits, were issued prior to the November 1990 promulgation of the final federal NPDES storm water regulations. By issuing these First Term Permits before the federal regulations took effect, the San Diego Water Board was able to provide the Copermittees additional flexibility in addressing and managing storm water discharges. The First Term Permits contained the essentials of the 1990 regulations, and required the Copermittees to develop and implement runoff management programs, but provided little specificity about what was required to be included in or actually achieved by those programs.

The flexibility provided in the First Term Permits was generally continued through the Second Term Permits. The combination of the lack of specificity in the First and Second Term Permits, a general lack of meaningful action by the Copermittees and a general lack of corresponding reaction (i.e. enforcement) by the San Diego Water Board during the first ten years of the storm water program, resulted in few substantive steps towards achieving improvements in the quality of receiving waters or storm water discharges from the MS4s.

[1] US EPA. 1999. 40 CFR Parts 9, 122, 123, and 124. National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. 64 FR 68727.

From 2001, the regulatory approach incorporated into Third Term Permits was a significant departure from the regulatory approach of the First and Second Term Permits. The Third Term Permits issued by the San Diego Water Board included more detailed requirements that outlined the minimum level of implementation required for the Copermittees' programs to meet the maximum extent practicable (MEP) standard for storm water. The Third Term Permits included more detail to emphasize and enhance the jurisdictional runoff management programs developed by the Copermittees and introduced requirements for developing and implementing watershed-based programs.

The Third Term Permits also incorporated two precedent setting decisions by the State Water Board. In Order WQ 99-05, the State Water Board established receiving water limitation language to be included in all MS4 permits. The State Water Board's precedential language clarified that municipal storm water permits must include provisions requiring discharges to be controlled to attain water quality standards in receiving waters. Unlike previously adopted versions of the receiving water limitation language in the First and Second Term Permits, the language no longer stated that "*violations of water quality standards are not violations of the municipal storm water permit under certain conditions*." In addition, the receiving water limitation language no longer indicated that the "*implementation of best management practices is the 'functional equivalent' of meeting water quality standards*." State Water Board Order WQ 99-05 specifically requires language in MS4 permits for the Copermittees to comply with water quality standards based discharge prohibitions and receiving water limitations through timely implementation of control measures and other actions to reduce pollutants in discharges. (See State Water Board Order WQ 99-05 (*Environmental Health Coalition*)).

In Order WQ 2000-11, also a precedential decision, the State Water Board addressed design standards for structural post-construction best management practices (BMPs) for new development and significant redevelopment. The State Water Board found that the design standards, which require that runoff generated by 85 percent of storm events from specific development categories be infiltrated or treated, reflect the MEP standard. State Water Board Order WQ 2000-11 also found that the post-construction BMP provisions, or Standard Storm Water Mitigation Plan (SSMP) provisions, constitute MEP for addressing storm water pollutant discharges resulting from specific development categories.

The Third Term San Diego County and Orange County Permits (Order Nos. 2001-01 and R9-2002-0001, respectively) were appealed to the State Water Board. Minor modifications were made by the State Water Board, but the requirements were largely upheld. In State Water Board Order WQ 2001-15, the State Water Board upheld the Third Term San Diego County Permit requirements with certain modifications. The State Water Board removed the prohibition of storm water discharges *into* the MS4 that cause or contribute to exceedances of water quality objectives. The revision allows for treatment of pollutants in storm water runoff after the pollutants have entered the MS4. State Water Board Order WQ 2001-15 otherwise upheld all the other requirements of the permit.

In addition to the modification to the discharge prohibition in Order WQ 2001-15, the State Water Board refined Order WQ 99-05 by making clear that the Copermittees may use an iterative approach to achieving compliance with water quality standards that involves ongoing assessments and revisions. Thus, the language for the discharge prohibitions and receiving water limitations was revised to explicitly require the Copermittees to implement an iterative process of assessments and revisions to comply with the discharge prohibitions and receiving water limitations. The San Diego Water Board retained the authority to enforce receiving water limitations and discharge prohibitions even if the Copermittee is engaged in the iterative process.

The Third Term San Diego County Permit was subsequently challenged in the Superior Court of the State of California and the Court of Appeal, Fourth Appellate District. The Court of Appeal, Fourth Appellate District, found that the approach of the Third Term San Diego County Permit to regulating discharges into the MS4 was appropriate (*Building Industry Ass'n. v. State Water Resources Control Bd., et al.,* 124 Cal.App.4th 866 (2004)). The State of California Supreme Court denied review sought by the Building Industry Association in March 2005.

The Fourth Term Permits, or current MS4 permits, began with the adoption of Order No. R9-2007-0001 issued to the Copermittees of San Diego County in January 2007. Order Nos. R9-2009-0002 and R9-2010-0016 were subsequently issued to the Copermittees of Orange County and Riverside County. The Fourth Term Permits continued to include more detailed requirements to be implemented by each Copermittee's jurisdictional runoff management program. The Fourth Term Permits also include requirements to further emphasize a watershed management approach and for more coordination among jurisdictional runoff management programs. In addition, the Fourth Term Permits included more requirements for assessing the effectiveness of the runoff management programs being implemented by the Copermittees. The intent of the inclusion of additional requirements was to enhance and better define elements of the permit that were expected to be incorporated into the iterative process for managing runoff from each Copermittee's jurisdiction and within the watersheds of the San Diego Region.

The Fourth Term Permits include several new and emerging approaches for managing storm water runoff and discharges. Low impact development (LID) requirements are included for development and significant redevelopment to reduce pollutants in storm water runoff from sites through more natural processes such as infiltration and biofiltration closer to the source, rather than utilizing conventional mechanical end-of-pipe treatment systems. Hydrograph modification (hydromodification) management requirements also are included to mitigate the potential for increased erosion in receiving waters due to increased runoff rates and durations often caused by development and increased impervious surfaces. The Fourth Term Orange County and Riverside County Permits introduced requirements to identify areas of existing development where retrofitting with LID projects would be feasible and could be implemented to reduce storm water runoff and pollutants in storm water discharges.

The Fourth Term Orange County and Riverside County Permits included a clearer distinction between storm water and non-storm water discharges. The term “urban runoff” was completely removed, and a distinction between storm water (wet weather) runoff and non-storm water (dry weather) runoff was emphasized. This clarification was made to prevent any potential misunderstanding that regulation under the MS4 permits is limited only to urbanized areas, and to prevent non-storm water runoff from being managed in the same manner as storm water runoff. The term “urban runoff” is not defined in the Code of Federal Regulations (CFR) or Federal Register (FR) in the regulation of MS4 discharges. According to the CWA 402(p)(3)(B)(ii), MS4 permits must include a requirement to effectively prohibit non-storm water discharges into the MS4s.

Finally, for the Fourth Term Orange County and Riverside County Permits the San Diego Water Board found that non-storm water discharges to the MS4 from over application of irrigation water are sources of pollutants. The San Diego Water Board found that non-storm water discharges resulting from over-irrigation must be prohibited from entering the MS4 in accordance with the requirements of the CWA and pursuant to 40 CFR 122.26(d)(2)(iv)(B)(1).

The requirements of the Fourth Term Permits issued to the Copermittees in each county within the San Diego Region now have substantively the same core requirements such as discharge prohibitions, receiving water limitations, jurisdictional runoff management program components, and monitoring program requirements. There are, however, several inconsistencies that exist among the three Fourth Term Permits which complicate oversight and implementation of the permits by the San Diego Water Board.

The Fourth Term San Diego County Permit expired in January 2012. The Fourth Term Orange County permit expired in December 2014 and the Fourth Term Riverside County Permit will expire in November 2015. Issuing the Fifth Term Permits within five years for three counties under three different permits would require the San Diego Water Board to expend significant time and resources for the issuance of the permits through three separate public proceedings, thereby greatly reducing the time and resources available to oversee implementation and compliance. Multiple permits also create confusion for determining compliance among regulated entities, especially for the land development community.

The San Diego Water Board has acknowledged that issuing a single MS4 permit for all the Copermittees in the San Diego Region can and is expected to result in more consistent implementation, improve communication among agencies within watersheds crossing multiple jurisdictions, and minimize resources spent with each permit renewal process. Within the findings of the Fourth Term Riverside County Permit issued in November 2010, the San Diego Water Board notified the public of its intent to develop and issue a single Regional MS4 Permit.

V. REGIONAL MS4 PERMIT APPROACH

The Fifth Term Permit, or Regional MS4 Permit, shifts the focus of the permit requirements from a minimum level of actions to be implemented by the Copermittees to identifying outcomes to be achieved by those actions. Order No. R9-2013-0001 represents an important paradigm shift in the approach for MS4 permits within the San Diego Region.

Historical Permitting Approach

The First and Second Term Permits were very broad and provided little specificity about what was required to be developed and implemented by the Copermittees. The Third Term Permits began to become more specific about the minimum level of implementation required by the Copermittees. The Fourth Term Permits subsequently increased in specificity. The MS4 permits have progressively become more detailed and focused on specifying the minimum level of actions expected to be implemented by the Copermittees. As detailed and specific as the MS4 permits have become, however, they include very little detail about what the desired outcomes of the required actions are expected to achieve. Compliance with the permit requirements has essentially been tracking numbers of actions and reporting, not tracking progress or actual improvements in the quality of receiving waters or discharges from the MS4s. The result has been an increase in actions being implemented by the Copermittees with little or no ability or expectations to determine whether or not improvements in water quality are being achieved.

The Fourth Term Permits result in significant resource expenditure by the Copermittees to report permit compliance information to the San Diego Water Board in the form of annual jurisdictional runoff management program, watershed program, and monitoring program reports. The San Diego Water Board must then expend much of its limited resources on reviewing more than 50 voluminous reports submitted annually by the Copermittees. The information currently reported by the Copermittees is of limited value when trying to measure progress toward achieving improvements in the quality of receiving waters or discharges from the MS4s. Oversight of the MS4 permits is further complicated by the inconsistencies among the requirements issued to the Orange County, San Diego County, and Riverside County Copermittees under three separate MS4 permits.

Under the Fourth Term Permits, the Copermittees must expend a significant portion of their limited resources collecting data of limited value, and putting together reports to submit that information to the San Diego Water Board. Likewise, the San Diego Water Board must expend most of its limited resources reviewing reports, and developing permits instead of working directly with the Copermittees to identify solutions to problems causing impacts to water quality. This is an unsustainable course that will continue to demand more resources from the Copermittees and the San Diego Water Board, and would continue to result in unknown water quality benefits.

New Permitting Approach

The goal of the Regional MS4 Permit is twofold: 1) bring a consistent set of MS4 permit requirements to all of the Copermittees within the San Diego Region; and, 2) provide an MS4 permit with requirements that will allow the Copermittees to focus their efforts and resources on achieving goals and desired outcomes toward the improvement of water quality rather than completing specific actions.

The overall approach included in the Regional MS4 Permit with respect to the jurisdictional runoff management programs will not differ significantly from the current permits. The general requirements for the jurisdictional runoff management program components and compliance with those requirements will remain and be applied consistently throughout the San Diego Region under the Regional MS4 Permit.

The most significant difference in the new permitting approach is the specific manner of implementation for those jurisdictional runoff management programs. Implementation will be based on decisions made by the Copermittees in accordance with what they have identified as their highest priority water quality conditions. In other words, the Copermittees will have significant control in how to implement the jurisdictional runoff management programs to best utilize their available resources in addressing a specific set of priorities effectively, instead of trying to address all the water quality priorities ineffectively.

The Copermittees are given the responsibility of identifying their highest priority water quality conditions that they intend to address. The Copermittees will develop goals that can be used to measure and demonstrate progress or improvements toward addressing those priorities. In addition to the goals, the Copermittees will provide a schedule for achieving the goals for those highest priorities. The measurement of progress toward achieving the goals for those highest priorities requires a better defined and more focused program of monitoring and assessment than under the Fourth Term Permits.

The monitoring and assessment program must be designed to inform the Copermittees of their progress, and the need for modifications in their jurisdictional runoff management programs and schedules to achieve their goals to improve water quality. The monitoring and assessment program requirements will have a more central role in the Regional MS4 Permit than in earlier permits. The monitoring and assessment requirements must also be designed to enable the Copermittees to focus and direct their efforts in implementing their jurisdictional runoff management programs toward their stated desired outcomes to improve the quality of receiving waters and/or discharges from the MS4s.

By providing an MS4 permit that allows the Copermittees to make more decisions about how to utilize and focus their resources, along with a better defined monitoring and assessment program to inform their water quality management decisions, the Copermittees will have the opportunity to:

1) *Plan strategically*. The Copermittees must have the ability to identify their available resources and develop and implement long term plans that can organize, collect, and use those resources in the most strategically advantageous and efficient manner possible. This ability to develop long term plans will allow the Copermittees to focus and utilize their resources in a more concerted way over the short term and long term to address specific water quality priorities through stated desired outcomes.

2) *Manage adaptively*. The Copermittees must be given the ability to modify their plans as additional information and data are collected from the monitoring and assessment programs. The Copermittees' plans may require modifications to the programs, priorities, goals, strategies, and/or schedules in order for the Copermittees to achieve a stated desired outcome.

3) *Identify synergies*. The Copermittees must be given more flexibility to identify efficiencies within and among their jurisdictional runoff management programs as the strategies are developed and implemented to increase the Copermittees' collective effectiveness. The Copermittees must also be able to identify and utilize resources available from other agencies and entities to further augment and enhance their jurisdictional runoff management programs and/or to collectively work with those other agencies and entities toward achieving a stated desired outcome.

The Regional MS4 Permit requirements will provide the Copermittees the flexibility and responsibility to decide what actions will be necessary to achieve an outcome that is tailored and designed by the Copermittees to improve specific prioritized water quality conditions. The San Diego Water Board expects the approach of the Regional MS4 Permit to give the Copermittees a greater sense of ownership for restoring the quality of receiving waters in the San Diego Region by becoming an integral part of the decision making process in identifying water quality conditions to be addressed, as well as determining the best use of their resources.

VI. ECONOMIC CONSIDERATIONS

Statutory Considerations

California Water Code (CWC) section 13241 requires the San Diego Water Board to consider certain factors, including economic considerations, in the adoption of water quality objectives. CWC section 13263 requires the San Diego Water Board to take into consideration the provisions of CWC section 13241 in adopting waste discharge requirements.

In *City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, the California Supreme Court considered whether Regional Water Boards must comply with CWC section 13241 when issuing waste discharge requirements under CWC section 13263(a) by taking into account the costs a permittee will incur in complying with the permit requirements. The Court concluded that whether it is necessary to consider such cost information "*depends on whether those restrictions meet or exceed the requirements of the federal Clean Water Act.*" (*Id.* at p. 627.) The Court ruled that Regional Water Boards may not consider the factors in CWC section 13241, including economics, to justify imposing pollutant restrictions that are less stringent than applicable federal law requires. (*Id.* At pp. 618, 626-627 ["*[Water Code section 13377 specifies that [] discharge permits issued by California's regional boards must meet the federal standards set by federal law. In effect, section 13377 forbids a regional board's consideration of any economic hardship on the part of the permit holder if doing so would result in the dilution of the requirements set by Congress in the Clean Water Act...Because CWC section 13263 cannot authorize what federal law forbids, it cannot authorize a regional board, when issuing a [] discharge permit, to use compliance costs to justify pollutant restrictions that do not comply with federal clean water standards*."]). However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Regional Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

As discussed in Section VII.F, Unfunded State Mandates, the San Diego Water Board finds that the requirements in this Order are not more stringent than the minimum federal requirements. Among other requirements, federal law requires MS4 permits to include requirements to effectively prohibit non-storm water discharges into the MS4s, in addition to requiring controls to reduce the discharge of pollutants in storm water to the MEP, and other provisions as USEPA or the State determines are appropriate for the control of pollutants in MS4 discharges.

The requirements in this Order may be more specific or detailed than those enumerated in federal regulations under 40 CFR 122.26 or in the USEPA guidance. However, the requirements have been designed to be consistent with and within the federal statutory mandates described in CWA section 402(p)(3)(B)(ii) and (iii) and the related federal regulations and guidance. Consistent with federal law, all of the

conditions in this Order could have been included in a permit adopted by USEPA in the absence of the in lieu authority of California to issue NPDES permits.

Moreover, the inclusion of numeric WQBELs in this Order does not cause this Order to be more stringent than federal law. Federal law authorizes both narrative and numeric effluent limitations to meet state water quality standards. The inclusion of WQBELs as discharge specifications in an NPDES permit in order to achieve compliance with water quality standards is not a more stringent requirement than the inclusion of BMP based permit limitations to achieve water quality standards (State Water Board Order No. WQ 2006-0012 (*Boeing*)). Therefore, consideration of the factors set forth in CWC section 13241 is not required for permit requirements to implement the effective prohibition on the discharge of non-storm water discharges into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determine appropriate to control such pollutants, as those requirements are mandated by federal law.

Included in the provisions of the Order are monitoring and reporting requirements that are designed to demonstrate that the Copermittees are implementing programs to comply with the CWA municipal storm water requirements. CWA section 308(a) and 40 CFR 122.41(h), (j)-(l), 122.44(i) and 122.48 require that all NPDES permits specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s (40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c)) also specify additional monitoring and reporting requirements. In addition to the federal requirements of the CWA, the San Diego Water Board also has the authority in CWC 13383 to establish monitoring, reporting, and recordkeeping requirements that implement federal and state laws and regulations through NPDES permits.

The monitoring and assessment information that will be reported to the San Diego Water Board is necessary to determine if the Copermittees are making progress toward achieving compliance with the discharge prohibitions, receiving water limitations, and effluent limitations under Provision A of the Order. The monitoring and assessment information that will be reported is also expected to be key to the iterative approach and adaptive management process that is required to be implemented by the Copermittees if they cannot meet the discharge prohibitions and receiving water limitations under the present conditions, which is also part of the requirements under Provision A of the Order.

Notwithstanding the above, the San Diego Water Board has considered cost information in issuing this Order, as discussed below. The San Diego Water Board has also considered all of the evidence that has been presented to the San Diego Water Board regarding the CWC section 13241 factors in adopting this Order. The San Diego Water Board finds that the requirements in this Order are reasonably necessary to protect beneficial uses identified in the Basin Plan and the economic information related to costs of compliance and other CWC section 13241 factors are not sufficient to justify failing to protect those beneficial uses. Where appropriate, the

San Diego Water Board has provided or will consider providing the Copermittees with additional time to implement control measures to achieve final WQBELs and/or water quality standards.

Cost Information

Discussions of the financial and economic ramifications of municipal storm water management programs tend to focus on the significant costs incurred by municipalities in developing and implementing the programs. When considering the cost of implementing the programs, however, it is also important to consider the alternative costs that are incurred when programs are not fully implemented, as well as the economic benefits which result from effective program implementation.

The recent financial and economic conditions have amplified the concerns about the costs incurred by the municipalities in developing and implementing their programs. The reduction in resources resulting from the recent financial and economic conditions has been cited by many of the Copermittees as a justification for reducing the requirements that must be met by their programs. While the recent conditions are a cause for concern in the short term, these programs also have an opportunity to identify and implement improvements and efficiencies before the next period of growth and development, resulting in more effective and sustainable programs over the long term.

In addition, it is very difficult to ascertain the true cost of implementation of the Copermittees' management programs because of inconsistencies in reporting by the Copermittees. Reported costs of compliance for the same program element can vary widely from city to city, often by a very wide margin that is not easily explained.[2] Despite these problems, efforts have been made to identify management program costs, which can be helpful in understanding the costs of program implementation.

The San Diego Water Board recognizes that the Copermittees will incur costs in implementing this Order, potentially above and beyond the costs from the Copermittees' prior permits. The San Diego Water Board also recognizes that, due to California's current economic condition, many Copermittees currently have limited staff and resources to implement actions to address its MS4 discharges. Based on the economic considerations below, the San Diego Water Board has provided the Copermittees a significant amount of flexibility to choose how to implement the requirements of the Order.

The Order also allows the Copermittees to customize their plans, programs, and monitoring requirements. In the end, it is up to the Copermittees to determine the effective BMPs and measures necessary to comply with this Order. The Copermittees can choose to implement the least expensive measures that are effective in meeting the requirements of this Order. This Order also does not require the Copermittees to

[2] LARWQCB, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.

fully implement all requirements within a single permit term. Where appropriate, the Board has provided the Copermittees with additional time outside of the permit term to implement control measures to achieve final WQBELs and/or water quality standards.

The San Diego Water Board has considered available cost information associated with compliance with this Order. It is not possible to predict accurately the cost impact of the requirements that involve an unknown level of implementation or that depend on environmental variables that are as yet undefined. Only general conclusions can be drawn from this information.

Estimated Municipal Storm Water Program Implementation Costs

The USEPA, the State Water Board, and the California Regional Water Quality Control Boards (Regional Water Boards) have attempted to evaluate the costs of implementing municipal storm water programs. The assessments have demonstrated that the true costs are difficult to ascertain and reported costs vary widely. In addition, reported fiscal analyses tend to neglect the costs incurred to municipalities when storm water and non-storm water runoff is not effectively managed, which are incurred as a result of pollution, contamination, nuisance, and damage to ecosystems, property, and human health. Nonetheless, they provide a useful context for considering the costs of requirements within Order No. R9-2013-0001.

In 1999, the USEPA reported on multiple studies it conducted to determine the cost of management programs. A study of Phase II municipalities determined that the annual cost of the Phase II program was expected to be $9.16 per household. The USEPA also studied 35 Phase I municipalities, finding costs to be $9.08 per household annually, similar to those anticipated for Phase II municipalities.[3]

The State Water Board commissioned a study by the California State University, Sacramento to assess costs of the Phase I MS4 program. This study includes an assessment of costs incurred by Phase I MS4s throughout the state to implement their programs. Annual cost per household in the study ranged from $18 to $46, with the Fresno-Clovis Metropolitan Area representing the lower end of the range, and the City of Encinitas (in San Diego County) representing the upper end of the range.[4]

A study on Phase I MS4 program costs was also conducted by the California Regional Water Quality Control Board, Los Angeles Region (Los Angeles Water Board), where program costs reported in the municipalities' annual reports were assessed. The Los Angeles Water Board estimated that average per household cost to implement the MS4 program in Los Angeles County was $12.50. [5]

[3] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791-68792.
[4] State Water Board, 2005. NPDES Stormwater Cost Survey. P. ii.
[5] Los Angeles Water Board, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.

It is important to note that reported program costs are not all attributable to solely complying with MS4 permits. Many program components, and their associated costs, existed before any MS4 permits were ever issued. For example, street sweeping and trash collection costs cannot be solely or even principally attributable to MS4 permit compliance, since these practices have long been expected from and implemented by municipalities.

Therefore, true program cost resulting from MS4 permit requirements is some fraction of reported costs. The California State University, Sacramento study found that only 38 percent of program costs are new costs fully attributable to MS4 permits. The remainder of the program costs was either pre-existing or resulted from enhancement of pre-existing programs.[6] In 2000, the County of Orange found that even lower amounts of program costs are solely attributable to MS4 permit compliance, reporting that the amount attributable to implement the County or Orange Drainage Area Management Plan (DAMP), was less than 20 percent of the total budget. The remaining 80 percent was attributable to pre-existing programs.[7] More current data from the County of Orange is not used in this discussion because the County of Orange no longer reports such information.

Estimated Value of Healthy Water Quality

Economic considerations of municipal storm water management programs cannot be limited only to program costs. Evaluation of programs must also consider information on the benefits derived from environmental protection and improvement.[8] Attention is often focused on municipal storm water management program costs, but the programs must also be viewed in terms of their value to the public.

Placing a value on healthy receiving waters is very difficult. Often the value of receiving waters with good water quality manifests in other forms, such as tourism, recreational opportunities, and/or increased property values. When surface water bodies are degraded, thereby degrading the habitat within and adjacent to the water bodies, the public loses the value and benefits associated with being able to use the area in and around the water bodies. Surface waters that are able to support the beneficial uses designated in the Basin Plan can sustain plants and wildlife that can attract visitors and residents, providing aesthetic, recreational, as well as monetary value to the public. At this time, however, there have been no studies for the San Diego Region to quantify the added value that surface waters with healthy water quality can provide.

[6] State Water Board, 2005. NPDES Stormwater Cost Survey. P. 58.
[7] County of Orange, 2000. A NPDES Annual Progress Report. P. 60.
[8] Ribaudo M.O. and D. Heelerstein. 1992, *Estimating Water Quality Benefits: Theoretical and Methodological Issues.* U.S. Department of Agriculture. Technical Bulletin No. 1808.

USEPA has estimated that household willingness to pay for improvements in fresh water quality for fishing and boating is approximately $158-$210.[9] This estimate can be considered conservative, since it does not include important considerations such as marine waters benefits, wildlife benefits, or flood control benefits. Another study conducted by California State University, Sacramento reported that the annual household willingness to pay for statewide clean water is approximately $180.[10]

A study conducted by the University of Southern California and University of California, Los Angeles assessed the costs and benefits of implementing various approaches for achieving compliance with the MS4 permits in the Los Angeles region. The study found that non-structural systems would cost $2.8 billion but provide $5.6 billion in benefit. If structural systems were determined to be needed, the study found that total costs would be $5.7 to $7.4 billion, while benefits could reach $18 billion.[11] Costs are anticipated to be borne over many years, probably at least ten years.

As can be seen, the benefits of the municipal storm water management programs are expected to considerably exceed their costs. Such findings are corroborated by USEPA, which found that the benefits of implementation of its Phase II storm water rule would also outweigh the costs.[12]

[9] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68793.
[10] State Water Board, 2005. NPDES Stormwater Cost Survey. P. iv.
[11] Los Angeles Water Board, 2004. Alternative Approaches to Stormwater Control.
[12] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791.

VII. APPLICABLE STATUTES, REGULATIONS, PLANS AND POLICIES

A. Legal Authorities – Federal Clean Water Act and California Water Code

This Order is issued pursuant to section 402 of the CWA and implementing regulations adopted by the USEPA and chapter 5.5, division 7 of the CWC (commencing with section 13370). This Order serves as an NPDES permit for point source discharges to surface waters. This Order also serves as waste discharge requirements pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

The objective of the CWA is "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*." To carry out this objective, the CWA requires the implementation of permit programs to regulate the discharge of pollutants and dredged or fill material to the navigable waters of the U.S. and to regulate the use and disposal of sewage sludge. CWA section 402 provides the legal authority to issue a permit for the discharge of pollutants to waters of the U.S. under the NPDES. The CWA provides that NPDES permits may be issued by states which are authorized to implement the provisions of that act. California became authorized to implement the NPDES permit program on May 14, 1973.

The Porter-Cologne Water Quality Control Act (Division 7, commencing with CWC section 13000) established the State Water Resources Control Board (State Water Board) and nine Regional Water Quality Control Boards (Regional Water Boards) as the principal state agencies with primary responsibility for the coordination and control of water quality. CWC section 13200(f) established the San Diego Water Board, which has the primary responsibility for the coordination and control of water quality in the San Diego Region, which includes all the basins draining into the Pacific Ocean between the southern boundary of the Santa Ana Region and the California-Mexico boundary. The San Diego Water Board implements the CWA through Chapter 5.5 of the CWC, commencing with section 13370. CWC section 13377 provides the San Diego Water Board the legal authority to issue waste discharge requirements to ensure compliance with all applicable provisions of the CWA and acts amendatory thereof or supplementary, thereto, to implement water quality control plans, or for the protection of beneficial uses, or to prevent nuisance.

CWA section 402(p) requires the USEPA or authorized state to issue NPDES permits for storm water discharges from municipal separate storm sewer systems (MS4s) to waters of the U.S. CWA section 402(p)(3)(B)(ii) requires that NPDES permits for storm water discharges from MS4s "*effectively prohibit non-storm water discharges*" into the MS4s. CWA section 402(p)(3)(B)(iii) requires that NPDES permits for storm water discharges from MS4s to "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable* [MEP], *including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*."

The USEPA published implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]), which prescribe permit application requirements for storm water discharges from MS4s pursuant to CWA 402(p), on November 16, 1990. The USEPA published an Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems, which provided guidance on permit application requirements for regulated MS4s, on May 17, 1996. The federal regulations in 40 CFR 122 and guidance issued by USEPA serve as the foundation for the provisions of Order No. R9-2013-0001. The legal authorities provided by the above statutes and regulations are included as part of the discussions in Section VIII of this Fact Sheet.

B. Legal Authority for the Permit Issued on a Region-wide Basis

CWA section 402(p)(3)(B) provides the San Diego Water Board the legal authority to issue an NPDES permit for the San Diego Region as compared to separate MS4 permits based upon County- and partial County-wide boundaries as they exist within the San Diego Region. CWA section 402(p)(3)(B) states that "*Permits for discharges from municipal storm sewers- (i) may be issued on a system- or jurisdiction-wide basis ....*" The federal regulations in 40 CFR 122.26(a)(1)(v) also state that the San Diego Water Board "*may designate dischargers from municipal separate storm sewers on a system-wide or jurisdiction-wide basis. In making this determination, the [San Diego Water Board] may consider the following factors: (A) the location of the discharge with respect to waters of the United States; (B) the size of the discharge; (C) the quantity and nature of the pollutants discharged to waters of the United States; and (D) other relevant factors*."

More specifically, the federal regulations provide that for large and medium MS4 systems, the San Diego Water Board may issue a regional permit. Specifically, the federal regulation in 40 CFR 122.26(a)(3) provide:

"*(ii) The Director may either issue one system-wide permit covering all discharges from municipal separate storm sewers within a large or medium municipal storm sewer system or issue distinct permits for appropriate categories of discharges within a large or municipal separate storm sewer system including, but not limited to: all discharges owned or operated by the same municipality; located within the same jurisdiction; all discharges within a system that discharge to the same watershed; discharges within a system that are similar in nature; or for individual discharges from municipal separate storm sewers within the system.*

(iii) The operator of a discharge from a municipal separate storm sewer which is part of a large or medium municipal separate storm sewer system must either: (A) Participate in a permit application (to be a permittee or a co-permittee) with one or more other operator of discharges from the large or medium municipal storm sewer system which covers all, or a portion of all, discharges from the municipal separate storm sewer system; (B) Submit a distinct permit application

which only covers discharges from the municipal separate storm sewers for which the operator is responsible; or (C) A regional authority may be responsible for submitting a permit application under the following guidelines....

(iv) One permit application may be submitted for all or a portion of all municipal separate storm sewers within adjacent or interconnected large or medium municipal separate storm sewer systems. The Director may issue one systemwide permit covering all, or a portion of all municipal separate storm sewers in adjacent or interconnected large or medium municipal separate storm sewer systems.

(v) Permits for all or a portion of all discharges from large or medium municipal separate storm sewer systems that are issued on a system-wide, jurisdiction-wide, watershed or other basis may specify different conditions relating to different discharges covered by the permit, including different management programs for different drainage areas which contribute storm water to the system."

Based on these regulations, the San Diego Water Board may issue a region-wide MS4 permit. The regulations also clarify that the permit may include different conditions for separate discharges covered by the permit. This allows the San Diego Water Board to ensure that suitable water quality conditions and provisions are identified for each watershed.

The USEPA's responses to comments in the Final Rule for the above-mentioned regulations also make it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide, permits. In the Final Rule published in the Federal Register and containing the responses to comments, USEPA notes that 40 CFR 122.26(a)(3)(iv) would allow an entire system in a geographical region under the purview of a State agency to be designated under a permit.[13] USEPA also states that many commenters wanted to allow the permitting authority broad discretion to establish system-wide permits, and that EPA believes that paragraphs 40 CFR 122.26 (a)(1)(v) and (a)(3)(ii) allow for such broad discretion.[14]

This Order creates watershed requirements that apply to multiple counties. The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees. Managing storm water on a regional and watershed basis is expected to result in improved water quality, as the Order focuses on monitoring and management practices necessary to improve each watershed rather than political boundaries. A single permit also allows the San Diego Water Board staff to expend fewer resources developing successive multiple permits and allows more resources to be devoted to working cooperatively with all three current groups of Copermittees to ensure implementation of this Order results in improved water quality.

[13] 55 Federal Register 47990-01, 48042
[14] Ibid

C. Federal and California Endangered Species Acts

This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2115.5) or the Federal Endangered Species Act (16 United States Code [USC] sections 1531 to 1544). This Order requires compliance with requirements to protect the beneficial uses of waters of the U.S. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

D. California Environmental Quality Act

The action to adopt an NPDES Permit is exempt from the provisions of Chapter 3 of the California Environmental Quality Act (CEQA) (Public Resources Code section 21100, et seq.) pursuant to CWC section 13389. (*County of Los Angeles v. Cal. Water Boards* (2006) 143 Cal.App.4th 985.)

E. State and Federal Regulations, Plans and Policies

The legal authority provided by the following regulations, plans, and policies are also included as part of the discussions in Section VIII of this Fact Sheet.

<u>Water Quality Control Plan for the San Diego Basin</u>

The CWA requires the San Diego Water Board to establish water quality standards for each water body in its region. Water quality standards include beneficial uses, water quality objectives and criteria that are established at levels sufficient to protect beneficial uses, and an antidegradation policy to prevent degrading of waters. On September 8, 1994, the San Diego Water Board adopted the *Water Quality Control Plan for the San Diego Basin (*Basin Plan). The Basin Plan designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters in the San Diego Region. The San Diego Water Board has amended the Basin Plan on multiple occasions since 1994. In addition, the Basin Plan implements State Water Board Resolution No. 88-63, which established state policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply. Beneficial uses applicable to the surface water bodies that receive discharges from the MS4s within the San Diego Region generally include those listed below:

The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region:

- Municipal and Domestic Supply (MUN)
- Agricultural Supply (AGR)

- Industrial Process Supply (PROC)
- Industrial Service Supply (IND)
- Ground Water Recharge (GWR)
- Contact Water Recreation (REC1)
- Non-contact Water Recreation (REC2)
- Warm Freshwater Habitat (WARM)
- Cold Freshwater Habitat (COLD)
- Wildlife Habitat (WILD)
- Rare, Threatened, or Endangered Species (RARE)
- Freshwater Replenishment (FRSH)
- Hydropower Generation (POW)
- Preservation of Biological Habitats of Special Significance (BIOL)

The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region:

- Navigation (NAV)
- Commercial and Sport Fishing (COMM)
- Estuarine Habitat (EST)
- Marine Habitat (MAR)
- Aquaculture (AQUA)
- Migration of Aquatic Organisms (MIGR)
- Spawning, Reproduction, and/or Early Development (SPWN)
- Shellfish Harvesting (SHELL)

Pursuant to Water Code sections 13263 and 13377, the requirements of this Order implement the Basin Plan.

<u>Water Quality Control Plan for Ocean Waters of California, California Ocean Plan</u>

In 1972, the State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan). The State Water Board adopted the most recent amended Ocean Plan on September 15, 2009. The Office of Administrative Law approved it on March 10, 2010. On October 8, 2010, USEPA approved the 2009 Ocean Plan. The Ocean Plan is applicable, in its entirety, to ocean waters of the State. In order to protect beneficial uses, the Ocean Plan establishes water quality objectives and a program of implementation. Pursuant to Water Code sections 13263 and 13377, the requirements of this Order implement the Ocean Plan. The Ocean Plan identifies the beneficial uses of ocean waters of the State to be protected as summarized below:

- Industrial water supply
- Water contact and non-contact recreation, including aesthetic enjoyment; navigation
- Commercial and sport fishing

- Mariculture
- Preservation and enhancement of designated Areas of Special Biological Significance
- Rare and endangered species
- Marine habitat
- Fish spawning and shellfish harvesting

On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving an exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges. On June 19, 2012, the State Water Board adopted Order No. 2012-0031, amending Order No. 2012-0012 to require pollutant load reductions to be achieved within six years for the ASBS Compliance Plans, section A.2.d(2) and ASBS Pollution Prevention Plans, section B.2.b(2). The State Water Board Resolution No. 2012-0012, as amended requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject terms and conditions of State Water Board Resolution No. 2012-0012, as amended. The Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012, as amended, applicable to these discharges, are incorporated in Attachment A of this Order. Requirements of this Order implement the Ocean Plan.

Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality

On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

Antidegradation Policy

Federal regulations (40 CFR 131.12) require that the state water quality standards include an antidegradation policy consistent with the federal antidegradation policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16 ("Statement of Policy with Respect to Maintaining the Quality of the Waters of the State"). State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law.

The San Diego Water Board's Basin Plan implements and incorporates by reference both the State and federal antidegradation policies. State Water Board Resolution No. 68-16 and 40 CFR 131.12 require the San Diego Water Board to maintain high quality waters of the State until it is demonstrated that any change in quality will be consistent with maximum benefit to the people of the State, will not unreasonably affect beneficial uses, and will not result in water quality less than that described in the San Diego Water Boards' policies. State Water Board Resolution No. 68-16 requires that discharges of waste be regulated to meet best practicable treatment or control to assure that pollution or nuisance will not occur and the highest water quality consistent with the maximum benefit to the people of the State be maintained.

The discharges permitted in this Order are consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Board Resolution No. 68-16. Many of the water bodies within the area covered by this Order are of high quality. The Order requires the Copermittees to meet best practicable treatment or control to meet water quality standards. As required by 40 CFR 122.44(a), the Copermittees must comply with the "maximum extent practicable" technology-based standard set forth in CWA section 402(p) for discharges of pollutants in storm water from the MS4s.

Many of the waters within the area covered by this Order are impaired and listed on the State's CWA Section 303(d) List and the San Diego Water Board has established TMDLs to address the impairments. This Order requires the Copermittees to comply with permit provisions to implement the WLAs set forth in the TMDLs in order to restore the beneficial uses of the impaired water bodies consistent with the assumptions and requirements of the TMDLs. This Order includes requirements to develop and implement storm water management programs, achieve WQBELs, and effectively prohibit non-storm water discharges into the MS4. The issuance of this Order does not authorize an increase in the amount of discharge of waste.

Anti-Backsliding Requirements

CWA sections 402(o) and 303(d)(4) and 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations or conditions may be relaxed. All effluent limitations and other conditions in this Order are at least as stringent as the effluent limitations in the previous permits issued to the San Diego County Copermittees, the Orange County Copermittees and the Riverside County Copermittees.

Clean Water Act Section 303(d) List

CWA section 303(d)(1) requires each State to identify specific water bodies within its boundaries where water quality standards are not being met or are not expected to be

met after implementation of technology-based effluent limitations on point sources. Water bodies that do not meet water quality standards are considered impaired and are placed on the state's "303(d) List." Periodically, USEPA approves the State's 303(d) List.

Most recently, USEPA approved the State's 2010 303(d) List of impaired water bodies on October 11, 2011, which includes certain receiving waters in the San Diego Region. For each listed water body, the state or USEPA is required to establish a TMDL of each pollutant impairing the water quality standards in that water body. A TMDL is a tool for implementing water quality standards and is based on the relationship between pollution sources and in-stream water quality conditions. The TMDL establishes the allowable pollutant loadings for a water body and thereby provides the basis to establish water quality-based controls. These controls should provide the pollution reduction necessary for a water body to meet water quality standards.

A TMDL is the sum of the allowable pollutant loads of a single pollutant from all contributing point sources (the waste load allocations or WLAs) and non-point sources (load allocations of LAs) plus the contribution from background sources and a margin of safety (40 CFR 130.2(i)). MS4 discharges are considered point source discharges. For 303(d)-listed water bodies and pollutants in the San Diego Region, the San Diego Water Board or USEPA develops and adopts TMDLs that specify these requirements.

Since 2002, the San Diego Water Board has established seven (7) TMDLs to remedy water quality impairments in various water bodies within the San Diego Region (see Attachment E to the Order). These TMDLs identify MS4 discharges as a source of pollutants to these water bodies, and, as required, establish WLAs for MS4 discharges to reduce the amount of pollutant discharged to receiving waters. CWA section 402(p)(3)(B)(iii) requires the San Diego Water Board to impose permit conditions, including: "management practices, control techniques and system, design and engineering methods, and *such other provisions as the Administrator or the State determines appropriate for the control of such pollutants."* (Emphasis added.) CWA section 402(a)(1) also requires states to issue permits with conditions necessary to carry out the provisions of the CWA. Federal regulations also require that NDPES permits contain WQBELs consistent with the assumptions and requirements of all available WLAs (40 CFR 122.44(d)(1)(vii)(B)). CWC section 13377 also requires that NPDES permits include limitations necessary to implement water quality control plans. Therefore, this Order includes WQBELs and other provisions to implement the TMDL WLAs assigned to Copermittees regulated by this Order.

<u>Other Regulations, Plans and Policies</u>

This Order implements all other applicable federal regulations and State regulations, plans and policies, including the California Toxics Rule at 40 CFR 131.38 (Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California Rule [California Toxics Rule or CTR]), and State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP).

F. Unfunded State Mandates

Article XIII B, Section 6(a) of the California Constitution provides that whenever "*any state agency mandates a new program or higher level of service on any local government, the state shall provide a subvention of funds to reimburse that local government for the costs of the program or increased level of service*." The requirements of this Order do not constitute state mandates that are subject to a subvention of funds for several reasons, including, but not limited to, the following.

First, the requirements of this Order do not constitute a new program or a higher level of service as compared to the requirements contained in the previous Fourth Term Permits. The overarching requirement to impose controls to reduce the pollutants in discharges from MS4s is dictated by the CWA and is not new to this permit cycle (33 USC section 1342(p)(3)(B)). The inclusion of new and advanced measures as the MS4 programs evolve and mature over time is anticipated under the CWA (55 FR 47990, 48052 (Nov. 16, 1990)), and to the extent requirements in this Order are interpreted as new advanced measures, they do not constitute a new program or higher level of service.

Second, and more broadly, mandates imposed by federal law, rather than by a state agency, are exempt from the requirement that the local agency's expenditures be reimbursed (Cal. Const., art. XIII B, section 9, subd. (b)). This Order implements federally mandated requirements under the CWA and its requirements are therefore not subject to subvention of funds. This includes federal requirements to effectively prohibit non-storm water discharges, to reduce the discharge of pollutants in storm water to the MEP, and to include such other provisions as the Administrator or the State determines appropriate for the control of such pollutants (33 USC section 1342(p)(3)(B)). Federal cases have held these provisions require the development of permits and permit provisions on a case-by-case basis to satisfy federal requirements. (*Natural Resources Defense Council, Inc., v. USEPA* (9th Cir. 1992) 966 F.2d 1292, 1308, fn. 17.)

The authority exercised under this Order is not reserved state authority under the CWA's savings clause (cf. *Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 627-628 [relying on 33 USC section 1370, which allows a state to develop requirements which are not "less stringent" than federal requirements]), but instead is part of a federal mandate to develop pollutant reduction requirements for municipal separate storm sewer systems. To this extent, it is entirely federal authority that forms the legal basis to establish the permit provisions. (See, *City of Rancho Cucamonga v. Regional Water Quality Control Board, Santa Ana Region* (2006) 135 Cal.App.4th 1377, 1389; *Building Industry Ass'n of San Diego Co. v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 882-883.)

The MEP standard is a flexible standard that balances a number of considerations, including technical feasibility, cost, public acceptance, regulatory compliance, and effectiveness. (*Building Ind. Ass'n., supra,* 124 Cal.App.4th at pp. 873-874, 889.) Such considerations change over time with advances in technology and with experience

gained in storm water management (55 FR 47990, 48052 (Nov. 16, 1990)). Accordingly, a determination of whether the conditions contained in this Order exceed the requirements of federal law cannot be based on a point by point comparison of the permit conditions and the minimum control measures that are required "at a minimum" to reduce pollutants to the maximum extent practicable and to protect water quality (40 CFR 122.34). Rather, the appropriate focus is whether the permit conditions, as a whole, exceed the MEP standard.

In recent months, the County of Los Angeles and County of Sacramento Superior Courts have granted writs setting aside decisions of the Commission on State Mandates that held certain requirements in Phase I permits constituted unfunded mandates. In both cases, the courts have found that the correct analysis in determining whether an MS4 permit constituted a state mandate was to evaluate whether the permit as a whole exceeds the MEP standard. (*State of Cal. v. Comm. on State Mandates* (Super. Ct. Sacramento County, 2012, No. 34-2010-80000604), *State of California v. County of Los Angeles* (Super. Ct. Los Angeles County, 2011, No. BS130730.) Both cases are currently pending appeal.

The requirements of the Order, taken as a whole rather than individually, are necessary to reduce the discharge of pollutants to the MEP and to protect water quality. The San Diego Water Board finds that the requirements of the Order are practicable, do not exceed federal law, and thus do not constitute an unfunded mandate. These findings are the expert conclusions of the principal state agency charged with implementing the NPDES program in California (CWC sections 13001, 13370).

It should also be noted that the provisions in this Order to effectively prohibit non-storm water discharges are also mandated by the CWA (33 USC section 1342(p)(3)(B)(ii)). Likewise, the provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state establishes or adopts a TMDL, federal law requires that permits must contain effluent limitations consistent with the assumptions and requirements of any applicable waste load allocation in a TMDL (40 CFR 122.44(d)(1)(vii)(B)).

Third, the local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental dischargers who are issued NPDES permits for storm water discharges. With a few inapplicable exceptions, the CWA regulates the discharge of pollutants from point sources (33 USC section 1342) and the Porter-Cologne Act regulates the discharge of waste (CWC section 13263), both without regard to the source of the pollutant or waste. As a result, the "costs incurred by local agencies" to protect water quality reflect an overarching regulatory scheme that places similar requirements on governmental and non-governmental dischargers. (See *County of Los Angeles v. State of California* (1987) 43 Cal.3d 46, 57-58 [finding comprehensive workers' compensation scheme did not create a cost for local agencies that was subject to state subvention].)

The CWA and the Porter-Cologne Act largely regulate storm water with an even hand, but to the extent there is any relaxation of this even-handed regulation, it is in favor of the local agencies. Generally, the CWA requires point source dischargers, including dischargers of storm water associated with industrial or construction activity, to comply strictly with water quality standards (33 USC section 1311(b)(1)(C); *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159, 1164-1165 [noting that industrial discharges must strictly comply with water quality standards]). As discussed in prior State Water Board decisions, certain provisions of this Order do not require strict compliance with water quality standards (State Water Board Order No. WQ 2001-0015, p. 7). Those provisions of this Order regulate the discharge of waste in municipal storm water under the CWA's MEP standard, not the BAT/BCT standard that applies to other types of discharges. These provisions, therefore, regulate the discharge of waste in municipal storm water more leniently than the discharge of waste from non-governmental sources.

Fourth, the Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)). To the extent that the local agency Copermittees have voluntarily availed themselves of the permit, the program is not a state mandate. (Accord, *County of San Diego v. State of California* (1997) 15 Cal.4th 68, 107-108.)

Fifth, the local agency Copermittees' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under state law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

Finally, even if any of the permit provisions could be considered unfunded mandates, under Government Code section 17556, subdivision (d), a state mandate is not subject to reimbursement if the local agency has the authority to charge a fee. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order, subject to certain voting requirements contained in the California Constitution. (See Cal. Const., Art. XIII D, section 6, subd. (c); see also *Howard Jarvis Taxpayers Ass'n v. City of Salinas* (2002) 98 Cal.App.4th 1351, 1358-1359.) The Fact Sheet demonstrates that numerous activities contribute to the pollutant loading in the MS4. Local agencies can levy service charges, fees, or assessments on these activities, independent of real property ownership. (See, e.g., *Apartment Ass'n of Los Angeles County, Inc., v. City of Los Angeles* (2001(24 Cal.4th 830, 842 [upholding inspection fees associated with renting property].) The authority and ability of a local agency to defray the cost of a program without raising taxes indicates that a program does not entail a cost subject to subvention. (*Clovis Unified School Dist. V. Chiang* (2010) 188 Cal.App.4th 794, 812, citing *Connell v. Sup. Ct.* (1997) 59 Cal.App.4th 382, 401; *County of Fresno v. State of California* (1991) 53 Cal. 3d. 482, 487-488.)

VIII. PROVISIONS

The provisions (i.e. NPDES permit requirements) of the Order are discussed below.

A. Prohibitions and Limitations

Purpose: Provision A includes the prohibitions and limitations requirements that are the foundation of all the subsequent requirements included in the Order. Compliance with the prohibitions and limitations will restore and protect receiving waters from impacts that may be caused by discharges into and from the Copermittees' MS4s and ultimately achieve the objective of the CWA.

In meeting the requirements set forth in the Order, the Copermittees must be cognizant that the prohibitions and limitations exist and will be the standard by which the San Diego Water Board will be measuring the progress and success of their implementation of the NPDES permit requirements.

***Discussion*:** The objective of the CWA is to "*restore and maintain the chemical, physical, and biological integrity of the Nation's waters*." The CWA requires the implementation of NPDES permit programs to regulate discharges of pollutants and dredged or fill material to the navigable waters of the U.S. For discharges into and from MS4s, the CWA requires the NPDES permits to "*effectively prohibit non-stormwater discharges into the storm sewers*" and "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable.*"

Provision A includes limitations, consistent with the requirements of the CWA for discharges from MS4s. Provision A expresses these limitations as discharge prohibitions, receiving water limitations, and effluent limitations. Compliance with the discharge prohibitions and receiving water limitations is also explicitly described, in conformance with precedential State Water Board Orders.

More specific and detailed discussions of the requirements of Provision A are provided below.

Provision A.1 (Discharge Prohibitions) prohibits the discharge of specific types of waste into and/or from the Copermittees' MS4s.

Provision A.1.a restates and reiterates Basin Plan Waste Discharge Prohibition 1, by prohibiting discharges into and from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the

state. The terms pollution,[15] contamination,[16] and nuisance[17] are defined under CWC 13050. Provision A.1.c incorporates all the waste discharge prohibitions of the Basin Plan into the requirements of the Order. The waste discharge prohibitions from the Basin Plan have been reproduced and provided in Attachment A to the Order.

Provision A.1.b requires non-storm water discharges into the MS4s to be effectively prohibited, consistent with the requirements of the CWA for MS4 permits to "*effectively prohibit non-stormwater discharges into the storm sewers*." The effective prohibition is required to be implemented by each Copermittee within its jurisdiction through the illicit discharge detection and elimination requirements under Provision E.2. The prohibition does not apply to NPDES permitted discharges into the Copermittees' MS4s.

The CWA employs the strategy of prohibiting the discharge of any pollutant from a point source into waters of the United States unless the discharger of the pollutant(s) obtains an NPDES permit pursuant to CWA Section 402. The 1987 amendment to the CWA includes provision 402(p) that specifically addresses NPDES permitting requirements for storm water discharges from MS4s. CWA section 402(p) prohibits the discharge of pollutants from specified MS4s to waters of the U.S. except as authorized by an NPDES permit and identifies two substantive standards for MS4 storm water permits. MS4 permits (1) "*shall include a requirement to effectively prohibit nonstormwater discharges into the storm sewers*" and (2) "*shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or State determines appropriate for the control of such pollutants*." (CWA section 402(p)(3)(B)(ii-iii).)

In November 1990, the USEPA published regulations addressing storm water discharges from MS4s (55 FR 47990 and following (Nov. 16, 1990) (Phase I Final Rule)). The regulations establish minimum requirements for MS4 permits, and generally focus on the requirement that MS4s implement programs to reduce the amount of pollutants found in storm water discharges to the MEP. The CWA's municipal storm water MEP standard does not require storm water discharges to strictly meet water quality standards, as is required for other NPDES permitted discharges. Compliance is achieved through an iterative approach of continuous

[15] CWC 13050(l): "(1) 'Pollution' means an alteration of the quality of waters of the state by waste to a degree which unreasonably affects either of the following: (A) The water for beneficial uses. (B) Facilities which serve beneficial uses. (2) 'Pollution' may include "contamination.

[16] CWC 13050(k): "Contamination' means an impairment of the quality of waters of the state by waste to a degree which creates a hazard to public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste, whether or not waters of the state are affected."

[17] CWC 13050(m): "Nuisance' means anything which meets all of the following requirements: (1) Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. (2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. (3) Occurs during, or as a result of, the treatment or disposal of wastes."

implementation of improved BMPs. This distinction reflects Congress's recognition that variability in flow and intensity of storm events render difficult strict compliance with water quality standards by MS4 permittees. In describing the controls that permits must include to reduce pollutants in storm water discharges to the MEP, the statute (CWA section 402(p)(3)(B)(iii)) states that the controls shall include: "*management practices, control techniques and system, design and engineering methods, and such other provisions as the [permit writer] determines appropriate for the control of such pollutants*."

In contrast, non-storm water discharges from the MS4 that are not authorized by separate NPDES permits are subject to requirements under the NPDES program, including discharge prohibitions, technology based effluent limitations and water quality-based effluent limitations (40 CFR 122.44). The regulations also require the Copermittee's program to include an element to detect and remove illicit discharges and improper disposal into the storm sewer (40 CFR 122.26(d)(2)(iv)(B)).

While "non-storm water" is not defined in the CWA or federal regulations, the federal regulations (at 40 CFR 122.26(b)(2)) define "*illicit discharge*" as *"any discharge to a municipal separate storm sewer that is not composed entirely of storm water and that is not covered by an NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer and discharges resulting from fire fighting activities)*." This definition is the most closely applicable definition of "non-storm water" contained in federal law. As stated in the Phase I Final Rule, USEPA added the illicit discharge program requirement to begin implementation of the 'effective prohibition' requirement to detect and control non-storm water discharges to their municipal system.

Thus, federal law mandates that permits issued to MS4s must require management practices that will result in reducing storm water pollutants to the MEP yet at the same time requires that non-storm water discharges be effectively prohibited from entering the MS4. "Effectively" prohibit does not mean that non-storm water discharges are authorized to be discharged into and from the Copermittees' MS4s. The Phase I Final Rule clarifies what "effectively prohibit" means (55 FR 47995):

> "*Section 402(p)(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…<u>Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit</u> (other than the permit for the discharge from the municipal separate storm sewer)*" [Emphasis added].

Consistent with federal law, unless non-storm water discharges to the MS4 are authorized by a separate NPDES permit, non-storm water discharges are appropriately subject to the effective prohibition requirement in the CWA and Regional

Water Boards are not limited by the iterative MEP approach to storm water regulation in crafting appropriate regulations for non-storm water discharges.

The federal regulations (40CFR122.26(d)(2)(i)(B)) require the Copermittees to establish the legal authority which authorizes or enables the Copermittees to prohibit illicit discharges to the MS4s. The federal regulations (40 CFR 122.26(d)(2)(vi)(B)(1)) require the Copermittees to "*implement and enforce an ordinance, order or similar means*" to prevent non-storm water discharges to their MS4s. Thus, the Copermittees are required to "*effectively*" prohibit non-storm water discharges to their MS4s through enforcing their legal authority established under "*ordinance, order or similar means*" and either remove those discharges to their MS4s, or require those discharges to obtain coverage under a separate NPDES permit. More detail about the program that must be implemented to "*effectively*" prohibit non-storm water discharges to the Copermittees' MS4s is provided under the discussion for Provision E.2.

Provision A.1.d was included to be consistent Resolution No. 2012-0012, adopted by the State Water Board on March 20, 2012. Provision A.1.d prohibits discharges from MS4s to Areas of Special Biological Significance (ASBS), except for storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach to the Heisler Park ASBS subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012. The pertinent Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 are provided in Attachment A to the Order.

<u>Provision A.2 (Receiving Water Limitations)</u> specifies the condition of the receiving waters that must be achieved when there are discharges from the Copermittees' MS4s. Receiving water limitations are included in all NPDES permits issued pursuant to the CWA section 402. CWA section 402(p)(3)(B)(iii) authorizes the inclusion of "*such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." This requirement gives USEPA or the State permitting authority, in this case the San Diego Water Board, discretion to determine what permit conditions are necessary to control pollutants.

In its Phase I Final Rule (see 55 FR 47990, 47994 (Nov. 16, 1990)), USEPA elaborated on these requirements, stating that, "*permits for discharges from municipal separate storm sewer systems must require controls to reduce the discharge of pollutants to the maximum extent practicable, and where necessary water quality-based controls*." USEPA reiterated in its Phase II Final Rule (64 FR 68722, 68737), that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL*." CWC section 13377 also requires that NPDES permits include limitations necessary to implement water quality control plans. Both the State Water Board and the San Diego Water Board have previously concluded that discharges from the MS4 contain pollutants that have the reasonable potential to cause or contribute to excursions above water quality

standards. As such, inclusion of receiving water limitations is appropriate to control MS4 discharges.

The inclusion of receiving water limitations is also consistent with the Ninth Circuit Court of Appeals' ruling in *Defenders of Wildlife v. Browner* (191 F.3d 1159, 1166 (1999)) that the permitting authority has discretion regarding the nature and timing of requirements that it includes as MS4 permit conditions to attain water quality standards. The Ninth Circuit Court of Appeals recently explained that, "*[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*" (*Natural Resources Defense Council v. County of Los Angeles* (9th Cir. 2011) 673 F.3d 880, 886 (revd. On other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013)))

The receiving water limitations included in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan or in water quality control plans or policies adopted by the State Water Board, including State Water Board Resolution No. 68-16, or in federal regulations, including but not limited to 40 CFR 131.12 and 131.38. The water quality objectives in the Basin Plan and other State Water Board plans and policies have been approved by USEPA and combined with designated beneficial uses constitute the water quality standards required under federal law.

Provision A.2.a requires that discharges from the Copermittees' MS4s must not cause or contribute to the violation of water quality standards in receiving waters. The water quality standards of the receiving waters must be protected from the impacts that may be caused by the Copermittees' MS4 discharges. Water quality standards applicable to the surface waters in the San Diego Region must be achieved through meeting the technology based standard of MEP through an iterative process of improved management actions. Provision A.2.a is also consistent with State Water Board Order WQ 99-05 precedent-setting language requiring discharges from MS4s to attain receiving water quality standards. The water quality control plans and policies with water quality standards applicable to the waters in the San Diego Region are included under Provision A.2.a.

Provisions A.2.b was included to be consistent with the requirements of State Water Board Resolution No. 2012-0012, adopted on March 20, 2012.

<u>Provision A.3 (Effluent Limitations)</u> specifies the condition of the discharges from the Copermittees' MS4s that must be achieved if and when there are discharges.

Consistent with CWA section 301(b)(1)(A) and 40 CFR 122.44(a), Provision A.3.a includes the technology-based effluent limitations that must be included in the Order.

The technology-based effluent limits, representing the minimum level of control that must be imposed in a permit under CWA section 402, requires that pollutants in discharges of storm water from the Copermittees' MS4s be reduced to the MEP. This provision applies specifically to storm water discharges. Non-storm water discharges must be effectively prohibited, as required under Provision A.1.b. Non-storm water (dry weather) discharges from the MS4 are not considered storm water (wet weather) discharges and therefore are not subject to the MEP standard.

The technology-based MEP standard is an ever-evolving, flexible, and advancing concept. Neither Congress nor USEPA has specifically defined the term "maximum extent practicable." Congress established this flexible MEP standard so that the administrative bodies would have "*the tools to meet the fundamental goals of the Clean Water Act in the context of storm water pollution*." (*Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 884.) As knowledge about controlling storm water runoff and discharges continues to evolve, so does the knowledge which constitutes MEP. Reducing the discharge of pollutants in storm water from the MS4 to the MEP requires the Copermittees to assess each program component and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP.

The San Diego Water Board or the State Water Board ultimately define MEP, and may include requirements that provide specific guidance on what is expected to demonstrate MEP. It is the responsibility of the Copermittees to propose actions that implement BMPs to reduce storm water pollution to the MEP. In other words, the Copermittees' runoff management programs developed and implemented under the Order are the Copermittees' proposals for achieving MEP. Their total collective and individual activities conducted pursuant to their runoff management programs become their proposal for achieving MEP as it applies both to their overall effort, as well as to specific activities. Provisions B through E of the Order provides a minimum framework to guide the Copermittees in achieving the MEP standard for discharges of pollutants in storm water.

Provision A.3.b incorporates any water quality based effluent limitations (WQBELs) applicable to the MS4s established for TMDLs adopted and approved for the San Diego Region and requires the Copermittees to comply with those WQBELs. This is consistent with 40 CFR 122.44(d)(1)(vii)(B), which requires that NPDES permits to incorporate WQBELs "*developed to protect a narrative water quality criterion, a numeric water quality criterion, or both…consistent with the assumptions and requirements of any available wasteload allocation for the discharge...*"

Pursuant to CWA section 303(d), for surface water bodies identified as impaired by one or more pollutants, the San Diego Water Board is required to establish TMDLs "*at a level necessary to implement the applicable water quality standards with seasonal variations and a margin of safety which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality*." The

TMDLs identify sources of the pollutants causing the impairments and assign portions of the TMDL as WLAs to point sources, which include MS4s.

WLAs must be expressed in NPDES permits as WQBELs, which may include one or more numeric components such as numeric effluent limits, and/or receiving water limitations, and/or BMP requirements. Because numeric targets for TMDLs typically include a component that will be protective of water quality standards, a TMDL will likely include one or more numeric receiving water limitations and/or effluent limitations as part of the assumptions or requirements of the TMDL. Any numeric receiving water limitations and/or effluent limitations developed as part of the assumptions or requirements of a TMDL must be incorporated and included as part of WQBELs for the MS4s.

Because the development and approval of new TMDLs, or modification of existing TMDLs, may occur during the term of this Order, the specific provisions of those TMDLs, including effluent limitations applicable to MS4s are provided within Attachment E to the Order. Attachment E will be updated with new TMDLs and modifications to existing TMDLs in a timely manner as they occur.

Provision A.4 (Compliance with Discharge Prohibitions and Receiving Water Limitations) describes the process required to be implemented by the Copermittees if compliance with the discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a are not being achieved under current conditions.

In its Phase II Stormwater Regulations, Final Rule, USEPA states that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL.*"[18] In a series of comment letters on MS4 permits issued by various Regional Water Boards, USEPA has also reiterated that MS4 discharges must meet water quality standards.[19] In addition, the Ninth Circuit Court of Appeals explained in a recent ruling that, *"[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*"[20]

[18] Phase II Stormwater Regulations, Final Rule, 64 Fed. Reg. 68722, 68737.
[19] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.
[20] NRDC v. County of Los Angeles (9th Cir. 2011), 673 F.3d 880, 886 (revd. on other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013))). See also, *Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 884-886, citing *Defenders of Wildlife v. Browning,* (9th Cir. 1999) 191 F.3d 1159.)

Water quality standards for the San Diego Region are established in the Basin Plan. The water quality standards of the Basin Plan are incorporated into this Order as the discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a. The discharge prohibitions and receiving water limitations in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations or prohibitions to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan, water quality control plans or policies adopted by the State Water Board, including Resolution No. 68-16, or federal regulations, including but not limited to, 40 CFR 131.12 and 131.38. The waste discharge prohibitions and water quality objectives in the Basin Plan have been approved by USEPA and combined with the designated beneficial uses constitute the water quality standards required under federal law.

Under federal law (CWA section 402(p)(3)(B)(iii)), an MS4 permit must include "*controls to reduce the discharge of pollutants to the maximum extent practicable...and such other provision as...the State determines appropriate for control of such pollutants*." The State Water Board has previously determined that limitations necessary to meet water quality standards are appropriate for the control of pollutants discharged by MS4s and must be included in MS4 permits. (State Water Board Orders WQ 91-03, 98-01, 99-05, 2001-15; see also *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159.) This Order prohibits discharges that cause or contribute to violations of water quality standards.

The discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a are included in this Order to ensure that discharges from the MS4s do not cause or contribute to exceedances of water quality objectives necessary to protect the beneficial uses of the receiving waters.

Provision A.4 is consistent with the precedent-setting language in State Water Board Order WQ 99-05 required to be included in municipal storm water permits. State Water Board Order WQ 2001-15 refined Order WQ 99-05 by requiring an iterative approach to compliance with water quality standards involving ongoing assessments and revisions, as referred to as the "iterative process." The "iterative process" is a fundamental NPDES requirement for municipal storm water permits to achieve the objectives of the CWA.

The State Water Board and Regional Water Boards have stated that the provisions under Provisions A.1.a, A.1.c, A.2.a, and A.4 are independently applicable, meaning that compliance with one provision does not provide a "safe harbor" where there is non-compliance with another provision (i.e., compliance with the Provision A.4 does not shield a Copermittee who may have violated Provision A.1.a, A.1.c, or A.2.a from an enforcement action). The intent of Provision A.4 is to ensure that the Copermittees have the necessary storm water management programs and controls in place, and that they are modified by the Copermittees in a timely fashion when necessary, so that compliance with Provisions A.1.a, A.1.c, and/or A.2.a is achieved as soon as possible. USEPA expressed the importance of this independent applicability in a series of

comment letters on MS4 permits proposed by various Regional Water Boards. At that time, USEPA expressly objected to certain MS4 permits that included language stating, *"permittees will not be in violation of this [receiving water limitation] provision … [if certain steps are taken to evaluate and improve the effectiveness of the jurisdictional runoff management programs],"* concluding that this phrase would not comply with the CWA.[21]

The Ninth Circuit held in *Natural Resources Defense Council v. County of Los Angeles* (2011) 673 F3d. 880, 886 (revd. on other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013))) that engagement in the iterative process does not provide a safe harbor from liability for violations of permit terms prohibiting exceedances of water quality standards. The Ninth Circuit holding is consistent with the position of the State and Regional Water Boards that exceedances of water quality standards in an MS4 permit constitute violations of permit terms subject to enforcement by the Water Boards or through a citizen suit. While the Water Boards have generally directed dischargers to achieve compliance by improving control measures through the iterative process, the San Diego Water Board retains the discretion to take other appropriate enforcement and the iterative process does not shield dischargers from citizen suits under the CWA.

The requirements of Provision A.4, therefore, are required to be implemented until the water quality standards expressed under Provisions A.1.a, A.1.c, and A.2.a are achieved. The CWA requires MS4 permits to "*require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." The requirements of this Order have been deemed or determined to be "appropriate" to achieve water quality standards in receiving waters.

Part of the "*controls*" required by the Order is the process described in Provision A.4. Provision A.4 includes the process that is ultimately expected to achieve compliance with the requirement that discharges from the MS4 do not cause or contribute to violations of water quality standards in the receiving waters. The implementation of Provision A.4 is required when the Copermittees or the San Diego Water Board have determined that discharges from the MS4 are causing or contributing to violations of water quality standards in the receiving waters.

The Copermittees must effectively prohibit non-storm water discharges into the MS4s, reduce the discharge of pollutants in storm water from the MS4s to the MEP, and ensure that their MS4 discharges do not cause or contribute to violations of water quality standards. If the Copermittees have effectively prohibited non-storm water

[21] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.

discharges and reduced storm water pollutant discharges to the MEP, but their discharges are still causing or contributing to violations of water quality standards, Provision A.4 provides a clear “iterative process” for the Copermittees to follow.

Provision A.4 essentially requires the Copermittees to implement additional BMPs until MS4 discharges no longer cause or contribute to a violation of water quality standards.

In assessing compliance and potential enforcement actions, the San Diego Water Board looks at the Copermittees’ efforts in total to meet the requirements of Provisions A.1.a, A.1.c, A.2.a and Provision A.4. The Copermittees need to demonstrate that they are making improvements to their programs and making progress toward achieving the discharge prohibitions and receiving water limitations in Provisions A.1.a, A.1.c, and A.2.a by implementing the requirements of Provision A.4. The San Diego Water Board would consider these efforts prior to strictly enforcing the requirements of Provisions A.1.a, A.1.c, and A.2.a. Causes of exceedances of the receiving water limitations can often be more difficult to identify and attribute solely to the Copermittees’ MS4s. The intent of the Order is to provide the Copermittees more clarity and flexibility in addressing these exceedances through the iterative approach and adaptive management process until the requirements under Provisions A.1.a, A.1.c, and A.2.a are fully achieved.

An exception to the iterative approach and adaptive management process would be in receiving waters subject to adopted and approved TMDLs. For TMDLs that are incorporated into the Order, there is a specific date for compliance to be achieved, after which the iterative approach and adaptive management process required under Provision A.4 no longer provides the flexibility to achieve compliance. Where compliance dates for a TMDL have passed, compliance with the WQBELs incorporated into the Order established by a TMDL in Attachment E to protect water quality standards is required. Thus, after the interim or final compliance dates for a TMDL have passed, if the discharges from the Copermittees’ MS4s are causing or contributing to a violation of WQBELs, exceedances of WQBELs must be strictly enforced by the San Diego Water Board. In the meantime, however, the Copermittees are in compliance with the interim or final TMDL requirements in Attachment E as long as the interim or final WQBELs are being achieved in accordance with the interim or final compliance dates.

B. Water Quality Improvement Plans

Purpose: Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges to the MS4s and control pollutants in storm water discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the Clean Water Act.

Provision B includes requirements for the Copermittees to develop and implement Water Quality Improvement Plans to ultimately comply with the prohibitions and limitations under Provision A. The Water Quality Improvement Plans will provide the Copermittees a comprehensive program that can achieve the requirements and further the objectives of the CWA. Implementation of the Water Quality Improvement Plans will also improve the quality of the receiving waters in the San Diego Region.

The Water Quality Improvement Plan is the backbone of the Regional MS4 Permit requirements. Provision B provides the guidance, criteria, and minimum expectations and requirements for the elements of the Water Quality Improvement Plan to be developed and implemented by the Copermittees. The Water Quality Improvement Plans will be implemented in the Watershed Management Area by the Copermittees within their jurisdictions through their jurisdictional runoff management programs.

The Water Quality Improvement Plan also incorporates a program to monitor and assess the progress of the Copermittees' jurisdictional runoff management programs toward improving the quality of discharges from the MS4s, as well as tracking improvements to the quality of receiving waters. A process to adapt and improve the effectiveness of the Water Quality Improvement Plans has also been incorporated into the requirements of Provision B to be consistent with the "iterative approach" required to achieve compliance with discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a, pursuant to the requirements of Provision A.4.

The Water Quality Improvement Plans have also been structured to incorporate the requirements of any TMDLs that have been adopted for the San Diego Region. Incorporating the requirements of the TMDLs into the requirements of Provision B allows the Copermittees to develop a single plan, instead of separate plans, to coordinate their non-storm water and storm water runoff management programs. The Water Quality Improvement Plans allow the Copermittees to meet the requirements of this Order, as well as fulfill the requirements of the TMDLs.

As an added benefit, if the Copermittees demonstrate that impaired water bodies within the Watershed Management Area listed on the 303(d) List will be addressed with their Water Quality Improvement Plans in a reasonable period of time, the San Diego Water Board may be able to remove the water bodies from the 303(d) List, which would greatly reduce the need for the San Diego Water Board to develop additional TMDLs that would have to be incorporated into the Order and implemented by the Copermittees.

***Discussion*:** The federal NPDES regulations require the Copermittees to develop a proposed management program (40 CFR 122.26(d)(2)(iv)). The proposed management program must include "*a comprehensive planning process*" and "*where necessary intergovernmental coordination*" for the "*duration of the permit.*" The Water Quality Improvement Plan is the Copermittees' "*comprehensive planning process*" document for the proposed management program that will be implemented within a Watershed Management Area. Implementation of the Water Quality Improvement Plan requires "*intergovernmental coordination*" among the Copermittees for at least the "*duration of the permit*," and likely into and beyond the next iteration of the permit.

Developing Water Quality Improvement Plans based upon watersheds is consistent with federal regulations that support the development of permit conditions, as well as implementation of storm water management programs, at a watershed scale (40 CFR 122.26(a)(3)(ii), 122.26(a)(3)(v), and 122.26(d)(2)(iv)). In 2003, USEPA issued a Watershed-Based NPDES Permitting Policy Statement (USEPA, 2003) that defines watershed-based permitting as an approach that produces NPDES permits that are issued to point sources on a geographic or watershed basis. In this policy statement, USEPA explains that "*[t]he utility of this tool relies heavily on a detailed, integrated, and inclusive watershed planning process*." USEPA identifies a number of important benefits of watershed permitting, including more environmentally effective results, the ability to emphasize measuring the effectiveness of targeted actions on improvements in water quality, reduced cost of improving the quality of the nation's waters and more effective implementation of watershed plans, including TMDLs, among others.

An emphasis on watersheds is appropriate at this stage in the San Diego Region's MS4 program to shift the focus to more targeted, water quality driven planning and implementation. Addressing discharges on a watershed scale focuses on water quality results by emphasizing the receiving waters in the watershed. The conditions of the receiving waters drive management actions, which in turn focus measures to address pollutant contributions from MS4 discharges.

The Water Quality Improvement Plan gives the Copermittees the responsibility of developing a comprehensive plan to coordinate the efforts of their jurisdictional runoff management programs for addressing the problems related to MS4 discharges causing impacts to water quality in the Watershed Management Area. The development of the plan provides the Copermittees the opportunity to provide significant input on how to implement their jurisdictional runoff management programs, and how to best utilize their available resources in addressing a focused set of

priorities that they believe will result in measureable improvements to water quality within the Watershed Management Area.

The Copermittees are encouraged to separate the Watershed Management Area into subwatersheds, as appropriate. This allows the Copermittees to identify priorities applicable to a subset of the Copermittees or specific water bodies or areas within the Watershed Management Area.

Included in the requirements for the elements to be included in the Water Quality Improvement Plan are monitoring and assessment requirements that are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order. In addition to the federal requirements of the CWA section 308(a) and 40 CFR 122.26(d), the San Diego Water Board has the authority to establish monitoring, reporting, and recordkeeping requirements for NPDES permits under CWC 13383.

More specific and detailed discussions of the requirements of Provision B are provided below.

Provision B.1 (Watershed Management Areas) requires the Copermittees to develop a Water Quality Improvement Plan for each of the Watershed Management Areas defined by the San Diego Water Board.

Pursuant to 40 CFR 122.26(d)(2)(iv), proposed management programs "*may impose controls on a…watershed basis…*" The Water Quality Improvement Plan is the Copermittees' proposed management program. A Water Quality Improvement Plan must be developed for each Watershed Management Area identified in the Order.

The Watershed Management Areas are identified in Table B-1. Table B-1 establishes ten (10) Watershed Management Areas, and identifies the Copermittees that are responsible for developing and implementing the Water Quality Improvement Plan for each Watershed Management Area.

The Copermittees from each of the three counties within the San Diego Region are expected to be phased in as their respective NPDES municipal storm water permits expire. Because Order No. R9-2007-0001 expired in January 2012, the San Diego County Copermittees were covered under the Regional MS4 Permit on June 27, 2013, the effective date of the Order. Because Order No. R9-2009-0002 expired in December 2014, the Orange County Copermittees are covered under the Regional MS4 Permit on April 1, 2015, the effective date of Order No. R9-2013-0001 as amended by Order No. R9-2015-0001.

After the San Diego Water Board receives and considers the Report of Waste Discharge required to be submitted by the Riverside County Copermittees pursuant to the requirements of their current permit, and makes any necessary changes to the Order, the Riverside County Copermittees will be covered under the Regional MS4

Permit after Order No. R9-2010-0016 expires in December 2015.

The Riverside County Copermittees also have the option to obtain coverage under the Regional MS4 Permit earlier than their respective permit expiration dates. The process to apply for early coverage is described Provision F.6.

Because the Santa Margarita River Watershed Management Area includes Copermittees from both San Diego County and Riverside County, a footnote to Table B-1 has been included to specify that the requirements of Provision B are not required to be implemented by the County of San Diego until the Riverside County Copermittees have received a notice of coverage under the Order. Until the Riverside County Copermittees are notified of coverage under the Order, the County of San Diego is subject to the prohibitions and limitations under Provision A, responsible for continuing to implement its existing jurisdictional runoff management program, and responsible for implementing the transitional monitoring and assessment requirements of Provision D, the transitional annual reporting requirements of Provision F.3.b, and the TMDL requirements of Attachment E to the Order.

The City of Laguna Woods and Laguna Hills are located partially within the jurisdictions of both the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board) and the San Diego Water Board. Written requests for designation of a single Regional Water Board to regulate matters pertaining to permitting of Phase I MS4 discharges were submitted to the San Diego Water Board and the Santa Ana Water Board by the City of Laguna Woods by letter dated September 8, 2014, and the City of Laguna Hills by letter dated March 12, 2014. The Cities of Laguna Woods and Laguna Hills requested designation of the San Diego Water Board pursuant to CWC section 13228. The Cities of Laguna Woods and Laguna Hills reported that management and implementation of municipal programs to comply with two different Phase I MS4 permits creates a significant administrative and financial burden and inhibits their ability to contribute to greater overall water quality improvements in either Region. In an effort to address these concerns, the San Diego Water Board and the Santa Ana Water Board have entered into an agreement dated February 10, 2015, whereby the San Diego Water Board is designated to regulate Phase I MS4 discharges within the jurisdiction of the Cities of Laguna Woods and Laguna Hills including areas in the Santa Region upon the later effective date of this Order or Tentative Order No. R8-2015-0001. Under the terms of the agreement, each Regional Water Board retains the authority to enforce provisions of the Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee (Water Code section 13228 (b)). Also under the terms of the agreement, any TMDL and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Laguna Woods or Laguna Hills as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement of the applicable TMDL would remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa

Ana Water Boards' San Diego Creek/Newport Bay TMDL and the San Diego Water Boards indicator Bacteria Project I Beaches and Creeks TMDL. In conformance with this agreement, a footnote to Table B-1 has been included to specify coverage under Order No. R9-2013-0001 for those Phase I MS4 discharges within the jurisdictional boundaries of the Cities of Laguna Woods and Laguna Hills within the Santa Ana Region. The footnote specifies that the City of Laguna Woods and Laguna Hills are identified as responsible Copermittees in the San Diego Creek/Newport Bay TMDL in the Santa Ana Region and remain obligated to comply with the San Diego Creek/Newport Bay TMDL pursuant to section XVIII of Tentative Order No. R8-2015-0001 (NPDES No. CAS618030) and any reissuance thereof.

The City of Lake Forest is located partially within the jurisdictions of both the Santa Ana Water Board and the San Diego Water Board. By letters dated January 14, 2013 and April 4, 2014 the City of Lake Forest submitted a written request, pursuant to CWC section 13228, to the San Diego Water Board and the Santa Ana Water Board requesting the Santa Ana Water Board be designated to regulate matters within the City of Lake Forest pertaining to permitting of their Phase I MS4 discharges. The City of Lake Forest reported that management and implementation of municipal programs to comply with two different Phase I MS4 permits creates a significant administrative and financial burden and inhibits their ability to contribute to greater overall water quality improvements in either Region. In an effort to address these concerns, the San Diego Water Board and the Santa Ana Water Board have entered into an agreement dated February 10, 2015, whereby the Santa Ana Water Board is designated to regulate Phase I MS4 discharges within the jurisdiction of the City of Lake Forest within the San Diego Region upon the later date of this Order or Santa Ana Water Board Tentative Order No. R8-2015-0001. Under the terms of the agreement, each Regional Water Board retains the authority to enforce provisions of the Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee (Water Code section 13228 (b)). Also under the terms of the agreement, any TMDL and associated Phase I MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the City of Lake Forest as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement authority for the applicable TMDL would remain with the Regional Water Board which has the jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Boards' San Diego Creek/Newport Bay TMDL and the San Diego Water Boards' indicator Bacteria Project I Beaches and Creeks TMDL. In conformance with this agreement, a footnote to Table B-1 has been included to specify that Phase I MS4 discharges within the jurisdictional boundaries of the City of Lake Forest located within the San Diego Region will be regulated under Santa Ana Water Board Order No. R8-2015-0001 (NPDES No. CAS618030) and any reissuance thereof. The footnote specifies that the City of Lake Forest is an identified responsible Copermittee in the Indicator Bacteria Project I Beaches and Creeks TMDL (Bacteria TMDL) in the San Diego Region and remains obligated to comply with the Bacteria TMDL pursuant to Attachment E of Order No. R9-2013-0001 and any reissuance thereto. The City is

also identified as a responsible Copermittee in the San Diego Creek/Newport Bay TMDL established by the Santa Ana Water Board. The City remains obligated to comply with the San Diego Creek/New Port Bay TMDL pursuant to the Santa Ana Water Board's Phase I MS4 Permit (Tentative Order No. R8-2015-0001 (NPDES No. CAS618030). Under the terms of the agreement, the City of Lake Forest must retain and continue implementation of the over irrigation prohibition in Title 15, Chapter 15, Section 14.030, List (b) of the City Municipal Code throughout its jurisdiction. Also under the terms of the agreement, the City of Lake Forest must actively participate in the development and implementation of the Aliso Creek Watershed Management Area Water Quality Improvement Plan required pursuant to Order No. R9-2013-0001, and any reissuance thereof.

The bases supporting the Cities of Laguna Woods, Laguna Hills, and Lake Forest requests to designate a specific Regional Water Board for regulatory oversight of Phase I MS4 discharges may change under future conditions and circumstances, therefore the San Diego Water Board will periodically review the effectiveness of the agreement during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate the agreement with the Santa Ana Water Board or otherwise modify the agreement subject to the approval of the Santa Ana Water Board.

Provision B.2 (Priority Water Quality Conditions) requires the Copermittees in each Watershed Management Area to identify the highest priority water quality conditions which will be the focus of the Water Quality Improvement Plan implementation.

Provisions B.2.a and B.2.b provide the criteria that must be assessed when characterizing the receiving water quality and potential impacts from MS4 discharges of the receiving waters within the Watershed Management Area. The criteria are based primarily on the requirements in 40 CFR 122.26(d)(1)(iv)(C) and (C)(1)-(9). Characterizing the receiving water quality and identifying the potential impacts caused by MS4 discharges to receiving waters in the Watershed Management Area is necessary to identify the impacts to receiving waters associated with MS4 discharges that are of the most concern to the Copermittees.

Based on the information required to be considered under Provisions B.2.a and B.2.b, Provision B.2.c requires to Copermittees to identify the highest priority water quality conditions related to discharges from the MS4s that will be the primary focus of the Water Quality Improvement Plan in the Watershed Management Area. Addressing and improving these highest priority water quality conditions will become the focus of each Copermittee's jurisdictional runoff management program as the Water Quality Improvement Plan is implemented in the Watershed Management Area. The highest priority water quality conditions are expected to include source of pollutants and/or stressors, and/or receiving water conditions, that the Copermittees consider the highest threats or most likely to have adverse impacts on the physical, chemical, and biological integrity of receiving waters. Addressing these threats and/or adverse impacts should restore the physical, chemical, and biological integrity of receiving

waters, and result in the restoration and protection of the beneficial uses of the receiving waters in the Watershed Management Area.

Provision B.2.d requires the Copermittees to identify known and suspected sources of pollutants and/or stressors contributing to the highest priority water quality conditions. The requirements of Provision B.2.d are based primarily on the requirements in 40 CFR 122.26(d)(1)(iii)(B)(1)-(6). The Copermittees are required to evaluate several factors in the identification of those sources. The Copermittees must consider and evaluate the following: (1) the land uses that may contribute toward impacts to receiving waters, (2) the locations of the Copermittees' MS4s that can convey and discharge runoff and pollutants to receiving waters, (3) other sources that discharge into the Copermittees' MS4s and receiving waters, and (4) other information and data that can help the Copermittees to evaluate the relative importance of or contribution from those sources toward the highest priority water quality conditions. Identifying the known and suspected sources, and their relative contribution toward the highest priority water quality conditions, will help the Copermittees to focus, direct, and prioritize their resources and implementation efforts within their jurisdictions.

Provision B.2.e requires the Copermittees to identify potential strategies that can result in improvements to water quality in MS4 discharges and/or receiving waters within the Watershed Management Area. Potential water quality improvement strategies will not necessarily be implemented by the Copermittees, but provide a "menu" of options that the Copermittees will consider for implementation. The public participation process that will be implemented during the development of the Water Quality Improvement Plan is where the potential water quality improvement strategies will be identified.

<u>Provision B.3 (Water Quality Improvement Goals, Strategies and Schedules)</u> requires the Copermittees in each Watershed Management Area to identify the goals that the Copermittees' jurisdictional runoff management programs will work toward achieving to address and improve the highest priority water quality conditions identified under Provision B.2.c; the strategies that will be implemented by the Copermittees within their jurisdictions and the Watershed Management Area to achieve the goals; and, the schedules for implementing the strategies and achieving the goals. The element of the Water Quality Improvement Plan required under Provision B.3 is where the "*comprehensive planning*" and "*intergovernmental coordination*" [40 CFR 122.26(d)(2)(iv)] of the Copermittees' actions for the proposed management programs within the Watershed Management Area is required to be described.

Provision B.3.a requires the Copermittees to identify interim and final numeric goals, and schedules to achieve those goals as part of the Water Quality Improvement Plans. Provision B.3.a.(1) requires the Copermittees to identify two types of numeric goals to be achieved:

(1) Final numeric goals in the receiving waters and/or MS4 discharges that will result in the protection of the water quality standards of the receiving waters for the highest priority water quality conditions identified by the Copermittees for Provision B.2.c. These final numeric goals are the ultimate goals for the Water Quality Improvement

Plan, and the achievement and maintenance of these final numeric goals will indicate that one or more beneficial uses have been successfully restored and/or protected from MS4 discharges.

(2) Interim numeric goals that can be used by the Copermittees to demonstrate progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges for the highest priority water quality conditions in the Watershed Management Area. Achievement of the interim numeric goals will demonstrate to the San Diego Water Board that the Copermittees' implementation efforts are progressing toward achieving the final numeric goals.

Provision B.3.a.(1) does not specify what the interim and final numeric goals must be based on, but they essentially must be designed to achieve compliance with water quality standards in the receiving waters. To that end, the interim goals must be based on measureable criteria or indicators capable of demonstrating progress toward achieving the numeric goals."

The interim and final numeric goals can be based on the water quality objectives in the Basin Plan. The water quality objectives in the Basin Plan, however, consist of numeric and narrative water quality objectives. Numeric water quality objectives can be directly used as numeric goals. Narrative water quality objectives, on the other hand, will require some interpretation to identify numeric goals. The achievement of multiple numeric goals based on the water quality objectives, used in combination, may be necessary to demonstrate that beneficial uses have been restored and/or protected.

The Copermittees could also propose other numeric goals that are not necessarily water quality objectives from the Basin Plan. For example, the Copermittees could propose a numeric goal that consists of achieving some percent improvement of a measureable indicator, such as acreage of a specific habitat or increase in a specific plant or animal species population. Other examples may include pollutant load reductions, number of impaired waterbodies delisted from the List of Water Quality Impaired Segments, Index of Biological Integrity (IBI) scores, etc.

The Copermittees may choose to develop interim numeric goals based on the final numeric goals they develop, such as incremental steps toward ultimately achieving the final numeric goals. The Copermittees may also choose to develop interim numeric goals that are based on other measureable indicators that can indirectly indicate improvements and progress toward the final numeric goals.

There are no limits to the types of interim numeric goals that could be proposed by the Copermittees, other than the goals must be based on measureable criteria or indicators capable of demonstrating progress toward achieving the numeric goals. Likewise, there are no limits to the types of final numeric goals that could be proposed by the Copermittees, other than the goals must "*restore and protect the water quality standards of the receiving waters.*"

Finally, Provision B.3.a.(2) also requires the Copermittees to develop schedules for measuring progress and achieving the interim and final numeric goals. Several criteria are included for the development of the schedules, but the Copermittees are required to achieve the numeric goals as soon as possible, consistent with federal NPDES regulations (40 CFR 122.47(a)(1)).

The Copermittees are also required to incorporate any compliance schedules for any applicable ASBS or TMDL requirements. Applicable ASBS and TMDL compliance schedules are set forth in Attachment A and Attachment E to the Order, respectively. The information provided by the Copermittees under Provision B.3.a.(2) will be used by the Copermittees and the San Diego Water Board to gauge and track the progress of the Copermittees' efforts in addressing the highest priority water quality conditions identified in the Water Quality Improvement Plan.

Provision B.3.b requires the Copermittees to identify the strategies and schedules to implement those strategies as part of the Water Quality Improvement Plans. Provision B.3.b requires the Copermittees to identify the water quality improvement strategies that will be and may be implemented within the Watershed Management Area to 1) reduce of pollutants in storm water discharged from the MS4 to the MEP, 2) effectively prohibit non-storm water discharges from entering the MS4, 3) protect water quality standards in receiving waters by controlling MS4 discharges so that they do not cause or contribute to exceedances of receiving water limitations, and 4) achieve applicable WQBELs that implement TMDLs. The Copermittees will select the strategies to be implemented based on the likely effectiveness and efficiency of the potential water quality improvement strategies identified under Provision B.2.e to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, and/or achieve the interim and final numeric goals identified under Provision B.3.a.

Provision B.3.b.(1) requires each Copermittee to identify the strategies that will be or may be implemented within its jurisdiction. Each Copermittee is required to describe the strategies it is committed to implementing as part of its jurisdictional runoff management requirements under Provisions E.2 through E.7, and the optional jurisdictional strategies that the Copermittee will implement, as necessary, to achieve the numeric goals.

Each Copermittee is expected to implement the optional jurisdictional strategies identified under Provisions B.3.b.(1)(b) when the jurisdictional strategies it has committed to implement under Provision B.3.b.(1)(a) are not making adequate progress toward the interim and final numeric goals in accordance with the schedules established under Provision B.3.a. Provision B.3.b.(1)(b)(v) requires each Copermittee to describe the circumstances necessary to trigger implementation of the optional jurisdictional strategies, in addition to the requirements of Provisions B.3.b.(1)(a).

The San Diego Water Board recognizes that there may be optional jurisdictional strategies that will likely require funding and/or resources for planning, permitting, procurement of labor and materials, and implementation. Thus, Provision B.3.b.(1)(b)(iv) requires each Copermittee to describe the funding and/or resources that are necessary to implement these optional jurisdictional strategies. This information may provide interested groups and members of the public an understanding of the resources that they could provide or assist in obtaining to implement these optional jurisdictional strategies.

Provision B.3.b.(2) requires the Copermittees in the Watershed Management Area to identify the regional or multi-jurisdictional strategies that may be implemented, as necessary, to achieve the numeric goals. Similar to the requirements of Provision B.3.b.(1)(b), these regional or multi-jurisdictional strategies will likely require funding and/or resources for planning, permitting, procurement of labor and materials, and implementation, and San Diego Water Board recognizes that these strategies may be difficult to implement with only Copermittee resources. Thus, Provision B.3.b.(2)(d) requires the Copermittees to describe the funding and/or resources necessary to implement these optional regional or multi-jurisdictional strategies. This information may provide interested groups and members of the public an understanding of the resources that they could provide or assist in obtaining to implement these optional regional or multi-jurisdictional strategies.

Provision B.3.b.(3) requires the Copermittees to develop and include schedules in the Water Quality Improvement Plan for implementing the water quality improvement strategies identified under Provisions B.3.b.(1) and B.3.b.(2). The schedule for implementing the water quality improvement strategies will be used by the Copermittees and San Diego Water Board to measure and demonstrate the progress of the Copermittees' implementation efforts toward reducing pollutants in storm water discharged from the MS4 to the MEP, and eliminating illicit non-storm water discharges from entering the MS4.

Provision B.3.b.(4) provides the Copermittees in each Watershed Management Area the option of implementing watershed-specific structural BMP requirements for Priority Development Projects. Historically, storm water permits have included very specific performance standards for permanent, structural BMPs. These standards describe the expectation for the capture or treatment of pollutants and control of excessive flow before storm water is discharged from a site. The Copermittees were also allowed to develop waiver programs for Priority Development Projects to avoid implementing the structural BMPs; however, the waiver programs were not necessarily tied into any sort of holistic watershed strategy. The result is that implementation of BMP requirements is largely done on a site-by-site basis. This requires proper design on the part of the Priority Development Project and strict oversight on the part of the Copermittee.

Provision B.3.b.(4) promotes the evaluation of multiple strategies for water quality improvement, in addition to the implementation of permanent structural BMPs, on a watershed-scale versus the site-by-site approach. In a report issued by the Southern

California Coastal Water Research Project (SCCWRP) and several other research institutions, the report emphasized that a successful hydromodification management program will involve watershed analysis as a first step, and that integrating multiple watershed-based strategies is preferable over a site-by-site approach. Indeed, the report states that the watershed analysis "…*should lead to identification of existing opportunities and constraints that can be used to help prioritize areas of greater concern, areas of restoration potential, infrastructure constraints, and pathways for potential cumulative effects*."[22] Provision B.3.b.(4) promotes the findings and recommendations of the report by providing a pathway for Copermittees to develop an integrated approach to their land development programs.

Under Provision B.3.b.(4), the Copermittees in a Watershed Management Area must first perform an analysis by gathering as much information pertaining to the physical characteristics of the Watershed Management Area as possible. This includes, for example, identifying potential areas of coarse sediment supply, present and anticipated future land uses, and locations of physical structures within receiving streams and upland areas that affect the watershed hydrology (such as bridges, culverts, and flood management basins). Once this information is collected, the Copermittees must produce GIS layers (maps) that include this information.

From there, the Copermittees must use the results of the Watershed Management Area Analysis to identify and compile a list of candidate projects that could potentially be used as alternative compliance options for Priority Development Projects. Such projects include, for example, opportunities for stream or riparian area rehabilitation, opportunities for retrofitting existing infrastructure to incorporate storm water retention or treatment, and opportunities for regional BMPs, among others. Once these candidate projects are identified, Copermittees may allow Priority Development Projects to fund, partially fund, or completely implement these candidate projects. The Copermittees must first find that implementing such a candidate project would provide greater overall benefit to the watershed than requiring implementation of the structural BMPs onsite, and also enter into a voluntary agreement with the Priority Development Project that authorizes this arrangement. The Copermittees may use Provision B.3.b.(4) as both 1) a mechanism to reach their stated goals of the Water Quality Improvement Plan by using Priority Development Projects to either fund or implement projects that will provide water quality benefit, and 2) an alternative to requiring strict adherence to the structural BMP design standards.

Additionally, Provision B.3.b.(4) allows the Copermittees to use the results of the Watershed Management Area Analysis to identify areas within the Watershed Management Area where it is appropriate to allow Priority Development Projects to be exempt from the hydromodification management BMP performance requirements. Provision E.3.c.(2) already allows exemptions for Priority Development Projects that discharge to a conveyance channel whose bed and bank are concrete lined from the

[22] 2012. ED Stein, F Federico, DB Booth, BP Bledsoe, C Bowles, Z Rubin, GM Kondolf, A Sengupta. Technical Report 667. Southern California Coastal Water Research Project. Costa Mesa, CA.

point of discharge to an enclosed embayment or the Pacific Ocean. However, there may be cases where further exemptions are warranted. The Copermittees may identify such cases on a watershed basis and include them in the Watershed Management Area Analysis; however, they must provide the supporting rationale to support all claims for exemptions.

Provision B.3.b.(4) provides an innovative pathway for Copermittees to regulate their land development programs by allowing alternative compliance in lieu of implementing structural BMPs on each and every Priority Development Project. This approach facilitates the integration of watershed-scale solutions for improving overall water quality and assisting Copermittees to achieve their stated goals of the Water Quality Improvement Plan. The San Diego Water Board understands, however, that undertaking this approach, which involves extensive planning, could be resource intensive for the Copermittees. Therefore, the Watershed Management Area Analysis is optional and not a requirement. The Copermittees can choose not to perform the watershed planning and mapping exercise described in Provision B.3.b.(4), and instead choose to require strict implementation of the structural BMPs onsite, pursuant to Provision E.3.b.

Provision B.4 (Water Quality Improvement Monitoring and Assessment) requires the Copermittees to develop an integrated monitoring and assessment program to track the progress of the Water Quality Improvement Plan toward meeting the implementation goals and schedules, and improving the water quality of the Watershed Management Area. Provision B.4 is the part of the Water Quality Improvement Plan where the Copermittees describe the monitoring data that will be collected, which is not only necessary to implement the "iterative approach" required by Provision A.4, but inform the adaptive management and "*comprehensive planning process*" that allows the Copermittees to make adjustments and modifications to the Water Quality Improvement Plans and the jurisdictional runoff management programs.

Provision B.4 requires the Copermittees, at a minimum, to include the requirements of Provision D as part of the water quality improvement monitoring and assessment program for the Water Quality Improvement Plan. The Copermittees, however, are not limited to the requirements of Provision D and may include additional monitoring and assessment methods to track progress toward improving water quality in the Watershed Management Area.

In addition to incorporating the requirements of Provision D, the water quality improvement monitoring and assessment program must incorporate any monitoring and assessment requirements specified for any applicable TMDLs included in Attachment E to the Order, and the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 for Watershed Management Areas with ASBS.

The monitoring and assessments required to be incorporated into the Water Quality Improvement Plan are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order.

Provision B.5 (Iterative Approach and Adaptive Management Process) requires the Copermittees to implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a.

Provision B.5 requires the Copermittees in each Watershed Management Area to re-evaluate the highest priority water quality conditions and potential water quality improvement strategies, the water quality improvement goals, strategies and schedules, and the water quality improvement monitoring and assessment program and provide recommendations for modifying those elements to improve the effectiveness of the Water Quality Improvement Plan. The re-evaluation of the Water Quality Improvement Plan is part of the assessment requirements of Provision D.

Provision B.6 (Water Quality Improvement Plan Submittal, Updates, and Implementation) requires to Copermittees to submit, update, and implement the Water Quality Improvement Plans.

The requirements for the process to develop and submit the Water Quality Improvement Plans is described in more detail under the discussion for Provision F.1. The process will include several opportunities for the public to provide input during the development of the Water Quality Improvement Plans. The process for updating the Water Quality Improvement Plans is described in more detail under the discussion for Provision F.3.c. Upon acceptance of the Water Quality Improvement Plan and updates, the Copermittees are required to immediately begin implementing the Water Quality Improvement Plan and subsequent updates.

The Water Quality Improvement Plan is expected to be a dynamic document that will evolve over time. The Water Quality Improvement Plan is also expected to be a long term plan that focuses the Copermittees' efforts and resources on a limited set of priority water quality conditions, with the ultimate goal of protecting all the beneficial uses of the receiving waters within the Watershed Management Area from impacts that may be caused or contributed to by MS4 discharges. As the Copermittees collect data, implement their jurisdictional runoff management programs, and review the results from their water quality improvement monitoring and assessment program, the Water Quality Improvement Plan is expected to be continually reviewed and updated until compliance with Provisions A.1.a, A.1.b, and A.2.a is achieved.

However, in specific cases supported by robust analytical documentation the implementation of the Water Quality Improvement Plans may demonstrate that TMDLs are not necessary for identified impaired water bodies within the Watershed Management Area if the analytical record demonstrates that technology-based effluent limitations required by the CWA, more stringent effluent limitations required by state, local, or federal authority, and/or other pollution control requirements (e.g., best management practices) required by local, state or federal authority are stringent enough to implement applicable

water quality standards within a reasonable period of time.[23]

The San Diego Water Board submits an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. According to USEPA guidance for the Integrated Report,[24] water bodies are placed in one of five categories. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 are placed on the 303(d) List.

Category 4 in the Integrated Report is for water bodies where available data and/or information indicate that at least one beneficial use is not being supported or is threatened, but a TMDL is not needed. [25] Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

Impaired water bodies can be included in Category 4a if a TMDL has been adopted and approved. The TMDLs in Attachment E to the Order implement the requirements of the TMDLs adopted by the San Diego Water Board, and approved by the State Water Board and USEPA. The water bodies in Attachment E will be included in Category 4a in the Integrated Report and removed from the 303(d) List.

Impaired water bodies can be included in Category 4b if there are *acceptable* "pollution control requirements" required by a local, state or federal authority stringent enough to implement applicable water quality standards within a reasonable period of time (e.g., a compliance date is set). When evaluating whether a particular set of pollution controls are "requirements," the USEPA considers a number of factors, including: (1) the authority (local, state, federal) under which the controls are required and will be implemented with respect to sources contributing to the water quality impairment (examples may include: self-executing state or local regulations, permits, and contracts and grant/funding agreements that require implementation of necessary controls), (2) existing commitments made by the sources and completion or soon to be completed implementation of the controls (including an analysis of the amount of actual implementation that has already occurred), (3) the certainty of dedicated funding for the implementation of the controls, and (4) other relevant factors as determined by USEPA depending on case-specific circumstances.[26]

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[23] 40 CFR 130.7(b)(1)
[24] USEPA, 2005. Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act
[25] Ibid
[26] Ibid

Impaired water bodies can be included in Category 4c if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution. Pollution, as defined by the CWA is "the man-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of water."[27] In other cases, pollution does not result from a pollutant and a TMDL is not required. Examples of circumstances where an impaired segment may be placed in Category 4c include segments impaired solely due to lack of adequate flow, stream channelization, or hydromodification. In these situations, there may be water quality management actions that can address the cause(s) of the impairment, but a TMDL may not be required to implement the actions.

The Water Quality Improvement Plans will require the implementation of pollution controls and water quality management actions (i.e. water quality improvement strategies) which can result in the attainment of water quality standards in water bodies impaired by discharges from the Copermittees' MS4s. The Water Quality Improvement Plans also include requirements that are expected to attain water quality standards in a reasonable period of time. The San Diego Water Board considers the Water Quality Improvement Plans to be a commitment by the Copermittees to develop, plan, budget for, and implement pollution controls that will attain water quality standards in receiving waters in a reasonable period of time, or as soon as possible. The results of the Copermittees' efforts in implementing the Water Quality Improvement Plans can be used to re-evaluate the condition of the impaired water bodies during the next update to the 303(d) List.

After the Copermittees submit the Water Quality Improvement Plans and demonstrate that water quality standards are being attained or will be attained in a reasonable period of time, the San Diego Water Board may re-evaluate the water bodies on the 303(d) List. These water bodies on the 303(d) List may be re-evaluated and placed into Category 4b or Category 4c in the Integrated Report. The water bodies placed in Category 4b or Category 4c in the Integrated Report must show a record that the water bodies are attaining water quality standards or supporting the identified beneficial uses, or will attain water quality standards or support identified beneficial uses in a reasonable period of time, in order for the water bodies to be appropriately removed from the 303(d) List.

[27] CWA section 502(19)

C. Action Levels

Purpose: Provision C includes requirements for the Copermittees to identify and include numeric action levels in the Water Quality Improvement Plan to direct and focus the Copermittees' jurisdictional runoff management program implementation efforts for controlling MS4 discharges to receiving waters.

***Discussion*:** Under Provision C, the numeric action levels required are for non-storm water discharges and storm water discharges. The non-storm water action levels (NALs) are applicable to non-storm water discharges from the Copermittees' MS4s, which can occur year-round. The storm water action levels (SALs) are applicable to storm water discharges from the Copermittees' MS4s, which occur during the rainy season defined as the period between October 1 and April 30.

The action levels required by Provision C are based on the action level requirements that were developed and incorporated into Order Nos. R9-2009-0002 and R9-2010-0016, the Orange County and Riverside County MS4 Permits, respectively. The Fact Sheets for these Orders provide detailed discussions about the development of the numeric NALs and SALs included in this Order.

Order Nos. R9-2009-0002 and R9-2010-0016 required the Copermittees to perform prescribed actions if the NALs or SALs are exceeded. The actions required under Order Nos. R9-2009-0002 and R9-2010-0016 generally included conducting additional monitoring and source investigations when a discharge from the MS4 is observed to exceed one or more NALs and/or SALs.

For this Order, however, the action levels of Provision C are to be used by the Copermittees to prioritize the actions to be implemented as part of the Water Quality Improvement Plan. Monitoring data collected by the Copermittees from MS4 outfalls will be compared with the NALs and SALs. Exceedances of the NALs and SALs will not require the Copermittees to immediately identify sources causing exceedances, but will provide some numeric indicator levels that can give the Copermittees a way to measure the relative severity of a pollutant contributing to receiving water quality impacts.

NALs and SALs must be included in the Water Quality Improvement Plans to be used by the Copermittees in directing and focusing their water quality improvement strategies. The Copermittees are expected to utilize the NALs and SALs to help focus their implementation efforts on addressing pollutants that have the most significant potential or observed impacts to receiving waters. The NALs and SALs will be used as part of the MS4 discharges assessments required under Provision D.4.b. The NALs and SALs may also be used by the Copermittees as the numeric goals to be achieved in MS4 discharges and/or receiving waters as the Water Quality Improvement Plans are implemented.

More specific and detailed discussions of the requirements of Provision C are provided below.

Provision C.1 (Non-storm Water Action Levels) requires the Copermittees to incorporate NALs into the Water Quality Improvement Plan for pollutants and/or constituents that are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions identified in the Water Quality Improvement Plan related to non-storm water discharges from the MS4s. NALs generally must be consistent with the water quality objectives found within the Basin Plan.

The NALs have been included to ensure that the Copermittees are implementing and complying with several requirements of the MS4 permit. The federal CWA requires permits for municipal storm sewer systems to "*effectively prohibit non-storm water discharges into the storm sewers*." The federal NPDES regulations, which were promulgated to implement the CWA requirements for discharges from municipal storm sewers, require a program to address illicit discharges, which are non-storm water discharges. Provision A.1.b prohibits "*[n]on-storm water discharges into MS4s*" unless the non-storm water discharge authorized by a separate NPDES permit. The NALs will be used as part of the illicit discharge detection and elimination program required pursuant to Provision E.2, as well as part of the MS4 discharges assessments required pursuant to Provision D.4.b.

Provision A.1.a prohibits non-storm water discharges from the MS4 from "*causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state.*" In addition, pursuant to Provision A.2.a, non-storm water discharges "*must not cause or contribute to the violation of water quality standards in any receiving waters*."

Ideally, the Copermittees' jurisdictional runoff management programs will eliminate all non-storm water discharges entering the MS4s within their jurisdictions. The complete elimination of non-storm water discharges to the Copermittees' MS4s would be in compliance with the CWA requirements for non-storm water discharges, as well as the prohibitions and limitations of Provisions A.1.a and A.2.a.

The federal regulations, however, also refer to several non-storm water discharge categories that must be addressed as illicit discharges if they are found to be a source of pollutants. The federal regulations thus identify some non-storm water discharges that are not required to be addressed as illicit discharges if they are not a source of pollutants (e.g. non-storm water discharges specified in Provisions E.2.a.(1)-(5)). Thus, these regulations imply that some non-storm water discharges into and from the MS4 may occur even if non-storm water discharges are "effectively" prohibited by the Copermittees.

If the source of a non-storm water discharge is identified as a category of non-storm water specified in Provisions E.2.a.(1)-(5), the NALs can be used to determine the category of non-storm water discharges is a source of pollutants. For other non-storm

water discharges not specified in Provisions E.2.a.(1)-(5), the CWA requires those discharges to be "*effectively"* prohibited by removing the discharge to the MS4 through enforcement of the Copermittees' legal authority established under "*ordinance, order or similar means*" to prohibit illicit discharges to the MS4s.

If there are non-storm water discharges that are not required to be addressed as illicit discharges, those discharges must comply, at a minimum, with the discharge prohibitions and receiving water limitations of Provision A. Thus, the non-storm water discharges from the MS4 must be at levels that will not cause or contribute to a condition of pollution, contamination, or nuisance (Provision A.1.a), and must not cause or contribute to a violation of water quality standards in receiving waters (Provision A.2.a) to be consistent with the discharge prohibitions and receiving water limitations of Provisions A.1.a and A.2.a.

Furthermore, the San Diego Region has predominantly intermittent and ephemeral rivers and streams which vary in flow volume and duration at spatial and temporal scales. For most of these river and stream systems, non-storm water discharges from the MS4 are likely to be the most significant or the only source contributing to surface flows present within the receiving water, especially during the dry season.

Therefore, because of the prohibitions and limitations of Provision A.1.a and A.2.a, and the likelihood that non-storm water discharges from the MS4 are the most significant or only source contributing to surface flows present within the receiving water, NALs generally must be consistent with the water quality objectives found within the Basin Plan. Non-storm water discharges that are meeting the NALs would not be expected to cause or contribute to an exceedance of water quality objectives in receiving waters, which would be consistent with the discharge prohibitions and receiving water limitations of Provisions A.1.a and A.2.a.

Exceedances of the NALs would then provide an indication of the relative severity of a pollutant in non-storm water discharges from the MS4 contributing to potential or observed receiving water quality impacts. The relative severity or significance of a pollutant in non-storm water discharges from the MS4 will provide the Copermittees a valuable source of information that can be used to identify priority water quality conditions within a Watershed Management Area and within each Copermittee's jurisdiction.

Tables C-1 through C-4 under Provision C.1.a specify numeric NALs for several parameters or pollutant constituents for non-storm water discharges from the MS4 to several water body types. The NALs for MS4 discharges given under Provision C.1.a are based on the water quality objectives for inland surface waters in the Basin Plan, and the water quality objectives for ocean waters in the Ocean Plan. The NALs for most of the metals were calculated based on the State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP). The NALs provided in Tables C-1

through C-4 must be included in the Water Quality Improvement Plans required to be developed pursuant to Provision B.

Provision C.1.b requires the Copermittees to identify NALs for pollutants and/or constituents, not specified in Provision C.1.a, which are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions of the Watershed Management Area related to non-storm water discharges from the MS4s. The NALs must be based on the water quality objectives in the Basin Plan. The NALs identified under Provision C.1.b must be included in the Water Quality Improvement Plan.

The San Diego Water Board recognizes that some of the NALs required pursuant to Provisions C.1.a and C.1.b may be exceeded more frequently than not. Thus, Provision C.1.c has been included in the Order to provide the Copermittees the option to develop secondary NALs that are set at levels greater than the levels required pursuant to Provisions C.1.a and C.1.b to further refine the prioritization and assessment of water quality improvement strategies for addressing non-storm water discharges to and from the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and from the MS4.

Provision C.2 (Storm Water Action Levels) requires the Copermittees to incorporate SALs into the Water Quality Improvement Plan for pollutants and/or constituents causing or contributing, or may be causing or contributing, to the highest priority water quality conditions identified in the Water Quality Improvement Plan related to storm water discharges from the MS4s.

The SALs have been included to ensure that the Copermittees are implementing and complying with several requirements of the MS4 permit. Provision A.1.a prohibits storm water discharges from the MS4 from "*causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state.*" In addition, pursuant to Provision A.2.a, storm water discharges "*must not cause or contribute to the violation of water quality standards in any receiving waters*."

Provision A.3.a, however, implicitly acknowledges that compliance with Provisions A.1.a and A.2.a cannot be achieved immediately for discharges of storm water from the MS4 by applying the MEP standard. Thus, Provision A.4 requires the Copermittees to implement an iterative approach to demonstrate that MEP is being achieved. This approach is supported by USEPA.

The federal CWA requires permits for municipal storm sewer systems to "*require controls to reduce the discharge of pollutants [in storm water] to the maximum extent practicable*, *including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants.*" MEP is an ever-evolving, flexible, and advancing concept. As knowledge about controlling storm water runoff

and discharges evolves, so does the knowledge which constitutes MEP. Reducing the discharge of storm water pollutants from the MS4 to the MEP requires the Copermittees to assess their jurisdictional runoff management programs and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP. The SALs provide the Copermittees measureable goals that may be used to demonstrate the achievement of MEP for reducing pollutants in storm water discharges from the MS4. The SALs will be used as part of the MS4 discharges assessments required under Provision D.4.a.

In June of 2006, the State Water Board's Blue Ribbon Storm Water Panel released its report titled "*The Feasibility of Numerical Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities*." In the recommendations, the Blue Ribbon panel proposed storm water effluent limitations which are computed using statistical based population approaches. The SALs specified in Table C-5 under Provision C.2.a were developed from a regional subset of nationwide Phase I MS4 data by using USEPA Rain Zone 6 (arid west) data.[28] Additionally, utilization of regional data is appropriate due to the addition of data into the nationwide Phase I MS4 monitoring dataset in February 2008. This additional data increased the number of USEPA Rain Zone 6 samples to more than 400, and included additional monitoring events within Southern California.

Utilizing data from USEPA Rain Zone 6 resulted in SALs which closely reflect the environmental conditions experienced in the San Diego Region. The localized subset of data includes sampling events from multiple Southern California locations including Orange, San Diego, Riverside, Los Angeles, and San Bernardino Counties. The dataset includes samples taken from highly built-out impervious areas and from storm events representative of Southern California conditions.

The SALs for cadmium, copper, lead and zinc require the measurement of hardness and to provide more specificity in the assessment of samples with SALs for total metal concentrations. While USEPA Rain Zone 6 data include a large sample size for concentrations of total metals, the impact the concentration will have on receiving waters will vary with receiving water hardness. Since it is the goal of the SALs, through the iterative process and MEP standard, to have MS4 storm water discharges meet all applicable water quality objectives, the hardness of the receiving water should be used when assessing the total metal concentration of a sample.

Thus, when there is an exceedance of a SAL for a metal, the Copermittee must determine if that exceedance is above the existing applicable water quality objectives based upon the hardness of the receiving water. The water quality objectives Copermittees must use to assess total metal SAL exceedances are the California Toxic Rule (CTR) and USEPA National Recommended Water Quality Criteria for Freshwater Aquatic Life 1 hour maximum concentrations. The 1 hour maximum

[28] Data used to develop SAL were obtained from http://rpitt.eng.ua.edu/Research/ms4/mainms4.shtml

concentration is to be used for comparison since it is expected to most replicate the impacts to waters of the State from the first flush following a precipitation event.

The statistically calculated SALs given in Table C-5 are at levels greater than the water quality objectives in the Basin Plan or Ocean Plan. Because the objective of the CWA is to "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*", meaning eventually pollutants in storm water discharges must be reduced to a level that cannot cause or contribute to an exceedance of water quality objectives in receiving waters, over time the SALs are expected to be reduced to a level that is based on the water quality objectives rather than statistical calculations. The San Diego Water Board will review the SALs as more data for discharges of storm water from the MS4s are collected, and revise them as conditions improve and the MEP standard advances. For the Water Quality Improvement Plans required under this Order, the SALs identified under Provision C.2.a must be included.

Provision C.2.b requires the Copermittees to identify SALs for pollutants and/or constituents, not specified in Provision C.2.a, which are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions of the Watershed Management Area related to storm water discharges from the MS4s. The SALs identified under Provision C.2.b must be included in the Water Quality Improvement Plan.

The San Diego Water Board recognizes that some of the SALs required pursuant to Provisions C.2.a and C.2.b may be exceeded more frequently than not. Thus, Provision C.2.c has been included in the Order to provide the Copermittees the option to develop secondary SALs that are set at levels greater than the levels required pursuant to Provisions C.2.a and C.2.b to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s.

D. Monitoring and Assessment Program Requirements

Purpose: Provision D includes minimum monitoring and assessment requirements that must be developed and implemented by the Copermittees as part of the Water Quality Improvement Plans. Implementation of the monitoring and assessment requirements of Provision D will allow the Copermittees to demonstrate that the requirements of the CWA to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP are being achieved. Implementation of the monitoring and assessment requirements of Provision D will also allow the Copermittees and the San Diego Water Board to track improvements to the water quality in the San Diego Region. The monitoring and assessment program requirements are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order.

***Discussion*:** The San Diego Water Board recognized that changes to the monitoring and assessment requirements of the Fourth Term Permit were necessary to improve the usefulness and usability of monitoring data collected by the Copermittees to support their jurisdictional storm water programs more efficiently and with increased effectiveness. The data collected are needed to better inform the Copermittees' understanding of the physical, chemical, and biological condition of the receiving waters and the quality of the MS4 discharges. The monitoring program needs to provide opportunities for the Copermittees to integrate regional monitoring efforts into municipal storm water monitoring requirements to provide a cost-effective approach to monitoring and avoid duplication of efforts.

The requirements in Provision D were largely recommended by the Copermittees as an outcome of the San Diego Water Boards Focused Meeting process. The monitoring and assessment program requirements now require collection of more specific information necessary for each Copermittee to adapt its jurisdictional runoff management program in such a way that focuses resources on a watershed's highest priority water quality conditions. The monitoring and assessment program will require the Copermittees to collect data that can be utilized to answer both watershed level management questions (e.g. Are the chemical, physical, and biological conditions of a receiving water protective, or likely protective of beneficial uses?), and specific jurisdictional runoff management program activity questions (e.g. Are the water quality improvement strategies of the jurisdictional program effectively eliminating non-storm water discharges to the MS4?).

The monitoring data collected and assessment information that will be reported to the San Diego Water Board are necessary to determine if the Copermittees are complying with the prohibitions and limitations of Provision A. The required monitoring and assessments that must be reported to the San Diego Water Board will be utilized for three purposes:

(1) Inform the Copermittees, San Diego Water Board, and the public on the progress of the Copermittees' efforts to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP;

(2) Inform the Copermittees, San Diego Water Board, and the public on the condition of water bodies receiving discharges from the Copermittees' MS4, and the progress of the Copermittees' water quality improvement implementation efforts toward improving the receiving water quality; and

(3) Inform the Copermittees, the San Diego Water Board, and the public on the effectiveness of the Water Quality Improvement Plan toward achieving (1) and (2).

The monitoring and assessment information reported pursuant to Provision F is also expected to be key to the iterative approach and adaptive management process required under Provision A.4 and implemented through the Water Quality Improvement Plan required under Provision B. As required by Provision A.4, the iterative approach and adaptive management process is required if the Copermittees cannot meet the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c, and/or A.2.a under the present conditions.

Provision D provides the minimum monitoring and assessment requirements that must be included in each Water Quality Improvement Plan to be developed and implemented by the Copermittees. The Copermittees, however, are not limited to the requirements of Provision D and may include additional methods to track progress toward improving water quality in a Watershed Management Area.

More specific and detailed discussions of the requirements of Provision D are provided below.

<u>Provision D.1 (Receiving Water Monitoring Requirements)</u> specifies the minimum receiving water monitoring that the Copermittees must conduct within the Watershed Management Area and include as part of the Water Quality Improvement Plan.

Provision D.1 establishes minimum monitoring requirements that must be conducted by the Copermittees within each Watershed Management Area. Provision D.1 requires the Copermittees to collect and develop the data and information necessary to determine potential impacts to the beneficial uses in the receiving waters due to discharges from the MS4s. The monitoring required under Provision D.1 will also provide the data that will allow the Copermittees to gauge the effectiveness and progress of its Water Quality Improvement Plan implementation efforts toward improving the quality of receiving waters.

The receiving water monitoring requirements of Provision D.1 are focused primarily on monitoring the conditions and response of the receiving waters to the Copermittees'

collective implementation efforts to reduce receiving water impacts that may be caused by the discharges from the MS4s. The preference of the San Diego Water Board is for the Copermittees to spend their resources achieving tangible and observable improvements in receiving water conditions instead of collecting samples and analyzing data that has consistently indicated that receiving water conditions are degraded and require improvement. In general, the ability to measure potential improvements in receiving water conditions due to any actions implemented by the Copermittees as part of the Water Quality Improvement Plan may require several years before a response can be observed. Thus, the frequency of collecting receiving water monitoring data has been kept to a minimum.

During the transitional period between adoption of this Order and San Diego Water Board acceptance of a Water Quality Improvement Plan, the Copermittees must conduct receiving water monitoring in accordance with Provision D.1.a. This approach to collecting receiving water data is different from what was required in the Fourth Term Permits, but one that truly embraces the concept of an integrated, cost-effective, streamlined receiving water monitoring approach.

Provision D.1.a requires Copermittees to continue performing the receiving water monitoring programs required in Order Nos. R-2007-0001, R9-2009-002, and R9-2010-0016; plus participation in: hydromodification management plan monitoring approved by the San Diego Water Board, monitoring plans as part of load reduction plans (either Bacteria Load Reduction Plans or Comprehensive Load Reduction Plans) for TMDLs in Attachment E of the Order, Storm Water Monitoring Coalition Regional Monitoring, Southern California Bight Regional Monitoring, Sediment Quality Monitoring, and ASBS Monitoring as applicable to a Watershed Management Area.

Provision D.1.a also provides an opportunity for the Copermittees to use third party data to meet receiving water monitoring requirements where feasible. Allowing the Copermittees to use the data currently collected through its participation in existing regional receiving water programs and that of third parties provides an efficiency of resources in obtaining the data necessary to inform the Copermittees and the San Diego Water Board about the physical, chemical, and biological conditions of the receiving waters, which can also help to focus the receiving water monitoring during the implementation of the Water Quality Improvement Plan. Once a Water Quality Improvement Plan is developed for a Watershed Management Area in compliance with Provision B of this Order, the transitional period is over and Copermittees are required to conduct receiving water monitoring according to the requirements of Provisions D.1.b-e.

Provision D.1.b requires each Copermittee to identify at least one long term receiving water monitoring station to be representative of receiving water quality within each Watershed Management Area. Long term receiving water monitoring stations can be located at any existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees. The requirements under Provision D.1.b. are

consistent with 40 CFR 122.26(d)(2)(iii)(D), which specifies that a "*monitoring program for representative data collection for the term of the permit*" may include "*instream locations.*" For each Watershed Management Area, at least one long term watershed monitoring station is required to be established and monitored. The Copermittees may choose to establish additional long term monitoring stations where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

Provision D.1.b. requires the Copermittees to locate the long term receiving water monitoring station at one of these existing receiving water monitoring stations to provide the Copermittees an opportunity to experience monitoring cost savings while continuing to collect the necessary data to assess the status and trends of receiving water quality conditions in 1) coastal water, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under both dry weather and wet weather conditions. Ideally these stations will continue to be monitored as part of the receiving water monitoring for each Watershed Management Area to maintain a consistent set of locations and a period of data that can be built upon with the monitoring required under this Order.

The receiving water monitoring requirements are separated into monitoring required during dry weather conditions pursuant to Provision D.1.c, and wet weather conditions pursuant to Provision D.1.d.

At each long term monitoring station the Copermittees must conduct at least three dry weather monitoring events as required pursuant to Provision D.1.c and at least three wet weather monitoring events as required pursuant to Provision D.1.d per permit term. Provisions D.1.c and D.1.d require the Copermittees to monitor priority water quality conditions identified in the Water Quality Improvement Plan, constituents listed as causing impairment of receiving waters in the Watershed Management Area, applicable NALs, toxicity, constituents listed in Tables D-2 and D-3, and constituents for implementation plans (e.g. Bacteria Load Reduction Plans and Comprehensive Load Reduction Plans). Required toxicity monitoring was changed to reflect an updated understanding of the unique challenges associated with sampling storm water for toxicity. Copermittees are required to sample storm water for toxicity during each dry weather and each wet weather event pursuant to Provision D.1.c.(4) and D.1.d.(4). Required toxicity monitoring is now consistent with the State Water Resources Control Board Policy for Toxicity Assessment and Control (Draft June 2012) and recently adopted MS4 permits for Caltrans and Los Angeles Water Board. Receiving water monitoring efforts in this Order have been streamlined to redirect resources to monitoring efforts that better support pollutant reduction solutions with an increasing emphasis on MS4 outfall monitoring, source identification and source abatement activities.

In addition to the receiving water monitoring requirements under Provisions D.1.b-d, Provision D.1.e requires the Copermittees participate in and/or conduct other types of receiving water monitoring. As recommended and requested by the Copermittees, Provision D.1.e.(1) requires the Copermittees to participate in existing regional monitoring, as applicable to each Watershed Management Area. Existing regional

monitoring includes monitoring conducted by the Storm Water Monitoring Coalition and for the Southern California Bight. Participation in and use of monitoring data collected from these existing regional water quality monitoring programs provide the Copermittees a greater opportunity for efficiency in the use of their resources to manage their storm water programs and those controllable discharges under their authority. Provision D.1.e.(1)(c) requires the south Orange County MS4 Copermittees to participate in "unified regional beach water quality monitoring." This monitoring replaces requirements to conduct "core monitoring" of beach water quality, as provided for in Appendix III of the 2012 California Ocean Plan.

Several different public agencies currently conduct routine, ongoing beach water quality monitoring in south Orange County in accordance with several different sets of requirements. The monitoring programs implemented to meet those requirements overlap temporally and spatially. These monitoring programs are partially but not fully integrated. In November 2010, the State Water Board adopted Resolution No. 2010-0053, which directed regional water boards to work with dischargers to modify beach water quality monitoring programs required by regional board-issued permits in order to eliminate redundancies and incorporate beach water quality monitoring required by beach water quality statutes, where appropriate.

In April 2012, the San Diego Water Board requested that its staff review beach water quality monitoring conducted in south Orange County. To assist in responding to that request, staff of the Board convened a workgroup that included representatives of the three public agencies that currently conduct almost all of the routine, ongoing beach water quality monitoring in south Orange County, i.e., South Orange County Wastewater Authority (SOCWA), Orange County Public Works, and Orange County Health Care Agency (OCHCA). The workgroup also included other interested parties, including representatives of the Sierra Club and Surfrider Foundation. In December 2012, the San Diego Water Board adopted Resolution No. R9-2012-0069, which endorsed the San Diego Water Board staff report entitled "A Framework for Monitoring and Assessment in the San Diego Region," dated November 2012.

The unified program is consistent with and will meet or exceed the minimum requirements for beach water quality monitoring and related public notification and reporting established by State law, including the California Ocean Plan. The unified program is consistent with State Water Board Resolution No. 2010-0053. The unified program is also consistent with and will help implement, "A Framework for Monitoring and Assessment in the San Diego Region," which emphasizes the need for question-driven, beneficial use-oriented monitoring and assessment. The primary purpose of the unified program will be to answer the question "Does beach water quality meet standards for the beneficial use of water contact recreation?"

The unified program is intended to be protective; it will help protect the health of swimmers, surfers, and others who use south Orange County beach waters for water contact recreational activities. The unified program is also intended to be reasonable; it will eliminate duplicative monitoring and will include triggers for public notification

and additional sampling at all sampling stations year-round. The unified program is intended to be equitable; responsibility for implementation of the unified program will be shared and the responsible agencies will jointly make arrangements to implement the program and will have the flexibility to jointly make short and/or long term changes in those arrangements.

The San Diego Water Board Executive Officer issued a written directive on December 5, 2014, pursuant to California Water Code section 13383, for SOCWA and the south Orange County MS4 Copermittees to implement the unified program in cooperation with OCHCA. The Executive Officer may make revisions to the unified program, provided that the unified program, as revised, continues to be consistent with and meet the requirements of State law, including the California Ocean Plan, for beach water quality monitoring and related public notification and reporting. Following a thirty day public comment period, and subject to a request for a hearing before the San Diego Water Board, any such revision shall take effect as specified in a written directive issued by the Executive Officer pursuant to California Water Code sections 13383. The program and any Executive Officer issued revisions to the program are subject to California Water Code section 13320 right of review from the date of issuance.

The unified program will supersede the existing routine, ongoing, beach water quality monitoring programs in south Orange County that are conducted in accordance with the existing requirements of the NPDES permits for discharges from the SOCWA ocean outfalls and the south Orange County MS4s. The requirement to participate in "regional monitoring" of beach water quality replaces requirements to conduct "core monitoring" of beach water quality, as provided for in Appendix III of the 2012 California Ocean Plan.

The State Water Resources Control Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part 1 Sediment Quality which became effective August 25, 2009 (Sediment Quality Monitoring Policy). Provision D.1.e.(2) requires any Copermittees with MS4 discharges to an enclosed bay or estuary to monitoring the sediments in the enclosed bay or estuary receiving water in accordance with the sediment quality monitoring procedures as prescribed in the Sediment Quality Monitoring Policy.

The State Water Board adopted Resolution No. 2012-0012 which approved exceptions to the California Ocean Plan for selected discharges into Areas of Special Biological Significance (ASBS), including special protections for beneficial uses. State Board Resolution No. 2012-0012 became effective on March 20, 2012, and Attachment B to the Resolution established limitations on point source storm water discharges to ASBS. Copermittees with MS4s that discharge to an ASBS must monitor its discharge to assure compliance with State Board Resolution No. 2012-0012 as required pursuant to Provision D.1.e.(3).

The San Diego Water Board is currently developing a regional monitoring strategy to assess the conditions of receiving waters in the San Diego Region. The monitoring requirements of Provision D.1 are expected to be incorporated or serve as a foundation of this regional monitoring strategy, but may require some modifications. When the San Diego Water Board develops an alternative regional monitoring strategy, the Copermittees will be required to participate in the development and implementation of the alternative regional monitoring program pursuant to Provision D.1.f.

Provision D.2 (MS4 Outfall Discharge Monitoring Requirements) specifies the minimum MS4 outfall discharge monitoring requirements that the Copermittees must incorporate and implement as part of the Water Quality Improvement Plan.

The dry weather MS4 outfall discharge monitoring requirements are included under Provisions D.2.a.(2) and D.2.b. The dry weather MS4 outfall discharge monitoring requirements are part of the "*program, including a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer*" required by 40 CFR 122.26(d)(2)(iv)(B), which is expected to achieve compliance with the CWA section 402(p)(3)(B)(ii) statutory requirement for municipal storm water permits to require the Copermittees to "*effectively prohibit non-storm water discharges into the storm sewers*." The dry weather MS4 outfall discharge monitoring data collection requirements are based on requirements under 40 CFR 122.26(d)(1)(iv)(D) and 122.26(d)(2)(iv)(B)(3).

The dry weather MS4 outfall discharge monitoring requirements are designed to provide wide spatial and temporal coverage of each jurisdiction to better understand the extent and magnitude of non-storm water discharges to receiving waters, and make a distinction between persistent and transient non-storm water flows. This information is expected to allow each Copermittee to focus its resources on eliminating and controlling the highest priority threats to receiving water quality, as well as integrating other elements of the storm water programs (e.g. complaint call response) and third party data to efficiently and effectively assist in efforts to eliminate non-storm water discharges.

The dry weather MS4 outfall discharge monitoring requirements of Provision D.2.a.(2) and D.2.b are separated into monitoring required before and after the San Diego Water Board accepts the Copermittees' Water Quality Improvement Plan. Outfall monitoring conducted prior to acceptance of the Water Quality Improvement Plan is referred to in the Order as Transitional MS4 Outfall Discharge Monitoring. Provision D.2.a.(2) includes the transitional dry weather MS4 outfall discharge monitoring requirements.

The requirements under Provision D.2.a.(2) are based on the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B), which include the requirements for a monitoring program to identify, detect, and eliminate illicit connections and illegal

discharges to the MS4s. The federal regulations (40 CFR 122.26(d)(1)(iv)(D)) require the monitoring program to include "*a field screening analysis for illicit connections and illegal dumping [that]…[a]t a minimum, include[s] a narrative description, for either each field screening point or major outfall, of visual observations made during dry weather periods.*" The federal regulations (40 CFR 122.26(d)(1)(v)(B)) require the monitoring program to include "*inspection procedures and methods for detecting and preventing illicit discharges, and describe areas where this program has been implemented.*" Furthermore, the monitoring program is required by federal regulations (40 CFR 122.26(d)(2)(iv)(B)) to include "*a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer.*"

Dry weather transitional MS4 outfall discharge monitoring requires each Copermittee to field screen (inspect) its major MS4 outfalls to classify the MS4 outfall locations as having persistent dry weather flows, transient dry weather flows, or no dry weather flows. To account for the variance in size of the 39 jurisdictions covered under this Order, the Copermittees recommended a tiered approach to the number of major MS4 outfalls that must be inspected. Provision D.2.a.(2)(a) provides a tiered approach to the number of major MS4 outfalls that must be visually inspected per jurisdiction as well as a minimum frequency each Copermittee must inspect each major MS4 outfall per year. This tiered approach is based on the total number of major MS4 outfalls within a Copermittees jurisdiction within each Watershed Management Area.

Based on the field screening, each Copermittee is required to make a determination whether any observed flowing, pooled, or ponded waters are transient or persistent flows. Based on this field screening information, other jurisdictional program information, and third party information, each Copermittee is required to prioritize the MS4 outfalls within its jurisdiction for follow up investigation and elimination of the non-storm water discharge, as part of its illicit discharge detection and elimination program required pursuant to Provision E.2. In accordance with the requirements of Provision E.2, each Copermittee is required to immediately investigate obvious illicit discharges (e.g. outfall discharges with unusual color, unusual odor, or high flows).

This approach allows a Copermittee to use all of its resources, as well as leverage resources and information provided by third parties, to effectively eliminate non-storm water discharges from its MS4 outfalls. If the source of the non-storm water discharge cannot be immediately eliminated, the Copermittee uses the persistent flow or transient flow classification along with other programmatic implementation data to prioritize the MS4 outfalls for future investigation. In accordance with the adaptive management approach deployed throughout this Order, Provision D.2.a.(2)(c) requires each Copermittee to update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow. The requirement of Provision D.2.a.(2)(c) assures that each Copermittee is collecting data that can be used to demonstrate compliance with the CWA requirement that each Copermittee must implement a program to "*effectively*

prohibit non-storm water discharges into the [MS4]" and with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

Provision D.2.b describes the dry weather MS4 outfall discharge monitoring required to be incorporated and implemented as part of the Water Quality Improvement Plan. Dry weather MS4 outfall discharge monitoring must be performed by each Copermittee to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. The emphasis of the dry weather MS4 outfall discharge monitoring required pursuant to Provision D.2.b is consistent with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

Provision D.2.b.(1) requires each Copermittee to continue field screening its major MS4 outfalls and identifying those with persistent flows and transient flows, as conducted during the transitional period (i.e. before the Water Quality Improvement Plan was developed). However, each Copermittee now has the flexibility to adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of non-storm water persistent flow discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan. In order to ensure a minimum number of outfalls are inspected, Provision D.2.b.(1) requires the number of visual inspections be equal to the number of visual inspections required in the tiered inspection program pursuant to Provision D.2.a.(2)(a).

Provision D.2.b.(2)(b) requires each Copermittee to monitor a minimum of 5 major MS4 outfalls with persistent flows identified as the highest priorities within a Copermittee's jurisdiction, within each Watershed Management Area. In other words, Copermittees located in more than one Watershed Management Area must identify at least 5 major MS4 outfalls with persistent flows in its jurisdiction in each Watershed Management Area. If a Copermittee is located in more than one Watershed Management Area, and they have less than 5 major MS4 outfalls with persistent flows per jurisdictional area per Watershed Management Area, all of the major MS4 outfalls must be identified as high priority dry weather persistent flow MS4 outfalls. The Copermittees identified as Responsible Copermittees by a TMDL in Attachment E of the Order may need to monitor more than 5 dry weather major MS4 outfall locations to determine compliance with the requirements of the TMDL(s).

Monitoring must occur at the highest priority outfall locations at least semi-annually until the non-storm water discharges have been eliminated for three consecutive dry weather monitoring events; identified to be authorized by a separate NPDES Permit; or reprioritized to a lower priority. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized MS4 major outfall in the Copermittee's jurisdiction within the Watershed Management Area, unless there are no remaining qualifying major MS4 outfalls within the Copermittees jurisdiction. The Copermittees must continually update their dry weather persistent

flow MS4 outfall discharge monitoring locations with the next highest priority non-storm water flow that have yet to be eliminated until all persistent and transient flows are eliminated or its threat reduced.

Non-storm water persistent flow MS4 outfall discharge monitoring data collected during each semi-annual monitoring event, must be collected and analyzed according to the requirements of Provision D.2.b.(2)(b)–(e). These monitoring requirements are consistent with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

The wet weather MS4 outfall discharge monitoring requirements are included under Provisions D.2.a.(3) and D.2.c. The wet weather MS4 outfall discharge monitoring requirements are necessary for the Copermittees to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable, using management practices, control techniques and system, design and engineering methods, and such other provisions which are appropriate*" required by 40CFR 122.26(d)(2)(iv), which is expected to achieve compliance with the CWA section 402(p)(3)(B)(iii) statutory requirement for municipal storm water permits to require "*controls to reduce the discharge of pollutants [in storm water] to the maximum extent practicable*." The wet weather MS4 outfall discharge monitoring data collection requirements are based on requirements under 40 CFR 122.26(d)(2)(iii), 122.26(d)(2)(iii)(A) and 122.26(d)(2)(iii)(A)(1)-(4), and 40 CFR 122.21(g)(7)(i)-(ii).

The wet weather MS4 outfall discharge monitoring requirements of Provision D.2.a.(3) and D.2.c are separated into monitoring required before and after the San Diego Water Board accepts the Copermittees' Water Quality Improvement Plan. Outfall monitoring conducted prior to acceptance of the Water Quality Improvement Plan is referred to in the Order as Transitional MS4 Outfall Discharge Monitoring. Provision D.2.a.(3) includes the transitional wet weather MS4 outfall discharge monitoring requirements.

Until the wet weather MS4 outfall discharge monitoring requirements of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board, the Copermittees must comply with the requirements of transitional wet weather MS4 outfall monitoring requirements pursuant to Provision D.2.a.(3). Provision D.2.a.(3) requires the Copermittees in each Watershed Management Area to sample, at least five of the major MS4 outfalls inventoried pursuant to Provision D.2.a.(1) once per wet season for the monitoring data required to be collected pursuant to Provision D.2.a.(3)(c)-(e). Provision D.2.a.(3) further requires at least one major MS4 outfall monitoring station be located in each Copermittee's jurisdiction within the Watershed Management Area.

At a minimum, the five sampling locations chosen must be representative of storm water discharges from residential, commercial, industrial, and typical mixed-use land uses present within a Watershed Management Area. The San Diego Water Board expects the Copermittees to extrapolate from these data to similar land uses

throughout the Watershed Management Area to better inform the Water Quality Improvement Plan development process by prioritizing drainages for implementation of storm water control efforts required pursuant to Provision E.

Provision D.2.c describes the wet weather MS4 outfall discharge monitoring required to be included and implemented as part of the Water Quality Improvement Plan. Provision D.2.c provides the Copermittees the flexibility to adjust the wet weather MS4 outfall discharge monitoring locations and frequencies in the Watershed Management Area, as needed, to identify sources of pollutants in storm water discharges from MS4s in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan.

Although Provision D.2.c.(1) allows the Copermittees to adaptively manage the wet weather MS4 outfall discharge monitoring locations and frequencies, the provision requires a minimum of at least five wet weather outfall stations to be monitored. Provision D.2.c.(2) further allows the Copermittees to modify the monitoring frequency at each wet weather MS4 outfall station to meet the goals of the Water Quality Improvement Plan as long as the monitoring frequency occurs at least once per year and is at an appropriate frequency to identify sources of pollutants in storm water discharges, guide pollutant source identification efforts, or determine compliance with the requirements of the applicable TMDLs in Attachment E to the Order.

The wet weather MS4 outfall discharge monitoring requirements of Provisions D.2.c.(3) and D.2.c.(4) are the same as the transitional wet weather MS4 outfall discharge monitoring. In contrast, the requirements of Provision D.2.c.(5) are focused on collecting analytical data specific to the highest priority water quality conditions in the Watershed Management Area identified in the Water Quality Improvement Plan. The wet weather MS4 outfall discharge monitoring data collection requirements are consistent with the requirements under 40 CFR 122.26(d)(2)(iii), 122.26(d)(2)(iii)(A) and 122.26(d)(2)(iii)(A)(1)-(4), and 40 CFR 122.21(g)(7)(i)-(ii).

<u>Provision D.3 (Special Studies)</u> requires the Copermittees to develop special studies that will be conducted for each Watershed Management Area and the entire San Diego Region. Data collected pursuant to Provision D.3 is to be used by the Copermittees to improve the effectiveness of the strategies implemented by the jurisdictional runoff management programs toward achieving the numeric goals identified in the Water Quality Improvement Plans and ultimately achieve compliance with the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c, and A.2.a, which is consistent with the requirements of Provision A.4.

Special studies are often necessary to fill data gaps or provide more refined information that allow the Copermittees to better manage the generation or elimination of pollutants and discharges to and from the MS4. In the Fourth Term Permits, the Copermittees have been required to implement special studies as directed by the San Diego Water Board. The special studies required by this Order provide the Copermittees more flexibility to identify and implement special studies that will be most

useful to improving the effectiveness of their jurisdictional runoff management programs.

Provision D.3.a.(1) requires the Copermittees to develop and conduct at least two special studies per Watershed Management Area, to be determined by the Copermittees. One of the two special studies may be accomplished through participation in a Regional Special Study required under Provision D.3.a.(2). The requirements provide the Copermittees great latitude in identifying and developing the special studies. Watershed Management Area special studies are required, at a minimum, to: (a) relate in some way to the highest water quality priorities identified by the Copermittees in the Water Quality Improvement Plan, (b) be conducted within the Watershed Management Area, and (c) include some form of participation (e.g. contribution of funds, personnel services, project management) by all the responsible Copermittees within the Watershed Management Area.

Examples of Watershed Management Area special studies might include, but are not limited to: (1) focused pollutant source identification studies, (2) BMP effectiveness and/or comparison studies, (3) pilot tests for new or emerging pollutant control methods, (4) receiving water pollutant or stressor source identification and/or mitigation studies, or (5) pollutant fate and transport studies. The Watershed Management Area special studies are expected to provide data that can be utilized by the Copermittees to improve the Water Quality Improvement Plan or implementation of the Copermittees' jurisdictional runoff management programs to address the highest priority water quality conditions.

Provision D.3.a.(2) requires the Copermittees to develop at least one special study that will be conducted for the entire San Diego region. The regional special study is expected to provide data that can be utilized by the Copermittees to improve the Water Quality Improvement Plan or implementation of the Copermittees' jurisdictional runoff management programs to identify or address regional water quality concerns and priorities.

An example of a regional special study would be to develop and establish allowable exceedance frequencies of the bacteria water quality objectives for several types of water bodies, during different wet and dry weather conditions the San Diego region. The special study would be related to bacteria, which is a priority for the San Diego region due to the adoption of "*Bacteria TMDL Project I – Beaches and Creeks in the San Diego Region*." The study results could be used to inform the Copermittees and the San Diego Water Board about the indictor bacteria water quality objective exceedance frequencies that occur in natural or reference watersheds.

<u>Provision D.4 (Assessment Requirements)</u> specifies the assessments that the Copermittees are required to perform, based on the monitoring data collected, and will be reported as part of the Annual Report for the Water Quality Improvement Plan implementation. Provision D.4 requires the Copermittees assess the progress of the

water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c, and A.2.a.

Provision D.4 specifies the assessments that Copermittees must perform for each Watershed Management Area to assess the effectiveness of each Copermittee's jurisdictional runoff management program and the Water Quality Improvement Plan. The effectiveness of each Copermittee's jurisdictional runoff management program and Water Quality Improvement Plan is measured through these types of assessments: (a) Receiving Waters Assessments (b) MS4 Outfall Discharges Assessments, (c) Special Studies Assessments, and (d) Integrated Assessment of Water Quality Improvement Plan.

Provision D.4.a requires the Copermittees to assess the status of receiving water conditions annually during the transitional monitoring period (during development of the Water Quality Improvement Plan) and after acceptance of the Water Quality Improvement Plan. The monitoring data collected pursuant to Provision D.1 will be evaluated, among other information, to assess the condition of a Watershed Management Area's streams, coastal waters, enclosed bays, harbors, estuaries, and lagoons. The focus of the receiving waters assessments is to measure progress toward the objective of the CWA to "*restore and maintain the chemical, physical, and biological integrity of the Nation's waters*" as the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program are implemented within a Watershed Management Area. Provision D.4.a is consistent with 40 CFR 122.42(c)(7) which requires the Copermittees to annually report the *"[i]dentification of water quality improvements or degradation."*

Provision D.4.b includes the MS4 outfall discharges assessment requirements. The focus of MS4 outfall discharges assessments is to determine if the Copermittees' are implementing programs that comply with the requirements of the CWA for MS4 permits to "*effectively prohibit non-stormwater discharges into the storm sewers*" and "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable.*" The monitoring data collected pursuant to Provisions D.2 will be evaluated, among other information, to assess the effectiveness of the transitional MS4 outfall field screening monitoring, the implementation of the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program. The MS4 outfall discharge assessments consist of Non-Storm Water Discharges Reduction Assessments and Storm Water Pollutant Discharges Reduction Assessments.

The Non-Storm Water Discharges Reduction Assessments are how each Copermittee will demonstrate that its jurisdictional runoff management program implementation efforts are achieving the CWA requirement to "*effectively prohibit non-stormwater discharges into the storm sewers.*" Provision D.4.b.(1) requires each Copermittee to assess and report on its illicit discharge detection and elimination program required pursuant to Provision E.2 to reduce and effectively prohibit non-storm water and illicit discharges into the MS4 within its jurisdiction. The Non-Storm Water Discharges

Reduction Assessments include specific assessment requirements applicable to each Copermittee.

As each Copermittee collects and analyzes the data collected pursuant to dry weather MS4 outfall discharges monitoring requirements of Provisions D.2.a.(2) and D.2.b, Provision D.4.b.(1) requires each Copermittee to assess the progress, assess the effectiveness of its current actions, and identify modifications necessary to increase the effectiveness of its actions toward reducing and eliminating non-storm water and illicit discharges to its MS4. The findings from these assessments are expected to be utilized by the Copermittee as part of its procedures to prioritize the non-storm water discharges that will be addressed by its Illicit Discharge Detection and Elimination program required pursuant to Provision E.2.

The assessment requirements of Provision D.4.a.(1) are consistent with 40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(3) which require "*procedures…to investigate portions of the separate storm sewer system that, <u>based on the results of the field screen, or other appropriate information</u> [emphasis added], indicate a reasonable potential of contain illicit discharges or other sources of non-storm water*" as part of a "*program…to detect and remove…illicit discharges and improper disposal into the storm sewer.*" The assessment requirements of Provision D.4.a.(1) are also consistent with 40 CFR122.42(c)(1) requires the Copermittees to annually report the "*status of implementing the components of the storm water management program that are established as permit conditions.*"

The Storm Water Pollutant Discharges Reduction Assessment is how the Copermittees in each Watershed Management Area will demonstrate that their jurisdictional runoff management program implementation efforts are achieving the CWA requirement to "*reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable*." Provision D.4.b.(2) requires the Copermittees in each Watershed Management Area to assess and report the progress of the Copermittees' efforts to reduce pollutants in storm water discharges from the MS4s to the MEP. The Storm Water Pollutant Discharges Reduction Assessments include specific assessment requirements during both the transitional monitoring period and after acceptance of the Water Quality Improvement Plan applicable to the Watershed Management Area and each Copermittee.

As the Copermittees collect and analyze the data collected pursuant to wet weather MS4 outfall discharges monitoring requirements of Provisions D.2.a.(3) and D.2.c, Provision D.4.b.(2) requires the Copermittees to assess runoff conditions during the transitional period, and the progress of the Water Quality Improvement Plan strategies toward reducing pollutants in storm water from the MS4 to the MEP. The findings from these assessments are expected to be utilized by the Copermittees to identify any modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify sources of pollutants in storm water discharges from the MS4s, as well as focus, modify, and improve the water quality improvement

strategies implemented by each Copermittee within its jurisdiction to reduce pollutants in storm water discharges to the MEP.

The assessment requirements of Provision D.4.b.(2) are consistent with 40 CFR 122.26(d)(2)(iii)(B) which requires "*[e]stimates of the annual pollutant load of the cumulative discharges to waters of the United States from all identified municipal outfalls…during a storm event…accompanied by a description of the procedures for estimating constituent loads and concentrations, including any modeling, data analysis, and calculation methods.*" The assessment requirements of Provision D.4.a.(2) are consistent with 40 CFR 122.26(d)(2)(v) which requires that each Copermittee assesses the *"estimated reductions in loadings of pollutants from discharges of municipal storm sewer constituents from municipal storm sewer systems expected as the result of the municipal storm water quality management program."* The assessment requirements of Provision D.4.b.(2) are also consistent with 40 CFR122.42(c)(1) requires the Copermittees to annually report the "*status of implementing the components of the storm water management program that are established as permit conditions.*"

Provision D.4.c includes the special studies assessment requirements. Performing special studies are how the Copermittees will address data gaps identified during the development of and updates to the Water Quality Improvement Plan. The relevant findings from the special studies assessments are expected to be incorporated as part of the applicable receiving water assessments, MS4 outfall discharge assessments, and integrated water quality improvement assessments required in Provision D.4.a, D.4.b, and D.4.d, respectively.

The assessment requirements in Provision D.4.d are part of the iterative approach and adaptive management process required by Provision A.4. The Copermittees are required to integrate the data collected pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to re-evaluate the Water Quality Improvement Plan.

The monitoring data collected pursuant to Provisions D.1 and D.2, and the results of the assessment required pursuant to Provisions D.4.a-c, will be used to determine whether the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program are effective, or require modifications or improvements to become more effective to achieve the requirements of the CWA. The assessments required by Provision D.4.d are consistent with 40 CFR 122.42(c)(1) which requires that the Copermittees to report the *"[t]he status of implementing the components of the storm water management program that are established as permit conditions."*

E. Jurisdictional Runoff Management Programs

Purpose: Provision E includes the requirements for the jurisdictional runoff management programs to be implemented by each of the Copermittees. Compliance with the requirements for the jurisdictional runoff management programs will allow the Copermittees to demonstrate that they are implementing programs to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP. The jurisdictional runoff management program document prepared by each Copermittee will also provide the details for implementing the water quality improvement strategies identified in the Water Quality Improvement Plan specifically within its jurisdiction.

***Discussion*:** Implementation of the jurisdictional runoff management program requirements under Provision E is how the Copermittees "*effectively prohibit non-stormwater discharges into the storm sewer,*" and outlines the "*controls to reduce the discharge of pollutants to the maximum extent practicable"* consistent with the federal regulations under 40 CFR 122.26. The jurisdictional runoff management program is part of the "*comprehensive planning process*" that is required pursuant to 40 CFR 122.26(d)(2)(iv). Where the Water Quality Improvement Plan is the "*comprehensive planning process*" on a Watershed Management Area scale, requiring "*intergovernmental coordination,*" the jurisdictional runoff management program document is the "*comprehensive planning process*" on a jurisdictional scale that should be coordinated with the other Copermittees in the Watershed Management Area to achieve the goals of the Water Quality Improvement Plan.

The jurisdictional runoff management program requirements are included to provide each Copermittee criteria that can be used to demonstrate that its storm water management program is implementing the "*comprehensive planning process*" within its jurisdiction to "*effectively prohibit non-stormwater discharges into the storm sewers,*" and to identify and implement the most effective "*controls to reduce the discharge of pollutants to the maximum extent practicable"* in accordance with the performance standards given in the CWA.

Provision E includes the requirements for each of the components that must be included in the Copermittee's jurisdictional runoff management program document that will be implemented by the Copermittee within its jurisdiction. Implementation of the components of each Copermittee's jurisdictional runoff management program must incorporate the water quality improvement strategies identified by each Copermittee in the Water Quality Improvement Plans, described pursuant to Provision B.3.b.(1)(a).

More specific and detailed discussions of the requirements of Provision E are provided below.

Provision E.1 (Legal Authority Establishment and Enforcement) requires each Copermittee to establish and enforce sufficient legal authority to control discharges to the MS4 within its jurisdiction.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system*" and be able to demonstrate that it can "*operate pursuant to legal authority established by statute, ordinance or series of contracts.*" Provision E.1.a describes the minimum legal authorities each Copermittee must establish for itself within its jurisdiction to control discharges to its MS4. The requirements of Provision E.1.a are consistent with the requirements set forth in 40 CFR 122.26(d)(2)(i)(A)-(F).

The certification statement required from each Copermittee by Provision E.1.b is included to provide the San Diego Water Board additional documentation that each Copermittee has established the legal authorities consistent with Provision E.1.a and 40 CFR 122.26(d)(2)(i)(A)-(F), and the Copermittee can "*operate pursuant to legal authority established by statute, ordinance or series of contracts.*"

Provision E.2 (Illicit Discharge Detection and Elimination) requires each Copermittee to implement an illicit discharge detection and elimination program to effectively prohibit non-storm water discharges to the MS4 by actively detecting and eliminating illicit discharges and disposal into its MS4.

Provision E.2 establishes the minimum requirements that each Copermittee must implement within its jurisdiction to effectively prohibit non-storm water discharges from entering its MS4. The federal CWA requires permits for municipal storm sewer systems to "*effectively prohibit non-storm water discharges into the storm sewers*." The federal regulations (40CFR122.26(d)(2)(i)(B)) require each Copermittee to establish the legal authority to prohibit illicit discharges to its MS4s. Under 40 CFR 122.26(d)(2)(iv)(B), each Copermittee must implement a "*program…to detect and remove…illicit discharges and improper disposal into the storm sewer.*" The federal NPDES regulations, under 40 CFR 122.26(b)(2), define illicit discharges as "*any discharge to a municipal separate storm sewer that is not composed entirely of storm water*." Thus, non-storm water discharges are not authorized to enter the MS4 and are considered to be illicit discharges, unless authorized by a separate NPDES permit.

The Phase I Final Rule clarifies that non-storm water discharges through an MS4 are not authorized under the CWA (55 FR 47995):

> "*Today's rule defines the term "illicit discharge" to describe any discharge through a municipal separate storm sewer system that is not composed entirely of storm water and that is not covered by an NPDES permit. Such illicit discharges are not authorized under the Clean Water Act. Section 402(p)(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…Ultimately, such non-storm water discharges through a municipal separate*

storm sewer must either be removed from the system or become subject to an NPDES permit."

The federal NPDES requirements for the program to address illicit discharges must include "*inspections, to implement and enforce an ordinance, orders, or other similar means to prevent illicit discharges to the MS4*." The federal NPDES regulations also reference several categories of "*non-storm water discharges or flows* [which] *shall be addressed where such discharges are identified…as sources of pollutants to waters of the United States*." The Phase I Final Rule (55 FR 48037) further clarified the requirements of 40 CFR 122.26(d)(2)(iv)(B)(1) as follows:

"*EPA is clarifying that section 402(p)(3)(B) of the CWA (which requires permits for municipal separate storm sewers to 'effectively' prohibit non-storm water discharges) does not require permits for municipalities to prohibit certain discharges or flows of nonstorm water to waters of the United States through municipal separate storm sewers in all cases*."

In previous iterations of the municipal storm water permits for the San Diego Region, these categories were simply listed and referred to as categories of non-storm water discharges "not prohibited" unless identified as a source of pollutants. The Copermittees have often referred to these categories as "exempt" discharges. In both cases, however, the language is inconsistent with the federal CWA and NPDES regulations. And, the clarification provided in the Phase I Final Rule does not specifically state that such discharges are "not prohibited" or "exempt" or in any way authorized. The federal NPDES regulations do, however, state that specific categories of non-storm water discharges must be "*addressed*" if identified as "*sources of pollutants to waters of the United States*."

The language of Provision E.2.a has been revised to be fully consistent with the language of the CWA and the requirements of the federal regulations under 40 CFR 122.26(d)(2)(iv)(B)(1). Provision E.2.a requires each Copermittee to address <u>all</u> types of non-storm water discharges into its MS4 as illicit discharges, <u>unless</u> the discharge is authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to Provisions E.2.a.(1) through E.2.a.(5). Only non-NPDES-permitted non-storm water discharges identified as a category of non-storm water discharges under Provisions E.2.a.(1) through E.2.a.(5) <u>and</u> *not identified as a source of pollutants* do not have to be addressed as illicit discharges. Categories of non-storm water discharges that meet the requirements of Provisions E.2.a.(1) through E.2.a.(5) do not have to be addressed by the Copermittee as illicit discharges.

Several of the non-storm water categories listed in 40 CFR 122.26(d)(2)(iv)(B)(1) have not been included in Provisions E.2.a.(1) through E.2.a.(5), including: street wash water, landscape irrigation, irrigation water, and lawn watering. Because these are no longer included within the categories listed under Provisions E.2.a.(1) through E.2.a.(5), the Copermittees must prohibit these types of non-storm water discharges

from entering the MS4. This is consistent with the clarification of 40 CFR 122.26(d)(2)(iv)(B)(1) in the Phase I Final Rule (55 FR 48037), which states:

> "*[T]he Director may include permit conditions that either require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*."

Street wash water is a category of non-storm water discharges that was removed when the Third Term Permits were issued. Street wash water is a source of several pollutants (e.g., metals, oil and grease, petroleum hydrocarbons, chlorinated solvents, sediment) which are generated during the street washing process. The removal of this category requires the Copermittees to prohibit this type of non-storm water discharge from entering the MS4.

The landscape irrigation, irrigation water, and lawn watering categories, collectively referred to hereafter as "over-irrigation" discharges, were removed from the list of non-storm water discharge categories in the Fourth Term Orange County and Riverside County Permits. Non-storm water discharges resulting from over-irrigation have been found to be a source of several types of pollutants (e.g., nutrients, bacteria, pesticides, sediment) in receiving waters. The San Diego Water Board and the Copermittees have identified categories of non-storm water discharges associated with over-irrigation as a source of pollutants and conveyance of pollutants to the MS4 and waters of the United States in the following documents:

- **SmartTimer/Edgescape Evaluation Program (SEEP) Grant Application**

  The State Water Board allocated grant funding to the SEEP project grant application submitted in 2006, which targeted irrigation runoff by retrofitting areas of existing development and documenting the conservation and runoff improvements. The basis of this grant project is that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 is a source and conveyance of pollutants. In addition, the grant application indicated that this alteration of natural flows is impacting the beneficial uses of waters of the state and U.S. Results from the study indicate that that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 *is* a source and conveyance of pollutants. The results of this study can be applied broadly to any area where over-irrigation takes place. The grant application included the following statements:

  > "*Irrigation runoff contributes flow & pollutant loads to creeks and beaches that are 303(d) listed for bacteria indicators.*"
  >
  > "*Regional program managers agree that the reduction and/or elimination of irrigation-related urban flows and associated pollutant loads may be key to successful attainment of water quality and beneficial use goals as outlined in the San Diego Basin Plan and Bacteria TMDL over the long term.*"

"*Elevated dry-weather storm drain flows, composed primarily … of landscape irrigation water wasted as runoff, carry pollutants that impair recreational use and aquatic habitats all along Southern California's urbanized coastline. Storm drain systems carry the wasted water, along with landscape derived pollutants such as bacteria, nutrients and pesticides, to local creeks and the ocean. Given the local Mediterranean climate, excessive perennial dry season stream flows are an unnatural hydrologic pattern, causing species shifts in local riparian communities and warm, unseasonal contaminated freshwater plumes in the near-shore marine environment.*"

- **2006-2007 Orange County Watershed Action Plan Annual Reports**

The Watershed Action Plan Annual Reports for the 2006-2007 reporting period were submitted by the County of Orange, Orange County Flood Control District and Copermittees within the San Juan Creek, Laguna Coastal Streams, Aliso Creek, and Dana Point Coastal Streams Watersheds. San Juan Creek, Laguna Coastal Streams, Aliso Creek and Dana Point Coastal Streams are all currently 303(d) listed as impaired for indicator bacteria within their watersheds and/or in the Pacific Ocean at the discharge points of their watersheds. The Orange County Copermittees, within their Watershed Action Strategy Table for fecal indicator bacteria included the following:

"*Support programs to reduce or eliminate the discharge of anthropogenic dry weather nuisance flow throughout the…watershed. Dry weather flow is the transport medium for bacteria and other 303(d) constituents of concern.*"

Additionally, they state that "*conditions in the MS4 contribute to high seasonal bacteria propagation in-pipe during warm weather. Landscape irrigation is a major contributor to dry weather flow, both as surface runoff due to over-irrigation and overspray onto pavements; and as subsurface seepage that finds its way into the MS4*."

- **Fiscal Year 2008 Carlsbad Watershed Urban Runoff Management Program Annual Report**

The Carlsbad Watershed Urban Runoff Management Program Annual Report for Fiscal Year 2008 was submitted by the Carlsbad Watershed Copermittees (Cities of Carlsbad, Encinitas, Escondido, Oceanside, San Marcos, Solana Beach, and Vista, and the County of San Diego). In the Annual Report, the Carlsbad Watershed Copermittees stated the following:

"The Carlsbad Watershed Management Area (WMA) collective watershed strategy identifies bacteria, sediment, and nutrients as high priority water quality pollutants in the Agua Hedionda (904.3 – bacteria and sediment), Buena Vista (904.2 – bacteria), and San Marcos Creek (904.5 – nutrients) Hydrologic Areas. Bacteria, sediment, and nutrients have been identified as potential discharges from over-irrigation."

- **2007-2008 San Diego Bay Watershed Urban Runoff Management Program Annual Report**

  The San Diego Bay Watershed Urban Runoff Management Program 2007-2008 Annual Report was submitted by the San Diego Bay Watershed Copermittees (Cities of Chula Vista, Coronado, Imperial Beach, La Mesa, Lemon Grove, National City, and San Diego, the County of San Diego, the Port of San Diego, and the San Diego County Airport Authority). In Appendix D of the Annual Report, titled "Likely Sources of Pollutants," the San Diego Bay Watershed Copermittees identified over-irrigation of lawns as a pollutant generating activity from business and/or residential land uses for bacteria, pesticides, and sediment.

- **Copermittee Public Education Materials**

  The Orange County Public Works *Tips for Landscape & Gardening* public education brochure states: "*Fertilizers, pesticides and other chemicals that are left on yards or driveways can be blown or washed into storm drains that flow to the ocean. Overwatering lawns can also send materials into storm drains*."

  The Riverside County Flood Control and Water Conservation District *Landscape and Garden* public education brochure states: *"Soil, yard wastes, over-watering and garden chemicals become part of the urban runoff mix that winds its way through streets, gutters and storm drains before entering lakes, rivers, streams, etc. Urban runoff pollution contaminates water and harms aquatic life!"*

- **Los Peñasquitos Lagoon Sedimentation/Siltation TMDL Technical Report**

  The Los Peñasquitos Lagoon Sedimentation/Siltation TMDL technical report was prepared for the City of San Diego and USEPA in October 2010. The technical report was included as a technical supporting document attached to the Sediment TMDL for Los Peñasquitos Lagoon staff report prepared by the San Diego Water Board, dated June 13, 2012. Under the Source Assessment section, the technical report states the following:

  > "*Dry weather loading is dominated by nuisance flows from urban land use activities such as car washing, sidewalk washing, and lawn over-irrigation, which pick up and transport sediment into receiving waters.*"

These documents confirm that non-storm water discharges associated with over-irrigation are a source of pollutants and should be addressed as illicit discharges to the MS4. Prohibiting non-storm water discharges associated with over-irrigation, however, is not a new requirement for the Copermittees because it is also consistent with and required by the Water Conservation in Landscaping Act (AB 1881, Laird).

The Water Conservation in Landscaping Act required the Department of Water Resources (DWR) to prepare a Model Water Efficient Landscape Ordinance for use by local agencies (e.g. the Copermittees). All local agencies were required to adopt a water efficient landscape ordinance by January 1, 2010. Local agencies could adopt the Water Efficient Landscape Ordinance developed by DWR, or an ordinance considered at least as effective as the Model Ordinance. The Water Efficient Landscape Ordinance includes a requirement that local agencies prohibit runoff from irrigation (§ 493.2):

> "*Local agencies shall prevent water waste resulting from inefficient landscape irrigation by* <u>*prohibiting runoff from leaving the target landscape*</u> *[emphasis added] due to low head drainage, overspray, or other similar conditions where water flows onto adjacent property, non-irrigated areas, walks, roadways, parking lots, or structures. Penalties for violation of these prohibitions shall be established locally*."

Furthermore, non-storm water discharges from over-irrigation not only transport and discharge pollutants to receiving waters, but are also a likely source of the dry weather flows causing changes to habitat within and along the receiving water bodies. Examples of habitat changes from the dry weather flows include perennialization of ephemeral streams, and conversion of saltwater and brackish water marsh habitats to freshwater marsh habitats (e.g. Los Peñasquitos Lagoon). Both of these examples have resulted in the promotion of invasive species in several areas of the San Diego Region.

The removal of the over-irrigation discharges categories does not require the Copermittees to strictly prohibit lawn and landscape irrigation, but does require the prohibition of excessive irrigation water that results in non-storm water discharges to the MS4. Non-storm water discharges to the MS4 from over-irrigation must be addressed as illicit discharges by the Copermittees pursuant to the requirements of Provision E.2.

The remaining non-storm water categories listed in 40 CFR 122.26(d)(2)(iv)(B)(1) are listed under Provisions E.2.a.(1) through E.2.a.(5) and generally fall into four categories: (1) non-storm water discharges subject to existing San Diego Water Board waste discharge requirements and NPDES permits; (2) non-storm water discharges generally not expected to be a source of pollutants to receiving waters; (3) non-storm water discharges likely to contain pollutants requiring some form of control to address the pollutants prior to discharging to the MS4; and (4) non-storm water discharges or flows associated with firefighting.

Provisions E.2.a.(1) and E.2.a.(2) include several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) for which the San Diego Water Board already has developed general waste discharge requirements and NPDES permits to address the discharges. The Copermittees are only required to address these types of non-storm water discharges as illicit discharges if the Copermittees or

the San Diego Water Board identifies these non-storm water discharges not having coverage under the applicable NPDES permit.

Provision E.2.a.(3) includes several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) which are generally not expected to be a source of pollutants to receiving waters, many of which originate from what are typically natural, uncontrollable sources. The Copermittees are only required to address these types of non-storm water discharges as illicit discharges if the Copermittees or the San Diego Water Board identifies these non-storm water discharges as a source of pollutants to receiving waters. Because many of these sources are generally uncontrollable, enforcing a prohibition may not be a possibility for the Copermittees. The Copermittees would be able to address these non-storm water discharges by preventing these non-storm water discharges from entering the MS4. This could potentially be achieved by sealing their MS4 structures so the discharges cannot enter the MS4.

Provision E.2.a.(4) includes several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) that are likely to contain pollutants requiring some form of control to address the pollutants prior to discharging to the MS4. At this time, an outright prohibition of these types of non-storm water discharges does not yet appear to be warranted. Thus, Provision E.2.a.(4) includes several requirements for the Copermittees to control the pollutants from these types of non-storm water discharges. This is consistent with the clarification of the federal regulations in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board has the authority to require the Copermittees to "*control any of these types of discharges where appropriate*."

Unlike non-storm water discharges from over-irrigation, these types of non-storm water discharges are not expected to occur in close proximity to each other or very frequently. Provided these types of non-storm water discharges are controlled as required in Provision E.2.a.(4), the Copermittees would only be required to address these types of non-storm water discharges as illicit discharges if the Copermittee or the San Diego Water Board identifies these non-storm water discharges as a source of pollutants to receiving waters.

Provision E.2.a.(5) includes specific requirements for fire fighting discharges and flows. The requirements for non-storm water discharges and flows associated with fire fighting have been separated into requirements for: a) non-emergency fire fighting discharges and flows, and b) emergency fire fighting discharges and flows.

The San Diego Water Board has found that discharges from building fire suppression system maintenance (e.g. fire sprinklers) contain waste and potentially a significant source of pollutants to receiving waters. As such, the San Diego Water Board is requiring these discharges be addressed as illicit discharges by the Copermittees. Thus, the discharges to the MS4 are to be prohibited via ordinance, order or similar means. For other non-emergency firefighting discharges and flows (i.e. flows from

controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems), the Copermittees are required to develop and implement a program to address pollutants in these non-storm water discharges and flows. This is consistent with the clarification of the federal regulations in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board has the authority to require the Copermittees to "*control any of these types of discharges where appropriate*."

For emergency firefighting discharges and flows, the Phase I Final Rule (55 FR 48037) has clarified the requirements of 40 CFR 122.26(d)(2)(iv)(B)(1) pertaining to emergency firefighting flows and discharges, which states:

> "*In the case of firefighting it is not the intention of these rules to prohibit in any circumstances the protection of life and public or private property through the use of water or other fire retardants that flow into separate storm sewers*."

Thus, the requirements have been made to be consistent with the guidance provided by the Phase I Final Rule. The Order recommends that the Copermittees develop and encourage implementation of BMPs to reduce or eliminate the discharge of pollutants from emergency firefighting flows to the MS4s and receiving waters. The Order does not include any requirements that should be interpreted as requiring the implementation of BMPs for emergency firefighting flows to the MS4s and receiving waters.

The Copermittees are expected to review the dry weather MS4 outfall discharge monitoring data they collect to determine if and when there are non-storm water discharges to or from their MS4s that are a source of pollutants to receiving waters. If the Copermittees identify one of the types of non-storm water discharges listed in Provisions E.2.a.(1) through E.2.a.(4) as a source of pollutants to receiving waters based on the review and evaluation of monitoring data, Provision E.2.a.(6) requires the Copermittees to prohibit those categories of discharges from entering the MS4 through ordinance, order or similar means. In addition, Provision E.2.a.(6) clarifies that the San Diego Water Board may identify categories of non-storm water discharges or flows listed under Provisions E.2.a.(1) through E.2.a.(4) that must be prohibited.

Provision E.2.a.(6) also provides the Copermittees an option to propose controls to be implemented for the category of non-storm water discharges as part of the Water Quality Improvement Plan instead of prohibiting the category of non-storm water discharges. If the Water Quality Improvement Plan is accepted by the San Diego Water Board with the proposed controls, the Copermittees will not be required to prohibit the category of non-storm water discharges to their MS4s as long as the controls are implemented. This is consistent with the clarification of 40 CFR 122.26(d)(2)(iv)(B)(1) in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board may "*require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*."

Finally, Provision E.2.a.(7) has been included in the requirements for non-storm water discharges to clarify that any non-storm water discharges to the Copermittee's MS4, even those identified pursuant to Provisions E.2.a.(1) through E.2.a.(4), must be reduced or eliminated, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit. Provision E.2.a.(7) is consistent with the requirements of CWA section 402(p)(3)(B)(ii) and 40 CFR 122.26(d)(1)(v)(B), as clarified in the Phase I Final Rule (55 FR 47995) that "*[u]ltimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit*." However, the reduction or elimination of those non-storm water discharges are expected to be achieved as feasible, in accordance with the priorities in the Water Quality Improvement Plan and when the resources are available to the Copermittee.

Consistent with 40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(1), each Copermittee must implement a "*program…to prevent illicit discharges to the municipal storm sewer system*" and "*detect…illicit discharges and improper disposal into the storm sewer.*" Provision E.2.b requires each Copermittee to implement measures to prevent and detect illicit discharges and connections to its MS4 as part of its illicit discharge detection and elimination program.

As part of the program to prevent and detect illicit discharges to the MS4, 40 CFR 122.26(d)(2)(iv)(B)(2) requires "*procedures to conduct on-going field screening activities during the life of the permit, including areas or locations that will be evaluated by such field screens*." As part of the procedures, each Copermittee is required to maintain an updated map of its entire MS4 and the corresponding drainage areas within its jurisdiction. Having knowledge about where inlets, access points, connections with other MS4s, and outfalls are located is necessary for each Copermittee to track, identify, and eliminate illicit discharges and connections. Thus, Provision E.2.b.(1) of the Order specifies that the map must include the segments of the storm sewer system owned, operated, and maintained by the Copermittee, and include locations of all known inlets, connections with other MS4s, and outfalls to the Copermittee's MS4. The remaining requirements of Provision E.2.b are consistent with the requirements of 40 CFR 122.26(d)(2)(iv)(B)(3)-(7) related to implementing measures to prevent and detect illicit discharges and connections to the MS4.

Provision E.2.c requires each Copermittee to conduct field screening and monitoring of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4. Field screening is a required element of the program to detect and eliminate illicit discharges and connections to the MS4, pursuant to 40 CFR 122.26(d)(2)(iv)(B)(2). The field screening requirement will be implemented through the dry weather MS4 outfall discharge monitoring required under Provisions D.2.a.(2) and D.2.b.(1).

Provision E.2.d specifies the measures each Copermittee must implement to eliminate illicit discharges and connections to its MS4. Elimination of illicit discharges and connections to the MS4 is consistent with the requirement of 40 CFR

122.26(d)(2)(iv)(B) "*to detect and remove [emphasis added]…illicit discharges and improper disposal into the storm sewer*" and will achieve the CWA requirement for MS4 permits to "*effectively prohibit non-storm water discharges into the storm sewers*."

Generally, each Copermittee is responsible for prioritizing its efforts to eliminate non-storm water and illicit discharges or connections to its MS4 based on field screening and monitoring data, NALs, illicit discharge investigation records, and the known or suspected sources. Sources of non-storm water and illicit discharges or connections must be eliminated by enforcing the legal authority established by each Copermittee pursuant to Provision E.1.

Provision E.3 (Development Planning) requires each Copermittee to use its land use and planning authority to implement a development planning program to control and reduce the discharge of pollutants in storm water from new development and significant redevelopment to the MEP. Proper implementation of the development planning program will also contribute toward effectively prohibiting non-storm water discharges from development projects to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." As part of the management program, 40 CFR 122.26(d)(2)(iv)(A)(2) requires "*planning procedures including a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment*."

Land development generally alters the natural conditions of the land by removing vegetative cover, compacting soil, and/or placement of concrete, asphalt, or other impervious surfaces. These impervious surfaces concentrate urban pollutants (such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not found in high concentrations in the natural environment. Pollutants that accumulate on impervious surfaces are not easily biodegraded nor subject to natural treatment processes.

Impervious surfaces greatly affect the natural hydrology of the land because they do not allow natural infiltration and treatment of storm water runoff to take place. Instead, storm water runoff from impervious surfaces is typically directed through pipes, curbs, gutters, and other hardscape into receiving waters, with little treatment, at significantly increased volumes and accelerated flow rates over what would occur naturally. The increased pollutant loads, storm water volume, discharge rates and velocities, and discharge durations from the MS4 adversely impact stream habitat by causing accelerated, unnatural erosion and scouring within creek bed and banks. Placement of impervious surfaces also encapsulates "good" sediment (such as sand, gravel, rocks and cobbles) that would normally replenish creek beds and banks to help

stabilize them. Collectively, these changes to natural hydrologic processes are termed hydrograph modification, or hydromodification.

Hydromodification, which is caused by both altered storm water flow and altered sediment flow regimes, is largely responsible for degradation of creeks, streams, and associated habitats in the San Diego Region. In an ongoing study by the Stormwater Monitoring Coalition to assess the health of streams throughout Southern California, researchers found that three of the four highest risk stressors to creeks (percent sands and fines present, channel alteration, and riparian disturbance) were related to physical habitat.[29] Researchers studying flood frequencies in Riverside County have found that increases in watershed imperviousness of only 9-22 percent can result in increases in peak flow rates for the two-year storm event of up to 100 percent.[30] Such changes in runoff have significant impacts on channel morphology.

In addition, a technical report issued by the Southern California Coastal Water Research Project (SCCWRP) stated that "*[r]ecent studies indicate that California's intermittent and ephemeral streams are more susceptible to the effects of hydromodification than streams from other parts of the United States. Physical degradation of stream channels in the central and eastern United States can initially be detected when watershed impervious cover approaches 10 percent, although biological effects (which may be more difficult to detect) may occur at lower levels. In contrast, initial response of streams in the semi-arid portions of California appears to occur between 3 and 5 percent impervious cover*."[31] These studies highlight the extent to which impacts originating from impervious surfaces created by land development are responsible for the degradation of creek and stream habitat.

This is consistent with what USEPA has noted, that "*[m]ost stormwater runoff is the result of the man-made hydrologic modifications that normally accompany development. The addition of impervious surfaces, soil compaction, and tree and vegetation removal result in alterations to the movement of water through the environment. As interception, evapotranspiration, and infiltration are reduced and precipitation is converted to overland flow, these modifications affect not only the characteristics of the developed site but also the watershed in which the development is located. Stormwater has been identified as one of the leading sources of pollution for all waterbody types in the United States. Furthermore, the impacts of stormwater pollution are not static; they usually increase with more development and urbanization*."[32]

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[29] Assessing the Health of Southern California Streams, Stormwater Monitoring Coalition, Fact Sheet
[30] Schueler and Holland, 2000. Storm Water Strategies for Arid and Semi-Arid Watersheds (Article 66). The Practice of Watershed Protection.
[31] Stein, E. and Zaleski, S., 2005. Technical Report 475, Managing Runoff to Protect Natural Streams: The Latest Development on Investigation and Management of Hydromodification in California. December 30, 2005.
[32] USEPA, 2007. Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices, December 2007.

Reducing the impact from the increased pollutant loads and flows generated by impervious surfaces within a watershed is essential to protecting and restoring the integrity of the receiving waters. Provision E.3 includes the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment*." The requirements of Provision E.3 will 1) minimize the generation and discharge of pollutants in storm water from the MS4, and 2) minimize the potential of storm water discharges from the MS4 from causing altered flow regimes and excessive downstream erosion in receiving waters.

The requirements of Provision E.3.a include the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment*" applicable to all development projects, regardless of size or purpose of development. In general, all development projects must implement onsite BMPs to remove pollutants from runoff prior to its discharge to any receiving waters, as close to the pollutant generating source as possible, and structural BMPs must not be constructed within waters of the U.S.

Furthermore, the onsite BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors (e.g. mosquitos, rodents, and flies). If not properly designed or maintained, certain BMPs implemented or required by municipalities may create a habitat for vectors. Monitoring studies conducted by the California Department of Public Health (CDPH) have documented that mosquitoes opportunistically breed in structural storm water BMPs, particularly those that hold standing water for over 96 hours. Certain site design features that hold standing water may similarly produce mosquitoes.

Structural BMPs and site design features should incorporate design, construction, and maintenance principles to promote drainage within 96 hours to minimize standing water available to mosquitoes. Nuisances and public health impacts resulting from vector breeding can be prevented with close collaboration and cooperative effort between municipalities and local vector control agencies and the CDPH during the development and implementation of storm water runoff management programs. The CDPH also has issued guidance for BMP implementation that will minimize potential nuisances and public health impacts resulting from vector breeding.[33]

All development projects are required to implement source control BMPs that will minimize the generation of pollutants. Additionally, each development project must implement, where applicable and feasible, low impact development (LID) BMPs to

[33] California Department of Public Health, 2012. Best Management Practices for Mosquito Control in California. (http://www.cdph.ca.gov/HealthInfo/discond/Documents/BMPforMosquitoControl07-12.pdf)

mimic the natural hydrology of the site and retain and/or treat pollutants in storm water runoff prior to discharging to and from the MS4.

The LID Center defines LID as "*a comprehensive land planning and engineering design approach with a goal of maintaining and enhancing the pre-development hydrologic regime of urban and developing watersheds.*"[34] LID designs seek to control storm water at the source, using small-scale integrated site design and management practices to mimic the natural hydrology of a site, retain storm water runoff by minimizing soil compaction and impervious surfaces, and disconnect storm water runoff from conveyances to the storm drain system.

LID BMPs may utilize interception, storage, evaporation, evapotranspiration, infiltration, and filtration processes to retain and/or treat pollutants in storm water before it is discharged from a site. Because of these numerous options, the San Diego Water Board expects that every development project will be able to implement some form of LID BMPs. Examples of LID BMPs include using permeable pavements, rain gardens, rain barrels, grassy swales, soil amendments, and native plants.

Provision E.3.a also includes requirements for all development projects to, where feasible, landscape with native and/or low water use plants to minimize the discharge of non-storm water discharges associated with excessive irrigation, as well as harvest (i.e., storage) and use precipitation to promote the concept of utilizing storm water as a resource.

While all development projects are subject to the requirements of Provision E.3.a, Provision E.3.b identifies Priority Development Projects that exceed given size thresholds and/or fit under specific use categories. Priority Development Projects are required to incorporate specific performance criteria for structural BMPs into the project plan to reduce the generation of pollutants, and address potential impacts from hydromodification.

The Priority Development Project categories are based on the requirements of the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), and do not differ significantly from the Fourth Term Permit for San Diego County. Furthermore, the Priority Development Project categories are consistent with Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), and Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit).

Because of the impact of relatively small increases in watershed impervious surfaces to receiving waters, Provision E.3.b.(1)(c)(iv) has been updated to include large driveways that are 5,000 square feet or more. The San Diego Water Board finds that large driveways can exacerbate altered flow regimes if not properly controlled.

[34] www.lowimpactdevelopment.org

Provision E.3.b.(3) describes projects that are exempt from Priority Development Project status. These include new or retrofit paved sidewalks, bicycle lanes, or trails that are designed and constructed to direct runoff to vegetated areas or be hydraulically disconnected from paved areas. The exemptions have been provided to encourage these types of projects because they provide multiple environmental benefits, such as promoting walking rather than driving, which will in turn improve air quality. Additionally, retrofitting of existing alleys, streets, or roads are exempt from Priority Development Project status if they are constructed using USEPA Green Streets guidance.[35] By doing so, retrofitting of these types of projects is encouraged. The San Diego Water Board recognizes that there are spatial constraints associated with these projects, and implementation of structural BMPs are not always feasible.

For development projects identified as Priority Development Projects, the requirements of Provision E.3.c are the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment.*" Provisions E.3.c.(1)-(3) describe the performance criteria for the structural BMPs that must be implemented for each Priority Development Project defined by Provision E.3.b.

Provision E.3.c.(1) describes the storm water pollutant control BMP requirements that must be implemented by all Priority Development Projects. The purpose of Provision E.3.c.(1) is to reduce pollutants in storm water runoff to the MEP from Priority Development Projects before it is discharged to the MS4. Of all the available treatment processes available, retention of storm water, and therefore capture of the pollutants in the storm water, will achieve 100 percent pollutant removal efficiency for the volume of storm water retained. No other method of treatment can achieve 100 percent pollutant removal efficiency. Thus, retention of as much storm water onsite is the most effective way to reduce pollutants in storm water discharges to, and consequently from the MS4, and controls pollutants in storm water discharges from a site to the MEP.

Under Provision E.3.c.(1)(a), retention of the pollutants in the runoff produced from the 85th percentile storm event ("design capture volume") is the design standard to which Priority Development Projects must comply. Since the 85th percentile storm event has previously been used as the numeric design standard for treatment control BMPs, this same size storm event is used as the numeric design standard for storm water retention. This is the MEP standard recognized by the San Diego Water Board and is consistent with the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), as well as Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and

[35] "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).

Riverside County MS4 Permits, respectively), Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit), and Los Angeles Water Board Order No. R4-2012-0175 (Los Angeles County MS4 Permit).

The 85th percentile storm event is the event that has a precipitation total greater than or equal to 85 percent of all storm events over a given period of record in a specific area or location. For example, to determine what the 85th percentile storm event is in a specific location, all 24 hour storms that have recorded values over a 30 year period would be tabulated and a 85th percentile storm would be determined from this record (i.e. 15 percent of the storms would be greater than the number determined to be the 85th percentile storm). Most jurisdictions in the San Diego Region have already developed isopluvial maps that can provide this type of information. The 85th percentile storm might be determined to be a number such as 1.0 inch, and this would be multiplied by the total area of the project footprint producing runoff to calculate the design capture volume. The Priority Development Project designer would then select a system of BMPs that would retain (i.e. intercept, store, infiltrate, evaporate, or evapotranspire) the pollutants contained in the design capture volume onsite.

Retention BMPs are necessary to capture and retain pollutants generated from a Priority Development Project. In a recent study performed by SCCWRP in the Los Angeles Region, they found "*that the magnitude of constituent load associated with storm water runoff depends, at least in part, on the amount of time available for pollutant build-up on land surfaces. The extended dry period that typically occurs in arid climates such as southern California maximizes the time for constituents to build-up on land surfaces, resulting in proportionally higher concentrations and loads during initial storms of the season*."[36] This implies that the "first flush" of a rainy season and the first storm events after long antecedent dry periods tend to have the highest pollutant loads. Capturing and retaining the pollutant loads of the "first flush" of a rainy season and the first storm events after long antecedent dry periods will reduce a significant portion of the pollutants in storm water discharged to and from the MS4.

The San Diego Water Board, however, acknowledges that in some situations retention of the full design capture volume onsite may not be technically feasible. In this event, the Copermittee may allow the Priority Development Project to use biofiltration BMPs to treat 1.5 times the design capture volume not reliably retained onsite, or biofiltration BMPs with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite.

The 1.5 multiplier is based on the finding in the Ventura County Technical Guidance Manual that biofiltration of 1.5 times the design capture volume not retained onsite will provide approximately the same pollutant removal as retention of the design capture

[36] Stein, E.D., Tiefenthaler, L.L., and Schiff, K.C., 2007. Technical Report 510, Sources, Patterns and Mechanisms of Storm Water Pollutant Loading from Watershed and Land Uses of the Greater Los Angeles Area, California, USA. March 20, 2007.

volume on an annual basis.[37] This standard is consistent with the Los Angeles Water Board's Los Angeles County and Ventura County municipal storm water permits (Order Nos. R4-2012-0175 and R4-2010-0108, respectively). The flow-thru design of 0.75 times the portion of the design capture volume not reliably retained onsite is consistent with the San Diego Water Board's Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively). In either case, the biofiltration BMPs must be designed with an appropriate hydraulic loading rate to maximize storm water retention and pollutant removal, as well as to prevent erosion, scour, and channeling within the BMP. Each Copermittee is required to update its BMP Design Manual to provide guidance for hydraulic loading rates and other biofiltration design criteria necessary to maximize storm water retention and pollutant removal.

The San Diego Water Board further recognizes that, in addition to not being technically feasible, retention of the full design capture storm onsite may be cost prohibitive, or may not provide as much water quality benefit to the Watershed Management Area as would implementing BMPs elsewhere in the watershed. Thus, Provision E.3.c.(1)(b) allows for the use of a combination of onsite retention BMPs, and the implementation of an Alternative Compliance Program described in Provision E.3.c.(3). Provision E.3.c.(3) is discussed in more detail below.

If the full design capture volume is not retained onsite either because biofiltration is not technically feasible, or a Copermittee grants a Priority Development Project permission to utilize the Alternative Compliance Program, then the pollutants in the portion of the design capture volume that are not reliably retained onsite must still be reduced to the MEP. Thus, flow-thru treatment control BMPs are required to be implemented on Priority Development Projects in addition to the retention BMPs. The requirements of Provisions E.3.c.(1)(a)(ii)[a]-[c] include the performance standards for flow-thru treatment control BMPs, consistent with the Fourth Term Permits in the San Diego Region.

Whereas the purpose of the requirements under Provision E.3.c.(1) is to reduce pollutants in storm water runoff to the MEP, the purpose of the requirements under Provision E.3.c.(2) is to maintain or restore more natural hydrologic flow regimes to prevent accelerated, unnatural erosion in downstream receiving waters, also to the MEP standard. Provision E.3.c.(2) describes hydromodification management BMP requirements that must be implemented by all Priority Development Projects.

The performance criteria for the implementation of hydromodification management BMPs on Priority Development Projects are consistent with the requirements in the Fourth Term Permits for Orange and Riverside Counties (Order Nos. R9-2009-0002 and R9-2010-0016, respectively). Modifications to the Orange County and Riverside County Hydromodification Management Plans (HMPs) will likely be minor, or may not

[37] Ventura Countywide Stormwater Management Program. 2011. Ventura Technical Guidance Manual, Manual Update, 2011.

be necessary. The HMP for San Diego County will likely require some minor modifications to incorporate the requirements of Provision E.3.c.(2) and become consistent with the Orange County and Riverside County HMPs. The San Diego Water Board does not, however, expect that it will be necessary for the San Diego County Copermittees to develop a new approach or significantly re-write the San Diego County HMP. This is because the premise of the hydromodification management BMP requirements, which are to control storm water runoff conditions (flow rates and durations) for Copermittee-defined range of flows, is unchanged from all Fourth Term Permits in the San Diego Region.

Provision E.3.c.(2)(a) requires that post-project runoff conditions mimic the *pre-development* runoff conditions, and not the *pre-project* runoff conditions. Fundamentally, the San Diego Water Board believes that using a hydrology baseline that approximates that of an undeveloped, natural watershed is the only way to facilitate the return of more natural hydrological conditions to already built-out watersheds, and ultimately improved stream health. On the other hand, using the *pre-project* hydrology as a baseline for redevelopment projects results in propagating the unnatural hydrology of urbanized areas. Propagating the urbanized flow regime does not support conditions for restoring degraded or channelized stream segments, and would forever sentence such streams to the degraded state. Furthermore, reducing the volume of storm water runoff associated with the urbanized flow regime will also result in reducing the discharge of pollutants into receiving waters, since storm water runoff from impervious surfaces contains untreated pollutants.

The San Diego Water Board understands that approximating the pre-development runoff condition associated with a redevelopment site is not necessarily straightforward because factors such as natural grade and native vegetation for the site cannot be precisely known. Therefore, the San Diego Water Board does not expect project designers to estimate historical conditions associated with redevelopment sites. Rather, the San Diego Water Board expects project designers and the Copermittees to approximate pre-development runoff conditions using the parameters of a *pervious* area rather than an *impervious* area. This means that for redevelopment sites, approximating pre-development runoff conditions equates to using existing onsite grade and assuming the infiltration characteristics of the underlying soil. A redevelopment Priority Development Project must not use runoff coefficients of concrete or asphalt to estimate pre-development runoff conditions. Rather, redevelopment projects must use available information pertaining to existing underlying soil type (such as soil maps published by the National Resource Conservation Service), onsite existing grade, and any other readily available pertinent information to estimate pre-development runoff conditions.

The San Diego Water Board understands, indeed asserts, that the pre-development hydrology of an area in question can only be roughly estimated and cannot be precisely known. However, using the hydrology of a natural condition, even if not precisely known, will provide significant benefit to receiving waters over using the hydrology associated with impervious (developed) surfaces. Therefore in order to

achieve the goals of the Clean Water Act, which are to "*restore and maintain the chemical, physical, and biological integrity of the nation's waters* [emphasis added]," the most appropriate standard to use for hydromodification management is the standard associated with the pre-development condition.

Provision E.3.c.(2)(b) requires Priority Development Projects to avoid known critical sediment yield areas or implement measures that would allow coarse sediment to be discharged to receiving waters, such that the natural sediment supply is unaffected by the project. This is necessary because the availability of coarse sediment supply is as much an issue for causing erosive conditions to receiving streams as are accelerated flows.

The San Diego Water Board recognizes that in some situations implementing the hydromodification management BMP requirements for flow control fully onsite may not be technically feasible, may be cost prohibitive, or may not provide any overall water quality benefits to the Watershed Management Area. Thus, Provision E.3.c.(2)(c) allows for the use of a combination of onsite hydromodification management BMPs for flow control and alternative compliance options described in Provision E.3.c.(3).

Provision E.3.c.(3) allows for alternative compliance in instances where the Copermittee determines that offsite measures will have a greater overall water quality benefit for the Watershed Management Area than if the Priority Development Project were to implement structural BMPs onsite. Consequently, watershed-specific structural BMP requirements are present in this Order in the form of allowable compliance offsite. The Alternative Compliance Program to Onsite Structural BMP Implementation Provision is intended to integrate with the Copermittees' planning efforts in the Water Quality Improvement Plans.

The Alternative Compliance Program is an option for Priority Development Projects where the governing Copermittee has participated in the development of a Watershed Management Area Analysis as part of the Water Quality Improvement Plan (described in Provision B.3.b.(4)). Such an approach is consistent with the latest findings in hydromodification management by the scientific community. In a Technical Report entitled *Hydromodification Assessment and Management in California,*[38] the report states:

> *"An effective [hydromodification] management program will likely include combinations of on-site measures (e.g., low-impact development techniques, flow-control basins), in-stream measures (e.g., stream habitat restoration), floodplain and riparian zone actions, and off-site measures. Off-site measures may include compensatory mitigation measures at upstream locations that are designed to help restore and manage flow and sediment yield in the watershed."*

[38] 2012. ED Stein, F Federico, DB Booth, BP Bledsoe, C Bowles, Z Rubin, GM Kondolf, A Sengupta. Technical Report 667. Southern California Coastal Water Research Project. Costa Mesa, CA.

Consistent with the ideas brought forth in the report, in the Watershed Management Area Analysis of Provision B.3.b.(4), which is optional, the Copermittees will develop watershed maps that include as much detail about factors that affect the hydrology of the watershed as is available. Such factors included identification of areas suitable for infiltration, coarse sediment supply areas, and locating stream channel structures and constrictions. Once these factors are mapped and studied, the Copermittees can identify areas in the watershed where candidate projects may be implemented that are expected to improve water quality in the watershed by providing more opportunity for infiltration, slowing down storm water flows, or attenuation of pollutants naturally via healthy stream habitat. These candidate projects may be in the form of retrofitting existing development, rehabilitating degraded stream segments, identifying regional BMPs, purchasing land to preserve valuable floodplain functions, and any other project(s) that the Copermittees identify.

Under the Alternative Compliance Program, Priority Development Projects may be allowed to fund, partially fund, or implement a candidate project, in lieu of implementing structural BMPs onsite, if they enter into a voluntary agreement with the governing Copermittee permitting this arrangement. Project proponents may also propose an alternative project not previously identified by the Copermittees. In either case, whether a project proponent implements a candidate project identified by the Copermittees or a separate alternative compliance project, the governing Copermittee must determine that implementation of the project will have a greater overall water quality benefit for the Watershed Management Area than fully implementing structural BMPs onsite. Determination of greater overall water quality benefits associated with alternative compliance projects would be accomplished by utilizing Water Quality Equivalency calculations developed pursuant to Provision E.3.c.(3)(a). Water Quality Equivalency calculations are necessary to establish a regional and technical basis for determining water quality benefits associated with alternative compliance projects, which can be consistently used by all Copermittees in the San Diego Region. Finally, if ~~If~~ alternative compliance involves funding or implementing a project that is outside the jurisdiction of the governing Copermittee, then that Copermittee may enter into an inter-agency agreement with the appropriate jurisdiction.

Finally, Provision E.3.c.(2)(d) allows Priority Development Projects to be exempt from the hydromodification management BMP requirements if there is no threat of erosion to downstream receiving waters (i.e. the receiving stream is concrete lined from the point of discharge all the way to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean). If the Copermittees believe that more exemptions are warranted, then they must perform the optional Watershed Management Area Analysis of Provision B.3.b.(4). Additional exemptions other than those specified in this Order may be established on a watershed basis, provided the Copermittees perform the analysis, provide supporting rationale for the exemptions, and complete the Water Quality Improvement Plan approval process pursuant to Provision F.1.

To facilitate the transition to this Order from the Fourth Term Permits for Orange and Riverside County Copermittees, Provision E.3.c.(2)(e) allows two additional temporary

exemptions from hydromodification management BMP implementation. The first temporary exemption allows relief from hydromodification management BMP implementation for Priority Development Projects discharging directly to an engineered channel conveyance system with a capacity to convey peak flows generated by the 10-year storm event all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean. Similar to the exemption allowed for concrete-lined channels, this exemption is premised on the concept that there is little threat of erosion to these types of engineered channel systems.

The second temporary exemption allows relief from hydromodification management BMP implementation for Priority Development Projects discharging directly to large river reaches with drainage areas larger than 100 square miles and a 100-year flow capacity in excess of 20,000 cubic feet per second. If this exemption is claimed, then properly sized energy dissipation is required at all discharge points associated with the Priority Development Project. This exemption is premised on the concept that large river reaches can essentially assimilate the accelerated flow rates associated with individual Priority Development Projects because they are inconsequential compared to the flow rate in the large river reach. Both of these exemptions are included in the Hydromodification Management Plan for San Diego County[39].

These temporary exemptions are allowed as a means to facilitate Orange and Riverside County Copermittees' transition to this Order from the Fourth Term Permits and are not meant to reside as permanent exemptions without additional rigorous technical analyses specific to each County. Therefore, these exemptions will no longer apply once the Copermittees' land development programs are fully updated to reflect the requirements of this Order, i.e., upon implementation of the BMP Design Manual pursuant to Provision F.2.b. If the Copermittees believe that these or other exemptions are warranted in the context of water quality improvement and stream restoration opportunities, then the Copermittees must perform the optional Watershed Management Area Analysis of Provision B.3.b.(4) and provide supporting rationale for the exemptions. The San Diego County Copermittees are also required to perform the optional Watershed Management Area Analysis to provide supporting rationale to justify use of these and other exemptions. Updated BMP Design Manuals including rationale to justify use of exemptions will be reviewed by the San Diego Water Board pursuant to Provision F.2.b.

Provisions E.3.c.(4) and E.3.c.(5) were included under the BMP requirements applicable to all development projects in the Fourth Term Permits for San Diego, Orange, and Riverside Counties (Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016, respectively). In this Order, the long-term BMP maintenance and infiltration and groundwater protection requirements apply to structural BMPs implemented by Priority Development Projects only.

[39] Final Hydromodification Management Plan Prepared for County of San Diego, March 2011

Provision E.3.d requires the Copermittees to update their BMP Design Manual as needed to incorporate the requirements of Provision E.3. The BMP Design Manual is formerly known as the Standard Storm Water Mitigation Plan, or SSMP, and was renamed so that the title has a more accurate description of the document content. The contents of the BMP Design Manual are largely unchanged from the previous Standard Storm Water Mitigation Plans required under the Fourth Term Permits. The BMP Design Manual fulfills the 40 CFR 122.26(d)(2)(iv)(A)(2) requirement that the Copermittee's development planning program includes "*a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment*."

As part of the "*planning procedures,*" 40 CFR 122.26(d)(2)(iv)(A)(2) requires the procedures to "*address controls to reduce pollutants in discharges from municipal separate storm sewers after construction is completed*." The requirements applicable to the implementation and oversight of structural BMPs at Priority Development Projects are provided under Provision E.3.e.

Proper installation of the structural BMPs approved for a Priority Development Project is necessary to ensure that pollutants in storm water discharges will be reduced to the MEP after the project is completed. In addition to the proper installation of structural BMPs, the maintenance of structural BMPs on Priority Development Projects is necessary to ensure that pollutants in storm water discharges will continue to be reduced to the MEP. Provision E.3.e.(1) includes the minimum requirements that each Copermittee must implement to ensure structural BMPs are properly installed and will be properly maintained.

The requirements under Provision E.3.e.(2)-(3) are necessary to demonstrate each Copermittee is implementing a program that complies with Provisions E.3.b-c and E.3.e.(1), and ensure structural BMPs at Priority Development Project will continue to be able to reduce pollutants in storm water discharges to the MEP.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary for any development projects to compel compliance with the requirements of Provision E.3 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.3.f requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

<u>Provision E.4 (Construction Management)</u> requires each Copermittee to implement a construction management program to control and reduce the discharge of pollutants in storm water from construction sites to the MEP. Proper implementation of the construction management program will also contribute toward effectively prohibiting non-storm water discharges from construction sites to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." As part of the management program, 40 CFR 122.26(d)(2)(iv)(D) requires "*a program to implement and maintain structural and non-structural best management practices to reduce pollutants in storm water runoff from construction sites to the municipal storm sewer system.*"

Construction sites can be significant sources of sediment, trash, and other pollutants to receiving waters. Although sediment is naturally occurring in the natural environment, the discharge of sediment under unnatural conditions is problematic to receiving waters. Fine sediment in creeks causes high turbidity that interferes with the functionality of native flora and fauna in local creeks. For example, turbidity interferes with both photosynthesis of water-philic plants, as well as successful foraging and reproduction of benthic macroinvertebrates. Sediment can also make it difficult for fish to breathe because it clogs fish gills. Other pollutants such as heavy metals or pesticides can adhere to sediment and are transported to receiving waters during storm events, where they dissolve in the water column and become bioavailable to aquatic organisms. Sediment is recognized as a major stressor to surface waters and is responsible for the impairment of several lagoons and creeks in the San Diego Region.

Provision E.4 includes requirements that each Copermittee must implement to minimize the discharge of sediment and other pollutants from construction sites to the MS4 within its jurisdiction. The requirements under Provision E.4 are consistent with the Fourth Term Permits for San Diego, Orange, and Riverside Counties. Therefore, Copermittees are expected to implement the requirements seamlessly, with minimal changes to their existing construction management programs. The Copermittees, however, are given more flexibility to run their programs as needed to maximize efficiency, and also to be consistent with the Water Quality Improvement Plan for the Watershed Management Area.

As part of the construction management program, 40 CFR 122.26(d)(2)(iv)(D)(1) requires "*procedures for site planning which incorporate consideration of potential water quality impacts.*" Provision E.4.a describes the minimum elements each Copermittee is required to include as part of the construction site planning and project approval process. The construction site planning and approval process is based primarily on ensuring each project had an adequate site-specific pollution control, construction BMP, and/or erosion and sediment control plan that will be implemented to minimize the discharge of pollutants in storm water to the MEP, and minimize impacts to receiving waters.

The requirements under Provision E.4.b provide the data and information necessary to identify "*priorities for inspecting sites and enforcing control measures*" required

pursuant to 40 CFR 122.26(d)(2)(iv)(D)(3). Under Provision E.4.b, each Copermittee must identify construction sites that are considered a high threat to downstream surface waters. Designation of "high threat to water quality" construction sites will necessitate the Copermittees to develop criteria to identify such sites. Provision E.4.b.(2) describes a list of factors that must be considered when the Copermittee considers threat to water quality. For example, a Copermittee must identify sites as "high threat to water quality" if it is located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions, according to the Water Quality Improvement Plan. This ensures that construction management program implementation is compatible with the Copermittee's identified highest priority water quality conditions.

Pursuant to 40 CFR 122.26(d)(2)(iv)(D)(2) each Copermittee is required describe "*requirements for nonstructural and structural best management practices*" at construction sites. Provision E.4.c includes the types of construction site BMPs that the Copermittees must implement, or require the implementation of, at each construction site to reduce pollutants in storm water discharges to the MEP.

Each Copermittee is expected to require the implementation of appropriate BMPs given specific site conditions, the season and likelihood of rain events, and construction phase (i.e. grading vs. vertical construction). This means that throughout the life of the project construction, the appropriate BMPs will vary, especially if the construction of the project spans multiple wet seasons. As opposed to describing specific minimum BMPs that must be implemented, the Order describes major BMP categories that should be considered for each site.

Each Copermittee is expected to use its 20 years of storm water experience and knowledge to require implementation of appropriate BMPs from the various categories at each construction site within its jurisdiction. For example, the San Diego Water Board expects that each site will be required to implement erosion control and sediment control. The San Diego Water Board also expects each Copermittee to require implementation of active/passive sediment treatment systems at sites where other BMPs have been tried and are known to be inadequate, and discharges of sediment are causing or contributing to water quality impairment downstream. Each Copermittee is granted flexibility in specifying the minimum level of BMP requirements at each site, but the San Diego Water Board expects each site to be capable of controlling pollutants in storm water discharges to the MEP and preventing illicit discharges.

The requirements under Provision E.4.d are necessary to demonstrate that each Copermittee is implementing a program that complies with Provisions E.4.a and E.4.c and ensure BMPs at construction sites will reduce pollutants in storm water discharges to the MEP.

Provision E.4.d does not include minimum required inspection frequencies for construction sites. Each Copermittee must use its experience and knowledge to

specify an appropriate inspection frequency for both high priority and lower priority sites in their jurisdictional runoff management program documents, and in accordance with the Water Quality Improvement Plan. Appropriate inspection frequencies may vary by Copermittee, but the San Diego Water Board expects that the stated frequency will be adequate for each Copermittee to properly oversee the construction sites within its jurisdiction, confirm BMPs are implemented to reduce pollutants in storm water discharges from constructions sites to the MEP, and make needed changes to its program on an ongoing basis as necessary.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary for any development projects to compel compliance with the requirements of Provision E.4 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.4.e requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

<u>Provision E.5 (Existing Development Management)</u> requires each Copermittee to implement an existing development management program to control and reduce the discharge of pollutants in storm water from areas of existing development to the MEP. Proper implementation of the existing development management program will also contribute toward effectively prohibiting non-storm water discharges from areas of existing development to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." Within 40 CFR 122.26(d)(2)(iv)(A) and (C), the management program is required to reduce impacts on receiving waters and reduce pollutants in storm water discharges to the MEP from commercial and residential areas, industrial facilities, and municipal facilities.

Commercial and residential areas, industrial facilities, and municipal facilities must be addressed by each Copermittee with the existing development management program required under Provision E.5. All other areas within each Copermittee's jurisdiction should be either undeveloped open space, or areas that are being developed or under construction. Areas being developed or under construction will be addressed by the Copermittee under the requirements of Provision E.3 (Development Planning) or Provision E.4 (Construction Management).

Areas of existing development typically include impervious surfaces such as sidewalks, driveways, roads, and rooftops, which generate and concentrate pollutants (such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not found in high concentrations in the natural environment. Pollutants that accumulate on impervious surfaces are not easily biodegraded or not subject to

natural treatment processes. When it rains, these pollutants are transported in storm water runoff from these impervious surfaces into receiving waters, resulting in poor water quality and degradation of beneficial uses.

In addition to the generation of pollutants, areas of existing development have generally altered the natural conditions of the land and removed vegetative cover, reduced the perviousness of the surface, and reduced the capacity of storm water that can be intercepted, captured, stored, infiltrated, evaporated, and/or evapotranspired. The alteration of the natural conditions and the impervious surfaces associated with areas of existing development causes water quality problems due to the alteration of natural flow regimes within the watersheds; resulting in hydromodification of channels, streams, and habitats that exist within or adjacent to the areas of existing development.

Thus, storm water discharges from areas of existing development are responsible for poor water quality, degraded habitats, and hydromodified channels throughout the developed portions of the watersheds in the San Diego Region. To improve the health and functionality of the receiving waters in a Watershed Management Area, land use practices and the amount of impervious surfaces in areas of existing development must change to reduce the various impacts caused by hydromodification and pollutants from storm water runoff generated in developed areas. Each Copermittee must be aggressive to address pollutant sources and runoff from areas of existing development to be able to reduce pollutants in storm water discharges from the MS4 to the MEP.

There is some overlap in the requirements under Provision E.5 with the requirements under Provisions E.2 (Illicit Discharge Detection and Elimination), E.3 (Development Planning), and E.4 (Construction Management). Illicit discharges frequently originate from areas of existing development. New development projects, when completed will become some type of residential, commercial, industrial or municipal existing development. Redevelopment projects are, by definition, redeveloping areas of existing development. And, redevelopment projects become construction sites located in areas of existing development. Much of the data and information collected, inspections performed, and enforcement actions taken for the requirements under Provisions E.2 to E.4 may also be utilized by the existing development management program. The requirements under Provision E.5, however, are focused primarily on reducing pollutants generated in areas of existing development that can be transported in storm water runoff and discharged to and from the MS4.

The requirements under Provision E.5 build upon existing program elements being implemented by the Copermittees. Provision E.5 is generally consistent with the existing development requirements of the Fourth Term Permits for Orange and Riverside Counties (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), but modified to provide more flexibility to implement the programs so resources can be better focused toward addressing the highest priority water quality conditions identified in the Water Quality Improvement Plans.

For a Copermittee to properly manage areas of existing development, having knowledge of what development exists within its jurisdiction is essential. Provision E.5.a requires each Copermittee to maintain a watershed-based inventory of all the existing development within its jurisdiction. This requirement is necessary for each Copermittee to implement the requirements of Provision E.5.b-e.

As opposed to just maintaining separate inventories based on the type of site, each Copermittee must maintain a watershed-based inventory that includes all types of existing development within its jurisdiction. By utilizing a watershed-based inventory, the Copermittees within a Watershed Management Area can combine their inventories and review the inventories by watershed in addition to by jurisdiction. Pollutant sources and strategies for abatement can then be evaluated on a watershed level, as opposed to evaluating sources and strategies strictly by type of site.

Provision E.5.a includes the information that must be included in the inventory. Provision E.5.a.(1) specifies what facilities or areas must be included in the inventory. A commercial type of existing development may be identified in the inventory as a facility (e.g. individual building, individual business) or an area (e.g. shopping center, commercial zone). An industrial type of existing development must be identified in the inventory by facility (e.g. individual industrial entity). A municipal type of existing development must be identified in the inventory by facility, with a list of specific municipal facilities that must be included in the inventory. A residential type of existing development must be identified by areas to be designated by the Copermittee. For each of the facilities and areas identified in the Copermittee's inventory developed pursuant to Provision E.5.a.(1), Provision E.5.a.(2) specifies the information that must be included in the description for the facility or area.

Provision E.5.a.(3) requires each Copermittee to maintain an updated map showing the location of inventoried existing development, watershed boundaries, and water bodies. This requirement was included because this information is expected to help the Copermittees in a Watershed Management Area identify and prioritize sources of pollutants and/or stressors in areas of existing development that contribute toward the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Knowledge of the existing development that are likely to be sources of pollutants contributing to the highest priority water quality conditions is expected to be a key element in the Copermittees' development of the water quality improvement strategies that will be included in the Water Quality Improvement Plans. The strategies described in the Water Quality Improvement Plans will direct efforts within the existing development management programs implemented by each Copermittee.

Pursuant to 40 CFR 122.26(d)(2)(iv)(A) each Copermittee is required describe "*structural and source control measures to reduce pollutants*" in storm water runoff discharged from areas of existing development. Provision E.5.b includes the BMP

implementation and maintenance requirements that the each Copermittee must require at areas of existing development to reduce pollutants in storm water discharges to the MEP. The San Diego Water Board, however, recognizes that BMP implementation and maintenance for residential areas will require much more education and encouragement through less authoritative measures than for commercial, industrial and municipal facilities and areas. Thus, the BMP implementation and maintenance requirements have been separated between requirements under Provision E.5.b.(1) for commercial, industrial and municipal facilities and areas, and Provision E.5.b.(2) for residential areas.

Most of the requirements in Provision E.5.b are consistent with the related requirements in the Fourth Term Permits. The level of specificity, however, has been changed to allow each Copermittee the flexibility to implement its program to achieve maximum efficiency, and to perform functions that will address the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Each Copermittee is expected to require the implementation of appropriate BMPs to address the expected pollutants from each facility or area. The Third and Fourth Term Permits described specific minimum BMPs that must be implemented at various sites. This Order, however, requires each Copermittee to designate minimum BMPs themselves and require implementation. Consistent with the Fourth Term Permits, each Copermittee is required to maintain, or require the maintenance of, all BMPs as needed.

The BMP implementation and maintenance requirements include a schedule of operation and maintenance activities for the MS4 and related structures (such as catch basins, storm drain inlets, and detention basins), as well as public streets and roads. Public streets and roads specifically include public unpaved roads. The San Diego Water Board identified, through investigations and complaints, sediment discharges from unpaved roads as a significant source of water quality problems in the San Diego Region. Inspection activities conducted by the San Diego Water Board since the Third Term Permits have found a lack of source control for many unpaved roads within the jurisdiction of the Copermittees.

Unpaved roads are a source of sediment that can be discharged in runoff to receiving waters, especially during storm events. Erosion of unpaved roadways occurs when soil particles are loosened and carried away from the roadway base, ditch, or road bank by water, wind, traffic, or other transport means. Exposed soils, high runoff velocities and volumes, sandy or silty soil types, and poor compaction increase the potential for erosion.

Road construction, culvert installation, and other maintenance activities can disturb the soil and drainage patterns to streams in undeveloped areas, causing excess runoff and thereby erosion and the release of sediment. Poorly designed unpaved roads can act as preferential drainage pathways that carry runoff and sediment into natural streams, impacting water quality. In addition, other public works activities along

unpaved roads have the potential to significantly affect sediment discharge and transport within streams and other waterways, which can degrade the beneficial uses of those waterways.

USEPA also recognizes that discharges from unpaved roads pose a significant potential threat to water quality. USEPA guidance[40] emphasizes the threat of unpaved roads to water quality:

> "*Dirt and gravel roads are a major potential source of these pollutants [sediment] and pollutants that bind to sediment such as oils, nutrients, pesticides, herbicides, and other toxic substances. Many roads have unstable surfaces and bases. Roads act like dams, concentrating flows that accelerate erosion of road materials and roadsides. Both unstable surfaces and accelerated erosion then lead to sediment and dust.*"

There are several guidance documents, developed by the USEPA,[41] the US Forest Service,[42] the University of California,[43] and others, that include design and construction specifications and BMPs that are readily available for implementation by public entities. Implementing design and other source control BMPs for unpaved roads in the region is necessary to reduce and minimize the impacts of sediment discharged during storm events from unpaved roads to the MS4s and receiving waters.

Provision E.5.c describes existing development site inspection frequency, content, and tracking that each Copermittee must incorporate into their existing development management programs. The requirements under Provision E.5.c are necessary to demonstrate each Copermittee is implementing a program that complies with Provision E.5.b and ensure BMPs implemented in areas of existing development will reduce pollutants in storm water discharges to the MEP. Provision E.5.c has been modified to include a minimum of once every 5 years for all inventoried facilities and areas of existing development, utilizing one or more methods of inspection.

In addition to onsite inspections, the methods of inspection have been expanded to include drive-by inspections. Inspections may be performed by the Copermittee's municipal and contract staff, or by volunteer monitoring or patrol programs. Volunteer monitoring or patrol programs are not expected to enforce the Copermittee's ordinances, or to inspect areas or facilities where members of the public are not allowed access. Volunteer monitoring or patrol programs must be trained by the Copermittee, and are only expected to collect visual observations. By utilizing drive-by

[40] USEPA, 2006. Environmentally Sensitive Maintenance for Dirt and Gravel Roads. Gesford and Anderson, USEPA-PA-2005.
[41] Ibid
[42] US Forest Service, 1996. Forest Service Specifications for Construction of Roads & Bridges. EM-7720-100. Revised August 1996.
[43] University of California Division of Agriculture and Natural Resources, 2007. Rural Roads: A Construction and Maintenance Guide of California Landowners. Publication 8262.

inspections and volunteer monitoring or patrol programs, the Copermittees will be able to maximize and efficiently use their resources to identify and address sources of pollutants in areas of existing development.

The municipal and contract staff of each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial, industrial, and municipal facilities and areas in its inventoried existing development pursuant to Provision E.5.c.(1)(a)(iv). An "equivalent" of at least 20 percent means if any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspections may count toward the total annual inspection requirement. Linear municipal facilities (i.e. MS4 linear channels, sanitary sewer collection systems, streets, roads and highways) in the Copermittee's existing development inventory are not subject to the inspection frequency requirement of Provision E.5.c.(1)(a)(iv).

The inspection content specified in Provision E.5.c.(2)(a) includes the information required to be collected during an inspection by any method. The inspection content specified in Provision E.5.c.(2)(b) includes additional information that must be collected when a Copermittee's municipal or contract staff perform an onsite inspection. Provision E.5.c.(3) specifies the information that each Copermittee must maintain in its existing development inspection records.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary to compel compliance with the requirements of Provision E.5 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.5.d requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Provisions E.5.e.(1)-(2) specifically require the Copermittee to identify areas of existing development as candidates for retrofitting, and streams, channels, and/or habitats as candidates for rehabilitation. Provisions E.5.e.(1)-(2) are based on the retrofitting requirements of the Fourth Term Permits for Orange and Riverside Counties, but modified to also include identifying projects to rehabilitate channels within areas of existing development. The requirements have also been modified to be more focused on utilizing these types of projects for addressing the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Interest and opportunity to retrofit areas of existing development and rehabilitate channels located in areas of existing development has been observed in several programs the San Diego Water Board oversees (e.g., CWA Section 401 Water Quality Certification program, supplemental environmental projects, and grant programs). Each jurisdiction has miles and miles of streets that could be retrofitted to become green streets. Reshaping landscaped areas from convex to concave configurations

can detain storm water instead of directing runoff as quickly as possible to the MS4. Retrofit projects could also include simply replacing impervious surfaces with permeable surfaces.

Retrofitting projects do not necessarily have to be expensive. Retrofitting projects could be as simple as redirecting downspouts from roofs to pervious or landscaped areas instead of to hardscaped areas discharging directly to the MS4, providing rain barrels to harvest storm water from downspouts for use at a later time, or planting more trees in areas with little vegetation to provide canopy that can intercept storm water. The San Diego Water Board encourages the Copermittees to identify simple, low-cost retrofitting opportunities that can be easily implemented, in addition to other more expensive retrofitting and channel rehabilitation projects.

Rehabilitation of channels, streams, and/or habitat will require more significant planning and resources to implement. There are, however, also abundant opportunities to rehabilitate channels, streams and/or habitats in or adjacent to areas of existing development. Each Watershed Management Area likely has several creeks and stream reaches that have been undergrounded, artificially hardened, or hydromodified that could be rehabilitated to be more sustainably configured, which would slow down storm water flows and potentially have more assimilative capacity for pollutants while still being supportive of designated beneficial uses.

The San Diego Water Board recognizes that it may be infeasible to implement retrofitting or channel rehabilitation projects within certain areas of a Copermittee's jurisdictions. For such areas, the Copermittee must instead identify, develop, and implement regional retrofitting and channel rehabilitation projects (i.e. projects that can retain and/or treat storm water from one or more areas of existing development) adjacent to and/or downstream of the areas of existing development.

Provisions E.5.e.(1)-(2) do not require the implementation of retrofitting and rehabilitation projects, but do require the Copermittee to develop a program with strategies to facilitate the implementation of these types of projects in areas of existing development. The strategies are expected to include allowing and encouraging Priority Development Projects to implement retrofitting types of projects as a means of compliance with the structural BMP performance criteria requirements of Provisions E.3.c.(1) and E.3.c.(2).

<u>Provision E.6 (Enforcement Response Plans)</u> requires each Copermittee to develop an Enforcement Response Plan as part of its jurisdictional runoff management program document. Proper implementation of the Enforcement Response Plans is necessary to effectively prohibit non-storm water discharges to the MS4, and reduce the discharge of pollutants in storm water from the MS4 to the MEP.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system*" and be able to demonstrate that it can "*operate pursuant to legal*

authority established by statute, ordinance or series of contracts" to control the discharge of non-storm water and pollutants in storm water to and from its MS4. Pursuant to 40 CFR 122.26(d)(2)(i)(E) each Copermittee is specifically required to have the legal authority to "*[r]equire compliance with conditions in ordinances, permits, contracts or order*s."

The requirements under Provision E.6 are necessary to demonstrate that each Copermittee can enforce its legal authority to *"effectively prohibit non-stormwater discharges"* and "*reduce the discharge of pollutants to the maximum extent practicable*" as well as "*[r]equire compliance with conditions in ordinances, permits, contracts or order*."

The Enforcement Response Plan required under Provision E.6 will serve as a reference for the Copermittee and the San Diego Water Board to determine if consistent enforcement actions are being implemented to achieve timely and effective compliance from all public and private entities that are not in compliance with the Copermittee's ordinances, permits, or other requirements. The Enforcement Response Plan must contain clear direction for the Copermittee to take immediate enforcement action, when appropriate and necessary, in their illicit discharge detection and elimination, development planning, construction management, and existing development management programs.

If the entities subject to the Copermittee's legal authority do not implement appropriate corrective actions in a timely manner, or if violations repeat, the Copermittee must take progressively stricter responses to enforce its legal authority and achieve compliance with its ordinances, permits, or other requirements to *"effectively prohibit non-stormwater discharges"* and "*reduce the discharge of pollutants to the maximum extent practicable.*"

<u>Provision E.7 (Public Education and Participation)</u> requires each Copermittee to implement a public education and participation program. Proper implementation of the public education and participation program as part of its jurisdictional runoff management program will contribute toward effectively prohibiting non-storm water discharges to the MS4, and toward the reduction of pollutants in storm water from the MS4 to the MEP.

Provision E.7 establishes the minimum requirements that each Copermittee must implement to engage members of the public as part of its jurisdictional runoff management program. In the Fourth Term Permits, the public education program requirements and the public participation requirements were included as separate jurisdictional runoff management program components. In this Order, the public education requirements have been consolidated with the public participation requirements, as both sets of requirements are related to the engagement of the public by each Copermittee. Engagement of the public is critical for the success of each Copermittee's jurisdictional runoff management program.

The Copermittees have been implementing public education programs for the last 20 years, which are now well established. The specificity of expected public education program elements of the Fourth Term Permits has been removed. For the most part, the public education program requirements in Provision E.7.a have been reduced to a set of requirements that are specifically included in the federal regulations under 40 CFR 122.26(d)(2)(iv)(A)(6), 122.26(d)(2)(B)(6) and 122.26(d)(2)(D)(4), which should already be incorporated into each Copermittee's existing public education program. Each Copermittee is expected to utilize the information and data collected from the monitoring and assessments conducted within the Watershed Management Area, and from its inventories and inspections to best direct its public education program resources toward addressing the highest priority water quality conditions identified within the Water Quality Improvement Plan.

According to 40 CFR 122.26(d)(2)(iv), public participation is required to be included as part of the "*comprehensive planning process*", which includes the development and implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs. The requirements under Provision E.7.b specify the opportunities that the public must be provided to be involved in the "*comprehensive planning process*", as required by to 40 CFR 122.26(d)(2)(iv).

Provision E.8 (Fiscal Analysis) requires each Copermittee to secure the resources and provide an analysis of the resources that will be necessary to implement the requirements of the Order. Adequate fiscal resources are necessary for a jurisdictional runoff management program to effectively prohibit non-storm water discharges to the MS4, and reduce pollutants in storm water from the MS4 to the MEP.

According to 40 CFR 122.26(d)(2)(vi), each Copermittee is responsible for providing "*a fiscal analysis of the necessary capital and operation and maintenance expenditures necessary to accomplish the activities*" required by this Order, including "*a description of the source of funds that are proposed to meet the necessary expenditures, including legal restrictions on the use of such funds.*" The fiscal analysis requirements of Provision E.8 are consistent with 40 CFR 122.26(d)(2)(vi).

The San Diego Water Board has chosen not to require a description of fiscal benefits realized from implementation of the jurisdictional runoff management programs. This is a recommendation from the National Association of Flood and Stormwater Management Agencies.[44] For instance, the fiscal analysis requirements do not address city-wide fiscal benefits of protection (e.g., public health, tourism, property values, economic activity, beneficial uses, etc.), even though many costs currently reported to the San Diego Water Board are for related activities. This type of assessment may help Copermittees improve the allocation of resources and it may help the Copermittees secure adequate funding for the program. Qualitative

[44] National Association of Flood and Stormwater Management Agencies. 2006. *Guidance for Municipal Stormwater Funding.* Prepared under a grant provided by the USEPA.

assessments, however, could be overly subjective and most Copermittees likely lack the ability to provide accurate quantitative assessments. The San Diego Water Board encourages the Copermittees to consider means for conducting assessments of fiscal benefits derived from the programs. Such assessments could be conducted on a regional scale similar to studies of program costs conducted by the State Water Board.[45]

[45] State Water Board, 2005. NPDES Stormwater Cost Survey.

F. Reporting

Purpose: Provision F includes the requirements for the documents and reports that the Copermittees must prepare and provide to the San Diego Water Board. The documents prepared by the Copermittees and provided to the San Diego Water Board and made available to the public will provide the documentation that the Copermittees are complying with the requirements of the Order.

***Discussion*:** Provision F requires the Copermittees to prepare several documents and reports that must be provided to the San Diego Water Board and made available to the public. The reporting requirements have been significantly reduced compared to the Fourth Term Permit reporting requirements. The reduction in reporting requirements was recommended by the San Diego County Copermittees in the Report of Water Discharge submitted in June 2011.

More specific and detailed discussions of the requirements of Provision F are provided below.

Provision F.1 (Water Quality Improvement Plans) requires the Copermittees in each Watershed Management Area to develop and submit a Water Quality Improvement Plan in accordance with the requirements of Provision B.

Of all the requirements of Provision F, the Water Quality Improvement Plans will likely be the documents requiring the most significant effort to develop. The content of the Water Quality Improvement Plans, however, is expected to include content that should already have been developed for the Watershed Plans and several elements that are included in the Monitoring and Reporting Programs required under the Fourth Term Permits.

Because the Water Quality Improvement Plan is part of the "*comprehensive planning process which involves public participation*," Provision F.1 includes requirements to give multiple opportunities to the public to provide input on the content of the plans.

Provision F.1.a.(1) specifies the elements that the Copermittees must include in the public participation process for the development of the Water Quality Improvement Plans. In order for the public to be aware of the opportunities to provide input, Provision F.1.a.(1)(a) requires the Copermittees to develop a publicly available and noticed schedule of the opportunities for the public to participate and provide comments during the development of the Water Quality Improvement Plan. These opportunities are when the public can provide the data, information, and recommendations that the Copermittees can consider during the development of the Water Quality Improvement Plans.

The San Diego Water Board recognizes, however, that the Copermittees cannot be expected to incorporate all the data, information, and recommendations that the public

may provide into the Water Quality Improvement Plans. The Copermittees will have to review the data, information, and recommendations received and make some decisions on what to incorporate into the Water Quality Improvement Plans. Before the Copermittees finalize their decisions, members of the public should be allowed to review the Copermittees' decisions. Thus, Provision F.1.a.(1)(b) requires the Copermittees to form a Water Quality Improvement Consultation Panel (Panel).

The Panel will consist of a member from the environmental community and a member from the development community familiar with the Watershed Management Area. A representative from the San Diego Water Board staff will also be part of the Panel. The Copermittees may choose to include additional members, but the Panel is only required to include three panel members.

The Panel will serve as an additional public participation and input mechanism during the development of the Water Quality Improvement Plans. The knowledge and expertise from these Panel members are expected to provide the Copermittees valuable direction during their decision-making process. The Copermittees will review the content of their planned submittals with the Panel members to receive recommendations. If the Panel provides recommendations, the Copermittees must consider revisions to the Water Quality Improvement Plan submittals.

The San Diego Water Board recognizes that the development of multiple Water Quality Improvement Plans concurrently may limit the ability of the public to review and provide comments to the Copermittees. Thus, Provision F.1.a.(1)(c) requires the Copermittees to coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public time and opportunity to participate during the development of the Water Quality Improvement Plans.

Provision F.1.a.(2) requires the Copermittees to develop and submit the first Water Quality Improvement Plan component, in accordance with the requirements of Provision B.2, which includes the identification of the priority water quality conditions and potential water quality improvement strategies. The public must be provided an opportunity to provide data, information and recommendations to be utilized in the development and identification of the priority water quality conditions and potential water quality improvement strategies for the Watershed Management Area. The Copermittees must consult with the Panel and consider making revisions. The Copermittees may submit the requirements of Provision B.2 as early as 6 months and no later than 12 months after the commencement of coverage under this Order. After the requirements of Provision B.2 are submitted to the San Diego Water Board, the public will be provided another opportunity to provide comments.

Provision F.1.a.(3) requires the Copermittees to develop and submit the second Water Quality Improvement Plan component, in accordance with the requirements of Provision B.3, which includes the identification of the numeric goals for the highest priority water quality conditions identified for the Watershed Management Area, and the strategies that will be implemented to achieve the potential numeric goals. The

Copermittees may also develop the Optional Watershed Management Area Analysis, in accordance with the requirements of Provision B.3.b.(4), as part of this submittal. The public must be provided an opportunity to provide data, information and recommendations to be utilized in the development and identification of the numeric goals and water quality improvement strategies for the Watershed Management Area. The Copermittees must consult with the Panel and consider making revisions. The Copermittees may submit the requirements of Provision B.3 as early as 9 months and no later than 18 months after the commencement of coverage under this Order. After the requirements of Provision B.3 are submitted to the San Diego Water Board, the public will be provided another opportunity to provide comments.

Finally, Provision F.1.b describes the process for the submittal and implementation of the Water Quality Improvement Plans. The complete Water Quality Improvement Plans are required to be submitted by the Copermittees within 24 months after the commencement of coverage under this Order. The San Diego Water Board will provide the public an opportunity to provide comments on each complete Water Quality Improvement Plan.

The San Diego Water Board will review each Water Quality Improvement Plan and the public comments received to determine if the Copermittees have submitted a Water Quality Improvement Plan that meets the requirements of Provision B. If a Water Quality Improvement Plan does not meet the requirements of Provision B, the Copermittees will be considered out of compliance and directed in writing by the San Diego Water Board Executive Officer to correct the deficiencies.

When a Water Quality Improvement Plan meets the requirements of Provision B, the San Diego Water Board will determine whether to hold a public hearing or to limit public input to submittal of written comments before accepting the Water Quality Improvement Plan. Implementation of the Water Quality Improvement Plan must begin within 30 days of acceptance.

The San Diego Water Board expects that any deficiencies in the Water Quality Improvement Plan will be identified either in the public comments or during the review by the San Diego Water Board before implementation begins. In the event any deficiencies are identified after the implementation of the Water Quality Improvement Plan, Provision F.1.b.(7) clarifies that the San Diego Water Board maintains the right to require the Copermittees to correct any deficiencies that may be identified.

<u>Provision F.2 (Updates)</u> requires the Copermittees to update specific documents that the Copermittees will utilize to implement the requirements of this Order.

Each Copermittee is required to continue implementing a jurisdictional runoff management program, as required under Provision E. Implementation of each Copermittee's jurisdictional runoff management program is directed by its jurisdictional runoff management program document. Provision F.2.a requires each Copermittee to update its jurisdictional runoff management program document to be consistent with

the requirements of Provision E concurrent with the submittal of the Water Quality Improvement Plan.

Likewise, each Copermittee must continue to require new development and redevelopment projects to implement BMPs to control pollutants in storm water runoff. The control of pollutants in storm water runoff from development and redevelopment projects within each Copermittee's jurisdiction is guided and directed by its BMP Design Manual, formerly known as a Standard Storm Water Mitigation Plan (SSMP). Provision F.2.b requires each Copermittee to update its BMP Design Manual to be consistent with the requirements of Provision E.3 concurrent with the submittal of the Water Quality Improvement Plan.

In general, the requirements of the Order should not necessitate a complete rewrite of each Copermittee's jurisdictional runoff management program document or BMP Design Manual, as was required by the Third Term Permits. The jurisdictional runoff management program and BMP Design Manual requirements of this Order are not significantly different than the requirements of the Fourth Term Permits. Thus, only sections of the Order which are new or have been significantly changed should warrant revisions to specific sections of the Copermittee's jurisdictional runoff management program document and BMP Design Manual.

Finally, the Water Quality Improvement Plans are expected to require updates as the iterative approach and adaptive management process included in the Water Quality Improvement Plan, as required under Provision B.5, is implemented by the Copermittees. Provision F.2.c.(1) requires the Copermittees to implement a public participation process for the proposed updates, review the proposed updates with the Panel, and submit the updates to the Water Quality Improvement Plan as part of the Annual Reports required under Provision F.3.b.

Also, because TMDLs are likely to be developed, adopted and approved during the term of the Order, Provision F.2.c.(2) has been included to expedite the incorporation of TMDLs into the Copermittees' Water Quality Improvement Plans as part of the update process, potentially before the Order is re-opened to incorporated the requirements of the new TMDLs.

<u>Provision F.3 (Progress Reporting)</u> requires the Copermittees to report on the progress of implementing the Water Quality Improvement Plans.

The requirements of Provision F.3 are to report the progress toward improving water quality that the Copermittees are achieving with the implementation of the Water Quality Improvement Plans and each Copermittee's jurisdictional runoff management program. The Progress Report Presentations required under Provision F.3.a are included to provide the Copermittees an opportunity to communicate directly with the San Diego Water Board and the public. The Progress Report Presentations will also provide the members of the San Diego Water Board and members of the public an opportunity to become more acquainted with the Copermittees and their projects and

programs to address non-storm water and storm water discharges into and from their MS4s.

The Annual Report requirements of Provision F.3.b are a consolidation of several reporting requirements from the Fourth Term Permits, including the Jurisdictional Runoff Management Program Annual Reports, the Watershed Annual Reports, and the Monitoring and Reporting Program Annual Reports. Furthermore, the Annual Report requirements are consistent with the requirements under 40 CFR 122.42(c).

Pursuant to 40 CFR 122.42(c), "*[t]he operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the Director…must submit an annual report*", which must include the following:

(1) *The status of implementing the components of the storm water management program that are established as permit conditions* [40 CFR 122.42(c)(1)];

(2) *Proposed changes to the storm water management programs that are established as permit conditions* [40 CFR 122.42(c)(2)];

(3) *Revisions, if necessary, to the assessment of controls and fiscal analysis* [40 CFR 122.42(c)(3)];

(4) *A summary of data, including monitoring data, that is accumulated throughout the reporting year* [40 CFR 122.42(c)(4)];

(5) *Annual expenditures and budget for year following each annual report* [40 CFR 122.42(c)(5)];

(6) *A summary describing the number and nature of enforcement actions, inspections, and public education programs* [40 CFR 122.42(c)(6)];

(7) *Identification of water quality improvements or degradation* [40 CFR 122.42(c)(7)].

Under the Fourth Term Permits, each Copermittee is responsible for submitting a Jurisdictional Runoff Management Program Annual Report; the Copermittees in each designated watershed are responsible for submitting a Watershed Annual Report; and the Copermittees from each county are responsible for submitting a Monitoring and Reporting Program Annual Report.

There are 39 Copermittees in the San Diego Region, each required to prepare and submit a Jurisdictional Runoff Management Program Annual Report. There are 9 designated watersheds in San Diego County, 6 designated watersheds in Orange County, and 1 designated watershed in Riverside County for a total of 16 designated watersheds, each requiring a Watershed Annual Report. There are 3 sets of Copermittees in 3 counties in the San Diego Region, requiring Copermittees from each county to prepare and submit a Monitoring and Reporting Program Annual Report.

Thus each Copermittee is currently required to prepare, or participate in the preparation of at least 3 annual reports. In addition, the San Diego County Copermittees are required to prepare and submit a Regional Urban Runoff Management Plan Annual Report.

In total, there are 59 annual reports that are prepared by the Copermittees and submitted to the San Diego Water Board for the Fourth Term Permits. The preparation of these annual reports requires significant time and resources from each Copermittee, which could otherwise be expended on actions that could improve water quality within its jurisdiction. In turn, significant time and resources are required from the San Diego Water Board staff to review these reports, which could otherwise be expended on working directly with the Copermittees to improve their implementation efforts toward restoring and protecting water quality.

Until the Water Quality Improvement Plans are developed, there will be a transitional period during which the Copermittees will continue to implement their existing jurisdictional runoff management programs. There will also be a transitional period during which the Copermittees will implement the transitional monitoring and assessment requirements of Provision D. During the transitional period, the Copermittees will submit annual reports pursuant to the requirements of Provisions F.3.b.(1) and F.3.b.(2).

Provision F.3.b.(1) includes the transitional annual reporting requirements for each Copermittee's jurisdictional runoff management program. The reporting of the jurisdictional runoff management program implementation efforts have been reduced to a single 2-page form. Each Copermittee is required to complete and submit a Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D or a revised form accepted by the San Diego Water Board) no later than October 31 of each year for each jurisdictional runoff management program reporting period (i.e. July 1 to June 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted. The Jurisdictional Runoff Management Program Annual Report Form will certify that each Copermittee has implemented its jurisdictional runoff management program in accordance with the requirements of Provision E. Each Copermittee may choose to continue to utilize and submit the jurisdictional runoff management program annual reporting format of its current Order until the first Water Quality Improvement Plan Annual Report is required to be submitted.

Provision F.3.b.(2) includes the transitional annual reporting requirements for the transitional monitoring and assessment program for each Watershed Management Area. The Copermittees in the Watershed Management Area are required to submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted. The Transitional Monitoring and Assessment Program Annual Report is required to include

the transitional period monitoring data collected pursuant to Provisions D.1.a and D.2.a, and the findings from the transitional period findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

Provision F.3.b.(3) includes the Water Quality Improvement Plan Annual Report requirements. Only one Water Quality Improvement Plan Annual Report is required for each of the ten (10) Watershed Management Areas designated under Provision B.1, which is a significant reduction in the number of annual reports required to be prepared and submitted by the Copermittees. The Water Quality Improvement Plan Annual Report will document the Copermittees' efforts to implement the Water Quality Improvement Plan. Each Water Quality Improvement Plan Annual Report will be focused primarily on reporting the analysis of the monitoring data collected pursuant to Provisions D.1-D.3 during the reporting period, and the assessments that are required pursuant to Provision D.4 based on the data. The monitoring data analyses and the assessments that are provided in the Water Quality Improvement Plan Annual Report will be the core of the report. The reporting of the jurisdictional runoff management program implementation efforts have been reduced to a single 2-page form, and will no longer be the primary focus of the reporting requirements as in the Third and Fourth Term Permits.

Each Copermittee will continue to prepare and submit a Jurisdictional Runoff Management Program Annual Report Form as part of the Water Quality Improvement Plan Annual Report to certify that each Copermittee has implemented its jurisdictional runoff management program in accordance with the requirements of Provision E. Instead of reviewing a voluminous report from each Copermittee, as was required under the Third and Fourth Term Permits, the San Diego Water Board will conduct audits of each Copermittee's jurisdictional runoff management program to investigate and confirm the information provided by each Copermittee on its Jurisdictional Runoff Management Program Annual Report Form. The audits will allow the San Diego Water Board to become more familiar with the each Copermittee's jurisdictional runoff management program, and each Copermittee will become more informed about the expectations of the San Diego Water Board.

The reduction in the number and content of the Water Quality Improvement Plan Annual Reports should result in significant time, cost and resource savings for the Copermittees, as well as the San Diego Water Board. Those savings should offset a significant portion of any additional costs that may be incurred to develop the Water Quality Improvement Plans and to implement the monitoring and assessment program requirements of Provision D.

The reporting period for the Water Quality Improvement Plan Annual Reports consists of two periods. Because the jurisdictional runoff management programs are typically budgeted and implemented during a fiscal year, the information provided on the Jurisdictional Runoff Management Program Annual Report Forms will cover the period from July 1 to June 30 of the following year.

The Water Quality Improvement Plan Annual Reports, however, are focused primarily on the monitoring data and the assessments based on the monitoring data. The monitoring data is collected during the monitoring year, which begins October 1 and ends September 30 of the following year. The monitoring year begins after the beginning of the fiscal year and ends after the end of the fiscal year. Therefore, to accommodate and capture the information collected during the fiscal year and the monitoring year, the Annual Report reporting period incorporates both periods.

Finally, Provision F.3.c requires the Copermittees to develop and submit a Regional Monitoring and Assessment Report. The Regional Monitoring and Assessment Report is similar to the Long Term Effectiveness Assessment required under the Fourth Term San Diego County Permit. The Regional Monitoring and Assessment Report is expected to utilize the entire body of data and information collected by the Copermittees during the term of this Order to assess improvements to water quality on a regional scale.

Provision F.4 (Regional Clearinghouse) requires the Copermittees to develop, update, and maintain an internet-based Regional Clearinghouse that can be used to store, disseminate, and share the Copermittees' documents, monitoring data, special studies, and any other data or information.

Most of the documents and data that are generated by the Copermittees can be provided in electronic format, and made available to the San Diego Water Board and the public on the internet. The San Diego Water Board has been gradually transitioning its document submittal requirements to electronic submittals. Provision F.4 has been included to further these efforts.

Provision F.4 has also been included to improve the exchange and availability of information among the Copermittees, as well as between the Copermittees and the San Diego Water Board. Provision F.4 will also make the information generated during the implementation of the Order more accessible to the public.

Provision F.5 (Report of Waste Discharge) requires the Copermittees to submit a Report of Waste Discharge to reapply for renewal of the Order prior to its expiration, in accordance with 40 CFR 122.21(d)(2) and CWC section 13376.

Because the Riverside County Copermittees will not be subject to the requirements of this Order until they are notified of coverage, Provision F.5.a describes the process of submitting a Report of Waste Discharge pursuant to the requirements of their current permit to obtain coverage under this Order.

For the Copermittees subject to the requirements of this Order, Provision F.5.b requires the Copermittees to submit a Report of Waste Discharge 180 days in advance of the expiration of this Order. Provision F.5.b also describes the minimum information to be included in the Report of Waste Discharge, based on USEPA

guidance "Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems," dated May 17, 1996.

Provision F.6 (Application for Early Coverage) describes the process that would allow the Orange County and/or Riverside County Copermittees to obtain coverage under this Order earlier than the expiration of their current Orders.

If the Riverside County Copermittees choose to obtain coverage under this Order earlier than the expiration of their current Orders, the preparation and submittal of a Report of Waste Discharge, as required by the Fourth Term Permits, will not be necessary. The existing Order for the respective county will be rescinded upon the effective coverage date under this Order, except for enforcement purposes.

G. Principal Watershed Copermittee Responsibilities

Purpose: Provision G includes the requirements for the Principal Watershed Copermittee designated by the Copermittees in each Watershed Management Area.

***Discussion*:** Unlike previous NPDES requirements, there will no longer be a single Principal Copermittee. Provision G.1 requires the Copermittees to designate a Principal Watershed Copermittee for each Watershed Management Area. There are ten (10) Watershed Management Areas in the San Diego Region, as defined in Table B-1 under Provision B.1 of the Order. An individual Copermittee should not be the Principal Watershed Copermittee for more than two (2) Watershed Management Areas. There could be up to ten (10) Principal Water Copermittees designated for the Watershed Management Areas in the San Diego Region.

Provision G.2 describes the minimum responsibilities of each Principal Watershed Copermittee. The primary responsibility of the Principal Watershed Copermittees is to serve as the liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues. Ideally, the Principal Watershed Copermittee can represent the interests of all the Copermittees within a Watershed Management Area during discussions or meetings to facilitate communication with the San Diego Water Board. The Principal Watershed Copermittees are also responsible for facilitating and coordinating the implementation efforts of the Copermittees and submittals of required documents and reports.

The Principal Watershed Copermittee is responsible for facilitating the efforts of the Copermittees within the Watershed Management Area to develop the Water Quality Improvement Plan required under Provision B, and submit it for approval in accordance with Provision F.1. The Principal Watershed Copermittee is also responsible for coordinating the submittal of the document updates, Progress Report Presentations, and Annual Reports required from the Copermittees within each Watershed Management Area under Provisions F.2, F.3.a, and F.3.b. The Principal Watershed Copermittees are responsible for coordinating with each other to develop and submit the Regional Clearinghouse, Regional Monitoring and Assessment Report, and the Report of Waste Discharge required under Provisions F.3.c, F.4, and F.5.

The designated Principal Watershed Copermittee for each Watershed Management Area does not necessarily have to serve as the Principal Watershed Copermittee for the entire term of the Order. If the Copermittees in a Watershed Management Area choose to designate a new Principal Watershed Copermittee, the change may be submitted as part of the Annual Report required under Provision F.3.b, with an update to the Water Quality Improvement Plan in accordance with Provision F.2.c.

Provision G.3 specifies that the Principal Watershed Copermittee is not responsible for ensuring that the other Copermittees within the Watershed Management Area are in compliance with the requirements of this Order

H. Modification of Order

Purpose: Provision H provides the conditions under which modifications to Order No. R9-2013-0001, as amended, may occur.

***Discussion*:** Provision H allows for modifications to Order No. R9-2013-0001, as amended, for bases in addition to modifications (minor and major) allowed under the federal regulations at 40 CFR 122.62 and 122.63.

Modifications to the Order require re-opening the Order (see Water Code section 13223), subject to the requirements of 40 CFR 122.44, 122.62 to 122.64, and 124.5, but only for the specific provisions subject to the modification. Proposed modifications of the Order will be made available for public review, a public notice and comment period, and a public hearing if requested. Comments on the provisions not subject to the proposed modifications are not required to be considered in the San Diego Water Board's responses to comments or during the public hearing.

Provision H.4 was included to specify that the Order will be re-opened for modifications if the State Water Board determines revisions to Provision A are warranted, an application for early coverage under the Order is received pursuant to Provision F.6, the Basin Plan is amended to modify an existing TMDL or incorporate a new TMDL, or the monitoring and assessment program requirements need to be updated or revised.

Provision H.5 was included to specify that the San Diego Water Board will re-open and consider modifications to this Order when the Orange County Copermittees or the Riverside County Copermittees submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders

I. Standard Permit Provisions and General Provisions

Purpose: Provision I incorporates the standard permit provisions required to be included in all NPDES permits, as well as several other general provisions.

***Discussion*:** Provision I refers to Attachment B to the Order. Attachment B expressly incorporates the conditions applicable to all NPDES permits as provided under 40 CFR 122.41(a)-(n), as well as the applicable conditions for MS4s and storm water discharges provided under 40 CFR 122.42(c) and 40 CFR 122.42(d), respectively. Attachment B also includes several general provisions that are typically included in or applicable to waste discharge requirements issued by the San Diego Water Board.

IX. ATTACHMENTS

The attachments to the Order are discussed below. The discussions describe the content of the attachments.

Attachment A – Discharge Prohibitions and Special Protections

Section 1 of Attachment A includes the Waste Discharge Prohibitions from the Basin Plan. They have been provided verbatim in their entirety.

Section 2 of Attachment A includes the "*Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges*" applicable to permitted point source discharges of storm water, adopted under State Water Board Resolution No. 2012-0012, as amended by Resolution No. 2012-0031. The terms, prohibitions, and special conditions (collectively referred to as special conditions) are established as limitations on point source storm water discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in ASBS, as required for State Water Quality Protection Areas pursuant to California Public Resources Code sections 36700(f) and 36710(f). These Special Protections were adopted by the State Water Board as part of the Ocean Plan General Exception.

Attachment B – Standard Permit Provisions and General Provisions

Conditions applicable to all NPDES permits, as required under 40 CFR 122.41, and conditions applicable to MS4s and storm water discharges, as required under 40 CFR 122.42(c) and 122.42(d), respectively are provided in Attachment B to the Order. They have been provided expressly in their entirety.

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. These general provisions are typically included in or applicable to waste discharge requirements issued by the San Diego Water Board. Many of the general provisions were developed by the State Water Board. Where a general provision is derived from statute or regulation, a citation of the statute or regulation section is provided. General provisions that do not provide a citation are included under the authority provided CWC 13377.

Attachment C – Acronyms, Abbreviations and Definitions

The acronyms and abbreviations that are used in the Order are provided in Attachment C. Attachment C also includes definitions that may provide an explanation or description of the meaning or intent of specific terms or phrases included in the Order.

Attachment D – Jurisdictional Runoff Management Program Annual Report Form

An example of the Jurisdictional Runoff Management Program Annual Report Form required to be submitted by each Copermittee as part of the Annual Reports required under Provision F.3.b.(1)(e) is provided as Attachment D to the Order. An electronic version of the form will be available from the San Diego Water Board after the adoption of the Order.

The Jurisdictional Runoff Management Program Annual Report Form includes the minimum information necessary to demonstrate that the Copermittee is implementing and in compliance with the requirements of Provision E, and includes much of the information required to be reported pursuant to 40 CFR 122.42(c).

The information that must be provided on the Jurisdictional Runoff Management Program Annual Report Form is limited to the fiscal year, which begins July 1 and ends June 30 of the following year. The information expected to be provided by the Copermittees in each section of the Jurisdictional Runoff Management Program Annual Report Form is discussed below.

I. COPERMITTEE INFORMATION

The name of the Copermittee (e.g. name of city, county, or special district) and the contact information for the storm water program manager are provided under this section.

II. LEGAL AUTHORITY

The Copermittee must confirm whether or not the legal authorities under Provision E.1.a have been established for itself within its jurisdiction.

The Copermittee must also confirm whether or not a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority, as required under Provision E.1.b. The certification statement required by Provision E.1.b is only required to be submitted with the first Annual Report required under Provision F.3.b.

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

The Copermittee must inform the San Diego Water Board whether or not an update to its jurisdictional runoff management program document was required or recommended by the San Diego Water Board during the reporting period. An update to the jurisdictional runoff management program is required under Provision F.2.a. The San Diego Water Board may recommend modifications to the jurisdictional runoff management program as part of the iterative approach and adaptive management process required under Provision B.5, which may result in an update that is necessary for the Copermittee's jurisdictional runoff management document.

If an update was required or recommended, the Copermittee must confirm whether or not the update was completed and made available on the Regional Clearinghouse within the reporting period. If no update was required or recommended, an answer is not required. If the answer is NO, meaning the required or recommended update was not completed and/or made available on the Regional Clearinghouse, the Copermittee must attach a schedule for the completion of the update and/or posting of the updated document on the Regional Clearinghouse.

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

The Copermittee must confirm whether or not a program was implemented during the fiscal year to actively detect and eliminate illicit discharges and connections in accordance with the requirements under Provision E.2.

In addition to confirming that a program to detect and eliminate illicit discharges was implemented during the reporting period, the Copermittee is also required to report on several items related to the program. The information that must be reported is limited to the fiscal year for the Annual Report.

All non-storm water discharges are considered illicit discharges unless the source is identified as one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5). If a non-storm water discharge is identified as one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5), the discharge is a non-storm water discharge, but not an illicit discharge. If a non-storm water discharge is identified but not in one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5), the discharge is both a non-storm water discharge and an illicit discharge.

V. DEVELOPMENT PLANNING PROGRAM

The Copermittee must confirm whether or not a development planning program was implemented during the fiscal year in accordance with the requirements under Provision E.3.

The Copermittee must also inform the San Diego Water Board whether or not an update to its BMP Design Manual was required or recommended by the San Diego Water Board during the fiscal year. An update to the BMP Design Manual is required under Provision F.2.b. The San Diego Water Board may recommend modifications to the BMP Design Manual, which may result in an update that is necessary for Copermittee's the BMP Design Manual.

If an update was required or recommended, the Copermittee must confirm whether or not the update was completed and made available on the Regional Clearinghouse within the reporting period. If no update was required or recommended, an answer is not required. If the answer is NO, meaning the required or recommended update was not completed and/or made available on the Regional Clearinghouse, the Copermittee must attach a schedule for the completion of the update and/or posting of the updated document on the Regional Clearinghouse.

The Copermittee is also required to report on several items related to the program. For the development and redevelopment projects that are reviewed under the program, the Copermittee must report the total number projects submitted for review during the fiscal year. Of those projects, the Copermittee must report the number that are Priority Development Projects, as defined under Provision E.3.b.(1). The Copermittee must also report the number of Priority Development Projects that were approved and/or granted occupancy during the fiscal year, regardless of when the project was originally submitted for review. Any projects that were approved during the fiscal year and granted any exemptions from the BMP Design Manual requirements and/or allowed to implement alternative compliance options in accordance with Provision E.3.c.(3) must be reported.

Finally, the Copermittee must also report on several items related to its oversight of permanent BMPs on Priority Development Projects within its jurisdiction, as required

under Provision E.3.e. The information that must be reported is limited to the fiscal year for the Annual Report.

VI. CONSTRUCTION MANAGEMENT PROGRAM

The Copermittee must confirm whether or not a construction management program was implemented during the fiscal year in accordance with the requirements under Provision E.4.

The Copermittee is also required to report on several items related to its oversight construction projects within its jurisdiction. The information that must be reported is limited to the fiscal year for the Annual Report.

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

The Copermittee must confirm whether or not an existing development management program was implemented during the fiscal year in accordance with the requirements under Provision E.5.

The Copermittee is also required to report on several items related to its oversight in areas of existing development within its jurisdiction. The information that must be reported is limited to the fiscal year for the Annual Report. The information must also be separated into four categories of existing development: municipal, commercial, industrial, and residential.

VIII. PUBLIC EDUCATION AND PARTICIPATION

The Copermittee must confirm whether or not a public education program component was implemented during the fiscal year in accordance with the requirements under Provision E.7.a.

The Copermittee must also confirm whether or not a public participation program component was implemented during the fiscal year in accordance with the requirements under Provision E.7.b.

IX. FISCAL ANALYSIS

The Copermittee must confirm a summary of its fiscal analysis, conducted in accordance with the requirements under Provision E.8, has been attached to the form.

X. CERTIFICATION

A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative must sign and certify the Jurisdictional Runoff Management Program Annual Report Form. The appropriate box must be checked to indicate the whether a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative is signing the form.

Attachment E – Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2013-0001

Attachment E provides specific provisions for implementing the load allocations (LAs) and wasteload allocations (WLAs) of Total Maximum Daily Loads (TMDLs) adopted by the San Diego Water Board and approved by USEPA in which the Copermittees are identified as responsible for discharges subject to the requirements of the TMDLs. Federal regulations require that NPDES requirements incorporate water quality based effluent limitations (WQBELs) that must be consistent with the requirements and assumptions of any available WLAs,[46] which may be expressed as numeric effluent limitations, when feasible, and/or as a best management practice (BMP) program of expanded or better-tailored BMPs.[47] Where the TMDL includes WLAs that provide numeric pollutant load or pollutant parameter objectives, the WLA has been, where feasible, translated into numeric WQBELs.[48]

For each TMDL in Attachment E, four sections are included:

a. Applicability: This section provides the resolution under which the TMDL Basin Plan amendment was adopted and approved, with the applicable adoption and approval dates. This section also gives the effective date of the TMDL and where the TMDL is applicable (i.e. Watershed Management Area and water body). The Copermittees that are responsible for implementing the specific provisions are also given in this section.

b. Final TMDL Compliance Requirements: For each TMDL, the final TMDL compliance requirements consist of the final TMDL compliance date(s), the final WQBELs, and the final TMDL compliance determination requirements. The final WQBELs are expressed in terms of receiving water limitations, effluent limitations, and/or best management practices (BMPs). The final WQBELs for the TMDLs are incorporated by reference into Provision A of the Order. The final WQBELs become enforceable when the final TMDL compliance dates have passed. Applicable BMPs within the final WQBELs must be incorporated into the Water Quality Improvement Plans. Compliance with the final WQBELs will be determined in accordance with the options provided under the final TMDL compliance determination requirements.

c. Interim TMDL Compliance Requirements: If the final TMDL compliance date has not passed and there are interim TMDL compliance requirements, they are included in this section. If there are interim WQBELs with interim compliance dates, the interim WQBELs become enforceable when the corresponding interim compliance dates have passed. Compliance with the interim WQBELs will be determined in accordance with the options provided under the interim TMDL compliance determination requirements.

d. Specific Monitoring and Assessment Requirements: If there are specific monitoring and assessment requirements that cannot be met with the monitoring and assessment program

[46] 40 CFR 122.44(d)(1)(vii)(B)
[47] 40 CFR 122.44(k)(2) and 40 CFR 122.44(k)(3)
[48] November 26, 2014 Memorandum from the USEPA, Revisions to the November 22, 2002 Memorandum "Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLA""

requirements under Provision D of the Order, the additional requirements are included in this section.

The requirements of the TMDLs are based on and consistent with the assumptions and requirements of any available adopted and approved TMDLs that have been incorporated into the Basin Plan. Modifications to the requirements for the TMDLs in Attachment E cannot be made unless the TMDLs are modified in the Basin Plan.

A modification to any aspect of a TMDL in the Basin Plan requires a Basin Plan amendment. A Basin Plan amendment to modify a TMDL will require the San Diego Water Board to adopt a resolution to amend the Basin Plan, which includes a separate public process. When the San Diego Water Board adopts a Basin Plan amendment, it subsequently requires approval from the State Water Board, the Office of Administrative Law, and the USEPA before it becomes effective.

If and when the TMDLs are a modified in the Basin Plan, the San Diego Water Board will revise the requirements of the Order in accordance with the Basin Plan amendment. When a Basin Plan amendment to modify a TMDL becomes effective, the San Diego Water Board will modify the requirements of the Order pursuant to the requirements of Provision H.4 of the Order as soon as possible.

Walsh, Laurie@Waterboards

From: lyris@swrcb18.waterboards.ca.gov
Sent: Wednesday, March 04, 2015 3:59 PM
To: Walsh, Laurie@Waterboards
Subject: Order R9-2015-0001 An Order Amending Order R9-2013-0001 and Attachments, San Diego Regional MS4 Permit

Water Boards This is a message from the California Regional Water Quality Control Board, San Diego Region (9).

Stakeholders and Interested Persons,

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) is pleased to inform you that the finalized copy of Order No. R9-2015-0001, NPDES No. CAS010266, *An Order Amending Order No. R9-2013-0001, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Amending Order), as adopted by the San Diego Water Board February 11, 2015 is complete and available electronically on the San Diego Water Board website at http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

Order No. R9-2015-0001 identifies specific changes made to Order R9-2013-0001 and Attachments. Specific changes can be seen in a blue underline and red-strikeout text version named Final Amended Order No. R9-2013-0001 (Order Only) and Final Fact Sheet to Amended Order No. R9-2013-0001 (Fact Sheet Only). A conformed copy of Order R9-2013-0001 and Attachments which incorporates all adopted changes is also available on the San Diego Water Board website at http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

Please submit any written correspondence in response to this email to SanDiego@waterboards.ca.gov. Electronic documents must be submitted as a single file, in Portable Document Format (PDF) format, and converted to text searchable format using Optical Character Recognition (OCR). All electronic documents must also include scanned copies of all signature pages; electronic signatures will not be accepted. Electronic documents submitted to the San Diego Water Board must include the following identification numbers in the header or subject line: PIN: CW-786088:lwalsh.

Laurie Walsh, PE
San Diego Water Board

2375 Northside Drive, Suite 100
San Diego, CA 92108
Direct Phone: 619-521-3373
Main Line: 619-516-1990
Fax No. (619) 516-1994
Email: Laurie.Walsh@waterboards.ca.gov

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD
www.waterboards.ca.gov/sandiego/

You are currently subscribed to reg9_riversideco_ms4permit as: Laurie.Walsh@waterboards.ca.gov.

To unsubscribe click here: leave-3786963-517884.fe4ac2551da2875f89bb8791d9bbf856@swrcb18.waterboards.ca.gov

Chiu, Wayne@Waterboards

From: lyris@swrcb18.waterboards.ca.gov
Sent: Thursday, April 02, 2015 9:16 AM
To: Chiu, Wayne@Waterboards
Subject: Notice of Public Workshops - Prior Lawful Approval and Alternative Compliance Pathway for Receiving Water Limitations Proposed Amendments to Order No. R9-2013-0001
Attachments: 2015-0402 Notice of PLA-RWL Public Workshops.pdf

Water Boards This is a message from the California Regional Water Quality Control Board, San Diego Region (9).

Stakeholders,

Attached is the San Diego Water Board's Notice of Public Workshops to discuss Prior Lawful Approval and Alternative Compliance Pathway for Receiving Water Limitations Proposed Amendments to Order No. R9-2013-0001.

This Notice and the Regional MS4 Permit is available on the Water Boards webpage at http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

If you have any questions please feel free to give me or Wayne a call or email.

Laurie Walsh, PE
San Diego Water Board

2375 Northside Drive, Suite 100
San Diego, CA 92108
Direct Phone: 619-521-3373
Main Line: 619-516-1990
Fax No. (619) 516-1994
Email: Laurie.Walsh@waterboards.ca.gov

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD
www.waterboards.ca.gov/sandiego/

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California Water Boards

Edmund G. Brown Jr.
Governor

Matthew Rodriquez
Secretary for
Environmental Protection

California Regional Water Quality Control Board, San Diego Region

NOTICE OF PUBLIC WORKSHOPS

Proposed Amendments to Order No. R9-2013-0001, as amended by Order No. R9-2015-0001, to Incorporate a Definition of Prior Lawful Approval for Priority Development Projects and an Alternative Compliance Pathway for Receiving Water Limitations

NOTICE IS HEREBY GIVEN that the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) will hold a series of public workshops to provide an opportunity for discussion and receive comments, information, and input from the public on proposed amendments to Order No. R9-2013-0001, as amended by Order No. R9-2015-0001, NPDES No. CAS0109266, *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Regional MS4 Permit). The workshops will be conducted by a professional facilitator. Two or more San Diego Water Board members may be present at the workshop, but no actions or voting will occur.

Background

On May 8, 2013, the San Diego Water Board adopted Order No. R9-2013-0001, which became effective for the San Diego County Copermittees on June 27, 2013. On February 11, 2015, the San Diego Water Board adopted Order No. R9-2015-0001, which amended Order No. R9-2013-0001, to extend coverage of the Regional MS4 Permit to the Orange County Copermittees and address a variety of other issues. The Regional MS4 Permit became effective for the Orange County Copermittees on April 1, 2015. In May 2015, the San Diego Water Board will begin the process to consider extending coverage of the Regional MS4 Permit to the Riverside County Copermittees.

During the proceedings for Order No. R9-2015-0001, the San Diego Water Board deferred consideration of two concepts proposed as permit amendments. In order to promote transparency and outreach, the Board determined that additional public discussions on those concepts should be scheduled to obtain input and advice from Copermittees and other key stakeholder groups prior to incorporating proposed permit language into a Tentative Order to amend the Regional MS4 Permit. The two proposed amendments would establish 1) a definition of the term “prior lawful approval” for priority development projects, and 2) an alternative compliance pathway that would conditionally allow the Copermittees to be in compliance with the receiving water limitations and related prohibitions in Provisions A.1.a, A.1.c, and A.2.a of the Regional MS4 Permit. Based on these considerations, the San Diego Water Board is scheduling a series of workshops to receive comments and information from the Copermittees and other key stakeholder groups concerning the prior lawful approval and receiving water limitations issues.

Objective of Public Workshops

The objective of the workshops is for the San Diego Water Board to gain a greater understanding of the perspectives that storm water program managers, non-government environmental organizations, and the development/business communities have on the prior lawful approval and receiving water limitations issues. While the professional facilitator may help the group to reach consensus on key issues, it is important to understand that consensus may not be attained at the workshops. The comments and information received during the workshops on these issues will be considered by the San Diego Water Board in finalizing proposed permit language that will be incorporated in a Tentative Order and released for formal public review and comment later this year in the course of the Board’s proceedings to consider extending Regional MS4 Permit coverage to

the Riverside County Copermittees. The San Diego Water Board is seeking comments and information addressing the following questions:

1. **Prior Lawful Approval for Priority Development Projects:** Is there a definition of prior lawful approval that will allow developers, the environmental community, and the Copermittees to clearly understand when a development project should be subject to the Priority Development Project requirements of the Regional MS4 Permit?

2. **Alternative Compliance Pathway for Receiving Water Limitations:** What ambitious, rigorous and transparent alternative compliance path should be required that allows a Copermittee an appropriate period of time to come into compliance with receiving water limitations, as a precondition of a Copermittee being considered in compliance with the receiving water limitations while fully implementing the compliance alternative?

Public Workshops Location

City of Vista Civic Center Complex
Community Room
200 Civic Center Drive
Vista, CA 92008

Stakeholder Participation

Participation at the public workshops will be structured to provide for an appropriate level of participation by key stakeholder groups, while preserving the ability for the meeting facilitator to ensure a collaborative discussion on the issues. Meeting participants will be divided into two groups: a limited group to be seated at the meeting table and an audience group. The total number of participants at the meeting table will be limited to twenty-five (25) persons subdivided into representative stakeholder groups as described in the table below.

Stakeholder Group	Participants at the Table
San Diego County Copermittees	5
Orange County Copermittees	4
Riverside County Copermittees	4
Environmental Community	3
Development/Business Community	3
USEPA	1
San Diego Water Board Permit Team	5

Groups of stakeholders can share their seats at the table and rotate particular topic experts from the audience to the table depending on the topic being discussed. Audience seating will be provided so that interested persons can attend the public workshops. Audience members will be allowed to ask questions and make comments at the end of each topic discussion period.

Public Workshops Schedule

The public workshops are scheduled as follows:

Workshop Date	Topic Discussion Period	Topic
Tuesday, April 28, 2015	9:30 am – 12:00 pm	Prior Lawful Approval for Priority Development Projects
	1:00 pm – 3:30 pm	Alternative Compliance Pathway for Receiving Water Limitations
Friday, May 22, 2015	9:30 am – 12:00 pm	Prior Lawful Approval for Priority Development Projects
	1:00 pm – 3:30 pm	Alternative Compliance Pathway for Receiving Water Limitations
Tuesday, June 30, 2015	9:30 am – 12:00 pm	San Diego Water Board Wrap-up Workshop on Prior Lawful Approval and Receiving Water Limitations

Availability of Draft Permit Language
The Regional MS4 Permit is available on the following webpage:
http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

Draft permit language will be made available for review and used as the starting point for workshop discussions on the prior lawful approval and receiving water limitations issues. The draft permit language will also be posted on the webpage above at least one week prior to the first scheduled workshop.

Electronic Mail List Subscription
The San Diego Water Board has established an electronic mail list specifically for information and notices on the development of a Regional MS4 Permit. The San Diego Water Board will use the email list to notify interested persons of upcoming important events and the availability of on-line documents. Persons interested in receiving future notices and information on this specific project can subscribe to one (1) of the electronic mail lists titled "Orange County MS4 Permit," "Riverside County MS4 Permit," or "San Diego MS4 Permit," located on the San Diego Water Board website at:
http://www.waterboards.ca.gov/resources/email_subscriptions/reg9_subscribe.shtml

Persons who wish to receive hard copy notices of future notices or meetings on the Regional MS4 Storm Water Permit in lieu of electronic notices should submit a request to Mr. Wayne Chiu, Water Resource Control Engineer, 2375 Northside Drive, Suite 100, San Diego, CA 92108.

Directions and Parking
Interstate 15 North or South to Highway 78 West OR Interstate 5 North or South to Highway 78 East to Civic Center Drive exit; go North on Civic Center Drive approximately 1.1 miles to stoplight at Alta Vista Drive; turn right on Alta Vista Drive and right into the Civic Center Complex parking lot; follow signs within Civic Center Complex to the Community Room. Free parking is available at the Civic Center Complex.

Contacts for Additional Information
The San Diego Water Board Regional MS4 Permit Team includes the following staff:

David Barker, P.E. – Supervising Water Resource Control Engineer
Eric Becker, P.E. – Senior Water Resource Control Engineer
Wayne Chiu, P.E. – Water Resource Control Engineer
Laurie Walsh, P.E. – Water Resource Control Engineer
Christina Arias, P.E. – Water Resource Control Engineer

Questions or requests for additional information regarding this notice should be directed to Laurie Walsh at (619) 521-3373 or laurie.walsh@waterboards.ca.gov, or Wayne Chiu at (619) 521-3354 or wayne.chiu@waterboards.ca.gov.

David W. Gibson
Executive Officer
April 2, 2015

Chiu, Wayne@Waterboards

From: lyris@swrcb18.waterboards.ca.gov
Sent: Tuesday, April 21, 2015 9:40 AM
To: Chiu, Wayne@Waterboards
Subject: Revised Notice of Public Workshops on Prior Lawful Approval and Receiving Water Limitation permit language
Attachments: 2015-0420 Revised Notice of PLA-RWL Public Workshops.pdf

Water Boards This is a message from the California Regional Water Quality Control Board, San Diego Region (9).

Greetings Stakeholders,

A change to the date and location of the May workshop was necessary. Therefore, we posted a Revised Public Notice to the San Diego Water Board's website at
http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

For your convenience I also attached the Revised Public Notice to this email.

Laurie Walsh, PE
San Diego Water Board

2375 Northside Drive, Suite 100
San Diego, CA 92108
Direct Phone: 619-521-3373
Main Line: 619-516-1990
Fax No. (619) 516-1994
Email: Laurie.Walsh@waterboards.ca.gov

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD
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California Water Boards

Edmund G. Brown Jr.
Governor

Matthew Rodriquez
Secretary for
Environmental Protection

California Regional Water Quality Control Board, San Diego Region

REVISED
NOTICE OF PUBLIC WORKSHOPS

Proposed Amendments to Order No. R9-2013-0001, as amended by Order No. R9-2015-0001, to Incorporate a Definition of Prior Lawful Approval for Priority Development Projects and an Alternative Compliance Pathway for Receiving Water Limitations

NOTICE IS HEREBY GIVEN that the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) will hold a series of public workshops to provide an opportunity for discussion and receive comments, information, and input from the public on proposed amendments to Order No. R9-2013-0001, as amended by Order No. R9-2015-0001, NPDES No. CAS0109266, *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Regional MS4 Permit). The workshops will be conducted by a professional facilitator. Two or more San Diego Water Board members may be present at the workshop, but no actions or voting will occur.

Background

On May 8, 2013, the San Diego Water Board adopted Order No. R9-2013-0001, which became effective for the San Diego County Copermittees on June 27, 2013. On February 11, 2015, the San Diego Water Board adopted Order No. R9-2015-0001, which amended Order No. R9-2013-0001, to extend coverage of the Regional MS4 Permit to the Orange County Copermittees and address a variety of other issues. The Regional MS4 Permit became effective for the Orange County Copermittees on April 1, 2015. In May 2015, the San Diego Water Board will begin the process to consider extending coverage of the Regional MS4 Permit to the Riverside County Copermittees.

During the proceedings for Order No. R9-2015-0001, the San Diego Water Board deferred consideration of two concepts proposed as permit amendments. In order to promote transparency and outreach, the Board determined that additional public discussions on those concepts should be scheduled to obtain input and advice from Copermittees and other key stakeholder groups prior to incorporating proposed permit language into a Tentative Order to amend the Regional MS4 Permit. The two proposed amendments would establish 1) a definition of the term “prior lawful approval” for priority development projects, and 2) an alternative compliance pathway that would conditionally allow the Copermittees to be in compliance with the receiving water limitations and related prohibitions in Provisions A.1.a, A.1.c, and A.2.a of the Regional MS4 Permit. Based on these considerations, the San Diego Water Board is scheduling a series of workshops to receive comments and information from the Copermittees and other key stakeholder groups concerning the prior lawful approval and receiving water limitations issues.

Objective of Public Workshops

The objective of the workshops is for the San Diego Water Board to gain a greater understanding of the perspectives that storm water program managers, non-government environmental organizations, and the development/business communities have on the prior lawful approval and receiving water limitations issues. While the professional facilitator may help the group to reach consensus on key issues, it is important to understand that consensus may not be attained at the workshops. The comments and information received during the workshops on these issues will be considered by the San Diego Water Board in finalizing proposed permit language that will be incorporated in a Tentative Order and released for formal public review and comment later this year in the course of the Board’s proceedings to consider extending Regional MS4 Permit coverage to

the Riverside County Copermittees. The San Diego Water Board is seeking comments and information addressing the following questions:

1. **Prior Lawful Approval for Priority Development Projects:** Is there a definition of prior lawful approval that will allow developers, the environmental community, and the Copermittees to clearly understand when a development project should be subject to the Priority Development Project requirements of the Regional MS4 Permit?
2. **Alternative Compliance Pathway for Receiving Water Limitations:** What ambitious, rigorous and transparent alternative compliance path should be required that allows a Copermittee an appropriate period of time to come into compliance with receiving water limitations, as a precondition of a Copermittee being considered in compliance with the receiving water limitations while fully implementing the compliance alternative?

Public Workshops Dates and Locations

April 28, 2015 and June 30, 2015
City of Vista Civic Center Complex
Community Room
200 Civic Center Drive
Vista, CA 92008

May 21, 2015
San Diego Water Board
Board Meeting Room
2375 Northside Drive, Suite 100
San Diego, CA 92108

Stakeholder Participation

Participation at the public workshops will be structured to provide for an appropriate level of participation by key stakeholder groups, while preserving the ability for the meeting facilitator to ensure a collaborative discussion on the issues. Meeting participants will be divided into two groups: a limited group to be seated at the meeting table and an audience group. The total number of participants at the meeting table will be limited to twenty-five (25) persons subdivided into representative stakeholder groups as described in the table below.

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USEPA	1
San Diego Water Board Permit Team	5

Groups of stakeholders can share their seats at the table and rotate particular topic experts from the audience to the table depending on the topic being discussed. Audience seating will be provided so that interested persons can attend the public workshops. Audience members will be allowed to ask questions and make comments at the end of each topic discussion period.

Public Workshops Schedule

The public workshops are scheduled as follows:

Workshop Date	Topic Discussion Period	Topic
Tuesday, April 28, 2015	9:30 am – 12:00 pm	Prior Lawful Approval for Priority Development Projects
	1:00 pm – 3:30 pm	Alternative Compliance Pathway for Receiving Water Limitations
Friday, ~~May 22, 2015~~ May 21, 2015	9:30 am – 12:00 pm	Prior Lawful Approval for Priority Development Projects
	1:00 pm – 3:30 pm	Alternative Compliance Pathway for Receiving Water Limitations
Tuesday, June 30, 2015	9:30 am – 12:00 pm	San Diego Water Board Wrap-up Workshop on Prior Lawful Approval and Receiving Water Limitations

Availability of Draft Permit Language
The Regional MS4 Permit is available on the following webpage:
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Draft permit language will be made available for review and used as the starting point for workshop discussions on the prior lawful approval and receiving water limitations issues. The draft permit language will also be posted on the webpage above at least one week prior to the first scheduled workshop.

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http://www.waterboards.ca.gov/resources/email_subscriptions/reg9_subscribe.shtml

Persons who wish to receive hard copy notices of future notices or meetings on the Regional MS4 Storm Water Permit in lieu of electronic notices should submit a request to Mr. Wayne Chiu, Water Resource Control Engineer, 2375 Northside Drive, Suite 100, San Diego, CA 92108.

Directions and Parking
City of Vista Civic Center Complex
Interstate 15 North or South to Highway 78 West OR Interstate 5 North or South to Highway 78 East to Civic Center Drive exit; go North on Civic Center Drive approximately 1.1 miles to stoplight at Alta Vista Drive; turn right on Alta Vista Drive and right into the Civic Center Complex parking lot; follow signs within Civic Center Complex to the Community Room. Free parking is available at the Civic Center Complex.

San Diego Water Board, Board Meeting Room
For directions to the San Diego Water Board office, please refer to:
http://www.waterboards.ca.gov/sandiego/about_us/contact_us/
On-site parking is available, and the facility is accessible to persons with disabilities. Two-hour free parking is available on a first-come first-serve basis and long term fee parking is available in an adjacent parking structure. The facility is also accessible via public transit.

Contacts for Additional Information
The San Diego Water Board Regional MS4 Permit Team includes the following staff:

David Barker, P.E. – Supervising Water Resource Control Engineer
Eric Becker, P.E. – Senior Water Resource Control Engineer
Wayne Chiu, P.E. – Water Resource Control Engineer
Laurie Walsh, P.E. – Water Resource Control Engineer
Christina Arias, P.E. – Water Resource Control Engineer

Questions or requests for additional information regarding this notice should be directed to Laurie Walsh at (619) 521-3373 or laurie.walsh@waterboards.ca.gov, or Wayne Chiu at (619) 521-3354 or wayne.chiu@waterboards.ca.gov.

David W. Gibson
Executive Officer
April 2, 2015
Revised April 20, 2015

Chiu, Wayne@Waterboards

From: lyris@swrcb18.waterboards.ca.gov
Sent: Wednesday, April 22, 2015 3:59 PM
To: Chiu, Wayne@Waterboards
Subject: April 28, 2015 San Diego Water Board Workshop on Prior Lawful Approval and Compliance Option to Receiving Water Limitations
Attachments: 2015-0428 PLA RWL Workshop Agenda.pdf

Water Boards This is a message from the California Regional Water Quality Control Board, San Diego Region (9).

Copermittees and Interested Persons,

Attached is an agenda for next Tuesdays April 28, 2015 Workshop on Prior Lawful Approval and Compliance Option to Receiving Water Limitations in the Regional MS4 Permit. This agenda along with baseline language (our starting point for each discussion) for each topic is also posted on our website http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

We look forward to a robust discussion with all.

Laurie Walsh, PE
San Diego Water Board

2375 Northside Drive, Suite 100
San Diego, CA 92108
Direct Phone: 619-521-3373
Main Line: 619-516-1990
Fax No. (619) 516-1994
Email: Laurie.Walsh@waterboards.ca.gov

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD
www.waterboards.ca.gov/sandiego/

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PUBLIC WORKSHOP AGENDA

Proposed Amendments to Order No. R9-2013-0001, as amended by Order No. R9-2015-0001, to Incorporate a Definition of Prior Lawful Approval for Priority Development Projects and an Alternative Compliance Pathway for Receiving Water Limitations

Tuesday, April 28, 2015

SESSION 1
9:30 a.m. to 12:00 p.m.
Prior Lawful Approval for Priority Development Projects

QUESTION: Is there a definition of prior lawful approval that will allow developers, the environmental community, and the Copermittees to clearly understand when a development project should be subject to the Priority Development Project requirements of the Regional MS4 Permit?

9:30 a.m. - 9:35 a.m.	Introductions [Table Participants]
9:35 a.m. - 9:50 a.m.	Workshop Procedures and Objectives [Lewis Michaelson, Katz & Associates]
9:50 a.m. - 10:00 a.m.	Background & Proposed Language [Laurie Walsh, San Diego Water Board]
10:00 a.m. - 11:30 a.m.	Discussion [Table Participants]
11:30 a.m. - 12:00 p.m.	Comments & Questions [All]

LUNCH
12:00 p.m. to 1:00 p.m.

SESSION 2
1:00 p.m. to 3:30 p.m.
Alternative Compliance Pathway for Receiving Water Limitations

QUESTION: What ambitious, rigorous and transparent alternative compliance path should be required that allows a Copermittee an appropriate period of time to come into compliance with receiving water limitations, as a precondition of a Copermittee being considered in compliance with the receiving water limitations while fully implementing the compliance alternative?

1:00 p.m. - 1:05 p.m.	Introductions [Table Participants]
1:05 p.m. - 1:20 p.m.	Workshop Procedures and Objectives [Lewis Michaelson, Katz & Associates]
1:20 p.m. - 1:30 p.m.	Background & Proposed Language [Wayne Chiu, San Diego Water Board]
1:30 p.m. - 3:00 p.m.	Discussion [Table Participants]
3:00 p.m. - 3:30 p.m.	Comments & Questions [All]

PUBLIC WORKSHOP AGENDA

Proposed Amendments to Order No. R9-2013-0001, as amended by Order No. R9-2015-0001, to Incorporate a Definition of Prior Lawful Approval for Priority Development Projects and an Alternative Compliance Pathway for Receiving Water Limitations

Tuesday, April 28, 2015

SESSION 1
9:30 a.m. to 12:00 p.m.
Prior Lawful Approval for Priority Development Projects

QUESTION: Is there a definition of prior lawful approval that will allow developers, the environmental community, and the Copermittees to clearly understand when a development project should be subject to the Priority Development Project requirements of the Regional MS4 Permit?

9:30 a.m. - 9:35 a.m.	Introductions [Table Participants]
9:35 a.m. - 9:50 a.m.	Workshop Procedures and Objectives [Lewis Michaelson, Katz & Associates]
9:50 a.m. - 10:00 a.m.	Background & Proposed Language [Laurie Walsh, San Diego Water Board]
10:00 a.m. - 11:30 a.m.	Discussion [Table Participants]
11:30 a.m. - 12:00 p.m.	Comments & Questions [All]

LUNCH
12:00 p.m. to 1:00 p.m.

SESSION 2
1:00 p.m. to 3:30 p.m.
Alternative Compliance Pathway for Receiving Water Limitations

QUESTION: What ambitious, rigorous and transparent alternative compliance path should be required that allows a Copermittee an appropriate period of time to come into compliance with receiving water limitations, as a precondition of a Copermittee being considered in compliance with the receiving water limitations while fully implementing the compliance alternative?

1:00 p.m. - 1:05 p.m.	Introductions [Table Participants]
1:05 p.m. - 1:20 p.m.	Workshop Procedures and Objectives [Lewis Michaelson, Katz & Associates]
1:20 p.m. - 1:30 p.m.	Background & Proposed Language [Wayne Chiu, San Diego Water Board]
1:30 p.m. - 3:00 p.m.	Discussion [Table Participants]
3:00 p.m. - 3:30 p.m.	Comments & Questions [All]

PUBLIC WORKSHOP
Proposed Amendments to Order No. R9-2013-0001, as amended by Order No. R9-2015-0001, to Incorporate a Definition of Prior Lawful Approval for Priority Development Projects and an Alternative Compliance Pathway for Receiving Water Limitations
April 28, 2015

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April 28, 2015

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PUBLIC WORKSHOP
Proposed Amendments to Order No. R9-2013-0001, as amended by Order No. R9-2015-0001, to Incorporate a Definition of Prior Lawful Approval for Priority Development Projects and an Alternative Compliance Pathway for Receiving Water Limitations
April 28, 2015

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Draft Definition of Prior Lawful Approval for Priority Development Projects

Insert the following as Provision E.3.e.(1)(b) and renumber the following provisions appropriately:

(b) For private development projects, prior lawful approval under this Order is a development approval or construction permit that either: 1) complies with the Priority Development Project requirements of the Fourth Term MS4 permits[1] and includes the design of the storm water drainage system for the project in its entirety as accepted by the Copermittee, or 2) confers a vested right to proceed under prior storm water requirements. For public projects, approval means that the design of the storm water drainage system for the project in its entirety has been stamped by the City or County Engineer. For any applicable portion(s) of the project, approvals may be extended to any subsequent discretionary or ministerial approvals necessary to implement the initial project approval with the following conditions:

(i) All subsequent permits must be issued within 5 years of the effective date of the BMP Design Manual pursuant to Provision E.3.d; and

(ii) BMP installation under subsequent approvals must remain in substantial conformity with the design of the storm water drainage system included in the initial approval.

[1] Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016 for San Diego, Orange, and Riverside Counties, respectively.

Draft Alternative Compliance Pathway for Receiving Water Limitations

Insert the following as Provision B.3.c:

c. DISCHARGE PROHIBITIONS AND RECEIVING WATER LIMITATIONS COMPLIANCE OPTION

(1) The Copermittees may utilize implementation of the water quality improvement strategies in the Water Quality Improvement Plan to demonstrate compliance with the requirements of Provisions A.1.a, A.1.c and A.2.a. For each Copermittee in the Watershed Management Area that chooses to utilize this option, the Copermittee will be in compliance with Provisions A.1.a, A.1.c and A.2.a if:

(a) Numeric goals and schedules developed pursuant to Provision B.3.a include the following numeric goals:

(i) Water quality based effluent limitations (WQBELs) expressed as concentration-based or load-based effluent limitations applicable to the Watershed Management Area established by the TMDLs in Attachment E to this Order; and

(ii) Numeric goals applicable to the Copermittee's MS4 discharges expressed as concentration-based or load-based effluent limitations for all other pollutants listed on the Clean Water Act Section 303(d) List of Water Quality Impaired Segments[1] for the receiving waters in the Watershed Management Area that do not have a TMDL developed; and

(iii) Numeric goals for receiving waters that will protect the conditions of the receiving waters and attain water quality standards.

(b) An analysis utilizing a watershed model or other watershed analytical tools is performed. The results must be included in the Water Quality Improvement Plan to quantitatively demonstrate that the implementation of the water quality improvement strategies required under Provision B.3.b will achieve the numeric goals within the established schedules required under Provision B.3.a. The analysis may be performed individually or jointly by the Copermittees choosing to utilize this option in the Watershed Management Area, and must be updated as part of the iterative approach and adaptive management process required under Provisions B.5.a-b.

(c) The Water Quality Improvement Plan specifies the monitoring and assessments (i.e. MS4 outfall discharge, receiving water, and/or special studies) that will be performed by the Copermittee to confirm the implementation of the water quality improvement strategies within its jurisdiction is making progress toward achieving the numeric goals in accordance with the established schedules developed pursuant to Provision

[1] 2002 and subsequent 303(d) Lists

B.3.c.(1)(a). The monitoring and assessments must be incorporated into the monitoring and assessment program required pursuant to Provision B.4. The monitoring and assessments must be updated as part of the iterative approach and adaptive management process required under Provision B.5.c.

(d) The numeric goals proposed pursuant to Provision B.3.c.(1)(a), the analysis performed pursuant to Provision B.3.c.(1)(b), and the specific monitoring and assessments proposed pursuant to Provision B.3.c.(1)(c) have been reviewed by the Water Quality Improvement Consultation Panel (see Provision F.1.a.(1)(b)) for any recommendations. Updates must be reviewed by the Water Quality Improvement Consultation Panel for any recommendations.

(2) Each Copermittee that chooses to utilize this option will, for the pollutant/water body combinations covered by the analysis, be in compliance with Provisions A.1.a, A.1.c and A.2.a when the Water Quality Improvement Plan, incorporating the requirements of Provision B.3.c.(1), is accepted by the San Diego Water Board.

(3) The Copermittee will, for the pollutant/water body combinations covered by the analysis, remain in compliance with Provisions A.1.a, A.1.c and A.2.a during the term of this Order as long as:

(a) The results of the analysis performed pursuant to Provision B.3.c.(1)(d) is accepted by the San Diego Water Board Executive Officer as part of the Water Quality Improvement Plan and as part of subsequent updates to the Water Quality Improvement Plan; AND

(b) The Copermittee continues to implement the water quality improvement strategies within its jurisdiction developed pursuant to Provision B.3.b.(1) in accordance with the schedules for implementing the strategies established pursuant to Provision B.3.b.(3)(a); AND

(c) The Copermittee continues to perform the monitoring and assessments specified in the Water Quality Improvement Plan, developed and implemented pursuant to Provision B.3.c.(1)(c), to demonstrate its progress toward achieving the numeric goals applicable to its MS4 discharges in accordance with the interim and final dates for achieving the numeric goals established pursuant to Provision B.3.a.(2); AND

(d) The Copermittee continues to implement the requirements of Provision A.4.a.

Regional Water Quality Control Board MS4 Permit Workshop

Prior Lawful Approval (PLA) Policy

Tuesday, April 28, 2015
200 Civic Center Drive
Vista, California

1

Introductions

- The Coalition
  - San Diego Building Industry Association
  - Building Industry Association of Southern California
  - Associated General Contractors
  - Associated Builders and Contractors
  - San Diego Regional Chamber of Commerce
  - Business Leadership Alliance
  - San Diego Association of Realtors
  - San Diego Apartment Association
  - NAIOP (National Association of Industrial & Office Properties)
  - BOMA (Building Office & Management Association
  - San Diego Chapter of the American Society of Landscape Architects.

2

Background

- Working with Copermittees/NGOs re: meaning of permit section E.3.e.(1)(a)
  - City of San Diego, County, Chula Vista, Carlsbad, San Marcos, Escondido, El Cajon, and Santee
  - Regional Board staff
  - Coastkeeper
- General agreement: the section requires clarification. But no consensus on specific language.
- Time for the Regional Board to weigh in.

3

Current Permit Language in E.3.e.(1)(a)

Applications **with** lawful approval before the BMP Design Manual is updated…

Copermittee **may** allow previous land development requirements to apply. [Emphasis added.]

Applications **without** lawful approval by the Copermittee by the time the BMP Design Manual is updated…

Copermittee must require and confirm the requirements of E.3 are implemented.

4

Language Revisions Proposed by Staff

Applications **with** prior lawful approval before the BMP Design Manual is ~~updated~~ implemented…

Copermittee may allow previous land development requirements to apply.

Applications **without** prior lawful approval by the Copermittee by the time the BMP Design Manual is ~~updated~~ implemented…

Copermittee must require and confirm the requirements of E.3 are implemented.

5

Issues Requiring Clarification by the Board

- What is the purpose of Section E.3.e.(1)(a)?
- What is a "Prior Lawful Approval"?
- When may a Copermittee use its discretion to allow previous land development requirements to apply?

6

The Purpose of Section E.3.e.(1)(a)

- Address the disconnect between permit cycles and entitlement cycles
  - Permits are revised every **5 years**.
  - Project approvals from inception to building permits are much longer (7 to 10 years)
- Provide predictability for design and financing
- Avoid takings claims against Copermittees over statutory and common-law vested rights

7

Permit Cycle Disconnect Example: Redevelopment of Brown Field Airport

- 2006: RFP by City of San Diego
- 2009: Development Department approval of site design including WQTR in conformity with 2007 permit
- 2013: Certification of EIR and approval of Site Development Permit including WQTR
- 2014: Challenge to certified EIR
- 2016: Grading permits and commencement of construction

But, if required to comply w/ 2013 permit…

And if investors walk away, ***back to Square 1!***

- Public is denied:
  - 6,000 new jobs, most at prevailing wage
  - A critical piece of public infrastructure
  - An economic engine in a depressed area
  - Tax revenue
  - Loss of water quality improvements for existing development on airport.

8

Defining a "Prior Lawful Approval"

- Currently an undefined term in the permit
  - Creates uncertainty and fear for Copermittees
  - Creates uncertainty for the development of both public and private projects whose entitlement cycles are much longer than permit cycles.
  - Creates funding uncertainties for both public and private projects.
- Other regional boards have addressed this issue.

9

Examples of PLA Policies in Other MS4 Permit Regions (see handout)

	Los Angeles County	Central Coast Region	Sacramento	Ventura County
Source	Order # R4-2012-0175	Post Construction Storm Water Management Requirements	Stormwater Quality Partnership Hydromodification Management Plan	Ventura Technical Guidance Manual
Date	November, 2012	July, 2013	February, 2013	July, 2011
• **Development Agreements**	Silent	Silent	Silent	Exempt
• **Vesting Tentative Maps**	Exempt	Silent	Silent	Exempt
• **Tentative Maps**	Silent	Silent	Exempt	Exempt
• **Other Discretionary Permit**	Exempt (1st permit)	Exempt	Exempt	Exempt
• **Other Ministerial Permit**	Silent	Exempt	Exempt	Silent
• **Commencement of Work**	Silent	Silent	Silent	Exempt

10

When may a Copermittee allow previous land development requirements to apply?

- Project complies with requirements in previous permit cycle
- The project has a vested right
- Special circumstances requiring Copermittee discretion
  - Health and Safety
  - Other

11

Clarity and Consistency Benefit Everyone

- Project applicants
- Copermittees
- Regional Board
- Non-governmental organizations
- Public

Objectives of Clear PLA Language

- Provide a clear minimum standard that each Copermittee can rely on as a basis for MS4 permit compliance.
- Recognize and honor vested rights in order to protect Copermittees from takings claims and to avoid budgetary crisis for CIP, FPPF and assessment district financing.
- Protect Copermittee land use authority by allowing them to impose higher standards required to protect health and safety or to prevent a nuisance.
- Reflect statewide trends in addressing the meaning and implementation of Prior Lawful Approval provisions, which are not unique to this permit.

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Proposed Permit Language
(Replaces Section E.3.e.(1)(a); does not alter (b) through (d))

(a) Each Copermittee must require and confirm that for all Priority Development Project applications that have not received prior lawful approval by the Copermittee by the time the BMP Design Manual is implemented pursuant to Provision E.3.d, the requirements of Provision E.3 are implemented. For project applications that have received prior lawful approval before the BMP Design Manual is implemented pursuant to Provision E.3.d, the Copermittee may allow previous land development requirements to apply.

i. For private development projects, "Prior Lawful Approval" means projects that have entered into a development agreement as defined by the California Government Code or have received a first discretionary approval or ministerial permit prior to the time the BMP Design Manual is implemented. A Prior Lawful Approval shall include any subsequent discretionary or ministerial entitlement necessary to implement the initial Prior Lawful Approval.

ii. For public projects, the Copermittee shall develop and adopt an equivalent approach to that for private projects.

iii. For project applications that have obtained a Prior Lawful Approval before the BMP Design Manual is implemented pursuant to Provision E.3.d, the Copermittee may use its discretion to allow previous land development requirements to apply.

iv. Projects with Prior Lawful Approvals as defined above that predate Order No.R9-2007-0001 for San Diego County Copermittees, Oder No. R9-2009-0002 for Orange County Copermittees, and Order No. R9-2010-0016 for Riverside County, Copermittees shall be required to incorporate Treatment Control BMPs necessary to achieve the water quality standards set forth in the applicable Orders identified above to the Maximum Extent Practicable, as determined by the Copermittee on a case by case basis.

14

The Coalition's Request

- Direct staff to incorporate the Coalition's proposed language for E.3.e.(1)(a) into Tentative Order No. R9-2015-0001 for review and comment by all stakeholders prior to consideration for adoption by the Regional Board.

15

Questions

?

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Proposed Prior Lawful Approval Language

e. Priority Development Project BMP Implementation and Oversight

Each Copermittee must implement a program that requires and confirms structural BMPs on all Priority Development Projects are designed, constructed, and maintained to remove pollutants in stormwater to the MEP.

(1) Structural BMP Approval and Verification Process

(a) Each Copermittee must require and confirm that for all Priority Development Project applications that have not received prior lawful approval by the Copermittee by the effective date of the BMP Design Manual pursuant to Provision E.3.d, the requirements of Provision E.3 must be implemented. For project applications that have received prior lawful approval before the effective date of the BMP Design Manual pursuant to Provision E.3.d, the Copermittee may allow previous land development requirements to apply.

(b) For private development projects, prior lawful approval under this Order is any development approval or construction permit that either:

1) complies with the Priority Development Project requirements of the immediately prior MS4 permits and includes the design of the storm water drainage system for the project in its entirety as accepted by the Copermittee, or

2) in the case of a development agreement, vesting tentative map or common law mechanism established by the State allowing for the vesting of rights, the rights vested shall be deemed to include the right to proceed under the Priority Development Project requirements of the immediately prior MS4 permits.

For public projects, approval means that the design of the storm water drainage system for the project in its entirety complies with the Priority Development Project requirements of the immediately prior MS4 permits and has been stamped by the City or County Engineer or engineer of record for the project. For public projects completed on a design build or similar basis where project design is completed after construction contract award, the project may be designed in conformance with the Priority Development Project requirements of the immediately prior MS4 permits if the contract is awarded before the effective date of the BMP Design Manual.

For any applicable portion(s) of a public or private project, approvals may be extended to any subsequent discretionary or ministerial approvals necessary to implement the initial project approval with the following conditions:

(i) All grading permits and other discretionary approvals, or equivalent discretionary approvals for public projects, must be issued within 5 years of the effective date of the BMP Design Manual pursuant to Provision E.3.d. Subsequent permits may be issued beyond 5 years after the effective date of the BMP Design Manual, provided that the backbone storm water drainage system that services or connects to the project, which is the subject of any subsequent permits, has already been constructed ~~and any remaining Structural BMP's have been installed in substantial conformity with the initial approval~~; and

(ii) BMP installation under subsequent approvals must remain in substantial conformity with the design of the storm water drainage system included in the initial approval.

Proposed Prior Lawful Approval Language ~~for~~

e. Priority Development Project BMP Implementation and Oversight

Each Copermittee must implement a program that requires and confirms structural BMPs on all Priority Development Projects are designed, constructed, and maintained to remove pollutants in stormwater to the ~~MS4 Permit~~MEP.

~~(1)~~ (1) Structural BMP Approval and Verification Process

~~a.~~ (a) Each Copermittee must require and confirm that for all Priority Development Project applications that have not received ~~Prior Lawful Approval~~prior lawful approval by the Copermittee by the ~~time~~ effective date of the BMP Design Manual ~~is implemented~~ pursuant to Provision E.3.d, the requirements of Provision E.3 ~~are implemented~~must be implemented. For project applications that have received prior lawful approval before the effective date of the BMP Design Manual pursuant to Provision E.3.d, the Copermittee may allow previous land development requirements to apply.

(b) For private development projects, ~~"Prior Lawful Approval" means projects~~ prior lawful approval under this Order is any development approval or construction permit that ~~have entered into~~either:

1) complies with the Priority Development Project requirements of the immediately prior MS4 permits and includes the design of the storm water drainage system for the project in its entirety as accepted by the Copermittee, or

2) in the case of a development agreement ~~as defined by the California Government Code or have received a first discretionary approval or ministerial permit prior to the time~~, vesting tentative map or common law mechanism established by the State allowing for the vesting of rights, the rights vested shall be deemed to include the right to proceed under the Priority Development Project requirements of the immediately prior MS4 permits.

For public projects, approval means that the design of the storm water drainage system for the project in its entirety complies with the Priority Development Project requirements of the immediately prior MS4 permits and has been stamped by the City or County Engineer or engineer of record for the project. For public projects completed on a design build or similar basis where project design is completed after construction contract award, the project may be designed in conformance with the Priority Development Project requirements of the

immediately prior MS4 permits if the contract is awarded before the effective date of the BMP Design Manual~~ is implemented. A Prior Lawful Approval shall include~~ .

~~i.~~ For any applicable portion(s) of a public or private project, approvals may be extended to any subsequent discretionary or ministerial ~~entitlement~~approvals necessary to implement the initial ~~ Prior Lawful Approval.~~project approval with the following conditions:

~~ii. For public projects, the Copermittee shall develop~~All grading permits and ~~adopt an~~other discretionary approvals, or equivalent ~~approach to that~~ discretionary approvals for ~~private projects.~~

~~iii. For project applications that have obtained a Prior Lawful Approval before~~public projects, must be issued within 5 years of the effective date of the BMP Design Manual ~~is implemented~~ pursuant to Provision E.3.d~~,~~. Subsequent permits may be issued beyond 5 years after the ~~Copermittee may use its discretion to allow previous land development requirements to apply.~~

(i) ~~iv. Projects with Prior Lawful Approvals as defined above that predate Order No.R9-2007-0001 for San Diego County Copermittees, Oder No. R9-2009-0002 for Orange County Copermittees, and Order No. R9-2010-0016 for Riverside County Copermittees shall be required to incorporate Treatment Control BMPs necessary to achieve~~effective date of the BMP Design Manual, provided that the backbone storm water ~~quality standards set forth in the applicable Orders to~~drainage system that services or connects to the ~~Maximum Extent Practicable, as determined by~~ project, which is the ~~Copermittee on a case by case basis.~~subject of any subsequent permits, has already been constructed and any remaining Structural BMP's have been installed in substantial conformity with the initial approval ; and

(ii) BMP installation under subsequent approvals must remain in substantial conformity with the design of the storm water drainage system included in the initial approval.

Comparison of RWQCB and Building Industry Coalition Proposals: April 27, 2015

	RWQCB	Building Industry Coalition
1. "Grandfathering" Trigger	Effective date of the BMP Design Manual (Dec. 24, 2015) o Before Effective Date: Fourth Term (or "immediately prior") MS4 permit" o After Effective Date: 2013 Permit standards	
2. Limitations on Coverage	2007 Permit floor <u>except</u> private development projects where the PLA includes a development approval or construction permit that <u>confers a vested right to proceed under prior storm water requirements</u>.	2007 Permit floor <u>in all instances</u>.
3. Private Development Projects	Any development approval or construction permit that either 1) complies with the PDP requirements of the Fourth Term [or immediately prior] MS4 permits and includes the design of the storm water drainage system for the project in its entirety as accepted by the Copermittee, OR	
	2) confers a vested right to proceed under prior storm water requirements.	2) in the case of a <u>development agreement, vesting tentative map or common law mechanism established by the State allowing for the vesting of rights</u>, the <u>rights vested shall be deemed to include</u> the right to proceed under the PDP requirements of the immediately prior MS4 permits
4. Public Projects	The design of the storm water drainage system for the project in its entirety has been stamped by the City or County Engineer.	The design of the storm water drainage system for the project in its entirety <u>complies with the PDP requirements of the immediately prior MS4 permits</u> and has been stamped by the City or County Engineer <u>or engineer of record for the project</u>. <u>For public projects completed on a design build or similar basis where project design is completed after construction contract award, the project may be designed in conformance with the Priority Development Project requirements of the immediately prior MS4 permits if the contract is awarded before the effective date of the BMP Design Manual</u>.
5. PLA Extensions	For any applicable portion(s) of a public or private project, approvals may be extended to any subsequent discretionary or ministerial approvals necessary to implement the initial project approval with the following conditions:	
	(i) <u>All subsequent permits</u> must be issued within 5 years of the effective date of the BMP Design Manual pursuant to Provision E.3.d, AND	(i) All <u>grading permits and other discretionary approvals, or equivalent discretionary approvals</u> for public projects, must be issued within 5 years of the effective date of the BMP Design Manual pursuant to Provision E.3.d., AND
		<u>Subsequent permits</u> may be issued beyond 5 years after the effective date of the BMP Design Manual, provided that the backbone storm water drainage system that services or connects to the project, which is the subject of any subsequent permits, has already been constructed; AND
	(ii) BMP installation under subsequent approvals must remain in substantial conformity with the design of the storm water drainage system included in the initial approval.	

Document	Ventura County	LA County	Sacramento	Central Coast Region	SD Region Proposal
Source	Ventura Technical Guidance Manual	Order # R4-2012-0175	Stormwater Quality Partnership Hydromodification Management Plan	Post Construction Storm Water Management Requirements	Copermittees and Private Parties
Date	July, 2011	November, 2012	February, 2013	July, 2013	August, 2014
Development Agreements	Exempt	Silent	Silent	Silent	Exempt
Vesting Tentative Maps	Exempt	Exempt	Silent	Silent	Silent
Tentative Maps	Exempt	Silent	Exempt	Silent	Silent
Other Discretionary Permit	Exempt	Exempt (1st permit)	Exempt	Exempt	Exempt
Other Ministerial Permit	Silent	Silent	Exempt	Exempt	Exempt
Commencement of Work	Exempt	Silent	Silent	Silent	Silent

Example - Central Coast Region "excerpts of Applicability of New Requirements"

Resolution No. R3-2013-0032

ATTACHMENT 1

POST-CONSTRUCTION STORMWATER MANAGEMENT REQUIREMENTS FOR DEVELOPMENT PROJECTS IN THE CENTRAL COAST REGION

July 12, 2013

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL COAST REGION
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Documents also are available at:
http://www.waterboards.ca.gov/centralcoast/water_issues/programs/stormwater/docs/lid/lid_hydromod_charette_index.shtml

projects with completed project applications dated prior to September 6, 2012. The Permittee must demonstrate that the application of the Post-Construction Requirements would pose financial infeasibility for the project. The Permittee shall not grant any exemptions without prior approval from the Central Coast Water Board Executive Officer.

If project seeks grandfathering based on "application" rather than an "approval", then an infeasibility analysis is req'd.

2) Performance Requirement No. 1: Site Design and Runoff Reduction
   a) The Permittee shall require all Regulated Projects that create and/or replace ≥ 2,500 square feet of impervious surface (collectively over the entire project site), including detached single-family home projects, to implement at least the following design strategies throughout the Regulated Project site:
      i) Limit disturbance of creeks and natural drainage features
      ii) Minimize compaction of highly permeable soils
      iii) Limit clearing and grading of native vegetation at the site to the minimum area needed to build the project, allow access, and provide fire protection
      iv) Minimize impervious surfaces by concentrating improvements on the least-sensitive portions of the site, while leaving the remaining land in a natural undisturbed state
      v) Minimize stormwater runoff by implementing one or more of the following site design measures:
         (1) Direct roof runoff into cisterns or rain barrels for reuse
         (2) Direct roof runoff onto vegetated areas safely away from building foundations and footings, consistent with California building code
         (3) Direct runoff from sidewalks, walkways, and/or patios onto vegetated areas safely away from building foundations and footings, consistent with California building code
         (4) Direct runoff from driveways and/or uncovered parking lots onto vegetated areas safely away from building foundations and footings, consistent with California building code
         (5) Construct bike lanes, driveways, uncovered parking lots, sidewalks, walkways, and patios with permeable surfaces
   b) The Permittee shall confirm that projects comply with Site Design and Runoff Reduction Performance Requirements by means of appropriate documentation (e.g., check lists) accompanying applications for project approval.

3) Performance Requirement No. 2: Water Quality Treatment
   a) The Permittee shall require Regulated Projects, except detached single-family homes, ≥ 5,000 square feet of Net Impervious Area, and detached single-family homes ≥ 15,000 square feet of Net Impervious Area, to treat stormwater runoff as required in the Water Quality Treatment Performance Requirements in Section B.3.b. to reduce pollutant loads and concentrations using physical, biological, and chemical removal.
      i) Net Impervious Area is the total (including new and replaced) post-project impervious areas, minus any reduction in total imperviousness from the pre-project to post-project condition: *Net Impervious Area = (New and Replaced Impervious Area) - (Reduced Impervious Area Credit)*, where *Reduced Impervious Area Credit* is the total pre-project to post-project reduction in impervious area, if any.
   b) The Permittee shall require each Regulated Project subject to Water Quality Treatment Performance Requirements to treat runoff generated by the Regulated Project site using the onsite measures below, listed in the order of preference (highest to lowest). Water Quality Treatment Performance Requirements shall apply to the runoff from existing, new, and replaced impervious surfaces on sites where runoff from existing impervious surfaces cannot be separated from runoff from new and replaced impervious surfaces.

(5) Crack sealing
(6) Resurfacing with in-kind material without expanding the road or parking lot
(7) Practices to maintain original line and grade, hydraulic capacity, and overall footprint of the road or parking lot
(8) Repair or reconstruction of the road because of slope failures, natural disasters, acts of God or other man-made disaster

ii) Sidewalk and bicycle path or lane projects, where no other impervious surfaces are created or replaced, built to direct stormwater runoff to adjacent vegetated areas
iii) Trails and pathways, where no other impervious surfaces are replaced or created, and built to direct stormwater runoff to adjacent vegetated areas
iv) Underground utility projects that replace the ground surface with in-kind material or materials with similar runoff characteristics
v) Curb and gutter improvement or replacement projects that are not part of any additional creation or replacement of impervious surface area (e.g., sidewalks, roadway)
vi) Second-story additions that do not increase the building footprint
vii) Raised (not built directly on the ground) decks, stairs, or walkways designed with spaces to allow for water drainage
viii) Photovoltaic systems installed on/over existing roof or other impervious surfaces, and panels located over pervious surfaces with well-maintained grass or vegetated groundcover, or panel arrays with a buffer strip at the most down gradient row of panels
ix) Temporary structures (in place for less than six months)
x) Electrical and utility vaults, sewer and water lift stations, backflows and other utility devices
xi) Above-ground fuel storage tanks and fuel farms with spill containment system

c) The Permittee shall apply the Post-Construction Requirements by March 6, 2014[1], to all applicable Regulated Projects that require approvals and/or permits issued under the Permittee's planning, building, or other comparable authority. Applicable Regulated Projects include both private development requiring permits, and public projects:

i) Private Development Projects
(1) Discretionary Projects – The Permittee shall apply the Post-Construction Requirements to those projects that have not received the first discretionary approval of project design.
(2) Ministerial Projects – If the project is only subject to ministerial approval, the Permittee shall apply the Post-Construction Requirements to those projects that have not received any ministerial approvals. If the ministerial project receives multiple ministerial approvals, the Permittee shall apply the Post-Construction Requirements to the first ministerial approval. Ministerial approvals include, but are not limited to, building permits, site engineering improvements, and grading permits.

ii) Public Development Projects
(1) The Permittee shall develop and implement an equivalent approach, to the above approach used for private development projects, to apply the Post-Construction Requirements to applicable public development projects, including applicable university development projects

iii) Exemptions – The Permittee may propose, to the Central Coast Water Board Executive Officer, a lesser application of the Post-Construction Requirements for

Grandfathered per 1st Discretionary Approval.

If project didn't have a Discretionary Approval, then its 1st Ministerial approval defines date of grandfathering.

[1] Newly enrolled Permittees Gonzales, Greenfield, and Guadalupe shall apply the Post-Construction Requirements by July 1, 2014.

019740

Example – Ventura Region
"Excerpts of Applicability on Revised Requirements"

Ventura County Technical Guidance Manual for Stormwater Quality Control Measures

Manual Update 2011

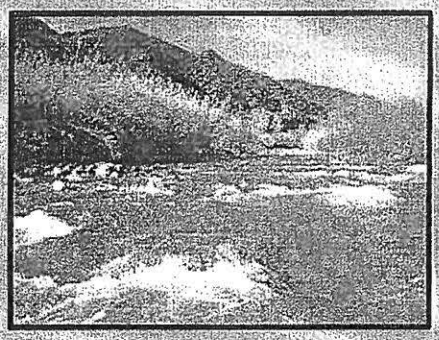

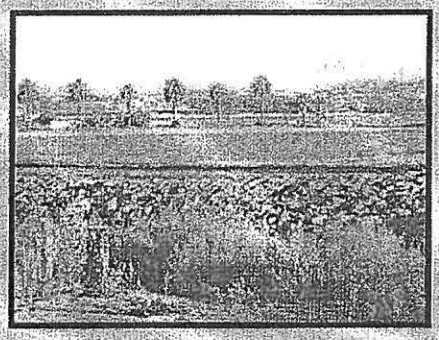

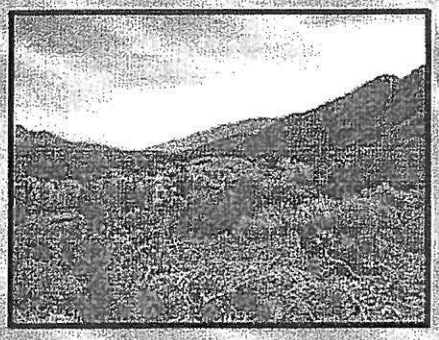

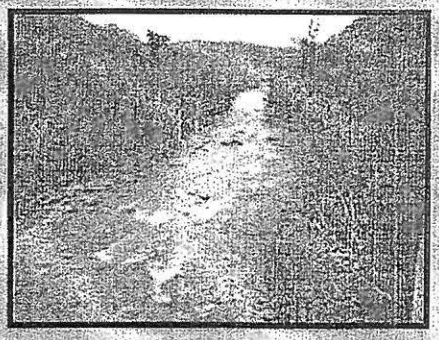

Ventura Countywide Stormwater Quality Management Program

Geosyntec consultants

LARRY WALKER ASSOCIATES

Prepared by

Larry Walker Associates
707 Fourth Street, Suite 200
Davis, CA 95616

Geosyntec Consultants
1111 Broadway, 6th Floor
Oakland, CA 94607

July 13, 2011

Existing single-family dwelling and accessory structure projects are exempt from the redevelopment requirements unless the project creates, adds, or replaces 10,000 square feet of impervious surface area.

Effective Date

The new development and redevelopment requirements contained in Part 4, Section E of Board Order R4-2010-0108 (the "Order") shall become effective 90 calendar days after the Regional Water Quality Control Board Executive Officer approves the 2011 TGM (the "Effective Date"). After the Effective Date, all applicable projects, except those identified below, must comply with the new development and redevelopment requirements contained in Part 4, Section E of the Order.

The new development and redevelopment requirements contained in Part 4, Section E of the Order shall not apply to the projects described in paragraphs 1 through 5 below. Projects meeting the criteria listed in paragraphs 1 through 5 below shall instead continue to comply with the performance criteria set forth in the 2002 Technical Guidance Manual for Stormwater Quality Control Measures under Board Order 00-108:

1) Projects or phases of projects where the project's applications have been "deemed complete for processing" (or words of equivalent meaning), including projects with ministerial approval, by the applicable local permitting agency in accordance with the local permitting agency's applicable rules prior to the Effective Date; or

2) Projects that are the subject of an approved Development Agreement and/or an adopted Specific Plan; or an application for a Development Agreement and/or Specific Plan where the application for the Development Agreement and/or Specific Plan has been "deemed complete for processing" (or words of equivalent meaning), by the applicable local permitting agency in accordance with the local permitting agency's applicable rules, and thereafter during the term of such Development Agreement and/or Specific Plan unless earlier cancelled or terminated; or

3) All private projects in which, prior to the Effective Date, the private party has completed public improvements; commenced design, obtained financing, and/or participated in the financing of the public improvements; or which requires the private party to reimburse the local agency for public improvements upon the development of such private project; or

4) Local agency projects for which the governing body or their designee has approved initiation of the project design prior to the Effective Date; or

5) A Tentative Map or Vesting Tentative Map deemed complete or approved by the local permitting agency prior to the Effective Date, and subsequently a Revised Map is submitted, the project would be exempt from the 2011 TGM provisions if the revisions substantially conform to original map design, consistent with

Subdivision Map Act requirements. Changes must also comply with local and state law.

The intent of these guidelines is to ensure that projects for which the applications have been deemed "complete" or the applicants have worked with local permitting agency staff to develop a final, or substantially final, drainage concept and site layout that includes water quality treatment based upon the performance criteria set forth in the 2002 Technical Guidance Manual for Stormwater Quality Control Measures prior to the Effective Date, are not required to redesign their proposed projects for purposes of complying with the new development and redevelopment requirements contained in Part 4, Section E of Board Order R4-2010-0108.

INTENT OF GRANDFATHERING

In addition, any project, phase of a project, or individual lot within a larger previously-approved project, where the application for such project has been "deemed complete for processing" (or words of equivalent meaning) that does not have a final or substantially final drainage concept as determined by the local permitting agency or a site layout that includes water quality treatment must comply with the performance standards set forth in the 2011 TGM.

1.6 Organization of the 2011 TGM

The 2011 TGM is divided into seven sections and nine appendices:

Section 1	Introduction
Section 2	Stormwater Management Standards
Section 3	Site Assessment and BMP Selection
Section 4	Site Design Principles & Techniques
Section 5	Source Control Measures
Section 6	Retention BMPs, Biofiltration BMPs, and Treatment Control Measure Design
Section 7	Operation and Maintenance Planning
Appendix A	Glossary of Terms
Appendix B	Maps: Watersheds Delineation, Existing Urban Areas, Environmentally Sensitive Areas, and 85th Percentile Rainfall Depth
Appendix C	Site Soil Type and Infiltration Testing

Land Development/ Home Building 101

Phases of Home Building*

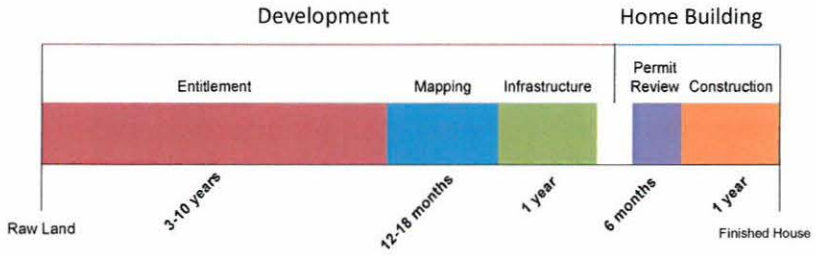

*Phases frequently overlap

- Entitlement Phase
  ~ Project pre-planning
  ~ Project Submittal and review by jurisdiction
  ~ CEQA Process
  ~ Design and conformance with all regulatory structures, local, state and federal**
  ~ Cost of capital associated with this process is in excess of 20% IRR or annualized return.

- Mapping Phase
  ~ Represents the design phase of the approved project
  ~ Potentially includes discretionary approvals from additional agencies, environmental permits, and 401 certification.
  ~ Cost of Capital associated with this process is 15-18% IRR or annualized return.

- Infrastructure Phase
  ~ Physically builds land development improvements
  ~ Process is largely subject to ministerial oversight
  ~ Cost of capital is approximately 10%

- Construction/Home Building
  ~ Comes at the end of long process
  ~ Extremely difficult to facilitate changes at this stage of development
  ~ Extremely expensive to facilitate changes at this stage of development
  ~ cost of capital is traditional bank financing at market rates

**Culminates in a discretionary action by jurisdiction

Receiving Water Limitations (RWLs)

San Diego County Copermittees

April 28, 2015

Alternative Compliance Option

Thank you!

Reference Goals, Not Effluent Limitations For Non-TMDL Pollutants

- Numeric goals should not reference effluent limitations except in the case of TMDLs

Adaptive Management to Address Non-303(d) Exceedances

- Address non-303(d) constituent exceedances through Water Quality Improvement Plan (WQIP) implementation, assessment and adaptation
- Focus resources on priorities
- Avoid developing compliance schedules for all water quality objectives

Compliance Pathway During Plan Development or Updates

- Add language to provide compliance with RWLs during WQIP development or future updates

Areas of Special Biological Significance

- Include alternative compliance with RWLs for MS4 discharges to Areas of Special Biological Significance

Other Issues

- Reference most recent 303(d) list
- Explore linkages between RWLs and the Alternative Compliance pathway
- Only pollutants from MS4 discharged should be required to be addressed by Alternative Compliance

San Diego Regional Water Quality Control Board
Definition of Prior Lawful Approval for Priority Development Projects
Workshop Summary
April 28, 2015
9:30 a.m. to 12:00 p.m.

Participants:
David Barker, San Diego Water Board
Eric Becker, San Diego Water Board
Laurie Walsh, San Diego Water Board
Wayne Chiu, San Diego Water Board
Wayne Rosenbaum, BIA
Mike McSweeney, BIA
Guy Asaro, BIA
Brendan Hastie, Rick Engineering
Marco Gonzalez, Coastal Environmental Rights Foundation
Julia Chunn-Heer, Surfrider Foundation
Colin Kelley, Orange County Coastkeeper / Inland Empire Waterkeeper
Richard Boon, County of Orange
Ryan Baron, County of Orange
Tracy Ingebrigtsen, City of Laguna Beach
David Garcia, Riverside County Flood Control & Water Conservation District
Jarrod Gibbon, County of Riverside
Sumer Hasenin, City of San Diego
Jon Van Rhyn , County of San Diego
Helen Davies, City of Escondido
Boushra Salem, City of Chula Vista
Lewis Michaelson, Katz & Associates

Summary of Comments

San Diego Water Board

- We are interested in understanding everyone's perspective.
- We felt the language brought to the Board was sufficient.
- The outcome of these meetings will be to have crafted language for approval by the Board.
- We believed at the time that prior lawful approval was clear enough. We're trying to think longer term in this permit cycle, since this language should be satisfactory for multiple permit cycles.
- In looking at other regions, we see they have no real agreement on this issue either, so there are no precedents or model language to follow or adapt.
- Questions from the Board:
    - What would be acceptable from the environmental community's perspective?
    - What meets the needs of responsible development interests?

- What will be implementable for the Copermittees?
- Is it enough to have a vested tentative map? Is it enough to have a development agreement? Do you need something else?

Developers

- The development community expressed gratitude toward the Board that there was a public participation process in place.
- There seems to be two sets of language out there for defining prior lawful approval. We feel that the language the Board has presented goes too far. We would prefer to look to the language of the previous permit cycle.
- Many projects don't follow permit cycles. Once a project starts under one set of rules we want to be able to finish under the same set of rules.
- The real challenge of the last permit cycle was how each jurisdiction understood and applied certain parts of the permit.
- Most projects have been in progress for years. These projects have gone through plan checks, CEQA processes, planning board review etc. Without clarification in the language of what prior lawful approval is we're looking at affecting major change on projects in the final 10% of their full cycle. The building industry is asking for certainty.
- The footnote in the previous permit still does not provide enough guidance. We would like to see well defined prior lawful approval that incorporates all the language of the 2007 permit.
- Developers are looking for clarity.
  - Even within "grading permits," for example, there are a large variety of types, as well as jurisdictions that don't issue them.
- Currently there are three ways of being vested: statutory approval via *Avco*, a development agreement, or a vested tentative map
- Permits are revised every 5 years, project approvals can take 7 to 10 years

Environmental Community

- We need to govern for the typical not for the anomaly.
- The types of houses being built now are not the types of houses being built prior to the recession. The old regulations are not in tune with what is actually being built.
- The NPDES permit is a state document that is implemented at the municipal level.
- There are circumstances that will occur that will pull the rug out from under the developer. It's always a risk that you take as a developer, and it can come from any number of sources. Evolving regulations are just one example.
- Given technology today why don't we have a database of how many vested tentative maps we have? Part of the environmental community's discomfort with allowing these types of conditions to qualify as prior lawful approval is that we do not know what the universe of cases are, where they are located, which watersheds are impacted, or how large the projects are.

- The environmental community won't accept anything less than what the case law already provides for. For [the environmental community] that would have to be a grading permit and some hard costs expended on good faith reliance on a prior approval, but not just soft costs.
- We agree that ambiguity of the language should be eliminated.
- In general we agree that water quality has gotten better over the last couple of decades. However, this has not been from the benevolence of the development community. We need clarity in the language to compel action.

Copermittees

- The Copermittees see the language as presented by the Board as sufficient. Everything that needs to be in it is in it.
- The only thing we can tell developers right now is there will be changes. We need certainty and an ability to tell people coming to our planning counter exactly what is going to be expected of them.
- Our real world experience is that people are trying to work out what design standards they need to build to. Even if I tell them to look at a document from January, that could change. I don't want to tell the developers the wrong information. The window between now and adoption of the new language is problematic for developers who are on the cusp of receiving approval.
- The majority of the projects we're facing are small scale projects. These are the projects we also want to make sure have prior lawful approval. We need clear direction from here.
- Just having a footnote is not good enough from a practical perspective
- Clear definition of what constitute these approvals is needed now.

San Diego Regional Water Quality Control Board
Alternative Compliance for Receiving Water Limitations
Workshop Summary
April 28, 2015
1:00 p.m. to 3:30 p.m.

Participants:

David Barker, San Diego Water Board
Eric Becker, San Diego Water Board
Laurie Walsh, San Diego Water Board
Wayne Chiu, San Diego Water Board
Betty Olsen, San Diego Water Board
Marco Gonzalez, Coastal Environmental Rights Foundation
Julia Chunn-Heer, Surfrider Foundation
Colin Kelley, Orange County Coastkeeper / Inland Empire Waterkeeper
Mike McSweeney, BIA
David Garcia, Riverside County Flood Control & Water Conservation District
Jarrod Gibbon, County of Riverside
JoAnn Weber, County of San Diego
Clem Brown, City of San Diego
Helen Davies, City of Escondido
Boushra Salem, City of Chula Vista
Richard Boon, County of Orange
Ryan Baron, County of Orange
Tracy Ingebrigtsen, City of Laguna Beach
Lewis Michaelson, Katz & Associates
Bree Robertoy, Katz & Associates

Summary of Comments

Copermittees

- There is a compelling need for an alternative compliance pathway, and the proposed approach is consistent with the direction the State Board is taking. Fundamentally, the language is a good start. The County of Orange supports the B.3.c language with some modifications. Specifically, section ‘B’ should reference section ‘A’ and vice versa.
- The City of San Diego supports the language and the idea of an alternative compliance pathway. The Water Quality Improvement Plans are leaps and bounds ahead of the previous permit in terms of promoting innovation and pursuing priorities, so that Copermittees can “move the needle.”
- It is challenging to discuss funding needs with elected officials when no assurance can be given them that compliance will be achieved. Copermittees have a good idea of funding needs at this point, but it’s hard to convince people to provide funding if there is no guarantee that they will be protected from the threat of litigation when they fund new projects.

- The City of Escondido is happy that alternative compliance is being addressed and generally likes the language.
- Recommendations from the San Diego County Copermittees include:
    - Focusing energy on highest priority pollutants and having language that reflects that.
    - Limiting to TMDLs.
    - Addressing the time period before approval of reasonable assurance plans and allowing for compliance during that period.
        - Response: Obtaining approval for a WQIP is a long process, so language needs to provide for enforceability during that time period.
        - Response: The Board does not want to include a compliance pathway during this time because it would not have the support of USEPA..
    - Adding alternative compliance language regarding areas of special biological significance (ASBS).
        - Response: ASBS is cited in provision 'A' in the permit. A WQIP could act as a compliance document.
        - Response: ASBS is "hallowed ground" to the environmental community, so this would be tough to do.
- Question: Are ecological outcomes included in B.c.3.iii, as opposed to concentration or load-based?
    - Answer: Yes.
- Question: Is the Section 'A' linkage we discussed in 2013 going to be considered?
    - Answer: It will be considered, but the Board doesn't want to limit the ability of environmental groups to take action if needed.

Environmental Community

- These standards have been around for more than 20 years, and the Supreme Court has ruled that these permits are enforceable. However, alternative compliance is a "safe harbor" that offers reduced accountability for responsible parties. A positive aspect of alternative compliance is that it requires numeric goals. Regulations should be focused on concrete (numeric) goals and achieving benchmarks within specified time periods.
- The language seems to encourage agencies to put out documents quickly to achieve compliance, rather than spending the time to finish a well-thought out document. Documents should be submitted when they're ready to meet permit standards.
- There has not been a municipal lawsuit based on receiving water limits in 15+ years. Lawsuits are typically based on programmatic failures. There is no need for interim "safe harbors" because there is no realistic threat of litigation, unless enforcement is a problem. Environmental groups want fishable, swimmable waters. To accomplish that, regulations should require quantifiable, objective goals.
    - Response: The permit is allowing Copermittees to shift away from the standard towards using creative solutions, which is risky. The threat of

litigation can be a barrier to getting plans approved by management and elected officials.

- Environmental groups want to see agencies attempting to make progress. As long as sincere efforts are being made to improve water quality, that would be the primary consideration before turning to litigation.
- Coastkeeper is frustrated with how slow progress has been. It's hard to square the idea that "removing liability" will speed up progress. The organization hasn't had adequate time to review the new language, but it prefers the language of the original permit.
- The Clean Water Act relies on NGOs being able to sue. Environmental groups need to have "teeth" to hold Copermittees accountable; otherwise there will be no progress.
- Submitting documents is not enough "liability;" Copermittees should be meeting requirements.
    - Response: The proposed language will provide for plans that must include schedules, numeric goals, etc., which will also help enable agencies to get funding for projects.
- A good plan is not enough. CEQA is a long process and funding will be an issue. There won't be enough incentive for plans to be executed. A dichotomy exists of wanting flexibility for municipalities, while also maintaining accountability. The focus should be on numbers, starting with outfalls and moving up the watershed looking for sources of pollution.
- What about instituting a time-limited alternative compliance?
- A precedent should be set for future agencies to follow. There should be enforceable, numeric goals that are date-certain and include specific projects.
    - Response: WQIPs address TMDLs, numeric goals, dates and projects. The enforceability is that if Copermittees don't implement WQIPs, they are not in compliance.
    - Response: When the Board finds a deficient program through auditing, we'll issue a notice and ask for agencies to make adjustments and show how they will fix it.
- Question: What are these documents going to look like?
    - Answer: They use water quality models based on real-world data and will include:
        - Numeric goals (not exceeding maximum outputs) and highest priorities.
        - Strategies to achieve goals and how to fund these.
        - Monitoring and assessment.
- Question: B.c.3.iii can also include things not under the control of MS4s. Where does prioritization fit into this in terms of compliance?
    - Answer: Strategies will be based on what is most important as well as what can achieve multiple benefits. Achievement of goals might be staggered. The plan should be laid out in advance and transparent. It's not intended to address everything in the watershed at once, but to lay out what you can and will control. The Board is looking for whether the receiving water is supporting its beneficial uses.

- The language should address when and where it is appropriate to use alternative compliance (i.e., toxicity, metal and mass loading issues probably won't work for alternative compliance since their accumulation only causes a bigger problem down the road if not initially addressed).

Development/Business Community

- Only the newer homes in San Diego have BMPs. While the development industry hasn't done any additional harm in the last several years, no one has really figured out how to fix the problems of prior development. We need to set up a program that focuses on capturing and treating pollutants, but in order to do that, municipalities need to involve developers.

Comments from the Audience

- San Diego County Water Authority - We need to work on this holistically, looking at the watershed in its entirety. We like the alternative compliance approach and want to encourage watershed-based planning and modeling.
- City of Encinitas (speaking as an engineer) - Everyone has been drinking potable water for many years. I think alternative compliance will work, but it takes lots of trust. When the population increases, it takes our intervention to improve water quality.

Chiu, Wayne@Waterboards

From: lyris@swrcb18.waterboards.ca.gov
Sent: Thursday, May 14, 2015 1:44 PM
To: Chiu, Wayne@Waterboards
Subject: San Diego Water Board May 21, 2015 Public Workshop on Prior Lawful Approval and Alternative Compliance Option for Receiving Water Limitations
Attachments: 2015-0514_Revised_Draft_PLA.pdf; 2015-0514_Revised_Draft_RWL.pdf; 2015-0521 _PLA_RWL_Workshop_Agenda.pdf; 2015-0428_PLA_Workshop_Summary.pdf; 2015-0428_RWL_Workshop_Summary.pdf

Water Boards This is a message from the California Regional Water Quality Control Board, San Diego Region (9).

Copermittees and Stakeholders,

Our **next workshop** to discuss draft permit language pertaining to Prior Lawful Approval and an Alternative Compliance Pathway for Receiving Water Limitations is next week **Thursday, May 21, 2015 at the San Diego Water Board office in our Regional Board Room**. The meeting begins at 9:30 a.m.

San Diego Water Board staff listened to all of the feedback during the April workshop and met again with several stakeholders and Copermittees individually to hear more specific issues on each topic before crafting revised draft language. Attached is a copy of the revised draft permit language for both Prior Lawful Approval and the Alternative Compliance Pathway for Receiving Water Limitations. Please come prepared to give us feedback on the revised draft language.

Also, attached to this email is the May 21, 2015 Workshop Agenda, and notes summarizing the discussions on Prior Lawful Approval and Alternative Compliance Pathway for Receiving Water Limitations that occurred during the April 28, 2015 workshop.

All of these documents are also on the San Diego Water Board's website at
http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

See you next week.

Laurie Walsh, PE
San Diego Water Board

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Draft Definition of Prior Lawful Approval for Priority Development Projects
Revised May 14, 2015

~~Insert the following as Provision E.3.e.(1)(b) and renumber the following provisions appropriately:~~

~~(b) For private development projects, prior lawful approval under this Order is a development approval or construction permit that either: 1) complies with the Priority Development Project requirements of the Fourth Term MS4 permits[1] and includes the design of the storm water drainage system for the project in its entirety as accepted by the Copermittee, or 2) confers a vested right to proceed under prior storm water requirements. For public projects, approval means that the design of the storm water drainage system for the project in its entirety has been stamped by the City or County Engineer. For any applicable portion(s) of the project, approvals may be extended to any subsequent discretionary or ministerial approvals necessary to implement the initial project approval with the following conditions:~~

~~(i) All subsequent permits must be issued within 5 years of the effective date of the BMP Design Manual pursuant to Provision E.3.d; and~~

~~(ii) BMP installation under subsequent approvals must remain in substantial conformity with the design of the storm water drainage system included in the initial approval.~~

Revise Provision E.3.e.(1)(a) as follows:

e. **PRIORITY DEVELOPMENT PROJECT BMP IMPLEMENTATION AND OVERSIGHT**

Each Copermittee must implement a program that requires and confirms structural BMPs on all Priority Development Projects are designed, constructed, and maintained to remove pollutants in storm water to the MEP.

(1) Structural BMP Approval and Verification Process

(a) Each Copermittee must require and confirm that ~~for~~ all Priority Development Projects ~~applications that have not received prior lawful approval by the Copermittee by the effective date of the BMP Design Manual pursuant to Provision E.3.d,~~ implement the requirements of Provision E.3 ~~must be implemented. For project applications that have received prior lawful approval before the effective date of the BMP Design Manual pursuant to Provision E.3.d~~, except that the Copermittee may allow previous land development requirements to apply to a Priority Development Project if all of the following conditions are met:~~.~~

[1] ~~Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016 for San Diego, Orange, and Riverside Counties, respectively.~~

(i) The Copermittee has, prior to the effective date of the BMP Design Manual required to be developed pursuant to Provision E.3.d, approved a design that incorporates the storm water drainage system for the Priority Development Project in its entirety, including all applicable structural pollutant treatment control and hydromodification management BMPs; AND

(ii) The Copermittee has, prior to the effective date of the BMP Design Manual required to be developed pursuant to Provision E.3.d, issued a building permit, or functional equivalent that authorizes the Priority Development Project applicant to commence construction activities, based on a design that incorporates the approved storm water drainage system for the Priority Development Project in its entirety; AND

(iii) The Copermittee confirms that there have been construction activities on the Priority Development Project site within the 365 days prior to the effective date of the BMP Design Manual required to be developed pursuant to Provision E.3.d, *OR* the Copermittee confirms that construction activities will commence on the Priority Development Project site within the 180 days after the effective date of the BMP Design Manual required to be developed pursuant to Provision E.3.d, where construction activities are undertaken in reliance on the building permit, or functional equivalent, issued by the Copermittee in conformance with Provision E.3.e.(1)(a)(ii).

Draft Alternative Compliance Pathway for Receiving Water Limitations
Revised May 14, 2015

Insert the following as Provision B.3.c:

c. DISCHARGE PROHIBITIONS AND RECEIVING WATER LIMITATIONS COMPLIANCE OPTION

Each Copermittee has the option to utilize the implementation of the Water Quality Improvement Plan to demonstrate compliance with the requirements of Provisions A.1.a, A.1.c and A.2.a within a Watershed Management Area. A Copermittee will be deemed to be in compliance with Provisions A.1.a, A.1.c and A.2.a within a Watershed Management Area when the following conditions are met:

(1) ~~The Copermittees may utilize implementation of the water quality improvement strategies in the Water Quality Improvement Plan to demonstrate compliance with the requirements of Provisions A.1.a, A.1.c and A.2.a. For each Copermittee in t~~The Water Quality Improvement Plan for a Watershed Management Area ~~that chooses to utilize this option, the Copermittee will be in compliance with Provisions A.1.a, A.1.c and A.2.a if~~ must incorporate the following:

(a) Numeric goals and schedules developed pursuant to Provision B.3.a that include the following ~~numeric goals~~:

(i) ~~Water quality based effluent limitations (~~WQBELs~~) expressed as concentration-based or load-based effluent limitations applicable to the Watershed Management Area~~ established by the TMDLs in Attachment E to this Order applicable to the Copermittee's jurisdiction within the Watershed Management Area; and

(ii) Numeric goals applicable to the Copermittee's MS4 discharges within the Watershed Management Area expressed as numeric concentration-based or load-based goals ~~effluent limitations~~ for all other pollutants listed on the Clean Water Act Section 303(d) List of Water Quality Impaired Segments[1] for the receiving waters in the Watershed Management Area that do not have a TMDL developed and incorporated into Attachment E to this Order; and

(iii) Numeric goals for receiving waters that will ~~protect~~ result in chemical, physical, and/or biological conditions of the receiving waters that will be protective of the beneficial uses within the Watershed Management Area under the Copermittee's jurisdiction. ~~and attain water quality standards~~.

(b) An analysis utilizing a watershed model or other watershed analytical tools ~~is performed. The results must be included in the Water Quality Improvement Plan~~ that meets the following conditions:

[1] ~~2002~~ 2010 and subsequent 303(d) Lists

(i) The analysis must ~~to~~ quantitatively demonstrate that the implementation of the water quality improvement strategies required under Provision B.3.b will achieve the numeric goals within the established schedules required ~~under~~ to be developed pursuant to Provisions B.3.a and B.3.c.(1)(a).

(ii) The development of the analysis must include a public participation process which allows the public to review and provide comments on the analysis methodology utilized and the assumptions included in the analysis. Public comments and responses must be included as part of the analysis documentation included in the Water Quality Improvement Plan.

(iii) The analysis may be performed by an individual~~ly~~ Copermittee only for its jurisdiction within the Watershed Management Area, or jointly by two or more of any of the Copermittees choosing to utilize this option for their jurisdictions within the same Watershed Management Area.~~,~~

(iv) ~~, and~~ The analysis must be updated as part of the iterative approach and adaptive management process required under Provisions B.5.a-b.

(c) ~~The Water Quality Improvement Plan s~~Specific~~es the~~ monitoring and assessments included in the monitoring and assessment program required pursuant to Provision B.4 ~~(i.e. MS4 outfall discharge, receiving water, and/or special studies)~~ that will be performed by the Copermittee to ~~confirm the~~ 1) demonstrate that the implementation of the water quality improvement strategies within its jurisdiction is making progress toward achieving the numeric goals in accordance with the established schedules developed pursuant to Provisions B.3.a and B.3.c.(1)(a), and 2) determine whether interim and final numeric goals have been achieved. ~~The monitoring and assessments must be incorporated into the monitoring and assessment program required pursuant to Provision B.4.~~ The specific monitoring and assessments must be updated as part of the iterative approach and adaptive management process required under Provision B.5.c.

(d) Documentation that ~~T~~the numeric goals proposed pursuant to Provision B.3.c.(1)(a), the analysis performed pursuant to Provision B.3.c.(1)(b), and the specific monitoring and assessments proposed pursuant to Provision B.3.c.(1)(c) have been reviewed by the Water Quality Improvement Consultation Panel (see Provision F.1.a.(1)(b)) for any recommendations. Updates must be reviewed by the Water Quality Improvement Consultation Panel for any recommendations.

(2) Each Copermittee that chooses to utilize this option will, for the pollutant/water body combinations ~~covered by~~ included in the analysis performed pursuant to Provision B.3.c.(1)(b), be deemed in compliance with Provisions A.1.a, A.1.c and A.2.a when the Water Quality Improvement Plan, incorporating the requirements of Provision B.3.c.(1), is accepted by the San Diego Water Board.

(3) The Copermittee will, for the pollutant/water body combinations ~~covered by~~ included in the analysis performed pursuant to Provision B.3.c.(1)(b), remain in compliance with Provisions A.1.a, A.1.c and A.2.a during the term of this Order as long as:

(a) The results of the analysis performed pursuant to Provision B.3.c.(1)(b~~d~~) is accepted by the San Diego Water Board Executive Officer as part of the Water Quality Improvement Plan and as part of subsequent updates to the Water Quality Improvement Plan; AND

(b) The Copermittee continues to implement the water quality improvement strategies within its jurisdiction developed pursuant to Provision B.3.b.(1) in accordance with the schedules for implementing the strategies established pursuant to Provision B.3.b.(3)(a); AND

(c) The Copermittee continues to perform the monitoring and assessments specified in the Water Quality Improvement Plan, developed and implemented pursuant to Provision B.3.c.(1)(c), to demonstrate its progress toward achieving the numeric goals applicable to its MS4 discharges in accordance with the interim and final dates for achieving the numeric goals established pursuant to Provision B.3.a.(2); AND

(d) The Copermittee continues to implement the requirements of Provision A.4.a.

San Diego Regional Water Quality Control Board
Definition of Prior Lawful Approval for Priority Development Projects
Workshop Summary
April 28, 2015
9:30 a.m. to 12:00 p.m.

Participants:
David Barker, San Diego Water Board
Eric Becker, San Diego Water Board
Laurie Walsh, San Diego Water Board
Wayne Chiu, San Diego Water Board
Wayne Rosenbaum, BIA
Mike McSweeney, BIA
Guy Asaro, BIA
Brendan Hastie, Rick Engineering
Marco Gonzalez, Coastal Environmental Rights Foundation
Julia Chunn-Heer, Surfrider Foundation
Colin Kelley, Orange County Coastkeeper / Inland Empire Waterkeeper
Richard Boon, County of Orange
Ryan Baron, County of Orange
Tracy Ingebrigtsen, City of Laguna Beach
David Garcia, Riverside County Flood Control & Water Conservation District
Jarrod Gibbon, County of Riverside
Sumer Hasenin, City of San Diego
Jon Van Rhyn , County of San Diego
Helen Davies, City of Escondido
Boushra Salem, City of Chula Vista
Lewis Michaelson, Katz & Associates

Summary of Comments

San Diego Water Board

- We are interested in understanding everyone's perspective.
- We felt the language brought to the Board was sufficient.
- The outcome of these meetings will be to have crafted language for approval by the Board.
- We believed at the time that prior lawful approval was clear enough. We're trying to think longer term in this permit cycle, since this language should be satisfactory for multiple permit cycles.
- In looking at other regions, we see they have no real agreement on this issue either, so there are no precedents or model language to follow or adapt.
- Questions from the Board:
    - What would be acceptable from the environmental community's perspective?
    - What meets the needs of responsible development interests?

- What will be implementable for the Copermittees?
- Is it enough to have a vested tentative map? Is it enough to have a development agreement? Do you need something else?

Developers

- The development community expressed gratitude toward the Board that there was a public participation process in place.
- There seems to be two sets of language out there for defining prior lawful approval. We feel that the language the Board has presented goes too far. We would prefer to look to the language of the previous permit cycle.
- Many projects don't follow permit cycles. Once a project starts under one set of rules we want to be able to finish under the same set of rules.
- The real challenge of the last permit cycle was how each jurisdiction understood and applied certain parts of the permit.
- Most projects have been in progress for years. These projects have gone through plan checks, CEQA processes, planning board review etc. Without clarification in the language of what prior lawful approval is we're looking at affecting major change on projects in the final 10% of their full cycle. The building industry is asking for certainty.
- The footnote in the previous permit still does not provide enough guidance. We would like to see well defined prior lawful approval that incorporates all the language of the 2007 permit.
- Developers are looking for clarity.
  - Even within "grading permits," for example, there are a large variety of types, as well as jurisdictions that don't issue them.
- Currently there are three ways of being vested: statutory approval via *Avco*, a development agreement, or a vested tentative map
- Permits are revised every 5 years, project approvals can take 7 to 10 years

Environmental Community

- We need to govern for the typical not for the anomaly.
- The types of houses being built now are not the types of houses being built prior to the recession. The old regulations are not in tune with what is actually being built.
- The NPDES permit is a state document that is implemented at the municipal level.
- There are circumstances that will occur that will pull the rug out from under the developer. It's always a risk that you take as a developer, and it can come from any number of sources. Evolving regulations are just one example.
- Given technology today why don't we have a database of how many vested tentative maps we have? Part of the environmental community's discomfort with allowing these types of conditions to qualify as prior lawful approval is that we do not know what the universe of cases are, where they are located, which watersheds are impacted, or how large the projects are.

- The environmental community won't accept anything less than what the case law already provides for. For [the environmental community] that would have to be a grading permit and some hard costs expended on good faith reliance on a prior approval, but not just soft costs.
- We agree that ambiguity of the language should be eliminated.
- In general we agree that water quality has gotten better over the last couple of decades. However, this has not been from the benevolence of the development community. We need clarity in the language to compel action.

Copermittees

- The Copermittees see the language as presented by the Board as sufficient. Everything that needs to be in it is in it.
- The only thing we can tell developers right now is there will be changes. We need certainty and an ability to tell people coming to our planning counter exactly what is going to be expected of them.
- Our real world experience is that people are trying to work out what design standards they need to build to. Even if I tell them to look at a document from January, that could change. I don't want to tell the developers the wrong information. The window between now and adoption of the new language is problematic for developers who are on the cusp of receiving approval.
- The majority of the projects we're facing are small scale projects. These are the projects we also want to make sure have prior lawful approval. We need clear direction from here.
- Just having a footnote is not good enough from a practical perspective
- Clear definition of what constitute these approvals is needed now.

San Diego Regional Water Quality Control Board
Alternative Compliance for Receiving Water Limitations
Workshop Summary
April 28, 2015
1:00 p.m. to 3:30 p.m.

Participants:

David Barker, San Diego Water Board
Eric Becker, San Diego Water Board
Laurie Walsh, San Diego Water Board
Wayne Chiu, San Diego Water Board
Betty Olsen, San Diego Water Board
Marco Gonzalez, Coastal Environmental Rights Foundation
Julia Chunn-Heer, Surfrider Foundation
Colin Kelley, Orange County Coastkeeper / Inland Empire Waterkeeper
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Richard Boon, County of Orange
Ryan Baron, County of Orange
Tracy Ingebrigtsen, City of Laguna Beach
Lewis Michaelson, Katz & Associates
Bree Robertoy, Katz & Associates

Summary of Comments

Copermittees

- There is a compelling need for an alternative compliance pathway, and the proposed approach is consistent with the direction the State Board is taking. Fundamentally, the language is a good start. The County of Orange supports the B.3.c language with some modifications. Specifically, section ‘B’ should reference section ‘A’ and vice versa.
- The City of San Diego supports the language and the idea of an alternative compliance pathway. The Water Quality Improvement Plans are leaps and bounds ahead of the previous permit in terms of promoting innovation and pursuing priorities, so that Copermittees can “move the needle.”
- It is challenging to discuss funding needs with elected officials when no assurance can be given them that compliance will be achieved. Copermittees have a good idea of funding needs at this point, but it’s hard to convince people to provide funding if there is no guarantee that they will be protected from the threat of litigation when they fund new projects.

- The City of Escondido is happy that alternative compliance is being addressed and generally likes the language.
- Recommendations from the San Diego County Copermittees include:
    - Focusing energy on highest priority pollutants and having language that reflects that.
    - Limiting to TMDLs.
    - Addressing the time period before approval of reasonable assurance plans and allowing for compliance during that period.
        - Response: Obtaining approval for a WQIP is a long process, so language needs to provide for enforceability during that time period.
        - Response: The Board does not want to include a compliance pathway during this time because it would not have the support of USEPA..
    - Adding alternative compliance language regarding areas of special biological significance (ASBS).
        - Response: ASBS is cited in provision 'A' in the permit. A WQIP could act as a compliance document.
        - Response: ASBS is "hallowed ground" to the environmental community, so this would be tough to do.
- Question: Are ecological outcomes included in B.c.3.iii, as opposed to concentration or load-based?
    - Answer: Yes.
- Question: Is the Section 'A' linkage we discussed in 2013 going to be considered?
    - Answer: It will be considered, but the Board doesn't want to limit the ability of environmental groups to take action if needed.

Environmental Community

- These standards have been around for more than 20 years, and the Supreme Court has ruled that these permits are enforceable. However, alternative compliance is a "safe harbor" that offers reduced accountability for responsible parties. A positive aspect of alternative compliance is that it requires numeric goals. Regulations should be focused on concrete (numeric) goals and achieving benchmarks within specified time periods.
- The language seems to encourage agencies to put out documents quickly to achieve compliance, rather than spending the time to finish a well-thought out document. Documents should be submitted when they're ready to meet permit standards.
- There has not been a municipal lawsuit based on receiving water limits in 15+ years. Lawsuits are typically based on programmatic failures. There is no need for interim "safe harbors" because there is no realistic threat of litigation, unless enforcement is a problem. Environmental groups want fishable, swimmable waters. To accomplish that, regulations should require quantifiable, objective goals.
    - Response: The permit is allowing Copermittees to shift away from the standard towards using creative solutions, which is risky. The threat of

litigation can be a barrier to getting plans approved by management and elected officials.

- Environmental groups want to see agencies attempting to make progress. As long as sincere efforts are being made to improve water quality, that would be the primary consideration before turning to litigation.
- Coastkeeper is frustrated with how slow progress has been. It's hard to square the idea that "removing liability" will speed up progress. The organization hasn't had adequate time to review the new language, but it prefers the language of the original permit.
- The Clean Water Act relies on NGOs being able to sue. Environmental groups need to have "teeth" to hold Copermittees accountable; otherwise there will be no progress.
- Submitting documents is not enough "liability;" Copermittees should be meeting requirements.
    - Response: The proposed language will provide for plans that must include schedules, numeric goals, etc., which will also help enable agencies to get funding for projects.
- A good plan is not enough. CEQA is a long process and funding will be an issue. There won't be enough incentive for plans to be executed. A dichotomy exists of wanting flexibility for municipalities, while also maintaining accountability. The focus should be on numbers, starting with outfalls and moving up the watershed looking for sources of pollution.
- What about instituting a time-limited alternative compliance?
- A precedent should be set for future agencies to follow. There should be enforceable, numeric goals that are date-certain and include specific projects.
    - Response: WQIPs address TMDLs, numeric goals, dates and projects. The enforceability is that if Copermittees don't implement WQIPs, they are not in compliance.
    - Response: When the Board finds a deficient program through auditing, we'll issue a notice and ask for agencies to make adjustments and show how they will fix it.
- Question: What are these documents going to look like?
    - Answer: They use water quality models based on real-world data and will include:
        - Numeric goals (not exceeding maximum outputs) and highest priorities.
        - Strategies to achieve goals and how to fund these.
        - Monitoring and assessment.
- Question: B.c.3.iii can also include things not under the control of MS4s. Where does prioritization fit into this in terms of compliance?
    - Answer: Strategies will be based on what is most important as well as what can achieve multiple benefits. Achievement of goals might be staggered. The plan should be laid out in advance and transparent. It's not intended to address everything in the watershed at once, but to lay out what you can and will control. The Board is looking for whether the receiving water is supporting its beneficial uses.

- The language should address when and where it is appropriate to use alternative compliance (i.e., toxicity, metal and mass loading issues probably won't work for alternative compliance since their accumulation only causes a bigger problem down the road if not initially addressed).

Development/Business Community

- Only the newer homes in San Diego have BMPs. While the development industry hasn't done any additional harm in the last several years, no one has really figured out how to fix the problems of prior development. We need to set up a program that focuses on capturing and treating pollutants, but in order to do that, municipalities need to involve developers.

Comments from the Audience

- San Diego County Water Authority - We need to work on this holistically, looking at the watershed in its entirety. We like the alternative compliance approach and want to encourage watershed-based planning and modeling.
- City of Encinitas (speaking as an engineer) - Everyone has been drinking potable water for many years. I think alternative compliance will work, but it takes lots of trust. When the population increases, it takes our intervention to improve water quality.

PUBLIC WORKSHOP AGENDA

Proposed Amendments to Order No. R9-2013-0001, as amended by Order No. R9-2015-0001, to Incorporate a Definition of Prior Lawful Approval for Priority Development Projects and an Alternative Compliance Pathway for Receiving Water Limitations

Thursday, May 21, 2015

Location: San Diego Water Board, Board Meeting Room, 2375 Northside Dr., Suite 100, San Diego, CA 92108

SESSION 1
9:30 a.m. to 12:00 p.m.
Prior Lawful Approval for Priority Development Projects

QUESTION: Is there a definition of prior lawful approval that will allow developers, the environmental community, and the Copermittees to clearly understand when a development project should be subject to the Priority Development Project requirements of the Regional MS4 Permit?

9:30 a.m. - 9:35 a.m.	Introductions [Table Participants]
9:35 a.m. - 9:45 a.m.	Workshop Procedures and Objectives [Lewis Michaelson, Katz & Associates]
9:45 a.m. - 10:00 a.m.	Revised Draft Permit Language [Laurie Walsh, San Diego Water Board]
10:00 a.m. - 11:30 a.m.	Discussion [Table Participants]
11:30 a.m. - 12:00 p.m.	Comments & Questions [All]

LUNCH
12:00 p.m. to 1:00 p.m.

SESSION 2
1:00 p.m. to 3:30 p.m.
Alternative Compliance Pathway for Receiving Water Limitations

QUESTION: What ambitious, rigorous and transparent alternative compliance path should be required that allows a Copermittee an appropriate period of time to come into compliance with receiving water limitations, as a precondition of a Copermittee being considered in compliance with the receiving water limitations while fully implementing the compliance alternative?

1:00 p.m. - 1:05 p.m.	Introductions [Table Participants]
1:05 p.m. - 1:15 p.m.	Workshop Procedures and Objectives [Lewis Michaelson, Katz & Associates]
1:15 p.m. - 1:30 p.m.	Revised Draft Permit Language [Wayne Chiu, San Diego Water Board]
1:30 p.m. - 3:00 p.m.	Discussion [Table Participants]
3:00 p.m. - 3:30 p.m.	Comments & Questions [All]

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PUBLIC WORKSHOP
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May 21, 2015

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PUBLIC WORKSHOP
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May 21, 2015

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April 28, 2015

Name	Agency/ Affiliation	Telephone	E-mail Address
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PUBLIC WORKSHOP
Proposed Amendments to Order No. R9-2013-0001, as amended by Order No. R9-2015-0001, to Incorporate a Definition of Prior Lawful Approval for Priority Development Projects and an Alternative Compliance Pathway for Receiving Water Limitations
May 21, 2015

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Alternative Compliance Pathway Workshop

Thursday, May 21st.

Topics

In-depth discussion of how Provision B.3.c(1)(a)(i)-(iii) will work:

- Seeking clarification that a Copermittee can comply with its numeric goals either at the outfall or in the receiving water.
- Seeking clarification that the *Alternative Compliance Option* should be utilized for Provision B.3.c(1)(a)(iii) persistent exceedances and that non-persistent exceedances can be addressed in existing watershed or jurisdictional programs.
- Seeking clarification that the *Alternative Compliance Option* will apply to TMDLs and water quality based effluent limitations.

Topics

- Seeking clarification the *Alternative Compliance Option* will apply to dry weather flows.
- Applying the *Alternative Compliance Option* to the planning phase of WQIPs.
- Seeking clarification that compliance with Provision E.2 means compliance with non-stormwater discharges.
- Linking Provision A to the *Alternative Compliance Option*.

Numeric Goals

Issue: Need for Outfall <u>or</u> Receiving Water "Goals."

Resolution: Include "Outfalls or Receiving Waters" in B.3.c.(1)(ii).

Non-Persistent Exceedances

Issue: Need for compliance pathway for single or intermittent exceedances of water quality objectives?

Resolution: Single or intermittent exceedances addressed through watershed or jurisdictional programs

TMDLs & WQBELs

Issue: Significance of A.3

Resolution: Compliance option needs to cover TMDLs and WQBELs

Interim WQIP Compliance

Issue: Need to have a compliance pathway during WQIP development.

Resolution: Specifically describe pathway in B.3.c.

Non-Stormwater Discharges

Issue: Non-stormwater discharges

Resolution: Compliance with Provision E.2 means compliance with the requirement to effectively prohibit non-stormwater discharges.

Provision A

Issue: Compliance needs to be clear.

Resolution: Need to link Provision A to Provision B.3.c.

Alternative Compliance Pathway for Receiving Water Limitations
May 21, 2015

MS4 Topics for Discussion (Not Prioritized)

- Seeking clarification that a Copermittee can comply with its numeric goals either at the outfall or in the receiving water.

- Seeking clarification that the *Alternative Compliance Option* should be utilized for Provision B.3.c(1)(a)(iii) persistent exceedances and that non-persistent exceedances can be addressed in existing watershed or jurisdictional programs.

- Seeking clarification that the *Alternative Compliance Option* will apply to TMDLs and water quality based effluent limitations.

- Applying the *Alternative Compliance Option* to the planning phase of WQIPs.

- Including dry weather flows in the *Alternative Compliance Option* or clarifying that a Copermittee is in compliance with non-stormwater discharges prohibition by implementing Provision E.2.

- Linking Provision A to the *Alternative Compliance Option*.

San Diego Regional Water Quality Control Board
Definition of Prior Lawful Approval for Priority Development Projects
Workshop Summary
May 21, 2015
9:30 a.m. to 12:00 p.m.

Participants

David Barker, San Diego Water Board
Eric Becker, San Diego Water Board
Laurie Walsh, San Diego Water Board
Wayne Chiu, San Diego Water Board
Tomas Morales, San Diego Water Board
Wayne Rosenbaum, Building Industry Association
Guy Asaro, Building Industry Association/McMillan Homes
Michael McSweeney, Building Industry Association
Brendan Hastie, Rick Engineering
David Garcia, Riverside County Flood Control & Water Conservation District
Jon Van Rhyn, County of San Diego
Sumer Hasenin, City of San Diego
Helen Davies, City of Escondido
Boushra Salem, City of Chula Vista
Matt O'Malley, San Diego Coastkeeper
Marco Gonzalez, Coastal Environmental Rights Foundation
Lewis Michaelson, Katz & Associates
Courtney Holowach, Katz & Associates

Summary of Revised Draft Permit Language

- Based on previous workshop discussions, some changes were made to define prior lawful approval, including:
  - Added clear language.
  - Requirements added for prior lawful approval:
    - A fully designed storm water drainage system, including applicable structural pollutant treatment control and hydromodification management BMPs approved by the Copermittee; and
    - A building permit prior to the BMP design manual effective date; and
    - Start construction activities within 180 days after the BMP effective date.

Summary of Comments

Copermittees

- County of San Diego: County of San Diego is not necessarily in agreement with the revised prior lawful approval language. There was other language that was

proposed during the last workshop and the County's position is that they still want to entertain that version of the language or parts of that language. Subparagraph 3 is problematic in that if it refers to the turning of dirt that does not line up with our permit cycle which makes it unenforceable. Clarification requested on sunset provision. The language as written now appears to grandfather in almost any project.

- City of San Diego: Language should refer to grading permit that allows construction or process equivalent rather than building permit. The City does not want to be in a position of having to make findings of infeasibility. It opens City up to litigation. Desire language that is enforceable and clear. Prolonged uncertainty regarding prior lawful approval determination and deciding on final language is unfair to permit applicants.
- City of Escondido: Permit cycle does not line up with the current language presented. Need to be able to give applicants clear direction.

Environmental Community

- Overall, we're pleased that the current language is consistent with *Avco*, which is what we were seeking. The words "functional equivalent" are ripe for litigation though. *Avco* is our standard. We want clarity, not to give discretion. Discretion is not clarity.
- The language can't address every statutory right, but it does a good job of being clear.

Development/Business Community

- As it pertains to the *Avco* standard, this language appears to be pretty good. Or it is pretty clear at least. There is a duty to review the projects with vesting rights. The problem is the proposed language may ignore certain rights. The language appears to place the responsibility and the authority with the agencies to not recognize a statutory right --- basically requiring a Copermittee not to recognize the statutory right.
- The language should recognize vested rights where they exist (e.g. vested tentative map). Language is trying to get as many folks into this process as possible. The building industry is not trying to get away with anything, just trying to assert a legal position. Regardless of the permit language, there are going to be people who are going to argue. The attempt was made to make this process simpler for the jurisdictions and our [the building] community.
    - San Diego Water Board Response: Our mission is to make sure that water quality is protected as soon as possible and that water quality is restored as quickly as possible. Other statutory vested rights are not as much of a concern. What is included in the revised draft language is based on *Avco*.
- The permit is to protect water, and that's what we should be doing. It is unclear whether the Copermittees have authority to make findings and allow exceptions (for building to the 2007 standards). It's not the permits going forward; it's the permits that have already been issued. Permits typically last 1 to 2 years with a possible 1 year extension. Can vary by jurisdiction.

  - San Diego Water Board Response: The way the permit is currently written, it does not provide discretion. We are open to giving more discretion as long as there are clear limitations.
- Understand trying to give flexibility with the phrase "functional equivalent" but perhaps use "permit that allows construction" instead. Building permit is the *Avco* language.
- BIA responded to a request for clarification on how many projects could potentially be grandfathered in when it comes to other statutory rights. Although it is hard to quantify, an estimate is between 200 to 500 projects. BIA is not trying to get away with something or do an end run. The intent is *not* to get as many projects as possible grandfathered.

Final Comments

- Copermitees should submit proposed language for the clarifications with regards to the *Avco* standard and the duration for starting construction activities to try and address existing development permit durations.
- Board staff will review suggested language changes and post revised language out before the next meeting on June 30, 2015.

San Diego Regional Water Quality Control Board
Alternative Compliance for Receiving Water Limitations
Workshop Summary
May 21, 2015
1:00 p.m. to 3:30 p.m.

Participants

David Barker, San Diego Water Board
Eric Becker, San Diego Water Board
Wayne Chiu, San Diego Water Board
Laurie Walsh, San Diego Water Board
Tomas Morales, San Diego Water Board
Jo Ann Weber, County of San Diego
Clem Brown, City of San Diego
Heather Stroud, City of San Diego
Helen Davies, City of Escondido
Richard Boon, County of Orange
Ryan Baron, County of Orange
Lisa Zawaski, City of Dana Point
Tracy Ingebrigtsen, City of Laguna Beach
David Garcia, Riverside County Flood Control & Water Conservation District
Stuart McKibbin, Riverside County Flood Control & Water Conservation District
Marco Gonzalez, Coastal Environmental Rights Foundation
Matt O'Malley, San Diego Coastkeeper
Michael McSweeney, Building Industry Association
Facilitator - Lewis Michaelson, Katz & Associates
Bree Robertoy, Katz & Associates

Summary of Revised Draft Permit Language

- Based on previous workshop discussions, some changes were made to the alternative compliance option, including:
  - Strengthened connection to Provision A
  - Replaced term "effluent limitations" with "numeric goals"
  - Restructured analysis component
  - Added public participation to analysis component

Summary of Comments

Copermittees

- Changing the language from effluent limitations to numeric goals makes the permit more workable.

- The revised language gives more comfort from a legal perspective and takes the uncertainty out of the process.
- MS4 topics for discussion identified by Copermittees:
  1. Seeking clarification that a Copermittee can comply with its numeric goals either at the MS4 outfall or in the receiving water.
     - Are the outfall numeric goals required to be load-based or concentration-based?
       - San Diego Water Board Response: Yes, the numeric goals for MS4 outfalls are required to be load-based or concentration-based.
     - Copermittees would like the numeric goals to be broader (e.g. restoring two miles of a stream, reduction in flow during dry weather, improving integrity index).
       - San Diego Water Board Response: The examples given sound like receiving water goals. Reduction in flow sounds like a reduction in load.
     - What about having MS4 outfall goals, but not goals for receiving waters?
       - San Diego Water Board Response: That's an option we can consider. Provision B.3.c.(1)(a)(ii) allows a Copermittee to show exceedances are from other sources. Provision B.3.c.(1)(a)(iii) allows a Copermittee to address beneficial uses in receiving waters. The San Diego Water Board would consider making revisions if they make sense. For instance, having numeric goals in the receiving water, instead of or in addition to having them for the MS4 outfalls. The vision has been to restore beneficial uses and show they're being supported. If that happens, arbitrary numbers for MS4 outfalls shouldn't matter as much.
  2. Seeking clarification that the *Alternative Compliance Option* should be utilized for persistent exceedances and that non-persistent exceedances can be addressed in existing watershed or jurisdictional programs.
     - Provision A.4.a already has policy for dealing with persistent exceedances.
     - Copermittees recommend there should only be numeric goals for Total Maximum Daily Loads (TMDLs) and 303 d-listed pollutants, allowing Copermittees to put resources into highest priorities. For intermittent exceedances, Copermittees should only be required to have strategies.
       - San Diego Water Board Response: Copermittees would not be required to have numeric goals for non-TMDLs or pollutants not on the 303 d list; those would be handled within a Copermittees regular program.
     - Copermittees recommend simplifying the process and give coverage from litigation by putting focus on implementation instead of modeling for pollutants that are not typically in exceedances (e.g. metals).
       - Environmental Community Response: Copermittees need to consider intermittent exceedances in the watershed model in order to have safe harbor, not just ignore them. Environmental groups have to prove an ongoing violation, so intermittent exceedances would not put Copermittees at risk of litigation.
       - Environmental Community Response: If there are intermittent violations, environmental groups won't be able to sue. The Board can still enforce.
     - What if a pollutant is persistent but not on the 303 d list yet?

    - San Diego Water Board Response: It would be best for the Copermittees to address these persistent exceedances without numeric goals before they go on the 303(d) List. If the persistent exceedances continue, the pollutant will likely be added to the 303(d) List, which would then require the Copermittee to set numeric goals for the alternative compliance pathway.
  - There is a potential unintended consequence of not being able to prioritize if Copermittees have to look at these persistent, but not prioritized pollutants. This seems counteractive to the goal of Water Quality Improvement Plans.
    - San Diego Water Board Response: If a pollutant is not on the 303(d) List the Copermittees are not required to develop numeric goals; the Copermittees can choose how/when they want to address them.
  - Copermittees don't want to base priorities on liability rather then what is affecting water quality.
    - San Diego Water Board Response: That's why Provision B.3.c.(1)(a)(iii) was included: to give Copermittees a way to show requirements are being met in receiving waters.
3. Seeking clarification that the *Alternative Compliance Option* will apply to TMDLs and water quality based effluent limitations (WQBELs).
  - Compliance option needs to cover TMDLs and WQBELs.
    - San Diego Water Board Response: It already does. Provision A.3.b requires Copermittees to comply with TMDLs and WQBELs in Attachment E.
  - Is A.3.b independently enforceable?
    - San Diego Water Board Response: If a Copermittee is out of compliance, the San Diego Water Board could choose to enforce Provision A.3.b or B.3.c.
    - Environmental Community Response: Including a direct link to Provision B.3.c in Provision A.3.b would probably be a problem for the USEPA.
4. Applying the *Alternative Compliance Option* to the planning phase of Water Quality Improvement Plans.
  - Copermittees recommend including compliance while the Water Quality Improvement Plans are being developed, and specifically describe in Provision B.3.c.
    - San Diego Water Board Response: The San Diego Water Board does not agree with the way the compliance option is included in the Los Angeles MS4 Permit. While the State Board upheld this aspect of the Los Angeles MS Permit, that does not require San Diego Water Board to handle it the same way, especially since we have significantly fewer TMDLs. The USEPA has said if a compliance option were to be included in the permit, it should not be during Water Quality Improvement Plan development. USEPA supports only granting compliance after the Water Quality Improvement Plan is accepted. Also, the State Board's draft order does not conflict with this approach.
  - This is about whether there is a reasonable amount of time to come into compliance. Copermittees who have not completed Water Quality

Improvement Plans are now out of compliance, and it could be up to two years before they will be in compliance (i.e. Orange County and Riverside County).
    - Environmental Community Response: This has been a 20 year process during which you haven't been sued. Copermittees should not be allowed to be in compliance without accepted Water Quality Improvement Plans.
    - San Diego Water Board Response: This is motivation to get the Water Quality Improvement Plans finished sooner
- What is the legal mechanism to obtain plan approval?
    - San Diego Water Board Response: There is a 30-day public comment period after final plans are completed. Then, the San Diego Water Board Executive Officer can accept the plans or have the Board adopt a resolution to accept the plans. This process is laid out in other parts of the permit.
- It can take 10, 20, or 40 years to come into compliance. There should be compliance during Water Quality Improvement Plan development.
- The State Board was okay with compliance during plan development as long as strict deadlines are met. The Regional MS4 Permit could follow that. Two years to complete the Water Quality Improvement Plan is a strict deadline, and Copermittees could not have met any stricter deadlines. Also, while Copermittees are developing Water Quality Improvement Plans, they must meet interim deadlines.
- There should be a monitoring plan, even during the interim.
- Unless there is a compliance pathway during entire Water Quality Improvement Plan development and implementation process, there will be threat of litigation for fecal bacteria contamination during wet weather. We will never get away from that unless we eliminate wildlife from the area. Copermittees shouldn't be exposed to the threat of litigation for that.
    - San Diego Water Board Response: The compliance pathway would not be applicable to bacteria since there is a TMDL that covers most of the region. The San Diego Water Board understands that the Copermittees are working on a study that may affect the water quality standards for wet weather.

5. Including dry weather flows in the *Alternative Compliance Option* or clarifying that a Copermittee is in compliance with non-stormwater discharge prohibition by implementing Provision E.2.
    - Copermittees recommend including non-storm water discharges in compliance language or provide affirmation that E.2 compliance is equivalent.
        - San Diego Water Board Response: Provision A.1.b clearly addresses this. Non-storm water discharges must be effectively prohibited and Copermittees should be enforcing this. The question is whether Copermittees are effective at enforcement. There is no need for clarification that the effective prohibition is to be implemented through

the requirements of Provision E.2, since the language is already there in Provision A.1.b.
    - Environmental Community Response: There's no way a Copermittee should allow prohibited non-storm water discharges. If it is from another entity, the responsible Copermittee should serve a notice or sue them.

6. Linking Provision A to the *Alternative Compliance Option*.
    - Provision A needs have a direct link to Provision B.3.c so it is not separately enforceable.
        - San Diego Water Board Response: The permit is written this way because the USEPA and State Board support the existing Provision A language. They support an alternative compliance pathway, which is proposed to be added. The permit was also revised to include stronger language suggesting Copermittees will be in compliance if they meet the requirements set forth in the permit. The language is not likely to be changed to include a link in Provision A.
    - Is it the Board's intent that Provision A will be separately enforceable?
        - San Diego Water Board Response: A third part would have a difficult time to separately enforce Provision A if a Copermittee is in compliance with Provision B.3.c. There's no way to write a permit that completely shields permit holders from the potential of a lawsuit.

- In regards to public participation process added to the analysis component, will additional time be included to complete this?
    - San Diego Water Board Response: This pathway is intended to be done as quickly as possible. Two years to develop a Water Quality Improvement Plan is a strict timeframe. Not every Copermittee is expected to use the alternative compliance option. A request for more time can be made if necessary. We don't want to extend this to the point where we run into another permit cycle.

Environmental Community

- This is a pretty good framework, but Provision B.3.c.(3) is a concern. There should be rigorous guidelines and a clear idea of what is going to happen and how long you can be in compliance. At what point does a Copermittee go from compliance to being out of compliance? The permit should specify frequency, milestones, etc. before a Copermittee has to recertify. The environmental community would like to see a maximum of one year compliance before completing a recertification process.
    - San Diego Water Board Response: The language is a little ambiguous to provide flexibility for how Copermittees set up plans. The expectation is that the San Diego Water Board will be checking status, etc. consistently. There is not a lot for a third party to use in order to audit this. However, it could be a consideration as we do want the process to be transparent. The primary concern is that a lot of these strategies take time to get up and running. Outcomes might not be seen for a while. The San Diego Water Board is open to seeing proposed language for this.
    - Copermittee Responses/Questions:
        - Modeling is very expensive. This seems like a significant undertaking.

  - The annual report will be going to clearinghouse; wouldn't that achieve the recertification goal?
  - An adaptive management process is already in place, which includes milestones and analysis. How is this different?
  - Isn't there a five year limit on interim goals, is that too long?
- Environmental Community Responses:
  - The environmental community would like to know at what point it would go back to a public process.
  - Alternative compliance is not the same as iterative process.
  - There needs to be more included to provide objective enforceability for third party.
  - If a Copermittee isn't meeting goals, then the process becomes longer and when is a Copermittee no longer in compliance?

Comments from Audience

- County of Orange – When asked whether Provision A is separately enforceable, the answer was that third party wouldn't be able to, but San Diego Water Board might. Are the two separately enforceable?
  - San Diego Water Board Response: We are not prepared to say yes or no in regards to separate enforceability by the San Diego Water Board.
- Tory R. Walker Engineering – My concern is that there would be an over-emphasis on models. In the end, a model is just that. I see room for other tools and I would want to stress that other, less expensive, tools can be used. Models can be pretty ineffective. There are simple tools that can be just as, or more, effective.

Final Comments

- The next workshop on June 30 will be more of a reporting out workshop than a discussion format. If anyone has specific comments and/or questions for consideration, feel free to reach out to the San Diego Water Board for a meeting in the next two weeks. There will also be a public comment period after the Tentative Order is released.
- Issues discussed today that might warrant additional changes to Provision B.3.c are:
  - Whether Provision A.3.b will be incorporated into the alternative compliance pathway
  - How Copermittees are allowed to propose numeric goals
  - When and/or how a Copermittee is no longer in compliance

A. PROHIBITIONS AND LIMITATIONS

The purpose of this provision is to describe the conditions under which storm water and non-storm water discharges into and from MS4s are prohibited or limited. The goal of the prohibitions and limitations is to protect the water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through the implementation of water quality improvement strategies and runoff management programs that effectively prohibit non-storm water discharges into the Copermittees' MS4s, and reduce pollutants in storm water discharges from the Copermittees' MS4s to the MEP. Implementation of the Compliance Option described in Provision B.3.c of this Order shall constitute compliance with the Discharge Prohibitions (A.1.a, A.1.c), Receiving Water Limitations (A.2) and Effluent Limitations (A.3.b) Provisions of this Order.

1. Discharge Prohibitions

a. Discharges from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the state are prohibited.

b. Non-storm water discharges into MS4s are to be effectively prohibited, through the implementation of Provision E.2, unless such discharges are authorized by a separate NPDES permit. Compliance with Provision E.2 shall constitute compliance with this requirement to "effectively prohibit" non-storm discharges.

c. Discharges from MS4s are subject to all waste discharge prohibitions in the Basin Plan, included in Attachment A to this Order.

d. Storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 applicable to these discharges, included in Attachment A to this Order. All other discharges from the Copermittees' MS4s to ASBS are prohibited.

2. Receiving Water Limitations

a. Discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters, including but not limited to all applicable provisions contained in:

(1) The San Diego Water Board's Basin Plan, including beneficial uses, water quality objectives, and implementation plans;

(2) State Water Board plans for water quality control including the following:

(a) Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries (Thermal Plan), and

(b) The Ocean Plan, including beneficial uses, water quality objectives, and implementation plans;

(3) State Water Board policies for water and sediment quality control including the following:

(a) Water Quality Control Policy for the Enclosed Bays and Estuaries of California,

(b) Sediment Quality Control Plan which includes the following narrative objectives for bays and estuaries:

(i) Pollutants in sediments shall not be present in quantities that, alone or in combination, are toxic to benthic communities, and

(ii) Pollutants shall not be present in sediments at levels that will bioaccumulate in aquatic life to levels that are harmful to human health,

(c) The Statement of Policy with Respect to Maintaining High Quality of Waters in California;[2]

(4) Priority pollutant criteria promulgated by the USEPA through the following:

(a) National Toxics Rule (NTR)[3] (promulgated on December 22, 1992 and amended on May 4, 1995), and

(b) California Toxics Rule (CTR).[4, 5]

b. Discharges from MS4s composed of storm water runoff must not alter natural ocean water quality in an ASBS.

3. Effluent Limitations

a. TECHNOLOGY BASED EFFLUENT LIMITATIONS

Pollutants in storm water discharges from MS4s must be reduced to the MEP.[6]

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

Each Copermittee must comply with applicable WQBELs established for the TMDLs in Attachment E to this Order, pursuant to the applicable TMDL compliance schedules.

4. Compliance with Discharge Prohibitions and Receiving Water Limitations

Each Copermittee must achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order through timely implementation of control measures and other actions as specified in Provisions B and E of this Order, including any modifications. The Water Quality Improvement Plans required under Provision B must be designed and

[2] State Water Resources Control Board No. 68-16
[3] 40 CFR 131.36
[4] 65 Federal Register 31682-31719 (May 18, 2000), adding Section 131.38 to 40 CFR
[5] If a water quality objective and a CTR criterion are in effect for the same priority pollutant, the more stringent of the two applies.
[6] This does not apply to MS4 discharges which receive subsequent treatment to reduce pollutants in storm water discharges to the MEP prior to entering receiving waters (e.g., low flow diversions to the sanitary sewer). Runoff treatment must occur prior to the discharge of runoff into receiving waters per Finding 7.

adapted to ultimately achieve compliance with Provisions A.1.a, A.1.c and A.2.a.

a. If exceedance(s) of water quality standards persist in receiving waters notwithstanding implementation of this Order, the Copermittees must comply with the following procedures:

(1) For exceedance(s) of a water quality standard in the process of being addressed by the Water Quality Improvement Plan, the Copermittee(s) must implement the Water Quality Improvement Plan as accepted by the San Diego Water Board, and update the Water Quality Improvement Plan, as necessary, pursuant to Provision F.2.c;

(2) Upon a determination by either the Copermittees or the San Diego Water Board that discharges from the MS4 are causing or contributing to a new exceedance of an applicable water quality standard not addressed by the Water Quality Improvement Plan, the Copermittees must submit the following updates to the Water Quality Improvement Plan pursuant to Provision F.2.c or as part of the Water Quality Improvement Plan Annual Report required under Provision F.3.b, unless the San Diego Water Board directs an earlier submittal:

(a) The water quality improvement strategies being implemented that are effective and will continue to be implemented,

(b) Water quality improvement strategies (i.e. BMPs, retrofitting projects, stream and/or habitat rehabilitation projects, adjustments to jurisdictional runoff management programs, etc.) that will be implemented to reduce or eliminate any pollutants or conditions that are causing or contributing to the exceedance of water quality standards,

(c) Updates to the schedule for implementation of the existing and additional water quality improvement strategies, and

(d) Updates to the monitoring and assessment program to track progress toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a of this Order;

(3) The San Diego Water Board may require the incorporation of additional modifications to the Water Quality Improvement Plan required under Provision B. The applicable Copermittees must submit any modifications to the update to the Water Quality Improvement Plan within 90 days of notification that additional modifications are required by the San Diego Water Board, or as otherwise directed;

(4) Within 90 days of the San Diego Water Board determination that the modifications to the Water Quality Improvement Plan required under Provision A.4.a.(3) meet the requirements of this Order, the applicable Copermittees must revise the jurisdictional runoff management program documents to incorporate the modified water quality improvement strategies that have been and will be implemented, the implementation schedule, and

any additional monitoring required; and

(5) Each Copermittee must implement the updated Water Quality Improvement Plan.

b. The procedure set forth above to achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order do not have to be repeated for continuing or recurring exceedances of the same water quality standard(s) following implementation of scheduled actions unless directed to do otherwise by the San Diego Water Board.

c. Nothing in Provisions A.4.a and A.4.b prevents the San Diego Water Board from enforcing any provision of this Order while the applicable Copermittees prepare and implement the above update to the Water Quality Improvement Plan and jurisdictional runoff management programs.

Insert the following as Provision B.3.c:

c. DISCHARGE PROHIBITIONS ~~AND~~, RECEIVING WATER LIMITATIONS, AND EFFLUENT LIMITATIONS COMPLIANCE OPTION

Each Copermittee has the option to utilize the implementation of the Water Quality Improvement Plan to achieve ~~demonstrate~~ compliance with the requirements of Provisions A.1.a, A.1.c, ~~and~~ A.2~~.a~~ and A.3.b within a Watershed Management Area. A Copermittee ~~will be deemed to be~~is in compliance with Provisions A.1.a, A.1.c, ~~and~~ A.2~~.a~~ and A.3.b within a Watershed Management Area for waterbody/pollutant combinations addressed under B.3.c.(1)(a) and B.3.c.(1)(b) that are caused or contributed to by MS4 discharges when the following conditions are met:

(1) The Water Quality Improvement Plan for a Watershed Management Area must incorporate the following:

(a) Numeric goals and schedules developed pursuant to Provision B.3.a that include the following:

(i) WQBELs established by the TMDLs in Attachment E to this Order applicable to the Copermittee's jurisdiction within the Watershed Management Area; and

(ii) Numeric goals applicable either to the Copermittee's MS4 discharges or to receiving waters impacted by such discharges within the Watershed Management Area ~~expressed as numeric concentration-based or load-based goals~~ for all other pollutants listed on the Clean Water Act Section 303(d) List of Water Quality Impaired Segments[1] for the receiving waters in the Watershed Management Area that do not have a TMDL developed and incorporated into Attachment E to this Order and where data indicates continued impairment of water quality in the receiving water; and

~~(iii) Numeric goals for receiving waters that will result in chemical, physical, and/or biological conditions of the receiving waters that will be protective of the beneficial uses within the Watershed Management Area under the Copermittee's jurisdiction.~~

(b) For other waterbody/pollutant combinations that do not meet the State's 303(d) listing requirements to indicate an impairment in the receiving water and exceedances of receiving water limitations persist, exceedances will be addressed through Provision A.4.a. For pollutants where exceedances have not been shown to be persistent, the pollutants shall continue to be addressed by existing watershed or jurisdictional programs.

[1] ~~2010 and subsequent 303(d) Lists~~Latest 303(d) List at the initiation of WQIP development or update

Comment [CoPer1]: Revised to incorporate effluent limitations associated with A.3.b.

Comment [CoPer2]: Revised to incorporate ASBS RWLs into the compliance approach for consistency amongst the Permit's RWL requirements. Note the remaining strikeouts for A.2~~.a.~~ are not identified with a comment to reduce repetition of the same comment.

Comment [CoPer3]: Revised to incorporate effluent limitations for TMDLs for consistency with the intent of the TMDL schedules. Note the remaining additions of A.3.b are not identified with a comment to reduce repetition of the same comment.

Comment [CoPer4]: Revised for clarity to affirm compliance and avoid potential misinterpretation of intent.

Comment [CoPer5]: Language added to clarify that if necessary or so desired Copermittees may address some but not all pollutants via the compliance pathway. The concern was that without clarification one could interpret the language as requiring all pollutants be addressed to utilize the compliance pathway (i.e., all or none). Also added clarity to focus being on issues caused to or contributed to by the MS4 consistent with Provision A.

Comment [CoPer6]: As described in B.3.a, numeric goals for non-TMDL pollutants may take a variety of forms (discharge or receiving water based, concentration or load based, etc.) to support WQIP implementation and measure progress. The approach in B.3.a was thoughtful and allowed for the selection of goals depending on the priority and desired outcome. Continuing the approach seems appropriate. Examples of non concentration or load based goals include: reduced presence of human markers/viruses found in discharges, reduced number of outfalls found to be discharging during dry weather, and reduced number of exceedances in receiving waters.

Comment [CoPer7]: The footnote was revised to clarify that the 303(d) list in place at the time of WQIP development/update should be used to avoid confusion on whether past listings that have been changed are required to be addressed.

Comment [CoPer8]: Language was added so that if, based on a review of available data, it was determined that a waterbody is no longer impaired, Copermittees would not follow this process, but would rather follow the process outlined in the next provision (a new part b below). Requiring WQIPs to address pollutants that are no longer listed (or ...

Comment [CoPer9]: Deleted as receiving waters were added to the previous bullet.

Comment [CoPer10]: As written, B.3.c does not explicitly provide a compliance pathway for exceedances of pollutants that are not addressed by a TMDL or on the 303(d) list. The addition of this language is intended to: ...

~~(b)~~(c) An analysis utilizing a watershed model or other watershed analytical tools that meets the following conditions for waterbody/pollutant combinations addressed under B.3.c.(1)(a):

(i) The analysis must quantitatively demonstrate that the implementation of the water quality improvement strategies required under Provision B.3.b will achieve the numeric goals within the established schedules required to be developed pursuant to Provisions B.3.a and B.3.c.(1)(a).

(ii) The development of the analysis must include a public participation process which allows the public to review and provide comments on the analysis methodology utilized and the assumptions included in the analysis. Public comments and responses must be included as part of the analysis documentation included in the Water Quality Improvement Plan.

(iii) The analysis may be performed by an individual Copermittee only for its jurisdiction within the Watershed Management Area, or jointly by two or more of any of the Copermittees choosing to utilize this option for their jurisdictions within the same Watershed Management Area.

(iv) The analysis must be updated as part of the iterative approach and adaptive management process required under Provisions B.5.a-b.

(v) Copermittees choosing to utilize the Water Quality Improvement Plan to demonstrate compliance with the requirements of Provisions A.1.a, A.1.c, A.2, A.3.b prior to updating WQIP priorities, goals, and strategies per adaptive management requirements in B.5, may submit documentation to the San Diego Water Board Executive Officer that demonstrates the strategies included within the Water Quality Improvement Plan address pollutants categorized under B.3.c.(1)(a)(ii) and B.3.c.(1)(b). During the first Water Quality Improvement Plan update required to address priorities, goals, and strategies, the requirements in B.3.c will be fully incorporated into the Water Quality Improvement Plan.

~~(c)~~(d) Specific the monitoring and assessments included in the monitoring and assessment program required pursuant to Provision B.4 that will be performed by the Copermittee to 1) demonstrate that the implementation of the water quality improvement strategies within its jurisdiction is making progress toward achieving the numeric goals in accordance with the established schedules developed pursuant to Provisions B.3.a and B.3.c.(1)(a), and 2) determine whether interim and final numeric goals have been achieved. The specific monitoring and assessments must be updated as part of the iterative approach and adaptive management process required under Provision B.5.c.

Comment [CoPer11]: Language added to clarify that if necessary or so desired Copermittees may address some but not all pollutants via the compliance pathway. The concern was that without clarification one could interpret the language as requiring all pollutants be addressed to utilize the compliance pathway (i.e., all or none). Also, with the addition of language related to a compliance pathway for non-TMDL/303(d) listed pollutants, clarity is needed regarding for which pollutants the requirements of this provision apply.

Comment [CoPer12]: San Diego County Copermittees will have just completed development of WQIPs at the time of adoption of the compliance pathway language. The language was added so that the pathway can be followed prior to a full WQIP update rather than necessitating a WQIP update immediately after a revised Permit is adopted. However, such an approach can only be followed if a demonstration can be made that the strategies that will be employed during the time period between the adoption of a new Permit and the first WQIP update will address the additional pollutants in some manner. The intent is demonstrate that actions are being taken in the interim prior to a full WQIP update.

~~(d)~~(e) Documentation that the numeric goals proposed pursuant to Provision B.3.c.(1)(a), the analysis performed pursuant to Provision B.3.c.(1)(~~b~~c), and the specific monitoring and assessments proposed pursuant to Provision B.3.c.(1)(~~c~~d) have been reviewed by the Water Quality Improvement Consultation Panel (see Provision F.1.a.(1)(b)) for any recommendations. Updates must be reviewed by the Water Quality Improvement Consultation Panel for any recommendations.

(2) A Copermittee who provides notice in writing to the Regional Board Executive Officer of its intent to utilize the Compliance Option provided in this Provision B.3.c shall be deemed in compliance with Provisions A.1.a, A.1.c, A.2 and A.3.b from the date of that notice to the date that the Executive Officer approves the Water Quality Improvement Plan pursuant to Provision F.1.b.(5) if the Copermittee meets all deadlines set forth in Provisions F.1.(a)-(b) for the development of the Water Quality Improvement Plan containing the Compliance Option and is otherwise in compliance with the requirements of this Provision B.3.c.

~~(2)~~(3) Each Copermittee that chooses to utilize this option ~~will~~is, for the pollutant/water body combinations set forth at ~~included in the analysis performed pursuant to~~ Provision B.3.c.(1)(~~b~~a) and Provision B.3.c.(1)(b), ~~be deemed~~ in compliance with Provisions A.1.a, A.1.c, ~~and~~ A.2.~~a~~ and A.3.b when the Water Quality Improvement Plan, incorporating the requirements of Provision B.3.c.(1), is accepted by the San Diego Water Board Executive Officer pursuant to Provision F.1.b(5).

~~(3)~~(4) The Copermittee ~~will~~is, for the pollutant/water body combinations included in the ~~analysis performed pursuant to~~ Provision B.3.c.(1)(~~b~~a) and Provision B.3.c.(1)(b), ~~remain~~ in compliance with Provisions A.1.a, A.1.c, ~~and~~ A.2~~.a~~ and A.3.b during the term of this Order as long as:

(a) The results of the analysis performed pursuant to Provision B.3.c.(1)(~~b~~c) is accepted by the San Diego Water Board Executive Officer as part of the Water Quality Improvement Plan and as part of subsequent updates to the Water Quality Improvement Plan; AND

(b) The Copermittee continues to implement the water quality improvement strategies within its jurisdiction developed pursuant to Provision B.3.b.(1) in accordance with the schedules for implementing the strategies established pursuant to Provision B.3.b.(3)(a); AND

(c) The Copermittee continues to perform the monitoring and assessments specified in the Water Quality Improvement Plan, developed and implemented pursuant to Provision B.3.c.(1)(~~c~~d), to demonstrate its progress toward achieving the numeric goals applicable to its MS4 discharges in accordance with the interim and final dates for achieving the numeric goals established pursuant to Provision B.3.a.(2); AND

(d) The Copermittee continues to implement the requirements of Provision A.4.a.

Comment [CoPer13]: Revised because of the addition of a new provision. Note the remaining revisions to references changed due to the addition of the new provision (B.3.c.(1)(b)) are not identified with a comment to reduce repetition of the same comment.

Comment [CoPer14]: The language was added so that during WQIP development/update and during the public/Regional Board's review, Copermittees have coverage so long as all deadlines are met and the WQIP is ultimately accepted by the RWQCB EO. Non-compliance during development/ update does not serve a purpose of improving water quality. Resources should focus on plan development and WQIP/program implementation rather than addressing exceedances/violations that stem from the provision the compliance pathway is seeking to address. The LA MS4 Permit expressly provides coverage during plan development and during plan revision when incorporating new pollutants (pgs. 49-52). The State Board's April 24, 2015 Tentative Order in response to petitioners on the LA MS4 Permit (SB TO) dated confirms the approach (pgs. 52-55). Further, the SB TO provides guidance (pgs. 85) on developing alternatives and includes providing a period of time to come into compliance. Without coverage during development/ update, such time is not provided and the approach could be considered inconsistent with the SB TO. Part of the reasoning in the SB TO is the clear process and deadlines for plan development. The coverage is not unlimited in time or scope and the approach provides constraints on applicability (including the ability for the RWQCB to reject the submittal and remove coverage as occurred in LA to multiple Permittees that failed to submit plans that met neither the letter nor the spirit of the LA MS4 Permit).

Comment [CoPer15]: Revised for clarity to affirm compliance and avoid potential misinterpretation of intent.

Comment [CoPer16]: Language added to capture the addition of sub-bullet b

Comment [CoPer17]: Revised for consistency with acceptance process in Provision F.

Comment [CoPer18]: Revised for clarity to affirm compliance and avoid potential misinterpretation of intent.

Comment [CoPer19]: Language added to capture the addition of sub-bullet b

Comment [CoPer20]: Revised for clarity to affirm compliance and avoid potential misinterpretation of intent.

Draft Alternative Compliance Pathway for Receiving Water Limitations
Revised May 14, 2015

Insert the following as Provision B.3.c:

c. DISCHARGE PROHIBITIONS AND RECEIVING WATER LIMITATIONS COMPLIANCE OPTION

Each Copermittee has the option to utilize the implementation of the Water Quality Improvement Plan to demonstrate compliance with the requirements of Provisions A.1.a, A.1.c and A.2.a within a Watershed Management Area. A Copermittee will be deemed to be in compliance with Provisions A.1.a, A.1.c and A.2.a within a Watershed Management Area when the following conditions are met:

(1) ~~The Copermittees may utilize implementation of the water quality improvement strategies in the Water Quality Improvement Plan to demonstrate compliance with the requirements of Provisions A.1.a, A.1.c and A.2.a. For each Copermittee in t~~The Water Quality Improvement Plan for a Watershed Management Area ~~that chooses to utilize this option, the Copermittee will be in compliance with Provisions A.1.a, A.1.c and A.2.a if~~ must incorporate the following:

(a) Numeric goals and schedules developed pursuant to Provision B.3.a that include the following ~~numeric goals~~:

(i) ~~Water quality based effluent limitations (~~WQBELs~~) expressed as concentration-based or load-based effluent limitations applicable to the Watershed Management Area~~ established by the TMDLs in Attachment E to this Order applicable to the Cop e rm itte e 's jurisd ictio n within the Watershed Management Area; and

(ii) Numeric goals applicable to the Copermittee's MS4 discharges within the Watershed Management Area expressed as numeric concentration-based or load-based goals ~~effluent limitations~~ for all other pollutants listed on the Clean Water Act Section 303(d) List of Water Quality Impaired Segments[1] for the receiving waters in the Watershed Management Area that do not have a TMDL developed and incorporated into Attachment E to this Order; and

(iii) Numeric goals applicable to the Copermittee's MS4 discharges within the WMA for which Copermittees seek Alternative Compliance status expressed as numeric concentration or load-based goals for all persistent pollutants not subject to a TMDL and not listed on the CWA Section 303(d) List of Water Quality Impaired Segments for the receiving waters in the WMA; and

(iv) Numeric goals for receiving waters that will ~~protect~~ result in chemical, physical, and biological conditions of the receiving waters that will be protective of the beneficial uses within the Watershed Management Area under the Copermittee's jurisdiction . ~~and attain water quality standards~~.

Comment [M1]: Removed "or" from "and/or". Clean Water Act requires protection and restoration of chemical, physical, and biological conditions.

(v) In addition to the numeric goals required in c.(1)(a.)(i)-(iv), Copermittees shall identify numeric goals, strategies, schedules, and dates for their achievement to control MS4 discharges such that they do not cause or contribute to exceedances of receiving water limitations in the timeframe(s) that reflects a realistic assessment of the shortest practicable time required. The time between dates shall not exceed one year.

OR

(v) A schedule for achieving annual interim numeric targets that reflects progress towards the numeric goals described in c.(1)(a.)(i)-(iv). The schedule must include a realistic assessment of the shortest practicable time required to ensure target pollutant(s) will not cause or contribute to exceedances of receiving water limitations.

(b) An analysis utilizing a watershed model or other watershed analytical tools ~~is performed. The results must be included in the Water Quality Improvement Plan~~ that meets the following conditions:

(i) The analysis must ~~to~~ quantitatively demonstrate that the implementation of the water quality improvement strategies required under Provision B.3.b will achieve the numeric goals within the established schedules required ~~under~~ to be developed pursuant to Provisions B.3.a and B.3.c.(1)(a).

(ii) The development of the analysis must include a public participation process which allows the public to review and provide comments on the analysis methodology utilized and the assumptions included in the analysis. Public comments and responses must be included as part of the analysis documentation included in the Water Quality Improvement Plan.

(iii) The analysis may be performed by an individual~~ly~~ Copermittee only for its jurisdiction within the Watershed Management Area, or jointly by two or more of any of the Copermittees choosing to utilize this option for their jurisdictions within the same Watershed Management Area.~~,~~

(iv) ~~, and~~ Subject to section 3 below, the analysis must be updated as part of the iterative approach and adaptive management process required under Provisions B.5.a-b.

[1] ~~2002~~ 2010 and subsequent 303(d) Lists

Comment [M2]: The idea behind these optional language sections is to require Copermittees to provide a clear blueprint for achievement of RWLs with annual numeric goals, strategies, schedules, and dates that must be provided and achieved. Section 3 (A)-(C) (below) refers to achievement of these goals and when Alt Compliance is no longer applicable.

Comment [M3]: This addition requires update of analysis, but points to Section 3 below that says such update may not necessarily be done under protection of Alt Compliance if Copermittee has not properly implemented their requirements. Essentially it's meant to differentiate the ongoing iterative, adaptive management process from the Alt Compliance process of updating analyses.

(c) ~~The Water Quality Improvement Plan s~~Specifi~~ces the~~ monitoring and assessments included in the monitoring and assessment program required pursuant to Provision B.4 ~~(i.e. MS4 outfall discharge, receiving water, and/or special studies)~~ that will be performed by the Copermittee to ~~confirm the~~ 1) demonstrate that the implementation of the water quality improvement strategies within its jurisdiction is making progress toward achieving the numeric goals in accordance with the established schedules developed pursuant to Provisions B.3.a and B.3.c.(1)(a), and 2) determine whether interim and final numeric goals have been achieved. ~~The monitoring and assessments must be incorporated into the monitoring and assessment program required pursuant to Provision B.4.~~ Subject to section 3 below, the specific monitoring and assessments must be updated as part of the iterative approach and adaptive management process required under Provision B.5.c.

(d) Documentation that ~~T~~the numeric goals proposed pursuant to Provision B.3.c.(1)(a), the analysis performed pursuant to Provision B.3.c.(1)(b), and the specific monitoring and assessments proposed pursuant to Provision B.3.c.(1)(c) have been reviewed by the Water Quality Improvement Consultation Panel (see Provision F.1.a.(1)(b)) for any recommendations. Updates must be reviewed by the Water Quality Improvement Consultation Panel for any recommendations.

(2) Each Copermittee that chooses to utilize this option will, for the pollutant/water body combinations ~~covered by~~ included in the analysis performed pursuant to Provision B.3.c.(1)(b), be deemed in compliance with Provisions A.1.a, A.1.c and A.2.a when the Water Quality Improvement Plan, incorporating the requirements of Provision B.3.c.(1), and subject to B.3.c.B., is accepted by the San Diego Water Board

(3) The Copermittee will, for the pollutant/water body combinations ~~covered by~~ included in the analysis performed pursuant to Provision B.3.c.(1)(b), remain in compliance with Provisions A.1.a, A.1.c and A.2.a during the term of this Order as long as:

(A)

(a) The results of the analysis performed pursuant to Provision B.3.c.(1)(b~~d~~) is accepted by the San Diego Water Board Executive Officer as part of the Water Quality Improvement Plan and as part of subsequent updates to the Water Quality Improvement Plan; AND

(b) The Copermittee continues to implement the water quality improvement strategies within its jurisdiction developed pursuant to Provision B.3.b.(1) in accordance with the schedules for implementing the strategies established pursuant to Provision B.3.b.(3)(a); AND

.

(c) The Copermittee continues to perform the monitoring and assessments specified in the Water Quality Improvement Plan, developed and implemented pursuant to Provision B.3.c.(1)(c), to demonstrate its progress toward achieving the numeric goals applicable to its MS4 discharges in accordance with the interim and final dates for achieving the numeric goals established pursuant to Provision B.3.a.(2); AND

(d) The Copermittee continues to implement the requirements of Provision A.4.a.

(B) Failure to comply with and to achieve the numeric goals, schedules, strategies, and/or dates under c(1)(a)(i)-(v) for any two consecutive reporting periods will automatically result in that Copermittee's forfeiture of RWL Alternative Compliance status.

(C) Copermittees who no longer quality for RWL Alternative Compliance due to nonattainment of numeric goals, dates, strategies and/or schedules may again qualify for RWL Compliance coverage only upon submittal of an approved updated analysis described in c(1)(b) that addresses the deficiencies that led to nonattainment of numeric goals, dates, strategie, and/or schedule attainment.

Comment [M4]: The idea behind this section is to disqualify a Copermittee with Alt Compliance coverage from protection if they fail to achieve what they set out to do to achieve RWL for two consecutive years. They automatically lapse back into status quo/iterative/adaptive mgmt.

Comment [M5]: Allows for reapplication for Alt Compliance coverage only once deficiencies are addressed. This may need to be a Section 4 instead of under 3.

Proposed Modifications to May 14, 2015 RWQCB Draft Language on Priority Development Project Approvals; Submitted by the County of San Diego, City of San Diego, and Building Industry Coalition -- June 11, 2015~~June 10, 2015~~

Revise May 14, 2015, Draft of Provision E.3.e.(1)(a) as follows:

e. **PRIORITY DEVELOPMENT PROJECT BMP IMPLEMENTATION AND OVERSIGHT**

Each Copermittee must implement a program that requires and confirms structural BMPs on all Priority Development Projects are designed, constructed, and maintained to remove pollutants in storm water to the MEP.

(1) Structural BMP Approval and Verification Process

(a) Each Copermittee must require and confirm that all Priority Development Projects implement the requirements of Provision E.3, except that the Copermittee may allow previous land development requirements to apply to a Priority Development Project if all of the following conditions are met:

(i) The Copermittee has, prior to the effective date of the BMP Design Manual required to be developed pursuant to Provision E.3.d, approved[1] a design that incorporates the storm water drainage system for the Priority Development Project in its entirety, including all applicable structural pollutant treatment control and hydromodification management BMPs, and that complies with the Priority Development Project requirements of the Previous Term MS4 permit;[2] AND

(ii) ~~The~~ For private projects, the Copermittee has, prior to the effective date of the BMP Design Manual required to be developed pursuant to Provision E.3.d, issued a development approval or construction permit ~~building permit, or functional equivalent that authorizes the Priority Development Project applicant to commence construction activities,~~based on a design that incorporates the approved storm water drainage system for the Priority Development Project in its entirety; AND

(iii) ~~The Copermittee confirms that there have been construction activities on the Priority Development Project site within the 365 days prior to the effective date of the BMP Design Manual required to be developed pursuant to Provision E.3.d, *OR* the Copermittee confirms that construction activities will commence on the Priority Development Project site within the 180 days after the effective date of the BMP Design Manual required to be developed pursuant to Provision E.3.d, where construction activities are undertaken in reliance on the building permit, or functional equivalent, issued by the Copermittee in conformance with Provision E.3.e.(1)(a)(ii).~~ All subsequent development approvals and construction permits, or equivalent

[1] For public projects, approval means that the design of the storm water drainage system for the project in its entirety has been stamped by the City or County Engineer, or engineer of record for the project.

[2] Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016 for San Diego, Orange, and Riverside Counties, respectively.

approvals for public projects, that are needed to implement the initial approval, must be issued within 5 years of the effective date of the BMP Design Manual pursuant to Provision E.3.d. BMP installation must remain in substantial conformity with the design of the storm water drainage system included in the initial approval.

(b) Alternatively, the Copermittee may allow previous land development requirements to apply to a Priority Development Project if application of Provision E.3 would be legally infeasible.

Chiu, Wayne@Waterboards

From: lyris@swrcb18.waterboards.ca.gov
Sent: Tuesday, June 23, 2015 3:30 PM
To: Chiu, Wayne@Waterboards
Subject: June 30, 2015 Public Workshop on Prior Lawful Approval and Alternative Compliance Pathway
Attachments: 2015-0630 PLA RWL Wrap-up Workshop Agenda.pdf; 2015-0623 Second Revised Draft RWL Compliance Pathway.pdf; 2015-0623 Second Revised Draft PLA.pdf

Water Boards This is a message from the California Regional Water Quality Control Board, San Diego Region (9).

Greetings,

Please find attached the agenda for the June 30, 2015 Public Workshop to be held at the City of Vista Civic Center Complex, Community Room, 200 Civic Center Drive, Vista, CA 92084. The workshop begins at 9:30 a.m.

As a result of the information and comments received during the April 28, 2015 and May 21, 2015 Public Workshops and additional meetings with various stakeholders, and proposed revisions provided by various stakeholders, the San Diego Water Board made additional revisions to the draft language for the Definition of Prior Lawful Approval for Priority Development Projects and the Alternative Compliance Pathway for Receiving Water Limitations. The revised language (also attached to this email), proposed revised language provided by various stakeholders, as well as notes summarizing the May 21, 2015 Public Workshop are available on the San Diego Water Board's website at: http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

As part of the proceedings to amend the Regional MS4 Permit (Order No. R9-2013-0001, as amended by Order No. R9-2015-0001) to extend coverage to the Riverside County Copermittees, the draft language is expected to be included into the proposed amendments to the Regional MS4 Permit. At the workshop, the Regional MS4 Permit Team will present the significant changes made to the draft language for the Definition of Prior Lawful Approval for Priority Development Projects and the Alternative Compliance Pathway for Receiving Water Limitations. The Regional MS4 Permit Team will also take comments and answer questions on the draft language at the workshop.

We look forward to seeing you at the workshop.

Wayne Chiu, PE
Water Resource Control Engineer
Storm Water Management
San Diego Water Board

You are currently subscribed to reg9_riversideco_ms4permit as: wchiu@waterboards.ca.gov.

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Draft Definition of Prior Lawful Approval for Priority Development Projects
Revised June 23, 2015

Revise Provision E.3.e.(1)(a) as follows:

e. **PRIORITY DEVELOPMENT PROJECT BMP IMPLEMENTATION AND OVERSIGHT**

Each Copermittee must implement a program that requires and confirms structural BMPs on all Priority Development Projects are designed, constructed, and maintained to remove pollutants in storm water to the MEP.

(1) Structural BMP Approval and Verification Process

(a) Each Copermittee must require and confirm that all Priority Development Projects implement the requirements of Provision E.3, except that the Copermittee may allow previous land development requirements to apply to a Priority Development Project if ~~all of~~ the ~~following~~ conditions of Provision E.3.e.(1)(a)(i) or Provision E.3.e.(1)(a)(ii) are met:

(i) The Copermittee has, prior to the effective date of the BMP Design Manual required to be developed pursuant to Provision E.3.d:~~,~~

[a] ~~a~~Approved[1] a design that incorporates the storm water drainage system for the Priority Development Project in its entirety, including all applicable structural pollutant treatment control and hydromodification management BMPs consistent with the previous applicable MS4 permit requirements;[2] AND

[b] Issued a private project permit or approval, or functional equivalent for public projects, that authorizes the Priority Development Project applicant to commence construction activities based on a design that incorporates the storm water drainage system approved in conformance with Provision E.3.e.(1)(a)(i)[a], AND

[c] Confirmed that there have been construction activities on the Priority Development Project site within the 365 days prior to the effective date of the BMP Design Manual, *OR* the Copermittee confirms that construction activities have commenced on the Priority Development Project site within the 180 days after the effective date of the BMP Design Manual, where construction activities are undertaken in reliance on the permit or approval, or functional equivalent for public projects, issued by the Copermittee in conformance with Provision E.3.e.(1)(a)(i)[b].

[d] All subsequent private project permits or approvals, or functional equivalent for public projects, that are needed to implement the

[1] For public projects, a design stamped by the City or County Engineer, or engineer of record for the project is considered an approved design.
[2] Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016 for San Diego County, Orange County, and Riverside County Copermittees, respectively

design initially approved in conformance with Provision E.3.e.(1)(a)(i)[a], must be issued within 5 years of the effective date of the BMP Design Manual. The storm water drainage system for the Priority Development Project in its entirety, including all applicable structural pollutant treatment control and hydromodification management BMPs must remain in substantial conformity with the design initially approved in conformance with Provision E.3.e.(1)(a)(i)[a].

(ii) The Copermittee does not have the land use authority or legal authority to require a Priority Development Project to implement the full requirements of Provision E.3. ~~has, prior to the effective date of the BMP Design Manual required to be developed pursuant to Provision E.3.d, issued a building permit, or functional equivalent, that authorizes the Priority Development Project applicant to commence construction activities, based on a design that incorporates the approved storm water drainage system for the Priority Development Project in its entirety; AND~~

~~(iii) The Copermittee confirms that there have been construction activities on the Priority Development Project site within the 365 days prior to the effective date of the BMP Design Manual required to be developed pursuant to Provision E.3.d, *OR* the Copermittee confirms that construction activities will commence on the Priority Development Project site within the 180 days after the effective date of the BMP Design Manual required to be developed pursuant to Provision E.3.d, where construction activities are undertaken in reliance on the building permit, or functional equivalent, issued by the Copermittee in conformance with Provision E.3.e.(1)(a)(ii).~~

Draft Alternative Compliance Pathway for Receiving Water Limitations
Revised June 23, 2015

Insert the following as Provision B.3.c:

c. ~~DISCHARGE~~ PROHIBITIONS AND ~~RECEIVING WATER~~ LIMITATIONS COMPLIANCE OPTION

Each Copermittee has the option to utilize the implementation of the Water Quality Improvement Plan to demonstrate compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, ~~and~~ A.2.a, and A.3.b within a Watershed Management Area subject to~~. A Copermittee will be deemed to be in compliance with Provisions A.1.a, A.1.c and A.2.a within a Watershed Management Area when~~ the following conditions ~~are met~~:

(1) A Copermittee is eligible to be deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2.a, and A.3.b within a Watershed Management Area when ~~T~~the Water Quality Improvement Plan for a Watershed Management Area ~~must~~ incorporates the following:

(a) Numeric goals, water quality improvement strategies, and schedules developed pursuant to Provisions B.3.a and B.3.b that include the following:

(i) Interim and final WQBELs established by the TMDLs in Attachment E to this Order applicable to the Copermittee's jurisdiction within the Watershed Management Area; AND ~~and~~

(ii) Interim and final numeric goals for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 applicable to the Copermittee's jurisdiction within the Watershed Management Area; AND

(iii) Interim and final ~~N~~numeric goals applicable to the Copermittee's MS4 discharges within the Watershed Management Area expressed as numeric concentration-based or load-based goals for all ~~other~~ pollutants and conditions listed on the Clean Water Act Section 303(d) List of Water Quality Impaired Segments[1] for the receiving waters in the Watershed Management Area that do not have a TMDL ~~developed and~~ incorporated into Attachment E to this Order; AND/OR ~~and~~

(iv) Interim and final ~~N~~numeric goals for pollutants and conditions identified as receiving water priorities in the Water Quality Improvement Plan ~~for receiving waters~~ that will result in chemical, physical, and~~/or~~ biological conditions protective of the beneficial uses of the receiving waters impacted by the Copermittee's MS4 discharges ~~that will be protective of the beneficial uses~~ within the Watershed Management Area ~~under the Copermittee's jurisdiction.~~; AND

[1] 2010 and subsequent 303(d) Lists

(v) The Copermittee has the option to include interim and final numeric goals applicable to the Copermittee's MS4 discharges and/or receiving waters within the Watershed Management Area for any pollutants or conditions in addition to those described in Provisions B.3.c.(1)(a)(i)-(iv); AND

(vi) Schedules for achieving each final numeric goal that reflect a realistic assessment of the shortest practicable time needed for achievement; AND

(vii) For each final numeric goal developed pursuant to Provisions B.3.a and B.3.c.(1)(a)(i)-(v), at least one annual milestone[2] and date for its achievement must be included within each Water Quality Improvement Plan Annual Report reporting period until the final numeric goal is achieved.

(b) An analysis ~~utilizing a watershed model or other watershed analytical tools~~ that meets the following conditions:

(i) The analysis, with clearly stated assumptions included in the analysis, must quantitatively demonstrate that the implementation of the water quality improvement strategies required under Provision B.3.b will achieve the final numeric goals within the ~~established~~ schedules ~~required to be~~ developed pursuant to Provisions B.3.a and B.3.c.(1)(a).

(ii) The development of the analysis must include a public participation process which allows the public to review and provide comments on the analysis methodology utilized and the assumptions included in the analysis. Public comments and responses must be included as part of the analysis documentation included in the Water Quality Improvement Plan.

(iii) The analysis may be performed by an individual Copermittee ~~only for its jurisdiction within the Watershed Management Area,~~ or jointly by two or more ~~of any of the~~ Copermittees choosing to utilize this compliance option for their jurisdictions within the ~~same~~ Watershed Management Area.

(iv) The analysis must be updated as part of the iterative approach and adaptive management process required under Provisions B.5.a-b.

(c) Specific monitoring and assessments ~~included in the monitoring and assessment program~~ required pursuant to Provision B.4.a that will be performed by the Copermittee capable of ~~to:~~ 1) demonstrating~~e~~ ~~that~~ whether the implementation of the water quality improvement strategies ~~within its jurisdiction~~ are making progress toward achieving the numeric goals in

[2] Annual milestones for each final numeric goal must build upon previous milestones and lead to the achievement of the final numeric goal. The annual milestones may consist of water quality improvement strategy implementation phases, interim numeric goals, and other acceptable metrics.

accordance with the established schedules developed pursuant to Provisions B.3.a and B.3.c.(1)(a), and 2) determining~~e~~ whether interim and final numeric goals have been achieved. The specific monitoring and assessments must be updated as part of the iterative approach and adaptive management process required under Provision B.5.c.

(d) Documentation showing that the numeric goals, schedules, and annual milestones proposed pursuant to Provision B.3.c.(1)(a), the analysis performed pursuant to Provision B.3.c.(1)(b), and the specific monitoring and assessments proposed pursuant to Provision B.3.c.(1)(c) have been reviewed by the Water Quality Improvement Consultation Panel (see Provision F.1.a.(1)(b)) ~~for any recommendations~~. Updates must be reviewed by the Water Quality Improvement Consultation Panel for any recommendations.

(2) Each Copermittee that voluntarily completes the requirements of Provision B.3.c.(1) is ~~chooses to utilize this option will, for the pollutant/water body combinations included in the analysis performed pursuant to Provision B.3.c.(1)(b), be~~ deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, ~~and~~ A.2.a, and A.3.b for the pollutants and conditions for which numeric goals are developed when the Water Quality Improvement Plan, incorporating the requirements of Provision B.3.c.(1), is accepted by the San Diego Water Board pursuant to Provision F.1.b or F.2.c. The Copermittee is considered to be in compliance during the term of this Order as long as:

~~(3) The Copermittee will, for the pollutant/water body combinations included in the analysis performed pursuant to Provision B.3.c.(1)(b), remain in compliance with Provisions A.1.a, A.1.c and A.2.a during the term of this Order as long as:~~

~~(a) The results of the analysis performed pursuant to Provision B.3.c.(1)(b) is accepted by the San Diego Water Board Executive Officer as part of the Water Quality Improvement Plan and as part of subsequent updates to the Water Quality Improvement Plan; AND~~

~~(b)~~(a) The Copermittee ~~continues to~~ is implementing the water quality improvement strategies within its jurisdiction developed pursuant to Provision B.3.b.(1) and in ~~accordance~~ compliance with the schedules for implementing the strategies established pursuant to Provisions B.3.b.(3)(a) and B.3.c.(1)(a)(vii); AND

~~(c)~~(b) The Copermittee ~~continues to~~ is performing the monitoring and assessments ~~specified in the Water Quality Improvement Plan,~~ developed ~~and implemented~~ pursuant to Provision B.3.c.(1)(c)~~, to demonstrate its progress toward achieving the numeric goals applicable to its MS4 discharges in accordance with the interim and final dates for achieving the numeric goals established pursuant to Provision B.3.a.(2)~~; AND

~~(d)~~(c) The Copermittee's assessments in the Water Quality Improvement Plan Annual Report submitted pursuant to Provision F.3.b.(3) support a conclusion that: 1) the Copermittee is in compliance with the annual milestones and dates for achievement developed pursuant to Provision B.3.c.(1)(a)(vii), OR 2) the Copermittee has provided acceptable rationale and recommends appropriate modifications to the interim numeric goals, and/or water quality improvement strategies, and/or schedules to improve the rate of progress toward achieving the final numeric goals developed pursuant to Provisions B.3.a and B.3.c.(1)(a)(i)-(vi); AND

(d) Any proposed modifications to the numeric goals, schedules, and/or annual milestones are accepted by the San Diego Water Board as part of subsequent updates to the Water Quality Improvement Plan pursuant to Provision F.2.c;[3] AND

(e) The Copermittee ~~continues to~~ is implementing the requirements of Provision A.4.a.

[3] A request for proposed changes to the Water Quality Improvement Plan does not stay any permit condition.

PUBLIC WORKSHOP AGENDA

Proposed Amendments to
Order No. R9-2013-0001, as amended by Order No. R9-2015-0001,
to Incorporate
a Definition of Prior Lawful Approval for Priority Development Projects and
an Alternative Compliance Pathway for Receiving Water Limitations

Tuesday, June 30, 2015
9:30 a.m. – 12:00 p.m.

Location: City of Vista Civic Center Complex, Community Room, 200 Civic Center Drive, Vista, CA 92084

1. Introductions (Lewis Michaelson)

2. Prior Lawful Approval Draft Permit Language

   QUESTION: Is there a definition of prior lawful approval that will allow developers, the environmental community, and the Copermittees to clearly understand when a development project should be subject to the Priority Development Project requirements of the Regional MS4 Permit?

   a. Review of Significant Language Changes (Christina Arias)

   b. Comments and Questions

3. Alternative Compliance Pathway for Receiving Water Limitations Draft Permit Language

   QUESTION: What ambitious, rigorous and transparent alternative compliance path should be required that allows a Copermittee an appropriate period of time to come into compliance with receiving water limitations, as a precondition of a Copermittee being considered in compliance with the receiving water limitations while fully implementing the compliance alternative?

   a. Review of Significant Language Changes (Wayne Chiu)

   b. Comments and Questions

4. Next Steps (Laurie Walsh)

Permit Team
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Eric Becker, Senior Water Resource Control Engineer- Eric.Becker@waterboards.ca.gov

ELECTRONIC MAIL LIST SUBSCRIPTION
The San Diego Water Board has established an electronic mail list specifically for information and notices on the development of a Regional MS4 Storm Water Permit. The San Diego Water Board will use the email list to notify interested persons of upcoming important events and the availability of on-line documents. Persons interested in receiving future notices and information on this specific project can subscribe to one (1) of the electronic mail lists titled “Orange County MS4 Permit, “ Riverside County MS4 Permit, or “San Diego MS4 Permit ”, located on the San Diego Water Board website at:
http://www.waterboards.ca.gov/resources/email_subscriptions/reg9_subscribe.shtml

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PUBLIC WORKSHOP
Proposed Amendments to Order No. R9-2013-0001, as amended by Order No. R9-2015-0001, to Incorporate a Definition of Prior Lawful Approval for Priority Development Projects and an Alternative Compliance Pathway for Receiving Water Limitations
June 30, 2015

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PUBLIC WORKSHOP
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June 30, 2015

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PUBLIC WORKSHOP
Proposed Amendments to Order No. R9-2013-0001, as amended by Order No. R9-2015-0001, to Incorporate a Definition of Prior Lawful Approval for Priority Development Projects and an Alternative Compliance Pathway for Receiving Water Limitations
June 30, 2015

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PUBLIC WORKSHOP

Proposed Amendments to Order No. R9-2013-0001, as amended by Order No. R9-2015-0001, to Incorporate a Definition of Prior Lawful Approval for Priority Development Projects and an Alternative Compliance Pathway for Receiving Water Limitations

June 30, 2015

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Regional MS4 Permit

Public Wrap-up Workshop

Proposed Amendments to
Order No. R9-2013-0001, as amended by Order No. R9-2015-0001

Definition of Prior Lawful Approval for Priority Development Projects
and
Alternative Compliance Pathway for Receiving Water Limitations

June 30, 2015

City of Vista Civic Center Complex

Prior Lawful Approval

Prior Lawful Approval

Review of Significant Language Changes

- **Copermittee /BIA Proposals**
  - Add Fourth Term Permit “floor”
  - Change “building permit” to “development approval or construction permit” based on design
  - Subsequent Approval and Permits Issued within 5 Years
  - Legal Infeasibility

Prior Lawful Approval

Review of Significant Language Changes

- **Revised Text June 23, 2015**
  - Added Fourth Term Permit “floor”
  - Changed “building permit” to “permit or approval” that authorizes commencement of construction
  - Subsequent Approval and Permits Issued within 5 Years
  - Added exception where Copermittee does not have land use or legal authority

Alternative Compliance Pathway

Alternative Compliance Pathway

Review of Significant Language Changes

- **Copermittee Proposals**
  - Link in Provision A
  - Compliance with Non-Storm Water Discharge Prohibition
  - Compliance During Development/Update
  - MS4 Outfall or Receiving Water Numeric Goals
  - Compliance for TMDL WQBELs
  - Compliance for “Other” Pollutants and Conditions

Alternative Compliance Pathway

Review of Significant Language Changes

- **Environmental Community Proposals**
  - Annual Numeric Goals, Strategies, Schedules, and Dates
  - Conditions to Trigger Non-Compliance

Alternative Compliance Pathway

Review of Significant Language Changes

- **Copermittee Proposals**
  - Link in Provision A

No additions

Alternative Compliance Pathway

Review of Significant Language Changes

- **Copermittee Proposals**
  - Compliance with Non-Storm Water Discharge Prohibition

No additions

Alternative Compliance Pathway

Review of Significant Language Changes

- **Copermittee Proposals**
  - Compliance During Development/Update

No additions

Alternative Compliance Pathway

Review of Significant Language Changes

- **Copermittee Proposals**
  - MS4 Outfall or Receiving Water Numeric Goals

Added
Additional Flexibility

Alternative Compliance Pathway

Review of Significant Language Changes

- **Copermittee Proposals**
  - Compliance for TMDL WQBELs

Added
Provisions A.1.d and A.3.b

Alternative Compliance Pathway

Review of Significant Language Changes

- **Copermittee Proposals**
  - Compliance for “Other” Pollutants and Conditions

Added
Option to Include
“Other” Pollutant and Conditions

Alternative Compliance Pathway

Review of Significant Language Changes

- **Environmental Community Proposals**
  - Annual Numeric Goals, Strategies, Schedules, and Dates

Added

Annual Milestones

Alternative Compliance Pathway

Review of Significant Language Changes

- **Environmental Community Proposals**
  - Conditions to Trigger Non-Compliance

Added

Annual Compliance Reporting

Regional Water Quality Control Board
San Diego Region

San Diego Regional Water Quality Control Board
Definition of Prior Lawful Approval for Priority Development Projects and Alternative Compliance Pathway for Receiving Water Limitations
Public Wrap-up Workshop Summary
June 30, 2015
9:30 a.m. to 12:00 p.m.

Summary of Audience Comments/Questions

Prior Lawful Approval Draft Permit Language

- **BIA**: This new language provides good clarification for both public and private projects

- **SANDAG**: We are a regional planning agency so we cross into many jurisdictions. Also, we often have a two year lag time between an environmental document and commencement of construction. So we feel like we're in a Catch-22. We might have to incur more expense and lose time having to redesign. How do these regulations apply to projects that might have a multiyear lead time?
  - **Water Board Response:** What has been described is what we have been talking about the last several months. This process started with a footnote in the previous San Diego County MS4 Permit and we have been discussing ever since. This language tries to clarify the intent of the footnote. It now is stated clearly to say that approvals should be tied to the issuance of a permit and the commencement of construction. At some point there has to be a cut off, but you can submit your concerns in comments on the tentative order.

- **Pardee Homes**: What is the reason vested tentative maps and development agreements have not been included. Example: A project that has been in process for ten years. The project is ready for a grading permit and it has all the discretionary approvals. The cake is baked, but there is no ability to proceed until we get 401 permits, over which we have no control and which can drag on.
  - **Water Board Response:** When we first started out in this process we were looking at clarifying that footnote. We were asked to consider other approvals, such as vested tentative maps and development agreements. However, as we learned what vested tentative maps and development agreements really are, we realized that those types of approvals were not in line with the intent of the footnote. It is also a matter of timing. We are trying to write permits for the long term, not just to address short term issues.
  - **BIA Comment**: Since this is basically devised from federal law this is why it basically trumps vested tentative maps and development agreements. The final authority is going to rest with the Copermittee. Unfortunately, they have to draw a line somewhere in the sand.

- **BIA**: Does the language give the Copermittees discretion in land use authority?
  - **Water Board Response:** Yes, the language maintains a Copermittee's land use authority. When we were looking at the comments and the discussions from the previous workshops, one of the comments was to maintain a Copermittee's land use authority.

- **BIA**: Has staff thought about extending the timeline so the Board can adopt and we can all understand what the Board is adopting?
  - **Water Board Response:** We are aware of the timing issues. We are hoping to release the tentative order in July. On the other hand, it should already be clear to you what the direction is. Please submit your comments about timing on the tentative order.

- **City of Escondido**: For clarification, not only does the project applicant have to have the permit, but they have to act on it within 6 months of the effective date of the BMP design manual, correct? So we will have to check that these sites have active construction or else they'll have to redesign?
  - **Water Board Response:** Correct

Alternative Compliance Pathway Draft Permit Language

- **County of San Diego:** Overall we are really happy with the language and about 90% of the way there. The Copermittees would like to thank staff for meeting and working with us.

- **San Diego Coastkeeper**: Under Provision B.3.c.(1)(b), the requirement for the analysis to utilize a watershed model and watershed analytical tools was removed. What is the basis? Or is everyone just going to wing it here? Will the Board be providing further guidance, perhaps like the Los Angeles Water Board?
  - **Water Board Response:** With the incorporation of the public process we are going to look at whether we believe what has been provided by the Copermittee is sufficient. Part of the reasoning is that we received some cautions about specifically requiring modeling, both because of the cost and because models do not guarantee you get a good answer. We do not agree with the Los Angeles Water Board approach in this case.

- **San Diego Coastkeeper**: For Provision B.3.c.(2)(c), there seems to be a level of subjectivity to accepting modifications to annual milestones.
  - **Water Board Response:** The key words are "acceptable" and "appropriate." We have to have some real rationale of why they didn't achieve their annual milestones and real recommendations to improve achievement of milestones. We wanted the ability to have some discretion to determine compliance. Ultimately that annual milestone is to gauge how well that program is working.

- **City of Laguna Beach**: Why was Provision A.3.a not included as part of the Alternative Compliance Pathway?
  - **Water Board Response:** We are not certain it is appropriate to include Provision A.2.b as part of the Alternative Compliance Pathway. We still need to do a little more legal analysis on whether or not that is justified.

- **County of Orange**: Does the footnote for annual milestones accommodate changes in direction or things that you pursue but don't always come to fruition? There can be legitimate false starts that can't be claimed to "build towards" the next step or the alternative that is adopted.
  - **Water Board Response:** Building upon a milestone doesn't always have to be in a linear fashion. It can be logarithmic or asymptotic.

- **County of Orange**: We are not talking about the shape of the curve, but actually abandoning something that isn't working and starting on a completely different tack. How could that be considered "building upon" even though that will undoubtedly happen at times?
- **City of Dana Point**: Are you able to use new technology?
  - **Water Board Response:** Milestones are not necessarily numeric. Milestones are what you are planning to do that are supposed to result in some kind of achievement in improving water quality. We tried to structure this permit so the Copermittees can be a little more assertive.

- **County of Orange**: How do annual milestones work with multi-year phasing?
  - **Water Board Response:** Any pollutant you're going to be looking at will likely involve a suite of strategies. You can pick a milestone the first year that corresponds to near-term actions and pick milestones in later years for actions that may not be initiated or achieved until later.

- **Surfrider**: Our biggest concern is the Copermittees not meeting those milestones and just hanging out there forever. Are you open to having some type of time certain for when one moves from compliance to non-compliance?
  - **Water Board Response:** After one year of missing a milestone we can determine that a Copermittee is out of compliance. The question is what triggers noncompliance. We don't want to lose the discretion to say that a Copermittee is out of or in compliance. An annual trigger point is now in the language, but we cannot craft language that is going to provide certainty for what will constitute that trigger until we look at the reasons for why a milestone was missed and the modifications that are being offered to rectify it.

- **Riverside County Flood Control**: How many annual milestones do we need to have to give you? It could be very difficult to predict milestones beyond a five-year permit term.
- **County of San Diego Comment**: The County could have up to 60 annual goals per year given we are in 8 watersheds. So many annual goals might have the effect of lowering the bar.
  - **Water Board Response:** You need to propose annual milestones until you get to the final numeric goal. Please submit these are comments on the tentative order.

- **City of San Diego**: Can you explain why Provision A.2.b was not included as part of the Alternative Compliance Pathway?
  - **Water Board Response:** We are not certain we have the authority to include Provision A.2.b as part of the Alternative Compliance Pathway. Our draft language still has to go through a legal review before issuing the tentative order.

Next Steps

The tentative order to amend the Regional MS4 Permit is anticipated to be released by the end of July, which will start the public written comment period. The plan is to go before the Board in November for adoption of the tentative order.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

2375 Northside Drive, Suite 100, San Diego, CA 92108
Phone (619) 516-1990 Fax (619) 516-1994
http://www.waterboards.ca.gov/sandiego

TENTATIVE
ORDER NO. R9-2015-0100

AN ORDER AMENDING ORDER NO. R9-2013-0001, NPDES NO. CAS010266, AS AMENDED BY ORDER NO. R9-2015-0001 NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The California Regional Water Quality Control Board, San Diego Region (hereinafter San Diego Water Board), finds that:

ENROLLMENT OF RIVERSIDE COUNTY COPERMITTEES

1. **Enrollment Process.** On May 8, 2013, the San Diego Water Board adopted Order No. R9-2013-0001, NPDES No. CAS019266, *National Pollutant Discharge Elimination System Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Order No. R9-2013-0001, or Regional MS4 Permit). Provision F.5 of that Order (as amended by Order No. R9-2015-0001) outlines a process to designate (enroll) the County of Riverside, the Riverside County Cities of Murrieta, Temecula, and Wildomar, and the Riverside County Flood Control and Water Conservation District as Copermittees under Order No. R9-2013-0001, responsible for compliance with the terms and the conditions of the Regional MS4 Permit. Provision F.5 provides that prior to such enrollment, the San Diego Water Board must first review and consider a Report of Waste Discharge (ROWD) submitted by the Riverside County Copermittees under their current MS4 Permit, Order No. R9-2010-0016, to determine whether the Copermittees should be enrolled under Order No. R9-2013-0001, and what changes to Order No. R9-2013-0001 proposed in the ROWD are appropriate.

2. **Report of Waste Discharge.** By letter dated May 8, 2015, the Riverside County Copermittees jointly submitted a ROWD in application for the reissuance of waste discharge requirements, pursuant to the requirements of section K.2.c of Order No. R9-2010-0016. The San Diego Water Board reviewed the ROWD and determined it is complete.

3. **Riverside County Copermittees Enrollment.** After consideration of the Riverside County Copermitees' ROWD and changes needed to Order No. R9-2013-0001, the San Diego Water Board determined that the County of Riverside, the Cities of Murrieta, Temecula, and Wildomar, and the Riverside County Flood Control and Water Conservation District should be enrolled as Copermittees under Order No. R9-2013-0001 and be responsible for compliance with the terms and the conditions of the Regional MS4 Permit. Enrolling the Riverside County Copermittees into Order No. R9-2013-0001 will provide regulatory consistency in the implementation of MS4 permit requirements throughout the San Diego Region, improve communication and coordination among Copermittees within watersheds crossing multiple jurisdictions, and maximize efficiency and economy of resources for the San Diego Water Board achieved through the redirection of staff permitting resources to better advance the storm water program. Enrollment of the Cities of Murrieta and Wildomar is subject to a California Water Code section 13228 agreement as set forth in the findings of this Order.

DESIGNATION OF A REGIONAL WATER BOARD

4. **Regional Water Board Designation.** The Cities of Menifee, Murrieta, and Wildomar are located partially within the jurisdictions of both the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board) and the San Diego Water Board. California Water Code section 13228 provides a way to streamline the regulation of entities whose jurisdictions straddle the border of two or more Regional Water Boards.

   As allowed by California Water Code section 13228, during the proceedings for Order No. R9-2010-0016, the Fourth Term Riverside County MS4 Permit, written requests for designation of a single Regional Water Board to regulate matters pertaining to Phase I MS4 discharges were submitted to the San Diego Water Board and Santa Ana Water Board by the City of Murrieta by letter dated July 20, 2010, the City of Wildomar by letter dated July 21, 2010, and the City of Menifee by letter dated July 22, 2010. The Cities of Murrieta and Wildomar requested designation of the San Diego Water Board, and the City of Menifee requested designation of the Santa Ana Water Board.

   As authorized by California Water Code section 13228 and pursuant to written agreements dated September 28, 2010 between the San Diego Water Board and the Santa Ana Water Board, the San Diego Water Board is designated under Order No. R9-2010-0016 to regulate Phase I MS4s within the entire jurisdictional area of the Cities of Murrieta and Wildomar, including those areas of each City located within the Santa Ana Water Board's geographic jurisdiction. The Santa Ana Water Board is designated under Order No. R8-2010-0033 to regulate the Phase I MS4s within the entire jurisdictional area of the City of Menifee, including those areas of the City located within the San Diego Water Board's geographic jurisdiction. Written requests to continue these Regional Water Board designations were submitted to the San Diego Water Board and Santa Ana Water Board by the City of Murrieta by

letter dated June 22, 2015, the City of Wildomar by letter dated June 23, 2015, and the City of Menifee by letter dated June 25, 2015.

5. **Factual Considerations.** The Santa Ana Water Board and San Diego Water Board establish generally consistent requirements for MS4 discharges to meet the technology-based standard of reducing pollutants in the discharge to the maximum extent practicable (MEP), a related iterative process to ensure MS4 discharges meet receiving water quality standards, and for non-storm water discharges to be effectively prohibited from entering the MS4. However due to the unique nature of watersheds and water quality issues in the San Diego Region and Santa Ana Region, MS4 permit requirements between the two Regional Water Boards may also vary to address region specific pollutant discharges and watershed conditions. The Cities of Menifee, Murrieta, and Wildomar report that management and implementation of municipal programs to comply with two different MS4 permits creates a significant administrative and financial burden that is not contributing to greater overall water quality improvements in either region.

6. **Regional Water Board Agreement.** The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated [Month][Day], 2015 to:

   a. Continue designation of the San Diego Water Board to regulate Phase I MS4 discharges within the entire jurisdictional area of the Cities of Murrieta and Wildomar, including those areas of each City located within the Santa Ana Region upon the effective date of Order R9-2015-0100, *and*

   b. Continue designation of the San Ana Water Board to regulate Phase I MS4 discharges within the entire jurisdictional area of the City of Menifee, including those areas of the City located within the San Diego Region, under Order No. R8-2010-0033 (NPDES No. CAS618030) as it may be amended or reissued upon the effective date of Order No. R9-2015-0100.

7. **Periodic Review of Regional Water Board Agreement.** The basis supporting the Cities of Menifee, Murrieta, and Wildomar requests to designate a specific Regional Water Board for regulatory oversight of MS4 discharges may change under future conditions and circumstances. Therefore the San Diego Water Board and Santa Ana Water Board will periodically review the effectiveness of the agreement during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate the agreement with the Santa Ana Water Board or otherwise modify the agreement subject to the approval of the Santa Ana Water Board.

AMENDMENTS TO ORDER NO. R9-2013-0001

8. **Effect of this Order.** Order No. R9-2013-0001 is not being reopened for any other purpose than the amendments contained herein. Except as contradicted or superseded by the findings and directives set forth in this Order, all of the previous findings and directives of Order No. R9-2013-0001 (as amended by Order No. R9-2015-0001) shall remain in full force and effect.

9. **Enroll Riverside County Copermittees.** This Order amends Order No. R9-2013-0001 to incorporate the County of Riverside, the Riverside County Cities of Murrieta, Temecula, and Wildomar, and the Riverside County Flood Control and Water Conservation District as Copermittees responsible for compliance with the terms and the conditions of Order No. R9-2013-0001, as amended by Order No. R9-2015-0001 and this Order.

10. **Alternative Compliance Pathway for Prohibitions and Limitations.** The San Diego County, Orange County, and Riverside County Copermittees have asserted that the prohibitions and limitations under Provision A of Order No. R9-2013-0001 may result in many years of noncompliance because years of technical efforts may ultimately be required to achieve compliance with the prohibitions and limitations, especially for wet weather discharges.

    The San Diego Water Board considered the incorporation of an alternative pathway to compliance during the adoption proceedings for Order No. R9-2013-0001 in May 2013, but chose not to include it at that time. During the proceedings for Order No. R9-2015-0001, amending Order No. R9-2013-0001 to extend coverage of the Regional MS4 Permit to the Orange County Copermittees and as reflected in Order No. R9-2015-0001, the San Diego Water Board committed to considering the incorporation of a well-defined, transparent, and finite alternative pathway to compliance in Order No. R9-2013-0001 during the MS4 permit reissuance proceedings for the Riverside County Copermittees.

    On June 16, 2015, the State Water Resources Control Board (State Water Board) adopted Order WQ 2015-0075, *In the Matter of Review of Order No. R4-2012-0175, NPDES Permit No. CAS004001, Waste Discharge Requirements for Municipal Separate Storm Sewer System (MS4) Discharges within the Coastal Watersheds of Los Angeles County, Except Those Discharges Originating from the City of Long Beach MS4,* which directs all Regional Water Boards to consider a watershed-based planning and implementation approach to compliance with receiving water limitations when issuing Phase I MS4 permits going forward. Consistent with the principles set forth in Order WQ 2015-0075, this Order amends Order No. R9-2013-0001 to incorporate an alternative compliance pathway that allows a Copermittee to utilize the watershed-based Water Quality Improvement Plan to be deemed in compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2.a, and A.3.b which are included in the prohibitions and limitations under Provision A of the Regional MS4 Permit.

    This Order amends the Fact Sheet of Order No. R9-2013-0001, Attachment F, section VII.E, Antidegradation Policy, to provide an expanded analysis consistent with the principles set forth in State Water Board Order WQ 2015-0075, demonstrating why the incorporation of an alternative compliance pathway for prohibitions and limitations in Order No. R9-2013-0001 complies with federal and state antidegradation policies. This Order also amends the Fact Sheet of Order No. R9-2013-0001, Attachment F, section VII.E, Anti-Backsliding Requirements, with an expanded analysis consistent with State Water Board Order WQ 2015-0075

demonstrating that the anti-backsliding requirements of the Clean Water Act and the federal regulations do not foreclose the incorporation of an alternative compliance pathway into Order No. R9-2013-0001.

11. **Update to Non-Storm Water Discharges.** Since Order No. R9-2013-0001 was adopted, the State Water Board adopted Order 2014-0194-DWQ (*Statewide National Pollutant Discharge Elimination System (NPDES) Permit for Drinking Water System Discharges to Waters of the United States*) and the San Diego Water Board adopted Order No. R9-2015-0013 (*General Waste Discharge Requirements for Groundwater Extraction Discharges to Surface Waters within the San Diego Region*). These orders are NPDES permits regulating non-storm water discharges that may be discharged to the Copermittees' MS4s. This Order amends Order No. R9-2013-0001 to incorporate State Water Board Order 2014-0194-DWQ and San Diego Water Board Order No. R9-2015-0013 into the requirements for addressing non-storm water discharges.

12. **Priority Development Project Definition Consistency.** The Fact Sheet of the Regional MS4 Permit as modified by Order No. R9-2015-0001, describes on Page F-98 the San Diego Water Board's intent that the Priority Development Project categories in Provision E.3.b.(1) be consistent with the categories in the Riverside County MS4 Permit (Order No. R9-2010-0016) and the Orange County MS4 Permit (Order No. R9-2009-0002). The San Diego Water Board's intention reflected in the Fact Sheet was not explicitly incorporated in some of the Priority Development Project categories described in Provision E.3.b.(1) and this Order amends the provision with clarifying language to better describe these categories consistent with the Fact Sheet. The Order also has been amended to include the requirements for updating the BMP Design Manual as a result of the corrections to the Priority Development Project categories in Provision E.3.b.(1).

13. **Definition of Prior Lawful Approval.** During the proceedings for Order No. R9-2015-0001, amending Order No. R9-2013-0001 to extend coverage of the Regional MS4 Permit to the Orange County Copermittees, the land development community asserted that the lack of a definition for the term "prior lawful approval" in the Regional MS4 Permit had created significant uncertainty for the San Diego County Copermittees, the land development community, and the general public about when the development planning requirements are applicable. The San Diego Water Board committed to considering the incorporation of additional guidance for prior lawful approval in Order No. R9-2013-0001 during the MS4 permit reissuance proceedings for the Riverside County Copermittees. This Order amends Order No. R9-2013-0001 to incorporate additional clarification describing when the structural BMP performance requirements are applicable to Priority Development Projects.

14. **Los Peñasquitos Lagoon Sediment TMDL.** During the proceedings for Order No. R9-2015-0001, amending Order No. R9-2013-0001 to extend coverage of the Regional MS4 Permit to the Orange County Copermittees, the San Diego County Copermittees responsible for implementing the TMDLs for Sediment in Los

Peñasquitos Lagoon requested several minor revisions to make the TMDL requirements consistent with the Basin Plan amendment adopted by the San Diego Water Board. This Order amends Attachment E to Order No. R9-2013-0001 to incorporate minor revisions to the Los Peñasquitos Lagoon Sediment TMDL to make the requirements consistent with the adopted Basin Plan amendment.

15. **Compliance Dates for TMDLs Beaches and Creeks Indicator Bacteria TMDLs.** A review of the interim and final compliance dates for the Revised TMDLs for Indicator Bacteria, Project I – Beaches and Creeks (Beaches and Creeks Indicator Bacteria TMDLs) in the San Diego Region in Attachment E to the Order revealed an inconsistency with the adopted Basin Plan amendment. This Order amends Attachment E to Order No. R9-2013-0001 to incorporate minor revisions to the Beaches and Creeks Indicator Bacteria TMDLs to make the requirements consistent with the adopted Basin Plan amendment.

16. **Removal of Application for Early Coverage Provisions.** Order No. R9-2013-0001, as amended by Order No. R9-2015-0001 included several provisions that allowed the Riverside County Copermittees to apply for early coverage under the Regional MS4 Permit prior to the expiration of Order No. R9-2010-0016. These provisions are no longer necessary once the Riverside County Copermittees are covered by the requirements of the Regional MS4 Permit with the adoption of this Order. This Order amends Order No. R9-2013-0001 to remove provisions related to applying for early coverage under the Regional MS4 Permit.

ADMINISTRATIVE FINDINGS

17. **California Environmental Quality Act**. This action is exempt from the requirement of preparation of environmental documents under the California Environmental Quality Act [Public Resources Code, Division 13, Chapter 3, Section 21000 et seq.] in accordance with California Water Code section 13389.

18. **Public Notice.** In accordance with State and federal laws and regulations, the San Diego Water Board has notified San Diego County, Orange County and Riverside County Copermittees, and all known interested agencies and persons of its intent to adopt this Order and has provided them with an opportunity to submit their written comments.

19. **Public Hearing.** The San Diego Water Board held a public hearing on November 18, 2015 and heard and considered all comments pertaining to the adoption of this Order.

20. **Notification.** Any person aggrieved by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with California Water Code section 13320 and California Code of Regulations, title 23, sections 2050 et seq. The State Water Board must receive the petition by 5:00 p.m., 30 days after the adoption date of this Order. Copies of the law and regulations applicable to filing petitions may be found on the Internet at:

http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

THEREFORE, IT IS HEREBY ORDERED,

1. This Order amends Order No. R9-2013-0001 and Fact Sheet as amended by Order No. R9-2015-0001 (Regional MS4 Permit and Fact Sheet). The revisions to the Regional MS4 Permit and Fact Sheet are shown Attachments 1 and 2 to this Order. Added text to the Regional MS4 Permit and Fact Sheet is displayed in blue-underline text and deleted text is displayed as red-strikeout text.

2. The amended Regional MS4 Permit and Fact Sheet included as Attachments 1 and 2 to this Order shall become effective on January 7, 2016.

3. The amended Regional MS4 Permit and Fact Sheet included as Attachments 1 and 2 to this Order shall supersede Order No. R9-2010-0016 for the Riverside County Copermittees except for enforcement purposes.

4. San Diego Water Board staff is directed to prepare and post a conformed copy of the Regional MS4 Permit and Fact Sheet, as amended by this Order, incorporating the revisions made by this Order.

I, David W. Gibson, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on November 18, 2015.

TENTATIVE

David W. Gibson
Executive Officer

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

ORDER NO. R9-2013-0001,
AS AMENDED BY ORDER NOS. R9-2015-0001 AND R9-2015-0100
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The San Diego County Copermittees in Table 1a are subject to waste discharge requirements set forth in this Order.

Table 1a. San Diego County Copermittees

City of Carlsbad	City of Oceanside
City of Chula Vista	City of Poway
City of Coronado	City of San Diego
City of Del Mar	City of San Marcos
City of El Cajon	City of Santee
City of Encinitas	City of Solana Beach
City of Escondido	City of Vista
City of Imperial Beach	County of San Diego
City of La Mesa	San Diego County Regional Airport Authority
City of Lemon Grove	San Diego Unified Port District
City of National City	

The Orange County Copermittees in Table 1b are subject to waste discharge requirements set forth in this Order.

Table 1b. Orange County Copermittees[1]

City of Aliso Viejo	City of Rancho Santa Margarita
City of Dana Point	City of San Clemente
City of Laguna Beach	City of San Juan Capistrano
City of Laguna Hills	City of Laguna Woods
City of Laguna Niguel	County of Orange
City of Mission Viejo	Orange County Flood Control District

~~After the San Diego Water Board receives and considers the Riverside County Copermittees' Report of Waste Discharge and makes any necessary changes to this Order, t~~The Riverside County Copermittees in Table 1c ~~will become~~ are subject to waste

[1] While not listed in Table 1b., the City of Lake Forest remains a Copermittee under this Order until the later effective date of this Order or the effective date of Santa Ana Water Board Tentative Order No. R8-2015-0001. Thereafter, the City of Lake Forest will no longer be considered a Copermittee under this Order because its Phase I MS4 discharges will be regulated by the Santa Ana Water Board pursuant to Water Code section 13228 designation. The requirements of this Order that apply to the City of Lake Forest for the duration of this Order, however, are described in Finding 29 and Footnote 2 to Table B-1.

discharge requirements set forth in this Order ~~after expiration of Order No.R9-2010-0016, NPDES No. CAS0108766 on or after November 10, 2015~~.

Table 1c. Riverside County Copermittees

City of Murrieta	County of Riverside
City of Temecula	Riverside County Flood Control and Water Conservation District
City of Wildomar	

~~The Riverside County Copermittees may become subject to the requirements of this Order at a date earlier than the expiration date of their current Order subject to the conditions described in Provision F.6 of this Order if the Riverside County Copermittees receive notification of coverage from the San Diego Water Board.~~

The term Copermittee in this Order refers to any San Diego County, Orange County, or Riverside County Copermittee covered under this Order, unless specified otherwise.

This Order provides permit coverage for the Copermittee discharges described in Table 2.

Table 2. Discharge Locations and Receiving Waters

Discharge Points	Locations throughout San Diego Region
Discharge Description	Municipal Separate Storm Sewer System (MS4) Discharges
Receiving Waters	Inland Surface Waters, Enclosed Bays and Estuaries, and Coastal Ocean Waters of the San Diego Region

Table 3. Administrative Information

This Order was adopted by the San Diego Water Board on:	**May 8, 2013**
Order No. R9-2013-0001 became effective on:	**June 27, 2013**
This Order as amended by R9-2015-0001 became effective on:	**April 1, 2015**
This Order as amended by R9-2015-0100 became effective on:	**January 7, 2016**
This Order will expire on:	**June 27, 2018**
The Copermittees must file a Report of Waste Discharge in accordance with Title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than 180 days in advance of the Order expiration date.	

I, David W. Gibson, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on May 8, 2013, as amended by adoption of Order No. R9-2015-0001 on February 11, 2015, and as amended by adoption of Order No. R9-2015-0100 on November 18, 2015.

TENTATIVE

David W. Gibson
Executive Officer

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ATTACHMENTS

Attachment A: Discharge Prohibitions and Special Protections A-1
Attachment B: Standard Permit Provisions and General Provisions B-1
Attachment C: Acronyms, Abbreviations and Definitions C-1
Attachment D: Jurisdictional Runoff Management Program Annual Report Form D-1
Attachment E: Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2013-0001, as amended by Order Nos. R9-2015-0001 and R9-2015-0100 ..... E-1
Attachment F: Fact Sheet / Technical Report for Order No. R9-2013-0001 as amended by Order Nos. R9-2015-0001 and R9-2015-0100 ..... F-1

I. FINDINGS

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), finds that:

JURISDICTION

1. **MS4 Ownership or Operation.** Each of the Copermittees owns or operates an MS4, through which it discharges storm water and non-storm water into waters of the U.S. within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the U.S.

2. **Legal and Regulatory Authority.** This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]) adopted by the United States Environmental Protection Agency (USEPA), and chapter 5.5, division 7 of the California Water Code (CWC) (commencing with section 13370). This Order serves as an NPDES permit for discharges from MS4s to surface waters. This Order also serves as waste discharge requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

   The San Diego Water Board has the legal authority to issue a regional MS4 permit pursuant to its authority under CWA section 402(p)(3)(B) and 40 CFR 122.26(a)(1)(v). The USEPA also made it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide permits (55 Federal Register [FR] 47990, 48039-48042). The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees and San Diego Water Board.

   The federal regulations make it clear that the Copermittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators (40 CFR 122.26(a)(3)(vi)). This Order does not require the Copermittees to manage storm water outside of their jurisdictional boundaries, but rather to work collectively to improve storm water management within watersheds.

3. **CWA NPDES Permit Conditions.** Pursuant to CWA section 402(p)(3)(B), NPDES permits for storm water discharges from MS4s must include requirements to effectively prohibit non-storm water discharges into MS4s, and require controls to reduce the discharge of pollutants in storm water to the maximum extent practicable (MEP), and to require other provisions as the San Diego Water Board determines are appropriate to control such pollutants. This Order prescribes conditions to assure compliance with the CWA requirements for owners and operators of MS4s to effectively prohibit non-storm water discharges into the MS4s, and require controls to reduce the discharge of pollutants in storm water from the MS4s to the MEP.

4. **CWA and CWC Monitoring Requirements.** CWA section 308(a) and 40 CFR 122.41(h),(j)-(l) and 122.48 require that NPDES permits must specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s also specify additional monitoring and reporting requirements in 40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c). CWC section 13383 authorizes the San Diego Water Board to establish monitoring, inspection, entry, reporting and recordkeeping requirements. This Order establishes monitoring and reporting requirements to implement federal and State requirements. This Order also includes requirements for the Orange County Copermittees to participate in, and together with South Orange County Wastewater Authority and Orange County Health Care Agency, share responsibility for implementing the unified approach to beach water quality monitoring and assessment program set forth in the October 2014 report, *Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County*, issued pursuant to CWC section 13383 in the San Diego Water Board December 5, 2014 Letter Directive.

5. **Total Maximum Daily Loads.** CWA section 303(d)(1)(A) requires that "[e]ach state shall identify those waters within its boundaries for which the effluent limitations are not stringent enough to implement any water quality standard applicable to such waters." The CWA also requires states to establish a priority ranking of impaired water bodies known as Water Quality Limited Segments and to establish Total Maximum Daily Loads (TMDLs) for such waters. This priority list of impaired water bodies is called the Clean Water Act Section 303(d) List of Water Quality Limited Segments, commonly referred to as the 303(d) List. The CWA requires the 303(d) List to be updated every two years.

   TMDLs are numerical calculations of the maximum amount of a pollutant that a water body can assimilate and still meet water quality standards. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point sources (waste load allocations or WLAs) and non-point sources (load allocations or LAs), background contribution, plus a margin of safety. Discharges from MS4s are point source discharges. The federal regulations (40 CFR 122.44(d)(1)(vii)(B)) require that NPDES permits incorporate water quality based effluent limitations (WQBELs) developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, consistent with the assumptions and requirements of any available WLA for the discharge. Requirements of this Order implement the TMDLs established by the San Diego Water Board or USEPA as of the date this Order was amended in 2015. This Order establishes WQBELs consistent with the assumptions and requirements of all available TMDL WLAs assigned to discharges from the Copermittees' MS4s.

6. **Non-Storm Water Discharges.** Pursuant to CWA section 402(p)(3)(B)(ii), this Order requires each Copermittee to effectively prohibit discharges of non-storm water into its MS4. Nevertheless, non-storm water discharges into and from the

MS4s continue to be reported to the San Diego Water Board by the Copermittees and other persons. Monitoring conducted by the Copermittees, as well as the 303(d) List, have identified dry weather, non-storm water discharges from the MS4s as a source of pollutants causing or contributing to receiving water quality impairments in the San Diego Region. The federal regulations (40 CFR 122.26(d)(2)(iv)(B)(1)) require the Copermittees to have a program to prevent illicit discharges to the MS4. The federal regulations, however, allow for specific categories of non-storm water discharges or flows to be addressed as illicit discharges only where such discharges are identified as sources of pollutants to waters of the U.S.

7. **In-Stream Treatment Systems.** Pursuant to federal regulations (40 CFR 131.10(a)), in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S. Authorizing the construction of a runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to accepting waste assimilation as an appropriate use for that water body. Runoff treatment must occur prior to the discharge of runoff into receiving waters. Treatment control best management practices (BMPs) must not be constructed in waters of the U.S. Construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body.

DISCHARGE CHARACTERISTICS AND RUNOFF MANAGEMENT

8. **Point Source Discharges of Pollutants.** Discharges from the MS4s contain waste, as defined in the CWC, and pollutants that adversely affect the quality of the waters of the state. A discharge from an MS4 is a “discharge of pollutants from a point source” into waters of the U.S. as defined in the CWA. Storm water and non-storm water discharges from the MS4s contain pollutants that cause or threaten to cause a violation of surface water quality standards, as outlined in the Water Quality Control Plan for the San Diego Basin (Basin Plan). Storm water and non-storm water discharges from the MS4s are subject to the conditions and requirements established in the Basin Plan for point source discharges.

9. **Potential Beneficial Use Impairment.** The discharge of pollutants and/or increased flows from MS4s may cause or threaten to cause the concentration of pollutants to exceed applicable receiving water quality objectives and impair or threaten to impair designated beneficial uses resulting in a condition of pollution, contamination, or nuisance.

10. **Pollutants Generated by Land Development.** Land development has created and continues to create new sources of non-storm water discharges and pollutants in storm water discharges as human population density increases. This brings higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash. Pollutants from these sources are dumped or washed off the surface by non-storm water or storm water flows into

and from the MS4s. When development converts natural vegetated pervious ground cover to impervious surfaces such as paved highways, streets, rooftops, and parking lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving a developed area without BMPs that can maintain pre-development runoff conditions will contain greater pollutant loads and have significantly greater runoff volume, velocity, and peak flow rate than pre-development runoff conditions from the same area.

11. **Runoff Discharges to Receiving Waters.** The MS4s discharge runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within the eleven hydrologic units comprising the San Diego Region. Historic and current development makes use of natural drainage patterns and features as conveyances for runoff. Rivers, streams and creeks in developed areas used in this manner are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and receiving water. Numerous receiving water bodies and water body segments have been designated as impaired by the San Diego Water Board pursuant to CWA section 303(d).

12. **Pollutants in Runoff.** The most common pollutants in runoff discharged from the MS4s include total suspended solids, sediment, pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., cadmium, copper, lead, and zinc), petroleum products and polynuclear aromatic hydrocarbons, synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus), oxygen-demanding substances (e.g., decaying vegetation, animal waste), detergents, and trash. As operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not prohibit or otherwise control. These discharges may cause or contribute to a condition of pollution or a violation of water quality standards.

13. **Human Health and Aquatic Life Impairment.** Pollutants in runoff discharged from the MS4s can threaten and adversely affect human health and aquatic organisms. Adverse responses of organisms to chemicals or physical agents in runoff range from physiological responses such as impaired reproduction or growth anomalies to mortality. Increased volume, velocity, rate, and duration of storm water runoff greatly accelerate the erosion of downstream natural channels. This alters stream channels and habitats and can adversely affect aquatic and terrestrial organisms.

14. **Water Quality Effects.** The Copermittees' water quality monitoring data submitted to date documents persistent exceedances of Basin Plan water quality objectives for runoff-related pollutants at various watershed monitoring stations. Persistent toxicity has also been observed at several watershed monitoring stations. In addition, bioassessment data indicate that the majority of the monitored receiving waters have

Poor to Very Poor Index of Biological Integrity (IBI) ratings. These findings indicate that runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in the San Diego Region. Non-storm water discharges from the MS4s have been shown to contribute significant levels of pollutants and flow in arid, developed Southern California watersheds, and contribute significantly to exceedances of applicable receiving water quality objectives.

15. **Non-Storm Water and Storm Water Discharges.** Non-storm water discharges from the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard of CWA section 402(p)(3)(B)(iii), which is explicitly for "Municipal … *Stormwater Discharges* (emphasis added)" from the MS4s. Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s must be effectively prohibited.

16. **Best Management Practices.** Waste and pollutants which are deposited and accumulate in MS4 drainage structures will be discharged from these structures to waters of the U.S. unless they are removed. These discharges may cause or contribute to, or threaten to cause or contribute to, a condition of pollution in receiving waters. For this reason, pollutants in storm water discharges from the MS4s can be and must be effectively reduced in runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Pollution prevention is the reduction or elimination of pollutant generation at its source and is the best "first line of defense." Source control BMPs (both structural and non-structural) minimize the contact between pollutants and runoff, therefore keeping pollutants onsite and out of receiving waters. Treatment control BMPs remove pollutants that have been mobilized by storm water or non-storm water flows.

17. **BMP Implementation.** Runoff needs to be addressed during the three major phases of development (planning, construction, and use) in order to reduce the discharge of storm water pollutants to the MEP, effectively prohibit non-storm water discharges, and protect receiving waters. Development which is not guided by water quality planning policies and principles can result in increased pollutant load discharges, flow rates, and flow durations which can negatively affect receiving water beneficial uses. Construction sites without adequate BMP implementation result in sediment runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. Existing development can generate substantial pollutant loads which are discharged in runoff to receiving waters. Retrofitting areas of existing development with storm water pollutant control and hydromodification management BMPs is necessary to address storm water discharges from existing development that may cause or contribute to a condition of pollution or a violation of water quality standards.

18. **Water Quality Improvements.** Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit

non-storm water discharges to the MS4s and control pollutants in storm water discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the CWA.

19. **Long Term Planning and Implementation.** Federal regulations require municipal storm water permits to expire 5 years from adoption, after which the permit must be renewed and reissued. The San Diego Water Board recognizes that the degradation of water quality and impacts to beneficial uses of the waters in the San Diego Region occurred over several decades. The San Diego Water Board further recognizes that a decade or more may be necessary to realize demonstrable improvement to the quality of waters in the San Diego Region. This Order includes a long term planning and implementation approach that will require more than a single permit term to complete.

WATER QUALITY STANDARDS

20. **Basin Plan.** The San Diego Water Board adopted the Water Quality Control Plan for the San Diego Basin (Basin Plan) on September 8, 1994, that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for receiving waters addressed through the plan. The Basin Plan was subsequently approved by the State Water Resources Control Board (State Water Board) on December 13, 1994. Subsequent revisions to the Basin Plan have also been adopted by the San Diego Water Board and approved by the State Water Board. Requirements of this Order implement the Basin Plan.

    The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Process Supply (PROC), Industrial Service Supply (IND), Ground Water Recharge (GWR), Contact Water Recreation (REC1), Non-contact Water Recreation (REC2), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Freshwater Replenishment (FRSH), Hydropower Generation (POW), and Preservation of Biological Habitats of Special Significance (BIOL). The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region: Navigation (NAV), Commercial and Sport Fishing (COMM), Estuarine Habitat (EST), Marine Habitat (MAR), Aquaculture (AQUA), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN), and Shellfish Harvesting (SHELL).

21. **Ocean Plan.** The State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, and 2005. The State Water Board adopted the latest amendment on ~~April 21, 2005~~ October 16, 2012 and it became effective on ~~February 14, 2006~~ August 19, 2013. The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean. Requirements of this Order implement the Ocean Plan.

    The Ocean Plan identifies the following beneficial uses of ocean waters of the state to be protected: Industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture; preservation and enhancement of designated Areas of Special Biological Significance; rare and endangered species; marine habitat; fish spawning and shellfish harvesting.

22. **Sediment Quality Control Plan**. On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes: 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

23. **National Toxics Rule and California Toxics Rule.** USEPA adopted the National Toxics Rule (NTR) on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the NTR applied in California. On May 18, 2000, USEPA adopted the California Toxics Rule (CTR). The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants.

24. **Antidegradation Policy.** This Order is in conformance with the federal Antidegradation Policy described in 40 CFR 131.12, and State Water Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality Waters in California*. Federal regulations at 40 CFR 131.12 require that the State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. State Water Board Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies. The Fact Sheet of this Order contains additional discussion about antidegradation.

25. **Anti-Backsliding Requirements.** Section 402(o)(2) of the CWA and federal regulations at 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations may be relaxed. All effluent limitations in this Order are at least as stringent as effluent limitations in the previous permits. The Fact Sheet of this Order contains additional discussion about anti-backsliding.

CONSIDERATIONS UNDER FEDERAL AND STATE LAW

26. **Coastal Zone Act Reauthorization Amendments.** Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states with approved coastal zone management programs to address non-point source pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point source pollution: agriculture, silviculture, urban, marinas, and hydromodification. This Order addresses the management measures required for the urban category, with the exception of septic systems. The runoff management programs developed pursuant to this Order fulfills the need for coastal cities to develop a runoff non-point source plan identified in the Non-Point Source Program Strategy and Implementation Plan. The San Diego Water Board addresses septic systems through the administration of other programs.

27. **Endangered Species Act.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 USC sections 1531 to 1544). This Order requires compliance with receiving water limits, and other requirements to protect the beneficial uses of waters of the State. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

28. **Report of Waste Discharge Process.** The waste discharge requirements set forth in this Order are based upon the Report of Waste Discharge submitted by the San Diego County Copermittees prior to the expiration of Order No. R9-2007-0001 (NPDES No. CAS0109266), ~~and~~ the Report of Waste Discharge submitted by the Orange County Copermittees prior to the expiration of Order No. R9-2009-0002 (CAS0108740), and the Report of Waste Discharge submitted by the Riverside County Copermittees prior to the expiration of Order No. R9-2010-0016 (CAS0108766). ~~The Riverside County Copermittees are not immediately covered by the waste discharge requirements in this Order. The San Diego Water Board understands that each municipality is unique although the Counties share watersheds and/or geographical boundaries. The Order will continue to use the Report of Waste Discharge process prior to initially making Riverside County Copermittees subject to the requirements of this Order.~~

The federal regulations (40 CFR 122.21(d)(2)) and CWC section 13376 impose a duty on the Copermittees to reapply for continued coverage through submittal of a Report of Waste Discharge no later than 180 days prior to expiration of a currently effective permit. The expiration date of this Order as shown in Table 3, and requirement to file a Report of Waste Discharge no later than 180 days prior to the expiration date of the Order, applies jointly to the San Diego County, Orange County, and Riverside County Copermittees. ~~This requirement is set forth in the Riverside County Copermittees' currently effective permit at ProvisionK.2.c. The Riverside County MS4 Permit, Order No. R9-2010-0016 (NPDES No. CAS0108766) expires on November 10, 2015.~~

~~Unless the Riverside County Copermittees apply for and receive early coverage under this Order, the Riverside County Copermittees' permit will be superseded by this Order upon expiration of their permit, subject to any necessary revisions to the requirements of this Order made after the San Diego Water Board considers their Report of Waste Discharge through the public process provided in 40 CFR Part 124.~~

29. Regional Water Board Designation. The Cities of Laguna Hills, Laguna Woods, ~~and~~ Lake Forest, Menifee, Murrieta, and Wildomar are located partially within the jurisdictions of the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board) and the San Diego Water Board and their discharges are subject to regulation by both Regional Water Boards. CWC section 13228 provides a way to streamline the regulation of entities whose jurisdictions straddle the border of two or more Regions. CWC section 13228 is implemented in this Order at the request of these six cities and to ease the regulatory burden of municipalities that lie in both the San Diego Water Board's and the adjacent Santa Ana Water Board's jurisdiction. MS4 discharges from these municipalities are regulated by the San Diego Water Board and Santa Ana Water Board as follows:

a. Pursuant to CWC section 13228, the Cities of Laguna Hills, Laguna Woods, and Lake Forest submitted written requests that one Regional Water Board be designated to regulate Phase I MS4 discharges for each of the Cities. The Santa Ana Water Board and the San Diego Water Board have entered into an agreement dated February 10, 2015, whereby the Cities of Laguna Woods and Laguna Hills are largely regulated by the San Diego Water Board under this Order, including those portions of the Cities of Laguna Woods and Laguna Hills not within the San Diego Water Board's jurisdiction, upon the effective date of this Order or Santa Ana Water Board Order No. R8-2015-0001, whichever is later. Similarly, the City of Lake Forest, including those portions of the City of Lake Forest within the San Diego Water Board's jurisdiction, is largely regulated by the Santa Ana Water Board under Order No. R8-2015-0001 (NPDES No. CAS618030) upon the later effective date of this Order or Order No. R8-2015-0001. The agreement provides that the City of Lake Forest is required to retain, and continue implementation of, its over-irrigation discharge prohibition in Title 15, Chapter 14.030, List (b) of the City Municipal Code for regulating storm water quality throughout its jurisdiction. The agreement also requires the City of Lake Forest to actively participate during development and implementation of the Aliso

Creek Watershed Management Area Water Quality Improvement Plan required pursuant to this Order. Each Regional Water Board retains the authority to enforce provisions of its Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee under the terms of the agreement (Water Code section 13228 (b)). Under the terms of the agreement, any TMDL and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Laguna Woods, Laguna Hills or Lake Forest as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement of the applicable TMDL will remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's San Diego Creek/Newport Bay TMDL and the San Diego Water Board's Indicator Bacteria Project I Beaches and Creeks TMDL. The San Diego Water Board will periodically review the effectiveness of the agreement during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate the agreement with Santa Ana Water Board or otherwise modify the agreement subject to the approval of the Santa Ana Water Board.

b. Pursuant to CWC section 13228, the Cities of Murrieta, Wildomar, and Menifee submitted written requests that one Regional Water Board be designated to regulate Phase I MS4 discharges for each of the Cities. The Santa Ana Water Board and the San Diego Water Board have entered into an agreement dated [Month][Day], 2015, whereby the Cities of Murrieta and Wildomar are largely regulated by the San Diego Water Board under this Order, including those portions of the Cities of Murrieta and Wildomar not within the San Diego Water Board's jurisdiction, upon the effective date of this Order. Similarly, the City of Menifee is largely regulated by the Santa Ana Water Board under Order No. R8-2010-0033 as it may be amended or reissued, including those portions of the City of Menifee within the San Diego Water Board's jurisdiction, upon the effective date of this Order. The agreement also requires the City of Menifee to actively participate during development and implementation of the Santa Margarita River Watershed Management Area Water Quality Improvement Plan required pursuant to this Order. Each Regional Water Board retains the authority to enforce provisions of its Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee under the terms of the agreement (Water Code section 13228 (b)). Under the terms of the agreement, any TMDL and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Menifee, Murrieta, or Wildomar as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement of the applicable TMDL will remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's Lake Elsinore/Canyon Lake Nutrient

TMDLs. The San Diego Water Board will periodically review the effectiveness of the agreement during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate the agreement with Santa Ana Water Board or otherwise modify the agreement subject to the approval of the Santa Ana Water Board.

30. **Integrated Report and Clean Water Act Section 303(d) List.** The San Diego Water Board and State Water Board submit an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. USEPA issued its *Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act* on July 29, 2005, which advocates the use of a five category approach for classifying the attainment status of water quality standards for water bodies in the Integrated Report. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 in the Integrated Report are placed on the 303(d) List.

    Water bodies with available data and/or information that indicate at least one beneficial use is not being supported or is threatened, but a TMDL is not required, are included in Category 4 in the Integrated Report. Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

    Implementation of the requirements of this Order may allow the San Diego Water Board to include surface waters impaired by discharges from the Copermittees' MS4s in Category 4 in the Integrated Report for consideration during the next 303(d) List submittal by the State to USEPA.

31. **Economic Considerations.** The California Supreme Court has ruled that although CWC section 13263 requires the State and Regional Water Boards (collectively Water Boards) to consider factors set forth in CWC section 13241 when issuing an NPDES permit, the Water Board may not consider the factors to justify imposing pollutant restrictions that are less stringent than the applicable federal regulations require. (*City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 618, 626-627.) However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

    As noted in the following finding, the San Diego Water Board finds that the requirements in this Order are not more stringent than the minimum federal

requirements. Therefore, a CWC section 13241 analysis is not required for permit requirements that implement the effective prohibition on the discharge of non-storm water into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determined appropriate to control such pollutants, as those requirements are mandated by federal law. Notwithstanding the above, the San Diego Water Board has developed an economic analysis of the requirements in this Order. The economic analysis is provided in the Fact Sheet.

32. **Unfunded Mandates.** This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following:

    a. This Order implements federally mandated requirements under CWA section 402 (33 USC section 1342(p)(3)(B)).

    b. The local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental and new dischargers who are issued NPDES permits for storm water and non-storm water discharges.

    c. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order.

    d. The Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)) and in lieu of numeric restrictions on their MS4 discharges (i.e. effluent limitations).

    e. The local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under State law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

    f. The provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state develops a TMDL, federal law requires that permits must contain water quality based effluent limitations consistent with the assumptions and requirements of any applicable wasteload allocation (40 CFR 122.44(d)(1)(vii)(B)).

    See the Fact Sheet for further discussion of unfunded mandates.

33. **California Environmental Quality Act.** The issuance of waste discharge requirements and an NPDES permit for the discharge of runoff from MS4s to waters of the U.S. is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 et seq.) in accordance with CWC section 13389.

STATE WATER BOARD DECISIONS

34. **Compliance with Prohibitions and Limitations.** The receiving water limitation language specified in this Order is consistent with language recommended by the USEPA and established in State Water Board Order WQ 99-05, *Own Motion Review of the Petition of Environmental Health Coalition to Review Waste Discharge Requirements Order No. 96-03, NPDES Permit No. CAS0108740*, adopted by the State Water Board on June 17, 1999. The receiving water limitation language in this Order requires storm water discharges from MS4s to not cause or contribute to a violation of water quality standards, which is to be achieved through an iterative approach requiring the implementation of improved and better-tailored BMPs over time. Implementation of the iterative approach to comply with receiving water limitations based on applicable water quality standards is necessary to ensure that storm water discharges from the MS4 will not ultimately cause or contribute to violations of water quality standards and will not create conditions of pollution, contamination, or nuisance.

The San Diego, Orange County, and Riverside County Copermittees have asserted that the prohibitions and limitations may result in many years of noncompliance because years of technical efforts may ultimately be required to achieve compliance with the prohibitions and limitations, especially for wet weather discharges. To address this concern, this Order includes an option that allows a Copermittee to be deemed in compliance with the prohibitions and limitations where more than one permit term may be necessary to achieve full compliance with the prohibitions and limitations. One or more Copermittees within a Watershed Management Area can choose to implement this option.

An alternative compliance pathway option has been included in this Order consistent with the approach described in Order WQ 2015-0075, *In the Matter of Review of Order No. R4-2012-0175, NPDES Permit No. CAS004001, Waste Discharge Requirements for Municipal Separate Storm Sewer System (MS4) Discharges within the Coastal Watersheds of Los Angeles County, Except Those Discharges Originating from the City of Long Beach MS4,* adopted by the State Water Board on June 16, 2015. State Water Board Order WQ 2015-0075 directs the Regional Water Boards to consider a watershed-based planning and implementation approach to compliance with receiving water limitations when issuing Phase I MS4 permits going forward. Order WQ 2015-0075 included seven principles that the Regional Water Boards are expected to follow when incorporating an alternative compliance pathway into an MS4 permit. The Fact Sheet discusses the incorporation of the seven principles stipulated in State Water Board Order WQ 2015-0075 into the alternative compliance pathway option in this Order.

35. **Special Conditions for Areas of Special Biological Significance.** On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving a general exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and

NPDES permitted municipal storm water discharges (General Exception). On June 19, 2012, the State Water Board adopted Order No. 2012-0031, amending the General Exception to require pollutant reductions to be achieved within six years in accordance with ASBS Compliance Plans and ASBS Pollution Prevention Plans. The General Exception requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject to the terms and conditions of the General Exception as amended. The Special Protections contained in Attachment B to the General Exception as amended are applicable to these discharges, and are hereby incorporated into Attachment A of this Order.

ADMINISTRATIVE FINDINGS

36. **Executive Officer Delegation of Authority.** The San Diego Water Board by prior resolution has delegated all matters that may legally be delegated to its Executive Officer to act on its behalf pursuant to CWC section 13223. Therefore, the Executive Officer is authorized to act on the San Diego Water Board's behalf on any matter within this Order unless such delegation is unlawful under CWC section 13223 or this Order explicitly states otherwise.

37. **Standard Provisions.** Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR 122.42, are provided in Attachment B to this Order.

38. **Fact Sheet.** The Fact Sheet for this Order contains background information, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of this Order. The Fact Sheet is hereby incorporated into this Order and constitutes part of the Findings of this Order.

39. **Public Notice.** In accordance with State and federal laws and regulations, the San Diego Water Board notified the Copermittees, and interested agencies and persons of its intent to prescribe waste discharge requirements for the control of discharges into and from the MS4s to waters of the U.S. and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet.

40. **Public Hearings.** The San Diego Water Board held a public hearing on April 10 and 11, 2013, that was continued to May 8, 2013 and heard and considered all comments pertaining to the terms and conditions of this Order. The San Diego Water Board also held a public workshop on October 8, 2015, and a public hearing

on February 11, 2015, and heard and considered all comments pertaining to the amendment of this Order through Order No. R9-2015-0001. The San Diego Water Board also held a public hearing on November 18, 2015, and heard and considered all comments pertaining to the amendment of this Order through Order No. R9-2015-0100. Details of these public hearings are provided in the Fact Sheet.

41. **Effective Date.** This Order serves as an NPDES permit pursuant to CWA section 402 or amendments thereto, and as to the San Diego County Copermittees listed in Table ~~2.~~1a., became effective fifty (50) days after the date of its adoption, and as to the Orange County Copermittees listed in Table ~~2.~~1b., ~~becomes~~ became effective on April 1, 2015, after Order No. R9-2015-0001 was ~~is~~ adopted, and as to the Riverside County Copermittees listed in Table 1c, became effective on January 7, 2016, after Order No. R9-2015-0100 was adopted, provided that the Regional Administrator, USEPA, Region IX, does not object to this Order.

42. **Review by the State Water Board.** Any person aggrieved by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with CWC section 13320 and California Code of Regulations, title 23, sections 2050, and following. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date of this Order, except that if the thirtieth day following the date of this Order falls on a Saturday, Sunday or State holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

THEREFORE, IT IS HEREBY ORDERED that the Copermittees, in order to meet the provisions contained in division 7 of the CWC (commencing with section 13000) and regulations adopted thereunder, and the provisions of the CWA and regulations adopted thereunder, must each comply with the requirements of this Order. This action in no way prevents the San Diego Water Board from taking enforcement action for past violations of the previous Order applicable to the Copermittees. If any part of this Order is subject to a temporary stay of enforcement, unless otherwise specified, the Copermittees must comply with the analogous portions of the previous Order, which will remain in effect for all purposes during the pendency of the stay.

II. PROVISIONS

A. PROHIBITIONS AND LIMITATIONS

The purpose of this provision is to describe the conditions under which storm water and non-storm water discharges into and from MS4s are prohibited or limited. The goal of the prohibitions and limitations is to protect the water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through the implementation of water quality improvement strategies and runoff management programs that effectively prohibit non-storm water discharges into the Copermittees' MS4s, and reduce pollutants in storm water discharges from the Copermittees' MS4s to the MEP.

1. Discharge Prohibitions

a. Discharges from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the state are prohibited.

b. Non-storm water discharges into MS4s are to be effectively prohibited, through the implementation of Provision E.2, unless such discharges are authorized by a separate NPDES permit.

c. Discharges from MS4s are subject to all waste discharge prohibitions in the Basin Plan, included in Attachment A to this Order.

d. Storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 applicable to these discharges, included in Attachment A to this Order. All other discharges from the Copermittees' MS4s to ASBS are prohibited.

2. Receiving Water Limitations

a. Discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters, including but not limited to all applicable provisions contained in:

(1) The San Diego Water Board's Basin Plan, including beneficial uses, water quality objectives, and implementation plans;

(2) State Water Board plans for water quality control including the following:

(a) Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries (Thermal Plan), and

(b) The Ocean Plan, including beneficial uses, water quality objectives, and implementation plans;

(3) State Water Board policies for water and sediment quality control including the following:

(a) Water Quality Control Policy for the Enclosed Bays and Estuaries of California,

(b) Sediment Quality Control Plan which includes the following narrative objectives for bays and estuaries:

(i) Pollutants in sediments shall not be present in quantities that, alone or in combination, are toxic to benthic communities, and

(ii) Pollutants shall not be present in sediments at levels that will bioaccumulate in aquatic life to levels that are harmful to human health,

(c) The Statement of Policy with Respect to Maintaining High Quality of Waters in California;[2]

(4) Priority pollutant criteria promulgated by the USEPA through the following:

(a) National Toxics Rule (NTR)[3] (promulgated on December 22, 1992 and amended on May 4, 1995), and

(b) California Toxics Rule (CTR).[4,5]

b. Discharges from MS4s composed of storm water runoff must not alter natural ocean water quality in an ASBS.

[2] State Water Board Resolution No. 68-16
[3] 40 CFR 131.36
[4] 65 Federal Register 31682-31719 (May 18, 2000), adding Section 131.38 to 40 CFR
[5] If a water quality objective and a CTR criterion are in effect for the same priority pollutant, the more stringent of the two applies.

3. Effluent Limitations

a. Technology Based Effluent Limitations

Pollutants in storm water discharges from MS4s must be reduced to the MEP.[6]

b. Water Quality Based Effluent Limitations

Each Copermittee must comply with applicable WQBELs established for the TMDLs in Attachment E to this Order, pursuant to the applicable TMDL compliance schedules.

4. Compliance with Discharge Prohibitions and Receiving Water Limitations

Each Copermittee must achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order through timely implementation of control measures and other actions as specified in Provisions B and E of this Order, including any modifications. The Water Quality Improvement Plans required under Provision B must be designed and adapted to ultimately achieve compliance with Provisions A.1.a, A.1.c and A.2.a.

a. If exceedance(s) of water quality standards persist in receiving waters notwithstanding implementation of this Order, the Copermittees must comply with the following procedures:

(1) For exceedance(s) of a water quality standard in the process of being addressed by the Water Quality Improvement Plan, the Copermittee(s) must implement the Water Quality Improvement Plan as accepted by the San Diego Water Board, and update the Water Quality Improvement Plan, as necessary, pursuant to Provision F.2.c;

(2) Upon a determination by either the Copermittees or the San Diego Water Board that discharges from the MS4 are causing or contributing to a new exceedance of an applicable water quality standard not addressed by the Water Quality Improvement Plan, the Copermittees must submit the following updates to the Water Quality Improvement Plan pursuant to Provision F.2.c or as part of the Water Quality Improvement Plan Annual Report required under Provision F.3.b, unless the San Diego Water Board directs an earlier submittal:

(a) The water quality improvement strategies being implemented that are effective and will continue to be implemented,

[6] This does not apply to MS4 discharges which receive subsequent treatment to reduce pollutants in storm water discharges to the MEP prior to entering receiving waters (e.g., low flow diversions to the sanitary sewer). Runoff treatment must occur prior to the discharge of runoff into receiving waters per Finding 7.

(b) Water quality improvement strategies (i.e. BMPs, retrofitting projects, stream and/or habitat rehabilitation projects, adjustments to jurisdictional runoff management programs, etc.) that will be implemented to reduce or eliminate any pollutants or conditions that are causing or contributing to the exceedance of water quality standards,

(c) Updates to the schedule for implementation of the existing and additional water quality improvement strategies, and

(d) Updates to the monitoring and assessment program to track progress toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a of this Order;

(3) The San Diego Water Board may require the incorporation of additional modifications to the Water Quality Improvement Plan required under Provision B. The applicable Copermittees must submit any modifications to the update to the Water Quality Improvement Plan within 90 days of notification that additional modifications are required by the San Diego Water Board, or as otherwise directed;

(4) Within 90 days of the San Diego Water Board determination that the modifications to the Water Quality Improvement Plan required under Provision A.4.a.(3) meet the requirements of this Order, the applicable Copermittees must revise the jurisdictional runoff management program documents to incorporate the modified water quality improvement strategies that have been and will be implemented, the implementation schedule, and any additional monitoring required; and

(5) Each Copermittee must implement the updated Water Quality Improvement Plan.

b. The procedure set forth above to achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order do not have to be repeated for continuing or recurring exceedances of the same water quality standard(s) following implementation of scheduled actions unless directed to do otherwise by the San Diego Water Board.

c. Nothing in Provisions A.4.a and A.4.b prevents the San Diego Water Board from enforcing any provision of this Order while the applicable Copermittees prepare and implement the above update to the Water Quality Improvement Plan and jurisdictional runoff management programs.

B. WATER QUALITY IMPROVEMENT PLANS

The purpose of this provision is to develop Water Quality Improvement Plans that guide the Copermittees' jurisdictional runoff management programs towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plans is to further the Clean Water Act's objective to protect, preserve, enhance, and restore the water quality and designated beneficial uses of waters of the state. This goal will be accomplished through an adaptive planning and management process that identifies the highest priority water quality conditions within a watershed and implements strategies through the jurisdictional runoff management programs to achieve improvements in the quality of discharges from the MS4s and receiving waters.

1. Watershed Management Areas

The Copermittees must develop a Water Quality Improvement Plan for each of the Watershed Management Areas in Table B-1. A total of ten Water Quality Improvement Plans must be developed for the San Diego Region.

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
San Juan (901.00)	South Orange County	- Aliso Creek - San Juan Creek - San Mateo Creek - Pacific Ocean - Heisler Park ASBS	- City of Aliso Viejo - City of Dana Point - City of Laguna Beach - City of Laguna Hills[1] - City of Laguna Niguel - City of Laguna Woods[1] - City of Lake Forest[2] - City of Mission Viejo - City of Rancho Santa Margarita - City of San Clemente - City of San Juan Capistrano - County of Orange - Orange County Flood Control District
Santa Margarita (902.00)	Santa Margarita River	- Murrieta Creek - Temecula Creek - Santa Margarita River - Santa Margarita Lagoon - Pacific Ocean	- City of Menifee[3] - City of Murrieta[~~3~~4] - City of Temecula[~~3~~] - City of Wildomar[~~3~~4] - County of Riverside[~~3~~] - County of San Diego[4] - Riverside County Flood Control and Water Conservation District[~~3~~]
San Luis Rey (903.00)	San Luis Rey River	- San Luis Rey River - San Luis Rey Estuary - Pacific Ocean	- City of Oceanside - City of Vista - County of San Diego

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
Carlsbad (904.00)	Carlsbad	- Loma Alta Slough - Buena Vista Lagoon - Agua Hedionda Lagoon - Batiquitos Lagoon - San Elijo Lagoon - Pacific Ocean	- City of Carlsbad - City of Encinitas - City of Escondido - City of Oceanside - City of San Marcos - City of Solana Beach - City of Vista - County of San Diego
San Dieguito (905.00)	San Dieguito River	- San Dieguito River - San Dieguito Lagoon - Pacific Ocean	- City of Del Mar - City of Escondido - City of Poway - City of San Diego - City of Solana Beach - County of San Diego
Penasquitos (906.00)	Penasquitos	- Los Penasquitos Lagoon - Pacific Ocean	- City of Del Mar - City of Poway - City of San Diego - County of San Diego
	Mission Bay	- Mission Bay - Pacific Ocean - San Diego Marine Life Refuge ASBS	- City of San Diego
San Diego (907.00)	San Diego River	- San Diego River - Pacific Ocean	- City of El Cajon - City of La Mesa - City of San Diego - City of Santee - County of San Diego
Pueblo San Diego (908.00) Sweetwater (909.00) Otay (910.00)	San Diego Bay	- Sweetwater River - Otay River - San Diego Bay - Pacific Ocean	- City of Chula Vista - City of Coronado - City of Imperial Beach - City of La Mesa - City of Lemon Grove - City of National City - City of San Diego - County of San Diego - San Diego County Regional Airport Authority - San Diego Unified Port District
Tijuana (911.00)	Tijuana River	- Tijuana River - Tijuana Estuary - Pacific Ocean	- City of Imperial Beach - City of San Diego - County of San Diego

Notes:

1. By agreement dated February 10, 2015, pursuant to Water Code section 13228, the Phase I MS4 discharges within the jurisdiction of the City of Laguna Hills and the City of Laguna Woods located in the Santa Ana Region are regulated by San Diego Water Board Order No. R9-2013-0001 as amended by Order No. R9-2015-0001, upon the later effective date of Order No. R9-2015-0001 or Santa Ana Water Board Tentative Order No. R8-2015-0001. The City of Laguna Hills and Laguna Woods must also comply with the requirements of the San Diego Creek/Newport Bay TMDL in section XVIII of Santa Ana Water Board Order No. R8-2015-0001.
2. By agreement dated February 10, 2015, pursuant to Water Code section 13228, Phase I MS4 discharges within the City of Lake Forest located within the San Diego Water Board Region are regulated by the Santa Ana Water Board Order No. R8-2015-0001 (NPDES No. CAS618030) upon the later effective date of this Order or Santa Ana Water Board Tentative Order No. R8-2015-0001. In accordance with the terms of the agreement between the San Diego Water Board and the Santa Ana Water Board, the City of Lake Forest must implement the requirements of the Bacteria TMDL in Attachment E of this Order, participate in preparation and implementation of the Water Quality Improvement Plan for the Aliso Creek Watershed Management Area as described in Provision B of this Order and continue implementation of its over-irrigation discharge prohibition in its City Ordinance, Title 15, Chapter 15, section 14.030, List (b).
3. By agreement dated [Month][Day], 2015, pursuant to Water Code section 13228, Phase I MS4 discharges within the City of Menifee located within the San Diego Water Board Region are regulated by the Santa Ana Water Board Order No. R8-2010-0033 as it may be amended or reissued (NPDES No. CAS618033) upon the later effective date of this Order. In accordance with the terms of the agreement between the San Diego Water Board and the Santa Ana Water Board, the City of Menifee must participate in preparation and implementation of the Water Quality Improvement Plan for the Santa Margarita River Watershed Management Area as described in Provision B of this Order.~~The Riverside County Copermittees will be covered under this Order after expiration of Order No. R9-2010-0016 or earlier if the Riverside County Copermittees meet the conditions in Provision F.6, upon further amendment of this Order.~~
4. By agreement dated [Month][Day], 2015, pursuant to Water Code section 13228, the Phase I MS4 discharges within the jurisdiction of the City of Murrieta and the City of Wildomar located in the Santa Ana Region are regulated by San Diego Water Board Order No. R9-2013-0001 as amended by Orders No. R9-2015-0001 and R9-2015-0100. The City of Murrieta and City of Wildomar must also comply with the requirements of the Lake Elsinore/Canyon Lake Nutrient TMDLs in section VI.D.2 of Santa Ana Water Board Order No. R8-2010-0033, or corresponding section as it may be amended or reissued.~~The County of San Diego is not required to implement the requirements of Provision B for its jurisdiction within the Santa Margarita River Watershed Management Area~~

~~until the Riverside County Copermittees have been notified of coverage under this Order. The County of San Diego is required to implement the requirements of Provisions D, F.3.b, and Attachment E until the Riverside County Copermittees have been notified of coverage under this Order.~~

2. Priority Water Quality Conditions

The Copermittees must identify the water quality priorities within each Watershed Management Area that will be addressed by the Water Quality Improvement Plan. Where appropriate, Watershed Management Areas may be separated into subwatersheds to focus water quality prioritization and jurisdictional runoff management program implementation efforts by receiving water.

a. Assessment of Receiving Water Conditions

The Copermittees must consider the following, at a minimum, to identify water quality priorities based on impacts of MS4 discharges on receiving water beneficial uses:

(1) Receiving waters listed as impaired on the CWA Section 303(d) List of Water Quality Limited Segments (303(d) List);

(2) TMDLs adopted and under development by the San Diego Water Board;

(3) Receiving waters recognized as sensitive or highly valued by the Copermittees, including estuaries designated under the National Estuary Program under CWA section 320, marine protected areas, wetlands defined by the State or U.S. Fish and Wildlife Service's National Wetlands Inventory as wetlands, waters having the Preservation of Biological Habitats of Special Significance (BIOL) beneficial use designation, and receiving waters identified as ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(4) The receiving water limitations of Provision A.2;

(5) Known historical versus current physical, chemical, and biological water quality conditions;

(6) Available, relevant, and appropriately collected and analyzed physical, chemical, and biological receiving water monitoring data, including, but not limited to, data describing:

(a) Chemical constituents,

(b) Water quality parameters (i.e. pH, temperature, conductivity, etc.),

(c) Toxicity Identification Evaluations for both receiving water column and sediment,

(d) Trash impacts,

(e) Bioassessments, and

(f) Physical habitat;

(7) Available evidence of erosional impacts in receiving waters due to accelerated flows (i.e. hydromodification);

(8) Available evidence of adverse impacts to the chemical, physical, and biological integrity of receiving waters; and

(9) The potential improvements in the overall condition of the Watershed Management Area that can be achieved.

b. ASSESSMENT OF IMPACTS FROM MS4 DISCHARGES

The Copermittees must consider the following, at a minimum, to identify the potential impacts to receiving waters that may be caused or contributed to by discharges from the Copermittees' MS4s:

(1) The discharge prohibitions of Provision A.1 and effluent limitations of Provision A.3; and

(2) Available, relevant, and appropriately collected and analyzed storm water and non-storm water monitoring data from the Copermittees' MS4 outfalls;

(3) Locations of each Copermittee's MS4 outfalls that discharge to receiving waters;

(4) Locations of MS4 outfalls that are known to persistently discharge non-storm water to receiving waters likely causing or contributing to impacts on receiving water beneficial uses;

(5) Locations of MS4 outfalls that are known to discharge pollutants in storm water causing or contributing to impacts on receiving water beneficial uses; and

(6) The potential improvements in the quality of discharges from the MS4 that can be achieved.

c. IDENTIFICATION OF PRIORITY WATER QUALITY CONDITIONS

(1) The Copermittees must use the information gathered for Provisions B.2.a and B.2.b to develop a list of priority water quality conditions as pollutants, stressors and/or receiving water conditions that are the highest threat to receiving water quality or that most adversely affect the quality of receiving waters. The list must include the following information for each priority water quality condition:

(a) The beneficial use(s) associated with the priority water quality condition;

(b) The geographic extent of the priority water quality condition within the Watershed Management Area, if known;

(c) The temporal extent of the priority water quality condition (e.g., dry weather and/or wet weather);

(d) The Copermittees with MS4s discharges that may cause or contribute to the priority water quality condition; and

(e) An assessment of the adequacy of and data gaps in the monitoring data to characterize the conditions causing or contributing to the priority water quality condition, including a consideration of spatial and temporal variation.

(2) The Copermittees must identify the highest priority water quality conditions to be addressed by the Water Quality Improvement Plan, and provide a rationale for selecting a subset of the water quality conditions identified pursuant to Provision B.2.c.(1) as the highest priorities.

d. IDENTIFICATION OF MS4 SOURCES OF POLLUTANTS AND/OR STRESSORS

The Copermittees must identify and prioritize known and suspected sources of storm water and non-storm water pollutants and/or other stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c. The identification of known and suspected sources of pollutants and/or stressors that cause or contribute to the highest priority water quality conditions as identified for Provision B.2.c must consider the following:

(1) Pollutant generating facilities, areas, and/or activities within the Watershed Management Area, including:

(a) Each Copermittee's inventory of construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas,

(b) Publicly owned parks and/or recreational areas,

(c) Open space areas,

(d) All currently operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste, and

(e) Areas not within the Copermittees' jurisdictions (e.g., Phase II MS4s, tribal lands, state lands, federal lands) that are known or suspected to be discharging to the Copermittees' MS4s;

(2) Locations of the Copermittees' MS4s, including the following:

(a) All MS4 outfalls that discharge to receiving waters, and

(b) Locations of major structural controls for storm water and non-storm water (e.g., retention basins, detention basins, major infiltration devices, etc.);

(3) Other known and suspected sources of non-storm water or pollutants in storm water discharges to receiving waters within the Watershed Management Area, including the following:

(a) Other MS4 outfalls (e.g., Phase II Municipal and Caltrans),

(b) Other NPDES permitted discharges,

(c) Any other discharges that may be considered point sources (e.g., private outfalls), and

(d) Any other discharges that may be considered non-point sources (e.g., agriculture, wildlife or other natural sources);

(4) Review of available data, including but not limited to:

(a) Findings from the Copermittees' illicit discharge detection and elimination programs,

(b) Findings from the Copermittees' MS4 outfall discharge monitoring,

(c) Findings from the Copermittees' receiving water monitoring,

(d) Findings from the Copermittees' MS4 outfall discharge and receiving water assessments, and

(e) Other available, relevant, and appropriately collected data, information, or studies related to pollutant sources and/or stressors that contribute to the highest priority water quality conditions as identified for Provision B.2.c.

(5) The adequacy of the available data to identify and prioritize sources and/or stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c.

e. IDENTIFICATION OF POTENTIAL WATER QUALITY IMPROVEMENT STRATEGIES

The Copermittees must evaluate the findings identified under Provisions B.2.a-d, and identify potential strategies that can result in improvements to water quality in MS4 discharges and/or receiving waters within the Watershed Management Area. Potential water quality improvement strategies that may be implemented within the Watershed Management Area must include the following:

(1) Structural BMPs, non-structural BMPs, incentives, or programs that can potentially be implemented to address the highest priority water quality conditions identified under Provision B.2.c, or MS4 sources of pollutants or stressors identified under Provision B.2.d,

(2) Retrofitting projects in areas of existing development within the Watershed Management Area that can potentially be implemented to reduce MS4 sources of pollutants or stressors identified under Provision B.2.d causing or contributing to the highest priority water quality conditions identified under Provision B.2.c, and

(3) Stream, channel, and/or habitat rehabilitation projects within the Watershed Management Area that can potentially be implemented to protect and/or improve conditions in receiving waters from MS4 pollutants and/or stressors identified under Provision B.2.d causing or contributing to the highest priority water quality conditions identified under Provision B.2.c.

3. Water Quality Improvement Goals, Strategies and Schedules

The Copermittees must identify and develop specific water quality improvement goals and strategies to address the highest priority water quality conditions identified within a Watershed Management Area. The water quality improvement goals and strategies must address the highest priority water quality conditions by effectively prohibiting non-storm water discharges to the MS4, reducing pollutants in storm water discharges from the MS4 to the MEP, and protecting the water quality standards of receiving waters.

a. WATER QUALITY IMPROVEMENT GOALS AND SCHEDULES

(1) Numeric Goals

The Copermittees must develop and incorporate numeric goals[7] into the

[7] Interim and final numeric goals may take a variety of forms such as TMDL established WQBELs, action levels, pollutant concentration, load reductions, number of impaired water bodies delisted from the List of Water Quality Impaired Segments, Index of Biotic Integrity (IBI) scores, or other appropriate metrics. Interim and final numeric goals are not necessarily limited to one criterion or indicator, but may include multiple criteria and/or indicators. Except for TMDL established WQBELs, interim and final numeric goals and corresponding schedules may be revised through the adaptive management process under Provision B.5.

Water Quality Improvement Plan. Numeric goals must be used to support Water Quality Improvement Plan implementation and measure reasonable progress towards addressing the highest priority water quality conditions identified under Provision B.2.c. The Copermittees must establish and incorporate the following numeric goals in the Water Quality Improvement Plan:

(a) Final numeric goals must be based on measureable criteria or indicators capable of demonstrating one or more of the following:

(i) Discharges from the Copermittees' MS4s will not cause or contribute to exceedances of water quality standards in receiving waters, AND/OR

(ii) The conditions of receiving waters and associated habitat are protected from MS4 discharges, AND/OR

(iii) Beneficial uses of receiving waters are protected from MS4 discharges and will be supported.

(b) Interim numeric goals must be based on measureable criteria or indicators capable of demonstrating reasonable incremental progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges as follows:

(i) One or more interim numeric goals may be established to demonstrate progress toward achieving each final numeric goal,

(ii) For each final numeric goal, at least one interim numeric goal must be expressed as a reasonable increment toward achievement of the final numeric goal,

(iii) For each final numeric goal, reasonable interim numeric goals must be established to be accomplished during each 5 year period between the acceptance of the Water Quality Improvement Plan and the achievement of the final numeric goals.

(2) <u>Schedules for Achieving Numeric Goals</u>

The Copermittees must develop and incorporate schedules for achieving the numeric goals into the Water Quality Improvement Plan. The schedules must demonstrate reasonable progress toward achieving the final numeric goals required for Provision B.3.a.(1). The Copermittees must incorporate the schedules for achieving the numeric goals into the Water Quality Improvement Plan based on the following considerations:

(a) Final dates for achieving all final numeric goals must be established considering the following:

(i) Final compliance dates for any applicable TMDLs in Attachment E to this Order;

(ii) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(iii) Achievement of the final numeric goals for the highest water quality priorities must be as soon as possible;

(iv) Final dates for achieving the final numeric goals must reflect a realistic assessment of the shortest practicable time required based on the temporal and spatial extent and factors associated with the highest priority water quality conditions identified under Provision B.2.c, and taking into account the time reasonably required to implement the water quality improvement strategies required pursuant to Provision B.3.b.

(b) Interim dates for achieving all interim numeric goals must be established considering the following:

(i) Interim compliance dates for any applicable TMDLs in Attachment E to this Order;

(ii) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(iii) Interim dates for achieving the interim numeric goals must reflect a realistic assessment of the shortest practicable time reasonably required, taking into account the time needed to implement new or significantly expanded programs and securing financing, if necessary; and

(iv) For each final numeric goal, at least one interim numeric goal must be established that the Copermittees will work toward achieving within the term of this Order.

b. WATER QUALITY IMPROVEMENT STRATEGIES AND SCHEDULES

Based on the likely effectiveness and efficiency of the potential water quality improvement strategies identified under Provision B.2.e to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a, the Copermittees must identify the strategies that will be implemented in each Watershed Management Area as follows:

(1) Jurisdictional Strategies

(a) Each Copermittee in the Watershed Management Area must identify the strategies that will be implemented within its jurisdiction as part of its jurisdictional runoff management program requirements under Provisions E.2 through E.7, including descriptions of the following:

(i) For each of the inventories developed for its jurisdiction, as required under Provisions D.2.a.(1), E.3.e.(2), E.4.b, and E.5.a, each Copermittee must identify the known and suspected areas or sources causing or contributing to the highest priority water quality conditions in the Watershed Management Area that the Copermittee will focus on in its efforts to effectively prohibit non-storm water discharges to its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, and achieve the interim and final numeric goals identified under Provision B.3.a;

(ii) BMPs that each Copermittee will implement, or require to be implemented, as applicable, for those areas or sources within its jurisdiction;

(iii) Education programs that each Copermittee will implement, as applicable, for those areas or sources within its jurisdiction;

(iv) Frequencies that each Copermittee will conduct inspections on those areas or sources within its jurisdiction;

(v) Incentive and enforcement programs that each Copermittee will implement, as applicable, for those areas or sources within its jurisdiction; and

(vi) Any other BMPs, incentives, or programs that each Copermittee will implement for those areas or sources within its jurisdiction.

(b) Identify the optional jurisdictional strategies that each Copermittee will implement within its jurisdiction, as necessary, to effectively prohibit non-storm water discharges to its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. Descriptions of the optional jurisdictional strategies must include:

(i) BMPs, incentives, or programs that may be implemented by the Copermittee within its jurisdiction in addition to the requirements of Provisions B.3.b.(1)(a);

(ii) Incentives or programs that may be implemented by the Copermittee to encourage or implement projects to retrofit areas of existing development within its jurisdiction;

(iii) Incentives or programs that may be implemented by the Copermittee to encourage or implement projects that will rehabilitate the conditions of channels or habitats within its jurisdiction;

(iv) The funds and/or resources that must be secured by the Copermittee to implement the optional strategies described for Provisions B.3.b.(1)(b)(i)-(iii) within its jurisdiction; and

(v) The circumstances necessary to trigger implementation of the optional jurisdictional strategies, in addition to the requirements of Provision B.3.b.(1)(a), to achieve the interim and final numeric goals within the schedules established under Provision B.3.a.

(c) Identify the strategies that will be implemented by the Copermittee in coordination with or with the cooperation of other agencies (e.g. Caltrans, water districts, school districts) and/or entities (e.g. non-governmental organizations) within its jurisdiction.

(2) Watershed Management Area Strategies

The Copermittees must identify the optional regional or multi-jurisdictional strategies that will be implemented in the Watershed Management Area, as necessary, to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. Descriptions of the optional regional or multi-jurisdictional strategies must include:

(a) Regional or multi-jurisdictional BMPs, incentives, or programs that may be implemented by the Copermittees in the Watershed Management Area;

(b) Incentives or programs that may be implemented by the Copermittees in the Watershed Management Area to encourage or implement regional or multi-jurisdictional projects to retrofit areas of existing development;

(c) Incentives or programs that may be implemented by the Copermittees to encourage or implement regional or multi-jurisdictional projects that will rehabilitate the conditions of channels, streams, or habitats within the Watershed Management Area;

(d) The funds and/or resources that must be secured by the Copermittees to implement the optional strategies described for Provisions B.3.b.(2)(a)-(c) within the Watershed Management Area; and

(e) The circumstances necessary to trigger implementation of the optional regional or multi-jurisdictional strategies to achieve the interim and final numeric goals within the schedules established under Provision B.3.a.

(3) Schedules for Implementing Strategies

The Copermittees must develop reasonable schedules for implementing the water quality improvement strategies identified under Provisions B.3.b.(1) and B.3.b.(2) to achieve the interim and final numeric goals identified and schedules established under Provision B.3.a. The Copermittees must incorporate the schedules to implement the water quality improvement strategies into the Water Quality Improvement Plan as follows:

(a) Each Copermittee must develop schedules for the jurisdictional strategies identified pursuant to Provisions B.3.b.(1)(a)-(b). Each schedule must specify:

(i) If each jurisdictional strategy identified pursuant to Provision B.3.b.(1)(a) will or will not be initiated upon acceptance of the Water Quality Improvement Plan;

(ii) For each jurisdictional strategy identified pursuant to Provision B.3.b.(1)(a) that will not be initiated upon acceptance of the Water Quality Improvement Plan, the shortest practicable time in which each jurisdictional strategy will be initiated after acceptance of the Water Quality Improvement Plan;

(iii) For each optional jurisdictional strategy identified pursuant to Provision B.3.b.(1)(b), a realistic assessment of the shortest practicable time required to:

[a] Secure the resources needed to fund the optional jurisdictional strategy, and
[b] Procure the resources, materials, labor, and applicable permits necessary to initiate implementation of the optional jurisdictional strategy;

(iv) If each jurisdictional strategy identified pursuant to Provisions B.3.b.(1)(a)-(b) is expected to be continuously implemented (e.g. inspections) or completed within a schedule (e.g. construction of structural BMP); and

(v) If a jurisdictional strategy identified pursuant to Provisions B.3.b.(1)(a)-(b) is expected to be completed within a schedule, the anticipated time to complete based on a realistic assessment of the shortest practicable time required.

(b) The Copermittees in the Watershed Management Area must develop schedules for the regional or multi-jurisdictional strategies identified pursuant to Provision B.3.b.(2). Each schedule must specify:

(i) A realistic assessment of the shortest practicable time to:

[a] Secure the resources needed to fund the optional regional or multi-jurisdictional strategy, and
[b] Procure the resources, materials, labor, and permits necessary to initiate the implementation of the optional regional or multi-jurisdictional strategy;

(ii) If each regional or multi-jurisdictional strategy identified pursuant to Provision B.3.b.(2) is expected to be continuously implemented (e.g. inspections) or completed within a schedule (e.g. construction of structural BMP); and

(iii) If a regional or multi-jurisdictional strategy and/or activity identified pursuant to Provisions B.3.b.(2) is expected to be completed within a schedule, the anticipated time to complete based on a realistic assessment of the shortest practicable time required.

(4) Optional Watershed Management Area Analysis

(a) For each Watershed Management Area, the Copermittees have the option to perform a Watershed Management Area Analysis for the purpose of developing watershed-specific requirements for structural BMP implementation, as described in Provision E.3.c.(3). The Watershed Management Area Analysis must include GIS layers (maps) as output. The analysis must include the following information, to the extent it is available, in order to characterize the Watershed Management Areas:

(i) A description of dominant hydrologic processes, such as areas where infiltration or overland flow likely dominates;

(ii) A description of existing streams in the watershed, including bed material and composition, and if they are perennial or ephemeral;

(iii) Current and anticipated future land uses;

(iv) Potential coarse sediment yield areas; and

(v) Locations of existing flood control structures and channel structures, such as stream armoring, constrictions, grade control structures, and hydromodification or flood management basins.

(b) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify and compile a list of candidate projects that could potentially be used as

alternative compliance options for Priority Development Projects, to be implemented in lieu of onsite structural BMP performance requirements described in Provisions E.3.c.(1) and E.3.c.(2)(a). Specifically, the Copermittees must identify opportunities to be included in the list of candidate projects in each Watershed Management Area, such as:

(i) Stream or riparian area rehabilitation;

(ii) Retrofitting existing infrastructure to incorporate storm water retention or treatment;

(iii) Regional BMPs;

(iv) Groundwater recharge projects;

(v) Water supply augmentation projects; and

(vi) Land purchases to preserve floodplain functions.

(c) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify areas within the Watershed Management Area where it is appropriate to allow Priority Development Projects to be exempt from the hydromodification management BMP performance requirements described in Provision E.3.c.(2), including supporting rationale.

c. Prohibitions and Limitations Compliance Option

Each Copermittee has the option to utilize the implementation of the Water Quality Improvement Plan to demonstrate compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2.a, and A.3.b within a Watershed Management Area subject to the following conditions:

(1) A Copermittee is eligible to be deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2.a, and A.3.b within a Watershed Management Area when the Water Quality Improvement Plan for a Watershed Management Area incorporates the following:

(a) Numeric goals, water quality improvement strategies, and schedules developed pursuant to Provisions B.3.a and B.3.b that include the following:

(i) Interim and final WQBELs established by the TMDLs in Attachment E to this Order applicable to the Copermittee's jurisdiction within the Watershed Management Area; AND

(ii) Interim and final numeric goals for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012

(included as Attachment A to this Order) applicable to the Copermittee's jurisdiction within the Watershed Management Area; AND

(iii) Interim and final numeric goals applicable to the Copermittee's MS4 discharges within the Watershed Management Area expressed as numeric concentration-based or load-based goals for all pollutants and conditions listed on the Clean Water Act Section 303(d) List of Water Quality Impaired Segments[8] for the receiving waters in the Watershed Management Area that do not have a TMDL incorporated into Attachment E to this Order; AND/OR

(iv) Interim and final numeric goals for pollutants and conditions identified as receiving water priorities in the Water Quality Improvement Plan that will result in chemical, physical, and biological conditions protective of the beneficial uses of the receiving waters impacted by the Copermittee's MS4 discharges within the Watershed Management Area; AND

(v) The Copermittee has the option to include interim and final numeric goals applicable to the Copermittee's MS4 discharges and/or receiving waters within the Watershed Management Area for any pollutants or conditions in addition to those described in Provisions B.3.c.(1)(a)(i)-(iv); AND

(vi) Schedules for achieving each final numeric goal that reflect a realistic assessment of the shortest practicable time needed for achievement; AND

(vii) For each final numeric goal developed pursuant to Provisions B.3.a and B.3.c.(1)(a)(i)-(v), at least one annual milestone[9] and date for its achievement must be included within each Water Quality Improvement Plan Annual Report reporting period until the final numeric goal is achieved.

(b) An analysis that meets all of the following conditions:

(i) The analysis, with clearly stated assumptions included in the analysis, must quantitatively demonstrate that the implementation of the water quality improvement strategies required under Provision B.3.b will achieve the final numeric goals within the schedules developed pursuant to Provisions B.3.a and B.3.c.(1)(a).

(ii) The development of the analysis must include a public participation process which allows the public to review and provide comments on

[8] 2010 and subsequent 303(d) Lists
[9] Annual milestones for each final numeric goal must build upon previous milestones and lead to the achievement of the final numeric goal. The annual milestones may consist of water quality improvement strategy implementation phases, interim numeric goals, and other acceptable metrics.

the analysis methodology utilized and the assumptions included in the analysis. Public comments and responses must be included as part of the analysis documentation included in the Water Quality Improvement Plan.

(iii) The analysis may be performed by an individual Copermittee or jointly by two or more Copermittees choosing to utilize this compliance option for their jurisdictions within the Watershed Management Area.

(iv) The analysis must be updated as part of the iterative approach and adaptive management process required under Provisions B.5.a-b.

(c) Specific monitoring and assessments required pursuant to Provision B.4.a that will be performed by the Copermittee capable of 1) demonstrating whether the implementation of the water quality improvement strategies are making progress toward achieving the numeric goals in accordance with the established schedules developed pursuant to Provisions B.3.a and B.3.c.(1)(a), and 2) determining whether interim and final numeric goals have been achieved. The specific monitoring and assessments must be updated as part of the iterative approach and adaptive management process required under Provision B.5.c.

(d) Documentation showing that the numeric goals, schedules, and annual milestones proposed pursuant to Provision B.3.c.(1)(a), the analysis performed pursuant to Provision B.3.c.(1)(b), and the specific monitoring and assessments proposed pursuant to Provision B.3.c.(1)(c) have been reviewed by the Water Quality Improvement Consultation Panel (see Provision F.1.a.(1)(b)). Updates must be reviewed by the Water Quality Improvement Consultation Panel for any recommendations.

(2) Each Copermittee that voluntarily completes the requirements of Provision B.3.c.(1) is deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2.a, and A.3.b for the pollutants and conditions for which numeric goals are developed when the Water Quality Improvement Plan, incorporating the requirements of Provision B.3.c.(1), is accepted by the San Diego Water Board pursuant to Provision F.1.b or F.2.c. The Copermittee is deemed in compliance during the term of this Order as long as:

(a) The Copermittee is implementing the water quality improvement strategies within its jurisdiction developed pursuant to Provision B.3.b.(1) and in compliance with the schedules for implementing the strategies established pursuant to Provisions B.3.b.(3)(a) and B.3.c.(1)(a)(vii); AND

(b) The Copermittee is performing the monitoring and assessments developed pursuant to Provision B.3.c.(1)(c); AND

(c) The Copermittee's assessments in the Water Quality Improvement Plan Annual Report submitted pursuant to Provision F.3.b.(3) support a conclusion that: 1) the Copermittee is in compliance with the annual milestones and dates for achievement developed pursuant to Provision B.3.c.(1)(a)(vii), OR 2) the Copermittee has provided acceptable rationale and recommends appropriate modifications to the interim numeric goals, and/or water quality improvement strategies, and/or schedules to improve the rate of progress toward achieving the final numeric goals developed pursuant to Provisions B.3.a and B.3.c.(1)(a)(i)-(vi); AND

(d) Any proposed modifications to the numeric goals, schedules, and/or annual milestones are accepted by the San Diego Water Board as part of subsequent updates to the Water Quality Improvement Plan pursuant to Provision F.2.c;[10] AND

(e) The Copermittee is implementing the requirements of Provision A.4.a.

4. Water Quality Improvement Monitoring and Assessment Program

a. The Copermittees in each Watershed Management Area must develop and incorporate an integrated monitoring and assessment program into the Water Quality Improvement Plan that assesses: 1) the progress toward achieving the numeric goals and schedules, 2) the progress toward addressing the highest priority water quality conditions for each Watershed Management Area, and 3) each Copermittee's overall efforts to implement the Water Quality Improvement Plan.

b. The monitoring and assessment program must incorporate the monitoring and assessment requirements of Provision D, which may allow the Copermittees to modify the program to be consistent with and focus on the highest priority water quality conditions for each Watershed Management Area.

c. For Watershed Management Areas with applicable TMDLs, the monitoring and assessment program must incorporate the specific monitoring and assessment requirements of Attachment E.

d. For Watershed Management Areas with any ASBS, the water quality monitoring and assessment program must incorporate the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

[10] A request for proposed changes to the Water Quality Improvement Plan does not stay any permit condition.

5. Iterative Approach and Adaptive Management Process

The Copermittees in each Watershed Management Area must implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a, and must include the following:

a. Re-Evaluation of Priority Water Quality Conditions

The priority water quality conditions and potential water quality improvement strategies included in the Water Quality Improvement Plan pursuant to Provisions B.2.c and B.2.e may be re-evaluated by the Copermittees as needed during the term of this Order as part of the Water Quality Improvement Plan Annual Report. Re-evaluation and recommendations for modifications to the priority water quality conditions and potential water quality improvement strategies must be provided in the Report of Waste Discharge, and must consider the following:

(1) Achieving the outcome of improved water quality in MS4 discharges and receiving waters through implementation of the water quality improvement strategies identified in the Water Quality Improvement Plan;

(2) New information developed when the requirements of Provisions B.2.a-c have been re-evaluated;

(3) Spatial and temporal accuracy of monitoring data collected to inform prioritization of water quality conditions and implementation strategies to address the highest priority water quality conditions;

(4) Availability of new information and data from sources other than the jurisdictional runoff management programs within the Watershed Management Area that informs the effectiveness of the actions implemented by the Copermittees;

(5) San Diego Water Board recommendations; and

(6) Recommendations for modifications solicited through a public participation process.

b. Adaptation of Goals, Strategies and Schedules

The water quality improvement goals, strategies and schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.3, must be re-evaluated and adapted as new information becomes available to result in more effective and efficient measures to address the highest priority water quality

conditions identified pursuant to Provision B.2.c. Re-evaluation of and modifications to the water quality improvement goals, strategies and schedules must be provided in the Water Quality Improvement Plan Annual Report, and must consider the following:

(1) Modifications to the priority water quality conditions based on Provision B.5.a;

(2) Progress toward achieving interim and final numeric goals in receiving waters and MS4 discharges for the highest priority water quality conditions in the Watershed Management Area,

(3) Progress toward achieving outcomes according to established schedules;

(4) New policies or regulations that may affect identified numeric goals;

(5) Measurable or demonstrable reductions of non-storm water discharges to and from each Copermittee's MS4;

(6) Measurable or demonstrable reductions of pollutants in storm water discharges from each Copermittee's MS4 to the MEP;

(7) New information developed when the requirements of Provisions B.2.b and B.2.d have been re-evaluated;

(8) Efficiency in implementing the Water Quality Improvement Plan;

(9) San Diego Water Board recommendations; and

(10) Recommendations for modifications solicited through a public participation process.

c. ADAPTATION OF MONITORING AND ASSESSMENT PROGRAM

The water quality improvement monitoring and assessment program, included in the Water Quality Improvement Plan pursuant to Provision B.4, must be re-evaluated and adapted when new information becomes available. Re-evaluation and recommendations for modifications to the monitoring and assessment program, pursuant to the requirements of Provision D, may be provided in the Water Quality Improvement Plan Annual Report, but must be provided in the Report of Waste Discharge.

6. Water Quality Improvement Plan Submittal, Updates, and Implementation

a. The Copermittees must submit and commence implementation of the Water Quality Improvement Plans in accordance with the requirements of Provision F.1.

b. The Copermittees must submit proposed updates to the Water Quality Improvement Plan for acceptance by the San Diego Water Board Executive Officer in accordance with the requirements of Provision F.2.c.

C. ACTION LEVELS

The purpose of this provision is for the Copermittees to incorporate numeric action levels in the Water Quality Improvement Plans. The goal of the action levels is to guide Water Quality Improvement Plan implementation efforts and measure progress towards the protection of water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through monitoring and assessing the quality of the MS4 discharges during the implementation of the Water Quality Improvement Plans.

1. Non-Storm Water Action Levels[11]

The Copermittees must develop and incorporate numeric non-storm water action levels (NALs) into the Water Quality Improvement Plan to: 1) support the development and prioritization of water quality improvement strategies for effectively prohibiting non-storm water discharges to the MS4s, 2) assess the effectiveness of the water quality improvement strategies toward addressing MS4 non-storm water discharges, required pursuant to Provision D.4.b.(1), and 3) support the detection and elimination of non-storm water and illicit discharges to the MS4, required pursuant to Provision E.2.[12]

a. The following NALs must be incorporated:

(1) Non-Storm Water Discharges from MS4s to Ocean Surf Zone

Table C-1. Non-Storm Water Action Levels for Discharges from MS4s to Ocean Surf Zone

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Total Coliform	MPN/100 ml	1,000	-	10,000/1,000[1]	OP
Fecal Coliform	MPN/100 ml	200[2]	-	400	OP
Enterococci	MPN/100 ml	35	-	104[3]	OP

Abbreviations/Acronyms
AMAL – average monthly action level
MDAL – maximum daily action level
OP – Ocean Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Total coliform density NAL is 1,000 MPN/100 ml when the fecal/total coliform ratio exceeds 0.1.
2. Fecal coliform density NAL is 200 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas."

[11] NALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, unless the NAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed.
[12] The Copermittees may utilize NALs or other benchmarks currently established by the Copermittees as interim NALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

(2) Non-Storm Water Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Table C-2. Non-Storm Water Action Levels for Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Turbidity	NTU	75	-	225	OP
pH	Units	Within limit of 6.0 to 9.0 at all times			OP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	35	-	104[3]	BP
Priority Pollutants	µg/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
OP – Ocean Plan water quality objective
NTU – Nephelometric Turbidity Units
µg/L – micrograms per liter
MDAL – maximum daily action level
BP – Basin Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas" and is not applicable to water bodies that are not designated with the water contact recreation (REC-1) beneficial use.

Table C-3. Non-Storm Water Action Levels for Priority Pollutants

Parameter	Units	Freshwater (CTR)		Saltwater (CTR)	
		MDAL	AMAL	MDAL	AMAL
Cadmium	µg/L	**	**	16	8
Copper	µg/L	*	*	5.8	2.9
Chromium III	µg/L	**	**	-	-
Chromium VI	µg/L	16	8.1	83	41
Lead	µg/L	*	*	14	2.9
Nickel	µg/L	**	**	14	6.8
Silver	µg/L	*	*	2.2	1.1
Zinc	µg/L	*	*	95	47

Abbreviations/Acronyms:
CTR – California Toxic Rule
AMAL – average monthly action level
µg/L – micrograms per liter
MDAL – maximum daily action level

Notes:
* Action levels developed on a case-by-case basis (see below)
** Action levels developed on a case-by-case basis (see below), but calculated criteria are not to exceed Maximum Contaminant Levels (MCLs) under the California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64431

The Cadmium, Copper, Chromium (III), Lead, Nickel, Silver and Zinc NALs for MS4 discharges to freshwater receiving waters will be developed on a case-by-case basis based on site-specific water quality data (receiving water hardness). For these priority pollutants, refer to 40 CFR 131.38(b)(2).

(3) Non-Storm Water Discharges from MS4s to Inland Surface Waters

Table C-4. Non-Storm Water Action Levels for Discharges from MS4s to Inland Surface Waters

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Dissolved Oxygen	mg/L	Not less than 5.0 in WARM waters and not less than 6.0 in COLD waters			BP
Turbidity	NTU	-	20	See MDAL	BP
pH	Units	Within limit of 6.5 to 8.5 at all times			BP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	33	-	61[3]	BP
Total Nitrogen	mg/L	-	1.0	See MDAL	BP
Total Phosphorus	mg/L	-	0.1	See MDAL	BP
MBAS	mg/L	-	0.5	See MDAL	BP
Iron	mg/L	-	0.3	See MDAL	BP
Manganese	mg/L	-	0.05	See MDAL	BP
Priority Pollutants	µg/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
BP – Basin Plan water quality objective
COLD – cold freshwater habitat beneficial use
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
MDAL – maximum daily action level
WARM – warm freshwater habitat beneficial use
MBAS – Methylene Blue Active Substances
MPN/100 ml – most probable number per 100 milliliters
µg/L – micrograms per liter

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for freshwater "designated beach areas" and is not applicable to water bodies that are not designated with the water contact recreation (REC-1) beneficial use.

b. If not identified in Provision C.1.a, NALs must be identified, developed and incorporated in the Water Quality Improvement Plan for any pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in receiving waters associated with the highest priority water quality conditions related to non-storm water discharges from the MS4s. NALs must be based on:

(1) Applicable water quality standards which may be dependent upon site-specific or receiving water-specific conditions or assumptions to be identified by the Copermittees; or

(2) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the NALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary NALs specific to the Watershed Management Area at levels greater than the NALs required by Provisions C.1.a and C.1.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for effectively prohibiting non-storm water discharges to the MS4s, as well as the detection and

elimination of non-storm water and illicit discharges to and from the MS4. The secondary NALs may be developed using an approach acceptable to the San Diego Water Board.

d. Dry weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.b may be utilized to develop or revise NALs based on watershed-specific data, subject to San Diego Water Board Executive Officer approval.

2. Storm Water Action Levels[13]

The Copermittees must develop and incorporate numeric storm water action levels (SALs) in the Water Quality Improvement Plans to: 1) support the development and prioritization of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s, and 2) assess the effectiveness of the water quality improvement strategies toward reducing pollutants in storm water discharges, required pursuant to Provision D.4.b.(2).[14]

a. The following SALs for discharges of storm water from the MS4 must be incorporated:

Table C-5. Storm Water Action Levels for Discharges from MS4s to Receiving Waters

Parameter	Units	Action Level
Turbidity	NTU	126
Nitrate & Nitrite (Total)	mg/L	2.6
Phosphorus (Total P)	mg/L	1.46
Cadmium (Total Cd)*	µg/L	3.0
Copper (Total Cu)*	µg/L	127
Lead (Total Pb)*	µg/L	250
Zinc (Total Zn)*	µg/L	976

Abbreviations/Acronyms:
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
µg/L – micrograms per liter

Notes:
* The sampling must include a measure of receiving water hardness at each MS4 outfall. If a total metal concentration exceeds the corresponding metals SAL in Table C-5, that concentration must be compared to the California Toxics Rule criteria and the USEPA 1-hour maximum concentration for the detected level of receiving water hardness associated with that sample. If it is determined that the sample's total metal concentration for that specific metal exceeds that SAL, but does not exceed the applicable USEPA 1-hour maximum concentration criterion for the measured level of hardness, then the sample result will not be considered above the SAL for that measurement.

[13] SALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, unless the SAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed.

[14] The Copermittees may utilize SALs or other benchmarks currently established by the Copermittees as interim SALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

b. If not identified in Provision C.2.a, SALs must be identified, developed and incorporated in the Water Quality Improvement Plan for pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in receiving waters associated with the highest priority water quality conditions related to storm water discharges from the MS4s. SALs must be based on:

(1) Federal and State water quality guidance and/or water quality standards; and

(2) Site-specific or receiving water-specific conditions; or

(3) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the SALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary SALs specific to the Watershed Management Area at levels greater than the SALs required by Provisions C.2.a and C.2.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s. The secondary SALs may be developed based on the approaches recommended by the State Water Board's Storm Water Panel[15] or using an approach acceptable to the San Diego Water Board.

d. Wet weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.c may be used to develop or revise SALs based upon watershed-specific data, subject to San Diego Water Board Executive Officer approval.

[15] Storm Water Panel Recommendations to the California State Water Resources Control Board: The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities (June 2006)

D. MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS

The purpose of this provision is for the Copermittees to monitor and assess the impact on the conditions of receiving waters caused by discharges from the Copermittees' MS4s under wet weather and dry weather conditions. The goal of the monitoring and assessment program is to inform the Copermittees about the nexus between the health of receiving waters and the water quality condition of the discharges from their MS4s. This goal will be accomplished through monitoring and assessing the conditions of the receiving waters, discharges from the MS4s, pollutant sources and/or stressors, and effectiveness of the water quality improvement strategies implemented as part of the Water Quality Improvement Plans.

1. Receiving Water Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the condition of the receiving waters in each Watershed Management Area during dry weather and wet weather. Following San Diego Water Board acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct long-term receiving water monitoring during implementation of the Water Quality Improvement Plan to assess the long term trends and determine if conditions in receiving waters are improving. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following receiving water monitoring procedures:

a. TRANSITIONAL RECEIVING WATER MONITORING

Until the monitoring requirements and schedules of Provisions D.1.b-e are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following receiving water monitoring in the Watershed Management Area:

(1) Continue the receiving water monitoring programs required in Order Nos. R9-2007-0001 (Monitoring and Reporting Program No. R9-2007-0001 Sections II.A.1-A.5), R9-2009-0002, and R9-2010-0016, unless the Executive Officer provides conditional approval for Copermittees to proceed with implementation of the proposed monitoring and assessment program developed in accordance with Provision B.4;

(2) Continue the monitoring in the Hydromodification Management Plans approved by the San Diego Water Board;

(3) Participate in the following regional receiving water monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring,

(b) Southern California Bight Regional Monitoring, and

(c) Sediment Quality Monitoring;

(4) Implement the monitoring programs developed as part of any implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) for the TMDLs in Attachment E to this Order; and

(5) For Watershed Management Areas with ASBS, implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

b. LONG-TERM RECEIVING WATER MONITORING STATIONS

The Copermittees must select at least one long-term receiving water monitoring station from among the existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees to be representative of the receiving water quality in the Watershed Management Area. Additional long-term receiving water monitoring stations must be selected where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

c. DRY WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three dry weather monitoring events at each of the long-term receiving water monitoring stations. At least one monitoring event must be conducted during the dry season (May 1 – September 30) and at least one monitoring event must be conducted during a dry weather period during the wet season (October 1 – April 30), after the first wet weather event of the season, with an antecedent dry period of at least 72 hours following a storm event producing measureable rainfall of greater than 0.1 inch.

(1) Dry Weather Receiving Water Field Observations

For each dry weather monitoring event, the Copermittees must record field observations consistent with Table D-1 at each long-term receiving water monitoring station.

Table D-1. Field Observations for Receiving Water Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) • Station description (i.e. deposits or stains, vegetation condition, structural condition, and observable biology) • Presence and assessment of trash in and around station

(2) Dry Weather Receiving Water Field Monitoring

For each dry weather monitoring event, if conditions allow the collection of the data, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

Table D-2. Field Monitoring Parameters for Receiving Water Monitoring Stations

Parameters
• pH • Temperature • Specific conductivity • Dissolved oxygen • Turbidity

(3) Dry Weather Receiving Water Analytical Monitoring

For each dry weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable NAL constituents, and

(v) Constituents listed in Table D-3.

Table D-3. Analytical Monitoring Constituents for Receiving Water Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Pesticides	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Mercury • Nickel • Selenium • Thallium • Zinc	• Organophosphate Pesticides • Pyrethroid Pesticides	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(4) Dry Weather Receiving Water Toxicity Monitoring

For each dry weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for aquatic toxicity in accordance with Table D-4. When the State Water Board's Policy for Toxicity Assessment and Control (Toxicity Policy) is approved and in effect, the San Diego Water Board Executive Officer may direct the Copermittees to replace current toxicity program elements with standardized procedures in the Toxicity Policy.

Table D-4. Dry Weather Chronic[1] Toxicity Testing for Receiving Water Monitoring Stations

Organism	Units	Test	USEPA Protocol
Freshwater			
Pimephales promelas (Fathead Minnow)	Pass / Fail	Larval Survival and Growth	EPA-821-R-02-013
Ceriodaphnia dubia (*Daphnid*)	Pass / Fail	Survival and Production	EPA-821-R-02-013
Selenastrum capricornutum (Green Algae)	Pass / Fail	Growth	EPA-821-R-02-013
Marine and Estuarine			
Strongylocentrotus purpuratus *(Purple Sea Urchin)*	Pass / Fail	Embryo-Larval Development	EPA-600-R-95-136

Notes:
1. Chronic toxicity testing is not required at receiving water monitoring stations located at mass loading stations if the channel flows are diverted year-round during dry weather conditions to the sanitary sewer for treatment.

(a) Freshwater Test Species and Methods: If samples are collected in receiving waters with salinity less than 1 ppt, the Copermittees must follow the methods for chronic toxicity tests as established in 40 CFR 136.3 using a single-concentration test design for routine monitoring, or a five-concentration test design for additional toxicity testing if the limitation is exceeded. The Copermittees must estimate the critical life stage chronic toxicity on undiluted samples in accordance with species and short term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms (EPA-821-R-02-013; Table IA, 40 CFR 136). Additional test species may be used by the Copermittees if approved by the San Diego Water Board Executive Officer. The Copermittees must conduct:

(i) A static renewal toxicity test with the fathead minnow, *Pimephales promelas* (Larval Survival and Growth Test Method 1000.0);

(ii) A static renewal toxicity test with the daphnid, *Ceriodaphnia dubia* (Survival and Reproduction Test Method 1002.0); and

(iii) A static renewal toxicity test with the green alga, *Selenastrum capricornutum* (also named *Raphidocelis subcapitata*) (Growth Test Method 1003.0).

(b) Marine and Estuarine Test Species and Methods: If samples are collected in receiving waters with salinity greater or equal to 1 ppt, the Copermittees must follow the methods for chronic toxicity tests as established in 40 CFR 136.3 using a single-concentration test design for routine monitoring, or a five-concentration test design for additional toxicity testing if the limitation is exceeded. The Copermittees must conduct the following critical life state chronic toxicity tests on undiluted samples in accordance with species and short term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms (EPA-600-R-95-136; 1995). Artificial sea salts must be used to increase sample salinity. The Copermittees must conduct a static non-renewal toxicity test with the purple sea urchin, *Strongylocentrotus purpuratus* (Embryo-larval Development Test Method). Additional species may be used by the Copermittees if approved by the San Diego Water Board Executive Officer.

(c) Holding Times: All toxicity tests must be conducted as soon as possible following sample collection. The 36-hour sample holding time for test initiation shall be targeted. However, no more than 72 hours shall elapse before the conclusion of sample collection and test initiation.

(d) Test Species Sensitivity Screening: To determine the most sensitive test species for freshwater, the Copermittees must screen 2 wet weather and 2 dry weather toxicity tests with a vertebrate, an invertebrate, and a plant species. After this screening period, subsequent monitoring must be conducted using the most sensitive test species. Alternatively, if a sensitive test species has already been determined, or if there is prior knowledge of potential toxicant(s) and a test species is sensitive to such toxicant(s), then monitoring must be conducted using only that test species. Sensitive test species determinations must also consider the most sensitive test species used for proximal receiving water monitoring. Rescreening must occur once each permit term.

(e) Chronic toxicity test biological endpoint data must be analyzed using the Test of Significant Toxicity t-test approach specified in *National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document* (USEPA, Office of Wastewater Management, Washington, D.C., EPA-833-R-10-003, 2010). For this monitoring program, the critical chronic instream waste concentration (IWC) is set at 100 percent receiving water (i.e. no dilution) for receiving water samples. A 100 percent receiving water and a control must be tested.

(f) Toxicity Identification Evaluation (TIE) / Toxicity Reduction Evaluation (TRE): If chronic toxicity is detected in receiving waters, the Copermittees must discuss the need for conducting a TIE/TRE in the assessments

required under Provision D.4.a.(2), and develop a plan for implementing the TIE/TRE to be incorporated in the Water Quality Improvement Plan.

(5) Dry Weather Receiving Water Bioassessment Monitoring

Bioassessment monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must conduct bioassessment monitoring during at least one dry weather monitoring event at each long-term receiving water monitoring station as follows:

(a) The following bioassessment samples and measurements must be collected:

(i) Macroinvertebrate samples must be collected in accordance with the "Reachwide Benthos (Multihabitat) Procedure" in the most current Surface Water Ambient Monitoring Program (SWAMP) Bioassessment Standard Operating Procedures (SOP), and amendments, as applicable;[16]

(ii) The "Full" suite of physical habitat characterization measurements must be collected in accordance with the most current SWAMP Bioassessment SOP, and as summarized in the SWAMP Stream Habitat Characterization Form – Full Version;[17] and

(iii) Freshwater algae samples must be collected in accordance with the SWAMP Standard Operating Procedures for Collecting Algae Samples.[18] Analysis of samples must include algal taxonomic composition (diatoms and soft algae) and algal biomass.

(b) The bioassessment samples, measurements, and appropriate water chemistry data must be used to calculate the following:

(i) An Index of Biological Integrity (IBI) for macroinvertebrates for each monitoring station where bioassessment monitoring was conducted, based on the most current calculation method;[19] and

[16] Ode, P.R.. 2007. Standard operating procedures for collecting macroinvertebrate samples and associated physical and chemical data for ambient bioassessments in California. California State Water Resources Control Board Surface Water Ambient Monitoring Program (SWAMP) Bioassessment SOP 001. http://www.swrcb.ca.gov/water_issues/programs/swamp/tools.shtml#monitoring

[17] Available at: http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/reports/fieldforms_fullversion052908.pdf

[18] Fetscher et al. 2009. Standard Operating Procedures for Collecting Stream Algae Samples and Associated Physical Habitat and Chemical Data for Ambient Bioassessments in California.

[19] The most current calculation method at the time the Order was adopted is outlined in "A Quantitative Tool for Assessing the Integrity of Southern California Coastal Streams" (Ode, et al. 2005. Environmental Management. Vol. 35, No. 1, pp. 1-13). If an updated or new calculation method is developed, either both

(ii) An IBI for algae for each monitoring station where bioassessment monitoring was conducted, when a calculation method is developed.[20]

(c) In lieu of the requirements of Provision D.1.c.(5)(a), the Copermittees may conduct the bioassessment monitoring in accordance with the "Triad" assessment approach[21] to calculate the IBIs required for Provision D.1.c.(5)(b). The Copermittees must conduct sampling, analysis, and reporting of specified in-stream biological and habitat data according to the protocols specified in the SCCWRP Technical Report No. 539, or subsequent protocols, if developed.

(6) Dry Weather Receiving Water Hydromodification Monitoring

In addition to the hydromodification monitoring conducted as part of the Copermittees' Hydromodification Management Plans, hydromodification monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must collect the following hydromodification monitoring observations and measurements within an appropriate domain of analysis during at least one dry weather monitoring event for each long-term receiving water monitoring station:

(a) Channel conditions, including:

(i) Channel dimensions,

(ii) Hydrologic and geomorphic conditions, and

(iii) Presence and condition of vegetation and habitat;

(b) Location of discharge points;

(c) Habitat integrity;

(d) Photo documentation of existing erosion and habitat impacts, with location (i.e. latitude and longitude coordinates) where photos were taken;

(e) Measurement or estimate of dimensions of any existing channel bed or bank eroded areas, including length, width, and depth of any incisions; and

(i.e. current and updated/new) methods must be used, or historical IBIs must be recalculated with the updated or new calculation method.

[20] When a calculation method is developed, IBIs must be calculated for all available and appropriate historical data.

[21] Stormwater Monitoring Coalition Model Monitoring Technical Committee, 2004. Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California. Technical Report #419. August 2004.

(f) Known or suspected cause(s) of existing downstream erosion or habitat impact, including flow, soil, slope, and vegetation conditions, as well as upstream land uses and contributing new and existing development.

d. WET WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three wet weather monitoring events at each long-term receiving water monitoring station. At least one wet weather monitoring event must be conducted during the first wet weather event of the wet season (October 1 – April 30), and at least one wet weather monitoring event during a wet weather event that occurs after February 1.

(1) Wet Weather Receiving Water Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each long-term receiving water monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event;

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(d) Presence and assessment of trash in and around station.

(2) Wet Weather Receiving Water Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

(3) Wet Weather Receiving Water Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) Constituents listed in Table D-3.

(4) <u>Wet Weather Receiving Water Toxicity Monitoring</u>

For each wet weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for chronic aquatic toxicity in accordance with Provisions D.1.c.(4)(a)-(f).

e. OTHER RECEIVING WATER MONITORING REQUIREMENTS

(1) Regional Monitoring

The Copermittees must participate in the following regional receiving waters monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring; and

(b) Southern California Bight Regional Monitoring and

(c) Unified Beach Water Quality Monitoring and Assessment Program. The Orange County Copermittees shall participate in and, together with South Orange County Wastewater Authority and Orange County Health Care Agency, shall share responsibility for implementation of a unified regional beach water quality monitoring and assessment program in south Orange County, as set forth in the October 2014 report, *Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County* , issued pursuant to CWC section 13383 and subject to future revision in the San Diego Water Board December 5, 2014 Letter Directive.

(2) Sediment Quality Monitoring

The Copermittees must perform sediment monitoring to assess compliance with sediment quality receiving water limits applicable to MS4 discharges to enclosed bays and estuaries. The monitoring may be performed either by individual or multiple Copermittees to assess compliance with receiving water limits, or through participation in a water body monitoring coalition. A Sediment Monitoring Plan which satisfies the requirements of the State Water Board's Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part 1 Sediment Quality (Sediment Control Plan) must be submitted as part of the monitoring and assessment program in the Water Quality Improvement Plan.

(a) The Sediment Monitoring Plan design must include the following:

(i) The elements required under Section VII.D (Receiving Water Limits Monitoring Frequency) and Section VII.E (Sediment Monitoring) of the Sediment Control Plan;

(ii) A Quality Assurance Project Plan (QAPP) describing the project objectives and organization, functional activities, and quality assurance/quality control protocols for the water and sediment monitoring; and

(iii) A schedule for completion of all sample collection and analysis activities and submission of Sediment Monitoring Reports.

(b) The Copermittees must implement the Sediment Monitoring Plan in accordance with the schedule contained in the Sediment Monitoring Plan, unless otherwise directed in writing by the San Diego Water Board Executive Officer.

(c) The Copermittees must incorporate a Sediment Monitoring Report as part of the Water Quality Improvement Plan Annual Report in accordance with the schedule contained in the Sediment Monitoring Plan, unless otherwise directed in writing by the San Diego Water Board Executive Officer. The Sediment Monitoring Report must contain the following information:

(i) Analysis: An evaluation, interpretation and tabulation of the water and sediment monitoring data, including interpretations and conclusions as to whether applicable Receiving Water Limitations in this Order have been attained at each sample station;

(ii) Sample Location Map: The locations, type, and number of samples must be identified and shown on a site map; and

(iii) California Environmental Data Exchange Network: A statement certifying that the monitoring data and results have been uploaded into the California Environmental Data Exchange Network (CEDEN).

(d) Based on the Sediment Monitoring Report conclusions the San Diego Water Board may require a human health risk assessment to determine if the human health objective contained in Receiving Water Limitations in Provision A.2.a.(3)(b)(ii) has been attained at each sample station. In conducting a risk assessment, the Copermittees must consider any applicable and relevant information, including California Environmental Protection Agency's (Cal/EPA) Office of Environmental Health Hazard Assessment (OEHHA) policies for fish consumption and risk assessment, Cal/EPA's Department of Toxic Substances Control (DTSC) Risk Assessment, and USEPA Human Health Risk Assessment policies.

(3) ASBS Monitoring

For Watershed Management Areas with ASBS, the Copermittees must implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

f. ALTERNATIVE WATERSHED MONITORING REQUIREMENTS

The San Diego Water Board may direct the Copermittees to participate in an effort to develop alternative watershed monitoring with other regulated entities, other interested parties, and the San Diego Water Board to refine, coordinate, and implement regional monitoring and assessment programs to determine the status and trends of water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams.

2. MS4 Outfall Discharge Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the discharges from the MS4 outfalls in each Watershed Management Area during dry weather and wet weather. Following San Diego Water Board acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct MS4 outfall discharge monitoring during implementation of the Water Quality Improvement Plan to assess the effectiveness of their jurisdictional runoff management programs toward effectively prohibiting non-storm water discharges into the MS4 and reducing pollutants in storm water discharges from their MS4s to the MEP. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following MS4 outfall monitoring procedures:

a. TRANSITIONAL MS4 OUTFALL DISCHARGE MONITORING

Until the monitoring requirements and schedules of Provisions D.2.b-c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following MS4 outfall discharge monitoring in the Watershed Management Area:

(1) MS4 Outfall Discharge Monitoring Station Inventory

Each Copermittee must identify all major MS4 outfalls that discharge directly to receiving waters within its jurisdiction and geo-locate those outfalls on a map of the MS4 pursuant to Provision E.2.b.(1). This information must be compiled into a MS4 outfall discharge monitoring station inventory, and must include the following information:

(a) Latitude and longitude of MS4 outfall point of discharge;

(b) Watershed Management Area;

(c) Hydrologic subarea;

(d) Outlet size;

(e) Accessibility (i.e. safety and without disturbance of critical habitat);

(f) Approximate drainage area; and

(g) Classification of whether the MS4 outfall is known to have persistent dry weather flows, transient dry weather flows, no dry weather flows, or unknown dry weather flows.

(2) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Until the monitoring requirements and schedules of Provision D.2.b are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, each Copermittee must perform dry weather MS4 outfall field screening monitoring to identify non-storm water and illicit discharges within its jurisdiction in accordance with Provision E.2.c, to determine which discharges are transient flows and which are persistent flows, and prioritize the dry weather MS4 discharges that will be investigated and eliminated in accordance with Provision E.2.d.

(a) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Frequency

Each Copermittee must field screen the MS4 outfalls in its inventory developed pursuant to Provision D.2.a.(1) as follows:

(i) For Copermittees with less than 125 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 80 percent of the outfalls must be visually inspected two times per year during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv).

(ii) For Copermittees with 125 major MS4 outfalls or more, but less than or equal to 500 that discharge to receiving waters within a Watershed Management Area, all the outfalls must be visually inspected at least annually during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv).

(iii) For Copermittees with more than 500 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 500 outfalls must be visually inspected at least annually during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv). Copermittees with more than 500 major MS4 outfalls within a Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;

[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(iv) For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major MS4 outfalls within its jurisdiction, at least 500 major MS4 outfalls within its inventory must be visually inspected at least annually during dry weather conditions. Copermittees with more than 500 major MS4 outfalls in more than one Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(v) Inspections of major MS4 outfalls conducted in response to public reports and staff or contractor reports and notifications may count toward the required visual inspections of MS4 outfall discharge monitoring stations.

(b) Transitional Dry Weather MS4 Outfall Discharge Field Screening Visual Observations

(i) An antecedent dry period of at least 72 hours following any storm event producing measurable rainfall greater than 0.1 inch is required prior to conducting field screening visual observations during a field screening monitoring event.

(ii) During the field screening monitoring event, each Copermittee must record visual observations consistent with Table D-5 at each MS4 outfall discharge monitoring station inspected.

Table D-5. Field Screening Visual Observations for MS4 Outfall Discharge Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) - Flow source(s) suspected or identified from non-storm water source investigation - Flow source(s) eliminated during non-storm water source identification • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) - Known or suspected source(s) of pooled or ponded water • Station description (i.e. deposits or stains, vegetation condition, structural condition, observable biology) • Presence and assessment of trash in and around station • Evidence or signs of illicit connections or illegal dumping

(iii) Each Copermittee must implement the requirements of Provisions E.2.d.(2)(c)-(e) based on the field observations required pursuant to Provision D.2.a.(2)(b)(ii).

(iv) Each Copermittee must evaluate field observations together with existing information available from prior reports, inspections and monitoring results to determine whether any observed flowing, pooled, or ponded waters are likely to be transient or persistent flow.[22]

(c) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Records

Based upon the results of the transitional dry weather MS4 outfall discharge field screening monitoring conducted pursuant to Provisions D.2.a.(2)(a)-(b), each Copermittee must update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow.

(3) Transitional Wet Weather MS4 Outfall Discharge Monitoring

Until the monitoring requirements and schedules of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the

[22] Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(a) Transitional Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees must select wet weather MS4 outfall discharge monitoring stations from the inventories developed pursuant to Provision D.2.a.(1) for each Watershed Management Area as follows:

(i) At least five wet weather MS4 outfall discharge monitoring stations that are representative of storm water discharges from areas consisting primarily of residential, commercial, industrial, and typical mixed-use land uses present within the Watershed Management Area;

(ii) At least one wet weather MS4 outfall discharge monitoring station for each Copermittee within the Watershed Management Area; and

(iii) The County of San Diego may select at least two (2) wet weather MS4 outfall discharge monitoring stations for the portion of the Santa Margarita River Watershed Management Area within its jurisdiction to be monitored during the transitional period until the Riverside County Copermittees are notified of coverage under this Order. After the Riverside County Copermittees are notified of coverage under this Order, the Copermittees in the Watershed Management Area must select wet weather MS4 outfall discharge monitoring stations consistent with the requirements above.

(b) Transitional Wet Weather MS4 Outfall Discharge Monitoring Frequency

Each wet weather MS4 outfall discharge monitoring station selected pursuant to Provision D.2.a.(3)(a) must be monitored once during the wet season (October 1 – April 30). The wet weather monitoring events must be selected to be representative of the range of hydrological conditions experienced in the region. At least 10 percent of samples must be conducted during the first wet weather event of the wet season, to include at least one such sample in each Watershed Management Area..

(c) Transitional Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(i) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(ii) The flow rates and volumes measured or estimated from the MS4 outfall (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(d) Transitional Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(e) Transitional Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, and indicator bacteria;

(iv) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

[a] Time-weighted composites collected over the length of the storm event or the first 24 hour period whichever is shorter, composed of discrete samples, which may be collected through the use of automated equipment, or

[b] Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

[c] If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during

the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours;

(v) Only one analysis of the composite of aliquots is required;

(vi) The samples must be analyzed for the following constituents:

[a] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

[b] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and

[c] Constituents listed in Table D-6.

Table D-6. Analytical Monitoring Constituents for Wet Weather MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Nickel • Selenium • Thallium • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(f) Other Transitional Wet Weather MS4 Outfall Discharge Monitoring

The San Diego County Copermittees must continue the wet weather MS4 outfall monitoring program developed under Order No. R9-2007-0001, as approved by the San Diego Water Board, through its planned completion.

b. Dry Weather MS4 Outfall Discharge Monitoring

Each Copermittee must perform dry weather MS4 outfall monitoring to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision

E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. Each Copermittee must conduct the following dry weather MS4 outfall discharge monitoring within its jurisdiction:

(1) Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Each Copermittee must continue to perform the dry weather MS4 outfall discharge field screening monitoring in accordance with the requirements of Provision D.2.a.(2). The Copermittee may adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of persistent flow non-storm water discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of visual inspections performed is equivalent to the number of visual inspections required under Provision D.2.a.(2)(a).

(2) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring

Each Copermittee must perform non-storm water persistent flow MS4 outfall discharge monitoring to determine which persistent non-storm water discharges contain concentrations of pollutants below NALs, and which persistent non-storm water discharges impact receiving water quality during dry weather. Each Copermittee must conduct the following non-storm water persistent flow MS4 outfall discharge monitoring within its jurisdiction:

(a) Prioritization of Non-Storm Water Persistent Flow MS4 Outfalls

Based upon the dry weather MS4 outfall discharge field screening monitoring records developed pursuant to Provision D.2.a.(2)(c), each Copermittee must identify and prioritize the MS4 outfalls with persistent flows based on the highest priority water quality conditions identified in the Water Quality Improvement Plan and any additional criteria developed by the Copermittee, which may include historical data and data from sources other than what the Copermittee collects.

(b) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring Frequency

(i) Based on the prioritization of major MS4 outfalls developed under Provision D.2.b.(2)(a), each Copermittee must identify, at a minimum, the 5 highest priority major MS4 outfalls with non-storm water persistent flows that the Copermittee will monitor within its jurisdiction in each Watershed Management Area. For Responsible Copermittees identified by a TMDL in Attachment E to this Order, if the 5 chosen outfall locations are not sufficient to determine compliance with the TMDL(s), then each Responsible Copermittee

must identify additional MS4 outfall monitoring locations within its jurisdiction sufficient to address compliance with the TMDL(s). If a Copermittee has less than 5 major outfalls within a Watershed Management Area, then the Copermittee must monitor all of its major MS4 outfalls with persistent flows within each Watershed Management Area. The location of the highest priority non-storm water persistent flow MS4 outfall monitoring stations must be identified on the map required pursuant to Provision E.2.b.(1). The map must specify which MS4 outfalls are being monitored for compliance with a TMDL.

(ii) Each of the highest priority non-storm water persistent flow MS4 outfall monitoring stations identified pursuant to Provision D.2.b.(2)(b)(i) must be monitored under dry weather conditions at least semi-annually until one of the following occurs:

[a] The non-storm water discharges have been effectively eliminated (i.e. no flowing, pooled, or ponded water) for three consecutive dry weather monitoring events; or

[b] The source(s) of the persistent flows has been identified as a category of non-storm water discharges that does not require an NPDES permit and does not have to be addressed as an illicit discharge because it was not identified as a source of pollutants (i.e. constituents in non-storm water discharge do not exceed NALs), and the persistent flow can be re-prioritized to a lower priority; or

[c] The constituents in the persistent flow non-storm water discharge do not exceed NALs, and the persistent flow can be re-prioritized to a lower priority; or

[d] The source(s) of the persistent flows has been identified as a non-storm water discharge authorized by a separate NPDES permit.

(iii) Where the criteria under Provision D.2.b.(2)(b)(ii) are not met, but the threat to water quality has been reduced by the Copermittee, the highest priority persistent flow MS4 outfall monitoring stations may be reprioritized accordingly for continued dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1).

(iv) Each Copermittee must document removal or re-prioritization of the highest priority persistent flow MS4 outfall monitoring stations identified under Provision D.2.b.(2)(a) in the Water Quality Improvement Plan Annual Report. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized major MS4 outfall in the Watershed Management Area within its jurisdiction, unless there are no remaining qualifying major MS4 outfalls within the Copermittee's jurisdiction in the Watershed Management Area.

(c) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Observations

During each semi-annual monitoring event, each Copermittee must record field observations consistent with Table D-5 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(d) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Monitoring

During each semi-annual monitoring event, if conditions allow the collection of the data, each Copermittee must monitor and record the parameters in Table D-2 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(e) Non-Storm Water Persistent Flow MS4 Outfall Discharge Analytical Monitoring

During each semi-annual monitoring event in which measurable flow is present, each Copermittee must collect and analyze samples from each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Collect grab or composite samples to be analyzed at a qualified laboratory for the following constituents:

[a] Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,
[b] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,
[c] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,
[d] Applicable NAL constituents, and
[e] Constituents listed in Table D-7. The Copermittees may adjust the list of constituents for the Watershed Management Area if historical data or supporting information can be provided that demonstrates or justifies the analysis of a constituent is not necessary.

Table D-7. Analytical Monitoring Constituents for Persistent Flow MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Total Hardness • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Cadmium • Copper • Lead • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(iv) If the Copermittee identifies and eliminates the source of the persistent flow non-storm water discharge, analysis of the sample is not required.

c. WET WEATHER MS4 OUTFALL DISCHARGE MONITORING

The Copermittees must perform wet weather MS4 outfall monitoring to identify pollutants in storm water discharges from the MS4s, to guide pollutant source identification efforts, and to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order. The Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(1) Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees may adjust the wet weather MS4 outfall discharge monitoring locations in the Watershed Management Area, as needed, to identify pollutants in storm water discharges from MS4s, to guide pollutant source identification efforts, and to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of stations is at least equivalent to the number of stations required under Provision D.2.a.(3)(a). Additional outfall monitoring locations, above the minimum per jurisdiction, may be required to demonstrate compliance with the WQBELs associated with the applicable TMDLs in Attachment E.

(2) Wet Weather MS4 Outfall Discharge Monitoring Frequency

The Copermittees must monitor the wet weather MS4 outfall discharge monitoring stations in the Watershed Management Area at least once (1) per year. The Copermittees may need to increase the frequency of monitoring in order to identify pollutants in storm water discharges from the MS4s causing or contributing to the highest priority water quality conditions, to guide pollutant source identification efforts, or to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order.

(3) Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(4) Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(5) Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites collected over the length of the storm event or the first 24 hour period, whichever is shorter , composed of discrete samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

(iii) If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours.

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) The Copermittees may adjust the analytical monitoring required for the Watershed Management Area, if the Copermittees have historical data or supporting information that can demonstrate or provide justification that the analysis of a constituent is not necessary.

3. Special Studies

a. Within the term of this Order, the Copermittees must initiate the following special studies:

(1) At least two special studies in each Watershed Management Area to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that cause or contribute to highest priority water quality conditions identified in the Water Quality Improvement Plan.

(2) At least one special study for the San Diego Region to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that are impacting receiving waters on a regional basis in the San Diego Region.

(3) One of the two special studies in each Watershed Management Area required pursuant to Provision D.3.a.(1) may be replaced by a special study implemented pursuant to Provision D.3.a.(2).

b. The special studies must, at a minimum, be in conformance with the following criteria:

(1) The special studies must be related to the highest priority water quality conditions identified by the Copermittees in the Watershed Management Area and/or for the entire San Diego Region;

(2) The special studies developed pursuant to Provision D.3.a.(1) must:

(a) Be implemented within the applicable Watershed Management Area, and

(b) Require some form of participation by all the Copermittees within the Watershed Management Area;

(3) The special studies developed pursuant to Provision D.3.a.(2) must:

(a) Be implemented within the San Diego Region, and

(b) Require some form of participation by all Copermittees covered under the requirements of this Order.

(4) The Copermittees are encouraged to partner with environmental groups or third parties knowledgeable of watershed conditions to complete the required special studies.

c. Special studies developed to identify sources of pollutants and/or stressors should be pollutant and/or stressor specific and based on historical monitoring data and monitoring performed pursuant to Provisions D.1 and D.2. Development of source identification special studies should include the following:

(1) A compilation of known information on the specific pollutant and/or stressor, including data on potential sources and movement of the pollutant and/or stressor within the watershed. Data generated by the Copermittees and others, as well as information available from a literature research on the pollutant and/or stressor should be compiled and analyzed as appropriate.

(2) An identification of data gaps, based on the compiled information generated on the specific pollutant and/or stressor identified in Provision D.3.c.(1). Source identification special studies should be developed to fill identified data gaps.

(3) A monitoring plan that will collect and provide data the Copermittees can utilize to do the following:

(a) Quantify the relative loading or impact of a pollutant and/or stressor from a particular source or pollutant generating activity;

(b) Improve understanding of the fate of a pollutant and/or stressor in the environment;

(c) Develop an inventory of known and suspected sources of a pollutant and/or stressor in the Watershed Management Area; and/or

(d) Prioritize known and suspected sources of a pollutant and/or stressor based on relative magnitude in discharges, geographical distribution (i.e., regional or localized), frequency of occurrence in discharges, human health risk, and controllability.

d. Special studies initiated prior to the effective date of this Order that meet the requirements of Provision D.3.b and are implemented during the term of this Order as part of the Water Quality Improvement Plan may be utilized to fulfill the special study requirements of Provision D.3.a. Special studies completed before the effective date of this Order cannot be utilized to fulfill the special study requirements of Provision D.3.a.

e. The Copermittees must submit the monitoring plans for the special studies in the Water Quality Improvement Plans required pursuant to Provision F.1.

f. The Copermittees are encouraged to share the results of the special studies regionally among the Copermittees to provide information useful in improving and adapting the management of non-storm water and storm water runoff through the implementation of the Water Quality Improvement Plans.

4. Assessment Requirements

Each Copermittee must evaluate the data collected pursuant to Provisions D.1, D.2 and D.3, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E, to assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a. Assessments must be performed as described in the following provisions:

a. Receiving Waters Assessments

(1) The Copermittees must assess and report the conditions of the receiving waters in the Watershed Management Area as follows:

(a) Based on data collected pursuant to Provision D.1.a, the assessments under Provision D.4.a.(2) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(b) Based on the data collected pursuant to Provisions D.1.a-e, the assessments required under Provision D.4.a.(2) must be included in the Report of Waste Discharge required pursuant to Provision F.5.b.

(2) The Copermittees must assess the status and trends of receiving water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under dry weather and wet weather conditions. For each of the three types of receiving waters in each Watershed Management Area the Copermittees must:

(a) Determine whether or not the conditions of the receiving waters are meeting the numeric goals established pursuant to Provision B.3.a;

(b) Identify the most critical beneficial uses that must be protected to ensure overall health of the receiving water;

(c) Determine whether or not those critical beneficial uses are being protected;

(d) Identify short-term and/or long-term improvements or degradation of those critical beneficial uses;

(e) Determine whether or not the strategies established in the Water Quality Improvement Plan contribute towards progress in achieving the interim and final numeric goals of the Water Quality Improvement Plan; and

(f) Identify data gaps in the monitoring data necessary to assess Provisions D.4.a.(2)(a)-(e).

b. MS4 OUTFALL DISCHARGES ASSESSMENTS

(1) Non-Storm Water Discharges Reduction Assessments

(a) Each Copermittee must assess and report the progress of its illicit discharge detection and elimination program, required to be implemented pursuant to Provision E.2, toward effectively prohibiting non-storm water and illicit discharges into the MS4 within its jurisdiction as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(2), the assessments under Provision D.4.b.(1)(b) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(ii) Based on the data collected pursuant to Provisions D.2.b, the assessments required under Provision D.4.b.(1)(c) must be included in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

(iii) Based on the data collected pursuant to Provisions D.2.b, the assessment required under Provision D.4.b.(1)(c) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.a.(2), each Copermittee must assess and report the following:

(i) Identify the known and suspected controllable sources (e.g. facilities, areas, land uses, pollutant generating activities) of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area;

(ii) Identify sources of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area that have been reduced or eliminated; and

(iii) Identify modifications to the field screening monitoring locations and frequencies for the MS4 outfalls in its inventory necessary to identify and eliminate sources of persistent flow non-storm water discharges pursuant to Provision D.2.b.

(c) Based on the dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1), each Copermittee must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(1)(b);

(ii) Based on the data collected and applicable NALs in the Water Quality Improvement Plan, rank the MS4 outfalls in the Copermittee's jurisdiction according to potential threat to receiving water quality, and produce a prioritized list of major MS4 outfalls for follow-up action to update the Water Quality Improvement Plan, with the goal of eliminating persistent flow non-storm water discharges and/or pollutant loads in order of the ranked priority list through targeted programmatic actions and source investigations;

(iii) For the highest priority major MS4 outfalls with persistent flows that are in exceedance of NALs, identify the known and suspected sources within the Copermittee's jurisdiction in the Watershed Management Area that may cause or contribute to the NAL exceedances;

(iv) Each Copermittee must analyze the data collected pursuant to Provision D.2.b, and utilize a model or other method, to calculate or estimate the non-storm water volumes and pollutant loads collectively discharged from all the major MS4s outfalls in its jurisdiction identified as having persistent dry weather flows during the monitoring year. These calculations or estimates must be updated annually.

[a] Each Copermittee must calculate or estimate the annual non-storm water volumes and pollutant loads collectively discharged from the Copermittee's major MS4 outfalls to receiving waters within the Copermittee's jurisdiction, with an estimate of the percent contribution from each known source for each MS4 outfall;

[b] Each Copermittee must annually identify and quantify (i.e. volume and pollutant loads) sources of non-storm water not subject to the Copermittee's legal authority that are discharged from the Copermittee's major MS4 outfalls to downstream receiving waters.

(v) Each Copermittee must review the data collected pursuant to Provision D.2.b and findings from the assessments required pursuant to Provision D.4.b.(1)(c)(i)-(iv) at least once during the term of this Order to:

[a] Identify reductions and progress in achieving reductions in non-storm water and illicit discharges to the Copermittee's MS4 in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction, with an estimate, if possible, of the non-storm water volume and/or pollutant load reductions attributable to specific water quality strategies implemented by the Copermittee; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittee in the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction.

(vi) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(1)(c)(i)-(v).

(2) <u>Storm Water Pollutant Discharges Reduction Assessments</u>

(a) The Copermittees must assess and report the progress of the water quality improvement strategies, required to be implemented pursuant to Provisions B and E, toward reducing pollutants in storm water discharges from the MS4s within the Watershed Management Area as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(3), the assessments under Provision D.4.b.(2)(b) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(ii) Based on the data collected pursuant to Provisions D.2.c, the assessments required under Provision D.4.b.(2)(c) must be included in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

(iii) Based on the data collected pursuant to Provisions D.2.c, the assessment required under Provisions D.4.b.(2)(c)-(d) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.a.(3) the Copermittees must assess and report the following:

(i) The Copermittees must analyze the monitoring data collected pursuant to Provision D.2.a.(3), and utilize a watershed model or other method, to calculate or estimate the following for each monitoring year:

[a] The average storm water runoff coefficient for each land use type within the Watershed Management Area;
[b] The volume of storm water and pollutant loads discharged from each of the Copermittee's monitored MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch;
[c] The total flow volume and pollutant loadings discharged from the Copermittee's jurisdiction within the Watershed Management Area over the course of the wet season, extrapolated from the data produced from the monitored MS4 outfalls; and
[d] The percent contribution of storm water volumes and pollutant loads discharged from each land use type within each hydrologic subarea with a major MS4 outfall to receiving waters or within each major MS4 outfall to receiving waters in the Copermittee's jurisdiction within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch.

(ii) Identify modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify pollutants in storm water discharges from the MS4s in the Watershed Management Area pursuant to Provision D.2.c.(1).

(c) Based on the wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.c the Copermittees must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(2)(b);

(ii) Based on the data collected and applicable SALs in the Water Quality Improvement Plan, analyze and compare the monitoring data to the analyses and assumptions used to develop the Water Quality Improvement Plans, including strategies developed pursuant to Provision B.3, and evaluate whether those analyses and assumptions should be updated as a component of the adaptive management efforts pursuant to Provision B.5 for follow-up action to update the Water Quality Improvement Plan;

(iii) The Copermittees must review the data collected pursuant to Provision D.2.c and findings from the assessments required pursuant to Provisions D.4.b.(2)(c)(i)-(ii) at least once during the term of this Order to:

[a] Identify reductions or progress in achieving reductions in pollutant concentrations and/or pollutant loads from different land uses and/or drainage areas discharging from the Copermittees' MS4s in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters within the Watershed Management Area to the MEP, with an estimate, if possible, of the pollutant load reductions attributable to specific water quality strategies implemented by the Copermittees; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittees in the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters in the Watershed Management Area to the MEP.

(iv) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(iii).

(d) The Copermittees must evaluate all the data collected pursuant to Provision D.2.c, and incorporate new outfall monitoring data into time series plots for each long-term monitoring constituent for the Watershed Management Area, and perform statistical trends analysis on the cumulative long-term wet weather MS4 outfall discharge water quality data set.

c. Special Studies Assessments

The Copermittees must annually evaluate the results and findings from the special studies developed and implemented pursuant to Provision D.3, and assess their relevance to the Copermittees' efforts to characterize receiving water conditions, understand sources of pollutants and/or stressors, and control and reduce the discharges of pollutants from the MS4 outfalls to receiving waters in the Watershed Management Area. The Copermittees must report the results of the special studies assessments applicable to the Watershed Management Area, and identify any necessary modifications or updates to the Water Quality Improvement Plan based on the results in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

d. Integrated Assessment of Water Quality Improvement Plan

As part of the iterative approach and adaptive management process required for the Water Quality Improvement Plan pursuant to Provision B.5, the Copermittees in each Watershed Management Area must integrate the data collected pursuant to Provisions D.1-D.3, the findings from the assessments required pursuant to

Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to assess the effectiveness of, and identify necessary modifications to, the Water Quality Improvement Plan as follows:

(1) The Copermittees must re-evaluate the priority water quality conditions and numeric goals for the Watershed Management Area, as needed, during the term of this Order pursuant to Provision B.5.a. The re-evaluation and recommendations for modifications to the priority water quality conditions, and/or numeric goals and corresponding schedules may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The priority water quality conditions and numeric goals for the Watershed Management Area must be re-evaluated as follows:

(a) Re-evaluate the receiving water conditions in the Watershed Management Area in accordance with Provision B.2.a;

(b) Re-evaluate the impacts on receiving waters in the Watershed Management Area from MS4 discharges in accordance with Provision B.2.b;

(c) Re-evaluate the identification of MS4 sources of pollutants and/or stressors in accordance with Provision B.2.d;

(d) Identify beneficial uses of the receiving waters that are protected in accordance with Provision D.4.a;

(e) Evaluate the progress toward achieving the interim and final numeric goals for protecting impacted beneficial uses in the receiving waters.

(2) The Copermittees must re-evaluate the water quality improvement strategies for the Watershed Management Area during the term of this Order pursuant to Provision B.5.b. The re-evaluation and recommendations for modifications to the water quality improvement strategies and schedules may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The water quality improvement strategies for the Watershed Management Area must be re-evaluated as follows:

(a) Identify the non-storm water and storm water pollutant loads from the Copermittees' MS4 outfalls in the Watershed Management Area, calculated or estimated pursuant to Provisions D.4.b;

(b) Identify the non-storm water and storm water pollutant load reductions, or other improvements to receiving water or water quality conditions, that are necessary to attain the interim and final numeric goals identified in the Water Quality Improvement Plan for protecting beneficial uses in the receiving waters;

(c) Identify the non-storm water and storm water pollutant load reductions, or other improvements to the quality of MS4 discharges, that are necessary for the Copermittees to demonstrate that non-storm water and storm water discharges from their MS4s are not causing or contributing to exceedances of receiving water limitations;

(d) Evaluate the progress of the water quality improvement strategies toward achieving the interim and final numeric goals identified in the Water Quality Improvement Plan for protecting beneficial uses in the receiving waters.

(3) The Copermittees must re-evaluate and adapt the water quality monitoring and assessment program for the Watershed Management Area when new information becomes available to improve the monitoring and assessment program pursuant to Provision B.5.c. The re-evaluation and recommendations for modifications to the monitoring and assessment program may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. Modifications to the water quality monitoring and assessment program must be consistent with the requirements of Provision D.1-D.3. The re-evaluation of the water quality monitoring and assessment program for the Watershed Management Area must consider the data gaps identified by the assessments required pursuant to Provisions D.4.a-b, and results of the special studies implemented pursuant to Provision D.4.c.

5. Monitoring Provisions

Each Copermittee must comply with all the monitoring, reporting, and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

E. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS

The purpose of this provision is for each Copermittee to implement a program to control the contribution of pollutants to and the discharges from the MS4 within its jurisdiction. The goal of the jurisdictional runoff management programs is to implement strategies that effectively prohibit non-storm water discharges to the MS4 and reduce the discharge of pollutants in storm water to the MEP. This goal will be accomplished through implementing the jurisdictional runoff management programs in accordance with the strategies identified in the Water Quality Improvement Plans.

Each Copermittee must update its jurisdictional runoff management program document, in accordance with Provision F.2.a, to incorporate all the requirements of Provision E. Until the Copermittee has updated its jurisdictional runoff management program document with the requirements of Provision E, the Copermittee must continue implementing its current jurisdictional runoff management program.

1. Legal Authority Establishment and Enforcement

a. Each Copermittee must establish, maintain, and enforce adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 through statute, ordinance, permit, contract, order, or similar means. This legal authority must, at a minimum, authorize the Copermittee to:

(1) Prohibit and eliminate all illicit discharges and illicit connections to its MS4;

(2) Control the contribution of pollutants in discharges of runoff associated with industrial and construction activity to its MS4 and control the quality of runoff from industrial and construction sites, including industrial and construction sites which have coverage under the statewide General Permit for Discharges of Storm Water Associated with Industrial Activities (Industrial General Permit) or General Permit for Discharges of Storm Water Associated with Construction Activities (Construction General Permit), as well as to those sites which do not;

(3) Control the discharge of spills, dumping, or disposal of materials other than storm water into its MS4;

(4) Control through interagency agreements among Copermittees the contribution of pollutants from one portion of the MS4 to another portion of the MS4;

(5) Control, by coordinating and cooperating with other owners of the MS4 such as Caltrans, the U.S. federal government, or sovereign Native American Tribes through interagency agreements, where possible, the contribution of pollutants from their portion of the MS4 to the portion of the MS4 within the Copermittee's jurisdiction;

(6) Require compliance with conditions in its statutes, ordinances, permits, contracts, orders, or similar means to hold dischargers to its MS4 accountable for their contributions of pollutants and flows;

(7) Require the use of BMPs to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(8) Require documentation on the effectiveness of BMPs implemented to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(9) Utilize enforcement mechanisms to require compliance with its statutes, ordinances, permits, contracts, orders, or similar means; and

(10) Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with its statutes, ordinances, permits, contracts, orders, or similar means and with the requirements of this Order, including the prohibition of illicit discharges and connections to its MS4; the Copermittee must also have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from industrial facilities, including construction sites, discharging into its MS4.

b. With the first Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3), each Copermittee must submit a statement certified by its Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative that the Copermittee has taken the necessary steps to obtain and maintain full legal authority within its jurisdiction to implement and enforce each of the requirements contained in this Order.

2. Illicit Discharge Detection and Elimination

Each Copermittee must implement a program to actively detect and eliminate illicit discharges and improper disposal into the MS4, or otherwise require the discharger to apply for and obtain a separate NPDES permit. The illicit discharge detection and elimination program must be implemented in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include, at a minimum, the following requirements:

a. Non-Storm Water Discharges

Each Copermittee must address all non-storm water discharges as illicit discharges unless a non-storm water discharge is either identified as a discharge authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to the following requirements:

(1) Discharges of non-storm water to the MS4 from the following categories must be addressed as illicit discharges unless the discharge has coverage or meets the exception criteria under NPDES Permit No. CAG919003~~1 (Order No. R9-2007-0034, or subsequent order) for discharges to San Diego Bay, or NPDES Permit No. CAG919002~~ (Order No. R9-2015-0013 ~~2008-0002~~, ~~or subsequent order~~ as it may be amended or reissued) for discharges to surface waters within the San Diego Region ~~other than San Diego Bay~~:

(1) Uncontaminated pumped ground water;

(2) Discharges from foundation drains;[23]

(3) Water from crawl space pumps; and

(4) Water from footing drains.[20]

(2) Discharges of non-storm water from water line flushing and water main breaks to the MS4 must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG679001 (Order No. R9-2010-0003, ~~or subsequent order~~ as it may be amended or reissued) or NPDES General Permit No. CAG140001 (Order 2014-0194-DWQ, as it may be amended or reissued). This category includes water line flushing and water main break discharges from water purveyors issued a water supply permit by the California Department of Public Health or federal military installations. Discharges from recycled or reclaimed water lines to the MS4 must be addressed as illicit discharges, unless the discharges have coverage under a separate NPDES permit.

(3) Discharges of non-storm water to the MS4 from the following categories must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a source of pollutants to receiving waters:

(a) Diverted stream flows;

(b) Rising ground waters;

(c) Uncontaminated ground water infiltration to MS4s;

(d) Springs;

(e) Flows from riparian habitats and wetlands;

[23] Provision E.2.a.(1) only applies to this category of non-storm water if the system is designed to be located at or below the groundwater table to actively or passively extract groundwater during any part of the year.

(f) Discharges from potable water sources;

(g) Discharges from foundation drains;[24] and

(h) Discharges from footing drains.[21]

(4) Discharges of non-storm water to the MS4 from the following categories must be controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means. Discharges of non-storm water to the MS4 from the following categories not controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means must be addressed by the Copermittee as illicit discharges.

(a) Air conditioning condensation

The discharge of air conditioning condensation should be directed to landscaped areas or other pervious surfaces, or to the sanitary sewer, where feasible.

(b) Individual residential vehicle washing

(i) The discharge of wash water should be directed to landscaped areas or other pervious surfaces where feasible; and

(ii) The minimization of water, washing detergent and other vehicle wash products used for residential vehicle washing, and the implementation of other practices or behaviors that will prevent the discharge of pollutants associated with individual residential vehicle washing from entering the MS4 must be encouraged.

(c) Dechlorinated swimming pool discharges

(i) Residual chlorine, algaecide, filter backwash, or other pollutants from swimming pools must be eliminated prior to discharging to the MS4; and

(ii) The discharge of saline swimming pool water must be directed to the sanitary sewer, landscaped areas, or other pervious surfaces that can accommodate the volume of water, unless the saline swimming pool water can be discharged via a pipe or concrete channel directly to a naturally saline water body (e.g. Pacific Ocean).

(5) Firefighting discharges to the MS4 must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board

[24] Provision E.2.a.(3) only applies to this category of non-storm water discharge if the system is designed to be located above the groundwater table at all times of the year, and the system is only expected to discharge non-storm water under unusual circumstances.

identifies the discharge as a significant source of pollutants to receiving waters. Firefighting discharges to the MS4 not identified as a significant source of pollutants to receiving waters, must be addressed, at a minimum, as follows:

(a) Non-emergency firefighting discharges

(i) Building fire suppression system maintenance discharges (e.g. sprinkler line flushing) to the MS4 must be addressed as illicit discharges unless BMPs are implemented to prevent pollutants associated with such discharges to the MS4.

(ii) Non-emergency firefighting discharges (i.e., discharges from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems) must be addressed by a program, to be developed and implemented by the Copermittee, to reduce or eliminate pollutants in such discharges from entering the MS4.

(b) Emergency firefighting discharges

Each Copermittee should develop and encourage implementation of BMPs to reduce or eliminate pollutants in emergency firefighting discharges to the MS4s and receiving waters within its jurisdiction. During emergency situations, priority of efforts should be directed toward life, property, and the environment (in descending order). BMPs should not interfere with immediate emergency response operations or impact public health and safety.

(6) If the Copermittee or San Diego Water Board identifies any category of non-storm water discharges listed under Provisions E.2.a.(1)-(4) as a source of pollutants to receiving waters, the category must be prohibited through ordinance, order, or similar means and addressed as an illicit discharge. Alternatively, the Copermittee may propose controls to be implemented for the category of non-storm water discharges as part of the Water Quality Improvement Plan instead of prohibiting the category of non-storm water discharges, and implement the controls if accepted by the San Diego Water Board as part of the Water Quality Improvement Plan.

(7) Each Copermittee must, where feasible and priorities and resources allow, reduce or eliminate non-storm water discharges listed under Provisions E.2.a.(1)-(4) into its MS4, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit.

b. PREVENT AND DETECT ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to prevent and detect illicit discharges to the MS4:

(1) Each Copermittee must maintain an updated map of its entire MS4 and the corresponding drainage areas. The accuracy of the MS4 map must be confirmed during the field screening required pursuant to Provision E.2.c. The MS4 map must be included as part of the jurisdictional runoff management program document. Any geographic information system (GIS) layers or files used by the Copermittee to maintain the MS4 map must be made available to the San Diego Water Board upon request. The MS4 map must identify the following:

(a) All segments of the MS4 owned, operated, and maintained by the Copermittee;

(b) All known locations of inlets that discharge and/or collect runoff into the Copermittee's MS4;

(c) All known locations of connections with other MS4s not owned or operated by the Copermittee (e.g. Caltrans MS4s);

(d) All known locations of MS4 outfalls and private outfalls that discharge runoff collected from areas within the Copermittee's jurisdiction;

(e) All segments of receiving waters within the Copermittee's jurisdiction that receive and convey runoff discharged from the Copermittee's MS4 outfalls;

(f) Locations of the MS4 outfalls, identified pursuant to Provision D.2.a.(1), within its jurisdiction; and

(g) Locations of the non-storm water persistent flow MS4 outfall discharge monitoring stations, identified pursuant to Provision D.2.b.(2), within its jurisdiction.

(2) Each Copermittee must use Copermittee personnel and contractors to assist in identifying and reporting illicit discharges and connections during their daily employment activities.

(3) Each Copermittee must promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges to or from the MS4, including the following methods for public reporting:

(a) Operate a public hotline, which can be Copermittee-specific or shared by the Copermittees, and must be capable of receiving reports in both English and Spanish 24 hours per day and seven days per week; and

(b) Designate an e-mail address for receiving electronic reports from the public, which can be Copermittee-specific or shared by the Copermittees, and must be prominently displayed on the Copermittee's webpage and the Regional Clearinghouse required pursuant to Provision F.4.

(4) Each Copermittee must implement practices and procedures (including a notification mechanism) to prevent, respond to, contain, and clean up any spills that may discharge into the MS4 within its jurisdiction from any source. The Copermittee must coordinate, to the extent possible, with spill response teams to prevent entry of spills into the MS4, and prevent contamination of surface water, ground water, and soil. The Copermittee must coordinate spill prevention, containment, and response activities throughout all appropriate Copermittee departments, programs, and agencies.

(5) Each Copermittee must implement practices and procedures to prevent and limit infiltration of seepage from sanitary sewers (including private laterals and failing septic systems) to the MS4.

(6) Each Copermittee must coordinate, when necessary, with upstream Copermittees and/or entities to prevent illicit discharges from upstream sources into the MS4 within its jurisdiction.

c. Field Screening

Each Copermittee must conduct field screening (i.e. visual observations, field testing, and/or analytical testing) of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4 in accordance with the dry weather MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

d. Investigate and Eliminate Illicit Discharges And Connections

Each Copermittee must include the following measures within its program to investigate and eliminate illicit discharges to the MS4:

(1) Each Copermittee must prioritize and determine when follow-up investigations will be performed in response to visual observations and/or water quality monitoring data collected during an investigation of a detected non-storm water or illicit discharge to or from the MS4. The criteria for prioritizing investigations must consider the following:

(a) Pollutants identified as causing or contributing to the highest water quality priorities identified in the Water Quality Improvement Plan;

(b) Pollutants identified as causing or contributing, or threatening to cause or contribute to impairments in water bodies on the 303(d) List and/or in environmentally sensitive areas (ESAs), located within its jurisdiction;

(c) Pollutants identified from sources or land uses known to exist within the area, drainage basin, or watershed that discharges to the portion of the MS4 within its jurisdiction included in the investigation;

(d) Pollutants identified as causing or contributing to an exceedance of a NAL in the Water Quality Improvement Plan; and

(e) Pollutants identified as a threat to human health or the environment.

(2) Each Copermittee must implement procedures to investigate and inspect portions of its MS4 that, based on reports or notifications, field screening, or other appropriate information, indicate a reasonable potential of receiving, containing, or discharging pollutants due to illicit discharges, illicit connections, or other sources of non-storm water. The procedures must include the following:

(a) Each Copermittee must develop criteria to:

(i) Assess the validity of each report or notification received; and

(ii) Prioritize the response to each report or notification received.

(b) Each Copermittee must prioritize and respond to each valid report or notification (e.g., public reports, staff or contractor reports and notifications, etc.) of an incident in a timely manner.

(c) In accordance with the requirements of Provision E.2.d.(1), each Copermittee must investigate and seek to identify the source(s) of discharges of non-storm water where flows are observed in and from the MS4 during the field screening required pursuant to Provision D.2.b.(1) as follows:

(i) Obvious illicit discharges must be immediately investigated to identify the source(s) of non-storm water discharges;

(ii) The investigation must include field investigations to identify sources or potential sources for the discharge, unless the source or potential source has already been identified during previous investigations; and

(iii) The investigation may include follow-up field investigations and/or reviewing Copermittee inventories and other land use data to identify potential sources of the discharge.

(d) Each Copermittee must maintain records and a database of the following information:

(i) Location of incident, including hydrologic subarea, portion of MS4 receiving the non-storm water or illicit discharge, and point of discharge or potential discharge from MS4 to receiving water;

(ii) Source of information initiating the investigation (e.g., public reports, staff or contractor reports and notifications, field screening, etc.);

(iii) Date the information used to initiate the investigation was received;

(iv) Date the investigation was initiated;

(v) Dates of follow-up investigations;

(vi) Identified or suspected source of the illicit discharge or connection, if determined;

(vii) Known or suspected related incidents, if any;

(viii) Result of the investigation; and

(ix) If a source cannot be identified and the investigation is not continued, document the response pursuant to the requirements of Provision E.2.d.(4).

(e) Each Copermittee must maintain records and, in accordance with the priorities of the Water Quality Improvement Plan, seek to identify the source(s) of non-storm water discharges from the MS4 where there is evidence of non-storm water having been discharged into or from the MS4 (e.g., pooled water), in accordance with MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

(3) Each Copermittee must initiate the implementation of procedures, in a timely manner, to eliminate all detected and identified illicit discharges and connections within its jurisdiction. The procedures must include the following responses:

(a) Each Copermittee must enforce its legal authority, as required under Provision E.1, to eliminate illicit discharges and connections to the MS4.

(b) If the Copermittee identifies the source as a controllable source of non-storm water or illicit discharge or connection, the Copermittee must implement its Enforcement Response Plan pursuant to Provision E.6 and enforce its legal authority to prohibit and eliminate illicit discharges and connections to its MS4.

(c) If the Copermittee identifies the source of the discharge as a category of non-storm water discharges in Provision E.2.a, and the discharge is in exceedance of NALs in the Water Quality Improvement Plan, then the Copermittee must determine if: (1) this is an isolated incident or set of

circumstances that will be addressed through its Enforcement Response Plan pursuant to Provision E.6, or (2) the category of discharge must be addressed through the prohibition of that category of discharge as an illicit discharge pursuant to Provision E.2.a.(6).

(d) If the Copermittee suspects the source of the non-storm water discharge as natural in origin (i.e. non-anthropogenically influenced) and in conveyance into the MS4, then the Copermittee must document and provide the data and evidence necessary to demonstrate to the San Diego Water Board that it is natural in origin and does not require further investigation.

(e) If the Copermittee is unable to identify and document the source of a recurring non-storm water discharge to or from the MS4, then the Copermittee must address the discharge as an illicit discharge and update its jurisdictional runoff management program to address the common and suspected sources of the non-storm water discharge within its jurisdiction in accordance with the Copermittee's priorities.

(4) Each Copermittee must submit a summary of the non-storm water discharges and illicit discharges and connections investigated and eliminated within its jurisdiction with each Water Quality Improvement Plan Annual Report required under Provision F.3.b.(3) of this Order.

3. Development Planning

Each Copermittee must use their land use and planning authorities to implement a development planning program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. BMP Requirements for All Development Projects

Each Copermittee must prescribe the following BMP requirements during the planning process (i.e. prior to project approval and issuance of local permits) for all development projects (regardless of project type or size), where local permits are issued, including unpaved roads and flood management projects:

(1) General Requirements

(a) Onsite BMPs must be located so as to remove pollutants from runoff prior to its discharge to any receiving waters, and as close to the source as possible;

(b) Structural BMPs must not be constructed within waters of the U.S.

(c) Onsite BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors (e.g. mosquitos, rodents, or flies).

(2) Source Control BMP Requirements

The following source control BMPs must be implemented at all development projects where applicable and feasible:

(a) Prevention of illicit discharges into the MS4;

(b) Storm drain system stenciling or signage;

(c) Protect outdoor material storage areas from rainfall, run-on, runoff, and wind dispersal;

(d) Protect materials stored in outdoor work areas from rainfall, run-on, runoff, and wind dispersal;

(e) Protect trash storage areas from rainfall, run-on, runoff, and wind dispersal; and

(f) Any additional BMPs determined to be necessary by the Copermittee to minimize pollutant generation at each project.

(3) Low Impact Development (LID) BMP Requirements

The following LID BMPs must be implemented at all development projects where applicable and feasible:

(a) Maintenance or restoration of natural storage reservoirs and drainage corridors (including topographic depressions, areas of permeable soils, natural swales, and ephemeral and intermittent streams);[25]

(b) Buffer zones for natural water bodies (where buffer zones are technically infeasible, require project applicant to include other buffers such as trees, access restrictions, etc.);

(c) Conservation of natural areas within the project footprint including existing trees, other vegetation, and soils;

(d) Construction of streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided public safety is not compromised;

[25] Development projects proposing to dredge or fill materials in waters of the U.S. must obtain a CWA Section 401 Water Quality Certification. Projects proposing to dredge or fill waters of the state must obtain waste discharge requirements.

(e) Minimization of the impervious footprint of the project;

(f) Minimization of soil compaction to landscaped areas;

(g) Disconnection of impervious surfaces through distributed pervious areas;

(h) Landscaped or other pervious areas designed and constructed to effectively receive and infiltrate, retain and/or treat runoff from impervious areas, prior to discharging to the MS4;

(i) Small collection strategies located at, or as close as possible to, the source (i.e. the point where storm water initially meets the ground) to minimize the transport of runoff and pollutants to the MS4 and receiving waters;

(j) Use of permeable materials for projects with low traffic areas and appropriate soil conditions;

(k) Landscaping with native or drought tolerant species; and

(l) Harvesting and using precipitation.

b. PRIORITY DEVELOPMENT PROJECTS

Priority Development Projects are land development projects that fall under the planning and building authority of the Copermittee for which the Copermittee must impose specific requirements, in addition to those described in Provision E.3.a, including the implementation of structural BMPs to meet the performance requirements described in Provision E.3.c.

(1) Definition of Priority Development Project

Priority Development Projects include the following:

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(b) Redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site on an existing site of 10,000 square feet or more of impervious surfaces). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(c) New and redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site), and support one or more of the following uses:

(i) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812).

(ii) Hillside development projects. This category includes development on any natural slope that is twenty-five percent or greater.

(iii) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce.

(iv) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

(d) New or redevelopment projects that create and/or replace 2,500 square feet or more of impervious surface (collectively over the entire project site), and discharging directly to an Environmentally Sensitive Area (ESA). "Discharging directly to" includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands).

(e) New development projects, or redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface, that support one or more of the following uses:

(i) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

(ii) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

(f) New or redevelopment projects that result in the disturbance of one or more acres of land and are expected to generate pollutants post construction.

(2) Special Considerations for Redevelopment Projects

The structural BMP performance requirements of Provision E.3.c are applicable to redevelopment Priority Development Projects, as defined in E.3.b.(1), as follows:

(a) Where redevelopment results in the creation or replacement of impervious surface in an amount of less than fifty percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provision E.3.c apply only to the creation or replacement of impervious surface, and not the entire development; or

(b) Where redevelopment results in the creation or replacement of impervious surface in an amount of more than fifty percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provision E.3.c apply to the entire development.

(3) Priority Development Project Exemptions

Each Copermittee has the discretion to exempt the following projects from being defined as Priority Development Projects:

(a) New or retrofit paved sidewalks, bicycle lanes, or trails that meet the following criteria:

(i) Designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas; OR

(ii) Designed and constructed to be hydraulically disconnected from paved streets or roads; OR

(iii) Designed and constructed with permeable pavements or surfaces in accordance with USEPA Green Streets guidance.[26]

(b) Retrofitting or redevelopment of existing paved alleys, streets or roads that are designed and constructed in accordance with the USEPA Green Streets guidance.[27]

c. Priority Development Project Structural BMP Performance Requirements

In addition to the BMP requirements listed for all development projects under Provision E.3.a, Priority Development Projects must also implement structural BMPs that conform to performance requirements described below.

[26] See "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).
[27] Ibid.

(1) Storm Water Pollutant Control BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite structural BMPs to control pollutants in storm water that may be discharged from a project as follows:

(a) Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite the pollutants contained in the volume of storm water runoff produced from a 24-hour 85th percentile storm event (design capture volume);[28]

(i) If a Copermittee determines that implementing BMPs to retain the full design capture volume onsite for a Priority Development Project is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize biofiltration BMPs. Biofiltration BMPs must be designed to have an appropriate hydraulic loading rate to maximize storm water retention and pollutant removal, as well as to prevent erosion, scour, and channeling within the BMP,[29] and must be sized to:

[a] Treat 1.5 times the design capture volume not reliably retained onsite, OR

[b] Treat the design capture volume not reliably retained onsite with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite.

(ii) If a Copermittee determines that biofiltration is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize flow-thru treatment control BMPs to treat runoff leaving the site, AND mitigate for the design capture volume not reliably retained onsite pursuant to Provision E.3.c.(1)(b). Flow thru treatment control BMPs must be sized and designed to:

[28] This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals.

[29] As part of the Copermittee's update to its BMP Design Manual, pursuant to Provision E.3.d, the Copermittee must provide guidance for hydraulic loading rates and other biofiltration design criteria necessary to maximize storm water retention and pollutant removal.

[a] Remove pollutants from storm water to the MEP;
[b] Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;
[c] Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Flow-thru treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of flow-thru treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

(b) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1)(a). The Priority Development Project must mitigate for the portion of the pollutant load in the design capture volume not retained onsite if Provision E.3.c.(3) is utilized. If a Priority Development Project is allowed to utilize alternative compliance, flow-thru treatment control BMPs must be implemented to treat the portion of the design capture volume that is not reliably retained onsite. Flow-thru treatment control BMPs must be sized and designed in accordance with Provisions E.3.c.(1)(a)(ii)[a]-[c].

(2) Hydromodification Management BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite BMPs to manage hydromodification that may be caused by storm water runoff discharged from a project as follows:

(a) Post-project runoff conditions (flow rates and durations) must not exceed pre-development runoff conditions by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat downstream of Priority Development Projects).

(i) In evaluating the range of flows that results in increased potential for erosion of natural (non-hardened) channels, the lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks.

(ii) The Copermittees may use monitoring results collected pursuant to Provision D.1.a.(2) to re-define the range of flows resulting in

increased potential for erosion, or degraded instream habitat conditions, as warranted by the data.

(b) Each Priority Development Project must avoid critical sediment yield areas known to the Copermittee or identified by the optional Watershed Management Area Analysis pursuant to Provision B.3.b.(4), or implement measures that allow critical coarse sediment to be discharged to receiving waters, such that there is no net impact to the receiving water.

(c) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the performance requirements of Provision E.3.c.(2)(a). The Priority Development Project must mitigate for the post-project runoff conditions not fully managed onsite if Provision E.3.c.(3) is utilized.

(d) Exemptions

Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provisions E.3.c.(2) where the project discharges storm water runoff to:

(i) Existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;

(ii) Conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; or

(iii) An area identified by the Copermittees as appropriate for an exemption by the optional Watershed Management Area Analysis incorporated into the Water Quality Improvement Plan pursuant to Provision B.3.b.(4).

(e) Interim Timeframe Exemptions

Until the Copermittees have updated their BMP Design Manual in accordance with Provision F.2.b with the requirements of Provision E, the Copermittees have the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provision E.3.c.(2) where the project discharges storm water runoff directly to:

(i) An engineered channel conveyance system with a capacity to convey peak flows generated by the 10-year storm event all the way from the

point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; and

(ii) Large river reaches with a drainage area larger than 100 square miles and a 100-year flow capacity in excess of 20,000 cubic feet per second, provided that properly sized energy dissipation is included at all Priority Development Project discharge points.

(3) Alternative Compliance Program to Onsite Structural BMP Implementation

At the discretion of each Copermittee, Priority Development Projects may be allowed to participate in an alternative compliance program in lieu of implementing the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a), provided that the Water Quality Improvement Plan includes the optional Watershed Management Area Analysis described in Provision B.3.b.(4), and Water Quality Equivalency calculations have been accepted by the San Diego Water Board's Executive Officer pursuant to Provision E.3.c.(3)(a). The alternative compliance program is available to a Priority Development Project only if the Priority Development Project applicant enters into a voluntary agreement with the Copermittee authorizing this arrangement. In addition to the voluntary agreement, relief from implementing structural BMPs onsite may be authorized by the Copermittee under the following conditions:

(a) Water Quality Equivalency

Copermittees must submit Water Quality Equivalency calculations for acceptance by the San Diego Water Board's Executive Officer prior to administering an alternative compliance program in order to establish a regional and technical basis for determining the water quality benefits associated with alternative compliance projects. Accepted Water Quality Equivalency calculations must be incorporated as part of any Copermittee's alternative compliance program necessary for evaluating Watershed Management Area Analysis candidate projects, project applicant-proposed alternative compliance projects, alternative compliance in lieu fee structures, and alternative compliance water quality credit systems as described in Provisions E.3.c.(3)(b)-(e).

(b) Watershed Management Area Analysis Candidate Projects

The Priority Development Project applicant agrees to fund, contribute funds to, or implement a candidate project identified by the Copermittees in the Watershed Management Area Analysis included in the Water Quality Improvement Plan, pursuant to Provisions B.3.b.(4) subject to the following conditions:

(i) The Copermittee must determine that implementation of the candidate project will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a) onsite;

(ii) If the Priority Development Project applicant chooses to fully or partially fund a candidate project, then the in-lieu fee structure described in Provision E.3.c.(3)(c) must be followed;

(iii) If the Priority Development Project applicant chooses to fully or partially fund a candidate project, then the Copermittee must ensure that the funds to be obtained from the Priority Development Project applicant are sufficient to mitigate for impacts caused by not fully implementing structural BMPs onsite, pursuant to the performance requirements described in Provisions E.3.c.(1) and E.3.c.(2)(a);

(iv) If the Priority Development Project applicant chooses to implement a candidate project, then the Copermittee must ensure that pollutant control and/or hydromodification management within the candidate project are sufficient to mitigate for impacts caused by not implementing structural BMPs fully onsite, pursuant to the performance requirements described in Provisions E.3.c.(1) and E.3.c.(2)(a);

(v) The voluntary agreement to fund, partially fund, or implement a candidate project must include reliable sources of funding for operation and maintenance of the candidate project;

(vi) Design of the candidate project must be conducted under an appropriately qualified engineer, geologist, architect, landscape architect, or other professional, licenses where applicable, and competent and proficient in the fields pertinent to the candidate project design;

(vii) The candidate project must be constructed as soon as possible, but no later than 4 years after the certificate of occupancy is granted for the first Priority Development Project that contributed funds toward the construction of the candidate project, unless a longer period of time is authorized by the San Diego Water Board Executive Officer; and

(viii) If the candidate project is constructed after the Priority Development Project is constructed, the Copermittee must require temporal mitigation for pollutant loads and altered flows that are discharged from the Priority Development Project.

(c) Project Applicant Proposed Alternative Compliance Projects

The Copermittee may allow a Priority Development Project applicant to propose and fund, contribute funds to, or implement an alternative compliance project not identified by the Watershed Management Area Analysis included in the Water Quality Improvement Plan pursuant to Provisions B.3.b.(4). This option is allowed provided the Copermittee determines that implementation of the alternative compliance project will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a) onsite, and is subject to the requirements described in Provisions E.3.c.(3)(a)(ii)-(viii).

(d) Alternative Compliance In-Lieu Fee Structure

If a Copermittee chooses to allow a Priority Development Project applicant to fund, or partially fund a candidate project or an alternative compliance project, then the Copermittee must develop and implement an in-lieu fee structure. This may be developed individually or with other Copermittees and/or entities, as a means for designing, developing, constructing, operating and maintaining offsite alternative compliance projects. The in-lieu fee must be transferred to the Copermittee (for public projects) or an escrow account (for private projects) prior to the construction of the Priority Development Project.

(e) Alternative Compliance Water Quality Credit System Option

The Copermittee may develop and implement an alternative compliance water quality credit system option, individually or with other Copermittees and/or entities, provided that such a credit system clearly exhibits that it will not allow discharges from Priority Development Projects to cause or contribute to a net impact over and above the impact caused by projects meeting the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a). Any credit system that a Copermittee chooses to implement must be submitted to the San Diego Water Board Executive Officer for review and acceptance as part of the Water Quality Improvement Plan.

(4) Long-Term Structural BMP Maintenance

Each Copermittee must require the project applicant to submit proof of the mechanism under which ongoing long-term maintenance of all structural BMPs will be conducted.

(5) Infiltration and Groundwater Protection

(a) Structural BMPs designed to primarily function as large, centralized infiltration devices (such as large infiltration trenches and infiltration basins) must not cause or contribute to an exceedance of an applicable groundwater quality objective. At a minimum, such infiltration BMPs must be in conformance with the design criteria listed below, unless the development project applicant demonstrates to the Copermittee that one or more of the specific design criteria listed below are not necessary to protect groundwater quality. The design criteria listed below do not apply to small infiltration systems dispersed throughout a development project.

(i) Runoff must undergo pretreatment such as sedimentation or filtration prior to infiltration;

(ii) Pollution prevention and source control BMPs must be implemented at a level appropriate to protect groundwater quality at sites where infiltration BMPs are to be used;

(iii) Infiltration BMPs must be adequately maintained to remove pollutants in storm water to the MEP;

(iv) The vertical distance from the base of any infiltration BMP to the seasonal high groundwater mark must be at least 10 feet. Where groundwater basins do not support beneficial uses, this vertical distance criteria may be reduced, provided groundwater quality is maintained;

(v) The soil through which infiltration is to occur must have physical and chemical characteristics (e.g., appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses;

(vi) Infiltration BMPs must not be used for areas of industrial or light industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee, unless source control BMPs to prevent exposure of high threat activities are implemented, or runoff from such activities is first treated or filtered to remove pollutants prior to infiltration; and

(vii) Infiltration BMPs must be located a minimum of 100 feet horizontally from any water supply wells.

(b) The Copermittee may develop, individually or with other Copermittees, alternative mandatory design criteria to that listed above for infiltration BMPs which are designed to primarily function as centralized infiltration devices. Before implementing the alternative design criteria in the development planning process the Copermitee(s) must:

(i) Notify the San Diego Water Board of the intent to implement the alternative design criteria submitted; and

(ii) Comply with any conditions set by the San Diego Water Board.

d. BMP DESIGN MANUAL UPDATE

Each Copermittee must update its BMP Design Manual[30] pursuant to Provision F.2.b. Until the Copermittee has updated its BMP Design Manual pursuant to Provision F.2.b.(1) ~~with the requirements of Provisions E.3.a-c~~, the Copermittee must continue implementing its current BMP Design Manual. ~~Unless directed otherwise by the San Diego Water Board, t~~The Copermittee must implement the updated BMP Design Manual within 180 days following completion of ~~completing~~ the update pursuant to Provision F.2.b.(1), unless directed otherwise by the San Diego Water Board Executive Officer. The update of the BMP Design Manual required pursuant to Provision F.2.b.(1) must include the following:

(1) Updated procedures to determine the nature and extent of storm water requirements applicable to a potential development or redevelopment projects. These procedures must inform project applicants of the storm water management requirements applicable to their project including, but not limited to, general requirements for all development projects, structural BMP design procedures and requirements, hydromodification management requirements, requirements specific to phased projects, and procedures specific to private developments and public improvement projects;

(2) Updated procedures to identify pollutants and conditions of concern for selecting the most appropriate structural BMPs that consider, at a minimum, the following:

(a) Receiving water quality (including pollutants for which receiving waters are listed as impaired under the CWA section 303(d) List);

(b) Pollutants, stressors, and/or receiving water conditions that cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(c) Land use type of the project and pollutants associated with that land use type; and

(d) Pollutants expected to be present onsite.

(3) Updated procedures for designing structural BMPs, including any updated performance requirements to be consistent with the requirements of Provision E.3.c for all structural BMPs listed in the BMP Design Manual;

[30] The BMP Design Manual was formerly known as the Standard Storm Water Mitigation Plan under Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016.

(4) Long-term maintenance criteria for each structural BMP listed in the BMP Design Manual; and

(5) Alternative compliance criteria, in accordance with the requirements under Provision E.3.c.(3), if the Copermittee elects to allow Priority Development Projects within its jurisdiction to utilize alternative compliance.

e. PRIORITY DEVELOPMENT PROJECT BMP IMPLEMENTATION AND OVERSIGHT

Each Copermittee must implement a program that requires and confirms structural BMPs on all Priority Development Projects are designed, constructed, and maintained to remove pollutants in storm water to the MEP.

(1) Structural BMP Approval and Verification Process

(a) Each Copermittee must require and confirm that ~~for~~ all Priority Development Projects ~~applications that have not received prior lawful approval by the Copermittee by the effective date of the BMP Design Manual pursuant to Provision E.3.d,~~ implement the requirements of Provision E.3, ~~must be implemented. For project applications that have received prior lawful approval before the effective date of the BMP Design Manual pursuant to Provision E.3.d, the Copermittee may allow previous land development requirements to apply.~~except that the Copermittee may allow previous land development requirements to apply to a Priority Development Project if the conditions of Provision E.3.e.(1)(a)(i) or Provision E.3.e.(1)(a)(ii) are met:

(i) The Copermittee has, prior to the effective date of the BMP Design Manual required to be developed pursuant to Provision E.3.d:

[a] Approved[31] a design that incorporates the storm water drainage system for the Priority Development Project in its entirety, including all applicable structural pollutant treatment control and hydromodification management BMPs consistent with the previous applicable MS4 permit requirements;[32] AND

[b] Issued a private project permit or approval, or functional equivalent for public projects, that authorizes the Priority Development Project applicant to commence construction activities based on a design that incorporates the storm water drainage system approved in conformance with Provision E.3.e.(1)(a)(i)[a]; AND

[31] For public projects, a design stamped by the City or County Engineer, or engineer of record for the project is considered an approved design.
[32] Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016 for San Diego County, Orange County, and Riverside County Copermittees, respectively

[c] Confirmed that there have been construction activities on the Priority Development Project site within the 365 days prior to the effective date of the BMP Design Manual, *OR* the Copermittee confirms that construction activities have commenced on the Priority Development Project site within the 180 days after the effective date of the BMP Design Manual, where construction activities are undertaken in reliance on the permit or approval, or functional equivalent for public projects, issued by the Copermittee in conformance with Provision E.3.e.(1)(a)(i)[b]; AND

[d] Issued all subsequent private project permits or approvals, or functional equivalent for public projects, that are needed to implement the design initially approved in conformance with Provision E.3.e.(1)(a)(i)[a] within 5 years of the effective date of the BMP Design Manual. The storm water drainage system for the Priority Development Project in its entirety, including all applicable structural pollutant treatment control and hydromodification management BMPs must remain in substantial conformity with the design initially approved in conformance with Provision E.3.e.(1)(a)(i)[a].

(ii) The Copermittee demonstrates it lacks the land use authority or legal authority to require a Priority Development Project to implement the requirements of Provision E.3.

(b) Each Copermittee must identify the roles and responsibilities of its various municipal departments in implementing the structural BMP requirements, including each stage of a project from application review and approval through BMP maintenance and inspections.

(c) Each Copermittee must require and confirm that appropriate easements and ownerships are properly recorded in public records and the information is conveyed to all appropriate parties when there is a change in project or site ownership.

(d) Each Copermittee must require and confirm that prior to occupancy and/or intended use of any portion of the Priority Development Project, each structural BMP is inspected to verify that it has been constructed and is operating in compliance with all of its specifications, plans, permits, ordinances, and the requirements of this Order.

(2) Priority Development Project Inventory and Prioritization

(a) Each Copermittee must develop, maintain, and update at least annually, a watershed-based database to track and inventory all Priority Development Projects and associated structural BMPs within its jurisdiction. Inventories must be accurate and complete beginning from December 2002 for the

San Diego County Copermittees, February 2003 for the Orange County Copermittees, and July 2005 for the Riverside County Copermittees. The use of an automated database system, such as GIS, is highly recommended. The database must include, at a minimum, the following information:

(i) Priority Development Project location (address and hydrologic subarea);

(ii) Descriptions of structural BMP type(s);

(iii) Date(s) of construction;

(iv) Party responsible for structural BMP maintenance;

(v) Dates and findings of structural BMP maintenance verifications; and

(vi) Corrective actions and/or resolutions, when applicable.

(b) Each Copermittee must prioritize the Priority Development Projects with structural BMPs within its jurisdiction. The designation of Priority Development Projects as high priority must consider the following:

(i) The highest water quality priorities identified in the Water Quality Improvement Plan;

(ii) Receiving water quality;

(iii) Number and sizes of structural BMPs;

(iv) Recommended maintenance frequency of structural BMPs;

(v) Likelihood of operation and maintenance issues of structural BMPs;

(vi) Land use and expected pollutants generated; and

(vii) Compliance record.

(3) Structural BMP Maintenance Verifications and Inspections

Each Copermittee is required to verify that structural BMPs on each Priority Development Project are adequately maintained, and continue to operate effectively to remove pollutants in storm water to the MEP through inspections, self-certifications, surveys, or other equally effective approaches.

(a) All (100 percent) of the structural BMPs at Priority Development Projects that are designated as high priority must be inspected directly by the Copermittee annually prior to each rainy season;

(b) For verifications performed through a means other than direct Copermittee inspection, adequate documentation must be required by the Copermittee to provide assurance that the required maintenance of structural BMPs at each Priority Development Project has been completed; and

(c) Appropriate follow-up measures (including re-inspections, enforcement, etc.) must be conducted to ensure that structural BMPs at each Priority Development Project continue to reduce pollutants in storm water to the MEP as originally designed.

f. DEVELOPMENT PROJECT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all development projects, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

4. Construction Management

Each Copermittee must implement a construction management program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. PROJECT APPROVAL PROCESS

Prior to issuance of any local permit(s) that allows the commencement of construction projects that involve ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff, each Copermittee must:

(1) Require a pollution control plan, construction BMP plan, and/or an erosion and sediment control plan, to be submitted by the project applicant to the Copermittee;

(2) Confirm the pollution control plan, construction BMP plan, and/or erosion and sediment control plan, complies with the local grading ordinance, other applicable local ordinances, and the requirements of this Order;

(3) Confirm the pollution control, construction BMP, and/or erosion and sediment control plan, includes seasonally appropriate and effective BMPs and management measures described in Provision E.4.c, as applicable to the project; and

(4) Verify that the project applicant has obtained coverage under the statewide Construction General Permit (Order 2009-0009-DWQ or subsequent Order), if applicable.

b. Construction Site Inventory and Tracking

(1) Each Copermittee must maintain and update, at least quarterly, a watershed-based inventory of all construction projects issued a local permit that allows ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff. The use of an automated database system, such as GIS, is highly recommended. The inventory must include:

(a) Relevant contact information for each site (e.g., name, address, phone, and email for the owner and contractor);

(b) The basic site information including location (address and hydrologic subarea), Waste Discharge Identification (WDID) number (if applicable), size of the site, and approximate area of disturbance;

(c) Whether or not the site is considered a high threat to water quality, as defined in Provision E.4.b.(2) below;

(d) The project start and completion dates;

(e) The required inspection frequency, as defined in the Copermittee's jurisdictional runoff management program document;

(f) The date the Copermittee accepted or approved the pollution control plan, construction BMP plan, and/or erosion and sediment control plan; and

(g) Whether or not there are ongoing enforcement actions administered to the site.

(2) Each Copermittee must identify all construction sites within its jurisdiction that represent a high threat to downstream surface water quality. The designation of construction sites as high threat to water quality must consider the following:

(a) Sites located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Sites located within the same hydrologic subarea and tributary to a water body segment listed as impaired for sediment on the CWA section 303(d) List;

(c) Sites located within, directly adjacent to, or discharging directly to a receiving water within an ESA; and

(d) Other sites determined by the Copermittees or the San Diego Water Board as a high threat to water quality.

c. CONSTRUCTION SITE BMP IMPLEMENTATION

Each Copermittee must implement, or require the implementation of effective BMPs to reduce discharges of pollutants in storm water from construction sites to the MEP, and effectively prohibit non-storm water discharges from construction sites into the MS4. These BMPs must be site specific, seasonally appropriate, and construction phase appropriate. BMPs must be implemented at each construction site year round. Dry season BMP implementation must plan for and address unseasonal rain events that may occur during the dry season (May 1 through September 30). Copermittees must implement, or require the implementation of, BMPs in the following categories:

(1) Project Planning;

(2) Good Site Management "Housekeeping", including waste management;

(3) Non-storm Water Management;

(4) Erosion Control;

(5) Sediment Control;

(6) Run-on and Run-off Control; and

(7) Active/Passive Sediment Treatment Systems, where applicable.

d. CONSTRUCTION SITE INSPECTIONS

Each Copermittee must conduct construction site inspections to require and confirm compliance with its local permits and applicable local ordinances, and the requirements of this Order. Priority for site inspections must consider threat to water quality pursuant to Provision E.4.b as well as the nature of the construction activity, topography, and the characteristics of soils and receiving water quality.

(1) <u>Inspection Frequency</u>

(a) Each Copermittee must conduct inspections at all inventoried sites, including high threat to water quality sites, at an appropriate frequency for each phase of construction to confirm the site reduces the discharge of pollutants in storm water from construction sites to the MEP, and effectively prohibits non-storm water discharges from entering the MS4.

(b) Each Copermittee must establish appropriate inspection frequencies for high threat to water quality sites, and all other sites, for each phase of construction. Inspection frequencies appropriate for addressing the

highest water quality priorities identified in the Water Quality Improvement Plan, and for complying with the requirements of this Order must be identified in each Copermittee's jurisdictional runoff management program document.

(c) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e., re-inspection, enforcement) necessary to require and confirm site compliance with its local permits and applicable local ordinances, and the requirements of this Order.

(2) Inspection Content

Inspections of construction sites by the Copermittee must include, at a minimum:

(a) Verification of coverage under the Construction General Permit (Notice of Intent (NOI) and/or WDID number) during initial inspections, when applicable;

(b) Assessment of compliance with its local permits and applicable local ordinances related to pollution prevention, including the implementation and maintenance of applicable BMPs;

(c) Assessment of BMP adequacy and effectiveness;

(d) Visual observations of actual non-storm water discharges;

(e) Visual observations of actual or potential discharge of sediment and/or construction related materials from the site;

(f) Visual observations of actual or potential illicit connections; and

(g) If any violations are found and BMP corrections are needed, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried construction sites. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Site name, location (address and hydrologic subarea), and WDID number (if applicable);

(b) Inspection date;

(c) Approximate amount of rainfall since last inspection;

(d) Description of problems observed with BMPs and indication of need for BMP addition/repair/replacement and any scheduled re-inspection, and date of re-inspection;

(e) Descriptions of any other specific inspection comments which must, at a minimum, include rationales for longer compliance time;

(f) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(g) Resolution of problems noted and date problems fixed.

e. CONSTRUCTION SITE ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried construction sites, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

5. Existing Development Management

Each Copermittee must implement an existing development management program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. EXISTING DEVELOPMENT INVENTORY AND TRACKING

Each Copermittee must maintain, and update at least annually, a watershed-based inventory of the existing development within its jurisdiction that may discharge a pollutant load to and from the MS4. The use of an automated database system, such as GIS, is highly recommended. The inventory must, at a minimum, include:

(1) Name, location (hydrological subarea and address, if applicable) of the following types of existing development with its jurisdiction:

(a) Commercial facilities or areas;

(b) Industrial facilities;

(c) Municipal facilities, including:

(i) MS4 and related structures;[33]

(ii) Roads, streets, and highways;

(iii) Parking facilities;

(iv) Municipal airfields;

(v) Parks and recreation facilities;

(vi) Flood management facilities, flood control devices and structures;

(vii) Operating or closed municipal landfills;

(viii) Publicly owned treatment works (including water and wastewater treatment plants) and sanitary sewer collection systems;

(ix) Corporate yards, including maintenance and storage yards for materials, waste, equipment, and vehicles;

(x) Hazardous waste collection facilities;

(xi) Other treatment, storage or disposal facilities for municipal waste; and

(xii) Other municipal facilities that the Copermittee determines may contribute a significant pollutant load to the MS4.

(d) Residential areas, which may be designated by one or more of the following:

(i) Residential management area;

(ii) Drainage basin or area;

(iii) Land use (e.g., single family, multi-family, rural);

(iv) Neighborhood;

(v) Common Interest Area;

(vi) Home Owner Association;

(vii) Mobile home park; and/or

(viii) Other designations accepted by the San Diego Water Board Executive Officer.

(2) A description of the facility or area, including the following information:

(a) Classification as commercial, industrial, municipal, or residential;

[33] The inventory may refer to the MS4 map required to be maintained pursuant to Provision E.2.b.(1).

(b) Status of facility or area as active or inactive;

(c) Identification if a business is a mobile business;

(d) SIC Code or NAICS Code, if applicable;

(e) Industrial General Permit NOI and/or WDID number, if applicable;

(f) Identification if a residential area is or includes a Common Interest Area / Home Owner Association, or mobile home park;

(g) Identification of pollutants generated and potentially generated by the facility or area;

(h) Whether the facility or area is adjacent to an ESA;

(i) Whether the facility or area is tributary to and within the same hydrologic subarea as a water body segment listed as impaired on the CWA section 303(d) List and generates pollutants for which the water body segment is impaired; and

(3) An annually updated map showing the location of inventoried existing development, watershed boundaries, and water bodies.

b. EXISTING DEVELOPMENT BMP IMPLEMENTATION AND MAINTENANCE

Each Copermittee must designate a minimum set of BMPs required for all inventoried existing development, including special event venues. The designated minimum BMPs must be specific to facility or area types and pollutant generating activities, as appropriate.

(1) Commercial, Industrial, and Municipal Facilities and Areas

(a) Pollution Prevention

Each Copermittee must require the use of pollution prevention methods by the commercial, industrial, and municipal facilities and areas in its inventoried existing development to address the priorities and strategies in the Water Quality Improvement Plan.

(b) BMP Implementation

Each Copermittee must require the implementation of designated BMPs at commercial facilities and areas, industrial facilities, and implement designated BMPs at municipal facilities in its inventoried existing development.

(c) BMP Operation and Maintenance

(i) Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development.

(ii) Each Copermittee must implement a schedule of operation and maintenance activities for its MS4 and related structures (including but not limited to catch basins, storm drain inlets, detention basins, etc.), and verify proper operation of all its municipal structural treatment controls designed to reduce pollutants (including floatables) in storm water discharges to or from its MS4s and related drainage structures. Operation and maintenance activities may include, but is not limited to, the following:

[a] Inspections of the MS4 and related structures;
[b] Cleaning of the MS4 and related structures; and
[c] Proper disposal of materials removed from cleaning of the MS4 and related structures.

(iii) Each Copermittee must implement a schedule of operation and maintenance for public streets, unpaved roads, paved roads, and paved highways within its jurisdiction to minimize pollutants that can be discharged in storm water.

(iv) Each Copermittee must implement controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers. Copermittees that operate both a municipal sanitary sewer system and a MS4 must implement controls and measures to prevent and eliminate seeping sewage from infiltrating the MS4. Copermittees that do not operate both a municipal sanitary sewer system and a MS4 must coordinate with sewering agencies to keep themselves informed of relevant and appropriate maintenance activities and sanitary sewage projects in their jurisdiction that may cause or contribute to seepage of sewage into the MS4.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must require the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from commercial facilities and areas and industrial facilities, and implement BMPs at municipal facilities in its inventoried existing development. Such BMPs must include, as appropriate, educational activities, permits, certifications and other measures for applicators and distributors.

(2) Residential Areas

(a) Pollution Prevention

Each Copermittee must promote and encourage the use of pollution prevention methods, where appropriate, by the residential areas in its inventoried existing development.

(b) BMP Implementation

Each Copermittee must promote and encourage the implementation of designated BMPs at residential areas in its inventoried existing development.

(c) BMP Operation and Maintenance

Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at residential areas in its inventoried existing development.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must promote and encourage the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from residential areas in its inventoried existing development.

c. EXISTING DEVELOPMENT INSPECTIONS

Each Copermittee must conduct inspections of inventoried existing development to ensure compliance with applicable local ordinances and permits, and the requirements of this Order.

(1) Inspection Frequency

(a) Each Copermittee must establish appropriate inspection frequencies for inventoried existing development in accordance with the following requirements:

(i) At a minimum, inventoried existing development must be inspected once every five years utilizing one or more of the following methods:

[a] Drive-by inspections by Copermittee municipal and contract staff;

[b] Onsite inspections by Copermittee municipal and contract staff; and/or

[c] Visual inspections of publicly accessible inventoried facilities or areas by volunteer monitoring or patrol programs that have been trained by the Copermittee;

(ii) The frequency of inspections must be appropriate to confirm that BMPs are being implemented to reduce the discharge of pollutants in storm water from the MS4 to the MEP and effectively prohibit non-storm water discharges to the MS4;

(iii) The frequency of inspections must be based on the potential for a facility or area to discharge non-storm water and pollutants in storm water, and should reflect the priorities set forth in the Water Quality Improvement Plan;

(iv) Each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development;[34] and

(v) Inventoried existing development must be inspected by the Copermittee, as needed, in response to valid public complaints.

(b) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e. education and outreach, re-inspection, enforcement) necessary to require and confirm compliance with its applicable local ordinances and permits and the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

(2) <u>Inspection Content</u>

(a) Inspections of existing development must include, at a minimum:

(i) Visual inspections for the presence of actual non-storm water discharges;

(ii) Visual inspections for the presence of actual or potential discharge of pollutants;

(iii) Visual inspections for the presence of actual or potential illicit connections; and

(iv) Verification that the description of the facility or area in the inventory, required pursuant to Provision E.5.a.(2), has not changed.

[34] If any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspection may count toward the total annual inspection requirement. This requirement excludes linear municipal facilities (i.e., MS4 linear channels, sanitary sewer collection systems, streets, roads and highways).

(b) Onsite inspections of existing development by the Copermittee must include, at a minimum:

(i) Assessment of compliance with its applicable local ordinances and permits related to non-storm water and storm water discharges and runoff;

(ii) Assessment of the implementation of the designated BMPs;

(iii) Verification of coverage under the Industrial General Permit, when applicable; and

(iv) If any problems or violations are found, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried existing development. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Name and location of the facility or area (address and hydrologic subarea) consistent with the inventory name and location, pursuant to Provision E.5.a.(1);

(b) Inspection and re-inspection date(s);

(c) Inspection method(s) (i.e. drive-by, onsite);

(d) Observations and findings from the inspection(s);

(e) For onsite inspections of existing development by Copermittee municipal or contract staff, the records must also include, as applicable:

(i) Description of any problems or violations found during the inspection(s);

(ii) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(iii) The date problems or violations were resolved.

d. EXISTING DEVELOPMENT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried existing development, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

e. RETROFITTING AND REHABILITATING AREAS OF EXISTING DEVELOPMENT

(1) Retrofitting Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to retrofit areas of existing development within its jurisdiction to address identified sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify areas of existing development as candidates for retrofitting, focusing on areas where retrofitting will address pollutants and/or stressors that contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for retrofitting projects may be utilized to reduce pollutants that may be discharged in storm water from areas of existing development, and/or address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of retrofitting projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting projects; and

(e) Where retrofitting projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional retrofitting projects (i.e. projects that can receive and/or treat storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment) adjacent to and/or downstream of the areas of existing development.

(2) Stream, Channel and/or Habitat Rehabilitation in Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to rehabilitate streams, channels, and/or habitats in areas of existing development within its jurisdiction to address the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify streams, channels, and/or habitats in areas of existing development as candidates for rehabilitation, focusing on areas where stream, channel, and/or habitat rehabilitation projects will address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for stream, channel, and/or habitat rehabilitation projects may be utilized to address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters, rehabilitate channelized or hydromodified streams, restore wetland and riparian habitat, restore watershed functions, and/or restore beneficial uses of receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of stream, channel, and/or habitat rehabilitation projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance stream, channel, and/or habitat rehabilitation projects; and

(e) Where stream, channel, and/or habitat rehabilitation projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional stream, channel, and/or habitat rehabilitation projects (i.e. projects that can receive storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment).

6. Enforcement Response Plans

Each Copermittee must develop and implement an Enforcement Response Plan as part of its jurisdictional runoff management program document. The Enforcement Response Plan must describe the applicable approaches and options to enforce its legal authority established pursuant to Provision E.1, as necessary, to achieve compliance with the requirements of this Order. The Enforcement Response Plan must be in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include the following:

a. Enforcement Response Plan Components

The Enforcement Response Plan must include the following individual components:

(1) Illicit Discharge Detection and Elimination Enforcement Component;

(2) Development Planning Enforcement Component;

(3) Construction Management Enforcement Component; and

(4) Existing Development Enforcement Component.

b. Enforcement Response Approaches and Options

Each component of the Enforcement Response Plan must describe the enforcement response approaches that the Copermittee will implement to compel compliance with its statutes, ordinances, permits, contracts, orders, or similar means, and the requirements of this Order. The description must include the protocols for implementing progressively stricter enforcement responses. The enforcement response approaches must include appropriate sanctions to compel compliance, including, at a minimum, the following tools or their equivalent:

(1) Verbal and written notices of violation;

(2) Cleanup requirements;

(3) Fines;

(4) Bonding requirements;

(5) Administrative and criminal penalties;

(6) Liens;

(7) Stop work orders; and

(8) Permit and occupancy denials.

c. Correction of Violations

(1) Violations must be corrected in a timely manner with the goal of correcting the violations within 30 calendar days after the violations are discovered, or prior to the next predicted rain event, whichever is sooner.

(2) If more than 30 calendar days are required to achieve compliance, then a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

d. Escalated Enforcement

(1) The Enforcement Response Plan must include a definition of "escalated enforcement." Escalated enforcement must include any enforcement scenario where a violation or other non-compliance is determined to cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan. Escalated enforcement may be defined differently for development planning, construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas.

(2) Where the Copermittee determines escalated enforcement is not required, a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

(3) Escalated enforcement actions must continue to increase in severity, as necessary, to compel compliance as soon as possible.

e. Reporting of Non-Compliant Sites

(1) Each Copermittee must notify the San Diego Water Board in writing within five (5) calendar days of issuing escalated enforcement (as defined in the Copermittee's Enforcement Response Plan) to a construction site that poses a significant threat to water quality as a result of violations or other non-compliance with its permits and applicable local ordinances, and the requirements of this Order. Written notification may be provided electronically by email to the appropriate San Diego Water Board staff.

(2) Each Copermittee must notify the San Diego Water Board of any persons required to obtain coverage under the statewide Industrial General Permit and Construction General Permit and failing to do so, within five (5) calendar days from the time the Copermittee become aware of the circumstances. Written notification may be provided electronically by email to RB9_Nonfilers@waterboards.ca.gov.

7. Public Education and Participation

Each Copermittee must implement, individually or with other Copermittees, a public education and participation program in accordance with the strategies identified in the Water Quality Improvement Plan to promote and encourage the development of programs, management practices, and behaviors that reduce the discharge of pollutants in storm water to the MEP, prevent controllable non-storm water discharges from entering the MS4, and protect water quality standards in receiving waters. The public education and participation program must be implemented in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include, at a minimum, the following requirements:

a. PUBLIC EDUCATION

The public education program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) Educational activities, public information activities, and other appropriate outreach activities intended to reduce pollutants associated with the application of pesticides, herbicides and fertilizer and other pollutants of concern in storm water discharges to and from its MS4 to the MEP, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed to address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(2) Educational activities, public information activities, and other appropriate outreach activities to facilitate the proper management and disposal of used oil and toxic materials; and

(3) Appropriate education and training measures for specific target audiences, such as construction site operators, residents, underserved target audiences and school-aged children, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed, based on high risk behaviors and pollutants of concern.

b. PUBLIC PARTICIPATION

The public participation program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) A process for members of the public to participate in updating the highest priority water quality conditions, numeric goals, and water quality improvement strategies in the Water Quality Improvement Plan;

(2) Opportunities for members of the public to participate in providing the Copermittee recommendations for improving the effectiveness of the water quality improvement strategies implemented within its jurisdiction; and

(3) Opportunities for members of the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or protection of the quality of receiving waters.

8. Fiscal Analysis

a. Each Copermittee must secure the resources necessary to meet all the requirements of this Order.

b. Each Copermittee must conduct an annual fiscal analysis of its jurisdictional runoff management program in its entirety. The fiscal analysis must include the following:

(1) Identification of the various categories of expenditures necessary to implement the requirements of this Order, including a description of the specific capital, operation and maintenance, and other expenditure items to be accounted for in each category of expenditures;

(2) The staff resources needed and allocated to meet the requirements of this Order, including any development, implementation, and enforcement activities required;

(3) The estimated expenditures for Provisions E.8.b.(1) and E.8.b.(2) for the current fiscal year; and

(4) The source(s) of funds that are proposed to meet the necessary expenditures described in Provisions E.8.b.(1) and E.8.b.(2), including legal restrictions on the use of such funds, for the current fiscal year and next fiscal year.

c. Each Copermittee must submit a summary of the annual fiscal analysis with each Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3).

d. Each Copermittee must provide the documentation used to develop the summary of the annual fiscal analysis upon request by the San Diego Water Board.

F. REPORTING

The purpose of this provision is to determine and document compliance with the requirements set forth in this Order. The goal of reporting is to communicate to the San Diego Water Board and the people of the State of California the implementation status of each jurisdictional runoff management program and compliance with the requirements of this Order. This goal is to be accomplished through the submittal of specific deliverables to the San Diego Water Board by the Copermittees.

1. Water Quality Improvement Plans

The Copermittees for each Watershed Management Area must develop and submit the Water Quality Improvement Plan in accordance with the following requirements:

a. WATER QUALITY IMPROVEMENT PLAN DEVELOPMENT

Each Water Quality Improvement Plan must be developed in accordance with the following process:

(1) Public Participation Process

The Copermittees must implement a public participation process to solicit data, information, and recommendations to be utilized in the development of the Water Quality Improvement Plan. The public participation process must include the following:

(a) The Copermittees must develop a publicly available and noticed schedule of the opportunities for the public to participate and provide comments during the development of the Water Quality Improvement Plan. The schedule may be adjusted as necessary by the Copermittees, provided the public is provided timely notification of the changes to the schedule.

(b) The Copermittees must form a Water Quality Improvement Consultation Panel to provide recommendations during the development of the Water Quality Improvement Plan. The Water Quality Improvement Consultation Panel must consist of at least the following members:

(i) A representative of the San Diego Water Board;

(ii) A representative of the environmental community familiar with the water quality conditions of concern of the receiving waters in the Watershed Management Area, preferably from an environmental interest group associated with a water body within the Watershed Management Area; and

(iii) A representative of the development community familiar with the opportunities and constraints for implementing structural BMPs,

retrofitting projects, and stream, channel or habitat rehabilitation projects in the Watershed Management Area, preferably with relevant engineering, hydrology, and/or geomorphology experience in the Watershed Management Area.

(c) The Copermittees must coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public time and opportunity to participate during the development of the Water Quality Improvement Plans.

(2) Priority Water Quality Conditions

(a) The Copermittees must solicit data, information and recommendations from the public to be utilized in the development and identification of the priority water quality conditions and potential water quality improvement strategies for the Watershed Management Area.

(b) The Copermittees must review the priority water quality conditions the Copermittees plan on including in the Water Quality Improvement Plan with the Water Quality Improvement Consultation Panel to receive recommendations or concurrence.

(c) The Copermittees must consider revisions to the priority water quality conditions based on recommendations from the Water Quality Improvement Consultation Panel.

(d) The Copermittees must include all the potential water quality improvement strategies identified by the public and the Water Quality Improvement Consultation Panel with the submittal of the priority water quality conditions to the San Diego Water Board.

(e) The Copermittees must submit the Water Quality Improvement Plan requirements of Provision B.2 to the San Diego Water Board as early as 6 months and no later than 12 months after the commencement of coverage under this Order. Upon receipt, the San Diego Water Board will issue a public notice and release the proposed priority water quality conditions and potential water quality improvement strategies for public review and comment for a minimum of 30 days.

(f) The Copermittees must consider revisions to the priority water quality conditions and potential water quality improvement strategies developed pursuant to Provision B.2 based on public comments received by the close of the comment period.

(3) Water Quality Improvement Goals, Strategies and Schedules

(a) The Copermittees must solicit recommendations from the public on potential numeric goals for the highest priority water quality conditions identified for the Watershed Management Area, and recommendations on the strategies that should be implemented to achieve the potential numeric goals.

(b) The Copermittees must consult with the Water Quality Improvement Consultation Panel and consider revisions to the following items based on the Panel's recommendations:

(i) The numeric goals and schedules the Copermittees propose to include in the Water Quality Improvement Plan;

(ii) The water quality improvement strategies and schedules the Copermittees propose to implement in the Watershed Management Area and include in the Water Quality Improvement Plan; and

(iii) If the Copermittees choose to implement Provision B.3.b.(4), the results of the Watershed Management Area Analysis the Copermittees proposed to incorporate into the Water Quality Improvement Plan.

(c) The Copermittees must submit the Water Quality Improvement Plan requirements of Provision B.3 to the San Diego Water Board as early as 9 months and no later than 18 months after the commencement of coverage under this Order. Upon receipt, the San Diego Water Board will issue a public notice and release the proposed water quality improvement goals, strategies and schedules for public review and comment for a minimum of 30 days.

(d) The Copermittees must consider revisions to the water quality improvement goals, strategies and schedules developed pursuant to Provision B.3 based on public comments received by the close of the comment period.

b. WATER QUALITY IMPROVEMENT PLAN SUBMITTAL AND IMPLEMENTATION

(1) Within 24 months after the commencement of coverage under this Order, the Copermittees for each Watershed Management Area must submit a complete Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order to the San Diego Water Board. The San Diego Water Board will issue a public notice and release the Water Quality Improvement Plan for public review and comment for a minimum of 30 days.

(2) The Copermittees must consider revisions to the Water Quality Improvement Plan based on written comments received by the close of the public comment period.

(3) The Copermittees must promptly submit any revisions to the Water Quality Improvement Plan to the San Diego Water Board no later than 60 days after the close of the public comment period.

(4) If issues concerning the Water Quality Improvement Plan are resolved informally through discussions among the Copermittees, the San Diego Water Board and interested parties, the San Diego Water Board Executive Officer may provide written notification of acceptance to the Copermittees that the Water Quality Improvement Plan meets the requirements of Provision B. However, if the Executive Officer determines that significant issues with the Water Quality Improvement Plan remain, the matter will be scheduled for San Diego Water Board consideration at a public meeting.

(5) The Copermittees must commence with implementation of the Water Quality Improvement Plan, in accordance with the water quality improvement strategies and schedules therein, upon written notification of acceptance with the Water Quality Improvement Plan by the San Diego Water Board Executive Officer.

(6) During implementation of the Water Quality Improvement Plan the Copermittees must correct any deficiencies in the Plan identified by the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report following a request by the Board to do so.

(7) The Water Quality Improvement Plan must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of receiving notification of acceptance with the Water Quality Improvement Plan by the San Diego Water Board Executive Officer.

2. Updates

a. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATES

Each Copermittee must update its jurisdictional runoff management program document in accordance with the following requirements:

(1) Each Copermittee is encouraged to seek public and key stakeholder participation and comments, as early and often as possible during the process of developing updates to its jurisdictional runoff management program document;

(2) Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E concurrent with the submittal of the Water Quality Improvement Plan. Each Copermittee must correct any deficiencies in the jurisdictional runoff management program document based on comments received from the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report;

(3) Each Copermittee must submit updates to its jurisdictional runoff management program, with the supporting rationale for the modifications, either in the Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b;

(4) The Copermittee must revise proposed modifications to its jurisdictional runoff management program as directed by the San Diego Water Board Executive Officer; and

(5) Updated jurisdictional runoff management program documents must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of submitting the Water Quality Improvement Plan Annual Report.

b. BMP DESIGN MANUAL UPDATES

Each Copermittee must update its BMP Design Manual in accordance with the following requirements:

(1) Each Copermittee must update its BMP Design Manual to incorporate the requirements of Provisions E.3.a-d concurrent with the submittal of the Water Quality Improvement Plan. Each Copermittee must correct any deficiencies in the BMP Design Manual based on comments received from the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report;

(2) ~~Subsequent~~ Any future updates to the BMP Design Manual made after its update pursuant to Provision F.2.b.(1) is completed must be consistent with the requirements of Provisions E.3.a-d and must be submitted as part of the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b; and

(3) ~~Updated~~ BMP Design Manuals must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of completing the update.

(4) If the San Diego Water Board amends Provisions E.3.a-d during the permit term but after the Copermittee has completed the update pursuant to

Provision F.2.b.(1), the Copermittee must revise its BMP Design Manual to incorporate the amended Provision E.3.a-d requirements as soon as possible but not later than 90 days after the date the San Diego Water Board adopts the amendments to Provisions E.3.a-d, unless otherwise directed by the San Diego Water Board Executive Officer.

c. Water Quality Improvement Plan Updates

(1) The Water Quality Improvement Plans must be updated in accordance with the following process:

(a) The Copermittees must develop and implement a public participation process to obtain data, information and recommendations for updating the Water Quality Improvement Plan. The public participation process must provide for a publicly available and noticed schedule of opportunities for the public to participate and provide comments during the development of updates to the Water Quality Improvement Plan;

(b) The Copermittees must consult with the Water Quality Improvement Consultation Panel on proposed updates of the Water Quality Improvement Plan, and consider the Water Quality Improvement Consultation Panel's recommendations in finalizing the proposed updates;

(c) The Copermittees for each Watershed Management Area must submit 1) proposed updates to the Water Quality Improvement Plan and supporting rationale, and 2) recommendations received from the public and the Water Quality Improvement Consultation Panel and the rationale for the requested updates, either in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The updates submitted will be deemed accepted for inclusion in the Water Quality Improvement Plan ninety (90) days after submission unless otherwise directed in writing by the San Diego Water Board Executive Officer;

(d) The Copermittees must revise the requested updates as directed by the San Diego Water Board Executive Officer; and

(e) Updated Water Quality Improvement Plans must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance of the requested updates by the San Diego Water Board.

(2) No later than six months following Office of Administrative Law and USEPA approval of any TMDL Basin Plan amendment with wasteload allocations (WLAs) assigned to the Copermittees during the term of this Order, the Copermittees must initiate an update to the applicable Water Quality Improvement Plans in accordance with Provision F.1 or Provision F.2.c.(1) to incorporate the requirements of the TMDL WLAs.

3. Progress Reporting

a. Progress Report Presentations

The Copermittees for each Watershed Management Area must periodically appear before the San Diego Water Board, as requested by the Board, to provide progress reports on the implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs.

b. Annual Reports

(1) Transitional Jurisdictional Runoff Management Program Annual Reports

(a) Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) no later than October 31 of each year for each jurisdictional runoff management program reporting period (i.e. July 1 to June 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted.

(b) Each Copermittee must submit the information on the Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) specific to the area within its jurisdiction in each Watershed Management Area.

(c) In addition to submitting the Jurisdictional Runoff Management Program Annual Report Form during the transitional reporting period, each Copermittee may continue to utilize and submit the jurisdictional runoff management program annual reporting format of its previous NPDES permit until the first Water Quality Improvement Plan Annual Report is required to be submitted.

(2) Transitional Monitoring and Assessment Program Annual Reports

The Copermittees for each Watershed Management Area must submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted under this Order. The Transitional Monitoring and Assessment Program Annual Reports must include:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1.a and D.2.a, summarized and presented in tabular and graphical form; and

(b) The findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

(3) Water Quality Improvement Plan Annual Reports

The Copermittees for each Watershed Management Area must submit a Water Quality Improvement Plan Annual Report for each reporting period no later than January 31 of the following year. The annual reporting period consists of two different periods: 1) July 1 to June 30 of the following year for the jurisdictional runoff management programs, 2) October 1 to September 30 of the following year for the monitoring and assessment programs. The Water Quality Improvement Plan Annual Reports must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Each Annual Report must include the following:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, summarized and presented in tabular and graphical form;

(b) The progress of the special studies required pursuant to Provision D.3, and the findings, interpretations and conclusions of a special study, or each phase of a special study, upon its completion;

(c) The findings, interpretations and conclusions from the assessments required pursuant to Provision D.4;

(d) The progress of implementing the Water Quality Improvement Plan, including, but not limited to, the following:

(i) The progress toward achieving the interim and final numeric goals for the highest water quality priorities for the Watershed Management Area;

(ii) The water quality improvement strategies that were implemented and/or no longer implemented by each of the Copermittees during the reporting period and previous reporting periods;

(iii) The water quality improvement strategies planned for implementation during the next reporting period;

(iv) Proposed modifications to the water quality improvement strategies, the public comments received and the supporting rationale for the proposed modifications;

(v) Previous modifications or updates incorporated into the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document and implemented by the Copermittees in the Watershed Management Area; and

(vi) Proposed modifications or updates to the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document;

(e) A completed Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) for each Copermittee in the Watershed Management Area, certified by a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative; and

(f) Each Copermittee must provide any data or documentation utilized in developing the Water Quality Improvement Plan Annual Report upon request by the San Diego Water Board. Any Copermittee monitoring data utilized in developing the Water Quality Improvement Plan Annual Report must be uploaded to the California Environmental Data Exchange Network (CEDEN).[35] Any Copermittee monitoring and assessment data utilized in developing the Water Quality Improvement Plan Annual Report must be available for access on the Regional Clearinghouse required pursuant to Provision F.4.

c. Regional Monitoring and Assessment Report

(1) The Copermittees must submit a Regional Monitoring and Assessment Report no later than 180 days prior to the expiration date of this Order. The Regional Monitoring and Assessment Report may be submitted as part of the Report of Waste Discharge required pursuant to Provision F.5.b. In preparing the report the Copermittees must consider the receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, and the findings, interpretations, and conclusions from the assessments required pursuant to Provision D.4. Based on these considerations the report must assess the following:

(a) The beneficial uses of the receiving waters within the San Diego Region that are supported and not adversely affected by the Copermittees' MS4 discharges;

(b) The beneficial uses of the receiving waters within the San Diego Region that are adversely impacted by the Copermittees' MS4 discharges;

(c) The progress toward protecting the beneficial uses in the receiving waters within the San Diego Region from the Copermittees' discharges; and

[35] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

(d) Pollutants or conditions of emerging concern that may impact beneficial uses in the receiving waters within the San Diego Region.

(2) The Regional Monitoring and Assessment Report must include recommendations for improving the implementation and assessment of the Water Quality Improvement Plans and jurisdictional runoff management programs.

(3) Each Copermittee must provide any data or documentation utilized in developing the Regional Monitoring and Assessment Report upon request by the San Diego Water Board. Any Copermittee monitoring and assessment data utilized in developing the Regional Monitoring and Assessment Report must be available for access on the Regional Clearinghouse required pursuant to Provision F.4.

4. Regional Clearinghouse

The Copermittees must develop, update, and maintain an internet-based Regional Clearinghouse that is made available to the public no later than 18 months after the effective date of this Order.[36]

a. The Copermittees, through the Regional Clearinghouse, must make the following documents and data available for access, and organized by Watershed Management Area. The documents and data may be linked to other internet-based data portals and databases where the original documents are stored:

(1) Water Quality Improvement Plan for the Watershed Management Area, and all updated versions with date of update;

(2) Annual Reports for the Watershed Management Area;

(3) Jurisdictional Runoff Management Program document for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(4) BMP Design Manual for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(5) Reports from special studies (e.g. source identification, BMP effectiveness assessment) conducted in the Watershed Management Area;

[36] The Copermittees may develop, update and maintain the clearinghouse(s) of other Copermittees or agencies.

(6) Monitoring data collected pursuant to Provision D for each Watershed Management Area must be uploaded to CEDEN,[37] with links to the uploaded data; and

(7) Available GIS data, layers, and/or shapefiles used to develop the maps generated and maintained by the Copermittees for the Water Quality Improvement Plans, Annual Reports, and jurisdictional runoff management program documents.

b. The Copermittees, through the Regional Clearinghouse, must make the following information and documents available for access:

(1) Contact information (point of contact, phone number, email address, and mailing address) for each Copermittee;

(2) Public hotline number for reporting non-storm water and illicit discharges for each Copermittee;

(3) Email address for reporting non-storm water and illicit discharges for each Copermittee;

(4) Link to each Copermittee's website, if available, where the public may find additional information about the Copermittee's storm water management program and for requesting records for the implementation of its program;

(5) Information about opportunities for the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or protection of the quality of receiving waters; and

(6) Reports from regional monitoring programs in which the Copermittees participate (e.g. Southern California Monitoring Coalition, Southern California Coastal Water Research Project Bight Monitoring);

(7) Regional Monitoring and Assessment Reports; and

(8) Any other information, data, and documents the Copermittees determine as appropriate for making available to the public.

[37] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

5. Report of Waste Discharge

~~a. The Riverside County Copermittees are required to submit a complete Report of Waste Discharge pursuant to the requirements of their current Order. The San Diego Water Board will review and consider the Report of Waste Discharge to determine whether modification to this Order, pursuant to the requirements of Provision H, will be required prior to the Riverside County Copermittees obtaining coverage under this Order. The current Order for Riverside County Copermittees is rescinded upon the date of effective coverage under this Order except for enforcement purposes.~~

~~b.~~
The Copermittees subject to the requirements of this Order must submit to the San Diego Water Board a complete Report of Waste Discharge as an application for the re-issuance of this Order and NPDES permit. The Report of Waste Discharge must be submitted no later than 180 days in advance of the expiration date of this Order. The Report of Waste Discharge must contain the following minimum information:

~~(1)~~
a. Names and addresses of the Copermittees;
~~(2)~~
b. Names and titles of the primary contacts of the Copermittees;
~~(3)~~
c. Proposed changes to the Copermittees' Water Quality Improvement Plans and the supporting justification;
~~(4)~~
d. Proposed changes to the Copermittees' jurisdictional runoff management programs and the supporting justification;
~~(5)~~
e. Any other information necessary for the re-issuance of this Order;
~~(6)~~
f. Any information to be included as part of the Report of Waste Discharge pursuant to the requirements of this Order; and
~~(7)~~
g. Any other information required by federal regulations for NPDES permit reissuance.

~~6. Application for Early Coverage~~

~~a. The Riverside County Copermittees may apply for early coverage under this Order by submitting a Report of Waste Discharge Form 200, with a written request for early coverage under this Order.~~

~~b. The San Diego Water Board will review the application for early coverage. A notification of coverage under this Order will be issued to the Copermittees in the respective county by the San Diego Water Board upon completion of the early coverage application requirements. The effective coverage date will be specified~~

~~in the notification of coverage. The Copermittees in the respective county are authorized to have MS4 discharges pursuant to the requirements of this Order starting on the effective coverage date specified in the notification of coverage. The existing Order for the respective county is rescinded upon the effective coverage date specified in the notification of coverage except for enforcement purposes.~~

~~7.~~

6. Reporting Provisions

Each Copermittee must comply with all the reporting and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

G. PRINCIPAL WATERSHED COPERMITTEE RESPONSIBILITIES

1. The Copermittees within each Watershed Management Area must designate a Principal Watershed Copermittee and notify the San Diego Water Board of the name of the Principal Watershed Copermittee. An individual Copermittee should not be designated a Principal Watershed Copermittee for more than two Watershed Management Areas. The notification may be submitted with the Water Quality Improvement Plan required pursuant to Provision F.1 of this Order.

2. The Principal Watershed Copermittee is responsible for, at a minimum, the following:

a. Serving as liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues, and when necessary and appropriate, representing the Copermittees in the Watershed Management Area before the San Diego Water Board;

b. Facilitating the development of the Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order;

c. Coordinating the submittal of the deliverables required by Provisions F.1, F.2, F.3.a, and F.3.b of this Order; and

d. Coordinating and developing, with the other Principal Watershed Copermittees, the requirements of Provisions F.3.c, F.4, and F.5.b of this Order.

3. The Principal Watershed Copermittee is not responsible for ensuring that the other Copermittees within the Watershed Management Area are in compliance with the requirements of this Order. Each Copermittee within the Watershed Management Area is responsible for complying with the requirements of this Order.

H. MODIFICATION OF ORDER

1. Modifications of the Order may be initiated by the San Diego Water Board or by the Copermittees. Requests by Copermittees must be made to the San Diego Water Board.

2. Minor modifications to the Order may be made by the San Diego Water Board where the proposed modification complies with all the prohibitions and limitations, and other requirements of this Order.

3. This Order may also be re-opened and modified, revoked and, reissued or terminated in accordance with the provisions of 40 CFR 122.44, 122.62 to 122.64, and 124.5. Causes for taking such actions include, but are not limited to, failure to comply with any condition of this Order and permit, and endangerment to human health or the environment resulting from the permitted activity.

4. This Order may be re-opened for modification for cause including but not limited to the following:

   ~~a. The State Water Board determines that revisions are warranted, and the San Diego Water Board concurs that revisions are necessary to those provisions of the Order addressing compliance with water quality standards in the receiving water and/or those provisions of the Order establishing an iterative process for implementation of management practices to assure compliance with water quality standards in the receiving water;~~

   ~~b. An application for early coverage under this Order is received pursuant to Provision F.6;~~

   ~~c.~~

   a. Any of the TMDLs in Attachment E to this Order are amended in the Basin Plan by San Diego Water Board, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA;

   ~~d.~~

   b. The Basin Plan is amended by the San Diego Water Board to incorporate a new TMDL, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA; or

   ~~e.~~

   c. Updating or revising the monitoring and reporting requirements is determined to be necessary, at the discretion of the San Diego Water Board. Such modification(s) may include, but is (are) not limited to, revision(s) to: (i) implement recommendations from Southern California Coastal Water Research Project (SCCWRP), (ii) develop, refine, implement, and/or coordinate a regional monitoring program, (iii) develop and implement improved monitoring and assessment programs in keeping with San Diego Water Board Resolution No. R9-2012-0069, Resolution in Support of a Regional Monitoring Framework, and/or (iv) add provisions to require the Copermittees to evaluate and provide information on cost and values of the monitoring and reporting program.

~~**5.** The San Diego Water Board, after opportunity for public comment and a public hearing, will re-open and consider modifications to this Order when the Riverside County Copermittees submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders.~~

I. STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

Each Copermittee must comply with all the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

ATTACHMENT A

DISCHARGE PROHIBITIONS AND SPECIAL PROTECTIONS

1. Basin Plan Waste Discharge Prohibitions

California Water Code Section 13243 provides that a Regional Water Board, in a water quality control plan, may specify certain conditions or areas where the discharge of waste or certain types of waste is not permitted. The following waste discharge prohibitions in the Water Quality Control Plan for the San Diego Basin (Basin Plan) are applicable to any person, as defined by Section 13050(c) of the California Water Code, who is a citizen, domiciliary, or political agency or entity of California whose activities in California could affect the quality of waters of the state within the boundaries of the San Diego Region.

1. The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in California Water Code Section 13050, is prohibited.

2. The discharge of waste to land, except as authorized by waste discharge requirements or the terms described in California Water Code Section 13264 is prohibited.

3. The discharge of pollutants or dredged or fill material to waters of the United States except as authorized by a National Pollutant Discharge Elimination System (NPDES) permit or a dredged or fill material permit (subject to the exemption described in California Water Code Section 13376) is prohibited.

4. Discharges of recycled water to lakes or reservoirs used for municipal water supply or to inland surface water tributaries thereto are prohibited, unless this San Diego Water Board issues a NPDES permit authorizing such a discharge; the proposed discharge has been approved by the State Department of Health Services (DHS) and the operating agency of the impacted reservoir; and the discharger has an approved fail-safe long-term disposal alternative.

5. The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the San Diego Water Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

6. The discharge of waste in a manner causing flow, ponding, or surfacing on lands not owned or under the control of the discharger is prohibited, unless the discharge is authorized by the San Diego Water Board.

7. The dumping, deposition, or discharge of waste directly into waters of the state, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the San Diego Water Board.

8. Any discharge to a storm water conveyance system that is not composed entirely of "*storm water*" is prohibited unless authorized by the San Diego Water Board. [The federal regulations, 40 CFR 122.26(b)(13), define storm water as storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from firefighting activities.] [§122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

9. The unauthorized discharge of treated or untreated sewage to waters of the state or to a storm water conveyance system is prohibited.

10. The discharge of industrial wastes to conventional septic tank/subsurface disposal systems, except as authorized by the terms described in California Water Code Section 13264, is prohibited.

11. The discharge of radioactive wastes amenable to alternative methods of disposal into the waters of the state is prohibited.

12. The discharge of any radiological, chemical, or biological warfare agent into waters of the state is prohibited.

13. The discharge of waste into a natural or excavated site below historic water levels is prohibited unless the discharge is authorized by the San Diego Water Board.

14. The discharge of sand, silt, clay, or other earthen materials from any activity, including land grading and construction, in quantities which cause deleterious bottom deposits, turbidity or discoloration in waters of the state or which unreasonably affect, or threaten to affect, beneficial uses of such waters is prohibited.

15. The discharge of treated or untreated sewage from vessels to Mission Bay, Oceanside Harbor, Dana Point Harbor, or other small boat harbors is prohibited.

16. The discharge of untreated sewage from vessels to San Diego Bay is prohibited.

17. The discharge of treated sewage from vessels to portions of San Diego Bay that are less than 30 feet deep at mean lower low water (MLLW) is prohibited.

18. The discharge of treated sewage from vessels, which do not have a properly functioning US Coast Guard certified Type I or Type II marine sanitation device, to portions of San Diego Bay that are greater than 30 feet deep at mean lower low water (MLLW) is prohibited.

2. Attachment B to State Water Board Resolution 2012-0012, as amended by State Water Board Resolution No. 2012-0031.

Special Protections for Areas of Special Biological Significance (ASBS), Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges

I. PROVISIONS FOR POINT SOURCE DISCHARGES OF STORM WATER AND NONPOINT SOURCE WASTE DISCHARGES

The following terms, prohibitions, and special conditions (hereafter collectively referred to as special conditions) are established as limitations on point source storm water and nonpoint source discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in Areas of Special Biological Significance (ASBS), as required for State Water Quality Protection Areas pursuant to California Public Resources Code Sections 36700(f) and 36710(f). These Special Protections are adopted by the State Water Board as part of the California Ocean Plan (Ocean Plan) General Exception.

The special conditions are organized by category of discharge. The State Water Resources Control Board (State Water Board) and Regional Water Quality Control Boards (Regional Water Boards) will determine categories and the means of regulation for those categories [e.g., Point Source Storm Water National Pollutant Discharge Elimination System (NPDES) or Nonpoint Source].

A. PERMITTED POINT SOURCE DISCHARGES OF STORM WATER

1. General Provisions for Permitted Point Source Discharges of Storm Water

   a. Existing storm water discharges into an ASBS are allowed only under the following conditions:

      (1) The discharges are authorized by an NPDES permit issued by the State Water Board or Regional Water Board;

      (2) The discharges comply with all of the applicable terms, prohibitions, and special conditions contained in these Special Protections; and

      (3) The discharges:

         (i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

         (ii) Are designed to prevent soil erosion;

         (iii) Occur only during wet weather;

         (iv) Are composed of only storm water runoff.

   b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

c. The discharge of trash is prohibited.

d. Only discharges from existing storm water outfalls are allowed. Any proposed or new storm water runoff discharge shall be routed to existing storm water discharge outfalls and shall not result in any new contribution of waste to an ASBS (i.e., no additional pollutant loading). "Existing storm water outfalls" are those that were constructed or under construction prior to January 1, 2005. "New contribution of waste" is defined as any addition of waste beyond what would have occurred as of January 1, 2005. A change to an existing storm water outfall, in terms of re-location or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges are prohibited except as provided below:

(1) The term "non-storm water discharges" means any waste discharges from a municipal separate storm sewer system (MS4) or other NPDES permitted storm drain system to an ASBS that are not composed entirely of storm water.

(2) (i) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability or occur naturally:

(a) Discharges associated with emergency fire fighting operations.

(b) Foundation and footing drains.

(c) Water from crawl space or basement pumps.

(d) Hillside dewatering.

(e) Naturally occurring groundwater seepage via a storm drain.

(f) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(ii) An NPDES permitting authority may authorize non-storm water discharges to an MS4 with a direct discharge to an ASBS only to the extent the NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

2. Compliance Plans for Inclusion in Storm Water Management Plans (SWMP) and Storm Water Pollution Prevention Plans (SWPPP).

The discharger shall specifically address the prohibition of non-storm water runoff and the requirement to maintain natural water quality for storm water discharges to an ASBS in an ASBS Compliance Plan to be included in its SWMP or a SWPPP, as appropriate to permit type. If a statewide permit includes a SWMP, then the discharger shall prepare a stand-alone compliance plan for ASBS discharges. The ASBS Compliance Plan is subject to approval by

the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (for permits issued by Regional Water Boards).

a. The Compliance Plan shall include a map of surface drainage of storm water runoff, showing areas of sheet runoff, prioritize discharges, and describe any structural Best Management Practices (BMPs) already employed and/or BMPs to be employed in the future. Priority discharges are those that pose the greatest water quality threat and which are identified to require installation of structural BMPs. The map shall also show the storm water conveyances in relation to other features such as service areas, sewage conveyances and treatment facilities, landslides, areas prone to erosion, and waste and hazardous material storage areas, if applicable. The SWMP or SWPPP shall also include a procedure for updating the map and plan when changes are made to the storm water conveyance facilities.

b. The ASBS Compliance Plan shall describe the measures by which all non-authorized non-storm water runoff (e.g., dry weather flows) has been eliminated, how these measures will be maintained over time, and how these measures are monitored and documented.

c. For Municipal Separate Storm Sewer System (MS4s), the ASBS Compliance Plan shall require minimum inspection frequencies as follows:

(1) The minimum inspection frequency for construction sites shall be weekly during rainy season;

(2) The minimum inspection frequency for industrial facilities shall be monthly during the rainy season;

(3) The minimum inspection frequency for commercial facilities (e.g., restaurants) shall be twice during the rainy season; and

(4) Storm water outfall drains equal to or greater than 18 inches (457 mm) in diameter or width shall be inspected once prior to the beginning of the rainy season and once during the rainy season and maintained to remove trash and other anthropogenic debris.

d. The ASBS Compliance Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff, that are necessary to comply with these special conditions, will be achieved through BMPs. Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that such installation would pose a threat to health or safety. BMPs to control storm water runoff discharges (at the end-of-pipe) during a design storm shall be designed to achieve on average the following target levels:

(1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

(2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges.

The baseline for these determinations is the effective date of the Exception, except for those structural BMPs installed between January 1, 2005 and adoption of these Special Protections, and the reductions must be achieved and documented within six (6) years of the effective date.

e. The ASBS Compliance Plan shall address erosion control and the prevention of anthropogenic sedimentation in ASBS. The natural habitat conditions in the ASBS shall not be altered as a result of anthropogenic sedimentation.

f. The ASBS Compliance Plan shall describe the non-structural BMPs currently employed and planned in the future (including those for construction activities), and include an implementation schedule. The ASBS Compliance Plan shall include non-structural BMPs that address public education and outreach. Education and outreach efforts must adequately inform the public that direct discharges of pollutants from private property not entering an MS4 are prohibited. The ASBS Compliance Plan shall also describe the structural BMPs, including any low impact development (LID) measures, currently employed and planned for higher threat discharges and include an implementation schedule. To control storm water runoff discharges (at the end-of-pipe) during a design storm, permittees must first consider, and use where feasible, LID practices to infiltrate, use, or evapotranspirate storm water runoff on-site, if LID practices would be the most effective at reducing pollutants from entering the ASBS.

g. The BMPs and implementation schedule shall be designed to ensure that natural water quality conditions in the receiving water are achieved and maintained by either reducing flows from impervious surfaces or reducing pollutant loading, or some combination thereof.

h. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents in storm water runoff that alter natural ocean water quality and the sources of these constituents.

(2) The report shall describe BMPs that are currently being implemented, BMPs that are identified in the SWMP or SWPPP for future implementation, and any additional BMPs that may be added to the SWMP or SWPPP to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the BMPs.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits), the discharger shall revise its ASBS Compliance Plan to incorporate any new or modified BMPs that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised SWMP or SWPPP, the discharger does not have to repeat

the same procedure for continuing or recurring exceedances of natural ocean water quality conditions due to the same constituent.

(5) The requirements of this section are in addition to the terms, prohibitions, and conditions contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within eighteen (18) months from the effective date of the Exception, the discharger shall submit a draft written ASBS Compliance Plan to the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that describes its strategy to comply with these special conditions, including the requirement to maintain natural water quality in the affected ASBS. The ASBS Compliance Plan shall include a description of appropriate non-structural controls and a time schedule to implement structural controls (implementation schedule) to comply with these special conditions for inclusion in the discharger's SWMP or SWPPP, as appropriate to permit type. The final ASBS Compliance Plan, including a description and final schedule for structural controls based on the results of runoff and receiving water monitoring, must be submitted within thirty (30) months from the effective date of the Exception.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these special conditions shall be implemented.

d. Within six (6) years of the effective date of the Exception, any structural controls identified in the ASBS Compliance Plan that are necessary to comply with these special conditions shall be operational.

e. Within six (6) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water, pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data, and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in

compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. for municipalities, a demonstration of significant hardship to discharger ratepayers, by showing the relationship of storm water fees to annual household income for residents within the discharger's jurisdictional area, and the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or

2. for other governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

B. NONPOINT SOURCE DISCHARGES

1. General Provisions for Nonpoint Sources

a. Existing nonpoint source waste discharges are allowed into an ASBS only under the following conditions:

(1) The discharges are authorized under waste discharge requirements, a conditional waiver of waste discharge requirements, or a conditional prohibition issued by the State Water Board or a Regional Water Board.

(2) The discharges are in compliance with the applicable terms, prohibitions, and special conditions contained in these Special Protections.

(3) The discharges:

(i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

(ii) Are designed to prevent soil erosion;

(iii) Occur only during wet weather;

(iv) Are composed of only storm water runoff.

b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

c. The discharge of trash is prohibited.

d. Only existing nonpoint source waste discharges are allowed. "Existing nonpoint source waste discharges" are discharges that were ongoing prior to January 1, 2005. "New nonpoint source discharges" are defined as those that commenced on or after January 1, 2005. A change to an existing nonpoint source discharge, in terms of relocation or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges from nonpoint sources (those not subject to an NPDES Permit) are prohibited except as provided below:

(1) The term "non-storm water discharges" means any waste discharges that are not composed entirely of storm water.

(2) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability, or occur naturally:

(i) Discharges associated with emergency fire fighting operations.

(ii) Foundation and footing drains.

(iii) Water from crawl space or basement pumps.

(iv) Hillside dewatering.

(v) Naturally occurring groundwater seepage via a storm drain.

(vi) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

f. At the San Clemente Island ASBS, discharges incidental to military training and research, development, test, and evaluation operations are allowed. Discharges incidental to underwater demolition and other in-water explosions are not allowed in the two military closure areas in the vicinity of Wilson Cove and Castle Rock. Discharges must not result in a violation of the water quality objectives, including the protection of the marine aquatic life beneficial use, anywhere in the ASBS.

g. At the San Nicolas Island and Begg Rock ASBS, discharges incidental to military research, development, testing, and evaluation of, and training with, guided missile and other weapons systems, fleet training exercises, small-scale amphibious warfare training, and special warfare training are allowed. Discharges incidental to underwater demolition and other in-water explosions are not allowed. Discharges must not result in a violation of the water quality objectives, including the protection of the marine aquatic life beneficial use, anywhere in the ASBS.

h. All other nonpoint source discharges not specifically authorized above are prohibited.

2. Planning and Reporting

a. The nonpoint source discharger shall develop an ASBS Pollution Prevention Plan, including an implementation schedule, to address storm water runoff and any other nonpoint source discharges from its facilities. The ASBS Pollution Prevention Plan must be equivalent in contents to an ASBS Compliance Plan as described in I (A)(2) in this document. The ASBS Pollution Prevention Plan is subject to approval by the Executive Director of the State Water Board (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements).

b. The ASBS Pollution Prevention Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff that are necessary to comply with these special conditions, will be achieved through Management Measures and associated Management Practices (Management Measures/Practices). Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director or Regional Water Board Executive Officer that such installation would pose a threat to health or safety. Management Measures to control storm water runoff during a design storm shall achieve on average the following target levels:

(1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

(2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges.

The baseline for these determinations is the effective date of the Exception, except for those structural BMPs installed between January 1, 2005 and adoption of these Special Protections, and the reductions must be achieved and documented within six (6) years of the effective date.

c. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff or other nonpoint source pollution is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and the Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents that alter natural water quality and the sources of these constituents.

(2) The report shall describe Management Measures/Practices that are currently being implemented, Management Measures/Practices that are identified in the ASBS Pollution Prevention Plan for future implementation, and any additional Management Measures/Practices that may be added to the Pollution Prevention Plan to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the Management Measures/Practices.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge

requirements), the discharger shall revise its ASBS Pollution Prevention Plan to incorporate any new or modified Management Measures/Practices that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised ASBS Pollution Prevention Plan, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural water quality conditions due to the same constituent.

(5) The requirements of this section are in addition to the terms, prohibitions, and conditions contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within eighteen (18) months from the effective date of the Exception, the discharger~~s~~ shall submit a draft written ASBS Pollution Prevention Plan to the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) that describes its strategy to comply with these special conditions, including the requirement to maintain natural ocean water quality in the affected ASBS. The Pollution Prevention Plan shall include a description of appropriate non-structural controls and a time schedule to implement structural controls to comply with these special conditions for inclusion in the discharger's Pollution Prevention Plan. The final ASBS Pollution Prevention Plan, including a description and final schedule for structural controls based on the results of runoff and receiving water monitoring, must be submitted within thirty (30) months from the effective date of the Exception.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these Special Protections shall be implemented.

d. Within six (6) years of the effective date of the Exception, any structural controls identified in the ASBS Pollution Prevention Plan that are necessary to comply with these special conditions shall be operational.

e. Within six (6) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) may only authorize additional time to comply

with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in (d.) or (e.). The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. a demonstration that the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or

2. for governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

II. ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES

In addition to the provisions in Section I (A) or I (B), respectively, a discharger with parks and recreation facilities shall comply with the following:

A. The discharger shall include a section in an ASBS Compliance Plan (for NPDES dischargers) or an ASBS Pollution Prevention Plan (for nonpoint source dischargers) to address storm water runoff from parks and recreation facilities.

1. The plan shall identify all pollutant sources, including sediment sources, which may result in waste entering storm water runoff. Pollutant sources include, but are not limited to, roadside rest areas and vistas, picnic areas, campgrounds, trash receptacles, maintenance facilities, park personnel housing, portable toilets, leach fields, fuel tanks, roads, piers, and boat launch facilities.

2. The plan shall describe BMPs or Management Measures/Practices that will be implemented to control soil erosion (both temporary and permanent erosion controls) and reduce or eliminate pollutants in storm water runoff in order to achieve and maintain natural water quality conditions in the affected ASBS. The plan shall include BMPs or Management Measures/Practices to ensure that trails and culverts are maintained to prevent erosion and minimize waste discharges to ASBS.

3. The plan shall include BMPs or Management Measures/Practices to prevent the discharge of pesticides or other chemicals, including agricultural chemicals, in storm water runoff to the affected ASBS.

4. The plan shall include BMPs or Management Measures/Practices that address public education and outreach. The goal of these BMPs or Management Measures/Practices is to ensure that the public is adequately informed that waste discharges to the affected ASBS are prohibited or limited by special conditions in these Special Protections. The BMPs or Management Measures/Practices shall include signage at camping, picnicking, beach and roadside parking areas, and visitor centers, or other appropriate measures, which notify the public of any applicable requirements of these Special Protections and identify the ASBS boundaries.

5. The plan shall include BMPs or Management Measures/Practices that address the prohibition against the discharge of trash to ASBS. The BMPs or Management Measures/Practices shall include measures to ensure that adequate trash receptacles are available for public use at visitor facilities, including parking areas, and that the receptacles are adequately maintained to prevent trash discharges into the ASBS. Appropriate measures include covering trash receptacles to prevent trash from being wind blown and periodically emptying the receptacles to prevent overflows.

6. The plan shall include BMPs or Management Measures/Practices to address runoff from parking areas and other developed features to ensure that the runoff does not alter natural water quality in the affected ASBS. BMPs or Management Measures/Practices shall include measures to reduce pollutant loading in runoff to the ASBS through installation of natural area buffers (LID), treatment, or other appropriate measures.

B. Maintenance and repair of park and recreation facilities must not result in waste discharges to the ASBS. The practice of road oiling must be minimized or eliminated, and must not result in waste discharges to the ASBS.

III. ADDITIONAL REQUIREMENTS – WATERFRONT AND MARINE OPERATIONS

In addition to the provisions in Section I (A) or I (B), respectively, a discharger with waterfront and marine operations shall comply with the following:

A. For discharges related to waterfront and marine operations, the discharger shall develop a Waterfront and Marine Operations Management Plan (Waterfront Plan). This plan shall contain appropriate Management Measures/Practices to address nonpoint source pollutant discharges to the affected ASBS.

1. The Waterfront Plan shall contain appropriate Management Measures/Practices for any waste discharges associated with the operation and maintenance of vessels, moorings, piers, launch ramps, and cleaning stations in order to ensure that beneficial uses are protected and natural water quality is maintained in the affected ASBS.

2. For discharges from marinas and recreational boating activities, the Waterfront Plan shall include appropriate Management Measures, described in The Plan for California's Nonpoint Source Pollution Control Program, for marinas and recreational boating, or equivalent practices, to ensure that nonpoint source pollutant discharges do not alter natural water quality in the affected ASBS.

3. The Waterfront Plan shall include Management Practices to address public education and outreach to ensure that the public is adequately informed that waste discharges to the affected ASBS are prohibited or limited by special conditions in these Special Protections. The management practices shall include appropriate signage, or similar measures, to inform the public of the ASBS restrictions and to identify the ASBS boundaries.

4. The Waterfront Plan shall include Management Practices to address the prohibition against trash discharges to ASBS. The Management Practices shall include the provision of adequate trash receptacles for marine recreation areas, including parking areas, launch ramps, and docks. The plan shall also include appropriate Management Practices to ensure that the receptacles are adequately maintained and secured in order to prevent trash discharges into the ASBS. Appropriate Management Practices include covering the trash receptacles to prevent trash from being windblown, staking or securing the trash receptacles so they don't tip over, and periodically emptying the receptacles to prevent overflow.

5. The discharger shall submit its Waterfront Plan to the by the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) within six months of the effective date of these special conditions. The Waterfront Plan is subject to approval by the State Water Board Executive Director or the Regional Water Board Executive Officer, as appropriate. The plan must be fully implemented within 18 months of the effective date of the Exception.

B. The discharge of chlorine, soaps, petroleum, other chemical contaminants, trash, fish offal, or human sewage to ASBS is prohibited. Sinks and fish cleaning stations are point source discharges of wastes and are prohibited from discharging into ASBS. Anthropogenic accumulations of discarded fouling organisms on the sea floor must be minimized.

C. Limited-term activities, such as the repair, renovation, or maintenance of waterfront facilities, including, but not limited to, piers, docks, moorings, and breakwaters, are authorized only in accordance with Chapter III.E.2 of the Ocean Plan.

D. If the discharger anticipates that the discharger will fail to fully implement the approved Waterfront Plan within the 18 month deadline, the discharger shall submit a technical report as soon as practicable to the State Water Board Executive Director or the Regional Water Board Executive Officer, as appropriate. The technical report shall contain reasons for failing to meet the deadline and propose a revised schedule to fully implement the plan.

E. The State Water Board or the Regional Water Board may, for good cause, authorize additional time to comply with the Waterfront Plan. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in Section III.A.5. The notice shall

describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality. The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. a demonstration of significant hardship by showing that the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate.

2. for governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

IV. MONITORING REQUIREMENTS

Monitoring is mandatory for all dischargers to assure compliance with the Ocean Plan. Monitoring requirements include both: (A) core discharge monitoring, and (B) ocean receiving water monitoring. The State and Regional Water Boards must approve sampling site locations and any adjustments to the monitoring programs. All ocean receiving water and reference area monitoring must be comparable with the Water Boards' Surface Water Ambient Monitoring Program (SWAMP).

Safety concerns: Sample locations and sampling periods must be determined considering safety issues. Sampling may be postponed upon notification to the State and Regional Water Boards if hazardous conditions prevail.

Analytical Chemistry Methods: All constituents must be analyzed using the lowest minimum detection limits comparable to the Ocean Plan water quality objectives. For metal analysis, all samples, including storm water effluent, reference samples, and ocean receiving water samples, must be analyzed by the approved analytical method with the lowest minimum detection limits (currently Inductively Coupled Plasma/Mass Spectrometry) described in the Ocean Plan.

A. CORE DISCHARGE MONITORING PROGRAM

1. General sampling requirements for timing and storm size:

   Runoff must be collected during a storm event that is greater than 0.1 inch and generates runoff, and at least 72 hours from the previously measurable storm event. Runoff samples shall be collected during the same storm and at approximately the same time when post-storm receiving water is sampled, and analyzed for the same constituents as receiving water and reference site samples (see section IV B) as described below.

2. Runoff flow measurements

   a. For municipal/industrial storm water outfalls in existence as of December 31, 2007,

18 inches (457mm) or greater in diameter/width (including multiple outfall pipes in combination having a width of 18 inches, runoff flows must be measured or calculated, using a method acceptable to and approved by the State and Regional Water Boards.

b. This will be reported annually for each precipitation season to the State and Regional Water Boards.

3. Runoff samples – storm events

a. For outfalls equal to or greater than 18 inches (0.46m) in diameter or width:

(1) samples of storm water runoff shall be collected during the same storm as receiving water samples and analyzed for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

(2) samples of storm water runoff shall be collected and analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

(3) If an applicant has no outfall greater than 36 inches, then storm water runoff from the applicant's largest outfall shall be further collected during the same storm as receiving water samples and analyzed for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates).

b. For outfalls equal to or greater than 36 inches (0.91m) in diameter or width:

(1) samples of storm water runoff shall be collected during the same storm as receiving water samples and analyzed for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

(2) samples of storm water runoff shall be further collected during the same storm as receiving water samples and analyzed for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates); and

(3) samples of storm water runoff shall be collected and analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

c. For an applicant not participating in a regional monitoring program [see below in Section IV (B)] in addition to (a.) and (b.) above, a minimum of the two largest outfalls or 20 percent of the larger outfalls, whichever is greater, shall be sampled (flow weighted composite samples) at least three times annually during wet weather (storm event) and analyzed for all Ocean Plan Table A constituents, Table B constituents for marine

aquatic life protection (except for toxicity, only chronic toxicity for three species shall be required), DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, and Ocean Plan indicator bacteria. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one (the largest) such discharge shall be sampled annually in each Region.

4. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may reduce or suspend core monitoring once the storm runoff is fully characterized. This determination may be made at any point after the discharge is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

B. Ocean Receiving Water and Reference Area Monitoring Program

In addition to performing the Core Discharge Monitoring Program in Section II.A above, all applicants having authorized discharges must perform ocean receiving water monitoring. In order to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS, dischargers may choose either (1) an individual monitoring program, or (2) participation in a regional integrated monitoring program.

1. Individual Monitoring Program: The requirements listed below are for those dischargers who elect to perform an individual monitoring program to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within the affected ASBS. In addition to Core Discharge Monitoring, the following additional monitoring requirements shall be met:

   a. Three times annually, during wet weather (storm events), the receiving water at the point of discharge from the outfalls described in section (IV)(A)(3)(c) above shall be sampled and analyzed for Ocean Plan Table A constituents, Table B constituents for marine aquatic life, DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, salinity, chronic toxicity (three species), and Ocean Plan indicator bacteria.

      The sample location for the ocean receiving water shall be in the surf zone at the point of discharges; this must be at the same location where storm water runoff is sampled. Receiving water shall be sampled prior to (pre-storm) and during (or immediately after) the same storm (post storm). Post storm sampling shall be during the same storm and at approximately the same time as when the runoff is sampled. Reference water quality shall also be sampled three times annually and analyzed for the same constituents pre-storm and post-storm, during the same storm seasons when receiving water is sampled. Reference stations will be determined by the State Water Board's Division of Water Quality and the applicable Regional Water Board(s).

   b. Sediment sampling shall occur at least three times during every five (5) year period. The subtidal sediment (sand or finer, if present) at the discharge shall be sampled and analyzed for Ocean Plan Table B constituents for marine aquatic life, DDT, PCBs, PAHs, pyrethroids, and OP pesticides. For sediment toxicity testing, only an acute toxicity test using the amphipod *Eohaustorius estuarius* must be performed.

c. A quantitative survey of intertidal benthic marine life shall be performed at the discharge and at a reference site. The survey shall be performed at least once every five (5) year period. The survey design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The results of the survey shall be completed and submitted to the State Water Board and Regional Water Board at least six months prior to the end of the permit cycle.

d. Once during each five (5) year period, a bioaccumulation study shall be conducted to determine the concentrations of metals and synthetic organic pollutants at representative discharge sites and at representative reference sites. The study design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The bioaccumulation study may include California mussels (*Mytilus californianus*) and/or sand crabs (*Emerita analoga* or *Blepharipoda occidentalis*). Based on the study results, the Regional Water Board and the State Water Board's Division of Water Quality, may adjust the study design in subsequent permits, or add or modify additional test organisms (such as shore crabs or fish), or modify the study design appropriate for the area and best available sensitive measures of contaminant exposure.

e. Marine Debris: Representative quantitative observations for trash by type and source shall be performed along the coast of the ASBS within the influence of the discharger's outfalls. The design, including locations and frequency, of the marine debris observations is subject to approval by the Regional Water Board and State Water Board's Division of Water Quality.

f. The monitoring requirements of the Individual Monitoring Program in this section are minimum requirements. After a minimum of one (1) year of continuous water quality monitoring of the discharges and ocean receiving waters, the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may require additional monitoring, or adjust, reduce or suspend receiving water and reference station monitoring. This determination may be made at any point after the discharge and receiving water is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

2. Regional Integrated Monitoring Program: Dischargers may elect to participate in a regional integrated monitoring program, in lieu of an individual monitoring program, to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS. This regional approach shall characterize natural water quality, pre- and post-storm, in ocean reference areas near the mouths of identified open space watersheds and the effects of the discharges on natural water quality (physical, chemical, and toxicity) in the ASBS receiving waters, and should include benthic marine aquatic life and bioaccumulation components. The design of the ASBS stratum of a regional integrated monitoring program may deviate from the otherwise prescribed individual monitoring approach (in Section IV.B.1) if approved by the State Water Board's Division of Water Quality and the Regional Water Boards.

a. Ocean reference areas shall be located at the drainages of flowing watersheds with minimal development (in no instance more than 10% development), and shall not be located in CWA Section 303(d) listed waterbodies or have tributaries that are 303(d) listed. Reference areas shall be free of wastewater discharges and anthropogenic non- storm water runoff. A minimum of low threat storm runoff discharges (e.g.

stream highway overpasses and campgrounds) may be allowed on a case-by-case basis. Reference areas shall be located in the same region as the ASBS receiving water monitoring occurs. The reference areas for each Region are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean reference water samples must be collected from each station, each from a separate storm during the same storm season that receiving water is sampled. A minimum of one reference location shall be sampled for each ASBS receiving water site sampled per responsible party. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

b. ASBS ocean receiving water must be sampled in the surf zone at the location where the runoff makes contact with ocean water (i.e. at "point zero"). Ocean receiving water stations must be representative of worst-case discharge conditions (i.e. co-located at a large drain greater than 36 inches, or if drains greater than 36 inches are not present in the ASBS then the largest drain greater than18 inches.) Ocean receiving water stations are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean receiving water samples must be collected during each storm season from each station, each from a separate storm. A minimum of one receiving water location shall be sampled in each ASBS per responsible party in that ASBS. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

c. Reference and receiving water sampling shall commence during the first full storm season following the adoption of these special conditions, and post-storm samples shall be collected during the same storm event when storm water runoff is sampled. Sampling shall occur in a minimum of two storm seasons. For those ASBS dischargers that have already participated in the Southern California Bight 2008 ASBS regional monitoring effort, sampling may be limited to only one storm season.

d. Receiving water and reference samples shall be analyzed for the same constituents as storm water runoff samples. At a minimum, constituents to be sampled and analyzed in reference and discharge receiving waters must include oil and grease, total suspended solids, Ocean Plan Table B metals for protection of marine life, Ocean Plan PAHs, pyrethroids, OP pesticides, ammonia, nitrate, phosphates, and critical life stage chronic toxicity for three species. In addition, within the range of the southern sea otter, indicator bacteria or some other measure of fecal contamination shall be analyzed.

3. Waterfront and Marine Operations: In addition to the above requirements for ocean receiving water monitoring, additional monitoring must be performed for marinas and boat launch and pier facilities:

a. For all marina or mooring field operators, in mooring fields with 10 or more occupied moorings, the ocean receiving water must be sampled for Ocean Plan indicator bacteria, residual chlorine, copper, zinc, grease and oil, methylene blue active substances (MBAS), and ammonia nitrogen.

(1) For mooring field operators opting for an individual monitoring program (Section IV.B.1 above), this sampling must occur weekly (on the weekend) from May through October.

(2) For mooring field operators opting to participate in a regional integrated monitoring program (Section IV.B.2 above), this sampling must occur monthly from May through October on a high use weekend in each month. The Water Boards may allow a reduction in the frequency of sampling, through the regional monitoring program, after the first year of monitoring.

b. For all mooring field operators, the subtidal sediment (sand or finer, if present) within mooring fields and below piers shall be sampled and analyzed for Ocean Plan Table B metals (for marine aquatic life beneficial use), acute toxicity, PAHs, and tributyltin. For sediment toxicity testing, only an acute toxicity test using the amphipod *Eohaustorius estuarius* must be performed. This sampling shall occur at least three times during a five (5) year period. For mooring field operators opting to participate in a regional integrated monitoring program, the Water Boards may allow a reduction in the frequency of sampling after the first sampling effort's results are assessed.

Glossary

At the point of discharge(s) – Means in the surf zone immediately where runoff from an outfall meets the ocean water (a.k.a., at point zero).

Areas of Special Biological Significance (ASBS) – Those areas designated by the State Water Board as ocean areas requiring protection of species or biological communities to the extent that alteration of natural water quality is undesirable. All Areas of Special Biological Significance are also classified as a subset of State Water Quality Protection Areas.

Design storm – For purposes of these Special Protections, a design storm is defined as the volume of runoff produced from one inch of precipitation per day or, if this definition is inconsistent with the discharger's applicable storm water permit, then the design storm shall be the definition included in the discharger's applicable storm water permit.

Development – Relevant to reference monitoring sites, means urban, industrial, agricultural, grazing, mining, and timber harvesting land uses.

Higher threat discharges - Permitted storm drains discharging equal to or greater than 18 inches, industrial storm drains, agricultural runoff discharged through an MS4, discharges associated with waterfront and marina operations (e.g., piers, launch ramps, mooring fields, and associated vessel support activities, except for passive discharges defined below), and direct discharges associated with commercial or industrial activities to ASBS.

Low Impact Development (LID) – A sustainable practice that benefits water supply and contributes to water quality protection. Unlike traditional storm water management, which entails collecting and conveying storm water runoff through storm drains, pipes, or other conveyances to a centralized storm water facility, LID focuses on using site design and storm water management to maintain the site's pre-development runoff rates and volumes. The goal of LID is to mimic a site's predevelopment hydrology by using design techniques that infiltrate, filter, store, evaporate, and detain runoff close to the source of rainfall.

Marine Operations – Marinas or mooring fields that contain slips or mooring locations for 10 or more vessels.

Management Measure (MM) - Economically achievable measures for the control of the addition of pollutants from various classes of nonpoint sources of pollution, which reflect the greatest degree of pollutant reduction achievable through the application of the best available nonpoint pollution control practices, technologies, processes, siting criteria, operating methods, or other alternatives. For example, in the "marinas and recreational boating" land- use category specified in the Plan for California's Nonpoint Source Pollution Control Program (NPS Program Plan) (SWRCB, 1999), "boat cleaning and maintenance" is considered a MM or the source of a specific class or type of NPS pollution.

Management Practice (MP) - The practices (e.g., structural, non-structural, operational, or other alternatives) that can be used either individually or in combination to address a specific MM class or classes of NPS pollution. For example, for the "boat cleaning and maintenance" MM, specific MPs can include, but are not limited to, methods for the selection of environmentally sensitive hull paints or methods for cleaning/removal of hull copper anti- fouling paints.

Municipal Separate Storm Sewer System (MS4) – A municipally-owned storm sewer system regulated under the Phase I or Phase II storm water program implemented in compliance with Clean Water Act section 402(p). Note that an MS4 program's boundaries are not necessarily congruent with the permittee's political boundaries.

Natural Ocean Water Quality - The water quality (based on selected physical, chemical and biological characteristics) that is required to sustain marine ecosystems, and which is without apparent human influence, *i.e.*, an absence of significant amounts of: (a) man-made constituents (*e.g.,* DDT); (b) other chemical (*e.g.,* trace metals), physical (temperature/thermal pollution, sediment burial), and biological (*e.g.*, bacteria) constituents at concentrations that have been elevated due to man's activities above those resulting from the naturally occurring processes that affect the area in question; and (c) non-indigenous biota (*e.g.,* invasive algal bloom species) that have been introduced either deliberately or accidentally by man. Discharges "*shall not alter natural ocean water quality*" as determined by a comparison to the range of constituent concentrations in reference areas agreed upon via the regional monitoring program(s). If monitoring information indicates that *natural ocean water quality* is not maintained, but there is sufficient evidence that a discharge is not contributing to the alteration of natural water quality, then the Regional Water Board may make that determination. In this case, sufficient information must include runoff sample data that has equal or lower concentrations for the range of constituents at the applicable reference area(s).

Nonpoint source – Nonpoint pollution sources generally are sources that do not meet the definition of a point source. Nonpoint source pollution typically results from land runoff, precipitation, atmospheric deposition, agricultural drainage, marine/boating operations or hydrologic modification. Nonpoint sources, for purposes of these Special Protections, include discharges that are not required to be regulated under an NPDES permit.

Non-storm water discharge – Any runoff that is not the result of a precipitation event. This is often referred to as "dry weather flow."

Non-structural control – A Best Management Practice that involves operational, maintenance, regulatory (e.g., ordinances) or educational activities designed to reduce or eliminate pollutants in runoff, and that are not structural controls (i.e. there are no physical structures involved).

Physical impossibility - Means any act of God, war, fire, earthquake, windstorm, flood or natural catastrophe; unexpected and unintended accidents not caused by discharger or its employees' negligence; civil disturbance, vandalism, sabotage or terrorism; restrain by court order or public authority or agency; or action or non-action by, or inability to

obtain the necessary authorizations or approvals from any governmental agency other than the permittee.

Representative sites and monitoring procedures – Are to be proposed by the discharger, with appropriate rationale, and subject to approval by Water Board staff.

Sheet-flow – Runoff that flows across land surfaces at a shallow depth relative to the cross- sectional width of the flow. These types of flow may or may not enter a storm drain system before discharge to receiving waters.

Storm Season – Also referred to as rainy season, means the months of the year from the onset of rainfall during autumn until the cessation of rainfall in the spring.

Structural control – A Best Management Practice that involves the installation of engineering solutions to the physical treatment or infiltration of runoff.

Surf Zone - The surf zone is defined as the submerged area between the breaking waves and the shoreline at any one time.

Surface Water Ambient Monitoring Program (SWAMP) comparable – Means that the monitoring program must 1) meet or exceed 2008 SWAMP Quality Assurance Program Management Plan (QAPP) Measurement Quality Objectives, or 2) have a Quality Assurance Project Plan that has been approved by SWAMP; in addition data must be formatted to match the database requirements of the SWAMP Information Management System. Adherence to the measurement quality objectives in the Southern California Bight 2008 ASBS Regional Monitoring Program QAPP and data base management comprises being SWAMP comparable.

Waterfront Operations - Piers, launch ramps, and cleaning stations in the water or on the adjacent shoreline.

Attachment 1
Special Protections Sections I(A)(3)(e) and I(B)(3)(e)
Flowchart to Determine Compliance with natural Water Quality

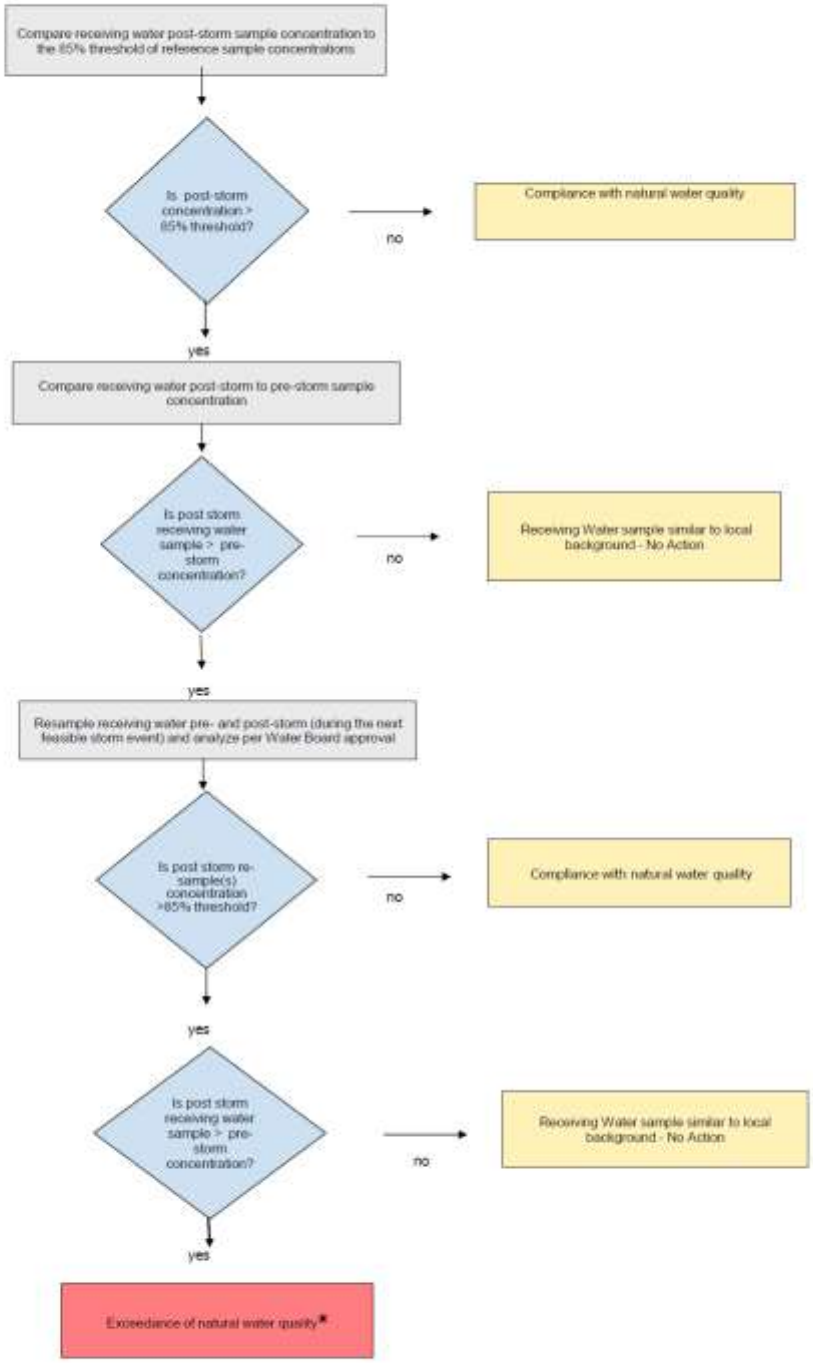

*** When an exceedance of natural water quality occurs, the discharger must comply with section I.A.2.h (for permitted storm water) or section I.B.2.c (for nonpoint sources). Note, when sampling data is available, end-of-pipe effluent concentrations will be considered by the Water Boards in making this determination.**

ATTACHMENT B

STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

1. Standard Permit Provisions

Code of Federal Regulations Title 40 Section 122.41 (40 CFR 122.41) includes conditions, or provisions, that apply to all National Pollutant Discharge Elimination System (NPDES) permits. Additional provisions applicable to NPDES permits are in 40 CFR 122.42. All applicable provisions in 40 CFR 122.41 and 40 CFR 122.42 must be incorporated into this Order and NPDES permit. The applicable 40 CFR 122.41 and 40 CFR 122.42 provisions are as follows:

a. DUTY TO COMPLY [40 CFR 122.41(a)]

The Copermittee must comply with all of the provisions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

(1) The Copermittee must comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement. [40 CFR 122.41(a)(1)]

(2) The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to a civil penalty not to exceed $25,000 per day for each violation. The CWA provides that any person who *negligently* violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than 2 years, or both. Any person who *knowingly* violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both. Any person who knowingly violates Section 301, 302, 303, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, and who knows at that time that he thereby places another person in imminent

danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.
[40 CFR 122.41(a)(2)]

(3) Any person may be assessed an administrative penalty by the San Diego Regional Water Quality Control Board (San Diego Water Board), State Water Resources Control Board (State Water Board), or United States Environmental Protection Agency (USEPA) for violating Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.
[40 CFR 122.41(a)(3)]

b. DUTY TO REAPPLY [40 CFR 122.41(b)]

If a Copermittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Copermittee must apply for and obtain a new permit.

c. NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE [40 CFR 122.41(c)]

It shall not be a defense for a Copermittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

d. DUTY TO MITIGATE [40 CFR 122.41(d)]

The Copermittee must take all reasonable steps to minimize or prevent any discharge or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

e. PROPER OPERATION AND MAINTENANCE [40 CFR 122.41(e)]

The Copermittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Copermittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by a Copermittee only when the operation is necessary to achieve compliance with the conditions of this permit.

f. PERMIT ACTIONS [40 CFR 122.41(f)]

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Copermittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

g. PROPERTY RIGHTS [40 CFR 122.41(g)]

This permit does not convey any property rights of any sort, or any exclusive privilege.

h. DUTY TO PROVIDE INFORMATION [40 CFR 122.41(h)]

The Copermittee must furnish to the San Diego Water Board, State Water Board, or USEPA within a reasonable time, any information which the San Diego Water Board, State Water Board, or USPEA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Copermittee must also furnish to the San Diego Water Board, State Water Board, or USPEA upon request, copies of records required to be kept by this permit.

i. INSPECTION AND ENTRY [40 CFR 122.41(i)]

The Copermittee must allow the San Diego Water Board, State Water Board, USEPA, and/or their authorized representative (including an authorized contractor acting as their representative), upon presentation of credentials and other documents as may be required by law, to:

(1) Enter upon the Copermittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit; [40 CFR 122.41(i)(1)]

(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit; [40 CFR 122.41(i)(2)]

(3) Inspect and photograph at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; [40 CFR 122.41(i)(3)] and

(4) Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location. [40 CFR 122.41(i)(4)]

j. MONITORING AND RECORDS [40 CFR 122.41(j)]

(1) Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity. [40 CFR 122.41(j)(1)]

(2) Except for records of monitoring information required by this permit related to the Copermittee's sewage sludge use and disposal activities, which shall be retained for

a period of at least five (5) years (or longer as required by 40 CFR Part 503), the Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time. [40 CFR 122.41(j)(2)]

(3) Records for monitoring information must include: [40 CFR 122.41(j)(3)]

(a) The date, exact place, and time of sampling or measurements; [40 CFR 122.41(j)(3)(i)]
(b) The individual(s) who performed the sampling or measurements; [40 CFR 122.41(j)(3)(ii)]
(c) The date(s) analyses were performed; [40 CFR 122.41(j)(3)(iii)]
(d) The individual(s) who performed the analyses; [40 CFR 122.41(j)(3)(iv)]
(e) The analytical techniques or methods used; [40 CFR 122.41(j)(3)(v)] and
(f) The results of such analyses. [40 CFR 122.41(j)(3)(vi)]

(4) Monitoring must be conducted according to test procedures under 40 CFR Part 136 unless another method is required under 40 CFR Subchapters N or O. [40 CFR 122.41(j)(4)]

In the case of pollutants for which there are no approved methods under 40 CFR Part 136 or otherwise required under 40 CFR Subchapters N and O, monitoring must be conducted according to a test procedure specified in the permit for such pollutants. [40 CFR 122.44(i)(1)(iv)]

(5) The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. [40 CFR 122.41(j)(5)]

k. SIGNATORY REQUIREMENT [40 CFR 122.41(k)]

(1) All applications, reports, or information submitted to the San Diego Water Board, State Water Board, or USEPA must be signed and certified. (See 40 CFR 122.22) [40 CFR 122.41(k)(1)]

(a) *For a municipality, State, Federal, or other public agency.* [All applications must be signed] by either a principal executive officer or ranking elected official. [40 CFR 122.22(a)(3)]

(b) All reports required by permits, and other information requested by the San Diego Water Board, State Water Board, or USEPA must be signed by a person described in paragraph (a) of this section, or by a duly authorized

representative of that person. A person is a duly authorized representative only if: [40 CFR 122.22(b)]

(i) The authorization is made in writing by a person described in paragraph (a) of this section; [40 CFR 122.22(b)(1)]

(ii) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company, (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) [40 CFR 122.22(b)(2)] and,

(iii) The written authorization is submitted to the San Diego Water Board and State Water Board. [40 CFR 122.22(b)(3)]

(c) *Changes to authorization.* If an authorization under paragraph (b) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (b) of this section must be submitted to the San Diego Water Board prior to or together with any reports, information, or applications to be signed by an authorized representative. [40 CFR 122.22(c)]

(d) *Certification.* Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." [40 CFR 122.22(d)]

(2) The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both. [40 CFR 122.41(k)(2)]

I. REPORTING REQUIREMENTS [40 CFR 122.41(l)]

(1) *Planned changes.* The Copermittee must give notice to the San Diego Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when: [40 CFR 122.41(l)(1)]

(a) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); [40 CFR 122.41(l)(1)(i)] or

(b) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1). [40 CFR 122.41(l)(1)(ii)]

(c) The alteration or addition results in a significant change in the Copermittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. [40 CFR 122.41(l)(1)(iii)]

(2) *Anticipated noncompliance*. The Copermittee must give advance notice to the San Diego Water Board or State Water Board of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements. [40 CFR 122.41(l)(2)]

(3) *Transfers*. This permit is not transferable to any person except after notice to the San Diego Water Board. The San Diego Water Board may require modification or revocation and reissuance of the permit to change the name of the Copermittee and incorporate such other requirements as may be necessary under the CWA. [40 CFR 122.41(l)(3)]

(4) *Monitoring reports.* Monitoring results must be reported at the intervals specified elsewhere in this permit. [40 CFR 122.41(l)(4)]

(a) Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the San Diego Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices. [40 CFR 122.41(l)(4)(i)]

(b) If the Copermittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or another method required for an industry-specific waste stream under 40 CFR Subchapters N or O, the results of this monitoring must be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the San Diego Water Board or State Water Board. [40 CFR 122.41(l)(4)(ii)]

(c) Calculations for all limitations which require averaging of measurements must utilize an arithmetic mean unless otherwise specified in the permit. [40 CFR 122.41(l)(4)(iii)]

(5) *Compliance schedules*. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date. [40 CFR 122.41(l)(5)]

(6) *Twenty-four hour reporting.*

(a) The Copermittee must report any noncompliance that may endanger health or the environment. Any information must be provided orally within 24 hours from the time the Copermittee becomes aware of the circumstances. A written submission must also be provided within five (5) days of the time the Copermittee becomes aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6)(i)]

(b) The following must be included as information which must be reported within 24 hours under this paragraph: [40 CFR 122.41(l)(6)(ii)]

(i) Any unanticipated bypass that exceeds any effluent limitation in the permit (See 40 CFR 122.41(g)). [40 CFR 122.41(l)(6)(ii)(A)]
(ii) Any upset which exceeds any effluent limitation in the permit. [40 CFR 122.41(l)(6)(ii)(B)] and,
(iii) Violation of a maximum daily discharge limitation for any of the pollutants listed by the San Diego Water Board in the permit to be reported within 24 hours. (See 40 CFR 122.44(g)) [40 CFR 122.41(l)(6)(ii)(C)]

(c) The San Diego Water Board may waive the above-required written report on a case-by-case basis if the oral report has been received within 24 hours. [40 CFR 122.41(l)(6)(iii)]

(7) *Other noncompliance.* The Copermittee must report all instances of noncompliance not reported in accordance with the standard provisions required under 40 CFR 122.41(l)(4), (5), and (6), at the time monitoring reports are submitted. The reports must contain the information listed in the standard provisions required under 40 CFR 122.41(l)(6). [40 CFR 122.41(l)(7))]

(8) *Other information.* When the Copermittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the San Diego Water Board, State Water Board, or USEPA, the Copermittee must promptly submit such facts or information. [40 CFR 122.41(l)(8)]

m. BYPASS [40 CFR 122.41(m)]

(1) *Definitions.*

(a) "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. [40 CFR 122.41(m)(1)(i)] or

(b) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or

substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
[40 CFR 122.41(m)(1)(ii)]

(2) *Bypass not exceeding limitations*. The Copermittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the standard provisions required under 40 CFR 122.41(m)(3) and (4).
[40 CFR 122.41(m)(2)]

(3) *Notice.*

(a) *Anticipated bypass*. If the Copermittee knows in advance of the need for a bypass, it must submit a notice, if possible at least ten days before the date of the bypass. [40 CFR 122.41(m)(3)(i)] or

(b) *Unanticipated bypass*. The Copermittee must submit notice of an unanticipated bypass in accordance with the standard provisions required under 40 CFR 122.41(l)(6) (24-hour notice).
[40 CFR 122.41(m)(3)(ii)]

(4) *Prohibition of Bypass.*

(a) Bypass is prohibited, and the San Diego Water Board may take enforcement action against a Copermittee for bypass, unless:
[40 CFR 122.41(m)(4)(i)]

(i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; [40 CFR 122.41(m)(4)(i)(A)]
(ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance;
[40 CFR 122.41(m)(4)(i)(B)] and,
(iii) The Copermittee submitted notice in accordance with the standard provisions required under 40 CFR 122.41(m)(3).
[40 CFR 122.41(m)(4)(i)(C)]

(b) The San Diego Water Board may approve an anticipated bypass, after considering its adverse effects, if the San Diego Water Board determines that it will meet the three conditions listed above.
[40 CFR 122.41(m)(4)(ii)]

n. UPSET [40 CFR 122.41(n)]

(1) *Definition.* "Upset" means an exceptional incident in which there is unintentional and

temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Copermittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. [40 CFR 122.41(n)(1)]

(2) *Effect of an upset*. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the standard provisions required under 40 CFR 122.41(n)(3) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. [40 CFR 122.41(n)(2)]

(3) *Conditions necessary for a demonstration of upset*. A Copermittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that: [40 CFR 122.41(n)(3)]

(a) An upset occurred and that the Copermittee can identify the cause(s) of the upset; [40 CFR 122.41(n)(3)(i)]
(b) The permitted facility was at the time being properly operated; [40 CFR 122.41(n)(3)(ii)] and
(c) The Copermittee submitted notice of the upset in accordance with the standard provisions required under 40 CFR 122.41(l)(6)(ii)(B) (24-hour notice). [40 CFR 122.41(n)(3)(iii)]
(d) The Copermittee complied with any remedial measures pursuant to the standard provisions required under 40 CFR 122.41(d). [40 CFR 122.41(n)(3)(iii)]

(4) *Burden of proof*. In any enforcement proceeding, the Copermittee seeking to establish the occurrence of an upset has the burden of proof. [40 CFR 122.41(n)(4)]

o. STANDARD PERMIT PROVISIONS FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS [40 CFR 122.42(c)]

The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the San Diego Water Board or State Water Board under 40 CFR 122.26(a)(1)(v) must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report must include:

(1) The status of implementing the components of the storm water management program that are established as permit conditions; [40 CFR 122.42(c)(1)]

(2) Proposed changes to the storm water management programs that are established as permit conditions. Such proposed changes must be consistent with 40 CFR 122.26(d)(2)(iii); [40 CFR 122.42(c)(2)] and

(3) Revisions, if necessary, to the assessment of controls and the fiscal analysis

reported in the permit application under 40 CFR 122.26(d)(2)(iv) and (v); [40 CFR 122.42(c)(3)]

(4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; [40 CFR 122.42(c)(4)]

(5) Annual expenditures and budget for year following each annual report; [40 CFR 122.42(c)(5)]

(6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; [40 CFR 122.42(c)(6)]

(7) Identification of water quality improvements or degradation. [40 CFR 122.42(c)(7)]

p. STANDARD PERMIT PROVISIONS FOR STORM WATER DISCHARGES [40 CFR 122.42(d)]

The initial permits for discharges composed entirely of storm water issued pursuant to 40 CFR 122.26(e)(7) must require compliance with the conditions of the permit as expeditiously as practicable, but in no event later than three years after the date of issuance of the permit.

2. General Provisions

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. The general provisions applicable to this Order and NPDES permit are as follows:

a. DISCHARGE OF WASTE IS A PRIVILEGE

No discharge of waste into the waters of the State, whether or not such discharge is made pursuant to waste discharge requirements, shall create a vested right to continue such discharge. All discharges of waste into waters of the State are privileges, not rights. [CWC Section 13263(g)]

b. DURATION OF ORDER AND NPDES PERMIT

(1) *Effective date*. This Order supersedes Order No. R9-2007-0001 for the San Diego County Copermittees listed in Table ~~2.~~1a and became effective on June 27, 2013~~ for those Copermittees~~. This Order as amended by Order R9-2015-0001 supersedes Order No. R9-2009-0002 for the Orange County Copermittees listed in Table 1b and its amendments through Order No. R9-2015-0001 ~~becomes~~ became effective April 1, 2015~~, following the date Order No. R9-2015-0001 is adopted~~. This Order as amended by Order Nos. R9-2015-0001 and R9-2015-0100 supersedes Order No. R9-2010-0016 for the Riverside County Copermittees listed in Table 1c and its amendments through Order No. R9-2015-0100 became effective January 7, 2016. ~~upon further amendment or earlier notice of coverage.~~

(2) *Expiration*. This Order and NPDES permit expires five years after June 27, 2013, its initial effective date. [40 CFR 122.46(a)]

(3) *Continuation of expired order*. After this Order and NPDES permit expires, the terms and conditions of this Order and NPDES permit are automatically continued pending issuance of a new permit if all requirements of the federal NPDES regulations on the continuation of expired permits (40 CFR 122.6) are complied with.

c. AVAILABILITY

A copy of this Order must be kept at a readily accessible location and must be available to on-site personnel at all times.

d. CONFIDENTIALITY OF INFORMATION

Except as provided for in 40 CFR 122.7, no information or documents submitted in accordance with or in application for this Order will be considered confidential, and all such information and documents shall be available for review by the public at the San Diego Water Board office.

Claims of confidentiality for the following information will be denied:
[40 CFR 122.7(b)]

(1) The name and address of any permit applicant or Copermittee; [40 CFR 122.7(b)(1)] and

(2) Permit applications and attachments, permits, and effluent data. [40 CFR 122.7(b)(2)]

e. EFFLUENT LIMITATIONS

(1) *Interim effluent limitations*. The Copermittee must comply with any interim effluent limitations as established by addendum, enforcement action, or revised waste discharge requirements which have been, or may be, adopted by the San Diego Water Board.

(2) *Other effluent limitations and standards*. If any applicable toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant and that standard or prohibition is more stringent than any limitation on the pollutant in the permit, the San Diego Water Board shall institute proceedings under these regulations to modify or revoke and reissue the permit to conform to the toxic effluent standard or prohibition. [40 CFR 122.44(b)(1)]

f. DUTY TO MINIMIZE OR CORRECT ADVERSE IMPACTS

The Copermittee must take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this Order, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the noncompliance.

g. PERMIT ACTIONS

The filing of a request by the Copermittee for modification, revocation and reissuance, or termination of this Order, or a notification of planned change in or anticipated noncompliance with this Order does not stay any condition of this Order. (See 40 CFR 122.41(f)) In addition, the following provisions apply to this Order:

(1) Upon application by any affected person, or on its own motion, the San Diego Water Board may review and revise the requirements in this Order. All requirements must be reviewed periodically. [CWC Section 13263(e)]

(2) This Order may be terminated or modified for cause, including, but not limited to, all of the following: [CWC Section 13381]

(a) Violation of any condition contained in the requirements of this Order. [CWC Section 13381(a)]

(b) Obtaining the requirements in this Order by misrepresentation, or failure to disclose fully all relevant facts. [CWC Section 13381(b)]

(c) A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge. [CWC Section 13381(c)]

(3) When this Order is transferred to a new owner or operator, such requirements as may be necessary under the CWC may be incorporated into this Order.

h. NPDES PERMITTED NON-STORM WATER DISCHARGES

The San Diego Water Board has, in prior years, issued a limited number of individual NPDES permits for non-storm water discharges to MS4s. The San Diego Water Board or State Water Board may in the future, upon prior notice to the Copermittee(s), issue an NPDES permit for any non-storm water discharge (or class of non-storm water discharges) to an MS4.

i. MONITORING

In addition to the standard provisions required under 40 CFR 122.41(j) and (l)(4), the following general monitoring provisions apply to this Order:

(1) Where procedures are not otherwise specified in Order, sampling, analysis and quality assurance/quality control must be conducted in accordance with the Quality Assurance Management Plan (QAMP) for the State of California's Surface Water Ambient Monitoring Program (SWAMP), adopted by the State Water Resources Control Board (State Water Board).

(2) Pursuant to 40 CFR 122.41(j)(2) and CWC Section 13383(a), each Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring

instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five (5) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time.

(3) All chemical, bacteriological, and toxicity analyses must be conducted at a laboratory certified for such analyses by the California Department of Public Health or a laboratory approved by the San Diego Water Board.

(4) For priority toxic pollutants that are identified in the California Toxics Rule (CTR) (65 Fed. Reg. 31682), the Copermittees must instruct their laboratories to establish calibration standards that are equivalent to or lower than the Minimum Levels (MLs) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP). If a Copermittee can demonstrate that a particular ML is not attainable, in accordance with procedures set forth in 40 CFR Part 136, the lowest quantifiable concentration of the lowest calibration standard analyzed by a specific analytical procedure (assuming that all the method specified sample weights, volumes, and processing steps have been followed) may be used instead of the ML listed in Appendix 4 of the SIP. The Copermittee must submit documentation from the laboratory to the San Diego Water Board for approval prior to raising the ML for any priority toxic pollutant.

j. ENFORCEMENT

(1) The San Diego Water Board is authorized to enforce the terms of this Order under several provisions of the CWC, including, but not limited to, CWC Sections 13385, 13386, and 13387.

(2) Nothing in this Order shall be construed to protect the Copermittee from its liabilities under federal, state, or local laws.

(3) The CWC provides for civil and criminal penalties comparable to, and in some cases greater than, those provided for under the CWA.

(4) Except as provided in the standard conditions required under 40 CFR 122.41(m) and (n), nothing in this Order shall be construed to relieve the Copermittee from civil or criminal penalties for noncompliance.

(5) Nothing in this Order shall be construed to preclude the institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties to which the Copermittee is or may be subject to under Section 311 of the CWA.

(6) Nothing in this Order shall be construed to preclude institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authoring preserved by Section 510 of the CWA.

k. SEVERABILITY

The provisions of this Order are severable, and if any provision of this Order, or the application of any provisions of this Order to any circumstance, is held invalid, the

application of such provision to other circumstances and the remainder of this Order shall not be affected thereby.

l. APPLICATIONS

Any application submitted by a Copermittee for reissuance or modification of this Order must satisfy all applicable requirements specified in federal regulations as well as any additional requirements for submittal of a Report of Waste Discharge specified in the CWC and the California Code of Regulations.

m. IMPLEMENTATION

All plans, reports and subsequent amendments submitted in compliance with this Order must be implemented immediately (or as otherwise specified). All submittals by Copermittees must be adequate to implement the requirements of this Order.

n. REPORT SUBMITTALS

(1) All report submittals must include an executive summary, introduction, conclusion, recommendations, and signed certified statement.

(2) Each Copermittee must submit a signed certified statement covering its responsibilities for each applicable submittal.

(3) The Principal Watershed Copermittee(s) must submit a signed certified statement covering its responsibilities for each applicable submittal and the sections of the submittals for which it is responsible.

(4) Unless otherwise directed, the Copermittees must submit ~~one hard copy and~~ one electronic copy of each report required under this Order to the San Diego Water Board at SanDiego@waterboards.ca.gov~~, and one electronic copy to the USEPA~~.

(5) When hard copies are requested or required, ~~T~~the Copermittees must submit reports and provide notifications as required by this Order to ~~the following~~:

EXECUTIVE OFFICER
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
2375 NORTHSIDE DRIVE, SUITE 100
SAN DIEGO CA 92108
Telephone: (619) 516-1990 Fax: (619) 516-1994

~~EUGENE BROMLEY~~
~~US ENVIRONMENTAL PROTECTION AGENCY~~
~~REGION IX~~
~~PERMITS ISSUANCE SECTION (W-5-1)~~
~~75 HAWTHORNE STREET~~
~~SAN FRANCISCO CA 94105~~

ATTACHMENT C

ACRONYMS AND ABBREVIATIONS

AMAL	Average Monthly Action Level
ASBS	Area(s) of Special Biological Significance
BMP	Best Management Practice
Basin Plan	Water Quality Control Plan for the San Diego Basin
CEQA	California Environmental Quality Act
CCR	California Code of Regulations
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWC	California Water Code
CZARA	Coastal Zone Act Reauthorization Amendments of 1990
ESAs	Environmentally Sensitive Areas
GIS	Geographic Information System
IBI	Index of Biological Integrity
LID	Low Impact Development
MDAL	Maximum Daily Action Level
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
NAL	Non-Storm Water Action Level
NAICS	North American Industry Classification System
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
ROWD	Report of Waste Discharge (application for NPDES reissuance)
SAL	Storm Water Action Level
San Diego Water Board	California Regional Water Quality Control Board, San Diego Region
SIC	Standard Industrial Classification Code
State Water Board	State Water Resources Control Board
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
WDID	Waste Discharge Identification Number
WLA	Waste Load Allocation
WQBEL	Water Quality Based Effluent Limitation

DEFINITIONS

Active/Passive Sediment Treatment - Using mechanical, electrical or chemical means to flocculate or coagulate suspended sediment for removal from runoff from construction sites prior to discharge.

Anthropogenic Litter – Trash generated from human activities, not including sediment.

Average Monthly Action Level – The highest allowable average of daily discharges over a calendar month.

Beneficial Uses - The uses of water necessary for the survival or wellbeing of man, plants, and wildlife. These uses of water serve to promote tangible and intangible economic, social, and environmental goals. "Beneficial Uses" of the waters of the State that may be protected include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. Existing beneficial uses are uses that were attained in the surface or ground water on or after November 28, 1975; and potential beneficial uses are uses that would probably develop in future years through the implementation of various control measures. "Beneficial Uses" are equivalent to "Designated Uses" under federal law. [California Water Code Section 13050(f)].

Best Management Practices (BMPs) - Defined in 40 CFR 122.2 as schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Bioassessment - The use of biological community information to evaluate the biological integrity of a water body and its watershed. With respect to aquatic ecosystems, bioassessment is the collection and analysis of samples of the benthic macroinvertebrate community together with physical/habitat quality measurements associated with the sampling site and the watershed to evaluate the biological condition (i.e. biotic integrity) of a water body.

Biofiltration - Practices that use vegetation and amended soils to detain and treat runoff from impervious areas. Treatment is through filtration, infiltration, adsorption, ion exchange, and biological uptake of pollutants.

Biological Integrity - Defined in Karr J.R. and D.R. Dudley. 1981. Ecological perspective on water quality goals. *Environmental Management* 5:55-68 as: "A balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitat of the region." Also referred to as ecosystem health.

BMP Design Manual – A plan developed to eliminate, reduce, or mitigate the impacts of runoff from development projects, including Priority Development Projects.

Chronic Toxicity – A measurement of sublethal effect (e.g. reduced growth, reproduction) to experimental test organisms exposed to an effluent or receiving waters compared to that of the control organisms.

Clean Water Act Section 303(d) Water Body - An impaired water body in which water quality does not meet applicable water quality standards and/or is not expected to meet water quality standards, even after the application of technology based pollution controls required by the CWA. The discharge of runoff to these water bodies by the Copermittees is significant because these discharges can cause or contribute to violations of applicable water quality standards.

Construction Activities – Actions implemented during construction of development or redevelopment projects during the Preliminary Phase (including rough grading and/or disking, clearing and grubbing operations, or any soil disturbance prior to mass grading), Grading or Land Development Phase (including topography and slope reconfiguration, alluvium removals, canyon cleanouts, rock undercuts, keyway excavations, land form grading, and stockpiling of select material for capping operations), Streets and Utility Phase (including excavation and street paving, lot grading, curbs, gutters and sidewalks, public utilities, public water facilities including fire hydrants, public sanitary sewer systems, storm sewer systems and/or other drainage improvements), or Vertical Construction Phase (including the build out of structures from foundations to roofing, including rough landscaping).

Construction Site – Any project, including projects requiring coverage under the Construction General Permit, that involves soil disturbing activities including, but not limited to, clearing, grading, disturbances to ground such as stockpiling, and excavation.

Contamination - As defined in the Porter-Cologne Water Quality Control Act, contamination is "an impairment of the quality of waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste whether or not waters of the State are affected."

Copermittee – A permittee to a NPDES permit that is only responsible for permit conditions relating to the discharge for which it is operator [40 CFR 122.26(b)(1)]. For the purposes of this Order, a Copermittee is one of the individual permittees identified in Tables 1a-1c of this Order.

Copermittees – All of the individual Copermittees, collectively.

Critical Channel Flow (Qc) – The channel flow that produces the critical shear stress that initiates bed movement or that erodes the toe of channel banks. When measuring Qc, it should be based on the weakest boundary material – either bed or bank.

Daily Discharge – Defined as either: (1) the total mass of the constituent discharged over the calendar day or any 24 hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g. concentration.)

The Daily Discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day, or other 24 hour period other than a day), or by the arithmetic mean of analytical results from one or more grab samples taken over the course of a day.

Development Projects - Construction, rehabilitation, redevelopment, or reconstruction of any public or private projects.

Dry Season –May 1 to September 30.

Dry Weather – Weather is considered dry if the preceding 72 hours has been without measurable precipitation (>0.1 inch).

Enclosed Bays – Enclosed bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost bay works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays do not include inland surface waters or ocean waters.

Erosion – When land is diminished or worn away due to wind, water, or glacial ice. Often the eroded debris (silt or sediment) becomes a pollutant via storm water runoff. Erosion occurs naturally but can be intensified by land clearing activities such as farming, development, road building, and timber harvesting.

Environmentally Sensitive Areas (ESAs) - Areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; areas designated as preserves or their equivalent under the Natural Communities Conservation Program within the Cities and County of Orange; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.

Estuaries – Waters, including coastal lagoons, located at the mouth of streams that serve as areas of mixing fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and ocean water. Estuaries do not include inland surface waters or ocean waters.

Existing Development – Any area that has been developed and exists for municipal, commercial, industrial, or residential purposes, uses, or activities. May include areas that are not actively used for its originally developed purpose, but may be re-purposed or redeveloped for another use or activity.

Flow Duration – The long-term period of time that flows occur above a threshold that causes significant sediment transport and may cause excessive erosion damage to creeks and streams (not a single storm event duration). The simplest way to visualize this is to consider a histogram of pre- and post-project flows using long-term records of hourly data. To maintain pre-development flow duration means that the total number of hours (counts) within each range of flows in a flow-duration histogram cannot increase between the pre- and post-development condition. Flow duration within the range of geomorphologically significant flows is important for managing erosion.

Grading - The cutting and/or filling of the land surface to a desired slope or elevation.

Groundwater – Subsurface water that occurs beneath the water table in soils and geologic formations that are fully saturated.

Hazardous Material – Any substance that poses a threat to human health or the environment due to its toxicity, corrosiveness, ignitability, explosive nature or chemical reactivity. These also include materials named by the USEPA in 40 CFR 116 to be reported if a designated quantity of the material is spilled into the waters of the U.S. or emitted into the environment.

Hazardous Waste - Hazardous waste is defined as "any waste which, under Section 600 of Title 22 of this code, is required to be managed according to Chapter 30 of Division 4.5 of Title 22 of this code" [CCR Title 22, Division 4.5, Chapter 11, Article 1].

Household Hazardous Waste – Paints, cleaning products, and other hazardous wastes generated during home improvement or maintenance activities.

Hydromodification – The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

Illicit Connection – Any man-made conveyance or drainage system through which a non-storm water discharge to the storm water drainage system occurs or may occur. Any connection to the MS4 that conveys an illicit discharge.

Illicit Discharge - Any discharge to the MS4 that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from firefighting activities [40 CFR 122.26(b)(2)].

Inactive Areas – Areas of construction activity that are not active and those that have been active and are not scheduled to be re-disturbed for at least 14 days.

Infiltration – In the context of low impact development, infiltration is defined as the percolation of water into the ground. Infiltration is often expressed as a rate (inches per hour), which is determined through an infiltration test. In the context of non-storm water, infiltration is water other than wastewater that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow [40 CFR 35.2005(20)].

Inland Surface Waters – Includes all surface waters of the State that do not include the ocean, enclosed bays, or estuaries.

Jurisdictional Runoff Management Program Document – A written description of the specific jurisdictional runoff management measures and programs that each Copermittee will implement to comply with this Order and ensure that storm water pollutant discharges in runoff are reduced to the MEP and do not cause or contribute to a violation of water quality standards.

Low Impact Development (LID) – A storm water management and land development strategy that emphasizes conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions.

Low Impact Development Best Management Practices (LID BMPs) – LID BMPs include schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States through storm water management and land development strategies that emphasize conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions. LID BMPs include retention practices that do not allow runoff, such as infiltration, rain water harvesting and reuse, and evapotranspiration. LID BMPs also include flow-through practices such as biofiltration that may have some discharge of storm water following pollutant reduction.

Major Outfall – As defined in the Code of Federal Regulations, a major outfall is a MS4 outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (i.e. discharge from a single conveyance other than a circular pipe which is associated with a drainage area of more than 50 acres); or, for MS4s that receive storm water from lands zoned for industrial activity (based on comprehensive zoning plans or equivalent), a MS4 outfall that discharges from a single pipe with an inside diameter of 12 inches or more or from its equivalent (i.e. discharge from other than a circular pipe associated with a drainage area of 2 acres or more).

Maximum Daily Action Level (MDAL) –The highest allowable daily discharge of a pollutant, over a calendar day (or 24 hour period). For pollutants with action levels expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with action levels expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

Maximum Extent Practicable (MEP) – The technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) for storm water that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) in combination with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than BAT. A definition for MEP is not provided either in the statute or in the regulations. Instead the definition of MEP is dynamic and will be defined by the following process over time: municipalities propose their definition of MEP by way of their runoff management programs. Their total collective and individual activities conducted pursuant to the runoff management programs becomes their proposal for MEP as it applies both to their overall effort, as well as to specific activities (e.g., MEP for street sweeping, or MEP for MS4 maintenance). In the absence of a proposal acceptable to the San Diego Water Board, the San Diego Water Board defines MEP.

In a memo dated February 11, 1993, entitled "Definition of Maximum Extent Practicable," Elizabeth Jennings, Senior Staff Counsel, SWRCB addressed the achievement of the MEP standard as follows:

"*To achieve the MEP standard, municipalities must employ whatever Best Management Practices (BMPs) are technically feasible (i.e., are likely to be effective) and are not cost prohibitive. The major emphasis is on technical feasibility. Reducing pollutants to the MEP means choosing effective BMPs, and rejecting applicable BMPs only where other effective BMPs will serve the same purpose, or the BMPs would not be technically feasible, or the cost would be prohibitive. In selecting BMPs to achieve the MEP standard, the following factors may be useful to consider:*

a. Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?
b. Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?
c. Public Acceptance: Does the BMP have public support?
d. Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?
e. Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc.?

The final determination regarding whether a municipality has reduced pollutants to the maximum extent practicable can only be made by the Regional or State Water Boards, and not by the municipal discharger. If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit derived, it would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs that would address a pollutant source, or to pick a BMP based solely on cost, which would be clearly less effective. In selecting BMPs the municipality must make a serious attempt to comply and practical solutions may not be lightly rejected. In any case, the burden would be on the municipal discharger to show compliance with its permit. After selecting a menu of BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented."

Monitoring Year – October 1 to September 30

Municipal Separate Storm Sewer System (MS4) – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designated or used for collecting or conveying storm water; (iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.26.

National Pollutant Discharge Elimination System (NPDES) - The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the CWA.

Non-Storm Water - All discharges to and from a MS4 that do not originate from precipitation events (i.e., all discharges from a MS4 other than storm water). Non-storm water includes illicit discharges and NPDES permitted discharges.

Nuisance - As defined in the Porter-Cologne Water Quality Control Act, a nuisance is "anything which meets all of the following requirements: 1) Is injurious to health, or is indecent, or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. 2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. 3) Occurs during, or as a result of, the treatment or disposal of wastes."

Ocean Waters – The territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the State Board's California Ocean Plan.

Order – Unless otherwise specified, refers to this Order, Order No. R9-2013-0001 (NPDES No. CAS0109266)

Outfall - Outfall means a point source as defined by 40 CFR 122.2 at the point where a municipal separate storm sewer discharges to waters of the US and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels or other conveyances which connect segments of the same stream or other waters of the US and are used to convey waters of the US.

Persistent Flow - Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

Person - A person is defined as an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof [40 CFR 122.2].

Point Source - Any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, landfill leachate collection systems, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

Pollutant - Any agent that may cause or contribute to the degradation of water quality such that a condition of pollution or contamination is created or aggravated.

Pollution - As defined in the Porter-Cologne Water Quality Control Act, pollution is "the alteration of the quality of the waters of the State by waste, to a degree which unreasonably affects either of the following: 1) The waters for beneficial uses; or 2) Facilities that serve these beneficial uses." Pollution may include contamination.

Pollution Prevention - Pollution prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control BMPs, treatment control BMPs, or disposal.

Pre-Development Runoff Conditions – Approximate flow rates and durations that exist or existed onsite before land development occurs. For new development projects, this equates to runoff conditions immediately before project construction. For redevelopment projects, this equates to runoff conditions from the project footprint assuming infiltration characteristics of the underlying soil, and existing grade. Runoff coefficients of concrete or asphalt must not be used. A redevelopment Priority Development Project must use available information pertaining to existing underlying soil type and onsite existing grade to estimate pre-development runoff conditions.

Priority Development Projects - New development and redevelopment projects defined under Provision E.3.b of Order No. R9-2013-0001, as amended by Order Nos. R9-2015-0001 and R9-2015-0100.

Rainy Season (aka Wet Season) –October 1 to April 30

Receiving Waters – Waters of the United States.

Receiving Water Limitations - Waste discharge requirements issued by the San Diego Water Board typically include both: (1) "Effluent Limitations" (or "Discharge Limitations") that specify the technology-based or water-quality-based effluent limitations; and (2) "Receiving Water Limitations" that specify the water quality objectives in the Basin Plan as well as any other limitations necessary to attain those objectives. In summary, the "Receiving Water Limitations" provision is the provision used to implement the requirements of CWA section 402(p)(3)(B).

Redevelopment - The creation and/or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include trenching and resurfacing associated with utility work; resurfacing existing roadways; new sidewalk construction, pedestrian ramps, or bike lane on existing roads; and routine replacement of damaged pavement, such as pothole repair.

Regional Clearinghouse – A central location for the collection and distribution of information developed and maintained by the Copermittees including, but not limited to, plans, reports, manuals, data, contact information, and/or links to such documents and information.

Rehabilitation - Remedial measures or activities for the purpose of improving or restoring the beneficial uses of streams, channels or river systems. Techniques may vary from in-stream restoration techniques to off-line storm water management practices installed in the system corridor or upland areas, or a combination of in-stream and out of stream techniques. Rehabilitation techniques may include, but are not limited to the following: riparian zone restoration, constructed wetlands, channel modifications that improve habitat and stability, and daylighting of drainage systems.

Reporting Period – The period of information that is reported in the Water Quality Improvement Plan Annual Report. The reporting period consists of two components: 1) July 1 to June 30, consistent with the fiscal year, for the implementation of the jurisdictional runoff management programs, and 2) October 1 to September 30, consistent with the monitoring year for the monitoring and assessment programs. Together, these two time periods constitute the reporting year for the Water Quality Improvement Plan Annual Report due January 31 following

the end of the monitoring year.
Retain – Keep or hold in a particular place, condition, or position without discharge to surface waters.

Retrofitting – Storm water management practice put into place after development has occurred in watersheds where the practices previously did not exist or are ineffective. Retrofitting of developed areas is intended to improve water quality, protect downstream channels, reduce flooding, or meet other specific objectives. Retrofitting developed areas may include, but is not limited to replacing roofs with green roofs, disconnecting downspouts or impervious surfaces to drain to pervious surfaces, replacing impervious surfaces with pervious surfaces, installing rain barrels, installing rain gardens, and trash area enclosures.

Runoff - All flows in a storm water conveyance system that consists of the following components: (1) storm water (wet weather flows) and (2) non-storm water including dry weather flows.

San Diego Water Board – As used in this document the term "San Diego Water Board" is synonymous with the term "Regional Board" as defined in Water Code section 13050(b) and is intended to refer to the California Regional Water Quality Control Board for the San Diego Region as specified in Water Code Section 13200.

Sediment - Soil, sand, and minerals washed from land into water. Sediment resulting from anthropogenic sources (i.e. human induced land disturbance activities) is considered a pollutant. This Order regulates only the discharges of sediment from anthropogenic sources and does not regulate naturally occurring sources of sediment. Sediment can destroy fish-nesting areas, clog animal habitats, and cloud waters so that sunlight does not reach aquatic plants.

Source Control BMP – Land use or site planning practices, or structural or nonstructural measures that aim to prevent runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between pollutants and runoff.

Storm Water – Per 40 CFR 122.26(b)(13), means storm water runoff, snowmelt runoff and surface runoff and drainage. Surface runoff and drainage pertains to runoff and drainage resulting from precipitation events.

Structural BMPs - A subset of BMPs which detains, retains, filters, removes, or prevents the release of pollutants to surface waters from development projects in perpetuity, after construction of a project is completed.

Test of Significant Toxicity (TST) - A statistical approach used to analyze toxicity test data. The TST incorporates a restated null hypothesis, Welch's t-test, and biological effect thresholds for chronic and acute toxicity.

Total Maximum Daily Load (TMDL) - The maximum amount of a pollutant that can be discharged into a water body from all sources (point and non-point) and still maintain water quality standards. Under CWA section 303(d), TMDLs must be developed for all water bodies that do not meet water quality standards after application of technology-based controls.

Toxicity - Adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies. The

water quality objectives for toxicity provided in the Basin Plan, state in part…"All waters shall be free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life….The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge."

Toxicity Identification Evaluation (TIE) - A set of procedures for identifying the specific chemical(s) responsible for toxicity. These procedures are performed in three phases (characterization, identification, and confirmation) using aquatic organism toxicity tests.

Toxicity Reduction Evaluation (TRE) - A study conducted in a step-wise process designed to identify the causative agents of effluent or ambient toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in toxicity. The first steps of the TRE consist of the collection of data relevant to the toxicity, including additional toxicity testing, and an evaluation of facility operations and maintenance practices, and best management practices. A Toxicity Identification Evaluation (TIE) may be required as part of the TRE, if appropriate.

Treatment Control BMP – Any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media absorption or any other physical, biological, or chemical process.

Unpaved Road – Any long, narrow stretch without pavement used for traveling by motor passenger vehicles between two or more points. Unpaved roads are generally constructed of dirt, gravel, aggregate or macadam and may be improved or unimproved.

Waste - As defined in CWC Section 13050(d), "waste includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal."

Article 2 of CCR Title 23, Chapter 15 (Chapter 15) contains a waste classification system that applies to solid and semi-solid waste, which cannot be discharged directly or indirectly to water of the state and which therefore must be discharged to land for treatment, storage, or disposal in accordance with Chapter 15. There are four classifications of waste (listed in order of highest to lowest threat to water quality): hazardous waste, designated waste, non-hazardous solid waste, and inert waste.

Water Quality Objective - Numerical or narrative limits on constituents or characteristics of water designated to protect designated beneficial uses of the water. [California Water Code Section 13050 (h)]. California's water quality objectives are established by the State and Regional Water Boards in the Water Quality Control Plans. Numeric or narrative limits for pollutants or characteristics of water designed to protect the beneficial uses of the water. In other words, a water quality objective is the maximum concentration of a pollutant that can exist in a receiving water and still generally ensure that the beneficial uses of the receiving water remain protected (i.e., not impaired). Since water quality objectives are designed specifically to protect the beneficial uses, when the objectives are violated the beneficial uses are, by definition, no longer protected and become impaired. This is a fundamental concept under the Porter Cologne Act. Equally fundamental is Porter Cologne's definition of pollution. A condition

of pollution exists when the water quality needed to support designated beneficial uses has become unreasonably affected or impaired; in other words, when the water quality objectives have been violated. These underlying definitions (regarding beneficial use protection) are the reason why all waste discharge requirements implementing the federal NPDES regulations require compliance with water quality objectives. (Water quality objectives are also called water quality criteria in the CWA.)

Water Quality Standards - Water quality standards, as defined in Clean Water Act section 303(c) consist of the beneficial uses (e.g., swimming, fishing, municipal drinking water supply, etc.,) of a water body and criteria (referred to as water quality objectives in the California Water Code) necessary to protect those uses. Under the Water Code, the water boards establish beneficial uses and water quality objectives in water quality control or basin plans. Together with an anti-degradation policy, these beneficial uses and water quality objectives serve as water quality standards under the Clean Water Act. In Clean Water Act parlance, state beneficial uses are called "designated uses" and state water quality objectives are called "criteria." Throughout this Order, the relevant term is used depending on the statutory scheme.

Waters of the State - Any water, surface or underground, including saline waters within the boundaries of the State [CWC section 13050 (e)]. The definition of the Waters of the State is broader than that for the Waters of the United States in that all water in the State is considered to be a Waters of the State regardless of circumstances or condition.

Waters of the United States - As defined in the 40 CFR 122.2, the Waters of the U.S. are defined as: "(a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate "wetlands;" (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters otherwise defined as waters of the United States under this definition: (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial seas; and (g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA."

Watershed - That geographical area which drains to a specified point on a water course, usually a confluence of streams or rivers (also known as drainage area, catchment, or river basin).

Wet Season (aka Rainy Season) – October 1 to April 30

Wet Weather – Weather is considered wet up to 72 hours after a storm event of 0.1 inches and greater, unless otherwise defined by another regulatory mechanism (e.g. a TMDL).

ATTACHMENT D

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

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JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

FY _____

I. COPERMITTEE INFORMATION

Copermittee Name:

Copermittee Primary Contact Name:

Copermittee Primary Contact Information:
Address:
City: County: State: Zip:
Telephone: Fax: Email:

II. LEGAL AUTHORITY

Has the Copermittee established adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐
A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority?	**YES**	☐
	NO	☐

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

Was an update of the jurisdictional runoff management program document required or recommended by the San Diego Water Board?	**YES**	☐
	NO	☐
If YES to the question above, did the Copermittee update its jurisdictional runoff management program document and make it available on the Regional Clearinghouse?	**YES**	☐
	NO	☐

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

Has the Copermittee implemented a program to actively detect and eliminate illicit discharges and connections to its MS4 that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

Number of non-storm water discharges reported by the public	
Number of non-storm water discharges detected by Copermittee staff or contractors	
Number of non-storm water discharges investigated by the Copermittee	
Number of sources of non-storm water discharges identified	
Number of non-storm water discharges eliminated	
Number of sources of illicit discharges or connections identified	
Number of illicit discharges or connections eliminated	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

V. DEVELOPMENT PLANNING PROGRAM

Has the Copermittee implemented a development planning program that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐
Was an update to the BMP Design Manual required or recommended by the San Diego Water Board?	**YES**	☐
	NO	☐
If YES to the question above, did the Copermittee update its BMP Design Manual and make it available on the Regional Clearinghouse?	**YES**	☐
	NO	☐

Number of proposed development projects in review	
Number of Priority Development Projects in review	
Number of Priority Development Projects approved	
Number of approved Priority Development Projects exempt from any BMP requirements	
Number of approved Priority Development Projects allowed alternative compliance	
Number of Priority Development Projects granted occupancy	

Number of completed Priority Development Projects in inventory	
Number of high priority Priority Development Project structural BMP inspections	
Number of Priority Development Project structural BMP violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

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VI. CONSTRUCTION MANAGEMENT PROGRAM

Has the Copermittee implemented a construction management program that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

Number of construction sites in inventory	
Number of active construction sites in inventory	
Number of inactive construction sites in inventory	
Number of construction sites closed/completed during reporting period	
Number of construction site inspections	
Number of construction site violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

Has the Copermittee implemented an existing development management program that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

	Municipal	Commercial	Industrial	Residential
Number of facilities or areas in inventory				
Number of existing development inspections				
Number of follow-up inspections				
Number of violations				
Number of enforcement actions issued				
Number of escalated enforcement actions issued				

VIII. PUBLIC EDUCATION AND PARTICIPATION

Has the Copermittee implemented a public education program component that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐
Has the Copermittee implemented a public participation program component that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

IX. FISCAL ANALYSIS

Has the Copermittee attached to this form a summary of its fiscal analysis that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

X. CERTIFICATION

I [☐ Principal Executive Officer ☐ Ranking Elected Official ☐ Duly Authorized Representative] certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature	Date
Print Name	Title
Telephone Number	Email

ATTACHMENT E

SPECIFIC PROVISIONS FOR TOTAL MAXIMUM DAILY LOADS APPLICABLE TO ORDER NO. R9-2013-0001, AS AMENDED BY ORDER NOS. R9-2015-0001 AND R9-2015-0100

These provisions implement load allocations (LAs) and wasteload allocations (WLAs) of the Total Maximum Daily Loads (TMDLs) established by the San Diego Water Board or USEPA under Clean Water Act section 303(c), applicable to discharges regulated under this Order. The provisions and schedules for implementation of the TMDLs described below must be incorporated into the Water Quality Improvement Plans, required pursuant to Provision B of this Order, for the specified Watershed Management Areas.

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed
2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin
3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed
4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek
5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay
6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)
7. Total Maximum Daily Load for Sediment in Los Peñasquitos Lagoon

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2002-0123

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	August 14, 2002
State Water Board Approval Date:	July 16, 2003
Office of Administrative Law Approval Date:	September 11, 2003
US EPA Approval Date:	November 3, 2003

(3) TMDL Effective Date: September 11, 2003

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final diazinon TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must be in compliance with the final TMDL compliance requirements as of December 31, 2010.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations:

Table 1.1
Final Receiving Water Limitations Expressed as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Diazinon	Acute	0.08 µg/L	1 hour
	Chronic	0.05 µg/L	4 days

(b) Final Effluent Limitations

Discharges from the MS4s containing concentrations that do not exceed the following effluent limitations will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 1.b.(2)(a):

Table 1.2
Final Effluent Limitations Expressed as Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation	Averaging Period
Diazinon	Acute	0.072 µg/L	1 hour
	Chronic	0.045 µg/L	4 days

(c) Best Management Practices

The following BMPs for Chollas Creek must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area and implemented by the Responsible Copermittees:

(i) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 1.b.(2)(a) and/or the effluent limitations under Specific Provision 1.b.(2)(b) for Chollas Creek.

(ii) The Responsible Copermittees must implement the Diazinon Toxicity Control Plan and Diazinon Public Outreach/Education Program as described in the report titled, *Technical Report for Total Maximum Daily Load for Diazinon in Chollas Creek Watershed, San Diego County*, dated August 14, 2002, including subsequent modifications, in order to achieve the receiving water limitations under Specific Provision 1.b.(2)(a) and/or the effluent limitations under Specific Provision 1.b.(2)(b).

(iii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 1.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 1.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 1.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 1.b.(2)(c) achieves compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 1.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 1.d, to demonstrate compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The Responsible Copermittees must be in compliance with the final diazinon TMDL compliance requirements as of December 31, 2010.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls for diazinon within the Chollas Creek watershed, and calculate or estimate the annual diazinon loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment

Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 1.b.(2)(b), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0019

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	September 22, 2005
Office of Administrative Law Approval Date:	December 2, 2005
US EPA Approval Date:	February 8, 2006

(3) TMDL Effective Date: December 2, 2005

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Shelter Island Yacht Basin

(6) Responsible Copermittee: City of San Diego

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final dissolved copper TMDL compliance requirements for Shelter Island Yacht Basin consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittee must be in compliance with the final TMDL compliance requirements as of December 2, 2005.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations:

Table 2.1
Final Receiving Water Limitations Expressed as Concentrations in Shelter Island Yacht Basin

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Dissolved Copper	Acute	4.8 µg/L x WER*	1 hour
	Chronic	3.1 µg/L x WER*	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 2.b.(2)(a):

Table 2.2
Final Effluent Limitations as Expressed as Annual Loads in MS4 Discharges to Shelter Island Yacht Basin

Constituent	Effluent Limitation
Dissolved Copper	30 kg/yr*

* If the water quality objectives for dissolved copper in Shelter Island Yacht Basin are changed in the future, then the margin of safety (MOS), TMDL and allocations will be recalculated using the *Method for Recalculation of the Total Maximum Daily Load for Dissolved Copper in the Shelter Island Yacht Basin, San Diego Bay* in the Basin Plan (p. 7-14).

(c) Best Management Practices

The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 2.b.(2)(a) and/or the effluent limitations under Specific Provision 2.b.(2)(b) for Shelter Island Yacht Basin. The BMPs must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 2.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 2.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittee develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 2.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 2.b.(2)(c) achieves compliance with Specific Provisions 2.b.(3)(a), 2.b.(3)(b) and/or 2.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 2.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 2.d, to demonstrate compliance with Specific Provisions 2.b.(3)(a), 2.b.(3)(b) and/or 2.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The Responsible Copermittees must be in compliance with the final dissolved copper TMDL compliance requirements as of December 2, 2005.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

The Responsible Copermittee must monitor the effluent of its MS4 outfalls for dissolved copper, and calculate or estimate the monthly and annual dissolved copper loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.(b)(2)of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0036

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	November 16, 2005
Office of Administrative Law Approval Date:	February 1, 2006
US EPA Approval Date:	March 22, 2006

(3) TMDL Effective Date: February 1, 2006

(4) Watershed Management Area: Santa Margarita River

(5) Water Body: Rainbow Creek

(6) Responsible Copermittee: County of San Diego

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final total nitrogen and total phosphorus TMDL compliance requirements for Rainbow Creek consist of the following

(1) Final TMDL Compliance Date

The Responsible Copermittee must comply with final TMDL compliance requirements by December 31, 2021.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance date under Specific Provision 3.b.(1):

Table 3.1
Final Receiving Water Limitations Expressed as Concentrations in Rainbow Creek

Constituent	Receiving Water Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing concentrations that do not exceed the following effluent limitations by the compliance date under Specific Provision 3.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 3.b.(2)(a):

Table 3.2
Final Effluent Limitations Expressed as Concentrations in MS4 Discharges to Rainbow Creek

Constituent	Effluent Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(ii) Annual pollutant loads from given land uses discharging to and from the MS4s that do not exceed the following annual loads by the compliance date under Specific Provision 3.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 3.b.(2)(a):

Table 3.3
Final Effluent Limitations Expressed as Annual Loads in MS4 Discharges to Rainbow Creek

Land Use	Total N	Total P
Commercial nurseries	116 kg/yr	3 kg/yr
Park	3 kg/yr	0.1 kg/yr
Residential areas	149 kg/yr	12 kg/yr
Urban areas	27 kg/yr	6 kg/yr

(c) Best Management Practices

(i) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 3.b.(2)(a) and/or the effluent limitations under Specific Provision 3.b.(2)(b) for Rainbow Creek.

(ii) The Responsible Copermittee should coordinate any BMPs implemented to address this TMDL with Caltrans and other sources as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under

Specific Provision 3.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 3.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the final effluent limitations under Specific Provision 3.b.(2)(b)(ii); OR

(e) The Responsible Copermittee develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 3.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Specific Provision 3.b.(2)(c) achieves compliance with Specific Provisions 3.b.(3)(a), 3.b.(3)(b), 3.b.(3)(c) and/or 3.b.(3)(d),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 3.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 3.d, to demonstrate compliance with Specific Provisions 3.b.(3)(a), 3.b.(3)(b), 3.b.(3)(c) and/or 3.b.(3)(d).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim total nitrogen and total phosphorus TMDL compliance requirements for Rainbow Creek consist of the following:

(1) Interim Compliance Dates and WQBELs

The Responsible Copermittee must comply with the interim WQBELs, expressed as annual loads, by December 31 of the interim compliance year given in Table 3.4.

Table 3.4
Interim Water Quality Based Effluent Limitations Expressed as Annual Loads in MS4 Discharges from Specific Land Uses to Rainbow Creek

	Total N Interim Effluent Limitations (kg/yr)			Total P Interim Effluent Limitations (kg/yr)		
	Interim Compliance Date			Interim Compliance Date		
Land Use	**2009**	**2013**	**2017**	**2009**	**2013**	**2017**
Commercial nurseries	390	299	196	20	16	10
Park	5	3	3	0.15	0.10	0.10
Residential areas	507	390	260	99	74	47
Urban areas	40	27	27	9	6	6

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 3.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 3.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the final effluent limitations under Specific Provision 3.b.(2)(b)(ii); OR

(e) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the interim effluent limitations under Specific Provision 3.c.(1); OR

(f) The Responsible Copermittee has submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

d. Specific Monitoring and Assessment Requirements

(1) The Responsible Copermittee must incorporate into the Water Quality Improvement Plan and implement the Sampling and Analysis Plan for Rainbow Creek Nutrient Reduction TMDL Implementation Water Quality Monitoring, dated January 2010.

(2) The results of any monitoring conducted during the reporting period, and assessment of whether the interim and final TMDL compliance requirements have been achieved must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 3.b.(2)(b)(i), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2007-0043

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2007
State Water Board Approval Date:	July 15, 2008
Office of Administrative Law Approval Date:	October 22, 2008
US EPA Approval Date:	December 18, 2008

(3) TMDL Effective Date: October 22, 2008

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final dissolved copper, lead, and zinc TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must comply with the final TMDL compliance requirements by October 22, 2028.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance date under Specific Provision 4.b.(1):

Table 4.1
Final Receiving Water Limitations Expressed as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$(0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$(0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$(0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$(0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations by the compliance date under Specific Provision 4.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 4.b.(2)(a):

Table 4.2
Final Effluent Limitations as Expressed Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(c) Best Management Practices

(i) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 4.b.(2)(a) and/or the effluent limitations under Specific Provision 4.b.(2)(b) for Chollas Creek.

(ii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans and the U.S. Navy as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 4.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 4.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 4.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 4.b.(2)(c) achieves compliance with Specific Provisions 4.b.(3)(a), 4.b.(3)(b) and/or 4.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 4.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 4.d, to demonstrate compliance with Specific Provisions 4.b.(3)(a), 4.b.(3)(b) and/or 4.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim dissolved copper, lead, and zinc TMDL compliance requirements for Chollas Creek consist of the following:

(1) Interim Compliance Date and WQBELs

The Responsible Copermittee must comply with the interim WQBELs, expressed as concentrations, by the interim compliance date given in Table 4.3:

Table 4.3
Interim Water Quality Based Effluent Limitations Expressed as Concentrations in MS4 Discharges to Chollas Creek

Interim Compliance Date	Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
October 22, 2018	Dissolved Copper	Acute	$1.2 \times 90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
	Dissolved Lead	Acute	$1.2 \times 90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
	Dissolved Zinc	Acute	$1.2 \times 90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 4.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 4.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) There are no exceedances of the interim effluent limitations under Specific

Provision 4.c.(1) at the Responsible Copermittee's MS4 outfalls; OR

(e) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance date.

d. Specific Monitoring and Assessment Requirements

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*, when it is amended to include monitoring requirements for the Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls discharging to Chollas Creek for dissolved copper, lead, and zinc, and calculate or estimate the monthly and annual dissolved copper, lead, and zinc loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 4.b.(2)(b) or 4.c.(1), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2008-0027

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 11, 2008
State Water Board Approval Date:	June 16, 2009
Office of Administrative Law Approval Date:	September 15, 2009
US EPA Approval Date:	October 26, 2009

(3) TMDL Effective Date: September 15, 2009

(4) Watershed Management Areas: See Table 5.0

(5) Water Bodies: See Table 5.0

(6) Responsible Copermittees: See Table 5.0

Table 5.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County	Dana Point Harbor	Baby Beach	-City of Dana Point -County of Orange
San Diego Bay	San Diego Bay	Shelter Island Shoreline Park	- San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final indicator bacteria TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Final TMDL Compliance Dates

(a) Baby Beach in Dana Point Harbor

The Responsible Copermittees for MS4 discharges to Baby Beach must be in compliance with the final TMDL compliance requirements according to the following compliance dates:

Table 5.1
Compliance Dates to Achieve Final TMDL Compliance Requirements For Baby Beach in Dana Point Harbor

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform	September 15, 2014	September 15, 2009
Fecal Coliform		September 15, 2009
Enterococcus		September 15, 2019

(b) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park must be in compliance with the final TMDL compliance requirements as of December 31, 2012.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance dates under Specific Provision 5.b.(1):

Table 5.2
Final Receiving Water Limitations Expressed as Bacteria Densities in the Water Body

	Receiving Water Limitations	
Constituent	Single Sample Maximum[1,2]	30-Day Geometric Mean[2]
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing indicator bacteria densities that do not exceed the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.3a
Final Effluent Limitations as Expressed as Bacteria Densities in MS4 Discharges to the Water Body

	Effluent Limitations	
Constituent	**Single Sample Maximum[1,2]**	**30-Day Geometric Mean[2]**
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.

(ii) Discharges from the MS4s containing indicator bacteria loads that do not exceed the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.4a
Final Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to the Baby Beach in Dana Point Harbor

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0.86×10^9 MPN/day	$3{,}254 \times 10^9$ MPN/30days
Fecal Coliform	0.17×10^9 MPN/day	112×10^9 MPN/30days
Enterococcus	0.03×10^9 MPN/day	114×10^9 MPN/30days

Table 5.4b
Final Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to the Shelter Island Shoreline Park in San Diego Bay

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0 MPN/day	198×10^9 MPN/30days
Fecal Coliform	0 MPN/day	8×10^9 MPN/30days
Enterococcus	0 MPN/day	26×10^9 MPN/30days

(iii) Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.5a
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to Baby Beach in Dana Point Harbor*

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	90.4%	0%
Fecal Coliform	82.7%	0%
Enterococcus	96.2%	62.2%

Notes:
* The percent load reductions are relative to data collected between 1996-2002. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittees' MS4s must not exceed the loads in Table 5.4a, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the water body.

Table 5.5b
*Final Effluent Limitations Expressed as Percent Load Reductions** in MS4 Discharges to Shelter Island Shoreline Park in San Diego Bay*

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0%	0%
Fecal Coliform	0%	0%
Enterococcus	0%	0%

Notes:
* The percent load reductions are relative to data collected between 1999-2004. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittee's MS4s must not exceed the loads in Table 5.4b, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the water body.

(c) Best Management Practices

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 5.0 must incorporate the Bacteria Load Reduction Plan (BLRP) required to be developed pursuant to Resolution No. R9-2008-0027.

(ii) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 5.b.(2)(a) and/or the effluent limitations under Specific Provision 5.b.(2)(b) for the segments or areas of the water bodies listed in Table 5.0

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.b.(2)(b)(ii); OR

(e) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 5.b.(2)(b)(iii); OR

(f) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(g) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 5.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 5.b.(2)(c) achieves compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 5.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 5.d, to demonstrate compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim indicator bacteria TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Baby Beach in Dana Point Harbor

(a) Interim TMDL Compliance Dates and WQBELs

The Responsible Copermittees for MS4 discharges to Baby Beach must comply with the following interim WQBELs by the interim compliance dates given in Tables 5.6a and/or 5.6b:

Table 5.6a
Interim Water Quality Based Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to Baby Beach in Dana Point Harbor

Constituent	Interim Compliance Dates	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	4.93×10^9 MPN/day	$3{,}254 \times 10^9$ MPN/30days*
Fecal Coliform	September 15, 2012	0.59×10^9 MPN/day	112×10^9 MPN/30days*
Enterococcus	September 15, 2012	0.42×10^9 MPN/day	301×10^9 MPN/30days
	September 15, 2016	0.03×10^9 MPN/day *	207×10^9 MPN/30days

Notes:
* Same as the final effluent limitations in Table 5.4a.

Table 5.6b
Interim Water Quality Based Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to Baby Beach in Dana Point Harbor*

Constituent	Interim Compliance Dates	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	45.2%	0%**
Fecal Coliform	September 15, 2012	41.4%	0%**
Enterococcus	September 15, 2012	48.1%	0%
	September 15, 2016	96.2%**	31.1%

Notes:
* The percent load reductions are relative to data collected between 1996-2002. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittees' MS4s must not exceed the loads in Table 5.6a, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the waterbody.
** Same as the final effluent limitations in Table 5.5a.

(b) Interim Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(i) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(ii) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(iii) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(iv) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.b(2)(b)(ii); OR

(v) The Responsible Copermittees can demonstrate that exceedances of the applicable receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(vi) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the interim effluent limitations under Table 5.6a of Specific Provision 5.c.(1)(a); OR

(vii) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the interim effluent limitations under Table 5.6b of Specific Provision 5.c.(1)(a); OR

(viii) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

(2) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park must be in compliance with the final indicator bacteria TMDL requirements as of December 31, 2012.

d. Specific Monitoring and Assessment Requirements

(1) Monitoring Stations

Monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[38] If discharges of bacteria from the MS4 exceed the applicable interim or final WQBELs, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(2) Monitoring Procedures

(a) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) The Responsible Copermittees must collect wet weather monitoring samples within the first 24 hours of a storm event[39] of the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(c) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

[38] Commonly referred to as AB 411 monitoring

[39] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs have been achieved.

(b) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 5.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(c) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to correlate elevated bacteria levels with known or suspected sewage spills from wastewater collection systems and treatment plants or boats.

(d) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2010-0001

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 10, 2010
State Water Board Approval Date:	December 14, 2010
Office of Administrative Law Approval Date:	April 4, 2011
US EPA Approval Date:	June 22, 2011

(3) TMDL Effective Date: April 4, 2011

(4) Watershed Management Areas: See Table 6.0

(5) Water Bodies: See Table 6.0

(6) Responsible Copermittees: See Table 6.0

Table 6.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	-City of Laguna Beach -County of Orange -Orange County Flood Control District
		at Heisler Park - North	
	Pacific Ocean Shoreline	at Main Laguna Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Woods -County of Orange -Orange County Flood Control District
		Laguna Beach at Ocean Avenue	
		Laguna Beach at Cleo Street	
		Arch Cove at Bluebird Canyon Road	
		Laguna Beach at Dumond Drive	
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Hills -City of Laguna Niguel -City of Laguna Woods -City of Lake Forest -City of Mission Viejo -County of Orange -Orange County Flood Control District
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	
	Aliso Creek Mouth	at mouth	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	-City of Dana Point -City of Laguna Beach -City of Laguna Niguel -County of Orange -Orange County Flood Control District
		Aliso Beach at Table Rock Drive	
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)	
		at Salt Creek (large outlet)	
		Salt Creek Beach at Salt Creek service road	
		Salt Creek Beach at Strand Road	
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	-City of Dana Point -City of Laguna Hills -City of Laguna Niguel -City of Mission Viejo -City of Rancho Santa Margarita -City of San Juan Capistrano -County of Orange -Orange County Flood Control District
	San Juan Creek	lower 1 mile	
	San Juan Creek Mouth	at mouth	
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	-City of Dana Point -City of San Clemente -County of Orange -Orange County Flood Control District
		Ole Hanson Beach Club Beach at Pico Drain	
		San Clemente City Beach at El Portal Street Stairs	
		San Clemente City Beach at Mariposa Street	
		San Clemente City Beach at Linda Lane	
		San Clemente City Beach at South Linda Lane	
		San Clemente City Beach at Lifeguard Headquarters	
		under San Clemente Municipal Pier	
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	
		San Clemente State Beach at Riviera Beach	
		Can Clemente State Beach at Cypress Shores	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	-City of Oceanside -City of Vista -County of San Diego
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	-City of Carlsbad -City of Encinitas -City of Escondido -City of San Marcos -County of San Diego
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	-City of Del Mar -City of Escondido -City of Poway -City of San Diego -City of Solana Beach -County of San Diego
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	-City of Del Mar -City of Poway -City of San Diego -County of San Diego
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	-City of San Diego
		La Jolla Shores Beach at Caminito del Oro	
		La Jolla Shores Beach at Vallecitos	
		La Jolla Shores Beach at Avenida de la Playa	
		at Casa Beach, Children's Pool	
		South Casa Beach at Coast Boulevard	
		Whispering Sands Beach at Ravina Street	
		Windansea Beach at Vista de la Playa	
		Windansea Beach at Bonair Street	
		Windansea Beach at Playa del Norte	
		Windansea Beach at Palomar Avenue	
		at Tourmaline Surf Park	
		Pacific Beach at Grand Avenue	
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I- Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	-City of El Cajon -City of Santee -County of San Diego
	San Diego River	lower 6 miles	-City of El Cajon -City of La Mesa -City of San Diego -City of Santee -County of San Diego
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	-City of La Mesa -City of Lemon Grove -City of San Diego -County of San Diego - San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final indicator bacteria TMDL compliance requirements for the water bodies listed in Table 6.0 consist of the following:

(1) Final TMDL Compliance Dates

The Responsible Copermittees for MS4 discharges to the water bodies listed in Table 6.0 must be in compliance with the final TMDL compliance requirements according to the following compliance dates:

Table 6.1
Compliance Dates to Achieve Final TMDL Compliance Requirements

Constituent	Dry Weather TMDL Compliance Date	Wet Weather TMDL Compliance Date*
Total Coliform	April 4, 2021	April 4, 2031 (April 4, 2021)
Fecal Coliform		
Enterococcus		

* The Wet Weather TMDL Compliance Date in parenthesis applies if the applicable Water Quality Improvement Plan does not include load reduction programs for other constituents (e.g. metals, pesticides, trash, nutrients, sediment, etc.) together with bacteria load reduction requirements of these TMDLs.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance dates under Specific Provision 6.b.(1):

Table 6.2a
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Beaches

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform	10,000	22%	1,000	0%
Fecal Coliform	400	22%	200	0%
Enterococcus	104	22%	35	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan.

Table 6.2b
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Creeks

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Fecal Coliform	400	22%	200	0%
Enterococcus	61 (104)	22%	33	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Basin Plan.
d. A single sample maximum of 104 MPN/100ml for *Enterococcus* may be applied as a receiving water limitation for creeks, instead of 61 MPN/100mL, if one or more of the creeks addressed by these TMDLs (San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek, San Diego River, and/or Chollas Creek) is designated with a "moderately to lightly used area" or less frequent usage frequency in the Basin Plan. Otherwise, the single sample maximum of 61 MPN/100mL for *Enterococcus* must be used to assess compliance with the allowable exceedance frequency.

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing indicator bacteria densities that do not exceed the following effluent limitations by the compliance dates under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a):

Table 6.2c
Final Effluent Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies in MS4 Discharges to the Water Body

Constituent	Concentration-Based Effluent Limitations			
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform[d]	10,000	22%	1,000	0%
Fecal Coliform	400	22%	200	0%
Enterococcus	104[e] / 61[f]	22%	35[e] / 33[f]	0%

Notes:
a. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan for discharges to beaches, and the Basin Plan for discharges to creeks and creek mouths.
d. Total coliform effluent limitations only apply to MS4 outfalls that discharge to the Pacific Ocean Shorelines and creek mouths listed in Table 6.0.
e. This *Enterococcus* effluent limitation applies to MS4 discharges to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
f. This *Enterococcus* effluent limitation applies to MS4 discharges to segments or areas of creeks or creek mouths listed in Table 6.0.

(ii) Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the compliance dates under Specific Provision 6.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a):

Table 6.3
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watershed and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
South Orange County	**San Joaquin Hills HSA** (901.11) and **Laguna Hills HSA** (901.12) - Pacific Ocean Shoreline	91.78%	91.72%	98.28%	46.85%	52.07%	51.26%
	Aliso HSA (901.13) - Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	95.47%	95.58%	99.13%	25.29%	26.62%	27.52% (27.37%)**
	Dana Point HSA (901.14) - Pacific Ocean Shoreline	95.04%	95.03%	98.98%	13.15%	14.86%	15.16%
	Lower San Juan HSA (901.27) - Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	72.96%	74.21%	94.94%	19.21%	12.82%	27.12% (26.90%)**
	San Clemente HA (901.30) - Pacific Ocean Shoreline	94.28%	94.23%	98.83%	23.85%	24.58%	25.26%
San Luis Rey River	**San Luis Rey HU** (903.00) - Pacific Ocean Shoreline	38.13%	39.09%	87.38%	5.62%	3.12%	11.69%

Table 6.3 (Cont'd)
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watershed and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
Carlsbad	**San Marcos HA** (904.50) - Pacific Ocean Shoreline	82.82%	82.55%	96.03%	18.47%	18.98%	20.19%
San Dieguito River	**San Dieguito HU** (905.00) - Pacific Ocean Shoreline	14.39%	20.72%	83.48%	4.29%	1.46%	7.72%
Penasquitos	**Miramar Reservoir HA** (906.10) - Pacific Ocean Shoreline	96.50%	96.59%	99.42%	1.61%	1.99%	1.93%
Mission Bay	**Scripps HA** (906.30) - Pacific Ocean Shoreline	96.44%	96.42%	99.25%	16.32%	21.14%	18.82%
	Tecolote HA (906.50) - Tecolote Creek	94.51%	94.59%	98.94%	16.51%	20.47%	18.15% (18.08%)**
San Diego River	**Mission San Diego HSA** (907.11) and **Santee HSA** (907.12) - Pacific Ocean Shoreline - Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles)	74.03%	69.44%	93.96%	38.14%	53.22%	42.74% (42.47%)**
San Diego Bay	**Chollas HSA** (908.22) - Chollas Creek	92.06%	92.15%	98.46%	17.82%	24.84%	21.46% (21.36%)**

Notes:
* The percent load reductions are based on reducing loads compared to pollutant loads from 2001 to 2002.
** The alternative *Enterococcus* percent load reduction was calculated based on a numeric target of 104 MPN/100mL instead of 61 MPN/100mL, protective of the REC-1 "moderately to lightly used area" usage frequency that is protective of freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative pollutant load reductions can be utilized.

(c) Best Management Practices

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 6.0 must incorporate the Comprehensive Load Reduction Plans (CLRPs) required to be developed pursuant to Resolution No. R9-2010-0001.

(ii) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 6.b.(2)(a) and/or the effluent limitations under Specific Provision 6.b.(2)(b) for the segments or areas of the water bodies listed in Table 6.0.

(iii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans, owners/operators of small MS4s, and agricultural dischargers as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(f) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 6.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 6.b.(2)(c) achieves compliance with Specific Provisions 6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), and/or 6.b.(3)(e),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 6.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 6.d, to demonstrate compliance with Specific Provisions 6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), 6.b.(3)(e) and/or 6.b.(3)(f).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim indicator bacteria TMDL compliance requirements for the water bodies listed in Table 6.0 consist of the following:

(1) Interim TMDL Compliance Dates

The Responsible Copermittees must achieve compliance with the interim TMDL compliance requirements, as determined in accordance with Specific Provision 6.c.(3), by the interim compliance dates given in Table 6.4, unless alternative interim compliance dates are accepted by the San Diego Water Board Executive Officer as part of the Water Quality Improvement Plan.

Table 6.4
Interim Compliance Dates to Achieve Interim TMDL Compliance Requirements

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs*
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	April 4, 2016	April 4, 2021 (April 4, 2016)
		at Heisler Park - North		
	Pacific Ocean Shoreline	at Main Laguna Beach	April 4, 2016	April 4, 2021 (April 4, 2016)
		Laguna Beach at Ocean Avenue		
		Laguna Beach at Cleo Street		
		Arch Cove at Bluebird Canyon Road		
		Laguna Beach at Dumond Drive		
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	April 4, 2016	April 4, 2021 (April 4, 2016)
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	April 4, 2018	April 4, 2021 (April 4, 2018)
	Aliso Creek Mouth	at mouth	April 4, 2018	April 4, 2021 (April 4, 2018)
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	April 4, 2016	April 4, 2021 (April 4, 2016)
		Aliso Beach at Table Rock Drive		
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)		
		at Salt Creek (large outlet)		
		Salt Creek Beach at Salt Creek service road	April 4, 2017	April 4, 2021 (April 4, 2017)
		Salt Creek Beach at Strand Road	April 4, 2017	April 4, 2021 (April 4, 2017)

Table 6.4 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs*
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	April 4, 2016	April 4, 2021 (April 4, 2016)
	San Juan Creek	lower 1 mile	April 4, 2018	April 4, 2021 (April 4, 2018)
	San Juan Creek Mouth	at mouth	April 4, 2016	April 4, 2021 (April 4, 2016)
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	April 4, 2016	April 4, 2021 (April 4, 2016)
		Ole Hanson Beach Club Beach at Pico Drain	April 4, 2016	April 4, 2021 (April 4, 2016)
		San Clemente City Beach at El Portal Street Stairs	April 4, 2017	April 4, 2021 (April 4, 2017)
		San Clemente City Beach at Mariposa Street		
		San Clemente City Beach at Linda Lane	April 4, 2016	April 4, 2021 (April 4, 2016)
		San Clemente City Beach at South Linda Lane	April 4, 2018	April 4, 2021 (April 4, 2018)
		San Clemente City Beach at Lifeguard Headquarters	April 4, 2017	April 4, 2021 (April 4, 2017)
		under San Clemente Municipal Pier		
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	April 4, 2018	April 4, 2021 (April 4, 2018)
		San Clemente State Beach at Riviera Beach	April 4, 2016	April 4, 2021 (April 4, 2016)
		Can Clemente State Beach at Cypress Shores	April 4, 2017	April 4, 2021 (April 4, 2017)
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	April 4, 2017	April 4, 2021 (April 4, 2017)
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	April 4, 2016	April 4, 2021 (April 4, 2016)
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	April 4, 2016	April 4, 2021 (April 4, 2016)

Table 6.4 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs*
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	April 4, 2016	April 4, 2021 (April 4, 2016)
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	April 4, 2016	April 4, 2021 (April 4, 2016)
		La Jolla Shores Beach at Caminito del Oro		
		La Jolla Shores Beach at Vallecitos		
		La Jolla Shores Beach at Avenida de la Playa		
		at Casa Beach, Children's Pool		
		South Casa Beach at Coast Boulevard		
		Whispering Sands Beach at Ravina Street		
		Windansea Beach at Vista de la Playa		
		Windansea Beach at Bonair Street		
		Windansea Beach at Playa del Norte		
		Windansea Beach at Palomar Avenue		
		at Tourmaline Surf Park		
		Pacific Beach at Grand Avenue		
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries		
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	April 4, 2018	April 4, 2021 (April 4, 2018)
	San Diego River	lower 6 miles		
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach		
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	April 4, 2018	April 4, 2021 (April 4, 2018)

* The Interim Compliance Dates to achieve the Interim Wet Weather WQBELs in parenthesis apply if the applicable Water Quality Improvement Plan does not include load reduction programs for other constituents (e.g. metals, pesticides, trash, nutrients, sediment, etc.) together with bacteria load reduction requirements of these TMDLs.

(2) Interim Water Quality Based Effluent Limitations

The Responsible Copermittees for discharges to the water bodies in Table 6.0 must comply with the following interim WQBELs by the interim compliance dates given in Specific Provision 6.c.(1):

(a) Interim Receiving Water Limitations

(i) *Interim Dry Weather Receiving Water Limitations*

The Responsible Copermittee must calculate the "existing" exceedance frequencies of the 30-day geometric mean water quality objectives for each of the indicator bacteria by analyzing the available monitoring data collected between January 1, 1996 and December 31, 2002. "Existing" exceedance frequencies may be calculated by water body and/or by Watershed Management Area listed in Table 6.0. Separate "existing" exceedance frequencies must be calculated for beaches and creeks/creek mouths.

The Responsible Copermittees must achieve a 50 percent reduction in the "existing" exceedance frequency of the 30-day geometric mean WQBELs for the water bodies listed in Table 6.0 by the interim compliance dates given in Table 6.4. A 50 percent reduction in the "existing" exceedance frequency is equivalent to half of the "existing" exceedance frequency of the 30-day geometric mean WQBELs.

The "existing" exceedance frequencies and the interim dry weather allowable exceedance frequencies (i.e. interim dry weather receiving water limitations) calculated by the Responsible Copermittees must be included in the Water Quality Improvement Plans for the applicable Watershed Management Areas.

(ii) *Interim Wet Weather Receiving Water Limitations*

The Responsible Copermittees must achieve the interim wet weather receiving water limitations in Table 6.5, expressed as interim wet weather allowable exceedance frequencies, by the interim compliance dates given in Table 6.4.

Table 6.5
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	38%	37%	39%
		at Heisler Park - North			
	Pacific Ocean Shoreline	at Main Laguna Beach			
		Laguna Beach at Ocean Avenue			
		Laguna Beach at Cleo Street			
		Arch Cove at Bluebird Canyon Road			
		Laguna Beach at Dumond Drive			
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	41%	41%	42%
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	41%	41%	42%
	Aliso Creek Mouth	at mouth	41%	41%	42%
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	36%	36%	36%
		Aliso Beach at Table Rock Drive			
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)			
		at Salt Creek (large outlet)			
		Salt Creek Beach at Salt Creek service road			
		Salt Creek Beach at Strand Road			

Table 6.5 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	44%	44%	48%
	San Juan Creek	lower 1 mile	44%	44%	47%
	San Juan Creek Mouth	at mouth	44%	44%	47%
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	35%	35%	36%
		Ole Hanson Beach Club Beach at Pico Drain			
		San Clemente City Beach at El Portal Street Stairs			
		San Clemente City Beach at Mariposa Street			
		San Clemente City Beach at Linda Lane			
		San Clemente City Beach at South Linda Lane			
		San Clemente City Beach at Lifeguard Headquarters			
		under San Clemente Municipal Pier			
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)			
		San Clemente State Beach at Riviera Beach			
		Can Clemente State Beach at Cypress Shores			
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	45%	44%	47%
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	40%	40%	41%
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	33%	33%	36%

Table 6.5 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	26%	26%	26%
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	37%	37%	37%
		La Jolla Shores Beach at Caminito del Oro			
		La Jolla Shores Beach at Vallecitos			
		La Jolla Shores Beach at Avenida de la Playa			
		at Casa Beach, Children's Pool			
		South Casa Beach at Coast Boulevard			
		Whispering Sands Beach at Ravina Street			
		Windansea Beach at Vista de la Playa			
		Windansea Beach at Bonair Street			
		Windansea Beach at Playa del Norte			
		Windansea Beach at Palomar Avenue			
		at Tourmaline Surf Park			
		Pacific Beach at Grand Avenue			
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries	49%	49%	51%
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	46%	43%	49%
	San Diego River	lower 6 miles	46%	43%	49%
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	46%	43%	51%
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	41%	41%	43%

(b) Interim Effluent Limitations

Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the interim compliance dates under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.c.(2)(a):

Table 6.6
Interim Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watersheds and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
South Orange County	**San Joaquin Hills HSA** (901.11) and **Laguna Hills HSA** (901.12) - Pacific Ocean Shoreline	45.89%	45.86%	49.14%	23.43%	26.04%	25.63%
	Aliso HSA (901.13) - Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	47.74%	47.79%	49.57%	12.65%	13.31%	13.76% (13.69%)**
	Dana Point HSA (901.14) - Pacific Ocean Shoreline	47.52%	47.52%	49.49%	6.58%	7.43%	7.58%
	Lower San Juan HSA (901.27) - Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	36.48%	37.11%	47.47%	9.61%	6.41%	13.56% (13.45%)**
	San Clemente HA (901.30) - Pacific Ocean Shoreline	47.14%	47.12%	49.42%	11.93%	12.29%	12.63%
San Luis Rey River	**San Luis Rey HU** (903.00) - Pacific Ocean Shoreline	19.07%	19.55%	43.69%	2.81%	1.56%	5.85%
Carlsbad	**San Marcos HA** (904.50) - Pacific Ocean Shoreline	41.41%	41.28%	48.02%	9.24%	9.49%	10.10%

Table 6.6 (Cont'd)
Interim Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watersheds and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
San Dieguito River	**San Dieguito HU** (905.00) - Pacific Ocean Shoreline	7.20%	10.36%	41.74%	2.15%	0.73%	3.86%
Penasquitos	**Miramar Reservoir HA** (906.10) - Pacific Ocean Shoreline	48.25%	48.30%	49.71%	0.81%	1.00%	0.97%
Mission Bay	**Scripps HA** (906.30) - Pacific Ocean Shoreline	48.22%	48.21%	49.63%	8.16%	10.57%	9.41%
	Tecolote HA (906.50) - Tecolote Creek	47.26%	47.30%	49.47%	8.26%	10.24%	9.08% (9.04%)**
San Diego River	**Mission San Diego HSA** (907.11) and **Santee HSA** (907.12) - Pacific Ocean Shoreline - Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles)	37.02%	34.72%	46.98%	19.07%	26.61%	21.37% (21.24%)**
San Diego Bay	**Chollas HSA** (908.22) - Chollas Creek	46.03%	46.08%	49.23%	8.91%	12.42%	10.73% (10.68%)**

Notes:
* The percent load reductions are based on reducing loads compared to pollutant loads from 2001 to 2002.
** The alternative *Enterococcus* percent load reduction was calculated based on a numeric target of 104 MPN/100mL instead of 61 MPN/100mL, protective of the REC-1 "moderately to lightly used area" usage frequency that is protective of freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative pollutant load reductions can be utilized.

(3) Interim TMDL Compliance Determination

Compliance with the interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(f) There are no exceedances of the interim receiving water limitations under Specific Provision 6.c.(2)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(g) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the interim effluent limitations under Specific Provision 6.c.(2)(b); OR

(h) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

d. Specific Monitoring and Assessment Requirements

(1) Monitoring and Assessment Requirements for Beaches

(a) Monitoring Stations

For beaches addressed by the TMDL, monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[40] If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source

[40] Commonly referred to as AB 411 monitoring

identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations at least once within the first 24 hours of the end of a storm event[41] during the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer in exceedance of the allowable exceedance frequencies in the receiving waters.

(iii) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(iv) For Pacific Ocean Shoreline segments or areas listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the dry weather and

[41] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

wet weather monitoring data to assess whether the interim and final WQBELs for the Pacific Ocean Shoreline segments or areas listed in Table 6.0 have been achieved.

(ii) Dry weather exceedance frequencies must be calculated as follows:

[a] 30-day geometric means must be calculated from the results of any dry weather samples collected from the segments or areas for each water body listed in Table 6.0;
[b] The method and number of samples need for calculating the 30-day geometric means must be consistent with the number of samples required by the Ocean Plan;
[c] Where there are multiple segments or areas associated with a water body listed in Table 6.0, the Copermittees may calculate geometric means for each segment or area, or combine the dry weather monitoring data from all the segments or areas to calculate geometric means for the water body;
[d] The exceedance frequency must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the dry season.

(iii) Wet weather exceedance frequencies must be calculated as follows:

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;
[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;
[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria densities reported from each storm event sampled; and
[d] The single sample maximum exceedance frequency must be calculated by dividing the number of wet weather days that exceed the single sample maximum receiving water limitations in Table 6.2 by the total number of wet weather days during the rainy season.
[e] The data collected for dry weather must be used in addition to the data collected for wet weather to calculate the wet weather 30-day geometric means. The exceedance frequency of the wet weather 30-day geometric means must be calculated by dividing the number of geometric means that exceed the geometric mean

receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the wet season.

(iv) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(v) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) Monitoring and Assessment Requirements for Creeks and Creek Mouths

(a) Monitoring Stations

For creeks addressed by the TMDL, monitoring locations should consist of, at a minimum, a location at or near the mouth of the creek (e.g. Mass Loading Station or Mass Emission Station) and one or more locations upstream of the mouth (e.g. Watershed Assessment Station). If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations in accordance with the requirements of Provision D.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations within the first 24 hours of the end of a storm event[42] during the rainy season (i.e. October 1 through April 30).

[42] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(iii) Samples collected from receiving water monitoring stations must be analyzed for fecal coliform and *Enterococcus* indicator bacteria.

(iv) For creeks or creek mouths listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the receiving water monitoring data to assess whether the interim and final receiving water WQBELs for the creeks and creek mouths listed in Table 6.0 have been achieved.

(ii) Dry weather exceedance frequencies must be calculated as follows:

[a] 30-day geometric means must be calculated from the results of any dry weather samples collected from the segment or area for each water body listed in Table 6.0;
[b] The method and number of samples need for calculating the 30-day geometric means must be consistent with the number of samples required by the Basin Plan;
[c] The exceedance frequency must be calculated by dividing the number of 30-day geometric means that exceed the 30-day geometric mean receiving water limitations in Table 6.2 by the total number of 30-day geometric means calculated from samples collected during the dry season.

(iii) Wet weather exceedance frequencies must be calculated as follows:

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;
[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;
[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria densities reported from each of the storm events sampled; and

[d] The exceedance frequency must be calculated by dividing the number of wet weather days that exceed the single sample maximum receiving water limitations in Table 6.2 by the total number of wet weather days during the rainy season.

[e] The data collected for dry weather must be used in addition to the data collected for wet weather to calculate the wet weather 30-day geometric means. The exceedance frequency of the wet weather 30-day geometric means must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the wet season.

(iv) The Responsible Copermittee must identify and incorporate additional MS4 outfall and receiving water monitoring stations and/or adjust monitoring frequencies to identify sources causing exceedances of the receiving water WQBELs.

(v) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(vi) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

7. Total Maximum Daily Loads for Sediment in Los Peñasquitos Lagoon

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2012-0033

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2012
State Water Board Approval Date:	January 21, 2014
Office of Administrative Law Approval Date:	July 14, 2014
US EPA Approval Date:	October 30, 2014

(3) TMDL Effective Date: July 14, 2014

(4) Watershed Management Area: ~~Los~~ Peñasquitos

(5) Water Body: Los Peñasquitos Lagoon

(6) Responsible Copermittees: County of San Diego, City of San Diego, City of Del Mar, and City of Poway

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final sediment TMDL compliance requirements for Los Peñasquitos Lagoon consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must be in compliance with the final TMDL compliance requirements by December 31, 2034.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not prohibit the sustainable restoration of tidal and non-tidal saltmarsh vegetation of at least 346 acres.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations by the compliance date under Provision 7.b(1) will not cause or contribute to a failure of the receiving water condition specified under Specific Provision 7.b.(2)(a):

Table 7.1
*Final Effluent Limitations as Expressed as Wet Season Loads in MS4 Discharges to Los Peñasquitos Lagoon**

Constituent	Effluent Limitation
Sediment	2,580 tons/wet season

* Final effluent limitations are to be achieved by the following Responsible Parties: County of San Diego, City of San Diego, City of Del Mar, City of Poway, Phase II MS4 permittees, Caltrans, general construction storm water NPDES permittees, and general industrial storm water NPDES permittees.

(c) Best Management Practices

(i) The Water Quality Improvement Plan for the Los Peñasquitos Watershed Management Area must incorporate the Sediment Load Reduction Plan required to be developed pursuant to Resolution No. R9-2012-0033.

(ii) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 7.b.(2)(a) and/or the Copermittee's portion of the effluent limitations under Specific Provision 7.b.(2)(b) for Los Peñasquitos Lagoon.

(3) Final TMDL Compliance Determination

Compliance determination with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) Successful restoration of 80 percent of the 1973 acreage of tidal and non-tidal lagoon salt marsh (346 acres) as described in Attachment A of Resolution No. R9-2010-0033; OR

(b) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 7.b.(2)(c)(ii) and/or other implementation actions to achieve compliance with Specific Provision 7.b.(3)(a) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 7.b.(2)(c)(ii) or other implementation actions to achieve compliance with Specific Provision 7.b.(3)(a),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 7.b.(2)(c)(ii) or other implementation actions, AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 7.d to demonstrate compliance with Specific Provision 7.b.(3)(a).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim sediment TMDL compliance requirements for Los Penasquitos Lagoon consist of the following:

(1) Interim Compliance Dates and WQBELs

The Responsible Copermittees must comply with the interim WQBELs, expressed as wet season loads, by December 31 of the interim compliance year set forth in Table 7.2.

Table 7.2
*Interim Water Quality Based Effluent Limitations Expressed as Wet Season Loads in MS4 Discharges**

Interim Compliance Date	Interim Effluent Limitations (tons/wet season)
December 31, 2019	6,691
December 31, 2023	5,663
December 31, 2027	4,636
December 31, 2029	3,608

* Interim effluent limitations are to be achieved by the following Responsible Parties: County of San Diego, City of San Diego, City of Del Mar, City of Poway, Phase II MS4 permittees, Caltrans, general construction storm water NPDES permittees, and general industrial storm water NPDES permittees.

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) The final receiving water limitation under Specific Provision 7.b.(2)(a) is met; OR

(c) There are no exceedances of the Copermittee's portion of interim effluent limitations under Table 7.2 at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the Copermittee's portion of the interim TMDL compliance requirements described in Attachment A of Resolution No. R9-2010-0033 will be achieved by the interim compliance date.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) Watershed Monitoring

The Responsible Copermittees must conduct suspended sediment, bed load, and flow monitoring to calculate total sediment loading to the Los Peñasquitos Lagoon for each wet season (October 1 thru April 30) as set forth below:

(a) The Responsible Copermittees must monitor enough storm events throughout the season to quantify sediment loading over each wet season, and

(b) The Responsible Copermittees must monitor at least 3 stations to quantify cumulative sediment loading into Los Peñasquitos Lagoon. Stations must be located within the Los Peñasquitos, Carroll Canyon, and Carmel Creek tributaries prior to discharging into Los Peñasquitos Lagoon.

(2) Lagoon Monitoring

The Responsible Copermittees must monitor Los Peñasquitos Lagoon each Fall for changes in the extent of the vegetation types as set forth below:

(a) The Responsible Copermittees must acquire aerial photos of Los Peñasquitos Lagoon and digitize them at an approximate scale of 1:2,500,

(b) The Responsible Copermittees must appropriately interpret the vegetation and classify the various types as saltmarsh, non-tidal saltmarsh, freshwater marsh, non-tidal saltmarsh –*Lolium perrene* infested, southern willow scrub/mulefat scrub, herbaceous wetland, or upland land cover.

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the monitoring data collected under Specific Provision 7.d(1) and 7.d(2) to assess whether the interim and final WQBELs have been achieved.

(b) For assessing and determining compliance with the final receiving water limitations under Specific Provision 7.b.(2)(a), the Responsible

Copermittees must use the data acquired under Specific Provision 7.d.(2) to estimate the acreage of tidal and non-tidal saltmarsh actually restored.

(c) For assessing and determining compliance with the final effluent limitations under Specific Provision 7.b.(2)(b), the Responsible Copermittees must use the data acquired under Specific Provision 7.d.(1) to estimate sediment loading into Los Peñasquitos Lagoon. Sediment loading must be evaluated using a 3-year, weighted rolling average. The first reported average shall be calculated using data collected in the year, 2015-2016, 2016-2017, and 2017-2018 wet seasons.

(d) The monitoring and assessment results must be submitted as part of the Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

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ATTACHMENT F

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

FACT SHEET / TECHNICAL REPORT

FOR

ORDER NO. R9-2013-0001
AS AMENDED BY ORDER NOS. R9-2015-0001 AND R9-2015-0100
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

May 8, 2013
Amended ~~on~~ February 11, 2015
and November 18, 2015

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I. FACT SHEET FORMAT

This Fact Sheet briefly sets forth the principal facts and the significant factual, legal, methodological, and policy questions that the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) considered in preparing Order No. R9-2013-0001 (Order), as amended by Order Nos. R9-2015-0001 and R9-2015-0100. In accordance with the Code of Federal Regulations (CFR) Title 40 Parts 124.8 and 124.56 (40 CFR 124.8 and 40 CFR 124.56), this Fact Sheet includes, but is not limited to, the following information:

1. Contact information
2. Public process and notification procedures
3. Background of municipal storm water permits
4. Regional MS4 Permit approach
5. Economic considerations
6. Applicable statutes, regulations, plans and policies
7. Discussion of the provisions in the Order

Tentative Order No. R9-2013-0001 was distributed for public review on October 31, 2012. The San Diego Water Board accepted written comments on ~~the~~ Tentative Order No. R9-2013-0001 until January 11, 2013. A public hearing was subsequently held on April 10 and 11, 2013, that was continued to May 8, 2013 to receive oral comments from interested persons. The San Diego Water Board adopted Order No. R9-2013-0001 on May 8, 2013.

Tentative Order No. R9-2015-0001, an Order amending Order No. R9-2013-0001, was distributed for public review on September 19, 2014. The San Diego Water Board accepted written comments on Tentative Order No. R9-2015-0001 until November 19, 2014. A public hearing was held on February 11, 2015, to receive oral comments from Copermittees and interested persons. The San Diego Water Board adopted Order No. R9-2015-0001 amending Order No. R9-2013-0001 on February 11, 2015. Order No. R9-2015-0001 amended the findings and provisions of Order No. R9-2013-0001 to:

a. Enroll the County of Orange, the Orange County Flood Control District and the south Orange County Cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano as Copermittees responsible for compliance with the terms and conditions of Order No. R9-2013-0001, as amended by Order No. R9-2015-0001;

b. Designate the San Diego Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the Cities of Laguna Woods and Laguna Hills and agree to the designation of the Santa Ana Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the City of Lake Forest, subject to the

terms of the February 10, 2015 agreement between San Diego Water Board and the Santa Ana Water Board described in Finding 29 of this Order, upon the later effective date of Order No. R9-2015-0001 or Order No. R8-2015-0001 (superseding Order No. R8-2009-0030);

c. Establish interim exceptions to land development requirements for those priority development projects that discharge to engineered channels and large river reaches as described in Provision E.3.c.(2)(e) of this Order;

d. Incorporate the amended requirements of the State Water Resources Control Board's (State Water Board) General Exception to require that pollutant reductions be achieved within 6 years for storm water and nonpoint source discharges to ASBS within the Region;

e. Incorporate applicable requirements of the Los Peñasquitos Lagoon Sediment TMDL; and

f. Require the Orange County Copermittees to implement the "*Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County*," dated October 2014, made effective in the Monitoring and Reporting Program/Order issued pursuant to California Water Code section 13383 in the December 5, 2014 San Diego Water Board Letter Directive and subject to future revisions by the Executive Officer after appropriate public input.

~~A public hearing was held on February 11, 2015, to receive oral comments from Copermittees and interested persons. The San Diego Water Board adopted Order No. R9-2015-0001 amending Order No. R9-2013-0001 on February 11, 2015.~~

Tentative Order No. R9-2015-0100, an Order amending Order No. R9-2013-0001 as amended by Order No. R9-2015-0001, was distributed for public review on July 31, 2015. The San Diego Water Board accepted written comments on Tentative Order No. R9-2015-0100 until September 14, 2015. A public hearing was held on November 18, 2015, to receive oral comments from Copermittees and interested persons. The San Diego Water Board adopted Order No. R9-2015-0100 amending Order No. R9-2013-0001 as amended by Order No. R9-2015-0001, on November 18, 2015. Order No. R9-2015-0100 amended the findings and provisions of Order No. R9-2013-0001 as amended by Order No. R9-2015-0001 to:

a. Enroll the County of Riverside, the Cities of Murrieta, Temecula, and Wildomar, and the Riverside County Flood Control and Water Conservation District as Copermittees responsible for compliance with the terms and conditions of Order No. R9-2013-0001, as amended by Order Nos. R9-2015-0001 and R9-2015-0100;

b. Continue designation of the San Diego Water Board to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Murrieta and Wildomar, including areas within the Santa Ana Region; and, agree to continue designation of the Santa Ana Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the City of Menifee, including areas within the San Diego Region, subject to the terms of the [Month][Day], 2015 agreement between San Diego Water Board and the Santa Ana Water Board described in Finding 29 of this Order;

d. Incorporate Provision B.3.c, which provides an option that allows a Copermittee to utilize the watershed-based Water Quality Improvement Plan to be deemed in compliance with the prohibitions and limitations of Provisions A.1.a, A.1.c, A.1.d, A.2.a, and A.3.b;

e. Incorporate minor revisions to Provisions E.2.a.(1) and E.2.a.(2) to include San Diego Water Board Order No. R9-2015-0013 and State Water Board Order 2014-0194-DWQ into the requirements for addressing non-storm water discharges to a Copermittee's MS4;

e. Incorporate minor revisions to Provision E.3.b.(1) to correct inconsistencies in the definition of a Priority Development Project as compared to the definitions in Order No. R9-2009-0002 (Fourth Term Orange County MS4 Permit) and Order No. R9-2010-0016 (Fourth Term Riverside County MS4 Permit), and requirements for incorporating the corrected definitions into the BMP Design Manual;

f. Incorporate revisions to Provision E.3.e.(1)(a) to provide additional clarity on when the structural BMP performance requirements of Provision E.3.c are applicable to Priority Development Projects;

e. Incorporate minor revisions to the Revised TMDLs for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region and the TMDLs for Sediment in Los Peñasquitos Lagoon in Attachment E to the Order to make the requirements consistent with the Basin Plan amendments adopted by the San Diego Water Board; and

f. Remove provisions related to allowing the Riverside County Copermittees to apply for early coverage under the Regional MS4 Permit.

The San Diego Water Board files applicable to the issuance of Order No. R9-2013-0001 and amendments thereto are incorporated into the administrative record in support of the findings and requirements of the Order.

II. CONTACT INFORMATION

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The Order and other related documents can be downloaded from the San Diego Water Board website at

http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

The documents referenced in this Fact Sheet and in Order No. R9-2013-0001 and amendments thereto are available for public review at the San Diego Water Board office, located at the address listed above. Public records are available for inspection during regular business hours, from 8:00 am to 5:00 pm Monday through Friday. To schedule an appointment to inspect public records, contact the San Diego Water Board Records Management Officer at 619-516-1990.

COPERMITTEES

Orange County Copermittees

- County of Orange
  - City of Aliso Viejo
  - City of Dana Point
  - City of Laguna Beach
  - City of Laguna Hills
  - City of Laguna Niguel
  - City of Laguna Woods
  - City of Lake Forest *
  - City of Mission Viejo
  - City of Ranch Santa Margarita
  - City of San Clemente
  - City of San Juan Capistrano
  - Orange County Flood Control District

* While not listed in the above table, the City of Lake Forest remains a Copermittee under this Order until the later effective date of this Order or Santa Ana Water Board Tentative Order No. R8-2015-0001. Thereafter, the City of Lake Forest will no longer be considered a Copermittee under this Order because its Phase I MS4 discharges will be regulated by the Santa Ana Water Board pursuant to Water Code section 13328 designation. The requirements of this Order that apply to the City of Lake Forest for the duration of this Order, consistent with the Water Code section 13228 agreement dated February 10, 2015, are described in Finding 29 and Footnote 2 to Table B-1.

Riverside County Copermittees

- County of Riverside
  - City of Menifee**
  - City of Murrieta
  - City of Temecula
  - City of Wildomar
  - Riverside County Flood Control and Water Conservation District

** The City of Menifee is not regulated as a Copermittee under this Order because its Phase I MS4 discharges are regulated by Santa Ana Water Board Order No. R8-2010-0033 as it may be amended or issued pursuant to Water Code section 13228 designation. The requirements of this Order that apply to the City of Menifee for the duration of this Order, consistent with the Water Code section 13228 written agreement dated [Month][Day], 2015, are described in Finding 29 and Footnote 3 to Table B-1.

San Diego County Copermittees

- County of San Diego
  - City of Carlsbad
  - City of Chula Vista
  - City of Coronado
  - City of Del Mar
  - City of El Cajon
  - City of Encinitas
  - City of Escondido
  - City of Imperial Beach
  - City of La Mesa
  - City of Lemon Grove
  - City of National City
  - City of Oceanside
  - City of Poway
  - City of San Diego
  - City of San Marcos
  - City of Santee
  - City of Solana Beach
  - City of Vista
  - San Diego County Regional Airport Authority
  - San Diego Unified Port District

III. PUBLIC PROCESS AND NOTIFICATION PROCEDURES

The San Diego Water Board followed the schedule listed below for the preparation of Order No. R9-2013-0001 and amendments thereto:

San Diego County Copermittee Permit Reissuance Process

1. On February 8, 2011, the San Diego Water Board met with the San Diego County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No. R9-2007-0001.

2. Between February and May 2011, the San Diego Water Board met with select San Diego County, Orange County, and Riverside County Copermittees, as well as representatives of the environmental community to discuss concepts and receive recommendations for elements to be incorporated in a Regional Municipal Separate Storm Sewer System Permit (Regional MS4 Permit).

3. On June 27, 2011 the San Diego Water Board received the Report of Waste Discharge from the San Diego County Copermittees for the renewal of their NPDES permit, Order No. R9-2007-0001.

4. On April 9, 2012, the San Diego Water Board released an administrative draft of Tentative Order No. R9-2013-0001 for preliminary informal comments and feedback.

5. On April 25, 2012, the San Diego Water Board held an informal public workshop to present the administrative draft of Tentative Order No. R9-2013-0001 and receive verbal comments.

6. Between June and August 2012, the San Diego Water Board held four (4) focused meetings with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community, and USEPA) to discuss and receive preliminary comments and feedback about specific elements in the administrative draft of Tentative Order No. R9-2013-0001.

7. On September 5, 2012, the San Diego Water Board held an informal public workshop to present the modifications that were expected to be incorporated into the Tentative Order based on the preliminary comments and feedback received during the focused meetings held between June and August 2012.

8. Informal written comments on the administrative draft of Tentative Order No. R9-2013-0001 were accepted until September 14, 2012.

9. On October 12, 2012, the San Diego Water Board released a revised administrative draft of Tentative Order No. R9-2013-0001.

10. On October 24, 2012, the San Diego Water Board held a focused meeting with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community, and USEPA) to discuss modifications incorporated into the administrative draft of Tentative Order No. R9-2013-0001.

11. On October 31, 2012, the San Diego Water Board released Tentative Order No. R9-2013-0001 for formal public review and comment.

12. On November 13, 2012 and December 12, 2012, the San Diego Water Board held a formal public Board workshop to present the public draft of Tentative Order No. R9-2013-0001 and receive verbal comments.

13. Formal written comments on the public draft of Tentative Order No. R9-2013-0001 were accepted until January 11, 2013.

14. A public hearing of Tentative Order No. R9-2013-0001 was conducted on April 10 and 11, 2013, that was continued to May 8, 2013.

Orange County Copermittee Permit Reissuance Process

15. On May 20, 2014 the San Diego Water Board received the Report of Waste Discharge from the Orange County Copermittees for the renewal of their MS4 NPDES permit, Order No. R9-2009-0002.

16. On June 24, 2014, the San Diego Water Board met with the Orange County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No.R9-2009-0002 and the process for enrollment as Copermittees under Regional MS4 Permit Order No. R9-2013-0001.

17. On July 1, 2014, the San Diego Water Board held a public meeting to discuss the Orange County Report of Waste Discharge and receive comments on potential modifications to Order No. R9-2013-0001. Based on comments received from the Orange County Copermittees and other interested persons at this meeting, the San Diego Water Board determined that additional public meetings were not needed prior to release of Tentative Order No. R9-2015-0001, amending Order No. R9-2013-0001 in redlined – strikeout format for public review and comment.

18. On September 19, 2014, the San Diego Water Board released Tentative Order No. R9-2015-0001 for a 60 day public review and comment period.

19. On October 8, 2014, the San Diego Water Board held a formal public workshop at a regular board meeting to receive information and discuss the proposed amendments to Order No. R9-2013-0001 described in Tentative Order No. R9-2015-0001.

20. In accordance with State and federal laws and regulations, the San Diego Water Board notified San Diego County, Orange County and Riverside County Copermittees, and all known interested agencies and persons of its intent to adopt Tentative Order No. R9-2015-0001 and provided them with an opportunity to submit their written comments and recommendations. Written comments and recommendations on Tentative Order No. R9-2015-0001 were accepted until November 19, 2014.

21. The San Diego Water Board held a public workshop on October 8, 2014, and a public hearing on February 11, 2015, and heard and considered all comments pertaining to the adoption of Tentative Order No. R9-2015-0001 on February 11, 2015.

Riverside County Copermittee Permit Reissuance Process

22. Between April and June 2015, the San Diego Water Board held three (3) public workshops with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community) to discuss and receive comments and feedback about amending Order No. R9-2013-0001 to incorporate a definition of prior lawful approval for Priority Development Projects, and an alternative compliance pathway for prohibitions and limitations in Provision A of the Order. A San Diego Water Board member attended the April and May 2015 public workshops, but no actions or voting took place.

23. On April 15, 2015, the San Diego Water Board met with the Riverside County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No.R9-2010-0016 and the process for enrollment as Copermittees under Order No. R9-2013-0001 (Regional MS4 Permit).

24. On May 8, 2015 the San Diego Water Board received a Report of Waste Discharge from the Riverside County Copermittees for the renewal of their MS4 NPDES permit, Order No. R9-2010-0016.

25. On July 31, 2015, the San Diego Water Board released Tentative Order No. R9-2015-0100 for a formal public review and comment period.

26. Formal written comments on the public draft of Tentative Order No. R9-2015-0100 were accepted until September 14, 2015, a formal public written comment period of 46 days.

27. A public hearing to receive oral comments on Tentative Order No. R9-2015-0100 was conducted on November 18, 2015.

IV. BACKGROUND OF THE SAN DIEGO REGION MUNICIPAL STORM WATER PERMITS

In developed and developing areas, storm water runoff is commonly transported through municipal separate storm sewer systems (MS4s) and discharged into local receiving water bodies. As the storm water runs off and flows over the land or impervious surfaces (e.g., paved streets, parking lots, and building rooftops), it accumulates debris, chemicals, sediment, and other pollutants that can adversely affect receiving water quality if discharged untreated. The United States Environmental Protection Agency (USEPA) recognizes wet weather flows from urban areas as the number one source of estuarine pollution in coastal communities,[1] such as those within the San Diego Region.

The federal Clean Water Act (CWA) was amended in 1987 to address and regulate discharges of storm water associated with industrial activities and from municipal storm sewers. With the amendments, many municipalities throughout the United States were obligated for the first time to obtain National Pollutant Discharge Elimination System (NPDES) permits for discharges of storm water from their MS4s.

In response to the CWA 1987 amendment, as well as the pending federal NPDES regulations which would implement the amendment, the San Diego Water Board issued "early" MS4 permits. The San Diego Water Board adopted and issued Order Nos. 90-38, 90-42, and 90-46 to regulate storm water discharges from the MS4s in Orange County, San Diego County, and Riverside County, respectively, within the San Diego Region on July 16, 1990.

The "early" MS4 permits, or First Term Permits, were issued prior to the November 1990 promulgation of the final federal NPDES storm water regulations. By issuing these First Term Permits before the federal regulations took effect, the San Diego Water Board was able to provide the Copermittees additional flexibility in addressing and managing storm water discharges. The First Term Permits contained the essentials of the 1990 regulations, and required the Copermittees to develop and implement runoff management programs, but provided little specificity about what was required to be included in or actually achieved by those programs.

The flexibility provided in the First Term Permits was generally continued through the Second Term Permits. The combination of the lack of specificity in the First and Second Term Permits, a general lack of meaningful action by the Copermittees and a general lack of corresponding reaction (i.e. enforcement) by the San Diego Water Board during the first ten years of the storm water program, resulted in few substantive steps towards achieving improvements in the quality of receiving waters or storm water discharges from the MS4s.

[1] US EPA. 1999. 40 CFR Parts 9, 122, 123, and 124. National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. 64 FR 68727.

From 2001, the regulatory approach incorporated into Third Term Permits was a significant departure from the regulatory approach of the First and Second Term Permits. The Third Term Permits issued by the San Diego Water Board included more detailed requirements that outlined the minimum level of implementation required for the Copermittees' programs to meet the maximum extent practicable (MEP) standard for storm water. The Third Term Permits included more detail to emphasize and enhance the jurisdictional runoff management programs developed by the Copermittees and introduced requirements for developing and implementing watershed-based programs.

The Third Term Permits also incorporated two precedent setting decisions by the State Water Board. In Order WQ 99-05, the State Water Board established receiving water limitation language to be included in all MS4 permits. The State Water Board's precedential language clarified that municipal storm water permits must include provisions requiring discharges to be controlled to attain water quality standards in receiving waters. Unlike previously adopted versions of the receiving water limitation language in the First and Second Term Permits, the language no longer stated that "*violations of water quality standards are not violations of the municipal storm water permit under certain conditions*." In addition, the receiving water limitation language no longer indicated that the "*implementation of best management practices is the 'functional equivalent' of meeting water quality standards*." State Water Board Order WQ 99-05 specifically requires language in MS4 permits for the Copermittees to comply with water quality standards based discharge prohibitions and receiving water limitations through timely implementation of control measures and other actions to reduce pollutants in discharges. (See State Water Board Order WQ 99-05 (*Environmental Health Coalition*)).

In Order WQ 2000-11, also a precedential decision, the State Water Board addressed design standards for structural post-construction best management practices (BMPs) for new development and significant redevelopment. The State Water Board found that the design standards, which require that runoff generated by 85 percent of storm events from specific development categories be infiltrated or treated, reflect the MEP standard. State Water Board Order WQ 2000-11 also found that the post-construction BMP provisions, or Standard Storm Water Mitigation Plan (SSMP) provisions, constitute MEP for addressing storm water pollutant discharges resulting from specific development categories.

The Third Term San Diego County and Orange County Permits (Order Nos. 2001-01 and R9-2002-0001, respectively) were appealed to the State Water Board. Minor modifications were made by the State Water Board, but the requirements were largely upheld. In State Water Board Order WQ 2001-15, the State Water Board upheld the Third Term San Diego County Permit requirements with certain modifications. The State Water Board removed the prohibition of storm water discharges *into* the MS4 that cause or contribute to exceedances of water quality objectives. The revision allows for treatment of pollutants in storm water runoff after the pollutants have entered the MS4.

State Water Board Order WQ 2001-15 otherwise upheld all the other requirements of the permit.

In addition to the modification to the discharge prohibition in Order WQ 2001-15, the State Water Board refined Order WQ 99-05 by making clear that the Copermittees may use an iterative approach to achieving compliance with water quality standards that involves ongoing assessments and revisions. Thus, the language for the discharge prohibitions and receiving water limitations was revised to explicitly require the Copermittees to implement an iterative process of assessments and revisions to comply with the discharge prohibitions and receiving water limitations. The San Diego Water Board retained the authority to enforce receiving water limitations and discharge prohibitions even if the Copermittee is engaged in the iterative process.

The Third Term San Diego County Permit was subsequently challenged in the Superior Court of the State of California and the Court of Appeal, Fourth Appellate District. The Court of Appeal, Fourth Appellate District, found that the approach of the Third Term San Diego County Permit to regulating discharges into the MS4 was appropriate (*Building Industry Ass'n. v. State Water Resources Control Bd., et al.,* 124 Cal.App.4th 866 (2004)). The State of California Supreme Court denied review sought by the Building Industry Association in March 2005.

The Fourth Term Permits~~, or current MS4 permits,~~ began with the adoption of Order No. R9-2007-0001 issued to the Copermittees of San Diego County in January 2007. Order Nos. R9-2009-0002 and R9-2010-0016 were subsequently issued to the Copermittees of Orange County and Riverside County. The Fourth Term Permits continued to include more detailed requirements to be implemented by each Copermittee's jurisdictional runoff management program. The Fourth Term Permits also included requirements to further emphasize a watershed management approach and for more coordination among jurisdictional runoff management programs. In addition, the Fourth Term Permits included more requirements for assessing the effectiveness of the runoff management programs being implemented by the Copermittees. The intent of the inclusion of additional requirements was to enhance and better define elements of the permit that were expected to be incorporated into the iterative process for managing runoff from each Copermittee's jurisdiction and within the watersheds of the San Diego Region.

The Fourth Term Permits included several new and emerging approaches for managing storm water runoff and discharges. Low impact development (LID) requirements are included for development and significant redevelopment to reduce pollutants in storm water runoff from sites through more natural processes such as infiltration and biofiltration closer to the source, rather than utilizing conventional mechanical end-of-pipe treatment systems. Hydrograph modification (hydromodification) management requirements also are included to mitigate the potential for increased erosion in receiving waters due to increased runoff rates and durations often caused by development and increased impervious surfaces. The Fourth Term Orange County and Riverside County Permits introduced requirements to identify areas of existing

development where retrofitting with LID projects would be feasible and could be implemented to reduce storm water runoff and pollutants in storm water discharges.

The Fourth Term Orange County and Riverside County Permits included a clearer distinction between storm water and non-storm water discharges. The term "urban runoff" was completely removed, and a distinction between storm water (wet weather) runoff and non-storm water (dry weather) runoff was emphasized. This clarification was made to prevent any potential misunderstanding that regulation under the MS4 permits is limited only to urbanized areas, and to prevent non-storm water runoff from being managed in the same manner as storm water runoff. The term "urban runoff" is not defined in the Code of Federal Regulations (CFR) or Federal Register (FR) in the regulation of MS4 discharges. According to the CWA 402(p)(3)(B)(ii), MS4 permits must include a requirement to effectively prohibit non-storm water discharges into the MS4s.

Finally, for the Fourth Term Orange County and Riverside County Permits the San Diego Water Board found that non-storm water discharges to the MS4 from over application of irrigation water are sources of pollutants. The San Diego Water Board found that non-storm water discharges resulting from over-irrigation must be prohibited from entering the MS4 in accordance with the requirements of the CWA and pursuant to 40 CFR 122.26(d)(2)(iv)(B)(1).

The requirements of the Fourth Term Permits issued to the Copermittees in each county within the San Diego Region now have substantively the same core requirements such as discharge prohibitions, receiving water limitations, jurisdictional runoff management program components, and monitoring program requirements. There are, however, several inconsistencies that exist among the three Fourth Term Permits which complicate oversight and implementation of the permits by the San Diego Water Board.

The Fourth Term San Diego County Permit expired in January 2012. The Fourth Term Orange County permit expired in December 2014 and the Fourth Term Riverside County Permit ~~will~~ expired in November 2015. Issuing the Fifth Term Permits within five years for three counties under three different permits would have required the San Diego Water Board to expend significant time and resources for the issuance of the permits through three separate public proceedings, thereby greatly reducing the time and resources available to oversee implementation and compliance. Multiple permits also create confusion for determining compliance among regulated entities, especially for the land development community.

The San Diego Water Board ~~has~~ acknowledged that issuing a single MS4 permit for all the Copermittees in the San Diego Region can and is expected to result in more consistent implementation, improve communication among agencies within watersheds crossing multiple jurisdictions, and minimize resources spent with each permit renewal process. Within the findings of the Fourth Term Riverside County Permit issued in November 2010, the San Diego Water Board notified the public of its intent to develop and issue a single Regional MS4 Permit.

V. REGIONAL MS4 PERMIT APPROACH

The Fifth Term Permit, or Regional MS4 Permit, shifts the focus of the permit requirements from a minimum level of actions to be implemented by the Copermittees to identifying outcomes to be achieved by those actions. Order No. R9-2013-0001 represents an important paradigm shift in the approach for MS4 permits within the San Diego Region.

Historical Permitting Approach

The First and Second Term Permits were very broad and provided little specificity about what was required to be developed and implemented by the Copermittees. The Third Term Permits began to become more specific about the minimum level of implementation required by the Copermittees. The Fourth Term Permits subsequently increased in specificity. The MS4 permits have progressively become more detailed and focused on specifying the minimum level of actions expected to be implemented by the Copermittees. As detailed and specific as the MS4 permits have become, however, they include very little detail about what the desired outcomes of the required actions are expected to achieve. Compliance with the permit requirements has essentially been tracking numbers of actions and reporting, not tracking progress or actual improvements in the quality of receiving waters or discharges from the MS4s. The result has been an increase in actions being implemented by the Copermittees with little or no ability or expectations to determine whether or not improvements in water quality are being achieved.

The Fourth Term Permits result in significant resource expenditure by the Copermittees to report permit compliance information to the San Diego Water Board in the form of annual jurisdictional runoff management program, watershed program, and monitoring program reports. The San Diego Water Board ~~must then~~ was required to expend much of its limited resources on reviewing more than 50 voluminous reports submitted annually by the Copermittees. The information ~~currently~~ reported by the Copermittees ~~is~~ was of limited value when trying to measure progress toward achieving improvements in the quality of receiving waters or discharges from the MS4s. Oversight of the MS4 permits ~~is~~ was further complicated by the inconsistencies among the requirements issued to the Orange County, San Diego County, and Riverside County Copermittees under three separate MS4 permits.

Under the Fourth Term Permits, the Copermittees ~~must~~ were required to expend a significant portion of their limited resources collecting data of limited value, and putting together reports to submit that information to the San Diego Water Board. Likewise, the San Diego Water Board ~~must~~ was required to expend most of its limited resources reviewing reports, and developing permits instead of working directly with the Copermittees to identify solutions to problems causing impacts to water quality. This ~~is~~ was an unsustainable course that ~~will~~ would have continued to demand more

resources from the Copermittees and the San Diego Water Board, and would have continued to result in unknown water quality benefits.

New Permitting Approach

The goal of the Regional MS4 Permit is twofold: 1) bring a consistent set of MS4 permit requirements to all of the Copermittees within the San Diego Region; and, 2) provide an MS4 permit with requirements that will allow the Copermittees to focus their efforts and resources on achieving goals and desired outcomes toward the improvement of water quality rather than completing specific actions.

The overall approach included in the Regional MS4 Permit with respect to the jurisdictional runoff management programs will not differ significantly from the current permits. The general requirements for the jurisdictional runoff management program components and compliance with those requirements will remain and be applied consistently throughout the San Diego Region under the Regional MS4 Permit.

The most significant difference in the new permitting approach is the specific manner of implementation for those jurisdictional runoff management programs. Implementation will be based on decisions made by the Copermittees in accordance with what they have identified as their highest priority water quality conditions. In other words, the Copermittees will have significant control in how to implement the jurisdictional runoff management programs to best utilize their available resources in addressing a specific set of priorities effectively, instead of trying to address all the water quality priorities ineffectively.

The Copermittees are given the responsibility of identifying their highest priority water quality conditions that they intend to address. The Copermittees will develop goals that can be used to measure and demonstrate progress or improvements toward addressing those priorities. In addition to the goals, the Copermittees will provide a schedule for achieving the goals for those highest priorities. The measurement of progress toward achieving the goals for those highest priorities requires a better defined and more focused program of monitoring and assessment than under the Fourth Term Permits.

The monitoring and assessment program must be designed to inform the Copermittees of their progress, and the need for modifications in their jurisdictional runoff management programs and schedules to achieve their goals to improve water quality. The monitoring and assessment program requirements will have a more central role in the Regional MS4 Permit than in earlier permits. The monitoring and assessment requirements must also be designed to enable the Copermittees to focus and direct their efforts in implementing their jurisdictional runoff management programs toward their stated desired outcomes to improve the quality of receiving waters and/or discharges from the MS4s.

By providing an MS4 permit that allows the Copermittees to make more decisions about how to utilize and focus their resources, along with a better defined monitoring and assessment program to inform their water quality management decisions, the Copermittees ~~will~~ have the opportunity to:

1) *Plan strategically*. The Copermittees must have the ability to identify their available resources and develop and implement long term plans that can organize, collect, and use those resources in the most strategically advantageous and efficient manner possible. This ability to develop long term plans will allow the Copermittees to focus and utilize their resources in a more concerted way over the short term and long term to address specific water quality priorities through stated desired outcomes.

2) *Manage adaptively*. The Copermittees must be given the ability to modify their plans as additional information and data are collected from the monitoring and assessment programs. The Copermittees' plans may require modifications to the programs, priorities, goals, strategies, and/or schedules in order for the Copermittees to achieve a stated desired outcome.

3) *Identify synergies*. The Copermittees must be given more flexibility to identify efficiencies within and among their jurisdictional runoff management programs as the strategies are developed and implemented to increase the Copermittees' collective effectiveness. The Copermittees must also be able to identify and utilize resources available from other agencies and entities to further augment and enhance their jurisdictional runoff management programs and/or to collectively work with those other agencies and entities toward achieving a stated desired outcome.

The Regional MS4 Permit requirements ~~will~~ provide the Copermittees the flexibility and responsibility to decide what actions will be necessary to achieve an outcome that is tailored and designed by the Copermittees to improve specific prioritized water quality conditions. The San Diego Water Board expects the approach of the Regional MS4 Permit to give the Copermittees a greater sense of ownership for restoring the quality of receiving waters in the San Diego Region by becoming an integral part of the decision making process in identifying water quality conditions to be addressed, as well as determining the best use of their resources.

VI. ECONOMIC CONSIDERATIONS

Statutory Considerations

California Water Code (CWC) section 13241 requires the San Diego Water Board to consider certain factors, including economic considerations, in the adoption of water quality objectives. CWC section 13263 requires the San Diego Water Board to take into consideration the provisions of CWC section 13241 in adopting waste discharge requirements.

In *City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, the California Supreme Court considered whether Regional Water Boards must comply with CWC section 13241 when issuing waste discharge requirements under CWC section 13263(a) by taking into account the costs a permittee will incur in complying with the permit requirements. The Court concluded that whether it is necessary to consider such cost information "*depends on whether those restrictions meet or exceed the requirements of the federal Clean Water Act.*" (*Id.* at p. 627.) The Court ruled that Regional Water Boards may not consider the factors in CWC section 13241, including economics, to justify imposing pollutant restrictions that are less stringent than applicable federal law requires. (*Id.* At pp. 618, 626-627 ["*[Water Code section 13377 specifies that [ ] discharge permits issued by California's regional boards must meet the federal standards set by federal law. In effect, section 13377 forbids a regional board's consideration of any economic hardship on the part of the permit holder if doing so would result in the dilution of the requirements set by Congress in the Clean Water Act...Because CWC section 13263 cannot authorize what federal law forbids, it cannot authorize a regional board, when issuing a [ ] discharge permit, to use compliance costs to justify pollutant restrictions that do not comply with federal clean water standards*."]). However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Regional Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

As discussed in Section VII.F, Unfunded State Mandates, the San Diego Water Board finds that the requirements in this Order are not more stringent than the minimum federal requirements. Among other requirements, federal law requires MS4 permits to include requirements to effectively prohibit non-storm water discharges into the MS4s, in addition to requiring controls to reduce the discharge of pollutants in storm water to the MEP, and other provisions as USEPA or the State determines are appropriate for the control of pollutants in MS4 discharges.

The requirements in this Order may be more specific or detailed than those enumerated in federal regulations under 40 CFR 122.26 or in the USEPA guidance. However, the requirements have been designed to be consistent with and within the federal statutory mandates described in CWA section 402(p)(3)(B)(ii) and (iii) and the related federal regulations and guidance. Consistent with federal law, all of the

conditions in this Order could have been included in a permit adopted by USEPA in the absence of the in lieu authority of California to issue NPDES permits.

Moreover, the inclusion of numeric WQBELs in this Order does not cause this Order to be more stringent than federal law. Federal law authorizes both narrative and numeric effluent limitations to meet state water quality standards. The inclusion of WQBELs as discharge specifications in an NPDES permit in order to achieve compliance with water quality standards is not a more stringent requirement than the inclusion of BMP based permit limitations to achieve water quality standards (State Water Board Order No. WQ 2006-0012 (*Boeing*)). Therefore, consideration of the factors set forth in CWC section 13241 is not required for permit requirements to implement the effective prohibition on the discharge of non-storm water discharges into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determine appropriate to control such pollutants, as those requirements are mandated by federal law.

Included in the provisions of the Order are monitoring and reporting requirements that are designed to demonstrate that the Copermittees are implementing programs to comply with the CWA municipal storm water requirements. CWA section 308(a) and 40 CFR 122.41(h), (j)-(l), 122.44(i) and 122.48 require that all NPDES permits specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s (40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c)) also specify additional monitoring and reporting requirements. In addition to the federal requirements of the CWA, the San Diego Water Board also has the authority in CWC 13383 to establish monitoring, reporting, and recordkeeping requirements that implement federal and state laws and regulations through NPDES permits.

The monitoring and assessment information that will be reported to the San Diego Water Board is necessary to determine if the Copermittees are making progress toward achieving compliance with the discharge prohibitions, receiving water limitations, and effluent limitations under Provision A of the Order. The monitoring and assessment information that will be reported is also expected to be key to the iterative approach and adaptive management process that is required to be implemented by the Copermittees if they cannot meet the discharge prohibitions and receiving water limitations under the present conditions, which is also part of the requirements under Provision A of the Order.

Notwithstanding the above, the San Diego Water Board has considered cost information in issuing this Order, as discussed below. The San Diego Water Board has also considered all of the evidence that has been presented to the San Diego Water Board regarding the CWC section 13241 factors in adopting this Order. The San Diego Water Board finds that the requirements in this Order are reasonably necessary to protect beneficial uses identified in the Basin Plan and the economic information related to costs of compliance and other CWC section 13241 factors are not sufficient to justify failing to protect those beneficial uses. Where appropriate, the

San Diego Water Board has provided or will consider providing the Copermittees with additional time to implement control measures to achieve final WQBELs and/or water quality standards.

Cost Information

Discussions of the financial and economic ramifications of municipal storm water management programs tend to focus on the significant costs incurred by municipalities in developing and implementing the programs. When considering the cost of implementing the programs, however, it is also important to consider the alternative costs that are incurred when programs are not fully implemented, as well as the economic benefits which result from effective program implementation.

The recent financial and economic conditions have amplified the concerns about the costs incurred by the municipalities in developing and implementing their programs. The reduction in resources resulting from the recent financial and economic conditions has been cited by many of the Copermittees as a justification for reducing the requirements that must be met by their programs. While the recent conditions are a cause for concern in the short term, these programs also have an opportunity to identify and implement improvements and efficiencies before the next period of growth and development, resulting in more effective and sustainable programs over the long term.

In addition, it is very difficult to ascertain the true cost of implementation of the Copermittees' management programs because of inconsistencies in reporting by the Copermittees. Reported costs of compliance for the same program element can vary widely from city to city, often by a very wide margin that is not easily explained.[2] Despite these problems, efforts have been made to identify management program costs, which can be helpful in understanding the costs of program implementation.

The San Diego Water Board recognizes that the Copermittees will incur costs in implementing this Order, potentially above and beyond the costs from the Copermittees' prior permits. The San Diego Water Board also recognizes that, due to California's current economic condition, many Copermittees currently have limited staff and resources to implement actions to address its MS4 discharges. Based on the economic considerations below, the San Diego Water Board has provided the Copermittees a significant amount of flexibility to choose how to implement the requirements of the Order.

The Order also allows the Copermittees to customize their plans, programs, and monitoring requirements. In the end, it is up to the Copermittees to determine the effective BMPs and measures necessary to comply with this Order. The Copermittees can choose to implement the least expensive measures that are effective in meeting

[2] Los Angeles Water Board, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.

the requirements of this Order. This Order also does not require the Copermittees to fully implement all requirements within a single permit term. Where appropriate, the Board has provided the Copermittees with additional time outside of the permit term to implement control measures to achieve final WQBELs and/or water quality standards.

The San Diego Water Board has considered available cost information associated with compliance with this Order. It is not possible to predict accurately the cost impact of the requirements that involve an unknown level of implementation or that depend on environmental variables that are as yet undefined. Only general conclusions can be drawn from this information.

Estimated Municipal Storm Water Program Implementation Costs

The USEPA, the State Water Board, and the California Regional Water Quality Control Boards (Regional Water Boards) have attempted to evaluate the costs of implementing municipal storm water programs. The assessments have demonstrated that the true costs are difficult to ascertain and reported costs vary widely. In addition, reported fiscal analyses tend to neglect the costs incurred to municipalities when storm water and non-storm water runoff is not effectively managed, which are incurred as a result of pollution, contamination, nuisance, and damage to ecosystems, property, and human health. Nonetheless, they provide a useful context for considering the costs of requirements within Order No. R9-2013-0001.

In 1999, the USEPA reported on multiple studies it conducted to determine the cost of management programs. A study of Phase II municipalities determined that the annual cost of the Phase II program was expected to be $9.16 per household. The USEPA also studied 35 Phase I municipalities, finding costs to be $9.08 per household annually, similar to those anticipated for Phase II municipalities.[3]

The State Water Board commissioned a study by the California State University, Sacramento to assess costs of the Phase I MS4 program. This study includes an assessment of costs incurred by Phase I MS4s throughout the state to implement their programs. Annual cost per household in the study ranged from $18 to $46, with the Fresno-Clovis Metropolitan Area representing the lower end of the range, and the City of Encinitas (in San Diego County) representing the upper end of the range.[4]

A study on Phase I MS4 program costs was also conducted by the California Regional Water Quality Control Board, Los Angeles Region (Los Angeles Water Board), where program costs reported in the municipalities' annual reports were assessed. The Los

[3] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791-68792.
[4] State Water Board, 2005. NPDES Stormwater Cost Survey. P. ii.

Angeles Water Board estimated that average per household cost to implement the MS4 program in Los Angeles County was $12.50. [5]

It is important to note that reported program costs are not all attributable to solely complying with MS4 permits. Many program components, and their associated costs, existed before any MS4 permits were ever issued. For example, street sweeping and trash collection costs cannot be solely or even principally attributable to MS4 permit compliance, since these practices have long been expected from and implemented by municipalities.

Therefore, true program cost resulting from MS4 permit requirements is some fraction of reported costs. The California State University, Sacramento study found that only 38 percent of program costs are new costs fully attributable to MS4 permits. The remainder of the program costs was either pre-existing or resulted from enhancement of pre-existing programs.[6] In 2000, the County of Orange found that even lower amounts of program costs are solely attributable to MS4 permit compliance, reporting that the amount attributable to implement the County or Orange Drainage Area Management Plan (DAMP), was less than 20 percent of the total budget. The remaining 80 percent was attributable to pre-existing programs.[7] More current data from the County of Orange is not used in this discussion because the County of Orange no longer reports such information.

Estimated Value of Healthy Water Quality

Economic considerations of municipal storm water management programs cannot be limited only to program costs. Evaluation of programs must also consider information on the benefits derived from environmental protection and improvement.[8] Attention is often focused on municipal storm water management program costs, but the programs must also be viewed in terms of their value to the public.

Placing a value on healthy receiving waters is very difficult. Often the value of receiving waters with good water quality manifests in other forms, such as tourism, recreational opportunities, and/or increased property values. When surface water bodies are degraded, thereby degrading the habitat within and adjacent to the water bodies, the public loses the value and benefits associated with being able to use the area in and around the water bodies. Surface waters that are able to support the beneficial uses designated in the Basin Plan can sustain plants and wildlife that can attract visitors and residents, providing aesthetic, recreational, as well as monetary value to the public. At this time, however, there have been no studies for the San

[5] Los Angeles Water Board, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.
[6] State Water Board, 2005. NPDES Stormwater Cost Survey. P. 58.
[7] County of Orange, 2000. A NPDES Annual Progress Report. P. 60.
[8] Ribaudo M.O. and D. Heelerstein. 1992, *Estimating Water Quality Benefits: Theoretical and Methodological Issues.* U.S. Department of Agriculture. Technical Bulletin No. 1808.

Diego Region to quantify the added value that surface waters with healthy water quality can provide.

USEPA has estimated that household willingness to pay for improvements in fresh water quality for fishing and boating is approximately $158-$210.[9] This estimate can be considered conservative, since it does not include important considerations such as marine waters benefits, wildlife benefits, or flood control benefits. Another study conducted by California State University, Sacramento reported that the annual household willingness to pay for statewide clean water is approximately $180.[10]

A study conducted by the University of Southern California and University of California, Los Angeles assessed the costs and benefits of implementing various approaches for achieving compliance with the MS4 permits in the Los Angeles region. The study found that non-structural systems would cost $2.8 billion but provide $5.6 billion in benefit. If structural systems were determined to be needed, the study found that total costs would be $5.7 to $7.4 billion, while benefits could reach $18 billion.[11] Costs are anticipated to be borne over many years, probably at least ten years.

As can be seen, the benefits of the municipal storm water management programs are expected to considerably exceed their costs. Such findings are corroborated by USEPA, which found that the benefits of implementation of its Phase II storm water rule would also outweigh the costs.[12]

[9] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68793.
[10] State Water Board, 2005. NPDES Stormwater Cost Survey. P. iv.
[11] Los Angeles Water Board, 2004. Alternative Approaches to Stormwater Control.
[12] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791.

VII. APPLICABLE STATUTES, REGULATIONS, PLANS AND POLICIES

A. Legal Authorities – Federal Clean Water Act and California Water Code

This Order is issued pursuant to section 402 of the CWA and implementing regulations adopted by the USEPA and chapter 5.5, division 7 of the CWC (commencing with section 13370). This Order serves as an NPDES permit for point source discharges to surface waters. This Order also serves as waste discharge requirements pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

The objective of the CWA is "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*." To carry out this objective, the CWA requires the implementation of permit programs to regulate the discharge of pollutants and dredged or fill material to the navigable waters of the U.S. and to regulate the use and disposal of sewage sludge. CWA section 402 provides the legal authority to issue a permit for the discharge of pollutants to waters of the U.S. under the NPDES. The CWA provides that NPDES permits may be issued by states which are authorized to implement the provisions of that act. California became authorized to implement the NPDES permit program on May 14, 1973.

The Porter-Cologne Water Quality Control Act (Division 7, commencing with CWC section 13000) established the State Water Resources Control Board (State Water Board) and nine Regional Water Quality Control Boards (Regional Water Boards) as the principal state agencies with primary responsibility for the coordination and control of water quality. CWC section 13200(f) established the San Diego Water Board, which has the primary responsibility for the coordination and control of water quality in the San Diego Region, which includes all the basins draining into the Pacific Ocean between the southern boundary of the Santa Ana Region and the California-Mexico boundary. The San Diego Water Board implements the CWA through Chapter 5.5 of the CWC, commencing with section 13370. CWC section 13377 provides the San Diego Water Board the legal authority to issue waste discharge requirements to ensure compliance with all applicable provisions of the CWA and acts amendatory thereof or supplementary, thereto, to implement water quality control plans, or for the protection of beneficial uses, or to prevent nuisance.

CWA section 402(p) requires the USEPA or authorized state to issue NPDES permits for storm water discharges from MS4s to waters of the U.S. CWA section 402(p)(3)(B)(ii) requires that NPDES permits for storm water discharges from MS4s "*effectively prohibit non-storm water discharges*" into the MS4s. CWA section 402(p)(3)(B)(iii) requires that NPDES permits for storm water discharges from MS4s to "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable* [MEP], *including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*."

The USEPA published implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]), which prescribe permit application requirements for storm water discharges from MS4s pursuant to CWA 402(p), on November 16, 1990. The USEPA published an Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems, which provided guidance on permit application requirements for regulated MS4s, on May 17, 1996. The federal regulations in 40 CFR 122 and guidance issued by USEPA serve as the foundation for the provisions of Order No. R9-2013-0001. The legal authorities provided by the above statutes and regulations are included as part of the discussions in Section VIII of this Fact Sheet.

B. Legal Authority for the Permit Issued on a Region-wide Basis

CWA section 402(p)(3)(B) provides the San Diego Water Board the legal authority to issue an NPDES permit for the San Diego Region as compared to separate MS4 permits based upon County- and partial County-wide boundaries as they existed within the San Diego Region. CWA section 402(p)(3)(B) states that "*Permits for discharges from municipal storm sewers- (i) may be issued on a system- or jurisdiction-wide basis* ...." The federal regulations in 40 CFR 122.26(a)(1)(v) also state that the San Diego Water Board "*may designate dischargers from municipal separate storm sewers on a system-wide or jurisdiction-wide basis. In making this determination, the [San Diego Water Board] may consider the following factors: (A) the location of the discharge with respect to waters of the United States; (B) the size of the discharge; (C) the quantity and nature of the pollutants discharged to waters of the United States; and (D) other relevant factors*."

More specifically, the federal regulations provide that for large and medium MS4 systems, the San Diego Water Board may issue a regional permit. Specifically, the federal regulation in 40 CFR 122.26(a)(3) provide:

"*(ii) The Director may either issue one system-wide permit covering all discharges from municipal separate storm sewers within a large or medium municipal storm sewer system or issue distinct permits for appropriate categories of discharges within a large or municipal separate storm sewer system including, but not limited to: all discharges owned or operated by the same municipality; located within the same jurisdiction; all discharges within a system that discharge to the same watershed; discharges within a system that are similar in nature; or for individual discharges from municipal separate storm sewers within the system.*

(iii) The operator of a discharge from a municipal separate storm sewer which is part of a large or medium municipal separate storm sewer system must either: (A) Participate in a permit application (to be a permittee or a co-permittee) with one or more other operator of discharges from the large or medium municipal storm sewer system which covers all, or a portion of all, discharges from the municipal separate storm sewer system; (B) Submit a distinct permit application which only covers discharges from the municipal separate storm sewers for

which the operator is responsible; or (C) A regional authority may be responsible for submitting a permit application under the following guidelines....

(iv) One permit application may be submitted for all or a portion of all municipal separate storm sewers within adjacent or interconnected large or medium municipal separate storm sewer systems. The Director may issue one systemwide permit covering all, or a portion of all municipal separate storm sewers in adjacent or interconnected large or medium municipal separate storm sewer systems.

(v) Permits for all or a portion of all discharges from large or medium municipal separate storm sewer systems that are issued on a system-wide, jurisdiction-wide, watershed or other basis may specify different conditions relating to different discharges covered by the permit, including different management programs for different drainage areas which contribute storm water to the system."

Based on these regulations, the San Diego Water Board may issue a region-wide MS4 permit. The regulations also clarify that the permit may include different conditions for separate discharges covered by the permit. This allows the San Diego Water Board to ensure that suitable water quality conditions and provisions are identified for each watershed.

The USEPA's responses to comments in the Final Rule for the above-mentioned regulations also make it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide, permits. In the Final Rule published in the Federal Register and containing the responses to comments, USEPA notes that 40 CFR 122.26(a)(3)(iv) would allow an entire system in a geographical region under the purview of a State agency to be designated under a permit.[13] USEPA also states that many commenters wanted to allow the permitting authority broad discretion to establish system-wide permits, and that EPA believes that paragraphs 40 CFR 122.26 (a)(1)(v) and (a)(3)(ii) allow for such broad discretion.[14]

This Order creates watershed requirements that apply to multiple counties. The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees. Managing storm water on a regional and watershed basis is expected to result in improved water quality, as the Order focuses on monitoring and management practices necessary to improve each watershed rather than political boundaries. A single permit also allows the San Diego Water Board staff to expend fewer resources developing successive multiple permits and allows more resources to be devoted to working cooperatively with all three current groups of Copermittees to ensure implementation of this Order results in improved water quality.

[13] 55 Federal Register 47990-01, 48042.
[14] Ibid.

C. Federal and California Endangered Species Acts

This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2115.5) or the Federal Endangered Species Act (16 United States Code [USC] sections 1531 to 1544). This Order requires compliance with requirements to protect the beneficial uses of waters of the U.S. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

D. California Environmental Quality Act

The action to adopt an NPDES Permit is exempt from the provisions of Chapter 3 of the California Environmental Quality Act (CEQA) (Public Resources Code section 21100, et seq.) pursuant to CWC section 13389. (*County of Los Angeles v. Cal. Water Boards* (2006) 143 Cal.App.4th 985.)

E. State and Federal Regulations, Plans and Policies

The legal authority provided by the following regulations, plans, and policies are also included as part of the discussions in Section VIII of this Fact Sheet.

Water Quality Control Plan for the San Diego Basin

The CWA requires the San Diego Water Board to establish water quality standards for each water body in its region. Water quality standards include beneficial uses, water quality objectives and criteria that are established at levels sufficient to protect beneficial uses, and an antidegradation policy to prevent degrading of waters. On September 8, 1994, the San Diego Water Board adopted the *Water Quality Control Plan for the San Diego Basin* (Basin Plan). The Basin Plan designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters in the San Diego Region. The San Diego Water Board has amended the Basin Plan on multiple occasions since 1994. In addition, the Basin Plan implements State Water Board Resolution No. 88-63, which established state policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply. Beneficial uses applicable to the surface water bodies that receive discharges from the MS4s within the San Diego Region generally include those listed below:

The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region:

- Municipal and Domestic Supply (MUN)
- Agricultural Supply (AGR)
- Industrial Process Supply (PROC)

- Industrial Service Supply (IND)
- Ground Water Recharge (GWR)
- Contact Water Recreation (REC1)
- Non-contact Water Recreation (REC2)
- Warm Freshwater Habitat (WARM)
- Cold Freshwater Habitat (COLD)
- Wildlife Habitat (WILD)
- Rare, Threatened, or Endangered Species (RARE)
- Freshwater Replenishment (FRSH)
- Hydropower Generation (POW)
- Preservation of Biological Habitats of Special Significance (BIOL)

The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region:

- Navigation (NAV)
- Commercial and Sport Fishing (COMM)
- Estuarine Habitat (EST)
- Marine Habitat (MAR)
- Aquaculture (AQUA)
- Migration of Aquatic Organisms (MIGR)
- Spawning, Reproduction, and/or Early Development (SPWN)
- Shellfish Harvesting (SHELL)

Pursuant to Water Code sections 13263 and 13377, the requirements of this Order implement the Basin Plan.

Water Quality Control Plan for Ocean Waters of California, California Ocean Plan

In 1972, the State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan). The State Water Board adopted the most recent amended Ocean Plan on October 16, 2012 ~~September 15, 2009~~. The Office of Administrative Law approved it on July 3, 2013 ~~March 10, 2010~~. ~~On October 8, 2010, USEPA approved the 2009 Ocean Plan.~~ The amended Ocean Plan became effective on August 19, 2013. The Ocean Plan is applicable, in its entirety, to ocean waters of the State. In order to protect beneficial uses, the Ocean Plan establishes water quality objectives and a program of implementation. Pursuant to Water Code sections 13263 and 13377, the requirements of this Order implement the Ocean Plan. The Ocean Plan identifies the beneficial uses of ocean waters of the State to be protected as summarized below:

- Industrial water supply
- Water contact and non-contact recreation, including aesthetic enjoyment; navigation

- Commercial and sport fishing
- Mariculture
- Preservation and enhancement of designated Areas of Special Biological Significance
- Rare and endangered species
- Marine habitat
- Fish spawning and shellfish harvesting

On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving an exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges. On June 19, 2012, the State Water Board adopted Order No. 2012-0031, amending Order No. 2012-0012 to require pollutant load reductions to be achieved within six years for the ASBS Compliance Plans, section A.2.d(2) and ASBS Pollution Prevention Plans, section B.2.b(2). The State Water Board Resolution No. 2012-0012, as amended requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject terms and conditions of State Water Board Resolution No. 2012-0012, as amended. The Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012, as amended, applicable to these discharges, are incorporated in Attachment A of this Order. Requirements of this Order implement the Ocean Plan.

Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality

On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

Antidegradation Policy

Federal regulations (40 CFR 131.12) require that the state water quality standards include an antidegradation policy consistent with the federal antidegradation policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16 ("Statement of Policy with Respect to Maintaining the Quality of

the Waters of the State"). State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law.

The San Diego Water Board's Basin Plan implements and incorporates by reference both the State and federal antidegradation policies. State Water Board Resolution No. 68-16 and 40 CFR 131.12 require the San Diego Water Board to maintain high quality waters of the State unless degradation is justified based on specific findings. First, the Board must ensure that "existing instream uses and the level of water quality necessary to protect the existing uses" are maintained and protected. Second, if the baseline quality of a water body for a given constituent exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water, that quality shall be maintained and protected through the requirements of the Order unless the Board makes findings that (1) any lowering of the water quality is necessary to accommodate important economic or social development in the area in which the waters are located; (2) water quality adequate to protect existing uses fully is assured; and (3) the highest statutory and regulatory requirements for all new and existing point sources and all cost-effective and reasonable best management practices for nonpoint source control are achieved. The San Diego Water Board must also comply with any requirements of State Water Board Resolution No. 68-16 beyond those imposed through incorporation of the federal antidegradation policy. In particular, the Board must find that not only present, but also anticipated future uses of water are protected, and must ensure best practicable treatment or control of the discharges. The baseline quality considered in making the appropriate findings is the best quality of the water since 1968, the year of the adoption of Resolution No. 68-16, or a lower level if that lower level was allowed through a permitting action that was consistent with the federal and state antidegradation policies. ~~until it is demonstrated that any change in quality will be consistent with maximum benefit to the people of the State, will not unreasonably affect beneficial uses, and will not result in water quality less than that described in the San Diego Water Boards' policies. State Water Board Resolution No. 68-16 requires that discharges of waste be regulated to meet best practicable treatment or control to assure that pollution or nuisance will not occur and the highest water quality consistent with the maximum benefit to the people of the State be maintained.~~

The discharges permitted in this Order are consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Board Resolution No. 68-16 as set forth below~~.~~: ~~Many of the water bodies within the area covered by this Order are of high quality. The Order requires the Copermittees to meet best practicable treatment or control to meet water quality standards. As required by 40 CFR 122.44(a), the Copermittees must comply with the "maximum extent practicable" technology-based standard set forth in CWA section 402(p) for discharges of pollutants in storm water from the MS4s.~~

1. Many of the waters within the area covered by this Order are impaired for multiple pollutants discharged through MS4s and are not high quality waters with regard to these pollutants. In most cases, there is insufficient data to determine whether these water bodies were impaired as early as 1968, but the limited available data shows

impairment dating back for more than two decades. Many such water bodies are ~~and~~ listed on the State's CWA Section 303(d) List and the San Diego Water Board has established TMDLs to address the impairments. This Order ensures that existing instream (beneficial) water uses and the level of water quality necessary to protect the existing uses is maintained and protected. This Order requires the Copermittees to comply with permit provisions to implement the WLAs set forth in the TMDLs in order to restore the beneficial uses of the impaired water bodies consistent with the assumptions and requirements of the TMDLs. This Order further requires compliance with receiving water limitations to meet water quality standards in the receiving water either by demonstrating compliance pursuant to Provision A and the Copermittees' monitoring and assessment program pursuant to Provision D of this Order, or by implementing Provision B.3.c with a schedule to achieve compliance with receiving water limitations. This Order includes requirements to develop and implement storm water management programs, achieve WQBELs, and effectively prohibit non-storm water discharges into the MS4. The issuance of this Order does not authorize an increase in the amount of discharge of waste.

2. To the extent that water bodies within the area covered by this Order are high quality waters with regard to some constituents, this Order finds as follows:

   a. Allowing limited degradation of high quality water bodies through MS4 discharges is necessary to accommodate important economic or social development in the area and is consistent with the maximum benefit to the people of the state. The discharge of storm water in certain circumstances is to the maximum benefit to the people of the state because it can assist with maintaining instream flows that support beneficial uses, may spur the development of multiple-benefit projects, and may be necessary for flood control, and public safety as well as to accommodate development in the area. The alternative – capturing all storm water from all storm events – would be an enormous opportunity cost that would preclude MS4 permittees from spending substantial funds on other important social needs. The Order ensures that any limited degradation does not affect existing and anticipated future uses of the water and does not result in water quality less than established standards. The Order requires compliance with receiving water limitations that act as a floor to any limited degradation.

   b. The Order requires the highest statutory and regulatory requirements and requires that the Copermittees meet best practicable treatment or control. The Order prohibits all non-storm water discharges, with a few enumerated exceptions, through the MS4 to the receiving waters. As required by 40 CFR section 122.44(a), the Copermittees must comply with the "maximum extent practicable" technology-based standard set forth in CWA section 402(p), and implement extensive minimum control measures in a storm water management program. Recognizing that best practicable treatment or control may evolve over time, the Order includes new and more specific requirements as compared to the prior Phase I MS4 permits for the San Diego County, Orange County and Riverside County Copermittees. The Order incorporates options to implement

Water Quality Improvement Plans that must specify detailed structural and non-structural storm water controls that must be implemented in accordance with an accepted proposed time schedule. The Order contains provisions to encourage, wherever feasible, retention of the storm water from the 85th percentile 24-hour storm event.

Anti-Backsliding Requirements

CWA sections 402(o) and 303(d)(4) and federal regulations at 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations or conditions may be relaxed. ~~All effluent limitations and other conditions in this Order are at least as stringent as the effluent limitations in the previous permits issued to the San Diego County Copermittees, the Orange County Copermittees, and the Riverside County Copermittees.~~ While this Order allows implementation of an alternative compliance pathway option in Provision B.3.c to constitute compliance with receiving water limitations under certain circumstances, the availability of that alternative and the corresponding availability of additional time to come into compliance with receiving water limitations~~,~~ does not violate the anti-backsliding provisions. The receiving water limitations provisions of this Order are imposed under section 402(p)(3)(B) of the Clean Water Act rather than based on best professional judgment, or based on section 301(b)(1)(C) or sections 303(d) or (e), and are accordingly not subject to the anti-backsliding requirements of section 402(o). Although the non-applicability is less clear with respect to the regulatory anti-backsliding provisions in 40 CFR 122.44(l), the regulatory history suggests that USEPA's intent was to establish the anti-backsliding regulations with respect to evolving technology standards for traditional point sources. (See, e.g., 44 Fed.Reg. 32854, 32864 (Jun. 7, 1979)). It is unnecessary, however, to resolve the ultimate applicability of the regulatory anti-backsliding provisions, because the alternative compliance pathway option in Provision B.3.c qualifies for an exception to backsliding as based on new information. The alternative compliance pathway option in Provision B.3.c of this Order was informed by new information available to the Board from experience and knowledge gained through the Los Angeles Water Board's process of developing over 30 watershed-based TMDLs and implementing several TMDLs since the adoption of the previous permits. In particular, the Los Angeles Water Board recognized the significance of allowing time to plan, design, fund, operate and maintain watershed-based BMPs necessary to attain water quality improvements and additionally recognized the potential for municipal storm water to benefit water supply. Thus, even if the receiving water limitations are subject to anti-backsliding requirements, they were revised based on new information that would support an exception to the anti-backsliding provisions. (33 U.S.C. § 1342(o)(2)(B)(i); 40 C.F.R. § 122.44(l)(1); 40 C.F.R. §122.44(l)(2)(i)(B)(1)).

Clean Water Act Section 303(d) List

CWA section 303(d)(1) requires each State to identify specific water bodies within its boundaries where water quality standards are not being met or are not expected to be

met after implementation of technology-based effluent limitations on point sources. Water bodies that do not meet water quality standards are considered impaired and are placed on the state's "303(d) List." Periodically, USEPA approves the State's 303(d) List.

Most recently, USEPA approved the State's 2010 303(d) List of impaired water bodies on October 11, 2011, which includes certain receiving waters in the San Diego Region. For each listed water body, the state or USEPA is required to establish a TMDL of each pollutant impairing the water quality standards in that water body. A TMDL is a tool for implementing water quality standards and is based on the relationship between pollution sources and in-stream water quality conditions. The TMDL establishes the allowable pollutant loadings for a water body and thereby provides the basis to establish water quality-based controls. These controls should provide the pollution reduction necessary for a water body to meet water quality standards.

A TMDL is the sum of the allowable pollutant loads of a single pollutant from all contributing point sources (the waste load allocations or WLAs) and non-point sources (load allocations of LAs) plus the contribution from background sources and a margin of safety (40 CFR 130.2(i)). MS4 discharges are considered point source discharges. For 303(d)-listed water bodies and pollutants in the San Diego Region, the San Diego Water Board or USEPA develops and adopts TMDLs that specify these requirements.

Since 2002, the San Diego Water Board has established seven (7) TMDLs to remedy water quality impairments in various water bodies within the San Diego Region (see Attachment E to the Order). These TMDLs identify MS4 discharges as a source of pollutants to these water bodies, and, as required, establish WLAs for MS4 discharges to reduce the amount of pollutant discharged to receiving waters. CWA section 402(p)(3)(B)(iii) requires the San Diego Water Board to impose permit conditions, including: "management practices, control techniques and system, design and engineering methods, and *such other provisions as the Administrator or the State determines appropriate for the control of such pollutants."* (Emphasis added.) CWA section 402(a)(1) also requires states to issue permits with conditions necessary to carry out the provisions of the CWA. Federal regulations also require that NDPES permits contain WQBELs consistent with the assumptions and requirements of all available WLAs (40 CFR 122.44(d)(1)(vii)(B)). CWC section 13377 also requires that NPDES permits include limitations necessary to implement water quality control plans. Therefore, this Order includes WQBELs and other provisions to implement the TMDL WLAs assigned to Copermittees regulated by this Order.

Other Regulations, Plans and Policies

This Order implements all other applicable federal regulations and State regulations, plans and policies, including the California Toxics Rule at 40 CFR 131.38 (Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California Rule [California Toxics Rule or CTR]), and State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP).

F. Unfunded State Mandates

Article XIII B, Section 6(a) of the California Constitution provides that whenever "*any state agency mandates a new program or higher level of service on any local government, the state shall provide a subvention of funds to reimburse that local government for the costs of the program or increased level of service*." The requirements of this Order do not constitute state mandates that are subject to a subvention of funds for several reasons, including, but not limited to, the following.

First, the requirements of this Order do not constitute a new program or a higher level of service as compared to the requirements contained in the previous Fourth Term Permits. The overarching requirement to impose controls to reduce the pollutants in discharges from MS4s is dictated by the CWA and is not new to this permit cycle (33 USC section 1342(p)(3)(B)). The inclusion of new and advanced measures as the MS4 programs evolve and mature over time is anticipated under the CWA (55 FR 47990, 48052 (Nov. 16, 1990)), and to the extent requirements in this Order are interpreted as new advanced measures, they do not constitute a new program or higher level of service.

Second, and more broadly, mandates imposed by federal law, rather than by a state agency, are exempt from the requirement that the local agency's expenditures be reimbursed (Cal. Const., art. XIII B, section 9, subd. (b)). This Order implements federally mandated requirements under the CWA and its requirements are therefore not subject to subvention of funds. This includes federal requirements to effectively prohibit non-storm water discharges, to reduce the discharge of pollutants in storm water to the MEP, and to include such other provisions as the Administrator or the State determines appropriate for the control of such pollutants (33 USC section 1342(p)(3)(B)). Federal cases have held these provisions require the development of permits and permit provisions on a case-by-case basis to satisfy federal requirements. (*Natural Resources Defense Council, Inc., v. USEPA* (9th Cir. 1992) 966 F.2d 1292, 1308, fn. 17.)

The authority exercised under this Order is not reserved state authority under the CWA's savings clause (cf. *Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 627-628 [relying on 33 USC section 1370, which allows a state to develop requirements which are not "less stringent" than federal requirements]), but instead is part of a federal mandate to develop pollutant reduction requirements for municipal separate storm sewer systems. To this extent, it is entirely federal authority that forms the legal basis to establish the permit provisions. (See, *City of Rancho Cucamonga v. Regional Water Quality Control Board, Santa Ana Region* (2006) 135 Cal.App.4th 1377, 1389; *Building Industry Ass'n of San Diego Co. v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 882-883.)

The MEP standard is a flexible standard that balances a number of considerations, including technical feasibility, cost, public acceptance, regulatory compliance, and effectiveness. (*Building Ind. Ass'n., supra,* 124 Cal.App.4th at pp. 873-874, 889.) Such

considerations change over time with advances in technology and with experience gained in storm water management (55 FR 47990, 48052 (Nov. 16, 1990)). Accordingly, a determination of whether the conditions contained in this Order exceed the requirements of federal law cannot be based on a point by point comparison of the permit conditions and the minimum control measures that are required "at a minimum" to reduce pollutants to the maximum extent practicable and to protect water quality (40 CFR 122.34). Rather, the appropriate focus is whether the permit conditions, as a whole, exceed the MEP standard.

In recent months, the County of Los Angeles and County of Sacramento Superior Courts have granted writs setting aside decisions of the Commission on State Mandates that held certain requirements in Phase I permits constituted unfunded mandates. In both cases, the courts have found that the correct analysis in determining whether an MS4 permit constituted a state mandate was to evaluate whether the permit as a whole exceeds the MEP standard. (*State of Cal. v. Comm. on State Mandates* (Super. Ct. Sacramento County, 2012, No. 34-2010-80000604), *State of California v. County of Los Angeles* (Super. Ct. Los Angeles County, 2011, No. BS130730.) Both cases are currently pending appeal.

The requirements of the Order, taken as a whole rather than individually, are necessary to reduce the discharge of pollutants to the MEP and to protect water quality. The San Diego Water Board finds that the requirements of the Order are practicable, do not exceed federal law, and thus do not constitute an unfunded mandate. These findings are the expert conclusions of the principal state agency charged with implementing the NPDES program in California (CWC sections 13001, 13370).

It should also be noted that the provisions in this Order to effectively prohibit non-storm water discharges are also mandated by the CWA (33 USC section 1342(p)(3)(B)(ii)). Likewise, the provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state establishes or adopts a TMDL, federal law requires that permits must contain effluent limitations consistent with the assumptions and requirements of any applicable waste load allocation in a TMDL (40 CFR 122.44(d)(1)(vii)(B)).

Third, the local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental dischargers who are issued NPDES permits for storm water discharges. With a few inapplicable exceptions, the CWA regulates the discharge of pollutants from point sources (33 USC section 1342) and the Porter-Cologne Act regulates the discharge of waste (CWC section 13263), both without regard to the source of the pollutant or waste. As a result, the "costs incurred by local agencies" to protect water quality reflect an overarching regulatory scheme that places similar requirements on governmental and non-governmental dischargers. (See *County of Los Angeles v. State of California* (1987) 43 Cal.3d 46, 57-58 [finding comprehensive workers' compensation scheme did not create a cost for local agencies that was subject to state subvention].)

The CWA and the Porter-Cologne Act largely regulate storm water with an even hand, but to the extent there is any relaxation of this even-handed regulation, it is in favor of the local agencies. Generally, the CWA requires point source dischargers, including dischargers of storm water associated with industrial or construction activity, to comply strictly with water quality standards (33 USC section 1311(b)(1)(C); *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159, 1164-1165 [noting that industrial discharges must strictly comply with water quality standards]). As discussed in prior State Water Board decisions, certain provisions of this Order do not require strict compliance with water quality standards (State Water Board Order No. WQ 2001-0015, p. 7). Those provisions of this Order regulate the discharge of waste in municipal storm water under the CWA's MEP standard, not the BAT/BCT standard that applies to other types of discharges. These provisions, therefore, regulate the discharge of waste in municipal storm water more leniently than the discharge of waste from non-governmental sources.

Fourth, the Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)). To the extent that the local agency Copermittees have voluntarily availed themselves of the permit, the program is not a state mandate. (Accord, *County of San Diego v. State of California* (1997) 15 Cal.4th 68, 107-108.)

Fifth, the local agency Copermittees' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under state law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

Finally, even if any of the permit provisions could be considered unfunded mandates, under Government Code section 17556, subdivision (d), a state mandate is not subject to reimbursement if the local agency has the authority to charge a fee. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order, subject to certain voting requirements contained in the California Constitution. (See Cal. Const., Art. XIII D, section 6, subd. (c); see also *Howard Jarvis Taxpayers Ass'n v. City of Salinas* (2002) 98 Cal.App.4th 1351, 1358-1359.) The Fact Sheet demonstrates that numerous activities contribute to the pollutant loading in the MS4. Local agencies can levy service charges, fees, or assessments on these activities, independent of real property ownership. (See, e.g., *Apartment Ass'n of Los Angeles County, Inc., v. City of Los Angeles* (2001(24 Cal.4th 830, 842 [upholding inspection fees associated with renting property].) The authority and ability of a local agency to defray the cost of a program without raising taxes indicates that a program does not entail a cost subject to subvention. (*Clovis Unified School Dist. V. Chiang* (2010) 188 Cal.App.4th 794, 812, citing *Connell v. Sup. Ct.* (1997) 59 Cal.App.4th 382, 401; *County of Fresno v. State of California* (1991) 53 Cal. 3d. 482, 487-488.)

VIII. PROVISIONS

The provisions (i.e. NPDES permit requirements) of the Order are discussed below.

A. Prohibitions and Limitations

Purpose: Provision A includes the prohibitions and limitations requirements that are the foundation of all the subsequent requirements included in the Order. Compliance with the prohibitions and limitations will restore and protect receiving waters from impacts that may be caused by discharges into and from the Copermittees' MS4s and ultimately achieve the objective of the CWA.

In meeting the requirements set forth in the Order, the Copermittees must be cognizant that the prohibitions and limitations exist and will be the standard by which the San Diego Water Board will be measuring the progress and success of their implementation of the NPDES permit requirements.

***Discussion*:** The objective of the CWA is to "*restore and maintain the chemical, physical, and biological integrity of the Nation's waters*." The CWA requires the implementation of NPDES permit programs to regulate discharges of pollutants and dredged or fill material to the navigable waters of the U.S. For discharges into and from MS4s, the CWA requires the NPDES permits to "*effectively prohibit non-stormwater discharges into the storm sewers*" and "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable.*"

Provision A includes limitations, consistent with the requirements of the CWA for discharges from MS4s. Provision A expresses these limitations as discharge prohibitions, receiving water limitations, and effluent limitations. Compliance with the discharge prohibitions and receiving water limitations is also explicitly described, in conformance with precedential State Water Board Orders.

More specific and detailed discussions of the requirements of Provision A are provided below.

Provision A.1 (Discharge Prohibitions) prohibits the discharge of specific types of waste into and/or from the Copermittees' MS4s.

Provision A.1.a restates and reiterates Basin Plan Waste Discharge Prohibition 1, by prohibiting discharges into and from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the

state. The terms pollution,[15] contamination,[16] and nuisance[17] are defined under CWC 13050. Provision A.1.c incorporates all the waste discharge prohibitions of the Basin Plan into the requirements of the Order. The waste discharge prohibitions from the Basin Plan have been reproduced and provided in Attachment A to the Order.

Provision A.1.b requires non-storm water discharges into the MS4s to be effectively prohibited, consistent with the requirements of the CWA for MS4 permits to "*effectively prohibit non-stormwater discharges into the storm sewers*." The effective prohibition is required to be implemented by each Copermittee within its jurisdiction through the illicit discharge detection and elimination requirements under Provision E.2. The prohibition does not apply to NPDES permitted discharges into the Copermittees' MS4s.

The CWA employs the strategy of prohibiting the discharge of any pollutant from a point source into waters of the United States unless the discharger of the pollutant(s) obtains an NPDES permit pursuant to CWA Section 402. The 1987 amendment to the CWA includes provision 402(p) that specifically addresses NPDES permitting requirements for storm water discharges from MS4s. CWA section 402(p) prohibits the discharge of pollutants from specified MS4s to waters of the U.S. except as authorized by an NPDES permit and identifies two substantive standards for MS4 storm water permits. MS4 permits (1) "*shall include a requirement to effectively prohibit non-stormwater discharges into the storm sewers*" and (2) "*shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or State determines appropriate for the control of such pollutants*." (CWA section 402(p)(3)(B)(ii)-(iii).)

In November 1990, the USEPA published regulations addressing storm water discharges from MS4s (55 FR 47990 and following (Nov. 16, 1990) (Phase I Final Rule)). The regulations establish minimum requirements for MS4 permits, and generally focus on the requirement that MS4s implement programs to reduce the amount of pollutants found in storm water discharges to the MEP. The CWA's municipal storm water MEP standard does not require storm water discharges to strictly meet water quality standards, as is required for other NPDES permitted

[15] CWC 13050(l): "(1) 'Pollution' means an alteration of the quality of waters of the state by waste to a degree which unreasonably affects either of the following: (A) The water for beneficial uses. (B) Facilities which serve beneficial uses. (2) 'Pollution' may include 'contamination.'

[16] CWC 13050(k): "Contamination' means an impairment of the quality of waters of the state by waste to a degree which creates a hazard to public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste, whether or not waters of the state are affected."

[17] CWC 13050(m): 'Nuisance' means anything which meets all of the following requirements: (1) Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. (2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. (3) Occurs during, or as a result of, the treatment or disposal of wastes."

discharges. Compliance is achieved through an iterative approach of continuous implementation of improved BMPs. This distinction reflects Congress's recognition that variability in flow and intensity of storm events render difficult strict compliance with water quality standards by MS4 permittees. In describing the controls that permits must include to reduce pollutants in storm water discharges to the MEP, the statute (CWA section 402(p)(3)(B)(iii)) states that the controls shall include: "*management practices, control techniques and system, design and engineering methods, and such other provisions as the [permit writer] determines appropriate for the control of such pollutants*."

In contrast, non-storm water discharges from the MS4 that are not authorized by separate NPDES permits are subject to requirements under the NPDES program, including discharge prohibitions, technology based effluent limitations and water quality-based effluent limitations (40 CFR 122.44). The regulations also require the Copermittee's program to include an element to detect and remove illicit discharges and improper disposal into the storm sewer (40 CFR 122.26(d)(2)(iv)(B)).

While "non-storm water" is not defined in the CWA or federal regulations, the federal regulations (at 40 CFR 122.26(b)(2)) define "*illicit discharge*" as *"any discharge to a municipal separate storm sewer that is not composed entirely of storm water and that is not covered by an NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer and discharges resulting from fire fighting activities)*." This definition is the most closely applicable definition of "non-storm water" contained in federal law. As stated in the Phase I Final Rule, USEPA added the illicit discharge program requirement to begin implementation of the 'effective prohibition' requirement to detect and control non-storm water discharges to their municipal system.

Thus, federal law mandates that permits issued to MS4s must require management practices that will result in reducing storm water pollutants to the MEP yet at the same time requires that non-storm water discharges be effectively prohibited from entering the MS4. "Effectively" prohibit does not mean that non-storm water discharges are authorized to be discharged into and from the Copermittees' MS4s. The Phase I Final Rule clarifies what "effectively prohibit" means (55 FR 47995):

> "*Section 402(p)(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…<u>Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit</u> (other than the permit for the discharge from the municipal separate storm sewer)*" [Emphasis added].

Consistent with federal law, unless non-storm water discharges to the MS4 are authorized by a separate NPDES permit, non-storm water discharges are

appropriately subject to the effective prohibition requirement in the CWA and Regional Water Boards are not limited by the iterative MEP approach to storm water regulation in crafting appropriate regulations for non-storm water discharges.

The federal regulations (40CFR122.26(d)(2)(i)(B)) require the Copermittees to establish the legal authority which authorizes or enables the Copermittees to prohibit illicit discharges to the MS4s. The federal regulations (40 CFR 122.26(d)(2)(vi)(B)(1)) require the Copermittees to "*implement and enforce an ordinance, order or similar means*" to prevent non-storm water discharges to their MS4s. Thus, the Copermittees are required to "*effectively*" prohibit non-storm water discharges to their MS4s through enforcing their legal authority established under "*ordinance, order or similar mean*s" and either remove those discharges to their MS4s, or require those discharges to obtain coverage under a separate NPDES permit. More detail about the program that must be implemented to "*effectively*" prohibit non-storm water discharges to the Copermittees' MS4s is provided under the discussion for Provision E.2.

Provision A.1.d was included to be consistent with Resolution No. 2012-0012, adopted by the State Water Board on March 20, 2012. Provision A.1.d prohibits discharges from MS4s to Areas of Special Biological Significance (ASBS), except for storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach to the Heisler Park ASBS subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012. The pertinent Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 are provided in Attachment A to the Order.

<u>Provision A.2 (Receiving Water Limitations)</u> specifies the condition of the receiving waters that must be achieved when there are discharges from the Copermittees' MS4s. Receiving water limitations are included in all NPDES permits issued pursuant to the CWA section 402. CWA section 402(p)(3)(B)(iii) authorizes the inclusion of "*such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." This requirement gives USEPA or the State permitting authority, in this case the San Diego Water Board, discretion to determine what permit conditions are necessary to control pollutants.

In its Phase I Final Rule (see 55 FR 47990, 47994 (Nov. 16, 1990)), USEPA elaborated on these requirements, stating that, "*permits for discharges from municipal separate storm sewer systems must require controls to reduce the discharge of pollutants to the maximum extent practicable, and where necessary water quality-based controls*." USEPA reiterated in its Phase II Final Rule (64 FR 68722, 68737), that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL*." CWC section 13377 also requires that NPDES permits include limitations necessary to implement water quality control plans. Both the State Water Board and the San Diego Water Board have previously concluded that discharges from the MS4 contain pollutants that have

the reasonable potential to cause or contribute to excursions above water quality standards. As such, inclusion of receiving water limitations is appropriate to control MS4 discharges.

The inclusion of receiving water limitations is also consistent with the Ninth Circuit Court of Appeals' ruling in *Defenders of Wildlife v. Browner* (191 F.3d 1159, 1166 (1999)) that the permitting authority has discretion regarding the nature and timing of requirements that it includes as MS4 permit conditions to attain water quality standards. The Ninth Circuit Court of Appeals recently explained that, "*[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*" (*Natural Resources Defense Council v. County of Los Angeles* (9th Cir. 2011) 673 F.3d 880, 886 (revd. On other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013)))

The receiving water limitations included in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan or in water quality control plans or policies adopted by the State Water Board, including State Water Board Resolution No. 68-16, or in federal regulations, including but not limited to 40 CFR 131.12 and 131.38. The water quality objectives in the Basin Plan and other State Water Board plans and policies have been approved by USEPA and combined with designated beneficial uses constitute the water quality standards required under federal law.

Provision A.2.a requires that discharges from the Copermittees' MS4s must not cause or contribute to the violation of water quality standards in receiving waters. The water quality standards of the receiving waters must be protected from the impacts that may be caused by the Copermittees' MS4 discharges. Water quality standards applicable to the surface waters in the San Diego Region must be achieved through meeting the technology based standard of MEP through an iterative process of improved management actions. Provision A.2.a is also consistent with State Water Board Order WQ 99-05 precedent-setting language requiring discharges from MS4s to attain receiving water quality standards. The water quality control plans and policies with water quality standards applicable to the waters in the San Diego Region are included under Provision A.2.a.

Provisions A.2.b was included to be consistent with the requirements of State Water Board Resolution No. 2012-0012, adopted on March 20, 2012.

Provision A.3 (Effluent Limitations) specifies the condition of the discharges from the Copermittees' MS4s that must be achieved if and when there are discharges.

Consistent with CWA section 301(b)(1)(A) and 40 CFR 122.44(a), Provision A.3.a includes the technology-based effluent limitations that must be included in the Order. The technology-based effluent limits, representing the minimum level of control that must be imposed in a permit under CWA section 402, requires that pollutants in discharges of storm water from the Copermittees' MS4s be reduced to the MEP. This provision applies specifically to storm water discharges. Non-storm water discharges must be effectively prohibited, as required under Provision A.1.b. Non-storm water (dry weather) discharges from the MS4 are not considered storm water (wet weather) discharges and therefore are not subject to the MEP standard.

The technology-based MEP standard is an ever-evolving, flexible, and advancing concept. Neither Congress nor USEPA has specifically defined the term "maximum extent practicable." Congress established this flexible MEP standard so that the administrative bodies would have "*the tools to meet the fundamental goals of the Clean Water Act in the context of storm water pollution*." (*Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 884.) As knowledge about controlling storm water runoff and discharges continues to evolve, so does the knowledge which constitutes MEP. Reducing the discharge of pollutants in storm water from the MS4 to the MEP requires the Copermittees to assess each program component and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP.

The San Diego Water Board or the State Water Board ultimately define MEP, and may include requirements that provide specific guidance on what is expected to demonstrate MEP. It is the responsibility of the Copermittees to propose actions that implement BMPs to reduce storm water pollution to the MEP. In other words, the Copermittees' runoff management programs developed and implemented under the Order are the Copermittees' proposals for achieving MEP. Their total collective and individual activities conducted pursuant to their runoff management programs become their proposal for achieving MEP as it applies both to their overall effort, as well as to specific activities. Provisions B through E of the Order provides a minimum framework to guide the Copermittees in achieving the MEP standard for discharges of pollutants in storm water.

Provision A.3.b incorporates any water quality based effluent limitations (WQBELs) applicable to the MS4s established for TMDLs adopted and approved for the San Diego Region and requires the Copermittees to comply with those WQBELs. This is consistent with 40 CFR 122.44(d)(1)(vii)(B), which requires that NPDES permits to incorporate WQBELs "*developed to protect a narrative water quality criterion, a numeric water quality criterion, or both…consistent with the assumptions and requirements of any available wasteload allocation for the discharge...*"

Pursuant to CWA section 303(d), for surface water bodies identified as impaired by one or more pollutants, the San Diego Water Board is required to establish TMDLs "*at a level necessary to implement the applicable water quality standards with seasonal variations and a margin of safety which takes into account any lack of knowledge*

concerning the relationship between effluent limitations and water quality." The TMDLs identify sources of the pollutants causing the impairments and assign portions of the TMDL as WLAs to point sources, which include MS4s.

WLAs must be expressed in NPDES permits as WQBELs, which may include one or more numeric components such as numeric effluent limits, and/or receiving water limitations, and/or BMP requirements. Because numeric targets for TMDLs typically include a component that will be protective of water quality standards, a TMDL will likely include one or more numeric receiving water limitations and/or effluent limitations as part of the assumptions or requirements of the TMDL. Any numeric receiving water limitations and/or effluent limitations developed as part of the assumptions or requirements of a TMDL must be incorporated and included as part of WQBELs for the MS4s.

Because the development and approval of new TMDLs, or modification of existing TMDLs, may occur during the term of this Order, the specific provisions of those TMDLs, including effluent limitations applicable to MS4s are provided within Attachment E to the Order. Attachment E will be updated with new TMDLs and modifications to existing TMDLs in a timely manner as they occur.

Provision A.4 (Compliance with Discharge Prohibitions and Receiving Water Limitations) describes the process required to be implemented by the Copermittees if compliance with the discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a are not being achieved under current conditions.

In its Phase II Stormwater Regulations, Final Rule, USEPA states that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL.*"[18] In a series of comment letters on MS4 permits issued by various Regional Water Boards, USEPA has also reiterated that MS4 discharges must meet water quality standards.[19] In addition, the Ninth Circuit Court of Appeals explained in a recent ruling that, *"[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*"[20]

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[18] Phase II Stormwater Regulations, Final Rule, 64 Fed. Reg. 68722, 68737.

[19] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.

[20] NRDC v. County of Los Angeles (9th Cir. 2011), 673 F.3d 880, 886 (revd. on other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013))). See also, *Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 884-886, citing *Defenders of Wildlife v. Browning,* (9th Cir. 1999) 191 F.3d 1159.)

Water quality standards for the San Diego Region are established in the Basin Plan. The water quality standards of the Basin Plan are incorporated into this Order as the discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a. The discharge prohibitions and receiving water limitations in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations or prohibitions to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan, water quality control plans or policies adopted by the State Water Board, including Resolution No. 68-16, or federal regulations, including but not limited to, 40 CFR 131.12 and 131.38. The waste discharge prohibitions and water quality objectives in the Basin Plan have been approved by USEPA and combined with the designated beneficial uses constitute the water quality standards required under federal law.

Under federal law (CWA section 402(p)(3)(B)(iii)), an MS4 permit must include "*controls to reduce the discharge of pollutants to the maximum extent practicable...and such other provision as...the State determines appropriate for control of such pollutants*." The State Water Board has previously determined that limitations necessary to meet water quality standards are appropriate for the control of pollutants discharged by MS4s and must be included in MS4 permits. (State Water Board Orders WQ 91-03, 98-01, 99-05, 2001-15; see also *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159.) This Order prohibits discharges that cause or contribute to violations of water quality standards.

The discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a are included in this Order to ensure that discharges from the MS4s do not cause or contribute to exceedances of water quality objectives necessary to protect the beneficial uses of the receiving waters.

Provision A.4 is consistent with the precedent-setting language in State Water Board Order WQ 99-05 required to be included in municipal storm water permits. State Water Board Order WQ 2001-15 refined Order WQ 99-05 by requiring an iterative approach to compliance with water quality standards involving ongoing assessments and revisions, referred to as the "iterative process." The "iterative process" is a fundamental NPDES requirement for municipal storm water permits to achieve the objectives of the CWA.

The State Water Board and Regional Water Boards have stated that the provisions under Provisions A.1.a, A.1.c, A.2.a, and A.4 are independently applicable, meaning that compliance with one provision does not provide a "safe harbor" where there is non-compliance with another provision (i.e., compliance with the Provision A.4 does not shield a Copermittee who may have violated Provision A.1.a, A.1.c, or A.2.a from an enforcement action). The intent of Provision A.4 is to ensure that the Copermittees have the necessary storm water management programs and controls in place, and that they are modified by the Copermittees in a timely fashion when necessary, so that compliance with Provisions A.1.a, A.1.c, and/or A.2.a is achieved as soon as possible. USEPA expressed the importance of this independent applicability in a series of

comment letters on MS4 permits proposed by various Regional Water Boards. At that time, USEPA expressly objected to certain MS4 permits that included language stating, *"permittees will not be in violation of this [receiving water limitation] provision … [if certain steps are taken to evaluate and improve the effectiveness of the jurisdictional runoff management programs],"* concluding that this phrase would not comply with the CWA.[21]

The Ninth Circuit held in *Natural Resources Defense Council v. County of Los Angeles* (2011) 673 F3d. 880, 886 (revd. on other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013))) that engagement in the iterative process does not provide a safe harbor from liability for violations of permit terms prohibiting exceedances of water quality standards. The Ninth Circuit holding is consistent with the position of the State and Regional Water Boards that exceedances of water quality standards in an MS4 permit constitute violations of permit terms subject to enforcement by the Water Boards or through a citizen suit. While the Water Boards have generally directed dischargers to achieve compliance by improving control measures through the iterative process, the San Diego Water Board retains the discretion to take other appropriate enforcement and the iterative process does not shield dischargers from citizen suits under the CWA.

The requirements of Provision A.4, therefore, are required to be implemented until the water quality standards expressed under Provisions A.1.a, A.1.c, and A.2.a are achieved. The CWA requires MS4 permits to "*require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." The requirements of this Order have been deemed or determined to be "appropriate" to achieve water quality standards in receiving waters.

Part of the "*controls*" required by the Order is the process described in Provision A.4. Provision A.4 includes the process that is ultimately expected to achieve compliance with the requirement that discharges from the MS4 do not cause or contribute to violations of water quality standards in the receiving waters. The implementation of Provision A.4 is required when the Copermittees or the San Diego Water Board have determined that discharges from the MS4 are causing or contributing to violations of water quality standards in the receiving waters.

The Copermittees must effectively prohibit non-storm water discharges into the MS4s, reduce the discharge of pollutants in storm water from the MS4s to the MEP, and ensure that their MS4 discharges do not cause or contribute to violations of water quality standards. If the Copermittees have effectively prohibited non-storm water

[21] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.

discharges and reduced storm water pollutant discharges to the MEP, but their discharges are still causing or contributing to violations of water quality standards, Provision A.4 provides a clear "iterative process" for the Copermittees to follow.

Provision A.4 essentially requires the Copermittees to implement additional BMPs until MS4 discharges no longer cause or contribute to a violation of water quality standards.

In assessing compliance and potential enforcement actions, the San Diego Water Board looks at the Copermittees' efforts in total to meet the requirements of Provisions A.1.a, A.1.c, A.2.a and Provision A.4. The Copermittees need to demonstrate that they are making improvements to their programs and making progress toward achieving the discharge prohibitions and receiving water limitations in Provisions A.1.a, A.1.c, and A.2.a by implementing the requirements of Provision A.4. The San Diego Water Board would consider these efforts prior to strictly enforcing the requirements of Provisions A.1.a, A.1.c, and A.2.a. Causes of exceedances of the receiving water limitations can often be more difficult to identify and attribute solely to the Copermittees' MS4s. The intent of the Order is to provide the Copermittees more clarity and flexibility in addressing these exceedances through the iterative approach and adaptive management process until the requirements under Provisions A.1.a, A.1.c, and A.2.a are fully achieved.

An exception to the iterative approach and adaptive management process would be in receiving waters subject to adopted and approved TMDLs. For TMDLs that are incorporated into the Order, there is a specific date for compliance to be achieved, after which the iterative approach and adaptive management process required under Provision A.4 no longer provides the flexibility to achieve compliance. Where compliance dates for a TMDL have passed, compliance with the WQBELs incorporated into the Order established by a TMDL in Attachment E to protect water quality standards is required. Thus, after the interim or final compliance dates for a TMDL have passed, if the discharges from the Copermittees' MS4s are causing or contributing to a violation of WQBELs, exceedances of WQBELs must be strictly enforced by the San Diego Water Board. In the meantime, however, the Copermittees are in compliance with the interim or final TMDL requirements in Attachment E as long as the interim or final WQBELs are being achieved in accordance with the interim or final compliance dates.

In addition, this Order includes an optional pathway that incorporates the requirements of Provision A.4 and would allow a Copermittee to be deemed in compliance with the requirements under Provisions A.1.a, A.1.c, A.1.d, A.2.a, and A.3.b during implementation of a Water Quality Improvement Plan that incorporates specific additional requirements. This alternative compliance pathway and the additional specific requirements are described below under the discussion for Provision B.3.c.

B. Water Quality Improvement Plans

Purpose: Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges to the MS4s and control pollutants in storm water discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the Clean Water Act.

Provision B includes requirements for the Copermittees to develop and implement Water Quality Improvement Plans to ultimately comply with the prohibitions and limitations under Provision A. The Water Quality Improvement Plans will provide the Copermittees a comprehensive program that can achieve the requirements and further the objectives of the CWA. Implementation of the Water Quality Improvement Plans will also improve the quality of the receiving waters in the San Diego Region.

The Water Quality Improvement Plan is the backbone of the Regional MS4 Permit requirements. Provision B provides the guidance, criteria, and minimum expectations and requirements for the elements of the Water Quality Improvement Plan to be developed and implemented by the Copermittees. The Water Quality Improvement Plans will be implemented in the Watershed Management Area by the Copermittees within their jurisdictions through their jurisdictional runoff management programs.

The Water Quality Improvement Plan also incorporates a program to monitor and assess the progress of the Copermittees' jurisdictional runoff management programs toward improving the quality of discharges from the MS4s, as well as tracking improvements to the quality of receiving waters. A process to adapt and improve the effectiveness of the Water Quality Improvement Plans has also been incorporated into the requirements of Provision B to be consistent with the "iterative approach" required to achieve compliance with discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a, pursuant to the requirements of Provision A.4.

The Water Quality Improvement Plans have also been structured to incorporate the requirements of any TMDLs that have been adopted for the San Diego Region. Incorporating the requirements of the TMDLs into the requirements of Provision B allows the Copermittees to develop a single plan, instead of separate plans, to coordinate their non-storm water and storm water runoff management programs. The Water Quality Improvement Plans allow the Copermittees to meet the requirements of this Order, as well as fulfill the requirements of the TMDLs.

As an added benefit, if the Copermittees demonstrate that impaired water bodies within the Watershed Management Area listed on the 303(d) List will be addressed with their Water Quality Improvement Plans in a reasonable period of time, the San Diego Water Board may be able to remove the water bodies from the 303(d) List, which would greatly reduce the need for the San Diego Water Board to develop additional TMDLs that would have to be incorporated into the Order and implemented by the Copermittees.

***Discussion*:** The federal NPDES regulations require the Copermittees to develop a proposed management program (40 CFR 122.26(d)(2)(iv)). The proposed management program must include "*a comprehensive planning process*" and "*where necessary intergovernmental coordination*" for the "*duration of the permit.*" The Water Quality Improvement Plan is the Copermittees' "*comprehensive planning process*" document for the proposed management program that will be implemented within a Watershed Management Area. Implementation of the Water Quality Improvement Plan requires "*intergovernmental coordination*" among the Copermittees for at least the "*duration of the permit*," and likely into and beyond the next iteration of the permit.

Developing Water Quality Improvement Plans based upon watersheds is consistent with federal regulations that support the development of permit conditions, as well as implementation of storm water management programs, at a watershed scale (40 CFR 122.26(a)(3)(ii), 122.26(a)(3)(v), and 122.26(d)(2)(iv)). In 2003, USEPA issued a Watershed-Based NPDES Permitting Policy Statement (USEPA, 2003) that defines watershed-based permitting as an approach that produces NPDES permits that are issued to point sources on a geographic or watershed basis. In this policy statement, USEPA explains that "*[t]he utility of this tool relies heavily on a detailed, integrated, and inclusive watershed planning process*." USEPA identifies a number of important benefits of watershed permitting, including more environmentally effective results, the ability to emphasize measuring the effectiveness of targeted actions on improvements in water quality, reduced cost of improving the quality of the nation's waters and more effective implementation of watershed plans, including TMDLs, among others.

An emphasis on watersheds is appropriate at this stage in the San Diego Region's MS4 program to shift the focus to more targeted, water quality driven planning and implementation. Addressing discharges on a watershed scale focuses on water quality results by emphasizing the receiving waters in the watershed. The conditions of the receiving waters drive management actions, which in turn focus measures to address pollutant contributions from MS4 discharges.

The Water Quality Improvement Plan gives the Copermittees the responsibility of developing a comprehensive plan to coordinate the efforts of their jurisdictional runoff management programs for addressing the problems related to MS4 discharges causing impacts to water quality in the Watershed Management Area. The development of the plan provides the Copermittees the opportunity to provide

significant input on how to implement their jurisdictional runoff management programs, and how to best utilize their available resources in addressing a focused set of priorities that they believe will result in measureable improvements to water quality within the Watershed Management Area.

The Copermittees are encouraged to separate the Watershed Management Area into subwatersheds, as appropriate. This allows the Copermittees to identify priorities applicable to a subset of the Copermittees or specific water bodies or areas within the Watershed Management Area.

Included in the requirements for the elements to be included in the Water Quality Improvement Plan are monitoring and assessment requirements that are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order. In addition to the federal requirements of the CWA section 308(a) and 40 CFR 122.26(d), the San Diego Water Board has the authority to establish monitoring, reporting, and recordkeeping requirements for NPDES permits under CWC 13383.

More specific and detailed discussions of the requirements of Provision B are provided below.

Provision B.1 (Watershed Management Areas) requires the Copermittees to develop a Water Quality Improvement Plan for each of the Watershed Management Areas defined by the San Diego Water Board.

Pursuant to 40 CFR 122.26(d)(2)(iv), proposed management programs "*may impose controls on a…watershed basis…*" The Water Quality Improvement Plan is the Copermittees' proposed management program. A Water Quality Improvement Plan must be developed for each Watershed Management Area identified in the Order.

The Watershed Management Areas are identified in Table B-1. Table B-1 establishes ten (10) Watershed Management Areas, and identifies the Copermittees that are responsible for developing and implementing the Water Quality Improvement Plan for each Watershed Management Area.

The Copermittees from each of the three counties within the San Diego Region ~~are~~ were ~~expected to be~~ phased in as their respective NPDES municipal storm water permits expired. ~~Because~~ Order No. R9-2007-0001 expired in January 2012, and the San Diego County Copermittees ~~were~~ became covered under the Regional MS4 Permit on June 27, 2013, the effective date of the Order. ~~Because~~ Order No. R9-2009-0002 expired in December 2014, and the Orange County Copermittees ~~are~~ became covered under the Regional MS4 Permit on April 1, 2015, the effective date of Order No. R9-2013-0001 as amended by Order No. R9-2015-0001. Order No. R9-2010-0016 expired in November 2015, and the Riverside County Copermittees became covered under the Regional MS4 Permit on January 7, 2016, the effective

date of Order No. R9-2013-0001 as amended by Order No. R9-2015-0100.

~~After the San Diego Water Board receives and considers the Report of Waste Discharge required to be submitted by the Riverside County Copermittees pursuant to the requirements of their current permit, and makes any necessary changes to the Order, the Riverside County Copermittees will be covered under the Regional MS4 Permit after Order No. R9-2010-0016 expires in December 2015.~~

~~The Riverside County Copermittees also have the option to obtain coverage under the Regional MS4 Permit earlier than their respective permit expiration dates. The process to apply for early coverage is described Provision F.6.~~

~~Because the Santa Margarita River Watershed Management Area includes Copermittees from both San Diego County and Riverside County, a footnote to Table B-1 has been included to specify that the requirements of Provision B are not required to be implemented by the County of San Diego until the Riverside County Copermittees have received a notice of coverage under the Order. Until the Riverside County Copermittees are notified of coverage under the Order, the County of San Diego is subject to the prohibitions and limitations under Provision A, responsible for continuing to implement its existing jurisdictional runoff management program, and responsible for implementing the transitional monitoring and assessment requirements of Provision D, the transitional annual reporting requirements of Provision F.3.b, and the TMDL requirements of Attachment E to the Order.~~

The Cities~~y~~ of Laguna Woods, ~~and~~ Laguna Hills, Murrieta, and Wildomar are located partially within the jurisdictions of both the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board) and the San Diego Water Board. Written requests for designation of a single Regional Water Board to regulate matters pertaining to permitting of Phase I MS4 discharges were submitted to the San Diego Water Board and the Santa Ana Water Board by the City of Laguna Woods by letter dated September 8, 2014, ~~and~~ the City of Laguna Hills by letter dated March 12, 2014, the City of Murrieta by letter dated June 22, 2015, and the City of Wildomar by letter dated June 23, 2015. The Cities of Laguna Woods, ~~and~~ Laguna Hills, Murrieta, and Wildomar requested designation of the San Diego Water Board pursuant to CWC section 13228.

The Cities of Laguna Woods, ~~and~~ Laguna Hills, Murrieta, and Wildomar reported that management and implementation of municipal programs to comply with two different Phase I MS4 permits creates a significant administrative and financial burden and inhibits their ability to contribute to greater overall water quality improvements in either Region. In an effort to address these concerns, the San Diego Water Board and the Santa Ana Water Board have entered into ~~an~~ written agreements ~~dated February 10, 2015~~, whereby the San Diego Water Board is designated to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Laguna Woods, ~~and~~ Laguna Hills, Murrieta, and Wildomar including ~~areas~~ the portions of the jurisdictions within the

Santa Ana Region. The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated February 10, 2015 to designate the San Diego Water Board to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Laguna Woods and Laguna Hills, including the portions of the jurisdictions within the Santa Ana Region, upon the later effective date of ~~this~~ Order No. R9-2015-0001 or Santa Ana Water Board Tentative Order No. R8-2015-0001. The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated [Month][Day], 2015 to designate the San Diego Water Board to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Murrieta and Wildomar, including the portions of the jurisdictions within the Santa Ana Region upon the effective date of Order R9-2015-0100.

Under the terms of the agreements, each Regional Water Board retains the authority to enforce provisions of the Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee (Water Code section 13228 (b)). Also under the terms of the agreements, any TMDL and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Laguna Woods, ~~or~~ Laguna Hills, Murrieta, or Wildomar as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement of the applicable TMDL would remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's San Diego Creek/Newport Bay TMDL and Lake Elsinore/Canyon Lake Nutrient TMDLs, and the San Diego Water Board's Indicator Bacteria Project I Beaches and Creeks TMDL.

In conformance with the~~is~~ agreements, ~~a~~ footnotes to Table B-1 ~~has been~~ are included to specify coverage under Order No. R9-2013-0001 for those Phase I MS4 discharges within the jurisdictional boundaries of the Cities of Laguna Woods, ~~and~~ Laguna Hills, Murrieta, and Wildomar within the Santa Ana Region. ~~The f~~Footnote 1 to Table B-1 specifies that the Cities~~y~~ of Laguna Woods and Laguna Hills are identified as responsible Copermittees in the San Diego Creek/Newport Bay TMDL in the Santa Ana Region and remain obligated to comply with the San Diego Creek/Newport Bay TMDL pursuant to section XVIII of Tentative Order No. R8-2015-0001 (NPDES No. CAS618030) and any reissuance thereof. Footnote 4 to Table B-1 specifies that the Cities of Murrieta and Wildomar are identified as responsible Copermittees in the Lake Elsinore/Canyon Lake Nutrient TMDLs in the Santa Ana Region and remain obligated to comply with the Lake Elsinore/Canyon Lake Nutrient TMDLs pursuant to section VI.D.2 of Order No. R8-2010-0033 (NPDES No. CAS618030) or corresponding section as it may be amended or reissued.

The Cities~~y~~ of Lake Forest and Menifee ~~is~~ are located partially within the jurisdictions of both the Santa Ana Water Board and the San Diego Water Board. Written requests for designation of a single Regional Water Board to regulate matters pertaining to

permitting of Phase I MS4 discharges were submitted to the San Diego Water Board and the Santa Ana Water Board by the City of Lake Forest by letters dated January 14, 2013 and April 4, 2014, and the City of Menifee by letter dated June 25, 2015. The Cities of Lake Forest and Menifee requested designation of the San Ana Water Board pursuant to CWC section 13228. ~~By letters dated January 14, 2013 and April 4, 2014 the City of Lake Forest submitted a written request, pursuant to CWC section 13228, to the San Diego Water Board and the Santa Ana Water Board requesting the Santa Ana Water Board be designated to regulate matters within the City of Lake Forest pertaining to permitting of their Phase I MS4 discharges.~~

The Cities~~y~~ of Lake Forest and Menifee reported that management and implementation of municipal programs to comply with two different Phase I MS4 permits creates a significant administrative and financial burden and inhibits their ability to contribute to greater overall water quality improvements in either Region. In an effort to address these concerns, the San Diego Water Board and the Santa Ana Water Board have entered into ~~an~~ written agreements ~~dated February 10, 2015~~, whereby the Santa Ana Water Board is designated to regulate Phase I MS4 discharges within the jurisdictions of the Cities~~y~~ of Lake Forest and Menifee including the portions of the jurisdictions within the San Diego Region. The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated February 10, 2015 to designate the San Ana Water Board to regulate Phase I MS4 discharges within the jurisdiction of the City of Lake Forest, including portions of the jurisdiction within the Santa Diego Region, upon the later date of ~~this~~ Order No. R9-2015-0001 or Santa Ana Water Board Tentative Order No. R8-2015-0001. The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated [Month][Day], 2015 to designate the San Ana Water Board to regulate Phase I MS4 discharges within the jurisdiction of the City of Menifee, including portions of the jurisdiction within the San Diego Region, under Order No. R8-2010-0033 (NPDES No. CAS618030) as it may be amended or reissued upon the effective date of Order No. R9-2015-0100.

Under the terms of the agreements, each Regional Water Board retains the authority to enforce provisions of the Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee (Water Code section 13228 (b)). Also under the terms of the agreements, any TMDL and associated Phase I MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities~~y~~ of Lake Forest or Menifee as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement authority for the applicable TMDL would remain with the Regional Water Board which has the jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's San Diego Creek/Newport Bay TMDL and Lake Elsinore/Canyon Lake Nutrient TMDLs, and the San Diego Water Board's Indicator Bacteria Project I Beaches and Creeks TMDL.

In conformance with the~~is~~ agreements, ~~a f~~Footnote 2 to Table B-1 has been included to specify that Phase I MS4 discharges within the jurisdictional boundaries of the City of Lake Forest located within the San Diego Region will be regulated under Santa Ana Water Board Order No. R8-2015-0001 (NPDES No. CAS618030) and any reissuance thereof. The footnote specifies that the City of Lake Forest is an identified responsible Copermittee in the Indicator Bacteria Project I Beaches and Creeks TMDL (Bacteria TMDL) in the San Diego Region and remains obligated to comply with the Bacteria TMDL pursuant to Attachment E of Order No. R9-2013-0001 and any reissuance thereto. The City of Lake Forest is also identified as a responsible Copermittee in the San Diego Creek/Newport Bay TMDL established by the Santa Ana Water Board. The City remains obligated to comply with the San Diego Creek/New Port Bay TMDL pursuant to the Santa Ana Water Board's Phase I MS4 Permit (Tentative Order No. R8-2015-0001 (NPDES No. CAS618030), as it may be amended or reissued). Under the terms of the agreement, the City of Lake Forest must retain and continue implementation of the over irrigation prohibition in Title 15, Chapter 15, Section 14.030, List (b) of the City Municipal Code throughout its jurisdiction. Also under the terms of the agreement, the City of Lake Forest must actively participate in the development and implementation of the ~~Aliso Creek~~ South Orange County Watershed Management Area Water Quality Improvement Plan required pursuant to Order No. R9-2013-0001, and any reissuance thereof.

Footnote 3 to Table B-1 has been included to specify that Phase I MS4 discharges within the jurisdictional boundaries of the City of Menifee located within the San Diego Region will be regulated under Santa Ana Water Board Order No. R8-2010-0033 (NPDES No. CAS618033) and any reissuance thereof. At this time, the City of Menifee is not identified as a responsible Copermittee for any TMDLs established by the San Diego Water Board. Under the terms of the agreement, the City of Menifee must actively participate in the development and implementation of the Santa Margarita River Watershed Management Area Water Quality Improvement Plan required pursuant to Order No. R9-2013-0001, and any reissuance thereof.

The basis supporting the Cities of Laguna Woods, Laguna Hills, ~~and~~ Lake Forest, Menifee, Murrieta, and Wildomar requests to designate a specific Regional Water Board for regulatory oversight of Phase I MS4 discharges may change under future conditions and circumstances, therefore the San Diego Water Board will periodically review the effectiveness of the agreements during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate ~~the~~ one or both of the agreements with the Santa Ana Water Board or otherwise modify the agreements subject to the approval of the Santa Ana Water Board.

Provision B.2 (Priority Water Quality Conditions) requires the Copermittees in each Watershed Management Area to identify the highest priority water quality conditions which will be the focus of the Water Quality Improvement Plan implementation.

Provisions B.2.a and B.2.b provide the criteria that must be assessed when

characterizing the receiving water quality and potential impacts from MS4 discharges of the receiving waters within the Watershed Management Area. The criteria are based primarily on the requirements in 40 CFR 122.26(d)(1)(iv)(C) and (C)(1)-(9). Characterizing the receiving water quality and identifying the potential impacts caused by MS4 discharges to receiving waters in the Watershed Management Area is necessary to identify the impacts to receiving waters associated with MS4 discharges that are of the most concern to the Copermittees.

Based on the information required to be considered under Provisions B.2.a and B.2.b, Provision B.2.c requires to Copermittees to identify the highest priority water quality conditions related to discharges from the MS4s that will be the primary focus of the Water Quality Improvement Plan in the Watershed Management Area. Addressing and improving these highest priority water quality conditions will become the focus of each Copermittee's jurisdictional runoff management program as the Water Quality Improvement Plan is implemented in the Watershed Management Area. The highest priority water quality conditions are expected to include sources of pollutants and/or stressors, and/or receiving water conditions, that the Copermittees consider the highest threats or most likely to have adverse impacts on the physical, chemical, and biological integrity of receiving waters. Addressing these threats and/or adverse impacts should restore the physical, chemical, and biological integrity of receiving waters, and result in the restoration and protection of the beneficial uses of the receiving waters in the Watershed Management Area.

Provision B.2.d requires the Copermittees to identify known and suspected sources of pollutants and/or stressors contributing to the highest priority water quality conditions. The requirements of Provision B.2.d are based primarily on the requirements in 40 CFR 122.26(d)(1)(iii)(B)(1)-(6). The Copermittees are required to evaluate several factors in the identification of those sources. The Copermittees must consider and evaluate the following: (1) the land uses that may contribute toward impacts to receiving waters, (2) the locations of the Copermittees' MS4s that can convey and discharge runoff and pollutants to receiving waters, (3) other sources that discharge into the Copermittees' MS4s and receiving waters, and (4) other information and data that can help the Copermittees to evaluate the relative importance of or contribution from those sources toward the highest priority water quality conditions. Identifying the known and suspected sources, and their relative contribution toward the highest priority water quality conditions, will help the Copermittees to focus, direct, and prioritize their resources and implementation efforts within their jurisdictions.

Provision B.2.e requires the Copermittees to identify potential strategies that can result in improvements to water quality in MS4 discharges and/or receiving waters within the Watershed Management Area. Potential water quality improvement strategies will not necessarily be implemented by the Copermittees, but provide a "menu" of options that the Copermittees will consider for implementation. The public participation process that will be implemented during the development of the Water Quality Improvement Plan is where the potential water quality improvement strategies will be identified.

Provision B.3 (Water Quality Improvement Goals, Strategies and Schedules) requires the Copermittees in each Watershed Management Area to identify the goals that the Copermittees' jurisdictional runoff management programs will work toward achieving to address and improve the highest priority water quality conditions identified under Provision B.2.c; the strategies that will be implemented by the Copermittees within their jurisdictions and the Watershed Management Area to achieve the goals; and, the schedules for implementing the strategies and achieving the goals. The element of the Water Quality Improvement Plan required under Provision B.3 is where the "*comprehensive planning*" and "*intergovernmental coordination*" [40 CFR 122.26(d)(2)(iv)] of the Copermittees' actions for the proposed management programs within the Watershed Management Area is required to be described.

Provision B.3.a requires the Copermittees to identify interim and final numeric goals, and schedules to achieve those goals as part of the Water Quality Improvement Plans. Provision B.3.a.(1) requires the Copermittees to identify two types of numeric goals to be achieved:

(1) Final numeric goals in the receiving waters and/or MS4 discharges that will result in the protection of the water quality standards of the receiving waters for the highest priority water quality conditions identified by the Copermittees for Provision B.2.c. These final numeric goals are the ultimate goals for the Water Quality Improvement Plan, and the achievement and maintenance of these final numeric goals will indicate that one or more beneficial uses have been successfully restored and/or protected from MS4 discharges.

(2) Interim numeric goals that can be used by the Copermittees to demonstrate progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges for the highest priority water quality conditions in the Watershed Management Area. Achievement of the interim numeric goals will demonstrate to the San Diego Water Board that the Copermittees' implementation efforts are progressing toward achieving the final numeric goals.

Provision B.3.a.(1) does not specify what the interim and final numeric goals must be based on, but they essentially must be designed to achieve compliance with water quality standards in the receiving waters. To that end, the interim goals must be based on measureable criteria or indicators capable of demonstrating progress toward achieving the numeric goals.

The interim and final numeric goals can be based on the water quality objectives in the Basin Plan. The water quality objectives in the Basin Plan, however, consist of numeric and narrative water quality objectives. Numeric water quality objectives can be directly used as numeric goals. Narrative water quality objectives, on the other hand, will require some interpretation to identify numeric goals. The achievement of multiple numeric goals based on the water quality objectives, used in combination,

may be necessary to demonstrate that beneficial uses have been restored and/or protected.

The Copermittees could also propose other numeric goals that are not necessarily water quality objectives from the Basin Plan. For example, the Copermittees could propose a numeric goal that consists of achieving some percent improvement of a measureable indicator, such as acreage of a specific habitat or increase in a specific plant or animal species population. Other examples may include pollutant load reductions, number of impaired waterbodies delisted from the List of Water Quality Impaired Segments, Index of Biological Integrity (IBI) scores, etc.

The Copermittees may choose to develop interim numeric goals based on the final numeric goals they develop, such as incremental steps toward ultimately achieving the final numeric goals. The Copermittees may also choose to develop interim numeric goals that are based on other measureable indicators that can indirectly indicate improvements and progress toward the final numeric goals.

There are no limits to the types of interim numeric goals that could be proposed by the Copermittees, other than the goals must be based on measureable criteria or indicators capable of demonstrating progress toward achieving the numeric goals. Likewise, there are no limits to the types of final numeric goals that could be proposed by the Copermittees, other than the goals must "*restore and protect the water quality standards of the receiving waters.*"

Finally, Provision B.3.a.(2) also requires the Copermittees to develop schedules for measuring progress and achieving the interim and final numeric goals. Several criteria are included for the development of the schedules, but the Copermittees are required to achieve the numeric goals as soon as possible, consistent with federal NPDES regulations (40 CFR 122.47(a)(1)).

The Copermittees are also required to incorporate any compliance schedules for applicable ASBS or TMDL requirements. Applicable ASBS and TMDL compliance schedules are set forth in Attachment A and Attachment E to the Order, respectively. The information provided by the Copermittees under Provision B.3.a.(2) will be used by the Copermittees and the San Diego Water Board to gauge and track the progress of the Copermittees' efforts in addressing the highest priority water quality conditions identified in the Water Quality Improvement Plan.

Provision B.3.b requires the Copermittees to identify the strategies and schedules to implement those strategies as part of the Water Quality Improvement Plans. Provision B.3.b requires the Copermittees to identify the water quality improvement strategies that will be and may be implemented within the Watershed Management Area to 1) reduce pollutants in storm water discharged from the MS4 to the MEP, 2) effectively prohibit non-storm water discharges from entering the MS4, 3) protect water quality standards in receiving waters by controlling MS4 discharges so that they do not cause

or contribute to exceedances of receiving water limitations, and 4) achieve applicable WQBELs that implement TMDLs. The Copermittees will select the strategies to be implemented based on the likely effectiveness and efficiency of the potential water quality improvement strategies identified under Provision B.2.e to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, and/or achieve the interim and final numeric goals identified under Provision B.3.a.

Provision B.3.b.(1) requires each Copermittee to identify the strategies that will be or may be implemented within its jurisdiction. Each Copermittee is required to describe the strategies it is committed to implementing as part of its jurisdictional runoff management requirements under Provisions E.2 through E.7, and the optional jurisdictional strategies that the Copermittee will implement, as necessary, to achieve the numeric goals.

Each Copermittee is expected to implement the optional jurisdictional strategies identified under Provisions B.3.b.(1)(b) when the jurisdictional strategies it has committed to implement under Provision B.3.b.(1)(a) are not making adequate progress toward the interim and final numeric goals in accordance with the schedules established under Provision B.3.a. Provision B.3.b.(1)(b)(v) requires each Copermittee to describe the circumstances necessary to trigger implementation of the optional jurisdictional strategies, in addition to the requirements of Provisions B.3.b.(1)(a).

The San Diego Water Board recognizes that there may be optional jurisdictional strategies that will likely require funding and/or resources for planning, permitting, procurement of labor and materials, and implementation. Thus, Provision B.3.b.(1)(b)(iv) requires each Copermittee to describe the funding and/or resources that are necessary to implement these optional jurisdictional strategies. This information may provide interested groups and members of the public an understanding of the resources that they could provide or assist in obtaining to implement these optional jurisdictional strategies.

Provision B.3.b.(2) requires the Copermittees in the Watershed Management Area to identify the regional or multi-jurisdictional strategies that may be implemented, as necessary, to achieve the numeric goals. Similar to the requirements of Provision B.3.b.(1)(b), these regional or multi-jurisdictional strategies will likely require funding and/or resources for planning, permitting, procurement of labor and materials, and implementation, and San Diego Water Board recognizes that these strategies may be difficult to implement with only Copermittee resources. Thus, Provision B.3.b.(2)(d) requires the Copermittees to describe the funding and/or resources necessary to implement these optional regional or multi-jurisdictional strategies. This information may provide interested groups and members of the public an understanding of the resources that they could provide or assist in obtaining to implement these optional regional or multi-jurisdictional strategies.

Provision B.3.b.(3) requires the Copermittees to develop and include schedules in the Water Quality Improvement Plan for implementing the water quality improvement strategies identified under Provisions B.3.b.(1) and B.3.b.(2). The schedule for implementing the water quality improvement strategies will be used by the Copermittees and San Diego Water Board to measure and demonstrate the progress of the Copermittees' implementation efforts toward reducing pollutants in storm water discharged from the MS4 to the MEP, and eliminating illicit non-storm water discharges from entering the MS4.

Provision B.3.b.(4) provides the Copermittees in each Watershed Management Area the option of implementing watershed-specific structural BMP requirements for Priority Development Projects. Historically, storm water permits have included very specific performance standards for permanent, structural BMPs. These standards describe the expectation for the capture or treatment of pollutants and control of excessive flow before storm water is discharged from a site. The Copermittees were also allowed to develop waiver programs for Priority Development Projects to avoid implementing the structural BMPs; however, the waiver programs were not necessarily tied into any sort of holistic watershed strategy. The result is that implementation of BMP requirements is largely done on a site-by-site basis. This requires proper design on the part of the Priority Development Project and strict oversight on the part of the Copermittee.

Provision B.3.b.(4) promotes the evaluation of multiple strategies for water quality improvement, in addition to the implementation of permanent structural BMPs, on a watershed-scale versus the site-by-site approach. In a report issued by the Southern California Coastal Water Research Project (SCCWRP) and several other research institutions, the report emphasized that a successful hydromodification management program will involve watershed analysis as a first step, and that integrating multiple watershed-based strategies is preferable over a site-by-site approach. Indeed, the report states that the watershed analysis "…*should lead to identification of existing opportunities and constraints that can be used to help prioritize areas of greater concern, areas of restoration potential, infrastructure constraints, and pathways for potential cumulative effects*."[22] Provision B.3.b.(4) promotes the findings and recommendations of the report by providing a pathway for Copermittees to develop an integrated approach to their land development programs.

Under Provision B.3.b.(4), the Copermittees in a Watershed Management Area must first perform an analysis by gathering as much information pertaining to the physical characteristics of the Watershed Management Area as possible. This includes, for example, identifying potential areas of coarse sediment supply, present and anticipated future land uses, and locations of physical structures within receiving streams and upland areas that affect the watershed hydrology (such as bridges,

[22] 2012. ED Stein, F Federico, DB Booth, BP Bledsoe, C Bowles, Z Rubin, GM Kondolf, A Sengupta. Technical Report 667. Southern California Coastal Water Research Project. Costa Mesa, CA.

culverts, and flood management basins). Once this information is collected, the Copermittees must produce GIS layers (maps) that include this information.

From there, the Copermittees must use the results of the Watershed Management Area Analysis to identify and compile a list of candidate projects that could potentially be used as alternative compliance options for Priority Development Projects. Such projects include, for example, opportunities for stream or riparian area rehabilitation, opportunities for retrofitting existing infrastructure to incorporate storm water retention or treatment, and opportunities for regional BMPs, among others. Once these candidate projects are identified, Copermittees may allow Priority Development Projects to fund, partially fund, or completely implement these candidate projects. The Copermittees must first find that implementing such a candidate project would provide greater overall benefit to the watershed than requiring implementation of the structural BMPs onsite, and also enter into a voluntary agreement with the Priority Development Project that authorizes this arrangement. The Copermittees may use Provision B.3.b.(4) as both 1) a mechanism to reach their stated goals of the Water Quality Improvement Plan by using Priority Development Projects to either fund or implement projects that will provide water quality benefit, and 2) an alternative to requiring strict adherence to the structural BMP design standards.

Additionally, Provision B.3.b.(4) allows the Copermittees to use the results of the Watershed Management Area Analysis to identify areas within the Watershed Management Area where it is appropriate to allow Priority Development Projects to be exempt from the hydromodification management BMP performance requirements. Provision E.3.c.(2) already allows exemptions for Priority Development Projects that discharge to a conveyance channel whose bed and bank are concrete lined from the point of discharge to an enclosed embayment or the Pacific Ocean. However, there may be cases where further exemptions are warranted. The Copermittees may identify such cases on a watershed basis and include them in the Watershed Management Area Analysis; however, they must provide the supporting rationale to support all claims for exemptions.

Provision B.3.b.(4) provides an innovative pathway for Copermittees to regulate their land development programs by allowing alternative compliance in lieu of implementing structural BMPs on each and every Priority Development Project. This approach facilitates the integration of watershed-scale solutions for improving overall water quality and assisting Copermittees to achieve their stated goals of the Water Quality Improvement Plan. The San Diego Water Board understands, however, that undertaking this approach, which involves extensive planning, could be resource intensive for the Copermittees. Therefore, the Watershed Management Area Analysis is optional and not a requirement. The Copermittees can choose not to perform the watershed planning and mapping exercise described in Provision B.3.b.(4), and instead choose to require strict implementation of the structural BMPs onsite, pursuant to Provision E.3.c.

Provision B.3.c is included to provide the Copermittees an option that allows the Copermittees to be deemed in compliance with the prohibitions and limitations (receiving water limitations) of Provisions A.1.a, A.1.c, A.1.d, A.2.a, and A.3.b. One or more Copermittees within a Watershed Management Area can choose to implement this option. This option is only expected to be utilized by a Copermittee that wishes to be deemed in compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2.a, and A.3.b.

The alternative compliance pathway option included in Provision B.3.c is consistent with the approach described in Order WQ 2015-0075, *In the Matter of Review of Order No. R4-2012-0175, NPDES Permit No. CAS004001, Waste Discharge Requirements for Municipal Separate Storm Sewer System (MS4) Discharges within the Coastal Watersheds of Los Angeles County, Except Those Discharges Originating from the City of Long Beach MS4,* adopted by the State Water Board on June 16, 2015. State Water Board Order WQ 2015-0075 directs the Regional Water Boards to consider a watershed-based planning and implementation approach to compliance with receiving water limitations when issuing Phase I MS4 permits going forward. Order WQ 2015-0075 included seven principles that the Regional Water Boards are expected to follow when incorporating an alternative compliance pathway into a MS4 permit. The San Diego Water Board incorporated the seven principles stipulated in State Water Board Order WQ 2015-0075 into the Regional MS4 Permit as follows:

1. Provision A of this Order continues to require compliance with water quality standards in the receiving water and does not deem good faith engagement in the iterative process to constitute compliance with receiving water limitations. Provision A of this Order continues to be consistent with the receiving water limitations provisions from State Water Board Order WQ 99-05.

2. Compliance with Provision B.3.c constitutes compliance with the requirements of the Provision A.3.b, which requires compliance with the WQBELs of the TMDLs in Attachment E to the Order, and is considered compliance with receiving water limitations for those TMDL water body-pollutant combinations.

3. Provision B.3.c is an ambitious, rigorous, and transparent alternative compliance pathway that allows a Copermittee appropriate time to come into compliance with receiving water limitations without being in violation of the receiving water limitations during implementation of the compliance alternative.

4. Provision B.3.c requirements are incorporated into a Water Quality Improvement Plan. Water Quality Improvement Plans are a watershed-based planning and implementation approach, which address multiple contaminants, and incorporate TMDL requirements.

5. The strategies required to be included in the Water Quality Improvement Plans promote and incentivize the use of green infrastructure and requires the implementation of low impact development principles.

6. The strategies required to be included in the Water Quality Improvement Plans encourage multi-benefit regional projects that capture, infiltrate, and reuse storm water and support a local sustainable water supply.

7. The alternative compliance pathway of Provision B.3.c includes rigor and accountability. The Copermittee is required, through a transparent public process, to demonstrate that water quality issues in the watershed have been analyzed and prioritized, and that appropriate solutions are proposed. The Copermittee is also required, through a transparent process, to monitor the results and return to their analysis to verify assumptions and update the solutions. The Copermittee is required to conduct this type of adaptive management on its own initiative without waiting for direction from the San Diego Water Board.

In order for a Copermittee to utilize this option, the Copermittee is required to include three components in the Water Quality Improvement Plan. The first component is a comprehensive set of numeric goals and schedules that will demonstrate the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2.a, and A.3.b will be achieved within a specified period of time. The criteria provided in the Order will require the Copermittee to demonstrate that the discharges from its MS4s will not cause or contribute to exceedances of water quality objectives in the receiving waters, and/or the receiving waters will be adequately protected from adverse impacts attributable to the Copermittee's MS4 discharges. The Copermittee is also required to specify annual milestones to be achieved each year, which adds rigor, accountability, and transparency to the process. The annual milestones may consist of water quality improvement strategy implementation phases, interim numeric goals, and other acceptable metrics, which are expected to build upon previous milestones and lead to the achievement of the final numeric goals.

The second component is an analysis to demonstrate that implementation of the water quality improvement strategies required under Provision B.3.b will achieve the numeric goals within the established schedules required under Provisions B.3.a and B.3.c.(1). Because the development of the analysis may require significant resources, the Order allows the Copermittees in each Watershed Management Area that choose to implement this option to perform the analysis individually, or pool their resources for the analysis collectively.

The analysis must "reasonably" and "quantitatively" demonstrate that the implementation of the water quality improvement strategies can achieve the numeric goals within the established schedules. However, as more data and information are collected during implementation of the Water Quality Improvement Plan to demonstrate progress toward achieving the numeric goals, the numeric goals, water quality improvement strategies and schedules may need to be modified. If the data and information indicate that modification is needed, the Copermittee must also update the analysis. With the exception of numeric goals and schedules associated with

TMDLs from Attachment E to the Order, the modification to the analysis would be allowed as part of the adaptive management process of the Water Quality Improvement Plan. For TMDLs, modification of numeric goals or schedules would likely require an amendment to the Basin Plan and Attachment E to the Order before the analysis and Water Quality Improvement Plan could include such modifications.

Thus, the third component is the key component that allows a Copermittee to demonstrate the implementation of the water quality improvement strategies within its jurisdiction is making progress toward achieving the final numeric goals. Each Copermittee must specify the monitoring and assessments that will be performed to confirm that implementation of the water quality improvement strategies are making progress toward achieving the numeric goals within the established schedules, and whether the interim and final numeric goals have been achieved.

These three components must then be reviewed by the Water Quality Improvement Consultation Panel. The Water Quality Improvement Consultation Panel is required to be formed as part of the public participation process for the development of the Water Quality Improvement Plans. The Water Quality Improvement Consultation Panel is described under Provision F.1.a.(1)(b). Review by the Water Quality Improvement Consultation Panel is included to provide an additional layer of input, support, and accountability for the implementation of this option.

Compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2.a, and A.3.b begins when the Water Quality Improvement Plan, incorporating the requirements of Provision B.3.c.(1), is accepted by the San Diego Water Board. Each Copermittee that chooses to implement and continues to implement this option will be in compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2.a, and A.3.b as long as the Copermittee continues to implement the strategies, monitoring and assessments as incorporated in the Water Quality Improvement Plan in accordance with Provision B.3.c.(1), and the Copermittee reports the achievement of the annual milestones each year, or provides acceptable rationale and recommends appropriate modifications to the interim numeric goals, and/or water quality improvement strategies, and/or schedules to improve the rate of progress toward achieving the final numeric goals.

Provision B.4 (Water Quality Improvement Monitoring and Assessment) requires the Copermittees to develop an integrated monitoring and assessment program to track the progress of the Water Quality Improvement Plan toward meeting the implementation goals and schedules, and improving the water quality of the Watershed Management Area. Provision B.4 is the part of the Water Quality Improvement Plan where the Copermittees describe the monitoring data that will be collected, which is not only necessary to implement the "iterative approach" required by Provision A.4, but inform the adaptive management and "*comprehensive planning process*" that allows the Copermittees to make adjustments and modifications to the Water Quality Improvement Plans and the jurisdictional runoff management programs.

Provision B.4 requires the Copermittees, at a minimum, to include the requirements of Provision D as part of the water quality improvement monitoring and assessment program for the Water Quality Improvement Plan. The Copermittees, however, are not limited to the requirements of Provision D and may include additional monitoring and assessment methods to track progress toward improving water quality in the Watershed Management Area.

In addition to incorporating the requirements of Provision D, the water quality improvement monitoring and assessment program must incorporate any monitoring and assessment requirements specified for any applicable TMDLs included in Attachment E to the Order, and the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 for Watershed Management Areas with ASBS.

The monitoring and assessments required to be incorporated into the Water Quality Improvement Plan are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order.

Provision B.5 (Iterative Approach and Adaptive Management Process) requires the Copermittees to implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a.

Provision B.5 requires the Copermittees in each Watershed Management Area to re-evaluate the highest priority water quality conditions and potential water quality improvement strategies, the water quality improvement goals, strategies and schedules, and the water quality improvement monitoring and assessment program and provide recommendations for modifying those elements to improve the effectiveness of the Water Quality Improvement Plan. The re-evaluation of the Water Quality Improvement Plan is part of the assessment requirements of Provision D.

Provision B.6 (Water Quality Improvement Plan Submittal, Updates, and Implementation) requires to Copermittees to submit, update, and implement the Water Quality Improvement Plans.

The requirements for the process to develop and submit the Water Quality Improvement Plans is described in more detail under the discussion for Provision F.1. The process will include several opportunities for the public to provide input during the development of the Water Quality Improvement Plans. The process for updating the Water Quality Improvement Plans is described in more detail under the discussion for Provision F.3.c. Upon acceptance of the Water Quality Improvement Plan and updates, the Copermittees are required to immediately begin implementing the Water Quality Improvement Plan and subsequent updates.

The Water Quality Improvement Plan is expected to be a dynamic document that will

evolve over time. The Water Quality Improvement Plan is also expected to be a long term plan that focuses the Copermittees' efforts and resources on a limited set of priority water quality conditions, with the ultimate goal of protecting all the beneficial uses of the receiving waters within the Watershed Management Area from impacts that may be caused or contributed to by MS4 discharges. As the Copermittees collect data, implement their jurisdictional runoff management programs, and review the results from their water quality improvement monitoring and assessment program, the Water Quality Improvement Plan is expected to be continually reviewed and updated until compliance with Provisions A.1.a, A.1.b, and A.2.a is achieved.

However, in specific cases supported by robust analytical documentation the implementation of the Water Quality Improvement Plans may demonstrate that TMDLs are not necessary for identified impaired water bodies within the Watershed Management Area if the analytical record demonstrates that technology-based effluent limitations required by the CWA, more stringent effluent limitations required by state, local, or federal authority, and/or other pollution control requirements (e.g., best management practices) required by local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time.[23]

The San Diego Water Board submits an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. According to USEPA guidance for the Integrated Report,[24] water bodies are placed in one of five categories. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 are placed on the 303(d) List.

Category 4 in the Integrated Report is for water bodies where available data and/or information indicate that at least one beneficial use is not being supported or is threatened, but a TMDL is not needed.[25] Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

Impaired water bodies can be included in Category 4a if a TMDL has been adopted and approved. The TMDLs in Attachment E to the Order implement the requirements of the TMDLs adopted by the San Diego Water Board, and approved by the State Water Board and USEPA. The water bodies in Attachment E will be included in

[23] 40 CFR 130.7(b)(1)
[24] USEPA, 2005. Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act
[25] Ibid

Category 4a in the Integrated Report and removed from the 303(d) List.

Impaired water bodies can be included in Category 4b if there are *acceptable* "pollution control requirements" required by a local, state or federal authority stringent enough to implement applicable water quality standards within a reasonable period of time (e.g., a compliance date is set). When evaluating whether a particular set of pollution controls are "requirements," the USEPA considers a number of factors, including: (1) the authority (local, state, federal) under which the controls are required and will be implemented with respect to sources contributing to the water quality impairment (examples may include: self-executing state or local regulations, permits, and contracts and grant/funding agreements that require implementation of necessary controls), (2) existing commitments made by the sources and completion or soon to be completed implementation of the controls (including an analysis of the amount of actual implementation that has already occurred), (3) the certainty of dedicated funding for the implementation of the controls, and (4) other relevant factors as determined by USEPA depending on case-specific circumstances.[26]

Impaired water bodies can be included in Category 4c if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution. Pollution, as defined by the CWA is "the man-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of water."[27] In other cases, pollution does not result from a pollutant and a TMDL is not required. Examples of circumstances where an impaired segment may be placed in Category 4c include segments impaired solely due to lack of adequate flow, stream channelization, or hydromodification. In these situations, there may be water quality management actions that can address the cause(s) of the impairment, but a TMDL may not be required to implement the actions.

The Water Quality Improvement Plans will require the implementation of pollution controls and water quality management actions (i.e. water quality improvement strategies) which can result in the attainment of water quality standards in water bodies impaired by discharges from the Copermittees' MS4s. The Water Quality Improvement Plans also include requirements that are expected to attain water quality standards in a reasonable period of time. The San Diego Water Board considers the Water Quality Improvement Plans to be a commitment by the Copermittees to develop, plan, budget for, and implement pollution controls that will attain water quality standards in receiving waters in a reasonable period of time, or as soon as possible. The results of the Copermittees' efforts in implementing the Water Quality Improvement Plans can be used to re-evaluate the condition of the impaired water bodies during the next update to the 303(d) List.

After the Copermittees submit the Water Quality Improvement Plans and demonstrate

[26] Ibid
[27] CWA section 502(19)

that water quality standards are being attained or will be attained in a reasonable period of time, the San Diego Water Board may re-evaluate the water bodies on the 303(d) List. These water bodies on the 303(d) List may be re-evaluated and placed into Category 4b or Category 4c in the Integrated Report. The water bodies placed in Category 4b or Category 4c in the Integrated Report must show a record that the water bodies are attaining water quality standards or supporting the identified beneficial uses, or will attain water quality standards or support identified beneficial uses in a reasonable period of time, in order for the water bodies to be appropriately removed from the 303(d) List.

C. Action Levels

Purpose: Provision C includes requirements for the Copermittees to identify and include numeric action levels in the Water Quality Improvement Plan to direct and focus the Copermittees' jurisdictional runoff management program implementation efforts for controlling MS4 discharges to receiving waters.

***Discussion*:** Under Provision C, the numeric action levels required are for non-storm water discharges and storm water discharges. The non-storm water action levels (NALs) are applicable to non-storm water discharges from the Copermittees' MS4s, which can occur year-round. The storm water action levels (SALs) are applicable to storm water discharges from the Copermittees' MS4s, which occur during the rainy season defined as the period between October 1 and April 30.

The action levels required by Provision C are based on the action level requirements that were developed and incorporated into Order Nos. R9-2009-0002 and R9-2010-0016, the Orange County and Riverside County MS4 Permits, respectively. The Fact Sheets for these Orders provide detailed discussions about the development of the numeric NALs and SALs included in this Order.

Order Nos. R9-2009-0002 and R9-2010-0016 required the Copermittees to perform prescribed actions if the NALs or SALs are exceeded. The actions required under Order Nos. R9-2009-0002 and R9-2010-0016 generally included conducting additional monitoring and source investigations when a discharge from the MS4 is observed to exceed one or more NALs and/or SALs.

For this Order, however, the action levels of Provision C are to be used by the Copermittees to prioritize the actions to be implemented as part of the Water Quality Improvement Plan. Monitoring data collected by the Copermittees from MS4 outfalls will be compared with the NALs and SALs. Exceedances of the NALs and SALs will not require the Copermittees to immediately identify sources causing exceedances, but will provide some numeric indicator levels that can give the Copermittees a way to measure the relative severity of a pollutant contributing to receiving water quality impacts.

NALs and SALs must be included in the Water Quality Improvement Plans to be used by the Copermittees in directing and focusing their water quality improvement strategies. The Copermittees are expected to utilize the NALs and SALs to help focus their implementation efforts on addressing pollutants that have the most significant potential or observed impacts to receiving waters. The NALs and SALs will be used as part of the MS4 discharges assessments required under Provision D.4.b. The NALs and SALs may also be used by the Copermittees as the numeric goals to be achieved in MS4 discharges and/or receiving waters as the Water Quality Improvement Plans are implemented.

More specific and detailed discussions of the requirements of Provision C are provided below.

Provision C.1 (Non-storm Water Action Levels) requires the Copermittees to incorporate NALs into the Water Quality Improvement Plan for pollutants and/or constituents that are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions identified in the Water Quality Improvement Plan related to non-storm water discharges from the MS4s. NALs generally must be consistent with the water quality objectives found within the Basin Plan.

The NALs have been included to ensure that the Copermittees are implementing and complying with several requirements of the MS4 permit. The federal CWA requires permits for municipal storm sewer systems to "*effectively prohibit non-storm water discharges into the storm sewers*." The federal NPDES regulations, which were promulgated to implement the CWA requirements for discharges from municipal storm sewers, require a program to address illicit discharges, which are non-storm water discharges. Provision A.1.b prohibits "*[n]on-storm water discharges into MS4s*" unless the non-storm water discharge authorized by a separate NPDES permit. The NALs will be used as part of the illicit discharge detection and elimination program required pursuant to Provision E.2, as well as part of the MS4 discharges assessments required pursuant to Provision D.4.b.

Provision A.1.a prohibits non-storm water discharges from the MS4 from "*causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state.*" In addition, pursuant to Provision A.2.a, non-storm water discharges "*must not cause or contribute to the violation of water quality standards in any receiving waters*."

Ideally, the Copermittees' jurisdictional runoff management programs will eliminate all non-storm water discharges entering the MS4s within their jurisdictions. The complete elimination of non-storm water discharges to the Copermittees' MS4s would be in compliance with the CWA requirements for non-storm water discharges, as well as the prohibitions and limitations of Provisions A.1.a and A.2.a.

The federal regulations, however, also refer to several non-storm water discharge categories that must be addressed as illicit discharges if they are found to be a source of pollutants. The federal regulations thus identify some non-storm water discharges that are not required to be addressed as illicit discharges if they are not a source of pollutants (e.g. non-storm water discharges specified in Provisions E.2.a.(1)-(5)). Thus, these regulations imply that some non-storm water discharges into and from the MS4 may occur even if non-storm water discharges are "effectively" prohibited by the Copermittees.

If the source of a non-storm water discharge is identified as a category of non-storm water specified in Provisions E.2.a.(1)-(5), the NALs can be used to determine if the category of non-storm water discharges is a source of pollutants. For other non-storm water discharges not specified in Provisions E.2.a.(1)-(5), the CWA requires those discharges to be "*effectively"* prohibited by removing the discharge to the MS4 through enforcement of the Copermittees' legal authority established under "*ordinance, order or similar means*" to prohibit illicit discharges to the MS4s.

If there are non-storm water discharges that are not required to be addressed as illicit discharges, those discharges must comply, at a minimum, with the discharge prohibitions and receiving water limitations of Provision A. Thus, the non-storm water discharges from the MS4 must be at levels that will not cause or contribute to a condition of pollution, contamination, or nuisance (Provision A.1.a), and must not cause or contribute to a violation of water quality standards in receiving waters (Provision A.2.a) to be consistent with the discharge prohibitions and receiving water limitations of Provisions A.1.a and A.2.a.

Furthermore, the San Diego Region has predominantly intermittent and ephemeral rivers and streams which vary in flow volume and duration at spatial and temporal scales. For most of these river and stream systems, non-storm water discharges from the MS4 are likely to be the most significant or the only source contributing to surface flows present within the receiving water, especially during the dry season.

Therefore, because of the prohibitions and limitations of Provision A.1.a and A.2.a, and the likelihood that non-storm water discharges from the MS4 are the most significant or only source contributing to surface flows present within the receiving water, NALs generally must be consistent with the water quality objectives found within the Basin Plan. Non-storm water discharges that are meeting the NALs would not be expected to cause or contribute to an exceedance of water quality objectives in receiving waters, which would be consistent with the discharge prohibitions and receiving water limitations of Provisions A.1.a and A.2.a.

Exceedances of the NALs would then provide an indication of the relative severity of a pollutant in non-storm water discharges from the MS4 contributing to potential or observed receiving water quality impacts. The relative severity or significance of a pollutant in non-storm water discharges from the MS4 will provide the Copermittees a valuable source of information that can be used to identify priority water quality conditions within a Watershed Management Area and within each Copermittee's jurisdiction.

Tables C-1 through C-4 under Provision C.1.a specify numeric NALs for several parameters or pollutant constituents for non-storm water discharges from the MS4 to several water body types. The NALs for MS4 discharges given under Provision C.1.a are based on the water quality objectives for inland surface waters in the Basin Plan, and the water quality objectives for ocean waters in the Ocean Plan. The NALs for

most of the metals were calculated based on the State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP). The NALs provided in Tables C-1 through C-4 must be included in the Water Quality Improvement Plans required to be developed pursuant to Provision B.

Provision C.1.b requires the Copermittees to identify NALs for pollutants and/or constituents, not specified in Provision C.1.a, which are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions of the Watershed Management Area related to non-storm water discharges from the MS4s. The NALs must be based on the water quality objectives in the Basin Plan. The NALs identified under Provision C.1.b must be included in the Water Quality Improvement Plan.

The San Diego Water Board recognizes that some of the NALs required pursuant to Provisions C.1.a and C.1.b may be exceeded more frequently than not. Thus, Provision C.1.c has been included in the Order to provide the Copermittees the option to develop secondary NALs that are set at levels greater than the levels required pursuant to Provisions C.1.a and C.1.b to further refine the prioritization and assessment of water quality improvement strategies for addressing non-storm water discharges to and from the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and from the MS4.

Provision C.2 (Storm Water Action Levels) requires the Copermittees to incorporate SALs into the Water Quality Improvement Plan for pollutants and/or constituents causing or contributing, or may be causing or contributing, to the highest priority water quality conditions identified in the Water Quality Improvement Plan related to storm water discharges from the MS4s.

The SALs have been included to ensure that the Copermittees are implementing and complying with several requirements of the MS4 permit. Provision A.1.a prohibits storm water discharges from the MS4 from "*causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state.*" In addition, pursuant to Provision A.2.a, storm water discharges "*must not cause or contribute to the violation of water quality standards in any receiving waters*."

Provision A.3.a, however, implicitly acknowledges that compliance with Provisions A.1.a and A.2.a cannot be achieved immediately for discharges of storm water from the MS4 by applying the MEP standard. Thus, Provision A.4 requires the Copermittees to implement an iterative approach to demonstrate that MEP is being achieved. This approach is supported by USEPA.

The federal CWA requires permits for municipal storm sewer systems to "*require controls to reduce the discharge of pollutants [in storm water] to the maximum extent*

practicable, *including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants.*" MEP is an ever-evolving, flexible, and advancing concept. As knowledge about controlling storm water runoff and discharges evolves, so does the knowledge which constitutes MEP. Reducing the discharge of storm water pollutants from the MS4 to the MEP requires the Copermittees to assess their jurisdictional runoff management programs and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP. The SALs provide the Copermittees measureable goals that may be used to demonstrate the achievement of MEP for reducing pollutants in storm water discharges from the MS4. The SALs will be used as part of the MS4 discharges assessments required under Provision D.4.a.

In June of 2006, the State Water Board's Blue Ribbon Storm Water Panel released its report titled "*The Feasibility of Numerical Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities*." In the recommendations, the Blue Ribbon panel proposed storm water effluent limitations which are computed using statistical based population approaches. The SALs specified in Table C-5 under Provision C.2.a were developed from a regional subset of nationwide Phase I MS4 data by using USEPA Rain Zone 6 (arid west) data.[28] Additionally, utilization of regional data is appropriate due to the addition of data into the nationwide Phase I MS4 monitoring dataset in February 2008. This additional data increased the number of USEPA Rain Zone 6 samples to more than 400, and included additional monitoring events within Southern California.

Utilizing data from USEPA Rain Zone 6 resulted in SALs which closely reflect the environmental conditions experienced in the San Diego Region. The localized subset of data includes sampling events from multiple Southern California locations including Orange, San Diego, Riverside, Los Angeles, and San Bernardino Counties. The dataset includes samples taken from highly built-out impervious areas and from storm events representative of Southern California conditions.

The SALs for cadmium, copper, lead and zinc require the measurement of hardness and to provide more specificity in the assessment of samples with SALs for total metal concentrations. While USEPA Rain Zone 6 data include a large sample size for concentrations of total metals, the impact the concentration will have on receiving waters will vary with receiving water hardness. Since it is the goal of the SALs, through the iterative process and MEP standard, to have MS4 storm water discharges meet all applicable water quality objectives, the hardness of the receiving water should be used when assessing the total metal concentration of a sample.

Thus, when there is an exceedance of a SAL for a metal, the Copermittee must determine if that exceedance is above the existing applicable water quality objectives

[28] Data used to develop SAL were obtained from http://rpitt.eng.ua.edu/Research/ms4/mainms4.shtml

based upon the hardness of the receiving water. The water quality objectives Copermittees must use to assess total metal SAL exceedances are the California Toxic Rule (CTR) and USEPA National Recommended Water Quality Criteria for Freshwater Aquatic Life 1 hour maximum concentrations. The 1-hour maximum concentration is to be used for comparison since it is expected to most replicate the impacts to waters of the State from the first flush following a precipitation event.

The statistically calculated SALs given in Table C-5 are at levels greater than the water quality objectives in the Basin Plan or Ocean Plan. Because the objective of the CWA is to "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*", meaning eventually pollutants in storm water discharges must be reduced to a level that cannot cause or contribute to an exceedance of water quality objectives in receiving waters, over time the SALs are expected to be reduced to a level that is based on the water quality objectives rather than statistical calculations. The San Diego Water Board will review the SALs as more data for discharges of storm water from the MS4s are collected, and revise them as conditions improve and the MEP standard advances. For the Water Quality Improvement Plans required under this Order, the SALs identified under Provision C.2.a must be included.

Provision C.2.b requires the Copermittees to identify SALs for pollutants and/or constituents, not specified in Provision C.2.a, which are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions of the Watershed Management Area related to storm water discharges from the MS4s. The SALs identified under Provision C.2.b must be included in the Water Quality Improvement Plan.

The San Diego Water Board recognizes that some of the SALs required pursuant to Provisions C.2.a and C.2.b may be exceeded more frequently than not. Thus, Provision C.2.c has been included in the Order to provide the Copermittees the option to develop secondary SALs that are set at levels greater than the levels required pursuant to Provisions C.2.a and C.2.b to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s.

D. Monitoring and Assessment Program Requirements

Purpose: Provision D includes minimum monitoring and assessment requirements that must be developed and implemented by the Copermittees as part of the Water Quality Improvement Plans. Implementation of the monitoring and assessment requirements of Provision D will allow the Copermittees to demonstrate that the requirements of the CWA to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP are being achieved. Implementation of the monitoring and assessment requirements of Provision D will also allow the Copermittees and the San Diego Water Board to track improvements to the water quality in the San Diego Region. The monitoring and assessment program requirements are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order.

***Discussion*:** The San Diego Water Board recognized that changes to the monitoring and assessment requirements of the Fourth Term Permit were necessary to improve the usefulness and usability of monitoring data collected by the Copermittees to support their jurisdictional storm water programs more efficiently and with increased effectiveness. The data collected are needed to better inform the Copermittees' understanding of the physical, chemical, and biological condition of the receiving waters and the quality of the MS4 discharges. The monitoring program needs to provide opportunities for the Copermittees to integrate regional monitoring efforts into municipal storm water monitoring requirements to provide a cost-effective approach to monitoring and avoid duplication of efforts.

The requirements in Provision D were largely recommended by the Copermittees as an outcome of the San Diego Water Boards Focused Meeting process. The monitoring and assessment program requirements now require collection of more specific information necessary for each Copermittee to adapt its jurisdictional runoff management program in such a way that focuses resources on a watershed's highest priority water quality conditions. The monitoring and assessment program will require the Copermittees to collect data that can be utilized to answer both watershed level management questions (e.g. Are the chemical, physical, and biological conditions of a receiving water protective, or likely protective of beneficial uses?), and specific jurisdictional runoff management program activity questions (e.g. Are the water quality improvement strategies of the jurisdictional program effectively eliminating non-storm water discharges to the MS4?).

The monitoring data collected and assessment information that will be reported to the San Diego Water Board are necessary to determine if the Copermittees are complying with the prohibitions and limitations of Provision A. The required monitoring and assessments that must be reported to the San Diego Water Board will be utilized for three purposes:

(1) Inform the Copermittees, San Diego Water Board, and the public on the progress of the Copermittees' efforts to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP;

(2) Inform the Copermittees, San Diego Water Board, and the public on the condition of water bodies receiving discharges from the Copermittees' MS4, and the progress of the Copermittees' water quality improvement implementation efforts toward improving the receiving water quality; and

(3) Inform the Copermittees, the San Diego Water Board, and the public on the effectiveness of the Water Quality Improvement Plan toward achieving (1) and (2).

The monitoring and assessment information reported pursuant to Provision F is also expected to be key to the iterative approach and adaptive management process required under Provision A.4 and implemented through the Water Quality Improvement Plan required under Provision B. As required by Provision A.4, the iterative approach and adaptive management process is required if the Copermittees cannot meet the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c, and/or A.2.a under the present conditions.

Provision D provides the minimum monitoring and assessment requirements that must be included in each Water Quality Improvement Plan to be developed and implemented by the Copermittees. The Copermittees, however, are not limited to the requirements of Provision D and may include additional methods to track progress toward improving water quality in a Watershed Management Area.

More specific and detailed discussions of the requirements of Provision D are provided below.

Provision D.1 (Receiving Water Monitoring Requirements) specifies the minimum receiving water monitoring that the Copermittees must conduct within the Watershed Management Area and include as part of the Water Quality Improvement Plan.

Provision D.1 establishes minimum monitoring requirements that must be conducted by the Copermittees within each Watershed Management Area. Provision D.1 requires the Copermittees to collect and develop the data and information necessary to determine potential impacts to the beneficial uses in the receiving waters due to discharges from the MS4s. The monitoring required under Provision D.1 will also provide the data that will allow the Copermittees to gauge the effectiveness and progress of its Water Quality Improvement Plan implementation efforts toward improving the quality of receiving waters.

The receiving water monitoring requirements of Provision D.1 are focused primarily on monitoring the conditions and response of the receiving waters to the Copermittees'

collective implementation efforts to reduce receiving water impacts that may be caused by the discharges from the MS4s. The preference of the San Diego Water Board is for the Copermittees to spend their resources achieving tangible and observable improvements in receiving water conditions instead of collecting samples and analyzing data that has consistently indicated that receiving water conditions are degraded and require improvement. In general, the ability to measure potential improvements in receiving water conditions due to any actions implemented by the Copermittees as part of the Water Quality Improvement Plan may require several years before a response can be observed. Thus, the frequency of collecting receiving water monitoring data has been kept to a minimum.

During the transitional period between adoption of this Order and San Diego Water Board acceptance of a Water Quality Improvement Plan, the Copermittees must conduct receiving water monitoring in accordance with Provision D.1.a. This approach to collecting receiving water data is different from what was required in the Fourth Term Permits, but one that truly embraces the concept of an integrated, cost-effective, streamlined receiving water monitoring approach.

Provision D.1.a requires Copermittees to continue performing the receiving water monitoring programs required in Order Nos. R-2007-0001, R9-2009-002, and R9-2010-0016; plus participation in: hydromodification management plan monitoring approved by the San Diego Water Board, monitoring plans as part of load reduction plans (either Bacteria Load Reduction Plans or Comprehensive Load Reduction Plans) for TMDLs in Attachment E of the Order, Storm Water Monitoring Coalition Regional Monitoring, Southern California Bight Regional Monitoring, Sediment Quality Monitoring, and ASBS Monitoring as applicable to a Watershed Management Area.

Provision D.1.a also provides an opportunity for the Copermittees to use third party data to meet receiving water monitoring requirements where feasible. Allowing the Copermittees to use the data currently collected through its participation in existing regional receiving water programs and that of third parties provides an efficiency of resources in obtaining the data necessary to inform the Copermittees and the San Diego Water Board about the physical, chemical, and biological conditions of the receiving waters, which can also help to focus the receiving water monitoring during the implementation of the Water Quality Improvement Plan. Once a Water Quality Improvement Plan is developed for a Watershed Management Area in compliance with Provision B of this Order, the transitional period is over and Copermittees are required to conduct receiving water monitoring according to the requirements of Provisions D.1.b-e.

Provision D.1.b requires each Copermittee to identify at least one long term receiving water monitoring station to be representative of receiving water quality within each Watershed Management Area. Long term receiving water monitoring stations can be located at any existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees. The requirements under Provision D.1.b. are

consistent with 40 CFR 122.26(d)(2)(iii)(D), which specifies that a "*monitoring program for representative data collection for the term of the permit*" may include "*instream locations.*" For each Watershed Management Area, at least one long term watershed monitoring station is required to be established and monitored. The Copermittees may choose to establish additional long term monitoring stations where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

Provision D.1.b. requires the Copermittees to locate the long term receiving water monitoring station at one of these existing receiving water monitoring stations to provide the Copermittees an opportunity to experience monitoring cost savings while continuing to collect the necessary data to assess the status and trends of receiving water quality conditions in 1) coastal water, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under both dry weather and wet weather conditions. Ideally these stations will continue to be monitored as part of the receiving water monitoring for each Watershed Management Area to maintain a consistent set of locations and a period of data that can be built upon with the monitoring required under this Order.

The receiving water monitoring requirements are separated into monitoring required during dry weather conditions pursuant to Provision D.1.c, and wet weather conditions pursuant to Provision D.1.d.

At each long term monitoring station the Copermittees must conduct at least three dry weather monitoring events as required pursuant to Provision D.1.c and at least three wet weather monitoring events as required pursuant to Provision D.1.d per permit term. Provisions D.1.c and D.1.d require the Copermittees to monitor priority water quality conditions identified in the Water Quality Improvement Plan, constituents listed as causing impairment of receiving waters in the Watershed Management Area, applicable NALs, toxicity, constituents listed in Tables D-2 and D-3, and constituents for implementation plans (e.g. Bacteria Load Reduction Plans and Comprehensive Load Reduction Plans). Required toxicity monitoring was changed to reflect an updated understanding of the unique challenges associated with sampling storm water for toxicity. Copermittees are required to sample receiving water for toxicity during each dry weather and each wet weather event pursuant to Provision D.1.c.(4) and D.1.d.(4). Required toxicity monitoring is now consistent with the State Water Resources Control Board Policy for Toxicity Assessment and Control (Draft June 2012) and recently adopted MS4 permits for Caltrans and Los Angeles Water Board. Receiving water monitoring efforts in this Order have been streamlined to redirect resources to monitoring efforts that better support pollutant reduction solutions with an increasing emphasis on MS4 outfall monitoring, source identification, and source abatement activities.

In addition to the receiving water monitoring requirements under Provisions D.1.b-d, Provision D.1.e requires the Copermittees participate in and/or conduct other types of receiving water monitoring. As recommended and requested by the Copermittees, Provision D.1.e.(1) requires the Copermittees to participate in existing regional monitoring, as applicable to each Watershed Management Area. Existing regional

monitoring includes monitoring conducted by the Storm Water Monitoring Coalition and for the Southern California Bight. Participation in and use of monitoring data collected from these existing regional water quality monitoring programs provide the Copermittees a greater opportunity for efficiency in the use of their resources to manage their storm water programs and those controllable discharges under their authority.

Provision D.1.e.(1)(c) requires the south Orange County MS4 Copermittees to participate in "unified regional beach water quality monitoring." This monitoring replaces requirements to conduct "core monitoring" of beach water quality, as provided for in Appendix III of the Ocean Plan.

Several different public agencies currently conduct routine, ongoing beach water quality monitoring in south Orange County in accordance with several different sets of requirements. The monitoring programs implemented to meet those requirements overlap temporally and spatially. These monitoring programs are partially but not fully integrated. In November 2010, the State Water Board adopted Resolution No. 2010-0053, which directed Regional Water Boards to work with dischargers to modify beach water quality monitoring programs required by Regional Water Board-issued permits in order to eliminate redundancies and incorporate beach water quality monitoring required by beach water quality statutes, where appropriate.

In April 2012, the San Diego Water Board requested that its staff review beach water quality monitoring conducted in south Orange County. To assist in responding to that request, staff of the Board convened a workgroup that included representatives of the three public agencies that currently conduct almost all of the routine, ongoing beach water quality monitoring in south Orange County, i.e., South Orange County Wastewater Authority (SOCWA), Orange County Public Works, and Orange County Health Care Agency (OCHCA). The workgroup also included other interested parties, including representatives of the Sierra Club and Surfrider Foundation. In December 2012, the San Diego Water Board adopted Resolution No. R9-2012-0069, which endorsed the San Diego Water Board staff report entitled "A Framework for Monitoring and Assessment in the San Diego Region," dated November 2012.

The unified program is consistent with and will meet or exceed the minimum requirements for beach water quality monitoring and related public notification and reporting established by State law, including the Ocean Plan. The unified program is consistent with State Water Board Resolution No. 2010-0053. The unified program is also consistent with and will help implement, "A Framework for Monitoring and Assessment in the San Diego Region," which emphasizes the need for question-driven, beneficial use-oriented monitoring and assessment. The primary purpose of the unified program will be to answer the question "Does beach water quality meet standards for the beneficial use of water contact recreation?"

The unified program is intended to be protective; it will help protect the health of swimmers, surfers, and others who use south Orange County beach waters for water

contact recreational activities. The unified program is also intended to be reasonable; it will eliminate duplicative monitoring and will include triggers for public notification and additional sampling at all sampling stations year-round. The unified program is intended to be equitable; responsibility for implementation of the unified program will be shared and the responsible agencies will jointly make arrangements to implement the program and will have the flexibility to jointly make short and/or long term changes in those arrangements.

The San Diego Water Board Executive Officer issued a written directive on December 5, 2014, pursuant to California Water Code section 13383, for SOCWA and the south Orange County MS4 Copermittees to implement the unified program in cooperation with OCHCA. The Executive Officer may make revisions to the unified program, provided that the unified program, as revised, continues to be consistent with and meet the requirements of State law, including the Ocean Plan, for beach water quality monitoring and related public notification and reporting. Following a thirty day public comment period, and subject to a request for a hearing before the San Diego Water Board, any such revision shall take effect as specified in a written directive issued by the Executive Officer pursuant to CWC section 13383. The program and any Executive Officer issued revisions to the program are subject to CWC section 13320 right of review from the date of issuance.

The unified program will supersede the existing routine, ongoing, beach water quality monitoring programs in south Orange County that are conducted in accordance with the existing requirements of the NPDES permits for discharges from the SOCWA ocean outfalls and the south Orange County MS4s. The requirement to participate in "regional monitoring" of beach water quality replaces requirements to conduct "core monitoring" of beach water quality, as provided for in Appendix III of the Ocean Plan.

The State Water Resources Control Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part 1 Sediment Quality which became effective August 25, 2009 (Sediment Quality Monitoring Policy). Provision D.1.e.(2) requires any Copermittees with MS4 discharges to an enclosed bay or estuary to monitoring the sediments in the enclosed bay or estuary receiving water in accordance with the sediment quality monitoring procedures as prescribed in the Sediment Quality Monitoring Policy.

The State Water Board adopted Resolution No. 2012-0012 which approved exceptions to the California Ocean Plan for selected discharges into Areas of Special Biological Significance (ASBS), including special protections for beneficial uses. State Board Resolution No. 2012-0012 became effective on March 20, 2012, and Attachment B to the Resolution established limitations on point source storm water discharges to ASBS. Copermittees with MS4s that discharge to an ASBS must monitor its discharge to assure compliance with State Board Resolution No. 2012-0012 as required pursuant to Provision D.1.e.(3).

The San Diego Water Board is developing a regional monitoring strategy to assess the conditions of receiving waters in the San Diego Region. The monitoring requirements of Provision D.1 are expected to be incorporated or serve as a foundation of this regional monitoring strategy, but may require some modifications. When the San Diego Water Board develops an alternative regional monitoring strategy, the Copermittees will be required to participate in the development and implementation of the alternative regional monitoring program pursuant to Provision D.1.f.

Provision D.2 (MS4 Outfall Discharge Monitoring Requirements) specifies the minimum MS4 outfall discharge monitoring requirements that the Copermittees must incorporate and implement as part of the Water Quality Improvement Plan.

The dry weather MS4 outfall discharge monitoring requirements are included under Provisions D.2.a.(2) and D.2.b. The dry weather MS4 outfall discharge monitoring requirements are part of the "*program, including a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer*" required by 40 CFR 122.26(d)(2)(iv)(B), which is expected to achieve compliance with the CWA section 402(p)(3)(B)(ii) statutory requirement for municipal storm water permits to require the Copermittees to "*effectively prohibit non-storm water discharges into the storm sewers*." The dry weather MS4 outfall discharge monitoring data collection requirements are based on requirements under 40 CFR 122.26(d)(1)(iv)(D) and 122.26(d)(2)(iv)(B)(3).

The dry weather MS4 outfall discharge monitoring requirements are designed to provide wide spatial and temporal coverage of each jurisdiction to better understand the extent and magnitude of non-storm water discharges to receiving waters, and make a distinction between persistent and transient non-storm water flows. This information is expected to allow each Copermittee to focus its resources on eliminating and controlling the highest priority threats to receiving water quality, as well as integrating other elements of the storm water programs (e.g. complaint call response) and third party data to efficiently and effectively assist in efforts to eliminate non-storm water discharges.

The dry weather MS4 outfall discharge monitoring requirements of Provision D.2.a.(2) and D.2.b are separated into monitoring required before and after the San Diego Water Board accepts the Copermittees' Water Quality Improvement Plan. Outfall monitoring conducted prior to acceptance of the Water Quality Improvement Plan is referred to in the Order as Transitional MS4 Outfall Discharge Monitoring. Provision D.2.a.(2) includes the transitional dry weather MS4 outfall discharge monitoring requirements.

The requirements under Provision D.2.a.(2) are based on the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B), which include the requirements for a monitoring program to identify, detect, and eliminate illicit connections and illegal discharges to the MS4s. The federal regulations (40 CFR 122.26(d)(1)(iv)(D)) require

the monitoring program to include "*a field screening analysis for illicit connections and illegal dumping [that]…[a]t a minimum, include[s] a narrative description, for either each field screening point or major outfall, of visual observations made during dry weather periods.*" The federal regulations (40 CFR 122.26(d)(1)(v)(B)) require the monitoring program to include "*inspection procedures and methods for detecting and preventing illicit discharges, and describe areas where this program has been implemented.*" Furthermore, the monitoring program is required by federal regulations (40 CFR 122.26(d)(2)(iv)(B)) to include "*a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer.*"

Dry weather transitional MS4 outfall discharge monitoring requires each Copermittee to field screen (inspect) its major MS4 outfalls to classify the MS4 outfall locations as having persistent dry weather flows, transient dry weather flows, or no dry weather flows. To account for the variance in size of the 39 jurisdictions covered under this Order, the Copermittees recommended a tiered approach to the number of major MS4 outfalls that must be inspected. Provision D.2.a.(2)(a) provides a tiered approach to the number of major MS4 outfalls that must be visually inspected per jurisdiction as well as a minimum frequency each Copermittee must inspect each major MS4 outfall per year. This tiered approach is based on the total number of major MS4 outfalls within a Copermittees jurisdiction within each Watershed Management Area.

Based on the field screening, each Copermittee is required to make a determination whether any observed flowing, pooled, or ponded waters are transient or persistent flows. Based on this field screening information, other jurisdictional program information, and third party information, each Copermittee is required to prioritize the MS4 outfalls within its jurisdiction for follow up investigation and elimination of the non-storm water discharge, as part of its illicit discharge detection and elimination program required pursuant to Provision E.2. In accordance with the requirements of Provision E.2, each Copermittee is required to immediately investigate obvious illicit discharges (e.g. outfall discharges with unusual color, unusual odor, or high flows).

This approach allows a Copermittee to use all of its resources, as well as leverage resources and information provided by third parties, to effectively eliminate non-storm water discharges from its MS4 outfalls. If the source of the non-storm water discharge cannot be immediately eliminated, the Copermittee uses the persistent flow or transient flow classification along with other programmatic implementation data to prioritize the MS4 outfalls for future investigation. In accordance with the adaptive management approach deployed throughout this Order, Provision D.2.a.(2)(c) requires each Copermittee to update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow. The requirement of Provision D.2.a.(2)(c) assures that each Copermittee is collecting data that can be used to demonstrate compliance with the CWA requirement that each Copermittee must implement a program to "*effectively*

prohibit non-storm water discharges into the [MS4]" and with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

Provision D.2.b describes the dry weather MS4 outfall discharge monitoring required to be incorporated and implemented as part of the Water Quality Improvement Plan. Dry weather MS4 outfall discharge monitoring must be performed by each Copermittee to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. The emphasis of the dry weather MS4 outfall discharge monitoring required pursuant to Provision D.2.b is consistent with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

Provision D.2.b.(1) requires each Copermittee to continue field screening its major MS4 outfalls and identifying those with persistent flows and transient flows, as conducted during the transitional period (i.e. before the Water Quality Improvement Plan was developed). However, each Copermittee now has the flexibility to adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of non-storm water persistent flow discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan. In order to ensure a minimum number of outfalls are inspected, Provision D.2.b.(1) requires the number of visual inspections be equal to the number of visual inspections required in the tiered inspection program pursuant to Provision D.2.a.(2)(a).

Provision D.2.b.(2)(b) requires each Copermittee to monitor a minimum of 5 major MS4 outfalls with persistent flows identified as the highest priorities within a Copermittee's jurisdiction, within each Watershed Management Area. In other words, Copermittees located in more than one Watershed Management Area must identify at least 5 major MS4 outfalls with persistent flows in its jurisdiction in each Watershed Management Area. If a Copermittee is located in more than one Watershed Management Area, and they have less than 5 major MS4 outfalls with persistent flows per jurisdictional area per Watershed Management Area, all of the major MS4 outfalls must be identified as high priority dry weather persistent flow MS4 outfalls. The Copermittees identified as Responsible Copermittees by a TMDL in Attachment E of the Order may need to monitor more than 5 dry weather major MS4 outfall locations to determine compliance with the requirements of the TMDL(s).

Monitoring must occur at the highest priority outfall locations at least semi-annually until the non-storm water discharges have been eliminated for three consecutive dry weather monitoring events; identified to be authorized by a separate NPDES Permit; or reprioritized to a lower priority. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized MS4 major outfall in the Copermittee's jurisdiction within the Watershed Management Area, unless there are no remaining qualifying major MS4 outfalls within the Copermittees jurisdiction. The Copermittees must continually update their dry weather persistent

flow MS4 outfall discharge monitoring locations with the next highest priority non-storm water flow that have yet to be eliminated until all persistent and transient flows are eliminated or its threat reduced.

Non-storm water persistent flow MS4 outfall discharge monitoring data collected during each semi-annual monitoring event, must be collected and analyzed according to the requirements of Provision D.2.b.(2)(b)-(e). These monitoring requirements are consistent with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

The wet weather MS4 outfall discharge monitoring requirements are included under Provisions D.2.a.(3) and D.2.c. The wet weather MS4 outfall discharge monitoring requirements are necessary for the Copermittees to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable, using management practices, control techniques and system, design and engineering methods, and such other provisions which are appropriate*" required by 40CFR 122.26(d)(2)(iv), which is expected to achieve compliance with the CWA section 402(p)(3)(B)(iii) statutory requirement for municipal storm water permits to require "*controls to reduce the discharge of pollutants [in storm water] to the maximum extent practicable*." The wet weather MS4 outfall discharge monitoring data collection requirements are based on requirements under 40 CFR 122.26(d)(2)(iii), 122.26(d)(2)(iii)(A) and 122.26(d)(2)(iii)(A)(1)-(4), and 40 CFR 122.21(g)(7)(i)-(ii).

The wet weather MS4 outfall discharge monitoring requirements of Provision D.2.a.(3) and D.2.c are separated into monitoring required before and after the San Diego Water Board accepts the Copermittees' Water Quality Improvement Plan. Outfall monitoring conducted prior to acceptance of the Water Quality Improvement Plan is referred to in the Order as Transitional MS4 Outfall Discharge Monitoring. Provision D.2.a.(3) includes the transitional wet weather MS4 outfall discharge monitoring requirements.

Until the wet weather MS4 outfall discharge monitoring requirements of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board, the Copermittees must comply with the requirements of transitional wet weather MS4 outfall monitoring requirements pursuant to Provision D.2.a.(3). Provision D.2.a.(3) requires the Copermittees in each Watershed Management Area to sample, at least five of the major MS4 outfalls inventoried pursuant to Provision D.2.a.(1) once per wet season for the monitoring data required to be collected pursuant to Provision D.2.a.(3)(c)-(e). Provision D.2.a.(3) further requires at least one major MS4 outfall monitoring station be located in each Copermittee's jurisdiction within the Watershed Management Area.

At a minimum, the five sampling locations chosen must be representative of storm water discharges from residential, commercial, industrial, and typical mixed-use land uses present within a Watershed Management Area. The San Diego Water Board expects the Copermittees to extrapolate from these data to similar land uses

throughout the Watershed Management Area to better inform the Water Quality Improvement Plan development process by prioritizing drainages for implementation of storm water control efforts required pursuant to Provision E.

Provision D.2.c describes the wet weather MS4 outfall discharge monitoring required to be included and implemented as part of the Water Quality Improvement Plan. Provision D.2.c provides the Copermittees the flexibility to adjust the wet weather MS4 outfall discharge monitoring locations and frequencies in the Watershed Management Area, as needed, to identify sources of pollutants in storm water discharges from MS4s in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan.

Although Provision D.2.c.(1) allows the Copermittees to adaptively manage the wet weather MS4 outfall discharge monitoring locations and frequencies, the provision requires a minimum of at least five wet weather outfall stations to be monitored. Provision D.2.c.(2) further allows the Copermittees to modify the monitoring frequency at each wet weather MS4 outfall station to meet the goals of the Water Quality Improvement Plan as long as the monitoring frequency occurs at least once per year and is at an appropriate frequency to identify sources of pollutants in storm water discharges, guide pollutant source identification efforts, or determine compliance with the requirements of the applicable TMDLs in Attachment E to the Order.

The wet weather MS4 outfall discharge monitoring requirements of Provisions D.2.c.(3) and D.2.c.(4) are the same as the transitional wet weather MS4 outfall discharge monitoring. In contrast, the requirements of Provision D.2.c.(5) are focused on collecting analytical data specific to the highest priority water quality conditions in the Watershed Management Area identified in the Water Quality Improvement Plan. The wet weather MS4 outfall discharge monitoring data collection requirements are consistent with the requirements under 40 CFR 122.26(d)(2)(iii), 122.26(d)(2)(iii)(A) and 122.26(d)(2)(iii)(A)(1)-(4), and 40 CFR 122.21(g)(7)(i)-(ii).

Provision D.3 (Special Studies) requires the Copermittees to develop special studies that will be conducted for each Watershed Management Area and the entire San Diego Region. Data collected pursuant to Provision D.3 is to be used by the Copermittees to improve the effectiveness of the strategies implemented by the jurisdictional runoff management programs toward achieving the numeric goals identified in the Water Quality Improvement Plans and ultimately achieve compliance with the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c, and A.2.a, which is consistent with the requirements of Provision A.4.

Special studies are often necessary to fill data gaps or provide more refined information that allow the Copermittees to better manage the generation or elimination of pollutants and discharges to and from the MS4. In the Fourth Term Permits, the Copermittees have been required to implement special studies as directed by the San Diego Water Board. The special studies required by this Order provide the Copermittees more flexibility to identify and implement special studies that will be most

useful to improving the effectiveness of their jurisdictional runoff management programs.

Provision D.3.a.(1) requires the Copermittees to develop and conduct at least two special studies per Watershed Management Area, to be determined by the Copermittees. One of the two special studies may be accomplished through participation in a Regional Special Study required under Provision D.3.a.(2). The requirements provide the Copermittees great latitude in identifying and developing the special studies. Watershed Management Area special studies are required, at a minimum, to: (a) relate in some way to the highest water quality priorities identified by the Copermittees in the Water Quality Improvement Plan, (b) be conducted within the Watershed Management Area, and (c) include some form of participation (e.g. contribution of funds, personnel services, project management) by all the responsible Copermittees within the Watershed Management Area.

Examples of Watershed Management Area special studies might include, but are not limited to: (1) focused pollutant source identification studies, (2) BMP effectiveness and/or comparison studies, (3) pilot tests for new or emerging pollutant control methods, (4) receiving water pollutant or stressor source identification and/or mitigation studies, or (5) pollutant fate and transport studies. The Watershed Management Area special studies are expected to provide data that can be utilized by the Copermittees to improve the Water Quality Improvement Plan or implementation of the Copermittees' jurisdictional runoff management programs to address the highest priority water quality conditions.

Provision D.3.a.(2) requires the Copermittees to develop at least one special study that will be conducted for the entire San Diego region. The regional special study is expected to provide data that can be utilized by the Copermittees to improve the Water Quality Improvement Plan or implementation of the Copermittees' jurisdictional runoff management programs to identify or address regional water quality concerns and priorities.

An example of a regional special study would be to develop and establish allowable exceedance frequencies of the bacteria water quality objectives for several types of water bodies, during different wet and dry weather conditions the San Diego region. The special study would be related to bacteria, which is a priority for the San Diego region due to the adoption of "*Bacteria TMDL Project I – Beaches and Creeks in the San Diego Region*." The study results could be used to inform the Copermittees and the San Diego Water Board about the indictor bacteria water quality objective exceedance frequencies that occur in natural or reference watersheds.

<u>Provision D.4 (Assessment Requirements)</u> specifies the assessments that the Copermittees are required to perform, based on the monitoring data collected, and will be reported as part of the Annual Report for the Water Quality Improvement Plan implementation. Provision D.4 requires the Copermittees assess the progress of the

water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c, and A.2.a.

Provision D.4 specifies the assessments that Copermittees must perform for each Watershed Management Area to assess the effectiveness of each Copermittee's jurisdictional runoff management program and the Water Quality Improvement Plan. The effectiveness of each Copermittee's jurisdictional runoff management program and Water Quality Improvement Plan is measured through these types of assessments: (a) Receiving Waters Assessments (b) MS4 Outfall Discharges Assessments, (c) Special Studies Assessments, and (d) Integrated Assessment of Water Quality Improvement Plan.

Provision D.4.a requires the Copermittees to assess the status of receiving water conditions annually during the transitional monitoring period (during development of the Water Quality Improvement Plan) and after acceptance of the Water Quality Improvement Plan. The monitoring data collected pursuant to Provision D.1 will be evaluated, among other information, to assess the condition of a Watershed Management Area's streams, coastal waters, enclosed bays, harbors, estuaries, and lagoons. The focus of the receiving waters assessments is to measure progress toward the objective of the CWA to "*restore and maintain the chemical, physical, and biological integrity of the Nation's waters*" as the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program are implemented within a Watershed Management Area. Provision D.4.a is consistent with 40 CFR 122.42(c)(7) which requires the Copermittees to annually report the *"[i]dentification of water quality improvements or degradation."*

Provision D.4.b includes the MS4 outfall discharges assessment requirements. The focus of MS4 outfall discharges assessments is to determine if the Copermittees' are implementing programs that comply with the requirements of the CWA for MS4 permits to "*effectively prohibit non-stormwater discharges into the storm sewers*" and "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable.*" The monitoring data collected pursuant to Provisions D.2 will be evaluated, among other information, to assess the effectiveness of the transitional MS4 outfall field screening monitoring, the implementation of the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program. The MS4 outfall discharge assessments consist of Non-Storm Water Discharges Reduction Assessments and Storm Water Pollutant Discharges Reduction Assessments.

The Non-Storm Water Discharges Reduction Assessments are how each Copermittee will demonstrate that its jurisdictional runoff management program implementation efforts are achieving the CWA requirement to "*effectively prohibit non-stormwater discharges into the storm sewers.*" Provision D.4.b.(1) requires each Copermittee to assess and report on its illicit discharge detection and elimination program required pursuant to Provision E.2 to reduce and effectively prohibit non-storm water and illicit discharges into the MS4 within its jurisdiction. The Non-Storm Water Discharges

Reduction Assessments include specific assessment requirements applicable to each Copermittee.

As each Copermittee collects and analyzes the data collected pursuant to dry weather MS4 outfall discharges monitoring requirements of Provisions D.2.a.(2) and D.2.b, Provision D.4.b.(1) requires each Copermittee to assess the progress, assess the effectiveness of its current actions, and identify modifications necessary to increase the effectiveness of its actions toward reducing and eliminating non-storm water and illicit discharges to its MS4. The findings from these assessments are expected to be utilized by the Copermittee as part of its procedures to prioritize the non-storm water discharges that will be addressed by its Illicit Discharge Detection and Elimination program required pursuant to Provision E.2.

The assessment requirements of Provision D.4.a.(1) are consistent with 40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(3) which require "*procedures…to investigate portions of the separate storm sewer system that, based on the results of the field screen, or other appropriate information [emphasis added], indicate a reasonable potential of contain illicit discharges or other sources of non-storm water*" as part of a "*program…to detect and remove…illicit discharges and improper disposal into the storm sewer.*" The assessment requirements of Provision D.4.a.(1) are also consistent with 40 CFR122.42(c)(1) requires the Copermittees to annually report the "*status of implementing the components of the storm water management program that are established as permit conditions.*"

The Storm Water Pollutant Discharges Reduction Assessment is how the Copermittees in each Watershed Management Area will demonstrate that their jurisdictional runoff management program implementation efforts are achieving the CWA requirement to "*reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable*." Provision D.4.b.(2) requires the Copermittees in each Watershed Management Area to assess and report the progress of the Copermittees' efforts to reduce pollutants in storm water discharges from the MS4s to the MEP. The Storm Water Pollutant Discharges Reduction Assessments include specific assessment requirements during both the transitional monitoring period and after acceptance of the Water Quality Improvement Plan applicable to the Watershed Management Area and each Copermittee.

As the Copermittees collect and analyze the data collected pursuant to wet weather MS4 outfall discharges monitoring requirements of Provisions D.2.a.(3) and D.2.c, Provision D.4.b.(2) requires the Copermittees to assess runoff conditions during the transitional period, and the progress of the Water Quality Improvement Plan strategies toward reducing pollutants in storm water from the MS4 to the MEP. The findings from these assessments are expected to be utilized by the Copermittees to identify any modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify sources of pollutants in storm water discharges from the MS4s, as well as focus, modify, and improve the water quality improvement

strategies implemented by each Copermittee within its jurisdiction to reduce pollutants in storm water discharges to the MEP.

The assessment requirements of Provision D.4.b.(2) are consistent with 40 CFR 122.26(d)(2)(iii)(B) which requires "*[e]stimates of the annual pollutant load of the cumulative discharges to waters of the United States from all identified municipal outfalls…during a storm event…accompanied by a description of the procedures for estimating constituent loads and concentrations, including any modeling, data analysis, and calculation methods.*" The assessment requirements of Provision D.4.a.(2) are consistent with 40 CFR 122.26(d)(2)(v) which requires that each Copermittee assesses the *"estimated reductions in loadings of pollutants from discharges of municipal storm sewer constituents from municipal storm sewer systems expected as the result of the municipal storm water quality management program."* The assessment requirements of Provision D.4.b.(2) are also consistent with 40 CFR122.42(c)(1) requires the Copermittees to annually report the "*status of implementing the components of the storm water management program that are established as permit conditions.*"

Provision D.4.c includes the special studies assessment requirements. Performing special studies are how the Copermittees will address data gaps identified during the development of and updates to the Water Quality Improvement Plan. The relevant findings from the special studies assessments are expected to be incorporated as part of the applicable receiving water assessments, MS4 outfall discharge assessments, and integrated water quality improvement assessments required in Provision D.4.a, D.4.b, and D.4.d, respectively.

The assessment requirements in Provision D.4.d are part of the iterative approach and adaptive management process required by Provision A.4. The Copermittees are required to integrate the data collected pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to re-evaluate the Water Quality Improvement Plan.

The monitoring data collected pursuant to Provisions D.1 and D.2, and the results of the assessment required pursuant to Provisions D.4.a-c, will be used to determine whether the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program are effective, or require modifications or improvements to become more effective to achieve the requirements of the CWA. The assessments required by Provision D.4.d are consistent with 40 CFR 122.42(c)(1) which requires that the Copermittees to report the *"[t]he status of implementing the components of the storm water management program that are established as permit conditions."*

E. Jurisdictional Runoff Management Programs

Purpose: Provision E includes the requirements for the jurisdictional runoff management programs to be implemented by each of the Copermittees. Compliance with the requirements for the jurisdictional runoff management programs will allow the Copermittees to demonstrate that they are implementing programs to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP. The jurisdictional runoff management program document prepared by each Copermittee will also provide the details for implementing the water quality improvement strategies identified in the Water Quality Improvement Plan specifically within its jurisdiction.

***Discussion*:** Implementation of the jurisdictional runoff management program requirements under Provision E is how the Copermittees "*effectively prohibit non-stormwater discharges into the storm sewer,*" and outlines the "*controls to reduce the discharge of pollutants to the maximum extent practicable"* consistent with the federal regulations under 40 CFR 122.26. The jurisdictional runoff management program is part of the "*comprehensive planning process*" that is required pursuant to 40 CFR 122.26(d)(2)(iv). Where the Water Quality Improvement Plan is the "*comprehensive planning process*" on a Watershed Management Area scale, requiring "*intergovernmental coordination,*" the jurisdictional runoff management program document is the "*comprehensive planning process*" on a jurisdictional scale that should be coordinated with the other Copermittees in the Watershed Management Area to achieve the goals of the Water Quality Improvement Plan.

The jurisdictional runoff management program requirements are included to provide each Copermittee criteria that can be used to demonstrate that its storm water management program is implementing the "*comprehensive planning process*" within its jurisdiction to "*effectively prohibit non-stormwater discharges into the storm sewers,*" and to identify and implement the most effective "*controls to reduce the discharge of pollutants to the maximum extent practicable"* in accordance with the performance standards given in the CWA.

Provision E includes the requirements for each of the components that must be included in the Copermittee's jurisdictional runoff management program document that will be implemented by the Copermittee within its jurisdiction. Implementation of the components of each Copermittee's jurisdictional runoff management program must incorporate the water quality improvement strategies identified by each Copermittee in the Water Quality Improvement Plans, described pursuant to Provision B.3.b.(1)(a).

More specific and detailed discussions of the requirements of Provision E are provided below.

Provision E.1 (Legal Authority Establishment and Enforcement) requires each Copermittee to establish and enforce sufficient legal authority to control discharges to the MS4 within its jurisdiction.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system*" and be able to demonstrate that it can "*operate pursuant to legal authority established by statute, ordinance or series of contracts.*" Provision E.1.a describes the minimum legal authorities each Copermittee must establish for itself within its jurisdiction to control discharges to its MS4. The requirements of Provision E.1.a are consistent with the requirements set forth in 40 CFR 122.26(d)(2)(i)(A)-(F).

The certification statement required from each Copermittee by Provision E.1.b is included to provide the San Diego Water Board additional documentation that each Copermittee has established the legal authorities consistent with Provision E.1.a and 40 CFR 122.26(d)(2)(i)(A)-(F), and the Copermittee can "*operate pursuant to legal authority established by statute, ordinance or series of contracts.*"

Provision E.2 (Illicit Discharge Detection and Elimination) requires each Copermittee to implement an illicit discharge detection and elimination program to effectively prohibit non-storm water discharges to the MS4 by actively detecting and eliminating illicit discharges and disposal into its MS4.

Provision E.2 establishes the minimum requirements that each Copermittee must implement within its jurisdiction to effectively prohibit non-storm water discharges from entering its MS4. The federal CWA requires permits for municipal storm sewer systems to "*effectively prohibit non-storm water discharges into the storm sewers*." The federal regulations (40CFR122.26(d)(2)(i)(B)) require each Copermittee to establish the legal authority to prohibit illicit discharges to its MS4s. Under 40 CFR 122.26(d)(2)(iv)(B), each Copermittee must implement a "*program…to detect and remove…illicit discharges and improper disposal into the storm sewer.*" The federal NPDES regulations, under 40 CFR 122.26(b)(2), define illicit discharges as "*any discharge to a municipal separate storm sewer that is not composed entirely of storm water*." Thus, non-storm water discharges are not authorized to enter the MS4 and are considered to be illicit discharges, unless authorized by a separate NPDES permit.

The Phase I Final Rule clarifies that non-storm water discharges through an MS4 are not authorized under the CWA (55 FR 47995):

> "*Today's rule defines the term "illicit discharge" to describe any discharge through a municipal separate storm sewer system that is not composed entirely of storm water and that is not covered by an NPDES permit. Such illicit discharges are not authorized under the Clean Water Act. Section 402(p)(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm*

sewer…Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit."

The federal NPDES requirements for the program to address illicit discharges must include "*inspections, to implement and enforce an ordinance, orders, or other similar means to prevent illicit discharges to the MS4*." The federal NPDES regulations also reference several categories of "*non-storm water discharges or flows* [which] *shall be addressed where such discharges are identified…as sources of pollutants to waters of the United States*." The Phase I Final Rule (55 FR 48037) further clarified the requirements of 40 CFR 122.26(d)(2)(iv)(B)(1) as follows:

"*EPA is clarifying that section 402(p)(3)(B) of the CWA (which requires permits for municipal separate storm sewers to 'effectively' prohibit non-storm water discharges) does not require permits for municipalities to prohibit certain discharges or flows of nonstorm water to waters of the United States through municipal separate storm sewers in all cases*."

In previous iterations of the municipal storm water permits for the San Diego Region, these categories were simply listed and referred to as categories of non-storm water discharges "not prohibited" unless identified as a source of pollutants. The Copermittees have often referred to these categories as "exempt" discharges. In both cases, however, the language is inconsistent with the federal CWA and NPDES regulations. And, the clarification provided in the Phase I Final Rule does not specifically state that such discharges are "not prohibited" or "exempt" or in any way authorized. The federal NPDES regulations do, however, state that specific categories of non-storm water discharges must be "*addressed*" if identified as "*sources of pollutants to waters of the United States*."

The language of Provision E.2.a has been revised to be fully consistent with the language of the CWA and the requirements of the federal regulations under 40 CFR 122.26(d)(2)(iv)(B)(1). Provision E.2.a requires each Copermittee to address <u>all</u> types of non-storm water discharges into its MS4 as illicit discharges, <u>unless</u> the discharge is authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to Provisions E.2.a.(1) through E.2.a.(5). Only non-NPDES-permitted non-storm water discharges identified as a category of non-storm water discharges under Provisions E.2.a.(1) through E.2.a.(5) <u>and</u> *not identified as a source of pollutants* do not have to be addressed as illicit discharges. Categories of non-storm water discharges that meet the requirements of Provisions E.2.a.(1) through E.2.a.(5) do not have to be addressed by the Copermittee as illicit discharges.

Several of the non-storm water categories listed in 40 CFR 122.26(d)(2)(iv)(B)(1) have not been included in Provisions E.2.a.(1) through E.2.a.(5), including: street wash water, landscape irrigation, irrigation water, and lawn watering. Because these are no

longer included within the categories listed under Provisions E.2.a.(1) through E.2.a.(5), the Copermittees must prohibit these types of non-storm water discharges from entering the MS4. This is consistent with the clarification of 40 CFR 122.26(d)(2)(iv)(B)(1) in the Phase I Final Rule (55 FR 48037), which states:

> "*[T]he Director may include permit conditions that either require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*."

Street wash water is a category of non-storm water discharges that was removed when the Third Term Permits were issued. Street wash water is a source of several pollutants (e.g., metals, oil and grease, petroleum hydrocarbons, chlorinated solvents, sediment) which are generated during the street washing process. The removal of this category requires the Copermittees to prohibit this type of non-storm water discharge from entering the MS4.

The landscape irrigation, irrigation water, and lawn watering categories, collectively referred to hereafter as "over-irrigation" discharges, were removed from the list of non-storm water discharge categories in the Fourth Term Orange County and Riverside County Permits. Non-storm water discharges resulting from over-irrigation have been found to be a source of several types of pollutants (e.g., nutrients, bacteria, pesticides, sediment) in receiving waters. The San Diego Water Board and the Copermittees have identified categories of non-storm water discharges associated with over-irrigation as a source of pollutants and conveyance of pollutants to the MS4 and waters of the United States in the following documents:

- **SmartTimer/Edgescape Evaluation Program (SEEP) Grant Application**

  The State Water Board allocated grant funding to the SEEP project grant application submitted in 2006, which targeted irrigation runoff by retrofitting areas of existing development and documenting the conservation and runoff improvements. The basis of this grant project is that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 is a source and conveyance of pollutants. In addition, the grant application indicated that this alteration of natural flows is impacting the beneficial uses of waters of the state and U.S. Results from the study indicate that that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 *is* a source and conveyance of pollutants. The results of this study can be applied broadly to any area where over-irrigation takes place. The grant application included the following statements:

  > "*Irrigation runoff contributes flow & pollutant loads to creeks and beaches that are 303(d) listed for bacteria indicators.*"
  >
  > "*Regional program managers agree that the reduction and/or elimination of irrigation-related urban flows and associated pollutant loads may be key to successful attainment of water quality and beneficial use goals as outlined in*

the San Diego Basin Plan and Bacteria TMDL over the long term."

"*Elevated dry-weather storm drain flows, composed primarily … of landscape irrigation water wasted as runoff, carry pollutants that impair recreational use and aquatic habitats all along Southern California's urbanized coastline. Storm drain systems carry the wasted water, along with landscape derived pollutants such as bacteria, nutrients and pesticides, to local creeks and the ocean. Given the local Mediterranean climate, excessive perennial dry season stream flows are an unnatural hydrologic pattern, causing species shifts in local riparian communities and warm, unseasonal contaminated freshwater plumes in the near-shore marine environment.*"

- **2006-2007 Orange County Watershed Action Plan Annual Reports**

The Watershed Action Plan Annual Reports for the 2006-2007 reporting period were submitted by the County of Orange, Orange County Flood Control District and Copermittees within the San Juan Creek, Laguna Coastal Streams, Aliso Creek, and Dana Point Coastal Streams Watersheds. San Juan Creek, Laguna Coastal Streams, Aliso Creek and Dana Point Coastal Streams are all currently 303(d) listed as impaired for indicator bacteria within their watersheds and/or in the Pacific Ocean at the discharge points of their watersheds. The Orange County Copermittees, within their Watershed Action Strategy Table for fecal indicator bacteria included the following:

"*Support programs to reduce or eliminate the discharge of anthropogenic dry weather nuisance flow throughout the…watershed. Dry weather flow is the transport medium for bacteria and other 303(d) constituents of concern.*"

Additionally, they state that "*conditions in the MS4 contribute to high seasonal bacteria propagation in-pipe during warm weather. Landscape irrigation is a major contributor to dry weather flow, both as surface runoff due to over-irrigation and overspray onto pavements; and as subsurface seepage that finds its way into the MS4*."

- **Fiscal Year 2008 Carlsbad Watershed Urban Runoff Management Program Annual Report**

The Carlsbad Watershed Urban Runoff Management Program Annual Report for Fiscal Year 2008 was submitted by the Carlsbad Watershed Copermittees (Cities of Carlsbad, Encinitas, Escondido, Oceanside, San Marcos, Solana Beach, and Vista, and the County of San Diego). In the Annual Report, the Carlsbad Watershed Copermittees stated the following:

"The Carlsbad Watershed Management Area (WMA) collective watershed strategy identifies bacteria, sediment, and nutrients as high priority water quality

pollutants in the Agua Hedionda (904.3 – bacteria and sediment), Buena Vista (904.2 – bacteria), and San Marcos Creek (904.5 – nutrients) Hydrologic Areas. Bacteria, sediment, and nutrients have been identified as potential discharges from over-irrigation."

- **2007-2008 San Diego Bay Watershed Urban Runoff Management Program Annual Report**

  The San Diego Bay Watershed Urban Runoff Management Program 2007-2008 Annual Report was submitted by the San Diego Bay Watershed Copermittees (Cities of Chula Vista, Coronado, Imperial Beach, La Mesa, Lemon Grove, National City, and San Diego, the County of San Diego, the Port of San Diego, and the San Diego County Airport Authority). In Appendix D of the Annual Report, titled "Likely Sources of Pollutants," the San Diego Bay Watershed Copermittees identified over-irrigation of lawns as a pollutant generating activity from business and/or residential land uses for bacteria, pesticides, and sediment.

- **Copermittee Public Education Materials**

  The Orange County Public Works *Tips for Landscape & Gardening* public education brochure states: "*Fertilizers, pesticides and other chemicals that are left on yards or driveways can be blown or washed into storm drains that flow to the ocean. Overwatering lawns can also send materials into storm drains*."

  The Riverside County Flood Control and Water Conservation District *Landscape and Garden* public education brochure states: *"Soil, yard wastes, over-watering and garden chemicals become part of the urban runoff mix that winds its way through streets, gutters and storm drains before entering lakes, rivers, streams, etc. Urban runoff pollution contaminates water and harms aquatic life!"*

- **Los Peñasquitos Lagoon Sedimentation/Siltation TMDL Technical Report**

  The Los Peñasquitos Lagoon Sedimentation/Siltation TMDL technical report was prepared for the City of San Diego and USEPA in October 2010. The technical report was included as a technical supporting document attached to the Sediment TMDL for Los Peñasquitos Lagoon staff report prepared by the San Diego Water Board, dated June 13, 2012. Under the Source Assessment section, the technical report states the following:

  "*Dry weather loading is dominated by nuisance flows from urban land use activities such as car washing, sidewalk washing, and lawn over-irrigation, which pick up and transport sediment into receiving waters.*"

These documents confirm that non-storm water discharges associated with over-irrigation are a source of pollutants and should be addressed as illicit discharges to the

MS4. Prohibiting non-storm water discharges associated with over-irrigation, however, is not a new requirement for the Copermittees because it is also consistent with and required by the Water Conservation in Landscaping Act (AB 1881, Laird).

The Water Conservation in Landscaping Act required the Department of Water Resources (DWR) to prepare a Model Water Efficient Landscape Ordinance for use by local agencies (e.g. the Copermittees). All local agencies were required to adopt a water efficient landscape ordinance by January 1, 2010. Local agencies could adopt the Water Efficient Landscape Ordinance developed by DWR, or an ordinance considered at least as effective as the Model Ordinance. The Water Efficient Landscape Ordinance includes a requirement that local agencies prohibit runoff from irrigation (§ 493.2):

> "*Local agencies shall prevent water waste resulting from inefficient landscape irrigation by* <u>*prohibiting runoff from leaving the target landscape*</u> *[emphasis added] due to low head drainage, overspray, or other similar conditions where water flows onto adjacent property, non-irrigated areas, walks, roadways, parking lots, or structures. Penalties for violation of these prohibitions shall be established locally*."

Furthermore, non-storm water discharges from over-irrigation not only transport and discharge pollutants to receiving waters, but are also a likely source of the dry weather flows causing changes to habitat within and along the receiving water bodies. Examples of habitat changes from the dry weather flows include perennialization of ephemeral streams, and conversion of saltwater and brackish water marsh habitats to freshwater marsh habitats (e.g. Los Peñasquitos Lagoon). Both of these examples have resulted in the promotion of invasive species in several areas of the San Diego Region.

The removal of the over-irrigation discharges categories does not require the Copermittees to strictly prohibit lawn and landscape irrigation, but does require the prohibition of excessive irrigation water that results in non-storm water discharges to the MS4. Non-storm water discharges to the MS4 from over-irrigation must be addressed as illicit discharges by the Copermittees pursuant to the requirements of Provision E.2.

The remaining non-storm water categories listed in 40 CFR 122.26(d)(2)(iv)(B)(1) are listed under Provisions E.2.a.(1) through E.2.a.(5) and generally fall into four categories: (1) non-storm water discharges subject to existing San Diego Water Board waste discharge requirements and NPDES permits; (2) non-storm water discharges generally not expected to be a source of pollutants to receiving waters; (3) non-storm water discharges likely to contain pollutants requiring some form of control to address the pollutants prior to discharging to the MS4; and (4) non-storm water discharges or flows associated with firefighting.

Provisions E.2.a.(1) and E.2.a.(2) include several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) for which the San Diego Water Board already has developed general waste discharge requirements and NPDES permits to address the discharges. The Copermittees are only required to address these types of non-storm water discharges as illicit discharges if the Copermittees or the San Diego Water Board identifies these non-storm water discharges not having coverage under the applicable NPDES permit.

Provision E.2.a.(3) includes several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) which are generally not expected to be a source of pollutants to receiving waters, many of which originate from what are typically natural, uncontrollable sources. The Copermittees are only required to address these types of non-storm water discharges as illicit discharges if the Copermittees or the San Diego Water Board identifies these non-storm water discharges as a source of pollutants to receiving waters. Because many of these sources are generally uncontrollable, enforcing a prohibition may not be a possibility for the Copermittees. The Copermittees would be able to address these non-storm water discharges by preventing these non-storm water discharges from entering the MS4. This could potentially be achieved by sealing their MS4 structures so the discharges cannot enter the MS4.

Provision E.2.a.(4) includes several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) that are likely to contain pollutants requiring some form of control to address the pollutants prior to discharging to the MS4. At this time, an outright prohibition of these types of non-storm water discharges does not yet appear to be warranted. Thus, Provision E.2.a.(4) includes several requirements for the Copermittees to control the pollutants from these types of non-storm water discharges. This is consistent with the clarification of the federal regulations in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board has the authority to require the Copermittees to "*control any of these types of discharges where appropriate*."

Unlike non-storm water discharges from over-irrigation, these types of non-storm water discharges are not expected to occur in close proximity to each other or very frequently. Provided these types of non-storm water discharges are controlled as required in Provision E.2.a.(4), the Copermittees would only be required to address these types of non-storm water discharges as illicit discharges if the Copermittee or the San Diego Water Board identifies these non-storm water discharges as a source of pollutants to receiving waters.

Provision E.2.a.(5) includes specific requirements for fire fighting discharges and flows. The requirements for non-storm water discharges and flows associated with fire fighting have been separated into requirements for: a) non-emergency fire fighting discharges and flows, and b) emergency fire fighting discharges and flows.

The San Diego Water Board has found that discharges from building fire suppression system maintenance (e.g. fire sprinklers) contain waste and potentially a significant source of pollutants to receiving waters. As such, the San Diego Water Board is requiring these discharges be addressed as illicit discharges by the Copermittees. Thus, the discharges to the MS4 are to be prohibited via ordinance, order or similar means. For other non-emergency firefighting discharges and flows (i.e. flows from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems), the Copermittees are required to develop and implement a program to address pollutants in these non-storm water discharges and flows. This is consistent with the clarification of the federal regulations in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board has the authority to require the Copermittees to "*control any of these types of discharges where appropriate*."

For emergency firefighting discharges and flows, the Phase I Final Rule (55 FR 48037) has clarified the requirements of 40 CFR 122.26(d)(2)(iv)(B)(1) pertaining to emergency firefighting flows and discharges, which states:

> "*In the case of firefighting it is not the intention of these rules to prohibit in any circumstances the protection of life and public or private property through the use of water or other fire retardants that flow into separate storm sewers*."

Thus, the requirements have been made to be consistent with the guidance provided by the Phase I Final Rule. The Order recommends that the Copermittees develop and encourage implementation of BMPs to reduce or eliminate the discharge of pollutants from emergency firefighting flows to the MS4s and receiving waters. The Order does not include any requirements that should be interpreted as requiring the implementation of BMPs for emergency firefighting flows to the MS4s and receiving waters.

The Copermittees are expected to review the dry weather MS4 outfall discharge monitoring data they collect to determine if and when there are non-storm water discharges to or from their MS4s that are a source of pollutants to receiving waters. If the Copermittees identify one of the types of non-storm water discharges listed in Provisions E.2.a.(1) through E.2.a.(4) as a source of pollutants to receiving waters based on the review and evaluation of monitoring data, Provision E.2.a.(6) requires the Copermittees to prohibit those categories of discharges from entering the MS4 through ordinance, order or similar means. In addition, Provision E.2.a.(6) clarifies that the San Diego Water Board may identify categories of non-storm water discharges or flows listed under Provisions E.2.a.(1) through E.2.a.(4) that must be prohibited.

Provision E.2.a.(6) also provides the Copermittees an option to propose controls to be implemented for the category of non-storm water discharges as part of the Water Quality Improvement Plan instead of prohibiting the category of non-storm water discharges. If the Water Quality Improvement Plan is accepted by the San Diego

Water Board with the proposed controls, the Copermittees will not be required to prohibit the category of non-storm water discharges to their MS4s as long as the controls are implemented. This is consistent with the clarification of 40 CFR 122.26(d)(2)(iv)(B)(1) in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board may "*require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*."

Finally, Provision E.2.a.(7) has been included in the requirements for non-storm water discharges to clarify that any non-storm water discharges to the Copermittee's MS4, even those identified pursuant to Provisions E.2.a.(1) through E.2.a.(4), must be reduced or eliminated, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit. Provision E.2.a.(7) is consistent with the requirements of CWA section 402(p)(3)(B)(ii) and 40 CFR 122.26(d)(1)(v)(B), as clarified in the Phase I Final Rule (55 FR 47995) that "*[u]ltimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit*." However, the reduction or elimination of those non-storm water discharges are expected to be achieved as feasible, in accordance with the priorities in the Water Quality Improvement Plan and when the resources are available to the Copermittee.

Consistent with 40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(1), each Copermittee must implement a "*program…to prevent illicit discharges to the municipal storm sewer system*" and "*detect…illicit discharges and improper disposal into the storm sewer.*" Provision E.2.b requires each Copermittee to implement measures to prevent and detect illicit discharges and connections to its MS4 as part of its illicit discharge detection and elimination program.

As part of the program to prevent and detect illicit discharges to the MS4, 40 CFR 122.26(d)(2)(iv)(B)(2) requires "*procedures to conduct on-going field screening activities during the life of the permit, including areas or locations that will be evaluated by such field screens*." As part of the procedures, each Copermittee is required to maintain an updated map of its entire MS4 and the corresponding drainage areas within its jurisdiction. Having knowledge about where inlets, access points, connections with other MS4s, and outfalls are located is necessary for each Copermittee to track, identify, and eliminate illicit discharges and connections. Thus, Provision E.2.b.(1) of the Order specifies that the map must include the segments of the storm sewer system owned, operated, and maintained by the Copermittee, and include locations of all known inlets, connections with other MS4s, and outfalls to the Copermittee's MS4. The remaining requirements of Provision E.2.b are consistent with the requirements of 40 CFR 122.26(d)(2)(iv)(B)(3)-(7) related to implementing measures to prevent and detect illicit discharges and connections to the MS4.

Provision E.2.c requires each Copermittee to conduct field screening and monitoring of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4. Field screening is a required

element of the program to detect and eliminate illicit discharges and connections to the MS4, pursuant to 40 CFR 122.26(d)(2)(iv)(B)(2). The field screening requirement will be implemented through the dry weather MS4 outfall discharge monitoring required under Provisions D.2.a.(2) and D.2.b.(1).

Provision E.2.d specifies the measures each Copermittee must implement to eliminate illicit discharges and connections to its MS4. Elimination of illicit discharges and connections to the MS4 is consistent with the requirement of 40 CFR 122.26(d)(2)(iv)(B) "*to detect and remove [emphasis added]…illicit discharges and improper disposal into the storm sewer*" and will achieve the CWA requirement for MS4 permits to "*effectively prohibit non-storm water discharges into the storm sewers*."

Generally, each Copermittee is responsible for prioritizing its efforts to eliminate non-storm water and illicit discharges or connections to its MS4 based on field screening and monitoring data, NALs, illicit discharge investigation records, and the known or suspected sources. Sources of non-storm water and illicit discharges or connections must be eliminated by enforcing the legal authority established by each Copermittee pursuant to Provision E.1.

Provision E.3 (Development Planning) requires each Copermittee to use its land use and planning authority to implement a development planning program to control and reduce the discharge of pollutants in storm water from new development and significant redevelopment to the MEP. Proper implementation of the development planning program will also contribute toward effectively prohibiting non-storm water discharges from development projects to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." As part of the management program, 40 CFR 122.26(d)(2)(iv)(A)(2) requires "*planning procedures including a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment*."

Land development generally alters the natural conditions of the land by removing vegetative cover, compacting soil, and/or placement of concrete, asphalt, or other impervious surfaces. These impervious surfaces concentrate urban pollutants (such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not found in high concentrations in the natural environment. Pollutants that accumulate on impervious surfaces are not easily biodegraded nor subject to natural treatment processes.

Impervious surfaces greatly affect the natural hydrology of the land because they do not allow natural infiltration and treatment of storm water runoff to take place. Instead,

storm water runoff from impervious surfaces is typically directed through pipes, curbs, gutters, and other hardscape into receiving waters, with little treatment, at significantly increased volumes and accelerated flow rates over what would occur naturally. The increased pollutant loads, storm water volume, discharge rates and velocities, and discharge durations from the MS4 adversely impact stream habitat by causing accelerated, unnatural erosion and scouring within creek bed and banks. Placement of impervious surfaces also encapsulates "good" sediment (such as sand, gravel, rocks and cobbles) that would normally replenish creek beds and banks to help stabilize them. Collectively, these changes to natural hydrologic processes are termed hydrograph modification, or hydromodification.

Hydromodification, which is caused by both altered storm water flow and altered sediment flow regimes, is largely responsible for degradation of creeks, streams, and associated habitats in the San Diego Region. In an ongoing study by the Stormwater Monitoring Coalition to assess the health of streams throughout Southern California, researchers found that three of the four highest risk stressors to creeks (percent sands and fines present, channel alteration, and riparian disturbance) were related to physical habitat.[29] Researchers studying flood frequencies in Riverside County have found that increases in watershed imperviousness of only 9-22 percent can result in increases in peak flow rates for the two-year storm event of up to 100 percent.[30] Such changes in runoff have significant impacts on channel morphology.

In addition, a technical report issued by the Southern California Coastal Water Research Project (SCCWRP) stated that "*[r]ecent studies indicate that California's intermittent and ephemeral streams are more susceptible to the effects of hydromodification than streams from other parts of the United States. Physical degradation of stream channels in the central and eastern United States can initially be detected when watershed impervious cover approaches 10 percent, although biological effects (which may be more difficult to detect) may occur at lower levels. In contrast, initial response of streams in the semi-arid portions of California appears to occur between 3 and 5 percent impervious cover*."[31] These studies highlight the extent to which impacts originating from impervious surfaces created by land development are responsible for the degradation of creek and stream habitat.

This is consistent with what USEPA has noted, that "*[m]ost stormwater runoff is the result of the man-made hydrologic modifications that normally accompany development. The addition of impervious surfaces, soil compaction, and tree and vegetation removal result in alterations to the movement of water through the environment. As interception, evapotranspiration, and infiltration are reduced and*

[29] Assessing the Health of Southern California Streams, Stormwater Monitoring Coalition, Fact Sheet
[30] Schueler and Holland, 2000. Storm Water Strategies for Arid and Semi-Arid Watersheds (Article 66). The Practice of Watershed Protection.
[31] Stein, E. and Zaleski, S., 2005. Technical Report 475, Managing Runoff to Protect Natural Streams: The Latest Development on Investigation and Management of Hydromodification in California. December 30, 2005.

precipitation is converted to overland flow, these modifications affect not only the characteristics of the developed site but also the watershed in which the development is located. Stormwater has been identified as one of the leading sources of pollution for all waterbody types in the United States. Furthermore, the impacts of stormwater pollution are not static; they usually increase with more development and urbanization."[32]

Reducing the impact from the increased pollutant loads and flows generated by impervious surfaces within a watershed is essential to protecting and restoring the integrity of the receiving waters. Provision E.3 includes the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment*." The requirements of Provision E.3 will 1) minimize the generation and discharge of pollutants in storm water from the MS4, and 2) minimize the potential of storm water discharges from the MS4 from causing altered flow regimes and excessive downstream erosion in receiving waters.

The requirements of Provision E.3.a include the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment*" applicable to all development projects, regardless of size or purpose of development. In general, all development projects must implement onsite BMPs to remove pollutants from runoff prior to its discharge to any receiving waters, as close to the pollutant generating source as possible, and structural BMPs must not be constructed within waters of the U.S.

Furthermore, the onsite BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors (e.g. mosquitos, rodents, and flies). If not properly designed or maintained, certain BMPs implemented or required by municipalities may create a habitat for vectors. Monitoring studies conducted by the California Department of Public Health (CDPH) have documented that mosquitoes opportunistically breed in structural storm water BMPs, particularly those that hold standing water for over 96 hours. Certain site design features that hold standing water may similarly produce mosquitoes.

Structural BMPs and site design features should incorporate design, construction, and maintenance principles to promote drainage within 96 hours to minimize standing water available to mosquitoes. Nuisances and public health impacts resulting from vector breeding can be prevented with close collaboration and cooperative effort between municipalities and local vector control agencies and the CDPH during the

[32] USEPA, 2007. Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices, December 2007.

development and implementation of storm water runoff management programs. The CDPH also has issued guidance for BMP implementation that will minimize potential nuisances and public health impacts resulting from vector breeding.[33]

All development projects are required to implement source control BMPs that will minimize the generation of pollutants. Additionally, each development project must implement, where applicable and feasible, low impact development (LID) BMPs to mimic the natural hydrology of the site and retain and/or treat pollutants in storm water runoff prior to discharging to and from the MS4.

The LID Center defines LID as "*a comprehensive land planning and engineering design approach with a goal of maintaining and enhancing the pre-development hydrologic regime of urban and developing watersheds.*"[34] LID designs seek to control storm water at the source, using small-scale integrated site design and management practices to mimic the natural hydrology of a site, retain storm water runoff by minimizing soil compaction and impervious surfaces, and disconnect storm water runoff from conveyances to the storm drain system.

LID BMPs may utilize interception, storage, evaporation, evapotranspiration, infiltration, and filtration processes to retain and/or treat pollutants in storm water before it is discharged from a site. Because of these numerous options, the San Diego Water Board expects that every development project will be able to implement some form of LID BMPs. Examples of LID BMPs include using permeable pavements, rain gardens, rain barrels, grassy swales, soil amendments, and native plants.

Provision E.3.a also includes requirements for all development projects to, where feasible, landscape with native and/or low water use plants to minimize the discharge of non-storm water discharges associated with excessive irrigation, as well as harvest (i.e., storage) and use precipitation to promote the concept of utilizing storm water as a resource.

While all development projects are subject to the requirements of Provision E.3.a, Provision E.3.b identifies Priority Development Projects that exceed given size thresholds and/or fit under specific use categories. Priority Development Projects are required to incorporate specific performance criteria for structural BMPs into the project plan to reduce the generation of pollutants, and address potential impacts from hydromodification.

The Priority Development Project categories are based on the requirements of the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-

[33] California Department of Public Health, 2012. Best Management Practices for Mosquito Control in California. (http://www.cdph.ca.gov/HealthInfo/discond/Documents/BMPforMosquitoControl07-12.pdf)
[34] www.lowimpactdevelopment.org

0002 and R9-2010-0016, respectively), and do not differ significantly from the Fourth Term Permit for San Diego County. Furthermore, the Priority Development Project categories are consistent with Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), and Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit).

Because of the impact of relatively small increases in watershed impervious surfaces to receiving waters, Provision E.3.b.(1)(c)(iv) has been updated to include large driveways that are 5,000 square feet or more. The San Diego Water Board finds that large driveways can exacerbate altered flow regimes if not properly controlled.

Provision E.3.b.(3) describes projects that are exempt from Priority Development Project status. These include new or retrofit paved sidewalks, bicycle lanes, or trails that are designed and constructed to direct runoff to vegetated areas or be hydraulically disconnected from paved areas. The exemptions have been provided to encourage these types of projects because they provide multiple environmental benefits, such as promoting walking rather than driving, which will in turn improve air quality. Additionally, retrofitting of existing alleys, streets, or roads are exempt from Priority Development Project status if they are constructed using USEPA Green Streets guidance.[35] By doing so, retrofitting of these types of projects is encouraged. The San Diego Water Board recognizes that there are spatial constraints associated with these projects, and implementation of structural BMPs are not always feasible.

For development projects identified as Priority Development Projects, the requirements of Provision E.3.c are the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment.*" Provisions E.3.c.(1)-(3) describe the performance criteria for the structural BMPs that must be implemented for each Priority Development Project defined by Provision E.3.b.

Provision E.3.c.(1) describes the storm water pollutant control BMP requirements that must be implemented by all Priority Development Projects. The purpose of Provision E.3.c.(1) is to reduce pollutants in storm water runoff to the MEP from Priority Development Projects before it is discharged to the MS4. Of all the available treatment processes available, retention of storm water, and therefore capture of the pollutants in the storm water, will achieve 100 percent pollutant removal efficiency for the volume of storm water retained. No other method of treatment can achieve 100 percent pollutant removal efficiency. Thus, retention of as much storm water onsite is the most effective way to reduce pollutants in storm water discharges to, and

[35] "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).

consequently from the MS4, and controls pollutants in storm water discharges from a site to the MEP.

Under Provision E.3.c.(1)(a), retention of the pollutants in the runoff produced from the 85th percentile storm event ("design capture volume") is the design standard to which Priority Development Projects must comply. Since the 85th percentile storm event has previously been used as the numeric design standard for treatment control BMPs, this same size storm event is used as the numeric design standard for storm water retention. This is the MEP standard recognized by the San Diego Water Board and is consistent with the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), as well as Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit), and Los Angeles Water Board Order No. R4-2012-0175 (Los Angeles County MS4 Permit).

The 85th percentile storm event is the event that has a precipitation total greater than or equal to 85 percent of all storm events over a given period of record in a specific area or location. For example, to determine what the 85th percentile storm event is in a specific location, all 24 hour storms that have recorded values over a 30 year period would be tabulated and a 85th percentile storm would be determined from this record (i.e. 15 percent of the storms would be greater than the number determined to be the 85th percentile storm). Most jurisdictions in the San Diego Region have already developed isopluvial maps that can provide this type of information. The 85th percentile storm might be determined to be a number such as 1.0 inch, and this would be multiplied by the total area of the project footprint producing runoff to calculate the design capture volume. The Priority Development Project designer would then select a system of BMPs that would retain (i.e. intercept, store, infiltrate, evaporate, or evapotranspire) the pollutants contained in the design capture volume onsite.

Retention BMPs are necessary to capture and retain pollutants generated from a Priority Development Project. In a recent study performed by SCCWRP in the Los Angeles Region, they found "*that the magnitude of constituent load associated with storm water runoff depends, at least in part, on the amount of time available for pollutant build-up on land surfaces. The extended dry period that typically occurs in arid climates such as southern California maximizes the time for constituents to build-up on land surfaces, resulting in proportionally higher concentrations and loads during initial storms of the season*."[36] This implies that the "first flush" of a rainy season and the first storm events after long antecedent dry periods tend to have the highest pollutant loads. Capturing and retaining the pollutant loads of the "first flush" of a rainy

[36] Stein, E.D., Tiefenthaler, L.L., and Schiff, K.C., 2007. Technical Report 510, Sources, Patterns and Mechanisms of Storm Water Pollutant Loading from Watershed and Land Uses of the Greater Los Angeles Area, California, USA. March 20, 2007.

season and the first storm events after long antecedent dry periods will reduce a significant portion of the pollutants in storm water discharged to and from the MS4.

The San Diego Water Board, however, acknowledges that in some situations retention of the full design capture volume onsite may not be technically feasible. In this event, the Copermittee may allow the Priority Development Project to use biofiltration BMPs to treat 1.5 times the design capture volume not reliably retained onsite, or biofiltration BMPs with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite.

The 1.5 multiplier is based on the finding in the Ventura County Technical Guidance Manual that biofiltration of 1.5 times the design capture volume not retained onsite will provide approximately the same pollutant removal as retention of the design capture volume on an annual basis.[37] This standard is consistent with the Los Angeles Water Board's Los Angeles County and Ventura County municipal storm water permits (Order Nos. R4-2012-0175 and R4-2010-0108, respectively). The flow-thru design of 0.75 times the portion of the design capture volume not reliably retained onsite is consistent with the San Diego Water Board's Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively). In either case, the biofiltration BMPs must be designed with an appropriate hydraulic loading rate to maximize storm water retention and pollutant removal, as well as to prevent erosion, scour, and channeling within the BMP. Each Copermittee is required to update its BMP Design Manual to provide guidance for hydraulic loading rates and other biofiltration design criteria necessary to maximize storm water retention and pollutant removal.

The San Diego Water Board further recognizes that, in addition to not being technically feasible, retention of the full design capture storm onsite may be cost prohibitive, or may not provide as much water quality benefit to the Watershed Management Area as would implementing BMPs elsewhere in the watershed. Thus, Provision E.3.c.(1)(b) allows for the use of a combination of onsite retention BMPs, and the implementation of an Alternative Compliance Program described in Provision E.3.c.(3). Provision E.3.c.(3) is discussed in more detail below.

If the full design capture volume is not retained onsite either because biofiltration is not technically feasible, or a Copermittee grants a Priority Development Project permission to utilize the Alternative Compliance Program, then the pollutants in the portion of the design capture volume that are not reliably retained onsite must still be reduced to the MEP. Thus, flow-thru treatment control BMPs are required to be implemented on Priority Development Projects in addition to the retention BMPs. The requirements of Provisions E.3.c.(1)(a)(ii)[a]-[c] include the performance standards for flow-thru

[37] Ventura Countywide Stormwater Management Program. 2011. Ventura Technical Guidance Manual, Manual Update, 2011.

treatment control BMPs, consistent with the Fourth Term Permits in the San Diego Region.

Whereas the purpose of the requirements under Provision E.3.c.(1) is to reduce pollutants in storm water runoff to the MEP, the purpose of the requirements under Provision E.3.c.(2) is to maintain or restore more natural hydrologic flow regimes to prevent accelerated, unnatural erosion in downstream receiving waters, also to the MEP standard. Provision E.3.c.(2) describes hydromodification management BMP requirements that must be implemented by all Priority Development Projects.

The performance criteria for the implementation of hydromodification management BMPs on Priority Development Projects are consistent with the requirements in the Fourth Term Permits for Orange and Riverside Counties (Order Nos. R9-2009-0002 and R9-2010-0016, respectively). Modifications to the Orange County and Riverside County Hydromodification Management Plans (HMPs) will likely be minor, or may not be necessary. The HMP for San Diego County will likely require some minor modifications to incorporate the requirements of Provision E.3.c.(2) and become consistent with the Orange County and Riverside County HMPs. The San Diego Water Board does not, however, expect that it will be necessary for the San Diego County Copermittees to develop a new approach or significantly re-write the San Diego County HMP. This is because the premise of the hydromodification management BMP requirements, which are to control storm water runoff conditions (flow rates and durations) for Copermittee-defined range of flows, is unchanged from all Fourth Term Permits in the San Diego Region.

Provision E.3.c.(2)(a) requires that post-project runoff conditions mimic the *pre-development* runoff conditions, and not the *pre-project* runoff conditions. Fundamentally, the San Diego Water Board believes that using a hydrology baseline that approximates that of an undeveloped, natural watershed is the only way to facilitate the return of more natural hydrological conditions to already built-out watersheds, and ultimately improved stream health. On the other hand, using the *pre-project* hydrology as a baseline for redevelopment projects results in propagating the unnatural hydrology of urbanized areas. Propagating the urbanized flow regime does not support conditions for restoring degraded or channelized stream segments, and would forever sentence such streams to the degraded state. Furthermore, reducing the volume of storm water runoff associated with the urbanized flow regime will also result in reducing the discharge of pollutants into receiving waters, since storm water runoff from impervious surfaces contains untreated pollutants.

The San Diego Water Board understands that approximating the pre-development runoff condition associated with a redevelopment site is not necessarily straightforward because factors such as natural grade and native vegetation for the site cannot be precisely known. Therefore, the San Diego Water Board does not expect project designers to estimate historical conditions associated with redevelopment sites. Rather, the San Diego Water Board expects project designers and the Copermittees to

approximate pre-development runoff conditions using the parameters of a *pervious* area rather than an *impervious* area. This means that for redevelopment sites, approximating pre-development runoff conditions equates to using existing onsite grade and assuming the infiltration characteristics of the underlying soil. A redevelopment Priority Development Project must not use runoff coefficients of concrete or asphalt to estimate pre-development runoff conditions. Rather, redevelopment projects must use available information pertaining to existing underlying soil type (such as soil maps published by the National Resource Conservation Service), onsite existing grade, and any other readily available pertinent information to estimate pre-development runoff conditions.

The San Diego Water Board understands, indeed asserts, that the pre-development hydrology of an area in question can only be roughly estimated and cannot be precisely known. However, using the hydrology of a natural condition, even if not precisely known, will provide significant benefit to receiving waters over using the hydrology associated with impervious (developed) surfaces. Therefore in order to achieve the goals of the Clean Water Act, which are to "*restore and maintain the chemical, physical, and biological integrity of the nation's waters* [emphasis added]," the most appropriate standard to use for hydromodification management is the standard associated with the pre-development condition.

Provision E.3.c.(2)(b) requires Priority Development Projects to avoid known critical sediment yield areas or implement measures that would allow coarse sediment to be discharged to receiving waters, such that the natural sediment supply is unaffected by the project. This is necessary because the availability of coarse sediment supply is as much an issue for causing erosive conditions to receiving streams as are accelerated flows.

The San Diego Water Board recognizes that in some situations implementing the hydromodification management BMP requirements for flow control fully onsite may not be technically feasible, may be cost prohibitive, or may not provide any overall water quality benefits to the Watershed Management Area. Thus, Provision E.3.c.(2)(c) allows for the use of a combination of onsite hydromodification management BMPs for flow control and alternative compliance options described in Provision E.3.c.(3).

Provision E.3.c.(3) allows for alternative compliance in instances where the Copermittee determines that offsite measures will have a greater overall water quality benefit for the Watershed Management Area than if the Priority Development Project were to implement structural BMPs onsite. Consequently, watershed-specific structural BMP requirements are present in this Order in the form of allowable compliance offsite. The Alternative Compliance Program to Onsite Structural BMP Implementation Provision is intended to integrate with the Copermittees' planning efforts in the Water Quality Improvement Plans.

The Alternative Compliance Program is an option for Priority Development Projects where the governing Copermittee has participated in the development of a Watershed Management Area Analysis as part of the Water Quality Improvement Plan (described in Provision B.3.b.(4)). Such an approach is consistent with the latest findings in hydromodification management by the scientific community. In a Technical Report entitled *Hydromodification Assessment and Management in California,*[38] the report states:

> *"An effective [hydromodification] management program will likely include combinations of on-site measures (e.g., low-impact development techniques, flow-control basins), in-stream measures (e.g., stream habitat restoration), floodplain and riparian zone actions, and off-site measures. Off-site measures may include compensatory mitigation measures at upstream locations that are designed to help restore and manage flow and sediment yield in the watershed."*

Consistent with the ideas brought forth in the report, in the Watershed Management Area Analysis of Provision B.3.b.(4), which is optional, the Copermittees will develop watershed maps that include as much detail about factors that affect the hydrology of the watershed as is available. Such factors included identification of areas suitable for infiltration, coarse sediment supply areas, and locating stream channel structures and constrictions. Once these factors are mapped and studied, the Copermittees can identify areas in the watershed where candidate projects may be implemented that are expected to improve water quality in the watershed by providing more opportunity for infiltration, slowing down storm water flows, or attenuation of pollutants naturally via healthy stream habitat. These candidate projects may be in the form of retrofitting existing development, rehabilitating degraded stream segments, identifying regional BMPs, purchasing land to preserve valuable floodplain functions, and any other project(s) that the Copermittees identify.

Under the Alternative Compliance Program, Priority Development Projects may be allowed to fund, partially fund, or implement a candidate project, in lieu of implementing structural BMPs onsite, if they enter into a voluntary agreement with the governing Copermittee permitting this arrangement. Project proponents may also propose an alternative project not previously identified by the Copermittees. In either case, whether a project proponent implements a candidate project identified by the Copermittees or a separate alternative compliance project, the governing Copermittee must determine that implementation of the project will have a greater overall water quality benefit for the Watershed Management Area than fully implementing structural BMPs onsite. Determination of greater overall water quality benefits associated with alternative compliance projects would be accomplished by utilizing Water Quality Equivalency calculations developed pursuant to Provision E.3.c.(3)(a). Water Quality Equivalency calculations are necessary to establish a regional and technical basis for

[38] 2012. ED Stein, F Federico, DB Booth, BP Bledsoe, C Bowles, Z Rubin, GM Kondolf, A Sengupta. Technical Report 667. Southern California Coastal Water Research Project. Costa Mesa, CA.

determining water quality benefits associated with alternative compliance projects, which can be consistently used by all Copermittees in the San Diego Region. Finally, if ~~I~~f alternative compliance involves funding or implementing a project that is outside the jurisdiction of the governing Copermittee, then that Copermittee may enter into an inter-agency agreement with the appropriate jurisdiction.

Finally, Provision E.3.c.(2)(d) allows Priority Development Projects to be exempt from the hydromodification management BMP requirements if there is no threat of erosion to downstream receiving waters (i.e. the receiving stream is concrete lined from the point of discharge all the way to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean). If the Copermittees believe that more exemptions are warranted, then they must perform the optional Watershed Management Area Analysis of Provision B.3.b.(4). Additional exemptions other than those specified in this Order may be established on a watershed basis, provided the Copermittees perform the analysis, provide supporting rationale for the exemptions, and complete the Water Quality Improvement Plan approval process pursuant to Provision F.1.

To facilitate the transition to this Order from the Fourth Term Permits for Orange and Riverside County Copermittees, Provision E.3.c.(2)(e) allows two additional temporary exemptions from hydromodification management BMP implementation. The first temporary exemption allows relief from hydromodification management BMP implementation for Priority Development Projects discharging directly to an engineered channel conveyance system with a capacity to convey peak flows generated by the 10-year storm event all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean. Similar to the exemption allowed for concrete-lined channels, this exemption is premised on the concept that there is little threat of erosion to these types of engineered channel systems.

The second temporary exemption allows relief from hydromodification management BMP implementation for Priority Development Projects discharging directly to large river reaches with drainage areas larger than 100 square miles and a 100-year flow capacity in excess of 20,000 cubic feet per second. If this exemption is claimed, then properly sized energy dissipation is required at all discharge points associated with the Priority Development Project. This exemption is premised on the concept that large river reaches can essentially assimilate the accelerated flow rates associated with individual Priority Development Projects because they are inconsequential compared to the flow rate in the large river reach. Both of these exemptions are included in the Hydromodification Management Plan for San Diego County[39].

These temporary exemptions are allowed as a means to facilitate Orange and Riverside County Copermittees' transition to this Order from the Fourth Term Permits and are not meant to reside as permanent exemptions without additional rigorous

[39] Final Hydromodification Management Plan Prepared for County of San Diego, March 2011

technical analyses specific to each County. Therefore, these exemptions will no longer apply once the Copermittees' land development programs are fully updated to reflect the requirements of this Order, i.e., upon implementation of the BMP Design Manual pursuant to Provision F.2.b. If the Copermittees believe that these or other exemptions are warranted in the context of water quality improvement and stream restoration opportunities, then the Copermittees must perform the optional Watershed Management Area Analysis of Provision B.3.b.(4) and provide supporting rationale for the exemptions. The San Diego County Copermittees are also required to perform the optional Watershed Management Area Analysis to provide supporting rationale to justify use of these and other exemptions. Updated BMP Design Manuals including rationale to justify use of exemptions will be reviewed by the San Diego Water Board pursuant to Provision F.2.b.

Provisions E.3.c.(4) and E.3.c.(5) were included under the BMP requirements applicable to all development projects in the Fourth Term Permits for San Diego, Orange, and Riverside Counties (Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016, respectively). In this Order, the long-term BMP maintenance and infiltration and groundwater protection requirements apply to structural BMPs implemented by Priority Development Projects only.

Provision E.3.d requires the Copermittees to update their BMP Design Manual as needed to incorporate the requirements of Provision E.3. The BMP Design Manual is formerly known as the Standard Storm Water Mitigation Plan, or SSMP, and was renamed so that the title has a more accurate description of the document content. The contents of the BMP Design Manual are largely unchanged from the previous Standard Storm Water Mitigation Plans required under the Fourth Term Permits. The BMP Design Manual fulfills the 40 CFR 122.26(d)(2)(iv)(A)(2) requirement that the Copermittee's development planning program includes "*a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment*."

As part of the "*planning procedures,*" 40 CFR 122.26(d)(2)(iv)(A)(2) requires the procedures to "*address controls to reduce pollutants in discharges from municipal separate storm sewers after construction is completed*." The requirements applicable to the implementation and oversight of structural BMPs at Priority Development Projects are provided under Provision E.3.e.

Proper installation of the structural BMPs approved for a Priority Development Project is necessary to ensure that pollutants in storm water discharges will be reduced to the MEP after the project is completed. In addition to the proper installation of structural BMPs, the maintenance of structural BMPs on Priority Development Projects is necessary to ensure that pollutants in storm water discharges will continue to be reduced to the MEP. Provision E.3.e.(1) includes the minimum requirements that each

Copermittee must implement to ensure structural BMPs are properly installed and will be properly maintained.

Provisions E.3.e.(1)(a)(i)-(ii) have been included to provide additional clarification regarding when a Copermittee may allow land development requirements from earlier MS4 permits to apply to a Priority Development Project. Since the MS4 permits issued from 2001 to the adoption of Order No. R9-2015-0001 amending Order No. R9-2013-0001 (Regional MS4 Permit), a Copermittee could allow development projects with "prior lawful approval" to be "grandfathered" into implementing BMP requirements from previous MS4 permits. The Copermittees were given the discretion to use their land use authority to determine when it was appropriate to allow a development project with prior lawful approval to implement BMP requirements from the previous MS4 permits, and when the most recent BMP requirements should be required to achieve the reduction of pollutants in storm water runoff from development projects to the MEP. However, the San Diego Water Board has found that the Copermittees and the development community frequently disagree about when a development project has prior lawful approval and what is necessary to reduce pollutants in storm water runoff from development projects to the MEP.

Therefore, Provisions E.3.e.(1)(a)(i)-(ii) were included to provide more clarity and certainty for the Copermittees, the land development community, and the general public about when the structural BMP performance standards of earlier MS4 permits may be allowed to be implemented. A Copermittee may allow a Priority Development Project to implement BMP requirements of the previous MS4 permit only if all requirements of Provisions E.3.e.(1)(a)(i)[a]-[d] have been met. Otherwise, the Copermittees must require all Priority Development Projects to incorporate the BMP requirements of Provision E.3 into the project to reduce pollutants in storm water runoff from development projects to the MEP.

Provisions E.3.e.(1)(a)(i)[a]-[d] are dependent upon the effective date of the BMP Design Manual. Unless otherwise directed by the San Diego Water Board, the effective date of the BMP Design Manual is December 24, 2015 for the San Diego County Copermittees, September 28, 2017 for the Orange County Copermittees, and July 5, 2018 for the Riverside County Copermittees.

Alternatively, if the Copermittee can demonstrate a lack of land use authority or legal authority to require a Priority Development Project to implement the requirements of Provision E.3, the Copermittee may allow land development requirements from the previous MS4 permits to apply. However, under these circumstances the San Diego Water Board expects the Copermittee to utilize its available land use authority or legal authority to require the implementation of as much of Provision E.3 as possible to reduce the discharge of pollutants in storm water from development and redevelopment projects within its jurisdiction to the MEP.

In cases where BMP requirements from the earlier MS4 permits govern the structural BMP design requirements of a Priority Development Project, the San Diego Water Board expects the Copermittees to be able to demonstrate, in a programmatic audit or other means, that a Priority Development Project met all the requirements listed under Provisions E.3.e.(1)(a)(i)[a]-[d], or have evidence that the Copermittee did not have the land use or legal authority to require the implementation of Provision E.3 for a Priority Development Project.

The requirements under Provision E.3.e.(2)-(3) are necessary to demonstrate each Copermittee is implementing a program that complies with Provisions E.3.b-c and E.3.e.(1), and ensure structural BMPs at Priority Development Project will continue to be able to reduce pollutants in storm water discharges to the MEP.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary for any development projects to compel compliance with the requirements of Provision E.3 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.3.f requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Provision E.4 (Construction Management) requires each Copermittee to implement a construction management program to control and reduce the discharge of pollutants in storm water from construction sites to the MEP. Proper implementation of the construction management program will also contribute toward effectively prohibiting non-storm water discharges from construction sites to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." As part of the management program, 40 CFR 122.26(d)(2)(iv)(D) requires "*a program to implement and maintain structural and non-structural best management practices to reduce pollutants in storm water runoff from construction sites to the municipal storm sewer system.*"

Construction sites can be significant sources of sediment, trash, and other pollutants to receiving waters. Although sediment is naturally occurring in the natural environment, the discharge of sediment under unnatural conditions is problematic to receiving waters. Fine sediment in creeks causes high turbidity that interferes with the functionality of native flora and fauna in local creeks. For example, turbidity interferes with both photosynthesis of water-philic plants, as well as successful foraging and reproduction of benthic macroinvertebrates. Sediment can also make it difficult for fish to breathe because it clogs fish gills. Other pollutants such as heavy metals or

pesticides can adhere to sediment and are transported to receiving waters during storm events, where they dissolve in the water column and become bioavailable to aquatic organisms. Sediment is recognized as a major stressor to surface waters and is responsible for the impairment of several lagoons and creeks in the San Diego Region.

Provision E.4 includes requirements that each Copermittee must implement to minimize the discharge of sediment and other pollutants from construction sites to the MS4 within its jurisdiction. The requirements under Provision E.4 are consistent with the Fourth Term Permits for San Diego, Orange, and Riverside Counties. Therefore, Copermittees are expected to implement the requirements seamlessly, with minimal changes to their existing construction management programs. The Copermittees, however, are given more flexibility to run their programs as needed to maximize efficiency, and also to be consistent with the Water Quality Improvement Plan for the Watershed Management Area.

As part of the construction management program, 40 CFR 122.26(d)(2)(iv)(D)(1) requires "*procedures for site planning which incorporate consideration of potential water quality impacts.*" Provision E.4.a describes the minimum elements each Copermittee is required to include as part of the construction site planning and project approval process. The construction site planning and approval process is based primarily on ensuring each project had an adequate site-specific pollution control, construction BMP, and/or erosion and sediment control plan that will be implemented to minimize the discharge of pollutants in storm water to the MEP, and minimize impacts to receiving waters.

The requirements under Provision E.4.b provide the data and information necessary to identify "*priorities for inspecting sites and enforcing control measures*" required pursuant to 40 CFR 122.26(d)(2)(iv)(D)(3). Under Provision E.4.b, each Copermittee must identify construction sites that are considered a high threat to downstream surface waters. Designation of "high threat to water quality" construction sites will necessitate the Copermittees to develop criteria to identify such sites. Provision E.4.b.(2) describes a list of factors that must be considered when the Copermittee considers threat to water quality. For example, a Copermittee must identify sites as "high threat to water quality" if it is located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions, according to the Water Quality Improvement Plan. This ensures that construction management program implementation is compatible with the Copermittee's identified highest priority water quality conditions.

Pursuant to 40 CFR 122.26(d)(2)(iv)(D)(2) each Copermittee is required describe "*requirements for nonstructural and structural best management practices*" at construction sites. Provision E.4.c includes the types of construction site BMPs that the Copermittees must implement, or require the implementation of, at each construction site to reduce pollutants in storm water discharges to the MEP.

Each Copermittee is expected to require the implementation of appropriate BMPs given specific site conditions, the season and likelihood of rain events, and construction phase (i.e. grading vs. vertical construction). This means that throughout the life of the project construction, the appropriate BMPs will vary, especially if the construction of the project spans multiple wet seasons. As opposed to describing specific minimum BMPs that must be implemented, the Order describes major BMP categories that should be considered for each site.

Each Copermittee is expected to use its 20 years of storm water experience and knowledge to require implementation of appropriate BMPs from the various categories at each construction site within its jurisdiction. For example, the San Diego Water Board expects that each site will be required to implement erosion control and sediment control. The San Diego Water Board also expects each Copermittee to require implementation of active/passive sediment treatment systems at sites where other BMPs have been tried and are known to be inadequate, and discharges of sediment are causing or contributing to water quality impairment downstream. Each Copermittee is granted flexibility in specifying the minimum level of BMP requirements at each site, but the San Diego Water Board expects each site to be capable of controlling pollutants in storm water discharges to the MEP and preventing illicit discharges.

The requirements under Provision E.4.d are necessary to demonstrate that each Copermittee is implementing a program that complies with Provisions E.4.a and E.4.c and ensure BMPs at construction sites will reduce pollutants in storm water discharges to the MEP.

Provision E.4.d does not include minimum required inspection frequencies for construction sites. Each Copermittee must use its experience and knowledge to specify an appropriate inspection frequency for both high priority and lower priority sites in their jurisdictional runoff management program documents, and in accordance with the Water Quality Improvement Plan. Appropriate inspection frequencies may vary by Copermittee, but the San Diego Water Board expects that the stated frequency will be adequate for each Copermittee to properly oversee the construction sites within its jurisdiction, confirm BMPs are implemented to reduce pollutants in storm water discharges from constructions sites to the MEP, and make needed changes to its program on an ongoing basis as necessary.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary for any development projects to compel compliance with the requirements of Provision E.4 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.4.e requires each Copermittee to enforce its legal authority

established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Provision E.5 (Existing Development Management) requires each Copermittee to implement an existing development management program to control and reduce the discharge of pollutants in storm water from areas of existing development to the MEP. Proper implementation of the existing development management program will also contribute toward effectively prohibiting non-storm water discharges from areas of existing development to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." Within 40 CFR 122.26(d)(2)(iv)(A) and (C), the management program is required to reduce impacts on receiving waters and reduce pollutants in storm water discharges to the MEP from commercial and residential areas, industrial facilities, and municipal facilities.

Commercial and residential areas, industrial facilities, and municipal facilities must be addressed by each Copermittee with the existing development management program required under Provision E.5. All other areas within each Copermittee's jurisdiction should be either undeveloped open space, or areas that are being developed or under construction. Areas being developed or under construction will be addressed by the Copermittee under the requirements of Provision E.3 (Development Planning) or Provision E.4 (Construction Management).

Areas of existing development typically include impervious surfaces such as sidewalks, driveways, roads, and rooftops, which generate and concentrate pollutants (such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not found in high concentrations in the natural environment. Pollutants that accumulate on impervious surfaces are not easily biodegraded or not subject to natural treatment processes. When it rains, these pollutants are transported in storm water runoff from these impervious surfaces into receiving waters, resulting in poor water quality and degradation of beneficial uses.

In addition to the generation of pollutants, areas of existing development have generally altered the natural conditions of the land and removed vegetative cover, reduced the perviousness of the surface, and reduced the capacity of storm water that can be intercepted, captured, stored, infiltrated, evaporated, and/or evapotranspired. The alteration of the natural conditions and the impervious surfaces associated with areas of existing development causes water quality problems due to the alteration of natural flow regimes within the watersheds; resulting in hydromodification of channels, streams, and habitats that exist within or adjacent to the areas of existing development.

Thus, storm water discharges from areas of existing development are responsible for poor water quality, degraded habitats, and hydromodified channels throughout the developed portions of the watersheds in the San Diego Region. To improve the health and functionality of the receiving waters in a Watershed Management Area, land use practices and the amount of impervious surfaces in areas of existing development must change to reduce the various impacts caused by hydromodification and pollutants from storm water runoff generated in developed areas. Each Copermittee must be aggressive to address pollutant sources and runoff from areas of existing development to be able to reduce pollutants in storm water discharges from the MS4 to the MEP.

There is some overlap in the requirements under Provision E.5 with the requirements under Provisions E.2 (Illicit Discharge Detection and Elimination), E.3 (Development Planning), and E.4 (Construction Management). Illicit discharges frequently originate from areas of existing development. New development projects, when completed will become some type of residential, commercial, industrial or municipal existing development. Redevelopment projects are, by definition, redeveloping areas of existing development. And, redevelopment projects become construction sites located in areas of existing development. Much of the data and information collected, inspections performed, and enforcement actions taken for the requirements under Provisions E.2 to E.4 may also be utilized by the existing development management program. The requirements under Provision E.5, however, are focused primarily on reducing pollutants generated in areas of existing development that can be transported in storm water runoff and discharged to and from the MS4.

The requirements under Provision E.5 build upon existing program elements being implemented by the Copermittees. Provision E.5 is generally consistent with the existing development requirements of the Fourth Term Permits for Orange and Riverside Counties (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), but modified to provide more flexibility to implement the programs so resources can be better focused toward addressing the highest priority water quality conditions identified in the Water Quality Improvement Plans.

For a Copermittee to properly manage areas of existing development, having knowledge of what development exists within its jurisdiction is essential. Provision E.5.a requires each Copermittee to maintain a watershed-based inventory of all the existing development within its jurisdiction. This requirement is necessary for each Copermittee to implement the requirements of Provision E.5.b-e.

As opposed to just maintaining separate inventories based on the type of site, each Copermittee must maintain a watershed-based inventory that includes all types of existing development within its jurisdiction. By utilizing a watershed-based inventory, the Copermittees within a Watershed Management Area can combine their inventories and review the inventories by watershed in addition to by jurisdiction. Pollutant

sources and strategies for abatement can then be evaluated on a watershed level, as opposed to evaluating sources and strategies strictly by type of site.

Provision E.5.a includes the information that must be included in the inventory. Provision E.5.a.(1) specifies what facilities or areas must be included in the inventory. A commercial type of existing development may be identified in the inventory as a facility (e.g. individual building, individual business) or an area (e.g. shopping center, commercial zone). An industrial type of existing development must be identified in the inventory by facility (e.g. individual industrial entity). A municipal type of existing development must be identified in the inventory by facility, with a list of specific municipal facilities that must be included in the inventory. A residential type of existing development must be identified by areas to be designated by the Copermittee. For each of the facilities and areas identified in the Copermittee's inventory developed pursuant to Provision E.5.a.(1), Provision E.5.a.(2) specifies the information that must be included in the description for the facility or area.

Provision E.5.a.(3) requires each Copermittee to maintain an updated map showing the location of inventoried existing development, watershed boundaries, and water bodies. This requirement was included because this information is expected to help the Copermittees in a Watershed Management Area identify and prioritize sources of pollutants and/or stressors in areas of existing development that contribute toward the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Knowledge of the existing development that are likely to be sources of pollutants contributing to the highest priority water quality conditions is expected to be a key element in the Copermittees' development of the water quality improvement strategies that will be included in the Water Quality Improvement Plans. The strategies described in the Water Quality Improvement Plans will direct efforts within the existing development management programs implemented by each Copermittee.

Pursuant to 40 CFR 122.26(d)(2)(iv)(A) each Copermittee is required describe "*structural and source control measures to reduce pollutants*" in storm water runoff discharged from areas of existing development. Provision E.5.b includes the BMP implementation and maintenance requirements that the each Copermittee must require at areas of existing development to reduce pollutants in storm water discharges to the MEP. The San Diego Water Board, however, recognizes that BMP implementation and maintenance for residential areas will require much more education and encouragement through less authoritative measures than for commercial, industrial and municipal facilities and areas. Thus, the BMP implementation and maintenance requirements have been separated between requirements under Provision E.5.b.(1) for commercial, industrial and municipal facilities and areas, and Provision E.5.b.(2) for residential areas.

Most of the requirements in Provision E.5.b are consistent with the related requirements in the Fourth Term Permits. The level of specificity, however, has been changed to allow each Copermittee the flexibility to implement its program to achieve maximum efficiency, and to perform functions that will address the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Each Copermittee is expected to require the implementation of appropriate BMPs to address the expected pollutants from each facility or area. The Third and Fourth Term Permits described specific minimum BMPs that must be implemented at various sites. This Order, however, requires each Copermittee to designate minimum BMPs themselves and require implementation. Consistent with the Fourth Term Permits, each Copermittee is required to maintain, or require the maintenance of, all BMPs as needed.

The BMP implementation and maintenance requirements include a schedule of operation and maintenance activities for the MS4 and related structures (such as catch basins, storm drain inlets, and detention basins), as well as public streets and roads. Public streets and roads specifically include public unpaved roads. The San Diego Water Board identified, through investigations and complaints, sediment discharges from unpaved roads as a significant source of water quality problems in the San Diego Region. Inspection activities conducted by the San Diego Water Board since the Third Term Permits have found a lack of source control for many unpaved roads within the jurisdiction of the Copermittees.

Unpaved roads are a source of sediment that can be discharged in runoff to receiving waters, especially during storm events. Erosion of unpaved roadways occurs when soil particles are loosened and carried away from the roadway base, ditch, or road bank by water, wind, traffic, or other transport means. Exposed soils, high runoff velocities and volumes, sandy or silty soil types, and poor compaction increase the potential for erosion.

Road construction, culvert installation, and other maintenance activities can disturb the soil and drainage patterns to streams in undeveloped areas, causing excess runoff and thereby erosion and the release of sediment. Poorly designed unpaved roads can act as preferential drainage pathways that carry runoff and sediment into natural streams, impacting water quality. In addition, other public works activities along unpaved roads have the potential to significantly affect sediment discharge and transport within streams and other waterways, which can degrade the beneficial uses of those waterways.

USEPA also recognizes that discharges from unpaved roads pose a significant potential threat to water quality. USEPA guidance[40] emphasizes the threat of unpaved roads to water quality:

[40] USEPA, 2006. Environmentally Sensitive Maintenance for Dirt and Gravel Roads. Gesford and Anderson, USEPA-PA-2005.

> "*Dirt and gravel roads are a major potential source of these pollutants [sediment] and pollutants that bind to sediment such as oils, nutrients, pesticides, herbicides, and other toxic substances. Many roads have unstable surfaces and bases. Roads act like dams, concentrating flows that accelerate erosion of road materials and roadsides. Both unstable surfaces and accelerated erosion then lead to sediment and dust.*"

There are several guidance documents, developed by the USEPA,[41] the US Forest Service,[42] the University of California,[43] and others, that include design and construction specifications and BMPs that are readily available for implementation by public entities. Implementing design and other source control BMPs for unpaved roads in the region is necessary to reduce and minimize the impacts of sediment discharged during storm events from unpaved roads to the MS4s and receiving waters.

Provision E.5.c describes existing development site inspection frequency, content, and tracking that each Copermittee must incorporate into their existing development management programs. The requirements under Provision E.5.c are necessary to demonstrate each Copermittee is implementing a program that complies with Provision E.5.b and ensure BMPs implemented in areas of existing development will reduce pollutants in storm water discharges to the MEP. Provision E.5.c has been modified to include a minimum of once every 5 years for all inventoried facilities and areas of existing development, utilizing one or more methods of inspection.

In addition to onsite inspections, the methods of inspection have been expanded to include drive-by inspections. Inspections may be performed by the Copermittee's municipal and contract staff, or by volunteer monitoring or patrol programs. Volunteer monitoring or patrol programs are not expected to enforce the Copermittee's ordinances, or to inspect areas or facilities where members of the public are not allowed access. Volunteer monitoring or patrol programs must be trained by the Copermittee, and are only expected to collect visual observations. By utilizing drive-by inspections and volunteer monitoring or patrol programs, the Copermittees will be able to maximize and efficiently use their resources to identify and address sources of pollutants in areas of existing development.

The municipal and contract staff of each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial, industrial, and municipal facilities and areas in its inventoried existing development pursuant to Provision E.5.c.(1)(a)(iv). An "equivalent" of at least 20 percent means if any commercial, industrial, or municipal facilities or areas require multiple onsite

[41] Ibid
[42] US Forest Service, 1996. Forest Service Specifications for Construction of Roads & Bridges. EM-7720-100. Revised August 1996.
[43] University of California Division of Agriculture and Natural Resources, 2007. Rural Roads: A Construction and Maintenance Guide of California Landowners. Publication 8262.

inspections during any given year, those additional inspections may count toward the total annual inspection requirement. Linear municipal facilities (i.e. MS4 linear channels, sanitary sewer collection systems, streets, roads and highways) in the Copermittee's existing development inventory are not subject to the inspection frequency requirement of Provision E.5.c.(1)(a)(iv).

The inspection content specified in Provision E.5.c.(2)(a) includes the information required to be collected during an inspection by any method. The inspection content specified in Provision E.5.c.(2)(b) includes additional information that must be collected when a Copermittee's municipal or contract staff perform an onsite inspection. Provision E.5.c.(3) specifies the information that each Copermittee must maintain in its existing development inspection records.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary to compel compliance with the requirements of Provision E.5 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.5.d requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Provisions E.5.e.(1)-(2) specifically require the Copermittee to identify areas of existing development as candidates for retrofitting, and streams, channels, and/or habitats as candidates for rehabilitation. Provisions E.5.e.(1)-(2) are based on the retrofitting requirements of the Fourth Term Permits for Orange and Riverside Counties, but modified to also include identifying projects to rehabilitate channels within areas of existing development. The requirements have also been modified to be more focused on utilizing these types of projects for addressing the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Interest and opportunity to retrofit areas of existing development and rehabilitate channels located in areas of existing development has been observed in several programs the San Diego Water Board oversees (e.g., CWA Section 401 Water Quality Certification program, supplemental environmental projects, and grant programs). Each jurisdiction has miles and miles of streets that could be retrofitted to become green streets. Reshaping landscaped areas from convex to concave configurations can detain storm water instead of directing runoff as quickly as possible to the MS4. Retrofit projects could also include simply replacing impervious surfaces with permeable surfaces.

Retrofitting projects do not necessarily have to be expensive. Retrofitting projects could be as simple as redirecting downspouts from roofs to pervious or landscaped areas instead of to hardscaped areas discharging directly to the MS4, providing rain barrels to harvest storm water from downspouts for use at a later time, or planting more trees in areas with little vegetation to provide canopy that can intercept storm

water. The San Diego Water Board encourages the Copermittees to identify simple, low-cost retrofitting opportunities that can be easily implemented, in addition to other more expensive retrofitting and channel rehabilitation projects.

Rehabilitation of channels, streams, and/or habitat will require more significant planning and resources to implement. There are, however, also abundant opportunities to rehabilitate channels, streams and/or habitats in or adjacent to areas of existing development. Each Watershed Management Area likely has several creeks and stream reaches that have been undergrounded, artificially hardened, or hydromodified that could be rehabilitated to be more sustainably configured, which would slow down storm water flows and potentially have more assimilative capacity for pollutants while still being supportive of designated beneficial uses.

The San Diego Water Board recognizes that it may be infeasible to implement retrofitting or channel rehabilitation projects within certain areas of a Copermittee's jurisdictions. For such areas, the Copermittee must instead identify, develop, and implement regional retrofitting and channel rehabilitation projects (i.e. projects that can retain and/or treat storm water from one or more areas of existing development) adjacent to and/or downstream of the areas of existing development.

Provisions E.5.e.(1)-(2) do not require the implementation of retrofitting and rehabilitation projects, but do require the Copermittee to develop a program with strategies to facilitate the implementation of these types of projects in areas of existing development. The strategies are expected to include allowing and encouraging Priority Development Projects to implement retrofitting types of projects as a means of compliance with the structural BMP performance criteria requirements of Provisions E.3.c.(1) and E.3.c.(2).

Provision E.6 (Enforcement Response Plans) requires each Copermittee to develop an Enforcement Response Plan as part of its jurisdictional runoff management program document. Proper implementation of the Enforcement Response Plans is necessary to effectively prohibit non-storm water discharges to the MS4, and reduce the discharge of pollutants in storm water from the MS4 to the MEP.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system*" and be able to demonstrate that it can "*operate pursuant to legal authority established by statute, ordinance or series of contracts*" to control the discharge of non-storm water and pollutants in storm water to and from its MS4. Pursuant to 40 CFR 122.26(d)(2)(i)(E) each Copermittee is specifically required to have the legal authority to "*[r]equire compliance with conditions in ordinances, permits, contracts or order*s."

The requirements under Provision E.6 are necessary to demonstrate that each Copermittee can enforce its legal authority to *"effectively prohibit non-stormwater discharges"* and "*reduce the discharge of pollutants to the maximum extent*

practicable" as well as "*[r]equire compliance with conditions in ordinances, permits, contracts or order*."

The Enforcement Response Plan required under Provision E.6 will serve as a reference for the Copermittee and the San Diego Water Board to determine if consistent enforcement actions are being implemented to achieve timely and effective compliance from all public and private entities that are not in compliance with the Copermittee's ordinances, permits, or other requirements. The Enforcement Response Plan must contain clear direction for the Copermittee to take immediate enforcement action, when appropriate and necessary, in their illicit discharge detection and elimination, development planning, construction management, and existing development management programs.

If the entities subject to the Copermittee's legal authority do not implement appropriate corrective actions in a timely manner, or if violations repeat, the Copermittee must take progressively stricter responses to enforce its legal authority and achieve compliance with its ordinances, permits, or other requirements to *"effectively prohibit non-stormwater discharges"* and "*reduce the discharge of pollutants to the maximum extent practicable.*"

Provision E.7 (Public Education and Participation) requires each Copermittee to implement a public education and participation program. Proper implementation of the public education and participation program as part of its jurisdictional runoff management program will contribute toward effectively prohibiting non-storm water discharges to the MS4, and toward the reduction of pollutants in storm water from the MS4 to the MEP.

Provision E.7 establishes the minimum requirements that each Copermittee must implement to engage members of the public as part of its jurisdictional runoff management program. In the Fourth Term Permits, the public education program requirements and the public participation requirements were included as separate jurisdictional runoff management program components. In this Order, the public education requirements have been consolidated with the public participation requirements, as both sets of requirements are related to the engagement of the public by each Copermittee. Engagement of the public is critical for the success of each Copermittee's jurisdictional runoff management program.

The Copermittees have been implementing public education programs for the last 20 years, which are now well established. The specificity of expected public education program elements of the Fourth Term Permits has been removed. For the most part, the public education program requirements in Provision E.7.a have been reduced to a set of requirements that are specifically included in the federal regulations under 40 CFR 122.26(d)(2)(iv)(A)(6), 122.26(d)(2)(B)(6) and 122.26(d)(2)(D)(4), which should already be incorporated into each Copermittee's existing public education program. Each Copermittee is expected to utilize the information and data collected from the monitoring and assessments conducted within the Watershed Management Area, and

from its inventories and inspections to best direct its public education program resources toward addressing the highest priority water quality conditions identified within the Water Quality Improvement Plan.

According to 40 CFR 122.26(d)(2)(iv), public participation is required to be included as part of the "*comprehensive planning process*", which includes the development and implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs. The requirements under Provision E.7.b specify the opportunities that the public must be provided to be involved in the "*comprehensive planning process*", as required by to 40 CFR 122.26(d)(2)(iv).

Provision E.8 (Fiscal Analysis) requires each Copermittee to secure the resources and provide an analysis of the resources that will be necessary to implement the requirements of the Order. Adequate fiscal resources are necessary for a jurisdictional runoff management program to effectively prohibit non-storm water discharges to the MS4, and reduce pollutants in storm water from the MS4 to the MEP.

According to 40 CFR 122.26(d)(2)(vi), each Copermittee is responsible for providing "*a fiscal analysis of the necessary capital and operation and maintenance expenditures necessary to accomplish the activities*" required by this Order, including "*a description of the source of funds that are proposed to meet the necessary expenditures, including legal restrictions on the use of such funds.*" The fiscal analysis requirements of Provision E.8 are consistent with 40 CFR 122.26(d)(2)(vi).

The San Diego Water Board has chosen not to require a description of fiscal benefits realized from implementation of the jurisdictional runoff management programs. This is a recommendation from the National Association of Flood and Stormwater Management Agencies.[44] For instance, the fiscal analysis requirements do not address city-wide fiscal benefits of protection (e.g., public health, tourism, property values, economic activity, beneficial uses, etc.), even though many costs currently reported to the San Diego Water Board are for related activities. This type of assessment may help Copermittees improve the allocation of resources and it may help the Copermittees secure adequate funding for the program. Qualitative assessments, however, could be overly subjective and most Copermittees likely lack the ability to provide accurate quantitative assessments. The San Diego Water Board encourages the Copermittees to consider means for conducting assessments of fiscal benefits derived from the programs. Such assessments could be conducted on a regional scale similar to studies of program costs conducted by the State Water Board.[45]

[44] National Association of Flood and Stormwater Management Agencies. 2006. *Guidance for Municipal Stormwater Funding.* Prepared under a grant provided by the USEPA.
[45] State Water Board, 2005. NPDES Stormwater Cost Survey.

F. Reporting

Purpose: Provision F includes the requirements for the documents and reports that the Copermittees must prepare and provide to the San Diego Water Board. The documents prepared by the Copermittees and provided to the San Diego Water Board and made available to the public will provide the documentation that the Copermittees are complying with the requirements of the Order.

***Discussion*:** Provision F requires the Copermittees to prepare several documents and reports that must be provided to the San Diego Water Board and made available to the public. The reporting requirements have been significantly reduced compared to the Fourth Term Permit reporting requirements. The reduction in reporting requirements was recommended by the San Diego County Copermittees in the Report of Water Discharge submitted in June 2011.

More specific and detailed discussions of the requirements of Provision F are provided below.

Provision F.1 (Water Quality Improvement Plans) requires the Copermittees in each Watershed Management Area to develop and submit a Water Quality Improvement Plan in accordance with the requirements of Provision B.

Of all the requirements of Provision F, the Water Quality Improvement Plans will likely be the documents requiring the most significant effort to develop. The content of the Water Quality Improvement Plans, however, is expected to include content that should already have been developed for the Watershed Plans and several elements that are included in the Monitoring and Reporting Programs required under the Fourth Term Permits.

Because the Water Quality Improvement Plan is part of the "*comprehensive planning process which involves public participation*," Provision F.1 includes requirements to give multiple opportunities to the public to provide input on the content of the plans.

Provision F.1.a.(1) specifies the elements that the Copermittees must include in the public participation process for the development of the Water Quality Improvement Plans. In order for the public to be aware of the opportunities to provide input, Provision F.1.a.(1)(a) requires the Copermittees to develop a publicly available and noticed schedule of the opportunities for the public to participate and provide comments during the development of the Water Quality Improvement Plan. These opportunities are when the public can provide the data, information, and recommendations that the Copermittees can consider during the development of the Water Quality Improvement Plans.

The San Diego Water Board recognizes, however, that the Copermittees cannot be expected to incorporate all the data, information, and recommendations that the public may provide into the Water Quality Improvement Plans. The Copermittees will have to review the data, information, and recommendations received and make some decisions on what to incorporate into the Water Quality Improvement Plans. Before the Copermittees finalize their decisions, members of the public should be allowed to review the Copermittees' decisions. Thus, Provision F.1.a.(1)(b) requires the Copermittees to form a Water Quality Improvement Consultation Panel (Panel).

The Panel will consist of a member from the environmental community and a member from the development community familiar with the Watershed Management Area. A representative from the San Diego Water Board staff will also be part of the Panel. The Copermittees may choose to include additional members, but the Panel is only required to include three panel members.

The Panel will serve as an additional public participation and input mechanism during the development of the Water Quality Improvement Plans. The knowledge and expertise from these Panel members are expected to provide the Copermittees valuable direction during their decision-making process. The Copermittees will review the content of their planned submittals with the Panel members to receive recommendations. If the Panel provides recommendations, the Copermittees must consider revisions to the Water Quality Improvement Plan submittals.

The San Diego Water Board recognizes that the development of multiple Water Quality Improvement Plans concurrently may limit the ability of the public to review and provide comments to the Copermittees. Thus, Provision F.1.a.(1)(c) requires the Copermittees to coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public time and opportunity to participate during the development of the Water Quality Improvement Plans.

Provision F.1.a.(2) requires the Copermittees to develop and submit the first Water Quality Improvement Plan component, in accordance with the requirements of Provision B.2, which includes the identification of the priority water quality conditions and potential water quality improvement strategies. The public must be provided an opportunity to provide data, information and recommendations to be utilized in the development and identification of the priority water quality conditions and potential water quality improvement strategies for the Watershed Management Area. The Copermittees must consult with the Panel and consider making revisions. The Copermittees may submit the requirements of Provision B.2 as early as 6 months and no later than 12 months after the commencement of coverage under this Order. After the requirements of Provision B.2 are submitted to the San Diego Water Board, the public will be provided another opportunity to provide comments.

Provision F.1.a.(3) requires the Copermittees to develop and submit the second Water Quality Improvement Plan component, in accordance with the requirements of Provision B.3, which includes the identification of the numeric goals for the highest

priority water quality conditions identified for the Watershed Management Area, and the strategies that will be implemented to achieve the potential numeric goals. The Copermittees may also develop the Optional Watershed Management Area Analysis, in accordance with the requirements of Provision B.3.b.(4), as part of this submittal. The public must be provided an opportunity to provide data, information and recommendations to be utilized in the development and identification of the numeric goals and water quality improvement strategies for the Watershed Management Area. The Copermittees must consult with the Panel and consider making revisions. The Copermittees may submit the requirements of Provision B.3 as early as 9 months and no later than 18 months after the commencement of coverage under this Order. After the requirements of Provision B.3 are submitted to the San Diego Water Board, the public will be provided another opportunity to provide comments.

Finally, Provision F.1.b describes the process for the submittal and implementation of the Water Quality Improvement Plans. The complete Water Quality Improvement Plans are required to be submitted by the Copermittees within 24 months after the commencement of coverage under this Order. The San Diego Water Board will provide the public an opportunity to provide comments on each complete Water Quality Improvement Plan.

The San Diego Water Board will review each Water Quality Improvement Plan and the public comments received to determine if the Copermittees have submitted a Water Quality Improvement Plan that meets the requirements of Provision B. If a Water Quality Improvement Plan does not meet the requirements of Provision B, the Copermittees will be considered out of compliance and directed in writing by the San Diego Water Board Executive Officer to correct the deficiencies.

When a Water Quality Improvement Plan meets the requirements of Provision B, the San Diego Water Board will determine whether to hold a public hearing or to limit public input to submittal of written comments before accepting the Water Quality Improvement Plan. Implementation of the Water Quality Improvement Plan must begin within 30 days of acceptance.

The San Diego Water Board expects that any deficiencies in the Water Quality Improvement Plan will be identified either in the public comments or during the review by the San Diego Water Board before implementation begins. In the event any deficiencies are identified after the implementation of the Water Quality Improvement Plan, Provision F.1.b.(7) clarifies that the San Diego Water Board maintains the right to require the Copermittees to correct any deficiencies that may be identified.

Provision F.2 (Updates) requires the Copermittees to update specific documents that the Copermittees will utilize to implement the requirements of this Order.

Each Copermittee is required to continue implementing a jurisdictional runoff management program, as required under Provision E. Implementation of each Copermittee's jurisdictional runoff management program is directed by its jurisdictional

runoff management program document. Provision F.2.a requires each Copermittee to update its jurisdictional runoff management program document to be consistent with the requirements of Provision E concurrent with the submittal of the Water Quality Improvement Plan.

Likewise, each Copermittee must continue to require new development and redevelopment projects to implement BMPs to control pollutants in storm water runoff. The control of pollutants in storm water runoff from development and redevelopment projects within each Copermittee's jurisdiction is guided and directed by its BMP Design Manual, formerly known as a Standard Storm Water Mitigation Plan (SSMP). Provision F.2.b requires each Copermittee to update its BMP Design Manual to be consistent with the requirements of Provision E.3 concurrent with the submittal of the Water Quality Improvement Plan.

For situations where the San Diego Water Board may amend the requirements of Provisions E.3.a-d after a Copermittee has updated its BMP Design Manual pursuant to Provision F.2.b.(1), Provision F.2.b.(4) gives the Copermittee up to 90 days to incorporate the amended requirements of Provision E.3.a-d into its BMP Design Manual. The San Diego Water Board Executive Officer has discretion to modify the 90-day time period depending on the complexity of the amendments or other information that warrants a change in the 90-day time period.

In general, the requirements of the Order should not necessitate a complete rewrite of each Copermittee's jurisdictional runoff management program document or BMP Design Manual, as was required by the Third Term Permits. The jurisdictional runoff management program and BMP Design Manual requirements of this Order are not significantly different than the requirements of the Fourth Term Permits. Thus, only sections of the Order which are new or have been significantly changed should warrant revisions to specific sections of the Copermittee's jurisdictional runoff management program document and BMP Design Manual.

Finally, the Water Quality Improvement Plans are expected to require updates as the iterative approach and adaptive management process included in the Water Quality Improvement Plan, as required under Provision B.5, is implemented by the Copermittees. Provision F.2.c.(1) requires the Copermittees to implement a public participation process for the proposed updates, review the proposed updates with the Panel, and submit the updates to the Water Quality Improvement Plan as part of the Annual Reports required under Provision F.3.b.

Also, because TMDLs are likely to be developed, adopted and approved during the term of the Order, Provision F.2.c.(2) has been included to expedite the incorporation of TMDLs into the Copermittees' Water Quality Improvement Plans as part of the update process, potentially before the Order is re-opened to incorporated the requirements of the new TMDLs.

Provision F.3 (Progress Reporting) requires the Copermittees to report on the progress of implementing the Water Quality Improvement Plans.

The requirements of Provision F.3 are to report the progress toward improving water quality that the Copermittees are achieving with the implementation of the Water Quality Improvement Plans and each Copermittee's jurisdictional runoff management program. The Progress Report Presentations required under Provision F.3.a are included to provide the Copermittees an opportunity to communicate directly with the San Diego Water Board and the public. The Progress Report Presentations will also provide the members of the San Diego Water Board and members of the public an opportunity to become more acquainted with the Copermittees and their projects and programs to address non-storm water and storm water discharges into and from their MS4s.

The Annual Report requirements of Provision F.3.b are a consolidation of several reporting requirements from the Fourth Term Permits, including the Jurisdictional Runoff Management Program Annual Reports, the Watershed Annual Reports, and the Monitoring and Reporting Program Annual Reports. Furthermore, the Annual Report requirements are consistent with the requirements under 40 CFR 122.42(c).

Pursuant to 40 CFR 122.42(c), "*[t]he operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the Director…must submit an annual report*", which must include the following:

(1) *The status of implementing the components of the storm water management program that are established as permit conditions* [40 CFR 122.42(c)(1)];

(2) *Proposed changes to the storm water management programs that are established as permit conditions* [40 CFR 122.42(c)(2)];

(3) *Revisions, if necessary, to the assessment of controls and fiscal analysis* [40 CFR 122.42(c)(3)];

(4) *A summary of data, including monitoring data, that is accumulated throughout the reporting year* [40 CFR 122.42(c)(4)];

(5) *Annual expenditures and budget for year following each annual report* [40 CFR 122.42(c)(5)];

(6) *A summary describing the number and nature of enforcement actions, inspections, and public education programs* [40 CFR 122.42(c)(6)];

(7) *Identification of water quality improvements or degradation* [40 CFR 122.42(c)(7)].

Under the Fourth Term Permits, each Copermittee is responsible for submitting a Jurisdictional Runoff Management Program Annual Report; the Copermittees in each

designated watershed are responsible for submitting a Watershed Annual Report; and the Copermittees from each county are responsible for submitting a Monitoring and Reporting Program Annual Report.

There are 39 Copermittees in the San Diego Region, each required to prepare and submit a Jurisdictional Runoff Management Program Annual Report. There are 9 designated watersheds in San Diego County, 6 designated watersheds in Orange County, and 1 designated watershed in Riverside County for a total of 16 designated watersheds, each requiring a Watershed Annual Report. There are 3 sets of Copermittees in 3 counties in the San Diego Region, requiring Copermittees from each county to prepare and submit a Monitoring and Reporting Program Annual Report. Thus each Copermittee is currently required to prepare, or participate in the preparation of at least 3 annual reports. In addition, the San Diego County Copermittees are required to prepare and submit a Regional Urban Runoff Management Plan Annual Report.

In total, there are 59 annual reports that are prepared by the Copermittees and submitted to the San Diego Water Board for the Fourth Term Permits. The preparation of these annual reports requires significant time and resources from each Copermittee, which could otherwise be expended on actions that could improve water quality within its jurisdiction. In turn, significant time and resources are required from the San Diego Water Board staff to review these reports, which could otherwise be expended on working directly with the Copermittees to improve their implementation efforts toward restoring and protecting water quality.

Until the Water Quality Improvement Plans are developed, there will be a transitional period during which the Copermittees will continue to implement their existing jurisdictional runoff management programs. There will also be a transitional period during which the Copermittees will implement the transitional monitoring and assessment requirements of Provision D. During the transitional period, the Copermittees will submit annual reports pursuant to the requirements of Provisions F.3.b.(1) and F.3.b.(2).

Provision F.3.b.(1) includes the transitional annual reporting requirements for each Copermittee's jurisdictional runoff management program. The reporting of the jurisdictional runoff management program implementation efforts have been reduced to a single 2-page form. Each Copermittee is required to complete and submit a Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D or a revised form accepted by the San Diego Water Board) no later than October 31 of each year for each jurisdictional runoff management program reporting period (i.e. July 1 to June 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted. The Jurisdictional Runoff Management Program Annual Report Form will certify that each Copermittee has implemented its jurisdictional runoff management program in accordance with the requirements of Provision E. Each Copermittee may choose to continue to utilize and submit the jurisdictional runoff management program annual reporting format of its

current Order until the first Water Quality Improvement Plan Annual Report is required to be submitted.

Provision F.3.b.(2) includes the transitional annual reporting requirements for the transitional monitoring and assessment program for each Watershed Management Area. The Copermittees in the Watershed Management Area are required to submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted. The Transitional Monitoring and Assessment Program Annual Report is required to include the transitional period monitoring data collected pursuant to Provisions D.1.a and D.2.a, and the findings from the transitional period findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

Provision F.3.b.(3) includes the Water Quality Improvement Plan Annual Report requirements. Only one Water Quality Improvement Plan Annual Report is required for each of the ten (10) Watershed Management Areas designated under Provision B.1, which is a significant reduction in the number of annual reports required to be prepared and submitted by the Copermittees. The Water Quality Improvement Plan Annual Report will document the Copermittees' efforts to implement the Water Quality Improvement Plan. Each Water Quality Improvement Plan Annual Report will be focused primarily on reporting the analysis of the monitoring data collected pursuant to Provisions D.1-D.3 during the reporting period, and the assessments that are required pursuant to Provision D.4 based on the data. The monitoring data analyses and the assessments that are provided in the Water Quality Improvement Plan Annual Report will be the core of the report. The reporting of the jurisdictional runoff management program implementation efforts have been reduced to a single 2-page form, and will no longer be the primary focus of the reporting requirements as in the Third and Fourth Term Permits.

Each Copermittee will continue to prepare and submit a Jurisdictional Runoff Management Program Annual Report Form as part of the Water Quality Improvement Plan Annual Report to certify that each Copermittee has implemented its jurisdictional runoff management program in accordance with the requirements of Provision E. Instead of reviewing a voluminous report from each Copermittee, as was required under the Third and Fourth Term Permits, the San Diego Water Board will conduct audits of each Copermittee's jurisdictional runoff management program to investigate and confirm the information provided by each Copermittee on its Jurisdictional Runoff Management Program Annual Report Form. The audits will allow the San Diego Water Board to become more familiar with the each Copermittee's jurisdictional runoff management program, and each Copermittee will become more informed about the expectations of the San Diego Water Board.

The reduction in the number and content of the Water Quality Improvement Plan Annual Reports should result in significant time, cost and resource savings for the

Copermittees, as well as the San Diego Water Board. Those savings should offset a significant portion of any additional costs that may be incurred to develop the Water Quality Improvement Plans and to implement the monitoring and assessment program requirements of Provision D.

The reporting period for the Water Quality Improvement Plan Annual Reports consists of two periods. Because the jurisdictional runoff management programs are typically budgeted and implemented during a fiscal year, the information provided on the Jurisdictional Runoff Management Program Annual Report Forms will cover the period from July 1 to June 30 of the following year.

The Water Quality Improvement Plan Annual Reports, however, are focused primarily on the monitoring data and the assessments based on the monitoring data. The monitoring data is collected during the monitoring year, which begins October 1 and ends September 30 of the following year. The monitoring year begins after the beginning of the fiscal year and ends after the end of the fiscal year. Therefore, to accommodate and capture the information collected during the fiscal year and the monitoring year, the Annual Report reporting period incorporates both periods.

Finally, Provision F.3.c requires the Copermittees to develop and submit a Regional Monitoring and Assessment Report. The Regional Monitoring and Assessment Report is similar to the Long Term Effectiveness Assessment required under the Fourth Term San Diego County Permit. The Regional Monitoring and Assessment Report is expected to utilize the entire body of data and information collected by the Copermittees during the term of this Order to assess improvements to water quality on a regional scale.

Provision F.4 (Regional Clearinghouse) requires the Copermittees to develop, update, and maintain an internet-based Regional Clearinghouse that can be used to store, disseminate, and share the Copermittees' documents, monitoring data, special studies, and any other data or information.

Most of the documents and data that are generated by the Copermittees can be provided in electronic format, and made available to the San Diego Water Board and the public on the internet. The San Diego Water Board has been gradually transitioning its document submittal requirements to electronic submittals. Provision F.4 has been included to further these efforts.

Provision F.4 has also been included to improve the exchange and availability of information among the Copermittees, as well as between the Copermittees and the San Diego Water Board. Provision F.4 will also make the information generated during the implementation of the Order more accessible to the public.

Provision F.5 (Report of Waste Discharge) requires the Copermittees to submit a Report of Waste Discharge to reapply for renewal of the Order prior to its expiration, in accordance with 40 CFR 122.21(d)(2) and CWC section 13376.

~~Because the Riverside County Copermittees will not be subject to the requirements of this Order until they are notified of coverage, Provision F.5.a describes the process of submitting a Report of Waste Discharge pursuant to the requirements of their current permit to obtain coverage under this Order.~~

~~For the Copermittees subject to the requirements of this Order,~~ Provision F.5~~.b~~ requires the Copermittees to submit a Report of Waste Discharge 180 days in advance of the expiration of this Order. Provision F.5~~.b~~ also describes the minimum information to be included in the Report of Waste Discharge, based on USEPA guidance "Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems," dated May 17, 1996.

~~Provision F.6 (Application for Early Coverage) describes the process that would allow the Orange County and/or Riverside County Copermittees to obtain coverage under this Order earlier than the expiration of their current Orders.~~

~~If the Riverside County Copermittees choose to obtain coverage under this Order earlier than the expiration of their current Orders, the preparation and submittal of a Report of Waste Discharge, as required by the Fourth Term Permits, will not be necessary. The existing Order for the respective county will be rescinded upon the effective coverage date under this Order, except for enforcement purposes.~~

G. Principal Watershed Copermittee Responsibilities

Purpose: Provision G includes the requirements for the Principal Watershed Copermittee designated by the Copermittees in each Watershed Management Area.

***Discussion*:** Unlike previous NPDES requirements, there will no longer be a single Principal Copermittee. Provision G.1 requires the Copermittees to designate a Principal Watershed Copermittee for each Watershed Management Area. There are ten (10) Watershed Management Areas in the San Diego Region, as defined in Table B-1 under Provision B.1 of the Order. An individual Copermittee should not be the Principal Watershed Copermittee for more than two (2) Watershed Management Areas. There could be up to ten (10) Principal Water Copermittees designated for the Watershed Management Areas in the San Diego Region.

Provision G.2 describes the minimum responsibilities of each Principal Watershed Copermittee. The primary responsibility of the Principal Watershed Copermittees is to serve as the liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues. Ideally, the Principal Watershed Copermittee can represent the interests of all the Copermittees within a Watershed Management Area during discussions or meetings to facilitate communication with the San Diego Water Board. The Principal Watershed Copermittees are also responsible for facilitating and coordinating the implementation efforts of the Copermittees and submittals of required documents and reports.

The Principal Watershed Copermittee is responsible for facilitating the efforts of the Copermittees within the Watershed Management Area to develop the Water Quality Improvement Plan required under Provision B, and submit it for approval in accordance with Provision F.1. The Principal Watershed Copermittee is also responsible for coordinating the submittal of the document updates, Progress Report Presentations, and Annual Reports required from the Copermittees within each Watershed Management Area under Provisions F.2, F.3.a, and F.3.b. The Principal Watershed Copermittees are responsible for coordinating with each other to develop and submit the Regional Clearinghouse, Regional Monitoring and Assessment Report, and the Report of Waste Discharge required under Provisions F.3.c, F.4, and F.5.

The designated Principal Watershed Copermittee for each Watershed Management Area does not necessarily have to serve as the Principal Watershed Copermittee for the entire term of the Order. If the Copermittees in a Watershed Management Area choose to designate a new Principal Watershed Copermittee, the change may be submitted as part of the Annual Report required under Provision F.3.b, with an update to the Water Quality Improvement Plan in accordance with Provision F.2.c.

Provision G.3 specifies that the Principal Watershed Copermittee is not responsible for ensuring that the other Copermittees within the Watershed Management Area are in compliance with the requirements of this Order

H. Modification of Order

Purpose: Provision H provides the conditions under which modifications to Order No. R9-2013-0001, as amended, may occur.

***Discussion*:** Provision H allows for modifications to Order No. R9-2013-0001, as amended, for bases in addition to modifications (minor and major) allowed under the federal regulations at 40 CFR 122.62 and 122.63.

Modifications to the Order require re-opening the Order (see Water Code section 13223), subject to the requirements of 40 CFR 122.44, 122.62 to 122.64, and 124.5, but only for the specific provisions subject to the modification. Proposed modifications of the Order will be made available for public review, a public notice and comment period, and a public hearing if requested. Comments on the provisions not subject to the proposed modifications are not required to be considered in the San Diego Water Board's responses to comments or during the public hearing.

Provision H.4 was included to specify that the Order will be re-opened for modifications if ~~the State Water Board determines revisions to Provision A are warranted, an application for early coverage under the Order is received pursuant to Provision F.6,~~ the Basin Plan is amended to modify an existing TMDL or incorporate a new TMDL, or the monitoring and assessment program requirements need to be updated or revised.

~~Provision H.5 was included to specify that the San Diego Water Board will re-open and consider modifications to this Order when the Orange County Copermittees or the Riverside County Copermittees submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders~~

I. Standard Permit Provisions and General Provisions

Purpose: Provision I incorporates the standard permit provisions required to be included in all NPDES permits, as well as several other general provisions.

***Discussion*:** Provision I refers to Attachment B to the Order. Attachment B expressly incorporates the conditions applicable to all NPDES permits as provided under 40 CFR 122.41(a)-(n), as well as the applicable conditions for MS4s and storm water discharges provided under 40 CFR 122.42(c) and 40 CFR 122.42(d), respectively. Attachment B also includes several general provisions that are typically included in or applicable to waste discharge requirements issued by the San Diego Water Board.

IX. ATTACHMENTS

The attachments to the Order are discussed below. The discussions describe the content of the attachments.

Attachment A – Discharge Prohibitions and Special Protections

Section 1 of Attachment A includes the Waste Discharge Prohibitions from the Basin Plan. They have been provided verbatim in their entirety.

Section 2 of Attachment A includes the "*Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges*" applicable to permitted point source discharges of storm water, adopted under State Water Board Resolution No. 2012-0012, as amended by Resolution No. 2012-0031. The terms, prohibitions, and special conditions (collectively referred to as special conditions) are established as limitations on point source storm water discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in ASBS, as required for State Water Quality Protection Areas pursuant to California Public Resources Code sections 36700(f) and 36710(f). These Special Protections were adopted by the State Water Board as part of the Ocean Plan General Exception.

Attachment B – Standard Permit Provisions and General Provisions

Conditions applicable to all NPDES permits, as required under 40 CFR 122.41, and conditions applicable to MS4s and storm water discharges, as required under 40 CFR 122.42(c) and 122.42(d), respectively are provided in Attachment B to the Order. They have been provided expressly in their entirety.

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. These general provisions are typically included in or applicable to waste discharge requirements issued by the San Diego Water Board. Many of the general provisions were developed by the State Water Board. Where a general provision is derived from statute or regulation, a citation of the statute or regulation section is provided. General provisions that do not provide a citation are included under the authority provided CWC 13377.

Attachment C – Acronyms, Abbreviations and Definitions

The acronyms and abbreviations that are used in the Order are provided in Attachment C. Attachment C also includes definitions that may provide an explanation or description of the meaning or intent of specific terms or phrases included in the Order.

Attachment D – Jurisdictional Runoff Management Program Annual Report Form

An example of the Jurisdictional Runoff Management Program Annual Report Form required to be submitted by each Copermittee as part of the Annual Reports required under Provision F.3.b.(1)(e) is provided as Attachment D to the Order. An electronic version of the form will be available from the San Diego Water Board after the adoption of the Order.

The Jurisdictional Runoff Management Program Annual Report Form includes the minimum information necessary to demonstrate that the Copermittee is implementing and in compliance with the requirements of Provision E, and includes much of the information required to be reported pursuant to 40 CFR 122.42(c).

The information that must be provided on the Jurisdictional Runoff Management Program Annual Report Form is limited to the fiscal year, which begins July 1 and ends June 30 of the following year. The information expected to be provided by the Copermittees in each section of the Jurisdictional Runoff Management Program Annual Report Form is discussed below.

I. COPERMITTEE INFORMATION

The name of the Copermittee (e.g. name of city, county, or special district) and the contact information for the storm water program manager are provided under this section.

II. LEGAL AUTHORITY

The Copermittee must confirm whether or not the legal authorities under Provision E.1.a have been established for itself within its jurisdiction.

The Copermittee must also confirm whether or not a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority, as required under Provision E.1.b. The certification statement required by Provision E.1.b is only required to be submitted with the first Annual Report required under Provision F.3.b.

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

The Copermittee must inform the San Diego Water Board whether or not an update to its jurisdictional runoff management program document was required or recommended by the San Diego Water Board during the reporting period. An update to the jurisdictional runoff management program is required under Provision F.2.a. The San Diego Water Board may recommend modifications to the jurisdictional runoff management program as part of the iterative approach and adaptive management process required under Provision B.5, which may result in an update that is necessary for the Copermittee's jurisdictional runoff management document.

If an update was required or recommended, the Copermittee must confirm whether or not the update was completed and made available on the Regional Clearinghouse within the reporting period. If no update was required or recommended, an answer is not required. If the answer is NO, meaning the required or recommended update was not completed and/or made available on the Regional Clearinghouse, the Copermittee must attach a

schedule for the completion of the update and/or posting of the updated document on the Regional Clearinghouse.

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

The Copermittee must confirm whether or not a program was implemented during the fiscal year to actively detect and eliminate illicit discharges and connections in accordance with the requirements under Provision E.2.

In addition to confirming that a program to detect and eliminate illicit discharges was implemented during the reporting period, the Copermittee is also required to report on several items related to the program. The information that must be reported is limited to the fiscal year for the Annual Report.

All non-storm water discharges are considered illicit discharges unless the source is identified as one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5). If a non-storm water discharge is identified as one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5), the discharge is a non-storm water discharge, but not an illicit discharge. If a non-storm water discharge is identified but not in one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5), the discharge is both a non-storm water discharge and an illicit discharge.

V. DEVELOPMENT PLANNING PROGRAM

The Copermittee must confirm whether or not a development planning program was implemented during the fiscal year in accordance with the requirements under Provision E.3.

The Copermittee must also inform the San Diego Water Board whether or not an update to its BMP Design Manual was required or recommended by the San Diego Water Board during the fiscal year. An update to the BMP Design Manual is required under Provision F.2.b. The San Diego Water Board may recommend modifications to the BMP Design Manual, which may result in an update that is necessary for Copermittee's the BMP Design Manual.

If an update was required or recommended, the Copermittee must confirm whether or not the update was completed and made available on the Regional Clearinghouse within the reporting period. If no update was required or recommended, an answer is not required. If the answer is NO, meaning the required or recommended update was not completed and/or made available on the Regional Clearinghouse, the Copermittee must attach a schedule for the completion of the update and/or posting of the updated document on the Regional Clearinghouse.

The Copermittee is also required to report on several items related to the program. For the development and redevelopment projects that are reviewed under the program, the Copermittee must report the total number projects submitted for review during the fiscal year. Of those projects, the Copermittee must report the number that are Priority Development Projects, as defined under Provision E.3.b.(1). The Copermittee must also report the number of Priority Development Projects that were approved and/or granted occupancy during the fiscal year, regardless of when the project was originally submitted for review. Any projects that were approved during the fiscal year and granted any

exemptions from the BMP Design Manual requirements and/or allowed to implement alternative compliance options in accordance with Provision E.3.c.(3) must be reported.

Finally, the Copermittee must also report on several items related to its oversight of permanent BMPs on Priority Development Projects within its jurisdiction, as required under Provision E.3.e. The information that must be reported is limited to the fiscal year for the Annual Report.

VI. CONSTRUCTION MANAGEMENT PROGRAM

The Copermittee must confirm whether or not a construction management program was implemented during the fiscal year in accordance with the requirements under Provision E.4.

The Copermittee is also required to report on several items related to its oversight construction projects within its jurisdiction. The information that must be reported is limited to the fiscal year for the Annual Report.

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

The Copermittee must confirm whether or not an existing development management program was implemented during the fiscal year in accordance with the requirements under Provision E.5.

The Copermittee is also required to report on several items related to its oversight in areas of existing development within its jurisdiction. The information that must be reported is limited to the fiscal year for the Annual Report. The information must also be separated into four categories of existing development: municipal, commercial, industrial, and residential.

VIII. PUBLIC EDUCATION AND PARTICIPATION

The Copermittee must confirm whether or not a public education program component was implemented during the fiscal year in accordance with the requirements under Provision E.7.a.

The Copermittee must also confirm whether or not a public participation program component was implemented during the fiscal year in accordance with the requirements under Provision E.7.b.

IX. FISCAL ANALYSIS

The Copermittee must confirm a summary of its fiscal analysis, conducted in accordance with the requirements under Provision E.8, has been attached to the form.

X. CERTIFICATION

A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative must sign and certify the Jurisdictional Runoff Management Program Annual Report Form. The appropriate box must be checked to indicate the whether a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative is signing the form.

Attachment E – Specific Provisions for Total Maximum Daily Loads

Attachment E provides specific provisions for implementing the load allocations (LAs) and wasteload allocations (WLAs) of Total Maximum Daily Loads (TMDLs) adopted by the San Diego Water Board and approved by USEPA in which the Copermittees are identified as responsible for discharges subject to the requirements of the TMDLs. Federal regulations require that NPDES requirements incorporate water quality based effluent limitations (WQBELs) that must be consistent with the requirements and assumptions of any available WLAs,[46] which may be expressed as numeric effluent limitations, when feasible, and/or as a best management practice (BMP) program of expanded or better-tailored BMPs.[47] Where the TMDL includes WLAs that provide numeric pollutant load or pollutant parameter objectives, the WLA has been, where feasible, translated into numeric WQBELs.[48]

For each TMDL in Attachment E, four sections are included:

a. Applicability: This section provides the resolution under which the TMDL Basin Plan amendment was adopted and approved, with the applicable adoption and approval dates. This section also gives the effective date of the TMDL and where the TMDL is applicable (i.e. Watershed Management Area and water body). The Copermittees that are responsible for implementing the specific provisions are also given in this section.

b. Final TMDL Compliance Requirements: For each TMDL, the final TMDL compliance requirements consist of the final TMDL compliance date(s), the final WQBELs, and the final TMDL compliance determination requirements. The final WQBELs are expressed in terms of receiving water limitations, effluent limitations, and/or best management practices (BMPs). The final WQBELs for the TMDLs are incorporated by reference into Provision A of the Order. The final WQBELs become enforceable when the final TMDL compliance dates have passed. Applicable BMPs within the final WQBELs must be incorporated into the Water Quality Improvement Plans. Compliance with the final WQBELs will be determined in accordance with the options provided under the final TMDL compliance determination requirements.

c. Interim TMDL Compliance Requirements: If the final TMDL compliance date has not passed and there are interim TMDL compliance requirements, they are included in this section. If there are interim WQBELs with interim compliance dates, the interim WQBELs become enforceable when the corresponding interim compliance dates have passed. Compliance with the interim WQBELs will be determined in accordance with the options provided under the interim TMDL compliance determination requirements.

d. Specific Monitoring and Assessment Requirements: If there are specific monitoring and assessment requirements that cannot be met with the monitoring and assessment program

[46] 40 CFR 122.44(d)(1)(vii)(B)
[47] 40 CFR 122.44(k)(2) and 40 CFR 122.44(k)(3)
[48] November 26, 2014 Memorandum from the USEPA, Revisions to the November 22, 2002 Memorandum "Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLA""

requirements under Provision D of the Order, the additional requirements are included in this section.

The requirements of the TMDLs are based on and consistent with the assumptions and requirements of any available adopted and approved TMDLs that have been incorporated into the Basin Plan. Modifications to the requirements for the TMDLs in Attachment E cannot be made unless the TMDLs are modified in the Basin Plan.

A modification to any aspect of a TMDL in the Basin Plan requires a Basin Plan amendment. A Basin Plan amendment to modify a TMDL will require the San Diego Water Board to adopt a resolution to amend the Basin Plan, which includes a separate public process. When the San Diego Water Board adopts a Basin Plan amendment, it subsequently requires approval from the State Water Board, the Office of Administrative Law, and the USEPA before it becomes effective.

If and when the TMDLs are a modified in the Basin Plan, the San Diego Water Board will revise the requirements of the Order in accordance with the Basin Plan amendment. When a Basin Plan amendment to modify a TMDL becomes effective, the San Diego Water Board will modify the requirements of the Order pursuant to the requirements of Provision H.4 of the Order as soon as possible.

THE PRESS-ENTERPRISE

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(2010, 2015.5 C.C.P)

Publication(s): The Press-Enterprise

PROOF OF PUBLICATION OF

Ad Desc.: 2777133

I am a citizen of the United States. I am over the age of eighteen years and not a party to or interested in the above entitled matter. I am an authorized representative of THE PRESS-ENTERPRISE, a newspaper in general circulation, printed and published daily in the County of Riverside, and which newspaper has been adjudicated a newspaper of general circulation by the Superior Court of the County of Riverside, State of California, under date of April 25, 1952, Case Number 54446, under date of March 29, 1957, Case Number 65673, under date of August 25, 1995, Case Number 267864, under date of February 4, 2013, Case Number RIC 1215735, under date of July 25, 2013, Case Number RIC 1305730, and under date of September 16, 2013, Case Number RIC 1309013; that the notice, of which the annexed is a printed copy, has been published in said newspaper in accordance with the instructions of the person(s) requesting publication, and not in any supplement thereof on the following dates, to wit:

07/29/2015

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

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CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, SAN DIEGO REGION
NOTICE OF OPPORTUNITY TO COMMENT AND PUBLIC HEARING

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) is scheduled to hold a public hearing to consider adoption of Tentative Order No. R9-2015-0100 (Tentative Order).

The Tentative Order proposes to amend the National Pollutant Discharge Elimination System (NPDES) Permit for Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region, Order No. R9-2013-0001, as amended by Order No. R9-2015-0001 (Regional MS4 Permit). Notice is hereby given that the San Diego Water Board will accept written comments on the Tentative Order and proposed changes to the Regional MS4 Permit in accordance with title 40 Code of Federal Regulations (CFR) section 124.10 and Water Code section 13167.5. Notice is also given that the San Diego Water Board will consider adoption of the Tentative Order at a public hearing on November 18, 2015.

The Tentative Order and attachments thereto, are available on the San Diego Water Board website at:
http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

The Tentative Order proposes to amend the Regional MS4 Permit to address a variety of issues including coverage for Copermittees in Riverside County consisting of the County of Riverside, the Riverside County Cities of Murrieta, Temecula, and Wildomar, and the Riverside County Flood Control and Water Conservation District and incorporation of limited permit provisions applicable to the City of Menifiee. If adopted, the Tentative Order will supersede the Riverside County Copermittees' current Fourth Term MS4 Permit. Order No. R9-2010-0016.

All written comments pertaining to the terms and conditions of the Tentative Order to be considered by the San Diego Water Board at the November 18, 2015 public hearing must be received no later than **5:00 p.m. on Monday September 14, 2015**. Written comments must be sent to the San Diego Water Board's office at 2375 Northside Drive, Suite 100, San Diego, CA 92108, faxed to (619) 516-1994, or e-mailed to sandiego@waterboards.ca.gov Attn: Wayne Chiu. Please indicate in the subject line of all written comments "Comment - Tentative Order No. R9-2015-0100, Place ID:786088WChiu." The early submission of written comments on the Tentative Order is encouraged.

The San Diego Water Board will prepare written responses to significant comments that are timely received. Consistent with State Water Resources Control Board regulations that apply to this proceeding, written comments received after 5:00 p.m. on Monday, September 14, 2015 will not be accepted and will not be incorporated into the administrative record if doing so would prejudice any party.

The public hearing on this matter will be held during the San Diego Water Board meeting scheduled for **November 18, 2015 in the Board Room of the San Diego Water Board Office, located at 2375 Northside Drive, San Diego, CA 92108**. The item will be heard during the meeting that starts at 9:00 a.m. The meeting notice and agenda, which will indicate any changes in the meeting location and may provide other specific information concerning this hearing, will be posted at least two weeks prior to the meeting date at http://www.waterboards.ca.gov/sandiego/board_info/agendas/.

Oral testimony at the public hearing will be allowed. The scope of oral testimony at the public hearing will be strictly limited to summarizing the previously submitted written comments, comments on revisions to the Tentative Order made in response to comments, and making policy statements. Oral testimony will be limited in time by the Board Chair.

The procedures governing San Diego Water Board meetings may be found at title 23, California Code of Regulations, section 647, et seq. and are available upon request. The hearing facilities will be accessible to persons with disabilities. The meeting notice and agenda for this meeting will provide contact information for persons requesting special accommodations.

Information related to this matter, including revisions made to the Tentative Order in response to written comments timely submitted, as well as the San Diego Water Board's responses to written comments timely submitted, will be available at the San Diego Water Board's office and the San Diego Water Board's storm water web page in advance of the public hearing. A separate notice will be sent announcing the availability of the revised Tentative Order and the responses to comments upon website posting of the documents.

Please contact Wayne Chiu at (619) 521-3354 or by email at Wayne.Chiu@waterboards.ca.gov for information regarding the above listed proposed permit action. Please bring the foregoing to the attention of any person known to you who would be interested in this matter.

DAVID W. GIBSON
Executive Officer
July 31, 2015
7/29/15
CNS-2777133#
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DECLARATION

I am a resident of San Diego County, over the age of eighteen years and not a party to any or interested in the matter noticed. The notice, of which the annexed is a printed copy appeared in the:

SAN DIEGO UNION TRIBUNE-

On the following dates:

JULY 29, 2015

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Dated at San Diego, California, this

29th of **JULY** **2015**

YOLANDA CÓRDOVA

CNS#2777134

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NOTICE

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DAVID W. GIBSON
Executive Officer
July 31, 2015
7/29/15
CNS-2777134#
THE SAN DIEGO UNION

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(2015.5 C.C.P.)

State of California)
County of ORANGE) ss

Notice Type: GPN - GOVT PUBLIC NOTICE

Ad Description:
Tentative Order R9-2015-0100

I am a citizen of the United States and a resident of the State of California; I am over the age of eighteen years, and not a party to or interested in the above entitled matter. I am the principal clerk of the printer and publisher of the THE REGISTER, a newspaper published in the English language in the city of SANTA ANA, county of ORANGE, and adjudged a newspaper of general circulation as defined by the laws of the State of California by the Superior Court of the County of ORANGE, State of California, under date 11/19/1905, Case No. A21046. That the notice, of which the annexed is a printed copy, has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to-wit:

07/29/2015

Executed on: 07/29/2015
At SANTA ANA, California

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Signature

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CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, SAN DIEGO REGION

NOTICE OF OPPORTUNITY TO COMMENT AND PUBLIC HEARING

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) is scheduled to hold a public hearing to consider adoption of Tentative Order No. R9-2015-0100 (Tentative Order).

The Tentative Order proposes to amend the National Pollutant Discharge Elimination System (NPDES) Permit for Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region, Order No. R9-2013-0001, as amended by Order No. R9-2015-0001 (Regional MS4 Permit). Notice is hereby given that the San Diego Water Board will accept written comments on the Tentative Order and proposed changes to the Regional MS4 Permit in accordance with title 40 Code of Federal Regulations (CFR) section 124.10 and Water Code section 13167.5. Notice is also given that the San Diego Water Board will consider adoption of the Tentative Order at a public hearing on November 18, 2015.

The Tentative Order and attachments thereto, are available on the San Diego Water Board website at:
http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml
The Tentative Order proposes to amend the Regional MS4 Permit to address a variety of issues including coverage for Copermittees in Riverside County consisting of the County of Riverside, the Riverside County Cities of Murrieta, Temecula, and Wildomar, and the Riverside County Flood Control and Water Conservation District and incorporation of limited permit provisions applicable to the City of Menifiee. If adopted, the Tentative Order will supersede the Riverside County Copermittees' current Fourth Term MS4 Permit, Order No. R9-2010-0016.

All written comments pertaining to the terms and conditions of the Tentative Order to be considered by the San Diego Water Board at the November 18, 2015 public hearing must be received no later than **5:00 p.m. on Monday September 14, 2015.** Written comments must be sent to the San Diego Water Board's office at 2375 Northside Drive, Suite 100, San Diego, CA 92108, faxed to (619) 516-1994, or e-mailed to sandiego@waterboards.ca.gov Attn: Wayne Chiu. Please indicate in the subject line of all written comments "Comment - Tentative Order No. R9-2015-0100, Place ID:786088WChiu." The early submission of written comments on the Tentative Order is encouraged.

The San Diego Water Board will prepare written responses to significant comments that are timely received. Consistent with State Water Resources Control Board regulations that apply to this proceeding, written comments received after 5:00 p.m. on Monday, September 14, 2015 will not be accepted and will not be incorporated into the administrative record if doing so would prejudice any party. Tentative Order R9-2015-0100 - 2 - July 31, 2015

The public hearing on this matter will be held during the San Diego Water Board meeting scheduled for **November 18, 2015 in the Board Room of the San Diego Water Board Office, located at 2375 Northside Drive, San Diego, CA 92108.** The item will be heard during the meeting that starts at 9:00 a.m. The meeting notice and agenda, which will indicate any changes in the meeting location and may provide other specific information concerning this hearing, will be posted at least two weeks prior to the meeting date at http://www.waterboards.ca.gov/sandiego/board_info/agendas/.

Oral testimony at the public hearing will be allowed. The scope of oral testimony at the public hearing will be strictly limited to summarizing the previously submitted written comments, comments on revisions to the Tentative Order made in response to comments, and making policy statements. Oral testimony will be limited in time by the Board Chair.

The procedures governing San Diego Water Board meetings may be found at title 23, California Code of Regulations, section 647, et seq. and are available upon request. The hearing facilities will be accessible to persons with disabilities. The meeting notice and agenda for this meeting will provide contact information for persons requesting special accommodations.

Information related to this matter, including revisions made to the Tentative Order in response to written comments timely submitted, as well as the San Diego Water Board's responses to written

(2015.5 C.C.P.)

State of California)
County of ORANGE) ss

Notice Type: GPN - GOVT PUBLIC NOTICE

Ad Description:
Tentative Order R9-2015-0100

I am a citizen of the United States and a resident of the State of California; I am over the age of eighteen years, and not a party to or interested in the above entitled matter. I am the principal clerk of the printer and publisher of the THE REGISTER, a newspaper published in the English language in the city of SANTA ANA, county of ORANGE, and adjudged a newspaper of general circulation as defined by the laws of the State of California by the Superior Court of the County of ORANGE, State of California, under date 11/19/1905, Case No. A21046. That the notice, of which the annexed is a printed copy, has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to-wit:

07/29/2015

Executed on: 07/29/2015
At SANTA ANA, California

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Signature

020249

to consider adoption of Tentative Order No. R9-2015-0100 (Tentative Order).

The Tentative Order proposes to amend the National Pollutant Discharge Elimination System (NPDES) Permit for Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region, Order No. R9-2013-0001, as amended by Order No. R9-2015-0001 (Regional MS4 Permit). Notice is hereby given that the San Diego Water Board will accept written comments on the Tentative Order and proposed changes to the Regional MS4 Permit in accordance with title 40 Code of Federal Regulations (CFR) section 124.10 and Water Code section 13167.5. Notice is also given that the San Diego Water Board will consider adoption of the Tentative Order at a public hearing on November 18, 2015.

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Please contact Wayne Chiu at (619) 521-3354 or by email at Wayne.Chiu@waterboards.ca.gov for information regarding the above listed proposed permit action. Please bring the foregoing to the attention of any person known to you who would be interested in this matter.

DAVID W. GIBSON
Executive Officer
July 31, 2015
7/29/15
CNS-2777135#
THE REGISTER 10073836

Chiu, Wayne@Waterboards

From: Chiu, Wayne@Waterboards
Sent: Friday, July 31, 2015 10:44 AM
To: 'Barbara Tipton'; 'Boushra Salem' (bsalem@chulavistaca.gov); Brown, Clement (CMBrown@sandiego.gov); Cecilia Padres-Tipton (ctipton@cityofsanteeca.gov); Cheryl Filar (cfilar@cityofvista.com); Chris Helmer (chelmer@cityofib.org); Elaine Lukey (Elaine.Lukey@carlsbadca.gov); Erik Steenblock (esteenblock@encinitasca.gov); Godby, Kim (kgodby@coronado.ca.us); Helen M. Davies (hdavies@ci.escondido.ca.us); Jaime Campos (jcampos@ci.el-cajon.ca.us); 'James Wood'; 'JoAnn Weber'; Joe Kuhn (jkuhn@ci.la-mesa.ca.us); Karen Holman (kholman@portofsandiego.org); Kolb, Ruth (RKolb@sandiego.gov); Malik Tamimi (mtamimi@lemongrove.ca.gov); Mikhail Ogawa (mikhail@mogawaeng.com); Mo Lahsaie (mlahsaie@ci.oceanside.ca.us); Reed Thornberry (rthornberry@san-marcos.net); Richard Gilb (rgilb@san.org); Steven Strapac (SStrapac@poway.org); Taryn Dunbar (tdunbar@cosb.org); Boon, Richard (Richard.Boon@ocpw.ocgov.com); Chris Crompton (chris.crompton@ocpw.ocgov.com); Christopher Macon (cmacon@lagunawoodscity.org); Greg Yi (greg.yi@rdmd.ocgov.com); 'Hossein Ajideh'; Humza Javed (hjaved@ci.laguna-hills.ca.us); Joe Ames (JAmes@cityofmissionviejo.org); Lisa Zawaski (lzawaski@danapoint.org); Mary Vondrak (vondrakM@san-clemente.org); Moy Yahya (myahya@cityofalisoviejo.com); Nancy Palmer (NPalmer@cityoflagunaniguel.org); Rae Beimer (RBeimer@cityofrsm.org); Slaven, Devin (dslaven@lakeforestca.gov); Tracy Ingebrigtsen (tingebrigtsen@lagunabeachcity.net); Aldo Licitra (Aldo.Licitra@cityoftemecula.org); Bill Woolsey (wwoolsey@murrieta.org); Bruckner, Scott (sebruckner@rcflood.org); Horn, Steven (Shorn@rceo.org); Matt Bennett (mbennett@cityofwildomar.org); 'Bill Paznokas'; 'Carol Roberts'; 'Cindy Lin'; 'Dave Smith'; 'Deborah Lee'; 'Robert Smith'
Cc: Walsh, Laurie@Waterboards; Arias, Christina@Waterboards
Subject: NOTICE OF OPPORTUNITY TO COMMENT AND PUBIC HEARING: Amendments to Regional MS4 Permit
Attachments: 2015-0731 Final Tent Order Cover Letter.pdf; 2015-0731 Final Public Cmt_Hearing Notice.pdf

Good morning Copermittees of the San Diego Region,

Please see the attached Cover Letter and Notice of Opportunity to Comment and Public Hearing for Tentative Order No. R9-2015-0100, *An Order Amending Order No. R9-2013-0001, NPDES No. CAS010266, as Amended by Order No. R9-2015-0001* (Tentative Order). The Tentative Order and proposed changes to the Regional MS4 Permit are available to download on the following webpage:
http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

The San Diego Water Board is accepting written comments on the Tentative Order and proposed changes to the Regional MS4 Permit. **Written comments must be received no later than 5 p.m. on Monday, September 14, 2015**.

The San Diego Water Board is scheduled to hold a public hearing to consider adoption of the Tentative Order. The public hearing to consider the Tentative Order will be held at the San Diego Water Board meeting at the following date and location:

November 18, 2015, beginning at 9 a.m.
San Diego Water Board Room
2375 Northside Drive, San Diego, CA 92108

Please see the attachments for further detail and contact me with any questions.

Thank you,

Wayne Chiu, PE
Water Resource Control Engineer
Storm Water Management Unit
California Regional Water Quality Control Board
San Diego Region
2375 Northside Drive, Suite 100
San Diego, CA 92108
Direct Line: (619) 521-3354
Main Line: (619) 516-1990

CALIFORNIA Water Boards

EDMUND G. BROWN JR. GOVERNOR

MATTHEW RODRIQUEZ SECRETARY FOR ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

July 31, 2015

Sent via E-mail

San Diego County Copermittees
Orange County Copermittees
Riverside County Copermittees

In reply refer to / attn:
Place ID: 786088:WChiu

Subject: Notice of Opportunity to Comment and Public Hearing
Tentative Order No. R9-2015-0100, An Order Amending Order No. R9-2013-0001, Regional Municipal Separate Storm Sewer (MS4) Permit for the San Diego Region

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) is releasing for public review and comment Tentative Order No. R9-2015-0100 (Tentative Order) amending Order No. R9-2013-0001, as amended by Order No. R9-2015-0001 (Regional MS4 Permit). The San Diego Water Board is scheduled to hold a public hearing to consider adoption of the Tentative Order during the Board meeting scheduled for November 18, 2015. The deadline for submission of written comments on the Tentative Order and other details regarding the public hearing is contained in the enclosed Notice of Opportunity to Comment and Public Hearing.

The Tentative Order and Notice of Opportunity to Comment and Public Hearing is available on the San Diego Water Board's website at http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml.

Interested persons may also receive a copy of the Tentative Order and its attachments by contacting Wayne Chiu at (619) 521-3354, or by email at Wayne.Chiu@waterboards.ca.gov or by visiting the San Diego Water Board's office at 2375 Northside Drive, Suite 100, San Diego, California 92108, weekdays between 8:00 a.m. and 5:00 p.m., telephone (619) 516-1990.

The Tentative Order proposes to amend the Regional MS4 Permit in response to the Riverside County Copermittees' Report of Waste Discharge (RoWD) submitted by letter dated May 8, 2015, and designate the Riverside County Copermittees as MS4 dischargers responsible for compliance with the terms and the conditions of the Permit. The Tentative Order also proposes to amend the Regional MS4 Permit to address a variety of other issues including 1) incorporation of an option to utilize the Water Quality Improvement Plan to demonstrate compliance with receiving water prohibitions and limitations, 2) clarification of land development requirements describing when a development project should be subject to the Priority Development Project (PDP) requirements, 3) amendment to the requirements for updating the BMP Design Manual as a result of corrections to the priority development project definitions, 4) clarification of requirements for non-storm water discharges covered by the Statewide NPDES Permit for Drinking Water Systems and the San Diego Water Board's General Waste Discharge Requirements for Groundwater Extraction Discharges to Surface Waters, and 5) clarification of the Indicator Bacteria, Project I - Beaches and Creeks and Los Penasquitos Lagoon Sediment Total Maximum Daily Load requirements to increase consistency with the Basin Plan Amendment. If

adopted, the Tentative Order will supersede the Riverside County Copermittees' current Fourth Term MS4 Permit, Order No. R9-2010-0016.

The Tentative Order amends the Regional MS4 Permit and its Fact Sheet (Attachment F of the Permit) as described in Attachments 1 and 2 of the Tentative Order. Changes to the Regional MS4 Permit and its Fact Sheet based upon the Tentative Order are displayed in blue-underline for added text and red-strikeout for deleted text in the attachments to the Tentative Order.

Interested persons desiring to receive future public notices regarding the Tentative Order, proceedings to consider its adoption and potential future modifications to the Regional MS4 Permit can subscribe to one of the electronic e-mail service lists titled "Orange County MS4 Permit," "Riverside County MS4 Permit," or "San Diego MS4 Permit" located on the San Diego Water Board website: http://www.waterboards.ca.gov/resources/email_subscriptions/reg9_subscribe.shtml.

In the subject line of any response, please include the requested "In reply refer to:" information located in the header of this letter. If you have any questions or comments, please contact Wayne Chiu by phone at (619) 521-3354, or by e-mail at Wayne.Chiu@waterboards.ca.gov.

Respectfully,

for David Barker, P.E.
Supervising Engineer
San Diego Regional Water Quality Control Board

DTB:bb:law

Enclosure: Notice of Opportunity to Comment and Public Hearing

cc (via email):

San Diego County Copermittees
Orange County Copermittees
Riverside County Copermittees
Natural Resource Agencies
San Diego County MS4 Permit E-mail Service List
Riverside County MS4 Permit E-mail Service List
Orange County MS4 Permit E-mail Service List
San Diego Water Board Agenda E-mail Service List

Tech Staff Info & Use	
Tentative Order No.	R9-2015-0100
NPDES No.	CAS0109266
Place ID	786088

San Diego County Copermittees

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Orange County Copermittees

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Riverside County Copermittees

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CALIFORNIA Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

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DAVID W. GIBSON
Executive Officer
July 31, 2015

Chiu, Wayne@Waterboards

From: lyris@swrcb18.waterboards.ca.gov
Sent: Friday, July 31, 2015 11:50 AM
To: Chiu, Wayne@Waterboards
Subject: NOTICE OF OPPORTUNITY TO COMMENT AND PUBIC HEARING: Amendments to Regional MS4 Permit
Attachments: 2015-0731_Public_Notice.pdf

Water Boards This is a message from the California Regional Water Quality Control Board, San Diego Region (9).

Dear Interested Persons:

Please see the attached Notice of Opportunity to Comment and Public Hearing for Tentative Order No. R9-2015-0100, *An Order Amending Order No. R9-2013-0001, NPDES No. CAS010266, as Amended by Order No. R9-2015-0001* (Tentative Order). The Tentative Order and proposed changes to the Regional MS4 Permit are available to download on the following webpage:
http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

The San Diego Water Board is accepting written comments on the Tentative Order and proposed changes to the Regional MS4 Permit. **Written comments must be received no later than 5 p.m. on Monday, September 14, 2015**.

The San Diego Water Board is scheduled to hold a public hearing to consider adoption of the Tentative Order. The public hearing to consider the Tentative Order will be held at the San Diego Water Board meeting at the following date and location:

November 18, 2015, beginning at 9 a.m.
San Diego Water Board Room
2375 Northside Drive, San Diego, CA 92108

Please see the attachments for further detail and contact me with any questions.

Thank you,
Wayne Chiu, PE
Water Resource Control Engineer
Storm Water Management Unit
California Regional Water Quality Control Board
San Diego Region
2375 Northside Drive, Suite 100
San Diego, CA 92108
Direct Line: (619) 521-3354
Main Line: (619) 516-1990

You are currently subscribed to reg9_riversideco_ms4permit as: wchiu@waterboards.ca.gov.

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CALIFORNIA Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

NOTICE OF OPPORTUNITY TO COMMENT AND PUBLIC HEARING

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) is scheduled to hold a public hearing to consider adoption of Tentative Order No. R9-2015-0100 (Tentative Order). The Tentative Order proposes to amend the National Pollutant Discharge Elimination System (NPDES) Permit for *Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region, Order No. R9-2013-0001, as amended by Order No. R9-2015-0001 (Regional MS4 Permit).* Notice is hereby given that the San Diego Water Board will accept written comments on the Tentative Order and proposed changes to the Regional MS4 Permit in accordance with title 40 Code of Federal Regulations (CFR) section 124.10 and Water Code section 13167.5. Notice is also given that the San Diego Water Board will consider adoption of the Tentative Order at a public hearing on November 18, 2015.

The Tentative Order and attachments thereto, are available on the San Diego Water Board website at:
http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

The Tentative Order proposes to amend the Regional MS4 Permit to address a variety of issues including coverage for Copermittees in Riverside County consisting of the County of Riverside, the Riverside County Cities of Murrieta, Temecula, and Wildomar, and the Riverside County Flood Control and Water Conservation District and incorporation of limited permit provisions applicable to the City of Menifiee. If adopted, the Tentative Order will supersede the Riverside County Copermittees' current Fourth Term MS4 Permit, Order No. R9-2010-0016.

All written comments pertaining to the terms and conditions of the Tentative Order to be considered by the San Diego Water Board at the November 18, 2015 public hearing must be received no later than **5:00 p.m. on Monday September 14, 2015**. Written comments must be sent to the San Diego Water Board's office at 2375 Northside Drive, Suite 100, San Diego, CA 92108, faxed to (619) 516-1994, or e-mailed to sandiego@waterboards.ca.gov Attn: Wayne Chiu. Please indicate in the subject line of all written comments "Comment - Tentative Order No. R9-2015-0100, Place ID:786088WChiu." The early submission of written comments on the Tentative Order is encouraged.

The San Diego Water Board will prepare written responses to significant comments that are timely received. Consistent with State Water Resources Control Board regulations that apply to this proceeding, written comments received after 5:00 p.m. on Monday, September 14, 2015 will not be accepted and will not be incorporated into the administrative record if doing so would prejudice any party.

The public hearing on this matter will be held during the San Diego Water Board meeting scheduled for **November 18, 2015 in the Board Room of the San Diego Water Board Office, located at 2375 Northside Drive, San Diego, CA 92108**. The item will be heard during the meeting that starts at 9:00 a.m. The meeting notice and agenda, which will indicate any changes in the meeting location and may provide other specific information concerning this hearing, will be posted at least two weeks prior to the meeting date at http://www.waterboards.ca.gov/sandiego/board_info/agendas/.

Oral testimony at the public hearing will be allowed. The scope of oral testimony at the public hearing will be strictly limited to summarizing the previously submitted written comments, comments on revisions to the Tentative Order made in response to comments, and making policy statements. Oral testimony will be limited in time by the Board Chair.

The procedures governing San Diego Water Board meetings may be found at title 23, California Code of Regulations, section 647, et seq. and are available upon request. The hearing facilities will be accessible to persons with disabilities. The meeting notice and agenda for this meeting will provide contact information for persons requesting special accommodations.

Information related to this matter, including revisions made to the Tentative Order in response to written comments timely submitted, as well as the San Diego Water Board's responses to written comments timely submitted, will be available at the San Diego Water Board's office and the San Diego Water Board's storm water web page in advance of the public hearing. A separate notice will be sent announcing the availability of the revised Tentative Order and the responses to comments upon website posting of the documents.

Please contact Wayne Chiu at (619) 521-3354 or by email at Wayne.Chiu@waterboards.ca.gov for information regarding the above listed proposed permit action. Please bring the foregoing to the attention of any person known to you who would be interested in this matter.

DAVID W. GIBSON
Executive Officer
July 31, 2015

Scott A. Mann
Mayor

John V. Denver
Mayor Pro Tem

Greg August
Councilmember

Matthew Liesemeyer
Councilmember

Vacant
Councilmember
District 3

September 10, 2015

Wayne Chiu
California Regional Water Quality Control Board, San Diego Region
2375 Northside Drive, Suite 100
San Diego, CA 92108

Subject: Comment - Tentative Order No. R9-2015-0100, Place ID: 786088WChiu

Dear Mr. Chiu,

The City of Menifee (the "City") would like to thank the San Diego Regional Water Quality Control Board ("San Diego Water Board") for the opportunity to comment on Tentative Order No. R9-2015-0100, an Order amending Order No. R9-2013-0001 as amended by Order No. R9-2015-0001 ("Tentative Order"). The City is committed to developing and implementing jurisdictional and regional programs and strategies that will improve overall water quality.

The City has been working hard to meet the requirements of the Santa Ana Region Permit under Order No. R8-2010-0033. The Report of Waste Discharge (ROWD) submitted to the Santa Ana Board in July 2015 highlights the Santa Ana Region's major water quality accomplishments since the Permit issuance. The City has been an active participant in the region, including in the development and implementation of the Comprehensive Nutrient Reduction Plan (CNRP) (approved July 2013) to address nutrient Total Maximum Daily Loads (TMDL) for Canyon Lake and Lake Elsinore and in the development of the Watershed Action Plan (WAP) (pending Santa Ana Regional Board approval). The City has also developed a Local Implementation Plan (LIP), which details the day-to-day jurisdictional storm water program to meet Permit requirements.

As stated in the Tentative Order, the City is located partially within the jurisdiction of both the San Diego Water Board and the Santa Ana Regional Water Quality Control Board ("Santa Ana Water Board"). More specifically, less than 1.3 square miles in the City is located in the Santa Margarita Watershed Management Area (WMA). To date, the San Diego Water Board and the Santa Ana Water Board have maintained agreements that designate the Santa Ana Water Board as the single Regional Water Board to regulate the City on matters pertaining to Phase I municipal separate storm sewer system (MS4) permits. The Tentative Order proposes continuing this practice, following past agreements, with the significant exception of now requiring the City to participate in the development and implementation of the Santa Margarita WMA Water Quality Improvement Plan (WQIP).

Both the City and the Riverside County Flood Control and Water Conservation District (RCFCWCD) maintain GIS layers of MS4 infrastructure that they own and

29714 Haun Road
Menifee, CA 92586
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www.cityofmenifee.us

operate within the City. Since the release of the Tentative Order, the City of Menifee has coordinated with RCFCWCD to investigate ownership of MS4 within the small portion of the City that is within the Santa Margarita WMA. As shown on the attached maps, MS4 within the portion of the City in the Santa Margarita WMA is owned and operated exclusively by RCFCWCD. The City of Menifee does not own or operate MS4 within the Santa Margarita WMA.

It is the City's understanding, according to the Code of Federal Regulations, title 40, section 122.1(b)(1), that "[t]he NPDES program requires permits for the discharge of 'pollutants' from any 'point source' into 'waters of the United States'". The City does not own or operate any "point sources," as defined in 40 C.F.R. § 122.2 or section 502(14) of the Clean Water Act, within the Santa Margarita WMA. Because the City is not responsible for any MS4 within the Santa Margarita

WMA, it should not be required to develop and implement the Santa Margarita WMA WQIP. For this reason, the City respectfully requests removal of language in the Tentative Order that requires the City to participate in the development and implementation of the Santa Margarita WMA WQIP. Suggested edits to the text of the Tentative Order are shown below:

- Attachment 1, Finding 29(b): "...the City of Menifee is largely regulated by the Santa Ana Water Board under Order No. R8-2010-0033 as it may be amended or reissued, including those portions of the City of Menifee within the San Diego Water Board's jurisdiction, upon the effective date of this Order. ~~The agreement also requires the City of Menifee to actively participate during development and implementation of the Santa Margarita River Watershed Management Area Water Quality Improvement Plan required pursuant to this Order~~..."
- Attachment 1, Table B-1 "Watershed Management Areas": Please strike the City of Menifee from the table and remove the associated footnote.
- Attachment 2, Provision B.1: "~~Footnote 3 to Table B-1 has been included to specify that Phase I MS4 discharges within the jurisdictional boundaries of the City of Menifee located within the San Diego Region will be regulated under Santa Ana Water Board Order No. R8-2010-0033 (NPDES No. CAS618033) and any reissuance thereof. At this time, the City of Menifee is not identified as a responsible Copermittee for any TMDLs established by the San Diego Water Board. Under the terms of the agreement, the City of Menifee must actively participate in the development and implementation of the Santa Margarita River Watershed Management Area Water Quality Improvement Plan required pursuant to Order No. R9-2013-0001, and any reissuance thereof.~~"
- Attachment 2: "The City of Menifee is not regulated as a Copermittee under this Order because it <u>does not own or operate</u> ~~Phase I~~ MS4 ~~discharges~~ <u>within the portion of the City that is located within the San Diego Region.</u> ~~Are regulated by Santa Ana Water Board Order No. R8-2010-0033 as it may be amended or issued pursuant to Water Code section 13228 designation. The requirements of this Order that apply to the City of Menifee for the duration of this Order, consistent with the Water Code section 13228 written agreement dated [Month][Day], 2015, are described in Finding 29 and Footnote 3 to Table B-1.~~"

Thank you for your consideration. Please feel free to contact me or Yolanda Macalalad at 951-639-1368 extension 169 if you have any questions regarding the above comments.

Sincerely,

Jonathan Smith, PE, QSD
Director of Public Works/City Engineer

Cc (by email):
ymacalalad@cityofmenifee.us
sglynn@cityofmenifee.us
nabad@cityofmenifee.us
sebruckner@rcflood.org

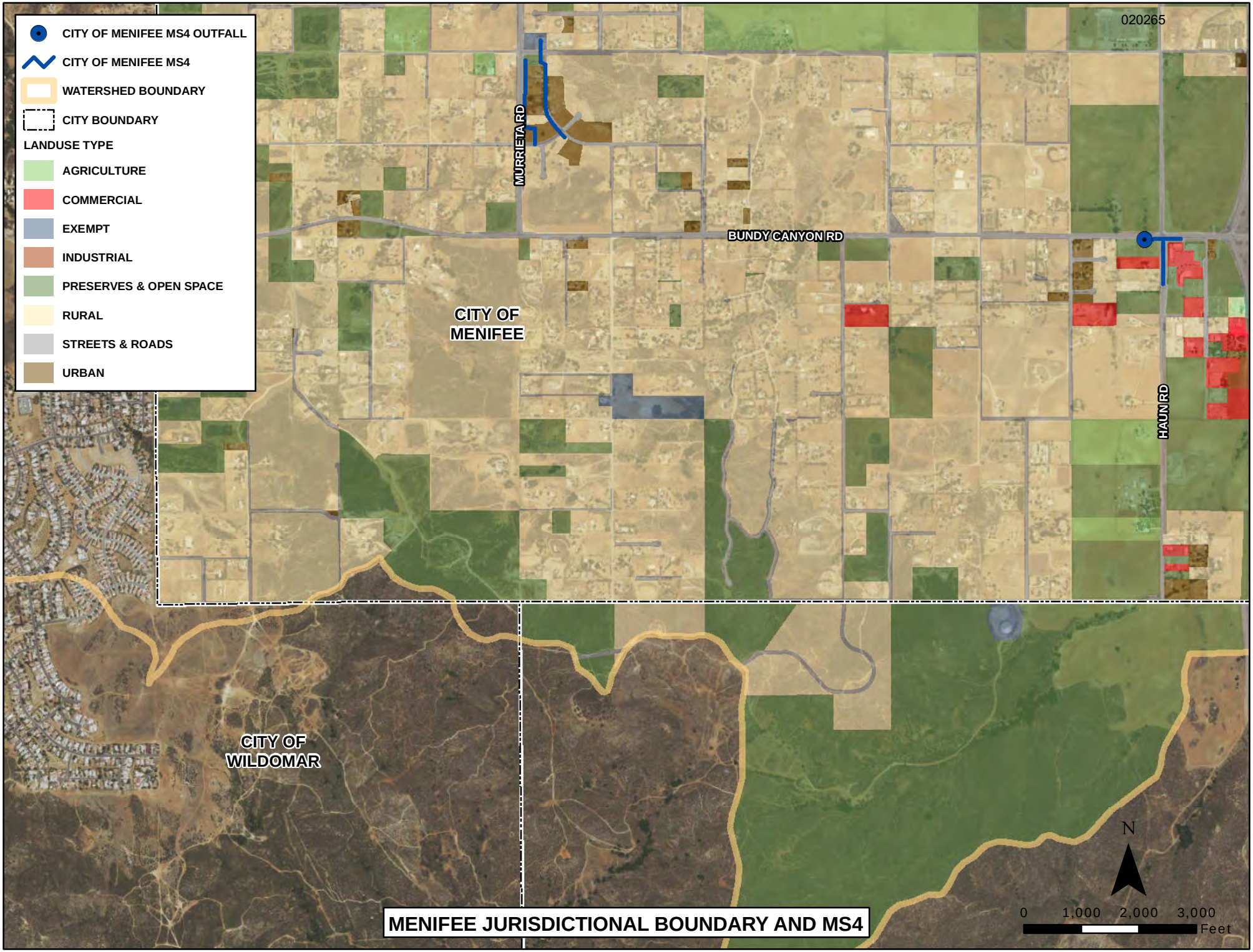

MENIFEE JURISDICTIONAL BOUNDARY AND MS4

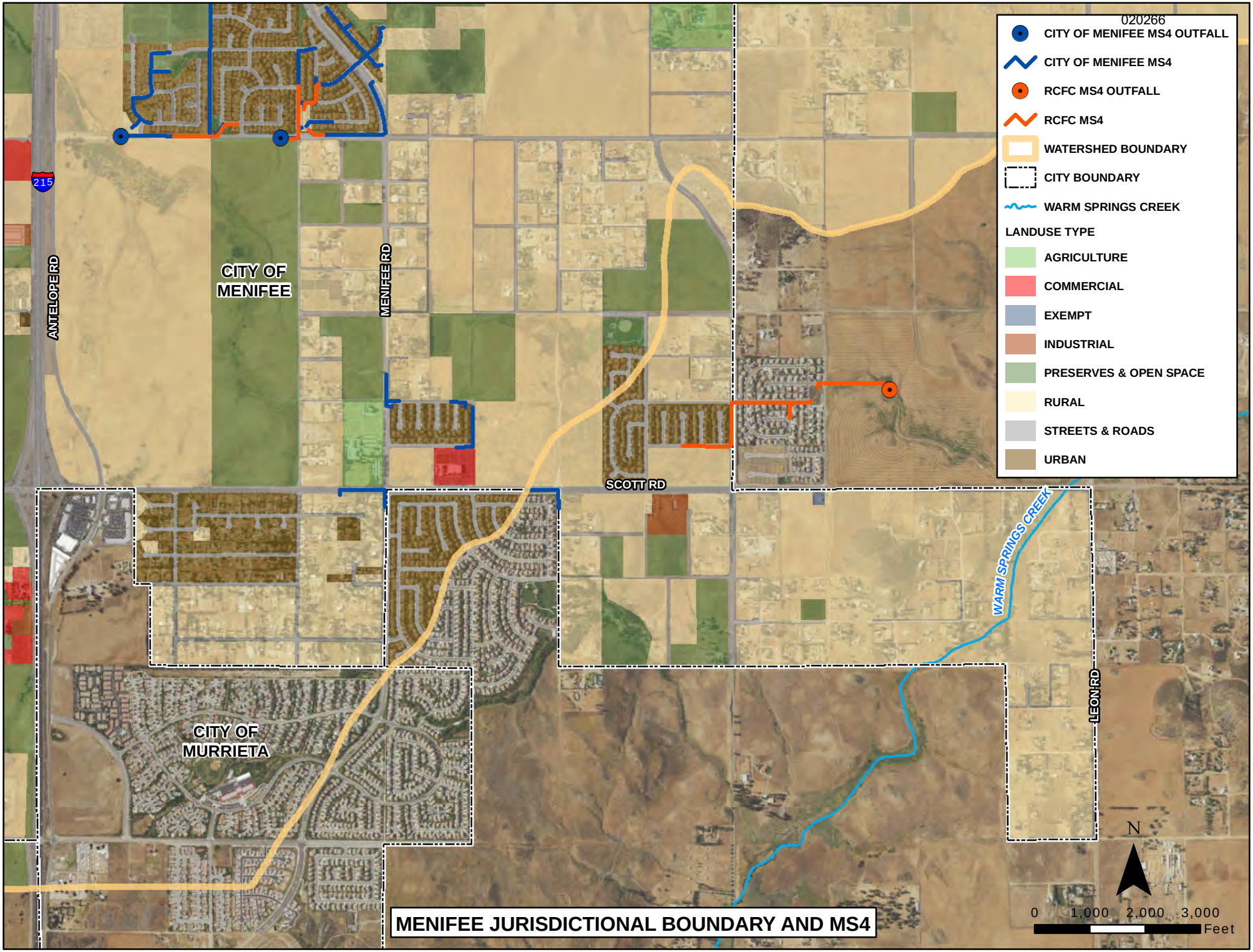

MENIFEE JURISDICTIONAL BOUNDARY AND MS4

September 10, 2015

San Diego Regional Water Quality Control Board
2375 Northside Drive, Suite 100
San Diego, CA 92108-2700
Attn: Wayne Chiu
sandiego@waterboards.ca.gov

Sent via email

Re: Environmental Groups Comments on Tentative Order R9-2015-0100; Receiving Water Limitations Alternative Compliance Pathway

Dear Wayne Chiu, Laurie Walsh, and Christina Arias:

Thank you for the opportunity to comment on Tentative Order R9-2015-0100 ("Tentative Order", "San Diego Order", or "TO"). San Diego Coastkeeper, Coastal Environmental Rights Foundation, and Surfrider Foundation San Diego Chapter ("Environmental Groups") are local non-profit organizations dedicated to the protection and restoration of regional waters and related environmental issues in San Diego. Our groups represent numerous San Diegans, act through community involvement, regulatory participation, and legal action to ensure the protection and restoration of our region's ocean, bays, and inland waters.

I. Introduction

Since the passage of the 2013 MS4 permit with our support, Environmental Groups have maintained the position that our regional stormwater permit is one that, if properly implemented with the appropriate resources and political will, could - and perhaps would - result in significant improvements to our waterways. We appreciate that the 2013 permit was born out of a more collaborate approach to permit development with broad stakeholder involvement. And while no single interest group received each and every provision it had hoped for, most recognize that the 2013 permit at least has the potential to realize significant water quality improvements.

The proposed draft language on alternative compliance for receiving water limitations ("safe harbor"), however, instead takes us in a very different direction than the one contemplated by the existing permit. The San Diego Regional Board's objective for the safe harbor development process was to come up with an, "ambitious, rigorous and transparent alternative compliance path," that would allow Copermittees, "to come into compliance with receiving water limitations".[1] Instead, adoption of the Tentative Order as written would result in a safe harbor

[1] *See* Public Workshop Agendas, April 28, 2015, May 21, 2015 and June 30, 2015; and Attachment 2 to TO No. R9-2015-0100, page F-61.

protection lacking guidance, objectivity, and accountability, that is inconsistent with Order WQ 2015-0075 (or "State Board's Order") and its findings, that violates the Clean Water Act and its governing regulations, and that would likely simply mimic the failed iterative approach.

Importantly, the State Board's Order provided specific guiding principles for other regions to follow when developing safe harbor provisions.[2] The State Board's Order repeatedly points out the acceptable justifications for and mechanisms through which a safe harbor provision would be allowable. The Tentative Order as drafted, however, ignores several of the principles (as discussed in more detail below) and it fails to adopt mechanisms that assure the process and outcomes of the State Board's Order and the Clean Water Act are met. As such, the TO is inconsistent with the State Board's Order. The San Diego Regional Board could cure this defect by instead looking to the guidance and mechanisms established in the State Board's Order, and in particular by adopting the Reasonable Assurance Analysis and Enhanced Watershed Management Plan (EWMP) approaches taken in the LA region. Combined, these approaches allow for the ambitious, rigorous, and transparent pathway to compliance, while providing for multi-benefit best management practices.

Furthermore, as drafted the proposed TO would violate the Clean Water Act. Specifically, the safe harbor provision – one that would excuse compliance with Water Quality Standards (WQS) in the Permit's Receiving Water Limitations (RWL) section - is illegal for several principal reasons: 1) the safe harbor violates anti-backsliding requirements; 2) without a more detailed accompanying analysis, the safe harbor violates state and federal antidegradation requirements; 3) the safe harbor violates CTR compliance deadlines; and 4) the Regional Board has thus far failed to make sufficient findings or provide evidence to support the inclusion of the safe harbor in the Tentative Order.

To avoid this result and for the reasons we have expressed to date in workshops, previous public comments to both the Regional Board and State Board, and below, Environmental Groups respectfully request the Regional Board reconsider the adoption of this draft language and strike the entire draft provision that would adopt a safe harbor, and instead require implementation of watershed management programs as one way to achieve, rather than demonstrate, compliance with RWLs and WQSs. Should the Board choose to adopt safe harbor language despite these concerns, we respectfully request the TO be made consistent with the State Board's Order through an amendment that includes the following: (1) the Reasonable Assurance Analysis guidance, modeling, and standards that were expressly approved by the State Board's Order and that are the lynchpin of the safe harbor approach, (2) a requirement that multi-benefit projects that incorporate pollutant removal and water supply augmentation as envisioned by the Los Angeles EWMPs be a necessary element of compliance BMPs, and (3) removal of the iterative process from the safe harbor scheme.

II. The Tentative Order As Drafted Is Inconsistent With The State Board's Order

The State Board makes their intentions very clear in their Order when they state, quite simply, "we believe that the MS4 permits should incorporate a well-defined, transparent, and finite alternative path to permit compliance that allows MS4 dischargers that are willing to pursue

[2] Order WQO 2015-0075, pages 51-52.

significant undertakings beyond the iterative process to be deemed in compliance with the receiving water limitations."[3]

The State Board's Order provided specific guidance principles for other regions to follow when developing safe harbor provisions.[4] Of particular relevance to the Tentative Order, the following principles are to apply to any region's safe harbor provisions:

1. The receiving water limitations provisions…should not deem good faith engagement in the iterative process to constitute such compliance.[5]
2. Permits should incorporate an ambitious, rigorous, and transparent alternative compliance path.[6]
3. The safe harbor should encourage multi-benefit regional projects that capture, infiltrate, and reuse storm water and support a local sustainable water supply.[7]
4. The safe harbor should have rigor and accountability.[8]

In upholding the LA Order's safe harbor scheme, the State Board affirmed in particular the Reasonable Assurance Analysis and multi-benefit requirements and incentives in the LA Order. With regard to the principles, the Board specifically stated that they, "direct all regional water boards to consider the WMP/EWMP approach to receiving water limitations compliance when issuing Phase I MS4 permits going forward,"[9] and that, they, "expect the regional water boards to follow these principles unless a regional water board makes a specific showing that application of a given principle is not appropriate for region-specific or permit-specific reasons."[10] As discussed below the Tentative Order is inconsistent with the State Board's Order insofar as it fails to follow the principles listed above and provides no specific showing as to why a given principle is not appropriate for the San Diego MS4 permit.

a. The Tentative Order is Inconsistent with the State Board Order Because It Contains No Reasonable Assurance Analysis ("RAA"), Protocols, or Guidelines to Ensure the Copermittee's Analysis and Resulting Plans Will Actually Achieve RWLs and WQSs.

While Environmental Groups fully support the comments submitted on the LA Order and State Board Order by NRDC, LA Waterkeeper, and Heal the Bay regarding the deficiencies and illegalities of the LA Order, and we agree the L.A. Order is illegal, at the very least the State Board-approved Order contained a Reasonable Assurance Analysis (or "RAA") based on modeling, as well as associated guidelines and protocols under which watershed strategies and safe harbor analyses must be conducted. Together the RAA and guidelines and protocols add a considerable degree of objectivity, rigor, and accountability not present in the San Diego Tentative Order or 2013 MS4 permit. In fact, earlier San Diego draft language had contained

[3] Order WQO 2015-0075, at page 16.
[4] Order WQO 2015-0075, pages 51-52.
[5] Order WQO 2015-0075, page 51.
[6] Id, page 52.
[7] Id.
[8] Id.
[9] Id. At 51
[10] Id.

the word "model", but it has since been removed.[11] Besides lacking the guidance that exists in the L.A scenario, the Tentative Order before us requires no validation, peer review, or minimum data requirements, nor does it appear to consider such requirements necessary. In short, it offers no guidance or protocols whatsoever to Copermittees, the citizenry, the State, and Regional Board.[12] Despite its own claims in the Fact Sheet[13], the Tentative Order is not "transparent", nor is it "ambitious" or "rigorous", and it lacks "rigor and accountability" and is inconsistent with the State Board's Order.[14]

The State Board-approved LA permit scheme, on the other hand, includes the requirement to conduct a Reasonable Assurance Analysis ("RAA") for both WMPs and EWMPs. The relevant permit language describes:

> (5) Permittees shall conduct a Reasonable Assurance Analysis for each water body-pollutant combination addressed by the Watershed Management Program. A Reasonable Assurance Analysis (RAA) shall be quantitative and performed using an approved model in the public domain. Models to be considered for the RAA, without exclusion, are the Watershed Management Modeling System (WMMS), Hydrologic Simulation Program-FORTRAN (HSPF), and the Structural BMP Prioritization and Analysis Tool (SBPAT). The RAA shall commence with assembly of all available, relevant subwatershed data collected within the last 10 years, including land use and pollutant loading data, establishment of quality assurance/quality control (QA/QC) criteria, QA/QC checks of the data, and identification of the data set meeting the criteria for use in the analysis. Data on performance of watershed control measures needed as model input shall be drawn only from peer-reviewed sources. These data shall be statistically analyzed to determine the best estimate of performance and the confidence limits on that estimate for the pollutants to be evaluated. The objective of the RAA shall be to demonstrate the ability of Watershed Management Programs and EWMPs to ensure that Permittees' MS4 discharges achieve applicable water quality based effluent limitations and do not cause or contribute to exceedances of receiving water limitations.[15]

The guidelines issued by the LA Regional Board for conducting RAA's go on to discuss the rigor and transparency of the RAA requirements by highlighting the level of detail required in the RAA saying, "the RAA must be adequate to identify the required reduction for each water body-

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[11] Language from May 2015 Draft, found at http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/docs/2015-0514_Revised_Draft_RWL.pdf. While the May 2015 language itself was also inconsistent with the State Board Order for failure to include RAAs and other guidance, it did at the very least mention modeling as the acceptable methodology.

[12] See Tentative Order Section B.3.c.1.(b)(i), which calls only for, "an analysis, with clearly stated assumptions".

[13] Attachment 2 to TO No. R9-2015-0100, page F-60.

[14] State Board required principles, Order WQO 2015-0075 at p. 51-52.

[15] Order No. R4-2012-0175 as amended by Order WQ 2015-0075, page 65.

pollutant combination at each compliance deadline and analyze the BMP scenario to achieve that deadline."[16]

The RAA in the LA Order and approved by the State Board is a "well-defined, transparent", detailed, pre-reviewed and approved modeling exercise, which includes minimum data point considerations and quality assurance criteria, and which taken together are intended to ensure that Copermittee's plans implement stormwater pollution control measures of the correct type, location, and size to achieve compliance with WQSs in receiving water bodies. The RAA, in fact, forms the bedrock for the plan development, and therefore for pollution control and compliance with the CWA for those Permittees that chose to develop such plans. As noted by the State Board in Order WQ 2015-0075 with respect to the LA MS4 permit,

> …the requirement for a reasonable assurance analysis in particular is designed to ensure that Permittees are choosing appropriate controls and milestones for the WMP/EWMP. Competent use of the reasonable assurance analysis should facilitate achievement of final compliance within the specified deadlines[17].

In stark contrast to the requirements of the State Board-approved LA Order, the San Diego Tentative Order calls only for, "an analysis, with clearly stated assumptions"[18]. The existing WQIPs in the San Diego permit contain no RAA or equivalent, and largely lack any of the objective criteria and guidelines that are present in the RAA.[19] The Tentative Order, then, is neither "well-defined" nor "transparent".[20]

What results from the TO is a completely subjective, ad-hoc process and review without standards or guidance. Importantly the lack of an RAA, standards, and guidance exists not only as related to the actual *development* of watershed plans that would receive full protection under the safe harbor (see above discussion on RAA), but also to staff, Board, and public *review* of those plans. When Board staff were questioned by Environmental Groups at the June 2015 workshop as to whether guidelines, protocols, or other criteria would be developed to dictate how such analyses would be conducted or reviewed, the response was that no such guidance would be developed. In essence, copermittees would be free to devise whatever type or kind of analysis they wish, and if such a plan was acceptable to the Board the safe harbor would apply.

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[16] Guidelines For Conducting Reasonable Assurance Analysis In A Watershed Management Program, Including An Enhanced Watershed Management Program; March 25, 2014; Prepared by Nguyen, Lai, Ridgeway, and Zhu for the Los Angeles Regional Water Quality Control Board, page 4.

[17] Order, at p.37.

[18] Tentative Order, p. 34, Section B.3.c.1.(b).(i).

[19] This issue was brought to light recently in the Regional Board's review of the final submitted WQIPs by Copermittees. The Board staff found most, if not all, WQIPs to be noncompliant with the permit. See: http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/docs/wqip/comments/SDWB.pdf last accessed August 17, 2015. Copermittees continue to complain the regulations governing WQIP development are unclear and subjective. The approved RAA methodology that is lacking from the San Diego permit and TO is meant to provide objectivity to the Board, the public, and the Copermittees.

[20] To further illustrate that lack of rigor and transparency in the TO, while the draft TO does include annual milestones that show progress towards a final numeric goal, such milestones "may consist of…other acceptable means." What these means are or might be is entirely lacking in transparency or clarity to both the public and the Copermittees.

Unfortunately the Tentative Order fails to require rigorous or transparent methods for either the regular WQIP or the safe harbor plans. As written, the existing San Diego permit and Tentative Order fail to include a rigorous, proven, pre-reviewed, approved test, and further fail to include accompanying guidelines or standards that provide for assurances of compliance. **The result is that the Tentative Order ignores not only the justifications used for developing and supporting the LA Order[21], but also ignores the language and mechanisms by which the LA Order will be implemented and that were expressly approved by the State Board.** In both of these ways the Tentative Order fails to realize the circumstances under which, and justification for, adoption of a safe harbor *might* even be appropriate in San Diego.

The Tentative Order would adopt a process without a performance standard and with no analysis or evidence in the record to demonstrate that implementing the devised plans will actually achieve compliance with WQSs. And while the Tentative Order Fact Sheet professes to incorporate each of the State Board's seven principles[22] the proposed safe harbor, which lacks any form of guidance[23], cannot under any imaginable circumstances be said to be "ambitious, rigorous, and transparent". [24]

These shortcomings are fatal to the Tentative Order's safe harbor inclusion into the San Diego MS4 permit. As such the language should be substantially revised based on comments made to date and herein, or removed altogether. While we acknowledge San Diego is not Los Angeles, the legal and factual basis upon which the LA Order was approved by the State Board very much dictates the acceptable circumstances under which San Diego's safe harbor language might pass muster under the State Board's Order.[25] As written the TO is inconsistent with the State Board's Order and guidelines.

b. The Tentative Order Is Inconsistent with the State Board's Order Because It Allows Good Faith Engagement and Implementation of the Iterative Process to Constitute as Compliance with Receiving Water Limitations

While the Fact Sheet claims that the seven principles included in Order WQ 2015-0075 have been incorporated into this Tentative Order, the Tentative Order fails to assure that "good faith engagement in the iterative process" will not deem a Copermittee in compliance and thus is inconsistent with the State Board's Order.[26] For instance, while the Tentative Order requires the monitoring and assessment program of the safe harbor to demonstrate only, "whether the implementation of the water quality improvement strategies are making progress towards

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[21] See comments below, specifically sections III.A.(1)a.-c., for more on the failures of the TO to adequately justify a safe harbor be included in the San Diego MS4 permit.

[22] Attachment 2 to Tentative Order No. R9-2015-0100, page F-60.

[23] For an example of the type of guidance that would be required of any analysis, see Guidelines For Conducting Reasonable Assurance Analysis In A Watershed Management Program, Including An Enhanced Watershed Management Program; March 25, 2014; Prepared by Nguyen, Lai, Ridgeway, and Zhu for the Los Angeles Regional Water Quality Control Board.

[24] For similar reasons the safe harbor fails to incorporate Principle 7 of the State Board which requires "rigor and accountability", and a program that is "transparent". Without more, Environmental Groups and the public are left to guess what "acceptable rational" and "appropriate modifications" are.

[25] See Order WQO 2015-0075. "We expect the regional water boards to follow these principles", p. 51.

[26] Attachment 2 to Tentative Order, Page F-60.

achieving the numeric goals"[27], the TO language does not require achievement of those goals. In actuality, the approach proposed by the draft language mirrors the flawed iterative process from previous permits and will result in more delay and confusion.

While at first glance it might appear that the eventual achievement of WQS and RWL is required to be considered compliant with the safe harbor provision, upon further inspection it becomes clear that this is not the case. Section B.3.c.(1).(c). of the Tentative Order states that "The Copermittee is deemed in compliance during the term of this Order as long as…(a) The Copermittee is implementing the water quality improvement strategies with its jurisdiction developed pursuant to Provision B.3.b.(1) and in compliance with the schedules for implementing the strategies established…".[28] Section B.3.c.(2)(c) states, however, the Copermittee must submit annual report assessments that either, "support a conclusion that: 1) the Copermittee is in compliance with the annual milestones and dates for achievement…, **OR** 2) the Copermittee has provided acceptable rationale and recommends appropriate modifications."[29]

Taken together, it becomes clear that once Copermittees develop a plan that is acceptable to the Regional Board they need only continue to provide "acceptable rationale" and recommend "appropriate modifications" when they fail to implement strategies or achieve the goals set out in their plan, including WQS, RWLs, and perhaps even WQBELs. Such an approach is not "finite", as the State Board Order requires[30], and it fails to necessarily require "significant undertakings beyond the iterative process".

The State Board Order once again makes it clear that such an approach would not be acceptable when it states, "we…ultimately disagree with Permittee Petitioners that implementation of the iterative process does or should constitute compliance with receiving water limitations."[31] The State Board Order discusses at length their position, as follows:

> We can support an alternative approach to compliance with receiving water limitations only to the extent that that approach requires clear and concrete milestones and deadlines toward achievement of receiving water limitations and a rigorous and transparent process to ensure that those milestones and deadlines are in fact met. Conversely, we cannot accept a process that leads to a continuous loop of iterative WMP/EWMP implementation without ultimate achievement of receiving water limitations.[32]

The Tentative Order language itself includes language clarifying that the safe harbor provisions and requirements are little more than a continuation of the, "iterative approach and adaptive management process" in addition to requiring nothing more than an "acceptable rationale and appropriate modifications" to continue receiving protections. With no standards as to what would be considered "acceptable rational" or "appropriate modifications", The Tentative Order

[27] Tentative Order No. R9-2015-0100, Section B.3.c.(1).(c).
[28] Tentative Order No. R9-2015-0100, Section B.3.c.(2)-(a).
[29] Tentative Order No. R9-2015-0100, Section B.3.c.(2)(c), emphasis added.
[30] Order WQO 2015-0075, page 16.
[31] Order WQO 2015-0075, page 10.
[32] Order WQO 2015-0075, page 33.

may require nothing more than a good faith engagement in what, on its face, is a continuing iterative process.[33] In fact, in several places the safe harbor makes it explicitly clear that it embraces the iterative process.[34]

We note that Board staff rejected a proposal by Environmental Groups to include language that would remove a Copermittee from safe harbor protection if annual milestones were not met for two years in a row.[35] Our proposed language would have helped ensure that Copermittees were not deemed in compliance simply for good faith engagement in the iterative process and that strict measurable requirements would continue to be met. The end goal of this suggested language was meant to ensure that if the best laid plans of the jurisdictions were not being implemented for one reason or another, the safe harbor would once again allow for citizen oversight and accountability as the Clean Water Act has always done. That proposal was ignored and instead language was included that would allow the safe harbor to be another version of the existing iterative process so long as a Copermittee who is not meeting its annual milestones (or RWLs, WQSs, or WQBELs) offers an "acceptable rationale and recommends appropriate modifications". This approach is both inconsistent with the State Board's Order and unlawful.[36]

c. The Tentative Order Is Inconsistent with the State Board's Order Because It Does Not Include Requirements for Multi-Benefit Projects or Stormwater Resource Projects

The State Board's Order is based, in part, on a fundamental shift in how stormwater pollution is addressed and the transition of stormwater from a nuisance to an asset (see discussion below in Section III.A.1.). This idea is embodied in the principle that any safe harbor, "should encourage multi-benefit regional projects that capture, infiltrate, and reuse storm water and support a local sustainable water supply."[37]

There are, however, no provisions that encourage or require the inclusion or evaluation of multi-beneficial projects in the San Diego permit. In fact, Environmental Groups failed to find even a single reference to the world "multi-benefit" in the 2013 permit or the Tentative Order, and our review of the eight Water Quality Improvement Plans (WQIPs) found a near total lack of commitment to the development and incorporation of multi-benefit regional projects in the San Diego region. This may be, in part, because San Diego's WQIPs differ in at least one important way from LA's EWMPs. Specifically, the San Diego WQIPs do not require any evaluation of

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[33] In several sections of the safe harbor the Board goes through great pains to note that the safe harbor embraces the iterative process.

[34] c(1)(b): "The analysis must be updates as part of the iterative approach and adaptive management process" and c(1)(c): "The specific monitoring and assessments must be updated as part of the iterative approach and adaptive management process".

[35] The relevant language read, "Failure to comply with and to achieve the numeric goals, schedules, strategies, and/or dates under c(1)(a)(i)-(v) for any two consecutive reporting periods will automatically result in that Copermittee's forfeiture of RWL Alternative Compliance status." From SD Coastkeeper's proposed amendments, available at: http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/docs/2015-0603_Enviro_RWL_Proposed_Revisions.pdf. Last accessed August 6, 2015.

[36] *See* comments in Section III below.

[37] Order WQO 2015-0075, p. 52.

collaboration on multi-benefit projects in our region to retain all non-storm water runoff or to retain all storm water runoff from the 85th percentile, 24-hour storm event. Where retention requirements are present in the San Diego permit they exist only for development or redevelopment projects over a certain size. Unlike in the LA Order, then, the San Diego permit does not require, or even incentivize, such multi-benefit evaluations or considerations for general compliance strategies.

Thus, while the Fact Sheet claims this safe harbor incorporates the seven principles of the State Board's Order, it fails to ensure that, "the strategies required to be included in the Water Quality Improvement Plans encourage multi-benefit regional projects that capture, infiltrate, and reuse storm water and support a local sustainable water supply."[38] As such, the TO is inconsistent with the State Board's Order.

d. The Draft Language As Written Would Allow for a Safe Harbor During Plan Review Periods

The San Diego Regional Board staff have made it clear that the Board will not allow a compliance option during plan review. However, the draft as written does exactly that in at least one instance Environmental Groups can think of. Specifically, the safe harbor would still apply between the period where a Copermittee (who is not complying with its annual milestones and dates for achievement) provides to the Regional Board under section (c) an "acceptable rationale" and recommends "appropriate modifications" to their plan, and the period of acceptance by the Regional Board (since section (d) requires express approval by the Board). The lag time between these two instances, which could potentially be as long as a permit cycle, would allow for a safe harbor during the non-attainment and non-acceptance period/during each plan review period. Such an instance would allow for a safe harbor even where the Copermittee was not fulfilling its obligations of its approved plan. To remedy this, section (c)(2) and section (d) should be removed, and strict compliance deadlines with the plan should be required.

III. If Adopted, the Tentative Order Would Be Illegal

As discussed in detail below, the draft language fails to comply with federal and state anti-degradation and anti-backsliding requirements, and allows illegal compliance schedules for the TMDL-based limitations necessary to implement the California Toxics Rule ("CTR").

A. The Draft Language Violates Anti-Backsliding Provisions

The Clean Water Act, through its anti-backsliding provisions, prohibits a permit from being renewed, reissued, or modified with effluent limitations less stringent than the comparable limitations in the previous permit.[39] Water quality based effluent limits in NPDES permits can be revised to be less stringent only where consistent with a TMDL properly incorporated into that

[38] Attachment 2 to Tentative Order R9-2015-0100.
[39] 33 U.S.C. § 1342(o)(1).

permit.[40] And any TMDL implementation must be consistent with the requirements for compliance schedules in NPDES permits.[41]

Federal regulations further require that "when a permit is renewed or reissued, interim effluent limitations, standards, or conditions must be at least as stringent as the final effluent limitations, standards, or conditions in the previous permit."[42] The receiving water limitations in existing MS4 Permits have been required to be incorporated into permits across the state since 1999, and many MS4 permits have included this language for over a decade. Any attempt to now include safe harbors in those permits from the required receiving water limitations would violate anti-backsliding provisions.[43]

Quite simply stated, the draft language as proposed violates the anti-backsliding provisions of the Clean Water Act, and adoption of the safe harbor would be in violation of the law. Any arguments to the contrary or assertions of exceptions or exemptions to anti-backsliding provisions would fail in the context of the San Diego MS4 permit, as discussed in more detail below.

(1) State Board and Los Angeles Legal Justifications for LA Order Are Inapplicable to San Diego Region

The Tentative Order appears to rely exclusively on justifications offered by both the Los Angeles Regional Board and the State Water Board Order WQ 2015-0075 in seeking to include a safe harbor in the San Diego permit. As we did in our comments to the State Board on the LA Draft Order in oral comments on December 2014 and in written comments from January 2015, Environmental Groups finds the Tentative Order's use of information, justifications, and processes gained from permit development in LA (and a long overdue permit at that) and its seemingly wholesale extrapolation of that reasoning, interpretation, and justifications to our region unpersuasive. Below we explore the justifications put forth by the Board to demonstrate why they do not apply outside of the LA region and are why they are wholly inapplicable to San Diego[44].

As mentioned above, the application of a safe harbor that weakens the applicability of RWL language to the San Diego region would fail to meet minimum federal requirements and would constitute a violation of the Clean Water Act's anti-backsliding provisions. The Clean Water Act and associated Federal Regulations, specifically 40 CFR 122.44(l)(1), provide that except in a narrow set of enumerated circumstances, "when a permit is renewed or reissued, interim effluent limitations, standards, or conditions must be at least as stringent as the final effluent limitations, standards, or conditions in the previous permit."

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[40] Id.

[41] See *In the Matter of Star-Kist Caribe, Inc.*, 1989 EPA App. LEXIS 38, at *7 (E.A.B. 1989); 33 U.S.C. § 1313(e)(3)(F); 40 C.F.R. § 122.47.)

[42] 40 C.F.R. 122.44(l)(1).

[43] *See* also United States Environmental Protection Agency Region III letter, "Backsliding is prohibited in NPDES permits. . . . Allowing additional time to complete a task that was required by the previous permit constitutes a less stringent condition and violates the prohibition against anti-backsliding." August 8, 2012.

[44] We should note that Environmental Groups join our sister organizations in Los Angeles in the assertion that the LA permit and Order have similar legal defects.

San Diego's justification for the safe harbor is the same justification used in the LA Order; namely that an exception to anti-backsliding exists.[45] Thus, we turn to the LA Order itself for justification. The LA Order, like this SD Tentative Order, makes slight mention of why the LA permit *may* not violate anti-backsliding[46], but then without discussing the justification in detail the orders simply state that justification isn't necessary because an exception allowing for backsliding exists.[47]

The Tentative Order itself appears to base the bulk of its acceptance that the safe harbor does not constitute backsliding on the LA Regional Board's Response to Comments document, wherein an argument was made that an exception to backsliding exists. The Order includes little analysis as to whether anti-backsliding actually applies (and importantly, the Order does not find that anti-backsliding provisions *do not* apply here), and instead focuses its attention on finding that an exception to backsliding exists in the case of the LA permit. The SD Tentative Order more or less mirrors this language and the related justifications.

The SD Tentative Order Fact Sheet states:

> The alternative compliance pathway option in Provision B.3.c. of this Order was informed by new information available to the Board from experience and knowledge gained through the Los Angeles Water Board's process of developing over 30 watershed-based TMDLs and implementing several TMDLs since the adoption of the previous permits. In particular, the Los Angeles Water Board recognized the significance of allowing time to plan, design, fund, operate and maintain watershed-based BMPs necessary to attain water quality improvements and additionally recognized the potential for municipal storm water to benefit water supply. Thus, even if the receiving water limitations are subject to anti-backsliding requirements, they were revised based on new information that would support an exception to the anti-backsliding provisions.[48]

It is clear, then, that the entire justification for claiming that an anti-backsliding exception applies to the SD Tentative Order is based upon the justifications listed in the LA Order and State Board Order, as we found no additional data or information presented in the SD Tentative Order or accompanying documents.

a. Water Board Rationales Fail to Support an Anti-Backsliding Exception in San Diego: "New Information", Paradigm Shift, Prioritization, and Lessons Learned

The LA Regional Board's Response to Comments upon which the State Board's justification hinges (and upon which San Diego's justification also relies), in turn, states that an exception exists, "if the circumstances on which the previous permit was based have materially and substantially changed since the time the previous permit was issued and would constitute cause

[45] Attachment 2 to Tentative Order No. R9-2015-011, page F-32.
[46] The Fact Sheet states, "although the non-applicability is less clear with respect to regulatory anti-backsliding provisions in 40 CFR 122.44(l)…" Id, p. F-32.
[47] Id.
[48] Attachment 2 to Tentative Order No. R9-2015-0100, page F-32.

for permit modification or revocation or reissuance under 40 CFR section 122.2. Like section 122.41(l), section 122.62 includes new information not available at the time the previous permit was issued as a cause for modification" (p. 51 of Response). The Response then goes on to justify an exception based largely upon the differences between the 2001 and 2012 permits in Los Angeles, a paradigm shift towards treating stormwater as an asset, and information gained during that lengthy 10-plus year time frame.

In stark contrast, no such large time gap between permits and no such large-scale paradigm shifts or information downloads have occurred between any two MS4 permits in San Diego. To its credit, the San Diego Regional Board has continually updated MS4 permits based upon lessons learned and the result has been a series of permits increasingly aimed at integrated water management approaches and watershed-wide planning. So while we disagree with the State Board Order and the LA Regional Board that an exception to anti-backsliding exists in LA based on those lessons learned and shifts in thinking, it is even more plain to us that the justification for any such exception clearly does not apply to San Diego.

To illustrate, the San Diego MS4 permits have since 2001 incorporated the RWL language of Order 99-05. In fact, the San Diego region has adopted several iterations of MS4 permits since 2001, including one in 2007 and another in 2013. Each of these has gradually evolved to include the paradigm shift included in Los Angeles' permit, as well as the lessons learned via the iterative process and its monitoring and assessment. Low impact development provisions have been included since 2007 in the San Diego permit[49], and on-site retention requirements[50], as well as incentives and direction towards onsite capture and use, already exist.[51] Further, San Diego's newest permit includes provisions for on-site capture and infiltration for development projects over a certain threshold.[52] In addition to the onsite capture and use provisions of those permits, watershed-wide planning efforts aimed at prioritization of waterbodies or pollutants also are already present in our permit.[53] Thus, the San Diego region has already adopted over time a series of permits that have gradually embraced and incorporated the paradigm shift and new information sited as the justification for the anti-backsliding exception.

The most recent San Diego 2013 MS4 permit also incorporates a framework to achieve RWLs in our region through the utilization of Water Quality Improvement Plans (WQIPs) and an adaptive management process[54]. Like the Los Angeles WMPs and EWMPs, WQIPs include prioritization of watershed conditions and pollutants[55], and contain numeric interim and final goals aimed at achieving RWLs[56]. Unlike the LA permit, however, our existing WQIPs do not require RAAs or any type of pre-reviewed modeling, nor do they require proof that the chosen actions and timeframes of the Copermittees will result in the attainment of RWLs and WQSs.

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[49] Order No. R9-2007-0001, Section D.1.d.(4).
[50] Order No. R9-2007-0001, Section D.1.c.(2)., and Order No. R9-2015-001 Section E.3.a.(3)(h)
[51] Order No. R9-2015-0001 Section E.3.a.(3)(l).
[52] Order No. R9-2015-0001 Section E.3.c.(1).(a).
[53] Order No. R9-2015-0001 Section B.1.
[54] Id, Section B.
[55] Id, Section B.2.
[56] Id, Section B.3.

Importantly, the RWL provisions have remained in place throughout these processes and permitting schemes that included the paradigm shifts, watershed planning, and prioritization planning. Certainly the reasoning behind the LA exception - if applicable at all - is not applicable to San Diego, and any directive to include a safe harbor in an existing permit that already includes watershed-based planning and integrated water management would run afoul of the anti-backsliding provisions of the Clean Water Act. Quite simply, since the San Diego permit already incorporates the paradigm shift, already contains prioritization and plans for meeting RWL requirements, and has chosen *not* to have a safe harbor, any relaxing of the conditions of the permit would not be as stringent as our existing permit, and thus would constitute backsliding under the Clean Water Act.

b. Water Board Rationales Fail to Support an Anti-Backsliding Exception in San Diego: Multi-benefit Projects and Local Water Supply

To further illustrate the problem with relying solely on the justifications used for the LA MS4 permit, we note that one of the fundamental reasons both the State and LA Regional Board found this approach appropriate was the incorporation into the LA permit of multi-beneficial regional projects that capture and infiltrate the 85th percent storm.[57] Multi-benefit approaches that consider water supply benefits underlie a core justification for the shift in approaches in general, and for the safe harbor specifically.

The SD Tentative Order Fact Sheet recognizes this when it states part of its justification for an anti-backsliding exception:

> The alternative compliance pathway option in Provision B.3.c. of this Order was informed by new information available to the Board…In particular, the Los Angeles Water Board…recognized the potential for municipal storm water to benefit water supply. Thus, even if the receiving water limitations are subject to anti-backsliding requirements, they were revised based on new information that would support an exception to the anti-backsliding provisions.[58]

In San Diego, however, the 85th percent storm capture requirement applies only to individual Priority Development Projects[59], and not to regional compliance or alternative compliance projects aimed at achieving WQSs or RWLs and benefitting local water supply. There are no requirements or incentives for regional multi-beneficial projects in the San Diego permit. In fact, Environmental Groups failed to find even a single reference to the world "multi-benefit" in the 2013 permit or the Tentative Order, and our review of the eight Water Quality Improvement Plans (WQIPs) found a near total lack of commitment to the development and incorporation of multi-benefit regional projects in the San Diego region. As such, while the Fact Sheet claims this safe harbor incorporates the seven principles of the State Board's Order, it completely fails to ensure that, "the strategies required to be included in the Water Quality Improvement Plans

[57] Order No. R4-2012-0175 as amended by Order WQ 2015-0075, Section VI.C.1.g.
[58] Attachment 2 to Tentative Order No. R9-2015-0100, page F-32.
[59] Order R9-2015-0001, Section E.3.c(.1)(a)

encourage multi-benefit regional projects that capture, infiltrate, and reuse storm water and support a local sustainable water supply."[60]

From a practical perspective relative to water supply benefits in stormwater management, the San Diego region differs in some important and substantial ways from its neighbor up north. First, while Los Angeles and other regions in Southern California generally have the ability to utilize groundwater basins for infiltration and groundwater aquifer recharge for local water supply production in a large-scale integrated water management fashion, the San Diego region does not have available to it the larger underground basins for such storage. While our region's permit may seek to incentivize and strive for more water supply from stormwater, it may very well be that solutions to our serious and continuing water quality issues come in the form of more traditional source and treatment control technologies that have been part of the repertoire of stormwater management for many years. Once again, the justification proposed for an anti-backsliding exception is simply not applicable to the San Diego region and its permitting scheme and history.[61]

c. Water Board Rationales Fail to Support an Anti-Backsliding Exception in San Diego: TMDL Incorporation into MS4 Permits and Lessons Learned

To an equally large degree the justification for an anti-backsliding exception is based on the development, monitoring, and analysis of 33 TMDLs in Los Angeles, coupled with a paradigm shift. In fact, in justifying the exception the LA Regional Board mentions the importance of its TMDLs toward the achievement of fishable and swimmable waters in LA when it says, "the majority of pollutants of concern from the Los Angeles County MS4 are addressed by the 33 TMDLs that are included in the Permit," (p. 37, Response to Comments), and it recognizes the prioritization of TMDLs as highest priority issues (p. 40, Response to Comments). The San Diego Tentative Order itself points to the experience in LA for its own justifications.[62]

In contrast to the LA region, however, the San Diego region has only a handful of TMDLs and the San Diego Regional Board remains much more reluctant to develop new TMDLs, choosing instead to look towards alternatives to TMDLs. Two instances where TMDL alternatives have been developed in just the last few years are in Oceanside's Loma Alta Slough (for nitrate impairment), and the Tijuana River Valley (for impairments of sedimentation and trash). In these instances, the San Diego Regional Board has chosen to utilize processes, avenues, or

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[60] Attachment 2 to Tentative Order R9-2015-0100.

[61] Further, even if these approaches could be considered "new", it would still not justify backsliding. An improvement or development of new technology provides the Copermittee with *additional* options for meeting the requirements imposed on them by the prior permit and hence does not justify eliminating or delaying those requirements.

[62] "The alternative compliance pathway option in Provision B.3.c. of this Order was informed by new information available to the Board from experience and knowledge gained through the Los Angeles Water Board's process of developing over 30 watershed-based TMDLs and implementing several TMDLs since the adoption of the previous permits." Attachment 2 to Tentative Order No. R9-2015-0100, page F-32.

procedures that do not have the strict interim and final milestones and deadlines for achieving receiving water limitations and objectives that are found in TMDLs.[63]

Our own regional permit includes Water Quality Improvement Plans that aim to prioritize and address pollutants within the Region and those WQIPs contain interim and final measurable benchmarks to show progress of meeting the goals of achieving RWLs. Without the RWLs kept in place and with few TMDLs to fall back on, however, insufficient enforcement mechanisms would exist for citizens of our region if the WQIPs fail to meet the goals of the Clean Water Act. This regional variation in strict controls makes it all the more imperative that the RWLs be kept and no safe harbor provided. Arguments that, as the State Board makes, "TMDL requirements and receiving water limitations, which may be implemented through the WMP/EWMP provisions, will be the means for achieving water quality standards for the majority of degraded water bodies in the region,"[64] ring hollow when regions outside of the LA region have so few TMDLs and the implementation of TMDLs can be measured in decades.

Finally with respect to time allowances the appropriate way for our region, which lacks the suite of TMDLs present in LA to address RWL issues, is through the MS4 permit and Time Schedule or other Orders that include strict interim and final milestones for compliance rather than an excuse from RWLs.

Without the definitive requirements of TMDLs, Environmental Groups and our members are left with just one way to measure whether our Copermittees are meeting, or will meet, the requirements of the CWA. That measure is the Clean Water Act itself, and the receiving water limitations provisions of the permits under the Act.

To date few, if any, third party lawsuits have been filed in San Diego for MS4 noncompliance. And yet while the new permits for LA and for San Diego region contain "carrots" to incentivize certain plans and programs aimed at meeting RWLs and WQSs, the San Diego permit has, to date, maintained the "stick" of possible enforcement actions when and where necessary to ensure RWLs will be achieved. Without TMDLs or other time-certain measures, it is vital to our success that third-party enforcement actions for RWL requirements not be precluded.

B. The Tentative Order Would Violate Anti-Degradation Requirements and the Anti-Degradation Findings Are Unsupported by the Evidence

The Tentative Order's anti-degradation analysis and findings are improper and lack basis.

(1) The Revised Draft Order's Anti-Degradation Analysis Fails to Comply with EPA Requirements and Lack Support in the Record

[63] While the Fact Sheet, in discussing anti-degradation, states that for water bodies listed on the State's CWA Section 303(d) List, the "San Diego Water Board has established TMDLs to address the impairments", Environmental Groups find this statement to be disingenuous. In actuality the San Diego Board has adopted only a handful of TMDLs and has failed to adopt TMDLs for two known impairments for which the TMDL process had already begun.

[64] Order WQ 2015-0075, page 26.

The Tentative Order claims "allowing limited degradation of high quality water bodies through MS4 discharges is necessary to accommodate important economic or social development in the area and is consistent with the maximum benefit to the people of the state."[65] However, the Regional Board has not undertaken the required analysis necessary to support such a finding.

EPA's Economic Guidance for Water Quality Standards Workbook[66] ("EPA Workbook") establishes a test to determine if there might be interference with an important social and economic development. The EPA Workbook outlines three steps involved in performing an economic impact analysis as part of an anti-degradation review: (1) verify the project's costs and calculate annual costs of the pollution control project; (2) determine if maintaining high-quality waters will interfere with development; and (3) determine if development is economically and socially important.[67] The EPA Workbook provides several worksheets for addressing these factors.[68] Yet neither the State Board nor the Regional Board have addressed these basic factors or completed the EPA worksheets – or provided any evidence even remotely resembling such an analysis – in reaching their conclusion.

As a result, the Revised Draft Order and the 2012 MS4 Permit are inconsistent with the procedures established by the EPA.

(2) The Tentative Order and 2013 MS4 Permit's Anti-Degradation Findings Are Flawed and Lack Basis

The Tentative Order must "set forth findings that bridge the analytical gap between the raw evidence and ultimate decision."[69] The Board's findings must provide "the analytic route [it] traveled from evidence to action" to satisfy this requirement, so as to allow the reviewing court to satisfy its duty to "compare the evidence and ultimate decision to 'the findings.'"[70] And mere recitation of legal requirements - as here - is not sufficient.[71] The Tentative Order as drafted does meet the requirements of law.

As noted above, the Tentative Order fails to follow the procedures and requirements outlined in the EPA Workbook. Rather than following EPA procedures, the Order proceeds to conduct an anti-degradation analysis that is unsupported by the evidence and is inadequate.

First, the Tentative Order lacks any evidence supporting the findings that any degradation of San Diego area waters will in fact "assist with maintaining instream flows that support beneficial uses, may spur the development of multiple benefit projects, and may be necessary for flood control, and public safety, as well as to accommodate development in the area."[72]

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[65] Attachment 2 to Tentative Order No. R9-2015-0100.
[66] U.S. Environmental Protection Agency, *Interim Economic Guidance for Water Quality Standards Workbook* (March 1995), available at http://water.epa.gov/scitech/swguidance/standards/economics/chaptr5.cfm
[67] *Id*. at 5-2
[68] *Id*. at Worksheets AA, AB, and O-Y.
[69] *See Topanga Association for a Scenic Community v. County of Los Angeles* (1974) 11 Cal.3d, 506, 514-516.
[70] *Id*. at 515.
[71] *Id*. at 515, n.16.
[72] Attachment 2 to TO No. R9-2015-0100, page F-32.

Second, the Tentative Order's anti-degradation analysis is flawed and cannot support the finding that degradation of San Diego area waterbodies justified. The Order improperly omits from its anti-degradation analysis an evaluation of impacts on water quality from the discharge of *polluted* storm water regulated by the 2013 MS4 Permit.[73] The conclusion that discharge of storm water is to the maximum benefit of the people is therefore flawed. In fact, it is highly doubtful any discharges of *polluted* stormwater "can assist in maintaining instream flows that support beneficial uses" because, regardless of any contribution to instream flows, *polluted* stormwater, as shown by the record, uniformly degrades waterbodies' beneficial uses. Further, the anti-degradation findings improperly conclude that the alternative to allowing water quality degradation is "capturing all storm water from all storm events."[74] Capturing all storm water from all storm events is *not* the only alternative to ensure no degradation occurs as a result of *polluted* stormwater discharges. There may be other alternatives. The Tentative Order, however, improperly fails to mention, let alone analyze, other alternatives in its anti-degradation analysis. As a result, the anti-degradation findings lack basis.

Finally, the State Board Order expressly recognizes the important, if not paramount, role the LA TMDLs play in anti-degradation, stating, "where water quality is already impaired, the Order requires implementation of TMDL requirements to achieve water quality standards over time."[75] They go on to state, "we expect that the Los Angeles MS4 Order's TMDL requirements and receiving water limitations, which may be implemented through the WMP/EWMP provisions, will be the means for achieving water quality standards for the majority of degraded water bodies in the region".[76] As discussed above, however, the San Diego region has far fewer TMDLs and has failed to develop TMDLs for several identified 303(d) impairments in the region for which TMDLs are proper.[77] Instead, the San Diego Board rely on the MS4 permit as a substitute to address impairments. Thus, when the Tentative Order copies verbatim the language of the State Board Order and states regarding impaired water bodies that, "many such water bodies are listed on the State's CWA Section 303(d) List and the San Diego Water Board has established TMDLs to address these impairment", it is not entirely incorrect.

For these reasons and the reasons provided in our comments to date, the Tentative Order fails to comply with anti-degradation requirements.

(3) The Draft Language and the 2013 MS4 Permit Illegally Authorize Compliance Schedules for California Toxics Rule ("CTR")-based TMDLs Beyond May 18, 2010.

The Tentative Order fails to recognize the requirements of the Inland Surface Water Plan, which prohibits compliance schedules for CTR-based TMDLs past May 18, 2010.[78] Since the WLAs

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[73] *Id.*
[74] *Id.*
[75] WQO Order 2015-0075, p 25.
[76] WQO Order 2015-0075, p 26.
[77] See discussion infra, Section III.A.(1).(c).
[78] 40 C.F.R. 131.38(e)(8); *see also* California Toxics Rule Response to Comments Report, Volume 1 (December 1999), prepared by the U.S. Environmental Protection Agency, Response to Comment CTR-002-010b (explaining that compliance scheduled for CTR-based WQBELs may not exceed five years), available at http://water.epa.gov/lawsregs/rulesregs/ctr/upload/2009_03_26_standards_rules_ctr_responses.pdf.

for the metal TMDLs in the San Diego region are based on the CTR criteria, compliance schedules for these TMDLs are only authorized for a maximum of 10 years from the time the CTR criteria were first promulgated in 2001. Thus, no discharger can be given a compliance schedule to meet Permit provisions based on CTR criteria after May 18, 2010. As a result, to the extent the safe harbor provisions are characterized as compliance schedules for CTR pollutants, they are illegal.

IV. Conclusion

Environmental Groups appreciate the time and effort by Board staff in working with stakeholders to find acceptable solutions to ensuring discharges from MS4s do not cause or contribute to the violation of water quality standards. Despite that hard work, however, the Tentative Order as proposed is inconsistent with the State Board's Order and would violate the Clean Water Act for the reasons described above and in discussions and comments Environmental Groups have made to Board staff and the Board thus far.

The Regional Board could correct each of these fatal deficiencies in the draft TO language and the safe harbor by choosing to not adopt the proposed language and instead continue to require implementation of watershed management programs as one way to achieve, rather than demonstrate, compliance with RWLs and WQSs. Environmental Groups respectfully request the Regional Board remove the safe harbor language. Should the Board chose to adopt safe harbor language despite the TO's legal and practical deficiencies, we respectfully request the TO be made consistent with the State Board's Order through an amendment that includes the following requirements, at a minimum: (1) the Reasonable Assurance Analysis and EWMP guidance, modeling, and standards that were expressly approved by the State Board's Order and that are the lynchpin of the approved safe harbor approach, (2) regional multi-benefit projects be a necessary element of compliance BMPs, (3) language that automatically triggers an end to the safe harbor protections, as earlier proposed by Environmental Groups and referenced above, and (4) removal of the iterative process from the safe harbor scheme.

Thank you for the opportunity to comment.

Sincerely,

Matt O'Malley
Legal & Policy Director
San Diego Coastkeeper

Livia Borak
Legal Advisor
Coastal Environmental Rights Foundation

Julia Chunn-Heer
Policy Manager
Surfrider Foundation San Diego Chapter

cc:
David Gibson, Executive Officer
Cindy Lin, EPA

CITY OF SANTEE

MAYOR
Randy Voepel

CITY COUNCIL
Jack E. Dale
Ronn Hall
Rob McNelis
John W. Minto

September 11, 2015

Via E-Mail [sandiego@waterboards.ca.gov]

David Gibson, Executive Officer
c/o Wayne Chiu
San Diego Regional Water Quality Control Board
2375 Northside Drive, Suite 100
San Diego, CA 92108

Re: Comment - Tentative Order No. R9-2015-0100, Place ID:786088WChiu

Dear Mr. Gibson and Mr. Chiu:

The City of Santee ("City") appreciates the opportunity to provide comments on San Diego Regional Water Quality Control Board ("Regional Board") Tentative Order No. R9-2015-0100 ("Tentative Order") amending Order No. R9-2013-0001, NPDES No. CAS010266, as amended by Order No. R9-2015-0001, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4) Draining the Watersheds within the San Diego Region ("MS4 Permit"). The City is committed to improving and sustaining water quality in the San Diego region and has undertaken extensive efforts to further these goals. The City is aware that the County of San Diego has prepared and submitted comments on the Tentative Order on behalf of Co-Permittees. The City would like to express its support for the County's comment letter and join with the County in the submission of those comments. The comments in this letter supplement the County's letter and are intended to allow the City and other Co-Permittees to continue working toward the common goal of improving water quality in the region.

1. THE CITY SUPPORTS INCORPORATION OF THE ALTERNATIVE COMPLIANCE PATHWAY FOR PROHIBITIONS AND LIMITATIONS

The City recognizes and appreciates the efforts of Regional Board staff to develop an alternative compliance pathway for incorporation into the MS4 Permit. Attaining water quality objectives is a long term commitment that poses special challenges for MS4s. Incorporation of an alternative compliance pathway recognizes the special challenges and long-term commitments necessary to make measurable steps in reaching water quality objectives. Use of the Water Quality Improvement Plan process establishes a rigorous and transparent pathway for compliance with Provisions A.1.a, A.1.c, A.1.d, A.2.a, and A.3.b. The City joins with other Co-Permittees in expressing its support for the alternative compliance pathway.

2. CLARIFY PROVISION A TO STATE THAT COMPLIANCE WITH PROVISION B.3 CONSTITUTES COMPLIANCE WITH PROVISIONS A.1.a, A.1.c, A.1.d, A.2, AND A.3.b OF THE MS4 PERMIT

The City is concerned that the prohibitions and limitations in Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b, as currently written, may be interpreted independent of the alternative compliance pathway in Provision B.3. A stand-alone reading of the prohibitions and limitations, without any reference to the compliance pathway provision, may expose the Co-Permittees to unintended liability, despite our rigorous efforts to successfully implement the alternative compliance pathway. The City joins with Co-Permittees in requesting that language be added to Provision A to clarify that the intent of the alternative compliance pathway is to create an alternative means of complying with Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b.

3. REVISE ANNUAL MILESTONE REQUIREMENT TO INCLUDE MEANINGFUL MILESTONES (PROVISION B.3.c.(1)(a)(vii), B.3.c.(1)(d), B.3.c.(2)(c), B.3.c.(2)(d) and footnote 9)

The Tentative Order's alternative compliance pathway requires Water Quality Improvement Plans to set annual milestones for each numeric goal. These milestones must build on previous milestones and lead to the achievement of a final numeric goal. While improvements to water quality may be more difficult to attain in the absence of clear goals and milestones, an artificial annual milestone for each goal does not account for the complicated and long-term nature of the strategies designed to attain water quality objectives. To establish meaningful milestones over time, the milestones should be developed as part of the adaptive management process. The City therefore joins with the Co-Permittees in requesting a revision to the annual milestone requirement in Provisions B.3.c.(1)(a)(vii), B.3.c.(1)(d), B.3.c.(2)(c), B.3.c.(2)(d) and footnote 9.

The City is grateful for Regional Board staff's extensive efforts in drafting a fair and workable alterative compliance pathway. We believe that with the minor modifications requested in this comment letter and those of the County on behalf of the City and other Co-Permittees, the City will be a position to move forward with confidence in attaining water quality improvements in the region.

Sincerely,

Melanie Kush

Melanie Kush, AICP
Acting Director of Development Services

C: Paul Malone, Interim City Manager
Scott Johnson, Principal Civil Engineer
Cecilia Tipton, Storm Water Program Manager
City Attorney

September 11, 2015

San Diego Regional Water Quality Control Board
2375 Northside Drive, Suite 100
San Diego, CA 92108-2700
Attn: Wayne Chiu
sandiego@waterboards.ca.gov

Sent via email

Re: Environmental Groups Comments on Tentative Order R9-2015-0100; Prior Lawful Approval Language

Dear Wayne Chiu, Laurie Walsh, and Christina Arias:

Thank you for the opportunity to comment on Tentative Order R9-2015-0100 ("Tentative Order", "San Diego Order", or "TO". San Diego Coastkeeper and Coastal Environmental Rights Foundation ("Environmental Groups") are local non-profit organizations dedicated to the protection and restoration of regional waters and related environmental issues in San Diego. Our groups represent numerous San Diegans, act through community involvement, regulatory participation, and legal action to ensure the protection and restoration of our region's ocean, bays, and inland waters.

The Tentative Order aims to more accurately define when land development requirements from earlier MS4 permits would apply to Priority Development Projects ("PDPs"). In doing so, the Order allows Copermittees to apply earlier permit requirements to PDPs under two scenarios.

The second scenario is straightforward in that it allows previous permit requirements if a, "Copermittee demonstrates that it lacks the land use authority or legal authority to require a Priority Development Project to implement the requirements of Provision E.3." Environmental Groups read this section, in conjunction with Section E.3.[1] and the TO Fact Sheet[2] to mean the Copermittee must be legally prevented from requiring compliance with the 2013 development requirements. Further, even if a Copermittee is legally prevented from requiring *some* development requirements under E.3., they must enforce those provisions that they are not legally prevented from requiring.

The first scenario, however, is more precise and includes a set of distinct conditions. That language reads:

[1] Order R9-2013-001 as amended by Order R9-2015-0001.
[2] Attachment 2 to TO R9-2015-0100, p. F-110.

(i) The Copermittee has, prior to the effective date of the BMP Design Manual required to be developed pursuant to Provision E.3.d:

[a] Approved a design that incorporates the storm water drainage system for the Priority Development Project in its entirety, including all applicable structural pollutant treatment control and hydromodification management BMPs consistent with the previous applicable MS4 permit requirements; AND

[b] Issued a private project permit or approval, or functional equivalent for public projects, that authorizes the Priority Development Project applicant to commence construction activities based on a design that incorporates the storm water drainage system approved in conformance with Provision E.3.e.(1)(a)(i)[a]; AND

[c] Confirmed that there have been construction activities on the Priority Development Project site within the 365 days prior to the effective date of the BMP Design Manual, *OR* the Copermittee confirms that construction activities have commenced on the Priority Development Project site within the 180 days after the effective date of the BMP Design Manual, where construction activities are undertaken in reliance on the permit or approval, or functional equivalent for public projects, issued by the Copermittee in conformance with Provision E.3.e.(1)(a)(i)[b]; AND

[d] Issued all subsequent private project permits or approvals, or functional equivalent for public projects, that are needed to implement the design initially approved in conformance with Provision E.3.e.(1)(a)(i)[a] within 5 years of the effective date of the BMP Design Manual. The storm water drainage system for the Priority Development Project in its entirety, including all applicable structural pollutant treatment control and hydromodification management BMPs must remain in substantial conformity with the design initially approved in conformance with Provision E.3.e.(1)(a)(i)[a].

The language essentially states that a PDP proponent must have received approval of its *specific* stormwater plans draft under the 2007 permit and must have begun construction activities within a year of the BMP manual taking effect or 180 after it takes effect. Finally, any additional approvals must be in substantial conformance and must be issued within 5 years of the BMP manual's effective date (December 24, 2015).

We appreciate the time and effort Board staff have put into researching and understanding the governing law on this issue. We believe the language has come a long way to more closely match the prevailing law that governs this issue. That said Environmental Groups continue to have a few concerns, discussed below in more detail.

Analysis

While more closely mirroring the governing law on this issue than previous drafts the Tentative Order, in seeking to reach a clear and concise definition, appears to some degree to back track on requirements of the existing MS4 permit and the law.

Avco remains the principal governing case law on the issue of judicial vested rights as applied to development. In *Avco*, the California Supreme Court held that no vested right existed where a

plaintiff had not *both* obtained a final building permit *and* begun grading. *Avco Cmty. Developers, Inc. v. S. Coast Reg'l Com.*, 17 Cal. 3d 785, 791 (1976). Courts of Appeal continue to follow the *Avco* model, holding that public entities may enforce changes in regulations notwithstanding prior subdivision approval unless the owner or developer "(1) has obtained a building permit for an identifiable structure, and (2) has performed substantial work in reliance thereon." *Hafen v. Cnty. of Orange*, 128 Cal. App. 4th 133, 143 (2005). A leading treatise further explains: "The vested rights rule requires that the government agency exercise its *final discretion* to issue a grant of authority or permit which *specifically describes* a particular approval or work of improvement. Thereafter, *if the developer begins to perform the work described* in the grant or permit, he or she may acquire a vested right to complete the *specific and particular* work that is described. The grant or permit does not give any rights to complete any work not specifically described." (emphasis added) *Miller & Starr, Cal. Real Estate* (3d ed.2001) § 25:70, pp. 324-325, 327-328.

If adopted, the proposed language would expand developers' rights beyond what is required by *Avco* and its progeny. By allowing for up to 6 months after the BMP manual, plus up to an additional 5 years for subsequent approvals, PDP proponents could have until 2021 to implement the requirements of the 2007 permit. The MEP standard is - and should be - more rigorous than a 14 year implementation schedule of an expired permit.

As written the Order's new provisions would be inconsistent with, and contrary to, the existing permit's requirements and federal law. While it certainly is legally permissible for the Regional Board to define prior lawful approval as requiring both a final permit and the commencement of work, it is actually inconsistent with other provisions of the MS4 to define it as anything short of that. Section E.1.a. requires each Copermittee to "establish, maintain, and enforce adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4," and adequate legal authority includes, at a minimum, "requiring the use of BMPs to prevent or reduce the discharge of pollutants into MS4s" *Order No. R9-2013-0001 E.1.a.(7)*. As explained above, it is well within all copermittees' legal authority to apply new BMPs to projects that have not begun substantial work and expended "hard costs"[3]. And, under the existing E.1.a. standard they would be required to use the full extent of that authority to apply updated requirements.

To that end Environmental Groups respectfully requests that the Tentative Order language be amended to require that construction activities have begun and substantial hard costs have been expended *prior* to the effective date of the BMP Design Manual. To achieve that result we respectfully request the removal of the following language, starting with [c]:

> *…OR* the Copermittee confirms that construction activities have commenced on the Priority Development Project site within the 180 days after the effective date of the BMP Design Manual, where construction activities are undertaken in reliance on the permit or approval, or functional equivalent for public projects, issued by the Copermittee in conformance with Provision E.3.e.(1)(a)(i)[b]; AND
> [d] Issued all subsequent private project permits or approvals, or functional equivalent for public projects, that are needed to implement the design initially approved in conformance with Provision E.3.e.(1)(a)(i)[a] within 5 years of the effective date of the BMP Design Manual. The storm water drainage system for the Priority Development Project in its entirety, including all applicable structural pollutant treatment control and

[3] *Hermosa Beach Stop Oil Coalition vs City of Hermosa Beach* (2001), 86 Cal.App.4th 534

hydromodification management BMPs must remain in substantial conformity with the design initially approved in conformance with Provision E.3.e.(1)(a)(i)[a].

This amendment would bring the new language in line with prevailing law on vested rights while preserving the requirements under the current permit for Copermittees to use their full legal authority to implement the Provisions of E.3.

Thank you for the opportunity to comment on the Tentative Order's Prior Lawful Approval amendments. Please feel free to contact me with any questions or for additional feedback.

Sincerely,

Livia Borak
Legal Advisor
Coastal Environmental Rights Foundation

Matt O'Malley
Legal & Policy Director
San Diego Environmental Groups

CITY OF DANA POINT

CITY COUNCIL

Carlos N. Olvera
Mayor

John A. Tomlinson
Mayor Pro Tem

Joseph L. Muller

J. Scott Schoeffel

Richard A. Viczorek

September 14, 2015

Via Electronic Submission to sandiego@waterboards.ca.gov, Attn: Wayne Chiu

Honorable Henry Abarbanel, Chair
Honorable Board Members
Attn: Mr. Wayne Chiu
California Regional Water Quality Control Board
San Diego - Region 9
2375 Northside Drive, Suite 100
San Diego, California 92108

Dear Chairman Abarbanel, Honorable Board Members, and Mr. Chiu:

Subject: Comment Letter — Tentative Order No. R9-2015-0100 Place ID: 786088WChiu

As the Mayor of the City of Dana Point, I write to express the City's serious concerns with certain aspects of the proposed amendments to San Diego Regional Water Quality Control Board ("Board") Tentative Order No. R9-2015-0100 (Tentative Order) amending Order No. R9-2013-0001, as amended by Order No. R9-2015-0001 ("Regional Permit"). I understand from my staff that the current revisions to the Regional Permit, if they are not amended to address the concerns raised in this letter, put the City of Dana Point (and other southern Orange County Cities) at risk of large unfunded liabilities without a meaningful path to obtain "compliance" with the Regional Permit (and by extension the Clean Water Act) for up to 18 months (and potentially longer). Of even greater concern, the open ended liability potentially created by the Regional Permit in its current form is likely to lead to litigation and piecemeal development of projects in response to specific federal court orders rather than a careful and collaborative process to develop and implement achievable watershed-wide water quality improvement plans ("WQIPs") for southern Orange County that will protect water quality within the City. I hope that the Board will seriously consider the City's comments provided in this letter and make revisions to the Regional Permit accordingly. I'd also ask that you carefully consider the comments provided by the legal counsel (attached to this letter as Exhibit A) in making needed changes to the Regional Permit prior to approval.

1. *The City is Already an Environmental Leader With a Strong Ethos for Clean Water*

I would not have sent this letter unless I was convinced the current approach advocated in the Regional Permit is likely to do more harm than good for the City's and Region's water quality improvements. I also realize that the City owes much of its success and economic prosperity to its high quality water resources and beaches. A clean environment is one of the things that draws people to the City of Dana Point. Dana Point citizens want clean water, but they also want regulations that achieve desired environmental outcomes in a reasonable manner, and at a cost that is proportional to benefits

received. The City's ethos of practical and proactive water quality regulation owes much to the City's former Mayor, Wayne Rayfield, a long-time advocate for ocean water quality, who served on the San Diego Regional Board from 2007 until 2012 and currently serves as the President of the Board for South Coast Water District, the City's main water and sewer agency. During Mr. Rayfield's tenure in City leadership, the City became a pioneer in efforts to eliminate stormwater pollution, and the City's extensive program to systematically improve and maintain water quality can be found on the City's website at www.danapoint.org/waterquality.

In addition to implementing source control management strategies and a robust illicit discharge control program, the City championed watershed-based management and elimination/diversion of dry weather discharges long before the City was directed to do so by the Regional Board. The City's approach to water quality is catalogued in the City's Strategic Plan (www.danapoint.org/index.aspx?page=54) and in the City's Guidance Document entitled "Protect Our Earth, Protect Our Ocean, a Paradigm for Water Quality." The Guidance Document is available online at www.danapoint.org/Modules/ShowDocument.aspx?documentid=3195, and it describes on pages 6-7 the City's 18 existing dry weather diversions that effectively capture most of the dry weather flows attributable to non-stormwater discharges of human origin within the City. These sanitary sewer diversion facilities were constructed at a cost of approximately 12 million dollars—primarily funded by City residents. The City also has pioneered innovative and extensive dry weather treatment Best Management Practices, such as the award-winning Salt Creek ozone Treatment Facility, bans on styrofoam and other types of plastics likely to wind up in City waters, a robust street sweeping program, and partnerships with local water districts to curb and eliminate excess irrigation that leads to runoff. Dana Point, as its Guidance Document and extensive list of water quality improvement projects can attest, is a City that is willing to do its share to address stormwater pollution and maximize water quality. Unfortunately, as addressed below, it does not appear that the Regional Permit (as proposed) is likely to lead to measurable water quality improvements within the City, only new costs and potential liabilities.

2. *Areas of Concern and Recommendations for Improvement*

a. The City Needs Interim Compliance While it Develops the Required WQIP for Southern Orange County. Dana Point supports in principle the WQIP concept as a practical vehicle for solving difficult water quality problems on a watershed-wide basis. The County and City staff have already demonstrated success in working collaboratively with other southern Orange County stakeholders, public and private, as evidenced by the South Orange County Watershed Management Area (SOCWMA), and will build on this experience and success to develop a scientifically defensible plan and associated projects that have the potential for enhanced protection of City waters. However, the proposed Regional Permit's departure from the previous best management practice ("BMP") based iterative approach to water quality improvement in favor of a strict liability framework during WQIP development is likely to pose severe compliance challenges for the City—making it far more difficult to adopt a collaborative problem solving posture.

Under the current language proposed by Board staff, the City will be potentially liable for a violation of the Regional Permit, and thus the Clean Water Act, every time it rains. While the City has

already diverted the vast majority of dry weather flows to the sanitary sewer (at great expense), it is not feasible to do so during wet weather due to sanitary sewer facility capacity and cost, and indeed trying to do so would risk drying up existing beneficial uses in San Juan Creek and other drainages within the City (indeed the drought has had a severe effect on riparian habitat in some locations—a condition that removing all runoff from the City MS4s could exacerbate). Because the San Diego Board has some of the most stringent water quality objectives in the state for bacteria, nutrients, and other contaminants that are in many cases caused by natural processes, it is likely that wet weather discharges from the City's MS4, at least some of the time, will contain pollutant concentrations in excess of the very stringent receiving water limitations contained in the San Diego Basin Plan. When that happens, if the Regional Permit is not amended, the City will presumably be strictly liable to third parties under the CWA—notwithstanding that any exceedances may have little or no nexus to controllable pollution within the City's boundaries. This is not a fair outcome, and we believe that it is not what Congress intended when it required regulation of municipal stormwater under the CWA in 1987.

It is my understanding that other Regional Boards around the state are also developing alternative compliance options ("ACOs") that would avoid the potentially harsh results associated with exceedances of receiving water limitations described in the last paragraph. Under the approach sanctioned by the State Water Resources Control Board ("State Board") in June of this year, municipal stormwater permittees that agree to participate in development of a WQIP, or a WQIP like plan for improving water quality, are deemed to be in compliance during the preparation and implementation of the WQIP if the permittee otherwise complies with the terms and timelines of its MS4 Permit (and the WQIP once it is developed/approved). The ACOs proposed in the current version of the Regional Permit, on the other hand, would leave the City strictly liable for any exceedance of basin plan standards (whether the result of City culpability or not), even as the City continues to aggressively implement its water pollution prevention efforts—leaving it vulnerable, potentially on a permanent basis, to third party lawsuits for any random exceedance even as it aggressively implements its robust clean water program.

Fundamentally, the City is most concerned with the current framework because it mandates the development of expensive projects and the City's extensive regulation of the day to day behavior of City residents where such actions may do very little to actually achieve water quality objectives (since impairment in the San Diego Region may be a result of non-point sources of pollution or non-controllable sources), while at the same time providing no assurances that the City will ever obtain compliance during and after WQIP development. At minimum, the current proposed ACOs proposed in the Regional Permit would have the City out of compliance with the Regional Permit, and subject to increasingly frequent CWA litigation, for a period of up to two years while the WQIP is in development, and this assumes that the Regional Board quickly acts to approve a southern Orange County WQIP. To be successful in improving water quality and maximizing the likelihood of obtaining numeric water quality objectives, the WQIP needs to be a data intensive and collaborative effort between the City, environmental advocates, the Regional Board and all of the other south Orange County stormwater permittees (and recycled water producers—who themselves may contribute significant loading to area streams). The WQIP, in order to obtain the reductions in non-point source pollution that are likely to be required, will have to be creative—with opportunities for offsets and other "credits" that provide compliance to municipal dischargers in exchange for undertaking projects that reduce or eliminate non-

point sources of pollution that the dischargers did not cause. The WQIP for southern Orange County, if it is to be effective, will not be a plan that can be developed quickly, or in a vacuum. Thus, the ability of the City to have interim compliance while working with its neighbors to develop a scientifically rigorous and effective WQIP—a plan that will accomplish what it was intended to do—becomes all the more important.

The City understands that most of the other Regional Boards around the state appear intent on providing ACOs for municipal dischargers that include some form of interim compliance while watershed based plans are in development. The San Diego Board should follow suit. Failure to provide interim compliance is fundamentally unfair for Cities like Dana Point that are already aggressively combatting stormwater pollution. The City would rather work collaboratively with the Regional Board (and the City's neighbors), as a full partner in the development of a robust WQIP that will result in significant and meaningful reductions in water pollution throughout southern Orange County. However, the current Regional Permit language that imposes strict liability for exceedances of water quality objectives—exceedances that appear inevitable no matter what action the City takes or doesn't take—will, because of the likelihood of liability to third parties , push the City away from collaborative efforts and towards a more defensive posture associated with litigation defense. This outcome is not good for the Regional Board, the City, or for southern Orange County watersheds. I accordingly ask you to strongly consider adding to the Regional Permit a mechanism for interim compliance for southern Orange County agencies who aggressively pursue WQIP development and implementation. It is the right thing to do, and the Regional Board can only gain by providing such a provision.

b. *It is Unfair to Impose Strict Liability for Non-Stormwater Discharges to the MS4 Where Nuisance Flows Are Diverted, and the Permittee Is Aggressively Implementing Its Illicit Discharge Program:* As the SWRCB acknowledged in its recent LA MS4 precedential order, preventing all non-stormwater runoff into an MS4 system can be a nearly impossible standard to meet at times since third parties—such as residents watering their lawns in a reasonable manner— may cause at least some incidental runoff to enter the City's MS4. Other Regional Boards have determined that permittees are in compliance with the CWA's direction to "effectively prohibit" all dry weather discharges when the City is implementing its illicit discharge prevention program and diverting, where feasible, residual "nuisance" flows to the sanitary sewer prior to entering a stream or the ocean. However, the Regional Permit in proposed paragraph E.2 of the Regional Permit, would arguably impose liability on the City even where: (1) all or most dry weather flows are diverted before the water reaches a Water of the State; (2) the discharge to the MS4 resulted from actions that the City may have very limited ability to control (such as sewer spills that are the responsibility of separate sewer agencies and runoff from irrigation of the steep slopes that predominate in Dana Point); (3) the City was fully implementing its illicit discharge prevention program. I respectfully ask that the Board direct its staff to work with the City to develop clarifying language, such as that recommended by our legal counsel in Exhibit A, that explains liability for non-stormwater discharges entering the MS4 is only appropriate when discharges are the result of culpability on the part of the City.

The City has other concerns that are reflected in Exhibit A, all of which the City incorporates herein by reference and formally requests that the Board consider. The City also reincorporates and reiterates here all of the comments it previously made on prior iterations of the Regional Permit and the

comments provided by the County of Orange submitted under separate cover. However, resolution of the issues discussed in this letter would go a long way towards resolving the City's concerns with the Regional Permit on a permanent basis.

I thank you for your consideration, and I look forward to a productive dialogue between our respective staffs that produces a win-win outcome for the City, the Regional Board and water quality in the San Diego Region.

Sincerely,

Carlos N. Olvera
Mayor

Attachment: Exhibit A

CC: David Gibson, Executive Officer, SDRWQCB
Patrick Munoz, Jeremy Jungreis, Rutan & Tucker LLP
Doug Chotkevys, Brad Fowler, Lisa Zawaski, Dana Point
Orange County Copermittees

Exhibit A

RUTAN
RUTAN & TUCKER, LLP

020298

Jeremy N. Jungreis
Direct Dial: (714) 338-1882

September 14, 2015

VIA ELECTRONIC MAIL

Mr. Wayne Chiu
Regional Water Quality Control Board, San Diego Region
2375 Northside Drive, Suite 100
San Diego, CA 92108
sandiego@waterboards.ca.gov

Re: Comments of the Cities of Dana Point and Laguna Beach on Proposed Tentative Order No. R9-2015-0100, Place ID: 786088

Dear Mr. Chiu:

This letter, which supplements and augments the letters submitted concurrently by the Mayors of the Cities of Dana Point and Laguna Beach, constitutes the further legal and technical comments of the Cities of Laguna Beach and Dana Point (the "Cities") to proposed amendments to San Diego Regional Water Quality Control Board ("Board") Order No. R9-2013-0001 (as amended by Order No. R9-2015-0001), proposed as Tentative Order No. R9-2015-0100 (the "Regional Permit"). The Cities also incorporate by reference, and assert as if separately stated herein, the comments submitted by the County of Orange ("County") on September 14, 2015, and the previous comments on the Regional Permit submitted by, or on behalf of, the City of Dana Point.[1]

The Cities appreciate the efforts of Regional Board staff to collaboratively engage the Permittees and other stakeholders in workshops where a variety of views on the question of receiving water limitations ("RWLs"), and how they should be achieved, were expressed. This manner of comment and stakeholder participation worked well in allowing all viewpoints to be expressed with sufficient time for vigorous discussion of issues with the Regional MS4 Permit. The Cities are hopeful that the issues addressed in this letter can be resolved via further

[1] The Cities by this reference incorporate, to the maximum extent allowed by law, all prior letters, comments, reports, presentations, oral and written testimony, data, communications, and other evidence made by, on behalf of, and in support of the County of Orange during the various workshops, hearings, and meetings relevant to the adoption of Order No. R9-2013-0001, as amended by Order No. R9-2015-0001 and Tentative Order No. R9-2015-0100. The Cities reserve the right to provide further comment as applicable.

productive dialogue prior to the approval hearing for the Regional Permit scheduled for November 18.

1. LEGAL CONCERNS WITH RECEIVING WATER LIMITATIONS AND ALTERNATIVE COMPLIANCE OPTIONS.

a. IT IS LIKELY IMPOSSIBLE, AND CERTAINLY NOT "PRACTICABLE," TO COMPLY WITH ALL OF THE DISCHARGE PROHIBITIONS IN THE REGIONAL PERMIT UNDER ALL CIRCUMSTANCES

Part II.A.2 (a) of the Regional Permit strictly prohibits discharges of municipal stormwater to Waters of the U.S. that do not meet all water quality objectives—notwithstanding that such discharges may in fact control pollutants to the "maximum extent practicable," and notwithstanding that exceedances of numeric objectives in the San Diego Basin Plan may be the result of factors that the Cities have no ability to control. In other words, as currently drafted, the Regional Permit will impose strict liability on the Cities for regulatory requirements that will, in some cases, be impossible to meet,[2] no matter how robust or aggressive the WQIP ultimately developed. Imposing strict liability on the Cities and thereby subjecting them to CWA Citizen Suits and Regional Board enforcement every time it rains,[3] when there is no realistic possibility of ever achieving the currently applicable numeric RWLs, is inconsistent with both state and federal law. Neither requires municipal stormwater permittees, who unlike private businesses do not have the option to "go out of business" (or otherwise shut down non-compliant stormwater facilities), to achieve the impossible, or to control what MS4 permittees have no ability or authority to control. (*See* CA Civ. Code, § 3531 ["The law never requires impossibilities"]; CA

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[2] As Regional Board staff is aware, some of the existing water quality objectives in the San Diego Basin Plan which give rise to the receiving water limitations referenced in Section II.A.2, may be at or below natural background levels, or be set at levels so low that they cannot be achieved without diverting all of the water in the MS4 to a reverse osmosis ("RO") treatment plant—thereby in most cases removing the water from the watershed altogether and changing its composition in ways that could be harmful to the watershed if reintroduced post-treatment (*See, e.g.*,http://news.stanford.edu/news/2015/september/arsenic-mystery-solved-090215.html [Stanford study showing association between rising arsenic levels and water treated with RO]. Even with RO treatment, it still would not be possible to reliably meet the current default San Diego Basin Plan standard for total nitrogen in surface waters of 1 part per million. (*See, e.g.*, *U.S. v. Eastern Municipal Water District* Case. No. CV 04-8182 (C.D. Ca 2010) (noting infeasibility of meeting 1 ppm total nitrogen standard required for NPDES issuance).

[3] (*See, e.g.*, *NRDC v. County of Los Angeles* (C.D. Cal. Mar. 30, 2015) 2015 U.S. Dist. LEXIS 40761 ["Defendants are liable for the 147 exceedances described in Defendants' monitoring reports, which the Ninth Circuit found were conclusively demonstrated to be Permit violations by Defendants' own pollution monitoring."].)

Civ. Code, § 3526 ["No man is responsible for that which no man can control"]; *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159, 1162; *Hughey v. JMS Dev. Corp.*, (11th Cir. 1996) 78 F.3d 1523, 1527-29; *Atlantic States Legal Foundation, Inc. v. Eastman Kodak Co.*, (2d Cir. 1993) 12 F.3d 353.)

The *Hughey* case referenced above is material to the scenario faced by the Cities with regard to the Regional Permit. In *Hughey*, the Plaintiff sued Defendant JMS for an alleged failure to obtain a storm water permit for the discharge of storm water from its construction project. The Plaintiff argued JMS had no authority to discharge any quantity or type of storm water from the project, i.e. a "zero discharge standard." until JMS had first obtained an NPDES permit. (*Id.* at 1527.) JMS did not dispute that storm water was discharged from its property and that it had not obtained an NPDES permit (allegedly in contravention of 33 U.S.C. § 1311), but claimed it was not in violation of the Clean Water Act because the Georgia Environmental Protection Division, the NPDES permitting authority, was not yet able to issue such permits. As a result, it was impossible for JMS to comply. (*Id.)* The Eleventh Circuit Court of Appeal held that the CWA does not require a permittee to achieve the impossible, finding that "Congress is presumed not to have intended an absurd (impossible) result." (*Id.* at 1529.) Specifically, the 11th Circuit found that: "***Congress could not have intended a strict application of the zero discharge standard in section 1311 (a) when compliance is factually impossible***. The evidence was uncontroverted that whenever it rained in Gwinnett County some discharge was going to occur; nothing JMS could do would prevent all rain water discharge. . . Lex non cogit ad impossibilia: The law does not compel the doing of impossibilities.") (*Id.*)

b. **IT IS PARAMOUNT THAT THE REGIONAL PERMIT PROVIDE INTERIM COMPLIANCE**

The ultimate outcome of imposing an unachievable discharge prohibition during the preparation and implementation of WQIPs will not be to improve water quality, but instead to increase litigation and costs incurred by public agencies in fighting enforcement actions and citizen suits, an opportunity not lost on entrepreneurial plaintiffs' attorneys. As the Regional Board is aware, the State Water Resources Control Board ("SWRCB") issued WQ 2015-0075 (hereinafter LA MS4 Order) in June of 2015. The LA MS4 Order is a precedential order that provides an alternative compliance option ("ACO") to permittees that would at least permit the Cities to remain in compliance with the CWA notwithstanding the current inability to demonstrate current attainment of all water quality standards in receiving waters at all times. Under the approach approved by the SWRCB, a city that agrees to participate in the development of the LA Regional Board's equivalent of a WQIP is deemed to be in compliance during the preparation of the WQIP if the city otherwise complies with the terms and timelines of its MS4 Permit. The "in compliance" status remains for as long as the city continues to diligently perform its obligations under the ACO in furtherance of projects and management actions that

result in the ultimate achievement of water quality objectives (which the LA Regional Board admitted would likely take decades in some cases). The ACO proposed in the current version of the Regional Permit, on the other hand, would hold the Cities strictly liable immediately for any exceedance (whether the result of the Cities' culpability or not), even as the Cities continue to spend substantial sums to develop projects that reduce pollution.

Perhaps more significantly, the approach proposed in the Regional Permit is, from what the Cities have learned, different from the approach currently being considered by other Regional Board in the state, in that the WQIP provides no interim compliance of any kind while the WQIP is in development (a period of 18 months in Orange County assuming no extensions are granted), and indeed the proposed ACO provides no compliance to any MS4 until such time as all of the watersheds within southern Orange County can demonstrate to a level of certainty that implementation of the WQIP will actually result in the complete achievement of all numeric water quality objectives—a task in and of itself that, as previously referenced, may not be physically possible in some locations for certain naturally occurring constituents such as bacteria, nutrients and metals. To be successful in improving water quality to the maximum extent within the Cities, the WQIP needs to be deliberate, scientifically rigorous, and a collaborative effort between the Cities, concerned citizens, the Regional Board and all of the other south Orange County stormwater permittees.

The current version of the Regional Permit would make such an effort difficult to achieve. All of the Orange County Co-Permittees, being currently out of compliance (and unlike the San Diego County permittees having no draft plan already completed), and facing CWA citizen suits at any time during plan development, will be forced to rush to develop a plan that may have little chance of being funded (Prop 218 and Prop 26 limitations) or implemented, while at the same time Co-Permittee funds that would otherwise go to collaboratively developing scientifically validated projects with immediate water quality benefits will need to be held back to facilitate ability to defend against filed by environmental groups seeking to impose strict liability.. Meanwhile, the Regional Board will presumably have less and less influence over the process of improving water quality as collaborative efforts break down and decisions about water quality projects, improvement plans, and pertinent timelines, shift to Federal Judges and environmental plaintiffs rather than the Regional Board. All sides would benefit from a carefully tailored interim compliance option that ensures rapid preparation of the WQIP while also ensuring the WQIP effort is not rendered superfluous by Federal Court decisions and consent decrees that may impose disparate and conflicting obligations on different permittees throughout the San Diego Region.

c. THE REGIONAL PERMIT SHOULD PROVIDE FOR THE DEVELOPMENT OF SITE SPECIFIC OBJECTIVES

The impossibility/impracticability of ever attaining RWLs in San Diego Region watersheds could be mitigated by specific reference in the Regional Permit to the potential development of site specific objectives that would potentially be attainable while also ensuring full protection of existing beneficial uses in southern Orange County. However, the San Diego Regional Board Staff has historically resisted stakeholder efforts to develop attainable site specific objectives for bacteria, nutrients and toxics, and has not offered the possibility of site specific objective development as a potential mechanism for the Cities to obtain long term compliance in conjunction with WQIP development. Taken to its logical conclusion, the Regional Board's current position on strict liability of MS4s for non-attainment of existing numeric objectives could result in development moratoria, and inability of local water agencies to undertake any kind of significant recycled water project requiring storage or conveyance of recycled water (or otherwise resulting in increased nutrient or salinity loading to southern Orange County streams).

San Juan Creek, which has been discussed as a potential site for a large scale indirect potable reuse ("IPR") project to recharge the depleted San Juan Groundwater Basin (classified as a surface water by the SWRCB), is already listed as being impaired for total nitrogen and phosphorous according to the 2012 SWRCB 303 (d) list. Since RO cannot reliably take recycled water below 1 ppm total nitrogen, and the 303 (d) listing indicates that there is no current assimilative capacity in San Juan Creek, it is unclear how such a project could ever be permitted by the Regional Board—notwithstanding the San Diego Region's dire need for additional local water supplies, and the Regional Board's desire to curtail existing ocean outfall discharges whenever practicable. Accordingly, the Cities, both of whom could benefit from the development of additional recycled water supplies in the Region, recommend that the Regional Permit and Staff Report specifically acknowledge the potential wisdom of developing site specific objectives in concert with the mandated WQIP development—even where site specific development may extend the period required to complete the WQIP process.

2. DISCHARGES OF NON-STORMWATER SHOULD NOT GIVE RISE TO LIABILITY UNDER THE PERMIT WHERE THE PERMITTEE IS FULLY IMPLEMENTING ITS ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM.

The Cities understand the desire of the Regional Board to prohibit discharges of non-stormwater "dry weather" or "nuisance" flows to the MS4. Such flows may, at times, contain significant amounts of pollutants that impair beneficial uses, so diversion of such flows where feasible makes sense. And that is precisely what both Cities have done in their respective service areas with the installation of dry weather flow diversion units that divert nuisance flows

whenever feasible.[4] However, language in Section E.2 can be read to hold the owner of the MS4 strictly liable under the Regional Permit where non-permitted discharges enter the MS4 and the owner of the MS4 did not otherwise prevent them from occurring. Indeed, it is often difficult for an MS4 operator to even identify the source of the broad universe of what the Regional Permit defines as illicit discharges on a given day (e.g., numerous houses in a neighborhood may be the cumulative cause of small amounts of runoff entering an MS4 with the "source" of the "non-stormwater discharge" varying each day according to residential irrigation patterns).[5] As the SWRCB acknowledged in footnote 133 of its recent decision in the LA MS4 Decision, Order No. WQ 2015-0075 , "[w]e recognize that even the most comprehensive efforts to address unauthorized non-storm water discharges may not eliminate all such discharges."

Because of the apparent intention of some environmental groups, as evidenced by recent Federal Court filings initiating Clean Water Act citizen suits (and seeking strict liability for alleged violations of MS4 permits), to impose liability on cities who are otherwise fully implementing their illicit detection programs (and diverting non-stormwater flows, whenever feasible, to the sanitary sewer),[6] the Cities urge the Regional Board to clarify that it does not intend to impose liability on MS4 permittees who are not otherwise complicit or culpable in dry weather flows entering the MS4 (and subsequently a Water of the U.S.). Accordingly, the Cities respectfully request that the Regional Board amend Section II.E.2 of the Regional Permit to read as follows:

"Each Copermittee must implement a program to actively detect and eliminate illicit discharges and improper disposal into the MS4, or otherwise require the discharger to apply for and obtain a separate NPDES permit. Compliance with the terms of this Provision E.2 shall constitute compliance with the requirement under Provision A.1.b to "effectively prohibit" non-

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[4] Dry weather diversions may be infeasible within the Cities where inadequate sewer line or wastewater treatment plant capacity exists, where the flows are a mix of non-stormwater runoff and rising groundwater, or where the geography or hydrology of the location makes installation of the units impracticable to install or maintain.

[5] It will also be very difficult for the Cities to determine on any given day what volume of dry weather (and wet weather) discharges are derived from separately permitted activities, or activities that fall outside of the CWA altogether such as agricultural return flows. To the extent that such identification is even physically possible, it may nevertheless be impossible for the Cities to determine which sources of dry weather flows are benign and which ones contain pollutants above RWLs.

[6] On at least two occasions within the past six months, the environmental group River Watch has sued MS4 operators for allegedly violating the prohibitions on municipal stormwater discharges that exceed RWLs, and for allegedly permitting non-stormwater discharges to enter the MS4 from non-permitted sources. The concerns expressed herein regarding third party liability associated with the Regional Permit are far from theoretical.

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storm discharges into the MS4, provided the Copermittee is in full compliance with all requirements in this Provision E.2 or is otherwise working diligently to address any identified deficiency. The illicit discharge detection and elimination program must be implemented in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include, at a minimum, the following requirements . . ."

It would also be beneficial for the Regional Board to clarify the definition of "discharges from potable water sources" in Section II.E.2.a (3)(f). Potable water used for residential irrigation that runs off in small quantities (and not otherwise invoking an issue of wasteful water use) would potentially be appropriate for exclusion from treatment as an illicit discharge (allowing permittees to focus on illicit discharges with significant water quality ramifications). However, as currently drafted, it is not clear whether "potable discharges" are intended to include runoff derived from turf or ornamental plant irrigation.

Thank you for the opportunity to comment. Both Cities look forward to working with Regional Board staff to develop language that will address the concerns expressed herein.

Very truly yours,

RUTAN & TUCKER, LLP

Jeremy N. Jungreis

JNJ:nd

ESCONDIDO
City of Choice

Emailed to: sandiego@waterboards.ca.gov
San Diego Regional Water Quality Control Board (RWQCB)
2375 Northside Drive, Suite 100
San Diego, CA 92108
Attention: Mr. Wayne Chiu
September 14, 2015

RE: Comment - Tentative Order No. R9-2015-0100, Place ID:786088WChiu.

Thank you for the opportunity to comment on the above-referenced permit. The City of Escondido is working with other San Diego County Copermittees in developing regional comments. This letter has been prepared to address an additional item of concern to staff.

In Attachment C, page C-3 a definition of construction activities has been added. Although staff understands that it may be useful to clarify what is considered construction activities, there is concern at the description of some of the types of activities as "phases." Phases of construction are significant as they are required to be considered when defining inspection frequencies for construction. The permit requires Copermittees to conduct inspections "at an appropriate frequency for each phase of construction."

This definition as written introduces additional phases (Preliminary Phase, Land Development Phase and Streets and Utility Phase) that are not necessarily discrete. Utilities and streets can be installed during any part of the construction project. The "Preliminary Phase" as described would be covered under the grading phase. It is not clear what the "Land Development Phase" covers. At present the City of Escondido tracks construction in two phases, grading and vertical which covers all construction activities.

The use of the word "Phase" to describe these aspects of construction activities introduces unnecessary complication to the inventorying and inspection of construction sites as it introduces artificial phases that will not be readily tracked. City of Escondido staff have just completed a two year process of updating their inspection programs to include systems to track construction sites through the grading and vertical phases and trained staff to follow these requirements. Adding the phase to these terms will require a reworking of the program to introduce artificial "phases" that are not discrete from what is already being addressed.

Recommendation: Eliminate the use of the term phase when describing construction activities as presented below.

> **Construction Activities** – Actions implemented during construction of development or redevelopment projects during the Preliminary Tasks~~Phase~~ (including rough grading and/or disking, clearing and grubbing operations, or any soil disturbance prior to mass grading), Grading or Land Development ~~Phase~~ (including topography and slope reconfiguration, alluvium removals, canyon cleanouts, rock undercuts,

keyway excavations, land form grading, and stockpiling of select material for capping operations), Streets and Utility Installation~~Phase~~ (including excavation and street paving, lot grading, curbs, gutters and sidewalks, public utilities, public water facilities including fire hydrants, public sanitary sewer systems, storm sewer systems and/or other drainage improvements), or Vertical Construction ~~Phase~~ (including the build out of structures from foundations to roofing, including rough landscaping).

I appreciate the opportunity to comment on the draft Tentative Order. I can be contacted at hdavies@escondido.org or at (760) 839-6315.

Helen M. Davies

Helen M. Davies, M.S, CPSWQ
Environmental Programs Manager

Electronic Submission to sandiego@waterboards.ca.gov
Honorable Chairman Henry Abarbanel and Board Members
Attn: Mr. Wayne Chiu
San Diego Regional Water Quality Control Board
2375 Northside Drive, Suite 100
San Diego, California 92108

Dear Chairman Abarbanel, Honorable Board Members, and Mr. Chiu:

Subject: Comment Letter — Tentative Order No. R9-2015-0100 Place ID: 786088WChiu

I am writing at the direction of a unanimous City Council of the City of Laguna Beach (the "City") to urge you to make certain changes to the language being proposed by staff to the Regional Board as amendments to the City's Regional Permit. This is a matter of great importance to the City. Specifically, we are concerned that the proposed amendments create undue liability for the City during the interim period prior to the adoption of a water quality improvement plan, and creates strict liability for the City for third party actions that it cannot control.

First, let me assure you that the City Council is fully committed to aggressively pursuing improvements in water quality. As demonstrated by our past actions, Laguna Beach is a community where water quality is taken very seriously, and we generally support the actions of the Board to make our beaches and watersheds cleaner. We are a leader in efforts to protect and improve water quality through a vigorous source control program and active investigation and enforcement of illicit discharges. As one of many examples of the City's strong commitment to improving water quality, the City has broadly invested in urban stormwater diversion units. These costly diversion units collect dry weather runoff and divert it to the sanitary sewer system. To date, 25 urban water diversion units have been installed and divert approximately 83% of the City's urban drainage area (all of the areas where diversion is feasible). This aggressive approach to stormwater pollution prevention has earned the City a summer and winter dry weather "grade" from Heal the Bay of an "A" or higher at all beaches within the City.

We understand Board staff is proposing to amend the Regional Permit with revisions that would impose strict liability on cities for any non-attainment of water quality standards, no matter what the cause, and irrespective of the feasibility of achieving numeric standards (at all times) in a water body. While we applaud the efforts of the Board to improve water quality in

the region, there are several aspects of what is being proposed that are likely to have adverse consequences. Accordingly, the City Council respectfully asks you and your staff to carefully consider the comments and recommendations in this letter, as well as those provided by our legal counsel (Exhibit A), and to work with the City to develop a fair resolution of our concerns.

The Proposed Amendments Unequivocally Should Require Interim Compliance While the City Develops a Water Quality Improvement Plan ("WQIP"). The draft language requires the City to develop a WQIP as a practical vehicle for improving water quality on a watershed basis but appears to impose strict liability on the City for discharges while the WQIP is being developed. A watershed approach to water quality improvement makes sense, and the City is generally supportive of the WQIP concept. However, the proposed Regional Permit's departure from the previous best management practice ("BMP") based approach in favor of a strict liability regime that mandates immediate attainment of numeric water quality objectives (some of which may be lower than natural background levels) poses a severe compliance challenge for the City. Under the proposed amendment, the City will be potentially liable for a violation of the Regional Permit, and thus the Clean Water Act, every time it rains. While the City has already diverted the vast majority of dry weather flows to the sanitary sewer, it is not feasible (nor good for the environment) to divert all wet weather flows. Because of the extremely stringent standards for bacteria, nutrients, and metals—constituents that the City may have little to no ability to control—wet weather flows from the City's MS4 are likely, no matter what actions the City takes, to contain pollutants in excess of receiving water limitations. When exceedances occur, the City will face fines/penalties from the Board (and the likelihood of Clean Water Act citizen suits) whether the City caused exceedances of receiving water limitations or not. This is not a fair result, and arbitrarily imposing liability without culpability will not lead to cleaner water.

To be successful in improving water quality to the maximum extent within the City, the WQIP needs to be a deliberate, scientifically rigorous, and collaborative effort between all interested stakeholders ***that recognizes the need for interim and long term compliance by the City*** while the WQIP is developed and implemented. A hastily compiled plan, speedily prepared because of fear of immediate strict liability, will not be the sort of plan that will accomplish the Board's objectives or the needs of City residents. It will only lead to litigation and uncertainty for all involved. We urge you to add some form of interim compliance for southern Orange County agencies who aggressively pursue WQIP development and implementation.

The Regional Permit Should not Impose Strict Liability Where the City Fully Implements a Robust Illicit Discharge Prevention Program and Diverts All Feasible Dry Weather Flows. The Regional Permit amendments would create what amounts to a ban on runoff into the MS4 when it is not raining (except for separately authorized discharges). Unfortunately, as the State Water Board recently acknowledged in its LA MS4 decision, preventing all runoff into an MS4 system can be nearly impossible since third parties—such as residents watering their lawns in a

reasonable manner—may nevertheless cause at least some incidental runoff to enter the MS4. The City has limited ability to stop third party sewage spills or other third party actions (e.g., washing of vehicles) that may result in small amounts of runoff entering the MS4 when it is not raining (even where the City is fully implementing and enforcing its illicit discharge program). The City will follow the Clean Water Act and "effectively prohibit" all dry weather discharges to receiving waters with its illicit discharge prevention program and diversion of dry weather flows. What the City cannot do is guarantee that runoff or illicit discharges never reach the City's MS4 (as the amended permit can be read to require). Please strongly consider revising the Regional Permit to eliminate any inference of strict liability where the City fully implements its illicit discharge program by adding the clarifying language recommended by our legal counsel.

Thank you for considering our requests. Our staff is available to assist in crafting language to address City concerns while facilitating the Board's continued improvement of water quality. If you have any questions please feel free to contact our Director of Water Quality, David Shissler at (949) 497-0328.

Sincerely,

Bob Whalen, Mayor

CC: David Gibson, Executive Officer, SDRWQCB
Jeremy Jungreis, Rutan & Tucker, LLP

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RUTAN & TUCKER, LLP

020310

Jeremy N. Jungreis
Direct Dial: (714) 338-1882

September 14, 2015

EXHIBIT A

VIA ELECTRONIC MAIL

Mr. Wayne Chiu
Regional Water Quality Control Board, San Diego Region
2375 Northside Drive, Suite 100
San Diego, CA 92108
sandiego@waterboards.ca.gov

Re: Comments of the Cities of Dana Point and Laguna Beach on Proposed Tentative Order No. R9-2015-0100, Place ID: 786088

Dear Mr. Chiu:

This letter, which supplements and augments the letters submitted concurrently by the Mayors of the Cities of Dana Point and Laguna Beach, constitutes the further legal and technical comments of the Cities of Laguna Beach and Dana Point (the "Cities") to proposed amendments to San Diego Regional Water Quality Control Board ("Board") Order No. R9-2013-0001 (as amended by Order No. R9-2015-0001), proposed as Tentative Order No. R9-2015-0100 (the "Regional Permit"). The Cities also incorporate by reference, and assert as if separately stated herein, the comments submitted by the County of Orange ("County") on September 14, 2015, and the previous comments on the Regional Permit submitted by, or on behalf of, the City of Dana Point.[1]

The Cities appreciate the efforts of Regional Board staff to collaboratively engage the Permittees and other stakeholders in workshops where a variety of views on the question of receiving water limitations ("RWLs"), and how they should be achieved, were expressed. This manner of comment and stakeholder participation worked well in allowing all viewpoints to be expressed with sufficient time for vigorous discussion of issues with the Regional MS4 Permit. The Cities are hopeful that the issues addressed in this letter can be resolved via further

[1] The Cities by this reference incorporate, to the maximum extent allowed by law, all prior letters, comments, reports, presentations, oral and written testimony, data, communications, and other evidence made by, on behalf of, and in support of the County of Orange during the various workshops, hearings, and meetings relevant to the adoption of Order No. R9-2013-0001, as amended by Order No. R9-2015-0001 and Tentative Order No. R9-2015-0100. The Cities reserve the right to provide further comment as applicable.

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productive dialogue prior to the approval hearing for the Regional Permit scheduled for November 18.

1. LEGAL CONCERNS WITH RECEIVING WATER LIMITATIONS AND ALTERNATIVE COMPLIANCE OPTIONS.

a. IT IS LIKELY IMPOSSIBLE, AND CERTAINLY NOT "PRACTICABLE," TO COMPLY WITH ALL OF THE DISCHARGE PROHIBITIONS IN THE REGIONAL PERMIT UNDER ALL CIRCUMSTANCES

Part II.A.2 (a) of the Regional Permit strictly prohibits discharges of municipal stormwater to Waters of the U.S. that do not meet all water quality objectives—notwithstanding that such discharges may in fact control pollutants to the "maximum extent practicable," and notwithstanding that exceedances of numeric objectives in the San Diego Basin Plan may be the result of factors that the Cities have no ability to control. In other words, as currently drafted, the Regional Permit will impose strict liability on the Cities for regulatory requirements that will, in some cases, be impossible to meet,[2] no matter how robust or aggressive the WQIP ultimately developed. Imposing strict liability on the Cities and thereby subjecting them to CWA Citizen Suits and Regional Board enforcement every time it rains,[3] when there is no realistic possibility of ever achieving the currently applicable numeric RWLs, is inconsistent with both state and federal law. Neither requires municipal stormwater permittees, who unlike private businesses do not have the option to "go out of business" (or otherwise shut down non-compliant stormwater facilities), to achieve the impossible, or to control what MS4 permittees have no ability or authority to control. (*See* CA Civ. Code, § 3531 ["The law never requires impossibilities"]; CA

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[2] As Regional Board staff is aware, some of the existing water quality objectives in the San Diego Basin Plan which give rise to the receiving water limitations referenced in Section II.A.2, may be at or below natural background levels, or be set at levels so low that they cannot be achieved without diverting all of the water in the MS4 to a reverse osmosis ("RO") treatment plant—thereby in most cases removing the water from the watershed altogether and changing its composition in ways that could be harmful to the watershed if reintroduced post-treatment (*See, e.g.*,http://news.stanford.edu/news/2015/september/arsenic-mystery-solved-090215.html [Stanford study showing association between rising arsenic levels and water treated with RO]. Even with RO treatment, it still would not be possible to reliably meet the current default San Diego Basin Plan standard for total nitrogen in surface waters of 1 part per million. (*See, e.g., U.S. v. Eastern Municipal Water District* Case. No. CV 04-8182 (C.D. Ca 2010) (noting infeasibility of meeting 1 ppm total nitrogen standard required for NPDES issuance).

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result in the ultimate achievement of water quality objectives (which the LA Regional Board admitted would likely take decades in some cases). The ACO proposed in the current version of the Regional Permit, on the other hand, would hold the Cities strictly liable immediately for any exceedance (whether the result of the Cities' culpability or not), even as the Cities continue to spend substantial sums to develop projects that reduce pollution.

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The current version of the Regional Permit would make such an effort difficult to achieve. All of the Orange County Co-Permittees, being currently out of compliance (and unlike the San Diego County permittees having no draft plan already completed), and facing CWA citizen suits at any time during plan development, will be forced to rush to develop a plan that may have little chance of being funded (Prop 218 and Prop 26 limitations) or implemented, while at the same time Co-Permittee funds that would otherwise go to collaboratively developing scientifically validated projects with immediate water quality benefits will need to be held back to facilitate ability to defend against filed by environmental groups seeking to impose strict liability. Meanwhile, the Regional Board will presumably have less and less influence over the process of improving water quality as collaborative efforts break down and decisions about water quality projects, improvement plans, and pertinent timelines, shift to Federal Judges and environmental plaintiffs rather than the Regional Board. All sides would benefit from a carefully tailored interim compliance option that ensures rapid preparation of the WQIP while also ensuring the WQIP effort is not rendered superfluous by Federal Court decisions and consent decrees that may impose disparate and conflicting obligations on different permittees throughout the San Diego Region.

c. <u>THE REGIONAL PERMIT SHOULD PROVIDE FOR THE DEVELOPMENT OF SITE SPECIFIC OBJECTIVES</u>

The impossibility/impracticability of ever attaining RWLs in San Diego Region watersheds could be mitigated by specific reference in the Regional Permit to the potential development of site specific objectives that would potentially be attainable while also ensuring full protection of existing beneficial uses in southern Orange County. However, the San Diego Regional Board Staff has historically resisted stakeholder efforts to develop attainable site specific objectives for bacteria, nutrients and toxics, and has not offered the possibility of site specific objective development as a potential mechanism for the Cities to obtain long term compliance in conjunction with WQIP development. Taken to its logical conclusion, the Regional Board's current position on strict liability of MS4s for non-attainment of existing numeric objectives could result in development moratoria, and inability of local water agencies to undertake any kind of significant recycled water project requiring storage or conveyance of recycled water (or otherwise resulting in increased nutrient or salinity loading to southern Orange County streams).

San Juan Creek, which has been discussed as a potential site for a large scale indirect potable reuse ("IPR") project to recharge the depleted San Juan Groundwater Basin (classified as a surface water by the SWRCB), is already listed as being impaired for total nitrogen and phosphorous according to the 2012 SWRCB 303 (d) list. Since RO cannot reliably take recycled water below 1 ppm total nitrogen, and the 303 (d) listing indicates that there is no current assimilative capacity in San Juan Creek, it is unclear how such a project could ever be permitted by the Regional Board—notwithstanding the San Diego Region's dire need for additional local water supplies, and the Regional Board's desire to curtail existing ocean outfall discharges whenever practicable. Accordingly, the Cities, both of whom could benefit from the development of additional recycled water supplies in the Region, recommend that the Regional Permit and Staff Report specifically acknowledge the potential wisdom of developing site specific objectives in concert with the mandated WQIP development—even where site specific development may extend the period required to complete the WQIP process.

2. <u>DISCHARGES OF NON-STORMWATER SHOULD NOT GIVE RISE TO LIABILITY UNDER THE PERMIT WHERE THE PERMITTEE IS FULLY IMPLEMENTING ITS ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM</u>.

The Cities understand the desire of the Regional Board to prohibit discharges of non-stormwater "dry weather" or "nuisance" flows to the MS4. Such flows may, at times, contain significant amounts of pollutants that impair beneficial uses, so diversion of such flows where feasible makes sense. And that is precisely what both Cities have done in their respective service areas with the installation of dry weather flow diversion units that divert nuisance flows whenever feasible.[4] However, language in Section E.2 can be read to hold the owner of the MS4

[4] Dry weather diversions may be infeasible within the Cities where inadequate sewer line or wastewater treatment plant capacity exists, where the flows are a mix of non-stormwater runoff

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strictly liable under the Regional Permit where non-permitted discharges enter the MS4 and the owner of the MS4 did not otherwise prevent them from occurring. Indeed, it is often difficult for an MS4 operator to even identify the source of the broad universe of what the Regional Permit defines as illicit discharges on a given day (e.g., numerous houses in a neighborhood may be the cumulative cause of small amounts of runoff entering an MS4 with the "source" of the "non-stormwater discharge" varying each day according to residential irrigation patterns).[5] As the SWRCB acknowledged in footnote 133 of its recent decision in the LA MS4 Decision, Order No. WQ 2015-0075 , "[w]e recognize that even the most comprehensive efforts to address unauthorized non-storm water discharges may not eliminate all such discharges."

Because of the apparent intention of some environmental groups, as evidenced by recent Federal Court filings initiating Clean Water Act citizen suits (and seeking strict liability for alleged violations of MS4 permits), to impose liability on cities who are otherwise fully implementing their illicit detection programs (and diverting non-stormwater flows, whenever feasible, to the sanitary sewer),[6] the Cities urge the Regional Board to clarify that it does not intend to impose liability on MS4 permittees who are not otherwise complicit or culpable in dry weather flows entering the MS4 (and subsequently a Water of the U.S.). Accordingly, the Cities respectfully request that the Regional Board amend Section II.E.2 of the Regional Permit to read as follows:

"Each Copermittee must implement a program to actively detect and eliminate illicit discharges and improper disposal into the MS4, or otherwise require the discharger to apply for and obtain a separate NPDES permit. Compliance with the terms of this Provision E.2 shall constitute compliance with the requirement under Provision A.1.b to "effectively prohibit" non-storm discharges into the MS4, provided the Copermittee is in full compliance with all requirements in this Provision E.2 or is otherwise working diligently to address any identified deficiency. The illicit discharge detection and elimination program must be implemented in

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and rising groundwater, or where the geography or hydrology of the location makes installation of the units impracticable to install or maintain.

[5] It will also be very difficult for the Cities to determine on any given day what volume of dry weather (and wet weather) discharges are derived from separately permitted activities, or activities that fall outside of the CWA altogether such as agricultural return flows. To the extent that such identification is even physically possible, it may nevertheless be impossible for the Cities to determine which sources of dry weather flows are benign and which ones contain pollutants above RWLs.

[6] On at least two occasions within the past six months, the environmental group California River Watch has sued MS4 operators for allegedly violating the prohibitions on municipal stormwater discharges that exceed RWLs, and for allegedly permitting non-stormwater discharges to enter the MS4 from non-permitted sources. The concerns expressed herein regarding third party liability associated with the Regional Permit are far from theoretical.

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accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include, at a minimum, the following requirements . . ."

It would also be beneficial for the Regional Board to clarify the definition of "discharges from potable water sources" in Section II.E.2.a (3)(f). Potable water used for residential irrigation that runs off in small quantities (and not otherwise invoking an issue of wasteful water use) would potentially be appropriate for exclusion from treatment as an illicit discharge (allowing permittees to focus on illicit discharges with significant water quality ramifications). However, as currently drafted, it is not clear whether "potable discharges" are intended to include runoff derived from turf or ornamental plant irrigation.

Thank you for the opportunity to comment. Both Cities look forward to working with Regional Board staff to develop language that will address the concerns expressed herein.

Very truly yours,

RUTAN & TUCKER, LLP

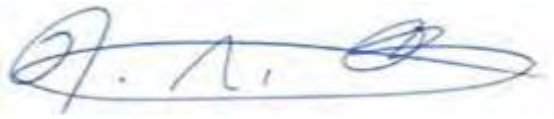

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September 14, 2015

VIA E-MAIL [SANDIEGO@WATERBOARDS.CA.GOV]

David Gibson, Executive Officer
c/o Wayne Chiu
San Diego Regional Water Quality Control Board
2375 Northside Drive, Suite 100,
San Diego, CA 92108

Re: Comment - Tentative Order No. R9-2015-0100, Place ID:786088WChiu

Dear Mr. Gibson and Mr. Chiu:

Best Best & Krieger represents the City of Lake Forest ("City"). The City submits the following comments on the California Regional Water Quality Control Board, San Diego Region ("SDRWQCB"), Tentative Order No. R9-2015-0100 ("Tentative Order") amending Order No. R9-2013-0001, NPDES No. CAS010266, as amended by Order No. R9-2015-0001, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4) Draining the Watersheds within the San Diego Region ("MS4 Permit"). The City is committed to improving and sustaining water quality in the San Diego region and has undertaken extensive efforts to further these goals. The City is aware that the County of Orange has prepared and submitted comments on the Tentative Order. The City would like to express its support for the County's comment letter and join with the County in the submission of those comments. The comments in this letter supplement the County's letter and are intended to allow the City and other Co-permittees to continue working toward the common goal of improving water quality in the region.

1. THE CITY SUPPORTS INCORPORATION OF THE ALTERNATIVE COMPLIANCE PATHWAY FOR PROHIBITIONS AND LIMITATIONS

The City appreciates the efforts of SDRWQCB staff to develop an alternative compliance pathway for incorporation into the MS4 Permit. MS4s face special challenges in attaining water quality objectives and immediate compliance with many of the objectives is not feasible. An alternative to strict compliance is consistent with the Ninth Circuit Court's recognition that the Clean Water Act "does not require municipal storm-sewer discharges to comply strictly with 33 U.S.C. § 1311(b)(1)(C)" regarding limitations. (*Defenders of Wildlife v. Browner* (9th Cir. 1999)

191 F.3d 1159, 1165.) The WQIP process establishes a rigorous, flexible and transparent pathway for compliance with Provisions A.1.a, A.1.c, A.1.d, A.2.a, and A.3.b. The City joins with other Co-Permittees in expressing its support for an alternative compliance pathway.

2. CLARIFY PROVISION A TO STATE THAT COMPLIANCE WITH PROVISION B.3 CONSTITUTES COMPLIANCE WITH PROVISIONS A.1.a, A.1.C, A.1.D, A.2, AND A.3.b OF THE MS4 PERMIT

The City is concerned that the prohibitions and limitations in Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b, as currently written, may be interpreted independent of the alternative compliance pathway in Provision B.3. The Ninth Circuit Court's decision in *Los Angeles County Flood Control District v. NRDC* interpreted an MS4 permit as a contract, with each provision as a stand-alone requirement. A stand-alone reading of the prohibitions and limitations, without any reference to the compliance pathway provision may expose the Co-Permittees to unintended liability, despite our rigorous efforts to successfully implement the alternative compliance pathway. The City joins with Co-Permittees in requesting the simple solution of adding language to Provision A that clarifies intent of the alternative compliance pathway is to create an alternative means of complying with Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b. In other words, the City requests adding language in Provision A simply referencing and linking the alternative compliance pathway in Provision B.

The City also seeks this clarification from its unique position pursuant to the Water Code section 13228 designation agreement between the San Diego and Santa Ana Regional Water Quality Control Boards. The City will actively participate in the development and implementation of the Aliso Creek Watershed Area Water Quality Improvement Plan even though its discharges within the SDRWQCB's jurisdiction are regulated by the Santa Ana Regional Water Quality Control Board. The City will invest substantial time and resources into the Water Quality Improvement Plan and seeks assurance that its efforts will not increase its exposure to liability rather than decrease exposure.

3. INCLUDE THE WQIP PLANNING PROCESS IN THE ALTERNATIVE COMPLIANCE PATHWAY

In light of the direction from the State Water Resources Control Board ("State Board"), the alternative compliance pathway should be extended to include the WQIP planning phase. The alternative compliance pathway currently begins after the WQIP has been completed and is being implemented. It does not extend to the WQIP planning process. The Permit establishes a structure, with timelines over two years, for the WQIP planning process. During the planning process, Co-Permittees will, among other activities, identify water quality priorities, identify and prioritize known and suspected sources of pollutants and stressors, identify potential strategies to improve water quality, create an integrated monitoring and assessment program, and develop

stormwater action levels and non-stormwater action levels into the WQIP. Each of these steps, and others, including the public participation process, occurs on a schedule and requires a substantial investment of time and resources.

Even though the City will participate in the Aliso Creek Watershed Area Water Quality Improvement Plan and anticipates meeting all Permit-established planning requirements, the City and other Co-Permittees remain open to liability for prohibitions and limitations violations, especially from third parties, during the planning process. The ultimate goal of the planning process is to create a WQIP designed to address prioritized water quality conditions. If the City is forced to divert funds away from the planning process to defend a third-party lawsuit during the planning period, such diversion will impede the City's ability to develop a thorough WQIP and undercuts the ultimate goal of the Permit.

Recognizing the need for a long-term approach to addressing water quality conditions, the State Board directed regional boards to "incorporate an ambitious, rigorous, and transparent alternative compliance path that allows permittees appropriate time to come into compliance with receiving water limitations without being in violation of the receiving water limitations during full implementation of the compliance alternative." (State Water Resources Control Board, Order WQ 2015-0075, p. 52.) With direction from the State Board to create a space and time for Co-Permittees to come into compliance with receiving water limitation without being in violation of the Permit, it is imperative that the Board extend the Permit's alternative compliance pathway to the planning phase. Because the planning process is integral to addressing water quality conditions, the City joins with the Co-Permittees in requesting that the alternative compliance pathway include the WQIP planning process.

4. REVISE ANNUAL MILESTONE REQUIREMENT TO INCLUDE MEANINGFUL MILESTONES (PROVISION B.3.c.(1)(a)(vii), B.3.c.(1)(d), B.3.c.(2)(c), B.3.c.(2)(d) and footnote 9)

The Tentative Order's alternative compliance pathway requires Water Quality Improvement Plans to set annual milestones for each numeric goal. These milestones must build on previous milestones and lead to the achievement of a final numeric goal. While improvements to water quality may be more difficult to attain in the absence of clear goals and milestones, an artificial annual milestone for each goal does not account for the complicated and long-term nature of the strategies designed to attain water quality objectives. Further, requiring annual milestones for every water body – pollutant combination restricts the Co-Permittees' ability to prioritize water quality conditions and dedicate limited resources to the highest priority milestones. In order to establish meaningful milestones over time, the milestones should be developed as part of the adaptive management process. The City therefore joins with the Co-Permittees in requesting a revision to the annual milestone requirement in Provisions B.3.c.(1)(a)(vii), B.3.c.(1)(d), B.3.c.(2)(c), B.3.c.(2)(d) and footnote 9.

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The City is grateful for SDRWQCB staff's efforts in drafting a fair and workable alterative compliance pathway. We believe that with the minor modifications requested in this comment letter and those of the County on behalf of the City and other Co-Permittees, the City will be a position to move forward with confidence in attaining water quality improvements in the region.

Sincerely,

Rebecca Andrews

Rebecca Andrews
for BEST BEST & KRIEGER LLP

cc: Tom Wheeler, P.E., Director of Public Works/City Engineer, City of Lake Forest
Devin Slaven, Environmental Manager, City of Lake Forest
Andre Monette, Special Counsel

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September 14, 2015

VIA E-MAIL [SANDIEGO@WATERBOARDS.CA.GOV]

David Gibson, Executive Officer
c/o Wayne Chiu
San Diego Regional Water Quality Control Board
2375 Northside Drive, Suite 100,
San Diego, CA 92108

Re: Comment - Tentative Order No. R9-2015-0100, Place ID:786088WChiu

Dear Mr. Gibson and Mr. Chiu:

Best Best & Krieger represents the City of San Clemente ("City"). The City submits the following comments on the California Regional Water Quality Control Board, San Diego Region ("SDRWQCB"), Tentative Order No. R9-2015-0100 ("Tentative Order") amending Order No. R9-2013-0001, NPDES No. CAS010266, as amended by Order No. R9-2015-0001, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4) Draining the Watersheds within the San Diego Region ("MS4 Permit"). The City is committed to improving and sustaining water quality in the San Diego region and has undertaken extensive efforts to further these goals. The City is aware that the County of Orange has prepared and submitted comments on the Tentative Order. The City would like to express its support for the County's comment letter and join with the County in the submission of those comments. The comments in this letter supplement the County's letter and are intended to allow the City and other Co-permittees to continue working toward the common goal of improving water quality in the region.

1. THE CITY SUPPORTS INCORPORATION OF THE ALTERNATIVE COMPLIANCE PATHWAY FOR PROHIBITIONS AND LIMITATIONS

The City appreciates the efforts of SDRWQCB staff to develop an alternative compliance pathway for incorporation into the MS4 Permit. MS4s face special challenges in attaining water quality objectives and immediate compliance with many of the objectives is not feasible. An alternative to strict compliance is consistent with the Ninth Circuit Court's recognition that the Clean Water Act "does not require municipal storm-sewer discharges to comply strictly with 33 U.S.C. § 1311(b)(1)(C)" regarding limitations. (*Defenders of Wildlife v. Browner* (9th Cir. 1999)

191 F.3d 1159, 1165.) The WQIP process establishes a rigorous, flexible and transparent pathway for compliance with Provisions A.1.a, A.1.c, A.1.d, A.2.a, and A.3.b. The City joins with other Co-Permittees in expressing its support for an alternative compliance pathway.

2. CLARIFY PROVISION A TO STATE THAT COMPLIANCE WITH PROVISION B.3 CONSTITUTES COMPLIANCE WITH PROVISIONS A.1.a, A.1.C, A.1.D, A.2, AND A.3.b OF THE MS4 PERMIT

The City is concerned that the prohibitions and limitations in Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b, as currently written, may be interpreted independent of the alternative compliance pathway in Provision B.3. The Ninth Circuit Court's decision in *Los Angeles County Flood Control District v. NRDC* interpreted an MS4 permit as a contract, with each provision as a stand-alone requirement. A stand-alone reading of the prohibitions and limitations, without any reference to the compliance pathway provision may expose the Co-Permittees to unintended liability, despite our rigorous efforts to successfully implement the alternative compliance pathway. The City joins with Co-Permittees in requesting the simple solution of adding language to Provision A that clarifies intent of the alternative compliance pathway is to create an alternative means of complying with Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b. In other words, the City requests adding language in Provision A simply referencing and linking the alternative compliance pathway in Provision B.

3. INCLUDE THE WQIP PLANNING PROCESS IN THE ALTERNATIVE COMPLIANCE PATHWAY

In light of the direction from the State Water Resources Control Board ("State Board"), the alternative compliance pathway should be extended to include the WQIP planning phase. The alternative compliance pathway currently begins after the WQIP has been completed and is being implemented. It does not extend to the WQIP planning process. The Permit establishes a structure, with timelines over two years, for the WQIP planning process. During the planning process, Co-Permittees will, among other activities, identify water quality priorities, identify and prioritize known and suspected sources of pollutants and stressors, identify potential strategies to improve water quality, create an integrated monitoring and assessment program, and develop stormwater action levels and non-stormwater action levels into the WQIP. Each of these steps, and others, including the public participation process, occurs on a schedule and requires a substantial investment of time and resources.

Even though the City will participate in a Water Quality Improvement Plan and anticipates meeting all Permit-established planning requirements, the City and other Co-Permittees remain open to liability for prohibitions and limitations violations, especially from third parties, during the planning process. The ultimate goal of the planning process is to create a WQIP designed to address prioritized water quality conditions. If the City is forced to divert funds away from the

planning process to defend a third-party lawsuit during the planning period, such diversion will impede the City's ability to develop a thorough WQIP and undercuts the ultimate goal of the Permit.

Recognizing the need for a long-term approach to addressing water quality conditions, the State Board directed regional boards to "incorporate an ambitious, rigorous, and transparent alternative compliance path that allows permittees appropriate time to come into compliance with receiving water limitations without being in violation of the receiving water limitations during full implementation of the compliance alternative." (State Water Resources Control Board, Order WQ 2015-0075, p. 52.) With direction from the State Board to create a space and time for Co-Permittees to come into compliance with receiving water limitation without being in violation of the Permit, it is imperative that the Board extend the Permit's alternative compliance pathway to the planning phase. Because the planning process is integral to addressing water quality conditions, the City joins with the Co-Permittees in requesting that the alternative compliance pathway include the WQIP planning process.

4. REVISE ANNUAL MILESTONE REQUIREMENT TO INCLUDE MEANINGFUL MILESTONES (PROVISION B.3.c.(1)(a)(vii), B.3.c.(1)(d), B.3.c.(2)(c), B.3.c.(2)(d) and footnote 9)

The Tentative Order's alternative compliance pathway requires Water Quality Improvement Plans to set annual milestones for each numeric goal. These milestones must build on previous milestones and lead to the achievement of a final numeric goal. While improvements to water quality may be more difficult to attain in the absence of clear goals and milestones, an artificial annual milestone for each goal does not account for the complicated and long-term nature of the strategies designed to attain water quality objectives. Further, requiring annual milestones for every water body – pollutant combination restricts the Co-Permittees' ability to prioritize water quality conditions and dedicate limited resources to the highest priority milestones. In order to establish meaningful milestones over time, the milestones should be developed as part of the adaptive management process. The City therefore joins with the Co-Permittees in requesting a revision to the annual milestone requirement in Provisions B.3.c.(1)(a)(vii), B.3.c.(1)(d), B.3.c.(2)(c), B.3.c.(2)(d) and footnote 9.

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BEST BEST & KRIEGER LLP
ATTORNEYS AT LAW

The City is grateful for SDRWQCB staff's efforts in drafting a fair and workable alterative compliance pathway. We believe that with the minor modifications requested in this comment letter and those of the County on behalf of the City and other Co-Permittees, the City will be a position to move forward with confidence in attaining water quality improvements in the region.

Sincerely,

Rebecca Andrews

Rebecca Andrews
for BEST BEST & KRIEGER LLP

cc: Mary Vondrak, City of San Clemente

THE CITY OF SAN DIEGO

September 14, 2015

VIA EMAIL TO: Laurie.Walsh@waterboards.ca.gov

Laurie Walsh, Water Resource Control Engineer
San Diego Regional Water Quality Control Board
2375 Northside Drive, Suite 100
San Diego, CA 92108

Subject: Comment Letter – Tentative Order No. R9-2015-0100

Dear Ms. Walsh:

The City of San Diego (City) appreciates the opportunity to provide comments on the Amendment to the Regional Municipal Separate Storm Sewer System (MS4) Permit for the San Diego Region (Tentative Order No. R9-2015-0100, herein referred to as the "Draft Tentative Order"). The City is committed to protecting and improving water quality in the San Diego Region. From this perspective, the City provides the following comments below. More detailed comments are included in the attached table (Attachment 1).

- *The Draft Tentative Order should include revisions to Provision B.3.c to align requirements with a once per permit term approach to milestones.* The City appreciates the inclusion of a Water Quality Improvement Plan (WQIP)-based alternative for complying with the receiving water limitations and discharge prohibitions in Provision A. In its recent order upholding a similar compliance alternative in the Los Angeles MS4 permit, the State Water Board recognized that allowing permit compliance to be based on implementation of watershed plans provide an opportunity to achieve greater water quality improvement than the status quo compliance approach. The City recommends several revisions to ensure an effective alternative compliance approach that is consistent with the State Water Board's guidance. Milestones and interim goals provide opportunities to achieve key outcomes, measure progress to final goals, and support the adaptive management process. The City understands that the transparency that goals and milestones create is important for the Regional Water Board and the public to track progress and evaluate compliance. However, the annual milestones proposed may be counterproductive because they do not allow the City enough time to reprogram activities and secure funding the following fiscal year to make any necessary adaptations to implement the WQIPs. While the shift to implementing programs and building water quality improvement projects is our primary focus moving forward, effective adaptive management, which allows for adequate time and consideration, is a key component of successful WQIP implementation.

Transportation & Storm Water Department
9370 Chesapeake Drive, Suite 100, MS 1900 • San Diego, CA 92123
Hotline (619) 235-1000 Fax (858) 541-4350

- *The Draft Tentative Order should include revisions to Provision B.3.c to include alternative compliance coverage for Provision A.2.b.* The City supports the inclusion of the receiving water limitations in the alternative compliance pathway of Provision B.3.c. As proposed, however, Provision B.3.c. omits alternative compliance coverage for the receiving water limitations regarding the Area of Special Biological Significance (ASBS) in Provision A.2.b. To be consistent with the intent of the alternative compliance pathway approach, the ASBS provisions should be included in the alternative compliance provisions similar to the other receiving water limitations provisions.

- *Draft Tentative Order Attachment E Tables 6.1 and 6.4 should be modified for consistency with the TMDL.* The proposed addition of a 10-year wet-weather compliance deadline of April 4, 2021 to Table 6.1, for water bodies in a WQIP that does not include load reductions for pollutants besides bacteria, is inconsistent with the adopted TMDL and thereby violates the Clean Water Act regulations at 40 C.F.R. § 122.44(d)(1)(vii)(B). This proposed amendment would subject the segments of beaches and creeks that were removed from the 303(d) list to requirements from which the de-listed segments are specifically exempt under the adopted TMDL. Under the TMDL, no BLRP or CLRP is required for the de-listed segments. The WQIP is a requirement of the MS4 Permit, not the TMDL, and is not a BLRP. Thus, there is no justification to require a 10-year compliance schedule for the de-listed segments, and the proposed amendment is not consistent with the TMDL.

- *Draft Tentative Order Attachment E should be modified to allow individual jurisdictional compliance with the TMDLs.* The City is committed to protecting and improving water quality and achieving compliance with TMDLs via the implementation of Water Quality Improvement Plans. However, language throughout Attachment E appears to preclude any Copermittee from using the WQIP compliance pathway unless all other Copermittees also are in compliance. The City has no authority to compel other Copermittees to comply and cannot be held liable for the actions or inactions of other agencies. Under federal Clean Water Act regulations that have been incorporated into the MS4 Permit, a Copermittee is responsible only for conditions relating to the discharges for which it is an operator.

- *Draft Tentative Order, Section E.3.e.(1), should be modified to include for development approvals.* The City supports the inclusion of the language proposed in the Draft Tentative Order which provides clarifications when a development project should be subject to the Priority Development Projects Requirements. However, the City recommends incorporating additional language allowing for development approvals as suggested in the language submitted by the City of San Diego to Regional Board staff on June 10, 2015 (Attachment 2).

Thank you for your time and consideration of these comments. If you have questions, please contact Ruth Kolb at (858) 541-4328 or at rkolb@sandiego.gov.

Sincerely,

Drew Kleis
Deputy Director

DK\rk

Attachments: 1. City of San Diego Comment Table
2. June 10, 2015 proposed permit language regarding applicability of Priority Development Project requirements

cc: Paz Gomez, Deputy Chief Operating Officer
Mike Hansen, Director of Land Use and Environmental Policy, Office of the Mayor
Kris McFadden, Director, Transportation & Storm Water Department
Heather Stroud, Deputy City Attorney, City Attorney's Office
Ruth Kolb, Program Manager, Transportation & Storm Water Department
Sumer Hasenin, Senior Engineer, Transportation & Storm Water Department
Clem Brown, Program Manager, Transportation & Storm Water Department

Attachment 1: City of San Diego Comment Table Regarding Tentative Order No. R9-2015-0100
September 14, 2015

Permit Section	Permit Page	Section Title	Reason for Proposed Changes/Comments	Proposed Changes
General Comment	NA	NA	NA	The proposed amendments do not address the issues raised in the City's Petition for Review of San Diego Regional Water Quality Control Board (Regional Board) Order No. R9-2013-0001, filed on June 7, 2013. The City does not waive any of those arguments, and urges the Regional Board to address those issues as part of this permit amendment.
Provision A. Prohibitions and Limitations				
II.A.1.d	16	Prohibitions and Limitations	Correction to updated ASBS resolution number.	Change reference from State Water Board Resolution No. 2012-0012, to Resolution No. 2012-0031.
Provision B. Water Quality Improvement Plans				
II.B.1	17	Watershed Management Areas	This NPDES Permit is applicable to discharges from Copermittee MS4s as stated in Section A.1. Discharges from other NPDES permits are governed by requirements within those permits.	Modify Section B.1 as follows: The Copermittees must develop a WQIP for <u>their MS4 discharges within</u> each of the Watershed Management Areas in Table B-1<u>.</u>
II.B.3.c.(1)(a)(ii)	33-34	Prohibitions and Limitations	Correction to updated ASBS resolution number.	Change reference from State Water Board Resolution No. 2012-0012, to Resolution No. 2012-0031.
II.B.3.c.(1)(a)(iii) through (vii)	33-34	Prohibitions and Limitations Compliance Option	The "and/or" in subsection (iii) creates confusion regarding whether the categories of numeric goals that follow are mandatory or optional. The proposed revision and renumbering adds clarity and is consistent with the City's understanding of Regional Board staff's intent.	(a) Numeric goals, water quality improvement strategies, and schedules developed pursuant to Provisions B.3.a and B.3.b that include the following: (i) Interim and final WQBELs established by the TMDLs in Attachment E to this Order applicable to the Copermittee's jurisdiction within the Watershed Management Area; AND (ii) Interim and final numeric goals for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 applicable to the Copermittee's jurisdiction within the Watershed Management Area; AND (iii) Interim and final numeric goals applicable to the Copermittee's MS4 discharges within the Watershed Management Area expressed as numeric concentration-based or load-based goals for all pollutants and conditions listed on the Clean Water Act Section 303(d) List of Water Quality

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				Impaired Segments for the receiving waters in the Watershed Management Area that do not have a TMDL incorporated into Attachment E to this Order; ~~AND/~~OR ~~(iv)~~ Interim and final numeric goals for pollutants and conditions identified as receiving water priorities in the Water Quality Improvement Plan that will result in chemical, physical, and biological conditions protective of the beneficial uses of the receiving waters impacted by the Copermittee's MS4 discharges within the Watershed Management Area; AND (iv) The Copermittee has the option to include interim and final numeric goals applicable to the Copermittee's MS4 discharges and/or receiving waters within the Watershed Management Area for any pollutants or conditions in addition to those described in Provisions B.3.c.(1)(a)(i)-(iii); AND (v~~i~~) Schedules for achieving each final numeric goal that reflect a realistic assessment of the shortest practicable time needed for achievement; AND (vi~~i~~) For each final numeric goal developed pursuant to Provisions B.3.a and B.3.c.(1)(a)(i)-(iv), at least one annual milestone and date for its achievement must be included within each Water Quality Improvement Plan Annual Report reporting period until the final numeric goal is achieved.
II.B.3.c, II.B.3.c.(1), and II.B.3.c.(2)	33, 35	Prohibitions and Limitations Compliance Option	State Board Order No. WQ 2015-0075 (p. 52) requires the Regional Board to "incorporate an ambitious, rigorous, and transparent alternative compliance path that allows permittees appropriate time to come into compliance with receiving water limitations without being in violation of the receiving water limitations during full implementation of the compliance alternative." The City appreciates the inclusion of most of the receiving water limitations in the alternative	**c. Prohibitions and Limitations Compliance Option** Each Copermittee has the option to utilize the implementation of the Water Quality Improvement Plan to demonstrate compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2~~.a~~, and A.3.b within a Watershed Management Area subject to the following conditions: (1) A Copermittee is eligible to be deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2~~.a~~, and A.3.b within a Watershed Management Area when the Water Quality Improvement Plan for a Watershed Management Area incorporates the following:

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			compliance pathway of Provision B.3.c. As proposed, however, Provision B.3.c. omits alternative compliance coverage for the receiving water limitations regarding the ASBS in Provision A.2.b, which states that "Discharges from MS4s composed of storm water runoff must not alter natural ocean water quality in an ASBS." Without inclusion in the alternative compliance pathway, the City does not have appropriate time to come into compliance with this provision.	. . . . (2) Each Copermittee that voluntarily completes the requirements of Provision B.3.c.(1) is deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2~~.a~~, and A.3.b for the pollutants and conditions for which numeric goals are developed when the Water Quality Improvement Plan, incorporating the requirements of Provision B.3.c.(1), is accepted by the San Diego Water Board pursuant to Provision F.1.b or F.2.c. The Copermittee is considered to be in compliance during the term of this Order as long as:
II.B.3.c.(1)(a)(vii) II.B.3.c.(1)(d) II.B.3.c.(2)(c)-(d)	34, 35, 36	Prohibitions and Limitations Compliance Option	Milestones and interim goals provide opportunities to achieve key outcomes, measure progress to final goals, and support the adaptive management process. The transparency that goals and milestones create is important for the Regional Water Board and the public to track progress and evaluate compliance as well as for the Copermittees to secure funding to implement the WQIPs. As the Copermittees complete the WQIP development/planning phase we are shifting to implementation. Upon completion of WQIPs, Copermittees will require much effort to transition from plan development to implementation, capital improvement planning, and seeking of funding sources to ensure that projects can be scheduled within the short planning periods. With the uncertainty of much of these efforts, Copermittee staff will	The following changes to Provision II.B.3.c are proposed to align requirements with a once per permit term approach to milestones: II.B.3.c.(1)(a)(vii) For each final numeric goal developed pursuant to Provisions B.3.a and B.3.c.(1)(a)(i)-(v), at least one ~~annual~~ milestone[9] and date for its achievement must be included within the permit term ~~each Water Quality Improvement Plan Annual Report reporting period~~ until the final numeric goal is achieved. Footnote 9 ~~Annual m~~Milestones for each final numeric goal must build upon previous milestones and lead to the achievement of the final numeric goal. The ~~annual~~ milestones may consist of water quality improvement strategy implementation phases, interim numeric goals, and other acceptable metrics. II.B.3.c.(1)(d) Documentation showing that the numeric goals, schedules, and ~~annual~~ milestones proposed pursuant to Provision B.3.c.(1)(a), the analysis performed pursuant to Provision B.3.c.(1)(b), and the specific monitoring and

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			be creating internal planning mechanisms and systems to restructure procedures and operations to facilitate this process. As part of the shift, Copermittees will work to secure funding via the budgeting process, which for the City is on two to five year planning horizons. The City submits annual budget requests the year before the funds are approved for implementation. . A five year planning horizon allows for implementation of more effective adaptive management. While the shift to implementing programs and building water quality improvement projects is our primary focus moving forward, adaptive management is a key component of WQIP implementation. As part of annual reporting Copermittees are required to describe the progress of implementing the WQIPs as well as identify modifications to the WQIP. These requirements include, but are not limited to reporting on the following: 1. Progress toward achieving the interim and final numeric goals; 2. The water quality improvement strategies that were implemented and/or no longer implemented; 3. The water quality improvement strategies planned for implementation during the next reporting period;	assessments proposed pursuant to Provision B.3.c.(1)(c) have been reviewed by the Water Quality Improvement Consultation Panel (see Provision F.1.a.(1)(b)). Updates must be reviewed by the Water Quality Improvement Consultation Panel for any recommendations. II.B.3.c.(2)(c) The Copermittee's assessments in the Water Quality Improvement Plan Annual Report submitted pursuant to Provision F.3.b.(3) support a conclusion that: 1) the Copermittee is in compliance with the ~~annual~~ milestones and dates for achievement developed pursuant to Provision B.3.c.(1)(a)(vii), OR 2) the Copermittee has provided acceptable rationale and recommends appropriate modifications to the interim numeric goals, and/or water quality improvement strategies, and/or schedules to improve the rate of progress toward achieving the final numeric goals developed pursuant to Provisions B.3.a and B.3.c.(1)(a)(i)-(vi); AND II.B.3.c.(2)(d) Any proposed modifications to the numeric goals, schedules, and/or ~~annual~~ milestones are accepted by the San Diego Water Board as part of subsequent updates to the Water Quality Improvement Plan pursuant to Provision F.2.c;10 AND

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			4. Proposed modifications to the water quality improvement strategies, the public comments received and the supporting rationale for the proposed modifications; 5. Previous modifications or updates incorporated into the WQIP and/or jurisdictional runoff management program document, which have been implemented; and 6. Proposed modifications or updates to the WQIPs and/or jurisdictional runoff management program document. These requirements, in conjunction with additional adaptive management provisions of the Permit, ensure a transparent measure of progress and meaningful modifications to the program are considered and implemented. However, requiring the identification and achievement of specific annual milestones as part of the Prohibitions and Limitations Compliance Options effectively keeps City staff within the planning framework with a major focus on reporting that dilutes resources for the shift to implementation. Additionally, the annual milestone requirement effectively accelerates the adaptive management process, lessening the ability to evaluate	

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			meaningful information and creatively adapt programs without risking non-compliance with the Permit. Because the City operates on two to five year planning horizons (described earlier, above), obtaining funding to significantly modify programs in response to information on an annual basis is not feasible. Furthermore, as required by the Permit, modifications must be reviewed and revised based on separate reviews by the Water Quality Improvement Consultation Panel, the public review, and Regional Water Board staff. Given this lengthy process, the City could identify modifications, but not be able to implement those modifications within the construct and compliance coverage of the Prohibitions and Limitations Compliance Options on an annual basis. While the City understands the desire to utilize milestones and supports interim measures of progress, the City feels that consideration should be given to an alternative approach or timeframe. Such an alternative should meet the goal of providing a transparent measure of progress (which is already supported by the Permit's annual reporting and adaptive management requirements) and support a determination of compliance while also supporting the shift to implementation in a manner consistent with both WQIP revision and review	

Permit Section	Permit Page	Section Title	Reason for Proposed Changes/Comments	Proposed Changes
			requirements and internal Copermittee processes. The 2013 Permit's approach of permit term interim limits and corresponding strategies with annual and permit term adaptive management requirements are manageable and appropriate. The approach was an improvement over the Los Angeles Region's disparate approach of requiring some water quality priorities to follow a schedule based on unrelated TMDLs and requiring others to meet annual milestones. The San Diego Region's approach provided opportunity to gather sufficient information to adapt where possible annually and approach more complex modifications on a permit term basis. This approach ~~9~~provides essential time for responsible agencies to shift planning and operational procedures, while seeking funding opportunities. A single milestone within the permit term also provides sufficient time to not only plan and implement projects, but to develop reporting procedures that demonstrate reasonable assurance and quantitative documentation of the progress towards meeting milestones. As such, the City proposes that the Regional Water Board maintain the balance set forth in the 2013 Permit and require the establishment of a single milestone within the permit term that measures progress towards meeting the interim or final goals set	

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			for the permit term.	
Provision E.3. Development Planning				
E.3.b.(1)	91, 92	Definition of Priority Development Projects	Sub-sections c and e should be combined to improve clarity of the requirements. Both sections have the same requirements for new and redevelopment projects but list different categories under each one.	Combine sub-sections (c) and (e). If sub-sections are not combined, add "collectively over the entire project site" to sub-section e, for consistency.
		Definition of Priority Development Projects	To provide clarity regarding redevelopment projects. There has been confusion of what is considered redevelopment vs. maintenance on "not redevelopment".	
E.3.d.	101	BMP Design Manual Update	This section should define the implementation date of the BMP Design Manual as the "effective date of the BMP Design Manual", to avoid confusion. Section E.3.e(1)(a)(i) references the "effective date of the BMP Design Manual".	Add the following clarifying language to Provision E.3.d: **d. BMP DESIGN MANUAL UPDATE** Each Copermittee must update its BMP Design Manual pursuant to Provision F.2.b. Until the Copermittee has updated its BMP Design Manual pursuant to Provision F.2.b.(1), the Copermittee must continue implementing its current BMP Design Manual. The Copermittee must implement the updated BMP Design Manual within 180 days following completion of the update pursuant to Provision F.2.b.(1), unless directed otherwise by the San Diego Water Board Executive Officer. <u>The date the BMP Design Manual is implemented is the "effective date" of the BMP Design Manual.</u> The update of the BMP Design Manual required pursuant to Provision F.2.b.(1) must include the following:
E.4		Construction Management	To streamline the requirements, minimize confusion and improve readability, sub-sections E.4.b. and E.4.d.(3) should be combined and duplicates deleted. Both sections contain information that needs to be collected, inventoried and tracked.	Combine sections E.4.b and E.4.d.(3).
Attachment	c-9	Definitions	The Redevelopment Definition is not	Revise the definition as follows to provide clarity:

Attachment 1: City of San Diego Comment Table Regarding Tentative Order No. R9-2015-0100
September 14, 2015

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C			easily understood.	Redevelopment – The creation and/or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, ~~and creation or addition of impervious surfaces.~~ Replacement of impervious surfaces includes any activity ~~that is not part of a routine maintenance activity~~ where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include routine maintenance activities; trenching and resurfacing associated with utility work; resurfacing existing roadways and parking lots; new sidewalk construction, pedestrian ramps, or bike lane on existing roads; and routine replacement of damaged pavement, such as pothole repair, overlay and pavement grinding.
F.2.b.(4)	126, 127	BMP Design Manual Update	It is unclear whether the 90 days to incorporate permit amendments changes the BMP Design Manual implementation date, which is also its effective date for the purpose of applicability of the development project requirements. There is a lot of confusion related to the initial effective date of Dec 24, 2015 and the update date anticipated to be Feb 18, 2016. If the intent is to change the implementation date (the "effective date") of all of the requirements of the BMP Design Manual to February 18, 2016, which appears to be the case based on correspondence with Regional Board staff, then clarifying language is needed.	Add the following clarifying language to Provision F.2.b.(4): (4) If the San Diego Water Board amends Provisions E.3.a-d during the permit term but after the Copermittee has completed the update pursuant to Provision F.2.b.(1), the Copermittee must revise its BMP Design Manual to incorporate the amended Provision E.3.a-d requirements as soon as possible but not later than 90 days after the date the San Diego Water Board adopts the amendments to Provisions E.3.a-d, unless otherwise directed by the San Diego Water Board Executive Officer. Under these circumstances, the effective date of the BMP Design Manual is 90 days after the date the San Diego Water Board adopts the amendments to Provisions E.3.a-d.

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Attachment E. Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2015-0001				
Attachment E, Sections 1.b(3)(d) 1.b(3)(d)(iv) 1.b(3)(d)(v) 2.b(3)(d)(iv) 2.b(3)(d)(v) 3.b(3)(d)(iv) 3.b(3)(d)(v) 4.b(3)(d) 4.b(3)(d)(iv) 4.b(3)(d)(v) 5.b(1)(a) 5.b(3)(d) 5.b(3)(e) 5.b(3)(f) 4.b(3)(g) 4.b(3)(g)(iv) 4.b(3)(g)(v) 5.c(1)(b)(iv) 5.c(1)(b)(v) 5.c(1)(b)(vi) 5.c(1)(b)(vii) 5.c(1)(b)(viii) 6.b(2)(b)(ii) 6.b(3)(d) 6.b(3)(e) 6.b(3)(f) 6.b(3)(f)(iv) 6.b(3)(f)(v) 6.c(2)(a)(i) 6.c(2)(a)(ii) 6.c(3)(d) 6.c(3)(e) 6.c(3)(f) 6.c(3)(g) 6.c(3)(h)	E-4 E-8 E-11 E-16 E-19 E-23 E-24 E-25 E-34 E-36 E-37 E-41 E-42 E-47	Final TMDL Compliance Determination	Compliance language requires all Copermittees to implement a WQIP for any of the Copermittees to utilize the WQIP based compliance approach for TMDLs. Copermittees have no authority to compel other Copermittees to implement BMPs and should not be held liable for the actions or inactions of others. Under 40 C.F.R. §§ 122.26(a)(3)(vi) and 122.26(b)(1), a Copermittee is responsible only for conditions relating to the discharges for which it is the operator.	Revise Attachment E Provisions to allow independent jurisdictional compliance. For example, revise Provisions E.1.b(3)(d) as follows: (d) The Responsible ~~Copermittees~~ Copermittee ~~develop~~ develops and ~~implement~~ implements the Water Quality Improvement Plan as follows: . . . . (iv) The Responsible ~~Copermittees~~ Copermittee ~~continue~~ continues to implement the BMPs required under Specific Provision 1.b.(2)(c), AND (v) The Responsible ~~Copermittees~~ Copermittee ~~continue~~ continues to perform the specific monitoring and assessments specified in Specific Provision 1.d, to demonstrate compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c).

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Attachment E. 6.	E-31	Final TMDL Compliance Requirement, Table 6.1	The proposed addition of a 10-year wet-weather compliance deadline of April 4, 2021 to Table 6.1, for water bodies in a Water Quality Improvement Plan (WQIP) that does not include load reductions for pollutants besides bacteria, is inconsistent with the adopted TMDL and thereby violates the Clean Water Act regulations at 40 C.F.R. § 122.44(d)(1)(vii)(B). This proposed amendment would subject the segments of beaches and creeks that were removed from the 303(d) list to requirements from which the de-listed segments are specifically exempt under the adopted TMDL. The adopted TMDL states in multiple instances (pp. A-2; A-12; A-65; and A-66) that for these delisted shorelines of the Pacific Ocean, no further action is required as long as monitoring data continues to support compliance with water quality standards, i.e., the beaches remain off future iterations of the 303(d) list: "Specific beach segments from some of the Pacific Ocean shorelines listed in the above table have been delisted from the 2008 303(d) list that was approved by the San Diego Board on December 16, 2009, <u>and therefore are not subject to any further action</u> as long as monitoring data continues to support compliance with water quality standards." Reso. No. R9-2010-0001 at	Delete proposed language in Table 6.1 and footnote.

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			A-2 [emphasis added]. Accordingly, the adopted TMDL specifies that for the de-listed segments, no Comprehensive Load Reduction Plan or Bacteria Load Reduction Plan is required: "For watersheds in [Insert table number] [sic]where there are no longer any impairments listed on the 2008 303(d) List, <u>the Phase I MS4s and Caltrans are not required to submit a BLRP or CLRP within 18 months of the effective date of these TMDLs</u>. If, however, any segment of a waterbody for the watershed (Pacific Ocean shoreline, creek, or mouth as shown in Table 11-5) is re-listed on a future 303(d) List for any type of indicator bacteria, the Phase I MS4s and Caltrans will be required to submit a BLRP or CLRP within 6 months of the adoption of the 303(d) List by the San Diego Regional Board." Reso. No. R9-2010-0001 at A-66 [emphasis added]. Under the TMDL, no BLRP or CLRP is required for the de-listed segments. The WQIP is a requirement of the MS4 Permit, not the TMDL, and is <u>not</u> a BLRP. Thus, there is no justification to require a 10-year compliance schedule for the de-listed segments, and the proposed amendment is not consistent with the TMDL and should not be adopted.	
Attachment	E-38	Interim TMDL	See above comment.	Delete proposed language in Table 6.4 and footnote.

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E. 6.	through E-40	Compliance Requirements, Table 6.4		
Attachment F. Fact Sheet/Technical Report				
Applicable Statutes, Regulations, Plans and Policies	F-30 – F-32	Antidegradation Policy & Anti-Backsliding Policy	The City supports the proposed amendments to the discussion on the MS4 Permit's consistency with the antidegradation policy and anti-backsliding policy.	NA
Provisions	F-60	Provision B.3 (Water Quality Improvement Plan Goals, Strategies and Schedules)	Finding no. 3 is not accurate as the MS4 Permit is currently drafted. Finding no. 3 states: "3. Provision B.3.c is an ambitious, rigorous, and transparent alternative compliance pathway that allows a Copermittee appropriate time to come into compliance with receiving water limitations without being in violation of the receiving water limitations during implementation of the compliance alternative." As currently drafted, Provision B.3.c does not allow the City appropriate time to come into compliance with the ASBS receiving water limitations in Provision A.2.b.	No changes are needed to this portion of the Fact Sheet so long as the City's proposed change to Provision B.3.c. to include compliance coverage for Provision A.2.b is accepted.

Revise May 14, 2015, Draft of Provision E.3.e.(1)(a) as follows:

e. **PRIORITY DEVELOPMENT PROJECT BMP IMPLEMENTATION AND OVERSIGHT**

Each Copermittee must implement a program that requires and confirms structural BMPs on all Priority Development Projects are designed, constructed, and maintained to remove pollutants in storm water to the MEP.

(1) Structural BMP Approval and Verification Process

(a) Each Copermittee must require and confirm that all Priority Development Projects implement the requirements of Provision E.3, except that the Copermittee may allow previous land development requirements to apply to a Priority Development Project if all of the following conditions are met:

(i) The Copermittee has, prior to the effective date of the BMP Design Manual required to be developed pursuant to Provision E.3.d, approved[1] a design that incorporates the storm water drainage system for the Priority Development Project in its entirety, including all applicable structural pollutant treatment control and hydromodification management BMPs, and that complies with the Priority Development Project requirements of the Previous Term MS4 permit;[2] AND

(ii) For private projects, the Copermittee has, prior to the effective date of the BMP Design Manual required to be developed pursuant to Provision E.3.d, issued a development approval or construction permit based on a design that incorporates the approved storm water drainage system for the Priority Development Project in its entirety; AND

(iii) All subsequent development approvals and construction permits, or equivalent approvals for public projects, that are needed to implement the initial approval, must be issued within 5 years of the effective date of the BMP Design Manual pursuant to Provision E.3.d. BMP installation must remain in substantial conformity with the design of the storm water drainage system included in the initial approval.

(b) Alternatively, the Copermittee may allow previous land development requirements to apply to a Priority Development Project if application of Provision E.3 would be legally infeasible.

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[1] For public projects, approval means that the design of the storm water drainage system for the project in its entirety has been stamped by the City or County Engineer, or engineer of record for the project.

[2] Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016 for San Diego, Orange, and Riverside Counties, respectively.

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September 14, 2015

VIA E-MAIL [SANDIEGO@WATERBOARDS.CA.GOV]

David Gibson, Executive Officer
c/o Wayne Chiu
San Diego Regional Water Quality Control Board
2375 Northside Drive, Suite 100,
San Diego, CA 92108

Re: Comment - Tentative Order No. R9-2015-0100, Place ID:786088WChiu

Dear Mr. Gibson and Mr. Chiu:

The City of San Juan Capistrano (City) is committed to improving and sustaining water quality in the San Diego region and has undertaken extensive efforts to further these goals. The City is aware that the County of Orange has prepared and submitted comments on the Tentative Order No. R9-2015-0100. The City would like to express its support for the County's comment letter and join with the County in the submission of those comments. The comments in the enclosed letter from BEST BEST & KRIEGER LLP supplement the County's letter and are intended to allow the City and other Co-permittees to continue working toward the common goal of improving water quality in the region.

Sincerely,

Hossein Ajideh, Ph.D., P.E.
Senior Civil Engineer

cc: Richard Boon, County of Orange
Rebecca Andrews, BEST BEST & KRIEGER LLP
Keith Till, Interim City Manager
Thom Coughran, P.E., Interim Public Works & Utilities Director
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September 14, 2015

VIA E-MAIL [SANDIEGO@WATERBOARDS.CA.GOV]

David Gibson, Executive Officer
c/o Wayne Chiu
San Diego Regional Water Quality Control Board
2375 Northside Drive, Suite 100,
San Diego, CA 92108

Re: Comment - Tentative Order No. R9-2015-0100, Place ID:786088WChiu

Dear Mr. Gibson and Mr. Chiu:

Best Best & Krieger represents the City of San Juan Capistrano ("City"). The City submits the following comments on the California Regional Water Quality Control Board, San Diego Region ("SDRWQCB"), Tentative Order No. R9-2015-0100 ("Tentative Order") amending Order No. R9-2013-0001, NPDES No. CAS010266, as amended by Order No. R9-2015-0001, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4) Draining the Watersheds within the San Diego Region ("MS4 Permit"). The City is committed to improving and sustaining water quality in the San Diego region and has undertaken extensive efforts to further these goals. The City is aware that the County of Orange has prepared and submitted comments on the Tentative Order. The City would like to express its support for the County's comment letter and join with the County in the submission of those comments. The comments in this letter supplement the County's letter and are intended to allow the City and other Co-permittees to continue working toward the common goal of improving water quality in the region.

1. THE CITY SUPPORTS INCORPORATION OF THE ALTERNATIVE COMPLIANCE PATHWAY FOR PROHIBITIONS AND LIMITATIONS

The City appreciates the efforts of SDRWQCB staff to develop an alternative compliance pathway for incorporation into the MS4 Permit. MS4s face special challenges in attaining water quality objectives and immediate compliance with many of the objectives is not feasible. An alternative to strict compliance is consistent with the Ninth Circuit Court's recognition that the Clean Water Act "does not require municipal storm-sewer discharges to comply strictly with 33 U.S.C. § 1311(b)(1)(C)" regarding limitations. (*Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159, 1165.) The WQIP process establishes a rigorous, flexible and transparent

pathway for compliance with Provisions A.1.a, A.1.c, A.1.d, A.2.a, and A.3.b. The City joins with other Co-Permittees in expressing its support for an alternative compliance pathway.

2. CLARIFY PROVISION A TO STATE THAT COMPLIANCE WITH PROVISION B.3 CONSTITUTES COMPLIANCE WITH PROVISIONS A.1.a, A.1.C, A.1.D, A.2, AND A.3.b OF THE MS4 PERMIT

The City is concerned that the prohibitions and limitations in Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b, as currently written, may be interpreted independent of the alternative compliance pathway in Provision B.3. The Ninth Circuit Court's decision in *Los Angeles County Flood Control District v. NRDC* interpreted an MS4 permit as a contract, with each provision as a stand-alone requirement. A stand-alone reading of the prohibitions and limitations, without any reference to the compliance pathway provision may expose the Co-Permittees to unintended liability, despite our rigorous efforts to successfully implement the alternative compliance pathway. The City joins with Co-Permittees in requesting the simple solution of adding language to Provision A that clarifies intent of the alternative compliance pathway is to create an alternative means of complying with Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b. In other words, the City requests adding language in Provision A simply referencing and linking the alternative compliance pathway in Provision B.

3. INCLUDE THE WQIP PLANNING PROCESS IN THE ALTERNATIVE COMPLIANCE PATHWAY

In light of the direction from the State Water Resources Control Board ("State Board"), the alternative compliance pathway should be extended to include the WQIP planning phase. The alternative compliance pathway currently begins after the WQIP has been completed and is being implemented. It does not extend to the WQIP planning process. The Permit establishes a structure, with timelines over two years, for the WQIP planning process. During the planning process, Co-Permittees will, among other activities, identify water quality priorities, identify and prioritize known and suspected sources of pollutants and stressors, identify potential strategies to improve water quality, create an integrated monitoring and assessment program, and develop stormwater action levels and non-stormwater action levels into the WQIP. Each of these steps, and others, including the public participation process, occurs on a schedule and requires a substantial investment of time and resources.

Even though the City will participate in a Water Quality Improvement Plan and anticipates meeting all Permit-established planning requirements, the City and other Co-Permittees remain open to liability for prohibitions and limitations violations, especially from third parties, during the planning process. The ultimate goal of the planning process is to create a WQIP designed to address prioritized water quality conditions. If the City is forced to divert funds away from the planning process to defend a third-party lawsuit during the planning period, such diversion will

impede the City's ability to develop a thorough WQIP and undercuts the ultimate goal of the Permit.

Recognizing the need for a long-term approach to addressing water quality conditions, the State Board directed regional boards to "incorporate an ambitious, rigorous, and transparent alternative compliance path that allows permittees appropriate time to come into compliance with receiving water limitations without being in violation of the receiving water limitations during full implementation of the compliance alternative." (State Water Resources Control Board, Order WQ 2015-0075, p. 52.) With direction from the State Board to create a space and time for Co-Permittees to come into compliance with receiving water limitation without being in violation of the Permit, it is imperative that the Board extend the Permit's alternative compliance pathway to the planning phase. Because the planning process is integral to addressing water quality conditions, the City joins with the Co-Permittees in requesting that the alternative compliance pathway include the WQIP planning process.

4. REVISE ANNUAL MILESTONE REQUIREMENT TO INCLUDE MEANINGFUL MILESTONES (PROVISION B.3.c.(1)(a)(vii), B.3.c.(1)(d), B.3.c.(2)(c), B.3.c.(2)(d) and footnote 9)

The Tentative Order's alternative compliance pathway requires Water Quality Improvement Plans to set annual milestones for each numeric goal. These milestones must build on previous milestones and lead to the achievement of a final numeric goal. While improvements to water quality may be more difficult to attain in the absence of clear goals and milestones, an artificial annual milestone for each goal does not account for the complicated and long-term nature of the strategies designed to attain water quality objectives. Further, requiring annual milestones for every water body – pollutant combination restricts the Co-Permittees' ability to prioritize water quality conditions and dedicate limited resources to the highest priority milestones. In order to establish meaningful milestones over time, the milestones should be developed as part of the adaptive management process. The City therefore joins with the Co-Permittees in requesting a revision to the annual milestone requirement in Provisions B.3.c.(1)(a)(vii), B.3.c.(1)(d), B.3.c.(2)(c), B.3.c.(2)(d) and footnote 9.

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BEST BEST & KRIEGER
ATTORNEYS AT LAW

The City is grateful for SDRWQCB staff's efforts in drafting a fair and workable alterative compliance pathway. We believe that with the minor modifications requested in this comment letter and those of the County on behalf of the City and other Co-Permittees, the City will be a position to move forward with confidence in attaining water quality improvements in the region.

Sincerely,

Rebecca Andrews

Rebecca Andrews
for BEST BEST & KRIEGER LLP

cc: Richard Boon, County of Orange

Construction Industry Coalition on Water Quality

September 14, 2015

Mr. Wayne Chiu, Senior Engineer
San Diego Regional Water Quality Control Board
2375 Northside Drive, Suite 100
San Diego, Ca 92108

Via Email: sandiego@waterboards.ca.gov

RE: Comment - Tentative Order No. R9-2015-0100, Place ID: 686088WChiu

Dear Mr. Chiu:

The Construction Industry Coalition on Water Quality (CICWQ) is submitting comments concerning Tentative Order No. R9-2015-0100 (National Pollutant Discharge Elimination System (NPDES) Permit for Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region, Order No R9-2013-0001, as amended by Order No. R9-2015-0001 (Regional MS4 Permit)). We are submitting this letter on behalf of the CICWQ membership, which is described below.

CICWQ is an advocacy, education, and research 501(c)(6) non-profit group of trade associations representing builders and trade contractors, home builders, labor unions, landowners, and project developers. CICWQ membership is comprised of members of four construction and building industry trade associations in southern California: The Associated General Contractors of California, Building Industry Association of Southern California, Engineering Contractors Association, and Southern California Contractors Association, as well as the United Contractors located in San Ramon in northern California. Collectively, members of these associations build a significant portion of the transportation, public and private infrastructure, and commercial and residential land development projects in California.

We present two main points for Regional Board consideration regarding the Draft Regional MS4 Permit:

I. The Regional Board is requiring increasingly stringent on-site stormwater retention requirements without evidence the existing, 2010 Southwest Riverside County MS4 permit water quality requirements are not working to protect water quality and maintain beneficial uses.

With the release of the Draft Regional MS4 Permit to incorporate watersheds in Southwest Riverside County within the San Diego Regional Water Quality Control Board (Regional Board) jurisdiction, the Regional Board is proposing to enact the most

stringent on-site requirements for stormwater runoff anywhere in California. Despite the demonstrable improvements in water quality runoff noted by the Riverside County permittees in their Report of Waste Discharge, Regional Board staff continues to require additional and less flexible on-site prescriptive performance measures for retaining stormwater runoff.

The program changes proposed in the Draft Regional MS4 Permit are being made without presenting any factual evidence that the existing low impact development water quality performance standards are not working, which the County of Riverside has required since the requirements became effective in 2012. We believe that because the current Southwest Riverside County Permit requirements are working well to protect water quality, presenting any evidence to the contrary is not actually possible. We note no Findings in the Draft Regional Permit that would suggest a need for any changes to program implementation and management.

II. The Regional Board is eliminating exemptions for hydromodification control, even when stormwater runoff is conveyed in the MS4 system to significantly hardened or engineered channels.

CICWQ and its membership believe that the regulations are tending, at some point, to require hydromodification control for all priority development projects regardless of receiving water susceptibility to hydromodification effects. This regulatory direction is undoubtedly driven by environmental NGO advocacy for removal of all concrete lined channels and receiving waters and complete restoration of all significantly or completely lined channels to "natural" conditions, regardless of the existing land uses and feasibility. This effort ignores the vital role flood control facilities play in urban infrastructure and the protection of life and property, and it ignores the significant public investment in these systems. Loss of hardened channel exemptions will result undoubtedly in increased costs for new and redevelopment of most public and private properties within the Regional Board's jurisdiction, and require project proponents to engage in a potentially costly and cumbersome bureaucratic process to "mitigate" for the effects (even the lack of) of hydromodification with no environmental benefit.

According to the Regional Board, hydromodification control requirements are being required to maintain geomorphic stability in receiving waters in southern California. However, it is clear that the alignment, grade and cross section of many urban streams has been irrevocably altered. A regulatory requirement to return flows to pre-development conditions will not allow stream restoration to occur. For urban areas, the Permit should support projects that enhance the functions and values of the receiving water within the constraints of the urban environment. Removing exemptions without consideration, or requiring extensive additional study to support exemptions that have been granted for years, appears to be a poor policy decision and one that is not supported technically.

Specifically, nowhere in the Draft Regional MS4 Permit is the lack of clear evidence for program changes more evident than the requirements for installing

hydromodification controls at priority development sites in Provision E.3.c.(2). In particular, we note the Regional Board is on a path to remove long-standing exemptions from hydromodification control requirements for certain projects whose discharge is conveyed to receiving waters via significantly or completely hardened and engineered channels. In the Draft Regional MS4 Permit for Southwest Riverside County, the Regional Board has provided "interim" exemptions that, while welcome in the interim, should be granted outright and without any additional study or consideration. Nor should additional updates or study be required on the part of the co-permittees to support granting exemptions, as required in the BMP Design Manual update referenced in Provision E.3.c.(2)(e).

And, as we have commented on during the adoption process for the San Diego County Regional MS4 permit in 2012 and 2013 and for the South Orange County Regional MS4 permit in 2014, new hydromodification control requirements that require a priority project to "avoid critical sediment yield areas" are unnecessarily restrictive, and do not reflect the dynamic and variable nature of the sediment supply that is delivered to stream systems in southern California. Our membership continues to report instances where priority development projects are being significantly delayed or stopped all together, because of the inability to comply with the requirement to avoid critical sediment yield areas. The most prevalent reason given is lack of engineering tools and techniques to comply with such a sweeping provision.

In summary, we have commented to the Regional Board about hydromodification control requirements in MS4 permits within its jurisdiction in a number of instances in the recent past, and many of our concerns and comments remain relevant in the current proceedings. While we note many of our suggestions have been ignored or discounted, we incorporate nonetheless those comments by reference here and cite specifically:

1) Comment Letter --Administrative Draft Regional Municipal Separate Storm Sewer System (Tentative Order No. R9-2012-0011); submitted September 14, 2012. See Item No. 3, page 6.

2) Comment Letter -- Tentative Order No.R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu; submitted January 13, 2013; See Items 3 and 4, pages 4-6.

3) San Diego Regional Water Quality Control Board's Draft MS4 Permit: A case study; submitted May, 2013. See pages 3-8.

These documents are included as attachments to this comment letter.

CICWQ's membership is in the forefront of water quality regulation, providing to water quality regulators practical ideas and solutions that are implementable and that have as their goal clean water outcomes. If you have any questions or want to discuss the content of our comment letter, please feel free to contact me at (951) 781-7310, ext. 210, (909) 525-0623, cell phone, or mgrey@biasc.org.

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Respectfully submitted,

Mark Grey, Ph.D.
Technical Director
Construction Industry Coalition on Water Quality

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January 11, 2013
Mr. Wayne Chiu, P.E.
San Diego Regional Water Quality Control Board
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San Diego, Ca 92123-4340

Re: Comment Letter– Tentative Order No.R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu."

Dear: Mr. Chiu,

On behalf of Building Industry Association of Southern California, Inc. (BIASC), Construction Industry Coalition on Water Quality (CICWQ) and the members of both, we appreciate the opportunity to provide comments on the San Diego Regional Water Quality Control Board Tentative Order No. R9-2013-0001; NPDES No. CAS0109266, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems ("MS4s") Draining the Watersheds within the San Diego Region (the "Tentative Order"). In addition, we respectfully request that our comment letter submitted to the Regional Board on September 14, 2012 be made a part of our overall comments to the Tentative Order and admitted into the formal administrative record, because the constructive suggestions for permit improvement remain relevant at this point in the Tentative Order development.

BIASC is a nonprofit trade association representing nearly 1,000 member companies, which together have nearly 100,000 employees. For decades, BIASC's members have built the majority of the new homes in Ventura, Los Angeles, Orange, Riverside, and San Bernardino Counties in southern California. CICWQ is an education, research, and advocacy water quality coalition comprised of representatives from five industry trade associations (in addition to BIASC) which are involved in the development of public and private building, infrastructure and roads throughout California (Associated General Contractors, Engineering Contractors Association, Southern California Contractors Association, Engineering and General Contractors Association, and United Contractors). All of the above trade associations, their members and the union labor work force are affected by the post-construction runoff control requirements proposed in the Tentative Order, and this letter is meant to provide the San Diego Regional Board with constructive suggestions for improvement.

We appreciate the Regional Board's earlier release of a precursor to the Tentative Order as an Administrative Draft, and the extensive stakeholder involvement process that ensued over the summer and autumn of 2012. Unfortunately, the Tentative Order does not reflect critically important changes to the Tentative Order's Development Planning requirements which we and many other public and private stakeholders recommended, both during the focused stakeholder meetings and in comments submitted to the Regional Board. Moreover, Regional Board staff does not provide sufficient findings of fact to support the priority project water quality and hydromodification control design criteria and performance standards in the Tentative Order. The requirements proposed in the Tentative Order are vastly different from those contained in the 2010 South Orange and South Riverside County MS4 permits, and there is simply insufficient performance data to demonstrate the need for any change.

We are concerned that key water quality and hydromodification control provisions within the Development Planning section (Section C.3) are (i) unsupported by substantial evidence, (ii) very bad public policy, and (iii) not properly considered as legally required. Specifically, certain provisions: (i) lack sufficient auditing or performance data showing the need for or advisability of such requirements, (ii) lack technical or scientific basis, and (iii) depart without any justification from required and approved technical documents that have been issued by the San Diego Regional Board for priority development projects in San Diego, Orange, and Riverside Counties. In addition, the hydromodification control provisions illuminate the Regional Board's failure to consider the factors required by California Water Code section 13241 – especially subsection (b) thereof.

1. There are no findings of fact to support changes in the requirements to evaluate, design and install LID BMPs (Section E.3.c) when comparing the proposed requirements in the Tentative Order with that of the requirements in the 2010 adopted South Orange and South Riverside County MS4 permits.

The Orange and Riverside County permits have been in effect for a short period of time (<2 years); and there is no data (program audits or annual report data, for example) that we can find that would support any changes to priority development project water quality control design criteria (found in Section E.3.C of the Tentative Order). Moreover, in one particular instance concerning which we and others have repeatedly commented to Regional Board staff, there is no technical justification provided by staff for requiring biofiltration LID BMP to be sized at 1.5 times the remaining design capture volume not reliably retained on-site. Section E.3.c.(3)(b)(i)[c] requires that if biofiltration is used as an alternative compliance method the biofiltration BMP is required to be sized to 1.5 times the design capture volume, which is an increase from the existing South Orange County permit. The permit and the fact sheet provide no technical justification for the 1.5 factor and therefore this requirement should be deleted from the permit. BIASC and CICWQ comment letter submitted to the Regional Board on September

14, 2012 and attachments including suggested permit redline remains relevant in this matter. We have provided this here as Attachment1.

2. There are no findings of fact or supporting technical and scientific data indicating the need for changes in hydromodification control requirements for priority development projects.

As we have commented before, there needs to be (i) an in-stream hydromodification control performance standard using the erosion potential (EP) approach; and (ii) the permit must recognize that there are a number of different types of channel hardening that have been used for armoring in stream systems besides concrete. In Attachment 1, we again make suggestions for improving the consistency of hydromodification control standards with those identified and allowed in the South Orange County MS4 permit.

The Tentative Order provides an "on-site" option for addressing hydromodification through flow duration control. This is an important element of the hydromodification control standard. However the Tentative Order is incomplete in that it lacks an option to assess and demonstrate hydromodification control through in-stream metrics. In many cases, significant development within a watershed has already caused hydromodification impacts. Requiring project-by-project flow duration control for each new project may not address the existing issue as effectively as a regionally-coordinated approach that combines upland control with in-stream remedies. Including the EP standard—as BIASC and CICWQ urge--would enable the development of more comprehensive approaches that include both upland controls and stream modifications (i.e., restoration). This option is critical for more effectively and efficiently protecting the region's aquatic resources.

Additionally, the Tentative Order includes an unnecessarily narrow definition of hardened channels that includes only those channels lined with concrete. Other forms of artificial hardening may be comparably resistant to hydromodification impacts, such as channels that are lined with rip rap, armored with soil cement, or armored with other practices. While the co-permittees or the project proponent should be responsible for demonstrating that a specific channel material is sufficiently stable, the narrow definition currently provided by the Tentative Order does not allow the use of sound engineering judgment and does not allow for use of innovative materials.

The comment letter submitted by BIASC and CICWQ to the Regional Board on September 14, 2012 remains relevant here, as the Regional Board staff did not make any changes to the hydromodification control requirements except for minor exemption allowances for using USGB council's LEED for redevelopment program standards. Exemptions, generally, are welcome and appropriate. But, in practice, referencing a voluntary, national green building and

development certification program for use as part of a NPDES permit does not provide a viable pathway for most priority development projects that are located in already urbanized areas that are served by existing MS4 infrastructure. Exemptions identified in the adopted San Diego Hydromodification Management Plan are appropriate and should be cited and referenced in the Tentative Order, and any reference to USGB LEED standards deleted.

3. Preserve the 2010 adopted San Diego County Hydromodification Management Plan elements

The Regional Board staff has provided no technical justification for the new hydromodification provisions. The HMPs for San Diego and South Orange County are based on sound science and should be allowed time to understand if they are adequate for mitigating hydromodification impacts. The Regional Board adopted the San Diego Hydromodification Management Plan (HMP) in July 2010. Significant work, technical analysis and stakeholder input have gone into the development of the HMP and these requirements have been in effect for just 16 months. Rather than providing separate criteria, the permit should acknowledge implementation of the Regional Board approved HMP as a sufficient mechanism for meeting hydromodification requirements. Of particular note and concern is the removal of exemptions for certain priority development projects (projects in urban areas with greater than 70% existing impervious surface, for example) that discharge to an MS4 system that then discharges into a significantly hardened channel system. It is unquestionably bad public policy to require installation of controls (or payment of in-lieu fees to compensate for the inability to install controls) when there is no threat to the receiving water.

To this end--and for sake of brevity, we support and encourage the Regional Board to accept comments from Orange County Public Works which pertain to the hydromodification control requirements. Changes in permit language as indicated in the County's redline of the Tentative Order would sufficiently address our concerns about the tentative hydromodification control requirements, and we urge the Regional Board to accept these changes.

Regional Board staff has publically stated that the proposed hydromodification control requirements in the Tentative Order are consistent with the 2010 adopted HMP and that only minor adaptation is necessary. That assertion is simply not true and in fact adoption of the Tentative Order requirements will render the HMP obsolete and require a total overhaul. According to the County of San Diego and the co-permittees within the County (and private developer stakeholders), more than $1.5 million have been spent to date developing the plan and conducting required monitoring. By changing the performance standards, requiring hydromodification controls at all priority development projects, and removing standard exemptions that are found in all other 4th term MS4 permits in California, the Regional Board is sweeping away years of program development activities and turning program implementation on

its head. The Tentative Order should explicitly recognize the findings of hydromodification management plans (HMPs) that have been previously approved by this Regional Board. The South Orange County HMP and the San Diego County HMPs were both the products of rigorous technical analysis based on the state of the practice, which were reviewed in detail by Regional Board Staff. The findings of these efforts must not be jeopardized under the new terms of the Tentative Order. *S*pecifically, findings regarding exempt water bodies must be appreciated and upheld, and they should be explicitly recognized in the Tentative Order.

4. The Tentative Order's proposed hydromodification control measures betray the Regional Board's failure to take into account the considerations required by California Water Code section 13241

For years, BIASC and CICWQ have been urging the water boards when developing MS4 permit requirements to address and respect their longstanding legal obligation to take into account the six, specified, non-exclusive factors which are set forth in California Government Code section 13241. The water boards have persistently refused. Most recently (just months ago), the Los Angeles Regional Board dismissed its obligation to consider the Section 13241 factors by noting that it had, in fact, more or less considered two of them (economics and some technical considerations). If the Regional Board here were to adhere to such a position, it would act in violation of California law and without justification.

There is perhaps no greater example of a permit condition written pursuant to a failure to consider the Section 13241 factors than the hydromodification control measures in the Tentative Order – particularly those which impose heroic, expensive engineering standards on development that drains into hardened flood control channels. Section 13241, subsection (b), requires consideration of the "[e]nvironmental characteristics of the hydrological unit under consideration…." By imposing expensive hydromodification control measures even where a receiving flood control system is already firmly hardened, the Tentative Order ignores this Section 13241, subsection (b), factor (obviously so, and regrettably consistent with the Regional Board's general refusal to take into account all six Section 13241 considerations).

BIASC and CICWQ believe that the water boards' persistent refusal to take demonstrably and meaningfully into account the Section 13241 required considerations results from a mistaken view of the applicable law. Specifically, the water boards' seemingly hold to the belief that the "maximum extent practicable" standard in federal law absolves the state agencies of any obligation to apply Section 13241when issuing MS4 permits. If indeed the water boards' legal position is thus, then it reflects a mistaken view of the degree of "federalism" reflected in the Clean Water Act and its interplay with the California Water Code. Moreover, such a position would reflect a failure to apply basic "federal preemption principles," which apply any time a party claims that federal law displaces state law.

BIASC and CICWQ urge the Regional Board to reconsider and reverse its refusal to apply meaningfully all six Section 13241 considerations, and to correct the Tentative Order accordingly.

Concluding Remarks:

BIASC and CICWQ have been active participants and contributors to the creation of improved MS4 permits across southern California. We continue to believe that rational, *implementable*, and *effective* permit requirements are critical to achieving great progress concerning water quality and our environment. We hope that these comments are received in the manner in which they are intended – to create a workable permit that improves water quality to the maximum extent practicable. We remain committed to a positive dialog with the Regional Board and its staff – one that will result in an informed, balanced and effective permit.

If you have any questions or want to discuss the content of our comment letter, please feel free to contact me at (951) 781-7310, ext. 213, (909) 525-0623, cell phone, or mgrey@biasc.org.

Sincerely,

Mark Grey, Ph.D.
Director of Environmental Affairs and Technical Director
Building Industry Association of Southern California and
Construction Industry Coalition on Water Quality

Enclosures:
Attachment 1

cc. Andy Henderson, Esq., Building Industry Legal Defense Foundation

020357

VIA E-MAIL

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September 14, 2012
Ms. Laurie Walsh, Senior Engineer
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, Ca 92123-4340

Re: ADMINISTRATIVE DRAFT REGIONAL MUNICIPAL SEPARATE STORM SEWER SYSTEM (Tentative Order No. R9-2012-0011)

Dear: Ms. Walsh

On behalf of the Building Industry Association of Southern California, Inc. (BIA/SC) and the Construction Industry Coalition on Water Quality (CICWQ) and the members of both, we appreciate the opportunity to provide comments on the Administrative Draft of the San Diego County Regional MS4 Permit (Administrative Draft Permit). We submit these comments in addition to and in support of comments made by our affiliate in San Diego County, the Building Industry Association of San Diego and its coalition partners, and comments submitted by Rancho Mission Viejo.

BIA/SC is a nonprofit trade association representing nearly 1,000 member companies, which together have nearly 100,000 employees. BIA/SC's members have, for decades, built the majority of the homes in Ventura, Los Angeles, Orange, Riverside, and San Bernardino Counties in southern California. CICWQ is a water quality coalition comprised of representatives from five industry trade associations (in addition to BIA/SC) involved in the development of public and private building, infrastructure and roads throughout California (Associated General Contractors, Engineering Contractors Association, Southern California Contractors Association, Engineering and General Contractors Association, and United Contractors). All of the above trade associations and their members and the union labor work force are affected by the post-construction runoff control requirements proposed in the Draft Permit, and this letter and supporting attachments are intended to provide the San Diego Regional Board staff with constructive suggestions for improvement.

We appreciate the Regional Board's release of the Administrative Draft Permit in April 2012, and the extensive stakeholder involvement process that ensued over the summer of 2012. The comments provided here are intended to further meet the permit's underlying objective of protecting and improving water quality within the watersheds administered by the San Diego Regional Board. Our comments, supporting attachments, and suggested redline permit language

modifications reflect years of working not only on MS4 permits issued by the San Diego Board, but other MS4 permits administered by the Los Angeles, Santa Ana, and San Francisco Bay Regional Water Quality Control Boards.

We have four primary concerns with the Administrative Draft Permit content and the following discussion summarizes those concerns and provides the technical basis for those concerns including supporting attachments:

1. **Administrative Draft Permit Provision E. 3.c.(2)(c) establishes a zero discharge standard for biofiltration-type LID BMPs that are designed with an outlet/underdrain. This type of LID BMP cannot meet the on-site design capture volume standard as it is written. Such a zero discharge standard is scientifically and technically unsound and unsupported.**

Biofiltration is an established LID BMP for use in attempting to mimic pre-development hydrology. The US EPA, in multiple guidance documents produced since 2006, have recognized the use of biofiltration-type systems such as curb contained biofilters, bioswales, rain gardens, and using landscape areas for impervious area disconnection as essential LID BMP elements to include in land development projects, a few of which are cited below. The inclusion of biofiltration BMPs in US EPA's menu is a reflection of the practical limitations to retention of stormwater – retention practices are not universally feasible or desirable. When appropriately selected and designed, biofiltration BMPs achieve high levels of pollutant removal, which may exceed pollutant removal achieved in retention BMPs, particularly in cases where retention BMPs are inappropriately applied.

The retention requirement is contrary to EPA's definition of LID because it disfavors development strategies designed to appropriately "filter" runoff, such as bioretention cells or other vegetated LID BMPs. There are five principal EPA documents regarding LID; and four of them identify the appropriate roles of biotreatment-type BMP, such as detention (i.e., slow down, treat through vegetation, and then release across property lines), filtration, and surface release of stormwater.

In a compilation of case studies by EPA, most of 17 exemplary projects included biotreatment elements, such as bioretention, swales, and wetlands. *See* U.S. EPA 841-F-07-006. Each of two case studies described in another EPA document (s*ee* Attachment 1 at pp. 1-2, EPA 841-B-00-005) included the use of underdrains, and the example in one of the two specifically fed into the MS4 system at issue. Another EPA document updated in January 2009 refers to the many practices used to adhere to LID principles of promoting a watershed's hydrologic and ecological functions, such as bioretention facilities and rain gardens. *See* Attachment 2 at p. 2, EPA-560-F-07-231 (describing "an under-drain system to release treated stormwater off site," permitting planted areas to "safely allow filtration and evapotranspiration of stormwater");

http://www.epa.gov/owow/nps/lid/ (fact sheet describing under-drains used to release treated stormwater off site and permitting planted areas to safely allow filtration of stormwater). Thus, EPA's literature and guidance clearly recognize the important and even necessary role that biofiltration/biotreatment approaches play in real-world implementation of LID principles.

The National Research Council, in their 2008 Report to Congress titled "Urban Stormwater Management in the United States" cite the use of biofiltration and bioretention systems in improving water quality and in attempting to mimic predevelopment hydrology at many different site contexts and locations across the United States. The 2008 NRC report contains and cites numerous examples of using biofiltration type systems to reduce runoff volume and pollutant loads. The 2008 NRC Report clearly recognizes the role that biofiltration systems play in the LID BMP feasibility and selection process, and in achieving runoff management goals. The report states "In some situations ARCD (Aquatic Resources Conservation Design) practices will not be feasible, at least not entirely, and the SCMs [stormwater control measures] conventionally used now and in the recent past (e.g., retention/detention basins, biofiltration without soil enhancement, and sand filters) should be integrated into the overall system to realize the highest management potential." Note that the NRC report definition of ARCD includes both retention and biofiltration elements.

From a management perspective, a review of 4th Term Phase I MS4 permits within California (San Francisco Bay Area, Sacramento Area, North and South Orange County, Western and Southern Riverside County, and San Bernardino County) shows that the use of biofiltration to meet water quality volume and flow control performance standards is clearly allowed (See matrices submitted by BIA/SC_CICWQ at the August 22, 2012 Stakeholder Meeting and provided to the Regional Board by Mark Grey on August 24, 2012). These Regional Boards in California recognize that biofilter-type LID BMPs are an integral component of applying site design principles which seek to mimic pre-development hydrology. Furthermore, these permits implement a clear LID BMP feasibility and selection process, one that first requires examination of on-site retention systems (infiltration, harvest and use, and evapotranspiration), before moving to the evaluation and potential selection of bioinfiltration (some infiltration achieved) and biofiltration systems. This feasibility evaluation hierarchy, which is clearly explained in the South Orange County and South Riverside County MS4 permits adopted by the San Diego Regional Board in 2009 and 2010, respectively, must be preserved and included in the next version of the Administrative Draft Permit.

In summary, the zero discharge standard established by the Administrative Draft Permit significantly narrows the definition of LID, which is contrary to US EPA guidance, the 2008 NRC Report, and the standards established in recently-adopted Permits by the San Diego Regional Board and other Regional Boards. In essence, the proposed provisions would establish a standard that (i) will be impracticable in a relatively large proportion of sites, and (ii) has not

been demonstrated to be necessary to protect receiving water quality. We provide in Attachment 3 suggested permit language to address the continued use of biofiltration.

2. **A mitigation requirement is established when using flow-thru biofiltration-type LID BMPs to manage that portion of the SWQDv that is not retained on-site. This requirement is inconsistent with all other adopted Phase I MS4 permits in California and nationally. Biofiltration and bioretention BMPs are established LID practices; requiring accompanying mitigation of SWQDv that has already been biofiltered penalizes and dis-incentivizes use of these controls.**

Equally problematic, because it does not allow biofiltration type LID BMPs to meet the on-site storm water quality design volume (SWQDv) standard, is the current requirement in Administrative Draft Permit Provision E. 3.c.(2)(c) to "perform mitigation for the portion of the pollutant load that is not retained on-site." In other words, the draft provisions would require that, if a project proponent cannot retain 100 percent of the SWQDv on-site, and must therefore use biofiltration LID BMPs (with a treated discharge), then the use and installation of these systems will trigger an off-site mitigation or in-lieu fee program participation requirement. This provision in the Administrative Draft Permit is technically unjustified, disfavors the use of all types of recognized biofiltration LID BMPs, and could theoretically require a project proponent to not only pay for the installation and O&M of a biofiltration LID BMP, but also require mitigation or fee payment for that portion of runoff managed by it.

Biofiltration BMPs including natural treatment systems such as those that are part of the Irvine Ranch Water District's Natural Treatment System in Orange County (a regional example) can remove vast quantities of pollutant load, and provide other benefits such as habitat, flood control, and aesthetic, recreational and educational value. To relegate multi-benefit biofiltration or biotreatment BMPs applied at a site scale to a status inferior to on-site retention BMPs is not justified on a water quality basis, and is poor public policy, essentially depriving the region of an extremely important and effective approach to managing water quality.

While we agree that project proponents should be required to retain stormwater where technically and economically feasible, there are numerous conditions beyond a project's control that make retention infeasible, undesirable and/or ineffective. For example, in achieving a zero discharge standard, it is necessary to either maintain pre-project ET (which is generally impracticable) or increase the volume of stormwater that is infiltrated (which is the common result). Over-infiltrating rainwater can have adverse consequences such as altering the natural flow regime of the receiving waters such that riparian habitat changes, mobilizing pre-existing contamination in shallow groundwater, increasing inflow and infiltration to sanitary sewers, causing damage from rising groundwater, and other potential effects. By discouraging the use of biofiltration LID BMPs where there are more appropriate than retention, the Administrative

Draft Permit irresponsibly encourages the use of retention where it may have adverse consequences.

Retention BMPs are not necessarily more effective than biofiltration BMPs as the Administrative Draft Permit implies, especially considering the back-to-back-to-back nature of storm systems that arrive in southern California during winter months and deliver the majority of total rainfall volume. The Administrative Draft Permit establishes a SWQDv that must be retained, but does not specify the time over which this volume must be drawn down (i.e., drained) in order to have capacity for the volume from subsequent storms. The rate at which the SWQDv can be drained is a function of the infiltration rates of soils and the demand for harvested water. Where soils are not sufficiently permeable and/or where harvested water demands are moderate to low, the drawdown time of retention BMPs can be in the range of several days to several weeks.

In comparison, biofiltration BMPs are designed with engineered soils that can generally drain the SWQDv much more quickly, on the order of several hours. In cases where retention opportunities are limited, this results in a higher level of capture and treatment by biofiltration BMPs than retention BMPs, which can more than offset the lower "treatment efficiency" afforded by biofiltration compared to full retention. For example, based on rigorous technical analysis contained in the Orange County Technical Guidance Document (Figure III.2, Page III-11), a hypothetical biofiltration BMP draining in 12 hours would achieve approximately 25 percent greater treatment of average annual stormwater runoff volume than an equivalently sized retention BMP that drains in 72 hours and approximately 60 percent greater treatment than a retention BMP that drains in 10 days.

Because drawdown time is an important factor in (i) assessing BMP effectiveness and (ii) evaluating the site-specific determination of whether retention or biofiltration are preferable, we strongly recommend (in addition to allowing the use of biofiltration or biotreatment systems to meet the retention standard) including a secondary performance metric of managing 80 percent of annual runoff volume using continuous simulation modeling. This provides a means of accounting for the performance of strictly on-site retention BMPs versus the addition of biofiltration or biotreatment BMPs which can be designed to manage a greater volume of average annual runoff volume than retention BMPs of the same size. The total amount of water captured and treated and associated pollutant load reduction should be a primary deciding factor in whether retention or biofiltration BMPs are selected for a given project. As written, the Administrative Draft Permit strongly discourages an entire group of effective practices which have the potential to provide better protection of water quality, when compared to retention, in a wide range of cases. Attachment 3 provides suggestions for permit language which corrects these deficiencies.

3. Hydromodification control measures should allow use of the EP method to meet in stream standards; recognize multiple types of channel hardening when evaluating applications for hydromodification control exemptions

In Attachment 3, we also make suggestions for improving the consistency of hydromodification control standards with those identified and allowed in the South Orange County MS4 permit. Specifically, we recommend providing for an in-stream hydromodification control performance standard using the erosion potential (EP) approach and recognizing that there are a number of different types of channel hardening that have been used for armoring in stream systems besides concrete.

The Administrative Draft Permit provides an "on-site" option for addressing hydromodification through flow duration control. This is an important element of the hydromodification control standard. However the Administrative Draft Permit is incomplete without an option to assess and demonstrate hydromodification control through in-stream metrics. In many cases, significant development within a watershed has already caused hydromodification impacts. Requiring project-by-project flow duration control for each new project may not address the existing issue as effectively as a regionally-coordinated approach that combines upland control with in-stream remedies. Including the EP standard enables the development of more comprehensive approaches that include both upland controls and stream modifications (i.e., restoration). This option is critical for more effectively and efficiently protecting the region's aquatic resources.

Additionally, the Administrative Draft Permit includes an unnecessarily narrow definition of hardened channels that includes only those channels lined with concrete. Other forms of artificial hardening may be comparably resistant to hydromodification impacts, such as channels that are lined with rip rap, armored with soil cement, or armored with other practices. While the Permittees or the project proponent should be responsible for demonstrating that a specific channel material is sufficiently stable, the narrow definition currently provided by the Administrative Draft Permit does not allow the use of sound engineering judgment and does not allow for use of innovative materials.

Finally, the Administrative Draft Permit should explicitly recognize the findings of hydromodification management plans (HMPs) that have been previously approved by this Board. The South Orange County HMP and the San Diego County HMPs were both the products of rigorous technical analysis based on the state of the practice, which were reviewed in detail by Board Staff. The findings of these efforts must not be jeopardized under the new terms of the Administrative Draft Permit. Specifically, findings regarding exempt water bodies must be appreciated and upheld, and they should be explicitly recognized in the Administrative Draft Permit per our suggested redline.

4. **The Permit must preserve important provisions for watershed level design and implementation of LID BMPs.**

The proposed development project criteria and requirements in the Administrative Draft Permit do not include the language in the current South Orange County Permit that provides for Alternative Compliance for Watershed-Based Planning (See page 40-41 of the 2009 Permit). We ask that the Regional Board continue to recognize the protections to water quality and enhancements to water bodies which are achieved through watershed-based projects such as the Rancho Mission Viejo Ranch Plan, as it has in the current South County MS4 permit, and define Watershed Planning as an alternative and co-equal approach to the project-specific requirements. Attachment 3 to this submittal contains suggested redline language for addition to the Administrative Draft Permit.

Concluding Remarks:

BIA/SC and CICWQ have been active participants and contributors to the creation of improved MS4 permits across southern California. We continue to believe that rational, *implementable*, and *effective* permit requirements are critical to achieving great progress concerning water quality and our environment. We hope that these comments are received in the manner in which they are intended – to continue the discussion of how we can create a workable permit that improves water quality to the maximum extent practicable. We remain committed to a positive dialog with the Board and its staff – one that will result in an informed, balanced and effective permit.

If you have any questions or want to discuss the content of our comment letter, please feel free to contact me at (951) 781-7310, ext. 213, (909) 525-0623, cell phone, or mgrey@biasc.org.

Sincerely,

Mark Grey, Ph.D.
Director of Environmental Affairs and Technical Director
Building Industry Association of Southern California and
Construction Industry Coalition on Water Quality

SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD DRAFT MS4 PERMIT: A CASE STUDY

Dennis Bowling, PE, MS; Mark Grey, Ph.D; Luis Parra, Ph.D, PE, MS, CPSWQ, ToR, D.WRE; Tory Walker, PE, CFM; Shawn Foy Weeden, GE, PE

On March 27, 2013, the San Diego Regional Water Quality Control Board (Region 9) ("RWQCB") released its Revised Tentative Order No. R9-2013-0001 (National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region) (hereafter, "Revised Draft Permit"). This article analyzes four components of the Revised Draft Permit, and identifies concerns with the Revised Draft Permit's treatment of those components based on the evidence that was before the RWQCB during its crafting of the Revised Draft Permit. The four components of the Revised Draft Permit are: hydromodification BMP requirements, the identification of a "pre-development" condition, Low Impact Development and the removal of pollutants in lieu of retaining stormwater onsite, and sediment transport requirements.

I. Hydromodification BMP Requirements

The Revised Draft Permit's Requirements

The Revised Draft Permit mandates that Copermittees require Priority Development Projects[1] to implement onsite Best Management Practices[2] ("BMPs") to manage hydromodification that may be caused by storm water runoff discharged from a project such that post-project runoff conditions must not exceed pre-development runoff conditions by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat downstream of Priority Development Projects). (Revised Draft Permit, Provision E.3.c.(2)(a).)

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[1] Priority Development Projects include: new development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site), or redevelopment projects that create or replace 5,000 square feet or more of impervious surface (collectively over the entire project site); new projects that create 5,000 square feet or more of impervious surface (collectively over the entire project site), and support restaurant, hillside development project, parking lot, or street, road, highway, freeway and driveway uses; new or redevelopment projects that create or replace 2,500 square feet or more of impervious surface (collectively over the entire project site), and discharge directly to an Environmentally Sensitive Area; new development projects that support use of an automotive repair shop or retail gasoline outlet, and new or redevelopment projects that result in the disturbance of one or more acre of land and are expected to generate pollutants post construction. (Revised Draft Permit, Provision E.3.b.(1))

[2] The Revised Draft Permit defines Best Management Practices as "Defined in 40 CFR 122.2 as schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage." (Revised Draft Permit, Attachment C, p. C-2.)

Copermittees have the discretion to exempt a Priority Development Project from Provision E.3.c.(2)(a)'s hydromodification management BMP performance requirements in three limited circumstances: where the project discharges storm water runoff to existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; where the project discharges stormwater runoff to conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific ocean; where the project discharges storm water runoff to an area identified by the Copermitee as appropriate for an exemption by the Watershed Management Area Analysis incorporated into the Water Quality Improvement Plan pursuant to Provision B.3.b.(4). (Revised Draft Permit, Provision E.3.c.(2)(d).) The Fact Sheet in support of the Revised Draft Permit ("Fact Sheet') states that, other than the projects exempted through the Watershed Management Area Analysis, the exemptions are considered appropriative because there is no threat of erosion to downstream receiving waters. (Fact Sheet, page F-102.)

The RWQCB describes its position regarding its ability to include the hydromodification management requirements in the Revised Draft Permit in its Response to Comments on Tentative Order No. R9-2013-0001 ("Response to Comments"). Specifically, the Board states that federal law mandates that MS4 permits require management practices that will result in reducing pollutants to the maximum extent possible. The RWQCB states that the Revised Draft Permit's requirement that Copermittees require Priority Development Projects to control post-project runoff flow rates and durations so that they do not exceed pre-development runoff flow rates and durations by more than ten percent is appropriate and necessary to reduce erosion and the discharge of pollutants into receiving waters. (Response to Comments, pages 43-45.) In response to concerns regarding the potential requirement of hydromodification management BMPs in instances where hydromodification would not take place, the RWQCB included in the Revised Draft Permit the exemption described above for projects that discharge to conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to the receiving waters. (*Id*.) The RWQCB, however, did not identify the extent to which such channels exist and would be a practical response to the challenge presented by complying with the hydromodification requirements in various venues.

In response to comments regarding the RWQCB's ability to regulate storm flow through hydromodification management requirements, the RWQCB states that the hydromodification management BMP requirements are for the control of pollutants in storm water discharges from the MS4. (Response to Comments, pages. 58-60.) While storm flow itself may be regulated as a result of the regulation of the pollutants within those flows, the RWQCB states that the hydromodification management BMP requirements are necessary to control the discharge of pollutants generated by new development and significant redevelopment projects in storm water discharges from the MS4 to the MEP. (*Id*.)

The Revised Draft Permit's Requirements are Unsupported

Both the Fact Sheet in support of the Revised Draft Permit and the RWQCB's Response to Comments cite to certain evidence that the RWQCB claims supports the hydromodification BMP requirements included in the Revised Draft Permit. However, as described below, this evidence

does not support the manner in which the RWQCB has incorporated hydromodification BMP requirements, particularly in regard to the Revised Draft Permit's failure to categorically exempt from compliance with the Hydromodification BMP requirements those projects that will discharge to a hardened channel that is not lined with concrete.

The Fact Sheet cites Assessing the Health of Southern California Streams, Stormwater Monitoring Coalition, Fact Sheet (Fact Sheet page F-89, Footnote 29[3]) ("SWMC Fact Sheet") in support of its claim that hydromodification is largely responsible for stream system degradation in San Diego County and that steam stressors including percent sands and fines present, channel alteration, and riparian disturbance are related to physical habitat changes caused by hydromodification. In the preparation of the SWMC Fact Sheet, more than 120 sites were sampled to provide data to make this determination, and the Southern California index of biotic integrity used to differentiate stream biological condition. The determination of relative degradation of stream (as compared to minimally disturbed reference sites) was made using a statistical method known as relative risk analysis. However, the SWMC Fact Sheet contains no discussion or presentation of the stream channel conditions found at the more than 120 sites used for the risk analysis.

Further, the SWMC Fact Sheet does not provide any data or support for modifying the existing hydromodification control requirements for significantly hardened channels defined in the 2007 version of the San Diego County MS4 Permit, or the process for obtaining a waiver from onsite compliance per the 2009 approved San Diego Hydromodification Management Program. The SWMC Fact Sheet describes an on-going study of Southern California streams and their biological characteristics relative to changes potentially caused by hydromodification. However, the SWMC Fact Sheet makes no distinction in stream susceptibility to hydromodification for those systems that are already significantly hardened. Accordingly, the SWMC Fact Sheet does not support any conclusions regarding the specific effects of or susceptibility to hydromodification on creeks, streams and associated habitats in San Diego County, or limiting the Draft Revised Permit's hydromodification exemption to only concrete lined channels.

The Fact Sheet cites Schueler and Holland, 2000, Storm Water Strategies for Arid and Semi-Arid Watersheds (article 66) The Practice of Watershed Protection (Fact Sheet page F-90, Footnote 30) to support its finding that increases in watershed imperviousness of 9-22% can result in increased peak flow rates and that these increased flow rates have an effect on channel morphology. This article describes climatalogical and hydrological variables that influence stormwater runoff generation in the arid west, in general, and provides recommendations for managing stormwater runoff using best practices to control pollutants in runoff and protect receiving waters from geomorphological changes. It does not include or address any issue related to already hardened channels systems or their susceptibility to the effects of hydromodification as a result of urban development.

[3] All references to footnotes within the Fact Sheet are in reference to the footnotes as they appear in the March 27, 2013 strikeout version of the Fact Sheet, recognizing that footnote references may change in the final version of the Fact Sheet.

The Fact Sheet cites Stein, E. and Zaleski S., 2005. Technical Report 475. Managing Runoff to Protect Natural Streams: The Latest Developments on Investigation and Management of Hydromodification in California. December 30, 2005. (Fact Sheet page F-90, Footnote 31) for the proposition that increases in uncontrolled imperviousness of as little as 3-10% can result in physical degradation of intermittent and ephemeral streams, and that stream systems in California are more susceptible to morphological changes than other areas in the US. However, the technical paper itself contains qualifying findings, not addressed by RWQCB in the Fact Sheet, concerning management of hydromodification effects. Specifically, Stein and Zaleski conclude that "not all streams will respond in the same manner [to the effects of hydromodification]" and that "Certain management strategies need to account for differences in stream type, stage of channel adjustment, current and expected amount of basin impervious cover, and existing or planned BMPs." (*Stein & Zaleski*, at page 15.)

Further, from a planning perspective, the authors of the technical report recommend that hydromodification should be addressed in both General and Specific Plans in terms of the location and design of new development, as site-by-site or project-specific approaches tend to be less effective and more costly to implement. (*Id.*, pages 11-12.) The authors go on to recommend that streams be surveyed and classified in order to identify areas with the greatest risk of impact from hydromodification. (*Id.*, page 15.) Taken collectively, these statements support recognition of the nature of channel condition in establishing the need for protection from hydromodification effects, which the Draft Revised Permit does not do. To rely on this article for support, the RWQCB would need to defer the proposed hydromodification provision to watershed specific implementation under each WQIP rather than the broad implementation proposed in the Draft Revised Permit.

The Fact Sheet further cites the USEPA, Reducing Stormwater Costs through Low Impact Development Strategies and Practices, December 2007 (Fact Sheet, page F-90 Footnote 32) to support the use of water quality and hydromodification control approaches using Low Impact Development ("LID") type controls, applied at a site scale regardless of receiving water or watershed condition. This USEPA study includes conclusions drawn from case studies done throughout the United States. The Fact Sheet cites the study to support and justify the development of hydromodification control requirements for all projects in San Diego County, yet the document does not include citation to specific evidence as to the need for or effectiveness of controls or whether they would be effective in the San Diego region as opposed to the specific case studies. The study highlights seventeen case studies of the implementation of LID principles into urban stormwater runoff management, with an emphasis on comparing the cost of installing LID BMPs to traditional or conventional stormwater management controls. However, there is no data or analysis presented concerning hydromodification; rather, LID principles are emphasized generally.

The Fact Sheet cites the website www.lowimpactdevelopment.org (Fact Sheet, page F-92 Footnote 34) in support of the Revised Draft Permit's use of the definition of Low Impact Development as crafted by the Low Impact Development Center, located in Maryland. However, this general citation offers no specific evidence or support other than to bolster the RWQCB's emphasis on LID BMPs applied at the site scale as a minimum compliance measure with MS4 permit conditions.

The Fact Sheet cites Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets (USEPA 2008) (Fact Sheet, page F-95 Footnote 38) to support the use of USEPA Green Streets Guidance to design and construct new roadways or significant roadway re-construction, which, if followed, allows project proponents to be exempted from Priority Development Project status. (Fact Sheet, pages F-94-F-95.) It is also cited in support of granting exemptions for construction of new or retrofit paved sidewalks, bicycle lanes, or trails that are designed to direct runoff to vegetated pervious areas (biofiltration systems, for example). According to the Fact Sheet, the exemptions are provided to "encourage these types of projects because they provide multiple environmental benefits such as promoting walking rather than driving, which will in turn improve air quality." (Fact Sheet, page F-94.)

However, the data in the publication do not address any specific requirement related to hydromodification control, but highlight the necessary consideration of the nature of the existing built environment encountered when building in urban areas. The publication's intent is clearly stated in its introduction: "This paper will evaluate programs and policies that have been used to successfully integrate green infrastructure into roads and right-of-ways." Integration of runoff controls into the context of the existing built environment is an essential consideration.

In fact, the logic cited by the RWQCB in the Fact Sheet in allowing exemptions for projects in dense urban areas that use green infrastructure techniques to the maximum extent practicable must be considered and extended to exemptions for hydromodification control when the ultimate receiving waters are significantly hardened using concrete or other armoring techniques. The Fact Sheet finds that by retrofitting the urban landscape with roadways using green infrastructure, it "recognizes that there are spatial constraints associated with these projects, and implementation of structural BMPs are not always feasible." (Fact Sheet, page F-95.) This recognition must be made equally with the need to consider or install hydromodification controls, especially when there is no threat to receiving water channel stability, and/or space constraints may preclude installation of large structural controls.

Housing, retail, and commercial development are now regulated to occur primarily in existing urban areas in order to concentrate population and employment in already dense or increasingly dense urban areas. *See* SANDAG 2050 Regional Transportation Plan, p.3-3 ["[The San Diego] region will meet or exceed [the SB 375] targets by, among other means, using land in ways that make developments more compact, conserving open space, and investing in a transportation network…"]; California Gov't Code § 65584.04(d)(2)(B) [California's metropolitan planning organizations are directed by SB 375 to consider the "availability of land suitable for urban development" -- including "opportunities for infill development and increased residential densities."]; California: A Primer on AB 32 and SB 375, Partnership for Sustainable Communities [an "[I]ncreasing the number of people living in cities and compact suburbs where transit and amenities are already in place may have a bigger impact on regional emissions, because those people will tend to walk to stores and take transit to work.".) Projects located in urban areas must comply with water quality LID treatment control requirements to the MEP, which will provide multiple environmental benefits, including improving receiving water quality for those runoff events up to the 85th percentile 24-hour storm. As urban areas are already served by hardened storm drain systems and flood control channels, there will be no effect on beneficial

uses in the receiving water from runoff greater than the water quality design capture volume. In fact, water quality would be expected to improve through the implementation of LID BMPs, and other benefits will be realized including decreases in traffic and associated pollutant load production, improved air quality through a reduction in vehicle traffic, and an overall increase in urban vegetation through the introduction of vegetated bioretention devices and urban street vegetation plantings as recommended in the Green Streets Guidance document.

Both the Fact Sheet and the Response to Comments cite E.D. Stein, F. Federico, D.B. Booth, B.P. Bledsoe, C. Bowles, Z. Rubin, G.M. Kondolf, A. Sengupta. Technical Report 667. Southern California Coastal Water Research Project. Costa Mesa, CA (2012) (Fact Sheet page F-101 Footnote 41; Response to Comments, pages 171, 183-184). The Fact Sheet cites Technical Report 667 in support of the development and use of an Alternative Compliance Program for those Priority Development Projects that cannot manage the applicable hydromodification control volume onsite, and instead require an off-site location in order to provide equivalent control or in-lieu payments to a fund providing resources to upstream or across watershed boundary projects. (Fact Sheet, page 101.) In addition, the RWQCB's Response to Comments cites the Technical Report in response to stakeholder comments in support of the very limited granting of exemptions to Priority Development Projects for installing onsite hydromodification control.

An Alternative Compliance Program is an established element of fourth term Phase I MS4 permits in California. However, with respect to considering and granting limited hydromodification control exemptions as described in the Response to Comments, at pages 171, 183-184, and 190, the RWQCB misinterprets the Technical Report's findings and the findings of an underlying scientific study cited in the report, and it does not consider other important findings and statements made in the report to support consideration of such exemptions.

In responding to comments regarding Hydromodification BMP requirements, the RWQCB cites two of the Technical Report's findings to support the statement that it "disagrees conceptually that blanket exemptions should be granted to all redevelopment projects that discharge to hardened channels." (Response to Comments, pages 183-184). First, the Regional Board incorrectly cites the Technical Report's finding that "the exemption of many small projects from hydromodification controls can result in cumulative impacts to downstream waterbodies...." (Technical Report 667, page 26; see Response to Comments, pages 183 and 190) This finding was made relative to receiving waters that are known to be susceptible to the additive effects of hydromodification, not with specific respect to receiving waters that are already concrete lined or otherwise significantly hardened. Moreover, the quotation's placement in the report is (i) found within a discussion of watershed scale hydromodification management concepts (especially as it applies to known or potentially susceptible receiving waters), not with specific respect to receiving waters that are already significantly hardened, and (ii) within a specific discussion of how current management strategies in municipal stormwater permits apply hydromodification standards; the author's note that requiring LID at all projects is positive measure for hydromodification, but the RWQCB's citation to Technical Report 667 does not appear to acknowledge this point.

The RWQCB cites the Technical Report work done by Booth and Jackson (1997) in King County, Washington to support its position that blanket exemptions not be granted to Priority Development Projects. This peer reviewed article described work done in an area undergoing rapid urbanization in east King County, Washington, where stream hydromodification sensitivity to land development was being recognized and measured. The empirical underpinning of the article was the changes noted in watershed imperviousness as a result of land development and corresponding changes in receiving water geomorphology as a result of development induced hydromodification. The watersheds and streams draining those watersheds were predominately under forest cover (see Booth and Jackson (1997) Table 1), which is unlike any receiving water system in San Diego County, and the specific stream systems were "natural" in channel condition. The article did not mention or address watersheds containing hardened receiving water channels. The conditions described by Booth and Jackson (1997) are much different and not representative of the conditions experienced by projects being developed within urban areas served by already hardened channel systems, and therefore do not support the RWQCB's position.

Technical Report 667 addresses the fact that stormwater permits may offer exemptions "for projects discharging to hardened channels or waterbodies," and cautions that "these exemptions may not be supportive of future stream restoration possibilities." Yet, its authors hedge such statements by stating that "a further limitation of the current permit structure is that there is no consideration of project characteristics such as position within the watershed and sensitivity of the receiving water reach....." (Technical Report 667, page 26.)

Second, the RWQCB repeatedly quotes Technical Report 667's finding that "an effective management program will likely include combinations of onsite measures (e.g., low-impact development techniques), in-stream measures (e.g., stream habitat restoration), and off-site measures. Off-site measures may include compensatory mitigation measures at upstream locations that are designed to help restore and manage flow and sediment yield in the watershed." (Technical Report 667, Page 26; see Response to Comments, pages 171, 184, 190; Fact Sheet, Page F-101).

The RWQCB cites to this quote to (i) support inclusion of the Alternative Compliance Program (Response to Comments, page 171), and (ii) support granting limited exemptions to Priority Development Projects for hydromodification control (Response to Comments, pages 184 and 190). While it is true that alternative compliance options should exist for those projects that drain to receiving waters known or believed to be susceptible to hydromodification effects, it is inappropriate to consider such options for projects that drain to already hardened channel systems because there is no threat, now or in the future, to downstream beneficial uses as a result of redevelopment. There is no scientific or technical nexus between the impact on the receiving water and the need for control. At worst case, any redevelopment project qualifying as a Priority Development Projects will contribute at least the same amount of runoff to the receiving water and likely much less if LID BMPs are feasible for implementation.

In the same section of comprehensive approaches to hydromodification management described in Technical Report 667 from where the quotation is derived, Technical Report 667's authors state that "the variety of types and conditions of receiving waters should result in a range of

requirements. This also means that objectives, and the management strategies employed to reach them, will need to acknowledge pre-existing impacts associated with historical land uses." The RWQCB must also consider this type of information in establishing appropriate exemptions for already hardened channel systems in urban areas within its jurisdiction.

The Revised Draft Permit's treatment of hydromodification management BMPs represents a significant change from the Final Hydromodification Plan for San Diego County, dated March 2011 ("San Diego HMP"). For redevelopment projects, these performance requirements are more stringent than the performance requirements of the San Diego HMP because they require evaluation of pre-development runoff conditions rather than pre-project runoff conditions.[4] Pre-development runoff conditions are defined as approximate flow rates and durations that exist or existed onsite before land development occurs. (Revised Draft Permit, Attachment C, page C-9.) For redevelopment projects, this equates to runoff conditions from the project footprint assuming infiltration characteristics of the underlying soil, and existing grade (i.e., using the parameters of a pervious area rather than an impervious area).

For many redevelopment projects, the difference between pre-development conditions and pre-project conditions is significant. This would require redevelopment projects on sites that are fully built to size hydromodification management BMPs as large as they would have been sized for a new development based on an estimate of the pre-project condition, yet they must be fit within the constraints of an already developed site. Furthermore, the change from a pre-project condition to pre-development condition requirement effectively invalidates some of the potential exemptions that certain redevelopment projects could have applied for under the approved San Diego HMP. Those approved exemptions could have facilitated the redevelopment process, encouraging redevelopment over new development. The exemptions are reasonable and are supported by extensive science and evidence. For example, under the San Diego HMP, projects that reduce impervious areas and reduce 2-year and 10-year peak flows to all outlets would be exempt. This exemption was a simple way to encourage redevelopment by removing the significant burden of hydromodification management BMPs, while achieving a net improvement to the watershed. Under the Revised Draft Permit, if adopted, this exemption would be effectively invalidated by the requirement to consider pre-development condition instead of pre-project condition because no project can reduce imperviousness below a pre-development condition. (Brown and Caldwell, Final Hydromodification Management Plan, prepared for County of San Diego, California, January 13, 2011.)

The other San Diego HMP exemption that may be invalidated or made more difficult to achieve by the Revised Draft Permit requirement to consider pre-development condition is its urban infill exemption. In the case of the urban infill exemption, a considerable effort was expended by the Copermittees, the San Diego HMP consultant, and the Technical Advisory Committee to prepare a cumulative impacts analysis to determine the thresholds and criteria for this exemption, and it was approved by the RWQCB as part of the San Diego HMP.

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[4] The State Water Resources Control Board recently concluded that determining pre-development conditions and using them as the baseline was not feasible at this time. (See e.g. SWRCB California Department of Transportation Municipal Separate Storm Sewer System (MS4) Permit Comment Response Report (April 27, 2012), at page 4.).

The Revised Draft Permit also presents a list of criteria for exemptions from hydromodification management BMP performance requirements. (Provision E.3.c.(2)(d)) This list of criteria omits certain exemptions that were included in the RWQCB's 2007 MS4 permit, pursuant to Order No. R9-2007-0001. Exemptions available under R9-2007-0001 that are not included in the Revised Draft Permit are: channels that are "significantly hardened (e.g., with rip-rap, sackcrete, etc.)" (note this means channels hardened with materials other than concrete – channels that are concrete lined to the Ocean will still be exempt), and projects where "the sub-watersheds below the projects' discharge points are highly impervious (e.g., >70%) and the potential for single-project and/or cumulative impacts is minimal." The list also does not include exempt river reaches that were approved as part of the Final HMP dated March 2011 (portions of Otay River, San Diego River, San Dieguito River, San Luis Rey River, and Sweetwater River). These exemptions were based on extensive studies. (*See* Brown and Caldwell, Final Hydromodification Management Plan, prepared for County of San Diego, California, January 13, 2011.) While the Revised Draft Permit does not preclude these previously exempt channels, rivers, or highly impervious watershed areas from being exempt under a Water Quality Improvement Plan (WQIP), it requires a complete new analysis ("Watershed Management Area Analysis" defined in Provision B.3.b.(4)(a)), and vetting through the public review and approval process of the WQIP in order to re-establish the exemptions through the WQIP. Copermittees, the San Diego HMP consultant, and the Technical Advisory Committee have already expended considerable efforts to identify criteria for exempt river reaches. The Revised Draft Permit does not identify any evidence that supports this change. Copermittees should not have to prepare a new study to maintain these exemptions, as they have already been reviewed and approved during the development of the San Diego HMP.

Finally, pursuant to Provision E.3.(d) of the Revised Draft Permit, the updated performance requirements for hydromodification management BMPs must be incorporated into the BMP Design Manual (formerly Standard Urban Stormwater Mitigation Plan). Based on Provision F.2.b, this will be due three months following approval of the WQIPs. Pursuant to Provision E.3.d, until a Copermittee has updated its BMP Design Manual, the Copermittee must continue implementing its current BMP Design Manual. On this basis, until the BMP Design Manual is updated and implemented, a pre-project condition rather than pre-development condition will be the standard for curve-matching to meet the San Diego HMP criteria, and all exemptions currently available in the approved San Diego HMP will remain available. New HMP exemptions may be created where appropriate through the WQIP process.

II. **Hydromodification Baseline: Pre-Development Runoff Conditions**

The Revised Draft Permit's Requirements

The Revised Draft Order requires that post-project runoff conditions mimic "pre-*development* runoff conditions", as opposed to pre-*project* runoff conditions. (Revised Draft Order, Provision E.3.c.(2)(a); Fact Sheet, p. F-99.) The Revised Draft Order defines Pre-Development Runoff Conditions as "Approximate flow rates and durations that exist or existed onsite before land development occurs. For new development projects, this equates to runoff conditions immediately before project construction. For redevelopment projects, this equates to runoff conditions from the project footprint assuming infiltration characteristics of the underlying soil,

and existing grade. Runoff coefficients of concrete or asphalt must not be used. A redevelopment Priority Development Project must use available information pertaining to existing underlying soil type and onsite existing grade to estimate pre-development runoff conditions." (Revised Draft Permit, p. C-8.)

The RWQCB stated, without evidence, that using a hydrology baseline that approximates that of an undeveloped, natural watershed is the only way to facilitate the return of more natural hydrological conditions to already built-out watersheds, and ultimately improved stream health, and that using pre-*project* hydrology as a baseline for redevelopment projects would result in propagating the unnatural hydrology of urbanized areas, which would not support conditions for restoring degraded or channelized stream segments. Furthermore, reducing the volume of storm water runoff associated with the urbanized flow regime will also result in reducing the discharge of pollutants into receiving waters, since storm water runoff from impervious surfaces contains untreated pollutants. (Fact Sheet, page F-99.)

The Revised Draft Permit indicates that the RWQCB understands that approximating the pre-development runoff condition associated with a redevelopment site is not straightforward because factors such as natural grade and native vegetation for the site cannot be precisely known. (Fact Sheet, page F-99) For this reason, the RWQCB expects project designers and the Copermittees to approximate pre-development runoff conditions using existing onsite grade and assuming the infiltration characteristics of the underlying soil. (Fact Sheet, pages F-99 – F-100). Redevelopment projects are to use available information pertaining to existing underlying soil types (such as soil maps published by the National Resource Conservation Service), onsite existing grade, and any other readily available pertinent information to estimate pre-development runoff conditions. (*Id*.) The RWQCB asserts that an area's pre-development hydrology can only be roughly estimated and cannot be precisely known, but that using the hydrology of a natural condition, even if not precisely known, will provide significant benefit to receiving waters over using the hydrology associated with developed surfaces. The RWQCB finds that in order to achieve the goals of the Clean Water Act to "restore and maintain the chemical, physical, and biological integrity of the nation's waters [emphasis added]," the most appropriate standard to use for hydromodification management is the standard associated with the pre-development condition. (Fact Sheet, pages F-99-F-100.)

The Revised Draft Permit's Requirements are Unsupported

The RWQCB's findings in support of these hydromodification requirements are contradicted, however, by the California State Water Resources Control Board's ("SWRCB") statements as part of the 2012 renewal of the California Department of Transportation's multiple separate storm sewer system permit. In its April 27, 2012 response to comments regarding hydromodification, the SWRCB stated that the use of a "pre-development" standard for hydromodification is not feasible at this time. (See SWRCB California Department of Transportation Municipal Separate Storm Sewer System (MS4) Permit Comment Response Report (April 27, 2012), at page 4.) Specifically, the Board stated:

> It is not possible to develop a mutually agreed-upon standard for pre-development hydrology without a lengthy stakeholder process.

> One of the biggest complicating factors is that our hydrology has been significantly altered by the addition of dry weather flows, sometimes in volumes that are 3-5 times the volume of stormwater flows. Biocriteria need to be developed for the state and the ecological limits of flow alteration that can be tolerated and still have some favorable biological outcome need to be determined. This is still 5-10 years away. The pre-project standard is appropriate at this time.

The RWQCB should not take action to implement an approach that the SWRCB has determined to be infeasible. (See United States v. California (SWRCB) (1986) 182 Cal.App.3d 82, 109.)

III. LID and Onsite Retention of Stormwater

The Revised Draft Permit's Requirements

The Revised Draft Permit modifies its prior provisions relating to structural BMP performance requirements for Priority Development Projects, requiring that those projects implement onsite structural BMPs to control pollutants in storm water that may be discharged from a project. Specifically, under Provision E.3.c.(1)(a) of the Revised Draft Permit, Priority Development Projects are required to implement Low Impact Development (LID) BMPs that are designed to retain onsite 100 percent of the pollutants contained in the volume of storm water runoff produced from a 24-hour 85th percentile storm event.[5] (Revised Draft Permit, p. 93.)

The Fact Sheet for the Revised Draft Permit indicates that the 85th percentile storm event is the design capture volume that has been used for treatment control BMPs previously, and that it is the MEP standard recognized by the RWQCB and is consistent with the Fourth Term MS4 permits for Los Angeles, Orange, Riverside and Ventura Counties. (Fact Sheet, page F-96.)

Under Provision E.3.c.(1)(a)'s onsite retention requirements, the designer of a Priority Development Project would select a system of BMPs that would retain onsite – through interception, storage, infiltration or evaporation – 100 percent of the pollutants in the 85th percentile storm event design capture volume. (See Fact Sheet, page F-97.) The Fact Sheet for the Revised Draft Permit states that such retention BMPs are necessary to capture and retain the pollutants generated from a Priority Development Project. (*Id.*) Pursuant to Provision E.3.c.(1)(b), in the event a Priority Development Project determines that onsite retention is not

[5] The Revised Draft Permit describes a 24-hour 85th percentile storm event as follows: "This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals." (Revised Draft Permit, page. 93, former Footnote 27.)

feasible, it may utilize flow-through treatment control BMPs to achieve the equivalent pollutant load removal that would have been achieved if the design capture volume were fully retained onsite. However, "In any event, no matter what types of BMPs (or combination of BMPs) are chosen, 100 percent of the pollutants contained in the design capture volume must not be allowed to be discharged from the Priority Development Project." (*Id*.)

Finally, if onsite retention is found to be cost prohibitive or not to provide the water quality benefit to the watershed as would implementing BMPs elsewhere in the watershed, Provision E.3.c.(1)(c) allows for the use of a combination of onsite retention BMPs, and the implementation of an Alternative Compliance Program described in Provision E.3.c.(3).

The Revised Draft Permit's Requirements are Infeasible within the Region

As described below, the requirement is infeasible and not supported by evidence cited to in the Revised Draft Permit, the Fact Sheet that supports it, the RWQCB's Response to Comment, or elsewhere.

Infiltration is Largely Infeasible in Region 9

The soil types in Region 9, and particularly San Diego County, are likely infeasible for infiltration where stormwater could eventually reach the underground aquifer. More than 70 percent of the soil types found in San Diego County possess a Soil Hydrologic Group classification of C and D (USDA, 1973). A large majority of the land area possesses a classification of C or D (SANDAG, 2007) and soft/hard rock (CGS, 2007). Using infiltration as a preferred method of stormwater remediation county-wide, therefore, is unsupported. Clearly stated, in the appropriate soil type, infiltration is a preferred alternative. In the wrong soil type the results could be catastrophic. (See photos 1 & 2).

Photo 1 – La Jolla Landslide (Ardath Shale Formation, Claystone, Hydrologic Group D)

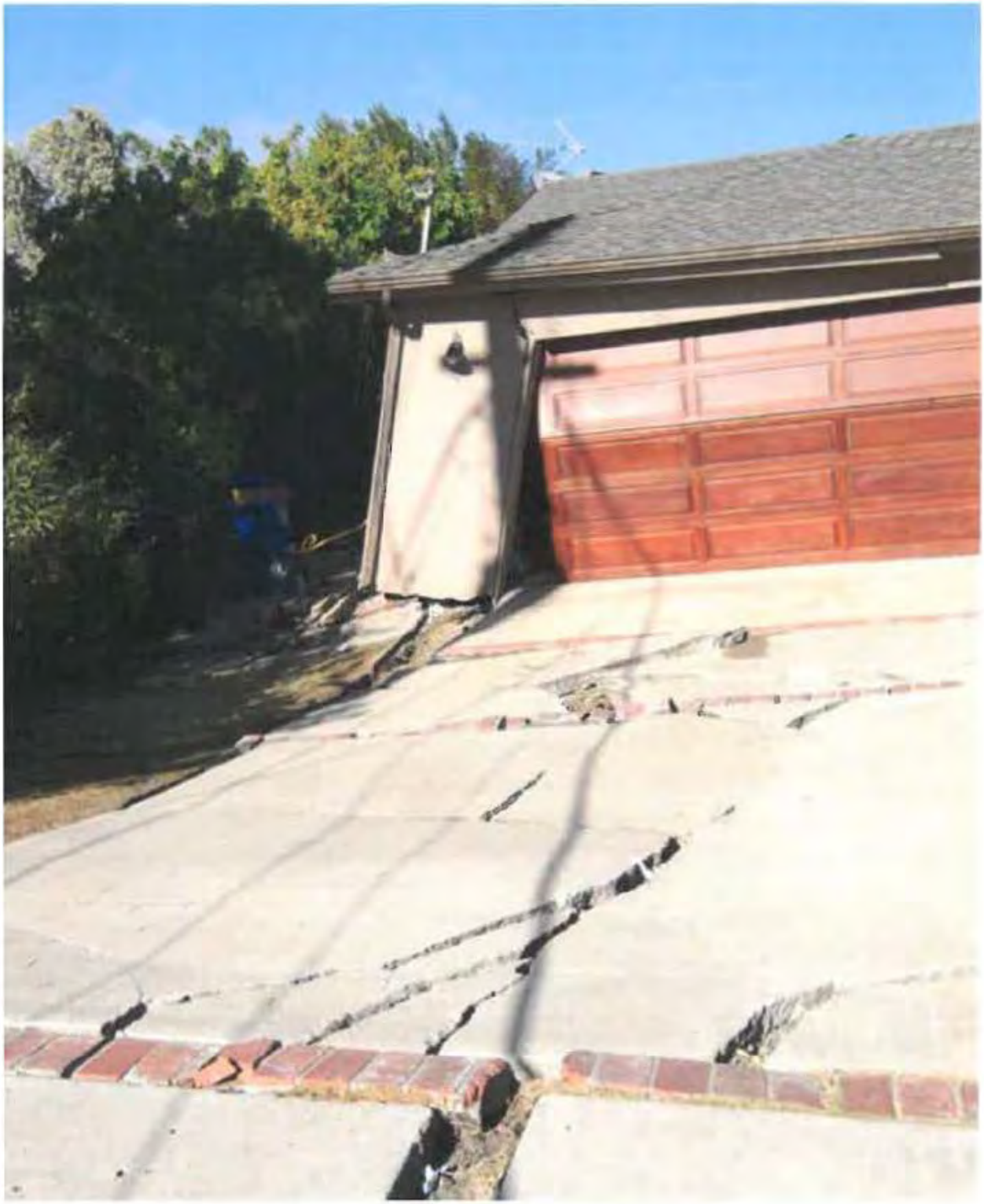

Photo 2 – La Jolla landslide (Ardath Shale Formation, Claystone, Hydrologic D)

For 70 years or more, both geotechnical engineers and civil engineers have designed projects to minimize water infiltration into the soils around and adjacent to buildings. A majority of geotechnical construction litigation is water intrusion related. (See Das, Braja M., Principles of

Geotechnical Engineering, 1994.) Water in clay based soils causes heaving, settling and failure of pavement, retaining walls and buildings. In extreme cases, these soils are prone to slippage, sinkholes or landslides. Additionally, when water enters these soil types it can travel laterally until it finds a utility trench, water or sewer line and then can undermine those systems. (Living with Expansive Soils, Marshall Addison, PhD. http://milliondollarstudent.com/ramjack/PDF/Living_with_Expansive_Soils.pdf; Low Impact Development Handbook, Stormwater Management Strategies, December 31, 2007, Page 39.) The water in these soils cannot infiltrate deep into the ground but moves as it can find voids and areas of better permeability. (Low Impact Development Handbook, Stormwater Management Strategies, December 31, 2007, Page 39.) (See photo 3, below.)

Photo 3 – Perched water visible on lower half of hillside (water migration)

Additionally, there are areas of the County where the soils are hard rock and infiltration cannot occur because water does not easily infiltrate into rock. (United States Department of Agriculture (USDA), Soil Survey, San Diego Area, California, December, 1973; SANDAG, County of San Diego Hydrology Manual Soil Hydrologic Group Map, 2007. California Geologic Survey (CGS), Preliminary Surface Geologic Materials Map, 2007.)

Since much of the construction within San Diego County is slab on grade construction, retaining water onsite through infiltration can even cause minor health and safety problems. Cured

concrete is still a porous material. If water is present in the soil, the slab can wick up water into the building (photos 4, 5 & 6). As buildings are well insulated and energy efficient, this water can lead to mold growth and damage anything placed on the slab (floor coverings, cabinets, furnishings). (Uniform Building Code, Title 24[6].) Water in a warm environment, without sufficient airflow exchange (because of better insulation, windows, etc.) provides the ideal conditions that lead to mold growth. This could create a major construction defect litigation problem for a builder or developer. Again, the geotechnical engineers and civil engineers have stressed the importance of moving water away from building as efficiently and quickly as possible for just this reason. (Building Code Requirements for Structural Concrete (ACI 318-08) and Commentary, American Concrete Institute [requires water barriers below slabs].) While ACI requires this, typically the entire footing doesn't receive a water barrier. Additionally, during construction the water barrier often may be punctured or moved and may not be as effective as called for in the ACI standard.

Photo 4- water migration through slab into cabinetry

[6] This section of the Uniform Building Code includes energy conservation measures, including requirements for better windows, improved weatherstripping, and additional insulation, which all lead to "tighter" and more energy efficient buildings. This is contrasted with older buildings, which "breathe" meaning that they have sufficient air flow to evaporate water wicking up through the slab before it becomes a problem. In newer buildings, water cannot evaporate and problem, such as mold, result.

Photo 5 – water migration through slab (mold under vinyl flooring)

Photo 6 – water migration through slab (white coating is efflorescence)

Retention and Re-use Requirements Raise Additional Concerns

Where onsite infiltration is not feasible, the next option is the capture and storage of stormwater for re-use. If a project will capture water in order to store it, a storage container must be constructed. Since an 85th percentile, 24 hour duration rain event can produce between ½" to ¾" of rainfall in a given area of San Diego (and up to 1-½" in mountainous areas, according to the 85th Percentile Precipitation Isopluvial Map of the San Diego County Hydrology Manual; see also http://www.projectcleanwater.org/html/wg_susmp.html), the amount of water to be stored could be considerable.

The Revised Draft Permit does not effectively address what happens with the retained water or how quickly it needs to be used, since the storage capacity would need to be utilized again for future rain events. Rain barrels are often mentioned as a solution, but care must be taken with regard to water breeding insects. Additionally, most commercially available rain barrels are made of plastic which degrades in the UV from sunlight. After a few years they become brittle and are prone to failure, putting water into the surrounding soils next to the building. Additionally, utilizing the optimum number of rain barrels is impractical, as it is too large to have a significant impact on water usage due to the erratic and clustered nature of the precipitation in San Diego County. According to a continuous simulation study prepared with hourly precipitation data of Lindbergh Airport in San Diego (the best precipitation data set in the County), the optimum rain barrel volume for retention purposes is about 12 – 50 gallon barrels for every 1,000 sq-ft of roof, using the theory of Diminishing Returns. (Parra, StormCon 2010.) Cisterns are another option mentioned as a potentially viable solution. Burying a tank in the ground may not be feasible for infill and redevelopment projects due to various Building Code issues.

Unintended Consequences

Both California AB 32 and SB 375 are landmark environmental laws addressing climate change and land use adaptation to reduce production of greenhouse gases. The intent of this legislation is to:

1. Use the regional transportation planning process to achieve reductions in greenhouse gas emissions consistent with AB 32's goals;
2. Offer California Environmental Quality Act incentives to encourage projects that are consistent with a regional plan that achieves greenhouse gas emission reductions; and
3. Coordinate the regional housing needs allocation process with the regional transportation process while maintaining local authority over land use decisions

The result is to encourage growth to occur inwards into the existing urban footprint. This is defined as "in-fill" development. An unintended consequence of the Revised Draft Permit is that its requirements actually make it more attractive and cost effective to build away from the existing urban footprint because of the land necessary to comply with the new requirements in the Revised Draft Permit. The 100% pollutant capture requirement and the removal of

hydromodification exemptions on infill development render these projects both technically and financially infeasible. (Refer to photograph 7.)

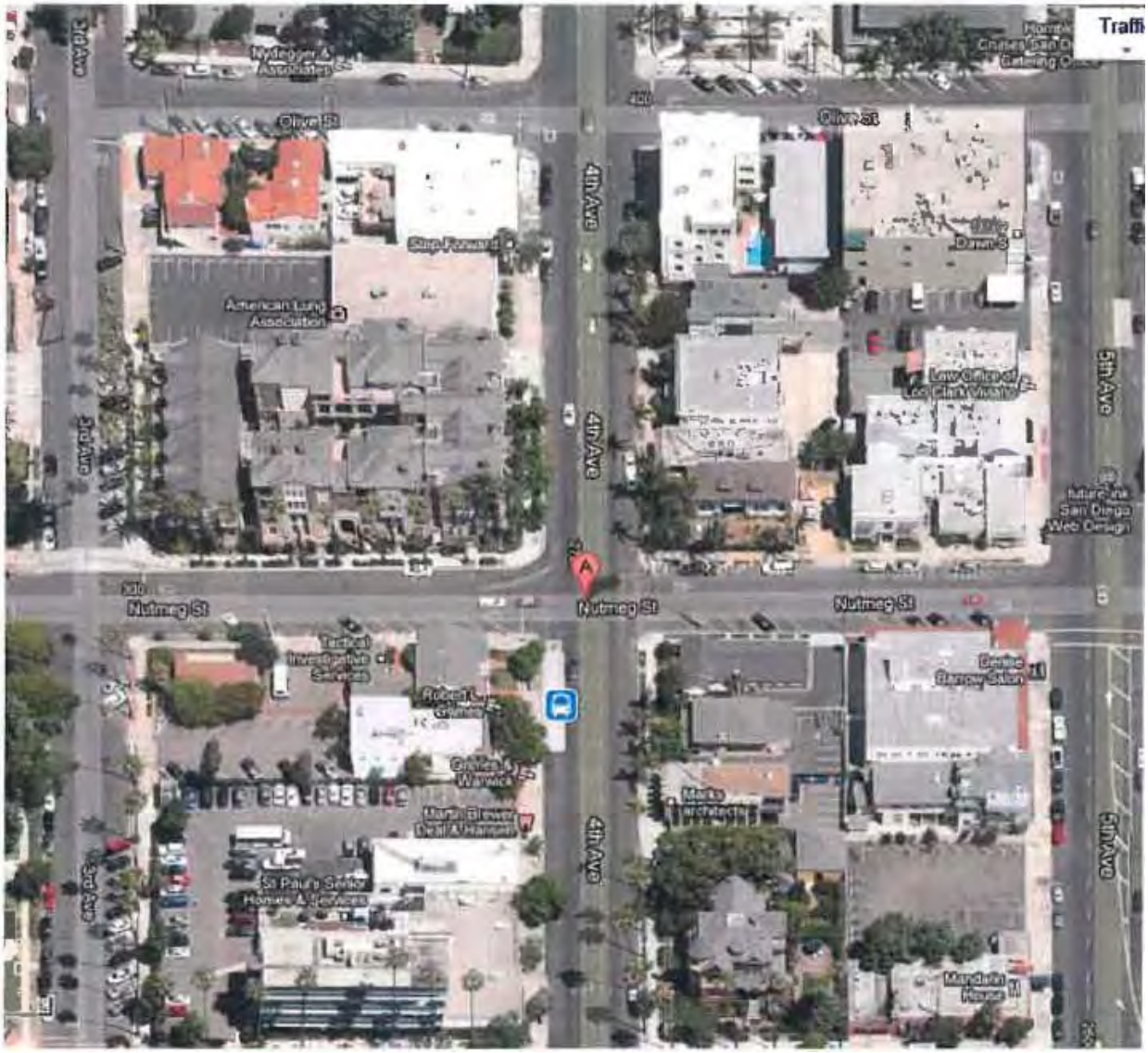

Photo 7 mid-rise condo project at the NW corner of 4th and Nutmeg, San Diego

Photo 7 shows a smart growth project on the northwest corner of 4th & Nutmeg in San Diego's highly urbanized Banker's Hill neighborhood: transit friendly (transit oriented development, TOD); walkable neighborhood; near parks, shopping and recreation (2 blocks from Balboa Park); near San Diego's airport; near Downtown/Hillcrest/Mission Valley work environments; and within the Smart Car (car 2 go) user footprint. Under the Revised Draft Permit, this project would become infeasible because of the 100% pollutant capture (infiltration/reuse) requirement and the loss of the hydromodification exemption previously included in the HMP.

The soil type at this location will not allow for infiltration. Additionally, to achieve the requisite density there is not enough land available to allow for supersizing of BMPs. There is no place to put a retention tank except under the building's parking structure. It may be infeasible to place a

tank under a building for a number of reasons: the difficulty or repairing a tank located below a building; the cost to integrate the tank into the building's foundation; if the tank were to leak, the entire building is subject to settlement issues, or failure, based on the water leaking into the surrounding soils; the added cost to operate and maintain the tank in perpetuity.

Photo 8 (street level) shows the building and that parking is located underneath the building. This is "podium" type construction and next to high-rise development, the most expensive type of construction for "smart growth" infill development. Complying with the Revised Draft Permit means this type of project becomes infeasible, both technically and financially. The Revised Draft Permit is silent on this issue and has not addressed this concern. The current language, whether intended or not, seems to eliminate this type of development project which is mandated and encouraged under SB 375.

Photo 8 – Street view: 4th and Nutmeg, San Diego (notice living units at ground level)

Whether or not water is infiltrated or stored onsite for reuse, the Revised Draft Permit includes no consideration of the fate of the pollutants existent in that water. In a storage tank or cistern, like a septic tank, gravity will cause most of the pollutants to fall to the bottom of the tank where they will remain and build up. Over time, the tank would gather year's worth of pollutants. If the tank owner is drawing the water for re-use, the water typically in any tank is drawn from the bottom, so the pollutants could be redistributed onsite. This raises questions of whether compliance with the Revised Draft Permit requirements would cause a health and safety concern to the person re-using the water, how often such a tank or cistern be emptied for cleaning, whether the mass of pollutants at the bottom of the tank would be considered a regulated waste,

and how and where a property owner could dispose of such a waste. An infiltration trench or basin would have the same pollutant disposal issues. The media (soil, sand gravel, etc.) in the trench or basin would need to be excavated and disposed of.

Another major concern with the new permit standard (infiltration or retention) is that it will deprive watersheds of the water that feeds riparian ecosystems. As the Revised Draft Permit offers creek and stream restoration or rehabilitation as an alternative compliance option to onsite hydromodification management, this raises the question of how can one restore those watercourses without the water that supplies them. (33 U.S.C. §1251(a) [the Clean Water Act was enacted "to restore and maintain the chemical, physical, and biological integrity of Nation's waters"].)

The Revised Draft Permit Includes no Support for the Ability to Comply with its Requirements

As described above, the phrase "retain onsite 100% of the pollutants" was recently added to the water quality management performance standard contained in the Revised Draft Permit (San Diego Regional MS4 permit Section E.3.c.(1)(a)). Unless a Priority Development Project can infiltrate the entire design capture volume, or reliably use the runoff collected in a harvest and use cistern system, retention of 100% of pollutants is impossible, and this is especially true for several pollutants of concern including bacteria or nutrients such as nitrogen or phosphorus.

The Revised Draft Permit offers no technical support for such a standard, including studies or data cited in the Fact Sheet, Response to Comments, or otherwise, that demonstrate 100% of pollutant can be prevented from being discharged from Priority Development Projects into the MS4 and into receiving waters. On the surface, such a requirement is conceptually feasible: no discharge equals no pollutants. However, the selection and application of retention type LID BMPs, principally soil infiltration systems and rainfall harvest and use systems, are subject to a myriad of technical infeasibility constraints, of which the RWQCB and others have identified (See for example, Orange County Model WQMP requirements and supporting Technical Guidance Document--TGD). In the absence of feasible application of infiltration or harvest and use, such a standard is unachievable. Rather, Regional Boards in California use water quality treatment design criteria that require project proponents to demonstrate that it cannot reliably retain 100% of the storm water quality design volume onsite before allowing the proponent to use biofiltration or biotreatment type LID BMPs. Only until the feasibility of these systems is exhausted may the proponent be allowed to use other types of management practices.

In the discussion in the Staff Report regarding justification for using the runoff created by the 24-hr 85th percentile rainfall event as the basis for a project's design capture volume, the RWQCB cites a Southern California Coastal Water Research Project ("SCCWRP") report prepared in 2007. This report includes findings that show the majority of pollutants from urban locations in the Los Angeles area of southern California arrive in receiving waters during the "early" part of storm events, and that the "highest constituent loading was observed early in the storm season, with inter-annual variability driven more by antecedent dry period that amount of rainfall."

The SCCWRP 2007 report also found that the "first flush" effect at land use sites was a function of watershed size. In other words, the smaller the watershed, the more pronounced the first flush

effect. Therefore, the author's note that "capturing constituent loads should focus on more than just the initial portion of the storm at moderate to large catchments". This statement, therefore, supports using the entire suite of LID type BMPs to manage urban runoff, including biofiltration systems, and supports using a secondary metric of sizing LID BMPs for retaining and treating 80% of the annual runoff volume in addition to capturing and treating individual rainfall events. In no case or instance cited in the SCCWRP 2007 report is there a recommendation or finding that supports a retention standard that achieves 100% pollutant containment. The aforementioned Orange County Model WQMP and TGD describe the LID BMP selection process and sizing criteria in detail (using both the 24-hr 85th percentile design storm and 80% annual runoff volume as sizing metrics), and provide several case study examples for support.

Such a restrictive and narrow definition of allowable LID BMPs is inconsistent with U.S. EPA guidance which promotes biofiltration and biotreatment as part of LID. Of five U.S. EPA sources regarding LID, four included biotreatment-type terms, such as detention (i.e., slow down, treat, then release), filtration, and surface release of storm water. In a compilation of case studies by U.S. EPA, most of 17 exemplary projects included biotreatment elements, such as bioretention, swales, wetlands, and green roofs. *See* U.S. EPA 841-F-07-006, discussed in a 2009 submittal from Mr. Eric Strecker, Geosyntec Consultants for the Construction Industry Coalition on Water Quality. In Mr. Strecker's analysis, each of two case studies described in another EPA document, s*ee* EPA 841-B-00-005, included the use of under-drains, and one of them specifically fed into the main storm drain system. A U.S. EPA document updated in January 2009 references additional resources, one of which refers to the many practices used to adhere to LID principles of promoting a watershed's hydrologic and ecological functions, such as bioretention facilities, rain gardens, vegetated rooftops, rain barrels, and permeable pavements. *See* EPA-560-F-07-231. A fact sheet used in conjunction with that document describes under-drains used to release treated storm water off site, permitting planted areas to safely allow filtration of storm water.

The State Water Resources Control Board (SWRCB) identifies LID as a sustainable practice that benefits water supply and contributes to water quality protection, stating that, "The <u>goal</u> of LID is to mimic a site's predevelopment hydrology by using design techniques that infiltrate, <u>filter</u>, store, evaporate, and <u>detain</u> runoff close to the source of rainfall" (emphasis added). SWRCB also states that, "LID practices include; <u>bioretention</u> facilities or rain gardens, grass swales and channels, vegetated rooftops, rain barrels, cisterns, vegetated filter strips, and permeable pavements" (emphasis added). As can be seen, SWRCB defines LID as including filtration, detention, and bioretention, and other practices, each of which produce runoff and would not be part of the LID standard under the tentative order and instead moves a project into "Alternative Compliance". In addition, SWRCB characterizes mimicking pre-development hydrology as a "goal," not an enforceable standard. *Found at*: http://www.waterboards.ca.gov/water_issues/programs/low_impact_development/.

The language in the current tentative Order, while clearly specifying a volume capture approach to sizing LID BMPs, introduces an incorrect definition of LID through restrictive application of BMPs to only those that infiltrate, harvest and use rainwater, and/or evapotranspire all of the captured water. In other words, permit language now requires that projects would be limited to zero discharge of a design storm volume with no runoff whatsoever allowed.

The US EPA defines LID as follows:

> *A comprehensive stormwater management and site-design technique. Within the LID framework, the goal of any construction project is* ***to design a hydrologically functional site that mimics predevelopment conditions.*** *This is achieved by using design techniques that infiltrate,* **filter***, evaporate, and store runoff close to its source.* (emphasis added)

http://cfpub1.epa.gov/npdes/greeninfrastructure/information.cfm#glossary .

Mandating the complete onsite retention of any sizable storm volume (i.e. runoff that never leaves as surface flows) is not a reasonable approach and the tentative Order attempts in places to redefine the allowable site design elements necessary to implement this concept. The tentative Order may implement LID in a way that is contrary to the EPA definition of LID by restricting BMPs to those that only achieve zero discharge—not allowing any BMPs that appropriately "filter" runoff, such as bioretention cells or other vegetated LID BMPs. Total, 100-percent retention remains impractical and unwise in most circumstances, and is not a goal that can be achieved for most projects within reasonable costs, despite best efforts. Moreover, such a mandate abandons the goal to mimic predevelopment conditions to the extent practicable, as EPA encourages.

The retention BMPs of infiltration, harvesting, and evapotranspiration ("ET") may be described as a first tier of LID BMPs, but they should not be universally mandated to the exclusion of all other options. As the EPA definition of LID indicates, biofiltration, bioretention, filter strips, and other BMPs based on using vegetation to promote stormwater treatment via filtration are fundamental to LID implementation. These BMPs may be specified as second tier options (although they best mimic pre-development conditions), but project proponents should have considerable discretion to use these BMPs, and should not be required to apply for a feasibility exception to do so.

The use of conventional BMPs (structural treatment installations) as the principal approach for stormwater management should be a last resort, available only when objective infeasibility criteria are satisfied, and when off-site opportunities are not readily available. When LID BMPs are infeasible, and nearby off-site options are not available, the use of conventional BMPs that have been demonstrated to be effective on the pollutants of concern should be a compliance option.

IV. Sediment Transport Requirements

The Revised Draft Permit's Requirements

The Revised Draft Permit requires Priority Development Projects to avoid known critical sediment yield areas or implement measures that allow coarse sediment to be discharged to receiving waters, such that the sediment supply is unaffected by the project. (Revised Draft Permit, Provision E.3.c.(2)(b).) The Revised Draft Permit does not define "coarse sediment"[7] as

[7] According to the technical literature, the beginning of sediment motion is not defined by the term "coarse sediment" but by more specific terms such as (1) Nearly Uniform Cohesionless

it is used in this section. The Fact Sheet supporting the Revised Draft Permit states that the requirement is necessary because coarse sediment supply is as much an issue for causing erosive conditions to receiving streams as are accelerated flows.[8] (Fact Sheet, page F-100.)

All development involves some loss of sediment. The Revised Draft Permit requires that "critical sediment yield areas" will be identified by studying the watersheds (through the Watershed Management Area Analyses[9]). These analyses would then be incorporated into the Water Quality Improvement Plans for each watershed. Thus, a new category of "Environmentally Sensitive Areas" will be identified and protected. This would be incompatible with development on that property. To understand why introducing a new category of sensitive area into the development planning process is such a concern requires an explanation of hydromodification basics and impacts on receiving waters.

Hydromodification Basics regarding Sediment Transport

Hydromodification is primarily understood within the context of impacts, potential or realized; that is, the effects of changes within a watershed on downstream fluvial systems (i.e., canyons, creeks, streams, rivers, lakes, lagoons, etc.). A change, or a number of changes, can cause or contribute to an imbalance within a fluvial system that has been in a state of dynamic equilibrium (relative stability within a range of erosivity/degradation and sedimentation/aggradation). Related secondary impacts (secondary as a consequence, not necessarily in importance) include habitat degradation, slope failures, infrastructure failures, and increased flooding risks, among others. (ADWR, 1996, 1998; USACOE, 1994).

The most common example of hydromodification is the covering of land with impervious surfaces, which deprives the waterways of naturally occurring sediment yield, while increasing runoff volumes, durations and peaks in those same waterways. Another example is the presence of a flood control dam upstream, which tends to trap sediment but also reduces damaging peak flows and volumes. (Aspen Environmental, 2006.) For the purposes of this paper, hydromodification will be understood as a direct consequence of urbanization, the covering over of land with impervious surfaces.

Sediment (Shields, 1936; Maidment, 1992), (2) Incipient Motion on Ripple and Dune Beds (Chabery et al, 1963; Mantz, 1977) ; Mixture of Nonuniform Cohesionless Sediment Sizes (Egiazoroff, Little and Meyer, Hayashi et al, among many others), and Cohesive Sediment (Mehta, (3 studies, 1986, 1989 and 1989)).

[8] This statement oversimplifies a complex issue, as in some watersheds, fine sands, dunes and ripples, and cohesive sediments can be an important geomorphic factor. (*See* Lane and Carson; Shen and Liu; Task Committee; previous studies).

[9] The Revised Draft Permit is silent as to the method to determine such critical yield areas, which could conceivably be established based upon the USLE equation (Wischmeier et al, 1971), by sediment-delivery ratio equations (Roehl, 1962), by sediment yield empirical formulas based on real measurements (Dendy and Bolton, 1976), or by more complex mathematical formulations (Ponce, 1989).

Understanding Fluvial Processes

Lane's Stream Balance Relationship states that dynamic equilibrium exists between stream power and the discharge of bed material sediment. (Lane, 1947.) It is usually stated as:

$$Q_s * D_{50} \alpha Q_w * S$$

Where Q_s is the sediment discharge, D_{50} is the sediment size, Q_w is the (water) discharge, and S is the bed slope. This proportional relationship is often graphically illustrated with a balance, as shown below, and it is not intended to be used as an equation. Some attempts to convert this relationship into an equation have been carried out. (Ponce, 1999.) The Lane relationship shows that where adjustments or modifications occur in the watershed or in the channel (in terms of Q_w, for example), another adjustment will begin to occur to preserve the equilibrium (in terms of S or Qs, for example).

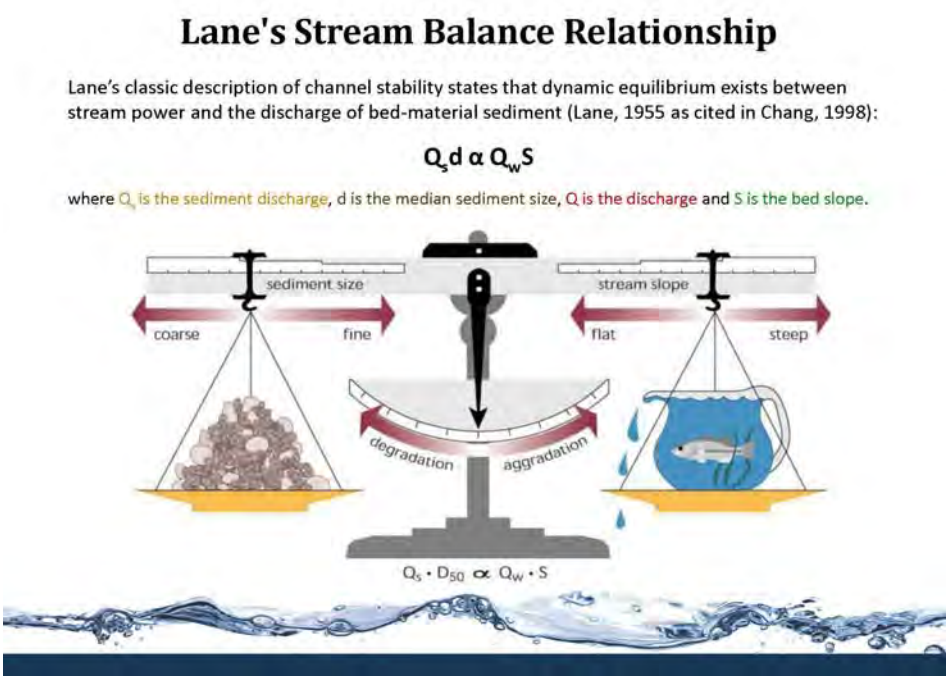

Three Local Examples

Hydromodification impacts vary, sometimes by orders of magnitude. (Hastings, 2005; Hecht, 2000.) The following three examples of fluvial systems within our region illustrate this well. Each is different, and each only represents one reach of the creek. As one travels upstream or downstream each of these creeks, impacts will vary widely.

<u>Oso Creek</u>

The photo below shows a portion of Oso Creek, approximately 1 kilometer (0.7 miles) downstream of a hardened channel. The severe degradation evident in this photo has occurred

within the past 20 years, due to development of a master planned community upstream. The composition of the bed and banks is primarily loose alluvium, so erosion has not been halted. The sediment from this reach is deposited in downstream reaches and has resulted in slope failures, biological degradation and flooding impacts downstream.

Oso Creek, approximately 1 kilometer (0.7 miles) downstream of a hardened channel

Escondido Creek

By contrast, the photo below indicates a creek in dynamic equilibrium 0.7 kilometers downstream of a hardened channel. The City of Escondido, incorporated in 1888, has certainly experienced its share of development, with most of the city draining to this natural channel for more than 100 years. This photo is typical of Escondido Creek for the remaining 23 kilometers (14 miles) to the ocean. That is not to say this creek is not subject to any degradation, only that over the decades the creek has mostly adjusted to a new state of dynamic equilibrium.

Escondido Creek in dynamic equilibrium 0.7 kilometers downstream of a hardened channel

Agua Hedionda Creek

The Agua Hedionda Creek watershed is in portions of several north San Diego jurisdictions. A 2008 Watershed Management Plan (TetraTech, 2008) identified a reach of the creek as a high priority project; Tory R. Walker Engineering, Inc. assembled a multi-disciplined team, which prepared a Preliminary Design Report for the rehabilitation of that reach. (Tory R. Walker Engineering, 2010.) The photo below illustrates the typical impacts of hydromodification within the reach, where an established Oak woodland is threatened.

Agua Hedionda Creek in Buena Vista Park near Melrose Avenue

The figures below illustrate the effects of hydromodification over time on hypothetical stream systems. (TRWE, 2010.)

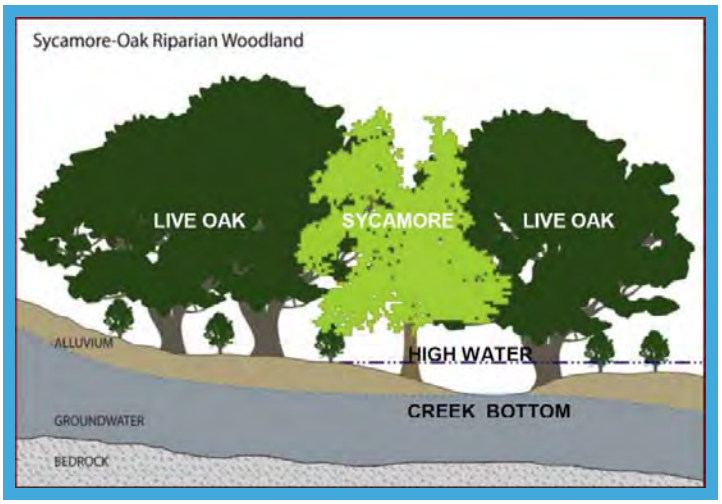

Stable System (circa 1900)

- High Groundwater Recharge
- Equilibrium Sediment Transport
- High Floodplain Function
- Low Discharge Velocities
- Dynamic and Broad Riparian Zone
- Diverse Riparian Habitat
- Sustainable Vegetation Mosaic
- Cool Seasonal Aquatic System

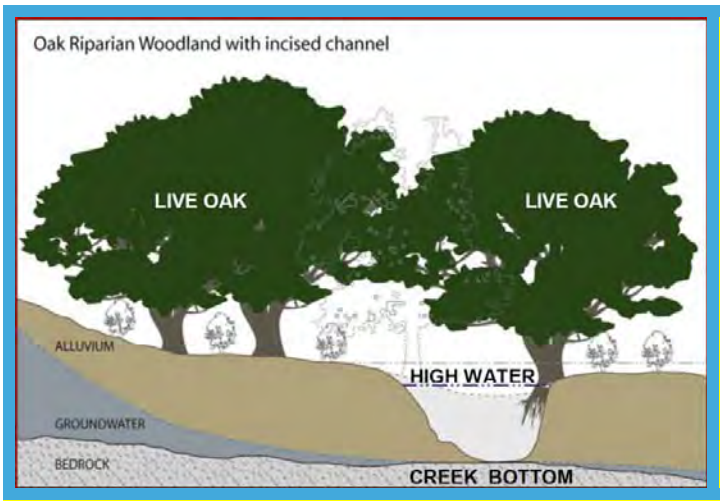

Early Incised System (Present)

- Depressed Groundwater Table
- High Groundwater Export
- Low Groundwater Recharge
- High Channel Bank Erosion
- Confined Low Floodplain Function
- High Discharge Velocities
- Diminishing Riparian Zone Width
- Low Diversity Riparian Habitat
- Poor Riparian Plant Recruitment
- Cool Seasonal/Perennial Aquatic System

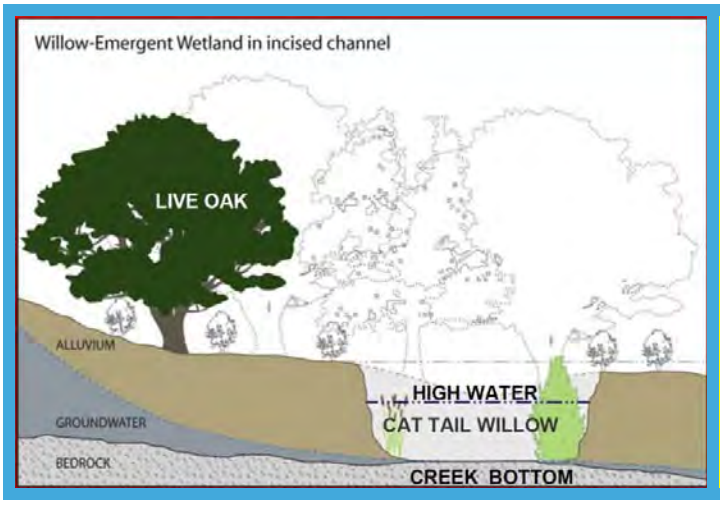

Mature Incised System (circa 2040)

- Groundwater Conditions Same as Now
- High Channel Bank Erosion
- Confined Low Floodplain Function
- High Discharge Velocities
- Diminishing Riparian Zone Width
- Low Diversity, Narrow Riparian Habitat
- High Scour Plant Loss
- Opportunistic Exotic Plant Recruitment
- Warm Seasonal/Perennial Aquatic System

Restoration of ecosystem functions that have been lost due to hydromodification may be accomplished through different mechanisms. The figure below illustrates two paths to the restoration of ecosystem functions over time – with and without human intervention to restore the lost functions. The shorter length of the "blue path" demonstrates the value of restoration/rehabilitation in a creek, whereas the length of the "red path" shows how a much longer period of time is needed for recovery of ecosystem functions when no human restorative action is taken. In the case of Agua Hedionda Creek, those ecosystem functions would be different.

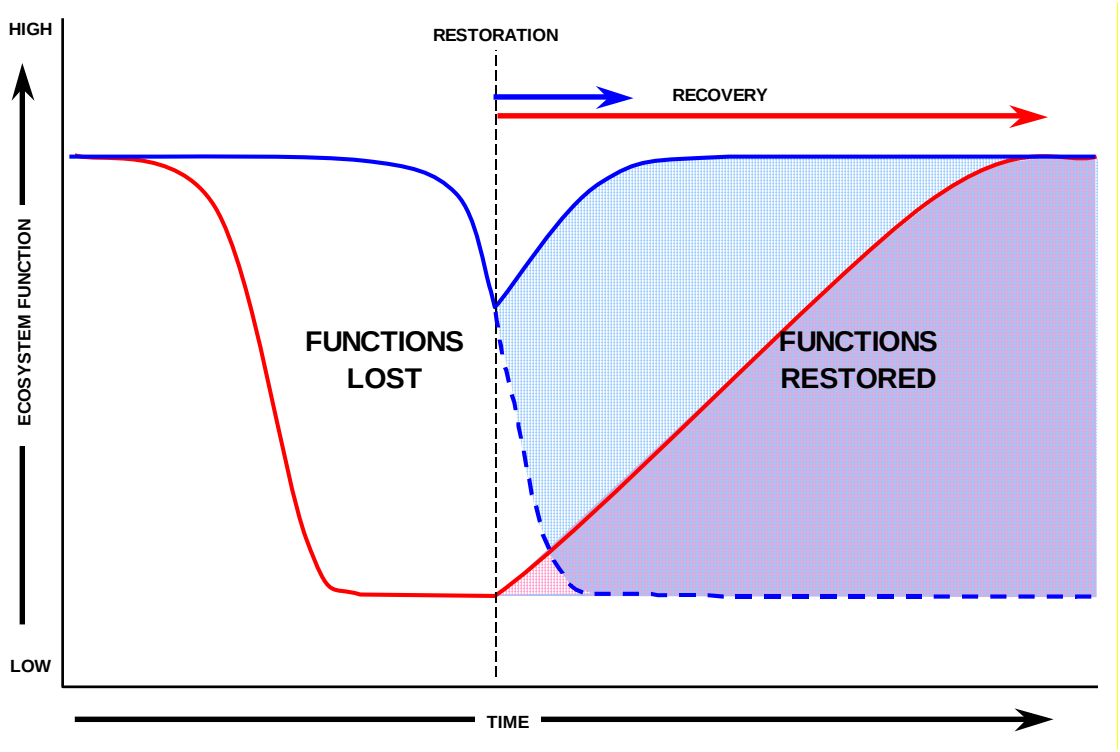

Effects of Ecosystem Trajectory on Restoration Values (TRWE, 2010.)

Stabilization

Stabilization of fluvial systems has generally been considered the typical "fix" to hydromodification. (USACOE, 1994.) Stabilization can be understood very broadly to include everything from concrete lining and piping underground to streambed or bank stabilization utilizing bioengineering techniques exclusively. Between these two "ends of the spectrum" are quite a number of techniques and types of materials, used in combination or separately, to "stabilize" these dynamic systems. Common techniques include grading of new "stable" channels, creating "benches" beside channels (thus increasing flood capacity and stability), constructing drop structures to flatten the longitudinal slopes, or meandering the stream channel to lengthen it. In addition to concrete lining, materials have typically included rock riprap, natural stone, concrete block systems, turf reinforcement mats, vegetation, imported sediment and/or cobbles of a certain gradation, gabion baskets, logs, and root wads. (NRCS, 2002; WSAHGP, 2003.)

Restoration and Rehabilitation

"Restoration" usually refers to attempts to restore a system back to a previous condition, while "rehabilitation" usually refers to attempts to improve a system while accounting for mostly irreversible changes (like a hydromodified watershed). This should not be understood as "giving up" on all efforts to lessen impacts within a watershed; rather, it should be understood within the context of the graph above. Time marches on, as the saying goes, so intervention requires an understanding of where a fluvial system is currently, along with an understanding of the current and future conditions of the watershed. For this reason, most work within fluvial systems is no longer described as "restoration," but rather "rehabilitation."

Onsite Approach Presented in Draft Permit

Attempts to address sediment balance through a directive within a permit will almost always fail; the complexity of the issue defies such an approach. The desire to compensate for the loss of course sediment due to development (even LID), or to avoid sediment yield areas altogether (both of which have been put forth in revisions of the Revised Draft Permit) shows a misunderstanding and a wrong focus on the issue by attempting to address it at the source. The currently proposed language in Section E.3.c.(2)(b) introduces a further complication, in that its implementation must necessarily prohibit the use of land for any compatible use other than allowing erosion to occur so that the downstream system has a supply of coarse sediment. This then becomes a land use decision.

Natural areas have produced sediment as part of a natural cycle of random precipitation events, vegetative cover and burns for millennia. Urbanization introduces a sudden and sometimes dramatic change to an equilibrium that has existed for a very long time (as in Oso Creek). In almost all cases throughout the San Diego Region, the effects of urbanization have already done most of the "work" on the downstream systems, so an onsite approach to the problem is much like closing the barn door after the horse has escaped. With that consideration, attempting to identify critical sediment yield areas within most of the watersheds will be an exercise in futility, as such areas would not typically be able to provide even a fraction of the amount of course sediment required to balance sediment through downstream reaches.

Another unintended consequence of the Revised Draft Permit Provision E.3.c.(2)(b) is that it will create a new land use restriction. The way this will likely proceed is that "critical sediment yield areas" will be identified by studying the watersheds (through the Watershed Management Area Analyses). Specifically, Copermittees will be required to prepare sediment yield studies of watersheds based on watershed-wide models and criteria that will approximately identify these critical sediment yield areas. These analyses would then be incorporated into the Water Quality Improvement Plans for each watershed. Thus, a new category of "Environmentally Sensitive Areas" will be identified and protected. After all, there is no other compatible use of such property, not even roads, so such property will become open space.

Sediment Balance Summary

In summary, sediment balance is very complicated and requires careful study of each watershed and fluvial system to understand how best to approach the issue. Fluvial systems, to transport the same amount of incoming sediment to downstream reaches, and eventually to the ocean, must often be modified. Many such systems are already modified, either as part of a natural process (degradation) or as the result of man-made modification. Attempts to address sediment balance through a directive within a permit will almost always fail; the complexity of the issue defies such an approach. The desire to compensate for the loss of coarse sediment due to development (even LID), or to avoid sediment yield areas altogether (both of which have been put forth in revisions of the Revised Draft Permit) shows a misunderstanding and a wrong focus on the issue by attempting to address it at the source. The currently proposed language in Section E.3.c.(2)(b) of the Revised Draft Permit introduces a further complication, in that its implementation must necessarily prohibit the use of land for any compatible use other than allowing erosion to occur so that the downstream system has a supply of coarse sediment. This

then becomes a land use decision. The best focus for this issue remains the water bodies themselves on a watershed by watershed and reach by reach basis.

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September 14, 2015

By E-Mail

Mr. Wayne Chiu
California Regional Water Quality Control Board, San Diego Region
2375 Northside Drive, Suite 100
San Diego, CA 92108

Dear Mr. Chiu

The County of Orange, as Principal Permittee of the Orange County Stormwater Program, and the Orange County Flood Control District (collectively, "County"), appreciate the opportunity to provide comments on Tentative Order No. R9-2015-0100 ("Tentative Order") proposing to amend the National Pollutant Discharge Elimination System (NPDES) Permit for *Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region, Order No. R9-2013-0001, as amended by Order No. R9-2015-0001 (Regional MS4 Permit)* ("Regional MS4 Permit" or "Permit"). In addition to the County, the Cities of Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Mission Viejo and San Juan Capistrano (collectively, "Permittee") were involved in the development of these comments and hereby concur with the issues herein. Where a Copermittee has more specific comments relevant to its jurisdiction, these will be expressed in separate written comments provided by the individual Copermittee.

The County supports vigorous implementation of programs and projects that will further water quality improvements in south Orange County. The County hereby submits these comments in belief that modifications to the Regional MS4 Permit are needed in order to better effectuate improvements to water quality as well as balance the role and obligations of the MS4s under the Clean Water Act and Porter-Cologne Water Quality Control Act.[1]

[1] In addition to these supplemental comments, the County by this reference incorporates all prior letters, comments, reports, presentations, oral and written testimony, data, communications, and other evidence made by, on behalf of, and in support of the County and the Permittees during the various workshops, hearings, and meetings relevant to the adoption of Order No. R9-2013-0001, as amended by Order No. R9-2015-0001 and Tentative Order No. R9-2015-0100. The County and Permittees reserve the right to provide further comment as applicable.

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I. Stakeholder Workshops Have Been Effective.

The Permittee laud the efforts of Regional Board staff to collaboratively engage the Permittee and other stakeholders through the use of mediated, roundtable workshops. This manner of comment has worked well in allowing all viewpoints to be expressed with sufficient time provided to allow for vigorous discussion of issues regarding the Regional MS4 Permit.

II. The Alternative Compliance Pathway for Prohibitions and Limitations Is Necessary, But It Must Contain Compliance During the Planning Period Along With Workable Implementation Milestones.

The Tentative Order proposes to include an alternative compliance pathway that would offer the Permittees compliance with the prohibitions and limitations provisions of the Regional MS4 Permit. The Permittees generally support this approach, and believe that an alternative compliance pathway is necessary in light of the difficulties in achieving water quality standards, the strict liability regime created by the Ninth Circuit's decision in *Los Angeles County Flood Control District v. NRDC*,[2] and recent clarification on receiving water limitations language by the State Water Resources Control Board ("State Board") on the LA MS4 Permit.[3]

As has been stated in prior comments by the Permittee, federal law does not require MS4 dischargers to strictly comply with water quality standards. In the Ninth Circuit Court of Appeals decision in *Defenders of Wildlife v. Browner*,[4] the court held that Congress only intended MS4 dischargers to meet the maximum extent practicable standard and that compliance with numeric effluent limitations was not required.[5] In fact, EPA has not promulgated any binding regulation requiring strict compliance with numeric limits, but has only issued guidance

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[1]In addition, for the reasons provided by the Permittees in prior oral and written comments, the Permittees continue to assert that the Regional Board has no system-wide, jurisdiction-wide, watershed or other basis by which to enroll the Permittees in the Regional MS4 Permit. By virtue of filing this comment letter, the Permittees do not waive any argument with respect to this issue, and have enrolled in the Regional MS4 Permit under protest.

[2] *NRDC v. County of Los Angeles* 673 F.3d 880, 886 (9th Cir. 2011) (revd. on other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013)) ("NRDC II).

[3] Order WQ 2015-0075, *In the Matter of Review of Order No. R4-2012-0175, NPDES Permit No. CAS004001, Waste Discharge Requirements for Municipal Separate Storm Sewer System (MS4) Discharges within the Coastal Watersheds of Los Angeles County, Except Those Discharges Originating from the City of Long Beach MS4*. ("State Board Order").

[4] 191 F.3d 1159 (9th Cir. 1999); *see also* 33 U.S.C. § 1342(p)(3)(B).

[5] This interpretation of the Clean Water Act has recently been upheld in the State of Maryland, and is thus, not unique to the Ninth Circuit. *Chesapeake Bay Foundation v. Md. Dep't of the Envt.*, Case No. 02-C-14-186144 (Anne Arundel Cir. Ct., Dec. 2, 2014); *In re Baltimore County MS4 Permit*, Case No. 03-C-14-000761 (Baltimore Cir. Ct., Oct. 7, 2014).

encouraging EPA regions and the States to adopt and require strict compliance with numeric effluent limits where feasible.[6] Thus, compliance with receiving water limitations is a State and Regional Board requirement. To further emphasize this point, the Ninth Circuit Court of Appeals in *NRDC II* interpreted the LA MS4 Permit's receiving water limitations language as a contract requiring the LA permittees to strictly meet numeric standards in that any exceedance was a violation of the permit.[7]

Regional Board staff has interpreted the Regional MS4 Permit as requiring strict compliance with water quality standards, noting at the Regional Board's May 8, 2013 adoption hearing on Order No. R9-2013-0001 that the Permittees were in immediate noncompliance with the Permit and that compliance would not be achieved within the 5-year Permit term.[8] The State Board, too, has clarified and mandated that regional water boards require strict compliance with water quality standards.[9]

As noted in Comments 13 through 15 in the County's November 19, 2014 comment letter and in various presentations by the Permittee and others throughout the adoption proceedings for the Permit, the Permittee have demonstrated that compliance with certain of the Permit's prohibitions, receiving water limitations and numeric effluent limits is not yet achievable, and may not be achievable in certain environmental conditions. This is due to the long-time urbanization of certain watersheds, the need to extensively retrofit this urbanization, the nature of stormwater transport, the lack of control municipalities have over certain pollutants, the technical and economic infeasibility of meeting certain numeric standards, and the need to change certain standards. Indeed, the Permittee have previously noted in testimony the key finding in *Pathogens In Urban Stormwater Systems* (American Society of Civil Engineers, 2014) that current recreational water quality criteria may likely be unattainable in wet weather. Therefore, in light of the State's mandate that water quality standards be strictly adhered to and the difficulties in attaining standards, an alternative compliance pathway is needed so that the

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[6] *See, e.g.*, Letter from Andrew D. Sawyers, Office of Wastewater Management, and Benita Best-Wong, Office of Wetlands, Ocean and Watersheds, United States Environmental Protection Agency, to Water Division Directors, Regions 1-10, United States Environmental Protection Agency, *Revisions to the November 22, 2002 Memorandum "Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on LA*s" (Nov. 26, 2014) ("EPA recommends . . . where feasible and appropriate, numeric requirements that attempt to maintain pre-development runoff conditions." "This memorandum is guidance. It is not a regulation and does not impose legally binding requirements on EPA or States.").

[7] *NRDC v. County of Los Angeles*, 673 F.3d at 892.

[8] Transcript vol. II, 75:15-19 (May 8, 2013).

[9] Order WQ 2015-0075, *In the Matter of Review of Order No. R4-2012-0175, NPDES Permit No. CAS004001, Waste Discharge Requirements for Municipal Separate Storm Sewer System (MS4) Discharges within the Coastal Watersheds of Los Angeles County, Except Those Discharges Originating from the City of Long Beach MS4*. ("State Board Order").

Permittee can continue to diligently plan, fund and rigorously implement their watershed programs without the trepidation of open-ended enforcement that follows from a strict liability regime. If the Regional Board is to require strict compliance with the prohibitions and limitations provisions of the Regional MS4 Permit, the Permittee support the addition of an alternative compliance pathway where it is robust, provides for regulatory certainty, and its implementation is technically and economically feasible.

A. The Permittee Support The Flexibility Of The Alternative Compliance Pathway

The proposed alternative compliance pathway at Provision B.3.c provides flexibility

B. Alternative Compliance Should Be Provided During The WQIP Planning Process.

The Permittees fundamental issue with the proposed alternative compliance pathway is that it does not address compliance during the WQIP planning process. It is only after a plan has been submitted and approved by the Executive Officer of the Regional Board that a Permittee is in compliance with the Permit's prohibitions and limitations.[10] This is directly contrary to the State Board's Order directing regional water boards to establish alternative compliance pathways and is in conflict with the findings and conclusions on which the Order is predicated. It is also raises questions of the Permit's fairness as well as its legal validity. The Permittees request that the Regional Board include a provision that allows compliance during the planning phase of the WQIP consistent with the State Board Order.

In the State Board Order, the State Board recognized that strict compliance with receiving water limitations "may result in many years of permit noncompliance, because it may take years of technical efforts to achieve compliance with the receiving water limitations, especially for wet weather discharges."[11] This statement is also referenced in the Tentative Order.[12] In recognizing the difficulties with attaining water quality standards, the State Board not only directed regional water boards to adopt alternative compliance pathways, it also upheld the interim compliance provisions of the LA Permit that allow the LA County Permittees to maintain compliance during the planning process for the WMP/EWMP (the functional equivalent of the Regional MS4 Permit's WQIP), so long as the planning process "is clearly constrained in a manner that sustains incentives to move on to approval and implementation and is structured with clear, enforceable provisions."[13] In fact, the State Board thought that there should have been more flexibility during the planning period than what was initially in the LA Permit, and allowed interim compliance

[10] Tentative Order, Provision B.3(c)(2).

[11] State Board Order, pg. 15.

[12] Tentative Order, Finding 10, pg. 4. The Tentative Order attributes this to the Permittees, but it is actually a direct quote from the State Board Order. The Permittees assert there are broader grounds by which strict compliance is unwarranted and, in some cases, unachievable.

[13] State Board Order, pp. 48-50.

even when there were deviations to the development schedule.[14] The State Board went even further and directed regional water boards to consider and adopt the WMP/EWMP approach unless regional differences dictated variances.[15]

The Tentative Order does not incorporate interim compliance during the planning phase of a WQIP, and the accompanying Fact Sheet does not indicate any region-specific or permit-specific reason why a material variance is warranted. The only justification that has been given during workshops on the alternative compliance option is that EPA has supported San Diego's proposed approach and that the San Diego Region "is not L.A." This insufficiently addresses the issue of why the Permittee should not be afforded a basic threshold of compliance during the 18-month planning period. It is also in direct conflict with the State Board Order, which describes in detail the issues with meeting water quality standards and the need for compliance over time. It is also the County's understanding that other regional water boards are following the State Board Order's compliance directive, such as the forthcoming MS4 permit by the Santa Ana Water Board for North Orange County where staff has indicated that the alternative compliance option will allow for interim compliance.

The absence of interim compliance when a Copermittee is diligently undergoing WQIP planning is patently unfair. As explained above, it undermines the State Board Order as well as the Tentative Order's recognition that compliance with water quality standards may take years to achieve.16 It is unreasonable to insist on strictly meeting water quality standards and establishing a compliance pathway, but not extending such compliance to the point at which a Copermittee most needs it.

The WQIP planning process is a significant financial undertaking. In Los Angeles County, preparation of equivalent watershed management plans has cost approximately $250,000 per watershed and these plans have identified final implementation costs per watershed in the range of $300 million to $6 billion.[17] It also unnecessarily exposes the Permittee to potentially

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[14] *Id.* at pg. 50 (adding Part VI.C.4.g. to the LA Permit allowing deviation from the WMP/EWMP development schedule).

[15] *Id.* at pg. 51 ("We direct all regional water boards to consider the WMP/EWMP approach to receiving water limitations compliance when issuing Phase I MS4 permits going forward. In doing so, we acknowledge that regional differences may dictate a variation on the WMP/EWMP approach, but believe that such variations must nevertheless be guided by a few principles. We expect the regional water boards to follow these principles unless a regional water board makes a specific showing that application of a given principle is not appropriate for region-specific or permit-specific reasons.").

[16] State Board Order, Conclusion 2, pg. 76. ("However, we find that municipal storm water dischargers may not be able to achieve water quality standards in the near term and therefore that it is appropriate for municipal storm water permits to incorporate a well-defined, transparent, and finite alternative path to permit compliance that allows MS4 dischargers that are willing to pursue significant undertakings beyond the iterative process to be deemed in compliance with the receiving water limitations.").

[17] County of Los Angeles Cost Study, *Projected WMP/EWMP Implementation Costs* (attached hereto).

unnecessary enforcement when significant resources and expenditures are underway to develop a long-term plan to improve water quality, particularly when a pollutant that is being addressed through the planning process is now the subject of an enforcement action or third party challenge. In other words, it would be unjustifiable to allow enforcement of a standard when the plan for attaining that standard is being developed and being reviewed by Regional Board staff. Furthermore, if the Regional MS4 Permit does not contain interim compliance, for the reasons set forth in the County's prior comments on the Regional MS4 Permit, it is unlawful. A permit that does not contain a compliance pathway or that is impossible to comply with is not in accordance with federal and state law.[18]

C. The Annual Milestone Requirement in the Alternative Compliance Pathway Is Arbitrary and Unworkable, and Should be Modified to Correspond to the Term of the MS4 Permit.

The alternative compliance pathway proposed in the Tentative Order includes Provision B.3.c(1)(a)(vii), recommended by certain stakeholders, requiring an annual milestone in the WQIP for each numeric goal. The Permittee believe that an annual milestone requirement is arbitrary, unworkable and may put the Permittee in a position to violate the California Constitution.

As has been expressed by the Permittee and Regional Board staff in the workshops leading up to the Tentative Order, the proposed alternative compliance pathway essentially requires the Permittee to develop an implementation plan and time schedule for each and every waterbody pollutant combination that exceeds or is likely to exceed a numeric limit. Thus, the alternative compliance pathway essentially requires the Permittee to develop a total maximum daily load (TMDL) and be under a Time Schedule Order for each pollutant to be deemed in compliance with the Permit.[19] When EPA or the State establish a TMDL, Section 303(d) of the Clean Water Act does not require implementation plans, but instead, implementation plans are left to a State's discretion as to whether one will be established as part of the MS4 permit. When an implementation plan is established by a State, it is a document or section of a document detailing the suite of corrective actions needed to reduce pollution and remediate an impaired waterbody.[20]

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[18] See County Comment Letter, Comments 13-15. See also, *Atlantic States Legal Fdn., Inc. v. Eastman Kodak Co.* 12 F.3d 353, 357 (2nd Cir, 1994); *Hughey v. JMS Development Corp.* 78 F.3d 1523, 1530 (11th Cir. 1996); *Divers Envt'l Conservation Organization v. State Water Resources Control Board*, 145 Cal.App.4th 246, 256 and 258 (2006).

[19] The County has previously commented on the Regional MS4 Permit that the imposition of an implementation plan and a time schedule sidesteps the procedures called for in the Clean Water Act and shifts the Regional Board's regulatory obligations to the Permittees. See County Comments, Comment 17, pg. 26, fn. 35 (Jan. 11, 2013).

[20] US EPA, Total Maximum Daily Loads, Glossary http://water.epa.gov/lawsregs/lawsguidance/cwa/tmdl/glossary.cfm#implementationplan ("Current 303(d)

Section 130.33(b)(10) of the Code of Federal Regulations sets forth certain criteria that an implementation plan must include, such as a description of actions and/or management measures and a general timeline for implementing those actions or measures along with interim milestones. There is no federal (or state) legal requirement, or EPA guidance, regarding the specific timing of the milestone or even that the milestone be anything more than a suggested target to attain.

It has been consistently recognized that the WQIPs will develop plans over a multi-year period that may span 10, 20 or 30 years in order to attain standards. It is inconceivable that an implementation plan will contain 20 annual milestones or even that a Copermittee could identify what that milestone might be in year 16, for example, in either the development or early implementation of the plan. WQIPs will focus on studies, monitoring, and review of data to inform the Copermittee as to what corrective actions are necessary, which will result in revisions to the plan. To imbed a milestone into a WQIP for each and every year is arbitrary. It is simply not how project or program development works from a planning perspective. For instance, in developing a project for the benefit of multiple MS4s across a watershed, a few years can be spent applying for grant funding and encumbering monies for the project. Oftentimes, environmental studies and the design of a project are being prepared concurrent with funding planning. A watershed-based program or project involves the letting of multiple contracts with various partners and stakeholders. Contracts include grant agreements; right-of-way dedications and other real property agreements; cooperative agreements with state, municipal and developer partners; architect-engineer agreements; construction contracts; operations and maintenance agreements; and procurement contracts. Although a general schedule is put together, project milestones often span multiple years and can fluctuate as new information is obtained or in the event of changing circumstances. Based on the robustness of the planning and development process, it is simply arbitrary to imbed an annual milestone for each and every numeric goal into an enforceable regulatory document. It also has Regional Board staff micro-managing the implementation process whereby unnecessary time will be spent developing an annual milestone and getting Regional Board staff's re-approval for any slippage in the timeline.

In many cases, WQIPs will be predicated on finding the necessary funds for carrying out implementation. The costs to address the numeric goals contemplated in a WQIP will be significant. Many of years of planning funding will go into even one numeric goal where monies will be allocated by the legislative body on a fiscal year basis and encumbered over many years. In addition to outside grant funds, a program or project's source of revenue will also be derived from taxes and fees, which fluctuate annually depending on factors like the market, inflation and cost indices, income, development, and other factors. Taxes and fees are further constrained in California by Propositions 218 and 26. Most fee programs, for instance, are designed for 10 or

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regulations do not require implementation plans, though some state regulations do require an implementation plan for a TMDL."); *see also*, 40 CFR § 130.

more years of fee collection in order to fund the necessary infrastructure or housing improvements needed. Therefore, a long-term implementation plan utilizing rigid annual milestones that include the funding and financing of projects is unworkable.

While an annual milestone may be the norm for a 5-year TSO that focuses on BMPs for a specific pollutant where final numeric limits are close to being attained, as demonstrated above, annual milestones for a 10 or 20-year plan for a difficult regulatory problem are arbitrary and unworkable. Instead, the Regional Board should consider a time period already used by state and federal law, which is the 5-year term of the Permit. When a TMDL implementation plan is developed, the plan is reported on in the annual report and then again in the Report of Waste Discharge. The next permit is fashioned based on the progress the Copermittee has made in that 5-year permit term.[21] The Regional Board should not deviate then from the established timelines already set forth in the law as the appropriate place to review progress is at the renewal of the Regional MS4 Permit. Compliance should not hinge on whether an individual action has occurred, but should be predicated on the collective actions of the Permit term, such that a Copermittee can demonstrate that reasonable progress has been made in attaining water quality standards.

D. The Prohibitions and Limitations Language of Provision A Should Specify That Compliance Can Be Determined By Utilizing The Alternative Compliance Pathway At Provision B.3.c.

The Prohibitions and Limitations language in Provision A should be aligned with the Water Quality Improvement Planning process described in Provision B. The Permittee appreciate the efforts to clarify the compliance determination in Provision B.3.c by linking it back to Provision A. However, as currently incorporated into the Tentative Order, Provision A makes no reference to Provision B.3.c, and thus, the Prohibitions and Limitations language may still be interpreted as stand-alone provisions that could subject the Permittee to state and federal enforcement actions as well as third party actions under the Clean Water Act's citizen suit provisions. To prevent this from occurring, a clear linkage between the compliance provisions in Provision B and the prohibitions, receiving water limitations, and effluent limitations must be established. Compliance with Provisions A.1, A.2 and A.3 should be linked to Provision B so that it is clear that the compliance mechanism for A.4 is the Water Quality Improvement Plan (Provision B) and/or the TMDL (Attachment E), as applicable. Permits are construed as contracts, and such a change would be a routine matter of contract drafting whereby contract provisions refer to one another for ease of reading and interpretation.

This change has been requested throughout the workshop and adoption proceedings for the Regional MS4 Permit, but no reason has been given for why this change could not be made. The

[21] This is also how air quality laws work under the Clean Air Act where a state implementation plan must demonstrate reasonable progress towards national ambient air quality standards, and is revisited on an 8-year basis.

Provision A language is not sacrosanct, and could be modified accordingly without changing the substance of the prohibitions and limitations set forth therein.

III. Provision E.2 Should Be Clarified That Implementation of A Copermittee's Illicit Discharge Detection and Elimination Program Constitutes Compliance with Effectively Prohibiting Non-Stormwater Discharges.

Section 402(p)(3)(B)(ii) of the Clean Water Act imposes a requirement to "effectively prohibit" non-storm water discharges. The State Board Order acknowledged that preventing all non-stormwater runoff into an MS4 can be a nearly impossible standard to meet at times, since third parties—such as residents watering their lawns in a reasonable manner—are likely to cause at least some incidental runoff to enter a Copermittee's MS4.[22] Other regional water boards have determined that Permittee are in compliance with the Clean Water Act's mandate to "effectively prohibit" all dry weather discharges when the Copermittee is implementing its illicit discharge prevention program. However, the Tentative Order in Provision E.2 could be interpreted to impose strict liability on the Permittee even where: (1) all or most dry weather flows are diverted before the water reaches a water of the State, (2) the discharge to the MS4 resulted from actions that the Copermittee may have very limited ability to control, and (3) the Copermittee was fully implementing its illicit discharge prevention program.

Provision E.2 of the Tentative Order should be amended to clarify that implementation of a Copermittee's illicit discharge, detection and elimination constitutes compliance with the requirement to effectively prohibit non-stormwater discharges.

IV. Compliance Dates For The Bacteria TMDL Should Be Changed.

Attachment E notes that the Responsible Permittee for MS4 discharges to waterbodies listed in Table 6.0 must be in compliance with final TMDL compliance requirements. However, the TMDL includes language stating that specific waterbody or beach segments included in the TMDL that have been delisted from the 2008 303(d) list are not subject to any further action as long as monitoring data continues to support compliance with water quality standards. Thus, the language in Attachment E is in conflict with the TMDL, and should be revised to reflect that no action is needed for delisted waterbody segments.

V. Exemption For Self Remediating Priority Development Projects

The list Priority Development Exemptions (Section E.3.b.(3)) should be revised to include projects that are effectively self remediating (i.e. all rainfall is retained) including, but not limited to, reservoirs and swimming pools.

[22] State Board Order, pg. 48, fn. 133 ("We recognize that even the most comprehensive efforts to address unauthorized non-storm water discharges may not eliminate all such discharges.").

Thank you for your attention to our comments. Please contact each of the undersigned directly if you have questions. For technical questions please also contact Chris Crompton at (714)955-0630 or Richard Boon at (714)955-0670.

Sincerely,

Mary Anne Skorpanich, Deputy Director
OC Environmental Resources

Ryan Baron, Senior Deputy County Counsel
Office of the County Counsel

Attachments: A - Summary of Projected WMP/EWMP Costs

Attachments: A - Summary of Projected WMP/EWMP Costs

Watershed	Project Type	Capital Costs	O/M Costs	TOTAL
Upper Santa Clara River	EWMP	$623.7 Million	-	$623.7 Million
Upper LA River	EWMP	$6.097 Billion	$210.84 Million (Annually)	$6.308 Billion
Rio Hondo/San Gabriel River	EWMP	$1.417 Billion	-	$1.417 Billion
Upper San Gabriel River	EWMP			$2.14 Billion
Malibu Creek	EWMP	$194.6 Million	$3.7 Million	$198.3 Million
Marina Del Rey	EWMP	$347.4 Million	$44.5 Million (Total)	$391.9 Million
North Santa Monica Bay Coastal Watersheds	EWMP	$32.5 Million	$21.7 Million (20-year life cycle)	$52.2 Million (20-year life Cycle)
Santa Monica Bay Jurisdictions 2 & 3	EWMP	$648.7 Million	$94.7 Million (20-year life cycle)	$743.4 Million
Santa Monica Bay and Dominguez Channel (Beach Cities)	EWMP	$89 Million	$3.1 Million (Annually)	$150 Million (20-year life cycle)
Palos Verdes Peninsula Agencies	EWMP	$129.5 Million	$1.52 Million (Annually)	$131.02 Million
Ballona Creek	EWMP	$2.723 Billion (by year 2021)	$77.74 Million (annually)	$2.8 Billion
Dominguez Channel	EWMP	$1.294 Billion	$12.4 Million (in year 2041)	$1.3064 Billion
Los Angeles River Upper Reach 2	WMP	$311 Million	-	$311 Million
Lower Los Angeles River	WMP	$293 Million	-	$293 Million
East San Gabriel Valley	WMP	$646.5 Million	-	$646.5 Million
Lower San Gabriel River	WMP	$64.63 Million	-	$64.63 Million
Los Cerritos Channel	WMP	$332 Million?		$332 Million?

County of San Diego

RICHARD E. CROMPTON
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September 14, 2015

Wayne Chiu, WRC Engineer
Regional Water Quality Control Board, San Diego Region
2375 Northside Drive, Suite 100
San Diego, CA 92108

Electronic Submission: sandiego@waterboards.ca.gov

Dear Mr. Chiu:

COMMENT LETTER – TENTATIVE ORDER NO. R9-2015-0100 PLACE ID:786088WCHIU

The County of San Diego (County) appreciates the opportunity to comment on the Regional Water Board's *Tentative Order R9-2015-0100, an Order Amending Order No. R9-2013-0001, NPDES No. CAS010266, as amended by Order No. R9-2015-0001, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4) Draining the Watersheds within the San Diego Region* (Tentative Order or Permit). Comments are followed by specific recommendations for modifications to the language in the Tentative Order. The noted references and page numbers refer to the redline strikeout version of the Tentative Order provided on the Regional Water Board's website.

County comments on the Tentative Order address the following general areas of concern:

- Receiving Water Limitations and the Alternative Compliance Pathway in Provisions A and B;
- BMP Design Manual Updates; and
- Total Maximum Daily Loads (TMDLs), specifically for Indicator Bacteria Project I and Los Peñasquitos Lagoon.

The County respectfully submits the following comments with respect to Tentative Order R9-2015-0100. These comments should not be construed as amending or modifying any of the County's positions with respect to any prior Regional Board order or action. The County reserves its right to continue to pursue any and all of its positions, arguments, challenges, petitions, and appeals with respect to any such prior Regional Board order or action.

1. Provision A.2. Receiving Water Limitations (page 17/138)
Receiving Water Limitations Provisions are not required in the Tentative Order

The County appreciates the inclusion of a Compliance Option in Provision B.3.c of the Tentative Order; however, we continue to believe that the Regional Board has ultimate discretion in regards to requiring strict numeric compliance with water quality standards as noted in the State Board Order addressing receiving water limitations[1]. The County respectfully requests that the Regional Board use its discretion to remove the requirement to comply with receiving water limitations in Provision A.2 of the Tentative Order. While the County recognizes that the State Board has issued an order on the Los Angeles MS4 Permit that includes findings about the receiving water limitations language, the County feels that the San Diego Regional Water Board should utilize the discretion discussed in the order:

> "Although it would be inconsistent with USEPA's general practice of requiring compliance with water quality standards over time through an iterative process, we may even have the flexibility to reverse our own precedent regarding receiving water limitations and receiving water limitations provisions and make a policy determination that, going forward, we will either no longer require compliance with water quality standards in MS4 permits, or will deem good faith engagement in the iterative process to constitute such compliance." (Footnotes omitted).[2]

While the State Board Order declined to reverse course and discontinue including receiving water limitations provisions in MS4 permits, the County respectfully submits that this is not a sound policy decision. The State Board broadly concluded that "the iterative process has been underutilized and ineffective to date in bringing MS4 discharges into compliance with water quality standards."[3] To the contrary, significant advances in reducing pollutants in receiving waters have been made and will continue to be made as science and technology improve and watershed management approaches are implemented. The County feels the Regional Water Board should allow the comprehensive and prioritized watershed planning efforts to be implemented and the effectiveness evaluated prior to incorporating receiving water limitations.

The inclusion of receiving water limitations language seems to overlook the intent of Congress in enacting §402(p) of the Clean Water Act, the Chief Counsel 1993 Memorandum explaining the rationale for the separate Maximum Extent Practicable (MEP) standard for MS4 systems, and Congress' recognition of the unique challenges that an MS4 faces with an open system.[4]

For example, the Caltrans Permit (Order 2012-0011 DWQ) contains language that is more consistent with Clean Water Act §402(p).[5] It recognizes the infeasibility of setting

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[1] Order WQ 2015-0075, p. 13; http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/docs/2015-0731_Tentative_Order_Attachment%201_(Amended_Order).pdf.
[2] *Id* at 14
[3] *Ibid.*
[4] 1993 Memorandum of Chief Counsel, p. 2
[5] Order 2012-0011 DWQ, Finding 20, p. 11; Provision A.1., p. 18.

numeric effluent criteria for municipal BMPs and urban discharges. Setting a policy consistent with these realities and using language that reflects the appropriate MEP standard and iterative process would advance improvement of water quality by creating a climate of cooperation and innovative solutions.

The County requests that the Regional Water Board use the discretion noted to remove the receiving water limitations from this MS4 permit. However, should the Board decide to keep the receiving water limitations language, we have recommended some modifications for consideration in the specific comments below.

SPECIFIC COMMENTS ON RECEIVING WATER LIMITATIONS

2. **Provision A. Prohibitions and Limitations (page 16/138)**
   ***Request:* Add sentence to Provision A to clarify its link to Provision B.**

   Rationale: The Prohibitions and Limitations language in Provision A should be aligned with and reference the compliance alternatives provided through the Water Quality Improvement Planning process described in Provision B.

   The proposed Prohibitions and Limitations provisions may be construed as standalone provisions that could expose the Copermittees to state and federal enforcement actions, as well as to third-party actions under the federal Clean Water Act's citizen suit provisions. A clear linkage between the compliance provisions and the prohibitions, receiving water limitations, and effluent limitations must be established. Compliance with Provisions A.1, A.2, and A.3 should be linked to Provision B so that it is clear that the compliance mechanism for A.4 is the Water Quality Improvement Plan (Provision B) and/or the TMDL (Attachment E), as applicable.

   Recommendation: *Include language in Provision A to indicate that compliance can be achieved through implementation of the Water Quality Improvement Plan, specifically through the Alternative Compliance Pathway added as Provision B.3.c. Add a sentence at end of first paragraph:*

   Implementation of the Compliance Option described in Provision B.3.c of this Order shall constitute compliance with the Discharge Prohibitions (A.1.a, A.1.c, A.1.d), Receiving Water Limitations (A.2), and Effluent Limitations (A.3.b) Provisions of this Order.

3. **Provision B.3.c. Prohibitions and Limitations Compliance Option (page 33/138)**
   Request: Restructure the annual milestone requirements in the Compliance Option so they are meaningful and realistic.

   Rationale: Provision B.3.c.(1)(a)(vii) requires annual milestones to be established for each numeric goal. Further, footnote #9 requires the following:

   "Annual milestones for each final numeric goal must build upon previous milestones and lead to the achievement of the final numeric goal. The annual

milestones may consist of water quality improvement strategy implementation phases, interim numeric goals, and other acceptable metrics."
While the County appreciates the desire to establish additional accountability toward the attainment of final numeric goals, the approach proposed in the Tentative Order is unrealistic and will not provide meaningful goals beyond the first few years. The County has three specific issues with the annual milestone approach:

Issue 3A: The process of implementing BMPs is often not linear in such a manner that actions would consistently "build upon" previous milestones. Copermittees may proceed with the implementation of one BMP (or packages of BMPs), but may later determine that a change of course is needed (e.g., a BMP's not effective, a better approach is identified). This concept has been recognized many times by the Regional Board in discussing the approach to Water Quality Improvement Plans. The County requests that this language be modified to reflect that course corrections may be warranted.

> ***Recommendation:*** *Replace "build upon previous milestones" with "cumulatively." (For complete proposed text revisions, see the Overall Recommendation at the end of this comment that integrates all suggested revisions for Comment #3.)*

Issue 3B: Annual milestones lose meaning after a certain timeframe. For example, it is reasonable to foresee milestones in the first several years of implementing a project, or even to foresee bigger picture milestones over a longer timeframe. Indeed, it is important to forecast the amount of time needed to implement projects to obtain the final goals. However, in forecasting longer-term efforts, milestones are typically not annual, but are at a much larger scale (e.g., multi-year periods). Practically speaking, it is reasonable to identify concrete milestones in Years 1 – 5 of a 30 year effort, whereas the milestones identified today for Year 10, 15, 20, etc. lose significant meaning and value.

> ***Recommendation:*** *Revise the annual milestones to require establishment of committed milestones for the permit term (e.g., Years 1 -5) and the forecasting of additional milestones for the next permit term (e.g., Years 6 – 10). This approach will result in firm commitments for each permit term and ensure that Copermittees are planning ahead in a meaningful way for the following permit term. This process continues until the final numeric goals are achieved. (For complete proposed text revisions, see the Overall Recommendation at the end of this comment that integrates all suggested revisions for Comment #3.)*

Issue 3C: While a requirement to identify annual milestones for each numeric goal may initially sound reasonable, the realistic number of annual milestones generated by such a requirement is unrealistic to measure and track. Take for example an estimate of the number of milestones that would be required just of the County:

8 Watershed Management Areas (WMA) x
2 waterbodies (assuming 1 creek and 1 beach) per WMA x
3 to 5 numeric goals per waterbody x
5 years in a permit term =
48 to 80 annual goals; 240 to 400 goals per permit term

The intent of the milestones is to increase accountability. However, tracking 48 to 80 milestones each year just for the County of San Diego would create an administratively intensive process that far outweighs the benefit. Alternatively, milestones could be established based on the permit term, rather than on an annual basis. Further, the Tentative Order should also explicitly acknowledge and allow for a specific milestone to apply to multiple numeric goals and/or waterbodies (as justified to be applicable and appropriate). This approach would streamline the process and create a more meaningful and clearer process of accountability.

Recommendations: *(1) Replace the requirement for annual milestones with a requirement to establish at least one milestone per permit term. This would result in approximately 48 – 80 goals in a permit term (based upon the estimate above), still providing significant accountability. (2) Explicitly allow a milestone to apply to more than one numeric goal and/or waterbody (as applicable and appropriate). (For complete proposed text revisions, see the Overall Recommendation at the end of this comment that integrates all suggested revisions for Comment #3.)*

Overall Recommendation for Comment #3: *Modify Provision B.3.c.(1)(a)(vii) , footnote 9,* B.3.c.(2)(c), and B.3.c.(2)(d) *as follows:*

B.3.c.(1)(a) (vii): For each final numeric goal developed pursuant to Provisions B.3.a and B.3.c.(1)(a)(i)-(v), at least one ~~annual~~ milestone[9] and date for its achievement must be included **for the permit term** within each Water Quality Improvement Plan **and progress toward attaining the milestone(s) reported upon during each** Annual Report reporting period**. Further, for each final numeric goal developed pursuant to Provisions B.3.a and B.3.c.(1)(a)(i)-(v), at least one milestone forecasted to be achieved in the next subsequent permit term must be included within each Water Quality Improvement Plan. This process will continue** until the final numeric goal is achieved.

Footnote 9: ~~Annual~~ ~~m~~**M**ilestones for each final numeric goal must ~~build upon previous milestones and~~ **cumulatively result in** ~~lead to~~ the achievement of the final numeric goal. The ~~annual~~ milestones may consist of water quality improvement strategy implementation phases, interim numeric goals, and other acceptable metrics. **The milestones may also address multiple numeric goals and/or multiple waterbodies, as applicable and appropriate.**

B.3.c.(2)(c): The Copermittee's' assessments in the Water Quality Improvement Plan Annual Report submitted pursuant to Provision F.3.b.(3) support a conclusion that: 1) the Copermittee is in compliance with the ~~annual~~ milestones and dates for achievement developed pursuant to Provision B.3.c.(1)(a)(vii), OR 2) the Copermittee has provided acceptable rationale and recommends appropriate modifications to the interim numeric goals, and/or water quality improvement strategies, and/or schedules to improve the rate of progress toward achieving the final numeric goals developed pursuant to Provisions B.3.a and B.3.c.(1)(a)(i)-(vi); AND

B.3.c.(2)(d): Any proposed modifications to the numeric goals, schedules, and/or ~~annual~~ milestones are accepted by the San Diego Water Board as part of subsequent updates to the Water Quality Improvement Plan pursuant to Provision F.2.c; AND

4. **Provision B.3.c. Prohibitions and Limitations Compliance Option (page 36/138)**
Request: **Add a compliance pathway to Provision B.3.c during development of or updates to the WQIP.**

Rationale: While developing a plan to comply with the Alternative Compliance Pathway, Copermittees should be deemed in compliance with Receiving Water Limitations where all Permit-required milestones related to development and/or implementation of the Water Quality Improvement Plan is met.

Recommendation: *Add language consistent with former recommendations provided during the reissuance process in 2013[6], consistent with the Los Angeles MS4 Permit[7], and consistent with the recently adopted State Board Order[8] upholding the alternative compliance approach used in the Los Angeles MS4 Permit. This would require: (1) language to require a Notice of Intent to utilize a WQIP-based compliance option, and (2) all deadlines for development and implementation of a WQIP pursuant to Provision F.1.(a) and (b), and Provision B are met AND the WQIP, or revised WQIP, ultimately receives approval. The following language should be added as Provision B.3.c.(3):*

(3) For cases when applicable discharge prohibitions (A.1.a, A.1.c, A.1.d), receiving water limitations (A.2.a), or effluent limitations (A.3.b) are not attained during the time period between a Copermittee's notification of intent to utilize a Water Quality Improvement Plan based compliance option and San Diego Water Board executive officer acceptance of the Water Quality Improvement Plan, a Copermittee is in compliance with Provision A.1.a, A.1.c,, A.1.d, A.2.a, and A.3.b if all of the following conditions are met:

a. All deadlines for development of a Water Quality Improvement Plan pursuant to Provision F.1.(a) and (b) or implementation of an existing Water Quality Improvement Plan pursuant to Provision B are met;
b. For the areas of the watershed to be covered by the alternative compliance option, the Copermittee(s) must initiate targeted implementation of programs through the agencies' existing programs that focus on the watershed's priority pollutants to effectively prohibit non-stormwater discharges to the MS4 and to reduce pollutants in stormwater discharges from the MS4 to the MEP;
c. Receives acceptance of the Water Quality Improvement Plan or updated Water Quality Improvement Plan within the time periods specified in Provision F.

[6] "SDCopermitteeFinal R9-2013-0001 Tentative Order DRAFT Strikeout_010413 –comments_3_27_TO_Copy.doc"
[7] Order No. R4-2012-0175, Part VI.C.2.d
[8] Order WQ-2015-0075, B.6, page 48

5. **Provision B.3.c.(1)(a)(iii) Prohibitions and Limitations Compliance Option (page 34/138)**

   Request: Numeric goals developed for 303(d) listed constituents should be applicable only if the MS4 is determined to be a source of the pollutant causing the impairment.

   Rationale: Provision B.3.c.(1)(a)(iii) appears to include all 303(d) listings in receiving waters without specifying that the impairment must be linked to MS4 discharges. There may be instances where MS4 discharges are not causing or contributing to the impairment. While that situation would result in a Permittee complying with Provision A without the need for the alternative compliance pathway in Provision B.3.c, clarity would avoid future confusion as to whether or not interim and final numeric goals need to be developed.[9]

   Recommendation: *Modify Provision B.3.c.(1)(a)(iii) as follows:*

   (iii) Interim and final numeric goals applicable to the Copermittee's MS4 discharges within the Watershed Management Area expressed as numeric concentration-based or load-based goals for all pollutants and conditions listed on the Clean Water Act Section 303(d) List of Water Quality Impaired Segments for the receiving waters in the Watershed Management Area that do not have a TMDL incorporated into Attachment E to this Order **<u>and where MS4 discharges are causing or contributing to the impairment;</u>** AND/OR

6. **Provision B.5. Iterative Approach and Adaptive Management Process (page 37/138)**

   Request: Permit language should address a trigger for updates to the watershed modeling/analysis as part of the adaptive management process.

   Rationale: Provision B.5 requires that the adaptive management process is performed annually. As drafted, the language could be interpreted to mean that the watershed model/analysis would have to be updated annually.

   Recommendation: *Include a new Provision B.5.d to clarify that updates to the watershed model/analysis within the adaptive management process are required only if conditions have changed significantly such that they would alter the model results. As part of the ROWD, the watersheds would conduct an analysis of whether conditions have changed sufficiently to warrant an update to the watershed model/analysis and, if so, provide a schedule for conducting the updated analysis.*[10]

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[9] Consistent with CASQA recommendations to SWRCB. California Stormwater Quality Association, Letter to Ms. Jeanine Townsend, Clerk to the Board, State Water Resources Control Board, Subject: SWRCB/OCC Files A-2236(a) through (kk); Comments on Proposed Order *In Re Petitions Challenging 2012 Los Angeles Municipal Separate Storm Sewer System Permit (Order No. R4-2012-0175)*, January 19, 2015.

[10] Consistent with CASQA recommendations to SWRCB. California Stormwater Quality Association, Letter to Ms. Jeanine Townsend, Clerk to the Board, State Water Resources Control Board, Subject: SWRCB/OCC Files A-2236(a) through (kk); Comments on Proposed Order *In Re Petitions Challenging 2012 Los Angeles Municipal Separate Storm Sewer System Permit (Order No. R4-2012-0175)*, January 19, 2015.

B.5.d. Updates to Optional Watershed Analysis [B.3.c.(1)(b)]
Updates to the optional watershed analysis included in Provision B.3.c.(1)(b) are required only if conditions have changed significantly within the watershed or where new information is available that would significantly alter the model results.

7. Provision F.2.b. BMP Design Manual Updates (Page 126/138)

Request: Allow adequate time for Copermittees to update and implement their BMP Design Manuals.

Rationale: The current Order establishes the Effective Date of the BMP Design Manual (and therefore of the requirements of Permit Section E.3.a-d) as December 24, 2015. This date was appropriate at the time of initial Permit adoption because it provided Copermittees sufficient time to develop updated content and modify the programs and regulatory authorities needed for implementation. The Tentative Order would now require Copermittees to *update* their BMP Design Manuals to incorporate the amended Provisions E.3.a-d within 90 days after the amended Provisions E.3.a-d are adopted by the Regional Board. Given that the Tentative Order proposes critical new modifications, additional time is requested to allow for their completion *and implementation*. The first of these are the changes in the definition of redevelopment Priority Development Projects (PDPs) proposed in Section II.E.3.b.(1)(c) through (e). The second is the addition of a modified process for establishing Prior Lawful Approval (PLA) under Section E.3.e.(1). We appreciate the work that Regional Board staff put into working with stakeholders and crafting these PLA provisions, and we support their adoption. However, we must also note that the current schedule for implementing updated BMP Design Manual provisions under the Tentative Order severely limits their potential application. Additional time is needed to: allow Copermittees to ensure regional consistency; modify local BMP Design Manuals; update policies, procedures, and other program documentation; conduct outreach to industry and project proponents; and modify local ordinances.

At a minimum, the Regional Board should allow six months from the adoption of new requirements to complete and implement these tasks. As currently written, if these provisions are adopted as proposed on November 18, Copermittees would have just 90 days to implement them. Please note the following inconsistencies in the Tentative Order and Technical Report regarding the extension of dates. First, the Technical Report (page F-110) states "Provisions E.3.e.(1)(a)[a]-[d] are dependent on the effective date of the BMP Design Manual. Unless otherwise directed by the San Diego Water Board, the effective date of the BMP Design Manual is December 24, 2015 for the San Diego County Copermittees ..." This is in contrast to Provision F.2.b.(4), which requires that *revision* of the updated BMP Design Manual be completed not later than 90 days after the date the San Diego Water Board adopts the amendments (i.e., by February 16, 2016). Since it is not possible for the BMP Design Manual effective date to precede its revision date, it must be assumed that the intent of Provision F.2.b.(4) is to also extend the effective date.

In recent correspondence on this issue, Regional Board staff has indicated their intent to explicitly extend the effective date by the same 90 days allowed for the BMP Design Manual revision using the discretion granted the Executive Officer under other proposed amendments to Section E.3.d. However, this is problematic for three reasons. First, since any extension granted by the Executive Officer could only be executed after the hearing,

Copermittees would have no assurances that it would actually occur. Second, extending the effective date by 90 days would merely make the revision and effective dates concurrent rather than rectifying the inconsistencies causing the confusion. Third, a 90-day extension of the effective date simply does not provide adequate time for both completing and implementing the BMP Design Manual update. We recommend that the *effective* date of the BMP Design Manual for the Copermittees be extended 180 days from the adoption of the Tentative Order (i.e., May 14, 2016). Modifying the Permit to specifically incorporate this effective date, rather than relying on the ability of the RWQCB Executive Officer to do so after the fact, would both provide the time necessary for critical program updates and the certainty needed to plan for them. It would also ensure that these critical changes are fully vetted in an open public forum.
We also recommend that Provision E.3.d. be modified to clarify that the date the BMP Design Manual is implemented (rather than revised) is the same as the "effective date". This will help to prevent any future confusion regarding the applicability of dates.

Since the County has already modified its Watershed Protection Ordinance (WPO) to reflect existing Permit content in anticipation of the December 24, 2015 BMP Design Manual effective date, we will now need to repeat this process to incorporate the modified PDP definition and the updated PLA process. The schedule below illustrates an anticipated *best case scenario* for updating and obtaining Board of Supervisors approval of the WPO.

12/06/15	Deadline for first draft Board letter and supporting materials (incl. update Watershed Protection Ordinance)
12/30/15	File the public notice with the Clerk of the Board
12/31/15	Official Public Notice Period
01/05/16	Board of Supervisors Hearing, 1st reading
01/26/16	Board of Supervisors Hearing, 2nd reading and approval
02/16/16	BMP Design Manual Effective Date if Extended by RWQCB Executive Officer
02/25/16	Revised WPO effective date (30 days after approval of amendments)
05/16/16	BMP Design Manual Effective Date proposed by County and Copermittees

As shown, completion of a WPO update alone would exceed the 90 days currently allowed by the Tentative Order. This means that even if the County is able to move another WPO update forward on the most aggressive possible schedule (which we cannot guarantee since this item would have to compete with other potential content on the Board agenda), the anticipated effective date of the WPO revisions would be after the BMP Design Manual effective date. We expect that other Copermittees will experience similar problems with the timing of their ordinance updates. While a nine-day discrepancy might not initially sound significant, it's important to emphasize that this could be much more, depending on actual WPO hearing schedules. This means, for instance, that the County would lack the legal authority to require that redevelopment projects under the updated PDP definition be considered PDPs during that interim period. It is not sound policy to knowingly impose updated Permit requirements on a schedule that the County or any other Copermittee

cannot meet. The RWQCB has been responsive to such concerns in the past, and we are requesting the same consideration here.

Even if ordinance revisions could be completed within 90 days, it is still insufficient time for completing other critical tasks (updating the County BMP Design Manual, then training staff and conducting industry outreach, etc.), all of which are required to responsibly and legally impose updated requirements on public and private projects. While Regional Board staff has suggested that Copermittees can start this process now, it is unrealistic to expect that they do so based only on the proposed requirements of this Tentative Order. It would be speculative to assume that the Tentative Order will be adopted as currently drafted, and Copermittees should not be expected to initiate specific program changes or ordinance revisions based on speculation. Moreover, asking project proponents to implement updated requirements without sufficient time to consider and design to them is unreasonable. We therefore request that the BMP Design Manual effective date be extended by 180 days in the adopted Order. As shown in the table above, this would provide additional time that necessary to avoid imposing a de facto condition of Copermittee non-compliance, and that is critical to getting these new requirements right.

Recommendations: *The County recommends that the Regional Board modify the requirement to specify that the updates be made to the BMP Design Manual, as follows:*

Provision E.3.d
Each Copermittee must update its BMP Design Manual pursuant to Provision F.2.b. Until the Copermittee has updated its BMP Design Manual pursuant to Provision F.2.b.(1), the Copermittee must continue implementing its current BMP Design Manual. The Copermittee must implement the updated BMP Design Manual within 180 days following completion of the update pursuant to Provision F.2.b.(1), unless directed otherwise by the San Diego Regional Water Board Executive Officer. **The date the BMP Design Manual is implemented is the "effective date" of the BMP Design Manual**. The update of the BMP Design Manual required pursuant to Provision F.2.b.(1) must include the following:

Provision F.2.b.(4)
If the San Diego Water Board amends Provisions E.3.a-d during the permit term but after the Copermittee has completed the update pursuant to Provision F.2.b.(1), the Copermittee must revise its BMP Design Manual to incorporate the amended Provision E.3.a-d requirements as soon as possible but no later than **180** days after the date the San Diego Water Board adopts the amendments to Provisions E.3.a-d, unless otherwise directed by the San Diego Water Board Executive Officer. **Under these circumstances, the effective date of the BMP Design Manual is 180 days after the date the San Diego Water Board adopts the amendments to Provisions E.3.a-d**.

8. Provision E.3.c.(2)(b) – Requirements to Manage Critical Coarse Sediment Yield

Request: Allow adequate time for Copermittees to study and collaboratively develop approaches to compensate for the loss of critical sediment supply.

Rationale: Section E.3.c.(2)(b) of the Order requires that each development project conduct studies and compensate for the loss of onsite sediment supply. In our January 11,

2013, comment letter on the initial adoption of this Permit, the County noted that the imposition of these requirements is speculative and premature given the current state of science and technology regarding these impacts and potential mitigation options. While the County and others continue to work to meet these requirements, we reiterate our previous comments. Until the impact of individual development projects on receiving water coarse sediment supply is better understood, the ability of Copermittees to require sediment compensation on a project-by-project basis in a technically and legally defensible manner will remain severely limited. Moreover, pursuing a longer-term, study-based approach will help to avoid unintended environmental impacts.

Recommendations: *We recommend the language be removed from Section E.c.3.(2)(b) and moved to Section E.3.d as line item (6) so that it can be addressed regionally instead of at a project level.*

9. Provision E.3.c. Priority Development Project Structural BMP Performance Requirements

Request: Clarify the intent and applicability of TCBMP treatment requirements to flow-thru BMP designs.

Rationale: Provision E.3.c.(1)(a)(i) describes performance requirements for biofiltration BMPs where retention of the full design capture volume is not feasible. Proposed revisions would clarify that option [a] under this Provision is intended for flow-based BMPs and that option [b] is intended for volume-based BMPs. Removal of the reference to "flow-thru design" would eliminate any unintended implications that the flow-thru treatment requirements of Provision E.3.c.(1)(a)(ii)[b] apply to BMPs addressed by the design criteria of Provision E.3.c.(1)(a)(i)[b]. The addition of "static storage" language clarifies this volume based BMP is not subject to flow routing requirements.

Recommendation: *Modify Provision E.3.c.(1)(a)(i)[b] as follows:*

[b] Treat the design capture volume not reliably retained onsite with a ~~flow-thru design that has a~~ total **static storage** volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained

SPECIFIC COMMENTS ON TMDL PROVISIONS

10. Attachment E-6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

Request: Issue 10A: Modify wet weather compliance timelines for delisted 303(d) waterbodies to 20 years to be consistent with the TMDL Resolution.

Rationale: **Issue 10A:** Footnotes and dates were added to Tables 6.1 and 6.4 to note earlier final and interim wet weather compliance dates, respectively, if the Water Quality Improvement Plans do not include "load reduction programs" to address other constituents.

Draft Tentative Order Attachment E Tables 6.1 and 6.4 should be modified for consistency with the TMDL. The proposed addition of a 10-year wet-weather compliance deadline of April 4, 2021, to Table 6.1, for water bodies in a WQIP that does not include load reductions for pollutants besides bacteria, is inconsistent with the adopted TMDL and thereby violates the Clean Water Act regulations at 40 C.F.R. § 122.44(d)(1)(vii)(B). This proposed amendment would subject the segments of beaches and creeks that were removed from the 303(d) list to requirements from which the de-listed segments are specifically exempt under the adopted TMDL. Under the TMDL, no BLRP or CLRP is required for the de-listed segments. The WQIP is a requirement of the MS4 Permit, not the TMDL, and is not a BLRP. Thus, there is no justification to require a 10-year compliance schedule for the de-listed segments, and the proposed amendment is not consistent with the TMDL.

Recommendation: *Delete proposed language in Table 6.1 and footnote.*
However, should the Regional Water Board decide to keep the footnote, we recommend modifications to be consistent with the adopted TMDL:

Recommendations:

Table 6.1 Footnote: **Except for segments removed from the 303(d) list,** ~~T~~the Wet Weather TMDL Compliance Date in parenthesis applies if the applicable Water Quality Improvement Plan does not include **anticipated** load reductions ~~programs~~ for other constituents **analogous to the Comprehensive Load Reduction Plan** together with bacteria load reduction requirements of this TMDL.

Table 6.4: Remove dates included in parentheses for segments removed from the 303(d) list.

Table 6.4 Footnote: The Interim Compliance Dates to achieve the Interim Wet Weather WQBELs in parenthesis apply if the applicable Water Quality Improvement Plan does not include **anticipated** load reductions ~~programs~~ for other constituents **analogous to the Comprehensive Load Reduction Plan** together with bacteria load reduction requirements of this TMDL.

Request: Issue 10B: Clarify that compliance with receiving water limitations will be assessed at the compliance points identified in the TMDL Monitoring Plan.

Rationale: **Issue 10B:** Compliance with the final and interim receiving water limitations as allowed by Attachment E-6.b.(3)(b), E-6.c.(3)(b), and E-6.c.(3)(f) should be consistent with the TMDL, Basin Plan Amendment, and approved TMDL Monitoring Plan. The Basin Plan Amendment defines the points for compliance in the receiving waters as follows:

"For beaches addressed by these TMDLs, monitoring locations should consist of, at a minimum, the same locations used to collect data required under MS4 NPDES monitoring requirements and beach monitoring for Health and Safety Code section 115880" and "[f]or creeks addressed by these TMDLs, monitoring locations should consist of, at a minimum, a location at or near the mouth of the creek (e.g., Mass

Loading Station or Mass Emission Station) and one or more locations upstream of the mouth (e.g., Watershed Assessment Stations)." [11]

The approved monitoring plans have defined monitoring compliance points consistent with the language in the Basin Plan Amendment. For consistency, the language in Attachment E-6 should be modified.

Recommendation: *Modify the appropriate language in the final and interim compliance pathways in Attachment E-6 as follows:*

E-6.b.(3) Final TMDL Compliance Determination

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at~~, or downstream of the Responsible Copermittee's MS4 outfalls~~ **the compliance point in the receiving water as defined in the approved TMDL monitoring plan**; OR

E-6.c.(3) Interim TMDL Compliance Determination

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at~~, or downstream of the Responsible Copermittee's MS4 outfalls~~ **the compliance point in the receiving water as defined in the approved TMDL monitoring plan**; OR

(f) There are no exceedances of the interim receiving water limitations under Specific Provision 6.c.(2)(a) in the receiving water at~~, or downstream of the Responsible Copermittee's MS4 outfalls~~ **the compliance point in the receiving water as defined in the approved TMDL monitoring plan**; OR

11. Attachment E-7. Total Maximum Daily Load for Sediment in Los Peñasquitos Lagoon

Request: Incorporate a land use-based compliance pathway that is consistent with the approach used to develop the TMDL[12].

Rationale: Attachment E-7 incorporates Los Peñasquitos Sediment TMDL (Sediment TMDL) requirements for Phase I MS4 Permittees. Both the TMDL and its incorporation into the MS4 Permit through Revised Tentative Order R9-2015-0100 provide multiple pathways for the responsible parties to demonstrate compliance. The County supports the flexibility provided by these options and, based on the following rationale, requests that the Regional Board also include an option for land use-based TMDL compliance.

The Sediment TMDL provides the framework and milestones to restore lagoon

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[11] California Regional Water Quality Control Board, San Diego Region. *Resolution No. R9-2010-0001, Attachment A. Amendment to the Water Quality Control Plan for the San Diego Basin (9) to Incorporate Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek).* Chapter 7(h)(7)(i) – Monitoring for TMDL Compliance and Compliance Assessment, p. A50.

[12] California Regional Water Quality Control Board, San Diego Region. *Resolution No. R9-2012-0033* and *Sediment TMDL for Los Penasquitos Lagoon, Staff Report, June 13, 2012.*
http://www.waterboards.ca.gov/sandiego/water_issues/programs/tmdls/los_penasquitos_lagoon.shtml

saltmarsh habitat to 80% of the acreage that existed in 1973 through numeric targets for sediment loading during the critical wet period based on 1970s conditions, when the sediment water quality standard was met.

The Sediment TMDL provides the following support for this approach:

- The numeric targets section finds that the water quality objective for sediment in the Lagoon was attained and beneficial uses were supported under 1970s land use conditions, and that the Lagoon was capable of assimilating 1970s sediment loads.

- The source assessment section links hydromodification caused by land development within the watershed to increased scouring and sediment transport. Phase I MS4s are noted as the main point source of sediment, primarily through the increased volume, velocity, frequency and discharge duration of runoff from developed areas, which transports built-up sediment, and accelerates downstream erosion. Hydromodification, the change in natural runoff characteristics caused by urbanization or other land use changes, is named as the driver for increased sediment loads from MS4s.

- The linkage analysis section relies on results from a computer model that relates sediment loading to land use, and notes that the 1970s condition represents a time period prior to major land development in the watershed.

Consequently, if the land use of a TMDL Responsible Party has not changed significantly since the 1970s baseline, the sediment loads from that Party's MS4 outfalls are expected to be approximately the same as the baseline level and within the amount allowed as part of the approved wasteload allocation. Therefore, since wasteload allocations are based on achieving 1970s sediment loads, if it can be demonstrated that limited land use change has resulted in sediment loads from a Responsible Party that have remained the same since the 1970s, and within the levels allowed by the wasteload allocation, the Party should be deemed in compliance with the Sediment TMDL.

> ***Recommendation:*** *The County requests that a land use-based TMDL compliance pathway be incorporated into Attachment E-7 through the following amendments (<u>underlined</u> text to be inserted):*

7.b.(2).(c) Best Management Practices

(i) The Water Quality Improvement Plan for the Los Penasquitos Watershed Management Area must incorporate the Sediment Load Reduction Plan required to be developed pursuant to Resolution No. R9-2012-0033. <u>Areas within the Los Penasquitos Watershed Management Area where it can be demonstrated that sediment loading has not increased beyond the allowable wasteload allocation as a result of limited or no land use changes since the 1973 baseline may be excluded from the Sediment Load Reduction Plan or Water Quality Improvement Plan.</u>

(ii) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 7.b.(2)(a) and/or the Copermittee's portion of the effluent limitations under Specific Provision 7.b.(2)(b) for Los Penasquitos Lagoon, unless it can be shown pursuant to Specific Provision 7.b.(2)(c)(i) that sediment loading has not increased beyond the allowable wasteload allocation as a result of limited or no land use changes since the 1973 baseline.

7.b.(3) Final TMDL Compliance Determination

(b) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 7.b.(2)(c)(ii) for land areas with significant land use changes from the TMDL baseline, or other implementation actions achieve compliance with Specific Provision 7.b.(3)(a).

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 7.d to demonstrate compliance with Specific Provision 7.b.(3)(a). Responsible Copermittees that can demonstrate land use-based TMDL compliance per the requirements in provision 7.b.(2)(c)(i) , and any jurisdictional areas with changes that are demonstrated to be in compliance with the TMDL as specified in Specific Provision 7.b.(3)(b)(ii), are exempt from Specific Provision 7.d, as they are fully attaining the final TMDL requirements.

7.c.(2) Interim TMDL Compliance Determination

(e) The Responsible Copermittees have demonstrated they are in compliance with the final TMDL as specified in Specific Provision 7.b.(3).

If you have questions or require additional information, please contact Jo Ann Weber, Planning Program Manager at (858) 495-5317 or e-mail at JoAnn.Weber@sdcounty.ca.gov.

Sincerely,

Todd Snyder

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RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

September 14, 2015

Sent via email to: sandiego@waterboards.ca.gov

Mr. Wayne Chiu
CRWQCB - San Diego Region
9174 Sky Park Court, Suite 100
San Diego, California 92108

Dear Mr. Chiu:

Re: Comment - Tentative Order No. R9-2015-0100, Place ID: 786088WChiu

The Riverside County Flood Control and Water Conservation District (District) appreciates this opportunity to submit comments on the above named Tentative Order, on behalf of the Riverside County MS4 Permittees within the San Diego Region (Riverside County Co-Permittees), which includes the District, the County of Riverside, and the Cities of Murrieta, Temecula and Wildomar. Tentative Order No. R9-2015-0100 (Tentative Order) proposes to amend the National Pollutant Discharge Elimination System (NPDES) Permit for Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region, Order No. R9-2013-0001, as amended by Order No. R9-2015-0001 (Regional Permit) to include the Riverside County Co-Permittees, and also incorporate limited permit provisions for the City of Menifee.

The Riverside County Co-Permittees have previously commented that the San Diego Regional Water Quality Control Board (Regional Board) lacks authority to adopt a Regional Permit covering San Diego, Orange, and Riverside Counties. Our concerns and legal objections to inclusion into the Regional Permit, as well as other comments on provisions in the Regional Permit, are more completely set forth in our written comment letters dated January 10, 2013 (regarding Order No. R9-2013-0001) and November 19, 2014 (regarding Order R9-2015-0001), and also in the Santa Margarita Region Report of Waste Discharge (ROWD) dated May 10, 2015. We respectfully request that these written comments and ROWD, as well as the testimony of the District and Riverside County witnesses at the Regional Board hearings held in 2013 and 2015 in connection with the adoption of these Orders, be incorporated in the record for this Tentative Order. We note that our previous comments regarding the absence of an alternative compliance pathway may no longer be relevant, given that an alternative compliance pathway is being proposed for adoption in the Tentative Order. For the convenience of the Board and staff, those previous written comments have been submitted under a separate cover.

Notwithstanding the above concerns, on August 26, 2015, District staff met with Regional Board staff on behalf of the Riverside County Co-Permittees to discuss issues relating to the Regional Permit; Regional Board staff provided valuable compliance assistance and recommendations during this meeting. Our discussion focused on the following issues:

- Permit implementation challenges resulting from the Riverside County Co-Permittees' necessary late entry into the 2013 Regional Permit;
- The Tentative Order's proposed receiving water limitations alternative compliance pathway language;
- The Tentative Order's proposal to include limited permit provisions for the City of Menifee; and
- Monitoring and assessment under Regional Permit Provision D.4.a(1)(a).

In what follows, we summarize the understandings that we reached with Regional Board staff on those issues as well as set forth our suggested revisions to certain elements of the Tentative Order's alternative compliance pathway section. Finally, we include a request for re-inclusion of a third-party certification program into the Regional Permit's existing development inspection provisions.

Permit Implementation Challenges Resulting from Late Entry into the 2013 Regional Permit

During our meeting with staff, we noted that several of the ROWD requirements of the Regional Permit[1], could not feasibly be completed by the Riverside County Co-Permittees because we would not have an approved Water Quality Improvement Plan (WQIP) or Jurisdictional Runoff Management Plan (JRMP) at the time of ROWD submittal, December 2017. We estimated the earliest possible date for Regional Board acceptance of our WQIP to be May 2018, just one month before Regional Permit expiration. It is our understanding that, while the ROWD must be submitted by the date specified in the Regional Permit, it only need address the provisions that can feasibly be completed with the data and information that is available to us prior to the deadline for ROWD submittal.

Additionally, we noted several other Regional Permit provisions, including requirements to submit certification of legal authority[2], assessment and subsequent WQIP revision requirements[3], and requirements to submit a regional monitoring and assessment report[4], which either require data gathered under an approved WQIP, or are due for submittal outside of the Regional Permit's term. From our discussion, we understand that the Regional Board would agree that: 1) the certification of legal authority which was submitted by the Riverside County Co-Permittees under Order No. R9-2010-0016 will remain effective until a new certification is submitted with our first WQIP annual report (after the current Permit term has ended), 2) any provisions regarding assessments or requiring data gathered under an approved WQIP will not be due until such time that the necessary data are gathered and the assessments made under time periods described in the Regional Permit, and 3) we should complete the regional monitoring and assessment report for the current Regional Permit term utilizing data gathered during the transitional monitoring period, as these will be the only data that will be available to us at that time.

Receiving Water Limitations Alternative Compliance Pathway Language

As the Regional Board Executive Officer and staff indicated in hearings on the Regional Permit, neither the Riverside County Co-Permittees, nor co-permittees from the other two counties in the Permit will be able to meet the Regional Permit's Receiving Water Limitations (RWL) provisions for some years. In light of that fact, which was also recognized by the State Water Board in its precedential Order WQ 2015-0075 regarding the Los Angeles County MS4 Permit, we appreciate that the Tentative Order proposes to incorporate a pathway to compliance with RWLs. We support the alternative compliance pathway concept set forth in Tentative Order Provision B.3.c, and for purposes of additional clarity and utility in the language, we offer the following three comments:

Comment #1

Proposed Provision B.3.c(1)(a)(vii) would require that co-permittees develop at least one annual milestone and date for its achievement for each final numeric goal included in the WQIP. We believe that this proposed provision may place undue burden on municipalities and municipal agencies, including the Riverside County Co-Permittees, particularly in the case of longer-term projects. For example, due to the nature of municipal budget and project approval processes, final numeric goals requiring 20 years or more to complete will necessarily generate annual milestones which will be less definitive and more speculative the farther out in time that they are projected. Moreover, we are sensitive to the even greater burden that this proposed

[1] Including Provisions B.5.a, B.5.c, D.4.d(1) through (3), and F.5.b(3) and (4)
[2] Provision E.1.b
[3] Provisions D.4.a(2), D.4.b(1)(c), D.4.b(2)(c), D.4.c, D.4.d
[4] Provision F.3.c

provision would place on other regional co-permittees that have jurisdiction over multiple watershed management areas (WMAs). To ease their burden, we believe that some accommodation should be made in the Tentative Order language to allow milestones to be spaced further apart. We propose the following revision to accommodate both concerns, but ask that these two concerns be considered as separate requests (proposed revised language in ***bold, underline***):

> Provision B.3.c(1)(a)(vii): *"For each final numeric goal developed pursuant to Provisions B.3.a and B.3.c.(1)(a)(i)-(v), at least ~~one annual~~ **two** milestones[footnote omitted] and dates for ~~its~~**their** achievement must be ~~included within each Water Quality Improvement Plan Annual Report reporting period until the final numeric goal is achieved~~ **developed for the permit term. The two, or more, milestones and dates for their achievement shall be submitted in the first Water Quality Improvement Plan Annual Report of each permit term. When a subsequent permit is adopted, a new set of milestones and dates for their achievement shall be submitted as part of the first Water Quality Improvement Plan Annual Report under that permit, until the final numeric goal is achieved."***

Comment #2

Proposed Provisions B.3.c(2) and B.3.c(2)(d) would enable co-permittees who opt to use the WQIP for RWL compliance to remain in compliance as long as they have a WQIP which has been accepted by the Regional Board in accordance with the WQIP update requirements of Provision F.2.c. While this language appears to provide that co-permittees remain in compliance so long as they meet the requirements for updates set forth in Provision B.3.c(2), other provisions of the Tentative Order or Regional Permit appear to introduce some uncertainty. First, we note that footnote 10 on page 36 states that proposed changes to the WQIP do not stay any permit provision. Second, Provision A.4.c states that, in connection with the updating of a WQIP, "[n]othing in Provisions A.4.a and A.4.b prevents the San Diego Water Board from enforcing any provision of this Order while the applicable Copermittees prepare and implement the above update to the Water Quality Improvement Plan and jurisdictional runoff management programs."

Additionally, it is unclear what the proper action should be in situations where one or more, but not all, co-permittees within a WMA require revision to their individual jurisdictional programs under the WQIP. Taken together, the Tentative Order language is unclear whether all of the other co-permittees would be covered during individual co-permittee-proposed periods of WQIP revision, public review, and Regional Board consideration, because during any periods of revision, the entire WMA would not have a Regional Board accepted WQIP as is required under Tentative Order Provision B.3.c.(2)(d). We believe that it is logical that co-permittees should be covered under the compliance pathway, as long as they continue to meet the other requirements of Provision B.3.c.(2), and the WMA has a WQIP which has been initially accepted by the Regional Board. In order to address these issues, we offer the following revisions to clarify:

> Provision B.3.c(2): *"Each Copermittee that voluntarily completes the requirements of Provision B.3.c.(1) is deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2.a, and A.3.b for the pollutants and conditions for which numeric goals are developed when the Water Quality Improvement Plan, incorporating the requirements of Provision B.3.c.(1), is accepted by the San Diego Water Board pursuant to Provision F.1.b~~ **or F.2.c**. The Copermittee is deemed in compliance during the term of this Order as long as:"*

> Provision B.3.c(2)(d): Delete.

> Provision A.4.c: *"**Except as provided in Provision B.3.c(2),** nothing in Provisions A.4.a and A.4.b prevents the San Diego Water Board from enforcing any provision of this Order while the applicable Copermittees prepare and implement the above update to the Water Quality Improvement Plan and jurisdictional runoff management programs."*

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Comment #3

Proposed Provision B.3.c does not provide for interim compliance for co-permittees who are engaged in the WQIP planning phase. The State Water Board, in Section II.B.6 of Order WQ 2015-0075, endorsed this provision in the 2012 Los Angeles County MS4 permit, which allows interim compliance for co-permittees under that permit while they are preparing their planning documents, subject to rigorous requirements.

We believe that the provision of interim compliance is consistent with Principle Number 3 in Section II.B.7 of the State Water Board Order WQ 2015-0075, which expects that every regional board have incorporated in their alternative compliance pathways a mechanism that "allows permittees appropriate time to come into compliance . . . during full implementation of the compliance alternative." When read with Section II.B.6 of the State Water Board's Order, we believe that the compliance pathway option should also apply during the development and approval period for the WQIP, so long as co-permittees are in compliance with all applicable permit requirements and time schedules. To effectuate such an option, we suggest the following language to be included as a new Provision B.3.c(3):

> ***"A Copermittee who provides written notice to the Regional Board Executive Officer of its intent to utilize the compliance option provided in Provision B.3.c shall be deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2.a, and A.3.b within a Watershed Management Area from the date of that notice to the date that the San Diego Water Board accepts the Water Quality Improvement Plan pursuant to Provisions F.1.b or F.2.c, provided that the Copermittee meets all deadlines set forth in Provisions F.1.a and b for the development of the Water Quality Improvement Plan, and is otherwise in compliance with the requirements of Provision B.3.c. Any failure by the Copermittee to meet such deadlines or to be in compliance shall, from the date of such failure, remove the "deemed complaint" status of the Copermittee unless and until the Copermittee's Water Quality Improvement Plan is accepted by the San Diego Water Board."***

Proposed Inclusion of the City of Menifee in WQIP Development and Implementation

The City of Menifee lies primarily within the Santa Ana Regional Board's jurisdiction; less than 1.3 square miles of the City are located within the Santa Margarita River WMA. Finding number 29.b and various portions of Attachment F of the Tentative Order describe the circumstances under which the Regional Board proposes, through agreements, to require the City of Menifee to participate during development and implementation of the Santa Margarita River WMA WQIP; Table B-1 also proposes to add the City as a "Responsible Co-Permittee" within the WMA.

During our aforementioned meeting, we presented MS4 inventory and mapping which shows that the City of Menifee does not currently own or operate any MS4 within the Santa Margarita River WMA. Regional Board staff explained that should the Regional Board adopt the Tentative Order, the City would be bound by the provisions of its Phase 1 MS4 Permit in the Santa Ana Region only, with the exception of applicable TMDLs which may be developed for the Santa Margarita River WMA in the future. It was further explained that, with the exception of adoption of applicable future TMDLs, the City's implementation of the WQIP would be achieved through implementation of Santa Ana Region MS4 Permit compliance documents and programs.

The City of Menifee has provided comments on the Tentative Order requesting removal of language in the Tentative Order that requires the City to participate in the development and implementation of the Santa Margarita WMA WQIP; the Riverside County Co-Permittees support the City's comments, which are attached to this letter.

Monitoring and Assessment

Provision D.4.a(1)(a) prescribes that assessments required to be made under Provision D.4.a(2) must be included in each co-permittee's transitional monitoring and assessment reports; however, Provision D.4.a(2) requires determination of whether strategies identified in the co-permittee's WQIP are progressing towards

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achieving interim and final numeric goals described in the WQIP. It is our understanding that transitional monitoring and assessment applies to the time period when a co-permittee's WQIP is being developed, and therefore assessments made during this time period cannot provide information on the progress of the WQIP. In light of this issue, which appears to have been a typographical error, we suggest the following revision:

> Provision D.4.a(1)(a): "***~~Based on~~ The*** *data collected pursuant to Provision D.1.a**~~, the assessments under Provision D.4.a(2)~~** must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2)."*

Re-Inclusion of the Optional Third-Party Certification Program into the Regional Permit's Existing Development Inspection Provisions

Section F.3.b(4)(c) of Order No. R9-2010-0016 allowed the Riverside County Co-Permittees the option to propose a third-party certification program for commercial and industrial inspection programs, subject to Regional Board Executive Officer acceptance. We note that a similar provision does not exist in the Tentative Order, and respectfully request inclusion of this option in the Regional Permit.

Conclusion

The Riverside County Co-Permittees are committed to water quality in the Santa Margarita River WMA, and look forward to continued collaboration with Regional Board staff. Thank you for your consideration of these comments. If you have any questions, please contact me at smckibbi@rcflood.org, or 951.955.1273.

Very truly yours,

STUART E. MCKIBBIN
Chief of Watershed Protection Division

Attachment
- City of Menifee Comment Letter dated September 10, 2015

SEB:cw
P8/172444

Scott A. Mann
Mayor

John V. Denver
Mayor Pro Tem

Greg August
Councilmember

Matthew Liesemeyer
Councilmember

Vacant
Councilmember
District 3

September 10, 2015

Wayne Chiu
California Regional Water Quality Control Board, San Diego Region
2375 Northside Drive, Suite 100
San Diego, CA 92108

Subject: Comment - Tentative Order No. R9-2015-0100, Place ID: 786088WChiu

Dear Mr. Chiu,

The City of Menifee (the "City") would like to thank the San Diego Regional Water Quality Control Board ("San Diego Water Board") for the opportunity to comment on Tentative Order No. R9-2015-0100, an Order amending Order No. R9-2013-0001 as amended by Order No. R9-2015-0001 ("Tentative Order"). The City is committed to developing and implementing jurisdictional and regional programs and strategies that will improve overall water quality.

The City has been working hard to meet the requirements of the Santa Ana Region Permit under Order No. R8-2010-0033. The Report of Waste Discharge (ROWD) submitted to the Santa Ana Board in July 2015 highlights the Santa Ana Region's major water quality accomplishments since the Permit issuance. The City has been an active participant in the region, including in the development and implementation of the Comprehensive Nutrient Reduction Plan (CNRP) (approved July 2013) to address nutrient Total Maximum Daily Loads (TMDL) for Canyon Lake and Lake Elsinore and in the development of the Watershed Action Plan (WAP) (pending Santa Ana Regional Board approval). The City has also developed a Local Implementation Plan (LIP), which details the day-to-day jurisdictional storm water program to meet Permit requirements.

As stated in the Tentative Order, the City is located partially within the jurisdiction of both the San Diego Water Board and the Santa Ana Regional Water Quality Control Board ("Santa Ana Water Board"). More specifically, less than 1.3 square miles in the City is located in the Santa Margarita Watershed Management Area (WMA). To date, the San Diego Water Board and the Santa Ana Water Board have maintained agreements that designate the Santa Ana Water Board as the single Regional Water Board to regulate the City on matters pertaining to Phase I municipal separate storm sewer system (MS4) permits. The Tentative Order proposes continuing this practice, following past agreements, with the significant exception of now requiring the City to participate in the development and implementation of the Santa Margarita WMA Water Quality Improvement Plan (WQIP).

Both the City and the Riverside County Flood Control and Water Conservation District (RCFCWCD) maintain GIS layers of MS4 infrastructure that they own and

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operate within the City. Since the release of the Tentative Order, the City of Menifee has coordinated with RCFCWCD to investigate ownership of MS4 within the small portion of the City that is within the Santa Margarita WMA. As shown on the attached maps, MS4 within the portion of the City in the Santa Margarita WMA is owned and operated exclusively by RCFCWCD. The City of Menifee does not own or operate MS4 within the Santa Margarita WMA.

It is the City's understanding, according to the Code of Federal Regulations, title 40, section 122.1(b)(1), that "[t]he NPDES program requires permits for the discharge of 'pollutants' from any 'point source' into 'waters of the United States'". The City does not own or operate any "point sources," as defined in 40 C.F.R. § 122.2 or section 502(14) of the Clean Water Act, within the Santa Margarita WMA. Because the City is not responsible for any MS4 within the Santa Margarita

WMA, it should not be required to develop and implement the Santa Margarita WMA WQIP. For this reason, the City respectfully requests removal of language in the Tentative Order that requires the City to participate in the development and implementation of the Santa Margarita WMA WQIP. Suggested edits to the text of the Tentative Order are shown below:

- Attachment 1, Finding 29(b): "...the City of Menifee is largely regulated by the Santa Ana Water Board under Order No. R8-2010-0033 as it may be amended or reissued, including those portions of the City of Menifee within the San Diego Water Board's jurisdiction, upon the effective date of this Order. ~~The agreement also requires the City of Menifee to actively participate during development and implementation of the Santa Margarita River Watershed Management Area Water Quality Improvement Plan required pursuant to this Order~~..."
- Attachment 1, Table B-1 "Watershed Management Areas": Please strike the City of Menifee from the table and remove the associated footnote.
- Attachment 2, Provision B.1: "~~Footnote 3 to Table B-1 has been included to specify that Phase I MS4 discharges within the jurisdictional boundaries of the City of Menifee located within the San Diego Region will be regulated under Santa Ana Water Board Order No. R8-2010-0033 (NPDES No. CAS618033) and any reissuance thereof. At this time, the City of Menifee is not identified as a responsible Copermittee for any TMDLs established by the San Diego Water Board. Under the terms of the agreement, the City of Menifee must actively participate in the development and implementation of the Santa Margarita River Watershed Management Area Water Quality Improvement Plan required pursuant to Order No. R9-2013-0001, and any reissuance thereof.~~"
- Attachment 2: "The City of Menifee is not regulated as a Copermittee under this Order because it <u>does not own or operate</u> ~~Phase I~~ MS4 ~~discharges~~ <u>within the portion of the City that is located within the San Diego Region.</u> ~~Are regulated by Santa Ana Water Board Order No. R8-2010-0033 as it may be amended or issued pursuant to Water Code section 13228 designation. The requirements of this Order that apply to the City of Menifee for the duration of this Order, consistent with the Water Code section 13228 written agreement dated [Month][Day], 2015, are described in Finding 29 and Footnote 3 to Table B-1.~~"

Thank you for your consideration. Please feel free to contact me or Yolanda Macalalad at 951-639-1368 extension 169 if you have any questions regarding the above comments.

Sincerely,

Jonathan Smith, PE, QSD
Director of Public Works/City Engineer

Cc (by email):
ymacalalad@cityofmenifee.us
sglynn@cityofmenifee.us
nabad@cityofmenifee.us
sebruckner@rcflood.org

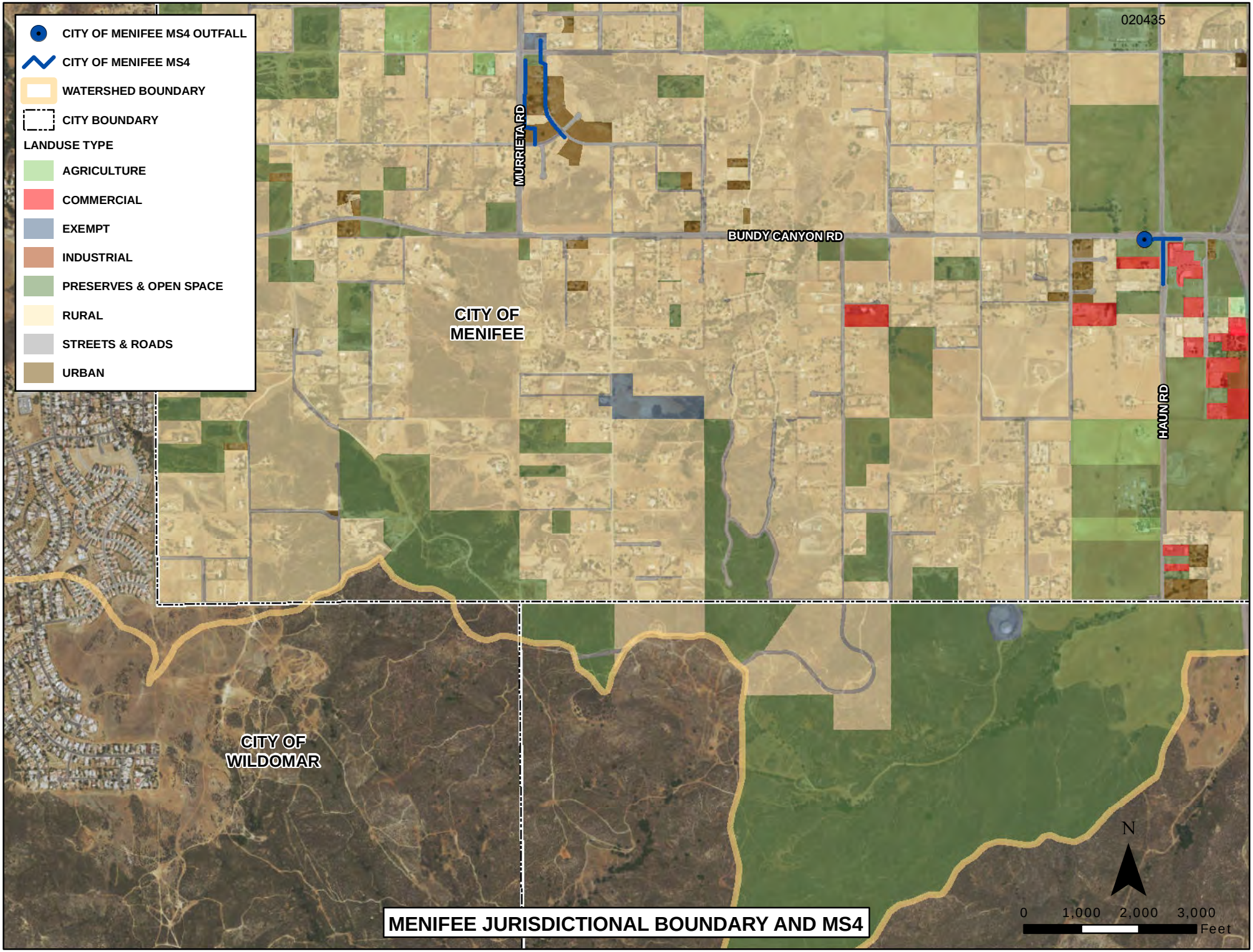

MENIFEE JURISDICTIONAL BOUNDARY AND MS4

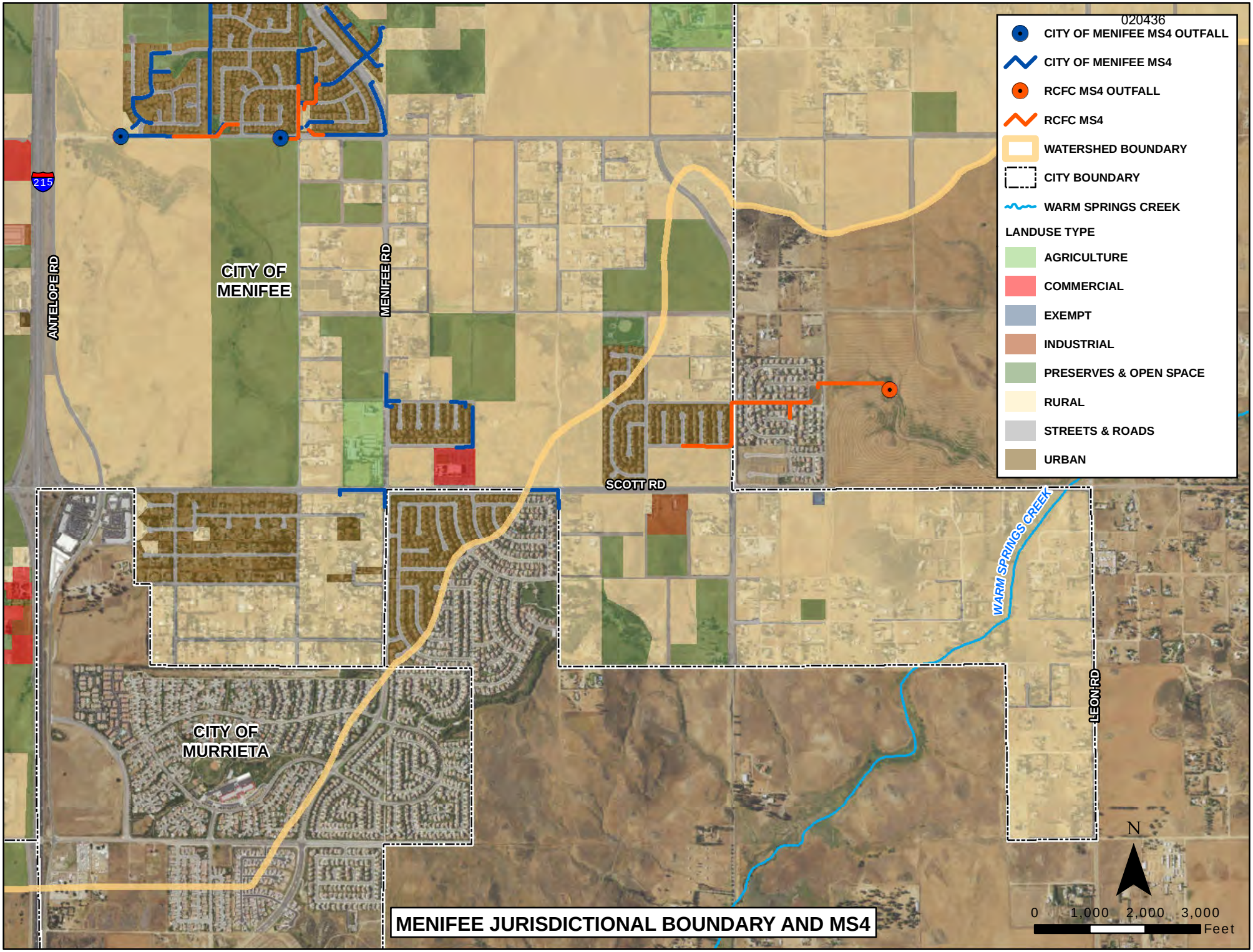

MENIFEE JURISDICTIONAL BOUNDARY AND MS4

WARREN D. WILLIAMS
General Manager-Chief Engineer

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RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

September 14, 2015

Sent via email to: sandiego@waterboards.ca.gov

Mr. Wayne Chiu
CRWQCB - San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Dear Mr. Chiu:

Re: Comment - Tentative Order No. R9-2015-0100, Place ID: 786088WChiu

In conjunction with our comment letter dated September 14, 2015, the Riverside County Co-Permittees[1] are submitting for inclusion into the administrative record for Tentative Order No. R9-2015-0100, comments which were submitted on previous Orders. Please find attached the following items:

- Comment letter dated January 10, 2013 regarding Order No. R9-2013-0001;
- Comment letter dated November 19, 2014 regarding Order R9-2015-0001; and
- Section 4.0 of the Santa Margarita Region Report of Waste Discharge (ROWD), dated May 10, 2015.

If you have any questions, please contact me at smckibbi@rcflood.org, or 951.955.1273.

Very truly yours,

STUART E. MCKIBBIN
Chief of Watershed Protection Division

Attachments

SEB:cw
P8/172432

[1] The Riverside County Flood Control and Water Conservation District, County of Riverside and the Cities of Murrieta, Temecula and Wildomar

4.0 Additional Comments on Proposed Permit

- **Previous Comments** - The Co-Permittees previously have expressed concerns regarding inclusion in the San Diego Regional Board's Regional Permit (Order No. R9-2013-0001, as modified by Order No. R9-2015-0001). The Co-Permittees' concerns and legal objections to inclusion in a regional permit are set out more fully in our written comment letter dated January 10, 2013, in Order No. R9-2013-0001 and November 19, 2014 regarding Order R9-2015-0001. For your convenience, these comments are included as Appendix D.

- **Receiving Water Limitations Language -** The Riverside County Co-Permittees continue to believe strongly that every MS4 Permit should incorporate a clear and achievable path to compliance for Co-Permittees. The Co-Permittees are actively participating in the workshops held by Regional Board staff concerning this important topic.

  The focus of the Watershed Workplan is on an iterative, flexible, and priority-setting approach that is intended to enable the Co-Permittees to focus on the most important water quality impairments in the SMR, and improve water quality. As we have previously commented, if the Co-Permittees have no protection from automatic liability for exceedances of water quality standards, they must address each such exceedance, even when that exceedance may be transitory or of minimal environmental or public health consequence. Stretching resources to address such issues diverts limited Co-Permittee resources from the most important threats to water quality and delays overall water quality improvement.

  State Board staff has already strongly signaled its support of alternative compliance language in MS4 permits, as set forth in the draft Order on the petitions challenging the 2012 Los Angeles County MS4 Permit. The Co-Permittees look forward to working with Regional Board staff, permittees from Orange and San Diego Counties, and the other stakeholders to develop appropriate alternative compliance language.

- **Prior Lawful Approval Language -** The Co-Permittees request language that allows each Co-Permittee to evaluate each project independently, in order to determine at their sole discretion, compliance as it relates to Prior Lawful Approval.

- **CEQA Processing Considerations** – Programmatic requirements that entail structural improvements such as retrofits and/or BMPs will trigger CEQA compliance. Future Permit language should discuss lead agency designation and consider CEQA processing in future workplan implementation timelines.

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General Manager-Chief Engineer

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RIVERSIDE COUNTY FLOOD CONTROL
AND WATER CONSERVATION DISTRICT

November 19, 2014

sent via email 11/19/14: Laurie.Walsh@waterboards.ca.gov

Ms. Laurie Walsh, P.E., WRC Engineer
CRWQCB - San Diego Region
2375 Northside Drive, Suite 100
San Diego, CA 92108

Dear Ms. Walsh:

Re: Comment - Tentative Order No. R9-2015-0001Place ID:65801LWalsh

This letter is written by the Riverside County Flood Control and Water Conservation District (District), on behalf of itself, the County of Riverside and the Cities of Murrieta, Temecula, and Wildomar (collectively, the Riverside County Co-Permittees) regarding Tentative Order No. R9-2015-0001 (Tentative Order). The Tentative Order proposes to add the County of Orange and other agencies located in South Orange County within the existing San Diego County Municipal Separate Storm Sewer System (MS4) Permit. The Riverside County Co-Permittees appreciate the opportunity provided by the San Diego Regional Water Quality Control Board (Regional Board) to offer its comments on the Tentative Order.

The Riverside County Co-Permittees wish to reiterate their concerns regarding a Regional MS4 Permit for San Diego, Orange, and Riverside Counties. Those concerns are set out more fully in our written comment letter dated January 10, 2013, on Order No. R9-2013-0001. The Riverside County Co-Permittees will be submitting a Report of Waste Discharge prior to the expiration of their current MS4 Permit, seeking either modification to the Regional Permit or an individual permit covering only those Co-Permittees. For your convenience, the January 10, 2013 comments are attached to this letter. The Co-Permittees request that this comment letter and attachments be added to the record for the Tentative Order, since most of the issues raised in those comments still pertain to the Tentative Order. The Co-Permittees also request that the oral testimony of Riverside County Co-Permittees on Order No. R9-2013-0001 be included in the record for the Tentative Order. The Riverside County Co-Permittees support the South Orange County Co-Permittees general approach to the issues raised by the Tentative Order.

Notwithstanding the Riverside County Co-Permittees' concerns to a Regional Permit, and subject to it, the Co-Permittees offer the following observations regarding the Tentative Order.

1. Need for Path to Compliance

As set forth in our written and oral comments on Order No. R9-2013-0001, the Riverside County Co-Permittees continue to believe strongly that every MS4 permit, including the Tentative Order, should

incorporate a clear and achievable path to compliance for Co-Permittees. As the Executive Officer and staff indicated in the hearings on Order No. R9-2013-0001, the San Diego County Co-Permittees will be out of compliance with the Permit's receiving water limitations (RWL) provisions for years. We agree with staff's assessment, and state further, that the lack of a provision to allow Co-Permittees to be considered in compliance with the RWL provisions leaves the Co-Permittees open to possible enforcement by third-parties and, as importantly, threatens the compliance approach that has been successfully employed by the Riverside County Co-Permittees to address water quality impairments in the Santa Margarita Region.

The Riverside County Co-Permittees agree with staff that a MS4 permit which allows the Permittees to adopt a "fail early and fail often" iterative approach to water quality is preferable to a permit which simply mandates certain actions. The Santa Margarita River Watershed Water Quality Workplan in Riverside County follows an iterative, flexible, and priority-setting approach that is intended to enable the Co-Permittees to focus on the most important water quality impairments in the Region, and make real, quantifiable improvements in water quality. As we have previously commented, if the Co-Permittees have no protection from liability for exceedances of water quality standards, they must address each such exceedance, even when that exceedance may be transitory or of minimal environmental or public health consequence. Stretching resources to address such issues diverts limited Co-Permittee resources from the most important threats to water quality and delays overall water quality improvement.

Recognizing this deficiency in the 2001 MS4 Permit for the Los Angeles County Co-Permittees, in its 2012 Permit, the Los Angeles Water Board adopted a path to compliance with RWLs through the development of adaptive and prioritized watershed management plans. The Riverside County Co-Permittees believe that a similar approach to RWL compliance should be included in the Tentative Order.

2. Hydromodification Provisions

While most of the substantive changes in the Tentative Order have specific application only to San Diego and/or South Orange Counties, the Riverside County Co-Permittees support exemptions for engineered channels and large river reaches in Provision E.3.c.(2)(e). This provision also provides an interim timeframe exemption for the implementation of hydromodification management BMP requirements for priority development projects.

The exemptions identified in Provision E.3.c.(2)(e) are appropriate and reasonable, and should be made permanent exemptions moving forward.

3. Basin Planning and Water Quality Improvement Plan (WQIP) General Comments

For the WQIPs to ultimately succeed, they need to be based upon regionally appropriate water quality standards. These water quality standards require review to ensure that they reflect sustainable conditions for beneficial uses, explicitly consider regulatory policy and environmental trade-offs

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inherent in the protection of beneficial uses, and address the nature and impact of stormwater upon beneficial uses.

The Riverside County Co-Permittees would like to thank the Regional Board and staff for working with the Santa Margarita River Nutrient Initiative Group on such a review. This group, which includes dischargers, tribal interests, interested non-profits, scientists, and Regional Board staff, is using a scientifically based and rigorous approach to evaluate potential water quality targets for, and sources of, nutrients in the Santa Margarita Watershed. It is our belief that this effort will lead to more considered, effective, and appropriate management of local receiving waters, and thereby promote quicker and more effective environmental outcomes. It may also assist with the identification and development of innovative and alternative programs to manage nutrients within the Region. This effort will inform the development of the Santa Margarita River Watershed Water Quality Workplan and other regulatory programs.

The Co-Permittees request and encourage Regional Board staff to work with other stakeholders to consider, prioritize, and address other perceived constraints and inconsistencies within the San Diego Region Basin Plan. Such efforts will ultimately result in a better focus of local and regional compliance programs, including the WQIPs, on actions that are more likely to effectively and quickly address public health risks and environmental risks to receiving waters. Such an approach is exactly in line with staff's emphasis on workable solutions to these challenges.

The Riverside County Co-Permittees appreciate the opportunity to comment on the Tentative Order. Should you have any questions regarding these comments, please contact David Garcia at 951.955.1330/dhgarcia@rcflood.org.

Very truly yours,

for JASON E. UHLEY
Chief of Watershed Protection Division

Attachment

DHG:cw
P8/165901

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General Manager-Chief Engineer

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RIVERSIDE COUNTY FLOOD CONTROL
AND WATER CONSERVATION DISTRICT

January 10, 2013

Mr. Wayne Chiu, P.E.
California Regional Water Quality
Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego, California 92123-4340

Dear Mr. Chiu:

Re: Tentative Order No. R9-2013-0001
Regional MS4 Permit
Place ID: 786088Wchiu

The Riverside County Flood Control and Water Conservation District (District) is submitting this comment letter on the above listed Tentative Draft Order on behalf of the Riverside County MS4 Copermittees within the San Diego Region (Riverside County Copermittees) which includes the District, the County of Riverside and the Cities of Murrieta, Temecula and Wildomar. Tentative Draft Order R9-2013-0001 (Draft Permit) was drafted by Board staff to cover Phase I municipal separate storm sewer system (MS4) Copermittees in San Diego County, southern Orange County, and the portion of southwestern Riverside County within the Santa Margarita Hydrologic Unit.

The Riverside County Copermittees have previously commented that the San Diego Water Board lacks authority to adopt a regional permit covering Orange and Riverside Counties, in addition to San Diego County; a comment which is discussed in further detail below and in the attached legal comments. Notwithstanding such objection, and subject to it, the Riverside County Copermittees are providing comments on the Draft Permit.

In the workshop on the Administrative Draft Order held on April 22, 2012 San Diego Water Board staff identified the following desired outcomes for the proposed permit:

- Improving the quality of water discharged from the MS4
- Restoring or enhancing Beneficial Uses and Receiving Water quality

It was further identified by Board staff that to be able to meet those goals, the proposed regional MS4 permit needed to be 1) Strategic, 2) Adaptive, and 3) Synergistic.

Notwithstanding the concerns of the Riverside County Copermittees with regard to the legal authority to issue a regional MS4 permit, the Copermittees agree that being able to adapt and direct resources toward specific water quality priorities in a given watershed, rather than all potential problems simultaneously, is more likely to result in actual and meaningful improvements in water quality. However, to be able to achieve those improvements the MS4 Permit must be crafted to provide the Copermittees with the ability to truly and fully

adaptively manage their programs to focus resources on those BMP strategies and monitoring efforts that are identified as being most effective, consistent with the MEP standard, at addressing watershed priorities.

Unfortunately, many provisions in the Draft Permit, including but not limited to the Receiving Water limitation provisions in Provision A and others discussed in this letter, still do not fully support the achievement of those outcomes. The Draft Permit does not provide the Copermittees with the flexibility to be fully strategic in managing their resources nor the ability to fully adapt their programs to focus on the highest priority water quality needs of the watershed. This comment letter and the other documents submitted herewith (a redline of the Draft Permit and Legal Comments) identify some suggestions which, if adopted by the San Diego Water Board, will help to address these limitations and facilitate the desired improvements.

This comment letter is organized as follows:

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As noted, the Riverside County Copermittees also are submitting a redline of the Draft Permit ("Redline") that proposes alternative language intended at achieving solutions to the various issues raised in this letter, and a Legal Comment document ("Legal Comments") that provides additional legal context for the various issues raised in this letter. The Riverside County Copermittees reserve their right, in the context of filing a Report of Waste Discharge ("ROWD") prior to the expiration of Order R9-2010-0016 (the 2010 MS4 Permit), to again address these issues and others relevant and appropriate to the SMR.

1 BACKGROUND

The Riverside County Copermittees were issued an extensive and prescriptive MS4 Permit in November 2010 which greatly expanded monitoring obligations, required special studies, a jurisdictional runoff management program, and Watershed Workplan requirements that were very different than the requirements set forth in the previous MS4 Permit issued to the Copermittees. Development and implementation of the 2010 MS4 Permit compliance requirements has been very expensive, especially in comparison to the relatively few demonstrated impairments of Beneficial Uses in the region and the Copermittees' resources. These requirements have left other important societal needs unfulfilled by the Riverside County Copermittees during a period of unprecedented and continuing economic distress. Further, the Riverside County Copermittees are still in the process of developing and implementing these 2010 MS4 Permit requirements, which is a serious concern given the very different compliance approach proposed in the Draft Permit. The Copermittees hope that the compliance efforts under the current MS4 Permit are taken into account when they submit their ROWD at the expiration of the 2010 MS4 Permit.

2 General Comments

2.1 Regional Permit

The Riverside County Copermittees respectfully submit that the San Diego Water Board is not authorized under the Clean Water Act or under its implementing regulations to issue a regional permit to Copermittees in San Diego County, South Orange County and the Santa Margarita Region (SMR) of Riverside County. As discussed more fully in the Legal Comments, the only circumstance under which the San Diego Water Board could issue such a permit would be if the Copermittees in these counties agreed to such a permit. Additionally, while the Draft Permit purports to affect the conduct of the Riverside County Copermittees upon expiration of the 2010 MS4 Permit in November 2015, the Riverside County Copermittees have not submitted a ROWD requesting coverage under a regional permit. Because no application has been made for the regional permit, which is a requirement set forth in the CWA regulations, the San Diego Water Board lacks jurisdiction to name the Riverside County Copermittees on the Draft Permit at this time.

Notwithstanding the above, the Riverside County Copermittees are submitting the comments in this letter based on:

- The San Diego Water Board staff's stated intent to enroll the Riverside County Copermittees in this permit upon expiration of the 2010 MS4 Permit.
- Statements made by San Diego Water Board staff that this comment period would serve as the primary opportunity for the Riverside County Copermittees to influence their next term MS4 Permit. The Riverside County Copermittees are entitled, as part of the ROWD process, to again raise relevant issues regarding permit provisions, but have undertaken in these comments to address major current concerns.

2.2 Outcome Focus

As mentioned above, the Copermittees agree that being able to adapt and direct resources toward addressing the specific water quality priorities in a given watershed, rather than all potential problems simultaneously, is more likely to result in actual/meaningful improvements in water quality. However, to be able to achieve those improvements, the MS4 Permit must fully integrate the following principles:

- **The Jurisdictional Program requirements must be fully flexible:** The Permit must be written in a way that allows the Copermittees to truly and adaptively manage their programs to fully focus their existing resources on those BMP strategies and monitoring efforts that are identified within the Water Quality Improvement Plan (WQIP) as being most effective, consistent with the Maximum Extent Practicable (MEP) standard, at addressing the watershed's priorities. We understand this to be the goal of the San Diego Water Board as well. While some elements of the Draft Permit embody this need, others do not and require dedication of resources to specific pre-defined efforts, regardless of the identified need for that effort in the watershed. The specific program areas that need more work to this end are:

    - The approach to addressing Non-stormwater discharges
    - Development Planning
    - Retrofitting
    - Channel Rehabilitation

These issues and proposed new language to address these issues are included throughout this letter and/or in the attached Redline.

- **Basin Plan updates need to be Prioritized by the San Diego Water Board:** For outcome-based permitting to be successful, the desired outcomes must be achievable by and appropriate to the Copermittee. To do that, the outcomes must take into account the background conditions in the watershed, and be appropriate for the attainment of Beneficial Uses in the specific waterbody, based on the specific conditions within and influencing that waterbody. The values in the Basin Plan should be comprehensively re-evaluated to ensure that water quality standards are scientifically justified to protect Beneficial Uses. Without updating the Basin Plan, the outcomes that the Copermittees target in the WQIPs would be arbitrary and not guaranteed to achieve the desired beneficial use improvements. Such an update should be pursued aggressively, led by and adequately funded by the San Diego Water Board, with participation by the MS4 Copermittees and other dischargers and stakeholders in the watershed.

- **Other Dischargers need to be Similarly Regulated by the San Diego Water Board:** The MS4 Copermittees are not the only dischargers of pollutants in the watershed. For example, the SMR of Riverside County includes State Lands (such as Caltrans), Tribal Lands, Agricultural Operators, Industrial Permit dischargers, Construction Permit dischargers, Phase II entities, Water Districts, and 'De Minimus' dischargers issued general permit coverage; all of which:

- Have separate regulatory programs (such as permits or waivers) implemented by the San Diego Water Board;
- May discharge pollutants, including non-stormwater, that can affect the quantity and quality of runoff, both directly within Receiving Waters, and in runoff discharges that may enter into and be discharged from the MS4; and
- Cannot be regulated by the Copermittees for the quantity and quality of their runoff because of their separate permits or waivers granted by the NPDES Program Administrator.

As such, while MS4 Copermittees can implement programs to reduce pollutants in discharges that are within their legal jurisdiction, no amount of effort by the MS4 Copermittees can be expected to fully attain water quality standards in the Receiving Waters. The only way to achieve that outcome will be for the NPDES Program Administrator (the San Diego Water Board in most cases) to directly regulate each of these entities to similar levels and standards as set forth by this Permit.

2.3 Responsibility for meeting goals of CWA

The CWA requires Copermittees subject to any MS4 permit, including the Draft Permit, only to address discharges from their MS4s. 33 U.S.C. § 1342(p)(3)(B). The Copermittees are not required to restore Beneficial Uses in any Receiving Water, or to address sources of pollution to those Receiving Waters that are not being discharged into or from those MS4s. However, in various provisions in the Draft Permit, there is a suggestion that the Copermittees are solely responsible for attaining water quality standards in their respective Receiving Waters. The San Diego Water Board must make clear in the Draft Permit that the responsibilities of the Copermittees are limited to their MS4s and the requirements of the CWA for municipal stormwater dischargers. Redline changes have been proposed in the above referenced portions of the Draft Permit to address this issue.

3 Specific Comments

The following comments represent specific high level concerns that the Riverside County Copermittees have identified at this time. Additional comments on the Draft Permit can be found in the Redline, as well as in the attached Legal Comments.

3.1 Findings

The Riverside County Copermittees have two separate sets of comments on the Findings. The first addresses the need for additional findings, with respect to aspects of California law and the physical setting of the SMR. The second set of comments focuses on existing Findings in the Draft Permit.

3.1.1 Needed Additional Findings

The Findings in the Draft Permit fail to fully address the context and conditions under which the proposed permit requirements are to be applied. A more complete explanation of this background is necessary to ensure that the Provisions ultimately included in the Draft Permit are credible, appropriate and legally required, and that the Permit Provisions (which must stem from the Findings) reflect the

context of the broader issues that affect MS4s within the region. The Riverside County Copermittees request that San Diego Water Board staff work with the MS4 Copermittees to expand the Findings, including the addition of findings to address the following:

California Water Law

California law requires that downstream entities must accept runoff from up-gradient properties. Owners and operators of MS4s are not exempt from this legal mandate, even if that runoff contains pollutants. Moreover, flood control districts, including the District, are mandated by the California Legislature (Legislature) to protect the lives and property of residents from floodwaters. The Riverside County Copermittees request that a finding, in the form set forth in the Redlines, be added to the Draft Permit.

Flooding

Many areas that would be under the jurisdiction of the Draft Permit are subject to periodic catastrophic flooding, which results from natural conditions, specifically the presence of mountains and hilly areas in close proximity to development, along with the effect of strong Pacific storms. This flooding would occur even in the absence of development. The Legislature recognized the importance of this issue in the early 20th Century, when it established flood control districts across the state, including in Riverside, Orange and San Diego Counties. Such flooding has, and if not controlled, could result in loss of life and widespread property damage. Further, the flooding can mobilize significant amounts of pollutants from industrial, commercial, residential and agricultural lands, damaging watercourses, habitat, and the Beneficial Uses therein. MS4 systems are designed and constructed to mitigate these impacts. The Riverside County Copermittees request that a finding in the form set forth in the Redline be added to the Draft Permit.

Flood Control District Acts

As noted above, the Legislature established Flood Control Districts in Orange, Riverside, and San Diego Counties through a series of Flood Control Acts. The Legislature determined that protection of life and property from the effects of flooding through the implementation of flood control improvements was a priority, and assigned those Districts with the sole responsibility to design, construct and maintain those improvements necessary to manage and contain floodwaters to prevent such negative impacts, as well as to conserve floodwaters for beneficial use. As noted above, these improvements represent fundamental water quality BMPs inasmuch as they reduce the widespread exposure of runoff to pollutants. The Flood Control Districts, while owners and operators of MS4s, have no authority or powers beyond those granted by the Legislature. The Legislature did not provide the Flood Control Districts, for example, the authority to regulate land uses within the municipal jurisdictions of Riverside County, nor to control the volume or quality of runoff discharged by those land uses. Findings describing the legislative priority for flood control and the limitations on the governing power of the Flood Control Districts should be added to set forth the appropriate role of the Flood Control Districts as MS4 Copermittees. The Riverside County Copermittees request that a finding, in the form set forth in the Redline, be added to the Draft Permit.

Limits on Extent of Permittee Legal Authority

The MS4 Copermittees lack the authority to regulate many significant sources of pollutants that may impact Receiving Waters. For example, the Copermittees cannot regulate pollutants discharged from federal and state lands, facilities, tribal lands, special districts, utilities, agricultural lands, or railroads. Moreover, the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) preclude local regulation of pesticides. The Riverside County Copermittees request that a finding in the form set forth in the Redline be added to the Draft Permit.

3.1.2 Comments on Existing Findings

Findings 3 and 15 (and elsewhere in Draft Permit)

In Findings 3 and 15 (and throughout the Draft Permit), it is stated that the CWA requires controls to reduce the discharge of pollutants "in stormwater" to the MEP. Finding 15, moreover, states that non-stormwater discharges from the MS4 are "not considered stormwater discharges and therefore are not subject to the MEP standard, stating that the MEP standard "is explicitly for 'Municipal . . . Stormwater Discharges" from the MS4s.

These conclusions are directly contrary to the plain language of the CWA, as set forth in the November 16, 1990 preamble accompanying the CWA stormwater regulations. Those authorities provide that the MEP standard applies to *all* pollutants discharged from the MS4, notwithstanding that some may be transported by non-stormwater. Additionally, the Redline reflects deletion of the limitation of the MEP standard to stormwater discharges in multiple locations, reflecting federal law. For a further discussion of this issue, please see the Legal Comments. The Riverside County Copermittees also request deletion of Finding 15.

Finding 11

This Finding states that "[r]ivers, streams and creeks in developed areas used [to convey runoff] . . . are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and Receiving Water." This statement is incorrect and must be deleted (as reflected in the Redline). For reasons more fully set forth in the Legal Comments, natural streams cannot be considered MS4; there is no MS4 "outfall" from a channelized river or stream to a natural stream; and, USEPA itself requires a distinction between MS4s and Receiving Waters.

Finding 12

This Finding states that as operators of MS4s, "Copermittees cannot passively receive and discharge pollutants from third parties." By providing free and open access to an MS4 that conveys discharges to Waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not prohibit or otherwise control. This statement is incorrect and must be deleted (as set forth in the Redline). As the discussion in the Legal Comments indicates, municipalities must maintain the MS4 to protect the lives and property of their citizens and to prevent nuisance. Flood Control Districts have a statutory obligation to operate and maintain such MS4, an obligation which is not affected by

either the CWA or the terms of the Draft Permit. While an MS4 operator has the obligation to effectively prohibit the entry of non-stormwater into the MS4, it does not have legal responsibility for such discharges, which are the responsibility of the discharger itself and subject to the jurisdiction of the San Diego Water Board, pursuant to Water Code section 13260 *et seq.*

Finding 28

This Finding recites that the San Diego Water Board finds that the requirements of the Draft Permit "are not more stringent than the minimum federal requirements." The Riverside County Copermittees disagree with this finding, as it is not supported by the evidence, *i.e.*, the many requirements in the Draft Permit which exceed the federal MEP standard. Moreover, any decision by the San Diego Water Board to adopt "other provisions" going beyond MEP is not a federal requirement, but rather a discretionary decision taken by a state agency under authorization in the CWA. *See Defenders of Wildlife v. Browner,* 191 F.3d 1159, 1164-65 (9th Cir. 1999). Please see discussion in the Legal Comments. The Finding also indicates that the San Diego Water Board has developed an economic analysis of the Draft Permit. As set forth in the Legal Comments, the Riverside County Copermittees challenge the adequacy of that analysis.

Finding 29

This finding purports to find that the Draft Permit does not constitute an unfunded state mandate. The Riverside County Copermittees disagree with the conclusions set forth in this finding. More importantly, the finding is without legal effect because exclusive jurisdiction as to whether a state mandate exists, and whether it is unfunded lies with the Commission on State Mandates. Government Code §§ 17751 and 17552; *Lucia Mar Unified School District v. Honig* (1988) 44 Cal.3d 830, 837; *Hayes v. Commission on State Mandates* (1992) 11 Cal.App.4th 1546, 1596-97. The finding of an agency that has no jurisdiction to make that finding is entitled to no weight and should be deleted, as shown in the Redline. For an additional discussion of these issues, please see the Legal Comments.

Finding 31

The Riverside County Copermittees believe that the Receiving Water Limitation ("RWL") language set forth in the Draft Permit renders compliance with the permit impossible, since exceedances of water quality standards occur routinely through no fault of the MS4 Permittees. Thus, unless the RWL is modified to provide the Copermittees with a means to be in compliance, those Copermittees risk the threat of arbitrary San Diego Water Board enforcement or the bringing of citizen suit lawsuits under the CWA, which could nullify compliance with all other terms set forth in the Draft Permit, as discussed more fully in the Legal Comments. The exposure to third party litigation from the proposed RWL language is one of the most significant threats to an otherwise collaborative approach to achieving long term water quality improvement. This threat was emphasized by the recent bringing of a citizen suit lawsuit against the City of Malibu, the County of Los Angeles and the Los Angeles County Flood Control District based on similar language in the 2001 Los Angeles County MS4 Permit. The Riverside County Copermittees have suggested modifications to Provision A in the Redline and as discussed below and in the Legal Comments that are intended to better support the Iterative Process for compliance authorized by the State Water Resources Control Board in Order No.

2001-15, through the WQIP process. The Copermittees also note that the State Board considered the problems with the RWL language at a recent workshop, which may eventually result in modifications which should, if applicable, be reflected in the Draft Permit. Other requested changes to the Findings are set forth in the Redline.

3.2 Provision A, Prohibitions and Limitations

As noted above, the requirements set forth in Provision A are of great concern to the Riverside County Copermittees. The Copermittees generally support an approach to compliance that utilizes WIQPs as the implementing mechanism for the 'Iterative Process' described in Provision A.4, and that by implementing that iterative process in accordance with A.4, that the Copermittee should be in compliance with Provisions A.1 and A.2. The Redline reflects edits of Provision A to clarify the linkage between the prohibitions and limitations in Provisions A.1. through A.3. and Provision A.4 – which is described as the method for complying with the prohibitions and limitations. It must be noted, however, that the Riverside County Copermittees do not agree with the approach suggested, that any WQIP-based compliance approach be necessarily accompanied by a Reasonable Assurance Analysis. Such analyses can be extremely complex, expensive and time-intensive to develop, and similar analyses are commonly developed within TMDL models; taking a number of years to develop and refine. Given that the Santa Margarita Watershed has no adopted TMDLs; thus, comprehensive pollutant transport and BMP models are not available for the suite of constituents that might be considered for prioritization within a WQIP for the Santa Margarita Watershed. In the context of a TMDL, such models would be developed by the combined resources of the San Diego Water Board and a range of stakeholders and dischargers. Undertaking such an exercise solely with the public resources of the 275,000 residents of the SMR is beyond the financial ability of the Copermittees and would shift the responsibility for development of TMDLs from the San Diego Water Board to the Copermittees. Comments on Provision A can be found below, in the Redline and in the Legal Comments.

3.2.1 Overview of Key Issues

As noted above, an overriding issue for the Riverside County Copermittees is having a permit that, while being appropriately proactive and aggressive at addressing the prioritized water quality conditions with the Receiving Waters, is one that all Copermittees can remain in compliance with while implementing those requirements. As presently drafted (and as made clear by statements in the Fact Sheet), Provision A imposes immediate potential liability on every Copermittee if monitoring in the Receiving Waters reflects exceedances of water quality standards that may have been caused or contributed to by MS4 discharges. San Diego Water Board staff has repeatedly indicated in workshop presentations that they expect that Copermittees will not be able to comply with the Receiving Water Limitations and Discharge Prohibitions for some time. Staff has separately indicated that they are interested in having the Copermittees undertake bold initiatives in trying to address urban runoff pollution, and that the Copermittees have actually been encouraged to "fail early and fail often" as this would reflect such progress in refining these initiatives. The iterative, flexible and priority-setting approach reflected in the WQIP is intended to allow the Copermittees to focus on the most important problems in their watershed. The entire approach is endangered, however, by RWL provisions which would allow either the San Diego Water Board or a citizen plaintiff to sue the Copermittees for any individual exceedance of the

RWLs. Under the current version of Provision A, the unmitigated risk of such actions leads not to bold initiatives but rather to attempts to minimize liability.

As set forth in the Legal Comments, this approach is not mandated by the CWA, State Board orders or the opinion of the Ninth Circuit Court of Appeals in *Natural Resources Defense Council v. County of Los Angeles*, 673 F.3d 880 (9th Cir. 2011), *reversed*, 568 U.S. __ (January 8, 2013). As importantly, the threat of immediate potential noncompliance actually interferes with the ability of the Copermittees, including the Riverside County Copermittees, to comply with the Draft Permit. Instead of being able to focus on pollutants of highest concern in the watershed, as called for in the WQIP, the Copermittees will be forced to try to address every pollutant monitored, since the exceedance of any water quality standard leads to immediate potential liability. Moreover, because citizen plaintiffs are entitled to injunctive relief under Section 505(a) of the CWA, a federal judge could order the Copermittees to undertake steps completely independent of the WQIP or other compliance provisions in the Draft Permit.

The Riverside County Copermittees do not object to compliance provisions that will provide a means to achieve real improvement in water quality. The Copermittees are willing to undertake these Provisions, because the success or failure is in their control. Compliance with the requirements of Provision A, however, is beyond the control of the Copermittees. Based on the statements made during the workshop process, the Riverside County Copermittees believe that the San Diego Water Board is serious about working with the Copermittees on a permit that provides flexibility and problem solving approaches. To ensure that this flexibility is not lost, the Draft Permit must tie in compliance with Provisions A.1 through A.3 to a process set forth in Provision A.4. This approach is shown in the Redline and is discussed further below.

3.2.2 Comments in support of specific changes

Provision A, Introduction

The introduction notes that pollutants "in stormwater discharges" from the MS4 must be controlled to the MEP. As discussed above, the CWA does not differentiate between stormwater and non-stormwater discharges from the MS4; both must be controlled to the MEP standard. The Riverside County Copermittees have requested revised language in the Redline. Additionally, the linkage between compliance with Discharge Prohibitions (Provision A.1), Receiving Water Limitations (Provision A.2) and Effluent Limitations (Provision A.3) should be noted as being defined by Provision A.4. This change is reflected in the Redline.

A.1.a

First, language must be added providing that compliance may be addressed through the process set forth in Provision A.4. This language is provided in the Redline. Second, the Provision prohibiting discharges which are "threatening to cause" a condition of pollution, etc., is unenforceable, because it prohibits an action that, with respect to MS4 operators, is beyond their control. Moreover, there is no authority for such provisions in the Porter-Cologne Act. The Riverside County Copermittees request

deletion of this phrase, as shown in the Redline. Additionally, as set forth in the Legal Comments, the Provision improperly expands the Discharge Prohibitions to Waters of the State.

A.1.b

40 CFR § 122.26(d)(2)(iv)(B)(1) clarifies that the requirement for an MS4 Copermittee to "effectively prohibit" the discharge of Non-stormwater/illegal discharges into its MS4s is to be accomplished through "a program, including inspections, to implement and enforce an ordinance, orders or similar means…". The language of this Provision should reflect federal law in this respect. The Redline reflects this change.

A.1.c

First, this Provision requires the Copermittees to comply with the Basin Plan prohibitions listed in Attachment A. This list is over-inclusive, as it contains requirements that are not applicable to some or all of the Copermittees' MS4 discharges, or to the Riverside County Copermittees in particular. The Riverside County Copermittees request that this Provision be amended to read as follows: "Discharges from MS4s are subject to all applicable waste Discharge Prohibitions in the Basin Plan." This change is noted in the Redline. Second, language must be added providing that compliance with this restriction can be obtained through the process set forth in Provision A.4. This language is provided in the Redline.

A.2.a

First, this Provision and Provisions A.1. and A.3 should be linked to the iterative process described in A.4. Please see the Redline.

Second, not all plans, policies, etc. set forth in Provision A.2.a.(1)-(4) may qualify as "water quality standards" or be applicable to all the MS4 Copermittees. These subsections should be deleted, and replaced with a reference to "Water Quality Standards," which is a defined term in the Draft Permit (This change is reflected in the Redline). Otherwise, the MS4 Permit would become over inclusive with respect to what is considered a water quality standard. Such standards must be established in accordance with federal and state law. If this process has not been followed for a particular requirement, it is not a "water quality standard."

A.3.a

As discussed above, this Provision erroneously states that pollutants "in stormwater discharges" from MS4s must be reduced to the MEP. Please see the Redline.

A.3.b

This Provision should also provide that compliance with a TMDL constitutes compliance with Provisions A.1 and A.2, for those pollutants/waterbodies subject to the TMDL.

A.4.a

The Riverside County Copermittees support an approach whereby compliance with Provisions A.1 through A.3 are achieved through a truly iterative approach, one which reflects the intent of the

precedential State Water Board Order Nos. 99-05 and 2001-015. As set forth in the Redline, the Riverside County Copermittees believe that they and the other Copermittees under the Draft Permit should be considered in compliance with Provisions A.1, A.2 and A.3, as applicable, through development of the WQIP, unless the San Diego Water Board denies approval of a WQIP or amendment thereof. This ensures that the Iterative Process which is the focus of the WQIP, is utilized to provide a means to be in compliance for the Copermittees.

A.4.c

This Provision should be deleted, as is reflected in the Redline. Again, this Provision defeats the purpose of an iterative approach to compliance with the Provisions A.1 through A.3, because it allows the San Diego Water Board to enforce any provision of the Draft Permit, including those provisions at any time. The San Diego Water Board obviously retains full ability to enforce the provisions of the Draft Permit, including with respect to the failure of the Copermittees to carry out required provisions. To short circuit the WQIP/JRMP process, however, is to defeat the entire intent of the Draft Permit.

3.3 Provision B, Water Quality Improvement Plans

3.3.1 Overview of Key Issues

- The goals and requirements of the WQIP need to be aligned with the requirements of the CWA that were established specifically for MS4 permits, and not impose the restoration of Receiving Waters entirely upon MS4 Copermittees.
- The WQIP should focus on addressing sources of pollutants within the jurisdiction of the respective Copermittees.
- The BMP strategies identified in the WQIP should fully inform the selection and design of programs identified in the JRMP. Some minor edits were proposed in Provision B, with additional edits as warranted in Provisions D and E.

3.3.2 Comments in support of specific changes

Introductory paragraph

The introductory language implies that the WQIP should be designed to unilaterally protect, preserve, enhance, and restore water quality and Beneficial Uses in waters of the state. As noted in Section 2.3 above, MS4 Copermittees are responsible only for discharges from their MS4s, not the unilateral protection of Beneficial Uses within their watersheds.

Redline edits were provided to:

- Tie the goals of the WQIP to the requirements of the CWA applicable to MS4 Permits.
- Replace 'waters of the state' with 'Receiving Waters' to be consistent with federal law.
- Clarify the linkage between Provision A and Provision B.

Additionally, Redline edits were provided to clarify that the strategies identified in the WQIP are intended to guide the specific actions that will be implemented by the Copermittees pursuant to Provision E.

B.1

The Riverside Copermittees support the redlines of the San Diego County Copermittees with regard to setting forth that the WQIP for the Santa Margarita Watershed Management Area (WMA) would commence upon enrollment of the Riverside County Copermittees into the Order.

B.2.e.

Two changes have been proposed, as shown in the Redline:

- The introductory paragraph includes language that clarifies that the Numeric Goals are not enforceable compliance standards, effluent limitations, or Receiving Water limitations. This clarification is consistent with San Diego Water Board staffs' verbally stated intent.
- Provision B.2.e.(1) as written requires that the final Numeric Goals be "capable of demonstrating the achievement of the restoration and/or protection of water quality standards in Receiving Waters". As discussed in Provision 2.3 above, meeting WQS in Receiving Waters is a goal of the overall NPDES regulatory programs under the CWA and not as a requirement to be accomplished alone by MS4 Copermittees. Redline edits have been provided to clarify that such goals are only required to be for MS4 discharges.

B.3.

In the Redline, edits were made to the introductory paragraph to ensure that the requirements are consistent with federal law. The CWA requires the 'effective prohibition' of non-stormwater discharges, not 'preventing' or 'eliminating' them.

Edits were also made to Provision B.3.a. to link the strategies more clearly to the Numeric Goals developed pursuant to Provision B.2.e, as well as to link them to the JRMP programs in Provision E.

B.5

In the Redline, edits were made to the introductory paragraph to clarify that the WQIP (and by extension the JRMP and Monitoring programs) are intended to meet the requirements of Provisions A.1, A.2, and A.3. The Tentative Order particularly excluded Provision A.1.b. (dealing with non-stormwater discharges). However, as discussed in the attached Legal Comments, the CWA requires that illegal discharges must be addressed via a program (as included in Provision E.2), and it is appropriate that the program be guided by the priorities and strategies included in the WQIP.

Other edits were made to clearly link Provision B.5 to the applicable requirements of Provision F.

3.4 Provision C, Action Levels

3.4.1 Overview of Key Issues

- The Action Levels (non-stormwater, and stormwater) applicable within each watershed should only be those that are associated with the priority water quality conditions in that watershed, or that are 303(d) listed for that watershed. For example, if Zinc is not a priority pollutant for a watershed, and is not 303(d) listed, there should not be a Zinc action level. This change is needed because Provision D requires analysis for all 'action level' parameters. Analysis for pollutants that are not a priority for a watershed is a waste of Copermittee resources.
- The Copermittees should be able to establish alternative action levels that are appropriate to the WMA within their WQIP. Such alternative action levels would be subject to Executive Officer approval as part of the WQIP approval process.
- Footnote 8 and 10 need to clarify that the NALs and SALs are not enforceable limitations.
- Various references to 'waters of the state' need to be changed to Receiving Waters for consistency with the Draft Order and the CWA.

Please see the Redline for further detailed comments and language changes.

3.5 Provision D, Monitoring and Assessment

The Riverside County Copermittees appreciate the changes in the monitoring program reflected in the Draft Permit, as compared to the Administrative Draft. However, elements of the revised requirements are still infeasible for the Riverside County Copermittees. The comments below identify modifications of areas of the monitoring requirement's which can significantly improve the Copermittees' ability to implement and comply with the requirements, while still maintaining appropriate jurisdictional accountability and assessment requirements to guide the implementation of the WQIPs and JRMP programs. The Redline provides further detailed comments and language changes.

3.5.1 Overview of Key Issues

- Dry Weather MS4 Outfall Monitoring
  - The level of effort dedicated to monitoring and addressing outfalls with non-stormwater discharges should be commensurate with the potential impact that discharge has on a Receiving Water. If a discharge, whether persistent or transient, has no or little potential for impacting a flowing Receiving Water, (e.g. due to infiltration, evaporation, or treatment of the flows), the outfall should be de-emphasized relative to other outfalls that have discharges that have connectivity to a flowing Receiving Water.
  - Outfall Dry Weather Field Screening – As currently drafted, the number of required visual inspections of outfalls during dry weather required per Provision D.2.a.(2)(a) and Provision D.2.b.(1) is both excessive and disproportionate. This will particularly impact smaller jurisdictions, which may be required to do more visual inspections of MS4 outfalls than would larger jurisdictions with more outfalls and more resources.
  - Similarly, as written, the Persistent Flow Outfall Monitoring requirements of Provision D.2.b.(2)(b) are excessive and also will disproportionately impact smaller jurisdictions.

Jurisdictions with several hundred outfalls will likely have significantly more resources to perform the required monitoring than smaller jurisdictions with fewer outfalls, yet both are required to implement the same level of persistent flow monitoring.

- Assessment Requirements
  - The assessment requirements require modeled extrapolation of monitored outfall data to non-monitored outfalls for the purposes of calculating loads from each outfall in each jurisdiction. Such extrapolations though modeling or other calculations will not accurately reflect actual jurisdictional loads, and have no benefit that directly analyzing the monitored data cannot more accurately provide.

3.5.2 Other Global Issues

- As currently drafted, MS4s operated by a flood control district within a city or county would be effectively double-counted for identification of outfalls in each jurisdiction and for performance of the load calculations from each jurisdiction. Additionally, Flood Control Districts have no land use or enforcement authorities outside of the MS4 and rely on the local Copermittee to address pollutant sources and discharges to their MS4. Redline edits have been included to clarify the relationship between districts and the municipal jurisdictions they serve for the purposes of outfall monitoring and the assessment requirements.
- Timelines for monitoring and assessments were clarified throughout and linked to specific reporting requirements of Provision F in the Redline.

3.5.3 Comments in support of specific changes

D.1.a.(3) and D.1.e.

The Redline clarifies that the Receiving Water monitoring described in these sections must be conducted as applicable to the WMA and the Copermittees' MS4 discharges, because some of the monitoring requirements only apply to MS4 discharges to certain waterbodies. Not all Copermittees within a WMA will have discharges to that waterbody.

D.1.b.

The Redline proposes language to allow for alternative long-term monitoring stations to be identified. Using the SMR as an example, the Copermittees might wish to utilize a location other than the existing stations due to the influence of groundwater during dry weather and/or the general lack of MS4 contributions in dry weather to those locations.

Table D-1 and D-6

The Redline proposes an addition to the list of field observations, an assessment for flow connectivity of any MS4 discharges to the sampled Receiving Water. It is important to know whether the sampled Receiving Water included a contribution of flows from MS4 discharges, or whether the data reflect conditions in the absence of an apparent MS4 discharge contribution.

D.2.a.(2)

The Redline clarifies that the identification of annual outfall monitoring requirements is based on municipal Copermittee boundaries, inclusive of Flood Control District MS4 outfalls within their jurisdiction.

The Redline clarifies that the field screening requirements apply to those outfalls in the Copermittee's inventory that are 'accessible'. If an outfall is inaccessible for safety reasons or due to habitat restrictions, it would not need to be field screened.

The Redline simplifies the 'tiers' in Provision D.2.a.(2)(a) by removing the lower tier (i), and expanding the second tier (ii) to cover all Copermittees with 500 or less outfalls. This resolves the disproportionality that occurs for Copermittees with a number of outfalls near the current 125 outfall threshold. For example, as currently drafted, a city with 150 outfalls would be required to do 150 visual inspections per year, but a smaller city with 120 outfalls would be required to do 192 visual inspections per year. The Redline also maintains the 80% requirement from the first tier to help smaller Copermittees manage their workload for meeting the field screening requirements while also conducting the additional source identifications that are required under the Draft Permit.

The Redline includes edits to Footnote 19 to clarify that persistent flow should effectively be a discharge that is hydraulically connected to a flowing Receiving Water. Any other discharges that are not affecting a flowing Receiving Water (such as pooled or ponded water) would be addressed as a Transient Discharge, with source IDs any time an obvious illegal discharge (i.e. color or odor) is identified.

D.2.a.(3)

The Redline incorporates edits proposed by the San Diego County Copermittees to require 10% of the samples in each WMA to be from a first storm event. As described in the comments of the San Diego County Copermittees, this will help avoid overly skewing of the data to 'first flush' data, while still incorporating such data into the data and analyses.

D.2.b.(1)

The Redline removes the requirement that the number of visual inspections performed be equivalent to the number of inspections required under Provision D.2.a.(2)(a).

As areas within a jurisdiction are confirmed not to have non-stormwater discharges, inspections of other outfalls would have to be perpetually (and unnecessarily) increased to maintain compliance with this requirement. For example, if a Copermittee had 150 outfalls, but after the transitional period it confirmed that 100 of those outfalls had no evidence of non-stormwater discharges to flowing Receiving Waters, it would have to visit the remaining 50 outfalls for up to three times a year to meet the requirement in this Provision. As the Copermittee got closer to eliminating non-stormwater flows at more outfalls, inspections at the remaining outfalls would quickly become excessive and unreasonable. Removing this requirement will better incentivize the elimination of non-stormwater

flows, as a Copermittee can look forward to reducing its workload in areas confirmed to not have non-stormwater flows.

D.2.b.(2)(b)

While the Riverside County Copermittees support the San Diego County Copermittees' proposal to reduce the number of required outfalls from 10 to 5 persistently flowing outfalls per WMA, the Riverside County Copermittees believe that applying the same minimum bar to all Copermittees is inappropriate and disproportionately affects smaller Copermittees that have commensurately less staff and resources.

The Riverside County Copermittees propose requiring monitoring of the top 10% of the prioritized persistent flow outfalls, with a lower and upper limit of 1 and 5 respectively, as shown in the redlines. With this change, the level of effort required of any individual Copermittee would scale consistent with the number of persistent flow outfalls within each Copermittees' jurisdiction.

Additionally, the Riverside County Copermittees request changing the requirement of Provision D.2.b.(2)(b)(ii) to require annual monitoring rather than semi-annual monitoring. With this change, a Copermittee could focus more of their annual budget on conduction Source ID efforts – which can result in eliminating problematic non-stormwater flows, rather than on a second monitoring event. Copermittees would still have the option to conduct a second monitoring event if they have more resources available and want to remove the outfall from their monitoring list sooner in accordance with Sub-Provisions [a] through [d].

D.2.b.(2)(e)

The Riverside County Copermittees support the San Diego County Copermittees' comments regarding allowing for a tailored list of constituents to be developed for each WMA. The Redline incorporates those edits.

D.3.

The Riverside County Copermittees support the changes recommended by the San Diego County Copermittees to this section, and these changes are reflected in the Redline.

D.4.a.(2)

This Provision as drafted would require the MS4 Copermittees to make comprehensive evaluations of Beneficial Uses that are beyond their expertise or the scope of an MS4 permit. Such evaluations and determinations would require advanced studies and cannot be answered with the monitoring data collected through this permit. This Provision should either be deleted or, alternatively the Riverside County Copermittees request that the assessments be focused on determining the status and progress toward addressing any Numeric Goals established for those Receiving Waters in the WQIP. Please see the Redline.

D.4.b.(1)

The Redline clarifies that outfall assessments are to be done for the area covered by each Municipal Copermittee (consistent with the proposed definition), and that the data to be used by each Municipal Copermittee would include the data collected from any Flood Control District Copermittee operated MS4s within its jurisdiction. This ensures that jurisdictional data is not double reported for Flood Control District MS4s within a city or county.

For Sub-Provision D.4.b.(1)(c)(iv) three key changes are requested in the Redline:

1) Annual volumes and pollutant loads should only be calculated from the monitored outfalls with persistent discharge to a flowing Receiving Water. This is directly applicable to the purpose of the Draft Permit and an important change, because volume and pollutant data extrapolated to non-monitored MS4 outfalls would be inaccurate and potentially misused if taken out of context. It is understood that San Diego Water Board staff want to ensure that jurisdictional accountability is maintained. However, since MS4 outfall monitoring will be conducted within each jurisdiction, inter-jurisdiction comparisons and accountability can be accomplished using the monitoring data directly without such extrapolations.
2) Added language to require a Copermittee to include in its jurisdictional load calculations any discharge that was demonstrated to have entered another Copermittees' MS4 before being discharged into the flowing Receiving Waters. This is important to ensure that each Copermittee maintains accountability for pollutants discharged to flowing Receiving Waters from within its jurisdiction.
3) The Redline proposes that the calculations of pollutant loads be only for the priority water quality constituents identified in the WQIP.

D.4.b.(2)(b)

Two key changes are recommended in the Redline:

1) Annual volumes and pollutant loads should only be calculated from the monitored outfalls for the monitored storm events. This is an important change because volume and pollutant data extrapolated to non-monitored events would be inaccurate and potentially misused if taken out of context. It is understood that San Diego Water Board staff want to ensure that jurisdictional accountability is maintained, so the Redline proposes that data from the monitored outfalls be extrapolated to identify loads for each jurisdiction during each monitored event. With this information, inter-jurisdiction comparisons and the desired 'accountability' can be accomplished using the monitoring data directly without such extrapolations to non-monitored events.
2) The Redline requests that calculations of pollutant loads be performed only for the priority water quality constituents identified in the WQIP.

D.4.b.(2)(c)

The Redline edits are consistent with those proposed by the San Diego County Copermittees, with minor modifications for clarity.

D.4.d.(2)(c)

It would be difficult to proactively determine the pollutant load reductions that *would* be necessary to demonstrate that discharges *are not* causing or contributing to exceedances of Receiving Water Limitations. Instead it would make more sense to calculate the necessary pollutant load reductions where the discharge has been demonstrated to be causing or contributing to such exceedances. In such circumstances, the necessary parameters would be known to calculate the needed load reduction. These changes are set forth in the Redline.

3.6 Provision E.1, Legal Authority

3.6.1 Overview of Key Issues

The Riverside County Copermittees note that Provision E.1, relating to the establishment of adequately legal authority, exceeds the requirements of federal CWA regulations in several respects. The federal regulations at 40 CFR 122.26(d)(2)(i)(A)-(F), provide explicit guidance for the Copermittees in developing the necessary legal authority to control MS4 discharges within its jurisdiction. However, several of the subsections of Provision E.1 go beyond these federal requirements, with respect to areas not within the responsibility of MS4 dischargers, such as negotiating with non-Copermittee entities. The Riverside County Copermittees have provided requested changes in the Redline, which are explained briefly below.

3.6.2 Comments in support of specific changes

E.1.a(1)

Changes in the Redline to accurately reflect the language of 40 CFR 122.26(d)(2)(i)(B).

E.1.a(2)

Changes in the Redline to accurately reflect the language of 40 CFR 122.26(d)(2)(i)(A). In addition, the Provision as written improperly requires the Copermittees to control the quality of runoff from sites covered by the state general permits for industrial activity and construction. These general permits are enforced by the State Board and the regional boards, and it is a state responsibility which cannot be handed off to the Municipal Copermittees.

E.1.a(3)

Changes in the Redline to accurately reflect the language of 40 CFR 122.26(d)(2)(i)(C).

E.1.a(5)

The Redline requests deletion of this Provision, which is not a requirement for municipal stormwater dischargers set forth in the CWA regulations. The Provision also improperly requests the Municipal Copermittees to attempt to negotiate with third parties the contribution of pollutants to the Copermittees' MS4. The Copermittees have no jurisdiction over such parties. The San Diego Water

Board has such jurisdiction, and should take responsibility for addressing non-MS4 sources of pollutants that may ultimately enter the MS4.

E.1.a(6)

Changes in the Redline to reflect accurately the language of 40 CFR 122.26(d)(2)(i)(E).

E.1.a(7)

The Redline requests deletion of this Provision, which is not a requirement for municipal stormwater dischargers set forth in the CWA regulations.

E.1.a(8)

The Redline requests deletion of this Provision, which is not a requirement for municipal stormwater dischargers set forth in the CWA regulations.

E.1.a(9)

The Redline requests deletion of this Provision, which is not a requirement for municipal stormwater dischargers set forth in the CWA regulations.

E.1.a(10)

The Redline requests both correction of the language in this Provision to comport with the federal regulations in 40 CFR 122.26(d)(2)(i)(F) and deletion of the second clause of this Provision, which is not found in 40 CFR 122.26(d)(2)(i)(F). Moreover, the requirement to inspect and monitor in the first clause of this Provision covers the issues set forth in the second clause. It is therefore unnecessary.

3.7 Provision E.2, IDDE

3.7.1 Overview of Key Issues

- The Draft Permit requires the Copermittees to address all non-stormwater discharges from the MS4 as illegal discharges, and then describes certain sources that need not be prohibited. This is effectively a 'guilty until proven innocent' provision, where a Copermittee will be required to expend potentially significant resources conducting source identification efforts any time non-stormwater is observed discharging from the MS4. In addition to the issues discussed in the Legal Comments, the Provision raises two practical and logistical problems:

    - This requirement is entirely independent of the determination that there are in fact any significant pollutants in such a discharge. A Copermittee could be spending substantial sums tracking (and then potentially enforcing upon) the source of a discharge that is not negatively impacting Receiving Waters. This not only is a waste of public resources, but would undermine the credibility of stormwater programs.
    - The San Diego Water Board and the State Water Board do not treat non-stormwater flows in the same manner across all of their regulatory mechanisms. For example, Order

> No. R9-2008-0002 allows non-stormwater discharges to occur, POTWs are issued permits for their discharges and agricultural operators can discharge irrigation water. The Copermittees should not be forced to conduct an expensive source investigation, only to find that the discharge complies with a permit or a waiver granted by the Water Board. The Copermittee would have no ability to address such a discharge as an 'illegal discharge', and further would have no ability to recuperate their costs for the source identification.

The best way to address these issues, is to require the Copermittee to have and enforce an effective prohibition of illegal discharges of *pollutants* (through statutes, ordinances, permits, contracts, orders or similar means), and then allow the Copermittee full discretion to determine which non-stormwater discharges have the potential to negatively impact Receiving Waters, consistent with the WQIP priorities – and address those as illegal discharges.

- Several categories of non-stormwater discharge that were previously conditionally exempt consistent with the CWA, are required by the Draft Permit to be treated as illegal discharges, unless they have coverage under another order issued by the San Diego Water Board. In addition to the problems identified above for conducting enforcement in the absence of a pollutant discharge, the San Diego Water Board, not the Copermittees, is responsible for evaluating coverage, need for coverage, and compliance with other orders issued by the Water Board. The Copermittees have neither authority nor jurisdiction. Please see the Redline.
- Several categories of non-stormwater discharge that were previously conditionally exempt consistent with the CWA, are required by the draft permit to be 'controlled' or otherwise prohibited by the Copermittees. The Fact Sheet further describes that such controls are warranted because they could potentially contain pollutants. However, the CWA only requires controls where the discharges are determined to be a significant source of pollutants. Please see Legal Comments for a further discussion of this issue as well as the Redline.
- The Draft Permit eliminates the conditional exemptions for Landscape Irrigation, Irrigation Water, and Lawn Watering (collectively 'irrigation runoff'). The San Diego Water Board has provided no data demonstrating that these discharge categories have contributed a significant pollutant load to Receiving Waters within Riverside County. Information discussed in the Fact Ssheet focuses on data from other counties. The only data from Riverside County is public educational material referring to irrigation runoff; this material, however, was adapted from public education material from other counties. That public educational material was intended to help prevent such discharges from becoming a significant source of impact on the Receiving Waters, and did not constitute a determination that such discharges are in fact, actually a significant source that needs to be subject to a prohibition. See the discussion in the Legal Comments as well as the Redline.
- The Draft Permit, in Provision E.2.a.(7) requires efforts to minimize or eliminate all non-stormwater flows, including those that are natural, conditionally exempt, or otherwise permitted by the San Diego Water Board, regardless of whether or not such discharges are not contributing pollutants to the MS4. Such a requirement conflicts with the prior Provisions E.2.a.(1) through

(5), which state conditions where such discharges need not be prohibited. The requirement should therefore be removed, as set forth in the Redline.

3.7.2 Comments in support of specific changes

E.2.a.(1) and (3)

The Riverside County Copermittees request that this Provision be deleted (as shown in the Redline) and the categories of non-stormwater discharges be re-incorporated into Provision E.2.a.(3). The apparent premise of Provision E.2.a(1) as drafted is that since the San Diego Water Board requires those discharges to have coverage under a separate order, they are illegal if they lack such coverage. The MS4 Copermittees, however, are not responsible for enforcing discharge coverage under separate San Diego Water Board orders; that is the responsibility of the San Diego Water Board itself. Requiring the Copermittees to enforce such entities for their lack of coverage under a separate San Diego Order shifts that responsibility from the Board to Copermittees. This is not authorized by the CWA or the Porter-Cologne Water Quality Act. The Copermittees are, under the CWA, only required to address such discharges as illegal discharges if the discharge is found to be contributing a significant pollutant load to the MS4. By moving those categories to Provision E.2.a.(3), as shown in the Redline, the Copermittees will still be required to treat such discharges as illegal discharges if and when they are found to be contributing significant pollutants to the MS4. This proposed approach is consistent with other MS4 permits in the state, including prior San Diego Water Board orders, and is further consistent with the approach taken for the WQIP, which is intended to allow the Copermittees to focus resources on addressing the specific impacts that MS4 discharges are having on Receiving Water quality.

E.2.a.(2)

This Provision requires the Copermittees to treat water line breaks as illegal discharges, which in turn requires the Copermittee to conduct enforcement measures. Water main breaks are accidental occurrences, or may be the result of acts of nature. It is no more appropriate to treat accidents as illegal and subject to enforcement than it would be for a city to declare vehicular accidents as illegal, and conduct enforcement against those involved. This language needs to be removed as shown in the Redline. Additionally, as discussed in the Legal Comments, a recent case from the federal district court in Virginia suggests that the regulation of mere flow may exceed the authority of the CWA.

E.2.a.(4)

The Redline clarifies that if the 'statues, ordinances, permits, contracts, orders or similar means' are enacted/adopted by a Copermittee, the categories of non-stormwater discharges listed do not need to be treated as illegal discharges. Otherwise, the language could be read to imply that, for example, if it was infeasible for a particular resident to direct wash water to landscaped areas, that the Copermittee would be required to treat that residents' discharge as illegal and enforce upon them.

E.2.a.(5)

Contrary to the provisions of the CWA regulations, prior MS4 permits issued by the San Diego Water Board and other permits in the state, the Draft Permit requires implementation of BMPs, where

feasible, during emergency firefighting activities. During such emergencies, all focus of public resources must appropriately be dedicated to protecting life and property. Any diversions from that mission would only serve to diminish and potentially compromise that mission. The Redline proposes language consistent with that adopted by the San Diego Water Board in 2010 for the Riverside County MS4 Permit (Order R9-2010-0016).

E.2.a.(7)

Provisions E.2.a.(1) through E.2.a.(6) describe circumstances where non-stormwater discharges need not be prohibited. This Provision then requires the Copermittees to minimize such 'conditionally allowed' flows anyway. This requirement exceeds the scope of the CWA and its implementing regulations and makes no sense. The Redline requests deletion of these Provisions.

E.2.b.(1)(d)

This Provision requires the MS4 Copermittees to map all known private outfalls to Receiving Waters. Such a requirement is beyond the scope of an MS4 permit and should be removed, as shown in the Redline. The Draft Permit does not require a Copermittee to address private outfalls to Receiving Waters; this is the responsibility of the San Diego Water Board, which governs all waste dischargers under the authority of the CWA or the Porter-Cologne Act.

E.2.b.(4)

This Provision requires the Copermittees, in conjunction with a spill, to 'prevent contamination of surface water, groundwater, and soil.'This requirement is clearly beyond the scope of an MS4 permit issued under the CWA (which regulates only discharges of water containing pollutants *from* the MS4 to Receiving Waters) and must be removed, as shown in the Redline. The Draft Permit could more appropriately require the Copermittees to 'coordinate, to the extent possible, with spill response teams to prevent entry of spills into the MS4.'

E.2.d.(2)(e)

The Redline requests edits to clarify that the intent of this Provision is to document and attempt to quantify any obvious sources of non-stormwater illegal discharges in response to the outfall monitoring, and that it is not necessary to conduct a full source identification any time there is evidence of water near an outfall.

New Provisions E.2.d.(3)(e)-(f)

The Redline adds two new provisions to this section to address a gap in potential outcomes from a source identification effort. These Provisions address scenarios where a Copermittee identifies A) the illegal discharge is coming from another upstream Copermittees' MS4, or B) that the discharge has been authorized by the San Diego Water Board, either through an order or waiver of WDRs. In the first scenario, the responsibility to continue the source identification, and conduct enforcement, would be transferred to the upstream Copermittee. In the second scenario, the responsibility for follow-up would fall on the San Diego Water Board, after receiving relevant information from the Copermittee. This Provision also provides for reimbursement to the Copermittee for the cost of the source identification, since the San Diego Water Board required the Copermittee to conduct the investigation,

while not commensurately prohibiting all non-storm water discharges from all other sources regulated by the Water Boards.

3.8 Provision E.3, Development Planning

3.8.1 Overview of Key Issues

- Priority Development Projects - The Tentative Order identifies categories of projects that are to be defined as 'Priority Development Projects' (PDPs), which in turn will be required to comply with specific water quality and Hydromodification mitigation and quantitative requirements. The criteria for PDPs is quite broad and would include the majority of development projects, from small convenience stores and residences, to mega malls and specific plan developments. The Fact Sheet describes that while some smaller project types may not have significant pollutant loads, they may have a hydrologic impact upon Receiving Waters. However, it is important to recognize that pursuant to Provision E.3.a., All projects are required to implement a variety of LID principles such as disconnecting impervious surfaces, draining impervious surfaces to landscaped areas, and minimization of soil compaction in landscaped areas. Since such LID principles will be implemented wherever feasible consistent with the MEP standard, these smaller development projects are unlikely to create a pollutant or hydrologic impact. Additionally, the Fact Sheet advocates incentivizing LID design concepts and green infrastructure and building principles. Accordingly, the Redline requests changes to Provision E.3.b.(3) as described in Provision 3.8.2 below. The Legal Comments further note the potential impact of the Virginia case (*Virginia Dept. of Transp. v. U.S. Environmental Protection* Agency) holding that the CWA does not regulate stormwater as a pollutant.
- Design Capture Volume – There are two problems with how the Draft Permit defines the Design Capture Volume:
    - The Draft Permit changes the 'design capture volume' from previous permits by eliminating the term 'runoff'. Prior permits described that the design capture volume is the volume of stormwater <u>runoff</u> from the 24-hour 85th percentile storm event. This permit changes that to be the volume of stormwater <u>produced</u> from a 24-hour 85th percentile storm event. The elimination of the term 'runoff' means that BMPs would need to be sized potentially much larger than previously. For example, if the 85th percentile storm is 1" and a BMP is designed to treat 1 acre of residential land with a coefficient of runoff of 0.6, then under the current permits the BMP must be sized to hold 2,178 cubic feet of water. However, under the language of the Draft Permit, the BMP treating the same area would be required to hold 3,630 cubic feet of water, a 70% increase in BMP size. Accordingly, the Redline restores the term 'runoff'.
    - Additionally, the Draft Permit defines the Design Capture Volume alternatively as: *"the volume of storm water that would be retained onsite if the site was fully undeveloped and naturally vegetated, as determined using continuous simulation modeling techniques based on site-specific soil conditions and typical native vegetative cover."* In addition, to the problem identified above regarding the volume of storm water <u>runoff</u>, this language does not provide a temporal standard for determining which volume to

calculate from a continuous simulation model. Additionally, such models are not commonly used among general practitioners in the civil engineering community. The Redlines propose an alternative and simpler approach for this second definition: "The volume of stormwater runoff produced from a 24-hour 85th percentile storm event, that would be retained onsite in the pre-project condition." This definition is advantageous for several reasons: 1) it is simple for any civil engineer to understand, calculate, and comply with and is based on the same storm and hydrologic calculations as the first option, 2) it respects natural hydrology for the site, which may have had runoff in the pre-project condition, and as such, is more compatible with the intent of LID to mimic natural hydrology, and 3) as a result it is less likely to result in potential degradation of Beneficial Uses downstream, from reductions in flows beyond the pre-project condition.

- Pre-Project vs Pre-Development – Both the Storm Water Pollutant Control BMP requirements and the Hydromodification Management BMP requirements in the Draft Permit specify a 'pre-development' condition as the mitigation standard for all PDPs. In addition to the legal problems with such a standard as set forth in the Legal Comments, there are practical problems with the standard.
    - The presumption made in the discussions in the Fact Sheet are that all Receiving Waters can, and will, be restored to a fully natural condition - effectively to a natural floodplain. This presumption does not address reality, which is that development has occurred in those floodplains over many generations. The San Diego Water Board obviously lacks the authority to force homeowners and businesses to vacate such floodplains to effectuate restored natural conditions. Such an action would represent an unconstitutional taking. Moreover, the Legislature, in the Flood Control Acts covering all three counties proposed to be covered by the Draft Permit, has specifically authorized Flood Control Districts to construct flood control structures required to protect the lives and properties of the citizens.
    - Mitigation to a pre-development condition also may not be necessary to protect Receiving Waters from the effects of Hydromodification. If, for example a Receiving Water with existing development tributary to it, has not experienced increased erosion due to that existing development, there is no reason to require Hydromodification mitigation to anything more than the existing condition. In the counter-example, if under the existing condition the Receiving Water has experienced increased erosion due to that existing development, then, legal issues aside, there would be technical benefit to mitigating to that pre-development condition.

  The Redline proposes alternative language that requires mitigation to a pre-development standard only where it is legal and technically justified based on the conditions of the Receiving Water.
- Alternative Compliance – The alternative compliance project options as set forth in the Draft Permit pose two key problems:

- Several statements are conflicting and thus confusing as to what the required standard is for the various alternative compliance projects. For example, throughout Provision E.3.c. it is stated that 'a PDP may be allowed to comply with Provision E.3.c.(1)(a) and/or Provision E.3.c.(2) if they …'. This language can be mis-read to imply that the project must comply both with Provisions E.3.c.(1)(a) and E.3.c.(2) *and* implement the alternative compliance project (thus negating the benefit of alternative compliance). The Redline clarifies this language.
- The Biofiltration option set forth in the Draft Permit arbitrarily, and without technical basis or justification, **doubles** the sizing standard for biofiltration BMPs from 0.75 times the design capture volume (as set forth in the 2010 MS4 Permit and the 2009 Orange County Permit) to 1.5 times the design capture volume. The existing 0.75 standard was set due to the fact that 1) the 85th percentile 24-hour storm occurs over a period of time, and 2) such BMPs have outflows and will regain some capacity during the storm event, and as such, do not need to instantaneously hold the entire 'Design Capture Volume' to have fully treated that volume. In fact, studies have shown that in addition to yielding excellent pollutant concentration reductions, LID Biofiltration BMPs are excellent at reducing the volume of runoff similar to retention BMPs. According to the ASCE International BMP database 60% or more of the long-term volume of runoff from a site can be retained within a Bioretention BMP (Bioretention BMPs are the primary 'biofiltration' BMP now allowed in Riverside County). In comparison, a Retention BMP sized to hold the runoff from the 85th percentile storm event (the Design Capture Volume) will end up retaining approximately 80% of the long-term volume of runoff. Thus, by simple proportions, a Bioretention BMP sized to 'hold' 100% of the Design Capture Volume may also be able to retain 80% of the long-term volume of runoff. $\left(\frac{0.75\times DCV}{60\%\ retained}=\frac{1.0\times DCV}{80\%\ retained}\right)$. This is being validated through Bioretention BMPs that have been constructed and are being monitored for such volume reductions at the Riverside County Flood Control District's headquarters in Riverside. Further, Biofiltration BMPs have the added benefit of providing better overall treatment of back to back storms. Where a Retention BMP would be full after the first storm, fully bypassing the second storm without treatment, a Biofiltration BMP will have restored some capacity after the first storm, providing for treatment of some or all of the second of the back to back storms. Thus, the attached redlines propose changing the sizing factor for Biofiltration BMPs to 1.0 times the Design Capture Volume. The Redline proposes changes consistent with these comments.

3.8.2 Comments in support of specific changes

Introduction

Provision E.3.g (Strategies to address the highest priority water quality conditions) was moved to the beginning to support and better integrate the development planning programs in the JRMP with the strategies developed in the WQIP.

E.3.a.(3)

The Redline changes the title of this section (and other appropriate references to this Provision) to refer to LID Principles, as identified in the CASQA LID Manual for Southern California (https://www.casqa.org/LIDDemo/LowImpactDevelopmentManual/tabid/242/Default.aspx)

E.3.b.(1)(c) (New Provision)

This Provision was added to clarify the requirements if a project that was already subjected to SSMP requirements redevelops a portion of the site.

E.3.b.(2)

The Redline edits shown for this Provision are primarily to simplify this Provision, by grouping various categories by their applicable square footage threshold and including some of the specifics in the definitions (Attachment C). Other changes (beyond reorganization) include:

- Removing the addition of 'driveways' from subsection (g) as described in Provision 3.8.1 of this letter.
- Adding a footnote for parking lots, to clarify that the trigger would not include parking lots that are not exposed to runoff, such as subterranean or covered parking lots. It is beneficial to not have parking lots exposed to runoff; excluding such parking lots from being defined as a PDP is a good way to encourage such practices.
- Hillside development projects were not included as it is not believed to be necessary anymore with the relatively low threshold (10,000 square feet) identified for other categories included in this and other recent MS4 permits.
- The definition for "Environmentally Sensitive Areas" from existing MS4 permits was restored to include the language referring to discharges that are not commingled with flows from adjacent or other upstream lands (note that the change is shown in the definitions per the re-organization suggested above).

E.3.b.(3)

- The PDP exemption for sidewalks, bicycle lanes, or trails, [E.3.b.(3)(a)] has been expanded to as shown in the Redline to include driveways and parking lots. If those projects implement criteria already described in that section, they are also unlikely to create an impact to Receiving Waters. Further, including those project types in that exemption will further incentivize developers to utilize those LID Principles.
- The exemption described in Provision E.3.b(3)(b), was modified as shown in the Redline, and as discussed in the comment letter submitted by the Riverside County Transportation Department. Please see that letter for a justification for the requested changes.
- As shown in the Redline, the exemptions for new and redeveloped single family residences [E.3.b.(3)(c) and (d)] were consolidated into a new provision [E.3.b.(3)(c)], covering all single family residential projects (both new and redeveloped). The key difference is that such projects would be considered exempt if they are both 1) not part of a larger common plan of development or planned subdivision, and 2) successfully incorporate each of the applicable source control and LID Principles identified in Provision E.2.a.(2)-(3) to the MEP.

- A new Provision-E.3.b.(3)(d), titled 'Watershed Protection Projects' was added in the Redline. The project types described therein are all projects that are undertaken to rehabilitate or prevent environmental, social, and economic damage within the watershed, including Receiving Waters. These projects, while they may in some cases require some level of impervious surfaces to be constructed, are 1) not designed for human use or activity that would generate pollutants, or are designed specifically to mitigate such pollutants; and 2) will implement each of the applicable source control and LID Principles identified in Provision E.2.a.(2)-(3) to the MEP.

E.3.c.(1)

In addition to the edits discussed in Provision 3.8.1 of this letter, the Redline removed subprovision E.3.c.(1)(c) , for two reasons:

- The requirements that must be met to when implementing an alternative compliance project are more fully described in Provision E.3.c.(3).
- The language, as drafted, appeared to require double-mitigation. It requires that: 1) conventional treatment is required to treat the entire volume not retained onsite, and 2) the pollutant load discharged must also be mitigated with an alternative compliance project. Such a scenario would be requiring double-mitigation. The Redline provides a clearer and more simple mitigation standard.

E.3.c.(2)

The Riverside County Copermittees have two concerns with this Provision:

- The first concern is the universal requirement to mitigate to the 'pre-development' standard, as discussed above in section 3.8.1 of this letter. The Copermittees in the Redline propose that this language be changed to the 'pre-project' condition. For new development projects, the 'pre-project' condition will be equivalent to the 'pre-development' condition. For redevelopment projects, the standard would be the conditions that exist onsite prior to the construction of the project. This is appropriate, because in many areas, particularly in areas of existing development that would be subject to 'redevelopment', Receiving Waters are engineered and maintained to 1) provide flood protection for the public, 2) ensure that floodwaters don't comingle with pollutants on adjacent private properties and 3) to ensure that the existing development draining to that system does not cause erosion. In cases where the Receiving Waters are not engineered and maintained, and erosion problems caused by existing development are observed, language has been added to the Redline to provide for additional standards to be developed in the WQIP, based on the WQIP priorities.
- Additionally, the Redline proposes an additional exemption from HMP requirements for projects that discharge into conveyance channels that are engineered and maintained for the build-out condition all the way from the project to a waterbody that is sufficiently resistant to Hydromodification. This language is consistent with the above discussions, and ensures the PDPs are not required to mitigate for non-existent impacts. Please see the specific language in the Redline. The engineered channel exemption can be found in other recent MS4 permits, including the recently adopted Los Angeles County MS4 Permit.

E.3.c.(3)(a) and (b)

These two Provisions were re-written in the Redline to be simpler and clearer on what BMPs, criteria, sizing standards are required for what type of project. This alternative language still meets the intent of the Draft Permit, while being easier to understand and comply with. Aside from simplifying the language, the following other changes were made in the Redline:

- The alternative compliance options must be determined to provide an equal or greater overall water quality benefit for the WMA.
- Additional options were provided for who can design the alternative compliance projects
- All alternative compliance projects are required to be consistent with the strategies in the WQIP. While the specific alternative compliance project would not be required to be identified in the WQIP, the goal of this language is to ensure that allowing the alternative compliance project would not in any way be detrimental to or contrary to the strategies in the WQIP.
- Requirements E.3.c.(3)(a)(iv) and (v) were removed entirely, as they conflict with E.3.c.(3)(a)(iii) which allowed the projects to be in the same WMA (preferably the same HSA)
- Changed the sizing factor for Biofiltration BMPs to 1.0 as discussed in section 3.8.1 of this letter, and deleted the option [d] which required triple mitigation by requiring Biofiltration + Conventional Treatment + Alternative Compliance projects.
- Added Conventional Treatment Control BMPs as an alternative compliance option, only where it has been shown to be technically infeasible to meet E.3.c.(1) and technically infeasible to implement LID Biofiltration Treatment Control BMPs.

E.3.c.(3)(c)

Redline edits in this section are primarily to simplify and consolidate the requirements. Sub-Provision [C] was removed, as it was duplicative of the mitigation standards for the alternative compliance project are specified in E.3.c.(3)(b) and E.3.c.(3)(c)(i)[a].

3.9 Provision E.4, Construction

3.9.1 Overview of Key Issues

This Riverside County Copermittees' comments and edits are set forth in the Redline.

- One key issue for the Copermittees is the edit shown in the Redline to Provision E.4.c, which clarifies that the Copermittees are responsible for *requiring* BMPs at private construction sites, and *implementing* BMPs at Copermittee construction sites.

3.9.2 Comments in support of specific changes

The Redline edits include comments supporting the requested edits.

3.10 Provision E.5., Existing Development

3.10.1 Overview of Key Issues

The Draft Permit includes requirements for advanced programs to identify opportunities and implement programs to facilitate the construction of Retrofit and Stream/Channel/Habitat Rehabilitation projects on private properties. Such requirements are clearly beyond the requirements of the CWA for a management plan to be implemented by an MS4 Copermittee. The Riverside County Copermittees request deletion of these requirements.

Alternatively, the Riverside County Copermittees have the following comments:

While these retrofitting and rehabilitation approaches can be helpful and/or needed in some circumstances, they are not required in all circumstances, nor are required to address all pollutants that may be identified in a WQIP as the highest priority water quality conditions. For example, some pollutants are best addressed with regulatory source controls at the state or federal level, such as the removal of copper from brake pads, and controls on pesticides, while other pollutants can be adequately addressed through inspections and enforcement. There are several problems with requiring Copermittee resources to be invested in such Retrofit and/or Rehabilitation strategies (collectively referred to as 'retrofit'):

- Land Ownership: The land that could potentially be identified for retrofit would likely not be owned by a Copermittee. The Copermittee therefore has no ability to force the property owner to retrofit their property. Although the Copermittee could potentially implement programs to "facilitate" implementation, such a program would still be limited by the rights of the individual property owner. Even if a Copermittee were to attempt to purchase a privately owned existing development for the purposes of retrofit (a step going far beyond any requirements in the CWA or the Porter-Cologne Act), such a process can take many years, and if the owner is unwilling to sell, the retrofit project could never be realized. In any scenario, the process to facilitate such "retrofits" is extremely costly and lengthy, with no guarantee of a benefit to water quality. Retrofits should only be undertaken where the Copermittee identifies it as a necessary step to addressing the MS4 contributions to Receiving Water problems to the MEP. Otherwise, it forces the Copermittee to utilize resources very ineffectively, which is contrary to the goals of the WQIP and may actually be detrimental to water quality.
- Permitting: Aside from the limitations discussed above, stream/channel/habitat restorations have the additional complexities of requiring other regulatory permits that are not the discretion of the San Diego Water Board nor the Copermittees to issue. Such projects can take many decades to implement, and thus, are not expected to be highly effective at addressing the goals of the WQIP, except in rare circumstances.

Redline edits have been provided to clarify that these strategies and programs should only be used when, and to the extent directed by the strategies developed in the WQIP.

3.10.2 Comments in support of specific changes

E.5.b.(1)(b) and (d)

BMP implementation requirements of Provision E.5.b.(1)(b) and (d) have been clarified in the Redline to require the Copermittee to implement BMPs on their existing development, and require implementation of BMPs on private existing development.

E.5.c.(1)(a)(iv)

The Riverside County Copermittees request deletion of this Provision. The Copermittees should be provided the flexibility to schedule inspections as they see fit, provided that the schedules they establish pursuant to E.5.c.(1)(a), and the minimum frequency in E.5.c.(1)(a)(i) are met. Requiring 20% every year will be difficult to track as businesses may be opened or closed throughout the year and throughout the permit term.

Additionally, the Riverside Copermittees understand that other Copermittees may be recommending that E.5.c.(1)(a)(i) be changed to 'once per permit term'. The Riverside Copermittees believe that the current language of 'once every five years' is more appropriate for two reasons: 1) not all Copermittees (i.e. OC and Riverside) will be enrolled into the permit at the beginning of the 'permit term', and 2) not all businesses will be in existence at the beginning of the permit term. Accordingly it is more appropriate to simply require the minimum to be once every five years, that way a program manager can simply look at the last time a facility was inspected, and use that date to schedule the next inspection.

3.11 Provision E.6, Enforcement Response Plans

3.11.1 Overview of Key Issues

The Riverside County Copermittees' edits and comments are shown in the Redline and discussed below.

3.11.2 Comments in support of specific changes

E.6.d.

The terminology in this Provision was changed in the Redline from 'escalated' enforcement to 'progressive' enforcement. The proposed language better reflects the nature of enforcement actions, which are not simply 'escalated' or 'not escalated', as implied by Provision E.6.d.(2), but are progressive as needed in response to the severity of the violation. Since every violation comes with a unique set of circumstances, it is not reasonable to presume that a single set of 'triggers' will universally result in the same level of enforcement.

3.12 Provision E.7, Public Education

3.12.1 Overview of Key Issues

The Riverside County Copermittees' edits and comments are shown in the Redline.

3.13 Provision, E.8 Fiscal Analysis

3.13.1 Overview of Key Issues

The requirement that the Copermittees "must secure all the resources necessary to comply with this Order" exceeds the requirements of the CWA and illegally intrudes on the home rule authority of municipalities to govern themselves. This must be deleted. Please also see Legal Comments.

With regard to other provisions, the Riverside County Copermittees' edits and comments are shown in the Redline.

3.14 Provision F

3.14.1 Overview of Key Issues

- F.1 – WQIP Submittal
  - Based on the schedule for the initial submittal of the Priority Water Quality Conditions and Numeric Goals, and the subsequent 60-day public review, only one month would be left for the Copermittees to finalize strategies based on those conditions and goals and the public input received. This is an insufficient amount of time. The Redline requests modifications to the schedule that would provide for the submittal of the final WQIP within 24 months (instead of 18), to provide additional time for the development of strategies.
- F.1 and F.2.
  - The schedules for submittals should be linked to the receipt of comments on prior submittals, or the approval of prior submittals, rather than the permit adoption date. If it is tied to the permit adoption date, the submittal dates could become out of sync with the comment periods or San Diego Water Board approvals if any unexpected delays occur (for example if the San Diego Water Board is delayed in approving a document, or posting a document online for public comment). The Redline requests appropriate modifications.
  - Implementation dates for the plans are unclear / undefined. The Redline clarifies this issue.
- F.3. Progress Reports
  - The reporting requirements across the transitional period were unclear. Redlines are provided to clarify and consolidate.
  - The Regional Monitoring and Assessment Report language was revised to be consistent with the requirements of the Integrated Assessment of the Water Quality Improvement Plan, rather than an additional, slightly different report, due at the same time.

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3.15 Attachments B and C

Comments and edits to Attachments B and C are shown in the Redline.

Very truly yours,

for JASON E. UHLEY
Chief of Watershed Protection Division

CP:cw
P8/

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

TENTATIVE
ORDER NO. R9-2013-0001
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The San Diego County Copermittees in Table 1a are subject to waste discharge requirements set forth in this Order.

Table 1a. San Diego County Copermittees

Municipal Copermittees	
City of Carlsbad	City of Oceanside
City of Chula Vista	City of Poway
City of Coronado	City of San Diego
City of Del Mar	City of San Marcos
City of El Cajon	City of Santee
City of Encinitas	City of Solana Beach
City of Escondido	City of Vista
City of Imperial Beach	County of San Diego
City of La Mesa	San Diego County Regional Airport Authority
City of Lemon Grove	San Diego Unified Port District
City of National City	

After the San Diego Water Board receives and considers the Orange County Copermittees' Report of Waste Discharge and makes any necessary changes to the Order, the Orange County Copermittees in Table 1b will become subject to waste discharge requirements set forth in this Order after expiration of Order No. R9-2009-0002, NPDES No. CAS0108740 on or after December 16, 2014.

Table 1b. Orange County Copermittees

Municipal Copermittees	
City of Aliso Viejo	City of Rancho Santa Margarita
City of Dana Point	City of San Clemente
City of Laguna Beach	City of San Juan Capistrano
City of Laguna Hills	City of Laguna Woods
City of Laguna Niguel	County of Orange
City of Lake Forest	~~Orange County Flood Control District~~

City of Mission Viejo	
Special District Copermittee	
Orange County Flood Control District	

After the San Diego Water Board receives and considers the Riverside County Copermittees' Report of Waste Discharge and makes any necessary changes to this Order, the Riverside County Copermittees in Table 1c will become subject to waste discharge requirements set forth in this Order after expiration of Order No. R9-2010-0016, NPDES No. CAS0108766 on or after November 10, 2015.

Table 1c. Riverside County Copermittees

Municipal Copermittee	
City of Murrieta	County of Riverside
City of Temecula	~~Riverside County Flood Control and Water Conservation District~~
City of Wildomar	
Special District Copermittee	
Riverside County Flood Control and Water Conservation District	

The Orange County Copermittees and Riverside County Copermittees may become subject to the requirements of this Order at a date earlier than the expiration date of their current Orders subject to the conditions described in Provision F.6 of this Order if the Copermittees in the respective county receive a notification of coverage from the San Diego Water Board.

The term Copermittee in this Order refers to any San Diego County, Orange County, or Riverside County Copermittee covered under this Order, unless specified otherwise.

This Order provides permit coverage for the Copermittee discharges described in Table 2.

Table 2. Discharge Locations and Receiving Waters

Discharge Points	Locations throughout San Diego Region
Discharge Description	Municipal Separate Storm Sewer System (MS4) Discharges
Receiving Waters	Inland Surface Waters, Enclosed Bays and Estuaries, and Coastal Ocean Waters of the San Diego Region

Table 3. Administrative Information

This Order was adopted by the San Diego Water Board on:	**Month Day, 2013**
This Order will become effective on:	**Month Day, 2013**
This Order will expire on:	**Month Day, 2018**
The Copermittees must file a Report of Waste Discharge in accordance with Title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than 180 days in advance of the Order expiration date.	

I, David W. Gibson, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on Month Day, 2013.

TENTATIVE

David W. Gibson
Executive Officer

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ATTACHMENTS

Attachment A - Discharge Prohibitions and Special Protections A-1
Attachment B - Standard Permit Provisions and General Provisions B-1
Attachment C - Acronyms, Abbreviations and Definitions C-1
Attachment D - Jurisdictional Runoff Management Program Annual Report Form D-1
Attachment E - Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2013-0001 ..... E-1
Attachment F - Fact Sheet / Technical Report for Order No. R9-2013-0001 ..... F-1

I. FINDINGS

Comment [A1]: See discussions in section 3.1 of the comment letter

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), finds that:

JURISDICTION

1. **MS4 Ownership or Operation.** Each of the Copermittees owns or operates an MS4, through which it discharges storm water and non-storm water into waters of the U.S. within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the U.S.

Many geographical areas subject to this Order are subject to the threat of periodic catastrophic flooding resulting from natural conditions, specifically the presence of mountains and hilly areas in close proximity to urban development and the effect of period strong Pacific Ocean storms. Such flooding would occur in the absence of development. The Legislature recognized the importance of this issue when it established flood control districts across the state, including in Orange, Riverside and San Diego Counties. Such flooding has in the past, and if not controlled, could in the future result in loss of life and property damage. Such flooding can also mobilize significant Pollutants from industrial, commercial, residential and agricultural lands, damaging watercourses and the beneficial uses thereof, including habitat. MS4s are designed and constructed to mitigate such impacts.

2. Riverside County Flood Control and Water Conservation District.

Comment [A2]: See discussion in section 3.1.1 of the comment letter.

In 1945, the California Legislature enacted the Riverside County Flood Control and Water Conservation District Act, establishing the Riverside County Flood Control and Water Conservation District (District). The objects and purposes of the Act are to provide for the control and conservation of flood and storm waters and for the protection of watercourses, watersheds, public highways, life and property within the District from damage or destruction from flood waters. Among its other powers, the District also has the power to conserve, reclaim and save such waters for beneficial use. However the Act does not provide the District with the power to control the volume or quality of discharges that runs off of private property, which may end up in the District's flood control system. The District is governed by the District's Board of Supervisors as a separate legal entity from the County of Riverside.

Many of the flood management systems that the District operates are defined by the Clean Water Act as an MS4, and include many of the larger MS4s within the Santa Margarita watershed region of Riverside County (SMR). District does not however

own or operate streets, catch basins or storm drains smaller than 36 inches that collect runoff from the incorporated and unincorporated jurisdictions within the SMR, and commonly connect into the District's flood management system. Such systems are typically owned and operated by either the County of Riverside or the incorporated Cities within the SMR.

The waters and pollutants that may enter the regional receiving waters and/or the District's flood management systems come from various sources. These sources can include storm water and non-storm water from the Municipal Copermittees under this permit as well as from other NPDES and non-NPDES permittees, including industrial waste water dischargers, waste water treatment facilities, industrial and construction stormwater dischargers, water suppliers, tribal lands, other state and federal government entities, and Caltrans. Sources can also include discharges from Phase II entities such as school districts and discharges from entities that have been granted waste discharge requirements or waivers of waste discharge requirements, including agricultural operations.

The District does not own or operate any municipal sanitary sewer systems, public streets, roads, or highways. The District has no planning, zoning, development permitting or other land use authority, thus, it has no permitting or governing authority over industrial or commercial facilities, residents, new developments or re-development projects, and development construction sites located in any incorporated or unincorporated areas within its service area, including the SMR. The Copermittees that have such authority are responsible for implementing a storm water management program to address pollutants discharged from such industrial and commercial facilities, residential areas, new development and re-development projects, and development construction sites within their jurisdictional boundaries. Nonetheless, as an owner and operator of an MS4, the District is required to control pollutant discharges into and from its MS4, such as through interagency agreements among Copermittees and other owners of a MS4, the contribution of pollutants from one portion of the MS4 to another portion of the MS4 within their jurisdiction.

2. **Legal and Regulatory Authority.** This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]) adopted by the United States Environmental Protection Agency (USEPA), and chapter 5.5, division 7 of the California Water Code (CWC) (commencing with section 13370). This Order serves as an NPDES permit for discharges from MS4s to surface waters. This Order also serves as waste discharge requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

   The San Diego Water Board has the legal authority to issue a regional MS4 permit pursuant to its authority under CWA section 402(p)(3)(B) and 40 CFR 122.26(a)(1)(v). The USEPA also made it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide permits (55 Federal Register [FR] 47990, 48039-48042). The regional nature of this Order will ensure consistency of regulation within watersheds and is expected

to result in overall cost savings for the Copermittees and San Diego Water Board.

The federal regulations make it clear that the Copermittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators (40 CFR 122.26(a)(3)(vi)). This Order does not require the Copermittees to manage storm water outside of their jurisdictional boundaries, but rather to work collectively to improve storm water management within watersheds.

3. **CWA NPDES Permit Conditions.** Pursuant to CWA section 402(p)(3)(B), NPDES permits for storm water discharges from MS4s must include requirements to effectively prohibit non-storm water discharges into MS4s, and require controls to reduce the discharge of pollutants from the MS4s ~~in storm water~~ to the maximum extent practicable (MEP), and to require other provisions as the San Diego Water Board determines are appropriate to control such pollutants. This Order prescribes conditions to assure compliance with the CWA requirements for owners and operators of MS4s to effectively prohibit non-storm water discharges in to the MS4s, and require controls to reduce the discharge of pollutants ~~in storm water~~ from the MS4s to the MEP.

Comment [A3]: See discussion in section 3.1.2 of the comment letter.

4. **CWA and CWC Monitoring Requirements.** CWA section 308(a) and 40 CFR 122.41(h),(j)-(l) and 122.48 require that NPDES permits must specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s also specify additional monitoring and reporting requirements in 40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c). CWC section 13383 authorizes the San Diego Water Board to establish monitoring, inspection, entry, reporting and recordkeeping requirements. This Order establishes monitoring and reporting requirements to implement federal and State requirements.

5. **Total Maximum Daily Loads.** CWA section 303(d)(1)(A) requires that "[e]ach state shall identify those waters within its boundaries for which the effluent limitations…are not stringent enough to implement any water quality standard applicable to such waters." The CWA also requires states to establish a priority ranking of impaired water bodies known as Water Quality Limited Segments and to establish Total Maximum Daily Loads (TMDLs) for such waters. This priority list of impaired water bodies is called the Clean Water Act Section 303(d) List of Water Quality Limited Segments, commonly referred to as the 303(d) List. The CWA requires the 303(d) List to be updated every two years.

   TMDLs are numerical calculations of the maximum amount of a pollutant that a water body can assimilate and still meet water quality standards. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point sources (waste load allocations or WLAs) and non-point sources (load allocations or LAs), background contribution, plus a margin of safety. Discharges from MS4s are point source discharges. The federal regulations (40 CFR 122.44(d)(1)(vii)(B)) require that NPDES permits to incorporate water quality based effluent limitations (WQBELs) developed to protect a narrative water quality criterion, a numeric water

quality criterion, or both, consistent with the assumptions and requirements of any available WLA for the discharge. Requirements of this Order implement the TMDLs adopted by the San Diego Water Board and approved by USEPA.

6. **Non-Storm Water Discharges.** Pursuant to CWA section 402(p)(3)(B)(ii), this Order requires each Copermittee to effectively prohibit discharges of non-storm water into its MS4. Nevertheless, non-storm water discharges into and from the MS4s continue to be reported to the San Diego Water Board by the Copermittees and other persons. Monitoring conducted by the Copermittees, as well as the 303(d) List, have identified dry weather, non-storm water discharges from the MS4s as a source of pollutants causing or contributing to receiving water quality impairments in the San Diego Region. The federal regulations (40 CFR 122.26(d)(2)(iv)(B)(1)) require the Copermittees to have a program to prevent illicit discharges to the MS4. The federal regulations, however, allow for specific categories of non-storm water discharges or flows to be addressed as illicit discharges only where such discharges are identified as sources of pollutants to waters of the U.S.

7. **In-Stream Treatment Systems.** Pursuant to federal regulations (40 CFR 131.10(a)), in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S. Authorizing the construction of a runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to accepting waste assimilation as an appropriate use for that water body. Runoff treatment must occur prior to the discharge of runoff into receiving waters. Treatment control best management practices (BMPs) must not be constructed in waters of the U.S. Construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body.

DISCHARGE CHARACTERISTICS AND RUNOFF MANAGEMENT

8. **Point Source Discharges of Pollutants.** Discharges from the MS4s may contain waste, as defined in the CWC, and pollutants that adversely affect the quality of the waters of the state. A discharge from an MS4 is a "discharge of pollutants from a point source" into waters of the U.S. as defined in the CWA. Storm water and non-storm water discharges from the MS4s may contain pollutants that cause or threaten to cause a violation of surface water quality standards, as outlined in the Water Quality Control Plan for the San Diego Basin (Basin Plan). ~~Storm water and non-storm water discharges from the MS4s are subject to the conditions and requirements established in the Basin Plan for point source discharges.~~

9. **Potential Beneficial Use Impairment.** The discharge of pollutants and/or increased flows from MS4s may cause or threaten to cause the concentration of pollutants to exceed applicable receiving water quality objectives and impair or threaten to impair designated beneficial uses or which may result~~ing~~ in a condition of pollution, contamination, or nuisance. In addition, the reduction of flows below the

existing condition may impact negatively impact beneficial uses.

10. **Pollutants Generated by Land Development.** Land development has created and continues to create new sources of non-storm water discharges and pollutants in storm water discharges as human population density increases. This brings higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash. Pollutants from these sources are dumped or washed off the surface by non-storm water or storm water flows into and from the MS4s. When development converts natural vegetated pervious ground cover to impervious surfaces such as paved highways, streets, rooftops, and parking lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving a developed area without BMPs that can maintain pre-development conditions will contain greater pollutant loads and have significantly greater runoff volume, velocity, and peak flow rate than pre-development runoff from the same area.

11. **Runoff Discharges to Receiving Waters.** The MS4s discharge runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within the eleven hydrologic units comprising the San Diego Region. ~~Historic and current development makes use of natural drainage patterns and features as conveyances for runoff. Rivers, streams and creeks in developed areas used in this manner are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and receiving water.~~ Numerous receiving water bodies and water body segments have been designated as impaired by the San Diego Water Board pursuant to CWA section 303(d).

Comment [A4]: See discussion in section 3.1.2 of the comment letter.

Pollutants in Runoff. The most common pollutants in runoff discharged from the MS4s include total suspended solids, sediment, pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., cadmium, copper, lead, and zinc), petroleum products and polynuclear aromatic hydrocarbons, synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus), oxygen-demanding substances (e.g., decaying vegetation, animal waste), detergents, and trash. ~~As operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not effectively prohibit or otherwise control.~~ These discharges may cause or contribute to a condition of pollution or a violation of water quality standards. California law requires downstream landowners, including owners and operators of MS4, to accept upstream flows, even if that flow contains Pollutants. Failure to do can create conditions.

Comment [A5]: See discussion in section 3.1.2 of the comment letter.

Limitation on Powers of Copermittees. This Order regulates the discharge of non-stormwater into and Pollutants from non-agricultural Anthropogenic sources from the MS4s owned and/or operated by the Copermittees. The Copermittees lack legal

Comment [A6]: This finding is based on Findings I.B and I.C in Order R8-2010-33, applicable to portions of Riverside County within the Santa Ana region.

jurisdiction over discharges into their MS4 from agricultural activities, State and federal facilities, public schools and hospitals, utilities, railroads, special districts, Native American tribal lands, wastewater management agencies and other point and non-point source discharges otherwise permitted by the Water Board. The Water Board recognizes that the Copermittees should not be held responsible for discharges from such facilities or Pollutants in those discharges. Also, certain activities and sources that generate pollutants present in urban runoff may be beyond the ability of the Copermittees to prevent or eliminate. Examples of these activities and sources include, but are not limited to: emissions from internal combustion engines, brake pad wear and tear, atmospheric deposition, non-Anthropogenic sources of bacteria (including wildlife and feral cats and dogs), the regulation of pesticides and leaching of naturally occurring nutrients and minerals from local soils. This Order is not intended to address background or naturally occurring Pollutants or flows.

12.

13. **Human Health and Aquatic Life Impairment.** Pollutants in runoff discharged from the MS4s can threaten and adversely affect human health and aquatic organisms. Adverse responses of organisms to chemicals or physical agents in runoff range from physiological responses such as impaired reproduction or growth anomalies to mortality. Increased volume, velocity, rate, and duration of storm water runoff greatly accelerate the erosion of downstream natural channels. This alters stream channels and habitats and can adversely affect aquatic and terrestrial organisms.

14. **Water Quality Effects.** The Copermittees' water quality monitoring data submitted to date documents various persistent exceedances of Basin Plan water quality objectives for runoff-related pollutants at various watershed monitoring stations. Persistent toxicity has also been observed at several watershed monitoring stations. In addition, bioassessment data indicate that the majority of the monitored receiving waters have Poor to Very Poor Index of Biological Integrity (IBI) ratings. ~~These findings indicate that runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in the San Diego Region. Non-storm water discharges from the MS4s have been shown to contribute significant levels of pollutants and flow in arid, developed Southern California watersheds, and contribute significantly to exceedances of applicable receiving water quality objectives.~~

Comment [A7]: These statements are completely unsubstantiated.

15. ~~**Non-Storm Water and Storm Water Discharges.** Non-storm water discharges from the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard of CWA section 402(p)(3)(B)(iii), which is explicitly for "Municipal … *Stormwater Discharges* (emphasis added)" from the MS4s. Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s must be effectively prohibited.~~

Comment [A8]: See discussion in section 3.1.2 of the comment letter.

16. **Best Management Practices.** Waste and pollutants which are deposited and accumulate in MS4 drainage structures may~~will~~ be discharged from these structures

to waters of the U.S. unless they are removed. These discharges may cause or contribute to, or threaten to cause or contribute to, a condition of pollution in receiving waters. For this reason, pollutants in storm water discharges from the MS4s can be and must be effectively reduced in runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Pollution prevention is the reduction or elimination of pollutant generation at its source and is the best "first line of defense". Source control BMPs (both structural and non-structural) minimize the contact between pollutants and runoff, therefore keeping pollutants onsite and out of receiving waters. Treatment control BMPs remove pollutants that have been mobilized by storm water or non-storm water flows.

17. **BMP Implementation.** Runoff needs to be addressed during the three major phases of development (planning, construction, and use) in order to reduce the discharge of storm water pollutants to the MEP, effectively prohibit non-storm water discharges, and protect receiving waters. Development which is not guided by water quality planning policies and principles can result in increased pollutant load discharges, flow rates, and flow durations which can negatively affect receiving water beneficial uses. Construction sites without adequate BMP implementation result in sediment runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. Existing development can generate substantial pollutant loads which are discharged in runoff to receiving waters. Retrofitting areas of existing development with storm water pollutant control and hydromodification management BMPs may in many cases be ~~is~~ necessary to address storm water discharges from existing development that may cause or contribute to a condition of pollution or a violation of water quality standards.

Comment [A9]: It is not necessary in all cases.

18. **Long Term Planning and Implementation.** Federal regulations require municipal storm water permits to expire 5 years from adoption, after which the permit must be renewed and reissued. The San Diego Water Board recognizes that the degradation of water quality and impacts to beneficial uses of the waters in the San Diego Region occurred over several decades. The San Diego Water Board further recognizes that a decade or more may be necessary to realize demonstrable improvement to the quality of waters in the Region. This Order includes a long term planning and implementation approach that will require more than a single permit term to complete.

WATER QUALITY STANDARDS

19. **Basin Plan.** The San Diego Water Board adopted the Water Quality Control Plan for the San Diego Basin (Basin Plan) on September 8, 1994 that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for receiving waters addressed through the plan. The Basin Plan was subsequently approved by the State Water

Resources Control Board (State Water Board) on December 13, 1994. Subsequent revisions to the Basin Plan have also been adopted by the San Diego Water Board and approved by the State Water Board. Requirements of this Order implement the Basin Plan.

The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Process Supply (PROC), Industrial Service Supply (IND), Ground Water Recharge (GWR), Contact Water Recreation (REC1), Non-contact Water Recreation (REC2), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Freshwater Replenishment (FRSH), Hydropower Generation (POW), and Preservation of Biological Habitats of Special Significance (BIOL). The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region: Navigation (NAV), Commercial and Sport Fishing (COMM), Estuarine Habitat (EST), Marine Habitat (MAR), Aquaculture (AQUA), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN), and Shellfish Harvesting (SHELL).

20. **Ocean Plan.** The State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, and 2005. The State Water Board adopted the latest amendment on April 21, 2005 and it became effective on February 14, 2006. The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean. Requirements of this Order implement the Ocean Plan.

    The Ocean Plan identifies the following beneficial uses of ocean waters of the state to be protected: Industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture; preservation and enhancement of designated Areas of Special Biological Significance; rare and endangered species; marine habitat; fish spawning and shellfish harvesting

21. **Sediment Quality Control Plan**. On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes: 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

22. **National Toxics Rule and California Toxics Rule.** USEPA adopted the National Toxics Rule (NTR) on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the NTR applied in California. On May 18, 2000, USEPA adopted the California Toxics Rule (CTR). The CTR promulgated

new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants.

23. **Antidegradation Policy.** This Order is in conformance with the federal Antidegradation Policy described in 40 CFR 131.12, and State Water Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality Waters in California*. Federal regulations at 40 CFR 131.12 require that the State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. State Water Board Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies.

CONSIDERATIONS UNDER FEDERAL AND STATE LAW

24. **Coastal Zone Act Reauthorization Amendments.** Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states with approved coastal zone management programs to address non-point source pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point source pollution: agriculture, silviculture, urban, marinas, and hydromodification. This Order addresses the management measures required for the urban category, with the exception of septic systems. The runoff management programs developed pursuant to this Order fulfills the need for coastal cities to develop a runoff non-point source plan identified in the Non-Point Source Program Strategy and Implementation Plan. The San Diego Water Board addresses septic systems through the administration of other programs.

25. **Endangered Species Act.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 USC sections 1531 to 1544). This Order requires compliance with receiving water limits, and other requirements to protect the beneficial uses of waters of the State. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

26. **Report of Waste Discharge Process.** The waste discharge requirements set forth in this Order are based upon the Report of Waste Discharge submitted by the San Diego County Copermittees prior to the expiration of Order No. R9-2007-0001 (NPDES No. CAS0109266). The Orange County and Riverside County Copermittees are not immediately covered by the waste discharge requirements in this Order. The San Diego Water Board understands that each municipality is

unique although the Counties share watersheds and geographical boundaries. The Order will continue to use the Report of Waste Discharge process prior to initially making Orange County or Riverside County Copermittees subject to the requirements of this Order.

The federal regulations (40 CFR 122.21(d)(2)) and CWC section 13376 impose a duty on the Copermittees to reapply for continued coverage through submittal of a Report of Waste Discharge no later than 180 days prior to expiration of a currently effective permit. This requirement is set forth in the Orange County Copermittees' and Riverside County Copermittees' currently effective permits at Provisions K.2.b and K.2.c, respectively. The Orange County Permit, Order No. R9-2009-0002 (NPDES No. CAS0108740) expires on December 16, 2014 and the Riverside County MS4 Permit, Order No. R9-2010-0016 (NPDES No. CAS0108766) expires on November 10, 2015.

Unless the Orange County or Riverside County Copermittees apply for and receive early coverage under this Order, the Orange County Copermittees' and the Riverside County Copermittees' respective permits will be superseded by this Order upon expiration of their respective permits, subject to any necessary revisions to the requirements of this Order made after the San Diego Water Board considers their respective Reports of Waste Discharge through the public process provided in 40 CFR 124.

Comment [A10]: Please see Comment Letter and Legal Comments regarding regional permit authority,

27. **Integrated Report and Clean Water Act Section 303(d) List.** The San Diego Water Board and State Water Board submit an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. USEPA issued its *Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act* on July 29, 2005, which advocates the use of a five category approach for classifying the attainment status of water quality standards for water bodies in the Integrated Report. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 in the Integrated Report are placed on the 303(d) List.

Water bodies with available data and/or information that indicate at least one beneficial use is not being supported or is threatened, but a TMDL is not required, are included in Category 4 in the Integrated Report. Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

Implementation of the requirements of this Order may allow the San Diego Water Board to include surface waters impaired by discharges from the Copermittees'

MS4s in Category 4 in the Integrated Report for consideration during the next 303(d) List submittal by the State to USEPA.

28. **Economic Considerations.** The California Supreme Court has ruled that although CWC section 13263 requires the State and Regional Water Boards (collectively Water Boards) to consider factors set forth in CWC section 13241 when issuing an NPDES permit, the Water Board may not consider the factors to justify imposing pollutant restrictions that are less stringent than the applicable federal regulations require. (*City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 618, 626-627.) However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

As noted in the following finding, the San Diego Water Board finds that the requirements in this permit are not more stringent than the minimum federal requirements. Therefore, a CWC section 13241 analysis is not required for permit requirements that implement the effective prohibition on the discharge of non-storm water into the MS4 or for controls to reduce the discharge of pollutants ~~in storm water~~ to the MEP, or other provisions that the San Diego Water Board has determined appropriate to control such pollutants, as those requirements are mandated by federal law. Notwithstanding the above, the San Diego Water Board has developed an economic analysis of the requirements in this Order. The economic analysis is provided in the Fact Sheet.

Comment [A11]: See discussion in section 3.1.2 of the Comment Letter and also Legal Comments..

29. ~~**Unfunded Mandates.** This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following:~~

~~**a.** This Order implements federally mandated requirements under CWA section 402 (33 USC section 1342(p)(3)(B)).~~

~~**b.** The local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental and new dischargers who are issued NPDES permits for storm water and non-storm water discharges.~~

~~**c.** The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order.~~

~~**d.** The Copermittees have requested permit coverage in lieu of compliance with the complete effective prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)) and in lieu of numeric restrictions on their MS4 discharges (i.e. effluent limitations).~~

~~**e.** The local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under State law predates the enactment of Article XIIIB, Section (6) of the California Constitution.~~

Comment [A12]: See discussion in section 3.1.2 of the comment letter and in the Legal Comments.

~~f. The provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state develops a TMDL, federal law requires that permits must contain water quality based effluent limitations consistent with the assumptions and requirements of any applicable wasteload allocation (40 CFR 122.44(d)(1)(vii)(B)).~~

~~See the Fact Sheet for further discussion of unfunded mandates.~~

30. **California Environmental Quality Act.** The issuance of waste discharge requirements and an NPDES permit for the discharge of runoff from MS4s to waters of the U.S. is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 et seq.) in accordance with CWC section 13389.

STATE WATER BOARD DECISIONS

31. **Compliance with Prohibitions and Limitations.** The receiving water limitation language specified in this Order is consistent with language recommended by the USEPA and established in State Water Board Order WQ 99-05, *Own Motion Review of the Petition of Environmental Health Coalition to Review Waste Discharge Requirements Order No. 96-03, NPDES Permit No. CAS0108740*, adopted by the State Water Board on June 17, 1999. The receiving water limitation language in this Order requires storm water discharges from MS4s to not cause or contribute to a violation of water quality standards, which is to be achieved through an iterative approach requiring the implementation of improved and better-tailored BMPs over time. Implementation of the iterative approach to comply with receiving water limitations based on applicable water quality standards is necessary to ensure that Pollutant ~~storm water~~ discharges from the MS4 will not ultimately cause or contribute to violations of water quality standards and will not create conditions of pollution, contamination, or nuisance.

Comment [A13]: See discussion in section 3.1.2 of the comment letter.

Comment [A14]: Please see discussion in section 3.1.2 of the Comment Letter and Legal Comments.

32. **Special Conditions for Areas of Special Biological Significance.** On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving an exception to the Ocean Plan effective prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges. State Water Board Resolution No. 2012-0012 requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, effective prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject terms and conditions of State Water Board Resolution No. 2012-0012. The Special

Protections contained in Attachment B to Resolution No. 2012-0012, applicable to these discharges, are hereby incorporated into this Order as if fully set forth herein.

ADMINISTRATIVE FINDINGS

33. **Executive Officer Delegation of Authority.** The San Diego Water Board by prior resolution has delegated all matters that may legally be delegated to its Executive Officer to act on its behalf pursuant to CWC section 13223. Therefore, the Executive Officer is authorized to act on the San Diego Water Board's behalf on any matter within this Order unless such delegation is unlawful under CWC section 13223 or this Order explicitly states otherwise.

34. **Standard Provisions.** Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR 122.42, are provided in Attachment B to this Order.

35. **Fact Sheet.** The Fact Sheet for this Order contains background information, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of this Order. The Fact Sheet is hereby incorporated into this Order and constitutes part of the Findings of this Order.

36. **Public Notice.** In accordance with State and federal laws and regulations, the San Diego Water Board notified the Copermittees, and interested agencies and persons of its intent to prescribe waste discharge requirements for the control of discharges into and from the MS4s to waters of the U.S. and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet.

37. **Public Hearing.** The San Diego Water Board held a public hearing on Month Day, 2013 and heard and considered all comments pertaining to the terms and conditions of this Order. Details of the public hearing are provided in the Fact Sheet.

38. **Effective Date.** This Order serves as an NPDES permit pursuant to CWA section 401 or amendments thereto, and becomes effective fifty (50) days after the date of its adoption, provided that the Regional Administrator, USEPA, Region IX, does not object to this Order.

39. **Review by the State Water Board.** Any person aggrieved by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with CWC section 13320 and California Code of Regulations, title 23, sections 2050, et seq. The State Water Board must receive the petition by 5:00 p.m., 30 days after the San Diego Water Board action, except that if the thirtieth day following the action falls on a Saturday, Sunday or State holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the

Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

THEREFORE, IT IS HEREBY ORDERED that the Copermittees, in order to meet the provisions contained in division 7 of the CWC and regulations adopted thereunder, and the provisions of the CWA and regulations adopted thereunder, must each comply with the following:

II. PROVISIONS

A. PROHIBITIONS AND LIMITATIONS

Comment [A15]: See discussion in section 3.2 of the comment letter.

The purpose of this provision is to describe the conditions under which storm water and non-storm water discharges into and from MS4s are to be effectively prohibited or limited. The goal of the prohibitions and limitations is to protect the water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through the implementation of water quality improvement strategies and runoff management programs that effectively prohibit non-storm water discharges into the Copermittees' MS4s, and reduce pollutants in ~~storm water~~ discharges from the Copermittees' MS4s to the MEP. The process for determination of compliance with the Discharge Prohibitions (A.1), Receiving Water Limitations (A.2), and Effluent Limitations (A.3) is defined in Provisions A.3.b and A.4.

1. Discharge Prohibitions

a. Discharges from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters ~~of the state~~ are to be ~~prohibited.~~ effectively prohibited, unless the Regional Board determines such discharges are addressed by the Copermittee through A.3.b or A.4, including any modifications.~~prohibited.~~

Comment [A16]: See discussion in section 3.2.2 of the comment letter.

b. Non-storm water discharges into MS4s are to be effectively prohibited through a program consistent with the requirements of provision E.2. of this order, including inspections, to implement and enforce an ordinance, orders or similar means to prevent illicit discharges to the MS4, unless such discharges are either authorized by a separate NPDES permit, or the discharge is a category of non-storm water discharges or flows that must be addressed pursuant to Provisions E.2.a.(1)-(5) of this Order.

Comment [A17]: See discussion in section 3.2.2 of the comment letter.

c. Discharges from MS4s are subject to all applicable waste discharge prohibitions in the Basin Plan, included in Attachment A to this Order, unless the Regional Board determines such discharges are addressed by the Copermittee through A.3.b or A.4, including any modifications.

Comment [A18]: See discussion in section 3.2.2 of the comment letter.

d. Storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No.

2012-0012 applicable to these discharges, included in Attachment A to this Order. All other discharges from the Copermittees' MS4s to ASBS are ~~to be effectively~~ prohibited.

2. Receiving Water Limitations

Comment [A19]: See discussion in section 3.2.2 of the comment letter.

a. Discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters, including but not limited to all applicable provisions ~~contained in:~~below, unless the Regional Board determines such discharges are addressed by the Copermittee through A.3.b or A.4::~~contained in:~~

(1) The San Diego Water Board's Basin Plan, including beneficial uses, water quality objectives, and implementation plans;

(2) State Water Board plans for water quality control including the following:

(a) Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries (Thermal Plan), and

(b) The Ocean Plan, including beneficial uses, water quality objectives, and implementation plans;

(3) State Water Board policies for water and sediment quality control including the following:

(a) Water Quality Control Policy for the Enclosed Bays and Estuaries of California,

(b) Sediment Quality Control Plan which includes the following narrative objectives for bays and estuaries:

(i) Pollutants in sediments shall not be present in quantities that, alone or in combination, are toxic to benthic communities, and

(ii) Pollutants shall not be present in sediments at levels that will bioaccumulate in aquatic life to levels that are harmful to human health,

(c) The Statement of Policy with Respect to Maintaining High Quality of Waters in California;[1]

(4) Priority pollutant criteria promulgated by the USEPA through the following:

[1] State Water Board Resolution No. 68-16

(a) National Toxics Rule (NTR)[2] (promulgated on December 22, 1992 and amended on May 4, 1995), and

(b) California Toxics Rule (CTR).[3,4]

b. Discharges from MS4s composed of storm water runoff must not alter natural ocean water quality in an ASBS.

[2] 40 CFR 131.36
[3] 65 Federal Register 31682-31719 (May 18, 2000), adding Section 131.38 to 40 CFR
[4] If a water quality objective and a CTR criterion are in effect for the same priority pollutant, the more stringent of the two applies.

3. Effluent Limitations

a. TECHNOLOGY BASED EFFLUENT LIMITATIONS

Comment [A20]: See discussion in section 3.2.2 of the comment letter.

Pollutants in ~~storm water~~ discharges from MS4s must be reduced to the MEP.[5]

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

This Order establishes water quality based effluent limitations (WQBELs) consistent with the assumptions and requirements of all available TMDL waste load allocations (WLAs) assigned to discharges from the Copermittees' MS4s. Each Copermittee must comply with applicable WQBELs established for the TMDLs in Attachment E to this Order, pursuant to the applicable TMDL compliance schedules.

4. Compliance with Discharge Prohibitions and Receiving Water Limitations

Comment [A21]: See discussion in section 3.2.2 of the comment letter.

Each Copermittee must achieve compliance with Provisions A.1.a~~,~~ through A.1.c and A.2.a of this Order through timely implementation of control measures and other actions as specified in Provisions B and E of this Order, including any modifications. The Water Quality Improvement Plans required under Provision B must be designed and adapted to ultimately achieve compliance with Provisions A.1.a~~,~~ through A.1.c and A.2.a~~.~~, as described in Provision B.2.~~.~~

a. If exceedance(s) of water quality standards persist in receiving waters notwithstanding implementation of this Order, the Copermittees must comply with the following procedures:

(1) For exceedance(s) of a water quality standard in the process of being addressed by the Water Quality Improvement Plan, the Copermittee(s) must implement the Water Quality Improvement Plan as accepted by the San Diego Water Board, and update the Water Quality Improvement Plan, as necessary, pursuant to Provision F.2.c;

(2) Upon a determination by either the Copermittees or the San Diego Water Board that discharges from the MS4 are causing or contributing to a new exceedance of an applicable water quality standard not addressed by the Water Quality Improvement Plan, the Copermittees must submit the following updates to the Water Quality Improvement Plan pursuant to Provision F.2.c or as part of the Annual Report required under Provision F.3.b, unless the San

[5] This does not apply to MS4 discharges which receive subsequent treatment to reduce pollutants in storm water discharges to the MEP prior to entering receiving waters (e.g., low flow diversions to the sanitary sewer). Runoff treatment must occur prior to the discharge of runoff into receiving waters per Finding 7.

Diego Water Board directs an earlier submittal:

(a) The water quality improvement strategies being implemented that are effective and will continue to be implemented,

(b) Water quality improvement strategies (i.e. BMPs, retrofitting projects, stream and/or habitat rehabilitation or restoration projects, adjustments to jurisdictional runoff management programs, etc.) that will be implemented to reduce or eliminate any pollutants or conditions that are causing or contributing to the exceedance of water quality standards,

(c) Updates to the schedule for implementation of the existing and additional water quality improvement strategies, and

(d) Updates to the monitoring and assessment program to track progress toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a of this Order;

(3) The San Diego Water Board may require the incorporation of additional modifications to the Water Quality Improvement Plan required under Provision B. The applicable Copermittees must submit any modifications to the update to the Water Quality Improvement Plan within 90 days of notification that additional modifications are required by the San Diego Water Board, or as otherwise directed;

(4) Within 90 days of the San Diego Water Board determination that the update to the Water Quality Improvement Plan meets the requirements of this Order, the applicable Copermittees must revise the jurisdictional runoff management program documents to incorporate the updated water quality improvement strategies that have been and will be implemented, the implementation schedule, and any additional monitoring required; and

(5) Each Copermittee must implement the updated Water Quality Improvement Plan.

b. The procedure set forth above to achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order do not have to be repeated for continuing or recurring exceedances of the same water quality standard(s) following implementation of scheduled actions unless directed to do otherwise by the San Diego Water Board.

c. Nothing in Provisions A.4.a and A.4.b prevents the San Diego Water Board from enforcing any of provisions B through I of this Order while the applicable Copermittees prepare and implement the above update to the Water Quality Improvement Plan and jurisdictional runoff management programs.

B. WATER QUALITY IMPROVEMENT PLANS

The purpose of this provision is to develop Water Quality Improvement Plans (WQIPs) that guide the Copermittees' jurisdictional runoff management programs towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plans is to ~~protect, preserve, enhance, and restorerestore the~~address the impacts of MS4 discharges so that such discharges do not impair water quality and designated beneficial uses of receiving waters~~. of the state.~~ Therefore, implementation of the WQIPs also provides the basis for complying with Provisions II.A.1, II.A.2, and II.A.3, as described in Provision II.A.4. This goal will be accomplished through an adaptive planning and management process that identifies the highest priority water quality conditions within a watershed and implements strategies through the jurisdictional runoff management programs to achieve improvements in the quality of discharges from the MS4s ~~and~~ to receiving waters. As such, the requirements outlined in Provision E may be modified for consistency with the WQIP priorities for the applicable Watershed Management Area, if appropriate justification is provided approved within the WQIP.

Comment [A22]: See section 3.3 of the comment letter for discussions of the changes requested herein.

Comment [A23]: See discussion in section 3.3.2 of the comment letter.

1. Watershed Management Areas

Comment [A24]: See discussion in section 3.3.2 of the comment letter.

The Copermittees must develop a Water Quality Improvement Plan for each of the Watershed Management Areas in Table B-1. A total of ten Water Quality Improvement Plans must be developed for the San Diego Region.

Development of the Water Quality Improvement Plan for the Santa Margarita River Watershed Management Area shall commence upon notification of coverage of the Riverside County Copermittees under this Order. Until this time, the County of San Diego shall use the water quality priorities in the Santa Margarita River Watershed Urban Runoff Management Plan, developed pursuant to Order No. R9-2007-0001, to guide implementation of Provisions D and E within its jurisdiction

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
San Juan (901.00)	South Orange County	- Aliso Creek - San Juan Creek - San Mateo Creek - Pacific Ocean - Heisler Park ASBS	- City of Aliso Viejo[1] - City of Dana Point[1] - City of Laguna Beach[1] - City of Laguna Hills[1] - City of Laguna Niguel[1] - City of Laguna Woods[1] - City of Lake Forest[1] - City of Mission Viejo[1] - City of Rancho Santa Margarita[1] - City of San Clemente[1] - City of San Juan Capistrano[1] - County of Orange[1] - Orange County Flood Control District[1]

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
Santa Margarita (902.00)	Santa Margarita River	- Murrieta Creek - Temecula Creek - Santa Margarita River - Santa Margarita Lagoon - Pacific Ocean	- City of Murrieta[2] - City of Temecula[2] - City of Wildomar[2] - County of Riverside[2] - County of San Diego[3] - Riverside County Flood Control and Water Conservation District[2]
San Luis Rey (903.00)	San Luis Rey River	- San Luis Rey River - San Luis Rey Estuary - Pacific Ocean	- City of Oceanside - City of Vista - County of San Diego
Carlsbad (904.00)	Carlsbad	- Loma Alta Slough - Buena Vista Lagoon - Agua Hedionda Lagoon - Batiquitos Lagoon - San Elijo Lagoon - Pacific Ocean	- City of Carlsbad - City of Encinitas - City of Escondido - City of Oceanside - City of San Marcos - City of Solana Beach - City of Vista - County of San Diego
San Dieguito (905.00)	San Dieguito River	- San Dieguito River - San Dieguito Lagoon - Pacific Ocean	- City of Del Mar - City of Escondido - City of Poway - City of San Diego - City of Solana Beach - County of San Diego
Penasquitos (906.00)	Penasquitos	- Los Penasquitos Lagoon - Pacific Ocean	- City of Del Mar - City of Poway - City of San Diego - County of San Diego
	Mission Bay	- Mission Bay - Pacific Ocean - San Diego Marine Life Refuge ASBS	- City of San Diego
San Diego (907.00)	San Diego River	- San Diego River - Pacific Ocean	- City of El Cajon - City of La Mesa - City of San Diego - City of Santee - County of San Diego
Pueblo San Diego (908.00) Sweetwater (909.00) Otay (910.00)	San Diego Bay	- Sweetwater River - Otay River - San Diego Bay - Pacific Ocean	- City of Chula Vista - City of Coronado - City of Imperial Beach - City of La Mesa - City of Lemon Grove - City of National City - City of San Diego - County of San Diego - San Diego County Regional Airport Authority - San Diego Unified Port District
Tijuana (911.00)	Tijuana River	- Tijuana River - Tijuana Estuary - Pacific Ocean	- City of Imperial Beach - City of San Diego - County of San Diego

Notes:

1. The Orange County Copermittees will be covered under this Order after expiration of Order No. R9-2009-0002, or earlier if the Orange County Copermittees meet the conditions in Provision F.6.
2. The Riverside County Copermittees will be covered under this Order after expiration of Order No. R9-2010-0016, or earlier if the Riverside County Copermittees meet the conditions in Provision F.6.
3. The County of San Diego is required to implement the requirements of Provision B for its jurisdiction within the Santa

Margarita River Watershed Management Area until the Riverside County Copermittees have been notified of coverage under this Order.

2. Priority Water Quality Conditions

The Copermittees must identify the water quality priorities within each Watershed Management Area that will be addressed by the Water Quality Improvement Plan. Where appropriate, Watershed Management Areas may be separated into subwatersheds to focus water quality prioritization and jurisdictional runoff management program implementation efforts by receiving water.

a. Assessment of Receiving Water Conditions

The Copermittees must consider the following, at a minimum, to identify water quality priorities based on impacts of MS4 discharges on receiving water beneficial uses:

(1) Receiving waters listed as impaired on the CWA Section 303(d) List of Water Quality Limited Segments (303(d) List);

(2) TMDLs adopted and under development by the San Diego Water Board;

(3) Receiving waters recognized as sensitive or highly valued by the Copermittees, including estuaries designated under the National Estuary Program under CWA section 320, wetlands defined by the State or U.S. Fish and Wildlife Service's National Wetlands Inventory as wetlands, and receiving waters identified as ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (Attachment A);

(4) The receiving water limitations of Provision A.2;

(5) Known historical versus current physical, chemical, and biological water quality conditions;

(6) Available, relevant, and appropriately collected and analyzed physical, chemical, and biological receiving water monitoring data, including, but not limited to, data describing:

(a) Chemical constituents,

(b) Water quality parameters (i.e. pH, temperature, conductivity, etc.),

(c) Toxicity Identification Evaluations for both receiving water column and sediment,

(d) Trash impacts,

(e) Bioassessments, and

(f) Physical habitat;

(7) Available evidence of erosional impacts in receiving waters due to accelerated flows (i.e. hydromodification);

(8) Available evidence of adverse impacts to the chemical, physical, and biological integrity of receiving waters; and

(9) The potential improvements in the overall condition of the Watershed Management Area that can be achieved.

b. ASSESSMENT OF IMPACTS FROM MS4 DISCHARGES

The Copermittees must consider the following, at a minimum, to identify the potential impacts to receiving waters that may be caused or contributed to by discharges from the Copermittees' MS4s:

(1) The discharge prohibitions of Provision A.1 and effluent limitations of Provision A.3; and

(2) Available, relevant, and appropriately collected and analyzed storm water and non-storm water monitoring data from the Copermittees' MS4 outfalls;

(3) Locations of each Copermittee's MS4 outfalls that discharge to receiving waters;

(4) Locations of MS4 outfalls that are known to persistently discharge non-storm water to receiving waters likely causing or contributing to impacts on receiving water beneficial uses;

(5) Locations of MS4 outfalls that are known to discharge pollutants in storm water causing or contributing to impacts on receiving water beneficial uses; and

(6) The potential improvements in the quality of discharges from the MS4 that can be achieved.

c. IDENTIFICATION OF PRIORITY WATER QUALITY CONDITIONS

(1) The Copermittees must use the information gathered for Provisions B.2.a and B.2.b to develop a list of priority water quality conditions as pollutants, stressors and/or receiving water conditions that are the highest threat to receiving water quality or that most adversely affect the physical, chemical, and biological integrity of receiving waters. The list must include the following information for each priority water quality condition:

(a) The beneficial use(s) associated with the priority water quality condition;

(b) The geographic extent of the priority water quality condition within the Watershed Management Area, if known;

(c) The temporal extent of the priority water quality condition (e.g., dry weather and/or wet weather);

(d) The Copermittees with MS4s discharges that may cause or contribute to the priority water quality condition; and

(e) An assessment of the adequacy of and data gaps in the monitoring data to characterize the conditions causing or contributing to the priority water quality condition, including a consideration of spatial and temporal variation.

(2) The Copermittees must identify the highest priority water quality conditions to be addressed by the Water Quality Improvement Plan, and provide a rationale for selecting a subset of the water quality conditions identified pursuant to Provision B.2.c.(1) as the highest priorities.

d. IDENTIFICATION OF MS4 SOURCES OF POLLUTANTS AND/OR STRESSORS

The Copermittees must identify and prioritize known and suspected sources of storm water and non-storm water pollutants and/or other stressors within their jurisdiction, associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c. ~~The identification of known and suspected sources of pollutants and/or stressors that cause or contribute to the highest priority water quality conditions as identified for Provision B.2.c must~~ considering the following:

(1) Pollutant generating facilities, areas, and/or activities within the Watershed Management Area, including:

(a) Each Copermittee's inventory of construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas,

(b) Publicly owned parks and/or recreational areas,

(c) Open space areas,

(d) All currently operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste,,, and

(e) Areas not within the Copermittees' jurisdictions (e.g., Phase II MS4s, tribal lands, state lands, federal lands) that are known or suspected to be discharging to the Copermittees' MS4s;

(2) Locations of the Copermittees' MS4s, including the following:

(a) All major MS4 outfalls [per 40CFR 122.26 (b)(5)] that discharge to receiving waters, and

(b) Locations of major structural controls for storm water and non-storm water (e.g., retention basins, detention basins, major infiltration devices, etc.);

(3) Other known and suspected sources of non-storm water or pollutants in storm water discharges to receiving waters within the Watershed Management Area, including the following:

(a) Other MS4 outfalls (e.g., Phase II Municipal and Caltrans),

(b) Other NPDES permitted discharges,

(c) Any other discharges that may be considered point sources (e.g., private outfalls), and

(d) Any other discharges that may be considered non-point sources (e.g., agriculture, wildlife or other natural sources);

(4) Review of available data, including but not limited to:

(a) Findings from the Copermittees' illicit discharge detection and elimination programs,

(b) Findings from the Copermittees' MS4 outfall discharge monitoring,

(c) Findings from the Copermittees' receiving water monitoring,

(d) Findings from the Copermittees' MS4 outfall discharge and receiving water assessments, and

(e) Other available, relevant, and appropriately collected data, information, or studies related to pollutant sources and/or stressors that contribute to the highest priority water quality conditions as identified for Provision B.2.c.

(5) The adequacy of the available data to identify and prioritize sources and/or stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c.

e. NUMERIC GOALS AND SCHEDULES

Comment [A25]: See discussion in section 3.3.2 of the comment letter.

The Copermittees must develop and incorporate action levels, interim and final numeric goals[6] and schedules into the Water Quality Improvement Plan. Numeric goals must be used to support Water Quality Improvement Plan implementation and measure progress towards addressing the highest priority water quality conditions identified under Provision B.2.c. . Action Levels, Numeric goals are not enforceable compliance standards, effluent limitations, or receiving water limitations. When establishing numeric goals and corresponding schedules, the Copermittees must consider the following:

(1) Final numeric goals must be based on measureable criteria or indicators, to be achieved in ~~the receiving waters and/or~~ MS4 discharges for the highest priority water quality conditions which will ~~be capable of demonstrating the achievement of the restoration and/or protection~~ comply with the Receiving Water Limitations (A.2) of this Order; ~~water quality standards in receiving waters;~~

(2) Interim numeric goals must be based on measureable criteria or indicators capable of demonstrating incremental progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges; and

(3) Schedules must be adequate for measuring progress toward achieving the interim and final numeric goals required for Provisions B.2.e.(1) and B.2.e.(2). Schedules must incorporate the following:

(a) Interim dates for achieving the interim numeric goals,

(b) Compliance schedules for any applicable TMDLs in Attachment E to this Order,

(c) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A),

(d) Achievement of the final numeric goals in the receiving waters and/or MS4 discharges for the highest water quality priorities must be as soon as possible, and

[6] Interim and final numeric goals may take a variety of forms such as TMDL established WQBELs, action levels, pollutant concentration, load reductions, number of impaired water bodies delisted from the List of Water Quality Impaired Segments, Index of Biotic Integrity (IBI) scores, or other appropriate metrics. Interim and final numeric goals are not necessarily limited to one criterion or indicator, but may include multiple criteria and/or indicators. Except for TMDL established WQBELs, interim and final numeric goals and corresponding schedules may be revised through the adaptive management process under Provision B.5.

(e) Final dates for achieving the final numeric goals must not initially extend more than 10 years beyond the effective date of this Order, unless a longer period of time is authorized by the San Diego Water Board Executive Officer through an approved WQIP or the schedule includes an applicable TMDL in Attachment E to this Order[7].

Comment [A26]: Clarify that a longer period can be granted through the WQIP process.

[7] Achievement of final numeric goals within 10 years represents progress towards attainment of water quality standards, but is not a requirement to fully attain all applicable water quality standards or all priority receiving water conditions within 10 years.

3. Water Quality Improvement Strategies and Schedules

Comment [A27]: See discussion in section 3.3.2 of the comment letter.

The Copermittees must develop specific water quality improvement strategies to address the highest priority water quality conditions identified within a Watershed Management Area. The water quality improvement strategies must address the highest priority water quality conditions by ensuring the effective prohibition of~~preventing or eliminating~~ non-storm water discharges to and from the MS4, reducing pollutants in ~~storm water~~ discharges from the MS4 to the MEP, as applicable to the priority water quality conditions established per provision B.2. ~~and restoring and/or protecting the water quality standards of receiving waters~~.

a. Water Quality Improvement Strategies

The Copermittees must identify and prioritize water quality improvement strategies based on their likely effectiveness and efficiency, and design the JRMP programs to focus resources on those strategies to~~implement strategies to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, improve the physical, chemical, and biological receiving water conditions, and~~ achieve the interim and final numeric goals in accordance with the schedules required for Provision B.2.e.(3). The following water quality improvement strategies must be included and described in the Water Quality Improvement Plan:

(1) Specific strategies and/or activities that may be implemented by one or more Copermittees within their jurisdictions through the jurisdictional runoff management programs that will address the highest priority water quality conditions within the Watershed Management Area, in accordance with the following requirements:

(a) Strategies and/or activities must, at a minimum, be described for each jurisdictional runoff management program component where strategies to address the highest priority water quality conditions are required under Provision E;

(b) The Water Quality Improvement Plan must describe the circumstances or conditions when and where the strategies or/activities should be or will be implemented, but specific details about how each Copermittee will implement the strategies and/or activities within its jurisdiction are not required; and

(c) Descriptions of strategies and/or activities must include any monitoring, information collection, special studies, and/or data analysis that is necessary to assess the effectiveness of the strategy and/or activity toward addressing the highest priority water quality conditions.

(2) Additional strategies and/or activities that may be implemented within the Watershed Management Area on a jurisdictional, sub-watershed, or watershed scale by one or more Copermittees, not specifically required under

Provision E, which are designed to achieve the interim and final numeric goals identified in Provisions B.2.e.(1) and B.2.e.(2);

b. IMPLEMENTATION SCHEDULES

(1) The Copermittees must develop schedules for implementing the water quality improvement strategies identified under Provision B.3.a to achieve the interim and final numeric goals identified under Provision B.2.e.(1) and B.2.e.(2). Schedules must be developed for both the water quality improvement strategies implemented by each Copermittee within its jurisdiction and for strategies that the Copermittees choose to implement on a collaborative basis.

(2) The Copermittees must incorporate the implementation compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

4. Water Quality Improvement Monitoring and Assessment Program

a. The Copermittees in each Watershed Management Area must develop and incorporate an integrated monitoring and assessment program into the Water Quality Improvement Plan that assesses: 1) the progress toward achieving the numeric goals and schedules, 2) the progress toward addressing the highest priority water quality conditions for each Watershed Management Area, and 3) each Copermittee's overall efforts to implement the Water Quality Improvement Plan.

b. The monitoring and assessment program must incorporate the monitoring and assessment requirements of Provision D, which may allow the Copermittees to modify the program to be consistent with and focus on the highest priority water quality conditions for each Watershed Management Area.

c. For Watershed Management Areas with applicable TMDLs, the monitoring and assessment program must incorporate the specific monitoring and assessment requirements of Attachment E.

d. For Watershed Management Areas with any ASBS, the water quality monitoring and assessment program must incorporate the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

5. Iterative Approach and Adaptive Management Process

Comment [A28]: See discussion in section 3.3.2 of the comment letter.

The Copermittees in each Watershed Management Area must implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management

programs to become more effective toward achieving compliance with Provisions A.1, A.2, and A.3.~~A.1.a, A.1.c and A.2.a~~, and must include the following:

a. RE-EVALUATION OF PRIORITY WATER QUALITY CONDITIONS

The priority receiving water quality conditions, and numeric goals and corresponding schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.2.c and B.2.e, may be re-evaluated by the Copermittees as needed during the term of this Order as part of the Annual Report. Re-evaluation and recommendations for modifications to the priority water quality conditions, and numeric goals and corresponding schedules must be provided in the Regional Monitoring and Assessment Report pursuant to F.3.c~~Report of Waste Discharge~~, and must consider the following:

(1) Achieving the outcome of improved water quality in MS4 discharges and receiving waters through implementation of the water quality improvement strategies identified in the Water Quality Improvement Plan;

(2) Progress toward achieving interim and final numeric goals in receiving waters and/or MS4 discharges for the highest priority water quality conditions in the Watershed Management Area,

(3) Progress toward achieving outcomes according to established schedules;

(4) New information developed when the requirements of Provisions B.2.a-c have been re-evaluated;

(5) New policies or regulations that may affect identified numeric goals;

(6) Spatial and temporal accuracy of monitoring data collected to inform prioritization of water quality conditions and implementation strategies to address the highest priority water quality conditions;

(7) Availability of new information and data from sources other than the jurisdictional runoff management programs within the Watershed Management Area that informs the effectiveness of the actions implemented by the Copermittees;

(8) San Diego Water Board recommendations; and

(9) Recommendations for modifications solicited through a public participation process.

b. ADAPTATION OF STRATEGIES AND SCHEDULES

The water quality improvement strategies and schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.3, must be re-evaluated and adapted as new information becomes available to result in more effective and efficient measures to achieve the numeric goals established pursuant to

Provision B.2.e. Re-evaluation of and modifications to the water quality improvement strategies, if determined to be necessary, must be provided in the applicable Annual Report per F.3.b.(3)., and must consider the following:

(1) Modifications to the priority water quality conditions, and numeric goals and corresponding schedules based on Provision B.5.a;

(2) Measurable or demonstrable reductions of non-storm water discharges to and from each Copermittee's MS4;

(3) Measurable or demonstrable reductions of pollutants in ~~storm water~~ discharges from each Copermittee's MS4 to the MEP;

(4) New information developed when the requirements of Provisions B.2.b and B.2.d have been re-evaluated;

(5) Efficiency in implementing the Water Quality Improvement Plan;

(6) San Diego Water Board recommendations; and

(7) Recommendations for modifications solicited through a public participation process.

c. ADAPTATION OF MONITORING AND ASSESSMENT PROGRAM

The water quality improvement monitoring and assessment program, included in the Water Quality Improvement Plan pursuant to Provisions B.4, must be re-evaluated and adapted when new information becomes available. Re-evaluation and recommendations for modifications to the monitoring and assessment program, pursuant to the requirements of Provision D, may be provided in the Annual Report, but must be provided in the Report of Waste Discharge.

6. Water Quality Improvement Plan Submittal, Updates, and Implementation

a. The Copermittees must submit the Water Quality Improvement Plans in accordance with the requirements of Provision F.1.

b. The Copermittees must submit proposed updates to the Water Quality Improvement Plan for acceptance by the San Diego Water Board Executive Officer in accordance with the requirements of Provision F.2.c.

c. The Copermittees must commence with implementation of the Water Quality Improvement Plans ~~immediately after acceptance by the San Diego Water Board, in accordance with the schedules, or subsequently updated schedules, within the Water Quality Improvement Plan.~~in accordance with Provision F.1.b.(5).

C. ACTION LEVELS

Comment [A29]: See comment letter section 3.4 for a discussion of the redlines shown herein.

The purpose of this provision is for the Copermittees to incorporate numeric non-stormwater action levels (NALs) and stormwater action levels (SALs) in the Water Quality Improvement Plans (Provision B), and numeric non-stormwater action levels (NALs) in the Illicit Discharge Detection and Elimination (IDDE) program (Provision E.2.).

- For the purposes of the WQIPs, ~~T~~the goal of the action levels is to guide ~~Water Quality Improvement Plan~~ the implementation efforts and measure progress towards the protection of the identified high priority water quality conditions and associated designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through monitoring and assessing the quality of the MS4 discharges during the implementation of the Water Quality Improvement Plans.

- For the purposes of the IDDE program, the goal of the non-stormwater action levels is to assist in determining whether a persistent non-stormwater discharge into or from the MS4 contains pollutants at levels that have the potential to negatively affect the identified high priority water quality conditions.

Action levels will be developed and incorporated into the WQIP (Provision B) and the IDDE Program (Provision E). Depending upon the goals/objectives for the use of the action levels and the priority receiving water conditions, the constituents and values at which they are set may differ between watersheds. Copermittees may develop Watershed Management Area specific numeric action levels for non-stormwater and stormwater MS4 discharges using an approach approved by the Regional Board or use the default non-stormwater and stormwater action levels prescribed in C.1 and C.2 below.

The Copermittees will submit the action levels as a part of the WQIP and JRMP submittals. The action levels currently established will serve as the interim action levels until revised action levels are completed and approved. Exceedances of the action levels are not subject to enforcement or non-compliance actions under this Order.

1. Default Non-Storm Water Action Levels[8]

~~The Copermittees must develop and incorporate numeric non-storm water action levels (NALs) into the Water Quality Improvement Plan to: 1) support the development and prioritization of water quality improvement strategies for addressing non-storm water discharges to and from the MS4s, 2) assess the effectiveness of the water quality improvement strategies toward addressing MS4~~

Comment [A30]: As discussed in section 2.4 of the Riverside comment letter.

[8] NALs are not ~~considered by the San Diego Water Board to be~~ enforceable limitations under this Order.

~~non-storm water discharges, required pursuant to Provision D.4.b.(1), and 3) support the detection and elimination of non-storm water and illicit discharges to and from the MS4, required pursuant to Provision E.2.~~[9]

a. The following NALs must be incorporated as applicable to the WMA and the Copermittees' MS4 discharges,~~:~~ if the Copermittees do not establish numeric action levels within the WQIP based on watershed priorities:

(1) Non-Storm Water Discharges from MS4s to Ocean Surf Zone

Table C-1. Non-Storm Water Action Levels for Discharges from MS4s to Ocean Surf Zone

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Total Coliform	MPN/100 ml	1,000	-	10,000/1,000[1]	OP
Fecal Coliform	MPN/100 ml	200[2]	-	400	OP
Enterococci	MPN/100 ml	35	-	104[3]	OP

Abbreviations/Acronyms

AMAL – average monthly action level
MDAL – maximum daily action level
OP – Ocean Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Total coliform density NAL is 1,000 MPN/100 ml when the fecal/total coliform ratio exceeds 0.1.
2. Fecal coliform density NAL is 200 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas."

[9] ~~The Copermittees may utilize NALs or other benchmarks currently established by the Copermittees as interim NALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.~~

(2) Non-Storm Water Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Table C-2. Non-Storm Water Action Levels for Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Turbidity	NTU	75	-	225	OP
pH	Units	Within limit of 6.0 to 9.0 at all times			OP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	35	-	104[3]	BP
Priority Pollutants	ug/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
OP – Ocean Plan water quality objective
NTU – Nephelometric Turbidity Units
ug/L – micrograms per liter
MDAL – maximum daily action level
BP – Basin Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas" and is not applicable to waterbodies that are not designated with the water contact recreation (REC-1) beneficial use.

Table C-3. Non-Storm Water Action Levels for Priority Pollutants

Parameter	Units	Freshwater (CTR)		Saltwater (CTR)	
		MDAL	AMAL	MDAL	AMAL
Cadmium	ug/L	**	**	16	8
Copper	ug/L	*	*	5.8	2.9
Chromium III	ug/L	**	**	-	-
Chromium VI	ug/L	16	8.1	83	41
Lead	ug/L	*	*	14	2.9
Nickel	ug/L	**	**	14	6.8
Silver	ug/L	*	*	2.2	1.1
Zinc	ug/L	*	*	95	47

Abbreviations/Acronyms:
CTR – California Toxic Rule
AMAL – average monthly action level
ug/L – micrograms per liter
MDAL – maximum daily action level

Notes:
* Action levels developed on a case-by-case basis (see below)
** Action levels developed on a case-by-case basis (see below), but calculated criteria are not to exceed Maximum Contaminant Levels (MCLs) under the California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64431

The Cadmium, Copper, Chromium (III), Lead, Nickel, Silver and Zinc NALs for MS4 discharges to freshwater receiving waters will be developed on a case-by-case basis because the freshwater criteria are based on site-specific water quality data (receiving water hardness). For these priority pollutants, refer to ~~the following equations (~~40 CFR 131.38.b.2 ~~for details) will be required~~:

~~Cadmium (Total Recoverable) = exp(0.7852[ln(hardness)] - 2.715)~~
~~Chromium III (Total Recoverable) = exp(0.8190[ln(hardness)] + 0.6848)~~
~~Copper (Total Recoverable) = exp(0.8545[ln(hardness)] - 1.702)~~
~~Lead (Total Recoverable) = exp(1.273[ln(hardness)] - 4.705)~~
~~Nickel (Total Recoverable) = exp(.8460[ln(hardness)] + 0.0584)~~
~~Silver (Total Recoverable) = exp(1.72[ln(hardness)] - 6.52)~~
~~Zinc (Total Recoverable) = exp(0.8473[ln(hardness)] + 0.884)~~

Comment [A31]: Consistent with SD Permittee recommendations.

(3) Non-Storm Water Discharges from MS4s to Inland Surface Waters

Table C-4. Non-Storm Water Action Levels for Discharges from MS4s to Inland Surface Waters

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Dissolved Oxygen	mg/L	Not less than 5.0 in WARM waters and not less than 6.0 in COLD waters			BP
Turbidity	NTU	-	20	See MDAL	BP
pH	Units	Within limit of 6.5 to 8.5 at all times			BP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	33	-	61[3]	BP
Total Nitrogen	mg/L	-	1.0	See MDAL	BP
Total Phosphorus	mg/L	-	0.1	See MDAL	BP
MBAS	mg/L	-	0.5	See MDAL	BP
Iron	mg/L	-	0.3	See MDAL	BP
Manganese	mg/L	-	0.05	See MDAL	BP
Priority Pollutants	ug/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
BP – Basin Plan water quality objective
COLD – cold freshwater habitat beneficial use
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
MDAL – maximum daily action level
WARM – warm freshwater habitat beneficial use
MBAS – Methylene Blue Active Substances
MPN/100 ml – most probable number per 100 milliliters
ug/L – micrograms per liter

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for freshwater "designated beach areas" and is not applicable to waterbodies that are not designated with the water contact recreation (REC-1) beneficial use.

b. NALs must be identified, developed and incorporated in the Water Quality Improvement Plan for any pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in Receiving waters ~~of the state~~ associated with the highest priority water quality conditions related to non-storm water discharges from the MS4s. NALs must be based on:

(1) Applicable water quality standards which may be dependent upon site-specific or receiving water-specific conditions or assumptions to be identified by the Copermittees; or

(2) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. ~~For the NALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary NALs specific to the Watershed Management Area at levels greater than the NALs required by Provisions C.1.a and C.1.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for addressing non-~~

~~storm water discharges to and from the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and from the MS4. The secondary NALs may be developed using an approach acceptable to the San Diego Water Board.~~

d. Dry weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.b may be utilized to develop or revise NALs based on watershed-specific data, subject to San Diego Water Board Executive Officer approval.

2. Default Storm Water Action Levels[10]

The Copermittees must develop and incorporate numeric storm water action levels (SALs) in the Water Quality Improvement Plans to: 1) support the development and prioritization of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s, and 2) assess the effectiveness of the water quality improvement strategies toward reducing pollutants in storm water discharges, required pursuant to Provision D.4.b.(2).[11]

a. The following SALs for discharges of storm water from the MS4 must be incorporated~~:~~ if the Copermittees do not establish stormwater action levels within the WQIP based on watershed priorities::~~:~~

Table C-5. Storm Water Action Levels for Discharges from MS4s to Receiving Waters

Parameter	Units	Action Level
Turbidity	NTU	126
Nitrate & Nitrite (Total)	mg/L	2.6
Phosphorus (Total P)	mg/L	1.46
Cadmium (Total Cd)*	µg/L	3.0
Copper (Total Cu)*	µg/L	127
Lead (Total Pb)*	µg/L	250
Zinc (Total Zn)*	µg/L	976

Abbreviations/Acronyms:
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
ug/L – micrograms per liter

Notes:
* The sampling must include a measure of receiving water hardness at each MS4 outfall. If a total metal concentration exceeds the corresponding metals SAL in Table C-5, that concentration must be compared to the California Toxics Rule criteria and the USEPA 1-hour maximum concentration for the detected level of receiving water hardness associated with that sample. If it is determined that the sample's total metal concentration for that specific metal exceeds that SAL, but does not exceed the applicable USEPA 1-hour maximum concentration criterion for the measured level of hardness, then the sample result will not be considered above the SAL for that measurement.

[10] SALs are not ~~considered by the San Diego Water Board to be~~ enforceable limitations under this Order.
[11] The Copermittees may utilize SALs or other benchmarks currently established by the Copermittees as interim SALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

b. SALs must be identified, developed and incorporated in the Water Quality Improvement Plan for pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in Receiving waters ~~of the state~~ associated with the highest water quality priorities related to storm water discharges from the MS4s. SALs must be based on:

(1) Federal and State water quality guidance and/or water quality standards; and

(2) Site-specific or receiving water-specific conditions; or

(3) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. ~~For the SALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary SALs specific to the Watershed Management Area at levels greater than the SALs required by Provisions C.2.a and C.2.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s. The secondary SALs may be developed based on the approaches recommended by the State Water Board's Storm Water Panel[12] or using an approach acceptable to the San Diego Water Board.~~

d. Wet weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.c may be used to develop or revise SALs based upon watershed-specific data, subject to San Diego Water Board Executive Officer approval.

~~[12] Storm Water Panel Recommendations to the California State Water Resources Control Board: The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities (June 2006)~~

D. MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS

Comment [A32]: See discussion in section 3.5 of the comment letter.

The purpose of this provision is for the Copermittees to monitor and assess the impact on the chemical, physical, and biological conditions of receiving waters caused by discharges from the Copermittees' MS4s under wet weather and dry weather conditions. The goal of the monitoring and assessment program is to inform the Copermittees about the nexus between the health of receiving waters and the water quality condition of the discharges from their MS4s to those receiving waters.~~.~~ This goal will be accomplished through monitoring and assessing the conditions of the receiving waters, discharges from the MS4s to those receiving waters, pollutant sources and/or stressors, and effectiveness of the water quality improvement strategies implemented as part of the Water Quality Improvement Plans.

1. Receiving Water Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the condition of the receiving waters in each Watershed Management Area during dry weather and wet weather. Following acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct long-term receiving water monitoring during implementation of the Water Quality Improvement Plan to assess the long term trends and determine if water quality conditions in receiving waters are improving. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following receiving water monitoring procedures:

a. TRANSITIONAL RECEIVING WATER MONITORING

Beginning October 1st or May 1st (whichever is sooner) following enrollment under this order and until~~Until~~ the monitoring requirements of Provisions D.1.b-e are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following receiving water monitoring in the Watershed Management Area:

(1) Continue the receiving water monitoring programs required in Order Nos. R9-2007-0001~~,~~ (Attachment A, Section II. A. 1-5),~~,~~ R9-2009-0002, and R9-2010-0016;

(2) Continue the monitoring in the Hydromodification Management Plans approved by the San Diego Water Board;

(3) Participate in the following regional receiving water monitoring programs, as applicable to the Watershed Management Area and each Copermittees' MS4 discharges:

Comment [A33]: See discussion in section 3.5.3 of the comment letter.

(a) Storm Water Monitoring Coalition Regional Monitoring,

(b) Southern California Bight Regional Monitoring, and

(c) Sediment Quality Monitoring;

(4) Implement the monitoring programs developed as part of any implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) for the TMDLs in Attachment E to this Order; and

(5) For Watershed Management Areas with ASBS, implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

b. LONG-TERM RECEIVING WATER MONITORING STATIONS

The Copermittees must select at least one long-term receiving water monitoring station from among the existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees to be representative of the receiving water quality in the Watershed Management Area. Additional or alternative long-term receiving water monitoring stations may~~must~~ be selected where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

Comment [A34]: See discussion in section 3.5.3 of the comment letter.

c. DRY WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three dry weather monitoring events at each of the long-term receiving water monitoring stations. At least one monitoring event must be conducted during the dry season (May 1 – September 30) and at least one monitoring event must be conducted during a dry weather period during the wet season (October 1 – April 30), after the first wet weather event of the season, with an antecedent dry period of at least 72 hours following a storm event producing measureable rainfall of greater than 0.1 inch.

(1) Dry Weather Receiving Water Field Observations

For each dry weather monitoring event, the Copermittees must record field observations consistent with Table D-1 at each long-term receiving water monitoring station.

Table D-1. Field Observations for Receiving Water Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) • Assessment of any observed connectivity of MS4 discharges to a flowing receiving water. • Station description (i.e. deposits or stains, vegetation condition, structural condition, and observable biology) • Presence and assessment of trash in and around station

Comment [A35]: See discussion in section 3.5.3 of the comment letter.

(2) Dry Weather Receiving Water Field Monitoring

For each dry weather monitoring event, if conditions allow the collection of the data, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

Table D-2. Field Monitoring Parameters for Receiving Water Monitoring Stations

Parameters
• pH • Temperature • Specific conductivity • Dissolved oxygen • Turbidity

(3) Dry Weather Receiving Water Analytical Monitoring

For each dry weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity,

dissolved oxygen, turbidity, hardness, and indicator bacteria Grab samples may also be collected for the analyses described in (f) where MS4 discharge runoff constitutes less than ten percent of the flow;

Comment [A36]: The receiving water stations in Riverside County either do not receive runoff from MS4 discharges or receive deminimus flows during dry weather conditions. The flow at these stations during dry weather consists virtually entirely of rising groundwater. Background receiving water quality conditions In such cases composite samples of receiving waters not affected by MS4 discharges is not warranted.

(d) For all other constituents where runoff constitutes more than ten percent of the flow, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable NAL constituents, and

(v) Constituents listed in Table D-3.

Table D-3. Analytical Monitoring Constituents for Receiving Water Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Pesticides	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1]	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Mercury • Nickel • Selenium • Thallium • Zinc	• Organophosphate Pesticides • Pyrethroid Pesticides	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

• Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia			

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(4) Dry Weather Receiving Water Toxicity Monitoring

For each dry weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for toxicity in accordance with Table D-4:

Table D-4. Dry Weather Toxicity Testing for Receiving Water Monitoring Stations

Freshwater Organism	Test Approach	USEPA Protocol[2]
Pimephales promelas	1 acute 1 chronic[1]	EPA-821-R-02-012
Hyalella Azteca	1 acute 1 chronic[1]	EPA-821-R-02-012
Psuedokirchneriella subcapitata	1 acute 1 chronic[1]	EPA-821-R-02-013

Notes:
1. Chronic toxicity testing is not required at receiving water monitoring stations located at mass loading stations if the channel flows are diverted year-round during dry weather conditions to the sanitary sewer for treatment.
2. USEPA protocols must be utilized for toxicity testing unless alternate toxicity testing protocols have been approved by the San Diego Water Board.

(5) Dry Weather Receiving Water Bioassessment Monitoring

Bioassessment monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must conduct bioassessment monitoring during at least one dry weather monitoring event at each long-term receiving water monitoring station as follows:

(a) The following bioassessment samples and measurements must be collected:

(i) Macroinvertebrate samples must be collected in accordance with the "Reachwide Benthos (Multihabitat) Procedure" in the most current Surface Water Ambient Monitoring Program (SWAMP) Bioassessment Standard Operating Procedures (SOP), and amendments, as applicable;[13]

(ii) The "Full" suite of physical habitat characterization measurements

[13] Ode, P.R.. 2007. Standard operating procedures for collecting macroinvertebrate samples and associated physical and chemical data for ambient bioassessments in California. California State Water Resources Control Board Surface Water Ambient Monitoring Program (SWAMP) Bioassessment SOP 001. http://www.swrcb.ca.gov/water_issues/programs/swamp/tools.shtml#monitoring

must be collected in accordance with the most current SWAMP Bioassessment SOP, and as summarized in the SWAMP Stream Habitat Characterization Form – Full Version;[14] and

(iii) Freshwater algae samples must be collected in accordance with the SWAMP Standard Operating Procedures for Collecting Algae Samples.[15] Analysis of samples must include algal taxonomic composition (diatoms and soft algae) and algal biomass.

(b) The bioassessment samples, measurements, and appropriate water chemistry data must be used to calculate the following:

(i) An Index of Biological Integrity (IBI) for macroinvertebrates for each monitoring station where bioassessment monitoring was conducted, based on the most current calculation method;[16] and

(ii) An IBI for algae for each monitoring station where bioassessment monitoring was conducted, when a calculation method is developed.[17]

(c) In lieu of the requirements of Provision D.1.c.(5)(a), the Copermittees may conduct the bioassessment monitoring in accordance with the "Triad" assessment approach[18] to calculate the IBIs required for Provision D.1.c.(5)(b). The Copermittees must conduct sampling, analysis, and reporting of specified in-stream biological and habitat data according to the protocols specified in the SCCWRP Technical Report No. 539, or subsequent protocols, if developed.

(6) Dry Weather Receiving Water Hydromodification Monitoring

In addition to the hydromodification monitoring conducted as part of the Copermittees' Hydromodification Management Plans, hydromodification monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must collect the

[14] Available at: http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/reports/fieldforms_fullversion052908.pdf

[15] Fetscher et al. 2009. Standard Operating Procedures for Collecting Stream Algae Samples and Associated Physical Habitat and Chemical Data for Ambient Bioassessments in California.

[16] The most current calculation method at the time the Order was adopted is outlined in "A Quantitative Tool for Assessing the Integrity of Southern California Coastal Streams" (Ode, et al. 2005. Environmental Management. Vol. 35, No. 1, pp. 1-13). If an updated or new calculation method is developed, either both (i.e. current and updated/new) methods must be used, or historical IBIs must be recalculated with the updated or new calculation method.

[17] When a calculation method is developed, IBIs must be calculated for all available and appropriate historical data.

[18] Stormwater Monitoring Coalition Model Monitoring Technical Committee, 2004. Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California. Technical Report #419. August 2004.

following hydromodification monitoring observations and measurements within an appropriate domain of analysis during at least one dry weather monitoring event for each long-term receiving water monitoring station:

(a) Channel conditions, including:

(i) Channel dimensions,

(ii) Hydrologic and geomorphic conditions, and

(iii) Presence and condition of vegetation and habitat;

(b) Location of discharge points;

(c) Habitat integrity;

(d) Photo documentation of existing erosion and habitat impacts, with location (i.e. latitude and longitude coordinates) where photos were taken;

(e) Measurement or estimate of dimensions of any existing channel bed or bank eroded areas, including length, width, and depth of any incisions; and

(f) Known or suspected cause(s) of existing downstream erosion or habitat impact, including flow, soil, slope, and vegetation conditions, as well as upstream land uses and contributing new and existing development.

d. WET WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three wet weather monitoring events at each long-term receiving water monitoring station. At least one wet weather monitoring event must be conducted during the first wet weather event of the wet season (October 1 – April 30), and at least one wet weather monitoring event during a wet weather event that occurs after February 1.

(1) Wet Weather Receiving Water Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each long-term receiving water monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event;

(b) The flow rates and volumes measured or estimated (data from nearby

USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(d) Presence and assessment of trash in and around station.

(2) Wet Weather Receiving Water Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

(3) Wet Weather Receiving Water Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) Constituents listed in Table D-3.

(4) Wet Weather Receiving Water Toxicity Monitoring

For each wet weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for toxicity in accordance with Table D-5:

Table D-5. Wet Weather Toxicity Testing for Receiving Water Monitoring Stations

Freshwater Organism	Test Approach	USEPA Protocol[1]
Pimephales promelas	1 acute	EPA-821-R-02-012
Hyalella Azteca	1 acute	EPA-821-R-02-012
Psuedokirchneriella subcapitata	1 acute	EPA-821-R-02-013

Notes:
1. USEPA protocols must be utilized for toxicity testing unless alternate toxicity testing protocols have been approved by the San Diego Water Board.

e. OTHER RECEIVING WATER MONITORING REQUIREMENTS

(1) Regional Monitoring

The Copermittees must participate in the following regional receiving waters monitoring programs, as applicable to the Watershed Management Area and the Copermittee's MS4 discharges:

(a) Storm Water Monitoring Coalition Regional Monitoring; and

(b) Southern California Bight Regional Monitoring.

(2) Sediment Quality Monitoring

The applicable Copermittees must perform sediment monitoring to assess compliance with sediment quality receiving water limits applicable to MS4

discharges to enclosed bays and estuaries. The monitoring may be performed either by individual or multiple affected Copermittees to assess compliance with receiving water limits, or through participation in a water body monitoring coalition. The Copermittees must identify sediment sampling stations that are spatially representative of the sediment within the water body segment or region of interest. Sediment quality monitoring must be conducted in conformance with the monitoring requirements set forth in the State Water Board Sediment Quality Control Plan.

(3) ASBS Monitoring

For Watershed Management Areas with ASBS, the applicable Copermittees must implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

f. ALTERNATIVE WATERSHED MONITORING REQUIREMENTS

The San Diego Water Board may direct the Copermittees to participate in an effort to develop alternative watershed monitoring with other regulated entities, other interested parties, and the San Diego Water Board to refine, coordinate, and implement regional monitoring and assessment programs to determine the status and trends of water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and/or 3) streams. As directed by the San Diego Water Board, such alternative watershed monitoring would be done in place and stead of the commensurate requirements set forth in Provision D.1.

2. MS4 Outfall Discharge Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the discharges from the major MS4 outfalls to receiving waters in each Watershed Management Area during dry weather and wet weather. Following acceptance of the Water Quality Improvement Plans and schedule for implementation of monitoring for each Watershed Management Area, the Copermittees must conduct MS4 outfall discharge monitoring during implementation of the Water Quality Improvement Plan to assess the effectiveness of their jurisdictional runoff management programs toward effectively prohibiting non-storm water discharges into the MS4 and reducing pollutants in ~~storm water~~ discharges ~~to and~~ from their MS4s to the MEP. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following MS4 outfall monitoring procedures:

Comment [A37]: Suggest same edits for SD and OC.

a. TRANSITIONAL MS4 OUTFALL DISCHARGE MONITORING

Beginning October 1st or May 1st (whichever is sooner) following enrollment under this order and until~~Until~~ the monitoring requirements of Provisions D.2.b-c

are incorporated into a Water Quality Improvement Plan and schedule for implementation of monitoring that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following monitoring of MS4 outfall discharges to flowing receiving waters ~~monitoring~~ in the Watershed Management Area:

(1) MS4 Outfall Discharge Monitoring Station Inventory

Each Municipal Copermittee must identify all major MS4 outfalls (including those operated by a Special District Copermittee) that discharge directly to receiving waters within its jurisdiction and geo-locate those outfalls on a map of the MS4 pursuant to Provision E.2.b.(1). This information must be compiled into a MS4 outfall discharge monitoring station inventory, and must include the following information:

(a) Latitude and longitude of MS4 outfall point of discharge;

(b) Watershed Management Area;

(c) Hydrologic subarea;

(d) Outlet size;

(e) Accessibility (i.e. safety and without disturbance of critical habitat);

(f) Approximate drainage area; and

(g) Classification of whether the MS4 outfall is known to have persistent dry weather flows, transient dry weather flows, no dry weather flows, or unknown dry weather flows.

(2) Transitional Dry Weather MS4 Outfall ~~Discharge~~ Field Screening ~~Monitoring~~

Until the monitoring requirements of Provision D.2.b are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, each Municipal Copermittee must perform the following dry weather MS4 outfall field screening monitoring to identify non-storm water and illicit discharges being discharged from MS4s within its jurisdiction in accordance with Provision E.2.c, to determine which discharges are transient ~~flows~~ and which are persistent discharges to flowing receiving waters~~flows~~, and prioritize the dry weather MS4 discharges that will be investigated and eliminated in accordance with Provision E.2.d. ~~Each Copermittee must conduct the following dry weather MS4 outfall discharge field screening monitoring within its jurisdiction:~~

Comment [A38]: Suggested change of title to better characterize the requirements of this section, compared to that of D.2.b.

Comments in this section are discussed in section 3.5.3 of the comment letter.

Comment [A39]: Duplicative of previous sentence

(a) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Frequency

Each Municipal Copermittee must field screen the accessible MS4 outfalls in its inventory developed pursuant to Provision D.2.a.(1) as follows:

(i) ~~For Copermittees with less than 125 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 80 percent of the outfalls must be visually inspected two times per year during dry weather conditions.~~

(ii) For Municipal Copermittees with ~~125 major MS4 outfalls or more, but~~ less than or equal to 500 MS4 outfalls~~,~~ that discharge to receiving waters within a Watershed Management Area, ~~all~~ at least 80 percent of the accessible outfalls must be visually inspected at least annually during dry weather conditions.

(iii) For Municipal Copermittees with more than 500 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 500 outfalls must be visually inspected at least annually during dry weather conditions. Copermittees with more than 500 major MS4 outfalls within a Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(iv) Municipal Copermittees with more than 500 major MS4 outfalls within its jurisdiction that are located in more than one Watershed Management Area, at least 500 major MS4 outfalls within its inventory must be visually inspected at least annually during dry weather conditions. Copermittees with more than 500 major MS4 outfalls in more than one Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;

[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and

[e] Flow rate.

(v) Inspections of major MS4 outfalls conducted in response to public reports and staff or contractor reports and notifications may count toward the required visual inspections of MS4 outfall discharge monitoring stations.

(b) Transitional Dry Weather MS4 Outfall Discharge Field Screening Visual Observations

(i) An antecedent dry period of at least 72 hours following any storm event producing measurable rainfall greater than 0.1 inch is required prior to conducting field screening visual observations during a field screening monitoring event.

(ii) During the field screening monitoring event, each Municipal Copermittee must record visual observations consistent with Table D-6 at each MS4 outfall discharge monitoring station inspected.

Table D-6. Field Screening Visual Observations for MS4 Outfall Discharge Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) - Flow source(s) suspected or identified from non-storm water source investigation - Flow source(s) eliminated during non-storm water source identification • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) - Known or suspected source(s) of pooled or ponded water • Assessment of any observed MS4 discharge ~~with~~ to a flowing receiving water. • Station description (i.e. deposits or stains, vegetation condition, structural condition, observable biology) • Presence and assessment of trash in and around station • Evidence or signs of illicit connections or illegal dumping

(iii) Each Municipal Copermittee must implement the requirements of Provisions E.2.d.(2)(c)-(e) based on the field observations.

(iv) Each Copermittee must evaluate field observations together with existing information available from prior reports, inspections and monitoring results to determine whether any observed flowing,

pooled, or ponded waters are likely to be transient or persistent flow.[19]

Comment [A40]: See footnote edits

(c) Transitional Dry Weather MS4 Outfall Discharge Field Screening ~~Monitoring~~ Records

Based upon the results of the transitional dry weather MS4 outfall discharge field screening monitoring conducted pursuant to Provisions D.2.a.(2)(a)-(b), each Municipal Copermittee must update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow.

(3) Transitional Wet Weather MS4 Outfall Discharge Monitoring

Comment [A41]: See discussion in section 3.5.3 of the comment letter.

Until the monitoring requirements of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(a) Transitional Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees must select at least five wet weather MS4 outfall discharge monitoring stations from the inventories developed pursuant to Provision D.2.a.(1) that are representative of storm water discharges from areas consisting primarily of residential, commercial, industrial, and typical mixed-use land uses present within the Watershed Management Area.

(b) Transitional Wet Weather MS4 Outfall Discharge Monitoring Frequency

Each wet weather MS4 outfall discharge monitoring station selected pursuant to Provision D.2.a.(3)(a) must be monitored twice during the wet season (October 1 – April 30~~)).~~) in the transitional period. The~~). One~~ wet weather monitoring ~~event~~events shall be selected to be representative of the range of hydrologic conditions experienced in the region. At least 10% of samples~~event~~ must be conducted during the first wet weather event of the wet season, ~~and~~to include~~and one wet weather monitoring event~~ at least one such sample in each Watershed Management Area~~, a month after the first wet weather event of the wet season.~~

[19] Persistent flow, for the purposes of provision II.D.2.b.(2) is defined as the presence of an MS4 discharge that is hydraulically connected to a flowing receiving~~, pooled, or ponded~~ water more than 72 hours after a measureable rainfall event of 0.1 inch or greater, during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

(c) Transitional Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded of the flow from~~at~~ each wet weather MS4 outfall discharge monitoring station:

(i) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(ii) The flow rates and volumes measured or estimated from the outfall (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(iii) ~~Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and~~

(iv) Presence ~~and assessment~~ of trash in and around station.

Comment [A42]: This isn't appropriate for a wet weather event.

Comment [A43]: This isn't appropriate for a wet weather event.

(d) Transitional Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(e) Transitional Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, and indicator bacteria;

(iv) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant

concentrations and runoff flows using one of the following techniques:

[a] Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

[b] Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

[c] If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours;

(v) Only one analysis of the composite of aliquots is required;

(vi) The samples must be analyzed for the following constituents:

[a] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

[b] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and

[c] Constituents listed in in Table D-7.

Table D-7. Analytical Monitoring Constituents for Wet Weather MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Nickel • Selenium • Thallium • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(f) Other Transitional Wet Weather MS4 Outfall Discharge Monitoring

The San Diego County Copermittees must continue the wet weather MS4 outfall monitoring program developed under Order No. R9-2007-0001, as approved by the San Diego Water Board, through its planned completion.

b. DRY WEATHER MS4 OUTFALL DISCHARGE MONITORING

Each Municipal Copermittee must perform the following dry weather MS4 outfall monitoring within its jurisdiction to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. ~~Each Copermittee must conduct the following dry weather MS4 outfall discharge monitoring within its jurisdiction:~~

Comment [A44]: Repetitive of previous sentence

(1) Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Comment [A45]: See discussion in section 3.5.3 of the comment letter.

Each Municipal Copermittee must continue to perform the dry weather MS4 outfall discharge field screening monitoring in accordance with the requirements of Provision D.2.a.(2). ~~The~~ however the Municipal Copermittee may adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of persistent ~~flow~~ non-storm water illegal discharges from the MS4 to flowing receiving waters in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan. ~~, provided the~~

~~number of visual inspections performed is equivalent to the number of visual inspections required under Provision D.2.a.(2)(a).~~

Comment [A46]: See comments in comment letter

(2) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring

Each Municipal Copermittee must perform the following non-storm water monitoring of MS4 outfalls that persistently ~~flow MS4 outfall~~ discharge to flowing receiving waters ~~monitoring~~ to determine which persistent non-storm water discharges contain concentrations of pollutants below NALs, and which persistent non-storm water discharges impact receiving water quality during dry weather. ~~Each Copermittee must conduct the following non-storm water persistent flow MS4 outfall discharge monitoring within its jurisdiction:~~

Comment [A47]: Repetitive of previous sentence.

(a) Prioritization of Non-Storm Water Persistent Flow MS4 Outfalls

Based upon the dry weather MS4 outfall discharge field screening monitoring records developed pursuant to Provision D.2.a.(2)(c), each Municipal Copermittee must identify and prioritize the MS4 outfalls within its jurisdiction that have~~with~~ persistent discharges to flowing receiving waters ~~flows~~ based on the highest priority water quality conditions identified in the Water Quality Improvement Plan and any additional criteria developed by the Copermittee, which may include historical data and data from sources other than what the Copermittee collects.

(b) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring Frequency

Comment [A48]: See comment letter section 3.5.3

(i) Based on the prioritization of major MS4 outfalls developed under Provision D.2.b.(2)(a), each Municipal Copermittee must identify, at a minimum, the top 10 percent of the~~10~~ highest priority major MS4 outfalls with non-storm water persistent flows that the Copermittee will monitor within each Watershed Management Area within its jurisdiction, with a minimum of one persistent ~~flow~~discharge outfall, and a maximum of 5 required per WMA. The location of the selected highest priority non-storm water persistent ~~flow~~ discharge MS4 outfall monitoring stations must be identified on the map required pursuant to Provision E.2.b.(1).

(ii) Each of the highest priority non-storm water persistent flow MS4 outfall monitoring stations identified pursuant to Provision D.2.b.(2)(b)(i) must be monitored under dry weather conditions at least ~~semi~~ annually until one of the following occurs:

[a] The non-storm water discharges have been effectively eliminated (i.e. no flowing, pooled, or ponded water) for three consecutive dry weather monitoring events; or

[b] The source(s) of the persistent flows has been identified as a category of non-storm water discharges that does not require an NPDES permit and does not have to be addressed as an illicit discharge because it was not identified as a source of pollutants (i.e. constituents in non-storm water discharge do not exceed NALs), and the persistent flow can be re-prioritized to a lower priority; or

[c] The constituents in the persistent flow non-storm water discharge do not exceed NALs, and the persistent flow can be re-prioritized to a lower priority; or

[d] The source(s) of the persistent flows has been identified as a non-storm water discharge authorized by a separate NPDES permit.

(iii) Where the criteria under Provision D.2.b.(2)(c)(ii) are not met, but the threat to water quality has been reduced by the Copermittee, the highest priority persistent flow MS4 outfall monitoring stations may be reprioritized accordingly for continued dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1).

(iv) Each Municipal Copermittee must document removal or re-prioritization of the highest priority persistent flow MS4 outfall monitoring stations identified under Provision D.2.b.(2)(b) in the Annual Report. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized MS4 major outfall in the Watershed Management Area within its jurisdiction, unless there are no remaining qualifying major MS4 outfalls within the Copermittee's jurisdiction in the Watershed Management Area.

(c) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Observations

During each semi-annual monitoring event, each Municipal Copermittee must record field observations consistent with Table D-6 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(d) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Monitoring

During each ~~semi-annual~~ monitoring event, if conditions allow the collection of the data, each Municipal Copermittee must monitor and record the parameters in Table D-2 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(e) Non-Storm Water Persistent Flow MS4 Outfall Discharge Analytical Monitoring

Comment [A49]: See discussion in section 3.5.3 of the comment letter.

During each semi-annual monitoring event in which measurable flow from the MS4 outfall to a flowing receiving water is present, each Municipal Copermittee must collect and analyze samples from each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) During development of the WQIP, for each WMA, consider the following sources to select constituents for collection of~~Collect~~ grab or composite samples to be analyzed at a qualified analytical laboratory::~~for the following constituents:~~

[a] Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,
[b] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,
[c] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,
[d] Applicable NAL constituents, and
[e] Constituents listed in Table D-8, unless the Copermittee has historical data that can demonstrate or provide justification that the analysis of the constituent is not necessary.

(iv) Copermittees may adjust the analytical list for a given WMA in successive monitoring events to add or eliminate constituents based on data that can demonstrate or provide justification regarding need or lack of need for the analysis of specific constituents.

Table D-8. Analytical Monitoring Constituents for Persistent Flow MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Total Hardness • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen	• Cadmium • Copper • Lead • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

• Ammonia		

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

~~(iv)~~(v) If the Copermittee identifies and eliminates the source of the persistent flow non-storm water discharge, analysis of the sample is not required.

c. WET WEATHER MS4 OUTFALL DISCHARGE MONITORING

The Copermittees must perform wet weather MS4 outfall monitoring to identify sources areas of pollutants in ~~storm water~~ discharges from the MS4s in the Watershed Management Area. The Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(1) Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees may adjust the wet weather MS4 outfall discharge monitoring locations and frequencies in the Watershed Management Area, as needed, to identify sources of pollutants in storm water discharges from MS4s in the Watershed Management Area in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of stations is at least equivalent to the number of stations required under Provision D.2.a.(3)(a).

(2) Wet Weather MS4 Outfall Discharge Monitoring Frequency

The Copermittees must monitor the wet weather MS4 outfall discharge monitoring stations in the Watershed Management Area at an appropriate frequency to identify source areas of pollutants in ~~storm water~~ discharges from the MS4s causing or contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan.

(3) Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or

estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

~~(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and~~

~~(d) Presence and assessment of trash in and around station.~~

Comment [A50]: These are inappropriate for wet weather observations.

(4) Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(5) Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

(iii) If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours.

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and

(iv) Applicable SAL constituents.

3. Special Studies

Comment [A51]: See discussion in section 3.5.3 of the comment letter.

a. Within the term of this Order, the Copermittees must initiate~~develop and implement~~ the following special studies:

(1) At least two~~three~~ special studies in each Watershed Management Area to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that cause or contribute to highest priority water quality conditions identified in the Water Quality Improvement Plan.

(2) At least one~~two~~ special study~~studies~~ for the San Diego Region to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that are impacting receiving waters on a regional basis in the San Diego Region.

(3) One of the two~~three~~ special studies in each Watershed Management Area may be replaced by a special study implemented pursuant to Provision D.3.a.(2).

b. The special studies must, at a minimum, be in conformance with the following criteria:

(1) The special studies must be related to the highest priority water quality conditions identified by the Copermittees in the Watershed Management Area and/or for the entire San Diego Region;

(2) The special studies developed pursuant to Provision D.3.a.(1) must:

(a) Be implemented within the applicable Watershed Management Area, and

(b) Require some form of participation by all the Copermittees within the Watershed Management Area;

(3) The special studies developed pursuant to Provision D.3.a.(2) must:

(a) Be implemented within the San Diego Region, and

(b) Require some form of participation by all Copermittees covered under the requirements of this Order.

c. Special studies developed to identify sources of pollutants and/or stressors should be pollutant and/or stressor specific and based on historical monitoring data and monitoring performed pursuant to Provisions D.1 and D.2. Development of source identification special studies should include the following:

(1) A compilation of known information on the specific pollutant and/or stressor, including data on potential sources and movement of the pollutant and/or stressor within the watershed. Data generated by the Copermittees and others, as well as information available from a literature research on the pollutant and/or stressor should be compiled and analyzed as appropriate.

(2) An identification of data gaps, based on the compiled information generated on the specific pollutant and/or stressor in Provision D.3.d.(1). Source identification special studies should be developed to fill identified data gaps.

(3) A monitoring plan that will collect and provide data the Copermittees can utilize to do the following:

(a) Quantify the relative loading or impact of a pollutant and/or stressor from a particular source or pollutant generating activity;

(b) Improve understanding of the fate of a pollutant and/or stressor in the environment;

(c) Develop an inventory of known and suspected sources of a pollutant and/or stressor in the Watershed Management Area; and/or

(d) Prioritize known and suspected sources of a pollutant and/or stressor based on relative magnitude in discharges, geographical distribution (i.e.,

regional or localized), frequency of occurrence in discharges, human health risk, and controllability.

d. Special studies initiated prior to the term~~acceptance~~ of ~~the~~this Order~~the Water Quality Improvement Plan~~ that meet the requirements of Provision D.3.b and are implemented~~completed~~ during the term of this Order may be utilized to fulfill the special study requirements of Provision D.3.a.

e. The Copermittees must submit the monitoring plans for the special studies in the Water Quality Improvement Plans required pursuant to Provision F.1.

f. The Copermittees are encouraged to share the results of the special studies regionally among the Copermittees to provide information useful in improving and adapting the management of non-storm water and storm water runoff through the implementation of the Water Quality Improvement Plans.

4. Assessment Requirements

Each Copermittee must evaluate the data collected pursuant to Provisions D.1, D.2 and D.3, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E, to assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a. Assessments must be performed as described in the following provisions:

a. RECEIVING WATERS ASSESSMENTS

(1) The Copermittees must assess and report the conditions of the receiving waters in the Watershed Management Area as follows:

(a) Based on data collected pursuant to Provision D.1.a, the assessments under Provision D.4.a.(2) must be included in the transitional~~first~~ Annual Report required pursuant to Provision F.3.b.(2~~1~~).

Comment [A52]: See our edits to that section

(b) Based on the data collected pursuant to Provisions D.1.a-e, the assessments required under Provision D.4.a.(2) must be included in the Report of Waste Discharge required pursuant to Provision F.5.b.

(2) The Copermittees must assess the status and trends of receiving water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under dry weather and wet weather conditions, as those conditions are affected by discharges from the Copermittees' MS4, to determine the progress towards meeting interim or final goals of the Water Quality Implementation Plan for the Watershed Management Area~~.~~ For each of the three types of receiving waters that are present in each Watershed Management Area the applicable Copermittees must:

Comment [A53]: See discussion in section 3.5.3 of the comment letter.

(a) Determine whether or not the conditions of the receiving waters are meeting any applicable numeric goals established pursuant to provision B.2.e.~~protective of the designated beneficial uses~~;

~~(b) Identify the most critical beneficial uses that must be protected or restored to ensure overall health of the receiving water;~~

~~(c) Determine whether or not those critical beneficial uses are being protected and where those beneficial used must be restored;~~

~~(d)~~(b) Identify short-term and/or long-term improvements or degradation of Receiving Water conditions related to those numeric goals~~those critical beneficial uses~~;

~~(e)~~(c) Identify data gaps in the monitoring data necessary to assess Provisions D.4.a.(2)(a)-(d).

b. MS4 OUTFALL DISCHARGES ASSESSMENTS

(1) Non-Storm Water Discharges Reduction Assessments

Comment [A54]: See discussion in section 3.5.3 of the comment letter for key changes. Other changes are described in comments below.

(a) ~~Each Copermittee must assess and report the progress of its illicit discharge detection and elimination program, required to be implemented pursuant to Provision E.2, toward reducing and effectively prohibiting non-storm water and illicit discharges into the MS4 within its jurisdiction as follows:~~

~~(i) Based on data collected pursuant to Provisions D.2.a.(2), the assessments under Provision D.4.b.(1)(b) must be included when complete in the Annual Report required pursuant to Provision F.3.b.(1).~~

~~(ii) Based on the data collected pursuant to Provisions D.2.b, the assessments required under Provision D.4.b.(1)(c) must be included in the first Annual Report required pursuant to Provision F.3.b.(1), and annually thereafter.~~

~~(iii) Based on the data collected pursuant to Provisions D.2.b, the assessment required under Provision D.4.b.(1)(c) must be included in the Report of Waste Discharge required pursuant to F.5.b.~~

Comment [A55]: For clarity and simplicity, these timelines were integrated into the following sections.

(b) Based on the transitional dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.a.(2), each

Municipal Copermittee must assess and report the following, as applicable to discharges from the MS4 (including Special District Copermittee MS4s) to flowing receiving waters within their jurisdiction, in the Annual Report required pursuant to Provision F.3.b.(2):~~:~~

(i) Identify the known and suspected controllable sources (e.g. facilities, areas, land uses, pollutant generating activities) of transient and persistent flow discharges to flowing receiving waters~~flows~~ within the Copermittee's jurisdiction in the Watershed Management Area;

(ii) Identify sources of transient and persistent flow discharges to flowing receiving waters~~flows~~ within the Copermittee's jurisdiction in the Watershed Management Area that have been reduced or eliminated; and

(iii) Identify modifications to the field screening monitoring locations and frequencies for the MS4 outfalls in its inventory necessary to identify and eliminate sources of persistent flow non-storm water discharges to flowing receiving waters, pursuant to Provision D.2.b.(1).

(c) Based on the dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b, each Municipal Copermittee must assess and report the following, as applicable to discharges from the MS4 (including Special District Copermittee MS4s) within their jurisdiction, in each Annual Report required pursuant to F.3.b.(3) and in the Report of Waste Discharge required pursuant to Provision F.5.b.:~~:~~

(i) The assessments required pursuant to Provision D.4.b.(1)(a~~b~~);

(ii) Based on the data collected and applicable NALs in the Water Quality Improvement Plan, rank the MS4 outfalls in the Copermittee's jurisdiction according to potential threat to receiving water quality, and produce a prioritized list of major MS4 outfalls for follow-up action to update the Water Quality Improvement Plan, with the goal of eliminating persistent flow non-storm water discharges to flowing receiving waters and/or pollutant loads in order of the ranked priority list through targeted programmatic actions and source investigations;

(iii) For the highest priority major MS4 outfalls with persistent flow discharges to a flowing receiving water~~flows~~ that are in exceedance of NALs, identify the known and suspected sources within the Copermittee's jurisdiction in the Watershed Management Area that may cause or contribute to the NAL exceedances;

(iv) Each Copermittee must analyze the data collected pursuant to Provision D.2.b.(2), and: ~~utilize a model or other method, to calculate or estimate the non-storm water volumes and pollutant loads collectively discharged from all the major MS4s outfalls in its jurisdiction identified as having persistent dry weather flows during~~

Comment [A56]: Per edits to that section

Comment [A57]: Per edits to that section

Comment [A58]: Per edits above

Comment [A59]: Edits to this section (and sub-sections) is different than SD edits.

the monitoring year. These calculations or estimates must be updated annually. Each Copermittee must calculate or estimate:

[a] Calculate or estimate annual non-storm water volumes and pollutant loads (associated with the priority constituents identified in the WQIP) collectively discharged from the monitored persistently flowing Copermittee's major MS4 outfalls discharging to flowing receiving waters within the Copermittee's jurisdiction, or discharged into another Copermittee's MS4 as demonstrated through provision E.2.d. with an estimate of the percent contribution from each known and suspected source for each MS4 outfall;

[b] Identify identify and quantify, where feasible, known sources of non-stormwater flows not [b] Annual non-storm water volumes and pollutant loads from areas or facilities subject to the Copermittee's legal authority that are discharged from the Copermittee's major MS4 outfalls to downstream receiving waters.

(v) Each Copermittee must review the data collected pursuant to Provision D.2.b and findings from the assessments required pursuant to Provision D.4.b.(1)(c)(i)-(iv) once per Permit termon an annual basis, and then report within the Regional Monitoring and Assessment Report per Provision F.3.c., the following to:

[a] Identify reductions and progress in achieving reductions in non-storm water and illicit discharges to the Copermittee's MS4 in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction, with an estimate, if possible, of the non-storm water volume and/or pollutant load reductions attributable to specific water quality strategies implemented by the Copermittee; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittee in the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction.

(vi) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(v).

(2) Storm Water Pollutant Discharges Reduction Assessments

(a) The Copermittees must assess and report the progress of the water quality improvement strategies, required to be implemented pursuant to

Comment [A60]: This is to help ensure jurisdictional accountability for what is being discharged from their jurisdiction.

~~Provisions B and E, toward reducing pollutants in storm water discharges from the MS4s within the Watershed Management Area as follows:~~

~~(i) Based on data collected pursuant to Provisions D.2.a.(3), the assessments under Provision D.4.b.(2)(b) must be included in the first Annual Report required pursuant to Provision F.3.b.(1).~~

~~Based on the data collected pursuant to Provisions D.2.c, the assessments required under ProvisionProvision first Annual Report required pursuant to Provision F.3.b.(1), and annually thereafter.~~

~~Based on the data collected pursuant to Provisions D.2.c, the assessment required under Provisions D.4.b.(2)(c)-(d) must be included in the Report of Waste Discharge required pursuant to F.5.b.~~

(b) Based on the transitional wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.a.(3) the Copermittees must assess and report the following in the Transitional Period Monitoring Report required pursuant to Provision F.3.b.(2):

(i) The Copermittees must analyze the monitoring data collected pursuant to Provision D.2.a.(3), and utilize a watershed model or other method, to calculate or estimate: ~~storm water volumes and pollutant loads discharged from the MS4s in each Copermittee's jurisdiction within the Watershed Management Area. The Copermittees must calculate or estimate the following for each monitoring year:~~

[a] The average storm water runoff coefficient for each land use type within the Watershed Management Area;

[b] The volume of storm water and pollutant loads discharged from each of the Copermittee's monitored major MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each monitored storm event with measurable rainfall greater than 0.1 inch, for each of the priority water quality constituents identified in the WQIP;

[c] The total volume and pollutant loads potentially discharged from each Municipal Copermittee's jurisdiction within the watershed management area, for each monitored event, extrapolated from the data produced from the monitored outfalls.

~~The pollutant loads discharged from each of the Copermittee's major MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch; and~~

~~[d] The percent contribution of storm water volumes and pollutant loads discharged from each land use type within the drainage basin to each of the Copermittee's major MS4 outfalls in its~~

Comment [A61]: See discussion in section 3.5.3 of the comment letter.

Comment [A62]: Removed as this was confusing as it was duplicative of the subsections below.

Comment [A63]: There is no need to perform this analysis for other pollutants not identified as priorities in the WQIP.

~~jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch.~~

(ii) Identify modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify ~~sources~~ pollutants in storm water discharges from the MS4s in the Watershed Management Area pursuant to Provision D.2.c.(1).

(c) Based on the wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.c the Copermittees must assess and report (i) and (ii) below in the annual reports required per F.3.b.(3), and (i) through (iv) below in the Regional Monitoring and Assessment Report required per F.3.c. ~~the following~~:

(i) The assessments required pursuant to Provision D.4.b.(2)(a~~b~~);

(ii) Based on the data collected and applicable SALs in the Water Quality Improvement Plan, analyze and compare the monitoring data to the analyses and assumptions used to develop the Water Quality Improvement Plans, including strategies developed per Provision B.3, and evaluate whether ~~,rank the MS4 outfalls in the Watershed Management Area according to potential threat to receiving water quality, and produce a prioritized list of major MS4~~ there is a need to update the Water Quality Improvement Plan;

(iii) The Copermittees must review the data collected pursuant to Provision D.2.c and findings from the assessments required pursuant to Provisions D.4.b.(2)(c)(i)-(ii) ~~on an annual basis~~ to:

[a] Identify reductions and progress in achieving reductions in pollutant concentrations and/or pollutant loads from different land uses and/or drainage areas discharging from the Copermittees' MS4s in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing pollutants in ~~storm water~~ discharges from the MS4s to receiving waters within the Watershed Management Area to the MEP, with an estimate, if possible, of the pollutant load reductions attributable to specific water quality strategies implemented by the Copermittees; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittees in the Watershed Management Area toward reducing pollutants in ~~storm water~~ discharges from the MS4s to receiving waters in the Watershed Management Area to the MEP.

(iv) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(iii).

Comment [A64]: See discussion in section 3.5.3 of the comment letter.

Comment [A65]: Per edits to that section

Comment [A66]: Per edits above

(d) Within the Regional Monitoring and Assessment report required pursuant to F.3.c.~~The~~ Copermittees must evaluate all the data collected pursuant to Provision D.2.c, and incorporate new outfall monitoring data into time series plots for each long-term monitoring constituent for the Watershed Management Area, and perform statistical trends analysis on the cumulative long-term wet weather MS4 outfall discharge water quality data set.

c. SPECIAL STUDIES ASSESSMENTS

The Copermittees must in the applicable annual report required pursuant to F.3.b.,~~annually~~ evaluate the results and findings from the special studies developed and implemented pursuant to Provision D.3, and assess their relevance to the Copermittees' efforts to characterize receiving water conditions, understand sources of pollutants and/or stressors, and control and reduce the discharges of pollutants from the MS4 outfalls to receiving waters in the Watershed Management Area. The Copermittees must report the results of the special studies assessments applicable to the Watershed Management Area, and identify any necessary modifications or updates to the Water Quality Improvement Plan based on the results in the Annual Reports required pursuant to Provision F.3.b.

d. INTEGRATED ASSESSMENT OF WATER QUALITY IMPROVEMENT PLAN

As part of the iterative approach and adaptive management process required for the Water Quality Improvement Plan pursuant to Provision B.5, the Copermittees in each Watershed Management Area must integrate the data collected pursuant to Provisions D.1-D.3, the findings from the assessments required pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to assess the effectiveness of, and identify necessary modifications to, the Water Quality Improvement Plan as follows:

(1) The Copermittees must re-evaluate the priority water quality conditions and numeric goals for the Watershed Management Area, as needed, during the term of this Order pursuant to Provision B.5.a. The re-evaluation and recommendations for modifications to the priority water quality conditions, and/or numeric goals and corresponding schedules may be provided in the Annual Reports required pursuant to Provision F.3.b, but must at least be provided in the Regional Monitoring and Assessment Report ~~of Waste Discharge~~ pursuant to Provision F.3.c~~5.b~~. The priority water quality conditions and numeric goals for the Watershed Management Area must be re-evaluated as follows:

(a) Re-evaluate the receiving water conditions in the Watershed Management Area in accordance with Provision B.2.a;

(b) Re-evaluate the impacts on receiving waters in the Watershed Management Area from MS4 discharges in accordance with Provision B.2.b;

(c) Re-evaluate the identification of MS4 sources of pollutants and/or stressors in accordance with Provision B.2.d;

(d) Identify beneficial uses of the receiving waters that are protected or must be restored in accordance with Provision D.4.a;

(e) Evaluate the progress toward achieving the interim and final numeric goals for restoring impacted beneficial uses in the receiving waters.

(2) The Copermittees must re-evaluate the water quality improvement strategies for the Watershed Management Area during the term of this Order pursuant to Provision B.5.b. The re-evaluation and recommendations for modifications to the water quality improvement strategies and schedules may be provided in the Annual Reports required pursuant to Provision F.3.b, but must at least be provided in the Regional Monitoring and Assessment Report pursuant to Provision F.3.c~~must be provided in the Annual Reports required pursuant to Provision F.3.b, and provided in the Report of Waste Discharge pursuant to Provision F.5.b~~. The water quality improvement strategies for the Watershed Management Area must be re-evaluated as follows:

(a) Identify the non-storm water and storm water pollutant loads from the Copermittees' MS4 outfalls in the Watershed Management Area, calculated or estimated pursuant to Provisions D.4.b;

(b) Identify the non-storm water and storm water pollutant load reductions, or other improvements to receiving water or water quality conditions, that are necessary to attain the interim and final numeric goals identified in the WQIP~~for restoring impacted beneficial uses in the receiving waters~~;

(c) Identify any~~the~~ non-storm water and storm water pollutant load reductions, or other improvements to the quality of MS4 discharges, that are necessary for the Copermittees to ~~demonstrate that non-storm water and storm water~~ reduce discharges of pollutants from their MS4s that have been demonstrated to be~~are not~~ causing or contributing to exceedances of receiving water limitations;

Comment [A67]: See discussion in section 3.5.3 of the comment letter.

(d) Evaluate the progress of the water quality improvement strategies toward achieving the interim and final numeric goals identified in the WQIP~~for restoring impacted beneficial uses in the receiving waters~~.

(3) The Copermittees must re-evaluate and adapt the water quality monitoring and assessment program for the Watershed Management Area when new information becomes available to improve the monitoring and assessment

program pursuant to Provision B.5.c. The re-evaluation and recommendations for modifications to the monitoring and assessment program may be provided in the Annual Reports required pursuant to Provision F.3.b, but must at least be provided in the Regional Monitoring and Assessment Report ~~of Waste Discharge~~ pursuant to Provision F.3.c~~5.b~~. Modifications to the water quality monitoring and assessment program must be consistent with the requirements of Provision D.1-D.3. The re-evaluation of the water quality monitoring and assessment program for the Watershed Management Area must consider the data gaps identified by the assessments required pursuant to Provisions D.4.a-b, and results of the special studies implemented pursuant to Provision D.4.c.

5. Monitoring Provisions

Each Copermittee must comply with all the monitoring, reporting, and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

E. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS

The purpose of this provision is for each Copermittee to implement a program to control the contribution of pollutants to and the discharges from the MS4 within its jurisdiction. The goal of the jurisdictional runoff management programs is to implement strategies that effectively prohibit non-storm water discharges to the MS4 and reduce the discharge of pollutants in ~~storm water~~ to the MEP. This goal will be accomplished through implementing the jurisdictional runoff management programs in accordance with the strategies identified in the Water Quality Improvement Plans.

Each Copermittee must update its jurisdictional runoff management program document, in accordance with Provision F.2.a, to incorporate all the requirements of Provision E, consistent with their legal authority. Until the Copermittee has updated its jurisdictional runoff management program document with the applicable requirements of Provision E, the Copermittee must continue implementing its current jurisdictional runoff management program.

Modification of Jurisdictional Runoff Management Program Requirements

Modifications shall be considered and where selected, proposed according to the process in Provision B.5. Proposed modifications may increase, decrease, and/or replace minimum requirements identified in Provision E.

1. Legal Authority Establishment and Enforcement

Comment [A68]: See discussion in section 3.6 of the comment letter.

a. Each Copermittee must establish, maintain, and enforce adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 through statute, ordinance, permit, or series of contracts, ~~order, or similar means~~ which~~. This legal authority must~~, at a minimum, authorize the Copermittee to:

(1) Effectively prohibit through ordinance, order or other similar means~~Prohibit and eliminate all~~ illicit discharges ~~and illicit connections~~ to its MS4;

(2) Control, through ordinance, permit, contract, order or similar means the contribution of pollutants in discharges to the MS4 by storm water discharges ~~of runoff~~ associated with industrial and construction activity~~ to its MS4~~, and ~~control~~ the quality of storm water discharges ~~runoff~~ from sites of industrial and construction activity~~sites~~, whose discharges have not been separately authorized through~~ that do not, including industrial and construction sites which~~ have coverage under the statewide General Permit for Discharges of Storm Water Associated with Industrial Activities (Industrial General Permit) or General Permit for Discharges of Storm Water Associated with Construction Activities (Construction General Permit)~~, as well as to those sites which do not;~~

Comment [A69]: See discussion in section 3.6.2 of the comment letter.

(3) Control, through ordinance, order or similar means the discharge to the MS4 of spills, dumping, or disposal of materials other than storm water~~ into its~~

Comment [A70]: See discussion in section 3.6.2 of the comment letter.

~~MS4~~;

(4) Control through interagency agreements among Copermittees the contribution of pollutants from one portion of the MS4 to another portion of the MS4;

(5) ~~Control, by coordinating and cooperating with other owners of the MS4 such as Caltrans, the U.S. federal government, or sovereign Native American Tribes through interagency agreements, where possible, the contribution of from their portion of the MS4 to the portion of the MS4 within the Copermittee's jurisdiction;~~

(6) Require compliance with conditions in its ~~statutes,~~ ordinances, permits, contracts, or orders~~, or similar means to hold dischargers to its MS4 accountable for their contributions of pollutants and flows~~;

(7) ~~Require the use of BMPs to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;~~

(8) ~~Require documentation on the effectiveness of BMPs implemented to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;~~

(9) ~~Utilize enforcement mechanisms to require compliance with its statutes, ordinances, permits, contracts, orders, or similar means; and~~

(10) Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with permit conditions~~its statutes, ordinances, permits, contracts, orders, or similar means and with the requirements of this Order~~, including the prohibition of illicit discharges and connections to its MS4; ~~the Copermittee must also have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from industrial facilities, including construction sites, discharging into its MS4.~~

b. With the first Annual Report required pursuant to Provision F.3.b, each Copermittee must submit a statement certified by its Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative that the Copermittee has taken the necessary steps to obtain and maintain full legal authority within its jurisdiction to implement and enforce each of the requirements contained in this Order.

2. Illicit Discharge Detection and Elimination

Each Copermittee must implement a program to actively detect and eliminate illicit discharges and improper disposal into the MS4, or otherwise require the discharger

Comment [A71]: See discussion in section 3.6.2 of the comment letter.

Comment [A72]: See discussion in section 3.6.2 of the comment letter.

Comment [A73]: See discussion in section 3.6.2 of the comment letter.

Comment [A74]: See discussion in section 3.6.2 of the comment letter.

Comment [A75]: See discussion in section 3.7 of the comment letter.

to apply for and obtain a separate NPDES permit. The illicit discharge detection and elimination program must be implemented in accordance with the strategies identified in the Water Quality Improvement Plan and include, at a minimum, the following requirements:

STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the illicit discharge detection and elimination program to address ~~non-storm water and~~ illicit discharges and connections that the Copermittee has identified as potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate~~ additional~~ BMPs, focus education, and/or increase/decrease frequency of inspections in specific areas); and

(2) The strategies and/or activities ~~must~~ may be modified from ~~consistent with~~ the default requirements of Provisions E.2.b-e~~a-d~~ ~~and~~ to be consistent with the strategies identified in the Water Quality Improvement Plan;

(3) The requirements of the programs as outlined in the following sub-provisions may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality improvement Plan(s).

a. NON-STORM WATER DISCHARGES

To the extent allowable by law, each~~Each~~ Copermittee must address all non-storm water discharges ~~from~~into the MS4 as illicit discharges, where the likelihood exists that they are a source of pollutants to the Receiving Waters, unless ~~a non-storm water~~the discharge is either identified as a discharge authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that is consistent with~~must be addressed pursuant to~~ the following requirements:

(1) ~~Discharges of non-storm water to the MS4 from the following categories must be addressed as illicit dischargeunless the discharge has coverage under NPDES Permit No. CAG919001 (Order No. R9-2007-0034, or subsequent order) for discharges to San Diego Bay, or NPDES Permit No. CAG919002 (Order No. R9-2008-0002, or subsequent order) for discharges to surface waters other than San Diego Bay.~~

Comment [A76]: See discussion in section 3.7.2 of the comment letter.

~~(a) Uncontaminated pumped ground water;~~

~~(b) Discharges from foundation drains;~~[20]

~~(c) Water from crawl space pumps; and~~

~~(d) Water from footing drains.~~[19]

(2) Discharges of non-storm water from water line flushing and water main breaks to the MS4 must be addressed as illicit discharges unless the discharge has coverage under a valid NPDES Permit, ~~No. CAG 679001~~ (Order No. R9-2010-0003, or a subsequent order). This category includes potable water line flushing ~~and water main break~~ discharges from water purveyors issued a water supply permit by the California Department of Public Health or federal military installations. Discharges from recycled or reclaimed water lines to the MS4 must be addressed as illicit discharges, unless the discharges have coverage under a separate NPDES permit.

Comment [A77]: See discussion in section 3.7.2 of the comment letter.

(3) Discharges of non-storm water into the MS4 from the following categories must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the individual discharge as a source of pollutants to receiving waters:

Comment [A78]: See discussion in section 3.7.2 of the comment letter.

(a) Diverted stream flows;

(b) Rising ground waters;

(c) Uncontaminated ground water infiltration to MS4s;

(d) Uncontaminated pumped ground water;

(e) Springs;

(f) Water from crawl space pumps;

~~(e)~~(g) Flows from riparian habitats and wetlands;

(h) Landscape irrigation;

(i) Irrigation water;

(j) Lawn watering;

Comment [A79]: See Legal Comments discussion.

[20] ~~Provision E.2.a.(1) only applies to this category on non-storm water if the system is designed to be located at or below the highest historical groundwater table to actively or passively extract groundwater during any part of the year.~~

~~(d)~~(k) Discharges from potable water sources;

~~(e)~~(l) Discharges from foundation drains;[21] ~~and~~

(m)Discharges from footing drains. .[21]

(4) Discharges of non-storm water into the MS4 from the following categories must be controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means. ~~Discharges of non-storm water to the MS4 from the following categories not controlled by the requirements given below through~~ If such statutes, ordinances, permits, contracts, orders, or similar means have not been enacted by the Copermittee, the applicable categories below must be addressed by the Copermittee as illicit discharges.

(a) Air conditioning condensation

The discharge of air conditioning condensation should~~must~~ be directed to landscaped areas or other pervious surfaces where feasible.

(b) Individual residential vehicle washing

(i) The discharge of wash water ~~must~~ should be directed to landscaped areas or other pervious surfaces where feasible; and

(ii) Minimize the use of water for vehicle washing, use as little washing detergent and other vehicle wash products as possible, wash vehicles at commercial wash facilities, and implement other practices or behaviors that will prevent the discharge of pollutants associated with individual residential vehicle washing from entering the MS4.

(c) Dechlorinated swimming pool discharges

(i) Eliminate residual chlorine, algaecide, filter backwash, or other pollutants from swimming pools prior to discharging to the MS4; and

(ii) The discharge of saline swimming pool water must be directed to the sanitary sewer, landscaped areas, or other pervious surfaces that can accommodate the volume of water, unless the saline swimming pool water can be discharged via a pipe or concrete channel directly to a naturally saline water body (e.g. Pacific Ocean).

(5) Firefighting discharges to the MS4 must be addressed by the Copermittee as

Comment [A80]: See discussion in section 3.7.2 of the comment letter.

Comment [A81]: See discussion in section 3.7.2 of the comment letter.

[21] ~~Provision E.2.a.(3) only applies to this category of non-storm water discharge if the system is designed to be located above the highest historical groundwater table at all times of the year, and the system is only expected to discharge non-storm water under unusual circumstances.~~

follows:illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a significant source of pollutants to receiving waters. Firefighting discharges to the MS4 not identified as a significant source of pollutants to receiving waters, must be addressed, at a minimum, as follows:

(a) Non-emergency firefighting discharges

(i) Building fire suppression system maintenance discharges (e.g.., sprinkler line flushing) to the MS4 must be addressed as illicit discharges unless appropriate BMPs are implemented.

(ii) Non-emergency firefighting discharges (i.e., discharges from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems) must be addressed by a program, to be developed and implemented by the Copermittee in conjunction with the local Fire Authority/District, to reduce or eliminate pollutants in such discharges from entering the MS4.

(b) Emergency firefighting discharges (i.e., flows necessary for the protection of life or property) do not require BMPs and need not be prohibited.

Each Copermittee should develop and encourage implementation of BMPs to reduce or eliminate pollutants in emergency firefighting discharges to the MS4s and receiving waters within its jurisdiction. During emergency situations, priority of efforts should be directed toward life, property, and the environment (in descending order). BMPs should not interfere with immediate emergency response operations or impact public health and safety.

(6) If the Copermittee or San Diego Water Board identifies any category of non-storm water discharges listed under Provisions E.2.a.(1)-(4) as a source of pollutants to receiving waters, the category must be effectively prohibited through ordinance, order, or similar means and addressed as an illicit discharge.

(7) Each Copermittee must, where feasible, reduce or eliminate non-storm water discharges listed under Provisions E.2.a.(1)-(4) into its MS4 whether or not the non-storm water discharge has been identified as an illicit discharge, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit.

Comment [A82]: See discussion in section 3.7.2 of the comment letter.

b. Prevent And Detect Illicit Discharges And Connections

Each Copermittee must include the following measures within its program to prevent and detect illicit discharges to the MS4:

(1) Each Copermittee must maintain an updated map of its entire MS4 and the corresponding drainage areas. The accuracy of the MS4 map must be confirmed during the field screening required pursuant to Provision E.2.c. The MS4 map must be included as part of the jurisdictional runoff management program document. Any geographic information system (GIS) layers or files used by the Copermittee to maintain the MS4 map must be made available to the San Diego Water Board upon request. The MS4 map must identify the following:

(a) All segments of the MS4 owned, operated, and maintained by the Copermittee;

(b) All known locations of inlets that discharge and/or collect runoff into the Copermittee's MS4;

(c) All known locations of connections with other MS4s not owned or operated by the Copermittee (e.g. Caltrans MS4s);

(d) All known locations of major MS4 outfalls as defined by 40 CFR §122.26(b)(5-6) ~~and private outfalls,~~ that discharge runoff collected from areas within the Copermittee's jurisdiction;

Comment [A83]: See discussion in section 3.7.2 of the comment letter.

(e) All segments of receiving waters within the Copermittee's jurisdiction that receive and convey runoff discharged from the Copermittee's MS4 outfalls;

(f) Locations of the MS4 outfalls, identified pursuant to Provision D.2.a.(1), within its jurisdiction; and

(g) Locations of the non-storm water persistent flow MS4 outfall discharge monitoring stations, identified pursuant to Provision D.2.b.(2)(b), within its jurisdiction.

(2) Each Copermittee must use Copermittee personnel and contractors to assist in identifying and reporting illicit discharges and connections during their daily employment activities.

(3) Each Copermittee must promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges to or from the MS4, including the following methods for public reporting:

(a) Operate a public hotline, which can be Copermittee-specific or shared by the Copermittees, and must be capable of receiving reports in both English and Spanish 24 hours per day and seven days per week; and

(b) Designate an e-mail address for receiving electronic reports from the public, which can be Copermittee-specific or shared by the Copermittees, and must be prominently displayed on the Copermittee's webpage and the Regional Clearinghouse required pursuant to Provision F.4.

(4) Each Copermittee must implement practices and procedures (including a notification mechanism) to prevent, respond to, contain, and clean up any spills that may discharge into the MS4 within its jurisdiction from any source. Such practices and procedures may include the coordination with other parties, such as sanitary sewer operators. The Copermittee must coordinate, to the extent possible, with spill response teams to prevent entry of spills into the MS4~~, and prevent contamination of surface water, ground water, and soil.~~ The Copermittee must coordinate spill prevention, containment, and response activities throughout all appropriate internal~~Copermittee~~ departments, programs, and agencies.

Comment [A84]: See discussion in section 3.7.2 of the comment letter.

(5) Each Copermittee must implement practices and procedures to ~~prevent~~ control and limit infiltration of seepage from sanitary sewers owned by a Copermittee agency (including private laterals and failing septic systems) to the MS4.

(6) Each Copermittee shall~~must~~ coordinate, when necessary, with upstream Copermittees and/or entities to prevent illicit discharges from upstream sources into the MS4 within its jurisdiction.

c. FIELD SCREENING

Each Copermittee must conduct field screening (i.e. visual observations, field testing, and/or analytical testing) of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4 in accordance with the dry weather MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

d. INVESTIGATE AND ELIMINATE ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to investigate and eliminate illicit discharges to the MS4 to comply with provision A.1.b:

(1) Each Copermittee must prioritize and determine when follow-up investigations will be performed in response to visual observations and/or water quality monitoring data collected during an investigation of a detected non-storm water ~~or~~ illicit discharge into or from the MS4. The criteria for prioritizing investigations must consider the following:

(a) Pollutants identified as causing or contributing to the highest water quality

priorities identified in the Water Quality Improvement Plan;

(b) Pollutants identified as causing or contributing, or threatening to cause or contribute to impairments in water bodies on the 303(d) List and/or in environmentally sensitive areas (ESAs), located within its jurisdiction;

(c) Pollutants identified from sources or land uses known to exist within the area, drainage basin, or watershed that discharges to the portion of the MS4 within its jurisdiction included in the investigation;

(d) Pollutants identified as causing or contributing to an exceedance of a NAL in the Water Quality Improvement Plan, where the source has not been identified as natural or otherwise permitted; and

(e) Pollutants identified as an immediate and significant threat to human health or the environment.

(2) Each Copermittee must implement procedures to investigate and inspect portions of its MS4 that, based on reports or notifications, field screening, or other appropriate information, indicate a reasonable potential of receiving, containing, or discharging pollutants due to illicit discharges, or illicit connections~~, or other sources of non-storm water~~. The procedures must include the following:

(a) Each Copermittee must develop criteria to:

(i) Assess the validity of each report or notification received; and

(ii) Prioritize the response to each report or notification received.

(b) Each Copermittee must prioritize and respond to each valid report or notification (e.g., public reports, staff or contractor reports and notifications, etc.) of an incident in a timely manner.

(c) ~~Each~~In accordance with the procedures defined in Provision E.2.d.(1), each~~Each~~ Copermittee must investigate and seek to identify the source(s) of discharges of non-storm water illicit discharges or illicit connections ~~where flows are~~ observed into and from the MS4 during the field screening required pursuant to Provision D.2.b.(1) as follows:

(i) Obvious illicit discharges (i.e., unusual color or odor) must be immediately investigated to identify the source(s) of non-storm water illegal discharges;

(ii) The investigation must include field investigations to identify sources or potential sources for the discharge, unless the source or potential source has already been identified during previous investigations; and

(iii) The investigation may include follow-up field investigations and/or reviewing Copermittee inventories and other land use data to identify potential sources of the discharge.

(d) Each Copermittee must maintain records and a database of the following information:

(i) Location of incident, including hydrologic subarea, portion of MS4 receiving the non-storm water ~~or~~ illicit discharge, and point of discharge or potential discharge from MS4 to receiving water;

(ii) Source of information initiating the investigation (e.g., public reports, staff or contractor reports and notifications, field screening, etc.);

(iii) Date the information used to initiate the investigation was received;

(iv) Date the investigation was initiated;

(v) Dates of follow-up investigations;

(vi) Identified or suspected source of the illicit discharge or connection, if determined;

(vii) Known or suspected related incidents, if any;

(viii) Result of the investigation; and

(ix) If a source cannot be identified and the investigation is not continued, a rationale for why a discharge does not pose a threat to water quality and/or does not require additional investigation.

(e) Each Copermittee must ~~track~~ document, and where feasible quantify, any readily~~and seek to~~ identifiable~~y~~ the source(s) of non-storm water illegal discharges from the MS4 where there is evidence of non-storm water ~~having been discharged~~illegal discharges or connections into or from the MS4 (e.g., pooled water), in accordance with MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.

Comment [A85]: See discussion in section 3.7.2 of the comment letter.

(3) Each Copermittee must initiate the implementation of procedures, in a timely manner, to eliminate all detected and identified illicit discharges and connections within its jurisdiction. The procedures must include the following responses:

(a) Each Copermittee must enforce its legal authority, as required under Provision E.1, to eliminate illicit discharges and connections to the MS4.

(b) If the Copermittee identifies the source as a controllable source of non-storm water ~~or~~ illicit discharge or connection, the Copermittee must implement its Enforcement Response Plan pursuant to Provision E.6 and enforce its legal authority to effectively prohibit and with the goal of eliminating~~e~~ illicit discharges and connections to its MS4.

(c) If the Copermittee identifies the source of the discharge as a category of non-storm water discharges in Provision E.2.a, and the discharge is in exceedance of NALs in the Water Quality Improvement Plan, then the Copermittee must determine if: (1) this is an isolated incident or set of circumstances that will be addressed through its Enforcement Response Plan pursuant to Provision E.6, or (2) the category of discharge must be addressed through the effective prohibition of that category of discharge as an illicit discharge pursuant to Provision E.2.a.(6).

(d) If the Copermittee suspects the source of the non-storm water discharge as natural in origin (i.e. non-anthropogenically influenced) and in conveyance into the MS4, then the Copermittee must document and provide the data and evidence necessary to demonstrate to the San Diego Water Board that it is natural in origin and does not require further investigation.

(e) If the Copermittee identifies that the discharge is coming from another Copermittees' jurisdiction, the receiving Copermittee must document and provide the findings to the upstream Copermittee. The obligation to implement the requirements of provision E.2.d.(3) are thenceforth the responsibility of the upstream Copermittee.

(f) If the Copermittee identifies the source as a non-storm water discharge that has been separately authorized by the San Diego Water Board, or that is contributing pollutants to the MS4 and that may require coverage under a WDR from the San Diego Water Board, the Copermittee shall provide all relevant findings to the San Diego Water Board and may back charge the Regional Board for the entire cost of conducting the source investigation.

Comment [A86]: See discussion in section 3.7.2 of the comment letter.

~~(e)~~(g) If the Copermittee is unable to identify and document the source of a recurring non-storm water discharge to or from the MS4, then the Copermittee must ~~address the discharge as an illicit discharge and~~ update its jurisdictional runoff management program to address the common and suspected sources of the non-storm water discharge within its jurisdiction in accordance with the Copermittee's priorities.

(4) Each Copermittee must submit a summary of the non-storm water discharges and illicit discharges and connections investigated and eliminated within its jurisdiction with each Annual Report required under Provision F.3.b of this Order.

3. Development Planning

Comment [A87]: See discussion in section 3.8 of the comment letter.

Each Copermittee must, within their jurisdiction, use their land use and planning

authorities, to the extent that they may lawfully impose requirements, to implement a development planning program in accordance with the strategies identified in the Water Quality Improvement Plan and includes, at a minimum, the following requirements:

STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Comment [A88]: See discussion in section 3.8.2 of the comment letter.

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the development planning program to address development and redevelopment projects that may become sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional or alternative BMPs, focus education, increase frequency of verifications and/or inspections, alternative compliance options);

(2) Each Copermittee must identify areas within its jurisdiction where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting and/or stream, channel, or habitat rehabilitation projects;

(3) Each Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify regional alternative compliance projects that Priority Development Projects may be allowed or should be encouraged to implement or participate in implementing; and

(4) The requirements of the programs as outlined in the following sub-provisions may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality improvement Plan(s).~~The strategies and/or activities must be consistent with the requirements of Provisions E.3.a-c and E.3.e-f and the strategies identified in the Water Quality Improvement Plan.~~

a. BMP REQUIREMENTS FOR ALL DEVELOPMENT PROJECTS

Each Copermittee, as practical and feasible, must prescribe the following BMP requirements during the planning process (i.e. prior to project approval and issuance of local permits) for all development projects (regardless of project type or size), where local permits are issued, including unpaved roads and flood management projects, except emergency / public safety projects implemented for the protection of persons and property:

(1) General Requirements

(a) Onsite BMPs must be located so as to remove pollutants from runoff prior to its discharge to any receiving waters, and as close to the source as possible; and

(b) Structural BMPs must not be constructed within a waters of the U.S.. ~~or waters of the state.~~

(2) Source Control BMP Requirements

The following source control BMPs must be implemented at all development projects where applicable and feasible:

(a) Prevention of illicit discharges into the MS4;

(b) Storm drain system stenciling or signage;

(c) Properly designed outdoor material storage areas;

(d) Properly designed outdoor work areas;

(e) Properly designed trash storage areas; and

(f) Any additional BMPs determined necessary by the Copermittee to minimize pollutant generation at each project.

(3) Low Impact Development (LID) ~~BMP Requirements~~Principles

Comment [A89]: See discussion in section 3.8.2 of the comment letter.

The following LID ~~BMPs~~ Principles must be implemented at all development projects where applicable and feasible:

(a) Maintenance or restoration of natural storage reservoirs and drainage corridors (including topographic depressions, areas of permeable soils, natural swales, and ephemeral and intermittent streams);[22]

(b) Buffer zones for natural water bodies (where buffer zones are technically infeasible, require project applicant to include other buffers such as trees, access restrictions, etc.);

(c) Conservation of natural areas within the project footprint including existing trees, other vegetation, and soils;

[22] Development projects proposing to dredge or fill materials in waters of the U.S. must obtain a CWA Section 401 Water Quality Certification. Projects proposing to dredge or fill waters of the state must obtain waste discharge requirements.

(d) Construction of streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided public safety is not compromised;

(e) Minimization of the impervious footprint of the project;

(f) Minimization of soil compaction to landscaped areas;

(g) Disconnection of impervious surfaces through distributed pervious areas;

(h) Landscaped or other pervious areas designed and constructed to effectively receive and infiltrate, retain and/or treat runoff from impervious areas, prior to discharging to the MS4;

(i) Small collection strategies located at, or as close as possible to, the source (i.e. the point where storm water initially meets the ground) to minimize the transport of runoff and pollutants to the MS4 and receiving waters;

(j) Use of permeable materials for projects with low traffic areas and appropriate soil conditions;

(k) Landscaping with native or drought tolerant species; and

(l) Harvesting and using precipitation.

b. PRIORITY DEVELOPMENT PROJECTS

(1) Definition of Priority Development Project

Priority Development Projects include the following:

(a) All new development projects that fall under the Priority Development Project categories listed under Provision E.3.b.(2) (where a new development project feature, such as a parking lot, falls into a Priority Development Project category, the entire project footprint is subject to Priority Development Project requirements); and

(b) Those redevelopment projects that create, add, or replace at least 5,000 square feet of impervious surfaces on an already developed site, and the redevelopment project is a Priority Development Project category listed under Provision E.3.b.(2) (where redevelopment results in an increase of less than fifty percent of the impervious surfaces of a previously existing development, and the existing development was not subject to Priority Development Project requirements, the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) apply only to the addition or replacement, and not to the entire development; where redevelopment

results in an increase of more than fifty percent of the impervious surfaces of a previously existing development, the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) apply to the entire development).

(c) Projects where redevelopment results in an increase of more than fifty percent of impervious surfaces of a previously existing development, and the existing development *was* subject to previous Priority Project Development Requirements, only the altered portion of development is subject to the new Priority Development Project requirements.

Comment [A90]: See discussion in section 3.8.2 of the comment letter.

(2) Priority Development Project Categories

Comment [A91]: See discussion in section 3.8.2 of the comment letter.

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This category includes commercial, industrial, residential, mixed-use, and public development projects on public or private land which fall under the planning and building authority of the Copermittee.

(b) New development projects that create 5,000 square feet or more of impervious surfaces (collectively over the entire project site), and are designed for support one or more of the following uses (see Appendix for definitions):

(i) Automotive repair shop
(ii) Restaurant
(iii) Parking lot[23]
(iv) Street, road, highway, freeway
(v) Retail gasoline outlet (RGO)

Comment [A92]: See footnote

~~(b) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.~~

~~(c) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812), where the land area for development is 5,000 square feet or more.~~

~~(d) Hillside development projects. This category includes any development which creates 5,000 square feet or more of impervious surface which is~~

[23] Excluding parking lots that are not subject to runoff, such as but not limited to covered or subterranean parking lots

located in an area with known erosive soil conditions, where the development will grade on any natural slope that is twenty-five percent or greater.

(e)(c) New development projects that create 2,500 square feet or more of impervious surfaces (collectively over the entire project site), and are Environmentally sensitive areas (ESAs). This category includes any development located within, directly adjacent to, or discharging directly to an ESA, which either creates 2,500 square feet of impervious surface on a proposed project site or increases the area of imperviousness of a proposed project site to 10 percent or more of its naturally occurring condition. "Directly adjacent to" means situated within 200 feet of the ESA. "Discharging directly to" means outflow from a drainage conveyance system that collects runoff from the subject development or redevelopment site and terminates at or in receiving waters within the ESA and is not commingled with flows from adjacent or other upstream lands.

(f) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce that has 5,000 square feet or more of impervious surface.

(g) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface that is 5,000 square feet or more used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

(h) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

(i)(d) Large development projects. This category includes any post-construction pollutant-generating new development projects that result in the permanent disturbance of one acre or more of land.

(3) Priority Development Project Exemptions

Comment [A93]: See discussion in section 3.8.2 of the comment letter.

Each Copermittee has the discretion to exempt the following projects from being defined as Priority Development Projects:

(a) New paved sidewalks, driveways, parking lots, bicycle lanes, or trails that meet the following criteria:

(i) Designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas; OR

(ii) Designed and constructed to be hydraulically disconnected from paved streets or roads; OR

(iii) Designed and constructed with permeable pavements or surfaces in accordance with USEPA Green Streets guidance.[24]

(b) Any impervious surface that is 5,000 square feet or more used for the transportation of automobiles, trucks, motorcycles, and other vehicles that is designed and constructed to the Maximum Extent Practicable in accordance with the USEPA Green Streets Guidance "Managing Wet Weather with Green Infrastructure: Green Streets"[25]. ~~Retrofitting of existing paved alleys, streets or roads that meet the following criteria:~~

~~(i) Must be two lanes or less; AND~~

~~(ii) Must be a retrofitting project implemented as part of an alternative compliance project option under Provision E.3.c.(3)(b)(v) to achieve the performance requirements of Provisions E.3.c.(1) and/or E.3.c.(2) for a Priority Development Project; AND~~

~~(iii) Designed and constructed in accordance with the USEPA Green Streets guidance.[26]~~

(c) Single-family residential projects that meet the following criteria:

(i) Must not be constructed as part of a larger development or proposed subdivision;

(ii) Successfully incorporate and document that they have incorporated, each of the applicable Source Control and LID BMP strategies identified in provisions E.3.a.(2)-(3) to the MEP.

~~(c) New single family residences that meet the following criteria:~~

~~(i) Must not be constructed as part of a larger development or proposed subdivision; AND~~

~~(ii) Designed and constructed to be certified under the U.S. Green Building Council (USGCB) Leadership in Energy and Environmental Design (LEED) for Homes green building certification program, receiving at least four (4) Surface Water Management credits under the Sustainable Sites category[27] OR~~

~~Designed and constructed with structural BMPs that will achieve the~~

[24] USEPA. 2008. http://water.epa.gov/infrastructure/greeninfrastructure/upload/gi_munichandbook_green_streets.pdf and http://water.epa.gov/infrastructure/greeninfrastructure/gi_policy.cfm#municipalhandbook ~~See "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).~~

~~[26] Ibid.~~

~~[27] See LEED for Homes rating system at http://www.usgbc.org~~

~~performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite~~

~~(d) Redevelopment of existing single family residences that meet the following criteria:~~

~~(i) Designed and constructed to be certified under the USGCB LEED for Homes green building certification program, receiving at least four (4) Surface Water Management credits under the Sustainable Sites category;[28] OR~~

~~(ii) Designed and constructed with structural BMPs that will achieve the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite.~~

(d) Watershed Protection Projects that meet the following criteria:

(i) Projects undertaken to rehabilitate or prevent environmental, social, and economic damage to the watershed, including receiving waters, by providing one or more of the following:

- Water quality protection by the proper management of stormwater and floodplains
- Flood risk reduction to adjacent land uses, stored matter and stockpiled material
- Elimination of the comingling of stormwater and hazardous materials
- Erosion Mitigation
- Restoration of Rivers and Ecosystems
- Groundwater Recharge
- Creation of new open space and wetlands
- Programs for water conservation, stormwater capture and management
- Retrofit projects constructed to improve water quality or address hydromodification.

(ii) AND are not expected to be pollutant generating or are designed to reduce existing pollutant loads

(iii) AND incorporate and document that they have incorporated, each of the applicable Source Control and LID BMP strategies identified in provisions E.3.a.(2)-(3) to the MEP.

(e) Emergency public safety projects in any of the Priority Development Categories may be excluded if the delay caused due to the requirement for a SSMP compromises public safety, public health and/or environmental protection

[28] ~~See LEED for Homes rating system at http://www.usgbc.org~~

c. Priority Development Project Structural BMP Performance Requirements

In addition to the BMP requirements listed for all development projects under Provision E.3.a, Priority Development Projects must also implement structural BMPs that conform to performance requirements below. If watershed-specific performance requirements are ~~may be~~ developed as part of a Water Quality Improvement Plan; these requirements would take precedence over the general performance requirements below. The watershed-specific requirement must provide at least equal protection as the general performance requirements below.

(1) Storm Water Pollutant Control BMP Requirements

Comment [A94]: See discussion in section 3.8.2 of the comment letter.

Each Copermittee must require each Priority Development Project to implement onsite structural BMPs to control pollutants in storm water that may be discharged from a project as follows:

(a) Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite the pollutants contained in the design capture volume. The design capture volume is equivalent to:

(i) The volume of storm water runoff produced from a 24-hour 85th percentile storm event;[29] OR

(ii) The volume of storm water runoff produced from a 24-hour 85th percentile storm event, that would be retained onsite ~~if~~ in the pre-project condition. ~~site was fully undeveloped and naturally vegetated~~, ~~as determined using continuous simulation modeling techniques based on site-specific soil conditions and typical native vegetative cover.~~

(b) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of~~to~~ complying with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1)(a).

~~(c) If a Priority Development project is allowed to utilize alternative compliance pursuant to Provisions E.3.c.(1)(b), flow-thru conventional~~

[29] This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals. The volume is a single event-based volume that occurs after an extended dry period.

~~treatment control BMPs must be implemented to treat the portion of the design capture volume that is not retained onsite. Additionally, project applicants must mitigate for the portion of the pollutant load in the design capture volume that is not retained onsite through one or more alternative compliance options under Provision E.3.c.(3). Conventional treatment control BMPs must be sized and designed to:~~

~~(i) Remove pollutants from storm water to the MEP;~~

~~(ii) Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;~~

~~(iii) Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Conventional treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of conventional treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.~~

(2) Hydromodification Management BMP Requirements

Comment [A95]: See discussion in section 3.8.2 of the comment letter.

Each Copermittee must require each Priority Development Project disturbing greater than one acre to implement management measures~~onsite structural BMPs~~ to ensure ~~manage hydromodification~~ that ~~may be caused by~~ storm water runoff discharged from the~~a~~ project won't cause adverse Hydromodification impacts in the downstream receiving waters as follows:

The Copermittees in each Watershed Management Area may establish within the WQIP, watershed specific mitigation requirements that will apply to priority development projects, based on the susceptibility of the receiving waters to Hydromodification impacts caused by the project, and consistent with the priorities and strategies identified in the WQIP. Such requirements may be uniform across a Hydrologic Unit, or identified at an appropriate smaller scale to ensure that receiving waters are properly protected.

(a) Post-project runoff flow rates and durations must not exceed pre-project ~~development (naturally occurring)~~ runoff flow rates and durations by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat conditions downstream of Priority Development Projects~~)~~.

(i) In evaluating the range of flows that results in increased potential for

erosion of natural (non-hardened) channels, the lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks.

~~(ii) For artificially hardened channels, analysis to identify the lower boundary must use characteristics of a natural stream segment similar to that found in the watershed. The lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or erodes the toe of the channel banks.~~

~~(iii)~~(ii) The Copermittees may use monitoring results collected pursuant to Provision D.1.a.(2) to re-define the range of flows resulting in increased potential for erosion, or degraded instream habitat conditions, as warranted by the data.

(b) Priority Development Projects ~~Post-project runoff flow rates and durations~~ must implement appropriate measures to minimize the ~~compensate~~ for the loss of sediment supply delivered ~~due~~ to the Receiving Waters, consistent with WQIP priorities, ~~development project,~~ should loss of sediment supply be anticipated to occur as a result of the development project.

(c) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of~~to comply with~~ the performance requirements of Provisions E.3.c.(2)(a)-(b).

(d) Exemptions

Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provisions E.3.c.(2)(a)-(b) where the project:

(i) Discharges storm water runoff into existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;

(ii) Discharges of storm water into conveyance channels whose bed and bank are engineered and maintained for the 10-year ultimate development flow rate all the way from the point of discharge from the project to an water body that is sufficiently resistant to hydromodification (water storage reservoirs, lakes, enclosed embayments, pacific ocean, or other water bodies identified in the WQIP);

~~(ii)~~(iii) Is a redevelopment Priority Development Project that meets the alternative compliance requirements of Provision E.3.c.(3)(b)(ii); or

~~(iii)~~(iv) Discharges storm water runoff into other areas identified by the San Diego Water Board as exempt from the requirements of Provisions E.3.c.(2)(a)-(b), through an approved WQIP.

(3) Alternative Compliance to Onsite Structural BMP Performance Requirements

Comment [A96]: See discussion in section 3.8.2 of the comment letter.

(a) Applicability

At the discretion of each Copermittee, Priority Development Projects may be allowed to implement one or more of the alternative compliance project options described in E.3.c.(3)(b) below, in lieu of complying with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2), under the following conditions:

(i) The Copermittee must determine that implementation of the alternative compliance option will have an equal or greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite;

(ii) The alternative compliance options must be designed by a registered professional engineer, geologist, architect, biologist, hydrologist, landscape architect, or other appropriate certified professional;

(iii) The alternative compliance option must be consistent with the strategies developed within the WQIP, for the highest priority water quality conditions.

(iv) The alternative compliance options must be implemented within the same Watershed Management Area as the Priority Development Project, and preferably within the same hydrologic subarea;

(v) The alternative compliance options must have reliable sources of funding for operation and maintenance.

(b) Alternative Compliance Options

(i) *LID Biofiltration Treatment Control BMPs*

LID biofiltration treatment control BMPs may be used as an alternative compliance option if the BMPs are sized and designed to:

[a] Remove pollutants from storm water to the MEP; AND
[b] Have an appropriate surface loading rate to prevent erosion, scour and channeling; AND
[c] Biofilter at least 1.0 times the design capture volume that is not reliably retained onsite

(ii) *LEED Certified Redevelopment Projects*

Priority Development Projects that are designed and constructed to be certified under the USGCB LEED for New Construction and Major Renovations green building certification program, or other locally accepted certification of equivalent effectiveness, may be considered as an acceptable alternative compliance option if the project meets the following criteria:

[a] The project is designed to receive at least: One (1) Site Design credit, and Two (2) Stormwater Design credits under the Sustainable Sites category.[30] , and

[b] The existing and future configuration of the receiving water must not be unnaturally altered or adversely impacted by the project.

(iii) *Watershed-Based Planned Development Projects*

Priority Development Projects greater than 100 acres in total project size (or smaller than 100 acres in size yet part of a larger common plan of development that is over 100 acres) may be considered as an acceptable alternative compliance option if the project meets the following conditions:

[a] The Priority Development Project was planned utilizing watershed and/or subwatershed based water quality, hydrologic, and fluvial geomorphologic planning principles that implement regional LID BMPs in accordance with the performance and location criteria of this Order and acceptable to the San Diego Water Board;

[b] Regional LID BMPs may be used provided that the BMPs capture and retain the volume of runoff produced from the design capture volume defined in Provision E.3.c.(1)(a)(i) and that such controls are located upstream of receiving waters;

[c] Regional LID BMPs must clearly exhibit that they will not result in a net impact from pollutant loadings over and above the impact caused by capture and retention of the design capture volume;

[d] Any portion of the design capture volume that is not retained by the regional LID BMPs must be treated using biofiltration BMPs; and

[e] Where regional LID BMPs are demonstrated to the Copermittee as technically infeasible to retain the entire design capture volume, any volume up to and including the design capture volume not retained by regional LID BMPs, nor treated by biofiltration BMPs, must be treated using conventional treatment control BMPs and the project applicant must implement additional alternative compliance project, in-lieu fee and/or water quality

[30] See LEED for New Construction and Major Renovations rating system at http://www.usgbc.org

credit system options below.

(iv) *Offsite Projects*

Offsite Projects, such as but not limited to Regional BMPs; Retrofitting Projects; Channel, Stream or Habitat Rehabilitation Projects; Water Supply Augmentation Projects; or other Offsite Projects proposed by a project proponent, may be considered as an acceptable alternative compliance option if the offsite project meets the following requirements:

- The project must provide a net result of at least the same level of pollutant removal, and/or protection from potential downstream and upstream erosion in the receiving water as would be required to meet the performance requirements of Provision E.3.c.(1) and E.3.c.(2), as applicable.
- The project must be consistent with the strategies identified in the WQIP.
- The project must be constructed and operational prior to occupancy being granted for the PDP.

(v) *Conventional Treatment Control BMPs*

Onsite Conventional Treatment Control BMPs may be used as an alternative compliance option, only if the following criteria have been met:

[a] It has been demonstrated to the satisfaction of the Copermittee that it is technically infeasible to comply with the onsite requirements of E.3.c.(1), AND

[b] It has been demonstrated to the satisfaction of the Copermittee that it is technically infeasible to implement onsite Biofiltration Treatment Control BMPs, AND

[c] The Conventional Treatment Control BMPs will remove pollutants from storm water to the MEP; AND

[d] The Conventional Treatment Control BMPs will filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two; AND

[e] The Conventional Treatment Control BMPs are ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Conventional treatment control BMPs with a low removal

efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of conventional treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

~~(a) Applicability~~

~~At the discretion of each Copermittee, Priority Development Projects may be allowed to utilize an alternative option to comply with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) under the following conditions:~~

~~(i) The Copermittee must determine that implementation of the alternative compliance option will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite;~~

~~(ii) The alternative compliance options must be designed by a registered professional engineer, geologist, architector landscape architect;~~

~~(iii) The alternative compliance options must be implemented within the same hydrologichydrologic unit as the Priority Development Project, and preferably within the same hydrologic subarea;~~

~~(iv) Receiving waters must not be utilized to convey storm water runoff to the alternative compliance options;~~

~~(v) The pollutants in storm water runoff from the Priority Development Project must be treated to the MEP by the alternative compliance options prior to being discharged to receiving waters;~~

~~(vi) Unless otherwise allowed by Provision E.3.c.(3)(b), the alternative compliance options must have a net result of at least the same level of pollutant removal as would have been achieved if the Priority Development Project had fully complied with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1) onsite;~~

~~(vii) Unless otherwise allowed by Provision E.3.c.(3)(b), the alternative compliance options must have a net result of at least the same level of protection from potential downstream and upstream erosion in the receiving water as would have been achieved if the Priority Development Project had fully complied with the hydromodification management BMP performance requirements of Provision E.3.c.(2) onsite; and~~

~~(viii) The alternative compliance options utilized by the Priority Development Project must have reliable sources of funding for operation and maintenance.~~

~~(b) Alternative Compliance Project Options~~

~~The Copermittee may allow implementation of one or more of the following project options as part of an alternative approach to complying with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2):~~

~~(i) *Onsite LID Biofiltration Treatment Control BMPs*~~

~~The Copermittee may allow Priority Development Projects to utilize onsite LID biofiltration treatment control BMPs to comply with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1). Onsite LID biofiltration treatment control BMPs must be sized and designed to:~~

~~[a] Remove pollutants from storm water to the MEP; AND~~
~~[b] Have an appropriate surface loading rate to prevent erosion, scour and channeling within the BMP; AND~~
~~[c] Biofilter at least 1.5 times the design capture volume that is not reliably retained onsite; OR~~
~~[d] Biofilter up to the design capture volume that is not reliably retained onsite, AND 1) treat the remaining portion of the design capture volume not retained onsite with conventional treatment control BMPs in accordance with Provision E.3.c.(1)(c), and 2) if necessary, mitigate for the portion of the pollutant load in the design capture volume not retained onsite through one or more alternative compliance project, in-lieu fee and/or water quality credit system options below.~~

~~(ii) *LEED Certified Redevelopment Projects*~~

~~The Copermittee may allow redevelopment Priority Development Projects to comply with designed and constructed to be certified under the USGCB LEED for New Construction and Major Renovations green building certification program. The Priority Development Project must receive at least one (1) Site Design credit and two (2) Stormwater Design credits under the Sustainable Sites category.[31] In addition, the existing and future configuration of the receiving water must not be unnaturally altered or adversely impacted by storm water flow rates and durations discharged from the site.~~

~~(iii) *Watershed Based Planned Development Projects*~~

~~The Copermittee may allow Priority Development Projects greater than 100 acres in total project size (or smaller than 100 acres in size~~

~~[31] See LEED for New Construction and Major Renovations rating system at http://www.usgbc.org~~

~~yet part of a larger common plan of development that is over 100 acres) to comply with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2). The Priority Development Project must comply with the following conditions:~~

~~[a] The Priority Development Project was planned utilizing watershed and/or subwatershed based water quality, hydrologic, and fluvial geomorphologic planning principles that implement regional LID BMPs in accordance with the performance and location criteria of this Order and acceptable to the San Diego Water Board;~~

~~[b] Regional LID BMPs may be used provided that the BMPs capture and retain the volume of runoff produced from the design capture volume defined in Provision E.3.c.(1)(a)(i) and that such controls are located upstream of receiving waters;~~

~~[c] Regional LID BMPs must clearly exhibit that they will not result in a net impact from pollutant loadings over and above the impact caused by capture and retention of the design capture volume;~~

~~[d] Any portion of the design capture volume that is not retained by the regional LID BMPs must be treated using biofiltration BMPs; and~~

~~[e] Where regional LID BMPs are demonstrated to the Copermittee as technically infeasible to retain the entire design capture volume, any volume up to and including the design capture volume not retained by regional LID BMPs, nor treated by biofiltration BMPs, must be treated using conventional treatment control BMPs and the project applicant must implement additional alternative compliance project, in-lieu fee and/or water quality credit system options below.~~

~~(iv) *Offsite Regional BMPs*~~

~~[a] The Copermittee may allow Priority Development Projects to utilize offsite regional BMPs to comply with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1) if the offsite regional BMPs have the capacity to receive and retain at least 1.1 times the design capture volume that is not reliably retained onsite.~~

~~[b] The Copermittee may allow Priority Development Projects to utilize offsite regional BMPs to comply with the hydromodification management BMP performance requirements of Provision E.3.c.(2) if the offsite regional BMPs have the capacity to manage the storm water flows rates and durations from the site such that the receiving waters are protected from the potential for increased erosion that would be caused if the unmanaged portion of the runoff was discharged from the site.~~

~~(v) *Offsite Retrofitting Projects*~~

~~The Copermittee may allow Priority Development Projects to utilize offsite retrofitting projects to comply with the storm water pollutant control and hydromodification management BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) if the retrofitting projects have been identified within the strategies included in the Water Quality Improvement Plan, or identified as potential retrofitting projects by the Copermittee pursuant to Provision E.5.~~

~~(vi) *Offsite Channel, Stream, or Habitat Rehabilitation Projects*~~

~~The Copermittee may allow Priority Development Projects to utilize offsite channel, stream, or habitat rehabilitation projects to comply with the hydromodification management BMP performance requirements of Provision E.3.c.(2) if the rehabilitation projects have been identified within the strategies included in the Water Quality Improvement Plan, or identified as potential channel rehabilitation projects by the Copermittee pursuant to Provision E.5. The channel, stream, or habitat rehabilitation project cannot be utilized for pollutant treatmentexcept where artificial wetlands areand located upstream of receiving waters.~~

~~(vii) *Offsite Regional Water Supply Augmentation Projects*~~

~~The Copermittee may allow Priority Development Projects to utilize offsite regional water supply augmentation projects (i.e. groundwater recharge, recycled water, storm water harvesting) to comply with the storm water pollutant control and hydromodification management BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) if the projects have been identified within the strategies included in the Water Quality Improvement Plan.~~

~~(viii) *Project Applicant Proposed Alternative Compliance Projects*~~

~~The Copermittee may allow one or more Priority Development Project applicant(s) to propose and implement alternative compliance projects to comply with the storm water pollutant control and hydromodification management BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) if the alternative compliance projects are consistent with, and will address the highest water quality priorities of the Water Quality Improvement Plan, and comply with the requirements of Provision E.3.c.(3)(a).~~

(c) Alternative Compliance In-Lieu Fee Option

The Copermittee may develop and implement an alternative compliance in-lieu fee option, individually or with other Copermittees and/or entities, as a means for designing, developing, constructing, operating and/or maintaining offsite alternative compliance projects under Provision E.3.c.(3)(b). Priority Development Projects allowed to utilize the

alternative compliance in-lieu fee option must comply with the following conditions:

(i) The in-lieu fee must be collected and held in accordance with the Mitigation Fee Act and all other applicable development fee laws. ~~transferred to the Copermittee (for public projects) or an escrow account (for private projects) prior to the date construction of the Priority Development Project is initiated~~.

(ii) If the in-lieu fee is applied to the development, design, ~~and~~ construction, operation and maintenance of offsite alternative compliance projects, the following conditions must be met:

[a] The offsite alternative compliance projects must meet ~~allow~~ the criteria identified within E.3.c.(3)(b)-, for each Priority Development Project relying on~~to comply with~~ the alternative compliance project;~~onsite BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2);~~

[b] The offsite alternative compliance projects must be constructed as soon as possible, but no later than 4 years after the certificate of occupancy is granted for the first Priority Development Project that contributed funds toward the construction of the offsite alternative compliance projects, unless a longer period of time is provided for in an approved WQIP~~authorized by the San Diego Water Board Executive Officer~~;

~~[c] The in-lieu fee for the Priority Development Project must include mitigation of the pollutant loads and increased storm water flow rates and durations that are allowed to discharge from the site before the offsite alternative compliance projects are constructed; and~~

[d] The in-lieu fee must also include the cost to operate and maintain the offsite alternative compliance projects for the anticipated life of the constructed priority development project.

(iii) If the in-lieu fee applies only~~is applied~~ to the operation and maintenance of offsite alternative compliance projects that have already been constructed, the offsite alternative compliance projects must meet~~allow~~ the requirements of E.3.c.(3)(a)(iv) and (v) as applicable, for each Priority Development Project relying on~~to comply with~~ the alternative compliance project..~~onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2).~~

(d) Alternative Compliance Water Quality Credit System Option

The Copermittee may develop and implement an alternative compliance water quality credit system option, individually or with other Copermittees

Comment [A97]: Please see Legal Comments.

and/or entities, provided that such a credit system clearly exhibits that it will not allow discharges from Priority Development Projects to cause or contribute to a net impact over and above the impact caused by projects meeting the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2). Any credit system that a Copermittee chooses to implement must be submitted to the San Diego Water Board Executive Officer for review and acceptance as part of the Water Quality Improvement Plan.

(4) Long-Term Structural BMP Maintenance

Each Copermittee must require the project applicant to submit proof of the mechanism under which ongoing long-term maintenance of all structural BMPs will be conducted.

(5) Infiltration and Groundwater Protection

(a) Structural BMPs designed to primarily function as large, centralized infiltration devices (such as large infiltration trenches and infiltration basins) must not cause or contribute to an exceedance of an applicable groundwater quality objective. At a minimum, such infiltration BMPs must be in conformance with the design criteria listed below, unless the development project applicant demonstrates to the Copermittee that one or more of the specific design criteria listed below are not necessary to protect groundwater quality. The design criteria listed below do not apply to small infiltration systems dispersed throughout a development project.

(i) Runoff must undergo pretreatment such as sedimentation or filtration prior to infiltration;

(ii) Pollution prevention and source control BMPs must be implemented at a level appropriate to protect groundwater quality at sites where infiltration BMPs are to be used;

(iii) Infiltration BMPs must be adequately maintained to remove pollutants in storm water to the MEP;

(iv) The vertical distance from the base of any infiltration BMP to the seasonal high groundwater mark must be at least 10 feet. Where groundwater basins do not support beneficial uses, this vertical distance criteria may be reduced, provided groundwater quality is maintained;

(v) The soil through which infiltration is to occur must have physical and chemical characteristics (e.g., appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses;

(vi) Infiltration BMPs must not be used for areas of industrial or light

industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee, unless first treated or filtered to remove pollutants prior to infiltration; and

(vii) Infiltration BMPs must be located a minimum of 100 feet horizontally from any water supply wells.

(b) The Copermittee may develop, individually or with other Copermittees, alternative mandatory design criteria to that listed above for infiltration BMPs which are designed to primarily function as centralized infiltration devices. Before implementing the alternative design criteria in the development planning process the Copermitee(s) must:

(i) Notify the San Diego Water Board of the intent to implement the alternative design criteria submitted; and

(ii) Comply with any conditions set by the San Diego Water Board.

d. BMP DESIGN MANUAL UPDATE

Each Copermittee must update and implement its BMP Design Manual[32] pursuant to Provision F.2.b. ~~Until the Copermittee has updated its BMP Design Manual with the requirements of Provisions E.3.a-c, the Copermittee must continue implementing its current BMP Design Manual. Unless directed otherwise by the San Diego Water Board, the Copermittee must implement the BMP Design Manual within 180 days of completing the update.~~ The update of the BMP Design Manual must include the following:

Comment [A98]: This info was incorporated into F.2.b.

(1) Updated procedures to determine the nature and extent of storm water requirements applicable to a potential development or redevelopment projects. These procedures must inform project applicants of the storm water management requirements applicable to their project including, but not limited to, general requirements for all development projects, structural BMP design procedures and requirements, hydromodification management requirements, requirements specific to phased projects, and procedures specific to private developments and public improvement projects;

(2) Updated procedures to identify ~~pollutants and conditions of concern for selecting~~ the most appropriate structural BMPs that consider, at a minimum, the following:

(a) The requirements of E.3.c.(1) and (2)

~~(a)~~(b) Receiving water quality (including pollutants for which receiving waters are listed as impaired under the CWA section 303(d) List);

[32] The BMP Design Manual was formerly known as the Standard Storm Water Mitigation Plan under Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016.

~~(b)~~(c) Pollutants, stressors, and/or receiving water conditions that cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

~~(c)~~(d) Land use type of the project and pollutants associated with that land use type; and

~~(d)~~(e) Pollutants expected to be present onsite.

(3) Updated procedures for designing structural BMPs, including any updated performance requirements to be consistent with the requirements of Provision E.3.c for all structural BMPs listed in the BMP Design Manual;

(4) Long-term maintenance criteria for each structural BMP listed in the BMP Design Manual; and

(5) Alternative compliance criteria, in accordance with the requirements under Provision E.3.c.(3), if the Copermittee elects to allow Priority Development Projects within its jurisdiction to utilize alternative compliance.

e. PRIORITY DEVELOPMENT PROJECT BMP IMPLEMENTATION AND OVERSIGHT

Each Copermittee must implement a program that requires and confirms structural BMPs on all Priority Development Projects are designed, constructed, and maintained to remove pollutants in storm water to the MEP.

(1) Structural BMP Approval and Verification Process

(a) Each Copermittee must require and confirm that for all Priority Development Project applications that have not received prior lawful approval by the Copermittee by 18 months after the commencement of coverage under this Order, the requirements of Provision E.3 are implemented. For project applications that have received prior lawful approval by 18 months after the commencement of coverage under this Order, the Copermittee may allow previous land development requirements to apply.

(b) Each Copermittee must identify the roles and responsibilities of their various municipal departments in implementing the structural BMP requirements, including each stage of a project from application review and approval through BMP maintenance and inspections.

(c) Each Copermittee must require and confirm that appropriate easements and ownerships are properly recorded in public records and the information is conveyed to all appropriate parties when there is a change in project or site ownership.

(d) Each Copermittee must require and confirm that prior to occupancy and/or intended use of any portion of the Priority Development Project, each structural BMP is inspected to verify that it has been constructed and is operating in compliance with all of its specifications, plans, permits, ordinances, and the requirements of this Order.

(2) Priority Development Project Inventory and Prioritization

(a) Each Copermittee must develop, maintain, and update ~~at~~regularly~~at least annually~~, a watershed-based database to track and inventory all constructed Priority Development Projects and associated structural BMPs within its jurisdiction. Inventories must be accurate and complete beginning from January 2002 for the San Diego County Copermittees, February 2003 for the Orange County Copermittees, and July 2005 for the Riverside County Copermittees~~.~~, where data is available.~~.~~ The use of an automated database system, such as GIS, is highly recommended. The database must include, at a minimum, the following information:

(i) Priority Development Project location (address and hydrologic subarea);

(ii) Descriptions of structural BMP type(s);

(iii) Date(s) of construction;

(iv) Party responsible for structural BMP maintenance;

(v) Dates and findings of structural BMP maintenance verifications; and

(vi) Corrective actions and/or resolutions when applicable.

(b) Each Copermittee must prioritize the Priority Development Projects with structural BMPs within its jurisdiction. The designation of Priority Development Projects as high priority must consider the following:

(i) The highest water quality priorities identified in the Water Quality Improvement Plan;

(ii) Receiving water quality;

(iii) Number and sizes of structural BMPs;

(iv) Recommended maintenance frequency of structural BMPs;

(v) Likelihood of operation and maintenance issues of structural BMPs;

(vi) Land use and expected pollutants generated; and

(vii) Compliance record.

(3) Structural BMP Maintenance Verifications and Inspections

Each Copermittee is required to verify that structural BMPs on each Priority

Development Project are adequately maintained, and continue to operate effectively to remove pollutants in storm water to the MEP through inspections, self-certifications, surveys, or other equally effective approaches.

(a) All (100 percent) of the structural BMPs at Priority Development Projects that are designated as high priority must be inspected directly by the Copermittee annually prior to each rainy season;

(b) For verifications performed through a means other than direct Copermittee inspection, adequate documentation must be required by the Copermittee to provide assurance that the required maintenance of structural BMPs at each Priority Development Project has been completed; and

(c) Appropriate follow-up measures (including re-inspections, enforcement, etc.) must be conducted to ensure that structural BMPs at each Priority Development Project continue to reduce pollutants in storm water to the MEP as originally designed.

f. DEVELOPMENT PROJECT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all development projects, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

g. ~~STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS~~

Comment [A99]: This section was moved to the beginning of provision E.3.

~~Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the development planning program to address development and redevelopment projects that may become sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:~~

~~(5) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, increase frequency of verifications and/or inspections, alternative compliance options);~~

~~(6) Each Copermittee must identify areas within its jurisdiction where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting and/or stream, channel, or habitat rehabilitation projects;~~

~~(7) Each Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify regional alternative compliance projects that Priority Development Projects may be allowed or should be encouraged to implement or participate in implementing; and~~

~~(8) The strategies and/or activities must be consistent with the requirements of Provisions E.3.a-c and E.3.e-f and the strategies identified in the Water Quality Improvement Plan.~~

4. Construction Management

Each Copermittee must implement a construction management program in accordance with the strategies identified in the Water Quality Improvement Plan and includes, at a minimum, the following requirements:

STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Comment [A100]: This section was moved from provision E.4.f, Changes are shown in Redline

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the construction management program to address construction sites that the Copermittee has identified as potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, and/or increase/decrease frequency of inspections for specific types of sites and/or activities); and

(2) The strategies and/or activities must be consistent with the requirements of Provisions E.4.c-e and the strategies identified in the Water Quality Improvement Plan.

(3) The requirements of the programs as outlined in the following sub-provisions may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality improvement Plan(s).

a. PROJECT APPROVAL PROCESS

Prior to issuance of any local permit(s) that allows the commencement of construction projects that involve ground disturbance or soil disturbing activities that has the reasonable potential to discharge a pollutant load to and from the MS4, as defined in each Copermittees' JRMP~~can potentially generate pollutants in storm water runoff~~, each Copermittee must:

(1) Require a ~~site-specific~~ Pollution Control Plan~~pollution control~~, construction BMP, and/or erosion and sediment control plan, to be submitted by the project applicant to the Copermittee;

(2) Confirm the Pollution Control Plan~~pollution control~~, construction BMP, and/or erosion and sediment control plan, complies with the local grading ordinance, other applicable local ordinances, and the requirements of this Order;

(3) Confirm the Pollution Control Plan~~pollution control~~, construction BMP, and/or erosion and sediment control plan, includes seasonally appropriate and effective BMPs and management measures described in Provision E.4.c, as applicable to the project; and

(4) Verify that the project applicant has obtained coverage under ~~applicable permits, including, but not limited to~~ the Construction General Permit~~, Clean Water Act Section 401 Water Quality Certification and Section 404 Permit, and California Department of Fish and Game Streambed Alteration Agreement~~.

b. CONSTRUCTION SITE INVENTORY AND TRACKING

(1) Each Copermittee must maintain, and update ~~at least monthly~~regularly, a watershed-based inventory of all construction projects issued a local permit that allows ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff. The use of an automated database system, such as GIS, is highly recommended. The inventory must include:

(a) Relevant contact information for each site (e.g., name, address, phone, and email for the owner and contractor);

(b) The basic site information including location (address and hydrologic subarea), Waste Discharge Identification (WDID) number (if applicable), size of the site, and approximate area of disturbance;

(c) Whether or not the site is considered a high threat to water quality, as defined in Provision E.4.b.(2) below;

(d) The project start and ~~anticipated~~ completion dates;

~~(e) Current construction phase;~~

~~(f)~~(e) The required inspection frequency, as defined in the Copermittee's jurisdictional runoff management program document;

~~(g)~~(f) The date the Copermittee accepted and/or approved the ~~site-specific~~ pollution control plan, construction BMP, and/or erosion and sediment control plan; and

~~(h)~~(g) Whether or not there are ongoing enforcement actions administered to the site.

Comment [A101]: Some of the info can only be updated based on an inspection, which may or may not be monthly year round for all sites.

Comment [A102]: The anticipated completion date is often unknown and can fluctuate based on unpredictable and unforeseen circumstances. Keeping track of accurate dates in an inventory would be difficult and would not add significant value to the database. Construction Inspectors keep a close eye on the progress of projects and would not need to rely on inventory data to achieve effective stormwater management and oversight. Once a project is completed, the date can be entered into the database,.

(2) Each Copermittee must identify all construction sites within its jurisdiction that represent a high threat to downstream surface water quality. The designation of construction sites as high threat to water quality must consider the following:

(a) Sites located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Sites located within the same hydrologic subarea and tributary to a water body segment listed as impaired for sediment on the CWA section 303(d) List;

(c) Sites located within, directly adjacent to, or discharging directly to a receiving water within an ESA; and

(d) Other sites determined by the Copermittees or the San Diego Water Board as a high threat to water quality.

c. CONSTRUCTION SITE BMP IMPLEMENTATION

Comment [A103]: See discussion in section 3.9.1 of the comment letter.

Each Copermittee must implement, or require the implementation of effective BMPs (for Copermittee construction sites and private construction sites, respectively) to reduce discharges of pollutants in ~~storm water~~ runoff from construction sites to the MEP, and effectively prohibit~~prevent~~ non-storm water discharges from construction sites into the MS4. These BMPs must be site specific, seasonally appropriate, and construction phase appropriate. BMPs must be implemented at each construction site year round. Dry season BMP implementation must plan for and address unseasonal rain events that may occur during the dry season (May 1 through September 30). Copermittees must implement, or require the implementation of, BMPs in the following categories:

(1) Project Planning;

(2) Good Site Management “Housekeeping”, including waste management;

(3) Non-storm Water Management;

(4) Erosion Control;

(5) Sediment Control;

(6) Run-on and Run-off Control; and

(7) Active/Passive Sediment Treatment Systems, where applicable.

d. CONSTRUCTION SITE INSPECTIONS

Each Copermittee must conduct construction site inspections to require and confirm compliance with its local permits and applicable local ordinances, and the requirements of this Order. Priority for site inspections must consider threat to water quality pursuant to Provision E.4.b as well as the nature of the construction activity, topography, and the characteristics of soils and receiving water quality.

(1) Inspection Frequency

(a) Each Copermittee must conduct inspections at all inventoried sites, including high threat to water quality sites, at an appropriate frequency for each phase of construction to confirm~~ensure~~ the site reduces the discharge of pollutants in runoff~~storm water~~ from construction sites to the MEP, and effectively prevents non-storm water discharges from entering the MS4.

(b) Each Copermittee must establish appropriate inspection frequencies for high threat to water quality sites, and all other sites, for each phase of construction. Inspection frequencies appropriate for addressing the highest water quality priorities identified in the Water Quality Improvement Plan, and for complying with the requirements of this Order must be identified in each Copermittee's jurisdictional runoff management program document.

(c) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e., re-inspection, enforcement) necessary to require and confirm site compliance with its local permits and applicable local ordinances, and the requirements of this Order.

(2) Inspection Content

Inspections of construction sites by the Copermittee must include, at a minimum:

(a) Verification of coverage under the Construction General Permit (Notice of Intent (NOI) and/or WDID number) during initial inspections, when applicable;

(b) Assessment of compliance with its local permits and applicable local ordinances related to pollution prevention, including the implementation and maintenance of applicable BMPs;

(c) Assessment of BMP adequacy and effectiveness;

(d) Visual observations of actual non-storm water discharges;

(e) Visual observations of actual or potential discharge of sediment and/or construction related materials from the site;

(f) Visual observations of actual or potential illicit connections; and

(g) If any violations are found and BMP corrections are needed, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried construction sites. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Site name, location (address and hydrologic subarea), and WDID number (if applicable);

(b) Inspection date;

(c) Weather condition during~~Approximate amount of rainfall since last~~ inspection;

(d) Description of problems observed with BMPs and indication of need for BMP addition/repair/replacement and any scheduled re-inspection, and date of re-inspection;

(e) Descriptions of any other specific inspection comments which must, at a minimum, include rationales for longer compliance time;

(f) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(g) Resolution of problems noted and date problems fixed.

e. CONSTRUCTION SITE ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried construction sites, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

5. Existing Development Management

Comment [A104]: See discussion in section 3.10 of the comment letter.

Each Copermittee must implement an existing development management program in accordance with the strategies identified in the Water Quality Improvement Plan. and includes, at a minimum, the following requirements:

STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Comment [A105]: Moved from sub-provision e. Changes shown in redline

Each Copermittee must implement the water quality improvement strategies, where necessary, to address areas of existing development within its jurisdiction that are identified as sources of pollutants and/or stressors contributing to the highest priority water quality conditions in the Watershed Management Area. For the existing development management program, the following strategies must be implemented:

(1) Specific Existing Development Management Program Strategies

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented within its jurisdiction to address areas of existing development that the Copermittee has identified as sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(a) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, and/or increase/decrease frequency of inspections for specific types of facilities, areas and/or activities);

(b) The facilities and/or areas within the Copermittee's jurisdiction where the strategies and/or activities will be implemented; and

(2) The requirements of the programs as outlined in the following sub-provisions may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality improvement Plan(s).~~The strategies and/or activities must be consistent with the requirements of Provisions E.5.b-d and the strategies identified in the Water Quality Improvement Plan.~~

a. EXISTING DEVELOPMENT INVENTORY AND TRACKING

Each Copermittee must maintain, and update at least annually, a watershed-based inventory of the existing development within its jurisdiction that ~~may~~has the reasonable potential to~~may~~ discharge a high priority pollutant load to and from the MS4, as defined in the Copermittee's JRMP. The use of an automated database system, such as GIS, is highly recommended. The inventory must, at a minimum, evaluate and include the following if identified as a source of a high priority pollutant~~include~~:

(1) Name, location (hydrological subarea and address, if applicable) of the following types of existing development with its jurisdiction:

(a) Commercial facilities or areas;

(b) Industrial facilities;

(c) Copermittee owned Municipal facilities, including:

(i) MS4 and related structures,[33]

(ii) Roads, streets, and highways,

(iii) Parking facilities,

(iv) Municipal airfields,

(v) Parks and recreation facilities,

(vi) Flood management projects and flood control devices and structures,

(vii) Operating or closed municipal landfills,

(viii) Publicly owned treatment works (including water and wastewater treatment plants) and sanitary sewer collection systems,

(ix) Corporate yards, including maintenance and storage yards for materials, waste, equipment, and vehicles,

(x) Hazardous waste collection facilities,

(xi) Other treatment, storage or disposal facilities for municipal waste, and

(xii) Other Copermittee owned municipal facilities that the Copermittee determines may contribute a significant high priority pollutant load to the MS4; and

(d) Residential areas, which may be designated by one or more of the following:

(i) Residential management area,

(ii) Drainage basin or area,

(iii) Land use (e.g., single family, multi-family, rural),

(iv) Neighborhood,

[33] The inventory may refer to the MS4 map required to be maintained pursuant to Provision E.2.b.(1).

(v) Common Interest Area,

(vi) Home Owner Association,

(vii) Mobile home park, and/or

(viii) Other designations accepted by the San Diego Water Board Executive Officer.

(2) A description of the facility or area, including the following information:

(a) Classification as commercial, industrial, municipal, or residential;

(b) Status of facility or area as active or inactive;

(c) Identification if a business is a mobile business;

(d) SIC Code or NAICS Code, if applicable;

(e) Industrial General Permit NOI and/or WDID number, if applicable;

(f) Identification if a residential area is or includes a Common Interest Area / Home Owner Association, or mobile home park;

(g) Identification of pollutants generated and potentially generated by the facility or area;

(h) Whether the facility or area is adjacent to an ESA;

(i) Whether the facility or area is tributary to and within the same hydrologic subarea as a water body segment listed as impaired on the CWA section 303(d) List and generates pollutants for which the water body segment is impaired; and

(j) Whether the facility or area contributes or potentially contributes to the highest priority water quality conditions identified in the Water Quality Improvement Plan.

(3) An annually updated map showing the location of inventoried existing development, watershed boundaries, and water bodies.

b. EXISTING DEVELOPMENT BMP IMPLEMENTATION AND MAINTENANCE

Each Copermittee must designate a minimum set of BMPs required for all inventoried existing development, including special event venues. The designated minimum BMPs must be specific to facility or area types and pollutant generating activities, as appropriate.

(1) Commercial, Industrial, and Municipal Facilities and Areas

(a) Pollution Prevention

Each Copermittee must require the use of appropriate pollution prevention methods by the commercial, industrial, and municipal facilities and areas in its inventoried existing development, as determined necessary by the Copermittee to address the priorities and strategies addressed in the WQIP.

(b) BMP Implementation

Comment [A106]: See discussion in section 3.10.2 of the comment letter.

Each Copermittee must ~~implement, or~~ require the implementation of, designated BMPs at commercial facilities and areas, industrial facilities, and implement designated BMPs at municipal facilities in its inventoried existing development, as determined necessary by the Copermittee to address the priorities and strategies addressed in the WQIP.

(c) BMP Operation and Maintenance

(i) Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development.

(ii) Each Copermittee must implement a schedule of operation and maintenance activities for its MS4 and related structures (including but not limited to catch basins, storm drain inlets, detention basins, etc.), and verify proper operation of all its municipal structural treatment controls designed to reduce pollutants (including floatables) in storm water discharges to or from its MS4s and related drainage structures. Operation and maintenance activities may include, but is not limited to, the following:

[a] Inspections of the MS4 and related structures;
[b] Cleaning of the MS4 and related structures; and
[c] Proper disposal of materials removed from cleaning of the MS4 and related structures.

(iii) Each Copermittee must implement a schedule of operation and maintenance for public streets, unpaved roads, paved roads, and paved highways and freeways within its jurisdiction to minimize pollutants that can be discharged in storm water.

(iv) Each Copermittee must implement the following controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers:

[a]~~.~~ Copermittees that operate both a municipal sanitary sewer system and a MS4 must implement controls and measures to

prevent and eliminate seeping sewage from infiltrating the MS4.

[b]- Copermittees that do not operate both a municipal sanitary sewer system and a MS4 must coordinate with sewering agencies to keep themselves informed of relevant and appropriate maintenance activities and sanitary sewage projects in their jurisdiction that may cause or contribute to seepage of sewage into the MS4.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Comment [A107]: See discussion in section 3.10.2 of the comment letter.

Each Copermittee must implement BMPs, or require the implementation of BMPs, to reduce pollutants in runoffstorm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from commercial facilities and areas, industrial facilities;, and implement such BMPs at municipal facilities in its inventoried existing development. Such BMPs must include, as appropriate, educational activities, permits, certifications and other measures for applicators and distributors.

(2) Residential Areas

(a) Pollution Prevention

Each Copermittee must promote and encourage the use of pollution prevention methods, where appropriate, by the residential areas in its inventoried existing development.

(b) BMP Implementation

Each Copermittee must promote and encourage the implementation of designated BMPs at residential areas in its inventoried existing development.

(c) BMP Operation and Maintenance

Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at residential areas in its inventoried existing development.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must promote and encourage the implementation of BMPs to reduce pollutants in runoffstorm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from residential areas in its inventoried existing development.

c. Existing Development Inspections

Each Copermittee must conduct inspections of inventoried existing development that have been identified by the Copermittee as having the reasonable potential to discharge pollutant loads from their MS4, to ensure compliance with applicable local ordinances and permits, and the requirements of this Order.

(1) Inspection Frequency

(a) Each Copermittee must establish appropriate inspection frequencies for inventoried existing development in accordance with the following requirements:

(i) At a minimum, inventoried existing development must be inspected once every five years utilizing one or more of the following methods:

[a] Drive-by inspections by Copermittee municipal and contract staff,
[b] Onsite inspections by Copermittee municipal and contract staff, and/or
[c] Inspections by volunteer monitoring or patrol programs trained by the Copermittee;

(ii) The frequency of inspections must be appropriate to confirm that BMPs are being implemented to reduce the discharge of pollutants in runoff~~storm water~~ from the MS4 to the MEP and effectively prohibit non-storm water discharges to the MS4;

(iii) The frequency of inspections must be based on the potential for a facility or area to discharge non-storm water and pollutants in storm water, and should reflect the priorities set forth in the Water Quality Improvement Plan;

~~(iv) Each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development;[34] and~~

~~(v)~~(iv) Inventoried existing development must be inspected by the Copermittee, as needed, in response to valid public complaints and findings from the Copermittee's municipal and contract staff or volunteer monitoring or patrol program inspections.

(b) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e. education and outreach, re-inspection, enforcement) necessary to require and confirm compliance with its applicable local

Comment [A108]: Recommend keeping this instead of SD proposed 'during the permit term'. The 'during the permit term' language is problematic for businesses that are added to the inventory during the permit term. For example, if a business is added to the inventory one month before the expiration of the permit, it may not be reasonable to expect it to be immediately inspected. It is also problematic for Riverside (and OC?), who may be added to the permit less than two years before the end of the permit term.

Comment [A109]: See discussion in section 3.10.2 of the comment letter.

~~[34] If any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspection may count toward the total annual inspection requirement. This requirement excludes linear municipal facilities (i.e., MS4, streets, roads and highways).~~

ordinances and permits and the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

(2) Inspection Content

(a) Inspections of existing development by the Copermittee or volunteer monitoring or patrol programs must include, at a minimum:

(i) Visual inspections for actual non-storm water discharges, if present;

(ii) Visual inspections for actual or potential discharge of pollutants, if present;

(iii) Visual inspections for actual or potential illicit connections, if present; and

(iv) Verification that the description of the facility or area in the inventory, required pursuant to Provision E.5.a.(2), has not changed.

(b) Onsite inspections of existing development by the Copermittee must include, at a minimum:

(i) Assessment of compliance with its applicable local ordinances and permits related to non-storm water and storm water discharges and runoff;

(ii) Assessment of the implementation of the designated BMPs;

(iii) Verification of coverage under the Industrial General Permit, when applicable; and

(iv) If any problems or violations are found, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried existing development. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Name and location of facility or area (address and hydrologic subarea) consistent with the inventory name and location, pursuant to Provision E.5.a.(1);

(b) Inspection and re-inspection date(s);

(c) Inspection method(s) (i.e. drive-by, onsite);

(d) Observations and findings from the inspection(s);

(e) For onsite inspections of existing development by Copermittee municipal or contract staff, the records must also include, as applicable:

(i) Description of any problems or violations found during the inspection(s),

(ii) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6, and

(iii) The date problems or violations were resolved.

d. EXISTING DEVELOPMENT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried existing development, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

e. RETROFITTING AND REHABILITATION~~STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS~~

~~Each Copermittee must implement the water quality improvement strategies, where necessary, to address areas of existing development within its jurisdiction that are identified as sources of pollutants and/or stressors contributing to the highest priority water quality conditions in the Watershed Management Area. For the existing development management program, the following strategies must be implemented:~~

~~(3) Specific Existing Development Management Program Strategies~~

~~Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented within its jurisdiction to address areas of existing development that the Copermittee has identified as sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:~~

~~(a) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, and/or increase/decrease frequency of inspections for specific types of facilities, areas and/or activities);~~

~~(b) The facilities and/or areas within the Copermittee's jurisdiction where the strategies and/or activities will be implemented; and~~

~~(c)~~(a) ~~The strategies and/or activities must be consistent with the requirements of Provisions E.5.b-d and the strategies identified in the Water Quality Improvement Plan.~~

~~(4)~~(3) Retrofitting Areas of Existing Development

Where identified in the WQIP as a required strategy to address the highest priority water quality conditions, each~~Each~~ Copermittee must describe in its jurisdictional runoff management program document, a program to retrofit areas of existing development within its jurisdiction to address identified sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must, where necessary pursuant to the strategies identified in the WQIP, identify areas of existing development as candidates for retrofitting, focusing on areas where retrofitting will address pollutants and/or stressors that contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for retrofitting projects may be utilized to reduce pollutants that may be discharged in storm water from areas of existing development, and/or address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of retrofitting projects, where needed in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting projects; and

(e) Where retrofitting projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional retrofitting projects (i.e. projects that can receive and/or treat storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment) adjacent to and/or downstream of the areas of existing development.

~~(5)~~(4) Stream, Channel and/or Habitat Rehabilitation in Areas of Existing Development

Where identified in the WQIP as a required strategy to address the highest priority water quality conditions, each~~Each~~ Copermittee must describe in its jurisdictional runoff management program document, a program to rehabilitate streams, channels, and/or habitats in areas of existing development within its jurisdiction to address the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must, where necessary pursuant to the strategies identified in the WQIP, identify streams, channels, and/or habitats in areas of existing development as candidates for rehabilitation, focusing on areas where stream, channel, and/or habitat rehabilitation projects will address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for stream, channel, and/or habitat rehabilitation projects may be utilized to address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters, rehabilitate channelized or hydromodified streams, restore wetland and riparian habitat, restore watershed functions, and/or ~~restore~~ protect beneficial uses of receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of stream, channel, and/or habitat rehabilitation projects, where needed, in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance stream, channel, and/or habitat rehabilitation projects; and

(e) Where stream, channel, and/or habitat rehabilitation projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional stream, channel, and/or habitat rehabilitation projects (i.e. projects that can receive storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment).

(5) Upon Regional Board Executive Officer approval the Copermittees may reallocate resources in the WQIPs for retrofit and rehabilitation project(s).

6. Enforcement Response Plans

Each Copermittee must develop and implement an Enforcement Response Plan as part of its jurisdictional runoff management program document. The Enforcement Response Plan must describe the applicable approaches and options to enforce its legal authority established pursuant to Provision E.1, as necessary, to achieve compliance with the requirements of this Order. Copermittees may continue to utilize and implement established, equivalent guidelines and procedures for enforcement. If such equivalent guidelines and procedures have not been developed, ~~T~~the Enforcement Response Plan must include the following:

a. ENFORCEMENT RESPONSE PLAN COMPONENTS

The Enforcement Response Plan must include the following individual components:

(1) Illicit Discharge Detection and Elimination Enforcement Component;

(2) Development Planning Enforcement Component;

(3) Construction Management Enforcement Component; and

(4) Existing Development Enforcement Component.

b. ENFORCEMENT RESPONSE APPROACHES AND OPTIONS

Each component of the Enforcement Response Plan must describe the enforcement response approaches that the Copermittee will implement to compel compliance with its statutes, ordinances, permits, contracts, orders, or similar means, and the requirements of this Order. The description must include the protocols for implementing progressively stricter enforcement responses. The enforcement response approaches must include appropriate sanctions, as legally appropriate, to compel compliance, including, at a minimum, the following tools or their equivalent:

(1) Verbal and written notices of violation;

(2) Cleanup requirements;

(3) Fines;

(4) Bonding requirements;

(5) Administrative and criminal (if intentional or criminally negligent) penalties;

(6) Liens;

(7) Stop work orders; and

(8) Permit and occupancy denials.

c. CORRECTION OF VIOLATIONS

(1) Violations must be corrected in a timely manner with the goal of correcting the violations within 30 calendar days after the violations are discovered, or prior to the next predicted rain event, whichever is sooner.

(2) The status of the enforcement actions~~If more than 30 calendar days are required to achieve compliance, then a rationale~~ must be recorded and updated in the applicable electronic database or tabular system used to track violations.

Comment [A110]: This is just asking for paperwork violations if someone forgets to write a specific justification – even if all appropriate steps are being diligently pursued. Request alternatively to simply require that the status be updated as appropriate.

d. ~~ESCALATED~~ PROGRESSIVE ENFORCEMENT

Comment [A111]: See discussion in section 3.11.2 of the comment letter.

(1) The Enforcement Response Plan must include a definition of "~~escalated~~ progressive enforcement." ~~Escalated~~ Progressive enforcement must include a series of enforcement actions that match the severity of the violations and include distinct, progressive steps. ~~any enforcement scenario where a violation or other non-compliance is determined to cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan~~. ~~Escalated~~ Progressive enforcement may be defined differently for development planning, construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and/or residential areas.

(2) Where the Copermittee determines ~~escalated~~ the identified progressive enforcement steps ~~is~~are not required, a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

(3) ~~Escalated~~ Progressive enforcement actions must continue to increase in severity, as necessary, to compel compliance as soon as possible.

e. REPORTING OF NON-COMPLIANT SITES

(1) Each Copermittee must notify the San Diego Water Board in writing within ~~22~~5 calendar~~2 working~~ days of issuing escalated enforcement (as defined in the Copermittee's Enforcement Response Plan) to a construction site that poses a significant threat to water quality as a result of violations or other non-compliance with its permits and applicable local ordinances, and the requirements of this Order. Written notification may be provided electronically by email.

(2) Each Copermittee must notify the San Diego Water Board of non-filers under the Industrial General Permit and Construction General Permit by email to Nonfilers_R9@waterboards.ca.gov.

7. Public Education and Participation

Each Copermittee must implement, individually or with other Copermittees, a public education and participation program in accordance with the strategies identified in the Water Quality Improvement Plan to promote and encourage the development of programs, management practices, and behaviors that reduce the discharge of pollutants in runoff~~storm water~~ to the MEP, prevent controllable non-storm water discharges from entering the MS4, and protect water quality standards in receiving waters.

STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Comment [A112]: Recommended move from (c)

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented within its jurisdiction, as applicable, to educate the public and encourage public participation to address potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) The target audiences and/or areas within the Copermittee's jurisdiction where the strategies and/or activities will be implemented;

(2) Provide specific details about how the strategies and/or activities will be implemented (e.g. educational topics, materials and/or activities, public outreach and participation programs and/or opportunities);

(3) Each Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify and implement regional public education and participation activities, programs and opportunities;

(4) Each Copermittee must incorporate a mechanism for evaluating and assessing educational and other public outreach activities, as needed, to identify progress and incorporate modifications necessary to increase the effectiveness of the public education and participation program.

(5) The requirements of the programs as outlined in the following sub-provisions

may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality improvement Plan(s).

a. PUBLIC EDUCATION

The public education program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) Educational activities, public information activities, and other appropriate outreach activities intended to reduce pollutants associated with the ~~application of pesticides, herbicides and fertilizer- and other pollutants of concern in storm water discharges to and from its MS4 to the MEP, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed to address the~~ highest priority water quality conditions identified in the Water Quality Improvement Plan;

(2) Educational activities, public information activities, and other appropriate outreach activities to facilitate the proper management and disposal of used oil and toxic materials; and

(3) Appropriate education and training measures for specific target audiences, such as construction site operators, residents, underserved target audiences and school-aged children, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed, based on high risk behaviors and pollutants of concern.

b. PUBLIC PARTICIPATION

The public participation program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) A process for members of the public to participate in updating the highest priority water quality conditions, numeric goals, and water quality improvement strategies in the Water Quality Improvement Plan.

(2) Opportunities for members of the public to participate in providing the Copermittee recommendations for improving the effectiveness of the water quality improvement strategies implemented within its jurisdiction.

(3) Opportunities for members of the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in ~~storm wate~~r discharges from

the MS4, and/or ~~restoration and~~ protection of the quality of receiving waters.

8. Fiscal Analysis

a. ~~Each Copermittee must secure the resources necessary to meet all the requirements of this Order~~.

b. Each Copermittee must conduct an annual fiscal analysis of its jurisdictional runoff management program in its entirety. The fiscal analysis must include the following:

(1) Identification of the various categories of expenditures necessary to implement the requirements of this Order, including a description of the specific capital, operation and maintenance, and other expenditure items to be accounted for in each category of expenditures;

(2) The staff resources needed and allocated to meet the requirements of this Order, including any development, implementation, and enforcement activities required;

(3) The estimated expenditures for Provisions E.8.b.(1) and E.8.b.(2) for the current fiscal year; and

(4) The source(s) of funds that are proposed to meet the necessary expenditures described in Provisions E.8.b.(1) and E.8.b.(2), including legal restrictions on the use of such funds, for the current fiscal year and next fiscal year.

c. Each Copermittee must submit a summary of the annual fiscal analysis with each Annual Report required pursuant to Provision F.3.b.

d. Each Copermittee must provide the documentation used to develop the summary of the annual fiscal analysis upon request by the San Diego Water Board.

Comment [A113]: Since the monitoring period is different than a fiscal year, we won't be able to consistently and accurately report monitoring costs incurred by the Copermittees. (which are a big part of overall budgets)

Comment [A114]: Please see Legal Comments.

F. REPORTING

Comment [A115]: See discussion in section 3.14 of the comment letter.

The purpose of this provision is to determine and document compliance with the requirements set forth in this Order. The goal of reporting is to communicate to the San Diego Water Board and the people of the State of California the implementation status of each jurisdictional runoff management program and compliance with the requirements of this Order. This goal is to be accomplished through the submittal of specific deliverables to the San Diego Water Board by the Copermittees.

1. Water Quality Improvement Plans

Comment [A116]: See discussion in section 3.14.1 of the comment letter.

The Copermittees for each Watershed Management Area must develop and submit the Water Quality Improvement Plan in accordance with the following requirements:

a. WATER QUALITY IMPROVEMENT PLAN DEVELOPMENT

Each Water Quality Improvement Plan must be developed in accordance with the following process:

(1) Priority Water Quality Conditions and Numeric Goals

(a) The Copermittees must implement a public participation process to solicit data and information to be utilized in the development and identification of the priority water quality conditions for the Watershed Management Area.

(b) The Copermittees are encouraged to involve the public and key stakeholders as early and often as possible during the development of the priority water quality conditions and numeric goals to be included in the Water Quality Improvement Plan.

(c) Within 6 months after the commencement of coverage under this Order, the Copermittees must develop and submit the Water Quality Improvement Plan requirements of Provision B.2 to the San Diego Water Board. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of 60 days.

(d) The Copermittees must revise the priority water quality conditions and numeric goals based on comments received and/or recommendations or direction from the San Diego Water Board Executive Officer.

(2) Water Quality Improvement Strategies and Schedules

(a) The Copermittees are encouraged to involve the public and key stakeholders as early and often as possible during the development of the water quality improvement strategies and schedules to be included in the Water Quality Improvement Plan.

(b) Within 9 months after receipt~~the commencement~~ of public comments and/or recommendations from the Executive Officer per (1)(c) above~~coverage under this Order~~, the Copermittees must develop and submit the Water Quality Improvement Plan requirements of Provision B.3 to the San Diego Water Board. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of 60 days.

(c) The Copermittees must revise the water quality improvement strategies and schedules based on comments received and/or recommendations or direction from the San Diego Water Board Executive Officer.

b. WATER QUALITY IMPROVEMENT PLAN SUBMITTAL

(1) Within 6~~18~~ months after receipt~~the commencement~~ of public comments and/or recommendations from the Executive Officer per (2)(c) above~~coverage under this Order~~, the Copermittees for each Watershed Management Area must submit a complete Water Quality Improvement Plan in accordance with the requirements of Provision B to the San Diego Water Board. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of 30 days.

(2) Based on the comments received, the San Diego Water Board will determine whether to hold a public hearing or to limit public input to submittal of written comments. If no hearing is held the San Diego Water Board will notify the Copermittees within 6 months that the Water Quality Improvement Plan has been accepted as complete following its review and determination that the Water Quality Improvement Plan meets the requirements of this Order.

(3) The Copermittees must revise the Water Quality Improvement Plan based on comments received and/or recommendations or direction from the San Diego Water Board Executive Officer.

(4) The Water Quality Improvement Plan must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance by the San Diego Water Board.

(5) Copermittees must commence with implementation of the BMP strategies identified in the Water Quality Improvement Plan no later than the fiscal year (July 1) following San Diego Water Board approval of the Water Quality Improvement Plan, and the monitoring strategies identified in the Water Quality Improvement Plan no later than October 1st (or May 1st, whichever is sooner) following the San Diego Water Board approval of the Water Quality Improvement Plan.

2. Updates

Comment [A117]: See discussion in section 3.14.1 of the comment letter.

a. Jurisdictional Runoff Management Program Document Updates

Each Copermittee must update its jurisdictional runoff management program document in accordance with the following requirements:

(1) Each Copermittee is encouraged to involve the public and key stakeholders as early and often as possible to solicit recommendations for updates to its jurisdictional runoff management program document.

(2) Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E and the strategies identified in the applicable WQIPs no later than 6~~18~~ months after approval~~the commencement~~ of the applicable Water Quality Improvement Plans (or updates thereto).~~coverage under this Order.~~

(3) The updated JRMP document must be implemented beginning July 1st following completion of the update, unless directed otherwise by the Executive Officer.

~~(3)~~(4) Each Copermittee must submit any subsequent updates to its jurisdictional runoff management program, with a rationale for the modifications, either in the Annual Report required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge required pursuant to Provision F.5.b.

~~(4)~~(5) The Copermittee must revise the modifications as directed by the San Diego Water Board Executive Officer.

~~(5)~~(6) Updated jurisdictional runoff management program documents must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of submitting the Annual Report.

b. BMP Design Manual Updates

Each Copermittee must update its BMP Design Manual in accordance with the following requirements:

(1) Each Copermittee must update its BMP Design Manual to incorporate the requirements of Provisions E.3.a-d, and E.3.g. no later than 6~~18~~ months after approval~~the commencement~~ of the applicable Water Quality Improvement Plans..

Comment [A118]: This is necessary for the WQIP strategies to inform the Development Planning process

(2) Unless directed otherwise by the San Diego Water Board, the Copermittee must implement the updated BMP Design Manual within 180 days of

Comment [A119]: An implementation date was missing from the Tentative Order

completing updates to the BMP Design Manual.

~~(1)~~(3) Until the Copermittee begins implementation of its updated BMP Design Manual, the Copermittee must continue implementing its current BMP Design Manual~~coverage under this Order~~.

Comment [A120]: This was moved to here

~~(2)~~(4) Subsequent updates must be consistent with the requirements of Provisions E.3.a-d and must be submitted as part of the Annual Reports required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge required pursuant to Provision F.5.b.

~~(3)~~(5) Updated BMP Design Manuals must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of completing the update.

c. WATER QUALITY IMPROVEMENT PLAN UPDATES

The Water Quality Improvement Plans must be updated in accordance with the following process:

(1) The Copermittees must implement a public participation process to solicit data and information to be utilized in updating the Water Quality Improvement Plan.

(2) The Copermittees are encouraged to involve the public and key stakeholders as early and often as possible during the updates to the Water Quality Improvement Plan.

(3) The Copermittees for each Watershed Management Area must submit requested updates to the Water Quality Improvement Plan, with the public input received and the rationale for the requested updates, either in the Annual Reports required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The requested updates are considered accepted by the San Diego Water Board if no response is provided to the Copermittee after 3 months of submitting the request.

(4) The Copermittees must revise the requested updates as directed by the San Diego Water Board Executive Officer.

(5) Updated Water Quality Improvement Plans must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance of the requested updates by the San Diego Water Board.

3. Progress Reporting

Comment [A121]: See discussion in section 3.14.1 of the comment letter.

a. PROGRESS REPORT PRESENTATIONS

The Copermittees for each Watershed Management Area must appear before the San Diego Water Board, as requested by the San Diego Water Board, to provide progress reports on the implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs.

b. ANNUAL REPORTS

Comment [A122]: See discussion in section 3.14.1 of the comment letter.

(1) Transitional Period JRMP Reports: Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (Attachment D or accepted revision) no later than October 31 of each year prior to the implementation of updated JRMP programs pursuant to F.2.a. Each Copermittee must submit the information on the Jurisdictional Runoff Management Program Annual Report Form specific to the area within its jurisdiction in each Watershed Management Area.

(2) Transitional Period Monitoring Report: The transitional period monitoring conducted pursuant to D.1.a and D.2.a. shall be reported in a single report that covers the entire reporting period from the initiation of the transitional period monitoring (as described in D.1.a and D.2.a.), through September 30th following approval of the Water Quality Improvement Plan. The Transitional Period Monitoring Report shall include the assessments required per D.4.a.(1)(a), D.4.b.(1)(a) and D.4.b.(2)(a); and be submitted by January 31st following completion of the above mentioned transitional period.

~~(1)~~(3) Post-Transitional Annual Reports – Following the initial transitional period after enrollment into this Order, the~~The~~ Copermittees for each Watershed Management Area must submit an combined Annual Report for each reporting period no later than January 31 of the following year. The annual reporting period consists of two periods: 1) July 1 to June 30 of the following year for the jurisdictional runoff management programs, 2) October 1 to September 30 of the following year for the monitoring and assessment programs~~. The first Annual Report must be prepared for the reporting period beginning July 1 after commencement of coverage under this Order, and upon San Diego Water Board determination that the Water Quality Improvement Plan meets the requirements of this Order to June 30 in the following year for the jurisdictional runoff management programs, and September 30 in the following year for the monitoring and assessment programs.~~ Annual Reports must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Each Annual Report must include the following:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, summarized and presented in tabular and graphical form;

(b) Progress of the special studies required pursuant to Provision D.3, and the results or findings when a special study, or each phase of a special study, is completed;

(c) The findings from the applicable assessments required pursuant to Provision D.4;

Comment [A123]: Not all are required annually.

(d) The progress of implementing the Water Quality Improvement Plan, including, but not limited to, the following:

(i) The progress toward achieving the interim and final numeric goals for the highest water quality priorities for the Watershed Management Area,

(ii) The water quality improvement strategies that were implemented and/or no longer implemented by each of the Copermittees during the reporting period and previous reporting periods, and are planned to be implemented during the next reporting period,

(iii) Proposed modifications to the water quality improvement strategies, with public input received and rationale for the proposed modifications,

(iv) Previously proposed modifications or updates incorporated into the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document and implemented by the Copermittees in the Watershed Management Area, and

(v) Proposed modifications or updates to the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document;

(e) A completed Jurisdictional Runoff Management Program Annual Report Form (Attachment D or accepted revision) for each Copermittee in the Watershed Management Area, certified by a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative.

~~(2) Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (Attachment D or accepted revision) no later than October 31 of each year until the first Annual Report is required to be submitted. Each Copermittee must submit the information on the Jurisdictional Runoff Management Program Annual Report Form specific to the area within its jurisdiction in each Watershed Management Area.~~

Comment [A124]: Adapted into new section (1)

~~(3)~~(4) Each Copermittee must provide any data or documentation utilized in

developing the Annual Report upon request by the San Diego Water Board. ~~AnyAny~~Copermittee~~Any~~ monitoring data utilized in developing the Annual Report must be uploaded to the California Environmental Data Exchange Network (CEDEN).[35] Any Copermittee monitoring and assessment data utilized in developing the Annual Report must be provided on the Regional Clearinghouse required pursuant to Provision F.4.

C. Regional Monitoring and Assessment Report

(1) The Copermittees must submit a Regional Monitoring and Assessment Report no later than 180 days in advance of the expiration date of this Order. The Regional Monitoring and Assessment Report may be submitted as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The Regional Monitoring and Assessment Report shall incorporate the Integrated Assessment of the Water Quality Improvement Plan per D.4.d.

~~(1) The Copermittees must review the receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, and findings from the assessments required pursuant to Provision D.4, to assess the following:~~

~~(2)~~

~~(3) The beneficial uses of the receiving waters within the San Diego Region that are protected or must be restored;~~

~~(4)~~

~~(5) The progress toward restoring impacted beneficial uses in the receiving waters within the San Diego Region; and~~

~~(6)~~

~~(7) Pollutants or conditions of emerging concern that may impact beneficial uses in the receiving waters within the San Diego Region.~~

~~(8)~~

~~(9) The Regional Monitoring and Assessment Report must include recommendations for improving the implementation and assessment of the Water Quality Improvement Plans and jurisdictional runoff management programs.~~

(2) Each Copermittee must provide any data or documentation utilized in developing the Regional Monitoring and Assessment Report upon request by the San Diego Water Board. Any monitoring and assessment data utilized in developing the Regional Monitoring and Assessment Report must be provided on the Regional Clearinghouse required pursuant to Provision F.4.

[35] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

4. Regional Clearinghouse

The Copermittees must develop, update, and maintain an internet-based Regional Clearinghouse that is made available to the public no later than 18 months after the effective date of this Order.[36]

a. The Copermittees, through the Regional Clearinghouse, must make the following documents and data available, organized by Watershed Management Area, which may be linked to other internet-based data portals and databases where the original documents are stored:

(1) Water Quality Improvement Plan for the Watershed Management Area, and all updated versions with date of update;

(2) Annual Reports for the Watershed Management Area;

(3) Jurisdictional Runoff Management Program document for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(4) BMP Design Manual for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(5) Reports from special studies (e.g. source identification, BMP effectiveness assessment) conducted in the Watershed Management Area;

(6) Monitoring data collected pursuant to Provision D for each Watershed Management Area must be uploaded to CEDEN,[37] with links to the uploaded data; and

(7) Available GIS data, layers, and/or shapefiles used to develop the maps generated and maintained by the Copermittees for the Water Quality Improvement Plans, Annual Reports, and jurisdictional runoff management program documents.

b. The Copermittees, through the Regional Clearinghouse, must make the following information and documents available:

(1) Contact information (point of contact, phone number, email address, and mailing address) for each Copermittee;

[36] The Copermittee may elect to develop and maintain the clearinghouse(s) provided by other Copermittees or agencies.

[37] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

(2) Public hotline number for reporting non-storm water and illicit discharges for each Copermittee;

(3) Email address for reporting non-storm water and illicit discharges for each Copermittee;

(4) Link to each Copermittee's website, if available, where the public may find additional information about the Copermittee's storm water management program and for requesting records for the implementation of its program;

(5) Information about opportunities for the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in ~~storm water~~ discharges from the MS4, and/or restoration and protection of the quality of receiving waters; and

(6) Reports from regional monitoring programs in which the Copermittees participate (e.g. Southern California Monitoring Coalition, Southern California Coastal Water Research Project Bight Monitoring);

(7) Regional Monitoring and Assessment Reports; and

(8) Any other information, data, and documents the Copermittees determine as appropriate for making available to the public.

5. Report of Waste Discharge

a. The Orange County Copermittees and the Riverside County Copermittees are required to submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders. The San Diego Water Board will review and consider the Reports of Waste Discharge to determine whether modification to this Order, pursuant to the requirements of Provision H, will be required prior the Orange County Copermittees and/or Riverside County Copermittees becoming covered under this Order. The current Orders for the Orange County Copermittees and Riverside County Copermittees are rescinded upon notification of coverage under this Order except for enforcement purposes.

b. The Copermittees subject to the requirements of this Order must submit to the San Diego Water Board a complete Report of Waste Discharge as an application for the re-issuance of this Order and NPDES permit. The Report of Waste Discharge must be submitted no later than 180 days in advance of the expiration date of this Order. The Report of Waste Discharge must contain the following minimum information:

(1) Names and addresses of the Copermittees;

(2) Names and titles of the primary contacts of the Copermittees;

(3) Proposed changes to the Copermittees' Water Quality Improvement Plans and the supporting justification;

(4) Proposed changes to the Copermittees' jurisdictional runoff management programs and the supporting justification;

(5) Any other information necessary for the re-issuance of this Order;

(6) Any information to be included as part of the Report of Waste Discharge pursuant to the requirements of this Order; and

(7) Any other information required by federal regulations for NPDES permit reissuance.

6. Application for Early Coverage

a. The Orange County Copermittees, collectively, or Riverside County Copermittees, collectively, may apply for early coverage under this Order by submitting a Report of Waste Discharge Form 200, with a written request for early coverage under this Order.

Comment [A125]: This form requests information that is not applicable to MS4s.

b. The San Diego Water Board will review the application for early coverage. A notification of coverage under this Order will be issued to the Copermittees in the respective county by the San Diego Water Board upon completion of the early coverage application requirements. The effective coverage date will be specified in the notification of coverage. The Copermittees in the respective county are authorized to have MS4 discharges pursuant to the requirements of this Order starting on the effective coverage date specified in the notification of coverage. The existing Order for the respective county is rescinded upon the effective coverage date specified in the notification of coverage except for enforcement purposes.

7. Reporting Provisions

Each Copermittee must comply with all the reporting and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

G. PRINCIPAL WATERSHED COPERMITTEE RESPONSIBILITIES

1. The Copermittees within each Watershed Management Area must designate a Principal Watershed Copermittee and notify the San Diego Water Board of the name of the Principal Watershed Copermittee. ~~An individual Copermittee should not be designated a Principal Watershed Copermittee for more than two Watershed Management Areas.~~ The notification may be submitted with the Water Quality Improvement Plan required pursuant to Provision F.1 of this Order.

2. The Principal Watershed Copermittee is responsible for, at a minimum, the following:

a. Serving as liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues, and when necessary and appropriate, representing the Copermittees in the Watershed Management Area before the San Diego Water Board.

b. Facilitating the development of the Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order

c. Coordinating the submittal of the deliverables required by Provisions F.1, F.2, F.3.a, and F.3.b of this Order.

d. Coordinating the development of~~and developing~~, with the other Principal Watershed Copermittees, the requirements of Provisions F.3.c, F.4, and F.5.b of this Order.

H. MODIFICATION OF PROGRAMS

1. Modifications of the Order may be initiated by the San Diego Water Board or by the Copermittees, including as part of the ROWD process applicable to the Orange County and Riverside County Copermittees. Requests by Copermittees must be made to the San Diego Water Board.

2. Minor modifications to the Order may be made by the San Diego Water Board Executive Officer, where the proposed modification complies with all the effective prohibitions and limitations, and other requirements of this Order.

3. Proposed modifications to the Order outside of the WQIP process that are not minor require amendment of this Order in accordance with this Order's rules, policies, and procedures.

4. The San Diego Water Board may re-open and modify this Order at any time prior to its expiration, after opportunity for public comment and a public hearing, if the State Water Board determines that revisions are warranted to those provisions of the Order addressing compliance with water quality standards in the receiving water and/or those provisions of the Order establishing an iterative process for implementation of management practices to assure compliance with water quality standards in the receiving water.

I. STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

Each Copermittee must comply with all the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

ATTACHMENT A

DISCHARGE PROHIBITIONS AND SPECIAL PROTECTIONS

1. Basin Plan Waste Discharge Prohibitions

California Water Code Section 13243 provides that a Regional Water Board, in a water quality control plan, may specify certain conditions or areas where the discharge of waste or certain types of waste is not permitted. The following waste discharge effective prohibitions in the Water Quality Control Plan for the San Diego Basin (Basin Plan) are applicable to any person, as defined by Section 13050(c) of the California Water Code, who is a citizen, domiciliary, or political agency or entity of California whose activities in California could affect the quality of waters of the state within the boundaries of the San Diego Region.

1. The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in California Water Code Section 13050, is prohibited.

2. The discharge of waste to land, except as authorized by waste discharge requirements or the terms described in California Water Code Section 13264 is prohibited.

3. The discharge of pollutants or dredged or fill material to waters of the United States except as authorized by a National Pollutant Discharge Elimination System (NPDES) permit or a dredged or fill material permit (subject to the exemption described in California Water Code Section 13376) is prohibited.

4. Discharges of recycled water to lakes or reservoirs used for municipal water supply or to inland surface water tributaries thereto are prohibited, unless this San Diego Water Board issues a NPDES permit authorizing such a discharge; the proposed discharge has been approved by the State Department of Health Services (DHS) and the operating agency of the impacted reservoir; and the discharger has an approved fail-safe long-term disposal alternative.

5. The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the San Diego Water Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

6. The discharge of waste in a manner causing flow, ponding, or surfacing on lands not owned or under the control of the discharger is prohibited, unless the discharge is authorized by the San Diego Water Board.

7. The dumping, deposition, or discharge of waste directly into waters of the state, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the San Diego Water Board.

8. Any discharge to a storm water conveyance system that is not composed entirely of "*storm water*" is effectively prohibited unless authorized by the San Diego Water Board. [The federal regulations, 40 CFR 122.26(b)(13), define storm water as storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from fire fighting activities.] [§122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

9. The unauthorized discharge of treated or untreated sewage to waters of the state or to a storm water conveyance system is prohibited.

10. The discharge of industrial wastes to conventional septic tank/subsurface disposal systems, except as authorized by the terms described in California Water Code Section 13264, is prohibited.

11. The discharge of radioactive wastes amenable to alternative methods of disposal into the waters of the state is prohibited.

12. The discharge of any radiological, chemical, or biological warfare agent into waters of the state is prohibited.

13. The discharge of waste into a natural or excavated site below historic water levels is prohibited unless the discharge is authorized by the San Diego Water Board.

14. The discharge of sand, silt, clay, or other earthen materials from any activity, including land grading and construction, in quantities which cause deleterious bottom deposits, turbidity or discoloration in waters of the state or which unreasonably affect, or threaten to affect, beneficial uses of such waters is prohibited.

15. The discharge of treated or untreated sewage from vessels to Mission Bay, Oceanside Harbor, Dana Point Harbor, or other small boat harbors is prohibited.

16. The discharge of untreated sewage from vessels to San Diego Bay is prohibited.

17. The discharge of treated sewage from vessels to portions of San Diego Bay that are less than 30 feet deep at mean lower low water (MLLW) is prohibited.

18. The discharge of treated sewage from vessels, which do not have a properly functioning US Coast Guard certified Type I or Type II marine sanitation device, to portions of San Diego Bay that are greater than 30 feet deep at mean lower low water (MLLW) is prohibited.

2. Attachment B to State Water Board Resolution 2012-0012

Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges

I. PROVISIONS FOR POINT SOURCE DISCHARGES OF STORM WATER AND NONPOINT SOURCE WASTE DISCHARGES

The following terms, effective prohibitions, and special conditions (hereafter collectively referred to as special conditions) are established as limitations on point source storm water and nonpoint source discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in Areas of Special Biological Significance (ASBS), as required for State Water Quality Protection Areas pursuant to California Public Resources Code Sections 36700(f) and 36710(f). These Special Protections are adopted by the State Water Board as part of the California Ocean Plan (Ocean Plan) General Exception.

The special conditions are organized by category of discharge. The State Water Resources Control Board (State Water Board) and Regional Water Quality Control Boards (Regional Water Boards) will determine categories and the means of regulation for those categories [e.g., Point Source Storm Water National Pollutant Discharge Elimination System (NPDES) or Nonpoint Source].

A. PERMITTED POINT SOURCE DISCHARGES OF STORM WATER

1. General Provisions for Permitted Point Source Discharges of Storm Water

   a. Existing storm water discharges into an ASBS are allowed only under the following conditions:

      (1) The discharges are authorized by an NPDES permit issued by the State Water Board or Regional Water Board;

      (2) The discharges comply with all of the applicable terms, effective prohibitions, and special conditions contained in these Special Protections; and

      (3) The discharges:

         (i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

         (ii) Are designed to prevent soil erosion;

         (iii) Occur only during wet weather;

         (iv) Are composed of only storm water runoff.

   b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

   c. The discharge of trash is effectively prohibited.

d. Only discharges from existing storm water outfalls are allowed. Any proposed or new storm water runoff discharge shall be routed to existing storm water discharge outfalls and shall not result in any new contribution of waste to an ASBS (i.e., no additional pollutant loading). “Existing storm water outfalls” are those that were constructed or under construction prior to January 1, 2005. “New contribution of waste” is defined as any addition of waste beyond what would have occurred as of January 1, 2005. A change to an existing storm water outfall, in terms of re-location or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges are effectively prohibited except as provided below:

(1) The term “non-storm water discharges” means any waste discharges from a municipal separate storm sewer system (MS4) or other NPDES permitted storm drain system to an ASBS that are not composed entirely of storm water.

(2) (i) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability or occur naturally:

(a) Discharges associated with emergency fire fighting operations.

(b) Foundation and footing drains.

(c) Water from crawl space or basement pumps.

(d) Hillside dewatering.

(e) Naturally occurring groundwater seepage via a storm drain.

(f) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(ii) An NPDES permitting authority may authorize non-storm water discharges to an MS4 with a direct discharge to an ASBS only to the extent the NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

2. Compliance Plans for Inclusion in Storm Water Management Plans (SWMP) and Storm Water Pollution Prevention Plans (SWPPP).

The discharger shall specifically address the effective prohibition of non-storm water runoff and the requirement to maintain natural water quality for storm water discharges to an ASBS in an ASBS Compliance Plan to be included in its SWMP or a SWPPP, as appropriate to permit type. If a statewide permit includes a SWMP, then the discharger shall prepare a stand-alone compliance plan for ASBS discharges. The ASBS Compliance Plan is subject to approval by the Executive Director of the State Water Board (statewide permits) or

Executive Officer of the Regional Water Board (for permits issued by Regional Water Boards).

a. The Compliance Plan shall include a map of surface drainage of storm water runoff, showing areas of sheet runoff, prioritize discharges, and describe any structural Best Management Practices (BMPs) already employed and/or BMPs to be employed in the future. Priority discharges are those that pose the greatest water quality threat and which are identified to require installation of structural BMPs. The map shall also show the storm water conveyances in relation to other features such as service areas, sewage conveyances and treatment facilities, landslides, areas prone to erosion, and waste and hazardous material storage areas, if applicable. The SWMP or SWPPP shall also include a procedure for updating the map and plan when changes are made to the storm water conveyance facilities.

b. The ASBS Compliance Plan shall describe the measures by which all non-authorized non-storm water runoff (e.g., dry weather flows) has been eliminated, how these measures will be maintained over time, and how these measures are monitored and documented.

c. For Municipal Separate Storm Sewer System (MS4s), the ASBS Compliance Plan shall require minimum inspection frequencies as follows:

   (1) The minimum inspection frequency for construction sites shall be weekly during rainy season;

   (2) The minimum inspection frequency for industrial facilities shall be monthly during the rainy season;

   (3) The minimum inspection frequency for commercial facilities (e.g., restaurants) shall be twice during the rainy season; and

   (4) Storm water outfall drains equal to or greater than 18 inches (457 mm) in diameter or width shall be inspected once prior to the beginning of the rainy season and once during the rainy season and maintained to remove trash and other anthropogenic debris.

d. The ASBS Compliance Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff, that are necessary to comply with these special conditions, will be achieved through BMPs. Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that such installation would pose a threat to health or safety. BMPs to control storm water runoff discharges (at the end-of-pipe) during a design storm shall be designed to achieve on average the following target levels:

   (1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

   (2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges. The baseline for the reduction is the effective date of the Exception. The

baseline for these determinations is the effective date of the Exception, and the reductions must be achieved and documented within four (4) years of the effective date.

e. The ASBS Compliance Plan shall address erosion control and the prevention of anthropogenic sedimentation in ASBS. The natural habitat conditions in the ASBS shall not be altered as a result of anthropogenic sedimentation.

f. The ASBS Compliance Plan shall describe the non-structural BMPs currently employed and planned in the future (including those for construction activities), and include an implementation schedule. The ASBS Compliance Plan shall include non-structural BMPs that address public education and outreach. Education and outreach efforts must adequately inform the public that direct discharges of pollutants from private property not entering an MS4 are effectively prohibited. The ASBS Compliance Plan shall also describe the structural BMPs, including any low impact development (LID) measures, currently employed and planned for higher threat discharges and include an implementation schedule. To control storm water runoff discharges (at the end-of-pipe) during a design storm, permittees must first consider using LID practices to infiltrate, use, or evapotranspirate storm water runoff on-site.

g. The BMPs and implementation schedule shall be designed to ensure that natural water quality conditions in the receiving water are achieved and maintained by either reducing flows from impervious surfaces or reducing pollutant loading, or some combination thereof.

h. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents in storm water runoff that alter natural ocean water quality and the sources of these constituents.

(2) The report shall describe BMPs that are currently being implemented, BMPs that are identified in the SWMP or SWPPP for future implementation, and any additional BMPs that may be added to the SWMP or SWPPP to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the BMPs.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits), the discharger shall revise its ASBS Compliance Plan to incorporate any new or modified BMPs that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised SWMP or SWPPP, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural ocean water quality conditions due to the same constituent.

(5) Compliance with this section does not excuse violations of any term, effective prohibition, or condition contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within one year from the effective date of the Exception, the discharger shall submit a written ASBS Compliance Plan to the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that describes its strategy to comply with these special conditions, including the requirement to maintain natural water quality in the affected ASBS. The ASBS Compliance Plan shall include a time schedule to implement appropriate non-structural and structural controls (implementation schedule) to comply with these special conditions for inclusion in the discharger's SWMP or SWPPP, as appropriate to permit type.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these special conditions shall be implemented.

d. Within four (4) years of the effective date of the Exception, any structural controls identified in the ASBS Compliance Plan that are necessary to comply with these special conditions shall be operational.

e. Within four (4) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water, pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data, and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

(1) for municipalities, a demonstration of significant hardship to discharger ratepayers, by showing the relationship of storm water fees to annual household income for residents within the discharger's jurisdictional area, and the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or
(2) for other governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process.

B. NONPOINT SOURCE DISCHARGES

[NOT INCLUDED]
[PROVISIONS FOR NONPOINT SOURCE DISCHARGES NOT APPLICABLE]

II. ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES

[NOT INCLUDED]
[ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES NOT APPLICABLE]

III. ADDITIONAL REQUIREMENTS – WATERFRONT AND MARINE OPERATIONS

[NOT INCLUDED]
[ADDITIONAL REQUIREMENTS FOR WATERFRONT AND MARINE OPERATIONS NOT APPLICABLE]

IV. MONITORING REQUIREMENTS

Monitoring is mandatory for all dischargers to assure compliance with the Ocean Plan. Monitoring requirements include both: (A) core discharge monitoring, and (B) ocean receiving water monitoring. The State and Regional Water Boards must approve sampling site locations and any adjustments to the monitoring programs. All ocean receiving water and reference area monitoring must be comparable with the Water Boards' Surface Water Ambient Monitoring Program (SWAMP).

Safety concerns: Sample locations and sampling periods must be determined considering safety issues. Sampling may be postponed upon notification to the State and Regional Water Boards if hazardous conditions prevail.

Analytical Chemistry Methods: All constituents must be analyzed using the lowest minimum detection limits comparable to the Ocean Plan water quality objectives. For metal analysis, all samples, including storm water effluent, reference samples, and ocean receiving water samples, must be analyzed by the approved analytical method with the lowest minimum detection limits (currently Inductively Coupled Plasma/Mass Spectrometry) described in the Ocean Plan.

A. CORE DISCHARGE MONITORING PROGRAM

1. General sampling requirements for timing and storm size:

   Runoff must be collected during a storm event that is greater than 0.1 inch and generates runoff, and at least 72 hours from the previously measurable storm event. Runoff samples shall be collected when post-storm receiving water is sampled, and analyzed for the same constituents as receiving water and reference site samples (see section IV B) as described below.

2. Runoff flow measurements

   a. For municipal/industrial storm water outfalls in existence as of December 31, 2007, 18 inches (457mm) or greater in diameter/width (including multiple outfall pipes in combination having a width of 18 inches, runoff flows must be measured or calculated, using a method acceptable to and approved by the State and Regional Water Boards.
   b. This will be reported annually for each precipitation season to the State and Regional Water Boards.

3. Runoff samples – storm events

   a. For outfalls equal to or greater than 18 inches (0.46m) in diameter or width:

      (1) samples of storm water runoff shall be analyzed during the same storm as receiving water samples for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination, ; and

      (2) samples of storm water runoff shall be analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS

      (3) If an applicant has no outfall greater than 36 inches, then storm water runoff from the applicant's largest outfall shall be further analyzed during the same storm as receiving water samples for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates).

   b. For outfalls equal to or greater than 36 inches (0.91m) in diameter or width:

      (1) samples of storm water runoff shall be analyzed during the same storm as receiving water samples for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

      (2) samples of storm water runoff shall be further analyzed during the same storm as receiving water samples for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides

(pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates) and

(3) samples of storm water runoff shall be analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

c. For an applicant not participating in a regional monitoring program [see below in Section IV (B)] in addition to (a.) and (b.) above, a minimum of the two largest outfalls or 20 percent of the larger outfalls, whichever is greater, shall be sampled (flow weighted composite samples) at least three times annually during wet weather (storm event) and analyzed for all Ocean Plan Table A constituents, Table B constituents for marine aquatic life protection (except for toxicity, only chronic toxicity for three species shall be required), DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, and Ocean Plan indicator bacteria. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one (the largest) such discharge shall be sampled annually in each Region.

4. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may reduce or suspend core monitoring once the storm runoff is fully characterized. This determination may be made at any point after the discharge is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

B. OCEAN RECEIVING WATER AND REFERENCE AREA MONITORING PROGRAM

In addition to performing the Core Discharge Monitoring Program in Section II.A above, all applicants having authorized discharges must perform ocean receiving water monitoring. In order to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS, dischargers may choose either (1) an individual monitoring program, or (2) participation in a regional integrated monitoring program.

1. Individual Monitoring Program: The requirements listed below are for those dischargers who elect to perform an individual monitoring program to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within the affected ASBS. In addition to Core Discharge Monitoring, the following additional monitoring requirements shall be met:

   a. Three times annually, during wet weather (storm events), the receiving water at the point of discharge from the outfalls described in section (IV)(A)(3)(c) above shall be sampled and analyzed for Ocean Plan Table A constituents, Table B constituents for marine aquatic life, DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, salinity, chronic toxicity (three species), and Ocean Plan indicator bacteria.

      The sample location for the ocean receiving water shall be in the surf zone at the point of discharges; this must be at the same location where storm water runoff is sampled. Receiving water shall be sampled at approximately the same time prior to (pre-storm) and during (or immediately after) the same storm (post storm). Reference water quality shall also be sampled and analyzed for the same constituents pre-storm and post-storm, during the same storms when receiving water is sampled. Reference stations will be

determined by the State Water Board's Division of Water Quality and the applicable Regional Water Board(s).

b. Sediment sampling shall occur at least three times during every five (5) year period. The subtidal sediment (sand or finer, if present) at the discharge shall be sampled and analyzed for Ocean Plan Table B constituents for marine aquatic life, DDT, PCBs, PAHs, pyrethroids, and OP pesticides. For sediment toxicity testing, only an acute toxicity test using the amphipod Eohaustorius estuarius must be performed.

c. A quantitative survey of intertidal benthic marine life shall be performed at the discharge and at a reference site. The survey shall be performed at least once every five (5) year period. The survey design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The results of the survey shall be completed and submitted to the State Water Board and Regional Water Board at least six months prior to the end of the permit cycle.

d. Once during each five (5) year period, a bioaccumulation study shall be conducted to determine the concentrations of metals and synthetic organic pollutants at representative discharge sites and at representative reference sites. The study design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The bioaccumulation study may include California mussels (Mytilus californianus) and/or sand crabs (Emerita analoga or Blepharipoda occidentalis). Based on the study results, the Regional Water Board and the State Water Board's Division of Water Quality, may adjust the study design in subsequent permits, or add or modify additional test organisms (such as shore crabs or fish), or modify the study design appropriate for the area and best available sensitive measures of contaminant exposure.

e. Marine Debris: Representative quantitative observations for trash by type and source shall be performed along the coast of the ASBS within the influence of the discharger's outfalls. The design, including locations and frequency, of the marine debris observations is subject to approval by the Regional Water Board and State Water Board's Division of Water Quality.

f. The monitoring requirements of the Individual Monitoring Program in this section are minimum requirements. After a minimum of one (1) year of continuous water quality monitoring of the discharges and ocean receiving waters, the Executive Director of the State Water Board (statewide permits) or Executive officer of the Regional Water Board (Regional Water Board permits) may require additional monitoring, or adjust, reduce or suspend receiving water and reference station monitoring. This determination may be made at any point after the discharge and receiving water is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

2. Regional Integrated Monitoring Program: Dischargers may elect to participate in a regional integrated monitoring program, in lieu of an individual monitoring program, to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS. This regional approach shall characterize natural water quality, pre- and post-storm, in ocean reference areas near the mouths of identified open space watersheds and the effects of the discharges on natural water quality (physical, chemical, and toxicity) in the ASBS receiving waters, and should include benthic marine aquatic life and bioaccumulation components. The design of the ASBS stratum of a regional integrated monitoring program may deviate from the otherwise prescribed individual

monitoring approach (in Section IV.B.1) if approved by the State Water Board's Division of Water Quality and the Regional Water Boards.

a. Ocean reference areas shall be located at the drainages of flowing watersheds with minimal development (in no instance more than 10% development), and shall not be located in CWA Section 303(d) listed waterbodies or have tributaries that are 303(d) listed. Reference areas shall be free of wastewater discharges and anthropogenic non-storm water runoff. A minimum of low threat storm runoff discharges (e.g. stream highway overpasses and campgrounds) may be allowed on a case-by-case basis. Reference areas shall be located in the same region as the ASBS receiving water monitoring occurs. The reference areas for each Region are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean reference water samples must be collected from each station, each from a separate storm. A minimum of one reference location shall be sampled for each ASBS receiving water site sampled per responsible party. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

b. ASBS ocean receiving water must be sampled in the surf zone at the location where the runoff makes contact with ocean water (i.e. at "point zero"). Ocean receiving water stations must be representative of worst-case discharge conditions (i.e. co-located at a large drain greater than 36 inches, or if drains greater than 36 inches are not present in the ASBS then the largest drain greater than18 inches.) Ocean receiving water stations are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean receiving water samples must be collected during each storm season from each station, each from a separate storm. A minimum of one receiving water location shall be sampled in each ASBS per responsible party in that ASBS. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

c. Reference and receiving water sampling shall commence during the first full storm season following the adoption of these special conditions, and post-storm samples shall be collected when annual storm water runoff is sampled. Sampling shall occur in a minimum of two storm seasons. For those ASBS dischargers that have already participated in the Southern California Bight 2008 ASBS regional monitoring effort, sampling may be limited to only one storm season.

d. Receiving water and reference samples shall be analyzed for the same constituents as storm water runoff samples. At a minimum, constituents to be sampled and analyzed in reference and discharge receiving waters must include oil and grease, total suspended solids, Ocean Plan Table B metals for protection of marine life, Ocean Plan PAHs, pyrethroids, OP pesticides, ammonia, nitrate, phosphates, and critical life stage chronic toxicity for three species. In addition, within the range of the southern sea otter, indicator bacteria or some other measure of fecal contamination shall be analyzed.

3. Waterfront and Marine Operations: In addition to the above requirements for ocean receiving water monitoring, additional monitoring must be performed for marinas and boat launch and pier facilities:

a. For all marina or mooring field operators, in mooring fields with 10 or more occupied moorings, the ocean receiving water must be sampled for Ocean Plan indicator bacteria, residual chlorine, copper, zinc, grease and oil, methylene blue active substances (MBAS), and ammonia nitrogen.

   (1) For mooring field operators opting for an individual monitoring program (Section IV.B.1 above), this sampling must occur weekly (on the weekend) from May through October.

   (2) For mooring field operators opting to participate in a regional integrated monitoring program (Section IV.B.2 above), this sampling must occur monthly from May through October on a high use weekend in each month. The Water Boards may allow a reduction in the frequency of sampling, through the regional monitoring program, after the first year of monitoring.

b. For all mooring field operators, the subtidal sediment (sand or finer, if present) within mooring fields and below piers shall be sampled and analyzed for Ocean Plan Table B metals (for marine aquatic life beneficial use), acute toxicity, PAHs, and tributyltin. For sediment toxicity testing, only an acute toxicity test using the amphipod Eohaustorius estuarius must be performed. This sampling shall occur at least three times during a five (5) year period. For mooring field operators opting to participate in a regional integrated monitoring program, the Water Boards may allow a reduction in the frequency of sampling after the first sampling effort's results are assessed.

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ATTACHMENT B

STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

1. Standard Permit Provisions

Code of Federal Regulations Title 40 Section 122.41 (40 CFR 122.41) includes conditions, or provisions, that apply to all National Pollutant Discharge Elimination System (NPDES) permits. Additional provisions applicable to NPDES permits are in 40 CFR 122.42. All applicable provisions in 40 CFR 122.41 and 40 CFR 122.42 must be incorporated into this Order and NPDES permit. The applicable 40 CFR 122.41 and 40 CFR 122.42 provisions are as follows:

a. DUTY TO COMPLY [40 CFR 122.41(a)]

The Copermittee must comply with all of the provisions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

(1) The Copermittee must comply with effluent standards or effective prohibitions established under Section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or effective prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement. [40 CFR 122.41(a)(1)]

(2) The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to a civil penalty not to exceed $25,000 per day for each violation. The CWA provides that any person who *negligently* violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than 2 years, or both. Any person who *knowingly* violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both. Any person who knowingly violates Section 301, 302, 303, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, and who knows at that time that he thereby places another person in imminent danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of

not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.
[40 CFR 122.41(a)(2)]

(3) Any person may be assessed an administrative penalty by the San Diego Regional Water Quality Control Board (San Diego Water Board), State Water Resources Control Board (State Water Board), or United States Environmental Protection Agency (USEPA) for violating Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.
[40 CFR 122.41(a)(3)]

b. DUTY TO REAPPLY [40 CFR 122.41(b)]

If a Copermittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Copermittee must apply for and obtain a new permit.

c. NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE [40 CFR 122.41(c)]

It shall not be a defense for a Copermittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

d. DUTY TO MITIGATE [40 CFR 122.41(d)]

The Copermittee must take all reasonable steps to minimize or prevent any discharge or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

e. PROPER OPERATION AND MAINTENANCE [40 CFR 122.41(e)]

The Copermittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Copermittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by a Copermittee only when the operation is necessary to achieve compliance with the conditions of this permit.

f. PERMIT ACTIONS [40 CFR 122.41(f)]

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Copermittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

g. PROPERTY RIGHTS [40 CFR 122.41(g)]

This permit does not convey any property rights of any sort, or any exclusive privilege.

h. DUTY TO PROVIDE INFORMATION [40 CFR 122.41(h)]

The Copermittee must furnish to the San Diego Water Board, State Water Board, or USEPA within a reasonable time, any information which the San Diego Water Board, State Water Board, or USPEA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Copermittee must also furnish to the San Diego Water Board, State Water Board, or USPEA upon request, copies of records required to be kept by this permit.

i. INSPECTION AND ENTRY [40 CFR 122.41(i)]

The Copermittee must allow the San Diego Water Board, State Water Board, USEPA, and/or their authorized representative (including an authorized contractor acting as their representative), upon presentation of credentials and other documents as may be required by law, to:

(1) Enter upon the Copermittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit; [40 CFR 122.41(i)(1)]

(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit; [40 CFR 122.41(i)(2)]

(3) Inspect and photograph at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; [40 CFR 122.41(i)(3)] and

(4) Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location. [40 CFR 122.41(i)(4)]

j. MONITORING AND RECORDS [40 CFR 122.41(j)]

(1) Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity. [40 CFR 122.41(j)(1)]

(2) Except for records of monitoring information required by this permit related to the Copermittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five (5) years (or longer as required by 40 CFR Part 503), the

Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time. [40 CFR 122.41(j)(2)]

(3) Records for monitoring information must include: [40 CFR 122.41(j)(3)]

(a) The date, exact place, and time of sampling or measurements; [40 CFR 122.41(j)(3)(i)]
(b) The individual(s) who performed the sampling or measurements; [40 CFR 122.41(j)(3)(ii)]
(c) The date(s) analyses were performed; [40 CFR 122.41(j)(3)(iii)]
(d) The individual(s) who performed the analyses; [40 CFR 122.41(j)(3)(iv)]
(e) The analytical techniques or methods used; [40 CFR 122.41(j)(3)(v)] and
(f) The results of such analyses. [40 CFR 122.41(j)(3)(vi)]

(4) Monitoring must be conducted according to test procedures under 40 CFR Part 136 unless another method is required under 40 CFR Subchapters N or O. [40 CFR 122.41(j)(4)]

In the case of pollutants for which there are no approved methods under 40 CFR Part 136 or otherwise required under 40 CFR Subchapters N and O, monitoring must be conducted according to a test procedure specified in the permit for such pollutants. [40 CFR 122.44(i)(1)(iv)]

(5) The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. [40 CFR 122.41(j)(5)]

k. SIGNATORY REQUIREMENT [40 CFR 122.41(k)]

(1) All applications, reports, or information submitted to the San Diego Water Board, State Water Board, or USEPA must be signed and certified. (See 40 CFR 122.22) [40 CFR 122.41(k)(1)]

(a) *For a municipality, State, Federal, or other public agency.* [All applications must be signed] [b]y either a principal executive officer or ranking elected official. [40 CFR 122.22(a)(3)]

(b) All reports required by permits, and other information requested by the San Diego Water Board, State Water Board, or USEPA must be signed by a person described in paragraph (a) of this section, or by a duly authorized representative of that person. A person is a duly authorized representative only if: [40 CFR 122.22(b)]

(i) The authorization is made in writing by a person described in paragraph (a) of this section; [40 CFR 122.22(b)(1)]

(ii) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company, (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) [40 CFR 122.22(b)(2)] and,

(iii) The written authorization is submitted to the San Diego Water Board and State Water Board. [40 CFR 122.22(b)(3)]

(c) *Changes to authorization.* If an authorization under paragraph (b) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (b) of this section must be submitted to the San Diego Water Board prior to or together with any reports, information, or applications to be signed by an authorized representative. [40 CFR 122.22(c)]

(d) *Certification.* Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." [40 CFR 122.22(d)]

(2) The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both. [40 CFR 122.41(k)(2)]

I. REPORTING REQUIREMENTS [40 CFR 122.41(l)]

(1) *Planned changes.* The Copermittee must give notice to the San Diego Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when: [40 CFR 122.41(l)(1)]

(a) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); [40 CFR 122.41(l)(1)(i)] or

(b) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which

are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1).
[40 CFR 122.41(l)(1)(ii)]

(c) The alteration or addition results in a significant change in the Copermittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. [40 CFR 122.41(l)(1)(iii)]

(2) *Anticipated noncompliance*. The Copermittee must give advance notice to the San Diego Water Board or State Water Board of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.
[40 CFR 122.41(l)(2)]

(3) *Transfers*. This permit is not transferable to any person except after notice to the San Diego Water Board. The San Diego Water Board may require modification or revocation and reissuance of the permit to change the name of the Copermittee and incorporate such other requirements as may be necessary under the CWA.
[40 CFR 122.41(l)(3)]

(4) *Monitoring reports.* Monitoring results must be reported at the intervals specified elsewhere in this permit. [40 CFR 122.41(l)(4)]

(a) Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the San Diego Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices. [40 CFR 122.41(l)(4)(i)]

(b) If the Copermittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or another method required for an industry-specific waste stream under 40 CFR Subchapters N or O, the results of this monitoring must be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the San Diego Water Board or State Water Board.
[40 CFR 122.41(l)(4)(ii)]

(c) Calculations for all limitations which require averaging of measurements must utilize an arithmetic mean unless otherwise specified in the permit.
[40 CFR 122.41(l)(4)(iii)]

(5) *Compliance schedules*. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date. [40 CFR 122.41(l)(5)]

(6) *Twenty-four hour reporting.*

(a) The Copermittee must report any noncompliance that may endanger health or the environment. Any information must be provided orally within 24 hours from the time the Copermittee becomes aware of the circumstances. A written submission must also be provided within five (5) days of the time the Copermittee becomes aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6)(i)]

(b) The following must be included as information which must be reported within 24 hours under this paragraph: [40 CFR 122.41(l)(6)(ii)]

(i) Any unanticipated bypass that exceeds any effluent limitation in the permit (See 40 CFR 122.41(g)). [40 CFR 122.41(l)(6)(ii)(A)]

(ii) Any upset which exceeds any effluent limitation in the permit. [40 CFR 122.41(l)(6)(ii)(B)] and,

(iii) Violation of a maximum daily discharge limitation for any of the pollutants listed by the San Diego Water Board in the permit to be reported within 24 hours. (See 40 CFR 122.44(g)) [40 CFR 122.41(l)(6)(ii)(C)]

(c) The San Diego Water Board may waive the above-required written report on a case-by-case basis if the oral report has been received within 24 hours. [40 CFR 122.41(l)(6)(iii)]

(7) *Other noncompliance.* The Copermittee must report all instances of noncompliance not reported in accordance with the standard provisions required under 40 CFR 122.41(l)(4), (5), and (6), at the time monitoring reports are submitted. The reports must contain the information listed in the standard provisions required under 40 CFR 122.41(l)(6). [40 CFR 122.41(l)(7))]

(8) *Other information.* When the Copermittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the San Diego Water Board, State Water Board, or USEPA, the Copermittee must promptly submit such facts or information. [40 CFR 122.41(l)(8)]

~~**m. BYPASS** [40 CFR 122.41(m)]~~

~~(1) *Definitions.*~~

~~(a) "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. [40 CFR 122.41(m)(1)(i)] or~~

~~(b) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be~~

Comment [A126]: While this is a standard condition for NPDES permits, it is manifestly inapplicable to MS4 permits. Since BMPs constructed to comply with the Order include bypass provisions to protect their entirety, the Copermittees would have to notify the Regional Board whenever a storm was predicted. This provision should be deleted.

~~expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.~~
~~[40 CFR 122.41(m)(1)(ii)]~~

~~(2) *Bypass not exceeding limitations*. The Copermittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the standard provisions required under 40 CFR 122.41(m)(3) and (4).~~
~~[40 CFR 122.41(m)(2)]~~

~~(3) *Notice*.~~

~~(a) *Anticipated bypass*. If the Copermittee knows in advance of the need for a bypass, it must submit a notice, if possible at least ten days before the date of the bypass. [40 CFR 122.41(m)(3)(i)] or~~

~~(b) *Unanticipated bypass*. The Copermittee must submit notice of an unanticipated bypass in accordance with the standard provisions required under 40 CFR 122.41(l)(6) (24 hour notice).~~
~~[40 CFR 122.41(m)(3)(ii)]~~

~~(4) *Prohibition of Bypass*.~~

~~(a) Bypass is prohibited, and the San Diego Water Board may take enforcement action against a Copermittee for bypass, unless:~~
~~[40 CFR 122.41(m)(4)(i)]~~

~~(i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; [40 CFR 122.41(m)(4)(i)(A)]~~
~~(ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance;~~
~~[40 CFR 122.41(m)(4)(i)(B)] and,~~
~~(iii) The Copermittee submitted notice in accordance with the standard provisions required under 40 CFR 122.41(m)(3).~~
~~[40 CFR 122.41(m)(4)(i)(C)]~~

~~(b) The San Diego Water Board may approve an anticipated bypass, after considering its adverse effects, if the San Diego Water Board determines that it will meet the three conditions listed above.~~
~~[40 CFR 122.41(m)(4)(ii)]~~

~~n.~~m. **UPSET** [40 CFR 122.41(n)]

(1) *Definition.* "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Copermittee. An upset does not

include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. [40 CFR 122.41(n)(1)]

(2) *Effect of an upset*. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the standard provisions required under 40 CFR 122.41(n)(3) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. [40 CFR 122.41(n)(2)]

(3) *Conditions necessary for a demonstration of upset*. A Copermittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that: [40 CFR 122.41(n)(3)]

(a) An upset occurred and that the Copermittee can identify the cause(s) of the upset; [40 CFR 122.41(n)(3)(i)]
(b) The permitted facility was at the time being properly operated; [40 CFR 122.41(n)(3)(ii)] and
(c) The Copermittee submitted notice of the upset in accordance with the standard provisions required under 40 CFR 122.41(l)(6)(ii)(B) (24-hour notice). [40 CFR 122.41(n)(3)(iii)]
(d) The Copermittee complied with any remedial measures pursuant to the standard provisions required under 40 CFR 122.41(d). [40 CFR 122.41(n)(3)(iii)]

(4) *Burden of proof*. In any enforcement proceeding, the Copermittee seeking to establish the occurrence of an upset has the burden of proof. [40 CFR 122.41(n)(4)]

~~o.~~n. STANDARD PERMIT PROVISIONS FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS

[40 CFR 122.42(c)]

The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the San Diego Water Board or State Water Board under 40 CFR 122.26(a)(1)(v) must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report must include:

(1) The status of implementing the components of the storm water management program that are established as permit conditions; [40 CFR 122.42(c)(1)]

(2) Proposed changes to the storm water management programs that are established as permit conditions. Such proposed changes must be consistent with 40 CFR 122.26(d)(2)(iii); [40 CFR 122.42(c)(2)] and

(3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under 40 CFR 122.26(d)(2)(iv) and (v); [40 CFR 122.42(c)(3)]

(4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; [40 CFR 122.42(c)(4)]

(5) Annual expenditures and budget for year following each annual report; [40 CFR 122.42(c)(5)]

(6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; [40 CFR 122.42(c)(6)]

(7) Identification of water quality improvements or degradation. [40 CFR 122.42(c)(7)]

~~p.~~o. **STANDARD PERMIT PROVISIONS FOR STORM WATER DISCHARGES** [40 CFR 122.42(d)]

The initial permits for discharges composed entirely of storm water issued pursuant to 40 CFR 122.26(e)(7) must require compliance with the conditions of the permit as expeditiously as practicable, but in no event later than three years after the date of issuance of the permit.

2. General Provisions

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. The general provisions applicable to this Order and NPDES permit are as follows:

a. DISCHARGE OF WASTE IS A PRIVILEGE

No discharge of waste into the waters of the State, whether or not such discharge is made pursuant to waste discharge requirements, shall create a vested right to continue such discharge. All discharges of waste into waters of the State are privileges, not rights. [CWC Section 13263(g)]

b. DURATION OF ORDER AND NPDES PERMIT

(1) *Effective date*. This Order and NPDES permit becomes effective on the 50th day after its adoption provided the USEPA has no objection. If the USEPA objects to its issuance, this Order shall not become effective until such objection is withdrawn. This Order supersedes Order No. R9-2007-0001 upon the effective date of this Order, and supersedes Order Nos. R9-2009-0002 and R9-2010-0016 upon their expiration or earlier notice of coverage.

(2) *Expiration*. This Order and NPDES permit expires five years after its effective date. [40 CFR 122.46(a)]

(3) *Continuation of expired order*. After this Order and NPDES permit expires, the terms and conditions of this Order and NPDES permit are automatically continued pending issuance of a new permit if all requirements of the federal NPDES regulations on the continuation of expired permits (40 CFR 122.6) are complied with.

c. AVAILABILITY

A copy of this Order must be kept at a readily accessible location and must be available to on-site personnel at all times.

d. CONFIDENTIALITY OF INFORMATION

Except as provided for in 40 CFR 122.7, no information or documents submitted in accordance with or in application for this Order will be considered confidential, and all such information and documents shall be available for review by the public at the San Diego Water Board office.

Claims of confidentiality for the following information will be denied:
[40 CFR 122.7(b)]

(1) The name and address of any permit applicant or Copermittee;
[40 CFR 122.7(b)(1)] and

(2) Permit applications and attachments, permits, and effluent data.
[40 CFR 122.7(b)(2)]

e. EFFLUENT LIMITATIONS

(1) *Interim effluent limitations*. The Copermittee must comply with any interim effluent limitations as established by addendum, enforcement action, or revised waste discharge requirements which have been, or may be, adopted by the San Diego Water Board.

(2) *Other effluent limitations and standards*. If any applicable toxic effluent standard or effective prohibition (including any schedule of compliance specified in such effluent standard or effective prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant and that standard or effective prohibition is more stringent than any limitation on the pollutant in the permit, the San Diego Water Board shall institute proceedings under these regulations to modify or revoke and reissue the permit to conform to the toxic effluent standard or effective prohibition. [40 CFR 122.44(b)(1~~)]~~)]. ~~)]~~

f. DUTY TO MINIMIZE OR CORRECT ADVERSE IMPACTS

The Copermittee must take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this Order, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the noncompliance.

g. PERMIT ACTIONS

The filing of a request by the Copermittee for modification, revocation and reissuance, or termination of this Order, or a notification of planned change in or anticipated

noncompliance with this Order does not stay any condition of this Order. (See 40 CFR 122.41(f)) In addition, the following provisions apply to this Order:

(1) Upon application by any affected person, or on its own motion, the San Diego Water Board may review and revise the requirements in this Order. All requirements must be reviewed periodically. [CWC Section 13263(e)]

(2) This Order may be terminated or modified for cause, including, but not limited to, all of the following: [CWC Section 13381]

(a) Violation of any condition contained in the requirements of this Order. [CWC Section 13381(a)]

(b) Obtaining the requirements in this Order by misrepresentation, or failure to disclose fully all relevant facts. [CWC Section 13381(b)]

(c) A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge. [CWC Section 13381(c)]

(3) When this Order is transferred to a new owner or operator, such requirements as may be necessary under the CWC may be incorporated into this Order.

h. NPDES PERMITTED NON-STORM WATER DISCHARGES

The San Diego Water Board has, in prior years, issued a limited number of individual NPDES permits for non-storm water discharges to MS4s. The San Diego Water Board or State Water Board may in the future, upon prior notice to the Copermittee(s), issue an NPDES permit for any non-storm water discharge (or class of non-storm water discharges) to an MS4. A Copermittee will not be held responsible for pollutants in its MS4 discharge originating from an NPDES-permitted non-storm water discharge.

Comment [A127]: This comment reflects the appropriate responsibility between NPDES dischargers.

i. MONITORING

In addition to the standard provisions required under 40 CFR 122.41(j) and (l)(4), the following general monitoring provisions apply to this Order:

(1) Where procedures are not otherwise specified in Order, sampling, analysis and quality assurance/quality control must be conducted in accordance with the Quality Assurance Management Plan (QAMP) for the State of California's Surface Water Ambient Monitoring Program (SWAMP), adopted by the State Water Resources Control Board (State Water Board).

(2) Pursuant to 40 CFR 122.41(j)(2) and CWC Section 13383(a), each Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five (5) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time.

Comment [A128]: This provision and the provision in Attachment B 1.j(2) conflict. The Water Board should reconcile these provisions or delete one.

(3) All chemical, bacteriological, and toxicity analyses must be conducted at a laboratory certified for such analyses by the California Department of Public Health or a laboratory approved by the San Diego Water Board.

(4) For priority toxic pollutants that are identified in the California Toxics Rule (CTR) (65 Fed. Reg. 31682), the Copermittees must instruct their laboratories to establish calibration standards that are equivalent to or lower than the Minimum Levels (MLs) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP). If a Copermittee can demonstrate that a particular ML is not attainable, in accordance with procedures set forth in 40 CFR Part 136, the lowest quantifiable concentration of the lowest calibration standard analyzed by a specific analytical procedure (assuming that all the method specified sample weights, volumes, and processing steps have been followed) may be used instead of the ML listed in Appendix 4 of the SIP. The Copermittee must submit documentation from the laboratory to the San Diego Water Board for approval prior to raising the ML for any priority toxic pollutant.

j. ENFORCEMENT

(1) The San Diego Water Board is authorized to enforce the terms of this Order under several provisions of the CWC, including, but not limited to, CWC Sections 13385, 13386, and 13387.

(2) Nothing in this Order shall be construed to protect the Copermittee from its liabilities under federal, state, or local laws.

(3) The CWC provides for civil and criminal penalties comparable to, and in some cases greater than, those provided for under the CWA.

(4) Except as provided in the standard conditions required under 40 CFR 122.41(m) and (n), nothing in this Order shall be construed to relieve the Copermittee from civil or criminal penalties for noncompliance.

(5) Nothing in this Order shall be construed to preclude the institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties to which the Copermittee is or may be subject to under Section 311 of the CWA.

(6) Nothing in this Order shall be construed to preclude institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authoring preserved by Section 510 of the CWA.

k. SEVERABILITY

The provisions of this Order are severable, and if any provision of this Order, or the application of any provisions of this Order to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this Order shall not be affected thereby.

l. APPLICATIONS

Any application submitted by a Copermittee for reissuance or modification of this Order must satisfy all applicable requirements specified in federal regulations as well as any additional requirements for submittal of a Report of Waste Discharge specified in the CWC and the California Code of Regulations.

m. IMPLEMENTATION

All plans, reports and subsequent amendments submitted in compliance with this Order must be implemented immediately (or as otherwise specified). All submittals by Copermittees must be adequate to implement the requirements of this Order.

n. REPORT SUBMITTALS

(1) All report submittals must include an executive summary, introduction, conclusion, recommendations, and signed certified statement.

(2) Each Copermittee must submit a signed certified statement covering its responsibilities for each applicable submittal.

(3) The Principal Watershed Copermittee(s) must submit a signed certified statement covering its responsibilities for each applicable submittal and the sections of the submittals for which it is responsible.

(4) Unless otherwise directed, the Copermittees must submit one hard copy and one electronic copy of each report required under this Order to the San Diego Water Board, and one electronic copy to the USEPA.

(5) The Copermittees must submit reports and provide notifications as required by this Order to the following:

EXECUTIVE OFFICER
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
9174 SKY PARK COURT, SUITE 100
SAN DIEGO CA 92123-4340
Telephone: (858) 467-2952 Fax: (858) 571-6972

EUGENE BROMLEY
US ENVIRONMENTAL PROTECTION AGENCY
REGION IX
PERMITS ISSUANCE SECTION (W-5-1)
75 HAWTHORNE STREET
SAN FRANCISCO CA 94105

ATTACHMENT C

ACRONYMS AND ABBREVIATIONS

AMAL	Average Monthly Action Level
ASBS	Area(s) of Special Biological Significance
BMP	Best Management Practice
Basin Plan	Water Quality Control Plan for the San Diego Basin
CEQA	California Environmental Quality Act
CCR	California Code of Regulations
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWC	California Water Code
CZARA	Coastal Zone Act Reauthorization Amendments of 1990
ESAs	Environmentally Sensitive Areas
GIS	Geographic Information System
IBI	Index of Biological Integrity
LID	Low Impact Development
MDAL	Maximum Daily Action Level
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
NAL	Non-Storm Water Action Level
NAICS	North American Industry Classification System
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
ROWD	Report of Waste Discharge (application for NPDES reissuance)
SAL	Storm Water Action Level
San Diego Water Board	California Regional Water Quality Control Board, San Diego Region
SIC	Standard Industrial Classification Code
State Water Board	State Water Resources Control Board
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
WDID	Waste Discharge Identification Number
WLA	Waste Load Allocation
WQBEL	Water Quality Based Effluent Limitation

DEFINITIONS

Active/Passive Sediment Treatment - Using mechanical, electrical or chemical means to flocculate or coagulate suspended sediment for removal from runoff from construction sites prior to discharge.

Anthropogenic Litter – Trash generated from human activities, not including sediment.

Automotive Repair Shop – a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539 or equivalent NAICS code.

Average Monthly Action Level – The highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month, or the geometric mean for bacteria, as applicable.

Beneficial Uses - The uses of water necessary for the survival or wellbeing of man, plants, and wildlife. These uses of water serve to promote tangible and intangible economic, social, and environmental goals. "Beneficial Uses" ~~of the waters of the State~~ that may be protected include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. Existing beneficial uses are uses that were attained in the surface or ground water on or after November 28, 1975; and potential beneficial uses are uses that would probably develop in future years through the implementation of various control measures. "Beneficial Uses" are equivalent to "Designated Uses" under federal law. [California Water Code Section 13050(f)].

Best Management Practices (BMPs) - Defined in 40 CFR 122.2 as schedules of activities, effective prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. In the case of municipal discharge permits, BMPs may be used in the place of numeric effluent limits.

Bioassessment - The use of biological community information to evaluate the biological integrity of a water body and its watershed. With respect to aquatic ecosystems, bioassessment is the collection and analysis of samples of the benthic macroinvertebrate community together with physical/habitat quality measurements associated with the sampling site and the watershed to evaluate the biological condition (i.e. biotic integrity) of a water body.

Biofiltration - Practices that use vegetation and amended soils to detain and treat runoff from impervious areas. Treatment is through filtration, infiltration, adsorption, ion exchange, and biological uptake of pollutants.

Biological Integrity - Defined in Karr J.R. and D.R. Dudley. 1981. Ecological perspective on water quality goals. *Environmental Management* 5:55-68 as: "A balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitat of the region." Also referred to as ecosystem health.

BMP Design Manual – A plan developed to eliminate, reduce, or mitigate the impacts of runoff from development projects, including Priority Development Projects.

Channel Rehabilitation and Improvement – Remedial measures or activities for the purpose of improving or restoring the environmental health of streams, channels or river systems. Techniques may vary from in-stream restoration techniques to off-line stormwater management practices installed in the system corridor or upland areas. Rehabilitation techniques may include, but are not limited to the following: riparian zone restoration, constructed wetlands, bank stabilization, channel modifications, and day lighting of drainage systems.

Comment [A129]: This term should be defined in Attachment C given its use in the Order.

Clean Water Act Section 303(d) Water Body - An impaired water body in which water quality does not meet applicable water quality standards and/or is not expected to meet water quality standards, even after the application of technology based pollution controls required by the CWA. The discharge of runoff to these water bodies by the Copermittees is significant because these discharges can cause or contribute to violations of applicable water quality standards.

Construction Site – Any project, including projects requiring coverage under the Construction General Permit, that involves soil disturbing activities greater than 10,000 square feet including, but not limited to, clearing, grading, disturbances to ground such as stockpiling, and excavation. This does not include interior construction activities such as interior remodeling, plumbing, electrical, or mechanical work.

Contamination - As defined in the Porter-Cologne Water Quality Control Act, contamination is "an impairment of the quality of waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste whether or not waters of the State are affected."

Copermittee – An incorporated city within the County of Orange, County of Riverside, or County of San Diego in the San Diego Region~~,~~ (Region 9),~~,~~ the County of Orange, the County of Riverside, the County of San Diego, the Orange County Flood Control District, the Riverside County Water Conservation and Flood Control District, the San Diego Regional Airport Authority, or the San Diego Unified Port District. See also "Municipal Copermittee" and "Special District Copermittee".

Comment [A130]: As set forth above, the Riverside County Copermittees make a distinction in these classes of Copermittees based on their respective legal authorities.

Copermittees – All of the individual Copermittees, collectively, unless the obligation in question is directed to one or a sub-group of Copermittees.

Comment [A131]: This clarifies that not all obligations in the Order directed to "Copermittees" are in fact applicable to all Copermittees.

Critical Channel Flow (Qc) – The channel flow that produces the critical shear stress that initiates bed movement or that erodes the toe of channel banks. When measuring Qc, it should be based on the weakest boundary material – either bed or bank.

Daily Discharge – Defined as either: (1) the total mass of the constituent discharged over the calendar day or any 24 hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g. concentration.)

The Daily Discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day, or other 24 hour period other than a day), or by the arithmetic mean of analytical results from one or more grab samples taken over the course of a

day.

Development Projects - Construction, rehabilitation, redevelopment, or reconstruction of any public or private residential project, industrial~~,~~ or commercial facility, or any other projects designed for post-construction human activity or occupation and involving land disturbance activities.

Comment [A132]: This definition clarifies the nature of Development Projects covered under the Order.

Direct Discharge to an Environmentally Sensitive Area – refers to outflow from a drainage conveyance system that collects runoff from the subject development or redevelopment site and terminates at or in receiving waters within the ESA, and is not commingled with flows from adjacent or other upstream lands.

Dry Season –May 1 to September 30.

Dry Weather – Weather is considered dry if the preceding 72 hours has been without measurable precipitation (>0.1 inch).

Enclosed Bays – Enclosed bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost bay works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays do not include inland surface waters or ocean waters.

Erosion – When land is diminished or worn away due to wind, water, or glacial ice. Often the eroded debris (silt or sediment) becomes a pollutant via storm water runoff. Erosion occurs naturally but can be intensified by land clearing activities such as farming, development, road building, and timber harvesting. This permit is concerned particularly with non-naturally occurring Erosion that eventually results in a Sediment discharge from MS4s into Receiving Waters.

Environmentally Sensitive Areas (ESAs) - Areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; areas designated as preserves or their equivalent under the Natural Communities Conservation Program within the Cities and County of Orange; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.

Estuaries – Waters, including coastal lagoons, located at the mouth of streams that serve as areas of mixing fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and ocean water. Estuaries do not include inland surface waters or ocean waters.

Existing Development – Any area that has been developed and exists for municipal, commercial, industrial, or residential purposes, uses, or activities. May include areas that are not actively used for its originally developed purpose, but may be re-purposed or redeveloped

for another use or activity.

Flow Duration – The long-term period of time that flows occur above a threshold that causes significant sediment transport and may cause excessive erosion damage to creeks and streams (not a single storm event duration). The simplest way to visualize this is to consider a histogram of pre- and post-project flows using long-term records of hourly data. To maintain pre-development flow duration means that the total number of hours (counts) within each range of flows in a flow-duration histogram cannot increase between the pre- and post-development condition. Flow duration within the range of geomorphologically significant flows is important for managing erosion.

Grading - The cutting and/or filling of the land surface to a desired slope or elevation.

Hazardous Material – Any substance that poses a threat to human health or the environment due to its toxicity, corrosiveness, ignitability, explosive nature or chemical reactivity. These also include materials named by the USEPA in 40 CFR 116 to be reported if a designated quantity of the material is spilled into the waters of the U.S. or emitted into the environment.

Hazardous Waste - Hazardous waste is defined as "any waste which, under Section 600 of Title 22 of this code, is required to be managed according to Chapter 30 of Division 4.5 of Title 22 of this code" [CCR Title 22, Division 4.5, Chapter 11, Article 1].

Household Hazardous Waste – Paints, cleaning products, and other hazardous wastes generated during home improvement or maintenance activities.

Hydromodification – The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

Illicit Connection – Any connection to the MS4 that conveys an illicit discharge.

Illicit Discharge - Any discharge to the MS4 that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from fire fighting activities [40 CFR 122.26(b)(2)]. Discharges from natural sources or from conditionally exempt sources described in this Order are not considered Illicit Discharges.

Inactive Areas – Areas of construction activity that are not active and those that have been active and are not scheduled to be re-disturbed for at least 14 days.

Infiltration – Water other than wastewater that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow [40 CFR 35.2005(20)].

Comment [A133]: Wrong definition. Should be defining infiltration (of stormwater into soil)

Inland Surface Waters – Includes all surface waters of the U.S.~~State~~ that do not include the ocean, enclosed bays, or estuaries.

Jurisdictional Runoff Management Program Document – A written description of the specific jurisdictional runoff management measures and programs that each Copermittee will implement to comply with this Order and ensure that illicit discharges are effectively prohibited, and storm water pollutant discharges in runoff are reduced to the MEP and do not cause or contribute to a violation of water quality standards.

Low Impact Development (LID) – A storm water management and land development strategy that emphasizes conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions.

Low Impact Development Best Management Practices (LID BMPs) – LID BMPs include schedules of activities, effective prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States through storm water management and land development strategies that emphasize conservation ~~s~~and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions. LID BMPs include retention practices that do not allow runoff, such as infiltration, rain water harvesting and reuse, and evapotranspiration. LID BMPs also include flow-through practices such as biofiltration that may have some discharge of storm water following pollutant reduction.

Major Outfall – As defined in the Code of Federal Regulations, a major outfall is a MS4 outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (i.e. discharge from a single conveyance other than a circular pipe which is associated with a drainage area of more than 50 acres); or, for MS4s that receive storm water from lands zoned for industrial activity (based on comprehensive zoning plans or equivalent), a MS4 outfall that discharges from a single pipe with an inside diameter of 12 inches or more or from its equivalent (i.e. discharge from other than a circular pipe associated with a drainage area of 2 acres or more).

Maximum Daily Action Level (MDAL) –The highest allowable daily discharge of a pollutant, over a calendar day (or 24 hour period). For pollutants with action levels expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with action levels expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

Maximum Extent Practicable (MEP) – The technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) ~~for storm water~~ that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) in combination with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than BAT. A definition for MEP is not provided either in the statute or in the regulations. Instead the definition of MEP is dynamic and will be defined by the following process over time: municipalities propose their definition of MEP by way of their runoff management programs. Their total collective and individual activities conducted pursuant to the runoff management programs becomes their proposal for MEP as it applies both to their overall effort, as well as to specific activities (e.g., MEP for street sweeping, or MEP for MS4 maintenance). In the absence of a proposal acceptable to the San Diego Water Board, the San Diego Water Board

defines MEP.

In a memo dated February 11, 1993, entitled "Definition of Maximum Extent Practicable," Elizabeth Jennings, Senior Staff Counsel, SWRCB addressed the achievement of the MEP standard as follows:

> "*To achieve the MEP standard, municipalities must employ whatever Best Management Practices (BMPs) are technically feasible (i.e., are likely to be effective) and are not cost prohibitive. The major emphasis is on technical feasibility. Reducing pollutants to the MEP means choosing effective BMPs, and rejecting applicable BMPs only where other effective BMPs will serve the same purpose, or the BMPs would not be technically feasible, or the cost would be prohibitive. In selecting BMPs to achieve the MEP standard, the following factors may be useful to consider:*
>
> *a. Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?*
> *b. Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?*
> *c. Public Acceptance: Does the BMP have public support?*
> *d. Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?*
> *e. Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc.?*
>
> *The final determination regarding whether a municipality has reduced pollutants to the maximum extent practicable can only be made by the Regional or State Water Boards, and not by the municipal discharger. If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit derived, it would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs that would address a pollutant source, or to pick a BMP based solely on cost, which would be clearly less effective. In selecting BMPs the municipality must make a serious attempt to comply and practical solutions may not be lightly rejected. In any case, the burden would be on the municipal discharger to show compliance with its permit. After selecting a menu of BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented."*

Monitoring Year – October 1 to September 30

Municipal Copermittee – Any Copermittee, exclusive of Special District Copermittees.

Comment [A134]: This definition clarifies distinction between municipal and special district copermittees.

Municipal Separate Storm Sewer System (MS4) – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designated or used for collecting or conveying storm water;

(iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.226. Copermittees need only comply with permit conditions relating to "discharges from the municipal separate storm sewers for which they are operators." 40 CFR 122.26(a)(vi).

Comment [A135]: These changes correct a citation and clarifies the responsibility of the copermittees as to other MS4s.

National Pollutant Discharge Elimination System (NPDES) - The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the CWA.

Non-Storm Water - All discharges to and from a MS4 that do not originate from precipitation events (i.e., all discharges from a MS4 other than storm water). ~~Non-storm water includes illicit discharges and NPDES permitted discharges.~~

Comment [A136]: This is overly limiting, There are other types of Non-storm discharges that do not fit these two categories (e.g. irrigated agriculture, natural flows, conditionally exempt flows, others). Rather than trying to identify all types of non-stormwater discharges, suggest just deleting this sentence.

Nuisance - As defined in the Porter-Cologne Water Quality Control Act, a nuisance is "anything which meets all of the following requirements: 1) Is injurious to health, or is indecent, or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. 2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. 3) Occurs during, or as a result of, the treatment or disposal of wastes."

Ocean Waters – the territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the State Board's California Ocean Plan.

Order – Unless otherwise specified, refers to this Order, Order No. R9-2013-0001 (NPDES No. CAS0109266)

Outfall – *Outfall* means a *point source* as defined by 40 CFR 122.2 at the point where a MS4 discharges to waters of the United States and does not include open conveyances connecting two MS4s, or pipes, tunnels or other conveyances which connect segments of the same stream or other waters of the United States and are used to convey waters of the United. 40 CFR 122.26(b)(9).

Comment [A137]: This federal regulatory definition clarifies the nature of an outfall.

Parking Lot – a land area or facility for the tempraory parking or storage of motor vehicles used personally, for business, or for commerce.

Comment [A138]: Definition placed in Attachment C for consistency.

Persistent Flow - Persistent flow is defined as the presence of an MS4 discharge that is hydraulically connected to a flowing~~, pooled, or ponded~~ receiving water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

Comment [A139]: Changes reflect the necessity of a connection to flowing receiving waters. Discharges that are pooled are not discharges to waters of the United States. Please see Comment Letter section 3.5.3.

Person - A person is defined as an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof [40 CFR 122.2].

Point Source - Any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, landfill leachate collection systems, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return

flows from irrigated agriculture or agricultural storm water runoff.

Pollutant - Any agent that may cause or contribute to the degradation of water quality such that a condition of pollution or contamination is created or aggravated.

Pollution - As defined in the Porter-Cologne Water Quality Control Act, pollution is "the alteration of the quality of the waters of the State by waste, to a degree that unreasonably affects the either of the following: 1) The waters for beneficial uses; or 2) Facilities that serve these beneficial uses." Pollution may include contamination.

Pollution Prevention - Pollution prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control BMPs, treatment control BMPs, or disposal.

Pre-Project~~Development~~ Runoff Conditions – Runoff conditions that exist~~existed~~ onsite immediately before the ~~existing development was constructed, or exists onsite before~~ planned development activities occur. Pre-development is not intended to be interpreted as that period before any human-induced land disturbance has occurred. 64 FR 68761.

Comment [A140]: This definition reflects the exact language used by U.S. EPA in the Federal Register. Moreover, it avoids the constitutional and statutory problems with requiring developers to mitigate for impacts not attributable to their project. It also is consistent with the CEQA standard for project impact mitigation.

Priority Development Projects - New development and redevelopment projects defined under Provision E.3.b of Order No. R9-2012-0011.

Properly Designed – Designed in accordance with the Copermittee's BMP Design Manual and/or any appropriate design requirements set forth by the Copermittee and based on widely accepted design criteria and in accordance with this Order.

Comment [A141]: This definition is required to address this standard, which is mentioned in the Order but not defined.

Rainy Season (aka Wet Season) –October 1 to April 30

Receiving Waters – Waters of the United States.

Receiving Water Limitations - Waste discharge requirements issued by the San Diego Water Board typically include both: (1) "Effluent Limitations" (or "Discharge Limitations") that specify the technology-based or water-quality-based effluent limitations; and (2) "Receiving Water Limitations" that specify the water quality objectives in the Basin Plan as well as any other limitations necessary to attain those objectives. In summary, the "Receiving Water Limitations" provision is the provision used to implement the requirements of CWA section 402(p)(3)(B).

Redevelopment - The creation, addition, and or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include trenching and resurfacing associated with utility work; parking lots; resurfacing existing roadways; cutting and reconfiguring of surface parking lots; new sidewalk construction, pedestrian ramps, or bike lane on existing roads; and routine replacement of damaged pavement, such as pothole repair and emergency restoration and public safety projects.

Comment [A142]: The changes requested in this definition appropriately exempts de minimis or emergency/public safety projects.

Reporting Period – The period of information that is reported in the Annual Report. The reporting period consists of two components: 1) July 1 to June 30, consistent with the fiscal

year, for the implementation of the jurisdictional runoff management programs, and 2) October 1 to September 30, consistent with the monitoring year for the monitoring and assessment programs. Together, these two time periods constitute the reporting year for the Annual Report due January 31 following the end of the monitoring year.

Restaurant – a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812).

Retail gasoline outlet (RGO) – a business that sells automotive or truck fuel to the general public with a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

Retain –Keep or hold in a particular place, condition, or position without discharge to ~~surface~~ Receiving W~~w~~aters.

Retrofitting – Storm water management practices put into place after development has occurred in watersheds where the practices previously did not exist~~.~~ or are ineffective.~~.~~ Retrofitting of developed areas is intended to improve water quality, protect downstream channels, reduce flooding, or meet other specific objectives. Retrofitting developed areas may include, but is not limited to replacing roofs with green roofs, disconnecting downspouts or impervious surfaces to drain to pervious surfaces, replacing impervious surfaces with pervious surfaces, installing rain barrels, installing rain gardens, and trash area enclosures.

Runoff - All flows in a storm water conveyance system that consists of the following components: (1) storm water (wet weather flows) and (2) non-storm water including dry weather flows.

San Diego Water Board – As used in this document the term "San Diego Water Board" is synonymous with the term "Regional Board" as defined in Water Code section 13050(b) and is intended to refer to the California Regional Water Quality Control Board for the San Diego Region as specified in Water Code Section 13200.

Sediment - Soil, sand, and minerals washed from land into water. Sediment resulting from anthropogenic sources (i.e. human induced land disturbance activities) that is discharged into Receiving Waters is considered a pollutant. This Order regulates only the discharges of sediment from anthropogenic sources into Receiving Waters and does not regulate naturally occurring sources of sediment. Sediment can destroy fish-nesting areas, clog animal habitats, and cloud waters so that sunlight does not reach aquatic plants.

Special District Copermittee – A separate legal entity that may own or operate MS4 systems, but has no land use authorities outside of their MS4. The Riverside County Flood Control and Water Conservation District [and Orange County Flood Control District?] is a [are] Special District Copermittee[s].

Source Control BMP – Land use or site planning practices, or structural or nonstructural measures that aim to prevent runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between pollutants and runoff.

Storm Water – Per 40 CFR 122.26(b)(13), means storm water runoff, snowmelt runoff and surface runoff and drainage. ~~Surface runoff and drainage pertains to runoff and drainage resulting from precipitation events.~~

Comment [A143]: Relocation of definition to Attachment C.

Comment [A144]: Definition added for clarity and consistency with prior redlines

Comment [A145]: Edit clarifies intent of definition.

Stream, Channel, or Habitat Rehabilitation – Measures or activities for the purpose of improving or restoring the environmental health (i.e. physical, chemical and biological integrity) of streams, channels, or river systems. Rehabilitation techniques may include, but are not limited to, riparian zone restoration, constructed wetlands, bank stabilization, channel reconfiguration, and daylighting drainage systems.

Street, Road, Highway, Freeway– Any paved impervious surface that is used for the transportation of automobiles, trucks, motorcycles, and other vehicles, with an ADT of at least 100 vehicles per day.

Comment [A146]: Definition relocated to Attachment C.

Comment [A147]: Consistent with RGO definition.

Structural BMPs - A subset of BMPs which detains, retains, filters, removes, or prevents the release of pollutants to surface waters from development projects in perpetuity, after construction of a project is completed.

Total Maximum Daily Load (TMDL) - The maximum amount of a pollutant that can be discharged into a water body from all sources (point and non-point) and still maintain water quality standards. Under CWA section 303(d), TMDLs must be developed for all water bodies that do not meet water quality standards after application of technology-based controls.

Toxicity - Adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies). The water quality objectives for toxicity provided in the Basin Plan, state in part…"All waters shall be free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life….The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge".

Treatment Control BMP – Any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media absorption or any other physical, biological, or chemical process.

Unpaved Road – Any long, narrow stretch without pavement used for traveling by motor passenger vehicles between two or more points. Unpaved roads are generally constructed of dirt, gravel, aggregate or macadam and may be improved or unimproved.

Waste - As defined in CWC Section 13050(d), "waste includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal."

Article 2 of CCR Title 23, Chapter 15 (Chapter 15) contains a waste classification system that applies to solid and semi-solid waste, which cannot be discharged directly or indirectly to water of the state and which therefore must be discharged to land for treatment, storage, or disposal in accordance with Chapter 15. There are four classifications of waste (listed in order of highest to lowest threat to water quality): hazardous waste, designated waste, non-hazardous solid waste, and inert waste.

Water Quality Objective - Numerical or narrative limits on constituents or characteristics of

water designated to protect designated beneficial uses of the water. [California Water Code Section 13050 (h)]. California's water quality objectives are established by the State and Regional Water Boards in the Water Quality Control Plans. Numeric or narrative limits for pollutants or characteristics of water designed to protect the beneficial uses of the water. In other words, a water quality objective is the maximum concentration of a pollutant that can exist in a receiving water and still generally ensure that the beneficial uses of the receiving water remain protected (i.e., not impaired). Since water quality objectives are designed specifically to protect the beneficial uses, when the objectives are violated the beneficial uses are, by definition, no longer protected and become impaired. This is a fundamental concept under the Porter Cologne Act. Equally fundamental is Porter Cologne's definition of pollution. A condition of pollution exists when the water quality needed to support designated beneficial uses has become unreasonably affected or impaired; in other words, when the water quality objectives have been violated. These underlying definitions (regarding beneficial use protection) are the reason why all waste discharge requirements implementing the federal NPDES regulations require compliance with water quality objectives. (Water quality objectives are also called water quality criteria in the CWA.)

Water Quality Standards - Water quality standards, as defined in Clean Water Act section 303(c) consist of the beneficial uses (e.g., swimming, fishing, municipal drinking water supply, etc.,) of a water body and criteria (referred to as water quality objectives in the California Water Code) necessary to protect those uses. Under the Water Code, the water boards establish beneficial uses and water quality objectives in water quality control or basin plans. Together with an anti-degradation policy, these beneficial uses and water quality objectives serve as water quality standards under the Clean Water Act. In Clean Water Act parlance, state beneficial uses are called "designated uses" and state water quality objectives are called "criteria." Throughout this Order, the relevant term is used depending on the statutory scheme.

Waters of the State - Any water, surface or underground, including saline waters within the boundaries of the State [CWC section 13050 (e)]. The definition of the Waters of the State is broader than that for the Waters of the United States in that all water in the State is considered to be a Waters of the State. ~~regardless of circumstances or condition.~~

Comment [A148]: The intent of the definition is to cover natural water sources, and not anthropogenic structures that collect runoff to reduce volume/velocity or pollutants.

Waters of the United States - As defined in the 40 CFR 122.2, the Waters of the U.S. are defined as: "(a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate "wetlands;" (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters otherwise defined as waters of the United States under this definition: (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial seas; and (g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA."

Watershed - That geographical area which drains to a specified point on a water course, usually a confluence of streams or rivers (also known as drainage area, catchment, or river basin).

Wet Season (aka Rainy Season) –October 1 to April 30

Wet Weather – Weather is considered wet if there is a storm event of 0.1 inches and greater and the following 72 hours, unless otherwise defined by the Copermittee for the purposes of monitoring consistent with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), or developed pursuant to another regulatory mechanism.

Comment [A149]: This is important as the monitoring requirements require you to sample the first 'Wet Weather' event. 0.1" of rainfall doesn't result in runoff in all watersheds. Copermittees should be able to define mobilization criteria to identify storms that are likely to produce runoff in that drainage area consistent with this EPA guidance.

LEGAL AND FACT SHEET COMMENTS ON TENTATIVE ORDER R9-2013-0001 MADE ON BEHALF OF THE RIVERSIDE COUNTY COPERMITTEES

This document provides comments on various legal issues raised by Tentative Order No. R9-2013-0001 (the "Draft Permit") and associated attachments, including Attachment F, the Fact Sheet/Technical Report ("Fact Sheet"), and are made on behalf of the Riverside County Flood Control & Water Conservation District ("District"), the County of Riverside and the Cities of Murrieta, Temecula and Wildomar (collectively, the "Riverside County Copermittees").

These legal comments are in addition to the other comments on the Draft Permit and attachments made by the Riverside County Copermittees (including the Comment Letter dated January 10, 2013 and signed by Jason E. Uhley, Chief of the District's Watershed Protection Division) and the redline attachment ("Redline"), as well as any comments or testimony which may be offered at the public hearing(s) on the Draft Permit. The Comment Letter and Redline also discuss legal issues. The Riverside County Copermittees appreciate this opportunity to comment and welcome any questions that Water Board staff may have.

These comments are submitted subject to the same reservations set forth in the Comment Letter regarding the Water Board's lack of authority, in the absence of agreement by the Riverside County Copermittees or the filing of a Report of Waste Discharge ("ROWD"), to issue a regional municipal separate storm sewer system ("MS4") permit to the Riverside County Copermittees. Submission of these comments does not waive this objection.

Request for Additional Public Comment

Before turning to comments on the Draft Permit, the Riverside County Copermittees wish to note that in view of the extensive comments made by them, as well as what we anticipate will be extensive comments by the South Orange County and San Diego County Copermittees, as well as from other stakeholders, it would greatly facilitate the permit adoption process if the Water Board were to release a revised Tentative Order for further review and comment prior to final adoption of the Permit. This will enable the Water Board staff to address the comments in a more orderly fashion and provide all parties with the opportunity to see how staff proposes to incorporate the comments in the Draft Permit.

Comments on Findings

Finding 2 and Fact Sheet Section VII.B: This finding recites that the Water Board "has the legal authority to issue a regional MS4 permit pursuant to its authority under Clean Water Act ("CWA") section 402(p)(3)(B) and 40 CFR 122.26(a)(i)(v)." Section VII.B of the Fact Sheet provides a more detailed rationale for this finding (at pages F-22-23).

The Riverside County Copermittees respectfully disagree with this finding and the analysis provided in the Fact Sheet. We do not believe that a regional MS4 permit is authorized under the CWA or the implementing regulations, absent agreement by the copermittees to be bound by such a MS4 permit (as is the case with the Bay Area MS4 permit covering discharges into the Bay).

The CWA itself does not explicitly authorize MS4 permits that, like the Draft Permit, cross county lines. CWA section 402(p)(3)(B) provides only that "[p]ermits for discharges from municipal storm sewers . . . may be issued on a system- or jurisdiction-wide basis." This language, contrary to the conclusion in Finding 2, indicates that a multi-county permit, covering several distinct non-interconnected municipal stormwater "systems" in multiple watersheds with multiple receiving waters, is not one issued on a "system-wide" basis and that an MS4 permit covering multiple jurisdictions in three different counties is not one issued on a "jurisdiction-wide basis." Because neither "system-wide" nor "jurisdiction-wide" are defined in the CWA, however, the CWA regulations must also be reviewed.

The regulatory provision cited in Finding 2, 40 CFR § 122.26(a)(1)(v), does not add clarity, since it merely repeats the "system-wide" and "jurisdiction-wide" language of the Act and the regulations define neither term. The regulations do, however, suggest that "system-wide" is not intended to cover multiple large MS4s in different jurisdictions. The regulations, at 40 CFR § 122.26(a)(1)(v) state that in making the determination to designate a system-wide or jurisdiction-wide basis" the permitting authority should consider the location of the "discharge" with respect to waters of the United States, the size of the discharge, the quantity and nature of the pollutants discharge and other relevant factors.

The Draft Permit covers multiple "discharges" into receiving waters located in three separate counties and the size, quality and nature of the discharges vary widely, due to varying hydrologic and climatic conditions in the three areas.

The Fact Sheet cites 40 CFR § 122.26(a)(3)(iv), which provides, in relevant part, that the Water Board "may issue one systemwide permit covering all, or a portion of all municipal separate storm systems in adjacent or interconnected large or medium municipal separate storm sewer systems." This provision does not, however, authorize issuance of a regional MS4 permit covering multiple counties and multiple watersheds that are not interconnected and which do not share a common receiving water. In fact, the only common fact uniting the various MS4s in the three counties under the Water Board's jurisdiction is that common jurisdiction.

First, even if the subject MS4 facilities otherwise met the criteria specified in the federal regulations (which, as noted below, they do not), the prospective permittees must apply for such a MS4 permit, as set forth in the first sentence of 40 CFR § 122.26(a)(3)(iv): "*One permit application may be submitted for all or a portion of all* municipal separate storm sewers within adjacent or interconnected large or medium municipal separate storm sewer systems." (emphasis supplied). No such application has been filed with respect to the Draft Permit. Only the San Diego County copermittees submitted a ROWD for MS4 facilities within that county.[1]

[1] Moreover, the fact that permittees have the ability to determine the geographic scope of the permit is reinforced by the language in 40 CFR § 122.26(a)(3)(iii)(B), which allows an individual municipality to submit "a distinct permit application which only covers discharges from the [MS4] for which the owner is responsible . . ." If a permittee can "opt out" of a multi-MS4 permit by submitting a individual permit application, a permitting authority such as a water board cannot impose a multi-MS4 permit on that permittee.

Second, this provision requires that the MS4s to be covered in the permit be "adjacent or interconnected." This is not true with respect to the MS4s proposed to be included within the Draft Permit. For example, the MS4 within the Santa Margarita Region of Riverside County is not "interconnected" with any other MS4s except those within that region. This is true also of the MS4s within South Orange County and San Diego County, which are not interconnected. Additionally, none of the MS4s in the three counties is "adjacent" to each other – each is separated by miles of non-urban area. In the SMR for example, the confluence of Temecula and Murrieta Creeks to form the Santa Margarita River is miles upstream of Rainbow Creek, the first discharge from San Diego County to the River. And, the confluence of Temecula and Murrieta Creeks is over 30 miles from the discharge of the Santa Margarita River to the Pacific Ocean.

The next inquiry is whether the three separate county MS4s could be considered, together, to form a single "large municipal separate storm sewer system." The federal MS4 regulations define this term as follows:

> *Large municipal separate storm sewer system* means all municipal separate storm sewers that are either:
>
> (i) Located in an incorporated place with a population of 250,000 or more . . . ."
>
> (ii) Located in the counties listed in Appendix H, except municipal separate storm sewers that are located in the incorporated places, townships or towns within such counties; or
>
> (iii) Owned or operated by a municipality other than those described [in paragraphs (i) and (ii)] . . . and that are designated by the Director as part of the large or medium municipal separate storm sewer system due to the interrelationship between the discharges of the designated storm sewer and the discharges from municipal separate storm sewers described [in paragraphs (i) and (ii)]. In making this determination the Director may consider the following factors:
>
> (A) Physical interconnections between the municipal separate storm sewers;
>
> (B) The location of discharges from the designated municipal separate storm sewer relative to discharges from municipal separate storm sewers described in [paragraph (i)];
>
> (C) The quantity and nature of pollutants discharged to waters of the United States;
>
> (D) The nature of the receiving waters; and
>
> (E) Other relevant factors, or
>
> (iv) The Director may, upon petition, designate as a large municipal separate storm sewer system, municipal separate storm sewers located within the boundaries of a region

> defined by a storm water management regional authority based on a jurisdictional, watershed, or other appropriate basis that includes one or more of the systems described [in paragraphs (i), (ii) or (iii)].

40 CFR § 122.26(b)(4).

None of paragraphs (i), (ii) or (iii) authorizes a regional MS4 permit such as that envisioned in the Draft Permit. The Draft Permit applies beyond a single incorporated place, County or municipality. Of these paragraphs, only paragraph (iv) could arguably be used to define the MS4s in the three Counties as a single MS4 and thus authorize a regional permit. The key limiting language is, however, "within the boundaries of a region **defined by a storm water management regional authority,** based on a jurisdictional, watershed, or other appropriate basis . . . ." A regional water board is not a stormwater management regional authority. This is clear from the MS4 regulations, which provide that a "**regional authority may be responsible for submitting a permit application"** under certain conditions. 40 CFR § 122.26(a)(3)(iii)(C). Clearly, a Water Board is not responsible for submitting MS4 permit applications.

U.S. EPA, in the Preamble to the final Phase I MS4 regulations (55 Fed Reg. 47990, November 16, 1990), further illuminated the meaning of the regulatory language. The Preamble indicates that commenters proposed eight different MS4 permitting options:

> Option 1 – systems owned or operated by incorporated places augmented by integrated discharges; Option 2 – systems owned or operated by incorporated places augmented with significant other municipal discharges; Option 3 – systems owned or operated by counties; Option 4 – systems owned and operated by States or State departments of transportation; Option 5 – systems within the boundaries of an incorporated place; Option 6 – systems within the boundaries of counties; Option 7 – systems in census designated urbanized areas; and Option 8 – systems defined by watershed boundaries.

55 Fed Reg. at 48039. None of these options encompasses the fact pattern presented by the Draft Permit, which covers multiple counties and multiple watersheds, are not interconnected, do not share common receiving waters and are located in separate census designated urbanized areas.

In explaining the derivation of 40 CFR 122.26(b)(4)(iv), U.S. EPA noted that it was "an outgrowth of comments on all options, especially Option 4 (State owned systems/State highways) and Option 8 (watersheds)." 55 Fed. Reg. at 48040. Thus, the Caltrans MS4 permit (which applies statewide) is authorized under paragraph (iv), since the "storm water management regional authority" defining the region to be covered is Caltrans itself. No such single authority exists for the three-county area proposed to be included in the Draft Permit, which also would encompass multiple watersheds.

Moreover, paragraph (iv) provides that the regional authority must "petition" the U.S. EPA Director to have a single MS4 designated within the boundaries of the region defined by the regional authority. Because California has been delegated NPDES permitting authority, a regional authority would presumably need to petition its Water Board to authorize such a regional permit. Since no such regional authority exists to establish the geographical basis for a

three-county MS4 permit, there is no such entity to "petition" the Water Board to establish a regional permit. This is clear from the Preamble to the Phase I regulations, which indicate that "regional storm water authorities" established by "some States or counties" may "petition the Director [or its state designee] to assume a regional role. 55 Fed. Reg. at 48042. It is clear from the Preamble that it is not the Water Board that has the authority to make such a petition, but rather the "storm water authorities" (i.e., municipalities, districts and Caltrans).

It should be noted that the Bay Area Regional MS4 Permit was a joint Bay Area Water Board and copermittee effort, coordinated by the Bay Area Stormwater Agencies Management Association ("BASMAA"). It is not the case that the Bay Area Water Board imposed this regional MS4 permit. The copermittees, coordinated by BASMAA, themselves determined to develop a regional MS4 permit. Further, all of the copermittees to the Bay Area Regional MS4 Permit discharge to a common receiving water, San Francisco Bay. Also, an Alaska MS4 permit cited in a letter from the Office of Chief Counsel to county counsel for Orange and Riverside Counties was issued to several municipalities and entities within a single "borough," which is equivalent in Alaska to a county.

Additionally, neither the Riverside County Copermittees nor those in South Orange County have filed ROWDs with the San Diego Water Board, which serve as the application for an NPDES MS4 permit in California. Water Code § 13260. The current Riverside County MS4 permit for the Santa Margarita Region provides that the ROWD is not required to be filed until May 2015, 180 days prior to the November 10, 2015 expiration date of that permit. Order R9-2010-0016, Part II.K.2.c.

> This ROWD must include:
>
> (1) Proposed changes to the Copermittees' runoff management programs; (2) Proposed changes to monitoring programs; (3) Justification for proposed changes; (4) Name and mailing addresses of the Copermittees; (5) Names and titles of primary contacts of the Copermittees; (6) Any other information necessary for the reissuance of this Order and (7) Any other information required by federal regulations for permit reapplications.

Id. It should be noted that several items of this ROWD are specifically intended to assist in the formulation of a new, SMR-specific MS4 permit, including proposed changes to the runoff management and monitoring programs, as well as justification for such changes, information necessary for "reissuance" of the SMR MS4 permit and information required by the federal regulations for MS4 permit reapplications.

As a simple jurisdictional matter, the Water Board cannot issue a regional MS4 permit to MS4 dischargers that have not applied for it. Moreover, as noted above, the SMR copermittees are entitled to apply for an MS4 permit applicable to their jurisdiction. Further, each individual copermittee has the right to apply for a MS4 permit covering only its discharges, as has the City of Long Beach in the Los Angeles Region.

Finding 3, Finding 15, in Fact Sheet Section VII.A and in Multiple Locations Throughout Draft Permit: In Finding 3, the Fact Sheet and in multiple locations throughout the Draft Permit (which are identified in the redline of the Draft Permit submitted with these comments by the Riverside County Copermittees ("Redline")), it is stated that the maximum extent practicable ("MEP") applies only to "storm water" discharges from the MS4. This is not correct.[2]

In fact, the Clean Water Act does not distinguish between non-stormwater and stormwater in terms of MS4 discharges which must be controlled to the MEP standard. *See* 33 U.S.C. § 1342(p)(3)(B)(iii)(the MS4 permit "shall require controls to reduce the discharge of pollutants to the maximum extent practicable . . . ." While the heading of 33 U.S.C. § 1342(p) refers to "Municipal and industrial stormwater discharges," this is not dispositive, as 33 U.S.C. § 1342(p)(3)(B)(ii), which requires the effective prohibition of "non-stormwater discharges" into the MS4. Thus, the language of this heading does not in fact support the argument that the MEP standard applies only to pollutants in stormwater discharges.

That both non-stormwater and stormwater must be controlled to the MEP standard was made clear by U.S. EPA itself in the preamble to the final Phase I stormwater regulations. In that preamble, U.S. EPA made it clear that "MEP control measures" would be implemented to address not only pollutants in "storm water" but also from "non-storm water discharges." As the preamble states:

> "Permittees are required to develop management programs for four types of pollutant sources which discharge to large and medium municipal storm sewer systems. Discharges from [such systems] are usually expected to be composed primarily of: (1) Runoff from commercial and residential areas; (2) storm water runoff from industrial areas; (3) runoff from construction sites; and (4) *non-storm water discharges*. Part 2 of the permit application has been designed to allow [permittees] the opportunity to propose *MEP control measures for each* of these components of the discharge."

55 Fed. Reg. at 48052 (emphasis supplied).

This language sets forth USEPA's understanding of the plain language of the CWA: "pollutants" must be controlled to the MEP from any MS4 "discharge," not merely pollutants in stormwater.

Finding 11: This finding, in relevant part, states that "[h]istoric and current development makes use of natural drainage patterns and features as conveyances for runoff. Rivers, streams and creeks in developed areas used in this manner are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and receiving water." This conclusion is legally incorrect.

First, under no circumstance can a natural stream constitute an MS4. The definition of "MS4" in the CWA regulations (a definition found in Attachment C of the Draft Permit) refers to a

[2] Finding 15 also states, erroneously, that the MEP standard "is explicitly for "Municipal . . . *Stormwater Discharges* (emphasis added)" from the MS4.

"conveyance or system of conveyances" "owned or operated" by a municipality. 40 CFR §122.26(b)(8). In California, natural rivers and streams are not "owned" nor "operated" by the municipality through which they flow. Moreover, a municipality obviously cannot "operate" a natural creek or stream. In further support of the point that a MS4 is an artificial, not natural, watercourse, the types of "conveyances" identified in the regulation ("roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains") all refer to anthropogenic structures, not natural streams. 40 CFR § 122.26(b)(8).

Second, a "receiving water" cannot also be an MS4, as is plain from the CWA regulations. An MS4 is itself defined as discharging to waters of the United States. 40 C.F.R. §122.26(b)(8). An MS4 cannot, in essence, discharge to itself. Moreover, an "outfall" from an MS4 (the point at which the discharge enters a receiving water) does not, pursuant to 40 C.F.R §122.26 (b)(9), include conveyances connecting "segments of the same stream or other waters of the United States and are used to convey waters of the United States."

Moreover, U.S. EPA, in the Preamble to the initial version of the MS4 regulations (53 Fed. Reg. 49416 (Dec. 7, 1988)) expressly determined that "streams, wetlands and other water bodies that are waters of the United States are not storm sewers for the purposes of this rule" and that "stream channelization, and stream bed stabilization, which occur in waters of the United States" were not subject to National Pollutant Discharge Elimination System ("NPDES") permits under Section 402 of the CWA. 53 Fed. Reg. at 49442.

Additionally, the United States Supreme Court recently reversed the Ninth Circuit Court of Appeals and ruled that flows from sections of the Los Angeles and San Gabriel Rivers that are comprised of concrete flood control channels are not a "discharge" under the CWA, confirming that such rivers, even if improved, are "receiving waters" along with any natural portions of those rivers. *Los Angeles County Flood Control Dist. v. Natural Resources Defense Council*, 568 U.S. __(January 8, 2013) (slip op.).

The above-cited statement in the finding is incorrect and should be stricken, as recommended in the Redline.

Finding 12: This finding states, in relevant part, that "[a]s operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not prohibit or otherwise control." This statement is legally incorrect, and ignores the salient point that the "discharger" of a pollutant is primarily responsible for controlling/permitting that discharge, under both the CWA and the Porter-Cologne Act. For example, under the Porter-Cologne Act, any persons discharging or proposing to discharge "waste" into waters of the state must file a report of waste discharge and obtain a waste discharge requirement. Water Code §§ 13260, 13263. The operator of the MS4 into which that water eventually flows is not "essentially accepting" responsibility for the discharge. The responsibility of the MS4 operator is established under the CWA, and that is to effectively prohibit non-stormwater discharges into [the MS4] and to control the discharge of pollutants from the MS4 to the MEP.

Moreover, the statement ignores the fact that in California, downstream property owners (including municipalities owning and operating MS4 facilities) must accept the flow of upstream waters. In fact, for a downstream municipality to block such flow would constitute an inverse condemnation or the creation of a nuisance under California law. *See Arreola v. County of Monterey* (2002) 99 Cal.App.4th 722 (obstruction of flood waters by improperly designed highway constituted inverse condemnation and nuisance).

Finding 28 and Fact Sheet Section VI: In the Finding, it is stated that the Water Board "finds that the requirements in this permit are not more stringent than the minimum federal requirements" and that therefore "a CWC section 13241 analysis is not required." The Finding further recites that notwithstanding this fact, "the San Diego Water Board has developed an economic analysis of the requirements in this Order."

For the reasons set forth in the comments of the Riverside County Copermittees, numerous provisions in the Draft Permit are in fact more stringent than the requirements of the CWA and its implementing regulations and therefore require an adequate Water Code § 13241 analysis. Unfortunately, this analysis is not provided in the Fact Sheet.

First, the economic analysis set forth in the Fact Sheet does not meet the requirements of Section 13241, as it does not analyze the six specific factors required to be analyzed under the section. Second, the analysis uses cost data from other sources, only a few of which were from the municipalities proposed to be included under the Draft Permit. These data are also a number of years old; the most recent study referenced in the Fact Sheet, the one done for the State Board by Cal State Sacramento, was dated January 2005 and included decade-old cost data from the City of Encinitas that dated from 2002-2003.

Third, the section of the Fact Sheet discussing the benefits of water quality notes that "there have been no studies for the San Diego Region to quantify the added value that surface waters with healthy water quality can provide." Thus, the Water Board has no evidence with which to compare the costs and benefits of the programs set forth in the Draft Permit. Moreover, the discussion makes the incorrect assumption that the alternative to the programs in the Draft Permit would be no controls on pollutants in urban runoff. As the Fact Sheet correctly notes, the Draft Permit is the fifth term MS4 permit for the copermittees. The previous four permits all contained increasingly complex and expensive control requirements, both structural and non-structural, designed to improve the quality of MS4 discharges. Thus, an appropriate cost analysis must compare the incremental costs of the programs set forth in the Draft Permit and the incremental benefits attributable to that permit. This has not been done in the Fact Sheet. Finally, the analysis does not recognize that the receiving waters provided economic benefits to residents of the San Diego Region long before issuance of the first MS4 permits in 1990. It is thus illogical to suggest that these pre-existing economic benefits would be lost if the Draft Permit is not adopted.

Finding 29 and Fact Sheet Section VII.F: The finding and the supporting argument in the Fact Sheet represents an attempt by Water Board staff to address whether the requirements of the Draft Permit represent an unfunded state mandate. That attempt, however, is beyond the scope of the Water Board's powers, since the *only* agency charged by the Legislature with determining

the presence of a state mandate, and whether that mandate is unfunded, is the Commission on State Mandates. Govt. Code § 17552; *Kinlaw v. State of California* (1991) 54 Cal.3d 326, 333. The Water Board has no jurisdiction to make a legal finding or discuss in the Fact Sheet that the Draft Permit, in whole or in part, does not constitute an unfunded state mandate.

Additionally fact sheets are required, under the CWA regulations, to provide the legal authority and reasons for each substantive permit provision (40 CFR § 124.8(a)(4); 40 CFR § 124.56(a)). *See also City of Rancho Cucamonga v. Regional Water Quality Control Board-Santa Ana Region* (2006), 135 Cal.App.4th 1377, 1382 (stating that fact sheets contains "the legal and factual grounds for the Water Board's recommendation to adopt the . . . permit"). Finding 29 and the discussion in Section VII.F of the Fact Sheet do not relate to any Draft Permit provision, nor provide legal authority or justification for the Draft Permit's adoption. As such, the finding and Fact Sheet discussion are surplussage and should be deleted.

The Riverside County Copermittees disagree with each of the arguments set forth in the Finding and Fact Sheet as to why the Draft Permit does not constitute an unfunded state mandate. Nevertheless, because the exclusive arena for such disagreements is the Commission on State Mandates, whose jurisdiction does not commence unless and until a test claim is filed before the Commission, the Copermittees need not and will not address those arguments.

Comments on Provisions in Draft Permit

Provision A and Fact Sheet Section VIII.A:

Lack of True Iterative Compliance Process

As set forth in the Redline and in the Comment Letter, the Riverside County Copermittees believe that to effectuate the iterative approach to compliance with water quality standards and other discharge prohibitions in the Draft Permit, the copermittees must be provided with the means to be in compliance. Based on monitoring, exceedances of water quality standards are occurring in the receiving waters subject to the Draft Permit, as set forth in Table G-14 to the latest 2011-2012 monitoring report submitted by the Riverside County Copermittees. Thus, if the copermittees are not provided an iterative means to be in compliance, which was contemplated by State Board's Order No. 2001-15, the copermittees will be issued an illegal MS4 permit, since it is a permit with which they cannot comply. This violates the intent of Congress in the CWA, which "is presumed not to have intended absurd (impossible) results." *Hughey v. JMS Development Corp.*, 78 F.3d 1523, 1529 (11th Cir. 1996); *accord, Mississippi River Revival v. City of Minneapolis*, 319 F.3d 1013, 1017-1018 (8th Cir. 2003).

With regard to the iterative process, Water Board staff has indicated numerous times during the workshop process that achievement of water quality standards is expected to take many years. The entire WQIP approach is aimed at the eventual attainment of such standards, as are the TMDLs issued to other copermittees, which have final compliance dates years into the future.

This approach is, however, put into jeopardy by the requirement, as expressed in the Fact Sheet at F-39, that the discharge prohibition and receiving water limitation provisions are

"independently applicable, meaning that compliance with one provision does not provide a 'safe harbor' where there is non-compliance with another provision (i.e., compliance with Provision A.4 does not shield a Copermittee who may have violated Provision A.1.a, A.1.c, or A.2.a from an enforcement action." While the Fact Sheet appropriately notes how this process should work through Provision A.4 (which "essentially requires the Copermittees to implement additional BMPs until MS4 discharges no longer cause or contribute to a violation of water quality standards") it also states that despite this iterative process, "the San Diego Water Board retains the discretion to take other appropriate enforcement and the iterative process does not shield dischargers from citizen suits under the CWA." Fact Sheet at F-40.

The consequences of this approach cannot be overemphasized. Despite the copermittees' good faith undertaking to follow the iterative process outlined in Provision A.4, a Water Board enforcement proceeding or a citizen suit can be brought for violations of water quality standards and, if the citizen plaintiff is successful, a federal judge is empowered to use his/her injunctive powers under Section 505(a) of the CWA to throw out the WQIP, JRMP or other compliance efforts of the copermittees and require other efforts. In such a case, the time and money spent by the copermittees in trying to comply with the Draft Permit, as well as the effort spent by the copermittees and Water Board staff in developing the Draft Permit's terms, are completely wasted.

Thus, the essential conundrum of Provision A, as presently drafted, is clearly exposed. Even though a copermittee may spend significant sums and undertake significant tasks under its WQIP or JRMP, be conducting expensive monitoring and special studies, and be in *full compliance* with all of the programmatic requirements of the Draft Permit, it would still face either a Water Board enforcement action or a citizen suit under Section 505 of the CWA. And, such a suit would allege exceedances of water quality standards (some of which are hardly capable of laboratory detection, much less control) that the Water Board acknowledges cannot be achieved for years.

Provision A is not, however, required by the CWA, as held by the Ninth Circuit in *Defenders of Wildlife v. Browner*, 191 F.3d 1159 (9th Cir. 1999). The holding in *Browner* is further reflected in State Board Order WQ 2001-15 (which the Fact Sheet acknowledges incorporates an "iterative process") which states:

> [O]ur [receiving water limitation] language, similar to the U.S. EPA's permit language discussed in the Browner case, **does not require strict compliance with water quality standards.** Our language requires that **storm water management plans be designed to achieve compliance with water quality standards**. **Compliance is to be achieved over time, through an iterative approach requiring improved BMPs**. As pointed out by the Browner court, there is nothing inconsistent between this approach and the determination that the Clean Water Act does not mandate strict compliance with water quality standards.

Order WQ 2001-15 at 7 (emphasis added). Thus, Provision A is inconsistent with the State Board's own precedential order, which requires the iterative approach effectuated by the suggested Redline changes.[3]

In further support, it may be noted that the U.S. EPA-drafted MS4 permit for the District of Columbia does not contain the type of language found in Provision A, but rather requires "an iterative and an adaptive management process for pollutant reduction and for achieving applicable water quality standard and/or total maximum daily load (TMDL) compliance." DC MS4 Permit Fact Sheet, page 5 (attached as Exhibit A).

Also, despite the assertion in the Fact Sheet that the copermittees are seeking a "safe harbor" from liability, this is incorrect. Every provision of an MS4 permit is subject to enforcement; given the complexity of the Draft Permit, the failure by a copermittee to comply with any provision could lead to such enforcement.

As noted above, MS4 discharges may not be achieving compliance with strict water quality standards, as recognized by the Issue Paper released by State Board staff in preparation for a November 20, 2012 workshop on receiving water limitation issues raised by *NRDC v. County of Los Angeles*. That Issue Paper stated that as "the storm water management programs of municipalities have matured, **an increasing body of monitoring data indicates that water quality standards are in fact not being met by many MS4s.**" (State Board Issue Paper, Page 2, emphasis supplied) (*see* Exhibit B.)

Perhaps most importantly, requiring strict and immediate compliance with discharge prohibition and receiving water limitations inhibits, not supports, the philosophy of the Draft Permit, which is to encourage the copermittees to focus on the most significant problems in their watersheds and to prioritize their resources to address those problems. Provision A, by contrast, discourages innovative approaches or prioritization, since all pollutants exceeding water quality standards create liability. Moreover, as discussed above, in the event of a citizen suit being brought such as that in the *NRDC* case, a federal judge could award injunctive relief to a successful plaintiff that could completely ignore or supplant the WQIP and other permit terms.

For additional discussion of receiving water limitations issues, please see Exhibit C, a letter submitted by the District to the State Board in connection with the recent workshop held by the State Board on receiving water limitations language. The Riverside County Copermittees hereby reference and incorporate this Exhibit into these comments.

The Riverside County Copermittees support a true iterative process that requires refinement and amendment of the WQIP and associated BMPs when receiving water limitation violations are recorded. That is the essence of the iterative process; the identification of problems and the development of BMPs to attempt to address those problems.

[3] While the Fact Sheet cites as authority *Natural Resources Defense Council v. County of Los Angeles*, discussed above, the Ninth Circuit was simply responding to language in the former Los Angeles County MS4 permit, and did not determine that such non-iterative language was required by the CWA.

The Redline proposes a means to achieve compliance using the WQIPs, which are intended to bring the copermittees into compliance with the discharge prohibition and receiving water limitation provisions of the Draft Permit over time. The Redline links compliance with Provisions A.1, A.2 and A.3 to A.4, which indicates that compliance is obtained through the preparation and updating of the WQIPs.

It must be noted, however, that the Riverside County Copermittees do not agree with the approach suggested by others, that any WQIP-based compliance approach be necessarily accompanied by a "Reasonable Assurance Analysis." Such an analysis could be extremely complex, expensive and time intensive to develop. Generally, such analyses are developed in the preparation of TMDLs and take a number of years to develop and refine. Given that the Santa Margarita Watershed has no adopted TMDLs, there are no comprehensive pollutant transport or BMP models available for the suite of constituents that might be considered for prioritization within a WQIP for that watershed. In the context of a TMDL, such models would be developed by the combined resources of the Water Board, stakeholders and dischargers. Requiring such an exercise to be undertaken solely with the public resources of the residents of the SMR is beyond the Copermittees' financial ability and would shift responsibility for development of TMDLs from the Water Board to the Copermittees.

Discussion in Fact Sheet

The Fact Sheet discussion also contains a number of legal and factual errors. First, the statement on page F-34 that non-stormwater discharges from the MS4 are subject to NPDES permitting requirements is unsupported by the plain language of the CWA, which (as noted above) applies the MEP standard to *all* discharges of pollutants from the MS4, not just those in stormwater. Also, such discharges are not subject to separate requirements under the NPDES program, as suggested on F-34, and non-storm water discharges are not the same, legally, as "illicit discharges." Please see discussion below.

Similarly, the Fact Sheet's conclusion that "Regional Water Boards are not limited by the iterative MEP approach to storm water regulation in crafting appropriate regulations for non-storm water discharges" is incorrect. The Fact Sheet correctly states that MEP has not been defined in the CWA or by U.S. EPA in the CWA regulations. However, the Fact Sheet incorrectly concludes that MEP is "ultimately defined" by the Water Boards or the State Board. What constitutes "MEP" is a question of federal law under the CWA, not a matter for definition by agencies which merely have been delegated the authority to enforce the CWA in California. The only source for such a finding is a memorandum from a State Board attorney, not case authority.

Moreover, Provisions B-E of the Draft Permit, far from establishing a "minimum framework" for the copermittees to achieve the MEP standard, sets forth in many cases requirements that far exceed the plain requirements of the CWA, the implementing regulations and in some cases even state law, or which require the copermittees to undertake steps that are not "practicable." These requirements are identified in the comments of the Riverside County Copermittees. In such respects, those requirements do not represent a "minimum framework" for MEP.

Other Issues

The Riverside County Copermittees also object to the provision in A.1.a and other portions of the Draft Permit that prohibit certain discharges into "waters of the state." The CWA regulates discharges into waters of the United States, which are surface waters. Expanding the prohibition to cover waters of the state expands the scope of the Draft Permit to protect groundwater, as a matter of state law. It should be noted that the recent Los Angeles County MS4 Permit appropriately applies this prohibition to waters of the United States.

Provision B.5: As noted in the Comment Letter, the CWA requires that illegal discharges into the MS4 be addressed by a program of steps taken to address such discharges. The Redline emphasizes that this program be guided by WQIP priorities, which is consistent with the overall intent of the Draft Program.

Provision E.2.a and E.2.a.(7): These provisions require the Copermittees to, as a part of their Illicit Discharge Detection and Elimination (IDDE) program, address all non-stormwater discharges as "illicit discharges," thus requiring the copermittees to "reduce or eliminate non-stormwater discharges" whether or not the discharges have been identified as "illicit."

The Fact Sheet asserts that "Provision E.2.a.(7) is consistent with the requirements of the CWA section 402(p)(3)(B)(ii) and 40CFR 122.26(d)(1)(v)(B). That assertion is not correct. Section 402(p)(3)(B)(ii) of the CWA states that MS4 permits "shall include a requirement to *effectively prohibit* non-stormwater discharges into the storm sewers" (emphasis supplied). The CWA regulations include two provisions designed to begin implementation of the "effective prohibition." The first provision requires MS4 permittees to perform a screening analysis, intended to provide sufficient information to develop priorities for a program to detect and remove illicit discharges. 40 CFR 122.26(d)(1)(iv)(D). The second requires MS4 permittees to develop a recommended site-specific management plan to detect and remove illicit discharges (or ensure they are covered by an NPDES permit) and to control improper disposal to MS4s. 40 CFR 122.26(d)(1)(iv)(D) and 122.26(d)(2)(B). The MS4 permittees are required to identify the non-stormwater discharge as an illicit discharge prior to having an obligation to effectively prohibit it. There is not otherwise a presumption to reduce or eliminate it.

40 CFR 122.26(d)(1)(v)(B), cited in the Fact Sheet, requires "[a] description of the existing program to identify illicit connections to the municipal storm sewer system. The description should include inspection procedures and methods for detecting and preventing illicit discharges, and describe areas where this program has been implemented."

The provision and rationale within the Fact Sheet blur the distinction between the copermittees' need to "effectively" prohibit non-stormwater discharges and to detect and eliminate illicit discharges.

- The requirement is "effectively prohibit" non-stormwater discharges, not "reduce or eliminate" non-stormwater discharges.
- Although copermittees are required to have a program to prevent illicit discharges to the MS4, non-stormwater discharges should only be addressed as illicit discharges where

such discharges are identified as sources of pollutants that may cause or contribute to an exceedance of a water quality objective.

- The IDDE program is established to detect and eliminate "illicit discharges", not non-stormwater discharges in general.

Please see the Redline for modifications to Provision E.2 addressing these issues.

Provision E.2.a.(3): In the Redline, the Riverside County Copermittees request that categories of irrigation runoff discharges (landscape irrigation, irrigation water and lawn watering) be considered as conditionally exempt discharges (not subject to treatment as illicit discharges).

The rationale for not including irrigation runoff discharges lacks a legal and factual basis. As noted in the Comment Letter, the only factual basis for this provision with respect to the Riverside County Copermittees is discussion in a public information informational brochure, which was itself based on a similar document from Orange County. Fact Sheet F-76. Despite assertions to the contrary in the Fact Sheet, this brochure does not represent a determination by the Riverside County Copermittees that irrigation runoff is a category of non-stormwater discharge that must be effectively prohibited. The other evidence in support of prohibiting the conditional exemption for irrigation runoff is entirely from different areas of the region, with different urban development patterns, lithology and hydrology. No specific determination has been made by the Copermittees (or the Water Board) that irrigation runoff in the Santa Margarita Region has actually been shown to be significant source of pollutants to receiving waters in the SMR.

EPA, in the preamble to the federal MS4 regulations, required that a *permittee* must make a finding that the "irrigation water" discharges must be a "source of pollutants to waters of the United States . . . ." 55 Fed. Reg. 48037. Moreover, such discharges must represent a "significant" source of pollutants to waters of the United States "under certain conditions." U.S. EPA, *Guidance Manual for the Preparation of Part 2 of the NPDES Permit Application for Discharges from Municipal Separate Storm Sewer Systems,* November 1992 ("EPA Part 2 Guidance Manual"), at p. 6-33. These conditions require a focus not on an entire category of discharges, but rather a discharger-by-discharger examination.

In the MS4 regulatory preamble, EPA stated that "[i]n general, municipalities will not be held responsible for prohibited some specific components of discharges or flows listed below through their [MS4], even though such components may be considered non-storm water discharges, unless such discharges *are specifically identified on a case-by-case basis as needing to be addressed."* 55 Fed. Reg. 47995 (emphasis supplied). In the Guidance Manual, EPA states:

> If an applicant knows . . . that landscape irrigation water from a ***particular site*** flows through and picks up pesticides **or *excess*** nutrients from fertilizer applications, there may be a reasonable potential for a storm water discharge to result in a water quality impact. In such an event, the applicant should contact the NPDES permitting authority to request that the authority order ***the discharger*** . . . to obtain a separate NPDES permit (or in this case, the discharge could be controlled through the storm water management program of the MS4).

EPA Part 2 Guidance Manual, p. 6-33 (emphasis added). Read in this context of this language, the Water Board has no power greater than a municipality in terms of its ability to identify non-stormwater discharges as "illicit" and thus required to be regulated, and must identify specific discharges, and not entire categories of discharges. *See* 55 Fed. Reg. 48037. This has not been done in the Fact Sheet.

Provision E.3(c): This provision requires the Copermittees to compel development projects that may not result in a hydromodification impact to the applicable receiving waters, to implement on-site or "alternative compliance" hydromodification mitigation measures and to use using "pre-development (naturally occurring)" runoff reference condition as applied to sites that are, in fact, developed.

The Riverside County Copermittees are concerned that implementing these requirements would subject the Copermittees to liability under the takings clauses of the U.S. and California Constitutions as well as under the Mitigation Fee Act because of the questionable nexus between such a project's lack of actual hydromodification impacts upon the receiving waters, and the hydromodification management measures required in the Draft Permit.

When imposing a condition on a development permit, a local government is required under the federal and state constitutions to establish that the condition bears a reasonable relationship to the impacts of the development project. This rule applies even to legislatively enacted requirements and impact fees or exactions.[4] Moreover, fees imposed on a discretionary ad hoc basis are subject to heightened scrutiny under a two-part test. First, local governments must show that there is a substantial relationship between the burden created by the impact of development and any fee or exaction.[5] Second, a development project's impacts must bear a "rough proportionality" to any development fee or exaction.[6] Under California law, the *Nollan/Dolan* heightened scrutiny test also applies to in-lieu fees.[7]

The Legislature has memorialized these requirements in the Mitigation Fee Act, which establishes procedures that local governments must follow to impose impact fees.[8] Irrespective of whether the hydromodification management requirements are implemented by legislative act or on an ad hoc basis, the copermittees' attempt to enforce them as proposed in the Draft Permit would likely result in claims by developers and property owners alleging unconstitutional takings of private property and violations of the Mitigation Fee Act. This is because a developer could argue that limiting hydromodification impacts of already developed property to its "naturally occurring" state, or requiring hydromodification mitigation measures for impacts not imposed by the project, would not have a legally sufficient nexus to the impact of the development project.

In addition, the Copermittees wish to bring the Water Board's attention to a recent case, *Virginia Dept. of Transportation v. United States Environmental Protection Agency*, Civ. Action No.

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[4] *Building Indus. Ass'n v. City of Patterson* (2009)171 Cal. App. 4th 886, 898.
[5] *Nollan v. California Coastal Comm'n*, 483 U.S. 825, 837 (1987).
[6] *Dolan v. City of Tigard*, 512 U.S. 374, 391 (1994).
[7] *Ehrlich v. City of Culver City* (1996) 12 Cal. 4th 854, 876.
[8] Cal. Gov't Code §§ 66000-66025.

1:12-CV-775 (E.D. Va. January 3, 2013) (slip op.), which is attached for the Water Board's convenience as Exhibit D. In this case, a federal district judge found that the CWA did not authorize U.S. EPA to regulate stormwater itself as a pollutant. The impact of this case is not known at this time, as it will probably be appealed to the Fourth Circuit Court of Appeals. Still, any approach to hydromodification which focuses on flows *per se*, as opposed to pollutants, may not withstand legal scrutiny.

Provision E.3.c.(3)(c)(i): This provision requires the entire alternative compliance in-lieu fee to be transferred to the copermittee or an escrow account prior to construction of a Priority Development Project (PDP). This provision is problematic, as development fees (which would include the in-lieu fees) are collected at the time of building permit issuance. In large-scale projects, permits may be issued (and development fees collected) in phases. Further, for master-planned developments, fees are generally negotiated through a development agreement to be collected based on certain development milestones. Therefore, collecting and holding the entire in-lieu fee prior to construction interferes with the development practice and may violate the Mitigation Fee Act and local development ordinances. The Redline requests that in-lieu fees be collected in accordance with state and local law.

Provision E.5: In addition to other comments on this provision and others in the Draft Permit relating to retrofitting, any requirements in Draft Permit relating to the retrofitting of engineered channels and other structures employed for flood control purposes must be consistent with the judgment of the flood control districts, to which the Legislature has assigned sole authority for the protection of the lives and property of their citizens from flooding. (Please see Comment Letter and proposed new findings in Redline for further discussion). Due to the urbanization of the counties over the past 150 years, as well as the particular topography and weather conditions found in Southern California, there is a great risk of flooding and hence the need for flood control structures and channels. The flood control districts have both the expertise and the sole legal authority to determine whether retrofitting of flood control structures can be accomplished in light of their statutory obligations, and that expertise and authority must be recognized in the Draft Permit.

Provision E.8: As noted in the Redline, the first requirement under Fiscal Analysis, that each "Copermittee must secure the resources necessary to meet all the requirements of this Order" has been deleted. This requirement is not found in the CWA regulations, which require only the conduct of a fiscal analysis. Moreover, this requirement intrudes on the home rule power of cities and counties by requiring, in essence, that municipal budgets must reflect the priority of compliance with the Order over any competing obligation, including police, fire protection and public health. A key issue in complying with stormwater and MS4 obligations is the ability of municipalities to afford the increasing costs associated with those obligations. In California, of course, the ability to raise taxes to pay for such obligations has been severely curtailed through several voter-approved propositions.

The Riverside County Copermittees request that Provision E.8.a be deleted.

EXHIBIT A

NPDES Permit No. DC0000221

AUTHORIZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM MUNICIPAL SEPARATE STORM SEWER SYSTEM PERMIT

In compliance with the provisions of the Clean Water Act, 33 U.S.C. §§ 1251 *et seq.*

Government of the District of Columbia
The John A. Wilson Building
1350 Pennsylvania Avenue, N.W.
Washington, D.C. 20004

is authorized to discharge from all portions of the municipal separate storm sewer system owned and operated by the District of Columbia to receiving waters named:

Potomac River, Anacostia River, Rock Creek and stream segments tributary to each such water body

in accordance with the Stormwater Management Program(s) dated February 19, 2009, subsequent updates, and related reports, strategies, effluent limitations, monitoring requirements and other conditions set forth in Parts I through IX herein.

The effective issuance date of this permit is: October 7, 2011.

This permit and the authorization to discharge shall expire at midnight, on: October 7, 2016.

Signed this 30th day of September, 2011.

Jon M. Capacasa, Director
Water Protection Division
U.S. Environmental Protection Agency
Region III

1. DISCHARGES AUTHORIZED UNDER THIS PERMIT

1.1 Permit Area

This permit covers all areas within the jurisdictional boundary of the District of Columbia served by, or otherwise contributing to discharges from, the Municipal Separate Storm Sewer System (MS4) owned or operated by the District of Columbia. This permit also covers all areas served by or contributing to discharges from MS4s owned or operated by other entities within the jurisdictional boundaries of the District of Columbia unless those areas have separate NPDES MS4 permit coverage or are specifically excluded herein from authorization under the District's stormwater program. Hereinafter these areas collectively are referred to as "MS4 Permit Area".

1.2 Authorized Discharges

This permit authorizes all stormwater point source discharges to waters of the United States from the District of Columbia's MS4 that comply with the requirements of this permit. This permit also authorizes the discharge of stormwater commingled with flows contributed by process wastewater, non-process wastewater, or stormwater associated with industrial activity provided such discharges are authorized under separate NPDES permits.

This permit authorizes the following non-stormwater discharges to the MS4 when appropriate stormwater activities and controls required through this permit have been applied and which are: (1) discharges resulting from clear water flows, roof drainage, dechlorinated water line flushing, landscape irrigation, ornamental fountains, diverted stream flows, rising ground waters, uncontaminated ground water infiltration to separate storm sewers, uncontaminated pumped ground water, discharges from potable water sources, foundation drains, air conditioning condensation, irrigation waters, springs, footing drains, lawn watering, individual resident car washing, flows from riparian habitats and wetlands, dechlorinated swimming pool discharges, wash water, fire fighting activities, and similar types of activities; and (2) which are managed so that water quality is not further impaired and that the requirements of the federal Clean Water Act, 33 U.S.C. §§ 1251 *et seq.*, and EPA regulations are met.

1.3 Limitations to Coverage

1.3.1 Non-stormwater Discharges

The permittee, as defined herein, shall effectively prohibit non-stormwater discharges into the MS4, except to the extent such discharges are regulated with an NPDES permit.

1.3.2 Waivers and Exemptions

This permit does not authorize the discharge of any pollutant from the MS4 which arises from or is based on any existing waivers and exemptions that may otherwise apply and are not consistent with the Federal Clean Water Act and other pertinent guidance, policies, and regulations. This narrative prohibition on the applicability of such waivers and exemptions extends to any activity that would otherwise be authorized under District law, regulations or

ordinance but which impedes the reduction or control of pollutants through the use of stormwater control measures and/or prevents compliance with the narrative /numeric effluent limits of this permit. Any such discharge not otherwise authorized may constitute a violation of this permit.

1.4 Discharge Limitations

The permittee must manage, implement and enforce a stormwater management program (SWMP) in accordance with the Clean Water Act and corresponding stormwater NPDES regulations, 40 C.F.R. Part 122, to meet the following requirements:

1.4.1. Effectively prohibit pollutants in stormwater discharges or other unauthorized discharges into the MS4 as necessary to comply with existing District of Columbia Water Quality Standards (DCWQS);

1.4.2. Attain applicable wasteload allocations (WLAs) for each established or approved Total Maximum Daily Load (TMDL) for each receiving water body, consistent with 33 U.S.C. § 1342(p)(3)(B)(iii); 40 C.F.R. § 122.44(k)(2) and (3); and

1.4.3. Comply with all other provisions and requirements contained in this permit, and in plans and schedules developed in fulfillment of this permit.

Compliance with the performance standards and provisions contained in Parts 2 through 8 of this permit shall constitute adequate progress toward compliance with DCWQS and WLAs for this permit term.

2. LEGAL AUTHORITY, RESOURCES AND STORMWATER PROGRAM ADMINSTRATION

2.1 Legal Authority

2.1.1 The permittee shall use its existing legal authority to control discharges to and from the Municipal Separate Storm Sewer System in order to prevent or reduce the discharge of pollutants to achieve water quality objectives, including but not limited to applicable water quality standards. To the extent deficiencies can be addressed through regulation or other Executive Branch action, the permittee shall remedy such deficiencies within 120 days. Deficiencies that can only be addressed through legislative action shall be remedied within 2 years of the effective date of this permit, except where otherwise stipulated, in accordance with the District's legislative process. Any changes to or deficiencies in the legal authority shall be explained in each Annual Report.

2.1.2 No later than 18 months following the effective date of this permit, the District shall update and implement Chapter 5 of Title 21 of District of Columbia Municipal Regulations (Water Quality and Pollution) ("updated DC Stormwater Regulations"), to address the control of stormwater throughout the MS4 Permit Area. Such regulations shall be consistent with this

FACT SHEET

National Pollutant Discharge Elimination System (NPDES)
Municipal Separate Storm Sewer System (MS4)
Permit No. DC0000221 (Government of the District of Columbia)

NPDES PERMIT NUMBER: DC0000221 (Reissuance)

FACILITY NAME AND MAILING ADDRESS:

Government of the District of Columbia
The John A. Wilson Building
1350 Pennsylvania Avenue, N.W.
Washington, D.C. 20004

MS4 ADMINISTRATOR NAME AND MAILING ADDRESS:

Director, District Department of the Environment
1200 First Street, N.E., 6th Floor
Washington, D.C. 20002

FACILITY LOCATION:

District of Columbia's Municipal Separate Storm Sewer System (MS4)

RECEIVING WATERS:

Potomac River, Anacostia River, Rock Creek, and Stream Segments Tributary
To Each Such Water Body

INTRODUCTION:

Today's action finalizes reissuance of the District of Columbia Municipal Separate Storm Sewer System (MS4) Permit. In the Final Permit EPA has continued to integrate the adaptive management approach with enhanced control measures to address the complex issues associated with urban stormwater runoff within the corporate boundaries of the District of Columbia, where stormwater discharges via the Municipal Separate Storm Sewer System (MS4).

Since the United States Environmental Protection Agency, Region III (EPA) issued the District of Columbia (the District) its first MS4 Permit in 2000, the Agency has responded to a number of legal challenges involving both that Permit (as well as amendments thereto) and the second-round MS4 Permit issued in 2004. For the better part of ten years, the Agency has worked with various parties in the litigation, including the District and two non-governmental organizations, Defenders of Wildlife and Friends of the Earth, to address the concerns of the various parties. The Agency has engaged in both litigation and negotiation, including formal

mediation.[1] These activities ultimately led to an enhanced stormwater management strategy in the District, consisting of measurable outputs for addressing the issues raised during the litigation and mediation process.

FACILITY BACKGROUND AND DESCRIPTION:

The Government of the District of Columbia owns and operates its own MS4, which discharges stormwater from various outfall locations throughout the District into its waterways.[2]

On April 21, 2010 EPA public noticed the Draft Permit. The Draft Fact Sheet published with that Draft Permit contains more extensive permit background information, and the reader is referred to that document for the history of the District of Columbia MS4 permit.

The public comment period closed on June 4, 2010. EPA received comments from 21 individual commenters and an additional 53 form letters. The Draft Permit, Draft Fact Sheet, and comments received on those documents are all available at: http://www.epa.gov/reg3wapd/npdes/draft_permits.html. The Final Permit reflects many of the comments received. EPA is simultaneously releasing a responsiveness summary responding to these comments.

ACTION TO BE TAKEN:

EPA is today reissuing the District of Columbia NPDES MS4 Permit. The Final Permit replaces the 2004 Permit, which expired on August 18, 2009 and has been administratively extended since that time. The Final Permit incorporates concepts and approaches developed from studies and pilot projects that were planned and implemented by the District under the 2000 and 2004 MS4 permits and modifying Letters of Agreement, and implements Total Maximum Daily Loads (TMDLs) that have been finalized since the prior permit was issued, including the Chesapeake Bay TMDL. A number of applicable measurable performance standards have been incorporated into the Final Permit. These and other changes between the 2004 Permit and today's Final Permit are reflected in a Comparison Document that is part of today's Permit issuance.

WATER QUALITY IN DISTRICT RECEIVING WATERS:

The District's *2008 Integrated Report to the Environmental Protection Agency and U.S. Congress Pursuant to Sections 305(b) and 303(d) Clean Water Act*[3] documents the serious water

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1 A procedural history of Permit appeals can be viewed at the EPA Environmental Appeals Board web: http://yosemite.epa.gov/oa/EAB_Web_Docket.nsf/77355bee1a56a5aa8525711400542d23/b5e5b68e89edabe98525714f00731c6f!OpenDocument&Highlight=2.municipal.

2 Portions of the District are served by a combined sanitary and storm sewer system. The discharges from the combined sewer system are not subject to the MS4 permit, but are covered under NPDES Permit No. xxxx issued to the District of Columbia Water and Sewer Authority.

3 District Department of the Environment, *The District of Columbia Water Quality Assessment, 2008 Integrated Report to the Environmental Protection Agency and U.S. Congress Pursuant to Sections 305(b) and 303(d) Clean Water Act* (hereinafter "2008 Integrated Report").

quality impairments in the surface waters in and around the District. A number of the relevant designated uses are not being met, *e.g.*, aquatic life, fish consumption, and full body contact, and there are a number of specific pollutants of concern that have been identified (for additional discussion on relevant TMDLs *see* Section 4.10 of this Final Fact Sheet).

Commenters on the Draft Permit expressed some frustration over very slow progress or even lack of progress after a decade of implementation of the MS4 program and even longer for other water quality programs. EPA appreciates this concern. Although the District's receiving waters are affected by a range of discharge sources, discharges from the MS4 are a significant contributor of pollutants and cause of stream degradation. EPA also recognizes, however, that stormwater management efforts that achieve a reversal of the ongoing degradation of water quality caused by urban stormwater discharges entail a long term, multi-faceted approach.

Consistent with the federal stormwater regulations for characterizing discharges from the MS4 (40 C.F.R. §122.26(d)(2)(iii)), the first two permit terms for the District's MS4 program required end-of-pipe monitoring to determine the type and severity of pollutants discharging via the system. The monitoring program was not designed to evaluate receiving water quality *per se*, therefore detection of trends or patterns was not reasonably possible. Today's Final Permit includes requirements for a Revised Monitoring Program, and one of the objectives for the program is to use a suite of approaches and indicators to evaluate and track water quality over the long-term (*see* discussion of Section 5.1 in this Final Fact Sheet).
There have been identified improvements in some areas. For example the *2008 Integrated Report* noted improvements in the diversity of submerged aquatic vegetation in the Potomac River, as well as improvements in fish species richness in Rock Creek. Biota metrics are often the best indicators of the integrity of any aquatic system.

EPA also notes that there are a variety of indirect measures indicative of improvement. The federal stormwater regulations foresaw the difficulty, especially in the near-term, of detecting measurable improvement in receiving waters, and relied instead on indirect measures, such as estimates of pollutant load reductions (40 C.F.R. §122.26(d)(2)(v)). The District documents these types of indirect measures in its annual reports, *e.g.*, tons of solids collected from catch basin clean-outs, amount of household hazardous waste collected, number of trees planted, square footage of green roofs installed, and many other measures of success.[4]

EPA believes that documenting trends in water quality, whether improvements, no change, or even further degradation, is an important element of a municipal water quality program. Today's Final Permit recognizes this principle, both in the types of robust measures required as well as the transition to new monitoring paradigms. EPA encourages all interested parties to provide the District with input during the development of these program elements.

THIS FACT SHEET:

(http://ddoe.dc.gov/ddoe/frames.asp?doc=/ddoe/lib/ddoe/information2/water.reg.leg/DC_IR_2008_Revised_9-9-2008.pdf)

4 District MS4 Annual Reports can be found at: http://ddoe.dc.gov/ddoe/cwp/view,a,1209,q,495855.asp

This Final Fact Sheet is organized to correspond with the chronological organization and numbering in today's Final Permit. Where descriptions or discussions may be relevant to more than one element of the Final Permit the reader will be referred to the relevant section(s).

To keep today's Final Fact Sheet of readable length, many of the elements included in the fact sheet published with the Draft Permit (Draft Fact Sheet) on April 21, 2010 have not been repeated, but are referenced. Readers are referred to the Draft Fact Sheet published with the Draft Permit for additional discussion on provisions that have been finalized as proposed.[5] The Final Fact Sheet does discuss significant changes since the 2004 Permit (even if discussed in the Draft Fact Sheet). The Final Fact Sheet also contains additional explanation of the Final Permit where commenters requested additional clarification. In addition, this Final Fact Sheet explains modifications to the Final Permit where provisions were changed in response to comments.

In many cases EPA made a number of very simple modifications to the Final Permit, *e.g.*, a word, phrase, or minor reorganization, simply for purposes of clarification. These modifications were not intended to change the substance of the permit provisions, only to clarify them. Most of those types of edits are not discussed in this Final Fact Sheet, but EPA has provided a Comparison Document of the Draft and Final Permits for readers who would like that level of detail.

Many commenters noted that the Draft Permit was not logically organized. EPA agrees. The major reorganization principles include:

1) There is a new Section 3, Stormwater Management Program (SWMP) Plan consolidating the various plans, strategies and other documents developed in fulfillment of permit requirements.
2) All implementation measures, *i.e.*, those stipulating management measures and implementation policies, are included in Section 4 of today's Final Permit. This includes "Source Identification" elements (Section 3 in the Draft Permit) and "Other Applicable Provisions" elements (Section 8 in the Draft Permit), which included TMDL requirements.
3) All monitoring requirements are consolidated in Section 5 of the Final Permit.
4) All reporting requirements are consolidated in Section 6 of the Final Permit.

EPA also refers readers to the Responsiveness Summary released today along with the Final Permit and Final Fact Sheet, for responses to comments and questions received on the Draft Permit. That document contains additional detailed explanations of the rationale for changes made to the Draft Permit in the Final Permit.

Finally, EPA made significant effort to avoid appending or incorporating by reference other documents containing permit requirements into the Final Permit. In the interest of clarity

5 The Permit and Fact Sheet proposed on April 21, 2010 can be viewed at: http://www.epa.gov/reg3wapd/npdes/draft_permits.html

and transparency EPA, to the extent possible, has included all requirements directly in the permit. Thus, EPA reviewed a variety of documents with relevant implementation measures, *e.g.*, TMDL Implementation Plans and the 2008 Modified Letter of Agreement to the 2004 permit[6], and translated elements of those plans and strategies into specific permit requirements that are now contained in the Final Permit. This Fact Sheet provides an explanation of the sources of provisions that are significant and are a direct result of one of those strategies.

1. DISCHARGES AUTHORIZED UNDER THIS PERMIT

(1.2 Authorized Discharges): The Final Permit authorizes certain non-stormwater discharges, including discharges from water line flushing. One commenter noted that many of these discharges, especially from potable water systems, contain concentrations of chlorine that may exceed water quality standards. EPA agrees, and has therefore clarified that dechlorinated water line flushing is authorized to be discharged under the Final Permit.

(1.4 Discharge Limitations): Comments on the language in Part 1.4 varied widely. Some commenters did not believe it was reasonable to require discharges to meet water quality standards. Other commenters believed this to be an unambiguous requirement of the Clean Water Act.

Today's Final Permit is premised upon EPA's longstanding view that the MS4 NPDES permit program is both an iterative and an adaptive management process for pollutant reduction and for achieving applicable water quality standard and/or total maximum daily load (TMDL) compliance. *See generally,* "National Pollutant Discharge Elimination System Permit Application Regulations for Stormwater Discharges," 55 F.R. 47990 (Nov. 16, 1990).

EPA is aware that many permittees, especially those in highly urbanized areas such as the District, likely will be unable to attain all applicable water quality standards within one or more MS4 permit cycles. Rather the attainment of applicable water quality standards as an incremental process is authorized under section 402(p)(3)(B)(iii) of the Clean Water Act, 33 U.S.C. § 1342(p)(3)(B)(iii), which requires an MS4 permit "to reduce the discharge of pollutants to the maximum extent practicable" (MEP) "and such other provisions" deemed appropriate to control pollutants in municipal stormwater discharges. To be clear, the goal of EPA's stormwater program is attainment of applicable water quality standards, but Congress expected that many municipal stormwater dischargers would need several permit cycles to achieve that goal.

Specifically, the Agency expects that attainment of applicable water quality standards in waters to which the District's MS4 discharges, requires staged implementation and increasingly more stringent requirements over several permitting cycles. During each cycle, EPA will continue to review deliverables from the District to ensure that its activities constitute sufficient progress toward standards attainment. With each permit reissuance EPA will continue to increase

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6 District Department of the Environment, *Modification to the Letter of Agreement dated November 27, 2007 for the NPDES Municipal Separate Storm Sewer (MS4) Permit DC0000222* (2008) http://www.epa.gov/reg3wapd/npdes/pdf/DCMS4/Letter.PDF

stringency until such time as standards are met in all receiving waters. Therefore today's Final Permit is clear that attainment of applicable water quality standards and consistency with the assumptions and requirements of any applicable WLA are requirements of the Permit, but, given the iterative nature of this requirement under CWA Section 402(p)(3)(B)(iii), the Final Permit is also clear that "compliance with all performance standards and provisions contained in the Final Permit shall constitute adequate progress toward compliance with DCWQS and WLAs for this permit term" (Section 1.4).

EPA believes that permitting authorities have the obligation to write permits with clear and enforceable provisions and thus the determination of what is the "maximum extent practicable" under a permit is one that must be made by the permitting authority and translated into provisions that are understandable and measurable. In this Final Permit EPA has carefully evaluated the maturity of the District stormwater program and the water quality status of the receiving waters, including TMDL wasteload allocations. In determining whether certain measures, actions and performance standards are practicable, EPA has also looked at other programs and measures around the country for feasibility of implementation. Therefore today's Final Permit does not qualify any provision with MEP thus leaving this determination to the discretion of the District. Instead each provision has already been determined to be the maximum extent practicable for this permit term for this discharger.

EPA modified the language in the Final Permit to provide clarity on the expectations consistent with the preceding explanation. Specifically Section 1.4.2 of the Final Permit requires that discharges 'attain' applicable wasteload allocations rather than just 'be consistent' with them, since the latter term is somewhat ambiguous.

In addition, the general discharge limitation 'no increase in pollutant loadings from discharges from the MS4 may occur to receiving waters' was removed because of the difficulty in measuring, demonstrating and enforcing this provision. Instead, consistent with EPA's belief that the Final Permit must include all of the enforceable requirements that would achieve this principle, the following discharge limitation is substituted: "comply with all other provisions and requirements contained in this permit, and in plans and schedules developed in fulfillment of this permit."

In addition, EPA made the following modifications: "Compliance with <u>the</u> performance standards and provisions contained in <u>Parts 2 through 8 of</u> this permit shall constitute adequate progress towards compliance with DCWQS <u>and WLAs for this permit term</u>" (*underlined text added*) (Section 1.4 of the Final Permit). EPA eliminated circularity with the addition of "Parts 2 through 8", clarifying that this requirement does not circle back to include the statements in 1.4.1 and 1.4.2, but rather interprets them. Also, although WLAs are a mechanism for attainment of water quality standards, EPA added the specific language "and WLAs" to make this concept explicit rather than just implicit. In addition this revised language emphasizes that the specific measures contained in the Final Permit, while appropriate for this permit term, will not necessarily constitute full compliance in subsequent permit terms. It is the expectation that with each permit reissuance, additional or enhanced requirements will be included with the objective

of ensuring that MS4 discharges do not cause or contribute to an exceedance of applicable water quality standards, including attainment of relevant WLAs.

2. LEGAL AUTHORITY, RESOURCES, AND STORMWATER PROGRAM ADMINISTRATION

(2.1 Legal Authority): Several commenters pointed out that there were a number of requirements in the Draft Permit without clear compliance schedules or deadlines, or with deadlines that did not correspond well to others in the permit. In the Final Permit, EPA has made several revisions to address these comments. For example, EPA changed a requirement that deficiencies in legal authority must be remedied "as soon as possible" to a 120-day requirement for deficiencies that can be addressed through regulation, and two years for deficiencies that require legislative action (Section 2.1.1). Also, EPA increased the compliance schedule for updating the District's stormwater regulation from twelve months to eighteen months, *id.,* so that this action could be adequately coordinated with the development of the District's new offsite mitigation/payment-in-lieu program (for more discussion see Section 4.1.3 below).

(2.2 Fiscal Resources): One commenter suggested eliminating the reference to the District's Enterprise Fund since funding was likely to come from a number of different budgets within the District. EPA agrees with this comment and has removed this reference.

On the other hand, many commenters noted that the implementation costs of the District's stormwater program will be significant. EPA agrees. The federal stormwater regulations identify the importance of adequate financial resources [40 C.F.R. §122.26(d)(1)(vi) and (d)(2)(vi)]. In addition, after seeing notable differences in the caliber of stormwater programs across the country, EPA recognizes that dedicated funding is critical for implementation of effective MS4 programs.[7,8,9] In 2009 the District established, and in 2010 revised, an impervious-based surface area fee for service to provide core funding to the stormwater program[10] (understanding that stormwater-related financing may still come from other sources as they fulfill multiple purposes, *e.g.,* street and public right-of-way retrofits). In conjunction with the 2010 rule-making to revise the fee the District issued a Frequently Asked Questions document[11] that indicates the intent to restrict this fee to its original purpose, *i.e.*, dedicated funding to implement the stormwater program and comply with MS4 permit requirements. EPA believes this action is essential, and he expects that the District will maintain a dedicated source of funding for the stormwater program.

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7 National Research Council, *Urban Stormwater Management in the United States* (2009) National Academy of Sciences http://www.nap.edu/catalog.php?record_id=12465

8 National Association of Flood and Stormwater Agencies, Funded by EPA, *Guidance for Municipal Stormwater Funding* (2006) http://www.nafsma.org/Guidance%20Manual%20Version%202X.pdf

9 EPA, *Funding Stormwater Programs* (2008) http://www.epa.gov/npdes/pubs/region3_factsheet_funding.pdf

10 District of Columbia, Rule 21-566 Stormwater Fees, http://www.dcregs.dc.gov/Gateway/RuleHome.aspx?RuleID=474056

11 District of Columbia, FAQ Document *Changes to the District's Stormwater Fee* (2010) http://ddoe.dc.gov/ddoe/frames.asp?doc=/ddoe/lib/ddoe/information2/water.reg.leg/Stormwater_Fee_FAQ_10-5-10_-final.pdf

EXHIBIT B

CALIFORNIA Water Boards

EDMUND G. BROWN JR. GOVERNOR

MATTHEW RODRIQUEZ SECRETARY FOR ENVIRONMENTAL PROTECTION

State Water Resources Control Board

State Water Resources Control Board

Issue Paper
Municipal Storm Water Permit Receiving Water Limitations
Board Workshop
November 20, 2012

ISSUE:

The State Water Resources Control Board (State Water Board) has been asked, in public comments received on National Pollutant Discharge Elimination System (NPDES) permits for Municipal Separate Storm Sewer Systems (MS4s), to adopt permit provisions that create a partial or complete exemption from enforcement for violations of water quality standards while a discharger engages in an iterative process of improving controls (commonly referred to as a "safe harbor" provision). The State Water Board has scheduled a public workshop to consider the issue.

DISCUSSION:

Background:

The Clean Water Act generally requires NPDES permits to include technology-based effluent limitations and any more stringent limitations necessary to meet water quality standards. In the context of NPDES permits for MS4s, however, the Clean Water Act does not reference the requirement to meet water quality standards. MS4 discharges must meet a technology-based standard of reducing pollutants in the discharge to the Maximum Extent Practicable (MEP), but requirements to meet water quality standards are at the discretion of the permitting agency.[1] Further, under the Porter-Cologne Water Quality Control Act, waste discharge requirements must implement applicable water quality control plans, including water quality objectives; however, the Porter-Cologne Act also affords the State Water Board and regional water quality control boards (collectively, Water Boards) flexibility to consider other factors, such as economics, when establishing any NPDES permit requirements that are more stringent than required by the Clean Water Act.[2]

The State Water Board has exercised its discretion with regard to requiring compliance with water quality standards in MS4 permits by directing, in precedential orders, that MS4 permits contain provisions requiring discharges to be controlled so as not to cause or contribute to exceedances of water quality standards in receiving waters.[3] However, consistent with federal

[1] 33 U.S.C. § 1342(p); *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159.

[2] Wat. Code, §§ 13241, 13263; *City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613.

[3] SWRCB Order WQ 98-01 (*Environmental Health Coalition*), WQ 99-05 (*Environmental Health Coalition)*.

law, the State Water Board has found it appropriate to implement Best Management Practices (BMPs) in lieu of numeric water quality-based effluent limitations to meet water quality standards.[4] Additionally, in lieu of "strict compliance" with water quality standards, the State Water Board has prescribed an iterative process whereby an exceedance of a water quality standard triggers a process of BMP improvements: reporting of the violation, submission of a report describing proposed improvements to BMPs expected to better meet water quality standards, and implementation of these new BMPs.

While the Water Boards have generally directed dischargers to achieve compliance with water quality standards by improving control measures through the iterative process, the iterative process does not provide a "safe harbor" to MS4 permittees: that is, when a discharger is shown to be causing or contributing to an exceedance of water quality standards, that discharger is in violation of the relevant discharge prohibitions and receiving water limitations of the permit and potentially subject to enforcement by the Water Boards or through a citizen suit, even if the discharger is actively engaged in the iterative process. Despite the lack of a safe harbor provision, however, the Water Boards have, as a matter of practice, declined to initiate enforcement actions against MS4 permittees who have been actively engaged in the iterative process. The Water Boards' decisions to decline to include a safe harbor in MS4 permits have been upheld by courts of appeal.[5]

Need for and Purpose of Workshop:

The lack of a safe harbor in the iterative process was recently highlighted by the Ninth Circuit's decision in a citizen suit brought by the Natural Resources Defense Council (NRDC) against the County of Los Angeles and the Los Angeles County Flood Control District for violations of the receiving water limitations of their MS4 permit. The Ninth Circuit confirmed that, as the receiving water limitations of the Water Boards' MS4 permits are currently drafted, engagement in the iterative process does not excuse liability for violations of water quality standards.[6]

As the storm water management programs of municipalities have matured, an increasing body of monitoring data indicates that water quality standards are in fact not being met by many MS4s. MS4s accordingly assert that the receiving water limitations and iterative process provisions of the Water Boards' permits do not afford them with a viable path to compliance for these violations, which may take years of technical efforts to correct, especially for wet weather discharges. MS4s argue that they are increasingly vulnerable to citizen suits and/or Water Board enforcement. This concern has been raised by the California Stormwater Quality Association (CASQA) in comments on the proposed Phase II MS4 permit and by the California Department of Transportation (Caltrans) in comments on the Caltrans MS4 permit adopted

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[4] *See* SWRCB Orders WQ 91-03 (*Citizens for a Better Environment)*, WQ 98-01 (*Environmental Health Coalition*), WQ 2001-15 (*Building Industry Association of San Diego County*); *See also* 40 C.F.R. § 122.44(k); Interim Permitting Approach for Water Quality-Based Effluent Limitations In Storm Water Permits, USEPA, September 1995. In such orders and guidance, the State Water Board and Environmental Protection Agency acknowledge that the storm water program may evolve over time to incorporate stricter limitations, including improved BMPs to meet water quality standards or numeric water quality based effluent limitations.

[5] *Building Industry Assn. of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866; *City of Rancho Cucamonga v. Regional Water Quality Control Bd.* (2006) 135 Cal.App.4th 1377; see also *Natural Resources Defense Council v. County of Los Angeles* (9th Cir. 2011) 673 F.3d 880, 897, n.7.

[6] *Natural Resources Defense Council v. County of Los Angeles, supra*, 673 F.3d at p. 897. On July 13, 2012, the United States Supreme Court granted review of this case on other grounds.

September 19, 2012, as well as by numerous MS4s and interested persons in comments on both permits. The issue is additionally relevant to the Phase I MS4 permits issued by the regional water quality control boards.[7]

At the same time, the environmental community has commented that the iterative process has been underutilized and ineffective to date in bringing MS4 discharges into compliance with water quality standards. Environmental parties argue that direct enforcement of water quality standards is necessary to protect water quality, especially in such second- or third-generation permits where dischargers have already had a number of years to come into compliance.

Because of the broad applicability of any policy decisions regarding the receiving water limitations and iterative process provisions, the State Water Board is holding a public workshop to consider several alternatives in addressing the issue and to seek public input on these alternatives. Following the workshop, the State Water Board may propose revisions to the receiving water limitations in the Caltrans MS4 and Phase II MS4 permits, and as necessary, re-open those permits after public review and comment, to make the revisions.

ALTERNATIVES FOR CONSIDERATION:

The State Water Board may consider the alternatives below, individually or in combination, to address concerns with the receiving water limitations in the Caltrans or Phase II MS4 permits. While the listed alternatives attempt to capture the range of alternatives before the State Water Board, the Board welcomes comments proposing other options and will not be limiting its consideration to the alternatives as listed in this issue paper.

The receiving water limitations language prescribed by State Water Board Order WQ 99-05 is attached as Attachment 1 and forms the basis of Alternative 1. CASQA has submitted specific proposed language for the Receiving Water Limitations provision of the proposed Phase II MS4 permit (CASQA Proposal). The CASQA Proposal is attached as Attachment 2 and is referenced as appropriate in the discussion of the alternatives below.

Alternative 1: Keep the status quo of no safe harbor.

This alternative makes no changes to the existing State Water Board approach or to the current language of the adopted Caltrans MS4 permit or the proposed Phase II MS4 permit. As stated previously, the current MS4 permit provisions laying out the iterative process are based on language set forth in precedential State Water Board orders. (See Attachment 1.) Alternative 1 adheres to the prescribed language. Under this alternative, the Water Boards may choose to exercise their enforcement discretion to refrain from taking action against dischargers engaged in good faith implementation of the iterative process; however, they would not be constrained from enforcing the receiving water limitations when an MS4 causes or contributes to exceedances of water quality standards. As a limitation within an NPDES permit, dischargers who cause or contribute to an exceedance of water quality standards could be subject to citizen suits.

[7] Note that the issue is not relevant to any other NPDES permits, including permits for storm water discharges associated with industrial activity, because all other NPDES permits must include technology-based effluent limitations and any more stringent limitations necessary to meet water quality standards. (33 U.S.C. § 1311(b)(1)(C).)

Alternative 2: No safe harbor, but provide greater clarity and specificity for iterative process implementation and wet weather data analysis.

Greater clarity and specificity in the MS4 permits as to the iterative process requirements may result in increased efforts to improve controls and achieve compliance. Such clarity and specificity may include:

1. Clarification on how compliance with the relevant discharge prohibitions and receiving water limitations is determined, including type and frequency of monitoring;
2. Clarification that dischargers must begin the iterative process after documentation of violations without waiting to be directed to do so by the Water Boards;
3. Specification of the minimum efforts that will constitute meaningful compliance with the iterative process;
4. Specification of the scope of any corrective action, including whether it applies only at the location where exceedances are measured or throughout the relevant watershed;
5. Specification of additional wet weather data analysis to better define and assess the impact of municipal storm water discharges on receiving waters, as well as the efficacy of specific best management practices.

As the MS4 program continues to mature and more data becomes available, this alternative may be enhanced by the development of water quality-based effluent limitations for pollutants, as appropriate, as a means of determining compliance with receiving water limitations. In addition, the enhanced wet weather data could be used to identify surrogates that could be used as a measure of protecting beneficial uses. In time, the data could be used to develop actual wet weather water quality standards or wet weather implementation provisions for existing water quality standards that could be applied consistently on a statewide basis.

Given the nature of storm water discharges and of MS4s, questions such as where and how compliance with water quality standards should be measured and how narrowly or broadly corrective actions should be applied, pose complicated technical issues that require careful study and consideration. These challenges notwithstanding, water quality improvements are more likely to be achieved as the iterative process becomes automatic and dischargers follow clear guidelines for determining and addressing non-compliance with permit terms. Such improvements may dissuade the Water Boards and the public from bringing enforcement actions/citizen suits for all except the most egregious and repeated violations.

In addition to being a stand-alone alternative, Alternative 2 may be considered in combination with Alternatives 3 through 5. The CASQA Proposal incorporates some greater specificity in the iterative process requirements as a component of its proposed receiving water limitations.

Alternative 3: Safe harbor that applies only if a discharger is in compliance with the implementation provisions of an approved TMDL.

Under Alternative 3, the receiving water limitations would be amended to provide a safe harbor for permittees that are in compliance with the implementation provisions of a TMDL. In effect, as long as the permittee is in compliance with the TMDL (including any compliance schedule) the terms of the TMDL would replace the requirement to comply with water quality standards for the pollutants that are covered by the TMDL.

The CASQA Proposal contemplates a safe harbor for dischargers in compliance with a TMDL as a component of the receiving water limitations.

Alternative 4: Safe harbor that applies if a discharger is in compliance with the implementation provisions of an approved TMDL, as in Alternative 3, and, in addition, that applies when the discharger engages in good faith compliance with the iterative process for exceedances caused by wet weather discharges.

In addition to the safe harbor for TMDL implementation, Alternative 4 would provide a safe harbor when dischargers engage in the iterative process in good faith to address violations of permit terms caused by wet weather discharges. Thus, if a storm water discharge from an MS4 is causing or contributing to an exceedance of a water quality standard in the receiving water, the exceedance would not constitute a violation of the permit as long as the discharger was engaged in good faith efforts to address the exceedance through improved controls. Alternative 4 recognizes that wet weather discharges from MS4s frequently cause or contribute to violations of water quality standards and allows the MS4s time to address these violations by improving control measures.

However, the safe harbor would not extend to dry weather discharges. Non-storm water discharges are generally prohibited in MS4 permits and only a few categories of non-storm water discharges are exempted from the prohibition, with the condition that these exempted discharges also be prohibited if they are identified as sources of pollutants to receiving waters.

Alternative 5: Full safe harbor.

This alternative would provide a full safe harbor to dischargers complying with the implementation provisions of a TMDL or engaging in the iterative process to address exceedances caused by wet or dry weather discharges.

The CASQA Proposal attached provides for a full safe harbor.

Attachments Removed

EXHIBIT C

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RIVERSIDE COUNTY FLOOD CONTROL
AND WATER CONSERVATION DISTRICT

November 13, 2012

Honorable Members of the State Water Resources Control Board
Attn: Ms. Jeanine Townsend, Clerk to the Board
State Water Resources Control Board
1001 I Street, 24th Floor
Sacramento, CA 95814

Dear Honorable Board Members and Ms. Townsend:

Re: Comment Letter – Receiving Water Limitations Language Workshop

I am writing on behalf of the Riverside County Flood Control and Water Conservation District ("District") regarding the State Water Resources Control Board's consideration of Receiving Water Limitations ("RWL") language in MS4 permits. This review was triggered by a decision of the Ninth Circuit United States Court of Appeals in *Natural Resources Defense Council v. County of Los Angeles* (9th Cir. 2011) 673 F.3d 880, *cert granted,* __ U.S. __ (June 25, 2012) ("*NRDC*"). This letter is being submitted in advance of the State Board's November 20, 2012 workshop on reform of the RWL language to be incorporated into MS4 permits as a matter of statewide policy.

The District is the Principal Permittee for three Phase I MS4 permits applicable to municipalities across Riverside County: Order R8-2010-0033, issued by the Santa Ana Regional Water Board to municipalities within the Santa Ana River Region of Riverside County; Order R9-2010-016, issued by the San Diego Regional Water Board to municipalities within the Santa Margarita Region of Riverside County; and Order R7-2008-0001, issued by the Colorado River Regional Water Board to municipalities within the Whitewater River Region of Riverside County. Given our unique perspective as the manager of three Phase 1 MS4 permits, the District and its staff thus, have considerable experience and expertise in developing and administering MS4 permits, and a keen understanding of the issues that the above mentioned court case creates.

The District strongly supports reform of the RWL language to make clear the State Board's often-expressed intention that MS4 Permittees' compliance with RWL be effectuated through an iterative process. However, under the Ninth Circuit's interpretation, any MS4 discharge that causes or contributes to an exceedance of a Water Quality Standard subjects the MS4 Permittee to civil penalty liability, injunctive relief and the payment of attorneys' fees in an action brought by a citizen plaintiff, even where the Permittee is fully implementing the programmatic requirements of their MS4 Permit.

The District supports the California Stormwater Quality Association's ("CASQA") efforts to obtain RWL language that ensures that the iterative process favored by the State Board is honored. The District also supports the comments of the California State Association of Counties, and believes the proposed RWL language attached to those comments is a step in the right direction.

This letter contains additional District comments about the RWL language and the iterative process. We believe that they are best expressed in terms of correcting misperceptions regarding the current RWL language, as interpreted by the Ninth Circuit.

Misperception Number One: Strict compliance with Water Quality Standards is required of MS4 Permittees by the Clean Water Act.

The Clean Water Act provides that MS4 discharges must control pollutants in discharges from the MS4 to the "Maximum Extent Practicable" (33 U.S.C. § 1342(p)(3)(B)(iii)). Unlike the case with other NPDES Permittees, the Clean Water Act does not require that municipalities strictly comply with Water Quality Standards, as determined by the Ninth Circuit in *Browner v. Defenders of Wildlife*. The State Board's own precedential Order WQ 2001-15 recognizes this fact and states that the RWL language was intended to be consistent with the *Browner* case. In that Order, which interpreted RWL language similar to that in *NRDC*, the Board stated:

> *[O]ur language, similar to the U.S. EPA's permit language discussed in the Browner case, does not require strict compliance with water quality standards. Our language requires that storm water management plans be designed to achieve compliance with water quality standards. Compliance is to be achieved over time, through an iterative approach requiring improved BMPs. As pointed out by the Browner court, there is nothing inconsistent between this approach and the determination that the Clean Water Act does not mandate strict compliance with water quality standards. [Order WQ 2001-15 at 7 (emphasis added)].*

Unfortunately, the Ninth Circuit completely disregarded this language, and the Order, in holding that strict compliance was required of MS4 Permittees.

USEPA itself has issued MS4 permits (in non-delegated states) that do not contain RWL language requiring strict compliance with Water Quality Standards. Therefore, it is clear that such compliance is not required by the Clean Water Act nor is such compliance established by USEPA policy. The most prominent example of a recent MS4 permit promulgated by USEPA is that for the District of Columbia ("DC Permit") (relevant portions of which are attached as Exhibit A), which was adopted in 2011.

Part 1.4 of the DC Permit contains the requirements relating to Water Quality Standards and provides, in relevant part: "Compliance with the performance standards and provisions contained in Parts 2 through 8 of the permit shall constitute adequate progress towards compliance with DCWQS [water quality standards] and WLAs [established under TMDLs] for this permit term." The DC Permit Fact Sheet explains the rationale for that language as follows [DC Permit Fact Sheet, Pages 5-6, emphasis added, attached as Exhibit B]:

> *Comments on the language in Part 1.4 varied widely. Some commenters did not believe it was reasonable to require discharges to meet water quality standards. Other commenters believed this to be an unambiguous requirement of the Clean Water Act.*

> *Today's Final Permit is premised upon* **EPA's longstanding view that the MS4 NPDES permit program is both an iterative and an adaptive management process for pollutant reduction and for achieving applicable water quality standard and/or total maximum daily load (TMDL) compliance.** *See generally, "National Pollutant Discharge Elimination System Permit Application Regulations for Stormwater Discharges," 55 F.R. 47990 (Nov. 16, 1990).*
>
> **EPA is aware that many Permittees, especially those in highly urbanized areas such as the District, likely will be unable to attain all applicable water quality standards within one or more MS4 permit cycles.** *Rather the attainment of applicable water quality standards* **as an incremental process** *is authorized under section 402(p)(3)(B)(iii) of the Clean Water Act, 33 U.S.C. § 1342(p)(3)(B)(iii), which requires an MS4 permit "to reduce the discharge of pollutants to the maximum extent practicable" (MEP) "and such other provisions" deemed appropriate to control pollutants in municipal stormwater discharges.* **To be clear, the goal of EPA's stormwater program is attainment of applicable water quality standards, but Congress expected that many municipal stormwater dischargers would need several permit cycles to achieve that goal.**
>
> *Specifically, the Agency expects that attainment of applicable water quality standards in waters to which the District's MS4 discharges, requires staged implementation and increasingly more stringent requirements over several permitting cycles. During each cycle, EPA will continue to review deliverables from the District to ensure that its activities constitute sufficient progress toward standards attainment. With each permit reissuance EPA will continue to increase stringency until such time as standards are met in all receiving waters.* **Therefore today's Final Permit is clear that attainment of applicable water quality standards and consistency with the assumptions and requirements of any applicable WLA are requirements of the Permit, but, given the iterative nature of this requirement under CWA Section 402(p)(3)(B)(iii), the Final Permit is also clear that "compliance with all performance standards and provisions contained in the Final Permit shall constitute adequate progress toward compliance with DCWQS and WLAs for this permit term" (Section 1.4).**

USEPA is now proposing clarifying changes to this language and to other sections of the DC Permit as the result of a settlement with various parties. However, those changes do not require strict compliance with Water Quality Standards, but rather compliance through the programs developed under the Permit.

The State Board is thus, free to adopt new RWL language that effectuates its previously expressed intent that MS4 permits not require strict compliance with Water Quality Standards with regard to contributions from discharges from MS4s.

Misperception Number Two: The MS4 Permittees are Seeking a "Safe Harbor" that would Insulate them from Responsibility Under the Clean Water Act.

While State Board staff's "Issue Paper" uses the term "safe harbor" in describing the iterative process, the District believes that this is fundamentally misleading. Even a cursory review of the terms of a typical MS4 permit in California reveals that it is full of compliance points. In the three MS4 Permits in which the District serves as Principal Permittee, literally every sentence is a separate point of compliance.

This fact is supported by the language of the Permits themselves. For example, in Order R8-2010-0033 Part XX.G provides: **"The Permittees must comply with all terms, requirements, and conditions of this Order. Any violation of this Order constitutes a violation of the CWA, its regulations and the California Water Code, and is grounds for enforcement action . . . ."** (emphasis added). Similar provisions are contained in the other two Riverside County MS4 Permits. Even without the strict Water Quality Standard language imposed under the Ninth Circuit's opinion, there is no "safe harbor" from liability under the Clean Water Act or, where applicable, the California Water Code, for any Permittee that fails to fully implement each the detailed and prescriptive requirements of its MS4 Permit.

There is a fundamental difference however, between fully complying with activities within the control and responsibility of the Permittees, such as monitoring, implementing BMPs and performing other programmatic requirements of the MS4 Permit; and being forced to guarantee that MS4 discharges will not cause or contribute to exceedances of Water Quality Standards in Receiving Waters, a guarantee that the Permittees' have no ability to make.

What the District and other MS4 Permittees seek is relief from what is essentially "guaranteed non-compliance" where a Permittee can be found in violation of their MS4 Permit even if the exceedance occurs at no fault of or failure by the Permittee, or put another way, even in circumstances where there is nothing a Permittee could have done to prevent that exceedance from occurring. In such a case, the Permittee can be held liable for potentially millions of dollars in legal costs, penalties and other expenses. We note that the City of Malibu, a city of only 13,000 residents, spent more than $2 million in defending against a citizen suit filed with respect to its MS4 Permit and more than $6 million to settle the case, including payment of $750,000 in attorney fees to plaintiffs. Given the tremendous financial challenges faced by every California municipality, including the District, the County of Riverside and the Permittee cities within the County, such a diversion of resources that otherwise would be directed at clean water programs or other vital municipal programs is a poor policy choice. And, as noted, it is not a policy choice that is required by the Clean Water Act, nor is it required by USEPA in their own Permits.

The District recognizes that regulatory enforcement actions and citizen suits are authorized by the Clean Water Act and that such suits may be an appropriate remedy where, for example, a Permittee has failed to comply with the programmatic requirements of its MS4 Permit. Where, however, the Permittees are complying with those requirements in good faith but, due to circumstances beyond

their control, their MS4 discharge causes or contributes to a Water Quality Standard exceedance in Receiving Waters, a citizen suit based on those exceedances potentially throws away the work done by the Permittees and the Water Boards under the MS4 Permit, as discussed below.

Misperception Number Three: MS4 can achieve compliance with strict Water Quality Standards.

MS4 Permittees cannot guarantee that discharges from their MS4s will in fact, not cause or contribute to an exceedance of Water Quality Standards in a Receiving Water. The monitoring conducted under our MS4 Permits reflects exceedances of various Water Quality Standards in Receiving Waters, and we understand that such results are typical for MS4 discharges around the state (please see Pages 2-3 of the CASQA comment letter dated November 2, 2012). The extreme variability of stormwater quality and quantity itself (which, in Southern California, arrives infrequently and from widely varying storm sizes) combined with a multitude of potential pollutant sources beyond a Permittee's ability to truly "control", make it impossible for a municipality to ensure that no discharges from its MS4 will ever cause or contribute to exceedances of Water Quality Standards in Receiving Waters. This was recognized by the Issue Paper released by State Board staff in preparation for the November 20th workshop, which found that as "the storm water management programs of municipalities have matured, **an increasing body of monitoring data indicates that water quality standards are in fact not being met by many MS4s**" (Issue Paper, Page 2 (emphasis supplied)).

Thus, even if municipal Permittees are to be held strictly liable for the ensuring that no discharges from their MS4s cause or contribute to an exceedance of Water Quality Standards, as the Ninth Circuit has interpreted the current RWL language, those Permittees have no ability to attain those standards. The reasons are several-fold and include the following:

1) Unlike an industrial NPDES Permittee, a municipal Permittee is not typically the source of the pollutants in the MS4 discharge (whether wet or dry). The municipality can regulate sources to some degree (through, for example, the operation of structural and non-structural BMPs and implementation of an Illegal Connection/Illicit Discharge program), but the municipality cannot guarantee that pollutants will not enter the MS4 and then be discharged into the Receiving Waters.

2) Municipalities cannot control natural sources of pollutants that are discharged through the MS4. Monitoring has indicated that many pollutants are likely from natural and not anthropogenic sources.

3) While Permittees conduct extensive public education programs as part of their MS4 programs, municipalities cannot "control" human behavior, or "prevent" an individual from taking an action that might cause pollution to enter the MS4. As an example, a resident may, despite all ordinances, regulations, potential penalties or enforcement, public outreach, available BMPs, etc., choose not to pick up after their pets, and

stormwater may, through no fault of the Permittee, pick up animal waste and deposit into the MS4.

4) MS4 Permittees cannot "prevent" flows from entering their MS4. To protect the health and property of their residents, MS4 operators must allow the legitimate flows of water into their drains. This is especially true for the District, which is charged directly by the Legislature [in Water Code App. §48-9] with the task of taking necessary steps to protect the people, properties and watersheds of Riverside County from the negative impacts of flooding. The District cannot, in effect, cause flooding by preventing flows from entering their storm drain, simply because such flows may contain pollutants that cause a violation of the Receiving Waters Limitation provisions of their MS4 Permits. In fact, California law requires downstream property owners (such as MS4 operators) to accept flows from upstream property owners.

5) Further, the authorities granted to flood control districts, such as this District, by the Legislature are narrow and do not include the authority to condition or regulate the quality or nature of stormwater runoff discharged from up gradient properties. This responsibility is appropriately assigned by the Legislature to the Regional Boards.

Similarly, MS4 Permittees cannot guarantee compliance with Water Quality Standards in dry weather. "Alternative 4" in the staff's Issue Paper suggests an alternative RWL approach that would not extend the iterative approach to dry weather discharges. The District submits that this alternative does not reflect the reality of urban runoff. Monitoring conducted under the Riverside County MS4 Permits reflects exceedances of Water Quality Standards during dry weather as well as wet weather. There is no justification for imposition of strict liability for exceedances during such conditions, for the following reasons:

1) During dry weather, other NPDES-permitted discharges continue to flow into the Receiving Waters. For example, much of the flow in the Santa Ana River during dry weather conditions is from non-MS4 sources, such as publicly owned treatment works. Additionally, numerous other separate NPDES-permitted discharges will occur, potentially at concentrations of pollutants that exceed Water Quality Standards. Evidence generated during the *NRDC* case involving the County of Los Angeles, for example, indicated that NPDES permits covering hundreds of these dischargers, including POTWs allowed the discharge of pollutants at concentrations *greater* than Water Quality Standards. Because of these discharges, which are legal and authorized by the Regional Boards, the MS4 Permittees have essentially no more control over compliance with Water Quality Standards in dry weather than they would have during wet weather conditions.

2) Accidental or even intentional illicit discharges by third parties into the MS4 obviously can occur during dry weather as well as wet weather. Such discharges would potentially have an even greater impact on sampling, since they are not diluted by large volumes of stormwater. For example, a vehicular accident recently caused hundreds of gallons of

asphalt tar to enter Sandia Creek, a Receiving Water in Riverside County. While this spill was not discharged through an MS4, if the vehicular accident had occurred in another portion of the watershed, the spill could feasibly have entered into and been discharged from an MS4. Similarly in many places throughout the State, sanitary sewer systems are owned and operated by special districts that have no relation to the MS4 Permittees that own or operate the MS4 systems. Nevertheless, an overflow of such sanitary sewer systems may cause an unavoidable discharge into, and from a Permittee-owned MS4. Such accidental or illicit discharges cannot be "prevented" or "controlled" by the Permittees except to the extent that they can be cleaned up or blocked if promptly reported. However, if the discharge has reached Receiving Waters and caused a measured exceedance of Water Quality Standards, under the Ninth Circuit's interpretation, liability for civil penalties, injunctive relief and attorneys fees will attach to the MS4 Permittee.

3) Enforcing strict Water Quality Standard limits in dry or wet weather is counter-productive to the watershed planning-based MS4 Permits currently being promulgated by many regional water boards. Enforcing such limits will divert Permittee attention and resources from watershed-based, monitoring-heavy compliance programs, as will be discussed in greater detail below.

In essence, under the Ninth Circuit's interpretation of the current RWL language, the District, and potentially every other MS4 Permittee in the state, is in violation of its Permit any time that an exceedance of a Water Quality Standard is recorded and attributed to a discharge from its MS4. This means that the Regional Water Boards have issued, and continue to adopt permits that include RWL language **which cannot be complied with**. The Clean Water Act, however, does not require Permittees to achieve the impossible. *See, e.g., Hughey v. JMS Development Corp.* (11th Cir. 1996) 78 F.3d 1523, 1530 ("In interpreting the liability provisions of the CWA, we realize that Congress is presumed not to have intended absurd (impossible) results.").

Misperception Number Four: The Current RWL Language is more Protective of Receiving Water Quality.

This statement is not only untrue but maintaining the current RWL language actually **impedes** efforts to protect Receiving Water Quality.

We understand that some stakeholders believe that there should be Numeric Effluent Limitations (NELs) contained in the MS4 Permits for purposes of accountability. In response, we note that many MS4 permits now contain numeric Stormwater and Non-stormwater Action Levels ("SALs" and "NALs") or other numeric targets or goals, the exceedance of which trigger specific compliance responses by the Permittees. It is these action levels (which were advocated by the Blue Ribbon Panel established by the State Board to investigate the appropriateness of NELs in MS4 permits) which provide such "numeric" accountability. This is in addition to the numerous other compliance documentation and reporting provisions required of MS4 Permittees that also provide measures of accountability.

More importantly, the current RWL language as interpreted by the Ninth Circuit actually impedes efforts by municipalities to protect water quality. First, by requiring immediate compliance, the language undermines efforts to bring Water Quality Standard-impaired waterbodies into compliance through the Total Maximum Daily Load ("TMDL") program. TMDLs are designed with the recognition that, due to the complexity of the issues causing the waterbody to be impaired in the first place, meeting these requirements cannot be achieved immediately. Therefore, TMDL compliance plans include timelines to achieve such compliance over periods of years and sometimes decades.

Second, most MS4 permits have begun incorporating sophisticated watershed management plans, which prioritize pollutants by waterbody and attempt, through aggressive monitoring and source identification efforts, to identify and address the sources of those prioritized pollutants. Municipalities subject to strict RWL language will have no ability to prioritize pollutants, since they must address any pollutant that exceeds a Water Quality Standard, irrespective of the relative impact that that discharge may have had upon the environment or beneficial uses. Moreover, these watershed management plan approaches employ cooperative monitoring and other watershed-based approaches. Permittees faced with potential liability for any exceedance of Water Quality Standards in Receiving Waters that may be caused or contributed to by discharges of their MS4s, will not likely volunteer to cooperate on any watershed-based approach, if cooperation could subject them to additional unnecessary liability.

Third, in a citizen suit brought under the Clean Water Act, a federal judge is free to impose any appropriate injunctive relief to enforce a permit (33 U.S.C. § 1365(a)). Thus, for example, a court could ignore the provisions of a MS4 permit in ordering municipal defendants to address Water Quality Standard exceedances in Receiving Water. This means that the thousands of people-hours invested in the Permit's development, implementation and oversight by municipalities, the Regional Water Boards and other stakeholders would be wasted. In essence, under the Ninth Circuit's reading of the RWL language, all other language in an MS4 permit appears to be superfluous, since the RWL language would control all compliance efforts. This result, of course, is not required by plain language of the Clean Water Act.

Fourth, if a municipality is in unavoidable and automatic non-compliance with the requirements of its MS4 Permit, it will be unable to justify budgeting for water quality management programs and BMPs otherwise required by the Permit as the municipality will simply receive no benefit from making compliance investments. To gain public support for stormwater programs, a municipality must demonstrate to its residents that such investments will constitute compliance with the Permit.

Discussion of Alternatives

The State Board staff's Issue Paper sets forth five alternatives for consideration. Alternative 1, no change in the current RWL language, is completely unacceptable to the District (and, we believe, to other municipalities across the state) because it fails to address the "guaranteed non-compliance" problem of the current language.

Alternative 2, which proposes to maintain the language that puts the MS4 Permittees in a situation of unavoidable and potentially "guaranteed" non-compliance, but would add greater specification as to how the iterative process might be carried out, is also unacceptable as the MS4 Permittees will still have no viable means to ensure their compliance with the RWL language. While the District does not object in principle to RWL language that spells out clearly, and in achievable terms, what is required of MS4 Permittees when exceedances are recorded, such a change alone does not address the fundamental issues identified in this letter.

Alternative 3, which proposes to provide an iterative process for compliance with the RWL only for pollutants being addressed by dischargers in compliance with an approved TMDL, is better than the first two alternatives, but is still entirely insufficient. By failing to provide a viable means for compliance with the RWL language for non-TMDL pollutants, this alternative language would force Permittees into unavoidable non-compliance, and require them to redirect their efforts and resources away from the TMDL activities, to those other pollutants, due to the strict liability attached to those exceedances. This would be a poor policy choice, as pollutants that are not subject to a TMDL may have significantly less, or even no impact on beneficial uses in the Receiving Waters, as noted in the CASQA comment letter.

Alternative 4, which excludes dry weather discharges from the iterative process to comply with the RWL, is unacceptable for the reasons previously set forth regarding an MS4 Permittees inability to truly "prevent" or "control" accidental or illegal dry weather discharges.

Alternative 5, which provides viable means for compliance with the RWL, for all types of MS4 discharges, is the only viable solution among the alternatives presented by State Board staff. In an era of limited budgets, the only and best way to make progress toward improving the quality our Receiving Waters, is to provide MS4 Permittees the ability to prioritize their efforts, as required in the Watershed Management Plan provisions contained in the most recent MS4 Permits, including the Los Angeles County Permit and the proposed Regional Permit for the San Diego Regional Water Board. As previously discussed, such prioritization cannot occur in the context of strict liability for the exceedance of Water Quality Standards in the Receiving Waters. For all of the reasons set forth in this letter, no other alternative makes policy sense or is congruent with the Maximum Extent Practicable standard in the Clean Water Act.

The District would add that Alternative 5 should additionally incorporate the concept of achieving RWL compliance through watershed management plans, and requests the Board to direct staff to work with stakeholders to ensure that any revised RWL language does not force intermittent or minor exceedances of Water Quality Standards to become de-facto higher priorities than those set by the watershed stakeholders.

In summary, the District supports CASQA, the California State Association of Counties and other municipal stakeholders in advocating for a fully iterative and viable approach to compliance with RWL language in both wet and dry weather conditions. Only when such an approach is in place and endorsed by the State Board will Permittees, including the District, feel confident that they can focus

fully on efforts to address pollutants in discharges into and from their MS4s, and not on preparing for costly and pointless litigation.

The District therefore, respectfully requests the State Board direct its staff to commence development of new language providing for an enforceable, iterative and viable process for MS4 Permittees to comply with the RWL language included in MS4 permits.

We wish to thank you and State Board staff for your consideration of these comments and any further comments, written or oral, that the District may make on these important issues.

Very truly yours,

Steve Thomas

for WARREN D. WILLIAMS
General Manager-Chief Engineer

CP:cw
P8/150189

EXHIBIT D

FILED
JAN - 3 2013
CLERK, U.S. DISTRICT COURT
ALEXANDRIA, VIRGINIA

IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF VIRGINIA
Alexandria Division

VIRGINIA DEPARTMENT OF TRANSPORTATION, ET AL, Plaintiffs, -v- UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, ET AL, Defendants.	Civil Action No. 1:12-CV-775

Memorandum Opinion

Before the Court is the Plaintiffs' motion for judgment on the pleadings under Federal Rule of Civil Procedure 12(c). The Defendants opposed the motion, and the Plaintiffs replied. The Court heard oral arguments on December 14, 2012 and now issues this memorandum opinion and accompanying order granting the Plaintiffs' motion.

Background

The Clean Water Act, 33 U.S.C. § 1251 et seq., establishes the basic structure for regulating discharge of pollutants into the waters of the United States, and provides certain mechanisms to improve and maintain the quality of surface waters.

One such mechanism is the requirement that states identify "designated uses" for each body of water within their borders, as well as "water quality criteria" sufficient to support those uses. 33 U.S.C. § 1313(c)(2)(A). The Environmental Protection Agency ("EPA") evaluates the uses and criteria developed by the states, and either approves them or else proposes and

promulgates its own set of standards. § 1313(c)(3).

Once the standards are in place, each state is required to maintain a list—also subject to approval or modification by EPA—of its waterbodies that are "impaired" because they do not meet their respective water quality criteria. 33 U.S.C. § 1313(d)(1)(A). For each waterbody on the impaired list, the state is required to establish a set of total maximum daily loads ("TMDLs") sufficient to bring the body back into compliance with its water quality criteria. § 1313(d)(1)(C). Each TMDL establishes the maximum amount of a pollutant that may be added to the waterbody daily from all sources (runoff, point sources, etc.). EPA is required to publish a list of pollutants suitable for maximum daily load measurement, § 1314(a)(2)(D), and it has determined that *all* pollutants are suitable for TMDLs, *see* Total Maximum Daily Loads Under Clean Water Act, 43 Fed. Reg. 60,662. Therefore, any pollutant that falls within the relatively broad definition of "pollutant" set forth in § 1362(6) may be regulated via TMDL. EPA can approve or modify as it sees fit TMDLs proposed by the states. § 1313(d)(2).

Here the state in question is Virginia, and the waterbody is a 25-mile long tributary of the Potomac River, located in Fairfax County, called Accotink Creek. The creek has been the subject of litigation in the past that is not relevant to this matter except the result: EPA was required to set TMDLs for Accotink Creek once Virginia failed to do so by a certain date. Specifically, the creek had been identified as having "benthic impairments," which is to say the community of organisms that live on or near the bottom of the creek were not as numerous or healthy as they should be. EPA was to set appropriate TMDLs to improve the health of the benthic community in Accotink Creek.

On April 18, 2011, EPA established a TMDL for Accotink Creek which limited the flow rate of stormwater into Accotink Creek to 681.8 ft^3/acre-day. The TMDL was designed to

regulate the amount of sediment in the Accotink, because EPA believed sediment was a primary cause of the benthic impairment. Both parties agree that sediment is a pollutant, and that stormwater is not. EPA refers to stormwater flow rate as a "surrogate" for sediment.

The Plaintiffs are now challenging the TMDL on multiple grounds, but presently before the Court is a single issue: Does the Clean Water Act authorize the EPA to regulate the level of a pollutant in Accotink Creek by establishing a TMDL for the flow of a nonpollutant into the creek?

Analysis

I. Standard of Review

Count I of the complaint, at issue here, is brought under the Administrative Procedures Act. *See* Comp. ¶ 169. The APA "confines judicial review of executive branch decisions to the administrative record of proceedings before the pertinent agency." *Shipbuilders Council of Am. V. U.S. Dept. of Homeland Sec.*, 770 F. Supp. 2d 793, 802 (E.D. Va. 2011). As such, the district court "sits as an appellate tribunal," and APA claims can be resolved equally well in the context of Rule 12 or Rule 56. *Univ. Med. Ctr. Of S. Nev. V. Shalala*, 173 F.3d 438, 441 n. 3 (D.C. Cir. 1999).

Because Count I presents a question of statutory interpretation, the Court reviews EPA's decision using the two-step analysis set forth in *Chevron, U.S.A., Inc. v. NRDC, Inc.*, 467 U.S. 837 (1984). For a given question of statutory interpretation, the first step under *Chevron* is to determine whether Congress addressed the "precise question at issue." 467 U.S. at 842. "If the intent of Congress is clear, that is the end of the matter . . . ." *Id.* If the Court cannot find that Congress has squarely addressed the question, the Court must move to Chevron's second step. In

the second step of statutory construction under *Chevron*, the Court must determine whether the agency's interpretation of the statute is "permissible." *Id.* at 843. The agency's construction is permissible if it is reasonable, but it need not be what the Court considers the *best* or *most reasonable* construction. *See id.* at 845. The Court is not to simply impose its own construction on the statute, but instead it gives deference to any reasonable statutory construction by the agency. *Id.* at 843.

II. Chevron Step One

Whether statutory ambiguity exists so that the issue cannot be settled at *Chevron's* first step is for the Court to decide, and the Court "owe[s] the agency no deference on the existence of ambiguity." *Am. Bar Ass'n v. FTC*, 430 F.3d 457, 468 (D.C. Cir. 2005). The Court begins the inquiry by "employing traditional tools of statutory construction." *Chevron*, 467 U.S. at 843 n.9. As always, the analysis begins with the text of the statute. *Nat'l Elec. Mfrs. Ass'n v. U.S. Dept'l of Energy*, 654 F.3d 496, 504 (4th Cir. 2011).

The text of the statute that requires states to establish their own TMDLs, 33 U.S.C. § 1313(d)(1)(C), is:

> Each State shall establish for the waters identified in paragraph (1)(A) of this subsection, and in accordance with the priority ranking, **the total maximum daily load, for those pollutants which the Administrator identifies** under section 1314(a)(2) of this title as suitable for such calculation. Such load shall be established at a level necessary to implement the applicable water quality standards with seasonal variations and a margin of safety which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality. (emphasis added)

The next subsection, § 1313(d)(2), grants EPA the authority to set TMDLs when the state

has not done so adequately. "Pollutant" is a statutorily defined term. 33 U.S.C. § 1362(6).

The Court sees no ambiguity in the wording of this statute. EPA is charged with establishing TMDLs for the appropriate pollutants; that does not give them authority to regulate nonpollutants. The parties agree that sediment is a pollutant under 33 U.S.C. § 1362(6), and stormwater is not. Then how does EPA claim jurisdiction over setting TMDLs for stormwater?

EPA frames the stormwater TMDL as a surrogate. EPA's research apparently indicates that the "[sediment] load in Accotink Creek is a function of the amount of stormwater runoff generated within the watershed." Def. Opp. at 8. And EPA believes that framing the TMDL in terms of stormwater flow rate is superior to simply expressing it in terms of maximum sediment load.

The DC Circuit has considered and rejected a similar attempt by EPA to take liberties with the way Congress intended it to express its TMDLs. In *Friends of the Earth, Inc. v. Env. Protection Agency*, EPA had promulgated TMDLs for the Anacostia River that expressed the maximum load of certain pollutants in terms of annual and seasonal amounts. 446 F.3d 140, 143 (D.C. Cir. 2006). The court found that expressing a TMDL in terms of annual or seasonal maximums was not allowed, because the statute granted authority only for daily loads. *Id.* at 148. The court reached its conclusion even though EPA apparently made a strong argument that expressing TMDLs in terms of annual or seasonal loads was an effective and reasonable approach. *See id.* Presumably a daily load could have been derived by simply dividing the annual load by 365, yet the court still required expression in the terms dictated by Congress.

Here too, EPA hopes to express a TMDL in terms other than those contemplated by the statute, arguing that such an expression is the most effective method. But, as *Friends of the Earth* illustrates, EPA may not regulate something over which it has no statutorily granted power—

annual loads or nonpollutants—as a proxy for something over which it *is* granted power—daily loads or pollutants.

EPA's argument that its surrogate approach should be allowed because the statute does not specifically forbid it fails. EPA is not explicitly forbidden from establishing total maximum *annual* loads any more than they are explicitly barred from establishing TMDLs for nonpollutants. The question is whether the statute grants the agency the authority it is claiming, not whether the statute explicitly withholds that authority. And in this case, as in *Friends of the Earth*, the statute simply does not grant EPA the authority it claims.

The dicta in *Weyerhaeuser Co. v. Costle* is not as helpful to EPA's case as it would like. 590 F.2d 1011, 1022 n.6 (D.C. Cir. 1978). It is true that the court said in a footnote "[i]t is well recognized that EPA can use pollution parameters that are not harmful in themselves, but act as indicators of harm." *Id.* But in that case, the non-harmful pollution parameters the EPA sought to regulate were components of the effluent commonly discharged from paper mills, *id.* at 1022, making them effluents themselves. And power to regulate effluents is expressly granted to the EPA in the relevant statutory section. *See* 33 U.S.C. § 1314(b).

EPA would like to create the impression that Congress has given it loose rein to determine exactly what it could and could not regulate. On page 16 of its opposition to this motion, EPA points out that "Congress authorized EPA to determine which pollutants were suitable for TMDL calculation and measurement." (Internal quotes removed). While this may be true, EPA glosses over the fact that 33 U.S.C. § 1314(a)(2)(D) only gives EPA the power to regulate pollutants as that term is defined—by Congress—elsewhere in the statute. And, as discussed above, sediment is a pollutant for these purposes, but stormwater is not.

In a similar vein, EPA regulations which imply that the agency has discretion to set the

TMDL as it sees fit do not bear on the question now before the Court. EPA has promulgated a regulation allowing TMDLs to be "expressed in terms of either mass per time, toxicity, or other appropriate measure," 40 C.F.R. § 130.2(i), and another that allows TMDLs to be expressed as a "property of pollution," 50 Fed. Reg. 1774, 1776 (Jan. 11, 1985). But, EPA citing these regulations to demonstrate that the surrogate TMDL approach is permissible is mere bootstrapping. To the extent the regulations allow EPA to set TMDLs for nonpollutants, they exceed the statutory authority of EPA.

The plain language of the statute trumps all, but legislative history also supports Plaintiffs' argument. Congress's intent to limit EPA's discretion in this context is evidenced by the committee record cited by Plaintiffs, which has also been used by the Ninth Circuit, in which Senator Randolph, Chairman of the Senate committee that amended the act in 1972, explained, "We have written into law precise standards and definite guidelines on how the environment should be protected. We have done more than just provide broad directives [for] administrators to follow." Pl. Mot. 7, *citing Nw. Envtl. Def. Ctr. v. Brown*, 640 F.3d 1063, 1072 (9th Cir. 2011). Congress created a statutory scheme that included a precise definition of the word "pollutant," and then gave EPA authority to set TMDLs for those pollutants. Senator Randolph's comments strongly imply that Congress did not intend anything more or less than what is written in the statute.

The Court considers the language of 33 U.S.C. § 1313(d)(1)(C) to be unambiguous. Congress has spoken directly on the question at issue, and its answer is that EPA's authority does not extend to establishing TMDLs for nonpollutants as surrogates for pollutants. The legislative history of the CWA is consistent with this reading. Therefore, this Court finds EPA's interpretation of § 1313 and the related provisions to be impermissibly broad based on analysis

under the first step of *Chevron* analysis.

III. Chevron Step Two

Because the Court considers Congress's intent to be clear and unambiguously expressed by the language of the statute, it need not move to the second step of *Chevron* analysis. But the Court notes that there is substantial reason to believe EPA's motives go beyond "permissible gap-filling."

Page 9 of EPA's opposition says, "stormwater flow rates as a surrogate would more effectively address the process by which sediment impairs aquatic life in Accontink Creek." If the sediment levels in Accotink Creek have become dangerously high, what better way to address the problem than by limiting the amount of sediment permitted in the creek? If sediment level is truly "a function of" the amount of stormwater runoff, as EPA claims, then the TMDL could just as easily be expressed in terms of sediment load.

In fact, the Board of Supervisors of Fairfax County argued at the December 14th hearing (without objection from EPA) that EPA has approved 3,700 TMDLs for sediment nationwide, and in Virginia has addressed 111 benthic impairments with TMDLs. None of them regulated the flow rate of stormwater. By comparison, EPA has tried out its novel approach of regulating sediment via flow in only four instances nationwide, and all four attempts were challenged in court. One has settled, the other three are still pending.

The Court suspects that the decision to regulate stormwater flow as a surrogate for sediment load would not constitute a permissible construction of § 1313(d)(1)(C), even given the deference due at *Chevron's* second step. This is especially likely because EPA is attempting to increase the extent of its own authority via flow TMDLs, which courts must examine carefully.

See Brown & Williamson Tobacco Corp. v. Food & Drug Admin., 153 F.3d 155, 161-62 (4th Cir. 1998). EPA's attempt to set TMDLs for nonpollutants probably goes beyond "permissible gap-filling" and is instead an impermissible construction of the statute.

Conclusion

The language of § 1313(d)(1)(C) is clear. EPA is authorized to set TMDLs to regulate pollutants, and pollutants are carefully defined. Stormwater runoff is not a pollutant, so EPA is not authorized to regulate it via TMDL. Claiming that the stormwater maximum load is a surrogate for sediment, which is a pollutant and therefore regulable, does not bring stormwater within the ambit of EPA's TMDL authority. Whatever reason EPA has for thinking that a stormwater flow rate TMDL is a better way of limiting sediment load than a sediment load TMDL, EPA cannot be allowed to exceed its clearly limited statutory authority. For these reasons, the Plaintiffs' motion for Rule 12(c) judgment on the pleadings on Count I of their complaint is granted.

January 3, 2013
Alexandria, Virginia

/s/ LOG
Liam O'Grady
United States District Judge

FILED
JAN - 3 2013
CLERK, U.S. DISTRICT COURT
ALEXANDRIA, VIRGINIA

IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF VIRGINIA
Alexandria Division

VIRGINIA DEPARTMENT OF TRANSPORTATION, ET AL, Plaintiffs, -v- UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, ET AL, Defendants.	Civil Action No. 1:12-CV-775

Order

In accordance with the memorandum opinion that accompanies this order, it is now **ORDERED**:

1. Plaintiffs' motion (Dkt. No. 29) for judgment on the pleadings as to Count I of the complaint is **GRANTED**.
2. The clerk shall enter judgment in favor of the Plaintiffs.
3. The Accotink Creek TMDL is remanded to EPA for reconsideration consistent with this order.

January 3, 2013
Alexandria, Virginia

/s/
Liam O'Grady
United States District Judge

County of San Diego

RICHARD E. CROMPTON
DIRECTOR

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September 14, 2015

Wayne Chiu, WRC Engineer
Regional Water Quality Control Board, San Diego Region
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San Diego, CA 92108

Electronic Submission: sandiego@waterboards.ca.gov

Dear Mr. Chiu:

COMMENT LETTER – TENTATIVE ORDER NO. R9-2015-0100 PLACE ID:786088WCHIU

The San Diego Copermittees (Copermittees) appreciate the opportunity to comment on the Regional Water Board's *Tentative Order R9-2015-0100, an Order Amending Order No. R9-2013-0001, NPDES No. CAS010266, as amended by Order No. R9-2015-0001, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4) Draining the Watersheds within the San Diego Region* (Tentative Order). The County of San Diego submits this letter on behalf of the San Diego Copermittees. The Copermittees include the Cities of Carlsbad, Chula Vista, Coronado, Del Mar, El Cajon, Encinitas, Escondido, Imperial Beach, La Mesa, Lemon Grove, National City, Oceanside, Poway, San Diego, San Marcos, Santee, Solana Beach, Vista, the County of San Diego, the San Diego County Regional Airport Authority, and the San Diego Unified Port District.

The Copermittees support water quality improvements in our watersheds through implementation of the MS4 Permit. We request modifications of specified elements of the Tentative Order that we believe will clarify the Permit requirements and facilitate Permit implementation. The comments include the Copermittees' requests for modifications of the Tentative Order, followed by rationale for the requests, and then specific suggested modifications to the language in the Tentative Order. The noted references and page numbers are based on a review of the redline strikeout version of the Tentative Order provided on the Regional Water Board's website[1].

[1] http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/docs/2015-0731_Tentative_Order_Attachment%201_(Amended_Order).pdf, accessed on August 24, 2015

These comments were developed jointly and represent a general consensus among the San Diego Copermittees. Where individual Copermittees have specific concerns relevant to their jurisdictions, these will be expressed in separate written comments provided by individual Copermittees.

1. Receiving Water Limitations Provision A. Prohibitions and Limitations (page 16/138)
Request: Add sentence to Provision A to clarify its link to Provision B.
Rationale: The Prohibitions and Limitations language in Provision A should be aligned with the Water Quality Improvement Planning process described in Provision B. We appreciate the efforts to date to align the two provisions, as Provision B does currently link back to Provision A. However, as currently incorporated into the Tentative Order, the proposed Prohibitions and Limitations provisions may still be interpreted as stand-alone provisions that could subject the Copermittees to state and federal enforcement actions, as well as to third party actions under the federal Clean Water Act's citizen suit provisions. To prevent this from occurring, a clear linkage between the compliance provisions in Provision B and the prohibitions, receiving water limitations, and effluent limitations must be established. Compliance with Provisions A.1, A.2 and A.3 should be linked to Provision B so that it is clear that the compliance mechanism for A.4 is the Water Quality Improvement Plan (Provision B) and/or the TMDL (Attachment E), as applicable.

Recommendation: Include streamlined language in Provision A to indicate that compliance can be achieved through implementation of the Water Quality Improvement Plan, specifically through the Alternative Compliance Pathway added as Provision B.3.c. Add a sentence at end of first paragraph:

Implementation of the Alternative Compliance Option described in Provision B.3.c of this Order shall constitute compliance with the Discharge Prohibitions (A.1.a, A.1.c, A.1.d), Receiving Water Limitations (A.2), and Effluent Limitations (A.3.b) Provisions of this Order.

2. Provision B.3.c. Prohibitions and Limitations Compliance Option (page 33/138)
Request: Restructure the annual milestone requirements in the Compliance Option to be more meaningful.

Rationale: The Tentative Order was revised to include an option for prohibitions and limitations compliance through the implementation of the Water Quality Improvement Plan, subject to conditions specified in Provision B.3.c.(1) and (2). Provision B.3.c.(1)(a)(vii) that requires at least one annual milestone to be established for each numeric goal. Footnote (9) states:
Annual milestones for each final numeric goal must build upon previous milestones and lead to the achievement of the final numeric goal. The annual milestones may consist of water quality improvement strategy implementation phases, interim numeric goals, and other acceptable metrics.

The Copermittees appreciate that the Regional Board has included the additional language for compliance through Water Quality Improvement Plan implementation. However, the Copermittees are concerned that the specific requirement for annual milestones will be overly constrictive and burdensome. Each Copermittee would potentially need to establish and track annual milestones for multiple goals within multiple waterbodies in each watershed

management area, resulting in dozens of annual milestones. Furthermore, it would likely be difficult to establish meaningful milestones for such a high number of goals over each year, especially far into the future. Practically speaking, it is reasonable to identify concrete milestones in Years 1 – 5 of a 30 year effort. More than five years into the future, milestones identified today lose significant meaning and value; milestones would be more meaningful if they were developed adaptively, based on the results of previous efforts.

The Copermittees recognize that milestones would benefit accountability for working towards their goals, but feel that the milestones would be more meaningful if they focus on the priority water quality conditions and were based on the permit cycle (i.e., one milestone per 5 year permit term for each waterbody pollutant combination to be covered under the alternative compliance pathway).

The Copermittees request that the Regional Board consider the following modifications to the language to make the milestone requirement more meaningful.

Recommendation: Modify Provision B.3.c.(1)(a)(vii) , footnote 9, B.3.c.(2)(c), and B.3.c.(2)(d) as follows:

B.3.c.(1)(a) (vii): For each final numeric goal developed pursuant to Provisions B.3.a and B.3.c.(1)(a)(i)-(v), at least one annual milestone[9] and date for its achievement must be included **for the permit term** within each Water Quality Improvement Plan **and progress towards attaining the milestone(s) reported upon during each** Annual Report reporting period**. Further, for each final numeric goal developed pursuant to Provisions B.3.a and B.3.c.(1)(a)(i)-(v), at least one milestone forecasted to be achieved in subsequent permit terms must be included within each Water Quality Improvement Plan. This process will continue** until the final numeric goal is achieved.

Footnote 9: Milestones for each final numeric goal must build upon previous milestones and **cumulatively result in** lead to the achievement of the final numeric goal. The annual milestones may consist of water quality improvement strategy implementation phases, interim numeric goals, and other acceptable metrics. **The milestones may also address multiple numeric goals and/or multiple waterbodies, as applicable and appropriate.**

B.3.c.(2)(c): The Copermittee's assessments in the Water Quality Improvement Plan Annual Report submitted pursuant to Provision F.3.b.(3) support a conclusion that: 1) the Copermittee is in compliance with the annual **milestones** and dates for achievement developed pursuant to Provision B.3.c.(1)(a)(vii), OR 2) the Copermittee has provided acceptable rationale and recommends appropriate modifications to the interim numeric goals, and/or water quality improvement strategies, and/or schedules to improve the rate of progress toward achieving the final numeric goals developed pursuant to Provisions B.3.a and B.3.c.(1)(a)(i)-(vi); AND

B.3.c.(2)(d): Any proposed modifications to the numeric goals, schedules, and/or annual milestones are accepted by the San Diego Water Board as part of subsequent updates to the Water Quality Improvement Plan pursuant to Provision F.2.c; AND

3. Provision B.5. Iterative Approach and Adaptive Management Process (page 37/138)
Request: Clarify timing and conditions for watershed model/analysis updates.

Rationale: Provision B.5 requires annual performance of the adaptive management process. As drafted, the new Provision B.3.c language could be interpreted to mean that the watershed model/analysis must be updated annually (B.3.c.(1)(b)(iv)). To add clarity, Provision B.5 should specify that updates to the watershed modeling/analysis are to be performed as determined through the adaptive management process.

Recommendation: Add a new Provision B.5.d to clarify that updates to watershed model/analysis are required only if it is determined through the adaptive management process that conditions have changed significantly such that they would alter the results of the previously completed model. As part of the Report of Waste Discharge, the Copermittees would conduct an analysis to determine whether conditions have sufficiently changed to warrant an update to the watershed model/analysis and if so, provide a schedule for conducting the updated analysis.[2]

B.5.d. Updates to Optional Watershed Analysis [B.3.c.(1)(b)]
Updates to the optional watershed analysis included in Provision B.3.c.(1)(b) are required only if conditions have changed significantly within the watershed or where new information is available that would significantly alter the model results.

4. Provision F.2.b. BMP Design Manual Updates (Page 126/138)
Request: Allow adequate time for Copermittees to update and implement their BMP Design Manuals.

Rationale: The current Order establishes the Effective Date of the BMP Design Manual (and therefore of the requirements of Permit Section E.3.a-d) as December 24, 2015. This date was appropriate at the time of initial Permit adoption because it provided sufficient time for the development of updated content and for the modification of Copermittee programs and regulatory authorities needed for implementation. The Tentative Order would require the Copermittees to update their BMP Design Manuals to incorporate the amended Provisions E.3.a-d within 90 days after the amended Provisions E.3.a-d are adopted by the Regional Board. Given that critical new modifications are now proposed in the Tentative Order, additional time should be provided to allow for their completion and implementation. The first of these are the changes in the definition of redevelopment Priority Development Projects (PDPs) proposed in Section II.E.3.b.(1)(c) through (e). The second is the addition of a modified process for establishing Prior Lawful Approval (PLA) under Section E.3.e.(1). The Copermittees appreciate the work that Regional Board staff put into working with stakeholders and crafting these PLA provisions, and we support their adoption. However, we must also note that the current implementation schedule for implementing updated BMP Design Manual provisions under the Tentative Order severely limits their potential application. In both instances, additional time is requested to: allow Copermittees to ensure regional consistency; modify local BMP Design Manuals; develop updated policies, procedures, and other program documentation; conduct outreach to industry and project proponents; and modify local ordinances.

At a minimum, six months from the adoption of new requirements should be allowed to complete and implement these tasks. However, if these provisions are adopted as proposed at

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[2] Consistent with CASQA recommendations to SWRCB. California Stormwater Quality Association, Letter to Ms. Jeanine Townsend, Clerk to the Board, State Water Resources Control Board, Subject: SWRCB/OCC Files A-2236(a) through (kk); Comments on Proposed Order *In Re Petitions Challenging 2012 Los Angeles Municipal Separate Storm Sewer System Permit (Order No. R4-2012-0175)*, January 19, 2015.

the November 18, 2015 Regional Board hearing, Copermittees would have just 90 days to implement them.

Please note the following inconsistency in the Tentative Order and Technical Report regarding the extension of dates. The Technical Report (page F-110) states "Provisions E.3.e.(1)(a)[a]-[d] are dependent on the effective date of the BMP Design Manual. Unless otherwise directed by the San Diego Water Board, the effective date of the BMP Design Manual is December 24, 2015 for the San Diego County Copermittees ..." This is in contrast to Provision F.2.b.(4), which requires that revision of the updated BMP Design Manual be completed not later than 90 days after the date the San Diego Water Board adopts the amendments (i.e., by February 16, 2016). Since it is not possible for the BMP Design Manual effective date to precede its revision date, it must be assumed that the intent of Provision F.2.b.(4) is to also extend the effective date.

In recent correspondence on this issue, Regional Board staff has indicated their intent to explicitly extend the effective date by the same 90 days allowed for the BMP Design Manual revision using the discretion granted the Executive Officer under other proposed amendments to Section E.3.d. However, this is problematic for three reasons. First, since any such extension granted by the Executive Officer could only be executed after the hearing, Copermittees would have no assurances that it would actually occur. Second, extending the effective date by 90 days would merely make the revision and effective dates concurrent rather than rectifying the inconsistencies causing the confusion. Third, a 90-day extension of the effective date simply does not provide adequate time to both complete and implement the BMP Design Manual update. For these reasons, the Copermittees request that the effective date of the BMP Design Manual for the Copermittees be extended 180 days from the adoption of the Tentative Order (i.e., May 14, 2016). Modifying the Permit to specifically incorporate this this new effective date, rather than relying on the ability of the RWQCB Executive Officer to do so after the fact, would both provide the time necessary for critical program updates and the certainty needed to plan for them. It would also ensure that these critical changes are fully vetted in an open public forum.

We also recommend that Provision E.3.d. be modified to clarify that the date the BMP Design Manual is implemented (rather than revised) is the same as the "effective date". This will help to prevent any future confusion regarding the applicability of dates.

Since Copermittees have already modified their ordinances to reflect existing Permit content in anticipation of the December 24, 2015 effective date, most will now need to repeat this process for these new provisions. Depending on each Copermittees' process, the time needed to modify ordinances alone can greatly exceed the 90 days currently proposed in the Tentative Order. Moreover, even if ordinance revisions can be completed within 90 days, there would still not be sufficient time to complete all of the other required tasks described above. While Regional Board staff has suggested that Copermittees can start this process now, it is unrealistic to expect that they do so based only on the proposed requirements of a this Tentative Order. It would be speculative to assume that the Tentative Order will be adopted as currently drafted, and Copermittees should not be expected to initiate specific program changes or ordinance revisions based on speculation. We therefore request that the BMP Design Manual effective date be extended by 180 days in the adopted Order.

Recommendations: The Copermittees recommend that the Regional Board modify the requirement to specify that the updates be made to the BMP Design Manual within 180 days, as follows:

Provision E.3.d
Each Copermittee must update its BMP Design Manual pursuant to Provision F.2.b. Until the Copermittee has updated its BMP Design Manual pursuant to Provision F.2.b.(1), the Copermittee must continue implementing its current BMP Design Manual. The Copermittee must implement the updated BMP Design Manual within 180 days following completion of the update pursuant to Provision F.2.b.(1), unless directed otherwise by the San Diego Regional Water Board Executive Officer. The date the BMP Design Manual is implemented is the "effective date" of the BMP Design Manual. The update of the BMP Design Manual required pursuant to Provision F.2.b.(1) must include the following:

Provision F.2.b.(4)
If the San Diego Water Board amends Provisions E.3.a-d during the permit term but after the Copermittee has completed the update pursuant to Provision F.2.b.(1), the Copermittee must revise its BMP Design Manual to incorporate the amended Provision E.3.a-d requirements as soon as possible but no later than **180** days after the date the San Diego Water Board adopts the amendments to Provisions E.3.a-d, unless otherwise directed by the San Diego Water Board Executive Officer. **Under these circumstances, the effective date of the BMP Design Manual is 180 days after the date the San Diego Water Board adopts the amendments to Provisions E.3.a-d.**

5. **Attachment E-6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek) (Page 227/236)**

Request: Modify draft Tentative Order Attachment E Tables 6.1 and 6.4 for consistency with the TMDL.

Rationale: The proposed addition of a 10-year wet-weather compliance deadline of April 4, 2021, to Table 6.1 for water bodies in a WQIP that do not include load reductions for pollutants besides bacteria is inconsistent with the adopted TMDL and thereby violates the Clean Water Act regulations at 40 C.F.R. § 122.44(d)(1)(vii)(B). This proposed amendment would subject the segments of beaches and creeks that were removed from the 303(d) list to requirements from which the de-listed segments are specifically exempt under the adopted TMDL. Under the TMDL, no BLRP or CLRP is required for the de-listed segments. The WQIP is a requirement of the MS4 Permit, not the TMDL, and it is not a BLRP. Thus, there is no justification to require a 10-year compliance schedule for the de-listed segments, and the proposed amendment is not consistent with the TMDL.

Recommendation: Delete proposed language in Table 6.1 and footnote.

The Copermittees submit the foregoing comments with respect to Tentative Order R9-2015-0100. These comments should not be construed as amending or modifying any of the Copermittees' positions with respect to any prior Regional Board order or action. Each of the

Copermittees reserves its right to continue to pursue any and all of its positions, arguments, challenges, petitions, and appeals with respect to any such prior Regional Board order or action.

The San Diego Copermittees thank you for your consideration of these comments. If you have questions or require additional information, please contact Jo Ann Weber at (858) 495-5317 or e-mail at JoAnn.Weber@sdcounty.ca.gov.

Sincerely,

Jo Ann Weber, Planning Program Manager
Watershed Protection Program

cc: Elaine, Lukey, City of Carlsbad
Boshra Salem, City of Chula Vista
Kim Goodby, City of Coronado
Kathleen Garcia, City of Del Mar
Jaime Campos, City of El Cajon
Erik Steenblock, City of Encinitas
Helen Perry, City of Escondido
Chris Helmer, City of Imperial Beach
Joe Kuhn, City of La Mesa
Malik Tamimi, City of Lemon Grove
Kuna Muthusamy, City of National City
Mo Lahsaie, City of Oceanside
Steve Strapac, City of Poway
Clem Brown, City of San Diego
Reed Thornberry, City of San Marcos
Cecilia Tipton, City of Santee
Dan Goldberg, City of Solana Beach
Cheryl Filer, City of Vista
Allison Vosskuhler, Port of San Diego
Richard Gilb, San Diego County Regional Airport Authority

Unified Port
of San Diego

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SAN DIEGO REGIONAL
WATER QUALITY
CONTROL BOARD
2015 SEP 14 AM 10 10

September 14, 2015

San Diego Regional Water Quality Control Board
2375 Northside Drive, Suite 100
San Diego, CA 92108
Attn: Wayne Chiu

Subject: **Comment - Tentative Order No. R9-2015-0100, Place ID:786088WChiu**

Dear Mr. Chiu:

The San Diego Unified Port District (District) submits the following comments to Tentative Order No. R9-2015-0100 (Tentative Order), which proposes to amend the *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4) Draining the Watersheds within the San Diego Region* (the Permit). The District continues to support the San Diego Regional Water Quality Control Board's (Regional Board) efforts to develop a Permit that appropriately regulates MS4 discharges in a manner protective of human and ecological health and that addresses the substantial economic and feasibility constraints faced by the Copermittees. The District also appreciates the workshops held by the Regional Board to consider and develop proposed language prior to the issuance of the Tentative Order.

The District reiterates the comments it has made on Order No. R9-2013-001 and Order No. R9-2015-001 and repeats and incorporates by reference these previously submitted comments, which were set forth in letters dated September 14, 2012, January 11, 2013, November 19, 2014, and in the transcript from the hearing that took place before the Regional Board on April 10 and 11 and on May 8, 2013. The District also incorporates by reference its position on the provision identified and addressed in its petition to the State Board, submitted on June 7, 2013 (Petition No. A-2254(o)).

As set forth in these previously submitted comments, the District continues to request that the Regional Board add language to the Permit clarifying that the location of an MS4 facility within the District's jurisdictional boundaries does not, without more, render the District an owner or operator of that facility. Though obvious, this concept is singularly important to the District given its unique status as the trustee of tidelands resources with boundaries that overlap with the Cities of San Diego, National City, Chula Vista, Imperial Beach, and Coronado (member cities). MS4 facilities owned and operated by the member cities traverse District boundaries, many without any storm water contribution from the District. These MS4 facilities were reserved by the member cities in the 1962 conveyances of tidelands properties to the District, and continue to be owned and operated by the member cities (and not the District) to this day. Attachment A includes the 1962 conveyance document for the record.

The law is clear: the District is not responsible for discharges from an MS4 that it does not own or operate, even if a portion of the MS4 falls within its boundaries. *See* 33 U.S.C. 1316(a)(4) ("owner or operator" defined as "any person who owns, leases, operates, controls, or supervises a source"); 40 C.F.R. 122.26(a)(3)(vi) ("Co-permittee need only comply with permit conditions relating to discharges from the municipal separate storm sewers *for which they are operators*.") (emphasis added); State Board, Order No. WQ 2015-0075, at 66 ("Permittees that have commingled MS4 discharges need only comply with permit conditions relating to discharges from the MS4 *for which they are owners or operators*.") (emphasis added). Indeed, as the Permit recognizes, "[t]he federal regulations make it clear that the Copermittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators (40 CFR 122.26(a)(3)(vi))."

Despite the clarity of the law, there has been substantial confusion as to the District's responsibility for MS4 facilities within its boundaries that are owned and operated by other Copermittees. For example, the District has been named to Draft Investigative Order R9-2015-0058, which pertains to an investigation of sediment quality in the Mouth of Chollas Creek, based on its status as an MS4 Copermittee—despite the fact that the District does not own or operate any portion of the MS4 that discharges into Chollas Creek.[1] As stated above, it would be improper to name the District to an investigative order based solely on its status as MS4 Copermittee. Yet it has become clear that without the clarifying language requested by the District, the Regional Board and others may look to the District to take responsibility for MS4 facilities that it does not own or operate and, thus, cannot legally control.

Thank you again for this opportunity to provide comments on the Tentative Order. If you have any questions please contact Karen Holman at (619) 725-6073 or via email at kholman@portofsandiego.org.

Respectfully,

Jason H. Giffen

D2#1035048
cc: Randa Coniglio, John Bolduc, John Carter, Karen Holman, Paul Brown
Attachments:
Attachment A: February 16, 1963, City of San Diego Conveyance Document and Drawings (CD)
Attachment B: July 30, 2015 District Comment Letter on Mouth of Chollas Creek Draft Investigative Order R9-2015-0058

[1] The District attaches and incorporates by reference its July 30, 2015 comments on Draft Investigative Order R9-2015-0058 (Attachment B to this letter).

Unified Port
of San Diego

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July 30, 2015

Sean McClain
California Regional Water Quality Control Board
San Diego Region
2375 Northside Drive, Suite 100
San Diego, CA 92108

Subject: San Diego Unified Port District Comments on Mouth of Chollas Creek-Draft Investigative Order R9-2015-0058

Dear Mr. McClain,

The San Diego Unified Port District ("District") appreciates the opportunity to submit comments on Investigative Order No. R9-2015-0058, Pertaining to an Investigation of Sediment Quality in the Mouth of Chollas Creek, dated June 1, 2015 ("draft Order").

The District supports the Regional Board's continued efforts to identify and eliminate sources of contamination impacting San Diego Bay (the "Bay"), including those that might exist within the Mouth of Chollas Creek and the Chollas Creek Tidal Prism ("Investigation Area"). As you know, the District acts as the public trustee and steward of its tidelands properties located in and adjacent to the Bay and works collaboratively with the Regional Board to ensure the health of Bay's ecosystems and their ability to sustain beneficial uses.

As set forth below, the District disputes the draft Order's findings regarding the District's responsibility for waste discharges to sediment within the Mouth of Chollas Creek and the Tidal Prism. Contrary to the draft Order's findings, the District does not own or operate the municipal separate storm sewer system ("MS4") that discharges storm water runoff to the Investigation Area, and does not own or operate any facilities that could reasonably be viewed as a source of Investigation Area contamination. Though the District fully supports the investigation of Chollas Creek Mouth and Tidal Prism sediments and asks that the Regional Board ensure contamination is eliminated, the parties responsible for the contamination should bear the cost and burden of its investigation and removal.

The District is submitting the following comments regarding factual findings of land ownership[1], corrections to the draft Order, and general points which have been coordinated with the other stakeholders on the draft Order's structure and timing.

1. <u>The Order Should Not Be Directed To The District.</u>

   a. The District Does Not Own Or Operate Any MS4 That Discharges Into the Investigation Area

[1] The District previously provided the Regional Board with information detailing the ownership and control over the Mouth of Chollas Creek and discharges to the same in the District's comment letters and technical report submitted to the Regional Board on April 8 and December 20, 2013 The District's expert, Robert Collacott, also testified to the fact that the District does not own or operate any portion of the Municipal Separate Storm Sewer system ("MS4") that discharges to this area during the administrative proceedings leading up to Regional Board Order No R9-2012-0024 These prior submissions and related briefs and petitions are incorporated by reference

The draft Order incorrectly states that the Mouth of Chollas Creek "receives discharges from the municipal separate storm sewer systems (MS4s) of ... the [District]" and that the District "own[s] and/or operate[s] MS4s that discharge storm water runoff directly into Chollas Creek." (draft Order Findings 7 & 10). Additionally, the draft Order (Finding 3) incorrectly identifies the Chollas Creek Tidal Prism area as "immediately adjacent to San Diego Bay under the jurisdiction of the San Diego Unified Port District and the U.S. Navy (Naval Base San Diego)."

The District does not own or operate any portion of the MS4 that discharges into the Investigation Area. Rather, the only MS4 located within the District's jurisdiction that discharges into Chollas Creek is owned and operated by the City of San Diego ("City"), which runs beneath 28th Street to outfall SW9. The City, which maintains overlapping jurisdictional boundaries within this area, retained this MS4 facility in the 1963 Conveyance of certain tideland property from the City to the District. This Conveyance excluded from the property transfer "all existing water, sewer and drainage facilities, known or unknown, the location ... being designated by engineering drawings" referenced in the Conveyance and to be "more specifically located by survey and location maps" at a later date. Attachment A, Page 6 (emphasis added). In fact, the City's own engineering drawings referenced in the Conveyance and City engineering drawings created years later identify this line as a City drainage facility (Attachments B and C). Furthermore, the City conceded that it owns this portion of the MS4 during the Shipyard Sediment Site administrative proceedings. Attachment D ("[T]he City storm drain system enters the NASSCO leasehold at the foot of 28th Street and terminates at the southeasterly corner" where it "discharges into Chollas Creek" at the SW9 outfall). The City's ownership and operation of this MS4 is beyond dispute.[1] Additionally, the Tidal Prism area lies upstream of the tidelands boundary and is within the City of San Diego and U.S. Navy jurisdictions.

It is possible that the Regional Board named the District due to the District's status as a Co-permittee on the municipal MS4 permit, Order No. R9-2013-0001 ("MS4 Permit"). However, this is inappropriate. The law is clear: the District is not responsible for discharges from portions of an MS4 that it does not own or operate, even if portions of those facilities fall within its jurisdiction. *See* 33 U.S.C. 1316(a)(4) ("owner or operator" defined as "any person who owns, leases, operates, controls, or supervises a source"); 40 C.F.R. 122.26(a)(3)(vi) ("Co-permittee need only comply with permit conditions relating to discharges from the municipal separate storm sewers *for which they are operators*.") (emphasis added); State Board Order No. WQ 2015-0075, at 66 ("Permittees that have commingled MS4 discharges need only comply with permit conditions relating to discharges from the MS4 *for which they are owners or operators*.") (emphasis added). Thus, Co-permittee status without more does not render the District an owner or operator of all MS4 covered by the permit and does not constitute a valid reason to direct the District to conduct an investigation within Chollas Creek. *See* MS4 Permit Paragraph 2 ("The federal regulations make it clear that the Co-permittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators (40 CFR 122.26(a)(3)(vi))"; State Board, Order No. WQ 2015-0075, at 67 ("joint responsibility in an MS4 Order is only appropriate if the ultimate responsibility for addressing an exceedance rests with those permittees

[1] The District has identified a single minor storm drain within its jurisdiction that drains approximately 870 ft² of non-industrial property in the vicinity of Chollas Creek. The drain appears to lead to a storm water line underneath Harbor Drive owned by the City that appears to be non-operational or potentially abandoned. In any event, the location of this drain does not render the District an owner or operator of an MS4 relevant to the investigation directed by the Order.

that actually cause or contribute to the exceedance in question."). Requiring the District to participate in this investigation would improperly require the District to address contamination caused by others.

Because the District does not own or operate any portion of the MS4 discharging to the Mouth of Chollas Creek, it should not be named to the Order. The draft Order should be revised to reflect the true ownership of MS4 facilities discharging to Chollas Creek and directed to those responsible for Investigation Area contamination.

b. The Regional Board Should Look To NASSCO To Address Any Contamination Caused By Its Operations

The draft Order identifies NASSCO as a source of pollutant discharges in Chollas Creek (Finding 12). NASSCO has been the exclusive operator of the shipbuilding and repair facilities at the current location since before the District came into existence. *See* Cleanup and Abatement Order No. R9-2012-0024, Finding 2. If NASSCO is in fact responsible for contamination within the Investigation Area, the Regional Board should look to NASSCO to address that contamination.

It is the long-established practice of the State Board to hold a non-discharging public entity landlord responsible for compliance only after the primary discharger has failed to perform or comply with its administrative obligations. *See* Petition of Wenwest, WQ 92-13; Petition of Schmidl, WQ 89-1; Petition of Forest, WQ 87-5. It has also been the Regional Board's practice not to order the District to participate in investigations of contamination caused by others, even if located within the District's jurisdiction. *See* Attachment E, Letter from James G. Smith, Regional Board to Gene Matsushita, Lockheed Martin (November 19, 2012). Indeed, it would be improper for the Regional Board to assign liability for contamination caused by private parties to the public trustee, especially if the only basis for this liability shift were the fact that the location of the contamination is land held in trust.

Comments Submitted With Other Stakeholders:
The following comments have been discussed with the other stakeholders identified on the draft Order; the District is in general agreement with these points.

2. Limit The Investigative Order To Phase One Elements Only. The District is in agreement with other stakeholders that this draft Order should be limited to Phase One elements. It is recommended that all actions and deadlines relating to Phase Two be removed. Including Phase Two in this initial Order appears to be premature, as the stakeholder roles, phase design, and implementation efforts in the second phase are reliant on Phase One findings. As such, determination of potential work elements and the stakeholder roles in Phase Two cannot be determined at this time.

3. Proposed Timelines Should Be Extended. The District agrees with the other stakeholders that the timeline for Phase One deliverables be extended. Developing a well-designed and comprehensive Phase One Work Plan and Quality Assurance Project Plan (QAPP) is a complex process that involves collaboration amongst the stakeholders on work products, contracting mechanisms and cost sharing, as well as

discussions with the Regional Board. The timeline in the Order does not provide adequate time to develop the aforementioned documents and incorporate any revisions suggested by Regional Board staff.

In addition, the Order's timeline should be extended to take into account field efforts, time to perform data analysis, and development of a report. The Order currently states that the Work Plan is due on November 19, 2015, and the Sediment Chemistry Assessment Report (Report) is due on August 31, 2016. The District respectfully requests that the timeline be extended as follows:

- Work Plan due March 30, 2016;
- Report due March 30, 2017.

This request is based on the understanding that the most appropriate time to assess ambient conditions is during summer months (May September). Monitoring in the summer of 2016 would then enable stakeholders to obtain monitoring results in the fall of 2016, and present findings in a report the following spring (2017).

4. Identify A Work Plan Approval Process. The District recommends that the final Order include language clarifying the Regional Board approval process for the Phase One Work Plan. The final Order should specify the review process and time period by which the Regional Board will review and approve the Work Plan. To avoid potential confusion or unnecessary delay, the District strongly recommends that the final Order provide at least a 90-day Work Plan review and approval process. In addition, the Order should clarify that the Regional Board will indicate concurrence with the Work Plan if no comments are received by the end of the 90-day period so the Work Plan implementation can begin.

5. Provide Clear Delineation of the Tidal Prism. The District agrees with the other stakeholders that the Order should define the geographical extent of the Chollas Creek Tidal Prism, similarly to the delineation of the Mouth of Chollas Creek. While the draft Order discusses the Chollas Creek Tidal Prism, the description of the geographical extent of the investigation does not clearly identify that the tidal prism is part of the overall Chollas Creek study area.

   The Investigation Area is comprised of two distinct segments: 1) the Mouth of Chollas Creek and 2) the Chollas Creek Tidal Prism. Because the Order calls for an investigation of the Tidal Prism, the tidal prism area should be clarified in the final Order and include a figure depicting the boundaries of the Chollas Creek Tidal Prism.

Factual Corrections to the Order

The District has reviewed the draft Order and the information relating to land ownership, leases, and jurisdictional authorities within the Chollas Creek drainage area. Based upon review of records of land ownership and leases, the District requests that the items below be corrected as detailed herein.

6. MS4 Ownership Operation. Findings 7 and 10 should be revised to reflect the fact that the District does not own or operate the MS4 discharging to Chollas Creek.

7. Tidal Prism. The District requests that Finding 3 be revised to correct the statements relating to the Tidal Prism, as follows:

   a) Replace the "San Diego Unified Port District" with the "City of San Diego" for jurisdictional ownership.

   b) Include a map of the Tidal Prism area within the body of the draft Order.

8. U.S. Navy and Nassco Leased Parcels. The draft Order (Findings 12 and 13) identifies the land owners for portions of the Chollas Creek Mouth. In particular it states that the Nassco facility is leased from the District. The draft Order does not state that Nassco also leases a portion of their facility from the U.S. Navy. The U.S. Navy is the land owner for areas on both sides of the Chollas Creek Mouth. The portion of U.S. Navy property on the northern side of the Chollas Creek Mouth is leased to Nassco. The District requests the following corrections to the draft Order:

   a) Revise the draft Order to identify that Nassco leases land from both the District and the U.S. Navy(Page 7), and

   b) Include correlating language on page 9 to indicate that the U.S. navy leases land to Nassco.

The District remains firm in its commitment to conduct operations and manage resources in an environmentally sensitive and responsible manner. As such, the District believes that efforts such as this Chollas Creek investigation supports the Regional Board's overarching efforts to develop a strategy that will achieve healthy waters in San Diego Bay. The District, as an interested party, is encouraged by the Regional Board's desire to investigate and address contamination within this area. We encourage you to continue to move these investigations forward in a manner that is consistent with the San Diego Bay Strategy.

Thank you again for this opportunity to provide comments on this important project. If you have any questions please contact Karen Holman at (619) 725-6073.

Sincerely,

Jason H. Giffen
Director, Environmental and Land Use Management

Attachments

Attachment A	February 16, 1963. City of San Diego Conveyance Document
Attachments B and C	City of San Diego Engineering Dept. Drainage Drawings
Attachment D	July 15, 2004 Report for the Investigation of Exceedances of the Sediment Quality Objectives at National Steel and Shipbuilding Company Shipyard
Attachment E	November 19, 2012. Letter from James G Smith Regional Board to Gene Matsushita Lockheed Martin

D2#965199 cc: John Carter, Jason H Giffen, Karen Holman, Paul Brown

Attachment A

PORT OF SAN DIEGO
P.O. Box 488
San Diego 12, Calif.

(86)
ORIGINAL

CONVEYANCE

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 75
FILED FEB 15 1963
MICROFILM NO. 8
OFFICE OF THE CLERK

THE CITY OF SAN DIEGO, a municipal corporation, in the County of San Diego, State of California, hereby conveys, without warranty, to the SAN DIEGO UNIFIED PORT DISTRICT, a Public Corporation established pursuant to the provisions of the San Diego Unified Port District Act, all those lands situate within the City of San Diego, County of San Diego, State of California, which are more particularly described as follows:

PARCEL I:

All those lands lying between the line of mean high tide of San Diego Bay and the pierhead line of said bay, and between the prolongation into said bay to the pierhead line of the northerly line of the United States military reservation on Point Loma and the prolongation into said bay to the pierhead line of the southwesterly line of the United States Naval Training Center and reserving therefrom such roadways and easements as hereinafter described, such boundaries, roadways and easements being shown in detail upon engineering drawings Nos. 1, 2, 2a, 2b, 2c, 3, 3a, 3b, 3c, 3d, 3e, 3f, 3g, 4, 4a, 4b, 14a, 14b, 14c, & 15a, 15b, 15c, 16a, 16b, 16c.

PARCEL II:

All those lands lying between the line of mean high tide of San Diego Bay and the pierhead line of said bay, and between an irregular westerly boundary being an irregular line beginning at Government Station 488 on the combined pierhead and bulkhead line and proceeding northerly; thence easterly; thence northerly; thence easterly; thence northeasterly along the boundary of the United States Marine Corps Base to the point where such boundary intersects the mean high tide line in the vicinity of Washington Street and Pacific Highway, and the northwesterly boundary lines of the United States Naval Station between the mean high tide line and the United States Pierhead Line being an irregular line, omitting therefrom the United States Coast Guard Base lying southerly of North Harbor Drive and in the vicinity of Lindbergh Field; and the Civic Center lying between North Harbor Drive and Pacific Highway and between Grape and Ash Streets; and the United States Naval Supply Center consisting of four parcels, (1) the block lying between Broadway and "E" Street and between North Harbor Drive and Pacific Highway, (2) the block lying between "B" and "F" Streets and between North Harbor Drive and Pacific Highway, (3) a portion of a block between "F" and Market Streets and North Harbor Drive and Pacific

I hereby certify that, if impressed with the seal of the San Diego Unified Port District, this is a true copy of the original record filed in the Office of the District Clerk of the San Diego Unified Port District as Document No. 75.

By _____ Date 9/22/2010 No. Pages: 8
Timothy A. Deuel
Deputy District Clerk

Highway, (4) The United States Naval Pier at the foot of "G" Street; and adding portions of fractional blocks 18 and 19, New San Diego, according to the Map thereof No. 456, lying above the mean high tide line; such boundaries, roadways, easements and omissions being shown in detail upon engineering drawings Nos. 4, 5, 6, 6a, 6b, 6c, 7, 8, 8a, 8b, 9, 9a, 9b, 9c, 9d, 9e, 10, 10a, 10b, 10c, 10d, 10e, 10f, 10g, 10h, 11, 12, 12a, 13, 13a, 13b, 13c, 14c, 14d, 14e, 14f, 15c, 15d, 15e, 15f, 16e, 16f, 14g, 15g, 16c, 16d, 16g.

The City retains from the conveyance of Parcel II the right of control and possession of that block surrounded by Pacific Highway on the west, Kettner Boulevard on the east, Market Street on the north, and Harbor Drive on the south, for a Police Station and for so long as the City continues to use it for that purpose.

PARCELS III through XIV:

The following described uplands lying above the line of mean high tide of San Diego Bay:

(Parcel III):

Lot 8, Block 135, La Playa, Couts Miscellaneous Map No. 37, lying above mean high tide line, and as shown on engineering drawing No. 2a.

(Parcel IV):

Portion Closed Street, Adjacent Lot 2, Block 154, La Playa, Couts Miscellaneous Map No. 37, lying above mean high tide line, and as shown on engineering drawing No. 2b.

(Parcel V):

Portions of Right of Way Lots 73 and 74 of Middletown, according to Jackson's Map of Middletown, and as shown on engineering drawing No. 8a.

(Parcel VI):

Portion of Lot 6, Block 272 of Middletown, according to Jackson's Map of Middletown, and as shown on engineering drawing No. 8b.

(Parcel VII):

Lot E, Block 22, New SanDiego, according to the Map thereof No. 456, lying above the mean high tide line.

(Parcel VIII):

Lot E, Block 23, New San Diego, according to the Map thereof No. 456, filed in the office of the County Recorder, said County of San Diego, excepting therefrom that portion, if any, lying below the mean high tide line of the Bay of San Diego, and excepting therefrom the Right of Way of the Atchison, Topeka and Santa Fe Railway Company.

(Parcel IX):

Portion of Lot F, Block 23, New San Diego, lying above the mean high tide line, and as shown on engineering drawing No. 10e.

(Parcel X):

All of Block 31, New San Diego, Map No. 458.

(Parcel XI):

Portion of Pueblo Lot 1164 northwesterly of Sampson Street, as shown on engineering drawing No. 12a.

(Parcel XII):

All of Block 45, Roseville, Map No. 155, lying above the mean high tide line.

(Parcel XIII):

Lot 6, Block 67 of Roseville, according to Map No. 155 of Roseville, lying above the mean high tide line, as shown on engineering drawing No. 13a.

(Parcel XIV):

The portions of Fractional Block 64 and the Unnumbered Fractional Block in San Diego Land and Town Company's Addition, according to record map thereof No. 379, lying between the mean high tide line of the Bay of San Diego, and the southerly right of way line of the Atchison, Topeka and Santa Fe Railroad, as shown on engineering drawing No. 13c.

ROADWAYS RESERVED

The City of San Diego specifically reserves easements for street purposes, as more particularly set forth hereinafter, including within such reservations the right to construct, maintain and operate all utilities and the right to grant franchises on such streets and to require franchise payments to The City of San Diego as authorized by the Charter of The City of San Diego:

PARCEL A: (Roads within Parcel I described above)

For San Antonio Avenue - an easement over that portion included between the mean high tide line and the prolongation of the easterly line of San Antonio Avenue as it now exists, as shown on engineering drawing No. 2.

For Talbot Street - an easement 70' in width extending from the mean high tide line to the southeasterly line of Anchorage Lane, as shown on engineering drawing No. 3f.

For Canyon Street - an easement 70' in width extending from the mean high tide line to the southeasterly line of the most southeasterly line of Anchorage Lane, as shown on engineering drawing No. 3g.

For Anchorage Lane - an easement 48' in width between the northeasterly line of Talbot Street and the southwesterly line of Canyon Street, and an easement 55' in width between the northeasterly line of Canyon Street and the southwesterly line of Byron Street, as shown on engineering drawings Nos. 3e and 3f.

For Byron Street - an easement 60' in width between the mean high tide line and the traffic circle at Byron Street and Yacht Harbor Drive, as shown on engineering drawings Nos. 3c, 3d.

For Yacht Harbor Drive - an easement of variable widths as shown on engineering drawings Nos. 2c, 2d, 2e, 4b.

For the traffic circle at Byron Street and Yacht Harbor Drive - easements of variable widths as shown on engineering drawing No. 2c.

For the traffic circle at the southwesterly end of Yacht Harbor Drive - easements of variable widths as shown on engineering drawing No. 2c.

For Garrison Street - an easement 70' in width extending from the mean high tide line to the northwesterly line of Scott Street, as shown on engineering drawing No. 3g.

For Scott Street - an easement 70' in width extending from the point where the mean high tide line intersects the southeasterly line of Scott Street to the southwesterly boundary of North Harbor Drive, the variable widths of such easement as shown on engineering drawing No. 3g.

For North Harbor Drive - an easement 167.5' in width extending easterly from the mean high tide line to the southwesterly line of the United States Naval Training Center, as shown on engineering drawing No. 4a.

For Lowell Street - an easement 73.5' in width extending southeasterly from the mean high tide line to the northerly line of North Harbor Drive, as shown on engineering drawing No. 4a.

PARCEL B: (Roads within Parcel II described above)

For 28th Street - an easement 126' in width extending from the mean high tide line to the northerly line of Harbor Drive, as shown on engineering drawing No. 13d.

For 8th Avenue - an easement 80' in width extending from the mean high tide line to the northeasterly line of Harbor Drive, as shown on engineering drawing No. 11.

For 5th Avenue - an easement 80' in width extending from the mean high tide line to the northeasterly line of Harbor Drive, as shown on engineering drawing No. 11.

For Kettner Boulevard - an easement 75' in width extending southerly from the mean high tide line to the northeasterly line of Harbor Drive, as shown on engineering drawing No. 10.

Broadway - an easement 126' in width extending from the westerly line of Pacific Highway to a line parallel to and 200' easterly from the United States bulkhead lines, as shown on engineering drawing No. 10g.

For Ash Street - an easement 80' in width extending from the westerly line of Pacific Highway to the easterly line of North Harbor Drive, as shown on engineering drawing No. 9a.

For Grape Street - an easement 80' in width extending from the westerly line of Pacific Highway to the easterly line of North Harbor Drive, as shown on engineering drawing No. 9b.

For Hawthorn Street - an easement 80' in width extending from the mean high tide line to the easterly line of Pacific Highway; an easement 80' in width extending from the northwesterly line of Pacific Highway to the northeasterly line of North Harbor Drive, as shown on engineering drawing No. 9.

For Ivy Street - an easement 80' in width extending from the mean high tide line to the easterly line of Pacific Highway, as shown on engineering drawing No. 9.

For Laurel Street - an easement 80' in width extending from the mean high tide line to the northeasterly line of Pacific Highway; an easement 80' in width extending from the southwesterly line of Pacific Highway to the northerly line of North Harbor Drive with a variable width at the Harbor Drive end of said easement, as shown on engineering drawings Nos. 9b, 9a.

For Palm Street - an easement 80' in width extending from the mean high tide line to the northeasterly line of Pacific Highway, as shown on engineering drawing No. 8.

For Sassafras Street - an easement 80' in width extending from the mean high tide line to the northeasterly line of Pacific Highway, as shown on engineering drawing No. 8.

For Vine Street - an easement 80' in width extending from the mean high tide line to the northeasterly line of Pacific Highway, as shown on engineering drawing No. 8.

For North Harbor Drive - an easement 200' in width extending from the westerly boundary line of Parcel II to the easterly line of the United States Coast Guard Base; an easement 179' in width extending from the easterly line of the United States Coast Guard Base to the vicinity of the prolongation of Date Street; an easement 165' in width extending from the vicinity of the prolongation of Date Street to the southerly line of Ash Street, as shown on engineering drawings Nos. 4, 5, 6, 7, 9.

For Harbor Drive - an easement of variable widths extending from the easterly line of Pacific Highway to where said street intersects the mean high tide line in

the vicinity of the prolongation of 16th Street; an easement providing for a right of way 120' in width from the vicinity of Schley Street to the vicinity of the United States Naval Repair Base; the variable widths of such easements as shown on engineering drawings Nos. 10, 11, 13.

For Pacific Highway - an easement providing for a right of way of variable widths between that point where the mean high tide line intersects the southwesterly line of Pacific Highway in the vicinity of Washington Street and the southerly line of Harbor Drive, as shown on engineering drawings Nos. 8, 9, 10.

For all the above-mentioned streets - an easement of such width for intersection purposes at the intersection of any of the aforementioned streets with each other or with any other roadway and as shown on the appropriate engineering drawings in Exhibit "A."

OTHER EASEMENTS RESERVED

City reserves easements in Parcels I through XIV for all existing water, sewer and drainage facilities, known or unknown, the location of known existing utilities being designated by engineering drawings Nos. 14a - 14g; 15a - 15g; 16a - 16g; unknown easements shall be more specifically located by survey and location maps of such easements shall be prepared, which maps shall become a part of this conveyance as a subsequent exhibit when approved by District and City.

QUITCLAIM

Parcel XV:

City quitclaims all its right, title and interest in all those submerged lands in the Bay of San Diego bayward of the pierhead line within the city limits of said city, excepting those lying easterly of the jetty and southerly of the peninsular of San Diego; and southerly of the common boundary of the City of San Diego and the City of National City as shown on engineering drawing No. 1.

EXHIBITS

All engineering drawing numbers referred to in this document under Parcels I through XIV; Roadways Parcels A and B; and Easements, by reference thereto are incorporated herein and attached hereto as Exhibit "A".

IN WITNESS WHEREOF, The City of San Diego has caused this conveyance to be executed by its Mayor and City Clerk, pursuant to resolution of the Council authorizing such execution, this 14th day of February, 1963.

THE CITY OF SAN DIEGO

By _____
Mayor of said City

ATTEST:

_____
City Clerk of said City

STATE OF CALIFORNIA)
) ss.
COUNTY OF SAN DIEGO)

900

On this 14th day of February, 19 63, before me, the undersigned, a Notary Public in and for said County and State, residing therein, duly commissioned and sworn, personally appeared CHARLES C. DAIL, known to me to be the Mayor, and PHILLIP ACKER, known to me to be the City Clerk of The City of San Diego, the municipal corporation that executed the within instrument, and known to me to be the persons who executed the within instrument on behalf of the municipal corporation therein named, and acknowledged to me that such municipal corporation executed the same.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal, in the County of San Diego, State of California, the day and year in this certificate first above written.

Helen M. Willig
Notary Public in and for the County of San Diego, State of California
HELEN M. WILLIG

(SEAL)
My Commission Expires
Sept. 11, 1966

FILE/PAGE NO. 28389
RECORDED REQUEST OF
FEB 15 11 42 AM '63
SERIES 4 BOOK 1963
OFFICIAL RECORDS
SAN DIEGO COUNTY, CALIF.
A. S. GRAY, RECORDER
NO FEE

8
-8-

174199 FEB 14 1963

7 75

Attachment B

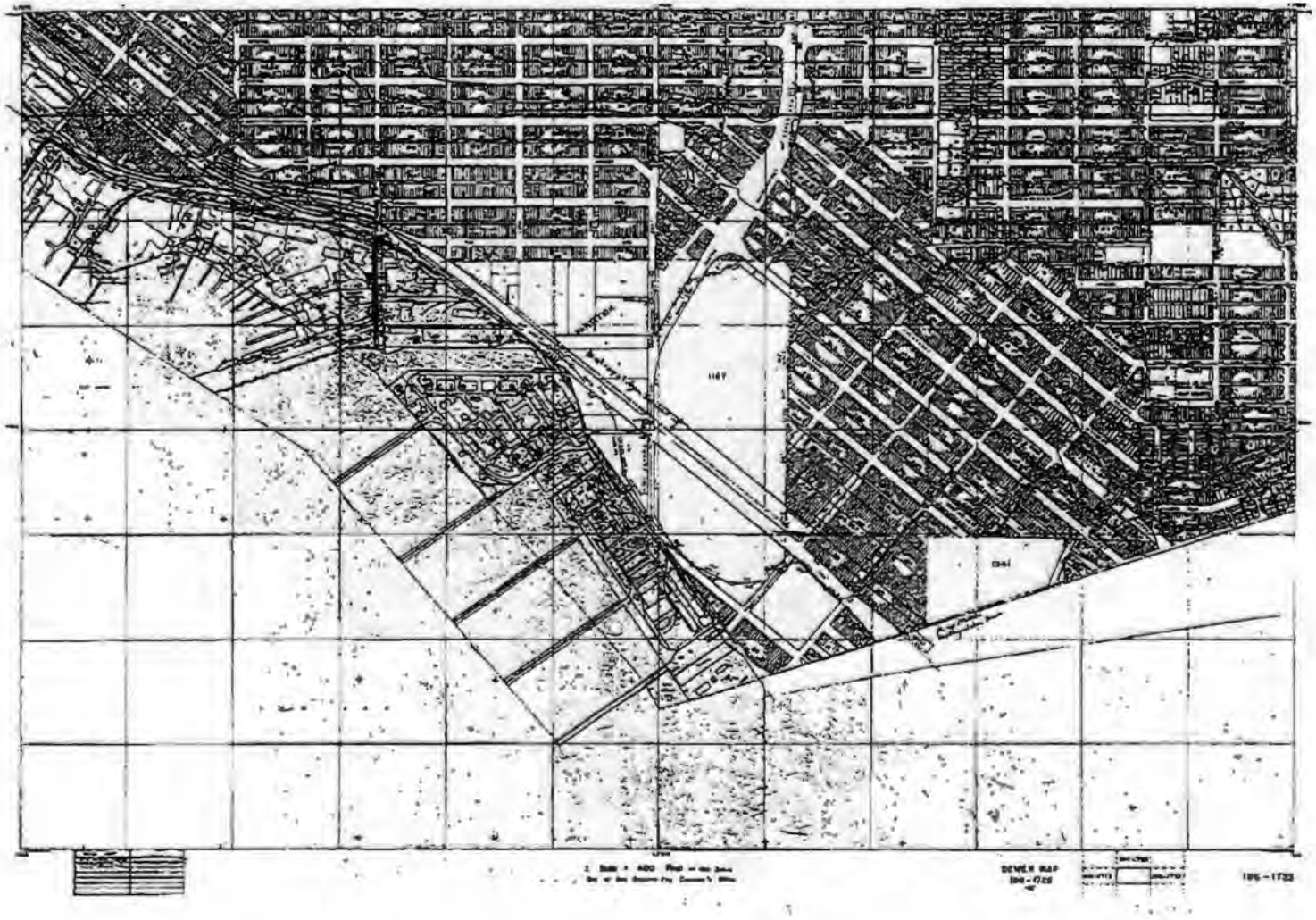

Attachment C

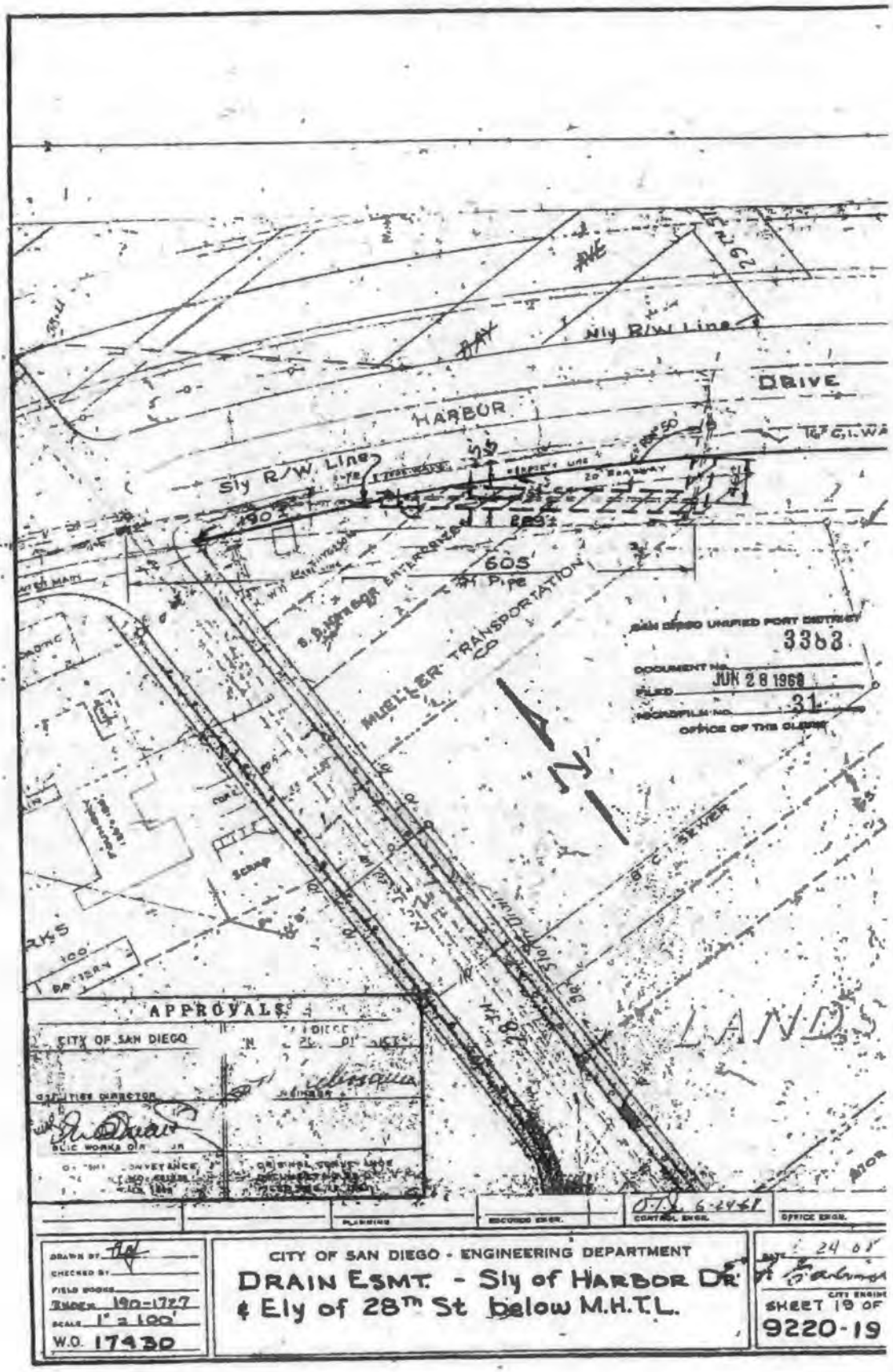

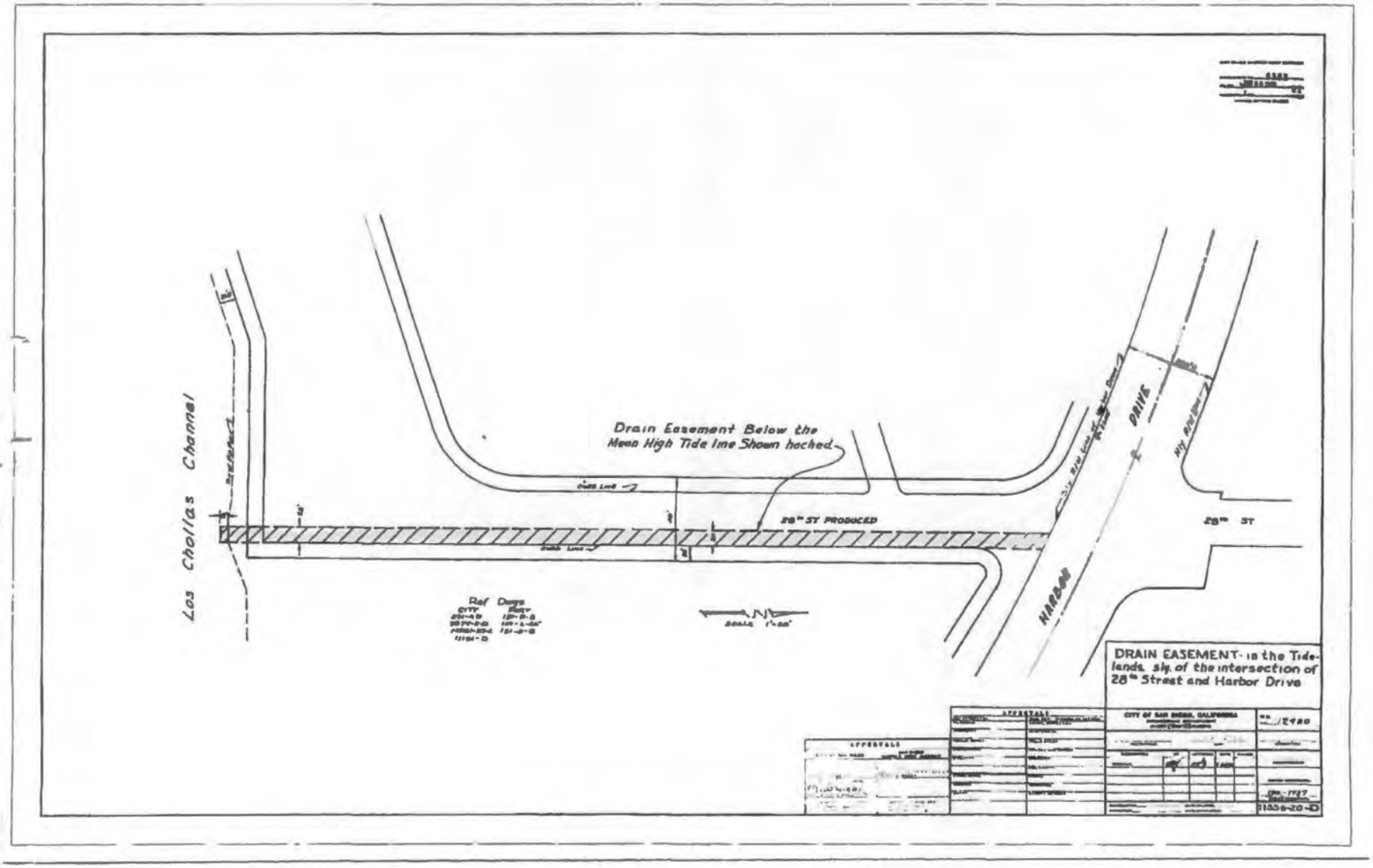
Los Chollas Channel
Drain Easement Below the Mean High Tide line Shown hached
28th ST PRODUCED
28th ST
HARBOR
DRIVE
Ref Datum
DRAIN EASEMENT - in the Tidelands s/y. of the intersection of 28th Street and Harbor Drive

Attachment D

City of San Diego

REPORT FOR THE INVESTIGATION OF EXCEEDANCES OF THE SEDIMENT QUALITY OBJECTIVES AT NATIONAL STEEL AND SHIPBUILDING COMPANY SHIPYARD

July 15, 2004

Storm Water Pollution Prevention Program
1970 B Street, MS 27A
San Diego, CA 92102

City's records do not contain all storm drain system information from the beginning of the twentieth century. The only historical map available is from 1942 (Attachment 4) The storm drain system is shown as a 4 x 3.5 foot reinforced concrete box along the southerly side of Belt Street in this drawing.

A current storm drain system map is enclosed for your reference as Attachment 5. This map indicates that the City storm drain system enters the NASSCO leasehold at the foot to 28th Street and terminates at the southeasterly corner and discharges into Chollas Creek. This storm drain outfall is referred to as SW9 in NASSCO sediment report map prepared by Exponent, a private company, dated September 23, 2003 (Attachment 6). Our research did not validate the Exponent report that storm drain SW3 is part of the City of San Diego storm drain conveyance system.

Scaled figures delineating tenant boundaries are enclosed as Attachment 7 and entitled NASSCO Shipyard Tenant Information Parcel Animation Supplement. The maps start at with the first tenant on record through 1962. There is a map for every year that a change in boundaries was recorded. Included with each map is a table providing information on the business name, parcel size, business code and lease start and end dates. The Shipyard Business Code spreadsheet (Attachment 8) was developed for color coding of parcel types for viewing of these maps on the enclosed CD (Attachment 9). This CD has instructions on how to open and view the maps in any ArcView program.

3. Monitoring Data Analysis

In order to link sediment to wet weather one should rely on multiple lines of evidence and one of those lines of evidence is to look at gradients to see if a strong gradient signal indicates that sediments are moving out from or into the river channel. The data collected offshore as dry weight concentrations do not provide evidence of this gradient. Second we would expect to see some correlation in the chemistry collected in the urban runoff program monitored samples (wet and dry weather sampling) and the contaminants observed in the sediments.

Historical urban runoff monitoring data both wet and dry seasons suggest signals of copper, zinc, and diazinon in Chollas Creek. Therefore, if there is a link between offshore contaminant of sediments and creek inputs one might reasonably expect to find a gradient of contamination of offshore sediments of these contaminants. Review of the historical sediment monitoring data collected at offshore station locations shows no evidence of a gradient of contamination.

Monitoring data from the Co-Permittee monitoring program was reviewed for this analysis and included sediment samples collected upstream in Chollas Creek and at the mouth of Chollas Creek in San Diego Bay from 1996 to 2000, wet weather data from the mass loading station in Chollas Creek from 1996 to 2004, dry weather data within the Chollas Creek watershed areas MS4 system from 2002 to 2003 (Table 1 and Table 2).

Water Boards

California Regional Water Quality Control Board, San Diego Region

November 19, 2012

In reply refer to / attn:
T10000002642:Janderson

Mr. Gene Matsushita
Sr. Manager, Environmental Remediation
Lockheed Martin Enterprise Business Services
2950 North Hollywood Way, Suite 125
Burbank, CA 91505

Subject: Lockheed Request to Direct the San Diego Unified Port District to Participate in the Investigation at the Marine Terminal and Railway

Mr. Matsushita:

Your letter dated June 18, 2012 requested that the San Diego Unified Port District (Port) be directed to participate in the investigation at the Lockheed Marine Terminal and Railway property. The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) does not routinely add a property owner to an enforcement order as a matter of course unless the Board determines that the property owner had discharged, or caused or permitted a discharge of waste. In this case the Lockheed Martin Corporation, as the owner and operator of the Marine Terminal and Railway facility, and lessee of the property, is primarily responsible for any discharges of waste to soil, groundwater, and to bay sediment from its operation of the Marine Terminal and Railway facility. The Port, as the lessor, did not discharge or cause or permit the discharges of waste from the Marine Terminal and Railway facility to the environment. Therefore, the San Diego Water Board will not direct the Port to participate in the investigation at this property

You also requested that the San Diego Water Board investigate the 48-inch storm water outfall that drains into the Harbor Island East Basin (East Basin). At this time, the San Diego Water Board does not intend to require further investigation of the 48-inch storm drain and outfall. Other than the Tow Basin property, which has been cleaned up, the San Diego Water Board has no knowledge of any other contaminated properties that are or were connected to the 48-inch storm drain that could have contributed contaminated sediment to the East Basin.

In the subject line of any response, please include the reference number **T10000002642:Janderson**. For questions or comments, please contact Mr. John Anderson by phone at (858) 467-2975, or by email Janderson@waterboards ca gov

Respectfully,

James G. Smith
Assistant Executive Officer

JGS jc jpa

cc via email:

Ms Kara Edewaard, Lockheed Martin, Kara.l.edewaard@lmco com
Mr Bill Hays, Port of San Diego, Bhays@portofsandiego.org
Ms. Karen Holman, Port of San Diego, Kholman@portofsandiego.org

Tech Staff Info & Use	
Order No	**R9-2011-002**
Geotracker Place ID	**T10000002642**

020746

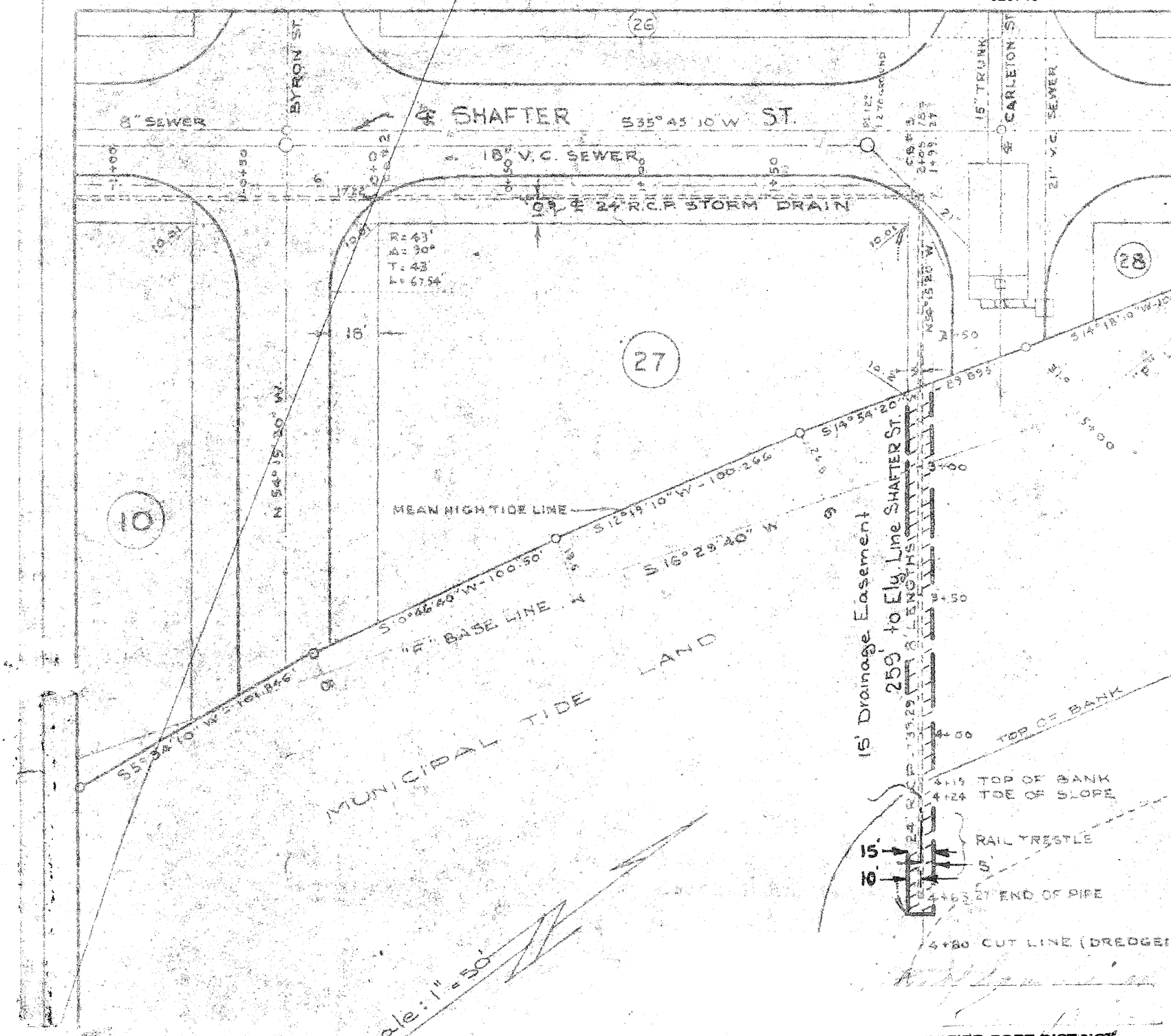

SAN DIEGO UNIFIED PORT DISTRICT

DOCUMENT NO. 3383

FILED JUN 28 1968

MICROFILM NO. 31

OFFICE OF THE CLERK

15' Drain Easement below M.H.T.L. shown hatched

		PLANNING	RECORDS ENGR	CONTROL ENGR 6-24-68	OFFICE ENGR

DRAWN BY J. P.
CHECKED BY
FIELD BOOKS 202-1699
SCALE 1" = 50'
WO 17430

CITY OF SAN DIEGO - ENGINEERING DEPARTMENT

DRAINAGE EASEMENT
Ext. Carleton St., below M.H.T.L.

TIDELANDS

DATE 6/24/68
CITY ENGINEER
SHEET 1 OF
9220-1-

HARBOR 220-MB

020747

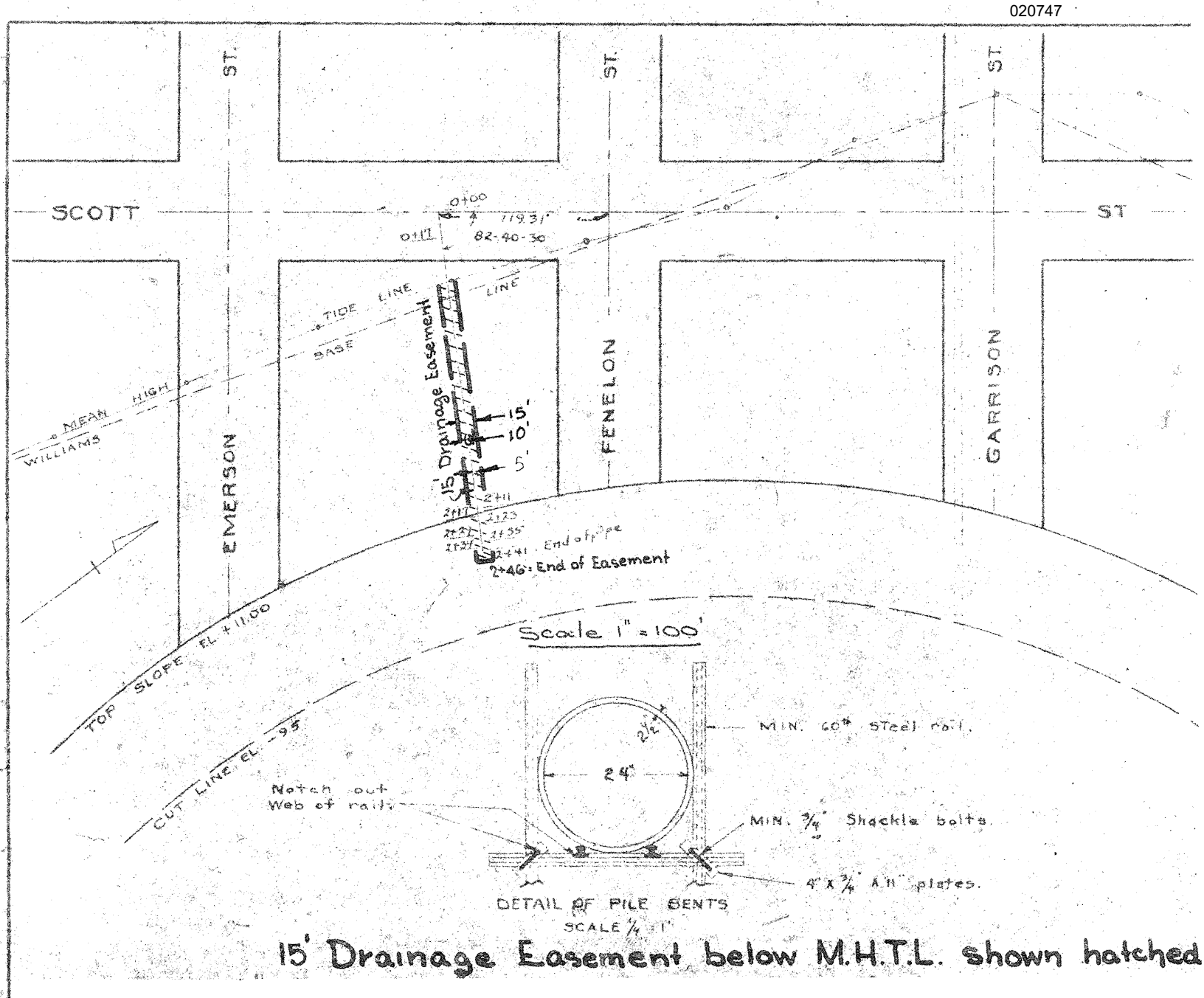

15' Drainage Easement below M.H.T.L. shown hatched

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 31
OFFICE OF THE CLERK

APPROVALS

PLANNING	RECORDS ENGR.	CONTROL ENGR.	OFFICE ENGR.
		O.J. 6-24-68	

DRAWN BY J.M.
CHECKED BY
FIELD BOOKS 204-1699
SCALE 1" = 100'
W.O. 17430

CITY OF SAN DIEGO - ENGINEERING DEPARTMENT
DRAINAGE EASEMENT
119Ft. South of Fenelon below M.H.T.L.
TIDELANDS

DATE 6/24/68
T. Gabriel
CITY ENGINEER
SHEET 2 OF 19
9220-2-B

HARBOR No. 219-MB

020748

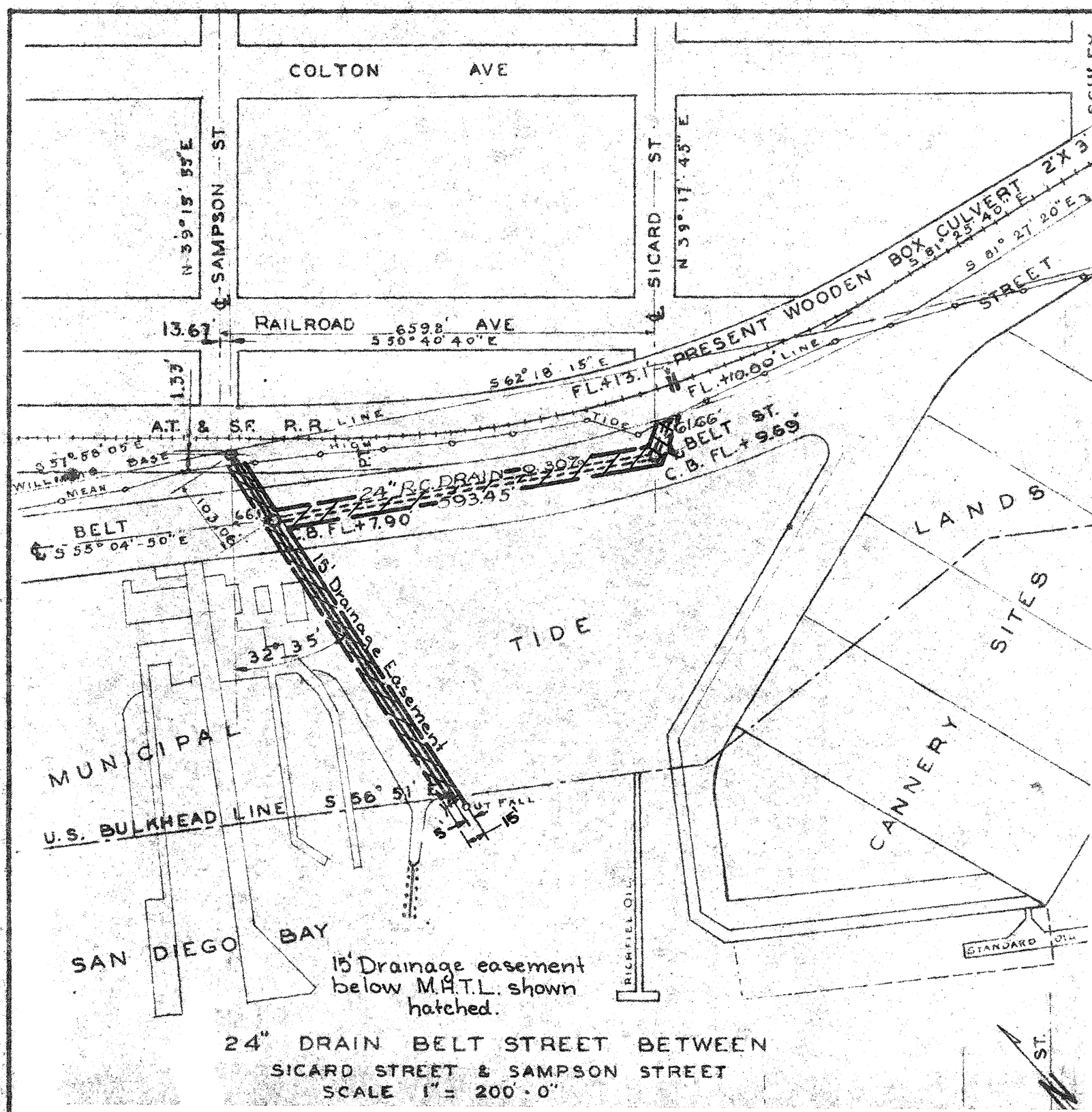

24" DRAIN BELT STREET BETWEEN
SICARD STREET & SAMPSON STREET
SCALE 1" = 200' - 0"

APPROVALS

SAN DIEGO UNIFIED PORT DISTRICT
3383
DOCUMENT NO.
FILED JUN 28 1968
MICROFILM NO. 31
OFFICE OF THE CLERK

		PLANNING	RECORDS ENGR.	CONTROL ENGR. 6-24-68
				OFFICE ENGR.

DRAWN BY J.A.
CHECKED BY
FIELD BOOKS 192 - 1725
SCALE 1" = 200'
W.O. 17430

CITY OF SAN DIEGO - ENGINEERING DEPARTMENT
DRAINAGE EASEMENT
S.Wly. of Sampson St. below M.H.T.L.
TIDELANDS

DATE 6/24/68
CITY ENGINEER
SHEET 3 OF
9220-3

HARBOR No. 68 MB

020749

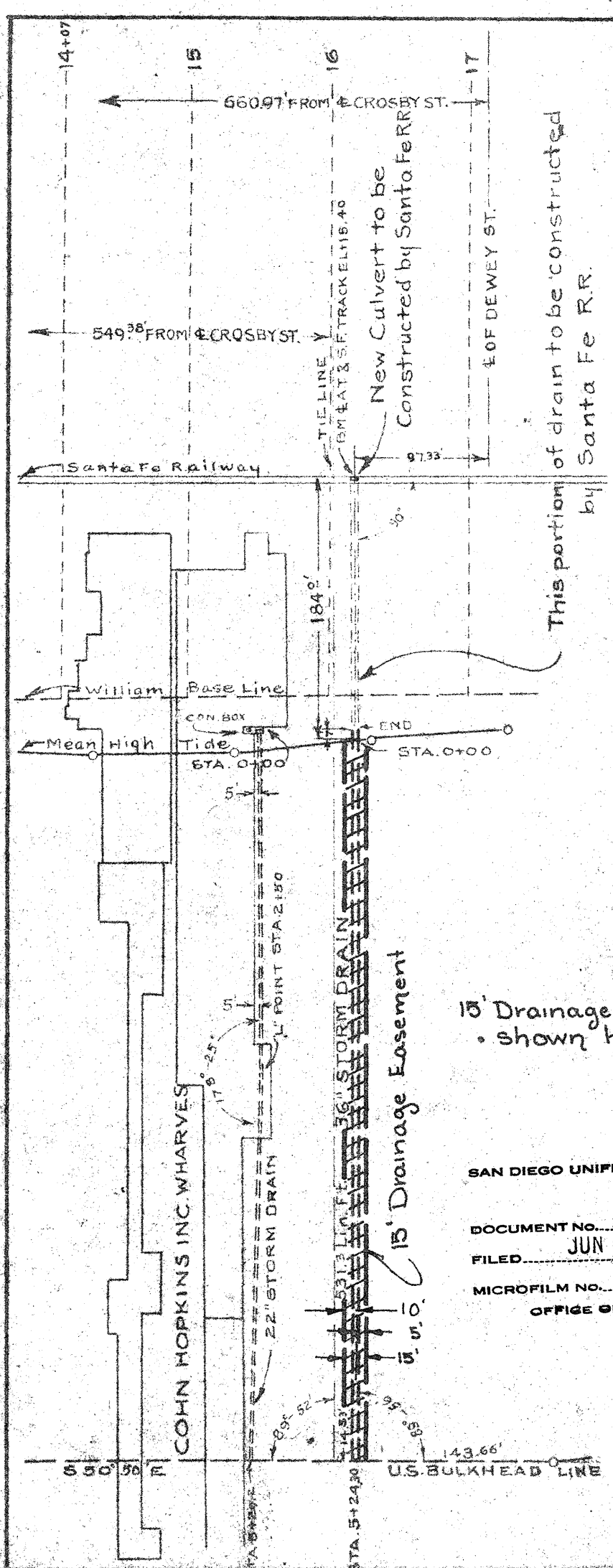

15' Drainage Easement shown hatched.

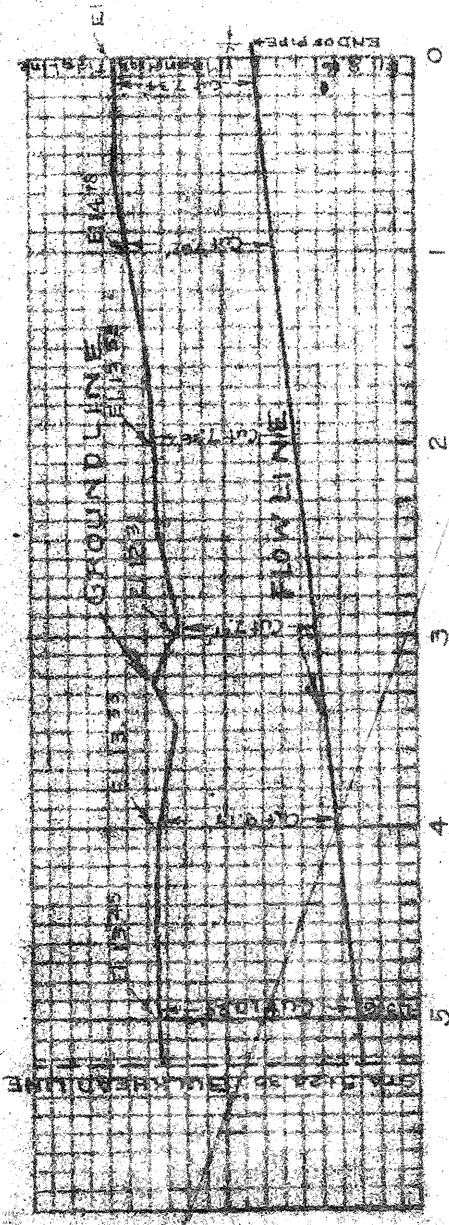

PROFILE 39 STORM DRAIN

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 31
OFFICE OF THE CLERK

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
FOR PUBLIC WORKS DIRECTOR	CHIEF ENGINEER
ORIGINAL CONVEYANCE DOCUMENT NO. [illegible] FILED [illegible]	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 13, 1968

PLANNING	RECORDS ENGR.	CONTROL ENGR.	OFFICE ENGR.
		6-24-68	

DRAWN BY J.A.
CHECKED BY
FIELD BOOKS 192-1723
SCALE 1" = 100'
W.O. 17430

CITY OF SAN DIEGO - ENGINEERING DEPARTMENT

DRAINAGE EASEMENT
S'ly of Dewey St. & E'ly of Crosby St.

TIDELANDS

DATE 6-24-68

CITY ENGINEER

SHEET 4 OF 1[illegible]

9220-4-

HARBOR No. 49MB

020750

MIDDLETOWN

MAP 4134-R

CALIFORNIA

TIDE LINE

HIGH HWY.

JUNIPER

BM 16.6

PACIFIC

N 20°12'30"W

R/W Line

MEAN HIGH

380.43'± MEAN

S27°47'30"W

N 59° 51' 30"W 113.41

149'±

95'±

R=234.85'
Δ=34°04'00"
L=139.64

STREET

279'±

110'±

N 04°00'E

DRAIN ESMT. BELOW M.H.T.L. SHOWN HATCHED

N69°47'10"E

N86°04'30"E 600.36

54" Drain

5'

10'

15'

100'

DRIVE

79'

R=80'
Δ=73°
L=101.93'

N69°47'10"E

278'±

N13°04'30E

100'

Sta. 328+56.00

18'

87

N 15°56'24"E (Rad)

AIRPORT FIELD

176.11

HARBOR

E.C. 334+68.56

N 07°27'30"W (Rad)

BULKHEAD

TAXIWAY

SAN DIEGO UNIFIED PORT DIS

DOCUMENT No. 3383

FILED JUN 28 1968

MICROFILM No. 31

OFFICE OF THE CLERK

APPROVALS

CITY OF SAN DIEGO

UTILITIES DIRECTOR

SAN DIEGO UNIFIED PORT DISTRICT

CHIEF ENGINEER

PUBLIC WORKS DIRECTOR

ORIGINAL CONVEYANCE

ORIGINAL CONVEYANCE

REF. DWGS.

Harbor Dept. DWGS.
38-L-1 Sheets 1 & 2
38-L-2
12-D-1
City DWG 2042-L

DRAWN BY O.T. 6-24-68

COORD. INDEX 204-1715

SCALE 1" = 200'

W.O. 17430

CITY OF SAN DIEGO - ENGINEERING DEPARTMENT

DRAIN ESMTS below M.H.T.L. s/y of Laural Street in Tidelands.

TIDELANDS

DATE 6-24-68

CITY ENGINEER

SHEET 5 OF 19

9220-5-1

SAN DIEGO UNIFIED PORT DISTRICT

DOCUMENT NO. 3383

FILED JUN 28 1968

MICROFILM NO. 31

OFFICE OF THE CLERK

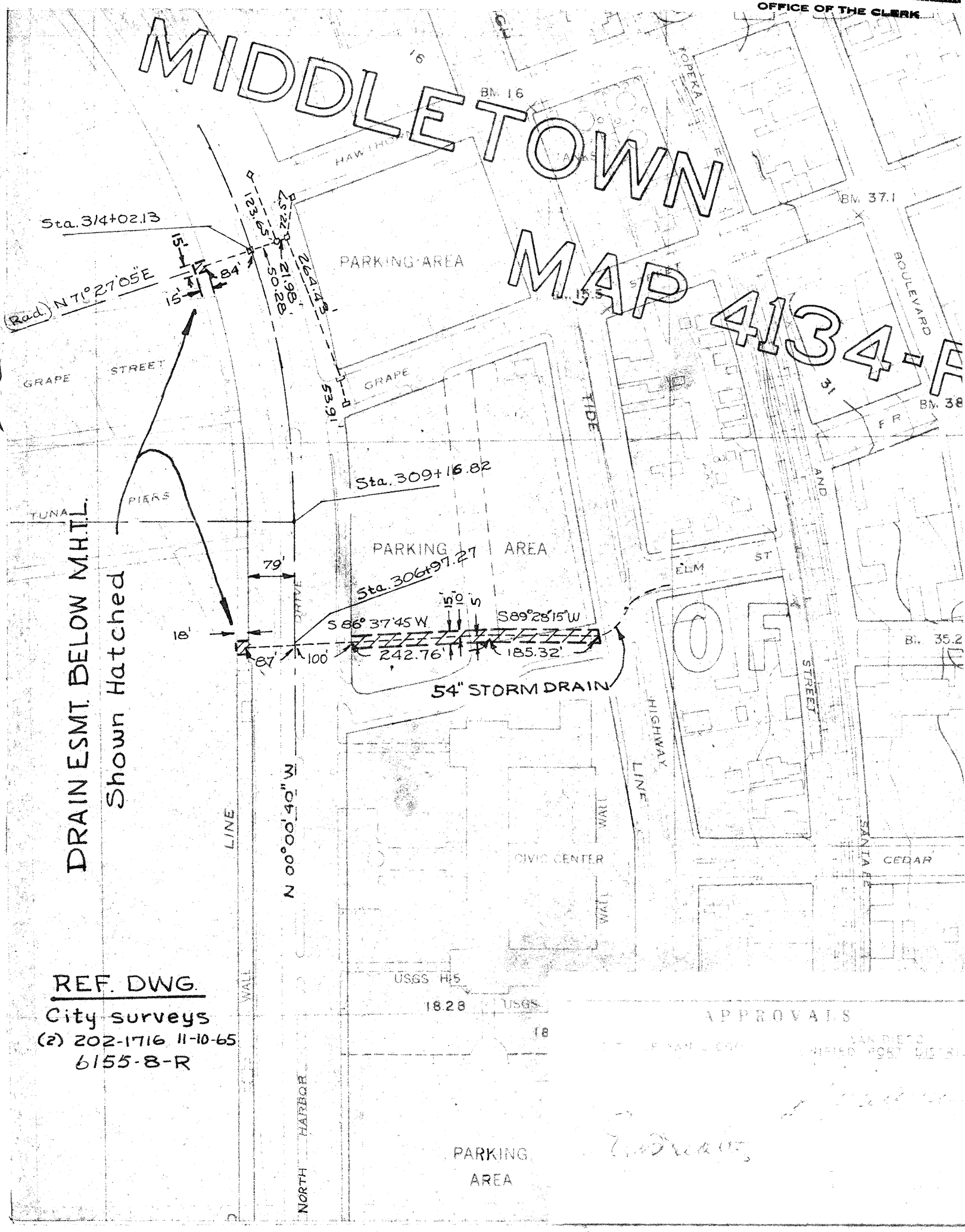

REF. DWG.
City surveys
(2) 202-1716 11-10-65
6155-8-R

O.T.J. 6-24-68

INDEX 202-1716
1" = 200'
17430

DRAIN ESMT. in Tidelands wly of Pacific Hwy nly of Cedar St. & sly of Hawthorn St.

TIDELANDS

SHEET 6 OF

9220-6-

020752

SAN DIEGO UNIFIED PORT DISTRICT

DOCUMENT NO. 3383

FILED JUN 28 1968

MICROFILM NO. 31

OFFICE OF THE CLERK

NEW SAN DIEGO

MAP 456

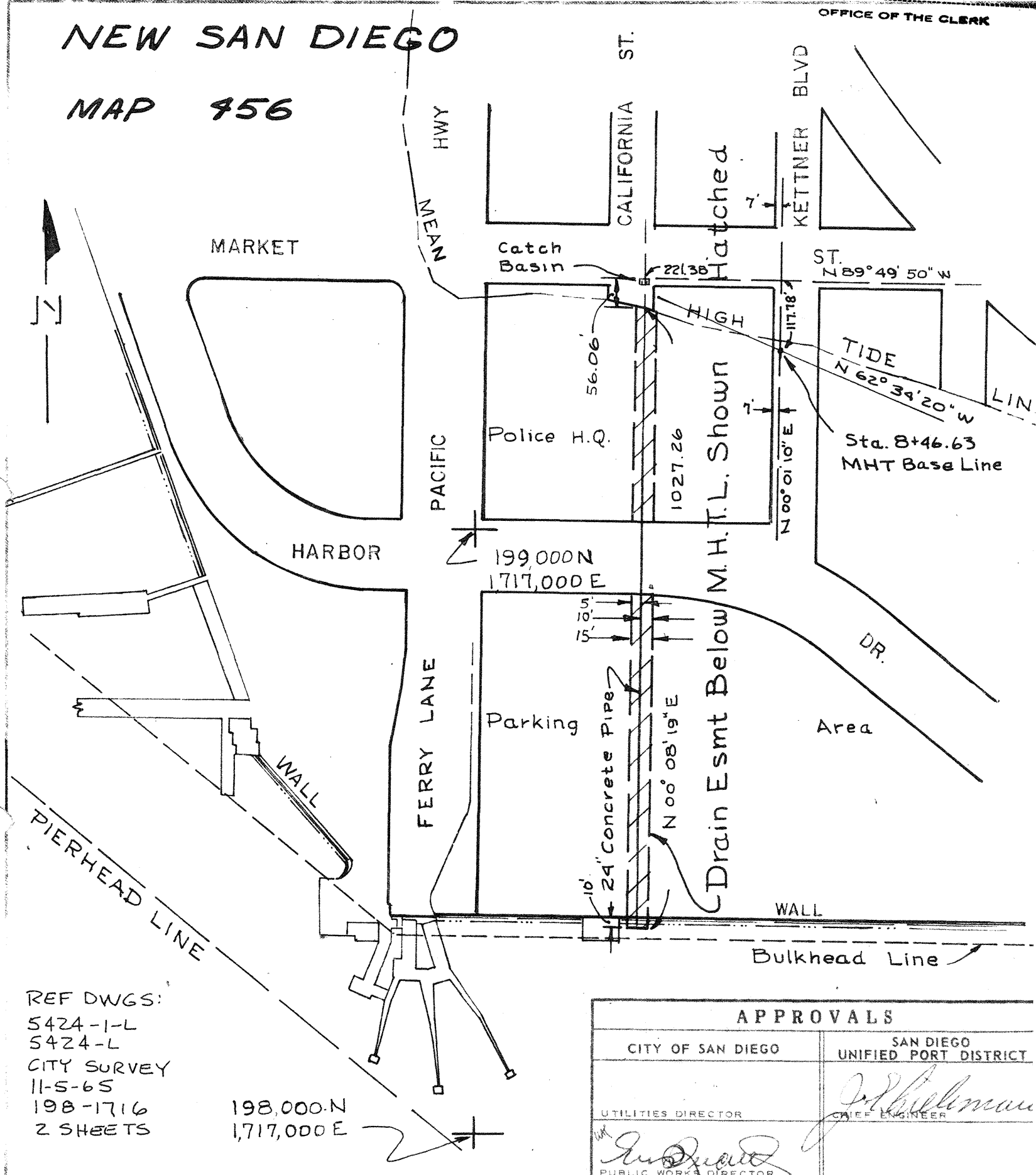

REF DWGS:
5424-1-L
5424-L
CITY SURVEY
11-5-65
198-1716
2 SHEETS

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
UTILITIES DIRECTOR	CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 651833 FILED FEB. 15, 1963	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 13, 1963

PLANNING | RECORDS ENGR. | CONTROL ENGR. 6-24-68 | OFFICE ENGR.

DRAWN BY
CHECKED BY
Coord Index 198-1717
SCALE 1" = 200'
W.O. 17430

CITY OF SAN DIEGO ENGINEERING DEPARTMENT

Drain Esmt. - in California St. Extended Below M.H.T.L.

TIDELANDS

DATE 6-24-68

SHEET 7 OF 19

9220-7-

SAN DIEGO UNIFIED PORT DI
020753
338
DOCUMENT NO.
FILED JUN 28 1968
MICROFILM NO. 31
OFFICE OF THE CLERK

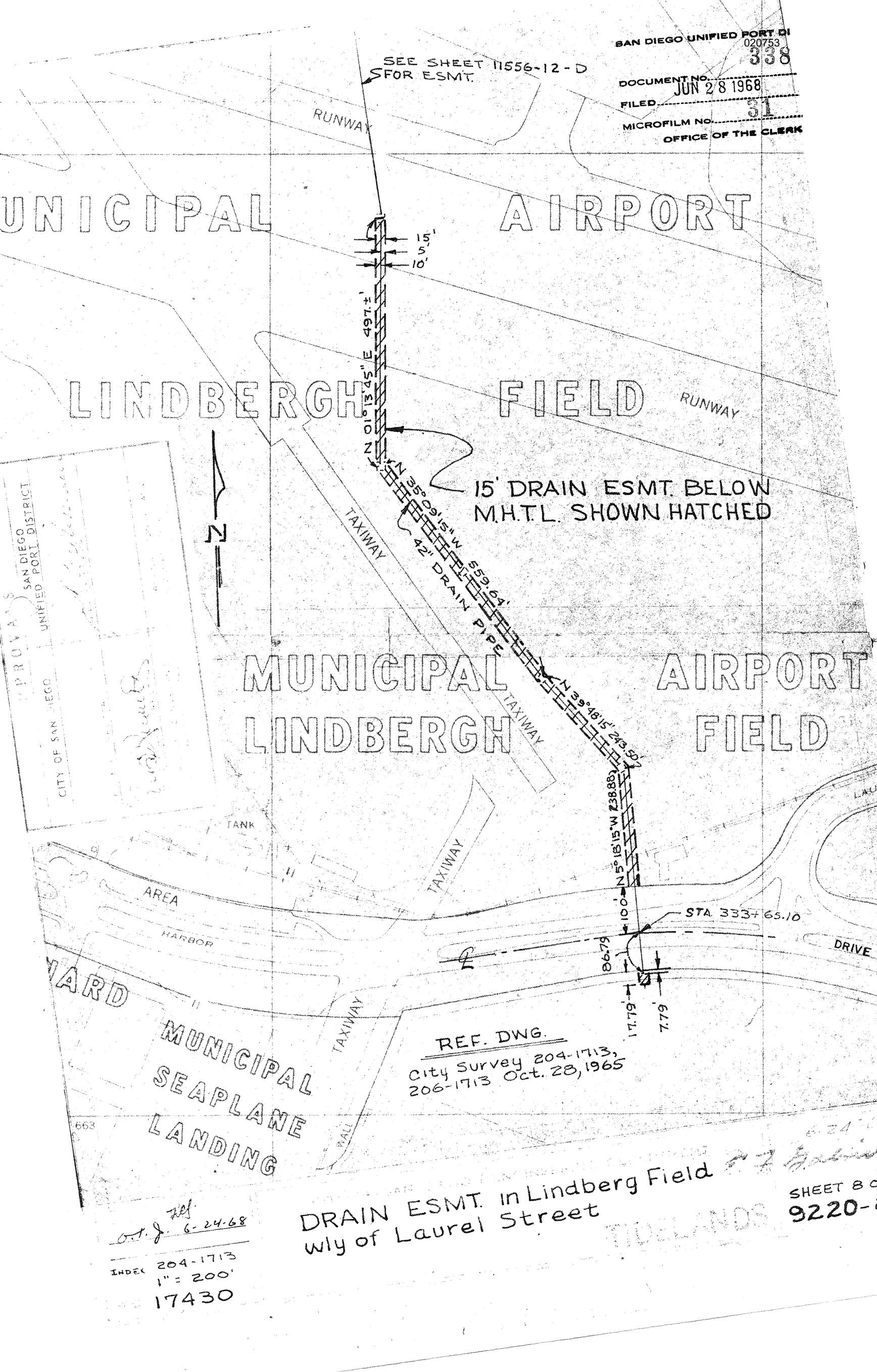

O.T.J. 6-24-68

INDEX 204-1713
1" = 200'
17430

DRAIN ESMT. in Lindberg Field
wly of Laurel Street

020754

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 31
OFFICE OF THE CLERK

REF DWGS:

14370-L Sheet 12 of 12
City Survey Sheet 1 of 1 index
198-1695 Oct 22, 1965

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
UTILITIES DIRECTOR	CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 651833 FILED FEB. 15, 1963	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 13, 1963

		PLANNING	RECORDS ENGR	CONTROL ENGR. 6-24-68	OFFICE ENGR.

DRAWN BY RCJ
CHECKED BY
INDEX 198-1695
SCALE 1" = 50'
W.O. 17430

CITY OF SAN DIEGO - ENGINEERING DEPARTMENT

Drain Esmt. Ely. of LAWRENCE STREET termination, below M.H.T.L.

TIDELANDS

DATE

SHEET 9 OF 19
9220-9-1

020755

SAN DIEGO UNIFIED PORT DI
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 31
OFFICE OF THE CLERK

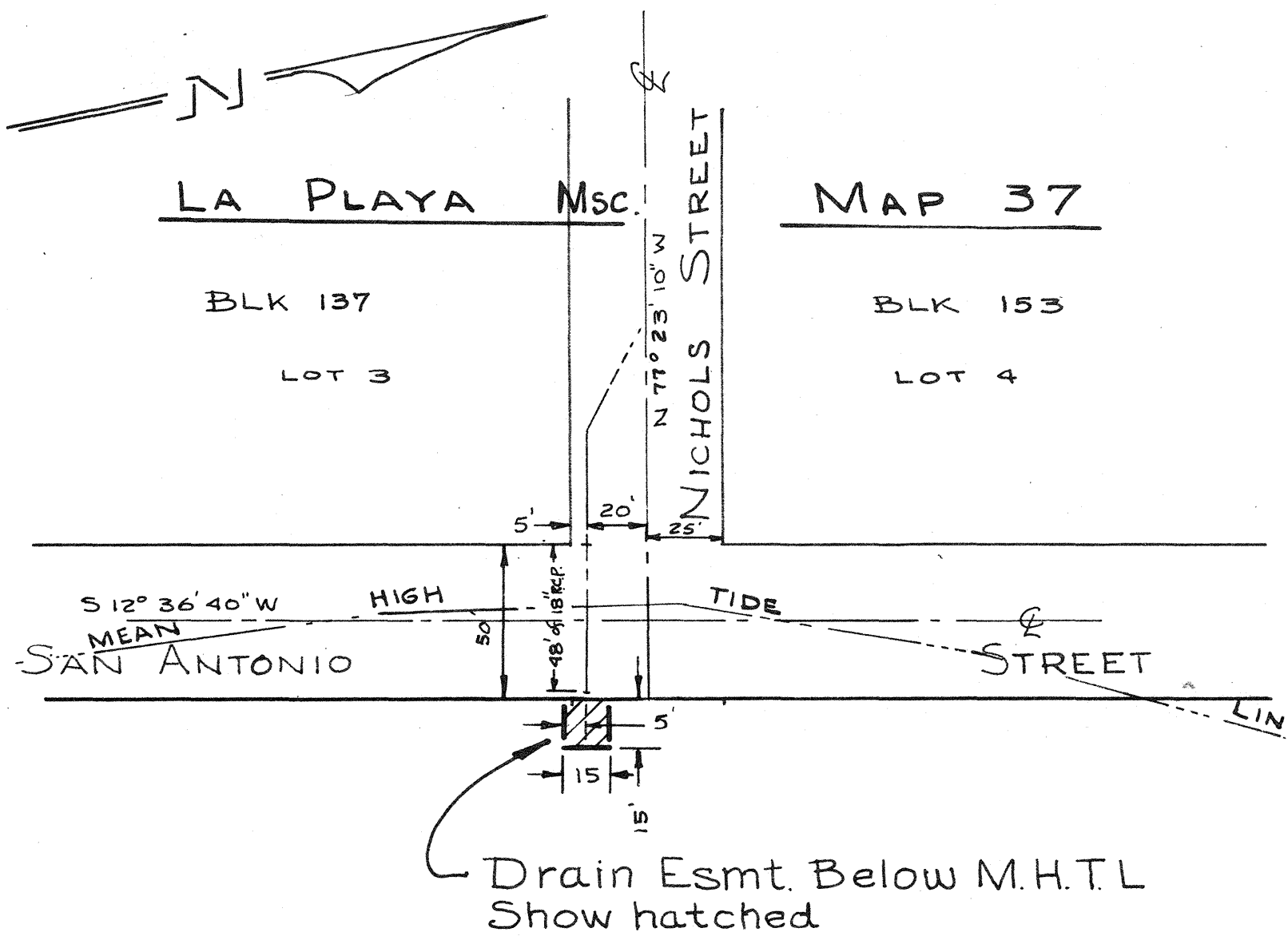

Ref Dwgs:

5657-D
14307-L Sh. 12 of 12

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
UTILITIES DIRECTOR	CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 651833 FILED FEB. 15, 1963	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 13, 1963

PLANNING	RECORDS ENGR	CONTROL ENGR.	OFFICE ENGR.
		O.J. 6-24-68	

DRAWN BY
CHEF
INDEX 198-1695
SCALE 1" = 50'
W.O. 17430

CITY OF SAN DIEGO - ENGINEERING DEPARTMENT

Drain Esmt Ely of the intersection of Nichols & San Antonio St's in tidelands

DATE
CITY ENGINEER
SHEET 10 OF 19
9220-10-E

020756

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 31
OFFICE OF THE CLERK

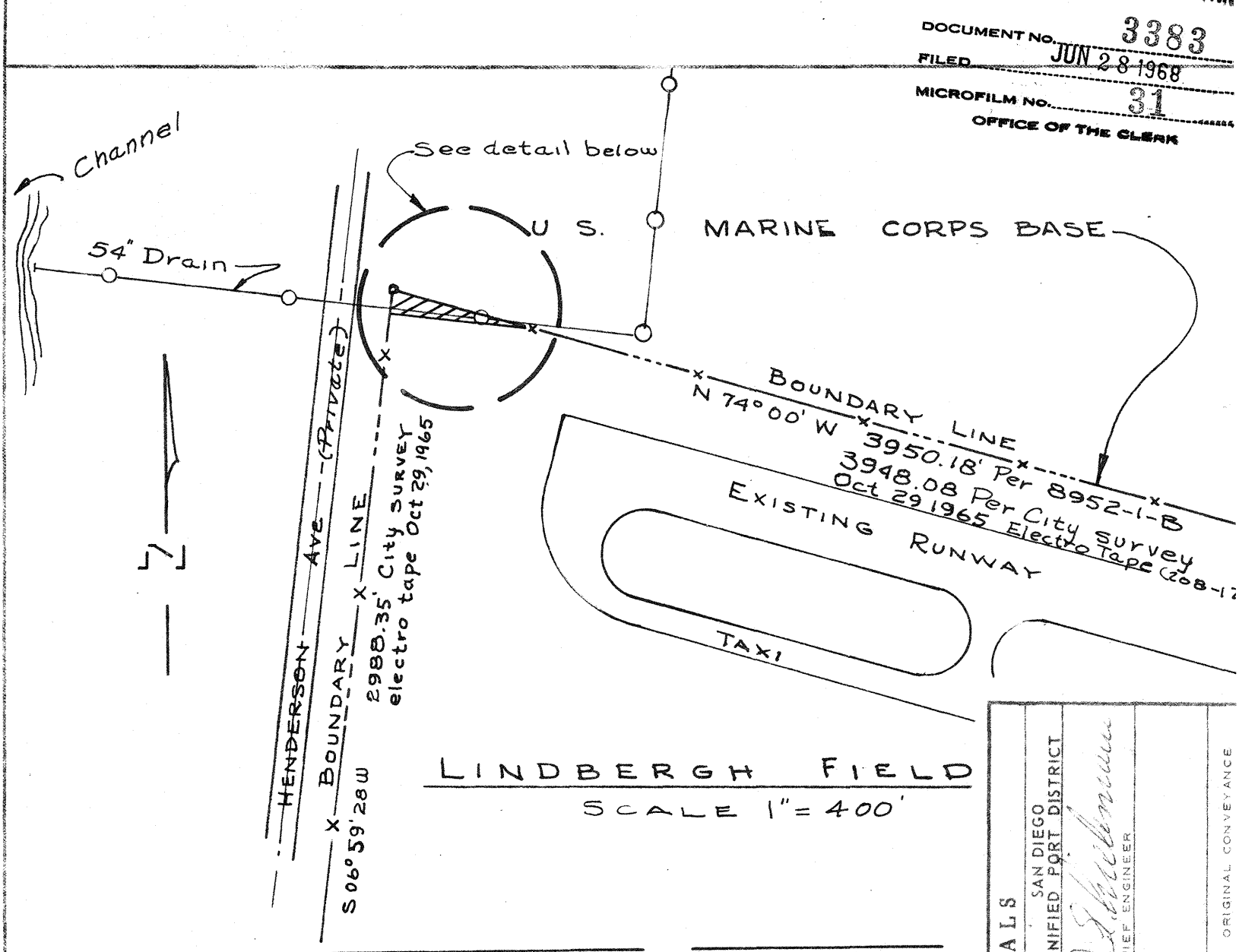

APPROVALS

CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
UTILITIES DIRECTOR	CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE	ORIGINAL CONVEYANCE

DETAIL
SCALE 1" = 50'

Ref. Dwgs:
Dept of Navy Dwg 624858 Sh
City 8952-1-B, City Survey o
54" Drain Oct 29, 1965 INDEX -
208-1707 Sh 1 of 1

PLANNING	RECORDS ENGR	CONTROL ENGR.	OFFICE ENGR.
		6-24-68	

DRAWN BY
CHECKED BY
C. INDEX 208-1707
SCALE As Noted
W.O. 17430

CITY OF SAN DIEGO - ENGINEERING DEPARTMENT
Drain Esmt. in tidelands of Lindbergh Field at N'wly. end of runway
TIDELANDS

DATE
CITY ENGINEER
SHEET 11 OF 19
9220-11-

020757

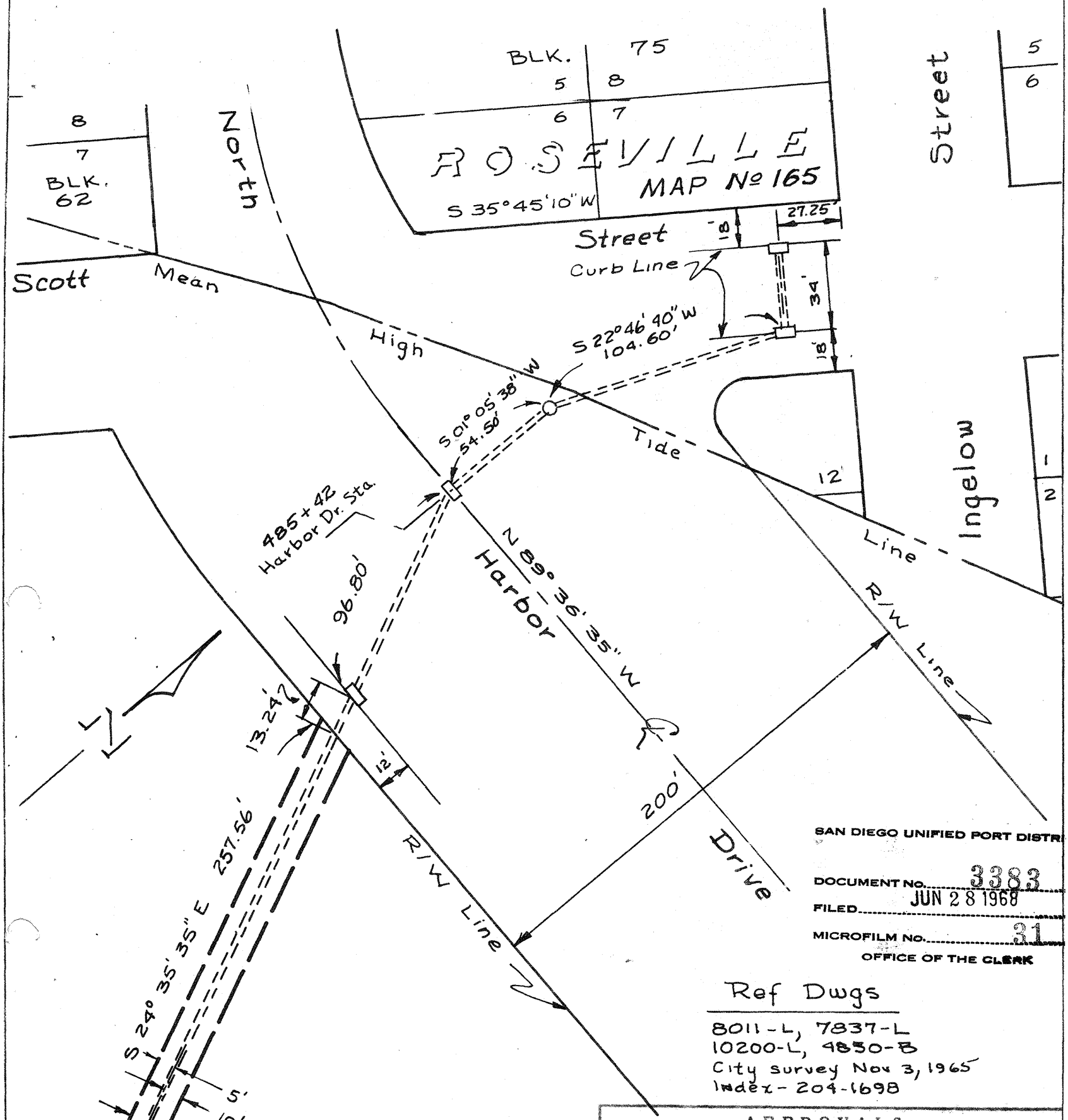

SAN DIEGO UNIFIED PORT DISTRICT

DOCUMENT No. 3383

FILED JUN 28 1968

MICROFILM No. 31

OFFICE OF THE CLERK

Ref Dwgs

8011-L, 7837-L
10200-L, 4850-B
City survey Nov 3, 1965
Index - 204-1698

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
UTILITIES DIRECTOR	CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 651833 FILED FEB. 15, 1963	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 13, 1963

PLANNING	RECORDS ENGR.	CONTROL ENGR.	OFFICE ENGR.
		CTJ 6-24-68	

DRAWN BY Ref

CHECKED BY

INDEX: 204-1699

SCALE 1" = 50'

W.O. 17430

CITY OF SAN DIEGO - ENGINEERING DEPARTMENT

Drain Esmt. S'ly of the intersection of North Harbor Dr & Scott Street in Tideland

TIDELANDS

DATE 6-24-68

CITY ENGINEER

SHEET 12 OF 19

9220-12-B

020758

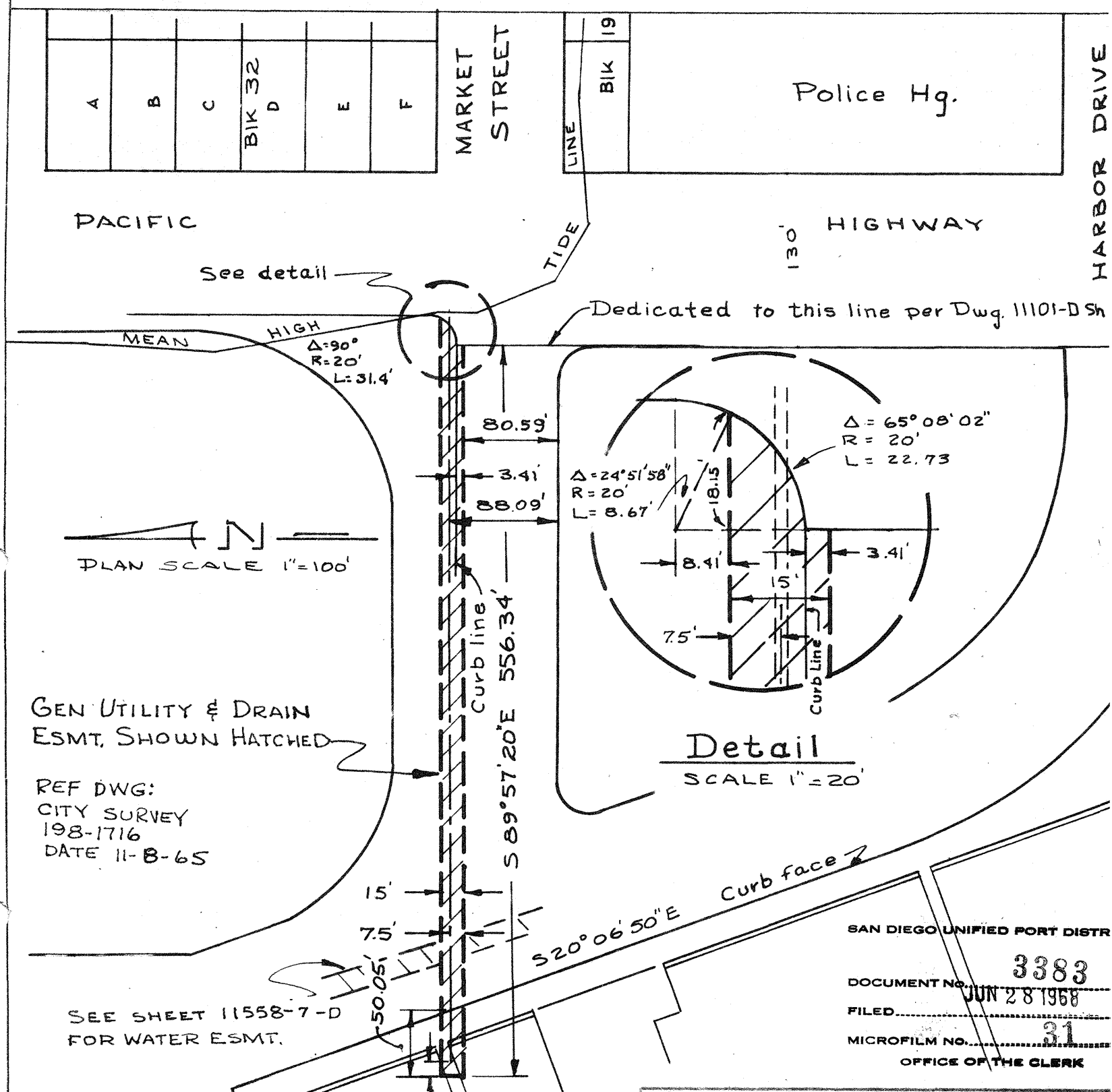

SAN DIEGO UNIFIED PORT DISTRICT

DOCUMENT NO. 3383

FILED JUN 28 1968

MICROFILM NO. 31

OFFICE OF THE CLERK

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
UTILITIES DIRECTOR	CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 651833 FILED FEB. 15, 1963	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 13, 1963

		PLANNING	RECORDS ENGR.	O.T.J. 6-24-68 CONTROL ENGR.	OFFICE ENGR.

DRAWN BY

CHECKED BY

INDEX 198-1715

SCALE AS NOTED

W.O. 17430

CITY OF SAN DIEGO - ENGINEERING DEPARTMENT

GEN. UTILITY & DRAIN ESMT. - Wly of the intersection of Pacific Hwy. & Market Street, in TIDELANDS

DATE 6-24-68

CITY ENGINEER

SHEET 13 OF 19

9220-13-B

SAN DIEGO UNIFIED PORT DISTRICT 020759

DOCUMENT No. 3383

FILED JUN 28 1968

MICROFILM No. 31

OFFICE OF THE CLERK

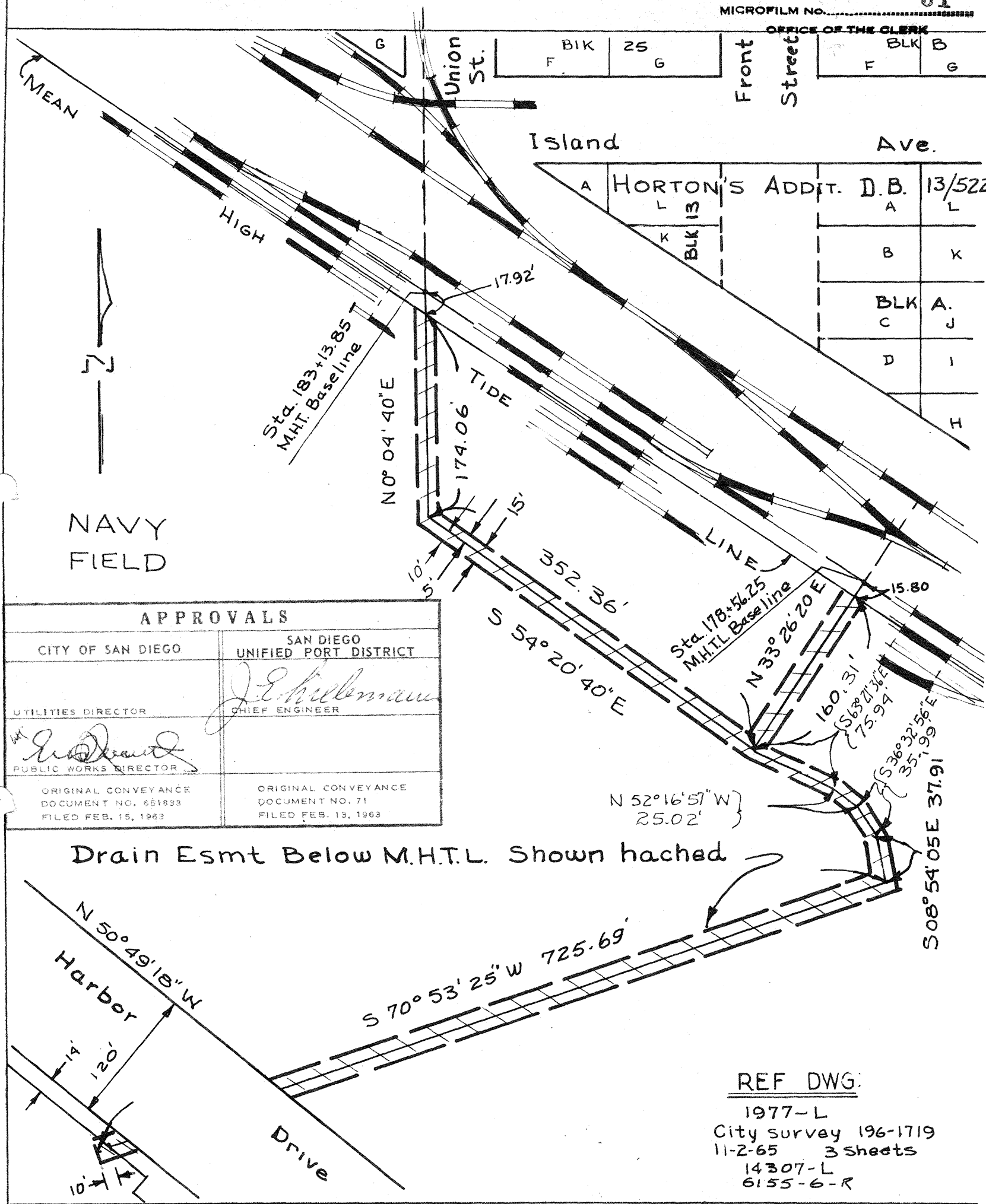

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
UTILITIES DIRECTOR	CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 651893 FILED FEB. 15, 1963	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 13, 1963

REF DWG:
1977-L
City survey 196-1719
11-2-65 3 sheets
14307-L
6155-6-R

PLANNING	RECORDS ENGR.	CONTROL ENGR.	OFFICE ENGR.
		O.T.A. 6-24-68	

DRAWN BY
CHECKED BY
INDEX 198-1716
SCALE 1" = 100'
W.O. 17430

CITY OF SAN DIEGO - ENGINEERING DEPARTMENT

Drain Esmt.-Below M.H.T.L.-Sly of Union & Front Streets-Thru Navy Field. in TIDELANDS

DATE
CITY ENGINEER
SHEET 14 OF 19
9220-14 B

SAN DIEGO UNIFIED PORT DISTRICT
020760

DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 31
OFFICE OF THE CLERK

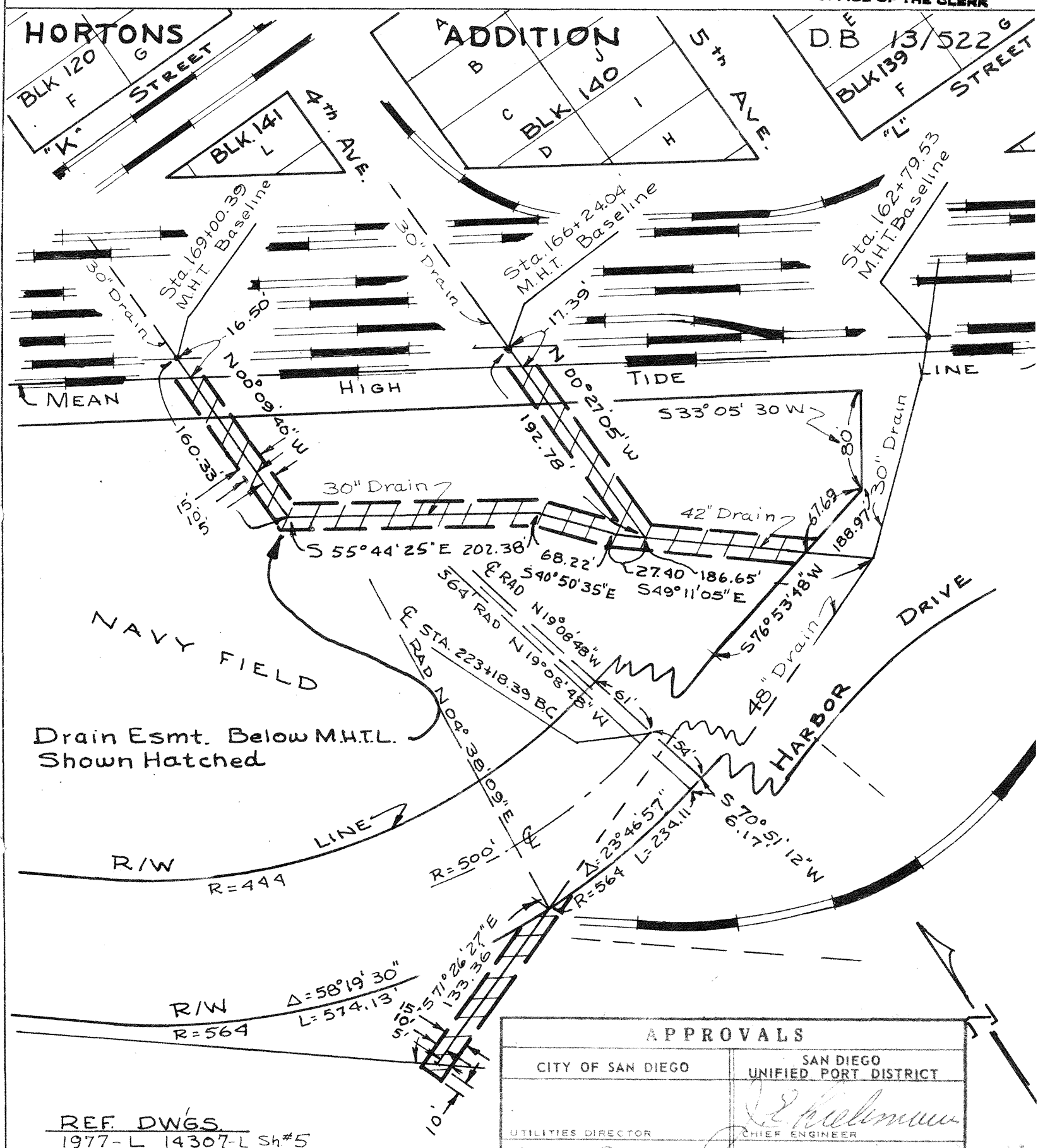

Drain Esmt. Below M.H.T.L.
Shown Hatched

REF. DWGS.
1977-L 14307-L Sh#5
City survey 196, 198-1719
Date: 11-4-65 Two sheets
Harbor Dr. Opng - 6155-5-R
43-L Sheet 22 & 23

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
UTILITIES DIRECTOR	CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 051835 FILED FEB. 15, 1963	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 13, 1963

PLANNING	RECORDS ENGR.	CONTROL ENGR.	OFFICE ENGR.
		O.T.J. 6-24-68	

DRAWN BY
CHECKED BY
FIELD BOOKS INDEX 196-1719
SCALE 1" = 100'
W.O. 17430

CITY OF SAN DIEGO - ENGINEERING DEPARTMENT

Drain Esmts Below M.H.T.L. Sly. of 3RD & 4Th Streets. & Sly. of Harbor Drive, in Tidelands

DATE
CITY ENGINEER
SHEET 15 OF 19
9220-15-B

020761

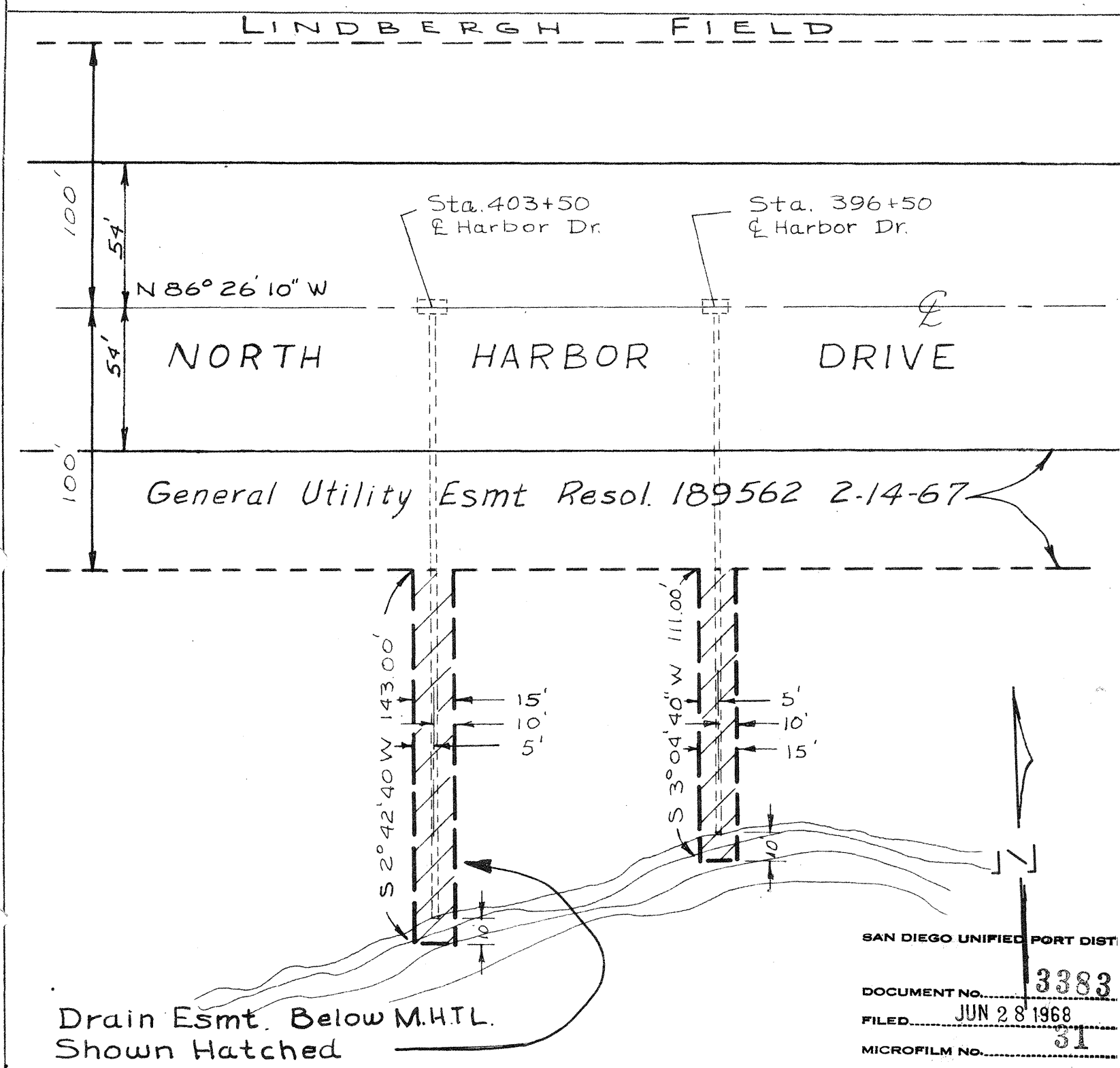

SAN DIEGO UNIFIED PORT DIST

DOCUMENT No. 3383

FILED JUN 28 1968

MICROFILM No. 31

OFFICE OF THE CLERK

Ref Dwg's
6155-9-R
City survey 204-1707 Oct. 29, 1965

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
UTILITIES DIRECTOR	CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 651833 FILED FEB. 15, 1963	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 13, 1968

		PLANNING	RECORDS ENGR.	CONTROL ENGR. 6-24-68	OFFICE ENGR.

DRAWN BY
CHECKED BY
FIELD BOOKS
INDEX 204-1707
SCALE 1" = 50'
W.O. 17430

CITY OF SAN DIEGO - ENGINEERING DEPARTMENT

Drain Esmt. Below M.H.T.L Sly of Lindbergh Field in Tidelands

DATE 6-24-68

CITY ENGINEER

SHEET 16 OF 19

9220-16-E

020762

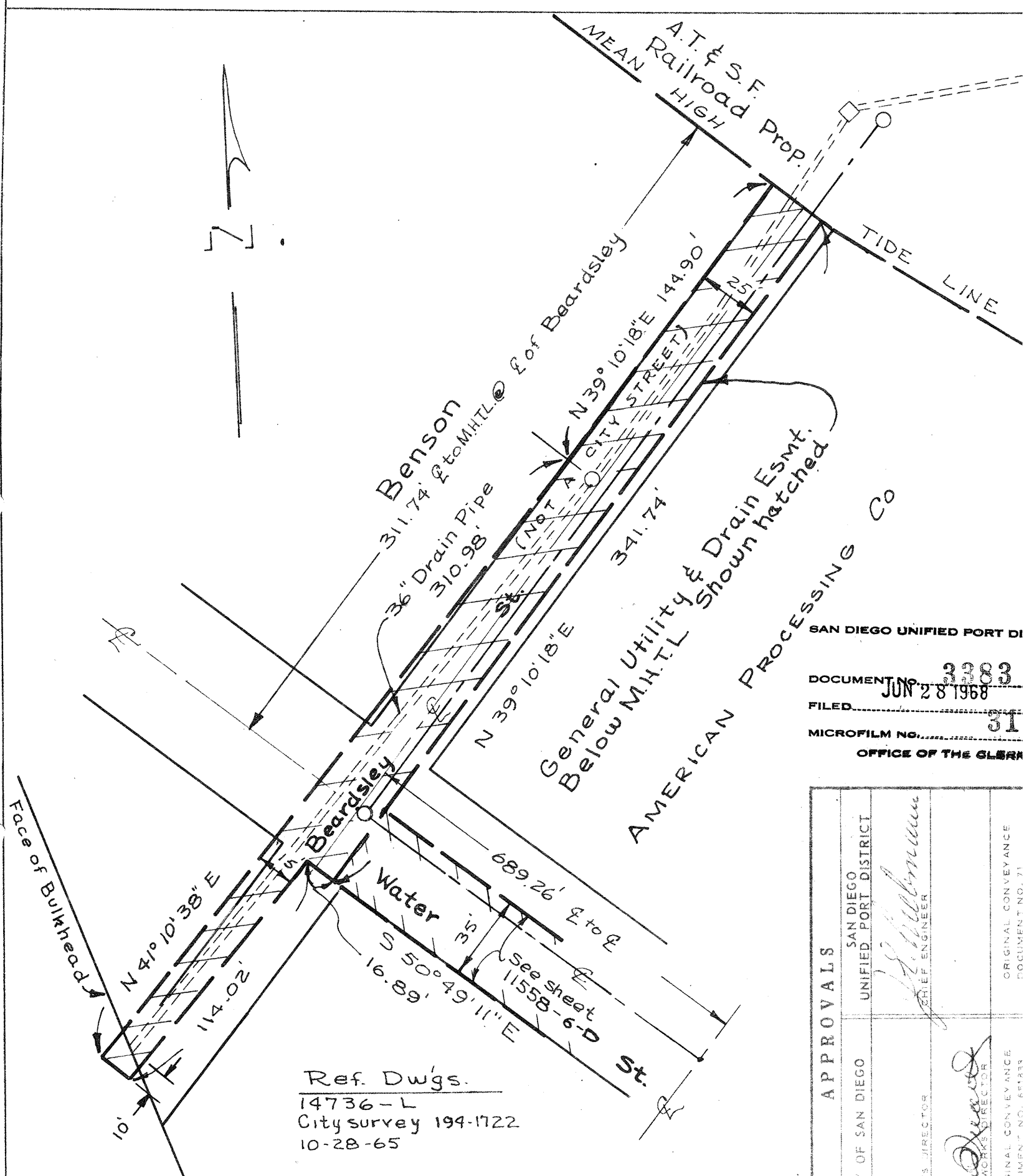

SAN DIEGO UNIFIED PORT DI

DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 31
OFFICE OF THE CLERK

APPROVALS

SAN DIEGO UNIFIED PORT DISTRICT	CHIEF ENGINEER	ORIGINAL CONVEYANCE DOCUMENT NO. 71
CITY OF SAN DIEGO	UTILITIES DIRECTOR / PUBLIC WORKS DIRECTOR	ORIGINAL CONVEYANCE DOCUMENT NO. 651333

PLANNING	RECORDS ENGR.	CONTROL ENGR.	OFFICE ENGR.
		O.T.J. 6-24-68	

DRAWN BY
CHECKED BY
FIELD BOOKS 194-1721
SCALE 1" = 50
W.O. 17430

CITY OF SAN DIEGO - ENGINEERING DEPARTMENT

General Utility & Drain Esmt. in Tidelands swly. of Beardsly St. & Harbor Dr. Below M.H.T.L.

DATE
CITY ENGINEER
SHEET 17 OF 19
9220-17-B

REF 206-D-2 HARBOR

020763

REF: DWGS
40-L Sheets 4 & 5
6155- R
City survey 202-1716
11-10-65

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 31
OFFICE OF THE CLERK

APPROVALS
SAN DIEGO UNIFIED PORT DISTRICT — CHIEF ENGINEER
CITY OF SAN DIEGO — UTILITIES DIRECTOR / PUBLIC WORKS DIRECTOR
ORIGINAL CONVEYANCE
ORIGINAL CONVEYANCE

PLANNING	RECORDS ENGR.	CONTROL ENGR.	OFFICE ENGR.
		6-24-68	

DRAWN BY
CHECKED BY
FIELD BOOKS
INDEX 202-1716
SCALE 1" = 100'
W.O. 17430

CITY OF SAN DIEGO - ENGINEERING DEPARTMENT
Drain Esmts Wly. of North Harbor Drive & Nly. of Ash St. in Tidelands

DATE
CITY ENGINEER
SHEET 18 OF 19
9220-18-E

020764

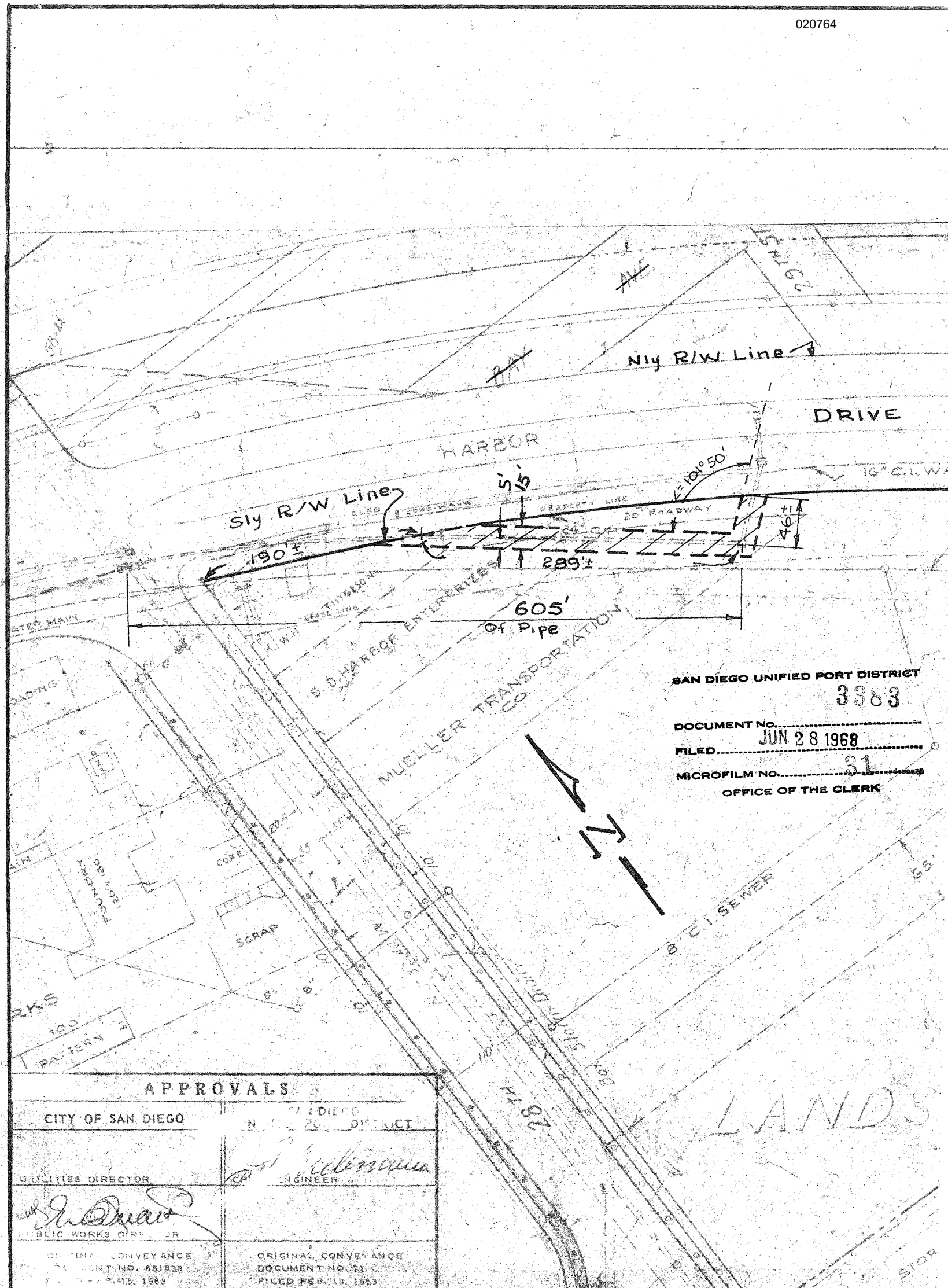

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 31
OFFICE OF THE CLERK

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
UTILITIES DIRECTOR	CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 651839 FILED FEB. 13, 1969	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 13, 1963

PLANNING	RECORDS ENGR.	CONTROL ENGR.	OFFICE ENGR.
		O.T.J. 6-24-68	

DRAWN BY Def
CHECKED BY
FIELD BOOKS
INDEX 190-1727
SCALE 1" = 100'
W.O. 17430

CITY OF SAN DIEGO - ENGINEERING DEPARTMENT

DRAIN ESMT. - Sly of HARBOR DR. & Ely of 28th St below M.H.T.L.

DATE 6-24-68
CITY ENGINEER
SHEET 19 OF
9220-19

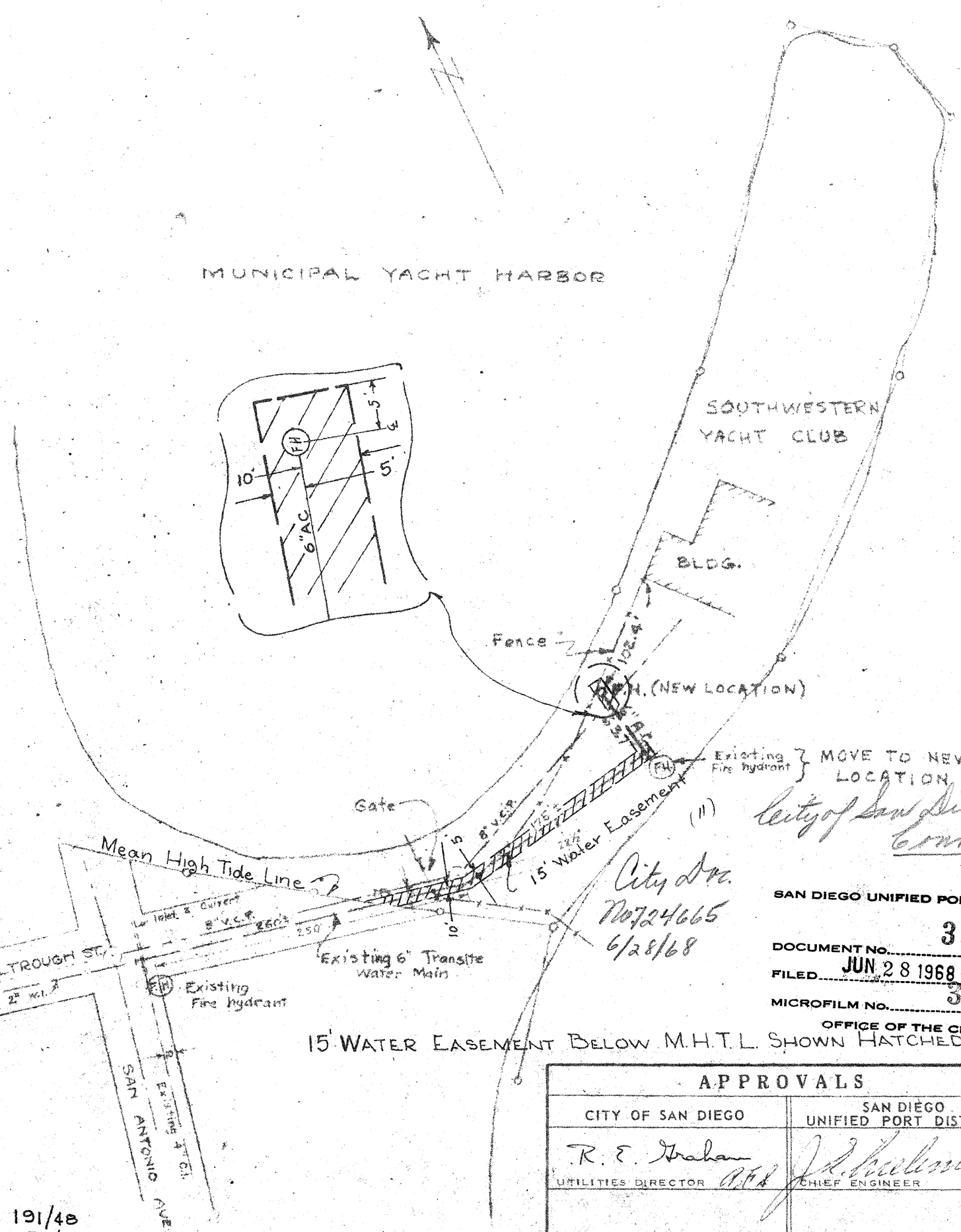

(11)

City of San Diego
Conveyance

City Doc.
No 724665
6/28/68

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 31
OFFICE OF THE CLERK

15' WATER EASEMENT BELOW M.H.T.L. SHOWN HATCHED

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R. E. Graham — UTILITIES DIRECTOR	J. R. Kuebemann — CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 651835 FILED FEB. 15, 1963	CONVEYANCE NO. 71 FILED FEB. 13, 1963

F.B. 191/48
250/13

Revised 4-21-59 by M.R.S.

PLANNING	RECORDS ENGR.	CONTROL ENGR.	OFFICE ENGR.
		O.T.J. 6-24-68	

DRAWN BY J.A.
CHECKED BY
FIELD BOOKS 200-1697
SCALE 1" = 100'
W.O. 17430

CITY OF SAN DIEGO - ENGINEERING DEPARTMENT

WATER EASEMENT Qualtrough St. below M.H.T.L.

TIDELANDS

DATE 6/24/68
CITY ENGINEER
SHEET 1 OF 11
9222-1-B

HARBOR No. 297-MB

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM NO. 31
OFFICE OF THE CLERK

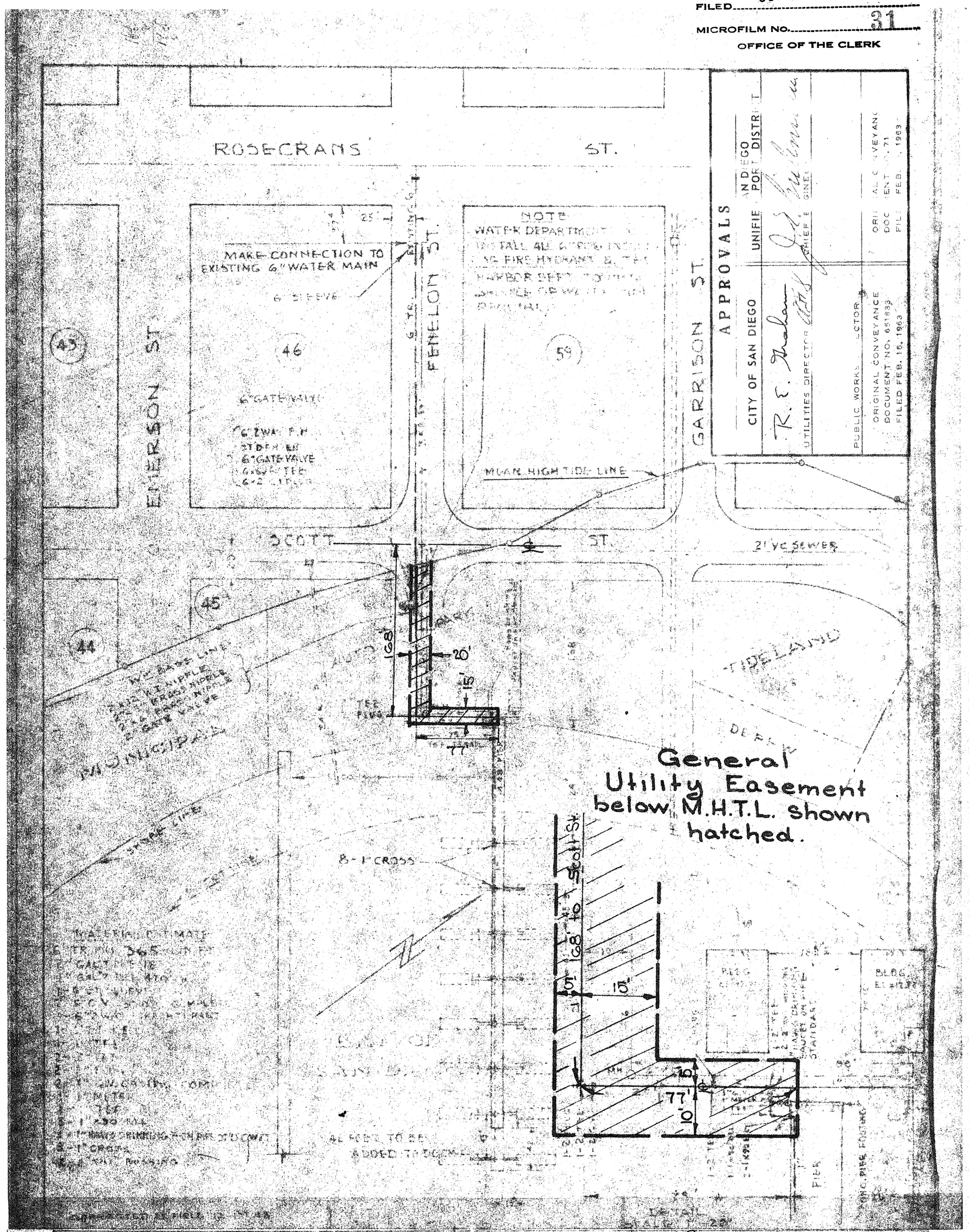

PLANNING	RECORDS ENGR	CONTROL ENGR.	OFFICE ENGR.
		O.T.J. 6-24-68	

DRAWN BY JA.
CHECKED BY
FIELD BOOKS 204-1699
SCALE 1" = 100'
W.O. 17430

CITY OF SAN DIEGO - ENGINEERING DEPARTMENT

WATER EASEMENT
Ext. Fenelon St. below M.H.T.L.

TIDELANDS

DATE 6-24-68
E. F. Galvin
CITY ENGINEER
SHEET 2 OF 11
9222-2-B

HARBOR Nº 237-MB

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 31
OFFICE OF THE CLERK

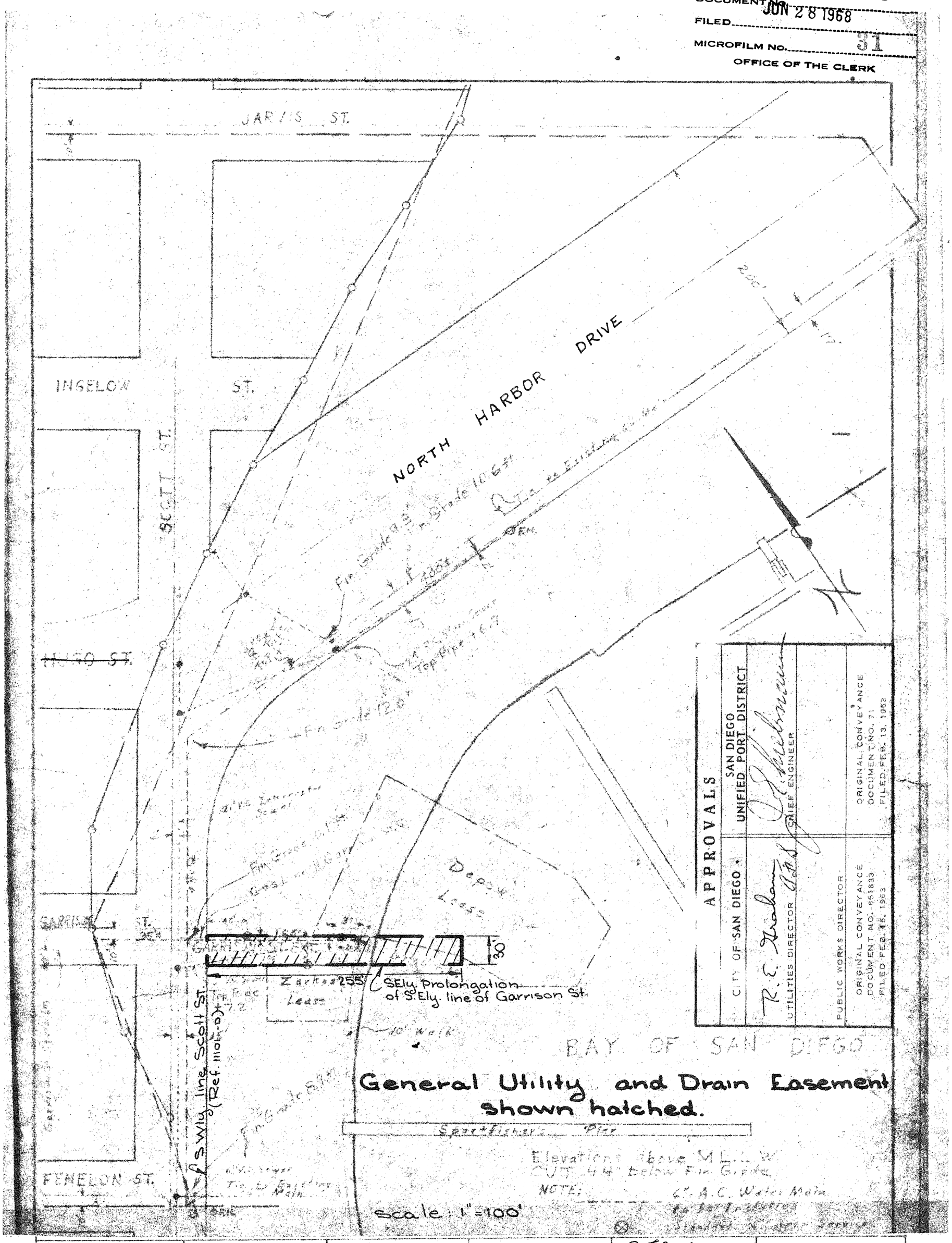

PLANNING	RECORDS ENGR.	CONTROL ENGR.	OFFICE ENGR.
		O.T.J. 6-24-68	

DRAWN BY J.A.
CHECKED BY
FIELD BOOKS 204-1699
SCALE 1" = 100'
W.O. 17430

CITY OF SAN DIEGO - ENGINEERING DEPARTMENT

WATER EASEMENT

Ext. Garrison St. below M.H.T.L.

TIDELANDS

DATE 6-24-68
CITY ENGINEER
SHEET 3 OF 11
9222-3-B

HARBOR Nº 258-MB-1

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 31
OFFICE OF THE CLERK

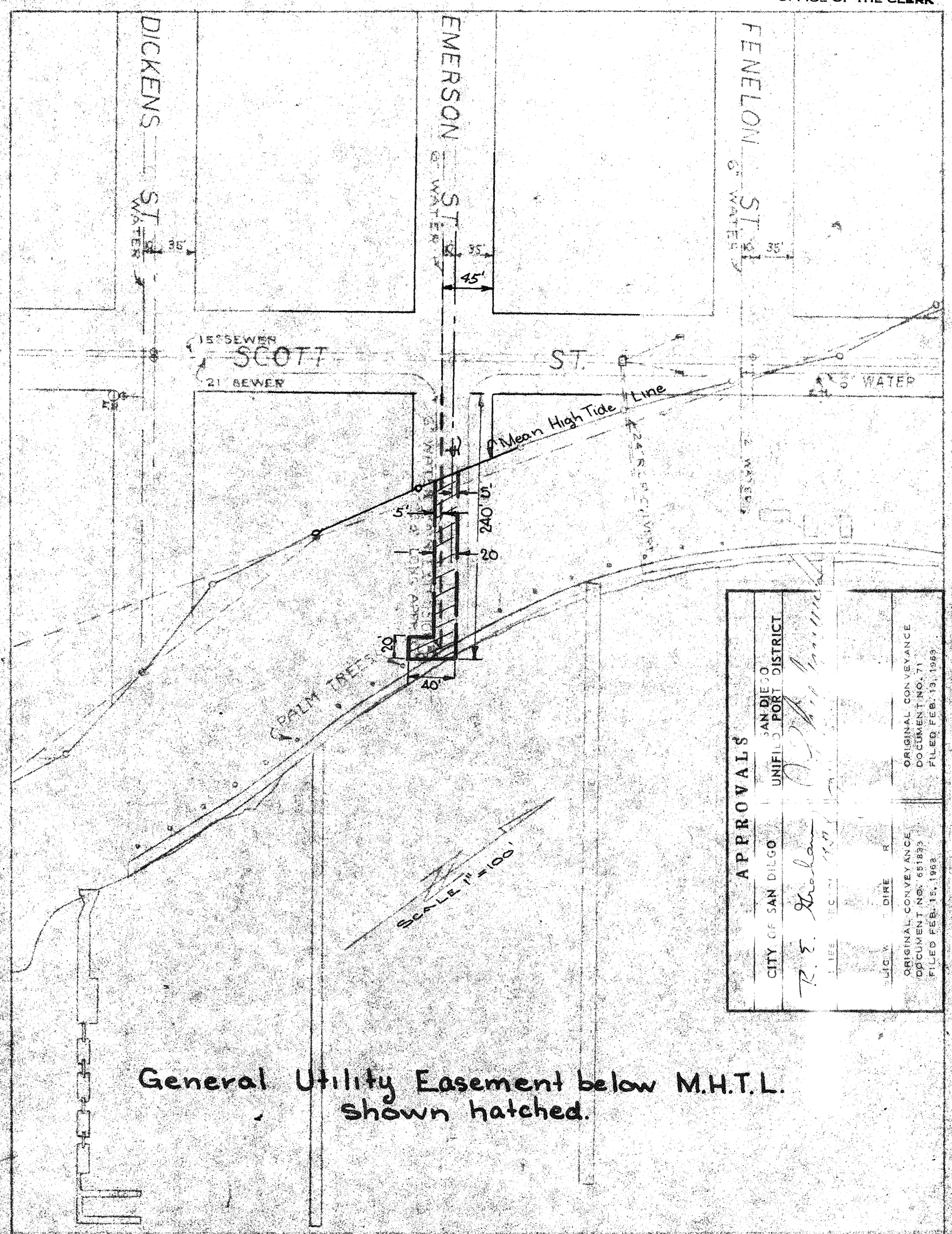

General Utility Easement below M.H.T.L. shown hatched.

PLANNING	RECORDS ENGR.	CONTROL ENGR.	OFFICE ENGR.
		O.T.J. 6-24-68	

DRAWN BY J.A.
CHECKED BY
FIELD BOOKS 202-1699
SCALE 1" = 100'
W.O. 17430

CITY OF SAN DIEGO - ENGINEERING DEPARTMENT
WATER EASEMENT
Ext. Emerson St. below M.H.T.L.
TIDELANDS

DATE 6-24-68
E. F. Gelnickoff
CITY ENGINEER
SHEET 4 OF 11
9222-4-B

HARBOR No. 264-MB

020769

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 31
OFFICE OF THE CLERK

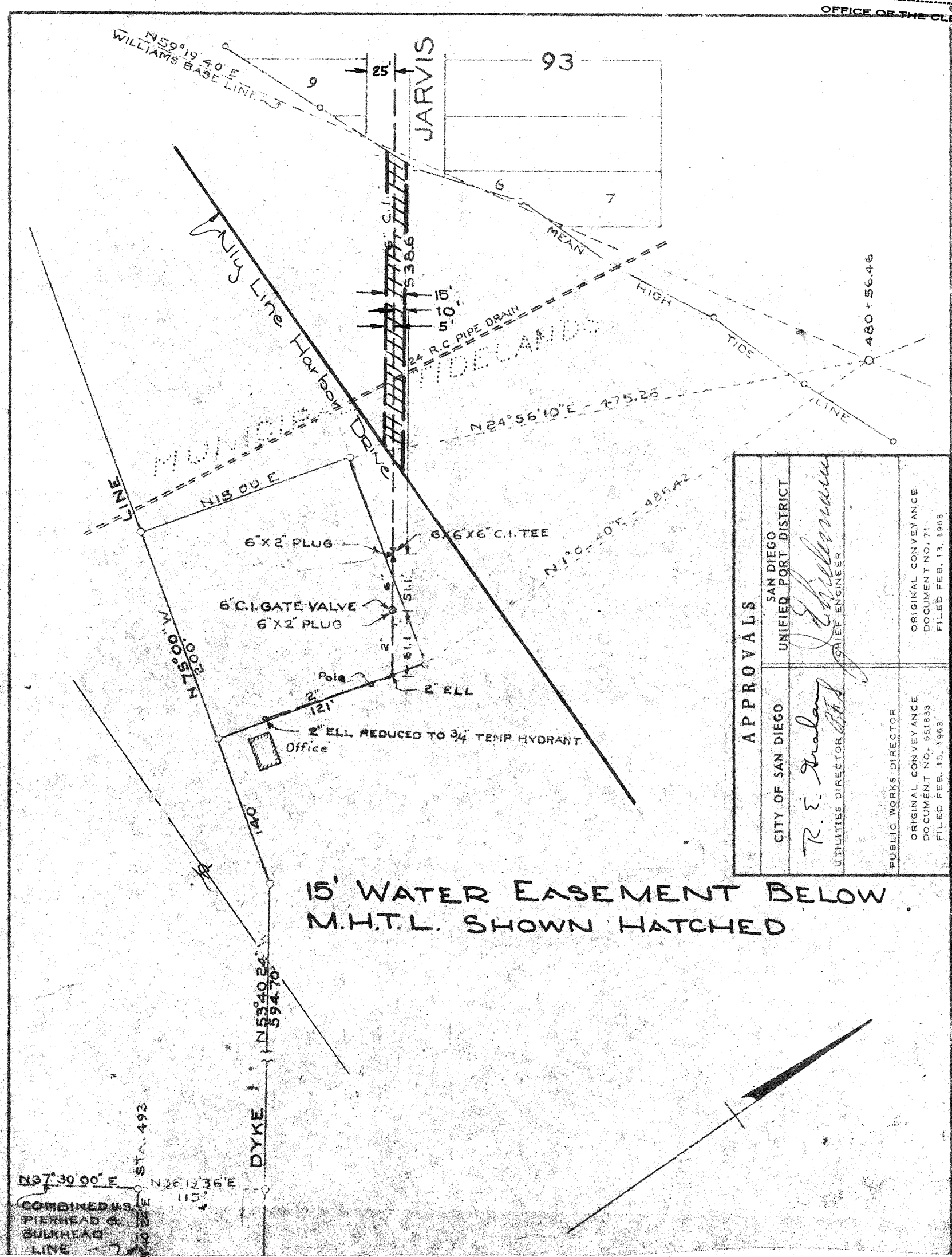

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R. E. Graham UTILITIES DIRECTOR	CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 651833 FILED FEB. 15, 1963	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 13, 1963

		PLANNING	RECORDS ENGR.	O.T.J. 6-24-68 CONTROL ENGR.	OFFICE ENGR.

DRAWN BY J.A.
CHECKED BY
FIELD BOOKS 204-1699
SCALE 1" = 100'
W.O. 17430

CITY OF SAN DIEGO - ENGINEERING DEPARTMENT
WATER EASEMENT
Ext. Jarvis Street
TIDELANDS

DATE 6-24-68
E. F. Gabrielson
CITY ENGINEER
SHEET 5 OF 11
9222-5-B

HARBOR No. 139-MB

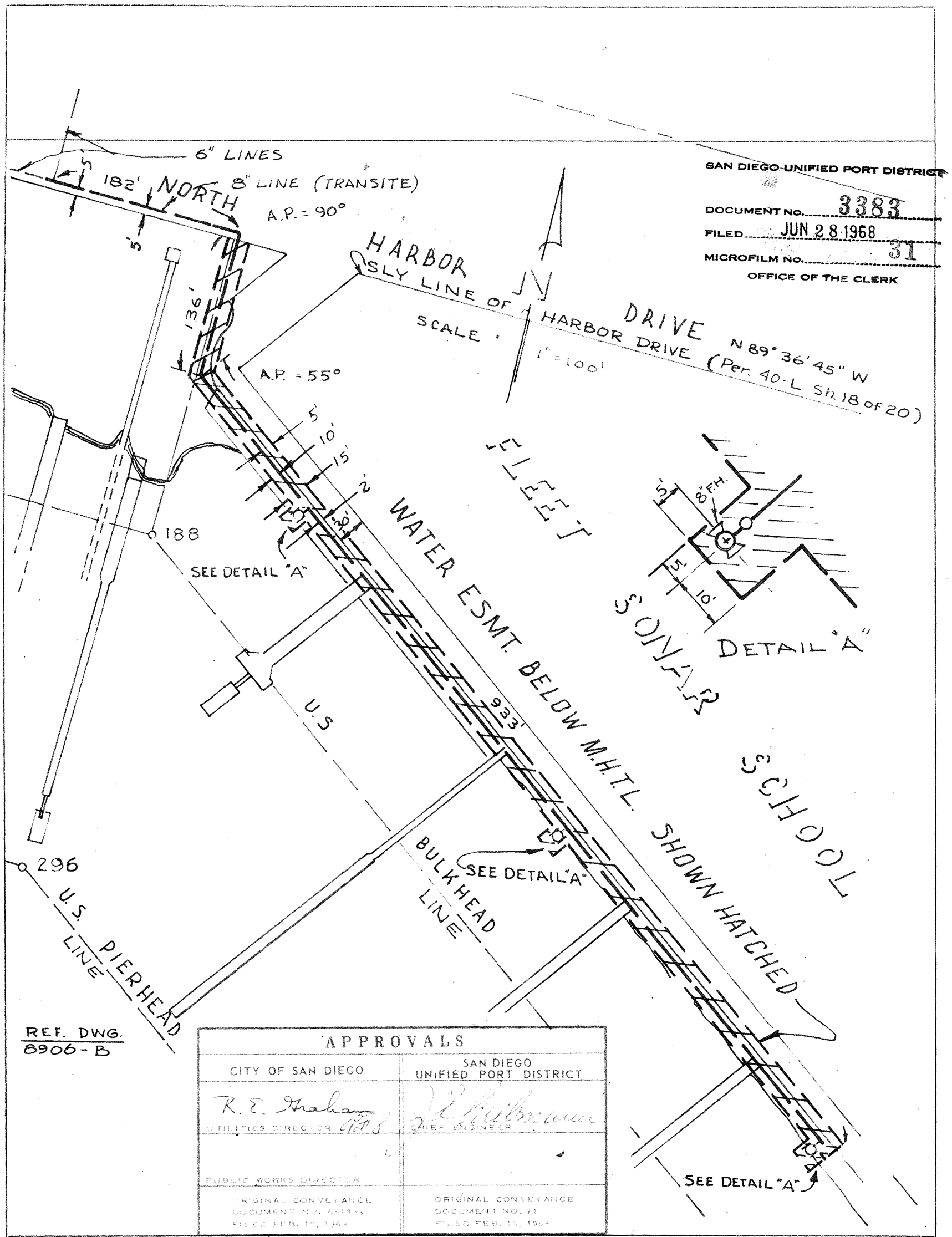

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 31
OFFICE OF THE CLERK

HARBOR Nº 292-MB

SAN DIEGO UNIFIED PORT DISTRICT

DOCUMENT No. 3383

FILED JUN 28 1968

MICROFILM No. 31

OFFICE OF THE CLERK

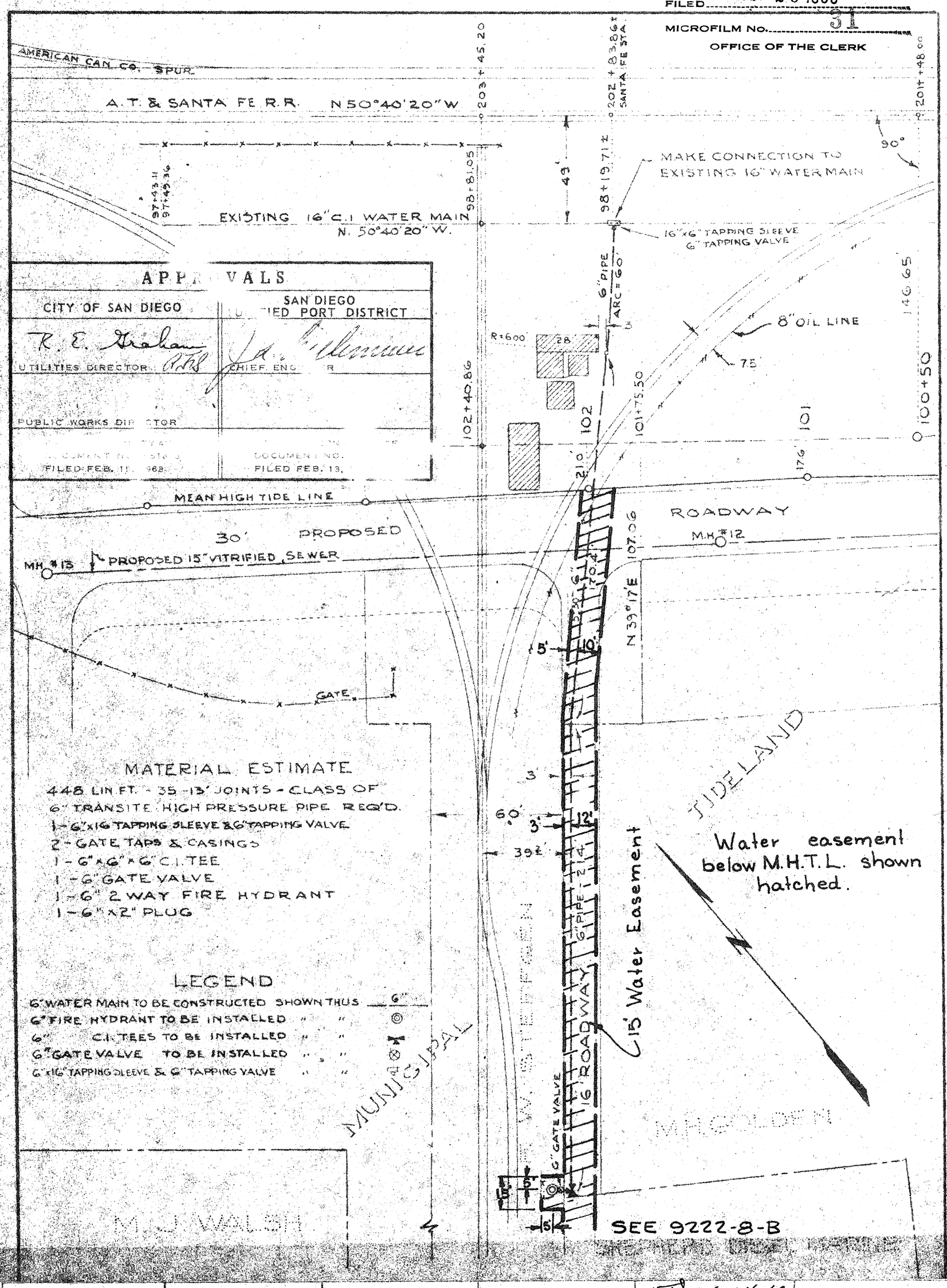

		PLANNING	RECORDS ENGR	C.T.J. 6-24-68 CONTROL ENGR.	OFFICE ENGR.

DRAWN BY J.A.
CHECKED BY
FIELD BOOKS 192-1723
SCALE 1" = 50'
W.O. 17430

CITY OF SAN DIEGO - ENGINEERING DEPARTMENT

WATER EASEMENT

1127'± N.Wly. from foot of Sampson St. below M.H.T.L.

TIDELANDS

DATE 6-24-68

CITY ENGINEER

SHEET 7 OF 11

9222-7-B

HARBOR No 178-MB, Sht. 1 of 2

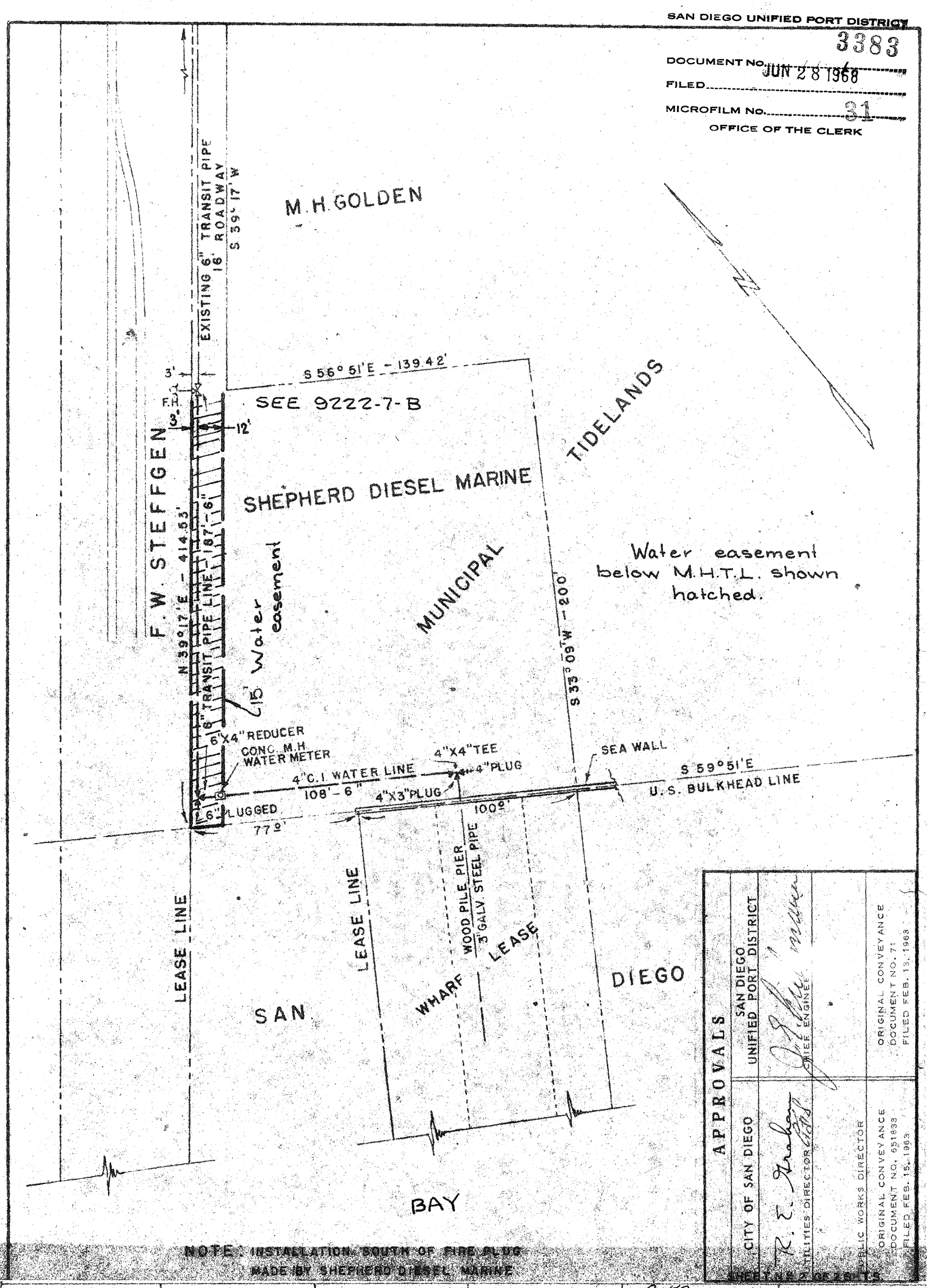
SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 31
OFFICE OF THE CLERK
M.H. GOLDEN
EXISTING 6" TRANSIT PIPE
16' ROADWAY
S 39° 17' W
S 56° 51' E - 139.42'
SEE 9222-7-B
TIDELANDS
F.W. STEFFGEN
SHEPHERD DIESEL MARINE
MUNICIPAL
Water easement
Water easement below M.H.T.L. shown hatched.
N 39° 17' E - 414.53'
8" TRANSIT PIPE LINE - 187'-6"
S 33° 09' W - 200'
6"X4" REDUCER
CONC. M.H.
WATER METER
4"C.I. WATER LINE
108'-6"
4"X4" TEE
4"PLUG
4"X3" PLUG
SEA WALL
S 59° 51' E
U.S. BULKHEAD LINE
PLUGGED
77.0'
100.0'
LEASE LINE
LEASE LINE
WOOD PILE PIER
3" GALV. STEEL PIPE
WHARF
LEASE
SAN
DIEGO
BAY
APPROVALS
CITY OF SAN DIEGO
UTILITIES DIRECTOR
PUBLIC WORKS DIRECTOR
ORIGINAL CONVEYANCE
DOCUMENT NO. 651833
FILED FEB. 15, 1963
SAN DIEGO UNIFIED PORT DISTRICT
CHIEF ENGINEER
ORIGINAL CONVEYANCE
DOCUMENT NO. 71
FILED FEB. 13, 1963
SHEET NO. 2 OF 28 SHTS.
NOTE: INSTALLATION SOUTH OF FIRE PLUG MADE BY SHEPHERD DIESEL MARINE
PLANNING
RECORDS ENGR.
CONTROL ENGR.
O.T.J. 6-24-68
OFFICE ENGR.
DRAWN BY J.A.
CHECKED BY
FIELD BOOKS 192-1723
SCALE 1" = 80'
W.O. 17430
CITY OF SAN DIEGO - ENGINEERING DEPARTMENT
WATER EASEMENT
1127'± N.Wly. from foot of Sampson St. below M.H.T.L.
DATE 6-24-68
CITY ENGINEER
SHEET 8 OF 11
9222-8-B
HARBOR No 178-MB, Sht. 1 of 2

SAN DIEGO UNIFIED PORT DISTRICT

DOCUMENT No. 3383

FILED JUN 28 1968

MICROFILM No. 31

OFFICE OF THE CLERK

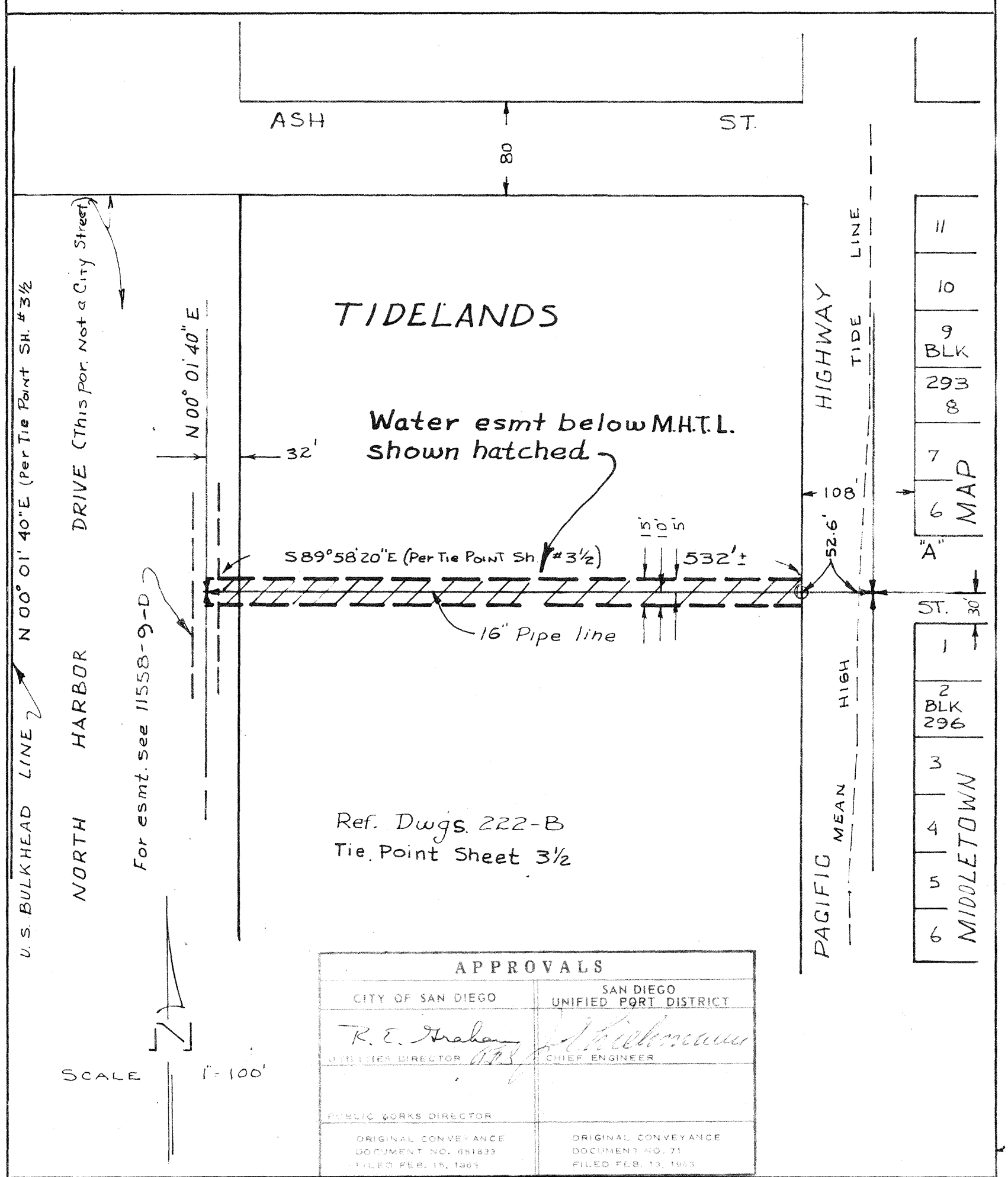

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R. E. Graham	J. Kuhlmann
UTILITIES DIRECTOR	CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 651833 FILED FEB. 15, 1963	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 13, 1963

		PLANNING	RECORDS ENGR.	CONTROL ENGR. 6-24-68	OFFICE ENGR.

DRAWN BY R.G.J.
CHECKED BY
FIELD BOOKS
INDEX 202-1715
SCALE 1" = 100'
W.O. 17430

CITY OF SAN DIEGO - ENGINEERING DEPARTMENT

WATER ESMT. - Wly of "A" St. below M.H.T.L. bet. Pacific Hwy. & North Harbor Dr.

DATE

CITY ENGINEER

SHEET 9 OF 11

9222-9-B

SAN DIEGO UNIFIED PORT DISTRICT

DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 31
OFFICE OF THE CLERK

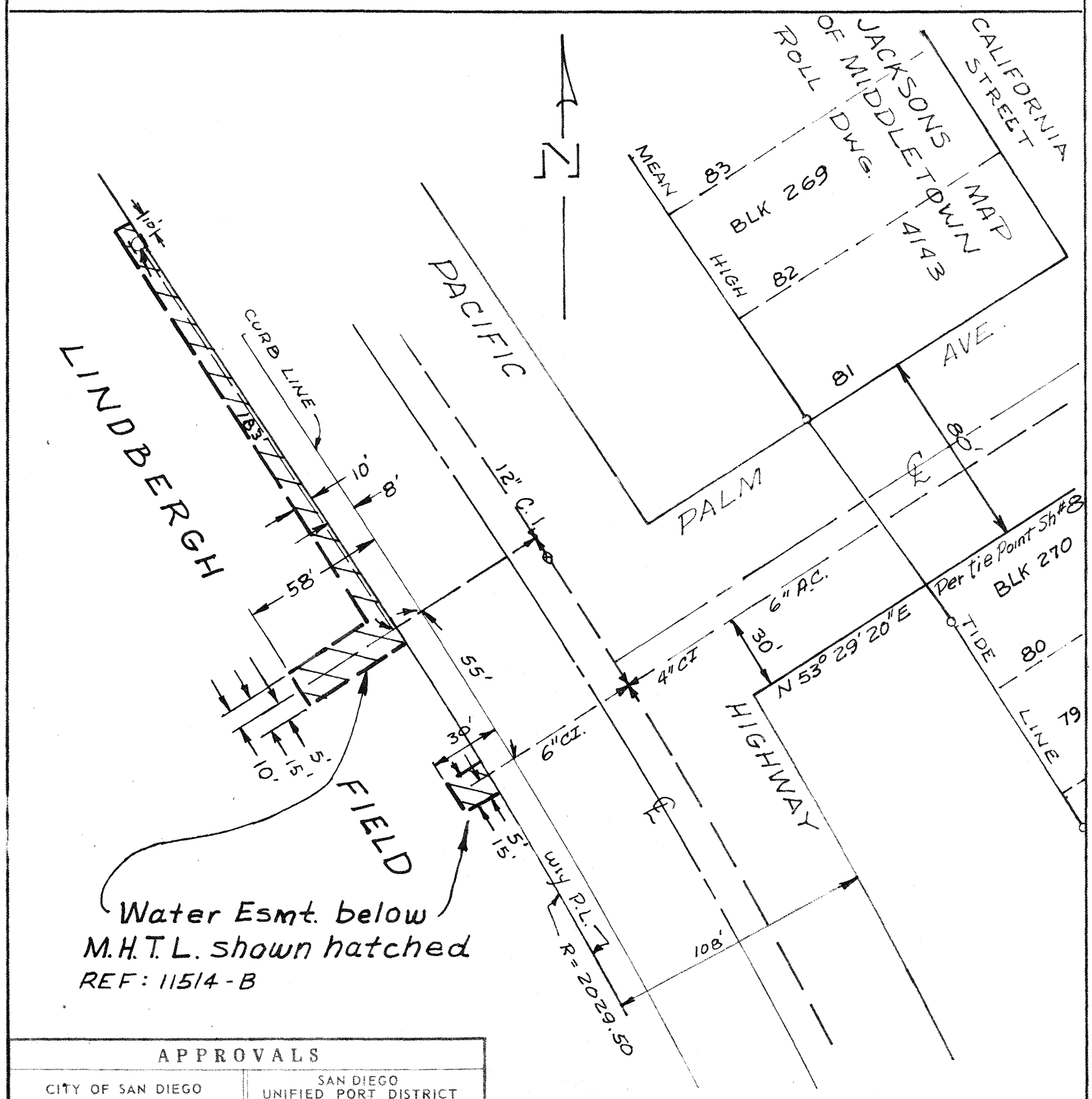

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R. E. Graham UTILITIES DIRECTOR	J. S. Kuhlemeier CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 651833 FILED FEB. 13, 1963	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 13, 1963

		PLANNING	RECORDS ENGR.	CONTROL ENGR.	OFFICE ENGR.
				O.T.J. 6-24-68	

DRAWN BY R.C.J.
CHECKED BY
FIELD BOOKS 206-1715
SCALE 1" = 50'
W.O. 17430

CITY OF SAN DIEGO - ENGINEERING DEPARTMENT

WATER EASEMENT - wly of Pacific Hwy at Palm Ave. in TIDELANDS

DATE
CITY ENGINEER

SHEET 10 OF 11
9222-10-B

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 31
OFFICE OF THE CLERK

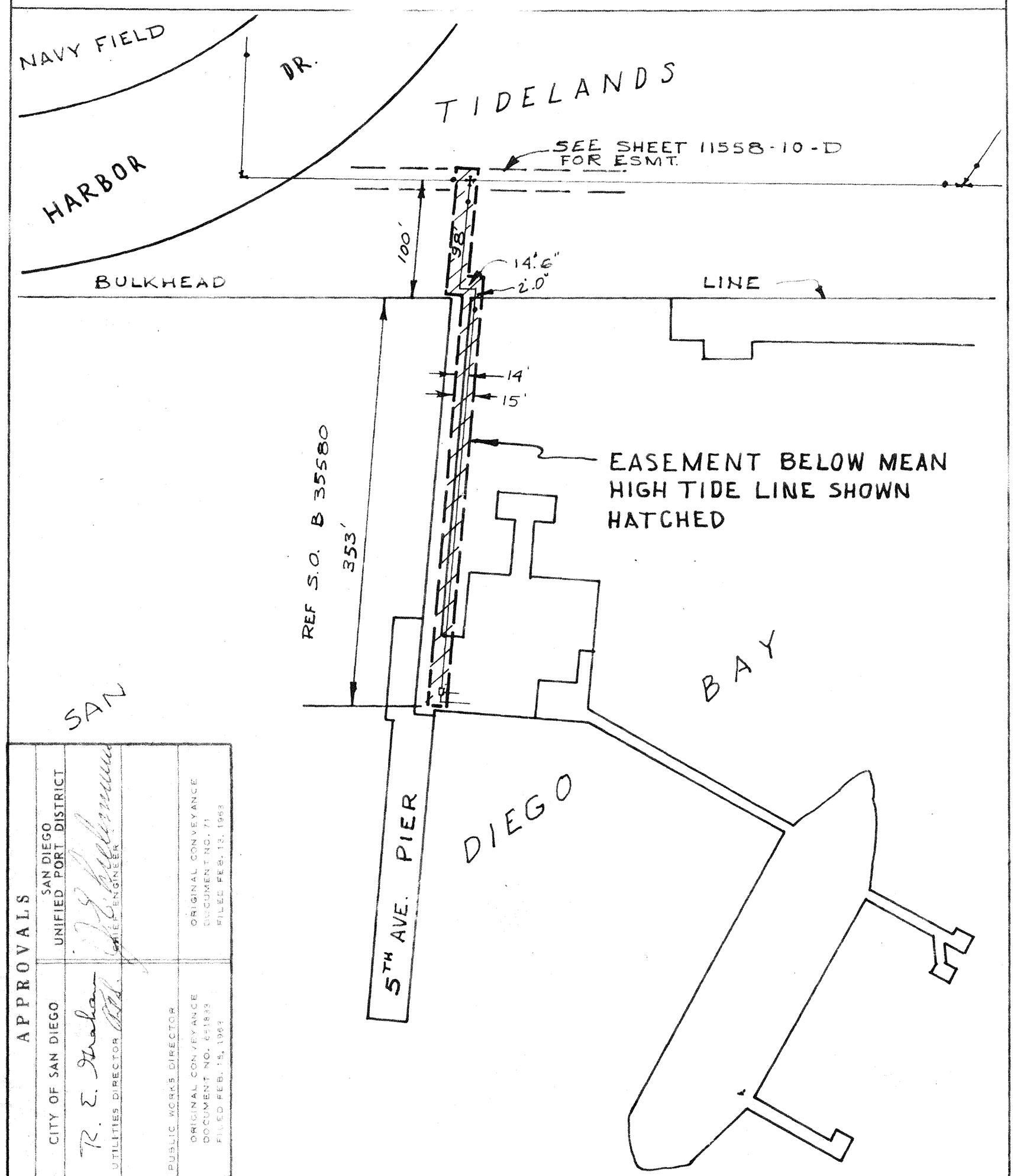

APPROVALS

CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R. E. Graham UTILITIES DIRECTOR	CHIEF ENGINEER
PUBLIC WORKS DIRECTOR ORIGINAL CONVEYANCE DOCUMENT NO. 651832 FILED FEB. 15, 1962	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 13, 1963

PLANNING	RECORDS ENGR.	CONTROL ENGR.	OFFICE ENGR.
		6-24-68	

DRAWN BY BCd
CHECKED BY
FIELD BOOKS 196-17/9
SCALE 1" = 100'
W.O. 17430

CITY OF SAN DIEGO - ENGINEERING DEPARTMENT

WATER EASEMENT- ON 5TH AVE PIER BELOW MEAN HIGH TIDE LINE TIDELANDS

DATE 6-20-68
CITY ENGINEER
SHEET 11 OF 11
9222-11-3

020776

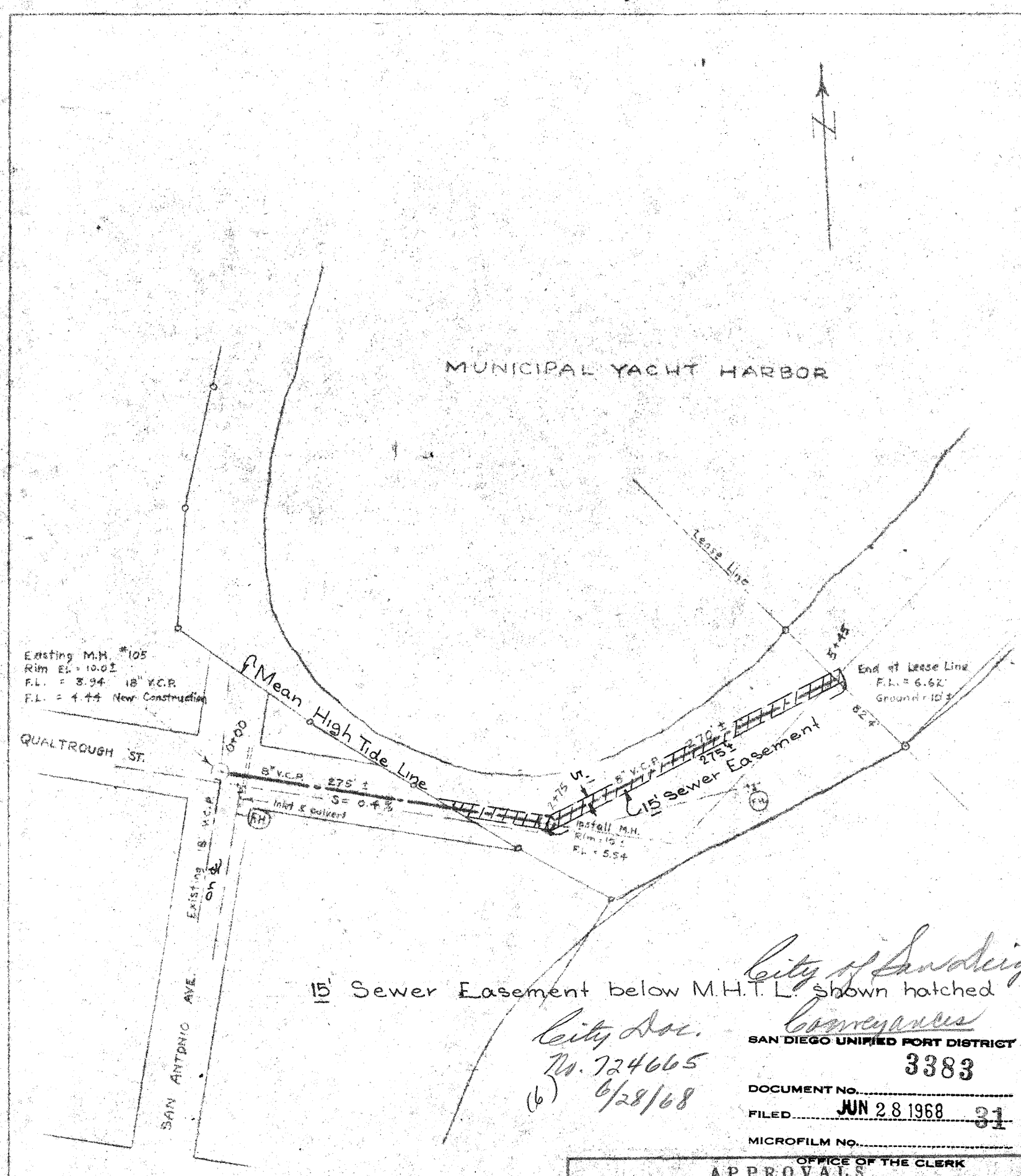
N
MUNICIPAL YACHT HARBOR
Lease Line
Existing M.H. #105
Rim El. = 10.0±
F.L. = 3.94 18" V.C.P.
F.L. = 4.44 New Construction
Mean High Tide Line
QUALTROUGH ST.
0+00
8" V.C.P. 275'±
S = 0.4%
Inlet & outlets
F.H.
Existing 18" V.C.P.
SAN ANTONIO AVE.
1+75 ±
8" V.C.P.
275'±
15' Sewer Easement
Install M.H.
Rim = 10'±
F.L. = 5.54
3+45
End at Lease Line
F.L. = 6.62'
Ground = 10'±
6+20
15' Sewer Easement below M.H.T.L. shown hatched
City Doc.
No. 724665
(6) 6/28/68
City of San Diego
Conveyances
SAN DIEGO UNIFIED PORT DISTRICT
3383
DOCUMENT No.
FILED JUN 28 1968 31
MICROFILM No.
OFFICE OF THE CLERK
APPROVALS
CITY OF SAN DIEGO
SAN DIEGO UNIFIED PORT DISTRICT
R. E. Graham
UTILITIES DIRECTOR
J. Kaltenmeier
CHIEF ENGINEER
PUBLIC WORKS DIRECTOR
ORIGINAL CONVEYANCE
DOCUMENT NO. 661833
FILED FEB. 15, 1968
ORIGINAL CONVEYANCE
DOCUMENT NO. 31
FILED FEB. 15, 1963
PLANNING
RECORDS ENGR.
O.T.J. 6-24-68
CONTROL ENGR.
OFFICE ENGR.
DRAWN BY J.P. RAF
CHECKED BY
FIELD BOOKS 200-1697
SCALE 1" = 100'
W.O. 17430
CITY OF SAN DIEGO - ENGINEERING DEPARTMENT
SEWER EASEMENT
Qualtrough St. below M.H.T.L.
TIDELANDS
DATE 6/24/68
E. H. Sommer
CITY ENGINEER
SHEET 1 OF 6
9221-1-B
HARBOR No 296-MB

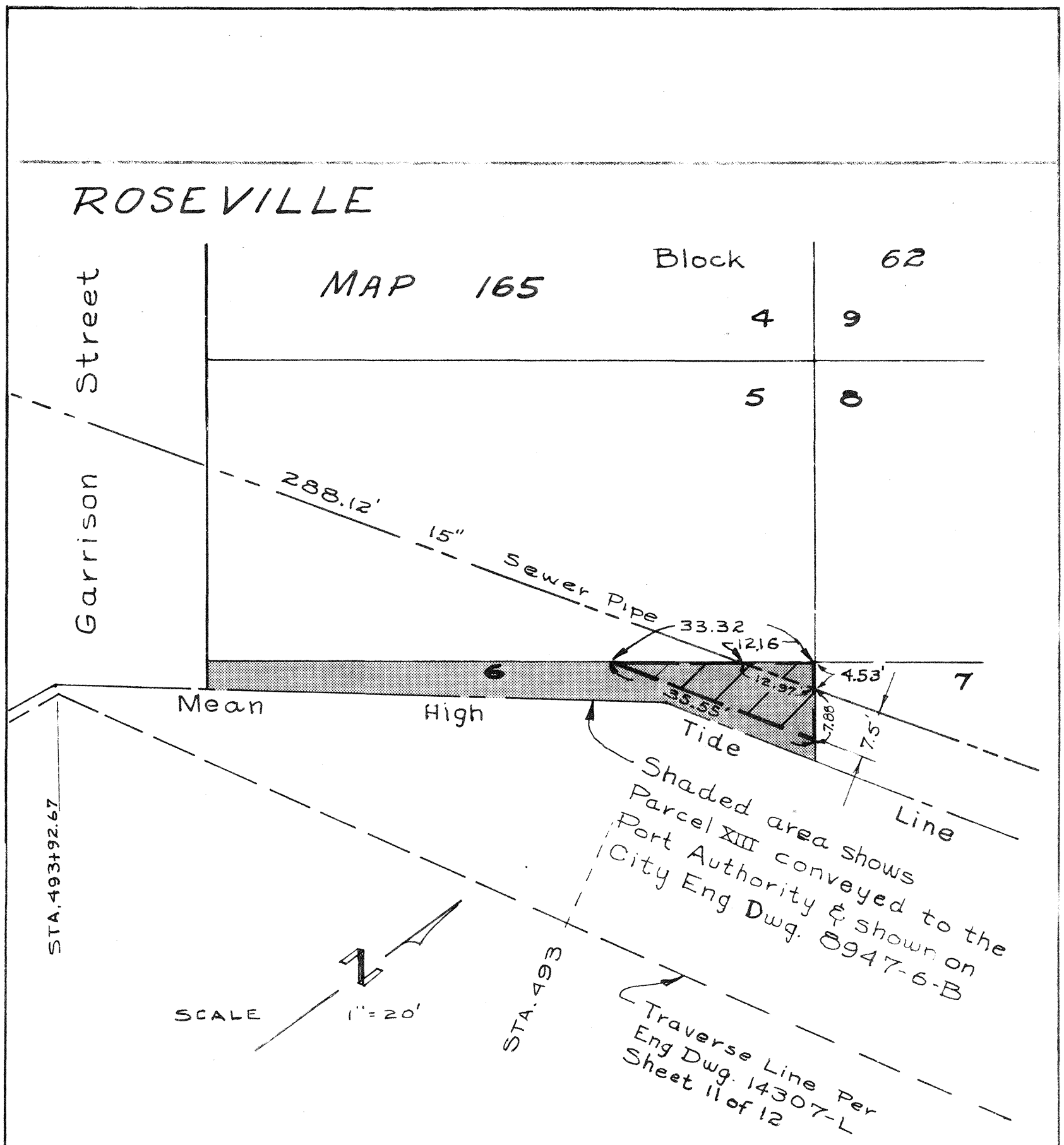

Sewer Esmt. Shown hatched thus

APPROVALS

CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R. E. Hudson	

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 31
OFFICE OF THE CLERK

6-24-68

R.C.D.
C. INDEX 204-1699
1" = 20'
W.O. 17430

CITY OF SAN DIEGO - ENGINEERING DEPARTMENT
Sewer Easement, in lot 6
Block 62 of Roseville Map 165

SHEET 2 OF 6
9221-2-B

020778

APPROVALS

CITY OF SAN DIEGO
UTILITIES DIRECTOR
ORIGINAL CONVEYANCE DOCUMENT NO. 6
FILED FEB. 15, 19

SAN DIEGO UNIFIED PORT DISTRICT
CHIEF ENGINEER
PUBLIC WORKS DIRECTOR
ORIGINAL CONVEYANCE DOCUMENT NO. 11
FILED FEB. 1 1963

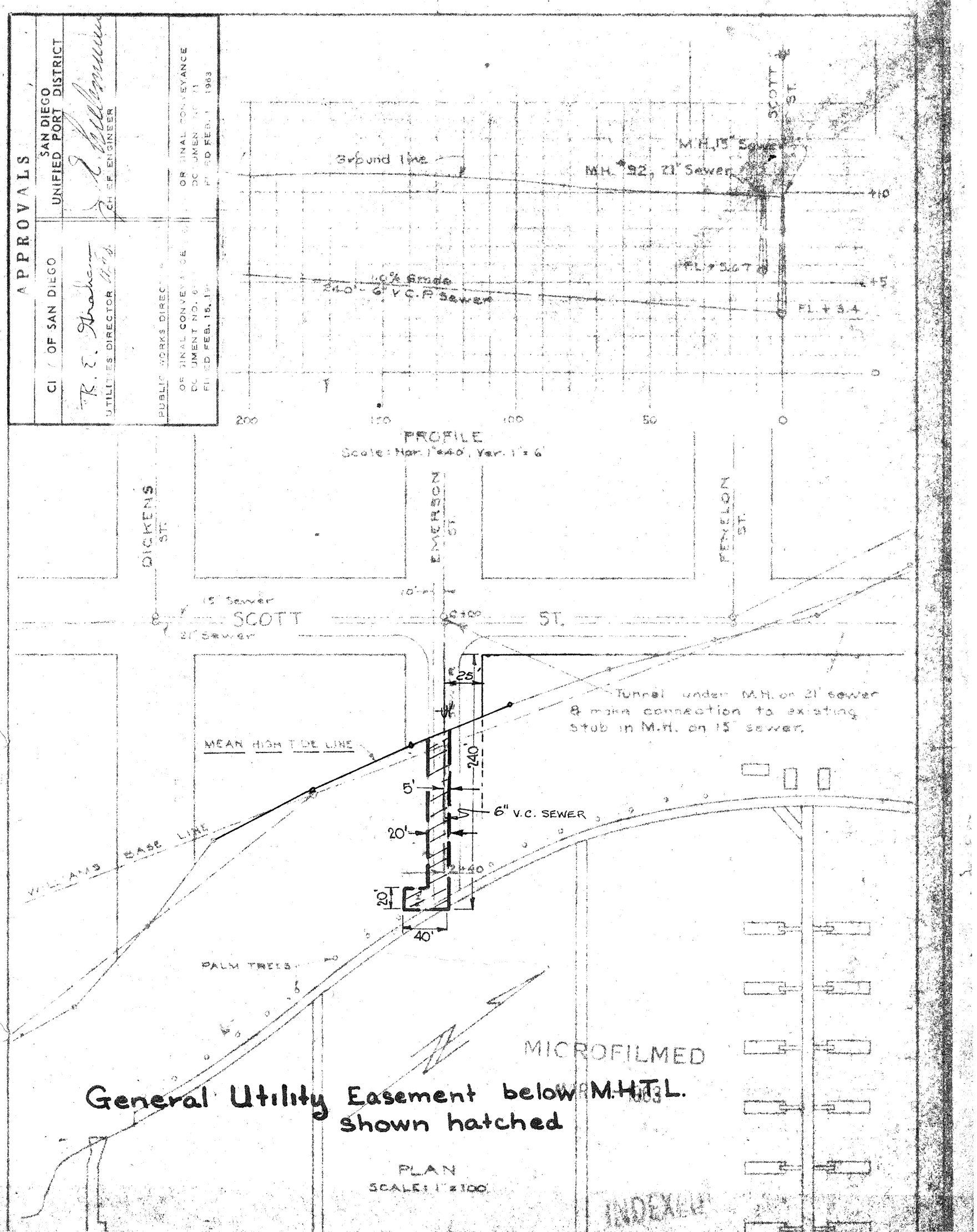

PLANNING	RECORDS ENGR	CONTROL ENGR O.J. 6-24-68	OFFICE ENGR

DRAWN BY J.A.
CHECKED BY
FIELD BOOKS 204-1699
SCALE AS SHOWN
W.O. 17430

CITY OF SAN DIEGO - ENGINEERING DEPARTMENT

SEWER EASEMENT
Ext. Emerson St. below M.H.T.L

TIDELANDS

DATE 6-24-68
CITY ENGINEER
SHEET 3 OF 6
9221-3-B

HARBOR No. 271-MB-1

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 31
OFFICE OF THE CLERK

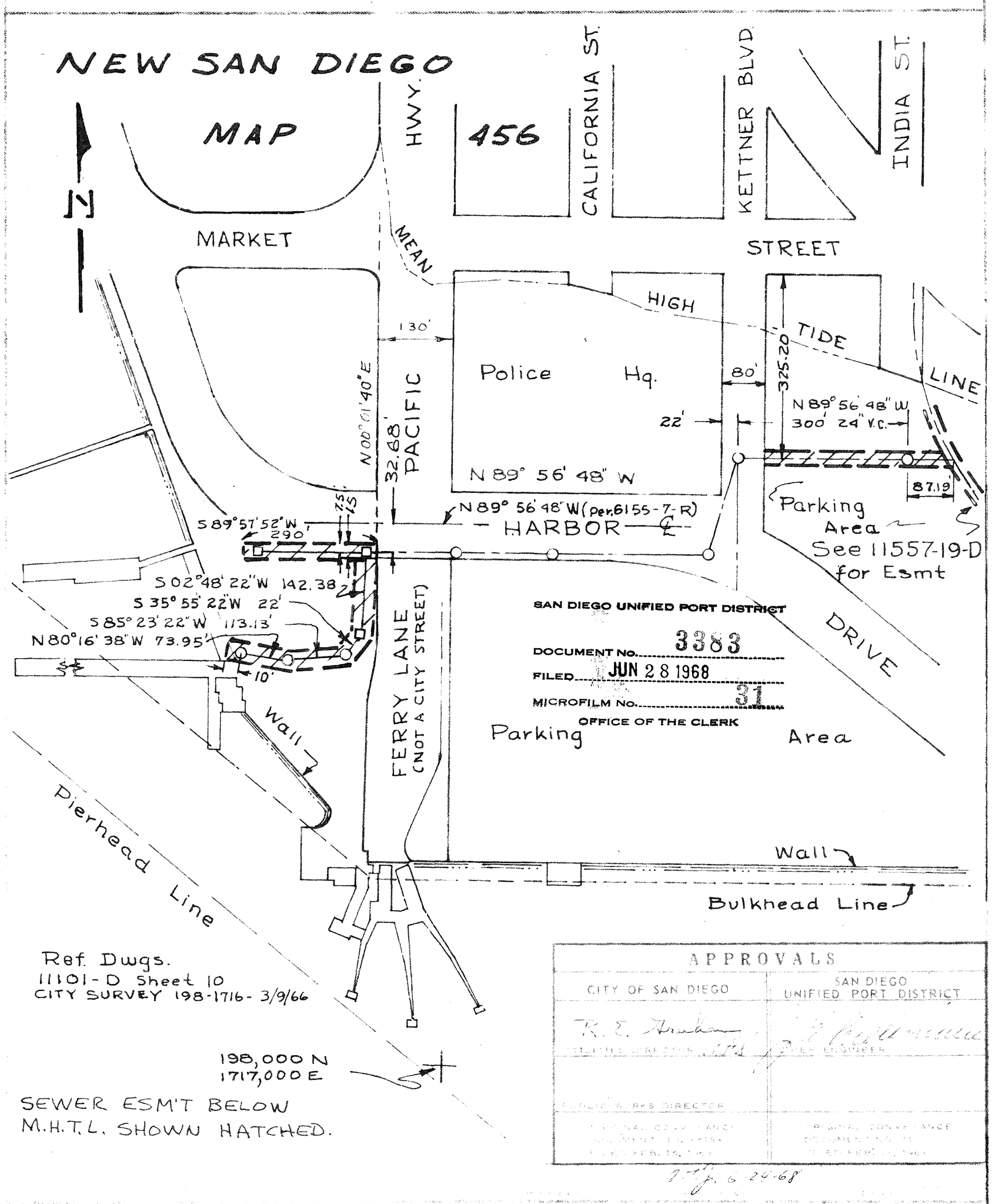
NEW SAN DIEGO
MAP
456
HWY.
CALIFORNIA ST.
KETTNER BLVD.
INDIA ST.
N
MARKET
STREET
MEAN
HIGH
TIDE
LINE
130'
Police
Hq.
80'
325.20
N 89° 56' 48" W
300' 24" V.C.
22'
N 00° 01' 40" E
32.68'
PACIFIC
N 89° 56' 48" W
87.19'
N 89° 56' 48" W (Per. 6155-7-R)
HARBOR
S 89° 57' 52" W
290'
Parking
Area
See 11557-19-D
for Esmt
S 02° 48' 22" W 142.38'
S 35° 55' 22" W 22'
S 85° 23' 22" W 113.13'
N 80° 16' 38" W 73.95'
10'
DRIVE
FERRY LANE
(NOT A CITY STREET)
Wall
Parking
Area
Pierhead Line
Wall
Bulkhead Line
Ref. Dwgs.
11101-D Sheet 10
CITY SURVEY 198-1716- 3/9/66
198,000 N
1717,000 E
SEWER ESM'T BELOW
M.H.T.L. SHOWN HATCHED.
APPROVALS
CITY OF SAN DIEGO
SAN DIEGO UNIFIED PORT DISTRICT
PUBLIC WORKS DIRECTOR
PORT ENGINEER
SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 31
OFFICE OF THE CLERK
6-24-68
C. INDEX 198-1717
1" = 200'
17430
Sewer Esmt Sly of Harbor Drive
& Wly of Ferry Lane. Also S. E'ly of
Kettner & Market Sts.
SHEET 4 OF 6
9221-4-

020780

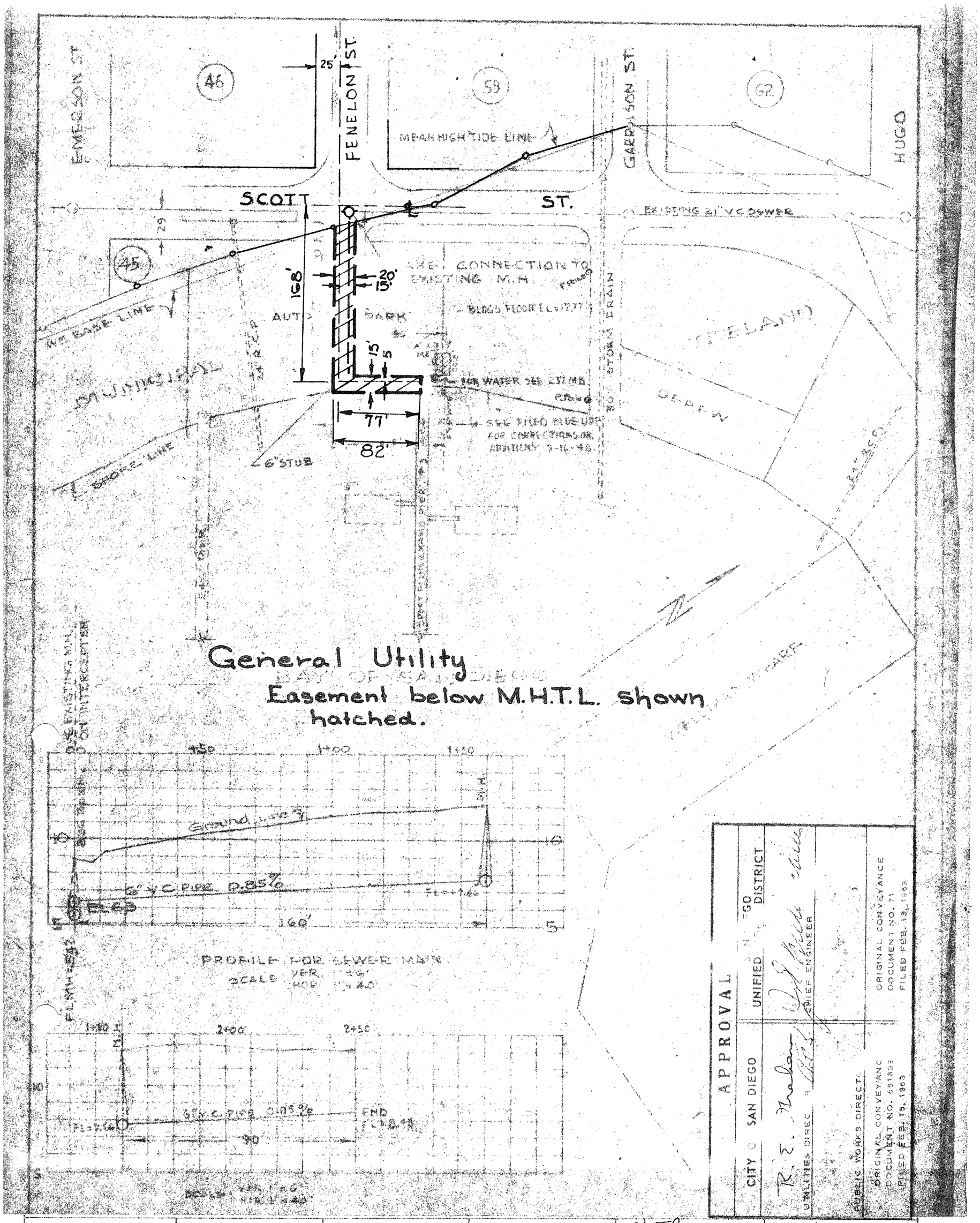

		PLANNING	RECORDS ENGR.	CONTROL ENGR. O.T.J. 6-24-68	OFFICE ENGR.

DRAWN BY J.A.
CHECKED BY
FIELD BOOKS 204-1699
SCALE 1" = 100'
W.O. 17430

CITY OF SAN DIEGO - ENGINEERING DEPARTMENT

SEWER EASEMENT
Ext. Fenelon St below M.H.T.L.

TIDELANDS

DATE 6-21-68
CITY ENGINEER
SHEET 5 OF 6
9221-5-B

HARBOR Nº 229-MB

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 31
OFFICE OF THE CLERK

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R. E. Graham UTILITIES DIRECTOR	J. Schuchmann CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 651-838 FILED FEB. 15, 1963	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 13, 1963

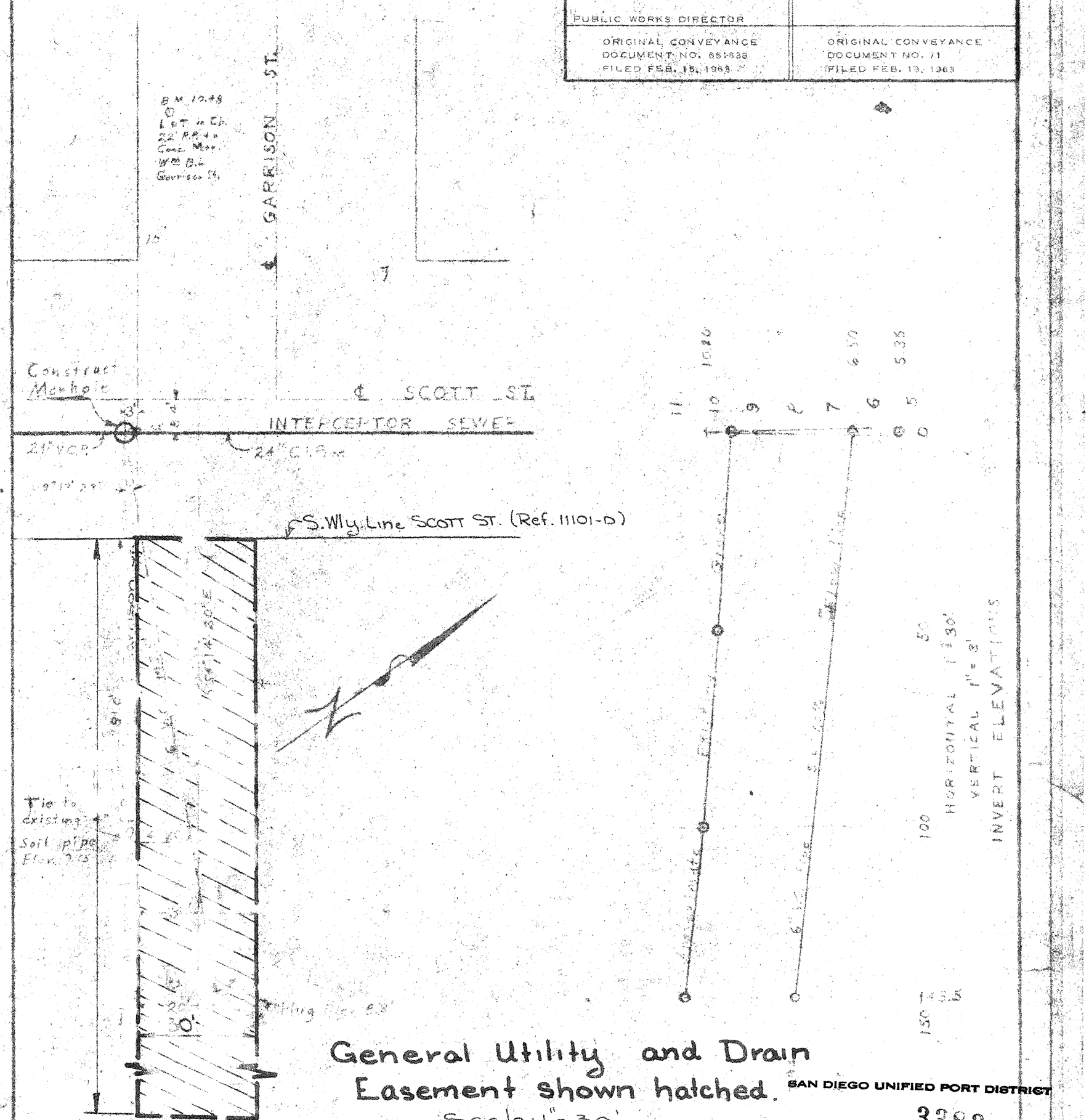

General Utility and Drain Easement shown hatched.

Scale: 1" = 30'

MANHOLE TO BE PLACED AT JUNCTION OF 24" C.I. PIPE & 21" V.C. PIPE
ELEVATION OF TOP OF MH = 10.20

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 31
OFFICE OF THE CLERK

		PLANNING	RECORDS ENGR.	CONTROL ENGR. O.T.J. 6-24-68	OFFICE ENGR.

DRAWN BY J.A.
CHECKED BY
FIELD BOOKS 204-1699
SCALE 1" = 30'
W.O. 17430

CITY OF SAN DIEGO - ENGINEERING DEPARTMENT
SEWER EASEMENT
Ext. Garrison St. below M.H.T.L.
TIDELANDS

DATE 6-24-68
R. Graham
CITY ENGINEER
SHEET 6 OF 6
9221-6-8

HARKER NO. 256-MB

020782

City of San Diego
Engineers

City Doc No.
724665
6/28/68
(23)

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 21
OFFICE OF THE CLERK

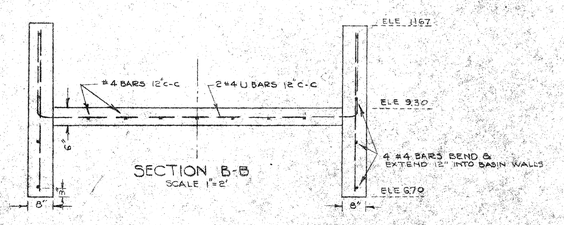

SECTION B-B
SCALE 1"=2'

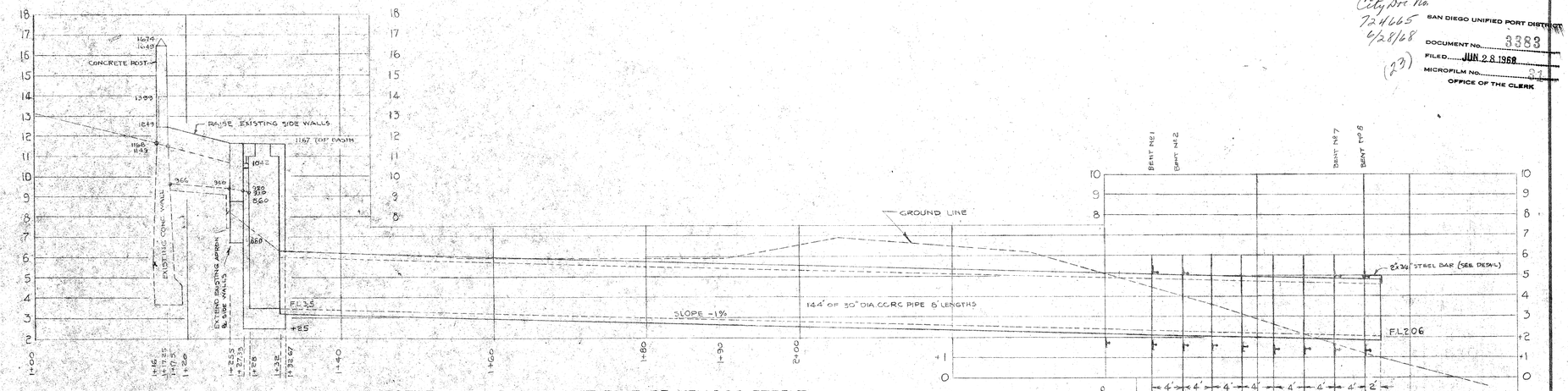

PROFILE OF STORM DRAIN AT FOOT OF KELLOGG STREET
SCALE HORIZ 1"=8'
VERT 1"=3'

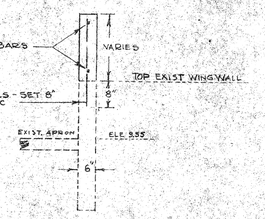

SECTION A-A
SCALE 1"=2'

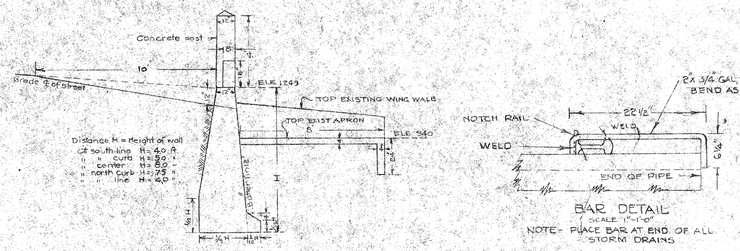

BAR DETAIL
SCALE 1"=1'-0"
NOTE- PLACE BAR AT END OF ALL STORM DRAINS

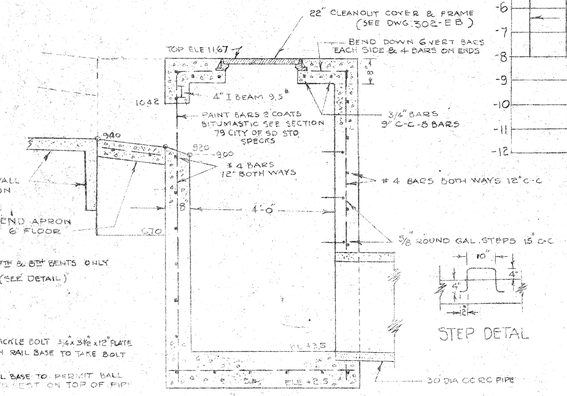

STEP DETAIL

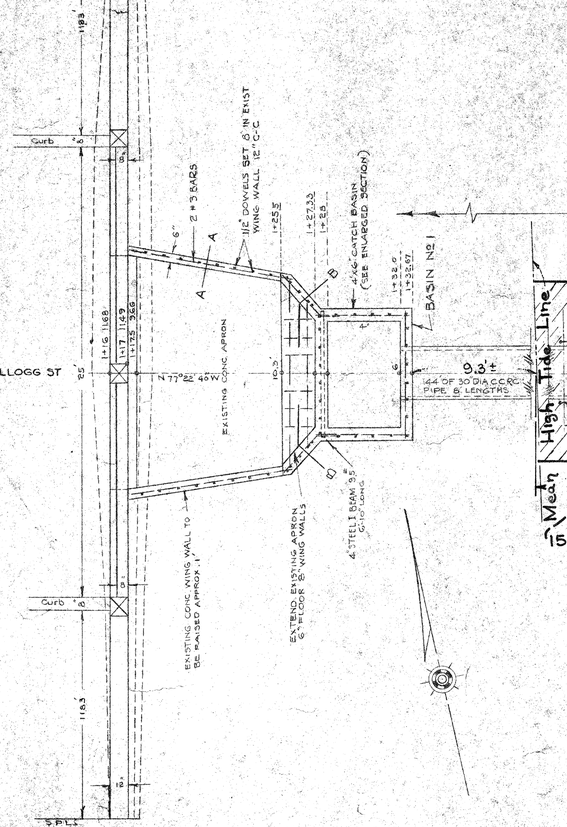

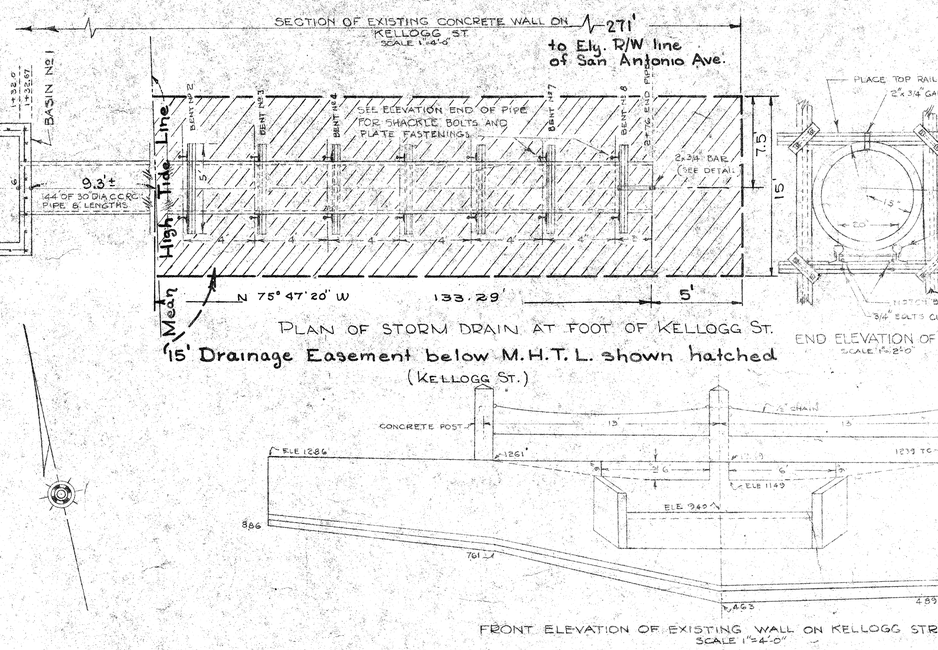

PLAN OF STORM DRAIN AT FOOT OF KELLOGG ST.
'15' Drainage Easement below M.H.T.L. shown hatched
(KELLOGG ST.)

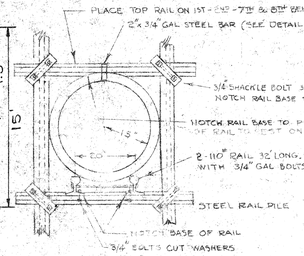

END ELEVATION OF PIPE
SCALE 1"=2'-0"

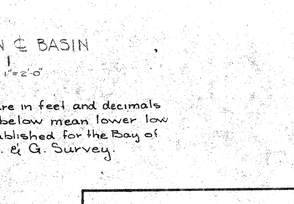

SECTION ON ℄ BASIN No 1
SCALE 1"=2'-0"

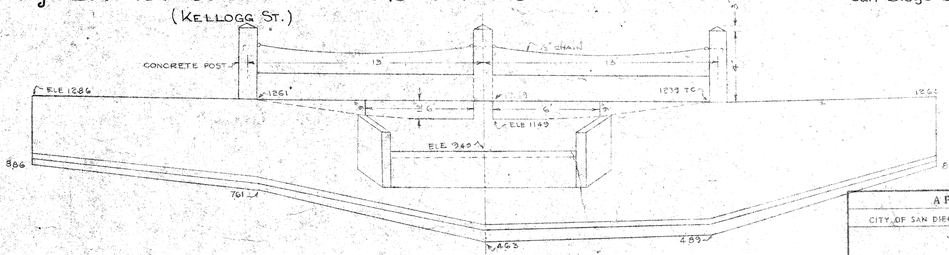

FRONT ELEVATION OF EXISTING WALL ON KELLOGG STREET
SCALE 1"=4'-0"

Elevations shown hereon are in feet and decimals of foot and are above or below mean lower low water or zero datum established for the Bay of San Diego by the U.S.C. & G. Survey.

WORK TO BE DONE

The improvement consists of the following work to be done according to these plans and the specifications prepared therefor by the Harbor Engineer of the City of San Diego. The construction of concrete box waterway, catch basin & 72 lin. ft. of 24" dia. c.c.r.c. pipe storm drain at the foot of McCall Street, The construction of wing walls, catch basin and 144 lin. ft. of 30" dia. c.c.r.c. pipe storm drain at the foot of Kellogg Street, The construction of Catch Basins approximately 23 lin. ft. of 18" dia. c.c.r.c. pipe and 72 lin. ft. of 24" dia. c.c.r.c. pipe storm drain at the foot of Owen Street including all other work appurtenant thereto.

DRAINAGE EASEMENT

Foot of Kellogg St. below M.H.T.L.
City Standard Dwg. No 302-E B accompanies these plans

TIDELANDS

APPROVALS

CITY OF SAN DIEGO
UTILITIES DIRECTOR
PUBLIC WORKS DIRECTOR
ORIGINAL CONVEYANCE DOCUMENT NO. 461833 FILED FEB. 15, 1963

SAN DIEGO UNIFIED PORT DISTRICT
CHIEF ENGINEER
ORIGINAL CONVEYANCE DOCUMENT NO. 74 FILED FEB. 12, 1963

CITY OF SAN DIEGO ENGINEERING DEPARTMENT	SHEET 1 OF 23 SHEETS		W.O. No 17430
PLAN REVISION: CHANGE / BY / DATE / APPROVAL	CITY ENGINEER	6/24/68 DATE	OFFICE ENGINEER
	WATER DEPT / SEWERAGE		SUPERVISOR
	PLANNING DEPT / DRAINAGE		CHECKED
CONSTRUCTION RECORD	ELECTRICAL / HIGHWAY		DESIGNED J. Allen
DATE STARTED / DATE COMPLETED	STRUCTURAL / GRADES		11556-1-D
CONTR / INSP.	TRAFFIC / CONTROL	6-24-68	
FIELD BOOK 198 - 1695			

HARBOR No 440-D, SH 1.

020783

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 31
OFFICE OF THE CLERK

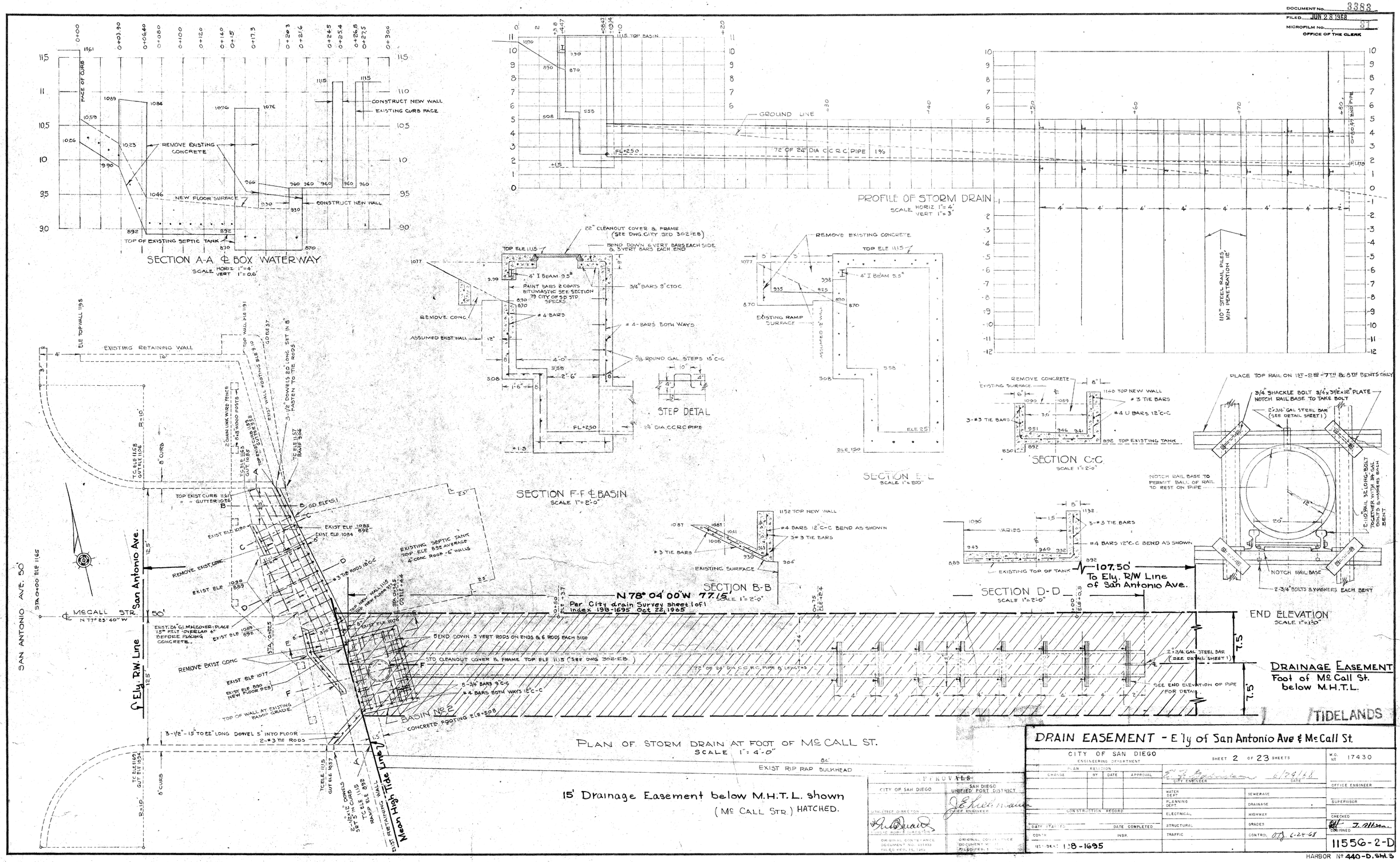

DRAIN EASEMENT - E'ly of San Antonio Ave & McCall St.

CITY OF SAN DIEGO
ENGINEERING DEPARTMENT

SHEET 2 OF 23 SHEETS

W.O. No 17430

PLAN CHANGE	BY	DATE	APPROVAL

CITY ENGINEER — DATE 6/29/68

CONSTRUCTION RECORD
DATE STARTED — DATE COMPLETED
CONTR — INSP.

WATER DEPT	SEWERAGE
PLANNING DEPT	DRAINAGE
ELECTRICAL	HIGHWAY
STRUCTURAL	GRADES
TRAFFIC	CONTROL

OFFICE ENGINEER
SUPERVISOR
CHECKED
DESIGNED J. Altman

REF. DWG. 198-1695

1155G-2-D

HARBOR No 440-D, Sht. 3

APPROVALS

CITY OF SAN DIEGO — UTILITIES DIRECTOR
SAN DIEGO UNIFIED PORT DISTRICT — CHIEF ENGINEER
PORT DIRECTOR

ORIGINAL CONTRACT DOCUMENT NO. 031833 FILED NOV. 15, 1962
ORIGINAL CONTRACT DOCUMENT NO. FILED NOV. 1, 1962

020784

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 31
OFFICE OF THE CLERK

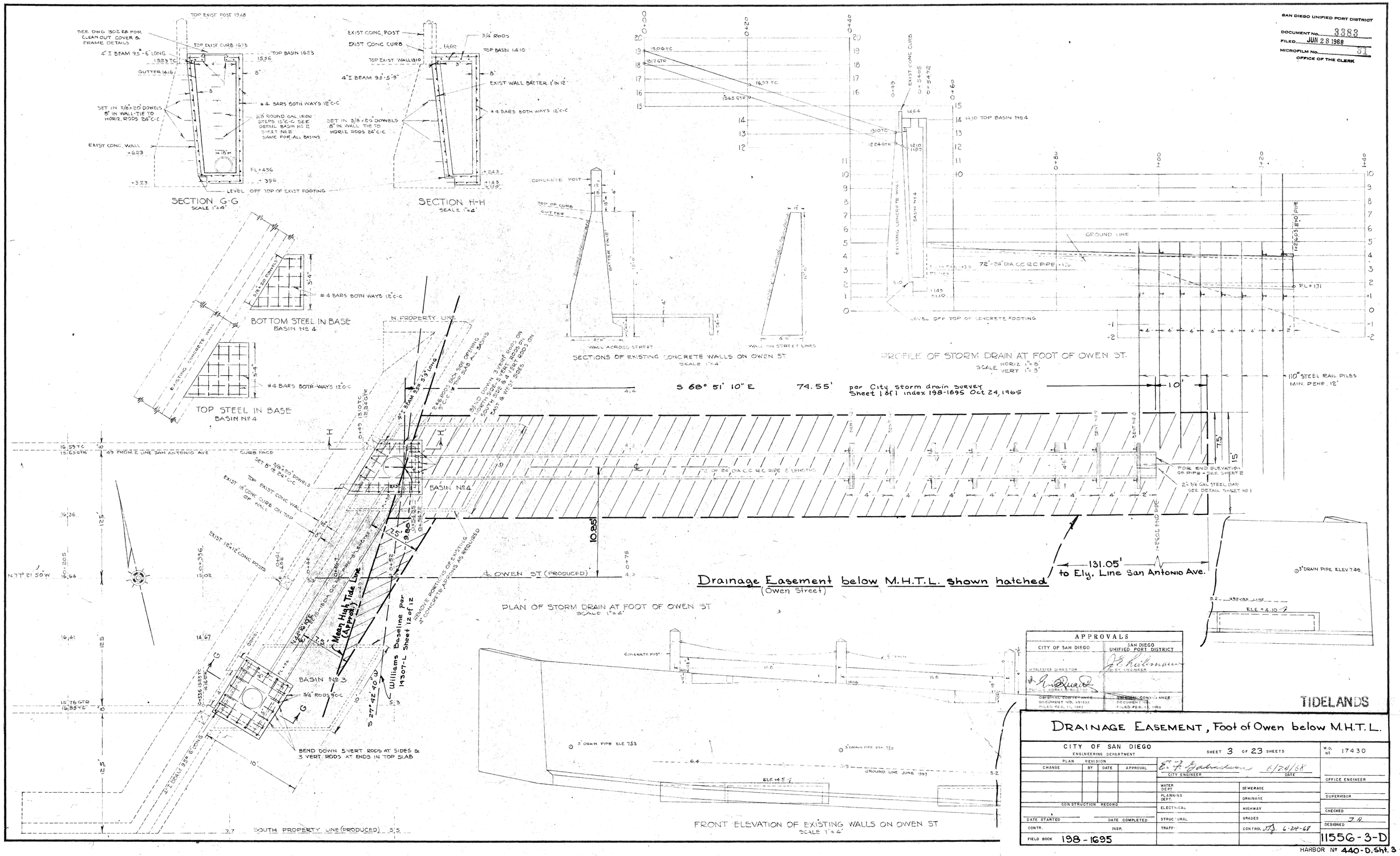

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
UTILITIES DIRECTOR	CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 451833 FILED FEB. 11, 1963	SUPPLEMENTAL CONVEYANCE DOCUMENT NO. FILED FEB. 13, 1963

DRAINAGE EASEMENT, Foot of Owen below M.H.T.L.

CITY OF SAN DIEGO
ENGINEERING DEPARTMENT

SHEET 3 OF 23 SHEETS

W.O. Nº 17430

PLAN REVISION			
CHANGE	BY	DATE	APPROVAL

CITY ENGINEER — DATE 6/24/68

OFFICE ENGINEER

WATER DEPT. — SEWERAGE
PLANNING DEPT. — DRAINAGE
ELECTRICAL — HIGHWAY
STRUCTURAL — GRADES
TRAFFIC — CONTROL

SUPERVISOR

CHECKED

DESIGNED J.A.

CONSTRUCTION RECORD
DATE STARTED — DATE COMPLETED
CONTR. — INSP.
FIELD BOOK 198-1695

11556-3-D

HARBOR Nº 440-D, Sht. 3

020785

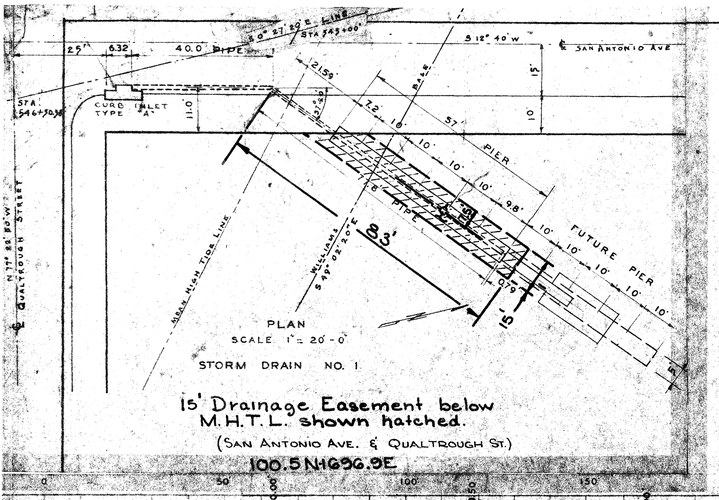

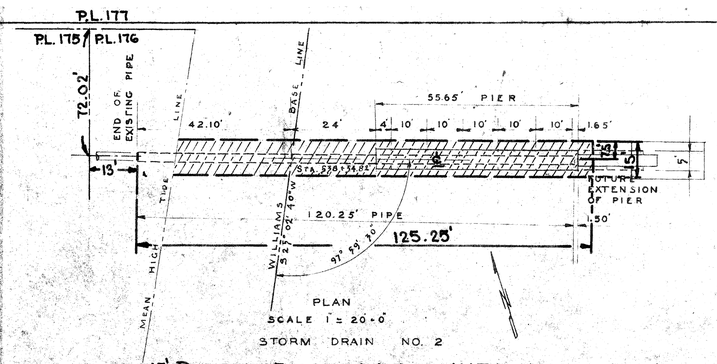

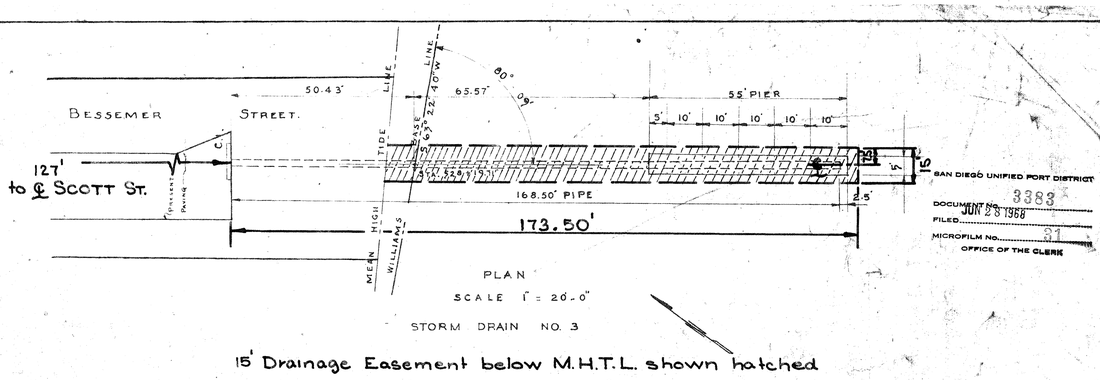

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 31
OFFICE OF THE CLERK

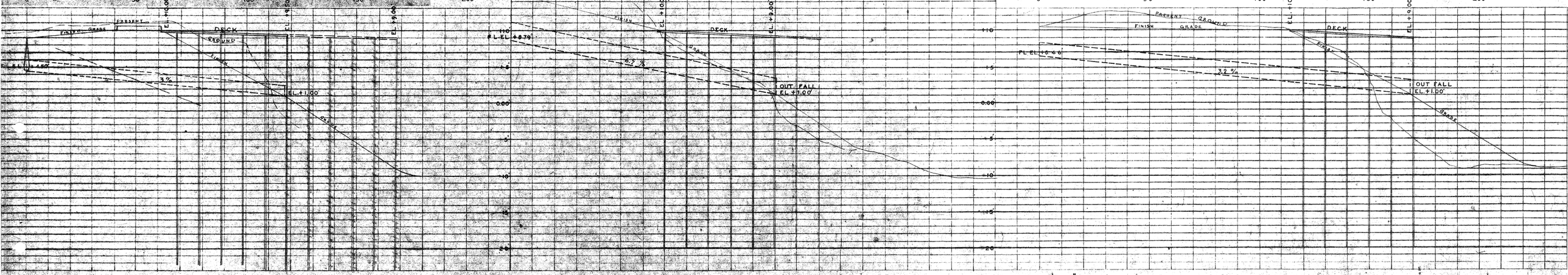

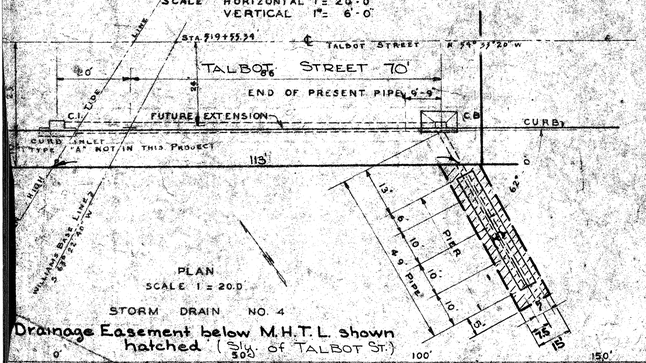

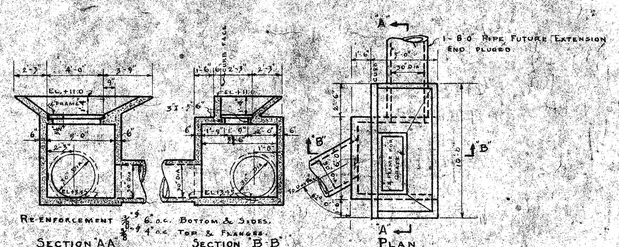

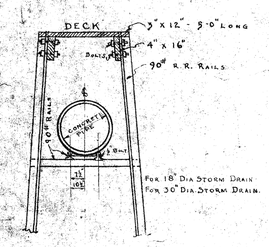

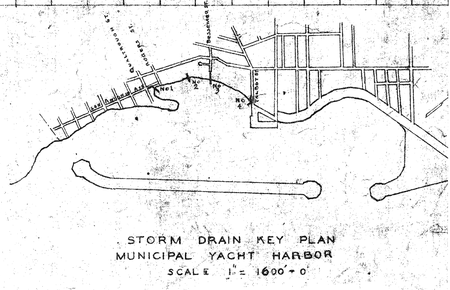

W.P.A. PROJECT # 9397 &
9813

DRAINAGE EASEMENTS
San Antonio Ave.
Bessemer St.
Talbot St. &
P.L. 176 below M.H.T.L.

TIDELANDS

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 4 OF 23 SHEETS

E. F. Quinlan 6/24/68

W.O. NO. 17430

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	JA	JTL	6-24-68	

APPROVALS
CITY OF SAN DIEGO
SAN DIEGO UNIFIED PORT DISTRICT
CHIEF ENGINEER
CHIEF ENGINEER-CEO
DIRECTOR OF PORT DEPARTMENT
DIRECTOR OF PORT DEPARTMENT
DIRECTOR OF PORT DEPARTMENT

020786

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO.
OFFICE OF THE CLERK

15' Drainage Easement below M.H.T.L. shown hatched.

ADDISON ST
N 54° 15' 20" W
264.93'
Ref. 8752-1-B
Closed by Resol. 152542, 3-11-62
LOKER SUB'D
Map № 5087
SHAFTER STREET
S 35° 45' 10" W
18" SEWER
CAÑON STREET
N 54° 33' 50" W
HIGH SEAS TUNA PACKING COMPANY
ANCHORAGE LANE
CATCH BASIN
CONCRETE PIT
EXISTING 12" PIPE
N 54° 15' 20" W 185.5'
12" CONC. PIPE
43° 21' 42"
122.7'
CONC. PIPE
N 10° 53' 38" W
55'
75° 45' 36"
N 54° 33' 50" W 120'
24" CONC. PIPE
47° 54' 36"
85'
PROPOSED END OF FILL
4+35.5 = 4+06.2
N 36° 39' 14" W 116.0'
77° 25'
32° 05' 24"
ADD APPROX. 10' V.C.P. TO MAKE CONNECTION WITH END OF EXISTING 10" V.C.P. EXISTING 10" V.C.P.
N 67° 14' 23" W 159.5'
24" CONC. PIPE
12° 40' 33"
6" C.I. WATER
8" V.C.P. SEWER
M.H. #3A
BM.H. #2
4" C.I. WATER
8" V.C.P. SEWER
4" C.I. TRANSITE WATER
BASE LINE
S 44° 26' 40" W 97.439'
S 39° 55' 40" W 101.330'
S 45° 11' W 108.008'
S 63° 22' 40" W
S 63° 22' 40" W
BASE LINE
Scale: None

APPROVALS

CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
UTILITIES DIRECTOR	PORT ENGINEER
BY PUBLIC WORKS DIRECTOR	
DRAINAGE CONVEYANCE DOCUMENT NO. 641855 FILED FEB. 15, 1965	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 13, 1962

Drainage Easement below M.H.T.L.
(N.Wly and S.Ely. of Anchorage Lane)

TIDELANDS

CITY OF SAN DIEGO
ENGINEERING DEPARTMENT

SHEET 5 OF 23 SHEETS

W.O. № 17430

PLAN REVISION			
CHANGE	BY	DATE	APPROVAL

CONSTRUCTION RECORD
DATE STARTED — DATE COMPLETED
CONTR. — INSP.
FIELD BOOK 202 - 1689

E. F. Gabrielsen 6/24/68
CITY ENGINEER — DATE

WATER DEPT.	SEWERAGE	
PLANNING DEPT.	DRAINAGE	
ELECTRICAL	HIGHWAY	
STRUCTURAL	GRADES	
TRAFFIC	CONTROL	

OFFICE ENGINEER
SUPERVISOR
CHECKED
DESIGNED J. Dillons
1155G-5-D

HARBOR № 15-D-35

020787

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO.
OFFICE OF THE CLERK

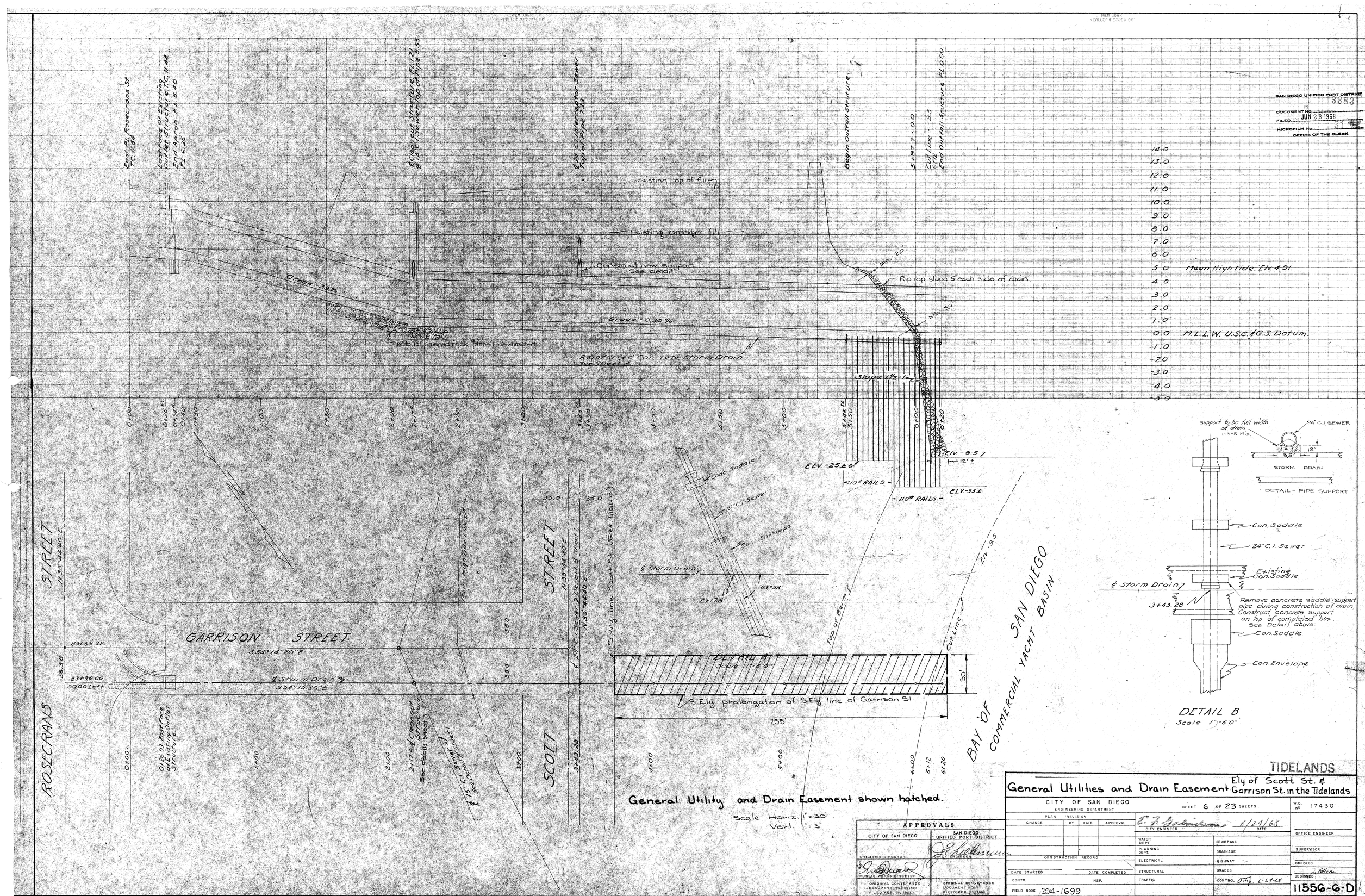

General Utility and Drain Easement shown hatched.

Scale Horiz. 1" = 30'
Vert. 1" = 3'

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
UTILITIES DIRECTOR	PORT ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 83383 FILED FEB. 27, 1963	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 13, 1963

TIDELANDS

General Utilities and Drain Easement

Ely of Scott St. & Garrison St. in the Tidelands

CITY OF SAN DIEGO
ENGINEERING DEPARTMENT

SHEET 6 OF 23 SHEETS

W.O. Nº 17430

PLAN REVISION			
CHANGE	BY	DATE	APPROVAL

CITY ENGINEER — DATE 6/24/68

OFFICE ENGINEER

SUPERVISOR

CHECKED

DESIGNED J. Allen

CONSTRUCTION RECORD

DATE STARTED — DATE COMPLETED

CONTR. — INSP.

FIELD BOOK 204-1699

WATER DEPT.	SEWERAGE
PLANNING DEPT.	DRAINAGE
ELECTRICAL	HIGHWAY
STRUCTURAL	GRADES
TRAFFIC	CONTROL Otty. 6-24-68

11556-G-D

HARBOR Nº 15-D-20 Sht. 1

020788

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 31
OFFICE OF THE CLERK

KEATS STREET

SHAFTER ST.

LOWELL STREET

LINE "A"

LINE "B"

SECTION A-A

SECTION B-B

Proposed 18" Pipe

Proposed 30" pipe

Edge of pavement

Curb top or rip rap

Rip Rap

Concrete wall & steel rail see a-a for details

4" A.C. Water (To be moved by others)

30" concrete pipe (1250-D)

Flow line

Ground line

Gutter grade

4" C.I. Water

24" concrete pipe (1250-D)

18" concrete pipe (1250-D)

Catch Basin No. 1

Catch Basin No. 2

Catch Basin No. 3

Catch Basin No. 4

Make connection to existing 18" pipe

Mean High Tide Line

Wilkinson Bass Line

Pipe Curve

Catch Basin No. 1 Standard Type G Curb Inlet

Curb Return Radius 14.2'

DETAIL AT SOUTHERLY CORNER SHAFTER & KEATS STREET

Use 6-9' pipe joints with 5" bevel on one end around curve.

CATCH BASIN NO. 1
STANDARD TYPE G
CURB INLET, SEE DETAIL

CATCH BASIN NO. 2
STANDARD TYPE H
CURB INLET

CATCH BASIN NO. 3
STANDARD TYPE H
CURB INLET

CATCH BASIN NO. 4
STANDARD TYPE H
CURB INLET

749.14'

S88°36'55"E

S88°36'20"E 133.2'

℄ Only line of North Harbor Drive

℄ Limits of Harbor Drive

NORTH LANE

℄ NORTH HARBOR DRIVE

SOUTH LANE

62.5'

100'

Plug existing 24" pipe

Replace curb

Outfall structure

Typical bent - outfall structure

Min. 85# steel bolt

Min. 1" shoulder bolts

Notch out flange of rail

3/4" x 7" x 12" plates

Nota.
City Datum: +9.01 M.L.L.W. or Harbor Datum.

Proposed storm drain shown thus

15' Drainage Easement shown hatched

TIDELANDS

APPROVALS
SAN DIEGO UNIFIED PORT DISTRICT
CITY OF SAN DIEGO
DIRECTOR OF PORT
CITY ENGINEER

ORIGINAL CONVEYANCE DOCUMENT FILED

DRAIN ESMT. - From Shafter St. & Keats St. to North Harbor Dr. Then Ely. adj to N. Harbor Dr. to Lowell St.

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 7 OF 23 SHEETS

W. O. NO. 17430

CITY ENGINEER	DATE	DIVISION HEAD

DESCRIPTION	BY	APPROVED	DATE	FILMED	DESIGN ENGINEER
ORIGINAL	RJ	CTJ	6-28-68		
					CONTROL CERTIFICATION
					204-1699 LAMBERT COORDINATES
223-D					11556-7-D

020789

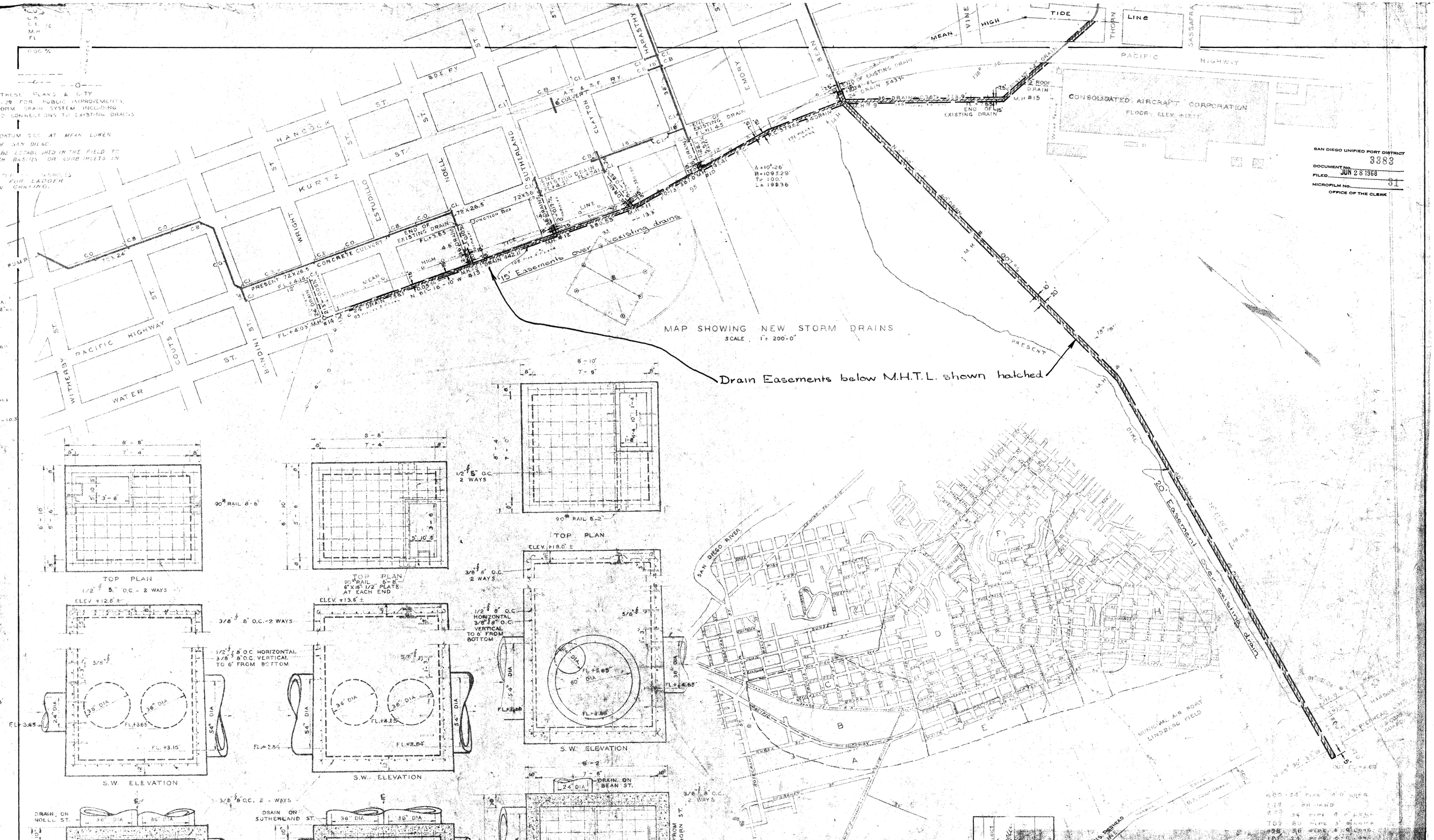

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 31
OFFICE OF THE CLERK

APPROVALS
CITY OF SAN DIEGO
SAN DIEGO UNIFIED PORT DISTRICT

ORIGINAL CONTRACT PROJECT NO. 1711
ORIGINAL CONVENIENCE PROJECT NO. 1711

DRAIN ESMT. - Between Estudillo St. & Thorn St., & from Bean St. S'ly. thru Lindbergh Field to San Diego Bay

TIDELANDS

CITY OF SAN DIEGO
ENGINEERING DEPARTMENT

SHEET 8 OF 23 SHEETS

W.O. NO. 17430

PLAN REVISION: CHANGE | DATE | APPROVAL

CITY ENGINEER — DATE 6/20/68

OFFICE ENGINEER

WATER DEPT. | SEWERAGE
PLANNING DEPT. | DRAINAGE
ELECTRICAL | HIGHWAY
STRUCTURAL | GRADES
TRAFFIC | CONTROL

SUPERVISOR

CHECKED 6-24-68

DESIGNED

CONSTRUCTION RECORD
DATE STARTED | DATE COMPLETED
CONTR. | INSP.

FIELD BOOK | INDEX 206-1711

11556-8-D

020790

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No.
OFFICE OF THE CLERK

DEVV-PROFILE DEVIL H

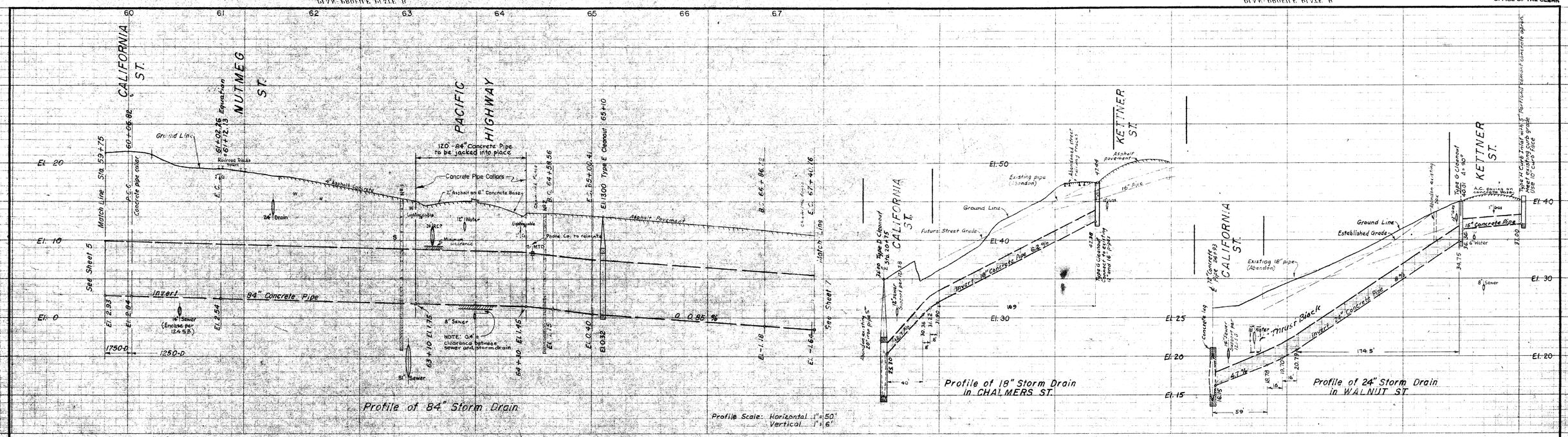

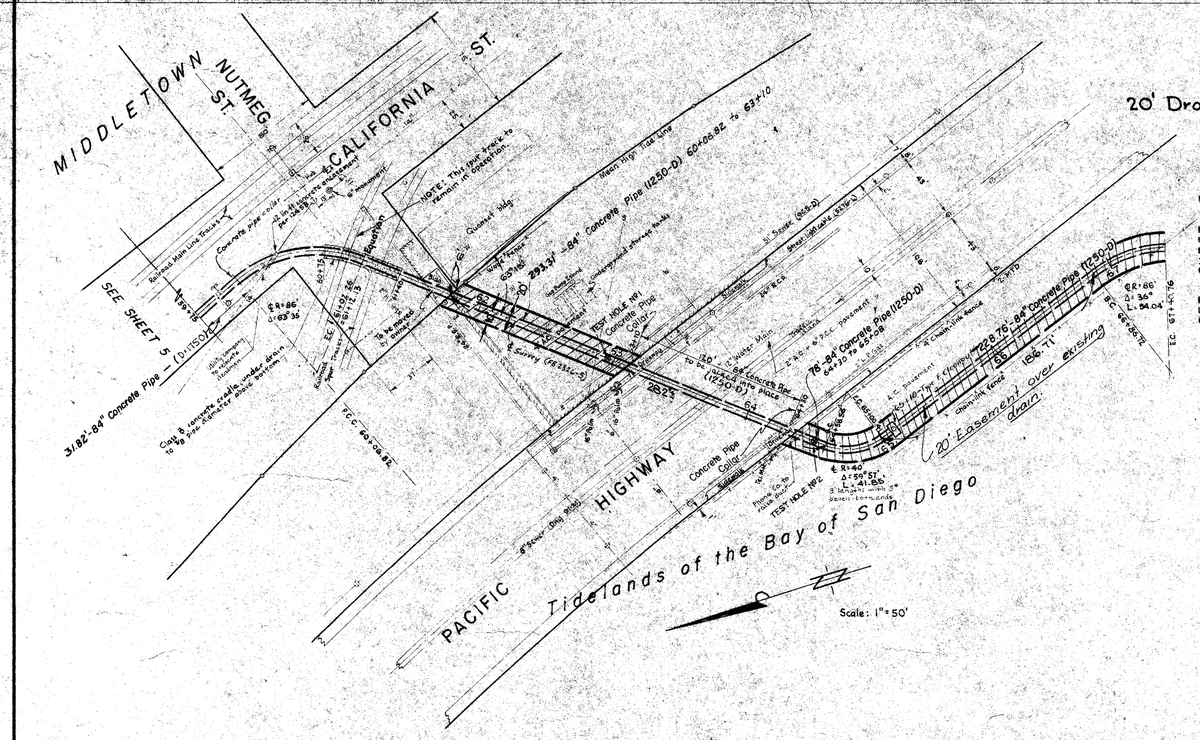

20' Drain easement below M.H.T.L. shown hatched.

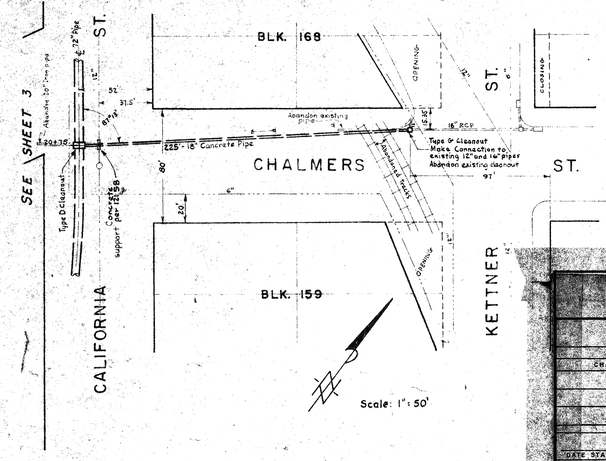

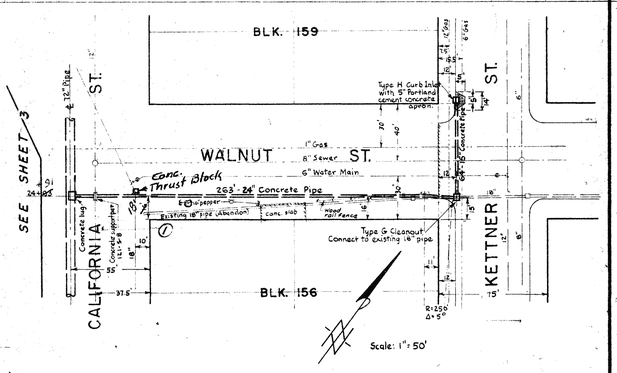

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
UTILITIES DIRECTOR	PORT ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 85588 EL. ED FEB. 19, 1963	ORIGINAL CONVEYANCE DOCUMENT NO. 75 EL. ED FEB. 19, 1963

DRAIN EASEMENT Nly of Laurel St., Ely & Wly of Pacific Hwy TIDELANDS

CITY OF SAN DIEGO
ENGINEERING DEPARTMENT

SHEET 9 OF 23 SHEETS

W.O. No. 17430

PLAN REVISION			
CHANGE	BY	DATE	APPROVAL

E. F. Robinson 6/24/68
CITY ENGINEER — DATE

OFFICE ENGINEER
SUPERVISOR
CHECKED J. J. 6-24-68
DESIGNED J. A. P.

CONSTRUCTION RECORD	
DATE STARTED	DATE COMPLETED
CONTR.	INSP.
FIELD BOOK	

WATER DEPT.	SEWERAGE
PLANNING DEPT.	DRAINAGE
ELECTRICAL	HIGHWAY
STRUCTURAL	GRADES
TRAFFIC	CONTROL
INDEX 206-1715	

11556-9-D

HARBOR No 2752-D City Dwg

020791

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO.
OFFICE OF THE CLERK

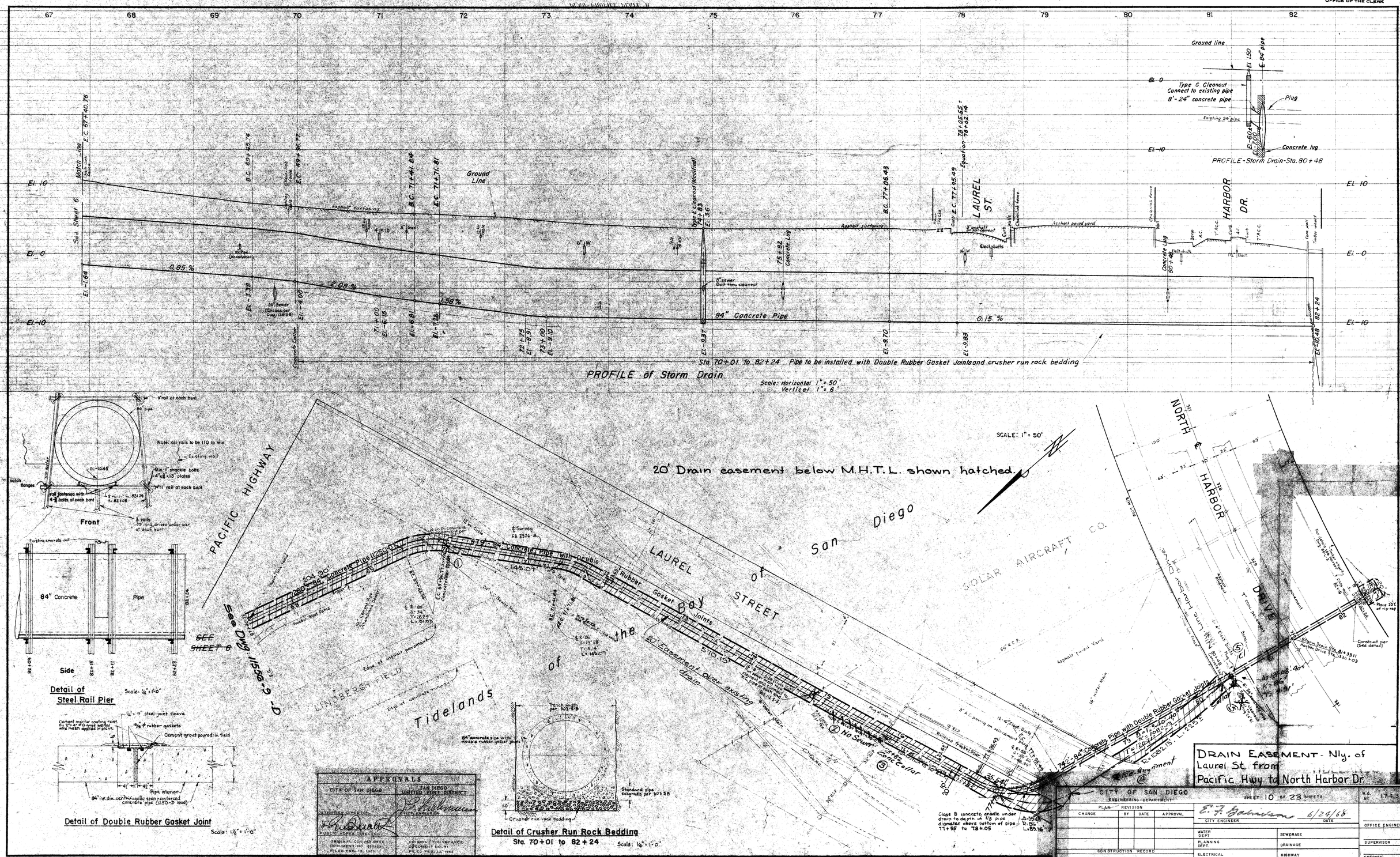

020792

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 31
OFFICE OF THE CLERK

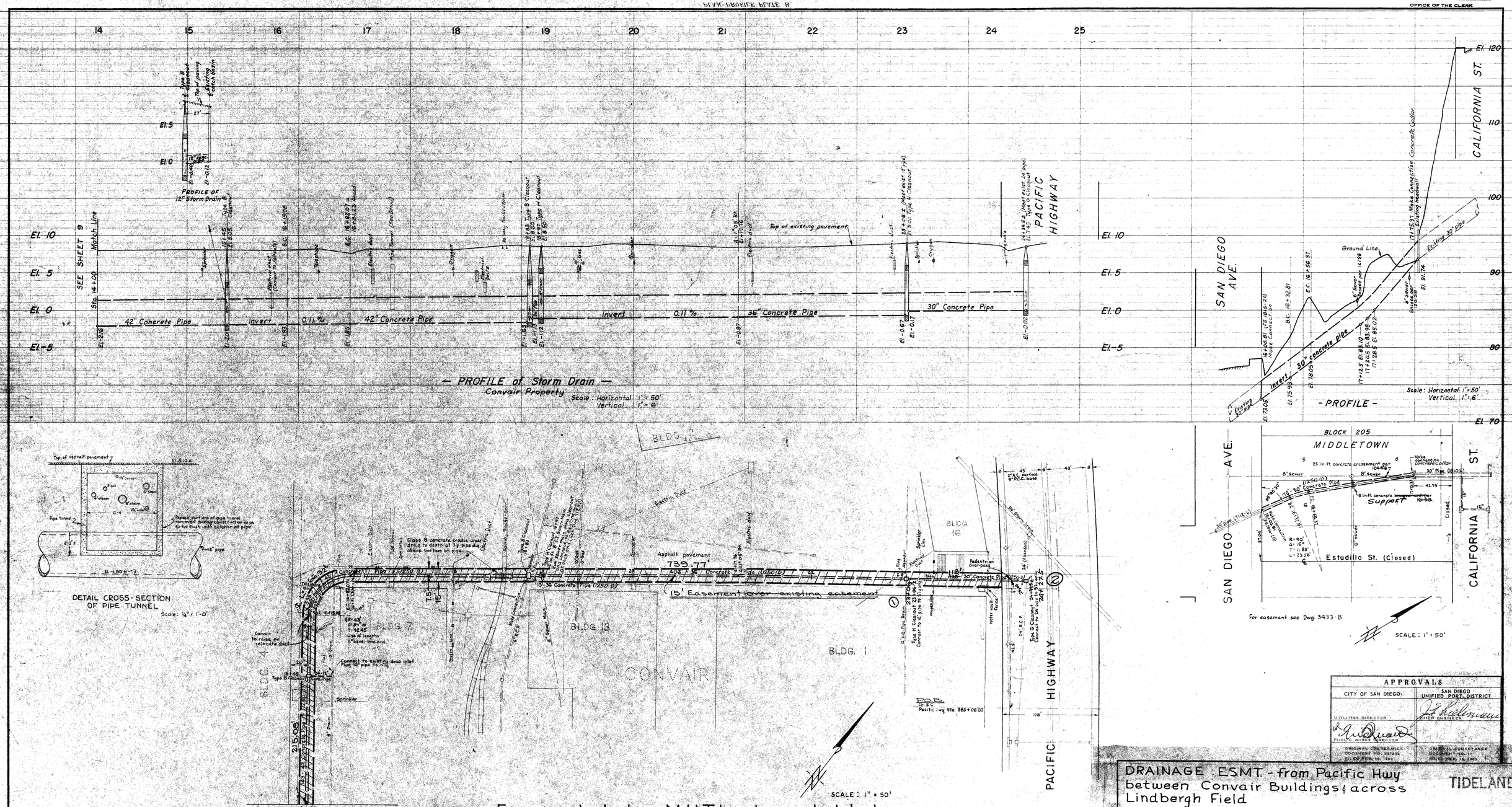

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
UTILITIES DIRECTOR	CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 157833 FILED FEB. 15, 1965	ORIGINAL CONVEYANCE DOCUMENT NO. 11 FILED JAN. 18, 1965

DRAINAGE ESMT. - from Pacific Hwy between Convair Buildings & across Lindbergh Field

TIDELANDS

CITY OF SAN DIEGO ENGINEERING DEPARTMENT				SHEET 11 OF 23 SHEETS		W.O. No. 17430
PLAN REVISION				E. F. Gabrielson 6/24/68		
CHANGE	BY	DATE	APPROVAL	CITY ENGINEER	DATE	OFFICE ENGINEER
				WATER DEPT.	SEWERAGE	
				PLANNING DEPT.	DRAINAGE	SUPERVISOR
CONSTRUCTION RECORD				ELECTRICAL	HIGHWAY	CHECKED.
DATE STARTED		DATE COMPLETED		STRUCTURAL	GRADES	R.C.J. DESIGNED
CONTR.		INSP.		TRAFFIC	CONTROL	1155G-11-D
FIELD BOOK				INDEX 208-1713		

~~HARBOR No~~ Ref. Dwg. 2756-D

020793

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 31
OFFICE OF THE CLERK

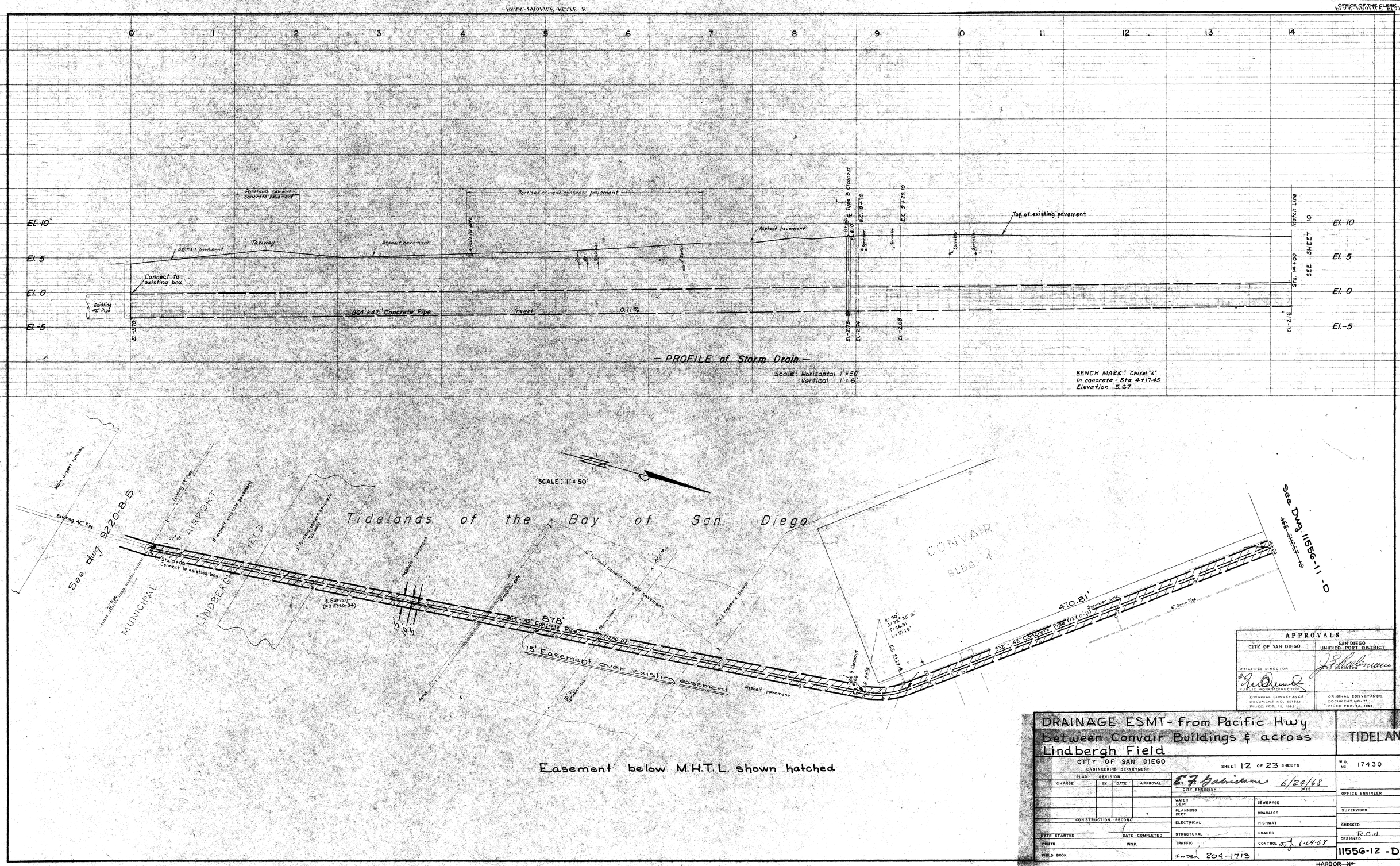

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
UTILITIES DIRECTOR	CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 601833 FILED FEB. 13, 1963	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 12, 1963

DRAINAGE ESMT - from Pacific Hwy between Convair Buildings & across Lindbergh Field

TIDELANDS

CITY OF SAN DIEGO
ENGINEERING DEPARTMENT

SHEET 12 OF 23 SHEETS

W.O. № 17430

PLAN REVISION				
CHANGE	BY	DATE	APPROVAL	

E. F. Gabrielsen 6/24/68
CITY ENGINEER DATE

OFFICE ENGINEER

SUPERVISOR

CHECKED

DESIGNED R.C.d

CONSTRUCTION RECORD
DATE STARTED DATE COMPLETED
CONTR. INSP.
FIELD BOOK

WATER DEPT.	SEWERAGE
PLANNING DEPT.	DRAINAGE
ELECTRICAL	HIGHWAY
STRUCTURAL	GRADES
TRAFFIC	CONTROL
INDEX 209-1713	

11556-12-D

~~HARBOR №~~
Rel City Dwg 2755-D

020794

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3388
FILED JUN 28 1968
MICROFILM No. 31
OFFICE OF THE CLERK

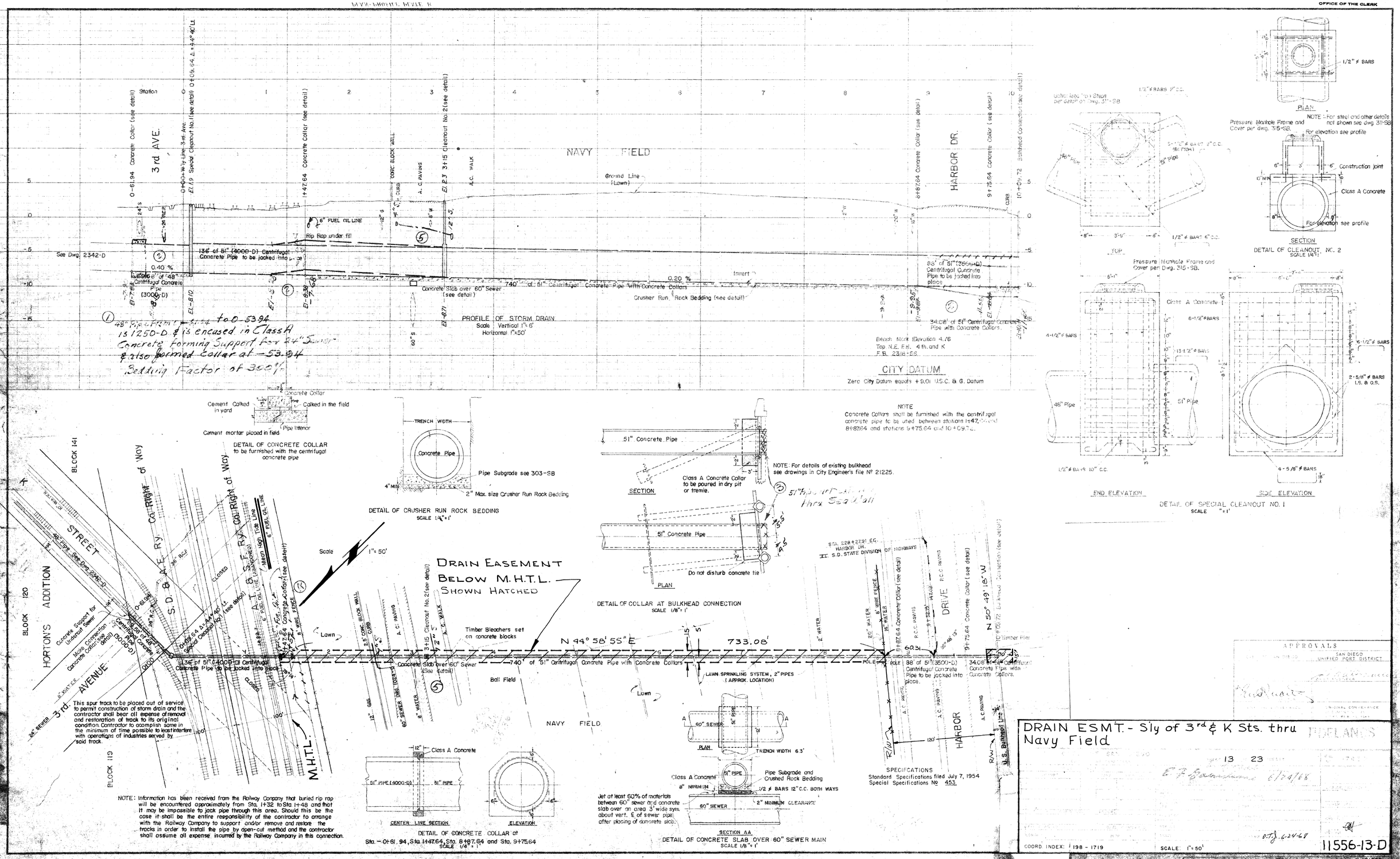

020795

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 31
OFFICE OF THE CLERK

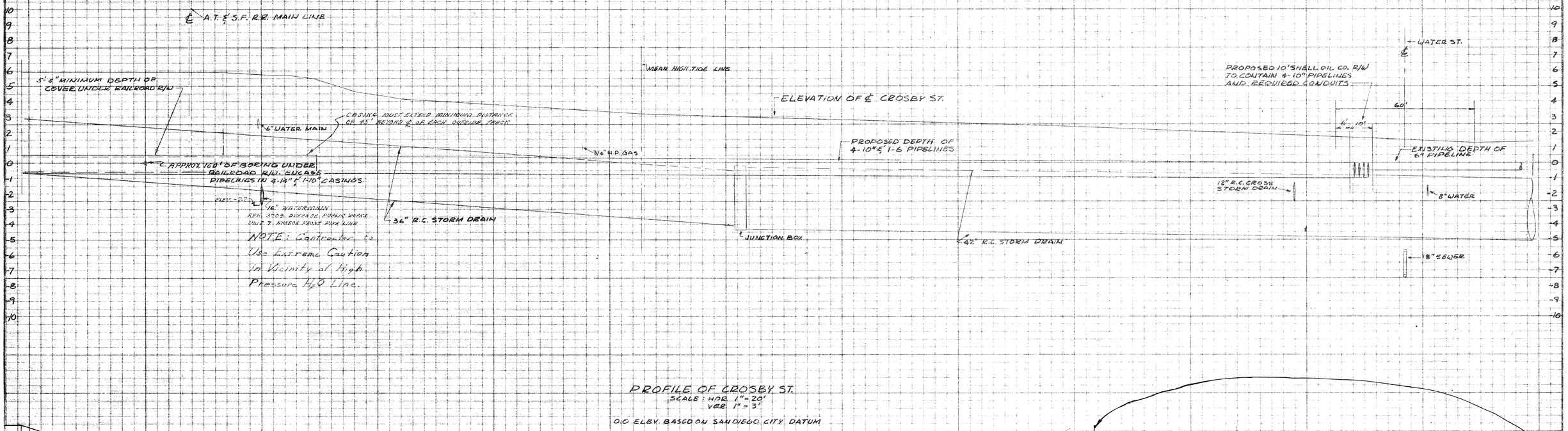

PROFILE OF CROSBY ST.
SCALE: HOR. 1" = 20'
VER. 1" = 3'
0.0 ELEV. BASED ON SAN DIEGO CITY DATUM

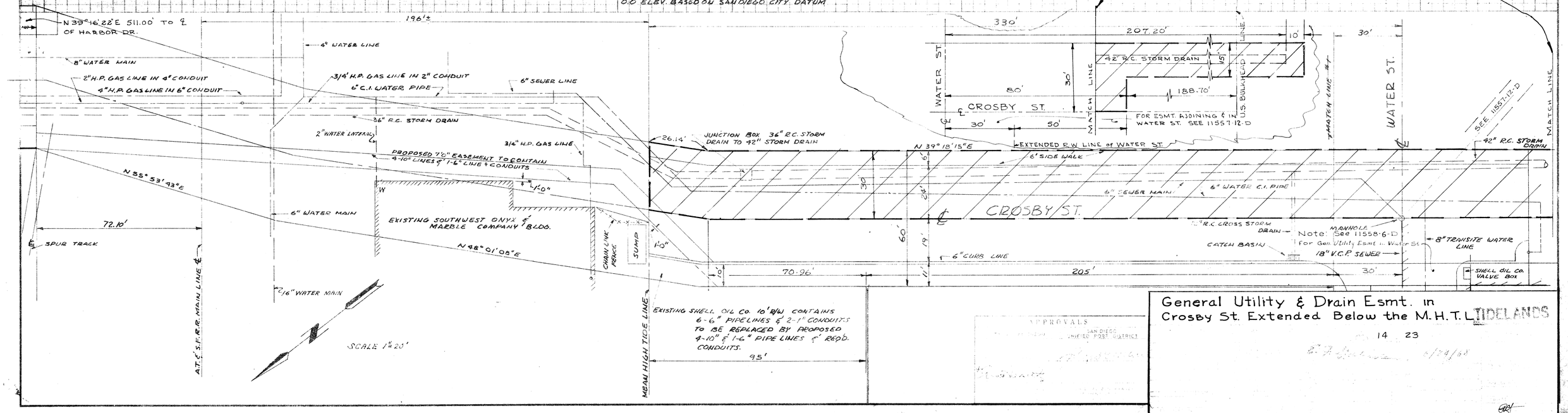

APPROVALS
SAN DIEGO UNIFIED PORT DISTRICT

General Utility & Drain Esmt. in Crosby St. Extended Below the M.H.T.L. TIDELANDS

14 23

E.A. Lewis 6/24/68

OJB 6-24-68

COORD. INDEX 192-1743 SCALE 1" = 20'

11556-14-D

REF 7811-D

020796

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No.
OFFICE OF THE CLERK

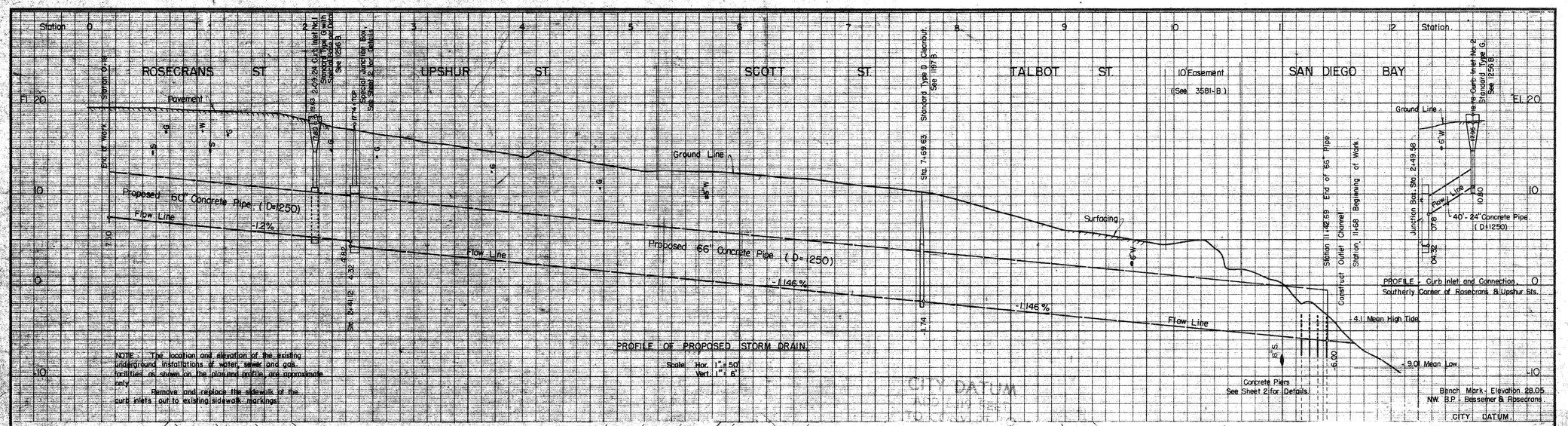

020797

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1966
MICROFILM NO. 21
OFFICE OF THE CLERK

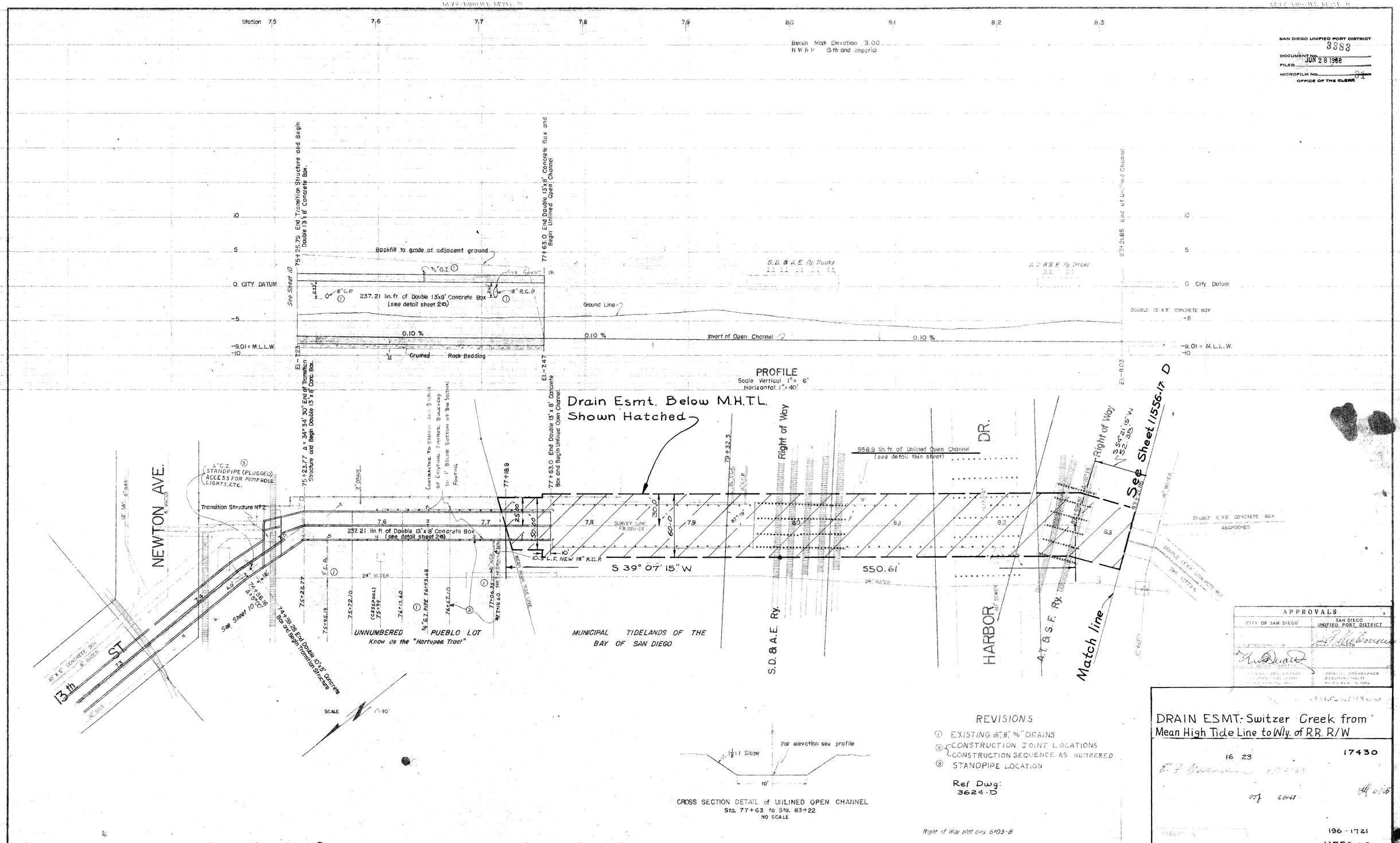

CROSS SECTION DETAIL of UNLINED OPEN CHANNEL
Sta. 77+63 to Sta. 83+22
NO SCALE

REVISIONS
1. EXISTING 18", 8", 3/4" DRAINS
2. CONSTRUCTION JOINT LOCATIONS
CONSTRUCTION SEQUENCE AS NUMBERED
3. STANDPIPE LOCATION

Ref Dwg: 3624-D

Right of Way plot dwg. 6103-B

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
CHIEF ENGINEER	CHIEF ENGINEER
ORIGINAL COVEL FILE DOCUMENT NO. 10383 FILED FEB. 16, 1961	ORIGINAL CONVEYANCE DOCUMENT NO. 21 FILED FEB. 9, 1962

DRAIN ESMT.- Switzer Creek from Mean High Tide Line to Wly. of R.R. R/W

16 23 17430

196 - 1721

11556-16 -

CONSTRUCTION RECORD	W.O. No. 21269
CONTRACTOR A.P. Van Valkenburgh Co.	ENGINEER Walker & Parsons
DATE STARTED 9-24-57	DATE 4-15-59
DATE COMPLETED 10-21-58	AS BUILT - 6-15-59

020798

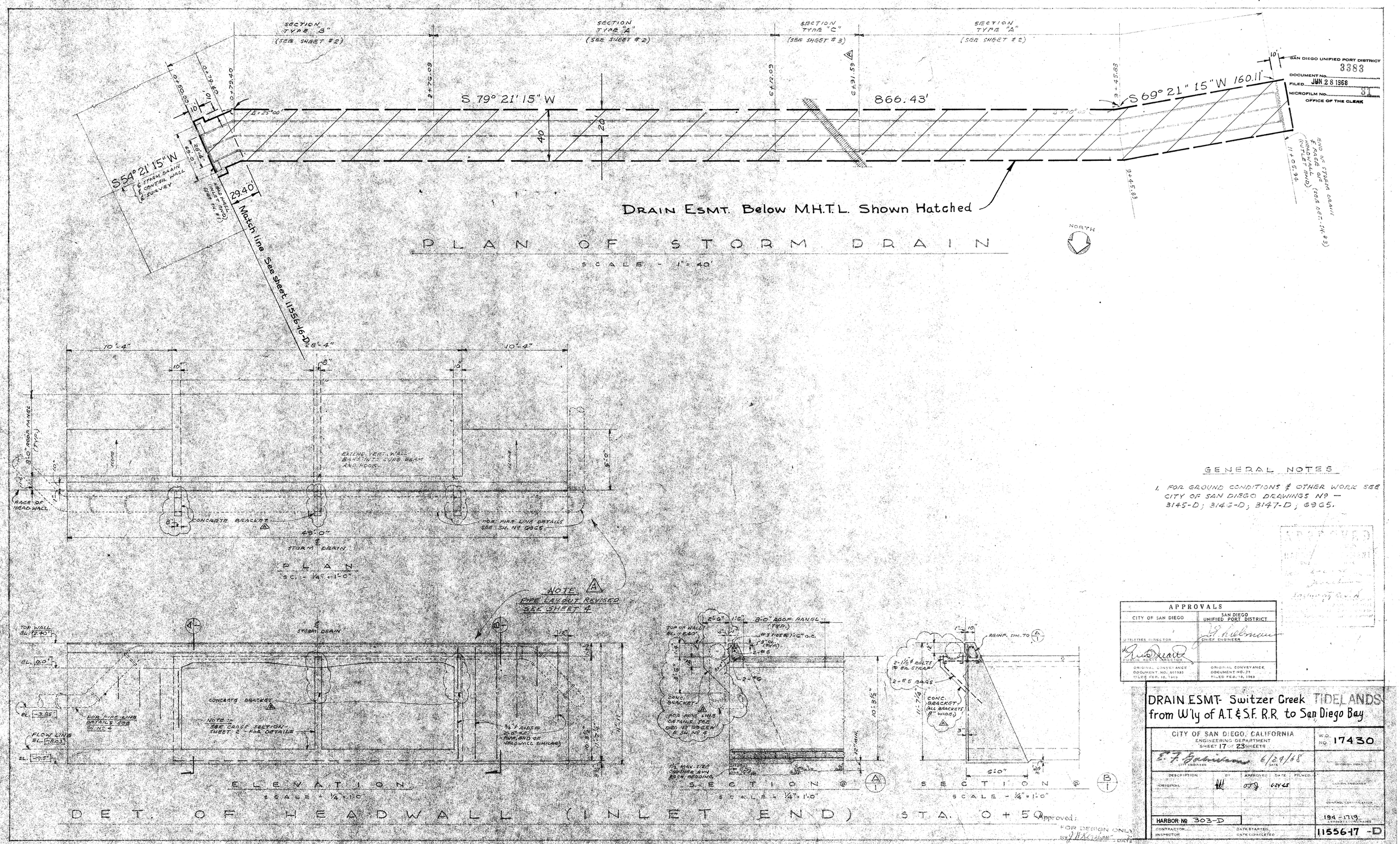
SECTION TYPE "B" (SEE SHEET #2)
SECTION TYPE "A" (SEE SHEET #2)
SECTION TYPE "C" (SEE SHEET #3)
SECTION TYPE "A" (SEE SHEET #2)
S 79° 21' 15" W
866.43'
S 69° 21' 15" W 160.11'
S 54° 21' 15" W
& STORM DRAIN & CONTROL WALL & SURVEY
Match line See sheet 11556-D
DRAIN ESMT. Below M.H.T.L. Shown Hatched
NORTH
PLAN OF STORM DRAIN
SCALE - 1" = 40'
SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 37
OFFICE OF THE CLERK
8'-0" ROOF PANEL (TYP.)
EXTEND VERT. WALL BARS INTO CURB BEAM AND HOOK
FACE OF HEADWALL
CONCRETE BRACKET
FOR PIPE LINE DETAILS SEE SH. No 6965
STORM DRAIN
PLAN
S.C. - 1/4" = 1'-0"
NOTE A
PIPE LAYOUT REVISED SEE SHEET 4
TOP WALL EL. 12.40'
EL. 9.0'
EL. -3.85'
FLOW LINE EL. -8.63'
EL. -9.5'
CONCRETE BRACKET
NOTE - SEE CROSS SECTION SHEET 2 - FOR DETAILS
3/4" ROLLER 24" O.C. (TOP END OF HEADWALL SIMILAR)
ELEVATION
SCALE - 1/4" = 1'-0"
8'-0" ROOF PANEL (TYP.)
#3 TIES @ 12" O.C.
2-#6
CONC. BRACKET
FOR PIPE LINE DETAILS SEE DRG. No 6965 SH. No 4
1½" MAX. FILL CAUTHER BUN FOR BEDDING
SECTION @ A/1
RAINP. SIM. TO A/1
2-1½" ϕ BOLTS @ EA. STRAP
2-#5 BARS
CONC. BRACKET (ALL BRACKETS 8" WIDE)
SECTION @ B/1
SCALE - 1/4" = 1'-0"
DET. OF HEADWALL (INLET END) STA. 0 + 50
Approved: FOR DESIGN ONLY
GENERAL NOTES
1. FOR GROUND CONDITIONS & OTHER WORK SEE CITY OF SAN DIEGO DRAWINGS No — 3145-D; 3146-D; 3147-D; 6965.
APPROVAL
APPROVALS
CITY OF SAN DIEGO
SAN DIEGO UNIFIED PORT DISTRICT
UTILITIES DIRECTOR
CHIEF ENGINEER
PUBLIC WORKS DIRECTOR
ORIGINAL CONVEYANCE DOCUMENT NO. 561933 FILED FEB. 12, 1963
ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 12, 1963
DRAIN ESMT. Switzer Creek TIDELANDS from W'ly of A.T. & S.F. R.R. to San Diego Bay
CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 17 OF 23 SHEETS
W.O. No. 17430
E. F. Robinson 6/24/68
CITY ENGINEER
DIVISION HEAD
DESCRIPTION BY APPROVED DATE FILMED
ORIGINAL
DIVISION ENGINEER
CONTROL CERTIFICATION
194-1719
HARBOR No 303-D
CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED
1155647-D

020799

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 34
OFFICE OF THE CLERK

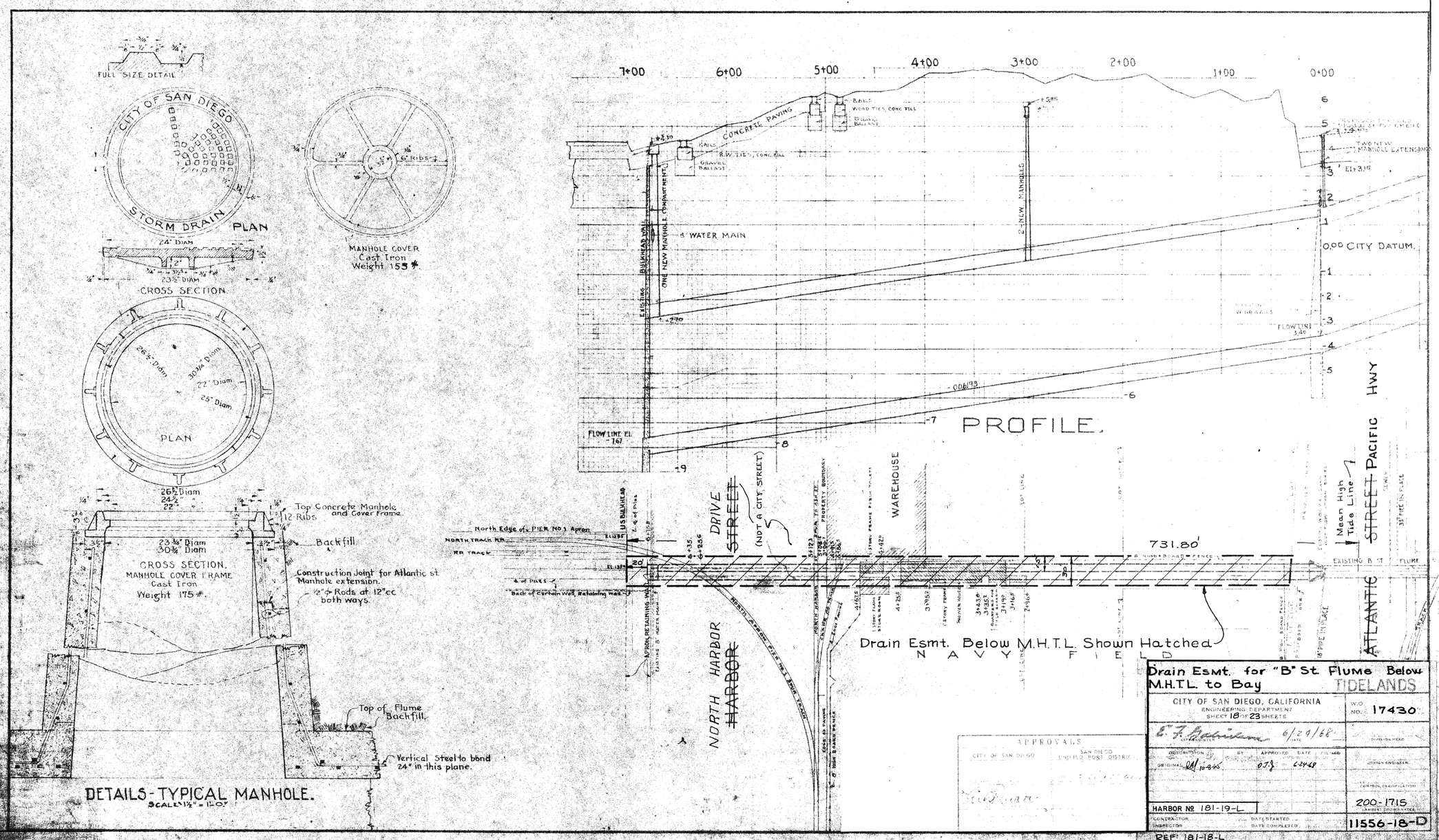

020800

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 31
OFFICE OF THE CLERK

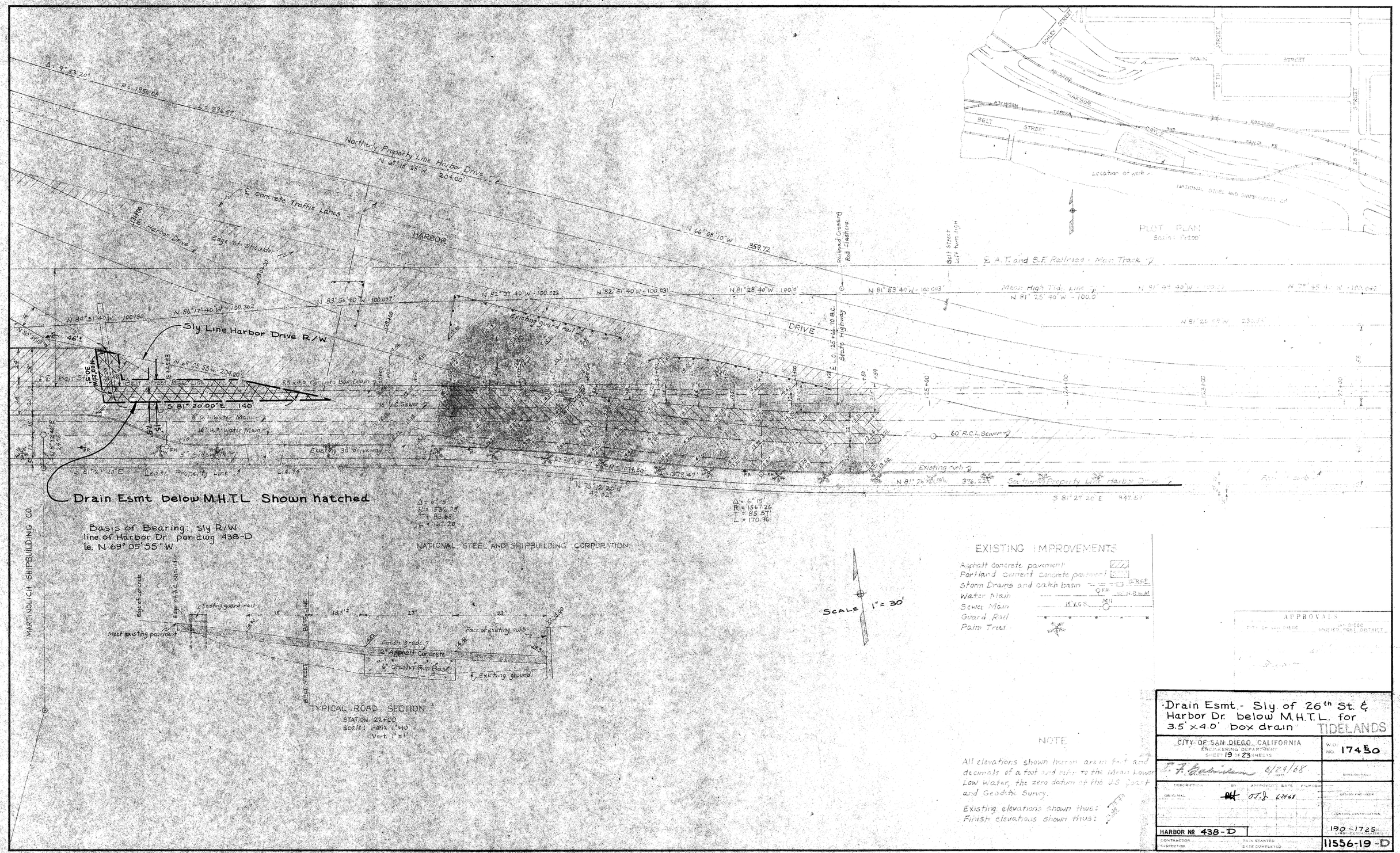

Drain Esmt.- Sly. of 26th St. & Harbor Dr. below M.H.T.L. for 3.5' x 4.0' box drain

TIDELANDS

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 19 OF 23 SHEETS

W.O. NO. 17430

T. F. Robinson 6/24/68

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL				

DRIVE-ON REAL

DESIGN ENGINEER

CONTROL CERTIFICATION

190-1725

HARBOR № 438-D

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

11556-19-D

020801

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 31
OFFICE OF THE CLERK

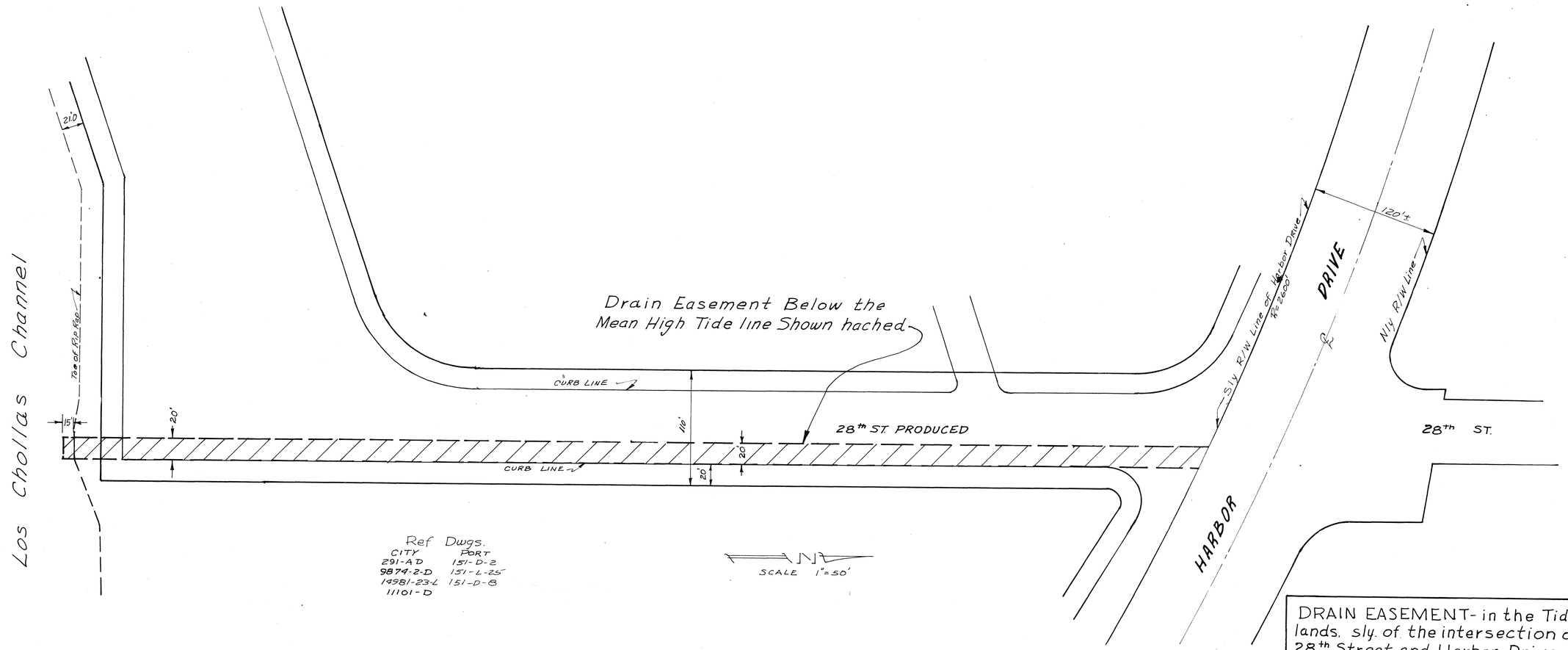

Ref Dwgs.

CITY	PORT
291-A D	151-D-2
9874-2-D	151-L-25
14981-23-L	151-D-8
11101-D	

DRAIN EASEMENT- in the Tidelands, sly. of the intersection of 28th Street and Harbor Drive

APPROVALS	
DEPARTMENTAL	ENG. DEPT. DIVISION OR SECTION
PLANNING	CONST. INSPECTION
PROPERTY	ELECTRICAL
PUBLIC WORKS	FIELD CHECK
RECREATION	GRADES AND DRAINS
UTILITIES	HIGHWAYS
	MONUMENTS
STRUCTURAL	PARKS
TRAFFIC	SEWERAGE
WATER	STREET ACTIONS

APPROVALS

CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
UTILITIES DIRECTOR	CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 69323 FILED FEB. 15, 1965	ORIGINAL CONVEYANCE DOCUMENT NO. 73 FILED FEB. 15, 1965

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 20 OF 23 SHEETS

W.O. NO. 17430

CITY ENGINEER — DATE — DIVISION HEAD

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL			6-24-68	

DESIGN ENGINEER

CONTROL CERTIFICATION

190-1727
LAMBERT COORDINATES

CONTRACTOR ..... DATE STARTED .....
INSPECTOR ..... DATE COMPLETED .....

11556-20-D

020802

NORTH HARBOR DRIVE

South property line of Harbor Drive

Existing 48" R.C.P.

Existing 30" R.C.P.

Abandoned

Sta. 387+80.93 ±

Sta. 384+62.09 B.C.

Sta. 382+89.89

S 56° 37' 58" W
166.47

S86° 26' 49" E

℄ NORTH HARBOR DRIVE

Collection along Harbor Dr.

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1969
MICROFILM NO. 34
OFFICE OF THE CLERK

SCALE 1" = 50'

Make connection

F.L. 0.32

NOT IN CONTRACT

Construct 232' ± of 48" R.C.P. storm drain

See detail of outfall

F.L. -0.14

F.L. 5.58

Construct Type D catch basin with Type S-2 grate. See Dwgs. D-12-55 D-33-59

Remove 12' of projecting rails

El. 12.0

El. 12.5

Construct 190' ± of 36" R.C.P. storm drain

C.O.

Fill joints of last four lengths of existing 36" R.C.P. on inside and where visible on outside.

Existing railroad rail outfall extends approx. 12' past end of existing 36" pipe.

Make connection

F.L. 5.36

S 48° 26' 26" W

Construct 104' ± of 36" R.C.P. storm drain

F.L. 4.46

F.L. 4.48

F.L. 4.30

∠ = 102° ±

El. 13.6

Note:
Fill will be to approx. elevations shown before start of work.

El. 13.5

S 29° 23' 34" E

Construct 298' ± of 36" R.C.P. storm drain

Make connection

Re-align last length of existing 12" R.C.P. with existing portion.

Existing 12" R.C.P.

Construct 92' ± of 12" R.C.P. storm drain

F.L. 10.10

See detail of concrete lug.

El. 14.0

See detail of outfall

El. 14.5

F.L. 3.36

San Diego Speedboat Club

INSTITUTE OF OCEANOGRAPHICAL SCIENCES

Existing concrete wall

TOWING BASIN BUILDING

Existing concrete wall

WEST BASIN

EAST BASIN

Approximate top of bank (Under construction)

Basis of Bearing: ℄ of Harbor Dr. per dwg. 204-D-1 (Harbor dwg) I.E. S86°26'49"E

Ref Dwgs:
603-D (HARBOR DWG)
17-D-114 " "
204-D-1 " "
6155-9R CITY
12125-2A-D CITY

WORK TO BE DONE

The improvement consists of the construction of a storm drain system, and the modifications as noted on the plans and specifications.

The construction of approximately 32' of 12" R.C.P., 300' of 36" R.C.P., 124' of 36" R.C.P., and 288' of 48" R.C.P. storm drain, as shown hereon.

CITY STANDARD DRAWINGS

D-12-55 Grate for storm drains and sewer manhole grates

D-33-59 Type D catch basin

All elevations shown hereon are in feet and decimals of a foot, and refer to the mean lower low water, the data datum of the U.S. Coast & Geodetic Survey.

LOCATION OF WORK

HARBOR DRIVE

WEST BASIN

EAST BASIN

HARBOR ISLAND

Bay of San Diego

LOCATION PLAN

Scale 1000' 2000' 3000' 4000' 5000'

DRAIN ESMT. - Sly of HARBOR DR. adjacent to the ENTRANCE of HARBOR ISLAND

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 21 OF 23 SHEETS

W.O. NO. 17430

CITY ENGINEER — DATE — DIVISION HEAD

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL			6-24-68	

DESIGN ENGINEER

CONTROL CERTIFICATION

204-1709
LAMBERT COORDINATES

CONTRACTOR ..... DATE STARTED .....
INSPECTOR ..... DATE COMPLETED .....

11556-21-D

APPROVALS

CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
ASSISTANT DIRECTOR	CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 1828 FILED FEB. 1963	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 13, 1963

020803

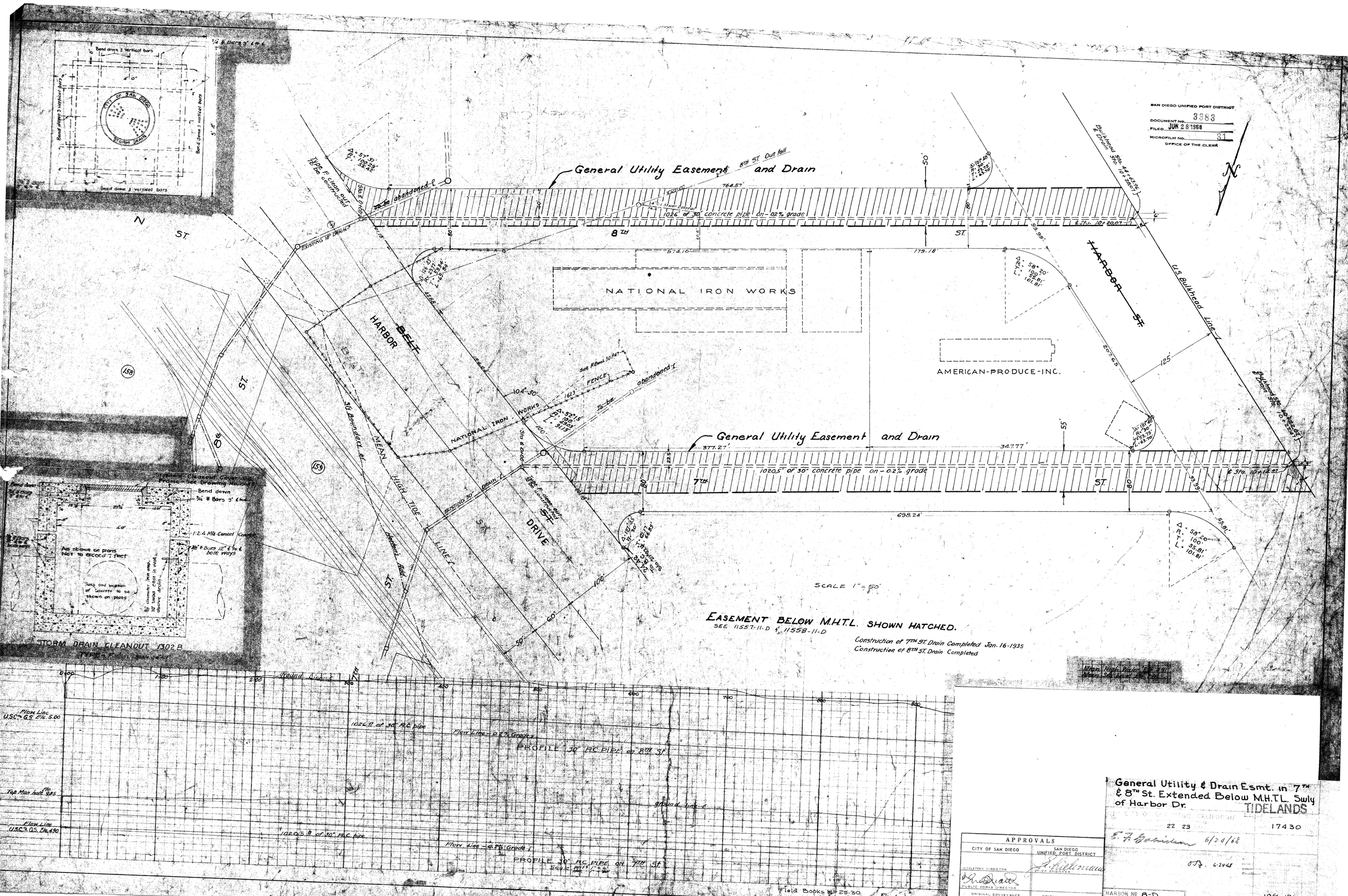
SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 31
OFFICE OF THE CLERK
General Utility Easement and Drain
8TH ST. Out fall
764.57'
1026' of 30" concrete pipe on - 0.2% grade
8TH ST.
179.18'
NATIONAL IRON WORKS
AMERICAN-PRODUCE-INC.
HARBOR ST.
U.S. Bulkhead Line
125'
207.65'
General Utility Easement and Drain
377.27'
347.77'
1020.5' of 30" concrete pipe on - 0.2% grade
7TH ST.
698.24'
N ST.
HARBOR BELT ST.
MEAN HIGH TIDE LINE
DRIVE
EXISTING 18" DRAIN
Type F clean out to be constructed
To be abandoned
FENCE
abandoned
NATIONAL IRON WORKS
EXISTING 30" DRAIN
Bulkhead Line
Bulkhead Line
Bulkhead Line
SCALE 1" = 50'
EASEMENT BELOW M.H.T.L. SHOWN HATCHED.
SEE 11557-11-D & 11558-11-D
Construction of 7TH ST. Drain Completed Jan. 16-1935
Construction of 8TH ST. Drain Completed
STORM DRAIN CLEANOUT 1302 B
TYPE F
Bend down 3 vertical bars
CITY OF SAN DIEGO
STORM DRAIN
Bend down
3/4" ø Bars 9" c to c
1:2:4 Mix Cement Concrete
As above on plans Not to exceed 7 feet
Size and location of Culverts to be shown on plans
PROFILE 30" RC PIPE on 8TH ST.
1026 ft of 30" R.C. pipe
Flow Line - 0.2% Grade
Flow Line U.S.C.&G.S. Ele. 5.00
Top Man hole Ele. 9.85
PROFILE 30" RC PIPE on 7TH ST.
1020.5 ft of 30" R.C. pipe
Flow Line - 0.2% Grade
Flow Line U.S.C.&G.S. Ele. 4.90
Field Books No. 25-30
Flowline Ele. 2.90
APPROVALS
CITY OF SAN DIEGO
SAN DIEGO UNIFIED PORT DISTRICT
UTILITIES DIRECTOR
CHIEF ENGINEER
PUBLIC WORKS DIRECTOR
ORIGINAL CONVEYANCE DOCUMENT NO. 61939 FILED FEB. 15, 1963
ORIGINAL CONVEYANCE DOCUMENT NO. FILED FEB. 13, 1963
General Utility & Drain Esmt. in 7TH & 8TH St. Extended Below M.H.T.L. Swly of Harbor Dr.
TIDELANDS
22 23
17430
6/24/68
HARBOR No 8-D
196-1719
11556-33

020804

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 31
OFFICE OF THE CLERK

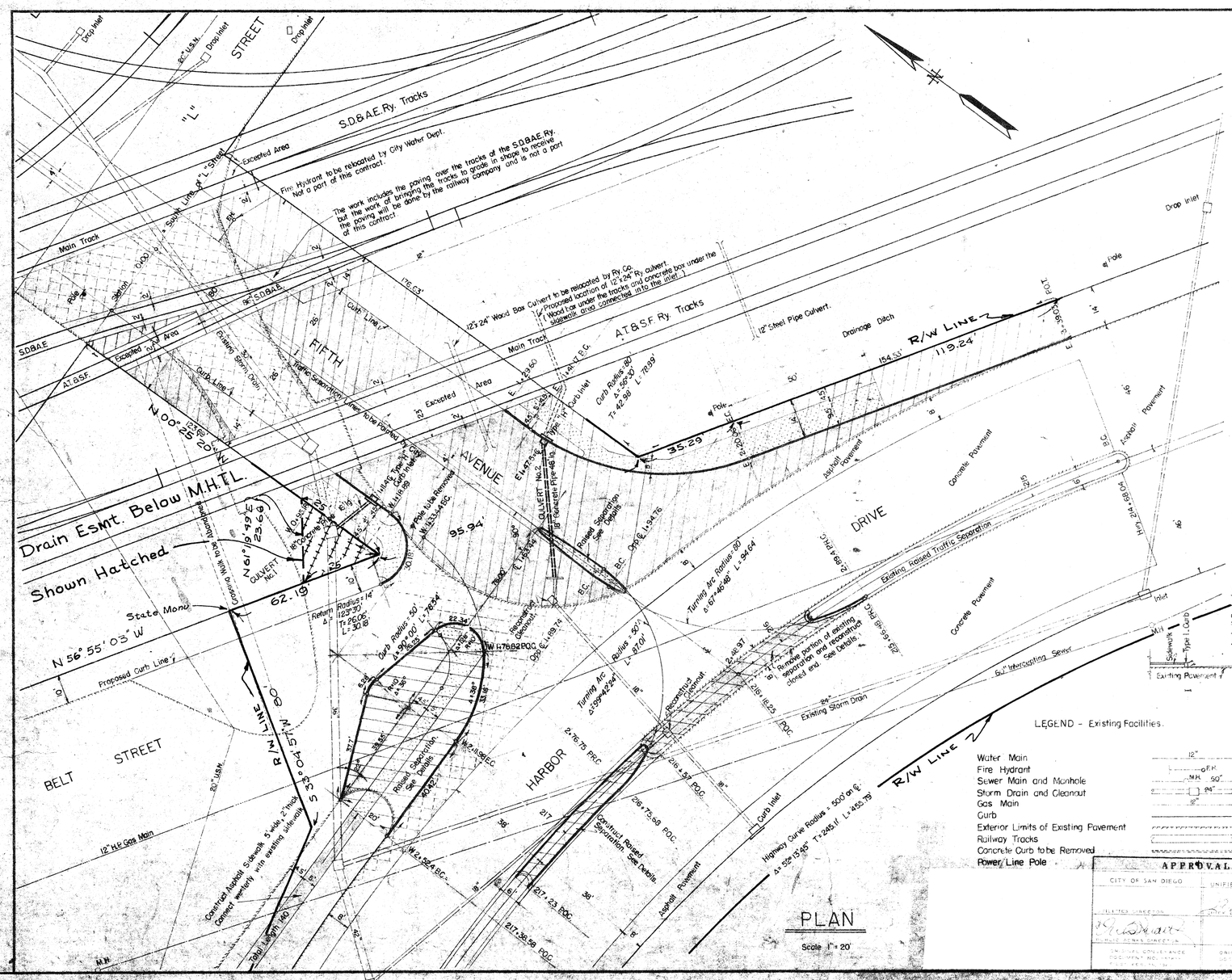
STREET
S.D.&A.E. Ry. Tracks
"L"
Excepted Area
Fire Hydrant to be relocated by City Water Dept.
Not a part of this contract.
The work includes the paving over the tracks of the S.D.&A.E. Ry.
but the work of bringing the tracks to grade in shape to receive
the paving will be done by the railway company and is not a part
of this contract.
Main Track
Drop Inlet
Drop Inlet
Drop Inlet
Drop Inlet
Curb Line
Curb Line
Curb Line

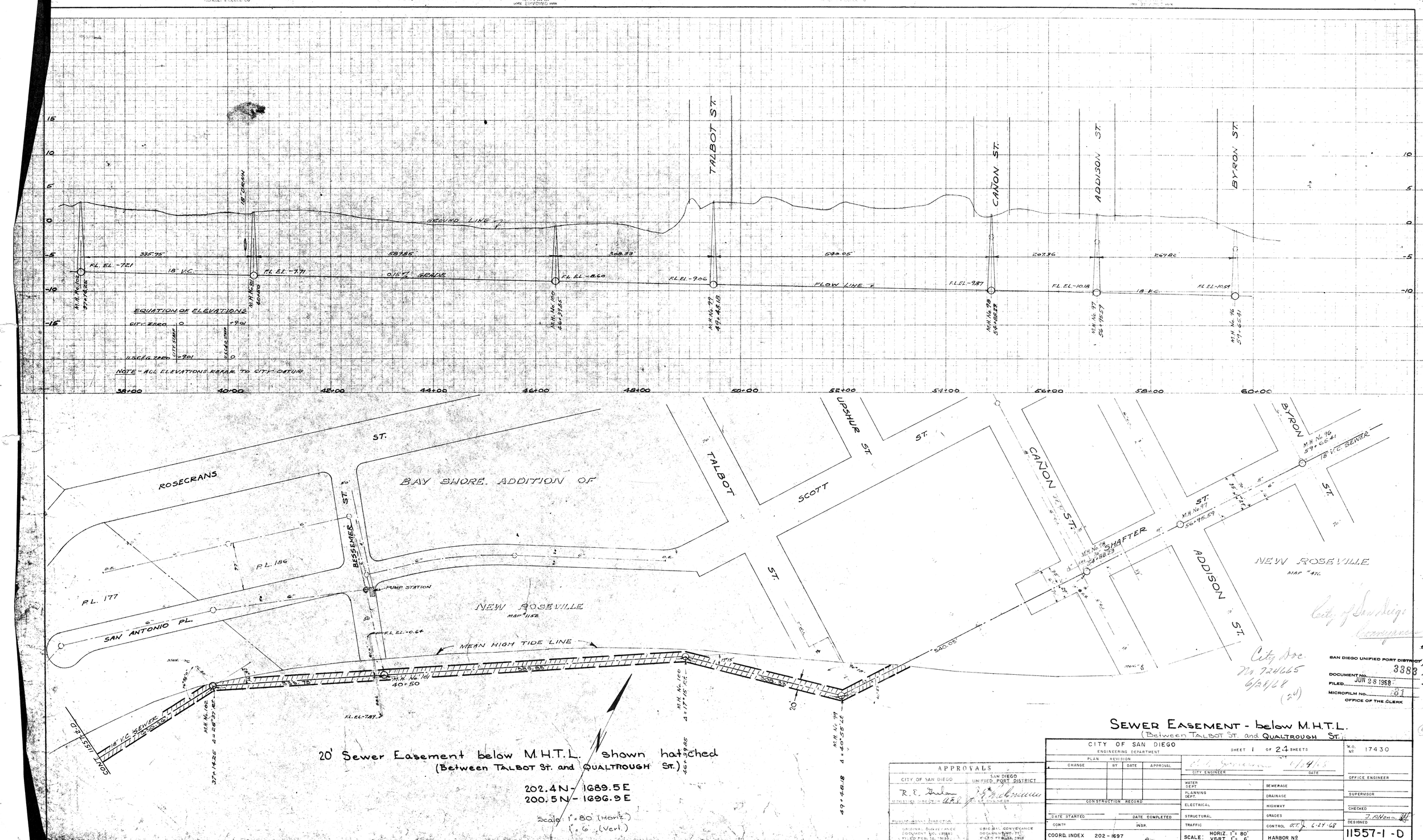
TALBOT ST.
CANON ST.
ADDISON ST.
BYRON ST.
18" CMP
GROUND LINE
335.75'
588.85'
308.33'
540.05'
207.36'
264.82'
F.L. EL. -7.21
18" V.C.
F.L. EL. -7.71
0.15% GRADE
F.L. EL. -8.60
F.L. EL. -9.06
FLOW LINE
F.L. EL. -9.87
F.L. EL. -10.18
18" V.C.
F.L. EL. -10.59
M.H. No. 102
M.H. No. 101
M.H. No. 100
M.H. No. 99
M.H. No. 98
M.H. No. 97
M.H. No. 96
EQUATION OF ELEVATIONS
CITY ZERO 0 +7.91
U.S.C.&G.SURV. -7.01 0
NOTE - ALL ELEVATIONS REFER TO CITY DATUM
38+00
40+00
42+00
44+00
46+00
48+00
50+00
52+00
54+00
56+00
58+00
60+00
ROSECRANS ST.
BAY SHORE ADDITION OF
BESSEMER ST.
P.L. 186
P.L. 177
SAN ANTONIO PL.
PUMP STATION
NEW ROSEVILLE
MAP #1152
F.L. EL. -0.64
MEAN HIGH TIDE LINE
M.H. No. 101
40+50
F.L. EL. -7.87
18" V.C. SEWER
CONT. 1557-D
M.H. No. 102
M.H. No. 100
M.H. No. 99
20'
TALBOT ST.
UPSHUR ST.
SCOTT ST.
CANON ST.
SHAFTER ST.
ADDISON ST.
BYRON ST.
NEW ROSEVILLE
MAP #476
M.H. No. 98
M.H. No. 97
M.H. No. 96
18" V.C. SEWER
City of San Diego
Company
City Doc.
No 724665
6/28/68
(24)
SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 01
OFFICE OF THE CLERK
20' Sewer Easement below M.H.T.L. shown hatched
(Between TALBOT St. and QUALTROUGH St.)
202.4N - 1689.5E
200.5N - 1696.9E
Scale 1" = 80' (Horiz.)
1" = 6' (Vert.)
SEWER EASEMENT - below M.H.T.L.
(Between TALBOT St. and QUALTROUGH St.)
APPROVALS
CITY OF SAN DIEGO
UTILITIES DIRECTOR
PUBLIC WORKS DIRECTOR
ORIGINAL SURVEYANCE DOCUMENT NO. 67383 FILED FEB. 16, 1962
SAN DIEGO UNIFIED PORT DISTRICT
CHIEF ENGINEER
ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 8, 1962
CITY OF SAN DIEGO
ENGINEERING DEPARTMENT
SHEET 1 OF 24 SHEETS
W.O. Nº 17430
PLAN REVISION
CHANGE BY DATE APPROVAL
CITY ENGINEER
DATE
OFFICE ENGINEER
WATER DEPT.
SEWERAGE
PLANNING DEPT.
DRAINAGE
SUPERVISOR
CONSTRUCTION RECORD
ELECTRICAL
HIGHWAY
CHECKED
DATE STARTED
DATE COMPLETED
STRUCTURAL
GRADES
CONTR
INSP.
TRAFFIC
CONTROL
DESIGNED
COORD. INDEX 202 - 1697
SCALE: HORIZ. 1" = 80' VERT. 1" = 6'
HARBOR Nº
11557-1-D
Ref. 981-D, Sht. 18

020806

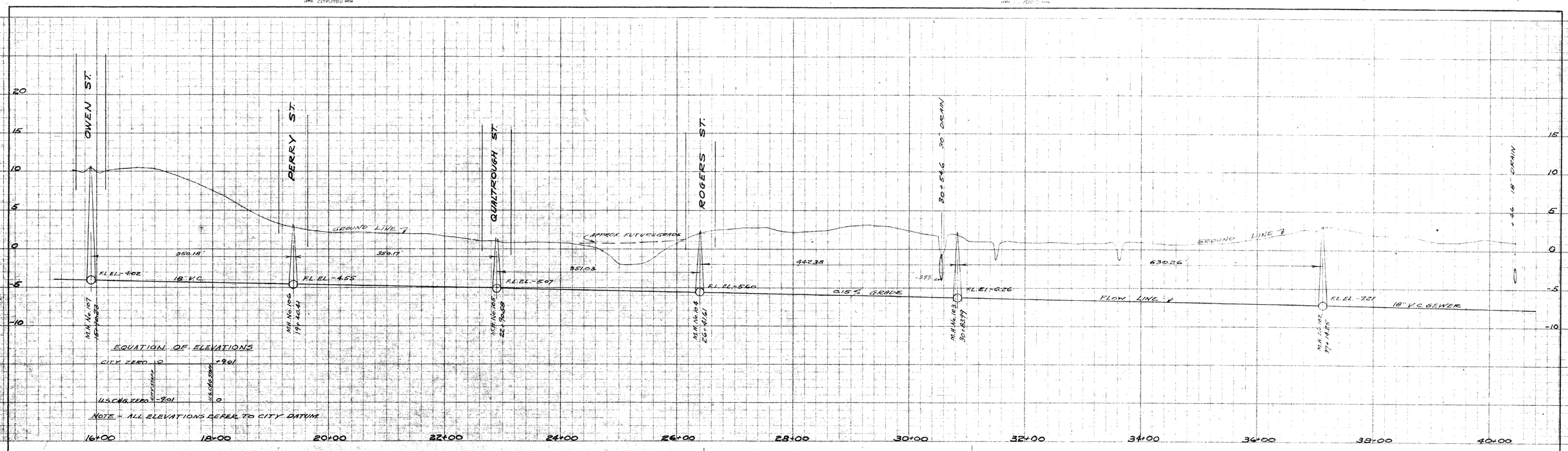

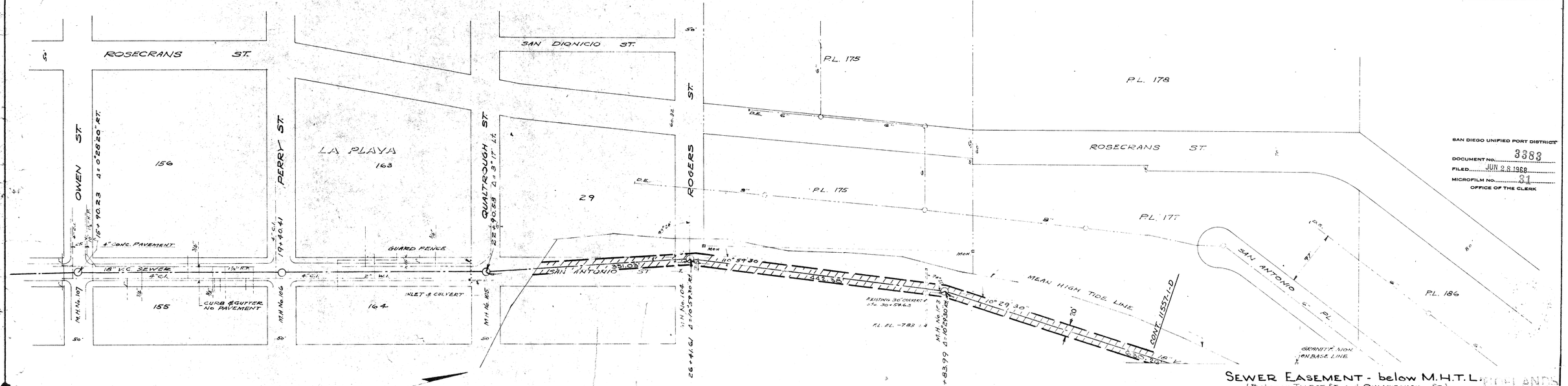

SEWER EASEMENT - below M.H.T.L.
(Between TALBOT ST. and QUALTROUGH ST.)

20' Sewer Easement below M.H.T.L. shown hatched
(Between TALBOT ST. and QUALTROUGH ST.)

202.4 N - 1689.5 E
200.5 N - 1696.9 E

Scale: 1" = 80' (Horiz)
1" = 6' (Vert.)

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R. E. Stalar	J. E. Lehmann
DIRECTOR	PORT ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 14242 FILED FEB. 14, 1962	ORIGINAL CONVEYANCE DOCUMENT NO. 14243 FILED FEB. 14, 1962

CITY OF SAN DIEGO ENGINEERING DEPARTMENT				SHEET 2 OF 24 SHEETS		W.O. No. 17430
PLAN REVISION						
CHANGE	BY	DATE	APPROVAL	CITY ENGINEER	DATE	OFFICE ENGINEER
				WATER DEPT.	SEWERAGE	
				PLANNING DEPT.	DRAINAGE	SUPERVISOR
CONSTRUCTION RECORD				ELECTRICAL	HIGHWAY	CHECKED
DATE STARTED		DATE COMPLETED		STRUCTURAL	GRADES	DESIGNED J. Pilone
CONTR.		INSP.		TRAFFIC	CONTROL 6-24-68	11557-2-D
COORD. INDEX 200-1695						

Ref. 981-D, Sht. 19

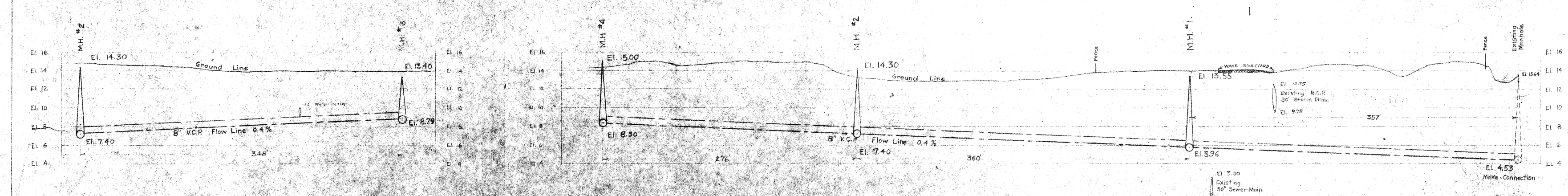

PROFILES OF SEWER

Scale: Horz. 1"=50' Vert. 1"=5'

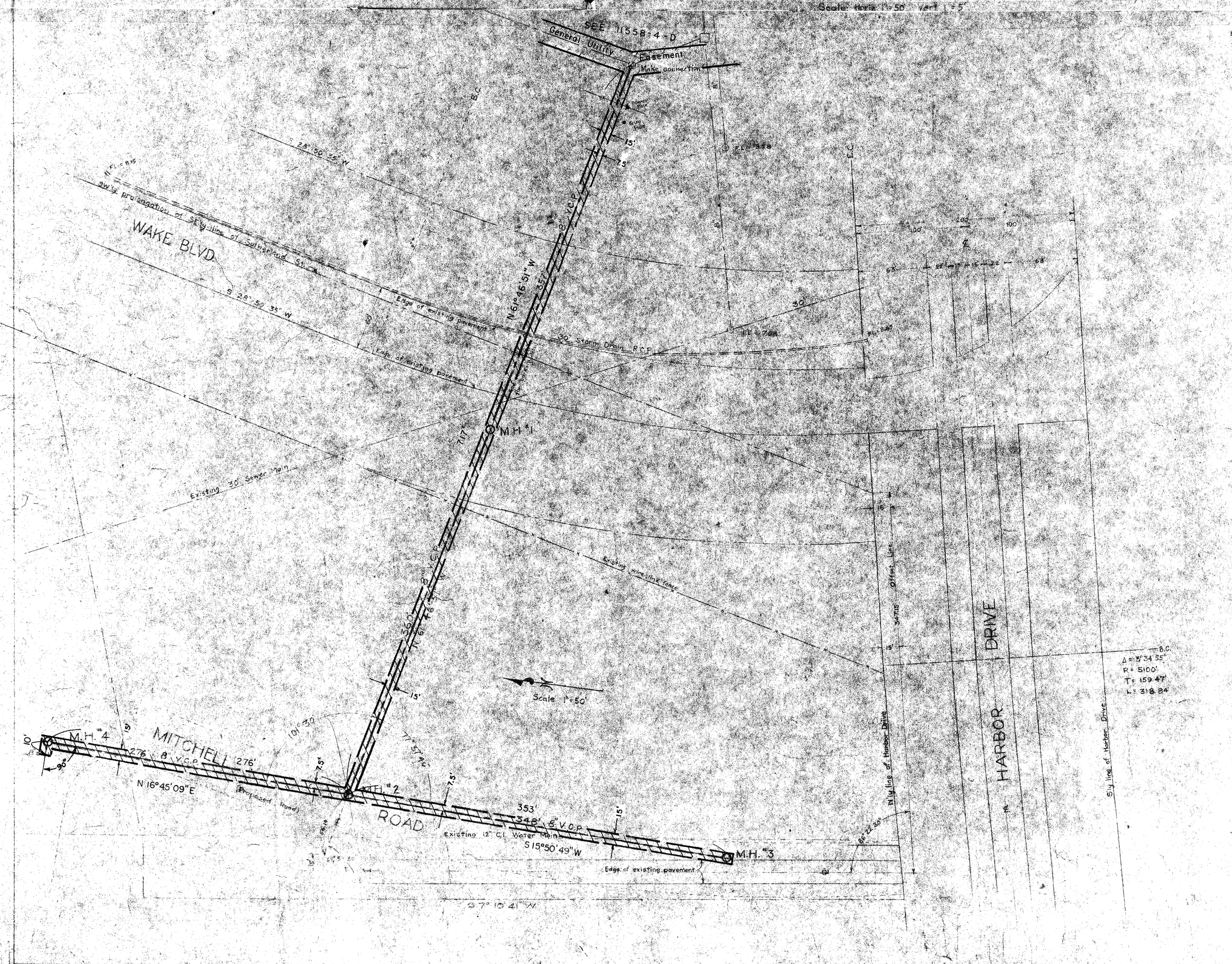

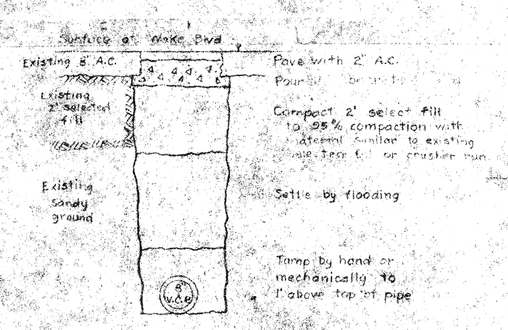

Cross section of trench crossing Wake Blvd.

Easement below M.H.T.L. shown hatched

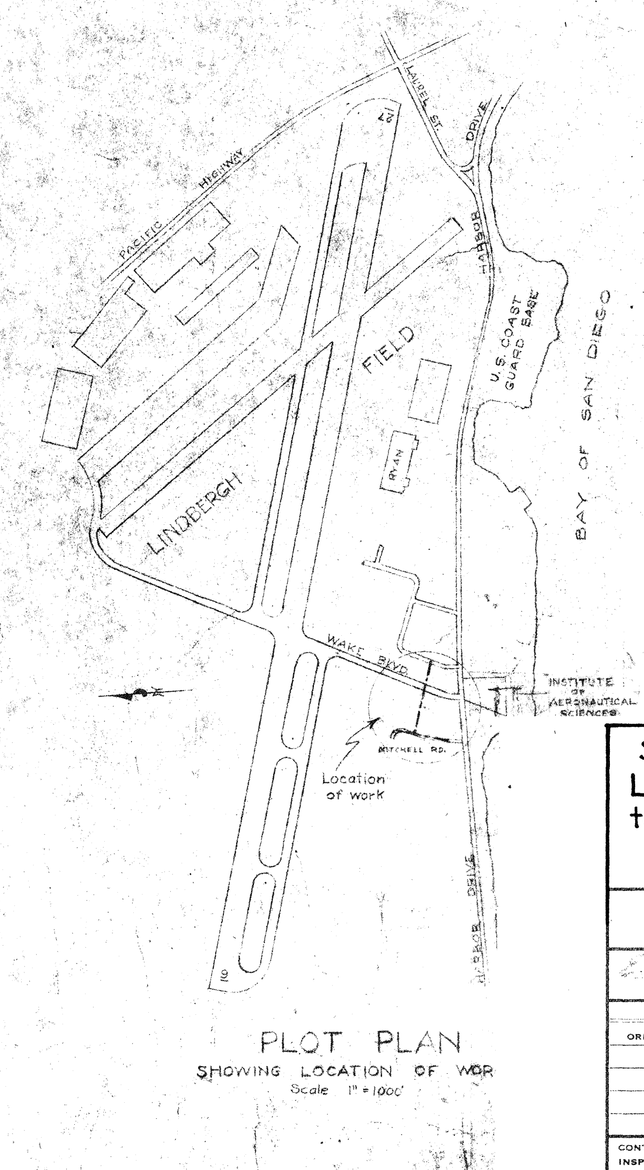

PLOT PLAN

SHOWING LOCATION OF WOR

Scale 1" = 1000'

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO.
OFFICE OF THE CLERK

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R. E. Hudson UTILITIES DIRECTOR 6-28-68	J. H. Kellemann CHIEF ENGINEER
PUBLIC WORKS INSPECTOR ORIGINAL CONVEYANCE DOCUMENT NO. 45883 FILED FEB. 17, 1953	ORIGINAL CONVEYANCE DOCUMENT NO. 11 FILED FEB. 13, 1953

SEWER ESMT. - Air freight area Lindbergh Field (E'ly of Wake Blvd to Mitchell Rd.) Below M.H.T.L.

TIDELANDS

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 3 OF 24 SHEETS

W.O. NO. 17430

CITY ENGINEER — DATE — DIVISION HEAD

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	[illegible]	[illegible]	6-28-68	

DESIGN ENGINEER

CONTROL CERTIFICATION

206-1709
LAMBERT COORDINATES

CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

11557-3 -D

HARBOR No 17-D-93

026808

See 11557-5-D

DETAIL OF CRUSHED ROCK BASE
(FOR SEWER PIPE IN MUCKY SOILS)

SECTION

ELEVATION

Length shown on plans

DETAIL OF CONCRETE ENCASEMENT

TYPICAL CROSS-SECTION OF THE ROADWAY ON THE SW'LY END OF SHELTER ISLAND, LOOKING SW'LY. AFTER PROPOSED IMPROVEMENTS

Existing water line MH #8 to MH #12

Sewer to be installed

SHELTER ISLAND DRIVE

BYRON STREET

MUNICIPAL YACHT HARBOR

General Utility Easement

Back of curb

Back of walk

EXISTING BUILDING

Sewer Easement ~ N.Ely. of N.Wly. R/W Line of Shelter Island Drive.

PIPE ALIGNMENT FOR INTAKE AND DISCHARGE
PUMP PIT #1
SCALE: 1" = 10'

NOTE: ALL EASEMENT SHOWN HATCHED.

Back of walk

Face of proposed curb

SEWER ESMT. ~ N.Wly. of N.Ely R/W of YACHT HARBOR DRIVE
PIPE ALIGNMENT FOR INTAKE AND DISCHARGE
PUMP PITS #2 & #3
SCALE: 1" = 10'

Scale 1" = 100'

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 31
OFFICE OF THE CLERK

APPROVALS

CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R. C. Snider	

SEWER EASEMENTS on SHELTER ISLAND
TIDELANDS

CITY OF SAN DIEGO
ENGINEERING DEPARTMENT

SHEET 4 OF 24 SHEETS

W.O. NO. 17430

PLAN REVISION				
CHANGE	BY	DATE	APPROVAL	

E. F. Bednarczyk 6/24/68
CITY ENGINEER — DATE

CONSTRUCTION RECORD			
DATE STARTED		DATE COMPLETED	
CONTR.		INSP.	
FIELD BOOK			

WATER DEPT.		SEWERAGE	
PLANNING DEPT.		DRAINAGE	
ELECTRICAL		HIGHWAY	
STRUCTURAL		GRADES	
TRAFFIC		CONTROL	D.J. 6-24-68
SCALE	1" = 100'	CORD. INDEX	202-1701

OFFICE ENGINEER
SUPERVISOR
CHECKED
DESIGNED
11557-4-D

HARBOR No 15-D-45, Sh 1

020809

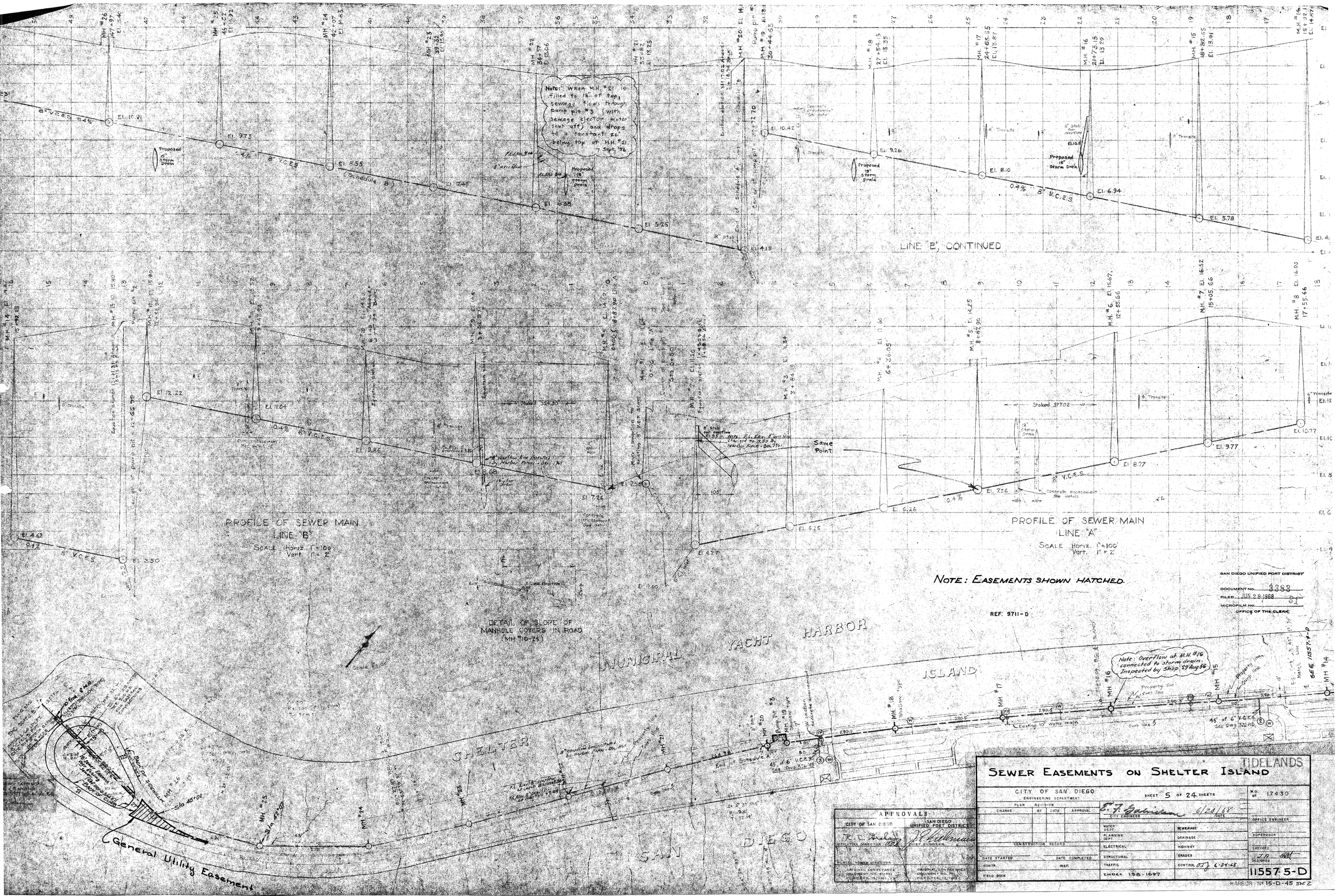
LINE "B", CONTINUED
PROFILE OF SEWER MAIN
LINE "B"
SCALE Horiz. 1"=100'
Vert. 1" = 2'
PROFILE OF SEWER MAIN
LINE "A"
SCALE Horiz. 1"=100'
Vert. 1" = 2'
Note: When M.H. #21 is filled to 18" of top, sewage flows through pump pit #3 (with sewage ejector motor shut off) and drops to a constant 26" below top of M.H. #21. 7 Sept. '56
Note: Overflow at M.H. #16 connected to storm drain. Inspected by Shop 29 Aug 56
Same Point
Staked 377.02
Staked 354.30
Proposed 15" Storm Drain
Concrete encasement See detail.
DETAIL OF SLOPE OF MANHOLE COVERS IN ROAD (MH #10-25)
MUNICIPAL YACHT HARBOR
SHELTER ISLAND
SAN DIEGO
General Utility Easement
Existing 10" Water main
45' of 6" V.C.E.S. See Dwg. 326-MB
SEE 11557-4-D
NOTE: EASEMENTS SHOWN HATCHED.
REF: 9711-D
SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No.
OFFICE OF THE CLERK
TIDELANDS
SEWER EASEMENTS ON SHELTER ISLAND
CITY OF SAN DIEGO
ENGINEERING DEPARTMENT
SHEET 5 OF 24 SHEETS
W.O. No. 17430
PLAN REVISION
CHANGE BY DATE APPROVAL
CITY ENGINEER
DATE
OFFICE ENGINEER
WATER DEPT.
SEWERAGE
PLANNING DEPT.
DRAINAGE
SUPERVISOR
CONSTRUCTION RECORD
ELECTRICAL
HIGHWAY
CHECKED
DATE STARTED
DATE COMPLETED
STRUCTURAL
GRADES
DESIGNED
CONTR.
INSP.
TRAFFIC
CONTROL
FIELD BOOK
INDEX 198-1697
11557-5-D
HARBOR No 15-D-45 Sht 2
APPROVALS
CITY OF SAN DIEGO
SAN DIEGO UNIFIED PORT DISTRICT
UTILITIES DIRECTOR
CHIEF ENGINEER
PUBLIC WORKS DIRECTOR
ORIGINAL CONVEYANCE DOCUMENT NO. 85193 FILED FEB. 15, 1961
ORIGINAL CONVEYANCE DOCUMENT NO. FILED FEB. 13, 1963

020810

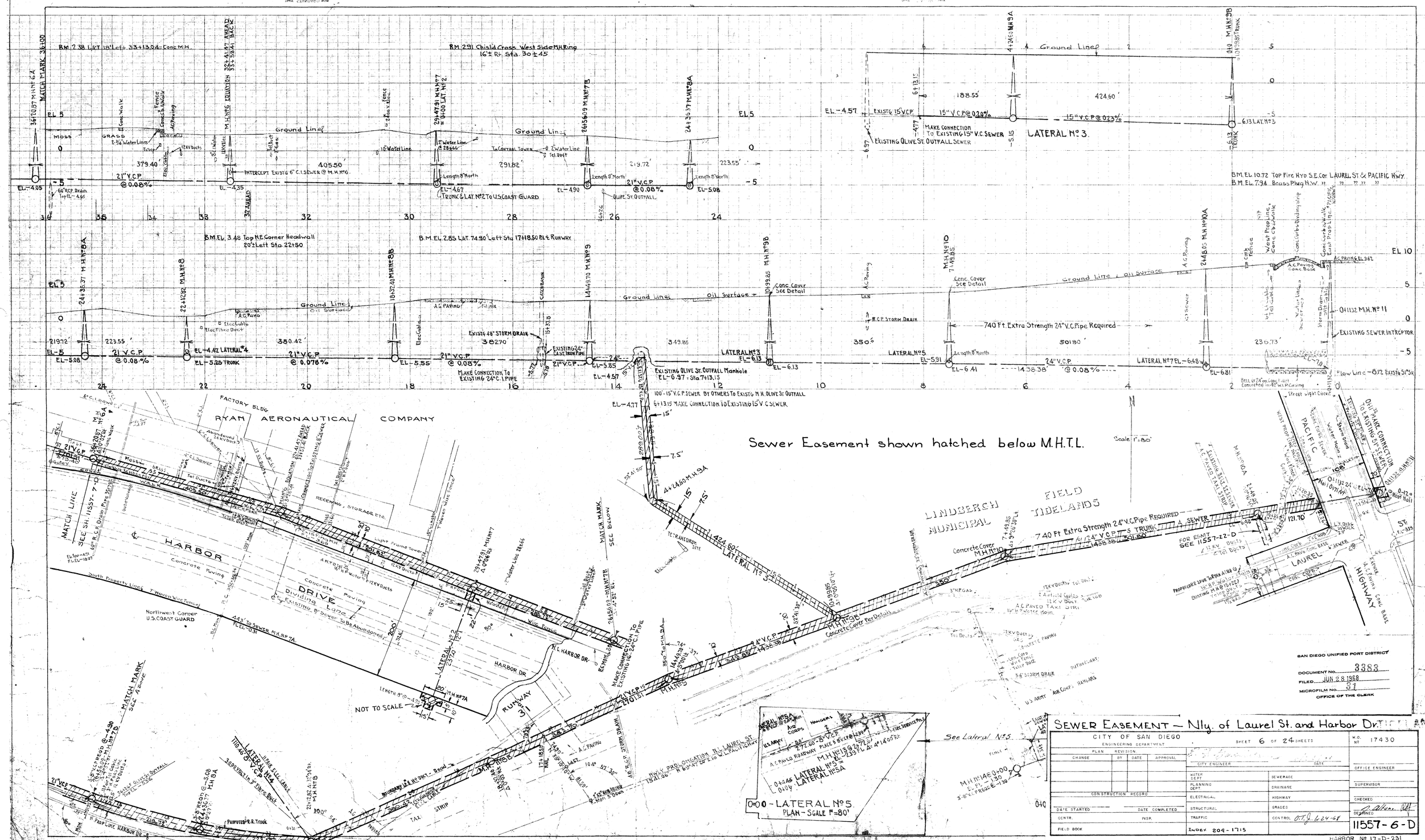
B.M. 2.38 L&T 18' Left 33+13.04 - Conc. M.H.
B.M. 2.91 Chisld Cross West Side M.H. Ring 16' ± Rt. Sta. 30 ± 45
B.M. EL. 10.72 Top Fire Hyd S.E. Cor LAUREL ST & PACIFIC HWY.
B.M. EL. 7.94 Brass Plug N.W.
B.M. EL. 3.48 Top N.E. Corner Headwall 20' Left Sta. 22+50
B.M. EL. 2.85 L&T. 74.90' Left Sta. 17+18.50 EL. RUNWAY
LATERAL No. 3.
Ground Line
Oil Surface
EXISTG 15" V.C.P.
15" V.C.P. @ 0.20%
15" V.C.P. @ 0.23%
MAKE CONNECTION TO EXISTING 15" V.C. SEWER
EXISTING OLIVE ST. OUTFALL SEWER
21" V.C.P. @ 0.08%
INTERCEPT EXISTG 6" C.I. SEWER @ M.H. No. 6
TRUNK & LAT. No. 2 TO U.S. COAST GUARD
OLIVE ST. OUTFALL
EXISTG 48" STORM DRAIN
EXISTING 24" CAST IRON PIPE
MAKE CONNECTION TO EXISTING 24" C.I. PIPE
EXISTING OLIVE ST. OUTFALL Manhole
740 Ft. Extra Strength 24" V.C. Pipe Required
EXISTING SEWER INTERCEPTOR
Flow Line - 8.12 Existg 51" Sr.
100' - 15" V.C.P. SEWER BY OTHERS TO EXISTG M.H. OLIVE ST. OUTFALL
6+13.15 MAKE CONNECTION TO EXISTING 15" V.C. SEWER
Sewer Easement shown hatched below M.H.T.L.
FACTORY BLDG.
RYAN AERONAUTICAL COMPANY
HARBOR DRIVE
Dividing Lane
Concrete Paving
Existing 8" Sewer to Be Abandoned
Northwest Corner U.S. COAST GUARD
MATCH LINE SEE SH. 11557-7-D
MATCH MARK SEE ABOVE
NOT TO SCALE
RUNWAY 31
HARBOR DR.
LINDBERGH FIELD MUNICIPAL TIDELANDS
LAUREL HIGHWAY
PACIFIC
See Lateral No. 5
LATERAL No. 5 PLAN - SCALE 1" = 80'
Scale 1" = 80'
SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 31
OFFICE OF THE CLERK
SEWER EASEMENT — Nly. of Laurel St. and Harbor Dr.
CITY OF SAN DIEGO
ENGINEERING DEPARTMENT
SHEET 6 OF 24 SHEETS
W.O. No. 17430
PLAN REVISION
CHANGE BY DATE APPROVAL
CITY ENGINEER DATE
OFFICE ENGINEER
WATER DEPT. SEWERAGE
PLANNING DEPT. DRAINAGE
SUPERVISOR
CONSTRUCTION RECORD
ELECTRICAL HIGHWAY
CHECKED
DATE STARTED DATE COMPLETED
STRUCTURAL GRADES
DESIGNED
CONTR. INSP.
TRAFFIC CONTROL
FIELD BOOK
INDEX 209-1715
11557-6-D
HARBOR No. 17-D-231

020811

B.M. EL. 5.69 on Sly Rim of Manhole 10' Rt. 57+95

M.H. No 4A — EL-0.75 — EL-0.35 — MAKE CONNECTION TO EXISTING SEWER @ — 224.28' — 8" V.C.P. @ 0.16% — 1.25 — 6" Elec. Conduits — EL-2.55 TRUNK & LAT. No 1 — M.H. No 4 — 48+10.19 — Con. Paving — HARBOR DRIVE — Con. Paving

LATERAL No. 1

16" C.I. WATER LINE

B.M. EL. 5.30 Sly Top R.R. Rail of 3 Rails Around Fire Hyd Left 48+88

B.M. EL. 3.21 Brass Plug in North Curb HARBOR DRIVE 71' Left Sta. 39+64.55 & 200' No of Mon. on S.L. HARB. DR.

Ground Line — 129' ± — 22.8 of 8" — EXISTING 8" SEWER — MAKE CONNECTION TO EXISTG SEWER LAT. "6" EL-3.21 — EL-3.71-TRUNK — M.H. No 5 40+39.27 — LATERAL No 6

60+62.12 M.H. No 1 — EL. 10 — Officers Quarters Elev. Floor = 6.21 — Building

57+95.54 M.H. No 2 — El. 5.73 Rim & Rt. Existing M.H.

M.H. No 3 55+34.53

M.H. No 3A 51+70.78

M.H. No 4A 48+10.43 — A.C. Paving — Fence

M.H. No 5A 44+24.27

M.H. No 5 40+39.27 — Con. Walk

M.H. No 6A 36+20.87 — Concrete Walk

Ground Line — Grade of Existing Sewer — Mass — Grass

EL+0.57 — 8" V.C.P. @ 0.40% — 286.58' — EL+0.58 — 261.01' — 12" V.C.P. @ 0.20% — EL-1.10 — 363.75' — 12" V.C.P. @ 0.20% — EL-1.83 — 360.35' — 4" C.I. — 8" C.I. — 12" V.C.P. @ 0.20% — EL-2.55 — 386.16 — 15" V.C.P. @ 0.15% — EL-3.13 — 385.00' — 15" V.C.P. @ 0.15% — EL-3.71 — 418.40' — 8" C.I. — 21" V.C.P. @ 0.08% — EL-4.05 — 373.40'

MATCH MARK

60 58 56 54 52 50 48 46 44 42 40 38 36

Sewer Easement shown hatched

Points on Extension to Southwest of Long Tangent on East Edge of Paving, East of Paving Case Said Tangent along Easterly boundary of Municipal Airport and Camp Sahara Westerly

Existing M.H. Rim 4.61 F.L. North 7.19 South 3.16 from Ea 6+ -1.96

Existing Boundary U.S. Marine Corps Base

Existing Manhole F.L. 0.16

Existing 8" Sewer

Manhole No 2 57+95.54 Lt. 19.99 To South of Existing M.H. Connect to Existing M.H. from Building

Manhole No 1 60+62.12

CAMP SAHARA sewage to be intercepted here.

CAMP SAHARA

Barracks — Officers — Elec. Duct — 1" HPGas — 10"-8" — 60" 286.58' — 8" V.C.P. — 1.96 — 22.8 of 8" — 24+9.8 — 2.63 — 1.11 — 1.11 — 2.63 — 15' — 15' — 15'

020812

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 31
OFFICE OF THE CLERK

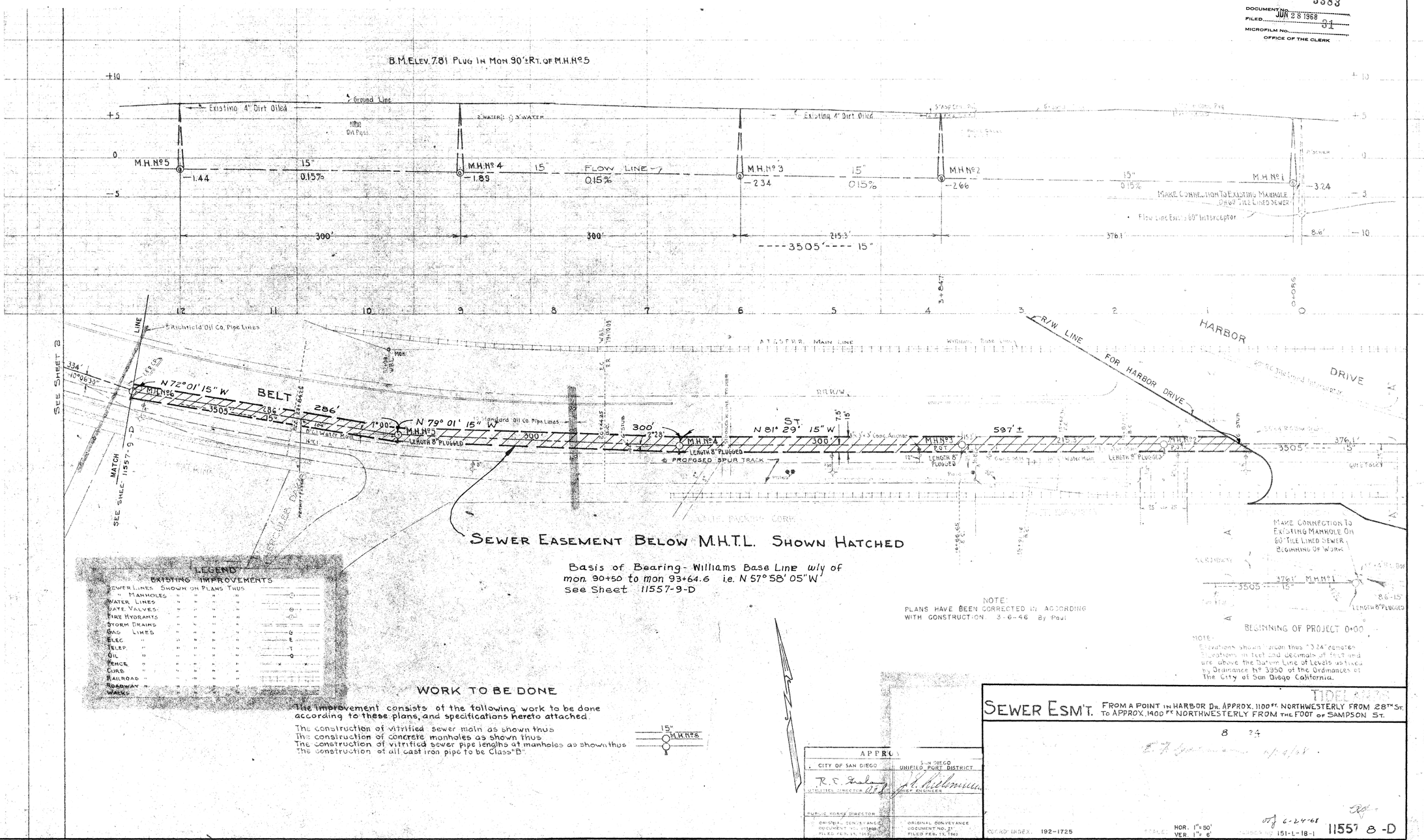

020813

Construct Storm Drain Cleanouts Typical of Drawing M.B. 174

B.M. Elev. 8.159 Plug in Mon. East of E.L. Sampson St. 65' ± Rt. of ℄

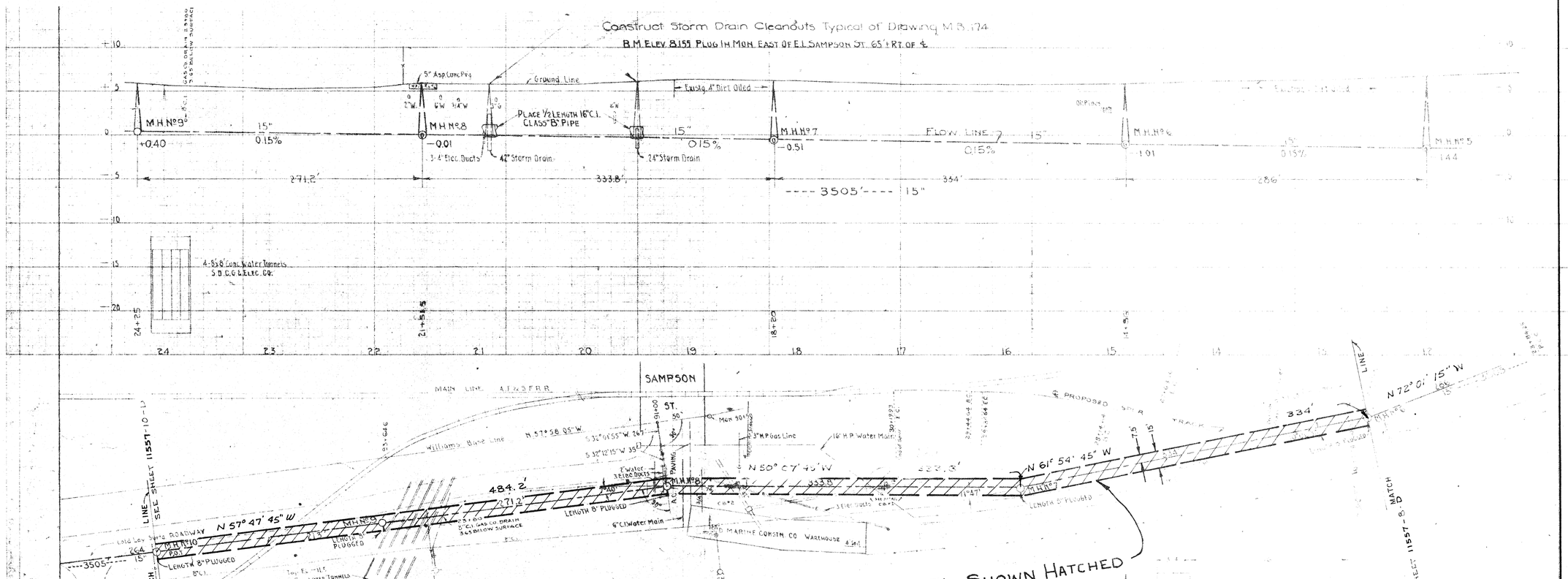

San Diego Unified Port District

Document No. 3383

Filed JUN 28 1968

Microfilm No. 32

Office of the Clerk

APPROVALS	
City of San Diego	San Diego Unified Port District
R. C. [illegible]	[illegible]

TIDELANDS

Sewer Esm't. From a point in Harbor Dr. approx. 1100 ft. northwesterly from 28th St. to approx. 1400 ft. northwesterly from the foot of Sampson St.

9 24 17430

192 - 1725

Hor. 1" = 50'
Ver. 1" = 6'

City 6-24-68

151-L-18-2 11557 9-D

020814

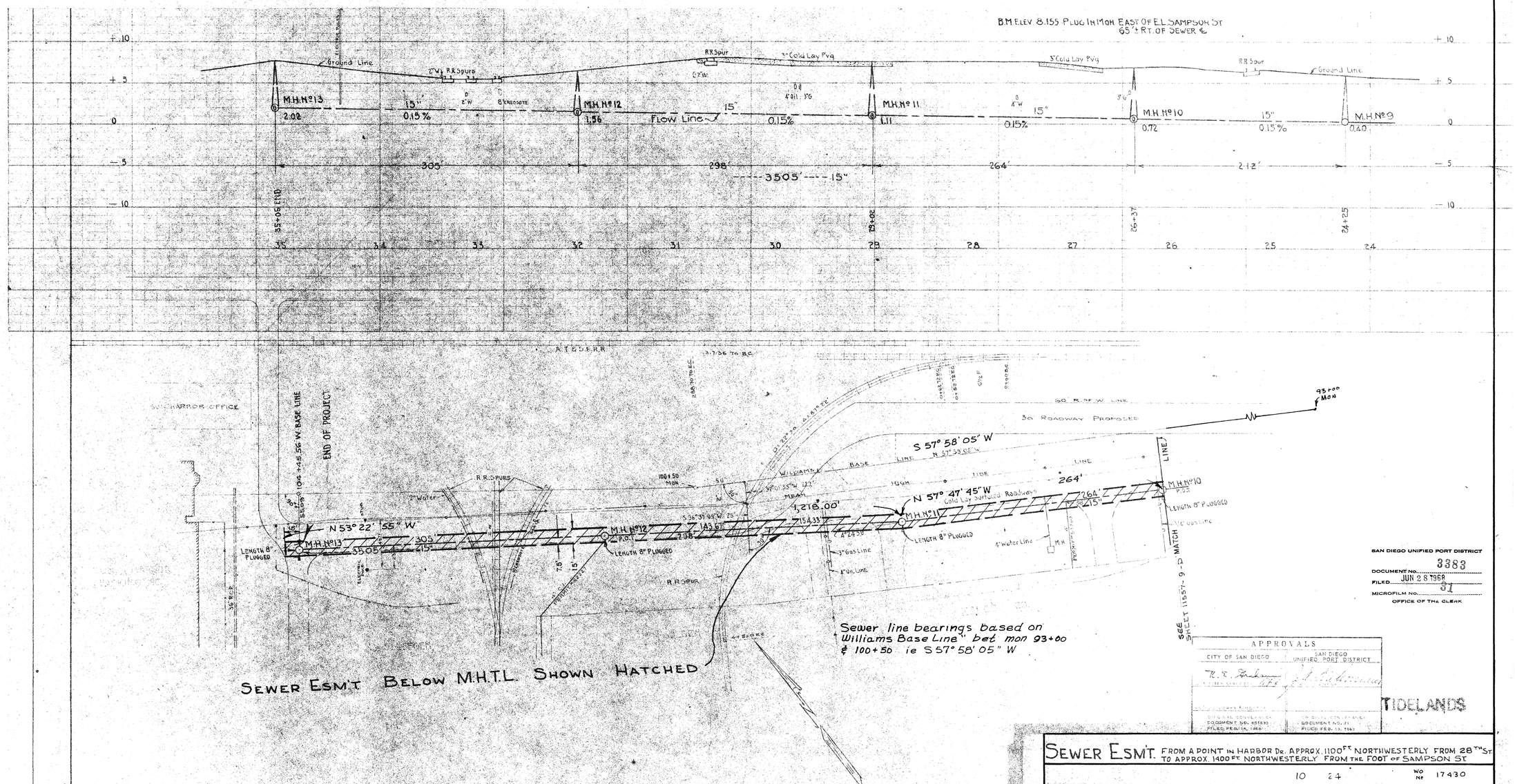

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 31
OFFICE OF THE CLERK

APPROVALS

CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT

TIDELANDS

SEWER ESM'T. FROM A POINT IN HARBOR DR. APPROX. 1100 FT NORTHWESTERLY FROM 28TH ST TO APPROX. 1400 FT NORTHWESTERLY FROM THE FOOT OF SAMPSON ST

10 24 WO No 17430

E.T. Bainiman 6/24/68

COORD. INDEX. 192-1723 SCALE HOR. 1" = 50' VER. 1" = 6' HARBOR No 151-L-18 -3 11557-10-D

020815

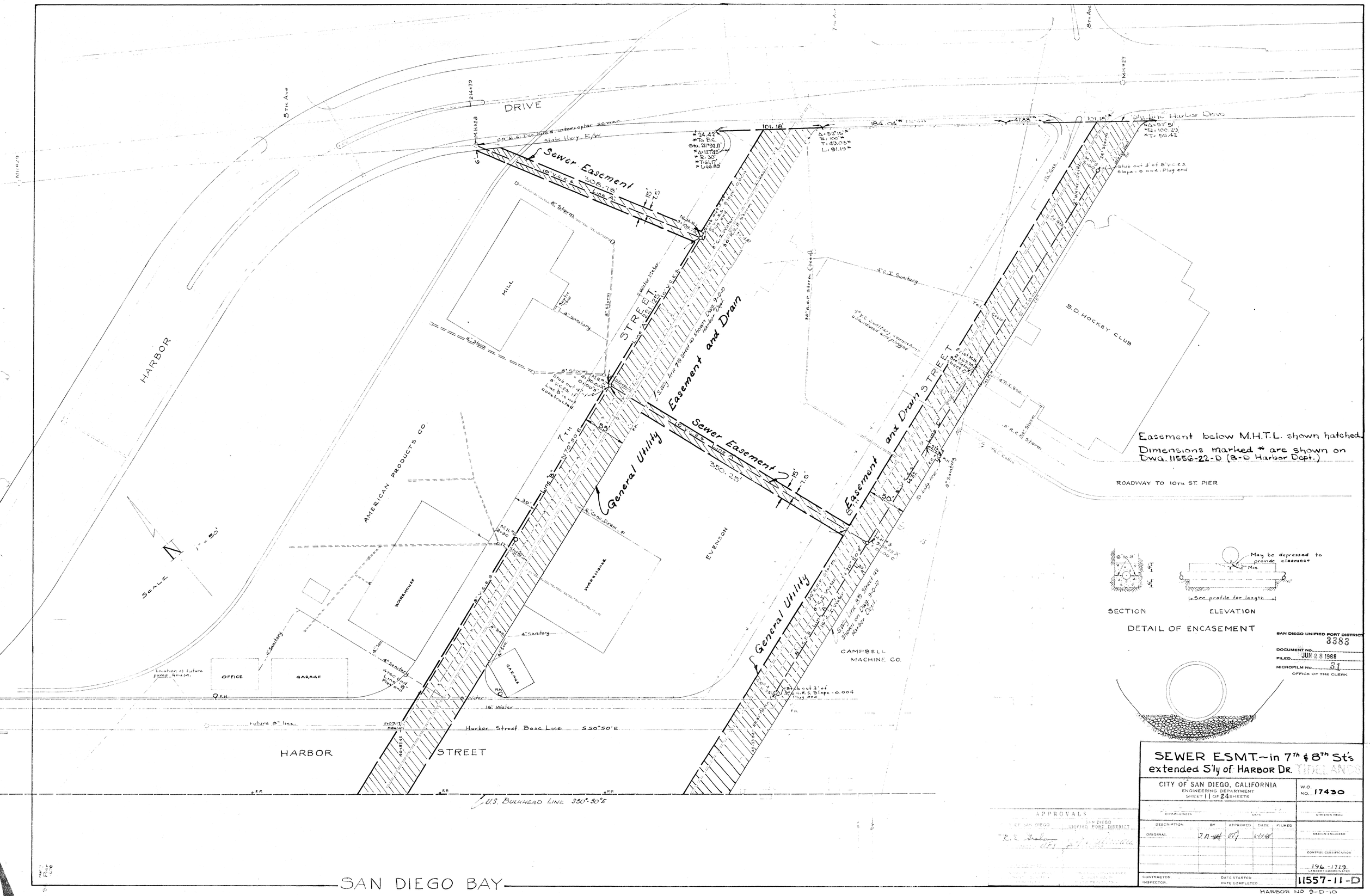
DRIVE
5TH. AVE
7TH. AVE
8TH. AVE
HARBOR
Sewer Easement
Easement and Drain
General Utility
Easement and Drain STREET
HARBOR STREET
Harbor Street Base Line S 50°50'E
U.S. BULKHEAD LINE S50°-50'E
AMERICAN PRODUCTS CO.
MILL
WAREHOUSE
OFFICE
GARAGE
EVERSON
CAMPBELL MACHINE CO.
S.D. HOCKEY CLUB
ROADWAY TO 10TH. ST. PIER
SAN DIEGO BAY
SCALE 1" = 50'
Easement below M.H.T.L. shown hatched.
Dimensions marked * are shown on DWG. 11556-22-D (B-D Harbor Dept.)
SECTION
ELEVATION
DETAIL OF ENCASEMENT
SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 31
OFFICE OF THE CLERK
SEWER ESMT.~in 7TH & 8TH St's extended S'ly of HARBOR DR.
CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 11 OF 24 SHEETS
W.O. NO. 17430
DESCRIPTION
BY
APPROVED
DATE
FILMED
ORIGINAL
APPROVALS
11557-11-D
HARBOR NO 9-D-10

020816

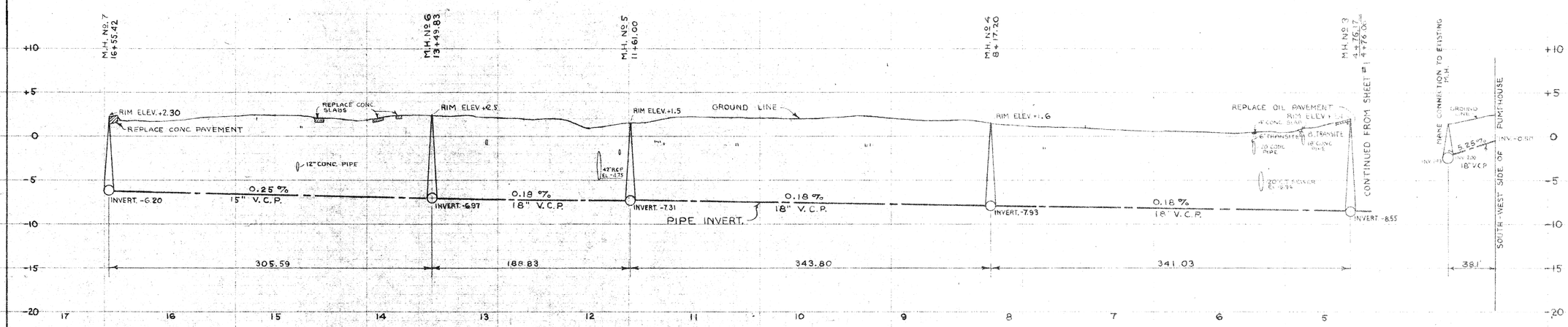

GRAVITY SECTION

OVERFLOW

(SEE SHEET # 1)

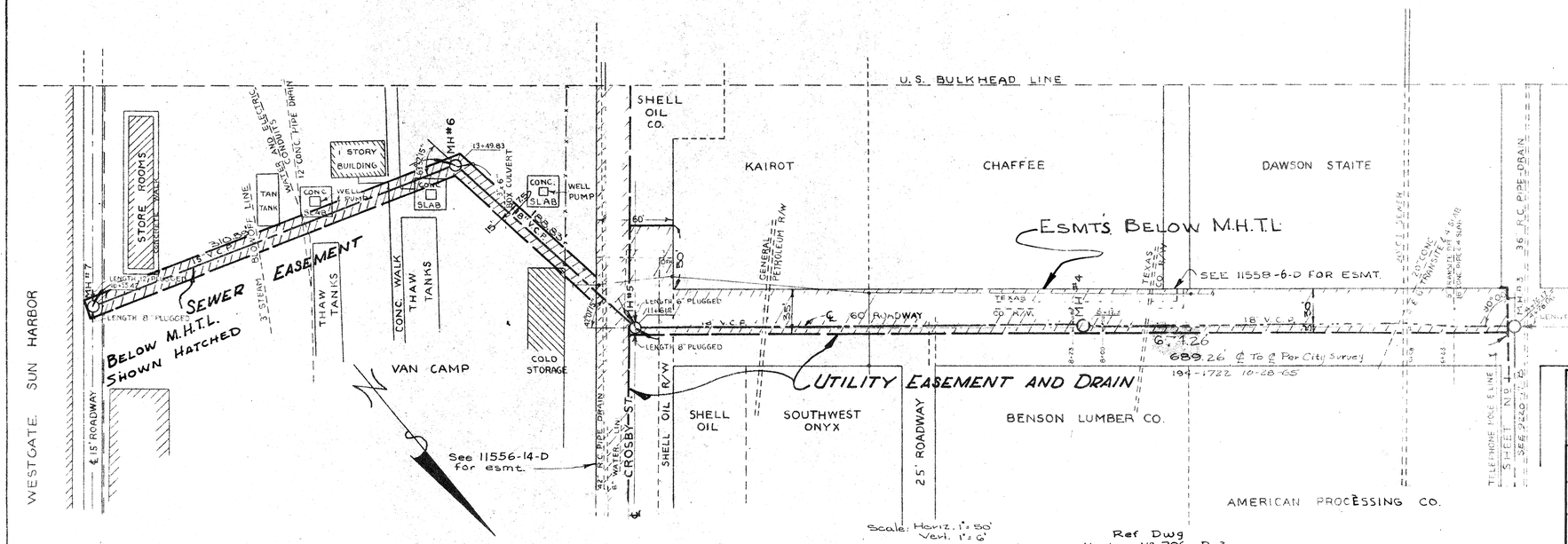

Scale: Horiz. 1" = 50'
Vert. 1" = 6'

Ref. Dwg
Harbor No 206-D-2

NOTE: ALL ELEVATIONS ARE ON CITY DATUM. M.L.L.W. = -9.01

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 31
OFFICE OF THE CLERK

APPROVALS
CITY OF SAN DIEGO
SAN DIEGO UNIFIED PORT DISTRICT

SEWER ESMT. - S'ely of Crosby St. & Water St (Not City Streets) in the TIDELANDS

CITY OF SAN DIEGO, CALIFORNIA ENGINEERING DEPARTMENT SHEET 12 OF 24 SHEETS	W.O. NO. 17430
CITY ENGINEER / DATE	DIVISION HEAD
DESCRIPTION / BY / APPROVED / DATE / FILMED ORIGINAL / J.A.Bell / DJ / 6-28-68	DESIGN ENGINEER
	CONTROL CERTIFICATION 194-1723
CONTRACTOR / DATE STARTED INSPECTOR / DATE COMPLETED	11557-12-D

020817

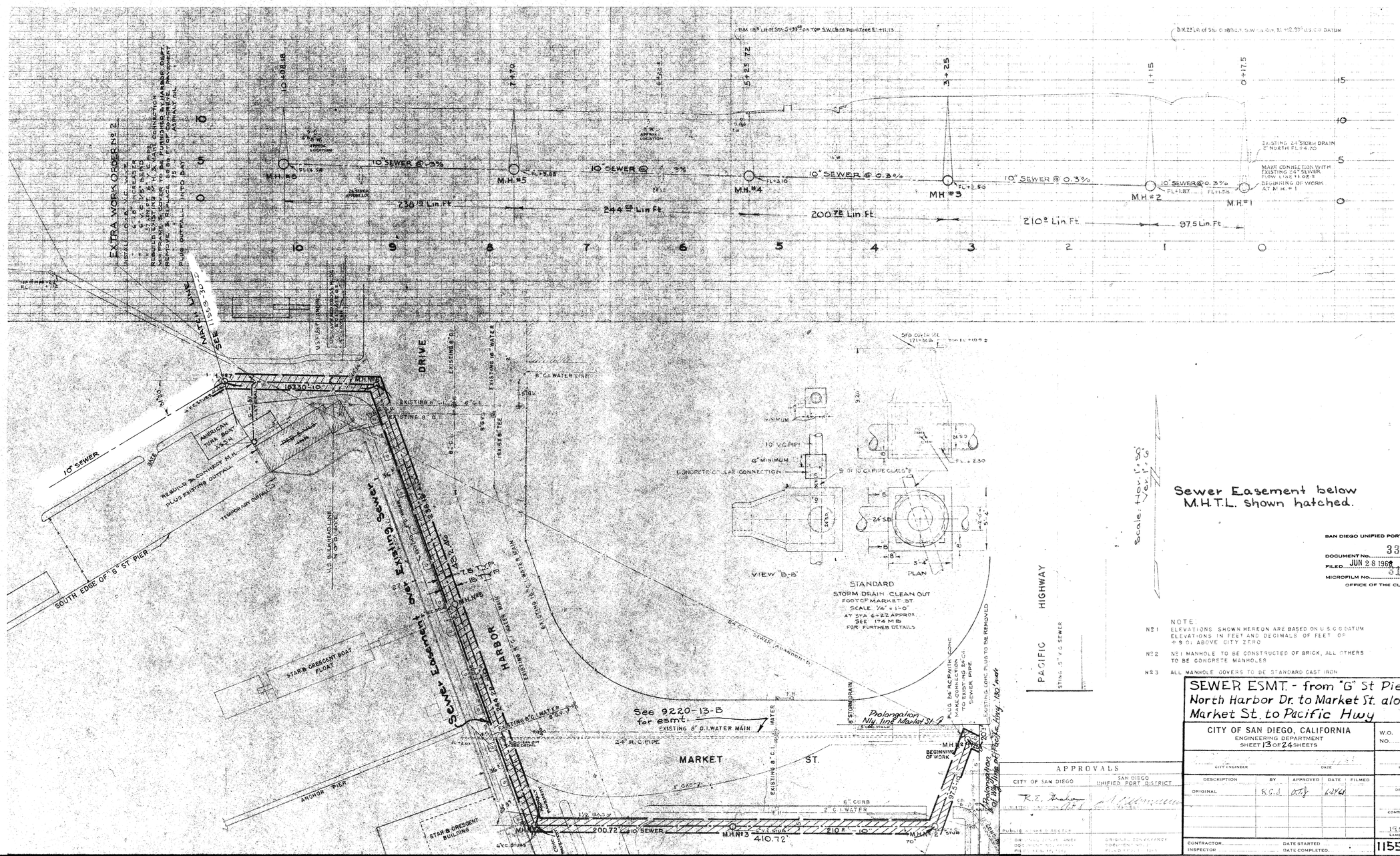

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 91
OFFICE OF THE CLERK

NOTE:
Nº 1 ELEVATIONS SHOWN HEREON ARE BASED ON U.S.C.G. DATUM ELEVATIONS IN FEET AND DECIMALS OF FEET OR +9.01 ABOVE CITY ZERO
Nº 2 Nº 1 MANHOLE TO BE CONSTRUCTED OF BRICK, ALL OTHERS TO BE CONCRETE MANHOLES
Nº 3 ALL MANHOLE COVERS TO BE STANDARD CAST IRON

APPROVALS

CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R.E. Anderson	

SEWER ESMT. - from "G" St Pier along North Harbor Dr. to Market St. along Market St. to Pacific Hwy

CITY OF SAN DIEGO
ENGINEERING DEPARTMENT
SHEET 13 OF 24 SHEETS

W.O. NO. 174.30

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	R.G.J.	O.T.J.	6-24-68	

CITY ENGINEER — DATE — DIVISION HEAD — DESIGN ENGINEER — CONTROL CERTIFICATION

198-1716
LAMBERT COORDINATES

CONTRACTOR ..... DATE STARTED .....
INSPECTOR ..... DATE COMPLETED .....

11557-13-D

W.A.M.C.: NO 58-L-4

020818

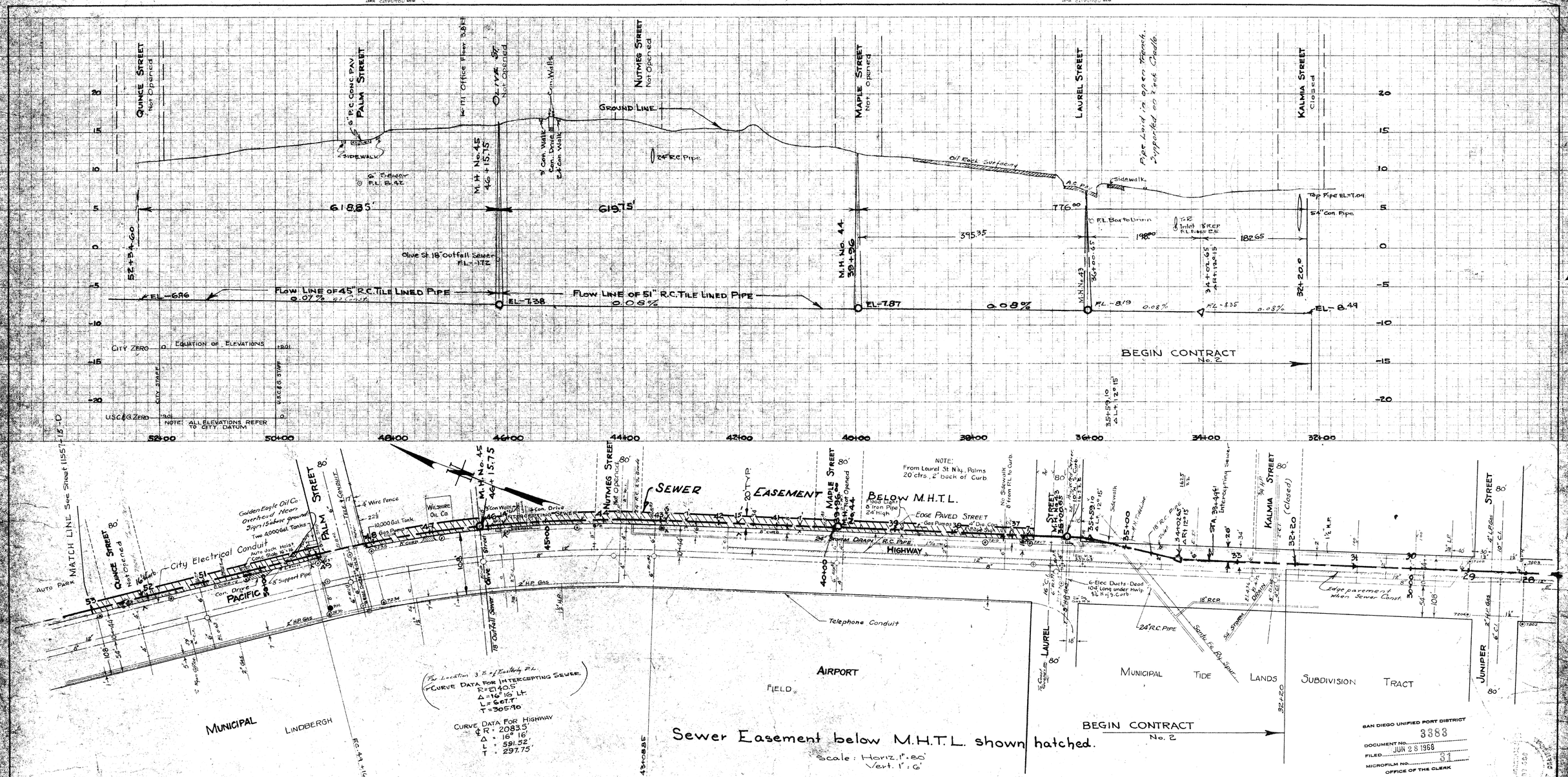

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 31
OFFICE OF THE CLERK

SEWER EASEMENT — TIDELANDS
Between Laurel and Bean St., below M.H.T.L.

CITY OF SAN DIEGO
ENGINEERING DEPARTMENT

SHEET 14 OF 24 SHEETS

W.O. No. 17430

PLAN REVISION			
CHANGE	BY	DATE	APPROVAL

CITY ENGINEER — DATE 6/24/68

CONSTRUCTION RECORD	
DATE STARTED	DATE COMPLETED
CONTR.	INSP.

WATER DEPT.		SEWERAGE	
PLANNING DEPT.		DRAINAGE	
ELECTRICAL		HIGHWAY	
STRUCTURAL		GRADES	
TRAFFIC		CONTROL	6-24-68

SCALE: HORIZ. 1" = 80' VERT. 1" = 6'

COORD. INDEX: 206-1715

OFFICE ENGINEER
SUPERVISOR
CHECKED
DESIGNED

11557-14-D

APPROVALS

CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R. E. Graham	L. Kleinsmith
ACTING CITY ENGINEER	CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 0-1 FILED MAY 1, 1963	ORIGINAL CONVEYANCE DOCUMENT NO. 0-1 FILED MAY 1, 1963

~~HARBOR No.~~
CITY No. 968-D, sht. 5. of 20

020819

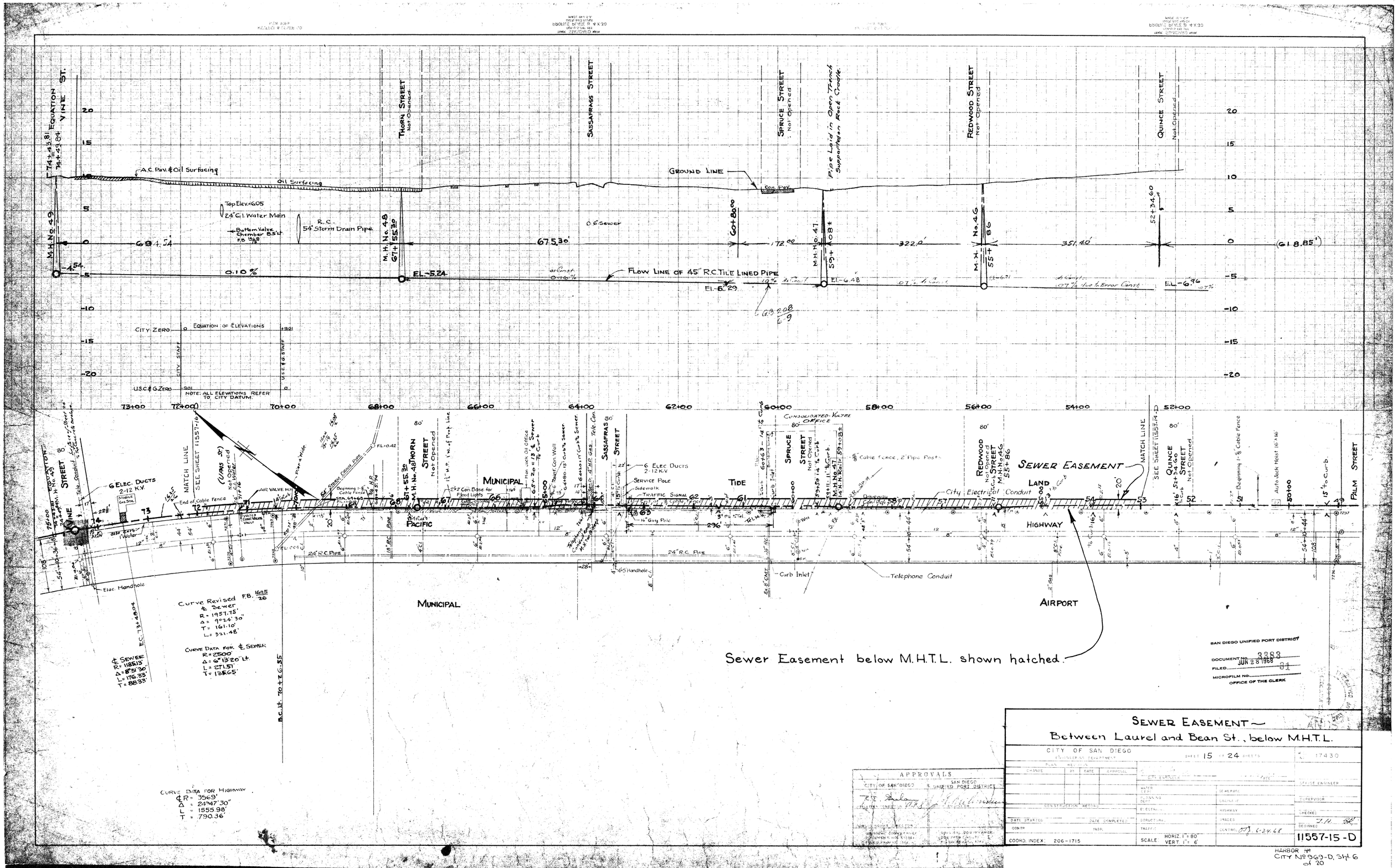
EQUATION ST.
VINE
THORN STREET
Not Opened
SASSAFRASS STREET
SPRUCE STREET
Not Opened
Pipe Laid in Open Trench
Supported on Rock Cradle
REDWOOD STREET
Not Opened
QUINCE STREET
Not Opened
A.C. Pav. & Oil Surfacing
Oil Surfacing
GROUND LINE
Con. Pav.
Top Elev. 4.05
24" Cl. Water Main
Bottom Valve Chamber 8.5' Lt.
R.C. 54" Storm Drain Pipe
0.6' Sewer
M.H. No. 4.9
M.H. No. 4.8
M.H. No. 4.7
M.H. No. 4.6
694.54'
675.30'
72.00'
322.0'
351.40'
(618.85')
0.10%
EL. -5.24
FLOW LINE OF 45" R.C. TILE LINED PIPE
EL. -6.29
EL. -6.48
EL. -6.21
EL. -6.96
CITY ZERO
EQUATION OF ELEVATIONS
U.S.C.&G. ZERO
NOTE: ALL ELEVATIONS REFER TO CITY DATUM.
CONSOLIDATED-VULTEE OFFICE
6 ELEC. DUCTS 2-12 K.V.
SERVICE POLE
Sidewalk
TRAFFIC SIGNAL
16' Guy Pole
Curb Inlet
Telephone Conduit
City Electrical Conduit
Cable Fence, 2' Pipe Posts
SEWER EASEMENT
MATCH LINE
SEE SHEET 11557-16
SEE SHEET 11557-14-D
MUNICIPAL
TIDE
LAND
HIGHWAY
AIRPORT
PACIFIC
PALM STREET
24" R.C. PIPE
Elec. Handhole
Curve Revised FB. 1625/26 & Sewer
R = 1957.75'
Δ = 9°24'30"
T = 161.16'
L = 321.48'
Curve Data for ℄ Sewer
R = 2500'
Δ = 6°13'20" Lt.
L = 271.51'
T = 135.65'
℄ Sewer
R = 1185.13'
Δ = 8°21'30"
L = 176.33'
T = 88.33'
Curve Data for Highway
℄ R = 3569'
Δ = 24°47'30"
L = 1555.98'
T = 790.36'
Sewer Easement below M.H.T.L. shown hatched.
SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO.
OFFICE OF THE CLERK
APPROVALS
CITY OF SAN DIEGO
SAN DIEGO UNIFIED PORT DISTRICT
SEWER EASEMENT —
Between Laurel and Bean St., below M.H.T.L.
CITY OF SAN DIEGO
ENGINEERING DEPARTMENT
SHEET 15 OF 24 SHEETS
K 17430
CHANGE
PLAN NO.
BY
DATE
APPROVAL
CITY ENGINEER
DATE
DEPUTY CITY ENGINEER
DEPUTY ENGINEER
WATER DEPT.
SEWERS
PLANNING DEPT.
HIGHWAY
ELECTRICAL
STRUCTURAL
GRADES
TRAFFIC
CONTROL
CONSTRUCTION RECORD
DATE STARTED
DATE COMPLETED
CONTR.
INSP.
COORD. INDEX: 206-1715
SCALE HORIZ. 1" = 80'
VERT. 1" = 6'
CHECKED
DESIGNED
11557-15-D
HARBOR No
CITY No 969-D, Sht. 6 of 20

020820

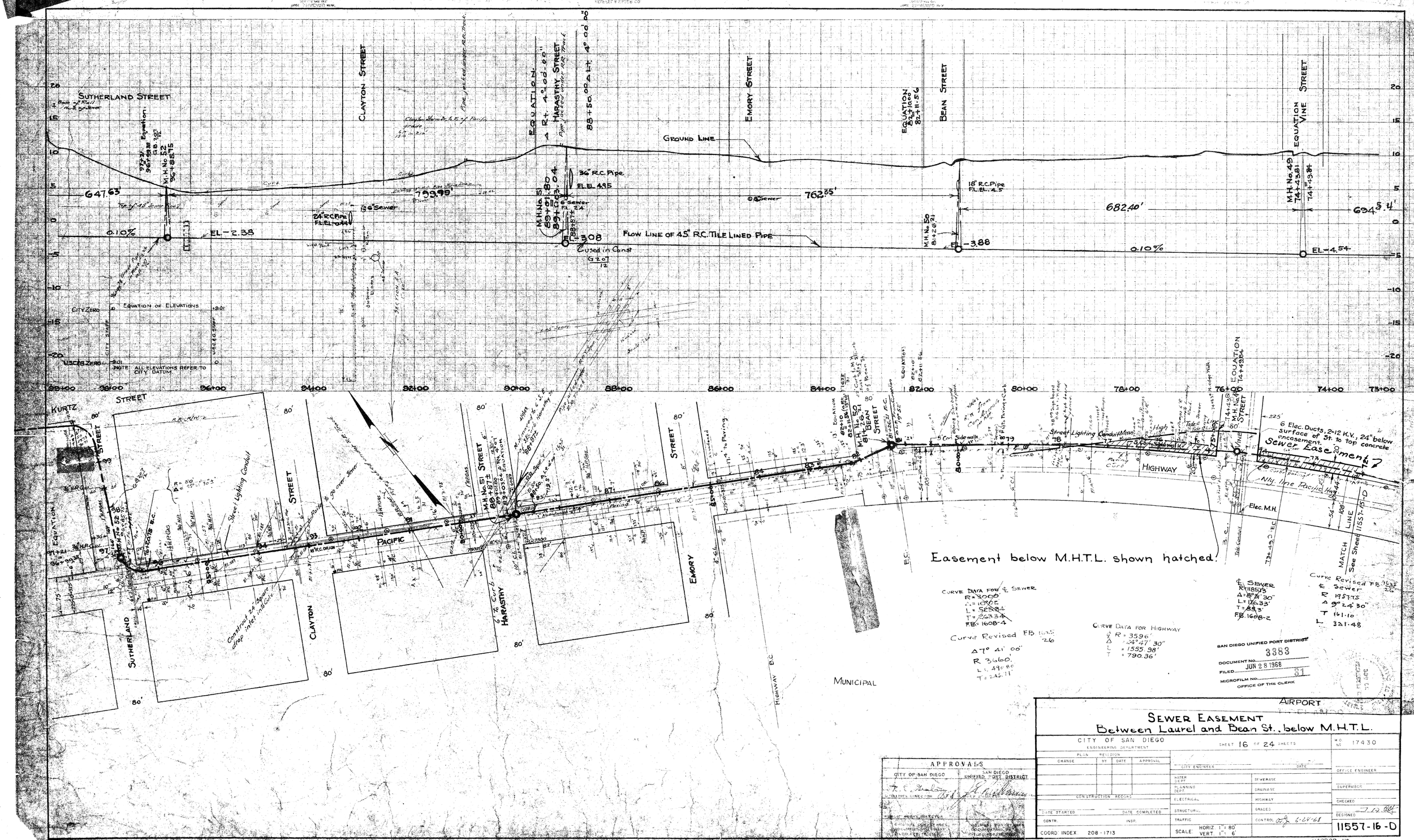
SUTHERLAND STREET
CLAYTON STREET
HARASTHY STREET
EMORY STREET
BEAN STREET
VINE STREET
EQUATION
GROUND LINE
647.63'
799.99'
762.35'
682.40'
694.54'
0.10%
EL.-2.38
-3.08
-3.88
EL.-4.54
FLOW LINE OF 45" R.C. TILE LINED PIPE
36" R.C. Pipe
FL.EL. 4.95
18" R.C. Pipe
FL.EL. 4.5
24" R.C. Pipe
M.H. No. 52
M.H. No. 49
M.H. No. 50
M.H. No. 51
CITY ZERO
EQUATION OF ELEVATIONS
NOTE: ALL ELEVATIONS REFER TO CITY DATUM
KURTZ STREET
PACIFIC HIGHWAY
MUNICIPAL AIRPORT
Easement below M.H.T.L. shown hatched.
6 Elec. Ducts, 2-12 K.V., 24" below surface of St. to top concrete encasement.
Sewer Easement
Street Lighting Conduit
Elec. M.H.
MATCH LINE See Sheet 11557-15-D
Curve Revised FB 1625 26
℄ Sewer
R = 1885.73
Δ = 8°41' 30"
L = 176.33'
T = 88.3'
FB 1608-2
Curve Revised FB 1625 26
℄ Sewer
R = 1957.75
Δ = 9°24' 30"
T = 161.10
L = 321.48
Curve Data for ℄ Sewer
R = 3000'
Δ = 10°05'
L = 528.24
T = 263.34
FB 1608-4
Curve Revised FB 1625 26
Δ 7° 41' 00"
R 3660'
L = 490.80
T = 245.11
Curve Data for Highway
R = 3596'
Δ = 24° 47' 30"
L = 1555.98'
T = 790.36'
SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 31
OFFICE OF THE CLERK
APPROVALS
CITY OF SAN DIEGO
SAN DIEGO UNIFIED PORT DISTRICT
SEWER EASEMENT
Between Laurel and Bean St., below M.H.T.L.
CITY OF SAN DIEGO
ENGINEERING DEPARTMENT
SHEET 16 OF 24 SHEETS
W.O. No. 17430
PLAN REVISION
CHANGE BY DATE APPROVAL
CITY ENGINEER DATE
WATER DEPT.
PLANNING DEPT.
ELECTRICAL
STRUCTURAL
TRAFFIC
SEWERAGE
DRAINAGE
HIGHWAY
GRADES
CONTROL
OFFICE ENGINEER
SUPERVISOR
CHECKED
DESIGNED
CONSTRUCTION RECORD
DATE STARTED
DATE COMPLETED
CONTR.
INSP.
COORD. INDEX 208-1713
SCALE: HORIZ. 1" = 80' VERT. 1" = 6'
11557-16-D
HARBOR No. CITY No. 969-D. Sht. 7 of 20

020821

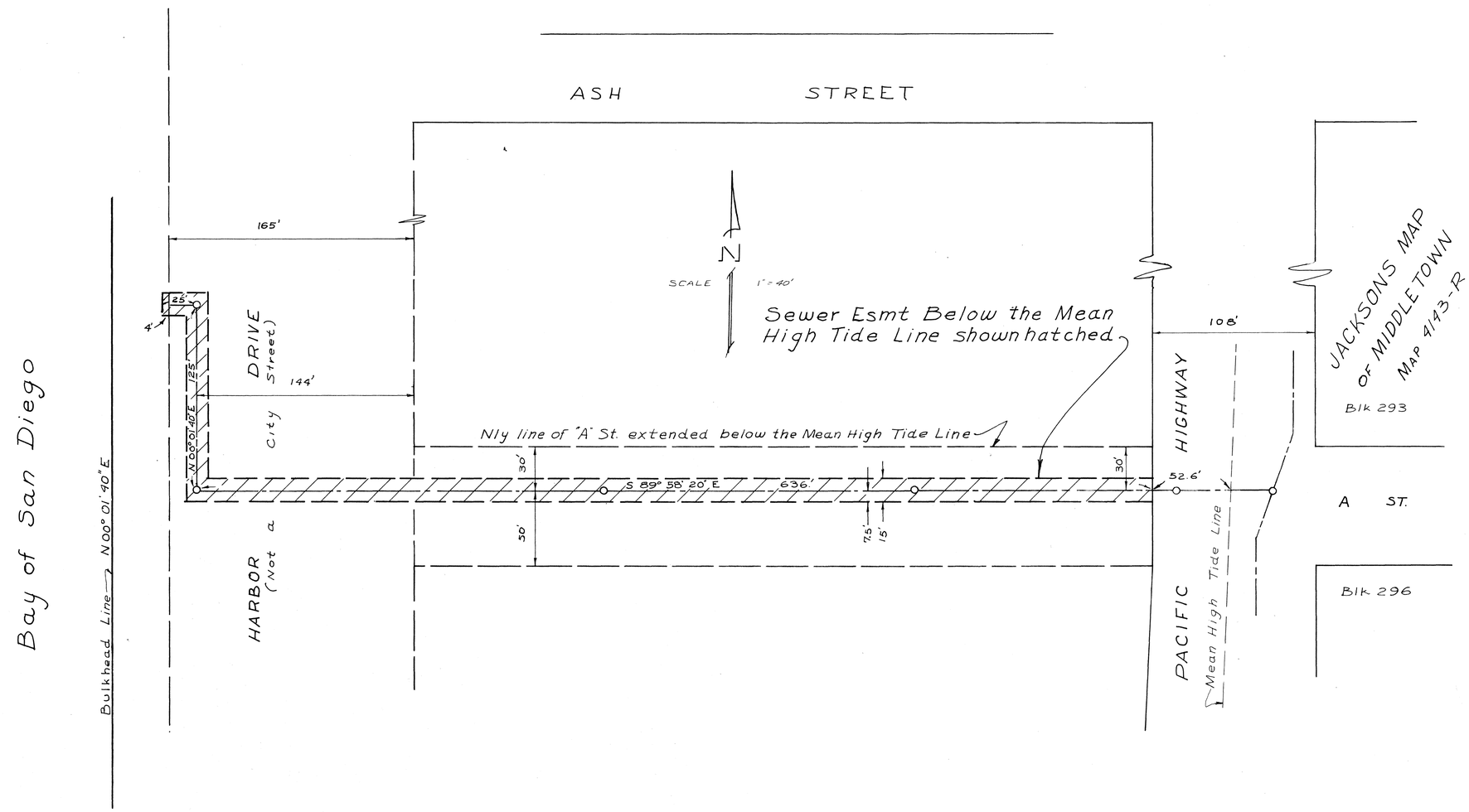

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 31
OFFICE OF THE CLERK

SEWER ESMT.- Wly of the intersection of Pacific Hwy. & "A" St. below the Mean High Tide Line (TIDELANDS)

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 17 OF 24 SHEETS

W.O. NO. 17430

CITY ENGINEER — DATE — DIVISION HEAD

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	R.C.J.	OTJ	6-24-68	

DESIGN ENGINEER

CONTROL CERTIFICATION

202 - 1715

LAMBERT COORDINATES

CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

11557-17-D

APPROVALS

CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R. E. Anderson	J. Fitzhugh
PUBLIC WORKS INSPECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 01-61	ORIGINAL CONVEYANCE DOCUMENT NO. 19

020822

EQUATION OF ELEVATION

CITY ZERO — 0.00 — CITY STAFF — 9.01

U.S.C.&G. ZERO — 9.01 — U.S.C.&G. STAFF — 0.00

NOTE: ALL ELEVATIONS REFER TO CITY ELEVATIONS.

Approx. Grade Harbor Drive

Ground Line

47+01.00 — M.H. No. 29 — El. -16.072

41+16.00 — M.H. No. 28 — El. -16.31 (Block 205 B)

32+89.00 — M.H. No. 27 — El. -17.45

24+25.85 — M.H. No. 26 — El. -18.13

700.00' — 535.00' — 829.98' — 863.15'

Flow Line of 60" R.C. Tile Lined Pipe

-0.08% — 0.08%

24" Storm Drain To R.

36" Storm Drain

30" R.C. Culvert Pipe

-6.79 Existing Sewer

Fill Rubbish

Equation 38+00.00 = 38+00.80

MATCH LINE 11557-19-D

SEWER EASEMENT BELOW M.H.T.L. SHOWN HATCHED

A.T.&S.F. RY.

Mean High Tide

HARBOR DRIVE

COLTON AVE.

IMPERIAL AVE.

COMMERCIAL ST.

6TH AVENUE — 7TH AVENUE — 8TH AVENUE — 9TH AVENUE

144 — 145 — 146 — 158 — 159

N 56° 55' 03" W — 420.75' — R = 2060 Δ = 4°48' 30" L = 172.88

N 54° 25' 03" W — 115.69' — R = 1940 Δ = 4°48' 30" L = 162.81'

S 33° 04' 57" W — 80.00' — 33.97'

S 70° 51' 12" W — 398.19' — S 76° 53' 15" W — 388.97'

Δ = 52° 13' 45" L = 401.09' — R = 440' — N 19° 09' 48" W — 396.63'

N 37° 43' 27" E

60" RCP Tile Lined Pipe

12" H.P. Gas Main

Asphalt Roadway

State Highway

Mean High Tide

REF. DWGS:
CITY ROLL DWG. 6155- Sheet 5 of 12
1023-D
1024-D
13408-68-L

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R. E. Gulay — UTILITIES DIRECTOR	J. E. Richardson — CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 651833 FILED FEB. 15, 1963	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 13, 1963

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 31
OFFICE OF THE CLERK

SEWER EASEMENT - Sly of 4th Ave in Navy Field (Tidelands)

E. F. Robinson 6/24/68

OTJ 6-24-68

11557-18-D

020823

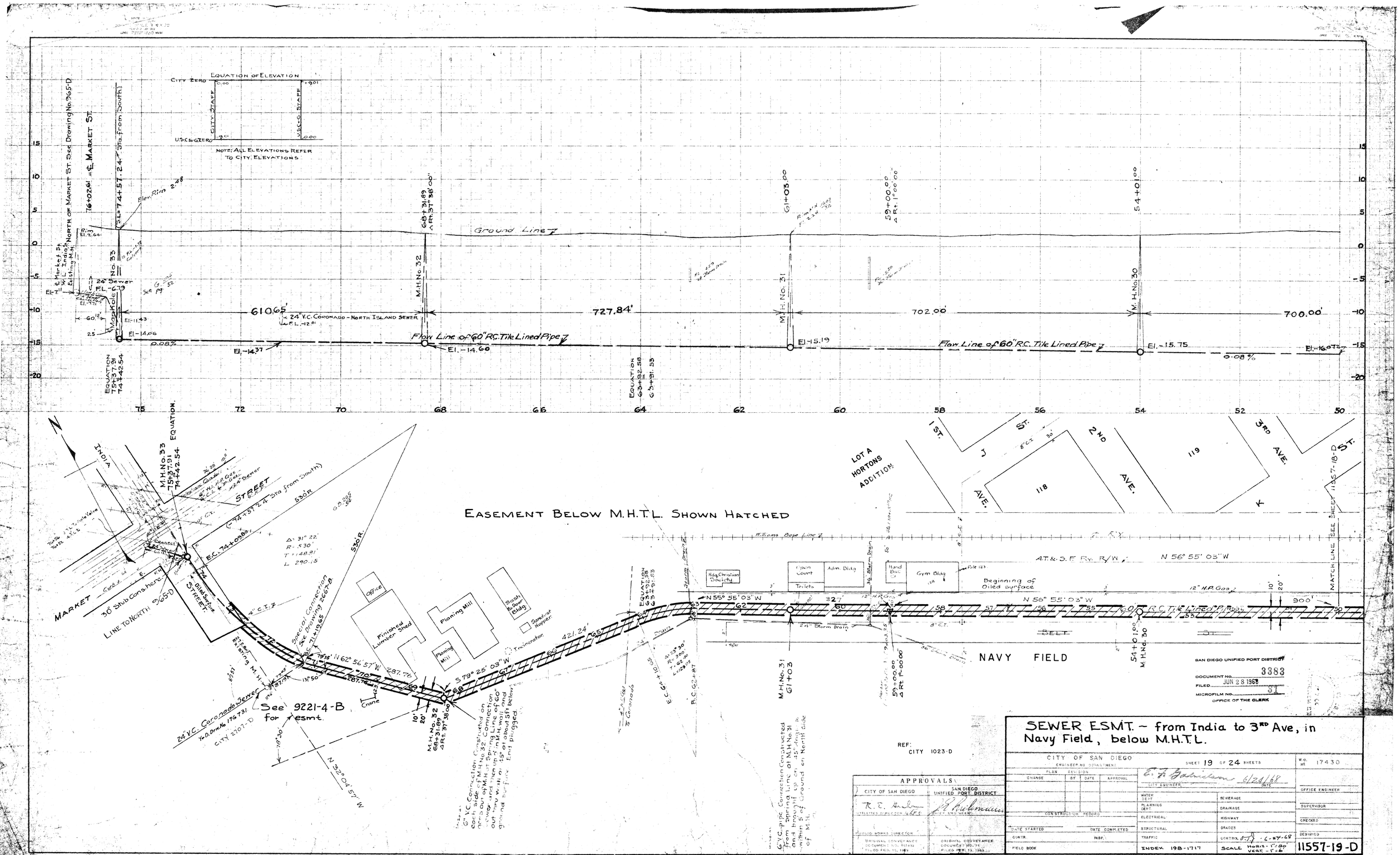
EQUATION OF ELEVATION
CITY ZERO
CITY STAFF
U.S.C.&G. ZERO
U.S.C.&G. STAFF
NOTE: ALL ELEVATIONS REFER TO CITY ELEVATIONS
NORTH OF MARKET ST. See Drawing No. 965-D
℄ MARKET ST.
Ground Line
Flow Line of 60" R.C. Tile Lined Pipe
24" V.C. CORONADO - NORTH ISLAND SEWER
M.H. No. 33
M.H. No. 32
M.H. No. 31
M.H. No. 30
610.65'
727.84'
702.00'
700.00'
0.08%
EQUATION
EASEMENT BELOW M.H.T.L. SHOWN HATCHED
INDIA
MARKET STREET
LOT A HORTONS ADDITION
1ST. ST.
2ND AVE.
3RD AVE.
J
K
118
119
Office
Finished Lumber Shed
Planing Mill
Sash & Door Bldg.
Adm. Bldg.
Gym Bldg.
Open Court
Toilets
Hand Ball Ct.
Bldg. Christian Society
Beginning of Oiled surface
A.T.&S.F. Ry. R/W
N 56° 55' 03" W
N 55° 55' 03" W
NAVY FIELD
BELT
24" Storm Drain
12" H.P. Gas
8" C.I.
See 9221-4-B for Esmt.
24" V.C. Coronado Sewer
Special Connection See Drawing 2667-B
MATCH LINE SEE SHEET 11557-18-D
SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 93
OFFICE OF THE CLERK
REF: CITY 1023-D
APPROVALS
CITY OF SAN DIEGO
SAN DIEGO UNIFIED PORT DISTRICT
SEWER ESMT. - from India to 3RD Ave, in Navy Field, below M.H.T.L.
CITY OF SAN DIEGO
ENGINEERING DEPARTMENT
SHEET 19 OF 24 SHEETS
W.O. No. 17430
CITY ENGINEER
OFFICE ENGINEER
SUPERVISOR
CHECKED
DESIGNED
WATER DEPT.
PLANNING DEPT.
ELECTRICAL
STRUCTURAL
TRAFFIC
SEWERAGE
DRAINAGE
HIGHWAY
GRADES
CONSTRUCTION RECORD
DATE STARTED
DATE COMPLETED
CONTR.
INSP.
FIELD BOOK
INDEX 198-1717
SCALE HORIZ. 1"=20' VERT. 1"=6'
11557-19-D
HARBOR No.

020824

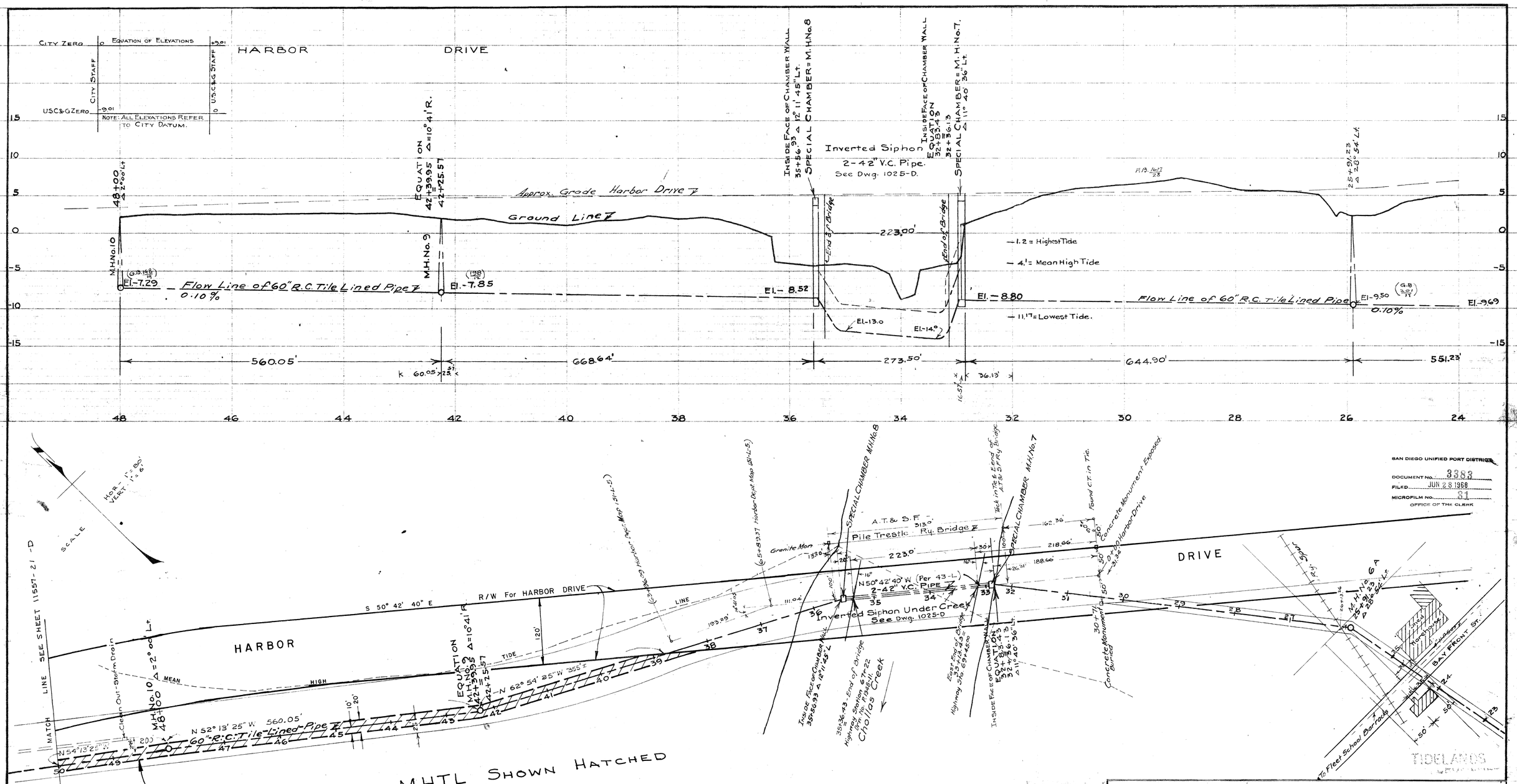

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 31
OFFICE OF THE CLERK

REF:
CITY DWGS 1018-D
6289-L
9391-B
RL 6155-1-R
13408-57-L
13408-58-L
43-L

APPROVALS

CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R. E. Nelson APL	J. Milnemann
PUBLIC WORKS DIRECTOR	CHIEF ENGINEER
ORIGINAL CONVEYANCE DOCUMENT NO. 5181 FILED FEB. 15, 1949	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 13, 1969

SEWER ESMT - Sly of HARBOR DR. Bet. 28TH & 32ND Sts below M.H.T.L

CITY OF SAN DIEGO
ENGINEERING DEPARTMENT
SHEET 20 OF 24 SHEETS
W.O. No. 17430

PLAN REVISION				
CHANGE	BY	DATE	APPROVAL	
CONSTRUCTION RECORD				
DATE STARTED		DATE COMPLETED		
CONTR.		INSP.		
FIELD BOOK				

E. J. Carlisle 6/24/68
CITY ENGINEER — DATE

WATER DEPT.		SEWERAGE	
PLANNING DEPT.		DRAINAGE	
ELECTRICAL		HIGHWAY	
STRUCTURAL		GRADES	
TRAFFIC		CONTROL	AJ 6-24-68
INDEX	190-1727		

OFFICE ENGINEER
SUPERVISOR
CHECKED
DESIGNED
11557-20-D

HARBOR No

020825

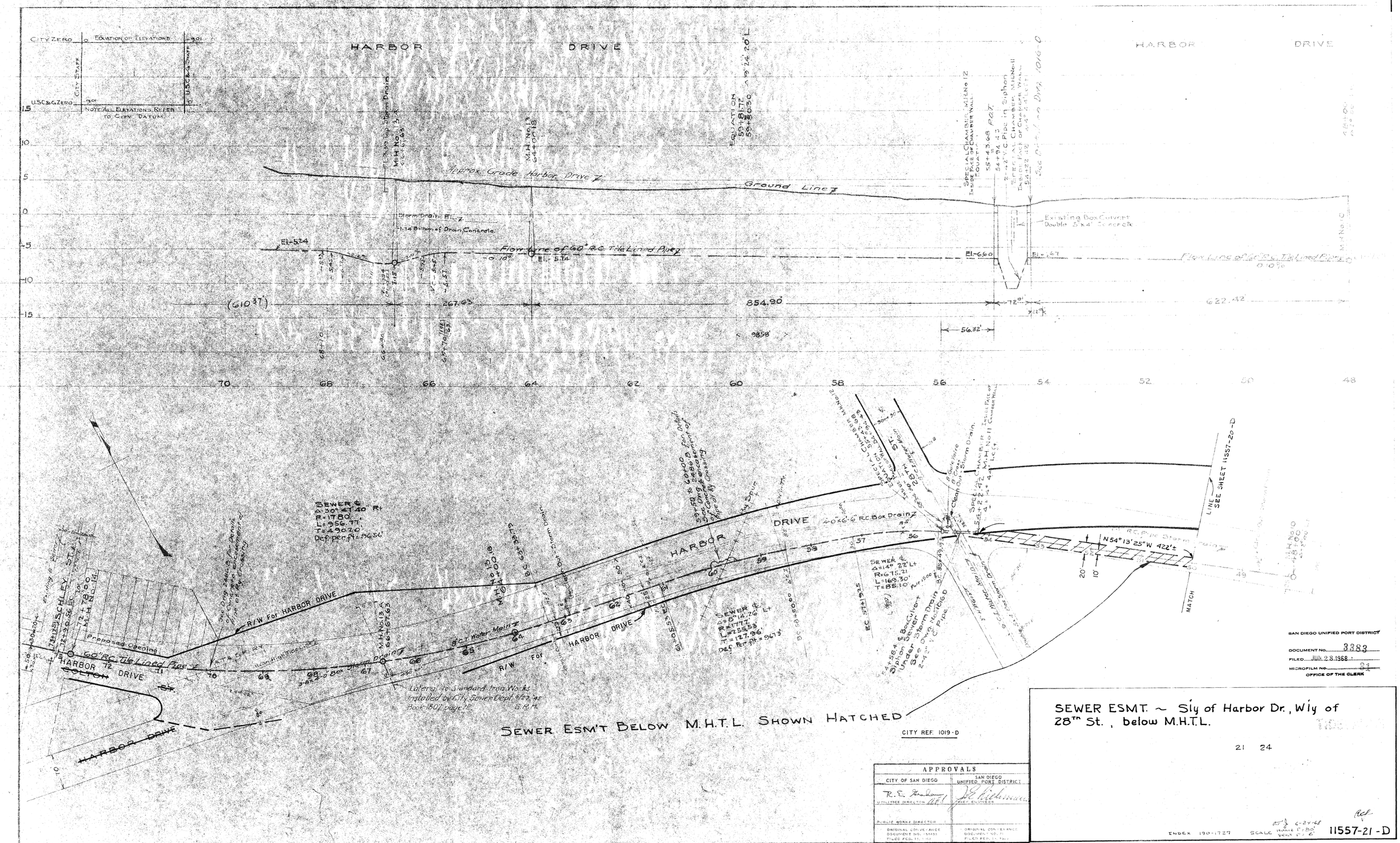
CITY ZERO
EQUATION OF ELEVATIONS
CITY STAFF
U.S.C.&G. STAFF
U.S.C&G ZERO
NOTE: ALL ELEVATIONS REFER TO CITY DATUM
HARBOR DRIVE
Approx Grade Harbor Drive
Ground Line
Storm Drain FL.
Bottom of Drain Concrete
Flow Line of 60" R.C. Tile Lined Pipe
Existing Box Culvert Double 5'x4' Concrete
SPECIAL CHAMBER, M.H. No 12
SPECIAL CHAMBER, M.H. No 11
(610.37')
267.03
854.90
622.42
56.32'
72.0'
SEWER ℄
Δ=30°47'40" Rt
R=1780.
L=956.77
T=490.20
Dep per ft=.9656
R/W For HARBOR DRIVE
Proposed Casing
60" R.C. Tile Lined Pipe
HARBOR DRIVE
COLTON ST.
SCHLEY ST.
Mean High Tide Line
8" C.T. Water Main
Lateral to Standard Irrig. Works Installed by City Sewer Dept. 8-27-45 Book 1507 page 12 E.R.H.
SEWER ESMT BELOW M.H.T.L. SHOWN HATCHED
CITY REF. 1019-D
4-0x6'-6" R.C. Box Drain
Clean Out Storm Drain
N54°13'25"W 422'±
LINE SEE SHEET 11557-20-D
MATCH
SEWER ℄
Δ=14°22'Lt
R=615.21
L=169.30'
T=85.10'
SEWER ℄
Δ=8°14.26' Lt
R=1777.
L=255.53
T=127.96'
Dep per ft=.9673
Union Sewer Under Storm Drain
See Dwg No. 1016-D
2-4" V.C. Pipe
SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No.
OFFICE OF THE CLERK
APPROVALS
CITY OF SAN DIEGO
SAN DIEGO UNIFIED PORT DISTRICT
UTILITIES DIRECTOR
CHIEF ENGINEER
PUBLIC WORKS DIRECTOR
ORIGINAL CONVEYANCE DOCUMENT NO.
FILED FEB. 15
ORIGINAL CONVEYANCE DOCUMENT NO.
FILED FEB.
SEWER ESMT. ~ S'ly of Harbor Dr., W'ly of 28th St., below M.H.T.L.
21 24
INDEX 190-1727
SCALE HORIZ 1"=50' VERT 1"=6'
6-27-68
11557-21-D

020826

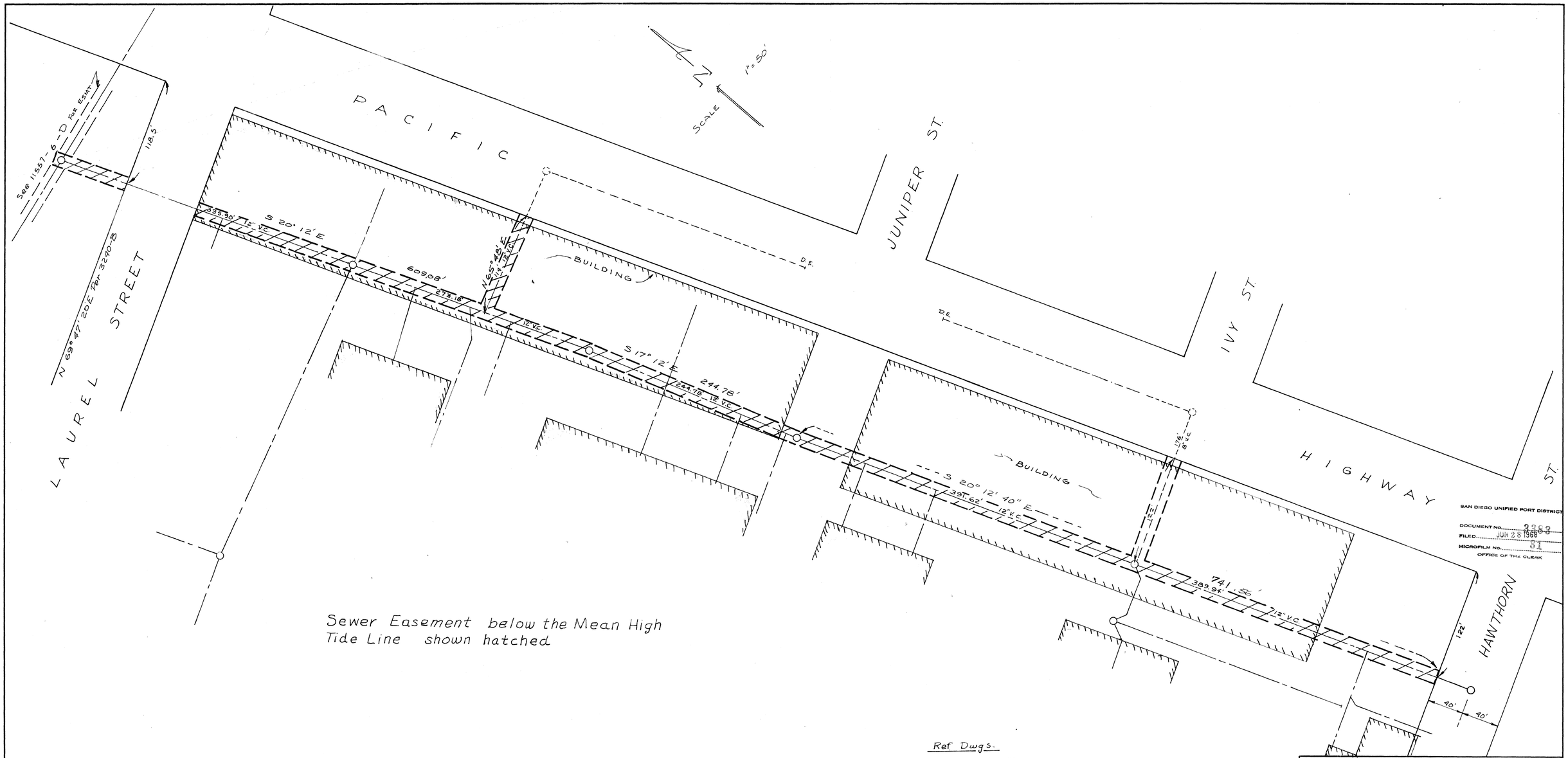

Sewer Easement below the Mean High Tide Line shown hatched

Ref Dwgs.
CITY - 1034-3-D
HARBOR - 17-D-23-2

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3363
FILED JUN 28 1966
MICROFILM NO. 31
OFFICE OF THE CLERK

SEWER EASEMENT - sly of LAUREL & wly of Pacific Hwy in the TIDELANDS

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 22 OF 24 SHEETS

W.O. NO. 17430

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R. T. Hudson	J. Williams
UTILITIES DIRECTOR	CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 141653 FILED FEB. 15, 1961	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 17, 1961

CITY ENGINEER — DATE — DIVISION HEAD

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	R.C.J.		6-2-61	

DESIGN ENGINEER

CONTROL CERTIFICATION

204-1716
LAMBERT COORDINATES

CONTRACTOR ..... DATE STARTED .....
INSPECTOR ..... DATE COMPLETED .....

11557-22-D

020827

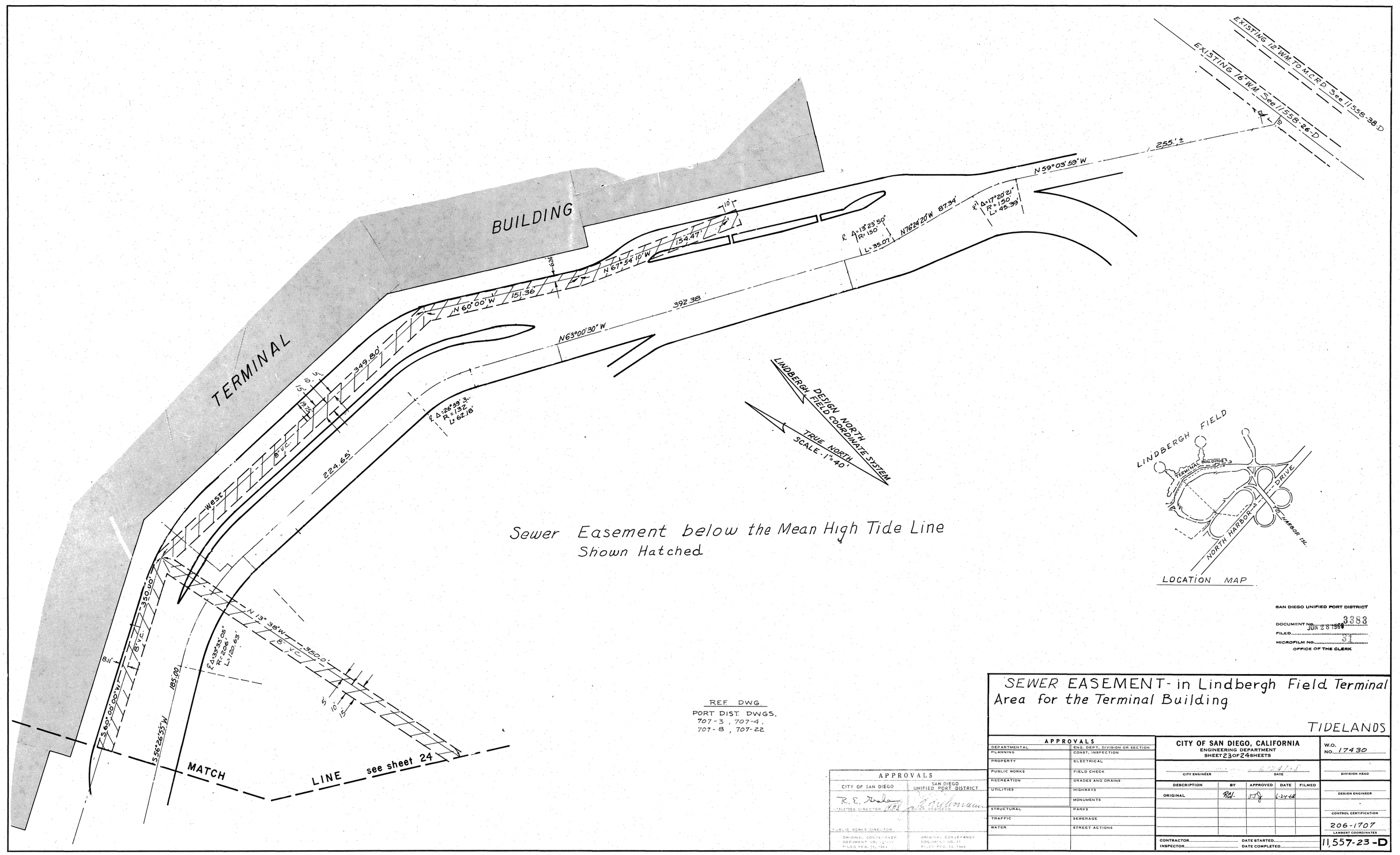

Sewer Easement below the Mean High Tide Line
Shown Hatched

REF. DWG.
PORT DIST. DWGS.
707-3, 707-4,
707-8, 707-22

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 31
OFFICE OF THE CLERK

APPROVALS

CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R. E. Hedges UTILITIES DIRECTOR	Coulman PORT ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 12111 FILED FEB. 12, 1963	ORIGINAL CONVEYANCE DOCUMENT NO. 27 FILED FEB. 12, 1963

SEWER EASEMENT - in Lindbergh Field Terminal Area for the Terminal Building

TIDELANDS

APPROVALS

DEPARTMENTAL	ENG. DEPT. DIVISION OR SECTION
PLANNING	CONST. INSPECTION
PROPERTY	ELECTRICAL
PUBLIC WORKS	FIELD CHECK
RECREATION	GRADES AND DRAINS
UTILITIES	HIGHWAYS
	MONUMENTS
STRUCTURAL	PARKS
TRAFFIC	SEWERAGE
WATER	STREET ACTIONS

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 23 OF 24 SHEETS

CITY ENGINEER — DATE 6-24-68

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	RCL	JJ	6-24-68	

CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

W.O. NO. 17430

DIVISION HEAD

DESIGN ENGINEER

CONTROL CERTIFICATION
206-1707
LAMBERT COORDINATES

11,557-23-D

020828

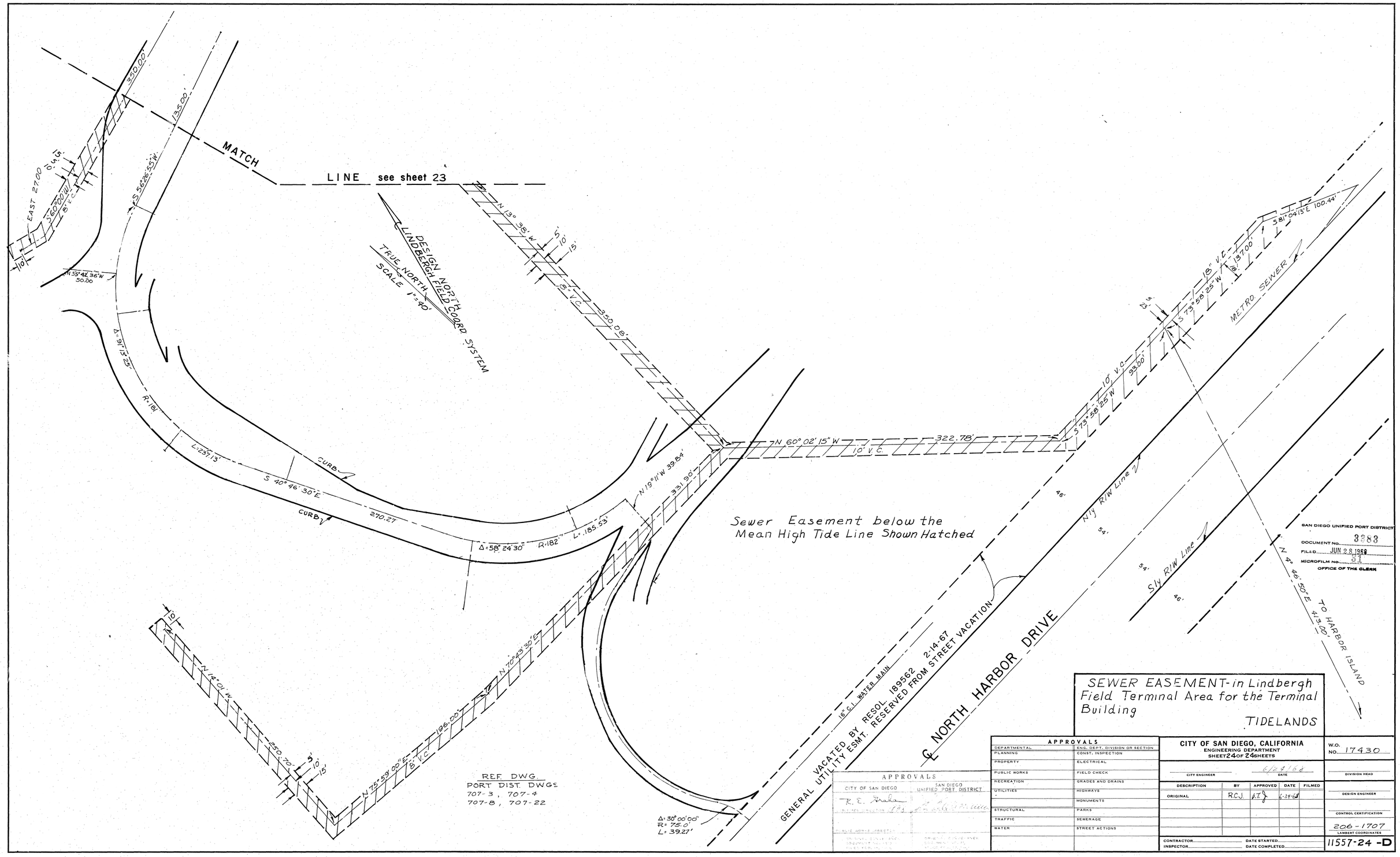
MATCH LINE see sheet 23
DESIGN NORTH
LINDBERGH FIELD COORD SYSTEM
TRUE NORTH
SCALE 1"=40'
EAST 2700 O.A.G.
S 56°26'55" W
N 55°42'36" W 50.00
350.00'
135.00'
Δ=91°13'25"
R=181'
L=231.13'
CURB
S 40°46'50" E
270.27'
Δ=58°24'30"
R=182'
L=185.53'
N 19°11' W 39.64'
331.90'
N 13° 38' W
350.08'
N 60°02'15" W
322.78'
10' V.C.
S 13°58'25" W
93.00'
S 73°58'25" W
S 81°04'13" E 100.44'
METRO. SEWER
N'ly R/W Line
S'ly R/W Line
N 4°46'50" E 413.00'
TO HARBOR ISLAND
Sewer Easement below the
Mean High Tide Line Shown Hatched
18" C.I. WATER MAIN
VACATED BY RESOL. 189562 2-14-67
GENERAL UTILITY ESMT. RESERVED FROM STREET VACATION
℄ NORTH HARBOR DRIVE
N 14°01' W
250.70'
N 75°59'00" E
195.00'
N 70°43'30" E
Δ=30°00'00"
R=75.0'
L=39.27'
REF. DWG.
PORT DIST. DWGS.
707-3, 707-4
707-8, 707-22
SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 31
OFFICE OF THE CLERK
SEWER EASEMENT-in Lindbergh Field Terminal Area for the Terminal Building
TIDELANDS
APPROVALS
DEPARTMENTAL
PLANNING
PROPERTY
PUBLIC WORKS
RECREATION
UTILITIES
STRUCTURAL
TRAFFIC
WATER
ENG. DEPT. DIVISION OR SECTION
CONST. INSPECTION
ELECTRICAL
FIELD CHECK
GRADES AND DRAINS
HIGHWAYS
MONUMENTS
PARKS
SEWERAGE
STREET ACTIONS
APPROVALS
CITY OF SAN DIEGO
SAN DIEGO UNIFIED PORT DISTRICT
CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 24 OF 24 SHEETS
W.O. NO. 17430
CITY ENGINEER
DATE 6/24/68
DIVISION HEAD
DESCRIPTION
BY
APPROVED
DATE
FILMED
ORIGINAL
R.C.J.
6-24-68
DESIGN ENGINEER
CONTROL CERTIFICATION
206-1707
LAMBERT COORDINATES
CONTRACTOR
DATE STARTED
INSPECTOR
DATE COMPLETED
11557-24-D

020829

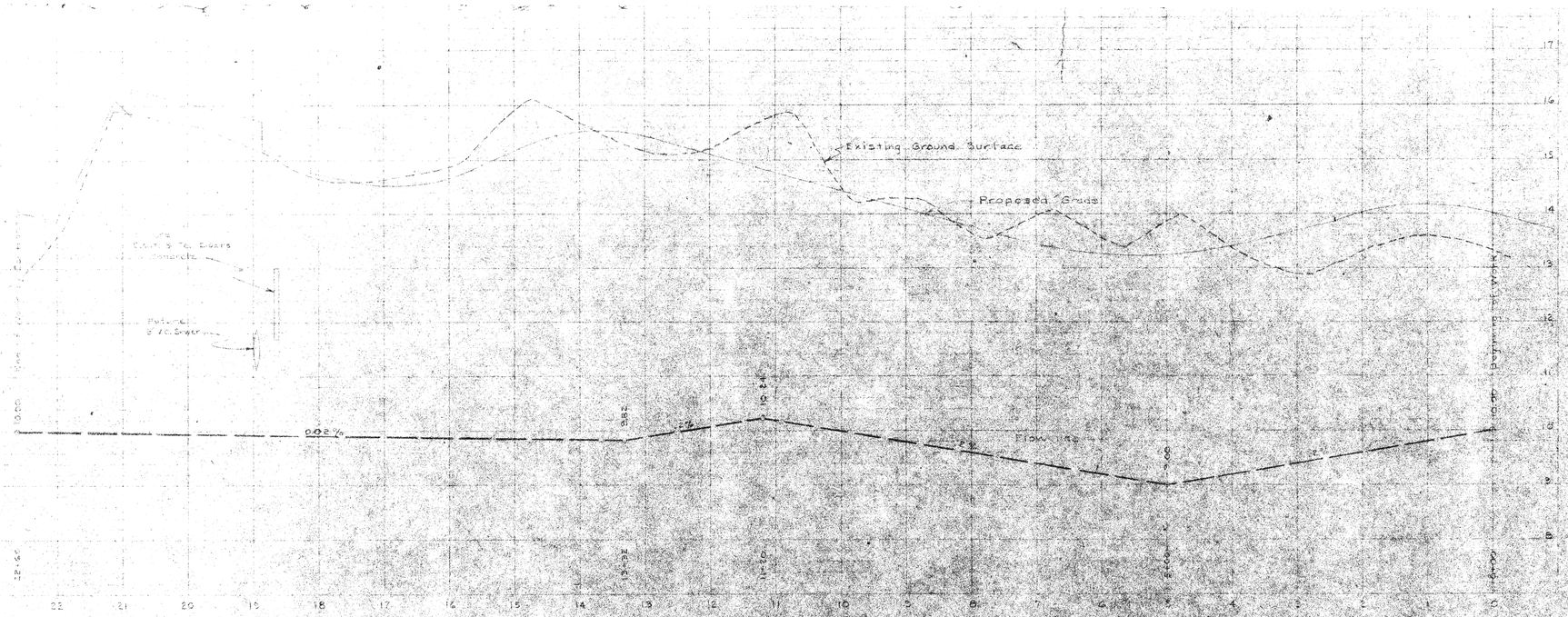

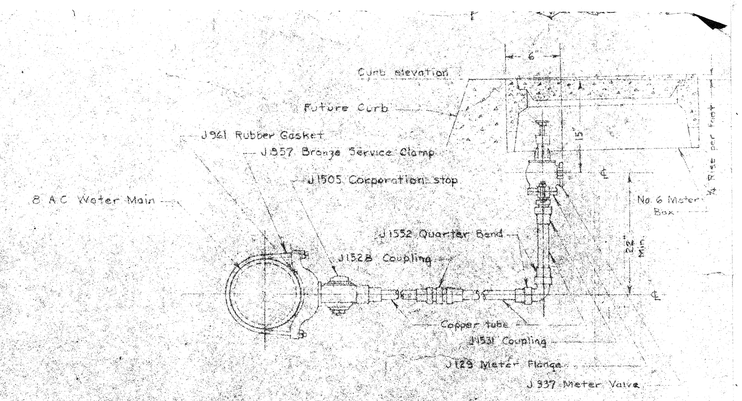

TYPICAL 2" WATER SERVICE CONNECTION
NO SCALE

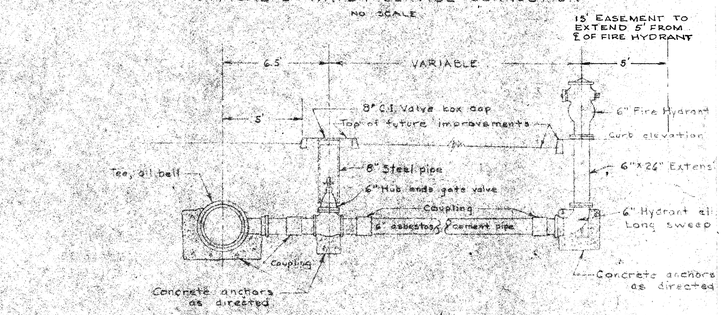

TYPICAL DETAIL OF HYDRANT ASSEMBLY
NO SCALE

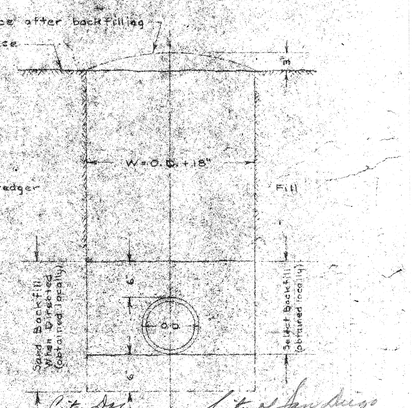

City Ord. No. 924665 6/28/68

City of San Diego Conveyance

TYPICAL TRENCH SECTION
SCALE: 1"=1'-0"

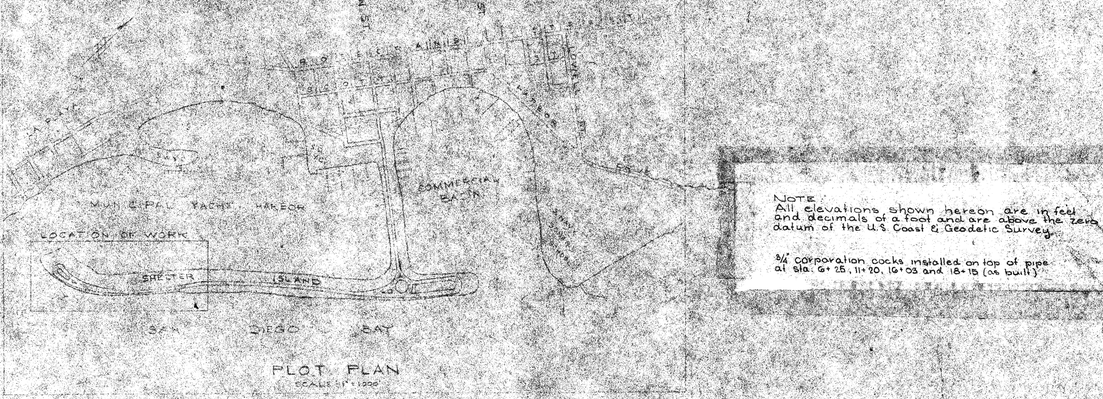

PLOT PLAN
SCALE 1"=1000'

NOTE:
All elevations shown hereon are in feet and decimals of a foot and are above the zero datum of the U.S. Coast & Geodetic Survey.

3/4" corporation cocks installed on top of pipe at sta. 6+25, 11+20, 14+03 and 18+15 (as built)

LEGEND
Proposed Water Main
Existing Water Main
Fire Hydrant
Gate Valve
Tee
45 Degree Bend
Water Service (2")

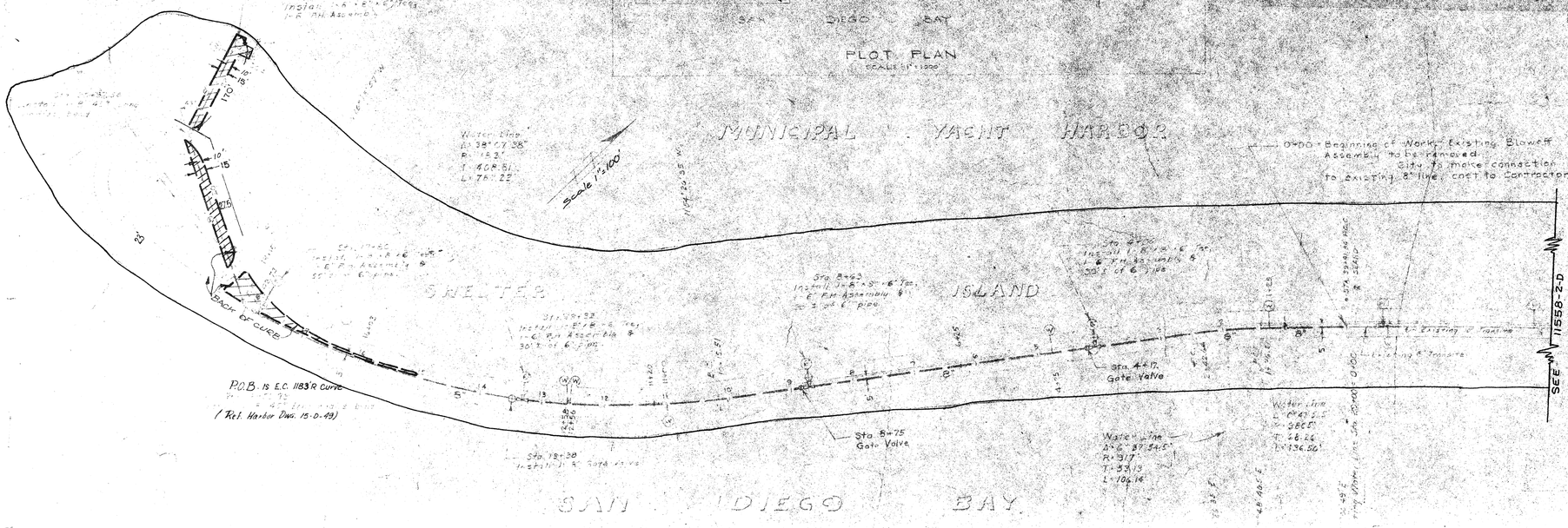

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R. E. Grahn (for) UTILITIES DIRECTOR	J. J. Kiddiman CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT No. 695833 FILED FEB. 15, 1962	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 13, 1980

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 31
OFFICE OF THE CLERK

Part 1 (20)

WATER EASEMENT ~ on Shelter Island

TIDELANDS

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 1 OF 39 SHEETS

W.O. NO. 17430

E. P. Jordan 6/24/68
CITY ENGINEER — DATE — DIVISION HEAD

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	J.H.Hann		6-24-68	

DESIGN ENGINEER

CONTROL CERTIFICATION

198-1697
LAMBERT COORDINATES

CONTRACTOR ____ DATE STARTED ____
INSPECTOR ____ DATE COMPLETED ____

11558-1 -D

HARBOR NO 15-D-49

020830

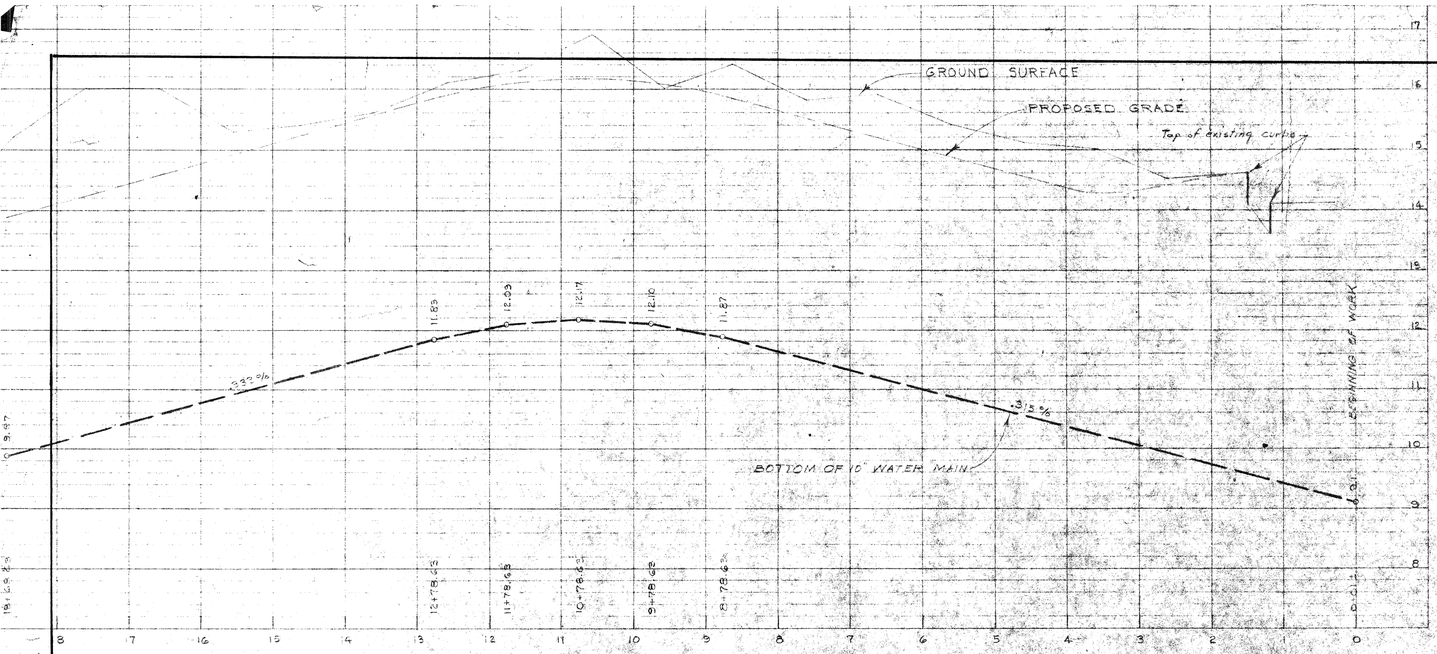

PROFILE
SCALE: HOR. 1" = 100'
VER. 1" = 1.2'

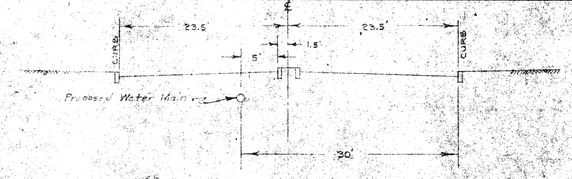

TYPICAL CROSS SECTION, LOOKING S'WLY, OF STREET ON SHELTER ISLAND AFTER PROPOSED IMPROVEMENTS.
SCALE: 1" = 10'

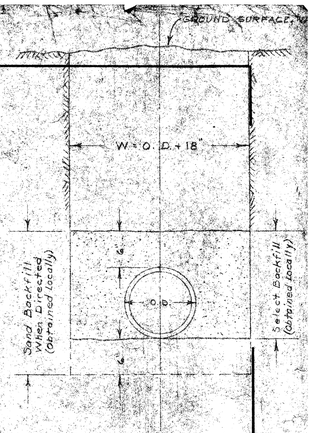

TYPICAL TRENCH SECTION
SCALE: 1" = 1'-0"

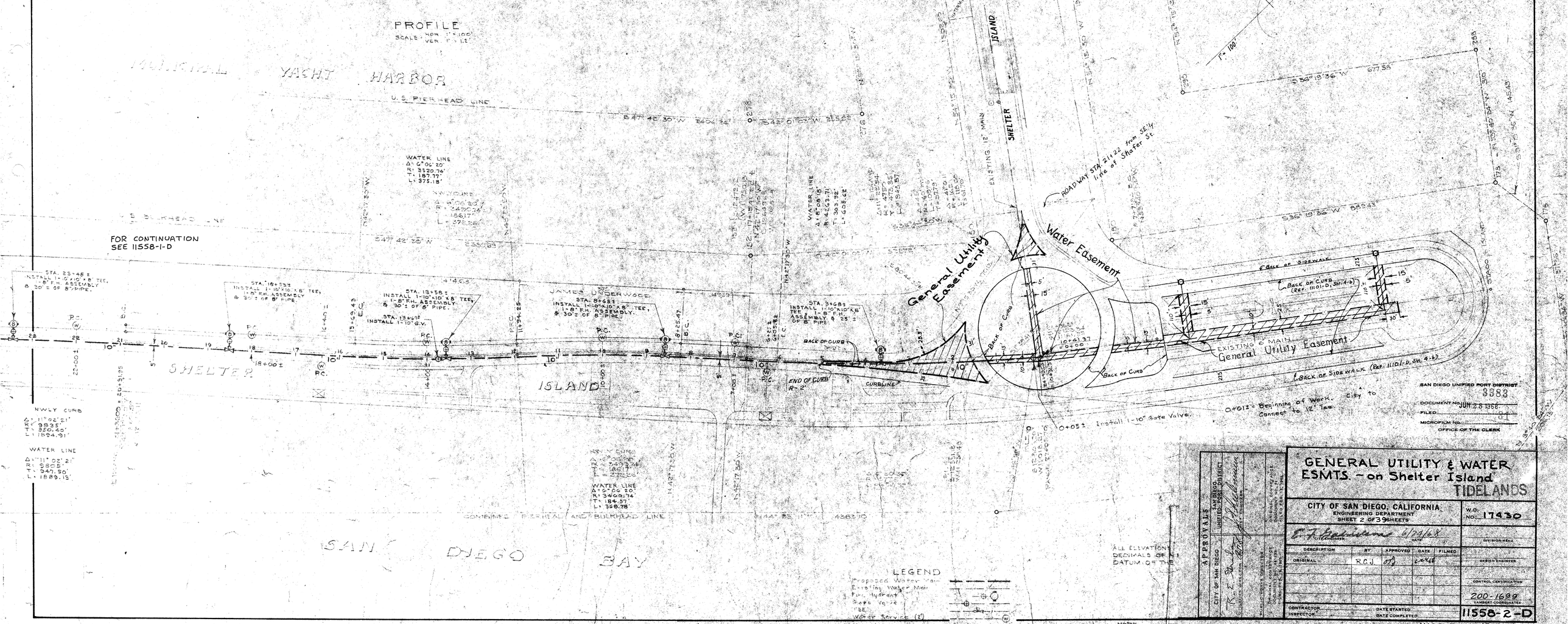

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED: JUN 28 1968
MICROFILM No.
OFFICE OF THE CLERK

APPROVALS
CITY OF SAN DIEGO — UNIFIED PORT DISTRICT
R. E. Sheldon — CHIEF DEPUTY CLERK
RECOMMENDED: CITY ENGINEER — UNIFIED PORT DISTRICT
APPROVED: CITY MANAGER — UNIFIED PORT DISTRICT

GENERAL UTILITY & WATER ESMTS. - on Shelter Island

TIDELANDS

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 2 OF 39 SHEETS

W.O. NO. 17430

E. A. Gardiner 6/24/68
CITY ENGINEER — DATE

DIVISION HEAD

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	R.C.J.	[illegible]	2-6-68	

DESIGN ENGINEER

CONTROL CERTIFICATION

200-1699
LAMBERT COORDINATES

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

11558-2-D

HARBOR No. 15-D-4

020831

LINDBERGH FIELD

RUNWAY 9-27

TAXI STRIP

UNIT NO. II

Section A-A
No Scale

BEGINNING OF WORK.
CITY TO INSTALL & CONNECT TO 12"x8" CROSS, COST TO CONTRACTOR $206.00

INSTALL 1-8" BLOW OFF ASSEMBLY
END OF WORK BY CONTRACTOR

Top of Storm Drain
7'± below surface

750'±
2455'±
2" ROAD MIX
INSTALL 1-8" GATE VALVE
8' Chain Link Fence

INSTALL 1-8"x8"x6" TEE,
1-6" F.H. ASSEMBLY,
SEE DETAIL

INSTALL 1-8" GATE VALVE

550'±
555'±
2" ROAD MIX

INSTALL 1-8"x8"x6" TEE,
1-6" F.H. ASSEMBLY,
SEE DETAIL

Top of Sewer
10'± below surface

INSTALL 1-8" BLOW OFF ASSEMBLY
END OF WORK BY CONTRACTOR

Connection as built:
Short length of Class 150 Transite Pipe and 11¾" Cast Iron F.H.'s & Tyleen Valves and Cross.

CONVAIR BLVD.
MCRD
WAKE BLVD.
A.C.

SCALE 1" = 100'

See 11558-20-D

6" Fire hydrant

Ground surface or top of pavement

8" C. Valve box cap

8' Chain link fence

8" MAIN

6" C.I. serrated extension
6" C.I. hydrant

Easement below M.H.T.L. shown hatched.

Connection as built:
Short length of Class 150 Transite Pipe, Cast Iron F.H.'s, Tyleen Valves and Tees.

6" Reinforced Concrete Taxi Strips

Top of Storm Drain
6'± below surface

see sheet 11558-23-D for esmt for 16" C.I. water line

BEGINNING OF WORK
CITY TO INSTALL & CONNECT TO 8" TEE, COST TO CONTRACTOR $100.00
INSTALL 1-8" GATE VALVE

750'±
1505'±
8"

Concr. Anchors
4"x4" Bracing
Cedar Tower

8' Chain Link Fence

INSTALL 1-8"x8"x6" TEE,
1-6" F.H. ASSEMBLY
& 17'± OF 6" PIPE
SEE DETAIL

INSTALL 1-8"x8"x6" TEE,
1-6" F.H. ASSEMBLY
& 17'± OF 6" PIPE
SEE DETAIL

INSTALL 1-8" BLOW OFF ASSEMBLY
END OF WORK BY CONTRACTOR

Water Easement
SEE 11558 4-D

UNIT NO. I

RYAN AERONAUTICAL CO.

Tee, all sides

6" C.I. or equal pipe

Concrete anchors as directed

Concrete anchor as directed

TYPICAL DETAIL OF HYDRANT ASSEMBLY
No SCALE

Replace Existing 8" A.C. Crossing Thus

Replace Existing 3" A.C. Crossing Thus

GROUND SURFACE

TOP OF PAVING

EXISTING 12" ROAD MIX

EXISTING 8" A.C.

PAVED WITH 3" A.C.

EXISTING 3" A.C.

16" SELECTED SAND

SELECT SAND

8" CRUSHER RUN

12" SELECT BORROW

Compact existing select material or crusher run to 95% compaction.

DREDGER

FILL

W.O.D. +18"

48"

Sand Back Fill When Directed

Select Backfill

O.D.

PACIFIC HIGHWAY

LINDBERGH FIELD

UNIT NO. I

UNIT NO. II

RYAN

HARBOR DRIVE

U.S. COAST GUARD BASE

CONVAIR BLVD.

EAST OF SAN DIEGO

PLOT PLAN
SHOWING LOCATION OF WORK

TYPICAL TRENCH SECTION
UNIT NO. I

TYPICAL TRENCH SECTION
UNIT NO. II

TYPICAL TRENCH SECTION
CROSSING A.C. PAVEMENT

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 31
OFFICE OF THE CLERK

LEGEND

Proposed Water Main
Small Water Mains
Fire Hydrant
Gate Valve
Tee
Sewer
Gas
Electric
Storm Drain
Cross

NOTE: ALL PIPE CLASS 200 TRANSITE EXCEPT AS NOTED

APPROVED
CITY OF SAN DIEGO
UNIFIED PORT DISTRICT
CITY ENGINEER
PORT ENGINEER
DIRECTOR PUBLIC WORKS
DIRECTOR PORT DEPT.

WATER ESMTS - 8" fire line in Lindbergh Field, E'ly & W'ly of Wake Blvd, N'ly of North Harbor Dr.

TIDELANDS

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 3 OF 3 SHEETS

W.O. NO. 17430

CITY ENGINEER 6/24/68 DATE

DIVISION HEAD

DESCRIPTION	BY	APPROVED	DATE	FILED
ORIGINAL			6-24-68	

DESIGN ENGINEER

CONTROL CERTIFICATION

206-1707
LAMBERT COORDINATES

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

11558-3-D

HARBOR No. 17-D-100

020832

See 11558-3-D
& 11558-24-D

SCALE 1" = 50'

EASEMENT BELOW M.H.T.L. SHOWN HATCHED.

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 8383
FILED JUN 28 1968
MICROFILM NO.
OFFICE OF THE CLERK

WORK TO BE DONE
The improvement consists of the following work to be done according to these plans and specifications hereto attached.
The construction of asbestos cement TRANSITE pipe water main as shown thus
The installation of cast iron gate valves, & cast iron valve boxes & covers as shown thus
The installation of fire hydrants and appurtenances complete as shown thus
The installation of other water main appurtenances as shown on the plans
EXISTING IMPROVEMENTS
Sewer lines shown thus
Sewer Manholes
Water Lines
Gate Valves
Gas Lines

GENERAL UTILITY & WATER ESMTS. ~ Northly of North Harbor Dr. & Ely of Wake Blvd. (NOT a CITY STREET) in the Tidelands

CITY OF SAN DIEGO ENGINEERING DEPARTMENT	SHEET 4 OF 39 SHEETS		W.O. NO. 17430
PLAN REVISION: CHANGE / BY / DATE / APPROVAL	E. F. Gabrielson 6/24/68 CITY ENGINEER DATE		OFFICE ENGINEER
	WATER DEPT.	SEWERAGE	SUPERVISOR
	PLANNING DEPT.	DRAINAGE	
CONSTRUCTION RECORD	ELECTRICAL	HIGHWAY	CHECKED
DATE STARTED / DATE COMPLETED	STRUCTURAL	BRIDGE	DESIGNED J.A.
CONTR. / INSP.	TRAFFIC	CONTROL J.T.J. 6-24-68	11558-4-D
FIELD BOOK	INDEX 206-1709	SCALE 1" = 50'	

APPROVALS
CITY OF SAN DIEGO — SAN DIEGO UNIFIED PORT DISTRICT
R. E. Gaede — PUBLIC HORBOR DIRECTOR — PORT ENGINEER
ORIGINAL CONVEYANCE DOCUMENT NO. 71 (STATE LANDS LEASE)
ORIGINAL CONVEYANCE DOCUMENT NO. 46583 (STATE LANDS LEASE)

HARBOR No. 17-D-76

020833

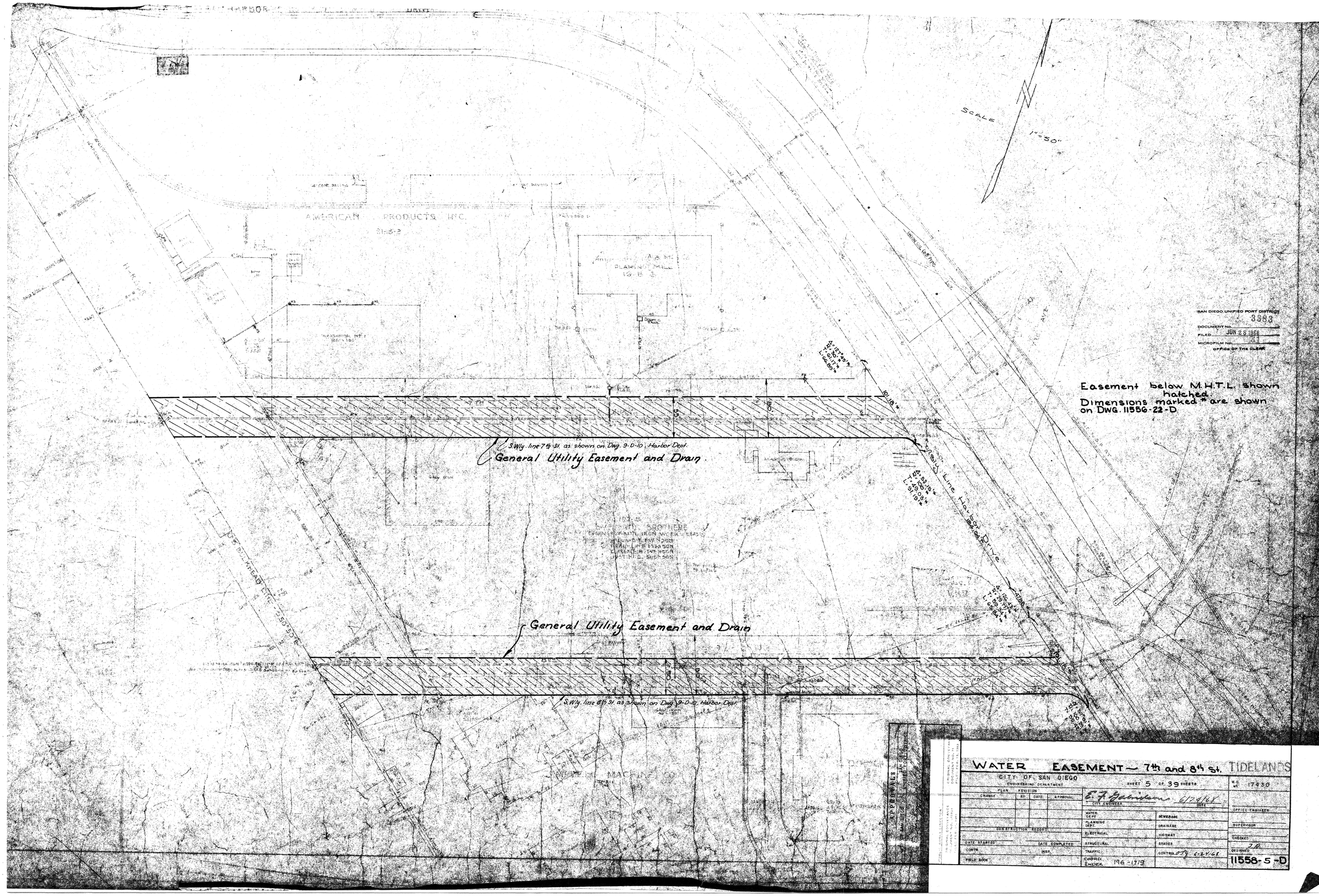
SCALE
1" = 50'
AMERICAN PRODUCTS INC.
PLANING MILL
S.Wly. line 7th St. as shown on Dwg. 9-D-10, Harbor Dept.
General Utility Easement and Drain.
55'
180'
Easy Line Harbor Drive
General Utility Easement and Drain
S.Wly. line 8th St. as shown on Dwg. 9-D-10, Harbor Dept.
U.S. Bulkhead Line
Easement below M.H.T.L. shown hatched.
Dimensions marked * are shown on DWG. 11556-22-D.
SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO.
OFFICE OF THE CLERK
WATER EASEMENT ~ 7th and 8th St. TIDELANDS
CITY OF SAN DIEGO
ENGINEERING DEPARTMENT
SHEET 5 OF 39 SHEETS
W.O. NO. 17430
PLAN REVISION
CHANGE BY DATE APPROVAL
CITY ENGINEER
DATE 6/24/68
WATER DEPT.
PLANNING DEPT.
ELECTRICAL
STRUCTURAL
TRAFFIC
SEWERAGE
DRAINAGE
HIGHWAY
GRADES
CONSTRUCTION RECORD
DATE STARTED
DATE COMPLETED
CONTR.
INSP.
FIELD BOOK
COORD. INDEX 196-1719
CONTROL 6-21-68
OFFICE ENGINEER
SUPERVISOR
CHECKED
DESIGNED
11558-5-D
APPROVALS
ORIGINAL CONTRACT
CHANGE NO. 1
CHANGE NO. 2
ORIGINAL DRAWING
DOCUMENT NO. 11558
FILE NO. 11558-5

020834

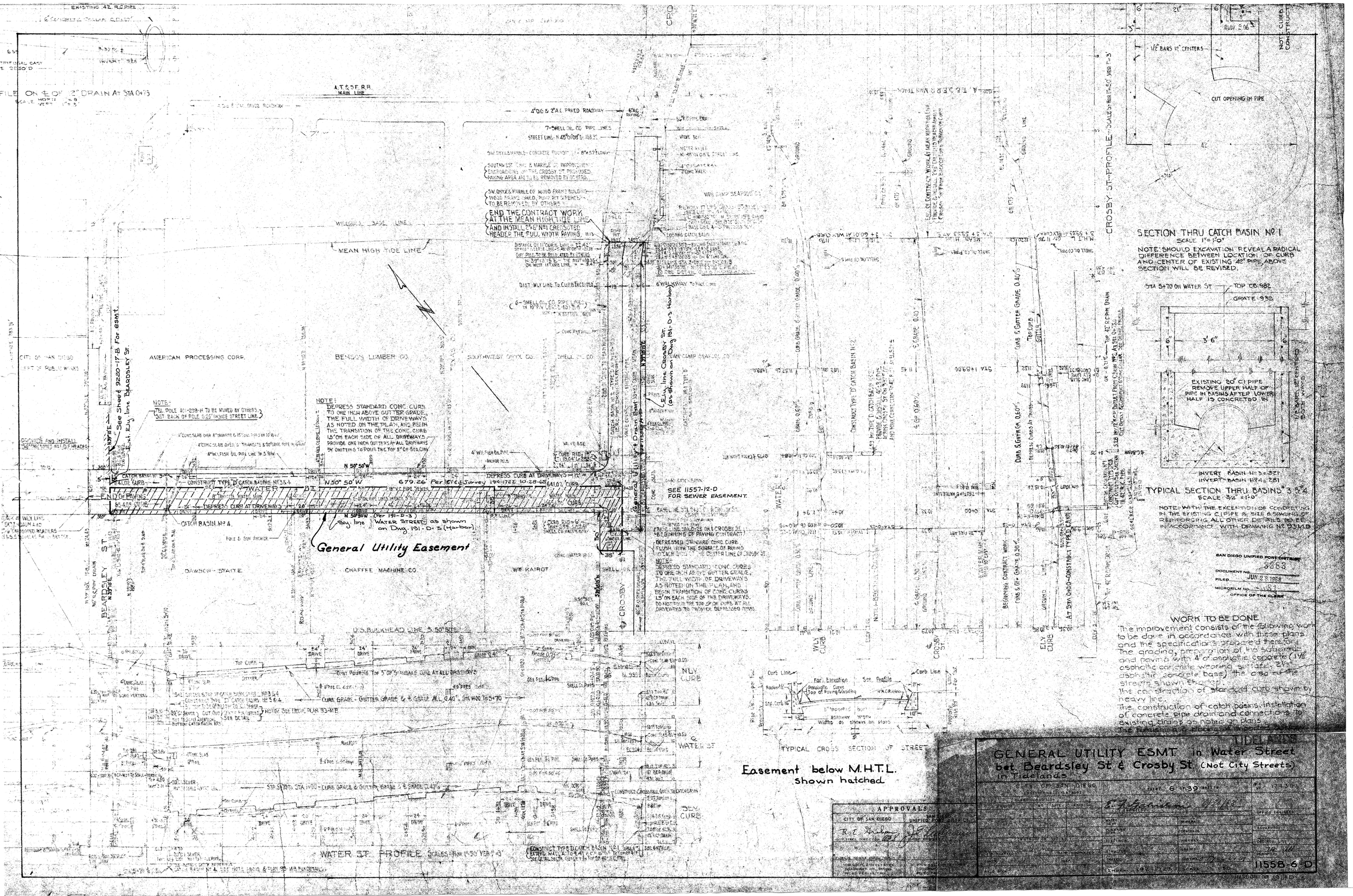
END THE CONTRACT WORK AT THE MEAN HIGH TIDE LINE AND INSTALL 2"x6" No1 CREOSOTED HEADER THE FULL WIDTH PAVING.
MEAN HIGH TIDE LINE
AMERICAN PROCESSING CORP.
BENSON LUMBER CO.
SOUTHWEST ONYX CO.
SHELL OIL CO.
VAN CAMP SEAFOOD CO.
CHAFFEE MACHINE CO.
W. E. KAIROT
DAWSON - STAITE
BEARDSLEY ST
CROSBY ST
WATER ST
General Utility Easement
See Sheet 9220-17-B For esmt.
SEE 11557-12-D FOR SEWER EASEMENT.
CROSBY ST. PROFILE
SECTION THRU CATCH BASIN No 1
SCALE 1"=1'0"
NOTE: SHOULD EXCAVATION REVEAL A RADICAL DIFFERENCE BETWEEN LOCATION OF CURB AND CENTER OF EXISTING 42" PIPE, ABOVE SECTION WILL BE REVISED.
EXISTING 20" C.I. PIPE REMOVE UPPER HALF OF PIPE IN BASIN AFTER LOWER HALF IS CONCRETED IN
TYPICAL SECTION THRU BASINS 3 & 4
SCALE 3/4"=1'0"
NOTE: WITH THE EXCEPTION OF CONCRETING IN THE EXISTING C.I. PIPE & SIZE & SPACING OF REINFORCING ALL OTHER DETAILS TO BE IN ACCORDANCE WITH DRAWING No 93-M.D.
WATER ST. PROFILE
TYPICAL CROSS SECTION OF STREET
Easement below M.H.T.L. shown hatched
SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3883
FILED JUN 28 1968
OFFICE OF THE CLERK
WORK TO BE DONE
The improvement consists of the following work to be done in accordance with these plans and the specifications prepared therefor. The grading, preparation of the subgrade and paving with 4" of asphaltic concrete (1½" asphaltic concrete wearing surface, 2½" asphaltic concrete base) the area of the streets shown shaded. The construction of standard curb shown by heavy line. The construction of catch basins, installation of concrete pipe drain and connections to existing drains as noted on plans.
TIDELANDS
GENERAL UTILITY ESMT. in Water Street bet Beardsley St & Crosby St. (Not City Streets) in Tidelands
CITY OF SAN DIEGO
11558-6-D
APPROVALS
CITY OF SAN DIEGO
UNIFIED PORT DISTRICT

020835

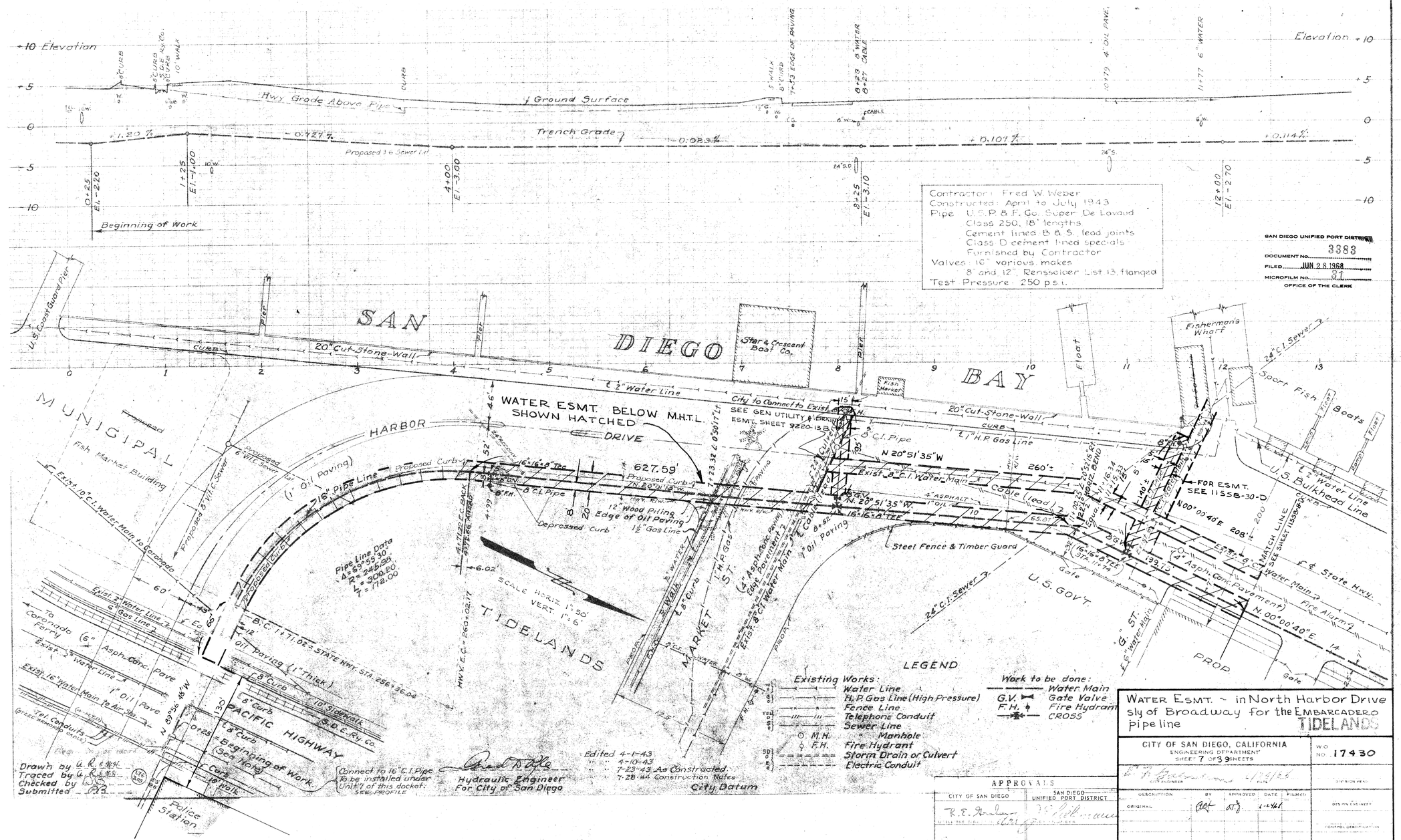
Elevation
Hwy. Grade Above Pipe
Ground Surface
Trench Grade
Proposed 3" Sewer Cl.
Beginning of Work
Contractor: Fred W. Weber
Constructed: April to July 1943
Pipe U.S.P.&F. Co. Super De Lavaud
Class 250, 18' lengths
Cement lined B.&S., lead joints
Class D cement lined specials
Furnished by Contractor
Valves 16" various makes
8" and 12" Rensselaer List 13, flanged
Test Pressure 250 p.s.i.
SAN DIEGO BAY
MUNICIPAL HARBOR
TIDELANDS
PACIFIC HIGHWAY
MARKET ST.
U.S. GOV'T
PROP
Fisherman's Wharf
Sport Fish Boats
Star & Crescent Boat Co.
Float
Fish Market Building
Police Station
20" Cut-Stone-Wall
2" Water Line
City to Connect to Exist.
WATER ESMT. BELOW M.H.T.L. SHOWN HATCHED
DRIVE
627.59'
N 20°51'35"W
260'±
Exist. 8" C.I. Water Main
Steel Fence & Timber Guard
FOR ESMT. SEE 11558-30-D
N 00°05'40"E 208'±
N 00°00'40"E
U.S. Bulkhead Line
State Hwy.
Water Main
Fire Alarm
Pipe Line Data
Δ = 89°55'30"
R = 246.00
L = 300.20
T = 172.00
SCALE HORIZ. 1" = 50'
VERT. 1" = 6'
Edited 4-1-43
4-10-43
7-23-43 As Constructed.
7-28-44 Construction Notes
City Datum
Hydraulic Engineer
For City of San Diego
Connect to 16" C.I. Pipe To be installed under Unit 1 of this docket. SEE PROFILE
Drawn by
Traced by
Checked by
Submitted
LEGEND
Existing Works:
Water Line
H.P. Gas Line (High Pressure)
Fence Line
Telephone Conduit
Sewer Line
M.H. Manhole
F.H. Fire Hydrant
Storm Drain or Culvert
Electric Conduit
Work to be done:
Water Main
G.V. Gate Valve
F.H. Fire Hydrant
CROSS
APPROVALS
CITY OF SAN DIEGO
SAN DIEGO UNIFIED PORT DISTRICT
PUBLIC WORKS DIRECTOR
ORIGINAL CONVEYANCE DOCUMENT NO. 81558 FILED FEB. 15, 1961
ORIGINAL CONVEYANCE DOCUMENT NO. 7 FILED FEB. 13, 1963
CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED
SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 31
OFFICE OF THE CLERK
WATER ESMT. ~ in North Harbor Drive sly of Broadway for the EMBARCADERO pipe line
TIDELANDS
CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 7 OF 39 SHEETS
W.O. NO. 17430
DESIGN ENGINEER
CONTROL CERTIFICATION
198-1715
11558-7-D
REF 3712-2-W

020836

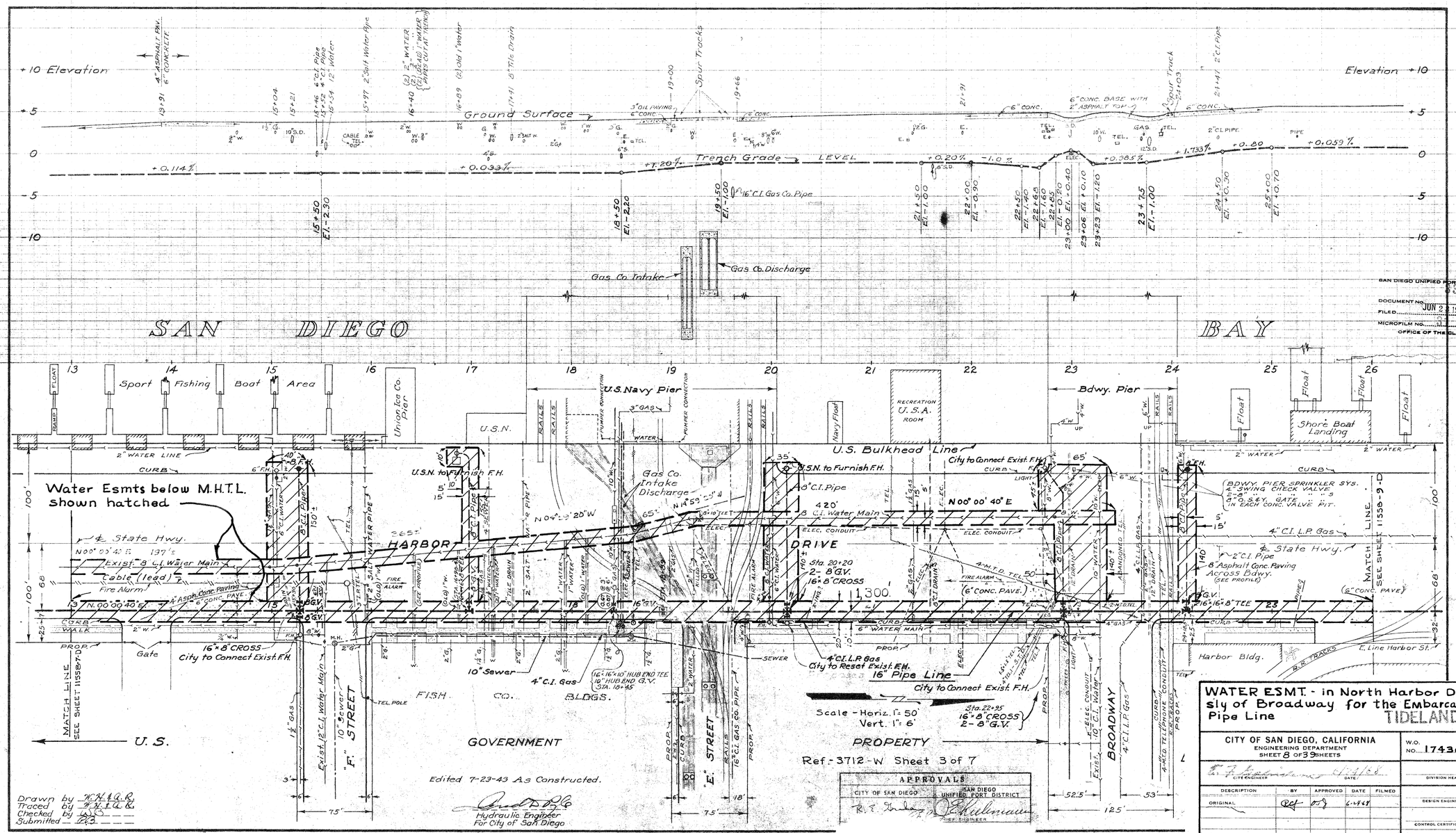
+10 Elevation
Elevation +10
Ground Surface
Trench Grade
LEVEL
Spur Tracks
Gas Co. Intake
Gas Co. Discharge
16" C.I. Gas Co. Pipe
SAN DIEGO BAY
Sport Fishing Boat Area
Union Ice Co. Pier
U.S. Navy Pier
Bdwy. Pier
Navy Float
RECREATION U.S.A. ROOM
Shore Boat Landing
Float
U.S. Bulkhead Line
City to Connect Exist. F.H.
U.S.N. to Furnish F.H.
Water Esmts below M.H.T.L. shown hatched
HARBOR DRIVE
1,300'
N 00° 00' 40" E
N 04° 23' 20" W
420'
8" C.I. Water Main
Exist. 8" C.I. Water Main
Cable (lead)
Fire Alarm
16" x 8" CROSS
City to Connect Exist. F.H.
10" Sewer
4" C.I. Gas
4" C.I. L.P. Gas
City to Reset Exist. F.H.
16" Pipe Line
City to Connect Exist. F.H.
Sta. 20+20
2-8" G.V.
16" x 8" CROSS
Sta. 22+25
16" x 8" CROSS
2-8" G.V.
16"x16"x10" HUB END TEE
10" HUB END G.V.
STA. 18+45
BDWY. PIER SPRINKLER SYS.
4" SWING CHECK VALVE
8" O.S.&Y. GATE
IN EACH CONC. VALVE PIT.
2" C.I. Pipe
8" Asphalt Conc. Paving Across Bdwy. (SEE PROFILE)
4" C.I. L.P. Gas
MATCH LINE SEE SHEET 11558-9-D
MATCH LINE SEE SHEET 11558-7-D
"F" STREET
"E" STREET
BROADWAY
FISH CO. BLDGS.
GOVERNMENT PROPERTY
Harbor Bldg.
C. Line Harbor St.
U. S.
Scale - Horiz. 1" = 50'
Vert. 1" = 6'
Ref.- 3712-W Sheet 3 of 7
Edited 7-23-43 As Constructed.
Hydraulic Engineer For City of San Diego
Drawn by
Traced by
Checked by
Submitted
APPROVALS
CITY OF SAN DIEGO
SAN DIEGO UNIFIED PORT DISTRICT
PUBLIC WORKS DIRECTOR
ORIGINAL CONVEYANCE DOCUMENT NO. 68188 FILED FEB. 11, 1958
ORIGINAL CONVEYANCE DOCUMENT NO. 75 FILED FEB. 13, 1953
SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 8383
FILED JUN 2 1 1968
MICROFILM NO.
OFFICE OF THE CLERK
WATER ESMT. - in North Harbor Drive sly of Broadway for the Embarcadero Pipe Line
TIDELANDS
CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 8 OF 39 SHEETS
W.O. NO. 17430
CITY ENGINEER
DIVISION HEAD
DESCRIPTION
BY
APPROVED
DATE
FILMED
ORIGINAL
DESIGN ENGINEER
CONTROL CERTIFICATION
198-1715
LAMBERT COORDINATES
CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED
11558-8-D

020837

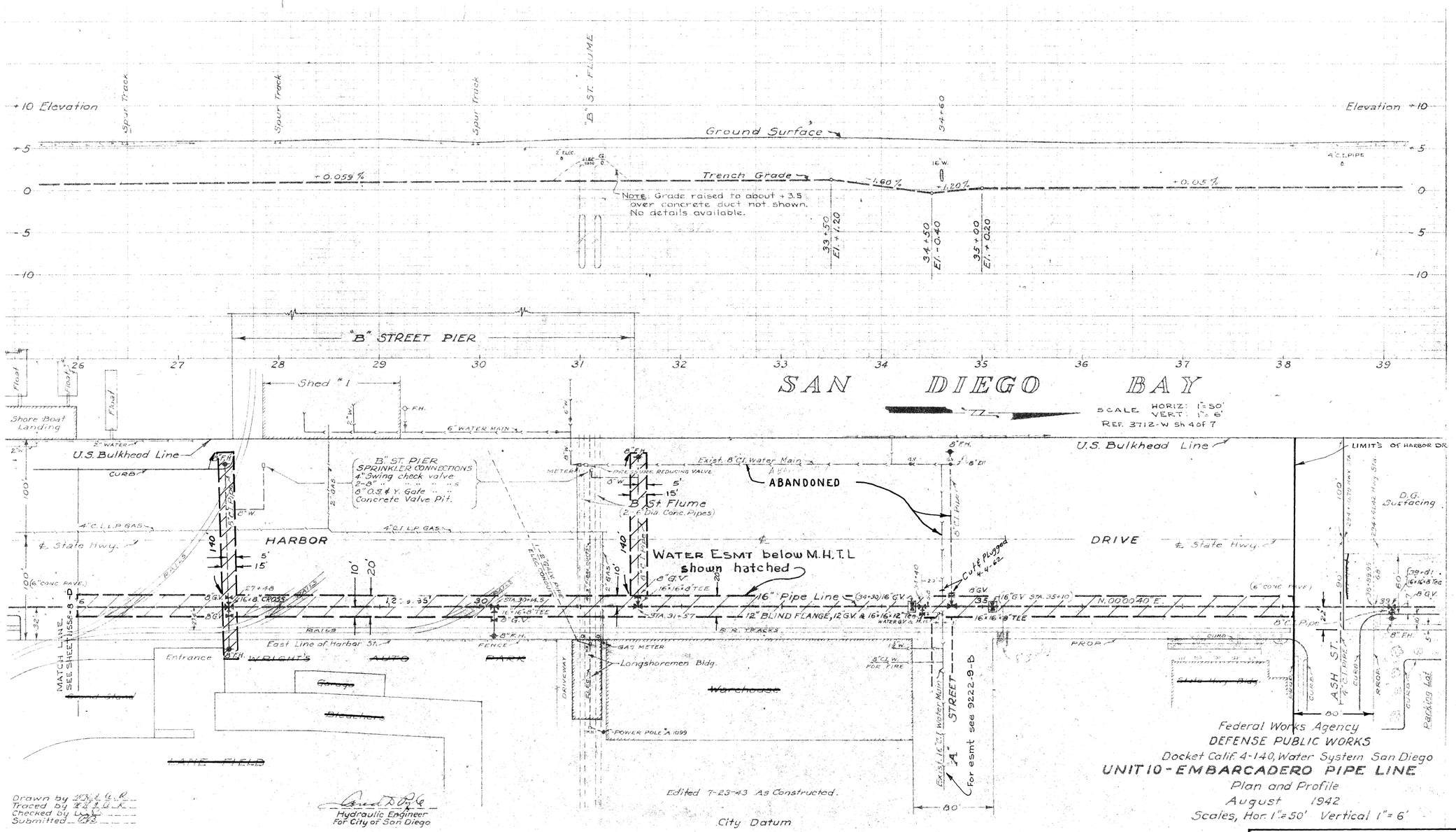

Drawn by [illegible]
Traced by [illegible]
Checked by [illegible]
Submitted [illegible]

Hydraulic Engineer
For City of San Diego

Federal Works Agency
DEFENSE PUBLIC WORKS
Docket Calif. 4-140, Water System San Diego
UNIT 10 - EMBARCADERO PIPE LINE
Plan and Profile
August 1942
Scales, Hor. 1"=50' Vertical 1"=6'

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 31
OFFICE OF THE CLERK

WATER ESMT. - in North Harbor Drive sly of Broadway for the EMBARCADERO pipe line
TIDELANDS

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R. E. Shaler	[illegible]
UTILITIES DIRECTOR	CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 15, 1963	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. [illegible] 1962

CITY OF SAN DIEGO, CALIFORNIA ENGINEERING DEPARTMENT SHEET 9 OF 39 SHEETS	W.O. NO. 17430
[illegible] 1/29/68	
DESCRIPTION / BY / APPROVED / DATE / FILMED	DESIGN ENGINEER
ORIGINAL / [illegible] / [illegible] / [illegible] / [illegible]	CONTRACT SUBMITTAL NO.
	202-1715
CONTRACTOR / INSPECTOR / DATE STARTED / DATE COMPLETED	11558 9 -D

020838

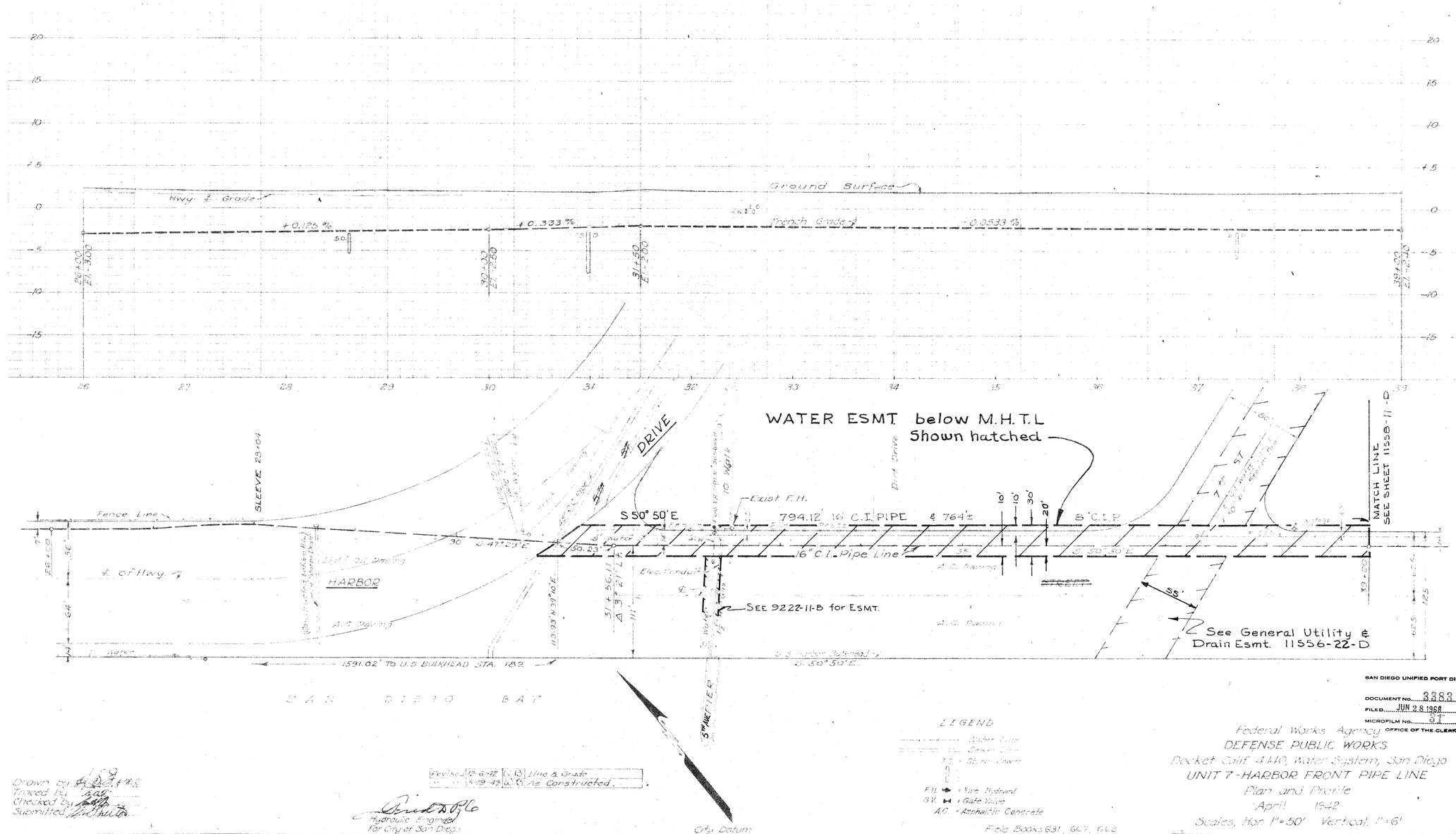

Drawn by
Traced by
Checked by
Submitted

Revised	12-6-42	Line & Grade
	4-19-43	As Constructed.

Hydraulic Engineer
For City of San Diego

LEGEND
Water Line
Sewer Line
Storm Sewer
F.H. = Fire Hydrant
G.V. = Gate Valve
A.C. = Asphaltic Concrete

Field Books 631, 667, 668

Ref. Dwg.
3709-W 6 of 23

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 34
OFFICE OF THE CLERK

Federal Works Agency
DEFENSE PUBLIC WORKS
Docket Calif. 4440, Water System, San Diego
UNIT 7-HARBOR FRONT PIPE LINE
Plan and Profile
April 1942
Scales, Hor. 1"=50' Vertical 1"=6'

WATER ESMT. - swly of 5th Ave & Harbor Drive
TIDELANDS

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 10 OF 39 SHEETS

W.O. NO. 17430

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL			1-2-42	

194-1719

11558-10-D

APPROVALS

CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
	ORIGINAL CONFERENCE DOCUMENT NO. 71 FILED FEB. 10, 1965

020839

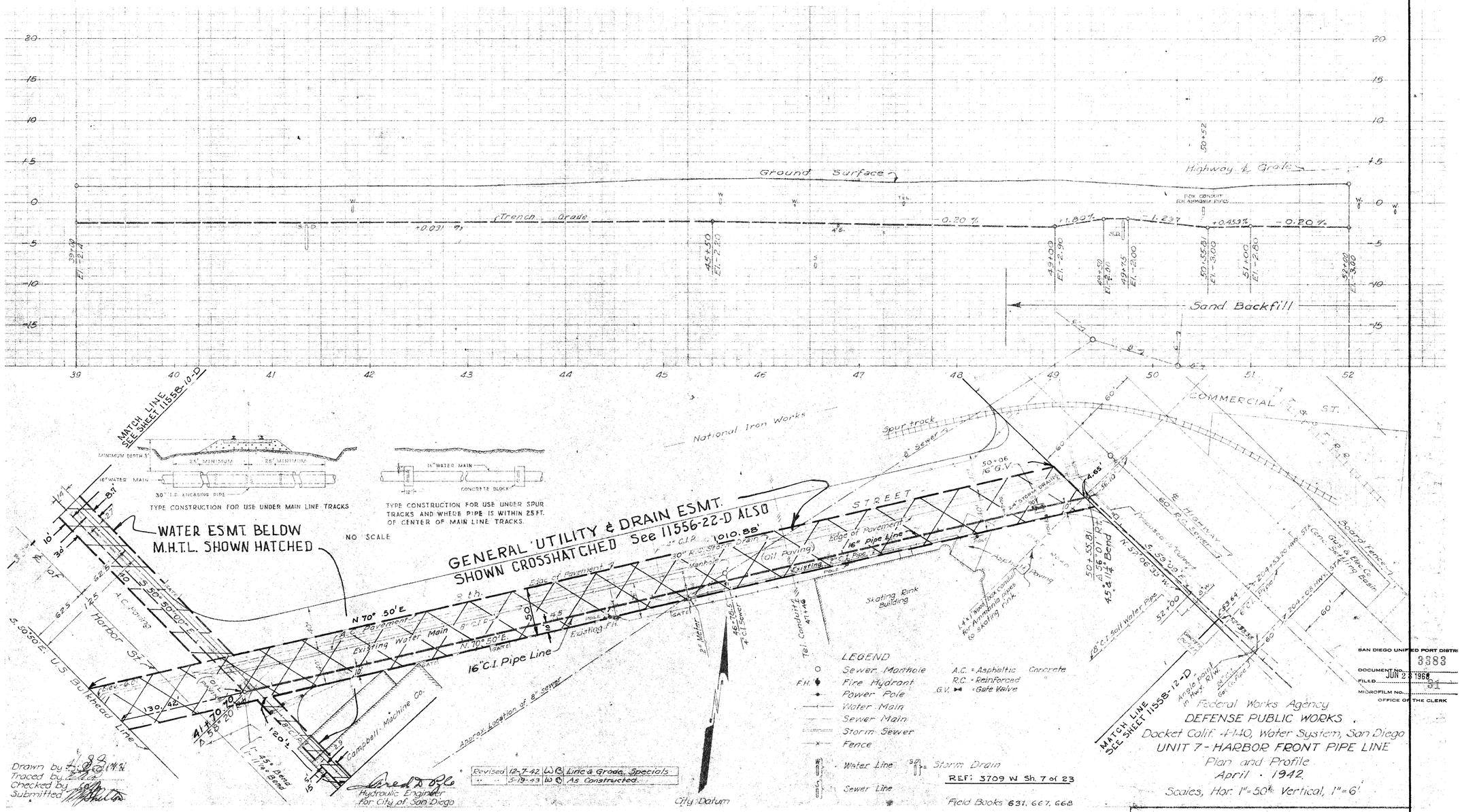

WATER ESMT. - Bet. 6TH St & 8TH St. sly of Harbor Drive, below M.H.T.L.

TIDELANDS

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 11 OF 39 SHEETS

W.O. NO. 17430

E. H. Rodewald 6/19/68
CITY ENGINEER — DATE — DIVISION HEAD

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL			6-4-68	

DESIGN ENGINEER

CONTROL CERTIFICATION

194-1719
STANDARD COORDINATES

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

11558-11-D

APPROVALS

CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R. E. Hedrick, UTILITIES DIRECTOR	E. H. Rodewald, CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 651833 FILED FEB. 12, 1963	ORIGINAL CONVEYANCE DOCUMENT NO. 77 FILED FEB. 13, 1963

020840

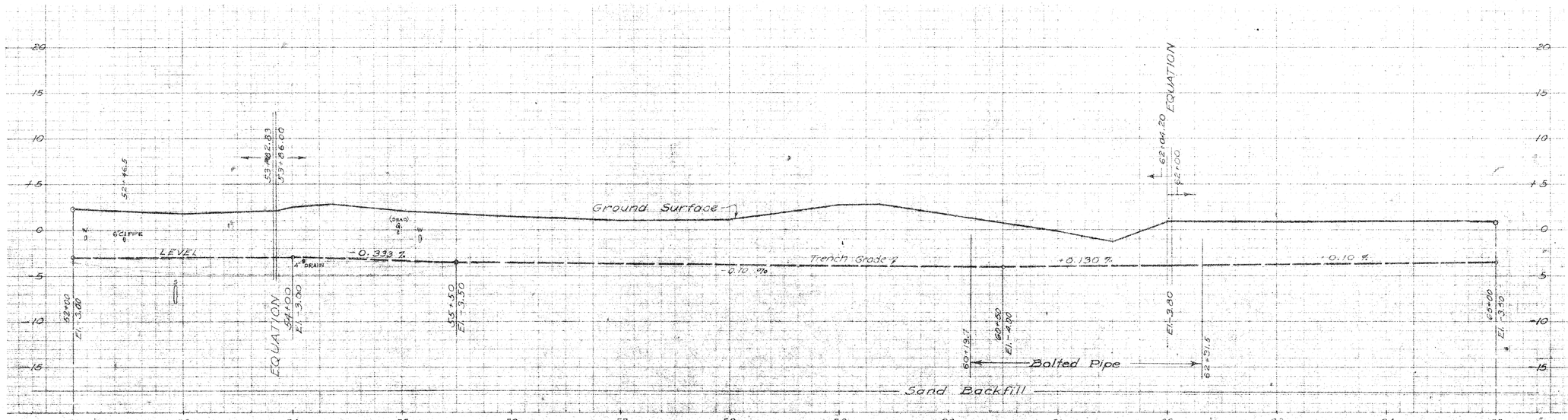

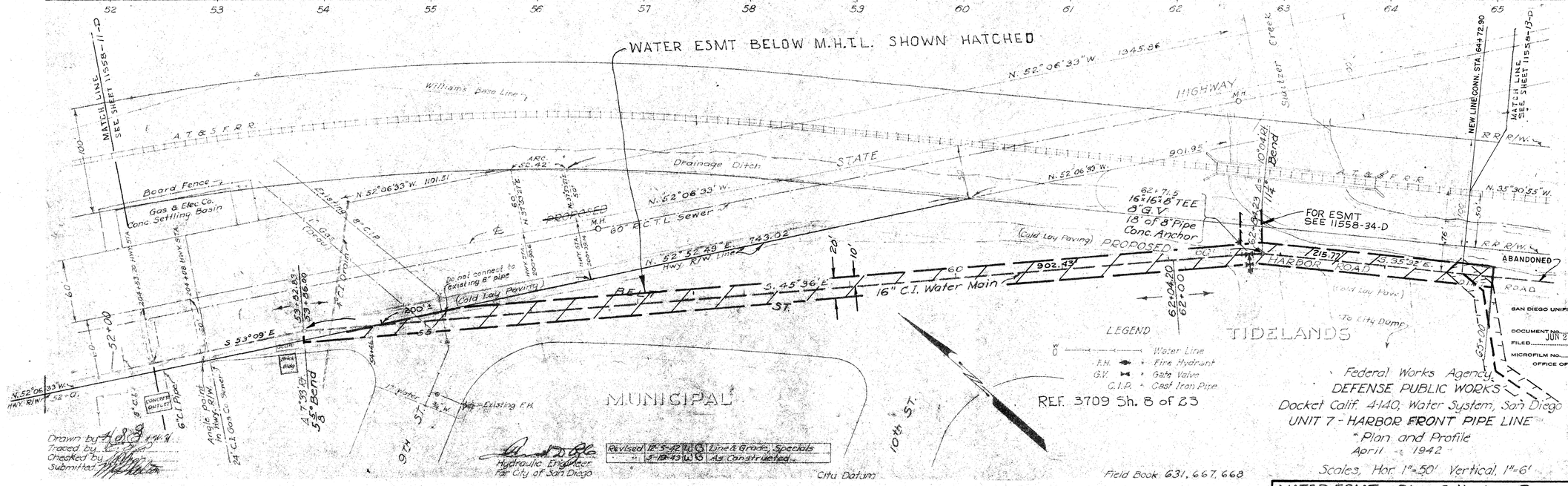

Federal Works Agency
DEFENSE PUBLIC WORKS
Docket Calif. 4-140; Water System, San Diego
UNIT 7 - HARBOR FRONT PIPE LINE
Plan and Profile
April 1942
Scales, Hor. 1"=50' Vertical, 1"=6'

SAN DIEGO UNIFIED PORT DIST
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM NO. 82
OFFICE OF THE CLERK

WATER ESMT. - Sly of Harbor Drive from 9th St. ely to Switzer Creek, below M.H.T.L. TIDELANDS

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 12 OF 39 SHEETS

W.O. NO. 17430

CITY ENGINEER — DATE — DIVISION HEAD

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	RJd	OTJ	6-24-68	

DESIGN ENGINEER

CONTROL CERTIFICATION

194-1721
LAMBERT COORDINATES

CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

11558-12-D

APPROVALS

CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R. S. Drake, UTILITIES DIRECTOR	J. F. Kettenmann, CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 631332 FILED FEB. 15, 1963	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 13, 1969

020841

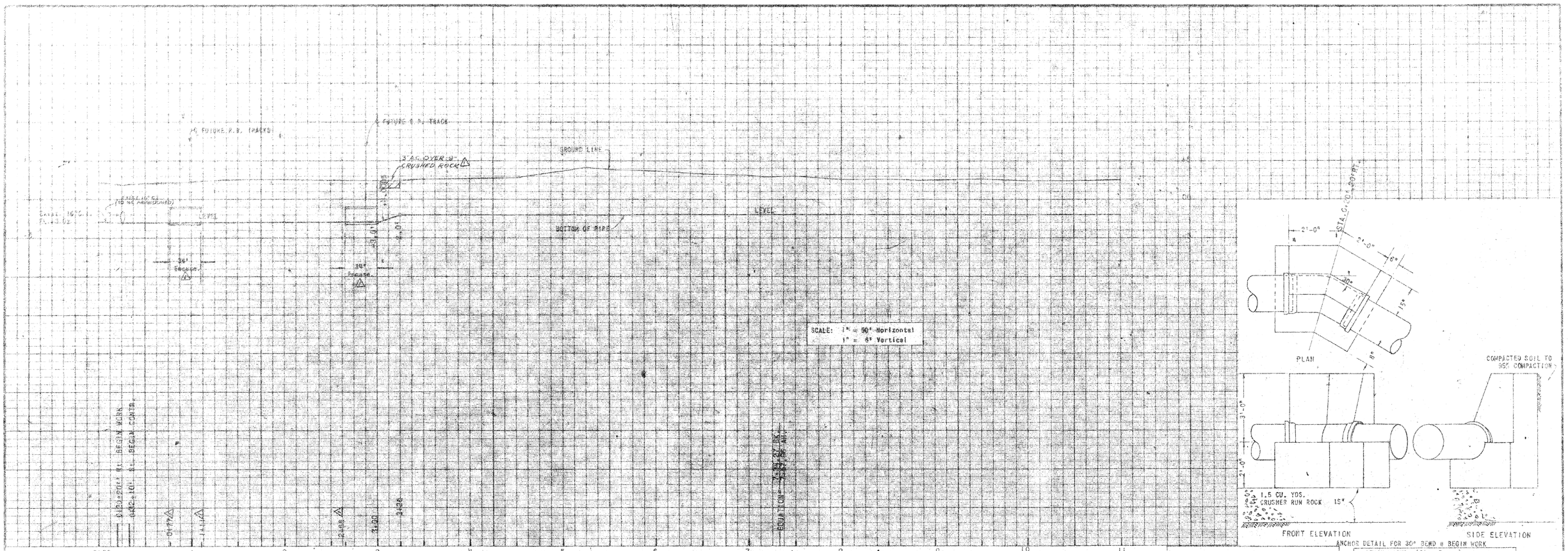

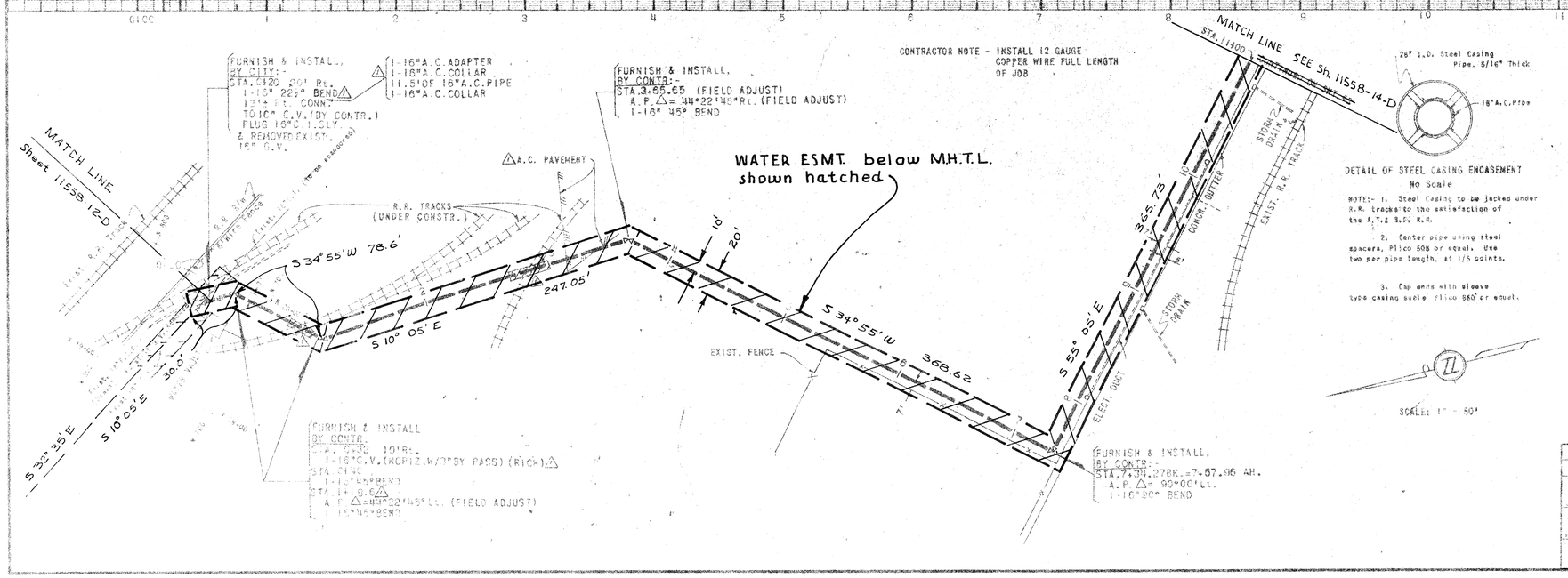

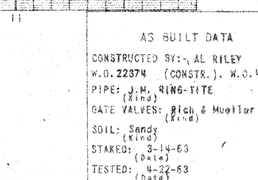

DETAIL OF STEEL CASING ENCASEMENT
No Scale

NOTE:- 1. Steel casing to be jacked under R.R. tracks to the satisfaction of the A.T.& S.F. R.R.

2. Center pipe using steel spacers, Pilco 505 or equal. Use two per pipe length, at 1/5 points.

3. Cap ends with sleeve type casing seals Pilco 860 or equal.

AS BUILT DATA

CONSTRUCTED BY:- AL RILEY
W.O. 22374 (CONSTR.), W.O. 48304 (ENGR.).
PIPE: J.H. RING-TITE (Kind)
GATE VALVES: Rich & Mueller (Kind)
SOIL: Sandy (Kind)
STAKED: 3-14-63 (Date)
TESTED: 4-22-63 (Date)
BACKFILL: Native (Kind)
NOTE: Include "CONSTRUCTION #F0050".
CONNECTIONS BY:- CITY FORCE.
W.O. 22375
PIPE: 16" A.C.
GATE VALVES: None

BENCH MARKS: (City Datum)
B.M.: H.W. B.P. - Dewey & Logan Sts. EL. 48.95
T.B.M.: Cut in Center Concr. Vault STA. 0+37 29' Rt. EL. 2.27
T.B.M.: P.K. in P. Pole #657526H STA. 26+42 10' Ft. EL. 5.12

REFERENCES:
Water Rk. II, Shts. G-23-C,D, G-24-B.
Gt. Bk. A-614.
315-D (R.R. Layout)
Harbor Dept. Plot Plan (Near Sigsbee)
L-50-25184 (A.T.& S.F. R.R.)
206-D-2 (Sewer, Harbor Dept.)
8298-W (Water)
Field Notes: G-23.A,B,C,D.
Dwg. G.P.K.-7 (Harbor Front P.L.)
Dwg. 206-D-2 (Sewer, Harbor Dept.)
RETIREMENT:
1928' of 16" C.I. (1942)
3-16" G.V.'s (1942)
600'± of 6" C.I. (1941)
3-6" G.V.'s (1941)
1-6" G.V. (1959)
1-6" Reg. Valve (1941)
2-6" F.H.& F.H. Servs. (1942)

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 51
OFFICE OF THE CLERK

REF. DWGS
10735-2-AD
3709 W Sh 8 of 23

APPROVALS

CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R. E. Graham (Acting) — CITY ENGINEER-INSPECTOR	J. F. Kilkenny — CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	CHIEF DEPUTY CLERK

WATER ESMT. - From Switzer Creek to Beardsley St., below M.H.T.L.

TIDELANDS

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 13 OF 39 SHEETS

W.O. NO. 17430

CITY ENGINEER — DATE 6/24/68 — DIVISION HEAD

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	RDJ	[illegible]	6-24-68	

DESIGN ENGINEER

CONTROL CERTIFICATION

196-1721
LAMBERT COORDINATES

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

11558-13-D

HARBOR FRONT 16" A.C. PL.

020842

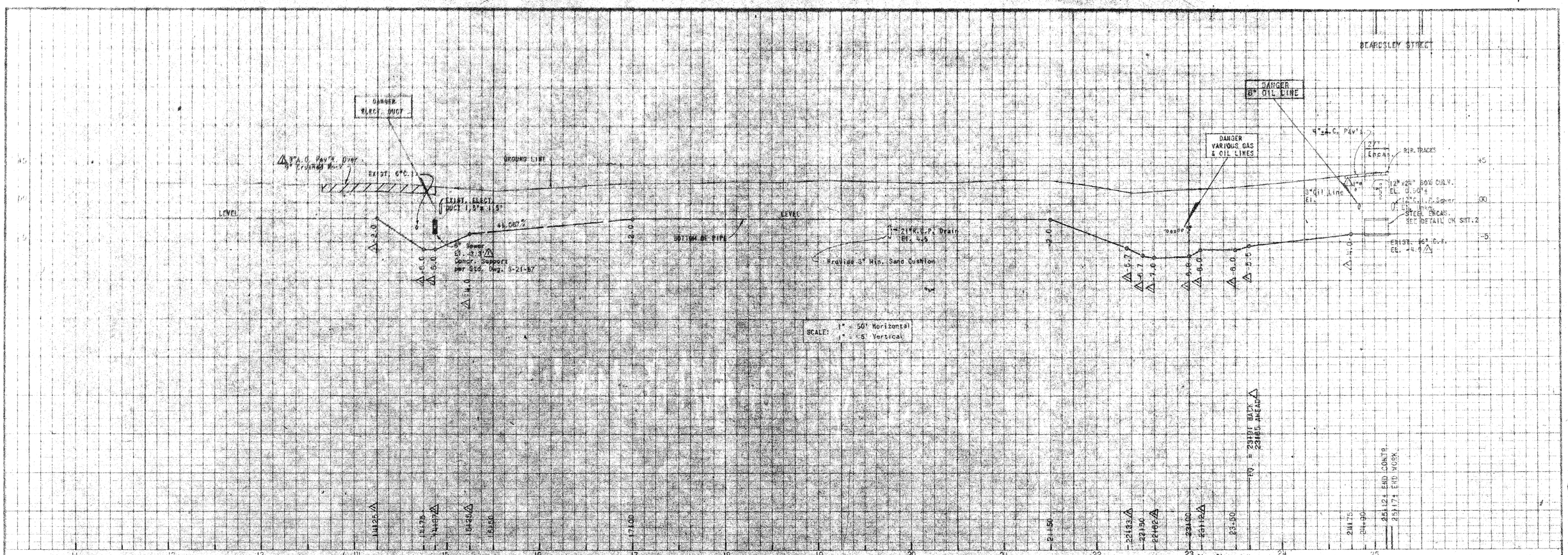

WATER ESMT. From Switzer Creek to Beardsley St., Continued, below M.H.T.L.

TIDELANDS

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 14 OF 39 SHEETS

W.O. NO. 17430

CITY ENGINEER — DATE — DIVISION HEAD

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	RCL		6 24 68	

DESIGN ENGINEER

CONTROL CERTIFICATION

194 - 1721
LAMBERT COORDINATES

CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

11558-14-D

APPROVALS

CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
UTILITIES DIRECTOR	
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE RECEIVED	ORIGINAL CONVEYANCE RECEIVED

020843

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 61
OFFICE OF THE CLERK

Federal Works Agency
DEFENSE PUBLIC WORKS
Docket Calif. 4-140, Water System, San Diego
UNIT 7 - HARBOR FRONT PIPE LINE
Plan and Profile
April 1942
Scales, Hor. 1" = 50' Vertical, 1" = 6'

WATER ESMT. sly of Harbor Drive between Sampson St. & Sicard St. below M.H.T.L. (TIDELANDS)

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 15 OF 38 SHEETS

W.O. NO. 17430

CITY ENGINEER — DATE 6/24/68 — DIVISION HEAD

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	R.C.J.		6-24-68	

DESIGN ENGINEER

CONTROL CERTIFICATION
192-1725
LAMBERT COORDINATES

CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

11558-15-D

APPROVALS

CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
UTILITIES DIRECTOR	CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 09162 FILED FEB. 13, 1959	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 13, 1962

020844

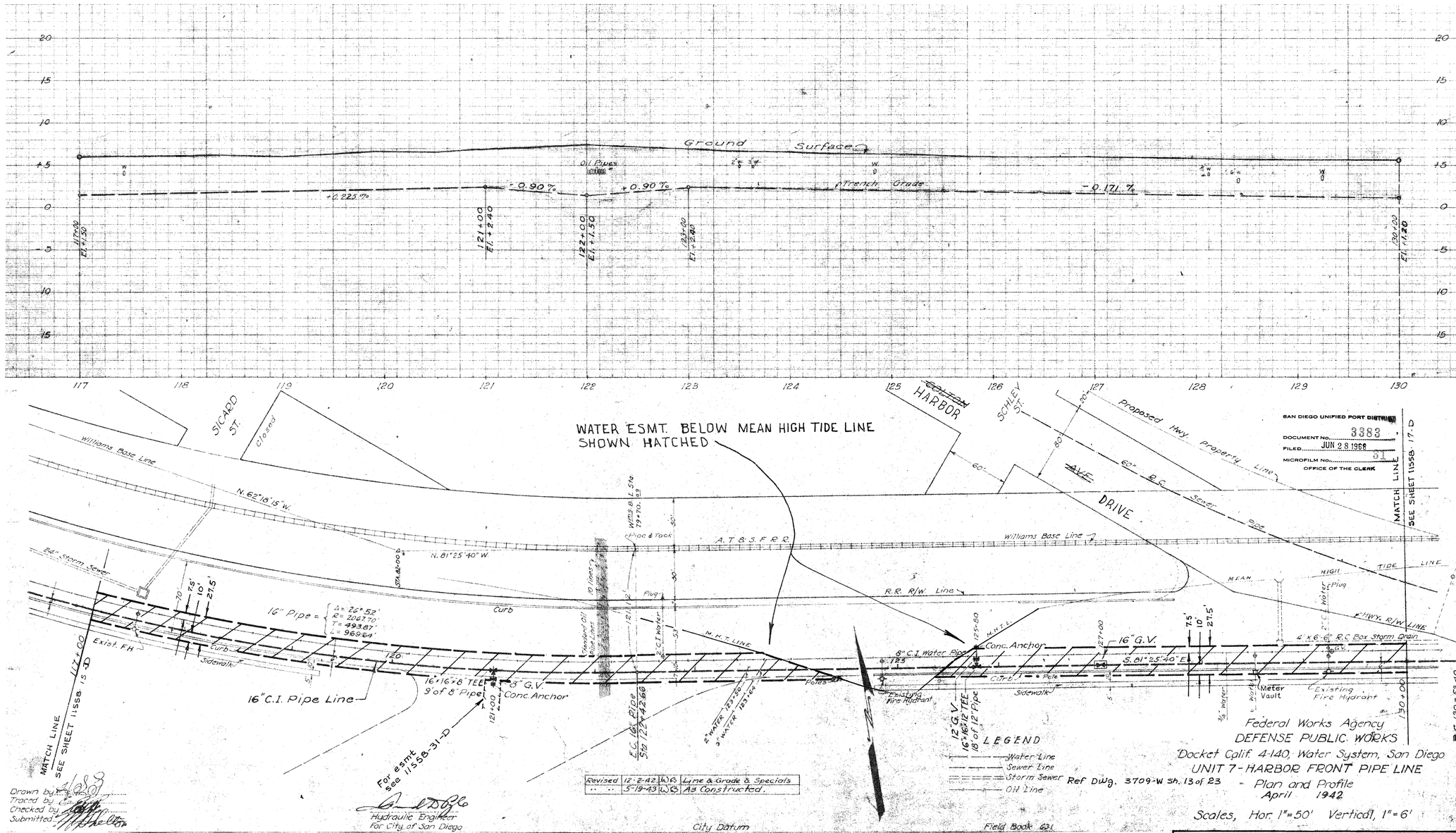

WATER ESMT. sly. of Harbor Drive from Sicard St. to 500' Ely of Schley St.

TIDELANDS

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 16 OF 39 SHEETS

W.O. NO. 17430

CITY ENGINEER — DATE 6/24/68

DIVISION HEAD

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	RCJ		6-24-68	

DESIGN ENGINEER

CONTROL CERTIFICATION

192-1725
LAMBERT COORDINATES

CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

11558-16-D

APPROVALS

CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
UTILITIES DIRECTOR	CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 451833 FILED FEB. 15, 1963	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 15, 1963

020845

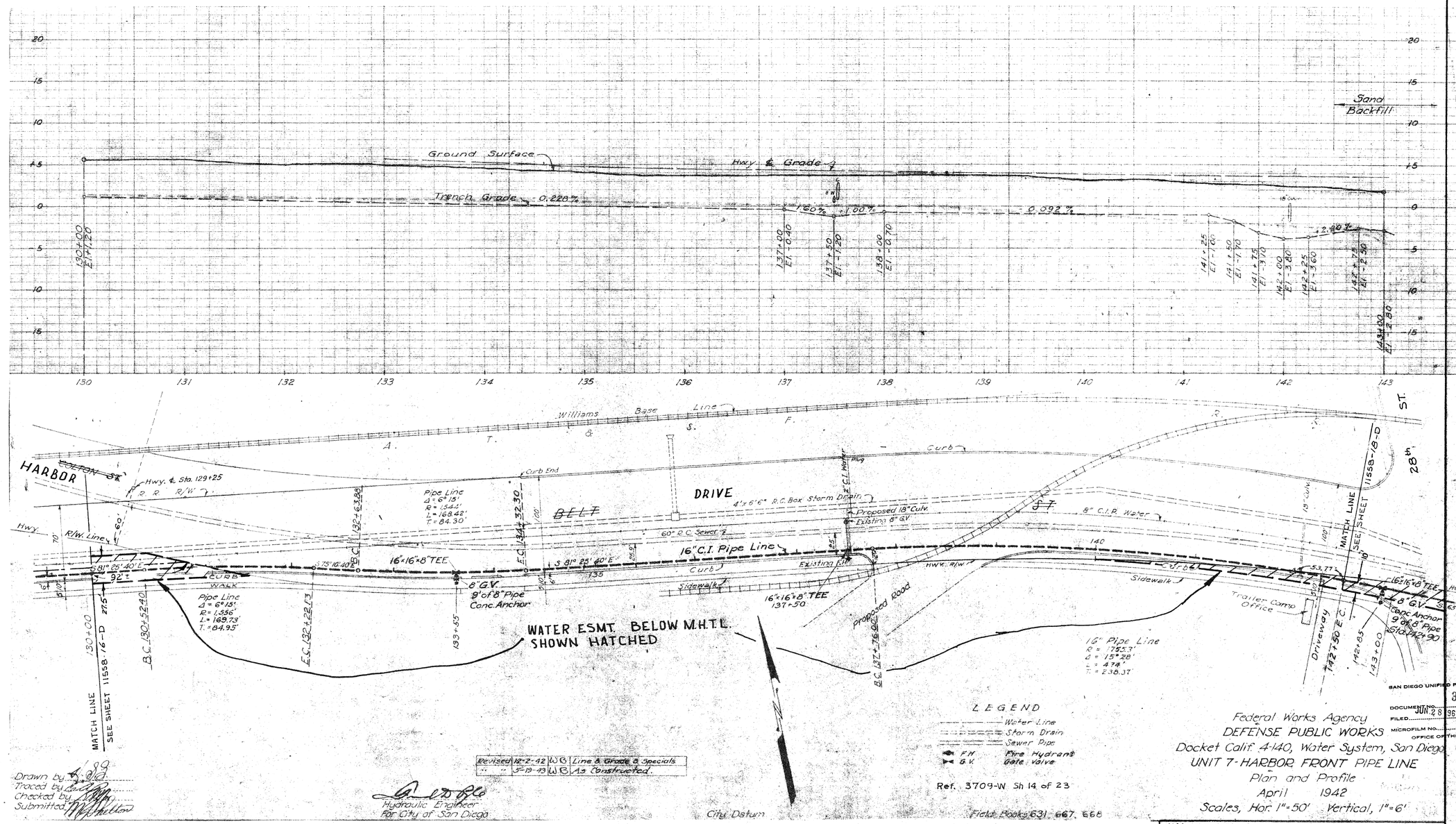

Revised	12-2-42	W.B.	Line & Grade & Specials
"	5-19-43	W.B.	As Constructed.

Drawn by
Traced by
Checked by
Submitted

Hydraulic Engineer
For City of San Diego

City Datum

Field Books 631, 667, 668

LEGEND

Water Line
Storm Drain
Sewer Pipe
F.H. Fire Hydrant
G.V. Gate Valve

Ref. 3709-W Sh 14 of 23

Federal Works Agency
DEFENSE PUBLIC WORKS
Docket Calif. 4-140, Water System, San Diego
UNIT 7-HARBOR FRONT PIPE LINE
Plan and Profile
April 1942
Scales, Hor. 1"=50' Vertical, 1"=6'

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT 3383
FILED JUN 28 1968
MICROFILM NO. 31
OFFICE OF THE CLERK

WATER ESMT. Sly of Harbor Drive from approx. 500' ely of Schley St to 28th St., Below M.H.T.L. TIDELANDS

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 17 OF 39 SHEETS

W.O. NO. 17430

City Engineer — Date 6/24/68 — Division Head

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	RCJ		6-27-68	

Design Engineer

Control Certification

190-1727
Lambert Coordinates

Contractor — Date Started
Inspector — Date Completed

11558-17-D

APPROVALS

CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R. E. Graham — Utilities Director	F. Kellemann — Chief Engineer
Public Works Director	
Original Conveyance Document No. 65523 Filed Feb. 15, 1963	Original Conveyance Document No. 71 Filed Feb. 13, 1963

020846

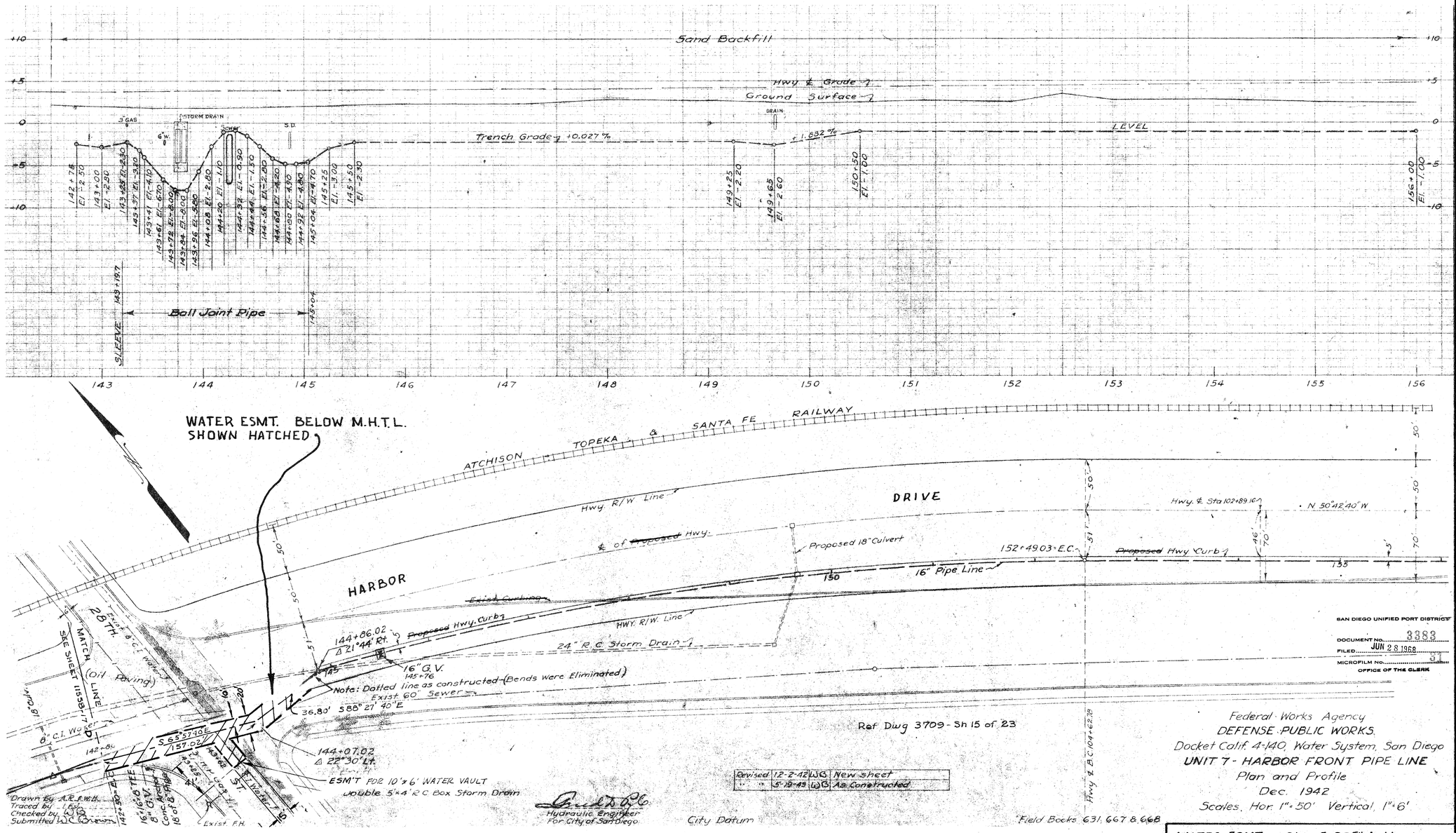

Revised	12-2-42	W.G.	New sheet
" "	5-19-43	W.G.	As Constructed

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No.
OFFICE OF THE CLERK

Federal Works Agency
DEFENSE PUBLIC WORKS
Docket Calif. 4-140, Water System, San Diego
UNIT 7 - HARBOR FRONT PIPE LINE
Plan and Profile
Dec. 1942
Scales, Hor. 1" = 50' Vertical 1" = 6'

WATER ESMT. - Sly of 28TH & Harbor Drive Below M.H.T.L. TIDELANDS

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 18 OF 39 SHEETS

W.O. NO. 17430

C.F. Salvadori 6/24/68
CITY ENGINEER DATE

DIVISION HEAD

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	R.C.J.		6-24-68	

DESIGN ENGINEER

CONTROL CERTIFICATION

190 - 1727
LAMBERT COORDINATES

CONTRACTOR DATE STARTED
INSPECTOR DATE COMPLETED

11558-18-D

APPROVALS

CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R.E. Shelley, UTILITIES DIRECTOR	J. Kilbourne, CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 41183 FILED FEB. 16, 1953	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 13, 1953

020847

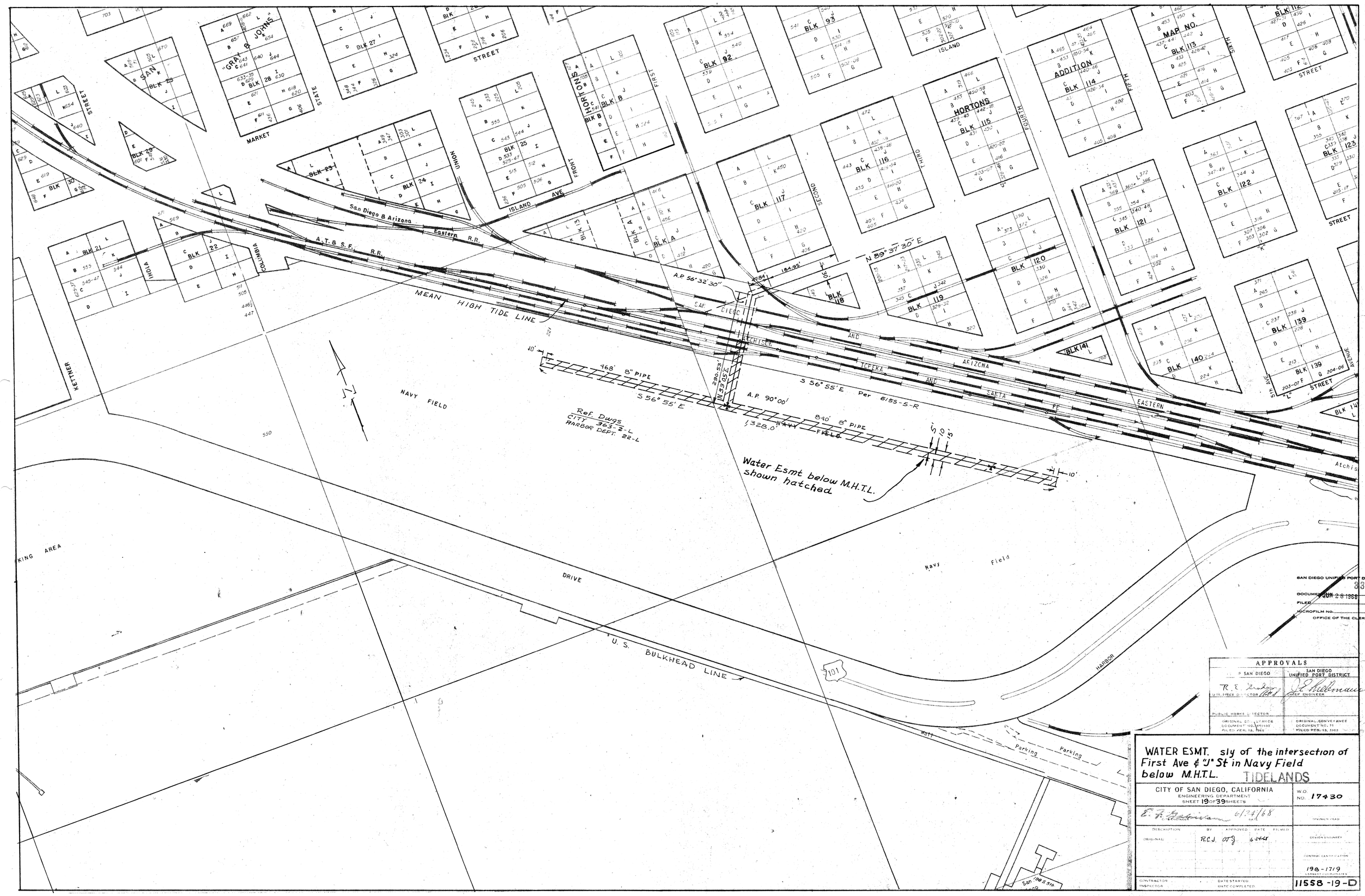
MEAN HIGH TIDE LINE
NAVY FIELD
Ref. Dwgs.
CITY 363.2-L
HARBOR DEPT. 22-L
Water Esmt below M.H.T.L.
shown hatched
A.P. 56°32'30"
A.P. 90°00'
S 56°55'E
S 56°55'E Per 6155-5-R
N 89°37'30" E
184.95'
468' 8" PIPE
840' 8" PIPE
1328.0'
290.53'
N 33°05'E
San Diego & Arizona Eastern R.R.
A.T.& S.F. R.R.
ATCHISON TOPEKA AND SANTA FE
ARIZONA EASTERN
Navy Field
HARBOR DRIVE
U.S. BULKHEAD LINE
Parking
Parking
101
MARKET STREET
ISLAND AVE
FIRST
SECOND
THIRD
FOURTH
FIFTH
SIXTH
"L" STREET
"K" STREET
ISLAND
COLUMBIA
INDIA
KETTNER
UNION
STATE
SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT JUN 28 1968
FILED
MICROFILM NO. 3383
OFFICE OF THE CLERK
APPROVALS
P. SAN DIEGO
SAN DIEGO UNIFIED PORT DISTRICT
UTILITIES DIRECTOR
CHIEF ENGINEER
PUBLIC WORKS DIRECTOR
ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 13, 1963
WATER ESMT. sly of the intersection of First Ave & "J" St in Navy Field below M.H.T.L.
TIDELANDS
CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 19 OF 39 SHEETS
W.O. NO. 17430
6/24/68
DIVISION HEAD
DESCRIPTION
BY
APPROVED
DATE
FILMED
ORIGINAL
R.C.J.
6-24-68
DESIGN ENGINEER
CONTROL CERTIFICATION
198-1719
LAMBERT COORDINATES
CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED
11558-19-D

020848

U.S. M.C.R.D. BOUNDARY LINE

TIDE LINE

231

229

MEAN HIGH 230

RUNWAY

U.S.M.C.R.D. WATER METER

15'
10'
5'

MUNICIPAL AIRPORT
LINDBERGH FIELD

FOR ESMT SEE 11558-3-D

2156

Water Esmt. below M.H.T.L. shown hatched
REF 11558-3-D

16" C.I WATER FOR ESMT SEE 11558-26-D

SCALE 1" = 200'

N 06° 54' 00" E

AIRLANE (Not a City Street)

TAXIWAY (Not a City Street)

STILLWATER ROAD (Not a City Street)

WINSHIP LANE (Not a City Street)

WAKE

TAXIWAY

RUNWAY

16" C.I. WATER

S 89° 58' 55" W 2683.97'

NORTH HARBOR DRIVE

NORTH HARBOR DRIVE

N 86° 26' 10" W

2586.07'

LINDBERGH DRIVE

See Detail

COMBINED

N 06° 54' 00" E

2156

Nly R/W Line

Gate valve

16" C.I. Water

Tangent

163.80'

N 86° 26' 10" W

℄ R = 5100'
Δ = 03° 34' 55"
T = 159.47'
L = 318.84'

DETAIL
SCALE 1" = 100'

PIERHEAD

STA. 387+80.93 E.C.

STA. 384+62.09 B.C.

SEAPLANE BASE

BULKHEAD

U.S. COAST GUARD

CENTER HARBOR EL. 9.24

HARBOR ISLAND

32°44'15"

32°44'00"

32°43'45"

206.000N

208N

207N

205N

Ref. Dwgs.
6155-B-R, 9-R, 10-R
40-L Sheet 11
6112-W Sheet 8
CITY SURVEY 206-1709, 6-1-66
CITY SURVEY 206-1709, 6-23-66

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R. F. Dinda	D. S. Kuhlmann
CITY AREA DIRECTOR	CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 655933 FILED FEB. 15, 1943	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 19, 1969

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3003
FILED JUN 23 1969
MICROFILM NO.
OFFICE OF THE CLERK

WATER ESMT. nly of North Harbor Dr. & Ely of Air Lane in Lindbergh Field (Tidelands) for Marine Corps Base

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 20 OF 39 SHEETS

W.O. NO. 17430

E. F. Gabelman 6/24/68
ENGINEER DATE

DIVISION HEAD

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	R.C.J.		6-24-68	

DESIGN ENGINEER

CONTROL CERTIFICATION
204-1707
LAMBERT COORDINATES

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

11558-20-D

City of San Diego
Conveyances

City Doc.
No. 224625
6/22/68

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968 at 9 A.M.
MICROFILM No.
OFFICE OF THE CLERK

Page 2
1/7

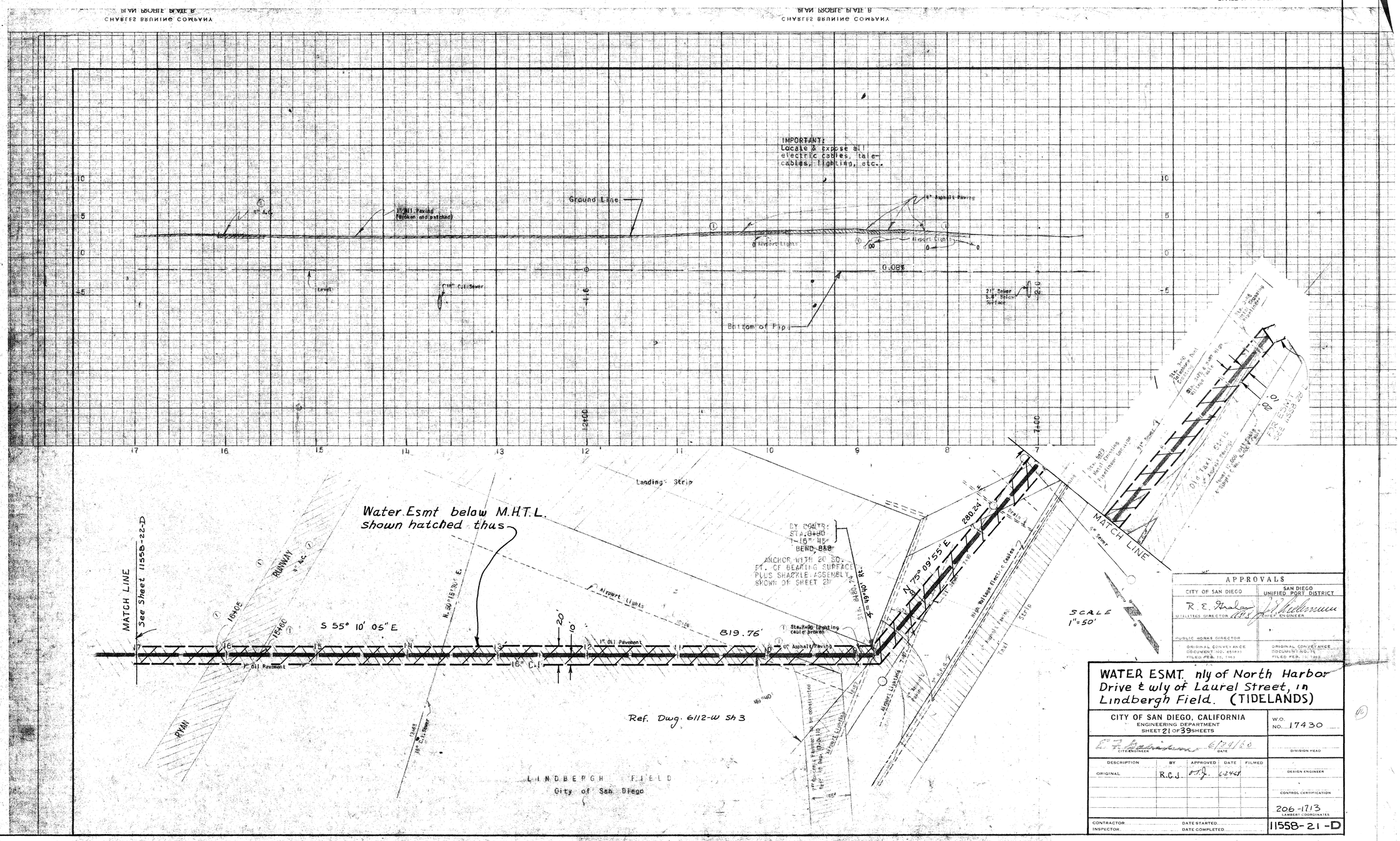

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R. E. Hinds — UTILITIES DIRECTOR	J. S. Wiedemann — CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 65181 FILED FEB. 15, 1963	ORIGINAL CONVEYANCE DOCUMENT NO. 74 FILED FEB. 15, 1963

WATER ESMT. nly of North Harbor Drive & wly of Laurel Street, in Lindbergh Field. (TIDELANDS)

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 21 OF 39 SHEETS

W.O. NO. 17430

E. A. Bateman — CITY ENGINEER — DATE 6/24/60 — DIVISION HEAD

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	R.C.J.	[illegible]	6-24-60	

DESIGN ENGINEER

CONTROL CERTIFICATION

206-1713
LAMBERT COORDINATES

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

11558-21-D

020850

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 31
OFFICE OF THE CLERK

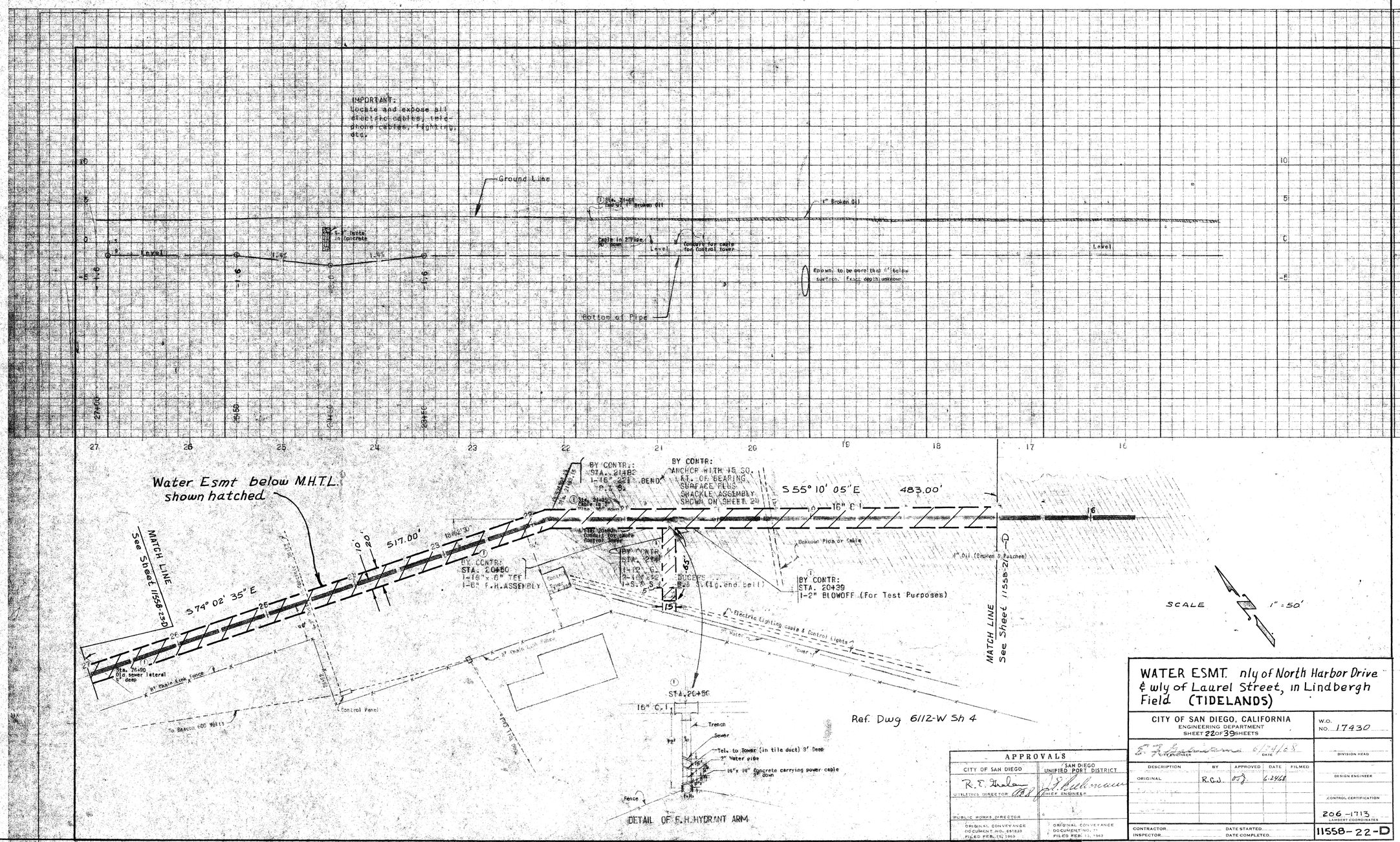

WATER ESMT. nly of North Harbor Drive & wly of Laurel Street, in Lindbergh Field (TIDELANDS)

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 22 OF 39 SHEETS

W.O. NO. 17430

CITY ENGINEER — DATE 6/24/68 — DIVISION HEAD

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	R.G.W.		6-24-68	

DESIGN ENGINEER

CONTROL CERTIFICATION

206-1713
LAMBERT COORDINATES

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

11558-22-D

APPROVALS

CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
UTILITIES DIRECTOR	CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 641833 FILED FEB. 19, 1963	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 13, 1963

020851

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 31
OFFICE OF THE CLERK

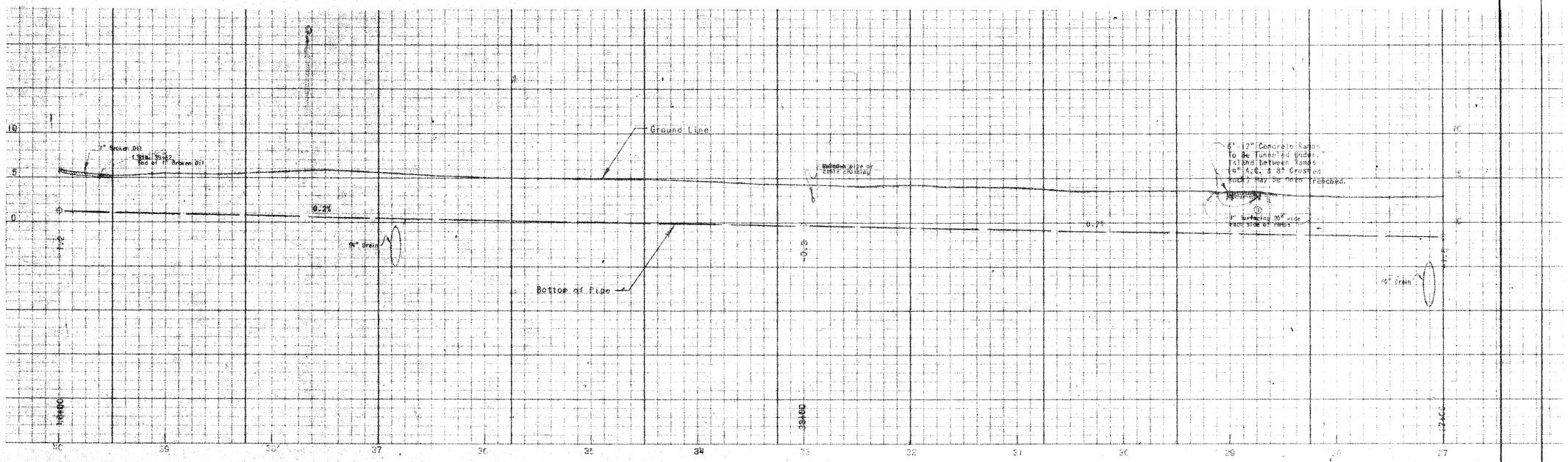

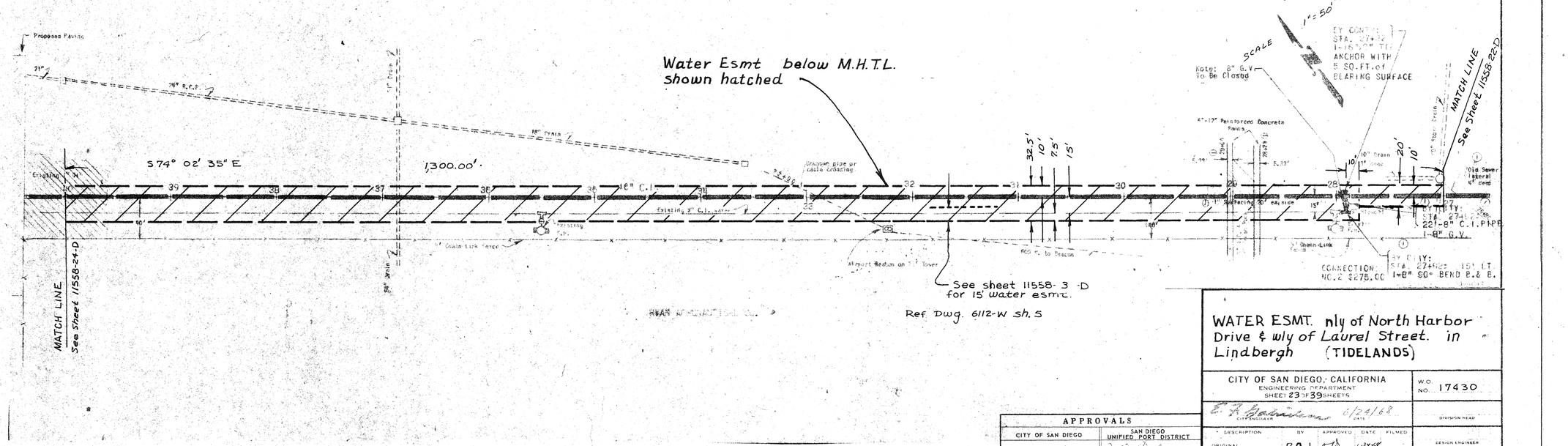

WATER ESMT. nly of North Harbor Drive & wly of Laurel Street. in Lindbergh (TIDELANDS)

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R. E. Grahm — UTILITIES DIRECTOR	J. E. Kuhnmuen — CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 651833 FILED FEB. 15, 1963	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 13, 1963

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 23 OF 39 SHEETS

W.O. NO. 17430

E. R. Kuhnmuen — CIVIL ENGINEER — DATE 6/24/68 — DIVISION HEAD

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	R.G.J.	O.H.J.	6-24-68	

DESIGN ENGINEER

CONTROL CERTIFICATION

206-1711
CAMERY COORDINATES

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

11558-23-D

020852

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 31
OFFICE OF THE CLERK

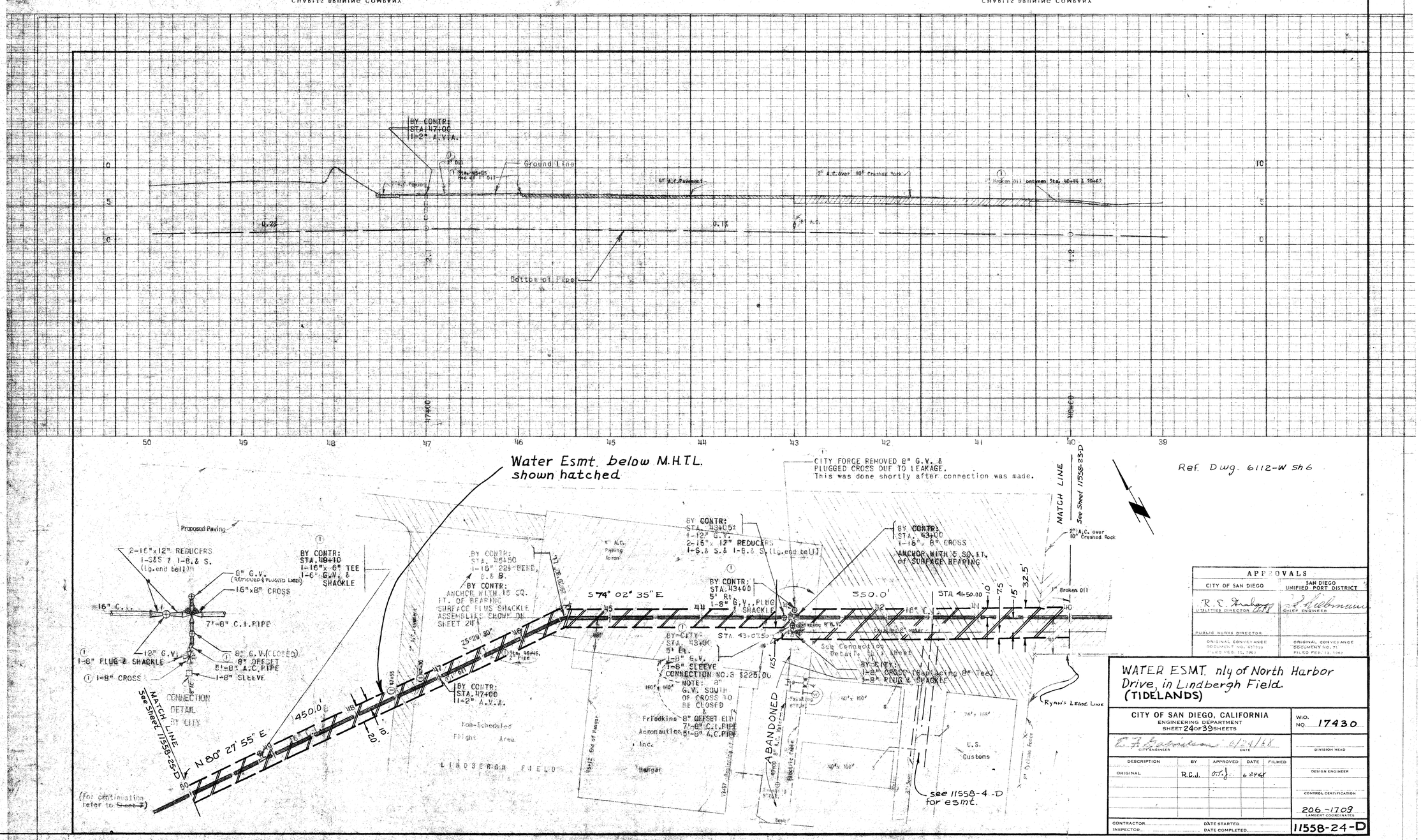
BY CONTR:
STA. 47+06
1-2" A.V.A.
Ground Line
8" A.C. Pavement
2" A.C. over 10" Crushed Rock
Bottom of Pipe
0.2%
0.1%
Water Esmt. below M.H.T.L. shown hatched
CITY FORCE REMOVED 8" G.V. & PLUGGED CROSS DUE TO LEAKAGE.
This was done shortly after connection was made.
MATCH LINE
See Sheet 11558-23-D
Ref. Dwg. 6112-W Sh 6
Proposed Paving
2-16"x12" REDUCERS
1-S&S & 1-B.& S.
(Lg.end bell)
8" G.V.
(REMOVED & PLUGGED LATER)
16"x8" CROSS
7'-8" C.I.PIPE
1-8" PLUG & SHACKLE
1-8" CROSS
8" G.V.(CLOSED)
8" OFFSET
5'-8" A.C.PIPE
1-8" SLEEVE
CONNECTION DETAIL BY CITY
BY CONTR:
STA. 40+10
1-16"x 6" TEE
1-6" G.V. & SHACKLE
BY CONTR:
STA. 46+50
1-16" 22½° BEND, B.& B.
BY CONTR:
ANCHOR WITH 15 SQ. FT. OF BEARING SURFACE PLUS SHACKLE ASSEMBLIES SHOWN ON SHEET 24
BY CONTR:
STA. 47+00
1-2" A.V.A.
S 74° 02' 35" E
N 80° 27' 55" E
450.0'
550.0'
STA. 41+50.00
BY CONTR:
STA. 43+51
1-12" G.V.
2-16"x 12" REDUCERS
1-S.& S.& 1-B.& S.(Lg.end bell)
BY CONTR:
STA. 43+00
1-16" x 8" CROSS
ANCHOR WITH 6 SQ. FT. of SURFACE BEARING
BY CONTR:
STA. 43+00
5' Rt.
1-8" G.V., PLUG & SHACKLE
BY CITY:
STA. 43+00
5' Rt.
1-8" G.V.
1-8" SLEEVE
CONNECTION NO. 3 $225.00
NOTE: 8" G.V. SOUTH OF CROSS TO BE CLOSED
Friedkins 8" OFFSET ELL
7'-8" C.I.PIPE
Aeronautics 5'-8" A.C.PIPE
Inc.
Hangar
ABANDONED
Electric Hole
U.S. Customs
see 11558-4-D for esmt.
Ryan's Lease Line
Non-Scheduled Flight Area
LINDBERGH FIELD
(For continuation refer to ~~Sheet 7~~)
MATCH LINE
See Sheet 11558-25-D
2" A.C. over 10" Crushed Rock
1" Broken Oil
Broken Oil between Sta. 40+55 & 39+67
Broken Oil
2" Oil
End of 1" Oil
Sta. 46+55
End of 1" Oil
Sta. 46+45, 2" Pipe
Sta. 47+55
Sta. 43+75.50
Sta. 43+00
Sta. 41+50
Sta. 40+10
Sta. 39+67
End of Paving
Existing 8" Water
Existing 8" G.V.
See Connection Detail, Sh. 3 sheet
BY CITY:
1-8" CROSS (Replacing 6" Tee)
1-8" PLUG & SHACKLE
Existing 6" G.V.
Existing 8" G.V.
Existing 6" G.V.
Existing 8" G.V.
Existing 8" G.V.
Existing 8

020853

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 31
OFFICE OF THE CLERK

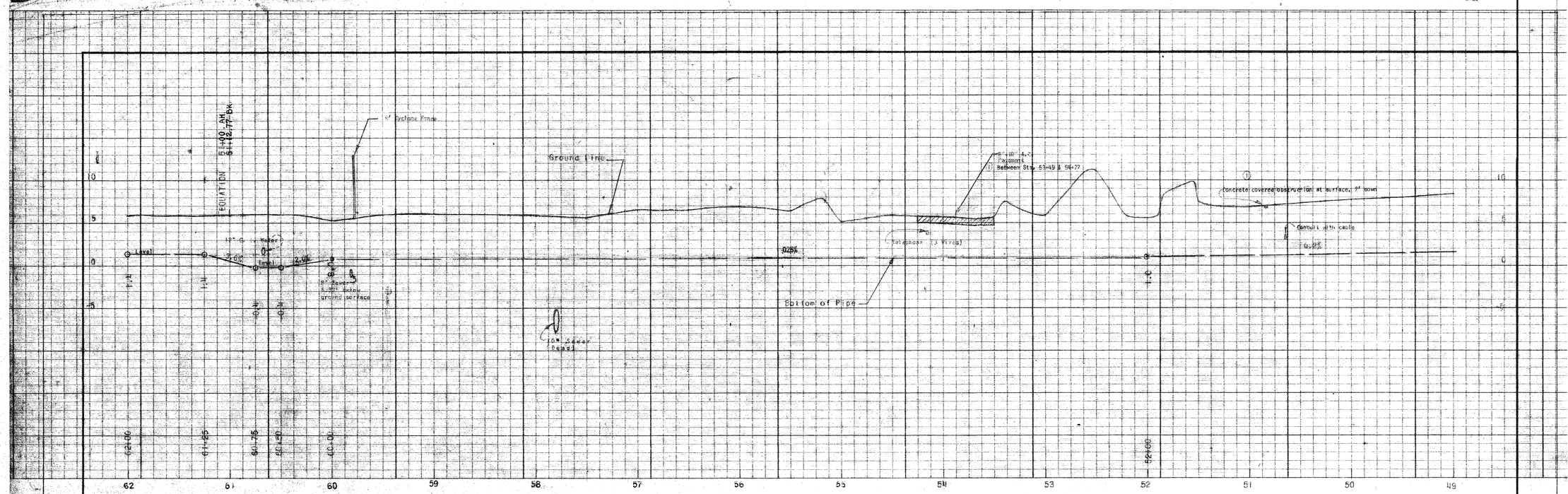

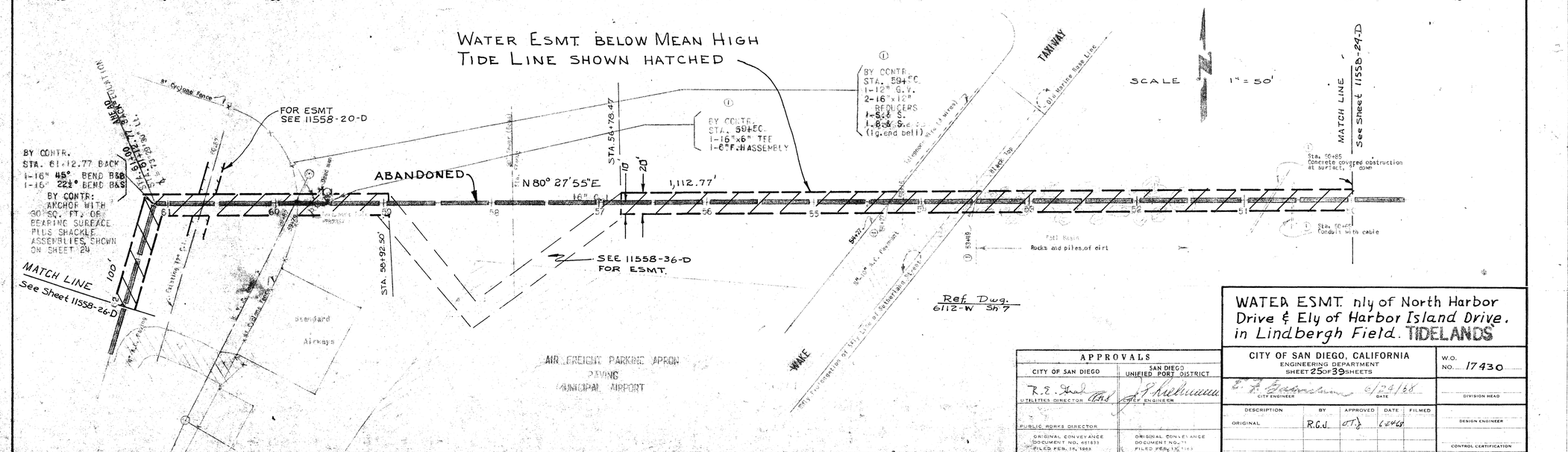
WATER ESMT. BELOW MEAN HIGH TIDE LINE SHOWN HATCHED
6' Cyclone fence
FOR ESMT SEE 11558-20-D
BY CONTR. STA. 61+12.77 BACK 1-16" 45° BEND B&B 1-16" 22½° BEND B&S
BY CONTR: ANCHOR WITH 30 SQ. FT. OF BEARING SURFACE PLUS SHACKLE ASSEMBLIES, SHOWN ON SHEET 29
MATCH LINE See Sheet 11558-26-D
ABANDONED
N 80° 27' 55" E
1,112.77'
STA. 58+92.50
STA. 54+78.47
BY CONTR. STA. 59+EC. 1-16"x6" TEE 1-6" F.H. ASSEMBLY
BY CONTR. STA. 54+EC. 1-12" G.V. 2-16"x12" REDUCERS 1-8" S. 1-8" S. (lg. end bell)
SEE 11558-36-D FOR ESMT.
TAXIWAY
Old Marine Base Line
SCALE 1" = 50'
MATCH LINE See Sheet 11558-24-D
Sta. 50+85 Concrete covered obstruction at surface, 7' down
Sta. 50+60 Conduit with cable
Fill Area Rocks and piles of dirt
Ref. Dwg. 6112-W Sh 7
Standard Airways
AIR FREIGHT PARKING APRON PAVING MUNICIPAL AIRPORT
WAKE
Only Extension of Sky Line of Gillespie Street
Existing 12" C.I.
Old Sewer Main
Telephone Line (4 wires)
Block Tar
Pavement
Edge of Pavement
Concrete Curb
Edge of Pavement
Concrete Curb
Edge of Pavement
Concrete Curb

020854

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 91
OFFICE OF THE CLERK

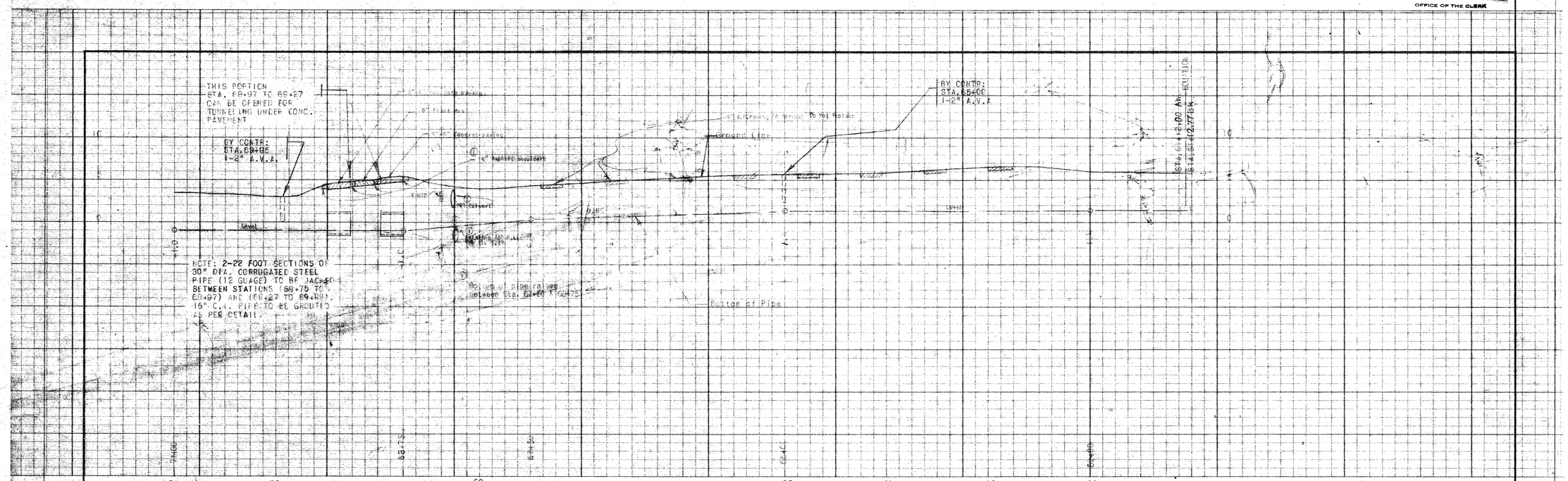

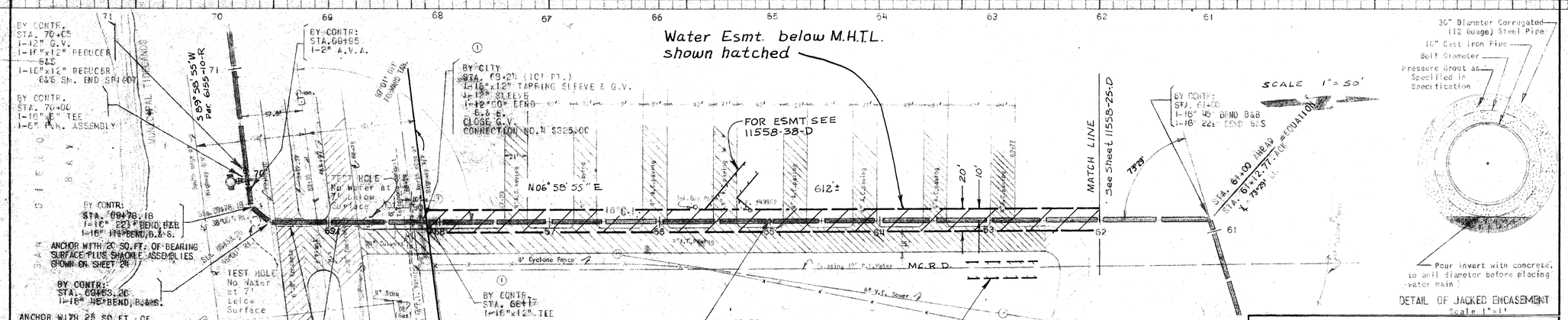

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R. E. Shalen — UTILITIES DIRECTOR & V.P.	H. Rubinson — CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 651833 FILED FEB. 13, 1963	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 13, 1963

WATER ESMT. nly of North Harbor Dr. ely of Harbor Island Dr., in Lindbergh Field TIDELANDS

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 26 OF 39 SHEETS

W.O. NO. 17430

CITY ENGINEER — DATE 6/24/68 — DIVISION HEAD

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	R.C.J.		6-24-68	

DESIGN ENGINEER

CONTROL CERTIFICATION

.206 - 1709
LAMBERT COORDINATES

CONTRACTOR ..... DATE STARTED .....
INSPECTOR ..... DATE COMPLETED .....

11558-26-D

020855

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO.
OFFICE OF THE CLERK

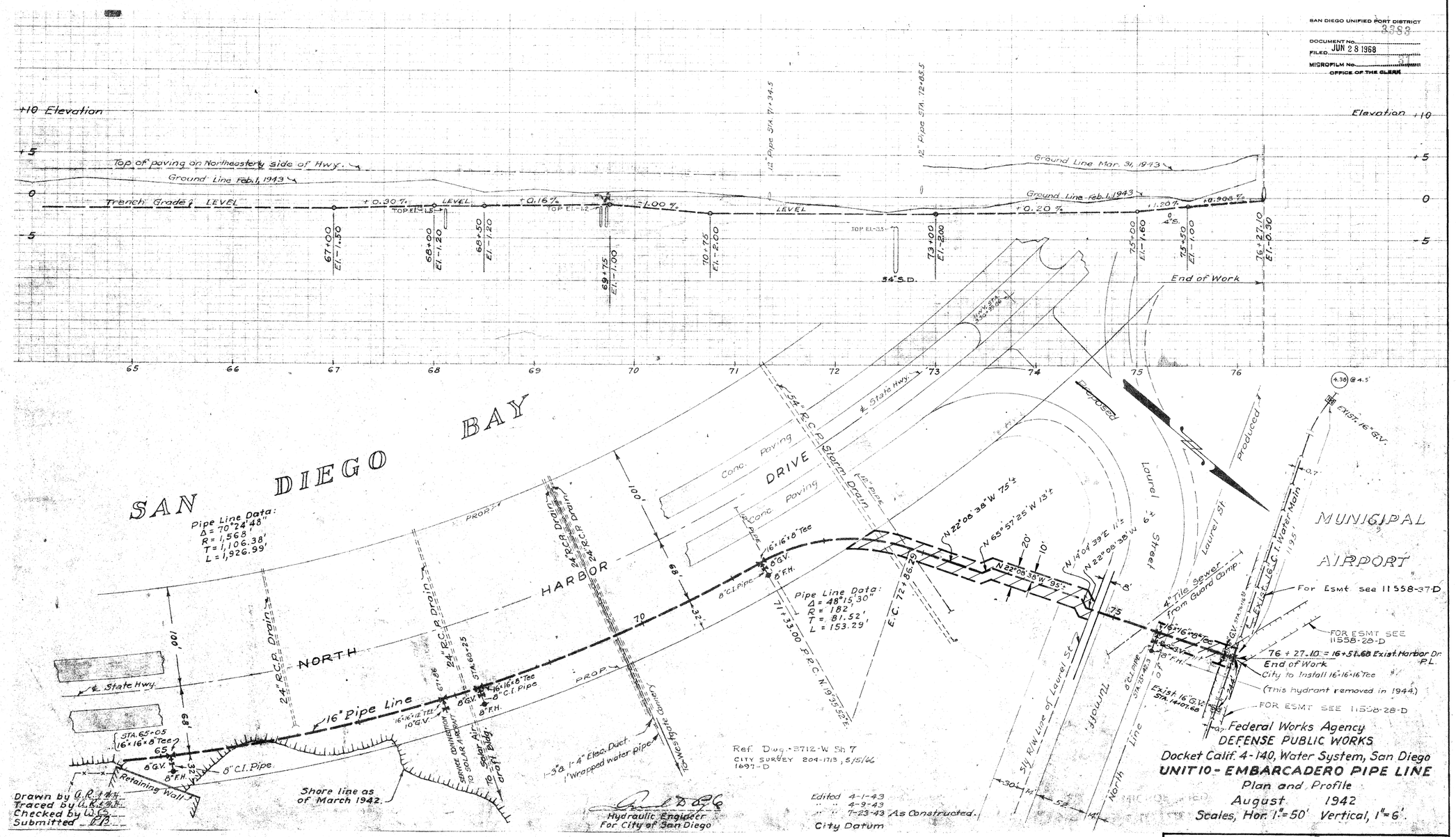

WATER ESMT. sly of Laurel Street & nly of North Harbor Drive

CITY OF SAN DIEGO, CALIFORNIA ENGINEERING DEPARTMENT SHEET 27 OF 39 SHEETS	W.O. NO. 17430
E. F. Schneider 6/24/68 BY ENGINEER DATE	DIVISION HEAD
DESCRIPTION: ORIGINAL — BY: R.C.J. — APPROVED: F.B. — DATE: 6-24-68 — FILMED	DESIGN ENGINEER
	CONTROL CERTIFICATION
	204-1715 LAMBERT COORDINATES
CONTRACTOR INSPECTOR — DATE STARTED DATE COMPLETED	11558-27-D

APPROVALS

CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R. S. Strahan UTILITIES DIRECTOR	E. F. Schneider CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 651833 FILED FEB. 15, 1943	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 13, 1968

020856

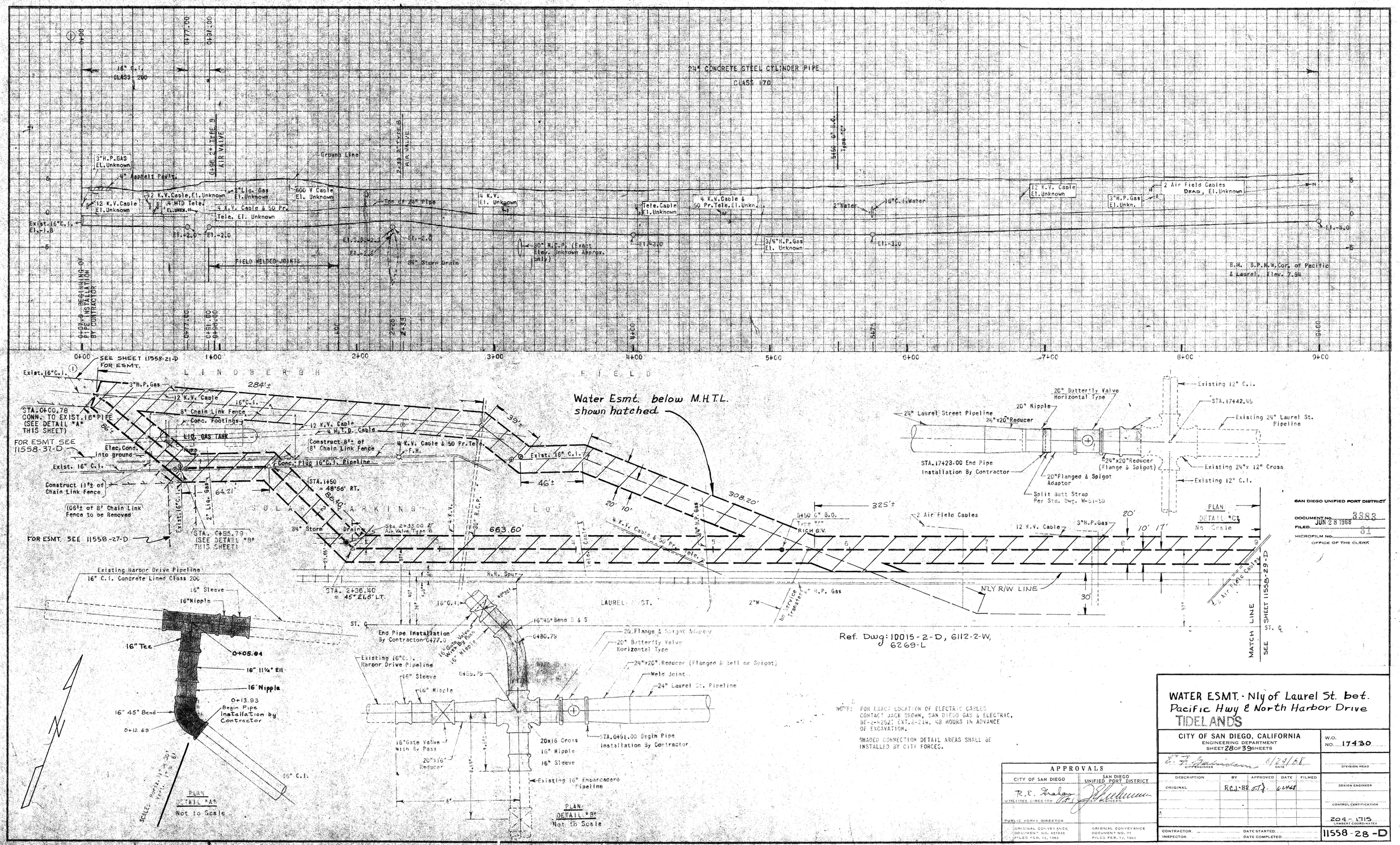

NOTE: FOR EXACT LOCATION OF ELECTRIC CABLES CONTACT JACK BROWN, SAN DIEGO GAS & ELECTRIC, BE-2-4252, EXT. 6-214, 48 HOURS IN ADVANCE OF EXCAVATION.

SHADED CONNECTION DETAIL AREAS SHALL BE INSTALLED BY CITY FORCES.

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R. E. Grahn UTILITIES DIRECTOR	J. Schelmann CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 85183 FILED FEB. 15, 1963	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 12, 1963

WATER ESMT. - N'ly of Laurel St. bet. Pacific Hwy & North Harbor Drive

TIDELANDS

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 28 OF 39 SHEETS

W.O. NO. 17430

CITY ENGINEER — DATE 6/23/68

DIVISION HEAD

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	RCJ-BR	OTJ	6-6-68	

DESIGN ENGINEER

CONTROL CERTIFICATION

204-1715
LAMBERT COORDINATES

CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

11558-28-D

020857

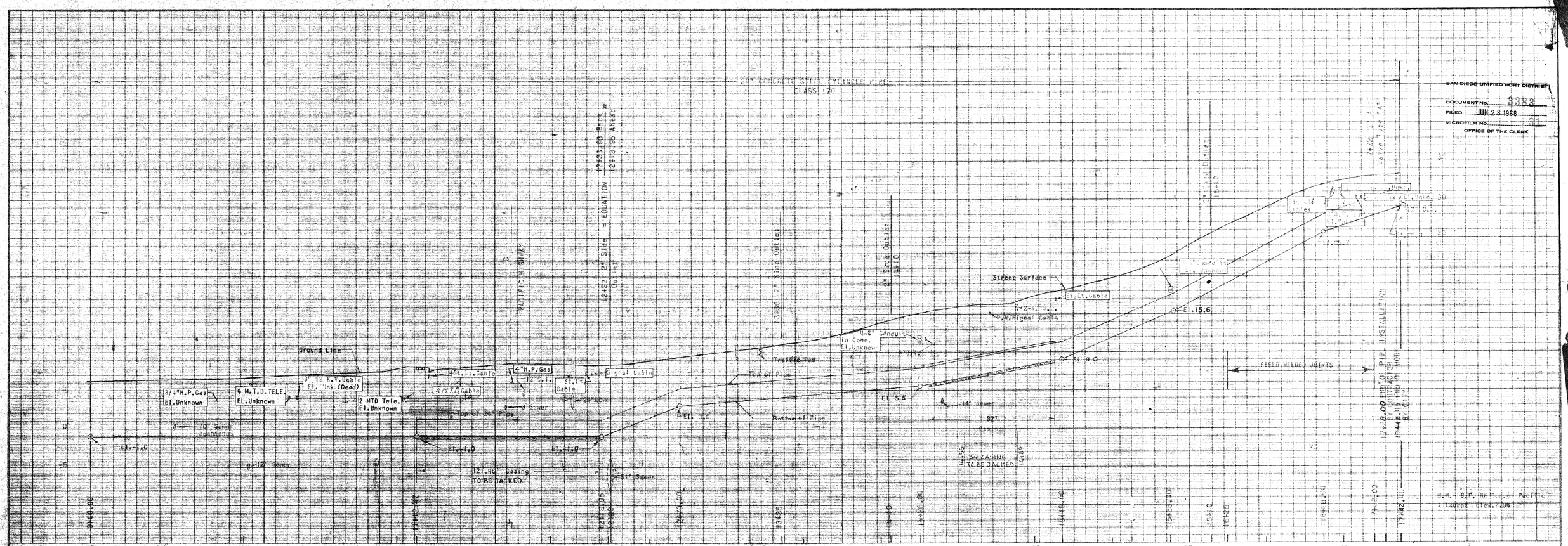

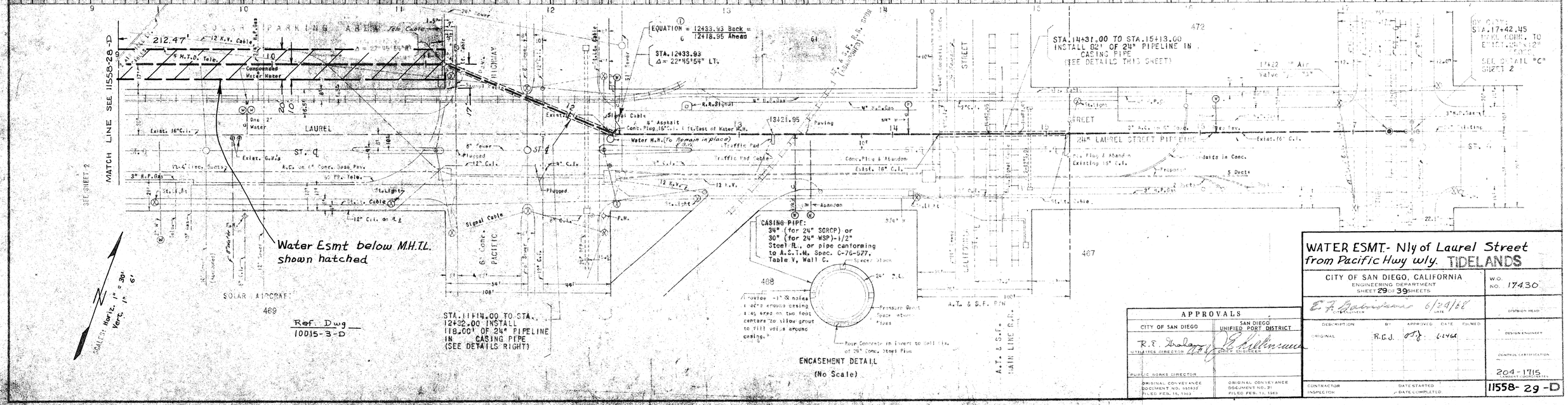

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO.
OFFICE OF THE CLERK

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R. E. Dalager — UTILITIES DIRECTOR	E. Hellmann — CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 655833 FILED FEB. 15, 1963	ORIGINAL CONVEYANCE DOCUMENT NO. 21 FILED FEB. 13, 1963

WATER ESMT.- Nly of Laurel Street from Pacific Hwy wly. TIDELANDS

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 29 OF 39 SHEETS

W.O. NO. 17430

E. F. Bonnisson — CITY ENGINEER — 6/24/68 — DATE — DIVISION HEAD

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	R.C.J.		6-24-68	

DESIGN ENGINEER

CONTROL CERTIFICATION

204-1715
(CONTROL COORD. COORDS.)

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

11558-29-D

020858

Existing Sewer lines shown thus ——— S ———
Existing Water lines shown thus ——— W ———

NOTE
See SD 1-1 for S & D view Sewer lines.
See SD 1-2 for W & Fire Line to Water line.

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 81
OFFICE OF THE CLERK

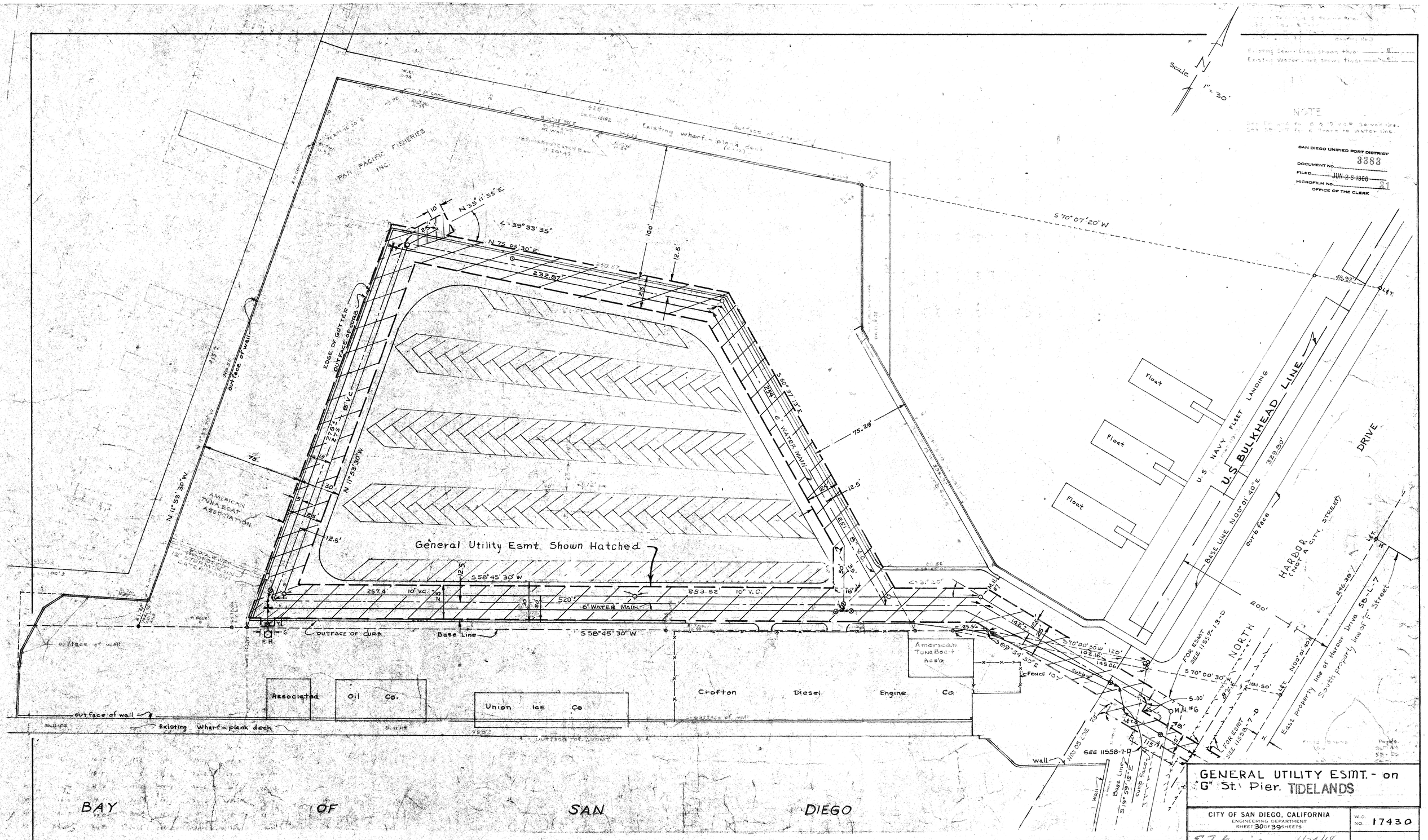

Ref. HARBOR Dwg 58-L-9 58-L-7

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R. E. Graber — UTILITIES DIRECTOR	J. Bellemere — CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 685833 FILED FEB. 15, 1965	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 13, 1963

GENERAL UTILITY ESMT. - on "G" St. Pier. TIDELANDS

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 30 OF 39 SHEETS

W.O. NO. 17430

E. F. Lawrence — DESIGNER — DATE 6/24/68

DIVISION HEAD

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	R.C.J.		6-6-68	

DESIGN ENGINEER

CONTROL IDENTIFICATION 198-1715 LAMBERT COORDINATES

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

11558-30-D

020859

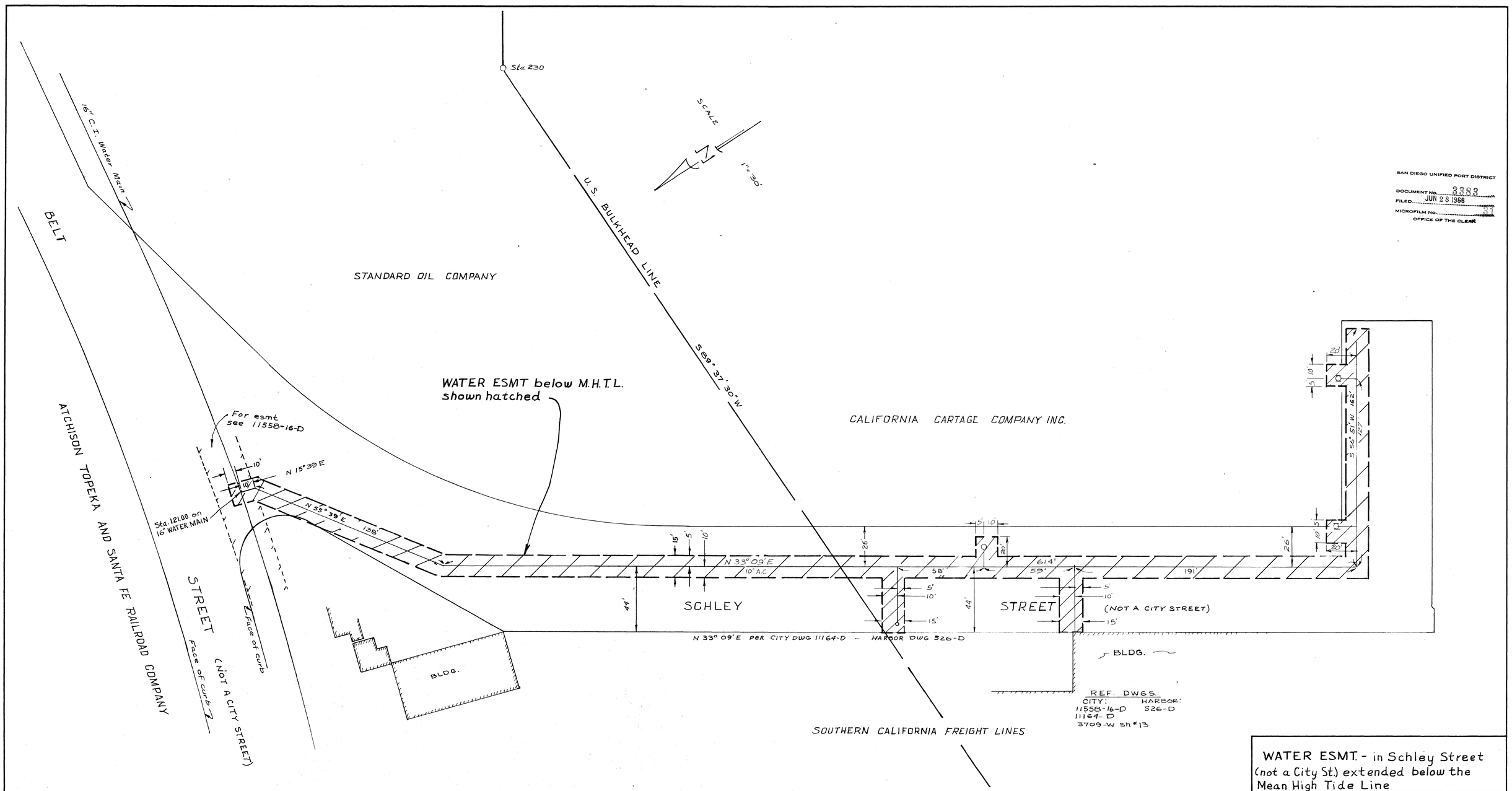

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1966
MICROFILM NO.
OFFICE OF THE CLERK

WATER ESMT. - in Schley Street (not a City St.) extended below the Mean High Tide Line

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 31 OF 39 SHEETS

W.O. NO. 17430

CITY ENGINEER — DATE — DIVISION HEAD

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	RCJ	O.H.J.	6-24-66	

DESIGN ENGINEER

CONTROL CERTIFICATION

192-1725
LAMBERT COORDINATES

CONTRACTOR
DATE STARTED
INSPECTOR
DATE COMPLETED

11558-31-D

APPROVALS

CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R. E. Graham, UTILITIES DIRECTOR	B. Kellerman, CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 85433 FILED FEB. 19, 1963	ORIGINAL CONVEYANCE DOCUMENT NO. 37 FILED FEB. 13, 1963

020860

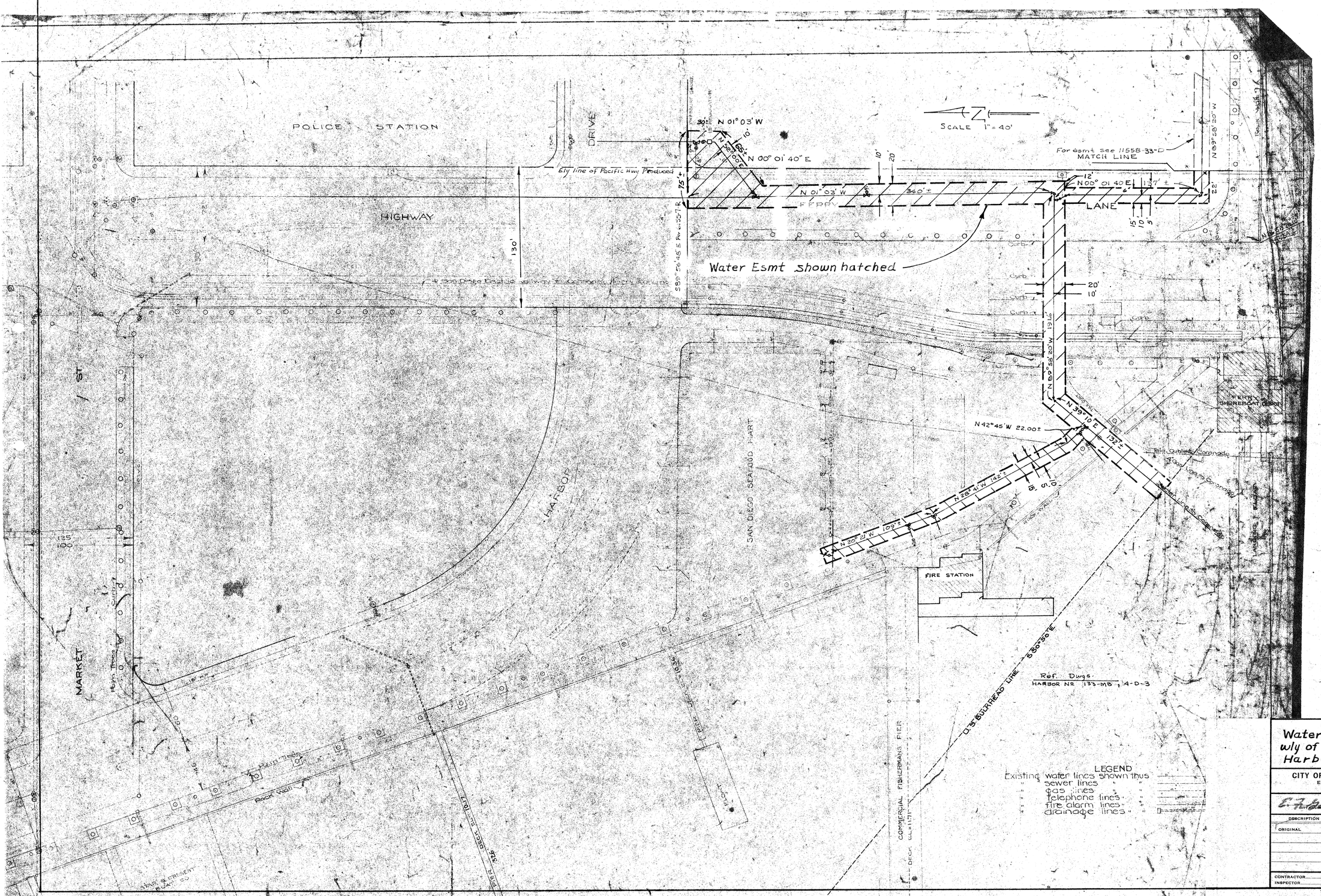
POLICE STATION
DRIVE
HIGHWAY
MARKET ST
HARBOR
SAN DIEGO SEAFOOD MART
COMMERCIAL FISHERMANS PIER
FIRE STATION
FERRY LANE
FERRY SHOREBOAT DOCK
SCALE 1" = 40'
N 01° 03' W
N 00° 01' 40" E
Ely line of Pacific Hwy Produced
For esmt see 11558-33-D
MATCH LINE
Water Esmt shown hatched
N 42° 45' W 22.00±
N 39° 10' E 192±
N 28° 41' W 142±
N 20° 21' W 109±
S 50° 50' E
U.S. BULKHEAD LINE
Ref. Dwgs.
HARBOR No 133-MB ; 4-D-3
Rock Wall
Palm Trees
Curb
Concrete Walk
Tele Cables Overhead
Tel Lines Overhead
Pole Line Overhead
Fence
Floor
Deck
Deck Elev 10.0
Deck Elev 9.0
Deck Elev 8.0
Deck Elev 7.0
Deck Elev 6.0
Deck Elev 5.0
Deck Elev 4.0
Deck Elev 3.0
Deck Elev 2.0
Deck Elev 1.0
Deck Elev 0.0
Deck Elev 1.0
Deck Elev 2.0
Deck Elev 3.0
Deck Elev 4.0
Deck Elev 5.0
Deck Elev 6.0
Deck Elev 7.0
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Deck Elev 9.0
Deck Elev 10.0
Deck Elev 11.0
Deck Elev 12.0
Deck Elev

020861

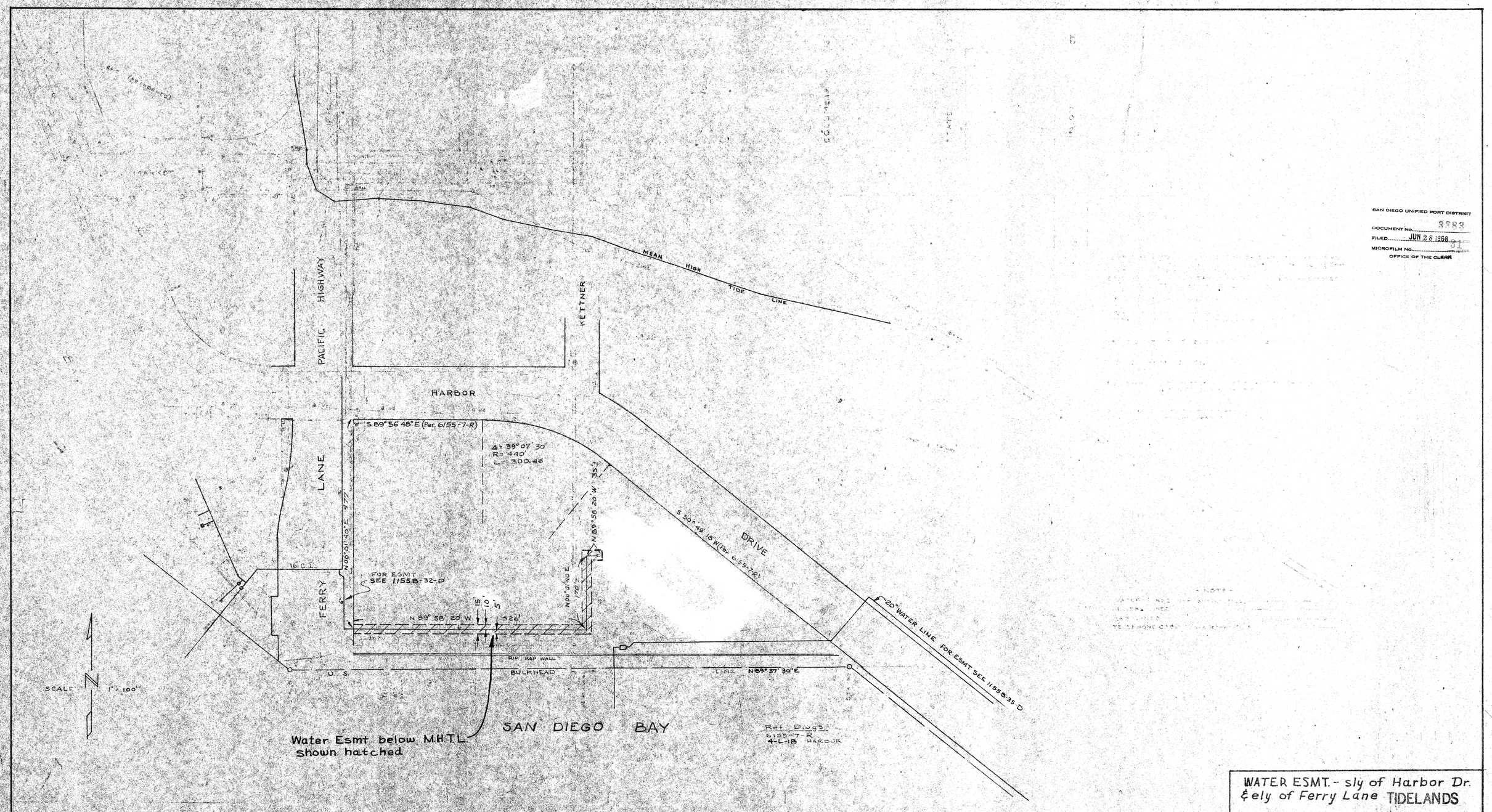

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No.
OFFICE OF THE CLERK

WATER ESMT. - sly of Harbor Dr. & ely of Ferry Lane TIDELANDS

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R. E. Strahl — UTILITIES DIRECTOR	J. E. Kuehlmann — CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 65183 FILED FEB. 19, 1963	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 18, 1963

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 33 OF 39 SHEETS

W.O. NO. 17430

E. F. Gabrielson — 6/24/68 — DIVISION HEAD

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	RGJ	OTJ	6-24-68	

DESIGN ENGINEER
CONTROL CERTIFICATION
198-1715
ENGR. COORDINATES

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

11558-33-D

020862

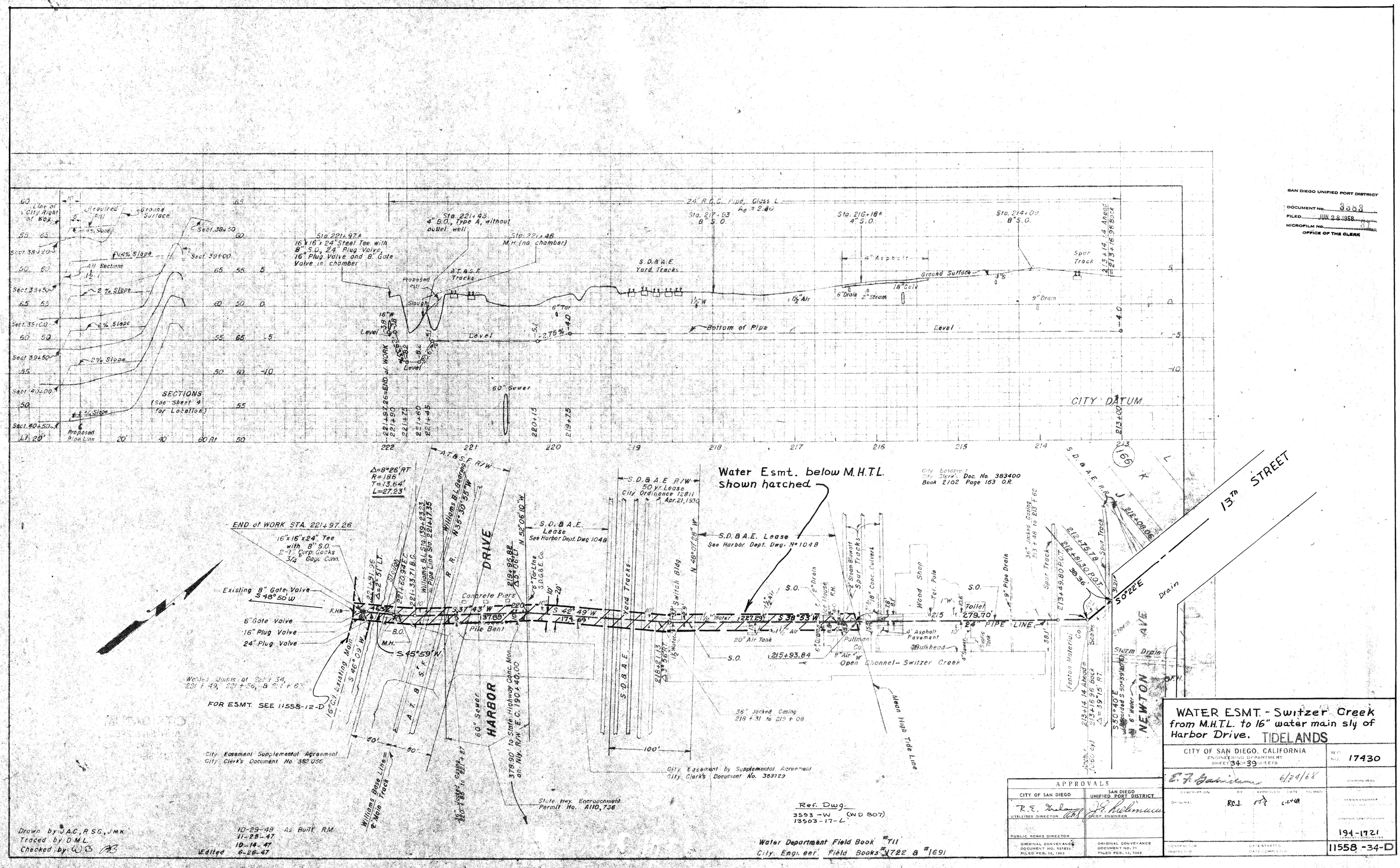

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3998
FILED JUN 28 1968
MICROFILM NO.
OFFICE OF THE CLERK

APPROVALS

CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R.E. Shelanu — UTILITIES DIRECTOR	J. Kelemen — CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 551833 FILED FEB. 15, 1963	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 13, 1963

WATER ESMT. - Switzer Creek from M.H.T.L. to 16" water main s/y of Harbor Drive. TIDELANDS

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 34-39 SHEETS

W.O. No. 17430

E.R. Gardiner 6/24/68 — DIVISION HEAD

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	R.G.J.		6-24-68	

DESIGN ENGINEER

CONTROL CERTIFICATION 194-1721

CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

11558-34-D

020863

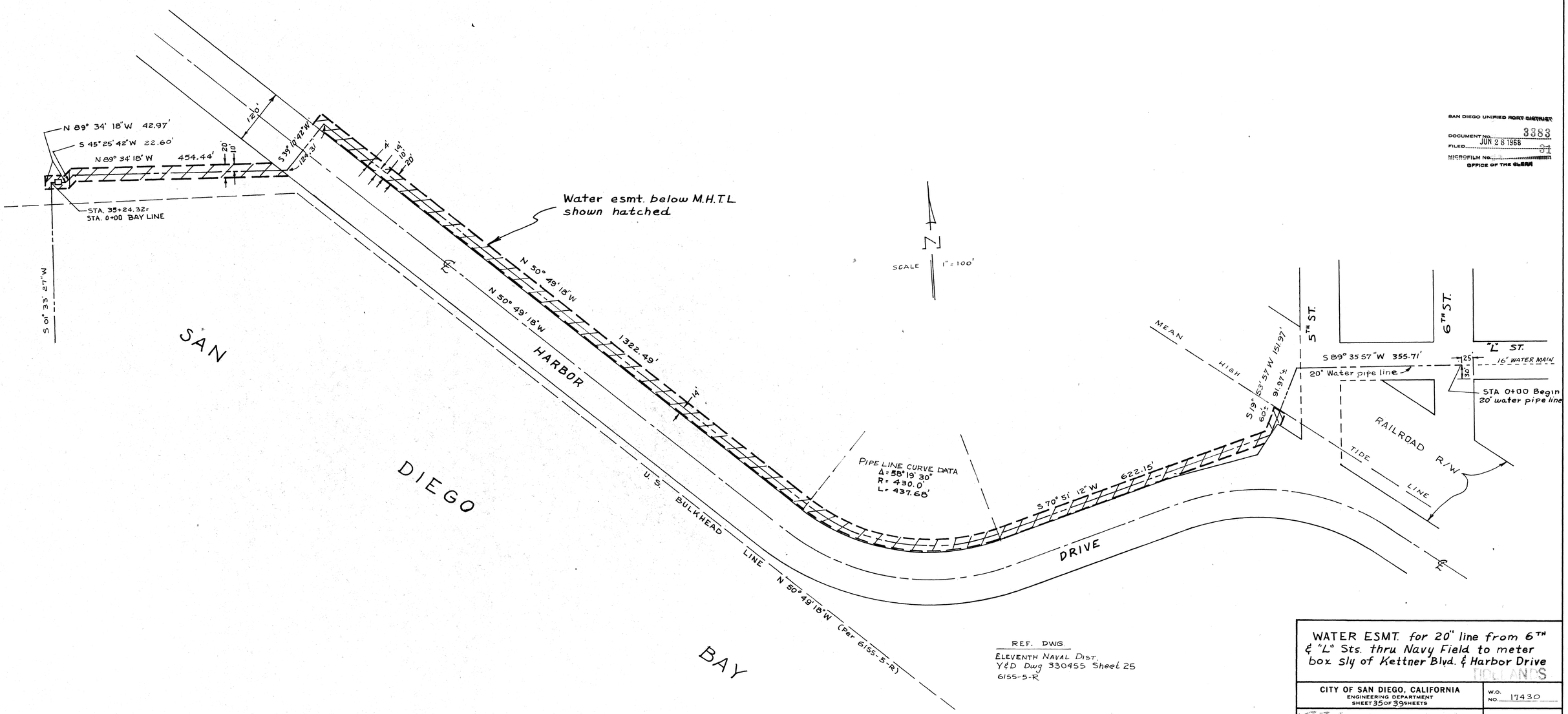

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 31
OFFICE OF THE CLERK

REF. DWG.
ELEVENTH NAVAL DIST.
Y&D Dwg 330455 Sheet 25
6155-5-R

WATER ESMT. for 20" line from 6TH & "L" Sts. thru Navy Field to meter box Sly of Kettner Blvd. & Harbor Drive

HOLLANDS

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 35 OF 39 SHEETS

W.O. NO. 17430

CITY ENGINEER — DATE — DIVISION HEAD

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	R.C.J.		6-24-68	

DESIGN ENGINEER

CONTROL CERTIFICATION

198 - 1715
LAMBERT COORDINATES

CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

11558-35 -D

APPROVALS

CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R. E. Gaddy — UTILITIES DIRECTOR	E. Hellmann — CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 651533 FILED FEB. 13, 1963	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 13, 1963

020864

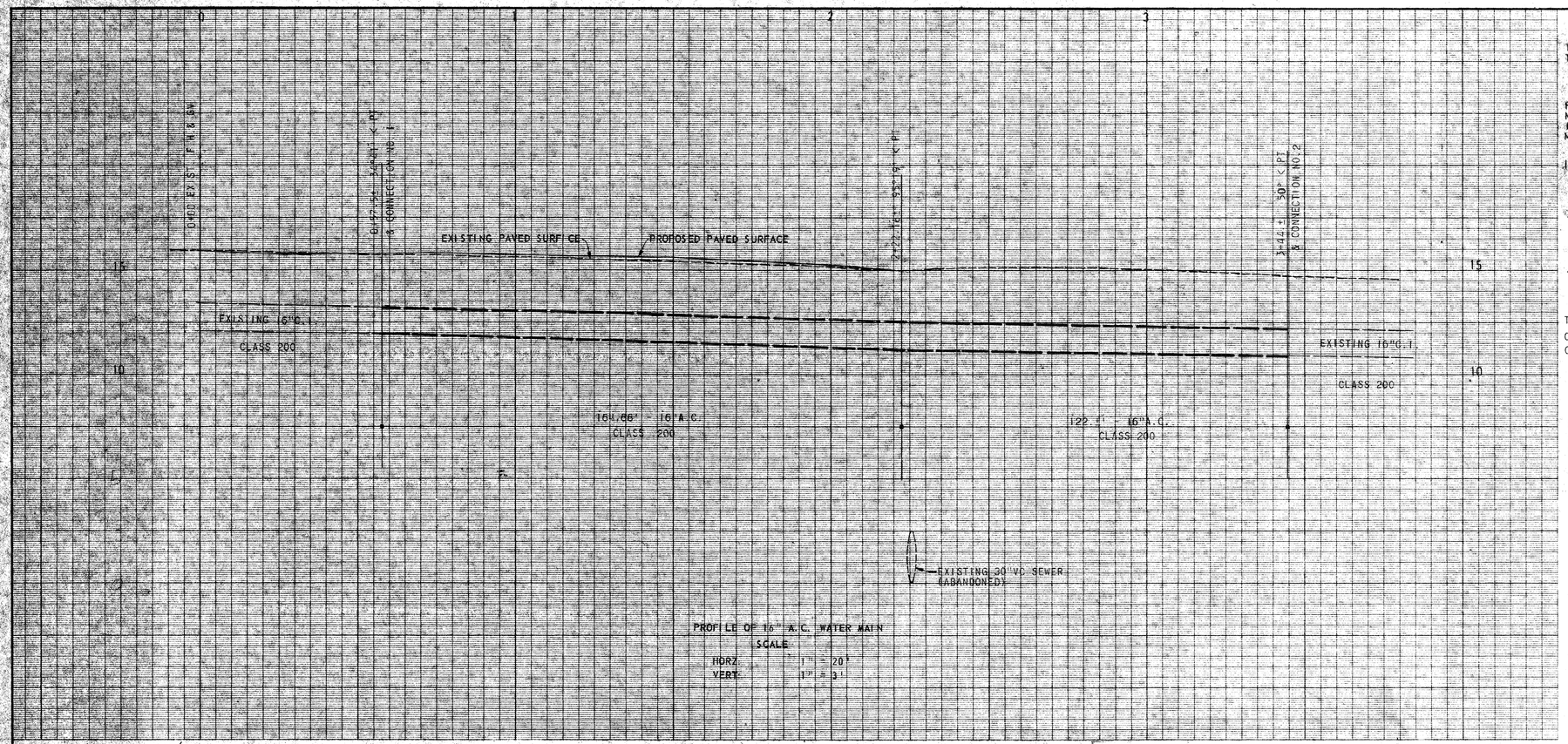

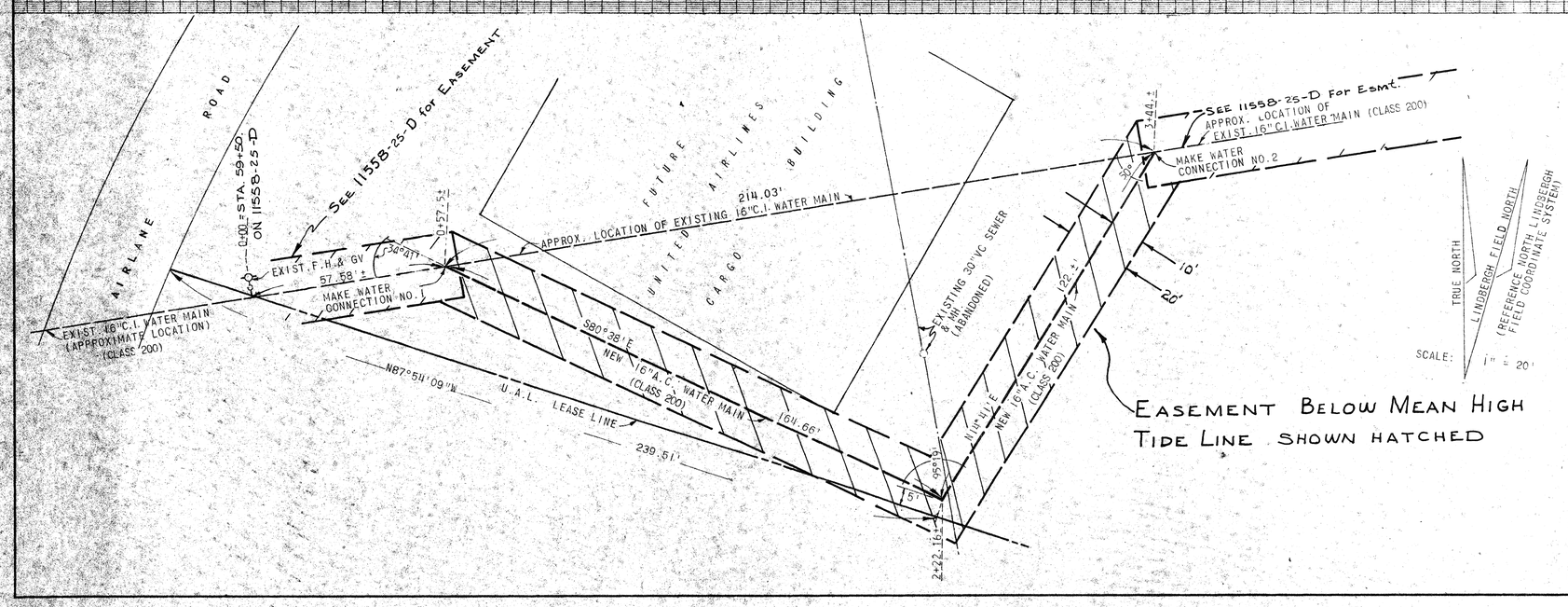

WORK TO BE DONE

THE IMPROVEMENTS CONSIST OF THE FOLLOWING WORK TO BE DONE ACCORDING TO THESE PLANS AND THE FOLLOWING STANDARD DRAWINGS AND SPECIFICATIONS OF THE CITY OF SAN DIEGO.

SPECIFICATIONS

PART I FILED APRIL 9, 1958 INCLUDING AMENDMENTS TO PART I FILED APRIL 8, 1959 AND NOVEMBER 29, 1952; PART I, SECTION I, FILED APRIL 5, 1967; PART II, FILED DECEMBER 14, 1966; PART III FILED FEBRUARY 16, 1966; PART IV FILED FEBRUARY 25, 1966; PART V FILED MARCH 1, 1966 SPECIAL CONDITIONS P-18 REVISED NOVEMBER 21, 1966, HERETO ATTACHED.

IMPROVEMENTS	STD DWGS	SYMBOL
A.C. WATER MAIN & APPURTENANCES	W-6-59; W-61-60	
LEGEND EXISTING WORK	P-1-56	

REFERENCE DRAWINGS

6112-7 W

THE COST OF WATER MAIN CONNECTIONS ON THESE PLANS ARE AS FOLLOWS:

CONNECTION NO. 1 $ 971.00
CONNECTION NO. 2 $ 971.00

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 31
OFFICE OF THE CLERK

BENCH MARK

U.S.C.& G. DISC # K899 IN
NORTH FACE OF AEROSPACE BLDG.
ELEV: 15.851 (M.L.L.W. DATUM)

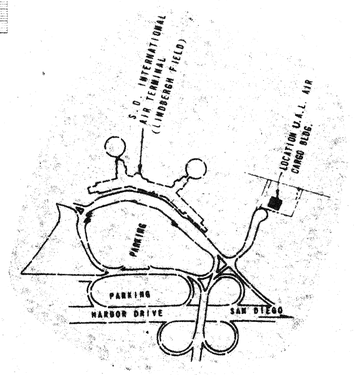

LOCATION MAP
NO SCALE

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R. E. Gudonson — UTILITIES DIRECTOR	J. B. Lichtenauer — CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
DOCUMENT NO. 651932 FILED FEB. 15, 1963	CONVEYANCE DOCUMENT NO. 71 FILED FEB. 15, 1963

WATER EASEMENT- RELOCATION OF 16" LINE IN LINDBERGH FIELD N'ly of N. HARBOR DR. W'LY OF LAUREL ST. FOR UNITED AIRLINES CARGO BUILDING

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 36 OF 39 SHEETS

W.O. NO. 17430

CITY ENGINEER — DATE — DIVISION HEAD

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	R.C.J.		6-24-68	

DESIGN ENGINEER
CONTROL CERTIFICATION
206-1707 LAMBERT COORDINATES
CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

11558-36-D

A-5781

PRIVATE CONTRACT
ENGINEER OF DESIGN
CHRISTENSEN, EVENSON & ASSOCIATES
Bill K. Bramble
Bill K. Bramble, R.C.E 8102

A-5781

020865

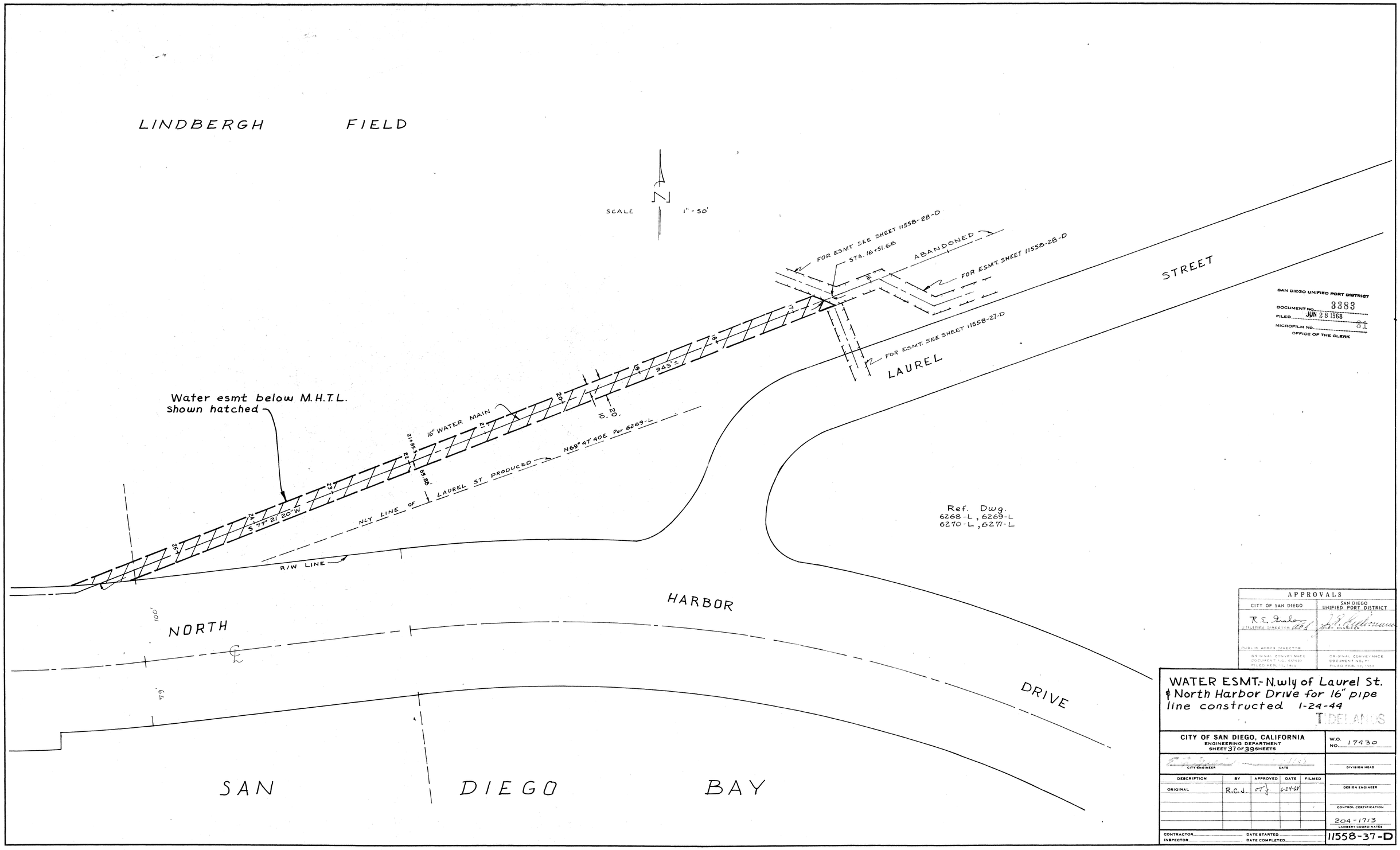
LINDBERGH FIELD
SCALE 1" = 50'
FOR ESMT SEE SHEET 11558-28-D
STA. 16+51.68
ABANDONED
FOR ESMT. SHEET 11558-28-D
FOR ESMT. SEE SHEET 11558-27-D
LAUREL STREET
Water esmt below M.H.T.L. shown hatched
16" WATER MAIN
N 20°
O.O.
243'±
21+93.5
22
58.86'
N69° 47' 40E Per 6269-L
NLY LINE OF LAUREL ST PRODUCED
S 77° 21' 20" W
24
25
R/W LINE
Ref. Dwg. 6268-L, 6269-L 6270-L, 6271-L
NORTH HARBOR DRIVE
100'
64'
SAN DIEGO BAY
SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 34
OFFICE OF THE CLERK
APPROVALS
CITY OF SAN DIEGO
SAN DIEGO UNIFIED PORT DISTRICT
UTILITIES DIRECTOR
CHIEF ENGINEER
PUBLIC WORKS DIRECTOR
ORIGINAL CONVEYANCE DOCUMENT NO. 657633 FILED FEB. 11, 1965
ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 10, 1965
WATER ESMT.- N.wly of Laurel St. & North Harbor Drive for 16" pipe line constructed 1-24-44
T. DELANEY
CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 37 OF 39 SHEETS
W.O. NO. 17430
CITY ENGINEER
DATE
DIVISION HEAD
DESCRIPTION
BY
APPROVED
DATE
FILMED
ORIGINAL
R.C.J.
6-24-61
DESIGN ENGINEER
CONTROL CERTIFICATION
204-1713
LAMBERT COORDINATES
CONTRACTOR
DATE STARTED
INSPECTOR
DATE COMPLETED
11558-37-D

020866

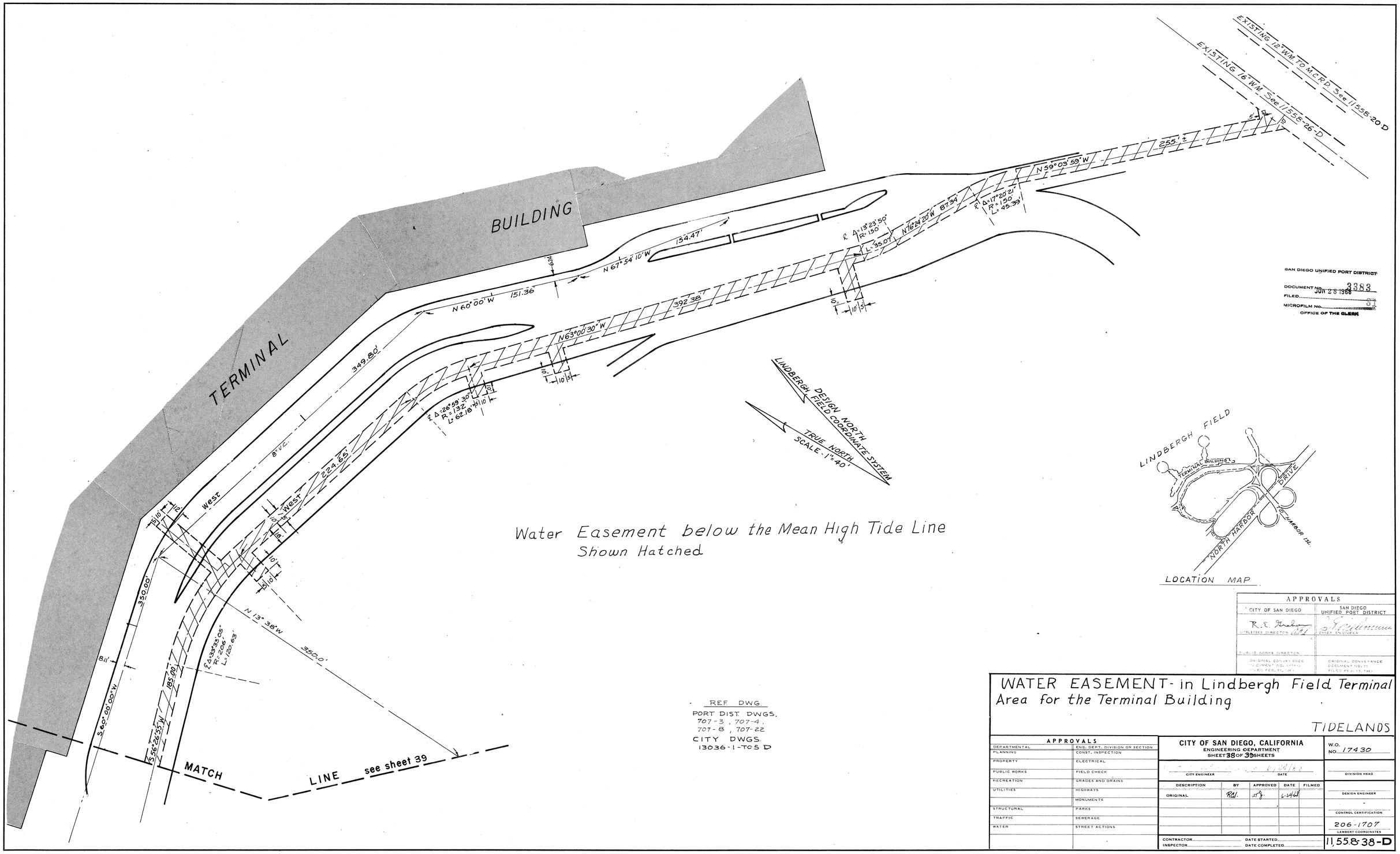
TERMINAL BUILDING
EXISTING 12" W.M. TO M.C.R.D. See 11558-20-D
EXISTING 16" W.M. See 11558-26-D
255.±
N 59°03'59" W
℄ Δ=17°20'21"
R=150'
L=45.39'
N 16°24'20" W 87.34'
℄ Δ=13°23'50"
R=150'
L=35.07'
154.47'
N 67°54'10" W
6.34'
N 60°00' W 151.36'
392.38'
N 63°00'30" W
349.80'
℄ Δ=26°59'30"
R=132'
L=62.18'
8" V.C.
224.65'
West
West
350.00'
N 13°38' W
350.0'
℄ Δ=33°33'05"
R=206'
L=120.65'
185.00'
S 60°00'00" W
S 56°26'55" W
MATCH LINE see sheet 39
LINDBERGH FIELD DESIGN NORTH
TRUE NORTH
SCALE - 1" = 40'
LINDBERGH FIELD
TERMINAL BUILDING
DRIVE
HARBOR ISL.
NORTH HARBOR
LOCATION MAP
Water Easement below the Mean High Tide Line
Shown Hatched
REF DWG.
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APPROVALS
CITY OF SAN DIEGO
SAN DIEGO UNIFIED PORT DISTRICT
UTILITIES DIRECTOR
CHIEF ENGINEER
PUBLIC WORKS DIRECTOR
ORIGINAL CONVEYANCE DOCUMENT NO. 3383 FILED FEB. 15, 1961
ORIGINAL CONVEYANCE DOCUMENT NO. 3383 FILED FEB. 13, 1961
WATER EASEMENT - in Lindbergh Field Terminal Area for the Terminal Building
TIDELANDS
APPROVALS
DEPARTMENTAL
PLANNING
PROPERTY
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RECREATION
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CONST. INSPECTION
ELECTRICAL
FIELD CHECK
GRADES AND DRAINS
HIGHWAYS
MONUMENTS
PARKS
SEWERAGE
STREET ACTIONS
CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 38 OF 39 SHEETS
CITY ENGINEER
DATE
DIVISION HEAD
DESCRIPTION
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ORIGINAL
DESIGN ENGINEER
CONTROL CERTIFICATION
206-1707
LAMBERT COORDINATES
CONTRACTOR
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DATE STARTED
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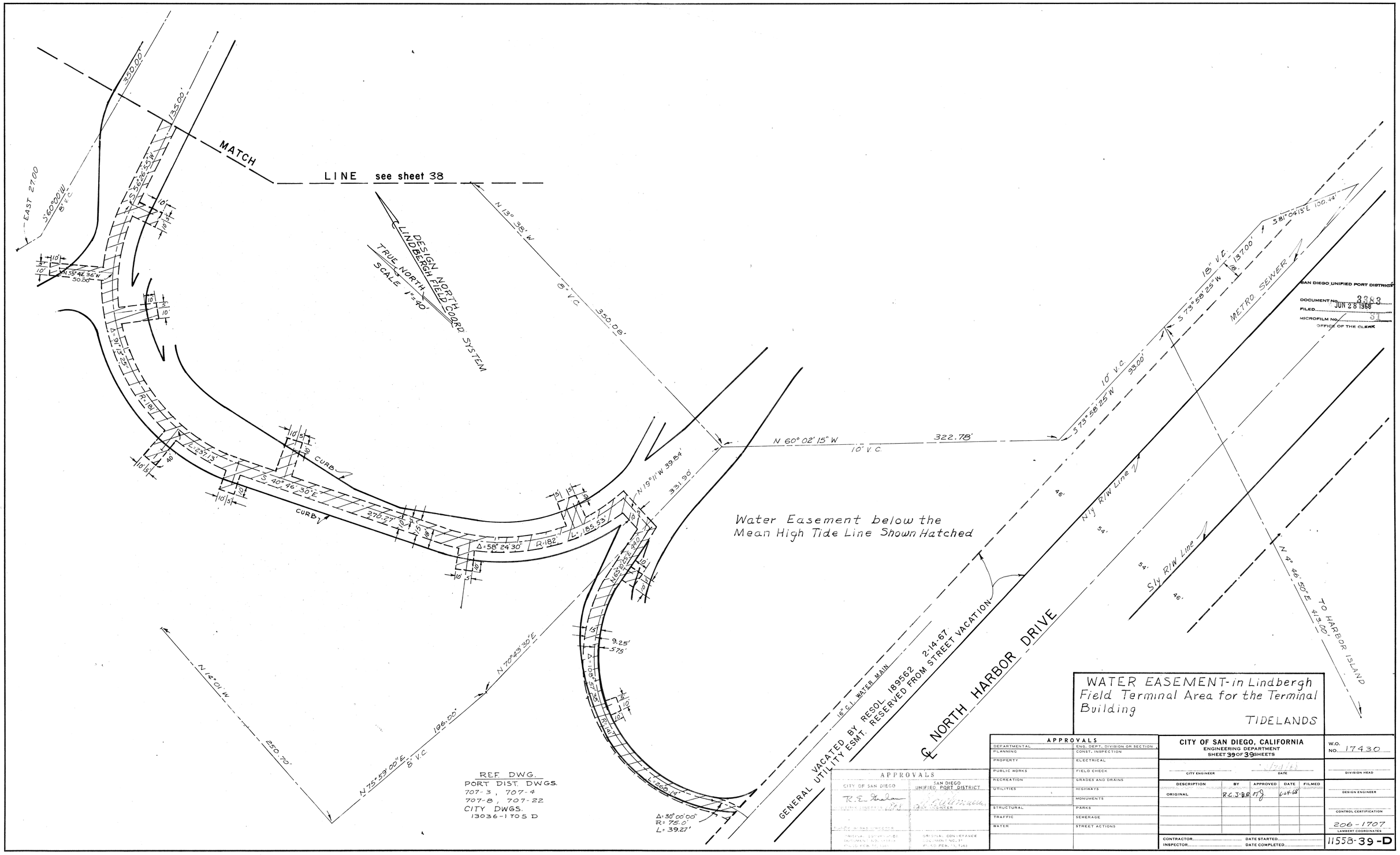

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 3
OFFICE OF THE CLERK

WATER EASEMENT-in Lindbergh Field Terminal Area for the Terminal Building

TIDELANDS

APPROVALS	
DEPARTMENTAL	ENG. DEPT. DIVISION OR SECTION
PLANNING	CONST. INSPECTION
PROPERTY	ELECTRICAL
PUBLIC WORKS	FIELD CHECK
RECREATION	GRADES AND DRAINS
UTILITIES	HIGHWAYS
	MONUMENTS
STRUCTURAL	PARKS
TRAFFIC	SEWERAGE
WATER	STREET ACTIONS

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R. E. Gralow	J. Williams
DIVISION ENGINEER	CHIEF ENGINEER
CHIEF ENGINEER	
ORIGINAL CONTRACT DOCUMENT NO.	ORIGINAL CONVEYANCE DOCUMENT NO.
FILED FOR RECORD	FILED FEB. 13, 1962

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 39 OF 39 SHEETS

CITY ENGINEER — DATE

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	R.C.J-B.R.		6-4-68	

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

W.O. NO. 17430

DIVISION HEAD

DESIGN ENGINEER

CONTROL CERTIFICATION

206-1707

LAMBERT COORDINATES

11558-39-D

Via e-mail to *hwalsh@waterboards.ca.gov*

San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

September 15, 2015

RE: **PROPOSED AMENDMENTS TO ORDER NO. R9-2013-0001, TENTATIVE ORDER NO. R9-2015-0100**

The South Laguna Civic Association (SLCA), established in 1946, is the principle community most impacted in the Aliso Watershed by the Orange County MS4 Permit. While over $20 million in public funds have been devoted to monitoring activities and reports, Co-permittees still concede they are out of compliance with most of the previous and current water quality regulations under the jurisdiction of the SDRWQCB MS4 Permit.

Pursuant to CWA Section 402(p)(3)(B), previous Aliso Watershed NPDES permits for storm water discharges from MS4s must include requirements to effectively prohibit non-storm water discharges into MS4s. However, present requirements have yet to achieve this mandate. Lacking is clear enforcement measures to incentivize Co-permitee compliance. Despite clear and mounting evidence of accumulated impacts from non-compliance, Co-permitees do not face fines and penalties for a pattern of careless management of MS4 outfalls. Instead of compliance, Co-permitees have chosen legal measures to hold MS4 permit regulations in permanent abeyance.

Public expectations require regulatory enforcement from the SDRWQCB. Clean up and Abatement Orders will motivate prompt mitigation measures and alternatives to include:

a) Immediate MS4 dry weather diversion to Publically Owned Treatment Facilities (POTWs)
b) Penalties and fines directed to Supplemental Environmental Projects by Third Party water quality NGOs and experts.
c) Local native tree planting to re-direct flows for irrigation and groundwater replenishment.

Fortunately, the iterative process from previous permitting cycles appears to have incorporated recommendations from SLCA and others for comprehensive mapping of the entire watershed and regulated coastal receiving waters in the present Tentative Order.

Public education can be best achieved if all facts are presented in clear map layers to determine MS4 impacts to all mandated beneficial uses. Likewise, elected officials as Co-Permitees must become literate in local natural baseline conditions and protected species through maps indicating Environmentally Sensitive Areas (ESHAs) within the watershed creek, wetland, estuary and coastal habitats to understand how best to achieve MS4 Permit compliance. Maps are the first step in restoring native flow rates to support indigenous drought tolerant trees and vegetation among impaired creek and coastal waters regulated by SDRWQCB.

Issues and recommendations submitted by SLCA in April 11, 2007 (Tentative Order No. R9-2007-2002) and December 10, 2012 (Tentative Order No. R9-2012-0011) remain relevant as Public Comment in the refining the Proposed Amendments to Order NO. R9-2013-0001, Tentative Order NO. R9-2015-0100 and are re-submitted as attachments.

The Aliso Watershed is a compact 34 square mile area suffering decades of neglect and pollution originating from poorly engineered residential developments among inland cities. Plans to add 17,000 new houses to South Orange County in the coming years will exacerbate the water pollution crisis facing Laguna Beach. Runoff management plans fail to control dry weather urban runoff and knowingly contribute directly to increased flows and erosion during routine storm events.

The Aliso Creek Wilderness Park remains degraded from erosion impacts to streambed habitat and threatens to expose critical sewage infrastructure transporting 10 to 15 million gallons of secondary sewage to the Aliso Creek Ocean Outfall only 1.2 miles offshore. A recent study by TetraTech for the South Orange County Wastewater Authority (SOCWA) determined the integrity of creek infrastructure to be capable of failure in as little as 5 years. Coastal receiving waters at the mouth of Aliso Creek are impaired by polluted urban runoff flowing at 1 to 5 million gallons per day (GPD). Aliso Creek is listed as a 303(d) Impaired Water Body by the Clean Water Act and continues to fail to meet present and previous MS4 Permit requirements. (Exhibit B – Aliso Creek Watershed 303(d) Impaired Waterbodies)

All Co-Permitees, as signatories to the MS4 Permit, are legally responsible for water quality in terms of coastal receiving waters. The regulatory and legal nexus is clear between unpermitted discharges by inland Co-Permitees, creek erosion and infrastructure damage, ocean pollution and public health hazards associated with these contaminated daily flows.

Aliso Beach, at the mouth of the federally listed contaminated creek, is permanently posted as a Clean Water Act 303(d) Impaired Water Body. Daily flows of urban runoff pollutes coastal receiving waters protected as the Laguna Beach State Marine Conservation Area established unanimously by the California Fish & Game Commission on January 1, 2012. Recent MPA coastal receiving water quality protections are referenced in Amended Order 2013-001 on page 21 of 313 section 2, A, 3 : http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/docs/updates030415/2015-0303_Final_Amended_Attachment_No_1_Order_2013-0001.pdf

Known and persistent water quality violations at Aliso Beach continue due to a lack of enforcement of MS4 permit regulations.

Additional comments to the CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD SAN DIEGO REGION ORDER NO. R9-2013-0001, AS AMENDED BY ORDER NO. R9-2015-0001 NPDES NO. CAS0109266 NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION Amended February 11, 2015 are:

2. Priority Water Quality Conditions

The Co-permittees must identify the water quality priorities within each Watershed Management Area that will be addressed by the Water Quality Improvement Plan. Where appropriate, Watershed Management Areas may be separated into subwatersheds to focus water quality prioritization and

jurisdictional runoff management program implementation efforts by receiving water. However, the Co-permitees lack maps identifying Environmentally Sensitive Habitat Areas (ESHA) such as the degraded Aliso Coastal Wetlands Estuary and State Marine Conservation Areas as well as local coastal receiving water tide pools, kelp forests and recreational sites. Similarly, maps must incorporate current studies for the Aliso watershed urban runoff coastal plume.

ASSESSMENT OF RECEIVING WATER CONDITIONS

The Co-permittees must consider the following, at a minimum, to identify water quality priorities based on impacts of MS4 discharges on receiving water beneficial uses:

(1) Map all creek and coastal receiving waters listed as impaired on the CWA Section 303(d) List of Water Quality Limited Segments (303(d) List);

(2) TMDLs adopted and under development by the San Diego Water Board;

(3) Map all receiving waters recognized as sensitive or highly valued by the Co-permittees, including estuaries designated under the National Estuary Program under CWA section 320, marine protected areas to include the Laguna Beach State Marine Conservation Area (SMCA), wetlands defined by the State or U.S. Fish and Wildlife Service's National Wetlands Inventory as wetlands that include the Aliso Estuary, waters having the Preservation of Biological Habitats of Special Significance (BIOL) beneficial use designation, and receiving waters identified as ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012;

(4) The receiving water limitations of Provision A.2;

(5) Map and illustrate known historical versus current physical, chemical, and biological water quality conditions and coastal receiving water urban runoff plumes;

(6) Publish for Public Education available, relevant, and appropriately collected and analyzed physical, chemical, and biological receiving water monitoring data, including, but not limited to, data describing: (a) Chemical constituents, (b) Water quality parameters (i.e. pH, temperature, conductivity, etc.), (c) Toxicity Identification Evaluations for both receiving water column and sediment (pathogens, viruses, nitrogen, phosphorous, microbeads, pharmaceuticals, etc.), (d) Trash impacts. Include map overlays for protected species and habitats. (See Attachment No. 1 Order No. R9-2013-0001 Page 22 of 131 May 8, 2013 As amended by Order No. R9-2015-0001 Amended February 11, 2015 PROVISION B: WATER QUALITY IMPROVEMENT PLANS B.2. Priority Water Quality Conditions (e) Bioassessments, and (f) Physical habitat).

(7) Present available evidence of erosional impacts in receiving waters due to accelerated flows (i.e. hydromodification). Map and identify inland dry weather urban runoff storm drain flow rates and on-going MS4 Permit violations. Indicate storm water erosion impacts from Laguna Beach Fuel Modification goat grazing. Identify existing erosion threats to the South Orange County Wastewater Authority (SOCWA) Effluent Transmission Main alongside Aliso Creek.

(8) Map protected whale and dolphin migration and foraging areas, Tidewater goby estuaries, creek wetlands and coastal urban runoff plumes among available evidence of adverse impacts to the chemical, physical, and biological integrity of receiving waters; and

(9) The potential improvements in the overall condition of the Watershed Management Area that can be achieved.
b. ASSESSMENT OF IMPACTS FROM MS4 DISCHARGES The Co-permittees must consider the following, at a minimum, to identify the potential impacts to receiving waters that may be caused or contributed to by discharges from the Co-permittees' MS4s: (1) The discharge prohibitions of Provision A.1 and effluent limitations of Provision A.3; and (2) Available, relevant, and appropriately collected and analyzed storm water and non-storm water monitoring data from the Co-permittees' MS4 outfalls; (3) Mapped locations of each Co-permittee's MS4 outfalls that discharge to receiving waters; (4) Mapped locations of MS4 outfalls that are known to persistently discharge non-storm water to receiving waters likely causing or contributing to impacts on receiving water beneficial uses; (5) Mapped locations of MS4 outfalls that are known to discharge pollutants in storm water causing or contributing to impacts on receiving water beneficial uses; and (6) The potential improvements in the quality of discharges from the MS4 that can be achieved.

IDENTIFICATION OF PRIORITY WATER QUALITY CONDITIONS

(1) The Co-permittees must use the information gathered for Provisions B.2.a and B.2.b to develop a list of priority water quality conditions as pollutants, stressors and/or receiving water conditions that are the highest threat to receiving water quality or that most adversely affect the quality of receiving waters. The list must include the following information for each priority water condition (Attachment No. 1 Order No. R9-2013-0001 Page 23 of 131 May 8, 2013 As amended by Order No. R9-2015-0001 Amended February 11, 2015).

(2) PROVISION B: WATER QUALITY IMPROVEMENT PLANS B.2. Priority Water Quality Conditions quality condition: (a) The beneficial use(s) associated with the priority water quality condition; (b) The geographic extent of the priority water quality condition within the Watershed Management Area, if known; (c) The temporal extent of the

priority water quality condition (e.g., dry weather and/or wet weather); (d) The Co-permittees with MS4s discharges that may cause or contribute to the priority water quality condition; and (e) An assessment of the adequacy of missing ESHA and MPA maps, coastal receiving water plume maps and data gaps in the monitoring data to characterize the conditions causing or contributing to the priority water quality condition, including a consideration of spatial and temporal variation.

(3) The Co-permittees must identify the highest priority water quality conditions to be addressed by the Water Quality Improvement Plan, and provide a rationale for selecting a subset of the water quality conditions identified pursuant to Provision B.2.c.(1) as the highest priorities.

d. IDENTIFICATION OF MS4 SOURCES OF POLLUTANTS AND/OR STRESSORS The Co-permittees must identify and prioritize known and suspected sources of storm water and non-storm water pollutants and/or other stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c. The identification of known and suspected sources of pollutants and/or stressors that cause or contribute to the highest priority water quality conditions as identified for Provision B.2.c must consider the following: (1) Pollutant generating facilities, areas, and/or activities within the Watershed Management Area, including: (a) Each Co-permittee's inventory of construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas, (b) Publicly owned parks and/or recreational areas, (c) Open space areas and goat grazed Fuel Modification Zones, (d) All currently operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste, and (e) Areas not within the Co-permittees' jurisdictions.

Priority Water Quality Conditions lands, state lands, federal lands including the Irvine Desalter Project that are known or suspected to be discharging to the Co-permittees' MS4s; (2) Mapped locations of the Co-permittees' MS4s, including the following: (a) All MS4 outfalls mapped plumes that discharge to receiving waters, and (b) Locations of major structural controls for storm water and non-storm water (e.g., retention basins, detention basins, major infiltration devices, etc.); (3) Other known and suspected sources of non-storm water or pollutants in storm water discharges to receiving waters within the Watershed Management Area, including the following: (a) Other MS4 outfalls (e.g., Phase II Municipal and Caltrans), (b) Other NPDES permitted discharges, (c) Any other discharges that may be considered point sources (e.g., private outfalls), and (d) Any other discharges that may be considered non-point sources (e.g., agriculture, wildlife or other natural sources);

(4) Review of available data, including but not limited to: (a) Findings from the Co-permittees' illicit discharge detection and elimination programs, (b) Findings from the Co-permittees' MS4 outfall discharge monitoring, (c) Findings from the Co-permittees' receiving water monitoring, (d) Findings from the Co-permittees' MS4 outfall discharge and receiving water assessments, and (e) Other available, relevant, and appropriately collected data, information, or studies related to pollutant sources and/or stressors that contribute to the highest priority water quality conditions as identified for Provision B.2.c. (5) The adequacy of the available data to identify and prioritize sources and/or stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c. for timely Cleanup and Abatement Orders from the SDRWQCB.

Recommended Actions

Poorly engineered projects can be re-engineered to achieve mandated water quality objectives.

1. Maps of all creek and coastal receiving waters indicating water quality impacts can be created by SCCWRP, Scripps, NOAA or any number of competent university or regulatory groups. A Bioregional Watershed Map will identify degraded land elements, offending storm drain outlets and candidate areas for re-forestation and estuarine/coastal restoration.

2. On an annual basis, citations against the primary six known storm drain point sources in each watershed can incrementally compel clean-up and abatement throughout a given watershed bioregion without the burden of costs to abate all points of contamination at once. Enforcement is a powerful economic incentive to achieve MS4 permit compliance. Failed Best Management Practices (BMPs) among urban runoff facilities, required as a Condition of Approval for inland residential developments, can be retrofitted with dry weather diversions to local Publically Owned Treatment Works (POTWs) or, alternatively, re-engineered with deep groundwater injection wells.

3. Fines must be allocated to re-vegetate impaired watersheds and kelp forests to restore the native functions of semi-arid creeks and protected coastal receiving waters. A re-forested Aliso Canyon with a canopy similar to San Mateo Creek will qualify for California Cap and Trade funding to offset costs. Restoration of natural habitats is demonstrated to be the best, most cost effective measure for improving watershed water quality.

4. Restoration of high value coastal wetlands and estuaries will guarantee protection of natural beach sand berms and provide measurable improvement to coastal receiving waters. Funds from the California Coastal Conservancy and other wetland recovery resources can offset costs.

5. Watershed restoration will offer multiple community benefits by reducing destructive stormwater flows, eliminating pollutants and increasing eco-tourist revenues to surrounding cities. Large street cisterns incorporating designs proposed by GeoSynTech for the re-development of the Aliso Golf Course can serve as a model for extensive rainwater

harvest/reuse systems. Street cisterns common throughout San Francisco since 1906, can capture and mitigate storm water flows for local beneficial reuse. Restoration of some or all of the 1500 foot Aliso Creek Ox Bow in Laguna Niguel will assist in restoring hydric soils to reduce stormwater impacts.

6. Increased use of recycled water for wildland fire suppression along the entire Highway 73 Toll Road bisecting the Laguna Greenbelt will maintain a healthy, fire safe wilderness area. Orange County Measure M and State Proposition funds are available to offset costs. Increased use of recycled water reduces ocean discharges to the Laguna State Marine Conservation Area.

7. A citywide network of recycled water for all of Laguna Beach will reduce imported water demand significantly and increase water security, disaster preparedness and fire suppression resources. Revenues from routine use for irrigation mandated Fuel Modification Zones will provide new revenue streams. Laguna Beach is the only Orange County city without a comprehensive recycled water program and remains a "once use" community of valuable imported water.

The MS4 Permit Renewal process offers the opportunity to advance beyond failed measures and begin the renewal of the region's unique watershed and coastal ecology. All Stakeholders can benefit through proactive initiatives and, as the overall watershed ecology improves, the cost savings from stormwater damage, water pollution, protracted litigation and public health threats will become evident. The South Laguna Civic Association has offered constructive, critical information and suggestions during the previous MS4 Permit cycle which have been often ignored to the public's detriment.

Cooperation and courage are essential and the South Laguna Civic Association remains committed to working towards real, measurable, sustainable solutions. On behalf of our community and the many visitors from throughout the world to our shores, we thank you for your review and support of our recommended actions.

Michael Beanan
Vice President
South Laguna Civic Association

mike@southlaguna.org

Attachments

SLCA Comments to Tentative Order No. R9-2007-0002 NPDES, No. CAS0108740
SLCA Comments to Tentative Order No. R9-2012-0011

July 7, 2014

Laurie,

Please convey my thanks and appreciation for SDRWQCB staff's willingness to host a workshop in South Orange County.

While many important issues were covered, I would like to supplement my comments and recommendations with a few useful images, links and docs.

"The Regional MS4 Permit will regulate MS4 discharges to inland surface waters, bays and estuaries and **coastal waters** throughout the three counties within the San Diego Region." http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/

MS4 Coastal Receiving Waters & Federally Protected Marine Mammals

Relative to regulated coastal receiving waters, federally protected migrating California Grey Whales and young calves frequent coves along South Laguna and immediately at the mouth of Aliso Creek - a CWA listed 303(d) Impaired Water Body with urban runoff dry weather summer flows averaging 1 MGD. Protected coastal dolphins suffer compromised immune systems from urban runoff plumes. Coastal receiving waters at Aliso Beach are part of a designated Laguna State Marine Conservation Area (SMCA).

The Laguna State Marine Conservation Area and Laguna State Marine Reserve are mapped marine life protection zones similar to an Area of Special Biological Significance (ASBS). Incorporation of coastal receiving waters among Co-Permittee documents represent a threshold requirement to determine MS4 impacts to protected State waters. Layed maps can illustrate Grey whale migration routes and local resting areas. Additional layers will map protected Coastal dolphin habitats and birthing grounds. Important recreational sites such as the Aliso Beach World Skimboard Championships, popular SCUBA diving sites and surfing beaches might constitute another map layer for stakeholder and public education of areas impacted by dry weather and stormwater runoff.

Co-permittees have a variety of resources to properly map and post coastal receiving waters with layered features to illustrate protected resources and beneficial uses. http://www.dfg.ca.gov/marine/mpa/scmpas_list.asp

Likewise, SCCWRP has dynamic mapping capabilities available to Co-permitees. http://www.sccwrp.org/Data/SearchAndMapData.aspx

Sound science and public education require a better understanding of coastal receiving waters. Dry weather urban runoff transports illicit MS4 discharges and pollutants to coastal waters. Daily ocean upwelling transports these constituents to nearshore waters and promotes summer long Harmful Algae Blooms (HABs) and localized eutrophication presently omitted from Co-permitee monitoring maps (See attached). Essential Fish Habitats (EFH) recognized by NOAA include local kelp forests and tidepools receiving inland urban runoff plumes.

An Integrated Watershed Management Plan must fully comply with mapping and monitoring of all regulated waters including coastal receiving waters. Land Development topics lacking mapped coastal receiving waters reflect a disconnect among Co-permitees and suggest omission of the very foundation of the regional economy, i.e., a healthy ocean. Images similar to those developed by OC Sanitation District of coastal plumes can correlate with improvements or shortcomings of inland MS4 management efforts to reduce flow rates of urban runoff. Mapping is the first step in monitoring water quality impacts. Proper mapping and monitoring establishes baseline data for effective restoration projects.

Restoration of Natural Flow Rates

Orange County ROWD goals to "restore to natural flows" represent a useful shift in understanding flow rates as a key transport of inland contaminates to regulated receiving waters. Achieving zero tolerance of discharges from inland MS4 stormdrains can be achieved by mapping and posting for public education offending stormdrains and implementing Clean-up and Abatement Orders as well as fines where necessary to shift the economic incentives towards compliance. The top three offending stormdrains in each watershed are well documented in annual reports and serve as immediate target sites for abatement (See attached).

An 85% retention of stormwater flows can be achieved by segmenting into rational units. For instance, one tree on site can hypothetically retain 5% of stormwater with another 10% retained by bioswales. Rainwater harvesting might retain another 10% to achieve a total net retention of 25% on site. The remaining 60% can be achieved with local mitigation programs such as subwatershed re-forestation of public lands, parking lot stormwater cisterns, street cisterns, etc.

"The restoration of riparian forests has subsequently become a major focus of watershed initiatives to improve degraded stream ecosystems."
http://link.springer.com/article/10.1023/A:1006495805300

Aliso Canyon & Wood's Canyon Wilderness Park is a stream ecosystem degraded by centuries of careless cattle grazing and erosion flows from faulty USACOE projects and inland developments. Reforestation of grazed habitats throughout the region is likely the most cost effective long range measure available to communities. Reforestation projects, funded as mitigation to help achieve a proposed development's 85% compliance, will engage local schools and civic groups to improve public stewardship of fragile ecosystems while protecting creek and coastal receiving waters.

Geochemistry is determined in large measure by degraded riparian ecosystems. Widespread regional deforestation represents systematic ecocide destruction of critical tree and vegetation biomass. Without vegetated biomass to provide soil cover and hillside stabilization, annual stormwater flows remove the protective soil mantle to expose clay substrate...a natural water filter for groundwater recharge. There are no "bad soils", only degraded habitats.

Wise use of biomass mulch, small bioswales around trees and reforestation of native vegetation will restore the soil mantle and reduce the intensification of erosion flows during storm events. Added benefits include improved air quality from plant photosynthesis, a reduction in the urban heat sink and improved property values associated with landscaped tree areas and forested reserves. Restored forested stream ecosystems are key to fish and wildlife recovery efforts.

Stormwater Cisterns

Although some stakeholders are unfamiliar with cisterns, major developments utilize these flow rate control systems to mitigate urban runoff volumes while ensuring local water reliability. http://www.pelicanhill.com/pdf/PelicanHillGolfClub.pdf

Golf courses are known point sources of contaminates polluting regulated receiving waters. Grants and incentives to re-engineer golf courses will achieve multiple community benefits including runoff reduction, less use of fertilizers and compliment State water conservation mandates. Educating Co-Permitees and developers about a variety of stormwater capture systems can greatly facilitate a "can do" attitude to combat a prevailing "can't do" strategy by staff and developers.
http://www.conteches.com/products/stormwater-management.aspx

A thorough cost-benefit analysis of the value of stormwater capture/reuse as an untapped water resource over a 30 year time horizon will reveal substantial savings in imported water as well as regulatory compliance costs. Unsubstantiated allegations of cost prohibitions for basic watershed improvements must be accompanied by a detailed financial report to enable the public an opportunity to challenge inflated cost estimates which are often used as unscientific justification for non-compliance.

The Athens Aliso Redevelopment Project, Page 53, Figure 29 depicts a Roadway Subsurface Cistern Design Concept to offer an engineered alternative for large street cisterns capable of replenishment with local groundwater, dry weather urban runoff or hi-purity 250 tds recycled water (See attached). The City of San Francisco among others, including medieval San Gimignano in Italy, have networks of street, plaza and park cisterns. Stormwater cisterns can be recharged and managed in summer months with local recycled water to retain usefulness as irrigation water, wildfire suppression, etc.

Going Forward

There are numerous opportunities to collaborate in improving Region 9 water quality. Partnering with the South Coast Water District, the all volunteer South Laguna Civic Association motivated the City of Laguna Beach, County of Orange and surrounding golf courses to gain funds for the Aliso Creek Urban Runoff Recovery, Reuse and Conservation
Project http://www.scwd.org/projects/alisocreek.asp

As a useful template, capturing urban runoff is now a viable alternative to creek, estuary and ocean pollution. Engaging private and public innovators will break the artificial barriers manufactured by some Co-permittees and developers to block progress in restoring the region's natural stream flows. The way forward is not impossible nor difficult when considering the alternatives of doing nothing or the barest of minimums to assure compliance. Water, especially during prolonged drought conditions, can no longer be carelessly wasted as a source of regional water quality impairment.

Going forward, let's continue to promote timely workshops and encourage if not require Co-permitees and stakeholders to collaborate with knowledgeable NGOs, academics and individuals in implementing productive water quality projects. Thank you again for staff efforts by the SDRWQCB to improve the next MS4 Permit to achieve measurable, lasting improvements.

Michael Beanan
Vice President
South Laguna Civic Association

Law Offices of C. Samuel Blick
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Facsimile (858) 225-0220
blicklawsd@gmail.com

Sent Via Electronic Transmission – November 3, 2015 @ 8:22 pm PST
(rb9agenda@waterboards.ca.gov)

November 3, 2015

Mr. David Gibson,
Executive Officer
Regional Water Quality Control Board
San Diego Region
Board Meeting Room
2375 Northside Drive, Suite 108
San Diego, California

Notice of Potential 'Taking' of Private Property – Safari Highlands Ranch, Pending Subdivision Map and Related Entitlements - Escondido California
Directed to San Diego Regional Water Quality Control Board (RWQCB)

Scheduled Meeting of November 18, 2015 – 2375 Northside Drive, Suite 108, San Diego, California

Dear Mr. Gibson:

This firm represents Safari Highlands Ranch, LLC, the owner of approximately 1100 acres of land in the General Plan and Specific Plan Area #4, of the City of Escondido, California, more specifically described in the attached exhibits.

This correspondence is not intended to fully state all arguments or law relevant to the RWQCB's potential decision at its forthcoming meeting on November 18, 2015, but is offered as 'Notice' of exposure to liability.

An analysis of the Potential Critical Coarse Sediment Yield Areas, as indicated on the attached exhibits and illustrated by our engineers of work, Hunsacker & Associates, proves to show that if the Hydromodification Management BMP Requirements considered by the RWQCB are adopted and applied to the Safari Highlands Ranch, such action will constitute in a total taking of the land value.

C. Samuel Blick
Attorney at Law

This action by the RWQCB will render the land and pending Subdivision Tract Map without value, as defined in Federal and State law, including but not limited to the well supported decision in *Lucas v. South Carolina Coastal Council, 424 S.E.2d 484, 486 (S.C. 1992).*

We urge you review the attached exhibit of the Safari Highland Ranch pending Subdivision Tract Map and related entitlements, noted as "REGIONAL WMAA – Safari Highland Ranch." This exhibit illustrates via the red triangles, areas identified as potential critical coarse sediment areas by the City of San Diego as lead agency to develop the new BMP Design Manual to implement the 2013 water quality permit.

This evidences the total taking of the land value, in that the manual requires complete avoidance of actual CCSYAs, offering no mitigation for developing any of the red triangles.

The Safari Highland Ranch development project is valued at completion of entitlements in excess of $500,000,000.00, and, since all value would be 'taken' by implementation of the proposed regulations, the exposure of the RWQCB and relevant agencies might easily exceed that figure.

We urge you to consider these statements of fact and law and decline to proceed with these unreasonable critical coarse sediment regulations.

Please accept this letter as part of the administrative record regarding the adoption of the proposed regulations.

Sincerely,

/s/ C. Samuel Blick

C. Samuel Blick
Attorney at Law

CSB: sh

Cc: Don Underwood, President, Concordia Communities,
San Diego Association of Governments
California Coastal Commission
United States Fish & Wildlife Service

California Department of Fish & Wildlife

C. Samuel Blick
Attorney at Law

United States Army Corps of Engineers

Enclosures:

REGIONAL WMAA – Map of Safari Highland Ranch
PROVISION E: JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS

LEGEND

POTENTIAL CRITICAL COARSE SEDIMENT YIELD AREAS

DATE OF PREPARATION 7/21/15

PREPARED BY:

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REGIONAL WMAA
SAFARI HIGHLANDS RANCH

CITY OF ESCONDIDO, CALIFORNIA

W.O. 2374-0017

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(b) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1)(a). The Priority Development Project must mitigate for the portion of the pollutant load in the design capture volume not retained onsite if Provision E.3.c.(3) is utilized. If a Priority Development Project is allowed to utilize alternative compliance, flow-thru treatment control BMPs must be implemented to treat the portion of the design capture volume that is not reliably retained onsite. Flow-thru treatment control BMPs must be sized and designed in accordance with Provisions E.3.c.(1)(a)(ii)[a]-[c].

(2) Hydromodification Management BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite BMPs to manage hydromodification that may be caused by storm water runoff discharged from a project as follows:

(a) Post-project runoff conditions (flow rates and durations) must not exceed pre-development runoff conditions by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat downstream of Priority Development Projects).

(i) In evaluating the range of flows that results in increased potential for erosion of natural (non-hardened) channels, the lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks.

(ii) The Copermittees may use monitoring results collected pursuant to Provision D.1.a.(2) to re-define the range of flows resulting in increased potential for erosion, or degraded instream habitat conditions, as warranted by the data.

(b) Each Priority Development Project must avoid critical sediment yield areas known to the Copermittee or identified by the optional Watershed Management Area Analysis pursuant to Provision B.3.b.(4), or implement measures that allow critical coarse sediment to be discharged to receiving waters, such that there is no net impact to the receiving water.

(c) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the performance requirements of Provision E.3.c.(2)(a). The Priority Development Project must mitigate for the post-project runoff conditions not fully managed onsite if Provision E.3.c.(3) is utilized.

The San Diego Water Board understands, indeed asserts, that the pre-development hydrology of an area in question can only be roughly estimated and cannot be precisely known. However, using the hydrology of a natural condition, even if not precisely known, will provide significant benefit to receiving waters over using the hydrology associated with pervious (developed) surfaces. Therefore in order to achieve the goals of the Clean Water Act, which are to "*restore and maintain the chemical, physical, and biological integrity of the nation's waters* [emphasis added]," the most appropriate standard to use for hydromodification management is the standard associated with the pre-development condition.

Provision E.3.c.(2)(b) requires Priority Development Projects to avoid known critical sediment yield areas or implement measures that would allow coarse sediment to be discharged to receiving waters, such that the natural sediment supply is unaffected by the project. This is necessary because coarse sediment supply is as much an issue for causing erosive conditions to receiving streams as are accelerated flows.

The San Diego Water Board recognizes that in some situations implementing the hydromodification management BMP requirements fully onsite may not be technically feasible, may be cost prohibitive, or may not provide any overall water quality benefits to the Watershed Management Area. Thus, Provision E.3.c.(2)(c) allows for the use of a combination of onsite hydromodification management BMPs and alternative compliance options described in Provision E.3.c.(3).

Provision E.3.c.(3) allows for alternative compliance in instances where the Copermittee determines that offsite measures will have a greater overall water quality benefit for the Watershed Management Area than if the Priority Development Project were to implement structural BMPs onsite. Consequently, watershed-specific structural BMP requirements are present in this Order in the form of allowable compliance offsite. The Alternative Compliance Program to Onsite Structural BMP Implementation Provision is intended to integrate with the Copermittees' planning efforts in the Water Quality Improvement Plans.

The Alternative Compliance Program is an option for Priority Development Projects where the governing Copermittee has participated in the development of a Watershed Management Area Analysis as part of the Water Quality Improvement Plan (described in Provision B.3.b.(4)). Such an approach is consistent with the latest findings in hydromodification management by the scientific community. In a Technical Report entitled *Hydromodification Assessment and Management in California,*[38] the report states:

> *"An effective [hydromodification] management program will likely include combinations of on-site measures (e.g., low-impact development techniques, flow-control basins), in-stream measures (e.g., stream habitat restoration), floodplain*

[38] 2012. ED Stein, F Federico, DB Booth, BP Bledsoe, C Bowles, Z Rubin, GM Kondolf, A Sengupta. Technical Report 667. Southern California Coastal Water Research Project. Costa Mesa, CA.

California Regional Water Quality Control Board
San Diego Region

Response to Comments Report

Tentative Order No. R9-2015-0100

An Order Amending Order No. R9-2013-0001, NPDES No. CAS010266, As Amended by Order No. R9-2015-0001 National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region

November 4, 2015

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Responses to Comments on Tentative Order No. R9-2015-0100

November 4, 2015

Introduction

This report contains responses to written comments timely received on Tentative Order No. R9-2015-0100, *An Order Amending Order No. R9-2013-0001, NPDES No. CAS010266*, *as Amended by Order No. R9-2015-0001, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Tentative Order). The Tentative Order and its attachments were available for public review and comment for 46 days, with the comment period ending on September 14, 2015. Specifically, the San Diego Water Board requested comments on the following three documents:

- Tentative Order No. R9-2015-0100;
- Attachment No. 1 – Revised Order No. R9-2013-0001; and
- Attachment No. 2 – Revised Fact Sheet to Order No. R9-2013-0001.

The phrases "Tentative Order" and "Regional MS4 Permit" in the following response to comments table refers to both Tentative Order No. R9-2015-0100 and the two attachments. Comments and responses are organized by the section of either Attachment 1 or Attachment 2 that is being referenced. Wherever possible, comments are grouped based on content and summarized by the San Diego Water Board. The actual comment letters can be accessed on the San Diego Water Board website at: http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

List of Commenters:
Comments were submitted by the following organizations, public agencies, or individuals (listed alphabetically):

1. City of Dana Point
2. City of Escondido
3. City of Laguna Beach
4. City of Lake Forest
5. City of Menifee
6. City of San Clemente
7. City of San Diego
8. City of San Juan Capistrano
9. City of Santee
10. Construction Industry Coalition on Water Quality (CICWQ)
11. County of San Diego
12. Environmental Groups (San Diego Coastkeeper, Coastal Environmental Rights Foundation, and Surfrider Foundation San Diego Chapter)
13. Orange County Copermittees
14. Riverside County Copermittees
15. San Diego Coastkeeper and Coastal Environmental Rights Foundation
16. San Diego County Copermittees
17. San Diego Unified Port District
18. South Laguna Civic Association

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RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2015-0100

November 4, 2015

Gnl-1	GENERAL COMMENTS	
	COMMENT: *Request to incorporate previous written comments and testimony in the record for this Tentative Order.* The Copermittees and other stakeholders requested that previous written comments and testimony be incorporated into the record for this Tentative Order. The comment letters also included copies of the written comments previously submitted during the proceedings to adopt Order No. R9-2013-0001, and the proceedings to adopt Order No. R9-2015-0001 to amend Order No. R9-2013-0001.	Riverside County Copermittees Orange County Copermittees City of Dana Point City of San Diego San Diego Unified Port District South Laguna Civic Association Construction Industry Coalition on Water Quality
	RESPONSE: The San Diego Water Board is incorporating the previous written comments and testimony provided during the proceedings to adopt Order No. R9-2013-0001, and the proceedings to adopt Order No. R9-2015-0001 to amend Order No. R9-2013-0001 into the record for this Tentative Order. The San Diego Water Board reviewed Tentative Order No. R9-2015-0100 and its Attachments and has determined that the March 27, 2013 responses to comments document prepared during the 2013 adoption process of Order No. R9-2013-0001, the January 21, 2015 responses to comments document prepared during the adoption process of Order No. R9-2015-0001, and the oral responses to comments during the workshops and hearings during those proceedings address the previously submitted comments and testimony. The San Diego Water Board is incorporating by this reference as if set forth in full herein its written responses to comments and oral responses to comments raised during the workshops and hearings on Order Nos. R9-2013-0001 and R9-2015-0001 into these responses. To the extent commenters incorporate issues and objections raised in petitions for review of Order No. R9-2013-0001 filed with the State Water Board in SWRCB/OCC File A-2254(a)-(p), or in petitions for review of Order No. R9-2015-0001, amending Order No. R9-2013-0001 (SWRCB/OCC File A-2367(a)-(i)), the San Diego Water Board notes that it has not yet had an opportunity to submit written responses to those petitions for review and is not specifically addressing those petitions for review in these responses to comments. The San Diego Water Board will submit written responses to the petitions for review at the appropriate time in the State Water Board's petition proceeding. No changes to the Tentative Order or its Attachments were made based on the renewed comments.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2015-0100

November 4, 2015

Gnl-2	GENERAL COMMENTS	
	COMMENT: *Request for clarification of implementation requirements for the Riverside County Copermittees as a result of late entry into the Regional MS4 Permit.* The Riverside County Copermittees noted that several provisions of the Regional MS4 Permit, including requirements to submit certification of legal authority, assessment and subsequent Water Quality Improvement Plan revision requirements, and requirements to submit a regional monitoring and assessment report, which either require data gathered under a Water Quality Improvement Plan that has been accepted by the San Diego Water Board, or are due for submittal outside of the Regional MS4 Permit's term. The Riverside County Copermittees wanted clarification that: 1) the certification of legal authority which was submitted by the Riverside County Copermittees under Order No. R9-2010-0016 will remain effective until a new certification is submitted with the first Water Quality Improvement Plan Annual Report (after the current Regional MS4 Permit term has ended), 2) any provisions regarding assessments or requiring data gathered under an accepted Water Quality Improvement Plan will not be due until such time that the necessary data are gathered and the assessments made under time periods described in the Regional MS4 Permit, and 3) the regional monitoring and assessment report for the current Regional MS4 Permit term should be completed utilizing data gathered during the transitional monitoring period, as these will be the only data that will be available at that time.	Riverside County Copermittees
	RESPONSE: The San Diego Water Board agrees that: 1) the certification of legal authority which was submitted by the Riverside County Copermittees under Order No. R9-2010-0016 will remain effective until a new certification is submitted with the first Water Quality Improvement Plan Annual Report (after the current Regional MS4 Permit term has ended), 2) any provisions regarding assessments or requiring data gathered under an accepted Water Quality Improvement Plan will not be due until such time that the necessary data are gathered and the assessments made under time periods described in the Regional MS4 Permit, and 3) the regional monitoring and assessment report for the current Regional MS4 Permit term should be completed utilizing data gathered during the transitional monitoring period, as these will be the only data that will be available at that time.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2015-0100

November 4, 2015

Gnl-3	GENERAL COMMENTS	
	COMMENT: *Request to remove the City of Menifee from Water Quality Improvement Plan development and implementation.* The Riverside County Copermittees and the City of Menifee requested several modifications to the Regional MS4 Permit that would remove the City of Menifee from the requirement to develop and implement the Water Quality Improvement Plan for the Santa Margarita River Watershed Management Area. The Riverside County Copermittees and the City of Menifee assert that the City of Menifee does not own or operate any MS4 within the Santa Margarita River Watershed Management Area, and provided a map showing the City's jurisdictional boundary and MS4.	Riverside County Copermittees City of Menifee
	RESPONSE: The San Diego Water Board reviewed the information provided by the commenters and disagrees that the City of Menifee does not own or operate any MS4 within the Santa Margarita Watershed Management Area. The maps provided by the commenters show a portion of MS4 along Scott Road within the Santa Margarita Watershed Management Area that is indicated to be owned by the City of Menifee. In addition, the maps provided by the commenters show that there is a residential area within the City of Menifee and within the Santa Margarita River Watershed Management Area with streets, curb, and gutter that drain to MS4 owned by the Riverside County Flood Control and Water Conservation District, which discharges to a tributary of Warm Springs Creek. Warm Springs Creek is an impaired water body in the Santa Margarita River Watershed Management Area and may become subject to the requirements of a TMDL in the future. The streets, curb, and gutter in the residential area are also considered part of the City of Menifee's MS4. The maps provided confirm that it is appropriate for the City of Menifee to be required to participate in the development and implementation of the Water Quality Improvement Plan for the Santa Margarita River Watershed Management Area. No changes were made to the Tentative Order as a result of this comment.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2015-0100

November 4, 2015

Gnl-4	GENERAL COMMENTS	
	COMMENT: *Stakeholder workshops have been effective.* The Orange County Copermittees expressed appreciation for the efforts of the San Diego Water Board staff to collaboratively engage the Copermittees and other stakeholders through the use of mediated workshops. The workshop format allowed all viewpoints to be expressed with sufficient time provided for discussion of issues regarding the Regional MS4 Permit.	Orange County Copermittees City of Dana Point City of Laguna Beach
	RESPONSE: The San Diego Water Board agrees that the collaborative approach utilized during the Regional MS4 Permit development and amendment processes has been beneficial for the San Diego Water Board staff to better understand the issues of concern to the stakeholders.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2015-0100

November 4, 2015

Gnl-5	GENERAL COMMENTS	
	COMMENT: *Requests for the Regional MS4 Permit to acknowledge the potential benefit of developing site specific water quality objectives in concert with development of the Water Quality Improvement Plan.* The Cities of Dana Point and Laguna Beach requested that the Regional MS4 Permit and Fact Sheet specifically acknowledge the benefit of developing site specific objectives in concert with the development of the Water Quality Improvement Plans, even if development of the site specific objectives may extend the period to complete development of the Water Quality Improvement Plans.	City of Dana Point City of Laguna Beach
	RESPONSE: The San Diego Water Board acknowledges that developing site specific water quality objectives (site specific objectives) may be appropriate where there are data that are available to support site specific objectives. The San Diego Water Board, however, disagrees that it is appropriate to delay development and implementation of any Water Quality Improvement Plans with an expectation that site specific objectives will be developed. Any action taken by the San Diego Water Board to establish site specific objectives would require amendment of the Basin Plan to incorporate the site specific objectives before they could be implemented in any NPDES permits or waste discharge requirements issued by the San Diego Water Board. The Basin Planning process requires separate proceedings that need to include the public, the San Diego Water Board, the State Water Board, the Office of Administrative Law, and the USEPA. This process will take much longer to complete than developing the Water Quality Improvement Plan. However, the San Diego Water Board encourages the Copermittees to utilize the Water Quality Improvement Plan development process to identify areas within the Watershed Management Area where developing site specific objectives may be appropriate and include special studies to collect data that can be used to support development of site specific objectives.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2015-0100

November 4, 2015

Gnl-6	GENERAL COMMENTS	
	COMMENT: *Request for clarification that location of a MS4 within the Port's jurisdictional boundaries does not render the Port an owner or operator of the MS4.* The San Diego Unified Port District (Port) asserts that just because a MS4 facility falls within its jurisdictional boundaries, which overlap with the Cities of San Diego, National City, Chula Vista, Imperial Beach, and Coronado (Member Cities), that does not mean the Port owns or operates the MS4 facility, and thus the Port would not be responsible for discharges from those MS4 facilities. Therefore, the Port requested revisions to the Tentative Order that clarify this distinction.	San Diego Unified Port District
	RESPONSE: The San Diego Water Board disagrees that the Tentative Order should be revised to include additional clarification. The Port owns and operates MS4 facilities (streets, curbs and gutters, catch basins, etc.) and lands within the tidelands that either convey or discharge storm water runoff into MS4 facilities owned or operated by Member Cities, or directly to receiving waters. The Port is responsible for complying with permit conditions pertaining to discharges from MS4 facilities and lands the Port owns or operates that discharge into MS4 facilities of Member Cities or directly to receiving waters. The Port must provide the evidence to demonstrate that it does not own or operate MS4 facilities or lands that discharge storm water runoff directly or indirectly into the MS4 facilities owned by the Member Cities. No changes were made to the Tentative Order as a result of this comment.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2015-0100

November 4, 2015

Gnl-7	GENERAL COMMENTS	
	COMMENT: *Compliance with all the discharge prohibitions in the Regional MS4 Permit under all circumstances is likely impossible.* The Cities of Dana Point and Laguna Beach asserts that compliance with all the discharge prohibitions in the Regional MS4 Permit under all circumstances is not practicable and likely impossible. The Cities go on to assert that the Cities are in a position of being required to comply with the discharge prohibitions under all circumstances, or are being required to meet a "zero discharge standard," both of which are impossible to achieve.	City of Dana Point City of Laguna Beach
	RESPONSE: The San Diego Water Board does not disagree with the assertion that the Copermittees are not in compliance with all the discharge prohibitions in the Regional MS4 Permit under all circumstances. The San Diego Water Board disagrees that it is not practicable and likely impossible to comply with all of the discharge prohibitions under all circumstances. The cases cited in support of the commenters' argument are inapposite and factually distinguishable from Order No. R9-2013-0001 (as amended) and the discharge prohibitions and receiving water limitations provisions therein. To date, the Copermittees have not implemented programs that are capable of complying with all of the discharge prohibitions under all circumstances, but that does not mean it is not practicable nor impossible. The assertion that complying with all the discharge prohibitions in the Regional MS4 Permit under all circumstances is not practicable and impossible cannot be supported without first demonstrating that the Copermittees have implemented all of their programs to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges to the maximum extent practicable (MEP). Moreover, several audits conducted recently by the San Diego Water Board indicate that the Copermittees may not be adequately implementing their basic jurisdictional runoff management program (JRMP) requirements to reduce pollutants in storm water discharges to the MEP standard. Even if the Copermittees implemented the basic JRMP requirements to the MEP standard, the Copermittees can also implement additional practicable actions or programs to comply with all of the discharge prohibitions in the Regional MS4 Permit.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2015-0100

November 4, 2015

Gnl-8	GENERAL COMMENTS	
	COMMENT: *Request for clarification by City of Lake Forest for applicability of the Water Quality Improvement Plan development requirements.* The City of Lake Forest requested clarification on its participation in development of the Water Quality Improvement Plan, based on the agreement that discharges from its MS4 in the San Diego Region will be regulated by the Santa Ana Water Board.	City of Lake Forest
	RESPONSE: The San Diego Water Board expects the City of Lake Forest to contribute to development of the Water Quality Improvement Plan and describe the water quality improvement strategies that will be implemented by the City to comply with TMDL requirements. The strategies implemented by the City of Lake Forest are only expected to implement the requirements of the Phase I MS4 Permit issued by the Santa Ana Water Board, except when and where additional strategies (known as optional jurisdictional strategies or Watershed Management Area strategies in the Regional MS4 Permit) may be necessary to achieve TMDL requirements. Likewise, if the Water Quality Improvement Plan includes final numeric goals that are not based on TMDL requirements, the City of Lake Forest is expected to include descriptions of the water quality improvement strategies that the City may implement to contribute toward achieving those final numeric goals.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2015-0100

November 4, 2015

Gnl-8	GENERAL COMMENTS	
	COMMENT: *Recommendations for actions that can be implemented to improve water quality.* The South Laguna Civic Association provided several recommended actions that may result in improvements to water quality.	South Laguna Civic Association
	RESPONSE: The San Diego Water Board appreciates the recommendations. The recommendations, however, appear to be actions that could be implemented as part of water quality improvement strategies by the Copermittees, and not necessarily appropriate to include into the requirements of the Tentative Order. The recommended actions provided by the commenter can be brought to the attention of the south Orange County Copermittees during the development of the Water Quality Improvement Plan. No changes were made to the Tentative Order as a result of this comment.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2015-0100

November 4, 2015

Gnl-10	GENERAL COMMENTS	
	COMMENT: *The Regional MS4 Permit illegally authorizes compliance schedules for CTR-based TMDLs beyond May 18, 2010.* The Environmental Groups assert the Tentative Order and the Regional MS4 Permit illegally authorize compliance schedules for TMDLs to achieve compliance with the CTR as required by the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP).	Environmental Groups
	RESPONSE: The San Diego Water Board disagrees that the Tentative Order or the Regional MS4 Permit are in conflict with the SIP. The Tentative Order and Regional MS4 Permit are consistent with the TMDLs and the SIP. The Regional MS4 Permit establishes requirements for the regulation of storm water discharges, and the compliance schedule requirements of the SIP do not apply to storm water discharges. Please refer to footnote 1 on page 3 of the SIP which states, "*This Policy does not apply to regulation of storm water discharges. The SWRCB has adopted precedential decisions addressing regulation of municipal storm water discharges in Orders WQ 91-03, 91-04, 96-13, 98-01, 99-05, and 2001-15.*"	

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A-1	PROVISION A: PROHIBITIONS AND LIMITATIONS	
	COMMENT: *Requests to include language in the prohibitions and limitations of Provision A that is linked to the alternative compliance pathway under Provision B.3.c.* The Orange County and San Diego County Copermittees, as well as several individual Copermittees, requested the addition of language to Provision A that explicitly states the implementation of the alternative compliance pathway under Provision B.3.c constitutes compliance with the discharge prohibitions and receiving water limitations in Provision A.	Orange County Copermittees City of Lake Forest City of San Clemente City of San Juan Capistrano San Diego County Copermittees City of Santee County of San Diego
	RESPONSE: The San Diego Water Board disagrees that it is appropriate or necessary to include additional language to Provision A. Provision A is consistent with the precedential language that was issued under State Water Board Order WQ 99-05. State Water Board Order WQ 2015-0075, which supports the inclusion of the alternative compliance pathway under Provision B.3.c, also states that Phase I MS4 permits should continue to use the receiving water limitations provisions as directed by Order WQ 99-05. No changes were made to the Tentative Order as a result of this comment.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2015-0100

November 4, 2015

A1-1	PROVISION A.1: Discharge Prohibitions	
	COMMENT: *Request to correct State Water Board Resolution No. 2012-0012 reference in Provision A.1.d to Resolution No. 2012-0031.* The City of San Diego requested that the reference to State Water Board Resolution No. 2012-0012 in Provision A.1.d be changed to Resolution No. 2012-0031.	City of San Diego
	RESPONSE: The San Diego Water Board agrees that the correction is appropriate. The reference to "State Water Board Resolution No. 2012-0012" under Provision A.1.d has been revised to "State Water Board Resolution No. 2012-0012, as amended by State Water Board Resolution No. 2012-0031."	

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A2-1	PROVISION A.2: Receiving Water Limitations	
	COMMENT: *Request for removal of receiving water limitations language from Regional MS4 Permit.* The County of San Diego requested that the San Diego Water Board use its discretion to remove the requirements to comply with receiving water limitations in Provision A.2 of the Regional MS4 Permit.	County of San Diego
	RESPONSE: The San Diego Water Board disagrees that it is appropriate to remove the requirements to comply with receiving water limitations in Provision A.2 of the Regional MS4 Permit. The receiving water limitations are consistent with precedential State Water Board Orders WQ 99-05 and WQ 2015-0075. No changes were made to the Tentative Order as a result of this comment.	

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B-1	PROVISION B: WATER QUALITY IMPROVEMENT PLANS	
	COMMENT: *Request to revise the language in Provision B.1 to specify the Water Quality Improvement Plans are to address discharges from the MS4.* The City of San Diego requested Provision B.1 be revised to state that the Copermittees must develop a Water Quality Improvement Plan for their MS4 discharges within each of the Watershed Management Areas in Table B-1.	City of San Diego
	RESPONSE: The San Diego Water Board disagrees that the Water Quality Improvement Plans should be specific to just addressing discharges from the MS4. The Regional MS4 Permit is for the regulation of the Copermittees' MS4 discharges, but the Water Quality Improvement Plan is a planning document that requires the Copermittees to evaluate and identify all water quality conditions of concern within a Watershed Management Area. The Copermittees then determine what conditions of concern are the priorities that should be addressed by their individual jurisdictional strategies and/or through watershed-wide strategies. The Water Quality Improvement Plan development process provides the Copermittees flexibility in determining how to address priority issues through establishment of goals that directly improve receiving water quality impacted by MS4 discharges, instead of only limiting goals to MS4 discharges. No changes were made to the Tentative Order as a result of this comment.	

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B2-1	PROVISION B.2: Priority Water Quality Conditions	
	COMMENT: *Request for revisions to the requirements for identifying priority water quality conditions under Provision B.2.* The South Laguna Civic Association provided proposed revisions to the requirements for identifying priority water quality conditions under Provision B.2. The proposed revisions appeared to include mapping of areas, incorporating areas of concern specific to south Orange County, and identifying issues that may be a concern specific to south Orange County.	South Laguna Civic Association
	RESPONSE: The San Diego Water Board reviewed the requested revisions to the requirements for identifying priority water quality conditions under Provision B.2. The San Diego Water Board did not identify any proposed revisions that were appropriate or necessary. The information requested to be included as part of the proposed revisions is information that should be brought to the attention of the south Orange County Copermittees during the development of the Water Quality Improvement Plan. No changes were made to the Tentative Order as a result of this comment.	

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B3c-1	PROVISION B.3.c: Prohibitions and Limitations Compliance Option	
	COMMENT: *Support for the inclusion of the receiving water limitations alternative compliance pathway in the Regional MS4 Permit.* The Riverside County, Orange County, and San Diego County Copermittees, as well as several individual Copermittees submitted comments that support the inclusion of the receiving water limitations alternative compliance pathway proposed to be incorporated into the Regional MS4 Permit as Provision B.3.c.	Riverside County Copermittees Orange County Copermittees City of Lake Forest City of San Clemente City of San Juan Capistrano City of San Diego City of Santee County of San Diego
	RESPONSE: The San Diego Water Board appreciates the support to include the receiving water limitations alternative compliance pathway into the Regional MS4 Permit.	

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B3c-2	PROVISION B.3.c: Prohibitions and Limitations Compliance Option	
	COMMENT: *Requests for revisions to the requirement for developing and incorporating annual milestones into the schedules for the alternative compliance pathway.* The Riverside County, Orange County, and San Diego County Copermittees, as well as several individual Copermittees requested revisions to the requirement to develop and incorporate annual milestones into the schedules for the alternative compliance pathway under Provision B.3.c. The Copermittees assert that annual milestones are burdensome, unworkable, and not meaningful. The Copermittees requested that milestones be limited to one or two milestones per permit term.	Riverside County Copermittees Orange County Copermittees City of Lake Forest City of San Clemente City of San Juan Capistrano San Diego County Copermittees City of San Diego City of Santee
	RESPONSE: The San Diego Water Board considered the proposed revisions and rationale provided and determined that revisions to the requirement for developing and incorporating annual milestones are appropriate. However, the San Diego Water Board does not agree that milestones should be limited to just one or two per permit term. The development and incorporation of annual milestones into the alternative compliance pathway is necessary for a Copermittee to be able to demonstrate to the San Diego Water Board and the public that there is a commitment to implementing a credible, rigorous, ambitious, and transparent plan to improve the quality of its MS4 discharges and/or receiving waters within its jurisdiction. The San Diego Water Board agrees, however, that annual milestones may become less meaningful after 5 or 10 years. Therefore, Provision B.3.c.(1)(a)(vii) and footnote 9 have been revised as follows: Provision B.3.c.(1)(a)(vii) For each final numeric goal developed pursuant to Provisions B.3.a and B.3.c.(1)(a)(i)-(v), ~~at least one~~ annual milestones[9] and the dates for ~~its~~ their achievement must be included within each of the next five (5) Water Quality Improvement Plan Annual Report reporting periods, or until the final numeric goal is achieved. Annual milestones and the dates for their achievement for the 5 Water Quality Improvement Plan Annual Report reporting periods of the next permit term, or until the final numeric goal is achieved, must be provided as part of the Report of Waste Discharge required pursuant to Provision F.5. Footnote 9 Annual milestones for each final numeric goal must ~~build upon previous milestones and lead to~~ be clearly and directly linked to, or demonstrate progress is being made toward, the achievement of the final numeric	

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B3c-2	PROVISION B.3.c: Prohibitions and Limitations Compliance Option	
	goal. The annual milestones may consist of water quality improvement strategy implementation phases, interim numeric goals, and other acceptable metrics. The annual milestones may address multiple numeric goals and/or multiple water bodies, as applicable and appropriate.	

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B3c-3	PROVISION B.3.c: Prohibitions and Limitations Compliance Option	
	COMMENT: *Requests for revisions to provide additional clarifying language for when a Copermittee is deemed in compliance with receiving water limitations.* The Riverside County Copermittees requested revisions to the alternative compliance pathway requirements under Provision B.3.c.(2) and the iterative process requirements under Provision A.4 to clarify when a Copermittee is deemed in compliance with receiving water limitations, especially relative to other Copermittees if updates are needed. The Environmental Groups requested revisions to Provision B.3.c.(2) to strictly require achievement of annual milestones and remove the potential for updates as a clearer way of determining when a Copermittee is no longer deemed in compliance.	Riverside County Copermittees Environmental Groups
	RESPONSE: The San Diego Water Board disagrees that revisions to Provision B.3.c.(2) are necessary to clarify when a Copermittee is deemed in compliance. The requirements under Provision B.3.c.(2) are clear criteria that the San Diego Water Board will use to determine if a Copermittee can be deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b. The commenters did, however, identify a scenario during the period of time a Copermittee has submitted "acceptable rationale and recommends appropriate modifications" and the San Diego Water Board accepts the rationale and recommended modifications where it may not be clear if a Copermittee is or is not in compliance. The intent was to continue deeming the Copermittee in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b during this period of time. To clarify this intent, the following has been added to the last paragraph of the discussion of Provision B.3.c on page F-62 in the Fact Sheet: The Copermittee continues to be deemed in compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b during the time the San Diego Water Board reviews the rationale and recommended modifications to the interim numeric goals, and/or water quality improvement strategies, and/or schedules. If and when the San Diego Water Board determines that it does not accept the rationale or recommendations, the Copermittee will be notified they are no longer deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b.	

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B3c-4	PROVISION B.3.c: Prohibitions and Limitations Compliance Option	
	COMMENT: *Requests to include compliance with receiving water limitations during the Water Quality Improvement Plan planning and development process.* The Riverside County and Orange County Copermittees, several Orange County cities, as well as the County of San Diego requested that the requirements under Provision B.3.c be revised to include compliance with the prohibitions and limitations of Provision A during the development of the Water Quality Improvement Plans. Several of the comments also assert that including compliance during development of the Water Quality Improvement Plan is consistent with State Water Board Order WQ 2015-0075.	Riverside County Copermittees Orange County Copermittees City of Dana Point City of Laguna Beach City of Lake Forest City of San Clemente City of San Juan Capistrano County of San Diego
	RESPONSE: The San Diego Water Board disagrees that it is appropriate to deem a Copermittee in compliance with any of the prohibitions and limitations under Provision A before a Water Quality Improvement Plan has been submitted and accepted by the San Diego Water Board. The San Diego Water Board also disagrees that State Water Board Order WQ 2015-0075 communicates that the State Water Board expects or requires in any way that Regional Water Boards allow for compliance with receiving water limitations during development of watershed management plans. The San Diego Water Board is concerned that allowing for compliance during the development of the Water Quality Improvement Plan would remove the motivation or incentive for Copermittees to develop a credible, rigorous, ambitious, and transparent plan. Before the San Diego Water Board can make a determination that a Copermittee has a credible, rigorous, ambitious, and transparent plan that can demonstrate discharges from a Copermittee's MS4 will not cause or contribute to exceedances of water quality standards in receiving waters, or that receiving waters will be protected from MS4 discharges, the San Diego Water Board must first have an opportunity to review the proposed plan. In response to the assertion that State Water Board Order WQ 2015-0075 encourages or mandates alternative compliance pathways to include compliance during development of the Water Quality Improvement Plan, the commenters failed to provide a clear citation of this direction. There is nothing within the State Water Board Order that explicitly requires the inclusion of an alternative compliance pathway in Phase I MS4 Permit, let alone compliance during development of the plan for alternative compliance. State Water Board Order WQ 2015-0075 only requires the San Diego Water Board to consider inclusion of an alternative compliance pathway, and include findings in the permit if the San Diego Water Board chooses not to include the alternative compliance pathway. In this case, the San Diego Water Board has chosen to incorporate an alternative compliance	

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B3c-4	PROVISION B.3.c: Prohibitions and Limitations Compliance Option	
	pathway, but without compliance during the development of the Water Quality Improvement Plan. Furthermore, the San Diego Water Board notes that USEPA has provided written comments to the Los Angeles Water Board (click here for link to letter), the Santa Ana Water Board (click here for link to letter), and the State Water Board click here for link to letter) that support the San Diego Water Board's approach to alternative compliance with receiving water limitations, specifically supporting the San Diego Water Board's decision not to include compliance during the development period for the Water Quality Improvement Plan. Based on this expressed support from USEPA, and the other reasons cited above, the San Diego Water Board is not allowing for a Copermittee to be deemed in compliance with the prohibitions and limitations under Provision A during the development of the Water Quality Improvement Plans. No changes were made to the Tentative Order as a result of this comment.	

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B3c-5	PROVISION B.3.c: Prohibitions and Limitations Compliance Option	
	COMMENT: *Request to include receiving water limitations for ASBS under Provision A.2.b as part of alternative compliance pathway.* The City of San Diego requested that the alternative compliance pathway be revised to also include compliance with the ASBS receiving water limitations required under Provision A.2.b.	City of San Diego
	RESPONSE: The San Diego Water Board considered the request to include the receiving water limitations for ASBS under Provision A.2.b as part of the alternative compliance pathway under Provision B.3.c and agree it is appropriate. References to "Provisions A.1.a, A.1.c, A.1.d, A.2.a, and A.3.b" under Provision B.3.c have been revised to "Provisions A.1.a, A.1.c, A.1.d, A.2~~.a~~, and A.3.b."	

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B3c-6	PROVISION B.3.c: Prohibitions and Limitations Compliance Option	
	COMMENT: *Requests for revisions to alternative compliance pathway numeric goal requirements proposed under Provision B.3.c.(1)(a)(iii).* The City of San Diego requested a revision to combine Provisions B.3.c.(1)(a)(iii) and B.3.c.(1)(a)(iv) to reduce confusion regarding whether the categories of numeric goals are mandatory or optional. The County of San Diego requested additional language to be added to Provision B.3.c.(1)(a)(iii) to limit the numeric goals for MS4 discharges only to pollutants or conditions where MS4 discharges are causing or contributing to the impairment.	City of San Diego County of San Diego
	RESPONSE: The San Diego Water Board disagrees that the revisions requested are appropriate or necessary. The City of San Diego's requested revision does not provide more clarity, and actually reduces the available options for numeric goals. Provisions B.3.c.(1)(a)(iii) and B.3.c.(1)(a)(iv) allow a Copermittee to choose interim and final numeric goals applicable to the Copermittee's MS4 outfalls, OR interim and final numeric goals applicable to the receiving waters, OR a combination of both. The City's proposed revisions would only allow a Copermittee to choose interim and final numeric goals applicable to the Copermittee's MS4 outfalls, OR interim and final numeric goals applicable to the receiving waters, but NOT a combination of both. The San Diego Water Board disagrees that the County's proposed revision is necessary because if a Copermittee's MS4 discharges do not contain pollutants that are causing or contributing to an impairment listed on the Clean Water Act Section 303(d) List of Water Quality Impaired Segments, the Copermittee should not have difficulty developing and including final numeric goals that can demonstrate their discharges are not causing or contributing to the impairment. The Copermittee will also have to collect data to demonstrate that the final numeric goals have been achieved and continue to be achieved. The data collected, assessed, and reported will demonstrate that the Copermittee is not causing or contributing to the impairment listed on the Clean Water Action Section 303(d) List. No changes were made to the Tentative Order as a result of this comment.	

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B3c-7	PROVISION B.3.c: Prohibitions and Limitations Compliance Option	
	COMMENT: *The alternative compliance pathway would result in safe harbor protection and should be removed from the Regional MS4 Permit.* The Environmental Groups assert that providing the alternative compliance pathway provides the Copermittees with safe harbor protection, and requested the alternative compliance pathway be removed from the Regional MS4 Permit.	Environmental Groups
	RESPONSE: The San Diego Water Board does not agree that the alternative compliance pathway provides the Copermittees with safe harbor protection that "simply mimics the failed iterative approach." Compliance with the alternative compliance pathway means, for compliance determination purposes, that the San Diego Water Board would deem a Copermittee that has fulfilled the requirements of the alternative compliance pathway as in compliance with the receiving water limitations. As long as the Copermittee is in compliance with the requirements under Provision B.3.c, the San Diego Water Board can consider the Copermittee in compliance with the prohibitions and limitations. Complying with the requirements of Provision B.3.c, however, will require a significant commitment, level of effort, and resources from any Copermittee that chooses to implement it. Any Copermittee that can comply with the requirements of Provision B.3.c will also be demonstrating a well defined and transparent commitment to improve water quality. Please also see responses to comments Gnl-10 and B3c-8. No changes were made to the Tentative Order as a result of this comment.	

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B3c-8	PROVISION B.3.c: Prohibitions and Limitations Compliance Option	
	COMMENT: *The alternative compliance pathway is inconsistent with the State Water Board's Order.* The Environmental Groups assert that the alternative compliance pathway in the Tentative Order is inconsistent with State Water Board Order WQ 2015-0075. The Environmental Groups assert that the alternative compliance pathway proposed in the Tentative Order is inconsistent because a) it does not contain specific guidance or protocols for a "well defined" and "transparent" analysis, b) it does not require a "finite" period of time to achieve receiving water limitations, and c) it does not include requirements for multi-benefit or storm water resource projects.	Environmental Groups
	RESPONSE: The San Diego Water Board disagrees that the alternative compliance pathway proposed in the Tentative Order is inconsistent with the State Water Board Order. The alternative compliance pathway in the Tentative Order is consistent with the State Water Board Order for the following reasons: a) In response to the assertion that the alternative compliance pathway in the Tentative Order does not include specific guidance or protocols for a "well defined" and "transparent analysis, the approach of the alternative compliance pathway in the Tentative Order is actually more "well defined" and "transparent" than the example provided by the commenter. The commenter provides permit language from the Los Angeles MS4 Permit as an example of specific guidance and protocols for a reasonable assurance analysis. While there is more description as to what components the reasonable assurance analysis must include, fundamentally the analysis is based on a computer model consisting of equations with assumptions which utilize data that are entered into and processed by a computer. Many of the variables in the equations will be based on assumptions, and members of the public may not know or understand how those variables may impact the results. The Los Angeles MS4 Permit does not include provisions that allows for or requires public participation or review of the model, its assumptions, and inputs. In contrast, the alternative compliance pathway in the Tentative Order does require an analysis with "clearly stated assumptions" which must go through a public participation process that allows the public to review and provide comments on the analysis methodology and the assumptions included in the analysis. The main difference in the approaches is that the Copermittee has more flexibility with how to do the analysis, and as long as there is understanding and support from the public and the San Diego Water Board. The Copermittee is not just limited to one or two "acceptable" models, but also is not precluded from the use of those models. The Tentative Order alternative compliance pathway is a truly transparent process for the public and provides for the public to participate in how the analysis is defined. Based on these	

B3c-8	PROVISION B.3.c: Prohibitions and Limitations Compliance Option	
	considerations, the analysis requirement is "well defined" and "transparent" consistent with the State Water Board Order. b) In response to the assertion that the alternative compliance pathway in the Tentative Order does not require a "finite" period of time to achieve compliance with receiving water limitations, the alternative compliance pathway requires a Copermittee to provide a schedule for when receiving water limitations are expected to be achieved. Any schedule with an expected end date is "finite." However, "finite" should not mean there is not room for making adjustments to the schedule if conditions warrant it. Absent the alternative compliance pathway, no assessments would necessarily be conducted to determine if or when receiving water limitations have been fully achieved. The San Diego Water Board prefers a permit that will provide support, incentive, and motivation for the Copermittees to achieve compliance with receiving water limitations within a foreseeable future rather than a permit that only has the threat of enforcement in the present and the foreseeable future. However, while the alternative compliance pathway removes the immediate threat of enforcement for violations of receiving water limitations, it also includes additional requirements that can be used to hold the Copermittee more accountable for implementing strategies to achieve compliance with receiving water limitations. In the end, the San Diego Water Board believes that the alternative compliance pathway provides a path to compliance with receiving water limitations that is "finite" compared to the "iterative process" that was previously required, consistent with the State Water Board Order. c) In response to the assertion that the alternative compliance pathway in the Tentative Order does not include requirements for multi-benefit or storm water resource projects, the San Diego Water Board acknowledges there is no text in Provision B.3.c that includes the term "multi-benefit." However, the Tentative Order does include several provisions that encourage multi-benefit and regional storm water resource projects without using the term "multi-benefit." The commenter should first review Provisions B.3.b.(1)(b) and B.3.b.(2). While these provisions are not specifically mentioned under Provision B.3.c, they are required to be included in the Water Quality Improvement Plan, which is where the alternative compliance pathway requirements of Provision B.3.c must be included. Provision B.3.b.(1)(b) requires each Copermittee to identify strategies to retrofit areas of existing development and rehabilitate conditions of channels or habitats within its jurisdiction, which are considered multi-benefit strategies. Provision B.3.b.(2) also requires the Copermittees in the Watershed Management Area to identify strategies to retrofit areas of existing development and rehabilitate conditions of	

B3c-8	PROVISION B.3.c: Prohibitions and Limitations Compliance Option	
	channels or habitats that are regional or multi-jurisdictional. Tied to Provisions B.3.b.(1)(b) and B.3.b.(2) are also the jurisdictional runoff management program (JRMP) requirements under Provisions E.3.c.(3) and E.5.e. Provision E.5.e requires each Copermittee to identify areas of existing development within its jurisdiction for retrofit and rehabilitation projects, and to identify strategies to facilitate implementation of those projects. Provision E.3.c.(3) provides each Copermittee the option to allow development projects to implement candidate projects identified as part of the optional Watershed Management Area Analysis allowed pursuant to Provision B.3.b.(4), also included in the Water Quality Improvement Plan. The candidate projects include several types of multi-benefit and storm water resource type projects, including but not limited to stream or riparian area rehabilitation, retrofitting existing infrastructure to incorporate storm water retention or treatment, regional BMPs, groundwater recharge projects, water supply augmentation, and land purchases to preserve floodplain functions. Therefore, while the alternative compliance pathway requirements under Provision B.3.c do not include the term “multi-benefit” in the text, the Tentative Order includes several provisions that require or encourage the implementation of multi-benefit and storm water resource projects consistent with the State Water Board Order.	

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B3c-9	PROVISION B.3.c: Prohibitions and Limitations Compliance Option	
	COMMENT: *The Tentative Order violates anti-backsliding requirements and the rationale provided does not support an anti-backsliding exception.* The Environmental Groups assert that the Tentative Order violates the anti-backsliding provisions of the Clean Water Act and its implementing regulations because the San Diego Water Board's findings related to the alternative compliance pathway fail to support the use of anti-backsliding exceptions.	Environmental Groups
	RESPONSE: The San Diego Water Board disagrees that the Tentative Order violates anti-backsliding provisions of the Clean Water Act and the federal regulations. The Clean Water Act generally prohibits the relaxation of effluent limitations in a reissued permit. However, as discussed in the Fact Sheet, it remains unresolved whether anti-backsliding provisions are applicable to the incorporation of an alternative compliance pathway into a regional MS4 permit. (please see page F-32 of the Fact Sheet; *please also see* State Board Order WQ 2015-0075 at pp 18-21, stating "it is unnecessary, however, to resolve the ultimate applicability of the regulatory anti-backsliding provisions"). Even if the anti-backsliding provisions do apply, the alternative pathway provisions fit squarely within an exception. There are numerous exceptions to the Clean Water Act's backsliding provisions based on new information. See, e.g., 33 U.S.C. § 1342(o)(2)(B)(i), 40 C.F.R. § 122.44(l)(i(B)(1). Additionally, Under 40 C.F.R. section 122.44(l), anti-backsliding provision do not apply if the circumstances on which the previous permit was based have materially and substantially changed since the time the previous permit was issued and would constitute cause for permit modification or revocation or reissuance under 40 C.F.R. section 122.62. Section 122.62 in turn states that new information not available at the time the previous permit was issued is cause for modification. 40 C.F.R. § 122.62(a)(2). Furthermore, the San Diego Water Board disagrees with the assertion that the new information from the lessons learned and experiences of the Los Angeles Water Board are somehow "unique" to the Los Angeles Region. To the extent that the permitting history in Los Angeles may be considered "unique" in any way, it is still consistent with the San Diego Water Board's experience with storm water permitting over the last decade. The transition to a Regional MS4 Permit in the Fifth Term Permit was driven, in part, by a growing recognition that a watershed management approach required regional action. In the Regional MS4 permit, the San Diego Water Board seeks to provide a consistent set of permit requirements for all of the Copermittees and to promote the efficiencies gained from collective action in jurisdictional runoff management.	

B3c-9	PROVISION B.3.c: Prohibitions and Limitations Compliance Option	
	The San Diego Water Board structured the Regional MS4 Permit to incorporate new information because there has been a statewide paradigm shift with respect to stormwater management. In June 2015, the State Water Board issued a precedential water quality order, Order WQ 2015-0075. This Order directed all of the Regional Water Boards to consider the Los Angeles Water Board's alternative compliance path to receiving water limits in all Phase I MS4 permits going forward (State Water Board Order WQ 2015-0075 at p 51). Moreover, the State Water Board made it clear that all regional water boards had been informed by the lessons learned in Los Angeles, stating "[f]urther, we [the State Water Board] find that all regional water boards are informed by the information gained in the Los Angeles Region, so that any regional water board that adopts an alternative compliance path in a subsequent Phase I permit would not be in violation of anti-backsliding requirements, regardless of the particular storm water permitting history of that region." Id. at p. 22 fn. 74. Thus, while the State Water Board Order relies heavily on the information and evidence related to the Los Angeles County MS4 Permit and its version of an alternative compliance pathway, the information and evidence are also applicable to and are expected to be utilized in the San Diego Region if an alternative compliance pathway is incorporated into the San Diego Regional MS4 Permit. For all of the reasons stated above, the alternative compliance path provisions do not violate federal anti-backsliding provisions. To clarify, however, the discussion on Anti-Backsliding Requirements on page F-32 in the Fact Sheet has been revised as follows: CWA sections 402(o) and 303(d)(4) and federal regulations at 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations or conditions may be relaxed. While this Order allows implementation of an alternative compliance pathway option in Provision B.3.c to constitute compliance with receiving water limitations under certain circumstances, the availability of that alternative and the corresponding availability of additional time to come into compliance with receiving water limitations does not violate the antibacksliding provisions. The receiving water limitations provisions of this Order are imposed under section 402(p)(3)(B) of the Clean Water Act rather than based on best professional judgment, or based on section 301(b)(1)(C) or sections 303(d) or (e), and are accordingly not subject to the anti-backsliding requirements of section 402(o). Although the non-applicability is less clear with respect to the regulatory anti-backsliding provisions in 40 CFR 122.44(l), the regulatory history suggests that USEPA's intent was to establish the anti-backsliding regulations with respect to evolving technology standards for traditional point sources. (See, e.g., 44 Fed.Reg. 32854, 32864 (Jun. 7, 1979)). It	

B3c-9	PROVISION B.3.c: Prohibitions and Limitations Compliance Option	
	is unnecessary, however, to resolve the ultimate applicability of the regulatory anti-backsliding provisions, because the alternative compliance pathway option in Provision B.3.c qualifies for an exception to backsliding as based on new information. The alternative compliance pathway option in Provision B.3.c of this Order was informed by new information available to the Board from experience and knowledge gained through storm water permitting at the Regional Water Boards in the last ten years. There has been a statewide paradigm shift in storm water management. State Water Board Order WQ 2015-0075 directed all of the Regional Water Boards to consider the Los Angeles Water Board's alternative compliance path to receiving water limitations in all Phase I MS4 permits going forward (State Water Board Order WQ 2015-0075 at page 51). T~~t~~he Los Angeles Water Board's process of developing over 30 watershed-based TMDLs and implementing several TMDLs since the adoption of the previous permits. In particular, the Los Angeles Water Board recognized the significance of allowing time to plan, design, fund, operate and maintain watershed-based BMPs necessary to attain water quality improvements and additionally recognized the potential for municipal storm water to benefit water supply. Similarly, the San Diego Water Board's experience developing and implementing the Fourth Term MS4 Permits and TMDLs that apply on a regionwide scale (i.e. TMDLs for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region) has resulted in a similar recognition of the need for a watershed-based approach that allows time to plan, design, fund, operate and maintain BMPs to address impaired waters that have been impacted by MS4 discharges. Thus, even if the receiving water limitations are subject to anti-backsliding requirements, they were revised based on new information that would support an exception to the anti-backsliding provisions. (33 U.S.C. § 1342(o)(2)(B)(i); 40 C.F.R. § 122.44(l)(1); 40 C.F.R. §122.44(l)(2)(i)(B)(1)).	

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B3c-10	PROVISION B.3.c: Prohibitions and Limitations Compliance Option	
	COMMENT: *The Tentative Order violates anti-degradation requirements and the anti-degradation findings are unsupported by evidence.* The Environmental Groups assert that the Tentative Order violates anti-degradation requirements and there is no evidence to support the anti-degradation findings. The Environmental Groups generally assert that anti-degradation findings from State Water Board Order WQ 2015-0075 are not applicable to the Tentative Order and the findings in the Tentative Order are unsupported by evidence.	Environmental Groups
	RESPONSE: Consistent with the direction of the State Water Board Order WQ 2015-0075 adopted in June 2015, the San Diego Water Board considered the inclusion of an alternative compliance pathway into the Regional MS4 Permit. With the inclusion of this new permit component, the federal and state antidegradation policies were considered in light of the evidence in the record and information about the nature of municipal storm water discharges, evolving municipal storm water permits and the State Water Board's precedential order. The Regional MS4 Permit and Fact Sheet were revised to be consistent with all of these considerations. The San Diego Water Board disagrees that the antidegradation findings in the Tentative Order are inadequate and unsupported by evidence in the record. The San Diego Water Board considered relevant information unique to the San Diego Region such as its own storm water permitting history and TMDL adoption and implementation through municipal storm water permits. The San Diego Water Board has adopted seven TMDL Basin Plan amendments that cover at least 30 waterbody-pollutant combinations, similar to the Los Angeles Region. The implementation of these 7 TMDLs through the Regional MS4 Permit is essential for achieving water quality standards in the region. Moreover, the State Water Board's discussion of appropriate antidegradation considerations for the Los Angeles MS4 Permit is equally applicable in the context of the San Diego Water Board's Tentative Order that incorporates an alternative compliance pathway. In its consideration of antidegradation, the State Water Board acknowledges that the Los Angeles MS4 permit "improves on past practices that have been inadequate to protect water quality, and includes a monitoring and assessment program that will identify any changes in water quality. [fn.] In general, under the Los Angeles MS4 Order, we expect to see a trajectory away from any past degradation, even if there may be some continued short-term degradation." (Order WQ 2015-0075, p. 26.) Likewise, the Regional MS4 Permit now requires Copermittees to design watershed based monitoring and assessment programs that promote and track progress towards meeting the relevant water quality objectives. As such, were the State Water Board considering the Tentative Order, it likely would reach the same conclusion about the San Diego Regional MS4 Permit.	

B3c-10	PROVISION B.3.c: Prohibitions and Limitations Compliance Option	
	The commenters incorrectly assert that the San Diego Water Board is required, but has failed, to follow procedures and requirements set forth in a USEPA document titled "*Interim Economic Guidance for Water Quality Standards Workbook"* (March 1995) (Workbook). USEPA's Workbook provides guidance that states may choose, but are not required, to follow. Although the Workbook does provide some information that states *may* use to consider whether degradation of high-quality waters is warranted from an economic impacts perspective, the guidance was not crafted to be used in the context of permitting of MS4 discharges. (See USEPA Workbook, cover memo, pp. 1-2 and Workbook, p. 1-1.) Instead, the San Diego Water Board has considered available guidance provided by the State Water Board in the Administrative Procedures Update (APU) 90-004 in conjunction with, among other things, available evidence about the quality of the receiving waters for discharges of storm water in finding that the Tentative Order complies with federal and state anti-degradation policies[1]. The antidegradation findings in the Tentative Order, like those adopted in the State Water Board Order for the final Los Angeles MS4 Permit, are supported by substantial evidence in the record for the Regional MS4 Permit. In the stormwater context, a generalized antidegradation analysis is appropriate. As the State Water Board acknowledges, guidance provided in the APU 90-004 "may be construed to exempt [a regional water board] from conducting an extensive pollutant by pollutant analysis for each water body in the region" where, as here, there is insufficient data available to carry out a complete antidegradation analysis for each water body-pollutant combination." (See Order WQ 2015-0075, p. 25.) The State Water Board notes the APU-90-004 "contemplates the appropriate antidegradation analysis for a discrete discharge or facility. It has limited value when considering anti-degradation in the context of storm water discharges from diffuse sources, conveyed through multiple outfalls, with multiple pollutants impacting multiple water bodies within a municipality, or in this case, a region, especially given that reliable data on the baseline water quality from 1968 is not available." (Id., p. 27; see also id., p. 27, n. 90 ["We note that USEPA did not conduct a detailed antidegradation analysis in issuing NPDES Permit No. DC00000221 for MS4 discharges to the District of Columbia, presumably for similar reasons. The court in *Asociacion de Gente Unida* also relied on APU 90-004 in part in rejecting an antidegradation analysis conducted by the Central Valley Regional Water Quality Control Board for discharges of pollutants to groundwater from dairy facilities region-wide, but the court's objection was to the regional water board's reliance on an illusory prohibition of discharge to groundwater in finding that no antidegradation analysis	

[1] See, e.g., 1996, 1998, 2002, 2006, 2010 Clean Water Action section 303(d) Lists for the San Diego Region, and monitoring reports from the San Diego County, Orange County, and Riverside County Copermittees since the First Term MS4 Permits issued in 1990.

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B3c-10	PROVISION B.3.c: Prohibitions and Limitations Compliance Option	
	was required, not to the sufficiency of any generalized antidegradation analysis the Board might have conducted in lieu of its reliance on the prohibition. (210 Cal.App.4th at pp. 1271-1273.]" Despite the commenters' assertions, the San Diego Water Board provides a clear statement of the basis for finding that the Tentative Order is consistent with the federal and state antidegradation policies. No revisions to the Tentative Order were made in response to these comments.	

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B5-1	PROVISION B.5: Iterative Approach and Adaptive Management Process	
	COMMENT: *Request for clarification of timing and conditions for alternative compliance pathway analysis updates.* The San Diego County Copermittees and the County of San Diego requested the addition of a provision under the Iterative Approach and Adaptive Management Process requirements of Provision B.5 to clarify the timing and conditions for when the analysis required for the alternative compliance pathway under Provision B.3.c.(1)(b) has to be updated.	San Diego County Copermittees County of San Diego
	RESPONSE: The San Diego Water Board has considered the requested additional language and determined that adding clarifying language is appropriate. The following text has been added as Provision B.5.d: **d. ADAPTATION OF PROHIBITIONS AND LIMITATIONS COMPLIANCE OPTION** If a Copermittee has implemented the Prohibitions and Limitations Compliance Option allowed to be included in the Water Quality Improvement Plan pursuant to Provision B.3.c, the Copermittee must re-evaluate and adapt the numeric goals, water quality improvement strategies, schedules, and annual milestones required under Provision B.3.c.(1) when significant new information becomes available, or with the Report of Waste Discharge required pursuant to Provision F.5. Significant changes in the numeric goals, water quality improvement strategies, schedules, or annual milestones requires an update to the analysis required under Provision B.3.c.(2).	

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D4a-1	PROVISION D.4.a: Receiving Waters Assessments	
	COMMENT: *Recommended revisions to transitional assessment requirements under Provision D.4.a.(1)(a).* The Riverside County Copermittees noted that Provision D.4.a.(1)(a) prescribes that assessments required to be made under Provision D.4.a.(2) must be included in each Copermittees' transitional monitoring and assessment reports; however, Provision D.4.a.(2)(e) requires determination of whether strategies identified in the Copermittees' Water Quality Improvement Plan are progressing towards achieving interim and final numeric goals described in the Water Quality Improvement Plan. The Riverside County Copermittees provided their understanding that transitional monitoring and assessment applies to the time period when the Copermittees' Water Quality Improvement Plan is being developed, and therefore assessments made during this time period cannot provide information on the progress of the Water Quality Improvement Plan. Based on their observations, the Riverside County Copermittees recommended revisions to Provision D.4.a.(1)(a).	Riverside County Copermittees
	RESPONSE: The San Diego Water Board disagrees that the revisions to Provision D.4.a.(1)(a) are necessary. It is true that the transitional monitoring and assessment applies to the time period when the Water Quality Improvement Plan is being developed. The commenters can fulfill the assessment requirement of Provision D.4.a.(2)(e) by either stating that they cannot make a determination until the Water Quality Improvement Plan is accepted and implemented, or assess the strategies that are currently being implemented at the time of the assessment and are expected to be included in the Water Quality Improvement Plan. The San Diego Water Board expects the assessments reported during the transitional period to serve as a baseline for improvements in water quality as the Water Quality Improvement Plans are implemented over time. No changes were made to the Tentative Order as a result of this comment.	

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E2-1	PROVISION E.2: Illicit Discharge Detection and Elimination	
	COMMENT: *Requests for revisions to clarify implementation of the illicit discharge and detection program under Provision E.2 is compliance with the requirement to effectively prohibit non-storm water discharges to the MS4.* The Orange County Copermittees, as well as the Cities of Dana Point and Laguna Beach, requested revisions to Provision E.2 to explicitly state that implementation of the illicit discharge detection and elimination requirements under Provision E.2 constitutes compliance with effective prohibition of non-storm water discharges to the MS4 required under Provision A.1.b.	Orange County Copermittees City of Dana Point City of Laguna Beach
	RESPONSE: The San Diego Water disagrees that revisions to Provision E.2 are necessary. Provision A.1.b explicitly states that Copermittees are required to effectively prohibit non-storm water discharges to the MS4 "*through the implementation of Provision E.2*." The Copermittees are already expected to demonstrate compliance with Provision A.1.b through the implementation of Provision E.2. If a Copermittee has not adequately implemented Provision E.2, then the Copermittee is not only, not in compliance with the requirements of Provision E.2, but by default will also not be in compliance with Provision A.1.b. The San Diego Water Board, however, recognizes that additional clarification may be helpful in understanding that implementing the requirements of Provision E.2 is how the San Diego Water Board will assess a Copermittee's compliance with the requirement to effectively prohibit non-storm water discharges to the MS4 under Provision A.1.b. Therefore, the San Diego Water Board has revised the opening paragraph of the discussion for Provision E.2 in the Fact Sheet (page F-81) to the following: Provision E.2.(Illicit Discharge Detection and Elimination) requires each Copermittee to implement an illicit discharge detection and elimination program to effectively prohibit non-storm water discharges to the MS4 by actively detecting and eliminating illicit discharges and disposal into its MS4. <u>If the San Diego Water Board finds that a Copermittee is fully implementing the requirements of Provision E.2, then the Copermittee is deemed in compliance with the effective prohibition of non-storm water discharges to the MS4 required under Provision A.1.b.</u>	

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E2-2	PROVISION E.2: Illicit Discharge Detection and Elimination	
	COMMENT: *Request for clarification of discharges of potable water sources under Provision E.2.a.(3)(f).* The Cities of Dana Point and Laguna Beach requested a clarification of the definition of "discharges from potable water sources" under Provision E.2.a.(3)(f). It is not clear to the Cities whether "potable discharges" are intended to include runoff derived from turf or ornamental plant irrigation.	City of Dana Point City of Laguna Beach
	RESPONSE: Discharges from potable water sources are sources of water that have been treated to drinking water standards and discharged to the MS4. Discharges of potable water that are applied to turf or ornamental plant irrigation before running off to the MS4 are not qualified as discharges of potable water under Provision E.2.a.(3)(f).	

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E3b1-1	PROVISION E.3.b.(1): Definition of Priority Development Project	
	COMMENT: *Request for revisions to the definition of Priority Development Projects under Provision E.3.b.(1).* The City of San Diego requested revisions to combine Provisions E.3.b.(1)(c) and E.3.b.(1)(e) under the provisions defining Priority Development Projects.	City of San Diego
	RESPONSE: The San Diego Water Board disagrees that combining sub-sections (c) and (e) of Provision E.3.b.(1) is appropriate. Sub-section (c) has a minimum square footage trigger for both new development projects and redevelopment projects. In contrast, subsection (e) has a minimum square footage trigger for redevelopment projects only; new development projects consisting of automotive repair shops and retail gasoline outlets are considered Priority Development Projects regardless of size.	

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E3b3-1	PROVISION E.3.b.(3): Priority Development Project Exemptions	
	COMMENT: *Request for Priority Development Project exemption for "self-remediating" projects.* The Orange County Copermittees requested that the list of Priority Development Project Exemptions under Provision E.3.b.(3) be revised to include projects that are effectively self-remediating (i.e. all rainfall is retained) including, but not limited to, reservoirs and swimming pools.	Orange County Copermittees
	RESPONSE: The San Diego Water Board disagrees that the requested change is necessary. If all rainfall is retained on a project, then the project has met the design standard, and an exemption is not needed. No changes were made to the Tentative Order as a result of this comment.	

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E3c1-1	PROVISION E.3.c.(1): Storm Water Pollutant Control BMP Requirements	
	COMMENT: *Request for revisions to clarify the biolfiltration storm water pollutant control BMP performance criteria.* The County of San Diego requested a revision to Provision E.3.c.(1)(a)(i)[b] to clarify the intent and applicability of the biolfiltration BMP design criteria.	County of San Diego
	RESPONSE: The San Diego Water Board disagrees that the proposed change is necessary. The wording describing the design requirements adequately describe the intent and applicability of the biofiltration BMP design criteria. Any proposed change incorporated during the adoption proceedings of the Tentative Order could be interpreted as a change in the requirement, when in fact there is no change. No changes were made to the Tentative Order as a result of this comment.	

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E3c1-2	PROVISION E.3.c.(1): Storm Water Pollutant Control BMP Requirements	
	COMMENT: *The San Diego Water Board is requiring increasingly stringent on-site storm water retention without evidence that the 2010 Southwest Riverside MS4 Permit requirements are not working.* CICWQ asserts that the Tentative Order has more stringent on-site storm water retention requirements than the 2010 Southwest Riverside County MS4 Permit (Order No. R9-2010-0016) requirements without any evidence that the requirements of Order No. R9-2010-0016 are not working to protect water quality and maintain beneficial uses.	Construction Industry Coalition on Water Quality (CICWQ)
	RESPONSE: The San Diego Water Board disagrees with the assertion that the Tentative Order has more stringent on-site storm water retention requirements over and above the requirements of Order No. R9-2010-0016. The purpose of the on-site retention requirement in both the Tentative Order and Order No. R9-2010-0016 is to retain on-site the pollutants contained in the volume of storm water runoff produced from a 24-hour 85th percentile storm event. This requirement has not changed from Order No. R9-2010-0016, and therefore the commenter is incorrect in stating that the San Diego Water Board is requiring additional prescriptive performance measures for retaining storm water runoff. This is the maximum extent practicable (MEP) standard recognized by the San Diego Water Board and is consistent with the Fourth Term MS4 Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), as well as Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), Los Angeles Water Board Order Nos. R4-2010-0108 and R4-2012-0175 (Ventura County and Los Angeles County MS4 Permits, respectively). Additionally, the storm water pollutant control and hydromodification management BMP requirements in the Tentative Order are more flexible than in Order No. R9-2010-0016 by providing an optional Alternative Compliance Program under Provision E.3.c.(3) of the Regional MS4 Permit. The Alternative Compliance Program, if developed by a Copermittee, would allow Priority Development Projects to fully comply with storm water pollutant control and hydromodification management BMP requirements either on-site, offsite, or a combination of both, if doing so would provide greater water quality benefit to the watershed.	

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E3c2-1	PROVISION E.3.c.(2): Hydromodification Management BMP Requirements	
	COMMENT: *Request for revisions to requirements to manage critical coarse sediment yield areas.* CICWQ asserts that the Tentative Order requirements for Priority Development Projects to "avoid critical sediment yield areas" are unnecessarily restrictive. The County of San Diego requested that the requirement to manage critical course sediment yield areas be moved from the hydromodification management BMP performance standard requirements under Provision E.3.c.(2)(b) to Provision E.3.d as part of the BMP Design Manual update to be addressed regionally.	County of San Diego Construction Industry Coalition on Water Quality (CICWQ)
	RESPONSE: The San Diego Water Board disagrees that the requirements to avoid critical sediment yield areas are unnecessarily restrictive or that they should be moved from under Provision E.3.c.(2)(b) to Provision E.3.d. The requirements are necessary to protect receiving waters from erosive flows caused by land development. As explained in the Fact Sheet to the Tentative Order, hydromodification, which is caused by both altered storm water flow and altered sediment flow regimes, is largely responsible for degradation of creeks, streams, and associated habitats in the San Diego Region. In an ongoing study by the Stormwater Monitoring Coalition to assess the health of streams throughout Southern California, researchers found that three of the four highest risk stressors to creeks (percent sands and fines present, channel alteration, and riparian disturbance) were related to physical habitat (*Assessing the Health of Southern California Streams, Stormwater Monitoring Coalition*, Fact Sheet). Researchers studying flood frequencies in Riverside County have found that increases in watershed imperviousness of only 9-22 percent can result in increases in peak flow rates for the two-year storm event of up to 100 percent (Schueler and Holland, 2000. *Storm Water Strategies for Arid and Semi-Arid Watersheds*, (Article 66). The Practice of Watershed Protection). Such changes in runoff have significant impacts on channel morphology, and given the current state of science the San Diego Water Board has included these requirements to reduce these potential impacts to receiving waters that may be caused by development projects. Placement of impervious surfaces as a result of urbanization is largely responsible for erosional impacts to streams because placement of impervious surfaces encapsulates "good" sediment (such as sand, gravel, rocks and cobbles) that would normally replenish creek beds and banks to help stabilize them. For this reason, the Tentative Order requires Priority Development Projects to avoid critical sediment yield areas, as defined by the	

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E3c2-1	PROVISION E.3.c.(2): Hydromodification Management BMP Requirements	
	Copermittees, or implement measures to allow coarse sediment to be discharged to receiving waters, such that there is no net impact to the receiving water. Such measures are designed to protect receiving waters and avoid impacts experienced as a result of past land development practices. The San Diego Water Board recognizes that implementation of new requirements is challenging, and is supportive of the Copermittees' efforts to develop guidance for land developers in meeting this requirement. Until this guidance is widely available, Copermittees and land developers should recognize that strict avoidance of critical sediment yield areas is not mandated and that compliance may be achieved by other methods, provided that the stream experiences "no net impact." No changes were made to the Tentative Order as a result of this comment.	

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E3c2-2	PROVISION E.3.c.(2): Hydromodification Management BMP Requirements	
	COMMENT: *Request for interim timeframe exemptions for hydromodification management BMP requirements to be granted outright without any additional study or consideration.* CICWQ asserts that the Tentative Order is eliminating exemptions for hydromodification control, even when stormwater runoff is conveyed in the MS4 system to significantly hardened or engineered channels. CICWQ requested that the San Diego Water Board revise the Tentative Order to make the interim timeframe exemptions under Provision E.3.c.(2)(e) part of the exemptions under Provision E.3.c.(2)(d) without any additional study or consideration.	Construction Industry Coalition on Water Quality (CICWQ)
	RESPONSE: The San Diego Water Board disagrees that the interim timeframe exemptions for hydromodification management BMP requirements should be granted outright without any additional study or consideration. The commenter correctly deduced that the driver behind the requirement to use the pre-development performance standard is the sustainability of geomorphically stable channels and the ability to return urbanized streams to a more natural state. The requirement to use pre-development runoff conditions as the performance standard is needed because using a hydrology baseline that approximates that of an undeveloped, natural watershed is the only way to facilitate the return of more natural hydrological conditions to already built-out watersheds, which in turn supports conditions for rehabilitating degraded or channelized stream segments. Contrary to what the commenter asserts, the Tentative Order does not require Copermittees to remove concrete from channels that are engineered to relieve flooding and protect life and property. The Tentative Order provides exemptions for Priority Development Projects that discharge to receiving waters where there is little threat of erosion, and subsequently implementing BMPs on-site would do little to protect the beneficial uses of such receiving waters. The commenter correctly states that the exemption for engineered channels is temporary. However, the commenter should note that there is a high likelihood that exemptions for engineered channels can become accepted as applicable for a Watershed Management Area. The Tentative Order allows for the Copermittees to recommend exemptions based on completion of an optional Watershed Management Area Analysis pursuant to Provision B.3.b.(4). As part of this effort, the Copermittees would identify, for example, areas of existing development in the watershed suitable for retrofitting, and areas suitable for stream rehabilitation. The Copermittees would also identify areas suitable for exemptions for hydromodification management, such as engineered channels that are needed for the protection of life and property. The interim	

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E3c2-2	PROVISION E.3.c.(2): Hydromodification Management BMP Requirements	
	timeframe exemption for engineered channels is not granted outright as permanent exemptions because the areas have not yet been analyzed in the context of stream rehabilitation opportunities. No changes were made to the Tentative Order as a result of this comment.	

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E3d-1	PROVISION E.3.d: BMP Design Manual Update	
	COMMENT: *Request for additional time for San Diego County Copermittees to update and implement their BMP Design Manuals.* The San Diego County Copermittees and the County of San Diego requested revisions to Provision E.3.d which would grant Copermittees up to 180 days to incorporate corrections to the definition of Priority Development Projects under Provision E.3.b.(1) and begin implementing their BMP Design Manuals.	San Diego County Copermittees County of San Diego
	RESPONSE: The San Diego Water Board disagrees that more time is needed to update and implement the BMP Design Manuals. In a letter dated May 29, 2015, the San Diego Water Board forewarned the San Diego County Copermittees that changes to the Priority Development Project categories were necessary in order to clearly reflect the intended definitions. At that time, the San Diego Water Board provided the language that is now proposed in the Tentative Order. The Copermittees have had ample opportunity to initiate and complete their local adoption processes in order to meet the BMP Design Manual implementation date. For this reason, more time is not necessary and a delay in BMP Design Manual implementation is not warranted. However, the San Diego Water Board will use Provision F.2.b.(4) to grant the Copermittees an extra 90 days beyond the original BMP Design Manual implementation date of December 24, 2015 to complete the update and begin implementation of the BMP Design Manual. Please also see response to comment F2b-1.	

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E3d-2	PROVISION E.3.d: BMP Design Manual Update	
	COMMENT: *Request for revisions to clarify the effective date of the BMP Design Manual is the same as the implementation date.* The San Diego County Copermittees, the City of San Diego, and the County of San Diego requested revisions to Provision E.3.d to include language that clarifies the effective date of the BMP Design Manual is the same as when the BMP Design Manual begins implementation.	San Diego County Copermittees City of San Diego County of San Diego
	RESPONSE: The San Diego Water Board agrees that the proposed modification would clarify the San Diego Water Board's intention. Provision E.3.d has been modified as follows: a. Each Copermittee must update its BMP Design Manual pursuant to Provision F.2.b. Until the Copermittee has updated its BMP Design Manual pursuant to Provision F.2.b.(1), the Copermittee must continue implementing its current BMP Design Manual. The Copermittee must implement the updated BMP Design Manual within 180 days following completion of the update pursuant to Provision F.2.b.(1), unless directed otherwise by the San Diego Water Board Executive Officer. The date the BMP Design Manual is implemented is the "effective date" of the BMP Design Manual.	

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E3e1-1	PROVISION E.3.e.(1): Structural BMP Approval and Verification Process	
	COMMENT: *Requests for revisions to the proposed language to define projects with prior lawful approval under Provision E.3.e.(1)(a).* The City of San Diego requested a revision to the proposed language to define projects with prior lawful approval to also include projects that have received development approvals. San Diego Coastkeeper and Coastal Environmental Rights Foundation requested revisions that would allow a Priority Development Project to proceed under previous land development requirements only if the Copermittee demonstrates that, among other required conditions, construction activities on the Priority Development Project commenced prior to the effective date of the new BMP Design Manual and that all approvals and permits necessary to complete the implementation of the initially approved design also be obtained prior to the effective date of the new BMP Design Manual.	City of San Diego San Diego Coastkeeper and Coastal Environmental Rights Foundation
	RESPONSE: The San Diego Water Board disagrees that any changes are needed to the proposed language in Provision E.3.e.(1)(a). Specifically, reliance on issuance of a development approval alone is not consistent with the San Diego Water Board's goal of requiring most new Priority Development Projects to be subject to the requirements in the new BMP Design Manual unless limited conditions are met. Nor is it consistent with the *Avco* line of cases, which requires commencement of construction and substantial reliance on the permit as the determining factors for grandfathering projects under previous development requirements. Reliance on issuance of a development approval alone may also result in many fewer Priority Development Projects implementing projects based on the new BMP Design Manual required in Order No. R9-2013-0001 as amended. With regard to the Environmental Groups' comment, the San Diego Water Board believes it is appropriate for the Copermitees to have the ability to allow a Priority Development Project meeting all other required conditions in Provision E.3.e.(1)(a) to proceed under previous land use development requirements if the Copermittee demonstrates that construction activities have commenced before, or within 180 days after, the effective date of the new BMP Design Manual. The Board believes it is appropriate to include a grace period of 180 days after the effective date of the BMP Design Manual in order to provide certainty of requirements for projects in process, and allow for scheduling of construction activities under optimal conditions, such as outside of nesting season, or during the dry season, when impacts from storm water runoff are minimized. And, as long as development projects complete construction of all phases in substantial conformity with the approved design, which includes storm water pollutant control and hydromodification management BMPs approved by the	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2015-0100

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E3e1-1	PROVISION E.3.e.(1): Structural BMP Approval and Verification Process	
	municipality, it is appropriate that prior lawful approval (the ability to proceed with development in accordance with the previous land use development requirements) remain valid during issuance of subsequent permits that may be necessary to complete the project within 5 years after the effective date of the new BMP Design Manual. Five years is an appropriate and reasonable period of time for those projects meeting all other conditions to be completed. No changes were made to the Tentative Order as a result of these comments.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2015-0100

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E4-1	PROVISION E.4: Construction Management	
	COMMENT: *Request for revisions to construction management program inventory and tracking requirements.* The City of San Diego requested that Provisions E.4.b and E.4.d.(3) be combined because both sections contain information that needs to be collected, inventoried, and tracked.	City of San Diego
	RESPONSE: The San Diego Water Board considered the requested revision and determined that it was not necessary. The Copermittees can implement an inventory and tracking system that may be utilized to manage the data that are collected and needed to fulfill the requirements of both Provision E.4.b and E.4.d.(3). No changes were made to the Tentative Order as a result of this comment.	

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November 4, 2015

E5c-1	PROVISION E.5.c: Existing Development Inspections	
	COMMENT: *Request to include an optional third-party certification program into the existing development inspection provisions.* Section F.3.b.(4)(c) of Order No. R9-2010-0016 allowed the Riverside County Copermittees the option to propose a third-party certification program for commercial and industrial inspection programs, subject to San Diego Water Board Executive Officer acceptance. The Riverside County Copermittees noted that a similar provision does not exist in the Tentative Order, and requested inclusion of this option in the Regional MS4 Permit.	Riverside County Copermittees
	RESPONSE: At this time the San Diego Water Board does not support the inclusion of a third-party certification program as part of the existing development inspection provisions. The San Diego Water Board has conducted audits of several Copermittees' existing development and post construction BMP inspection programs in the San Diego Region that utilize self certifications or third-party certifications to verify the proper operation and maintenance of post construction BMPs. These audits have found such programs have not adequately confirmed that BMPs are being properly operated and maintained so they are effective at removing pollutants in storm water discharges from commercial and industrial sites to the MEP. However, the Regional MS4 Permit provides the Copermittees significant flexibility in the implementation of their existing development inspection programs, and does not preclude the use of third-party certification programs during years where inspections are not necessarily required. If the Copermittees can develop a third-party certification program that can demonstrate such a program can be implemented in a way that will ensure BMPs are being properly operated and maintained so they are effective at removing pollutants in storm water discharges from commercial and industrial sites to the MEP, the San Diego Water Board may reconsider including such an option into the Regional MS4 Permit during the renewal process anticipated to begin in early 2018. No changes were made to the Tentative Order as a result of this comment.	

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November 4, 2015

F2b-1	PROVISION F.2.b: BMP Design Manual Updates	
	COMMENT: *Request for revisions to clarify the effective date of the BMP Design Manual.* The San Diego County Copermittees, the City of San Diego, and the County of San Diego requested revisions to Provision F.2.b.(4) to include language that clarifies the effective date of the BMP Design Manual if an update to the BMP Design Manual is required.	San Diego County Copermittees City of San Diego County of San Diego
	RESPONSE: The San Diego Water Board agrees that the proposed modification to the text in Provision F.2.b.(4) would clarify that the BMP Design Manual effective date is no later than 90 days after the San Diego Water Board adopts amendments to Provisions E.3.a-d. Provision F.2.b.(4) will be modified as follows: (4) If the San Diego Water Board amends Provisions E.3.a-d during the permit term but after the Copermittee has completed the update pursuant to Provision F.2.b.(1), the Copermittee must revise its BMP Design Manual to incorporate the amended Provision E.3.a-d requirements as soon as possible but not later than 90 days after the date the San Diego Water Board adopts the amendments to Provisions E.3.a-d, unless otherwise directed by the San Diego Water Board Executive Officer. Under these circumstances, the effective date of the BMP Design Manual is not later than 90 days after the date the San Diego Water Board adopts the amendments to Provisions E.3.a-d, unless otherwise directed by the San Diego Water Board Executive Officer.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2015-0100

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AttC-1	ATTACHMENT C: Acronyms, Abbreviations, and Definitions	
	COMMENT: *Request for revisions to definition of Construction Activities.* The City of Escondido requested revisions to the definition of Construction Activities in Attachment C to the Regional MS4 Permit. The commenter requested the removal of the term "phase" from the definition because the term introduces artificial phases during a construction project that cannot be readily tracked.	City of Escondido
	RESPONSE: The San Diego Water Board agrees that the revisions are appropriate. The definition of Construction Activities in Attachment C has been revised as follows: **Construction Activities** – Actions implemented during construction of development or redevelopment projects during the Preliminary Tasks ~~Phase~~ (including rough grading and/or disking, clearing and grubbing operations, or any soil disturbance prior to mass grading), Grading or Land Development ~~Phase~~ (including topography and slope reconfiguration, alluvium removals, canyon cleanouts, rock undercuts, keyway excavations, land form grading, and stockpiling of select material for capping operations), Streets and Utility Installation ~~Phase~~ (including excavation and street paving, lot grading, curbs, gutters and sidewalks, public utilities, public water facilities including fire hydrants, public sanitary sewer systems, storm sewer systems and/or other drainage improvements), or Vertical Construction ~~Phase~~ (including the build out of structures from foundations to roofing, including rough landscaping).	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2015-0100

November 4, 2015

AttC-2	ATTACHMENT C: Acronyms, Abbreviations, and Definitions	
	COMMENT: *Request for revisions to definition of Redevelopment.* The City of San Diego requested revisions to the definition of Redevelopment in Attachment C to the Regional MS4 Permit to improve the clarity of the definition.	City of San Diego
	RESPONSE: The San Diego Water Board agrees that revisions would provide additional clarity in the definition of Redevelopment. The definition of Redevelopment in Attachment C has been revised as follows: **Redevelopment** – The creation and/or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure~~, and creation or addition of impervious surfaces~~. Replacement of impervious surfaces includes any activity ~~that is not part of a routine maintenance activity~~ where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include routine maintenance activities, such as trenching and resurfacing associated with utility work; pavement grinding; resurfacing existing roadways,~~; new~~ sidewalks ~~construction~~, pedestrian ramps, or bike lanes on existing roads; and routine replacement of damaged pavement, such as pothole repair.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2015-0100

November 4, 2015

AttE-1	ATTACHMENT E: Specific Provisions for Total Maximum Daily Loads	
	COMMENT: *Request for revisions to TMDL requirements in Attachment E to the Regional MS4 Permit to allow independent jurisdictional compliance with TMDLs.* The City of San Diego requested revisions to the TMDL requirements in Attachment E to the Regional MS4 Permit that would allow independent jurisdictional compliance instead of requiring all the Copermittees named as responsible to comply with the TMDL requirements.	City of San Diego
	RESPONSE: The San Diego Water Board disagrees that modifications are needed to the language pertaining to TMDL compliance determination. The commenter correctly asserts that the intent of the language, and in fact, the intent of the Water Quality Improvement Plan concept, is that the Copermittees develop the Water Quality Improvement Plans collectively and evaluate water quality improvement strategies on a watershed basis. The San Diego Water Board recognizes that the Copermittees have no authority over other Copermittees to compel TMDL compliance; therefore, the Tentative Order has multiple compliance determination pathways available to each Copermittee to achieve compliance. The final compliance determination pathways are presented in Attachment E Specific (TMDL) Provisions 1.b.(3), 2.b.(3), 3.b.(3), 4.b.(3), 5.b.(3), 6.b.(3), and 7.b.(3). There are several compliance determination pathways that allow a Copermittee to demonstrate independent jurisdictional compliance with water quality based effluent limitations (WQBELs). No changes were made to the Tentative Order as a result of this comment.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2015-0100

November 4, 2015

AttE6-1	ATTACHMENT E.6: Beaches and Creeks Bacteria TMDLs	
	COMMENT: *Requests for revisions to clarify that water bodies de-listed from the 303(d) List are not subject to the Beaches and Creeks TMDL requirements.* The Orange County Copermittees requested revisions to the Beaches and Creeks Bacteria TMDLs requirements in Attachment E to state that specific water bodies or beach segments included in Table 6.0 that have been delisted from the 2008 Clean Water Act Section 303(d) List of Water Quality Impaired Segments are not subject to any further action as long as monitoring data continues to support compliance with water quality standards.	Orange County Copermittees
	RESPONSE: The San Diego Water Board disagrees that any revisions are necessary or appropriate. The Orange County Copermittees correctly state that the water bodies listed in Table 6.0 must be in compliance with the final TMDL compliance requirements (and WQBELs). If a water body or beach segment has been de-listed, then the MS4 discharge WQBELs and/or receiving water WQBELs should already be achieved, but the BMP WQBELs and the monitoring and assessment requirements are still required to be implemented to maintain the achievement of the MS4 discharge WQBELs and/or receiving water WQBELs in the de-listed water body or beach segment. No changes were made to the Tentative Order as a result of this comment.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2015-0100

November 4, 2015

AttE6-2	ATTACHMENT E.6: Beaches and Creeks Bacteria TMDLs	
	COMMENT: *Request for revisions to compliance dates for the Beaches and Creeks Bacteria TMDLs.* The San Diego County Copermittees, the City of San Diego, and the County of San Diego requested that the compliance dates proposed to be added to Tables 6.1 and 6.4 be removed. The commenters assert that the compliance dates proposed to be added are inconsistent with the requirements of the Beaches and Creeks Bacteria TMDLs. The commenters also assert that the Beaches and Creeks Bacteria TMDLs do not require the development of a Bacteria Load Reduction Plan (BLRP) or Comprehensive Load Reduction Plan (CLRP) for segments of beaches or creeks de-listed from the Clean Water Act Section 303(d) List of Water Quality Limited Segments.	San Diego County Copermittees City of San Diego County of San Diego
	RESPONSE: The San Diego Water Board disagrees that the addition of the compliance dates is inconsistent with the Beaches and Creeks Bacteria TMDLs requirements. The San Diego Water Board also disagrees that segments of beaches or creeks de-listed from the Clean Water Act Section 303(d) List of Water Quality Limited Segments are not required to develop a BLRP or CLRP. The compliance date for the Beaches and Creeks Bacteria TMDLs is specified on page 7-107 of the Basin Plan as follows: *"Full implementation of the TMDLs for indicator bacteria shall be completed as soon as possible, but no later than 10 years from the effective date for both the dry weather and wet weather TMDLs, unless an alternative compliance schedule is approved as part of a Comprehensive Load Reduction Plan, as described in the following section. The effective date of these TMDLs is April 4, 2011.* *The San Diego Water Board will require the Phase I MS4s to submit Bacteria Load Reduction Plan (BLRPs) outlining the proposed BMP program that will be capable of achieving the necessary load reduction required to attain the bacteria TMDLs in the receiving water, acceptable to the Regional Board within 18 months after the effective date of these TMDLs…."* Tables 7-53 and 7-54 on page 7-108 in Chapter 7 of the Basin Plan present the compliance schedules that apply if the Copermittees develop a BLRP. Page 7-109 of the Basin Plan describes the potential for the Copermittees to develop CLRPs. If the Copermittees choose to develop a CLRP, the compliance date and schedule for the Beaches and Creeks Bacteria TMDLs is specified on page 7-109 of the Basin Plan in Table 7-55 and as follows:	

AttE6-2	ATTACHMENT E.6: Beaches and Creeks Bacteria TMDLs	
	"….the dischargers may develop and submit a CLRP for all constituents of concern in lieu of the BLRP, and to propose an appropriately tailored alternative compliance schedule. Proposed alternative compliance schedules tailored under this provision may not extend beyond 10 years for the dry weather bacteria TMDLs and 20 years for the wet weather bacteria TMDLs from the effective date …." Tables 6.1 and 6.4 were revised in the Tentative Order to be consistent with the compliance schedules of Tables 7-53, 7-54, and 7-55 of the Beaches and Creeks Bacteria TMDLs in the Basin Plan. Therefore, the addition of the compliance dates proposed to be added to Tables 6.1 and 6.4 are consistent with the requirements of the Beaches and Creeks Bacteria TMDLs. As for the assertion that the Beaches and Creeks Bacteria TMDLs do not require BLRPs or CLRPs for segments of beaches or creeks de-listed from the Clean Water Act Section 303(d) List of Water Quality Limited Segments, the commenters appear to be citing text from the TMDL Compliance Schedule section instead of the TMDL Implementation Plan section of the Beaches and Creeks Bacteria TMDLs. It is true that on page 7-107 of the Basin Plan, includes a statement that: "*For watersheds in Table 7-52 where there are no longer any impairments listed on the 2008 303(d) List, the Phase I MS4s and Caltrans are not required to submit a BLRP or CLRP within 18 months of the effective date of the TMDLs.*" However, this statement is under the TMDL Compliance Schedule requirements and was only included to indicate that the San Diego Water Board would not require a BLRP or CLRP to be submitted within 18 months of the effective date. It was not intended to mean that a BLRP or CLRP would never be required. If the commenters look under the TMDL Implementation Plan requirements for Phase I MS4s, which begins on page 7-85 of the Basin Plan, there is no statement that a BLRP or CLRP will not be required for "*watersheds … where there are no longer any impairments listed on the 2008 303(d) List."* The TMDL Implementation Plan for Phase I MS4 does, however, state the following on page 7-86 of the Basin Plan: "*The WQBELs will likely consist of receiving water limitations (based on the numeric targets) and require the implementation of a BMP program to achieve the TMDLs in receiving waters. The Phase I MS4s will be required to submit Bacteria Load Reduction Plans (BLRPs) or Comprehensive Load Reduction Plans (CLRPs) outlining a proposed BMP program capable of achieving the necessary load reductions required to attain the TMDLs in receiving waters, acceptable to the San Diego Water, within 18 months after the effective date of these TMDLs. The San Diego Water Board will require the BLRPs or CLRPs to be developed on a watershed or region wide scale. The BLRPs or CLRPs should be developed and*	

AttE6-2	ATTACHMENT E.6: Beaches and Creeks Bacteria TMDLs	
	incorporated as part of the Watershed Runoff Management Programs required under the Phase I MS4 NPDES requirements…." The TMDL Implementation Plan requirements clearly state the BLRPs or CLRPs are required and do not have any exceptions. The TMDL Compliance Schedule requirements do allow an exception from submitting a BLRP or CLRP within 18 months of the effective date, but do not state that a BLRP or CLRP will never be required. Specific Provision 6.b.(2)(c)(i) is consistent with the TMDL Implementation Plan requirements in the Basin Plan by requiring a CLRP to be on a watershed scale and incorporated into the Water Quality Improvement Plans (i.e. Watershed Runoff Management Program), which includes a BMP implementation program capable of achieving the necessary load reductions required to attain the TMDLs in receiving waters for all the applicable Watershed Management Areas in Table 6.0. Table 6.0 lists all the beaches and areas included in the Beaches and Creeks Bacteria TMDLs from the Basin Plan. Please also see the response to comment AttE6-1. However, the San Diego Water Board recognizes that Specific Provision 6.b.(2)(c)(i) only allows for the Copermittees to incorporate CLRPs into the Water Quality Improvement Plans. Therefore, to be consistent with the Beaches and Creeks Bacteria TMDLs, which allows for BLRPs to be developed and submitted, Specific Provision 6.b.(2)(c)(i) has been revised as follows: (i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 6.0 must incorporate the <u>Bacteria Load Reduction Plans (BLRPs) or</u> Comprehensive Load Reduction Plans (CLRPs) required to be developed pursuant to Resolution No. R9-2010-0001.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2015-0100

November 4, 2015

AttE6-3	ATTACHMENT E.6: Beaches and Creeks Bacteria TMDLs	
	COMMENT: *Request for revisions to clarify that compliance with receiving water limitations in the Beaches and Creek Bacteria TMDLs will be assessed at the compliance points identified in the TMDL Monitoring Plan.* The County of San Diego requested revisions to the Beaches and Creeks Bacteria TMDLs requirements to specify that compliance with receiving water limitations can be determined at the compliance points identified in the TMDL Monitoring Plans that are included in the Water Quality Improvement Plans.	County of San Diego
	RESPONSE: The San Diego Water Board disagrees that the revision is necessary. The Beaches and Creeks Bacteria TMDLs interim and final compliance determination requirements includes a pathway that allows the Copermittees to demonstrate that there are no exceedances of the final (or interim) receiving water limitations in the receiving water "*at, or downstream of the Responsible Copermittee's MS4 outfalls*." The Specific Monitoring and Assessment Requirements of the Beaches and Creeks Bacteria TMDLs specifies the locations where monitoring is required to determine compliance. For beaches, the required monitoring locations are "*at, or downstream of the Responsible Copermittee's MS4 outfalls*." For creeks, the monitoring locations are required to be at or near the mouth and one or more locations upstream of the mouth, both of which should be "*at, or downstream of the Responsible Copermittee's MS4 outfalls*." If the receiving waters are not exceeding the final (or interim) receiving water limitations expressed as exceedance frequencies at the required receiving water monitoring locations, then the Copermittees have demonstrated compliance with the receiving water WQBELs "*at, or downstream of the Responsible Copermittee's MS4 outfalls*." If, however, there are exceedances at a receiving water monitoring location, then the upstream Copermittees will need to demonstrate compliance with another compliance determination pathway. No changes were made to the Tentative Order as a result of this comment.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2015-0100

November 4, 2015

AttE7-1	ATTACHMENT E.7: Los Penasquitos Lagoon Sediment TMDL	
	COMMENT: *Request for revisions to incorporate a land use-based compliance pathway into the Los Penasquitos Lagoon Sediment TMDL.* The County of San Diego requested revisions to the Total Maximum Daily Load for Sediment in Los Penasquitos Lagoon (Los Penasquitos Sediment TMDL) in Attachment E to incorporate a land use-based compliance pathway.	County of San Diego
	RESPONSE: The San Diego Water Board disagrees that changes are needed to accommodate a land use-based compliance pathway for the Los Penasquitos Lagoon Sediment TMDL. The commenter states that if the land use has not changed significantly from the 1970s baseline, the timeframe at which water quality standards in the lagoon were met, then the sediment loads from the Copermittee's MS4s are expected to be approximately the same as the baseline levels and within the amount allowed in the wasteload allocation. The San Diego Water Board agrees that under this scenario in which land use has not changed significantly, the sediment levels would be approximately the same as baseline levels. If this is confirmed through water quality monitoring, then the Copermittee has likely met its portion of the final effluent limit described in Provision 7.b.(2)(b) and has achieved compliance. For this reason, changes to the TMDL compliance pathways are not needed or warranted. No changes were made to the Tentative Order as a result of this comment.	

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

Errata Sheet
November 4, 2015

TENTATIVE ORDER NO. R9-2015-0100

AN ORDER AMENDING ORDER NO. R9-2013-0001, NPDES NO. CAS010266, AS AMENDED BY ORDER NO. R9-2015-0001 NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The following changes are proposed to the revised version of Tentative Order No. R9-2015-0100 and its Attachments included as Supporting Document No. 1 for Item No. 11 on the San Diego Water Board November 18, 2015 Board Meeting Agenda.

1. Tentative Order No. R9-2015-0100 Errata

Revise the beginning of Finding 6 as follows:

6. Regional Water Board Agreement. The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated ~~[Month][Day]~~ October 26, 2015 to:

2. Attachment No. 1 to Tentative Order No. R9-2015-0100 Errata

a) Revise Finding 29.b as follows:

b. Pursuant to CWC section 13228, the Cities of Murrieta, Wildomar, and Menifee submitted written requests that one Regional Water Board be designated to regulate Phase I MS4 discharges for each of the Cities. The Santa Ana Water Board and the San Diego Water Board have entered into an agreement dated ~~[Month][Day]~~ October 26, 2015, whereby the Cities of Murrieta and Wildomar are largely regulated by the San Diego Water Board under this Order, including those portions of the Cities of Murrieta and Wildomar not within the San Diego Water Board's jurisdiction, upon the effective date of this Order….

b) Revise Provision A.1.d as follows:

d. Storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012, as amended by State Water Board Resolution No. 2012-0031, applicable to these discharges, included in Attachment A to this Order. All other discharges from the Copermittees' MS4s to ASBS are prohibited.

c) Revise the beginning of Provision B.3.c as follows:

c. PROHIBITIONS AND LIMITATIONS COMPLIANCE OPTION

Each Copermittee has the option to utilize the implementation of the Water Quality Improvement Plan to demonstrate compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2~~.a~~, and A.3.b within a Watershed Management Area subject to the following conditions:

d) Revise Provision B.3.c.(1) as follows:

(1) A Copermittee is eligible to be deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2~~.a~~, and A.3.b within a Watershed Management Area when the Water Quality Improvement Plan for a Watershed Management Area incorporates the following:

e) Revise Provision B.3.c.(1)(a)(vii) as follows:

(vii) For each final numeric goal developed pursuant to Provisions B.3.a and B.3.c.(1)(a)(i)-(v), ~~at least one~~ annual milestones[9] and the dates for ~~its~~ their achievement must be included within each of the next five (5) Water Quality Improvement Plan Annual Report reporting periods, or until the final numeric goal is achieved. Annual milestones and the dates for their achievement for the 5 Water Quality Improvement Plan Annual Report reporting periods of the next permit term, or until the final numeric goal is achieved, must be provided as part of the Report of Waste Discharge required pursuant to Provision F.5.

f) Revise Footnote 9 as follows:

[9] Annual milestones for each final numeric goal must ~~build upon previous milestones and lead to~~ be clearly and directly linked to, or demonstrate progress is being made toward, the achievement of the final numeric goal. The annual milestones may consist of water quality improvement strategy implementation phases, interim numeric goals, and other acceptable metrics. The annual milestones may address multiple numeric goals and/or multiple water bodies, as applicable and appropriate.

g) Revise Provision B.3.c.(2) as follows:

(2) Each Copermittee that voluntarily completes the requirements of Provision B.3.c.(1) is deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2~~.a~~, and A.3.b for the pollutants and conditions for which numeric goals are developed when the Water Quality Improvement Plan, incorporating the requirements of Provision B.3.c.(1), is accepted by the San Diego Water Board pursuant to Provision F.1.b or F.2.c. The Copermittee is deemed in compliance during the term of this Order as long as:

h) Revise Provision B.3.c.(2)(d) as follows:

(d) Any proposed modifications to the numeric goals, strategies, schedules, and/or annual milestones are accepted by the San Diego Water Board as part of subsequent updates to the Water Quality Improvement Plan pursuant to Provision F.2.c;[10] AND

i) Add Provision B.5.d as follows:

d. ADAPTATION OF PROHIBITIONS AND LIMITATIONS COMPLIANCE OPTION

If a Copermittee has implemented the Prohibitions and Limitations Compliance Option allowed to be included in the Water Quality Improvement Plan pursuant to Provision B.3.c, the Copermittee must re-evaluate and adapt the numeric goals, water quality improvement strategies, schedules, and annual milestones required under Provision B.3.c.(1) when significant new information becomes available, or with the Report of Waste Discharge required pursuant to Provision F.5. Significant changes in the numeric goals, water quality improvement strategies, schedules, or annual milestones requires an update to the analysis required under Provision B.3.c.(2).

j) Revise Provision E.3.d as follows:

(d) Each Copermittee must update its BMP Design Manual pursuant to Provision F.2.b. Until the Copermittee has updated its BMP Design Manual pursuant to Provision F.2.b.(1), the Copermittee must continue implementing its current BMP Design Manual. The Copermittee must implement the updated BMP Design Manual within 180 days following completion of the update pursuant to Provision F.2.b.(1), unless directed otherwise by the San Diego Water Board Executive Officer. The date the BMP Design Manual is implemented is the "effective date" of the BMP Design Manual.

k) Revise Provision F.2.b.(4) as follows:

(4) If the San Diego Water Board amends Provisions E.3.a-d during the permit term but after the Copermittee has completed the update pursuant to Provision F.2.b.(1), the Copermittee must revise its BMP Design Manual to incorporate the amended Provision E.3.a-d requirements as soon as possible but no~~t~~ later than 90 days after the date the San Diego Water Board adopts the amendments to Provisions E.3.a-d, unless otherwise directed by the San Diego Water Board Executive Officer. Under these circumstances, the effective date of the BMP Design Manual is no later than 90 days after the date the San Diego Water Board adopts the amendments to Provisions E.3.a-d, unless otherwise directed by the San Diego Water Board Executive Officer.

l) Revise the definition of Construction Activities in Attachment C as follows:

Construction Activities – Actions implemented during construction of development or redevelopment projects during the Preliminary Tasks ~~Phase~~ (including rough grading and/or disking, clearing and grubbing operations, or any soil disturbance prior to mass grading), Grading or Land Development ~~Phase~~ (including topography and slope reconfiguration, alluvium removals, canyon cleanouts, rock undercuts, keyway excavations, land form grading, and stockpiling of select material for capping operations), Streets and Utility Installation ~~Phase~~ (including excavation and street paving, lot grading, curbs, gutters and sidewalks, public utilities, public water facilities including fire hydrants, public sanitary sewer systems, storm sewer systems and/or other drainage improvements), or Vertical Construction ~~Phase~~ (including the build out of structures from foundations to roofing, including rough landscaping).

m) Revise the definition of Redevelopment in Attachment C as follows:

Redevelopment – The creation and/or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, and the addition to or replacement of a structure~~, and creation or addition of impervious surfaces~~. Replacement of impervious surfaces includes any activity ~~that is not part of a routine maintenance activity~~ where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include routine maintenance activities, such as trenching and resurfacing associated with utility work; pavement grinding; resurfacing existing roadways,~~; new~~ sidewalks ~~construction~~, pedestrian ramps, or bike lanes on existing roads; and routine replacement of damaged pavement, such as pothole repair.

n) Revise Specific Provision 6.b.(2)(c)(i) in Attachment E as follows:

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 6.0 must incorporate the Bacteria Load Reduction Plans (BLRPs) or Comprehensive Load Reduction Plans (CLRPs) required to be developed pursuant to Resolution No. R9-2010-0001.

3. Attachment No. 2 to Tentative Order No. R9-2015-00100 Errata

a) Revise the text on page F-5 of the Fact Sheet as follows:

b. Continue designation of the San Diego Water Board to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Murrieta and Wildomar, including areas within the Santa Ana Region; and, agree to continue designation of the Santa Ana Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the City of Menifee, including areas within the San Diego Region, subject to the terms of the ~~[Month][Day]~~ October 26, 2015 agreement between San Diego Water Board and the Santa Ana Water Board described in Finding 29 of this Order;

c. Incorporate Provision B.3.c, which provides an option that allows a Copermittee to utilize the watershed-based Water Quality Improvement Plan to be deemed in compliance with the prohibitions and limitations of Provisions A.1.a, A.1.c, A.1.d, A.2~~.a~~, and A.3.b;

b) Revise the text on page F-7 of the Fact Sheet as follows:

** The City of Menifee is not regulated as a Copermittee under this Order because its Phase I MS4 discharges are regulated by Santa Ana Water Board Order No. R8-2010-0033 as it may be amended or issued pursuant to Water Code section 13228 designation. The requirements of this Order that apply to the City of Menifee for the duration of this Order, consistent with the Water Code section 13228 written agreement dated ~~[Month][Day]~~ October 26, 2015, are described in Finding 29 and Footnote 3 to Table B-1.

c) Revise the text on page F-32 of the Fact Sheet as follows:

Anti-Backsliding Requirements

CWA sections 402(o) and 303(d)(4) and federal regulations at 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations or conditions may be relaxed. While this Order allows implementation of an alternative compliance pathway option in Provision B.3.c to constitute compliance with receiving water limitations under certain circumstances, the availability of that alternative and the corresponding availability of additional time to come into compliance with receiving water limitations does not violate the antibacksliding provisions. The receiving water limitations provisions of this Order are imposed under section 402(p)(3)(B) of the Clean Water Act rather than based on best professional judgment, or based on section 301(b)(1)(C) or sections 303(d) or (e), and are accordingly not subject to the anti-backsliding requirements of section 402(o). Although the non-applicability is less clear with respect to the regulatory anti-backsliding provisions in 40 CFR 122.44(l), the regulatory history suggests that USEPA's intent was to establish the anti-backsliding regulations with respect to evolving technology standards for traditional point sources. (See, e.g., 44 Fed.Reg. 32854, 32864 (Jun. 7, 1979)). It is unnecessary, however, to resolve the ultimate applicability of the regulatory anti-backsliding provisions, because the alternative compliance pathway option in Provision B.3.c qualifies for an exception to backsliding as based on new information.

The alternative compliance pathway option in Provision B.3.c of this Order was informed by new information available to the Board from experience and knowledge gained through storm water permitting at the Regional Water Boards in the last ten years. There has been a statewide paradigm shift in storm water management. State Water Board Order WQ 2015-0075 directed all of the Regional Water Boards to consider the Los Angeles Water Board's alternative compliance path to receiving water limitations in all Phase I MS4 permits going forward (State Water Board Order WQ 2015-0075 at page 51). T~~t~~he Los Angeles Water Board's process of developing over 30 watershed-based TMDLs and implementing several TMDLs since the adoption of the previous permits. In particular, the Los Angeles Water Board recognized the significance of allowing time to plan, design, fund, operate and maintain watershed-based BMPs necessary to attain water quality improvements and additionally recognized the potential for municipal storm water to benefit water supply. Similarly, the San Diego Water Board's experience developing and implementing the Fourth Term MS4 Permits and TMDLs that apply on a region-wide scale (e.g. TMDLs for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region) has resulted in a similar recognition of the need for a watershed-based approach that allows time to plan, design, fund, operate and maintain BMPs to address impaired waters that have been impacted by MS4 discharges. Thus, even if the receiving water limitations are subject to anti-backsliding requirements, they were revised based on new information that would support an exception to the anti-backsliding provisions. (33 U.S.C. § 1342(o)(2)(B)(i); 40 C.F.R. § 122.44(l)(1); 40 C.F.R. §122.44(l)(2)(i)(B)(1)).

d) Revise the text on page F-51 of the Fact Sheet as follows:

The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated February 10, 2015 to designate the San Diego Water Board to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Laguna Woods and Laguna Hills, including the portions of the jurisdictions within the Santa Ana Region, upon the later effective date of Order No. R9-2015-0001 or Santa Ana Water Board Tentative Order No. R8-2015-0001. The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated ~~[Month][Day]~~ October 26, 2015 to designate the San Diego Water Board to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Murrieta and Wildomar, including the portions of the jurisdictions within the Santa Ana Region upon the effective date of Order R9-2015-0100.

e) Revise the text on page F-52 of the Fact Sheet as follows:

The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated February 10, 2015 to designate the San Ana Water Board to regulate Phase I MS4 discharges within the jurisdiction of the City of Lake Forest, including portions of the jurisdiction within the Santa Diego Region, upon the later date of Order No. R9-2015-0001 or Santa Ana Water Board Tentative Order No. R8-2015-0001. The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated ~~[Month][Day]~~ October 26, 2015 to designate the San Ana Water Board to regulate Phase I MS4 discharges within the jurisdiction of the City of Menifee, including portions of the jurisdiction within the San Diego Region, under Order No. R8-2010-0033 (NPDES No. CAS618030) as it may be amended or reissued upon the effective date of Order No. R9-2015-0100.

f) Revise the text on pages F-60 through F-62 of the Fact Sheet as follows:

Replace the references to “Provisions A.1.a, A.1.c, A.1.d, A.2.a, and A.3.b” with “Provisions A.1.a, A.1.c, A.1.d, A.2~~.a~~, and A.3.b.”

g) Revise the text on page F-62 of the Fact Sheet as follows:

Compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2~~.a~~, and A.3.b begins when the Water Quality Improvement Plan, incorporating the requirements of Provision B.3.c.(1), is accepted by the San Diego Water Board. Each Copermittee that chooses to implement and continues to implement this option will be deemed in compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2~~.a~~, and A.3.b as long as the Copermittee continues to implement the strategies, monitoring and assessments as incorporated in the Water Quality Improvement Plan in accordance with Provision B.3.c.(1), and the Copermittee reports the achievement of the annual milestones each year, or provides acceptable rationale and recommends appropriate modifications to the interim numeric goals, and/or water quality improvement strategies, and/or schedules to improve the rate of progress toward achieving the final numeric goals. The Copermittee continues to be deemed in compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b during the time the San Diego Water Board reviews the rationale and recommended modifications to the interim numeric goals, and/or water quality improvement strategies, and/or schedules. If and when the San Diego Water Board determines that it does not accept the rationale or recommendations, the Copermittee will be notified they are no longer deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b.

h) Revise the text on page F-81 of the Fact Sheet as follows:

Provision E.2.(Illicit Discharge Detection and Elimination) requires each Copermittee to implement an illicit discharge detection and elimination program to effectively prohibit non-storm water discharges to the MS4 by actively detecting and eliminating illicit discharges and disposal into its MS4. If the San Diego Water Board finds that a Copermittee is fully implementing the requirements of Provision E.2, then the Copermittee is deemed in compliance with the effective prohibition of non-storm water discharges to the MS4 required under Provision A.1.b.

Chiu, Wayne@Waterboards

From: lyris@swrcb18.waterboards.ca.gov
Sent: Thursday, November 05, 2015 8:54 AM
To: Chiu, Wayne@Waterboards
Subject: Response to Comments for Tentative Order No. R9-2015-0100 now posted

Water Boards This is a message from the California Regional Water Quality Control Board, San Diego Region (9).

Dear MS4 Permit Stakeholders,

The Responses to Comments and an Errata Sheet for Tentative Order No. R9-2015-0100, *An Order Amending Order No. R9-2013-0001, NPDES No. CAS010266*, *as amended by Order No. R9-2015-0001, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Tentative Order) are now available on the Regional Board's website at http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/rsd_stormwater.shtml.

The Public Hearing on Tentative Order No. R9-2015-0100 will be held during the San Diego Water Board meeting scheduled for November 18, 2015, beginning at 9 am. The meeting will take place at the San Diego Water Board's Hearing Room at 2375 Northside Dr., Suite 100, San Diego, 92108.

For questions pertaining to the Tentative Order or the upcoming Board meeting, please contact me or Wayne Chiu at Wayne.Chiu@waterboards.ca.gov or 619.521.3354.

Christina Arias, PE
Water Resource Control Engineer
San Diego Regional Water Quality Control Board
2375 Northside Drive, Suite 100
San Diego, CA 92108
Tel. (619) 521-3361
Christina.Arias@waterboards.ca.gov

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Chiu, Wayne@Waterboards

From: lyris@swrcb18.waterboards.ca.gov
Sent: Tuesday, November 10, 2015 4:16 PM
To: Chiu, Wayne@Waterboards
Subject: REVISED Responses to Comments and Errata Sheet posted on website

Water Boards This is a message from the California Regional Water Quality Control Board, San Diego Region (9).

Dear MS4 Permit Stakeholders,

The San Diego Water Board has posted **Revised** Responses to Comments, and a **Revised** Errata Sheet, in preparation of the Public Hearing on Tentative Order No. R9-2015-0100. The revised documents are available here: http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/rsd_stormwater.shtml.

The Public Hearing on the Tentative Order is scheduled for Wednesday, November 18, 2015, beginning at 9 am at the San Diego Water Board's Hearing Room. Please contact me with any questions or concerns.

Christina Arias, PE
Water Resource Control Engineer
San Diego Regional Water Quality Control Board
2375 Northside Drive, Suite 100
San Diego, CA 92108
Tel. (619) 521-3361
Christina.Arias@waterboards.ca.gov

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California Regional Water Quality Control Board
San Diego Region

Response to Comments Report

Tentative Order No. R9-2015-0100

An Order Amending Order No. R9-2013-0001, NPDES No. CAS010266, As Amended by Order No. R9-2015-0001 National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region

November 4, 2015
Revised November 10, 2015

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
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San Diego Region

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By

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Christina Arias, *P.E., Water Resource Control Engineer*

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Responses to Comments on Tentative Order No. R9-2015-0100

November 4, 2015

Revised November 10, 2015

Introduction

This report contains responses to written comments timely received on Tentative Order No. R9-2015-0100, *An Order Amending Order No. R9-2013-0001, NPDES No. CAS010266*, *as Amended by Order No. R9-2015-0001, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Tentative Order). The Tentative Order and its attachments were available for public review and comment for 46 days, with the comment period ending on September 14, 2015. Specifically, the San Diego Water Board requested comments on the following three documents:

- Tentative Order No. R9-2015-0100;
- Attachment No. 1 – Revised Order No. R9-2013-0001; and
- Attachment No. 2 – Revised Fact Sheet to Order No. R9-2013-0001.

The phrases "Tentative Order" and "Regional MS4 Permit" in the following response to comments table refers to both Tentative Order No. R9-2015-0100 and the two attachments. Comments and responses are organized by the section of either Attachment 1 or Attachment 2 that is being referenced. Wherever possible, comments are grouped based on content and summarized by the San Diego Water Board. The actual comment letters can be accessed on the San Diego Water Board website at: http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

List of Commenters:
Comments were submitted by the following organizations, public agencies, or individuals (listed alphabetically):

1. City of Dana Point
2. City of Escondido
3. City of Laguna Beach
4. City of Lake Forest
5. City of Menifee
6. City of San Clemente
7. City of San Diego
8. City of San Juan Capistrano
9. City of Santee
10. Construction Industry Coalition on Water Quality (CICWQ)
11. County of San Diego
12. Environmental Groups (San Diego Coastkeeper, Coastal Environmental Rights Foundation, and Surfrider Foundation San Diego Chapter)
13. Orange County Copermittees
14. Riverside County Copermittees
15. San Diego Coastkeeper and Coastal Environmental Rights Foundation
16. San Diego County Copermittees
17. San Diego Unified Port District
18. South Laguna Civic Association
19. Safari Highlands Ranch

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RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2015-0100

November 4, 2015 / Revised November 10, 2015

Gnl-1	GENERAL COMMENTS	
	COMMENT: *Request to incorporate previous written comments and testimony in the record for this Tentative Order.* The Copermittees and other stakeholders requested that previous written comments and testimony be incorporated into the record for this Tentative Order. The comment letters also included copies of the written comments previously submitted during the proceedings to adopt Order No. R9-2013-0001, and the proceedings to adopt Order No. R9-2015-0001 to amend Order No. R9-2013-0001.	Riverside County Copermittees Orange County Copermittees City of Dana Point City of San Diego San Diego Unified Port District South Laguna Civic Association Construction Industry Coalition on Water Quality
	RESPONSE: The San Diego Water Board is incorporating the previous written comments and testimony provided during the proceedings to adopt Order No. R9-2013-0001, and the proceedings to adopt Order No. R9-2015-0001 to amend Order No. R9-2013-0001 into the record for this Tentative Order. The San Diego Water Board reviewed Tentative Order No. R9-2015-0100 and its Attachments and has determined that the March 27, 2013 responses to comments document prepared during the 2013 adoption process of Order No. R9-2013-0001, the January 21, 2015 responses to comments document prepared during the adoption process of Order No. R9-2015-0001, and the oral responses to comments during the workshops and hearings during those proceedings address the previously submitted comments and testimony. The San Diego Water Board is incorporating by this reference as if set forth in full herein its written responses to comments and oral responses to comments raised during the workshops and hearings on Order Nos. R9-2013-0001 and R9-2015-0001 into these responses. To the extent commenters incorporate issues and objections raised in petitions for review of Order No. R9-2013-0001 filed with the State Water Board in SWRCB/OCC File A-2254(a)-(p), or in petitions for review of Order No. R9-2015-0001, amending Order No. R9-2013-0001 (SWRCB/OCC File A-2367(a)-(i)), the San Diego Water Board notes that it has not yet had an opportunity to submit written responses to those petitions for review and is not specifically addressing those petitions for review in these responses to comments. The San Diego Water Board will submit written responses to the petitions for review at the appropriate time in the State Water Board's petition proceeding. No changes to the Tentative Order or its Attachments were made based on the renewed comments.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2015-0100

November 4, 2015 / Revised November 10, 2015

Gnl-2	GENERAL COMMENTS	
	COMMENT: *Request for clarification of implementation requirements for the Riverside County Copermittees as a result of late entry into the Regional MS4 Permit.* The Riverside County Copermittees noted that several provisions of the Regional MS4 Permit, including requirements to submit certification of legal authority, assessment and subsequent Water Quality Improvement Plan revision requirements, and requirements to submit a regional monitoring and assessment report, which either require data gathered under a Water Quality Improvement Plan that has been accepted by the San Diego Water Board, or are due for submittal outside of the Regional MS4 Permit's term. The Riverside County Copermittees wanted clarification that: 1) the certification of legal authority which was submitted by the Riverside County Copermittees under Order No. R9-2010-0016 will remain effective until a new certification is submitted with the first Water Quality Improvement Plan Annual Report (after the current Regional MS4 Permit term has ended), 2) any provisions regarding assessments or requiring data gathered under an accepted Water Quality Improvement Plan will not be due until such time that the necessary data are gathered and the assessments made under time periods described in the Regional MS4 Permit, and 3) the regional monitoring and assessment report for the current Regional MS4 Permit term should be completed utilizing data gathered during the transitional monitoring period, as these will be the only data that will be available at that time.	Riverside County Copermittees
	RESPONSE: The San Diego Water Board agrees that: 1) the certification of legal authority which was submitted by the Riverside County Copermittees under Order No. R9-2010-0016 will remain effective until a new certification is submitted with the first Water Quality Improvement Plan Annual Report (after the current Regional MS4 Permit term has ended), 2) any provisions regarding assessments or requiring data gathered under an accepted Water Quality Improvement Plan will not be due until such time that the necessary data are gathered and the assessments made under time periods described in the Regional MS4 Permit, and 3) the regional monitoring and assessment report for the current Regional MS4 Permit term should be completed utilizing data gathered during the transitional monitoring period, as these will be the only data that will be available at that time.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2015-0100

November 4, 2015 / Revised November 10, 2015

Gnl-3	GENERAL COMMENTS	
	COMMENT: *Request to remove the City of Menifee from Water Quality Improvement Plan development and implementation.* The Riverside County Copermittees and the City of Menifee requested several modifications to the Regional MS4 Permit that would remove the City of Menifee from the requirement to develop and implement the Water Quality Improvement Plan for the Santa Margarita River Watershed Management Area. The Riverside County Copermittees and the City of Menifee assert that the City of Menifee does not own or operate any MS4 within the Santa Margarita River Watershed Management Area, and provided a map showing the City's jurisdictional boundary and MS4.	Riverside County Copermittees City of Menifee
	RESPONSE: The San Diego Water Board reviewed the information provided by the commenters and disagrees that the City of Menifee does not own or operate any MS4 within the Santa Margarita Watershed Management Area. The maps provided by the commenters show a portion of MS4 along Scott Road within the Santa Margarita Watershed Management Area that is indicated to be owned by the City of Menifee. In addition, the maps provided by the commenters show that there is a residential area within the City of Menifee and within the Santa Margarita River Watershed Management Area with streets, curb, and gutter that drain to MS4 owned by the Riverside County Flood Control and Water Conservation District, which discharges to a tributary of Warm Springs Creek. Warm Springs Creek is an impaired water body in the Santa Margarita River Watershed Management Area and may become subject to the requirements of a TMDL in the future. The streets, curb, and gutter in the residential area are also considered part of the City of Menifee's MS4. The maps provided confirm that it is appropriate for the City of Menifee to be required to participate in the development and implementation of the Water Quality Improvement Plan for the Santa Margarita River Watershed Management Area. No changes were made to the Tentative Order as a result of this comment.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2015-0100

November 4, 2015 / Revised November 10, 2015

Gnl-4	GENERAL COMMENTS	
	COMMENT: *Stakeholder workshops have been effective.* The Orange County Copermittees expressed appreciation for the efforts of the San Diego Water Board staff to collaboratively engage the Copermittees and other stakeholders through the use of mediated workshops. The workshop format allowed all viewpoints to be expressed with sufficient time provided for discussion of issues regarding the Regional MS4 Permit.	Orange County Copermittees City of Dana Point City of Laguna Beach
	RESPONSE: The San Diego Water Board agrees that the collaborative approach utilized during the Regional MS4 Permit development and amendment processes has been beneficial for the San Diego Water Board staff to better understand the issues of concern to the stakeholders.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2015-0100

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Gnl-5	GENERAL COMMENTS	
	COMMENT: *Requests for the Regional MS4 Permit to acknowledge the potential benefit of developing site specific water quality objectives in concert with development of the Water Quality Improvement Plan.* The Cities of Dana Point and Laguna Beach requested that the Regional MS4 Permit and Fact Sheet specifically acknowledge the benefit of developing site specific objectives in concert with the development of the Water Quality Improvement Plans, even if development of the site specific objectives may extend the period to complete development of the Water Quality Improvement Plans.	City of Dana Point City of Laguna Beach
	RESPONSE: The San Diego Water Board acknowledges that developing site specific water quality objectives (site specific objectives) may be appropriate where there are data that are available to support site specific objectives. The San Diego Water Board, however, disagrees that it is appropriate to delay development and implementation of any Water Quality Improvement Plans with an expectation that site specific objectives will be developed. Any action taken by the San Diego Water Board to establish site specific objectives would require amendment of the Basin Plan to incorporate the site specific objectives before they could be implemented in any NPDES permits or waste discharge requirements issued by the San Diego Water Board. The Basin Planning process requires separate proceedings that need to include the public, the San Diego Water Board, the State Water Board, the Office of Administrative Law, and the USEPA. This process will take much longer to complete than developing the Water Quality Improvement Plan. However, the San Diego Water Board encourages the Copermittees to utilize the Water Quality Improvement Plan development process to identify areas within the Watershed Management Area where developing site specific objectives may be appropriate and include special studies to collect data that can be used to support development of site specific objectives.	

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Gnl-6	GENERAL COMMENTS	
	COMMENT: *Request for clarification that location of a MS4 within the Port's jurisdictional boundaries does not render the Port an owner or operator of the MS4.* The San Diego Unified Port District (Port) asserts that just because a MS4 facility falls within its jurisdictional boundaries, which overlap with the Cities of San Diego, National City, Chula Vista, Imperial Beach, and Coronado (Member Cities), that does not mean the Port owns or operates the MS4 facility, and thus the Port would not be responsible for discharges from those MS4 facilities. Therefore, the Port requested revisions to the Tentative Order that clarify this distinction.	San Diego Unified Port District
	RESPONSE: The San Diego Water Board disagrees that the Tentative Order should be revised to include additional clarification. The Port owns and operates MS4 facilities (streets, curbs and gutters, catch basins, etc.) and lands within the tidelands that either convey or discharge storm water runoff into MS4 facilities owned or operated by Member Cities, or directly to receiving waters. The Port is responsible for complying with permit conditions pertaining to discharges from MS4 facilities and lands the Port owns or operates that discharge into MS4 facilities of Member Cities or directly to receiving waters. The Port must provide the evidence to demonstrate that it does not own or operate MS4 facilities or lands that discharge storm water runoff directly or indirectly into the MS4 facilities owned by the Member Cities. No changes were made to the Tentative Order as a result of this comment.	

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Gnl-7	GENERAL COMMENTS	
	COMMENT: *Compliance with all the discharge prohibitions in the Regional MS4 Permit under all circumstances is likely impossible.* The Cities of Dana Point and Laguna Beach asserts that compliance with all the discharge prohibitions in the Regional MS4 Permit under all circumstances is not practicable and likely impossible. The Cities go on to assert that the Cities are in a position of being required to comply with the discharge prohibitions under all circumstances, or are being required to meet a "zero discharge standard," both of which are impossible to achieve.	City of Dana Point City of Laguna Beach
	RESPONSE: The San Diego Water Board does not disagree with the assertion that the Copermittees are not in compliance with all the discharge prohibitions in the Regional MS4 Permit under all circumstances. The San Diego Water Board disagrees that it is not practicable and likely impossible to comply with all of the discharge prohibitions under all circumstances. The cases cited in support of the commenters' argument are inapposite and factually distinguishable from Order No. R9-2013-0001 (as amended) and the discharge prohibitions and receiving water limitations provisions therein. To date, the Copermittees have not implemented programs that are capable of complying with all of the discharge prohibitions under all circumstances, but that does not mean it is not practicable nor impossible. The assertion that complying with all the discharge prohibitions in the Regional MS4 Permit under all circumstances is not practicable and impossible cannot be supported without first demonstrating that the Copermittees have implemented all of their programs to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges to the maximum extent practicable (MEP). Moreover, several audits conducted recently by the San Diego Water Board indicate that the Copermittees may not be adequately implementing their basic jurisdictional runoff management program (JRMP) requirements to reduce pollutants in storm water discharges to the MEP standard. Even if the Copermittees implemented the basic JRMP requirements to the MEP standard, the Copermittees can also implement additional practicable actions or programs to comply with all of the discharge prohibitions in the Regional MS4 Permit.	

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Gnl-8	GENERAL COMMENTS	
	COMMENT: *Request for clarification by City of Lake Forest for applicability of the Water Quality Improvement Plan development requirements.* The City of Lake Forest requested clarification on its participation in development of the Water Quality Improvement Plan, based on the agreement that discharges from its MS4 in the San Diego Region will be regulated by the Santa Ana Water Board.	City of Lake Forest
	RESPONSE: The San Diego Water Board expects the City of Lake Forest to contribute to development of the Water Quality Improvement Plan and describe the water quality improvement strategies that will be implemented by the City to comply with TMDL requirements. The strategies implemented by the City of Lake Forest are only expected to implement the requirements of the Phase I MS4 Permit issued by the Santa Ana Water Board, except when and where additional strategies (known as optional jurisdictional strategies or Watershed Management Area strategies in the Regional MS4 Permit) may be necessary to achieve TMDL requirements. Likewise, if the Water Quality Improvement Plan includes final numeric goals that are not based on TMDL requirements, the City of Lake Forest is expected to include descriptions of the water quality improvement strategies that the City may implement to contribute toward achieving those final numeric goals.	

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Gnl-8	GENERAL COMMENTS	
	COMMENT: *Recommendations for actions that can be implemented to improve water quality.* The South Laguna Civic Association provided several recommended actions that may result in improvements to water quality.	South Laguna Civic Association
	RESPONSE: The San Diego Water Board appreciates the recommendations. The recommendations, however, appear to be actions that could be implemented as part of water quality improvement strategies by the Copermittees, and not necessarily appropriate to include into the requirements of the Tentative Order. The recommended actions provided by the commenter can be brought to the attention of the south Orange County Copermittees during the development of the Water Quality Improvement Plan. No changes were made to the Tentative Order as a result of this comment.	

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Gnl-10	GENERAL COMMENTS	
	COMMENT: *The Regional MS4 Permit illegally authorizes compliance schedules for CTR-based TMDLs beyond May 18, 2010.* The Environmental Groups assert the Tentative Order and the Regional MS4 Permit illegally authorize compliance schedules for TMDLs to achieve compliance with the CTR as required by the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP).	Environmental Groups
	RESPONSE: The San Diego Water Board disagrees that the Tentative Order or the Regional MS4 Permit are in conflict with the SIP. The Tentative Order and Regional MS4 Permit are consistent with the TMDLs and the SIP. The Regional MS4 Permit establishes requirements for the regulation of storm water discharges, and the compliance schedule requirements of the SIP do not apply to storm water discharges. Please refer to footnote 1 on page 3 of the SIP which states, "*This Policy does not apply to regulation of storm water discharges. The SWRCB has adopted precedential decisions addressing regulation of municipal storm water discharges in Orders WQ 91-03, 91-04, 96-13, 98-01, 99-05, and 2001-15.*"	

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A-1	PROVISION A: PROHIBITIONS AND LIMITATIONS	
	COMMENT: *Requests to include language in the prohibitions and limitations of Provision A that is linked to the alternative compliance pathway under Provision B.3.c.* The Orange County and San Diego County Copermittees, as well as several individual Copermittees, requested the addition of language to Provision A that explicitly states the implementation of the alternative compliance pathway under Provision B.3.c constitutes compliance with the discharge prohibitions and receiving water limitations in Provision A.	Orange County Copermittees City of Lake Forest City of San Clemente City of San Juan Capistrano San Diego County Copermittees City of Santee County of San Diego
	RESPONSE: The San Diego Water Board disagrees that it is appropriate or necessary to include additional language to Provision A. Provision A is consistent with the precedential language that was issued under State Water Board Order WQ 99-05. State Water Board Order WQ 2015-0075, which supports the inclusion of the alternative compliance pathway under Provision B.3.c, also states that Phase I MS4 permits should continue to use the receiving water limitations provisions as directed by Order WQ 99-05. No changes were made to the Tentative Order as a result of this comment.	

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A1-1	PROVISION A.1: Discharge Prohibitions	
	COMMENT: *Request to correct State Water Board Resolution No. 2012-0012 reference in Provision A.1.d to Resolution No. 2012-0031.* The City of San Diego requested that the reference to State Water Board Resolution No. 2012-0012 in Provision A.1.d be changed to Resolution No. 2012-0031.	City of San Diego
	RESPONSE: The San Diego Water Board agrees that the correction is appropriate. The reference to "State Water Board Resolution No. 2012-0012" under Provision A.1.d has been revised to "State Water Board Resolution No. 2012-0012, as amended by State Water Board Resolution No. 2012-0031."	

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A2-1	PROVISION A.2: Receiving Water Limitations	
	COMMENT: *Request for removal of receiving water limitations language from Regional MS4 Permit.* The County of San Diego requested that the San Diego Water Board use its discretion to remove the requirements to comply with receiving water limitations in Provision A.2 of the Regional MS4 Permit.	County of San Diego
	RESPONSE: The San Diego Water Board disagrees that it is appropriate to remove the requirements to comply with receiving water limitations in Provision A.2 of the Regional MS4 Permit. The receiving water limitations are consistent with precedential State Water Board Orders WQ 99-05 and WQ 2015-0075. No changes were made to the Tentative Order as a result of this comment.	

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B-1	PROVISION B: WATER QUALITY IMPROVEMENT PLANS	
	COMMENT: *Request to revise the language in Provision B.1 to specify the Water Quality Improvement Plans are to address discharges from the MS4.* The City of San Diego requested Provision B.1 be revised to state that the Copermittees must develop a Water Quality Improvement Plan for their MS4 discharges within each of the Watershed Management Areas in Table B-1.	City of San Diego
	RESPONSE: The San Diego Water Board disagrees that the Water Quality Improvement Plans should be specific to just addressing discharges from the MS4. The Regional MS4 Permit is for the regulation of the Copermittees' MS4 discharges, but the Water Quality Improvement Plan is a planning document that requires the Copermittees to evaluate and identify all water quality conditions of concern within a Watershed Management Area. The Copermittees then determine what conditions of concern are the priorities that should be addressed by their individual jurisdictional strategies and/or through watershed-wide strategies. The Water Quality Improvement Plan development process provides the Copermittees flexibility in determining how to address priority issues through establishment of goals that directly improve receiving water quality impacted by MS4 discharges, instead of only limiting goals to MS4 discharges. No changes were made to the Tentative Order as a result of this comment.	

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B2-1	PROVISION B.2: Priority Water Quality Conditions	
	COMMENT: *Request for revisions to the requirements for identifying priority water quality conditions under Provision B.2.* The South Laguna Civic Association provided proposed revisions to the requirements for identifying priority water quality conditions under Provision B.2. The proposed revisions appeared to include mapping of areas, incorporating areas of concern specific to south Orange County, and identifying issues that may be a concern specific to south Orange County.	South Laguna Civic Association
	RESPONSE: The San Diego Water Board reviewed the requested revisions to the requirements for identifying priority water quality conditions under Provision B.2. The San Diego Water Board did not identify any proposed revisions that were appropriate or necessary. The information requested to be included as part of the proposed revisions is information that should be brought to the attention of the south Orange County Copermittees during the development of the Water Quality Improvement Plan. No changes were made to the Tentative Order as a result of this comment.	

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B3c-1	PROVISION B.3.c: Prohibitions and Limitations Compliance Option	
	COMMENT: *Support for the inclusion of the receiving water limitations alternative compliance pathway in the Regional MS4 Permit.* The Riverside County, Orange County, and San Diego County Copermittees, as well as several individual Copermittees submitted comments that support the inclusion of the receiving water limitations alternative compliance pathway proposed to be incorporated into the Regional MS4 Permit as Provision B.3.c.	Riverside County Copermittees Orange County Copermittees City of Lake Forest City of San Clemente City of San Juan Capistrano City of San Diego City of Santee County of San Diego
	RESPONSE: The San Diego Water Board appreciates the support to include the receiving water limitations alternative compliance pathway into the Regional MS4 Permit.	

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B3c-2	PROVISION B.3.c: Prohibitions and Limitations Compliance Option	
	COMMENT: *Requests for revisions to the requirement for developing and incorporating annual milestones into the schedules for the alternative compliance pathway.* The Riverside County, Orange County, and San Diego County Copermittees, as well as several individual Copermittees requested revisions to the requirement to develop and incorporate annual milestones into the schedules for the alternative compliance pathway under Provision B.3.c. The Copermittees assert that annual milestones are burdensome, unworkable, and not meaningful. The Copermittees requested that milestones be limited to one or two milestones per permit term.	Riverside County Copermittees Orange County Copermittees City of Lake Forest City of San Clemente City of San Juan Capistrano San Diego County Copermittees City of San Diego City of Santee
	RESPONSE: The San Diego Water Board considered the proposed revisions and rationale provided and determined that revisions to the requirement for developing and incorporating annual milestones are appropriate. However, the San Diego Water Board does not agree that milestones should be limited to just one or two per permit term. The development and incorporation of annual milestones into the alternative compliance pathway is necessary for a Copermittee to be able to demonstrate to the San Diego Water Board and the public that there is a commitment to implementing a credible, rigorous, ambitious, and transparent plan to improve the quality of its MS4 discharges and/or receiving waters within its jurisdiction. The San Diego Water Board agrees, however, that annual milestones may become less meaningful after 5 or 10 years. Therefore, Provision B.3.c.(1)(a)(vii) and footnote 9 have been revised as follows: Provision B.3.c.(1)(a)(vii) For each final numeric goal developed pursuant to Provisions B.3.a and B.3.c.(1)(a)(i)-(v), ~~at least one~~ annual milestones[9] and the dates for ~~its~~ their achievement must be included within each of the next five (5) Water Quality Improvement Plan Annual Report reporting periods, or until the final numeric goal is achieved. Annual milestones and the dates for their achievement for the 5 Water Quality Improvement Plan Annual Report reporting periods of the next permit term, or until the final numeric goal is achieved, must be provided as part of the Report of Waste Discharge required pursuant to Provision F.5. Footnote 9 Annual milestones for each final numeric goal must ~~build upon previous milestones and lead to~~ be clearly and directly linked to, or demonstrate progress is being made toward, the achievement of the final numeric	

B3c-2	PROVISION B.3.c: Prohibitions and Limitations Compliance Option	
	goal. The annual milestones may consist of water quality improvement strategy implementation phases, interim numeric goals, and other acceptable metrics. The annual milestones may address multiple numeric goals and/or multiple water bodies, as applicable and appropriate.	

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B3c-3	PROVISION B.3.c: Prohibitions and Limitations Compliance Option	
	COMMENT: *Requests for revisions to provide additional clarifying language for when a Copermittee is deemed in compliance with receiving water limitations.* The Riverside County Copermittees requested revisions to the alternative compliance pathway requirements under Provision B.3.c.(2) and the iterative process requirements under Provision A.4 to clarify when a Copermittee is deemed in compliance with receiving water limitations, especially relative to other Copermittees if updates are needed. The Environmental Groups requested revisions to Provision B.3.c.(2) to strictly require achievement of annual milestones and remove the potential for updates as a clearer way of determining when a Copermittee is no longer deemed in compliance.	Riverside County Copermittees Environmental Groups
	RESPONSE: The San Diego Water Board disagrees that revisions to Provision B.3.c.(2) are necessary to clarify when a Copermittee is deemed in compliance. The requirements under Provision B.3.c.(2) are clear criteria that the San Diego Water Board will use to determine if a Copermittee can be deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b. The commenters did, however, identify a scenario during the period of time a Copermittee has submitted "acceptable rationale and recommends appropriate modifications" and the San Diego Water Board accepts the rationale and recommended modifications where it may not be clear if a Copermittee is or is not in compliance. The intent was to continue deeming the Copermittee in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b during this period of time. To clarify this intent, the following has been added to the last paragraph of the discussion of Provision B.3.c on page F-62 in the Fact Sheet: The Copermittee continues to be deemed in compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b during the time the San Diego Water Board reviews the rationale and recommended modifications to the interim numeric goals, and/or water quality improvement strategies, and/or schedules. If and when the San Diego Water Board determines that it does not accept the rationale or recommendations, the Copermittee will be notified they are no longer deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b.	

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B3c-4	PROVISION B.3.c: Prohibitions and Limitations Compliance Option	
	COMMENT: *Requests to include compliance with receiving water limitations during the Water Quality Improvement Plan planning and development process.* The Riverside County and Orange County Copermittees, several Orange County cities, as well as the County of San Diego requested that the requirements under Provision B.3.c be revised to include compliance with the prohibitions and limitations of Provision A during the development of the Water Quality Improvement Plans. Several of the comments also assert that including compliance during development of the Water Quality Improvement Plan is consistent with State Water Board Order WQ 2015-0075.	Riverside County Copermittees Orange County Copermittees City of Dana Point City of Laguna Beach City of Lake Forest City of San Clemente City of San Juan Capistrano County of San Diego
	RESPONSE: The San Diego Water Board disagrees that it is appropriate to deem a Copermittee in compliance with any of the prohibitions and limitations under Provision A before a Water Quality Improvement Plan has been submitted and accepted by the San Diego Water Board. The San Diego Water Board also disagrees that State Water Board Order WQ 2015-0075 communicates that the State Water Board expects or requires in any way that Regional Water Boards allow for compliance with receiving water limitations during development of watershed management plans. The San Diego Water Board is concerned that allowing for compliance during the development of the Water Quality Improvement Plan would remove the motivation or incentive for Copermittees to develop a credible, rigorous, ambitious, and transparent plan. Before the San Diego Water Board can make a determination that a Copermittee has a credible, rigorous, ambitious, and transparent plan that can demonstrate discharges from a Copermittee's MS4 will not cause or contribute to exceedances of water quality standards in receiving waters, or that receiving waters will be protected from MS4 discharges, the San Diego Water Board must first have an opportunity to review the proposed plan. In response to the assertion that State Water Board Order WQ 2015-0075 encourages or mandates alternative compliance pathways to include compliance during development of the Water Quality Improvement Plan, the commenters failed to provide a clear citation of this direction. There is nothing within the State Water Board Order that explicitly requires the inclusion of an alternative compliance pathway in Phase I MS4 Permit, let alone compliance during development of the plan for alternative compliance. State Water Board Order WQ 2015-0075 only requires the San Diego Water Board to consider inclusion of an alternative compliance pathway, and include findings in the permit if the San Diego Water Board chooses not to include the alternative compliance pathway. In this case, the San Diego Water Board has chosen to incorporate an alternative compliance	

B3c-4	PROVISION B.3.c: Prohibitions and Limitations Compliance Option	
	pathway, but without compliance during the development of the Water Quality Improvement Plan. Furthermore, the San Diego Water Board notes that USEPA has provided written comments to the Los Angeles Water Board (click here and here for links to letters), the Santa Ana Water Board (click here for link to letter), and the State Water Board click here for link to letter) that support the San Diego Water Board's approach to alternative compliance with receiving water limitations, specifically supporting the San Diego Water Board's decision not to include compliance during the development period for the Water Quality Improvement Plan. Based on this expressed support from USEPA, and the other reasons cited above, the San Diego Water Board is not allowing for a Copermittee to be deemed in compliance with the prohibitions and limitations under Provision A during the development of the Water Quality Improvement Plans. No changes were made to the Tentative Order as a result of this comment.	

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B3c-5	PROVISION B.3.c: Prohibitions and Limitations Compliance Option	
	COMMENT: *Request to include receiving water limitations for ASBS under Provision A.2.b as part of alternative compliance pathway.* The City of San Diego requested that the alternative compliance pathway be revised to also include compliance with the ASBS receiving water limitations required under Provision A.2.b.	City of San Diego
	RESPONSE: The San Diego Water Board considered the request to include the receiving water limitations for ASBS under Provision A.2.b as part of the alternative compliance pathway under Provision B.3.c and agree it is appropriate. References to "Provisions A.1.a, A.1.c, A.1.d, A.2.a, and A.3.b" under Provision B.3.c have been revised to "Provisions A.1.a, A.1.c, A.1.d, A.2~~.a~~, and A.3.b."	

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B3c-6	PROVISION B.3.c: Prohibitions and Limitations Compliance Option	
	COMMENT: *Requests for revisions to alternative compliance pathway numeric goal requirements proposed under Provision B.3.c.(1)(a)(iii).* The City of San Diego requested a revision to combine Provisions B.3.c.(1)(a)(iii) and B.3.c.(1)(a)(iv) to reduce confusion regarding whether the categories of numeric goals are mandatory or optional. The County of San Diego requested additional language to be added to Provision B.3.c.(1)(a)(iii) to limit the numeric goals for MS4 discharges only to pollutants or conditions where MS4 discharges are causing or contributing to the impairment.	City of San Diego County of San Diego
	RESPONSE: The San Diego Water Board disagrees that the revisions requested are appropriate or necessary. The City of San Diego's requested revision does not provide more clarity, and actually reduces the available options for numeric goals. Provisions B.3.c.(1)(a)(iii) and B.3.c.(1)(a)(iv) allow a Copermittee to choose interim and final numeric goals applicable to the Copermittee's MS4 outfalls, OR interim and final numeric goals applicable to the receiving waters, OR a combination of both. The City's proposed revisions would only allow a Copermittee to choose interim and final numeric goals applicable to the Copermittee's MS4 outfalls, OR interim and final numeric goals applicable to the receiving waters, but NOT a combination of both. The San Diego Water Board disagrees that the County's proposed revision is necessary because if a Copermittee's MS4 discharges do not contain pollutants that are causing or contributing to an impairment listed on the Clean Water Act Section 303(d) List of Water Quality Impaired Segments, the Copermittee should not have difficulty developing and including final numeric goals that can demonstrate their discharges are not causing or contributing to the impairment. The Copermittee will also have to collect data to demonstrate that the final numeric goals have been achieved and continue to be achieved. The data collected, assessed, and reported will demonstrate that the Copermittee is not causing or contributing to the impairment listed on the Clean Water Action Section 303(d) List. No changes were made to the Tentative Order as a result of this comment.	

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B3c-7	PROVISION B.3.c: Prohibitions and Limitations Compliance Option	
	COMMENT: *The alternative compliance pathway would result in safe harbor protection and should be removed from the Regional MS4 Permit.* The Environmental Groups assert that providing the alternative compliance pathway provides the Copermittees with safe harbor protection, and requested the alternative compliance pathway be removed from the Regional MS4 Permit.	Environmental Groups
	RESPONSE: The San Diego Water Board does not agree that the alternative compliance pathway provides the Copermittees with safe harbor protection that "simply mimics the failed iterative approach." Compliance with the alternative compliance pathway means, for compliance determination purposes, that the San Diego Water Board would deem a Copermittee that has fulfilled the requirements of the alternative compliance pathway as in compliance with the receiving water limitations. As long as the Copermittee is in compliance with the requirements under Provision B.3.c, the San Diego Water Board can consider the Copermittee in compliance with the prohibitions and limitations. Complying with the requirements of Provision B.3.c, however, will require a significant commitment, level of effort, and resources from any Copermittee that chooses to implement it. Any Copermittee that can comply with the requirements of Provision B.3.c will also be demonstrating a well defined and transparent commitment to improve water quality. Please also see response~~s~~ to comment~~s~~ ~~Gnl-10 and~~ B3c-8. No changes were made to the Tentative Order as a result of this comment.	

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B3c-8	PROVISION B.3.c: Prohibitions and Limitations Compliance Option	
	COMMENT: *The alternative compliance pathway is inconsistent with the State Water Board's Order.* The Environmental Groups assert that the alternative compliance pathway in the Tentative Order is inconsistent with State Water Board Order WQ 2015-0075. The Environmental Groups assert that the alternative compliance pathway proposed in the Tentative Order is inconsistent because a) it does not contain specific guidance or protocols for a "well defined" and "transparent" analysis, b) it does not require a "finite" period of time to achieve receiving water limitations, and c) it does not include requirements for multi-benefit or storm water resource projects.	Environmental Groups
	RESPONSE: The San Diego Water Board disagrees that the alternative compliance pathway proposed in the Tentative Order is inconsistent with the State Water Board Order. The alternative compliance pathway in the Tentative Order is consistent with the State Water Board Order for the following reasons: a) In response to the assertion that the alternative compliance pathway in the Tentative Order does not include specific guidance or protocols for a "well defined" and "transparent analysis, the approach of the alternative compliance pathway in the Tentative Order is actually more "well defined" and "transparent" than the example provided by the commenter. The commenter provides permit language from the Los Angeles MS4 Permit as an example of specific guidance and protocols for a reasonable assurance analysis. While there is more description as to what components the reasonable assurance analysis must include, fundamentally the analysis is based on a computer model consisting of equations with assumptions which utilize data that are entered into and processed by a computer. Many of the variables in the equations will be based on assumptions, and members of the public may not know or understand how those variables may impact the results. The Los Angeles MS4 Permit does not include provisions that allows for or requires public participation or review of the model, its assumptions, and inputs. In contrast, the alternative compliance pathway in the Tentative Order does require an analysis with "clearly stated assumptions" which must go through a public participation process that allows the public to review and provide comments on the analysis methodology and the assumptions included in the analysis. The main difference in the approaches is that the Copermittee has more flexibility with how to do the analysis, and as long as there is understanding and support from the public and the San Diego Water Board. The Copermittee is not just limited to one or two "acceptable" models, but also is not precluded from the use of those models. The Tentative Order alternative compliance pathway is a truly transparent process for the public and provides for the public to participate in how the analysis is defined. Based on these	

B3c-8	PROVISION B.3.c: Prohibitions and Limitations Compliance Option	
	considerations, the analysis requirement is "well defined" and "transparent" consistent with the State Water Board Order. b) In response to the assertion that the alternative compliance pathway in the Tentative Order does not require a "finite" period of time to achieve compliance with receiving water limitations, the alternative compliance pathway requires a Copermittee to provide a schedule for when receiving water limitations are expected to be achieved. Any schedule with an expected end date is "finite." However, "finite" should not mean there is not room for making adjustments to the schedule if conditions warrant it. Absent the alternative compliance pathway, no assessments would necessarily be conducted to determine if or when receiving water limitations have been fully achieved. The San Diego Water Board prefers a permit that will provide support, incentive, and motivation for the Copermittees to achieve compliance with receiving water limitations within a foreseeable future rather than a permit that only has the threat of enforcement in the present and the foreseeable future. However, while the alternative compliance pathway removes the immediate threat of enforcement for violations of receiving water limitations, it also includes additional requirements that can be used to hold the Copermittee more accountable for implementing strategies to achieve compliance with receiving water limitations. In the end, the San Diego Water Board believes that the alternative compliance pathway provides a path to compliance with receiving water limitations that is "finite" compared to the "iterative process" that was previously required, consistent with the State Water Board Order. c) In response to the assertion that the alternative compliance pathway in the Tentative Order does not include requirements for multi-benefit or storm water resource projects, the San Diego Water Board acknowledges there is no text in Provision B.3.c that includes the term "multi-benefit." However, the Tentative Order does include several provisions that encourage multi-benefit and regional storm water resource projects without using the term "multi-benefit." The commenter should first review Provisions B.3.b.(1)(b) and B.3.b.(2). While these provisions are not specifically mentioned under Provision B.3.c, they are required to be included in the Water Quality Improvement Plan, which is where the alternative compliance pathway requirements of Provision B.3.c must be included. Provision B.3.b.(1)(b) requires each Copermittee to identify strategies to retrofit areas of existing development and rehabilitate conditions of channels or habitats within its jurisdiction, which are considered multi-benefit strategies. Provision B.3.b.(2) also requires the Copermittees in the Watershed Management Area to identify strategies to retrofit areas of existing development and rehabilitate conditions of	

B3c-8	PROVISION B.3.c: Prohibitions and Limitations Compliance Option	
	channels or habitats that are regional or multi-jurisdictional. Tied to Provisions B.3.b.(1)(b) and B.3.b.(2) are also the jurisdictional runoff management program (JRMP) requirements under Provisions E.3.c.(3) and E.5.e. Provision E.5.e requires each Copermittee to identify areas of existing development within its jurisdiction for retrofit and rehabilitation projects, and to identify strategies to facilitate implementation of those projects. Provision E.3.c.(3) provides each Copermittee the option to allow development projects to implement candidate projects identified as part of the optional Watershed Management Area Analysis allowed pursuant to Provision B.3.b.(4), also included in the Water Quality Improvement Plan. The candidate projects include several types of multi-benefit and storm water resource type projects, including but not limited to stream or riparian area rehabilitation, retrofitting existing infrastructure to incorporate storm water retention or treatment, regional BMPs, groundwater recharge projects, water supply augmentation, and land purchases to preserve floodplain functions. Therefore, while the alternative compliance pathway requirements under Provision B.3.c do not include the term “multi-benefit” in the text, the Tentative Order includes several provisions that require or encourage the implementation of multi-benefit and storm water resource projects consistent with the State Water Board Order.	

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B3c-9	PROVISION B.3.c: Prohibitions and Limitations Compliance Option	
	COMMENT: *The Tentative Order violates anti-backsliding requirements and the rationale provided does not support an anti-backsliding exception.* The Environmental Groups assert that the Tentative Order violates the anti-backsliding provisions of the Clean Water Act and its implementing regulations because the San Diego Water Board's findings related to the alternative compliance pathway fail to support the use of anti-backsliding exceptions.	Environmental Groups
	RESPONSE: The San Diego Water Board disagrees that the Tentative Order violates anti-backsliding provisions of the Clean Water Act and the federal regulations. The Clean Water Act generally prohibits the relaxation of effluent limitations in a reissued permit. However, as discussed in the Fact Sheet, it remains unresolved whether anti-backsliding provisions are applicable to the incorporation of an alternative compliance pathway into a regional MS4 permit. (please see page F-32 of the Fact Sheet; *please also see* State Board Order WQ 2015-0075 at pp 18-21, stating "it is unnecessary, however, to resolve the ultimate applicability of the regulatory anti-backsliding provisions"). Even if the anti-backsliding provisions do apply, the alternative pathway provisions fit squarely within an exception. There are numerous exceptions to the Clean Water Act's backsliding provisions based on new information. See, e.g., 33 U.S.C. § 1342(o)(2)(B)(i), 40 C.F.R. § 122.44(l)(i(B)(1). Additionally, Under 40 C.F.R. section 122.44(l), anti-backsliding provision do not apply if the circumstances on which the previous permit was based have materially and substantially changed since the time the previous permit was issued and would constitute cause for permit modification or revocation or reissuance under 40 C.F.R. section 122.62. Section 122.62 in turn states that new information not available at the time the previous permit was issued is cause for modification. 40 C.F.R. § 122.62(a)(2). Furthermore, the San Diego Water Board disagrees with the assertion that the new information from the lessons learned and experiences of the Los Angeles Water Board are somehow "unique" to the Los Angeles Region. To the extent that the permitting history in Los Angeles may be considered "unique" in any way, it is still consistent with the San Diego Water Board's experience with storm water permitting over the last decade. The transition to a Regional MS4 Permit in the Fifth Term Permit was driven, in part, by a growing recognition that a watershed management approach required regional action. In the Regional MS4 permit, the San Diego Water Board seeks to provide a consistent set of permit requirements for all of the Copermittees and to promote the efficiencies gained from collective action in jurisdictional runoff management.	

B3c-9	PROVISION B.3.c: Prohibitions and Limitations Compliance Option	
	The San Diego Water Board structured the Regional MS4 Permit to incorporate new information because there has been a statewide paradigm shift with respect to stormwater management. In June 2015, the State Water Board issued a precedential water quality order, Order WQ 2015-0075. This Order directed all of the Regional Water Boards to consider the Los Angeles Water Board's alternative compliance path to receiving water limits in all Phase I MS4 permits going forward (State Water Board Order WQ 2015-0075 at p 51). Moreover, the State Water Board made it clear that all regional water boards had been informed by the lessons learned in Los Angeles, stating "[f]urther, we [the State Water Board] find that all regional water boards are informed by the information gained in the Los Angeles Region, so that any regional water board that adopts an alternative compliance path in a subsequent Phase I permit would not be in violation of anti-backsliding requirements, regardless of the particular storm water permitting history of that region." Id. at p. 22 fn. 74. Thus, while the State Water Board Order relies heavily on the information and evidence related to the Los Angeles County MS4 Permit and its version of an alternative compliance pathway, the information and evidence are also applicable to and are expected to be utilized in the San Diego Region if an alternative compliance pathway is incorporated into the San Diego Regional MS4 Permit. For all of the reasons stated above, the alternative compliance path provisions do not violate federal anti-backsliding provisions. To clarify, however, the discussion on Anti-Backsliding Requirements on page F-32 in the Fact Sheet has been revised as follows: CWA sections 402(o) and 303(d)(4) and federal regulations at 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations or conditions may be relaxed. While this Order allows implementation of an alternative compliance pathway option in Provision B.3.c to constitute compliance with receiving water limitations under certain circumstances, the availability of that alternative and the corresponding availability of additional time to come into compliance with receiving water limitations does not violate the antibacksliding provisions. The receiving water limitations provisions of this Order are imposed under section 402(p)(3)(B) of the Clean Water Act rather than based on best professional judgment, or based on section 301(b)(1)(C) or sections 303(d) or (e), and are accordingly not subject to the anti-backsliding requirements of section 402(o). Although the non-applicability is less clear with respect to the regulatory anti-backsliding provisions in 40 CFR 122.44(l), the regulatory history suggests that USEPA's intent was to establish the anti-backsliding regulations with respect to evolving technology standards for traditional point sources. (See, e.g., 44 Fed.Reg. 32854, 32864 (Jun. 7, 1979)). It	

B3c-9	PROVISION B.3.c: Prohibitions and Limitations Compliance Option	
	is unnecessary, however, to resolve the ultimate applicability of the regulatory anti-backsliding provisions, because the alternative compliance pathway option in Provision B.3.c qualifies for an exception to backsliding as based on new information. The alternative compliance pathway option in Provision B.3.c of this Order was informed by new information available to the Board from experience and knowledge gained through storm water permitting at the Regional Water Boards in the last ten years. There has been a statewide paradigm shift in storm water management. State Water Board Order WQ 2015-0075 directed all of the Regional Water Boards to consider the Los Angeles Water Board's alternative compliance path to receiving water limitations in all Phase I MS4 permits going forward (State Water Board Order WQ 2015-0075 at page 51). Tt, and the Los Angeles Water Board's process of developing over 30 watershed-based TMDLs and implementing several TMDLs since the adoption of the previous permits. In particular, the Los Angeles Water Board recognized the significance of allowing time to plan, design, fund, operate and maintain watershed-based BMPs necessary to attain water quality improvements and additionally recognized the potential for municipal storm water to benefit water supply. Similarly, the San Diego Water Board's experience developing and implementing the Fourth Term MS4 Permits and TMDLs that apply on a regionwide scale (i.e. TMDLs for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region) has resulted in a similar recognition of the need for a watershed-based approach that allows time to plan, design, fund, operate and maintain BMPs to address impaired waters that have been impacted by MS4 discharges. Thus, even if the receiving water limitations are subject to anti-backsliding requirements, they were revised based on new information that would support an exception to the anti-backsliding provisions. (33 U.S.C. § 1342(o)(2)(B)(i); 40 C.F.R. § 122.44(l)(1); 40 C.F.R. §122.44(l)(2)(i)(B)(1)).	

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B3c-10	PROVISION B.3.c: Prohibitions and Limitations Compliance Option	
	COMMENT: *The Tentative Order violates anti-degradation requirements and the anti-degradation findings are unsupported by evidence.* The Environmental Groups assert that the Tentative Order violates anti-degradation requirements and there is no evidence to support the anti-degradation findings. The Environmental Groups generally assert that anti-degradation findings from State Water Board Order WQ 2015-0075 are not applicable to the Tentative Order and the findings in the Tentative Order are unsupported by evidence.	Environmental Groups
	RESPONSE: Consistent with the direction of the State Water Board Order WQ 2015-0075 adopted in June 2015, the San Diego Water Board considered the inclusion of an alternative compliance pathway into the Regional MS4 Permit. With the inclusion of this new permit component, the federal and state antidegradation policies were considered in light of the evidence in the record and information about the nature of municipal storm water discharges, evolving municipal storm water permits and the State Water Board's precedential order. The Regional MS4 Permit and Fact Sheet were revised to be consistent with all of these considerations. The San Diego Water Board disagrees that the antidegradation findings in the Tentative Order are inadequate and unsupported by evidence in the record. The San Diego Water Board considered relevant information unique to the San Diego Region such as its own storm water permitting history and TMDL adoption and implementation through municipal storm water permits. The San Diego Water Board has adopted seven TMDL Basin Plan amendments that cover at least 30 waterbody-pollutant combinations, similar to the Los Angeles Region. The implementation of these 7 TMDLs through the Regional MS4 Permit is essential for achieving water quality standards in the region. Moreover, the State Water Board's discussion of appropriate antidegradation considerations for the Los Angeles MS4 Permit is equally applicable in the context of the San Diego Water Board's Tentative Order that incorporates an alternative compliance pathway. In its consideration of antidegradation, the State Water Board acknowledges that the Los Angeles MS4 permit "improves on past practices that have been inadequate to protect water quality, and includes a monitoring and assessment program that will identify any changes in water quality. [fn.] In general, under the Los Angeles MS4 Order, we expect to see a trajectory away from any past degradation, even if there may be some continued short-term degradation." (Order WQ 2015-0075, p. 26.) Likewise, the Regional MS4 Permit now requires Copermittees to design watershed based monitoring and assessment programs that promote and track progress towards meeting the relevant water quality objectives. As such, were the State Water Board considering the Tentative Order, it likely would reach the same conclusion about the San Diego Regional MS4 Permit.	

B3c-10	PROVISION B.3.c: Prohibitions and Limitations Compliance Option	
	The commenters incorrectly assert that the San Diego Water Board is required, but has failed, to follow procedures and requirements set forth in a USEPA document titled "*Interim Economic Guidance for Water Quality Standards Workbook"* (March 1995) (Workbook). USEPA's Workbook provides guidance that states may choose, but are not required, to follow. Although the Workbook does provide some information that states *may* use to consider whether degradation of high-quality waters is warranted from an economic impacts perspective, the guidance was not crafted to be used in the context of permitting of MS4 discharges. (See USEPA Workbook, cover memo, pp. 1-2 and Workbook, p. 1-1.) Instead, the San Diego Water Board has considered available guidance provided by the State Water Board in the Administrative Procedures Update (APU) 90-004 in conjunction with, among other things, available evidence about the quality of the receiving waters for discharges of storm water in finding that the Tentative Order complies with federal and state anti-degradation policies[1]. The antidegradation findings in the Tentative Order, like those adopted in the State Water Board Order for the final Los Angeles MS4 Permit, are supported by substantial evidence in the record for the Regional MS4 Permit. In the stormwater context, a generalized antidegradation analysis is appropriate. As the State Water Board acknowledges, guidance provided in the APU 90-004 "may be construed to exempt [a regional water board] from conducting an extensive pollutant by pollutant analysis for each water body in the region" where, as here, there is insufficient data available to carry out a complete antidegradation analysis for each water body-pollutant combination." (See Order WQ 2015-0075, p. 25.) The State Water Board notes the APU-90-004 "contemplates the appropriate antidegradation analysis for a discrete discharge or facility. It has limited value when considering anti-degradation in the context of storm water discharges from diffuse sources, conveyed through multiple outfalls, with multiple pollutants impacting multiple water bodies within a municipality, or in this case, a region, especially given that reliable data on the baseline water quality from 1968 is not available." (Id., p. 27; see also id., p. 27, n. 90 ["We note that USEPA did not conduct a detailed antidegradation analysis in issuing NPDES Permit No. DC00000221 for MS4 discharges to the District of Columbia, presumably for similar reasons. The court in *Asociacion de Gente Unida* also relied on APU 90-004 in part in rejecting an antidegradation analysis conducted by the Central Valley Regional Water Quality Control Board for discharges of pollutants to groundwater from dairy facilities region-wide, but the court's objection was to the regional water board's reliance on an illusory prohibition of discharge to groundwater in finding that no antidegradation analysis	

[1] See, e.g., 1996, 1998, 2002, 2006, 2010 Clean Water Action section 303(d) Lists for the San Diego Region, and monitoring reports from the San Diego County, Orange County, and Riverside County Copermittees since the First Term MS4 Permits issued in 1990.

B3c-10	PROVISION B.3.c: Prohibitions and Limitations Compliance Option	
	was required, not to the sufficiency of any generalized antidegradation analysis the Board might have conducted in lieu of its reliance on the prohibition. (210 Cal.App.4th at pp. 1271-1273.]" Despite the commenters' assertions, the San Diego Water Board provides a clear statement of the basis for finding that the Tentative Order is consistent with the federal and state antidegradation policies. No revisions to the Tentative Order were made in response to these comments.	

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B5-1	PROVISION B.5: Iterative Approach and Adaptive Management Process	
	COMMENT: *Request for clarification of timing and conditions for alternative compliance pathway analysis updates.* The San Diego County Copermittees and the County of San Diego requested the addition of a provision under the Iterative Approach and Adaptive Management Process requirements of Provision B.5 to clarify the timing and conditions for when the analysis required for the alternative compliance pathway under Provision B.3.c.(1)(b) has to be updated.	San Diego County Copermittees County of San Diego
	RESPONSE: The San Diego Water Board has considered the requested additional language and determined that adding clarifying language is appropriate. The following text has been added as Provision B.5.d: **d. ADAPTATION OF PROHIBITIONS AND LIMITATIONS COMPLIANCE OPTION** If a Copermittee has implemented the Prohibitions and Limitations Compliance Option allowed to be included in the Water Quality Improvement Plan pursuant to Provision B.3.c, the Copermittee must re-evaluate and adapt the numeric goals, water quality improvement strategies, schedules, and annual milestones required under Provision B.3.c.(1) when significant new information becomes available, or with the Report of Waste Discharge required pursuant to Provision F.5. Significant changes in the numeric goals, water quality improvement strategies, schedules, or annual milestones requires an update to the analysis required under Provision B.3.c.(2).	

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D4a-1	PROVISION D.4.a: Receiving Waters Assessments	
	COMMENT: *Recommended revisions to transitional assessment requirements under Provision D.4.a.(1)(a).* The Riverside County Copermittees noted that Provision D.4.a.(1)(a) prescribes that assessments required to be made under Provision D.4.a.(2) must be included in each Copermittees' transitional monitoring and assessment reports; however, Provision D.4.a.(2)(e) requires determination of whether strategies identified in the Copermittees' Water Quality Improvement Plan are progressing towards achieving interim and final numeric goals described in the Water Quality Improvement Plan. The Riverside County Copermittees provided their understanding that transitional monitoring and assessment applies to the time period when the Copermittees' Water Quality Improvement Plan is being developed, and therefore assessments made during this time period cannot provide information on the progress of the Water Quality Improvement Plan. Based on their observations, the Riverside County Copermittees recommended revisions to Provision D.4.a.(1)(a).	Riverside County Copermittees
	RESPONSE: The San Diego Water Board disagrees that the revisions to Provision D.4.a.(1)(a) are necessary. It is true that the transitional monitoring and assessment applies to the time period when the Water Quality Improvement Plan is being developed. The commenters can fulfill the assessment requirement of Provision D.4.a.(2)(e) by either stating that they cannot make a determination until the Water Quality Improvement Plan is accepted and implemented, or assess the strategies that are currently being implemented at the time of the assessment and are expected to be included in the Water Quality Improvement Plan. The San Diego Water Board expects the assessments reported during the transitional period to serve as a baseline for improvements in water quality as the Water Quality Improvement Plans are implemented over time. No changes were made to the Tentative Order as a result of this comment.	

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E2-1	PROVISION E.2: Illicit Discharge Detection and Elimination	
	COMMENT: *Requests for revisions to clarify implementation of the illicit discharge and detection program under Provision E.2 is compliance with the requirement to effectively prohibit non-storm water discharges to the MS4.* The Orange County Copermittees, as well as the Cities of Dana Point and Laguna Beach, requested revisions to Provision E.2 to explicitly state that implementation of the illicit discharge detection and elimination requirements under Provision E.2 constitutes compliance with effective prohibition of non-storm water discharges to the MS4 required under Provision A.1.b.	Orange County Copermittees City of Dana Point City of Laguna Beach
	RESPONSE: The San Diego Water disagrees that revisions to Provision E.2 are necessary. Provision A.1.b explicitly states that Copermittees are required to effectively prohibit non-storm water discharges to the MS4 "*through the implementation of Provision E.2*." The Copermittees are already expected to demonstrate compliance with Provision A.1.b through the implementation of Provision E.2. If a Copermittee has not adequately implemented Provision E.2, then the Copermittee is not only, not in compliance with the requirements of Provision E.2, but by default will also not be in compliance with Provision A.1.b. The San Diego Water Board, however, recognizes that additional clarification may be helpful in understanding that implementing the requirements of Provision E.2 is how the San Diego Water Board will assess a Copermittee's compliance with the requirement to effectively prohibit non-storm water discharges to the MS4 under Provision A.1.b. Therefore, the San Diego Water Board has revised the opening paragraph of the discussion for Provision E.2 in the Fact Sheet (page F-81) to the following: Provision E.2.(Illicit Discharge Detection and Elimination) requires each Copermittee to implement an illicit discharge detection and elimination program to effectively prohibit non-storm water discharges to the MS4 by actively detecting and eliminating illicit discharges and disposal into its MS4. <u>If the San Diego Water Board finds that a Copermittee is fully implementing the requirements of Provision E.2, then the Copermittee is deemed in compliance with the effective prohibition of non-storm water discharges to the MS4 required under Provision A.1.b.</u>	

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E2-2	PROVISION E.2: Illicit Discharge Detection and Elimination	
	COMMENT: *Request for clarification of discharges of potable water sources under Provision E.2.a.(3)(f).* The Cities of Dana Point and Laguna Beach requested a clarification of the definition of "discharges from potable water sources" under Provision E.2.a.(3)(f). It is not clear to the Cities whether "potable discharges" are intended to include runoff derived from turf or ornamental plant irrigation.	City of Dana Point City of Laguna Beach
	RESPONSE: Discharges from potable water sources are sources of water that have been treated to drinking water standards and discharged to the MS4. Discharges of potable water that are applied to turf or ornamental plant irrigation before running off to the MS4 are not qualified as discharges of potable water under Provision E.2.a.(3)(f).	

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E3b1-1	PROVISION E.3.b.(1): Definition of Priority Development Project	
	COMMENT: *Request for revisions to the definition of Priority Development Projects under Provision E.3.b.(1).* The City of San Diego requested revisions to combine Provisions E.3.b.(1)(c) and E.3.b.(1)(e) under the provisions defining Priority Development Projects.	City of San Diego
	RESPONSE: The San Diego Water Board disagrees that combining sub-sections (c) and (e) of Provision E.3.b.(1) is appropriate. Sub-section (c) has a minimum square footage trigger for both new development projects and redevelopment projects. In contrast, subsection (e) has a minimum square footage trigger for redevelopment projects only; new development projects consisting of automotive repair shops and retail gasoline outlets are considered Priority Development Projects regardless of size.	

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E3b3-1	PROVISION E.3.b.(3): Priority Development Project Exemptions	
	COMMENT: *Request for Priority Development Project exemption for "self-remediating" projects.* The Orange County Copermittees requested that the list of Priority Development Project Exemptions under Provision E.3.b.(3) be revised to include projects that are effectively self-remediating (i.e. all rainfall is retained) including, but not limited to, reservoirs and swimming pools.	Orange County Copermittees
	RESPONSE: The San Diego Water Board disagrees that the requested change is necessary. If all rainfall is retained on a project, then the project has met the design standard, and an exemption is not needed. No changes were made to the Tentative Order as a result of this comment.	

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E3c1-1	PROVISION E.3.c.(1): Storm Water Pollutant Control BMP Requirements	
	COMMENT: *Request for revisions to clarify the biolfiltration storm water pollutant control BMP performance criteria.* The County of San Diego requested a revision to Provision E.3.c.(1)(a)(i)[b] to clarify the intent and applicability of the biolfiltration BMP design criteria.	County of San Diego
	RESPONSE: The San Diego Water Board disagrees that the proposed change is necessary. The wording describing the design requirements adequately describe the intent and applicability of the biofiltration BMP design criteria. Any proposed change incorporated during the adoption proceedings of the Tentative Order could be interpreted as a change in the requirement, when in fact there is no change. No changes were made to the Tentative Order as a result of this comment.	

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E3c1-2	PROVISION E.3.c.(1): Storm Water Pollutant Control BMP Requirements	
	COMMENT: *The San Diego Water Board is requiring increasingly stringent on-site storm water retention without evidence that the 2010 Southwest Riverside MS4 Permit requirements are not working.* CICWQ asserts that the Tentative Order has more stringent on-site storm water retention requirements than the 2010 Southwest Riverside County MS4 Permit (Order No. R9-2010-0016) requirements without any evidence that the requirements of Order No. R9-2010-0016 are not working to protect water quality and maintain beneficial uses.	Construction Industry Coalition on Water Quality (CICWQ)
	RESPONSE: The San Diego Water Board disagrees with the assertion that the Tentative Order has more stringent on-site storm water retention requirements over and above the requirements of Order No. R9-2010-0016. The purpose of the on-site retention requirement in both the Tentative Order and Order No. R9-2010-0016 is to retain on-site the pollutants contained in the volume of storm water runoff produced from a 24-hour 85th percentile storm event. This requirement has not changed from Order No. R9-2010-0016, and therefore the commenter is incorrect in stating that the San Diego Water Board is requiring additional prescriptive performance measures for retaining storm water runoff. This is the maximum extent practicable (MEP) standard recognized by the San Diego Water Board and is consistent with the Fourth Term MS4 Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), as well as Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), Los Angeles Water Board Order Nos. R4-2010-0108 and R4-2012-0175 (Ventura County and Los Angeles County MS4 Permits, respectively). Additionally, the storm water pollutant control and hydromodification management BMP requirements in the Tentative Order are more flexible than in Order No. R9-2010-0016 by providing an optional Alternative Compliance Program under Provision E.3.c.(3) of the Regional MS4 Permit. The Alternative Compliance Program, if developed by a Copermittee, would allow Priority Development Projects to fully comply with storm water pollutant control and hydromodification management BMP requirements either on-site, offsite, or a combination of both, if doing so would provide greater water quality benefit to the watershed.	

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E3c2-1	PROVISION E.3.c.(2): Hydromodification Management BMP Requirements	
	COMMENT: *Request for revisions to requirements to manage critical coarse sediment yield areas.* CICWQ asserts that the Tentative Order requirements for Priority Development Projects to "avoid critical sediment yield areas" are unnecessarily restrictive. The County of San Diego requested that the requirement to manage critical course sediment yield areas be moved from the hydromodification management BMP performance standard requirements under Provision E.3.c.(2)(b) to Provision E.3.d as part of the BMP Design Manual update to be addressed regionally.	County of San Diego Construction Industry Coalition on Water Quality (CICWQ)
	RESPONSE: The San Diego Water Board disagrees that the requirements to avoid critical sediment yield areas are unnecessarily restrictive or that they should be moved from under Provision E.3.c.(2)(b) to Provision E.3.d. The requirements are necessary to protect receiving waters from erosive flows caused by land development. As explained in the Fact Sheet to the Tentative Order, hydromodification, which is caused by both altered storm water flow and altered sediment flow regimes, is largely responsible for degradation of creeks, streams, and associated habitats in the San Diego Region. In an ongoing study by the Stormwater Monitoring Coalition to assess the health of streams throughout Southern California, researchers found that three of the four highest risk stressors to creeks (percent sands and fines present, channel alteration, and riparian disturbance) were related to physical habitat (*Assessing the Health of Southern California Streams, Stormwater Monitoring Coalition*, Fact Sheet). Researchers studying flood frequencies in Riverside County have found that increases in watershed imperviousness of only 9-22 percent can result in increases in peak flow rates for the two-year storm event of up to 100 percent (Schueler and Holland, 2000. *Storm Water Strategies for Arid and Semi-Arid Watersheds*, (Article 66). The Practice of Watershed Protection). Such changes in runoff have significant impacts on channel morphology, and given the current state of science the San Diego Water Board has included these requirements to reduce these potential impacts to receiving waters that may be caused by development projects. Placement of impervious surfaces as a result of urbanization is largely responsible for erosional impacts to streams because placement of impervious surfaces encapsulates "good" sediment (such as sand, gravel, rocks and cobbles) that would normally replenish creek beds and banks to help stabilize them. For this reason, the Tentative Order requires Priority Development Projects to avoid critical sediment yield areas, as defined by the	

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E3c2-1	PROVISION E.3.c.(2): Hydromodification Management BMP Requirements	
	Copermittees, or implement measures to allow coarse sediment to be discharged to receiving waters, such that there is no net impact to the receiving water. Such measures are designed to protect receiving waters and avoid impacts experienced as a result of past land development practices. The San Diego Water Board recognizes that implementation of new requirements is challenging, and is supportive of the Copermittees' efforts to develop guidance for land developers in meeting this requirement. Until this guidance is widely available, Copermittees and land developers should recognize that strict avoidance of critical sediment yield areas is not mandated and that compliance may be achieved by other methods, provided that the stream experiences "no net impact." No changes were made to the Tentative Order as a result of this comment.	

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E3c2-2	PROVISION E.3.c.(2): Hydromodification Management BMP Requirements	
	COMMENT: *Request for interim timeframe exemptions for hydromodification management BMP requirements to be granted outright without any additional study or consideration.* CICWQ asserts that the Tentative Order is eliminating exemptions for hydromodification control, even when stormwater runoff is conveyed in the MS4 system to significantly hardened or engineered channels. CICWQ requested that the San Diego Water Board revise the Tentative Order to make the interim timeframe exemptions under Provision E.3.c.(2)(e) part of the exemptions under Provision E.3.c.(2)(d) without any additional study or consideration.	Construction Industry Coalition on Water Quality (CICWQ)
	RESPONSE: The San Diego Water Board disagrees that the interim timeframe exemptions for hydromodification management BMP requirements should be granted outright without any additional study or consideration. The commenter correctly deduced that the driver behind the requirement to use the pre-development performance standard is the sustainability of geomorphically stable channels and the ability to return urbanized streams to a more natural state. The requirement to use pre-development runoff conditions as the performance standard is needed because using a hydrology baseline that approximates that of an undeveloped, natural watershed is the only way to facilitate the return of more natural hydrological conditions to already built-out watersheds, which in turn supports conditions for rehabilitating degraded or channelized stream segments. Contrary to what the commenter asserts, the Tentative Order does not require Copermittees to remove concrete from channels that are engineered to relieve flooding and protect life and property. The Tentative Order provides exemptions for Priority Development Projects that discharge to receiving waters where there is little threat of erosion, and subsequently implementing BMPs on-site would do little to protect the beneficial uses of such receiving waters. The commenter correctly states that the exemption for engineered channels is temporary. However, the commenter should note that there is a high likelihood that exemptions for engineered channels can become accepted as applicable for a Watershed Management Area. The Tentative Order allows for the Copermittees to recommend exemptions based on completion of an optional Watershed Management Area Analysis pursuant to Provision B.3.b.(4). As part of this effort, the Copermittees would identify, for example, areas of existing development in the watershed suitable for retrofitting, and areas suitable for stream rehabilitation. The Copermittees would also identify areas suitable for exemptions for hydromodification management, such as engineered channels that are needed for the protection of life and property. The interim	

E3c2-2	PROVISION E.3.c.(2): Hydromodification Management BMP Requirements	
	timeframe exemption for engineered channels is not granted outright as permanent exemptions because the areas have not yet been analyzed in the context of stream rehabilitation opportunities. No changes were made to the Tentative Order as a result of this comment.	

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E3c2-3	PROVISION E.3.c.(2): Hydromodification Management BMP Requirements	
	COMMENT: *The requirement in the Regional MS4 Permit for Priority Development Projects to avoid coarse sediment yield areas results in a potential "taking" of private property.* Safari Highlands Ranch asserts that the requirement under Provision E.3.c.(2)(b) of the Regional MS4 Permit for Priority Development Projects to avoid critical coarse sediment yield areas known to the Copermittees or identified by the optional Watershed Management Area Analysis will result in a "taking" of the total land value of private property that is located in areas identified as critical coarse sediment yield areas.	Safari Highlands Ranch
	RESPONSE: The San Diego Water Board disagrees with the assertion that the requirements under Provision E.3.c.(2)(b) results in a "taking" of private property if the development project is located in area identified by the Copermittees as a critical coarse sediment area. Provision E.3.c.(2)(b) does not require the Copermittees to prohibit a development project from going forward if it cannot avoid critical coarse sediment yield areas. Provision E.2.c.(2)(b) states that Priority Development Projects are required to avoid critical sediment yield areas *OR* implement measures that allow critical coarse sediment to be discharged to receiving water, such that there is *no net impact* to the receiving waters. Provision E.3.c.(2)(b) provides the Copermittees the ability to allow Priority Development Projects to implement measures other than avoiding coarse sediment yield areas to achieve *no net impact* to the receiving waters. The Copermittees allows this is through the requirements in their BMP Design Manuals. The San Diego Water Board has reviewed the San Diego County Copermittees' Final Model BMP Design Manual (click here for link), dated June 2015, and found that it allows for a development project proponent to "*propose project-specific onsite measures to ensure that critical coarse sediment can be discharged to receiving waters, such that threre is no net impact to the receiving water*" (see section 6.2.4.2 of Model BMP Design Manual). The Final Model BMP Design Manual does not require avoidance of critical coarse sediment areas as the only option for Priority Development Projects and is in compliance with Provision E.3.c.(2)(b) of the Regional MS4 Permit. Please also see response to comment E3c2-1. No changes were made to the Tentative Order as a result of this comment.	

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E3d-1	PROVISION E.3.d: BMP Design Manual Update	
	COMMENT: *Request for additional time for San Diego County Copermittees to update and implement their BMP Design Manuals.* The San Diego County Copermittees and the County of San Diego requested revisions to Provision E.3.d which would grant Copermittees up to 180 days to incorporate corrections to the definition of Priority Development Projects under Provision E.3.b.(1) and begin implementing their BMP Design Manuals.	San Diego County Copermittees County of San Diego
	RESPONSE: The San Diego Water Board disagrees that more time is needed to update and implement the BMP Design Manuals. In a letter dated May 29, 2015, the San Diego Water Board forewarned the San Diego County Copermittees that changes to the Priority Development Project categories were necessary in order to clearly reflect the intended definitions. At that time, the San Diego Water Board provided the language that is now proposed in the Tentative Order. The Copermittees have had ample opportunity to initiate and complete their local adoption processes in order to meet the BMP Design Manual implementation date. For this reason, more time is not necessary and a delay in BMP Design Manual implementation is not warranted. However, the San Diego Water Board will use Provision F.2.b.(4) to grant the Copermittees an extra 90 days beyond the original BMP Design Manual implementation date of December 24, 2015 to complete the update and begin implementation of the BMP Design Manual. Please also see response to comment F2b-1.	

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E3d-2	PROVISION E.3.d: BMP Design Manual Update	
	COMMENT: *Request for revisions to clarify the effective date of the BMP Design Manual is the same as the implementation date.* The San Diego County Copermittees, the City of San Diego, and the County of San Diego requested revisions to Provision E.3.d to include language that clarifies the effective date of the BMP Design Manual is the same as when the BMP Design Manual begins implementation.	San Diego County Copermittees City of San Diego County of San Diego
	RESPONSE: The San Diego Water Board agrees that the proposed modification would clarify the San Diego Water Board's intention. Provision E.3.d has been modified as follows: a. Each Copermittee must update its BMP Design Manual pursuant to Provision F.2.b. Until the Copermittee has updated its BMP Design Manual pursuant to Provision F.2.b.(1), the Copermittee must continue implementing its current BMP Design Manual. The Copermittee must implement the updated BMP Design Manual within 180 days following completion of the update pursuant to Provision F.2.b.(1), unless directed otherwise by the San Diego Water Board Executive Officer. The date the BMP Design Manual is implemented is the "effective date" of the BMP Design Manual.	

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E3e1-1	PROVISION E.3.e.(1): Structural BMP Approval and Verification Process	
	COMMENT: *Requests for revisions to the proposed language to define projects with prior lawful approval under Provision E.3.e.(1)(a).* The City of San Diego requested a revision to the proposed language to define projects with prior lawful approval to also include projects that have received development approvals. San Diego Coastkeeper and Coastal Environmental Rights Foundation requested revisions that would allow a Priority Development Project to proceed under previous land development requirements only if the Copermittee demonstrates that, among other required conditions, construction activities on the Priority Development Project commenced prior to the effective date of the new BMP Design Manual and that all approvals and permits necessary to complete the implementation of the initially approved design also be obtained prior to the effective date of the new BMP Design Manual.	City of San Diego San Diego Coastkeeper and Coastal Environmental Rights Foundation
	RESPONSE: The San Diego Water Board disagrees that any changes are needed to the proposed language in Provision E.3.e.(1)(a). Specifically, reliance on issuance of a development approval alone is not consistent with the San Diego Water Board's goal of requiring most new Priority Development Projects to be subject to the requirements in the new BMP Design Manual unless limited conditions are met. Nor is it consistent with the *Avco* line of cases, which requires commencement of construction and substantial reliance on the permit as the determining factors for grandfathering projects under previous development requirements. Reliance on issuance of a development approval alone may also result in many fewer Priority Development Projects implementing projects based on the new BMP Design Manual required in Order No. R9-2013-0001 as amended. With regard to the Environmental Groups' comment, the San Diego Water Board believes it is appropriate for the Copermitees to have the ability to allow a Priority Development Project meeting all other required conditions in Provision E.3.e.(1)(a) to proceed under previous land use development requirements if the Copermittee demonstrates that construction activities have commenced before, or within 180 days after, the effective date of the new BMP Design Manual. The Board believes it is appropriate to include a grace period of 180 days after the effective date of the BMP Design Manual in order to provide certainty of requirements for projects in process, and allow for scheduling of construction activities under optimal conditions, such as outside of nesting season, or during the dry season, when impacts from storm water runoff are minimized. And, as long as development projects complete construction of all phases in substantial conformity with the approved design, which includes storm water pollutant control and hydromodification management BMPs approved by the	

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E3e1-1	PROVISION E.3.e.(1): Structural BMP Approval and Verification Process	
	municipality, it is appropriate that prior lawful approval (the ability to proceed with development in accordance with the previous land use development requirements) remain valid during issuance of subsequent permits that may be necessary to complete the project within 5 years after the effective date of the new BMP Design Manual. Five years is an appropriate and reasonable period of time for those projects meeting all other conditions to be completed. No changes were made to the Tentative Order as a result of these comments.	

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E4-1	PROVISION E.4: Construction Management	
	COMMENT: *Request for revisions to construction management program inventory and tracking requirements.* The City of San Diego requested that Provisions E.4.b and E.4.d.(3) be combined because both sections contain information that needs to be collected, inventoried, and tracked.	City of San Diego
	RESPONSE: The San Diego Water Board considered the requested revision and determined that it was not necessary. The Copermittees can implement an inventory and tracking system that may be utilized to manage the data that are collected and needed to fulfill the requirements of both Provision E.4.b and E.4.d.(3). No changes were made to the Tentative Order as a result of this comment.	

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E5c-1	PROVISION E.5.c: Existing Development Inspections	
	COMMENT: *Request to include an optional third-party certification program into the existing development inspection provisions.* Section F.3.b.(4)(c) of Order No. R9-2010-0016 allowed the Riverside County Copermittees the option to propose a third-party certification program for commercial and industrial inspection programs, subject to San Diego Water Board Executive Officer acceptance. The Riverside County Copermittees noted that a similar provision does not exist in the Tentative Order, and requested inclusion of this option in the Regional MS4 Permit.	Riverside County Copermittees
	RESPONSE: At this time the San Diego Water Board does not support the inclusion of a third-party certification program as part of the existing development inspection provisions. The San Diego Water Board has conducted audits of several Copermittees' existing development and post construction BMP inspection programs in the San Diego Region that utilize self certifications or third-party certifications to verify the proper operation and maintenance of post construction BMPs. These audits have found such programs have not adequately confirmed that BMPs are being properly operated and maintained so they are effective at removing pollutants in storm water discharges from commercial and industrial sites to the MEP. However, the Regional MS4 Permit provides the Copermittees significant flexibility in the implementation of their existing development inspection programs, and does not preclude the use of third-party certification programs during years where inspections are not necessarily required. If the Copermittees can develop a third-party certification program that can demonstrate such a program can be implemented in a way that will ensure BMPs are being properly operated and maintained so they are effective at removing pollutants in storm water discharges from commercial and industrial sites to the MEP, the San Diego Water Board may reconsider including such an option into the Regional MS4 Permit during the renewal process anticipated to begin in early 2018. No changes were made to the Tentative Order as a result of this comment.	

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F2b-1	PROVISION F.2.b: BMP Design Manual Updates	
	COMMENT: *Request for revisions to clarify the effective date of the BMP Design Manual.* The San Diego County Copermittees, the City of San Diego, and the County of San Diego requested revisions to Provision F.2.b.(4) to include language that clarifies the effective date of the BMP Design Manual if an update to the BMP Design Manual is required.	San Diego County Copermittees City of San Diego County of San Diego
	RESPONSE: The San Diego Water Board agrees that the proposed modification to the text in Provision F.2.b.(4) would clarify that the BMP Design Manual effective date is no later than 90 days after the San Diego Water Board adopts amendments to Provisions E.3.a-d. Provision F.2.b.(4) will be modified as follows: (4) If the San Diego Water Board amends Provisions E.3.a-d during the permit term but after the Copermittee has completed the update pursuant to Provision F.2.b.(1), the Copermittee must revise its BMP Design Manual to incorporate the amended Provision E.3.a-d requirements as soon as possible but not later than 90 days after the date the San Diego Water Board adopts the amendments to Provisions E.3.a-d, unless otherwise directed by the San Diego Water Board Executive Officer. Under these circumstances, the effective date of the BMP Design Manual is not later than 90 days after the date the San Diego Water Board adopts the amendments to Provisions E.3.a-d, unless otherwise directed by the San Diego Water Board Executive Officer.	

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AttC-1	ATTACHMENT C: Acronyms, Abbreviations, and Definitions	
	COMMENT: *Request for revisions to definition of Construction Activities.* The City of Escondido requested revisions to the definition of Construction Activities in Attachment C to the Regional MS4 Permit. The commenter requested the removal of the term "phase" from the definition because the term introduces artificial phases during a construction project that cannot be readily tracked.	City of Escondido
	RESPONSE: The San Diego Water Board agrees that the revisions are appropriate. The definition of Construction Activities in Attachment C has been revised as follows: **Construction Activities** – Actions implemented during construction of development or redevelopment projects during the Preliminary Tasks ~~Phase~~ (including rough grading and/or disking, clearing and grubbing operations, or any soil disturbance prior to mass grading), Grading or Land Development ~~Phase~~ (including topography and slope reconfiguration, alluvium removals, canyon cleanouts, rock undercuts, keyway excavations, land form grading, and stockpiling of select material for capping operations), Streets and Utility Installation ~~Phase~~ (including excavation and street paving, lot grading, curbs, gutters and sidewalks, public utilities, public water facilities including fire hydrants, public sanitary sewer systems, storm sewer systems and/or other drainage improvements), or Vertical Construction ~~Phase~~ (including the build out of structures from foundations to roofing, including rough landscaping).	

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AttC-2	ATTACHMENT C: Acronyms, Abbreviations, and Definitions	
	COMMENT: *Request for revisions to definition of Redevelopment.* The City of San Diego requested revisions to the definition of Redevelopment in Attachment C to the Regional MS4 Permit to improve the clarity of the definition.	City of San Diego
	RESPONSE: The San Diego Water Board agrees that revisions would provide additional clarity in the definition of Redevelopment. The definition of Redevelopment in Attachment C has been revised as follows: **Redevelopment** – The creation and/or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure~~, and creation or addition of impervious surfaces~~. Replacement of impervious surfaces includes any activity ~~that is not part of a routine maintenance activity~~ where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include routine maintenance activities, such as trenching and resurfacing associated with utility work; pavement grinding; resurfacing existing roadways,~~; new~~ sidewalks ~~construction~~, pedestrian ramps, or bike lanes on existing roads; and routine replacement of damaged pavement, such as pothole repair.	

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AttE-1	ATTACHMENT E: Specific Provisions for Total Maximum Daily Loads	
	COMMENT: *Request for revisions to TMDL requirements in Attachment E to the Regional MS4 Permit to allow independent jurisdictional compliance with TMDLs.* The City of San Diego requested revisions to the TMDL requirements in Attachment E to the Regional MS4 Permit that would allow independent jurisdictional compliance instead of requiring all the Copermittees named as responsible to comply with the TMDL requirements.	City of San Diego
	RESPONSE: The San Diego Water Board disagrees that modifications are needed to the language pertaining to TMDL compliance determination. The commenter correctly asserts that the intent of the language, and in fact, the intent of the Water Quality Improvement Plan concept, is that the Copermittees develop the Water Quality Improvement Plans collectively and evaluate water quality improvement strategies on a watershed basis. The San Diego Water Board recognizes that the Copermittees have no authority over other Copermittees to compel TMDL compliance; therefore, the Tentative Order has multiple compliance determination pathways available to each Copermittee to achieve compliance. The final compliance determination pathways are presented in Attachment E Specific (TMDL) Provisions 1.b.(3), 2.b.(3), 3.b.(3), 4.b.(3), 5.b.(3), 6.b.(3), and 7.b.(3). There are several compliance determination pathways that allow a Copermittee to demonstrate independent jurisdictional compliance with water quality based effluent limitations (WQBELs). No changes were made to the Tentative Order as a result of this comment.	

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AttE6-1	ATTACHMENT E.6: Beaches and Creeks Bacteria TMDLs	
	COMMENT: *Requests for revisions to clarify that water bodies de-listed from the 303(d) List are not subject to the Beaches and Creeks TMDL requirements.* The Orange County Copermittees requested revisions to the Beaches and Creeks Bacteria TMDLs requirements in Attachment E to state that specific water bodies or beach segments included in Table 6.0 that have been delisted from the 2008 Clean Water Act Section 303(d) List of Water Quality Impaired Segments are not subject to any further action as long as monitoring data continues to support compliance with water quality standards.	Orange County Copermittees
	RESPONSE: The San Diego Water Board disagrees that any revisions are necessary or appropriate. The Orange County Copermittees correctly state that the water bodies listed in Table 6.0 must be in compliance with the final TMDL compliance requirements (and WQBELs). If a water body or beach segment has been de-listed, then the MS4 discharge WQBELs and/or receiving water WQBELs should already be achieved, but the BMP WQBELs and the monitoring and assessment requirements are still required to be implemented to maintain the achievement of the MS4 discharge WQBELs and/or receiving water WQBELs in the de-listed water body or beach segment. No changes were made to the Tentative Order as a result of this comment.	

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AttE6-2	ATTACHMENT E.6: Beaches and Creeks Bacteria TMDLs	
	COMMENT: *Request for revisions to compliance dates for the Beaches and Creeks Bacteria TMDLs.* The San Diego County Copermittees, the City of San Diego, and the County of San Diego requested that the compliance dates proposed to be added to Tables 6.1 and 6.4 be removed. The commenters assert that the compliance dates proposed to be added are inconsistent with the requirements of the Beaches and Creeks Bacteria TMDLs. The commenters also assert that the Beaches and Creeks Bacteria TMDLs do not require the development of a Bacteria Load Reduction Plan (BLRP) or Comprehensive Load Reduction Plan (CLRP) for segments of beaches or creeks de-listed from the Clean Water Act Section 303(d) List of Water Quality Limited Segments.	San Diego County Copermittees City of San Diego County of San Diego
	RESPONSE: The San Diego Water Board disagrees that the addition of the compliance dates is inconsistent with the Beaches and Creeks Bacteria TMDLs requirements. The San Diego Water Board also disagrees that segments of beaches or creeks de-listed from the Clean Water Act Section 303(d) List of Water Quality Limited Segments are not required to develop a BLRP or CLRP. The compliance date for the Beaches and Creeks Bacteria TMDLs is specified on page 7-107 of the Basin Plan as follows: *"Full implementation of the TMDLs for indicator bacteria shall be completed as soon as possible, but no later than 10 years from the effective date for both the dry weather and wet weather TMDLs, unless an alternative compliance schedule is approved as part of a Comprehensive Load Reduction Plan, as described in the following section. The effective date of these TMDLs is April 4, 2011.* *The San Diego Water Board will require the Phase I MS4s to submit Bacteria Load Reduction Plan (BLRPs) outlining the proposed BMP program that will be capable of achieving the necessary load reduction required to attain the bacteria TMDLs in the receiving water, acceptable to the Regional Board within 18 months after the effective date of these TMDLs…."* Tables 7-53 and 7-54 on page 7-108 in Chapter 7 of the Basin Plan present the compliance schedules that apply if the Copermittees develop a BLRP. Page 7-109 of the Basin Plan describes the potential for the Copermittees to develop CLRPs. If the Copermittees choose to develop a CLRP, the compliance date and schedule for the Beaches and Creeks Bacteria TMDLs is specified on page 7-109 of the Basin Plan in Table 7-55 and as follows:	

AttE6-2	ATTACHMENT E.6: Beaches and Creeks Bacteria TMDLs	
	"….the dischargers may develop and submit a CLRP for all constituents of concern in lieu of the BLRP, and to propose an appropriately tailored alternative compliance schedule. Proposed alternative compliance schedules tailored under this provision may not extend beyond 10 years for the dry weather bacteria TMDLs and 20 years for the wet weather bacteria TMDLs from the effective date …." Tables 6.1 and 6.4 were revised in the Tentative Order to be consistent with the compliance schedules of Tables 7-53, 7-54, and 7-55 of the Beaches and Creeks Bacteria TMDLs in the Basin Plan. Therefore, the addition of the compliance dates proposed to be added to Tables 6.1 and 6.4 are consistent with the requirements of the Beaches and Creeks Bacteria TMDLs. As for the assertion that the Beaches and Creeks Bacteria TMDLs do not require BLRPs or CLRPs for segments of beaches or creeks de-listed from the Clean Water Act Section 303(d) List of Water Quality Limited Segments, the commenters appear to be citing text from the TMDL Compliance Schedule section instead of the TMDL Implementation Plan section of the Beaches and Creeks Bacteria TMDLs. It is true that on page 7-107 of the Basin Plan, includes a statement that: "*For watersheds in Table 7-52 where there are no longer any impairments listed on the 2008 303(d) List, the Phase I MS4s and Caltrans are not required to submit a BLRP or CLRP within 18 months of the effective date of the TMDLs.*" However, this statement is under the TMDL Compliance Schedule requirements and was only included to indicate that the San Diego Water Board would not require a BLRP or CLRP to be submitted within 18 months of the effective date. It was not intended to mean that a BLRP or CLRP would never be required. If the commenters look under the TMDL Implementation Plan requirements for Phase I MS4s, which begins on page 7-85 of the Basin Plan, there is no statement that a BLRP or CLRP will not be required for "*watersheds … where there are no longer any impairments listed on the 2008 303(d) List."* The TMDL Implementation Plan for Phase I MS4 does, however, state the following on page 7-86 of the Basin Plan: "*The WQBELs will likely consist of receiving water limitations (based on the numeric targets) and require the implementation of a BMP program to achieve the TMDLs in receiving waters. The Phase I MS4s will be required to submit Bacteria Load Reduction Plans (BLRPs) or Comprehensive Load Reduction Plans (CLRPs) outlining a proposed BMP program capable of achieving the necessary load reductions required to attain the TMDLs in receiving waters, acceptable to the San Diego Water, within 18 months after the effective date of these TMDLs. The San Diego Water Board will require the BLRPs or CLRPs to be developed on a watershed or region wide scale. The BLRPs or CLRPs should be developed and*	

AttE6-2	ATTACHMENT E.6: Beaches and Creeks Bacteria TMDLs	
	incorporated as part of the Watershed Runoff Management Programs required under the Phase I MS4 NPDES requirements…." The TMDL Implementation Plan requirements clearly state the BLRPs or CLRPs are required and do not have any exceptions. The TMDL Compliance Schedule requirements do allow an exception from submitting a BLRP or CLRP within 18 months of the effective date, but do not state that a BLRP or CLRP will never be required. Specific Provision 6.b.(2)(c)(i) is consistent with the TMDL Implementation Plan requirements in the Basin Plan by requiring a CLRP to be on a watershed scale and incorporated into the Water Quality Improvement Plans (i.e. Watershed Runoff Management Program), which includes a BMP implementation program capable of achieving the necessary load reductions required to attain the TMDLs in receiving waters for all the applicable Watershed Management Areas in Table 6.0. Table 6.0 lists all the beaches and areas included in the Beaches and Creeks Bacteria TMDLs from the Basin Plan. Please also see the response to comment AttE6-1. However, the San Diego Water Board recognizes that Specific Provision 6.b.(2)(c)(i) only allows for the Copermittees to incorporate CLRPs into the Water Quality Improvement Plans. Therefore, to be consistent with the Beaches and Creeks Bacteria TMDLs, which allows for BLRPs to be developed and submitted, Specific Provision 6.b.(2)(c)(i) has been revised as follows: (i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 6.0 must incorporate the <u>Bacteria Load Reduction Plans (BLRPs) or</u> Comprehensive Load Reduction Plans (CLRPs) required to be developed pursuant to Resolution No. R9-2010-0001.	

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AttE6-3	ATTACHMENT E.6: Beaches and Creeks Bacteria TMDLs	
	COMMENT: *Request for revisions to clarify that compliance with receiving water limitations in the Beaches and Creek Bacteria TMDLs will be assessed at the compliance points identified in the TMDL Monitoring Plan.* The County of San Diego requested revisions to the Beaches and Creeks Bacteria TMDLs requirements to specify that compliance with receiving water limitations can be determined at the compliance points identified in the TMDL Monitoring Plans that are included in the Water Quality Improvement Plans.	County of San Diego
	RESPONSE: The San Diego Water Board disagrees that the revision is necessary. The Beaches and Creeks Bacteria TMDLs interim and final compliance determination requirements includes a pathway that allows the Copermittees to demonstrate that there are no exceedances of the final (or interim) receiving water limitations in the receiving water "*at, or downstream of the Responsible Copermittee's MS4 outfalls*." The Specific Monitoring and Assessment Requirements of the Beaches and Creeks Bacteria TMDLs specifies the locations where monitoring is required to determine compliance. For beaches, the required monitoring locations are "*at, or downstream of the Responsible Copermittee's MS4 outfalls*." For creeks, the monitoring locations are required to be at or near the mouth and one or more locations upstream of the mouth, both of which should be "*at, or downstream of the Responsible Copermittee's MS4 outfalls*." If the receiving waters are not exceeding the final (or interim) receiving water limitations expressed as exceedance frequencies at the required receiving water monitoring locations, then the Copermittees have demonstrated compliance with the receiving water WQBELs "*at, or downstream of the Responsible Copermittee's MS4 outfalls*." If, however, there are exceedances at a receiving water monitoring location, then the upstream Copermittees will need to demonstrate compliance with another compliance determination pathway. No changes were made to the Tentative Order as a result of this comment.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2015-0100

November 4, 2015 / Revised November 10, 2015

AttE7-1	ATTACHMENT E.7: Los Penasquitos Lagoon Sediment TMDL	
	COMMENT: *Request for revisions to incorporate a land use-based compliance pathway into the Los Penasquitos Lagoon Sediment TMDL.* The County of San Diego requested revisions to the Total Maximum Daily Load for Sediment in Los Penasquitos Lagoon (Los Penasquitos Sediment TMDL) in Attachment E to incorporate a land use-based compliance pathway.	County of San Diego
	RESPONSE: The San Diego Water Board disagrees that changes are needed to accommodate a land use-based compliance pathway for the Los Penasquitos Lagoon Sediment TMDL. The commenter states that if the land use has not changed significantly from the 1970s baseline, the timeframe at which water quality standards in the lagoon were met, then the sediment loads from the Copermittee's MS4s are expected to be approximately the same as the baseline levels and within the amount allowed in the wasteload allocation. The San Diego Water Board agrees that under this scenario in which land use has not changed significantly, the sediment levels would be approximately the same as baseline levels. If this is confirmed through water quality monitoring, then the Copermittee has likely met its portion of the final effluent limit described in Provision 7.b.(2)(b) and has achieved compliance. For this reason, changes to the TMDL compliance pathways are not needed or warranted. No changes were made to the Tentative Order as a result of this comment.	

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

Errata Sheet
November 4, 2015
Revised November 10, 2015

TENTATIVE ORDER NO. R9-2015-0100

AN ORDER AMENDING ORDER NO. R9-2013-0001, NPDES NO. CAS010266, AS AMENDED BY ORDER NO. R9-2015-0001 NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The following changes are proposed to the revised version of Tentative Order No. R9-2015-0100 and its Attachments included as Supporting Document No. 1 for Item No. 11 on the San Diego Water Board November 18, 2015 Board Meeting Agenda.

1. Tentative Order No. R9-2015-0100 Errata

Revise the beginning of Finding 6 as follows:

6. Regional Water Board Agreement. The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated ~~[Month][Day]~~ October 26, 2015 to:

2. Attachment No. 1 to Tentative Order No. R9-2015-0100 Errata

a) Revise Finding 29.b as follows:

b. Pursuant to CWC section 13228, the Cities of Murrieta, Wildomar, and Menifee submitted written requests that one Regional Water Board be designated to regulate Phase I MS4 discharges for each of the Cities. The Santa Ana Water Board and the San Diego Water Board have entered into an agreement dated ~~[Month][Day]~~ October 26, 2015, whereby the Cities of Murrieta and Wildomar are largely regulated by the San Diego Water Board under this Order, including those portions of the Cities of Murrieta and Wildomar not within the San Diego Water Board's jurisdiction, upon the effective date of this Order….

b) Revise Provision A.1.d as follows:

d. Storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012, as amended by State Water Board Resolution No. 2012-0031, applicable to these discharges, included in Attachment A to this Order. All other discharges from the Copermittees' MS4s to ASBS are prohibited.

c) Revise the beginning of Provision B.3.c as follows:

c. PROHIBITIONS AND LIMITATIONS COMPLIANCE OPTION

Each Copermittee has the option to utilize the implementation of the Water Quality Improvement Plan to demonstrate compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2~~.a~~, and A.3.b within a Watershed Management Area subject to the following conditions:

d) Revise Provision B.3.c.(1) as follows:

(1) A Copermittee is eligible to be deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2~~.a~~, and A.3.b within a Watershed Management Area when the Water Quality Improvement Plan for a Watershed Management Area incorporates the following:

e) Revise Provision B.3.c.(1)(a)(vii) as follows:

(vii) For each final numeric goal developed pursuant to Provisions B.3.a and B.3.c.(1)(a)(i)-(v), ~~at least one~~ annual milestones[9] and the dates for ~~its~~ their achievement must be included within each of the next five (5) Water Quality Improvement Plan Annual Report reporting periods, or until the final numeric goal is achieved. Annual milestones and the dates for their achievement for the 5 Water Quality Improvement Plan Annual Report reporting periods of the next permit term, or until the final numeric goal is achieved, must be provided as part of the Report of Waste Discharge required pursuant to Provision F.5.

f) Revise Footnote 9 as follows:

[9] Annual milestones for each final numeric goal must ~~build upon previous milestones and lead to~~ be clearly and directly linked to, or demonstrate progress is being made toward, the achievement of the final numeric goal. The annual milestones may consist of water quality improvement strategy implementation phases, interim numeric goals, and other acceptable metrics. The annual milestones may address multiple numeric goals and/or multiple water bodies, as applicable and appropriate.

g) Revise Provision B.3.c.(2) as follows:

(2) Each Copermittee that voluntarily completes the requirements of Provision B.3.c.(1) is deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2~~.a~~, and A.3.b for the pollutants and conditions for which numeric goals are developed when the Water Quality Improvement Plan, incorporating the requirements of Provision B.3.c.(1), is accepted by the San Diego Water Board pursuant to Provision F.1.b or F.2.c. The Copermittee is deemed in compliance during the term of this Order as long as:

h) Revise Provision B.3.c.(2)(d) as follows:

(d) Any proposed modifications to the numeric goals, strategies, schedules, and/or annual milestones are accepted by the San Diego Water Board as part of subsequent updates to the Water Quality Improvement Plan pursuant to Provision F.2.c;[10] AND

i) Add Provision B.5.d as follows:

d. ADAPTATION OF PROHIBITIONS AND LIMITATIONS COMPLIANCE OPTION

If a Copermittee has implemented the Prohibitions and Limitations Compliance Option allowed to be included in the Water Quality Improvement Plan pursuant to Provision B.3.c, the Copermittee must re-evaluate and adapt the numeric goals, water quality improvement strategies, schedules, and annual milestones required under Provision B.3.c.(1) when significant new information becomes available, or with the Report of Waste Discharge required pursuant to Provision F.5. Significant changes in the numeric goals, water quality improvement strategies, schedules, or annual milestones requires an update to the analysis required under Provision B.3.c.(2).

j) Revise Provision E.3.d as follows:

(d) Each Copermittee must update its BMP Design Manual pursuant to Provision F.2.b. Until the Copermittee has updated its BMP Design Manual pursuant to Provision F.2.b.(1), the Copermittee must continue implementing its current BMP Design Manual. The Copermittee must implement the updated BMP Design Manual within 180 days following completion of the update pursuant to Provision F.2.b.(1), unless directed otherwise by the San Diego Water Board Executive Officer. The date the BMP Design Manual is implemented is the "effective date" of the BMP Design Manual.

k) Revise Provision F.2.b.(4) as follows:

(4) If the San Diego Water Board amends Provisions E.3.a-d during the permit term but after the Copermittee has completed the update pursuant to Provision F.2.b.(1), the Copermittee must revise its BMP Design Manual to incorporate the amended Provision E.3.a-d requirements as soon as possible but no~~t~~ later than 90 days after the date the San Diego Water Board adopts the amendments to Provisions E.3.a-d, unless otherwise directed by the San Diego Water Board Executive Officer. Under these circumstances, the effective date of the BMP Design Manual is no later than 90 days after the date the San Diego Water Board adopts the amendments to Provisions E.3.a-d, unless otherwise directed by the San Diego Water Board Executive Officer.

l) Revise the definition of Construction Activities in Attachment C as follows:

Construction Activities – Actions implemented during construction of development or redevelopment projects during the Preliminary Tasks ~~Phase~~ (including rough grading and/or disking, clearing and grubbing operations, or any soil disturbance prior to mass grading), Grading or Land Development ~~Phase~~ (including topography and slope reconfiguration, alluvium removals, canyon cleanouts, rock undercuts, keyway excavations, land form grading, and stockpiling of select material for capping operations), Streets and Utility Installation ~~Phase~~ (including excavation and street paving, lot grading, curbs, gutters and sidewalks, public utilities, public water facilities including fire hydrants, public sanitary sewer systems, storm sewer systems and/or other drainage improvements), or Vertical Construction ~~Phase~~ (including the build out of structures from foundations to roofing, including rough landscaping).

m) Revise the definition of Redevelopment in Attachment C as follows:

Redevelopment – The creation and/or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, and the addition to or replacement of a structure~~, and creation or addition of impervious surfaces~~. Replacement of impervious surfaces includes any activity ~~that is not part of a routine maintenance activity~~ where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include routine maintenance activities, such as trenching and resurfacing associated with utility work; pavement grinding; resurfacing existing roadways,~~; new~~ sidewalks ~~construction~~, pedestrian ramps, or bike lanes on existing roads; and routine replacement of damaged pavement, such as pothole repair.

n) Revise Specific Provision 6.b.(2)(c)(i) in Attachment E as follows:

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 6.0 must incorporate the Bacteria Load Reduction Plans (BLRPs) or Comprehensive Load Reduction Plans (CLRPs) required to be developed pursuant to Resolution No. R9-2010-0001.

3. Attachment No. 2 to Tentative Order No. R9-2015-00100 Errata

a) Revise the text on page F-5 of the Fact Sheet as follows:

b. Continue designation of the San Diego Water Board to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Murrieta and Wildomar, including areas within the Santa Ana Region; and, agree to continue designation of the Santa Ana Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the City of Menifee, including areas within the San Diego Region, subject to the terms of the ~~[Month][Day]~~ October 26, 2015 agreement between San Diego Water Board and the Santa Ana Water Board described in Finding 29 of this Order;

c. Incorporate Provision B.3.c, which provides an option that allows a Copermittee to utilize the watershed-based Water Quality Improvement Plan to be deemed in compliance with the prohibitions and limitations of Provisions A.1.a, A.1.c, A.1.d, A.2~~.a~~, and A.3.b;

b) Revise the text on page F-7 of the Fact Sheet as follows:

** The City of Menifee is not regulated as a Copermittee under this Order because its Phase I MS4 discharges are regulated by Santa Ana Water Board Order No. R8-2010-0033 as it may be amended or issued pursuant to Water Code section 13228 designation. The requirements of this Order that apply to the City of Menifee for the duration of this Order, consistent with the Water Code section 13228 written agreement dated ~~[Month][Day]~~ October 26, 2015, are described in Finding 29 and Footnote 3 to Table B-1.

c) Revise the text on page F-32 of the Fact Sheet as follows:

Anti-Backsliding Requirements

CWA sections 402(o) and 303(d)(4) and federal regulations at 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations or conditions may be relaxed. While this Order allows implementation of an alternative compliance pathway option in Provision B.3.c to constitute compliance with receiving water limitations under certain circumstances, the availability of that alternative and the corresponding availability of additional time to come into compliance with receiving water limitations does not violate the antibacksliding provisions. The receiving water limitations provisions of this Order are imposed under section 402(p)(3)(B) of the Clean Water Act rather than based on best professional judgment, or based on section 301(b)(1)(C) or sections 303(d) or (e), and are accordingly not subject to the anti-backsliding requirements of section 402(o). Although the non-applicability is less clear with respect to the regulatory anti-backsliding provisions in 40 CFR 122.44(l), the regulatory history suggests that USEPA's intent was to establish the anti-backsliding regulations with respect to evolving technology standards for traditional point sources. (See, e.g., 44 Fed.Reg. 32854, 32864 (Jun. 7, 1979)). It is unnecessary, however, to resolve the ultimate applicability of the regulatory anti-backsliding provisions, because the alternative compliance pathway option in Provision B.3.c qualifies for an exception to backsliding as based on new information.

The alternative compliance pathway option in Provision B.3.c of this Order was informed by new information available to the Board from experience and knowledge gained through storm water permitting at the Regional Water Boards in the last ten years. There has been a statewide paradigm shift in storm water management. State Water Board Order WQ 2015-0075 directed all of the Regional Water Boards to consider the Los Angeles Water Board's alternative compliance path to receiving water limitations in all Phase I MS4 permits going forward (State Water Board Order WQ 2015-0075 at page 51). ~~It~~, and the Los Angeles Water Board's process of developing over 30 watershed-based TMDLs and implementing several TMDLs since the adoption of the previous permits. In particular, the Los Angeles Water Board recognized the significance of allowing time to plan, design, fund, operate and maintain watershed-based BMPs necessary to attain water quality improvements and additionally recognized the potential for municipal storm water to benefit water supply. Similarly, the San Diego Water Board's experience developing and implementing the Fourth Term MS4 Permits and TMDLs that apply on a region-wide scale (e.g. TMDLs for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region) has resulted in a similar recognition of the need for a watershed-based approach that allows time to plan, design, fund, operate and maintain BMPs to address impaired waters that have been impacted by MS4 discharges. Thus, even if the receiving water limitations are subject to anti-backsliding requirements, they were revised based on new information that would support an exception to the anti-backsliding provisions. (33 U.S.C. § 1342(o)(2)(B)(i); 40 C.F.R. § 122.44(l)(1); 40 C.F.R. §122.44(l)(2)(i)(B)(1)).

d) Revise the text on page F-51 of the Fact Sheet as follows:

The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated February 10, 2015 to designate the San Diego Water Board to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Laguna Woods and Laguna Hills, including the portions of the jurisdictions within the Santa Ana Region, upon the later effective date of Order No. R9-2015-0001 or Santa Ana Water Board Tentative Order No. R8-2015-0001. The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated ~~[Month][Day]~~ October 26, 2015 to designate the San Diego Water Board to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Murrieta and Wildomar, including the portions of the jurisdictions within the Santa Ana Region upon the effective date of Order R9-2015-0100.

e) Revise the text on page F-52 of the Fact Sheet as follows:

The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated February 10, 2015 to designate the San Ana Water Board to regulate Phase I MS4 discharges within the jurisdiction of the City of Lake Forest, including portions of the jurisdiction within the Santa Diego Region, upon the later date of Order No. R9-2015-0001 or Santa Ana Water Board Tentative Order No. R8-2015-0001. The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated ~~[Month][Day]~~ October 26, 2015 to designate the San Ana Water Board to regulate Phase I MS4 discharges within the jurisdiction of the City of Menifee, including portions of the jurisdiction within the San Diego Region, under Order No. R8-2010-0033 (NPDES No. CAS618030) as it may be amended or reissued upon the effective date of Order No. R9-2015-0100.

f) Revise the text on pages F-60 through F-62 of the Fact Sheet as follows:

Replace the references to "Provisions A.1.a, A.1.c, A.1.d, A.2.a, and A.3.b" with "Provisions A.1.a, A.1.c, A.1.d, A.2~~.a~~, and A.3.b."

g) Revise the text on page F-62 of the Fact Sheet as follows:

Compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2~~.a~~, and A.3.b begins when the Water Quality Improvement Plan, incorporating the requirements of Provision B.3.c.(1), is accepted by the San Diego Water Board. Each Copermittee that chooses to implement and continues to implement this option will be deemed in compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2~~.a~~, and A.3.b as long as the Copermittee continues to implement the strategies, monitoring and assessments as incorporated in the Water Quality Improvement Plan in accordance with Provision B.3.c.(1), and the Copermittee reports the achievement of the annual milestones each year, or provides acceptable rationale and recommends appropriate modifications to the interim numeric goals, and/or water quality improvement strategies, and/or schedules to improve the rate of progress toward achieving the final numeric goals. The Copermittee continues to be deemed in compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b during the time the San Diego Water Board reviews the rationale and recommended modifications to the interim numeric goals, and/or water quality improvement strategies, and/or schedules. If and when the San Diego Water Board determines that it does not accept the rationale or recommendations, the Copermittee will be notified they are no longer deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b.

h) Revise the text on page F-81 of the Fact Sheet as follows:

Provision E.2.(Illicit Discharge Detection and Elimination) requires each Copermittee to implement an illicit discharge detection and elimination program to effectively prohibit non-storm water discharges to the MS4 by actively detecting and eliminating illicit discharges and disposal into its MS4. If the San Diego Water Board finds that a Copermittee is fully implementing the requirements of Provision E.2, then the Copermittee is deemed in compliance with the effective prohibition of non-storm water discharges to the MS4 required under Provision A.1.b.

Chiu, Wayne@Waterboards

From: Chiu, Wayne@Waterboards
Sent: Friday, July 31, 2015 10:44 AM
To: 'Barbara Tipton'; 'Boushra Salem' (bsalem@chulavistaca.gov); Brown, Clement (CMBrown@sandiego.gov); Cecilia Padres-Tipton (ctipton@cityofsanteeca.gov); Cheryl Filar (cfilar@cityofvista.com); Chris Helmer (chelmer@cityofib.org); Elaine Lukey (Elaine.Lukey@carlsbadca.gov); Erik Steenblock (esteenblock@encinitasca.gov); Godby, Kim (kgodby@coronado.ca.us); Helen M. Davies (hdavies@ci.escondido.ca.us); Jaime Campos (jcampos@ci.el-cajon.ca.us); 'James Wood'; 'JoAnn Weber'; Joe Kuhn (jkuhn@ci.la-mesa.ca.us); Karen Holman (kholman@portofsandiego.org); Kolb, Ruth (RKolb@sandiego.gov); Malik Tamimi (mtamimi@lemongrove.ca.gov); Mikhail Ogawa (mikhail@mogawaeng.com); Mo Lahsaie (mlahsaie@ci.oceanside.ca.us); Reed Thornberry (rthornberry@san-marcos.net); Richard Gilb (rgilb@san.org); Steven Strapac (SStrapac@poway.org); Taryn Dunbar (tdunbar@cosb.org); Boon, Richard (Richard.Boon@ocpw.ocgov.com); Chris Crompton (chris.crompton@ocpw.ocgov.com); Christopher Macon (cmacon@lagunawoodscity.org); Greg Yi (greg.yi@rdmd.ocgov.com); 'Hossein Ajideh'; Humza Javed (hjaved@ci.laguna-hills.ca.us); Joe Ames (JAmes@cityofmissionviejo.org); Lisa Zawaski (lzawaski@danapoint.org); Mary Vondrak (vondrakM@san-clemente.org); Moy Yahya (myahya@cityofalisoviejo.com); Nancy Palmer (NPalmer@cityoflagunaniguel.org); Rae Beimer (RBeimer@cityofrsm.org); Slaven, Devin (dslaven@lakeforestca.gov); Tracy Ingebrigtsen (tingebrigtsen@lagunabeachcity.net); Aldo Licitra (Aldo.Licitra@cityoftemecula.org); Bill Woolsey (wwoolsey@murrieta.org); Bruckner, Scott (sebruckner@rcflood.org); Horn, Steven (Shorn@rceo.org); Matt Bennett (mbennett@cityofwildomar.org); 'Bill Paznokas'; 'Carol Roberts'; 'Cindy Lin'; 'Dave Smith'; 'Deborah Lee'; 'Robert Smith'
Cc: Walsh, Laurie@Waterboards; Arias, Christina@Waterboards
Subject: NOTICE OF OPPORTUNITY TO COMMENT AND PUBIC HEARING: Amendments to Regional MS4 Permit
Attachments: 2015-0731 Final Tent Order Cover Letter.pdf; 2015-0731 Final Public Cmt_Hearing Notice.pdf

Good morning Copermittees of the San Diego Region,

Please see the attached Cover Letter and Notice of Opportunity to Comment and Public Hearing for Tentative Order No. R9-2015-0100, *An Order Amending Order No. R9-2013-0001, NPDES No. CAS010266, as Amended by Order No. R9-2015-0001* (Tentative Order). The Tentative Order and proposed changes to the Regional MS4 Permit are available to download on the following webpage:
http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

The San Diego Water Board is accepting written comments on the Tentative Order and proposed changes to the Regional MS4 Permit. **Written comments must be received no later than 5 p.m. on Monday, September 14, 2015**.

The San Diego Water Board is scheduled to hold a public hearing to consider adoption of the Tentative Order. The public hearing to consider the Tentative Order will be held at the San Diego Water Board meeting at the following date and location:

November 18, 2015, beginning at 9 a.m.
San Diego Water Board Room
2375 Northside Drive, San Diego, CA 92108

Please see the attachments for further detail and contact me with any questions.

Thank you,

Wayne Chiu, PE
Water Resource Control Engineer
Storm Water Management Unit
California Regional Water Quality Control Board
San Diego Region
2375 Northside Drive, Suite 100
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Main Line: (619) 516-1990

California Water Boards

Edmund G. Brown Jr.
Governor

Matthew Rodriquez
Secretary for Environmental Protection

California Regional Water Quality Control Board, San Diego Region

July 31, 2015

Sent via E-mail

San Diego County Copermittees
Orange County Copermittees
Riverside County Copermittees

In reply refer to / attn:
Place ID: 786088:WChiu

Subject: Notice of Opportunity to Comment and Public Hearing
Tentative Order No. R9-2015-0100, An Order Amending Order No. R9-2013-0001, Regional Municipal Separate Storm Sewer (MS4) Permit for the San Diego Region

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) is releasing for public review and comment Tentative Order No. R9-2015-0100 (Tentative Order) amending Order No. R9-2013-0001, as amended by Order No. R9-2015-0001 (Regional MS4 Permit). The San Diego Water Board is scheduled to hold a public hearing to consider adoption of the Tentative Order during the Board meeting scheduled for November 18, 2015. The deadline for submission of written comments on the Tentative Order and other details regarding the public hearing is contained in the enclosed Notice of Opportunity to Comment and Public Hearing.

The Tentative Order and Notice of Opportunity to Comment and Public Hearing is available on the San Diego Water Board's website at http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml.

Interested persons may also receive a copy of the Tentative Order and its attachments by contacting Wayne Chiu at (619) 521-3354, or by email at Wayne.Chiu@waterboards.ca.gov or by visiting the San Diego Water Board's office at 2375 Northside Drive, Suite 100, San Diego, California 92108, weekdays between 8:00 a.m. and 5:00 p.m., telephone (619) 516-1990.

The Tentative Order proposes to amend the Regional MS4 Permit in response to the Riverside County Copermittees' Report of Waste Discharge (RoWD) submitted by letter dated May 8, 2015, and designate the Riverside County Copermittees as MS4 dischargers responsible for compliance with the terms and the conditions of the Permit. The Tentative Order also proposes to amend the Regional MS4 Permit to address a variety of other issues including 1) incorporation of an option to utilize the Water Quality Improvement Plan to demonstrate compliance with receiving water prohibitions and limitations, 2) clarification of land development requirements describing when a development project should be subject to the Priority Development Project (PDP) requirements, 3) amendment to the requirements for updating the BMP Design Manual as a result of corrections to the priority development project definitions, 4) clarification of requirements for non-storm water discharges covered by the Statewide NPDES Permit for Drinking Water Systems and the San Diego Water Board's General Waste Discharge Requirements for Groundwater Extraction Discharges to Surface Waters, and 5) clarification of the Indicator Bacteria, Project I - Beaches and Creeks and Los Penasquitos Lagoon Sediment Total Maximum Daily Load requirements to increase consistency with the Basin Plan Amendment. If

adopted, the Tentative Order will supersede the Riverside County Copermittees' current Fourth Term MS4 Permit, Order No. R9-2010-0016.

The Tentative Order amends the Regional MS4 Permit and its Fact Sheet (Attachment F of the Permit) as described in Attachments 1 and 2 of the Tentative Order. Changes to the Regional MS4 Permit and its Fact Sheet based upon the Tentative Order are displayed in blue-underline for added text and red-strikeout for deleted text in the attachments to the Tentative Order.

Interested persons desiring to receive future public notices regarding the Tentative Order, proceedings to consider its adoption and potential future modifications to the Regional MS4 Permit can subscribe to one of the electronic e-mail service lists titled "Orange County MS4 Permit," "Riverside County MS4 Permit," or "San Diego MS4 Permit" located on the San Diego Water Board website: http://www.waterboards.ca.gov/resources/email_subscriptions/reg9_subscribe.shtml.

In the subject line of any response, please include the requested "In reply refer to:" information located in the header of this letter. If you have any questions or comments, please contact Wayne Chiu by phone at (619) 521-3354, or by e-mail at Wayne.Chiu@waterboards.ca.gov.

Respectfully,

for David Barker, P.E.
Supervising Engineer
San Diego Regional Water Quality Control Board

DTB:bb:law

Enclosure: Notice of Opportunity to Comment and Public Hearing

cc (via email):

San Diego County Copermittees
Orange County Copermittees
Riverside County Copermittees
Natural Resource Agencies
San Diego County MS4 Permit E-mail Service List
Riverside County MS4 Permit E-mail Service List
Orange County MS4 Permit E-mail Service List
San Diego Water Board Agenda E-mail Service List

Tech Staff Info & Use	
Tentative Order No.	R9-2015-0100
NPDES No.	CAS0109266
Place ID	786088

San Diego County Copermittees

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Environmental Services Division
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Orange County Copermittees

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Riverside County Flood Control
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Matt Bennett
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CALIFORNIA Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

NOTICE OF OPPORTUNITY TO COMMENT AND PUBLIC HEARING

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http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

The Tentative Order proposes to amend the Regional MS4 Permit to address a variety of issues including coverage for Copermittees in Riverside County consisting of the County of Riverside, the Riverside County Cities of Murrieta, Temecula, and Wildomar, and the Riverside County Flood Control and Water Conservation District and incorporation of limited permit provisions applicable to the City of Menifiee. If adopted, the Tentative Order will supersede the Riverside County Copermittees' current Fourth Term MS4 Permit, Order No. R9-2010-0016.

All written comments pertaining to the terms and conditions of the Tentative Order to be considered by the San Diego Water Board at the November 18, 2015 public hearing must be received no later than **5:00 p.m. on Monday September 14, 2015**. Written comments must be sent to the San Diego Water Board's office at 2375 Northside Drive, Suite 100, San Diego, CA 92108, faxed to (619) 516-1994, or e-mailed to sandiego@waterboards.ca.gov Attn: Wayne Chiu. Please indicate in the subject line of all written comments "Comment - Tentative Order No. R9-2015-0100, Place ID:786088WChiu." The early submission of written comments on the Tentative Order is encouraged.

The San Diego Water Board will prepare written responses to significant comments that are timely received. Consistent with State Water Resources Control Board regulations that apply to this proceeding, written comments received after 5:00 p.m. on Monday, September 14, 2015 will not be accepted and will not be incorporated into the administrative record if doing so would prejudice any party.

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Please contact Wayne Chiu at (619) 521-3354 or by email at Wayne.Chiu@waterboards.ca.gov for information regarding the above listed proposed permit action. Please bring the foregoing to the attention of any person known to you who would be interested in this matter.

DAVID W. GIBSON
Executive Officer
July 31, 2015

Chiu, Wayne@Waterboards

From: lyris@swrcb18.waterboards.ca.gov
Sent: Friday, July 31, 2015 11:50 AM
To: Chiu, Wayne@Waterboards
Subject: NOTICE OF OPPORTUNITY TO COMMENT AND PUBIC HEARING: Amendments to Regional MS4 Permit
Attachments: 2015-0731_Public_Notice.pdf

Water Boards This is a message from the California Regional Water Quality Control Board, San Diego Region (9).

Dear Interested Persons:

Please see the attached Notice of Opportunity to Comment and Public Hearing for Tentative Order No. R9-2015-0100, *An Order Amending Order No. R9-2013-0001, NPDES No. CAS010266, as Amended by Order No. R9-2015-0001* (Tentative Order). The Tentative Order and proposed changes to the Regional MS4 Permit are available to download on the following webpage:
http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

The San Diego Water Board is accepting written comments on the Tentative Order and proposed changes to the Regional MS4 Permit. **Written comments must be received no later than 5 p.m. on Monday, September 14, 2015**.

The San Diego Water Board is scheduled to hold a public hearing to consider adoption of the Tentative Order. The public hearing to consider the Tentative Order will be held at the San Diego Water Board meeting at the following date and location:

November 18, 2015, beginning at 9 a.m.
San Diego Water Board Room
2375 Northside Drive, San Diego, CA 92108

Please see the attachments for further detail and contact me with any questions.

Thank you,
Wayne Chiu, PE
Water Resource Control Engineer
Storm Water Management Unit
California Regional Water Quality Control Board
San Diego Region
2375 Northside Drive, Suite 100
San Diego, CA 92108
Direct Line: (619) 521-3354
Main Line: (619) 516-1990

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CALIFORNIA Water Boards

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DAVID W. GIBSON
Executive Officer
July 31, 2015

THE PRESS-ENTERPRISE

1825 Chicago Ave, Suite 100
Riverside, CA 92507
951-684-1200
951-368-9018 FAX

PROOF OF PUBLICATION
(2010, 2015.5 C.C.P)

Publication(s): The Press-Enterprise

PROOF OF PUBLICATION OF

Ad Desc.: 2777133

I am a citizen of the United States. I am over the age of eighteen years and not a party to or interested in the above entitled matter. I am an authorized representative of THE PRESS-ENTERPRISE, a newspaper in general circulation, printed and published daily in the County of Riverside, and which newspaper has been adjudicated a newspaper of general circulation by the Superior Court of the County of Riverside, State of California, under date of April 25, 1952, Case Number 54446, under date of March 29, 1957, Case Number 65673, under date of August 25, 1995, Case Number 267864, under date of February 4, 2013, Case Number RIC 1215735, under date of July 25, 2013, Case Number RIC 1305730, and under date of September 16, 2013, Case Number RIC 1309013; that the notice, of which the annexed is a printed copy, has been published in said newspaper in accordance with the instructions of the person(s) requesting publication, and not in any supplement thereof on the following dates, to wit:

07/29/2015

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Date: Jul 29, 2015

At: Riverside, California

CALIF NEWSPAPER SERV BUREAU
PO BOX 60460
LOS ANGELES, CA 90060

Ad Number: 0010073792-01

P.O. Number: 2777133

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CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, SAN DIEGO REGION
NOTICE OF OPPORTUNITY TO COMMENT AND PUBLIC HEARING

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) is scheduled to hold a public hearing to consider adoption of Tentative Order No. R9-2015-0100 (Tentative Order).

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All written comments pertaining to the terms and conditions of the Tentative Order to be considered by the San Diego Water Board at the November 18, 2015 public hearing must be received no later than **5:00 p.m. on Monday September 14, 2015**. Written comments must be sent to the San Diego Water Board's office at 2375 Northside Drive, Suite 100, San Diego, CA 92108, faxed to (619) 516-1994, or e-mailed to sandiego@waterboards.ca.gov Attn: Wayne Chiu. Please indicate in the subject line of all written comments "Comment - Tentative Order No. R9-2015-0100, Place ID:786088WChiu." The early submission of written comments on the Tentative Order is encouraged.

The San Diego Water Board will prepare written responses to significant comments that are timely received. Consistent with State Water Resources Control Board regulations that apply to this proceeding, written comments received after 5:00 p.m. on Monday, September 14, 2015 will not be accepted and will not be incorporated into the administrative record if doing so would prejudice any party.

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Please contact Wayne Chiu at (619) 521-3354 or by email at Wayne.Chiu@waterboards.ca.gov for information regarding the above listed proposed permit action. Please bring the foregoing to the attention of any person known to you who would be interested in this matter.

DAVID W. GIBSON
Executive Officer
July 31, 2015
7/29/15
CNS-2777133#
THE PRESS ENTERPRISE

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DECLARATION

I am a resident of San Diego County, over the age of eighteen years and not a party to any or interested in the matter noticed. The notice, of which the annexed is a printed copy appeared in the:

SAN DIEGO UNION TRIBUNE-

On the following dates:

JULY 29, 2015

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Dated at San Diego, California, this

29th of **JULY** **2015**

YOLANDA CÓRDOVA

CNS#2777134

"The only Public Notice which is justifiable from the standpoint of true economy and the public interest, is that which reaches those who are affected by it"

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A0000038328 92

NOTICE

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, SAN DIEGO REGION

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DAVID W. GIBSON
Executive Officer
July 31, 2015
7/29/15
CNS-2777134#
THE SAN DIEGO UNION

THE REGISTER

625 N GRAND AVE, SANTA ANA, CA 92701
Telephone (714) 796-7000 / Fax (714) 796-6059

This space for filing stamp only

PROOF OF PUBLICATION

(2015.5 C.C.P.)

State of California)
County of ORANGE) ss

Notice Type: GPN - GOVT PUBLIC NOTICE

Ad Description:
Tentative Order R9-2015-0100

I am a citizen of the United States and a resident of the State of California; I am over the age of eighteen years, and not a party to or interested in the above entitled matter. I am the principal clerk of the printer and publisher of the THE REGISTER, a newspaper published in the English language in the city of SANTA ANA, county of ORANGE, and adjudged a newspaper of general circulation as defined by the laws of the State of California by the Superior Court of the County of ORANGE, State of California, under date 11/19/1905, Case No. A21046. That the notice, of which the annexed is a printed copy, has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to-wit:

07/29/2015

Executed on: 07/29/2015
At SANTA ANA, California

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Signature

A0000038277 7 1

_CNS#: 2777135

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, SAN DIEGO REGION

NOTICE OF OPPORTUNITY TO COMMENT AND PUBLIC HEARING

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) is scheduled to hold a public hearing to consider adoption of Tentative Order No. R9-2015-0100 (Tentative Order).

The Tentative Order proposes to amend the National Pollutant Discharge Elimination System (NPDES) Permit for Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region, Order No. R9-2013-0001, as amended by Order No. R9-2015-0001 (Regional MS4 Permit). Notice is hereby given that the San Diego Water Board will accept written comments on the Tentative Order and proposed changes to the Regional MS4 Permit in accordance with title 40 Code of Federal Regulations (CFR) section 124.10 and Water Code section 13167.5. Notice is also given that the San Diego Water Board will consider adoption of the Tentative Order at a public hearing on November 18, 2015.

The Tentative Order and attachments thereto, are available on the San Diego Water Board website at:
http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml
The Tentative Order proposes to amend the Regional MS4 Permit to address a variety of issues including coverage for Copermittees in Riverside County consisting of the County of Riverside, the Riverside County Cities of Murrieta, Temecula, and Wildomar, and the Riverside County Flood Control and Water Conservation District and incorporation of limited permit provisions applicable to the City of Menifiee. If adopted, the Tentative Order will supersede the Riverside County Copermittees' current Fourth Term MS4 Permit, Order No. R9-2010-0016.

All written comments pertaining to the terms and conditions of the Tentative Order to be considered by the San Diego Water Board at the November 18, 2015 public hearing must be received no later than **5:00 p.m. on Monday September 14, 2015.** Written comments must be sent to the San Diego Water Board's office at 2375 Northside Drive, Suite 100, San Diego, CA 92108, faxed to (619) 516-1994, or e-mailed to sandiego@waterboards.ca.gov Attn: Wayne Chiu. Please indicate in the subject line of all written comments "Comment - Tentative Order No. R9-2015-0100, Place ID:786088WChiu." The early submission of written comments on the Tentative Order is encouraged.

The San Diego Water Board will prepare written responses to significant comments that are timely received. Consistent with State Water Resources Control Board regulations that apply to this proceeding, written comments received after 5:00 p.m. on Monday, September 14, 2015 will not be accepted and will not be incorporated into the administrative record if doing so would prejudice any party. Tentative Order R9-2015-0100 - 2 - July 31, 2015

The public hearing on this matter will be held during the San Diego Water Board meeting scheduled for **November 18, 2015 in the Board Room of the San Diego Water Board Office, located at 2375 Northside Drive, San Diego, CA 92108.** The item will be heard during the meeting that starts at 9:00 a.m. The meeting notice and agenda, which will indicate any changes in the meeting location and may provide other specific information concerning this hearing, will be posted at least two weeks prior to the meeting date at http://www.waterboards.ca.gov/sandiego/board_info/agendas/.

Oral testimony at the public hearing will be allowed. The scope of oral testimony at the public hearing will be strictly limited to summarizing the previously submitted written comments, comments on revisions to the Tentative Order made in response to comments, and making policy statements. Oral testimony will be limited in time by the Board Chair.

The procedures governing San Diego Water Board meetings may be found at title 23, California Code of Regulations, section 647, et seq. and are available upon request. The hearing facilities will be accessible to persons with disabilities. The meeting notice and agenda for this meeting will provide contact information for persons requesting special accommodations.

Information related to this matter, including revisions made to the Tentative Order in response to written comments timely submitted, as well as the San Diego Water Board's responses to written

(2015.5 C.C.P.)

State of California)
County of ORANGE) ss

Notice Type: GPN - GOVT PUBLIC NOTICE

Ad Description:
Tentative Order R9-2015-0100

I am a citizen of the United States and a resident of the State of California; I am over the age of eighteen years, and not a party to or interested in the above entitled matter. I am the principal clerk of the printer and publisher of the THE REGISTER, a newspaper published in the English language in the city of SANTA ANA, county of ORANGE, and adjudged a newspaper of general circulation as defined by the laws of the State of California by the Superior Court of the County of ORANGE, State of California, under date 11/19/1905, Case No. A21046. That the notice, of which the annexed is a printed copy, has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to-wit:

07/29/2015

Executed on: 07/29/2015
At SANTA ANA, California

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Signature

to consider adoption of Tentative Order No. R9-2015-0100 (Tentative Order).

The Tentative Order proposes to amend the National Pollutant Discharge Elimination System (NPDES) Permit for Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region, Order No. R9-2013-0001, as amended by Order No. R9-2015-0001 (Regional MS4 Permit). Notice is hereby given that the San Diego Water Board will accept written comments on the Tentative Order and proposed changes to the Regional MS4 Permit in accordance with title 40 Code of Federal Regulations (CFR) section 124.10 and Water Code section 13167.5. Notice is also given that the San Diego Water Board will consider adoption of the Tentative Order at a public hearing on November 18, 2015.

The Tentative Order and attachments thereto, are available on the San Diego Water Board website at: http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml
The Tentative Order proposes to amend the Regional MS4 Permit to address a variety of issues including coverage for Copermittees in Riverside County consisting of the County of Riverside, the Riverside County Cities of Murrieta, Temecula, and Wildomar, and the Riverside County Flood Control and Water Conservation District and incorporation of limited permit provisions applicable to the City of Menifiee. If adopted, the Tentative Order will supersede the Riverside County Copermittees' current Fourth Term MS4 Permit, Order No. R9-2010-0016.

All written comments pertaining to the terms and conditions of the Tentative Order to be considered by the San Diego Water Board at the R9-2015-0100, Place ID:786088WChiu." The early submission of written comments on the Tentative Order is encouraged.

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The San Diego Water Board will prepare written responses to significant comments that are timely received. Consistent with State Water Resources Control Board regulations that apply to this proceeding, written comments received after 5:00 p.m. on Monday, September 14, 2015 will not be accepted and will not be incorporated into the administrative record if doing so would prejudice any party. Tentative Order R9-2015-0100 - 2 - July 31, 2015

The public hearing on this matter will be held during the San Diego Water Board meeting scheduled for **November 18, 2015 in the Board Room of the San Diego Water Board Office, located at 2375 Northside Drive, San Diego, CA 92108**. The item will be heard during the meeting that starts at 9:00 a.m. The meeting notice and agenda, which will indicate any changes in the meeting location and may provide other specific information concerning this hearing, will be posted at least two weeks prior to the meeting date at http://www.waterboards.ca.gov/sandiego/board_info/agendas/.

Oral testimony at the public hearing will be allowed. The scope of oral testimony at the public hearing will be strictly limited to summarizing the previously submitted written comments, comments on revisions to the Tentative Order made in response to comments, and making policy statements. Oral testimony will be limited in time by the Board Chair.

The procedures governing San Diego Water Board meetings may be found at title 23, California Code of Regulations, section 647, et seq. and are available upon request. The hearing facilities will be accessible to persons with disabilities. The meeting notice and agenda for this meeting will provide contact information for persons requesting special accommodations.

Information related to this matter, including revisions made to the Tentative Order in response to written comments timely submitted, as well as the San Diego Water Board's responses to written comments timely submitted, will be available at the San Diego Water Board's office and the San Diego Water Board's storm water web page in advance of the public hearing. A separate notice will be sent announcing the availability of the revised Tentative Order and the responses to comments upon website posting of the documents.

Please contact Wayne Chiu at (619) 521-3354 or by email at Wayne.Chiu@waterboards.ca.gov for information regarding the above listed proposed permit action. Please bring the foregoing to the attention of any person known to you who would be interested in this matter.

DAVID W. GIBSON
Executive Officer
July 31, 2015
7/29/15
CNS-2777135#
THE REGISTER 10073836

Chiu, Wayne@Waterboards

From: Walsh, Laurie@Waterboards
Sent: Friday, November 13, 2015 9:16 AM
To: Matt O'Malley (matt@sdcoastkeeper.org); Joann Weber; Baron, Ryan [COCO] (ryan.baron@coco.ocgov.com); McKibbin, Stuart (SMCKIBBI@rcflood.org) (SMCKIBBI@rcflood.org); Richard Boon; Lisa Zawaski; Mike McSweeney (MMcSweeney@biasandiego.org); Julia Chunn (julia@surfridersd.org)
Cc: Chiu, Wayne@Waterboards; Arias, Christina@Waterboards; Ryan, Erica@Waterboards; Barker, David@Waterboards; Hagan, Catherine@Waterboards; Nunez, Adriana@Waterboards; Smith, James@Waterboards; Gibson, David@Waterboards; Barbra Tipton; Boushra Salem; Cecilia Padres-Tipton; Cheryl Filar; Chris Helmer; Erik Steenblock ; Helen Davies; James Wood Jr (James.Wood@carlsbadca.gov); Jamie Campos; Joe Juhn; Karen Holman; Kim Godby; Kleis, Andrew (AKleis@sandiego.gov); Lukey, Elaine; Malik Tamimi (mtamimi@lemongrove.ca.gov); Mikhail Ogawa; Mo Lahsaiezadeh; Richard Gilb; RThornberry@san-marcos.net; Ruth Kolb; Steven Strapac; Taryn Dunbar; Brad Fowler; Chris Crompton; Christopher Macon ; Devin Slaven ; Grant Sharp; Greg Yi; Humza Javed; Ames, Joe@MISSIONVIEJO@DOT; Keith Van Der Maaten; Mary Vondrak; MaryAnne Skorpanich; Moy Yahya; Nancy Palmer; Rae Beimer; Tom Bonigut; Tracy Ingebrigtsen; Bill Woolsey; Bob Moehling; David Garcia; Eric Lomeli; James Ozouf; Jason Uhley; Licitra, Aldo; Matt Bennett; Scott Bruckner; Steve Horn
Subject: Speaker Schedule and Time Allocations - San Diego Water Board November 18, 2015 Public Hearing on Agenda Item No. 11 Proposed Amendment to Regional MS4 Permit

Copermittees, Stakeholders, and other Interested Persons,

In response to requests for time allocations to present testimony to the San Diego Water Board during its November 18, 2015 public hearing on Agenda Item No. 11 , Tentative Order No. R9-2015-0100, *An Order to amend Order R9-2013-0001, as amended by Order No. R9-2015-0001, NPDES No. CAS0109266, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region,* the amounts of time and anticipated order of speakers is as follows:

1. San Diego Water Board Staff Presentation – 25 minutes
2. Elected Officials – No earlier than 10 a.m., but will be heard as soon as possible after Board staff presentation – 3 minutes per speaker
3. Riverside Co. CoPermittees – 15 minutes
4. Orange Co. CoPermittees – 30 minutes
5. San Diego Co. CoPermittees – 30 minutes
6. Building Industrial Association – 15 minutes
7. Coastkeeper/Coastal Environmental Rights Foundation – 30 minutes
8. Interested persons: 3 minutes each

The Board Chair retains discretion to modify the time allocations including to grant a speaker(s) more time upon request at the hearing.

***Laurie Walsh,* PE**

Senior Water Resource Control Engineer
Storm Water Management
San Diego Water Board

2375 Northside Drive, Suite 100
San Diego, CA 92108
Direct Phone: (619) 521-3373
Main Line: (619) 516-1990
Fax No. (619) 516-1994
Email: Laurie.Walsh@waterboards.ca.gov

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD
www.waterboards.ca.gov/sandiego/

STATE OF CALIFORNIA
REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

MEETING NOTICE AND AGENDA[1]

Wednesday, November 18, 2015
9:00 a.m.

Water Quality Control Board
Board Meeting Room
2375 Northside Drive, Suite 108
San Diego, California

Video broadcast of meetings will be available at:
http://www.calepa.ca.gov/Broadcast

The purpose of this meeting is for the San Diego Water Board to obtain testimony and information from concerned and affected persons and to make decisions based on the information received. Persons who want to submit written comments or evidence on any agenda item must comply with the procedures described in the agenda and agenda notes. Persons wishing to speak at the meeting should complete an attendance card (see Note F, attached to this Notice). The San Diego Water Board requests that all lengthy comments be submitted in writing in advance of the meeting date. To ensure that the San Diego Water Board members and staff have the opportunity to review and consider written material, comments should be received in the San Diego Water Board's office no later than noon on Tuesday, November 3, 2015* and should indicate the agenda item to which it is applicable. If the submitted written material is more than 5 pages or contains foldouts, color graphics, maps, two copies must be submitted. Written material submitted after 5:00 P.M. on Tuesday, November 10, 2015, will not be provided to the Board members and may not be considered by the San Diego Water Board (See Note D, attached to this Notice).

****PLEASE NOTE THAT SOME ITEMS ON THE AGENDA MAY HAVE BEEN PREVIOUSLY NOTICED WITH EARLIER DEADLINES FOR SUBMITTING WRITTEN COMMENTS OR MAY HAVE A SEPARATE HEARING PROCEDURES DOCUMENT THAT ESTABLISHES DIFFERENT DEADLINES OR PROCEDURES FOR SUBMITTING WRITTEN MATERIALS. IN THOSE CASES THE DIFFERENT DEADLINES OR PROCEDURES APPLY.***

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[1] Versión en español disponible también en:
http://www.waterboards.ca.gov/sandiego/board_info/agendas/index.shtml

Comments on agenda items will be accepted by E-mail subject to the same conditions set forth for other written submissions. E-mail must be submitted to: rb9agenda@waterboards.ca.gov. Type the word "Agenda" in the subject line.

Pursuant to Title 23, California Code of Regulations, section 648.4, the San Diego Water Board may refuse to admit written testimony or evidence into the record if it is not submitted to the San Diego Water Board in a timely manner and shall refuse to do so if admitting it would prejudice any party or the board, unless the proponent demonstrates that compliance with the deadline would create an unreasonable hardship.

NOTE D, attached to this Notice, refers to the procedures that will be followed by the San Diego Water Board in contested adjudicatory matters if a separate Hearing Procedures Document has not been issued for a particular agenda item. Parties requesting an alternate hearing process must do so in accord with the directions in NOTE D. Any such request, together with supporting material, must be received in the San Diego Water Board's office no later than noon on Tuesday, November 10, 2015 (unless an earlier deadline is established in a separate hearing procedures document).

Copies of the agenda items to be considered by the San Diego Water Board as they are available are posted on the San Diego Water Board's website at http://www.waterboards.ca.gov/sandiego/board_info/agendas

Except for items designated as time certain, there are no set times for agenda items. Items may be taken out of order at the discretion of the Chairman.

1. Roll Call and Introductions.

2. PUBLIC FORUM: Any person may address the Board regarding a matter within the Board's jurisdiction that is not related to an item on this meeting agenda and is not a pending matter that may be scheduled for a future meeting. **Comments will generally be limited to three minutes, unless otherwise directed by the Board Chairperson**. Any person wishing to make a longer presentation should contact the Executive Officer at least ten days prior to the meeting.

3. Minutes of Board Meeting: September 9, 2015

4. Chairman's, Board Members', State Board Liaison's and Executive Officer's Reports: These items are for Board discussion only. No public testimony will be allowed, and the Board will take no formal action.

5. Future Agenda Items: Board members may discuss items for possible inclusion on future agendas. (*David Gibson*)

6. Approval of 2016 Meeting Schedule. *(David Gibson)*

Consent Calendar: Items 7 through 10 are considered non-controversial issues. (NOTE: If there is public interest, concern, or discussion regarding any consent calendar item or a request for a public hearing, then the item(s) will be removed from the Consent Calendar and considered after all other agenda items have been completed.)

7. Rescission of WDRs: An Order Rescinding Order Nos. 88-65, 94-06, 94-34, and 94-63, Individual Waste Discharge Requirements for Hanson Aggregates Sand and Gravel Operations in Escondido, Lakeside, and San Diego (Tentative Order No. R9-2015-0105). *(Roger Mitchell)*

8. NPDES Permit Reissuance: University of California, San Diego – Scripps Institution of Oceanography Discharge to the Pacific Ocean (Tentative Order No. R9-2015-0070, NPDES No. CA0107239). *(Joann Lim)*

9. U.S. Department of the Navy, Naval Base Coronado. *(Kristin Schwall)*

    a. NPDES Permit Reissuance: Discharge to the Pacific Ocean, San Diego Bay and the Tijuana River Estuary (Tentative Order No. R9-2015-0117, NPDES No. CA0109185).

    b. Time Schedule Order: A Time Schedule Order Requiring the U.S. Department of the Navy to Comply with Requirements Prescribed in Tentative Order No. R9-2015-0117, NPDES No. CA0109185 (Tentative Order No. R9-2015-0118).

Remainder of the Agenda (Non-Consent Items):

10. THIS ITEM HAS BEEN POSTPONED - Information Item: Presentation on the San Ysidro Lan Treatment and Reuse Facility as a Model Facility for Sustainability. *(Alex Cali)*

11. NPDES Permit Amendment: An Order to amend Order R9-2013-0001, as amended by Order No. R9-2015-0001, NPDES No. CAS0109266, *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region*. The amendment includes, but is not limited to, incorporation of the County of Riverside, the Cities of Murrieta, Temecula, and Wildomar, and the Riverside County Flood Control and Water Conservation District as Copermittees (Tentative Order No. R9-2015-0100). *(Wayne Chiu and Christina Arias)*

12. *Closed Session*-Discussion of Ongoing Litigation [Authorized under Government Code Section 11126, subd. (e)]. The San Diego Water Board may meet in closed session to discuss ongoing litigation for the following cases:

    Civil Actions (Judicial and Administrative, other than Petitions for Review filed with the State Water Board)

    a. In re: Test Claim on California Regional Water Quality Control Board, San Diego Region, Order No. R9-2007-001, (NPDES No. CAS0108758) Waste

Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego County, the San Diego Unified Port District, and the San Diego County Regional Airport Authority adopted on January 24, 2007. Test Claim filed by San Diego County, et al., with Commission on State Mandates, No. 07-TC-09 (filed June 2008). *(Catherine George Hagan)*

b. *State of California Department of Finance, State Water Resources Control Board, And California Regional Water Quality Control Board, San Diego Region v. Commission on State Mandates.* Petition for Writ of Administrative Mandamus. Sacramento County Superior Court, Case No. 34-2010-80000604 (filed July 2010), pending at Court of Appeal. *(Catherine George Hagan)*

c. *In re: Citizens Development Corporation, Debtor and Debtor in Possession*, Case No. 10-15142-LT11. United States Bankruptcy Court, Southern District of California. (San Diego Water Board Claim in Bankruptcy) (filed June 2011). (*Catherine George Hagan*)

d. *Test Claim on California Regional Water Quality Control Board, San Diego Region, Order No. R9-2009-0002, (NPDES No. CAS0108740) Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of Orange, the Incorporated Cities of the County of Orange, and the Orange County Flood Control District adopted on December 16, 2009. Test Claim filed by County of Orange, et al., with Commission on State Mandates, No. 10-TC-11* (filed June 2011). *(Catherine George Hagan)*

e. *Test Claim on California Regional Water Quality Control Board, San Diego Region, Order No. R9-2010-0016 (NPDES No. CAS0108766) adopted November 10, 2010, County of Riverside, Riverside County Flood Control and Water Conservation District, and the Cities of Murrieta, Temecula and Wildomar, Co-Claimants, filed with Commission on State Mandates, No. 11-TC-03 (filed November 2011) (Inactive per Test Claimants' request pending outcome of related litigation).* *(Catherine George Hagan)*

f. *Coastal Environmental Rights Foundation, a CA non-profit public benefit corporation v. California Regional Water Quality Control Board, San Diego Region.* Petition for Writ of Administrative Mandamus. San Diego County Superior Court, Case No. 37-2014-00038672-CU-WM-CTL (filed November 2014) (Challenging NPDES General Permit for Residual Firework Pollutant Waste Discharges to Waters of the United States, San Diego Region, Order No R9-2011-0022). (*Ben Neill*)

g. *Test Claim on California Regional Water Quality Control Board, San Diego Region, Order No. R9-2013-0001 (Regional MS4 Permit) filed with Commission on State Mandates by County of San Diego. (San Diego Region Water Permit – County of San Diego, Test Claim No. 14-TC-03 (filed June 2015). (Inactive per Test Claimants' request pending outcome of related litigation).* *(Catherine George Hagan)*

h. *San Diego Gas & Electric Company v. San Diego Regional Water Quality Control Board.* Petition for Writ of Administrative Mandamus. San Diego County Superior Court Case No. 37-2015-00032608-CU-WM-CTL (filed September 2015) (Challenging Cleanup and Abatement Order No. R9-2012-0024 for San Diego Bay Shipyard Sediment Site). *(Catherine George Hagan)*

Petitions for Review Pending Before State Water Resources Control Board[2]

i. Petitions for Review of Regional Municipal Separate Storm Sewer System Order No. R9-2013-0001 (NPDES No. CAS0109266), adopted May 8, 2013, filed by (1) San Diego County Regional Airport Authority (stay requested), (2) City of Lake Forest (abeyance request), (3) City of Aliso Viejo (abeyance request), (4) City of Laguna Hills (abeyance request), (5) City of Rancho Santa Margarita (abeyance request), (6) City of Chula Vista, (7) City of National City, (8) Riverside County Flood Control and Water Conservation District, the County of Riverside, and the Cities of Murrieta, Temecula, and Wildomar (abeyance request), (9) City of Dana Point (abeyance request), (10) City of Mission Viejo (abeyance request), (11) City of San Clemente (abeyance request), (12) County of Orange and Orange County Flood Control District (abeyance request), (13) San Diego Unified Port District, (14) City of San Diego (abeyance request), (15) County of San Diego, and (16) City of Laguna Niguel. SWRCB/OCC File A-2254(a)-(p), filed June 2013.[3] (*Wayne Chiu*)

j. Petition of San Diego Unified Port District, Waste Discharge Requirements Order No. R9-2013-0093 for San Diego Shipyard Sediment Remediation Project, San Diego Bay, San Diego County, July 10, 2013, SWRCB/OCC File A-2263, filed August 2013 (stay requested). (*Alan Monji*)

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[2] Petitions for review of San Diego Water Board actions or inactions filed with the State Water Board being held in abeyance by the State Water Board are generally not listed in the agenda. The titles of these matters are available at the San Diego Water Board. Please contact Catherine George Hagan at catherine.hagan@waterboards.ca.gov or 619-521-3012 for more information.

[3] On March 12 and 13, 2015, ten of the entities that filed petitions for review of the Regional MS4 Permit (Order No. R9-2013-0001) filed petitions for review of Order No. R9-2015-0001 amending the Regional MS4 Permit to incorporate Orange County Copermittees. Those filing to challenge the 2015 Order are the Cities of Rancho Santa Margarita, Laguna Hills, Aliso Viejo, San Clemente, Laguna Niguel, Dana Point, Mission Viejo, San Diego, and the County of Orange and Orange County Flood Control District. The petitions are numbered SWRCB/OCC Files A-2367(a) through (j) and all are being held in abeyance by the State Water Board at the petitioners' request.

k. Petition of Donan Environmental Services, Inc., Cleanup and Abatement Order No. R9-2013-0022 at the Site of the Former Santa Ysabel Chevron Station, 30350 Highway 78, Santa Ysabel, San Diego County, September 18, 2013, SWRCB/OCC File A-2277, filed October 2013. (*Sean McClain*)

l. Petition of Kinder Morgan Energy Partners, L.P., for Review of Denial of Request to Rescind or Modify Time Schedule Order No. R9-2011-0052, November 26, 2014, SWRCB/OCC File A-2354, Filed December 23, 2014 (Stay Requested). (*Ben Neill*)

13. *Closed Session*-Consideration of Initiation of Litigation or Discussion of Significant Exposure to Litigation. The San Diego Water Board may meet in closed session to initiate or consider initiating litigation concerning matters within its jurisdiction or to discuss significant exposure to litigation [Authorized under Government Code Section 11126(e)]. *(David Gibson)*

14. *Closed Session*-Deliberation on a Decision to be Reached Based on Evidence Introduced in a Hearing. The San Diego Water Board may meet in closed session to consider evidence received in an adjudicative hearing and to deliberate on a decision to be reached based upon that evidence [Authorized under Government Code Section 11126(c)(3)].

15. *Closed Session*-Personnel. The San Diego Water Board may meet in closed session to consider the appointment, employment, evaluation of performance, or dismissal of a public employee or to hear complaints or charges brought against that employee by another person or employee unless the employee requests a public hearing [Authorized under Government Code Section 11126(a)].

16. Arrangements for Next Meeting and Adjournment:

    Wednesday, December 16, 2015-9:00 a.m.
    Water Quality Control Board
    Board Meeting Room
    2375 Northside Drive, Suite 108
    San Diego, California

NOTIFICATIONS

A. **Video broadcast of meetings will be available at: http://www.calepa.ca.gov/Broadcast.** The San Diego Water Board's use of video broadcast is a courtesy and is for informational purposes only. It is not always reliable and is not a substitute for personal attendance at a Board meeting.

B. **Follow the Board Meeting on Twitter**: Updates on the progress of the San Diego Water Board meeting will be posted on Twitter at www.twitter.com/SDWaterBoard. The San Diego Water Board's use of Twitter is a courtesy and is for informational purposes only. It is not always reliable, and is not a substitute for personal attendance at a Board meeting.

DIRECTIONS TO MEETING

From Downtown: Green Line light rail towards Santee to Fenton Parkway Station. Walk to 2375 Northside Drive (about 9 minutes). Head northwest on Fenton Parkway to Northside Drive. Right on Northside Drive.

I-15 north-take the Friars Road West exit (toward Qualcomm Stadium)-follow signs to stay on Friars Road. Turn left onto Fenton Parkway. Turn left at first signal (Northside Drive). Our building is located at the end of the court-veer to the left into the parking structure. Parking will be validated for the parking structure.

From the North: Pacific Surfliner Train 572 towards San Diego Santa Fe Depot. Walk to San Diego Old Town Transit Center (about 1 minute). Green Line light rail towards Santee to Fenton Parkway Station. Walk to 2375 Northside Drive (about 9 minutes). Head northwest on Fenton Parkway to Northside Drive. Right on Northside Drive

I-15 south-take the Friars Road West exit-follow signs to stay on Friars Road. Turn left onto Fenton Parkway. Turn left at first signal (Northside Drive). Our building is located at the end of the court-veer to the left into the parking structure. Parking will be validated for the parking structure.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
Summary of Board Actions and Proceedings
At the September 9, 2015 Board Meeting

MINUTES	REGIONAL BOARD ACTIONS
Minutes of the August 12, 2015 Board Meeting.	Approved Minutes.
NON-CONSENT ITEMS	
Information Item: Update on Water Law. *(Catherine George Hagan)*	Information Item only; no action taken.
Information Item: Update from Energy and Environmental Sciences Group at U.S. Navy SPAWAR Systems Center Pacific on Ongoing Monitoring and Assessment Techniques. *(David Gibson)*	Information item only; no action taken.
Information Item: Water Quality Coordinating Committee (WQCC) Issue Discussion in Preparation for the October WQCC Meeting. *(David Gibson)*	Information item only; no action taken.

NOTES:

A. GENERAL STATEMENT. The primary duty of the San Diego Water Board is to protect the quality of the waters within the region for all beneficial uses. This duty is implemented by formulation and adoption of water quality plans for specific ground or surface water basins and by prescribing and enforcing requirements on all domestic and industrial waste discharges. Responsibilities and procedures of the Regional Water Quality Control Board come from the State's Porter-Cologne Water Quality Act and the Nation's Clean Water Act.

   The purpose of the meeting is for the Board to obtain testimony and information from concerned and affected parties and make decisions after considering the recommendations made by the Executive Officer.

   All interested persons may speak at the San Diego Water Board meeting and are expected to orally summarize their written submittals. Testimony should be presented in writing prior to the meeting and only a summary of pertinent points presented orally. Oral testimony (i.e., direct testimony or comment) will be limited in time by the Board Chair (typically 3 minutes for interested persons and no more than 10 minutes for designated parties). A timer may be used and speakers are expected to honor the time limits.

B. PROCEDURE FOR CONSENT (UNCONTESTED) CALENDAR (see also 23 C.C.R. § 647.2) Consent or uncontested agenda items are items for which there appears to be no controversy and which can be acted upon by the San Diego Water Board with no discussion. Such items have been properly noticed and all interested parties consent to the staff recommendation. The San Diego Water Board Chair will recognize late revisions submitted by staff and will then call for a motion and vote on all of the consent calendar items by the San Diego Water Board.

   If any San Diego Water Board member or member of the public raises a question or issue regarding an item that requires San Diego Water Board discussion, the item may be removed from the consent calendar and considered separately in an order determined by the Chair. Anyone wishing to contest a consent item on the agenda is expected to appear in person at the San Diego Water Board meeting and explain to the San Diego Water Board the reason that it is contested.

C. PROCEDURE FOR INFORMATION ITEMS (see also 23 C.C.R. 649, et. seq.). Information items are items presented to the San Diego Water Board for discussion only and for which no San Diego Water Board action or vote is normally taken. The San Diego Water Board usually will hear a presentation by staff, but may hear presentations by others. Comments by interested persons shall also be allowed. Members of the public wishing to address the San Diego Water Board on the topic under discussion should submit an attendance card beforehand indicating their request to speak to the San Diego Water Board. Comment from the public should be for clarification or to add to the San Diego Water Board’s understanding of the item; such comment must not be testimonial

in nature or argumentative, as speakers are not under oath and the proceeding is not adversarial. Time limits may be imposed on interested persons.

D. PROCEDURES FOR NON-CONSENT (CONTESTED) AGENDA ITEMS. Non-consent or contested agenda items are items to which the parties involved have not consented and the staff recommendation is in dispute. The procedure that applies to such items depends on the nature of the matter. Matters before the San Diego Water Board may be quasi-legislative or quasi-judicial (adjudicative proceedings). Such items may require a public hearing and all interested persons will be provided an opportunity to make comments.

Contested Adjudicative Matters

Contested agenda items that are adjudicative, not quasi-legislative, are governed by the rules for adjudicative proceedings. State Water Resources Control Board (State Water Board) regulations setting forth the procedures for adjudicative proceedings before the State and Regional Water Boards are codified in Title 23, California Code of Regulations, Division 3. Adjudicative proceedings before the State and Regional Water Boards are governed by State Water Board regulations as authorized by Chapter 4.5 of the Administrative Procedures Act (commencing with section 11400 of the Government Code). State Water Board regulations further provide that, with certain exceptions, adjudicative proceedings will be conducted in accordance with sections 800-805 of the Evidence Code and section 11513 of Chapter 5 of the Government Code. (Other provisions of Chapter 5 of the Government Code do not apply to adjudicative proceedings before the State and Regional Water Boards). A copy of those regulations and Chapter 4.5 of the Administrative Procedures Act, section 11513 of the Government Code and sections 801-805 of the Evidence Code can be found at http://www.waterboards.ca.gov/laws_regulations/.

An adjudicative proceeding is a hearing to receive evidence for determination of facts pursuant to which the State or Regional Water Board formulates and issues a decision. A decision determines a legal right, duty, privilege, immunity or other legal interest of a particular person or persons. Examples of adjudicative proceedings include hearings to receive evidence concerning the issuance of waste discharge requirements or National Pollutant Discharge Elimination System (NPDES) permits, concerning cease and desist orders, and concerning orders imposing administrative civil liability. Adjudicative proceedings are not conducted according to the technical rules of evidence, and the San Diego Water Board will accept testimony and comments that are reasonably relevant to the issues before the Board. Testimony or comments that are not reasonably relevant, or that are repetitious, will be excluded.

In some adjudicative matters, most frequently administrative civil liability matters, a separate Hearing Procedures Document has been issued. In those cases, the procedures set forth in that Document will apply, subject to discretionary modification by the Chairman. For other adjudicatory matters, the Chair may establish specific procedures for each item, and consistent with section 648, subdivision (d) of title 23 of the California Code of Regulations may waive nonstatutory provisions of the regulations. Generally, all witnesses testifying

before the San Diego Water Board must affirm the truth of their testimony and are subject to questioning by the Board Members.

Absent a separate Hearing Procedures Document, the Board normally conducts adjudicative proceedings in an informal manner. That is, the Board does not, generally, require the designation of parties, the prior identification of witnesses, prior submission of written testimony, or the cross examination of witnesses. Any requests for an alternate hearing process should be directed to the Executive Officer and must be received by the San Diego Water Board by the deadline set forth on pages 1-2 of the Agenda.

When the San Diego Water Board determines that a hearing will be formal (as opposed to informal, as described above), participants in a contested agenda item are either “designated parties” or “interested persons.” Only designated parties will have the right to cross-examination, and may be subject to cross-examination. Interested persons (i.e., nondesignated parties) do not have a right to cross-examination, but may ask the San Diego Water Board to clarify testimony. Interested persons may also be asked to clarify their statements at the discretion of the San Diego Water Board.

Designated parties include:

- Discharger or Responsible Party
- Persons directly affected by the discharge
- Staff of the San Diego Water Board (if specified in the applicable hearing procedures)

All other persons wishing to testify or provide comments for a formal hearing are “interested persons” and not “designated parties.” Such interested persons may request status as a designated party for purposes of the formal hearing by submitting such request in writing to the San Diego Water Board no later than the date specified at the beginning of the Agenda Notice or in the applicable Notice of Public Hearing or Hearing Procedures Document. The request must explain the basis for status as a designated party and, in particular, how the person is directly affected by the discharge.

All persons testifying must state their name, address, affiliation, and whether they have taken the oath before testifying. The order of testimony for formal hearings generally will be as follows, unless modified by the San Diego Water Board Chair:

- Testimony and cross-examination of San Diego Water Board staff
- Testimony and cross-examination of discharger
- Testimony and cross-examination of other designated parties
- Testimony by interested persons
- Closing statement by designated parties other than discharger
- Closing statement by discharger
- Closing statement by staff
- Recommendation by Executive Officer (as appropriate)
- Close hearing

- Deliberation and voting by San Diego Water Board

Closing statements shall be for the purpose of summarization and rebuttal and are not to be used to introduce new evidence or testimony. After considering evidence, testimony, and comments, the San Diego Water Board may choose to adopt an order regarding a proposed agenda item.

Quasi-legislative Matters

Quasi-legislative matters include rulemaking and some informational proceedings. These matters may include hearings for the adoption or amendment of regulations, water quality control plans, and hearings to gather information to assist the State and Regional Water Boards in formulating policy for future action. They are not adjudicative proceedings and are subject to different procedures. (See PROCEDURE FOR INFORMATION ITEMS, above, and Cal. Code Regs. Tit. 23, § 649, et seq.)

E. CONTRIBUTIONS TO SAN DIEGO WATER BOARD MEMBERS. Persons applying for or actively supporting or opposing waste discharge requirements or other San Diego Water Board orders must comply with legal requirements if they or their agents have contributed or proposed to contribute $250 or more to the campaign of a San Diego Water Board member for elected office. Contact the San Diego Water Board for details if you fall into this category.

F. PROCEDURAL INFORMATION. The San Diego Water Board may meet in closed session to discuss matters in litigation, including discussion of initiated litigation, significant exposure to litigation, or decisions to initiate litigation [Authority: Government Code § 11126(e)]; deliberate on a decision to be reached based upon evidence introduced in an adjudicatory hearing [Authority: Government Code § 11126(d)]; or to consider the appointment, employment or dismissal of a public employee to hear complaints or charges brought against a public employee [Authority: Government Code §11126(a)].

The San Diego Water Board may break for lunch at approximately noon at the discretion of the Chairman. During the lunch break San Diego Water Board members may have lunch together. Other than properly noticed closed session items, San Diego Water Board business will not be discussed.

Agenda items are subject to postponement. A listing of postponed items will be posted in the meeting room. You may contact the designated staff contact person in advance of the meeting day for information on the status of any agenda item.

Speaker Cards. All persons desiring to address the San Diego Water Board are required to fill out a speaker card. Cards are normally provided near the entrance to the meeting room. San Diego Water Board staff can assist you in locating the cards.

Please fill out a separate card for each item you plan to speak on. All relevant sections, including the oath, must be completed. Please use the appropriate color card, as indicated below:

- Blue: Public Comments (for items requiring no San Diego Water Board action-Public Forum, status reports, etc.).
- Green: Public Testimony, in support of the tentative action.
- Pink: Public Testimony, opposed to the tentative action.

G. AVAILABILITY OF EXECUTIVE OFFICER'S REPORT AND AGENDA MATERIAL. Visit our website at www.waterboards.ca.gov/sandiego to view the Executive Officer's Report over the internet two days prior to the San Diego Water Board meeting. A copy can also be obtained by contacting the staff office. A limited number of copies are available at the meeting.

Copies of most agenda items to be considered by the San Diego Water Board are posted as available on the San Diego Water Board's website at http://www.waterboards.ca.gov/sandiego/board_info/agendas.

Details concerning other agenda items are available for public reference during normal working hours at the San Diego Water Board's office. The appropriate staff contact person, indicated with the specific agenda item, can answer questions and provide additional information. For additional information about the Board, please see the attached sheet.

H. PETITION OF SAN DIEGO WATER BOARD ACTION. In accordance with California Water Code section 13320 and California Code of Regulations, title 23, section 2050 et seq., any person affected adversely by most decisions of the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) may petition the State Water Resources Control Board (State Board) to review the decision. The petition must be received by the State Board within 30 days of the San Diego Water Board's meeting at which the adverse action was taken. Copies of the law and regulations applicable to filing petitions will be provided upon request.

I. HEARING RECORD. Material presented to the Board as part of testimony (e.g. photographs, slides, charts, diagrams etc.) that is to be made part of the record must be left with the Board. Photographs or slides of large exhibits are acceptable.

All Board files, exhibits, and agenda material pertaining to items on this agenda are hereby made a part of the record.

J. ACCESSIBILITY. The facility is accessible to people with disabilities. Individuals who have special accommodation or language needs, please contact Ms. Chris Blank at (619) 521-3382 or cblank@waterboards.ca.gov at least 5 working days prior to the meeting. TTY/TDD/Speech-to-Speech users may dial 7-1-1 for the California Relay Service.

K. PRESENTATION EQUIPMENT. Providing and operating projectors and other presentation aids are the responsibilities of the speakers. Some equipment may be available at the Board Meeting; however, the type of equipment available will vary dependent on the meeting location. Because of compatibility issues, provision and operation of laptop computers and projectors for Power Point presentations will generally be the responsibility of the individual speakers. To ascertain the availability of presentation equipment please contact Ms. Chris Blank at (619) 521-3382 or cblank@waterboards.ca.gov at least 5 working days prior to the meeting.

State of California
Regional Water Quality Control Board
San Diego Region

EXECUTIVE OFFICER SUMMARY REPORT
November 18, 2015

ITEM: 11

SUBJECT: NPDES Permit Amendment: An Order to amend Order No. R9-2013-0001, as Amended by Order No. R9-2015-0001, NPDES No. CAS0109266, *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Regional MS4 Permit). The amendment includes, but is not limited to, incorporation of the County of Riverside, the Cities of Murrieta, Temecula, and Wildomar, and the Riverside County Flood Control and Water Conservation District as Copermittees under the Regional MS4 Permit. (Tentative Order No. R9-2015-0100) (*Wayne Chiu and Christina Arias*)

PURPOSE: *To consider adoption of Tentative Order No. R9-2015-0100 to amend Order No. R9-2013-0001, as amended by Order No. R9-2015-0001* **(Supporting Document No. 1)**.

RECOMMENDATION: Adoption of Tentative Order No. R9-2015-0100 with errata is recommended.

KEY ISSUES:

1. The Tentative Order amends the Regional MS4 Permit to include an optional pathway for a Copermittee to be deemed in compliance with receiving water prohibitions and limitations while fully implementing over a period of time a rigorous and transparent alternative compliance path to come into compliance (referred to as the "alternative compliance option"). The proposed alternative compliance option is consistent with State Water Resources Control Board (State Water Board) Order No. WQ 2015-0075, which directs Regional Water Boards to consider a watershed-based planning and implementation approach to compliance with receiving water limitations in Phase I MS4 permits. The environmental community opposed State Water Board Order No. WQ 2015-0075, and oppose the inclusion of the alternative compliance option in the Regional MS4

Permit because they consider it a “safe harbor” from enforcement of receiving water prohibitions and limitations.

2. The Tentative Order amends the Regional MS4 Permit to include additional language that clarifies when a development project has “prior lawful approval.” Development projects that have “prior lawful approval” are only required to implement the development planning requirements of the previous MS4 Permit. All other development projects are subject to the development planning requirements of the Regional MS4 Permit. This additional language was requested for inclusion in the Regional MS4 Permit by the development community and the San Diego County Copermittees.

PRACTICAL VISION: The Regional MS4 Permit directly implements several chapters of the San Diego Water Board’s Practical Vision. Multiple provisions of the Regional MS4 Permit pertain to the development and implementation of strategies to achieve healthy waters and recovery of stream, wetlands, and riparian ecosystems. These strategies implement an outcome-based approach, with a focus on achieving measureable reductions in MS4 pollutant discharges and improvements in receiving water quality. By extending the coverage of the Regional MS4 Permit to incorporate the Riverside County Copermittees, the Tentative Order will enable these Copermittees to more flexibly deploy resources to achieve goals that will yield the greatest water quality improvements.

DISCUSSION: The County of Riverside, the Cities of Murrieta, Temecula, and Wildomar, and the Riverside County Flood Control and Water Conservation District (collectively referred to as Riverside County Copermittees) are currently regulated by their Fourth Term MS4 permit, Order No. R9-2010-0016, which expires on November 10, 2015. A map showing the boundaries of these municipalities and the San Diego Water Board’s jurisdiction is provided in **Supporting Document No. 2**.

The Riverside County Copermittees jointly submitted a Report of Waste Discharge (RoWD) in application for MS4 permit reissuance on May 8, 2015. The San Diego Water Board reviewed the Riverside County Copermittees’ RoWD, including its recommendations, and found it to be consistent with the framework, intent, and requirements of the Regional

MS4 Permit. The Tentative Order proposes to amend the Regional MS4 Permit to incorporate the Riverside County Copermittees.

In addition to amending the Regional MS4 Permit to incorporate the Riverside County Copermittees, the Tentative Order also proposes to amend the Regional MS4 Permit to address a variety of other issues including: 1) incorporation of an alternative compliance option to demonstrate compliance with receiving water prohibitions and limitations; 2) clarification of land development requirements describing when a development project has "prior lawful approval" or should be subject to the development planning requirements in the Regional MS4 Permit; 3) Regional Water Board designation to continue consolidated regulation of Phase I MS4 discharges for the Cities of Menifee, Murrieta, and Wildomar pursuant to Water Code section 13228; 4) incorporation of requirements for updating the BMP Design Manual when revisions are made to development planning requirements; 5) clarification of requirements for non-storm water discharges covered by the Statewide NPDES Permit for Drinking Water Systems and the San Diego Water Board's General Waste Discharge Requirements for Groundwater Extraction Discharges to Surface Waters; and 6) clarification of the Indicator Bacteria, Project I - Beaches and Creeks and Los Penasquitos Lagoon Sediment Total Maximum Daily Load (TMDL) requirements to increase consistency with the Basin Plan TMDL implementation requirements.

Between April and June 2015, the San Diego Water Board conducted three workshops to receive comments and information from Copermittees and other key stakeholders concerning the alternative compliance option and prior lawful approval issues. A San Diego Water Board member was present at the April and May 2015 workshops. Draft permit language that was developed as a result of these workshops was incorporated into the proposed amendments to the Regional MS4 Permit.

The proposed amendments to the Regional MS4 Permit were incorporated into the Tentative Order released for public comment on July 31, 2015, and are highlighted in blue underline and red-strikeout text in Attachments 1 and 2 to the Tentative Order (**Supporting Document No. 1**). The Tentative Order was released for a 46-day public review and comment period that concluded on September 14, 2015.

Eighteen comment letters were timely received and are presented in **Supporting Document No. 3**. The San Diego Water Board responses to these comments are presented in **Supporting Document No. 4**. In response to comments, additional revisions to Attachments 1 and 2 to the Tentative Order are recommended, and are presented on an Errata Sheet in **Supporting Document No. 5**. A summary of the amendments to the Regional MS4 Permit is provided below:

Alternative Compliance Option
During the February 11, 2015 San Diego Water Board hearing to amend the Regional MS4 Permit to extend coverage to the Orange County Copermittees, the San Diego County, Orange County, and Riverside County Copermittees renewed their request that the Board include the alternative compliance option. The San Diego Water Board declined to include the alternative compliance option but committed to re-examining the option during the proceedings to extend coverage of the Regional MS4 Permit to the Riverside County Copermittees. The proposed alternative compliance option amendment is incorporated as Provision B.3.c in the Regional MS4 Permit, beginning on page 33 in Attachment 1 to the Tentative Order (**Supporting Document No. 1**).

On June 16, 2015, the State Water Board adopted Order WQ 2015-0075 (**Supporting Document No. 6**) which affirmed the concept of an alternative compliance option in the Los Angeles County MS4 Permit and directed that all Regional Water Boards consider inclusion of the option in Phase I MS4 permits going forward. State Water Board Order WQ 2015-0075 includes seven principles that Regional Water Boards are expected to follow if they choose to incorporate an alternative compliance option in a Phase I MS4 permit. The alternative compliance option requirements under Provision B.3.c in Attachment 1 to the Tentative Order are consistent with the seven principles stipulated in State Water Board Order WQ 2015-0075.

Comments submitted from the Copermittees support the proposed alternative compliance option amendment, but generally requested modifications that would result in a less rigorous and transparent process. Comments from the environmental community strongly oppose the inclusion of the proposed alternative compliance option amendment because there is a concern that the Copermittees could have a “safe harbor” from enforcement for violations of receiving water

prohibitions and limitations. The environmental community raised several issues asserting the proposed alternative compliance option is illegal, as well as asserting several inconsistencies with the direction from State Water Board Order WQ 2015-0075. Minor revisions to Provision B.3.c in Attachment 1 to the Tentative Order and the corresponding Fact Sheet discussion in Attachment 2 to the Tentative Order were made in response to the comments, which are shown on the Errata Sheet presented in **Supporting Document No. 5.** The finalized proposed alternative compliance option requirements remain substantively the same as the language developed as a result of the public workshops. Please see responses to comments B3c-1 through B3c-9 and B5-1 in **Supporting Document No. 4**.

Defining Prior Lawful Approval

During the February 11, 2015 Board hearing to amend the Regional MS4 Permit to extend coverage to the Orange County Copermittees, the San Diego Water Board considered including a definition for "prior lawful approval" which was requested by members of the development community and the San Diego County Copermittees. However, the San Diego Water Board decided not to include the definition at that time, but committed to re-examining the issue during the proceedings to extend coverage of the Regional MS4 Permit to the Riverside County Copermittees.

The proposed prior lawful approval amendment language developed as a result of the workshops was incorporated into Provision E.3.e.(1)(a) of the Regional MS4 Permit, which can be found beginning on page 102 in Attachment 1 to the Tentative Order (**Supporting Document No. 1**).

Designation of a Regional Water Board

In 2010, the San Diego Water Board and the Santa Ana Water Board entered into an agreement pursuant to Water Code section 13228 whereby the San Diego Water Board is designated to regulate MS4 discharges within the jurisdictions of the Cities of Murrieta and Wildomar and the Santa Ana Water Board is designated to regulate MS4 discharges within the jurisdiction of the City of Menifee. The political boundaries of these cities are split between the jurisdictions of both the San Diego Water Board and the Santa Ana Water Board. The map in **Supporting Document No. 2** shows the political boundaries of these cities in comparison to the San Diego Water Board and the Santa Ana Water Board regional boundaries.

The San Diego Water Board and the Santa Ana Water Board are continuing the agreement pursuant to Water Code section 13228 to designate a single Regional Water Board to regulate MS4 discharges within the jurisdictions of the Cities of Menifee, Murrieta, and Wildomar. The agreement letters signed by the Executive Officers of the San Diego Water Board and Santa Ana Water Board and sent to the Cities of Menifee, Murrieta, and Wildomar are presented in **Supporting Document No. 7**.

In accordance with the agreement, the Tentative Order amends Table B-1 of the Regional MS4 Permit to require the City of Menifee to participate in the development of the Water Quality Improvement Plan for the Santa Margarita River Watershed Management Area. Table B-1 of the Regional MS4 Permit can be found beginning on page 20 in Attachment 1 to the Tentative Order (**Supporting Document No. 1**).

Other Proposed Amendments

The Tentative Order also includes proposed amendments to make corrections, updates, or clarifications to the language in the Regional MS4 Permit. The San Diego Water Board added requirements for updating the BMP Design Manual when the development planning requirements under Provisions E.3.a-d of the Regional MS4 Permit are revised by the San Diego Water Board after the BMP Design Manual has been submitted by the Copermittees. These requirements were included as a result of corrections that were made to the definition of Priority Development Projects. The corrections to the definition of Priority Development Projects can be found under Provision E.3.b.(1) beginning on page 91, and the proposed amendments for the requirements to update the BMP Design Manual can be found under Provision E.3.d on page 101 and Provision F.2.b beginning on page 126 in Attachment 1 to the Tentative Order (**Supporting Document No. 1**).

The Tentative Order includes proposed amendments to update the requirements for non-storm water discharges to include the recently adopted Statewide NPDES Permit for Drinking Water Systems and the San Diego Water Board's General Waste Discharge Requirements for Groundwater Extraction Discharges to Surface Waters. The proposed amendments can be found under Provisions E.2.a.(1) and E.2.a.(2) on page 82 in Attachment 1 to the Tentative Order.

The Tentative Order also proposes amendments to the requirements in the Indicator Bacteria, Project I – Beaches and Creeks TMDL and Los Peñasquitos Lagoon Sediment TMDL to increase consistency with the TMDL Basin Plan amendments. The proposed amendments to the Indicator Bacteria, Project I – Beaches and Creeks TMDL include adding requirements that allow the Copermittees to develop a Bacteria Load Reduction Plan (BLRP) as well as a Comprehensive Load Reduction Plan (CLRP). The proposed amendments can be found in Tables 6.1 and 6.4 on page E-31 and E-38, respectively, in Attachment 1of the Tentative Order. The proposed amendments to the Los Peñasquitos Lagoon Sediment TMDL include additional clarifying language to the Final TMDL Compliance Determination requirements, which can be found on page E-54.

In addition, as a result of comments received, the San Diego Water Board agreed to amendments that 1) clarify the effective date of the BMP Design Manual (see responses to comments E3d-2 and F2b-1), 2) clarify the definitions for Construction Activities and Redevelopment in Attachment C to the Regional MS4 Permit (see response to comments AttC-1 and AttC-2), and 3) clarify in the Fact Sheet that complying with the Illicit Discharge Detection and Elimination requirements under Provision E.2 is deemed to be compliance with the effective prohibition of non-storm water discharges to the Copermittee's MS4 under Provision A.1.b (see response to comment E2-1). These proposed amendments are also shown on the Errata Sheet in **Supporting Document No. 5**.

LEGAL CONCERNS: Responses to legal comments received during the public comment period are included in the Response to Comments Report under comments Gnl-10, B3c-3, B3c-5, and B3c-7 through B3c-9 in **Supporting Document No. 4**.

SUPPORTING DOCUMENTS:

1. Tentative Order No. R9-2015-0100 with Attachments:
   1) Revised Order No. R9-2013-0001
   2) Revised Fact Sheet to Order No. R9-2013-0001
2. Map of Santa Margarita Hydrologic Unit Showing Riverside County Copermittees' Boundaries

3. Comment Letters Received on Tentative Order No. R9-2015-0100 and Attachments

4. San Diego Water Board Response to Comments Report

5. Errata Sheet listing additional changes to the Tentative Order and Attachments

6. State Water Board Order WQ 2015-0075

7. San Diego Water Board and Santa Ana Water Board Agreement Letters for Single Regional Water Board Designation to Regulate MS4 Discharges from the Cities of Menifee, Murrieta, and Wildomar

8. Notice of Public Hearing

PUBLIC NOTICE: Notice of this item was provided to interested persons via the San Diego Water Board e-mail subscription list on July 31, 2015 **(Supporting Document No. 8)**. Notice was also published in the Riverside Press Enterprise, San Diego Union, and Orange County Register newspapers. It was also provided in the Meeting Notice and Agenda for the November 18, 2015 Board meeting, which is posted on the San Diego Water Board's website.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

2375 Northside Drive, Suite 100, San Diego, CA 92108
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TENTATIVE
ORDER NO. R9-2015-0100

AN ORDER AMENDING ORDER NO. R9-2013-0001, NPDES NO. CAS010266, AS AMENDED BY ORDER NO. R9-2015-0001 NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The California Regional Water Quality Control Board, San Diego Region (hereinafter San Diego Water Board), finds that:

ENROLLMENT OF RIVERSIDE COUNTY COPERMITTEES

1. **Enrollment Process.** On May 8, 2013, the San Diego Water Board adopted Order No. R9-2013-0001, NPDES No. CAS019266, *National Pollutant Discharge Elimination System Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Order No. R9-2013-0001, or Regional MS4 Permit). Provision F.5 of that Order (as amended by Order No. R9-2015-0001) outlines a process to designate (enroll) the County of Riverside, the Riverside County Cities of Murrieta, Temecula, and Wildomar, and the Riverside County Flood Control and Water Conservation District as Copermittees under Order No. R9-2013-0001, responsible for compliance with the terms and the conditions of the Regional MS4 Permit. Provision F.5 provides that prior to such enrollment, the San Diego Water Board must first review and consider a Report of Waste Discharge (ROWD) submitted by the Riverside County Copermittees under their current MS4 Permit, Order No. R9-2010-0016, to determine whether the Copermittees should be enrolled under Order No. R9-2013-0001, and what changes to Order No. R9-2013-0001 proposed in the ROWD are appropriate.

2. **Report of Waste Discharge.** By letter dated May 8, 2015, the Riverside County Copermittees jointly submitted a ROWD in application for the reissuance of waste discharge requirements, pursuant to the requirements of section K.2.c of Order No. R9-2010-0016. The San Diego Water Board reviewed the ROWD and determined it is complete.

3. **Riverside County Copermittees Enrollment.** After consideration of the Riverside County Copermitees' ROWD and changes needed to Order No. R9-2013-0001, the San Diego Water Board determined that the County of Riverside, the Cities of Murrieta, Temecula, and Wildomar, and the Riverside County Flood Control and Water Conservation District should be enrolled as Copermittees under Order No. R9-2013-0001 and be responsible for compliance with the terms and the conditions of the Regional MS4 Permit. Enrolling the Riverside County Copermittees into Order No. R9-2013-0001 will provide regulatory consistency in the implementation of MS4 permit requirements throughout the San Diego Region, improve communication and coordination among Copermittees within watersheds crossing multiple jurisdictions, and maximize efficiency and economy of resources for the San Diego Water Board achieved through the redirection of staff permitting resources to better advance the storm water program. Enrollment of the Cities of Murrieta and Wildomar is subject to a California Water Code section 13228 agreement as set forth in the findings of this Order.

DESIGNATION OF A REGIONAL WATER BOARD

4. **Regional Water Board Designation.** The Cities of Menifee, Murrieta, and Wildomar are located partially within the jurisdictions of both the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board) and the San Diego Water Board. California Water Code section 13228 provides a way to streamline the regulation of entities whose jurisdictions straddle the border of two or more Regional Water Boards.

   As allowed by California Water Code section 13228, during the proceedings for Order No. R9-2010-0016, the Fourth Term Riverside County MS4 Permit, written requests for designation of a single Regional Water Board to regulate matters pertaining to Phase I MS4 discharges were submitted to the San Diego Water Board and Santa Ana Water Board by the City of Murrieta by letter dated July 20, 2010, the City of Wildomar by letter dated July 21, 2010, and the City of Menifee by letter dated July 22, 2010. The Cities of Murrieta and Wildomar requested designation of the San Diego Water Board, and the City of Menifee requested designation of the Santa Ana Water Board.

   As authorized by California Water Code section 13228 and pursuant to written agreements dated September 28, 2010 between the San Diego Water Board and the Santa Ana Water Board, the San Diego Water Board is designated under Order No. R9-2010-0016 to regulate Phase I MS4s within the entire jurisdictional area of the Cities of Murrieta and Wildomar, including those areas of each City located within the Santa Ana Water Board's geographic jurisdiction. The Santa Ana Water Board is designated under Order No. R8-2010-0033 to regulate the Phase I MS4s within the entire jurisdictional area of the City of Menifee, including those areas of the City located within the San Diego Water Board's geographic jurisdiction. Written requests to continue these Regional Water Board designations were submitted to the San Diego Water Board and Santa Ana Water Board by the City of Murrieta by

letter dated June 22, 2015, the City of Wildomar by letter dated June 23, 2015, and the City of Menifee by letter dated June 25, 2015.

5. **Factual Considerations.** The Santa Ana Water Board and San Diego Water Board establish generally consistent requirements for MS4 discharges to meet the technology-based standard of reducing pollutants in the discharge to the maximum extent practicable (MEP), a related iterative process to ensure MS4 discharges meet receiving water quality standards, and for non-storm water discharges to be effectively prohibited from entering the MS4. However due to the unique nature of watersheds and water quality issues in the San Diego Region and Santa Ana Region, MS4 permit requirements between the two Regional Water Boards may also vary to address region specific pollutant discharges and watershed conditions. The Cities of Menifee, Murrieta, and Wildomar report that management and implementation of municipal programs to comply with two different MS4 permits creates a significant administrative and financial burden that is not contributing to greater overall water quality improvements in either region.

6. **Regional Water Board Agreement.** The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated [Month][Day], 2015 to:

   a. Continue designation of the San Diego Water Board to regulate Phase I MS4 discharges within the entire jurisdictional area of the Cities of Murrieta and Wildomar, including those areas of each City located within the Santa Ana Region upon the effective date of Order R9-2015-0100, *and*

   b. Continue designation of the San Ana Water Board to regulate Phase I MS4 discharges within the entire jurisdictional area of the City of Menifee, including those areas of the City located within the San Diego Region, under Order No. R8-2010-0033 (NPDES No. CAS618030) as it may be amended or reissued upon the effective date of Order No. R9-2015-0100.

7. **Periodic Review of Regional Water Board Agreement.** The basis supporting the Cities of Menifee, Murrieta, and Wildomar requests to designate a specific Regional Water Board for regulatory oversight of MS4 discharges may change under future conditions and circumstances. Therefore the San Diego Water Board and Santa Ana Water Board will periodically review the effectiveness of the agreement during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate the agreement with the Santa Ana Water Board or otherwise modify the agreement subject to the approval of the Santa Ana Water Board.

AMENDMENTS TO ORDER NO. R9-2013-0001

8. **Effect of this Order.** Order No. R9-2013-0001 is not being reopened for any other purpose than the amendments contained herein. Except as contradicted or superseded by the findings and directives set forth in this Order, all of the previous findings and directives of Order No. R9-2013-0001 (as amended by Order No. R9-2015-0001) shall remain in full force and effect.

9. **Enroll Riverside County Copermittees.** This Order amends Order No. R9-2013-0001 to incorporate the County of Riverside, the Riverside County Cities of Murrieta, Temecula, and Wildomar, and the Riverside County Flood Control and Water Conservation District as Copermittees responsible for compliance with the terms and the conditions of Order No. R9-2013-0001, as amended by Order No. R9-2015-0001 and this Order.

10. **Alternative Compliance Pathway for Prohibitions and Limitations.** The San Diego County, Orange County, and Riverside County Copermittees have asserted that the prohibitions and limitations under Provision A of Order No. R9-2013-0001 may result in many years of noncompliance because years of technical efforts may ultimately be required to achieve compliance with the prohibitions and limitations, especially for wet weather discharges.

    The San Diego Water Board considered the incorporation of an alternative pathway to compliance during the adoption proceedings for Order No. R9-2013-0001 in May 2013, but chose not to include it at that time. During the proceedings for Order No. R9-2015-0001, amending Order No. R9-2013-0001 to extend coverage of the Regional MS4 Permit to the Orange County Copermittees and as reflected in Order No. R9-2015-0001, the San Diego Water Board committed to considering the incorporation of a well-defined, transparent, and finite alternative pathway to compliance in Order No. R9-2013-0001 during the MS4 permit reissuance proceedings for the Riverside County Copermittees.

    On June 16, 2015, the State Water Resources Control Board (State Water Board) adopted Order WQ 2015-0075, *In the Matter of Review of Order No. R4-2012-0175, NPDES Permit No. CAS004001, Waste Discharge Requirements for Municipal Separate Storm Sewer System (MS4) Discharges within the Coastal Watersheds of Los Angeles County, Except Those Discharges Originating from the City of Long Beach MS4,* which directs all Regional Water Boards to consider a watershed-based planning and implementation approach to compliance with receiving water limitations when issuing Phase I MS4 permits going forward. Consistent with the principles set forth in Order WQ 2015-0075, this Order amends Order No. R9-2013-0001 to incorporate an alternative compliance pathway that allows a Copermittee to utilize the watershed-based Water Quality Improvement Plan to be deemed in compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2.a, and A.3.b which are included in the prohibitions and limitations under Provision A of the Regional MS4 Permit.

    This Order amends the Fact Sheet of Order No. R9-2013-0001, Attachment F, section VII.E, Antidegradation Policy, to provide an expanded analysis consistent with the principles set forth in State Water Board Order WQ 2015-0075, demonstrating why the incorporation of an alternative compliance pathway for prohibitions and limitations in Order No. R9-2013-0001 complies with federal and state antidegradation policies. This Order also amends the Fact Sheet of Order No. R9-2013-0001, Attachment F, section VII.E, Anti-Backsliding Requirements, with an expanded analysis consistent with State Water Board Order WQ 2015-0075

demonstrating that the anti-backsliding requirements of the Clean Water Act and the federal regulations do not foreclose the incorporation of an alternative compliance pathway into Order No. R9-2013-0001.

11. **Update to Non-Storm Water Discharges.** Since Order No. R9-2013-0001 was adopted, the State Water Board adopted Order 2014-0194-DWQ (*Statewide National Pollutant Discharge Elimination System (NPDES) Permit for Drinking Water System Discharges to Waters of the United States*) and the San Diego Water Board adopted Order No. R9-2015-0013 (*General Waste Discharge Requirements for Groundwater Extraction Discharges to Surface Waters within the San Diego Region*). These orders are NPDES permits regulating non-storm water discharges that may be discharged to the Copermittees' MS4s. This Order amends Order No. R9-2013-0001 to incorporate State Water Board Order 2014-0194-DWQ and San Diego Water Board Order No. R9-2015-0013 into the requirements for addressing non-storm water discharges.

12. **Priority Development Project Definition Consistency.** The Fact Sheet of the Regional MS4 Permit as modified by Order No. R9-2015-0001, describes on Page F-98 the San Diego Water Board's intent that the Priority Development Project categories in Provision E.3.b.(1) be consistent with the categories in the Riverside County MS4 Permit (Order No. R9-2010-0016) and the Orange County MS4 Permit (Order No. R9-2009-0002). The San Diego Water Board's intention reflected in the Fact Sheet was not explicitly incorporated in some of the Priority Development Project categories described in Provision E.3.b.(1) and this Order amends the provision with clarifying language to better describe these categories consistent with the Fact Sheet. The Order also has been amended to include the requirements for updating the BMP Design Manual as a result of the corrections to the Priority Development Project categories in Provision E.3.b.(1).

13. **Definition of Prior Lawful Approval.** During the proceedings for Order No. R9-2015-0001, amending Order No. R9-2013-0001 to extend coverage of the Regional MS4 Permit to the Orange County Copermittees, the land development community asserted that the lack of a definition for the term "prior lawful approval" in the Regional MS4 Permit had created significant uncertainty for the San Diego County Copermittees, the land development community, and the general public about when the development planning requirements are applicable. The San Diego Water Board committed to considering the incorporation of additional guidance for prior lawful approval in Order No. R9-2013-0001 during the MS4 permit reissuance proceedings for the Riverside County Copermittees. This Order amends Order No. R9-2013-0001 to incorporate additional clarification describing when the structural BMP performance requirements are applicable to Priority Development Projects.

14. **Los Peñasquitos Lagoon Sediment TMDL.** During the proceedings for Order No. R9-2015-0001, amending Order No. R9-2013-0001 to extend coverage of the Regional MS4 Permit to the Orange County Copermittees, the San Diego County Copermittees responsible for implementing the TMDLs for Sediment in Los

Peñasquitos Lagoon requested several minor revisions to make the TMDL requirements consistent with the Basin Plan amendment adopted by the San Diego Water Board. This Order amends Attachment E to Order No. R9-2013-0001 to incorporate minor revisions to the Los Peñasquitos Lagoon Sediment TMDL to make the requirements consistent with the adopted Basin Plan amendment.

15. **Compliance Dates for TMDLs Beaches and Creeks Indicator Bacteria TMDLs.** A review of the interim and final compliance dates for the Revised TMDLs for Indicator Bacteria, Project I – Beaches and Creeks (Beaches and Creeks Indicator Bacteria TMDLs) in the San Diego Region in Attachment E to the Order revealed an inconsistency with the adopted Basin Plan amendment. This Order amends Attachment E to Order No. R9-2013-0001 to incorporate minor revisions to the Beaches and Creeks Indicator Bacteria TMDLs to make the requirements consistent with the adopted Basin Plan amendment.

16. **Removal of Application for Early Coverage Provisions.** Order No. R9-2013-0001, as amended by Order No. R9-2015-0001 included several provisions that allowed the Riverside County Copermittees to apply for early coverage under the Regional MS4 Permit prior to the expiration of Order No. R9-2010-0016. These provisions are no longer necessary once the Riverside County Copermittees are covered by the requirements of the Regional MS4 Permit with the adoption of this Order. This Order amends Order No. R9-2013-0001 to remove provisions related to applying for early coverage under the Regional MS4 Permit.

ADMINISTRATIVE FINDINGS

17. **California Environmental Quality Act**. This action is exempt from the requirement of preparation of environmental documents under the California Environmental Quality Act [Public Resources Code, Division 13, Chapter 3, Section 21000 et seq.] in accordance with California Water Code section 13389.

18. **Public Notice.** In accordance with State and federal laws and regulations, the San Diego Water Board has notified San Diego County, Orange County and Riverside County Copermittees, and all known interested agencies and persons of its intent to adopt this Order and has provided them with an opportunity to submit their written comments.

19. **Public Hearing.** The San Diego Water Board held a public hearing on November 18, 2015 and heard and considered all comments pertaining to the adoption of this Order.

20. **Notification.** Any person aggrieved by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with California Water Code section 13320 and California Code of Regulations, title 23, sections 2050 et seq. The State Water Board must receive the petition by 5:00 p.m., 30 days after the adoption date of this Order. Copies of the law and regulations applicable to filing petitions may be found on the Internet at:

http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

THEREFORE, IT IS HEREBY ORDERED,

1. This Order amends Order No. R9-2013-0001 and Fact Sheet as amended by Order No. R9-2015-0001 (Regional MS4 Permit and Fact Sheet). The revisions to the Regional MS4 Permit and Fact Sheet are shown Attachments 1 and 2 to this Order. Added text to the Regional MS4 Permit and Fact Sheet is displayed in blue-underline text and deleted text is displayed as red-strikeout text.

2. The amended Regional MS4 Permit and Fact Sheet included as Attachments 1 and 2 to this Order shall become effective on January 7, 2016.

3. The amended Regional MS4 Permit and Fact Sheet included as Attachments 1 and 2 to this Order shall supersede Order No. R9-2010-0016 for the Riverside County Copermittees except for enforcement purposes.

4. San Diego Water Board staff is directed to prepare and post a conformed copy of the Regional MS4 Permit and Fact Sheet, as amended by this Order, incorporating the revisions made by this Order.

I, David W. Gibson, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on November 18, 2015.

TENTATIVE

David W. Gibson
Executive Officer

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

ORDER NO. R9-2013-0001,
AS AMENDED BY ORDER NOS. R9-2015-0001 AND R9-2015-0100
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The San Diego County Copermittees in Table 1a are subject to waste discharge requirements set forth in this Order.

Table 1a. San Diego County Copermittees

City of Carlsbad	City of Oceanside
City of Chula Vista	City of Poway
City of Coronado	City of San Diego
City of Del Mar	City of San Marcos
City of El Cajon	City of Santee
City of Encinitas	City of Solana Beach
City of Escondido	City of Vista
City of Imperial Beach	County of San Diego
City of La Mesa	San Diego County Regional Airport Authority
City of Lemon Grove	San Diego Unified Port District
City of National City	

The Orange County Copermittees in Table 1b are subject to waste discharge requirements set forth in this Order.

Table 1b. Orange County Copermittees[1]

City of Aliso Viejo	City of Rancho Santa Margarita
City of Dana Point	City of San Clemente
City of Laguna Beach	City of San Juan Capistrano
City of Laguna Hills	City of Laguna Woods
City of Laguna Niguel	County of Orange
City of Mission Viejo	Orange County Flood Control District

~~After the San Diego Water Board receives and considers the Riverside County Copermittees' Report of Waste Discharge and makes any necessary changes to this Order, t~~The Riverside County Copermittees in Table 1c ~~will become~~ are subject to waste

[1] While not listed in Table 1b., the City of Lake Forest remains a Copermittee under this Order until the later effective date of this Order or the effective date of Santa Ana Water Board Tentative Order No. R8-2015-0001. Thereafter, the City of Lake Forest will no longer be considered a Copermittee under this Order because its Phase I MS4 discharges will be regulated by the Santa Ana Water Board pursuant to Water Code section 13228 designation. The requirements of this Order that apply to the City of Lake Forest for the duration of this Order, however, are described in Finding 29 and Footnote 2 to Table B-1.

discharge requirements set forth in this Order ~~after expiration of Order No.R9-2010-0016, NPDES No. CAS0108766 on or after November 10, 2015~~.

Table 1c. Riverside County Copermittees

City of Murrieta	County of Riverside
City of Temecula	Riverside County Flood Control and Water Conservation District
City of Wildomar	

~~The Riverside County Copermittees may become subject to the requirements of this Order at a date earlier than the expiration date of their current Order subject to the conditions described in Provision F.6 of this Order if the Riverside County Copermittees receive notification of coverage from the San Diego Water Board.~~

The term Copermittee in this Order refers to any San Diego County, Orange County, or Riverside County Copermittee covered under this Order, unless specified otherwise.

This Order provides permit coverage for the Copermittee discharges described in Table 2.

Table 2. Discharge Locations and Receiving Waters

Discharge Points	Locations throughout San Diego Region
Discharge Description	Municipal Separate Storm Sewer System (MS4) Discharges
Receiving Waters	Inland Surface Waters, Enclosed Bays and Estuaries, and Coastal Ocean Waters of the San Diego Region

Table 3. Administrative Information

This Order was adopted by the San Diego Water Board on:	**May 8, 2013**
Order No. R9-2013-0001 became effective on:	**June 27, 2013**
This Order as amended by R9-2015-0001 became effective on:	**April 1, 2015**
This Order as amended by R9-2015-0100 became effective on:	**January 7, 2016**
This Order will expire on:	**June 27, 2018**
The Copermittees must file a Report of Waste Discharge in accordance with Title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than 180 days in advance of the Order expiration date.	

I, David W. Gibson, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on May 8, 2013, as amended by adoption of Order No. R9-2015-0001 on February 11, 2015, and as amended by adoption of Order No. R9-2015-0100 on November 18, 2015.

TENTATIVE

David W. Gibson
Executive Officer

Order No. R9-2013-0001
As amended by Order No. R9-2015-0001 and Order No. R9-2015-0100

Amended February 11, 2015
Amended November 18, 2015

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ATTACHMENTS

Attachment A: Discharge Prohibitions and Special Protections A-1
Attachment B: Standard Permit Provisions and General Provisions B-1
Attachment C: Acronyms, Abbreviations and Definitions C-1
Attachment D: Jurisdictional Runoff Management Program Annual Report Form D-1
Attachment E: Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2013-0001, as amended by Order Nos. R9-2015-0001 and R9-2015-0100 ..... E-1
Attachment F: Fact Sheet / Technical Report for Order No. R9-2013-0001 as amended by Order Nos. R9-2015-0001 and R9-2015-0100 ..... F-1

I. FINDINGS

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), finds that:

JURISDICTION

1. **MS4 Ownership or Operation.** Each of the Copermittees owns or operates an MS4, through which it discharges storm water and non-storm water into waters of the U.S. within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the U.S.

2. **Legal and Regulatory Authority.** This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]) adopted by the United States Environmental Protection Agency (USEPA), and chapter 5.5, division 7 of the California Water Code (CWC) (commencing with section 13370). This Order serves as an NPDES permit for discharges from MS4s to surface waters. This Order also serves as waste discharge requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

   The San Diego Water Board has the legal authority to issue a regional MS4 permit pursuant to its authority under CWA section 402(p)(3)(B) and 40 CFR 122.26(a)(1)(v). The USEPA also made it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide permits (55 Federal Register [FR] 47990, 48039-48042). The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees and San Diego Water Board.

   The federal regulations make it clear that the Copermittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators (40 CFR 122.26(a)(3)(vi)). This Order does not require the Copermittees to manage storm water outside of their jurisdictional boundaries, but rather to work collectively to improve storm water management within watersheds.

3. **CWA NPDES Permit Conditions.** Pursuant to CWA section 402(p)(3)(B), NPDES permits for storm water discharges from MS4s must include requirements to effectively prohibit non-storm water discharges into MS4s, and require controls to reduce the discharge of pollutants in storm water to the maximum extent practicable (MEP), and to require other provisions as the San Diego Water Board determines are appropriate to control such pollutants. This Order prescribes conditions to assure compliance with the CWA requirements for owners and operators of MS4s to effectively prohibit non-storm water discharges into the MS4s, and require controls to reduce the discharge of pollutants in storm water from the MS4s to the MEP.

4. **CWA and CWC Monitoring Requirements.** CWA section 308(a) and 40 CFR 122.41(h),(j)-(l) and 122.48 require that NPDES permits must specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s also specify additional monitoring and reporting requirements in 40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c). CWC section 13383 authorizes the San Diego Water Board to establish monitoring, inspection, entry, reporting and recordkeeping requirements. This Order establishes monitoring and reporting requirements to implement federal and State requirements. This Order also includes requirements for the Orange County Copermittees to participate in, and together with South Orange County Wastewater Authority and Orange County Health Care Agency, share responsibility for implementing the unified approach to beach water quality monitoring and assessment program set forth in the October 2014 report, *Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County*, issued pursuant to CWC section 13383 in the San Diego Water Board December 5, 2014 Letter Directive.

5. **Total Maximum Daily Loads.** CWA section 303(d)(1)(A) requires that "[e]ach state shall identify those waters within its boundaries for which the effluent limitations are not stringent enough to implement any water quality standard applicable to such waters." The CWA also requires states to establish a priority ranking of impaired water bodies known as Water Quality Limited Segments and to establish Total Maximum Daily Loads (TMDLs) for such waters. This priority list of impaired water bodies is called the Clean Water Act Section 303(d) List of Water Quality Limited Segments, commonly referred to as the 303(d) List. The CWA requires the 303(d) List to be updated every two years.

   TMDLs are numerical calculations of the maximum amount of a pollutant that a water body can assimilate and still meet water quality standards. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point sources (waste load allocations or WLAs) and non-point sources (load allocations or LAs), background contribution, plus a margin of safety. Discharges from MS4s are point source discharges. The federal regulations (40 CFR 122.44(d)(1)(vii)(B)) require that NPDES permits incorporate water quality based effluent limitations (WQBELs) developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, consistent with the assumptions and requirements of any available WLA for the discharge. Requirements of this Order implement the TMDLs established by the San Diego Water Board or USEPA as of the date this Order was amended in 2015. This Order establishes WQBELs consistent with the assumptions and requirements of all available TMDL WLAs assigned to discharges from the Copermittees' MS4s.

6. **Non-Storm Water Discharges.** Pursuant to CWA section 402(p)(3)(B)(ii), this Order requires each Copermittee to effectively prohibit discharges of non-storm water into its MS4. Nevertheless, non-storm water discharges into and from the

MS4s continue to be reported to the San Diego Water Board by the Copermittees and other persons. Monitoring conducted by the Copermittees, as well as the 303(d) List, have identified dry weather, non-storm water discharges from the MS4s as a source of pollutants causing or contributing to receiving water quality impairments in the San Diego Region. The federal regulations (40 CFR 122.26(d)(2)(iv)(B)(1)) require the Copermittees to have a program to prevent illicit discharges to the MS4. The federal regulations, however, allow for specific categories of non-storm water discharges or flows to be addressed as illicit discharges only where such discharges are identified as sources of pollutants to waters of the U.S.

7. **In-Stream Treatment Systems.** Pursuant to federal regulations (40 CFR 131.10(a)), in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S. Authorizing the construction of a runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to accepting waste assimilation as an appropriate use for that water body. Runoff treatment must occur prior to the discharge of runoff into receiving waters. Treatment control best management practices (BMPs) must not be constructed in waters of the U.S. Construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body.

DISCHARGE CHARACTERISTICS AND RUNOFF MANAGEMENT

8. **Point Source Discharges of Pollutants.** Discharges from the MS4s contain waste, as defined in the CWC, and pollutants that adversely affect the quality of the waters of the state. A discharge from an MS4 is a “discharge of pollutants from a point source” into waters of the U.S. as defined in the CWA. Storm water and non-storm water discharges from the MS4s contain pollutants that cause or threaten to cause a violation of surface water quality standards, as outlined in the Water Quality Control Plan for the San Diego Basin (Basin Plan). Storm water and non-storm water discharges from the MS4s are subject to the conditions and requirements established in the Basin Plan for point source discharges.

9. **Potential Beneficial Use Impairment.** The discharge of pollutants and/or increased flows from MS4s may cause or threaten to cause the concentration of pollutants to exceed applicable receiving water quality objectives and impair or threaten to impair designated beneficial uses resulting in a condition of pollution, contamination, or nuisance.

10. **Pollutants Generated by Land Development.** Land development has created and continues to create new sources of non-storm water discharges and pollutants in storm water discharges as human population density increases. This brings higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash. Pollutants from these sources are dumped or washed off the surface by non-storm water or storm water flows into

and from the MS4s. When development converts natural vegetated pervious ground cover to impervious surfaces such as paved highways, streets, rooftops, and parking lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving a developed area without BMPs that can maintain pre-development runoff conditions will contain greater pollutant loads and have significantly greater runoff volume, velocity, and peak flow rate than pre-development runoff conditions from the same area.

11. **Runoff Discharges to Receiving Waters.** The MS4s discharge runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within the eleven hydrologic units comprising the San Diego Region. Historic and current development makes use of natural drainage patterns and features as conveyances for runoff. Rivers, streams and creeks in developed areas used in this manner are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and receiving water. Numerous receiving water bodies and water body segments have been designated as impaired by the San Diego Water Board pursuant to CWA section 303(d).

12. **Pollutants in Runoff.** The most common pollutants in runoff discharged from the MS4s include total suspended solids, sediment, pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., cadmium, copper, lead, and zinc), petroleum products and polynuclear aromatic hydrocarbons, synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus), oxygen-demanding substances (e.g., decaying vegetation, animal waste), detergents, and trash. As operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not prohibit or otherwise control. These discharges may cause or contribute to a condition of pollution or a violation of water quality standards.

13. **Human Health and Aquatic Life Impairment.** Pollutants in runoff discharged from the MS4s can threaten and adversely affect human health and aquatic organisms. Adverse responses of organisms to chemicals or physical agents in runoff range from physiological responses such as impaired reproduction or growth anomalies to mortality. Increased volume, velocity, rate, and duration of storm water runoff greatly accelerate the erosion of downstream natural channels. This alters stream channels and habitats and can adversely affect aquatic and terrestrial organisms.

14. **Water Quality Effects.** The Copermittees' water quality monitoring data submitted to date documents persistent exceedances of Basin Plan water quality objectives for runoff-related pollutants at various watershed monitoring stations. Persistent toxicity has also been observed at several watershed monitoring stations. In addition, bioassessment data indicate that the majority of the monitored receiving waters have

Poor to Very Poor Index of Biological Integrity (IBI) ratings. These findings indicate that runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in the San Diego Region. Non-storm water discharges from the MS4s have been shown to contribute significant levels of pollutants and flow in arid, developed Southern California watersheds, and contribute significantly to exceedances of applicable receiving water quality objectives.

15. **Non-Storm Water and Storm Water Discharges.** Non-storm water discharges from the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard of CWA section 402(p)(3)(B)(iii), which is explicitly for "Municipal … *Stormwater Discharges* (emphasis added)" from the MS4s. Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s must be effectively prohibited.

16. **Best Management Practices.** Waste and pollutants which are deposited and accumulate in MS4 drainage structures will be discharged from these structures to waters of the U.S. unless they are removed. These discharges may cause or contribute to, or threaten to cause or contribute to, a condition of pollution in receiving waters. For this reason, pollutants in storm water discharges from the MS4s can be and must be effectively reduced in runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Pollution prevention is the reduction or elimination of pollutant generation at its source and is the best "first line of defense." Source control BMPs (both structural and non-structural) minimize the contact between pollutants and runoff, therefore keeping pollutants onsite and out of receiving waters. Treatment control BMPs remove pollutants that have been mobilized by storm water or non-storm water flows.

17. **BMP Implementation.** Runoff needs to be addressed during the three major phases of development (planning, construction, and use) in order to reduce the discharge of storm water pollutants to the MEP, effectively prohibit non-storm water discharges, and protect receiving waters. Development which is not guided by water quality planning policies and principles can result in increased pollutant load discharges, flow rates, and flow durations which can negatively affect receiving water beneficial uses. Construction sites without adequate BMP implementation result in sediment runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. Existing development can generate substantial pollutant loads which are discharged in runoff to receiving waters. Retrofitting areas of existing development with storm water pollutant control and hydromodification management BMPs is necessary to address storm water discharges from existing development that may cause or contribute to a condition of pollution or a violation of water quality standards.

18. **Water Quality Improvements.** Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit

non-storm water discharges to the MS4s and control pollutants in storm water discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the CWA.

19. **Long Term Planning and Implementation.** Federal regulations require municipal storm water permits to expire 5 years from adoption, after which the permit must be renewed and reissued. The San Diego Water Board recognizes that the degradation of water quality and impacts to beneficial uses of the waters in the San Diego Region occurred over several decades. The San Diego Water Board further recognizes that a decade or more may be necessary to realize demonstrable improvement to the quality of waters in the San Diego Region. This Order includes a long term planning and implementation approach that will require more than a single permit term to complete.

WATER QUALITY STANDARDS

20. **Basin Plan.** The San Diego Water Board adopted the Water Quality Control Plan for the San Diego Basin (Basin Plan) on September 8, 1994, that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for receiving waters addressed through the plan. The Basin Plan was subsequently approved by the State Water Resources Control Board (State Water Board) on December 13, 1994. Subsequent revisions to the Basin Plan have also been adopted by the San Diego Water Board and approved by the State Water Board. Requirements of this Order implement the Basin Plan.

The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Process Supply (PROC), Industrial Service Supply (IND), Ground Water Recharge (GWR), Contact Water Recreation (REC1), Non-contact Water Recreation (REC2), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Freshwater Replenishment (FRSH), Hydropower Generation (POW), and Preservation of Biological Habitats of Special Significance (BIOL). The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region: Navigation (NAV), Commercial and Sport Fishing (COMM), Estuarine Habitat (EST), Marine Habitat (MAR), Aquaculture (AQUA), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN), and Shellfish Harvesting (SHELL).

21. **Ocean Plan.** The State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, and 2005. The State Water Board adopted the latest amendment on ~~April 21, 2005~~ October 16, 2012 and it became effective on ~~February 14, 2006~~ August 19, 2013. The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean. Requirements of this Order implement the Ocean Plan.

    The Ocean Plan identifies the following beneficial uses of ocean waters of the state to be protected: Industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture; preservation and enhancement of designated Areas of Special Biological Significance; rare and endangered species; marine habitat; fish spawning and shellfish harvesting.

22. **Sediment Quality Control Plan**. On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes: 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

23. **National Toxics Rule and California Toxics Rule.** USEPA adopted the National Toxics Rule (NTR) on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the NTR applied in California. On May 18, 2000, USEPA adopted the California Toxics Rule (CTR). The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants.

24. **Antidegradation Policy.** This Order is in conformance with the federal Antidegradation Policy described in 40 CFR 131.12, and State Water Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality Waters in California*. Federal regulations at 40 CFR 131.12 require that the State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. State Water Board Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies. The Fact Sheet of this Order contains additional discussion about antidegradation.

25. **Anti-Backsliding Requirements.** Section 402(o)(2) of the CWA and federal regulations at 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations may be relaxed. All effluent limitations in this Order are at least as stringent as effluent limitations in the previous permits. The Fact Sheet of this Order contains additional discussion about anti-backsliding.

CONSIDERATIONS UNDER FEDERAL AND STATE LAW

26. **Coastal Zone Act Reauthorization Amendments.** Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states with approved coastal zone management programs to address non-point source pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point source pollution: agriculture, silviculture, urban, marinas, and hydromodification. This Order addresses the management measures required for the urban category, with the exception of septic systems. The runoff management programs developed pursuant to this Order fulfills the need for coastal cities to develop a runoff non-point source plan identified in the Non-Point Source Program Strategy and Implementation Plan. The San Diego Water Board addresses septic systems through the administration of other programs.

27. **Endangered Species Act.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 USC sections 1531 to 1544). This Order requires compliance with receiving water limits, and other requirements to protect the beneficial uses of waters of the State. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

28. **Report of Waste Discharge Process.** The waste discharge requirements set forth in this Order are based upon the Report of Waste Discharge submitted by the San Diego County Copermittees prior to the expiration of Order No. R9-2007-0001 (NPDES No. CAS0109266), ~~and~~ the Report of Waste Discharge submitted by the Orange County Copermittees prior to the expiration of Order No. R9-2009-0002 (CAS0108740), and the Report of Waste Discharge submitted by the Riverside County Copermittees prior to the expiration of Order No. R9-2010-0016 (CAS0108766). ~~The Riverside County Copermittees are not immediately covered by the waste discharge requirements in this Order. The San Diego Water Board understands that each municipality is unique although the Counties share watersheds and/or geographical boundaries. The Order will continue to use the Report of Waste Discharge process prior to initially making Riverside County Copermittees subject to the requirements of this Order.~~

The federal regulations (40 CFR 122.21(d)(2)) and CWC section 13376 impose a duty on the Copermittees to reapply for continued coverage through submittal of a Report of Waste Discharge no later than 180 days prior to expiration of a currently effective permit. The expiration date of this Order as shown in Table 3, and requirement to file a Report of Waste Discharge no later than 180 days prior to the expiration date of the Order, applies jointly to the San Diego County, Orange County, and Riverside County Copermittees. ~~This requirement is set forth in the Riverside County Copermittees' currently effective permit at ProvisionK.2.c. The Riverside County MS4 Permit, Order No. R9-2010-0016 (NPDES No. CAS0108766) expires on November 10, 2015.~~

~~Unless the Riverside County Copermittees apply for and receive early coverage under this Order, the Riverside County Copermittees' permit will be superseded by this Order upon expiration of their permit, subject to any necessary revisions to the requirements of this Order made after the San Diego Water Board considers their Report of Waste Discharge through the public process provided in 40 CFR Part 124.~~

29. Regional Water Board Designation. The Cities of Laguna Hills, Laguna Woods, ~~and~~ Lake Forest, Menifee, Murrieta, and Wildomar are located partially within the jurisdictions of the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board) and the San Diego Water Board and their discharges are subject to regulation by both Regional Water Boards. CWC section 13228 provides a way to streamline the regulation of entities whose jurisdictions straddle the border of two or more Regions. CWC section 13228 is implemented in this Order at the request of these six cities and to ease the regulatory burden of municipalities that lie in both the San Diego Water Board's and the adjacent Santa Ana Water Board's jurisdiction. MS4 discharges from these municipalities are regulated by the San Diego Water Board and Santa Ana Water Board as follows:

a. Pursuant to CWC section 13228, the Cities of Laguna Hills, Laguna Woods, and Lake Forest submitted written requests that one Regional Water Board be designated to regulate Phase I MS4 discharges for each of the Cities. The Santa Ana Water Board and the San Diego Water Board have entered into an agreement dated February 10, 2015, whereby the Cities of Laguna Woods and Laguna Hills are largely regulated by the San Diego Water Board under this Order, including those portions of the Cities of Laguna Woods and Laguna Hills not within the San Diego Water Board's jurisdiction, upon the effective date of this Order or Santa Ana Water Board Order No. R8-2015-0001, whichever is later. Similarly, the City of Lake Forest, including those portions of the City of Lake Forest within the San Diego Water Board's jurisdiction, is largely regulated by the Santa Ana Water Board under Order No. R8-2015-0001 (NPDES No. CAS618030) upon the later effective date of this Order or Order No. R8-2015-0001. The agreement provides that the City of Lake Forest is required to retain, and continue implementation of, its over-irrigation discharge prohibition in Title 15, Chapter 14.030, List (b) of the City Municipal Code for regulating storm water quality throughout its jurisdiction. The agreement also requires the City of Lake Forest to actively participate during development and implementation of the Aliso

Creek Watershed Management Area Water Quality Improvement Plan required pursuant to this Order. Each Regional Water Board retains the authority to enforce provisions of its Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee under the terms of the agreement (Water Code section 13228 (b)). Under the terms of the agreement, any TMDL and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Laguna Woods, Laguna Hills or Lake Forest as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement of the applicable TMDL will remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's San Diego Creek/Newport Bay TMDL and the San Diego Water Board's Indicator Bacteria Project I Beaches and Creeks TMDL. The San Diego Water Board will periodically review the effectiveness of the agreement during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate the agreement with Santa Ana Water Board or otherwise modify the agreement subject to the approval of the Santa Ana Water Board.

b. Pursuant to CWC section 13228, the Cities of Murrieta, Wildomar, and Menifee submitted written requests that one Regional Water Board be designated to regulate Phase I MS4 discharges for each of the Cities. The Santa Ana Water Board and the San Diego Water Board have entered into an agreement dated [Month][Day], 2015, whereby the Cities of Murrieta and Wildomar are largely regulated by the San Diego Water Board under this Order, including those portions of the Cities of Murrieta and Wildomar not within the San Diego Water Board's jurisdiction, upon the effective date of this Order. Similarly, the City of Menifee is largely regulated by the Santa Ana Water Board under Order No. R8-2010-0033 as it may be amended or reissued, including those portions of the City of Menifee within the San Diego Water Board's jurisdiction, upon the effective date of this Order. The agreement also requires the City of Menifee to actively participate during development and implementation of the Santa Margarita River Watershed Management Area Water Quality Improvement Plan required pursuant to this Order. Each Regional Water Board retains the authority to enforce provisions of its Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee under the terms of the agreement (Water Code section 13228 (b)). Under the terms of the agreement, any TMDL and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Menifee, Murrieta, or Wildomar as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement of the applicable TMDL will remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's Lake Elsinore/Canyon Lake Nutrient

TMDLs. The San Diego Water Board will periodically review the effectiveness of the agreement during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate the agreement with Santa Ana Water Board or otherwise modify the agreement subject to the approval of the Santa Ana Water Board.

30. **Integrated Report and Clean Water Act Section 303(d) List.** The San Diego Water Board and State Water Board submit an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. USEPA issued its *Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act* on July 29, 2005, which advocates the use of a five category approach for classifying the attainment status of water quality standards for water bodies in the Integrated Report. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 in the Integrated Report are placed on the 303(d) List.

    Water bodies with available data and/or information that indicate at least one beneficial use is not being supported or is threatened, but a TMDL is not required, are included in Category 4 in the Integrated Report. Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

    Implementation of the requirements of this Order may allow the San Diego Water Board to include surface waters impaired by discharges from the Copermittees' MS4s in Category 4 in the Integrated Report for consideration during the next 303(d) List submittal by the State to USEPA.

31. **Economic Considerations.** The California Supreme Court has ruled that although CWC section 13263 requires the State and Regional Water Boards (collectively Water Boards) to consider factors set forth in CWC section 13241 when issuing an NPDES permit, the Water Board may not consider the factors to justify imposing pollutant restrictions that are less stringent than the applicable federal regulations require. (*City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 618, 626-627.) However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

    As noted in the following finding, the San Diego Water Board finds that the requirements in this Order are not more stringent than the minimum federal

requirements. Therefore, a CWC section 13241 analysis is not required for permit requirements that implement the effective prohibition on the discharge of non-storm water into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determined appropriate to control such pollutants, as those requirements are mandated by federal law. Notwithstanding the above, the San Diego Water Board has developed an economic analysis of the requirements in this Order. The economic analysis is provided in the Fact Sheet.

32. **Unfunded Mandates.** This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following:

    a. This Order implements federally mandated requirements under CWA section 402 (33 USC section 1342(p)(3)(B)).

    b. The local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental and new dischargers who are issued NPDES permits for storm water and non-storm water discharges.

    c. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order.

    d. The Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)) and in lieu of numeric restrictions on their MS4 discharges (i.e. effluent limitations).

    e. The local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under State law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

    f. The provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state develops a TMDL, federal law requires that permits must contain water quality based effluent limitations consistent with the assumptions and requirements of any applicable wasteload allocation (40 CFR 122.44(d)(1)(vii)(B)).

    See the Fact Sheet for further discussion of unfunded mandates.

33. **California Environmental Quality Act.** The issuance of waste discharge requirements and an NPDES permit for the discharge of runoff from MS4s to waters of the U.S. is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 et seq.) in accordance with CWC section 13389.

STATE WATER BOARD DECISIONS

34. **Compliance with Prohibitions and Limitations.** The receiving water limitation language specified in this Order is consistent with language recommended by the USEPA and established in State Water Board Order WQ 99-05, *Own Motion Review of the Petition of Environmental Health Coalition to Review Waste Discharge Requirements Order No. 96-03, NPDES Permit No. CAS0108740*, adopted by the State Water Board on June 17, 1999. The receiving water limitation language in this Order requires storm water discharges from MS4s to not cause or contribute to a violation of water quality standards, which is to be achieved through an iterative approach requiring the implementation of improved and better-tailored BMPs over time. Implementation of the iterative approach to comply with receiving water limitations based on applicable water quality standards is necessary to ensure that storm water discharges from the MS4 will not ultimately cause or contribute to violations of water quality standards and will not create conditions of pollution, contamination, or nuisance.

The San Diego, Orange County, and Riverside County Copermittees have asserted that the prohibitions and limitations may result in many years of noncompliance because years of technical efforts may ultimately be required to achieve compliance with the prohibitions and limitations, especially for wet weather discharges. To address this concern, this Order includes an option that allows a Copermittee to be deemed in compliance with the prohibitions and limitations where more than one permit term may be necessary to achieve full compliance with the prohibitions and limitations. One or more Copermittees within a Watershed Management Area can choose to implement this option.

An alternative compliance pathway option has been included in this Order consistent with the approach described in Order WQ 2015-0075, *In the Matter of Review of Order No. R4-2012-0175, NPDES Permit No. CAS004001, Waste Discharge Requirements for Municipal Separate Storm Sewer System (MS4) Discharges within the Coastal Watersheds of Los Angeles County, Except Those Discharges Originating from the City of Long Beach MS4,* adopted by the State Water Board on June 16, 2015. State Water Board Order WQ 2015-0075 directs the Regional Water Boards to consider a watershed-based planning and implementation approach to compliance with receiving water limitations when issuing Phase I MS4 permits going forward. Order WQ 2015-0075 included seven principles that the Regional Water Boards are expected to follow when incorporating an alternative compliance pathway into an MS4 permit. The Fact Sheet discusses the incorporation of the seven principles stipulated in State Water Board Order WQ 2015-0075 into the alternative compliance pathway option in this Order.

35. **Special Conditions for Areas of Special Biological Significance.** On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving a general exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and

NPDES permitted municipal storm water discharges (General Exception). On June 19, 2012, the State Water Board adopted Order No. 2012-0031, amending the General Exception to require pollutant reductions to be achieved within six years in accordance with ASBS Compliance Plans and ASBS Pollution Prevention Plans. The General Exception requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject to the terms and conditions of the General Exception as amended. The Special Protections contained in Attachment B to the General Exception as amended are applicable to these discharges, and are hereby incorporated into Attachment A of this Order.

ADMINISTRATIVE FINDINGS

36. **Executive Officer Delegation of Authority.** The San Diego Water Board by prior resolution has delegated all matters that may legally be delegated to its Executive Officer to act on its behalf pursuant to CWC section 13223. Therefore, the Executive Officer is authorized to act on the San Diego Water Board's behalf on any matter within this Order unless such delegation is unlawful under CWC section 13223 or this Order explicitly states otherwise.

37. **Standard Provisions.** Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR 122.42, are provided in Attachment B to this Order.

38. **Fact Sheet.** The Fact Sheet for this Order contains background information, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of this Order. The Fact Sheet is hereby incorporated into this Order and constitutes part of the Findings of this Order.

39. **Public Notice.** In accordance with State and federal laws and regulations, the San Diego Water Board notified the Copermittees, and interested agencies and persons of its intent to prescribe waste discharge requirements for the control of discharges into and from the MS4s to waters of the U.S. and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet.

40. **Public Hearings.** The San Diego Water Board held a public hearing on April 10 and 11, 2013, that was continued to May 8, 2013 and heard and considered all comments pertaining to the terms and conditions of this Order. The San Diego Water Board also held a public workshop on October 8, 2015, and a public hearing

on February 11, 2015, and heard and considered all comments pertaining to the amendment of this Order through Order No. R9-2015-0001. The San Diego Water Board also held a public hearing on November 18, 2015, and heard and considered all comments pertaining to the amendment of this Order through Order No. R9-2015-0100. Details of these public hearings are provided in the Fact Sheet.

41. **Effective Date.** This Order serves as an NPDES permit pursuant to CWA section 402 or amendments thereto, and as to the San Diego County Copermittees listed in Table ~~2.~~1a., became effective fifty (50) days after the date of its adoption, and as to the Orange County Copermittees listed in Table ~~2.~~1b., ~~becomes~~ became effective on April 1, 2015, after Order No. R9-2015-0001 was ~~is~~ adopted, and as to the Riverside County Copermittees listed in Table 1c, became effective on January 7, 2016, after Order No. R9-2015-0100 was adopted, provided that the Regional Administrator, USEPA, Region IX, does not object to this Order.

42. **Review by the State Water Board.** Any person aggrieved by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with CWC section 13320 and California Code of Regulations, title 23, sections 2050, and following. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date of this Order, except that if the thirtieth day following the date of this Order falls on a Saturday, Sunday or State holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

THEREFORE, IT IS HEREBY ORDERED that the Copermittees, in order to meet the provisions contained in division 7 of the CWC (commencing with section 13000) and regulations adopted thereunder, and the provisions of the CWA and regulations adopted thereunder, must each comply with the requirements of this Order. This action in no way prevents the San Diego Water Board from taking enforcement action for past violations of the previous Order applicable to the Copermittees. If any part of this Order is subject to a temporary stay of enforcement, unless otherwise specified, the Copermittees must comply with the analogous portions of the previous Order, which will remain in effect for all purposes during the pendency of the stay.

II. PROVISIONS

A. PROHIBITIONS AND LIMITATIONS

The purpose of this provision is to describe the conditions under which storm water and non-storm water discharges into and from MS4s are prohibited or limited. The goal of the prohibitions and limitations is to protect the water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through the implementation of water quality improvement strategies and runoff management programs that effectively prohibit non-storm water discharges into the Copermittees' MS4s, and reduce pollutants in storm water discharges from the Copermittees' MS4s to the MEP.

1. Discharge Prohibitions

a. Discharges from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the state are prohibited.

b. Non-storm water discharges into MS4s are to be effectively prohibited, through the implementation of Provision E.2, unless such discharges are authorized by a separate NPDES permit.

c. Discharges from MS4s are subject to all waste discharge prohibitions in the Basin Plan, included in Attachment A to this Order.

d. Storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 applicable to these discharges, included in Attachment A to this Order. All other discharges from the Copermittees' MS4s to ASBS are prohibited.

2. Receiving Water Limitations

a. Discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters, including but not limited to all applicable provisions contained in:

(1) The San Diego Water Board's Basin Plan, including beneficial uses, water quality objectives, and implementation plans;

(2) State Water Board plans for water quality control including the following:

(a) Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries (Thermal Plan), and

(b) The Ocean Plan, including beneficial uses, water quality objectives, and implementation plans;

(3) State Water Board policies for water and sediment quality control including the following:

(a) Water Quality Control Policy for the Enclosed Bays and Estuaries of California,

(b) Sediment Quality Control Plan which includes the following narrative objectives for bays and estuaries:

(i) Pollutants in sediments shall not be present in quantities that, alone or in combination, are toxic to benthic communities, and

(ii) Pollutants shall not be present in sediments at levels that will bioaccumulate in aquatic life to levels that are harmful to human health,

(c) The Statement of Policy with Respect to Maintaining High Quality of Waters in California;[2]

(4) Priority pollutant criteria promulgated by the USEPA through the following:

(a) National Toxics Rule (NTR)[3] (promulgated on December 22, 1992 and amended on May 4, 1995), and

(b) California Toxics Rule (CTR).[4,5]

b. Discharges from MS4s composed of storm water runoff must not alter natural ocean water quality in an ASBS.

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[2] State Water Board Resolution No. 68-16
[3] 40 CFR 131.36
[4] 65 Federal Register 31682-31719 (May 18, 2000), adding Section 131.38 to 40 CFR
[5] If a water quality objective and a CTR criterion are in effect for the same priority pollutant, the more stringent of the two applies.

3. Effluent Limitations

a. Technology Based Effluent Limitations

Pollutants in storm water discharges from MS4s must be reduced to the MEP.[6]

b. Water Quality Based Effluent Limitations

Each Copermittee must comply with applicable WQBELs established for the TMDLs in Attachment E to this Order, pursuant to the applicable TMDL compliance schedules.

4. Compliance with Discharge Prohibitions and Receiving Water Limitations

Each Copermittee must achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order through timely implementation of control measures and other actions as specified in Provisions B and E of this Order, including any modifications. The Water Quality Improvement Plans required under Provision B must be designed and adapted to ultimately achieve compliance with Provisions A.1.a, A.1.c and A.2.a.

a. If exceedance(s) of water quality standards persist in receiving waters notwithstanding implementation of this Order, the Copermittees must comply with the following procedures:

(1) For exceedance(s) of a water quality standard in the process of being addressed by the Water Quality Improvement Plan, the Copermittee(s) must implement the Water Quality Improvement Plan as accepted by the San Diego Water Board, and update the Water Quality Improvement Plan, as necessary, pursuant to Provision F.2.c;

(2) Upon a determination by either the Copermittees or the San Diego Water Board that discharges from the MS4 are causing or contributing to a new exceedance of an applicable water quality standard not addressed by the Water Quality Improvement Plan, the Copermittees must submit the following updates to the Water Quality Improvement Plan pursuant to Provision F.2.c or as part of the Water Quality Improvement Plan Annual Report required under Provision F.3.b, unless the San Diego Water Board directs an earlier submittal:

(a) The water quality improvement strategies being implemented that are effective and will continue to be implemented,

[6] This does not apply to MS4 discharges which receive subsequent treatment to reduce pollutants in storm water discharges to the MEP prior to entering receiving waters (e.g., low flow diversions to the sanitary sewer). Runoff treatment must occur prior to the discharge of runoff into receiving waters per Finding 7.

(b) Water quality improvement strategies (i.e. BMPs, retrofitting projects, stream and/or habitat rehabilitation projects, adjustments to jurisdictional runoff management programs, etc.) that will be implemented to reduce or eliminate any pollutants or conditions that are causing or contributing to the exceedance of water quality standards,

(c) Updates to the schedule for implementation of the existing and additional water quality improvement strategies, and

(d) Updates to the monitoring and assessment program to track progress toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a of this Order;

(3) The San Diego Water Board may require the incorporation of additional modifications to the Water Quality Improvement Plan required under Provision B. The applicable Copermittees must submit any modifications to the update to the Water Quality Improvement Plan within 90 days of notification that additional modifications are required by the San Diego Water Board, or as otherwise directed;

(4) Within 90 days of the San Diego Water Board determination that the modifications to the Water Quality Improvement Plan required under Provision A.4.a.(3) meet the requirements of this Order, the applicable Copermittees must revise the jurisdictional runoff management program documents to incorporate the modified water quality improvement strategies that have been and will be implemented, the implementation schedule, and any additional monitoring required; and

(5) Each Copermittee must implement the updated Water Quality Improvement Plan.

b. The procedure set forth above to achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order do not have to be repeated for continuing or recurring exceedances of the same water quality standard(s) following implementation of scheduled actions unless directed to do otherwise by the San Diego Water Board.

c. Nothing in Provisions A.4.a and A.4.b prevents the San Diego Water Board from enforcing any provision of this Order while the applicable Copermittees prepare and implement the above update to the Water Quality Improvement Plan and jurisdictional runoff management programs.

B. WATER QUALITY IMPROVEMENT PLANS

The purpose of this provision is to develop Water Quality Improvement Plans that guide the Copermittees' jurisdictional runoff management programs towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plans is to further the Clean Water Act's objective to protect, preserve, enhance, and restore the water quality and designated beneficial uses of waters of the state. This goal will be accomplished through an adaptive planning and management process that identifies the highest priority water quality conditions within a watershed and implements strategies through the jurisdictional runoff management programs to achieve improvements in the quality of discharges from the MS4s and receiving waters.

1. Watershed Management Areas

The Copermittees must develop a Water Quality Improvement Plan for each of the Watershed Management Areas in Table B-1. A total of ten Water Quality Improvement Plans must be developed for the San Diego Region.

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
San Juan (901.00)	South Orange County	- Aliso Creek - San Juan Creek - San Mateo Creek - Pacific Ocean - Heisler Park ASBS	- City of Aliso Viejo - City of Dana Point - City of Laguna Beach - City of Laguna Hills[1] - City of Laguna Niguel - City of Laguna Woods[1] - City of Lake Forest[2] - City of Mission Viejo - City of Rancho Santa Margarita - City of San Clemente - City of San Juan Capistrano - County of Orange - Orange County Flood Control District
Santa Margarita (902.00)	Santa Margarita River	- Murrieta Creek - Temecula Creek - Santa Margarita River - Santa Margarita Lagoon - Pacific Ocean	- City of Menifee[3] - City of Murrieta[3,4] - City of Temecula[3] - City of Wildomar[3,4] - County of Riverside[3] - County of San Diego[4] - Riverside County Flood Control and Water Conservation District[3]
San Luis Rey (903.00)	San Luis Rey River	- San Luis Rey River - San Luis Rey Estuary - Pacific Ocean	- City of Oceanside - City of Vista - County of San Diego

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
Carlsbad (904.00)	Carlsbad	- Loma Alta Slough - Buena Vista Lagoon - Agua Hedionda Lagoon - Batiquitos Lagoon - San Elijo Lagoon - Pacific Ocean	- City of Carlsbad - City of Encinitas - City of Escondido - City of Oceanside - City of San Marcos - City of Solana Beach - City of Vista - County of San Diego
San Dieguito (905.00)	San Dieguito River	- San Dieguito River - San Dieguito Lagoon - Pacific Ocean	- City of Del Mar - City of Escondido - City of Poway - City of San Diego - City of Solana Beach - County of San Diego
Penasquitos (906.00)	Penasquitos	- Los Penasquitos Lagoon - Pacific Ocean	- City of Del Mar - City of Poway - City of San Diego - County of San Diego
	Mission Bay	- Mission Bay - Pacific Ocean - San Diego Marine Life Refuge ASBS	- City of San Diego
San Diego (907.00)	San Diego River	- San Diego River - Pacific Ocean	- City of El Cajon - City of La Mesa - City of San Diego - City of Santee - County of San Diego
Pueblo San Diego (908.00) Sweetwater (909.00) Otay (910.00)	San Diego Bay	- Sweetwater River - Otay River - San Diego Bay - Pacific Ocean	- City of Chula Vista - City of Coronado - City of Imperial Beach - City of La Mesa - City of Lemon Grove - City of National City - City of San Diego - County of San Diego - San Diego County Regional Airport Authority - San Diego Unified Port District
Tijuana (911.00)	Tijuana River	- Tijuana River - Tijuana Estuary - Pacific Ocean	- City of Imperial Beach - City of San Diego - County of San Diego

Notes:

1. By agreement dated February 10, 2015, pursuant to Water Code section 13228, the Phase I MS4 discharges within the jurisdiction of the City of Laguna Hills and the City of Laguna Woods located in the Santa Ana Region are regulated by San Diego Water Board Order No. R9-2013-0001 as amended by Order No. R9-2015-0001, upon the later effective date of Order No. R9-2015-0001 or Santa Ana Water Board Tentative Order No. R8-2015-0001. The City of Laguna Hills and Laguna Woods must also comply with the requirements of the San Diego Creek/Newport Bay TMDL in section XVIII of Santa Ana Water Board Order No. R8-2015-0001.
2. By agreement dated February 10, 2015, pursuant to Water Code section 13228, Phase I MS4 discharges within the City of Lake Forest located within the San Diego Water Board Region are regulated by the Santa Ana Water Board Order No. R8-2015-0001 (NPDES No. CAS618030) upon the later effective date of this Order or Santa Ana Water Board Tentative Order No. R8-2015-0001. In accordance with the terms of the agreement between the San Diego Water Board and the Santa Ana Water Board, the City of Lake Forest must implement the requirements of the Bacteria TMDL in Attachment E of this Order, participate in preparation and implementation of the Water Quality Improvement Plan for the Aliso Creek Watershed Management Area as described in Provision B of this Order and continue implementation of its over-irrigation discharge prohibition in its City Ordinance, Title 15, Chapter 15, section 14.030, List (b).
3. By agreement dated [Month][Day], 2015, pursuant to Water Code section 13228, Phase I MS4 discharges within the City of Menifee located within the San Diego Water Board Region are regulated by the Santa Ana Water Board Order No. R8-2010-0033 as it may be amended or reissued (NPDES No. CAS618033) upon the later effective date of this Order. In accordance with the terms of the agreement between the San Diego Water Board and the Santa Ana Water Board, the City of Menifee must participate in preparation and implementation of the Water Quality Improvement Plan for the Santa Margarita River Watershed Management Area as described in Provision B of this Order.~~The Riverside County Copermittees will be covered under this Order after expiration of Order No. R9-2010-0016 or earlier if the Riverside County Copermittees meet the conditions in Provision F.6, upon further amendment of this Order.~~
4. By agreement dated [Month][Day], 2015, pursuant to Water Code section 13228, the Phase I MS4 discharges within the jurisdiction of the City of Murrieta and the City of Wildomar located in the Santa Ana Region are regulated by San Diego Water Board Order No. R9-2013-0001 as amended by Orders No. R9-2015-0001 and R9-2015-0100. The City of Murrieta and City of Wildomar must also comply with the requirements of the Lake Elsinore/Canyon Lake Nutrient TMDLs in section VI.D.2 of Santa Ana Water Board Order No. R8-2010-0033, or corresponding section as it may be amended or reissued.~~The County of San Diego is not required to implement the requirements of Provision B for its jurisdiction within the Santa Margarita River Watershed Management Area~~

~~until the Riverside County Copermittees have been notified of coverage under this Order. The County of San Diego is required to implement the requirements of Provisions D, F.3.b, and Attachment E until the Riverside County Copermittees have been notified of coverage under this Order.~~

2. Priority Water Quality Conditions

The Copermittees must identify the water quality priorities within each Watershed Management Area that will be addressed by the Water Quality Improvement Plan. Where appropriate, Watershed Management Areas may be separated into subwatersheds to focus water quality prioritization and jurisdictional runoff management program implementation efforts by receiving water.

a. Assessment of Receiving Water Conditions

The Copermittees must consider the following, at a minimum, to identify water quality priorities based on impacts of MS4 discharges on receiving water beneficial uses:

(1) Receiving waters listed as impaired on the CWA Section 303(d) List of Water Quality Limited Segments (303(d) List);

(2) TMDLs adopted and under development by the San Diego Water Board;

(3) Receiving waters recognized as sensitive or highly valued by the Copermittees, including estuaries designated under the National Estuary Program under CWA section 320, marine protected areas, wetlands defined by the State or U.S. Fish and Wildlife Service's National Wetlands Inventory as wetlands, waters having the Preservation of Biological Habitats of Special Significance (BIOL) beneficial use designation, and receiving waters identified as ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(4) The receiving water limitations of Provision A.2;

(5) Known historical versus current physical, chemical, and biological water quality conditions;

(6) Available, relevant, and appropriately collected and analyzed physical, chemical, and biological receiving water monitoring data, including, but not limited to, data describing:

(a) Chemical constituents,

(b) Water quality parameters (i.e. pH, temperature, conductivity, etc.),

(c) Toxicity Identification Evaluations for both receiving water column and sediment,

(d) Trash impacts,

(e) Bioassessments, and

(f) Physical habitat;

(7) Available evidence of erosional impacts in receiving waters due to accelerated flows (i.e. hydromodification);

(8) Available evidence of adverse impacts to the chemical, physical, and biological integrity of receiving waters; and

(9) The potential improvements in the overall condition of the Watershed Management Area that can be achieved.

b. ASSESSMENT OF IMPACTS FROM MS4 DISCHARGES

The Copermittees must consider the following, at a minimum, to identify the potential impacts to receiving waters that may be caused or contributed to by discharges from the Copermittees' MS4s:

(1) The discharge prohibitions of Provision A.1 and effluent limitations of Provision A.3; and

(2) Available, relevant, and appropriately collected and analyzed storm water and non-storm water monitoring data from the Copermittees' MS4 outfalls;

(3) Locations of each Copermittee's MS4 outfalls that discharge to receiving waters;

(4) Locations of MS4 outfalls that are known to persistently discharge non-storm water to receiving waters likely causing or contributing to impacts on receiving water beneficial uses;

(5) Locations of MS4 outfalls that are known to discharge pollutants in storm water causing or contributing to impacts on receiving water beneficial uses; and

(6) The potential improvements in the quality of discharges from the MS4 that can be achieved.

c. IDENTIFICATION OF PRIORITY WATER QUALITY CONDITIONS

(1) The Copermittees must use the information gathered for Provisions B.2.a and B.2.b to develop a list of priority water quality conditions as pollutants, stressors and/or receiving water conditions that are the highest threat to receiving water quality or that most adversely affect the quality of receiving waters. The list must include the following information for each priority water quality condition:

(a) The beneficial use(s) associated with the priority water quality condition;

(b) The geographic extent of the priority water quality condition within the Watershed Management Area, if known;

(c) The temporal extent of the priority water quality condition (e.g., dry weather and/or wet weather);

(d) The Copermittees with MS4s discharges that may cause or contribute to the priority water quality condition; and

(e) An assessment of the adequacy of and data gaps in the monitoring data to characterize the conditions causing or contributing to the priority water quality condition, including a consideration of spatial and temporal variation.

(2) The Copermittees must identify the highest priority water quality conditions to be addressed by the Water Quality Improvement Plan, and provide a rationale for selecting a subset of the water quality conditions identified pursuant to Provision B.2.c.(1) as the highest priorities.

d. IDENTIFICATION OF MS4 SOURCES OF POLLUTANTS AND/OR STRESSORS

The Copermittees must identify and prioritize known and suspected sources of storm water and non-storm water pollutants and/or other stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c. The identification of known and suspected sources of pollutants and/or stressors that cause or contribute to the highest priority water quality conditions as identified for Provision B.2.c must consider the following:

(1) Pollutant generating facilities, areas, and/or activities within the Watershed Management Area, including:

(a) Each Copermittee's inventory of construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas,

(b) Publicly owned parks and/or recreational areas,

(c) Open space areas,

(d) All currently operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste, and

(e) Areas not within the Copermittees' jurisdictions (e.g., Phase II MS4s, tribal lands, state lands, federal lands) that are known or suspected to be discharging to the Copermittees' MS4s;

(2) Locations of the Copermittees' MS4s, including the following:

(a) All MS4 outfalls that discharge to receiving waters, and

(b) Locations of major structural controls for storm water and non-storm water (e.g., retention basins, detention basins, major infiltration devices, etc.);

(3) Other known and suspected sources of non-storm water or pollutants in storm water discharges to receiving waters within the Watershed Management Area, including the following:

(a) Other MS4 outfalls (e.g., Phase II Municipal and Caltrans),

(b) Other NPDES permitted discharges,

(c) Any other discharges that may be considered point sources (e.g., private outfalls), and

(d) Any other discharges that may be considered non-point sources (e.g., agriculture, wildlife or other natural sources);

(4) Review of available data, including but not limited to:

(a) Findings from the Copermittees' illicit discharge detection and elimination programs,

(b) Findings from the Copermittees' MS4 outfall discharge monitoring,

(c) Findings from the Copermittees' receiving water monitoring,

(d) Findings from the Copermittees' MS4 outfall discharge and receiving water assessments, and

(e) Other available, relevant, and appropriately collected data, information, or studies related to pollutant sources and/or stressors that contribute to the highest priority water quality conditions as identified for Provision B.2.c.

(5) The adequacy of the available data to identify and prioritize sources and/or stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c.

e. IDENTIFICATION OF POTENTIAL WATER QUALITY IMPROVEMENT STRATEGIES

The Copermittees must evaluate the findings identified under Provisions B.2.a-d, and identify potential strategies that can result in improvements to water quality in MS4 discharges and/or receiving waters within the Watershed Management Area. Potential water quality improvement strategies that may be implemented within the Watershed Management Area must include the following:

(1) Structural BMPs, non-structural BMPs, incentives, or programs that can potentially be implemented to address the highest priority water quality conditions identified under Provision B.2.c, or MS4 sources of pollutants or stressors identified under Provision B.2.d,

(2) Retrofitting projects in areas of existing development within the Watershed Management Area that can potentially be implemented to reduce MS4 sources of pollutants or stressors identified under Provision B.2.d causing or contributing to the highest priority water quality conditions identified under Provision B.2.c, and

(3) Stream, channel, and/or habitat rehabilitation projects within the Watershed Management Area that can potentially be implemented to protect and/or improve conditions in receiving waters from MS4 pollutants and/or stressors identified under Provision B.2.d causing or contributing to the highest priority water quality conditions identified under Provision B.2.c.

3. Water Quality Improvement Goals, Strategies and Schedules

The Copermittees must identify and develop specific water quality improvement goals and strategies to address the highest priority water quality conditions identified within a Watershed Management Area. The water quality improvement goals and strategies must address the highest priority water quality conditions by effectively prohibiting non-storm water discharges to the MS4, reducing pollutants in storm water discharges from the MS4 to the MEP, and protecting the water quality standards of receiving waters.

a. WATER QUALITY IMPROVEMENT GOALS AND SCHEDULES

(1) Numeric Goals

The Copermittees must develop and incorporate numeric goals[7] into the

[7] Interim and final numeric goals may take a variety of forms such as TMDL established WQBELs, action levels, pollutant concentration, load reductions, number of impaired water bodies delisted from the List of Water Quality Impaired Segments, Index of Biotic Integrity (IBI) scores, or other appropriate metrics. Interim and final numeric goals are not necessarily limited to one criterion or indicator, but may include multiple criteria and/or indicators. Except for TMDL established WQBELs, interim and final numeric goals and corresponding schedules may be revised through the adaptive management process under Provision B.5.

Water Quality Improvement Plan. Numeric goals must be used to support Water Quality Improvement Plan implementation and measure reasonable progress towards addressing the highest priority water quality conditions identified under Provision B.2.c. The Copermittees must establish and incorporate the following numeric goals in the Water Quality Improvement Plan:

(a) Final numeric goals must be based on measureable criteria or indicators capable of demonstrating one or more of the following:

(i) Discharges from the Copermittees' MS4s will not cause or contribute to exceedances of water quality standards in receiving waters, AND/OR

(ii) The conditions of receiving waters and associated habitat are protected from MS4 discharges, AND/OR

(iii) Beneficial uses of receiving waters are protected from MS4 discharges and will be supported.

(b) Interim numeric goals must be based on measureable criteria or indicators capable of demonstrating reasonable incremental progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges as follows:

(i) One or more interim numeric goals may be established to demonstrate progress toward achieving each final numeric goal,

(ii) For each final numeric goal, at least one interim numeric goal must be expressed as a reasonable increment toward achievement of the final numeric goal,

(iii) For each final numeric goal, reasonable interim numeric goals must be established to be accomplished during each 5 year period between the acceptance of the Water Quality Improvement Plan and the achievement of the final numeric goals.

(2) <u>Schedules for Achieving Numeric Goals</u>

The Copermittees must develop and incorporate schedules for achieving the numeric goals into the Water Quality Improvement Plan. The schedules must demonstrate reasonable progress toward achieving the final numeric goals required for Provision B.3.a.(1). The Copermittees must incorporate the schedules for achieving the numeric goals into the Water Quality Improvement Plan based on the following considerations:

(a) Final dates for achieving all final numeric goals must be established considering the following:

(i) Final compliance dates for any applicable TMDLs in Attachment E to this Order;

(ii) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(iii) Achievement of the final numeric goals for the highest water quality priorities must be as soon as possible;

(iv) Final dates for achieving the final numeric goals must reflect a realistic assessment of the shortest practicable time required based on the temporal and spatial extent and factors associated with the highest priority water quality conditions identified under Provision B.2.c, and taking into account the time reasonably required to implement the water quality improvement strategies required pursuant to Provision B.3.b.

(b) Interim dates for achieving all interim numeric goals must be established considering the following:

(i) Interim compliance dates for any applicable TMDLs in Attachment E to this Order;

(ii) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(iii) Interim dates for achieving the interim numeric goals must reflect a realistic assessment of the shortest practicable time reasonably required, taking into account the time needed to implement new or significantly expanded programs and securing financing, if necessary; and

(iv) For each final numeric goal, at least one interim numeric goal must be established that the Copermittees will work toward achieving within the term of this Order.

b. WATER QUALITY IMPROVEMENT STRATEGIES AND SCHEDULES

Based on the likely effectiveness and efficiency of the potential water quality improvement strategies identified under Provision B.2.e to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a, the Copermittees must identify the strategies that will be implemented in each Watershed Management Area as follows:

(1) Jurisdictional Strategies

(a) Each Copermittee in the Watershed Management Area must identify the strategies that will be implemented within its jurisdiction as part of its jurisdictional runoff management program requirements under Provisions E.2 through E.7, including descriptions of the following:

(i) For each of the inventories developed for its jurisdiction, as required under Provisions D.2.a.(1), E.3.e.(2), E.4.b, and E.5.a, each Copermittee must identify the known and suspected areas or sources causing or contributing to the highest priority water quality conditions in the Watershed Management Area that the Copermittee will focus on in its efforts to effectively prohibit non-storm water discharges to its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, and achieve the interim and final numeric goals identified under Provision B.3.a;

(ii) BMPs that each Copermittee will implement, or require to be implemented, as applicable, for those areas or sources within its jurisdiction;

(iii) Education programs that each Copermittee will implement, as applicable, for those areas or sources within its jurisdiction;

(iv) Frequencies that each Copermittee will conduct inspections on those areas or sources within its jurisdiction;

(v) Incentive and enforcement programs that each Copermittee will implement, as applicable, for those areas or sources within its jurisdiction; and

(vi) Any other BMPs, incentives, or programs that each Copermittee will implement for those areas or sources within its jurisdiction.

(b) Identify the optional jurisdictional strategies that each Copermittee will implement within its jurisdiction, as necessary, to effectively prohibit non-storm water discharges to its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. Descriptions of the optional jurisdictional strategies must include:

(i) BMPs, incentives, or programs that may be implemented by the Copermittee within its jurisdiction in addition to the requirements of Provisions B.3.b.(1)(a);

(ii) Incentives or programs that may be implemented by the Copermittee to encourage or implement projects to retrofit areas of existing development within its jurisdiction;

(iii) Incentives or programs that may be implemented by the Copermittee to encourage or implement projects that will rehabilitate the conditions of channels or habitats within its jurisdiction;

(iv) The funds and/or resources that must be secured by the Copermittee to implement the optional strategies described for Provisions B.3.b.(1)(b)(i)-(iii) within its jurisdiction; and

(v) The circumstances necessary to trigger implementation of the optional jurisdictional strategies, in addition to the requirements of Provision B.3.b.(1)(a), to achieve the interim and final numeric goals within the schedules established under Provision B.3.a.

(c) Identify the strategies that will be implemented by the Copermittee in coordination with or with the cooperation of other agencies (e.g. Caltrans, water districts, school districts) and/or entities (e.g. non-governmental organizations) within its jurisdiction.

(2) Watershed Management Area Strategies

The Copermittees must identify the optional regional or multi-jurisdictional strategies that will be implemented in the Watershed Management Area, as necessary, to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. Descriptions of the optional regional or multi-jurisdictional strategies must include:

(a) Regional or multi-jurisdictional BMPs, incentives, or programs that may be implemented by the Copermittees in the Watershed Management Area;

(b) Incentives or programs that may be implemented by the Copermittees in the Watershed Management Area to encourage or implement regional or multi-jurisdictional projects to retrofit areas of existing development;

(c) Incentives or programs that may be implemented by the Copermittees to encourage or implement regional or multi-jurisdictional projects that will rehabilitate the conditions of channels, streams, or habitats within the Watershed Management Area;

(d) The funds and/or resources that must be secured by the Copermittees to implement the optional strategies described for Provisions B.3.b.(2)(a)-(c) within the Watershed Management Area; and

(e) The circumstances necessary to trigger implementation of the optional regional or multi-jurisdictional strategies to achieve the interim and final numeric goals within the schedules established under Provision B.3.a.

(3) Schedules for Implementing Strategies

The Copermittees must develop reasonable schedules for implementing the water quality improvement strategies identified under Provisions B.3.b.(1) and B.3.b.(2) to achieve the interim and final numeric goals identified and schedules established under Provision B.3.a. The Copermittees must incorporate the schedules to implement the water quality improvement strategies into the Water Quality Improvement Plan as follows:

(a) Each Copermittee must develop schedules for the jurisdictional strategies identified pursuant to Provisions B.3.b.(1)(a)-(b). Each schedule must specify:

(i) If each jurisdictional strategy identified pursuant to Provision B.3.b.(1)(a) will or will not be initiated upon acceptance of the Water Quality Improvement Plan;

(ii) For each jurisdictional strategy identified pursuant to Provision B.3.b.(1)(a) that will not be initiated upon acceptance of the Water Quality Improvement Plan, the shortest practicable time in which each jurisdictional strategy will be initiated after acceptance of the Water Quality Improvement Plan;

(iii) For each optional jurisdictional strategy identified pursuant to Provision B.3.b.(1)(b), a realistic assessment of the shortest practicable time required to:

[a] Secure the resources needed to fund the optional jurisdictional strategy, and
[b] Procure the resources, materials, labor, and applicable permits necessary to initiate implementation of the optional jurisdictional strategy;

(iv) If each jurisdictional strategy identified pursuant to Provisions B.3.b.(1)(a)-(b) is expected to be continuously implemented (e.g. inspections) or completed within a schedule (e.g. construction of structural BMP); and

(v) If a jurisdictional strategy identified pursuant to Provisions B.3.b.(1)(a)-(b) is expected to be completed within a schedule, the anticipated time to complete based on a realistic assessment of the shortest practicable time required.

(b) The Copermittees in the Watershed Management Area must develop schedules for the regional or multi-jurisdictional strategies identified pursuant to Provision B.3.b.(2). Each schedule must specify:

(i) A realistic assessment of the shortest practicable time to:

[a] Secure the resources needed to fund the optional regional or multi-jurisdictional strategy, and

[b] Procure the resources, materials, labor, and permits necessary to initiate the implementation of the optional regional or multi-jurisdictional strategy;

(ii) If each regional or multi-jurisdictional strategy identified pursuant to Provision B.3.b.(2) is expected to be continuously implemented (e.g. inspections) or completed within a schedule (e.g. construction of structural BMP); and

(iii) If a regional or multi-jurisdictional strategy and/or activity identified pursuant to Provisions B.3.b.(2) is expected to be completed within a schedule, the anticipated time to complete based on a realistic assessment of the shortest practicable time required.

(4) Optional Watershed Management Area Analysis

(a) For each Watershed Management Area, the Copermittees have the option to perform a Watershed Management Area Analysis for the purpose of developing watershed-specific requirements for structural BMP implementation, as described in Provision E.3.c.(3). The Watershed Management Area Analysis must include GIS layers (maps) as output. The analysis must include the following information, to the extent it is available, in order to characterize the Watershed Management Areas:

(i) A description of dominant hydrologic processes, such as areas where infiltration or overland flow likely dominates;

(ii) A description of existing streams in the watershed, including bed material and composition, and if they are perennial or ephemeral;

(iii) Current and anticipated future land uses;

(iv) Potential coarse sediment yield areas; and

(v) Locations of existing flood control structures and channel structures, such as stream armoring, constrictions, grade control structures, and hydromodification or flood management basins.

(b) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify and compile a list of candidate projects that could potentially be used as

alternative compliance options for Priority Development Projects, to be implemented in lieu of onsite structural BMP performance requirements described in Provisions E.3.c.(1) and E.3.c.(2)(a). Specifically, the Copermittees must identify opportunities to be included in the list of candidate projects in each Watershed Management Area, such as:

(i) Stream or riparian area rehabilitation;

(ii) Retrofitting existing infrastructure to incorporate storm water retention or treatment;

(iii) Regional BMPs;

(iv) Groundwater recharge projects;

(v) Water supply augmentation projects; and

(vi) Land purchases to preserve floodplain functions.

(c) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify areas within the Watershed Management Area where it is appropriate to allow Priority Development Projects to be exempt from the hydromodification management BMP performance requirements described in Provision E.3.c.(2), including supporting rationale.

c. Prohibitions and Limitations Compliance Option

Each Copermittee has the option to utilize the implementation of the Water Quality Improvement Plan to demonstrate compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2.a, and A.3.b within a Watershed Management Area subject to the following conditions:

(1) A Copermittee is eligible to be deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2.a, and A.3.b within a Watershed Management Area when the Water Quality Improvement Plan for a Watershed Management Area incorporates the following:

(a) Numeric goals, water quality improvement strategies, and schedules developed pursuant to Provisions B.3.a and B.3.b that include the following:

(i) Interim and final WQBELs established by the TMDLs in Attachment E to this Order applicable to the Copermittee's jurisdiction within the Watershed Management Area; AND

(ii) Interim and final numeric goals for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012

(included as Attachment A to this Order) applicable to the Copermittee's jurisdiction within the Watershed Management Area; AND

(iii) Interim and final numeric goals applicable to the Copermittee's MS4 discharges within the Watershed Management Area expressed as numeric concentration-based or load-based goals for all pollutants and conditions listed on the Clean Water Act Section 303(d) List of Water Quality Impaired Segments[8] for the receiving waters in the Watershed Management Area that do not have a TMDL incorporated into Attachment E to this Order; AND/OR

(iv) Interim and final numeric goals for pollutants and conditions identified as receiving water priorities in the Water Quality Improvement Plan that will result in chemical, physical, and biological conditions protective of the beneficial uses of the receiving waters impacted by the Copermittee's MS4 discharges within the Watershed Management Area; AND

(v) The Copermittee has the option to include interim and final numeric goals applicable to the Copermittee's MS4 discharges and/or receiving waters within the Watershed Management Area for any pollutants or conditions in addition to those described in Provisions B.3.c.(1)(a)(i)-(iv); AND

(vi) Schedules for achieving each final numeric goal that reflect a realistic assessment of the shortest practicable time needed for achievement; AND

(vii) For each final numeric goal developed pursuant to Provisions B.3.a and B.3.c.(1)(a)(i)-(v), at least one annual milestone[9] and date for its achievement must be included within each Water Quality Improvement Plan Annual Report reporting period until the final numeric goal is achieved.

(b) An analysis that meets all of the following conditions:

(i) The analysis, with clearly stated assumptions included in the analysis, must quantitatively demonstrate that the implementation of the water quality improvement strategies required under Provision B.3.b will achieve the final numeric goals within the schedules developed pursuant to Provisions B.3.a and B.3.c.(1)(a).

(ii) The development of the analysis must include a public participation process which allows the public to review and provide comments on

[8] 2010 and subsequent 303(d) Lists

[9] Annual milestones for each final numeric goal must build upon previous milestones and lead to the achievement of the final numeric goal. The annual milestones may consist of water quality improvement strategy implementation phases, interim numeric goals, and other acceptable metrics.

the analysis methodology utilized and the assumptions included in the analysis. Public comments and responses must be included as part of the analysis documentation included in the Water Quality Improvement Plan.

(iii) The analysis may be performed by an individual Copermittee or jointly by two or more Copermittees choosing to utilize this compliance option for their jurisdictions within the Watershed Management Area.

(iv) The analysis must be updated as part of the iterative approach and adaptive management process required under Provisions B.5.a-b.

(c) Specific monitoring and assessments required pursuant to Provision B.4.a that will be performed by the Copermittee capable of 1) demonstrating whether the implementation of the water quality improvement strategies are making progress toward achieving the numeric goals in accordance with the established schedules developed pursuant to Provisions B.3.a and B.3.c.(1)(a), and 2) determining whether interim and final numeric goals have been achieved. The specific monitoring and assessments must be updated as part of the iterative approach and adaptive management process required under Provision B.5.c.

(d) Documentation showing that the numeric goals, schedules, and annual milestones proposed pursuant to Provision B.3.c.(1)(a), the analysis performed pursuant to Provision B.3.c.(1)(b), and the specific monitoring and assessments proposed pursuant to Provision B.3.c.(1)(c) have been reviewed by the Water Quality Improvement Consultation Panel (see Provision F.1.a.(1)(b)). Updates must be reviewed by the Water Quality Improvement Consultation Panel for any recommendations.

(2) Each Copermittee that voluntarily completes the requirements of Provision B.3.c.(1) is deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2.a, and A.3.b for the pollutants and conditions for which numeric goals are developed when the Water Quality Improvement Plan, incorporating the requirements of Provision B.3.c.(1), is accepted by the San Diego Water Board pursuant to Provision F.1.b or F.2.c. The Copermittee is deemed in compliance during the term of this Order as long as:

(a) The Copermittee is implementing the water quality improvement strategies within its jurisdiction developed pursuant to Provision B.3.b.(1) and in compliance with the schedules for implementing the strategies established pursuant to Provisions B.3.b.(3)(a) and B.3.c.(1)(a)(vii); AND

(b) The Copermittee is performing the monitoring and assessments developed pursuant to Provision B.3.c.(1)(c); AND

(c) The Copermittee's assessments in the Water Quality Improvement Plan Annual Report submitted pursuant to Provision F.3.b.(3) support a conclusion that: 1) the Copermittee is in compliance with the annual milestones and dates for achievement developed pursuant to Provision B.3.c.(1)(a)(vii), OR 2) the Copermittee has provided acceptable rationale and recommends appropriate modifications to the interim numeric goals, and/or water quality improvement strategies, and/or schedules to improve the rate of progress toward achieving the final numeric goals developed pursuant to Provisions B.3.a and B.3.c.(1)(a)(i)-(vi); AND

(d) Any proposed modifications to the numeric goals, schedules, and/or annual milestones are accepted by the San Diego Water Board as part of subsequent updates to the Water Quality Improvement Plan pursuant to Provision F.2.c;[10] AND

(e) The Copermittee is implementing the requirements of Provision A.4.a.

4. Water Quality Improvement Monitoring and Assessment Program

a. The Copermittees in each Watershed Management Area must develop and incorporate an integrated monitoring and assessment program into the Water Quality Improvement Plan that assesses: 1) the progress toward achieving the numeric goals and schedules, 2) the progress toward addressing the highest priority water quality conditions for each Watershed Management Area, and 3) each Copermittee's overall efforts to implement the Water Quality Improvement Plan.

b. The monitoring and assessment program must incorporate the monitoring and assessment requirements of Provision D, which may allow the Copermittees to modify the program to be consistent with and focus on the highest priority water quality conditions for each Watershed Management Area.

c. For Watershed Management Areas with applicable TMDLs, the monitoring and assessment program must incorporate the specific monitoring and assessment requirements of Attachment E.

d. For Watershed Management Areas with any ASBS, the water quality monitoring and assessment program must incorporate the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

[10] A request for proposed changes to the Water Quality Improvement Plan does not stay any permit condition.

5. Iterative Approach and Adaptive Management Process

The Copermittees in each Watershed Management Area must implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a, and must include the following:

a. Re-Evaluation of Priority Water Quality Conditions

The priority water quality conditions and potential water quality improvement strategies included in the Water Quality Improvement Plan pursuant to Provisions B.2.c and B.2.e may be re-evaluated by the Copermittees as needed during the term of this Order as part of the Water Quality Improvement Plan Annual Report. Re-evaluation and recommendations for modifications to the priority water quality conditions and potential water quality improvement strategies must be provided in the Report of Waste Discharge, and must consider the following:

(1) Achieving the outcome of improved water quality in MS4 discharges and receiving waters through implementation of the water quality improvement strategies identified in the Water Quality Improvement Plan;

(2) New information developed when the requirements of Provisions B.2.a-c have been re-evaluated;

(3) Spatial and temporal accuracy of monitoring data collected to inform prioritization of water quality conditions and implementation strategies to address the highest priority water quality conditions;

(4) Availability of new information and data from sources other than the jurisdictional runoff management programs within the Watershed Management Area that informs the effectiveness of the actions implemented by the Copermittees;

(5) San Diego Water Board recommendations; and

(6) Recommendations for modifications solicited through a public participation process.

b. Adaptation of Goals, Strategies and Schedules

The water quality improvement goals, strategies and schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.3, must be re-evaluated and adapted as new information becomes available to result in more effective and efficient measures to address the highest priority water quality

conditions identified pursuant to Provision B.2.c. Re-evaluation of and modifications to the water quality improvement goals, strategies and schedules must be provided in the Water Quality Improvement Plan Annual Report, and must consider the following:

(1) Modifications to the priority water quality conditions based on Provision B.5.a;

(2) Progress toward achieving interim and final numeric goals in receiving waters and MS4 discharges for the highest priority water quality conditions in the Watershed Management Area,

(3) Progress toward achieving outcomes according to established schedules;

(4) New policies or regulations that may affect identified numeric goals;

(5) Measurable or demonstrable reductions of non-storm water discharges to and from each Copermittee's MS4;

(6) Measurable or demonstrable reductions of pollutants in storm water discharges from each Copermittee's MS4 to the MEP;

(7) New information developed when the requirements of Provisions B.2.b and B.2.d have been re-evaluated;

(8) Efficiency in implementing the Water Quality Improvement Plan;

(9) San Diego Water Board recommendations; and

(10) Recommendations for modifications solicited through a public participation process.

c. ADAPTATION OF MONITORING AND ASSESSMENT PROGRAM

The water quality improvement monitoring and assessment program, included in the Water Quality Improvement Plan pursuant to Provision B.4, must be re-evaluated and adapted when new information becomes available. Re-evaluation and recommendations for modifications to the monitoring and assessment program, pursuant to the requirements of Provision D, may be provided in the Water Quality Improvement Plan Annual Report, but must be provided in the Report of Waste Discharge.

6. Water Quality Improvement Plan Submittal, Updates, and Implementation

a. The Copermittees must submit and commence implementation of the Water Quality Improvement Plans in accordance with the requirements of Provision F.1.

b. The Copermittees must submit proposed updates to the Water Quality Improvement Plan for acceptance by the San Diego Water Board Executive Officer in accordance with the requirements of Provision F.2.c.

C. ACTION LEVELS

The purpose of this provision is for the Copermittees to incorporate numeric action levels in the Water Quality Improvement Plans. The goal of the action levels is to guide Water Quality Improvement Plan implementation efforts and measure progress towards the protection of water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through monitoring and assessing the quality of the MS4 discharges during the implementation of the Water Quality Improvement Plans.

1. Non-Storm Water Action Levels[11]

The Copermittees must develop and incorporate numeric non-storm water action levels (NALs) into the Water Quality Improvement Plan to: 1) support the development and prioritization of water quality improvement strategies for effectively prohibiting non-storm water discharges to the MS4s, 2) assess the effectiveness of the water quality improvement strategies toward addressing MS4 non-storm water discharges, required pursuant to Provision D.4.b.(1), and 3) support the detection and elimination of non-storm water and illicit discharges to the MS4, required pursuant to Provision E.2.[12]

a. The following NALs must be incorporated:

(1) Non-Storm Water Discharges from MS4s to Ocean Surf Zone

Table C-1. Non-Storm Water Action Levels for Discharges from MS4s to Ocean Surf Zone

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Total Coliform	MPN/100 ml	1,000	-	10,000/1,000[1]	OP
Fecal Coliform	MPN/100 ml	200[2]	-	400	OP
Enterococci	MPN/100 ml	35	-	104[3]	OP

Abbreviations/Acronyms
AMAL – average monthly action level
MDAL – maximum daily action level
OP – Ocean Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Total coliform density NAL is 1,000 MPN/100 ml when the fecal/total coliform ratio exceeds 0.1.
2. Fecal coliform density NAL is 200 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas."

[11] NALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, unless the NAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed.
[12] The Copermittees may utilize NALs or other benchmarks currently established by the Copermittees as interim NALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

(2) Non-Storm Water Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Table C-2. Non-Storm Water Action Levels for Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Turbidity	NTU	75	-	225	OP
pH	Units	Within limit of 6.0 to 9.0 at all times			OP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	35	-	104[3]	BP
Priority Pollutants	µg/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
OP – Ocean Plan water quality objective
NTU – Nephelometric Turbidity Units
µg/L – micrograms per liter
MDAL – maximum daily action level
BP – Basin Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas" and is not applicable to water bodies that are not designated with the water contact recreation (REC-1) beneficial use.

Table C-3. Non-Storm Water Action Levels for Priority Pollutants

Parameter	Units	Freshwater (CTR)		Saltwater (CTR)	
		MDAL	AMAL	MDAL	AMAL
Cadmium	µg/L	**	**	16	8
Copper	µg/L	*	*	5.8	2.9
Chromium III	µg/L	**	**	-	-
Chromium VI	µg/L	16	8.1	83	41
Lead	µg/L	*	*	14	2.9
Nickel	µg/L	**	**	14	6.8
Silver	µg/L	*	*	2.2	1.1
Zinc	µg/L	*	*	95	47

Abbreviations/Acronyms:
CTR – California Toxic Rule
AMAL – average monthly action level
µg/L – micrograms per liter
MDAL – maximum daily action level

Notes:
* Action levels developed on a case-by-case basis (see below)
** Action levels developed on a case-by-case basis (see below), but calculated criteria are not to exceed Maximum Contaminant Levels (MCLs) under the California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64431

The Cadmium, Copper, Chromium (III), Lead, Nickel, Silver and Zinc NALs for MS4 discharges to freshwater receiving waters will be developed on a case-by-case basis based on site-specific water quality data (receiving water hardness). For these priority pollutants, refer to 40 CFR 131.38(b)(2).

(3) Non-Storm Water Discharges from MS4s to Inland Surface Waters

Table C-4. Non-Storm Water Action Levels for Discharges from MS4s to Inland Surface Waters

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Dissolved Oxygen	mg/L	Not less than 5.0 in WARM waters and not less than 6.0 in COLD waters			BP
Turbidity	NTU	-	20	See MDAL	BP
pH	Units	Within limit of 6.5 to 8.5 at all times			BP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	33	-	61[3]	BP
Total Nitrogen	mg/L	-	1.0	See MDAL	BP
Total Phosphorus	mg/L	-	0.1	See MDAL	BP
MBAS	mg/L	-	0.5	See MDAL	BP
Iron	mg/L	-	0.3	See MDAL	BP
Manganese	mg/L	-	0.05	See MDAL	BP
Priority Pollutants	µg/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
BP – Basin Plan water quality objective
COLD – cold freshwater habitat beneficial use
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
MDAL – maximum daily action level
WARM – warm freshwater habitat beneficial use
MBAS – Methylene Blue Active Substances
MPN/100 ml – most probable number per 100 milliliters
µg/L – micrograms per liter

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for freshwater "designated beach areas" and is not applicable to water bodies that are not designated with the water contact recreation (REC-1) beneficial use.

b. If not identified in Provision C.1.a, NALs must be identified, developed and incorporated in the Water Quality Improvement Plan for any pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in receiving waters associated with the highest priority water quality conditions related to non-storm water discharges from the MS4s. NALs must be based on:

(1) Applicable water quality standards which may be dependent upon site-specific or receiving water-specific conditions or assumptions to be identified by the Copermittees; or

(2) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the NALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary NALs specific to the Watershed Management Area at levels greater than the NALs required by Provisions C.1.a and C.1.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for effectively prohibiting non-storm water discharges to the MS4s, as well as the detection and

elimination of non-storm water and illicit discharges to and from the MS4. The secondary NALs may be developed using an approach acceptable to the San Diego Water Board.

d. Dry weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.b may be utilized to develop or revise NALs based on watershed-specific data, subject to San Diego Water Board Executive Officer approval.

2. Storm Water Action Levels[13]

The Copermittees must develop and incorporate numeric storm water action levels (SALs) in the Water Quality Improvement Plans to: 1) support the development and prioritization of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s, and 2) assess the effectiveness of the water quality improvement strategies toward reducing pollutants in storm water discharges, required pursuant to Provision D.4.b.(2).[14]

a. The following SALs for discharges of storm water from the MS4 must be incorporated:

Table C-5. Storm Water Action Levels for Discharges from MS4s to Receiving Waters

Parameter	Units	Action Level
Turbidity	NTU	126
Nitrate & Nitrite (Total)	mg/L	2.6
Phosphorus (Total P)	mg/L	1.46
Cadmium (Total Cd)*	µg/L	3.0
Copper (Total Cu)*	µg/L	127
Lead (Total Pb)*	µg/L	250
Zinc (Total Zn)*	µg/L	976

Abbreviations/Acronyms:
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
µg/L – micrograms per liter

Notes:
* The sampling must include a measure of receiving water hardness at each MS4 outfall. If a total metal concentration exceeds the corresponding metals SAL in Table C-5, that concentration must be compared to the California Toxics Rule criteria and the USEPA 1-hour maximum concentration for the detected level of receiving water hardness associated with that sample. If it is determined that the sample's total metal concentration for that specific metal exceeds that SAL, but does not exceed the applicable USEPA 1-hour maximum concentration criterion for the measured level of hardness, then the sample result will not be considered above the SAL for that measurement.

[13] SALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, unless the SAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed.

[14] The Copermittees may utilize SALs or other benchmarks currently established by the Copermittees as interim SALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

b. If not identified in Provision C.2.a, SALs must be identified, developed and incorporated in the Water Quality Improvement Plan for pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in receiving waters associated with the highest priority water quality conditions related to storm water discharges from the MS4s. SALs must be based on:

(1) Federal and State water quality guidance and/or water quality standards; and

(2) Site-specific or receiving water-specific conditions; or

(3) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the SALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary SALs specific to the Watershed Management Area at levels greater than the SALs required by Provisions C.2.a and C.2.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s. The secondary SALs may be developed based on the approaches recommended by the State Water Board's Storm Water Panel[15] or using an approach acceptable to the San Diego Water Board.

d. Wet weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.c may be used to develop or revise SALs based upon watershed-specific data, subject to San Diego Water Board Executive Officer approval.

[15] Storm Water Panel Recommendations to the California State Water Resources Control Board: The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities (June 2006)

D. MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS

The purpose of this provision is for the Copermittees to monitor and assess the impact on the conditions of receiving waters caused by discharges from the Copermittees' MS4s under wet weather and dry weather conditions. The goal of the monitoring and assessment program is to inform the Copermittees about the nexus between the health of receiving waters and the water quality condition of the discharges from their MS4s. This goal will be accomplished through monitoring and assessing the conditions of the receiving waters, discharges from the MS4s, pollutant sources and/or stressors, and effectiveness of the water quality improvement strategies implemented as part of the Water Quality Improvement Plans.

1. Receiving Water Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the condition of the receiving waters in each Watershed Management Area during dry weather and wet weather. Following San Diego Water Board acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct long-term receiving water monitoring during implementation of the Water Quality Improvement Plan to assess the long term trends and determine if conditions in receiving waters are improving. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following receiving water monitoring procedures:

a. TRANSITIONAL RECEIVING WATER MONITORING

Until the monitoring requirements and schedules of Provisions D.1.b-e are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following receiving water monitoring in the Watershed Management Area:

(1) Continue the receiving water monitoring programs required in Order Nos. R9-2007-0001 (Monitoring and Reporting Program No. R9-2007-0001 Sections II.A.1-A.5), R9-2009-0002, and R9-2010-0016, unless the Executive Officer provides conditional approval for Copermittees to proceed with implementation of the proposed monitoring and assessment program developed in accordance with Provision B.4;

(2) Continue the monitoring in the Hydromodification Management Plans approved by the San Diego Water Board;

(3) Participate in the following regional receiving water monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring,

(b) Southern California Bight Regional Monitoring, and

(c) Sediment Quality Monitoring;

(4) Implement the monitoring programs developed as part of any implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) for the TMDLs in Attachment E to this Order; and

(5) For Watershed Management Areas with ASBS, implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

b. LONG-TERM RECEIVING WATER MONITORING STATIONS

The Copermittees must select at least one long-term receiving water monitoring station from among the existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees to be representative of the receiving water quality in the Watershed Management Area. Additional long-term receiving water monitoring stations must be selected where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

c. DRY WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three dry weather monitoring events at each of the long-term receiving water monitoring stations. At least one monitoring event must be conducted during the dry season (May 1 – September 30) and at least one monitoring event must be conducted during a dry weather period during the wet season (October 1 – April 30), after the first wet weather event of the season, with an antecedent dry period of at least 72 hours following a storm event producing measureable rainfall of greater than 0.1 inch.

(1) Dry Weather Receiving Water Field Observations

For each dry weather monitoring event, the Copermittees must record field observations consistent with Table D-1 at each long-term receiving water monitoring station.

Table D-1. Field Observations for Receiving Water Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) • Station description (i.e. deposits or stains, vegetation condition, structural condition, and observable biology) • Presence and assessment of trash in and around station

(2) Dry Weather Receiving Water Field Monitoring

For each dry weather monitoring event, if conditions allow the collection of the data, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

Table D-2. Field Monitoring Parameters for Receiving Water Monitoring Stations

Parameters
• pH • Temperature • Specific conductivity • Dissolved oxygen • Turbidity

(3) Dry Weather Receiving Water Analytical Monitoring

For each dry weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable NAL constituents, and

(v) Constituents listed in Table D-3.

Table D-3. Analytical Monitoring Constituents for Receiving Water Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Pesticides	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Mercury • Nickel • Selenium • Thallium • Zinc	• Organophosphate Pesticides • Pyrethroid Pesticides	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(4) Dry Weather Receiving Water Toxicity Monitoring

For each dry weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for aquatic toxicity in accordance with Table D-4. When the State Water Board's Policy for Toxicity Assessment and Control (Toxicity Policy) is approved and in effect, the San Diego Water Board Executive Officer may direct the Copermittees to replace current toxicity program elements with standardized procedures in the Toxicity Policy.

Table D-4. Dry Weather Chronic[1] Toxicity Testing for Receiving Water Monitoring Stations

Organism	Units	Test	USEPA Protocol
Freshwater			
Pimephales promelas (Fathead Minnow)	Pass / Fail	Larval Survival and Growth	EPA-821-R-02-013
Ceriodaphnia dubia (*Daphnid*)	Pass / Fail	Survival and Production	EPA-821-R-02-013
Selenastrum capricornutum (Green Algae)	Pass / Fail	Growth	EPA-821-R-02-013
Marine and Estuarine			
Strongylocentrotus purpuratus *(Purple Sea Urchin)*	Pass / Fail	Embryo-Larval Development	EPA-600-R-95-136

Notes:
1. Chronic toxicity testing is not required at receiving water monitoring stations located at mass loading stations if the channel flows are diverted year-round during dry weather conditions to the sanitary sewer for treatment.

(a) Freshwater Test Species and Methods: If samples are collected in receiving waters with salinity less than 1 ppt, the Copermittees must follow the methods for chronic toxicity tests as established in 40 CFR 136.3 using a single-concentration test design for routine monitoring, or a five-concentration test design for additional toxicity testing if the limitation is exceeded. The Copermittees must estimate the critical life stage chronic toxicity on undiluted samples in accordance with species and short term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms (EPA-821-R-02-013; Table IA, 40 CFR 136). Additional test species may be used by the Copermittees if approved by the San Diego Water Board Executive Officer. The Copermittees must conduct:

(i) A static renewal toxicity test with the fathead minnow, *Pimephales promelas* (Larval Survival and Growth Test Method 1000.0);

(ii) A static renewal toxicity test with the daphnid, *Ceriodaphnia dubia* (Survival and Reproduction Test Method 1002.0); and

(iii) A static renewal toxicity test with the green alga, *Selenastrum capricornutum* (also named *Raphidocelis subcapitata*) (Growth Test Method 1003.0).

(b) Marine and Estuarine Test Species and Methods: If samples are collected in receiving waters with salinity greater or equal to 1 ppt, the Copermittees must follow the methods for chronic toxicity tests as established in 40 CFR 136.3 using a single-concentration test design for routine monitoring, or a five-concentration test design for additional toxicity testing if the limitation is exceeded. The Copermittees must conduct the following critical life state chronic toxicity tests on undiluted samples in accordance with species and short term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms (EPA-600-R-95-136; 1995). Artificial sea salts must be used to increase sample salinity. The Copermittees must conduct a static non-renewal toxicity test with the purple sea urchin, *Strongylocentrotus purpuratus* (Embryo-larval Development Test Method). Additional species may be used by the Copermittees if approved by the San Diego Water Board Executive Officer.

(c) Holding Times: All toxicity tests must be conducted as soon as possible following sample collection. The 36-hour sample holding time for test initiation shall be targeted. However, no more than 72 hours shall elapse before the conclusion of sample collection and test initiation.

(d) Test Species Sensitivity Screening: To determine the most sensitive test species for freshwater, the Copermittees must screen 2 wet weather and 2 dry weather toxicity tests with a vertebrate, an invertebrate, and a plant species. After this screening period, subsequent monitoring must be conducted using the most sensitive test species. Alternatively, if a sensitive test species has already been determined, or if there is prior knowledge of potential toxicant(s) and a test species is sensitive to such toxicant(s), then monitoring must be conducted using only that test species. Sensitive test species determinations must also consider the most sensitive test species used for proximal receiving water monitoring. Rescreening must occur once each permit term.

(e) Chronic toxicity test biological endpoint data must be analyzed using the Test of Significant Toxicity t-test approach specified in *National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document* (USEPA, Office of Wastewater Management, Washington, D.C., EPA-833-R-10-003, 2010). For this monitoring program, the critical chronic instream waste concentration (IWC) is set at 100 percent receiving water (i.e. no dilution) for receiving water samples. A 100 percent receiving water and a control must be tested.

(f) Toxicity Identification Evaluation (TIE) / Toxicity Reduction Evaluation (TRE): If chronic toxicity is detected in receiving waters, the Copermittees must discuss the need for conducting a TIE/TRE in the assessments

required under Provision D.4.a.(2), and develop a plan for implementing the TIE/TRE to be incorporated in the Water Quality Improvement Plan.

(5) Dry Weather Receiving Water Bioassessment Monitoring

Bioassessment monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must conduct bioassessment monitoring during at least one dry weather monitoring event at each long-term receiving water monitoring station as follows:

(a) The following bioassessment samples and measurements must be collected:

(i) Macroinvertebrate samples must be collected in accordance with the "Reachwide Benthos (Multihabitat) Procedure" in the most current Surface Water Ambient Monitoring Program (SWAMP) Bioassessment Standard Operating Procedures (SOP), and amendments, as applicable;[16]

(ii) The "Full" suite of physical habitat characterization measurements must be collected in accordance with the most current SWAMP Bioassessment SOP, and as summarized in the SWAMP Stream Habitat Characterization Form – Full Version;[17] and

(iii) Freshwater algae samples must be collected in accordance with the SWAMP Standard Operating Procedures for Collecting Algae Samples.[18] Analysis of samples must include algal taxonomic composition (diatoms and soft algae) and algal biomass.

(b) The bioassessment samples, measurements, and appropriate water chemistry data must be used to calculate the following:

(i) An Index of Biological Integrity (IBI) for macroinvertebrates for each monitoring station where bioassessment monitoring was conducted, based on the most current calculation method;[19] and

[16] Ode, P.R.. 2007. Standard operating procedures for collecting macroinvertebrate samples and associated physical and chemical data for ambient bioassessments in California. California State Water Resources Control Board Surface Water Ambient Monitoring Program (SWAMP) Bioassessment SOP 001. http://www.swrcb.ca.gov/water_issues/programs/swamp/tools.shtml#monitoring

[17] Available at: http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/reports/fieldforms_fullversion052908.pdf

[18] Fetscher et al. 2009. Standard Operating Procedures for Collecting Stream Algae Samples and Associated Physical Habitat and Chemical Data for Ambient Bioassessments in California.

[19] The most current calculation method at the time the Order was adopted is outlined in "A Quantitative Tool for Assessing the Integrity of Southern California Coastal Streams" (Ode, et al. 2005. Environmental Management. Vol. 35, No. 1, pp. 1-13). If an updated or new calculation method is developed, either both

(ii) An IBI for algae for each monitoring station where bioassessment monitoring was conducted, when a calculation method is developed.[20]

(c) In lieu of the requirements of Provision D.1.c.(5)(a), the Copermittees may conduct the bioassessment monitoring in accordance with the "Triad" assessment approach[21] to calculate the IBIs required for Provision D.1.c.(5)(b). The Copermittees must conduct sampling, analysis, and reporting of specified in-stream biological and habitat data according to the protocols specified in the SCCWRP Technical Report No. 539, or subsequent protocols, if developed.

(6) Dry Weather Receiving Water Hydromodification Monitoring

In addition to the hydromodification monitoring conducted as part of the Copermittees' Hydromodification Management Plans, hydromodification monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must collect the following hydromodification monitoring observations and measurements within an appropriate domain of analysis during at least one dry weather monitoring event for each long-term receiving water monitoring station:

(a) Channel conditions, including:

(i) Channel dimensions,

(ii) Hydrologic and geomorphic conditions, and

(iii) Presence and condition of vegetation and habitat;

(b) Location of discharge points;

(c) Habitat integrity;

(d) Photo documentation of existing erosion and habitat impacts, with location (i.e. latitude and longitude coordinates) where photos were taken;

(e) Measurement or estimate of dimensions of any existing channel bed or bank eroded areas, including length, width, and depth of any incisions; and

(i.e. current and updated/new) methods must be used, or historical IBIs must be recalculated with the updated or new calculation method.

[20] When a calculation method is developed, IBIs must be calculated for all available and appropriate historical data.

[21] Stormwater Monitoring Coalition Model Monitoring Technical Committee, 2004. Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California. Technical Report #419. August 2004.

(f) Known or suspected cause(s) of existing downstream erosion or habitat impact, including flow, soil, slope, and vegetation conditions, as well as upstream land uses and contributing new and existing development.

d. WET WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three wet weather monitoring events at each long-term receiving water monitoring station. At least one wet weather monitoring event must be conducted during the first wet weather event of the wet season (October 1 – April 30), and at least one wet weather monitoring event during a wet weather event that occurs after February 1.

(1) Wet Weather Receiving Water Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each long-term receiving water monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event;

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(d) Presence and assessment of trash in and around station.

(2) Wet Weather Receiving Water Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

(3) Wet Weather Receiving Water Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) Constituents listed in Table D-3.

(4) Wet Weather Receiving Water Toxicity Monitoring

For each wet weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for chronic aquatic toxicity in accordance with Provisions D.1.c.(4)(a)-(f).

e. OTHER RECEIVING WATER MONITORING REQUIREMENTS

(1) Regional Monitoring

The Copermittees must participate in the following regional receiving waters monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring; and

(b) Southern California Bight Regional Monitoring and

(c) Unified Beach Water Quality Monitoring and Assessment Program. The Orange County Copermittees shall participate in and, together with South Orange County Wastewater Authority and Orange County Health Care Agency, shall share responsibility for implementation of a unified regional beach water quality monitoring and assessment program in south Orange County, as set forth in the October 2014 report, *Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County* , issued pursuant to CWC section 13383 and subject to future revision in the San Diego Water Board December 5, 2014 Letter Directive.

(2) Sediment Quality Monitoring

The Copermittees must perform sediment monitoring to assess compliance with sediment quality receiving water limits applicable to MS4 discharges to enclosed bays and estuaries. The monitoring may be performed either by individual or multiple Copermittees to assess compliance with receiving water limits, or through participation in a water body monitoring coalition. A Sediment Monitoring Plan which satisfies the requirements of the State Water Board's Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part 1 Sediment Quality (Sediment Control Plan) must be submitted as part of the monitoring and assessment program in the Water Quality Improvement Plan.

(a) The Sediment Monitoring Plan design must include the following:

(i) The elements required under Section VII.D (Receiving Water Limits Monitoring Frequency) and Section VII.E (Sediment Monitoring) of the Sediment Control Plan;

(ii) A Quality Assurance Project Plan (QAPP) describing the project objectives and organization, functional activities, and quality assurance/quality control protocols for the water and sediment monitoring; and

(iii) A schedule for completion of all sample collection and analysis activities and submission of Sediment Monitoring Reports.

(b) The Copermittees must implement the Sediment Monitoring Plan in accordance with the schedule contained in the Sediment Monitoring Plan, unless otherwise directed in writing by the San Diego Water Board Executive Officer.

(c) The Copermittees must incorporate a Sediment Monitoring Report as part of the Water Quality Improvement Plan Annual Report in accordance with the schedule contained in the Sediment Monitoring Plan, unless otherwise directed in writing by the San Diego Water Board Executive Officer. The Sediment Monitoring Report must contain the following information:

(i) Analysis: An evaluation, interpretation and tabulation of the water and sediment monitoring data, including interpretations and conclusions as to whether applicable Receiving Water Limitations in this Order have been attained at each sample station;

(ii) Sample Location Map: The locations, type, and number of samples must be identified and shown on a site map; and

(iii) California Environmental Data Exchange Network: A statement certifying that the monitoring data and results have been uploaded into the California Environmental Data Exchange Network (CEDEN).

(d) Based on the Sediment Monitoring Report conclusions the San Diego Water Board may require a human health risk assessment to determine if the human health objective contained in Receiving Water Limitations in Provision A.2.a.(3)(b)(ii) has been attained at each sample station. In conducting a risk assessment, the Copermittees must consider any applicable and relevant information, including California Environmental Protection Agency's (Cal/EPA) Office of Environmental Health Hazard Assessment (OEHHA) policies for fish consumption and risk assessment, Cal/EPA's Department of Toxic Substances Control (DTSC) Risk Assessment, and USEPA Human Health Risk Assessment policies.

(3) ASBS Monitoring

For Watershed Management Areas with ASBS, the Copermittees must implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

f. ALTERNATIVE WATERSHED MONITORING REQUIREMENTS

The San Diego Water Board may direct the Copermittees to participate in an effort to develop alternative watershed monitoring with other regulated entities, other interested parties, and the San Diego Water Board to refine, coordinate, and implement regional monitoring and assessment programs to determine the status and trends of water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams.

2. MS4 Outfall Discharge Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the discharges from the MS4 outfalls in each Watershed Management Area during dry weather and wet weather. Following San Diego Water Board acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct MS4 outfall discharge monitoring during implementation of the Water Quality Improvement Plan to assess the effectiveness of their jurisdictional runoff management programs toward effectively prohibiting non-storm water discharges into the MS4 and reducing pollutants in storm water discharges from their MS4s to the MEP. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following MS4 outfall monitoring procedures:

a. TRANSITIONAL MS4 OUTFALL DISCHARGE MONITORING

Until the monitoring requirements and schedules of Provisions D.2.b-c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following MS4 outfall discharge monitoring in the Watershed Management Area:

(1) MS4 Outfall Discharge Monitoring Station Inventory

Each Copermittee must identify all major MS4 outfalls that discharge directly to receiving waters within its jurisdiction and geo-locate those outfalls on a map of the MS4 pursuant to Provision E.2.b.(1). This information must be compiled into a MS4 outfall discharge monitoring station inventory, and must include the following information:

(a) Latitude and longitude of MS4 outfall point of discharge;

(b) Watershed Management Area;

(c) Hydrologic subarea;

(d) Outlet size;

(e) Accessibility (i.e. safety and without disturbance of critical habitat);

(f) Approximate drainage area; and

(g) Classification of whether the MS4 outfall is known to have persistent dry weather flows, transient dry weather flows, no dry weather flows, or unknown dry weather flows.

(2) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Until the monitoring requirements and schedules of Provision D.2.b are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, each Copermittee must perform dry weather MS4 outfall field screening monitoring to identify non-storm water and illicit discharges within its jurisdiction in accordance with Provision E.2.c, to determine which discharges are transient flows and which are persistent flows, and prioritize the dry weather MS4 discharges that will be investigated and eliminated in accordance with Provision E.2.d.

(a) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Frequency

Each Copermittee must field screen the MS4 outfalls in its inventory developed pursuant to Provision D.2.a.(1) as follows:

(i) For Copermittees with less than 125 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 80 percent of the outfalls must be visually inspected two times per year during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv).

(ii) For Copermittees with 125 major MS4 outfalls or more, but less than or equal to 500 that discharge to receiving waters within a Watershed Management Area, all the outfalls must be visually inspected at least annually during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv).

(iii) For Copermittees with more than 500 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 500 outfalls must be visually inspected at least annually during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv). Copermittees with more than 500 major MS4 outfalls within a Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;

[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(iv) For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major MS4 outfalls within its jurisdiction, at least 500 major MS4 outfalls within its inventory must be visually inspected at least annually during dry weather conditions. Copermittees with more than 500 major MS4 outfalls in more than one Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(v) Inspections of major MS4 outfalls conducted in response to public reports and staff or contractor reports and notifications may count toward the required visual inspections of MS4 outfall discharge monitoring stations.

(b) Transitional Dry Weather MS4 Outfall Discharge Field Screening Visual Observations

(i) An antecedent dry period of at least 72 hours following any storm event producing measurable rainfall greater than 0.1 inch is required prior to conducting field screening visual observations during a field screening monitoring event.

(ii) During the field screening monitoring event, each Copermittee must record visual observations consistent with Table D-5 at each MS4 outfall discharge monitoring station inspected.

Table D-5. Field Screening Visual Observations for MS4 Outfall Discharge Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) - Flow source(s) suspected or identified from non-storm water source investigation - Flow source(s) eliminated during non-storm water source identification • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) - Known or suspected source(s) of pooled or ponded water • Station description (i.e. deposits or stains, vegetation condition, structural condition, observable biology) • Presence and assessment of trash in and around station • Evidence or signs of illicit connections or illegal dumping

(iii) Each Copermittee must implement the requirements of Provisions E.2.d.(2)(c)-(e) based on the field observations required pursuant to Provision D.2.a.(2)(b)(ii).

(iv) Each Copermittee must evaluate field observations together with existing information available from prior reports, inspections and monitoring results to determine whether any observed flowing, pooled, or ponded waters are likely to be transient or persistent flow.[22]

(c) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Records

Based upon the results of the transitional dry weather MS4 outfall discharge field screening monitoring conducted pursuant to Provisions D.2.a.(2)(a)-(b), each Copermittee must update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow.

(3) Transitional Wet Weather MS4 Outfall Discharge Monitoring

Until the monitoring requirements and schedules of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the

[22] Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(a) Transitional Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees must select wet weather MS4 outfall discharge monitoring stations from the inventories developed pursuant to Provision D.2.a.(1) for each Watershed Management Area as follows:

(i) At least five wet weather MS4 outfall discharge monitoring stations that are representative of storm water discharges from areas consisting primarily of residential, commercial, industrial, and typical mixed-use land uses present within the Watershed Management Area;

(ii) At least one wet weather MS4 outfall discharge monitoring station for each Copermittee within the Watershed Management Area; and

(iii) The County of San Diego may select at least two (2) wet weather MS4 outfall discharge monitoring stations for the portion of the Santa Margarita River Watershed Management Area within its jurisdiction to be monitored during the transitional period until the Riverside County Copermittees are notified of coverage under this Order. After the Riverside County Copermittees are notified of coverage under this Order, the Copermittees in the Watershed Management Area must select wet weather MS4 outfall discharge monitoring stations consistent with the requirements above.

(b) Transitional Wet Weather MS4 Outfall Discharge Monitoring Frequency

Each wet weather MS4 outfall discharge monitoring station selected pursuant to Provision D.2.a.(3)(a) must be monitored once during the wet season (October 1 – April 30). The wet weather monitoring events must be selected to be representative of the range of hydrological conditions experienced in the region. At least 10 percent of samples must be conducted during the first wet weather event of the wet season, to include at least one such sample in each Watershed Management Area..

(c) Transitional Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(i) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(ii) The flow rates and volumes measured or estimated from the MS4 outfall (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(d) Transitional Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(e) Transitional Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, and indicator bacteria;

(iv) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

[a] Time-weighted composites collected over the length of the storm event or the first 24 hour period whichever is shorter, composed of discrete samples, which may be collected through the use of automated equipment, or

[b] Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

[c] If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during

the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours;

(v) Only one analysis of the composite of aliquots is required;

(vi) The samples must be analyzed for the following constituents:

[a] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

[b] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and

[c] Constituents listed in Table D-6.

Table D-6. Analytical Monitoring Constituents for Wet Weather MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Nickel • Selenium • Thallium • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(f) Other Transitional Wet Weather MS4 Outfall Discharge Monitoring

The San Diego County Copermittees must continue the wet weather MS4 outfall monitoring program developed under Order No. R9-2007-0001, as approved by the San Diego Water Board, through its planned completion.

b. Dry Weather MS4 Outfall Discharge Monitoring

Each Copermittee must perform dry weather MS4 outfall monitoring to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision

E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. Each Copermittee must conduct the following dry weather MS4 outfall discharge monitoring within its jurisdiction:

(1) Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Each Copermittee must continue to perform the dry weather MS4 outfall discharge field screening monitoring in accordance with the requirements of Provision D.2.a.(2). The Copermittee may adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of persistent flow non-storm water discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of visual inspections performed is equivalent to the number of visual inspections required under Provision D.2.a.(2)(a).

(2) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring

Each Copermittee must perform non-storm water persistent flow MS4 outfall discharge monitoring to determine which persistent non-storm water discharges contain concentrations of pollutants below NALs, and which persistent non-storm water discharges impact receiving water quality during dry weather. Each Copermittee must conduct the following non-storm water persistent flow MS4 outfall discharge monitoring within its jurisdiction:

(a) Prioritization of Non-Storm Water Persistent Flow MS4 Outfalls

Based upon the dry weather MS4 outfall discharge field screening monitoring records developed pursuant to Provision D.2.a.(2)(c), each Copermittee must identify and prioritize the MS4 outfalls with persistent flows based on the highest priority water quality conditions identified in the Water Quality Improvement Plan and any additional criteria developed by the Copermittee, which may include historical data and data from sources other than what the Copermittee collects.

(b) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring Frequency

(i) Based on the prioritization of major MS4 outfalls developed under Provision D.2.b.(2)(a), each Copermittee must identify, at a minimum, the 5 highest priority major MS4 outfalls with non-storm water persistent flows that the Copermittee will monitor within its jurisdiction in each Watershed Management Area. For Responsible Copermittees identified by a TMDL in Attachment E to this Order, if the 5 chosen outfall locations are not sufficient to determine compliance with the TMDL(s), then each Responsible Copermittee

must identify additional MS4 outfall monitoring locations within its jurisdiction sufficient to address compliance with the TMDL(s). If a Copermittee has less than 5 major outfalls within a Watershed Management Area, then the Copermittee must monitor all of its major MS4 outfalls with persistent flows within each Watershed Management Area. The location of the highest priority non-storm water persistent flow MS4 outfall monitoring stations must be identified on the map required pursuant to Provision E.2.b.(1). The map must specify which MS4 outfalls are being monitored for compliance with a TMDL.

(ii) Each of the highest priority non-storm water persistent flow MS4 outfall monitoring stations identified pursuant to Provision D.2.b.(2)(b)(i) must be monitored under dry weather conditions at least semi-annually until one of the following occurs:

[a] The non-storm water discharges have been effectively eliminated (i.e. no flowing, pooled, or ponded water) for three consecutive dry weather monitoring events; or

[b] The source(s) of the persistent flows has been identified as a category of non-storm water discharges that does not require an NPDES permit and does not have to be addressed as an illicit discharge because it was not identified as a source of pollutants (i.e. constituents in non-storm water discharge do not exceed NALs), and the persistent flow can be re-prioritized to a lower priority; or

[c] The constituents in the persistent flow non-storm water discharge do not exceed NALs, and the persistent flow can be re-prioritized to a lower priority; or

[d] The source(s) of the persistent flows has been identified as a non-storm water discharge authorized by a separate NPDES permit.

(iii) Where the criteria under Provision D.2.b.(2)(b)(ii) are not met, but the threat to water quality has been reduced by the Copermittee, the highest priority persistent flow MS4 outfall monitoring stations may be reprioritized accordingly for continued dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1).

(iv) Each Copermittee must document removal or re-prioritization of the highest priority persistent flow MS4 outfall monitoring stations identified under Provision D.2.b.(2)(a) in the Water Quality Improvement Plan Annual Report. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized major MS4 outfall in the Watershed Management Area within its jurisdiction, unless there are no remaining qualifying major MS4 outfalls within the Copermittee's jurisdiction in the Watershed Management Area.

(c) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Observations

During each semi-annual monitoring event, each Copermittee must record field observations consistent with Table D-5 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(d) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Monitoring

During each semi-annual monitoring event, if conditions allow the collection of the data, each Copermittee must monitor and record the parameters in Table D-2 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(e) Non-Storm Water Persistent Flow MS4 Outfall Discharge Analytical Monitoring

During each semi-annual monitoring event in which measurable flow is present, each Copermittee must collect and analyze samples from each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Collect grab or composite samples to be analyzed at a qualified laboratory for the following constituents:

[a] Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,
[b] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,
[c] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,
[d] Applicable NAL constituents, and
[e] Constituents listed in Table D-7. The Copermittees may adjust the list of constituents for the Watershed Management Area if historical data or supporting information can be provided that demonstrates or justifies the analysis of a constituent is not necessary.

Table D-7. Analytical Monitoring Constituents for Persistent Flow MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Total Hardness • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Cadmium • Copper • Lead • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(iv) If the Copermittee identifies and eliminates the source of the persistent flow non-storm water discharge, analysis of the sample is not required.

c. WET WEATHER MS4 OUTFALL DISCHARGE MONITORING

The Copermittees must perform wet weather MS4 outfall monitoring to identify pollutants in storm water discharges from the MS4s, to guide pollutant source identification efforts, and to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order. The Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(1) Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees may adjust the wet weather MS4 outfall discharge monitoring locations in the Watershed Management Area, as needed, to identify pollutants in storm water discharges from MS4s, to guide pollutant source identification efforts, and to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of stations is at least equivalent to the number of stations required under Provision D.2.a.(3)(a). Additional outfall monitoring locations, above the minimum per jurisdiction, may be required to demonstrate compliance with the WQBELs associated with the applicable TMDLs in Attachment E.

(2) Wet Weather MS4 Outfall Discharge Monitoring Frequency

The Copermittees must monitor the wet weather MS4 outfall discharge monitoring stations in the Watershed Management Area at least once (1) per year. The Copermittees may need to increase the frequency of monitoring in order to identify pollutants in storm water discharges from the MS4s causing or contributing to the highest priority water quality conditions, to guide pollutant source identification efforts, or to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order.

(3) Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(4) Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(5) Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites collected over the length of the storm event or the first 24 hour period, whichever is shorter , composed of discrete samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

(iii) If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours.

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) The Copermittees may adjust the analytical monitoring required for the Watershed Management Area, if the Copermittees have historical data or supporting information that can demonstrate or provide justification that the analysis of a constituent is not necessary.

3. Special Studies

a. Within the term of this Order, the Copermittees must initiate the following special studies:

(1) At least two special studies in each Watershed Management Area to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that cause or contribute to highest priority water quality conditions identified in the Water Quality Improvement Plan.

(2) At least one special study for the San Diego Region to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that are impacting receiving waters on a regional basis in the San Diego Region.

(3) One of the two special studies in each Watershed Management Area required pursuant to Provision D.3.a.(1) may be replaced by a special study implemented pursuant to Provision D.3.a.(2).

b. The special studies must, at a minimum, be in conformance with the following criteria:

(1) The special studies must be related to the highest priority water quality conditions identified by the Copermittees in the Watershed Management Area and/or for the entire San Diego Region;

(2) The special studies developed pursuant to Provision D.3.a.(1) must:

(a) Be implemented within the applicable Watershed Management Area, and

(b) Require some form of participation by all the Copermittees within the Watershed Management Area;

(3) The special studies developed pursuant to Provision D.3.a.(2) must:

(a) Be implemented within the San Diego Region, and

(b) Require some form of participation by all Copermittees covered under the requirements of this Order.

(4) The Copermittees are encouraged to partner with environmental groups or third parties knowledgeable of watershed conditions to complete the required special studies.

c. Special studies developed to identify sources of pollutants and/or stressors should be pollutant and/or stressor specific and based on historical monitoring data and monitoring performed pursuant to Provisions D.1 and D.2. Development of source identification special studies should include the following:

(1) A compilation of known information on the specific pollutant and/or stressor, including data on potential sources and movement of the pollutant and/or stressor within the watershed. Data generated by the Copermittees and others, as well as information available from a literature research on the pollutant and/or stressor should be compiled and analyzed as appropriate.

(2) An identification of data gaps, based on the compiled information generated on the specific pollutant and/or stressor identified in Provision D.3.c.(1). Source identification special studies should be developed to fill identified data gaps.

(3) A monitoring plan that will collect and provide data the Copermittees can utilize to do the following:

(a) Quantify the relative loading or impact of a pollutant and/or stressor from a particular source or pollutant generating activity;

(b) Improve understanding of the fate of a pollutant and/or stressor in the environment;

(c) Develop an inventory of known and suspected sources of a pollutant and/or stressor in the Watershed Management Area; and/or

(d) Prioritize known and suspected sources of a pollutant and/or stressor based on relative magnitude in discharges, geographical distribution (i.e., regional or localized), frequency of occurrence in discharges, human health risk, and controllability.

d. Special studies initiated prior to the effective date of this Order that meet the requirements of Provision D.3.b and are implemented during the term of this Order as part of the Water Quality Improvement Plan may be utilized to fulfill the special study requirements of Provision D.3.a. Special studies completed before the effective date of this Order cannot be utilized to fulfill the special study requirements of Provision D.3.a.

e. The Copermittees must submit the monitoring plans for the special studies in the Water Quality Improvement Plans required pursuant to Provision F.1.

f. The Copermittees are encouraged to share the results of the special studies regionally among the Copermittees to provide information useful in improving and adapting the management of non-storm water and storm water runoff through the implementation of the Water Quality Improvement Plans.

4. Assessment Requirements

Each Copermittee must evaluate the data collected pursuant to Provisions D.1, D.2 and D.3, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E, to assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a. Assessments must be performed as described in the following provisions:

a. Receiving Waters Assessments

(1) The Copermittees must assess and report the conditions of the receiving waters in the Watershed Management Area as follows:

(a) Based on data collected pursuant to Provision D.1.a, the assessments under Provision D.4.a.(2) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(b) Based on the data collected pursuant to Provisions D.1.a-e, the assessments required under Provision D.4.a.(2) must be included in the Report of Waste Discharge required pursuant to Provision F.5.b.

(2) The Copermittees must assess the status and trends of receiving water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under dry weather and wet weather conditions. For each of the three types of receiving waters in each Watershed Management Area the Copermittees must:

(a) Determine whether or not the conditions of the receiving waters are meeting the numeric goals established pursuant to Provision B.3.a;

(b) Identify the most critical beneficial uses that must be protected to ensure overall health of the receiving water;

(c) Determine whether or not those critical beneficial uses are being protected;

(d) Identify short-term and/or long-term improvements or degradation of those critical beneficial uses;

(e) Determine whether or not the strategies established in the Water Quality Improvement Plan contribute towards progress in achieving the interim and final numeric goals of the Water Quality Improvement Plan; and

(f) Identify data gaps in the monitoring data necessary to assess Provisions D.4.a.(2)(a)-(e).

b. MS4 OUTFALL DISCHARGES ASSESSMENTS

(1) Non-Storm Water Discharges Reduction Assessments

(a) Each Copermittee must assess and report the progress of its illicit discharge detection and elimination program, required to be implemented pursuant to Provision E.2, toward effectively prohibiting non-storm water and illicit discharges into the MS4 within its jurisdiction as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(2), the assessments under Provision D.4.b.(1)(b) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(ii) Based on the data collected pursuant to Provisions D.2.b, the assessments required under Provision D.4.b.(1)(c) must be included in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

(iii) Based on the data collected pursuant to Provisions D.2.b, the assessment required under Provision D.4.b.(1)(c) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.a.(2), each Copermittee must assess and report the following:

(i) Identify the known and suspected controllable sources (e.g. facilities, areas, land uses, pollutant generating activities) of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area;

(ii) Identify sources of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area that have been reduced or eliminated; and

(iii) Identify modifications to the field screening monitoring locations and frequencies for the MS4 outfalls in its inventory necessary to identify and eliminate sources of persistent flow non-storm water discharges pursuant to Provision D.2.b.

(c) Based on the dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1), each Copermittee must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(1)(b);

(ii) Based on the data collected and applicable NALs in the Water Quality Improvement Plan, rank the MS4 outfalls in the Copermittee's jurisdiction according to potential threat to receiving water quality, and produce a prioritized list of major MS4 outfalls for follow-up action to update the Water Quality Improvement Plan, with the goal of eliminating persistent flow non-storm water discharges and/or pollutant loads in order of the ranked priority list through targeted programmatic actions and source investigations;

(iii) For the highest priority major MS4 outfalls with persistent flows that are in exceedance of NALs, identify the known and suspected sources within the Copermittee's jurisdiction in the Watershed Management Area that may cause or contribute to the NAL exceedances;

(iv) Each Copermittee must analyze the data collected pursuant to Provision D.2.b, and utilize a model or other method, to calculate or estimate the non-storm water volumes and pollutant loads collectively discharged from all the major MS4s outfalls in its jurisdiction identified as having persistent dry weather flows during the monitoring year. These calculations or estimates must be updated annually.

[a] Each Copermittee must calculate or estimate the annual non-storm water volumes and pollutant loads collectively discharged from the Copermittee's major MS4 outfalls to receiving waters within the Copermittee's jurisdiction, with an estimate of the percent contribution from each known source for each MS4 outfall;

[b] Each Copermittee must annually identify and quantify (i.e. volume and pollutant loads) sources of non-storm water not subject to the Copermittee's legal authority that are discharged from the Copermittee's major MS4 outfalls to downstream receiving waters.

(v) Each Copermittee must review the data collected pursuant to Provision D.2.b and findings from the assessments required pursuant to Provision D.4.b.(1)(c)(i)-(iv) at least once during the term of this Order to:

[a] Identify reductions and progress in achieving reductions in non-storm water and illicit discharges to the Copermittee's MS4 in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction, with an estimate, if possible, of the non-storm water volume and/or pollutant load reductions attributable to specific water quality strategies implemented by the Copermittee; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittee in the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction.

(vi) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(1)(c)(i)-(v).

(2) Storm Water Pollutant Discharges Reduction Assessments

(a) The Copermittees must assess and report the progress of the water quality improvement strategies, required to be implemented pursuant to Provisions B and E, toward reducing pollutants in storm water discharges from the MS4s within the Watershed Management Area as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(3), the assessments under Provision D.4.b.(2)(b) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(ii) Based on the data collected pursuant to Provisions D.2.c, the assessments required under Provision D.4.b.(2)(c) must be included in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

(iii) Based on the data collected pursuant to Provisions D.2.c, the assessment required under Provisions D.4.b.(2)(c)-(d) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.a.(3) the Copermittees must assess and report the following:

(i) The Copermittees must analyze the monitoring data collected pursuant to Provision D.2.a.(3), and utilize a watershed model or other method, to calculate or estimate the following for each monitoring year:

[a] The average storm water runoff coefficient for each land use type within the Watershed Management Area;
[b] The volume of storm water and pollutant loads discharged from each of the Copermittee's monitored MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch;
[c] The total flow volume and pollutant loadings discharged from the Copermittee's jurisdiction within the Watershed Management Area over the course of the wet season, extrapolated from the data produced from the monitored MS4 outfalls; and
[d] The percent contribution of storm water volumes and pollutant loads discharged from each land use type within each hydrologic subarea with a major MS4 outfall to receiving waters or within each major MS4 outfall to receiving waters in the Copermittee's jurisdiction within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch.

(ii) Identify modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify pollutants in storm water discharges from the MS4s in the Watershed Management Area pursuant to Provision D.2.c.(1).

(c) Based on the wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.c the Copermittees must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(2)(b);

(ii) Based on the data collected and applicable SALs in the Water Quality Improvement Plan, analyze and compare the monitoring data to the analyses and assumptions used to develop the Water Quality Improvement Plans, including strategies developed pursuant to Provision B.3, and evaluate whether those analyses and assumptions should be updated as a component of the adaptive management efforts pursuant to Provision B.5 for follow-up action to update the Water Quality Improvement Plan;

(iii) The Copermittees must review the data collected pursuant to Provision D.2.c and findings from the assessments required pursuant to Provisions D.4.b.(2)(c)(i)-(ii) at least once during the term of this Order to:

[a] Identify reductions or progress in achieving reductions in pollutant concentrations and/or pollutant loads from different land uses and/or drainage areas discharging from the Copermittees' MS4s in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters within the Watershed Management Area to the MEP, with an estimate, if possible, of the pollutant load reductions attributable to specific water quality strategies implemented by the Copermittees; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittees in the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters in the Watershed Management Area to the MEP.

(iv) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(iii).

(d) The Copermittees must evaluate all the data collected pursuant to Provision D.2.c, and incorporate new outfall monitoring data into time series plots for each long-term monitoring constituent for the Watershed Management Area, and perform statistical trends analysis on the cumulative long-term wet weather MS4 outfall discharge water quality data set.

c. Special Studies Assessments

The Copermittees must annually evaluate the results and findings from the special studies developed and implemented pursuant to Provision D.3, and assess their relevance to the Copermittees' efforts to characterize receiving water conditions, understand sources of pollutants and/or stressors, and control and reduce the discharges of pollutants from the MS4 outfalls to receiving waters in the Watershed Management Area. The Copermittees must report the results of the special studies assessments applicable to the Watershed Management Area, and identify any necessary modifications or updates to the Water Quality Improvement Plan based on the results in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

d. Integrated Assessment of Water Quality Improvement Plan

As part of the iterative approach and adaptive management process required for the Water Quality Improvement Plan pursuant to Provision B.5, the Copermittees in each Watershed Management Area must integrate the data collected pursuant to Provisions D.1-D.3, the findings from the assessments required pursuant to

Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to assess the effectiveness of, and identify necessary modifications to, the Water Quality Improvement Plan as follows:

(1) The Copermittees must re-evaluate the priority water quality conditions and numeric goals for the Watershed Management Area, as needed, during the term of this Order pursuant to Provision B.5.a. The re-evaluation and recommendations for modifications to the priority water quality conditions, and/or numeric goals and corresponding schedules may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The priority water quality conditions and numeric goals for the Watershed Management Area must be re-evaluated as follows:

(a) Re-evaluate the receiving water conditions in the Watershed Management Area in accordance with Provision B.2.a;

(b) Re-evaluate the impacts on receiving waters in the Watershed Management Area from MS4 discharges in accordance with Provision B.2.b;

(c) Re-evaluate the identification of MS4 sources of pollutants and/or stressors in accordance with Provision B.2.d;

(d) Identify beneficial uses of the receiving waters that are protected in accordance with Provision D.4.a;

(e) Evaluate the progress toward achieving the interim and final numeric goals for protecting impacted beneficial uses in the receiving waters.

(2) The Copermittees must re-evaluate the water quality improvement strategies for the Watershed Management Area during the term of this Order pursuant to Provision B.5.b. The re-evaluation and recommendations for modifications to the water quality improvement strategies and schedules may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The water quality improvement strategies for the Watershed Management Area must be re-evaluated as follows:

(a) Identify the non-storm water and storm water pollutant loads from the Copermittees' MS4 outfalls in the Watershed Management Area, calculated or estimated pursuant to Provisions D.4.b;

(b) Identify the non-storm water and storm water pollutant load reductions, or other improvements to receiving water or water quality conditions, that are necessary to attain the interim and final numeric goals identified in the Water Quality Improvement Plan for protecting beneficial uses in the receiving waters;

(c) Identify the non-storm water and storm water pollutant load reductions, or other improvements to the quality of MS4 discharges, that are necessary for the Copermittees to demonstrate that non-storm water and storm water discharges from their MS4s are not causing or contributing to exceedances of receiving water limitations;

(d) Evaluate the progress of the water quality improvement strategies toward achieving the interim and final numeric goals identified in the Water Quality Improvement Plan for protecting beneficial uses in the receiving waters.

(3) The Copermittees must re-evaluate and adapt the water quality monitoring and assessment program for the Watershed Management Area when new information becomes available to improve the monitoring and assessment program pursuant to Provision B.5.c. The re-evaluation and recommendations for modifications to the monitoring and assessment program may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. Modifications to the water quality monitoring and assessment program must be consistent with the requirements of Provision D.1-D.3. The re-evaluation of the water quality monitoring and assessment program for the Watershed Management Area must consider the data gaps identified by the assessments required pursuant to Provisions D.4.a-b, and results of the special studies implemented pursuant to Provision D.4.c.

5. Monitoring Provisions

Each Copermittee must comply with all the monitoring, reporting, and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

E. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS

The purpose of this provision is for each Copermittee to implement a program to control the contribution of pollutants to and the discharges from the MS4 within its jurisdiction. The goal of the jurisdictional runoff management programs is to implement strategies that effectively prohibit non-storm water discharges to the MS4 and reduce the discharge of pollutants in storm water to the MEP. This goal will be accomplished through implementing the jurisdictional runoff management programs in accordance with the strategies identified in the Water Quality Improvement Plans.

Each Copermittee must update its jurisdictional runoff management program document, in accordance with Provision F.2.a, to incorporate all the requirements of Provision E. Until the Copermittee has updated its jurisdictional runoff management program document with the requirements of Provision E, the Copermittee must continue implementing its current jurisdictional runoff management program.

1. Legal Authority Establishment and Enforcement

a. Each Copermittee must establish, maintain, and enforce adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 through statute, ordinance, permit, contract, order, or similar means. This legal authority must, at a minimum, authorize the Copermittee to:

(1) Prohibit and eliminate all illicit discharges and illicit connections to its MS4;

(2) Control the contribution of pollutants in discharges of runoff associated with industrial and construction activity to its MS4 and control the quality of runoff from industrial and construction sites, including industrial and construction sites which have coverage under the statewide General Permit for Discharges of Storm Water Associated with Industrial Activities (Industrial General Permit) or General Permit for Discharges of Storm Water Associated with Construction Activities (Construction General Permit), as well as to those sites which do not;

(3) Control the discharge of spills, dumping, or disposal of materials other than storm water into its MS4;

(4) Control through interagency agreements among Copermittees the contribution of pollutants from one portion of the MS4 to another portion of the MS4;

(5) Control, by coordinating and cooperating with other owners of the MS4 such as Caltrans, the U.S. federal government, or sovereign Native American Tribes through interagency agreements, where possible, the contribution of pollutants from their portion of the MS4 to the portion of the MS4 within the Copermittee's jurisdiction;

(6) Require compliance with conditions in its statutes, ordinances, permits, contracts, orders, or similar means to hold dischargers to its MS4 accountable for their contributions of pollutants and flows;

(7) Require the use of BMPs to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(8) Require documentation on the effectiveness of BMPs implemented to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(9) Utilize enforcement mechanisms to require compliance with its statutes, ordinances, permits, contracts, orders, or similar means; and

(10) Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with its statutes, ordinances, permits, contracts, orders, or similar means and with the requirements of this Order, including the prohibition of illicit discharges and connections to its MS4; the Copermittee must also have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from industrial facilities, including construction sites, discharging into its MS4.

b. With the first Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3), each Copermittee must submit a statement certified by its Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative that the Copermittee has taken the necessary steps to obtain and maintain full legal authority within its jurisdiction to implement and enforce each of the requirements contained in this Order.

2. Illicit Discharge Detection and Elimination

Each Copermittee must implement a program to actively detect and eliminate illicit discharges and improper disposal into the MS4, or otherwise require the discharger to apply for and obtain a separate NPDES permit. The illicit discharge detection and elimination program must be implemented in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include, at a minimum, the following requirements:

a. NON-STORM WATER DISCHARGES

Each Copermittee must address all non-storm water discharges as illicit discharges unless a non-storm water discharge is either identified as a discharge authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to the following requirements:

(1) Discharges of non-storm water to the MS4 from the following categories must be addressed as illicit discharges unless the discharge has coverage or meets the exception criteria under NPDES Permit No. CAG919003~~1 (Order No. R9-2007-0034, or subsequent order) for discharges to San Diego Bay, or NPDES Permit No. CAG919002~~ (Order No. R9-2015-0013 ~~2008-0002~~, ~~or subsequent order~~ as it may be amended or reissued) for discharges to surface waters within the San Diego Region ~~other than San Diego Bay~~:

(1) Uncontaminated pumped ground water;

(2) Discharges from foundation drains;[23]

(3) Water from crawl space pumps; and

(4) Water from footing drains.[20]

(2) Discharges of non-storm water from water line flushing and water main breaks to the MS4 must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG679001 (Order No. R9-2010-0003, ~~or subsequent order~~ as it may be amended or reissued) or NPDES General Permit No. CAG140001 (Order 2014-0194-DWQ, as it may be amended or reissued). This category includes water line flushing and water main break discharges from water purveyors issued a water supply permit by the California Department of Public Health or federal military installations. Discharges from recycled or reclaimed water lines to the MS4 must be addressed as illicit discharges, unless the discharges have coverage under a separate NPDES permit.

(3) Discharges of non-storm water to the MS4 from the following categories must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a source of pollutants to receiving waters:

(a) Diverted stream flows;

(b) Rising ground waters;

(c) Uncontaminated ground water infiltration to MS4s;

(d) Springs;

(e) Flows from riparian habitats and wetlands;

[23] Provision E.2.a.(1) only applies to this category of non-storm water if the system is designed to be located at or below the groundwater table to actively or passively extract groundwater during any part of the year.

(f) Discharges from potable water sources;

(g) Discharges from foundation drains;[24] and

(h) Discharges from footing drains.[21]

(4) Discharges of non-storm water to the MS4 from the following categories must be controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means. Discharges of non-storm water to the MS4 from the following categories not controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means must be addressed by the Copermittee as illicit discharges.

(a) Air conditioning condensation

The discharge of air conditioning condensation should be directed to landscaped areas or other pervious surfaces, or to the sanitary sewer, where feasible.

(b) Individual residential vehicle washing

(i) The discharge of wash water should be directed to landscaped areas or other pervious surfaces where feasible; and

(ii) The minimization of water, washing detergent and other vehicle wash products used for residential vehicle washing, and the implementation of other practices or behaviors that will prevent the discharge of pollutants associated with individual residential vehicle washing from entering the MS4 must be encouraged.

(c) Dechlorinated swimming pool discharges

(i) Residual chlorine, algaecide, filter backwash, or other pollutants from swimming pools must be eliminated prior to discharging to the MS4; and

(ii) The discharge of saline swimming pool water must be directed to the sanitary sewer, landscaped areas, or other pervious surfaces that can accommodate the volume of water, unless the saline swimming pool water can be discharged via a pipe or concrete channel directly to a naturally saline water body (e.g. Pacific Ocean).

(5) Firefighting discharges to the MS4 must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board

[24] Provision E.2.a.(3) only applies to this category of non-storm water discharge if the system is designed to be located above the groundwater table at all times of the year, and the system is only expected to discharge non-storm water under unusual circumstances.

identifies the discharge as a significant source of pollutants to receiving waters. Firefighting discharges to the MS4 not identified as a significant source of pollutants to receiving waters, must be addressed, at a minimum, as follows:

(a) Non-emergency firefighting discharges

(i) Building fire suppression system maintenance discharges (e.g. sprinkler line flushing) to the MS4 must be addressed as illicit discharges unless BMPs are implemented to prevent pollutants associated with such discharges to the MS4.

(ii) Non-emergency firefighting discharges (i.e., discharges from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems) must be addressed by a program, to be developed and implemented by the Copermittee, to reduce or eliminate pollutants in such discharges from entering the MS4.

(b) Emergency firefighting discharges

Each Copermittee should develop and encourage implementation of BMPs to reduce or eliminate pollutants in emergency firefighting discharges to the MS4s and receiving waters within its jurisdiction. During emergency situations, priority of efforts should be directed toward life, property, and the environment (in descending order). BMPs should not interfere with immediate emergency response operations or impact public health and safety.

(6) If the Copermittee or San Diego Water Board identifies any category of non-storm water discharges listed under Provisions E.2.a.(1)-(4) as a source of pollutants to receiving waters, the category must be prohibited through ordinance, order, or similar means and addressed as an illicit discharge. Alternatively, the Copermittee may propose controls to be implemented for the category of non-storm water discharges as part of the Water Quality Improvement Plan instead of prohibiting the category of non-storm water discharges, and implement the controls if accepted by the San Diego Water Board as part of the Water Quality Improvement Plan.

(7) Each Copermittee must, where feasible and priorities and resources allow, reduce or eliminate non-storm water discharges listed under Provisions E.2.a.(1)-(4) into its MS4, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit.

b. PREVENT AND DETECT ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to prevent and detect illicit discharges to the MS4:

(1) Each Copermittee must maintain an updated map of its entire MS4 and the corresponding drainage areas. The accuracy of the MS4 map must be confirmed during the field screening required pursuant to Provision E.2.c. The MS4 map must be included as part of the jurisdictional runoff management program document. Any geographic information system (GIS) layers or files used by the Copermittee to maintain the MS4 map must be made available to the San Diego Water Board upon request. The MS4 map must identify the following:

(a) All segments of the MS4 owned, operated, and maintained by the Copermittee;

(b) All known locations of inlets that discharge and/or collect runoff into the Copermittee's MS4;

(c) All known locations of connections with other MS4s not owned or operated by the Copermittee (e.g. Caltrans MS4s);

(d) All known locations of MS4 outfalls and private outfalls that discharge runoff collected from areas within the Copermittee's jurisdiction;

(e) All segments of receiving waters within the Copermittee's jurisdiction that receive and convey runoff discharged from the Copermittee's MS4 outfalls;

(f) Locations of the MS4 outfalls, identified pursuant to Provision D.2.a.(1), within its jurisdiction; and

(g) Locations of the non-storm water persistent flow MS4 outfall discharge monitoring stations, identified pursuant to Provision D.2.b.(2), within its jurisdiction.

(2) Each Copermittee must use Copermittee personnel and contractors to assist in identifying and reporting illicit discharges and connections during their daily employment activities.

(3) Each Copermittee must promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges to or from the MS4, including the following methods for public reporting:

(a) Operate a public hotline, which can be Copermittee-specific or shared by the Copermittees, and must be capable of receiving reports in both English and Spanish 24 hours per day and seven days per week; and

(b) Designate an e-mail address for receiving electronic reports from the public, which can be Copermittee-specific or shared by the Copermittees, and must be prominently displayed on the Copermittee's webpage and the Regional Clearinghouse required pursuant to Provision F.4.

(4) Each Copermittee must implement practices and procedures (including a notification mechanism) to prevent, respond to, contain, and clean up any spills that may discharge into the MS4 within its jurisdiction from any source. The Copermittee must coordinate, to the extent possible, with spill response teams to prevent entry of spills into the MS4, and prevent contamination of surface water, ground water, and soil. The Copermittee must coordinate spill prevention, containment, and response activities throughout all appropriate Copermittee departments, programs, and agencies.

(5) Each Copermittee must implement practices and procedures to prevent and limit infiltration of seepage from sanitary sewers (including private laterals and failing septic systems) to the MS4.

(6) Each Copermittee must coordinate, when necessary, with upstream Copermittees and/or entities to prevent illicit discharges from upstream sources into the MS4 within its jurisdiction.

c. Field Screening

Each Copermittee must conduct field screening (i.e. visual observations, field testing, and/or analytical testing) of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4 in accordance with the dry weather MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

d. Investigate and Eliminate Illicit Discharges And Connections

Each Copermittee must include the following measures within its program to investigate and eliminate illicit discharges to the MS4:

(1) Each Copermittee must prioritize and determine when follow-up investigations will be performed in response to visual observations and/or water quality monitoring data collected during an investigation of a detected non-storm water or illicit discharge to or from the MS4. The criteria for prioritizing investigations must consider the following:

(a) Pollutants identified as causing or contributing to the highest water quality priorities identified in the Water Quality Improvement Plan;

(b) Pollutants identified as causing or contributing, or threatening to cause or contribute to impairments in water bodies on the 303(d) List and/or in environmentally sensitive areas (ESAs), located within its jurisdiction;

(c) Pollutants identified from sources or land uses known to exist within the area, drainage basin, or watershed that discharges to the portion of the MS4 within its jurisdiction included in the investigation;

(d) Pollutants identified as causing or contributing to an exceedance of a NAL in the Water Quality Improvement Plan; and

(e) Pollutants identified as a threat to human health or the environment.

(2) Each Copermittee must implement procedures to investigate and inspect portions of its MS4 that, based on reports or notifications, field screening, or other appropriate information, indicate a reasonable potential of receiving, containing, or discharging pollutants due to illicit discharges, illicit connections, or other sources of non-storm water. The procedures must include the following:

(a) Each Copermittee must develop criteria to:

(i) Assess the validity of each report or notification received; and

(ii) Prioritize the response to each report or notification received.

(b) Each Copermittee must prioritize and respond to each valid report or notification (e.g., public reports, staff or contractor reports and notifications, etc.) of an incident in a timely manner.

(c) In accordance with the requirements of Provision E.2.d.(1), each Copermittee must investigate and seek to identify the source(s) of discharges of non-storm water where flows are observed in and from the MS4 during the field screening required pursuant to Provision D.2.b.(1) as follows:

(i) Obvious illicit discharges must be immediately investigated to identify the source(s) of non-storm water discharges;

(ii) The investigation must include field investigations to identify sources or potential sources for the discharge, unless the source or potential source has already been identified during previous investigations; and

(iii) The investigation may include follow-up field investigations and/or reviewing Copermittee inventories and other land use data to identify potential sources of the discharge.

(d) Each Copermittee must maintain records and a database of the following information:

(i) Location of incident, including hydrologic subarea, portion of MS4 receiving the non-storm water or illicit discharge, and point of discharge or potential discharge from MS4 to receiving water;

(ii) Source of information initiating the investigation (e.g., public reports, staff or contractor reports and notifications, field screening, etc.);

(iii) Date the information used to initiate the investigation was received;

(iv) Date the investigation was initiated;

(v) Dates of follow-up investigations;

(vi) Identified or suspected source of the illicit discharge or connection, if determined;

(vii) Known or suspected related incidents, if any;

(viii) Result of the investigation; and

(ix) If a source cannot be identified and the investigation is not continued, document the response pursuant to the requirements of Provision E.2.d.(4).

(e) Each Copermittee must maintain records and, in accordance with the priorities of the Water Quality Improvement Plan, seek to identify the source(s) of non-storm water discharges from the MS4 where there is evidence of non-storm water having been discharged into or from the MS4 (e.g., pooled water), in accordance with MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

(3) Each Copermittee must initiate the implementation of procedures, in a timely manner, to eliminate all detected and identified illicit discharges and connections within its jurisdiction. The procedures must include the following responses:

(a) Each Copermittee must enforce its legal authority, as required under Provision E.1, to eliminate illicit discharges and connections to the MS4.

(b) If the Copermittee identifies the source as a controllable source of non-storm water or illicit discharge or connection, the Copermittee must implement its Enforcement Response Plan pursuant to Provision E.6 and enforce its legal authority to prohibit and eliminate illicit discharges and connections to its MS4.

(c) If the Copermittee identifies the source of the discharge as a category of non-storm water discharges in Provision E.2.a, and the discharge is in exceedance of NALs in the Water Quality Improvement Plan, then the Copermittee must determine if: (1) this is an isolated incident or set of

circumstances that will be addressed through its Enforcement Response Plan pursuant to Provision E.6, or (2) the category of discharge must be addressed through the prohibition of that category of discharge as an illicit discharge pursuant to Provision E.2.a.(6).

(d) If the Copermittee suspects the source of the non-storm water discharge as natural in origin (i.e. non-anthropogenically influenced) and in conveyance into the MS4, then the Copermittee must document and provide the data and evidence necessary to demonstrate to the San Diego Water Board that it is natural in origin and does not require further investigation.

(e) If the Copermittee is unable to identify and document the source of a recurring non-storm water discharge to or from the MS4, then the Copermittee must address the discharge as an illicit discharge and update its jurisdictional runoff management program to address the common and suspected sources of the non-storm water discharge within its jurisdiction in accordance with the Copermittee's priorities.

(4) Each Copermittee must submit a summary of the non-storm water discharges and illicit discharges and connections investigated and eliminated within its jurisdiction with each Water Quality Improvement Plan Annual Report required under Provision F.3.b.(3) of this Order.

3. Development Planning

Each Copermittee must use their land use and planning authorities to implement a development planning program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. BMP Requirements for All Development Projects

Each Copermittee must prescribe the following BMP requirements during the planning process (i.e. prior to project approval and issuance of local permits) for all development projects (regardless of project type or size), where local permits are issued, including unpaved roads and flood management projects:

(1) General Requirements

(a) Onsite BMPs must be located so as to remove pollutants from runoff prior to its discharge to any receiving waters, and as close to the source as possible;

(b) Structural BMPs must not be constructed within waters of the U.S.

(c) Onsite BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors (e.g. mosquitos, rodents, or flies).

(2) Source Control BMP Requirements

The following source control BMPs must be implemented at all development projects where applicable and feasible:

(a) Prevention of illicit discharges into the MS4;

(b) Storm drain system stenciling or signage;

(c) Protect outdoor material storage areas from rainfall, run-on, runoff, and wind dispersal;

(d) Protect materials stored in outdoor work areas from rainfall, run-on, runoff, and wind dispersal;

(e) Protect trash storage areas from rainfall, run-on, runoff, and wind dispersal; and

(f) Any additional BMPs determined to be necessary by the Copermittee to minimize pollutant generation at each project.

(3) Low Impact Development (LID) BMP Requirements

The following LID BMPs must be implemented at all development projects where applicable and feasible:

(a) Maintenance or restoration of natural storage reservoirs and drainage corridors (including topographic depressions, areas of permeable soils, natural swales, and ephemeral and intermittent streams);[25]

(b) Buffer zones for natural water bodies (where buffer zones are technically infeasible, require project applicant to include other buffers such as trees, access restrictions, etc.);

(c) Conservation of natural areas within the project footprint including existing trees, other vegetation, and soils;

(d) Construction of streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided public safety is not compromised;

[25] Development projects proposing to dredge or fill materials in waters of the U.S. must obtain a CWA Section 401 Water Quality Certification. Projects proposing to dredge or fill waters of the state must obtain waste discharge requirements.

(e) Minimization of the impervious footprint of the project;

(f) Minimization of soil compaction to landscaped areas;

(g) Disconnection of impervious surfaces through distributed pervious areas;

(h) Landscaped or other pervious areas designed and constructed to effectively receive and infiltrate, retain and/or treat runoff from impervious areas, prior to discharging to the MS4;

(i) Small collection strategies located at, or as close as possible to, the source (i.e. the point where storm water initially meets the ground) to minimize the transport of runoff and pollutants to the MS4 and receiving waters;

(j) Use of permeable materials for projects with low traffic areas and appropriate soil conditions;

(k) Landscaping with native or drought tolerant species; and

(l) Harvesting and using precipitation.

b. PRIORITY DEVELOPMENT PROJECTS

Priority Development Projects are land development projects that fall under the planning and building authority of the Copermittee for which the Copermittee must impose specific requirements, in addition to those described in Provision E.3.a, including the implementation of structural BMPs to meet the performance requirements described in Provision E.3.c.

(1) Definition of Priority Development Project

Priority Development Projects include the following:

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(b) Redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site on an existing site of 10,000 square feet or more of impervious surfaces). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(c) New and redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site), and support one or more of the following uses:

(i) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812).

(ii) Hillside development projects. This category includes development on any natural slope that is twenty-five percent or greater.

(iii) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce.

(iv) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

(d) New or redevelopment projects that create and/or replace 2,500 square feet or more of impervious surface (collectively over the entire project site), and discharging directly to an Environmentally Sensitive Area (ESA). "Discharging directly to" includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands).

(e) New development projects, or redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface, that support one or more of the following uses:

(i) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

(ii) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

(f) New or redevelopment projects that result in the disturbance of one or more acres of land and are expected to generate pollutants post construction.

(2) Special Considerations for Redevelopment Projects

The structural BMP performance requirements of Provision E.3.c are applicable to redevelopment Priority Development Projects, as defined in E.3.b.(1), as follows:

(a) Where redevelopment results in the creation or replacement of impervious surface in an amount of less than fifty percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provision E.3.c apply only to the creation or replacement of impervious surface, and not the entire development; or

(b) Where redevelopment results in the creation or replacement of impervious surface in an amount of more than fifty percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provision E.3.c apply to the entire development.

(3) Priority Development Project Exemptions

Each Copermittee has the discretion to exempt the following projects from being defined as Priority Development Projects:

(a) New or retrofit paved sidewalks, bicycle lanes, or trails that meet the following criteria:

(i) Designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas; OR

(ii) Designed and constructed to be hydraulically disconnected from paved streets or roads; OR

(iii) Designed and constructed with permeable pavements or surfaces in accordance with USEPA Green Streets guidance.[26]

(b) Retrofitting or redevelopment of existing paved alleys, streets or roads that are designed and constructed in accordance with the USEPA Green Streets guidance.[27]

c. Priority Development Project Structural BMP Performance Requirements

In addition to the BMP requirements listed for all development projects under Provision E.3.a, Priority Development Projects must also implement structural BMPs that conform to performance requirements described below.

[26] See "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).
[27] Ibid.

(1) Storm Water Pollutant Control BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite structural BMPs to control pollutants in storm water that may be discharged from a project as follows:

(a) Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite the pollutants contained in the volume of storm water runoff produced from a 24-hour 85th percentile storm event (design capture volume);[28]

(i) If a Copermittee determines that implementing BMPs to retain the full design capture volume onsite for a Priority Development Project is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize biofiltration BMPs. Biofiltration BMPs must be designed to have an appropriate hydraulic loading rate to maximize storm water retention and pollutant removal, as well as to prevent erosion, scour, and channeling within the BMP,[29] and must be sized to:

[a] Treat 1.5 times the design capture volume not reliably retained onsite, OR

[b] Treat the design capture volume not reliably retained onsite with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite.

(ii) If a Copermittee determines that biofiltration is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize flow-thru treatment control BMPs to treat runoff leaving the site, AND mitigate for the design capture volume not reliably retained onsite pursuant to Provision E.3.c.(1)(b). Flow thru treatment control BMPs must be sized and designed to:

[28] This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals.

[29] As part of the Copermittee's update to its BMP Design Manual, pursuant to Provision E.3.d, the Copermittee must provide guidance for hydraulic loading rates and other biofiltration design criteria necessary to maximize storm water retention and pollutant removal.

[a] Remove pollutants from storm water to the MEP;

[b] Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;

[c] Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Flow-thru treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of flow-thru treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

(b) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1)(a). The Priority Development Project must mitigate for the portion of the pollutant load in the design capture volume not retained onsite if Provision E.3.c.(3) is utilized. If a Priority Development Project is allowed to utilize alternative compliance, flow-thru treatment control BMPs must be implemented to treat the portion of the design capture volume that is not reliably retained onsite. Flow-thru treatment control BMPs must be sized and designed in accordance with Provisions E.3.c.(1)(a)(ii)[a]-[c].

(2) Hydromodification Management BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite BMPs to manage hydromodification that may be caused by storm water runoff discharged from a project as follows:

(a) Post-project runoff conditions (flow rates and durations) must not exceed pre-development runoff conditions by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat downstream of Priority Development Projects).

(i) In evaluating the range of flows that results in increased potential for erosion of natural (non-hardened) channels, the lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks.

(ii) The Copermittees may use monitoring results collected pursuant to Provision D.1.a.(2) to re-define the range of flows resulting in

increased potential for erosion, or degraded instream habitat conditions, as warranted by the data.

(b) Each Priority Development Project must avoid critical sediment yield areas known to the Copermittee or identified by the optional Watershed Management Area Analysis pursuant to Provision B.3.b.(4), or implement measures that allow critical coarse sediment to be discharged to receiving waters, such that there is no net impact to the receiving water.

(c) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the performance requirements of Provision E.3.c.(2)(a). The Priority Development Project must mitigate for the post-project runoff conditions not fully managed onsite if Provision E.3.c.(3) is utilized.

(d) Exemptions

Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provisions E.3.c.(2) where the project discharges storm water runoff to:

(i) Existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;

(ii) Conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; or

(iii) An area identified by the Copermittees as appropriate for an exemption by the optional Watershed Management Area Analysis incorporated into the Water Quality Improvement Plan pursuant to Provision B.3.b.(4).

(e) Interim Timeframe Exemptions

Until the Copermittees have updated their BMP Design Manual in accordance with Provision F.2.b with the requirements of Provision E, the Copermittees have the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provision E.3.c.(2) where the project discharges storm water runoff directly to:

(i) An engineered channel conveyance system with a capacity to convey peak flows generated by the 10-year storm event all the way from the

point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; and

(ii) Large river reaches with a drainage area larger than 100 square miles and a 100-year flow capacity in excess of 20,000 cubic feet per second, provided that properly sized energy dissipation is included at all Priority Development Project discharge points.

(3) Alternative Compliance Program to Onsite Structural BMP Implementation

At the discretion of each Copermittee, Priority Development Projects may be allowed to participate in an alternative compliance program in lieu of implementing the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a), provided that the Water Quality Improvement Plan includes the optional Watershed Management Area Analysis described in Provision B.3.b.(4), and Water Quality Equivalency calculations have been accepted by the San Diego Water Board's Executive Officer pursuant to Provision E.3.c.(3)(a). The alternative compliance program is available to a Priority Development Project only if the Priority Development Project applicant enters into a voluntary agreement with the Copermittee authorizing this arrangement. In addition to the voluntary agreement, relief from implementing structural BMPs onsite may be authorized by the Copermittee under the following conditions:

(a) Water Quality Equivalency

Copermittees must submit Water Quality Equivalency calculations for acceptance by the San Diego Water Board's Executive Officer prior to administering an alternative compliance program in order to establish a regional and technical basis for determining the water quality benefits associated with alternative compliance projects. Accepted Water Quality Equivalency calculations must be incorporated as part of any Copermittee's alternative compliance program necessary for evaluating Watershed Management Area Analysis candidate projects, project applicant-proposed alternative compliance projects, alternative compliance in lieu fee structures, and alternative compliance water quality credit systems as described in Provisions E.3.c.(3)(b)-(e).

(b) Watershed Management Area Analysis Candidate Projects

The Priority Development Project applicant agrees to fund, contribute funds to, or implement a candidate project identified by the Copermittees in the Watershed Management Area Analysis included in the Water Quality Improvement Plan, pursuant to Provisions B.3.b.(4) subject to the following conditions:

(i) The Copermittee must determine that implementation of the candidate project will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a) onsite;

(ii) If the Priority Development Project applicant chooses to fully or partially fund a candidate project, then the in-lieu fee structure described in Provision E.3.c.(3)(c) must be followed;

(iii) If the Priority Development Project applicant chooses to fully or partially fund a candidate project, then the Copermittee must ensure that the funds to be obtained from the Priority Development Project applicant are sufficient to mitigate for impacts caused by not fully implementing structural BMPs onsite, pursuant to the performance requirements described in Provisions E.3.c.(1) and E.3.c.(2)(a);

(iv) If the Priority Development Project applicant chooses to implement a candidate project, then the Copermittee must ensure that pollutant control and/or hydromodification management within the candidate project are sufficient to mitigate for impacts caused by not implementing structural BMPs fully onsite, pursuant to the performance requirements described in Provisions E.3.c.(1) and E.3.c.(2)(a);

(v) The voluntary agreement to fund, partially fund, or implement a candidate project must include reliable sources of funding for operation and maintenance of the candidate project;

(vi) Design of the candidate project must be conducted under an appropriately qualified engineer, geologist, architect, landscape architect, or other professional, licenses where applicable, and competent and proficient in the fields pertinent to the candidate project design;

(vii) The candidate project must be constructed as soon as possible, but no later than 4 years after the certificate of occupancy is granted for the first Priority Development Project that contributed funds toward the construction of the candidate project, unless a longer period of time is authorized by the San Diego Water Board Executive Officer; and

(viii) If the candidate project is constructed after the Priority Development Project is constructed, the Copermittee must require temporal mitigation for pollutant loads and altered flows that are discharged from the Priority Development Project.

(c) Project Applicant Proposed Alternative Compliance Projects

The Copermittee may allow a Priority Development Project applicant to propose and fund, contribute funds to, or implement an alternative compliance project not identified by the Watershed Management Area Analysis included in the Water Quality Improvement Plan pursuant to Provisions B.3.b.(4). This option is allowed provided the Copermittee determines that implementation of the alternative compliance project will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a) onsite, and is subject to the requirements described in Provisions E.3.c.(3)(a)(ii)-(viii).

(d) Alternative Compliance In-Lieu Fee Structure

If a Copermittee chooses to allow a Priority Development Project applicant to fund, or partially fund a candidate project or an alternative compliance project, then the Copermittee must develop and implement an in-lieu fee structure. This may be developed individually or with other Copermittees and/or entities, as a means for designing, developing, constructing, operating and maintaining offsite alternative compliance projects. The in-lieu fee must be transferred to the Copermittee (for public projects) or an escrow account (for private projects) prior to the construction of the Priority Development Project.

(e) Alternative Compliance Water Quality Credit System Option

The Copermittee may develop and implement an alternative compliance water quality credit system option, individually or with other Copermittees and/or entities, provided that such a credit system clearly exhibits that it will not allow discharges from Priority Development Projects to cause or contribute to a net impact over and above the impact caused by projects meeting the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a). Any credit system that a Copermittee chooses to implement must be submitted to the San Diego Water Board Executive Officer for review and acceptance as part of the Water Quality Improvement Plan.

(4) Long-Term Structural BMP Maintenance

Each Copermittee must require the project applicant to submit proof of the mechanism under which ongoing long-term maintenance of all structural BMPs will be conducted.

(5) Infiltration and Groundwater Protection

(a) Structural BMPs designed to primarily function as large, centralized infiltration devices (such as large infiltration trenches and infiltration basins) must not cause or contribute to an exceedance of an applicable groundwater quality objective. At a minimum, such infiltration BMPs must be in conformance with the design criteria listed below, unless the development project applicant demonstrates to the Copermittee that one or more of the specific design criteria listed below are not necessary to protect groundwater quality. The design criteria listed below do not apply to small infiltration systems dispersed throughout a development project.

(i) Runoff must undergo pretreatment such as sedimentation or filtration prior to infiltration;

(ii) Pollution prevention and source control BMPs must be implemented at a level appropriate to protect groundwater quality at sites where infiltration BMPs are to be used;

(iii) Infiltration BMPs must be adequately maintained to remove pollutants in storm water to the MEP;

(iv) The vertical distance from the base of any infiltration BMP to the seasonal high groundwater mark must be at least 10 feet. Where groundwater basins do not support beneficial uses, this vertical distance criteria may be reduced, provided groundwater quality is maintained;

(v) The soil through which infiltration is to occur must have physical and chemical characteristics (e.g., appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses;

(vi) Infiltration BMPs must not be used for areas of industrial or light industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee, unless source control BMPs to prevent exposure of high threat activities are implemented, or runoff from such activities is first treated or filtered to remove pollutants prior to infiltration; and

(vii) Infiltration BMPs must be located a minimum of 100 feet horizontally from any water supply wells.

(b) The Copermittee may develop, individually or with other Copermittees, alternative mandatory design criteria to that listed above for infiltration BMPs which are designed to primarily function as centralized infiltration devices. Before implementing the alternative design criteria in the development planning process the Copermitee(s) must:

(i) Notify the San Diego Water Board of the intent to implement the alternative design criteria submitted; and

(ii) Comply with any conditions set by the San Diego Water Board.

d. BMP DESIGN MANUAL UPDATE

Each Copermittee must update its BMP Design Manual[30] pursuant to Provision F.2.b. Until the Copermittee has updated its BMP Design Manual pursuant to Provision F.2.b.(1) ~~with the requirements of Provisions E.3.a-c~~, the Copermittee must continue implementing its current BMP Design Manual. ~~Unless directed otherwise by the San Diego Water Board, t~~The Copermittee must implement the updated BMP Design Manual within 180 days following completion of ~~completing~~ the update pursuant to Provision F.2.b.(1), unless directed otherwise by the San Diego Water Board Executive Officer. The update of the BMP Design Manual required pursuant to Provision F.2.b.(1) must include the following:

(1) Updated procedures to determine the nature and extent of storm water requirements applicable to a potential development or redevelopment projects. These procedures must inform project applicants of the storm water management requirements applicable to their project including, but not limited to, general requirements for all development projects, structural BMP design procedures and requirements, hydromodification management requirements, requirements specific to phased projects, and procedures specific to private developments and public improvement projects;

(2) Updated procedures to identify pollutants and conditions of concern for selecting the most appropriate structural BMPs that consider, at a minimum, the following:

(a) Receiving water quality (including pollutants for which receiving waters are listed as impaired under the CWA section 303(d) List);

(b) Pollutants, stressors, and/or receiving water conditions that cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(c) Land use type of the project and pollutants associated with that land use type; and

(d) Pollutants expected to be present onsite.

(3) Updated procedures for designing structural BMPs, including any updated performance requirements to be consistent with the requirements of Provision E.3.c for all structural BMPs listed in the BMP Design Manual;

[30] The BMP Design Manual was formerly known as the Standard Storm Water Mitigation Plan under Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016.

(4) Long-term maintenance criteria for each structural BMP listed in the BMP Design Manual; and

(5) Alternative compliance criteria, in accordance with the requirements under Provision E.3.c.(3), if the Copermittee elects to allow Priority Development Projects within its jurisdiction to utilize alternative compliance.

e. PRIORITY DEVELOPMENT PROJECT BMP IMPLEMENTATION AND OVERSIGHT

Each Copermittee must implement a program that requires and confirms structural BMPs on all Priority Development Projects are designed, constructed, and maintained to remove pollutants in storm water to the MEP.

(1) Structural BMP Approval and Verification Process

(a) Each Copermittee must require and confirm that ~~for~~ all Priority Development Projects ~~applications that have not received prior lawful approval by the Copermittee by the effective date of the BMP Design Manual pursuant to Provision E.3.d,~~ implement the requirements of Provision E.3, ~~must be implemented. For project applications that have received prior lawful approval before the effective date of the BMP Design Manual pursuant to Provision E.3.d, the Copermittee may allow previous land development requirements to apply.~~except that the Copermittee may allow previous land development requirements to apply to a Priority Development Project if the conditions of Provision E.3.e.(1)(a)(i) or Provision E.3.e.(1)(a)(ii) are met:

(i) The Copermittee has, prior to the effective date of the BMP Design Manual required to be developed pursuant to Provision E.3.d:

[a] Approved[31] a design that incorporates the storm water drainage system for the Priority Development Project in its entirety, including all applicable structural pollutant treatment control and hydromodification management BMPs consistent with the previous applicable MS4 permit requirements;[32] AND

[b] Issued a private project permit or approval, or functional equivalent for public projects, that authorizes the Priority Development Project applicant to commence construction activities based on a design that incorporates the storm water drainage system approved in conformance with Provision E.3.e.(1)(a)(i)[a]; AND

[31] For public projects, a design stamped by the City or County Engineer, or engineer of record for the project is considered an approved design.
[32] Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016 for San Diego County, Orange County, and Riverside County Copermittees, respectively

[c] Confirmed that there have been construction activities on the Priority Development Project site within the 365 days prior to the effective date of the BMP Design Manual, *OR* the Copermittee confirms that construction activities have commenced on the Priority Development Project site within the 180 days after the effective date of the BMP Design Manual, where construction activities are undertaken in reliance on the permit or approval, or functional equivalent for public projects, issued by the Copermittee in conformance with Provision E.3.e.(1)(a)(i)[b]; AND

[d] Issued all subsequent private project permits or approvals, or functional equivalent for public projects, that are needed to implement the design initially approved in conformance with Provision E.3.e.(1)(a)(i)[a] within 5 years of the effective date of the BMP Design Manual. The storm water drainage system for the Priority Development Project in its entirety, including all applicable structural pollutant treatment control and hydromodification management BMPs must remain in substantial conformity with the design initially approved in conformance with Provision E.3.e.(1)(a)(i)[a].

(ii) The Copermittee demonstrates it lacks the land use authority or legal authority to require a Priority Development Project to implement the requirements of Provision E.3.

(b) Each Copermittee must identify the roles and responsibilities of its various municipal departments in implementing the structural BMP requirements, including each stage of a project from application review and approval through BMP maintenance and inspections.

(c) Each Copermittee must require and confirm that appropriate easements and ownerships are properly recorded in public records and the information is conveyed to all appropriate parties when there is a change in project or site ownership.

(d) Each Copermittee must require and confirm that prior to occupancy and/or intended use of any portion of the Priority Development Project, each structural BMP is inspected to verify that it has been constructed and is operating in compliance with all of its specifications, plans, permits, ordinances, and the requirements of this Order.

(2) Priority Development Project Inventory and Prioritization

(a) Each Copermittee must develop, maintain, and update at least annually, a watershed-based database to track and inventory all Priority Development Projects and associated structural BMPs within its jurisdiction. Inventories must be accurate and complete beginning from December 2002 for the

San Diego County Copermittees, February 2003 for the Orange County Copermittees, and July 2005 for the Riverside County Copermittees. The use of an automated database system, such as GIS, is highly recommended. The database must include, at a minimum, the following information:

(i) Priority Development Project location (address and hydrologic subarea);

(ii) Descriptions of structural BMP type(s);

(iii) Date(s) of construction;

(iv) Party responsible for structural BMP maintenance;

(v) Dates and findings of structural BMP maintenance verifications; and

(vi) Corrective actions and/or resolutions, when applicable.

(b) Each Copermittee must prioritize the Priority Development Projects with structural BMPs within its jurisdiction. The designation of Priority Development Projects as high priority must consider the following:

(i) The highest water quality priorities identified in the Water Quality Improvement Plan;

(ii) Receiving water quality;

(iii) Number and sizes of structural BMPs;

(iv) Recommended maintenance frequency of structural BMPs;

(v) Likelihood of operation and maintenance issues of structural BMPs;

(vi) Land use and expected pollutants generated; and

(vii) Compliance record.

(3) Structural BMP Maintenance Verifications and Inspections

Each Copermittee is required to verify that structural BMPs on each Priority Development Project are adequately maintained, and continue to operate effectively to remove pollutants in storm water to the MEP through inspections, self-certifications, surveys, or other equally effective approaches.

(a) All (100 percent) of the structural BMPs at Priority Development Projects that are designated as high priority must be inspected directly by the Copermittee annually prior to each rainy season;

(b) For verifications performed through a means other than direct Copermittee inspection, adequate documentation must be required by the Copermittee to provide assurance that the required maintenance of structural BMPs at each Priority Development Project has been completed; and

(c) Appropriate follow-up measures (including re-inspections, enforcement, etc.) must be conducted to ensure that structural BMPs at each Priority Development Project continue to reduce pollutants in storm water to the MEP as originally designed.

f. DEVELOPMENT PROJECT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all development projects, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

4. Construction Management

Each Copermittee must implement a construction management program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. PROJECT APPROVAL PROCESS

Prior to issuance of any local permit(s) that allows the commencement of construction projects that involve ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff, each Copermittee must:

(1) Require a pollution control plan, construction BMP plan, and/or an erosion and sediment control plan, to be submitted by the project applicant to the Copermittee;

(2) Confirm the pollution control plan, construction BMP plan, and/or erosion and sediment control plan, complies with the local grading ordinance, other applicable local ordinances, and the requirements of this Order;

(3) Confirm the pollution control, construction BMP, and/or erosion and sediment control plan, includes seasonally appropriate and effective BMPs and management measures described in Provision E.4.c, as applicable to the project; and

(4) Verify that the project applicant has obtained coverage under the statewide Construction General Permit (Order 2009-0009-DWQ or subsequent Order), if applicable.

b. CONSTRUCTION SITE INVENTORY AND TRACKING

(1) Each Copermittee must maintain and update, at least quarterly, a watershed-based inventory of all construction projects issued a local permit that allows ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff. The use of an automated database system, such as GIS, is highly recommended. The inventory must include:

(a) Relevant contact information for each site (e.g., name, address, phone, and email for the owner and contractor);

(b) The basic site information including location (address and hydrologic subarea), Waste Discharge Identification (WDID) number (if applicable), size of the site, and approximate area of disturbance;

(c) Whether or not the site is considered a high threat to water quality, as defined in Provision E.4.b.(2) below;

(d) The project start and completion dates;

(e) The required inspection frequency, as defined in the Copermittee's jurisdictional runoff management program document;

(f) The date the Copermittee accepted or approved the pollution control plan, construction BMP plan, and/or erosion and sediment control plan; and

(g) Whether or not there are ongoing enforcement actions administered to the site.

(2) Each Copermittee must identify all construction sites within its jurisdiction that represent a high threat to downstream surface water quality. The designation of construction sites as high threat to water quality must consider the following:

(a) Sites located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Sites located within the same hydrologic subarea and tributary to a water body segment listed as impaired for sediment on the CWA section 303(d) List;

(c) Sites located within, directly adjacent to, or discharging directly to a receiving water within an ESA; and

(d) Other sites determined by the Copermittees or the San Diego Water Board as a high threat to water quality.

c. CONSTRUCTION SITE BMP IMPLEMENTATION

Each Copermittee must implement, or require the implementation of effective BMPs to reduce discharges of pollutants in storm water from construction sites to the MEP, and effectively prohibit non-storm water discharges from construction sites into the MS4. These BMPs must be site specific, seasonally appropriate, and construction phase appropriate. BMPs must be implemented at each construction site year round. Dry season BMP implementation must plan for and address unseasonal rain events that may occur during the dry season (May 1 through September 30). Copermittees must implement, or require the implementation of, BMPs in the following categories:

(1) Project Planning;

(2) Good Site Management "Housekeeping", including waste management;

(3) Non-storm Water Management;

(4) Erosion Control;

(5) Sediment Control;

(6) Run-on and Run-off Control; and

(7) Active/Passive Sediment Treatment Systems, where applicable.

d. CONSTRUCTION SITE INSPECTIONS

Each Copermittee must conduct construction site inspections to require and confirm compliance with its local permits and applicable local ordinances, and the requirements of this Order. Priority for site inspections must consider threat to water quality pursuant to Provision E.4.b as well as the nature of the construction activity, topography, and the characteristics of soils and receiving water quality.

(1) <u>Inspection Frequency</u>

(a) Each Copermittee must conduct inspections at all inventoried sites, including high threat to water quality sites, at an appropriate frequency for each phase of construction to confirm the site reduces the discharge of pollutants in storm water from construction sites to the MEP, and effectively prohibits non-storm water discharges from entering the MS4.

(b) Each Copermittee must establish appropriate inspection frequencies for high threat to water quality sites, and all other sites, for each phase of construction. Inspection frequencies appropriate for addressing the

highest water quality priorities identified in the Water Quality Improvement Plan, and for complying with the requirements of this Order must be identified in each Copermittee's jurisdictional runoff management program document.

(c) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e., re-inspection, enforcement) necessary to require and confirm site compliance with its local permits and applicable local ordinances, and the requirements of this Order.

(2) Inspection Content

Inspections of construction sites by the Copermittee must include, at a minimum:

(a) Verification of coverage under the Construction General Permit (Notice of Intent (NOI) and/or WDID number) during initial inspections, when applicable;

(b) Assessment of compliance with its local permits and applicable local ordinances related to pollution prevention, including the implementation and maintenance of applicable BMPs;

(c) Assessment of BMP adequacy and effectiveness;

(d) Visual observations of actual non-storm water discharges;

(e) Visual observations of actual or potential discharge of sediment and/or construction related materials from the site;

(f) Visual observations of actual or potential illicit connections; and

(g) If any violations are found and BMP corrections are needed, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried construction sites. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Site name, location (address and hydrologic subarea), and WDID number (if applicable);

(b) Inspection date;

(c) Approximate amount of rainfall since last inspection;

(d) Description of problems observed with BMPs and indication of need for BMP addition/repair/replacement and any scheduled re-inspection, and date of re-inspection;

(e) Descriptions of any other specific inspection comments which must, at a minimum, include rationales for longer compliance time;

(f) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(g) Resolution of problems noted and date problems fixed.

e. CONSTRUCTION SITE ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried construction sites, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

5. Existing Development Management

Each Copermittee must implement an existing development management program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. EXISTING DEVELOPMENT INVENTORY AND TRACKING

Each Copermittee must maintain, and update at least annually, a watershed-based inventory of the existing development within its jurisdiction that may discharge a pollutant load to and from the MS4. The use of an automated database system, such as GIS, is highly recommended. The inventory must, at a minimum, include:

(1) Name, location (hydrological subarea and address, if applicable) of the following types of existing development with its jurisdiction:

(a) Commercial facilities or areas;

(b) Industrial facilities;

(c) Municipal facilities, including:

(i) MS4 and related structures;[33]

(ii) Roads, streets, and highways;

(iii) Parking facilities;

(iv) Municipal airfields;

(v) Parks and recreation facilities;

(vi) Flood management facilities, flood control devices and structures;

(vii) Operating or closed municipal landfills;

(viii) Publicly owned treatment works (including water and wastewater treatment plants) and sanitary sewer collection systems;

(ix) Corporate yards, including maintenance and storage yards for materials, waste, equipment, and vehicles;

(x) Hazardous waste collection facilities;

(xi) Other treatment, storage or disposal facilities for municipal waste; and

(xii) Other municipal facilities that the Copermittee determines may contribute a significant pollutant load to the MS4.

(d) Residential areas, which may be designated by one or more of the following:

(i) Residential management area;

(ii) Drainage basin or area;

(iii) Land use (e.g., single family, multi-family, rural);

(iv) Neighborhood;

(v) Common Interest Area;

(vi) Home Owner Association;

(vii) Mobile home park; and/or

(viii) Other designations accepted by the San Diego Water Board Executive Officer.

(2) A description of the facility or area, including the following information:

(a) Classification as commercial, industrial, municipal, or residential;

[33] The inventory may refer to the MS4 map required to be maintained pursuant to Provision E.2.b.(1).

(b) Status of facility or area as active or inactive;

(c) Identification if a business is a mobile business;

(d) SIC Code or NAICS Code, if applicable;

(e) Industrial General Permit NOI and/or WDID number, if applicable;

(f) Identification if a residential area is or includes a Common Interest Area / Home Owner Association, or mobile home park;

(g) Identification of pollutants generated and potentially generated by the facility or area;

(h) Whether the facility or area is adjacent to an ESA;

(i) Whether the facility or area is tributary to and within the same hydrologic subarea as a water body segment listed as impaired on the CWA section 303(d) List and generates pollutants for which the water body segment is impaired; and

(3) An annually updated map showing the location of inventoried existing development, watershed boundaries, and water bodies.

b. EXISTING DEVELOPMENT BMP IMPLEMENTATION AND MAINTENANCE

Each Copermittee must designate a minimum set of BMPs required for all inventoried existing development, including special event venues. The designated minimum BMPs must be specific to facility or area types and pollutant generating activities, as appropriate.

(1) Commercial, Industrial, and Municipal Facilities and Areas

(a) Pollution Prevention

Each Copermittee must require the use of pollution prevention methods by the commercial, industrial, and municipal facilities and areas in its inventoried existing development to address the priorities and strategies in the Water Quality Improvement Plan.

(b) BMP Implementation

Each Copermittee must require the implementation of designated BMPs at commercial facilities and areas, industrial facilities, and implement designated BMPs at municipal facilities in its inventoried existing development.

(c) BMP Operation and Maintenance

(i) Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development.

(ii) Each Copermittee must implement a schedule of operation and maintenance activities for its MS4 and related structures (including but not limited to catch basins, storm drain inlets, detention basins, etc.), and verify proper operation of all its municipal structural treatment controls designed to reduce pollutants (including floatables) in storm water discharges to or from its MS4s and related drainage structures. Operation and maintenance activities may include, but is not limited to, the following:

[a] Inspections of the MS4 and related structures;
[b] Cleaning of the MS4 and related structures; and
[c] Proper disposal of materials removed from cleaning of the MS4 and related structures.

(iii) Each Copermittee must implement a schedule of operation and maintenance for public streets, unpaved roads, paved roads, and paved highways within its jurisdiction to minimize pollutants that can be discharged in storm water.

(iv) Each Copermittee must implement controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers. Copermittees that operate both a municipal sanitary sewer system and a MS4 must implement controls and measures to prevent and eliminate seeping sewage from infiltrating the MS4. Copermittees that do not operate both a municipal sanitary sewer system and a MS4 must coordinate with sewering agencies to keep themselves informed of relevant and appropriate maintenance activities and sanitary sewage projects in their jurisdiction that may cause or contribute to seepage of sewage into the MS4.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must require the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from commercial facilities and areas and industrial facilities, and implement BMPs at municipal facilities in its inventoried existing development. Such BMPs must include, as appropriate, educational activities, permits, certifications and other measures for applicators and distributors.

(2) Residential Areas

(a) Pollution Prevention

Each Copermittee must promote and encourage the use of pollution prevention methods, where appropriate, by the residential areas in its inventoried existing development.

(b) BMP Implementation

Each Copermittee must promote and encourage the implementation of designated BMPs at residential areas in its inventoried existing development.

(c) BMP Operation and Maintenance

Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at residential areas in its inventoried existing development.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must promote and encourage the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from residential areas in its inventoried existing development.

c. EXISTING DEVELOPMENT INSPECTIONS

Each Copermittee must conduct inspections of inventoried existing development to ensure compliance with applicable local ordinances and permits, and the requirements of this Order.

(1) Inspection Frequency

(a) Each Copermittee must establish appropriate inspection frequencies for inventoried existing development in accordance with the following requirements:

(i) At a minimum, inventoried existing development must be inspected once every five years utilizing one or more of the following methods:

[a] Drive-by inspections by Copermittee municipal and contract staff;

[b] Onsite inspections by Copermittee municipal and contract staff; and/or

[c] Visual inspections of publicly accessible inventoried facilities or areas by volunteer monitoring or patrol programs that have been trained by the Copermittee;

(ii) The frequency of inspections must be appropriate to confirm that BMPs are being implemented to reduce the discharge of pollutants in storm water from the MS4 to the MEP and effectively prohibit non-storm water discharges to the MS4;

(iii) The frequency of inspections must be based on the potential for a facility or area to discharge non-storm water and pollutants in storm water, and should reflect the priorities set forth in the Water Quality Improvement Plan;

(iv) Each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development;[34] and

(v) Inventoried existing development must be inspected by the Copermittee, as needed, in response to valid public complaints.

(b) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e. education and outreach, re-inspection, enforcement) necessary to require and confirm compliance with its applicable local ordinances and permits and the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

(2) <u>Inspection Content</u>

(a) Inspections of existing development must include, at a minimum:

(i) Visual inspections for the presence of actual non-storm water discharges;

(ii) Visual inspections for the presence of actual or potential discharge of pollutants;

(iii) Visual inspections for the presence of actual or potential illicit connections; and

(iv) Verification that the description of the facility or area in the inventory, required pursuant to Provision E.5.a.(2), has not changed.

[34] If any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspection may count toward the total annual inspection requirement. This requirement excludes linear municipal facilities (i.e., MS4 linear channels, sanitary sewer collection systems, streets, roads and highways).

(b) Onsite inspections of existing development by the Copermittee must include, at a minimum:

(i) Assessment of compliance with its applicable local ordinances and permits related to non-storm water and storm water discharges and runoff;

(ii) Assessment of the implementation of the designated BMPs;

(iii) Verification of coverage under the Industrial General Permit, when applicable; and

(iv) If any problems or violations are found, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried existing development. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Name and location of the facility or area (address and hydrologic subarea) consistent with the inventory name and location, pursuant to Provision E.5.a.(1);

(b) Inspection and re-inspection date(s);

(c) Inspection method(s) (i.e. drive-by, onsite);

(d) Observations and findings from the inspection(s);

(e) For onsite inspections of existing development by Copermittee municipal or contract staff, the records must also include, as applicable:

(i) Description of any problems or violations found during the inspection(s);

(ii) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(iii) The date problems or violations were resolved.

d. EXISTING DEVELOPMENT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried existing development, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

e. RETROFITTING AND REHABILITATING AREAS OF EXISTING DEVELOPMENT

(1) Retrofitting Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to retrofit areas of existing development within its jurisdiction to address identified sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify areas of existing development as candidates for retrofitting, focusing on areas where retrofitting will address pollutants and/or stressors that contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for retrofitting projects may be utilized to reduce pollutants that may be discharged in storm water from areas of existing development, and/or address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of retrofitting projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting projects; and

(e) Where retrofitting projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional retrofitting projects (i.e. projects that can receive and/or treat storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment) adjacent to and/or downstream of the areas of existing development.

(2) Stream, Channel and/or Habitat Rehabilitation in Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to rehabilitate streams, channels, and/or habitats in areas of existing development within its jurisdiction to address the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify streams, channels, and/or habitats in areas of existing development as candidates for rehabilitation, focusing on areas where stream, channel, and/or habitat rehabilitation projects will address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for stream, channel, and/or habitat rehabilitation projects may be utilized to address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters, rehabilitate channelized or hydromodified streams, restore wetland and riparian habitat, restore watershed functions, and/or restore beneficial uses of receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of stream, channel, and/or habitat rehabilitation projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance stream, channel, and/or habitat rehabilitation projects; and

(e) Where stream, channel, and/or habitat rehabilitation projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional stream, channel, and/or habitat rehabilitation projects (i.e. projects that can receive storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment).

6. Enforcement Response Plans

Each Copermittee must develop and implement an Enforcement Response Plan as part of its jurisdictional runoff management program document. The Enforcement Response Plan must describe the applicable approaches and options to enforce its legal authority established pursuant to Provision E.1, as necessary, to achieve compliance with the requirements of this Order. The Enforcement Response Plan must be in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include the following:

a. Enforcement Response Plan Components

The Enforcement Response Plan must include the following individual components:

(1) Illicit Discharge Detection and Elimination Enforcement Component;

(2) Development Planning Enforcement Component;

(3) Construction Management Enforcement Component; and

(4) Existing Development Enforcement Component.

b. Enforcement Response Approaches and Options

Each component of the Enforcement Response Plan must describe the enforcement response approaches that the Copermittee will implement to compel compliance with its statutes, ordinances, permits, contracts, orders, or similar means, and the requirements of this Order. The description must include the protocols for implementing progressively stricter enforcement responses. The enforcement response approaches must include appropriate sanctions to compel compliance, including, at a minimum, the following tools or their equivalent:

(1) Verbal and written notices of violation;

(2) Cleanup requirements;

(3) Fines;

(4) Bonding requirements;

(5) Administrative and criminal penalties;

(6) Liens;

(7) Stop work orders; and

(8) Permit and occupancy denials.

c. Correction of Violations

(1) Violations must be corrected in a timely manner with the goal of correcting the violations within 30 calendar days after the violations are discovered, or prior to the next predicted rain event, whichever is sooner.

(2) If more than 30 calendar days are required to achieve compliance, then a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

d. Escalated Enforcement

(1) The Enforcement Response Plan must include a definition of "escalated enforcement." Escalated enforcement must include any enforcement scenario where a violation or other non-compliance is determined to cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan. Escalated enforcement may be defined differently for development planning, construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas.

(2) Where the Copermittee determines escalated enforcement is not required, a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

(3) Escalated enforcement actions must continue to increase in severity, as necessary, to compel compliance as soon as possible.

e. Reporting of Non-Compliant Sites

(1) Each Copermittee must notify the San Diego Water Board in writing within five (5) calendar days of issuing escalated enforcement (as defined in the Copermittee's Enforcement Response Plan) to a construction site that poses a significant threat to water quality as a result of violations or other non-compliance with its permits and applicable local ordinances, and the requirements of this Order. Written notification may be provided electronically by email to the appropriate San Diego Water Board staff.

(2) Each Copermittee must notify the San Diego Water Board of any persons required to obtain coverage under the statewide Industrial General Permit and Construction General Permit and failing to do so, within five (5) calendar days from the time the Copermittee become aware of the circumstances. Written notification may be provided electronically by email to RB9_Nonfilers@waterboards.ca.gov.

7. Public Education and Participation

Each Copermittee must implement, individually or with other Copermittees, a public education and participation program in accordance with the strategies identified in the Water Quality Improvement Plan to promote and encourage the development of programs, management practices, and behaviors that reduce the discharge of pollutants in storm water to the MEP, prevent controllable non-storm water discharges from entering the MS4, and protect water quality standards in receiving waters. The public education and participation program must be implemented in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include, at a minimum, the following requirements:

a. PUBLIC EDUCATION

The public education program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) Educational activities, public information activities, and other appropriate outreach activities intended to reduce pollutants associated with the application of pesticides, herbicides and fertilizer and other pollutants of concern in storm water discharges to and from its MS4 to the MEP, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed to address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(2) Educational activities, public information activities, and other appropriate outreach activities to facilitate the proper management and disposal of used oil and toxic materials; and

(3) Appropriate education and training measures for specific target audiences, such as construction site operators, residents, underserved target audiences and school-aged children, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed, based on high risk behaviors and pollutants of concern.

b. PUBLIC PARTICIPATION

The public participation program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) A process for members of the public to participate in updating the highest priority water quality conditions, numeric goals, and water quality improvement strategies in the Water Quality Improvement Plan;

(2) Opportunities for members of the public to participate in providing the Copermittee recommendations for improving the effectiveness of the water quality improvement strategies implemented within its jurisdiction; and

(3) Opportunities for members of the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or protection of the quality of receiving waters.

8. Fiscal Analysis

a. Each Copermittee must secure the resources necessary to meet all the requirements of this Order.

b. Each Copermittee must conduct an annual fiscal analysis of its jurisdictional runoff management program in its entirety. The fiscal analysis must include the following:

(1) Identification of the various categories of expenditures necessary to implement the requirements of this Order, including a description of the specific capital, operation and maintenance, and other expenditure items to be accounted for in each category of expenditures;

(2) The staff resources needed and allocated to meet the requirements of this Order, including any development, implementation, and enforcement activities required;

(3) The estimated expenditures for Provisions E.8.b.(1) and E.8.b.(2) for the current fiscal year; and

(4) The source(s) of funds that are proposed to meet the necessary expenditures described in Provisions E.8.b.(1) and E.8.b.(2), including legal restrictions on the use of such funds, for the current fiscal year and next fiscal year.

c. Each Copermittee must submit a summary of the annual fiscal analysis with each Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3).

d. Each Copermittee must provide the documentation used to develop the summary of the annual fiscal analysis upon request by the San Diego Water Board.

F. REPORTING

The purpose of this provision is to determine and document compliance with the requirements set forth in this Order. The goal of reporting is to communicate to the San Diego Water Board and the people of the State of California the implementation status of each jurisdictional runoff management program and compliance with the requirements of this Order. This goal is to be accomplished through the submittal of specific deliverables to the San Diego Water Board by the Copermittees.

1. Water Quality Improvement Plans

The Copermittees for each Watershed Management Area must develop and submit the Water Quality Improvement Plan in accordance with the following requirements:

a. WATER QUALITY IMPROVEMENT PLAN DEVELOPMENT

Each Water Quality Improvement Plan must be developed in accordance with the following process:

(1) Public Participation Process

The Copermittees must implement a public participation process to solicit data, information, and recommendations to be utilized in the development of the Water Quality Improvement Plan. The public participation process must include the following:

(a) The Copermittees must develop a publicly available and noticed schedule of the opportunities for the public to participate and provide comments during the development of the Water Quality Improvement Plan. The schedule may be adjusted as necessary by the Copermittees, provided the public is provided timely notification of the changes to the schedule.

(b) The Copermittees must form a Water Quality Improvement Consultation Panel to provide recommendations during the development of the Water Quality Improvement Plan. The Water Quality Improvement Consultation Panel must consist of at least the following members:

(i) A representative of the San Diego Water Board;

(ii) A representative of the environmental community familiar with the water quality conditions of concern of the receiving waters in the Watershed Management Area, preferably from an environmental interest group associated with a water body within the Watershed Management Area; and

(iii) A representative of the development community familiar with the opportunities and constraints for implementing structural BMPs,

retrofitting projects, and stream, channel or habitat rehabilitation projects in the Watershed Management Area, preferably with relevant engineering, hydrology, and/or geomorphology experience in the Watershed Management Area.

(c) The Copermittees must coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public time and opportunity to participate during the development of the Water Quality Improvement Plans.

(2) Priority Water Quality Conditions

(a) The Copermittees must solicit data, information and recommendations from the public to be utilized in the development and identification of the priority water quality conditions and potential water quality improvement strategies for the Watershed Management Area.

(b) The Copermittees must review the priority water quality conditions the Copermittees plan on including in the Water Quality Improvement Plan with the Water Quality Improvement Consultation Panel to receive recommendations or concurrence.

(c) The Copermittees must consider revisions to the priority water quality conditions based on recommendations from the Water Quality Improvement Consultation Panel.

(d) The Copermittees must include all the potential water quality improvement strategies identified by the public and the Water Quality Improvement Consultation Panel with the submittal of the priority water quality conditions to the San Diego Water Board.

(e) The Copermittees must submit the Water Quality Improvement Plan requirements of Provision B.2 to the San Diego Water Board as early as 6 months and no later than 12 months after the commencement of coverage under this Order. Upon receipt, the San Diego Water Board will issue a public notice and release the proposed priority water quality conditions and potential water quality improvement strategies for public review and comment for a minimum of 30 days.

(f) The Copermittees must consider revisions to the priority water quality conditions and potential water quality improvement strategies developed pursuant to Provision B.2 based on public comments received by the close of the comment period.

(3) Water Quality Improvement Goals, Strategies and Schedules

(a) The Copermittees must solicit recommendations from the public on potential numeric goals for the highest priority water quality conditions identified for the Watershed Management Area, and recommendations on the strategies that should be implemented to achieve the potential numeric goals.

(b) The Copermittees must consult with the Water Quality Improvement Consultation Panel and consider revisions to the following items based on the Panel's recommendations:

(i) The numeric goals and schedules the Copermittees propose to include in the Water Quality Improvement Plan;

(ii) The water quality improvement strategies and schedules the Copermittees propose to implement in the Watershed Management Area and include in the Water Quality Improvement Plan; and

(iii) If the Copermittees choose to implement Provision B.3.b.(4), the results of the Watershed Management Area Analysis the Copermittees proposed to incorporate into the Water Quality Improvement Plan.

(c) The Copermittees must submit the Water Quality Improvement Plan requirements of Provision B.3 to the San Diego Water Board as early as 9 months and no later than 18 months after the commencement of coverage under this Order. Upon receipt, the San Diego Water Board will issue a public notice and release the proposed water quality improvement goals, strategies and schedules for public review and comment for a minimum of 30 days.

(d) The Copermittees must consider revisions to the water quality improvement goals, strategies and schedules developed pursuant to Provision B.3 based on public comments received by the close of the comment period.

b. WATER QUALITY IMPROVEMENT PLAN SUBMITTAL AND IMPLEMENTATION

(1) Within 24 months after the commencement of coverage under this Order, the Copermittees for each Watershed Management Area must submit a complete Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order to the San Diego Water Board. The San Diego Water Board will issue a public notice and release the Water Quality Improvement Plan for public review and comment for a minimum of 30 days.

(2) The Copermittees must consider revisions to the Water Quality Improvement Plan based on written comments received by the close of the public comment period.

(3) The Copermittees must promptly submit any revisions to the Water Quality Improvement Plan to the San Diego Water Board no later than 60 days after the close of the public comment period.

(4) If issues concerning the Water Quality Improvement Plan are resolved informally through discussions among the Copermittees, the San Diego Water Board and interested parties, the San Diego Water Board Executive Officer may provide written notification of acceptance to the Copermittees that the Water Quality Improvement Plan meets the requirements of Provision B. However, if the Executive Officer determines that significant issues with the Water Quality Improvement Plan remain, the matter will be scheduled for San Diego Water Board consideration at a public meeting.

(5) The Copermittees must commence with implementation of the Water Quality Improvement Plan, in accordance with the water quality improvement strategies and schedules therein, upon written notification of acceptance with the Water Quality Improvement Plan by the San Diego Water Board Executive Officer.

(6) During implementation of the Water Quality Improvement Plan the Copermittees must correct any deficiencies in the Plan identified by the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report following a request by the Board to do so.

(7) The Water Quality Improvement Plan must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of receiving notification of acceptance with the Water Quality Improvement Plan by the San Diego Water Board Executive Officer.

2. Updates

a. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATES

Each Copermittee must update its jurisdictional runoff management program document in accordance with the following requirements:

(1) Each Copermittee is encouraged to seek public and key stakeholder participation and comments, as early and often as possible during the process of developing updates to its jurisdictional runoff management program document;

(2) Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E concurrent with the submittal of the Water Quality Improvement Plan. Each Copermittee must correct any deficiencies in the jurisdictional runoff management program document based on comments received from the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report;

(3) Each Copermittee must submit updates to its jurisdictional runoff management program, with the supporting rationale for the modifications, either in the Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b;

(4) The Copermittee must revise proposed modifications to its jurisdictional runoff management program as directed by the San Diego Water Board Executive Officer; and

(5) Updated jurisdictional runoff management program documents must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of submitting the Water Quality Improvement Plan Annual Report.

b. BMP DESIGN MANUAL UPDATES

Each Copermittee must update its BMP Design Manual in accordance with the following requirements:

(1) Each Copermittee must update its BMP Design Manual to incorporate the requirements of Provisions E.3.a-d concurrent with the submittal of the Water Quality Improvement Plan. Each Copermittee must correct any deficiencies in the BMP Design Manual based on comments received from the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report;

(2) ~~Subsequent~~ Any future updates to the BMP Design Manual made after its update pursuant to Provision F.2.b.(1) is completed must be consistent with the requirements of Provisions E.3.a-d and must be submitted as part of the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b; and

(3) ~~Updated~~ BMP Design Manuals must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of completing the update.

(4) If the San Diego Water Board amends Provisions E.3.a-d during the permit term but after the Copermittee has completed the update pursuant to

Provision F.2.b.(1), the Copermittee must revise its BMP Design Manual to incorporate the amended Provision E.3.a-d requirements as soon as possible but not later than 90 days after the date the San Diego Water Board adopts the amendments to Provisions E.3.a-d, unless otherwise directed by the San Diego Water Board Executive Officer.

c. WATER QUALITY IMPROVEMENT PLAN UPDATES

(1) The Water Quality Improvement Plans must be updated in accordance with the following process:

(a) The Copermittees must develop and implement a public participation process to obtain data, information and recommendations for updating the Water Quality Improvement Plan. The public participation process must provide for a publicly available and noticed schedule of opportunities for the public to participate and provide comments during the development of updates to the Water Quality Improvement Plan;

(b) The Copermittees must consult with the Water Quality Improvement Consultation Panel on proposed updates of the Water Quality Improvement Plan, and consider the Water Quality Improvement Consultation Panel's recommendations in finalizing the proposed updates;

(c) The Copermittees for each Watershed Management Area must submit 1) proposed updates to the Water Quality Improvement Plan and supporting rationale, and 2) recommendations received from the public and the Water Quality Improvement Consultation Panel and the rationale for the requested updates, either in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The updates submitted will be deemed accepted for inclusion in the Water Quality Improvement Plan ninety (90) days after submission unless otherwise directed in writing by the San Diego Water Board Executive Officer;

(d) The Copermittees must revise the requested updates as directed by the San Diego Water Board Executive Officer; and

(e) Updated Water Quality Improvement Plans must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance of the requested updates by the San Diego Water Board.

(2) No later than six months following Office of Administrative Law and USEPA approval of any TMDL Basin Plan amendment with wasteload allocations (WLAs) assigned to the Copermittees during the term of this Order, the Copermittees must initiate an update to the applicable Water Quality Improvement Plans in accordance with Provision F.1 or Provision F.2.c.(1) to incorporate the requirements of the TMDL WLAs.

3. Progress Reporting

a. Progress Report Presentations

The Copermittees for each Watershed Management Area must periodically appear before the San Diego Water Board, as requested by the Board, to provide progress reports on the implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs.

b. Annual Reports

(1) Transitional Jurisdictional Runoff Management Program Annual Reports

(a) Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) no later than October 31 of each year for each jurisdictional runoff management program reporting period (i.e. July 1 to June 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted.

(b) Each Copermittee must submit the information on the Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) specific to the area within its jurisdiction in each Watershed Management Area.

(c) In addition to submitting the Jurisdictional Runoff Management Program Annual Report Form during the transitional reporting period, each Copermittee may continue to utilize and submit the jurisdictional runoff management program annual reporting format of its previous NPDES permit until the first Water Quality Improvement Plan Annual Report is required to be submitted.

(2) Transitional Monitoring and Assessment Program Annual Reports

The Copermittees for each Watershed Management Area must submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted under this Order. The Transitional Monitoring and Assessment Program Annual Reports must include:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1.a and D.2.a, summarized and presented in tabular and graphical form; and

(b) The findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

(3) Water Quality Improvement Plan Annual Reports

The Copermittees for each Watershed Management Area must submit a Water Quality Improvement Plan Annual Report for each reporting period no later than January 31 of the following year. The annual reporting period consists of two different periods: 1) July 1 to June 30 of the following year for the jurisdictional runoff management programs, 2) October 1 to September 30 of the following year for the monitoring and assessment programs. The Water Quality Improvement Plan Annual Reports must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Each Annual Report must include the following:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, summarized and presented in tabular and graphical form;

(b) The progress of the special studies required pursuant to Provision D.3, and the findings, interpretations and conclusions of a special study, or each phase of a special study, upon its completion;

(c) The findings, interpretations and conclusions from the assessments required pursuant to Provision D.4;

(d) The progress of implementing the Water Quality Improvement Plan, including, but not limited to, the following:

(i) The progress toward achieving the interim and final numeric goals for the highest water quality priorities for the Watershed Management Area;

(ii) The water quality improvement strategies that were implemented and/or no longer implemented by each of the Copermittees during the reporting period and previous reporting periods;

(iii) The water quality improvement strategies planned for implementation during the next reporting period;

(iv) Proposed modifications to the water quality improvement strategies, the public comments received and the supporting rationale for the proposed modifications;

(v) Previous modifications or updates incorporated into the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document and implemented by the Copermittees in the Watershed Management Area; and

(vi) Proposed modifications or updates to the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document;

(e) A completed Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) for each Copermittee in the Watershed Management Area, certified by a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative; and

(f) Each Copermittee must provide any data or documentation utilized in developing the Water Quality Improvement Plan Annual Report upon request by the San Diego Water Board. Any Copermittee monitoring data utilized in developing the Water Quality Improvement Plan Annual Report must be uploaded to the California Environmental Data Exchange Network (CEDEN).[35] Any Copermittee monitoring and assessment data utilized in developing the Water Quality Improvement Plan Annual Report must be available for access on the Regional Clearinghouse required pursuant to Provision F.4.

c. Regional Monitoring and Assessment Report

(1) The Copermittees must submit a Regional Monitoring and Assessment Report no later than 180 days prior to the expiration date of this Order. The Regional Monitoring and Assessment Report may be submitted as part of the Report of Waste Discharge required pursuant to Provision F.5.b. In preparing the report the Copermittees must consider the receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, and the findings, interpretations, and conclusions from the assessments required pursuant to Provision D.4. Based on these considerations the report must assess the following:

(a) The beneficial uses of the receiving waters within the San Diego Region that are supported and not adversely affected by the Copermittees' MS4 discharges;

(b) The beneficial uses of the receiving waters within the San Diego Region that are adversely impacted by the Copermittees' MS4 discharges;

(c) The progress toward protecting the beneficial uses in the receiving waters within the San Diego Region from the Copermittees' discharges; and

[35] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

(d) Pollutants or conditions of emerging concern that may impact beneficial uses in the receiving waters within the San Diego Region.

(2) The Regional Monitoring and Assessment Report must include recommendations for improving the implementation and assessment of the Water Quality Improvement Plans and jurisdictional runoff management programs.

(3) Each Copermittee must provide any data or documentation utilized in developing the Regional Monitoring and Assessment Report upon request by the San Diego Water Board. Any Copermittee monitoring and assessment data utilized in developing the Regional Monitoring and Assessment Report must be available for access on the Regional Clearinghouse required pursuant to Provision F.4.

4. Regional Clearinghouse

The Copermittees must develop, update, and maintain an internet-based Regional Clearinghouse that is made available to the public no later than 18 months after the effective date of this Order.[36]

a. The Copermittees, through the Regional Clearinghouse, must make the following documents and data available for access, and organized by Watershed Management Area. The documents and data may be linked to other internet-based data portals and databases where the original documents are stored:

(1) Water Quality Improvement Plan for the Watershed Management Area, and all updated versions with date of update;

(2) Annual Reports for the Watershed Management Area;

(3) Jurisdictional Runoff Management Program document for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(4) BMP Design Manual for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(5) Reports from special studies (e.g. source identification, BMP effectiveness assessment) conducted in the Watershed Management Area;

[36] The Copermittees may develop, update and maintain the clearinghouse(s) of other Copermittees or agencies.

(6) Monitoring data collected pursuant to Provision D for each Watershed Management Area must be uploaded to CEDEN,[37] with links to the uploaded data; and

(7) Available GIS data, layers, and/or shapefiles used to develop the maps generated and maintained by the Copermittees for the Water Quality Improvement Plans, Annual Reports, and jurisdictional runoff management program documents.

b. The Copermittees, through the Regional Clearinghouse, must make the following information and documents available for access:

(1) Contact information (point of contact, phone number, email address, and mailing address) for each Copermittee;

(2) Public hotline number for reporting non-storm water and illicit discharges for each Copermittee;

(3) Email address for reporting non-storm water and illicit discharges for each Copermittee;

(4) Link to each Copermittee's website, if available, where the public may find additional information about the Copermittee's storm water management program and for requesting records for the implementation of its program;

(5) Information about opportunities for the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or protection of the quality of receiving waters; and

(6) Reports from regional monitoring programs in which the Copermittees participate (e.g. Southern California Monitoring Coalition, Southern California Coastal Water Research Project Bight Monitoring);

(7) Regional Monitoring and Assessment Reports; and

(8) Any other information, data, and documents the Copermittees determine as appropriate for making available to the public.

[37] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

5. Report of Waste Discharge

~~a. The Riverside County Copermittees are required to submit a complete Report of Waste Discharge pursuant to the requirements of their current Order. The San Diego Water Board will review and consider the Report of Waste Discharge to determine whether modification to this Order, pursuant to the requirements of Provision H, will be required prior to the Riverside County Copermittees obtaining coverage under this Order. The current Order for Riverside County Copermittees is rescinded upon the date of effective coverage under this Order except for enforcement purposes.~~

~~b.~~
The Copermittees subject to the requirements of this Order must submit to the San Diego Water Board a complete Report of Waste Discharge as an application for the re-issuance of this Order and NPDES permit. The Report of Waste Discharge must be submitted no later than 180 days in advance of the expiration date of this Order. The Report of Waste Discharge must contain the following minimum information:

~~(1)~~
a. Names and addresses of the Copermittees;
~~(2)~~
b. Names and titles of the primary contacts of the Copermittees;
~~(3)~~
c. Proposed changes to the Copermittees' Water Quality Improvement Plans and the supporting justification;
~~(4)~~
d. Proposed changes to the Copermittees' jurisdictional runoff management programs and the supporting justification;
~~(5)~~
e. Any other information necessary for the re-issuance of this Order;
~~(6)~~
f. Any information to be included as part of the Report of Waste Discharge pursuant to the requirements of this Order; and
~~(7)~~
g. Any other information required by federal regulations for NPDES permit reissuance.

~~6. Application for Early Coverage~~

~~a. The Riverside County Copermittees may apply for early coverage under this Order by submitting a Report of Waste Discharge Form 200, with a written request for early coverage under this Order.~~

~~b. The San Diego Water Board will review the application for early coverage. A notification of coverage under this Order will be issued to the Copermittees in the respective county by the San Diego Water Board upon completion of the early coverage application requirements. The effective coverage date will be specified~~

~~in the notification of coverage. The Copermittees in the respective county are authorized to have MS4 discharges pursuant to the requirements of this Order starting on the effective coverage date specified in the notification of coverage. The existing Order for the respective county is rescinded upon the effective coverage date specified in the notification of coverage except for enforcement purposes.~~

~~7.~~

6. Reporting Provisions

Each Copermittee must comply with all the reporting and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

G. PRINCIPAL WATERSHED COPERMITTEE RESPONSIBILITIES

1. The Copermittees within each Watershed Management Area must designate a Principal Watershed Copermittee and notify the San Diego Water Board of the name of the Principal Watershed Copermittee. An individual Copermittee should not be designated a Principal Watershed Copermittee for more than two Watershed Management Areas. The notification may be submitted with the Water Quality Improvement Plan required pursuant to Provision F.1 of this Order.

2. The Principal Watershed Copermittee is responsible for, at a minimum, the following:

a. Serving as liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues, and when necessary and appropriate, representing the Copermittees in the Watershed Management Area before the San Diego Water Board;

b. Facilitating the development of the Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order;

c. Coordinating the submittal of the deliverables required by Provisions F.1, F.2, F.3.a, and F.3.b of this Order; and

d. Coordinating and developing, with the other Principal Watershed Copermittees, the requirements of Provisions F.3.c, F.4, and F.5.b of this Order.

3. The Principal Watershed Copermittee is not responsible for ensuring that the other Copermittees within the Watershed Management Area are in compliance with the requirements of this Order. Each Copermittee within the Watershed Management Area is responsible for complying with the requirements of this Order.

H. MODIFICATION OF ORDER

1. Modifications of the Order may be initiated by the San Diego Water Board or by the Copermittees. Requests by Copermittees must be made to the San Diego Water Board.

2. Minor modifications to the Order may be made by the San Diego Water Board where the proposed modification complies with all the prohibitions and limitations, and other requirements of this Order.

3. This Order may also be re-opened and modified, revoked and, reissued or terminated in accordance with the provisions of 40 CFR 122.44, 122.62 to 122.64, and 124.5. Causes for taking such actions include, but are not limited to, failure to comply with any condition of this Order and permit, and endangerment to human health or the environment resulting from the permitted activity.

4. This Order may be re-opened for modification for cause including but not limited to the following:

   ~~a. The State Water Board determines that revisions are warranted, and the San Diego Water Board concurs that revisions are necessary to those provisions of the Order addressing compliance with water quality standards in the receiving water and/or those provisions of the Order establishing an iterative process for implementation of management practices to assure compliance with water quality standards in the receiving water;~~

   ~~b. An application for early coverage under this Order is received pursuant to Provision F.6;~~

   ~~c.~~

   a. Any of the TMDLs in Attachment E to this Order are amended in the Basin Plan by San Diego Water Board, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA;

   ~~d.~~

   b. The Basin Plan is amended by the San Diego Water Board to incorporate a new TMDL, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA; or

   ~~e.~~

   c. Updating or revising the monitoring and reporting requirements is determined to be necessary, at the discretion of the San Diego Water Board. Such modification(s) may include, but is (are) not limited to, revision(s) to: (i) implement recommendations from Southern California Coastal Water Research Project (SCCWRP), (ii) develop, refine, implement, and/or coordinate a regional monitoring program, (iii) develop and implement improved monitoring and assessment programs in keeping with San Diego Water Board Resolution No. R9-2012-0069, Resolution in Support of a Regional Monitoring Framework, and/or (iv) add provisions to require the Copermittees to evaluate and provide information on cost and values of the monitoring and reporting program.

~~**5.** The San Diego Water Board, after opportunity for public comment and a public hearing, will re-open and consider modifications to this Order when the Riverside County Copermittees submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders.~~

I. STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

Each Copermittee must comply with all the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

ATTACHMENT A

DISCHARGE PROHIBITIONS AND SPECIAL PROTECTIONS

1. Basin Plan Waste Discharge Prohibitions

California Water Code Section 13243 provides that a Regional Water Board, in a water quality control plan, may specify certain conditions or areas where the discharge of waste or certain types of waste is not permitted. The following waste discharge prohibitions in the Water Quality Control Plan for the San Diego Basin (Basin Plan) are applicable to any person, as defined by Section 13050(c) of the California Water Code, who is a citizen, domiciliary, or political agency or entity of California whose activities in California could affect the quality of waters of the state within the boundaries of the San Diego Region.

1. The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in California Water Code Section 13050, is prohibited.

2. The discharge of waste to land, except as authorized by waste discharge requirements or the terms described in California Water Code Section 13264 is prohibited.

3. The discharge of pollutants or dredged or fill material to waters of the United States except as authorized by a National Pollutant Discharge Elimination System (NPDES) permit or a dredged or fill material permit (subject to the exemption described in California Water Code Section 13376) is prohibited.

4. Discharges of recycled water to lakes or reservoirs used for municipal water supply or to inland surface water tributaries thereto are prohibited, unless this San Diego Water Board issues a NPDES permit authorizing such a discharge; the proposed discharge has been approved by the State Department of Health Services (DHS) and the operating agency of the impacted reservoir; and the discharger has an approved fail-safe long-term disposal alternative.

5. The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the San Diego Water Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

6. The discharge of waste in a manner causing flow, ponding, or surfacing on lands not owned or under the control of the discharger is prohibited, unless the discharge is authorized by the San Diego Water Board.

7. The dumping, deposition, or discharge of waste directly into waters of the state, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the San Diego Water Board.

8. Any discharge to a storm water conveyance system that is not composed entirely of "*storm water*" is prohibited unless authorized by the San Diego Water Board. [The federal regulations, 40 CFR 122.26(b)(13), define storm water as storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from firefighting activities.] [§122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

9. The unauthorized discharge of treated or untreated sewage to waters of the state or to a storm water conveyance system is prohibited.

10. The discharge of industrial wastes to conventional septic tank/subsurface disposal systems, except as authorized by the terms described in California Water Code Section 13264, is prohibited.

11. The discharge of radioactive wastes amenable to alternative methods of disposal into the waters of the state is prohibited.

12. The discharge of any radiological, chemical, or biological warfare agent into waters of the state is prohibited.

13. The discharge of waste into a natural or excavated site below historic water levels is prohibited unless the discharge is authorized by the San Diego Water Board.

14. The discharge of sand, silt, clay, or other earthen materials from any activity, including land grading and construction, in quantities which cause deleterious bottom deposits, turbidity or discoloration in waters of the state or which unreasonably affect, or threaten to affect, beneficial uses of such waters is prohibited.

15. The discharge of treated or untreated sewage from vessels to Mission Bay, Oceanside Harbor, Dana Point Harbor, or other small boat harbors is prohibited.

16. The discharge of untreated sewage from vessels to San Diego Bay is prohibited.

17. The discharge of treated sewage from vessels to portions of San Diego Bay that are less than 30 feet deep at mean lower low water (MLLW) is prohibited.

18. The discharge of treated sewage from vessels, which do not have a properly functioning US Coast Guard certified Type I or Type II marine sanitation device, to portions of San Diego Bay that are greater than 30 feet deep at mean lower low water (MLLW) is prohibited.

2. Attachment B to State Water Board Resolution 2012-0012, as amended by State Water Board Resolution No. 2012-0031.

Special Protections for Areas of Special Biological Significance (ASBS), Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges

I. PROVISIONS FOR POINT SOURCE DISCHARGES OF STORM WATER AND NONPOINT SOURCE WASTE DISCHARGES

The following terms, prohibitions, and special conditions (hereafter collectively referred to as special conditions) are established as limitations on point source storm water and nonpoint source discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in Areas of Special Biological Significance (ASBS), as required for State Water Quality Protection Areas pursuant to California Public Resources Code Sections 36700(f) and 36710(f). These Special Protections are adopted by the State Water Board as part of the California Ocean Plan (Ocean Plan) General Exception.

The special conditions are organized by category of discharge. The State Water Resources Control Board (State Water Board) and Regional Water Quality Control Boards (Regional Water Boards) will determine categories and the means of regulation for those categories [e.g., Point Source Storm Water National Pollutant Discharge Elimination System (NPDES) or Nonpoint Source].

A. PERMITTED POINT SOURCE DISCHARGES OF STORM WATER

1. General Provisions for Permitted Point Source Discharges of Storm Water

   a. Existing storm water discharges into an ASBS are allowed only under the following conditions:

      (1) The discharges are authorized by an NPDES permit issued by the State Water Board or Regional Water Board;

      (2) The discharges comply with all of the applicable terms, prohibitions, and special conditions contained in these Special Protections; and

      (3) The discharges:

         (i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

         (ii) Are designed to prevent soil erosion;

         (iii) Occur only during wet weather;

         (iv) Are composed of only storm water runoff.

   b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

c. The discharge of trash is prohibited.

d. Only discharges from existing storm water outfalls are allowed. Any proposed or new storm water runoff discharge shall be routed to existing storm water discharge outfalls and shall not result in any new contribution of waste to an ASBS (i.e., no additional pollutant loading). "Existing storm water outfalls" are those that were constructed or under construction prior to January 1, 2005. "New contribution of waste" is defined as any addition of waste beyond what would have occurred as of January 1, 2005. A change to an existing storm water outfall, in terms of re-location or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges are prohibited except as provided below:

(1) The term "non-storm water discharges" means any waste discharges from a municipal separate storm sewer system (MS4) or other NPDES permitted storm drain system to an ASBS that are not composed entirely of storm water.

(2) (i) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability or occur naturally:

(a) Discharges associated with emergency fire fighting operations.

(b) Foundation and footing drains.

(c) Water from crawl space or basement pumps.

(d) Hillside dewatering.

(e) Naturally occurring groundwater seepage via a storm drain.

(f) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(ii) An NPDES permitting authority may authorize non-storm water discharges to an MS4 with a direct discharge to an ASBS only to the extent the NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

2. Compliance Plans for Inclusion in Storm Water Management Plans (SWMP) and Storm Water Pollution Prevention Plans (SWPPP).

The discharger shall specifically address the prohibition of non-storm water runoff and the requirement to maintain natural water quality for storm water discharges to an ASBS in an ASBS Compliance Plan to be included in its SWMP or a SWPPP, as appropriate to permit type. If a statewide permit includes a SWMP, then the discharger shall prepare a stand-alone compliance plan for ASBS discharges. The ASBS Compliance Plan is subject to approval by

the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (for permits issued by Regional Water Boards).

a. The Compliance Plan shall include a map of surface drainage of storm water runoff, showing areas of sheet runoff, prioritize discharges, and describe any structural Best Management Practices (BMPs) already employed and/or BMPs to be employed in the future. Priority discharges are those that pose the greatest water quality threat and which are identified to require installation of structural BMPs. The map shall also show the storm water conveyances in relation to other features such as service areas, sewage conveyances and treatment facilities, landslides, areas prone to erosion, and waste and hazardous material storage areas, if applicable. The SWMP or SWPPP shall also include a procedure for updating the map and plan when changes are made to the storm water conveyance facilities.

b. The ASBS Compliance Plan shall describe the measures by which all non-authorized non-storm water runoff (e.g., dry weather flows) has been eliminated, how these measures will be maintained over time, and how these measures are monitored and documented.

c. For Municipal Separate Storm Sewer System (MS4s), the ASBS Compliance Plan shall require minimum inspection frequencies as follows:

(1) The minimum inspection frequency for construction sites shall be weekly during rainy season;

(2) The minimum inspection frequency for industrial facilities shall be monthly during the rainy season;

(3) The minimum inspection frequency for commercial facilities (e.g., restaurants) shall be twice during the rainy season; and

(4) Storm water outfall drains equal to or greater than 18 inches (457 mm) in diameter or width shall be inspected once prior to the beginning of the rainy season and once during the rainy season and maintained to remove trash and other anthropogenic debris.

d. The ASBS Compliance Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff, that are necessary to comply with these special conditions, will be achieved through BMPs. Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that such installation would pose a threat to health or safety. BMPs to control storm water runoff discharges (at the end-of-pipe) during a design storm shall be designed to achieve on average the following target levels:

(1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

(2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges.

The baseline for these determinations is the effective date of the Exception, except for those structural BMPs installed between January 1, 2005 and adoption of these Special Protections, and the reductions must be achieved and documented within six (6) years of the effective date.

e. The ASBS Compliance Plan shall address erosion control and the prevention of anthropogenic sedimentation in ASBS. The natural habitat conditions in the ASBS shall not be altered as a result of anthropogenic sedimentation.

f. The ASBS Compliance Plan shall describe the non-structural BMPs currently employed and planned in the future (including those for construction activities), and include an implementation schedule. The ASBS Compliance Plan shall include non-structural BMPs that address public education and outreach. Education and outreach efforts must adequately inform the public that direct discharges of pollutants from private property not entering an MS4 are prohibited. The ASBS Compliance Plan shall also describe the structural BMPs, including any low impact development (LID) measures, currently employed and planned for higher threat discharges and include an implementation schedule. To control storm water runoff discharges (at the end-of-pipe) during a design storm, permittees must first consider, and use where feasible, LID practices to infiltrate, use, or evapotranspirate storm water runoff on-site, if LID practices would be the most effective at reducing pollutants from entering the ASBS.

g. The BMPs and implementation schedule shall be designed to ensure that natural water quality conditions in the receiving water are achieved and maintained by either reducing flows from impervious surfaces or reducing pollutant loading, or some combination thereof.

h. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents in storm water runoff that alter natural ocean water quality and the sources of these constituents.

(2) The report shall describe BMPs that are currently being implemented, BMPs that are identified in the SWMP or SWPPP for future implementation, and any additional BMPs that may be added to the SWMP or SWPPP to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the BMPs.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits), the discharger shall revise its ASBS Compliance Plan to incorporate any new or modified BMPs that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised SWMP or SWPPP, the discharger does not have to repeat

the same procedure for continuing or recurring exceedances of natural ocean water quality conditions due to the same constituent.

(5) The requirements of this section are in addition to the terms, prohibitions, and conditions contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within eighteen (18) months from the effective date of the Exception, the discharger shall submit a draft written ASBS Compliance Plan to the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that describes its strategy to comply with these special conditions, including the requirement to maintain natural water quality in the affected ASBS. The ASBS Compliance Plan shall include a description of appropriate non-structural controls and a time schedule to implement structural controls (implementation schedule) to comply with these special conditions for inclusion in the discharger's SWMP or SWPPP, as appropriate to permit type. The final ASBS Compliance Plan, including a description and final schedule for structural controls based on the results of runoff and receiving water monitoring, must be submitted within thirty (30) months from the effective date of the Exception.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these special conditions shall be implemented.

d. Within six (6) years of the effective date of the Exception, any structural controls identified in the ASBS Compliance Plan that are necessary to comply with these special conditions shall be operational.

e. Within six (6) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water, pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data, and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in

compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. for municipalities, a demonstration of significant hardship to discharger ratepayers, by showing the relationship of storm water fees to annual household income for residents within the discharger's jurisdictional area, and the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or

2. for other governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

B. NONPOINT SOURCE DISCHARGES

1. General Provisions for Nonpoint Sources

a. Existing nonpoint source waste discharges are allowed into an ASBS only under the following conditions:

(1) The discharges are authorized under waste discharge requirements, a conditional waiver of waste discharge requirements, or a conditional prohibition issued by the State Water Board or a Regional Water Board.

(2) The discharges are in compliance with the applicable terms, prohibitions, and special conditions contained in these Special Protections.

(3) The discharges:

(i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

(ii) Are designed to prevent soil erosion;

(iii) Occur only during wet weather;

(iv) Are composed of only storm water runoff.

b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

c. The discharge of trash is prohibited.

d. Only existing nonpoint source waste discharges are allowed. "Existing nonpoint source waste discharges" are discharges that were ongoing prior to January 1, 2005. "New nonpoint source discharges" are defined as those that commenced on or after January 1, 2005. A change to an existing nonpoint source discharge, in terms of relocation or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges from nonpoint sources (those not subject to an NPDES Permit) are prohibited except as provided below:

(1) The term "non-storm water discharges" means any waste discharges that are not composed entirely of storm water.

(2) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability, or occur naturally:

(i) Discharges associated with emergency fire fighting operations.

(ii) Foundation and footing drains.

(iii) Water from crawl space or basement pumps.

(iv) Hillside dewatering.

(v) Naturally occurring groundwater seepage via a storm drain.

(vi) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

f. At the San Clemente Island ASBS, discharges incidental to military training and research, development, test, and evaluation operations are allowed. Discharges incidental to underwater demolition and other in-water explosions are not allowed in the two military closure areas in the vicinity of Wilson Cove and Castle Rock. Discharges must not result in a violation of the water quality objectives, including the protection of the marine aquatic life beneficial use, anywhere in the ASBS.

g. At the San Nicolas Island and Begg Rock ASBS, discharges incidental to military research, development, testing, and evaluation of, and training with, guided missile and other weapons systems, fleet training exercises, small-scale amphibious warfare training, and special warfare training are allowed. Discharges incidental to underwater demolition and other in-water explosions are not allowed. Discharges must not result in a violation of the water quality objectives, including the protection of the marine aquatic life beneficial use, anywhere in the ASBS.

h. All other nonpoint source discharges not specifically authorized above are prohibited.

2. Planning and Reporting

a. The nonpoint source discharger shall develop an ASBS Pollution Prevention Plan, including an implementation schedule, to address storm water runoff and any other nonpoint source discharges from its facilities. The ASBS Pollution Prevention Plan must be equivalent in contents to an ASBS Compliance Plan as described in I (A)(2) in this document. The ASBS Pollution Prevention Plan is subject to approval by the Executive Director of the State Water Board (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements).

b. The ASBS Pollution Prevention Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff that are necessary to comply with these special conditions, will be achieved through Management Measures and associated Management Practices (Management Measures/Practices). Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director or Regional Water Board Executive Officer that such installation would pose a threat to health or safety. Management Measures to control storm water runoff during a design storm shall achieve on average the following target levels:

(1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

(2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges.

The baseline for these determinations is the effective date of the Exception, except for those structural BMPs installed between January 1, 2005 and adoption of these Special Protections, and the reductions must be achieved and documented within six (6) years of the effective date.

c. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff or other nonpoint source pollution is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and the Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents that alter natural water quality and the sources of these constituents.

(2) The report shall describe Management Measures/Practices that are currently being implemented, Management Measures/Practices that are identified in the ASBS Pollution Prevention Plan for future implementation, and any additional Management Measures/Practices that may be added to the Pollution Prevention Plan to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the Management Measures/Practices.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge

requirements), the discharger shall revise its ASBS Pollution Prevention Plan to incorporate any new or modified Management Measures/Practices that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised ASBS Pollution Prevention Plan, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural water quality conditions due to the same constituent.

(5) The requirements of this section are in addition to the terms, prohibitions, and conditions contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within eighteen (18) months from the effective date of the Exception, the discharger~~s~~ shall submit a draft written ASBS Pollution Prevention Plan to the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) that describes its strategy to comply with these special conditions, including the requirement to maintain natural ocean water quality in the affected ASBS. The Pollution Prevention Plan shall include a description of appropriate non-structural controls and a time schedule to implement structural controls to comply with these special conditions for inclusion in the discharger's Pollution Prevention Plan. The final ASBS Pollution Prevention Plan, including a description and final schedule for structural controls based on the results of runoff and receiving water monitoring, must be submitted within thirty (30) months from the effective date of the Exception.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these Special Protections shall be implemented.

d. Within six (6) years of the effective date of the Exception, any structural controls identified in the ASBS Pollution Prevention Plan that are necessary to comply with these special conditions shall be operational.

e. Within six (6) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) may only authorize additional time to comply

with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in (d.) or (e.). The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. a demonstration that the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or

2. for governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

II. ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES

In addition to the provisions in Section I (A) or I (B), respectively, a discharger with parks and recreation facilities shall comply with the following:

A. The discharger shall include a section in an ASBS Compliance Plan (for NPDES dischargers) or an ASBS Pollution Prevention Plan (for nonpoint source dischargers) to address storm water runoff from parks and recreation facilities.

1. The plan shall identify all pollutant sources, including sediment sources, which may result in waste entering storm water runoff. Pollutant sources include, but are not limited to, roadside rest areas and vistas, picnic areas, campgrounds, trash receptacles, maintenance facilities, park personnel housing, portable toilets, leach fields, fuel tanks, roads, piers, and boat launch facilities.

2. The plan shall describe BMPs or Management Measures/Practices that will be implemented to control soil erosion (both temporary and permanent erosion controls) and reduce or eliminate pollutants in storm water runoff in order to achieve and maintain natural water quality conditions in the affected ASBS. The plan shall include BMPs or Management Measures/Practices to ensure that trails and culverts are maintained to prevent erosion and minimize waste discharges to ASBS.

3. The plan shall include BMPs or Management Measures/Practices to prevent the discharge of pesticides or other chemicals, including agricultural chemicals, in storm water runoff to the affected ASBS.

4. The plan shall include BMPs or Management Measures/Practices that address public education and outreach. The goal of these BMPs or Management Measures/Practices is to ensure that the public is adequately informed that waste discharges to the affected ASBS are prohibited or limited by special conditions in these Special Protections. The BMPs or Management Measures/Practices shall include signage at camping, picnicking, beach and roadside parking areas, and visitor centers, or other appropriate measures, which notify the public of any applicable requirements of these Special Protections and identify the ASBS boundaries.

5. The plan shall include BMPs or Management Measures/Practices that address the prohibition against the discharge of trash to ASBS. The BMPs or Management Measures/Practices shall include measures to ensure that adequate trash receptacles are available for public use at visitor facilities, including parking areas, and that the receptacles are adequately maintained to prevent trash discharges into the ASBS. Appropriate measures include covering trash receptacles to prevent trash from being wind blown and periodically emptying the receptacles to prevent overflows.

6. The plan shall include BMPs or Management Measures/Practices to address runoff from parking areas and other developed features to ensure that the runoff does not alter natural water quality in the affected ASBS. BMPs or Management Measures/Practices shall include measures to reduce pollutant loading in runoff to the ASBS through installation of natural area buffers (LID), treatment, or other appropriate measures.

B. Maintenance and repair of park and recreation facilities must not result in waste discharges to the ASBS. The practice of road oiling must be minimized or eliminated, and must not result in waste discharges to the ASBS.

III. ADDITIONAL REQUIREMENTS – WATERFRONT AND MARINE OPERATIONS

In addition to the provisions in Section I (A) or I (B), respectively, a discharger with waterfront and marine operations shall comply with the following:

A. For discharges related to waterfront and marine operations, the discharger shall develop a Waterfront and Marine Operations Management Plan (Waterfront Plan). This plan shall contain appropriate Management Measures/Practices to address nonpoint source pollutant discharges to the affected ASBS.

1. The Waterfront Plan shall contain appropriate Management Measures/Practices for any waste discharges associated with the operation and maintenance of vessels, moorings, piers, launch ramps, and cleaning stations in order to ensure that beneficial uses are protected and natural water quality is maintained in the affected ASBS.

2. For discharges from marinas and recreational boating activities, the Waterfront Plan shall include appropriate Management Measures, described in The Plan for California's Nonpoint Source Pollution Control Program, for marinas and recreational boating, or equivalent practices, to ensure that nonpoint source pollutant discharges do not alter natural water quality in the affected ASBS.

3. The Waterfront Plan shall include Management Practices to address public education and outreach to ensure that the public is adequately informed that waste discharges to the affected ASBS are prohibited or limited by special conditions in these Special Protections. The management practices shall include appropriate signage, or similar measures, to inform the public of the ASBS restrictions and to identify the ASBS boundaries.

4. The Waterfront Plan shall include Management Practices to address the prohibition against trash discharges to ASBS. The Management Practices shall include the provision of adequate trash receptacles for marine recreation areas, including parking areas, launch ramps, and docks. The plan shall also include appropriate Management Practices to ensure that the receptacles are adequately maintained and secured in order to prevent trash discharges into the ASBS. Appropriate Management Practices include covering the trash receptacles to prevent trash from being windblown, staking or securing the trash receptacles so they don't tip over, and periodically emptying the receptacles to prevent overflow.

5. The discharger shall submit its Waterfront Plan to the by the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) within six months of the effective date of these special conditions. The Waterfront Plan is subject to approval by the State Water Board Executive Director or the Regional Water Board Executive Officer, as appropriate. The plan must be fully implemented within 18 months of the effective date of the Exception.

B. The discharge of chlorine, soaps, petroleum, other chemical contaminants, trash, fish offal, or human sewage to ASBS is prohibited. Sinks and fish cleaning stations are point source discharges of wastes and are prohibited from discharging into ASBS. Anthropogenic accumulations of discarded fouling organisms on the sea floor must be minimized.

C. Limited-term activities, such as the repair, renovation, or maintenance of waterfront facilities, including, but not limited to, piers, docks, moorings, and breakwaters, are authorized only in accordance with Chapter III.E.2 of the Ocean Plan.

D. If the discharger anticipates that the discharger will fail to fully implement the approved Waterfront Plan within the 18 month deadline, the discharger shall submit a technical report as soon as practicable to the State Water Board Executive Director or the Regional Water Board Executive Officer, as appropriate. The technical report shall contain reasons for failing to meet the deadline and propose a revised schedule to fully implement the plan.

E. The State Water Board or the Regional Water Board may, for good cause, authorize additional time to comply with the Waterfront Plan. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in Section III.A.5. The notice shall

describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality. The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. a demonstration of significant hardship by showing that the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate.

2. for governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

IV. MONITORING REQUIREMENTS

Monitoring is mandatory for all dischargers to assure compliance with the Ocean Plan. Monitoring requirements include both: (A) core discharge monitoring, and (B) ocean receiving water monitoring. The State and Regional Water Boards must approve sampling site locations and any adjustments to the monitoring programs. All ocean receiving water and reference area monitoring must be comparable with the Water Boards' Surface Water Ambient Monitoring Program (SWAMP).

Safety concerns: Sample locations and sampling periods must be determined considering safety issues. Sampling may be postponed upon notification to the State and Regional Water Boards if hazardous conditions prevail.

Analytical Chemistry Methods: All constituents must be analyzed using the lowest minimum detection limits comparable to the Ocean Plan water quality objectives. For metal analysis, all samples, including storm water effluent, reference samples, and ocean receiving water samples, must be analyzed by the approved analytical method with the lowest minimum detection limits (currently Inductively Coupled Plasma/Mass Spectrometry) described in the Ocean Plan.

A. CORE DISCHARGE MONITORING PROGRAM

1. General sampling requirements for timing and storm size:

   Runoff must be collected during a storm event that is greater than 0.1 inch and generates runoff, and at least 72 hours from the previously measurable storm event. Runoff samples shall be collected during the same storm and at approximately the same time when post-storm receiving water is sampled, and analyzed for the same constituents as receiving water and reference site samples (see section IV B) as described below.

2. Runoff flow measurements

   a. For municipal/industrial storm water outfalls in existence as of December 31, 2007,

18 inches (457mm) or greater in diameter/width (including multiple outfall pipes in combination having a width of 18 inches, runoff flows must be measured or calculated, using a method acceptable to and approved by the State and Regional Water Boards.

b. This will be reported annually for each precipitation season to the State and Regional Water Boards.

3. Runoff samples – storm events

a. For outfalls equal to or greater than 18 inches (0.46m) in diameter or width:

(1) samples of storm water runoff shall be collected during the same storm as receiving water samples and analyzed for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

(2) samples of storm water runoff shall be collected and analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

(3) If an applicant has no outfall greater than 36 inches, then storm water runoff from the applicant's largest outfall shall be further collected during the same storm as receiving water samples and analyzed for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates).

b. For outfalls equal to or greater than 36 inches (0.91m) in diameter or width:

(1) samples of storm water runoff shall be collected during the same storm as receiving water samples and analyzed for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

(2) samples of storm water runoff shall be further collected during the same storm as receiving water samples and analyzed for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates); and

(3) samples of storm water runoff shall be collected and analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

c. For an applicant not participating in a regional monitoring program [see below in Section IV (B)] in addition to (a.) and (b.) above, a minimum of the two largest outfalls or 20 percent of the larger outfalls, whichever is greater, shall be sampled (flow weighted composite samples) at least three times annually during wet weather (storm event) and analyzed for all Ocean Plan Table A constituents, Table B constituents for marine

aquatic life protection (except for toxicity, only chronic toxicity for three species shall be required), DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, and Ocean Plan indicator bacteria. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one (the largest) such discharge shall be sampled annually in each Region.

4. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may reduce or suspend core monitoring once the storm runoff is fully characterized. This determination may be made at any point after the discharge is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

B. Ocean Receiving Water and Reference Area Monitoring Program

In addition to performing the Core Discharge Monitoring Program in Section II.A above, all applicants having authorized discharges must perform ocean receiving water monitoring. In order to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS, dischargers may choose either (1) an individual monitoring program, or (2) participation in a regional integrated monitoring program.

1. Individual Monitoring Program: The requirements listed below are for those dischargers who elect to perform an individual monitoring program to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within the affected ASBS. In addition to Core Discharge Monitoring, the following additional monitoring requirements shall be met:

   a. Three times annually, during wet weather (storm events), the receiving water at the point of discharge from the outfalls described in section (IV)(A)(3)(c) above shall be sampled and analyzed for Ocean Plan Table A constituents, Table B constituents for marine aquatic life, DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, salinity, chronic toxicity (three species), and Ocean Plan indicator bacteria.

      The sample location for the ocean receiving water shall be in the surf zone at the point of discharges; this must be at the same location where storm water runoff is sampled. Receiving water shall be sampled prior to (pre-storm) and during (or immediately after) the same storm (post storm). Post storm sampling shall be during the same storm and at approximately the same time as when the runoff is sampled. Reference water quality shall also be sampled three times annually and analyzed for the same constituents pre-storm and post-storm, during the same storm seasons when receiving water is sampled. Reference stations will be determined by the State Water Board's Division of Water Quality and the applicable Regional Water Board(s).

   b. Sediment sampling shall occur at least three times during every five (5) year period. The subtidal sediment (sand or finer, if present) at the discharge shall be sampled and analyzed for Ocean Plan Table B constituents for marine aquatic life, DDT, PCBs, PAHs, pyrethroids, and OP pesticides. For sediment toxicity testing, only an acute toxicity test using the amphipod *Eohaustorius estuarius* must be performed.

c. A quantitative survey of intertidal benthic marine life shall be performed at the discharge and at a reference site. The survey shall be performed at least once every five (5) year period. The survey design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The results of the survey shall be completed and submitted to the State Water Board and Regional Water Board at least six months prior to the end of the permit cycle.

d. Once during each five (5) year period, a bioaccumulation study shall be conducted to determine the concentrations of metals and synthetic organic pollutants at representative discharge sites and at representative reference sites. The study design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The bioaccumulation study may include California mussels (*Mytilus californianus*) and/or sand crabs (*Emerita analoga* or *Blepharipoda occidentalis*). Based on the study results, the Regional Water Board and the State Water Board's Division of Water Quality, may adjust the study design in subsequent permits, or add or modify additional test organisms (such as shore crabs or fish), or modify the study design appropriate for the area and best available sensitive measures of contaminant exposure.

e. Marine Debris: Representative quantitative observations for trash by type and source shall be performed along the coast of the ASBS within the influence of the discharger's outfalls. The design, including locations and frequency, of the marine debris observations is subject to approval by the Regional Water Board and State Water Board's Division of Water Quality.

f. The monitoring requirements of the Individual Monitoring Program in this section are minimum requirements. After a minimum of one (1) year of continuous water quality monitoring of the discharges and ocean receiving waters, the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may require additional monitoring, or adjust, reduce or suspend receiving water and reference station monitoring. This determination may be made at any point after the discharge and receiving water is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

2. Regional Integrated Monitoring Program: Dischargers may elect to participate in a regional integrated monitoring program, in lieu of an individual monitoring program, to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS. This regional approach shall characterize natural water quality, pre- and post-storm, in ocean reference areas near the mouths of identified open space watersheds and the effects of the discharges on natural water quality (physical, chemical, and toxicity) in the ASBS receiving waters, and should include benthic marine aquatic life and bioaccumulation components. The design of the ASBS stratum of a regional integrated monitoring program may deviate from the otherwise prescribed individual monitoring approach (in Section IV.B.1) if approved by the State Water Board's Division of Water Quality and the Regional Water Boards.

a. Ocean reference areas shall be located at the drainages of flowing watersheds with minimal development (in no instance more than 10% development), and shall not be located in CWA Section 303(d) listed waterbodies or have tributaries that are 303(d) listed. Reference areas shall be free of wastewater discharges and anthropogenic non- storm water runoff. A minimum of low threat storm runoff discharges (e.g.

stream highway overpasses and campgrounds) may be allowed on a case-by-case basis. Reference areas shall be located in the same region as the ASBS receiving water monitoring occurs. The reference areas for each Region are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean reference water samples must be collected from each station, each from a separate storm during the same storm season that receiving water is sampled. A minimum of one reference location shall be sampled for each ASBS receiving water site sampled per responsible party. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

b. ASBS ocean receiving water must be sampled in the surf zone at the location where the runoff makes contact with ocean water (i.e. at "point zero"). Ocean receiving water stations must be representative of worst-case discharge conditions (i.e. co-located at a large drain greater than 36 inches, or if drains greater than 36 inches are not present in the ASBS then the largest drain greater than18 inches.) Ocean receiving water stations are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean receiving water samples must be collected during each storm season from each station, each from a separate storm. A minimum of one receiving water location shall be sampled in each ASBS per responsible party in that ASBS. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

c. Reference and receiving water sampling shall commence during the first full storm season following the adoption of these special conditions, and post-storm samples shall be collected during the same storm event when storm water runoff is sampled. Sampling shall occur in a minimum of two storm seasons. For those ASBS dischargers that have already participated in the Southern California Bight 2008 ASBS regional monitoring effort, sampling may be limited to only one storm season.

d. Receiving water and reference samples shall be analyzed for the same constituents as storm water runoff samples. At a minimum, constituents to be sampled and analyzed in reference and discharge receiving waters must include oil and grease, total suspended solids, Ocean Plan Table B metals for protection of marine life, Ocean Plan PAHs, pyrethroids, OP pesticides, ammonia, nitrate, phosphates, and critical life stage chronic toxicity for three species. In addition, within the range of the southern sea otter, indicator bacteria or some other measure of fecal contamination shall be analyzed.

3. Waterfront and Marine Operations: In addition to the above requirements for ocean receiving water monitoring, additional monitoring must be performed for marinas and boat launch and pier facilities:

a. For all marina or mooring field operators, in mooring fields with 10 or more occupied moorings, the ocean receiving water must be sampled for Ocean Plan indicator bacteria, residual chlorine, copper, zinc, grease and oil, methylene blue active substances (MBAS), and ammonia nitrogen.

(1) For mooring field operators opting for an individual monitoring program (Section IV.B.1 above), this sampling must occur weekly (on the weekend) from May through October.

(2) For mooring field operators opting to participate in a regional integrated monitoring program (Section IV.B.2 above), this sampling must occur monthly from May through October on a high use weekend in each month. The Water Boards may allow a reduction in the frequency of sampling, through the regional monitoring program, after the first year of monitoring.

b. For all mooring field operators, the subtidal sediment (sand or finer, if present) within mooring fields and below piers shall be sampled and analyzed for Ocean Plan Table B metals (for marine aquatic life beneficial use), acute toxicity, PAHs, and tributyltin. For sediment toxicity testing, only an acute toxicity test using the amphipod *Eohaustorius estuarius* must be performed. This sampling shall occur at least three times during a five (5) year period. For mooring field operators opting to participate in a regional integrated monitoring program, the Water Boards may allow a reduction in the frequency of sampling after the first sampling effort's results are assessed.

Glossary

At the point of discharge(s) – Means in the surf zone immediately where runoff from an outfall meets the ocean water (a.k.a., at point zero).

Areas of Special Biological Significance (ASBS) – Those areas designated by the State Water Board as ocean areas requiring protection of species or biological communities to the extent that alteration of natural water quality is undesirable. All Areas of Special Biological Significance are also classified as a subset of State Water Quality Protection Areas.

Design storm – For purposes of these Special Protections, a design storm is defined as the volume of runoff produced from one inch of precipitation per day or, if this definition is inconsistent with the discharger's applicable storm water permit, then the design storm shall be the definition included in the discharger's applicable storm water permit.

Development – Relevant to reference monitoring sites, means urban, industrial, agricultural, grazing, mining, and timber harvesting land uses.

Higher threat discharges - Permitted storm drains discharging equal to or greater than 18 inches, industrial storm drains, agricultural runoff discharged through an MS4, discharges associated with waterfront and marina operations (e.g., piers, launch ramps, mooring fields, and associated vessel support activities, except for passive discharges defined below), and direct discharges associated with commercial or industrial activities to ASBS.

Low Impact Development (LID) – A sustainable practice that benefits water supply and contributes to water quality protection. Unlike traditional storm water management, which entails collecting and conveying storm water runoff through storm drains, pipes, or other conveyances to a centralized storm water facility, LID focuses on using site design and storm water management to maintain the site's pre-development runoff rates and volumes. The goal of LID is to mimic a site's predevelopment hydrology by using design techniques that infiltrate, filter, store, evaporate, and detain runoff close to the source of rainfall.

Marine Operations – Marinas or mooring fields that contain slips or mooring locations for 10 or more vessels.

Management Measure (MM) - Economically achievable measures for the control of the addition of pollutants from various classes of nonpoint sources of pollution, which reflect the greatest degree of pollutant reduction achievable through the application of the best available nonpoint pollution control practices, technologies, processes, siting criteria, operating methods, or other alternatives. For example, in the "marinas and recreational boating" land- use category specified in the Plan for California's Nonpoint Source Pollution Control Program (NPS Program Plan) (SWRCB, 1999), "boat cleaning and maintenance" is considered a MM or the source of a specific class or type of NPS pollution.

Management Practice (MP) - The practices (e.g., structural, non-structural, operational, or other alternatives) that can be used either individually or in combination to address a specific MM class or classes of NPS pollution. For example, for the "boat cleaning and maintenance" MM, specific MPs can include, but are not limited to, methods for the selection of environmentally sensitive hull paints or methods for cleaning/removal of hull copper anti- fouling paints.

Municipal Separate Storm Sewer System (MS4) – A municipally-owned storm sewer system regulated under the Phase I or Phase II storm water program implemented in compliance with Clean Water Act section 402(p). Note that an MS4 program's boundaries are not necessarily congruent with the permittee's political boundaries.

Natural Ocean Water Quality - The water quality (based on selected physical, chemical and biological characteristics) that is required to sustain marine ecosystems, and which is without apparent human influence, *i.e.*, an absence of significant amounts of: (a) man-made constituents (*e.g.,* DDT); (b) other chemical (*e.g.,* trace metals), physical (temperature/thermal pollution, sediment burial), and biological (*e.g.*, bacteria) constituents at concentrations that have been elevated due to man's activities above those resulting from the naturally occurring processes that affect the area in question; and (c) non-indigenous biota (*e.g.,* invasive algal bloom species) that have been introduced either deliberately or accidentally by man. Discharges "*shall not alter natural ocean water quality*" as determined by a comparison to the range of constituent concentrations in reference areas agreed upon via the regional monitoring program(s). If monitoring information indicates that *natural ocean water quality* is not maintained, but there is sufficient evidence that a discharge is not contributing to the alteration of natural water quality, then the Regional Water Board may make that determination. In this case, sufficient information must include runoff sample data that has equal or lower concentrations for the range of constituents at the applicable reference area(s).

Nonpoint source – Nonpoint pollution sources generally are sources that do not meet the definition of a point source. Nonpoint source pollution typically results from land runoff, precipitation, atmospheric deposition, agricultural drainage, marine/boating operations or hydrologic modification. Nonpoint sources, for purposes of these Special Protections, include discharges that are not required to be regulated under an NPDES permit.

Non-storm water discharge – Any runoff that is not the result of a precipitation event. This is often referred to as "dry weather flow."

Non-structural control – A Best Management Practice that involves operational, maintenance, regulatory (e.g., ordinances) or educational activities designed to reduce or eliminate pollutants in runoff, and that are not structural controls (i.e. there are no physical structures involved).

Physical impossibility - Means any act of God, war, fire, earthquake, windstorm, flood or natural catastrophe; unexpected and unintended accidents not caused by discharger or its employees' negligence; civil disturbance, vandalism, sabotage or terrorism; restrain by court order or public authority or agency; or action or non-action by, or inability to

obtain the necessary authorizations or approvals from any governmental agency other than the permittee.

Representative sites and monitoring procedures – Are to be proposed by the discharger, with appropriate rationale, and subject to approval by Water Board staff.

Sheet-flow – Runoff that flows across land surfaces at a shallow depth relative to the cross- sectional width of the flow. These types of flow may or may not enter a storm drain system before discharge to receiving waters.

Storm Season – Also referred to as rainy season, means the months of the year from the onset of rainfall during autumn until the cessation of rainfall in the spring.

Structural control – A Best Management Practice that involves the installation of engineering solutions to the physical treatment or infiltration of runoff.

Surf Zone - The surf zone is defined as the submerged area between the breaking waves and the shoreline at any one time.

Surface Water Ambient Monitoring Program (SWAMP) comparable – Means that the monitoring program must 1) meet or exceed 2008 SWAMP Quality Assurance Program Management Plan (QAPP) Measurement Quality Objectives, or 2) have a Quality Assurance Project Plan that has been approved by SWAMP; in addition data must be formatted to match the database requirements of the SWAMP Information Management System. Adherence to the measurement quality objectives in the Southern California Bight 2008 ASBS Regional Monitoring Program QAPP and data base management comprises being SWAMP comparable.

Waterfront Operations - Piers, launch ramps, and cleaning stations in the water or on the adjacent shoreline.

Attachment 1
Special Protections Sections I(A)(3)(e) and I(B)(3)(e)
Flowchart to Determine Compliance with natural Water Quality

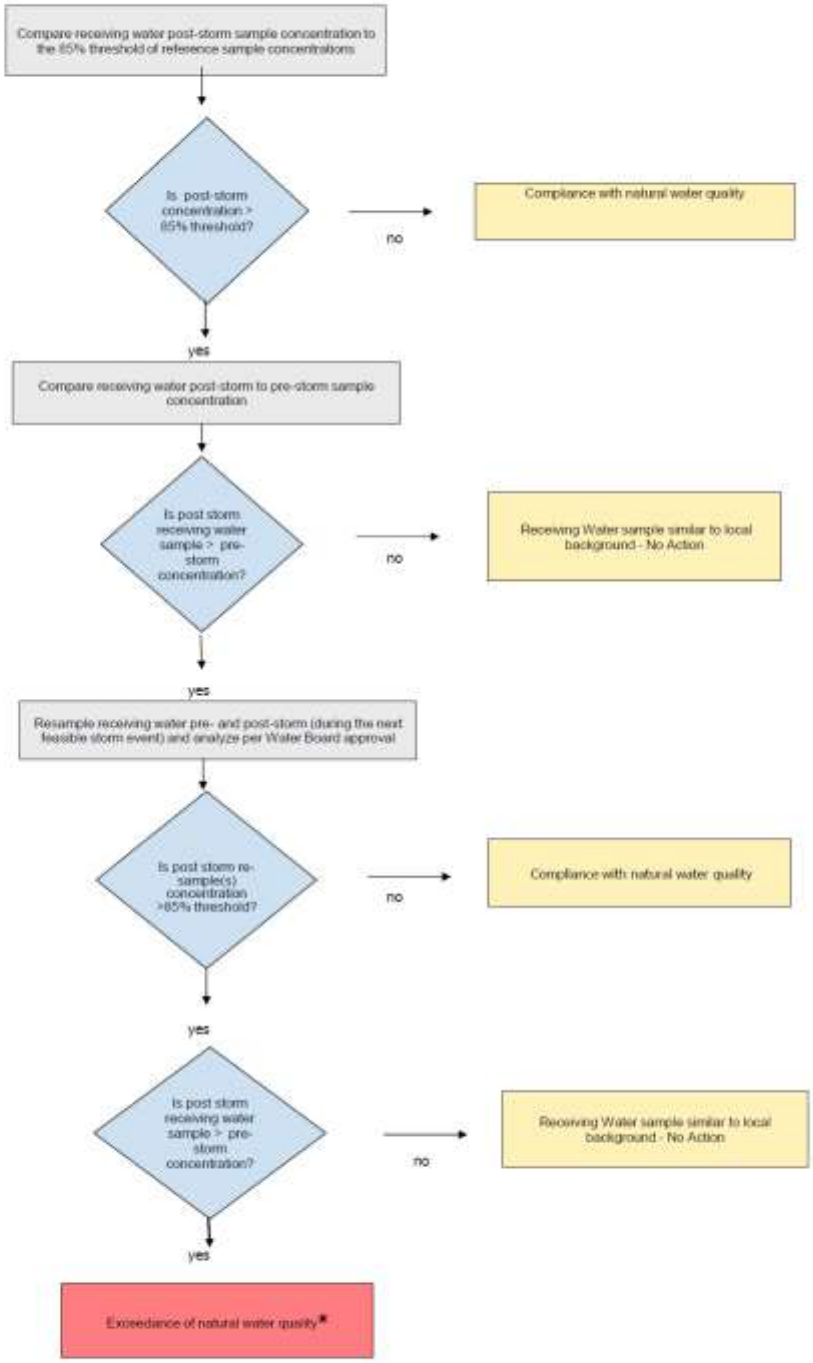

*** When an exceedance of natural water quality occurs, the discharger must comply with section I.A.2.h (for permitted storm water) or section I.B.2.c (for nonpoint sources). Note, when sampling data is available, end-of-pipe effluent concentrations will be considered by the Water Boards in making this determination.**

ATTACHMENT B

STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

1. Standard Permit Provisions

Code of Federal Regulations Title 40 Section 122.41 (40 CFR 122.41) includes conditions, or provisions, that apply to all National Pollutant Discharge Elimination System (NPDES) permits. Additional provisions applicable to NPDES permits are in 40 CFR 122.42. All applicable provisions in 40 CFR 122.41 and 40 CFR 122.42 must be incorporated into this Order and NPDES permit. The applicable 40 CFR 122.41 and 40 CFR 122.42 provisions are as follows:

a. DUTY TO COMPLY [40 CFR 122.41(a)]

The Copermittee must comply with all of the provisions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

(1) The Copermittee must comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement. [40 CFR 122.41(a)(1)]

(2) The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to a civil penalty not to exceed $25,000 per day for each violation. The CWA provides that any person who *negligently* violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than 2 years, or both. Any person who *knowingly* violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both. Any person who knowingly violates Section 301, 302, 303, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, and who knows at that time that he thereby places another person in imminent

danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.
[40 CFR 122.41(a)(2)]

(3) Any person may be assessed an administrative penalty by the San Diego Regional Water Quality Control Board (San Diego Water Board), State Water Resources Control Board (State Water Board), or United States Environmental Protection Agency (USEPA) for violating Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.
[40 CFR 122.41(a)(3)]

b. DUTY TO REAPPLY [40 CFR 122.41(b)]

If a Copermittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Copermittee must apply for and obtain a new permit.

c. NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE [40 CFR 122.41(c)]

It shall not be a defense for a Copermittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

d. DUTY TO MITIGATE [40 CFR 122.41(d)]

The Copermittee must take all reasonable steps to minimize or prevent any discharge or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

e. PROPER OPERATION AND MAINTENANCE [40 CFR 122.41(e)]

The Copermittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Copermittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by a Copermittee only when the operation is necessary to achieve compliance with the conditions of this permit.

f. PERMIT ACTIONS [40 CFR 122.41(f)]

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Copermittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

g. PROPERTY RIGHTS [40 CFR 122.41(g)]

This permit does not convey any property rights of any sort, or any exclusive privilege.

h. DUTY TO PROVIDE INFORMATION [40 CFR 122.41(h)]

The Copermittee must furnish to the San Diego Water Board, State Water Board, or USEPA within a reasonable time, any information which the San Diego Water Board, State Water Board, or USPEA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Copermittee must also furnish to the San Diego Water Board, State Water Board, or USPEA upon request, copies of records required to be kept by this permit.

i. INSPECTION AND ENTRY [40 CFR 122.41(i)]

The Copermittee must allow the San Diego Water Board, State Water Board, USEPA, and/or their authorized representative (including an authorized contractor acting as their representative), upon presentation of credentials and other documents as may be required by law, to:

(1) Enter upon the Copermittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit; [40 CFR 122.41(i)(1)]

(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit; [40 CFR 122.41(i)(2)]

(3) Inspect and photograph at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; [40 CFR 122.41(i)(3)] and

(4) Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location. [40 CFR 122.41(i)(4)]

j. MONITORING AND RECORDS [40 CFR 122.41(j)]

(1) Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity. [40 CFR 122.41(j)(1)]

(2) Except for records of monitoring information required by this permit related to the Copermittee's sewage sludge use and disposal activities, which shall be retained for

a period of at least five (5) years (or longer as required by 40 CFR Part 503), the Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time. [40 CFR 122.41(j)(2)]

(3) Records for monitoring information must include: [40 CFR 122.41(j)(3)]

(a) The date, exact place, and time of sampling or measurements; [40 CFR 122.41(j)(3)(i)]
(b) The individual(s) who performed the sampling or measurements; [40 CFR 122.41(j)(3)(ii)]
(c) The date(s) analyses were performed; [40 CFR 122.41(j)(3)(iii)]
(d) The individual(s) who performed the analyses; [40 CFR 122.41(j)(3)(iv)]
(e) The analytical techniques or methods used; [40 CFR 122.41(j)(3)(v)] and
(f) The results of such analyses. [40 CFR 122.41(j)(3)(vi)]

(4) Monitoring must be conducted according to test procedures under 40 CFR Part 136 unless another method is required under 40 CFR Subchapters N or O. [40 CFR 122.41(j)(4)]

In the case of pollutants for which there are no approved methods under 40 CFR Part 136 or otherwise required under 40 CFR Subchapters N and O, monitoring must be conducted according to a test procedure specified in the permit for such pollutants. [40 CFR 122.44(i)(1)(iv)]

(5) The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. [40 CFR 122.41(j)(5)]

k. SIGNATORY REQUIREMENT [40 CFR 122.41(k)]

(1) All applications, reports, or information submitted to the San Diego Water Board, State Water Board, or USEPA must be signed and certified. (See 40 CFR 122.22) [40 CFR 122.41(k)(1)]

(a) *For a municipality, State, Federal, or other public agency.* [All applications must be signed] by either a principal executive officer or ranking elected official. [40 CFR 122.22(a)(3)]

(b) All reports required by permits, and other information requested by the San Diego Water Board, State Water Board, or USEPA must be signed by a person described in paragraph (a) of this section, or by a duly authorized

representative of that person. A person is a duly authorized representative only if: [40 CFR 122.22(b)]

(i) The authorization is made in writing by a person described in paragraph (a) of this section; [40 CFR 122.22(b)(1)]

(ii) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company, (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) [40 CFR 122.22(b)(2)] and,

(iii) The written authorization is submitted to the San Diego Water Board and State Water Board. [40 CFR 122.22(b)(3)]

(c) *Changes to authorization.* If an authorization under paragraph (b) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (b) of this section must be submitted to the San Diego Water Board prior to or together with any reports, information, or applications to be signed by an authorized representative. [40 CFR 122.22(c)]

(d) *Certification.* Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." [40 CFR 122.22(d)]

(2) The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both. [40 CFR 122.41(k)(2)]

I. REPORTING REQUIREMENTS [40 CFR 122.41(l)]

(1) *Planned changes.* The Copermittee must give notice to the San Diego Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when: [40 CFR 122.41(l)(1)]

(a) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); [40 CFR 122.41(l)(1)(i)] or

(b) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1). [40 CFR 122.41(l)(1)(ii)]

(c) The alteration or addition results in a significant change in the Copermittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. [40 CFR 122.41(l)(1)(iii)]

(2) *Anticipated noncompliance*. The Copermittee must give advance notice to the San Diego Water Board or State Water Board of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements. [40 CFR 122.41(l)(2)]

(3) *Transfers*. This permit is not transferable to any person except after notice to the San Diego Water Board. The San Diego Water Board may require modification or revocation and reissuance of the permit to change the name of the Copermittee and incorporate such other requirements as may be necessary under the CWA. [40 CFR 122.41(l)(3)]

(4) *Monitoring reports.* Monitoring results must be reported at the intervals specified elsewhere in this permit. [40 CFR 122.41(l)(4)]

(a) Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the San Diego Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices. [40 CFR 122.41(l)(4)(i)]

(b) If the Copermittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or another method required for an industry-specific waste stream under 40 CFR Subchapters N or O, the results of this monitoring must be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the San Diego Water Board or State Water Board. [40 CFR 122.41(l)(4)(ii)]

(c) Calculations for all limitations which require averaging of measurements must utilize an arithmetic mean unless otherwise specified in the permit. [40 CFR 122.41(l)(4)(iii)]

(5) *Compliance schedules*. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date. [40 CFR 122.41(l)(5)]

(6) *Twenty-four hour reporting.*

(a) The Copermittee must report any noncompliance that may endanger health or the environment. Any information must be provided orally within 24 hours from the time the Copermittee becomes aware of the circumstances. A written submission must also be provided within five (5) days of the time the Copermittee becomes aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6)(i)]

(b) The following must be included as information which must be reported within 24 hours under this paragraph: [40 CFR 122.41(l)(6)(ii)]

(i) Any unanticipated bypass that exceeds any effluent limitation in the permit (See 40 CFR 122.41(g)). [40 CFR 122.41(l)(6)(ii)(A)]
(ii) Any upset which exceeds any effluent limitation in the permit. [40 CFR 122.41(l)(6)(ii)(B)] and,
(iii) Violation of a maximum daily discharge limitation for any of the pollutants listed by the San Diego Water Board in the permit to be reported within 24 hours. (See 40 CFR 122.44(g)) [40 CFR 122.41(l)(6)(ii)(C)]

(c) The San Diego Water Board may waive the above-required written report on a case-by-case basis if the oral report has been received within 24 hours. [40 CFR 122.41(l)(6)(iii)]

(7) *Other noncompliance.* The Copermittee must report all instances of noncompliance not reported in accordance with the standard provisions required under 40 CFR 122.41(l)(4), (5), and (6), at the time monitoring reports are submitted. The reports must contain the information listed in the standard provisions required under 40 CFR 122.41(l)(6). [40 CFR 122.41(l)(7))]

(8) *Other information.* When the Copermittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the San Diego Water Board, State Water Board, or USEPA, the Copermittee must promptly submit such facts or information. [40 CFR 122.41(l)(8)]

m. BYPASS [40 CFR 122.41(m)]

(1) *Definitions.*

(a) "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. [40 CFR 122.41(m)(1)(i)] or

(b) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or

substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
[40 CFR 122.41(m)(1)(ii)]

(2) *Bypass not exceeding limitations*. The Copermittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the standard provisions required under 40 CFR 122.41(m)(3) and (4).
[40 CFR 122.41(m)(2)]

(3) *Notice.*

(a) *Anticipated bypass*. If the Copermittee knows in advance of the need for a bypass, it must submit a notice, if possible at least ten days before the date of the bypass. [40 CFR 122.41(m)(3)(i)] or

(b) *Unanticipated bypass*. The Copermittee must submit notice of an unanticipated bypass in accordance with the standard provisions required under 40 CFR 122.41(l)(6) (24-hour notice).
[40 CFR 122.41(m)(3)(ii)]

(4) *Prohibition of Bypass.*

(a) Bypass is prohibited, and the San Diego Water Board may take enforcement action against a Copermittee for bypass, unless:
[40 CFR 122.41(m)(4)(i)]

(i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; [40 CFR 122.41(m)(4)(i)(A)]

(ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance;
[40 CFR 122.41(m)(4)(i)(B)] and,

(iii) The Copermittee submitted notice in accordance with the standard provisions required under 40 CFR 122.41(m)(3).
[40 CFR 122.41(m)(4)(i)(C)]

(b) The San Diego Water Board may approve an anticipated bypass, after considering its adverse effects, if the San Diego Water Board determines that it will meet the three conditions listed above.
[40 CFR 122.41(m)(4)(ii)]

n. UPSET [40 CFR 122.41(n)]

(1) *Definition.* "Upset" means an exceptional incident in which there is unintentional and

temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Copermittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. [40 CFR 122.41(n)(1)]

(2) *Effect of an upset*. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the standard provisions required under 40 CFR 122.41(n)(3) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. [40 CFR 122.41(n)(2)]

(3) *Conditions necessary for a demonstration of upset*. A Copermittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that: [40 CFR 122.41(n)(3)]

(a) An upset occurred and that the Copermittee can identify the cause(s) of the upset; [40 CFR 122.41(n)(3)(i)]
(b) The permitted facility was at the time being properly operated; [40 CFR 122.41(n)(3)(ii)] and
(c) The Copermittee submitted notice of the upset in accordance with the standard provisions required under 40 CFR 122.41(l)(6)(ii)(B) (24-hour notice). [40 CFR 122.41(n)(3)(iii)]
(d) The Copermittee complied with any remedial measures pursuant to the standard provisions required under 40 CFR 122.41(d). [40 CFR 122.41(n)(3)(iii)]

(4) *Burden of proof*. In any enforcement proceeding, the Copermittee seeking to establish the occurrence of an upset has the burden of proof. [40 CFR 122.41(n)(4)]

o. STANDARD PERMIT PROVISIONS FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS [40 CFR 122.42(c)]

The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the San Diego Water Board or State Water Board under 40 CFR 122.26(a)(1)(v) must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report must include:

(1) The status of implementing the components of the storm water management program that are established as permit conditions; [40 CFR 122.42(c)(1)]

(2) Proposed changes to the storm water management programs that are established as permit conditions. Such proposed changes must be consistent with 40 CFR 122.26(d)(2)(iii); [40 CFR 122.42(c)(2)] and

(3) Revisions, if necessary, to the assessment of controls and the fiscal analysis

reported in the permit application under 40 CFR 122.26(d)(2)(iv) and (v); [40 CFR 122.42(c)(3)]

(4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; [40 CFR 122.42(c)(4)]

(5) Annual expenditures and budget for year following each annual report; [40 CFR 122.42(c)(5)]

(6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; [40 CFR 122.42(c)(6)]

(7) Identification of water quality improvements or degradation. [40 CFR 122.42(c)(7)]

p. STANDARD PERMIT PROVISIONS FOR STORM WATER DISCHARGES [40 CFR 122.42(d)]

The initial permits for discharges composed entirely of storm water issued pursuant to 40 CFR 122.26(e)(7) must require compliance with the conditions of the permit as expeditiously as practicable, but in no event later than three years after the date of issuance of the permit.

2. General Provisions

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. The general provisions applicable to this Order and NPDES permit are as follows:

a. DISCHARGE OF WASTE IS A PRIVILEGE

No discharge of waste into the waters of the State, whether or not such discharge is made pursuant to waste discharge requirements, shall create a vested right to continue such discharge. All discharges of waste into waters of the State are privileges, not rights. [CWC Section 13263(g)]

b. DURATION OF ORDER AND NPDES PERMIT

(1) *Effective date*. This Order supersedes Order No. R9-2007-0001 for the San Diego County Copermittees listed in Table ~~2.~~1a and became effective on June 27, 2013~~ for those Copermittees~~. This Order as amended by Order R9-2015-0001 supersedes Order No. R9-2009-0002 for the Orange County Copermittees listed in Table 1b and its amendments through Order No. R9-2015-0001 ~~becomes~~ became effective April 1, 2015~~, following the date Order No. R9-2015-0001 is adopted~~. This Order as amended by Order Nos. R9-2015-0001 and R9-2015-0100 supersedes Order No. R9-2010-0016 for the Riverside County Copermittees listed in Table 1c and its amendments through Order No. R9-2015-0100 became effective January 7, 2016. ~~upon further amendment or earlier notice of coverage.~~

(2) *Expiration*. This Order and NPDES permit expires five years after June 27, 2013, its initial effective date. [40 CFR 122.46(a)]

(3) *Continuation of expired order*. After this Order and NPDES permit expires, the terms and conditions of this Order and NPDES permit are automatically continued pending issuance of a new permit if all requirements of the federal NPDES regulations on the continuation of expired permits (40 CFR 122.6) are complied with.

c. AVAILABILITY

A copy of this Order must be kept at a readily accessible location and must be available to on-site personnel at all times.

d. CONFIDENTIALITY OF INFORMATION

Except as provided for in 40 CFR 122.7, no information or documents submitted in accordance with or in application for this Order will be considered confidential, and all such information and documents shall be available for review by the public at the San Diego Water Board office.

Claims of confidentiality for the following information will be denied:
[40 CFR 122.7(b)]

(1) The name and address of any permit applicant or Copermittee; [40 CFR 122.7(b)(1)] and

(2) Permit applications and attachments, permits, and effluent data. [40 CFR 122.7(b)(2)]

e. EFFLUENT LIMITATIONS

(1) *Interim effluent limitations*. The Copermittee must comply with any interim effluent limitations as established by addendum, enforcement action, or revised waste discharge requirements which have been, or may be, adopted by the San Diego Water Board.

(2) *Other effluent limitations and standards*. If any applicable toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant and that standard or prohibition is more stringent than any limitation on the pollutant in the permit, the San Diego Water Board shall institute proceedings under these regulations to modify or revoke and reissue the permit to conform to the toxic effluent standard or prohibition. [40 CFR 122.44(b)(1)]

f. DUTY TO MINIMIZE OR CORRECT ADVERSE IMPACTS

The Copermittee must take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this Order, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the noncompliance.

g. PERMIT ACTIONS

The filing of a request by the Copermittee for modification, revocation and reissuance, or termination of this Order, or a notification of planned change in or anticipated noncompliance with this Order does not stay any condition of this Order. (See 40 CFR 122.41(f)) In addition, the following provisions apply to this Order:

(1) Upon application by any affected person, or on its own motion, the San Diego Water Board may review and revise the requirements in this Order. All requirements must be reviewed periodically. [CWC Section 13263(e)]

(2) This Order may be terminated or modified for cause, including, but not limited to, all of the following: [CWC Section 13381]

(a) Violation of any condition contained in the requirements of this Order. [CWC Section 13381(a)]

(b) Obtaining the requirements in this Order by misrepresentation, or failure to disclose fully all relevant facts. [CWC Section 13381(b)]

(c) A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge. [CWC Section 13381(c)]

(3) When this Order is transferred to a new owner or operator, such requirements as may be necessary under the CWC may be incorporated into this Order.

h. NPDES PERMITTED NON-STORM WATER DISCHARGES

The San Diego Water Board has, in prior years, issued a limited number of individual NPDES permits for non-storm water discharges to MS4s. The San Diego Water Board or State Water Board may in the future, upon prior notice to the Copermittee(s), issue an NPDES permit for any non-storm water discharge (or class of non-storm water discharges) to an MS4.

i. MONITORING

In addition to the standard provisions required under 40 CFR 122.41(j) and (l)(4), the following general monitoring provisions apply to this Order:

(1) Where procedures are not otherwise specified in Order, sampling, analysis and quality assurance/quality control must be conducted in accordance with the Quality Assurance Management Plan (QAMP) for the State of California's Surface Water Ambient Monitoring Program (SWAMP), adopted by the State Water Resources Control Board (State Water Board).

(2) Pursuant to 40 CFR 122.41(j)(2) and CWC Section 13383(a), each Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring

instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five (5) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time.

(3) All chemical, bacteriological, and toxicity analyses must be conducted at a laboratory certified for such analyses by the California Department of Public Health or a laboratory approved by the San Diego Water Board.

(4) For priority toxic pollutants that are identified in the California Toxics Rule (CTR) (65 Fed. Reg. 31682), the Copermittees must instruct their laboratories to establish calibration standards that are equivalent to or lower than the Minimum Levels (MLs) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP). If a Copermittee can demonstrate that a particular ML is not attainable, in accordance with procedures set forth in 40 CFR Part 136, the lowest quantifiable concentration of the lowest calibration standard analyzed by a specific analytical procedure (assuming that all the method specified sample weights, volumes, and processing steps have been followed) may be used instead of the ML listed in Appendix 4 of the SIP. The Copermittee must submit documentation from the laboratory to the San Diego Water Board for approval prior to raising the ML for any priority toxic pollutant.

j. ENFORCEMENT

(1) The San Diego Water Board is authorized to enforce the terms of this Order under several provisions of the CWC, including, but not limited to, CWC Sections 13385, 13386, and 13387.

(2) Nothing in this Order shall be construed to protect the Copermittee from its liabilities under federal, state, or local laws.

(3) The CWC provides for civil and criminal penalties comparable to, and in some cases greater than, those provided for under the CWA.

(4) Except as provided in the standard conditions required under 40 CFR 122.41(m) and (n), nothing in this Order shall be construed to relieve the Copermittee from civil or criminal penalties for noncompliance.

(5) Nothing in this Order shall be construed to preclude the institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties to which the Copermittee is or may be subject to under Section 311 of the CWA.

(6) Nothing in this Order shall be construed to preclude institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authoring preserved by Section 510 of the CWA.

k. SEVERABILITY

The provisions of this Order are severable, and if any provision of this Order, or the application of any provisions of this Order to any circumstance, is held invalid, the

application of such provision to other circumstances and the remainder of this Order shall not be affected thereby.

l. APPLICATIONS

Any application submitted by a Copermittee for reissuance or modification of this Order must satisfy all applicable requirements specified in federal regulations as well as any additional requirements for submittal of a Report of Waste Discharge specified in the CWC and the California Code of Regulations.

m. IMPLEMENTATION

All plans, reports and subsequent amendments submitted in compliance with this Order must be implemented immediately (or as otherwise specified). All submittals by Copermittees must be adequate to implement the requirements of this Order.

n. REPORT SUBMITTALS

(1) All report submittals must include an executive summary, introduction, conclusion, recommendations, and signed certified statement.

(2) Each Copermittee must submit a signed certified statement covering its responsibilities for each applicable submittal.

(3) The Principal Watershed Copermittee(s) must submit a signed certified statement covering its responsibilities for each applicable submittal and the sections of the submittals for which it is responsible.

(4) Unless otherwise directed, the Copermittees must submit ~~one hard copy and~~ one electronic copy of each report required under this Order to the San Diego Water Board at SanDiego@waterboards.ca.gov~~, and one electronic copy to the USEPA~~.

(5) When hard copies are requested or required, ~~T~~the Copermittees must submit reports and provide notifications as required by this Order to ~~the following~~:

EXECUTIVE OFFICER
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
2375 NORTHSIDE DRIVE, SUITE 100
SAN DIEGO CA 92108
Telephone: (619) 516-1990 Fax: (619) 516-1994

~~EUGENE BROMLEY~~
~~US ENVIRONMENTAL PROTECTION AGENCY~~
~~REGION IX~~
~~PERMITS ISSUANCE SECTION (W-5-1)~~
~~75 HAWTHORNE STREET~~
~~SAN FRANCISCO CA 94105~~

ATTACHMENT C

ACRONYMS AND ABBREVIATIONS

AMAL	Average Monthly Action Level
ASBS	Area(s) of Special Biological Significance
BMP	Best Management Practice
Basin Plan	Water Quality Control Plan for the San Diego Basin
CEQA	California Environmental Quality Act
CCR	California Code of Regulations
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWC	California Water Code
CZARA	Coastal Zone Act Reauthorization Amendments of 1990
ESAs	Environmentally Sensitive Areas
GIS	Geographic Information System
IBI	Index of Biological Integrity
LID	Low Impact Development
MDAL	Maximum Daily Action Level
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
NAL	Non-Storm Water Action Level
NAICS	North American Industry Classification System
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
ROWD	Report of Waste Discharge (application for NPDES reissuance)
SAL	Storm Water Action Level
San Diego Water Board	California Regional Water Quality Control Board, San Diego Region
SIC	Standard Industrial Classification Code
State Water Board	State Water Resources Control Board
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
WDID	Waste Discharge Identification Number
WLA	Waste Load Allocation
WQBEL	Water Quality Based Effluent Limitation

DEFINITIONS

Active/Passive Sediment Treatment - Using mechanical, electrical or chemical means to flocculate or coagulate suspended sediment for removal from runoff from construction sites prior to discharge.

Anthropogenic Litter – Trash generated from human activities, not including sediment.

Average Monthly Action Level – The highest allowable average of daily discharges over a calendar month.

Beneficial Uses - The uses of water necessary for the survival or wellbeing of man, plants, and wildlife. These uses of water serve to promote tangible and intangible economic, social, and environmental goals. "Beneficial Uses" of the waters of the State that may be protected include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. Existing beneficial uses are uses that were attained in the surface or ground water on or after November 28, 1975; and potential beneficial uses are uses that would probably develop in future years through the implementation of various control measures. "Beneficial Uses" are equivalent to "Designated Uses" under federal law. [California Water Code Section 13050(f)].

Best Management Practices (BMPs) - Defined in 40 CFR 122.2 as schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Bioassessment - The use of biological community information to evaluate the biological integrity of a water body and its watershed. With respect to aquatic ecosystems, bioassessment is the collection and analysis of samples of the benthic macroinvertebrate community together with physical/habitat quality measurements associated with the sampling site and the watershed to evaluate the biological condition (i.e. biotic integrity) of a water body.

Biofiltration - Practices that use vegetation and amended soils to detain and treat runoff from impervious areas. Treatment is through filtration, infiltration, adsorption, ion exchange, and biological uptake of pollutants.

Biological Integrity - Defined in Karr J.R. and D.R. Dudley. 1981. Ecological perspective on water quality goals. *Environmental Management* 5:55-68 as: "A balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitat of the region." Also referred to as ecosystem health.

BMP Design Manual – A plan developed to eliminate, reduce, or mitigate the impacts of runoff from development projects, including Priority Development Projects.

Chronic Toxicity – A measurement of sublethal effect (e.g. reduced growth, reproduction) to experimental test organisms exposed to an effluent or receiving waters compared to that of the control organisms.

Clean Water Act Section 303(d) Water Body - An impaired water body in which water quality does not meet applicable water quality standards and/or is not expected to meet water quality standards, even after the application of technology based pollution controls required by the CWA. The discharge of runoff to these water bodies by the Copermittees is significant because these discharges can cause or contribute to violations of applicable water quality standards.

Construction Activities – Actions implemented during construction of development or redevelopment projects during the Preliminary Phase (including rough grading and/or disking, clearing and grubbing operations, or any soil disturbance prior to mass grading), Grading or Land Development Phase (including topography and slope reconfiguration, alluvium removals, canyon cleanouts, rock undercuts, keyway excavations, land form grading, and stockpiling of select material for capping operations), Streets and Utility Phase (including excavation and street paving, lot grading, curbs, gutters and sidewalks, public utilities, public water facilities including fire hydrants, public sanitary sewer systems, storm sewer systems and/or other drainage improvements), or Vertical Construction Phase (including the build out of structures from foundations to roofing, including rough landscaping).

Construction Site – Any project, including projects requiring coverage under the Construction General Permit, that involves soil disturbing activities including, but not limited to, clearing, grading, disturbances to ground such as stockpiling, and excavation.

Contamination - As defined in the Porter-Cologne Water Quality Control Act, contamination is "an impairment of the quality of waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste whether or not waters of the State are affected."

Copermittee – A permittee to a NPDES permit that is only responsible for permit conditions relating to the discharge for which it is operator [40 CFR 122.26(b)(1)]. For the purposes of this Order, a Copermittee is one of the individual permittees identified in Tables 1a-1c of this Order.

Copermittees – All of the individual Copermittees, collectively.

Critical Channel Flow (Qc) – The channel flow that produces the critical shear stress that initiates bed movement or that erodes the toe of channel banks. When measuring Qc, it should be based on the weakest boundary material – either bed or bank.

Daily Discharge – Defined as either: (1) the total mass of the constituent discharged over the calendar day or any 24 hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g. concentration.)

The Daily Discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day, or other 24 hour period other than a day), or by the arithmetic mean of analytical results from one or more grab samples taken over the course of a day.

Development Projects - Construction, rehabilitation, redevelopment, or reconstruction of any public or private projects.

Dry Season –May 1 to September 30.

Dry Weather – Weather is considered dry if the preceding 72 hours has been without measurable precipitation (>0.1 inch).

Enclosed Bays – Enclosed bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost bay works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays do not include inland surface waters or ocean waters.

Erosion – When land is diminished or worn away due to wind, water, or glacial ice. Often the eroded debris (silt or sediment) becomes a pollutant via storm water runoff. Erosion occurs naturally but can be intensified by land clearing activities such as farming, development, road building, and timber harvesting.

Environmentally Sensitive Areas (ESAs) - Areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; areas designated as preserves or their equivalent under the Natural Communities Conservation Program within the Cities and County of Orange; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.

Estuaries – Waters, including coastal lagoons, located at the mouth of streams that serve as areas of mixing fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and ocean water. Estuaries do not include inland surface waters or ocean waters.

Existing Development – Any area that has been developed and exists for municipal, commercial, industrial, or residential purposes, uses, or activities. May include areas that are not actively used for its originally developed purpose, but may be re-purposed or redeveloped for another use or activity.

Flow Duration – The long-term period of time that flows occur above a threshold that causes significant sediment transport and may cause excessive erosion damage to creeks and streams (not a single storm event duration). The simplest way to visualize this is to consider a histogram of pre- and post-project flows using long-term records of hourly data. To maintain pre-development flow duration means that the total number of hours (counts) within each range of flows in a flow-duration histogram cannot increase between the pre- and post-development condition. Flow duration within the range of geomorphologically significant flows is important for managing erosion.

Grading - The cutting and/or filling of the land surface to a desired slope or elevation.

Groundwater – Subsurface water that occurs beneath the water table in soils and geologic formations that are fully saturated.

Hazardous Material – Any substance that poses a threat to human health or the environment due to its toxicity, corrosiveness, ignitability, explosive nature or chemical reactivity. These also include materials named by the USEPA in 40 CFR 116 to be reported if a designated quantity of the material is spilled into the waters of the U.S. or emitted into the environment.

Hazardous Waste - Hazardous waste is defined as "any waste which, under Section 600 of Title 22 of this code, is required to be managed according to Chapter 30 of Division 4.5 of Title 22 of this code" [CCR Title 22, Division 4.5, Chapter 11, Article 1].

Household Hazardous Waste – Paints, cleaning products, and other hazardous wastes generated during home improvement or maintenance activities.

Hydromodification – The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

Illicit Connection – Any man-made conveyance or drainage system through which a non-storm water discharge to the storm water drainage system occurs or may occur. Any connection to the MS4 that conveys an illicit discharge.

Illicit Discharge - Any discharge to the MS4 that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from firefighting activities [40 CFR 122.26(b)(2)].

Inactive Areas – Areas of construction activity that are not active and those that have been active and are not scheduled to be re-disturbed for at least 14 days.

Infiltration – In the context of low impact development, infiltration is defined as the percolation of water into the ground. Infiltration is often expressed as a rate (inches per hour), which is determined through an infiltration test. In the context of non-storm water, infiltration is water other than wastewater that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow [40 CFR 35.2005(20)].

Inland Surface Waters – Includes all surface waters of the State that do not include the ocean, enclosed bays, or estuaries.

Jurisdictional Runoff Management Program Document – A written description of the specific jurisdictional runoff management measures and programs that each Copermittee will implement to comply with this Order and ensure that storm water pollutant discharges in runoff are reduced to the MEP and do not cause or contribute to a violation of water quality standards.

Low Impact Development (LID) – A storm water management and land development strategy that emphasizes conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions.

Low Impact Development Best Management Practices (LID BMPs) – LID BMPs include schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States through storm water management and land development strategies that emphasize conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions. LID BMPs include retention practices that do not allow runoff, such as infiltration, rain water harvesting and reuse, and evapotranspiration. LID BMPs also include flow-through practices such as biofiltration that may have some discharge of storm water following pollutant reduction.

Major Outfall – As defined in the Code of Federal Regulations, a major outfall is a MS4 outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (i.e. discharge from a single conveyance other than a circular pipe which is associated with a drainage area of more than 50 acres); or, for MS4s that receive storm water from lands zoned for industrial activity (based on comprehensive zoning plans or equivalent), a MS4 outfall that discharges from a single pipe with an inside diameter of 12 inches or more or from its equivalent (i.e. discharge from other than a circular pipe associated with a drainage area of 2 acres or more).

Maximum Daily Action Level (MDAL) –The highest allowable daily discharge of a pollutant, over a calendar day (or 24 hour period). For pollutants with action levels expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with action levels expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

Maximum Extent Practicable (MEP) – The technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) for storm water that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) in combination with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than BAT. A definition for MEP is not provided either in the statute or in the regulations. Instead the definition of MEP is dynamic and will be defined by the following process over time: municipalities propose their definition of MEP by way of their runoff management programs. Their total collective and individual activities conducted pursuant to the runoff management programs becomes their proposal for MEP as it applies both to their overall effort, as well as to specific activities (e.g., MEP for street sweeping, or MEP for MS4 maintenance). In the absence of a proposal acceptable to the San Diego Water Board, the San Diego Water Board defines MEP.

In a memo dated February 11, 1993, entitled "Definition of Maximum Extent Practicable," Elizabeth Jennings, Senior Staff Counsel, SWRCB addressed the achievement of the MEP standard as follows:

"*To achieve the MEP standard, municipalities must employ whatever Best Management Practices (BMPs) are technically feasible (i.e., are likely to be effective) and are not cost prohibitive. The major emphasis is on technical feasibility. Reducing pollutants to the MEP means choosing effective BMPs, and rejecting applicable BMPs only where other effective BMPs will serve the same purpose, or the BMPs would not be technically feasible, or the cost would be prohibitive. In selecting BMPs to achieve the MEP standard, the following factors may be useful to consider:*

a. Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?
b. Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?
c. Public Acceptance: Does the BMP have public support?
d. Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?
e. Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc.?

The final determination regarding whether a municipality has reduced pollutants to the maximum extent practicable can only be made by the Regional or State Water Boards, and not by the municipal discharger. If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit derived, it would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs that would address a pollutant source, or to pick a BMP based solely on cost, which would be clearly less effective. In selecting BMPs the municipality must make a serious attempt to comply and practical solutions may not be lightly rejected. In any case, the burden would be on the municipal discharger to show compliance with its permit. After selecting a menu of BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented."

Monitoring Year – October 1 to September 30

Municipal Separate Storm Sewer System (MS4) – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designated or used for collecting or conveying storm water; (iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.26.

National Pollutant Discharge Elimination System (NPDES) - The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the CWA.

Non-Storm Water - All discharges to and from a MS4 that do not originate from precipitation events (i.e., all discharges from a MS4 other than storm water). Non-storm water includes illicit discharges and NPDES permitted discharges.

Nuisance - As defined in the Porter-Cologne Water Quality Control Act, a nuisance is "anything which meets all of the following requirements: 1) Is injurious to health, or is indecent, or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. 2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. 3) Occurs during, or as a result of, the treatment or disposal of wastes."

Ocean Waters – The territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the State Board's California Ocean Plan.

Order – Unless otherwise specified, refers to this Order, Order No. R9-2013-0001 (NPDES No. CAS0109266)

Outfall - Outfall means a point source as defined by 40 CFR 122.2 at the point where a municipal separate storm sewer discharges to waters of the US and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels or other conveyances which connect segments of the same stream or other waters of the US and are used to convey waters of the US.

Persistent Flow - Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

Person - A person is defined as an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof [40 CFR 122.2].

Point Source - Any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, landfill leachate collection systems, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

Pollutant - Any agent that may cause or contribute to the degradation of water quality such that a condition of pollution or contamination is created or aggravated.

Pollution - As defined in the Porter-Cologne Water Quality Control Act, pollution is "the alteration of the quality of the waters of the State by waste, to a degree which unreasonably affects either of the following: 1) The waters for beneficial uses; or 2) Facilities that serve these beneficial uses." Pollution may include contamination.

Pollution Prevention - Pollution prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control BMPs, treatment control BMPs, or disposal.

Pre-Development Runoff Conditions – Approximate flow rates and durations that exist or existed onsite before land development occurs. For new development projects, this equates to runoff conditions immediately before project construction. For redevelopment projects, this equates to runoff conditions from the project footprint assuming infiltration characteristics of the underlying soil, and existing grade. Runoff coefficients of concrete or asphalt must not be used. A redevelopment Priority Development Project must use available information pertaining to existing underlying soil type and onsite existing grade to estimate pre-development runoff conditions.

Priority Development Projects - New development and redevelopment projects defined under Provision E.3.b of Order No. R9-2013-0001, as amended by Order Nos. R9-2015-0001 and R9-2015-0100.

Rainy Season (aka Wet Season) –October 1 to April 30

Receiving Waters – Waters of the United States.

Receiving Water Limitations - Waste discharge requirements issued by the San Diego Water Board typically include both: (1) "Effluent Limitations" (or "Discharge Limitations") that specify the technology-based or water-quality-based effluent limitations; and (2) "Receiving Water Limitations" that specify the water quality objectives in the Basin Plan as well as any other limitations necessary to attain those objectives. In summary, the "Receiving Water Limitations" provision is the provision used to implement the requirements of CWA section 402(p)(3)(B).

Redevelopment - The creation and/or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include trenching and resurfacing associated with utility work; resurfacing existing roadways; new sidewalk construction, pedestrian ramps, or bike lane on existing roads; and routine replacement of damaged pavement, such as pothole repair.

Regional Clearinghouse – A central location for the collection and distribution of information developed and maintained by the Copermittees including, but not limited to, plans, reports, manuals, data, contact information, and/or links to such documents and information.

Rehabilitation - Remedial measures or activities for the purpose of improving or restoring the beneficial uses of streams, channels or river systems. Techniques may vary from in-stream restoration techniques to off-line storm water management practices installed in the system corridor or upland areas, or a combination of in-stream and out of stream techniques. Rehabilitation techniques may include, but are not limited to the following: riparian zone restoration, constructed wetlands, channel modifications that improve habitat and stability, and daylighting of drainage systems.

Reporting Period – The period of information that is reported in the Water Quality Improvement Plan Annual Report. The reporting period consists of two components: 1) July 1 to June 30, consistent with the fiscal year, for the implementation of the jurisdictional runoff management programs, and 2) October 1 to September 30, consistent with the monitoring year for the monitoring and assessment programs. Together, these two time periods constitute the reporting year for the Water Quality Improvement Plan Annual Report due January 31 following

the end of the monitoring year.
Retain – Keep or hold in a particular place, condition, or position without discharge to surface waters.

Retrofitting – Storm water management practice put into place after development has occurred in watersheds where the practices previously did not exist or are ineffective. Retrofitting of developed areas is intended to improve water quality, protect downstream channels, reduce flooding, or meet other specific objectives. Retrofitting developed areas may include, but is not limited to replacing roofs with green roofs, disconnecting downspouts or impervious surfaces to drain to pervious surfaces, replacing impervious surfaces with pervious surfaces, installing rain barrels, installing rain gardens, and trash area enclosures.

Runoff - All flows in a storm water conveyance system that consists of the following components: (1) storm water (wet weather flows) and (2) non-storm water including dry weather flows.

San Diego Water Board – As used in this document the term "San Diego Water Board" is synonymous with the term "Regional Board" as defined in Water Code section 13050(b) and is intended to refer to the California Regional Water Quality Control Board for the San Diego Region as specified in Water Code Section 13200.

Sediment - Soil, sand, and minerals washed from land into water. Sediment resulting from anthropogenic sources (i.e. human induced land disturbance activities) is considered a pollutant. This Order regulates only the discharges of sediment from anthropogenic sources and does not regulate naturally occurring sources of sediment. Sediment can destroy fish-nesting areas, clog animal habitats, and cloud waters so that sunlight does not reach aquatic plants.

Source Control BMP – Land use or site planning practices, or structural or nonstructural measures that aim to prevent runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between pollutants and runoff.

Storm Water – Per 40 CFR 122.26(b)(13), means storm water runoff, snowmelt runoff and surface runoff and drainage. Surface runoff and drainage pertains to runoff and drainage resulting from precipitation events.

Structural BMPs - A subset of BMPs which detains, retains, filters, removes, or prevents the release of pollutants to surface waters from development projects in perpetuity, after construction of a project is completed.

Test of Significant Toxicity (TST) - A statistical approach used to analyze toxicity test data. The TST incorporates a restated null hypothesis, Welch's t-test, and biological effect thresholds for chronic and acute toxicity.

Total Maximum Daily Load (TMDL) - The maximum amount of a pollutant that can be discharged into a water body from all sources (point and non-point) and still maintain water quality standards. Under CWA section 303(d), TMDLs must be developed for all water bodies that do not meet water quality standards after application of technology-based controls.

Toxicity - Adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies. The

water quality objectives for toxicity provided in the Basin Plan, state in part…"All waters shall be free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life….The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge."

Toxicity Identification Evaluation (TIE) - A set of procedures for identifying the specific chemical(s) responsible for toxicity. These procedures are performed in three phases (characterization, identification, and confirmation) using aquatic organism toxicity tests.

Toxicity Reduction Evaluation (TRE) - A study conducted in a step-wise process designed to identify the causative agents of effluent or ambient toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in toxicity. The first steps of the TRE consist of the collection of data relevant to the toxicity, including additional toxicity testing, and an evaluation of facility operations and maintenance practices, and best management practices. A Toxicity Identification Evaluation (TIE) may be required as part of the TRE, if appropriate.

Treatment Control BMP – Any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media absorption or any other physical, biological, or chemical process.

Unpaved Road – Any long, narrow stretch without pavement used for traveling by motor passenger vehicles between two or more points. Unpaved roads are generally constructed of dirt, gravel, aggregate or macadam and may be improved or unimproved.

Waste - As defined in CWC Section 13050(d), "waste includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal."

Article 2 of CCR Title 23, Chapter 15 (Chapter 15) contains a waste classification system that applies to solid and semi-solid waste, which cannot be discharged directly or indirectly to water of the state and which therefore must be discharged to land for treatment, storage, or disposal in accordance with Chapter 15. There are four classifications of waste (listed in order of highest to lowest threat to water quality): hazardous waste, designated waste, non-hazardous solid waste, and inert waste.

Water Quality Objective - Numerical or narrative limits on constituents or characteristics of water designated to protect designated beneficial uses of the water. [California Water Code Section 13050 (h)]. California's water quality objectives are established by the State and Regional Water Boards in the Water Quality Control Plans. Numeric or narrative limits for pollutants or characteristics of water designed to protect the beneficial uses of the water. In other words, a water quality objective is the maximum concentration of a pollutant that can exist in a receiving water and still generally ensure that the beneficial uses of the receiving water remain protected (i.e., not impaired). Since water quality objectives are designed specifically to protect the beneficial uses, when the objectives are violated the beneficial uses are, by definition, no longer protected and become impaired. This is a fundamental concept under the Porter Cologne Act. Equally fundamental is Porter Cologne's definition of pollution. A condition

of pollution exists when the water quality needed to support designated beneficial uses has become unreasonably affected or impaired; in other words, when the water quality objectives have been violated. These underlying definitions (regarding beneficial use protection) are the reason why all waste discharge requirements implementing the federal NPDES regulations require compliance with water quality objectives. (Water quality objectives are also called water quality criteria in the CWA.)

Water Quality Standards - Water quality standards, as defined in Clean Water Act section 303(c) consist of the beneficial uses (e.g., swimming, fishing, municipal drinking water supply, etc.,) of a water body and criteria (referred to as water quality objectives in the California Water Code) necessary to protect those uses. Under the Water Code, the water boards establish beneficial uses and water quality objectives in water quality control or basin plans. Together with an anti-degradation policy, these beneficial uses and water quality objectives serve as water quality standards under the Clean Water Act. In Clean Water Act parlance, state beneficial uses are called "designated uses" and state water quality objectives are called "criteria." Throughout this Order, the relevant term is used depending on the statutory scheme.

Waters of the State - Any water, surface or underground, including saline waters within the boundaries of the State [CWC section 13050 (e)]. The definition of the Waters of the State is broader than that for the Waters of the United States in that all water in the State is considered to be a Waters of the State regardless of circumstances or condition.

Waters of the United States - As defined in the 40 CFR 122.2, the Waters of the U.S. are defined as: "(a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate "wetlands;" (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters otherwise defined as waters of the United States under this definition: (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial seas; and (g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA."

Watershed - That geographical area which drains to a specified point on a water course, usually a confluence of streams or rivers (also known as drainage area, catchment, or river basin).

Wet Season (aka Rainy Season) – October 1 to April 30

Wet Weather – Weather is considered wet up to 72 hours after a storm event of 0.1 inches and greater, unless otherwise defined by another regulatory mechanism (e.g. a TMDL).

ATTACHMENT D

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

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Order No. R9-2013-0001
As amended by Order No. R9-2015-0001
and Order No. R9-2015-0100

Amended February 11, 2015
Amended November 18, 2015

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

FY _____

I. COPERMITTEE INFORMATION

Copermittee Name:

Copermittee Primary Contact Name:

Copermittee Primary Contact Information:
Address:
City: County: State: Zip:
Telephone: Fax: Email:

II. LEGAL AUTHORITY

Has the Copermittee established adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐
A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority?	**YES**	☐
	NO	☐

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

Was an update of the jurisdictional runoff management program document required or recommended by the San Diego Water Board?	**YES**	☐
	NO	☐
If YES to the question above, did the Copermittee update its jurisdictional runoff management program document and make it available on the Regional Clearinghouse?	**YES**	☐
	NO	☐

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

Has the Copermittee implemented a program to actively detect and eliminate illicit discharges and connections to its MS4 that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

Number of non-storm water discharges reported by the public	
Number of non-storm water discharges detected by Copermittee staff or contractors	
Number of non-storm water discharges investigated by the Copermittee	
Number of sources of non-storm water discharges identified	
Number of non-storm water discharges eliminated	
Number of sources of illicit discharges or connections identified	
Number of illicit discharges or connections eliminated	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

V. DEVELOPMENT PLANNING PROGRAM

Has the Copermittee implemented a development planning program that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐
Was an update to the BMP Design Manual required or recommended by the San Diego Water Board?	**YES**	☐
	NO	☐
If YES to the question above, did the Copermittee update its BMP Design Manual and make it available on the Regional Clearinghouse?	**YES**	☐
	NO	☐

Number of proposed development projects in review	
Number of Priority Development Projects in review	
Number of Priority Development Projects approved	
Number of approved Priority Development Projects exempt from any BMP requirements	
Number of approved Priority Development Projects allowed alternative compliance	
Number of Priority Development Projects granted occupancy	

Number of completed Priority Development Projects in inventory	
Number of high priority Priority Development Project structural BMP inspections	
Number of Priority Development Project structural BMP violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

Order No. R9-2013-0001
As amended by Order No. R9-2015-0001
and Order No. R9-2015-0100

Amended February 11, 2015
Amended November 18, 2015

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

FY _____

VI. CONSTRUCTION MANAGEMENT PROGRAM

Has the Copermittee implemented a construction management program that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

Number of construction sites in inventory	
Number of active construction sites in inventory	
Number of inactive construction sites in inventory	
Number of construction sites closed/completed during reporting period	
Number of construction site inspections	
Number of construction site violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

Has the Copermittee implemented an existing development management program that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

	Municipal	Commercial	Industrial	Residential
Number of facilities or areas in inventory				
Number of existing development inspections				
Number of follow-up inspections				
Number of violations				
Number of enforcement actions issued				
Number of escalated enforcement actions issued				

VIII. PUBLIC EDUCATION AND PARTICIPATION

Has the Copermittee implemented a public education program component that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐
Has the Copermittee implemented a public participation program component that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

IX. FISCAL ANALYSIS

Has the Copermittee attached to this form a summary of its fiscal analysis that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

X. CERTIFICATION

I [☐ Principal Executive Officer ☐ Ranking Elected Official ☐ Duly Authorized Representative] certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature	Date
Print Name	Title
Telephone Number	Email

ATTACHMENT E

SPECIFIC PROVISIONS FOR TOTAL MAXIMUM DAILY LOADS APPLICABLE TO ORDER NO. R9-2013-0001, AS AMENDED BY ORDER NOS. R9-2015-0001 AND R9-2015-0100

These provisions implement load allocations (LAs) and wasteload allocations (WLAs) of the Total Maximum Daily Loads (TMDLs) established by the San Diego Water Board or USEPA under Clean Water Act section 303(c), applicable to discharges regulated under this Order. The provisions and schedules for implementation of the TMDLs described below must be incorporated into the Water Quality Improvement Plans, required pursuant to Provision B of this Order, for the specified Watershed Management Areas.

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed
2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin
3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed
4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek
5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay
6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)
7. Total Maximum Daily Load for Sediment in Los Peñasquitos Lagoon

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2002-0123

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	August 14, 2002
State Water Board Approval Date:	July 16, 2003
Office of Administrative Law Approval Date:	September 11, 2003
US EPA Approval Date:	November 3, 2003

(3) TMDL Effective Date: September 11, 2003

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final diazinon TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must be in compliance with the final TMDL compliance requirements as of December 31, 2010.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations:

Table 1.1
Final Receiving Water Limitations Expressed as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Diazinon	Acute	0.08 µg/L	1 hour
	Chronic	0.05 µg/L	4 days

(b) Final Effluent Limitations

Discharges from the MS4s containing concentrations that do not exceed the following effluent limitations will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 1.b.(2)(a):

Table 1.2
Final Effluent Limitations Expressed as Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation	Averaging Period
Diazinon	Acute	0.072 µg/L	1 hour
	Chronic	0.045 µg/L	4 days

(c) Best Management Practices

The following BMPs for Chollas Creek must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area and implemented by the Responsible Copermittees:

(i) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 1.b.(2)(a) and/or the effluent limitations under Specific Provision 1.b.(2)(b) for Chollas Creek.

(ii) The Responsible Copermittees must implement the Diazinon Toxicity Control Plan and Diazinon Public Outreach/Education Program as described in the report titled, *Technical Report for Total Maximum Daily Load for Diazinon in Chollas Creek Watershed, San Diego County*, dated August 14, 2002, including subsequent modifications, in order to achieve the receiving water limitations under Specific Provision 1.b.(2)(a) and/or the effluent limitations under Specific Provision 1.b.(2)(b).

(iii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 1.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 1.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 1.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 1.b.(2)(c) achieves compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 1.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 1.d, to demonstrate compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The Responsible Copermittees must be in compliance with the final diazinon TMDL compliance requirements as of December 31, 2010.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls for diazinon within the Chollas Creek watershed, and calculate or estimate the annual diazinon loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment

Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 1.b.(2)(b), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0019

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	September 22, 2005
Office of Administrative Law Approval Date:	December 2, 2005
US EPA Approval Date:	February 8, 2006

(3) TMDL Effective Date: December 2, 2005

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Shelter Island Yacht Basin

(6) Responsible Copermittee: City of San Diego

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final dissolved copper TMDL compliance requirements for Shelter Island Yacht Basin consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittee must be in compliance with the final TMDL compliance requirements as of December 2, 2005.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations:

Table 2.1
Final Receiving Water Limitations Expressed as Concentrations in Shelter Island Yacht Basin

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Dissolved Copper	Acute	4.8 µg/L x WER*	1 hour
	Chronic	3.1 µg/L x WER*	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 2.b.(2)(a):

Table 2.2
Final Effluent Limitations as Expressed as Annual Loads in MS4 Discharges to Shelter Island Yacht Basin

Constituent	Effluent Limitation
Dissolved Copper	30 kg/yr*

* If the water quality objectives for dissolved copper in Shelter Island Yacht Basin are changed in the future, then the margin of safety (MOS), TMDL and allocations will be recalculated using the *Method for Recalculation of the Total Maximum Daily Load for Dissolved Copper in the Shelter Island Yacht Basin, San Diego Bay* in the Basin Plan (p. 7-14).

(c) Best Management Practices

The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 2.b.(2)(a) and/or the effluent limitations under Specific Provision 2.b.(2)(b) for Shelter Island Yacht Basin. The BMPs must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 2.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 2.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittee develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 2.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 2.b.(2)(c) achieves compliance with Specific Provisions 2.b.(3)(a), 2.b.(3)(b) and/or 2.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 2.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 2.d, to demonstrate compliance with Specific Provisions 2.b.(3)(a), 2.b.(3)(b) and/or 2.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The Responsible Copermittees must be in compliance with the final dissolved copper TMDL compliance requirements as of December 2, 2005.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

The Responsible Copermittee must monitor the effluent of its MS4 outfalls for dissolved copper, and calculate or estimate the monthly and annual dissolved copper loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.(b)(2)of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0036

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	November 16, 2005
Office of Administrative Law Approval Date:	February 1, 2006
US EPA Approval Date:	March 22, 2006

(3) TMDL Effective Date: February 1, 2006

(4) Watershed Management Area: Santa Margarita River

(5) Water Body: Rainbow Creek

(6) Responsible Copermittee: County of San Diego

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final total nitrogen and total phosphorus TMDL compliance requirements for Rainbow Creek consist of the following

(1) Final TMDL Compliance Date

The Responsible Copermittee must comply with final TMDL compliance requirements by December 31, 2021.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance date under Specific Provision 3.b.(1):

Table 3.1
Final Receiving Water Limitations Expressed as Concentrations in Rainbow Creek

Constituent	Receiving Water Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing concentrations that do not exceed the following effluent limitations by the compliance date under Specific Provision 3.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 3.b.(2)(a):

Table 3.2
Final Effluent Limitations Expressed as Concentrations in MS4 Discharges to Rainbow Creek

Constituent	Effluent Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(ii) Annual pollutant loads from given land uses discharging to and from the MS4s that do not exceed the following annual loads by the compliance date under Specific Provision 3.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 3.b.(2)(a):

Table 3.3
Final Effluent Limitations Expressed as Annual Loads in MS4 Discharges to Rainbow Creek

Land Use	Total N	Total P
Commercial nurseries	116 kg/yr	3 kg/yr
Park	3 kg/yr	0.1 kg/yr
Residential areas	149 kg/yr	12 kg/yr
Urban areas	27 kg/yr	6 kg/yr

(c) Best Management Practices

(i) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 3.b.(2)(a) and/or the effluent limitations under Specific Provision 3.b.(2)(b) for Rainbow Creek.

(ii) The Responsible Copermittee should coordinate any BMPs implemented to address this TMDL with Caltrans and other sources as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under

Specific Provision 3.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 3.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the final effluent limitations under Specific Provision 3.b.(2)(b)(ii); OR

(e) The Responsible Copermittee develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 3.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Specific Provision 3.b.(2)(c) achieves compliance with Specific Provisions 3.b.(3)(a), 3.b.(3)(b), 3.b.(3)(c) and/or 3.b.(3)(d),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 3.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 3.d, to demonstrate compliance with Specific Provisions 3.b.(3)(a), 3.b.(3)(b), 3.b.(3)(c) and/or 3.b.(3)(d).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim total nitrogen and total phosphorus TMDL compliance requirements for Rainbow Creek consist of the following:

(1) Interim Compliance Dates and WQBELs

The Responsible Copermittee must comply with the interim WQBELs, expressed as annual loads, by December 31 of the interim compliance year given in Table 3.4.

Table 3.4
Interim Water Quality Based Effluent Limitations Expressed as Annual Loads in MS4 Discharges from Specific Land Uses to Rainbow Creek

	Total N Interim Effluent Limitations (kg/yr)			Total P Interim Effluent Limitations (kg/yr)		
	Interim Compliance Date			Interim Compliance Date		
Land Use	**2009**	**2013**	**2017**	**2009**	**2013**	**2017**
Commercial nurseries	390	299	196	20	16	10
Park	5	3	3	0.15	0.10	0.10
Residential areas	507	390	260	99	74	47
Urban areas	40	27	27	9	6	6

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 3.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 3.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the final effluent limitations under Specific Provision 3.b.(2)(b)(ii); OR

(e) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the interim effluent limitations under Specific Provision 3.c.(1); OR

(f) The Responsible Copermittee has submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

d. Specific Monitoring and Assessment Requirements

(1) The Responsible Copermittee must incorporate into the Water Quality Improvement Plan and implement the Sampling and Analysis Plan for Rainbow Creek Nutrient Reduction TMDL Implementation Water Quality Monitoring, dated January 2010.

(2) The results of any monitoring conducted during the reporting period, and assessment of whether the interim and final TMDL compliance requirements have been achieved must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 3.b.(2)(b)(i), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2007-0043

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2007
State Water Board Approval Date:	July 15, 2008
Office of Administrative Law Approval Date:	October 22, 2008
US EPA Approval Date:	December 18, 2008

(3) TMDL Effective Date: October 22, 2008

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final dissolved copper, lead, and zinc TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must comply with the final TMDL compliance requirements by October 22, 2028.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance date under Specific Provision 4.b.(1):

Table 4.1
Final Receiving Water Limitations Expressed as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$(0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$(0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$(0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$(0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations by the compliance date under Specific Provision 4.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 4.b.(2)(a):

Table 4.2
Final Effluent Limitations as Expressed Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(c) Best Management Practices

(i) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 4.b.(2)(a) and/or the effluent limitations under Specific Provision 4.b.(2)(b) for Chollas Creek.

(ii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans and the U.S. Navy as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 4.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 4.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 4.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 4.b.(2)(c) achieves compliance with Specific Provisions 4.b.(3)(a), 4.b.(3)(b) and/or 4.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 4.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 4.d, to demonstrate compliance with Specific Provisions 4.b.(3)(a), 4.b.(3)(b) and/or 4.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim dissolved copper, lead, and zinc TMDL compliance requirements for Chollas Creek consist of the following:

(1) Interim Compliance Date and WQBELs

The Responsible Copermittee must comply with the interim WQBELs, expressed as concentrations, by the interim compliance date given in Table 4.3:

Table 4.3
Interim Water Quality Based Effluent Limitations Expressed as Concentrations in MS4 Discharges to Chollas Creek

Interim Compliance Date	Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
October 22, 2018	Dissolved Copper	Acute	$1.2 \times 90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
	Dissolved Lead	Acute	$1.2 \times 90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
	Dissolved Zinc	Acute	$1.2 \times 90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 4.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 4.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) There are no exceedances of the interim effluent limitations under Specific

Provision 4.c.(1) at the Responsible Copermittee's MS4 outfalls; OR

(e) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance date.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*, when it is amended to include monitoring requirements for the Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls discharging to Chollas Creek for dissolved copper, lead, and zinc, and calculate or estimate the monthly and annual dissolved copper, lead, and zinc loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 4.b.(2)(b) or 4.c.(1), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2008-0027

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 11, 2008
State Water Board Approval Date:	June 16, 2009
Office of Administrative Law Approval Date:	September 15, 2009
US EPA Approval Date:	October 26, 2009

(3) TMDL Effective Date: September 15, 2009

(4) Watershed Management Areas: See Table 5.0

(5) Water Bodies: See Table 5.0

(6) Responsible Copermittees: See Table 5.0

Table 5.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County	Dana Point Harbor	Baby Beach	-City of Dana Point -County of Orange
San Diego Bay	San Diego Bay	Shelter Island Shoreline Park	- San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final indicator bacteria TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Final TMDL Compliance Dates

(a) Baby Beach in Dana Point Harbor

The Responsible Copermittees for MS4 discharges to Baby Beach must be in compliance with the final TMDL compliance requirements according to the following compliance dates:

Table 5.1
Compliance Dates to Achieve Final TMDL Compliance Requirements For Baby Beach in Dana Point Harbor

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform	September 15, 2014	September 15, 2009
Fecal Coliform		September 15, 2009
Enterococcus		September 15, 2019

(b) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park must be in compliance with the final TMDL compliance requirements as of December 31, 2012.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance dates under Specific Provision 5.b.(1):

Table 5.2
Final Receiving Water Limitations Expressed as Bacteria Densities in the Water Body

	Receiving Water Limitations	
Constituent	Single Sample Maximum[1,2]	30-Day Geometric Mean[2]
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing indicator bacteria densities that do not exceed the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.3a
Final Effluent Limitations as Expressed as Bacteria Densities in MS4 Discharges to the Water Body

	Effluent Limitations	
Constituent	**Single Sample Maximum[1,2]**	**30-Day Geometric Mean[2]**
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.

(ii) Discharges from the MS4s containing indicator bacteria loads that do not exceed the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.4a
Final Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to the Baby Beach in Dana Point Harbor

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0.86×10^9 MPN/day	$3{,}254 \times 10^9$ MPN/30days
Fecal Coliform	0.17×10^9 MPN/day	112×10^9 MPN/30days
Enterococcus	0.03×10^9 MPN/day	114×10^9 MPN/30days

Table 5.4b
Final Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to the Shelter Island Shoreline Park in San Diego Bay

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0 MPN/day	198×10^9 MPN/30days
Fecal Coliform	0 MPN/day	8×10^9 MPN/30days
Enterococcus	0 MPN/day	26×10^9 MPN/30days

(iii) Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.5a
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to Baby Beach in Dana Point Harbor*

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	90.4%	0%
Fecal Coliform	82.7%	0%
Enterococcus	96.2%	62.2%

Notes:
* The percent load reductions are relative to data collected between 1996-2002. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittees' MS4s must not exceed the loads in Table 5.4a, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the water body.

Table 5.5b
*Final Effluent Limitations Expressed as Percent Load Reductions** in MS4 Discharges to Shelter Island Shoreline Park in San Diego Bay*

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0%	0%
Fecal Coliform	0%	0%
Enterococcus	0%	0%

Notes:
* The percent load reductions are relative to data collected between 1999-2004. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittee's MS4s must not exceed the loads in Table 5.4b, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the water body.

(c) Best Management Practices

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 5.0 must incorporate the Bacteria Load Reduction Plan (BLRP) required to be developed pursuant to Resolution No. R9-2008-0027.

(ii) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 5.b.(2)(a) and/or the effluent limitations under Specific Provision 5.b.(2)(b) for the segments or areas of the water bodies listed in Table 5.0

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.b.(2)(b)(ii); OR

(e) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 5.b.(2)(b)(iii); OR

(f) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(g) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 5.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 5.b.(2)(c) achieves compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 5.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 5.d, to demonstrate compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim indicator bacteria TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Baby Beach in Dana Point Harbor

(a) Interim TMDL Compliance Dates and WQBELs

The Responsible Copermittees for MS4 discharges to Baby Beach must comply with the following interim WQBELs by the interim compliance dates given in Tables 5.6a and/or 5.6b:

Table 5.6a
Interim Water Quality Based Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to Baby Beach in Dana Point Harbor

Constituent	Interim Compliance Dates	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	4.93×10^9 MPN/day	$3{,}254 \times 10^9$ MPN/30days*
Fecal Coliform	September 15, 2012	0.59×10^9 MPN/day	112×10^9 MPN/30days*
Enterococcus	September 15, 2012	0.42×10^9 MPN/day	301×10^9 MPN/30days
	September 15, 2016	0.03×10^9 MPN/day *	207×10^9 MPN/30days

Notes:
* Same as the final effluent limitations in Table 5.4a.

Table 5.6b
Interim Water Quality Based Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to Baby Beach in Dana Point Harbor*

Constituent	Interim Compliance Dates	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	45.2%	0%**
Fecal Coliform	September 15, 2012	41.4%	0%**
Enterococcus	September 15, 2012	48.1%	0%
	September 15, 2016	96.2%**	31.1%

Notes:
* The percent load reductions are relative to data collected between 1996-2002. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittees' MS4s must not exceed the loads in Table 5.6a, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the waterbody.
** Same as the final effluent limitations in Table 5.5a.

(b) Interim Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(i) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(ii) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(iii) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(iv) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.b(2)(b)(ii); OR

(v) The Responsible Copermittees can demonstrate that exceedances of the applicable receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(vi) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the interim effluent limitations under Table 5.6a of Specific Provision 5.c.(1)(a); OR

(vii) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the interim effluent limitations under Table 5.6b of Specific Provision 5.c.(1)(a); OR

(viii) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

(2) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park must be in compliance with the final indicator bacteria TMDL requirements as of December 31, 2012.

d. Specific Monitoring and Assessment Requirements

(1) Monitoring Stations

Monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[38] If discharges of bacteria from the MS4 exceed the applicable interim or final WQBELs, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(2) Monitoring Procedures

(a) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) The Responsible Copermittees must collect wet weather monitoring samples within the first 24 hours of a storm event[39] of the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(c) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

[38] Commonly referred to as AB 411 monitoring

[39] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs have been achieved.

(b) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 5.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(c) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to correlate elevated bacteria levels with known or suspected sewage spills from wastewater collection systems and treatment plants or boats.

(d) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2010-0001

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 10, 2010
State Water Board Approval Date:	December 14, 2010
Office of Administrative Law Approval Date:	April 4, 2011
US EPA Approval Date:	June 22, 2011

(3) TMDL Effective Date: April 4, 2011

(4) Watershed Management Areas: See Table 6.0

(5) Water Bodies: See Table 6.0

(6) Responsible Copermittees: See Table 6.0

Table 6.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	-City of Laguna Beach -County of Orange -Orange County Flood Control District
		at Heisler Park - North	
	Pacific Ocean Shoreline	at Main Laguna Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Woods -County of Orange -Orange County Flood Control District
		Laguna Beach at Ocean Avenue	
		Laguna Beach at Cleo Street	
		Arch Cove at Bluebird Canyon Road	
		Laguna Beach at Dumond Drive	
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Hills -City of Laguna Niguel -City of Laguna Woods -City of Lake Forest -City of Mission Viejo -County of Orange -Orange County Flood Control District
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	
	Aliso Creek Mouth	at mouth	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	-City of Dana Point -City of Laguna Beach -City of Laguna Niguel -County of Orange -Orange County Flood Control District
		Aliso Beach at Table Rock Drive	
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)	
		at Salt Creek (large outlet)	
		Salt Creek Beach at Salt Creek service road	
		Salt Creek Beach at Strand Road	
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	-City of Dana Point -City of Laguna Hills -City of Laguna Niguel -City of Mission Viejo -City of Rancho Santa Margarita -City of San Juan Capistrano -County of Orange -Orange County Flood Control District
	San Juan Creek	lower 1 mile	
	San Juan Creek Mouth	at mouth	
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	-City of Dana Point -City of San Clemente -County of Orange -Orange County Flood Control District
		Ole Hanson Beach Club Beach at Pico Drain	
		San Clemente City Beach at El Portal Street Stairs	
		San Clemente City Beach at Mariposa Street	
		San Clemente City Beach at Linda Lane	
		San Clemente City Beach at South Linda Lane	
		San Clemente City Beach at Lifeguard Headquarters	
		under San Clemente Municipal Pier	
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	
		San Clemente State Beach at Riviera Beach	
		Can Clemente State Beach at Cypress Shores	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	-City of Oceanside -City of Vista -County of San Diego
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	-City of Carlsbad -City of Encinitas -City of Escondido -City of San Marcos -County of San Diego
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	-City of Del Mar -City of Escondido -City of Poway -City of San Diego -City of Solana Beach -County of San Diego
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	-City of Del Mar -City of Poway -City of San Diego -County of San Diego
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	-City of San Diego
		La Jolla Shores Beach at Caminito del Oro	
		La Jolla Shores Beach at Vallecitos	
		La Jolla Shores Beach at Avenida de la Playa	
		at Casa Beach, Children's Pool	
		South Casa Beach at Coast Boulevard	
		Whispering Sands Beach at Ravina Street	
		Windansea Beach at Vista de la Playa	
		Windansea Beach at Bonair Street	
		Windansea Beach at Playa del Norte	
		Windansea Beach at Palomar Avenue	
		at Tourmaline Surf Park	
		Pacific Beach at Grand Avenue	
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I- Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	-City of El Cajon -City of Santee -County of San Diego
	San Diego River	lower 6 miles	-City of El Cajon -City of La Mesa -City of San Diego -City of Santee -County of San Diego
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	-City of La Mesa -City of Lemon Grove -City of San Diego -County of San Diego - San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final indicator bacteria TMDL compliance requirements for the water bodies listed in Table 6.0 consist of the following:

(1) Final TMDL Compliance Dates

The Responsible Copermittees for MS4 discharges to the water bodies listed in Table 6.0 must be in compliance with the final TMDL compliance requirements according to the following compliance dates:

Table 6.1
Compliance Dates to Achieve Final TMDL Compliance Requirements

Constituent	Dry Weather TMDL Compliance Date	Wet Weather TMDL Compliance Date*
Total Coliform	April 4, 2021	April 4, 2031 (April 4, 2021)
Fecal Coliform		
Enterococcus		

* The Wet Weather TMDL Compliance Date in parenthesis applies if the applicable Water Quality Improvement Plan does not include load reduction programs for other constituents (e.g. metals, pesticides, trash, nutrients, sediment, etc.) together with bacteria load reduction requirements of these TMDLs.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance dates under Specific Provision 6.b.(1):

Table 6.2a
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Beaches

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform	10,000	22%	1,000	0%
Fecal Coliform	400	22%	200	0%
Enterococcus	104	22%	35	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan.

Table 6.2b
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Creeks

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Fecal Coliform	400	22%	200	0%
Enterococcus	61 (104)	22%	33	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Basin Plan.
d. A single sample maximum of 104 MPN/100ml for *Enterococcus* may be applied as a receiving water limitation for creeks, instead of 61 MPN/100mL, if one or more of the creeks addressed by these TMDLs (San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek, San Diego River, and/or Chollas Creek) is designated with a "moderately to lightly used area" or less frequent usage frequency in the Basin Plan. Otherwise, the single sample maximum of 61 MPN/100mL for *Enterococcus* must be used to assess compliance with the allowable exceedance frequency.

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing indicator bacteria densities that do not exceed the following effluent limitations by the compliance dates under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a):

Table 6.2c
Final Effluent Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies in MS4 Discharges to the Water Body

Constituent	Concentration-Based Effluent Limitations			
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform[d]	10,000	22%	1,000	0%
Fecal Coliform	400	22%	200	0%
Enterococcus	104[e] / 61[f]	22%	35[e] / 33[f]	0%

Notes:
a. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan for discharges to beaches, and the Basin Plan for discharges to creeks and creek mouths.
d. Total coliform effluent limitations only apply to MS4 outfalls that discharge to the Pacific Ocean Shorelines and creek mouths listed in Table 6.0.
e. This *Enterococcus* effluent limitation applies to MS4 discharges to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
f. This *Enterococcus* effluent limitation applies to MS4 discharges to segments or areas of creeks or creek mouths listed in Table 6.0.

(ii) Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the compliance dates under Specific Provision 6.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a):

Table 6.3
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watershed and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
South Orange County	**San Joaquin Hills HSA** (901.11) and **Laguna Hills HSA** (901.12) - Pacific Ocean Shoreline	91.78%	91.72%	98.28%	46.85%	52.07%	51.26%
	Aliso HSA (901.13) - Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	95.47%	95.58%	99.13%	25.29%	26.62%	27.52% (27.37%)**
	Dana Point HSA (901.14) - Pacific Ocean Shoreline	95.04%	95.03%	98.98%	13.15%	14.86%	15.16%
	Lower San Juan HSA (901.27) - Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	72.96%	74.21%	94.94%	19.21%	12.82%	27.12% (26.90%)**
	San Clemente HA (901.30) - Pacific Ocean Shoreline	94.28%	94.23%	98.83%	23.85%	24.58%	25.26%
San Luis Rey River	**San Luis Rey HU** (903.00) - Pacific Ocean Shoreline	38.13%	39.09%	87.38%	5.62%	3.12%	11.69%

Table 6.3 (Cont'd)
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watershed and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
Carlsbad	**San Marcos HA** (904.50) - Pacific Ocean Shoreline	82.82%	82.55%	96.03%	18.47%	18.98%	20.19%
San Dieguito River	**San Dieguito HU** (905.00) - Pacific Ocean Shoreline	14.39%	20.72%	83.48%	4.29%	1.46%	7.72%
Penasquitos	**Miramar Reservoir HA** (906.10) - Pacific Ocean Shoreline	96.50%	96.59%	99.42%	1.61%	1.99%	1.93%
Mission Bay	**Scripps HA** (906.30) - Pacific Ocean Shoreline	96.44%	96.42%	99.25%	16.32%	21.14%	18.82%
	Tecolote HA (906.50) - Tecolote Creek	94.51%	94.59%	98.94%	16.51%	20.47%	18.15% (18.08%)**
San Diego River	**Mission San Diego HSA** (907.11) and **Santee HSA** (907.12) - Pacific Ocean Shoreline - Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles)	74.03%	69.44%	93.96%	38.14%	53.22%	42.74% (42.47%)**
San Diego Bay	**Chollas HSA** (908.22) - Chollas Creek	92.06%	92.15%	98.46%	17.82%	24.84%	21.46% (21.36%)**

Notes:
* The percent load reductions are based on reducing loads compared to pollutant loads from 2001 to 2002.
** The alternative *Enterococcus* percent load reduction was calculated based on a numeric target of 104 MPN/100mL instead of 61 MPN/100mL, protective of the REC-1 "moderately to lightly used area" usage frequency that is protective of freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative pollutant load reductions can be utilized.

(c) Best Management Practices

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 6.0 must incorporate the Comprehensive Load Reduction Plans (CLRPs) required to be developed pursuant to Resolution No. R9-2010-0001.

(ii) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 6.b.(2)(a) and/or the effluent limitations under Specific Provision 6.b.(2)(b) for the segments or areas of the water bodies listed in Table 6.0.

(iii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans, owners/operators of small MS4s, and agricultural dischargers as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(f) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 6.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 6.b.(2)(c) achieves compliance with Specific Provisions 6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), and/or 6.b.(3)(e),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 6.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 6.d, to demonstrate compliance with Specific Provisions 6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), 6.b.(3)(e) and/or 6.b.(3)(f).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim indicator bacteria TMDL compliance requirements for the water bodies listed in Table 6.0 consist of the following:

(1) Interim TMDL Compliance Dates

The Responsible Copermittees must achieve compliance with the interim TMDL compliance requirements, as determined in accordance with Specific Provision 6.c.(3), by the interim compliance dates given in Table 6.4, unless alternative interim compliance dates are accepted by the San Diego Water Board Executive Officer as part of the Water Quality Improvement Plan.

Table 6.4
Interim Compliance Dates to Achieve Interim TMDL Compliance Requirements

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs*
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	April 4, 2016	April 4, 2021 (April 4, 2016)
		at Heisler Park - North		
	Pacific Ocean Shoreline	at Main Laguna Beach	April 4, 2016	April 4, 2021 (April 4, 2016)
		Laguna Beach at Ocean Avenue		
		Laguna Beach at Cleo Street		
		Arch Cove at Bluebird Canyon Road		
		Laguna Beach at Dumond Drive		
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	April 4, 2016	April 4, 2021 (April 4, 2016)
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	April 4, 2018	April 4, 2021 (April 4, 2018)
	Aliso Creek Mouth	at mouth	April 4, 2018	April 4, 2021 (April 4, 2018)
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	April 4, 2016	April 4, 2021 (April 4, 2016)
		Aliso Beach at Table Rock Drive		
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)		
		at Salt Creek (large outlet)		
		Salt Creek Beach at Salt Creek service road	April 4, 2017	April 4, 2021 (April 4, 2017)
		Salt Creek Beach at Strand Road	April 4, 2017	April 4, 2021 (April 4, 2017)

Table 6.4 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs*
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	April 4, 2016	April 4, 2021 (April 4, 2016)
	San Juan Creek	lower 1 mile	April 4, 2018	April 4, 2021 (April 4, 2018)
	San Juan Creek Mouth	at mouth	April 4, 2016	April 4, 2021 (April 4, 2016)
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	April 4, 2016	April 4, 2021 (April 4, 2016)
		Ole Hanson Beach Club Beach at Pico Drain	April 4, 2016	April 4, 2021 (April 4, 2016)
		San Clemente City Beach at El Portal Street Stairs	April 4, 2017	April 4, 2021 (April 4, 2017)
		San Clemente City Beach at Mariposa Street		
		San Clemente City Beach at Linda Lane	April 4, 2016	April 4, 2021 (April 4, 2016)
		San Clemente City Beach at South Linda Lane	April 4, 2018	April 4, 2021 (April 4, 2018)
		San Clemente City Beach at Lifeguard Headquarters	April 4, 2017	April 4, 2021 (April 4, 2017)
		under San Clemente Municipal Pier		
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	April 4, 2018	April 4, 2021 (April 4, 2018)
		San Clemente State Beach at Riviera Beach	April 4, 2016	April 4, 2021 (April 4, 2016)
		Can Clemente State Beach at Cypress Shores	April 4, 2017	April 4, 2021 (April 4, 2017)
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	April 4, 2017	April 4, 2021 (April 4, 2017)
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	April 4, 2016	April 4, 2021 (April 4, 2016)
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	April 4, 2016	April 4, 2021 (April 4, 2016)

Table 6.4 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs*
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	April 4, 2016	April 4, 2021 (April 4, 2016)
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	April 4, 2016	April 4, 2021 (April 4, 2016)
		La Jolla Shores Beach at Caminito del Oro		
		La Jolla Shores Beach at Vallecitos		
		La Jolla Shores Beach at Avenida de la Playa		
		at Casa Beach, Children's Pool		
		South Casa Beach at Coast Boulevard		
		Whispering Sands Beach at Ravina Street		
		Windansea Beach at Vista de la Playa		
		Windansea Beach at Bonair Street		
		Windansea Beach at Playa del Norte		
		Windansea Beach at Palomar Avenue		
		at Tourmaline Surf Park		
		Pacific Beach at Grand Avenue		
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries		
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	April 4, 2018	April 4, 2021 (April 4, 2018)
	San Diego River	lower 6 miles		
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach		
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	April 4, 2018	April 4, 2021 (April 4, 2018)

* The Interim Compliance Dates to achieve the Interim Wet Weather WQBELs in parenthesis apply if the applicable Water Quality Improvement Plan does not include load reduction programs for other constituents (e.g. metals, pesticides, trash, nutrients, sediment, etc.) together with bacteria load reduction requirements of these TMDLs.

(2) Interim Water Quality Based Effluent Limitations

The Responsible Copermittees for discharges to the water bodies in Table 6.0 must comply with the following interim WQBELs by the interim compliance dates given in Specific Provision 6.c.(1):

(a) Interim Receiving Water Limitations

(i) *Interim Dry Weather Receiving Water Limitations*

The Responsible Copermittee must calculate the "existing" exceedance frequencies of the 30-day geometric mean water quality objectives for each of the indicator bacteria by analyzing the available monitoring data collected between January 1, 1996 and December 31, 2002. "Existing" exceedance frequencies may be calculated by water body and/or by Watershed Management Area listed in Table 6.0. Separate "existing" exceedance frequencies must be calculated for beaches and creeks/creek mouths.

The Responsible Copermittees must achieve a 50 percent reduction in the "existing" exceedance frequency of the 30-day geometric mean WQBELs for the water bodies listed in Table 6.0 by the interim compliance dates given in Table 6.4. A 50 percent reduction in the "existing" exceedance frequency is equivalent to half of the "existing" exceedance frequency of the 30-day geometric mean WQBELs.

The "existing" exceedance frequencies and the interim dry weather allowable exceedance frequencies (i.e. interim dry weather receiving water limitations) calculated by the Responsible Copermittees must be included in the Water Quality Improvement Plans for the applicable Watershed Management Areas.

(ii) *Interim Wet Weather Receiving Water Limitations*

The Responsible Copermittees must achieve the interim wet weather receiving water limitations in Table 6.5, expressed as interim wet weather allowable exceedance frequencies, by the interim compliance dates given in Table 6.4.

Table 6.5
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	38%	37%	39%
		at Heisler Park - North			
	Pacific Ocean Shoreline	at Main Laguna Beach			
		Laguna Beach at Ocean Avenue			
		Laguna Beach at Cleo Street			
		Arch Cove at Bluebird Canyon Road			
		Laguna Beach at Dumond Drive			
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	41%	41%	42%
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	41%	41%	42%
	Aliso Creek Mouth	at mouth	41%	41%	42%
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	36%	36%	36%
		Aliso Beach at Table Rock Drive			
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)			
		at Salt Creek (large outlet)			
		Salt Creek Beach at Salt Creek service road			
		Salt Creek Beach at Strand Road			

Table 6.5 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	44%	44%	48%
	San Juan Creek	lower 1 mile	44%	44%	47%
	San Juan Creek Mouth	at mouth	44%	44%	47%
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	35%	35%	36%
		Ole Hanson Beach Club Beach at Pico Drain			
		San Clemente City Beach at El Portal Street Stairs			
		San Clemente City Beach at Mariposa Street			
		San Clemente City Beach at Linda Lane			
		San Clemente City Beach at South Linda Lane			
		San Clemente City Beach at Lifeguard Headquarters			
		under San Clemente Municipal Pier			
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)			
		San Clemente State Beach at Riviera Beach			
		Can Clemente State Beach at Cypress Shores			
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	45%	44%	47%
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	40%	40%	41%
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	33%	33%	36%

Table 6.5 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	26%	26%	26%
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	37%	37%	37%
		La Jolla Shores Beach at Caminito del Oro			
		La Jolla Shores Beach at Vallecitos			
		La Jolla Shores Beach at Avenida de la Playa			
		at Casa Beach, Children's Pool			
		South Casa Beach at Coast Boulevard			
		Whispering Sands Beach at Ravina Street			
		Windansea Beach at Vista de la Playa			
		Windansea Beach at Bonair Street			
		Windansea Beach at Playa del Norte			
		Windansea Beach at Palomar Avenue			
		at Tourmaline Surf Park			
		Pacific Beach at Grand Avenue			
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries	49%	49%	51%
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	46%	43%	49%
	San Diego River	lower 6 miles	46%	43%	49%
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	46%	43%	51%
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	41%	41%	43%

(b) Interim Effluent Limitations

Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the interim compliance dates under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.c.(2)(a):

Table 6.6
Interim Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watersheds and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
South Orange County	**San Joaquin Hills HSA** (901.11) and **Laguna Hills HSA** (901.12) - Pacific Ocean Shoreline	45.89%	45.86%	49.14%	23.43%	26.04%	25.63%
	Aliso HSA (901.13) - Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	47.74%	47.79%	49.57%	12.65%	13.31%	13.76% (13.69%)**
	Dana Point HSA (901.14) - Pacific Ocean Shoreline	47.52%	47.52%	49.49%	6.58%	7.43%	7.58%
	Lower San Juan HSA (901.27) - Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	36.48%	37.11%	47.47%	9.61%	6.41%	13.56% (13.45%)**
	San Clemente HA (901.30) - Pacific Ocean Shoreline	47.14%	47.12%	49.42%	11.93%	12.29%	12.63%
San Luis Rey River	**San Luis Rey HU** (903.00) - Pacific Ocean Shoreline	19.07%	19.55%	43.69%	2.81%	1.56%	5.85%
Carlsbad	**San Marcos HA** (904.50) - Pacific Ocean Shoreline	41.41%	41.28%	48.02%	9.24%	9.49%	10.10%

Table 6.6 (Cont'd)
Interim Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watersheds and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
San Dieguito River	**San Dieguito HU** (905.00) - Pacific Ocean Shoreline	7.20%	10.36%	41.74%	2.15%	0.73%	3.86%
Penasquitos	**Miramar Reservoir HA** (906.10) - Pacific Ocean Shoreline	48.25%	48.30%	49.71%	0.81%	1.00%	0.97%
Mission Bay	**Scripps HA** (906.30) - Pacific Ocean Shoreline	48.22%	48.21%	49.63%	8.16%	10.57%	9.41%
	Tecolote HA (906.50) - Tecolote Creek	47.26%	47.30%	49.47%	8.26%	10.24%	9.08% (9.04%)**
San Diego River	**Mission San Diego HSA** (907.11) and **Santee HSA** (907.12) - Pacific Ocean Shoreline - Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles)	37.02%	34.72%	46.98%	19.07%	26.61%	21.37% (21.24%)**
San Diego Bay	**Chollas HSA** (908.22) - Chollas Creek	46.03%	46.08%	49.23%	8.91%	12.42%	10.73% (10.68%)**

Notes:
* The percent load reductions are based on reducing loads compared to pollutant loads from 2001 to 2002.
** The alternative *Enterococcus* percent load reduction was calculated based on a numeric target of 104 MPN/100mL instead of 61 MPN/100mL, protective of the REC-1 "moderately to lightly used area" usage frequency that is protective of freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative pollutant load reductions can be utilized.

(3) Interim TMDL Compliance Determination

Compliance with the interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(f) There are no exceedances of the interim receiving water limitations under Specific Provision 6.c.(2)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(g) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the interim effluent limitations under Specific Provision 6.c.(2)(b); OR

(h) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

d. Specific Monitoring and Assessment Requirements

(1) Monitoring and Assessment Requirements for Beaches

(a) Monitoring Stations

For beaches addressed by the TMDL, monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[40] If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source

[40] Commonly referred to as AB 411 monitoring

identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations at least once within the first 24 hours of the end of a storm event[41] during the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer in exceedance of the allowable exceedance frequencies in the receiving waters.

(iii) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(iv) For Pacific Ocean Shoreline segments or areas listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the dry weather and

[41] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

wet weather monitoring data to assess whether the interim and final WQBELs for the Pacific Ocean Shoreline segments or areas listed in Table 6.0 have been achieved.

(ii) Dry weather exceedance frequencies must be calculated as follows:

[a] 30-day geometric means must be calculated from the results of any dry weather samples collected from the segments or areas for each water body listed in Table 6.0;
[b] The method and number of samples need for calculating the 30-day geometric means must be consistent with the number of samples required by the Ocean Plan;
[c] Where there are multiple segments or areas associated with a water body listed in Table 6.0, the Copermittees may calculate geometric means for each segment or area, or combine the dry weather monitoring data from all the segments or areas to calculate geometric means for the water body;
[d] The exceedance frequency must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the dry season.

(iii) Wet weather exceedance frequencies must be calculated as follows:

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;
[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;
[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria densities reported from each storm event sampled; and
[d] The single sample maximum exceedance frequency must be calculated by dividing the number of wet weather days that exceed the single sample maximum receiving water limitations in Table 6.2 by the total number of wet weather days during the rainy season.
[e] The data collected for dry weather must be used in addition to the data collected for wet weather to calculate the wet weather 30-day geometric means. The exceedance frequency of the wet weather 30-day geometric means must be calculated by dividing the number of geometric means that exceed the geometric mean

receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the wet season.

(iv) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(v) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) Monitoring and Assessment Requirements for Creeks and Creek Mouths

(a) Monitoring Stations

For creeks addressed by the TMDL, monitoring locations should consist of, at a minimum, a location at or near the mouth of the creek (e.g. Mass Loading Station or Mass Emission Station) and one or more locations upstream of the mouth (e.g. Watershed Assessment Station). If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations in accordance with the requirements of Provision D.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations within the first 24 hours of the end of a storm event[42] during the rainy season (i.e. October 1 through April 30).

[42] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(iii) Samples collected from receiving water monitoring stations must be analyzed for fecal coliform and *Enterococcus* indicator bacteria.

(iv) For creeks or creek mouths listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the receiving water monitoring data to assess whether the interim and final receiving water WQBELs for the creeks and creek mouths listed in Table 6.0 have been achieved.

(ii) Dry weather exceedance frequencies must be calculated as follows:

[a] 30-day geometric means must be calculated from the results of any dry weather samples collected from the segment or area for each water body listed in Table 6.0;
[b] The method and number of samples need for calculating the 30-day geometric means must be consistent with the number of samples required by the Basin Plan;
[c] The exceedance frequency must be calculated by dividing the number of 30-day geometric means that exceed the 30-day geometric mean receiving water limitations in Table 6.2 by the total number of 30-day geometric means calculated from samples collected during the dry season.

(iii) Wet weather exceedance frequencies must be calculated as follows:

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;
[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;
[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria densities reported from each of the storm events sampled; and

[d] The exceedance frequency must be calculated by dividing the number of wet weather days that exceed the single sample maximum receiving water limitations in Table 6.2 by the total number of wet weather days during the rainy season.

[e] The data collected for dry weather must be used in addition to the data collected for wet weather to calculate the wet weather 30-day geometric means. The exceedance frequency of the wet weather 30-day geometric means must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the wet season.

(iv) The Responsible Copermittee must identify and incorporate additional MS4 outfall and receiving water monitoring stations and/or adjust monitoring frequencies to identify sources causing exceedances of the receiving water WQBELs.

(v) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(vi) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

7. Total Maximum Daily Loads for Sediment in Los Peñasquitos Lagoon

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2012-0033

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2012
State Water Board Approval Date:	January 21, 2014
Office of Administrative Law Approval Date:	July 14, 2014
US EPA Approval Date:	October 30, 2014

(3) TMDL Effective Date: July 14, 2014

(4) Watershed Management Area: ~~Los~~ Peñasquitos

(5) Water Body: Los Peñasquitos Lagoon

(6) Responsible Copermittees: County of San Diego, City of San Diego, City of Del Mar, and City of Poway

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final sediment TMDL compliance requirements for Los Peñasquitos Lagoon consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must be in compliance with the final TMDL compliance requirements by December 31, 2034.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not prohibit the sustainable restoration of tidal and non-tidal saltmarsh vegetation of at least 346 acres.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations by the compliance date under Provision 7.b(1) will not cause or contribute to a failure of the receiving water condition specified under Specific Provision 7.b.(2)(a):

Table 7.1
*Final Effluent Limitations as Expressed as Wet Season Loads in MS4 Discharges to Los Peñasquitos Lagoon**

Constituent	Effluent Limitation
Sediment	2,580 tons/wet season

* Final effluent limitations are to be achieved by the following Responsible Parties: County of San Diego, City of San Diego, City of Del Mar, City of Poway, Phase II MS4 permittees, Caltrans, general construction storm water NPDES permittees, and general industrial storm water NPDES permittees.

(c) Best Management Practices

(i) The Water Quality Improvement Plan for the Los Peñasquitos Watershed Management Area must incorporate the Sediment Load Reduction Plan required to be developed pursuant to Resolution No. R9-2012-0033.

(ii) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 7.b.(2)(a) and/or the Copermittee's portion of the effluent limitations under Specific Provision 7.b.(2)(b) for Los Peñasquitos Lagoon.

(3) Final TMDL Compliance Determination

Compliance determination with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) Successful restoration of 80 percent of the 1973 acreage of tidal and non-tidal lagoon salt marsh (346 acres) as described in Attachment A of Resolution No. R9-2010-0033; OR

(b) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 7.b.(2)(c)(ii) and/or other implementation actions to achieve compliance with Specific Provision 7.b.(3)(a) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 7.b.(2)(c)(ii) or other implementation actions to achieve compliance with Specific Provision 7.b.(3)(a),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 7.b.(2)(c)(ii) or other implementation actions, AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 7.d to demonstrate compliance with Specific Provision 7.b.(3)(a).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim sediment TMDL compliance requirements for Los Penasquitos Lagoon consist of the following:

(1) Interim Compliance Dates and WQBELs

The Responsible Copermittees must comply with the interim WQBELs, expressed as wet season loads, by December 31 of the interim compliance year set forth in Table 7.2.

Table 7.2
*Interim Water Quality Based Effluent Limitations Expressed as Wet Season Loads in MS4 Discharges**

Interim Compliance Date	Interim Effluent Limitations (tons/wet season)
December 31, 2019	6,691
December 31, 2023	5,663
December 31, 2027	4,636
December 31, 2029	3,608

* Interim effluent limitations are to be achieved by the following Responsible Parties: County of San Diego, City of San Diego, City of Del Mar, City of Poway, Phase II MS4 permittees, Caltrans, general construction storm water NPDES permittees, and general industrial storm water NPDES permittees.

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) The final receiving water limitation under Specific Provision 7.b.(2)(a) is met; OR

(c) There are no exceedances of the Copermittee's portion of interim effluent limitations under Table 7.2 at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the Copermittee's portion of the interim TMDL compliance requirements described in Attachment A of Resolution No. R9-2010-0033 will be achieved by the interim compliance date.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) Watershed Monitoring

The Responsible Copermittees must conduct suspended sediment, bed load, and flow monitoring to calculate total sediment loading to the Los Peñasquitos Lagoon for each wet season (October 1 thru April 30) as set forth below:

(a) The Responsible Copermittees must monitor enough storm events throughout the season to quantify sediment loading over each wet season, and

(b) The Responsible Copermittees must monitor at least 3 stations to quantify cumulative sediment loading into Los Peñasquitos Lagoon. Stations must be located within the Los Peñasquitos, Carroll Canyon, and Carmel Creek tributaries prior to discharging into Los Peñasquitos Lagoon.

(2) Lagoon Monitoring

The Responsible Copermittees must monitor Los Peñasquitos Lagoon each Fall for changes in the extent of the vegetation types as set forth below:

(a) The Responsible Copermittees must acquire aerial photos of Los Peñasquitos Lagoon and digitize them at an approximate scale of 1:2,500,

(b) The Responsible Copermittees must appropriately interpret the vegetation and classify the various types as saltmarsh, non-tidal saltmarsh, freshwater marsh, non-tidal saltmarsh –*Lolium perrene* infested, southern willow scrub/mulefat scrub, herbaceous wetland, or upland land cover.

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the monitoring data collected under Specific Provision 7.d(1) and 7.d(2) to assess whether the interim and final WQBELs have been achieved.

(b) For assessing and determining compliance with the final receiving water limitations under Specific Provision 7.b.(2)(a), the Responsible

Copermittees must use the data acquired under Specific Provision 7.d.(2) to estimate the acreage of tidal and non-tidal saltmarsh actually restored.

(c) For assessing and determining compliance with the final effluent limitations under Specific Provision 7.b.(2)(b), the Responsible Copermittees must use the data acquired under Specific Provision 7.d.(1) to estimate sediment loading into Los Peñasquitos Lagoon. Sediment loading must be evaluated using a 3-year, weighted rolling average. The first reported average shall be calculated using data collected in the year, 2015-2016, 2016-2017, and 2017-2018 wet seasons.

(d) The monitoring and assessment results must be submitted as part of the Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

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ATTACHMENT F

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

FACT SHEET / TECHNICAL REPORT

FOR

ORDER NO. R9-2013-0001
AS AMENDED BY ORDER NOS. R9-2015-0001 AND R9-2015-0100
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

May 8, 2013
Amended ~~on~~ February 11, 2015
and November 18, 2015

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I. FACT SHEET FORMAT

This Fact Sheet briefly sets forth the principal facts and the significant factual, legal, methodological, and policy questions that the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) considered in preparing Order No. R9-2013-0001 (Order), as amended by Order Nos. R9-2015-0001 and R9-2015-0100. In accordance with the Code of Federal Regulations (CFR) Title 40 Parts 124.8 and 124.56 (40 CFR 124.8 and 40 CFR 124.56), this Fact Sheet includes, but is not limited to, the following information:

1. Contact information
2. Public process and notification procedures
3. Background of municipal storm water permits
4. Regional MS4 Permit approach
5. Economic considerations
6. Applicable statutes, regulations, plans and policies
7. Discussion of the provisions in the Order

Tentative Order No. R9-2013-0001 was distributed for public review on October 31, 2012. The San Diego Water Board accepted written comments on ~~the~~ Tentative Order No. R9-2013-0001 until January 11, 2013. A public hearing was subsequently held on April 10 and 11, 2013, that was continued to May 8, 2013 to receive oral comments from interested persons. The San Diego Water Board adopted Order No. R9-2013-0001 on May 8, 2013.

Tentative Order No. R9-2015-0001, an Order amending Order No. R9-2013-0001, was distributed for public review on September 19, 2014. The San Diego Water Board accepted written comments on Tentative Order No. R9-2015-0001 until November 19, 2014. A public hearing was held on February 11, 2015, to receive oral comments from Copermittees and interested persons. The San Diego Water Board adopted Order No. R9-2015-0001 amending Order No. R9-2013-0001 on February 11, 2015. Order No. R9-2015-0001 amended the findings and provisions of Order No. R9-2013-0001 to:

a. Enroll the County of Orange, the Orange County Flood Control District and the south Orange County Cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano as Copermittees responsible for compliance with the terms and conditions of Order No. R9-2013-0001, as amended by Order No. R9-2015-0001;

b. Designate the San Diego Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the Cities of Laguna Woods and Laguna Hills and agree to the designation of the Santa Ana Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the City of Lake Forest, subject to the

terms of the February 10, 2015 agreement between San Diego Water Board and the Santa Ana Water Board described in Finding 29 of this Order, upon the later effective date of Order No. R9-2015-0001 or Order No. R8-2015-0001 (superseding Order No. R8-2009-0030);

c. Establish interim exceptions to land development requirements for those priority development projects that discharge to engineered channels and large river reaches as described in Provision E.3.c.(2)(e) of this Order;

d. Incorporate the amended requirements of the State Water Resources Control Board's (State Water Board) General Exception to require that pollutant reductions be achieved within 6 years for storm water and nonpoint source discharges to ASBS within the Region;

e. Incorporate applicable requirements of the Los Peñasquitos Lagoon Sediment TMDL; and

f. Require the Orange County Copermittees to implement the "*Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County*," dated October 2014, made effective in the Monitoring and Reporting Program/Order issued pursuant to California Water Code section 13383 in the December 5, 2014 San Diego Water Board Letter Directive and subject to future revisions by the Executive Officer after appropriate public input.

~~A public hearing was held on February 11, 2015, to receive oral comments from Copermittees and interested persons. The San Diego Water Board adopted Order No. R9-2015-0001 amending Order No. R9-2013-0001 on February 11, 2015.~~

Tentative Order No. R9-2015-0100, an Order amending Order No. R9-2013-0001 as amended by Order No. R9-2015-0001, was distributed for public review on July 31, 2015. The San Diego Water Board accepted written comments on Tentative Order No. R9-2015-0100 until September 14, 2015. A public hearing was held on November 18, 2015, to receive oral comments from Copermittees and interested persons. The San Diego Water Board adopted Order No. R9-2015-0100 amending Order No. R9-2013-0001 as amended by Order No. R9-2015-0001, on November 18, 2015. Order No. R9-2015-0100 amended the findings and provisions of Order No. R9-2013-0001 as amended by Order No. R9-2015-0001 to:

a. Enroll the County of Riverside, the Cities of Murrieta, Temecula, and Wildomar, and the Riverside County Flood Control and Water Conservation District as Copermittees responsible for compliance with the terms and conditions of Order No. R9-2013-0001, as amended by Order Nos. R9-2015-0001 and R9-2015-0100;

b. Continue designation of the San Diego Water Board to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Murrieta and Wildomar, including areas within the Santa Ana Region; and, agree to continue designation of the Santa Ana Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the City of Menifee, including areas within the San Diego Region, subject to the terms of the [Month][Day], 2015 agreement between San Diego Water Board and the Santa Ana Water Board described in Finding 29 of this Order;

d. Incorporate Provision B.3.c, which provides an option that allows a Copermittee to utilize the watershed-based Water Quality Improvement Plan to be deemed in compliance with the prohibitions and limitations of Provisions A.1.a, A.1.c, A.1.d, A.2.a, and A.3.b;

e. Incorporate minor revisions to Provisions E.2.a.(1) and E.2.a.(2) to include San Diego Water Board Order No. R9-2015-0013 and State Water Board Order 2014-0194-DWQ into the requirements for addressing non-storm water discharges to a Copermittee's MS4;

e. Incorporate minor revisions to Provision E.3.b.(1) to correct inconsistencies in the definition of a Priority Development Project as compared to the definitions in Order No. R9-2009-0002 (Fourth Term Orange County MS4 Permit) and Order No. R9-2010-0016 (Fourth Term Riverside County MS4 Permit), and requirements for incorporating the corrected definitions into the BMP Design Manual;

f. Incorporate revisions to Provision E.3.e.(1)(a) to provide additional clarity on when the structural BMP performance requirements of Provision E.3.c are applicable to Priority Development Projects;

e. Incorporate minor revisions to the Revised TMDLs for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region and the TMDLs for Sediment in Los Peñasquitos Lagoon in Attachment E to the Order to make the requirements consistent with the Basin Plan amendments adopted by the San Diego Water Board; and

f. Remove provisions related to allowing the Riverside County Copermittees to apply for early coverage under the Regional MS4 Permit.

The San Diego Water Board files applicable to the issuance of Order No. R9-2013-0001 and amendments thereto are incorporated into the administrative record in support of the findings and requirements of the Order.

II. CONTACT INFORMATION

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The Order and other related documents can be downloaded from the San Diego Water Board website at

http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

The documents referenced in this Fact Sheet and in Order No. R9-2013-0001 and amendments thereto are available for public review at the San Diego Water Board office, located at the address listed above. Public records are available for inspection during regular business hours, from 8:00 am to 5:00 pm Monday through Friday. To schedule an appointment to inspect public records, contact the San Diego Water Board Records Management Officer at 619-516-1990.

COPERMITTEES

Orange County Copermittees

- County of Orange
  - City of Aliso Viejo
  - City of Dana Point
  - City of Laguna Beach
  - City of Laguna Hills
  - City of Laguna Niguel
  - City of Laguna Woods
  - City of Lake Forest *
  - City of Mission Viejo
  - City of Ranch Santa Margarita
  - City of San Clemente
  - City of San Juan Capistrano
  - Orange County Flood Control District

* While not listed in the above table, the City of Lake Forest remains a Copermittee under this Order until the later effective date of this Order or Santa Ana Water Board Tentative Order No. R8-2015-0001. Thereafter, the City of Lake Forest will no longer be considered a Copermittee under this Order because its Phase I MS4 discharges will be regulated by the Santa Ana Water Board pursuant to Water Code section 13328 designation. The requirements of this Order that apply to the City of Lake Forest for the duration of this Order, consistent with the Water Code section 13228 agreement dated February 10, 2015, are described in Finding 29 and Footnote 2 to Table B-1.

Riverside County Copermittees

- County of Riverside
  - City of Menifee**
  - City of Murrieta
  - City of Temecula
  - City of Wildomar
  - Riverside County Flood Control and Water Conservation District

** The City of Menifee is not regulated as a Copermittee under this Order because its Phase I MS4 discharges are regulated by Santa Ana Water Board Order No. R8-2010-0033 as it may be amended or issued pursuant to Water Code section 13228 designation. The requirements of this Order that apply to the City of Menifee for the duration of this Order, consistent with the Water Code section 13228 written agreement dated [Month][Day], 2015, are described in Finding 29 and Footnote 3 to Table B-1.

San Diego County Copermittees

- County of San Diego
  - City of Carlsbad
  - City of Chula Vista
  - City of Coronado
  - City of Del Mar
  - City of El Cajon
  - City of Encinitas
  - City of Escondido
  - City of Imperial Beach
  - City of La Mesa
  - City of Lemon Grove
  - City of National City
  - City of Oceanside
  - City of Poway
  - City of San Diego
  - City of San Marcos
  - City of Santee
  - City of Solana Beach
  - City of Vista
  - San Diego County Regional Airport Authority
  - San Diego Unified Port District

III. PUBLIC PROCESS AND NOTIFICATION PROCEDURES

The San Diego Water Board followed the schedule listed below for the preparation of Order No. R9-2013-0001 and amendments thereto:

San Diego County Copermittee Permit Reissuance Process

1. On February 8, 2011, the San Diego Water Board met with the San Diego County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No. R9-2007-0001.

2. Between February and May 2011, the San Diego Water Board met with select San Diego County, Orange County, and Riverside County Copermittees, as well as representatives of the environmental community to discuss concepts and receive recommendations for elements to be incorporated in a Regional Municipal Separate Storm Sewer System Permit (Regional MS4 Permit).

3. On June 27, 2011 the San Diego Water Board received the Report of Waste Discharge from the San Diego County Copermittees for the renewal of their NPDES permit, Order No. R9-2007-0001.

4. On April 9, 2012, the San Diego Water Board released an administrative draft of Tentative Order No. R9-2013-0001 for preliminary informal comments and feedback.

5. On April 25, 2012, the San Diego Water Board held an informal public workshop to present the administrative draft of Tentative Order No. R9-2013-0001 and receive verbal comments.

6. Between June and August 2012, the San Diego Water Board held four (4) focused meetings with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community, and USEPA) to discuss and receive preliminary comments and feedback about specific elements in the administrative draft of Tentative Order No. R9-2013-0001.

7. On September 5, 2012, the San Diego Water Board held an informal public workshop to present the modifications that were expected to be incorporated into the Tentative Order based on the preliminary comments and feedback received during the focused meetings held between June and August 2012.

8. Informal written comments on the administrative draft of Tentative Order No. R9-2013-0001 were accepted until September 14, 2012.

9. On October 12, 2012, the San Diego Water Board released a revised administrative draft of Tentative Order No. R9-2013-0001.

10. On October 24, 2012, the San Diego Water Board held a focused meeting with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community, and USEPA) to discuss modifications incorporated into the administrative draft of Tentative Order No. R9-2013-0001.

11. On October 31, 2012, the San Diego Water Board released Tentative Order No. R9-2013-0001 for formal public review and comment.

12. On November 13, 2012 and December 12, 2012, the San Diego Water Board held a formal public Board workshop to present the public draft of Tentative Order No. R9-2013-0001 and receive verbal comments.

13. Formal written comments on the public draft of Tentative Order No. R9-2013-0001 were accepted until January 11, 2013.

14. A public hearing of Tentative Order No. R9-2013-0001 was conducted on April 10 and 11, 2013, that was continued to May 8, 2013.

Orange County Copermittee Permit Reissuance Process

15. On May 20, 2014 the San Diego Water Board received the Report of Waste Discharge from the Orange County Copermittees for the renewal of their MS4 NPDES permit, Order No. R9-2009-0002.

16. On June 24, 2014, the San Diego Water Board met with the Orange County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No.R9-2009-0002 and the process for enrollment as Copermittees under Regional MS4 Permit Order No. R9-2013-0001.

17. On July 1, 2014, the San Diego Water Board held a public meeting to discuss the Orange County Report of Waste Discharge and receive comments on potential modifications to Order No. R9-2013-0001. Based on comments received from the Orange County Copermittees and other interested persons at this meeting, the San Diego Water Board determined that additional public meetings were not needed prior to release of Tentative Order No. R9-2015-0001, amending Order No. R9-2013-0001 in redlined – strikeout format for public review and comment.

18. On September 19, 2014, the San Diego Water Board released Tentative Order No. R9-2015-0001 for a 60 day public review and comment period.

19. On October 8, 2014, the San Diego Water Board held a formal public workshop at a regular board meeting to receive information and discuss the proposed amendments to Order No. R9-2013-0001 described in Tentative Order No. R9-2015-0001.

20. In accordance with State and federal laws and regulations, the San Diego Water Board notified San Diego County, Orange County and Riverside County Copermittees, and all known interested agencies and persons of its intent to adopt Tentative Order No. R9-2015-0001 and provided them with an opportunity to submit their written comments and recommendations. Written comments and recommendations on Tentative Order No. R9-2015-0001 were accepted until November 19, 2014.

21. The San Diego Water Board held a public workshop on October 8, 2014, and a public hearing on February 11, 2015, and heard and considered all comments pertaining to the adoption of Tentative Order No. R9-2015-0001 on February 11, 2015.

Riverside County Copermittee Permit Reissuance Process

22. Between April and June 2015, the San Diego Water Board held three (3) public workshops with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community) to discuss and receive comments and feedback about amending Order No. R9-2013-0001 to incorporate a definition of prior lawful approval for Priority Development Projects, and an alternative compliance pathway for prohibitions and limitations in Provision A of the Order. A San Diego Water Board member attended the April and May 2015 public workshops, but no actions or voting took place.

23. On April 15, 2015, the San Diego Water Board met with the Riverside County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No.R9-2010-0016 and the process for enrollment as Copermittees under Order No. R9-2013-0001 (Regional MS4 Permit).

24. On May 8, 2015 the San Diego Water Board received a Report of Waste Discharge from the Riverside County Copermittees for the renewal of their MS4 NPDES permit, Order No. R9-2010-0016.

25. On July 31, 2015, the San Diego Water Board released Tentative Order No. R9-2015-0100 for a formal public review and comment period.

26. Formal written comments on the public draft of Tentative Order No. R9-2015-0100 were accepted until September 14, 2015, a formal public written comment period of 46 days.

27. A public hearing to receive oral comments on Tentative Order No. R9-2015-0100 was conducted on November 18, 2015.

IV. BACKGROUND OF THE SAN DIEGO REGION MUNICIPAL STORM WATER PERMITS

In developed and developing areas, storm water runoff is commonly transported through municipal separate storm sewer systems (MS4s) and discharged into local receiving water bodies. As the storm water runs off and flows over the land or impervious surfaces (e.g., paved streets, parking lots, and building rooftops), it accumulates debris, chemicals, sediment, and other pollutants that can adversely affect receiving water quality if discharged untreated. The United States Environmental Protection Agency (USEPA) recognizes wet weather flows from urban areas as the number one source of estuarine pollution in coastal communities,[1] such as those within the San Diego Region.

The federal Clean Water Act (CWA) was amended in 1987 to address and regulate discharges of storm water associated with industrial activities and from municipal storm sewers. With the amendments, many municipalities throughout the United States were obligated for the first time to obtain National Pollutant Discharge Elimination System (NPDES) permits for discharges of storm water from their MS4s.

In response to the CWA 1987 amendment, as well as the pending federal NPDES regulations which would implement the amendment, the San Diego Water Board issued "early" MS4 permits. The San Diego Water Board adopted and issued Order Nos. 90-38, 90-42, and 90-46 to regulate storm water discharges from the MS4s in Orange County, San Diego County, and Riverside County, respectively, within the San Diego Region on July 16, 1990.

The "early" MS4 permits, or First Term Permits, were issued prior to the November 1990 promulgation of the final federal NPDES storm water regulations. By issuing these First Term Permits before the federal regulations took effect, the San Diego Water Board was able to provide the Copermittees additional flexibility in addressing and managing storm water discharges. The First Term Permits contained the essentials of the 1990 regulations, and required the Copermittees to develop and implement runoff management programs, but provided little specificity about what was required to be included in or actually achieved by those programs.

The flexibility provided in the First Term Permits was generally continued through the Second Term Permits. The combination of the lack of specificity in the First and Second Term Permits, a general lack of meaningful action by the Copermittees and a general lack of corresponding reaction (i.e. enforcement) by the San Diego Water Board during the first ten years of the storm water program, resulted in few substantive steps towards achieving improvements in the quality of receiving waters or storm water discharges from the MS4s.

[1] US EPA. 1999. 40 CFR Parts 9, 122, 123, and 124. National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. 64 FR 68727.

From 2001, the regulatory approach incorporated into Third Term Permits was a significant departure from the regulatory approach of the First and Second Term Permits. The Third Term Permits issued by the San Diego Water Board included more detailed requirements that outlined the minimum level of implementation required for the Copermittees' programs to meet the maximum extent practicable (MEP) standard for storm water. The Third Term Permits included more detail to emphasize and enhance the jurisdictional runoff management programs developed by the Copermittees and introduced requirements for developing and implementing watershed-based programs.

The Third Term Permits also incorporated two precedent setting decisions by the State Water Board. In Order WQ 99-05, the State Water Board established receiving water limitation language to be included in all MS4 permits. The State Water Board's precedential language clarified that municipal storm water permits must include provisions requiring discharges to be controlled to attain water quality standards in receiving waters. Unlike previously adopted versions of the receiving water limitation language in the First and Second Term Permits, the language no longer stated that "*violations of water quality standards are not violations of the municipal storm water permit under certain conditions*." In addition, the receiving water limitation language no longer indicated that the "*implementation of best management practices is the 'functional equivalent' of meeting water quality standards*." State Water Board Order WQ 99-05 specifically requires language in MS4 permits for the Copermittees to comply with water quality standards based discharge prohibitions and receiving water limitations through timely implementation of control measures and other actions to reduce pollutants in discharges. (See State Water Board Order WQ 99-05 (*Environmental Health Coalition*)).

In Order WQ 2000-11, also a precedential decision, the State Water Board addressed design standards for structural post-construction best management practices (BMPs) for new development and significant redevelopment. The State Water Board found that the design standards, which require that runoff generated by 85 percent of storm events from specific development categories be infiltrated or treated, reflect the MEP standard. State Water Board Order WQ 2000-11 also found that the post-construction BMP provisions, or Standard Storm Water Mitigation Plan (SSMP) provisions, constitute MEP for addressing storm water pollutant discharges resulting from specific development categories.

The Third Term San Diego County and Orange County Permits (Order Nos. 2001-01 and R9-2002-0001, respectively) were appealed to the State Water Board. Minor modifications were made by the State Water Board, but the requirements were largely upheld. In State Water Board Order WQ 2001-15, the State Water Board upheld the Third Term San Diego County Permit requirements with certain modifications. The State Water Board removed the prohibition of storm water discharges *into* the MS4 that cause or contribute to exceedances of water quality objectives. The revision allows for treatment of pollutants in storm water runoff after the pollutants have entered the MS4.

State Water Board Order WQ 2001-15 otherwise upheld all the other requirements of the permit.

In addition to the modification to the discharge prohibition in Order WQ 2001-15, the State Water Board refined Order WQ 99-05 by making clear that the Copermittees may use an iterative approach to achieving compliance with water quality standards that involves ongoing assessments and revisions. Thus, the language for the discharge prohibitions and receiving water limitations was revised to explicitly require the Copermittees to implement an iterative process of assessments and revisions to comply with the discharge prohibitions and receiving water limitations. The San Diego Water Board retained the authority to enforce receiving water limitations and discharge prohibitions even if the Copermittee is engaged in the iterative process.

The Third Term San Diego County Permit was subsequently challenged in the Superior Court of the State of California and the Court of Appeal, Fourth Appellate District. The Court of Appeal, Fourth Appellate District, found that the approach of the Third Term San Diego County Permit to regulating discharges into the MS4 was appropriate (*Building Industry Ass'n. v. State Water Resources Control Bd., et al.,* 124 Cal.App.4th 866 (2004)). The State of California Supreme Court denied review sought by the Building Industry Association in March 2005.

The Fourth Term Permits~~, or current MS4 permits,~~ began with the adoption of Order No. R9-2007-0001 issued to the Copermittees of San Diego County in January 2007. Order Nos. R9-2009-0002 and R9-2010-0016 were subsequently issued to the Copermittees of Orange County and Riverside County. The Fourth Term Permits continued to include more detailed requirements to be implemented by each Copermittee's jurisdictional runoff management program. The Fourth Term Permits also included requirements to further emphasize a watershed management approach and for more coordination among jurisdictional runoff management programs. In addition, the Fourth Term Permits included more requirements for assessing the effectiveness of the runoff management programs being implemented by the Copermittees. The intent of the inclusion of additional requirements was to enhance and better define elements of the permit that were expected to be incorporated into the iterative process for managing runoff from each Copermittee's jurisdiction and within the watersheds of the San Diego Region.

The Fourth Term Permits included several new and emerging approaches for managing storm water runoff and discharges. Low impact development (LID) requirements are included for development and significant redevelopment to reduce pollutants in storm water runoff from sites through more natural processes such as infiltration and biofiltration closer to the source, rather than utilizing conventional mechanical end-of-pipe treatment systems. Hydrograph modification (hydromodification) management requirements also are included to mitigate the potential for increased erosion in receiving waters due to increased runoff rates and durations often caused by development and increased impervious surfaces. The Fourth Term Orange County and Riverside County Permits introduced requirements to identify areas of existing

development where retrofitting with LID projects would be feasible and could be implemented to reduce storm water runoff and pollutants in storm water discharges.

The Fourth Term Orange County and Riverside County Permits included a clearer distinction between storm water and non-storm water discharges. The term "urban runoff" was completely removed, and a distinction between storm water (wet weather) runoff and non-storm water (dry weather) runoff was emphasized. This clarification was made to prevent any potential misunderstanding that regulation under the MS4 permits is limited only to urbanized areas, and to prevent non-storm water runoff from being managed in the same manner as storm water runoff. The term "urban runoff" is not defined in the Code of Federal Regulations (CFR) or Federal Register (FR) in the regulation of MS4 discharges. According to the CWA 402(p)(3)(B)(ii), MS4 permits must include a requirement to effectively prohibit non-storm water discharges into the MS4s.

Finally, for the Fourth Term Orange County and Riverside County Permits the San Diego Water Board found that non-storm water discharges to the MS4 from over application of irrigation water are sources of pollutants. The San Diego Water Board found that non-storm water discharges resulting from over-irrigation must be prohibited from entering the MS4 in accordance with the requirements of the CWA and pursuant to 40 CFR 122.26(d)(2)(iv)(B)(1).

The requirements of the Fourth Term Permits issued to the Copermittees in each county within the San Diego Region now have substantively the same core requirements such as discharge prohibitions, receiving water limitations, jurisdictional runoff management program components, and monitoring program requirements. There are, however, several inconsistencies that exist among the three Fourth Term Permits which complicate oversight and implementation of the permits by the San Diego Water Board.

The Fourth Term San Diego County Permit expired in January 2012. The Fourth Term Orange County permit expired in December 2014 and the Fourth Term Riverside County Permit ~~will~~ expired in November 2015. Issuing the Fifth Term Permits within five years for three counties under three different permits would have required the San Diego Water Board to expend significant time and resources for the issuance of the permits through three separate public proceedings, thereby greatly reducing the time and resources available to oversee implementation and compliance. Multiple permits also create confusion for determining compliance among regulated entities, especially for the land development community.

The San Diego Water Board ~~has~~ acknowledged that issuing a single MS4 permit for all the Copermittees in the San Diego Region can and is expected to result in more consistent implementation, improve communication among agencies within watersheds crossing multiple jurisdictions, and minimize resources spent with each permit renewal process. Within the findings of the Fourth Term Riverside County Permit issued in November 2010, the San Diego Water Board notified the public of its intent to develop and issue a single Regional MS4 Permit.

V. REGIONAL MS4 PERMIT APPROACH

The Fifth Term Permit, or Regional MS4 Permit, shifts the focus of the permit requirements from a minimum level of actions to be implemented by the Copermittees to identifying outcomes to be achieved by those actions. Order No. R9-2013-0001 represents an important paradigm shift in the approach for MS4 permits within the San Diego Region.

Historical Permitting Approach

The First and Second Term Permits were very broad and provided little specificity about what was required to be developed and implemented by the Copermittees. The Third Term Permits began to become more specific about the minimum level of implementation required by the Copermittees. The Fourth Term Permits subsequently increased in specificity. The MS4 permits have progressively become more detailed and focused on specifying the minimum level of actions expected to be implemented by the Copermittees. As detailed and specific as the MS4 permits have become, however, they include very little detail about what the desired outcomes of the required actions are expected to achieve. Compliance with the permit requirements has essentially been tracking numbers of actions and reporting, not tracking progress or actual improvements in the quality of receiving waters or discharges from the MS4s. The result has been an increase in actions being implemented by the Copermittees with little or no ability or expectations to determine whether or not improvements in water quality are being achieved.

The Fourth Term Permits result in significant resource expenditure by the Copermittees to report permit compliance information to the San Diego Water Board in the form of annual jurisdictional runoff management program, watershed program, and monitoring program reports. The San Diego Water Board ~~must then~~ was required to expend much of its limited resources on reviewing more than 50 voluminous reports submitted annually by the Copermittees. The information ~~currently~~ reported by the Copermittees ~~is~~ was of limited value when trying to measure progress toward achieving improvements in the quality of receiving waters or discharges from the MS4s. Oversight of the MS4 permits ~~is~~ was further complicated by the inconsistencies among the requirements issued to the Orange County, San Diego County, and Riverside County Copermittees under three separate MS4 permits.

Under the Fourth Term Permits, the Copermittees ~~must~~ were required to expend a significant portion of their limited resources collecting data of limited value, and putting together reports to submit that information to the San Diego Water Board. Likewise, the San Diego Water Board ~~must~~ was required to expend most of its limited resources reviewing reports, and developing permits instead of working directly with the Copermittees to identify solutions to problems causing impacts to water quality. This ~~is~~ was an unsustainable course that ~~will~~ would have continued to demand more

resources from the Copermittees and the San Diego Water Board, and would have continued to result in unknown water quality benefits.

New Permitting Approach

The goal of the Regional MS4 Permit is twofold: 1) bring a consistent set of MS4 permit requirements to all of the Copermittees within the San Diego Region; and, 2) provide an MS4 permit with requirements that will allow the Copermittees to focus their efforts and resources on achieving goals and desired outcomes toward the improvement of water quality rather than completing specific actions.

The overall approach included in the Regional MS4 Permit with respect to the jurisdictional runoff management programs will not differ significantly from the current permits. The general requirements for the jurisdictional runoff management program components and compliance with those requirements will remain and be applied consistently throughout the San Diego Region under the Regional MS4 Permit.

The most significant difference in the new permitting approach is the specific manner of implementation for those jurisdictional runoff management programs. Implementation will be based on decisions made by the Copermittees in accordance with what they have identified as their highest priority water quality conditions. In other words, the Copermittees will have significant control in how to implement the jurisdictional runoff management programs to best utilize their available resources in addressing a specific set of priorities effectively, instead of trying to address all the water quality priorities ineffectively.

The Copermittees are given the responsibility of identifying their highest priority water quality conditions that they intend to address. The Copermittees will develop goals that can be used to measure and demonstrate progress or improvements toward addressing those priorities. In addition to the goals, the Copermittees will provide a schedule for achieving the goals for those highest priorities. The measurement of progress toward achieving the goals for those highest priorities requires a better defined and more focused program of monitoring and assessment than under the Fourth Term Permits.

The monitoring and assessment program must be designed to inform the Copermittees of their progress, and the need for modifications in their jurisdictional runoff management programs and schedules to achieve their goals to improve water quality. The monitoring and assessment program requirements will have a more central role in the Regional MS4 Permit than in earlier permits. The monitoring and assessment requirements must also be designed to enable the Copermittees to focus and direct their efforts in implementing their jurisdictional runoff management programs toward their stated desired outcomes to improve the quality of receiving waters and/or discharges from the MS4s.

By providing an MS4 permit that allows the Copermittees to make more decisions about how to utilize and focus their resources, along with a better defined monitoring and assessment program to inform their water quality management decisions, the Copermittees ~~will~~ have the opportunity to:

1) *Plan strategically*. The Copermittees must have the ability to identify their available resources and develop and implement long term plans that can organize, collect, and use those resources in the most strategically advantageous and efficient manner possible. This ability to develop long term plans will allow the Copermittees to focus and utilize their resources in a more concerted way over the short term and long term to address specific water quality priorities through stated desired outcomes.

2) *Manage adaptively*. The Copermittees must be given the ability to modify their plans as additional information and data are collected from the monitoring and assessment programs. The Copermittees' plans may require modifications to the programs, priorities, goals, strategies, and/or schedules in order for the Copermittees to achieve a stated desired outcome.

3) *Identify synergies*. The Copermittees must be given more flexibility to identify efficiencies within and among their jurisdictional runoff management programs as the strategies are developed and implemented to increase the Copermittees' collective effectiveness. The Copermittees must also be able to identify and utilize resources available from other agencies and entities to further augment and enhance their jurisdictional runoff management programs and/or to collectively work with those other agencies and entities toward achieving a stated desired outcome.

The Regional MS4 Permit requirements ~~will~~ provide the Copermittees the flexibility and responsibility to decide what actions will be necessary to achieve an outcome that is tailored and designed by the Copermittees to improve specific prioritized water quality conditions. The San Diego Water Board expects the approach of the Regional MS4 Permit to give the Copermittees a greater sense of ownership for restoring the quality of receiving waters in the San Diego Region by becoming an integral part of the decision making process in identifying water quality conditions to be addressed, as well as determining the best use of their resources.

VI. ECONOMIC CONSIDERATIONS

Statutory Considerations

California Water Code (CWC) section 13241 requires the San Diego Water Board to consider certain factors, including economic considerations, in the adoption of water quality objectives. CWC section 13263 requires the San Diego Water Board to take into consideration the provisions of CWC section 13241 in adopting waste discharge requirements.

In *City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, the California Supreme Court considered whether Regional Water Boards must comply with CWC section 13241 when issuing waste discharge requirements under CWC section 13263(a) by taking into account the costs a permittee will incur in complying with the permit requirements. The Court concluded that whether it is necessary to consider such cost information "*depends on whether those restrictions meet or exceed the requirements of the federal Clean Water Act.*" (*Id.* at p. 627.) The Court ruled that Regional Water Boards may not consider the factors in CWC section 13241, including economics, to justify imposing pollutant restrictions that are less stringent than applicable federal law requires. (*Id.* At pp. 618, 626-627 ["*[Water Code section 13377 specifies that [ ] discharge permits issued by California's regional boards must meet the federal standards set by federal law. In effect, section 13377 forbids a regional board's consideration of any economic hardship on the part of the permit holder if doing so would result in the dilution of the requirements set by Congress in the Clean Water Act...Because CWC section 13263 cannot authorize what federal law forbids, it cannot authorize a regional board, when issuing a [ ] discharge permit, to use compliance costs to justify pollutant restrictions that do not comply with federal clean water standards*."]). However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Regional Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

As discussed in Section VII.F, Unfunded State Mandates, the San Diego Water Board finds that the requirements in this Order are not more stringent than the minimum federal requirements. Among other requirements, federal law requires MS4 permits to include requirements to effectively prohibit non-storm water discharges into the MS4s, in addition to requiring controls to reduce the discharge of pollutants in storm water to the MEP, and other provisions as USEPA or the State determines are appropriate for the control of pollutants in MS4 discharges.

The requirements in this Order may be more specific or detailed than those enumerated in federal regulations under 40 CFR 122.26 or in the USEPA guidance. However, the requirements have been designed to be consistent with and within the federal statutory mandates described in CWA section 402(p)(3)(B)(ii) and (iii) and the related federal regulations and guidance. Consistent with federal law, all of the

conditions in this Order could have been included in a permit adopted by USEPA in the absence of the in lieu authority of California to issue NPDES permits.

Moreover, the inclusion of numeric WQBELs in this Order does not cause this Order to be more stringent than federal law. Federal law authorizes both narrative and numeric effluent limitations to meet state water quality standards. The inclusion of WQBELs as discharge specifications in an NPDES permit in order to achieve compliance with water quality standards is not a more stringent requirement than the inclusion of BMP based permit limitations to achieve water quality standards (State Water Board Order No. WQ 2006-0012 (*Boeing*)). Therefore, consideration of the factors set forth in CWC section 13241 is not required for permit requirements to implement the effective prohibition on the discharge of non-storm water discharges into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determine appropriate to control such pollutants, as those requirements are mandated by federal law.

Included in the provisions of the Order are monitoring and reporting requirements that are designed to demonstrate that the Copermittees are implementing programs to comply with the CWA municipal storm water requirements. CWA section 308(a) and 40 CFR 122.41(h), (j)-(l), 122.44(i) and 122.48 require that all NPDES permits specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s (40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c)) also specify additional monitoring and reporting requirements. In addition to the federal requirements of the CWA, the San Diego Water Board also has the authority in CWC 13383 to establish monitoring, reporting, and recordkeeping requirements that implement federal and state laws and regulations through NPDES permits.

The monitoring and assessment information that will be reported to the San Diego Water Board is necessary to determine if the Copermittees are making progress toward achieving compliance with the discharge prohibitions, receiving water limitations, and effluent limitations under Provision A of the Order. The monitoring and assessment information that will be reported is also expected to be key to the iterative approach and adaptive management process that is required to be implemented by the Copermittees if they cannot meet the discharge prohibitions and receiving water limitations under the present conditions, which is also part of the requirements under Provision A of the Order.

Notwithstanding the above, the San Diego Water Board has considered cost information in issuing this Order, as discussed below. The San Diego Water Board has also considered all of the evidence that has been presented to the San Diego Water Board regarding the CWC section 13241 factors in adopting this Order. The San Diego Water Board finds that the requirements in this Order are reasonably necessary to protect beneficial uses identified in the Basin Plan and the economic information related to costs of compliance and other CWC section 13241 factors are not sufficient to justify failing to protect those beneficial uses. Where appropriate, the

San Diego Water Board has provided or will consider providing the Copermittees with additional time to implement control measures to achieve final WQBELs and/or water quality standards.

Cost Information

Discussions of the financial and economic ramifications of municipal storm water management programs tend to focus on the significant costs incurred by municipalities in developing and implementing the programs. When considering the cost of implementing the programs, however, it is also important to consider the alternative costs that are incurred when programs are not fully implemented, as well as the economic benefits which result from effective program implementation.

The recent financial and economic conditions have amplified the concerns about the costs incurred by the municipalities in developing and implementing their programs. The reduction in resources resulting from the recent financial and economic conditions has been cited by many of the Copermittees as a justification for reducing the requirements that must be met by their programs. While the recent conditions are a cause for concern in the short term, these programs also have an opportunity to identify and implement improvements and efficiencies before the next period of growth and development, resulting in more effective and sustainable programs over the long term.

In addition, it is very difficult to ascertain the true cost of implementation of the Copermittees' management programs because of inconsistencies in reporting by the Copermittees. Reported costs of compliance for the same program element can vary widely from city to city, often by a very wide margin that is not easily explained.[2] Despite these problems, efforts have been made to identify management program costs, which can be helpful in understanding the costs of program implementation.

The San Diego Water Board recognizes that the Copermittees will incur costs in implementing this Order, potentially above and beyond the costs from the Copermittees' prior permits. The San Diego Water Board also recognizes that, due to California's current economic condition, many Copermittees currently have limited staff and resources to implement actions to address its MS4 discharges. Based on the economic considerations below, the San Diego Water Board has provided the Copermittees a significant amount of flexibility to choose how to implement the requirements of the Order.

The Order also allows the Copermittees to customize their plans, programs, and monitoring requirements. In the end, it is up to the Copermittees to determine the effective BMPs and measures necessary to comply with this Order. The Copermittees can choose to implement the least expensive measures that are effective in meeting

[2] Los Angeles Water Board, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.

the requirements of this Order. This Order also does not require the Copermittees to fully implement all requirements within a single permit term. Where appropriate, the Board has provided the Copermittees with additional time outside of the permit term to implement control measures to achieve final WQBELs and/or water quality standards.

The San Diego Water Board has considered available cost information associated with compliance with this Order. It is not possible to predict accurately the cost impact of the requirements that involve an unknown level of implementation or that depend on environmental variables that are as yet undefined. Only general conclusions can be drawn from this information.

Estimated Municipal Storm Water Program Implementation Costs

The USEPA, the State Water Board, and the California Regional Water Quality Control Boards (Regional Water Boards) have attempted to evaluate the costs of implementing municipal storm water programs. The assessments have demonstrated that the true costs are difficult to ascertain and reported costs vary widely. In addition, reported fiscal analyses tend to neglect the costs incurred to municipalities when storm water and non-storm water runoff is not effectively managed, which are incurred as a result of pollution, contamination, nuisance, and damage to ecosystems, property, and human health. Nonetheless, they provide a useful context for considering the costs of requirements within Order No. R9-2013-0001.

In 1999, the USEPA reported on multiple studies it conducted to determine the cost of management programs. A study of Phase II municipalities determined that the annual cost of the Phase II program was expected to be $9.16 per household. The USEPA also studied 35 Phase I municipalities, finding costs to be $9.08 per household annually, similar to those anticipated for Phase II municipalities.[3]

The State Water Board commissioned a study by the California State University, Sacramento to assess costs of the Phase I MS4 program. This study includes an assessment of costs incurred by Phase I MS4s throughout the state to implement their programs. Annual cost per household in the study ranged from $18 to $46, with the Fresno-Clovis Metropolitan Area representing the lower end of the range, and the City of Encinitas (in San Diego County) representing the upper end of the range.[4]

A study on Phase I MS4 program costs was also conducted by the California Regional Water Quality Control Board, Los Angeles Region (Los Angeles Water Board), where program costs reported in the municipalities' annual reports were assessed. The Los

[3] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791-68792.
[4] State Water Board, 2005. NPDES Stormwater Cost Survey. P. ii.

Angeles Water Board estimated that average per household cost to implement the MS4 program in Los Angeles County was $12.50.[5]

It is important to note that reported program costs are not all attributable to solely complying with MS4 permits. Many program components, and their associated costs, existed before any MS4 permits were ever issued. For example, street sweeping and trash collection costs cannot be solely or even principally attributable to MS4 permit compliance, since these practices have long been expected from and implemented by municipalities.

Therefore, true program cost resulting from MS4 permit requirements is some fraction of reported costs. The California State University, Sacramento study found that only 38 percent of program costs are new costs fully attributable to MS4 permits. The remainder of the program costs was either pre-existing or resulted from enhancement of pre-existing programs.[6] In 2000, the County of Orange found that even lower amounts of program costs are solely attributable to MS4 permit compliance, reporting that the amount attributable to implement the County or Orange Drainage Area Management Plan (DAMP), was less than 20 percent of the total budget. The remaining 80 percent was attributable to pre-existing programs.[7] More current data from the County of Orange is not used in this discussion because the County of Orange no longer reports such information.

Estimated Value of Healthy Water Quality

Economic considerations of municipal storm water management programs cannot be limited only to program costs. Evaluation of programs must also consider information on the benefits derived from environmental protection and improvement.[8] Attention is often focused on municipal storm water management program costs, but the programs must also be viewed in terms of their value to the public.

Placing a value on healthy receiving waters is very difficult. Often the value of receiving waters with good water quality manifests in other forms, such as tourism, recreational opportunities, and/or increased property values. When surface water bodies are degraded, thereby degrading the habitat within and adjacent to the water bodies, the public loses the value and benefits associated with being able to use the area in and around the water bodies. Surface waters that are able to support the beneficial uses designated in the Basin Plan can sustain plants and wildlife that can attract visitors and residents, providing aesthetic, recreational, as well as monetary value to the public. At this time, however, there have been no studies for the San

[5] Los Angeles Water Board, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.
[6] State Water Board, 2005. NPDES Stormwater Cost Survey. P. 58.
[7] County of Orange, 2000. A NPDES Annual Progress Report. P. 60.
[8] Ribaudo M.O. and D. Heelerstein. 1992, *Estimating Water Quality Benefits: Theoretical and Methodological Issues.* U.S. Department of Agriculture. Technical Bulletin No. 1808.

Diego Region to quantify the added value that surface waters with healthy water quality can provide.

USEPA has estimated that household willingness to pay for improvements in fresh water quality for fishing and boating is approximately $158-$210.[9] This estimate can be considered conservative, since it does not include important considerations such as marine waters benefits, wildlife benefits, or flood control benefits. Another study conducted by California State University, Sacramento reported that the annual household willingness to pay for statewide clean water is approximately $180.[10]

A study conducted by the University of Southern California and University of California, Los Angeles assessed the costs and benefits of implementing various approaches for achieving compliance with the MS4 permits in the Los Angeles region. The study found that non-structural systems would cost $2.8 billion but provide $5.6 billion in benefit. If structural systems were determined to be needed, the study found that total costs would be $5.7 to $7.4 billion, while benefits could reach $18 billion.[11] Costs are anticipated to be borne over many years, probably at least ten years.

As can be seen, the benefits of the municipal storm water management programs are expected to considerably exceed their costs. Such findings are corroborated by USEPA, which found that the benefits of implementation of its Phase II storm water rule would also outweigh the costs.[12]

[9] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68793.
[10] State Water Board, 2005. NPDES Stormwater Cost Survey. P. iv.
[11] Los Angeles Water Board, 2004. Alternative Approaches to Stormwater Control.
[12] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791.

VII. APPLICABLE STATUTES, REGULATIONS, PLANS AND POLICIES

A. Legal Authorities – Federal Clean Water Act and California Water Code

This Order is issued pursuant to section 402 of the CWA and implementing regulations adopted by the USEPA and chapter 5.5, division 7 of the CWC (commencing with section 13370). This Order serves as an NPDES permit for point source discharges to surface waters. This Order also serves as waste discharge requirements pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

The objective of the CWA is "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*." To carry out this objective, the CWA requires the implementation of permit programs to regulate the discharge of pollutants and dredged or fill material to the navigable waters of the U.S. and to regulate the use and disposal of sewage sludge. CWA section 402 provides the legal authority to issue a permit for the discharge of pollutants to waters of the U.S. under the NPDES. The CWA provides that NPDES permits may be issued by states which are authorized to implement the provisions of that act. California became authorized to implement the NPDES permit program on May 14, 1973.

The Porter-Cologne Water Quality Control Act (Division 7, commencing with CWC section 13000) established the State Water Resources Control Board (State Water Board) and nine Regional Water Quality Control Boards (Regional Water Boards) as the principal state agencies with primary responsibility for the coordination and control of water quality. CWC section 13200(f) established the San Diego Water Board, which has the primary responsibility for the coordination and control of water quality in the San Diego Region, which includes all the basins draining into the Pacific Ocean between the southern boundary of the Santa Ana Region and the California-Mexico boundary. The San Diego Water Board implements the CWA through Chapter 5.5 of the CWC, commencing with section 13370. CWC section 13377 provides the San Diego Water Board the legal authority to issue waste discharge requirements to ensure compliance with all applicable provisions of the CWA and acts amendatory thereof or supplementary, thereto, to implement water quality control plans, or for the protection of beneficial uses, or to prevent nuisance.

CWA section 402(p) requires the USEPA or authorized state to issue NPDES permits for storm water discharges from MS4s to waters of the U.S. CWA section 402(p)(3)(B)(ii) requires that NPDES permits for storm water discharges from MS4s "*effectively prohibit non-storm water discharges*" into the MS4s. CWA section 402(p)(3)(B)(iii) requires that NPDES permits for storm water discharges from MS4s to "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable* [MEP], *including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*."

The USEPA published implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]), which prescribe permit application requirements for storm water discharges from MS4s pursuant to CWA 402(p), on November 16, 1990. The USEPA published an Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems, which provided guidance on permit application requirements for regulated MS4s, on May 17, 1996. The federal regulations in 40 CFR 122 and guidance issued by USEPA serve as the foundation for the provisions of Order No. R9-2013-0001. The legal authorities provided by the above statutes and regulations are included as part of the discussions in Section VIII of this Fact Sheet.

B. Legal Authority for the Permit Issued on a Region-wide Basis

CWA section 402(p)(3)(B) provides the San Diego Water Board the legal authority to issue an NPDES permit for the San Diego Region as compared to separate MS4 permits based upon County- and partial County-wide boundaries as they existed within the San Diego Region. CWA section 402(p)(3)(B) states that "*Permits for discharges from municipal storm sewers- (i) may be issued on a system- or jurisdiction-wide basis* ...." The federal regulations in 40 CFR 122.26(a)(1)(v) also state that the San Diego Water Board "*may designate dischargers from municipal separate storm sewers on a system-wide or jurisdiction-wide basis. In making this determination, the [San Diego Water Board] may consider the following factors: (A) the location of the discharge with respect to waters of the United States; (B) the size of the discharge; (C) the quantity and nature of the pollutants discharged to waters of the United States; and (D) other relevant factors*."

More specifically, the federal regulations provide that for large and medium MS4 systems, the San Diego Water Board may issue a regional permit. Specifically, the federal regulation in 40 CFR 122.26(a)(3) provide:

"*(ii) The Director may either issue one system-wide permit covering all discharges from municipal separate storm sewers within a large or medium municipal storm sewer system or issue distinct permits for appropriate categories of discharges within a large or municipal separate storm sewer system including, but not limited to: all discharges owned or operated by the same municipality; located within the same jurisdiction; all discharges within a system that discharge to the same watershed; discharges within a system that are similar in nature; or for individual discharges from municipal separate storm sewers within the system.*

(iii) The operator of a discharge from a municipal separate storm sewer which is part of a large or medium municipal separate storm sewer system must either: (A) Participate in a permit application (to be a permittee or a co-permittee) with one or more other operator of discharges from the large or medium municipal storm sewer system which covers all, or a portion of all, discharges from the municipal separate storm sewer system; (B) Submit a distinct permit application which only covers discharges from the municipal separate storm sewers for

which the operator is responsible; or (C) A regional authority may be responsible for submitting a permit application under the following guidelines....

(iv) One permit application may be submitted for all or a portion of all municipal separate storm sewers within adjacent or interconnected large or medium municipal separate storm sewer systems. The Director may issue one systemwide permit covering all, or a portion of all municipal separate storm sewers in adjacent or interconnected large or medium municipal separate storm sewer systems.

(v) Permits for all or a portion of all discharges from large or medium municipal separate storm sewer systems that are issued on a system-wide, jurisdiction-wide, watershed or other basis may specify different conditions relating to different discharges covered by the permit, including different management programs for different drainage areas which contribute storm water to the system."

Based on these regulations, the San Diego Water Board may issue a region-wide MS4 permit. The regulations also clarify that the permit may include different conditions for separate discharges covered by the permit. This allows the San Diego Water Board to ensure that suitable water quality conditions and provisions are identified for each watershed.

The USEPA's responses to comments in the Final Rule for the above-mentioned regulations also make it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide, permits. In the Final Rule published in the Federal Register and containing the responses to comments, USEPA notes that 40 CFR 122.26(a)(3)(iv) would allow an entire system in a geographical region under the purview of a State agency to be designated under a permit.[13] USEPA also states that many commenters wanted to allow the permitting authority broad discretion to establish system-wide permits, and that EPA believes that paragraphs 40 CFR 122.26 (a)(1)(v) and (a)(3)(ii) allow for such broad discretion.[14]

This Order creates watershed requirements that apply to multiple counties. The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees. Managing storm water on a regional and watershed basis is expected to result in improved water quality, as the Order focuses on monitoring and management practices necessary to improve each watershed rather than political boundaries. A single permit also allows the San Diego Water Board staff to expend fewer resources developing successive multiple permits and allows more resources to be devoted to working cooperatively with all three current groups of Copermittees to ensure implementation of this Order results in improved water quality.

[13] 55 Federal Register 47990-01, 48042.
[14] Ibid.

C. Federal and California Endangered Species Acts

This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2115.5) or the Federal Endangered Species Act (16 United States Code [USC] sections 1531 to 1544). This Order requires compliance with requirements to protect the beneficial uses of waters of the U.S. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

D. California Environmental Quality Act

The action to adopt an NPDES Permit is exempt from the provisions of Chapter 3 of the California Environmental Quality Act (CEQA) (Public Resources Code section 21100, et seq.) pursuant to CWC section 13389. (*County of Los Angeles v. Cal. Water Boards* (2006) 143 Cal.App.4th 985.)

E. State and Federal Regulations, Plans and Policies

The legal authority provided by the following regulations, plans, and policies are also included as part of the discussions in Section VIII of this Fact Sheet.

Water Quality Control Plan for the San Diego Basin

The CWA requires the San Diego Water Board to establish water quality standards for each water body in its region. Water quality standards include beneficial uses, water quality objectives and criteria that are established at levels sufficient to protect beneficial uses, and an antidegradation policy to prevent degrading of waters. On September 8, 1994, the San Diego Water Board adopted the *Water Quality Control Plan for the San Diego Basin* (Basin Plan). The Basin Plan designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters in the San Diego Region. The San Diego Water Board has amended the Basin Plan on multiple occasions since 1994. In addition, the Basin Plan implements State Water Board Resolution No. 88-63, which established state policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply. Beneficial uses applicable to the surface water bodies that receive discharges from the MS4s within the San Diego Region generally include those listed below:

The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region:

- Municipal and Domestic Supply (MUN)
- Agricultural Supply (AGR)
- Industrial Process Supply (PROC)

- Industrial Service Supply (IND)
- Ground Water Recharge (GWR)
- Contact Water Recreation (REC1)
- Non-contact Water Recreation (REC2)
- Warm Freshwater Habitat (WARM)
- Cold Freshwater Habitat (COLD)
- Wildlife Habitat (WILD)
- Rare, Threatened, or Endangered Species (RARE)
- Freshwater Replenishment (FRSH)
- Hydropower Generation (POW)
- Preservation of Biological Habitats of Special Significance (BIOL)

The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region:

- Navigation (NAV)
- Commercial and Sport Fishing (COMM)
- Estuarine Habitat (EST)
- Marine Habitat (MAR)
- Aquaculture (AQUA)
- Migration of Aquatic Organisms (MIGR)
- Spawning, Reproduction, and/or Early Development (SPWN)
- Shellfish Harvesting (SHELL)

Pursuant to Water Code sections 13263 and 13377, the requirements of this Order implement the Basin Plan.

Water Quality Control Plan for Ocean Waters of California, California Ocean Plan

In 1972, the State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan). The State Water Board adopted the most recent amended Ocean Plan on October 16, 2012 ~~September 15, 2009~~. The Office of Administrative Law approved it on July 3, 2013 ~~March 10, 2010~~. ~~On October 8, 2010, USEPA approved the 2009 Ocean Plan.~~ The amended Ocean Plan became effective on August 19, 2013. The Ocean Plan is applicable, in its entirety, to ocean waters of the State. In order to protect beneficial uses, the Ocean Plan establishes water quality objectives and a program of implementation. Pursuant to Water Code sections 13263 and 13377, the requirements of this Order implement the Ocean Plan. The Ocean Plan identifies the beneficial uses of ocean waters of the State to be protected as summarized below:

- Industrial water supply
- Water contact and non-contact recreation, including aesthetic enjoyment; navigation

- Commercial and sport fishing
- Mariculture
- Preservation and enhancement of designated Areas of Special Biological Significance
- Rare and endangered species
- Marine habitat
- Fish spawning and shellfish harvesting

On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving an exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges. On June 19, 2012, the State Water Board adopted Order No. 2012-0031, amending Order No. 2012-0012 to require pollutant load reductions to be achieved within six years for the ASBS Compliance Plans, section A.2.d(2) and ASBS Pollution Prevention Plans, section B.2.b(2). The State Water Board Resolution No. 2012-0012, as amended requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject terms and conditions of State Water Board Resolution No. 2012-0012, as amended. The Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012, as amended, applicable to these discharges, are incorporated in Attachment A of this Order. Requirements of this Order implement the Ocean Plan.

Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality

On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

Antidegradation Policy

Federal regulations (40 CFR 131.12) require that the state water quality standards include an antidegradation policy consistent with the federal antidegradation policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16 ("Statement of Policy with Respect to Maintaining the Quality of

the Waters of the State"). State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law.

The San Diego Water Board's Basin Plan implements and incorporates by reference both the State and federal antidegradation policies. State Water Board Resolution No. 68-16 and 40 CFR 131.12 require the San Diego Water Board to maintain high quality waters of the State unless degradation is justified based on specific findings. First, the Board must ensure that "existing instream uses and the level of water quality necessary to protect the existing uses" are maintained and protected. Second, if the baseline quality of a water body for a given constituent exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water, that quality shall be maintained and protected through the requirements of the Order unless the Board makes findings that (1) any lowering of the water quality is necessary to accommodate important economic or social development in the area in which the waters are located; (2) water quality adequate to protect existing uses fully is assured; and (3) the highest statutory and regulatory requirements for all new and existing point sources and all cost-effective and reasonable best management practices for nonpoint source control are achieved. The San Diego Water Board must also comply with any requirements of State Water Board Resolution No. 68-16 beyond those imposed through incorporation of the federal antidegradation policy. In particular, the Board must find that not only present, but also anticipated future uses of water are protected, and must ensure best practicable treatment or control of the discharges. The baseline quality considered in making the appropriate findings is the best quality of the water since 1968, the year of the adoption of Resolution No. 68-16, or a lower level if that lower level was allowed through a permitting action that was consistent with the federal and state antidegradation policies. ~~until it is demonstrated that any change in quality will be consistent with maximum benefit to the people of the State, will not unreasonably affect beneficial uses, and will not result in water quality less than that described in the San Diego Water Boards' policies. State Water Board Resolution No. 68-16 requires that discharges of waste be regulated to meet best practicable treatment or control to assure that pollution or nuisance will not occur and the highest water quality consistent with the maximum benefit to the people of the State be maintained.~~

The discharges permitted in this Order are consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Board Resolution No. 68-16 as set forth below~~.~~: ~~Many of the water bodies within the area covered by this Order are of high quality. The Order requires the Copermittees to meet best practicable treatment or control to meet water quality standards. As required by 40 CFR 122.44(a), the Copermittees must comply with the "maximum extent practicable" technology-based standard set forth in CWA section 402(p) for discharges of pollutants in storm water from the MS4s.~~

1. Many of the waters within the area covered by this Order are impaired for multiple pollutants discharged through MS4s and are not high quality waters with regard to these pollutants. In most cases, there is insufficient data to determine whether these water bodies were impaired as early as 1968, but the limited available data shows

impairment dating back for more than two decades. Many such water bodies are ~~and~~ listed on the State's CWA Section 303(d) List and the San Diego Water Board has established TMDLs to address the impairments. This Order ensures that existing instream (beneficial) water uses and the level of water quality necessary to protect the existing uses is maintained and protected. This Order requires the Copermittees to comply with permit provisions to implement the WLAs set forth in the TMDLs in order to restore the beneficial uses of the impaired water bodies consistent with the assumptions and requirements of the TMDLs. This Order further requires compliance with receiving water limitations to meet water quality standards in the receiving water either by demonstrating compliance pursuant to Provision A and the Copermittees' monitoring and assessment program pursuant to Provision D of this Order, or by implementing Provision B.3.c with a schedule to achieve compliance with receiving water limitations. This Order includes requirements to develop and implement storm water management programs, achieve WQBELs, and effectively prohibit non-storm water discharges into the MS4. The issuance of this Order does not authorize an increase in the amount of discharge of waste.

2. To the extent that water bodies within the area covered by this Order are high quality waters with regard to some constituents, this Order finds as follows:

   a. Allowing limited degradation of high quality water bodies through MS4 discharges is necessary to accommodate important economic or social development in the area and is consistent with the maximum benefit to the people of the state. The discharge of storm water in certain circumstances is to the maximum benefit to the people of the state because it can assist with maintaining instream flows that support beneficial uses, may spur the development of multiple-benefit projects, and may be necessary for flood control, and public safety as well as to accommodate development in the area. The alternative – capturing all storm water from all storm events – would be an enormous opportunity cost that would preclude MS4 permittees from spending substantial funds on other important social needs. The Order ensures that any limited degradation does not affect existing and anticipated future uses of the water and does not result in water quality less than established standards. The Order requires compliance with receiving water limitations that act as a floor to any limited degradation.

   b. The Order requires the highest statutory and regulatory requirements and requires that the Copermittees meet best practicable treatment or control. The Order prohibits all non-storm water discharges, with a few enumerated exceptions, through the MS4 to the receiving waters. As required by 40 CFR section 122.44(a), the Copermittees must comply with the "maximum extent practicable" technology-based standard set forth in CWA section 402(p), and implement extensive minimum control measures in a storm water management program. Recognizing that best practicable treatment or control may evolve over time, the Order includes new and more specific requirements as compared to the prior Phase I MS4 permits for the San Diego County, Orange County and Riverside County Copermittees. The Order incorporates options to implement

Water Quality Improvement Plans that must specify detailed structural and non-structural storm water controls that must be implemented in accordance with an accepted proposed time schedule. The Order contains provisions to encourage, wherever feasible, retention of the storm water from the 85th percentile 24-hour storm event.

Anti-Backsliding Requirements

CWA sections 402(o) and 303(d)(4) and federal regulations at 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations or conditions may be relaxed. ~~All effluent limitations and other conditions in this Order are at least as stringent as the effluent limitations in the previous permits issued to the San Diego County Copermittees, the Orange County Copermittees, and the Riverside County Copermittees.~~ While this Order allows implementation of an alternative compliance pathway option in Provision B.3.c to constitute compliance with receiving water limitations under certain circumstances, the availability of that alternative and the corresponding availability of additional time to come into compliance with receiving water limitations~~,~~ does not violate the anti-backsliding provisions. The receiving water limitations provisions of this Order are imposed under section 402(p)(3)(B) of the Clean Water Act rather than based on best professional judgment, or based on section 301(b)(1)(C) or sections 303(d) or (e), and are accordingly not subject to the anti-backsliding requirements of section 402(o). Although the non-applicability is less clear with respect to the regulatory anti-backsliding provisions in 40 CFR 122.44(l), the regulatory history suggests that USEPA's intent was to establish the anti-backsliding regulations with respect to evolving technology standards for traditional point sources. (See, e.g., 44 Fed.Reg. 32854, 32864 (Jun. 7, 1979)). It is unnecessary, however, to resolve the ultimate applicability of the regulatory anti-backsliding provisions, because the alternative compliance pathway option in Provision B.3.c qualifies for an exception to backsliding as based on new information. The alternative compliance pathway option in Provision B.3.c of this Order was informed by new information available to the Board from experience and knowledge gained through the Los Angeles Water Board's process of developing over 30 watershed-based TMDLs and implementing several TMDLs since the adoption of the previous permits. In particular, the Los Angeles Water Board recognized the significance of allowing time to plan, design, fund, operate and maintain watershed-based BMPs necessary to attain water quality improvements and additionally recognized the potential for municipal storm water to benefit water supply. Thus, even if the receiving water limitations are subject to anti-backsliding requirements, they were revised based on new information that would support an exception to the anti-backsliding provisions. (33 U.S.C. § 1342(o)(2)(B)(i); 40 C.F.R. § 122.44(l)(1); 40 C.F.R. §122.44(l)(2)(i)(B)(1)).

Clean Water Act Section 303(d) List

CWA section 303(d)(1) requires each State to identify specific water bodies within its boundaries where water quality standards are not being met or are not expected to be

met after implementation of technology-based effluent limitations on point sources. Water bodies that do not meet water quality standards are considered impaired and are placed on the state's "303(d) List." Periodically, USEPA approves the State's 303(d) List.

Most recently, USEPA approved the State's 2010 303(d) List of impaired water bodies on October 11, 2011, which includes certain receiving waters in the San Diego Region. For each listed water body, the state or USEPA is required to establish a TMDL of each pollutant impairing the water quality standards in that water body. A TMDL is a tool for implementing water quality standards and is based on the relationship between pollution sources and in-stream water quality conditions. The TMDL establishes the allowable pollutant loadings for a water body and thereby provides the basis to establish water quality-based controls. These controls should provide the pollution reduction necessary for a water body to meet water quality standards.

A TMDL is the sum of the allowable pollutant loads of a single pollutant from all contributing point sources (the waste load allocations or WLAs) and non-point sources (load allocations of LAs) plus the contribution from background sources and a margin of safety (40 CFR 130.2(i)). MS4 discharges are considered point source discharges. For 303(d)-listed water bodies and pollutants in the San Diego Region, the San Diego Water Board or USEPA develops and adopts TMDLs that specify these requirements.

Since 2002, the San Diego Water Board has established seven (7) TMDLs to remedy water quality impairments in various water bodies within the San Diego Region (see Attachment E to the Order). These TMDLs identify MS4 discharges as a source of pollutants to these water bodies, and, as required, establish WLAs for MS4 discharges to reduce the amount of pollutant discharged to receiving waters. CWA section 402(p)(3)(B)(iii) requires the San Diego Water Board to impose permit conditions, including: "management practices, control techniques and system, design and engineering methods, and *such other provisions as the Administrator or the State determines appropriate for the control of such pollutants."* (Emphasis added.) CWA section 402(a)(1) also requires states to issue permits with conditions necessary to carry out the provisions of the CWA. Federal regulations also require that NDPES permits contain WQBELs consistent with the assumptions and requirements of all available WLAs (40 CFR 122.44(d)(1)(vii)(B)). CWC section 13377 also requires that NPDES permits include limitations necessary to implement water quality control plans. Therefore, this Order includes WQBELs and other provisions to implement the TMDL WLAs assigned to Copermittees regulated by this Order.

Other Regulations, Plans and Policies

This Order implements all other applicable federal regulations and State regulations, plans and policies, including the California Toxics Rule at 40 CFR 131.38 (Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California Rule [California Toxics Rule or CTR]), and State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP).

F. Unfunded State Mandates

Article XIII B, Section 6(a) of the California Constitution provides that whenever "*any state agency mandates a new program or higher level of service on any local government, the state shall provide a subvention of funds to reimburse that local government for the costs of the program or increased level of service*." The requirements of this Order do not constitute state mandates that are subject to a subvention of funds for several reasons, including, but not limited to, the following.

First, the requirements of this Order do not constitute a new program or a higher level of service as compared to the requirements contained in the previous Fourth Term Permits. The overarching requirement to impose controls to reduce the pollutants in discharges from MS4s is dictated by the CWA and is not new to this permit cycle (33 USC section 1342(p)(3)(B)). The inclusion of new and advanced measures as the MS4 programs evolve and mature over time is anticipated under the CWA (55 FR 47990, 48052 (Nov. 16, 1990)), and to the extent requirements in this Order are interpreted as new advanced measures, they do not constitute a new program or higher level of service.

Second, and more broadly, mandates imposed by federal law, rather than by a state agency, are exempt from the requirement that the local agency's expenditures be reimbursed (Cal. Const., art. XIII B, section 9, subd. (b)). This Order implements federally mandated requirements under the CWA and its requirements are therefore not subject to subvention of funds. This includes federal requirements to effectively prohibit non-storm water discharges, to reduce the discharge of pollutants in storm water to the MEP, and to include such other provisions as the Administrator or the State determines appropriate for the control of such pollutants (33 USC section 1342(p)(3)(B)). Federal cases have held these provisions require the development of permits and permit provisions on a case-by-case basis to satisfy federal requirements. (*Natural Resources Defense Council, Inc., v. USEPA* (9th Cir. 1992) 966 F.2d 1292, 1308, fn. 17.)

The authority exercised under this Order is not reserved state authority under the CWA's savings clause (cf. *Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 627-628 [relying on 33 USC section 1370, which allows a state to develop requirements which are not "less stringent" than federal requirements]), but instead is part of a federal mandate to develop pollutant reduction requirements for municipal separate storm sewer systems. To this extent, it is entirely federal authority that forms the legal basis to establish the permit provisions. (See, *City of Rancho Cucamonga v. Regional Water Quality Control Board, Santa Ana Region* (2006) 135 Cal.App.4th 1377, 1389; *Building Industry Ass'n of San Diego Co. v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 882-883.)

The MEP standard is a flexible standard that balances a number of considerations, including technical feasibility, cost, public acceptance, regulatory compliance, and effectiveness. (*Building Ind. Ass'n., supra,* 124 Cal.App.4th at pp. 873-874, 889.) Such

considerations change over time with advances in technology and with experience gained in storm water management (55 FR 47990, 48052 (Nov. 16, 1990)). Accordingly, a determination of whether the conditions contained in this Order exceed the requirements of federal law cannot be based on a point by point comparison of the permit conditions and the minimum control measures that are required "at a minimum" to reduce pollutants to the maximum extent practicable and to protect water quality (40 CFR 122.34). Rather, the appropriate focus is whether the permit conditions, as a whole, exceed the MEP standard.

In recent months, the County of Los Angeles and County of Sacramento Superior Courts have granted writs setting aside decisions of the Commission on State Mandates that held certain requirements in Phase I permits constituted unfunded mandates. In both cases, the courts have found that the correct analysis in determining whether an MS4 permit constituted a state mandate was to evaluate whether the permit as a whole exceeds the MEP standard. (*State of Cal. v. Comm. on State Mandates* (Super. Ct. Sacramento County, 2012, No. 34-2010-80000604), *State of California v. County of Los Angeles* (Super. Ct. Los Angeles County, 2011, No. BS130730.) Both cases are currently pending appeal.

The requirements of the Order, taken as a whole rather than individually, are necessary to reduce the discharge of pollutants to the MEP and to protect water quality. The San Diego Water Board finds that the requirements of the Order are practicable, do not exceed federal law, and thus do not constitute an unfunded mandate. These findings are the expert conclusions of the principal state agency charged with implementing the NPDES program in California (CWC sections 13001, 13370).

It should also be noted that the provisions in this Order to effectively prohibit non-storm water discharges are also mandated by the CWA (33 USC section 1342(p)(3)(B)(ii)). Likewise, the provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state establishes or adopts a TMDL, federal law requires that permits must contain effluent limitations consistent with the assumptions and requirements of any applicable waste load allocation in a TMDL (40 CFR 122.44(d)(1)(vii)(B)).

Third, the local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental dischargers who are issued NPDES permits for storm water discharges. With a few inapplicable exceptions, the CWA regulates the discharge of pollutants from point sources (33 USC section 1342) and the Porter-Cologne Act regulates the discharge of waste (CWC section 13263), both without regard to the source of the pollutant or waste. As a result, the "costs incurred by local agencies" to protect water quality reflect an overarching regulatory scheme that places similar requirements on governmental and non-governmental dischargers. (See *County of Los Angeles v. State of California* (1987) 43 Cal.3d 46, 57-58 [finding comprehensive workers' compensation scheme did not create a cost for local agencies that was subject to state subvention].)

The CWA and the Porter-Cologne Act largely regulate storm water with an even hand, but to the extent there is any relaxation of this even-handed regulation, it is in favor of the local agencies. Generally, the CWA requires point source dischargers, including dischargers of storm water associated with industrial or construction activity, to comply strictly with water quality standards (33 USC section 1311(b)(1)(C); *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159, 1164-1165 [noting that industrial discharges must strictly comply with water quality standards]). As discussed in prior State Water Board decisions, certain provisions of this Order do not require strict compliance with water quality standards (State Water Board Order No. WQ 2001-0015, p. 7). Those provisions of this Order regulate the discharge of waste in municipal storm water under the CWA's MEP standard, not the BAT/BCT standard that applies to other types of discharges. These provisions, therefore, regulate the discharge of waste in municipal storm water more leniently than the discharge of waste from non-governmental sources.

Fourth, the Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)). To the extent that the local agency Copermittees have voluntarily availed themselves of the permit, the program is not a state mandate. (Accord, *County of San Diego v. State of California* (1997) 15 Cal.4th 68, 107-108.)

Fifth, the local agency Copermittees' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under state law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

Finally, even if any of the permit provisions could be considered unfunded mandates, under Government Code section 17556, subdivision (d), a state mandate is not subject to reimbursement if the local agency has the authority to charge a fee. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order, subject to certain voting requirements contained in the California Constitution. (See Cal. Const., Art. XIII D, section 6, subd. (c); see also *Howard Jarvis Taxpayers Ass'n v. City of Salinas* (2002) 98 Cal.App.4th 1351, 1358-1359.) The Fact Sheet demonstrates that numerous activities contribute to the pollutant loading in the MS4. Local agencies can levy service charges, fees, or assessments on these activities, independent of real property ownership. (See, e.g., *Apartment Ass'n of Los Angeles County, Inc., v. City of Los Angeles* (2001(24 Cal.4th 830, 842 [upholding inspection fees associated with renting property].) The authority and ability of a local agency to defray the cost of a program without raising taxes indicates that a program does not entail a cost subject to subvention. (*Clovis Unified School Dist. V. Chiang* (2010) 188 Cal.App.4th 794, 812, citing *Connell v. Sup. Ct.* (1997) 59 Cal.App.4th 382, 401; *County of Fresno v. State of California* (1991) 53 Cal. 3d. 482, 487-488.)

VIII. PROVISIONS

The provisions (i.e. NPDES permit requirements) of the Order are discussed below.

A. Prohibitions and Limitations

Purpose: Provision A includes the prohibitions and limitations requirements that are the foundation of all the subsequent requirements included in the Order. Compliance with the prohibitions and limitations will restore and protect receiving waters from impacts that may be caused by discharges into and from the Copermittees' MS4s and ultimately achieve the objective of the CWA.

In meeting the requirements set forth in the Order, the Copermittees must be cognizant that the prohibitions and limitations exist and will be the standard by which the San Diego Water Board will be measuring the progress and success of their implementation of the NPDES permit requirements.

***Discussion*:** The objective of the CWA is to "*restore and maintain the chemical, physical, and biological integrity of the Nation's waters*." The CWA requires the implementation of NPDES permit programs to regulate discharges of pollutants and dredged or fill material to the navigable waters of the U.S. For discharges into and from MS4s, the CWA requires the NPDES permits to "*effectively prohibit non-stormwater discharges into the storm sewers*" and "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable.*"

Provision A includes limitations, consistent with the requirements of the CWA for discharges from MS4s. Provision A expresses these limitations as discharge prohibitions, receiving water limitations, and effluent limitations. Compliance with the discharge prohibitions and receiving water limitations is also explicitly described, in conformance with precedential State Water Board Orders.

More specific and detailed discussions of the requirements of Provision A are provided below.

Provision A.1 (Discharge Prohibitions) prohibits the discharge of specific types of waste into and/or from the Copermittees' MS4s.

Provision A.1.a restates and reiterates Basin Plan Waste Discharge Prohibition 1, by prohibiting discharges into and from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the

state. The terms pollution,[15] contamination,[16] and nuisance[17] are defined under CWC 13050. Provision A.1.c incorporates all the waste discharge prohibitions of the Basin Plan into the requirements of the Order. The waste discharge prohibitions from the Basin Plan have been reproduced and provided in Attachment A to the Order.

Provision A.1.b requires non-storm water discharges into the MS4s to be effectively prohibited, consistent with the requirements of the CWA for MS4 permits to "*effectively prohibit non-stormwater discharges into the storm sewers*." The effective prohibition is required to be implemented by each Copermittee within its jurisdiction through the illicit discharge detection and elimination requirements under Provision E.2. The prohibition does not apply to NPDES permitted discharges into the Copermittees' MS4s.

The CWA employs the strategy of prohibiting the discharge of any pollutant from a point source into waters of the United States unless the discharger of the pollutant(s) obtains an NPDES permit pursuant to CWA Section 402. The 1987 amendment to the CWA includes provision 402(p) that specifically addresses NPDES permitting requirements for storm water discharges from MS4s. CWA section 402(p) prohibits the discharge of pollutants from specified MS4s to waters of the U.S. except as authorized by an NPDES permit and identifies two substantive standards for MS4 storm water permits. MS4 permits (1) "*shall include a requirement to effectively prohibit non-stormwater discharges into the storm sewers*" and (2) "*shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or State determines appropriate for the control of such pollutants*." (CWA section 402(p)(3)(B)(ii)-(iii).)

In November 1990, the USEPA published regulations addressing storm water discharges from MS4s (55 FR 47990 and following (Nov. 16, 1990) (Phase I Final Rule)). The regulations establish minimum requirements for MS4 permits, and generally focus on the requirement that MS4s implement programs to reduce the amount of pollutants found in storm water discharges to the MEP. The CWA's municipal storm water MEP standard does not require storm water discharges to strictly meet water quality standards, as is required for other NPDES permitted

[15] CWC 13050(l): "(1) 'Pollution' means an alteration of the quality of waters of the state by waste to a degree which unreasonably affects either of the following: (A) The water for beneficial uses. (B) Facilities which serve beneficial uses. (2) 'Pollution' may include 'contamination.'

[16] CWC 13050(k): "Contamination' means an impairment of the quality of waters of the state by waste to a degree which creates a hazard to public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste, whether or not waters of the state are affected."

[17] CWC 13050(m): 'Nuisance' means anything which meets all of the following requirements: (1) Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. (2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. (3) Occurs during, or as a result of, the treatment or disposal of wastes."

discharges. Compliance is achieved through an iterative approach of continuous implementation of improved BMPs. This distinction reflects Congress's recognition that variability in flow and intensity of storm events render difficult strict compliance with water quality standards by MS4 permittees. In describing the controls that permits must include to reduce pollutants in storm water discharges to the MEP, the statute (CWA section 402(p)(3)(B)(iii)) states that the controls shall include: "*management practices, control techniques and system, design and engineering methods, and such other provisions as the [permit writer] determines appropriate for the control of such pollutants*."

In contrast, non-storm water discharges from the MS4 that are not authorized by separate NPDES permits are subject to requirements under the NPDES program, including discharge prohibitions, technology based effluent limitations and water quality-based effluent limitations (40 CFR 122.44). The regulations also require the Copermittee's program to include an element to detect and remove illicit discharges and improper disposal into the storm sewer (40 CFR 122.26(d)(2)(iv)(B)).

While "non-storm water" is not defined in the CWA or federal regulations, the federal regulations (at 40 CFR 122.26(b)(2)) define "*illicit discharge*" as *"any discharge to a municipal separate storm sewer that is not composed entirely of storm water and that is not covered by an NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer and discharges resulting from fire fighting activities)*." This definition is the most closely applicable definition of "non-storm water" contained in federal law. As stated in the Phase I Final Rule, USEPA added the illicit discharge program requirement to begin implementation of the 'effective prohibition' requirement to detect and control non-storm water discharges to their municipal system.

Thus, federal law mandates that permits issued to MS4s must require management practices that will result in reducing storm water pollutants to the MEP yet at the same time requires that non-storm water discharges be effectively prohibited from entering the MS4. "Effectively" prohibit does not mean that non-storm water discharges are authorized to be discharged into and from the Copermittees' MS4s. The Phase I Final Rule clarifies what "effectively prohibit" means (55 FR 47995):

> "*Section 402(p)(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…<u>Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit</u> (other than the permit for the discharge from the municipal separate storm sewer)*" [Emphasis added].

Consistent with federal law, unless non-storm water discharges to the MS4 are authorized by a separate NPDES permit, non-storm water discharges are

appropriately subject to the effective prohibition requirement in the CWA and Regional Water Boards are not limited by the iterative MEP approach to storm water regulation in crafting appropriate regulations for non-storm water discharges.

The federal regulations (40CFR122.26(d)(2)(i)(B)) require the Copermittees to establish the legal authority which authorizes or enables the Copermittees to prohibit illicit discharges to the MS4s. The federal regulations (40 CFR 122.26(d)(2)(vi)(B)(1)) require the Copermittees to "*implement and enforce an ordinance, order or similar means*" to prevent non-storm water discharges to their MS4s. Thus, the Copermittees are required to "*effectively*" prohibit non-storm water discharges to their MS4s through enforcing their legal authority established under "*ordinance, order or similar mean*s" and either remove those discharges to their MS4s, or require those discharges to obtain coverage under a separate NPDES permit. More detail about the program that must be implemented to "*effectively*" prohibit non-storm water discharges to the Copermittees' MS4s is provided under the discussion for Provision E.2.

Provision A.1.d was included to be consistent with Resolution No. 2012-0012, adopted by the State Water Board on March 20, 2012. Provision A.1.d prohibits discharges from MS4s to Areas of Special Biological Significance (ASBS), except for storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach to the Heisler Park ASBS subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012. The pertinent Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 are provided in Attachment A to the Order.

Provision A.2 (Receiving Water Limitations) specifies the condition of the receiving waters that must be achieved when there are discharges from the Copermittees' MS4s. Receiving water limitations are included in all NPDES permits issued pursuant to the CWA section 402. CWA section 402(p)(3)(B)(iii) authorizes the inclusion of "*such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." This requirement gives USEPA or the State permitting authority, in this case the San Diego Water Board, discretion to determine what permit conditions are necessary to control pollutants.

In its Phase I Final Rule (see 55 FR 47990, 47994 (Nov. 16, 1990)), USEPA elaborated on these requirements, stating that, "*permits for discharges from municipal separate storm sewer systems must require controls to reduce the discharge of pollutants to the maximum extent practicable, and where necessary water quality-based controls*." USEPA reiterated in its Phase II Final Rule (64 FR 68722, 68737), that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL*." CWC section 13377 also requires that NPDES permits include limitations necessary to implement water quality control plans. Both the State Water Board and the San Diego Water Board have previously concluded that discharges from the MS4 contain pollutants that have

the reasonable potential to cause or contribute to excursions above water quality standards. As such, inclusion of receiving water limitations is appropriate to control MS4 discharges.

The inclusion of receiving water limitations is also consistent with the Ninth Circuit Court of Appeals' ruling in *Defenders of Wildlife v. Browner* (191 F.3d 1159, 1166 (1999)) that the permitting authority has discretion regarding the nature and timing of requirements that it includes as MS4 permit conditions to attain water quality standards. The Ninth Circuit Court of Appeals recently explained that, "*[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*" (*Natural Resources Defense Council v. County of Los Angeles* (9th Cir. 2011) 673 F.3d 880, 886 (revd. On other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013)))

The receiving water limitations included in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan or in water quality control plans or policies adopted by the State Water Board, including State Water Board Resolution No. 68-16, or in federal regulations, including but not limited to 40 CFR 131.12 and 131.38. The water quality objectives in the Basin Plan and other State Water Board plans and policies have been approved by USEPA and combined with designated beneficial uses constitute the water quality standards required under federal law.

Provision A.2.a requires that discharges from the Copermittees' MS4s must not cause or contribute to the violation of water quality standards in receiving waters. The water quality standards of the receiving waters must be protected from the impacts that may be caused by the Copermittees' MS4 discharges. Water quality standards applicable to the surface waters in the San Diego Region must be achieved through meeting the technology based standard of MEP through an iterative process of improved management actions. Provision A.2.a is also consistent with State Water Board Order WQ 99-05 precedent-setting language requiring discharges from MS4s to attain receiving water quality standards. The water quality control plans and policies with water quality standards applicable to the waters in the San Diego Region are included under Provision A.2.a.

Provisions A.2.b was included to be consistent with the requirements of State Water Board Resolution No. 2012-0012, adopted on March 20, 2012.

<u>Provision A.3 (Effluent Limitations)</u> specifies the condition of the discharges from the Copermittees' MS4s that must be achieved if and when there are discharges.

Consistent with CWA section 301(b)(1)(A) and 40 CFR 122.44(a), Provision A.3.a includes the technology-based effluent limitations that must be included in the Order. The technology-based effluent limits, representing the minimum level of control that must be imposed in a permit under CWA section 402, requires that pollutants in discharges of storm water from the Copermittees' MS4s be reduced to the MEP. This provision applies specifically to storm water discharges. Non-storm water discharges must be effectively prohibited, as required under Provision A.1.b. Non-storm water (dry weather) discharges from the MS4 are not considered storm water (wet weather) discharges and therefore are not subject to the MEP standard.

The technology-based MEP standard is an ever-evolving, flexible, and advancing concept. Neither Congress nor USEPA has specifically defined the term "maximum extent practicable." Congress established this flexible MEP standard so that the administrative bodies would have "*the tools to meet the fundamental goals of the Clean Water Act in the context of storm water pollution*." (*Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 884.) As knowledge about controlling storm water runoff and discharges continues to evolve, so does the knowledge which constitutes MEP. Reducing the discharge of pollutants in storm water from the MS4 to the MEP requires the Copermittees to assess each program component and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP.

The San Diego Water Board or the State Water Board ultimately define MEP, and may include requirements that provide specific guidance on what is expected to demonstrate MEP. It is the responsibility of the Copermittees to propose actions that implement BMPs to reduce storm water pollution to the MEP. In other words, the Copermittees' runoff management programs developed and implemented under the Order are the Copermittees' proposals for achieving MEP. Their total collective and individual activities conducted pursuant to their runoff management programs become their proposal for achieving MEP as it applies both to their overall effort, as well as to specific activities. Provisions B through E of the Order provides a minimum framework to guide the Copermittees in achieving the MEP standard for discharges of pollutants in storm water.

Provision A.3.b incorporates any water quality based effluent limitations (WQBELs) applicable to the MS4s established for TMDLs adopted and approved for the San Diego Region and requires the Copermittees to comply with those WQBELs. This is consistent with 40 CFR 122.44(d)(1)(vii)(B), which requires that NPDES permits to incorporate WQBELs "*developed to protect a narrative water quality criterion, a numeric water quality criterion, or both…consistent with the assumptions and requirements of any available wasteload allocation for the discharge...*"

Pursuant to CWA section 303(d), for surface water bodies identified as impaired by one or more pollutants, the San Diego Water Board is required to establish TMDLs "*at a level necessary to implement the applicable water quality standards with seasonal variations and a margin of safety which takes into account any lack of knowledge*

concerning the relationship between effluent limitations and water quality." The TMDLs identify sources of the pollutants causing the impairments and assign portions of the TMDL as WLAs to point sources, which include MS4s.

WLAs must be expressed in NPDES permits as WQBELs, which may include one or more numeric components such as numeric effluent limits, and/or receiving water limitations, and/or BMP requirements. Because numeric targets for TMDLs typically include a component that will be protective of water quality standards, a TMDL will likely include one or more numeric receiving water limitations and/or effluent limitations as part of the assumptions or requirements of the TMDL. Any numeric receiving water limitations and/or effluent limitations developed as part of the assumptions or requirements of a TMDL must be incorporated and included as part of WQBELs for the MS4s.

Because the development and approval of new TMDLs, or modification of existing TMDLs, may occur during the term of this Order, the specific provisions of those TMDLs, including effluent limitations applicable to MS4s are provided within Attachment E to the Order. Attachment E will be updated with new TMDLs and modifications to existing TMDLs in a timely manner as they occur.

Provision A.4 (Compliance with Discharge Prohibitions and Receiving Water Limitations) describes the process required to be implemented by the Copermittees if compliance with the discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a are not being achieved under current conditions.

In its Phase II Stormwater Regulations, Final Rule, USEPA states that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL.*"[18] In a series of comment letters on MS4 permits issued by various Regional Water Boards, USEPA has also reiterated that MS4 discharges must meet water quality standards.[19] In addition, the Ninth Circuit Court of Appeals explained in a recent ruling that, *"[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*"[20]

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[18] Phase II Stormwater Regulations, Final Rule, 64 Fed. Reg. 68722, 68737.

[19] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.

[20] NRDC v. County of Los Angeles (9th Cir. 2011), 673 F.3d 880, 886 (revd. on other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013))). See also, *Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 884-886, citing *Defenders of Wildlife v. Browning,* (9th Cir. 1999) 191 F.3d 1159.)

Water quality standards for the San Diego Region are established in the Basin Plan. The water quality standards of the Basin Plan are incorporated into this Order as the discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a. The discharge prohibitions and receiving water limitations in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations or prohibitions to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan, water quality control plans or policies adopted by the State Water Board, including Resolution No. 68-16, or federal regulations, including but not limited to, 40 CFR 131.12 and 131.38. The waste discharge prohibitions and water quality objectives in the Basin Plan have been approved by USEPA and combined with the designated beneficial uses constitute the water quality standards required under federal law.

Under federal law (CWA section 402(p)(3)(B)(iii)), an MS4 permit must include "*controls to reduce the discharge of pollutants to the maximum extent practicable...and such other provision as...the State determines appropriate for control of such pollutants*." The State Water Board has previously determined that limitations necessary to meet water quality standards are appropriate for the control of pollutants discharged by MS4s and must be included in MS4 permits. (State Water Board Orders WQ 91-03, 98-01, 99-05, 2001-15; see also *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159.) This Order prohibits discharges that cause or contribute to violations of water quality standards.

The discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a are included in this Order to ensure that discharges from the MS4s do not cause or contribute to exceedances of water quality objectives necessary to protect the beneficial uses of the receiving waters.

Provision A.4 is consistent with the precedent-setting language in State Water Board Order WQ 99-05 required to be included in municipal storm water permits. State Water Board Order WQ 2001-15 refined Order WQ 99-05 by requiring an iterative approach to compliance with water quality standards involving ongoing assessments and revisions, referred to as the "iterative process." The "iterative process" is a fundamental NPDES requirement for municipal storm water permits to achieve the objectives of the CWA.

The State Water Board and Regional Water Boards have stated that the provisions under Provisions A.1.a, A.1.c, A.2.a, and A.4 are independently applicable, meaning that compliance with one provision does not provide a "safe harbor" where there is non-compliance with another provision (i.e., compliance with the Provision A.4 does not shield a Copermittee who may have violated Provision A.1.a, A.1.c, or A.2.a from an enforcement action). The intent of Provision A.4 is to ensure that the Copermittees have the necessary storm water management programs and controls in place, and that they are modified by the Copermittees in a timely fashion when necessary, so that compliance with Provisions A.1.a, A.1.c, and/or A.2.a is achieved as soon as possible. USEPA expressed the importance of this independent applicability in a series of

comment letters on MS4 permits proposed by various Regional Water Boards. At that time, USEPA expressly objected to certain MS4 permits that included language stating, *"permittees will not be in violation of this [receiving water limitation] provision … [if certain steps are taken to evaluate and improve the effectiveness of the jurisdictional runoff management programs],"* concluding that this phrase would not comply with the CWA.[21]

The Ninth Circuit held in *Natural Resources Defense Council v. County of Los Angeles* (2011) 673 F3d. 880, 886 (revd. on other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013))) that engagement in the iterative process does not provide a safe harbor from liability for violations of permit terms prohibiting exceedances of water quality standards. The Ninth Circuit holding is consistent with the position of the State and Regional Water Boards that exceedances of water quality standards in an MS4 permit constitute violations of permit terms subject to enforcement by the Water Boards or through a citizen suit. While the Water Boards have generally directed dischargers to achieve compliance by improving control measures through the iterative process, the San Diego Water Board retains the discretion to take other appropriate enforcement and the iterative process does not shield dischargers from citizen suits under the CWA.

The requirements of Provision A.4, therefore, are required to be implemented until the water quality standards expressed under Provisions A.1.a, A.1.c, and A.2.a are achieved. The CWA requires MS4 permits to "*require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." The requirements of this Order have been deemed or determined to be "appropriate" to achieve water quality standards in receiving waters.

Part of the "*controls*" required by the Order is the process described in Provision A.4. Provision A.4 includes the process that is ultimately expected to achieve compliance with the requirement that discharges from the MS4 do not cause or contribute to violations of water quality standards in the receiving waters. The implementation of Provision A.4 is required when the Copermittees or the San Diego Water Board have determined that discharges from the MS4 are causing or contributing to violations of water quality standards in the receiving waters.

The Copermittees must effectively prohibit non-storm water discharges into the MS4s, reduce the discharge of pollutants in storm water from the MS4s to the MEP, and ensure that their MS4 discharges do not cause or contribute to violations of water quality standards. If the Copermittees have effectively prohibited non-storm water

[21] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.

discharges and reduced storm water pollutant discharges to the MEP, but their discharges are still causing or contributing to violations of water quality standards, Provision A.4 provides a clear "iterative process" for the Copermittees to follow.

Provision A.4 essentially requires the Copermittees to implement additional BMPs until MS4 discharges no longer cause or contribute to a violation of water quality standards.

In assessing compliance and potential enforcement actions, the San Diego Water Board looks at the Copermittees' efforts in total to meet the requirements of Provisions A.1.a, A.1.c, A.2.a and Provision A.4. The Copermittees need to demonstrate that they are making improvements to their programs and making progress toward achieving the discharge prohibitions and receiving water limitations in Provisions A.1.a, A.1.c, and A.2.a by implementing the requirements of Provision A.4. The San Diego Water Board would consider these efforts prior to strictly enforcing the requirements of Provisions A.1.a, A.1.c, and A.2.a. Causes of exceedances of the receiving water limitations can often be more difficult to identify and attribute solely to the Copermittees' MS4s. The intent of the Order is to provide the Copermittees more clarity and flexibility in addressing these exceedances through the iterative approach and adaptive management process until the requirements under Provisions A.1.a, A.1.c, and A.2.a are fully achieved.

An exception to the iterative approach and adaptive management process would be in receiving waters subject to adopted and approved TMDLs. For TMDLs that are incorporated into the Order, there is a specific date for compliance to be achieved, after which the iterative approach and adaptive management process required under Provision A.4 no longer provides the flexibility to achieve compliance. Where compliance dates for a TMDL have passed, compliance with the WQBELs incorporated into the Order established by a TMDL in Attachment E to protect water quality standards is required. Thus, after the interim or final compliance dates for a TMDL have passed, if the discharges from the Copermittees' MS4s are causing or contributing to a violation of WQBELs, exceedances of WQBELs must be strictly enforced by the San Diego Water Board. In the meantime, however, the Copermittees are in compliance with the interim or final TMDL requirements in Attachment E as long as the interim or final WQBELs are being achieved in accordance with the interim or final compliance dates.

In addition, this Order includes an optional pathway that incorporates the requirements of Provision A.4 and would allow a Copermittee to be deemed in compliance with the requirements under Provisions A.1.a, A.1.c, A.1.d, A.2.a, and A.3.b during implementation of a Water Quality Improvement Plan that incorporates specific additional requirements. This alternative compliance pathway and the additional specific requirements are described below under the discussion for Provision B.3.c.

B. Water Quality Improvement Plans

Purpose: Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges to the MS4s and control pollutants in storm water discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the Clean Water Act.

Provision B includes requirements for the Copermittees to develop and implement Water Quality Improvement Plans to ultimately comply with the prohibitions and limitations under Provision A. The Water Quality Improvement Plans will provide the Copermittees a comprehensive program that can achieve the requirements and further the objectives of the CWA. Implementation of the Water Quality Improvement Plans will also improve the quality of the receiving waters in the San Diego Region.

The Water Quality Improvement Plan is the backbone of the Regional MS4 Permit requirements. Provision B provides the guidance, criteria, and minimum expectations and requirements for the elements of the Water Quality Improvement Plan to be developed and implemented by the Copermittees. The Water Quality Improvement Plans will be implemented in the Watershed Management Area by the Copermittees within their jurisdictions through their jurisdictional runoff management programs.

The Water Quality Improvement Plan also incorporates a program to monitor and assess the progress of the Copermittees' jurisdictional runoff management programs toward improving the quality of discharges from the MS4s, as well as tracking improvements to the quality of receiving waters. A process to adapt and improve the effectiveness of the Water Quality Improvement Plans has also been incorporated into the requirements of Provision B to be consistent with the "iterative approach" required to achieve compliance with discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a, pursuant to the requirements of Provision A.4.

The Water Quality Improvement Plans have also been structured to incorporate the requirements of any TMDLs that have been adopted for the San Diego Region. Incorporating the requirements of the TMDLs into the requirements of Provision B allows the Copermittees to develop a single plan, instead of separate plans, to coordinate their non-storm water and storm water runoff management programs. The Water Quality Improvement Plans allow the Copermittees to meet the requirements of this Order, as well as fulfill the requirements of the TMDLs.

As an added benefit, if the Copermittees demonstrate that impaired water bodies within the Watershed Management Area listed on the 303(d) List will be addressed with their Water Quality Improvement Plans in a reasonable period of time, the San Diego Water Board may be able to remove the water bodies from the 303(d) List, which would greatly reduce the need for the San Diego Water Board to develop additional TMDLs that would have to be incorporated into the Order and implemented by the Copermittees.

***Discussion*:** The federal NPDES regulations require the Copermittees to develop a proposed management program (40 CFR 122.26(d)(2)(iv)). The proposed management program must include "*a comprehensive planning process*" and "*where necessary intergovernmental coordination*" for the "*duration of the permit.*" The Water Quality Improvement Plan is the Copermittees' "*comprehensive planning process*" document for the proposed management program that will be implemented within a Watershed Management Area. Implementation of the Water Quality Improvement Plan requires "*intergovernmental coordination*" among the Copermittees for at least the "*duration of the permit*," and likely into and beyond the next iteration of the permit.

Developing Water Quality Improvement Plans based upon watersheds is consistent with federal regulations that support the development of permit conditions, as well as implementation of storm water management programs, at a watershed scale (40 CFR 122.26(a)(3)(ii), 122.26(a)(3)(v), and 122.26(d)(2)(iv)). In 2003, USEPA issued a Watershed-Based NPDES Permitting Policy Statement (USEPA, 2003) that defines watershed-based permitting as an approach that produces NPDES permits that are issued to point sources on a geographic or watershed basis. In this policy statement, USEPA explains that "*[t]he utility of this tool relies heavily on a detailed, integrated, and inclusive watershed planning process*." USEPA identifies a number of important benefits of watershed permitting, including more environmentally effective results, the ability to emphasize measuring the effectiveness of targeted actions on improvements in water quality, reduced cost of improving the quality of the nation's waters and more effective implementation of watershed plans, including TMDLs, among others.

An emphasis on watersheds is appropriate at this stage in the San Diego Region's MS4 program to shift the focus to more targeted, water quality driven planning and implementation. Addressing discharges on a watershed scale focuses on water quality results by emphasizing the receiving waters in the watershed. The conditions of the receiving waters drive management actions, which in turn focus measures to address pollutant contributions from MS4 discharges.

The Water Quality Improvement Plan gives the Copermittees the responsibility of developing a comprehensive plan to coordinate the efforts of their jurisdictional runoff management programs for addressing the problems related to MS4 discharges causing impacts to water quality in the Watershed Management Area. The development of the plan provides the Copermittees the opportunity to provide

significant input on how to implement their jurisdictional runoff management programs, and how to best utilize their available resources in addressing a focused set of priorities that they believe will result in measureable improvements to water quality within the Watershed Management Area.

The Copermittees are encouraged to separate the Watershed Management Area into subwatersheds, as appropriate. This allows the Copermittees to identify priorities applicable to a subset of the Copermittees or specific water bodies or areas within the Watershed Management Area.

Included in the requirements for the elements to be included in the Water Quality Improvement Plan are monitoring and assessment requirements that are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order. In addition to the federal requirements of the CWA section 308(a) and 40 CFR 122.26(d), the San Diego Water Board has the authority to establish monitoring, reporting, and recordkeeping requirements for NPDES permits under CWC 13383.

More specific and detailed discussions of the requirements of Provision B are provided below.

Provision B.1 (Watershed Management Areas) requires the Copermittees to develop a Water Quality Improvement Plan for each of the Watershed Management Areas defined by the San Diego Water Board.

Pursuant to 40 CFR 122.26(d)(2)(iv), proposed management programs "*may impose controls on a…watershed basis…*" The Water Quality Improvement Plan is the Copermittees' proposed management program. A Water Quality Improvement Plan must be developed for each Watershed Management Area identified in the Order.

The Watershed Management Areas are identified in Table B-1. Table B-1 establishes ten (10) Watershed Management Areas, and identifies the Copermittees that are responsible for developing and implementing the Water Quality Improvement Plan for each Watershed Management Area.

The Copermittees from each of the three counties within the San Diego Region ~~are~~ were ~~expected to be~~ phased in as their respective NPDES municipal storm water permits expired. ~~Because~~ Order No. R9-2007-0001 expired in January 2012, and the San Diego County Copermittees ~~were~~ became covered under the Regional MS4 Permit on June 27, 2013, the effective date of the Order. ~~Because~~ Order No. R9-2009-0002 expired in December 2014, and the Orange County Copermittees ~~are~~ became covered under the Regional MS4 Permit on April 1, 2015, the effective date of Order No. R9-2013-0001 as amended by Order No. R9-2015-0001. Order No. R9-2010-0016 expired in November 2015, and the Riverside County Copermittees became covered under the Regional MS4 Permit on January 7, 2016, the effective

date of Order No. R9-2013-0001 as amended by Order No. R9-2015-0100.

~~After the San Diego Water Board receives and considers the Report of Waste Discharge required to be submitted by the Riverside County Copermittees pursuant to the requirements of their current permit, and makes any necessary changes to the Order, the Riverside County Copermittees will be covered under the Regional MS4 Permit after Order No. R9-2010-0016 expires in December 2015.~~

~~The Riverside County Copermittees also have the option to obtain coverage under the Regional MS4 Permit earlier than their respective permit expiration dates. The process to apply for early coverage is described Provision F.6.~~

~~Because the Santa Margarita River Watershed Management Area includes Copermittees from both San Diego County and Riverside County, a footnote to Table B-1 has been included to specify that the requirements of Provision B are not required to be implemented by the County of San Diego until the Riverside County Copermittees have received a notice of coverage under the Order. Until the Riverside County Copermittees are notified of coverage under the Order, the County of San Diego is subject to the prohibitions and limitations under Provision A, responsible for continuing to implement its existing jurisdictional runoff management program, and responsible for implementing the transitional monitoring and assessment requirements of Provision D, the transitional annual reporting requirements of Provision F.3.b, and the TMDL requirements of Attachment E to the Order.~~

The Cities~~y~~ of Laguna Woods, ~~and~~ Laguna Hills, Murrieta, and Wildomar are located partially within the jurisdictions of both the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board) and the San Diego Water Board. Written requests for designation of a single Regional Water Board to regulate matters pertaining to permitting of Phase I MS4 discharges were submitted to the San Diego Water Board and the Santa Ana Water Board by the City of Laguna Woods by letter dated September 8, 2014, ~~and~~ the City of Laguna Hills by letter dated March 12, 2014, the City of Murrieta by letter dated June 22, 2015, and the City of Wildomar by letter dated June 23, 2015. The Cities of Laguna Woods, ~~and~~ Laguna Hills, Murrieta, and Wildomar requested designation of the San Diego Water Board pursuant to CWC section 13228.

The Cities of Laguna Woods, ~~and~~ Laguna Hills, Murrieta, and Wildomar reported that management and implementation of municipal programs to comply with two different Phase I MS4 permits creates a significant administrative and financial burden and inhibits their ability to contribute to greater overall water quality improvements in either Region. In an effort to address these concerns, the San Diego Water Board and the Santa Ana Water Board have entered into ~~an~~ written agreements ~~dated February 10, 2015~~, whereby the San Diego Water Board is designated to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Laguna Woods, ~~and~~ Laguna Hills, Murrieta, and Wildomar including ~~areas~~ the portions of the jurisdictions within the

Santa Ana Region. The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated February 10, 2015 to designate the San Diego Water Board to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Laguna Woods and Laguna Hills, including the portions of the jurisdictions within the Santa Ana Region, upon the later effective date of ~~this~~ Order No. R9-2015-0001 or Santa Ana Water Board Tentative Order No. R8-2015-0001. The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated [Month][Day], 2015 to designate the San Diego Water Board to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Murrieta and Wildomar, including the portions of the jurisdictions within the Santa Ana Region upon the effective date of Order R9-2015-0100.

Under the terms of the agreements, each Regional Water Board retains the authority to enforce provisions of the Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee (Water Code section 13228 (b)). Also under the terms of the agreements, any TMDL and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Laguna Woods, ~~or~~ Laguna Hills, Murrieta, or Wildomar as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement of the applicable TMDL would remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's San Diego Creek/Newport Bay TMDL and Lake Elsinore/Canyon Lake Nutrient TMDLs, and the San Diego Water Board's Indicator Bacteria Project I Beaches and Creeks TMDL.

In conformance with the~~is~~ agreements, ~~a~~ footnotes to Table B-1 ~~has been~~ are included to specify coverage under Order No. R9-2013-0001 for those Phase I MS4 discharges within the jurisdictional boundaries of the Cities of Laguna Woods, ~~and~~ Laguna Hills, Murrieta, and Wildomar within the Santa Ana Region. ~~The f~~Footnote 1 to Table B-1 specifies that the Cities~~y~~ of Laguna Woods and Laguna Hills are identified as responsible Copermittees in the San Diego Creek/Newport Bay TMDL in the Santa Ana Region and remain obligated to comply with the San Diego Creek/Newport Bay TMDL pursuant to section XVIII of Tentative Order No. R8-2015-0001 (NPDES No. CAS618030) and any reissuance thereof. Footnote 4 to Table B-1 specifies that the Cities of Murrieta and Wildomar are identified as responsible Copermittees in the Lake Elsinore/Canyon Lake Nutrient TMDLs in the Santa Ana Region and remain obligated to comply with the Lake Elsinore/Canyon Lake Nutrient TMDLs pursuant to section VI.D.2 of Order No. R8-2010-0033 (NPDES No. CAS618030) or corresponding section as it may be amended or reissued.

The Cities~~y~~ of Lake Forest and Menifee ~~is~~ are located partially within the jurisdictions of both the Santa Ana Water Board and the San Diego Water Board. Written requests for designation of a single Regional Water Board to regulate matters pertaining to

permitting of Phase I MS4 discharges were submitted to the San Diego Water Board and the Santa Ana Water Board by the City of Lake Forest by letters dated January 14, 2013 and April 4, 2014, and the City of Menifee by letter dated June 25, 2015. The Cities of Lake Forest and Menifee requested designation of the San Ana Water Board pursuant to CWC section 13228. ~~By letters dated January 14, 2013 and April 4, 2014 the City of Lake Forest submitted a written request, pursuant to CWC section 13228, to the San Diego Water Board and the Santa Ana Water Board requesting the Santa Ana Water Board be designated to regulate matters within the City of Lake Forest pertaining to permitting of their Phase I MS4 discharges.~~

The Cities~~y~~ of Lake Forest and Menifee reported that management and implementation of municipal programs to comply with two different Phase I MS4 permits creates a significant administrative and financial burden and inhibits their ability to contribute to greater overall water quality improvements in either Region. In an effort to address these concerns, the San Diego Water Board and the Santa Ana Water Board have entered into ~~an~~ written agreements ~~dated February 10, 2015~~, whereby the Santa Ana Water Board is designated to regulate Phase I MS4 discharges within the jurisdictions of the Cities~~y~~ of Lake Forest and Menifee including the portions of the jurisdictions within the San Diego Region. The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated February 10, 2015 to designate the San Ana Water Board to regulate Phase I MS4 discharges within the jurisdiction of the City of Lake Forest, including portions of the jurisdiction within the Santa Diego Region, upon the later date of ~~this~~ Order No. R9-2015-0001 or Santa Ana Water Board Tentative Order No. R8-2015-0001. The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated [Month][Day], 2015 to designate the San Ana Water Board to regulate Phase I MS4 discharges within the jurisdiction of the City of Menifee, including portions of the jurisdiction within the San Diego Region, under Order No. R8-2010-0033 (NPDES No. CAS618030) as it may be amended or reissued upon the effective date of Order No. R9-2015-0100.

Under the terms of the agreements, each Regional Water Board retains the authority to enforce provisions of the Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee (Water Code section 13228 (b)). Also under the terms of the agreements, any TMDL and associated Phase I MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities~~y~~ of Lake Forest or Menifee as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement authority for the applicable TMDL would remain with the Regional Water Board which has the jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's San Diego Creek/Newport Bay TMDL and Lake Elsinore/Canyon Lake Nutrient TMDLs, and the San Diego Water Board's Indicator Bacteria Project I Beaches and Creeks TMDL.

In conformance with the~~is~~ agreements, ~~a f~~Footnote 2 to Table B-1 has been included to specify that Phase I MS4 discharges within the jurisdictional boundaries of the City of Lake Forest located within the San Diego Region will be regulated under Santa Ana Water Board Order No. R8-2015-0001 (NPDES No. CAS618030) and any reissuance thereof. The footnote specifies that the City of Lake Forest is an identified responsible Copermittee in the Indicator Bacteria Project I Beaches and Creeks TMDL (Bacteria TMDL) in the San Diego Region and remains obligated to comply with the Bacteria TMDL pursuant to Attachment E of Order No. R9-2013-0001 and any reissuance thereto. The City of Lake Forest is also identified as a responsible Copermittee in the San Diego Creek/Newport Bay TMDL established by the Santa Ana Water Board. The City remains obligated to comply with the San Diego Creek/New Port Bay TMDL pursuant to the Santa Ana Water Board's Phase I MS4 Permit (Tentative Order No. R8-2015-0001 (NPDES No. CAS618030), as it may be amended or reissued). Under the terms of the agreement, the City of Lake Forest must retain and continue implementation of the over irrigation prohibition in Title 15, Chapter 15, Section 14.030, List (b) of the City Municipal Code throughout its jurisdiction. Also under the terms of the agreement, the City of Lake Forest must actively participate in the development and implementation of the ~~Aliso Creek~~ South Orange County Watershed Management Area Water Quality Improvement Plan required pursuant to Order No. R9-2013-0001, and any reissuance thereof.

Footnote 3 to Table B-1 has been included to specify that Phase I MS4 discharges within the jurisdictional boundaries of the City of Menifee located within the San Diego Region will be regulated under Santa Ana Water Board Order No. R8-2010-0033 (NPDES No. CAS618033) and any reissuance thereof. At this time, the City of Menifee is not identified as a responsible Copermittee for any TMDLs established by the San Diego Water Board. Under the terms of the agreement, the City of Menifee must actively participate in the development and implementation of the Santa Margarita River Watershed Management Area Water Quality Improvement Plan required pursuant to Order No. R9-2013-0001, and any reissuance thereof.

The basis supporting the Cities of Laguna Woods, Laguna Hills, ~~and~~ Lake Forest, Menifee, Murrieta, and Wildomar requests to designate a specific Regional Water Board for regulatory oversight of Phase I MS4 discharges may change under future conditions and circumstances, therefore the San Diego Water Board will periodically review the effectiveness of the agreements during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate ~~the~~ one or both of the agreements with the Santa Ana Water Board or otherwise modify the agreements subject to the approval of the Santa Ana Water Board.

Provision B.2 (Priority Water Quality Conditions) requires the Copermittees in each Watershed Management Area to identify the highest priority water quality conditions which will be the focus of the Water Quality Improvement Plan implementation.

Provisions B.2.a and B.2.b provide the criteria that must be assessed when

characterizing the receiving water quality and potential impacts from MS4 discharges of the receiving waters within the Watershed Management Area. The criteria are based primarily on the requirements in 40 CFR 122.26(d)(1)(iv)(C) and (C)(1)-(9). Characterizing the receiving water quality and identifying the potential impacts caused by MS4 discharges to receiving waters in the Watershed Management Area is necessary to identify the impacts to receiving waters associated with MS4 discharges that are of the most concern to the Copermittees.

Based on the information required to be considered under Provisions B.2.a and B.2.b, Provision B.2.c requires to Copermittees to identify the highest priority water quality conditions related to discharges from the MS4s that will be the primary focus of the Water Quality Improvement Plan in the Watershed Management Area. Addressing and improving these highest priority water quality conditions will become the focus of each Copermittee's jurisdictional runoff management program as the Water Quality Improvement Plan is implemented in the Watershed Management Area. The highest priority water quality conditions are expected to include sources of pollutants and/or stressors, and/or receiving water conditions, that the Copermittees consider the highest threats or most likely to have adverse impacts on the physical, chemical, and biological integrity of receiving waters. Addressing these threats and/or adverse impacts should restore the physical, chemical, and biological integrity of receiving waters, and result in the restoration and protection of the beneficial uses of the receiving waters in the Watershed Management Area.

Provision B.2.d requires the Copermittees to identify known and suspected sources of pollutants and/or stressors contributing to the highest priority water quality conditions. The requirements of Provision B.2.d are based primarily on the requirements in 40 CFR 122.26(d)(1)(iii)(B)(1)-(6). The Copermittees are required to evaluate several factors in the identification of those sources. The Copermittees must consider and evaluate the following: (1) the land uses that may contribute toward impacts to receiving waters, (2) the locations of the Copermittees' MS4s that can convey and discharge runoff and pollutants to receiving waters, (3) other sources that discharge into the Copermittees' MS4s and receiving waters, and (4) other information and data that can help the Copermittees to evaluate the relative importance of or contribution from those sources toward the highest priority water quality conditions. Identifying the known and suspected sources, and their relative contribution toward the highest priority water quality conditions, will help the Copermittees to focus, direct, and prioritize their resources and implementation efforts within their jurisdictions.

Provision B.2.e requires the Copermittees to identify potential strategies that can result in improvements to water quality in MS4 discharges and/or receiving waters within the Watershed Management Area. Potential water quality improvement strategies will not necessarily be implemented by the Copermittees, but provide a "menu" of options that the Copermittees will consider for implementation. The public participation process that will be implemented during the development of the Water Quality Improvement Plan is where the potential water quality improvement strategies will be identified.

Provision B.3 (Water Quality Improvement Goals, Strategies and Schedules) requires the Copermittees in each Watershed Management Area to identify the goals that the Copermittees' jurisdictional runoff management programs will work toward achieving to address and improve the highest priority water quality conditions identified under Provision B.2.c; the strategies that will be implemented by the Copermittees within their jurisdictions and the Watershed Management Area to achieve the goals; and, the schedules for implementing the strategies and achieving the goals. The element of the Water Quality Improvement Plan required under Provision B.3 is where the "*comprehensive planning*" and "*intergovernmental coordination*" [40 CFR 122.26(d)(2)(iv)] of the Copermittees' actions for the proposed management programs within the Watershed Management Area is required to be described.

Provision B.3.a requires the Copermittees to identify interim and final numeric goals, and schedules to achieve those goals as part of the Water Quality Improvement Plans. Provision B.3.a.(1) requires the Copermittees to identify two types of numeric goals to be achieved:

(1) Final numeric goals in the receiving waters and/or MS4 discharges that will result in the protection of the water quality standards of the receiving waters for the highest priority water quality conditions identified by the Copermittees for Provision B.2.c. These final numeric goals are the ultimate goals for the Water Quality Improvement Plan, and the achievement and maintenance of these final numeric goals will indicate that one or more beneficial uses have been successfully restored and/or protected from MS4 discharges.

(2) Interim numeric goals that can be used by the Copermittees to demonstrate progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges for the highest priority water quality conditions in the Watershed Management Area. Achievement of the interim numeric goals will demonstrate to the San Diego Water Board that the Copermittees' implementation efforts are progressing toward achieving the final numeric goals.

Provision B.3.a.(1) does not specify what the interim and final numeric goals must be based on, but they essentially must be designed to achieve compliance with water quality standards in the receiving waters. To that end, the interim goals must be based on measureable criteria or indicators capable of demonstrating progress toward achieving the numeric goals.

The interim and final numeric goals can be based on the water quality objectives in the Basin Plan. The water quality objectives in the Basin Plan, however, consist of numeric and narrative water quality objectives. Numeric water quality objectives can be directly used as numeric goals. Narrative water quality objectives, on the other hand, will require some interpretation to identify numeric goals. The achievement of multiple numeric goals based on the water quality objectives, used in combination,

may be necessary to demonstrate that beneficial uses have been restored and/or protected.

The Copermittees could also propose other numeric goals that are not necessarily water quality objectives from the Basin Plan. For example, the Copermittees could propose a numeric goal that consists of achieving some percent improvement of a measureable indicator, such as acreage of a specific habitat or increase in a specific plant or animal species population. Other examples may include pollutant load reductions, number of impaired waterbodies delisted from the List of Water Quality Impaired Segments, Index of Biological Integrity (IBI) scores, etc.

The Copermittees may choose to develop interim numeric goals based on the final numeric goals they develop, such as incremental steps toward ultimately achieving the final numeric goals. The Copermittees may also choose to develop interim numeric goals that are based on other measureable indicators that can indirectly indicate improvements and progress toward the final numeric goals.

There are no limits to the types of interim numeric goals that could be proposed by the Copermittees, other than the goals must be based on measureable criteria or indicators capable of demonstrating progress toward achieving the numeric goals. Likewise, there are no limits to the types of final numeric goals that could be proposed by the Copermittees, other than the goals must "*restore and protect the water quality standards of the receiving waters.*"

Finally, Provision B.3.a.(2) also requires the Copermittees to develop schedules for measuring progress and achieving the interim and final numeric goals. Several criteria are included for the development of the schedules, but the Copermittees are required to achieve the numeric goals as soon as possible, consistent with federal NPDES regulations (40 CFR 122.47(a)(1)).

The Copermittees are also required to incorporate any compliance schedules for applicable ASBS or TMDL requirements. Applicable ASBS and TMDL compliance schedules are set forth in Attachment A and Attachment E to the Order, respectively. The information provided by the Copermittees under Provision B.3.a.(2) will be used by the Copermittees and the San Diego Water Board to gauge and track the progress of the Copermittees' efforts in addressing the highest priority water quality conditions identified in the Water Quality Improvement Plan.

Provision B.3.b requires the Copermittees to identify the strategies and schedules to implement those strategies as part of the Water Quality Improvement Plans. Provision B.3.b requires the Copermittees to identify the water quality improvement strategies that will be and may be implemented within the Watershed Management Area to 1) reduce pollutants in storm water discharged from the MS4 to the MEP, 2) effectively prohibit non-storm water discharges from entering the MS4, 3) protect water quality standards in receiving waters by controlling MS4 discharges so that they do not cause

or contribute to exceedances of receiving water limitations, and 4) achieve applicable WQBELs that implement TMDLs. The Copermittees will select the strategies to be implemented based on the likely effectiveness and efficiency of the potential water quality improvement strategies identified under Provision B.2.e to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, and/or achieve the interim and final numeric goals identified under Provision B.3.a.

Provision B.3.b.(1) requires each Copermittee to identify the strategies that will be or may be implemented within its jurisdiction. Each Copermittee is required to describe the strategies it is committed to implementing as part of its jurisdictional runoff management requirements under Provisions E.2 through E.7, and the optional jurisdictional strategies that the Copermittee will implement, as necessary, to achieve the numeric goals.

Each Copermittee is expected to implement the optional jurisdictional strategies identified under Provisions B.3.b.(1)(b) when the jurisdictional strategies it has committed to implement under Provision B.3.b.(1)(a) are not making adequate progress toward the interim and final numeric goals in accordance with the schedules established under Provision B.3.a. Provision B.3.b.(1)(b)(v) requires each Copermittee to describe the circumstances necessary to trigger implementation of the optional jurisdictional strategies, in addition to the requirements of Provisions B.3.b.(1)(a).

The San Diego Water Board recognizes that there may be optional jurisdictional strategies that will likely require funding and/or resources for planning, permitting, procurement of labor and materials, and implementation. Thus, Provision B.3.b.(1)(b)(iv) requires each Copermittee to describe the funding and/or resources that are necessary to implement these optional jurisdictional strategies. This information may provide interested groups and members of the public an understanding of the resources that they could provide or assist in obtaining to implement these optional jurisdictional strategies.

Provision B.3.b.(2) requires the Copermittees in the Watershed Management Area to identify the regional or multi-jurisdictional strategies that may be implemented, as necessary, to achieve the numeric goals. Similar to the requirements of Provision B.3.b.(1)(b), these regional or multi-jurisdictional strategies will likely require funding and/or resources for planning, permitting, procurement of labor and materials, and implementation, and San Diego Water Board recognizes that these strategies may be difficult to implement with only Copermittee resources. Thus, Provision B.3.b.(2)(d) requires the Copermittees to describe the funding and/or resources necessary to implement these optional regional or multi-jurisdictional strategies. This information may provide interested groups and members of the public an understanding of the resources that they could provide or assist in obtaining to implement these optional regional or multi-jurisdictional strategies.

Provision B.3.b.(3) requires the Copermittees to develop and include schedules in the Water Quality Improvement Plan for implementing the water quality improvement strategies identified under Provisions B.3.b.(1) and B.3.b.(2). The schedule for implementing the water quality improvement strategies will be used by the Copermittees and San Diego Water Board to measure and demonstrate the progress of the Copermittees' implementation efforts toward reducing pollutants in storm water discharged from the MS4 to the MEP, and eliminating illicit non-storm water discharges from entering the MS4.

Provision B.3.b.(4) provides the Copermittees in each Watershed Management Area the option of implementing watershed-specific structural BMP requirements for Priority Development Projects. Historically, storm water permits have included very specific performance standards for permanent, structural BMPs. These standards describe the expectation for the capture or treatment of pollutants and control of excessive flow before storm water is discharged from a site. The Copermittees were also allowed to develop waiver programs for Priority Development Projects to avoid implementing the structural BMPs; however, the waiver programs were not necessarily tied into any sort of holistic watershed strategy. The result is that implementation of BMP requirements is largely done on a site-by-site basis. This requires proper design on the part of the Priority Development Project and strict oversight on the part of the Copermittee.

Provision B.3.b.(4) promotes the evaluation of multiple strategies for water quality improvement, in addition to the implementation of permanent structural BMPs, on a watershed-scale versus the site-by-site approach. In a report issued by the Southern California Coastal Water Research Project (SCCWRP) and several other research institutions, the report emphasized that a successful hydromodification management program will involve watershed analysis as a first step, and that integrating multiple watershed-based strategies is preferable over a site-by-site approach. Indeed, the report states that the watershed analysis "…*should lead to identification of existing opportunities and constraints that can be used to help prioritize areas of greater concern, areas of restoration potential, infrastructure constraints, and pathways for potential cumulative effects*."[22] Provision B.3.b.(4) promotes the findings and recommendations of the report by providing a pathway for Copermittees to develop an integrated approach to their land development programs.

Under Provision B.3.b.(4), the Copermittees in a Watershed Management Area must first perform an analysis by gathering as much information pertaining to the physical characteristics of the Watershed Management Area as possible. This includes, for example, identifying potential areas of coarse sediment supply, present and anticipated future land uses, and locations of physical structures within receiving streams and upland areas that affect the watershed hydrology (such as bridges,

[22] 2012. ED Stein, F Federico, DB Booth, BP Bledsoe, C Bowles, Z Rubin, GM Kondolf, A Sengupta. Technical Report 667. Southern California Coastal Water Research Project. Costa Mesa, CA.

culverts, and flood management basins). Once this information is collected, the Copermittees must produce GIS layers (maps) that include this information.

From there, the Copermittees must use the results of the Watershed Management Area Analysis to identify and compile a list of candidate projects that could potentially be used as alternative compliance options for Priority Development Projects. Such projects include, for example, opportunities for stream or riparian area rehabilitation, opportunities for retrofitting existing infrastructure to incorporate storm water retention or treatment, and opportunities for regional BMPs, among others. Once these candidate projects are identified, Copermittees may allow Priority Development Projects to fund, partially fund, or completely implement these candidate projects. The Copermittees must first find that implementing such a candidate project would provide greater overall benefit to the watershed than requiring implementation of the structural BMPs onsite, and also enter into a voluntary agreement with the Priority Development Project that authorizes this arrangement. The Copermittees may use Provision B.3.b.(4) as both 1) a mechanism to reach their stated goals of the Water Quality Improvement Plan by using Priority Development Projects to either fund or implement projects that will provide water quality benefit, and 2) an alternative to requiring strict adherence to the structural BMP design standards.

Additionally, Provision B.3.b.(4) allows the Copermittees to use the results of the Watershed Management Area Analysis to identify areas within the Watershed Management Area where it is appropriate to allow Priority Development Projects to be exempt from the hydromodification management BMP performance requirements. Provision E.3.c.(2) already allows exemptions for Priority Development Projects that discharge to a conveyance channel whose bed and bank are concrete lined from the point of discharge to an enclosed embayment or the Pacific Ocean. However, there may be cases where further exemptions are warranted. The Copermittees may identify such cases on a watershed basis and include them in the Watershed Management Area Analysis; however, they must provide the supporting rationale to support all claims for exemptions.

Provision B.3.b.(4) provides an innovative pathway for Copermittees to regulate their land development programs by allowing alternative compliance in lieu of implementing structural BMPs on each and every Priority Development Project. This approach facilitates the integration of watershed-scale solutions for improving overall water quality and assisting Copermittees to achieve their stated goals of the Water Quality Improvement Plan. The San Diego Water Board understands, however, that undertaking this approach, which involves extensive planning, could be resource intensive for the Copermittees. Therefore, the Watershed Management Area Analysis is optional and not a requirement. The Copermittees can choose not to perform the watershed planning and mapping exercise described in Provision B.3.b.(4), and instead choose to require strict implementation of the structural BMPs onsite, pursuant to Provision E.3.c.

Provision B.3.c is included to provide the Copermittees an option that allows the Copermittees to be deemed in compliance with the prohibitions and limitations (receiving water limitations) of Provisions A.1.a, A.1.c, A.1.d, A.2.a, and A.3.b. One or more Copermittees within a Watershed Management Area can choose to implement this option. This option is only expected to be utilized by a Copermittee that wishes to be deemed in compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2.a, and A.3.b.

The alternative compliance pathway option included in Provision B.3.c is consistent with the approach described in Order WQ 2015-0075, *In the Matter of Review of Order No. R4-2012-0175, NPDES Permit No. CAS004001, Waste Discharge Requirements for Municipal Separate Storm Sewer System (MS4) Discharges within the Coastal Watersheds of Los Angeles County, Except Those Discharges Originating from the City of Long Beach MS4,* adopted by the State Water Board on June 16, 2015. State Water Board Order WQ 2015-0075 directs the Regional Water Boards to consider a watershed-based planning and implementation approach to compliance with receiving water limitations when issuing Phase I MS4 permits going forward. Order WQ 2015-0075 included seven principles that the Regional Water Boards are expected to follow when incorporating an alternative compliance pathway into a MS4 permit. The San Diego Water Board incorporated the seven principles stipulated in State Water Board Order WQ 2015-0075 into the Regional MS4 Permit as follows:

1. Provision A of this Order continues to require compliance with water quality standards in the receiving water and does not deem good faith engagement in the iterative process to constitute compliance with receiving water limitations. Provision A of this Order continues to be consistent with the receiving water limitations provisions from State Water Board Order WQ 99-05.

2. Compliance with Provision B.3.c constitutes compliance with the requirements of the Provision A.3.b, which requires compliance with the WQBELs of the TMDLs in Attachment E to the Order, and is considered compliance with receiving water limitations for those TMDL water body-pollutant combinations.

3. Provision B.3.c is an ambitious, rigorous, and transparent alternative compliance pathway that allows a Copermittee appropriate time to come into compliance with receiving water limitations without being in violation of the receiving water limitations during implementation of the compliance alternative.

4. Provision B.3.c requirements are incorporated into a Water Quality Improvement Plan. Water Quality Improvement Plans are a watershed-based planning and implementation approach, which address multiple contaminants, and incorporate TMDL requirements.

5. The strategies required to be included in the Water Quality Improvement Plans promote and incentivize the use of green infrastructure and requires the implementation of low impact development principles.

6. The strategies required to be included in the Water Quality Improvement Plans encourage multi-benefit regional projects that capture, infiltrate, and reuse storm water and support a local sustainable water supply.

7. The alternative compliance pathway of Provision B.3.c includes rigor and accountability. The Copermittee is required, through a transparent public process, to demonstrate that water quality issues in the watershed have been analyzed and prioritized, and that appropriate solutions are proposed. The Copermittee is also required, through a transparent process, to monitor the results and return to their analysis to verify assumptions and update the solutions. The Copermittee is required to conduct this type of adaptive management on its own initiative without waiting for direction from the San Diego Water Board.

In order for a Copermittee to utilize this option, the Copermittee is required to include three components in the Water Quality Improvement Plan. The first component is a comprehensive set of numeric goals and schedules that will demonstrate the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2.a, and A.3.b will be achieved within a specified period of time. The criteria provided in the Order will require the Copermittee to demonstrate that the discharges from its MS4s will not cause or contribute to exceedances of water quality objectives in the receiving waters, and/or the receiving waters will be adequately protected from adverse impacts attributable to the Copermittee's MS4 discharges. The Copermittee is also required to specify annual milestones to be achieved each year, which adds rigor, accountability, and transparency to the process. The annual milestones may consist of water quality improvement strategy implementation phases, interim numeric goals, and other acceptable metrics, which are expected to build upon previous milestones and lead to the achievement of the final numeric goals.

The second component is an analysis to demonstrate that implementation of the water quality improvement strategies required under Provision B.3.b will achieve the numeric goals within the established schedules required under Provisions B.3.a and B.3.c.(1). Because the development of the analysis may require significant resources, the Order allows the Copermittees in each Watershed Management Area that choose to implement this option to perform the analysis individually, or pool their resources for the analysis collectively.

The analysis must "reasonably" and "quantitatively" demonstrate that the implementation of the water quality improvement strategies can achieve the numeric goals within the established schedules. However, as more data and information are collected during implementation of the Water Quality Improvement Plan to demonstrate progress toward achieving the numeric goals, the numeric goals, water quality improvement strategies and schedules may need to be modified. If the data and information indicate that modification is needed, the Copermittee must also update the analysis. With the exception of numeric goals and schedules associated with

TMDLs from Attachment E to the Order, the modification to the analysis would be allowed as part of the adaptive management process of the Water Quality Improvement Plan. For TMDLs, modification of numeric goals or schedules would likely require an amendment to the Basin Plan and Attachment E to the Order before the analysis and Water Quality Improvement Plan could include such modifications.

Thus, the third component is the key component that allows a Copermittee to demonstrate the implementation of the water quality improvement strategies within its jurisdiction is making progress toward achieving the final numeric goals. Each Copermittee must specify the monitoring and assessments that will be performed to confirm that implementation of the water quality improvement strategies are making progress toward achieving the numeric goals within the established schedules, and whether the interim and final numeric goals have been achieved.

These three components must then be reviewed by the Water Quality Improvement Consultation Panel. The Water Quality Improvement Consultation Panel is required to be formed as part of the public participation process for the development of the Water Quality Improvement Plans. The Water Quality Improvement Consultation Panel is described under Provision F.1.a.(1)(b). Review by the Water Quality Improvement Consultation Panel is included to provide an additional layer of input, support, and accountability for the implementation of this option.

Compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2.a, and A.3.b begins when the Water Quality Improvement Plan, incorporating the requirements of Provision B.3.c.(1), is accepted by the San Diego Water Board. Each Copermittee that chooses to implement and continues to implement this option will be in compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2.a, and A.3.b as long as the Copermittee continues to implement the strategies, monitoring and assessments as incorporated in the Water Quality Improvement Plan in accordance with Provision B.3.c.(1), and the Copermittee reports the achievement of the annual milestones each year, or provides acceptable rationale and recommends appropriate modifications to the interim numeric goals, and/or water quality improvement strategies, and/or schedules to improve the rate of progress toward achieving the final numeric goals.

Provision B.4 (Water Quality Improvement Monitoring and Assessment) requires the Copermittees to develop an integrated monitoring and assessment program to track the progress of the Water Quality Improvement Plan toward meeting the implementation goals and schedules, and improving the water quality of the Watershed Management Area. Provision B.4 is the part of the Water Quality Improvement Plan where the Copermittees describe the monitoring data that will be collected, which is not only necessary to implement the "iterative approach" required by Provision A.4, but inform the adaptive management and "*comprehensive planning process*" that allows the Copermittees to make adjustments and modifications to the Water Quality Improvement Plans and the jurisdictional runoff management programs.

Provision B.4 requires the Copermittees, at a minimum, to include the requirements of Provision D as part of the water quality improvement monitoring and assessment program for the Water Quality Improvement Plan. The Copermittees, however, are not limited to the requirements of Provision D and may include additional monitoring and assessment methods to track progress toward improving water quality in the Watershed Management Area.

In addition to incorporating the requirements of Provision D, the water quality improvement monitoring and assessment program must incorporate any monitoring and assessment requirements specified for any applicable TMDLs included in Attachment E to the Order, and the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 for Watershed Management Areas with ASBS.

The monitoring and assessments required to be incorporated into the Water Quality Improvement Plan are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order.

Provision B.5 (Iterative Approach and Adaptive Management Process) requires the Copermittees to implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a.

Provision B.5 requires the Copermittees in each Watershed Management Area to re-evaluate the highest priority water quality conditions and potential water quality improvement strategies, the water quality improvement goals, strategies and schedules, and the water quality improvement monitoring and assessment program and provide recommendations for modifying those elements to improve the effectiveness of the Water Quality Improvement Plan. The re-evaluation of the Water Quality Improvement Plan is part of the assessment requirements of Provision D.

Provision B.6 (Water Quality Improvement Plan Submittal, Updates, and Implementation) requires to Copermittees to submit, update, and implement the Water Quality Improvement Plans.

The requirements for the process to develop and submit the Water Quality Improvement Plans is described in more detail under the discussion for Provision F.1. The process will include several opportunities for the public to provide input during the development of the Water Quality Improvement Plans. The process for updating the Water Quality Improvement Plans is described in more detail under the discussion for Provision F.3.c. Upon acceptance of the Water Quality Improvement Plan and updates, the Copermittees are required to immediately begin implementing the Water Quality Improvement Plan and subsequent updates.

The Water Quality Improvement Plan is expected to be a dynamic document that will

evolve over time. The Water Quality Improvement Plan is also expected to be a long term plan that focuses the Copermittees' efforts and resources on a limited set of priority water quality conditions, with the ultimate goal of protecting all the beneficial uses of the receiving waters within the Watershed Management Area from impacts that may be caused or contributed to by MS4 discharges. As the Copermittees collect data, implement their jurisdictional runoff management programs, and review the results from their water quality improvement monitoring and assessment program, the Water Quality Improvement Plan is expected to be continually reviewed and updated until compliance with Provisions A.1.a, A.1.b, and A.2.a is achieved.

However, in specific cases supported by robust analytical documentation the implementation of the Water Quality Improvement Plans may demonstrate that TMDLs are not necessary for identified impaired water bodies within the Watershed Management Area if the analytical record demonstrates that technology-based effluent limitations required by the CWA, more stringent effluent limitations required by state, local, or federal authority, and/or other pollution control requirements (e.g., best management practices) required by local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time.[23]

The San Diego Water Board submits an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. According to USEPA guidance for the Integrated Report,[24] water bodies are placed in one of five categories. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 are placed on the 303(d) List.

Category 4 in the Integrated Report is for water bodies where available data and/or information indicate that at least one beneficial use is not being supported or is threatened, but a TMDL is not needed.[25] Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

Impaired water bodies can be included in Category 4a if a TMDL has been adopted and approved. The TMDLs in Attachment E to the Order implement the requirements of the TMDLs adopted by the San Diego Water Board, and approved by the State Water Board and USEPA. The water bodies in Attachment E will be included in

[23] 40 CFR 130.7(b)(1)
[24] USEPA, 2005. Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act
[25] Ibid

Category 4a in the Integrated Report and removed from the 303(d) List.

Impaired water bodies can be included in Category 4b if there are *acceptable* "pollution control requirements" required by a local, state or federal authority stringent enough to implement applicable water quality standards within a reasonable period of time (e.g., a compliance date is set). When evaluating whether a particular set of pollution controls are "requirements," the USEPA considers a number of factors, including: (1) the authority (local, state, federal) under which the controls are required and will be implemented with respect to sources contributing to the water quality impairment (examples may include: self-executing state or local regulations, permits, and contracts and grant/funding agreements that require implementation of necessary controls), (2) existing commitments made by the sources and completion or soon to be completed implementation of the controls (including an analysis of the amount of actual implementation that has already occurred), (3) the certainty of dedicated funding for the implementation of the controls, and (4) other relevant factors as determined by USEPA depending on case-specific circumstances.[26]

Impaired water bodies can be included in Category 4c if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution. Pollution, as defined by the CWA is "the man-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of water."[27] In other cases, pollution does not result from a pollutant and a TMDL is not required. Examples of circumstances where an impaired segment may be placed in Category 4c include segments impaired solely due to lack of adequate flow, stream channelization, or hydromodification. In these situations, there may be water quality management actions that can address the cause(s) of the impairment, but a TMDL may not be required to implement the actions.

The Water Quality Improvement Plans will require the implementation of pollution controls and water quality management actions (i.e. water quality improvement strategies) which can result in the attainment of water quality standards in water bodies impaired by discharges from the Copermittees' MS4s. The Water Quality Improvement Plans also include requirements that are expected to attain water quality standards in a reasonable period of time. The San Diego Water Board considers the Water Quality Improvement Plans to be a commitment by the Copermittees to develop, plan, budget for, and implement pollution controls that will attain water quality standards in receiving waters in a reasonable period of time, or as soon as possible. The results of the Copermittees' efforts in implementing the Water Quality Improvement Plans can be used to re-evaluate the condition of the impaired water bodies during the next update to the 303(d) List.

After the Copermittees submit the Water Quality Improvement Plans and demonstrate

[26] Ibid
[27] CWA section 502(19)

that water quality standards are being attained or will be attained in a reasonable period of time, the San Diego Water Board may re-evaluate the water bodies on the 303(d) List. These water bodies on the 303(d) List may be re-evaluated and placed into Category 4b or Category 4c in the Integrated Report. The water bodies placed in Category 4b or Category 4c in the Integrated Report must show a record that the water bodies are attaining water quality standards or supporting the identified beneficial uses, or will attain water quality standards or support identified beneficial uses in a reasonable period of time, in order for the water bodies to be appropriately removed from the 303(d) List.

C. Action Levels

Purpose: Provision C includes requirements for the Copermittees to identify and include numeric action levels in the Water Quality Improvement Plan to direct and focus the Copermittees' jurisdictional runoff management program implementation efforts for controlling MS4 discharges to receiving waters.

***Discussion*:** Under Provision C, the numeric action levels required are for non-storm water discharges and storm water discharges. The non-storm water action levels (NALs) are applicable to non-storm water discharges from the Copermittees' MS4s, which can occur year-round. The storm water action levels (SALs) are applicable to storm water discharges from the Copermittees' MS4s, which occur during the rainy season defined as the period between October 1 and April 30.

The action levels required by Provision C are based on the action level requirements that were developed and incorporated into Order Nos. R9-2009-0002 and R9-2010-0016, the Orange County and Riverside County MS4 Permits, respectively. The Fact Sheets for these Orders provide detailed discussions about the development of the numeric NALs and SALs included in this Order.

Order Nos. R9-2009-0002 and R9-2010-0016 required the Copermittees to perform prescribed actions if the NALs or SALs are exceeded. The actions required under Order Nos. R9-2009-0002 and R9-2010-0016 generally included conducting additional monitoring and source investigations when a discharge from the MS4 is observed to exceed one or more NALs and/or SALs.

For this Order, however, the action levels of Provision C are to be used by the Copermittees to prioritize the actions to be implemented as part of the Water Quality Improvement Plan. Monitoring data collected by the Copermittees from MS4 outfalls will be compared with the NALs and SALs. Exceedances of the NALs and SALs will not require the Copermittees to immediately identify sources causing exceedances, but will provide some numeric indicator levels that can give the Copermittees a way to measure the relative severity of a pollutant contributing to receiving water quality impacts.

NALs and SALs must be included in the Water Quality Improvement Plans to be used by the Copermittees in directing and focusing their water quality improvement strategies. The Copermittees are expected to utilize the NALs and SALs to help focus their implementation efforts on addressing pollutants that have the most significant potential or observed impacts to receiving waters. The NALs and SALs will be used as part of the MS4 discharges assessments required under Provision D.4.b. The NALs and SALs may also be used by the Copermittees as the numeric goals to be achieved in MS4 discharges and/or receiving waters as the Water Quality Improvement Plans are implemented.

More specific and detailed discussions of the requirements of Provision C are provided below.

Provision C.1 (Non-storm Water Action Levels) requires the Copermittees to incorporate NALs into the Water Quality Improvement Plan for pollutants and/or constituents that are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions identified in the Water Quality Improvement Plan related to non-storm water discharges from the MS4s. NALs generally must be consistent with the water quality objectives found within the Basin Plan.

The NALs have been included to ensure that the Copermittees are implementing and complying with several requirements of the MS4 permit. The federal CWA requires permits for municipal storm sewer systems to "*effectively prohibit non-storm water discharges into the storm sewers*." The federal NPDES regulations, which were promulgated to implement the CWA requirements for discharges from municipal storm sewers, require a program to address illicit discharges, which are non-storm water discharges. Provision A.1.b prohibits "*[n]on-storm water discharges into MS4s*" unless the non-storm water discharge authorized by a separate NPDES permit. The NALs will be used as part of the illicit discharge detection and elimination program required pursuant to Provision E.2, as well as part of the MS4 discharges assessments required pursuant to Provision D.4.b.

Provision A.1.a prohibits non-storm water discharges from the MS4 from "*causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state.*" In addition, pursuant to Provision A.2.a, non-storm water discharges "*must not cause or contribute to the violation of water quality standards in any receiving waters*."

Ideally, the Copermittees' jurisdictional runoff management programs will eliminate all non-storm water discharges entering the MS4s within their jurisdictions. The complete elimination of non-storm water discharges to the Copermittees' MS4s would be in compliance with the CWA requirements for non-storm water discharges, as well as the prohibitions and limitations of Provisions A.1.a and A.2.a.

The federal regulations, however, also refer to several non-storm water discharge categories that must be addressed as illicit discharges if they are found to be a source of pollutants. The federal regulations thus identify some non-storm water discharges that are not required to be addressed as illicit discharges if they are not a source of pollutants (e.g. non-storm water discharges specified in Provisions E.2.a.(1)-(5)). Thus, these regulations imply that some non-storm water discharges into and from the MS4 may occur even if non-storm water discharges are "effectively" prohibited by the Copermittees.

If the source of a non-storm water discharge is identified as a category of non-storm water specified in Provisions E.2.a.(1)-(5), the NALs can be used to determine if the category of non-storm water discharges is a source of pollutants. For other non-storm water discharges not specified in Provisions E.2.a.(1)-(5), the CWA requires those discharges to be "*effectively"* prohibited by removing the discharge to the MS4 through enforcement of the Copermittees' legal authority established under "*ordinance, order or similar means*" to prohibit illicit discharges to the MS4s.

If there are non-storm water discharges that are not required to be addressed as illicit discharges, those discharges must comply, at a minimum, with the discharge prohibitions and receiving water limitations of Provision A. Thus, the non-storm water discharges from the MS4 must be at levels that will not cause or contribute to a condition of pollution, contamination, or nuisance (Provision A.1.a), and must not cause or contribute to a violation of water quality standards in receiving waters (Provision A.2.a) to be consistent with the discharge prohibitions and receiving water limitations of Provisions A.1.a and A.2.a.

Furthermore, the San Diego Region has predominantly intermittent and ephemeral rivers and streams which vary in flow volume and duration at spatial and temporal scales. For most of these river and stream systems, non-storm water discharges from the MS4 are likely to be the most significant or the only source contributing to surface flows present within the receiving water, especially during the dry season.

Therefore, because of the prohibitions and limitations of Provision A.1.a and A.2.a, and the likelihood that non-storm water discharges from the MS4 are the most significant or only source contributing to surface flows present within the receiving water, NALs generally must be consistent with the water quality objectives found within the Basin Plan. Non-storm water discharges that are meeting the NALs would not be expected to cause or contribute to an exceedance of water quality objectives in receiving waters, which would be consistent with the discharge prohibitions and receiving water limitations of Provisions A.1.a and A.2.a.

Exceedances of the NALs would then provide an indication of the relative severity of a pollutant in non-storm water discharges from the MS4 contributing to potential or observed receiving water quality impacts. The relative severity or significance of a pollutant in non-storm water discharges from the MS4 will provide the Copermittees a valuable source of information that can be used to identify priority water quality conditions within a Watershed Management Area and within each Copermittee's jurisdiction.

Tables C-1 through C-4 under Provision C.1.a specify numeric NALs for several parameters or pollutant constituents for non-storm water discharges from the MS4 to several water body types. The NALs for MS4 discharges given under Provision C.1.a are based on the water quality objectives for inland surface waters in the Basin Plan, and the water quality objectives for ocean waters in the Ocean Plan. The NALs for

most of the metals were calculated based on the State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP). The NALs provided in Tables C-1 through C-4 must be included in the Water Quality Improvement Plans required to be developed pursuant to Provision B.

Provision C.1.b requires the Copermittees to identify NALs for pollutants and/or constituents, not specified in Provision C.1.a, which are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions of the Watershed Management Area related to non-storm water discharges from the MS4s. The NALs must be based on the water quality objectives in the Basin Plan. The NALs identified under Provision C.1.b must be included in the Water Quality Improvement Plan.

The San Diego Water Board recognizes that some of the NALs required pursuant to Provisions C.1.a and C.1.b may be exceeded more frequently than not. Thus, Provision C.1.c has been included in the Order to provide the Copermittees the option to develop secondary NALs that are set at levels greater than the levels required pursuant to Provisions C.1.a and C.1.b to further refine the prioritization and assessment of water quality improvement strategies for addressing non-storm water discharges to and from the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and from the MS4.

Provision C.2 (Storm Water Action Levels) requires the Copermittees to incorporate SALs into the Water Quality Improvement Plan for pollutants and/or constituents causing or contributing, or may be causing or contributing, to the highest priority water quality conditions identified in the Water Quality Improvement Plan related to storm water discharges from the MS4s.

The SALs have been included to ensure that the Copermittees are implementing and complying with several requirements of the MS4 permit. Provision A.1.a prohibits storm water discharges from the MS4 from "*causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state.*" In addition, pursuant to Provision A.2.a, storm water discharges "*must not cause or contribute to the violation of water quality standards in any receiving waters*."

Provision A.3.a, however, implicitly acknowledges that compliance with Provisions A.1.a and A.2.a cannot be achieved immediately for discharges of storm water from the MS4 by applying the MEP standard. Thus, Provision A.4 requires the Copermittees to implement an iterative approach to demonstrate that MEP is being achieved. This approach is supported by USEPA.

The federal CWA requires permits for municipal storm sewer systems to "*require controls to reduce the discharge of pollutants [in storm water] to the maximum extent*

practicable, *including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants.*" MEP is an ever-evolving, flexible, and advancing concept. As knowledge about controlling storm water runoff and discharges evolves, so does the knowledge which constitutes MEP. Reducing the discharge of storm water pollutants from the MS4 to the MEP requires the Copermittees to assess their jurisdictional runoff management programs and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP. The SALs provide the Copermittees measureable goals that may be used to demonstrate the achievement of MEP for reducing pollutants in storm water discharges from the MS4. The SALs will be used as part of the MS4 discharges assessments required under Provision D.4.a.

In June of 2006, the State Water Board's Blue Ribbon Storm Water Panel released its report titled "*The Feasibility of Numerical Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities*." In the recommendations, the Blue Ribbon panel proposed storm water effluent limitations which are computed using statistical based population approaches. The SALs specified in Table C-5 under Provision C.2.a were developed from a regional subset of nationwide Phase I MS4 data by using USEPA Rain Zone 6 (arid west) data.[28] Additionally, utilization of regional data is appropriate due to the addition of data into the nationwide Phase I MS4 monitoring dataset in February 2008. This additional data increased the number of USEPA Rain Zone 6 samples to more than 400, and included additional monitoring events within Southern California.

Utilizing data from USEPA Rain Zone 6 resulted in SALs which closely reflect the environmental conditions experienced in the San Diego Region. The localized subset of data includes sampling events from multiple Southern California locations including Orange, San Diego, Riverside, Los Angeles, and San Bernardino Counties. The dataset includes samples taken from highly built-out impervious areas and from storm events representative of Southern California conditions.

The SALs for cadmium, copper, lead and zinc require the measurement of hardness and to provide more specificity in the assessment of samples with SALs for total metal concentrations. While USEPA Rain Zone 6 data include a large sample size for concentrations of total metals, the impact the concentration will have on receiving waters will vary with receiving water hardness. Since it is the goal of the SALs, through the iterative process and MEP standard, to have MS4 storm water discharges meet all applicable water quality objectives, the hardness of the receiving water should be used when assessing the total metal concentration of a sample.

Thus, when there is an exceedance of a SAL for a metal, the Copermittee must determine if that exceedance is above the existing applicable water quality objectives

[28] Data used to develop SAL were obtained from http://rpitt.eng.ua.edu/Research/ms4/mainms4.shtml

based upon the hardness of the receiving water. The water quality objectives Copermittees must use to assess total metal SAL exceedances are the California Toxic Rule (CTR) and USEPA National Recommended Water Quality Criteria for Freshwater Aquatic Life 1 hour maximum concentrations. The 1-hour maximum concentration is to be used for comparison since it is expected to most replicate the impacts to waters of the State from the first flush following a precipitation event.

The statistically calculated SALs given in Table C-5 are at levels greater than the water quality objectives in the Basin Plan or Ocean Plan. Because the objective of the CWA is to "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*", meaning eventually pollutants in storm water discharges must be reduced to a level that cannot cause or contribute to an exceedance of water quality objectives in receiving waters, over time the SALs are expected to be reduced to a level that is based on the water quality objectives rather than statistical calculations. The San Diego Water Board will review the SALs as more data for discharges of storm water from the MS4s are collected, and revise them as conditions improve and the MEP standard advances. For the Water Quality Improvement Plans required under this Order, the SALs identified under Provision C.2.a must be included.

Provision C.2.b requires the Copermittees to identify SALs for pollutants and/or constituents, not specified in Provision C.2.a, which are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions of the Watershed Management Area related to storm water discharges from the MS4s. The SALs identified under Provision C.2.b must be included in the Water Quality Improvement Plan.

The San Diego Water Board recognizes that some of the SALs required pursuant to Provisions C.2.a and C.2.b may be exceeded more frequently than not. Thus, Provision C.2.c has been included in the Order to provide the Copermittees the option to develop secondary SALs that are set at levels greater than the levels required pursuant to Provisions C.2.a and C.2.b to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s.

D. Monitoring and Assessment Program Requirements

Purpose: Provision D includes minimum monitoring and assessment requirements that must be developed and implemented by the Copermittees as part of the Water Quality Improvement Plans. Implementation of the monitoring and assessment requirements of Provision D will allow the Copermittees to demonstrate that the requirements of the CWA to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP are being achieved. Implementation of the monitoring and assessment requirements of Provision D will also allow the Copermittees and the San Diego Water Board to track improvements to the water quality in the San Diego Region. The monitoring and assessment program requirements are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order.

***Discussion*:** The San Diego Water Board recognized that changes to the monitoring and assessment requirements of the Fourth Term Permit were necessary to improve the usefulness and usability of monitoring data collected by the Copermittees to support their jurisdictional storm water programs more efficiently and with increased effectiveness. The data collected are needed to better inform the Copermittees' understanding of the physical, chemical, and biological condition of the receiving waters and the quality of the MS4 discharges. The monitoring program needs to provide opportunities for the Copermittees to integrate regional monitoring efforts into municipal storm water monitoring requirements to provide a cost-effective approach to monitoring and avoid duplication of efforts.

The requirements in Provision D were largely recommended by the Copermittees as an outcome of the San Diego Water Boards Focused Meeting process. The monitoring and assessment program requirements now require collection of more specific information necessary for each Copermittee to adapt its jurisdictional runoff management program in such a way that focuses resources on a watershed's highest priority water quality conditions. The monitoring and assessment program will require the Copermittees to collect data that can be utilized to answer both watershed level management questions (e.g. Are the chemical, physical, and biological conditions of a receiving water protective, or likely protective of beneficial uses?), and specific jurisdictional runoff management program activity questions (e.g. Are the water quality improvement strategies of the jurisdictional program effectively eliminating non-storm water discharges to the MS4?).

The monitoring data collected and assessment information that will be reported to the San Diego Water Board are necessary to determine if the Copermittees are complying with the prohibitions and limitations of Provision A. The required monitoring and assessments that must be reported to the San Diego Water Board will be utilized for three purposes:

(1) Inform the Copermittees, San Diego Water Board, and the public on the progress of the Copermittees' efforts to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP;

(2) Inform the Copermittees, San Diego Water Board, and the public on the condition of water bodies receiving discharges from the Copermittees' MS4, and the progress of the Copermittees' water quality improvement implementation efforts toward improving the receiving water quality; and

(3) Inform the Copermittees, the San Diego Water Board, and the public on the effectiveness of the Water Quality Improvement Plan toward achieving (1) and (2).

The monitoring and assessment information reported pursuant to Provision F is also expected to be key to the iterative approach and adaptive management process required under Provision A.4 and implemented through the Water Quality Improvement Plan required under Provision B. As required by Provision A.4, the iterative approach and adaptive management process is required if the Copermittees cannot meet the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c, and/or A.2.a under the present conditions.

Provision D provides the minimum monitoring and assessment requirements that must be included in each Water Quality Improvement Plan to be developed and implemented by the Copermittees. The Copermittees, however, are not limited to the requirements of Provision D and may include additional methods to track progress toward improving water quality in a Watershed Management Area.

More specific and detailed discussions of the requirements of Provision D are provided below.

Provision D.1 (Receiving Water Monitoring Requirements) specifies the minimum receiving water monitoring that the Copermittees must conduct within the Watershed Management Area and include as part of the Water Quality Improvement Plan.

Provision D.1 establishes minimum monitoring requirements that must be conducted by the Copermittees within each Watershed Management Area. Provision D.1 requires the Copermittees to collect and develop the data and information necessary to determine potential impacts to the beneficial uses in the receiving waters due to discharges from the MS4s. The monitoring required under Provision D.1 will also provide the data that will allow the Copermittees to gauge the effectiveness and progress of its Water Quality Improvement Plan implementation efforts toward improving the quality of receiving waters.

The receiving water monitoring requirements of Provision D.1 are focused primarily on monitoring the conditions and response of the receiving waters to the Copermittees'

collective implementation efforts to reduce receiving water impacts that may be caused by the discharges from the MS4s. The preference of the San Diego Water Board is for the Copermittees to spend their resources achieving tangible and observable improvements in receiving water conditions instead of collecting samples and analyzing data that has consistently indicated that receiving water conditions are degraded and require improvement. In general, the ability to measure potential improvements in receiving water conditions due to any actions implemented by the Copermittees as part of the Water Quality Improvement Plan may require several years before a response can be observed. Thus, the frequency of collecting receiving water monitoring data has been kept to a minimum.

During the transitional period between adoption of this Order and San Diego Water Board acceptance of a Water Quality Improvement Plan, the Copermittees must conduct receiving water monitoring in accordance with Provision D.1.a. This approach to collecting receiving water data is different from what was required in the Fourth Term Permits, but one that truly embraces the concept of an integrated, cost-effective, streamlined receiving water monitoring approach.

Provision D.1.a requires Copermittees to continue performing the receiving water monitoring programs required in Order Nos. R-2007-0001, R9-2009-002, and R9-2010-0016; plus participation in: hydromodification management plan monitoring approved by the San Diego Water Board, monitoring plans as part of load reduction plans (either Bacteria Load Reduction Plans or Comprehensive Load Reduction Plans) for TMDLs in Attachment E of the Order, Storm Water Monitoring Coalition Regional Monitoring, Southern California Bight Regional Monitoring, Sediment Quality Monitoring, and ASBS Monitoring as applicable to a Watershed Management Area.

Provision D.1.a also provides an opportunity for the Copermittees to use third party data to meet receiving water monitoring requirements where feasible. Allowing the Copermittees to use the data currently collected through its participation in existing regional receiving water programs and that of third parties provides an efficiency of resources in obtaining the data necessary to inform the Copermittees and the San Diego Water Board about the physical, chemical, and biological conditions of the receiving waters, which can also help to focus the receiving water monitoring during the implementation of the Water Quality Improvement Plan. Once a Water Quality Improvement Plan is developed for a Watershed Management Area in compliance with Provision B of this Order, the transitional period is over and Copermittees are required to conduct receiving water monitoring according to the requirements of Provisions D.1.b-e.

Provision D.1.b requires each Copermittee to identify at least one long term receiving water monitoring station to be representative of receiving water quality within each Watershed Management Area. Long term receiving water monitoring stations can be located at any existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees. The requirements under Provision D.1.b. are

consistent with 40 CFR 122.26(d)(2)(iii)(D), which specifies that a "*monitoring program for representative data collection for the term of the permit*" may include "*instream locations.*" For each Watershed Management Area, at least one long term watershed monitoring station is required to be established and monitored. The Copermittees may choose to establish additional long term monitoring stations where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

Provision D.1.b. requires the Copermittees to locate the long term receiving water monitoring station at one of these existing receiving water monitoring stations to provide the Copermittees an opportunity to experience monitoring cost savings while continuing to collect the necessary data to assess the status and trends of receiving water quality conditions in 1) coastal water, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under both dry weather and wet weather conditions. Ideally these stations will continue to be monitored as part of the receiving water monitoring for each Watershed Management Area to maintain a consistent set of locations and a period of data that can be built upon with the monitoring required under this Order.

The receiving water monitoring requirements are separated into monitoring required during dry weather conditions pursuant to Provision D.1.c, and wet weather conditions pursuant to Provision D.1.d.

At each long term monitoring station the Copermittees must conduct at least three dry weather monitoring events as required pursuant to Provision D.1.c and at least three wet weather monitoring events as required pursuant to Provision D.1.d per permit term. Provisions D.1.c and D.1.d require the Copermittees to monitor priority water quality conditions identified in the Water Quality Improvement Plan, constituents listed as causing impairment of receiving waters in the Watershed Management Area, applicable NALs, toxicity, constituents listed in Tables D-2 and D-3, and constituents for implementation plans (e.g. Bacteria Load Reduction Plans and Comprehensive Load Reduction Plans). Required toxicity monitoring was changed to reflect an updated understanding of the unique challenges associated with sampling storm water for toxicity. Copermittees are required to sample receiving water for toxicity during each dry weather and each wet weather event pursuant to Provision D.1.c.(4) and D.1.d.(4). Required toxicity monitoring is now consistent with the State Water Resources Control Board Policy for Toxicity Assessment and Control (Draft June 2012) and recently adopted MS4 permits for Caltrans and Los Angeles Water Board. Receiving water monitoring efforts in this Order have been streamlined to redirect resources to monitoring efforts that better support pollutant reduction solutions with an increasing emphasis on MS4 outfall monitoring, source identification, and source abatement activities.

In addition to the receiving water monitoring requirements under Provisions D.1.b-d, Provision D.1.e requires the Copermittees participate in and/or conduct other types of receiving water monitoring. As recommended and requested by the Copermittees, Provision D.1.e.(1) requires the Copermittees to participate in existing regional monitoring, as applicable to each Watershed Management Area. Existing regional

monitoring includes monitoring conducted by the Storm Water Monitoring Coalition and for the Southern California Bight. Participation in and use of monitoring data collected from these existing regional water quality monitoring programs provide the Copermittees a greater opportunity for efficiency in the use of their resources to manage their storm water programs and those controllable discharges under their authority.

Provision D.1.e.(1)(c) requires the south Orange County MS4 Copermittees to participate in "unified regional beach water quality monitoring." This monitoring replaces requirements to conduct "core monitoring" of beach water quality, as provided for in Appendix III of the Ocean Plan.

Several different public agencies currently conduct routine, ongoing beach water quality monitoring in south Orange County in accordance with several different sets of requirements. The monitoring programs implemented to meet those requirements overlap temporally and spatially. These monitoring programs are partially but not fully integrated. In November 2010, the State Water Board adopted Resolution No. 2010-0053, which directed Regional Water Boards to work with dischargers to modify beach water quality monitoring programs required by Regional Water Board-issued permits in order to eliminate redundancies and incorporate beach water quality monitoring required by beach water quality statutes, where appropriate.

In April 2012, the San Diego Water Board requested that its staff review beach water quality monitoring conducted in south Orange County. To assist in responding to that request, staff of the Board convened a workgroup that included representatives of the three public agencies that currently conduct almost all of the routine, ongoing beach water quality monitoring in south Orange County, i.e., South Orange County Wastewater Authority (SOCWA), Orange County Public Works, and Orange County Health Care Agency (OCHCA). The workgroup also included other interested parties, including representatives of the Sierra Club and Surfrider Foundation. In December 2012, the San Diego Water Board adopted Resolution No. R9-2012-0069, which endorsed the San Diego Water Board staff report entitled "A Framework for Monitoring and Assessment in the San Diego Region," dated November 2012.

The unified program is consistent with and will meet or exceed the minimum requirements for beach water quality monitoring and related public notification and reporting established by State law, including the Ocean Plan. The unified program is consistent with State Water Board Resolution No. 2010-0053. The unified program is also consistent with and will help implement, "A Framework for Monitoring and Assessment in the San Diego Region," which emphasizes the need for question-driven, beneficial use-oriented monitoring and assessment. The primary purpose of the unified program will be to answer the question "Does beach water quality meet standards for the beneficial use of water contact recreation?"

The unified program is intended to be protective; it will help protect the health of swimmers, surfers, and others who use south Orange County beach waters for water

contact recreational activities. The unified program is also intended to be reasonable; it will eliminate duplicative monitoring and will include triggers for public notification and additional sampling at all sampling stations year-round. The unified program is intended to be equitable; responsibility for implementation of the unified program will be shared and the responsible agencies will jointly make arrangements to implement the program and will have the flexibility to jointly make short and/or long term changes in those arrangements.

The San Diego Water Board Executive Officer issued a written directive on December 5, 2014, pursuant to California Water Code section 13383, for SOCWA and the south Orange County MS4 Copermittees to implement the unified program in cooperation with OCHCA. The Executive Officer may make revisions to the unified program, provided that the unified program, as revised, continues to be consistent with and meet the requirements of State law, including the Ocean Plan, for beach water quality monitoring and related public notification and reporting. Following a thirty day public comment period, and subject to a request for a hearing before the San Diego Water Board, any such revision shall take effect as specified in a written directive issued by the Executive Officer pursuant to CWC section 13383. The program and any Executive Officer issued revisions to the program are subject to CWC section 13320 right of review from the date of issuance.

The unified program will supersede the existing routine, ongoing, beach water quality monitoring programs in south Orange County that are conducted in accordance with the existing requirements of the NPDES permits for discharges from the SOCWA ocean outfalls and the south Orange County MS4s. The requirement to participate in "regional monitoring" of beach water quality replaces requirements to conduct "core monitoring" of beach water quality, as provided for in Appendix III of the Ocean Plan.

The State Water Resources Control Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part 1 Sediment Quality which became effective August 25, 2009 (Sediment Quality Monitoring Policy). Provision D.1.e.(2) requires any Copermittees with MS4 discharges to an enclosed bay or estuary to monitoring the sediments in the enclosed bay or estuary receiving water in accordance with the sediment quality monitoring procedures as prescribed in the Sediment Quality Monitoring Policy.

The State Water Board adopted Resolution No. 2012-0012 which approved exceptions to the California Ocean Plan for selected discharges into Areas of Special Biological Significance (ASBS), including special protections for beneficial uses. State Board Resolution No. 2012-0012 became effective on March 20, 2012, and Attachment B to the Resolution established limitations on point source storm water discharges to ASBS. Copermittees with MS4s that discharge to an ASBS must monitor its discharge to assure compliance with State Board Resolution No. 2012-0012 as required pursuant to Provision D.1.e.(3).

The San Diego Water Board is developing a regional monitoring strategy to assess the conditions of receiving waters in the San Diego Region. The monitoring requirements of Provision D.1 are expected to be incorporated or serve as a foundation of this regional monitoring strategy, but may require some modifications. When the San Diego Water Board develops an alternative regional monitoring strategy, the Copermittees will be required to participate in the development and implementation of the alternative regional monitoring program pursuant to Provision D.1.f.

Provision D.2 (MS4 Outfall Discharge Monitoring Requirements) specifies the minimum MS4 outfall discharge monitoring requirements that the Copermittees must incorporate and implement as part of the Water Quality Improvement Plan.

The dry weather MS4 outfall discharge monitoring requirements are included under Provisions D.2.a.(2) and D.2.b. The dry weather MS4 outfall discharge monitoring requirements are part of the "*program, including a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer*" required by 40 CFR 122.26(d)(2)(iv)(B), which is expected to achieve compliance with the CWA section 402(p)(3)(B)(ii) statutory requirement for municipal storm water permits to require the Copermittees to "*effectively prohibit non-storm water discharges into the storm sewers*." The dry weather MS4 outfall discharge monitoring data collection requirements are based on requirements under 40 CFR 122.26(d)(1)(iv)(D) and 122.26(d)(2)(iv)(B)(3).

The dry weather MS4 outfall discharge monitoring requirements are designed to provide wide spatial and temporal coverage of each jurisdiction to better understand the extent and magnitude of non-storm water discharges to receiving waters, and make a distinction between persistent and transient non-storm water flows. This information is expected to allow each Copermittee to focus its resources on eliminating and controlling the highest priority threats to receiving water quality, as well as integrating other elements of the storm water programs (e.g. complaint call response) and third party data to efficiently and effectively assist in efforts to eliminate non-storm water discharges.

The dry weather MS4 outfall discharge monitoring requirements of Provision D.2.a.(2) and D.2.b are separated into monitoring required before and after the San Diego Water Board accepts the Copermittees' Water Quality Improvement Plan. Outfall monitoring conducted prior to acceptance of the Water Quality Improvement Plan is referred to in the Order as Transitional MS4 Outfall Discharge Monitoring. Provision D.2.a.(2) includes the transitional dry weather MS4 outfall discharge monitoring requirements.

The requirements under Provision D.2.a.(2) are based on the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B), which include the requirements for a monitoring program to identify, detect, and eliminate illicit connections and illegal discharges to the MS4s. The federal regulations (40 CFR 122.26(d)(1)(iv)(D)) require

the monitoring program to include "*a field screening analysis for illicit connections and illegal dumping [that]…[a]t a minimum, include[s] a narrative description, for either each field screening point or major outfall, of visual observations made during dry weather periods.*" The federal regulations (40 CFR 122.26(d)(1)(v)(B)) require the monitoring program to include "*inspection procedures and methods for detecting and preventing illicit discharges, and describe areas where this program has been implemented.*" Furthermore, the monitoring program is required by federal regulations (40 CFR 122.26(d)(2)(iv)(B)) to include "*a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer.*"

Dry weather transitional MS4 outfall discharge monitoring requires each Copermittee to field screen (inspect) its major MS4 outfalls to classify the MS4 outfall locations as having persistent dry weather flows, transient dry weather flows, or no dry weather flows. To account for the variance in size of the 39 jurisdictions covered under this Order, the Copermittees recommended a tiered approach to the number of major MS4 outfalls that must be inspected. Provision D.2.a.(2)(a) provides a tiered approach to the number of major MS4 outfalls that must be visually inspected per jurisdiction as well as a minimum frequency each Copermittee must inspect each major MS4 outfall per year. This tiered approach is based on the total number of major MS4 outfalls within a Copermittees jurisdiction within each Watershed Management Area.

Based on the field screening, each Copermittee is required to make a determination whether any observed flowing, pooled, or ponded waters are transient or persistent flows. Based on this field screening information, other jurisdictional program information, and third party information, each Copermittee is required to prioritize the MS4 outfalls within its jurisdiction for follow up investigation and elimination of the non-storm water discharge, as part of its illicit discharge detection and elimination program required pursuant to Provision E.2. In accordance with the requirements of Provision E.2, each Copermittee is required to immediately investigate obvious illicit discharges (e.g. outfall discharges with unusual color, unusual odor, or high flows).

This approach allows a Copermittee to use all of its resources, as well as leverage resources and information provided by third parties, to effectively eliminate non-storm water discharges from its MS4 outfalls. If the source of the non-storm water discharge cannot be immediately eliminated, the Copermittee uses the persistent flow or transient flow classification along with other programmatic implementation data to prioritize the MS4 outfalls for future investigation. In accordance with the adaptive management approach deployed throughout this Order, Provision D.2.a.(2)(c) requires each Copermittee to update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow. The requirement of Provision D.2.a.(2)(c) assures that each Copermittee is collecting data that can be used to demonstrate compliance with the CWA requirement that each Copermittee must implement a program to "*effectively*

prohibit non-storm water discharges into the [MS4]" and with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

Provision D.2.b describes the dry weather MS4 outfall discharge monitoring required to be incorporated and implemented as part of the Water Quality Improvement Plan. Dry weather MS4 outfall discharge monitoring must be performed by each Copermittee to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. The emphasis of the dry weather MS4 outfall discharge monitoring required pursuant to Provision D.2.b is consistent with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

Provision D.2.b.(1) requires each Copermittee to continue field screening its major MS4 outfalls and identifying those with persistent flows and transient flows, as conducted during the transitional period (i.e. before the Water Quality Improvement Plan was developed). However, each Copermittee now has the flexibility to adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of non-storm water persistent flow discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan. In order to ensure a minimum number of outfalls are inspected, Provision D.2.b.(1) requires the number of visual inspections be equal to the number of visual inspections required in the tiered inspection program pursuant to Provision D.2.a.(2)(a).

Provision D.2.b.(2)(b) requires each Copermittee to monitor a minimum of 5 major MS4 outfalls with persistent flows identified as the highest priorities within a Copermittee's jurisdiction, within each Watershed Management Area. In other words, Copermittees located in more than one Watershed Management Area must identify at least 5 major MS4 outfalls with persistent flows in its jurisdiction in each Watershed Management Area. If a Copermittee is located in more than one Watershed Management Area, and they have less than 5 major MS4 outfalls with persistent flows per jurisdictional area per Watershed Management Area, all of the major MS4 outfalls must be identified as high priority dry weather persistent flow MS4 outfalls. The Copermittees identified as Responsible Copermittees by a TMDL in Attachment E of the Order may need to monitor more than 5 dry weather major MS4 outfall locations to determine compliance with the requirements of the TMDL(s).

Monitoring must occur at the highest priority outfall locations at least semi-annually until the non-storm water discharges have been eliminated for three consecutive dry weather monitoring events; identified to be authorized by a separate NPDES Permit; or reprioritized to a lower priority. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized MS4 major outfall in the Copermittee's jurisdiction within the Watershed Management Area, unless there are no remaining qualifying major MS4 outfalls within the Copermittees jurisdiction. The Copermittees must continually update their dry weather persistent

flow MS4 outfall discharge monitoring locations with the next highest priority non-storm water flow that have yet to be eliminated until all persistent and transient flows are eliminated or its threat reduced.

Non-storm water persistent flow MS4 outfall discharge monitoring data collected during each semi-annual monitoring event, must be collected and analyzed according to the requirements of Provision D.2.b.(2)(b)-(e). These monitoring requirements are consistent with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

The wet weather MS4 outfall discharge monitoring requirements are included under Provisions D.2.a.(3) and D.2.c. The wet weather MS4 outfall discharge monitoring requirements are necessary for the Copermittees to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable, using management practices, control techniques and system, design and engineering methods, and such other provisions which are appropriate*" required by 40CFR 122.26(d)(2)(iv), which is expected to achieve compliance with the CWA section 402(p)(3)(B)(iii) statutory requirement for municipal storm water permits to require "*controls to reduce the discharge of pollutants [in storm water] to the maximum extent practicable*." The wet weather MS4 outfall discharge monitoring data collection requirements are based on requirements under 40 CFR 122.26(d)(2)(iii), 122.26(d)(2)(iii)(A) and 122.26(d)(2)(iii)(A)(1)-(4), and 40 CFR 122.21(g)(7)(i)-(ii).

The wet weather MS4 outfall discharge monitoring requirements of Provision D.2.a.(3) and D.2.c are separated into monitoring required before and after the San Diego Water Board accepts the Copermittees' Water Quality Improvement Plan. Outfall monitoring conducted prior to acceptance of the Water Quality Improvement Plan is referred to in the Order as Transitional MS4 Outfall Discharge Monitoring. Provision D.2.a.(3) includes the transitional wet weather MS4 outfall discharge monitoring requirements.

Until the wet weather MS4 outfall discharge monitoring requirements of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board, the Copermittees must comply with the requirements of transitional wet weather MS4 outfall monitoring requirements pursuant to Provision D.2.a.(3). Provision D.2.a.(3) requires the Copermittees in each Watershed Management Area to sample, at least five of the major MS4 outfalls inventoried pursuant to Provision D.2.a.(1) once per wet season for the monitoring data required to be collected pursuant to Provision D.2.a.(3)(c)-(e). Provision D.2.a.(3) further requires at least one major MS4 outfall monitoring station be located in each Copermittee's jurisdiction within the Watershed Management Area.

At a minimum, the five sampling locations chosen must be representative of storm water discharges from residential, commercial, industrial, and typical mixed-use land uses present within a Watershed Management Area. The San Diego Water Board expects the Copermittees to extrapolate from these data to similar land uses

throughout the Watershed Management Area to better inform the Water Quality Improvement Plan development process by prioritizing drainages for implementation of storm water control efforts required pursuant to Provision E.

Provision D.2.c describes the wet weather MS4 outfall discharge monitoring required to be included and implemented as part of the Water Quality Improvement Plan. Provision D.2.c provides the Copermittees the flexibility to adjust the wet weather MS4 outfall discharge monitoring locations and frequencies in the Watershed Management Area, as needed, to identify sources of pollutants in storm water discharges from MS4s in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan.

Although Provision D.2.c.(1) allows the Copermittees to adaptively manage the wet weather MS4 outfall discharge monitoring locations and frequencies, the provision requires a minimum of at least five wet weather outfall stations to be monitored. Provision D.2.c.(2) further allows the Copermittees to modify the monitoring frequency at each wet weather MS4 outfall station to meet the goals of the Water Quality Improvement Plan as long as the monitoring frequency occurs at least once per year and is at an appropriate frequency to identify sources of pollutants in storm water discharges, guide pollutant source identification efforts, or determine compliance with the requirements of the applicable TMDLs in Attachment E to the Order.

The wet weather MS4 outfall discharge monitoring requirements of Provisions D.2.c.(3) and D.2.c.(4) are the same as the transitional wet weather MS4 outfall discharge monitoring. In contrast, the requirements of Provision D.2.c.(5) are focused on collecting analytical data specific to the highest priority water quality conditions in the Watershed Management Area identified in the Water Quality Improvement Plan. The wet weather MS4 outfall discharge monitoring data collection requirements are consistent with the requirements under 40 CFR 122.26(d)(2)(iii), 122.26(d)(2)(iii)(A) and 122.26(d)(2)(iii)(A)(1)-(4), and 40 CFR 122.21(g)(7)(i)-(ii).

Provision D.3 (Special Studies) requires the Copermittees to develop special studies that will be conducted for each Watershed Management Area and the entire San Diego Region. Data collected pursuant to Provision D.3 is to be used by the Copermittees to improve the effectiveness of the strategies implemented by the jurisdictional runoff management programs toward achieving the numeric goals identified in the Water Quality Improvement Plans and ultimately achieve compliance with the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c, and A.2.a, which is consistent with the requirements of Provision A.4.

Special studies are often necessary to fill data gaps or provide more refined information that allow the Copermittees to better manage the generation or elimination of pollutants and discharges to and from the MS4. In the Fourth Term Permits, the Copermittees have been required to implement special studies as directed by the San Diego Water Board. The special studies required by this Order provide the Copermittees more flexibility to identify and implement special studies that will be most

useful to improving the effectiveness of their jurisdictional runoff management programs.

Provision D.3.a.(1) requires the Copermittees to develop and conduct at least two special studies per Watershed Management Area, to be determined by the Copermittees. One of the two special studies may be accomplished through participation in a Regional Special Study required under Provision D.3.a.(2). The requirements provide the Copermittees great latitude in identifying and developing the special studies. Watershed Management Area special studies are required, at a minimum, to: (a) relate in some way to the highest water quality priorities identified by the Copermittees in the Water Quality Improvement Plan, (b) be conducted within the Watershed Management Area, and (c) include some form of participation (e.g. contribution of funds, personnel services, project management) by all the responsible Copermittees within the Watershed Management Area.

Examples of Watershed Management Area special studies might include, but are not limited to: (1) focused pollutant source identification studies, (2) BMP effectiveness and/or comparison studies, (3) pilot tests for new or emerging pollutant control methods, (4) receiving water pollutant or stressor source identification and/or mitigation studies, or (5) pollutant fate and transport studies. The Watershed Management Area special studies are expected to provide data that can be utilized by the Copermittees to improve the Water Quality Improvement Plan or implementation of the Copermittees' jurisdictional runoff management programs to address the highest priority water quality conditions.

Provision D.3.a.(2) requires the Copermittees to develop at least one special study that will be conducted for the entire San Diego region. The regional special study is expected to provide data that can be utilized by the Copermittees to improve the Water Quality Improvement Plan or implementation of the Copermittees' jurisdictional runoff management programs to identify or address regional water quality concerns and priorities.

An example of a regional special study would be to develop and establish allowable exceedance frequencies of the bacteria water quality objectives for several types of water bodies, during different wet and dry weather conditions the San Diego region. The special study would be related to bacteria, which is a priority for the San Diego region due to the adoption of "*Bacteria TMDL Project I – Beaches and Creeks in the San Diego Region*." The study results could be used to inform the Copermittees and the San Diego Water Board about the indictor bacteria water quality objective exceedance frequencies that occur in natural or reference watersheds.

Provision D.4 (Assessment Requirements) specifies the assessments that the Copermittees are required to perform, based on the monitoring data collected, and will be reported as part of the Annual Report for the Water Quality Improvement Plan implementation. Provision D.4 requires the Copermittees assess the progress of the

water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c, and A.2.a.

Provision D.4 specifies the assessments that Copermittees must perform for each Watershed Management Area to assess the effectiveness of each Copermittee's jurisdictional runoff management program and the Water Quality Improvement Plan. The effectiveness of each Copermittee's jurisdictional runoff management program and Water Quality Improvement Plan is measured through these types of assessments: (a) Receiving Waters Assessments (b) MS4 Outfall Discharges Assessments, (c) Special Studies Assessments, and (d) Integrated Assessment of Water Quality Improvement Plan.

Provision D.4.a requires the Copermittees to assess the status of receiving water conditions annually during the transitional monitoring period (during development of the Water Quality Improvement Plan) and after acceptance of the Water Quality Improvement Plan. The monitoring data collected pursuant to Provision D.1 will be evaluated, among other information, to assess the condition of a Watershed Management Area's streams, coastal waters, enclosed bays, harbors, estuaries, and lagoons. The focus of the receiving waters assessments is to measure progress toward the objective of the CWA to "*restore and maintain the chemical, physical, and biological integrity of the Nation's waters*" as the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program are implemented within a Watershed Management Area. Provision D.4.a is consistent with 40 CFR 122.42(c)(7) which requires the Copermittees to annually report the *"[i]dentification of water quality improvements or degradation."*

Provision D.4.b includes the MS4 outfall discharges assessment requirements. The focus of MS4 outfall discharges assessments is to determine if the Copermittees' are implementing programs that comply with the requirements of the CWA for MS4 permits to "*effectively prohibit non-stormwater discharges into the storm sewers*" and "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable.*" The monitoring data collected pursuant to Provisions D.2 will be evaluated, among other information, to assess the effectiveness of the transitional MS4 outfall field screening monitoring, the implementation of the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program. The MS4 outfall discharge assessments consist of Non-Storm Water Discharges Reduction Assessments and Storm Water Pollutant Discharges Reduction Assessments.

The Non-Storm Water Discharges Reduction Assessments are how each Copermittee will demonstrate that its jurisdictional runoff management program implementation efforts are achieving the CWA requirement to "*effectively prohibit non-stormwater discharges into the storm sewers.*" Provision D.4.b.(1) requires each Copermittee to assess and report on its illicit discharge detection and elimination program required pursuant to Provision E.2 to reduce and effectively prohibit non-storm water and illicit discharges into the MS4 within its jurisdiction. The Non-Storm Water Discharges

Reduction Assessments include specific assessment requirements applicable to each Copermittee.

As each Copermittee collects and analyzes the data collected pursuant to dry weather MS4 outfall discharges monitoring requirements of Provisions D.2.a.(2) and D.2.b, Provision D.4.b.(1) requires each Copermittee to assess the progress, assess the effectiveness of its current actions, and identify modifications necessary to increase the effectiveness of its actions toward reducing and eliminating non-storm water and illicit discharges to its MS4. The findings from these assessments are expected to be utilized by the Copermittee as part of its procedures to prioritize the non-storm water discharges that will be addressed by its Illicit Discharge Detection and Elimination program required pursuant to Provision E.2.

The assessment requirements of Provision D.4.a.(1) are consistent with 40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(3) which require "*procedures…to investigate portions of the separate storm sewer system that, based on the results of the field screen, or other appropriate information [emphasis added], indicate a reasonable potential of contain illicit discharges or other sources of non-storm water*" as part of a "*program…to detect and remove…illicit discharges and improper disposal into the storm sewer.*" The assessment requirements of Provision D.4.a.(1) are also consistent with 40 CFR122.42(c)(1) requires the Copermittees to annually report the "*status of implementing the components of the storm water management program that are established as permit conditions.*"

The Storm Water Pollutant Discharges Reduction Assessment is how the Copermittees in each Watershed Management Area will demonstrate that their jurisdictional runoff management program implementation efforts are achieving the CWA requirement to "*reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable*." Provision D.4.b.(2) requires the Copermittees in each Watershed Management Area to assess and report the progress of the Copermittees' efforts to reduce pollutants in storm water discharges from the MS4s to the MEP. The Storm Water Pollutant Discharges Reduction Assessments include specific assessment requirements during both the transitional monitoring period and after acceptance of the Water Quality Improvement Plan applicable to the Watershed Management Area and each Copermittee.

As the Copermittees collect and analyze the data collected pursuant to wet weather MS4 outfall discharges monitoring requirements of Provisions D.2.a.(3) and D.2.c, Provision D.4.b.(2) requires the Copermittees to assess runoff conditions during the transitional period, and the progress of the Water Quality Improvement Plan strategies toward reducing pollutants in storm water from the MS4 to the MEP. The findings from these assessments are expected to be utilized by the Copermittees to identify any modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify sources of pollutants in storm water discharges from the MS4s, as well as focus, modify, and improve the water quality improvement

strategies implemented by each Copermittee within its jurisdiction to reduce pollutants in storm water discharges to the MEP.

The assessment requirements of Provision D.4.b.(2) are consistent with 40 CFR 122.26(d)(2)(iii)(B) which requires "*[e]stimates of the annual pollutant load of the cumulative discharges to waters of the United States from all identified municipal outfalls…during a storm event…accompanied by a description of the procedures for estimating constituent loads and concentrations, including any modeling, data analysis, and calculation methods.*" The assessment requirements of Provision D.4.a.(2) are consistent with 40 CFR 122.26(d)(2)(v) which requires that each Copermittee assesses the *"estimated reductions in loadings of pollutants from discharges of municipal storm sewer constituents from municipal storm sewer systems expected as the result of the municipal storm water quality management program."* The assessment requirements of Provision D.4.b.(2) are also consistent with 40 CFR122.42(c)(1) requires the Copermittees to annually report the "*status of implementing the components of the storm water management program that are established as permit conditions.*"

Provision D.4.c includes the special studies assessment requirements. Performing special studies are how the Copermittees will address data gaps identified during the development of and updates to the Water Quality Improvement Plan. The relevant findings from the special studies assessments are expected to be incorporated as part of the applicable receiving water assessments, MS4 outfall discharge assessments, and integrated water quality improvement assessments required in Provision D.4.a, D.4.b, and D.4.d, respectively.

The assessment requirements in Provision D.4.d are part of the iterative approach and adaptive management process required by Provision A.4. The Copermittees are required to integrate the data collected pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to re-evaluate the Water Quality Improvement Plan.

The monitoring data collected pursuant to Provisions D.1 and D.2, and the results of the assessment required pursuant to Provisions D.4.a-c, will be used to determine whether the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program are effective, or require modifications or improvements to become more effective to achieve the requirements of the CWA. The assessments required by Provision D.4.d are consistent with 40 CFR 122.42(c)(1) which requires that the Copermittees to report the *"[t]he status of implementing the components of the storm water management program that are established as permit conditions."*

E. Jurisdictional Runoff Management Programs

Purpose: Provision E includes the requirements for the jurisdictional runoff management programs to be implemented by each of the Copermittees. Compliance with the requirements for the jurisdictional runoff management programs will allow the Copermittees to demonstrate that they are implementing programs to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP. The jurisdictional runoff management program document prepared by each Copermittee will also provide the details for implementing the water quality improvement strategies identified in the Water Quality Improvement Plan specifically within its jurisdiction.

***Discussion*:** Implementation of the jurisdictional runoff management program requirements under Provision E is how the Copermittees "*effectively prohibit non-stormwater discharges into the storm sewer,*" and outlines the "*controls to reduce the discharge of pollutants to the maximum extent practicable"* consistent with the federal regulations under 40 CFR 122.26. The jurisdictional runoff management program is part of the "*comprehensive planning process*" that is required pursuant to 40 CFR 122.26(d)(2)(iv). Where the Water Quality Improvement Plan is the "*comprehensive planning process*" on a Watershed Management Area scale, requiring "*intergovernmental coordination,*" the jurisdictional runoff management program document is the "*comprehensive planning process*" on a jurisdictional scale that should be coordinated with the other Copermittees in the Watershed Management Area to achieve the goals of the Water Quality Improvement Plan.

The jurisdictional runoff management program requirements are included to provide each Copermittee criteria that can be used to demonstrate that its storm water management program is implementing the "*comprehensive planning process*" within its jurisdiction to "*effectively prohibit non-stormwater discharges into the storm sewers,*" and to identify and implement the most effective "*controls to reduce the discharge of pollutants to the maximum extent practicable"* in accordance with the performance standards given in the CWA.

Provision E includes the requirements for each of the components that must be included in the Copermittee's jurisdictional runoff management program document that will be implemented by the Copermittee within its jurisdiction. Implementation of the components of each Copermittee's jurisdictional runoff management program must incorporate the water quality improvement strategies identified by each Copermittee in the Water Quality Improvement Plans, described pursuant to Provision B.3.b.(1)(a).

More specific and detailed discussions of the requirements of Provision E are provided below.

Provision E.1 (Legal Authority Establishment and Enforcement) requires each Copermittee to establish and enforce sufficient legal authority to control discharges to the MS4 within its jurisdiction.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system*" and be able to demonstrate that it can "*operate pursuant to legal authority established by statute, ordinance or series of contracts.*" Provision E.1.a describes the minimum legal authorities each Copermittee must establish for itself within its jurisdiction to control discharges to its MS4. The requirements of Provision E.1.a are consistent with the requirements set forth in 40 CFR 122.26(d)(2)(i)(A)-(F).

The certification statement required from each Copermittee by Provision E.1.b is included to provide the San Diego Water Board additional documentation that each Copermittee has established the legal authorities consistent with Provision E.1.a and 40 CFR 122.26(d)(2)(i)(A)-(F), and the Copermittee can "*operate pursuant to legal authority established by statute, ordinance or series of contracts.*"

Provision E.2 (Illicit Discharge Detection and Elimination) requires each Copermittee to implement an illicit discharge detection and elimination program to effectively prohibit non-storm water discharges to the MS4 by actively detecting and eliminating illicit discharges and disposal into its MS4.

Provision E.2 establishes the minimum requirements that each Copermittee must implement within its jurisdiction to effectively prohibit non-storm water discharges from entering its MS4. The federal CWA requires permits for municipal storm sewer systems to "*effectively prohibit non-storm water discharges into the storm sewers*." The federal regulations (40CFR122.26(d)(2)(i)(B)) require each Copermittee to establish the legal authority to prohibit illicit discharges to its MS4s. Under 40 CFR 122.26(d)(2)(iv)(B), each Copermittee must implement a "*program…to detect and remove…illicit discharges and improper disposal into the storm sewer.*" The federal NPDES regulations, under 40 CFR 122.26(b)(2), define illicit discharges as "*any discharge to a municipal separate storm sewer that is not composed entirely of storm water*." Thus, non-storm water discharges are not authorized to enter the MS4 and are considered to be illicit discharges, unless authorized by a separate NPDES permit.

The Phase I Final Rule clarifies that non-storm water discharges through an MS4 are not authorized under the CWA (55 FR 47995):

> "*Today's rule defines the term "illicit discharge" to describe any discharge through a municipal separate storm sewer system that is not composed entirely of storm water and that is not covered by an NPDES permit. Such illicit discharges are not authorized under the Clean Water Act. Section 402(p)(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm*

sewer…Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit."

The federal NPDES requirements for the program to address illicit discharges must include "*inspections, to implement and enforce an ordinance, orders, or other similar means to prevent illicit discharges to the MS4*." The federal NPDES regulations also reference several categories of "*non-storm water discharges or flows* [which] *shall be addressed where such discharges are identified…as sources of pollutants to waters of the United States*." The Phase I Final Rule (55 FR 48037) further clarified the requirements of 40 CFR 122.26(d)(2)(iv)(B)(1) as follows:

"*EPA is clarifying that section 402(p)(3)(B) of the CWA (which requires permits for municipal separate storm sewers to 'effectively' prohibit non-storm water discharges) does not require permits for municipalities to prohibit certain discharges or flows of nonstorm water to waters of the United States through municipal separate storm sewers in all cases*."

In previous iterations of the municipal storm water permits for the San Diego Region, these categories were simply listed and referred to as categories of non-storm water discharges "not prohibited" unless identified as a source of pollutants. The Copermittees have often referred to these categories as "exempt" discharges. In both cases, however, the language is inconsistent with the federal CWA and NPDES regulations. And, the clarification provided in the Phase I Final Rule does not specifically state that such discharges are "not prohibited" or "exempt" or in any way authorized. The federal NPDES regulations do, however, state that specific categories of non-storm water discharges must be "*addressed*" if identified as "*sources of pollutants to waters of the United States*."

The language of Provision E.2.a has been revised to be fully consistent with the language of the CWA and the requirements of the federal regulations under 40 CFR 122.26(d)(2)(iv)(B)(1). Provision E.2.a requires each Copermittee to address <u>all</u> types of non-storm water discharges into its MS4 as illicit discharges, <u>unless</u> the discharge is authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to Provisions E.2.a.(1) through E.2.a.(5). Only non-NPDES-permitted non-storm water discharges identified as a category of non-storm water discharges under Provisions E.2.a.(1) through E.2.a.(5) <u>and</u> *not identified as a source of pollutants* do not have to be addressed as illicit discharges. Categories of non-storm water discharges that meet the requirements of Provisions E.2.a.(1) through E.2.a.(5) do not have to be addressed by the Copermittee as illicit discharges.

Several of the non-storm water categories listed in 40 CFR 122.26(d)(2)(iv)(B)(1) have not been included in Provisions E.2.a.(1) through E.2.a.(5), including: street wash water, landscape irrigation, irrigation water, and lawn watering. Because these are no

longer included within the categories listed under Provisions E.2.a.(1) through E.2.a.(5), the Copermittees must prohibit these types of non-storm water discharges from entering the MS4. This is consistent with the clarification of 40 CFR 122.26(d)(2)(iv)(B)(1) in the Phase I Final Rule (55 FR 48037), which states:

> "*[T]he Director may include permit conditions that either require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*."

Street wash water is a category of non-storm water discharges that was removed when the Third Term Permits were issued. Street wash water is a source of several pollutants (e.g., metals, oil and grease, petroleum hydrocarbons, chlorinated solvents, sediment) which are generated during the street washing process. The removal of this category requires the Copermittees to prohibit this type of non-storm water discharge from entering the MS4.

The landscape irrigation, irrigation water, and lawn watering categories, collectively referred to hereafter as "over-irrigation" discharges, were removed from the list of non-storm water discharge categories in the Fourth Term Orange County and Riverside County Permits. Non-storm water discharges resulting from over-irrigation have been found to be a source of several types of pollutants (e.g., nutrients, bacteria, pesticides, sediment) in receiving waters. The San Diego Water Board and the Copermittees have identified categories of non-storm water discharges associated with over-irrigation as a source of pollutants and conveyance of pollutants to the MS4 and waters of the United States in the following documents:

- **SmartTimer/Edgescape Evaluation Program (SEEP) Grant Application**

  The State Water Board allocated grant funding to the SEEP project grant application submitted in 2006, which targeted irrigation runoff by retrofitting areas of existing development and documenting the conservation and runoff improvements. The basis of this grant project is that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 is a source and conveyance of pollutants. In addition, the grant application indicated that this alteration of natural flows is impacting the beneficial uses of waters of the state and U.S. Results from the study indicate that that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 *is* a source and conveyance of pollutants. The results of this study can be applied broadly to any area where over-irrigation takes place. The grant application included the following statements:

  > "*Irrigation runoff contributes flow & pollutant loads to creeks and beaches that are 303(d) listed for bacteria indicators.*"
  >
  > "*Regional program managers agree that the reduction and/or elimination of irrigation-related urban flows and associated pollutant loads may be key to successful attainment of water quality and beneficial use goals as outlined in*

the San Diego Basin Plan and Bacteria TMDL over the long term."

"*Elevated dry-weather storm drain flows, composed primarily … of landscape irrigation water wasted as runoff, carry pollutants that impair recreational use and aquatic habitats all along Southern California's urbanized coastline. Storm drain systems carry the wasted water, along with landscape derived pollutants such as bacteria, nutrients and pesticides, to local creeks and the ocean. Given the local Mediterranean climate, excessive perennial dry season stream flows are an unnatural hydrologic pattern, causing species shifts in local riparian communities and warm, unseasonal contaminated freshwater plumes in the near-shore marine environment.*"

- **2006-2007 Orange County Watershed Action Plan Annual Reports**

The Watershed Action Plan Annual Reports for the 2006-2007 reporting period were submitted by the County of Orange, Orange County Flood Control District and Copermittees within the San Juan Creek, Laguna Coastal Streams, Aliso Creek, and Dana Point Coastal Streams Watersheds. San Juan Creek, Laguna Coastal Streams, Aliso Creek and Dana Point Coastal Streams are all currently 303(d) listed as impaired for indicator bacteria within their watersheds and/or in the Pacific Ocean at the discharge points of their watersheds. The Orange County Copermittees, within their Watershed Action Strategy Table for fecal indicator bacteria included the following:

"*Support programs to reduce or eliminate the discharge of anthropogenic dry weather nuisance flow throughout the…watershed. Dry weather flow is the transport medium for bacteria and other 303(d) constituents of concern.*"

Additionally, they state that "*conditions in the MS4 contribute to high seasonal bacteria propagation in-pipe during warm weather. Landscape irrigation is a major contributor to dry weather flow, both as surface runoff due to over-irrigation and overspray onto pavements; and as subsurface seepage that finds its way into the MS4*."

- **Fiscal Year 2008 Carlsbad Watershed Urban Runoff Management Program Annual Report**

The Carlsbad Watershed Urban Runoff Management Program Annual Report for Fiscal Year 2008 was submitted by the Carlsbad Watershed Copermittees (Cities of Carlsbad, Encinitas, Escondido, Oceanside, San Marcos, Solana Beach, and Vista, and the County of San Diego). In the Annual Report, the Carlsbad Watershed Copermittees stated the following:

"The Carlsbad Watershed Management Area (WMA) collective watershed strategy identifies bacteria, sediment, and nutrients as high priority water quality

pollutants in the Agua Hedionda (904.3 – bacteria and sediment), Buena Vista (904.2 – bacteria), and San Marcos Creek (904.5 – nutrients) Hydrologic Areas. Bacteria, sediment, and nutrients have been identified as potential discharges from over-irrigation."

- **2007-2008 San Diego Bay Watershed Urban Runoff Management Program Annual Report**

  The San Diego Bay Watershed Urban Runoff Management Program 2007-2008 Annual Report was submitted by the San Diego Bay Watershed Copermittees (Cities of Chula Vista, Coronado, Imperial Beach, La Mesa, Lemon Grove, National City, and San Diego, the County of San Diego, the Port of San Diego, and the San Diego County Airport Authority). In Appendix D of the Annual Report, titled "Likely Sources of Pollutants," the San Diego Bay Watershed Copermittees identified over-irrigation of lawns as a pollutant generating activity from business and/or residential land uses for bacteria, pesticides, and sediment.

- **Copermittee Public Education Materials**

  The Orange County Public Works *Tips for Landscape & Gardening* public education brochure states: "*Fertilizers, pesticides and other chemicals that are left on yards or driveways can be blown or washed into storm drains that flow to the ocean. Overwatering lawns can also send materials into storm drains*."

  The Riverside County Flood Control and Water Conservation District *Landscape and Garden* public education brochure states: *"Soil, yard wastes, over-watering and garden chemicals become part of the urban runoff mix that winds its way through streets, gutters and storm drains before entering lakes, rivers, streams, etc. Urban runoff pollution contaminates water and harms aquatic life!"*

- **Los Peñasquitos Lagoon Sedimentation/Siltation TMDL Technical Report**

  The Los Peñasquitos Lagoon Sedimentation/Siltation TMDL technical report was prepared for the City of San Diego and USEPA in October 2010. The technical report was included as a technical supporting document attached to the Sediment TMDL for Los Peñasquitos Lagoon staff report prepared by the San Diego Water Board, dated June 13, 2012. Under the Source Assessment section, the technical report states the following:

  "*Dry weather loading is dominated by nuisance flows from urban land use activities such as car washing, sidewalk washing, and lawn over-irrigation, which pick up and transport sediment into receiving waters.*"

These documents confirm that non-storm water discharges associated with over-irrigation are a source of pollutants and should be addressed as illicit discharges to the

MS4. Prohibiting non-storm water discharges associated with over-irrigation, however, is not a new requirement for the Copermittees because it is also consistent with and required by the Water Conservation in Landscaping Act (AB 1881, Laird).

The Water Conservation in Landscaping Act required the Department of Water Resources (DWR) to prepare a Model Water Efficient Landscape Ordinance for use by local agencies (e.g. the Copermittees). All local agencies were required to adopt a water efficient landscape ordinance by January 1, 2010. Local agencies could adopt the Water Efficient Landscape Ordinance developed by DWR, or an ordinance considered at least as effective as the Model Ordinance. The Water Efficient Landscape Ordinance includes a requirement that local agencies prohibit runoff from irrigation (§ 493.2):

> "*Local agencies shall prevent water waste resulting from inefficient landscape irrigation by* <u>*prohibiting runoff from leaving the target landscape*</u> *[emphasis added] due to low head drainage, overspray, or other similar conditions where water flows onto adjacent property, non-irrigated areas, walks, roadways, parking lots, or structures. Penalties for violation of these prohibitions shall be established locally*."

Furthermore, non-storm water discharges from over-irrigation not only transport and discharge pollutants to receiving waters, but are also a likely source of the dry weather flows causing changes to habitat within and along the receiving water bodies. Examples of habitat changes from the dry weather flows include perennialization of ephemeral streams, and conversion of saltwater and brackish water marsh habitats to freshwater marsh habitats (e.g. Los Peñasquitos Lagoon). Both of these examples have resulted in the promotion of invasive species in several areas of the San Diego Region.

The removal of the over-irrigation discharges categories does not require the Copermittees to strictly prohibit lawn and landscape irrigation, but does require the prohibition of excessive irrigation water that results in non-storm water discharges to the MS4. Non-storm water discharges to the MS4 from over-irrigation must be addressed as illicit discharges by the Copermittees pursuant to the requirements of Provision E.2.

The remaining non-storm water categories listed in 40 CFR 122.26(d)(2)(iv)(B)(1) are listed under Provisions E.2.a.(1) through E.2.a.(5) and generally fall into four categories: (1) non-storm water discharges subject to existing San Diego Water Board waste discharge requirements and NPDES permits; (2) non-storm water discharges generally not expected to be a source of pollutants to receiving waters; (3) non-storm water discharges likely to contain pollutants requiring some form of control to address the pollutants prior to discharging to the MS4; and (4) non-storm water discharges or flows associated with firefighting.

Provisions E.2.a.(1) and E.2.a.(2) include several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) for which the San Diego Water Board already has developed general waste discharge requirements and NPDES permits to address the discharges. The Copermittees are only required to address these types of non-storm water discharges as illicit discharges if the Copermittees or the San Diego Water Board identifies these non-storm water discharges not having coverage under the applicable NPDES permit.

Provision E.2.a.(3) includes several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) which are generally not expected to be a source of pollutants to receiving waters, many of which originate from what are typically natural, uncontrollable sources. The Copermittees are only required to address these types of non-storm water discharges as illicit discharges if the Copermittees or the San Diego Water Board identifies these non-storm water discharges as a source of pollutants to receiving waters. Because many of these sources are generally uncontrollable, enforcing a prohibition may not be a possibility for the Copermittees. The Copermittees would be able to address these non-storm water discharges by preventing these non-storm water discharges from entering the MS4. This could potentially be achieved by sealing their MS4 structures so the discharges cannot enter the MS4.

Provision E.2.a.(4) includes several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) that are likely to contain pollutants requiring some form of control to address the pollutants prior to discharging to the MS4. At this time, an outright prohibition of these types of non-storm water discharges does not yet appear to be warranted. Thus, Provision E.2.a.(4) includes several requirements for the Copermittees to control the pollutants from these types of non-storm water discharges. This is consistent with the clarification of the federal regulations in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board has the authority to require the Copermittees to "*control any of these types of discharges where appropriate*."

Unlike non-storm water discharges from over-irrigation, these types of non-storm water discharges are not expected to occur in close proximity to each other or very frequently. Provided these types of non-storm water discharges are controlled as required in Provision E.2.a.(4), the Copermittees would only be required to address these types of non-storm water discharges as illicit discharges if the Copermittee or the San Diego Water Board identifies these non-storm water discharges as a source of pollutants to receiving waters.

Provision E.2.a.(5) includes specific requirements for fire fighting discharges and flows. The requirements for non-storm water discharges and flows associated with fire fighting have been separated into requirements for: a) non-emergency fire fighting discharges and flows, and b) emergency fire fighting discharges and flows.

The San Diego Water Board has found that discharges from building fire suppression system maintenance (e.g. fire sprinklers) contain waste and potentially a significant source of pollutants to receiving waters. As such, the San Diego Water Board is requiring these discharges be addressed as illicit discharges by the Copermittees. Thus, the discharges to the MS4 are to be prohibited via ordinance, order or similar means. For other non-emergency firefighting discharges and flows (i.e. flows from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems), the Copermittees are required to develop and implement a program to address pollutants in these non-storm water discharges and flows. This is consistent with the clarification of the federal regulations in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board has the authority to require the Copermittees to "*control any of these types of discharges where appropriate*."

For emergency firefighting discharges and flows, the Phase I Final Rule (55 FR 48037) has clarified the requirements of 40 CFR 122.26(d)(2)(iv)(B)(1) pertaining to emergency firefighting flows and discharges, which states:

> "*In the case of firefighting it is not the intention of these rules to prohibit in any circumstances the protection of life and public or private property through the use of water or other fire retardants that flow into separate storm sewers*."

Thus, the requirements have been made to be consistent with the guidance provided by the Phase I Final Rule. The Order recommends that the Copermittees develop and encourage implementation of BMPs to reduce or eliminate the discharge of pollutants from emergency firefighting flows to the MS4s and receiving waters. The Order does not include any requirements that should be interpreted as requiring the implementation of BMPs for emergency firefighting flows to the MS4s and receiving waters.

The Copermittees are expected to review the dry weather MS4 outfall discharge monitoring data they collect to determine if and when there are non-storm water discharges to or from their MS4s that are a source of pollutants to receiving waters. If the Copermittees identify one of the types of non-storm water discharges listed in Provisions E.2.a.(1) through E.2.a.(4) as a source of pollutants to receiving waters based on the review and evaluation of monitoring data, Provision E.2.a.(6) requires the Copermittees to prohibit those categories of discharges from entering the MS4 through ordinance, order or similar means. In addition, Provision E.2.a.(6) clarifies that the San Diego Water Board may identify categories of non-storm water discharges or flows listed under Provisions E.2.a.(1) through E.2.a.(4) that must be prohibited.

Provision E.2.a.(6) also provides the Copermittees an option to propose controls to be implemented for the category of non-storm water discharges as part of the Water Quality Improvement Plan instead of prohibiting the category of non-storm water discharges. If the Water Quality Improvement Plan is accepted by the San Diego

Water Board with the proposed controls, the Copermittees will not be required to prohibit the category of non-storm water discharges to their MS4s as long as the controls are implemented. This is consistent with the clarification of 40 CFR 122.26(d)(2)(iv)(B)(1) in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board may "*require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*."

Finally, Provision E.2.a.(7) has been included in the requirements for non-storm water discharges to clarify that any non-storm water discharges to the Copermittee's MS4, even those identified pursuant to Provisions E.2.a.(1) through E.2.a.(4), must be reduced or eliminated, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit. Provision E.2.a.(7) is consistent with the requirements of CWA section 402(p)(3)(B)(ii) and 40 CFR 122.26(d)(1)(v)(B), as clarified in the Phase I Final Rule (55 FR 47995) that "*[u]ltimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit*." However, the reduction or elimination of those non-storm water discharges are expected to be achieved as feasible, in accordance with the priorities in the Water Quality Improvement Plan and when the resources are available to the Copermittee.

Consistent with 40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(1), each Copermittee must implement a "*program…to prevent illicit discharges to the municipal storm sewer system*" and "*detect…illicit discharges and improper disposal into the storm sewer.*" Provision E.2.b requires each Copermittee to implement measures to prevent and detect illicit discharges and connections to its MS4 as part of its illicit discharge detection and elimination program.

As part of the program to prevent and detect illicit discharges to the MS4, 40 CFR 122.26(d)(2)(iv)(B)(2) requires "*procedures to conduct on-going field screening activities during the life of the permit, including areas or locations that will be evaluated by such field screens*." As part of the procedures, each Copermittee is required to maintain an updated map of its entire MS4 and the corresponding drainage areas within its jurisdiction. Having knowledge about where inlets, access points, connections with other MS4s, and outfalls are located is necessary for each Copermittee to track, identify, and eliminate illicit discharges and connections. Thus, Provision E.2.b.(1) of the Order specifies that the map must include the segments of the storm sewer system owned, operated, and maintained by the Copermittee, and include locations of all known inlets, connections with other MS4s, and outfalls to the Copermittee's MS4. The remaining requirements of Provision E.2.b are consistent with the requirements of 40 CFR 122.26(d)(2)(iv)(B)(3)-(7) related to implementing measures to prevent and detect illicit discharges and connections to the MS4.

Provision E.2.c requires each Copermittee to conduct field screening and monitoring of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4. Field screening is a required

element of the program to detect and eliminate illicit discharges and connections to the MS4, pursuant to 40 CFR 122.26(d)(2)(iv)(B)(2). The field screening requirement will be implemented through the dry weather MS4 outfall discharge monitoring required under Provisions D.2.a.(2) and D.2.b.(1).

Provision E.2.d specifies the measures each Copermittee must implement to eliminate illicit discharges and connections to its MS4. Elimination of illicit discharges and connections to the MS4 is consistent with the requirement of 40 CFR 122.26(d)(2)(iv)(B) "*to detect and remove [emphasis added]…illicit discharges and improper disposal into the storm sewer*" and will achieve the CWA requirement for MS4 permits to "*effectively prohibit non-storm water discharges into the storm sewers*."

Generally, each Copermittee is responsible for prioritizing its efforts to eliminate non-storm water and illicit discharges or connections to its MS4 based on field screening and monitoring data, NALs, illicit discharge investigation records, and the known or suspected sources. Sources of non-storm water and illicit discharges or connections must be eliminated by enforcing the legal authority established by each Copermittee pursuant to Provision E.1.

Provision E.3 (Development Planning) requires each Copermittee to use its land use and planning authority to implement a development planning program to control and reduce the discharge of pollutants in storm water from new development and significant redevelopment to the MEP. Proper implementation of the development planning program will also contribute toward effectively prohibiting non-storm water discharges from development projects to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." As part of the management program, 40 CFR 122.26(d)(2)(iv)(A)(2) requires "*planning procedures including a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment*."

Land development generally alters the natural conditions of the land by removing vegetative cover, compacting soil, and/or placement of concrete, asphalt, or other impervious surfaces. These impervious surfaces concentrate urban pollutants (such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not found in high concentrations in the natural environment. Pollutants that accumulate on impervious surfaces are not easily biodegraded nor subject to natural treatment processes.

Impervious surfaces greatly affect the natural hydrology of the land because they do not allow natural infiltration and treatment of storm water runoff to take place. Instead,

storm water runoff from impervious surfaces is typically directed through pipes, curbs, gutters, and other hardscape into receiving waters, with little treatment, at significantly increased volumes and accelerated flow rates over what would occur naturally. The increased pollutant loads, storm water volume, discharge rates and velocities, and discharge durations from the MS4 adversely impact stream habitat by causing accelerated, unnatural erosion and scouring within creek bed and banks. Placement of impervious surfaces also encapsulates "good" sediment (such as sand, gravel, rocks and cobbles) that would normally replenish creek beds and banks to help stabilize them. Collectively, these changes to natural hydrologic processes are termed hydrograph modification, or hydromodification.

Hydromodification, which is caused by both altered storm water flow and altered sediment flow regimes, is largely responsible for degradation of creeks, streams, and associated habitats in the San Diego Region. In an ongoing study by the Stormwater Monitoring Coalition to assess the health of streams throughout Southern California, researchers found that three of the four highest risk stressors to creeks (percent sands and fines present, channel alteration, and riparian disturbance) were related to physical habitat.[29] Researchers studying flood frequencies in Riverside County have found that increases in watershed imperviousness of only 9-22 percent can result in increases in peak flow rates for the two-year storm event of up to 100 percent.[30] Such changes in runoff have significant impacts on channel morphology.

In addition, a technical report issued by the Southern California Coastal Water Research Project (SCCWRP) stated that "*[r]ecent studies indicate that California's intermittent and ephemeral streams are more susceptible to the effects of hydromodification than streams from other parts of the United States. Physical degradation of stream channels in the central and eastern United States can initially be detected when watershed impervious cover approaches 10 percent, although biological effects (which may be more difficult to detect) may occur at lower levels. In contrast, initial response of streams in the semi-arid portions of California appears to occur between 3 and 5 percent impervious cover*."[31] These studies highlight the extent to which impacts originating from impervious surfaces created by land development are responsible for the degradation of creek and stream habitat.

This is consistent with what USEPA has noted, that "*[m]ost stormwater runoff is the result of the man-made hydrologic modifications that normally accompany development. The addition of impervious surfaces, soil compaction, and tree and vegetation removal result in alterations to the movement of water through the environment. As interception, evapotranspiration, and infiltration are reduced and*

[29] Assessing the Health of Southern California Streams, Stormwater Monitoring Coalition, Fact Sheet
[30] Schueler and Holland, 2000. Storm Water Strategies for Arid and Semi-Arid Watersheds (Article 66). The Practice of Watershed Protection.
[31] Stein, E. and Zaleski, S., 2005. Technical Report 475, Managing Runoff to Protect Natural Streams: The Latest Development on Investigation and Management of Hydromodification in California. December 30, 2005.

precipitation is converted to overland flow, these modifications affect not only the characteristics of the developed site but also the watershed in which the development is located. Stormwater has been identified as one of the leading sources of pollution for all waterbody types in the United States. Furthermore, the impacts of stormwater pollution are not static; they usually increase with more development and urbanization."[32]

Reducing the impact from the increased pollutant loads and flows generated by impervious surfaces within a watershed is essential to protecting and restoring the integrity of the receiving waters. Provision E.3 includes the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment*." The requirements of Provision E.3 will 1) minimize the generation and discharge of pollutants in storm water from the MS4, and 2) minimize the potential of storm water discharges from the MS4 from causing altered flow regimes and excessive downstream erosion in receiving waters.

The requirements of Provision E.3.a include the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment*" applicable to all development projects, regardless of size or purpose of development. In general, all development projects must implement onsite BMPs to remove pollutants from runoff prior to its discharge to any receiving waters, as close to the pollutant generating source as possible, and structural BMPs must not be constructed within waters of the U.S.

Furthermore, the onsite BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors (e.g. mosquitos, rodents, and flies). If not properly designed or maintained, certain BMPs implemented or required by municipalities may create a habitat for vectors. Monitoring studies conducted by the California Department of Public Health (CDPH) have documented that mosquitoes opportunistically breed in structural storm water BMPs, particularly those that hold standing water for over 96 hours. Certain site design features that hold standing water may similarly produce mosquitoes.

Structural BMPs and site design features should incorporate design, construction, and maintenance principles to promote drainage within 96 hours to minimize standing water available to mosquitoes. Nuisances and public health impacts resulting from vector breeding can be prevented with close collaboration and cooperative effort between municipalities and local vector control agencies and the CDPH during the

[32] USEPA, 2007. Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices, December 2007.

development and implementation of storm water runoff management programs. The CDPH also has issued guidance for BMP implementation that will minimize potential nuisances and public health impacts resulting from vector breeding.[33]

All development projects are required to implement source control BMPs that will minimize the generation of pollutants. Additionally, each development project must implement, where applicable and feasible, low impact development (LID) BMPs to mimic the natural hydrology of the site and retain and/or treat pollutants in storm water runoff prior to discharging to and from the MS4.

The LID Center defines LID as "*a comprehensive land planning and engineering design approach with a goal of maintaining and enhancing the pre-development hydrologic regime of urban and developing watersheds.*"[34] LID designs seek to control storm water at the source, using small-scale integrated site design and management practices to mimic the natural hydrology of a site, retain storm water runoff by minimizing soil compaction and impervious surfaces, and disconnect storm water runoff from conveyances to the storm drain system.

LID BMPs may utilize interception, storage, evaporation, evapotranspiration, infiltration, and filtration processes to retain and/or treat pollutants in storm water before it is discharged from a site. Because of these numerous options, the San Diego Water Board expects that every development project will be able to implement some form of LID BMPs. Examples of LID BMPs include using permeable pavements, rain gardens, rain barrels, grassy swales, soil amendments, and native plants.

Provision E.3.a also includes requirements for all development projects to, where feasible, landscape with native and/or low water use plants to minimize the discharge of non-storm water discharges associated with excessive irrigation, as well as harvest (i.e., storage) and use precipitation to promote the concept of utilizing storm water as a resource.

While all development projects are subject to the requirements of Provision E.3.a, Provision E.3.b identifies Priority Development Projects that exceed given size thresholds and/or fit under specific use categories. Priority Development Projects are required to incorporate specific performance criteria for structural BMPs into the project plan to reduce the generation of pollutants, and address potential impacts from hydromodification.

The Priority Development Project categories are based on the requirements of the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-

[33] California Department of Public Health, 2012. Best Management Practices for Mosquito Control in California. (http://www.cdph.ca.gov/HealthInfo/discond/Documents/BMPforMosquitoControl07-12.pdf)
[34] www.lowimpactdevelopment.org

0002 and R9-2010-0016, respectively), and do not differ significantly from the Fourth Term Permit for San Diego County. Furthermore, the Priority Development Project categories are consistent with Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), and Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit).

Because of the impact of relatively small increases in watershed impervious surfaces to receiving waters, Provision E.3.b.(1)(c)(iv) has been updated to include large driveways that are 5,000 square feet or more. The San Diego Water Board finds that large driveways can exacerbate altered flow regimes if not properly controlled.

Provision E.3.b.(3) describes projects that are exempt from Priority Development Project status. These include new or retrofit paved sidewalks, bicycle lanes, or trails that are designed and constructed to direct runoff to vegetated areas or be hydraulically disconnected from paved areas. The exemptions have been provided to encourage these types of projects because they provide multiple environmental benefits, such as promoting walking rather than driving, which will in turn improve air quality. Additionally, retrofitting of existing alleys, streets, or roads are exempt from Priority Development Project status if they are constructed using USEPA Green Streets guidance.[35] By doing so, retrofitting of these types of projects is encouraged. The San Diego Water Board recognizes that there are spatial constraints associated with these projects, and implementation of structural BMPs are not always feasible.

For development projects identified as Priority Development Projects, the requirements of Provision E.3.c are the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment.*" Provisions E.3.c.(1)-(3) describe the performance criteria for the structural BMPs that must be implemented for each Priority Development Project defined by Provision E.3.b.

Provision E.3.c.(1) describes the storm water pollutant control BMP requirements that must be implemented by all Priority Development Projects. The purpose of Provision E.3.c.(1) is to reduce pollutants in storm water runoff to the MEP from Priority Development Projects before it is discharged to the MS4. Of all the available treatment processes available, retention of storm water, and therefore capture of the pollutants in the storm water, will achieve 100 percent pollutant removal efficiency for the volume of storm water retained. No other method of treatment can achieve 100 percent pollutant removal efficiency. Thus, retention of as much storm water onsite is the most effective way to reduce pollutants in storm water discharges to, and

[35] "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).

consequently from the MS4, and controls pollutants in storm water discharges from a site to the MEP.

Under Provision E.3.c.(1)(a), retention of the pollutants in the runoff produced from the 85th percentile storm event ("design capture volume") is the design standard to which Priority Development Projects must comply. Since the 85th percentile storm event has previously been used as the numeric design standard for treatment control BMPs, this same size storm event is used as the numeric design standard for storm water retention. This is the MEP standard recognized by the San Diego Water Board and is consistent with the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), as well as Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit), and Los Angeles Water Board Order No. R4-2012-0175 (Los Angeles County MS4 Permit).

The 85th percentile storm event is the event that has a precipitation total greater than or equal to 85 percent of all storm events over a given period of record in a specific area or location. For example, to determine what the 85th percentile storm event is in a specific location, all 24 hour storms that have recorded values over a 30 year period would be tabulated and a 85th percentile storm would be determined from this record (i.e. 15 percent of the storms would be greater than the number determined to be the 85th percentile storm). Most jurisdictions in the San Diego Region have already developed isopluvial maps that can provide this type of information. The 85th percentile storm might be determined to be a number such as 1.0 inch, and this would be multiplied by the total area of the project footprint producing runoff to calculate the design capture volume. The Priority Development Project designer would then select a system of BMPs that would retain (i.e. intercept, store, infiltrate, evaporate, or evapotranspire) the pollutants contained in the design capture volume onsite.

Retention BMPs are necessary to capture and retain pollutants generated from a Priority Development Project. In a recent study performed by SCCWRP in the Los Angeles Region, they found "*that the magnitude of constituent load associated with storm water runoff depends, at least in part, on the amount of time available for pollutant build-up on land surfaces. The extended dry period that typically occurs in arid climates such as southern California maximizes the time for constituents to build-up on land surfaces, resulting in proportionally higher concentrations and loads during initial storms of the season*."[36] This implies that the "first flush" of a rainy season and the first storm events after long antecedent dry periods tend to have the highest pollutant loads. Capturing and retaining the pollutant loads of the "first flush" of a rainy

[36] Stein, E.D., Tiefenthaler, L.L., and Schiff, K.C., 2007. Technical Report 510, Sources, Patterns and Mechanisms of Storm Water Pollutant Loading from Watershed and Land Uses of the Greater Los Angeles Area, California, USA. March 20, 2007.

season and the first storm events after long antecedent dry periods will reduce a significant portion of the pollutants in storm water discharged to and from the MS4.

The San Diego Water Board, however, acknowledges that in some situations retention of the full design capture volume onsite may not be technically feasible. In this event, the Copermittee may allow the Priority Development Project to use biofiltration BMPs to treat 1.5 times the design capture volume not reliably retained onsite, or biofiltration BMPs with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite.

The 1.5 multiplier is based on the finding in the Ventura County Technical Guidance Manual that biofiltration of 1.5 times the design capture volume not retained onsite will provide approximately the same pollutant removal as retention of the design capture volume on an annual basis.[37] This standard is consistent with the Los Angeles Water Board's Los Angeles County and Ventura County municipal storm water permits (Order Nos. R4-2012-0175 and R4-2010-0108, respectively). The flow-thru design of 0.75 times the portion of the design capture volume not reliably retained onsite is consistent with the San Diego Water Board's Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively). In either case, the biofiltration BMPs must be designed with an appropriate hydraulic loading rate to maximize storm water retention and pollutant removal, as well as to prevent erosion, scour, and channeling within the BMP. Each Copermittee is required to update its BMP Design Manual to provide guidance for hydraulic loading rates and other biofiltration design criteria necessary to maximize storm water retention and pollutant removal.

The San Diego Water Board further recognizes that, in addition to not being technically feasible, retention of the full design capture storm onsite may be cost prohibitive, or may not provide as much water quality benefit to the Watershed Management Area as would implementing BMPs elsewhere in the watershed. Thus, Provision E.3.c.(1)(b) allows for the use of a combination of onsite retention BMPs, and the implementation of an Alternative Compliance Program described in Provision E.3.c.(3). Provision E.3.c.(3) is discussed in more detail below.

If the full design capture volume is not retained onsite either because biofiltration is not technically feasible, or a Copermittee grants a Priority Development Project permission to utilize the Alternative Compliance Program, then the pollutants in the portion of the design capture volume that are not reliably retained onsite must still be reduced to the MEP. Thus, flow-thru treatment control BMPs are required to be implemented on Priority Development Projects in addition to the retention BMPs. The requirements of Provisions E.3.c.(1)(a)(ii)[a]-[c] include the performance standards for flow-thru

[37] Ventura Countywide Stormwater Management Program. 2011. Ventura Technical Guidance Manual, Manual Update, 2011.

treatment control BMPs, consistent with the Fourth Term Permits in the San Diego Region.

Whereas the purpose of the requirements under Provision E.3.c.(1) is to reduce pollutants in storm water runoff to the MEP, the purpose of the requirements under Provision E.3.c.(2) is to maintain or restore more natural hydrologic flow regimes to prevent accelerated, unnatural erosion in downstream receiving waters, also to the MEP standard. Provision E.3.c.(2) describes hydromodification management BMP requirements that must be implemented by all Priority Development Projects.

The performance criteria for the implementation of hydromodification management BMPs on Priority Development Projects are consistent with the requirements in the Fourth Term Permits for Orange and Riverside Counties (Order Nos. R9-2009-0002 and R9-2010-0016, respectively). Modifications to the Orange County and Riverside County Hydromodification Management Plans (HMPs) will likely be minor, or may not be necessary. The HMP for San Diego County will likely require some minor modifications to incorporate the requirements of Provision E.3.c.(2) and become consistent with the Orange County and Riverside County HMPs. The San Diego Water Board does not, however, expect that it will be necessary for the San Diego County Copermittees to develop a new approach or significantly re-write the San Diego County HMP. This is because the premise of the hydromodification management BMP requirements, which are to control storm water runoff conditions (flow rates and durations) for Copermittee-defined range of flows, is unchanged from all Fourth Term Permits in the San Diego Region.

Provision E.3.c.(2)(a) requires that post-project runoff conditions mimic the *pre-development* runoff conditions, and not the *pre-project* runoff conditions. Fundamentally, the San Diego Water Board believes that using a hydrology baseline that approximates that of an undeveloped, natural watershed is the only way to facilitate the return of more natural hydrological conditions to already built-out watersheds, and ultimately improved stream health. On the other hand, using the *pre-project* hydrology as a baseline for redevelopment projects results in propagating the unnatural hydrology of urbanized areas. Propagating the urbanized flow regime does not support conditions for restoring degraded or channelized stream segments, and would forever sentence such streams to the degraded state. Furthermore, reducing the volume of storm water runoff associated with the urbanized flow regime will also result in reducing the discharge of pollutants into receiving waters, since storm water runoff from impervious surfaces contains untreated pollutants.

The San Diego Water Board understands that approximating the pre-development runoff condition associated with a redevelopment site is not necessarily straightforward because factors such as natural grade and native vegetation for the site cannot be precisely known. Therefore, the San Diego Water Board does not expect project designers to estimate historical conditions associated with redevelopment sites. Rather, the San Diego Water Board expects project designers and the Copermittees to

approximate pre-development runoff conditions using the parameters of a *pervious* area rather than an *impervious* area. This means that for redevelopment sites, approximating pre-development runoff conditions equates to using existing onsite grade and assuming the infiltration characteristics of the underlying soil. A redevelopment Priority Development Project must not use runoff coefficients of concrete or asphalt to estimate pre-development runoff conditions. Rather, redevelopment projects must use available information pertaining to existing underlying soil type (such as soil maps published by the National Resource Conservation Service), onsite existing grade, and any other readily available pertinent information to estimate pre-development runoff conditions.

The San Diego Water Board understands, indeed asserts, that the pre-development hydrology of an area in question can only be roughly estimated and cannot be precisely known. However, using the hydrology of a natural condition, even if not precisely known, will provide significant benefit to receiving waters over using the hydrology associated with impervious (developed) surfaces. Therefore in order to achieve the goals of the Clean Water Act, which are to "*restore and maintain the chemical, physical, and biological integrity of the nation's waters* [emphasis added]," the most appropriate standard to use for hydromodification management is the standard associated with the pre-development condition.

Provision E.3.c.(2)(b) requires Priority Development Projects to avoid known critical sediment yield areas or implement measures that would allow coarse sediment to be discharged to receiving waters, such that the natural sediment supply is unaffected by the project. This is necessary because the availability of coarse sediment supply is as much an issue for causing erosive conditions to receiving streams as are accelerated flows.

The San Diego Water Board recognizes that in some situations implementing the hydromodification management BMP requirements for flow control fully onsite may not be technically feasible, may be cost prohibitive, or may not provide any overall water quality benefits to the Watershed Management Area. Thus, Provision E.3.c.(2)(c) allows for the use of a combination of onsite hydromodification management BMPs for flow control and alternative compliance options described in Provision E.3.c.(3).

Provision E.3.c.(3) allows for alternative compliance in instances where the Copermittee determines that offsite measures will have a greater overall water quality benefit for the Watershed Management Area than if the Priority Development Project were to implement structural BMPs onsite. Consequently, watershed-specific structural BMP requirements are present in this Order in the form of allowable compliance offsite. The Alternative Compliance Program to Onsite Structural BMP Implementation Provision is intended to integrate with the Copermittees' planning efforts in the Water Quality Improvement Plans.

The Alternative Compliance Program is an option for Priority Development Projects where the governing Copermittee has participated in the development of a Watershed Management Area Analysis as part of the Water Quality Improvement Plan (described in Provision B.3.b.(4)). Such an approach is consistent with the latest findings in hydromodification management by the scientific community. In a Technical Report entitled *Hydromodification Assessment and Management in California,*[38] the report states:

> *"An effective [hydromodification] management program will likely include combinations of on-site measures (e.g., low-impact development techniques, flow-control basins), in-stream measures (e.g., stream habitat restoration), floodplain and riparian zone actions, and off-site measures. Off-site measures may include compensatory mitigation measures at upstream locations that are designed to help restore and manage flow and sediment yield in the watershed."*

Consistent with the ideas brought forth in the report, in the Watershed Management Area Analysis of Provision B.3.b.(4), which is optional, the Copermittees will develop watershed maps that include as much detail about factors that affect the hydrology of the watershed as is available. Such factors included identification of areas suitable for infiltration, coarse sediment supply areas, and locating stream channel structures and constrictions. Once these factors are mapped and studied, the Copermittees can identify areas in the watershed where candidate projects may be implemented that are expected to improve water quality in the watershed by providing more opportunity for infiltration, slowing down storm water flows, or attenuation of pollutants naturally via healthy stream habitat. These candidate projects may be in the form of retrofitting existing development, rehabilitating degraded stream segments, identifying regional BMPs, purchasing land to preserve valuable floodplain functions, and any other project(s) that the Copermittees identify.

Under the Alternative Compliance Program, Priority Development Projects may be allowed to fund, partially fund, or implement a candidate project, in lieu of implementing structural BMPs onsite, if they enter into a voluntary agreement with the governing Copermittee permitting this arrangement. Project proponents may also propose an alternative project not previously identified by the Copermittees. In either case, whether a project proponent implements a candidate project identified by the Copermittees or a separate alternative compliance project, the governing Copermittee must determine that implementation of the project will have a greater overall water quality benefit for the Watershed Management Area than fully implementing structural BMPs onsite. Determination of greater overall water quality benefits associated with alternative compliance projects would be accomplished by utilizing Water Quality Equivalency calculations developed pursuant to Provision E.3.c.(3)(a). Water Quality Equivalency calculations are necessary to establish a regional and technical basis for

[38] 2012. ED Stein, F Federico, DB Booth, BP Bledsoe, C Bowles, Z Rubin, GM Kondolf, A Sengupta. Technical Report 667. Southern California Coastal Water Research Project. Costa Mesa, CA.

determining water quality benefits associated with alternative compliance projects, which can be consistently used by all Copermittees in the San Diego Region. Finally, if ~~I~~f alternative compliance involves funding or implementing a project that is outside the jurisdiction of the governing Copermittee, then that Copermittee may enter into an inter-agency agreement with the appropriate jurisdiction.

Finally, Provision E.3.c.(2)(d) allows Priority Development Projects to be exempt from the hydromodification management BMP requirements if there is no threat of erosion to downstream receiving waters (i.e. the receiving stream is concrete lined from the point of discharge all the way to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean). If the Copermittees believe that more exemptions are warranted, then they must perform the optional Watershed Management Area Analysis of Provision B.3.b.(4). Additional exemptions other than those specified in this Order may be established on a watershed basis, provided the Copermittees perform the analysis, provide supporting rationale for the exemptions, and complete the Water Quality Improvement Plan approval process pursuant to Provision F.1.

To facilitate the transition to this Order from the Fourth Term Permits for Orange and Riverside County Copermittees, Provision E.3.c.(2)(e) allows two additional temporary exemptions from hydromodification management BMP implementation. The first temporary exemption allows relief from hydromodification management BMP implementation for Priority Development Projects discharging directly to an engineered channel conveyance system with a capacity to convey peak flows generated by the 10-year storm event all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean. Similar to the exemption allowed for concrete-lined channels, this exemption is premised on the concept that there is little threat of erosion to these types of engineered channel systems.

The second temporary exemption allows relief from hydromodification management BMP implementation for Priority Development Projects discharging directly to large river reaches with drainage areas larger than 100 square miles and a 100-year flow capacity in excess of 20,000 cubic feet per second. If this exemption is claimed, then properly sized energy dissipation is required at all discharge points associated with the Priority Development Project. This exemption is premised on the concept that large river reaches can essentially assimilate the accelerated flow rates associated with individual Priority Development Projects because they are inconsequential compared to the flow rate in the large river reach. Both of these exemptions are included in the Hydromodification Management Plan for San Diego County[39].

These temporary exemptions are allowed as a means to facilitate Orange and Riverside County Copermittees' transition to this Order from the Fourth Term Permits and are not meant to reside as permanent exemptions without additional rigorous

[39] Final Hydromodification Management Plan Prepared for County of San Diego, March 2011

technical analyses specific to each County. Therefore, these exemptions will no longer apply once the Copermittees' land development programs are fully updated to reflect the requirements of this Order, i.e., upon implementation of the BMP Design Manual pursuant to Provision F.2.b. If the Copermittees believe that these or other exemptions are warranted in the context of water quality improvement and stream restoration opportunities, then the Copermittees must perform the optional Watershed Management Area Analysis of Provision B.3.b.(4) and provide supporting rationale for the exemptions. The San Diego County Copermittees are also required to perform the optional Watershed Management Area Analysis to provide supporting rationale to justify use of these and other exemptions. Updated BMP Design Manuals including rationale to justify use of exemptions will be reviewed by the San Diego Water Board pursuant to Provision F.2.b.

Provisions E.3.c.(4) and E.3.c.(5) were included under the BMP requirements applicable to all development projects in the Fourth Term Permits for San Diego, Orange, and Riverside Counties (Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016, respectively). In this Order, the long-term BMP maintenance and infiltration and groundwater protection requirements apply to structural BMPs implemented by Priority Development Projects only.

Provision E.3.d requires the Copermittees to update their BMP Design Manual as needed to incorporate the requirements of Provision E.3. The BMP Design Manual is formerly known as the Standard Storm Water Mitigation Plan, or SSMP, and was renamed so that the title has a more accurate description of the document content. The contents of the BMP Design Manual are largely unchanged from the previous Standard Storm Water Mitigation Plans required under the Fourth Term Permits. The BMP Design Manual fulfills the 40 CFR 122.26(d)(2)(iv)(A)(2) requirement that the Copermittee's development planning program includes "*a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment*."

As part of the "*planning procedures,*" 40 CFR 122.26(d)(2)(iv)(A)(2) requires the procedures to "*address controls to reduce pollutants in discharges from municipal separate storm sewers after construction is completed*." The requirements applicable to the implementation and oversight of structural BMPs at Priority Development Projects are provided under Provision E.3.e.

Proper installation of the structural BMPs approved for a Priority Development Project is necessary to ensure that pollutants in storm water discharges will be reduced to the MEP after the project is completed. In addition to the proper installation of structural BMPs, the maintenance of structural BMPs on Priority Development Projects is necessary to ensure that pollutants in storm water discharges will continue to be reduced to the MEP. Provision E.3.e.(1) includes the minimum requirements that each

Copermittee must implement to ensure structural BMPs are properly installed and will be properly maintained.

Provisions E.3.e.(1)(a)(i)-(ii) have been included to provide additional clarification regarding when a Copermittee may allow land development requirements from earlier MS4 permits to apply to a Priority Development Project. Since the MS4 permits issued from 2001 to the adoption of Order No. R9-2015-0001 amending Order No. R9-2013-0001 (Regional MS4 Permit), a Copermittee could allow development projects with "prior lawful approval" to be "grandfathered" into implementing BMP requirements from previous MS4 permits. The Copermittees were given the discretion to use their land use authority to determine when it was appropriate to allow a development project with prior lawful approval to implement BMP requirements from the previous MS4 permits, and when the most recent BMP requirements should be required to achieve the reduction of pollutants in storm water runoff from development projects to the MEP. However, the San Diego Water Board has found that the Copermittees and the development community frequently disagree about when a development project has prior lawful approval and what is necessary to reduce pollutants in storm water runoff from development projects to the MEP.

Therefore, Provisions E.3.e.(1)(a)(i)-(ii) were included to provide more clarity and certainty for the Copermittees, the land development community, and the general public about when the structural BMP performance standards of earlier MS4 permits may be allowed to be implemented. A Copermittee may allow a Priority Development Project to implement BMP requirements of the previous MS4 permit only if all requirements of Provisions E.3.e.(1)(a)(i)[a]-[d] have been met. Otherwise, the Copermittees must require all Priority Development Projects to incorporate the BMP requirements of Provision E.3 into the project to reduce pollutants in storm water runoff from development projects to the MEP.

Provisions E.3.e.(1)(a)(i)[a]-[d] are dependent upon the effective date of the BMP Design Manual. Unless otherwise directed by the San Diego Water Board, the effective date of the BMP Design Manual is December 24, 2015 for the San Diego County Copermittees, September 28, 2017 for the Orange County Copermittees, and July 5, 2018 for the Riverside County Copermittees.

Alternatively, if the Copermittee can demonstrate a lack of land use authority or legal authority to require a Priority Development Project to implement the requirements of Provision E.3, the Copermittee may allow land development requirements from the previous MS4 permits to apply. However, under these circumstances the San Diego Water Board expects the Copermittee to utilize its available land use authority or legal authority to require the implementation of as much of Provision E.3 as possible to reduce the discharge of pollutants in storm water from development and redevelopment projects within its jurisdiction to the MEP.

In cases where BMP requirements from the earlier MS4 permits govern the structural BMP design requirements of a Priority Development Project, the San Diego Water Board expects the Copermittees to be able to demonstrate, in a programmatic audit or other means, that a Priority Development Project met all the requirements listed under Provisions E.3.e.(1)(a)(i)[a]-[d], or have evidence that the Copermittee did not have the land use or legal authority to require the implementation of Provision E.3 for a Priority Development Project.

The requirements under Provision E.3.e.(2)-(3) are necessary to demonstrate each Copermittee is implementing a program that complies with Provisions E.3.b-c and E.3.e.(1), and ensure structural BMPs at Priority Development Project will continue to be able to reduce pollutants in storm water discharges to the MEP.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary for any development projects to compel compliance with the requirements of Provision E.3 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.3.f requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Provision E.4 (Construction Management) requires each Copermittee to implement a construction management program to control and reduce the discharge of pollutants in storm water from construction sites to the MEP. Proper implementation of the construction management program will also contribute toward effectively prohibiting non-storm water discharges from construction sites to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." As part of the management program, 40 CFR 122.26(d)(2)(iv)(D) requires "*a program to implement and maintain structural and non-structural best management practices to reduce pollutants in storm water runoff from construction sites to the municipal storm sewer system.*"

Construction sites can be significant sources of sediment, trash, and other pollutants to receiving waters. Although sediment is naturally occurring in the natural environment, the discharge of sediment under unnatural conditions is problematic to receiving waters. Fine sediment in creeks causes high turbidity that interferes with the functionality of native flora and fauna in local creeks. For example, turbidity interferes with both photosynthesis of water-philic plants, as well as successful foraging and reproduction of benthic macroinvertebrates. Sediment can also make it difficult for fish to breathe because it clogs fish gills. Other pollutants such as heavy metals or

pesticides can adhere to sediment and are transported to receiving waters during storm events, where they dissolve in the water column and become bioavailable to aquatic organisms. Sediment is recognized as a major stressor to surface waters and is responsible for the impairment of several lagoons and creeks in the San Diego Region.

Provision E.4 includes requirements that each Copermittee must implement to minimize the discharge of sediment and other pollutants from construction sites to the MS4 within its jurisdiction. The requirements under Provision E.4 are consistent with the Fourth Term Permits for San Diego, Orange, and Riverside Counties. Therefore, Copermittees are expected to implement the requirements seamlessly, with minimal changes to their existing construction management programs. The Copermittees, however, are given more flexibility to run their programs as needed to maximize efficiency, and also to be consistent with the Water Quality Improvement Plan for the Watershed Management Area.

As part of the construction management program, 40 CFR 122.26(d)(2)(iv)(D)(1) requires "*procedures for site planning which incorporate consideration of potential water quality impacts.*" Provision E.4.a describes the minimum elements each Copermittee is required to include as part of the construction site planning and project approval process. The construction site planning and approval process is based primarily on ensuring each project had an adequate site-specific pollution control, construction BMP, and/or erosion and sediment control plan that will be implemented to minimize the discharge of pollutants in storm water to the MEP, and minimize impacts to receiving waters.

The requirements under Provision E.4.b provide the data and information necessary to identify "*priorities for inspecting sites and enforcing control measures*" required pursuant to 40 CFR 122.26(d)(2)(iv)(D)(3). Under Provision E.4.b, each Copermittee must identify construction sites that are considered a high threat to downstream surface waters. Designation of "high threat to water quality" construction sites will necessitate the Copermittees to develop criteria to identify such sites. Provision E.4.b.(2) describes a list of factors that must be considered when the Copermittee considers threat to water quality. For example, a Copermittee must identify sites as "high threat to water quality" if it is located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions, according to the Water Quality Improvement Plan. This ensures that construction management program implementation is compatible with the Copermittee's identified highest priority water quality conditions.

Pursuant to 40 CFR 122.26(d)(2)(iv)(D)(2) each Copermittee is required describe "*requirements for nonstructural and structural best management practices*" at construction sites. Provision E.4.c includes the types of construction site BMPs that the Copermittees must implement, or require the implementation of, at each construction site to reduce pollutants in storm water discharges to the MEP.

Each Copermittee is expected to require the implementation of appropriate BMPs given specific site conditions, the season and likelihood of rain events, and construction phase (i.e. grading vs. vertical construction). This means that throughout the life of the project construction, the appropriate BMPs will vary, especially if the construction of the project spans multiple wet seasons. As opposed to describing specific minimum BMPs that must be implemented, the Order describes major BMP categories that should be considered for each site.

Each Copermittee is expected to use its 20 years of storm water experience and knowledge to require implementation of appropriate BMPs from the various categories at each construction site within its jurisdiction. For example, the San Diego Water Board expects that each site will be required to implement erosion control and sediment control. The San Diego Water Board also expects each Copermittee to require implementation of active/passive sediment treatment systems at sites where other BMPs have been tried and are known to be inadequate, and discharges of sediment are causing or contributing to water quality impairment downstream. Each Copermittee is granted flexibility in specifying the minimum level of BMP requirements at each site, but the San Diego Water Board expects each site to be capable of controlling pollutants in storm water discharges to the MEP and preventing illicit discharges.

The requirements under Provision E.4.d are necessary to demonstrate that each Copermittee is implementing a program that complies with Provisions E.4.a and E.4.c and ensure BMPs at construction sites will reduce pollutants in storm water discharges to the MEP.

Provision E.4.d does not include minimum required inspection frequencies for construction sites. Each Copermittee must use its experience and knowledge to specify an appropriate inspection frequency for both high priority and lower priority sites in their jurisdictional runoff management program documents, and in accordance with the Water Quality Improvement Plan. Appropriate inspection frequencies may vary by Copermittee, but the San Diego Water Board expects that the stated frequency will be adequate for each Copermittee to properly oversee the construction sites within its jurisdiction, confirm BMPs are implemented to reduce pollutants in storm water discharges from constructions sites to the MEP, and make needed changes to its program on an ongoing basis as necessary.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary for any development projects to compel compliance with the requirements of Provision E.4 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.4.e requires each Copermittee to enforce its legal authority

established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Provision E.5 (Existing Development Management) requires each Copermittee to implement an existing development management program to control and reduce the discharge of pollutants in storm water from areas of existing development to the MEP. Proper implementation of the existing development management program will also contribute toward effectively prohibiting non-storm water discharges from areas of existing development to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." Within 40 CFR 122.26(d)(2)(iv)(A) and (C), the management program is required to reduce impacts on receiving waters and reduce pollutants in storm water discharges to the MEP from commercial and residential areas, industrial facilities, and municipal facilities.

Commercial and residential areas, industrial facilities, and municipal facilities must be addressed by each Copermittee with the existing development management program required under Provision E.5. All other areas within each Copermittee's jurisdiction should be either undeveloped open space, or areas that are being developed or under construction. Areas being developed or under construction will be addressed by the Copermittee under the requirements of Provision E.3 (Development Planning) or Provision E.4 (Construction Management).

Areas of existing development typically include impervious surfaces such as sidewalks, driveways, roads, and rooftops, which generate and concentrate pollutants (such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not found in high concentrations in the natural environment. Pollutants that accumulate on impervious surfaces are not easily biodegraded or not subject to natural treatment processes. When it rains, these pollutants are transported in storm water runoff from these impervious surfaces into receiving waters, resulting in poor water quality and degradation of beneficial uses.

In addition to the generation of pollutants, areas of existing development have generally altered the natural conditions of the land and removed vegetative cover, reduced the perviousness of the surface, and reduced the capacity of storm water that can be intercepted, captured, stored, infiltrated, evaporated, and/or evapotranspired. The alteration of the natural conditions and the impervious surfaces associated with areas of existing development causes water quality problems due to the alteration of natural flow regimes within the watersheds; resulting in hydromodification of channels, streams, and habitats that exist within or adjacent to the areas of existing development.

Thus, storm water discharges from areas of existing development are responsible for poor water quality, degraded habitats, and hydromodified channels throughout the developed portions of the watersheds in the San Diego Region. To improve the health and functionality of the receiving waters in a Watershed Management Area, land use practices and the amount of impervious surfaces in areas of existing development must change to reduce the various impacts caused by hydromodification and pollutants from storm water runoff generated in developed areas. Each Copermittee must be aggressive to address pollutant sources and runoff from areas of existing development to be able to reduce pollutants in storm water discharges from the MS4 to the MEP.

There is some overlap in the requirements under Provision E.5 with the requirements under Provisions E.2 (Illicit Discharge Detection and Elimination), E.3 (Development Planning), and E.4 (Construction Management). Illicit discharges frequently originate from areas of existing development. New development projects, when completed will become some type of residential, commercial, industrial or municipal existing development. Redevelopment projects are, by definition, redeveloping areas of existing development. And, redevelopment projects become construction sites located in areas of existing development. Much of the data and information collected, inspections performed, and enforcement actions taken for the requirements under Provisions E.2 to E.4 may also be utilized by the existing development management program. The requirements under Provision E.5, however, are focused primarily on reducing pollutants generated in areas of existing development that can be transported in storm water runoff and discharged to and from the MS4.

The requirements under Provision E.5 build upon existing program elements being implemented by the Copermittees. Provision E.5 is generally consistent with the existing development requirements of the Fourth Term Permits for Orange and Riverside Counties (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), but modified to provide more flexibility to implement the programs so resources can be better focused toward addressing the highest priority water quality conditions identified in the Water Quality Improvement Plans.

For a Copermittee to properly manage areas of existing development, having knowledge of what development exists within its jurisdiction is essential. Provision E.5.a requires each Copermittee to maintain a watershed-based inventory of all the existing development within its jurisdiction. This requirement is necessary for each Copermittee to implement the requirements of Provision E.5.b-e.

As opposed to just maintaining separate inventories based on the type of site, each Copermittee must maintain a watershed-based inventory that includes all types of existing development within its jurisdiction. By utilizing a watershed-based inventory, the Copermittees within a Watershed Management Area can combine their inventories and review the inventories by watershed in addition to by jurisdiction. Pollutant

sources and strategies for abatement can then be evaluated on a watershed level, as opposed to evaluating sources and strategies strictly by type of site.

Provision E.5.a includes the information that must be included in the inventory. Provision E.5.a.(1) specifies what facilities or areas must be included in the inventory. A commercial type of existing development may be identified in the inventory as a facility (e.g. individual building, individual business) or an area (e.g. shopping center, commercial zone). An industrial type of existing development must be identified in the inventory by facility (e.g. individual industrial entity). A municipal type of existing development must be identified in the inventory by facility, with a list of specific municipal facilities that must be included in the inventory. A residential type of existing development must be identified by areas to be designated by the Copermittee. For each of the facilities and areas identified in the Copermittee's inventory developed pursuant to Provision E.5.a.(1), Provision E.5.a.(2) specifies the information that must be included in the description for the facility or area.

Provision E.5.a.(3) requires each Copermittee to maintain an updated map showing the location of inventoried existing development, watershed boundaries, and water bodies. This requirement was included because this information is expected to help the Copermittees in a Watershed Management Area identify and prioritize sources of pollutants and/or stressors in areas of existing development that contribute toward the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Knowledge of the existing development that are likely to be sources of pollutants contributing to the highest priority water quality conditions is expected to be a key element in the Copermittees' development of the water quality improvement strategies that will be included in the Water Quality Improvement Plans. The strategies described in the Water Quality Improvement Plans will direct efforts within the existing development management programs implemented by each Copermittee.

Pursuant to 40 CFR 122.26(d)(2)(iv)(A) each Copermittee is required describe "*structural and source control measures to reduce pollutants*" in storm water runoff discharged from areas of existing development. Provision E.5.b includes the BMP implementation and maintenance requirements that the each Copermittee must require at areas of existing development to reduce pollutants in storm water discharges to the MEP. The San Diego Water Board, however, recognizes that BMP implementation and maintenance for residential areas will require much more education and encouragement through less authoritative measures than for commercial, industrial and municipal facilities and areas. Thus, the BMP implementation and maintenance requirements have been separated between requirements under Provision E.5.b.(1) for commercial, industrial and municipal facilities and areas, and Provision E.5.b.(2) for residential areas.

Most of the requirements in Provision E.5.b are consistent with the related requirements in the Fourth Term Permits. The level of specificity, however, has been changed to allow each Copermittee the flexibility to implement its program to achieve maximum efficiency, and to perform functions that will address the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Each Copermittee is expected to require the implementation of appropriate BMPs to address the expected pollutants from each facility or area. The Third and Fourth Term Permits described specific minimum BMPs that must be implemented at various sites. This Order, however, requires each Copermittee to designate minimum BMPs themselves and require implementation. Consistent with the Fourth Term Permits, each Copermittee is required to maintain, or require the maintenance of, all BMPs as needed.

The BMP implementation and maintenance requirements include a schedule of operation and maintenance activities for the MS4 and related structures (such as catch basins, storm drain inlets, and detention basins), as well as public streets and roads. Public streets and roads specifically include public unpaved roads. The San Diego Water Board identified, through investigations and complaints, sediment discharges from unpaved roads as a significant source of water quality problems in the San Diego Region. Inspection activities conducted by the San Diego Water Board since the Third Term Permits have found a lack of source control for many unpaved roads within the jurisdiction of the Copermittees.

Unpaved roads are a source of sediment that can be discharged in runoff to receiving waters, especially during storm events. Erosion of unpaved roadways occurs when soil particles are loosened and carried away from the roadway base, ditch, or road bank by water, wind, traffic, or other transport means. Exposed soils, high runoff velocities and volumes, sandy or silty soil types, and poor compaction increase the potential for erosion.

Road construction, culvert installation, and other maintenance activities can disturb the soil and drainage patterns to streams in undeveloped areas, causing excess runoff and thereby erosion and the release of sediment. Poorly designed unpaved roads can act as preferential drainage pathways that carry runoff and sediment into natural streams, impacting water quality. In addition, other public works activities along unpaved roads have the potential to significantly affect sediment discharge and transport within streams and other waterways, which can degrade the beneficial uses of those waterways.

USEPA also recognizes that discharges from unpaved roads pose a significant potential threat to water quality. USEPA guidance[40] emphasizes the threat of unpaved roads to water quality:

[40] USEPA, 2006. Environmentally Sensitive Maintenance for Dirt and Gravel Roads. Gesford and Anderson, USEPA-PA-2005.

> "*Dirt and gravel roads are a major potential source of these pollutants [sediment] and pollutants that bind to sediment such as oils, nutrients, pesticides, herbicides, and other toxic substances. Many roads have unstable surfaces and bases. Roads act like dams, concentrating flows that accelerate erosion of road materials and roadsides. Both unstable surfaces and accelerated erosion then lead to sediment and dust.*"

There are several guidance documents, developed by the USEPA,[41] the US Forest Service,[42] the University of California,[43] and others, that include design and construction specifications and BMPs that are readily available for implementation by public entities. Implementing design and other source control BMPs for unpaved roads in the region is necessary to reduce and minimize the impacts of sediment discharged during storm events from unpaved roads to the MS4s and receiving waters.

Provision E.5.c describes existing development site inspection frequency, content, and tracking that each Copermittee must incorporate into their existing development management programs. The requirements under Provision E.5.c are necessary to demonstrate each Copermittee is implementing a program that complies with Provision E.5.b and ensure BMPs implemented in areas of existing development will reduce pollutants in storm water discharges to the MEP. Provision E.5.c has been modified to include a minimum of once every 5 years for all inventoried facilities and areas of existing development, utilizing one or more methods of inspection.

In addition to onsite inspections, the methods of inspection have been expanded to include drive-by inspections. Inspections may be performed by the Copermittee's municipal and contract staff, or by volunteer monitoring or patrol programs. Volunteer monitoring or patrol programs are not expected to enforce the Copermittee's ordinances, or to inspect areas or facilities where members of the public are not allowed access. Volunteer monitoring or patrol programs must be trained by the Copermittee, and are only expected to collect visual observations. By utilizing drive-by inspections and volunteer monitoring or patrol programs, the Copermittees will be able to maximize and efficiently use their resources to identify and address sources of pollutants in areas of existing development.

The municipal and contract staff of each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial, industrial, and municipal facilities and areas in its inventoried existing development pursuant to Provision E.5.c.(1)(a)(iv). An "equivalent" of at least 20 percent means if any commercial, industrial, or municipal facilities or areas require multiple onsite

[41] Ibid
[42] US Forest Service, 1996. Forest Service Specifications for Construction of Roads & Bridges. EM-7720-100. Revised August 1996.
[43] University of California Division of Agriculture and Natural Resources, 2007. Rural Roads: A Construction and Maintenance Guide of California Landowners. Publication 8262.

inspections during any given year, those additional inspections may count toward the total annual inspection requirement. Linear municipal facilities (i.e. MS4 linear channels, sanitary sewer collection systems, streets, roads and highways) in the Copermittee's existing development inventory are not subject to the inspection frequency requirement of Provision E.5.c.(1)(a)(iv).

The inspection content specified in Provision E.5.c.(2)(a) includes the information required to be collected during an inspection by any method. The inspection content specified in Provision E.5.c.(2)(b) includes additional information that must be collected when a Copermittee's municipal or contract staff perform an onsite inspection. Provision E.5.c.(3) specifies the information that each Copermittee must maintain in its existing development inspection records.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary to compel compliance with the requirements of Provision E.5 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.5.d requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Provisions E.5.e.(1)-(2) specifically require the Copermittee to identify areas of existing development as candidates for retrofitting, and streams, channels, and/or habitats as candidates for rehabilitation. Provisions E.5.e.(1)-(2) are based on the retrofitting requirements of the Fourth Term Permits for Orange and Riverside Counties, but modified to also include identifying projects to rehabilitate channels within areas of existing development. The requirements have also been modified to be more focused on utilizing these types of projects for addressing the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Interest and opportunity to retrofit areas of existing development and rehabilitate channels located in areas of existing development has been observed in several programs the San Diego Water Board oversees (e.g., CWA Section 401 Water Quality Certification program, supplemental environmental projects, and grant programs). Each jurisdiction has miles and miles of streets that could be retrofitted to become green streets. Reshaping landscaped areas from convex to concave configurations can detain storm water instead of directing runoff as quickly as possible to the MS4. Retrofit projects could also include simply replacing impervious surfaces with permeable surfaces.

Retrofitting projects do not necessarily have to be expensive. Retrofitting projects could be as simple as redirecting downspouts from roofs to pervious or landscaped areas instead of to hardscaped areas discharging directly to the MS4, providing rain barrels to harvest storm water from downspouts for use at a later time, or planting more trees in areas with little vegetation to provide canopy that can intercept storm

water. The San Diego Water Board encourages the Copermittees to identify simple, low-cost retrofitting opportunities that can be easily implemented, in addition to other more expensive retrofitting and channel rehabilitation projects.

Rehabilitation of channels, streams, and/or habitat will require more significant planning and resources to implement. There are, however, also abundant opportunities to rehabilitate channels, streams and/or habitats in or adjacent to areas of existing development. Each Watershed Management Area likely has several creeks and stream reaches that have been undergrounded, artificially hardened, or hydromodified that could be rehabilitated to be more sustainably configured, which would slow down storm water flows and potentially have more assimilative capacity for pollutants while still being supportive of designated beneficial uses.

The San Diego Water Board recognizes that it may be infeasible to implement retrofitting or channel rehabilitation projects within certain areas of a Copermittee's jurisdictions. For such areas, the Copermittee must instead identify, develop, and implement regional retrofitting and channel rehabilitation projects (i.e. projects that can retain and/or treat storm water from one or more areas of existing development) adjacent to and/or downstream of the areas of existing development.

Provisions E.5.e.(1)-(2) do not require the implementation of retrofitting and rehabilitation projects, but do require the Copermittee to develop a program with strategies to facilitate the implementation of these types of projects in areas of existing development. The strategies are expected to include allowing and encouraging Priority Development Projects to implement retrofitting types of projects as a means of compliance with the structural BMP performance criteria requirements of Provisions E.3.c.(1) and E.3.c.(2).

Provision E.6 (Enforcement Response Plans) requires each Copermittee to develop an Enforcement Response Plan as part of its jurisdictional runoff management program document. Proper implementation of the Enforcement Response Plans is necessary to effectively prohibit non-storm water discharges to the MS4, and reduce the discharge of pollutants in storm water from the MS4 to the MEP.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system*" and be able to demonstrate that it can "*operate pursuant to legal authority established by statute, ordinance or series of contracts*" to control the discharge of non-storm water and pollutants in storm water to and from its MS4. Pursuant to 40 CFR 122.26(d)(2)(i)(E) each Copermittee is specifically required to have the legal authority to "*[r]equire compliance with conditions in ordinances, permits, contracts or order*s."

The requirements under Provision E.6 are necessary to demonstrate that each Copermittee can enforce its legal authority to *"effectively prohibit non-stormwater discharges"* and "*reduce the discharge of pollutants to the maximum extent*

practicable" as well as "*[r]equire compliance with conditions in ordinances, permits, contracts or order*."

The Enforcement Response Plan required under Provision E.6 will serve as a reference for the Copermittee and the San Diego Water Board to determine if consistent enforcement actions are being implemented to achieve timely and effective compliance from all public and private entities that are not in compliance with the Copermittee's ordinances, permits, or other requirements. The Enforcement Response Plan must contain clear direction for the Copermittee to take immediate enforcement action, when appropriate and necessary, in their illicit discharge detection and elimination, development planning, construction management, and existing development management programs.

If the entities subject to the Copermittee's legal authority do not implement appropriate corrective actions in a timely manner, or if violations repeat, the Copermittee must take progressively stricter responses to enforce its legal authority and achieve compliance with its ordinances, permits, or other requirements to *"effectively prohibit non-stormwater discharges"* and "*reduce the discharge of pollutants to the maximum extent practicable.*"

Provision E.7 (Public Education and Participation) requires each Copermittee to implement a public education and participation program. Proper implementation of the public education and participation program as part of its jurisdictional runoff management program will contribute toward effectively prohibiting non-storm water discharges to the MS4, and toward the reduction of pollutants in storm water from the MS4 to the MEP.

Provision E.7 establishes the minimum requirements that each Copermittee must implement to engage members of the public as part of its jurisdictional runoff management program. In the Fourth Term Permits, the public education program requirements and the public participation requirements were included as separate jurisdictional runoff management program components. In this Order, the public education requirements have been consolidated with the public participation requirements, as both sets of requirements are related to the engagement of the public by each Copermittee. Engagement of the public is critical for the success of each Copermittee's jurisdictional runoff management program.

The Copermittees have been implementing public education programs for the last 20 years, which are now well established. The specificity of expected public education program elements of the Fourth Term Permits has been removed. For the most part, the public education program requirements in Provision E.7.a have been reduced to a set of requirements that are specifically included in the federal regulations under 40 CFR 122.26(d)(2)(iv)(A)(6), 122.26(d)(2)(B)(6) and 122.26(d)(2)(D)(4), which should already be incorporated into each Copermittee's existing public education program. Each Copermittee is expected to utilize the information and data collected from the monitoring and assessments conducted within the Watershed Management Area, and

from its inventories and inspections to best direct its public education program resources toward addressing the highest priority water quality conditions identified within the Water Quality Improvement Plan.

According to 40 CFR 122.26(d)(2)(iv), public participation is required to be included as part of the "*comprehensive planning process*", which includes the development and implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs. The requirements under Provision E.7.b specify the opportunities that the public must be provided to be involved in the "*comprehensive planning process*", as required by to 40 CFR 122.26(d)(2)(iv).

Provision E.8 (Fiscal Analysis) requires each Copermittee to secure the resources and provide an analysis of the resources that will be necessary to implement the requirements of the Order. Adequate fiscal resources are necessary for a jurisdictional runoff management program to effectively prohibit non-storm water discharges to the MS4, and reduce pollutants in storm water from the MS4 to the MEP.

According to 40 CFR 122.26(d)(2)(vi), each Copermittee is responsible for providing "*a fiscal analysis of the necessary capital and operation and maintenance expenditures necessary to accomplish the activities*" required by this Order, including "*a description of the source of funds that are proposed to meet the necessary expenditures, including legal restrictions on the use of such funds.*" The fiscal analysis requirements of Provision E.8 are consistent with 40 CFR 122.26(d)(2)(vi).

The San Diego Water Board has chosen not to require a description of fiscal benefits realized from implementation of the jurisdictional runoff management programs. This is a recommendation from the National Association of Flood and Stormwater Management Agencies.[44] For instance, the fiscal analysis requirements do not address city-wide fiscal benefits of protection (e.g., public health, tourism, property values, economic activity, beneficial uses, etc.), even though many costs currently reported to the San Diego Water Board are for related activities. This type of assessment may help Copermittees improve the allocation of resources and it may help the Copermittees secure adequate funding for the program. Qualitative assessments, however, could be overly subjective and most Copermittees likely lack the ability to provide accurate quantitative assessments. The San Diego Water Board encourages the Copermittees to consider means for conducting assessments of fiscal benefits derived from the programs. Such assessments could be conducted on a regional scale similar to studies of program costs conducted by the State Water Board.[45]

[44] National Association of Flood and Stormwater Management Agencies. 2006. *Guidance for Municipal Stormwater Funding.* Prepared under a grant provided by the USEPA.
[45] State Water Board, 2005. NPDES Stormwater Cost Survey.

F. Reporting

Purpose: Provision F includes the requirements for the documents and reports that the Copermittees must prepare and provide to the San Diego Water Board. The documents prepared by the Copermittees and provided to the San Diego Water Board and made available to the public will provide the documentation that the Copermittees are complying with the requirements of the Order.

***Discussion*:** Provision F requires the Copermittees to prepare several documents and reports that must be provided to the San Diego Water Board and made available to the public. The reporting requirements have been significantly reduced compared to the Fourth Term Permit reporting requirements. The reduction in reporting requirements was recommended by the San Diego County Copermittees in the Report of Water Discharge submitted in June 2011.

More specific and detailed discussions of the requirements of Provision F are provided below.

Provision F.1 (Water Quality Improvement Plans) requires the Copermittees in each Watershed Management Area to develop and submit a Water Quality Improvement Plan in accordance with the requirements of Provision B.

Of all the requirements of Provision F, the Water Quality Improvement Plans will likely be the documents requiring the most significant effort to develop. The content of the Water Quality Improvement Plans, however, is expected to include content that should already have been developed for the Watershed Plans and several elements that are included in the Monitoring and Reporting Programs required under the Fourth Term Permits.

Because the Water Quality Improvement Plan is part of the "*comprehensive planning process which involves public participation*," Provision F.1 includes requirements to give multiple opportunities to the public to provide input on the content of the plans.

Provision F.1.a.(1) specifies the elements that the Copermittees must include in the public participation process for the development of the Water Quality Improvement Plans. In order for the public to be aware of the opportunities to provide input, Provision F.1.a.(1)(a) requires the Copermittees to develop a publicly available and noticed schedule of the opportunities for the public to participate and provide comments during the development of the Water Quality Improvement Plan. These opportunities are when the public can provide the data, information, and recommendations that the Copermittees can consider during the development of the Water Quality Improvement Plans.

The San Diego Water Board recognizes, however, that the Copermittees cannot be expected to incorporate all the data, information, and recommendations that the public may provide into the Water Quality Improvement Plans. The Copermittees will have to review the data, information, and recommendations received and make some decisions on what to incorporate into the Water Quality Improvement Plans. Before the Copermittees finalize their decisions, members of the public should be allowed to review the Copermittees' decisions. Thus, Provision F.1.a.(1)(b) requires the Copermittees to form a Water Quality Improvement Consultation Panel (Panel).

The Panel will consist of a member from the environmental community and a member from the development community familiar with the Watershed Management Area. A representative from the San Diego Water Board staff will also be part of the Panel. The Copermittees may choose to include additional members, but the Panel is only required to include three panel members.

The Panel will serve as an additional public participation and input mechanism during the development of the Water Quality Improvement Plans. The knowledge and expertise from these Panel members are expected to provide the Copermittees valuable direction during their decision-making process. The Copermittees will review the content of their planned submittals with the Panel members to receive recommendations. If the Panel provides recommendations, the Copermittees must consider revisions to the Water Quality Improvement Plan submittals.

The San Diego Water Board recognizes that the development of multiple Water Quality Improvement Plans concurrently may limit the ability of the public to review and provide comments to the Copermittees. Thus, Provision F.1.a.(1)(c) requires the Copermittees to coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public time and opportunity to participate during the development of the Water Quality Improvement Plans.

Provision F.1.a.(2) requires the Copermittees to develop and submit the first Water Quality Improvement Plan component, in accordance with the requirements of Provision B.2, which includes the identification of the priority water quality conditions and potential water quality improvement strategies. The public must be provided an opportunity to provide data, information and recommendations to be utilized in the development and identification of the priority water quality conditions and potential water quality improvement strategies for the Watershed Management Area. The Copermittees must consult with the Panel and consider making revisions. The Copermittees may submit the requirements of Provision B.2 as early as 6 months and no later than 12 months after the commencement of coverage under this Order. After the requirements of Provision B.2 are submitted to the San Diego Water Board, the public will be provided another opportunity to provide comments.

Provision F.1.a.(3) requires the Copermittees to develop and submit the second Water Quality Improvement Plan component, in accordance with the requirements of Provision B.3, which includes the identification of the numeric goals for the highest

priority water quality conditions identified for the Watershed Management Area, and the strategies that will be implemented to achieve the potential numeric goals. The Copermittees may also develop the Optional Watershed Management Area Analysis, in accordance with the requirements of Provision B.3.b.(4), as part of this submittal. The public must be provided an opportunity to provide data, information and recommendations to be utilized in the development and identification of the numeric goals and water quality improvement strategies for the Watershed Management Area. The Copermittees must consult with the Panel and consider making revisions. The Copermittees may submit the requirements of Provision B.3 as early as 9 months and no later than 18 months after the commencement of coverage under this Order. After the requirements of Provision B.3 are submitted to the San Diego Water Board, the public will be provided another opportunity to provide comments.

Finally, Provision F.1.b describes the process for the submittal and implementation of the Water Quality Improvement Plans. The complete Water Quality Improvement Plans are required to be submitted by the Copermittees within 24 months after the commencement of coverage under this Order. The San Diego Water Board will provide the public an opportunity to provide comments on each complete Water Quality Improvement Plan.

The San Diego Water Board will review each Water Quality Improvement Plan and the public comments received to determine if the Copermittees have submitted a Water Quality Improvement Plan that meets the requirements of Provision B. If a Water Quality Improvement Plan does not meet the requirements of Provision B, the Copermittees will be considered out of compliance and directed in writing by the San Diego Water Board Executive Officer to correct the deficiencies.

When a Water Quality Improvement Plan meets the requirements of Provision B, the San Diego Water Board will determine whether to hold a public hearing or to limit public input to submittal of written comments before accepting the Water Quality Improvement Plan. Implementation of the Water Quality Improvement Plan must begin within 30 days of acceptance.

The San Diego Water Board expects that any deficiencies in the Water Quality Improvement Plan will be identified either in the public comments or during the review by the San Diego Water Board before implementation begins. In the event any deficiencies are identified after the implementation of the Water Quality Improvement Plan, Provision F.1.b.(7) clarifies that the San Diego Water Board maintains the right to require the Copermittees to correct any deficiencies that may be identified.

Provision F.2 (Updates) requires the Copermittees to update specific documents that the Copermittees will utilize to implement the requirements of this Order.

Each Copermittee is required to continue implementing a jurisdictional runoff management program, as required under Provision E. Implementation of each Copermittee's jurisdictional runoff management program is directed by its jurisdictional

runoff management program document. Provision F.2.a requires each Copermittee to update its jurisdictional runoff management program document to be consistent with the requirements of Provision E concurrent with the submittal of the Water Quality Improvement Plan.

Likewise, each Copermittee must continue to require new development and redevelopment projects to implement BMPs to control pollutants in storm water runoff. The control of pollutants in storm water runoff from development and redevelopment projects within each Copermittee's jurisdiction is guided and directed by its BMP Design Manual, formerly known as a Standard Storm Water Mitigation Plan (SSMP). Provision F.2.b requires each Copermittee to update its BMP Design Manual to be consistent with the requirements of Provision E.3 concurrent with the submittal of the Water Quality Improvement Plan.

For situations where the San Diego Water Board may amend the requirements of Provisions E.3.a-d after a Copermittee has updated its BMP Design Manual pursuant to Provision F.2.b.(1), Provision F.2.b.(4) gives the Copermittee up to 90 days to incorporate the amended requirements of Provision E.3.a-d into its BMP Design Manual. The San Diego Water Board Executive Officer has discretion to modify the 90-day time period depending on the complexity of the amendments or other information that warrants a change in the 90-day time period.

In general, the requirements of the Order should not necessitate a complete rewrite of each Copermittee's jurisdictional runoff management program document or BMP Design Manual, as was required by the Third Term Permits. The jurisdictional runoff management program and BMP Design Manual requirements of this Order are not significantly different than the requirements of the Fourth Term Permits. Thus, only sections of the Order which are new or have been significantly changed should warrant revisions to specific sections of the Copermittee's jurisdictional runoff management program document and BMP Design Manual.

Finally, the Water Quality Improvement Plans are expected to require updates as the iterative approach and adaptive management process included in the Water Quality Improvement Plan, as required under Provision B.5, is implemented by the Copermittees. Provision F.2.c.(1) requires the Copermittees to implement a public participation process for the proposed updates, review the proposed updates with the Panel, and submit the updates to the Water Quality Improvement Plan as part of the Annual Reports required under Provision F.3.b.

Also, because TMDLs are likely to be developed, adopted and approved during the term of the Order, Provision F.2.c.(2) has been included to expedite the incorporation of TMDLs into the Copermittees' Water Quality Improvement Plans as part of the update process, potentially before the Order is re-opened to incorporated the requirements of the new TMDLs.

Provision F.3 (Progress Reporting) requires the Copermittees to report on the progress of implementing the Water Quality Improvement Plans.

The requirements of Provision F.3 are to report the progress toward improving water quality that the Copermittees are achieving with the implementation of the Water Quality Improvement Plans and each Copermittee's jurisdictional runoff management program. The Progress Report Presentations required under Provision F.3.a are included to provide the Copermittees an opportunity to communicate directly with the San Diego Water Board and the public. The Progress Report Presentations will also provide the members of the San Diego Water Board and members of the public an opportunity to become more acquainted with the Copermittees and their projects and programs to address non-storm water and storm water discharges into and from their MS4s.

The Annual Report requirements of Provision F.3.b are a consolidation of several reporting requirements from the Fourth Term Permits, including the Jurisdictional Runoff Management Program Annual Reports, the Watershed Annual Reports, and the Monitoring and Reporting Program Annual Reports. Furthermore, the Annual Report requirements are consistent with the requirements under 40 CFR 122.42(c).

Pursuant to 40 CFR 122.42(c), "*[t]he operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the Director…must submit an annual report*", which must include the following:

(1) *The status of implementing the components of the storm water management program that are established as permit conditions* [40 CFR 122.42(c)(1)];

(2) *Proposed changes to the storm water management programs that are established as permit conditions* [40 CFR 122.42(c)(2)];

(3) *Revisions, if necessary, to the assessment of controls and fiscal analysis* [40 CFR 122.42(c)(3)];

(4) *A summary of data, including monitoring data, that is accumulated throughout the reporting year* [40 CFR 122.42(c)(4)];

(5) *Annual expenditures and budget for year following each annual report* [40 CFR 122.42(c)(5)];

(6) *A summary describing the number and nature of enforcement actions, inspections, and public education programs* [40 CFR 122.42(c)(6)];

(7) *Identification of water quality improvements or degradation* [40 CFR 122.42(c)(7)].

Under the Fourth Term Permits, each Copermittee is responsible for submitting a Jurisdictional Runoff Management Program Annual Report; the Copermittees in each

designated watershed are responsible for submitting a Watershed Annual Report; and the Copermittees from each county are responsible for submitting a Monitoring and Reporting Program Annual Report.

There are 39 Copermittees in the San Diego Region, each required to prepare and submit a Jurisdictional Runoff Management Program Annual Report. There are 9 designated watersheds in San Diego County, 6 designated watersheds in Orange County, and 1 designated watershed in Riverside County for a total of 16 designated watersheds, each requiring a Watershed Annual Report. There are 3 sets of Copermittees in 3 counties in the San Diego Region, requiring Copermittees from each county to prepare and submit a Monitoring and Reporting Program Annual Report. Thus each Copermittee is currently required to prepare, or participate in the preparation of at least 3 annual reports. In addition, the San Diego County Copermittees are required to prepare and submit a Regional Urban Runoff Management Plan Annual Report.

In total, there are 59 annual reports that are prepared by the Copermittees and submitted to the San Diego Water Board for the Fourth Term Permits. The preparation of these annual reports requires significant time and resources from each Copermittee, which could otherwise be expended on actions that could improve water quality within its jurisdiction. In turn, significant time and resources are required from the San Diego Water Board staff to review these reports, which could otherwise be expended on working directly with the Copermittees to improve their implementation efforts toward restoring and protecting water quality.

Until the Water Quality Improvement Plans are developed, there will be a transitional period during which the Copermittees will continue to implement their existing jurisdictional runoff management programs. There will also be a transitional period during which the Copermittees will implement the transitional monitoring and assessment requirements of Provision D. During the transitional period, the Copermittees will submit annual reports pursuant to the requirements of Provisions F.3.b.(1) and F.3.b.(2).

Provision F.3.b.(1) includes the transitional annual reporting requirements for each Copermittee's jurisdictional runoff management program. The reporting of the jurisdictional runoff management program implementation efforts have been reduced to a single 2-page form. Each Copermittee is required to complete and submit a Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D or a revised form accepted by the San Diego Water Board) no later than October 31 of each year for each jurisdictional runoff management program reporting period (i.e. July 1 to June 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted. The Jurisdictional Runoff Management Program Annual Report Form will certify that each Copermittee has implemented its jurisdictional runoff management program in accordance with the requirements of Provision E. Each Copermittee may choose to continue to utilize and submit the jurisdictional runoff management program annual reporting format of its

current Order until the first Water Quality Improvement Plan Annual Report is required to be submitted.

Provision F.3.b.(2) includes the transitional annual reporting requirements for the transitional monitoring and assessment program for each Watershed Management Area. The Copermittees in the Watershed Management Area are required to submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted. The Transitional Monitoring and Assessment Program Annual Report is required to include the transitional period monitoring data collected pursuant to Provisions D.1.a and D.2.a, and the findings from the transitional period findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

Provision F.3.b.(3) includes the Water Quality Improvement Plan Annual Report requirements. Only one Water Quality Improvement Plan Annual Report is required for each of the ten (10) Watershed Management Areas designated under Provision B.1, which is a significant reduction in the number of annual reports required to be prepared and submitted by the Copermittees. The Water Quality Improvement Plan Annual Report will document the Copermittees' efforts to implement the Water Quality Improvement Plan. Each Water Quality Improvement Plan Annual Report will be focused primarily on reporting the analysis of the monitoring data collected pursuant to Provisions D.1-D.3 during the reporting period, and the assessments that are required pursuant to Provision D.4 based on the data. The monitoring data analyses and the assessments that are provided in the Water Quality Improvement Plan Annual Report will be the core of the report. The reporting of the jurisdictional runoff management program implementation efforts have been reduced to a single 2-page form, and will no longer be the primary focus of the reporting requirements as in the Third and Fourth Term Permits.

Each Copermittee will continue to prepare and submit a Jurisdictional Runoff Management Program Annual Report Form as part of the Water Quality Improvement Plan Annual Report to certify that each Copermittee has implemented its jurisdictional runoff management program in accordance with the requirements of Provision E. Instead of reviewing a voluminous report from each Copermittee, as was required under the Third and Fourth Term Permits, the San Diego Water Board will conduct audits of each Copermittee's jurisdictional runoff management program to investigate and confirm the information provided by each Copermittee on its Jurisdictional Runoff Management Program Annual Report Form. The audits will allow the San Diego Water Board to become more familiar with the each Copermittee's jurisdictional runoff management program, and each Copermittee will become more informed about the expectations of the San Diego Water Board.

The reduction in the number and content of the Water Quality Improvement Plan Annual Reports should result in significant time, cost and resource savings for the

Copermittees, as well as the San Diego Water Board. Those savings should offset a significant portion of any additional costs that may be incurred to develop the Water Quality Improvement Plans and to implement the monitoring and assessment program requirements of Provision D.

The reporting period for the Water Quality Improvement Plan Annual Reports consists of two periods. Because the jurisdictional runoff management programs are typically budgeted and implemented during a fiscal year, the information provided on the Jurisdictional Runoff Management Program Annual Report Forms will cover the period from July 1 to June 30 of the following year.

The Water Quality Improvement Plan Annual Reports, however, are focused primarily on the monitoring data and the assessments based on the monitoring data. The monitoring data is collected during the monitoring year, which begins October 1 and ends September 30 of the following year. The monitoring year begins after the beginning of the fiscal year and ends after the end of the fiscal year. Therefore, to accommodate and capture the information collected during the fiscal year and the monitoring year, the Annual Report reporting period incorporates both periods.

Finally, Provision F.3.c requires the Copermittees to develop and submit a Regional Monitoring and Assessment Report. The Regional Monitoring and Assessment Report is similar to the Long Term Effectiveness Assessment required under the Fourth Term San Diego County Permit. The Regional Monitoring and Assessment Report is expected to utilize the entire body of data and information collected by the Copermittees during the term of this Order to assess improvements to water quality on a regional scale.

Provision F.4 (Regional Clearinghouse) requires the Copermittees to develop, update, and maintain an internet-based Regional Clearinghouse that can be used to store, disseminate, and share the Copermittees' documents, monitoring data, special studies, and any other data or information.

Most of the documents and data that are generated by the Copermittees can be provided in electronic format, and made available to the San Diego Water Board and the public on the internet. The San Diego Water Board has been gradually transitioning its document submittal requirements to electronic submittals. Provision F.4 has been included to further these efforts.

Provision F.4 has also been included to improve the exchange and availability of information among the Copermittees, as well as between the Copermittees and the San Diego Water Board. Provision F.4 will also make the information generated during the implementation of the Order more accessible to the public.

Provision F.5 (Report of Waste Discharge) requires the Copermittees to submit a Report of Waste Discharge to reapply for renewal of the Order prior to its expiration, in accordance with 40 CFR 122.21(d)(2) and CWC section 13376.

~~Because the Riverside County Copermittees will not be subject to the requirements of this Order until they are notified of coverage, Provision F.5.a describes the process of submitting a Report of Waste Discharge pursuant to the requirements of their current permit to obtain coverage under this Order.~~

~~For the Copermittees subject to the requirements of this Order,~~ Provision F.5~~.b~~ requires the Copermittees to submit a Report of Waste Discharge 180 days in advance of the expiration of this Order. Provision F.5~~.b~~ also describes the minimum information to be included in the Report of Waste Discharge, based on USEPA guidance "Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems," dated May 17, 1996.

~~Provision F.6 (Application for Early Coverage) describes the process that would allow the Orange County and/or Riverside County Copermittees to obtain coverage under this Order earlier than the expiration of their current Orders.~~

~~If the Riverside County Copermittees choose to obtain coverage under this Order earlier than the expiration of their current Orders, the preparation and submittal of a Report of Waste Discharge, as required by the Fourth Term Permits, will not be necessary. The existing Order for the respective county will be rescinded upon the effective coverage date under this Order, except for enforcement purposes.~~

G. Principal Watershed Copermittee Responsibilities

Purpose: Provision G includes the requirements for the Principal Watershed Copermittee designated by the Copermittees in each Watershed Management Area.

***Discussion*:** Unlike previous NPDES requirements, there will no longer be a single Principal Copermittee. Provision G.1 requires the Copermittees to designate a Principal Watershed Copermittee for each Watershed Management Area. There are ten (10) Watershed Management Areas in the San Diego Region, as defined in Table B-1 under Provision B.1 of the Order. An individual Copermittee should not be the Principal Watershed Copermittee for more than two (2) Watershed Management Areas. There could be up to ten (10) Principal Water Copermittees designated for the Watershed Management Areas in the San Diego Region.

Provision G.2 describes the minimum responsibilities of each Principal Watershed Copermittee. The primary responsibility of the Principal Watershed Copermittees is to serve as the liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues. Ideally, the Principal Watershed Copermittee can represent the interests of all the Copermittees within a Watershed Management Area during discussions or meetings to facilitate communication with the San Diego Water Board. The Principal Watershed Copermittees are also responsible for facilitating and coordinating the implementation efforts of the Copermittees and submittals of required documents and reports.

The Principal Watershed Copermittee is responsible for facilitating the efforts of the Copermittees within the Watershed Management Area to develop the Water Quality Improvement Plan required under Provision B, and submit it for approval in accordance with Provision F.1. The Principal Watershed Copermittee is also responsible for coordinating the submittal of the document updates, Progress Report Presentations, and Annual Reports required from the Copermittees within each Watershed Management Area under Provisions F.2, F.3.a, and F.3.b. The Principal Watershed Copermittees are responsible for coordinating with each other to develop and submit the Regional Clearinghouse, Regional Monitoring and Assessment Report, and the Report of Waste Discharge required under Provisions F.3.c, F.4, and F.5.

The designated Principal Watershed Copermittee for each Watershed Management Area does not necessarily have to serve as the Principal Watershed Copermittee for the entire term of the Order. If the Copermittees in a Watershed Management Area choose to designate a new Principal Watershed Copermittee, the change may be submitted as part of the Annual Report required under Provision F.3.b, with an update to the Water Quality Improvement Plan in accordance with Provision F.2.c.

Provision G.3 specifies that the Principal Watershed Copermittee is not responsible for ensuring that the other Copermittees within the Watershed Management Area are in compliance with the requirements of this Order

H. Modification of Order

Purpose: Provision H provides the conditions under which modifications to Order No. R9-2013-0001, as amended, may occur.

***Discussion*:** Provision H allows for modifications to Order No. R9-2013-0001, as amended, for bases in addition to modifications (minor and major) allowed under the federal regulations at 40 CFR 122.62 and 122.63.

Modifications to the Order require re-opening the Order (see Water Code section 13223), subject to the requirements of 40 CFR 122.44, 122.62 to 122.64, and 124.5, but only for the specific provisions subject to the modification. Proposed modifications of the Order will be made available for public review, a public notice and comment period, and a public hearing if requested. Comments on the provisions not subject to the proposed modifications are not required to be considered in the San Diego Water Board's responses to comments or during the public hearing.

Provision H.4 was included to specify that the Order will be re-opened for modifications if ~~the State Water Board determines revisions to Provision A are warranted, an application for early coverage under the Order is received pursuant to Provision F.6,~~ the Basin Plan is amended to modify an existing TMDL or incorporate a new TMDL, or the monitoring and assessment program requirements need to be updated or revised.

~~Provision H.5 was included to specify that the San Diego Water Board will re-open and consider modifications to this Order when the Orange County Copermittees or the Riverside County Copermittees submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders~~

I. Standard Permit Provisions and General Provisions

Purpose: Provision I incorporates the standard permit provisions required to be included in all NPDES permits, as well as several other general provisions.

***Discussion*:** Provision I refers to Attachment B to the Order. Attachment B expressly incorporates the conditions applicable to all NPDES permits as provided under 40 CFR 122.41(a)-(n), as well as the applicable conditions for MS4s and storm water discharges provided under 40 CFR 122.42(c) and 40 CFR 122.42(d), respectively. Attachment B also includes several general provisions that are typically included in or applicable to waste discharge requirements issued by the San Diego Water Board.

IX. ATTACHMENTS

The attachments to the Order are discussed below. The discussions describe the content of the attachments.

Attachment A – Discharge Prohibitions and Special Protections

Section 1 of Attachment A includes the Waste Discharge Prohibitions from the Basin Plan. They have been provided verbatim in their entirety.

Section 2 of Attachment A includes the "*Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges*" applicable to permitted point source discharges of storm water, adopted under State Water Board Resolution No. 2012-0012, as amended by Resolution No. 2012-0031. The terms, prohibitions, and special conditions (collectively referred to as special conditions) are established as limitations on point source storm water discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in ASBS, as required for State Water Quality Protection Areas pursuant to California Public Resources Code sections 36700(f) and 36710(f). These Special Protections were adopted by the State Water Board as part of the Ocean Plan General Exception.

Attachment B – Standard Permit Provisions and General Provisions

Conditions applicable to all NPDES permits, as required under 40 CFR 122.41, and conditions applicable to MS4s and storm water discharges, as required under 40 CFR 122.42(c) and 122.42(d), respectively are provided in Attachment B to the Order. They have been provided expressly in their entirety.

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. These general provisions are typically included in or applicable to waste discharge requirements issued by the San Diego Water Board. Many of the general provisions were developed by the State Water Board. Where a general provision is derived from statute or regulation, a citation of the statute or regulation section is provided. General provisions that do not provide a citation are included under the authority provided CWC 13377.

Attachment C – Acronyms, Abbreviations and Definitions

The acronyms and abbreviations that are used in the Order are provided in Attachment C. Attachment C also includes definitions that may provide an explanation or description of the meaning or intent of specific terms or phrases included in the Order.

Attachment D – Jurisdictional Runoff Management Program Annual Report Form

An example of the Jurisdictional Runoff Management Program Annual Report Form required to be submitted by each Copermittee as part of the Annual Reports required under Provision F.3.b.(1)(e) is provided as Attachment D to the Order. An electronic version of the form will be available from the San Diego Water Board after the adoption of the Order.

The Jurisdictional Runoff Management Program Annual Report Form includes the minimum information necessary to demonstrate that the Copermittee is implementing and in compliance with the requirements of Provision E, and includes much of the information required to be reported pursuant to 40 CFR 122.42(c).

The information that must be provided on the Jurisdictional Runoff Management Program Annual Report Form is limited to the fiscal year, which begins July 1 and ends June 30 of the following year. The information expected to be provided by the Copermittees in each section of the Jurisdictional Runoff Management Program Annual Report Form is discussed below.

I. COPERMITTEE INFORMATION

The name of the Copermittee (e.g. name of city, county, or special district) and the contact information for the storm water program manager are provided under this section.

II. LEGAL AUTHORITY

The Copermittee must confirm whether or not the legal authorities under Provision E.1.a have been established for itself within its jurisdiction.

The Copermittee must also confirm whether or not a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority, as required under Provision E.1.b. The certification statement required by Provision E.1.b is only required to be submitted with the first Annual Report required under Provision F.3.b.

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

The Copermittee must inform the San Diego Water Board whether or not an update to its jurisdictional runoff management program document was required or recommended by the San Diego Water Board during the reporting period. An update to the jurisdictional runoff management program is required under Provision F.2.a. The San Diego Water Board may recommend modifications to the jurisdictional runoff management program as part of the iterative approach and adaptive management process required under Provision B.5, which may result in an update that is necessary for the Copermittee's jurisdictional runoff management document.

If an update was required or recommended, the Copermittee must confirm whether or not the update was completed and made available on the Regional Clearinghouse within the reporting period. If no update was required or recommended, an answer is not required. If the answer is NO, meaning the required or recommended update was not completed and/or made available on the Regional Clearinghouse, the Copermittee must attach a

schedule for the completion of the update and/or posting of the updated document on the Regional Clearinghouse.

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

The Copermittee must confirm whether or not a program was implemented during the fiscal year to actively detect and eliminate illicit discharges and connections in accordance with the requirements under Provision E.2.

In addition to confirming that a program to detect and eliminate illicit discharges was implemented during the reporting period, the Copermittee is also required to report on several items related to the program. The information that must be reported is limited to the fiscal year for the Annual Report.

All non-storm water discharges are considered illicit discharges unless the source is identified as one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5). If a non-storm water discharge is identified as one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5), the discharge is a non-storm water discharge, but not an illicit discharge. If a non-storm water discharge is identified but not in one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5), the discharge is both a non-storm water discharge and an illicit discharge.

V. DEVELOPMENT PLANNING PROGRAM

The Copermittee must confirm whether or not a development planning program was implemented during the fiscal year in accordance with the requirements under Provision E.3.

The Copermittee must also inform the San Diego Water Board whether or not an update to its BMP Design Manual was required or recommended by the San Diego Water Board during the fiscal year. An update to the BMP Design Manual is required under Provision F.2.b. The San Diego Water Board may recommend modifications to the BMP Design Manual, which may result in an update that is necessary for Copermittee's the BMP Design Manual.

If an update was required or recommended, the Copermittee must confirm whether or not the update was completed and made available on the Regional Clearinghouse within the reporting period. If no update was required or recommended, an answer is not required. If the answer is NO, meaning the required or recommended update was not completed and/or made available on the Regional Clearinghouse, the Copermittee must attach a schedule for the completion of the update and/or posting of the updated document on the Regional Clearinghouse.

The Copermittee is also required to report on several items related to the program. For the development and redevelopment projects that are reviewed under the program, the Copermittee must report the total number projects submitted for review during the fiscal year. Of those projects, the Copermittee must report the number that are Priority Development Projects, as defined under Provision E.3.b.(1). The Copermittee must also report the number of Priority Development Projects that were approved and/or granted occupancy during the fiscal year, regardless of when the project was originally submitted for review. Any projects that were approved during the fiscal year and granted any

exemptions from the BMP Design Manual requirements and/or allowed to implement alternative compliance options in accordance with Provision E.3.c.(3) must be reported.

Finally, the Copermittee must also report on several items related to its oversight of permanent BMPs on Priority Development Projects within its jurisdiction, as required under Provision E.3.e. The information that must be reported is limited to the fiscal year for the Annual Report.

VI. CONSTRUCTION MANAGEMENT PROGRAM

The Copermittee must confirm whether or not a construction management program was implemented during the fiscal year in accordance with the requirements under Provision E.4.

The Copermittee is also required to report on several items related to its oversight construction projects within its jurisdiction. The information that must be reported is limited to the fiscal year for the Annual Report.

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

The Copermittee must confirm whether or not an existing development management program was implemented during the fiscal year in accordance with the requirements under Provision E.5.

The Copermittee is also required to report on several items related to its oversight in areas of existing development within its jurisdiction. The information that must be reported is limited to the fiscal year for the Annual Report. The information must also be separated into four categories of existing development: municipal, commercial, industrial, and residential.

VIII. PUBLIC EDUCATION AND PARTICIPATION

The Copermittee must confirm whether or not a public education program component was implemented during the fiscal year in accordance with the requirements under Provision E.7.a.

The Copermittee must also confirm whether or not a public participation program component was implemented during the fiscal year in accordance with the requirements under Provision E.7.b.

IX. FISCAL ANALYSIS

The Copermittee must confirm a summary of its fiscal analysis, conducted in accordance with the requirements under Provision E.8, has been attached to the form.

X. CERTIFICATION

A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative must sign and certify the Jurisdictional Runoff Management Program Annual Report Form. The appropriate box must be checked to indicate the whether a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative is signing the form.

Attachment E – Specific Provisions for Total Maximum Daily Loads

Attachment E provides specific provisions for implementing the load allocations (LAs) and wasteload allocations (WLAs) of Total Maximum Daily Loads (TMDLs) adopted by the San Diego Water Board and approved by USEPA in which the Copermittees are identified as responsible for discharges subject to the requirements of the TMDLs. Federal regulations require that NPDES requirements incorporate water quality based effluent limitations (WQBELs) that must be consistent with the requirements and assumptions of any available WLAs,[46] which may be expressed as numeric effluent limitations, when feasible, and/or as a best management practice (BMP) program of expanded or better-tailored BMPs.[47] Where the TMDL includes WLAs that provide numeric pollutant load or pollutant parameter objectives, the WLA has been, where feasible, translated into numeric WQBELs.[48]

For each TMDL in Attachment E, four sections are included:

a. Applicability: This section provides the resolution under which the TMDL Basin Plan amendment was adopted and approved, with the applicable adoption and approval dates. This section also gives the effective date of the TMDL and where the TMDL is applicable (i.e. Watershed Management Area and water body). The Copermittees that are responsible for implementing the specific provisions are also given in this section.

b. Final TMDL Compliance Requirements: For each TMDL, the final TMDL compliance requirements consist of the final TMDL compliance date(s), the final WQBELs, and the final TMDL compliance determination requirements. The final WQBELs are expressed in terms of receiving water limitations, effluent limitations, and/or best management practices (BMPs). The final WQBELs for the TMDLs are incorporated by reference into Provision A of the Order. The final WQBELs become enforceable when the final TMDL compliance dates have passed. Applicable BMPs within the final WQBELs must be incorporated into the Water Quality Improvement Plans. Compliance with the final WQBELs will be determined in accordance with the options provided under the final TMDL compliance determination requirements.

c. Interim TMDL Compliance Requirements: If the final TMDL compliance date has not passed and there are interim TMDL compliance requirements, they are included in this section. If there are interim WQBELs with interim compliance dates, the interim WQBELs become enforceable when the corresponding interim compliance dates have passed. Compliance with the interim WQBELs will be determined in accordance with the options provided under the interim TMDL compliance determination requirements.

d. Specific Monitoring and Assessment Requirements: If there are specific monitoring and assessment requirements that cannot be met with the monitoring and assessment program

[46] 40 CFR 122.44(d)(1)(vii)(B)
[47] 40 CFR 122.44(k)(2) and 40 CFR 122.44(k)(3)
[48] November 26, 2014 Memorandum from the USEPA, Revisions to the November 22, 2002 Memorandum "Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLA""

requirements under Provision D of the Order, the additional requirements are included in this section.

The requirements of the TMDLs are based on and consistent with the assumptions and requirements of any available adopted and approved TMDLs that have been incorporated into the Basin Plan. Modifications to the requirements for the TMDLs in Attachment E cannot be made unless the TMDLs are modified in the Basin Plan.

A modification to any aspect of a TMDL in the Basin Plan requires a Basin Plan amendment. A Basin Plan amendment to modify a TMDL will require the San Diego Water Board to adopt a resolution to amend the Basin Plan, which includes a separate public process. When the San Diego Water Board adopts a Basin Plan amendment, it subsequently requires approval from the State Water Board, the Office of Administrative Law, and the USEPA before it becomes effective.

If and when the TMDLs are a modified in the Basin Plan, the San Diego Water Board will revise the requirements of the Order in accordance with the Basin Plan amendment. When a Basin Plan amendment to modify a TMDL becomes effective, the San Diego Water Board will modify the requirements of the Order pursuant to the requirements of Provision H.4 of the Order as soon as possible.

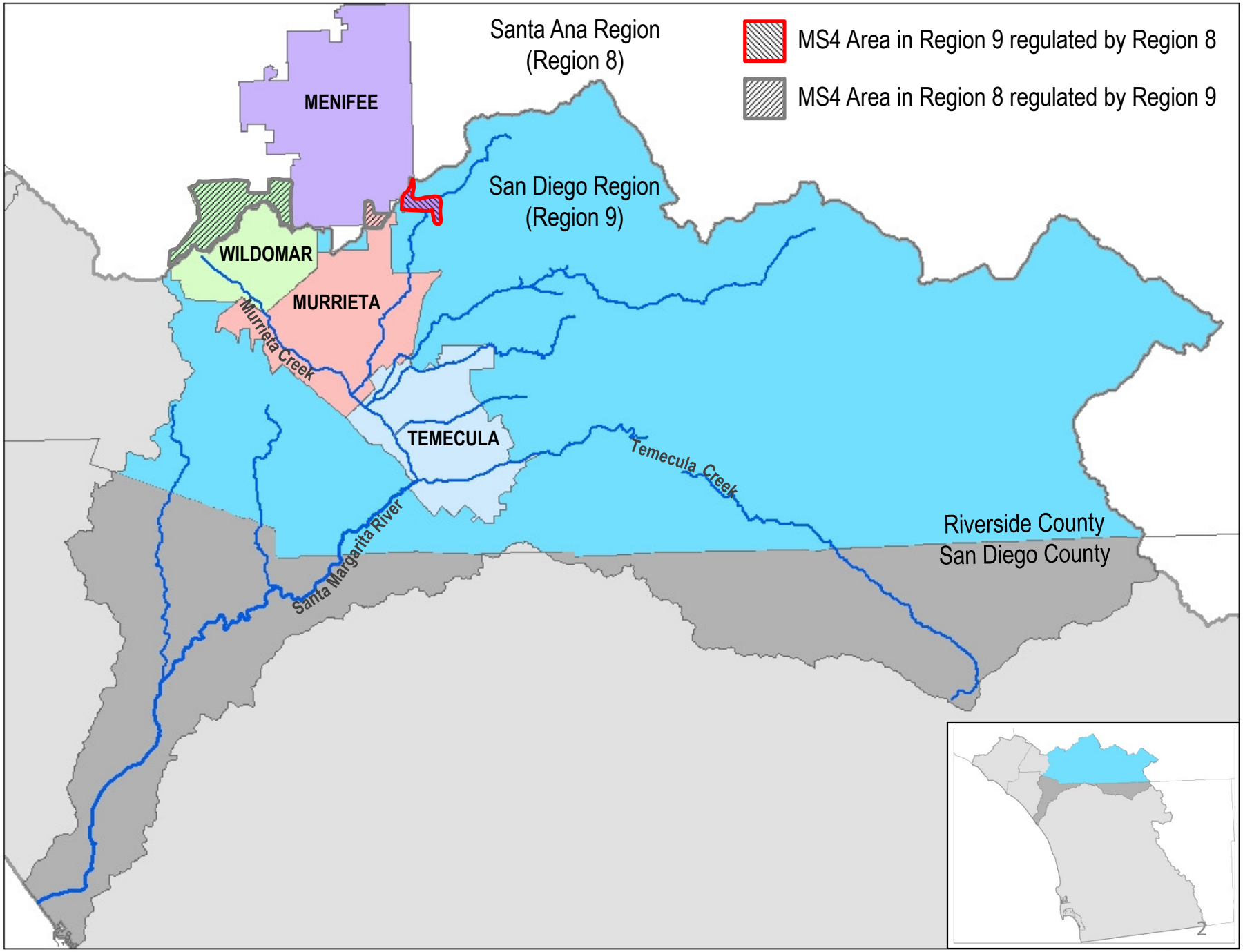
Santa Ana Region
(Region 8)
MS4 Area in Region 9 regulated by Region 8
MS4 Area in Region 8 regulated by Region 9
MENIFEE
San Diego Region
(Region 9)
WILDOMAR
MURRIETA
Murrieta Creek
TEMECULA
Temecula Creek
Santa Margarita River
Riverside County
San Diego County
2

WARREN D. WILLIAMS
General Manager-Chief Engineer

1995 MARKET STREET
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951.955.1200
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RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

September 14, 2015

Sent via email to: sandiego@waterboards.ca.gov

Mr. Wayne Chiu
CRWQCB - San Diego Region
9174 Sky Park Court, Suite 100
San Diego, California 92108

Dear Mr. Chiu:

Re: Comment - Tentative Order No. R9-2015-0100, Place ID: 786088WChiu

The Riverside County Flood Control and Water Conservation District (District) appreciates this opportunity to submit comments on the above named Tentative Order, on behalf of the Riverside County MS4 Permittees within the San Diego Region (Riverside County Co-Permittees), which includes the District, the County of Riverside, and the Cities of Murrieta, Temecula and Wildomar. Tentative Order No. R9-2015-0100 (Tentative Order) proposes to amend the National Pollutant Discharge Elimination System (NPDES) Permit for Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region, Order No. R9-2013-0001, as amended by Order No. R9-2015-0001 (Regional Permit) to include the Riverside County Co-Permittees, and also incorporate limited permit provisions for the City of Menifee.

The Riverside County Co-Permittees have previously commented that the San Diego Regional Water Quality Control Board (Regional Board) lacks authority to adopt a Regional Permit covering San Diego, Orange, and Riverside Counties. Our concerns and legal objections to inclusion into the Regional Permit, as well as other comments on provisions in the Regional Permit, are more completely set forth in our written comment letters dated January 10, 2013 (regarding Order No. R9-2013-0001) and November 19, 2014 (regarding Order R9-2015-0001), and also in the Santa Margarita Region Report of Waste Discharge (ROWD) dated May 10, 2015. We respectfully request that these written comments and ROWD, as well as the testimony of the District and Riverside County witnesses at the Regional Board hearings held in 2013 and 2015 in connection with the adoption of these Orders, be incorporated in the record for this Tentative Order. We note that our previous comments regarding the absence of an alternative compliance pathway may no longer be relevant, given that an alternative compliance pathway is being proposed for adoption in the Tentative Order. For the convenience of the Board and staff, those previous written comments have been submitted under a separate cover.

Notwithstanding the above concerns, on August 26, 2015, District staff met with Regional Board staff on behalf of the Riverside County Co-Permittees to discuss issues relating to the Regional Permit; Regional Board staff provided valuable compliance assistance and recommendations during this meeting. Our discussion focused on the following issues:

- Permit implementation challenges resulting from the Riverside County Co-Permittees' necessary late entry into the 2013 Regional Permit;
- The Tentative Order's proposed receiving water limitations alternative compliance pathway language;
- The Tentative Order's proposal to include limited permit provisions for the City of Menifee; and
- Monitoring and assessment under Regional Permit Provision D.4.a(1)(a).

In what follows, we summarize the understandings that we reached with Regional Board staff on those issues as well as set forth our suggested revisions to certain elements of the Tentative Order's alternative compliance pathway section. Finally, we include a request for re-inclusion of a third-party certification program into the Regional Permit's existing development inspection provisions.

Permit Implementation Challenges Resulting from Late Entry into the 2013 Regional Permit

During our meeting with staff, we noted that several of the ROWD requirements of the Regional Permit[1], could not feasibly be completed by the Riverside County Co-Permittees because we would not have an approved Water Quality Improvement Plan (WQIP) or Jurisdictional Runoff Management Plan (JRMP) at the time of ROWD submittal, December 2017. We estimated the earliest possible date for Regional Board acceptance of our WQIP to be May 2018, just one month before Regional Permit expiration. It is our understanding that, while the ROWD must be submitted by the date specified in the Regional Permit, it only need address the provisions that can feasibly be completed with the data and information that is available to us prior to the deadline for ROWD submittal.

Additionally, we noted several other Regional Permit provisions, including requirements to submit certification of legal authority[2], assessment and subsequent WQIP revision requirements[3], and requirements to submit a regional monitoring and assessment report[4], which either require data gathered under an approved WQIP, or are due for submittal outside of the Regional Permit's term. From our discussion, we understand that the Regional Board would agree that: 1) the certification of legal authority which was submitted by the Riverside County Co-Permittees under Order No. R9-2010-0016 will remain effective until a new certification is submitted with our first WQIP annual report (after the current Permit term has ended), 2) any provisions regarding assessments or requiring data gathered under an approved WQIP will not be due until such time that the necessary data are gathered and the assessments made under time periods described in the Regional Permit, and 3) we should complete the regional monitoring and assessment report for the current Regional Permit term utilizing data gathered during the transitional monitoring period, as these will be the only data that will be available to us at that time.

Receiving Water Limitations Alternative Compliance Pathway Language

As the Regional Board Executive Officer and staff indicated in hearings on the Regional Permit, neither the Riverside County Co-Permittees, nor co-permittees from the other two counties in the Permit will be able to meet the Regional Permit's Receiving Water Limitations (RWL) provisions for some years. In light of that fact, which was also recognized by the State Water Board in its precedential Order WQ 2015-0075 regarding the Los Angeles County MS4 Permit, we appreciate that the Tentative Order proposes to incorporate a pathway to compliance with RWLs. We support the alternative compliance pathway concept set forth in Tentative Order Provision B.3.c, and for purposes of additional clarity and utility in the language, we offer the following three comments:

Comment #1

Proposed Provision B.3.c(1)(a)(vii) would require that co-permittees develop at least one annual milestone and date for its achievement for each final numeric goal included in the WQIP. We believe that this proposed provision may place undue burden on municipalities and municipal agencies, including the Riverside County Co-Permittees, particularly in the case of longer-term projects. For example, due to the nature of municipal budget and project approval processes, final numeric goals requiring 20 years or more to complete will necessarily generate annual milestones which will be less definitive and more speculative the farther out in time that they are projected. Moreover, we are sensitive to the even greater burden that this proposed

[1] Including Provisions B.5.a, B.5.c, D.4.d(1) through (3), and F.5.b(3) and (4)
[2] Provision E.1.b
[3] Provisions D.4.a(2), D.4.b(1)(c), D.4.b(2)(c), D.4.c, D.4.d
[4] Provision F.3.c

provision would place on other regional co-permittees that have jurisdiction over multiple watershed management areas (WMAs). To ease their burden, we believe that some accommodation should be made in the Tentative Order language to allow milestones to be spaced further apart. We propose the following revision to accommodate both concerns, but ask that these two concerns be considered as separate requests (proposed revised language in ***bold, underline***):

> Provision B.3.c(1)(a)(vii): *"For each final numeric goal developed pursuant to Provisions B.3.a and B.3.c.(1)(a)(i)-(v), at least* ~~*one annual*~~ ***two*** *milestones[footnote omitted] and dates for* ~~*its*~~***their*** *achievement must be* ~~***included within each Water Quality Improvement Plan Annual Report reporting period until the final numeric goal is achieved***~~ ***developed for the permit term. The two, or more, milestones and dates for their achievement shall be submitted in the first Water Quality Improvement Plan Annual Report of each permit term. When a subsequent permit is adopted, a new set of milestones and dates for their achievement shall be submitted as part of the first Water Quality Improvement Plan Annual Report under that permit, until the final numeric goal is achieved."***

Comment #2

Proposed Provisions B.3.c(2) and B.3.c(2)(d) would enable co-permittees who opt to use the WQIP for RWL compliance to remain in compliance as long as they have a WQIP which has been accepted by the Regional Board in accordance with the WQIP update requirements of Provision F.2.c. While this language appears to provide that co-permittees remain in compliance so long as they meet the requirements for updates set forth in Provision B.3.c(2), other provisions of the Tentative Order or Regional Permit appear to introduce some uncertainty. First, we note that footnote 10 on page 36 states that proposed changes to the WQIP do not stay any permit provision. Second, Provision A.4.c states that, in connection with the updating of a WQIP, "[n]othing in Provisions A.4.a and A.4.b prevents the San Diego Water Board from enforcing any provision of this Order while the applicable Copermittees prepare and implement the above update to the Water Quality Improvement Plan and jurisdictional runoff management programs."

Additionally, it is unclear what the proper action should be in situations where one or more, but not all, co-permittees within a WMA require revision to their individual jurisdictional programs under the WQIP. Taken together, the Tentative Order language is unclear whether all of the other co-permittees would be covered during individual co-permittee-proposed periods of WQIP revision, public review, and Regional Board consideration, because during any periods of revision, the entire WMA would not have a Regional Board accepted WQIP as is required under Tentative Order Provision B.3.c.(2)(d). We believe that it is logical that co-permittees should be covered under the compliance pathway, as long as they continue to meet the other requirements of Provision B.3.c.(2), and the WMA has a WQIP which has been initially accepted by the Regional Board. In order to address these issues, we offer the following revisions to clarify:

> Provision B.3.c(2): *"Each Copermittee that voluntarily completes the requirements of Provision B.3.c.(1) is deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2.a, and A.3.b for the pollutants and conditions for which numeric goals are developed when the Water Quality Improvement Plan, incorporating the requirements of Provision B.3.c.(1), is accepted by the San Diego Water Board pursuant to Provision F.1.b* ~~*or F.2.c*~~*. The Copermittee is deemed in compliance during the term of this Order as long as:"*
>
> Provision B.3.c(2)(d): Delete.
>
> Provision A.4.c: ***"Except as provided in Provision B.3.c(2),*** *nothing in Provisions A.4.a and A.4.b prevents the San Diego Water Board from enforcing any provision of this Order while the applicable Copermittees prepare and implement the above update to the Water Quality Improvement Plan and jurisdictional runoff management programs."*

Comment #3

Proposed Provision B.3.c does not provide for interim compliance for co-permittees who are engaged in the WQIP planning phase. The State Water Board, in Section II.B.6 of Order WQ 2015-0075, endorsed this provision in the 2012 Los Angeles County MS4 permit, which allows interim compliance for co-permittees under that permit while they are preparing their planning documents, subject to rigorous requirements.

We believe that the provision of interim compliance is consistent with Principle Number 3 in Section II.B.7 of the State Water Board Order WQ 2015-0075, which expects that every regional board have incorporated in their alternative compliance pathways a mechanism that "allows permittees appropriate time to come into compliance . . . during full implementation of the compliance alternative." When read with Section II.B.6 of the State Water Board's Order, we believe that the compliance pathway option should also apply during the development and approval period for the WQIP, so long as co-permittees are in compliance with all applicable permit requirements and time schedules. To effectuate such an option, we suggest the following language to be included as a new Provision B.3.c(3):

> ***"A Copermittee who provides written notice to the Regional Board Executive Officer of its intent to utilize the compliance option provided in Provision B.3.c shall be deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2.a, and A.3.b within a Watershed Management Area from the date of that notice to the date that the San Diego Water Board accepts the Water Quality Improvement Plan pursuant to Provisions F.1.b or F.2.c, provided that the Copermittee meets all deadlines set forth in Provisions F.1.a and b for the development of the Water Quality Improvement Plan, and is otherwise in compliance with the requirements of Provision B.3.c. Any failure by the Copermittee to meet such deadlines or to be in compliance shall, from the date of such failure, remove the "deemed complaint" status of the Copermittee unless and until the Copermittee's Water Quality Improvement Plan is accepted by the San Diego Water Board."***

Proposed Inclusion of the City of Menifee in WQIP Development and Implementation

The City of Menifee lies primarily within the Santa Ana Regional Board's jurisdiction; less than 1.3 square miles of the City are located within the Santa Margarita River WMA. Finding number 29.b and various portions of Attachment F of the Tentative Order describe the circumstances under which the Regional Board proposes, through agreements, to require the City of Menifee to participate during development and implementation of the Santa Margarita River WMA WQIP; Table B-1 also proposes to add the City as a "Responsible Co-Permittee" within the WMA.

During our aforementioned meeting, we presented MS4 inventory and mapping which shows that the City of Menifee does not currently own or operate any MS4 within the Santa Margarita River WMA. Regional Board staff explained that should the Regional Board adopt the Tentative Order, the City would be bound by the provisions of its Phase 1 MS4 Permit in the Santa Ana Region only, with the exception of applicable TMDLs which may be developed for the Santa Margarita River WMA in the future. It was further explained that, with the exception of adoption of applicable future TMDLs, the City's implementation of the WQIP would be achieved through implementation of Santa Ana Region MS4 Permit compliance documents and programs.

The City of Menifee has provided comments on the Tentative Order requesting removal of language in the Tentative Order that requires the City to participate in the development and implementation of the Santa Margarita WMA WQIP; the Riverside County Co-Permittees support the City's comments, which are attached to this letter.

Monitoring and Assessment

Provision D.4.a(1)(a) prescribes that assessments required to be made under Provision D.4.a(2) must be included in each co-permittee's transitional monitoring and assessment reports; however, Provision D.4.a(2) requires determination of whether strategies identified in the co-permittee's WQIP are progressing towards

achieving interim and final numeric goals described in the WQIP. It is our understanding that transitional monitoring and assessment applies to the time period when a co-permittee's WQIP is being developed, and therefore assessments made during this time period cannot provide information on the progress of the WQIP. In light of this issue, which appears to have been a typographical error, we suggest the following revision:

> Provision D.4.a(1)(a): "***~~Based on~~ The*** *data collected pursuant to Provision D.1.a**~~, the assessments under Provision D.4.a(2)~~*** *must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2)."*

Re-Inclusion of the Optional Third-Party Certification Program into the Regional Permit's Existing Development Inspection Provisions

Section F.3.b(4)(c) of Order No. R9-2010-0016 allowed the Riverside County Co-Permittees the option to propose a third-party certification program for commercial and industrial inspection programs, subject to Regional Board Executive Officer acceptance. We note that a similar provision does not exist in the Tentative Order, and respectfully request inclusion of this option in the Regional Permit.

Conclusion

The Riverside County Co-Permittees are committed to water quality in the Santa Margarita River WMA, and look forward to continued collaboration with Regional Board staff. Thank you for your consideration of these comments. If you have any questions, please contact me at smckibbi@rcflood.org, or 951.955.1273.

Very truly yours,

STUART E. MCKIBBIN
Chief of Watershed Protection Division

Attachment
- City of Menifee Comment Letter dated September 10, 2015

SEB:cw
P8/172444

Scott A. Mann
Mayor

John V. Denver
Mayor Pro Tem

Greg August
Councilmember

Matthew Liesemeyer
Councilmember

Vacant
Councilmember
District 3

September 10, 2015

Wayne Chiu
California Regional Water Quality Control Board, San Diego Region
2375 Northside Drive, Suite 100
San Diego, CA 92108

Subject: Comment - Tentative Order No. R9-2015-0100, Place ID: 786088WChiu

Dear Mr. Chiu,

The City of Menifee (the "City") would like to thank the San Diego Regional Water Quality Control Board ("San Diego Water Board") for the opportunity to comment on Tentative Order No. R9-2015-0100, an Order amending Order No. R9-2013-0001 as amended by Order No. R9-2015-0001 ("Tentative Order"). The City is committed to developing and implementing jurisdictional and regional programs and strategies that will improve overall water quality.

The City has been working hard to meet the requirements of the Santa Ana Region Permit under Order No. R8-2010-0033. The Report of Waste Discharge (ROWD) submitted to the Santa Ana Board in July 2015 highlights the Santa Ana Region's major water quality accomplishments since the Permit issuance. The City has been an active participant in the region, including in the development and implementation of the Comprehensive Nutrient Reduction Plan (CNRP) (approved July 2013) to address nutrient Total Maximum Daily Loads (TMDL) for Canyon Lake and Lake Elsinore and in the development of the Watershed Action Plan (WAP) (pending Santa Ana Regional Board approval). The City has also developed a Local Implementation Plan (LIP), which details the day-to-day jurisdictional storm water program to meet Permit requirements.

As stated in the Tentative Order, the City is located partially within the jurisdiction of both the San Diego Water Board and the Santa Ana Regional Water Quality Control Board ("Santa Ana Water Board"). More specifically, less than 1.3 square miles in the City is located in the Santa Margarita Watershed Management Area (WMA). To date, the San Diego Water Board and the Santa Ana Water Board have maintained agreements that designate the Santa Ana Water Board as the single Regional Water Board to regulate the City on matters pertaining to Phase I municipal separate storm sewer system (MS4) permits. The Tentative Order proposes continuing this practice, following past agreements, with the significant exception of now requiring the City to participate in the development and implementation of the Santa Margarita WMA Water Quality Improvement Plan (WQIP).

Both the City and the Riverside County Flood Control and Water Conservation District (RCFCWCD) maintain GIS layers of MS4 infrastructure that they own and

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operate within the City. Since the release of the Tentative Order, the City of Menifee has coordinated with RCFCWCD to investigate ownership of MS4 within the small portion of the City that is within the Santa Margarita WMA. As shown on the attached maps, MS4 within the portion of the City in the Santa Margarita WMA is owned and operated exclusively by RCFCWCD. The City of Menifee does not own or operate MS4 within the Santa Margarita WMA.

It is the City's understanding, according to the Code of Federal Regulations, title 40, section 122.1(b)(1), that "[t]he NPDES program requires permits for the discharge of 'pollutants' from any 'point source' into 'waters of the United States'". The City does not own or operate any "point sources," as defined in 40 C.F.R. § 122.2 or section 502(14) of the Clean Water Act, within the Santa Margarita WMA. Because the City is not responsible for any MS4 within the Santa Margarita

WMA, it should not be required to develop and implement the Santa Margarita WMA WQIP. For this reason, the City respectfully requests removal of language in the Tentative Order that requires the City to participate in the development and implementation of the Santa Margarita WMA WQIP. Suggested edits to the text of the Tentative Order are shown below:

- Attachment 1, Finding 29(b): "...the City of Menifee is largely regulated by the Santa Ana Water Board under Order No. R8-2010-0033 as it may be amended or reissued, including those portions of the City of Menifee within the San Diego Water Board's jurisdiction, upon the effective date of this Order. ~~The agreement also requires the City of Menifee to actively participate during development and implementation of the Santa Margarita River Watershed Management Area Water Quality Improvement Plan required pursuant to this Order~~..."
- Attachment 1, Table B-1 "Watershed Management Areas": Please strike the City of Menifee from the table and remove the associated footnote.
- Attachment 2, Provision B.1: "~~Footnote 3 to Table B-1 has been included to specify that Phase I MS4 discharges within the jurisdictional boundaries of the City of Menifee located within the San Diego Region will be regulated under Santa Ana Water Board Order No. R8-2010-0033 (NPDES No. CAS618033) and any reissuance thereof. At this time, the City of Menifee is not identified as a responsible Copermittee for any TMDLs established by the San Diego Water Board. Under the terms of the agreement, the City of Menifee must actively participate in the development and implementation of the Santa Margarita River Watershed Management Area Water Quality Improvement Plan required pursuant to Order No. R9-2013-0001, and any reissuance thereof.~~"
- Attachment 2: "The City of Menifee is not regulated as a Copermittee under this Order because it <u>does not own or operate</u> ~~Phase I~~ MS4 ~~discharges~~ <u>within the portion of the City that is located within the San Diego Region.</u> ~~Are regulated by Santa Ana Water Board Order No. R8-2010-0033 as it may be amended or issued pursuant to Water Code section 13228 designation. The requirements of this Order that apply to the City of Menifee for the duration of this Order, consistent with the Water Code section 13228 written agreement dated [Month][Day], 2015, are described in Finding 29 and Footnote 3 to Table B-1.~~"

Wayne Chiu
San Diego Water Board
September 9, 2015

Thank you for your consideration. Please feel free to contact me or Yolanda Macalalad at 951-639-1368 extension 169 if you have any questions regarding the above comments.

Sincerely,

Jonathan Smith, PE, QSD
Director of Public Works/City Engineer

Cc (by email):
ymacalalad@cityofmenifee.us
sglynn@cityofmenifee.us
nabad@cityofmenifee.us
sebruckner@rcflood.org

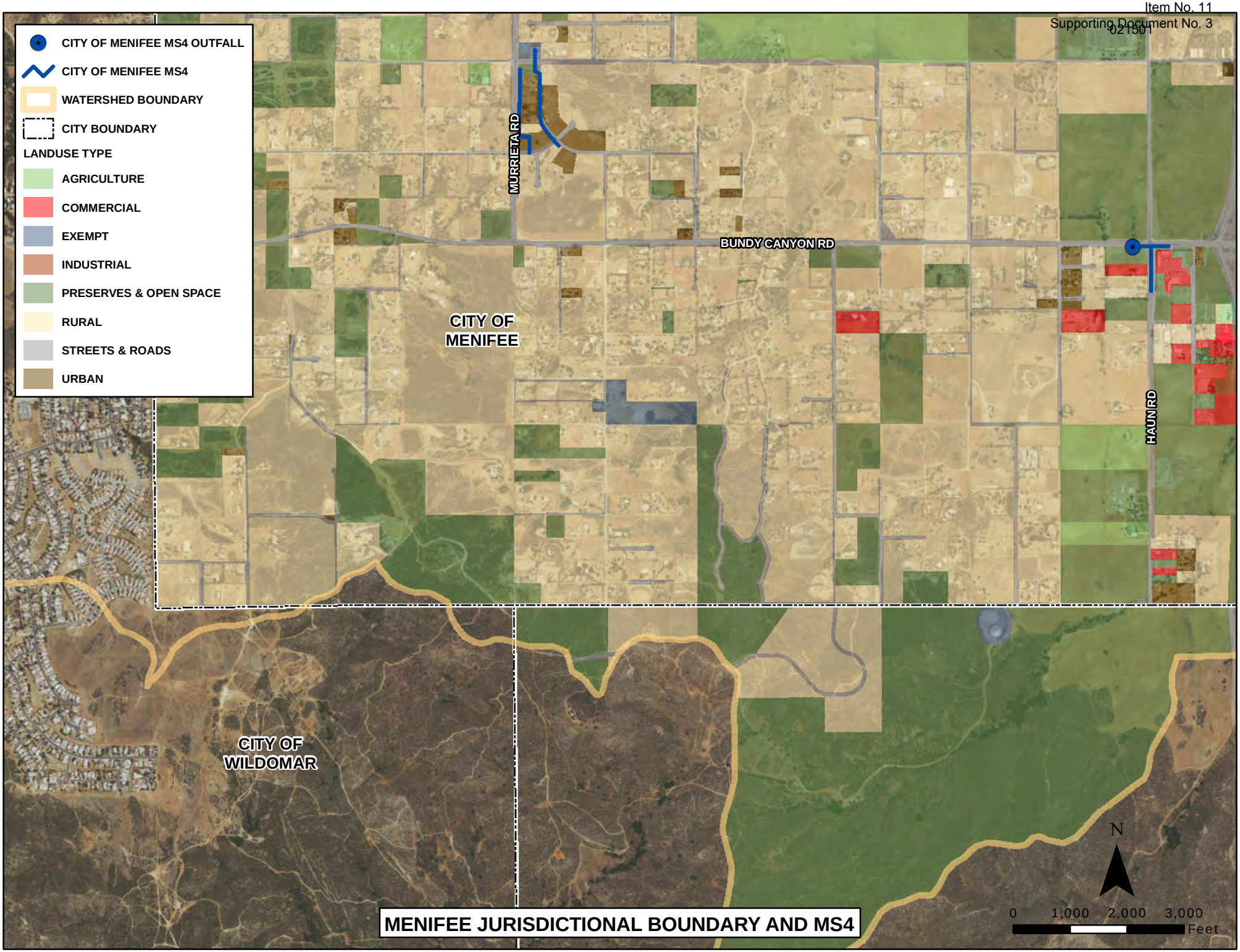

MENIFEE JURISDICTIONAL BOUNDARY AND MS4

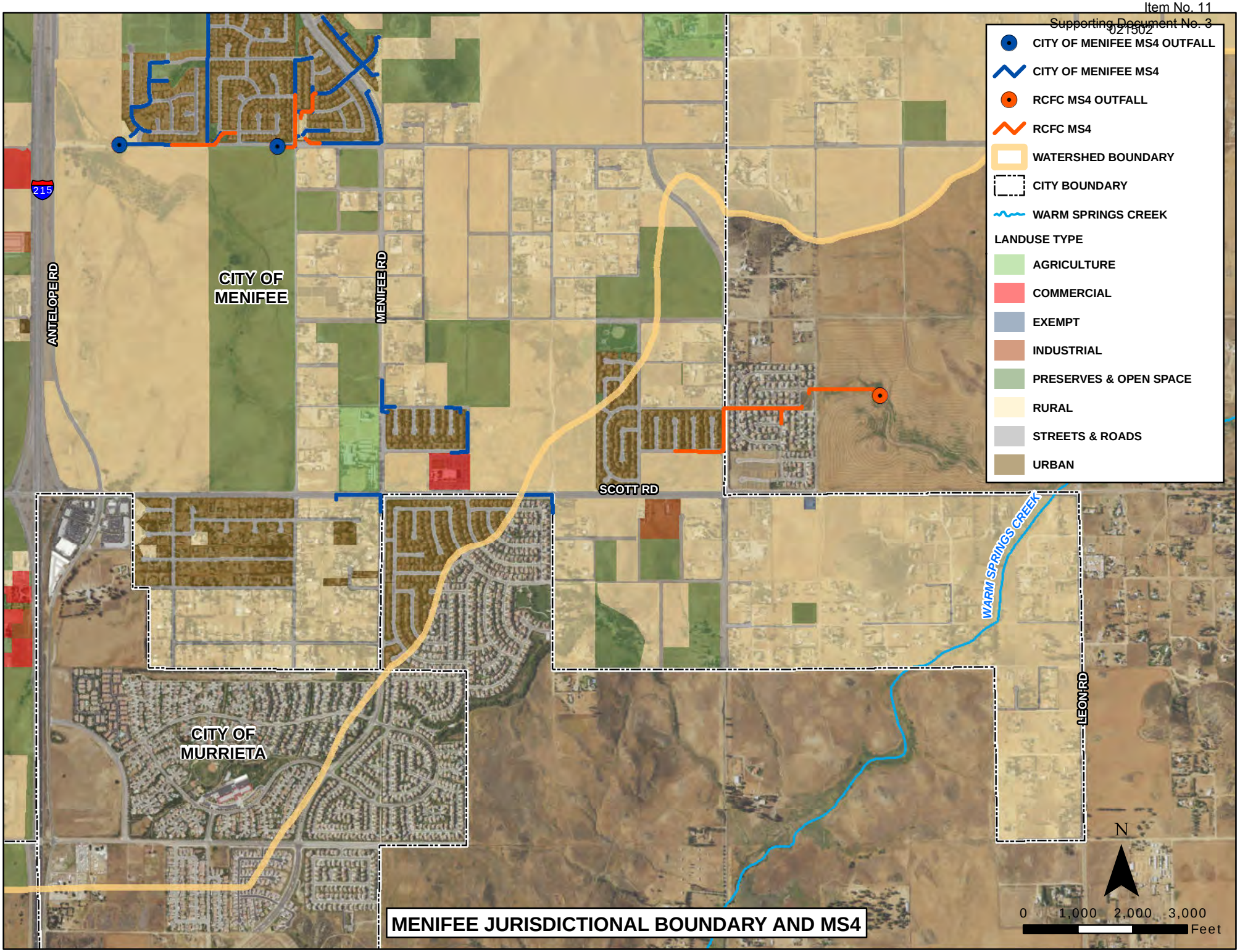

MENIFEE JURISDICTIONAL BOUNDARY AND MS4

WARREN D. WILLIAMS
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RIVERSIDE COUNTY FLOOD CONTROL
AND WATER CONSERVATION DISTRICT

September 14, 2015

Sent via email to: sandiego@waterboards.ca.gov

Mr. Wayne Chiu
CRWQCB - San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Dear Mr. Chiu:

Re: Comment - Tentative Order No. R9-2015-0100, Place ID: 786088WChiu

In conjunction with our comment letter dated September 14, 2015, the Riverside County Co-Permittees[1] are submitting for inclusion into the administrative record for Tentative Order No. R9-2015-0100, comments which were submitted on previous Orders. Please find attached the following items:

- Comment letter dated January 10, 2013 regarding Order No. R9-2013-0001;
- Comment letter dated November 19, 2014 regarding Order R9-2015-0001; and
- Section 4.0 of the Santa Margarita Region Report of Waste Discharge (ROWD), dated May 10, 2015.

If you have any questions, please contact me at smckibbi@rcflood.org, or 951.955.1273.

Very truly yours,

STUART E. MCKIBBIN
Chief of Watershed Protection Division

Attachments

SEB:cw
P8/172432

[1] The Riverside County Flood Control and Water Conservation District, County of Riverside and the Cities of Murrieta, Temecula and Wildomar

4.0 Additional Comments on Proposed Permit

- **Previous Comments** - The Co-Permittees previously have expressed concerns regarding inclusion in the San Diego Regional Board's Regional Permit (Order No. R9-2013-0001, as modified by Order No. R9-2015-0001). The Co-Permittees' concerns and legal objections to inclusion in a regional permit are set out more fully in our written comment letter dated January 10, 2013, in Order No. R9-2013-0001 and November 19, 2014 regarding Order R9-2015-0001. For your convenience, these comments are included as Appendix D.

- **Receiving Water Limitations Language -** The Riverside County Co-Permittees continue to believe strongly that every MS4 Permit should incorporate a clear and achievable path to compliance for Co-Permittees. The Co-Permittees are actively participating in the workshops held by Regional Board staff concerning this important topic.

  The focus of the Watershed Workplan is on an iterative, flexible, and priority-setting approach that is intended to enable the Co-Permittees to focus on the most important water quality impairments in the SMR, and improve water quality. As we have previously commented, if the Co-Permittees have no protection from automatic liability for exceedances of water quality standards, they must address each such exceedance, even when that exceedance may be transitory or of minimal environmental or public health consequence. Stretching resources to address such issues diverts limited Co-Permittee resources from the most important threats to water quality and delays overall water quality improvement.

  State Board staff has already strongly signaled its support of alternative compliance language in MS4 permits, as set forth in the draft Order on the petitions challenging the 2012 Los Angeles County MS4 Permit. The Co-Permittees look forward to working with Regional Board staff, permittees from Orange and San Diego Counties, and the other stakeholders to develop appropriate alternative compliance language.

- **Prior Lawful Approval Language -** The Co-Permittees request language that allows each Co-Permittee to evaluate each project independently, in order to determine at their sole discretion, compliance as it relates to Prior Lawful Approval.

- **CEQA Processing Considerations** – Programmatic requirements that entail structural improvements such as retrofits and/or BMPs will trigger CEQA compliance. Future Permit language should discuss lead agency designation and consider CEQA processing in future workplan implementation timelines.

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RIVERSIDE COUNTY FLOOD CONTROL
AND WATER CONSERVATION DISTRICT

November 19, 2014

sent via email 11/19/14: Laurie.Walsh@waterboards.ca.gov

Ms. Laurie Walsh, P.E., WRC Engineer
CRWQCB - San Diego Region
2375 Northside Drive, Suite 100
San Diego, CA 92108

Dear Ms. Walsh:

Re: Comment - Tentative Order No. R9-2015-0001Place ID:65801LWalsh

This letter is written by the Riverside County Flood Control and Water Conservation District (District), on behalf of itself, the County of Riverside and the Cities of Murrieta, Temecula, and Wildomar (collectively, the Riverside County Co-Permittees) regarding Tentative Order No. R9-2015-0001 (Tentative Order). The Tentative Order proposes to add the County of Orange and other agencies located in South Orange County within the existing San Diego County Municipal Separate Storm Sewer System (MS4) Permit. The Riverside County Co-Permittees appreciate the opportunity provided by the San Diego Regional Water Quality Control Board (Regional Board) to offer its comments on the Tentative Order.

The Riverside County Co-Permittees wish to reiterate their concerns regarding a Regional MS4 Permit for San Diego, Orange, and Riverside Counties. Those concerns are set out more fully in our written comment letter dated January 10, 2013, on Order No. R9-2013-0001. The Riverside County Co-Permittees will be submitting a Report of Waste Discharge prior to the expiration of their current MS4 Permit, seeking either modification to the Regional Permit or an individual permit covering only those Co-Permittees. For your convenience, the January 10, 2013 comments are attached to this letter. The Co-Permittees request that this comment letter and attachments be added to the record for the Tentative Order, since most of the issues raised in those comments still pertain to the Tentative Order. The Co-Permittees also request that the oral testimony of Riverside County Co-Permittees on Order No. R9-2013-0001 be included in the record for the Tentative Order. The Riverside County Co-Permittees support the South Orange County Co-Permittees general approach to the issues raised by the Tentative Order.

Notwithstanding the Riverside County Co-Permittees' concerns to a Regional Permit, and subject to it, the Co-Permittees offer the following observations regarding the Tentative Order.

1. Need for Path to Compliance

As set forth in our written and oral comments on Order No. R9-2013-0001, the Riverside County Co-Permittees continue to believe strongly that every MS4 permit, including the Tentative Order, should

incorporate a clear and achievable path to compliance for Co-Permittees. As the Executive Officer and staff indicated in the hearings on Order No. R9-2013-0001, the San Diego County Co-Permittees will be out of compliance with the Permit's receiving water limitations (RWL) provisions for years. We agree with staff's assessment, and state further, that the lack of a provision to allow Co-Permittees to be considered in compliance with the RWL provisions leaves the Co-Permittees open to possible enforcement by third-parties and, as importantly, threatens the compliance approach that has been successfully employed by the Riverside County Co-Permittees to address water quality impairments in the Santa Margarita Region.

The Riverside County Co-Permittees agree with staff that a MS4 permit which allows the Permittees to adopt a "fail early and fail often" iterative approach to water quality is preferable to a permit which simply mandates certain actions. The Santa Margarita River Watershed Water Quality Workplan in Riverside County follows an iterative, flexible, and priority-setting approach that is intended to enable the Co-Permittees to focus on the most important water quality impairments in the Region, and make real, quantifiable improvements in water quality. As we have previously commented, if the Co-Permittees have no protection from liability for exceedances of water quality standards, they must address each such exceedance, even when that exceedance may be transitory or of minimal environmental or public health consequence. Stretching resources to address such issues diverts limited Co-Permittee resources from the most important threats to water quality and delays overall water quality improvement.

Recognizing this deficiency in the 2001 MS4 Permit for the Los Angeles County Co-Permittees, in its 2012 Permit, the Los Angeles Water Board adopted a path to compliance with RWLs through the development of adaptive and prioritized watershed management plans. The Riverside County Co-Permittees believe that a similar approach to RWL compliance should be included in the Tentative Order.

2. Hydromodification Provisions

While most of the substantive changes in the Tentative Order have specific application only to San Diego and/or South Orange Counties, the Riverside County Co-Permittees support exemptions for engineered channels and large river reaches in Provision E.3.c.(2)(e). This provision also provides an interim timeframe exemption for the implementation of hydromodification management BMP requirements for priority development projects.

The exemptions identified in Provision E.3.c.(2)(e) are appropriate and reasonable, and should be made permanent exemptions moving forward.

3. Basin Planning and Water Quality Improvement Plan (WQIP) General Comments

For the WQIPs to ultimately succeed, they need to be based upon regionally appropriate water quality standards. These water quality standards require review to ensure that they reflect sustainable conditions for beneficial uses, explicitly consider regulatory policy and environmental trade-offs

inherent in the protection of beneficial uses, and address the nature and impact of stormwater upon beneficial uses.

The Riverside County Co-Permittees would like to thank the Regional Board and staff for working with the Santa Margarita River Nutrient Initiative Group on such a review. This group, which includes dischargers, tribal interests, interested non-profits, scientists, and Regional Board staff, is using a scientifically based and rigorous approach to evaluate potential water quality targets for, and sources of, nutrients in the Santa Margarita Watershed. It is our belief that this effort will lead to more considered, effective, and appropriate management of local receiving waters, and thereby promote quicker and more effective environmental outcomes. It may also assist with the identification and development of innovative and alternative programs to manage nutrients within the Region. This effort will inform the development of the Santa Margarita River Watershed Water Quality Workplan and other regulatory programs.

The Co-Permittees request and encourage Regional Board staff to work with other stakeholders to consider, prioritize, and address other perceived constraints and inconsistencies within the San Diego Region Basin Plan. Such efforts will ultimately result in a better focus of local and regional compliance programs, including the WQIPs, on actions that are more likely to effectively and quickly address public health risks and environmental risks to receiving waters. Such an approach is exactly in line with staff's emphasis on workable solutions to these challenges.

The Riverside County Co-Permittees appreciate the opportunity to comment on the Tentative Order. Should you have any questions regarding these comments, please contact David Garcia at 951.955.1330/dhgarcia@rcflood.org.

Very truly yours,

for JASON E. UHLEY
Chief of Watershed Protection Division

Attachment

DHG:cw
P8/165901

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General Manager-Chief Engineer

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RIVERSIDE COUNTY FLOOD CONTROL
AND WATER CONSERVATION DISTRICT

January 10, 2013

Mr. Wayne Chiu, P.E.
California Regional Water Quality
Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego, California 92123-4340

Dear Mr. Chiu:

Re: Tentative Order No. R9-2013-0001
Regional MS4 Permit
Place ID: 786088Wchiu

The Riverside County Flood Control and Water Conservation District (District) is submitting this comment letter on the above listed Tentative Draft Order on behalf of the Riverside County MS4 Copermittees within the San Diego Region (Riverside County Copermittees) which includes the District, the County of Riverside and the Cities of Murrieta, Temecula and Wildomar. Tentative Draft Order R9-2013-0001 (Draft Permit) was drafted by Board staff to cover Phase I municipal separate storm sewer system (MS4) Copermittees in San Diego County, southern Orange County, and the portion of southwestern Riverside County within the Santa Margarita Hydrologic Unit.

The Riverside County Copermittees have previously commented that the San Diego Water Board lacks authority to adopt a regional permit covering Orange and Riverside Counties, in addition to San Diego County; a comment which is discussed in further detail below and in the attached legal comments. Notwithstanding such objection, and subject to it, the Riverside County Copermittees are providing comments on the Draft Permit.

In the workshop on the Administrative Draft Order held on April 22, 2012 San Diego Water Board staff identified the following desired outcomes for the proposed permit:

- Improving the quality of water discharged from the MS4
- Restoring or enhancing Beneficial Uses and Receiving Water quality

It was further identified by Board staff that to be able to meet those goals, the proposed regional MS4 permit needed to be 1) Strategic, 2) Adaptive, and 3) Synergistic.

Notwithstanding the concerns of the Riverside County Copermittees with regard to the legal authority to issue a regional MS4 permit, the Copermittees agree that being able to adapt and direct resources toward specific water quality priorities in a given watershed, rather than all potential problems simultaneously, is more likely to result in actual and meaningful improvements in water quality. However, to be able to achieve those improvements the MS4 Permit must be crafted to provide the Copermittees with the ability to truly and fully

adaptively manage their programs to focus resources on those BMP strategies and monitoring efforts that are identified as being most effective, consistent with the MEP standard, at addressing watershed priorities.

Unfortunately, many provisions in the Draft Permit, including but not limited to the Receiving Water limitation provisions in Provision A and others discussed in this letter, still do not fully support the achievement of those outcomes. The Draft Permit does not provide the Copermittees with the flexibility to be fully strategic in managing their resources nor the ability to fully adapt their programs to focus on the highest priority water quality needs of the watershed. This comment letter and the other documents submitted herewith (a redline of the Draft Permit and Legal Comments) identify some suggestions which, if adopted by the San Diego Water Board, will help to address these limitations and facilitate the desired improvements.

This comment letter is organized as follows:

1 BACKGROUND 3
2 GENERAL COMMENTS 3
2.1 REGIONAL PERMIT 3
2.2 OUTCOME FOCUS 4
2.3 RESPONSIBILITY FOR MEETING GOALS OF CWA 5
3 SPECIFIC COMMENTS 5
3.1 FINDINGS 5
3.2 PROVISION A, PROHIBITIONS AND LIMITATIONS 9
3.3 PROVISION B, WATER QUALITY IMPROVEMENT PLANS 12
3.4 PROVISION C, ACTION LEVELS 14
3.5 PROVISION D, MONITORING AND ASSESSMENT 14
3.6 PROVISION E.1, LEGAL AUTHORITY 19
3.7 PROVISION E.2, IDDE 20
3.8 PROVISION E.3, DEVELOPMENT PLANNING 24
3.9 PROVISION E.4, CONSTRUCTION 29
3.10 PROVISION E.5., EXISTING DEVELOPMENT 30
3.11 PROVISION E.6, ENFORCEMENT RESPONSE PLANS 31
3.12 PROVISION E.7, PUBLIC ED 31
3.13 PROVISION, E.8 FISCAL ANALYSIS 32
3.14 PROVISION F 32
3.15 ATTACHMENT C 33

As noted, the Riverside County Copermittees also are submitting a redline of the Draft Permit ("Redline") that proposes alternative language intended at achieving solutions to the various issues raised in this letter, and a Legal Comment document ("Legal Comments") that provides additional legal context for the various issues raised in this letter. The Riverside County Copermittees reserve their right, in the context of filing a Report of Waste Discharge ("ROWD") prior to the expiration of Order R9-2010-0016 (the 2010 MS4 Permit), to again address these issues and others relevant and appropriate to the SMR.

1 BACKGROUND

The Riverside County Copermittees were issued an extensive and prescriptive MS4 Permit in November 2010 which greatly expanded monitoring obligations, required special studies, a jurisdictional runoff management program, and Watershed Workplan requirements that were very different than the requirements set forth in the previous MS4 Permit issued to the Copermittees. Development and implementation of the 2010 MS4 Permit compliance requirements has been very expensive, especially in comparison to the relatively few demonstrated impairments of Beneficial Uses in the region and the Copermittees' resources. These requirements have left other important societal needs unfulfilled by the Riverside County Copermittees during a period of unprecedented and continuing economic distress. Further, the Riverside County Copermittees are still in the process of developing and implementing these 2010 MS4 Permit requirements, which is a serious concern given the very different compliance approach proposed in the Draft Permit. The Copermittees hope that the compliance efforts under the current MS4 Permit are taken into account when they submit their ROWD at the expiration of the 2010 MS4 Permit.

2 General Comments

2.1 Regional Permit

The Riverside County Copermittees respectfully submit that the San Diego Water Board is not authorized under the Clean Water Act or under its implementing regulations to issue a regional permit to Copermittees in San Diego County, South Orange County and the Santa Margarita Region (SMR) of Riverside County. As discussed more fully in the Legal Comments, the only circumstance under which the San Diego Water Board could issue such a permit would be if the Copermittees in these counties agreed to such a permit. Additionally, while the Draft Permit purports to affect the conduct of the Riverside County Copermittees upon expiration of the 2010 MS4 Permit in November 2015, the Riverside County Copermittees have not submitted a ROWD requesting coverage under a regional permit. Because no application has been made for the regional permit, which is a requirement set forth in the CWA regulations, the San Diego Water Board lacks jurisdiction to name the Riverside County Copermittees on the Draft Permit at this time.

Notwithstanding the above, the Riverside County Copermittees are submitting the comments in this letter based on:

- The San Diego Water Board staff's stated intent to enroll the Riverside County Copermittees in this permit upon expiration of the 2010 MS4 Permit.
- Statements made by San Diego Water Board staff that this comment period would serve as the primary opportunity for the Riverside County Copermittees to influence their next term MS4 Permit. The Riverside County Copermittees are entitled, as part of the ROWD process, to again raise relevant issues regarding permit provisions, but have undertaken in these comments to address major current concerns.

2.2 Outcome Focus

As mentioned above, the Copermittees agree that being able to adapt and direct resources toward addressing the specific water quality priorities in a given watershed, rather than all potential problems simultaneously, is more likely to result in actual/meaningful improvements in water quality. However, to be able to achieve those improvements, the MS4 Permit must fully integrate the following principles:

- **The Jurisdictional Program requirements must be fully flexible:** The Permit must be written in a way that allows the Copermittees to truly and adaptively manage their programs to fully focus their existing resources on those BMP strategies and monitoring efforts that are identified within the Water Quality Improvement Plan (WQIP) as being most effective, consistent with the Maximum Extent Practicable (MEP) standard, at addressing the watershed's priorities. We understand this to be the goal of the San Diego Water Board as well. While some elements of the Draft Permit embody this need, others do not and require dedication of resources to specific pre-defined efforts, regardless of the identified need for that effort in the watershed. The specific program areas that need more work to this end are:

    - The approach to addressing Non-stormwater discharges
    - Development Planning
    - Retrofitting
    - Channel Rehabilitation

These issues and proposed new language to address these issues are included throughout this letter and/or in the attached Redline.

- **Basin Plan updates need to be Prioritized by the San Diego Water Board:** For outcome-based permitting to be successful, the desired outcomes must be achievable by and appropriate to the Copermittee. To do that, the outcomes must take into account the background conditions in the watershed, and be appropriate for the attainment of Beneficial Uses in the specific waterbody, based on the specific conditions within and influencing that waterbody. The values in the Basin Plan should be comprehensively re-evaluated to ensure that water quality standards are scientifically justified to protect Beneficial Uses. Without updating the Basin Plan, the outcomes that the Copermittees target in the WQIPs would be arbitrary and not guaranteed to achieve the desired beneficial use improvements. Such an update should be pursued aggressively, led by and adequately funded by the San Diego Water Board, with participation by the MS4 Copermittees and other dischargers and stakeholders in the watershed.

- **Other Dischargers need to be Similarly Regulated by the San Diego Water Board:** The MS4 Copermittees are not the only dischargers of pollutants in the watershed. For example, the SMR of Riverside County includes State Lands (such as Caltrans), Tribal Lands, Agricultural Operators, Industrial Permit dischargers, Construction Permit dischargers, Phase II entities, Water Districts, and 'De Minimus' dischargers issued general permit coverage; all of which:

- Have separate regulatory programs (such as permits or waivers) implemented by the San Diego Water Board;
- May discharge pollutants, including non-stormwater, that can affect the quantity and quality of runoff, both directly within Receiving Waters, and in runoff discharges that may enter into and be discharged from the MS4; and
- Cannot be regulated by the Copermittees for the quantity and quality of their runoff because of their separate permits or waivers granted by the NPDES Program Administrator.

As such, while MS4 Copermittees can implement programs to reduce pollutants in discharges that are within their legal jurisdiction, no amount of effort by the MS4 Copermittees can be expected to fully attain water quality standards in the Receiving Waters. The only way to achieve that outcome will be for the NPDES Program Administrator (the San Diego Water Board in most cases) to directly regulate each of these entities to similar levels and standards as set forth by this Permit.

2.3 Responsibility for meeting goals of CWA

The CWA requires Copermittees subject to any MS4 permit, including the Draft Permit, only to address discharges from their MS4s. 33 U.S.C. § 1342(p)(3)(B). The Copermittees are not required to restore Beneficial Uses in any Receiving Water, or to address sources of pollution to those Receiving Waters that are not being discharged into or from those MS4s. However, in various provisions in the Draft Permit, there is a suggestion that the Copermittees are solely responsible for attaining water quality standards in their respective Receiving Waters. The San Diego Water Board must make clear in the Draft Permit that the responsibilities of the Copermittees are limited to their MS4s and the requirements of the CWA for municipal stormwater dischargers. Redline changes have been proposed in the above referenced portions of the Draft Permit to address this issue.

3 Specific Comments

The following comments represent specific high level concerns that the Riverside County Copermittees have identified at this time. Additional comments on the Draft Permit can be found in the Redline, as well as in the attached Legal Comments.

3.1 Findings

The Riverside County Copermittees have two separate sets of comments on the Findings. The first addresses the need for additional findings, with respect to aspects of California law and the physical setting of the SMR. The second set of comments focuses on existing Findings in the Draft Permit.

3.1.1 Needed Additional Findings

The Findings in the Draft Permit fail to fully address the context and conditions under which the proposed permit requirements are to be applied. A more complete explanation of this background is necessary to ensure that the Provisions ultimately included in the Draft Permit are credible, appropriate and legally required, and that the Permit Provisions (which must stem from the Findings) reflect the

context of the broader issues that affect MS4s within the region. The Riverside County Copermittees request that San Diego Water Board staff work with the MS4 Copermittees to expand the Findings, including the addition of findings to address the following:

California Water Law

California law requires that downstream entities must accept runoff from up-gradient properties. Owners and operators of MS4s are not exempt from this legal mandate, even if that runoff contains pollutants. Moreover, flood control districts, including the District, are mandated by the California Legislature (Legislature) to protect the lives and property of residents from floodwaters. The Riverside County Copermittees request that a finding, in the form set forth in the Redlines, be added to the Draft Permit.

Flooding

Many areas that would be under the jurisdiction of the Draft Permit are subject to periodic catastrophic flooding, which results from natural conditions, specifically the presence of mountains and hilly areas in close proximity to development, along with the effect of strong Pacific storms. This flooding would occur even in the absence of development. The Legislature recognized the importance of this issue in the early 20th Century, when it established flood control districts across the state, including in Riverside, Orange and San Diego Counties. Such flooding has, and if not controlled, could result in loss of life and widespread property damage. Further, the flooding can mobilize significant amounts of pollutants from industrial, commercial, residential and agricultural lands, damaging watercourses, habitat, and the Beneficial Uses therein. MS4 systems are designed and constructed to mitigate these impacts. The Riverside County Copermittees request that a finding in the form set forth in the Redline be added to the Draft Permit.

Flood Control District Acts

As noted above, the Legislature established Flood Control Districts in Orange, Riverside, and San Diego Counties through a series of Flood Control Acts. The Legislature determined that protection of life and property from the effects of flooding through the implementation of flood control improvements was a priority, and assigned those Districts with the sole responsibility to design, construct and maintain those improvements necessary to manage and contain floodwaters to prevent such negative impacts, as well as to conserve floodwaters for beneficial use. As noted above, these improvements represent fundamental water quality BMPs inasmuch as they reduce the widespread exposure of runoff to pollutants. The Flood Control Districts, while owners and operators of MS4s, have no authority or powers beyond those granted by the Legislature. The Legislature did not provide the Flood Control Districts, for example, the authority to regulate land uses within the municipal jurisdictions of Riverside County, nor to control the volume or quality of runoff discharged by those land uses. Findings describing the legislative priority for flood control and the limitations on the governing power of the Flood Control Districts should be added to set forth the appropriate role of the Flood Control Districts as MS4 Copermittees. The Riverside County Copermittees request that a finding, in the form set forth in the Redline, be added to the Draft Permit.

Limits on Extent of Permittee Legal Authority

The MS4 Copermittees lack the authority to regulate many significant sources of pollutants that may impact Receiving Waters. For example, the Copermittees cannot regulate pollutants discharged from federal and state lands, facilities, tribal lands, special districts, utilities, agricultural lands, or railroads. Moreover, the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) preclude local regulation of pesticides. The Riverside County Copermittees request that a finding in the form set forth in the Redline be added to the Draft Permit.

3.1.2 Comments on Existing Findings

Findings 3 and 15 (and elsewhere in Draft Permit)

In Findings 3 and 15 (and throughout the Draft Permit), it is stated that the CWA requires controls to reduce the discharge of pollutants "in stormwater" to the MEP. Finding 15, moreover, states that non-stormwater discharges from the MS4 are "not considered stormwater discharges and therefore are not subject to the MEP standard, stating that the MEP standard "is explicitly for 'Municipal . . . Stormwater Discharges" from the MS4s.

These conclusions are directly contrary to the plain language of the CWA, as set forth in the November 16, 1990 preamble accompanying the CWA stormwater regulations. Those authorities provide that the MEP standard applies to *all* pollutants discharged from the MS4, notwithstanding that some may be transported by non-stormwater. Additionally, the Redline reflects deletion of the limitation of the MEP standard to stormwater discharges in multiple locations, reflecting federal law. For a further discussion of this issue, please see the Legal Comments. The Riverside County Copermittees also request deletion of Finding 15.

Finding 11

This Finding states that "[r]ivers, streams and creeks in developed areas used [to convey runoff] . . . are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and Receiving Water." This statement is incorrect and must be deleted (as reflected in the Redline). For reasons more fully set forth in the Legal Comments, natural streams cannot be considered MS4; there is no MS4 "outfall" from a channelized river or stream to a natural stream; and, USEPA itself requires a distinction between MS4s and Receiving Waters.

Finding 12

This Finding states that as operators of MS4s, "Copermittees cannot passively receive and discharge pollutants from third parties." By providing free and open access to an MS4 that conveys discharges to Waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not prohibit or otherwise control. This statement is incorrect and must be deleted (as set forth in the Redline). As the discussion in the Legal Comments indicates, municipalities must maintain the MS4 to protect the lives and property of their citizens and to prevent nuisance. Flood Control Districts have a statutory obligation to operate and maintain such MS4, an obligation which is not affected by

either the CWA or the terms of the Draft Permit. While an MS4 operator has the obligation to effectively prohibit the entry of non-stormwater into the MS4, it does not have legal responsibility for such discharges, which are the responsibility of the discharger itself and subject to the jurisdiction of the San Diego Water Board, pursuant to Water Code section 13260 *et seq.*

Finding 28

This Finding recites that the San Diego Water Board finds that the requirements of the Draft Permit "are not more stringent than the minimum federal requirements." The Riverside County Copermittees disagree with this finding, as it is not supported by the evidence, *i.e.*, the many requirements in the Draft Permit which exceed the federal MEP standard. Moreover, any decision by the San Diego Water Board to adopt "other provisions" going beyond MEP is not a federal requirement, but rather a discretionary decision taken by a state agency under authorization in the CWA. *See Defenders of Wildlife v. Browner,* 191 F.3d 1159, 1164-65 (9th Cir. 1999). Please see discussion in the Legal Comments. The Finding also indicates that the San Diego Water Board has developed an economic analysis of the Draft Permit. As set forth in the Legal Comments, the Riverside County Copermittees challenge the adequacy of that analysis.

Finding 29

This finding purports to find that the Draft Permit does not constitute an unfunded state mandate. The Riverside County Copermittees disagree with the conclusions set forth in this finding. More importantly, the finding is without legal effect because exclusive jurisdiction as to whether a state mandate exists, and whether it is unfunded lies with the Commission on State Mandates. Government Code §§ 17751 and 17552; *Lucia Mar Unified School District v. Honig* (1988) 44 Cal.3d 830, 837; *Hayes v. Commission on State Mandates* (1992) 11 Cal.App.4th 1546, 1596-97. The finding of an agency that has no jurisdiction to make that finding is entitled to no weight and should be deleted, as shown in the Redline. For an additional discussion of these issues, please see the Legal Comments.

Finding 31

The Riverside County Copermittees believe that the Receiving Water Limitation ("RWL") language set forth in the Draft Permit renders compliance with the permit impossible, since exceedances of water quality standards occur routinely through no fault of the MS4 Permittees. Thus, unless the RWL is modified to provide the Copermittees with a means to be in compliance, those Copermittees risk the threat of arbitrary San Diego Water Board enforcement or the bringing of citizen suit lawsuits under the CWA, which could nullify compliance with all other terms set forth in the Draft Permit, as discussed more fully in the Legal Comments. The exposure to third party litigation from the proposed RWL language is one of the most significant threats to an otherwise collaborative approach to achieving long term water quality improvement. This threat was emphasized by the recent bringing of a citizen suit lawsuit against the City of Malibu, the County of Los Angeles and the Los Angeles County Flood Control District based on similar language in the 2001 Los Angeles County MS4 Permit. The Riverside County Copermittees have suggested modifications to Provision A in the Redline and as discussed below and in the Legal Comments that are intended to better support the Iterative Process for compliance authorized by the State Water Resources Control Board in Order No.

2001-15, through the WQIP process. The Copermittees also note that the State Board considered the problems with the RWL language at a recent workshop, which may eventually result in modifications which should, if applicable, be reflected in the Draft Permit. Other requested changes to the Findings are set forth in the Redline.

3.2 Provision A, Prohibitions and Limitations

As noted above, the requirements set forth in Provision A are of great concern to the Riverside County Copermittees. The Copermittees generally support an approach to compliance that utilizes WIQPs as the implementing mechanism for the 'Iterative Process' described in Provision A.4, and that by implementing that iterative process in accordance with A.4, that the Copermittee should be in compliance with Provisions A.1 and A.2. The Redline reflects edits of Provision A to clarify the linkage between the prohibitions and limitations in Provisions A.1. through A.3. and Provision A.4 – which is described as the method for complying with the prohibitions and limitations. It must be noted, however, that the Riverside County Copermittees do not agree with the approach suggested, that any WQIP-based compliance approach be necessarily accompanied by a Reasonable Assurance Analysis. Such analyses can be extremely complex, expensive and time-intensive to develop, and similar analyses are commonly developed within TMDL models; taking a number of years to develop and refine. Given that the Santa Margarita Watershed has no adopted TMDLs; thus, comprehensive pollutant transport and BMP models are not available for the suite of constituents that might be considered for prioritization within a WQIP for the Santa Margarita Watershed. In the context of a TMDL, such models would be developed by the combined resources of the San Diego Water Board and a range of stakeholders and dischargers. Undertaking such an exercise solely with the public resources of the 275,000 residents of the SMR is beyond the financial ability of the Copermittees and would shift the responsibility for development of TMDLs from the San Diego Water Board to the Copermittees. Comments on Provision A can be found below, in the Redline and in the Legal Comments.

3.2.1 Overview of Key Issues

As noted above, an overriding issue for the Riverside County Copermittees is having a permit that, while being appropriately proactive and aggressive at addressing the prioritized water quality conditions with the Receiving Waters, is one that all Copermittees can remain in compliance with while implementing those requirements. As presently drafted (and as made clear by statements in the Fact Sheet), Provision A imposes immediate potential liability on every Copermittee if monitoring in the Receiving Waters reflects exceedances of water quality standards that may have been caused or contributed to by MS4 discharges. San Diego Water Board staff has repeatedly indicated in workshop presentations that they expect that Copermittees will not be able to comply with the Receiving Water Limitations and Discharge Prohibitions for some time. Staff has separately indicated that they are interested in having the Copermittees undertake bold initiatives in trying to address urban runoff pollution, and that the Copermittees have actually been encouraged to "fail early and fail often" as this would reflect such progress in refining these initiatives. The iterative, flexible and priority-setting approach reflected in the WQIP is intended to allow the Copermittees to focus on the most important problems in their watershed. The entire approach is endangered, however, by RWL provisions which would allow either the San Diego Water Board or a citizen plaintiff to sue the Copermittees for any individual exceedance of the

RWLs. Under the current version of Provision A, the unmitigated risk of such actions leads not to bold initiatives but rather to attempts to minimize liability.

As set forth in the Legal Comments, this approach is not mandated by the CWA, State Board orders or the opinion of the Ninth Circuit Court of Appeals in *Natural Resources Defense Council v. County of Los Angeles*, 673 F.3d 880 (9th Cir. 2011), *reversed*, 568 U.S. __ (January 8, 2013). As importantly, the threat of immediate potential noncompliance actually interferes with the ability of the Copermittees, including the Riverside County Copermittees, to comply with the Draft Permit. Instead of being able to focus on pollutants of highest concern in the watershed, as called for in the WQIP, the Copermittees will be forced to try to address every pollutant monitored, since the exceedance of any water quality standard leads to immediate potential liability. Moreover, because citizen plaintiffs are entitled to injunctive relief under Section 505(a) of the CWA, a federal judge could order the Copermittees to undertake steps completely independent of the WQIP or other compliance provisions in the Draft Permit.

The Riverside County Copermittees do not object to compliance provisions that will provide a means to achieve real improvement in water quality. The Copermittees are willing to undertake these Provisions, because the success or failure is in their control. Compliance with the requirements of Provision A, however, is beyond the control of the Copermittees. Based on the statements made during the workshop process, the Riverside County Copermittees believe that the San Diego Water Board is serious about working with the Copermittees on a permit that provides flexibility and problem solving approaches. To ensure that this flexibility is not lost, the Draft Permit must tie in compliance with Provisions A.1 through A.3 to a process set forth in Provision A.4. This approach is shown in the Redline and is discussed further below.

3.2.2 Comments in support of specific changes

Provision A, Introduction

The introduction notes that pollutants "in stormwater discharges" from the MS4 must be controlled to the MEP. As discussed above, the CWA does not differentiate between stormwater and non-stormwater discharges from the MS4; both must be controlled to the MEP standard. The Riverside County Copermittees have requested revised language in the Redline. Additionally, the linkage between compliance with Discharge Prohibitions (Provision A.1), Receiving Water Limitations (Provision A.2) and Effluent Limitations (Provision A.3) should be noted as being defined by Provision A.4. This change is reflected in the Redline.

A.1.a

First, language must be added providing that compliance may be addressed through the process set forth in Provision A.4. This language is provided in the Redline. Second, the Provision prohibiting discharges which are "threatening to cause" a condition of pollution, etc., is unenforceable, because it prohibits an action that, with respect to MS4 operators, is beyond their control. Moreover, there is no authority for such provisions in the Porter-Cologne Act. The Riverside County Copermittees request

deletion of this phrase, as shown in the Redline. Additionally, as set forth in the Legal Comments, the Provision improperly expands the Discharge Prohibitions to Waters of the State.

A.1.b

40 CFR § 122.26(d)(2)(iv)(B)(1) clarifies that the requirement for an MS4 Copermittee to "effectively prohibit" the discharge of Non-stormwater/illegal discharges into its MS4s is to be accomplished through "a program, including inspections, to implement and enforce an ordinance, orders or similar means…". The language of this Provision should reflect federal law in this respect. The Redline reflects this change.

A.1.c

First, this Provision requires the Copermittees to comply with the Basin Plan prohibitions listed in Attachment A. This list is over-inclusive, as it contains requirements that are not applicable to some or all of the Copermittees' MS4 discharges, or to the Riverside County Copermittees in particular. The Riverside County Copermittees request that this Provision be amended to read as follows: "Discharges from MS4s are subject to all applicable waste Discharge Prohibitions in the Basin Plan." This change is noted in the Redline. Second, language must be added providing that compliance with this restriction can be obtained through the process set forth in Provision A.4. This language is provided in the Redline.

A.2.a

First, this Provision and Provisions A.1. and A.3 should be linked to the iterative process described in A.4. Please see the Redline.

Second, not all plans, policies, etc. set forth in Provision A.2.a.(1)-(4) may qualify as "water quality standards" or be applicable to all the MS4 Copermittees. These subsections should be deleted, and replaced with a reference to "Water Quality Standards," which is a defined term in the Draft Permit (This change is reflected in the Redline). Otherwise, the MS4 Permit would become over inclusive with respect to what is considered a water quality standard. Such standards must be established in accordance with federal and state law. If this process has not been followed for a particular requirement, it is not a "water quality standard."

A.3.a

As discussed above, this Provision erroneously states that pollutants "in stormwater discharges" from MS4s must be reduced to the MEP. Please see the Redline.

A.3.b

This Provision should also provide that compliance with a TMDL constitutes compliance with Provisions A.1 and A.2, for those pollutants/waterbodies subject to the TMDL.

A.4.a

The Riverside County Copermittees support an approach whereby compliance with Provisions A.1 through A.3 are achieved through a truly iterative approach, one which reflects the intent of the

precedential State Water Board Order Nos. 99-05 and 2001-015. As set forth in the Redline, the Riverside County Copermittees believe that they and the other Copermittees under the Draft Permit should be considered in compliance with Provisions A.1, A.2 and A.3, as applicable, through development of the WQIP, unless the San Diego Water Board denies approval of a WQIP or amendment thereof. This ensures that the Iterative Process which is the focus of the WQIP, is utilized to provide a means to be in compliance for the Copermittees.

A.4.c

This Provision should be deleted, as is reflected in the Redline. Again, this Provision defeats the purpose of an iterative approach to compliance with the Provisions A.1 through A.3, because it allows the San Diego Water Board to enforce any provision of the Draft Permit, including those provisions at any time. The San Diego Water Board obviously retains full ability to enforce the provisions of the Draft Permit, including with respect to the failure of the Copermittees to carry out required provisions. To short circuit the WQIP/JRMP process, however, is to defeat the entire intent of the Draft Permit.

3.3 Provision B, Water Quality Improvement Plans

3.3.1 Overview of Key Issues

- The goals and requirements of the WQIP need to be aligned with the requirements of the CWA that were established specifically for MS4 permits, and not impose the restoration of Receiving Waters entirely upon MS4 Copermittees.
- The WQIP should focus on addressing sources of pollutants within the jurisdiction of the respective Copermittees.
- The BMP strategies identified in the WQIP should fully inform the selection and design of programs identified in the JRMP. Some minor edits were proposed in Provision B, with additional edits as warranted in Provisions D and E.

3.3.2 Comments in support of specific changes

Introductory paragraph

The introductory language implies that the WQIP should be designed to unilaterally protect, preserve, enhance, and restore water quality and Beneficial Uses in waters of the state. As noted in Section 2.3 above, MS4 Copermittees are responsible only for discharges from their MS4s, not the unilateral protection of Beneficial Uses within their watersheds.

Redline edits were provided to:

- Tie the goals of the WQIP to the requirements of the CWA applicable to MS4 Permits.
- Replace 'waters of the state' with 'Receiving Waters' to be consistent with federal law.
- Clarify the linkage between Provision A and Provision B.

Additionally, Redline edits were provided to clarify that the strategies identified in the WQIP are intended to guide the specific actions that will be implemented by the Copermittees pursuant to Provision E.

B.1

The Riverside Copermittees support the redlines of the San Diego County Copermittees with regard to setting forth that the WQIP for the Santa Margarita Watershed Management Area (WMA) would commence upon enrollment of the Riverside County Copermittees into the Order.

B.2.e.

Two changes have been proposed, as shown in the Redline:

- The introductory paragraph includes language that clarifies that the Numeric Goals are not enforceable compliance standards, effluent limitations, or Receiving Water limitations. This clarification is consistent with San Diego Water Board staffs' verbally stated intent.
- Provision B.2.e.(1) as written requires that the final Numeric Goals be "capable of demonstrating the achievement of the restoration and/or protection of water quality standards in Receiving Waters". As discussed in Provision 2.3 above, meeting WQS in Receiving Waters is a goal of the overall NPDES regulatory programs under the CWA and not as a requirement to be accomplished alone by MS4 Copermittees. Redline edits have been provided to clarify that such goals are only required to be for MS4 discharges.

B.3.

In the Redline, edits were made to the introductory paragraph to ensure that the requirements are consistent with federal law. The CWA requires the 'effective prohibition' of non-stormwater discharges, not 'preventing' or 'eliminating' them.

Edits were also made to Provision B.3.a. to link the strategies more clearly to the Numeric Goals developed pursuant to Provision B.2.e, as well as to link them to the JRMP programs in Provision E.

B.5

In the Redline, edits were made to the introductory paragraph to clarify that the WQIP (and by extension the JRMP and Monitoring programs) are intended to meet the requirements of Provisions A.1, A.2, and A.3. The Tentative Order particularly excluded Provision A.1.b. (dealing with non-stormwater discharges). However, as discussed in the attached Legal Comments, the CWA requires that illegal discharges must be addressed via a program (as included in Provision E.2), and it is appropriate that the program be guided by the priorities and strategies included in the WQIP.

Other edits were made to clearly link Provision B.5 to the applicable requirements of Provision F.

3.4 Provision C, Action Levels

3.4.1 Overview of Key Issues

- The Action Levels (non-stormwater, and stormwater) applicable within each watershed should only be those that are associated with the priority water quality conditions in that watershed, or that are 303(d) listed for that watershed. For example, if Zinc is not a priority pollutant for a watershed, and is not 303(d) listed, there should not be a Zinc action level. This change is needed because Provision D requires analysis for all 'action level' parameters. Analysis for pollutants that are not a priority for a watershed is a waste of Copermittee resources.
- The Copermittees should be able to establish alternative action levels that are appropriate to the WMA within their WQIP. Such alternative action levels would be subject to Executive Officer approval as part of the WQIP approval process.
- Footnote 8 and 10 need to clarify that the NALs and SALs are not enforceable limitations.
- Various references to 'waters of the state' need to be changed to Receiving Waters for consistency with the Draft Order and the CWA.

Please see the Redline for further detailed comments and language changes.

3.5 Provision D, Monitoring and Assessment

The Riverside County Copermittees appreciate the changes in the monitoring program reflected in the Draft Permit, as compared to the Administrative Draft. However, elements of the revised requirements are still infeasible for the Riverside County Copermittees. The comments below identify modifications of areas of the monitoring requirement's which can significantly improve the Copermittees' ability to implement and comply with the requirements, while still maintaining appropriate jurisdictional accountability and assessment requirements to guide the implementation of the WQIPs and JRMP programs. The Redline provides further detailed comments and language changes.

3.5.1 Overview of Key Issues

- Dry Weather MS4 Outfall Monitoring
  - The level of effort dedicated to monitoring and addressing outfalls with non-stormwater discharges should be commensurate with the potential impact that discharge has on a Receiving Water. If a discharge, whether persistent or transient, has no or little potential for impacting a flowing Receiving Water, (e.g. due to infiltration, evaporation, or treatment of the flows), the outfall should be de-emphasized relative to other outfalls that have discharges that have connectivity to a flowing Receiving Water.
  - Outfall Dry Weather Field Screening – As currently drafted, the number of required visual inspections of outfalls during dry weather required per Provision D.2.a.(2)(a) and Provision D.2.b.(1) is both excessive and disproportionate. This will particularly impact smaller jurisdictions, which may be required to do more visual inspections of MS4 outfalls than would larger jurisdictions with more outfalls and more resources.
  - Similarly, as written, the Persistent Flow Outfall Monitoring requirements of Provision D.2.b.(2)(b) are excessive and also will disproportionately impact smaller jurisdictions.

Jurisdictions with several hundred outfalls will likely have significantly more resources to perform the required monitoring than smaller jurisdictions with fewer outfalls, yet both are required to implement the same level of persistent flow monitoring.

- Assessment Requirements
  - The assessment requirements require modeled extrapolation of monitored outfall data to non-monitored outfalls for the purposes of calculating loads from each outfall in each jurisdiction. Such extrapolations though modeling or other calculations will not accurately reflect actual jurisdictional loads, and have no benefit that directly analyzing the monitored data cannot more accurately provide.

3.5.2 Other Global Issues

- As currently drafted, MS4s operated by a flood control district within a city or county would be effectively double-counted for identification of outfalls in each jurisdiction and for performance of the load calculations from each jurisdiction. Additionally, Flood Control Districts have no land use or enforcement authorities outside of the MS4 and rely on the local Copermittee to address pollutant sources and discharges to their MS4. Redline edits have been included to clarify the relationship between districts and the municipal jurisdictions they serve for the purposes of outfall monitoring and the assessment requirements.
- Timelines for monitoring and assessments were clarified throughout and linked to specific reporting requirements of Provision F in the Redline.

3.5.3 Comments in support of specific changes

D.1.a.(3) and D.1.e.

The Redline clarifies that the Receiving Water monitoring described in these sections must be conducted as applicable to the WMA and the Copermittees' MS4 discharges, because some of the monitoring requirements only apply to MS4 discharges to certain waterbodies. Not all Copermittees within a WMA will have discharges to that waterbody.

D.1.b.

The Redline proposes language to allow for alternative long-term monitoring stations to be identified. Using the SMR as an example, the Copermittees might wish to utilize a location other than the existing stations due to the influence of groundwater during dry weather and/or the general lack of MS4 contributions in dry weather to those locations.

Table D-1 and D-6

The Redline proposes an addition to the list of field observations, an assessment for flow connectivity of any MS4 discharges to the sampled Receiving Water. It is important to know whether the sampled Receiving Water included a contribution of flows from MS4 discharges, or whether the data reflect conditions in the absence of an apparent MS4 discharge contribution.

D.2.a.(2)

The Redline clarifies that the identification of annual outfall monitoring requirements is based on municipal Copermittee boundaries, inclusive of Flood Control District MS4 outfalls within their jurisdiction.

The Redline clarifies that the field screening requirements apply to those outfalls in the Copermittee's inventory that are 'accessible'. If an outfall is inaccessible for safety reasons or due to habitat restrictions, it would not need to be field screened.

The Redline simplifies the 'tiers' in Provision D.2.a.(2)(a) by removing the lower tier (i), and expanding the second tier (ii) to cover all Copermittees with 500 or less outfalls. This resolves the disproportionality that occurs for Copermittees with a number of outfalls near the current 125 outfall threshold. For example, as currently drafted, a city with 150 outfalls would be required to do 150 visual inspections per year, but a smaller city with 120 outfalls would be required to do 192 visual inspections per year. The Redline also maintains the 80% requirement from the first tier to help smaller Copermittees manage their workload for meeting the field screening requirements while also conducting the additional source identifications that are required under the Draft Permit.

The Redline includes edits to Footnote 19 to clarify that persistent flow should effectively be a discharge that is hydraulically connected to a flowing Receiving Water. Any other discharges that are not affecting a flowing Receiving Water (such as pooled or ponded water) would be addressed as a Transient Discharge, with source IDs any time an obvious illegal discharge (i.e. color or odor) is identified.

D.2.a.(3)

The Redline incorporates edits proposed by the San Diego County Copermittees to require 10% of the samples in each WMA to be from a first storm event. As described in the comments of the San Diego County Copermittees, this will help avoid overly skewing of the data to 'first flush' data, while still incorporating such data into the data and analyses.

D.2.b.(1)

The Redline removes the requirement that the number of visual inspections performed be equivalent to the number of inspections required under Provision D.2.a.(2)(a).

As areas within a jurisdiction are confirmed not to have non-stormwater discharges, inspections of other outfalls would have to be perpetually (and unnecessarily) increased to maintain compliance with this requirement. For example, if a Copermittee had 150 outfalls, but after the transitional period it confirmed that 100 of those outfalls had no evidence of non-stormwater discharges to flowing Receiving Waters, it would have to visit the remaining 50 outfalls for up to three times a year to meet the requirement in this Provision. As the Copermittee got closer to eliminating non-stormwater flows at more outfalls, inspections at the remaining outfalls would quickly become excessive and unreasonable. Removing this requirement will better incentivize the elimination of non-stormwater

flows, as a Copermittee can look forward to reducing its workload in areas confirmed to not have non-stormwater flows.

D.2.b.(2)(b)

While the Riverside County Copermittees support the San Diego County Copermittees' proposal to reduce the number of required outfalls from 10 to 5 persistently flowing outfalls per WMA, the Riverside County Copermittees believe that applying the same minimum bar to all Copermittees is inappropriate and disproportionately affects smaller Copermittees that have commensurately less staff and resources.

The Riverside County Copermittees propose requiring monitoring of the top 10% of the prioritized persistent flow outfalls, with a lower and upper limit of 1 and 5 respectively, as shown in the redlines. With this change, the level of effort required of any individual Copermittee would scale consistent with the number of persistent flow outfalls within each Copermittees' jurisdiction.

Additionally, the Riverside County Copermittees request changing the requirement of Provision D.2.b.(2)(b)(ii) to require annual monitoring rather than semi-annual monitoring. With this change, a Copermittee could focus more of their annual budget on conduction Source ID efforts – which can result in eliminating problematic non-stormwater flows, rather than on a second monitoring event. Copermittees would still have the option to conduct a second monitoring event if they have more resources available and want to remove the outfall from their monitoring list sooner in accordance with Sub-Provisions [a] through [d].

D.2.b.(2)(e)

The Riverside County Copermittees support the San Diego County Copermittees' comments regarding allowing for a tailored list of constituents to be developed for each WMA. The Redline incorporates those edits.

D.3.

The Riverside County Copermittees support the changes recommended by the San Diego County Copermittees to this section, and these changes are reflected in the Redline.

D.4.a.(2)

This Provision as drafted would require the MS4 Copermittees to make comprehensive evaluations of Beneficial Uses that are beyond their expertise or the scope of an MS4 permit. Such evaluations and determinations would require advanced studies and cannot be answered with the monitoring data collected through this permit. This Provision should either be deleted or, alternatively the Riverside County Copermittees request that the assessments be focused on determining the status and progress toward addressing any Numeric Goals established for those Receiving Waters in the WQIP. Please see the Redline.

D.4.b.(1)

The Redline clarifies that outfall assessments are to be done for the area covered by each Municipal Copermittee (consistent with the proposed definition), and that the data to be used by each Municipal Copermittee would include the data collected from any Flood Control District Copermittee operated MS4s within its jurisdiction. This ensures that jurisdictional data is not double reported for Flood Control District MS4s within a city or county.

For Sub-Provision D.4.b.(1)(c)(iv) three key changes are requested in the Redline:

1) Annual volumes and pollutant loads should only be calculated from the monitored outfalls with persistent discharge to a flowing Receiving Water. This is directly applicable to the purpose of the Draft Permit and an important change, because volume and pollutant data extrapolated to non-monitored MS4 outfalls would be inaccurate and potentially misused if taken out of context. It is understood that San Diego Water Board staff want to ensure that jurisdictional accountability is maintained. However, since MS4 outfall monitoring will be conducted within each jurisdiction, inter-jurisdiction comparisons and accountability can be accomplished using the monitoring data directly without such extrapolations.
2) Added language to require a Copermittee to include in its jurisdictional load calculations any discharge that was demonstrated to have entered another Copermittees' MS4 before being discharged into the flowing Receiving Waters. This is important to ensure that each Copermittee maintains accountability for pollutants discharged to flowing Receiving Waters from within its jurisdiction.
3) The Redline proposes that the calculations of pollutant loads be only for the priority water quality constituents identified in the WQIP.

D.4.b.(2)(b)

Two key changes are recommended in the Redline:

1) Annual volumes and pollutant loads should only be calculated from the monitored outfalls for the monitored storm events. This is an important change because volume and pollutant data extrapolated to non-monitored events would be inaccurate and potentially misused if taken out of context. It is understood that San Diego Water Board staff want to ensure that jurisdictional accountability is maintained, so the Redline proposes that data from the monitored outfalls be extrapolated to identify loads for each jurisdiction during each monitored event. With this information, inter-jurisdiction comparisons and the desired 'accountability' can be accomplished using the monitoring data directly without such extrapolations to non-monitored events.
2) The Redline requests that calculations of pollutant loads be performed only for the priority water quality constituents identified in the WQIP.

D.4.b.(2)(c)

The Redline edits are consistent with those proposed by the San Diego County Copermittees, with minor modifications for clarity.

D.4.d.(2)(c)

It would be difficult to proactively determine the pollutant load reductions that *would* be necessary to demonstrate that discharges *are not* causing or contributing to exceedances of Receiving Water Limitations. Instead it would make more sense to calculate the necessary pollutant load reductions where the discharge has been demonstrated to be causing or contributing to such exceedances. In such circumstances, the necessary parameters would be known to calculate the needed load reduction. These changes are set forth in the Redline.

3.6 Provision E.1, Legal Authority

3.6.1 Overview of Key Issues

The Riverside County Copermittees note that Provision E.1, relating to the establishment of adequately legal authority, exceeds the requirements of federal CWA regulations in several respects. The federal regulations at 40 CFR 122.26(d)(2)(i)(A)-(F), provide explicit guidance for the Copermittees in developing the necessary legal authority to control MS4 discharges within its jurisdiction. However, several of the subsections of Provision E.1 go beyond these federal requirements, with respect to areas not within the responsibility of MS4 dischargers, such as negotiating with non-Copermittee entities. The Riverside County Copermittees have provided requested changes in the Redline, which are explained briefly below.

3.6.2 Comments in support of specific changes

E.1.a(1)

Changes in the Redline to accurately reflect the language of 40 CFR 122.26(d)(2)(i)(B).

E.1.a(2)

Changes in the Redline to accurately reflect the language of 40 CFR 122.26(d)(2)(i)(A). In addition, the Provision as written improperly requires the Copermittees to control the quality of runoff from sites covered by the state general permits for industrial activity and construction. These general permits are enforced by the State Board and the regional boards, and it is a state responsibility which cannot be handed off to the Municipal Copermittees.

E.1.a(3)

Changes in the Redline to accurately reflect the language of 40 CFR 122.26(d)(2)(i)(C).

E.1.a(5)

The Redline requests deletion of this Provision, which is not a requirement for municipal stormwater dischargers set forth in the CWA regulations. The Provision also improperly requests the Municipal Copermittees to attempt to negotiate with third parties the contribution of pollutants to the Copermittees' MS4. The Copermittees have no jurisdiction over such parties. The San Diego Water

Board has such jurisdiction, and should take responsibility for addressing non-MS4 sources of pollutants that may ultimately enter the MS4.

E.1.a(6)

Changes in the Redline to reflect accurately the language of 40 CFR 122.26(d)(2)(i)(E).

E.1.a(7)

The Redline requests deletion of this Provision, which is not a requirement for municipal stormwater dischargers set forth in the CWA regulations.

E.1.a(8)

The Redline requests deletion of this Provision, which is not a requirement for municipal stormwater dischargers set forth in the CWA regulations.

E.1.a(9)

The Redline requests deletion of this Provision, which is not a requirement for municipal stormwater dischargers set forth in the CWA regulations.

E.1.a(10)

The Redline requests both correction of the language in this Provision to comport with the federal regulations in 40 CFR 122.26(d)(2)(i)(F) and deletion of the second clause of this Provision, which is not found in 40 CFR 122.26(d)(2)(i)(F). Moreover, the requirement to inspect and monitor in the first clause of this Provision covers the issues set forth in the second clause. It is therefore unnecessary.

3.7 Provision E.2, IDDE

3.7.1 Overview of Key Issues

- The Draft Permit requires the Copermittees to address all non-stormwater discharges from the MS4 as illegal discharges, and then describes certain sources that need not be prohibited. This is effectively a 'guilty until proven innocent' provision, where a Copermittee will be required to expend potentially significant resources conducting source identification efforts any time non-stormwater is observed discharging from the MS4. In addition to the issues discussed in the Legal Comments, the Provision raises two practical and logistical problems:

    - This requirement is entirely independent of the determination that there are in fact any significant pollutants in such a discharge. A Copermittee could be spending substantial sums tracking (and then potentially enforcing upon) the source of a discharge that is not negatively impacting Receiving Waters. This not only is a waste of public resources, but would undermine the credibility of stormwater programs.
    - The San Diego Water Board and the State Water Board do not treat non-stormwater flows in the same manner across all of their regulatory mechanisms. For example, Order

> No. R9-2008-0002 allows non-stormwater discharges to occur, POTWs are issued permits for their discharges and agricultural operators can discharge irrigation water. The Copermittees should not be forced to conduct an expensive source investigation, only to find that the discharge complies with a permit or a waiver granted by the Water Board. The Copermittee would have no ability to address such a discharge as an 'illegal discharge', and further would have no ability to recuperate their costs for the source identification.

The best way to address these issues, is to require the Copermittee to have and enforce an effective prohibition of illegal discharges of *pollutants* (through statutes, ordinances, permits, contracts, orders or similar means), and then allow the Copermittee full discretion to determine which non-stormwater discharges have the potential to negatively impact Receiving Waters, consistent with the WQIP priorities – and address those as illegal discharges.

- Several categories of non-stormwater discharge that were previously conditionally exempt consistent with the CWA, are required by the Draft Permit to be treated as illegal discharges, unless they have coverage under another order issued by the San Diego Water Board. In addition to the problems identified above for conducting enforcement in the absence of a pollutant discharge, the San Diego Water Board, not the Copermittees, is responsible for evaluating coverage, need for coverage, and compliance with other orders issued by the Water Board. The Copermittees have neither authority nor jurisdiction. Please see the Redline.
- Several categories of non-stormwater discharge that were previously conditionally exempt consistent with the CWA, are required by the draft permit to be 'controlled' or otherwise prohibited by the Copermittees. The Fact Sheet further describes that such controls are warranted because they could potentially contain pollutants. However, the CWA only requires controls where the discharges are determined to be a significant source of pollutants. Please see Legal Comments for a further discussion of this issue as well as the Redline.
- The Draft Permit eliminates the conditional exemptions for Landscape Irrigation, Irrigation Water, and Lawn Watering (collectively 'irrigation runoff'). The San Diego Water Board has provided no data demonstrating that these discharge categories have contributed a significant pollutant load to Receiving Waters within Riverside County. Information discussed in the Fact Ssheet focuses on data from other counties. The only data from Riverside County is public educational material referring to irrigation runoff; this material, however, was adapted from public education material from other counties. That public educational material was intended to help prevent such discharges from becoming a significant source of impact on the Receiving Waters, and did not constitute a determination that such discharges are in fact, actually a significant source that needs to be subject to a prohibition. See the discussion in the Legal Comments as well as the Redline.
- The Draft Permit, in Provision E.2.a.(7) requires efforts to minimize or eliminate all non-stormwater flows, including those that are natural, conditionally exempt, or otherwise permitted by the San Diego Water Board, regardless of whether or not such discharges are not contributing pollutants to the MS4. Such a requirement conflicts with the prior Provisions E.2.a.(1) through

(5), which state conditions where such discharges need not be prohibited. The requirement should therefore be removed, as set forth in the Redline.

3.7.2 Comments in support of specific changes

E.2.a.(1) and (3)

The Riverside County Copermittees request that this Provision be deleted (as shown in the Redline) and the categories of non-stormwater discharges be re-incorporated into Provision E.2.a.(3). The apparent premise of Provision E.2.a(1) as drafted is that since the San Diego Water Board requires those discharges to have coverage under a separate order, they are illegal if they lack such coverage. The MS4 Copermittees, however, are not responsible for enforcing discharge coverage under separate San Diego Water Board orders; that is the responsibility of the San Diego Water Board itself. Requiring the Copermittees to enforce such entities for their lack of coverage under a separate San Diego Order shifts that responsibility from the Board to Copermittees. This is not authorized by the CWA or the Porter-Cologne Water Quality Act. The Copermittees are, under the CWA, only required to address such discharges as illegal discharges if the discharge is found to be contributing a significant pollutant load to the MS4. By moving those categories to Provision E.2.a.(3), as shown in the Redline, the Copermittees will still be required to treat such discharges as illegal discharges if and when they are found to be contributing significant pollutants to the MS4. This proposed approach is consistent with other MS4 permits in the state, including prior San Diego Water Board orders, and is further consistent with the approach taken for the WQIP, which is intended to allow the Copermittees to focus resources on addressing the specific impacts that MS4 discharges are having on Receiving Water quality.

E.2.a.(2)

This Provision requires the Copermittees to treat water line breaks as illegal discharges, which in turn requires the Copermittee to conduct enforcement measures. Water main breaks are accidental occurrences, or may be the result of acts of nature. It is no more appropriate to treat accidents as illegal and subject to enforcement than it would be for a city to declare vehicular accidents as illegal, and conduct enforcement against those involved. This language needs to be removed as shown in the Redline. Additionally, as discussed in the Legal Comments, a recent case from the federal district court in Virginia suggests that the regulation of mere flow may exceed the authority of the CWA.

E.2.a.(4)

The Redline clarifies that if the 'statues, ordinances, permits, contracts, orders or similar means' are enacted/adopted by a Copermittee, the categories of non-stormwater discharges listed do not need to be treated as illegal discharges. Otherwise, the language could be read to imply that, for example, if it was infeasible for a particular resident to direct wash water to landscaped areas, that the Copermittee would be required to treat that residents' discharge as illegal and enforce upon them.

E.2.a.(5)

Contrary to the provisions of the CWA regulations, prior MS4 permits issued by the San Diego Water Board and other permits in the state, the Draft Permit requires implementation of BMPs, where

feasible, during emergency firefighting activities. During such emergencies, all focus of public resources must appropriately be dedicated to protecting life and property. Any diversions from that mission would only serve to diminish and potentially compromise that mission. The Redline proposes language consistent with that adopted by the San Diego Water Board in 2010 for the Riverside County MS4 Permit (Order R9-2010-0016).

E.2.a.(7)

Provisions E.2.a.(1) through E.2.a.(6) describe circumstances where non-stormwater discharges need not be prohibited. This Provision then requires the Copermittees to minimize such 'conditionally allowed' flows anyway. This requirement exceeds the scope of the CWA and its implementing regulations and makes no sense. The Redline requests deletion of these Provisions.

E.2.b.(1)(d)

This Provision requires the MS4 Copermittees to map all known private outfalls to Receiving Waters. Such a requirement is beyond the scope of an MS4 permit and should be removed, as shown in the Redline. The Draft Permit does not require a Copermittee to address private outfalls to Receiving Waters; this is the responsibility of the San Diego Water Board, which governs all waste dischargers under the authority of the CWA or the Porter-Cologne Act.

E.2.b.(4)

This Provision requires the Copermittees, in conjunction with a spill, to 'prevent contamination of surface water, groundwater, and soil.'This requirement is clearly beyond the scope of an MS4 permit issued under the CWA (which regulates only discharges of water containing pollutants *from* the MS4 to Receiving Waters) and must be removed, as shown in the Redline. The Draft Permit could more appropriately require the Copermittees to 'coordinate, to the extent possible, with spill response teams to prevent entry of spills into the MS4.'

E.2.d.(2)(e)

The Redline requests edits to clarify that the intent of this Provision is to document and attempt to quantify any obvious sources of non-stormwater illegal discharges in response to the outfall monitoring, and that it is not necessary to conduct a full source identification any time there is evidence of water near an outfall.

New Provisions E.2.d.(3)(e)-(f)

The Redline adds two new provisions to this section to address a gap in potential outcomes from a source identification effort. These Provisions address scenarios where a Copermittee identifies A) the illegal discharge is coming from another upstream Copermittees' MS4, or B) that the discharge has been authorized by the San Diego Water Board, either through an order or waiver of WDRs. In the first scenario, the responsibility to continue the source identification, and conduct enforcement, would be transferred to the upstream Copermittee. In the second scenario, the responsibility for follow-up would fall on the San Diego Water Board, after receiving relevant information from the Copermittee. This Provision also provides for reimbursement to the Copermittee for the cost of the source identification, since the San Diego Water Board required the Copermittee to conduct the investigation,

while not commensurately prohibiting all non-storm water discharges from all other sources regulated by the Water Boards.

3.8 Provision E.3, Development Planning

3.8.1 Overview of Key Issues

- Priority Development Projects - The Tentative Order identifies categories of projects that are to be defined as 'Priority Development Projects' (PDPs), which in turn will be required to comply with specific water quality and Hydromodification mitigation and quantitative requirements. The criteria for PDPs is quite broad and would include the majority of development projects, from small convenience stores and residences, to mega malls and specific plan developments. The Fact Sheet describes that while some smaller project types may not have significant pollutant loads, they may have a hydrologic impact upon Receiving Waters. However, it is important to recognize that pursuant to Provision E.3.a., All projects are required to implement a variety of LID principles such as disconnecting impervious surfaces, draining impervious surfaces to landscaped areas, and minimization of soil compaction in landscaped areas. Since such LID principles will be implemented wherever feasible consistent with the MEP standard, these smaller development projects are unlikely to create a pollutant or hydrologic impact. Additionally, the Fact Sheet advocates incentivizing LID design concepts and green infrastructure and building principles. Accordingly, the Redline requests changes to Provision E.3.b.(3) as described in Provision 3.8.2 below. The Legal Comments further note the potential impact of the Virginia case (*Virginia Dept. of Transp. v. U.S. Environmental Protection* Agency) holding that the CWA does not regulate stormwater as a pollutant.
- Design Capture Volume – There are two problems with how the Draft Permit defines the Design Capture Volume:
    - The Draft Permit changes the 'design capture volume' from previous permits by eliminating the term 'runoff'. Prior permits described that the design capture volume is the volume of stormwater <u>runoff</u> from the 24-hour 85th percentile storm event. This permit changes that to be the volume of stormwater <u>produced</u> from a 24-hour 85th percentile storm event. The elimination of the term 'runoff' means that BMPs would need to be sized potentially much larger than previously. For example, if the 85th percentile storm is 1" and a BMP is designed to treat 1 acre of residential land with a coefficient of runoff of 0.6, then under the current permits the BMP must be sized to hold 2,178 cubic feet of water. However, under the language of the Draft Permit, the BMP treating the same area would be required to hold 3,630 cubic feet of water, a 70% increase in BMP size. Accordingly, the Redline restores the term 'runoff'.
    - Additionally, the Draft Permit defines the Design Capture Volume alternatively as: *"the volume of storm water that would be retained onsite if the site was fully undeveloped and naturally vegetated, as determined using continuous simulation modeling techniques based on site-specific soil conditions and typical native vegetative cover."* In addition, to the problem identified above regarding the volume of storm water <u>runoff</u>, this language does not provide a temporal standard for determining which volume to

calculate from a continuous simulation model. Additionally, such models are not commonly used among general practitioners in the civil engineering community. The Redlines propose an alternative and simpler approach for this second definition: "The volume of stormwater runoff produced from a 24-hour 85th percentile storm event, that would be retained onsite in the pre-project condition." This definition is advantageous for several reasons: 1) it is simple for any civil engineer to understand, calculate, and comply with and is based on the same storm and hydrologic calculations as the first option, 2) it respects natural hydrology for the site, which may have had runoff in the pre-project condition, and as such, is more compatible with the intent of LID to mimic natural hydrology, and 3) as a result it is less likely to result in potential degradation of Beneficial Uses downstream, from reductions in flows beyond the pre-project condition.

- Pre-Project vs Pre-Development – Both the Storm Water Pollutant Control BMP requirements and the Hydromodification Management BMP requirements in the Draft Permit specify a 'pre-development' condition as the mitigation standard for all PDPs. In addition to the legal problems with such a standard as set forth in the Legal Comments, there are practical problems with the standard.
    - The presumption made in the discussions in the Fact Sheet are that all Receiving Waters can, and will, be restored to a fully natural condition - effectively to a natural floodplain. This presumption does not address reality, which is that development has occurred in those floodplains over many generations. The San Diego Water Board obviously lacks the authority to force homeowners and businesses to vacate such floodplains to effectuate restored natural conditions. Such an action would represent an unconstitutional taking. Moreover, the Legislature, in the Flood Control Acts covering all three counties proposed to be covered by the Draft Permit, has specifically authorized Flood Control Districts to construct flood control structures required to protect the lives and properties of the citizens.
    - Mitigation to a pre-development condition also may not be necessary to protect Receiving Waters from the effects of Hydromodification. If, for example a Receiving Water with existing development tributary to it, has not experienced increased erosion due to that existing development, there is no reason to require Hydromodification mitigation to anything more than the existing condition. In the counter-example, if under the existing condition the Receiving Water has experienced increased erosion due to that existing development, then, legal issues aside, there would be technical benefit to mitigating to that pre-development condition.

  The Redline proposes alternative language that requires mitigation to a pre-development standard only where it is legal and technically justified based on the conditions of the Receiving Water.
- Alternative Compliance – The alternative compliance project options as set forth in the Draft Permit pose two key problems:

- Several statements are conflicting and thus confusing as to what the required standard is for the various alternative compliance projects. For example, throughout Provision E.3.c. it is stated that 'a PDP may be allowed to comply with Provision E.3.c.(1)(a) and/or Provision E.3.c.(2) if they …'. This language can be mis-read to imply that the project must comply both with Provisions E.3.c.(1)(a) and E.3.c.(2) *and* implement the alternative compliance project (thus negating the benefit of alternative compliance). The Redline clarifies this language.
- The Biofiltration option set forth in the Draft Permit arbitrarily, and without technical basis or justification, **doubles** the sizing standard for biofiltration BMPs from 0.75 times the design capture volume (as set forth in the 2010 MS4 Permit and the 2009 Orange County Permit) to 1.5 times the design capture volume. The existing 0.75 standard was set due to the fact that 1) the 85th percentile 24-hour storm occurs over a period of time, and 2) such BMPs have outflows and will regain some capacity during the storm event, and as such, do not need to instantaneously hold the entire 'Design Capture Volume' to have fully treated that volume. In fact, studies have shown that in addition to yielding excellent pollutant concentration reductions, LID Biofiltration BMPs are excellent at reducing the volume of runoff similar to retention BMPs. According to the ASCE International BMP database 60% or more of the long-term volume of runoff from a site can be retained within a Bioretention BMP (Bioretention BMPs are the primary 'biofiltration' BMP now allowed in Riverside County). In comparison, a Retention BMP sized to hold the runoff from the 85th percentile storm event (the Design Capture Volume) will end up retaining approximately 80% of the long-term volume of runoff. Thus, by simple proportions, a Bioretention BMP sized to 'hold' 100% of the Design Capture Volume may also be able to retain 80% of the long-term volume of runoff. $\left(\frac{0.75\times DCV}{60\%\ retained}=\frac{1.0\times DCV}{80\%\ retained}\right)$. This is being validated through Bioretention BMPs that have been constructed and are being monitored for such volume reductions at the Riverside County Flood Control District's headquarters in Riverside. Further, Biofiltration BMPs have the added benefit of providing better overall treatment of back to back storms. Where a Retention BMP would be full after the first storm, fully bypassing the second storm without treatment, a Biofiltration BMP will have restored some capacity after the first storm, providing for treatment of some or all of the second of the back to back storms. Thus, the attached redlines propose changing the sizing factor for Biofiltration BMPs to 1.0 times the Design Capture Volume. The Redline proposes changes consistent with these comments.

3.8.2 Comments in support of specific changes

Introduction

Provision E.3.g (Strategies to address the highest priority water quality conditions) was moved to the beginning to support and better integrate the development planning programs in the JRMP with the strategies developed in the WQIP.

E.3.a.(3)

The Redline changes the title of this section (and other appropriate references to this Provision) to refer to LID Principles, as identified in the CASQA LID Manual for Southern California (https://www.casqa.org/LIDDemo/LowImpactDevelopmentManual/tabid/242/Default.aspx)

E.3.b.(1)(c) (New Provision)

This Provision was added to clarify the requirements if a project that was already subjected to SSMP requirements redevelops a portion of the site.

E.3.b.(2)

The Redline edits shown for this Provision are primarily to simplify this Provision, by grouping various categories by their applicable square footage threshold and including some of the specifics in the definitions (Attachment C). Other changes (beyond reorganization) include:

- Removing the addition of 'driveways' from subsection (g) as described in Provision 3.8.1 of this letter.
- Adding a footnote for parking lots, to clarify that the trigger would not include parking lots that are not exposed to runoff, such as subterranean or covered parking lots. It is beneficial to not have parking lots exposed to runoff; excluding such parking lots from being defined as a PDP is a good way to encourage such practices.
- Hillside development projects were not included as it is not believed to be necessary anymore with the relatively low threshold (10,000 square feet) identified for other categories included in this and other recent MS4 permits.
- The definition for "Environmentally Sensitive Areas" from existing MS4 permits was restored to include the language referring to discharges that are not commingled with flows from adjacent or other upstream lands (note that the change is shown in the definitions per the re-organization suggested above).

E.3.b.(3)

- The PDP exemption for sidewalks, bicycle lanes, or trails, [E.3.b.(3)(a)] has been expanded to as shown in the Redline to include driveways and parking lots. If those projects implement criteria already described in that section, they are also unlikely to create an impact to Receiving Waters. Further, including those project types in that exemption will further incentivize developers to utilize those LID Principles.
- The exemption described in Provision E.3.b(3)(b), was modified as shown in the Redline, and as discussed in the comment letter submitted by the Riverside County Transportation Department. Please see that letter for a justification for the requested changes.
- As shown in the Redline, the exemptions for new and redeveloped single family residences [E.3.b.(3)(c) and (d)] were consolidated into a new provision [E.3.b.(3)(c)], covering all single family residential projects (both new and redeveloped). The key difference is that such projects would be considered exempt if they are both 1) not part of a larger common plan of development or planned subdivision, and 2) successfully incorporate each of the applicable source control and LID Principles identified in Provision E.2.a.(2)-(3) to the MEP.

- A new Provision-E.3.b.(3)(d), titled 'Watershed Protection Projects' was added in the Redline. The project types described therein are all projects that are undertaken to rehabilitate or prevent environmental, social, and economic damage within the watershed, including Receiving Waters. These projects, while they may in some cases require some level of impervious surfaces to be constructed, are 1) not designed for human use or activity that would generate pollutants, or are designed specifically to mitigate such pollutants; and 2) will implement each of the applicable source control and LID Principles identified in Provision E.2.a.(2)-(3) to the MEP.

E.3.c.(1)

In addition to the edits discussed in Provision 3.8.1 of this letter, the Redline removed subprovision E.3.c.(1)(c) , for two reasons:

- The requirements that must be met to when implementing an alternative compliance project are more fully described in Provision E.3.c.(3).
- The language, as drafted, appeared to require double-mitigation. It requires that: 1) conventional treatment is required to treat the entire volume not retained onsite, and 2) the pollutant load discharged must also be mitigated with an alternative compliance project. Such a scenario would be requiring double-mitigation. The Redline provides a clearer and more simple mitigation standard.

E.3.c.(2)

The Riverside County Copermittees have two concerns with this Provision:

- The first concern is the universal requirement to mitigate to the 'pre-development' standard, as discussed above in section 3.8.1 of this letter. The Copermittees in the Redline propose that this language be changed to the 'pre-project' condition. For new development projects, the 'pre-project' condition will be equivalent to the 'pre-development' condition. For redevelopment projects, the standard would be the conditions that exist onsite prior to the construction of the project. This is appropriate, because in many areas, particularly in areas of existing development that would be subject to 'redevelopment', Receiving Waters are engineered and maintained to 1) provide flood protection for the public, 2) ensure that floodwaters don't comingle with pollutants on adjacent private properties and 3) to ensure that the existing development draining to that system does not cause erosion. In cases where the Receiving Waters are not engineered and maintained, and erosion problems caused by existing development are observed, language has been added to the Redline to provide for additional standards to be developed in the WQIP, based on the WQIP priorities.
- Additionally, the Redline proposes an additional exemption from HMP requirements for projects that discharge into conveyance channels that are engineered and maintained for the build-out condition all the way from the project to a waterbody that is sufficiently resistant to Hydromodification. This language is consistent with the above discussions, and ensures the PDPs are not required to mitigate for non-existent impacts. Please see the specific language in the Redline. The engineered channel exemption can be found in other recent MS4 permits, including the recently adopted Los Angeles County MS4 Permit.

E.3.c.(3)(a) and (b)

These two Provisions were re-written in the Redline to be simpler and clearer on what BMPs, criteria, sizing standards are required for what type of project. This alternative language still meets the intent of the Draft Permit, while being easier to understand and comply with. Aside from simplifying the language, the following other changes were made in the Redline:

- The alternative compliance options must be determined to provide an equal or greater overall water quality benefit for the WMA.
- Additional options were provided for who can design the alternative compliance projects
- All alternative compliance projects are required to be consistent with the strategies in the WQIP. While the specific alternative compliance project would not be required to be identified in the WQIP, the goal of this language is to ensure that allowing the alternative compliance project would not in any way be detrimental to or contrary to the strategies in the WQIP.
- Requirements E.3.c.(3)(a)(iv) and (v) were removed entirely, as they conflict with E.3.c.(3)(a)(iii) which allowed the projects to be in the same WMA (preferably the same HSA)
- Changed the sizing factor for Biofiltration BMPs to 1.0 as discussed in section 3.8.1 of this letter, and deleted the option [d] which required triple mitigation by requiring Biofiltration + Conventional Treatment + Alternative Compliance projects.
- Added Conventional Treatment Control BMPs as an alternative compliance option, only where it has been shown to be technically infeasible to meet E.3.c.(1) and technically infeasible to implement LID Biofiltration Treatment Control BMPs.

E.3.c.(3)(c)

Redline edits in this section are primarily to simplify and consolidate the requirements. Sub-Provision [C] was removed, as it was duplicative of the mitigation standards for the alternative compliance project are specified in E.3.c.(3)(b) and E.3.c.(3)(c)(i)[a].

3.9 Provision E.4, Construction

3.9.1 Overview of Key Issues

This Riverside County Copermittees' comments and edits are set forth in the Redline.

- One key issue for the Copermittees is the edit shown in the Redline to Provision E.4.c, which clarifies that the Copermittees are responsible for *requiring* BMPs at private construction sites, and *implementing* BMPs at Copermittee construction sites.

3.9.2 Comments in support of specific changes

The Redline edits include comments supporting the requested edits.

3.10 Provision E.5., Existing Development

3.10.1 Overview of Key Issues

The Draft Permit includes requirements for advanced programs to identify opportunities and implement programs to facilitate the construction of Retrofit and Stream/Channel/Habitat Rehabilitation projects on private properties. Such requirements are clearly beyond the requirements of the CWA for a management plan to be implemented by an MS4 Copermittee. The Riverside County Copermittees request deletion of these requirements.

Alternatively, the Riverside County Copermittees have the following comments:

While these retrofitting and rehabilitation approaches can be helpful and/or needed in some circumstances, they are not required in all circumstances, nor are required to address all pollutants that may be identified in a WQIP as the highest priority water quality conditions. For example, some pollutants are best addressed with regulatory source controls at the state or federal level, such as the removal of copper from brake pads, and controls on pesticides, while other pollutants can be adequately addressed through inspections and enforcement. There are several problems with requiring Copermittee resources to be invested in such Retrofit and/or Rehabilitation strategies (collectively referred to as 'retrofit'):

- Land Ownership: The land that could potentially be identified for retrofit would likely not be owned by a Copermittee. The Copermittee therefore has no ability to force the property owner to retrofit their property. Although the Copermittee could potentially implement programs to "facilitate" implementation, such a program would still be limited by the rights of the individual property owner. Even if a Copermittee were to attempt to purchase a privately owned existing development for the purposes of retrofit (a step going far beyond any requirements in the CWA or the Porter-Cologne Act), such a process can take many years, and if the owner is unwilling to sell, the retrofit project could never be realized. In any scenario, the process to facilitate such "retrofits" is extremely costly and lengthy, with no guarantee of a benefit to water quality. Retrofits should only be undertaken where the Copermittee identifies it as a necessary step to addressing the MS4 contributions to Receiving Water problems to the MEP. Otherwise, it forces the Copermittee to utilize resources very ineffectively, which is contrary to the goals of the WQIP and may actually be detrimental to water quality.
- Permitting: Aside from the limitations discussed above, stream/channel/habitat restorations have the additional complexities of requiring other regulatory permits that are not the discretion of the San Diego Water Board nor the Copermittees to issue. Such projects can take many decades to implement, and thus, are not expected to be highly effective at addressing the goals of the WQIP, except in rare circumstances.

Redline edits have been provided to clarify that these strategies and programs should only be used when, and to the extent directed by the strategies developed in the WQIP.

3.10.2 Comments in support of specific changes

E.5.b.(1)(b) and (d)

BMP implementation requirements of Provision E.5.b.(1)(b) and (d) have been clarified in the Redline to require the Copermittee to implement BMPs on their existing development, and require implementation of BMPs on private existing development.

E.5.c.(1)(a)(iv)

The Riverside County Copermittees request deletion of this Provision. The Copermittees should be provided the flexibility to schedule inspections as they see fit, provided that the schedules they establish pursuant to E.5.c.(1)(a), and the minimum frequency in E.5.c.(1)(a)(i) are met. Requiring 20% every year will be difficult to track as businesses may be opened or closed throughout the year and throughout the permit term.

Additionally, the Riverside Copermittees understand that other Copermittees may be recommending that E.5.c.(1)(a)(i) be changed to 'once per permit term'. The Riverside Copermittees believe that the current language of 'once every five years' is more appropriate for two reasons: 1) not all Copermittees (i.e. OC and Riverside) will be enrolled into the permit at the beginning of the 'permit term', and 2) not all businesses will be in existence at the beginning of the permit term. Accordingly it is more appropriate to simply require the minimum to be once every five years, that way a program manager can simply look at the last time a facility was inspected, and use that date to schedule the next inspection.

3.11 Provision E.6, Enforcement Response Plans

3.11.1 Overview of Key Issues

The Riverside County Copermittees' edits and comments are shown in the Redline and discussed below.

3.11.2 Comments in support of specific changes

E.6.d.

The terminology in this Provision was changed in the Redline from 'escalated' enforcement to 'progressive' enforcement. The proposed language better reflects the nature of enforcement actions, which are not simply 'escalated' or 'not escalated', as implied by Provision E.6.d.(2), but are progressive as needed in response to the severity of the violation. Since every violation comes with a unique set of circumstances, it is not reasonable to presume that a single set of 'triggers' will universally result in the same level of enforcement.

3.12 Provision E.7, Public Education

3.12.1 Overview of Key Issues

The Riverside County Copermittees' edits and comments are shown in the Redline.

3.13 Provision, E.8 Fiscal Analysis

3.13.1 Overview of Key Issues

The requirement that the Copermittees "must secure all the resources necessary to comply with this Order" exceeds the requirements of the CWA and illegally intrudes on the home rule authority of municipalities to govern themselves. This must be deleted. Please also see Legal Comments.

With regard to other provisions, the Riverside County Copermittees' edits and comments are shown in the Redline.

3.14 Provision F

3.14.1 Overview of Key Issues

- F.1 – WQIP Submittal
  - Based on the schedule for the initial submittal of the Priority Water Quality Conditions and Numeric Goals, and the subsequent 60-day public review, only one month would be left for the Copermittees to finalize strategies based on those conditions and goals and the public input received. This is an insufficient amount of time. The Redline requests modifications to the schedule that would provide for the submittal of the final WQIP within 24 months (instead of 18), to provide additional time for the development of strategies.
- F.1 and F.2.
  - The schedules for submittals should be linked to the receipt of comments on prior submittals, or the approval of prior submittals, rather than the permit adoption date. If it is tied to the permit adoption date, the submittal dates could become out of sync with the comment periods or San Diego Water Board approvals if any unexpected delays occur (for example if the San Diego Water Board is delayed in approving a document, or posting a document online for public comment). The Redline requests appropriate modifications.
  - Implementation dates for the plans are unclear / undefined. The Redline clarifies this issue.
- F.3. Progress Reports
  - The reporting requirements across the transitional period were unclear. Redlines are provided to clarify and consolidate.
  - The Regional Monitoring and Assessment Report language was revised to be consistent with the requirements of the Integrated Assessment of the Water Quality Improvement Plan, rather than an additional, slightly different report, due at the same time.

3.15 Attachments B and C

Comments and edits to Attachments B and C are shown in the Redline.

Very truly yours,

for JASON E. UHLEY
Chief of Watershed Protection Division

CP:cw
P8/

Riverside Copermittee Redlines

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

TENTATIVE
ORDER NO. R9-2013-0001
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The San Diego County Copermittees in Table 1a are subject to waste discharge requirements set forth in this Order.

Table 1a. San Diego County Copermittees

Municipal Copermittees	
City of Carlsbad	City of Oceanside
City of Chula Vista	City of Poway
City of Coronado	City of San Diego
City of Del Mar	City of San Marcos
City of El Cajon	City of Santee
City of Encinitas	City of Solana Beach
City of Escondido	City of Vista
City of Imperial Beach	County of San Diego
City of La Mesa	San Diego County Regional Airport Authority
City of Lemon Grove	San Diego Unified Port District
City of National City	

After the San Diego Water Board receives and considers the Orange County Copermittees' Report of Waste Discharge and makes any necessary changes to the Order, the Orange County Copermittees in Table 1b will become subject to waste discharge requirements set forth in this Order after expiration of Order No. R9-2009-0002, NPDES No. CAS0108740 on or after December 16, 2014.

Table 1b. Orange County Copermittees

Municipal Copermittees	
City of Aliso Viejo	City of Rancho Santa Margarita
City of Dana Point	City of San Clemente
City of Laguna Beach	City of San Juan Capistrano
City of Laguna Hills	City of Laguna Woods
City of Laguna Niguel	County of Orange
City of Lake Forest	~~Orange County Flood Control District~~

Riverside Copermittee Redlines

City of Mission Viejo	
Special District Copermittee	
Orange County Flood Control District	

After the San Diego Water Board receives and considers the Riverside County Copermittees' Report of Waste Discharge and makes any necessary changes to this Order, the Riverside County Copermittees in Table 1c will become subject to waste discharge requirements set forth in this Order after expiration of Order No. R9-2010-0016, NPDES No. CAS0108766 on or after November 10, 2015.

Table 1c. Riverside County Copermittees

Municipal Copermittee	
City of Murrieta	County of Riverside
City of Temecula	~~Riverside County Flood Control and Water Conservation District~~
City of Wildomar	
Special District Copermittee	
Riverside County Flood Control and Water Conservation District	

The Orange County Copermittees and Riverside County Copermittees may become subject to the requirements of this Order at a date earlier than the expiration date of their current Orders subject to the conditions described in Provision F.6 of this Order if the Copermittees in the respective county receive a notification of coverage from the San Diego Water Board.

The term Copermittee in this Order refers to any San Diego County, Orange County, or Riverside County Copermittee covered under this Order, unless specified otherwise.

This Order provides permit coverage for the Copermittee discharges described in Table 2.

Table 2. Discharge Locations and Receiving Waters

Discharge Points	Locations throughout San Diego Region
Discharge Description	Municipal Separate Storm Sewer System (MS4) Discharges
Receiving Waters	Inland Surface Waters, Enclosed Bays and Estuaries, and Coastal Ocean Waters of the San Diego Region

Table 3. Administrative Information

This Order was adopted by the San Diego Water Board on:	**Month Day, 2013**
This Order will become effective on:	**Month Day, 2013**
This Order will expire on:	**Month Day, 2018**
The Copermittees must file a Report of Waste Discharge in accordance with Title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than 180 days in advance of the Order expiration date.	

Riverside Copermittee Redlines

I, David W. Gibson, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on Month Day, 2013.

TENTATIVE

David W. Gibson
Executive Officer

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ATTACHMENTS

Attachment A - Discharge Prohibitions and Special Protections A-1
Attachment B - Standard Permit Provisions and General Provisions B-1
Attachment C - Acronyms, Abbreviations and Definitions C-1
Attachment D - Jurisdictional Runoff Management Program Annual Report Form D-1
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Attachment F - Fact Sheet / Technical Report for Order No. R9-2013-0001 ..... F-1

Riverside Copermittee Redlines

I. FINDINGS

Comment [A1]: See discussions in section 3.1 of the comment letter

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), finds that:

JURISDICTION

1. **MS4 Ownership or Operation.** Each of the Copermittees owns or operates an MS4, through which it discharges storm water and non-storm water into waters of the U.S. within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the U.S.

Many geographical areas subject to this Order are subject to the threat of periodic catastrophic flooding resulting from natural conditions, specifically the presence of mountains and hilly areas in close proximity to urban development and the effect of period strong Pacific Ocean storms. Such flooding would occur in the absence of development. The Legislature recognized the importance of this issue when it established flood control districts across the state, including in Orange, Riverside and San Diego Counties. Such flooding has in the past, and if not controlled, could in the future result in loss of life and property damage. Such flooding can also mobilize significant Pollutants from industrial, commercial, residential and agricultural lands, damaging watercourses and the beneficial uses thereof, including habitat. MS4s are designed and constructed to mitigate such impacts.

2. Riverside County Flood Control and Water Conservation District.

Comment [A2]: See discussion in section 3.1.1 of the comment letter.

In 1945, the California Legislature enacted the Riverside County Flood Control and Water Conservation District Act, establishing the Riverside County Flood Control and Water Conservation District (District). The objects and purposes of the Act are to provide for the control and conservation of flood and storm waters and for the protection of watercourses, watersheds, public highways, life and property within the District from damage or destruction from flood waters. Among its other powers, the District also has the power to conserve, reclaim and save such waters for beneficial use. However the Act does not provide the District with the power to control the volume or quality of discharges that runs off of private property, which may end up in the District's flood control system. The District is governed by the District's Board of Supervisors as a separate legal entity from the County of Riverside.

Many of the flood management systems that the District operates are defined by the Clean Water Act as an MS4, and include many of the larger MS4s within the Santa Margarita watershed region of Riverside County (SMR). District does not however

own or operate streets, catch basins or storm drains smaller than 36 inches that collect runoff from the incorporated and unincorporated jurisdictions within the SMR, and commonly connect into the District's flood management system. Such systems are typically owned and operated by either the County of Riverside or the incorporated Cities within the SMR.

The waters and pollutants that may enter the regional receiving waters and/or the District's flood management systems come from various sources. These sources can include storm water and non-storm water from the Municipal Copermittees under this permit as well as from other NPDES and non-NPDES permittees, including industrial waste water dischargers, waste water treatment facilities, industrial and construction stormwater dischargers, water suppliers, tribal lands, other state and federal government entities, and Caltrans. Sources can also include discharges from Phase II entities such as school districts and discharges from entities that have been granted waste discharge requirements or waivers of waste discharge requirements, including agricultural operations.

The District does not own or operate any municipal sanitary sewer systems, public streets, roads, or highways. The District has no planning, zoning, development permitting or other land use authority, thus, it has no permitting or governing authority over industrial or commercial facilities, residents, new developments or re-development projects, and development construction sites located in any incorporated or unincorporated areas within its service area, including the SMR. The Copermittees that have such authority are responsible for implementing a storm water management program to address pollutants discharged from such industrial and commercial facilities, residential areas, new development and re-development projects, and development construction sites within their jurisdictional boundaries. Nonetheless, as an owner and operator of an MS4, the District is required to control pollutant discharges into and from its MS4, such as through interagency agreements among Copermittees and other owners of a MS4, the contribution of pollutants from one portion of the MS4 to another portion of the MS4 within their jurisdiction.

2. **Legal and Regulatory Authority.** This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]) adopted by the United States Environmental Protection Agency (USEPA), and chapter 5.5, division 7 of the California Water Code (CWC) (commencing with section 13370). This Order serves as an NPDES permit for discharges from MS4s to surface waters. This Order also serves as waste discharge requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

   The San Diego Water Board has the legal authority to issue a regional MS4 permit pursuant to its authority under CWA section 402(p)(3)(B) and 40 CFR 122.26(a)(1)(v). The USEPA also made it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide permits (55 Federal Register [FR] 47990, 48039-48042). The regional nature of this Order will ensure consistency of regulation within watersheds and is expected

to result in overall cost savings for the Copermittees and San Diego Water Board.

The federal regulations make it clear that the Copermittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators (40 CFR 122.26(a)(3)(vi)). This Order does not require the Copermittees to manage storm water outside of their jurisdictional boundaries, but rather to work collectively to improve storm water management within watersheds.

3. **CWA NPDES Permit Conditions.** Pursuant to CWA section 402(p)(3)(B), NPDES permits for storm water discharges from MS4s must include requirements to effectively prohibit non-storm water discharges into MS4s, and require controls to reduce the discharge of pollutants from the MS4s ~~in storm water~~ to the maximum extent practicable (MEP), and to require other provisions as the San Diego Water Board determines are appropriate to control such pollutants. This Order prescribes conditions to assure compliance with the CWA requirements for owners and operators of MS4s to effectively prohibit non-storm water discharges in to the MS4s, and require controls to reduce the discharge of pollutants ~~in storm water~~ from the MS4s to the MEP.

Comment [A3]: See discussion in section 3.1.2 of the comment letter.

4. **CWA and CWC Monitoring Requirements.** CWA section 308(a) and 40 CFR 122.41(h),(j)-(l) and 122.48 require that NPDES permits must specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s also specify additional monitoring and reporting requirements in 40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c). CWC section 13383 authorizes the San Diego Water Board to establish monitoring, inspection, entry, reporting and recordkeeping requirements. This Order establishes monitoring and reporting requirements to implement federal and State requirements.

5. **Total Maximum Daily Loads.** CWA section 303(d)(1)(A) requires that "[e]ach state shall identify those waters within its boundaries for which the effluent limitations…are not stringent enough to implement any water quality standard applicable to such waters." The CWA also requires states to establish a priority ranking of impaired water bodies known as Water Quality Limited Segments and to establish Total Maximum Daily Loads (TMDLs) for such waters. This priority list of impaired water bodies is called the Clean Water Act Section 303(d) List of Water Quality Limited Segments, commonly referred to as the 303(d) List. The CWA requires the 303(d) List to be updated every two years.

   TMDLs are numerical calculations of the maximum amount of a pollutant that a water body can assimilate and still meet water quality standards. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point sources (waste load allocations or WLAs) and non-point sources (load allocations or LAs), background contribution, plus a margin of safety. Discharges from MS4s are point source discharges. The federal regulations (40 CFR 122.44(d)(1)(vii)(B)) require that NPDES permits to incorporate water quality based effluent limitations (WQBELs) developed to protect a narrative water quality criterion, a numeric water

quality criterion, or both, consistent with the assumptions and requirements of any available WLA for the discharge. Requirements of this Order implement the TMDLs adopted by the San Diego Water Board and approved by USEPA.

6. **Non-Storm Water Discharges.** Pursuant to CWA section 402(p)(3)(B)(ii), this Order requires each Copermittee to effectively prohibit discharges of non-storm water into its MS4. Nevertheless, non-storm water discharges into and from the MS4s continue to be reported to the San Diego Water Board by the Copermittees and other persons. Monitoring conducted by the Copermittees, as well as the 303(d) List, have identified dry weather, non-storm water discharges from the MS4s as a source of pollutants causing or contributing to receiving water quality impairments in the San Diego Region. The federal regulations (40 CFR 122.26(d)(2)(iv)(B)(1)) require the Copermittees to have a program to prevent illicit discharges to the MS4. The federal regulations, however, allow for specific categories of non-storm water discharges or flows to be addressed as illicit discharges only where such discharges are identified as sources of pollutants to waters of the U.S.

7. **In-Stream Treatment Systems.** Pursuant to federal regulations (40 CFR 131.10(a)), in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S. Authorizing the construction of a runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to accepting waste assimilation as an appropriate use for that water body. Runoff treatment must occur prior to the discharge of runoff into receiving waters. Treatment control best management practices (BMPs) must not be constructed in waters of the U.S. Construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body.

DISCHARGE CHARACTERISTICS AND RUNOFF MANAGEMENT

8. **Point Source Discharges of Pollutants.** Discharges from the MS4s may contain waste, as defined in the CWC, and pollutants that adversely affect the quality of the waters of the state. A discharge from an MS4 is a “discharge of pollutants from a point source” into waters of the U.S. as defined in the CWA. Storm water and non-storm water discharges from the MS4s may contain pollutants that cause or threaten to cause a violation of surface water quality standards, as outlined in the Water Quality Control Plan for the San Diego Basin (Basin Plan). ~~Storm water and non-storm water discharges from the MS4s are subject to the conditions and requirements established in the Basin Plan for point source discharges.~~

9. **Potential Beneficial Use Impairment.** The discharge of pollutants and/or increased flows from MS4s may cause or threaten to cause the concentration of pollutants to exceed applicable receiving water quality objectives and impair or threaten to impair designated beneficial uses or which may result~~ing~~ in a condition of pollution, contamination, or nuisance. In addition, the reduction of flows below the

existing condition may impact negatively impact beneficial uses.

10. **Pollutants Generated by Land Development.** Land development has created and continues to create new sources of non-storm water discharges and pollutants in storm water discharges as human population density increases. This brings higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash. Pollutants from these sources are dumped or washed off the surface by non-storm water or storm water flows into and from the MS4s. When development converts natural vegetated pervious ground cover to impervious surfaces such as paved highways, streets, rooftops, and parking lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving a developed area without BMPs that can maintain pre-development conditions will contain greater pollutant loads and have significantly greater runoff volume, velocity, and peak flow rate than pre-development runoff from the same area.

11. **Runoff Discharges to Receiving Waters.** The MS4s discharge runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within the eleven hydrologic units comprising the San Diego Region. ~~Historic and current development makes use of natural drainage patterns and features as conveyances for runoff. Rivers, streams and creeks in developed areas used in this manner are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and receiving water.~~ Numerous receiving water bodies and water body segments have been designated as impaired by the San Diego Water Board pursuant to CWA section 303(d).

Comment [A4]: See discussion in section 3.1.2 of the comment letter.

Pollutants in Runoff. The most common pollutants in runoff discharged from the MS4s include total suspended solids, sediment, pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., cadmium, copper, lead, and zinc), petroleum products and polynuclear aromatic hydrocarbons, synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus), oxygen-demanding substances (e.g., decaying vegetation, animal waste), detergents, and trash. ~~As operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not effectively prohibit or otherwise control.~~ These discharges may cause or contribute to a condition of pollution or a violation of water quality standards. California law requires downstream landowners, including owners and operators of MS4, to accept upstream flows, even if that flow contains Pollutants. Failure to do can create conditions.

Comment [A5]: See discussion in section 3.1.2 of the comment letter.

Limitation on Powers of Copermittees. This Order regulates the discharge of non-stormwater into and Pollutants from non-agricultural Anthropogenic sources from the MS4s owned and/or operated by the Copermittees. The Copermittees lack legal

Comment [A6]: This finding is based on Findings I.B and I.C in Order R8-2010-33, applicable to portions of Riverside County within the Santa Ana region.

jurisdiction over discharges into their MS4 from agricultural activities, State and federal facilities, public schools and hospitals, utilities, railroads, special districts, Native American tribal lands, wastewater management agencies and other point and non-point source discharges otherwise permitted by the Water Board. The Water Board recognizes that the Copermittees should not be held responsible for discharges from such facilities or Pollutants in those discharges. Also, certain activities and sources that generate pollutants present in urban runoff may be beyond the ability of the Copermittees to prevent or eliminate. Examples of these activities and sources include, but are not limited to: emissions from internal combustion engines, brake pad wear and tear, atmospheric deposition, non-Anthropogenic sources of bacteria (including wildlife and feral cats and dogs), the regulation of pesticides and leaching of naturally occurring nutrients and minerals from local soils. This Order is not intended to address background or naturally occurring Pollutants or flows.

12.

13. **Human Health and Aquatic Life Impairment.** Pollutants in runoff discharged from the MS4s can threaten and adversely affect human health and aquatic organisms. Adverse responses of organisms to chemicals or physical agents in runoff range from physiological responses such as impaired reproduction or growth anomalies to mortality. Increased volume, velocity, rate, and duration of storm water runoff greatly accelerate the erosion of downstream natural channels. This alters stream channels and habitats and can adversely affect aquatic and terrestrial organisms.

14. **Water Quality Effects.** The Copermittees' water quality monitoring data submitted to date documents various persistent exceedances of Basin Plan water quality objectives for runoff-related pollutants at various watershed monitoring stations. Persistent toxicity has also been observed at several watershed monitoring stations. In addition, bioassessment data indicate that the majority of the monitored receiving waters have Poor to Very Poor Index of Biological Integrity (IBI) ratings. ~~These findings indicate that runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in the San Diego Region. Non-storm water discharges from the MS4s have been shown to contribute significant levels of pollutants and flow in arid, developed Southern California watersheds, and contribute significantly to exceedances of applicable receiving water quality objectives.~~

Comment [A7]: These statements are completely unsubstantiated.

15. ~~**Non-Storm Water and Storm Water Discharges.** Non-storm water discharges from the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard of CWA section 402(p)(3)(B)(iii), which is explicitly for "Municipal … *Stormwater Discharges* (emphasis added)" from the MS4s. Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s must be effectively prohibited.~~

Comment [A8]: See discussion in section 3.1.2 of the comment letter.

16. **Best Management Practices.** Waste and pollutants which are deposited and accumulate in MS4 drainage structures may~~will~~ be discharged from these structures

to waters of the U.S. unless they are removed. These discharges may cause or contribute to, or threaten to cause or contribute to, a condition of pollution in receiving waters. For this reason, pollutants in storm water discharges from the MS4s can be and must be effectively reduced in runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Pollution prevention is the reduction or elimination of pollutant generation at its source and is the best "first line of defense". Source control BMPs (both structural and non-structural) minimize the contact between pollutants and runoff, therefore keeping pollutants onsite and out of receiving waters. Treatment control BMPs remove pollutants that have been mobilized by storm water or non-storm water flows.

17. **BMP Implementation.** Runoff needs to be addressed during the three major phases of development (planning, construction, and use) in order to reduce the discharge of storm water pollutants to the MEP, effectively prohibit non-storm water discharges, and protect receiving waters. Development which is not guided by water quality planning policies and principles can result in increased pollutant load discharges, flow rates, and flow durations which can negatively affect receiving water beneficial uses. Construction sites without adequate BMP implementation result in sediment runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. Existing development can generate substantial pollutant loads which are discharged in runoff to receiving waters. Retrofitting areas of existing development with storm water pollutant control and hydromodification management BMPs may in many cases be ~~is~~ necessary to address storm water discharges from existing development that may cause or contribute to a condition of pollution or a violation of water quality standards.

Comment [A9]: It is not necessary in all cases.

18. **Long Term Planning and Implementation.** Federal regulations require municipal storm water permits to expire 5 years from adoption, after which the permit must be renewed and reissued. The San Diego Water Board recognizes that the degradation of water quality and impacts to beneficial uses of the waters in the San Diego Region occurred over several decades. The San Diego Water Board further recognizes that a decade or more may be necessary to realize demonstrable improvement to the quality of waters in the Region. This Order includes a long term planning and implementation approach that will require more than a single permit term to complete.

WATER QUALITY STANDARDS

19. **Basin Plan.** The San Diego Water Board adopted the Water Quality Control Plan for the San Diego Basin (Basin Plan) on September 8, 1994 that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for receiving waters addressed through the plan. The Basin Plan was subsequently approved by the State Water

Resources Control Board (State Water Board) on December 13, 1994. Subsequent revisions to the Basin Plan have also been adopted by the San Diego Water Board and approved by the State Water Board. Requirements of this Order implement the Basin Plan.

The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Process Supply (PROC), Industrial Service Supply (IND), Ground Water Recharge (GWR), Contact Water Recreation (REC1), Non-contact Water Recreation (REC2), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Freshwater Replenishment (FRSH), Hydropower Generation (POW), and Preservation of Biological Habitats of Special Significance (BIOL). The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region: Navigation (NAV), Commercial and Sport Fishing (COMM), Estuarine Habitat (EST), Marine Habitat (MAR), Aquaculture (AQUA), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN), and Shellfish Harvesting (SHELL).

20. **Ocean Plan.** The State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, and 2005. The State Water Board adopted the latest amendment on April 21, 2005 and it became effective on February 14, 2006. The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean. Requirements of this Order implement the Ocean Plan.

    The Ocean Plan identifies the following beneficial uses of ocean waters of the state to be protected: Industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture; preservation and enhancement of designated Areas of Special Biological Significance; rare and endangered species; marine habitat; fish spawning and shellfish harvesting

21. **Sediment Quality Control Plan**. On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes: 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

22. **National Toxics Rule and California Toxics Rule.** USEPA adopted the National Toxics Rule (NTR) on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the NTR applied in California. On May 18, 2000, USEPA adopted the California Toxics Rule (CTR). The CTR promulgated

new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants.

23. **Antidegradation Policy.** This Order is in conformance with the federal Antidegradation Policy described in 40 CFR 131.12, and State Water Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality Waters in California*. Federal regulations at 40 CFR 131.12 require that the State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. State Water Board Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies.

CONSIDERATIONS UNDER FEDERAL AND STATE LAW

24. **Coastal Zone Act Reauthorization Amendments.** Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states with approved coastal zone management programs to address non-point source pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point source pollution: agriculture, silviculture, urban, marinas, and hydromodification. This Order addresses the management measures required for the urban category, with the exception of septic systems. The runoff management programs developed pursuant to this Order fulfills the need for coastal cities to develop a runoff non-point source plan identified in the Non-Point Source Program Strategy and Implementation Plan. The San Diego Water Board addresses septic systems through the administration of other programs.

25. **Endangered Species Act.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 USC sections 1531 to 1544). This Order requires compliance with receiving water limits, and other requirements to protect the beneficial uses of waters of the State. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

26. **Report of Waste Discharge Process.** The waste discharge requirements set forth in this Order are based upon the Report of Waste Discharge submitted by the San Diego County Copermittees prior to the expiration of Order No. R9-2007-0001 (NPDES No. CAS0109266). The Orange County and Riverside County Copermittees are not immediately covered by the waste discharge requirements in this Order. The San Diego Water Board understands that each municipality is

unique although the Counties share watersheds and geographical boundaries. The Order will continue to use the Report of Waste Discharge process prior to initially making Orange County or Riverside County Copermittees subject to the requirements of this Order.

The federal regulations (40 CFR 122.21(d)(2)) and CWC section 13376 impose a duty on the Copermittees to reapply for continued coverage through submittal of a Report of Waste Discharge no later than 180 days prior to expiration of a currently effective permit. This requirement is set forth in the Orange County Copermittees' and Riverside County Copermittees' currently effective permits at Provisions K.2.b and K.2.c, respectively. The Orange County Permit, Order No. R9-2009-0002 (NPDES No. CAS0108740) expires on December 16, 2014 and the Riverside County MS4 Permit, Order No. R9-2010-0016 (NPDES No. CAS0108766) expires on November 10, 2015.

Unless the Orange County or Riverside County Copermittees apply for and receive early coverage under this Order, the Orange County Copermittees' and the Riverside County Copermittees' respective permits will be superseded by this Order upon expiration of their respective permits, subject to any necessary revisions to the requirements of this Order made after the San Diego Water Board considers their respective Reports of Waste Discharge through the public process provided in 40 CFR 124.

Comment [A10]: Please see Comment Letter and Legal Comments regarding regional permit authority,

27. **Integrated Report and Clean Water Act Section 303(d) List.** The San Diego Water Board and State Water Board submit an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. USEPA issued its *Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act* on July 29, 2005, which advocates the use of a five category approach for classifying the attainment status of water quality standards for water bodies in the Integrated Report. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 in the Integrated Report are placed on the 303(d) List.

Water bodies with available data and/or information that indicate at least one beneficial use is not being supported or is threatened, but a TMDL is not required, are included in Category 4 in the Integrated Report. Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

Implementation of the requirements of this Order may allow the San Diego Water Board to include surface waters impaired by discharges from the Copermittees'

MS4s in Category 4 in the Integrated Report for consideration during the next 303(d) List submittal by the State to USEPA.

28. **Economic Considerations.** The California Supreme Court has ruled that although CWC section 13263 requires the State and Regional Water Boards (collectively Water Boards) to consider factors set forth in CWC section 13241 when issuing an NPDES permit, the Water Board may not consider the factors to justify imposing pollutant restrictions that are less stringent than the applicable federal regulations require. (*City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 618, 626-627.) However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

As noted in the following finding, the San Diego Water Board finds that the requirements in this permit are not more stringent than the minimum federal requirements. Therefore, a CWC section 13241 analysis is not required for permit requirements that implement the effective prohibition on the discharge of non-storm water into the MS4 or for controls to reduce the discharge of pollutants ~~in storm water~~ to the MEP, or other provisions that the San Diego Water Board has determined appropriate to control such pollutants, as those requirements are mandated by federal law. Notwithstanding the above, the San Diego Water Board has developed an economic analysis of the requirements in this Order. The economic analysis is provided in the Fact Sheet.

Comment [A11]: See discussion in section 3.1.2 of the Comment Letter and also Legal Comments..

29. ~~**Unfunded Mandates.** This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following:~~

~~**a.** This Order implements federally mandated requirements under CWA section 402 (33 USC section 1342(p)(3)(B)).~~

~~**b.** The local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental and new dischargers who are issued NPDES permits for storm water and non-storm water discharges.~~

~~**c.** The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order.~~

~~**d.** The Copermittees have requested permit coverage in lieu of compliance with the complete effective prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)) and in lieu of numeric restrictions on their MS4 discharges (i.e. effluent limitations).~~

~~**e.** The local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under State law predates the enactment of Article XIIIB, Section (6) of the California Constitution.~~

Comment [A12]: See discussion in section 3.1.2 of the comment letter and in the Legal Comments.

~~f. The provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state develops a TMDL, federal law requires that permits must contain water quality based effluent limitations consistent with the assumptions and requirements of any applicable wasteload allocation (40 CFR 122.44(d)(1)(vii)(B)).~~

~~See the Fact Sheet for further discussion of unfunded mandates.~~

30. **California Environmental Quality Act.** The issuance of waste discharge requirements and an NPDES permit for the discharge of runoff from MS4s to waters of the U.S. is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 et seq.) in accordance with CWC section 13389.

STATE WATER BOARD DECISIONS

31. **Compliance with Prohibitions and Limitations.** The receiving water limitation language specified in this Order is consistent with language recommended by the USEPA and established in State Water Board Order WQ 99-05, *Own Motion Review of the Petition of Environmental Health Coalition to Review Waste Discharge Requirements Order No. 96-03, NPDES Permit No. CAS0108740*, adopted by the State Water Board on June 17, 1999. The receiving water limitation language in this Order requires storm water discharges from MS4s to not cause or contribute to a violation of water quality standards, which is to be achieved through an iterative approach requiring the implementation of improved and better-tailored BMPs over time. Implementation of the iterative approach to comply with receiving water limitations based on applicable water quality standards is necessary to ensure that Pollutant ~~storm water~~ discharges from the MS4 will not ultimately cause or contribute to violations of water quality standards and will not create conditions of pollution, contamination, or nuisance.

Comment [A13]: See discussion in section 3.1.2 of the comment letter.

Comment [A14]: Please see discussion in section 3.1.2 of the Comment Letter and Legal Comments.

32. **Special Conditions for Areas of Special Biological Significance.** On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving an exception to the Ocean Plan effective prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges. State Water Board Resolution No. 2012-0012 requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, effective prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject terms and conditions of State Water Board Resolution No. 2012-0012. The Special

Protections contained in Attachment B to Resolution No. 2012-0012, applicable to these discharges, are hereby incorporated into this Order as if fully set forth herein.

ADMINISTRATIVE FINDINGS

33. **Executive Officer Delegation of Authority.** The San Diego Water Board by prior resolution has delegated all matters that may legally be delegated to its Executive Officer to act on its behalf pursuant to CWC section 13223. Therefore, the Executive Officer is authorized to act on the San Diego Water Board's behalf on any matter within this Order unless such delegation is unlawful under CWC section 13223 or this Order explicitly states otherwise.

34. **Standard Provisions.** Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR 122.42, are provided in Attachment B to this Order.

35. **Fact Sheet.** The Fact Sheet for this Order contains background information, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of this Order. The Fact Sheet is hereby incorporated into this Order and constitutes part of the Findings of this Order.

36. **Public Notice.** In accordance with State and federal laws and regulations, the San Diego Water Board notified the Copermittees, and interested agencies and persons of its intent to prescribe waste discharge requirements for the control of discharges into and from the MS4s to waters of the U.S. and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet.

37. **Public Hearing.** The San Diego Water Board held a public hearing on Month Day, 2013 and heard and considered all comments pertaining to the terms and conditions of this Order. Details of the public hearing are provided in the Fact Sheet.

38. **Effective Date.** This Order serves as an NPDES permit pursuant to CWA section 401 or amendments thereto, and becomes effective fifty (50) days after the date of its adoption, provided that the Regional Administrator, USEPA, Region IX, does not object to this Order.

39. **Review by the State Water Board.** Any person aggrieved by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with CWC section 13320 and California Code of Regulations, title 23, sections 2050, et seq. The State Water Board must receive the petition by 5:00 p.m., 30 days after the San Diego Water Board action, except that if the thirtieth day following the action falls on a Saturday, Sunday or State holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the

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Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

THEREFORE, IT IS HEREBY ORDERED that the Copermittees, in order to meet the provisions contained in division 7 of the CWC and regulations adopted thereunder, and the provisions of the CWA and regulations adopted thereunder, must each comply with the following:

II. PROVISIONS

A. PROHIBITIONS AND LIMITATIONS

Comment [A15]: See discussion in section 3.2 of the comment letter.

The purpose of this provision is to describe the conditions under which storm water and non-storm water discharges into and from MS4s are to be effectively prohibited or limited. The goal of the prohibitions and limitations is to protect the water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through the implementation of water quality improvement strategies and runoff management programs that effectively prohibit non-storm water discharges into the Copermittees' MS4s, and reduce pollutants in ~~storm water~~ discharges from the Copermittees' MS4s to the MEP. The process for determination of compliance with the Discharge Prohibitions (A.1), Receiving Water Limitations (A.2), and Effluent Limitations (A.3) is defined in Provisions A.3.b and A.4.

1. Discharge Prohibitions

a. Discharges from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters ~~of the state~~ are to be ~~prohibited.~~ effectively prohibited, unless the Regional Board determines such discharges are addressed by the Copermittee through A.3.b or A.4, including any modifications.~~prohibited.~~

Comment [A16]: See discussion in section 3.2.2 of the comment letter.

b. Non-storm water discharges into MS4s are to be effectively prohibited through a program consistent with the requirements of provision E.2. of this order, including inspections, to implement and enforce an ordinance, orders or similar means to prevent illicit discharges to the MS4, unless such discharges are either authorized by a separate NPDES permit, or the discharge is a category of non-storm water discharges or flows that must be addressed pursuant to Provisions E.2.a.(1)-(5) of this Order.

Comment [A17]: See discussion in section 3.2.2 of the comment letter.

c. Discharges from MS4s are subject to all applicable waste discharge prohibitions in the Basin Plan, included in Attachment A to this Order, unless the Regional Board determines such discharges are addressed by the Copermittee through A.3.b or A.4, including any modifications.

Comment [A18]: See discussion in section 3.2.2 of the comment letter.

d. Storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No.

2012-0012 applicable to these discharges, included in Attachment A to this Order. All other discharges from the Copermittees' MS4s to ASBS are ~~to be effectively~~ prohibited.

2. Receiving Water Limitations

Comment [A19]: See discussion in section 3.2.2 of the comment letter.

a. Discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters, including but not limited to all applicable provisions ~~contained in:~~below, unless the Regional Board determines such discharges are addressed by the Copermittee through A.3.b or A.4::~~contained in:~~

(1) The San Diego Water Board's Basin Plan, including beneficial uses, water quality objectives, and implementation plans;

(2) State Water Board plans for water quality control including the following:

(a) Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries (Thermal Plan), and

(b) The Ocean Plan, including beneficial uses, water quality objectives, and implementation plans;

(3) State Water Board policies for water and sediment quality control including the following:

(a) Water Quality Control Policy for the Enclosed Bays and Estuaries of California,

(b) Sediment Quality Control Plan which includes the following narrative objectives for bays and estuaries:

(i) Pollutants in sediments shall not be present in quantities that, alone or in combination, are toxic to benthic communities, and

(ii) Pollutants shall not be present in sediments at levels that will bioaccumulate in aquatic life to levels that are harmful to human health,

(c) The Statement of Policy with Respect to Maintaining High Quality of Waters in California;[1]

(4) Priority pollutant criteria promulgated by the USEPA through the following:

[1] State Water Board Resolution No. 68-16

(a) National Toxics Rule (NTR)[2] (promulgated on December 22, 1992 and amended on May 4, 1995), and

(b) California Toxics Rule (CTR).[3,4]

b. Discharges from MS4s composed of storm water runoff must not alter natural ocean water quality in an ASBS.

[2] 40 CFR 131.36
[3] 65 Federal Register 31682-31719 (May 18, 2000), adding Section 131.38 to 40 CFR
[4] If a water quality objective and a CTR criterion are in effect for the same priority pollutant, the more stringent of the two applies.

3. Effluent Limitations

a. TECHNOLOGY BASED EFFLUENT LIMITATIONS

Comment [A20]: See discussion in section 3.2.2 of the comment letter.

Pollutants in ~~storm water~~ discharges from MS4s must be reduced to the MEP.[5]

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

This Order establishes water quality based effluent limitations (WQBELs) consistent with the assumptions and requirements of all available TMDL waste load allocations (WLAs) assigned to discharges from the Copermittees' MS4s. Each Copermittee must comply with applicable WQBELs established for the TMDLs in Attachment E to this Order, pursuant to the applicable TMDL compliance schedules.

4. Compliance with Discharge Prohibitions and Receiving Water Limitations

Comment [A21]: See discussion in section 3.2.2 of the comment letter.

Each Copermittee must achieve compliance with Provisions A.1.a~~,~~ through A.1.c and A.2.a of this Order through timely implementation of control measures and other actions as specified in Provisions B and E of this Order, including any modifications. The Water Quality Improvement Plans required under Provision B must be designed and adapted to ultimately achieve compliance with Provisions A.1.a~~,~~ through A.1.c and A.2.a~~.~~, as described in Provision B.2.~~.~~

a. If exceedance(s) of water quality standards persist in receiving waters notwithstanding implementation of this Order, the Copermittees must comply with the following procedures:

(1) For exceedance(s) of a water quality standard in the process of being addressed by the Water Quality Improvement Plan, the Copermittee(s) must implement the Water Quality Improvement Plan as accepted by the San Diego Water Board, and update the Water Quality Improvement Plan, as necessary, pursuant to Provision F.2.c;

(2) Upon a determination by either the Copermittees or the San Diego Water Board that discharges from the MS4 are causing or contributing to a new exceedance of an applicable water quality standard not addressed by the Water Quality Improvement Plan, the Copermittees must submit the following updates to the Water Quality Improvement Plan pursuant to Provision F.2.c or as part of the Annual Report required under Provision F.3.b, unless the San

[5] This does not apply to MS4 discharges which receive subsequent treatment to reduce pollutants in storm water discharges to the MEP prior to entering receiving waters (e.g., low flow diversions to the sanitary sewer). Runoff treatment must occur prior to the discharge of runoff into receiving waters per Finding 7.

Diego Water Board directs an earlier submittal:

(a) The water quality improvement strategies being implemented that are effective and will continue to be implemented,

(b) Water quality improvement strategies (i.e. BMPs, retrofitting projects, stream and/or habitat rehabilitation or restoration projects, adjustments to jurisdictional runoff management programs, etc.) that will be implemented to reduce or eliminate any pollutants or conditions that are causing or contributing to the exceedance of water quality standards,

(c) Updates to the schedule for implementation of the existing and additional water quality improvement strategies, and

(d) Updates to the monitoring and assessment program to track progress toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a of this Order;

(3) The San Diego Water Board may require the incorporation of additional modifications to the Water Quality Improvement Plan required under Provision B. The applicable Copermittees must submit any modifications to the update to the Water Quality Improvement Plan within 90 days of notification that additional modifications are required by the San Diego Water Board, or as otherwise directed;

(4) Within 90 days of the San Diego Water Board determination that the update to the Water Quality Improvement Plan meets the requirements of this Order, the applicable Copermittees must revise the jurisdictional runoff management program documents to incorporate the updated water quality improvement strategies that have been and will be implemented, the implementation schedule, and any additional monitoring required; and

(5) Each Copermittee must implement the updated Water Quality Improvement Plan.

b. The procedure set forth above to achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order do not have to be repeated for continuing or recurring exceedances of the same water quality standard(s) following implementation of scheduled actions unless directed to do otherwise by the San Diego Water Board.

c. Nothing in Provisions A.4.a and A.4.b prevents the San Diego Water Board from enforcing any of provisions B through I of this Order while the applicable Copermittees prepare and implement the above update to the Water Quality Improvement Plan and jurisdictional runoff management programs.

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B. WATER QUALITY IMPROVEMENT PLANS

The purpose of this provision is to develop Water Quality Improvement Plans (WQIPs) that guide the Copermittees' jurisdictional runoff management programs towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plans is to ~~protect, preserve, enhance, and restorerestore the~~address the impacts of MS4 discharges so that such discharges do not impair water quality and designated beneficial uses of receiving waters~~. of the state.~~ Therefore, implementation of the WQIPs also provides the basis for complying with Provisions II.A.1, II.A.2, and II.A.3, as described in Provision II.A.4. This goal will be accomplished through an adaptive planning and management process that identifies the highest priority water quality conditions within a watershed and implements strategies through the jurisdictional runoff management programs to achieve improvements in the quality of discharges from the MS4s ~~and~~ to receiving waters. As such, the requirements outlined in Provision E may be modified for consistency with the WQIP priorities for the applicable Watershed Management Area, if appropriate justification is provided approved within the WQIP.

Comment [A22]: See section 3.3 of the comment letter for discussions of the changes requested herein.

Comment [A23]: See discussion in section 3.3.2 of the comment letter.

1. Watershed Management Areas

Comment [A24]: See discussion in section 3.3.2 of the comment letter.

The Copermittees must develop a Water Quality Improvement Plan for each of the Watershed Management Areas in Table B-1. A total of ten Water Quality Improvement Plans must be developed for the San Diego Region.

Development of the Water Quality Improvement Plan for the Santa Margarita River Watershed Management Area shall commence upon notification of coverage of the Riverside County Copermittees under this Order. Until this time, the County of San Diego shall use the water quality priorities in the Santa Margarita River Watershed Urban Runoff Management Plan, developed pursuant to Order No. R9-2007-0001, to guide implementation of Provisions D and E within its jurisdiction

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
San Juan (901.00)	South Orange County	- Aliso Creek - San Juan Creek - San Mateo Creek - Pacific Ocean - Heisler Park ASBS	- City of Aliso Viejo[1] - City of Dana Point[1] - City of Laguna Beach[1] - City of Laguna Hills[1] - City of Laguna Niguel[1] - City of Laguna Woods[1] - City of Lake Forest[1] - City of Mission Viejo[1] - City of Rancho Santa Margarita[1] - City of San Clemente[1] - City of San Juan Capistrano[1] - County of Orange[1] - Orange County Flood Control District[1]

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Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
Santa Margarita (902.00)	Santa Margarita River	- Murrieta Creek - Temecula Creek - Santa Margarita River - Santa Margarita Lagoon - Pacific Ocean	- City of Murrieta[2] - City of Temecula[2] - City of Wildomar[2] - County of Riverside[2] - County of San Diego[3] - Riverside County Flood Control and Water Conservation District[2]
San Luis Rey (903.00)	San Luis Rey River	- San Luis Rey River - San Luis Rey Estuary - Pacific Ocean	- City of Oceanside - City of Vista - County of San Diego
Carlsbad (904.00)	Carlsbad	- Loma Alta Slough - Buena Vista Lagoon - Agua Hedionda Lagoon - Batiquitos Lagoon - San Elijo Lagoon - Pacific Ocean	- City of Carlsbad - City of Encinitas - City of Escondido - City of Oceanside - City of San Marcos - City of Solana Beach - City of Vista - County of San Diego
San Dieguito (905.00)	San Dieguito River	- San Dieguito River - San Dieguito Lagoon - Pacific Ocean	- City of Del Mar - City of Escondido - City of Poway - City of San Diego - City of Solana Beach - County of San Diego
Penasquitos (906.00)	Penasquitos	- Los Penasquitos Lagoon - Pacific Ocean	- City of Del Mar - City of Poway - City of San Diego - County of San Diego
	Mission Bay	- Mission Bay - Pacific Ocean - San Diego Marine Life Refuge ASBS	- City of San Diego
San Diego (907.00)	San Diego River	- San Diego River - Pacific Ocean	- City of El Cajon - City of La Mesa - City of San Diego - City of Santee - County of San Diego
Pueblo San Diego (908.00) Sweetwater (909.00) Otay (910.00)	San Diego Bay	- Sweetwater River - Otay River - San Diego Bay - Pacific Ocean	- City of Chula Vista - City of Coronado - City of Imperial Beach - City of La Mesa - City of Lemon Grove - City of National City - City of San Diego - County of San Diego - San Diego County Regional Airport Authority - San Diego Unified Port District
Tijuana (911.00)	Tijuana River	- Tijuana River - Tijuana Estuary - Pacific Ocean	- City of Imperial Beach - City of San Diego - County of San Diego

Notes:
1. The Orange County Copermittees will be covered under this Order after expiration of Order No. R9-2009-0002, or earlier if the Orange County Copermittees meet the conditions in Provision F.6.
2. The Riverside County Copermittees will be covered under this Order after expiration of Order No. R9-2010-0016, or earlier if the Riverside County Copermittees meet the conditions in Provision F.6.
3. The County of San Diego is required to implement the requirements of Provision B for its jurisdiction within the Santa

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Margarita River Watershed Management Area until the Riverside County Copermittees have been notified of coverage under this Order.

2. Priority Water Quality Conditions

The Copermittees must identify the water quality priorities within each Watershed Management Area that will be addressed by the Water Quality Improvement Plan. Where appropriate, Watershed Management Areas may be separated into subwatersheds to focus water quality prioritization and jurisdictional runoff management program implementation efforts by receiving water.

a. Assessment of Receiving Water Conditions

The Copermittees must consider the following, at a minimum, to identify water quality priorities based on impacts of MS4 discharges on receiving water beneficial uses:

(1) Receiving waters listed as impaired on the CWA Section 303(d) List of Water Quality Limited Segments (303(d) List);

(2) TMDLs adopted and under development by the San Diego Water Board;

(3) Receiving waters recognized as sensitive or highly valued by the Copermittees, including estuaries designated under the National Estuary Program under CWA section 320, wetlands defined by the State or U.S. Fish and Wildlife Service's National Wetlands Inventory as wetlands, and receiving waters identified as ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (Attachment A);

(4) The receiving water limitations of Provision A.2;

(5) Known historical versus current physical, chemical, and biological water quality conditions;

(6) Available, relevant, and appropriately collected and analyzed physical, chemical, and biological receiving water monitoring data, including, but not limited to, data describing:

(a) Chemical constituents,

(b) Water quality parameters (i.e. pH, temperature, conductivity, etc.),

(c) Toxicity Identification Evaluations for both receiving water column and sediment,

(d) Trash impacts,

(e) Bioassessments, and

(f) Physical habitat;

(7) Available evidence of erosional impacts in receiving waters due to accelerated flows (i.e. hydromodification);

(8) Available evidence of adverse impacts to the chemical, physical, and biological integrity of receiving waters; and

(9) The potential improvements in the overall condition of the Watershed Management Area that can be achieved.

b. ASSESSMENT OF IMPACTS FROM MS4 DISCHARGES

The Copermittees must consider the following, at a minimum, to identify the potential impacts to receiving waters that may be caused or contributed to by discharges from the Copermittees' MS4s:

(1) The discharge prohibitions of Provision A.1 and effluent limitations of Provision A.3; and

(2) Available, relevant, and appropriately collected and analyzed storm water and non-storm water monitoring data from the Copermittees' MS4 outfalls;

(3) Locations of each Copermittee's MS4 outfalls that discharge to receiving waters;

(4) Locations of MS4 outfalls that are known to persistently discharge non-storm water to receiving waters likely causing or contributing to impacts on receiving water beneficial uses;

(5) Locations of MS4 outfalls that are known to discharge pollutants in storm water causing or contributing to impacts on receiving water beneficial uses; and

(6) The potential improvements in the quality of discharges from the MS4 that can be achieved.

c. IDENTIFICATION OF PRIORITY WATER QUALITY CONDITIONS

(1) The Copermittees must use the information gathered for Provisions B.2.a and B.2.b to develop a list of priority water quality conditions as pollutants, stressors and/or receiving water conditions that are the highest threat to receiving water quality or that most adversely affect the physical, chemical, and biological integrity of receiving waters. The list must include the following information for each priority water quality condition:

(a) The beneficial use(s) associated with the priority water quality condition;

(b) The geographic extent of the priority water quality condition within the Watershed Management Area, if known;

(c) The temporal extent of the priority water quality condition (e.g., dry weather and/or wet weather);

(d) The Copermittees with MS4s discharges that may cause or contribute to the priority water quality condition; and

(e) An assessment of the adequacy of and data gaps in the monitoring data to characterize the conditions causing or contributing to the priority water quality condition, including a consideration of spatial and temporal variation.

(2) The Copermittees must identify the highest priority water quality conditions to be addressed by the Water Quality Improvement Plan, and provide a rationale for selecting a subset of the water quality conditions identified pursuant to Provision B.2.c.(1) as the highest priorities.

d. IDENTIFICATION OF MS4 SOURCES OF POLLUTANTS AND/OR STRESSORS

The Copermittees must identify and prioritize known and suspected sources of storm water and non-storm water pollutants and/or other stressors within their jurisdiction, associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c. ~~The identification of known and suspected sources of pollutants and/or stressors that cause or contribute to the highest priority water quality conditions as identified for Provision B.2.c must~~ considering the following:

(1) Pollutant generating facilities, areas, and/or activities within the Watershed Management Area, including:

(a) Each Copermittee's inventory of construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas,

(b) Publicly owned parks and/or recreational areas,

(c) Open space areas,

(d) All currently operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste,,, and

(e) Areas not within the Copermittees' jurisdictions (e.g., Phase II MS4s, tribal lands, state lands, federal lands) that are known or suspected to be discharging to the Copermittees' MS4s;

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(2) Locations of the Copermittees' MS4s, including the following:

(a) All major MS4 outfalls [per 40CFR 122.26 (b)(5)] that discharge to receiving waters, and

(b) Locations of major structural controls for storm water and non-storm water (e.g., retention basins, detention basins, major infiltration devices, etc.);

(3) Other known and suspected sources of non-storm water or pollutants in storm water discharges to receiving waters within the Watershed Management Area, including the following:

(a) Other MS4 outfalls (e.g., Phase II Municipal and Caltrans),

(b) Other NPDES permitted discharges,

(c) Any other discharges that may be considered point sources (e.g., private outfalls), and

(d) Any other discharges that may be considered non-point sources (e.g., agriculture, wildlife or other natural sources);

(4) Review of available data, including but not limited to:

(a) Findings from the Copermittees' illicit discharge detection and elimination programs,

(b) Findings from the Copermittees' MS4 outfall discharge monitoring,

(c) Findings from the Copermittees' receiving water monitoring,

(d) Findings from the Copermittees' MS4 outfall discharge and receiving water assessments, and

(e) Other available, relevant, and appropriately collected data, information, or studies related to pollutant sources and/or stressors that contribute to the highest priority water quality conditions as identified for Provision B.2.c.

(5) The adequacy of the available data to identify and prioritize sources and/or stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c.

e. NUMERIC GOALS AND SCHEDULES

Comment [A25]: See discussion in section 3.3.2 of the comment letter.

The Copermittees must develop and incorporate action levels, interim and final numeric goals[6] and schedules into the Water Quality Improvement Plan. Numeric goals must be used to support Water Quality Improvement Plan implementation and measure progress towards addressing the highest priority water quality conditions identified under Provision B.2.c. . Action Levels, Numeric goals are not enforceable compliance standards, effluent limitations, or receiving water limitations. When establishing numeric goals and corresponding schedules, the Copermittees must consider the following:

(1) Final numeric goals must be based on measureable criteria or indicators, to be achieved in ~~the receiving waters and/or~~ MS4 discharges for the highest priority water quality conditions which will ~~be capable of demonstrating the achievement of the restoration and/or protection~~ comply with the Receiving Water Limitations (A.2) of this Order; ~~water quality standards in receiving waters;~~

(2) Interim numeric goals must be based on measureable criteria or indicators capable of demonstrating incremental progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges; and

(3) Schedules must be adequate for measuring progress toward achieving the interim and final numeric goals required for Provisions B.2.e.(1) and B.2.e.(2). Schedules must incorporate the following:

(a) Interim dates for achieving the interim numeric goals,

(b) Compliance schedules for any applicable TMDLs in Attachment E to this Order,

(c) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A),

(d) Achievement of the final numeric goals in the receiving waters and/or MS4 discharges for the highest water quality priorities must be as soon as possible, and

[6] Interim and final numeric goals may take a variety of forms such as TMDL established WQBELs, action levels, pollutant concentration, load reductions, number of impaired water bodies delisted from the List of Water Quality Impaired Segments, Index of Biotic Integrity (IBI) scores, or other appropriate metrics. Interim and final numeric goals are not necessarily limited to one criterion or indicator, but may include multiple criteria and/or indicators. Except for TMDL established WQBELs, interim and final numeric goals and corresponding schedules may be revised through the adaptive management process under Provision B.5.

Riverside Copermittee Redlines

(e) Final dates for achieving the final numeric goals must not initially extend more than 10 years beyond the effective date of this Order, unless a longer period of time is authorized by the San Diego Water Board Executive Officer through an approved WQIP or the schedule includes an applicable TMDL in Attachment E to this Order[7].

Comment [A26]: Clarify that a longer period can be granted through the WQIP process.

[7] Achievement of final numeric goals within 10 years represents progress towards attainment of water quality standards, but is not a requirement to fully attain all applicable water quality standards or all priority receiving water conditions within 10 years.

3. Water Quality Improvement Strategies and Schedules

Comment [A27]: See discussion in section 3.3.2 of the comment letter.

The Copermittees must develop specific water quality improvement strategies to address the highest priority water quality conditions identified within a Watershed Management Area. The water quality improvement strategies must address the highest priority water quality conditions by ensuring the effective prohibition of~~preventing or eliminating~~ non-storm water discharges to and from the MS4, reducing pollutants in ~~storm water~~ discharges from the MS4 to the MEP, as applicable to the priority water quality conditions established per provision B.2. ~~and restoring and/or protecting the water quality standards of receiving waters~~.

a. Water Quality Improvement Strategies

The Copermittees must identify and prioritize water quality improvement strategies based on their likely effectiveness and efficiency, and design the JRMP programs to focus resources on those strategies to~~implement strategies to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, improve the physical, chemical, and biological receiving water conditions, and~~ achieve the interim and final numeric goals in accordance with the schedules required for Provision B.2.e.(3). The following water quality improvement strategies must be included and described in the Water Quality Improvement Plan:

(1) Specific strategies and/or activities that may be implemented by one or more Copermittees within their jurisdictions through the jurisdictional runoff management programs that will address the highest priority water quality conditions within the Watershed Management Area, in accordance with the following requirements:

(a) Strategies and/or activities must, at a minimum, be described for each jurisdictional runoff management program component where strategies to address the highest priority water quality conditions are required under Provision E;

(b) The Water Quality Improvement Plan must describe the circumstances or conditions when and where the strategies or/activities should be or will be implemented, but specific details about how each Copermittee will implement the strategies and/or activities within its jurisdiction are not required; and

(c) Descriptions of strategies and/or activities must include any monitoring, information collection, special studies, and/or data analysis that is necessary to assess the effectiveness of the strategy and/or activity toward addressing the highest priority water quality conditions.

(2) Additional strategies and/or activities that may be implemented within the Watershed Management Area on a jurisdictional, sub-watershed, or watershed scale by one or more Copermittees, not specifically required under

Provision E, which are designed to achieve the interim and final numeric goals identified in Provisions B.2.e.(1) and B.2.e.(2);

b. IMPLEMENTATION SCHEDULES

(1) The Copermittees must develop schedules for implementing the water quality improvement strategies identified under Provision B.3.a to achieve the interim and final numeric goals identified under Provision B.2.e.(1) and B.2.e.(2). Schedules must be developed for both the water quality improvement strategies implemented by each Copermittee within its jurisdiction and for strategies that the Copermittees choose to implement on a collaborative basis.

(2) The Copermittees must incorporate the implementation compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

4. Water Quality Improvement Monitoring and Assessment Program

a. The Copermittees in each Watershed Management Area must develop and incorporate an integrated monitoring and assessment program into the Water Quality Improvement Plan that assesses: 1) the progress toward achieving the numeric goals and schedules, 2) the progress toward addressing the highest priority water quality conditions for each Watershed Management Area, and 3) each Copermittee's overall efforts to implement the Water Quality Improvement Plan.

b. The monitoring and assessment program must incorporate the monitoring and assessment requirements of Provision D, which may allow the Copermittees to modify the program to be consistent with and focus on the highest priority water quality conditions for each Watershed Management Area.

c. For Watershed Management Areas with applicable TMDLs, the monitoring and assessment program must incorporate the specific monitoring and assessment requirements of Attachment E.

d. For Watershed Management Areas with any ASBS, the water quality monitoring and assessment program must incorporate the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

5. Iterative Approach and Adaptive Management Process

Comment [A28]: See discussion in section 3.3.2 of the comment letter.

The Copermittees in each Watershed Management Area must implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management

programs to become more effective toward achieving compliance with Provisions A.1, A.2, and A.3.~~A.1.a, A.1.c and A.2.a~~, and must include the following:

a. RE-EVALUATION OF PRIORITY WATER QUALITY CONDITIONS

The priority receiving water quality conditions, and numeric goals and corresponding schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.2.c and B.2.e, may be re-evaluated by the Copermittees as needed during the term of this Order as part of the Annual Report. Re-evaluation and recommendations for modifications to the priority water quality conditions, and numeric goals and corresponding schedules must be provided in the Regional Monitoring and Assessment Report pursuant to F.3.c~~Report of Waste Discharge~~, and must consider the following:

(1) Achieving the outcome of improved water quality in MS4 discharges and receiving waters through implementation of the water quality improvement strategies identified in the Water Quality Improvement Plan;

(2) Progress toward achieving interim and final numeric goals in receiving waters and/or MS4 discharges for the highest priority water quality conditions in the Watershed Management Area,

(3) Progress toward achieving outcomes according to established schedules;

(4) New information developed when the requirements of Provisions B.2.a-c have been re-evaluated;

(5) New policies or regulations that may affect identified numeric goals;

(6) Spatial and temporal accuracy of monitoring data collected to inform prioritization of water quality conditions and implementation strategies to address the highest priority water quality conditions;

(7) Availability of new information and data from sources other than the jurisdictional runoff management programs within the Watershed Management Area that informs the effectiveness of the actions implemented by the Copermittees;

(8) San Diego Water Board recommendations; and

(9) Recommendations for modifications solicited through a public participation process.

b. ADAPTATION OF STRATEGIES AND SCHEDULES

The water quality improvement strategies and schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.3, must be re-evaluated and adapted as new information becomes available to result in more effective and efficient measures to achieve the numeric goals established pursuant to

Provision B.2.e. Re-evaluation of and modifications to the water quality improvement strategies, if determined to be necessary, must be provided in the applicable Annual Report per F.3.b.(3)., and must consider the following:

(1) Modifications to the priority water quality conditions, and numeric goals and corresponding schedules based on Provision B.5.a;

(2) Measurable or demonstrable reductions of non-storm water discharges to and from each Copermittee's MS4;

(3) Measurable or demonstrable reductions of pollutants in ~~storm water~~ discharges from each Copermittee's MS4 to the MEP;

(4) New information developed when the requirements of Provisions B.2.b and B.2.d have been re-evaluated;

(5) Efficiency in implementing the Water Quality Improvement Plan;

(6) San Diego Water Board recommendations; and

(7) Recommendations for modifications solicited through a public participation process.

c. ADAPTATION OF MONITORING AND ASSESSMENT PROGRAM

The water quality improvement monitoring and assessment program, included in the Water Quality Improvement Plan pursuant to Provisions B.4, must be re-evaluated and adapted when new information becomes available. Re-evaluation and recommendations for modifications to the monitoring and assessment program, pursuant to the requirements of Provision D, may be provided in the Annual Report, but must be provided in the Report of Waste Discharge.

6. Water Quality Improvement Plan Submittal, Updates, and Implementation

a. The Copermittees must submit the Water Quality Improvement Plans in accordance with the requirements of Provision F.1.

b. The Copermittees must submit proposed updates to the Water Quality Improvement Plan for acceptance by the San Diego Water Board Executive Officer in accordance with the requirements of Provision F.2.c.

c. The Copermittees must commence with implementation of the Water Quality Improvement Plans ~~immediately after acceptance by the San Diego Water Board, in accordance with the schedules, or subsequently updated schedules, within the Water Quality Improvement Plan.~~in accordance with Provision F.1.b.(5).

Riverside Copermittee Redlines

C. ACTION LEVELS

Comment [A29]: See comment letter section 3.4 for a discussion of the redlines shown herein.

The purpose of this provision is for the Copermittees to incorporate numeric non-stormwater action levels (NALs) and stormwater action levels (SALs) in the Water Quality Improvement Plans (Provision B), and numeric non-stormwater action levels (NALs) in the Illicit Discharge Detection and Elimination (IDDE) program (Provision E.2.).

- For the purposes of the WQIPs, ~~T~~the goal of the action levels is to guide ~~Water Quality Improvement Plan~~ the implementation efforts and measure progress towards the protection of the identified high priority water quality conditions and associated designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through monitoring and assessing the quality of the MS4 discharges during the implementation of the Water Quality Improvement Plans.

- For the purposes of the IDDE program, the goal of the non-stormwater action levels is to assist in determining whether a persistent non-stormwater discharge into or from the MS4 contains pollutants at levels that have the potential to negatively affect the identified high priority water quality conditions.

Action levels will be developed and incorporated into the WQIP (Provision B) and the IDDE Program (Provision E). Depending upon the goals/objectives for the use of the action levels and the priority receiving water conditions, the constituents and values at which they are set may differ between watersheds. Copermittees may develop Watershed Management Area specific numeric action levels for non-stormwater and stormwater MS4 discharges using an approach approved by the Regional Board or use the default non-stormwater and stormwater action levels prescribed in C.1 and C.2 below.

The Copermittees will submit the action levels as a part of the WQIP and JRMP submittals. The action levels currently established will serve as the interim action levels until revised action levels are completed and approved. Exceedances of the action levels are not subject to enforcement or non-compliance actions under this Order.

1. Default Non-Storm Water Action Levels[8]

~~The Copermittees must develop and incorporate numeric non-storm water action levels (NALs) into the Water Quality Improvement Plan to: 1) support the development and prioritization of water quality improvement strategies for addressing non-storm water discharges to and from the MS4s, 2) assess the effectiveness of the water quality improvement strategies toward addressing MS4~~

Comment [A30]: As discussed in section 2.4 of the Riverside comment letter.

[8] NALs are not ~~considered by the San Diego Water Board to be~~ enforceable limitations under this Order.

~~non-storm water discharges, required pursuant to Provision D.4.b.(1), and 3) support the detection and elimination of non-storm water and illicit discharges to and from the MS4, required pursuant to Provision E.2.~~[9]

a. The following NALs must be incorporated as applicable to the WMA and the Copermittees' MS4 discharges,~~:~~ if the Copermittees do not establish numeric action levels within the WQIP based on watershed priorities:

(1) Non-Storm Water Discharges from MS4s to Ocean Surf Zone

Table C-1. Non-Storm Water Action Levels for Discharges from MS4s to Ocean Surf Zone

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Total Coliform	MPN/100 ml	1,000	-	10,000/1,000[1]	OP
Fecal Coliform	MPN/100 ml	200[2]	-	400	OP
Enterococci	MPN/100 ml	35	-	104[3]	OP

Abbreviations/Acronyms
AMAL – average monthly action level
OP – Ocean Plan water quality objective
MDAL – maximum daily action level
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Total coliform density NAL is 1,000 MPN/100 ml when the fecal/total coliform ratio exceeds 0.1.
2. Fecal coliform density NAL is 200 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas."

[9] ~~The Copermittees may utilize NALs or other benchmarks currently established by the Copermittees as interim NALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.~~

(2) Non-Storm Water Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Table C-2. Non-Storm Water Action Levels for Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Turbidity	NTU	75	-	225	OP
pH	Units	Within limit of 6.0 to 9.0 at all times			OP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	35	-	104[3]	BP
Priority Pollutants	ug/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
OP – Ocean Plan water quality objective
NTU – Nephelometric Turbidity Units
ug/L – micrograms per liter
MDAL – maximum daily action level
BP – Basin Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas" and is not applicable to waterbodies that are not designated with the water contact recreation (REC-1) beneficial use.

Table C-3. Non-Storm Water Action Levels for Priority Pollutants

Parameter	Units	Freshwater (CTR)		Saltwater (CTR)	
		MDAL	AMAL	MDAL	AMAL
Cadmium	ug/L	**	**	16	8
Copper	ug/L	*	*	5.8	2.9
Chromium III	ug/L	**	**	-	-
Chromium VI	ug/L	16	8.1	83	41
Lead	ug/L	*	*	14	2.9
Nickel	ug/L	**	**	14	6.8
Silver	ug/L	*	*	2.2	1.1
Zinc	ug/L	*	*	95	47

Abbreviations/Acronyms:
CTR – California Toxic Rule
AMAL – average monthly action level
ug/L – micrograms per liter
MDAL – maximum daily action level

Notes:
* Action levels developed on a case-by-case basis (see below)
** Action levels developed on a case-by-case basis (see below), but calculated criteria are not to exceed Maximum Contaminant Levels (MCLs) under the California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64431

The Cadmium, Copper, Chromium (III), Lead, Nickel, Silver and Zinc NALs for MS4 discharges to freshwater receiving waters will be developed on a case-by-case basis because the freshwater criteria are based on site-specific water quality data (receiving water hardness). For these priority pollutants, refer to ~~the following equations (~~40 CFR 131.38.b.2 for details~~) will be required~~:

~~Cadmium (Total Recoverable) = exp(0.7852[ln(hardness)] - 2.715)~~
~~Chromium III (Total Recoverable) = exp(0.8190[ln(hardness)] + 0.6848)~~
~~Copper (Total Recoverable) = exp(0.8545[ln(hardness)] - 1.702)~~
~~Lead (Total Recoverable) = exp(1.273[ln(hardness)] - 4.705)~~
~~Nickel (Total Recoverable) = exp(.8460[ln(hardness)] + 0.0584)~~
~~Silver (Total Recoverable) = exp(1.72[ln(hardness)] - 6.52)~~
~~Zinc (Total Recoverable) = exp(0.8473[ln(hardness)] + 0.884)~~

Comment [A31]: Consistent with SD Permittee recommendations.

(3) Non-Storm Water Discharges from MS4s to Inland Surface Waters

Table C-4. Non-Storm Water Action Levels for Discharges from MS4s to Inland Surface Waters

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Dissolved Oxygen	mg/L	Not less than 5.0 in WARM waters and not less than 6.0 in COLD waters			BP
Turbidity	NTU	-	20	See MDAL	BP
pH	Units	Within limit of 6.5 to 8.5 at all times			BP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	33	-	61[3]	BP
Total Nitrogen	mg/L	-	1.0	See MDAL	BP
Total Phosphorus	mg/L	-	0.1	See MDAL	BP
MBAS	mg/L	-	0.5	See MDAL	BP
Iron	mg/L	-	0.3	See MDAL	BP
Manganese	mg/L	-	0.05	See MDAL	BP
Priority Pollutants	ug/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
BP – Basin Plan water quality objective
COLD – cold freshwater habitat beneficial use
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
MDAL – maximum daily action level
WARM – warm freshwater habitat beneficial use
MBAS – Methylene Blue Active Substances
MPN/100 ml – most probable number per 100 milliliters
ug/L – micrograms per liter

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for freshwater "designated beach areas" and is not applicable to waterbodies that are not designated with the water contact recreation (REC-1) beneficial use.

b. NALs must be identified, developed and incorporated in the Water Quality Improvement Plan for any pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in Receiving waters ~~of the state~~ associated with the highest priority water quality conditions related to non-storm water discharges from the MS4s. NALs must be based on:

(1) Applicable water quality standards which may be dependent upon site-specific or receiving water-specific conditions or assumptions to be identified by the Copermittees; or

(2) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. ~~For the NALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary NALs specific to the Watershed Management Area at levels greater than the NALs required by Provisions C.1.a and C.1.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for addressing non-~~

~~storm water discharges to and from the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and from the MS4. The secondary NALs may be developed using an approach acceptable to the San Diego Water Board.~~

d. Dry weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.b may be utilized to develop or revise NALs based on watershed-specific data, subject to San Diego Water Board Executive Officer approval.

2. Default Storm Water Action Levels[10]

The Copermittees must develop and incorporate numeric storm water action levels (SALs) in the Water Quality Improvement Plans to: 1) support the development and prioritization of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s, and 2) assess the effectiveness of the water quality improvement strategies toward reducing pollutants in storm water discharges, required pursuant to Provision D.4.b.(2).[11]

a. The following SALs for discharges of storm water from the MS4 must be incorporated~~:~~ if the Copermittees do not establish stormwater action levels within the WQIP based on watershed priorities::~~:~~

Table C-5. Storm Water Action Levels for Discharges from MS4s to Receiving Waters

Parameter	Units	Action Level
Turbidity	NTU	126
Nitrate & Nitrite (Total)	mg/L	2.6
Phosphorus (Total P)	mg/L	1.46
Cadmium (Total Cd)*	µg/L	3.0
Copper (Total Cu)*	µg/L	127
Lead (Total Pb)*	µg/L	250
Zinc (Total Zn)*	µg/L	976

Abbreviations/Acronyms:
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
ug/L – micrograms per liter

Notes:
* The sampling must include a measure of receiving water hardness at each MS4 outfall. If a total metal concentration exceeds the corresponding metals SAL in Table C-5, that concentration must be compared to the California Toxics Rule criteria and the USEPA 1-hour maximum concentration for the detected level of receiving water hardness associated with that sample. If it is determined that the sample's total metal concentration for that specific metal exceeds that SAL, but does not exceed the applicable USEPA 1-hour maximum concentration criterion for the measured level of hardness, then the sample result will not be considered above the SAL for that measurement.

[10] SALs are not ~~considered by the San Diego Water Board to be~~ enforceable limitations under this Order.
[11] The Copermittees may utilize SALs or other benchmarks currently established by the Copermittees as interim SALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

b. SALs must be identified, developed and incorporated in the Water Quality Improvement Plan for pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in Receiving waters ~~of the state~~ associated with the highest water quality priorities related to storm water discharges from the MS4s. SALs must be based on:

(1) Federal and State water quality guidance and/or water quality standards; and

(2) Site-specific or receiving water-specific conditions; or

(3) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. ~~For the SALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary SALs specific to the Watershed Management Area at levels greater than the SALs required by Provisions C.2.a and C.2.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s. The secondary SALs may be developed based on the approaches recommended by the State Water Board's Storm Water Panel[12] or using an approach acceptable to the San Diego Water Board.~~

d. Wet weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.c may be used to develop or revise SALs based upon watershed-specific data, subject to San Diego Water Board Executive Officer approval.

~~[12] Storm Water Panel Recommendations to the California State Water Resources Control Board: The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities (June 2006)~~

D. MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS

Comment [A32]: See discussion in section 3.5 of the comment letter.

The purpose of this provision is for the Copermittees to monitor and assess the impact on the chemical, physical, and biological conditions of receiving waters caused by discharges from the Copermittees' MS4s under wet weather and dry weather conditions. The goal of the monitoring and assessment program is to inform the Copermittees about the nexus between the health of receiving waters and the water quality condition of the discharges from their MS4s to those receiving waters.~~.~~ This goal will be accomplished through monitoring and assessing the conditions of the receiving waters, discharges from the MS4s to those receiving waters, pollutant sources and/or stressors, and effectiveness of the water quality improvement strategies implemented as part of the Water Quality Improvement Plans.

1. Receiving Water Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the condition of the receiving waters in each Watershed Management Area during dry weather and wet weather. Following acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct long-term receiving water monitoring during implementation of the Water Quality Improvement Plan to assess the long term trends and determine if water quality conditions in receiving waters are improving. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following receiving water monitoring procedures:

a. TRANSITIONAL RECEIVING WATER MONITORING

Beginning October 1st or May 1st (whichever is sooner) following enrollment under this order and until~~Until~~ the monitoring requirements of Provisions D.1.b-e are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following receiving water monitoring in the Watershed Management Area:

(1) Continue the receiving water monitoring programs required in Order Nos. R9-2007-0001~~,~~ (Attachment A, Section II. A. 1-5),~~,~~ R9-2009-0002, and R9-2010-0016;

(2) Continue the monitoring in the Hydromodification Management Plans approved by the San Diego Water Board;

(3) Participate in the following regional receiving water monitoring programs, as applicable to the Watershed Management Area and each Copermittees' MS4 discharges:

Comment [A33]: See discussion in section 3.5.3 of the comment letter.

(a) Storm Water Monitoring Coalition Regional Monitoring,

(b) Southern California Bight Regional Monitoring, and

(c) Sediment Quality Monitoring;

(4) Implement the monitoring programs developed as part of any implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) for the TMDLs in Attachment E to this Order; and

(5) For Watershed Management Areas with ASBS, implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

b. LONG-TERM RECEIVING WATER MONITORING STATIONS

The Copermittees must select at least one long-term receiving water monitoring station from among the existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees to be representative of the receiving water quality in the Watershed Management Area. Additional or alternative long-term receiving water monitoring stations may~~must~~ be selected where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

Comment [A34]: See discussion in section 3.5.3 of the comment letter.

c. DRY WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three dry weather monitoring events at each of the long-term receiving water monitoring stations. At least one monitoring event must be conducted during the dry season (May 1 – September 30) and at least one monitoring event must be conducted during a dry weather period during the wet season (October 1 – April 30), after the first wet weather event of the season, with an antecedent dry period of at least 72 hours following a storm event producing measureable rainfall of greater than 0.1 inch.

(1) Dry Weather Receiving Water Field Observations

For each dry weather monitoring event, the Copermittees must record field observations consistent with Table D-1 at each long-term receiving water monitoring station.

Table D-1. Field Observations for Receiving Water Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) • Assessment of any observed connectivity of MS4 discharges to a flowing receiving water. • Station description (i.e. deposits or stains, vegetation condition, structural condition, and observable biology) • Presence and assessment of trash in and around station

Comment [A35]: See discussion in section 3.5.3 of the comment letter.

(2) Dry Weather Receiving Water Field Monitoring

For each dry weather monitoring event, if conditions allow the collection of the data, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

Table D-2. Field Monitoring Parameters for Receiving Water Monitoring Stations

Parameters
• pH • Temperature • Specific conductivity • Dissolved oxygen • Turbidity

(3) Dry Weather Receiving Water Analytical Monitoring

For each dry weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity,

dissolved oxygen, turbidity, hardness, and indicator bacteria Grab samples may also be collected for the analyses described in (f) where MS4 discharge runoff constitutes less than ten percent of the flow;

Comment [A36]: The receiving water stations in Riverside County either do not receive runoff from MS4 discharges or receive deminimus flows during dry weather conditions. The flow at these stations during dry weather consists virtually entirely of rising groundwater. Background receiving water quality conditions In such cases composite samples of receiving waters not affected by MS4 discharges is not warranted.

(d) For all other constituents where runoff constitutes more than ten percent of the flow, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable NAL constituents, and

(v) Constituents listed in Table D-3.

Table D-3. Analytical Monitoring Constituents for Receiving Water Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Pesticides	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1]	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Mercury • Nickel • Selenium • Thallium • Zinc	• Organophosphate Pesticides • Pyrethroid Pesticides	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

• Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia			

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(4) Dry Weather Receiving Water Toxicity Monitoring

For each dry weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for toxicity in accordance with Table D-4:

Table D-4. Dry Weather Toxicity Testing for Receiving Water Monitoring Stations

Freshwater Organism	Test Approach	USEPA Protocol[2]
Pimephales promelas	1 acute 1 chronic[1]	EPA-821-R-02-012
Hyalella Azteca	1 acute 1 chronic[1]	EPA-821-R-02-012
Psuedokirchneriella subcapitata	1 acute 1 chronic[1]	EPA-821-R-02-013

Notes:
1. Chronic toxicity testing is not required at receiving water monitoring stations located at mass loading stations if the channel flows are diverted year-round during dry weather conditions to the sanitary sewer for treatment.
2. USEPA protocols must be utilized for toxicity testing unless alternate toxicity testing protocols have been approved by the San Diego Water Board.

(5) Dry Weather Receiving Water Bioassessment Monitoring

Bioassessment monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must conduct bioassessment monitoring during at least one dry weather monitoring event at each long-term receiving water monitoring station as follows:

(a) The following bioassessment samples and measurements must be collected:

(i) Macroinvertebrate samples must be collected in accordance with the "Reachwide Benthos (Multihabitat) Procedure" in the most current Surface Water Ambient Monitoring Program (SWAMP) Bioassessment Standard Operating Procedures (SOP), and amendments, as applicable;[13]

(ii) The "Full" suite of physical habitat characterization measurements

[13] Ode, P.R.. 2007. Standard operating procedures for collecting macroinvertebrate samples and associated physical and chemical data for ambient bioassessments in California. California State Water Resources Control Board Surface Water Ambient Monitoring Program (SWAMP) Bioassessment SOP 001. http://www.swrcb.ca.gov/water_issues/programs/swamp/tools.shtml#monitoring

must be collected in accordance with the most current SWAMP Bioassessment SOP, and as summarized in the SWAMP Stream Habitat Characterization Form – Full Version;[14] and

(iii) Freshwater algae samples must be collected in accordance with the SWAMP Standard Operating Procedures for Collecting Algae Samples.[15] Analysis of samples must include algal taxonomic composition (diatoms and soft algae) and algal biomass.

(b) The bioassessment samples, measurements, and appropriate water chemistry data must be used to calculate the following:

(i) An Index of Biological Integrity (IBI) for macroinvertebrates for each monitoring station where bioassessment monitoring was conducted, based on the most current calculation method;[16] and

(ii) An IBI for algae for each monitoring station where bioassessment monitoring was conducted, when a calculation method is developed.[17]

(c) In lieu of the requirements of Provision D.1.c.(5)(a), the Copermittees may conduct the bioassessment monitoring in accordance with the "Triad" assessment approach[18] to calculate the IBIs required for Provision D.1.c.(5)(b). The Copermittees must conduct sampling, analysis, and reporting of specified in-stream biological and habitat data according to the protocols specified in the SCCWRP Technical Report No. 539, or subsequent protocols, if developed.

(6) Dry Weather Receiving Water Hydromodification Monitoring

In addition to the hydromodification monitoring conducted as part of the Copermittees' Hydromodification Management Plans, hydromodification monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must collect the

[14] Available at: http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/reports/fieldforms_fullversion052908.pdf
[15] Fetscher et al. 2009. Standard Operating Procedures for Collecting Stream Algae Samples and Associated Physical Habitat and Chemical Data for Ambient Bioassessments in California.
[16] The most current calculation method at the time the Order was adopted is outlined in "A Quantitative Tool for Assessing the Integrity of Southern California Coastal Streams" (Ode, et al. 2005. Environmental Management. Vol. 35, No. 1, pp. 1-13). If an updated or new calculation method is developed, either both (i.e. current and updated/new) methods must be used, or historical IBIs must be recalculated with the updated or new calculation method.
[17] When a calculation method is developed, IBIs must be calculated for all available and appropriate historical data.
[18] Stormwater Monitoring Coalition Model Monitoring Technical Committee, 2004. Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California. Technical Report #419. August 2004.

following hydromodification monitoring observations and measurements within an appropriate domain of analysis during at least one dry weather monitoring event for each long-term receiving water monitoring station:

(a) Channel conditions, including:

(i) Channel dimensions,

(ii) Hydrologic and geomorphic conditions, and

(iii) Presence and condition of vegetation and habitat;

(b) Location of discharge points;

(c) Habitat integrity;

(d) Photo documentation of existing erosion and habitat impacts, with location (i.e. latitude and longitude coordinates) where photos were taken;

(e) Measurement or estimate of dimensions of any existing channel bed or bank eroded areas, including length, width, and depth of any incisions; and

(f) Known or suspected cause(s) of existing downstream erosion or habitat impact, including flow, soil, slope, and vegetation conditions, as well as upstream land uses and contributing new and existing development.

d. WET WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three wet weather monitoring events at each long-term receiving water monitoring station. At least one wet weather monitoring event must be conducted during the first wet weather event of the wet season (October 1 – April 30), and at least one wet weather monitoring event during a wet weather event that occurs after February 1.

(1) Wet Weather Receiving Water Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each long-term receiving water monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event;

(b) The flow rates and volumes measured or estimated (data from nearby

USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(d) Presence and assessment of trash in and around station.

(2) Wet Weather Receiving Water Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

(3) Wet Weather Receiving Water Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) Constituents listed in Table D-3.

(4) Wet Weather Receiving Water Toxicity Monitoring

For each wet weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for toxicity in accordance with Table D-5:

Table D-5. Wet Weather Toxicity Testing for Receiving Water Monitoring Stations

Freshwater Organism	Test Approach	USEPA Protocol[1]
Pimephales promelas	1 acute	EPA-821-R-02-012
Hyalella Azteca	1 acute	EPA-821-R-02-012
Psuedokirchneriella subcapitata	1 acute	EPA-821-R-02-013

Notes:
1. USEPA protocols must be utilized for toxicity testing unless alternate toxicity testing protocols have been approved by the San Diego Water Board.

e. OTHER RECEIVING WATER MONITORING REQUIREMENTS

(1) Regional Monitoring

The Copermittees must participate in the following regional receiving waters monitoring programs, as applicable to the Watershed Management Area and the Copermittee's MS4 discharges:

(a) Storm Water Monitoring Coalition Regional Monitoring; and

(b) Southern California Bight Regional Monitoring.

(2) Sediment Quality Monitoring

The applicable Copermittees must perform sediment monitoring to assess compliance with sediment quality receiving water limits applicable to MS4

discharges to enclosed bays and estuaries. The monitoring may be performed either by individual or multiple affected Copermittees to assess compliance with receiving water limits, or through participation in a water body monitoring coalition. The Copermittees must identify sediment sampling stations that are spatially representative of the sediment within the water body segment or region of interest. Sediment quality monitoring must be conducted in conformance with the monitoring requirements set forth in the State Water Board Sediment Quality Control Plan.

(3) ASBS Monitoring

For Watershed Management Areas with ASBS, the applicable Copermittees must implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

f. ALTERNATIVE WATERSHED MONITORING REQUIREMENTS

The San Diego Water Board may direct the Copermittees to participate in an effort to develop alternative watershed monitoring with other regulated entities, other interested parties, and the San Diego Water Board to refine, coordinate, and implement regional monitoring and assessment programs to determine the status and trends of water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and/or 3) streams. As directed by the San Diego Water Board, such alternative watershed monitoring would be done in place and stead of the commensurate requirements set forth in Provision D.1.

2. MS4 Outfall Discharge Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the discharges from the major MS4 outfalls to receiving waters in each Watershed Management Area during dry weather and wet weather. Following acceptance of the Water Quality Improvement Plans and schedule for implementation of monitoring for each Watershed Management Area, the Copermittees must conduct MS4 outfall discharge monitoring during implementation of the Water Quality Improvement Plan to assess the effectiveness of their jurisdictional runoff management programs toward effectively prohibiting non-storm water discharges into the MS4 and reducing pollutants in ~~storm water~~ discharges ~~to and~~ from their MS4s to the MEP. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following MS4 outfall monitoring procedures:

Comment [A37]: Suggest same edits for SD and OC.

a. TRANSITIONAL MS4 OUTFALL DISCHARGE MONITORING

Beginning October 1st or May 1st (whichever is sooner) following enrollment under this order and until~~Until~~ the monitoring requirements of Provisions D.2.b-c

are incorporated into a Water Quality Improvement Plan and schedule for implementation of monitoring that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following monitoring of MS4 outfall discharges to flowing receiving waters ~~monitoring~~ in the Watershed Management Area:

(1) MS4 Outfall Discharge Monitoring Station Inventory

Each Municipal Copermittee must identify all major MS4 outfalls (including those operated by a Special District Copermittee) that discharge directly to receiving waters within its jurisdiction and geo-locate those outfalls on a map of the MS4 pursuant to Provision E.2.b.(1). This information must be compiled into a MS4 outfall discharge monitoring station inventory, and must include the following information:

(a) Latitude and longitude of MS4 outfall point of discharge;

(b) Watershed Management Area;

(c) Hydrologic subarea;

(d) Outlet size;

(e) Accessibility (i.e. safety and without disturbance of critical habitat);

(f) Approximate drainage area; and

(g) Classification of whether the MS4 outfall is known to have persistent dry weather flows, transient dry weather flows, no dry weather flows, or unknown dry weather flows.

(2) Transitional Dry Weather MS4 Outfall ~~Discharge~~ Field Screening ~~Monitoring~~

Until the monitoring requirements of Provision D.2.b are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, each Municipal Copermittee must perform the following dry weather MS4 outfall field screening monitoring to identify non-storm water and illicit discharges being discharged from MS4s within its jurisdiction in accordance with Provision E.2.c, to determine which discharges are transient ~~flows~~ and which are persistent discharges to flowing receiving waters~~flows~~, and prioritize the dry weather MS4 discharges that will be investigated and eliminated in accordance with Provision E.2.d. ~~Each Copermittee must conduct the following dry weather MS4 outfall discharge field screening monitoring within its jurisdiction:~~

Comment [A38]: Suggested change of title to better characterize the requirements of this section, compared to that of D.2.b.

Comments in this section are discussed in section 3.5.3 of the comment letter.

Comment [A39]: Duplicative of previous sentence

(a) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Frequency

Each Municipal Copermittee must field screen the accessible MS4 outfalls in its inventory developed pursuant to Provision D.2.a.(1) as follows:

(i) ~~For Copermittees with less than 125 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 80 percent of the outfalls must be visually inspected two times per year during dry weather conditions.~~

(ii) For Municipal Copermittees with ~~125 major MS4 outfalls or more, but~~ less than or equal to 500 MS4 outfalls~~,~~ that discharge to receiving waters within a Watershed Management Area, ~~all~~ at least 80 percent of the accessible outfalls must be visually inspected at least annually during dry weather conditions.

(iii) For Municipal Copermittees with more than 500 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 500 outfalls must be visually inspected at least annually during dry weather conditions. Copermittees with more than 500 major MS4 outfalls within a Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(iv) Municipal Copermittees with more than 500 major MS4 outfalls within its jurisdiction that are located in more than one Watershed Management Area, at least 500 major MS4 outfalls within its inventory must be visually inspected at least annually during dry weather conditions. Copermittees with more than 500 major MS4 outfalls in more than one Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;

[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and

[e] Flow rate.

(v) Inspections of major MS4 outfalls conducted in response to public reports and staff or contractor reports and notifications may count toward the required visual inspections of MS4 outfall discharge monitoring stations.

(b) Transitional Dry Weather MS4 Outfall Discharge Field Screening Visual Observations

(i) An antecedent dry period of at least 72 hours following any storm event producing measurable rainfall greater than 0.1 inch is required prior to conducting field screening visual observations during a field screening monitoring event.

(ii) During the field screening monitoring event, each Municipal Copermittee must record visual observations consistent with Table D-6 at each MS4 outfall discharge monitoring station inspected.

Table D-6. Field Screening Visual Observations for MS4 Outfall Discharge Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) - Flow source(s) suspected or identified from non-storm water source investigation - Flow source(s) eliminated during non-storm water source identification • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) - Known or suspected source(s) of pooled or ponded water • Assessment of any observed MS4 discharge ~~with~~ to a flowing receiving water. • Station description (i.e. deposits or stains, vegetation condition, structural condition, observable biology) • Presence and assessment of trash in and around station • Evidence or signs of illicit connections or illegal dumping

(iii) Each Municipal Copermittee must implement the requirements of Provisions E.2.d.(2)(c)-(e) based on the field observations.

(iv) Each Copermittee must evaluate field observations together with existing information available from prior reports, inspections and monitoring results to determine whether any observed flowing,

pooled, or ponded waters are likely to be transient or persistent flow.[19]

Comment [A40]: See footnote edits

(c) Transitional Dry Weather MS4 Outfall Discharge Field Screening ~~Monitoring~~ Records

Based upon the results of the transitional dry weather MS4 outfall discharge field screening monitoring conducted pursuant to Provisions D.2.a.(2)(a)-(b), each Municipal Copermittee must update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow.

(3) Transitional Wet Weather MS4 Outfall Discharge Monitoring

Comment [A41]: See discussion in section 3.5.3 of the comment letter.

Until the monitoring requirements of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(a) Transitional Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees must select at least five wet weather MS4 outfall discharge monitoring stations from the inventories developed pursuant to Provision D.2.a.(1) that are representative of storm water discharges from areas consisting primarily of residential, commercial, industrial, and typical mixed-use land uses present within the Watershed Management Area.

(b) Transitional Wet Weather MS4 Outfall Discharge Monitoring Frequency

Each wet weather MS4 outfall discharge monitoring station selected pursuant to Provision D.2.a.(3)(a) must be monitored twice during the wet season (October 1 – April 30~~)).~~) in the transitional period. The~~). One~~ wet weather monitoring ~~event~~events shall be selected to be representative of the range of hydrologic conditions experienced in the region. At least 10% of samples~~event~~ must be conducted during the first wet weather event of the wet season, ~~and~~to include~~and one wet weather monitoring event~~ at least one such sample in each Watershed Management Area~~, a month after the first wet weather event of the wet season.~~

[19] Persistent flow, for the purposes of provision II.D.2.b.(2) is defined as the presence of an MS4 discharge that is hydraulically connected to a flowing receiving~~, pooled, or ponded~~ water more than 72 hours after a measureable rainfall event of 0.1 inch or greater, during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

(c) Transitional Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded of the flow from~~at~~ each wet weather MS4 outfall discharge monitoring station:

(i) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(ii) The flow rates and volumes measured or estimated from the outfall (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(iii) ~~Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and~~

(iv) Presence ~~and assessment~~ of trash in and around station.

Comment [A42]: This isn't appropriate for a wet weather event.

Comment [A43]: This isn't appropriate for a wet weather event.

(d) Transitional Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(e) Transitional Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, and indicator bacteria;

(iv) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant

concentrations and runoff flows using one of the following techniques:

[a] Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or
[b] Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or
[c] If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours;

(v) Only one analysis of the composite of aliquots is required;

(vi) The samples must be analyzed for the following constituents:

[a] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,
[b] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and
[c] Constituents listed in in Table D-7.

Table D-7. Analytical Monitoring Constituents for Wet Weather MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Nickel • Selenium • Thallium • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(f) Other Transitional Wet Weather MS4 Outfall Discharge Monitoring

The San Diego County Copermittees must continue the wet weather MS4 outfall monitoring program developed under Order No. R9-2007-0001, as approved by the San Diego Water Board, through its planned completion.

b. DRY WEATHER MS4 OUTFALL DISCHARGE MONITORING

Each Municipal Copermittee must perform the following dry weather MS4 outfall monitoring within its jurisdiction to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. ~~Each Copermittee must conduct the following dry weather MS4 outfall discharge monitoring within its jurisdiction:~~

Comment [A44]: Repetitive of previous sentence

(1) Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Comment [A45]: See discussion in section 3.5.3 of the comment letter.

Each Municipal Copermittee must continue to perform the dry weather MS4 outfall discharge field screening monitoring in accordance with the requirements of Provision D.2.a.(2). ~~The~~ however the Municipal Copermittee may adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of persistent ~~flow~~ non-storm water illegal discharges from the MS4 to flowing receiving waters in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan. ~~, provided the~~

~~number of visual inspections performed is equivalent to the number of visual inspections required under Provision D.2.a.(2)(a).~~

Comment [A46]: See comments in comment letter

(2) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring

Each Municipal Copermittee must perform the following non-storm water monitoring of MS4 outfalls that persistently ~~flow MS4 outfall~~ discharge to flowing receiving waters ~~monitoring~~ to determine which persistent non-storm water discharges contain concentrations of pollutants below NALs, and which persistent non-storm water discharges impact receiving water quality during dry weather. ~~Each Copermittee must conduct the following non-storm water persistent flow MS4 outfall discharge monitoring within its jurisdiction:~~

Comment [A47]: Repetitive of previous sentence.

(a) Prioritization of Non-Storm Water Persistent Flow MS4 Outfalls

Based upon the dry weather MS4 outfall discharge field screening monitoring records developed pursuant to Provision D.2.a.(2)(c), each Municipal Copermittee must identify and prioritize the MS4 outfalls within its jurisdiction that have~~with~~ persistent discharges to flowing receiving waters ~~flows~~ based on the highest priority water quality conditions identified in the Water Quality Improvement Plan and any additional criteria developed by the Copermittee, which may include historical data and data from sources other than what the Copermittee collects.

(b) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring Frequency

Comment [A48]: See comment letter section 3.5.3

(i) Based on the prioritization of major MS4 outfalls developed under Provision D.2.b.(2)(a), each Municipal Copermittee must identify, at a minimum, the top 10 percent of the~~10~~ highest priority major MS4 outfalls with non-storm water persistent flows that the Copermittee will monitor within each Watershed Management Area within its jurisdiction, with a minimum of one persistent ~~flow~~discharge outfall, and a maximum of 5 required per WMA. The location of the selected highest priority non-storm water persistent ~~flow~~ discharge MS4 outfall monitoring stations must be identified on the map required pursuant to Provision E.2.b.(1).

(ii) Each of the highest priority non-storm water persistent flow MS4 outfall monitoring stations identified pursuant to Provision D.2.b.(2)(b)(i) must be monitored under dry weather conditions at least ~~semi~~ annually until one of the following occurs:

[a] The non-storm water discharges have been effectively eliminated (i.e. no flowing, pooled, or ponded water) for three consecutive dry weather monitoring events; or

[b] The source(s) of the persistent flows has been identified as a category of non-storm water discharges that does not require an NPDES permit and does not have to be addressed as an illicit discharge because it was not identified as a source of pollutants (i.e. constituents in non-storm water discharge do not exceed NALs), and the persistent flow can be re-prioritized to a lower priority; or

[c] The constituents in the persistent flow non-storm water discharge do not exceed NALs, and the persistent flow can be re-prioritized to a lower priority; or

[d] The source(s) of the persistent flows has been identified as a non-storm water discharge authorized by a separate NPDES permit.

(iii) Where the criteria under Provision D.2.b.(2)(c)(ii) are not met, but the threat to water quality has been reduced by the Copermittee, the highest priority persistent flow MS4 outfall monitoring stations may be reprioritized accordingly for continued dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1).

(iv) Each Municipal Copermittee must document removal or re-prioritization of the highest priority persistent flow MS4 outfall monitoring stations identified under Provision D.2.b.(2)(b) in the Annual Report. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized MS4 major outfall in the Watershed Management Area within its jurisdiction, unless there are no remaining qualifying major MS4 outfalls within the Copermittee's jurisdiction in the Watershed Management Area.

(c) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Observations

During each semi-annual monitoring event, each Municipal Copermittee must record field observations consistent with Table D-6 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(d) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Monitoring

During each ~~semi-annual~~ monitoring event, if conditions allow the collection of the data, each Municipal Copermittee must monitor and record the parameters in Table D-2 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(e) Non-Storm Water Persistent Flow MS4 Outfall Discharge Analytical Monitoring

Comment [A49]: See discussion in section 3.5.3 of the comment letter.

During each semi-annual monitoring event in which measurable flow from the MS4 outfall to a flowing receiving water is present, each Municipal Copermittee must collect and analyze samples from each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) During development of the WQIP, for each WMA, consider the following sources to select constituents for collection of~~Collect~~ grab or composite samples to be analyzed at a qualified analytical laboratory::~~for the following constituents:~~

[a] Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,
[b] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,
[c] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,
[d] Applicable NAL constituents, and
[e] Constituents listed in Table D-8, unless the Copermittee has historical data that can demonstrate or provide justification that the analysis of the constituent is not necessary.

(iv) Copermittees may adjust the analytical list for a given WMA in successive monitoring events to add or eliminate constituents based on data that can demonstrate or provide justification regarding need or lack of need for the analysis of specific constituents.

Table D-8. Analytical Monitoring Constituents for Persistent Flow MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Total Hardness • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen	• Cadmium • Copper • Lead • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

• Ammonia		

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

~~(iv)~~(v) If the Copermittee identifies and eliminates the source of the persistent flow non-storm water discharge, analysis of the sample is not required.

c. WET WEATHER MS4 OUTFALL DISCHARGE MONITORING

The Copermittees must perform wet weather MS4 outfall monitoring to identify sources areas of pollutants in ~~storm water~~ discharges from the MS4s in the Watershed Management Area. The Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(1) Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees may adjust the wet weather MS4 outfall discharge monitoring locations and frequencies in the Watershed Management Area, as needed, to identify sources of pollutants in storm water discharges from MS4s in the Watershed Management Area in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of stations is at least equivalent to the number of stations required under Provision D.2.a.(3)(a).

(2) Wet Weather MS4 Outfall Discharge Monitoring Frequency

The Copermittees must monitor the wet weather MS4 outfall discharge monitoring stations in the Watershed Management Area at an appropriate frequency to identify source areas of pollutants in ~~storm water~~ discharges from the MS4s causing or contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan.

(3) Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or

estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

~~(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and~~

~~(d) Presence and assessment of trash in and around station.~~

Comment [A50]: These are inappropriate for wet weather observations.

(4) Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(5) Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

(iii) If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours.

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and

(iv) Applicable SAL constituents.

3. Special Studies

Comment [A51]: See discussion in section 3.5.3 of the comment letter.

a. Within the term of this Order, the Copermittees must initiate~~develop and implement~~ the following special studies:

(1) At least two~~three~~ special studies in each Watershed Management Area to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that cause or contribute to highest priority water quality conditions identified in the Water Quality Improvement Plan.

(2) At least one~~two~~ special study~~studies~~ for the San Diego Region to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that are impacting receiving waters on a regional basis in the San Diego Region.

(3) One of the two~~three~~ special studies in each Watershed Management Area may be replaced by a special study implemented pursuant to Provision D.3.a.(2).

b. The special studies must, at a minimum, be in conformance with the following criteria:

(1) The special studies must be related to the highest priority water quality conditions identified by the Copermittees in the Watershed Management Area and/or for the entire San Diego Region;

(2) The special studies developed pursuant to Provision D.3.a.(1) must:

(a) Be implemented within the applicable Watershed Management Area, and

(b) Require some form of participation by all the Copermittees within the Watershed Management Area;

(3) The special studies developed pursuant to Provision D.3.a.(2) must:

(a) Be implemented within the San Diego Region, and

(b) Require some form of participation by all Copermittees covered under the requirements of this Order.

c. Special studies developed to identify sources of pollutants and/or stressors should be pollutant and/or stressor specific and based on historical monitoring data and monitoring performed pursuant to Provisions D.1 and D.2. Development of source identification special studies should include the following:

(1) A compilation of known information on the specific pollutant and/or stressor, including data on potential sources and movement of the pollutant and/or stressor within the watershed. Data generated by the Copermittees and others, as well as information available from a literature research on the pollutant and/or stressor should be compiled and analyzed as appropriate.

(2) An identification of data gaps, based on the compiled information generated on the specific pollutant and/or stressor in Provision D.3.d.(1). Source identification special studies should be developed to fill identified data gaps.

(3) A monitoring plan that will collect and provide data the Copermittees can utilize to do the following:

(a) Quantify the relative loading or impact of a pollutant and/or stressor from a particular source or pollutant generating activity;

(b) Improve understanding of the fate of a pollutant and/or stressor in the environment;

(c) Develop an inventory of known and suspected sources of a pollutant and/or stressor in the Watershed Management Area; and/or

(d) Prioritize known and suspected sources of a pollutant and/or stressor based on relative magnitude in discharges, geographical distribution (i.e.,

regional or localized), frequency of occurrence in discharges, human health risk, and controllability.

d. Special studies initiated prior to the termacceptance of thethis Orderthe Water Quality Improvement Plan that meet the requirements of Provision D.3.b and are implementedcompleted during the term of this Order may be utilized to fulfill the special study requirements of Provision D.3.a.

e. The Copermittees must submit the monitoring plans for the special studies in the Water Quality Improvement Plans required pursuant to Provision F.1.

f. The Copermittees are encouraged to share the results of the special studies regionally among the Copermittees to provide information useful in improving and adapting the management of non-storm water and storm water runoff through the implementation of the Water Quality Improvement Plans.

4. Assessment Requirements

Each Copermittee must evaluate the data collected pursuant to Provisions D.1, D.2 and D.3, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E, to assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a. Assessments must be performed as described in the following provisions:

a. RECEIVING WATERS ASSESSMENTS

(1) The Copermittees must assess and report the conditions of the receiving waters in the Watershed Management Area as follows:

(a) Based on data collected pursuant to Provision D.1.a, the assessments under Provision D.4.a.(2) must be included in the transitionalfirst Annual Report required pursuant to Provision F.3.b.(21).

Comment [A52]: See our edits to that section

(b) Based on the data collected pursuant to Provisions D.1.a-e, the assessments required under Provision D.4.a.(2) must be included in the Report of Waste Discharge required pursuant to Provision F.5.b.

(2) The Copermittees must assess the status and trends of receiving water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under dry weather and wet weather conditions, as those conditions are affected by discharges from the Copermittees' MS4, to determine the progress towards meeting interim or final goals of the Water Quality Implementation Plan for the Watershed Management Area. For each of the three types of receiving waters that are present in each Watershed Management Area the applicable Copermittees must:

Comment [A53]: See discussion in section 3.5.3 of the comment letter.

(a) Determine whether or not the conditions of the receiving waters are meeting any applicable numeric goals established pursuant to provision B.2.e.~~protective of the designated beneficial uses~~;

~~(b) Identify the most critical beneficial uses that must be protected or restored to ensure overall health of the receiving water;~~

~~(c) Determine whether or not those critical beneficial uses are being protected and where those beneficial used must be restored;~~

~~(d)~~(b) Identify short-term and/or long-term improvements or degradation of Receiving Water conditions related to those numeric goals~~those critical beneficial uses~~;

~~(e)~~(c) Identify data gaps in the monitoring data necessary to assess Provisions D.4.a.(2)(a)-(d).

b. MS4 OUTFALL DISCHARGES ASSESSMENTS

(1) Non-Storm Water Discharges Reduction Assessments

Comment [A54]: See discussion in section 3.5.3 of the comment letter for key changes. Other changes are described in comments below.

(a) ~~Each Copermittee must assess and report the progress of its illicit discharge detection and elimination program, required to be implemented pursuant to Provision E.2, toward reducing and effectively prohibiting non-storm water and illicit discharges into the MS4 within its jurisdiction as follows:~~

~~(i) Based on data collected pursuant to Provisions D.2.a.(2), the assessments under Provision D.4.b.(1)(b) must be included when complete in the Annual Report required pursuant to Provision F.3.b.(1).~~

~~(ii) Based on the data collected pursuant to Provisions D.2.b, the assessments required under Provision D.4.b.(1)(c) must be included in the first Annual Report required pursuant to Provision F.3.b.(1), and annually thereafter.~~

~~(iii) Based on the data collected pursuant to Provisions D.2.b, the assessment required under Provision D.4.b.(1)(c) must be included in the Report of Waste Discharge required pursuant to F.5.b.~~

Comment [A55]: For clarity and simplicity, these timelines were integrated into the following sections.

(b) Based on the transitional dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.a.(2), each

Municipal Copermittee must assess and report the following, as applicable to discharges from the MS4 (including Special District Copermittee MS4s) to flowing receiving waters within their jurisdiction, in the Annual Report required pursuant to Provision F.3.b.(2):~~:~~

(i) Identify the known and suspected controllable sources (e.g. facilities, areas, land uses, pollutant generating activities) of transient and persistent flow discharges to flowing receiving waters~~flows~~ within the Copermittee's jurisdiction in the Watershed Management Area;

(ii) Identify sources of transient and persistent flow discharges to flowing receiving waters~~flows~~ within the Copermittee's jurisdiction in the Watershed Management Area that have been reduced or eliminated; and

(iii) Identify modifications to the field screening monitoring locations and frequencies for the MS4 outfalls in its inventory necessary to identify and eliminate sources of persistent flow non-storm water discharges to flowing receiving waters, pursuant to Provision D.2.b.(1).

(c) Based on the dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b, each Municipal Copermittee must assess and report the following, as applicable to discharges from the MS4 (including Special District Copermittee MS4s) within their jurisdiction, in each Annual Report required pursuant to F.3.b.(3) and in the Report of Waste Discharge required pursuant to Provision F.5.b.:~~:~~

(i) The assessments required pursuant to Provision D.4.b.(1)(a~~b~~);

(ii) Based on the data collected and applicable NALs in the Water Quality Improvement Plan, rank the MS4 outfalls in the Copermittee's jurisdiction according to potential threat to receiving water quality, and produce a prioritized list of major MS4 outfalls for follow-up action to update the Water Quality Improvement Plan, with the goal of eliminating persistent flow non-storm water discharges to flowing receiving waters and/or pollutant loads in order of the ranked priority list through targeted programmatic actions and source investigations;

(iii) For the highest priority major MS4 outfalls with persistent flow discharges to a flowing receiving water~~flows~~ that are in exceedance of NALs, identify the known and suspected sources within the Copermittee's jurisdiction in the Watershed Management Area that may cause or contribute to the NAL exceedances;

(iv) Each Copermittee must analyze the data collected pursuant to Provision D.2.b.(2), and: ~~utilize a model or other method, to calculate or estimate the non-storm water volumes and pollutant loads collectively discharged from all the major MS4s outfalls in its jurisdiction identified as having persistent dry weather flows during~~

Comment [A56]: Per edits to that section

Comment [A57]: Per edits to that section

Comment [A58]: Per edits above

Comment [A59]: Edits to this section (and sub-sections) is different than SD edits.

~~the monitoring year. These calculations or estimates must be updated annually. Each Copermittee must calculate or estimate:~~

[a] Calculate or estimate annual non-storm water volumes and pollutant loads (associated with the priority constituents identified in the WQIP) collectively discharged from the monitored persistently flowing ~~Copermittee's~~ major MS4 outfalls discharging to flowing receiving waters within the Copermittee's jurisdiction, or discharged into another Copermittee's MS4 as demonstrated through provision E.2.d.~~with an estimate of the percent contribution from each known and suspected source for each MS4 outfall~~;

[b] Identify ~~identify~~ and quantify, where feasible, known sources of non-stormwater flows not ~~[b] Annual non-storm water volumes and pollutant loads from areas or facilities~~ subject to the Copermittee's legal authority that are discharged from the Copermittee's major MS4 outfalls to downstream receiving waters.

Comment [A60]: This is to help ensure jurisdictional accountability for what is being discharged from their jurisdiction.

(v) Each Copermittee must review the data collected pursuant to Provision D.2.b and findings from the assessments required pursuant to Provision D.4.b.(1)(c)(i)-(iv) ~~once per Permit termon an annual basis, and then report~~ within the Regional Monitoring and Assessment Report per Provision F.3.c., the following ~~to~~:

[a] Identify reductions and progress in achieving reductions in non-storm water and illicit discharges to the Copermittee's MS4 in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction, with an estimate, if possible, of the non-storm water volume and/or pollutant load reductions attributable to specific water quality strategies implemented by the Copermittee; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittee in the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction.

(vi) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(v).

(2) Storm Water Pollutant Discharges Reduction Assessments

(a) ~~The Copermittees must assess and report the progress of the water quality improvement strategies, required to be implemented pursuant to~~

~~Provisions B and E, toward reducing pollutants in storm water discharges from the MS4s within the Watershed Management Area as follows:~~

~~(i) Based on data collected pursuant to Provisions D.2.a.(3), the assessments under Provision D.4.b.(2)(b) must be included in the first Annual Report required pursuant to Provision F.3.b.(1).~~

~~Based on the data collected pursuant to Provisions D.2.c, the assessments required under ProvisionProvision first Annual Report required pursuant to Provision F.3.b.(1), and annually thereafter.~~

~~Based on the data collected pursuant to Provisions D.2.c, the assessment required under Provisions D.4.b.(2)(c)-(d) must be included in the Report of Waste Discharge required pursuant to F.5.b.~~

(b) Based on the transitional wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.a.(3) the Copermittees must assess and report the following in the Transitional Period Monitoring Report required pursuant to Provision F.3.b.(2):

(i) The Copermittees must analyze the monitoring data collected pursuant to Provision D.2.a.(3), and utilize a watershed model or other method, to calculate or estimate: ~~storm water volumes and pollutant loads discharged from the MS4s in each Copermittee's jurisdiction within the Watershed Management Area. The Copermittees must calculate or estimate the following for each monitoring year:~~

[a] The average storm water runoff coefficient for each land use type within the Watershed Management Area;

[b] The volume of storm water and pollutant loads discharged from each of the Copermittee's monitored major MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each monitored storm event with measurable rainfall greater than 0.1 inch, for each of the priority water quality constituents identified in the WQIP;

[c] The total volume and pollutant loads potentially discharged from each Municipal Copermittee's jurisdiction within the watershed management area, for each monitored event, extrapolated from the data produced from the monitored outfalls.

~~The pollutant loads discharged from each of the Copermittee's major MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch; and~~

~~[d] The percent contribution of storm water volumes and pollutant loads discharged from each land use type within the drainage basin to each of the Copermittee's major MS4 outfalls in its~~

Comment [A61]: See discussion in section 3.5.3 of the comment letter.

Comment [A62]: Removed as this was confusing as it was duplicative of the subsections below.

Comment [A63]: There is no need to perform this analysis for other pollutants not identified as priorities in the WQIP.

~~jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch.~~

(ii) Identify modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify ~~sources~~ pollutants in storm water discharges from the MS4s in the Watershed Management Area pursuant to Provision D.2.c.(1).

(c) Based on the wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.c the Copermittees must assess and report (i) and (ii) below in the annual reports required per F.3.b.(3), and (i) through (iv) below in the Regional Monitoring and Assessment Report required per F.3.c. ~~the following~~:

(i) The assessments required pursuant to Provision D.4.b.(2)(a~~b~~);

(ii) Based on the data collected and applicable SALs in the Water Quality Improvement Plan, analyze and compare the monitoring data to the analyses and assumptions used to develop the Water Quality Improvement Plans, including strategies developed per Provision B.3, and evaluate whether ~~,rank the MS4 outfalls in the Watershed Management Area according to potential threat to receiving water quality, and produce a prioritized list of major MS4~~ there is a need to update the Water Quality Improvement Plan;

(iii) The Copermittees must review the data collected pursuant to Provision D.2.c and findings from the assessments required pursuant to Provisions D.4.b.(2)(c)(i)-(ii) ~~on an annual basis~~ to:

[a] Identify reductions and progress in achieving reductions in pollutant concentrations and/or pollutant loads from different land uses and/or drainage areas discharging from the Copermittees' MS4s in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing pollutants in ~~storm water~~ discharges from the MS4s to receiving waters within the Watershed Management Area to the MEP, with an estimate, if possible, of the pollutant load reductions attributable to specific water quality strategies implemented by the Copermittees; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittees in the Watershed Management Area toward reducing pollutants in ~~storm water~~ discharges from the MS4s to receiving waters in the Watershed Management Area to the MEP.

(iv) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(iii).

Comment [A64]: See discussion in section 3.5.3 of the comment letter.

Comment [A65]: Per edits to that section

Comment [A66]: Per edits above

(d) Within the Regional Monitoring and Assessment report required pursuant to F.3.c.~~The~~ Copermittees must evaluate all the data collected pursuant to Provision D.2.c, and incorporate new outfall monitoring data into time series plots for each long-term monitoring constituent for the Watershed Management Area, and perform statistical trends analysis on the cumulative long-term wet weather MS4 outfall discharge water quality data set.

c. SPECIAL STUDIES ASSESSMENTS

The Copermittees must in the applicable annual report required pursuant to F.3.b.,~~annually~~ evaluate the results and findings from the special studies developed and implemented pursuant to Provision D.3, and assess their relevance to the Copermittees' efforts to characterize receiving water conditions, understand sources of pollutants and/or stressors, and control and reduce the discharges of pollutants from the MS4 outfalls to receiving waters in the Watershed Management Area. The Copermittees must report the results of the special studies assessments applicable to the Watershed Management Area, and identify any necessary modifications or updates to the Water Quality Improvement Plan based on the results in the Annual Reports required pursuant to Provision F.3.b.

d. INTEGRATED ASSESSMENT OF WATER QUALITY IMPROVEMENT PLAN

As part of the iterative approach and adaptive management process required for the Water Quality Improvement Plan pursuant to Provision B.5, the Copermittees in each Watershed Management Area must integrate the data collected pursuant to Provisions D.1-D.3, the findings from the assessments required pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to assess the effectiveness of, and identify necessary modifications to, the Water Quality Improvement Plan as follows:

(1) The Copermittees must re-evaluate the priority water quality conditions and numeric goals for the Watershed Management Area, as needed, during the term of this Order pursuant to Provision B.5.a. The re-evaluation and recommendations for modifications to the priority water quality conditions, and/or numeric goals and corresponding schedules may be provided in the Annual Reports required pursuant to Provision F.3.b, but must at least be provided in the Regional Monitoring and Assessment Report ~~of Waste Discharge~~ pursuant to Provision F.3.c~~5.b~~. The priority water quality conditions and numeric goals for the Watershed Management Area must be re-evaluated as follows:

(a) Re-evaluate the receiving water conditions in the Watershed Management Area in accordance with Provision B.2.a;

(b) Re-evaluate the impacts on receiving waters in the Watershed Management Area from MS4 discharges in accordance with Provision B.2.b;

(c) Re-evaluate the identification of MS4 sources of pollutants and/or stressors in accordance with Provision B.2.d;

(d) Identify beneficial uses of the receiving waters that are protected or must be restored in accordance with Provision D.4.a;

(e) Evaluate the progress toward achieving the interim and final numeric goals for restoring impacted beneficial uses in the receiving waters.

(2) The Copermittees must re-evaluate the water quality improvement strategies for the Watershed Management Area during the term of this Order pursuant to Provision B.5.b. The re-evaluation and recommendations for modifications to the water quality improvement strategies and schedules may be provided in the Annual Reports required pursuant to Provision F.3.b, but must at least be provided in the Regional Monitoring and Assessment Report pursuant to Provision F.3.c~~must be provided in the Annual Reports required pursuant to Provision F.3.b, and provided in the Report of Waste Discharge pursuant to Provision F.5.b~~. The water quality improvement strategies for the Watershed Management Area must be re-evaluated as follows:

(a) Identify the non-storm water and storm water pollutant loads from the Copermittees' MS4 outfalls in the Watershed Management Area, calculated or estimated pursuant to Provisions D.4.b;

(b) Identify the non-storm water and storm water pollutant load reductions, or other improvements to receiving water or water quality conditions, that are necessary to attain the interim and final numeric goals identified in the WQIP~~for restoring impacted beneficial uses in the receiving waters~~;

(c) Identify any~~the~~ non-storm water and storm water pollutant load reductions, or other improvements to the quality of MS4 discharges, that are necessary for the Copermittees to ~~demonstrate that non-storm water and storm water~~ reduce discharges of pollutants from their MS4s that have been demonstrated to be~~are not~~ causing or contributing to exceedances of receiving water limitations;

Comment [A67]: See discussion in section 3.5.3 of the comment letter.

(d) Evaluate the progress of the water quality improvement strategies toward achieving the interim and final numeric goals identified in the WQIP~~for restoring impacted beneficial uses in the receiving waters~~.

(3) The Copermittees must re-evaluate and adapt the water quality monitoring and assessment program for the Watershed Management Area when new information becomes available to improve the monitoring and assessment

program pursuant to Provision B.5.c. The re-evaluation and recommendations for modifications to the monitoring and assessment program may be provided in the Annual Reports required pursuant to Provision F.3.b, but must at least be provided in the Regional Monitoring and Assessment Report ~~of Waste Discharge~~ pursuant to Provision F.3.c~~5.b~~. Modifications to the water quality monitoring and assessment program must be consistent with the requirements of Provision D.1-D.3. The re-evaluation of the water quality monitoring and assessment program for the Watershed Management Area must consider the data gaps identified by the assessments required pursuant to Provisions D.4.a-b, and results of the special studies implemented pursuant to Provision D.4.c.

5. Monitoring Provisions

Each Copermittee must comply with all the monitoring, reporting, and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

E. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS

The purpose of this provision is for each Copermittee to implement a program to control the contribution of pollutants to and the discharges from the MS4 within its jurisdiction. The goal of the jurisdictional runoff management programs is to implement strategies that effectively prohibit non-storm water discharges to the MS4 and reduce the discharge of pollutants in ~~storm water~~ to the MEP. This goal will be accomplished through implementing the jurisdictional runoff management programs in accordance with the strategies identified in the Water Quality Improvement Plans.

Each Copermittee must update its jurisdictional runoff management program document, in accordance with Provision F.2.a, to incorporate all the requirements of Provision E, consistent with their legal authority. Until the Copermittee has updated its jurisdictional runoff management program document with the applicable requirements of Provision E, the Copermittee must continue implementing its current jurisdictional runoff management program.

Modification of Jurisdictional Runoff Management Program Requirements

Modifications shall be considered and where selected, proposed according to the process in Provision B.5. Proposed modifications may increase, decrease, and/or replace minimum requirements identified in Provision E.

1. Legal Authority Establishment and Enforcement

Comment [A68]: See discussion in section 3.6 of the comment letter.

a. Each Copermittee must establish, maintain, and enforce adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 through statute, ordinance, permit, or series of contracts, ~~order, or similar means~~ which~~. This legal authority must~~, at a minimum, authorize the Copermittee to:

(1) Effectively prohibit through ordinance, order or other similar means~~Prohibit and eliminate all~~ illicit discharges ~~and illicit connections~~ to its MS4;

(2) Control, through ordinance, permit, contract, order or similar means the contribution of pollutants in discharges to the MS4 by storm water discharges ~~of runoff~~ associated with industrial and construction activity~~ to its MS4~~, and ~~control~~ the quality of storm water discharges ~~runoff~~ from sites of industrial and construction activity~~sites~~, whose discharges have not been separately authorized through~~ that do not, including industrial and construction sites which~~ have coverage under the statewide General Permit for Discharges of Storm Water Associated with Industrial Activities (Industrial General Permit) or General Permit for Discharges of Storm Water Associated with Construction Activities (Construction General Permit)~~, as well as to those sites which do not;~~

Comment [A69]: See discussion in section 3.6.2 of the comment letter.

(3) Control, through ordinance, order or similar means the discharge to the MS4 of spills, dumping, or disposal of materials other than storm water~~ into its~~

Comment [A70]: See discussion in section 3.6.2 of the comment letter.

~~MS4~~;

(4) Control through interagency agreements among Copermittees the contribution of pollutants from one portion of the MS4 to another portion of the MS4;

(5) ~~Control, by coordinating and cooperating with other owners of the MS4 such as Caltrans, the U.S. federal government, or sovereign Native American Tribes through interagency agreements, where possible, the contribution of from their portion of the MS4 to the portion of the MS4 within the Copermittee's jurisdiction;~~

(6) Require compliance with conditions in its ~~statutes,~~ ordinances, permits, contracts, or orders~~, or similar means to hold dischargers to its MS4 accountable for their contributions of pollutants and flows~~;

(7) ~~Require the use of BMPs to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;~~

(8) ~~Require documentation on the effectiveness of BMPs implemented to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;~~

(9) ~~Utilize enforcement mechanisms to require compliance with its statutes, ordinances, permits, contracts, orders, or similar means; and~~

(10) Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with permit conditions~~its statutes, ordinances, permits, contracts, orders, or similar means and with the requirements of this Order~~, including the prohibition of illicit discharges and connections to its MS4; ~~the Copermittee must also have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from industrial facilities, including construction sites, discharging into its MS4.~~

b. With the first Annual Report required pursuant to Provision F.3.b, each Copermittee must submit a statement certified by its Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative that the Copermittee has taken the necessary steps to obtain and maintain full legal authority within its jurisdiction to implement and enforce each of the requirements contained in this Order.

2. Illicit Discharge Detection and Elimination

Each Copermittee must implement a program to actively detect and eliminate illicit discharges and improper disposal into the MS4, or otherwise require the discharger

Comment [A71]: See discussion in section 3.6.2 of the comment letter.

Comment [A72]: See discussion in section 3.6.2 of the comment letter.

Comment [A73]: See discussion in section 3.6.2 of the comment letter.

Comment [A74]: See discussion in section 3.6.2 of the comment letter.

Comment [A75]: See discussion in section 3.7 of the comment letter.

to apply for and obtain a separate NPDES permit. The illicit discharge detection and elimination program must be implemented in accordance with the strategies identified in the Water Quality Improvement Plan and include, at a minimum, the following requirements:

STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the illicit discharge detection and elimination program to address ~~non-storm water and~~ illicit discharges and connections that the Copermittee has identified as potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate~~ additional~~ BMPs, focus education, and/or increase/decrease frequency of inspections in specific areas); and

(2) The strategies and/or activities ~~must~~ may be modified from ~~consistent with~~ the default requirements of Provisions E.2.b-e~~a-d~~ ~~and~~ to be consistent with the strategies identified in the Water Quality Improvement Plan;

(3) The requirements of the programs as outlined in the following sub-provisions may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality improvement Plan(s).

a. NON-STORM WATER DISCHARGES

To the extent allowable by law, each~~Each~~ Copermittee must address all non-storm water discharges ~~from~~into the MS4 as illicit discharges, where the likelihood exists that they are a source of pollutants to the Receiving Waters, unless ~~a non-storm water~~the discharge is either identified as a discharge authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that is consistent with~~must be addressed pursuant to~~ the following requirements:

(1) ~~Discharges of non-storm water to the MS4 from the following categories must be addressed as illicit dischargeunless the discharge has coverage under NPDES Permit No. CAG919001 (Order No. R9-2007-0034, or subsequent order) for discharges to San Diego Bay, or NPDES Permit No. CAG919002 (Order No. R9-2008-0002, or subsequent order) for discharges to surface waters other than San Diego Bay.~~

Comment [A76]: See discussion in section 3.7.2 of the comment letter.

~~(a) Uncontaminated pumped ground water;~~

~~(b) Discharges from foundation drains;~~[20]

~~(c) Water from crawl space pumps; and~~

~~(d) Water from footing drains.~~[19]

(2) Discharges of non-storm water from water line flushing and water main breaks to the MS4 must be addressed as illicit discharges unless the discharge has coverage under a valid NPDES Permit, ~~No. CAG 679001~~ (Order No. R9-2010-0003, or a subsequent order). This category includes potable water line flushing ~~and water main break~~ discharges from water purveyors issued a water supply permit by the California Department of Public Health or federal military installations. Discharges from recycled or reclaimed water lines to the MS4 must be addressed as illicit discharges, unless the discharges have coverage under a separate NPDES permit.

Comment [A77]: See discussion in section 3.7.2 of the comment letter.

(3) Discharges of non-storm water into the MS4 from the following categories must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the individual discharge as a source of pollutants to receiving waters:

Comment [A78]: See discussion in section 3.7.2 of the comment letter.

(a) Diverted stream flows;

(b) Rising ground waters;

(c) Uncontaminated ground water infiltration to MS4s;

(d) Uncontaminated pumped ground water;

(e) Springs;

(f) Water from crawl space pumps;

~~(e)~~(g) Flows from riparian habitats and wetlands;

(h) Landscape irrigation;

(i) Irrigation water;

(j) Lawn watering;

Comment [A79]: See Legal Comments discussion.

[20] ~~Provision E.2.a.(1) only applies to this category on non-storm water if the system is designed to be located at or below the highest historical groundwater table to actively or passively extract groundwater during any part of the year.~~

~~(d)~~(k) Discharges from potable water sources;

~~(e)~~(l) Discharges from foundation drains;[21] ~~and~~

(m)Discharges from footing drains. .[21]

(4) Discharges of non-storm water into the MS4 from the following categories must be controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means~~.~~ ~~Discharges of non-storm water to the MS4 from the following categories not controlled by the requirements given below through~~ If such statutes, ordinances, permits, contracts, orders, or similar means have not been enacted by the Copermittee, the applicable categories below must be addressed by the Copermittee as illicit discharges.

Comment [A80]: See discussion in section 3.7.2 of the comment letter.

(a) Air conditioning condensation

The discharge of air conditioning condensation should~~must~~ be directed to landscaped areas or other pervious surfaces where feasible.

(b) Individual residential vehicle washing

(i) The discharge of wash water ~~must~~ should be directed to landscaped areas or other pervious surfaces where feasible; and

(ii) Minimize the use of water for vehicle washing, use as little washing detergent and other vehicle wash products as possible, wash vehicles at commercial wash facilities, and implement other practices or behaviors that will prevent the discharge of pollutants associated with individual residential vehicle washing from entering the MS4.

(c) Dechlorinated swimming pool discharges

(i) Eliminate residual chlorine, algaecide, filter backwash, or other pollutants from swimming pools prior to discharging to the MS4; and

(ii) The discharge of saline swimming pool water must be directed to the sanitary sewer, landscaped areas, or other pervious surfaces that can accommodate the volume of water, unless the saline swimming pool water can be discharged via a pipe or concrete channel directly to a naturally saline water body (e.g. Pacific Ocean).

(5) Firefighting discharges to the MS4 must be addressed by the Copermittee as

Comment [A81]: See discussion in section 3.7.2 of the comment letter.

~~[21] Provision E.2.a.(3) only applies to this category of non-storm water discharge if the system is designed to be located above the highest historical groundwater table at all times of the year, and the system is only expected to discharge non-storm water under unusual circumstances.~~

follows:illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a significant source of pollutants to receiving waters. Firefighting discharges to the MS4 not identified as a significant source of pollutants to receiving waters, must be addressed, at a minimum, as follows:

(a) Non-emergency firefighting discharges

(i) Building fire suppression system maintenance discharges (e.g.., sprinkler line flushing) to the MS4 must be addressed as illicit discharges unless appropriate BMPs are implemented.

(ii) Non-emergency firefighting discharges (i.e., discharges from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems) must be addressed by a program, to be developed and implemented by the Copermittee in conjunction with the local Fire Authority/District, to reduce or eliminate pollutants in such discharges from entering the MS4.

(b) Emergency firefighting discharges (i.e., flows necessary for the protection of life or property) do not require BMPs and need not be prohibited.

Each Copermittee should develop and encourage implementation of BMPs to reduce or eliminate pollutants in emergency firefighting discharges to the MS4s and receiving waters within its jurisdiction. During emergency situations, priority of efforts should be directed toward life, property, and the environment (in descending order). BMPs should not interfere with immediate emergency response operations or impact public health and safety.

(6) If the Copermittee or San Diego Water Board identifies any category of non-storm water discharges listed under Provisions E.2.a.(1)-(4) as a source of pollutants to receiving waters, the category must be effectively prohibited through ordinance, order, or similar means and addressed as an illicit discharge.

(7) Each Copermittee must, where feasible, reduce or eliminate non-storm water discharges listed under Provisions E.2.a.(1)-(4) into its MS4 whether or not the non-storm water discharge has been identified as an illicit discharge, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit.

Comment [A82]: See discussion in section 3.7.2 of the comment letter.

b. Prevent And Detect Illicit Discharges And Connections

Each Copermittee must include the following measures within its program to prevent and detect illicit discharges to the MS4:

Riverside Copermittee Redlines

(1) Each Copermittee must maintain an updated map of its entire MS4 and the corresponding drainage areas. The accuracy of the MS4 map must be confirmed during the field screening required pursuant to Provision E.2.c. The MS4 map must be included as part of the jurisdictional runoff management program document. Any geographic information system (GIS) layers or files used by the Copermittee to maintain the MS4 map must be made available to the San Diego Water Board upon request. The MS4 map must identify the following:

(a) All segments of the MS4 owned, operated, and maintained by the Copermittee;

(b) All known locations of inlets that discharge and/or collect runoff into the Copermittee's MS4;

(c) All known locations of connections with other MS4s not owned or operated by the Copermittee (e.g. Caltrans MS4s);

(d) All known locations of major MS4 outfalls as defined by 40 CFR §122.26(b)(5-6) ~~and private outfalls,~~ that discharge runoff collected from areas within the Copermittee's jurisdiction;

Comment [A83]: See discussion in section 3.7.2 of the comment letter.

(e) All segments of receiving waters within the Copermittee's jurisdiction that receive and convey runoff discharged from the Copermittee's MS4 outfalls;

(f) Locations of the MS4 outfalls, identified pursuant to Provision D.2.a.(1), within its jurisdiction; and

(g) Locations of the non-storm water persistent flow MS4 outfall discharge monitoring stations, identified pursuant to Provision D.2.b.(2)(b), within its jurisdiction.

(2) Each Copermittee must use Copermittee personnel and contractors to assist in identifying and reporting illicit discharges and connections during their daily employment activities.

(3) Each Copermittee must promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges to or from the MS4, including the following methods for public reporting:

(a) Operate a public hotline, which can be Copermittee-specific or shared by the Copermittees, and must be capable of receiving reports in both English and Spanish 24 hours per day and seven days per week; and

(b) Designate an e-mail address for receiving electronic reports from the public, which can be Copermittee-specific or shared by the Copermittees, and must be prominently displayed on the Copermittee's webpage and the Regional Clearinghouse required pursuant to Provision F.4.

(4) Each Copermittee must implement practices and procedures (including a notification mechanism) to prevent, respond to, contain, and clean up any spills that may discharge into the MS4 within its jurisdiction from any source. Such practices and procedures may include the coordination with other parties, such as sanitary sewer operators. The Copermittee must coordinate, to the extent possible, with spill response teams to prevent entry of spills into the MS4~~, and prevent contamination of surface water, ground water, and soil.~~ The Copermittee must coordinate spill prevention, containment, and response activities throughout all appropriate internal~~Copermittee~~ departments, programs, and agencies.

Comment [A84]: See discussion in section 3.7.2 of the comment letter.

(5) Each Copermittee must implement practices and procedures to ~~prevent~~ control and limit infiltration of seepage from sanitary sewers owned by a Copermittee agency (including private laterals and failing septic systems) to the MS4.

(6) Each Copermittee shall~~must~~ coordinate, when necessary, with upstream Copermittees and/or entities to prevent illicit discharges from upstream sources into the MS4 within its jurisdiction.

c. FIELD SCREENING

Each Copermittee must conduct field screening (i.e. visual observations, field testing, and/or analytical testing) of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4 in accordance with the dry weather MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

d. INVESTIGATE AND ELIMINATE ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to investigate and eliminate illicit discharges to the MS4 to comply with provision A.1.b:

(1) Each Copermittee must prioritize and determine when follow-up investigations will be performed in response to visual observations and/or water quality monitoring data collected during an investigation of a detected non-storm water ~~or~~ illicit discharge into or from the MS4. The criteria for prioritizing investigations must consider the following:

(a) Pollutants identified as causing or contributing to the highest water quality

priorities identified in the Water Quality Improvement Plan;

(b) Pollutants identified as causing or contributing, or threatening to cause or contribute to impairments in water bodies on the 303(d) List and/or in environmentally sensitive areas (ESAs), located within its jurisdiction;

(c) Pollutants identified from sources or land uses known to exist within the area, drainage basin, or watershed that discharges to the portion of the MS4 within its jurisdiction included in the investigation;

(d) Pollutants identified as causing or contributing to an exceedance of a NAL in the Water Quality Improvement Plan, where the source has not been identified as natural or otherwise permitted; and

(e) Pollutants identified as an immediate and significant threat to human health or the environment.

(2) Each Copermittee must implement procedures to investigate and inspect portions of its MS4 that, based on reports or notifications, field screening, or other appropriate information, indicate a reasonable potential of receiving, containing, or discharging pollutants due to illicit discharges, or illicit connections~~, or other sources of non-storm water~~. The procedures must include the following:

(a) Each Copermittee must develop criteria to:

(i) Assess the validity of each report or notification received; and

(ii) Prioritize the response to each report or notification received.

(b) Each Copermittee must prioritize and respond to each valid report or notification (e.g., public reports, staff or contractor reports and notifications, etc.) of an incident in a timely manner.

(c) ~~Each~~In accordance with the procedures defined in Provision E.2.d.(1), each~~Each~~ Copermittee must investigate and seek to identify the source(s) of discharges of non-storm water illicit discharges or illicit connections ~~where flows are~~ observed into and from the MS4 during the field screening required pursuant to Provision D.2.b.(1) as follows:

(i) Obvious illicit discharges (i.e., unusual color or odor) must be immediately investigated to identify the source(s) of non-storm water illegal discharges;

(ii) The investigation must include field investigations to identify sources or potential sources for the discharge, unless the source or potential source has already been identified during previous investigations; and

(iii) The investigation may include follow-up field investigations and/or reviewing Copermittee inventories and other land use data to identify potential sources of the discharge.

(d) Each Copermittee must maintain records and a database of the following information:

(i) Location of incident, including hydrologic subarea, portion of MS4 receiving the non-storm water ~~or~~ illicit discharge, and point of discharge or potential discharge from MS4 to receiving water;

(ii) Source of information initiating the investigation (e.g., public reports, staff or contractor reports and notifications, field screening, etc.);

(iii) Date the information used to initiate the investigation was received;

(iv) Date the investigation was initiated;

(v) Dates of follow-up investigations;

(vi) Identified or suspected source of the illicit discharge or connection, if determined;

(vii) Known or suspected related incidents, if any;

(viii) Result of the investigation; and

(ix) If a source cannot be identified and the investigation is not continued, a rationale for why a discharge does not pose a threat to water quality and/or does not require additional investigation.

(e) Each Copermittee must ~~track~~ document, and where feasible quantify, any readily~~and seek to~~ identifiable~~y~~ the source(s) of non-storm water illegal discharges from the MS4 where there is evidence of non-storm water ~~having been discharged~~illegal discharges or connections into or from the MS4 (e.g., pooled water), in accordance with MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.

Comment [A85]: See discussion in section 3.7.2 of the comment letter.

(3) Each Copermittee must initiate the implementation of procedures, in a timely manner, to eliminate all detected and identified illicit discharges and connections within its jurisdiction. The procedures must include the following responses:

(a) Each Copermittee must enforce its legal authority, as required under Provision E.1, to eliminate illicit discharges and connections to the MS4.

(b) If the Copermittee identifies the source as a controllable source of non-storm water ~~or~~ illicit discharge or connection, the Copermittee must implement its Enforcement Response Plan pursuant to Provision E.6 and enforce its legal authority to effectively prohibit and with the goal of eliminating~~e~~ illicit discharges and connections to its MS4.

(c) If the Copermittee identifies the source of the discharge as a category of non-storm water discharges in Provision E.2.a, and the discharge is in exceedance of NALs in the Water Quality Improvement Plan, then the Copermittee must determine if: (1) this is an isolated incident or set of circumstances that will be addressed through its Enforcement Response Plan pursuant to Provision E.6, or (2) the category of discharge must be addressed through the effective prohibition of that category of discharge as an illicit discharge pursuant to Provision E.2.a.(6).

(d) If the Copermittee suspects the source of the non-storm water discharge as natural in origin (i.e. non-anthropogenically influenced) and in conveyance into the MS4, then the Copermittee must document and provide the data and evidence necessary to demonstrate to the San Diego Water Board that it is natural in origin and does not require further investigation.

(e) If the Copermittee identifies that the discharge is coming from another Copermittees' jurisdiction, the receiving Copermittee must document and provide the findings to the upstream Copermittee. The obligation to implement the requirements of provision E.2.d.(3) are thenceforth the responsibility of the upstream Copermittee.

(f) If the Copermittee identifies the source as a non-storm water discharge that has been separately authorized by the San Diego Water Board, or that is contributing pollutants to the MS4 and that may require coverage under a WDR from the San Diego Water Board, the Copermittee shall provide all relevant findings to the San Diego Water Board and may back charge the Regional Board for the entire cost of conducting the source investigation.

Comment [A86]: See discussion in section 3.7.2 of the comment letter.

~~(e)~~(g) If the Copermittee is unable to identify and document the source of a recurring non-storm water discharge to or from the MS4, then the Copermittee must ~~address the discharge as an illicit discharge and~~ update its jurisdictional runoff management program to address the common and suspected sources of the non-storm water discharge within its jurisdiction in accordance with the Copermittee's priorities.

(4) Each Copermittee must submit a summary of the non-storm water discharges and illicit discharges and connections investigated and eliminated within its jurisdiction with each Annual Report required under Provision F.3.b of this Order.

3. Development Planning

Comment [A87]: See discussion in section 3.8 of the comment letter.

Each Copermittee must, within their jurisdiction, use their land use and planning

authorities, to the extent that they may lawfully impose requirements, to implement a development planning program in accordance with the strategies identified in the Water Quality Improvement Plan and includes, at a minimum, the following requirements:

STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Comment [A88]: See discussion in section 3.8.2 of the comment letter.

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the development planning program to address development and redevelopment projects that may become sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional or alternative BMPs, focus education, increase frequency of verifications and/or inspections, alternative compliance options);

(2) Each Copermittee must identify areas within its jurisdiction where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting and/or stream, channel, or habitat rehabilitation projects;

(3) Each Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify regional alternative compliance projects that Priority Development Projects may be allowed or should be encouraged to implement or participate in implementing; and

(4) The requirements of the programs as outlined in the following sub-provisions may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality improvement Plan(s).~~The strategies and/or activities must be consistent with the requirements of Provisions E.3.a-c and E.3.e-f and the strategies identified in the Water Quality Improvement Plan.~~

a. BMP REQUIREMENTS FOR ALL DEVELOPMENT PROJECTS

Each Copermittee, as practical and feasible, must prescribe the following BMP requirements during the planning process (i.e. prior to project approval and issuance of local permits) for all development projects (regardless of project type or size), where local permits are issued, including unpaved roads and flood management projects, except emergency / public safety projects implemented for the protection of persons and property:

(1) General Requirements

(a) Onsite BMPs must be located so as to remove pollutants from runoff prior to its discharge to any receiving waters, and as close to the source as possible; and

(b) Structural BMPs must not be constructed within a waters of the U.S.. ~~or waters of the state.~~

(2) Source Control BMP Requirements

The following source control BMPs must be implemented at all development projects where applicable and feasible:

(a) Prevention of illicit discharges into the MS4;

(b) Storm drain system stenciling or signage;

(c) Properly designed outdoor material storage areas;

(d) Properly designed outdoor work areas;

(e) Properly designed trash storage areas; and

(f) Any additional BMPs determined necessary by the Copermittee to minimize pollutant generation at each project.

(3) Low Impact Development (LID) ~~BMP Requirements~~Principles

Comment [A89]: See discussion in section 3.8.2 of the comment letter.

The following LID ~~BMPs~~ Principles must be implemented at all development projects where applicable and feasible:

(a) Maintenance or restoration of natural storage reservoirs and drainage corridors (including topographic depressions, areas of permeable soils, natural swales, and ephemeral and intermittent streams);[22]

(b) Buffer zones for natural water bodies (where buffer zones are technically infeasible, require project applicant to include other buffers such as trees, access restrictions, etc.);

(c) Conservation of natural areas within the project footprint including existing trees, other vegetation, and soils;

[22] Development projects proposing to dredge or fill materials in waters of the U.S. must obtain a CWA Section 401 Water Quality Certification. Projects proposing to dredge or fill waters of the state must obtain waste discharge requirements.

(d) Construction of streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided public safety is not compromised;

(e) Minimization of the impervious footprint of the project;

(f) Minimization of soil compaction to landscaped areas;

(g) Disconnection of impervious surfaces through distributed pervious areas;

(h) Landscaped or other pervious areas designed and constructed to effectively receive and infiltrate, retain and/or treat runoff from impervious areas, prior to discharging to the MS4;

(i) Small collection strategies located at, or as close as possible to, the source (i.e. the point where storm water initially meets the ground) to minimize the transport of runoff and pollutants to the MS4 and receiving waters;

(j) Use of permeable materials for projects with low traffic areas and appropriate soil conditions;

(k) Landscaping with native or drought tolerant species; and

(l) Harvesting and using precipitation.

b. PRIORITY DEVELOPMENT PROJECTS

(1) Definition of Priority Development Project

Priority Development Projects include the following:

(a) All new development projects that fall under the Priority Development Project categories listed under Provision E.3.b.(2) (where a new development project feature, such as a parking lot, falls into a Priority Development Project category, the entire project footprint is subject to Priority Development Project requirements); and

(b) Those redevelopment projects that create, add, or replace at least 5,000 square feet of impervious surfaces on an already developed site, and the redevelopment project is a Priority Development Project category listed under Provision E.3.b.(2) (where redevelopment results in an increase of less than fifty percent of the impervious surfaces of a previously existing development, and the existing development was not subject to Priority Development Project requirements, the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) apply only to the addition or replacement, and not to the entire development; where redevelopment

results in an increase of more than fifty percent of the impervious surfaces of a previously existing development, the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) apply to the entire development).

(c) Projects where redevelopment results in an increase of more than fifty percent of impervious surfaces of a previously existing development, and the existing development *was* subject to previous Priority Project Development Requirements, only the altered portion of development is subject to the new Priority Development Project requirements.

Comment [A90]: See discussion in section 3.8.2 of the comment letter.

(2) Priority Development Project Categories

Comment [A91]: See discussion in section 3.8.2 of the comment letter.

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This category includes commercial, industrial, residential, mixed-use, and public development projects on public or private land which fall under the planning and building authority of the Copermittee.

(b) New development projects that create 5,000 square feet or more of impervious surfaces (collectively over the entire project site), and are designed for support one or more of the following uses (see Appendix for definitions):

(i) Automotive repair shop
(ii) Restaurant
(iii) Parking lot[23]
(iv) Street, road, highway, freeway
(v) Retail gasoline outlet (RGO)

Comment [A92]: See footnote

~~(b) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.~~

~~(c) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812), where the land area for development is 5,000 square feet or more.~~

~~(d) Hillside development projects. This category includes any development which creates 5,000 square feet or more of impervious surface which is~~

[23] Excluding parking lots that are not subject to runoff, such as but not limited to covered or subterranean parking lots

located in an area with known erosive soil conditions, where the development will grade on any natural slope that is twenty-five percent or greater.

(e)(c) New development projects that create 2,500 square feet or more of impervious surfaces (collectively over the entire project site), and are Environmentally sensitive areas (ESAs). This category includes any development located within, directly adjacent to, or discharging directly to an ESA, which either creates 2,500 square feet of impervious surface on a proposed project site or increases the area of imperviousness of a proposed project site to 10 percent or more of its naturally occurring condition. "Directly adjacent to" means situated within 200 feet of the ESA. "Discharging directly to" means outflow from a drainage conveyance system that collects runoff from the subject development or redevelopment site and terminates at or in receiving waters within the ESA and is not commingled with flows from adjacent or other upstream lands.

(f) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce that has 5,000 square feet or more of impervious surface.

(g) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface that is 5,000 square feet or more used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

(h) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

(i)(d) Large development projects. This category includes any post-construction pollutant-generating new development projects that result in the permanent disturbance of one acre or more of land.

(3) Priority Development Project Exemptions

Comment [A93]: See discussion in section 3.8.2 of the comment letter.

Each Copermittee has the discretion to exempt the following projects from being defined as Priority Development Projects:

(a) New paved sidewalks, driveways, parking lots, bicycle lanes, or trails that meet the following criteria:

(i) Designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas; OR

(ii) Designed and constructed to be hydraulically disconnected from paved streets or roads; OR

(iii) Designed and constructed with permeable pavements or surfaces in accordance with USEPA Green Streets guidance.[24]

(b) Any impervious surface that is 5,000 square feet or more used for the transportation of automobiles, trucks, motorcycles, and other vehicles that is designed and constructed to the Maximum Extent Practicable in accordance with the USEPA Green Streets Guidance "Managing Wet Weather with Green Infrastructure: Green Streets"[25]. ~~Retrofitting of existing paved alleys, streets or roads that meet the following criteria:~~

~~(i) Must be two lanes or less; AND~~

~~(ii) Must be a retrofitting project implemented as part of an alternative compliance project option under Provision E.3.c.(3)(b)(v) to achieve the performance requirements of Provisions E.3.c.(1) and/or E.3.c.(2) for a Priority Development Project; AND~~

~~(iii) Designed and constructed in accordance with the USEPA Green Streets guidance.[26]~~

(c) Single-family residential projects that meet the following criteria:

(i) Must not be constructed as part of a larger development or proposed subdivision;

(ii) Successfully incorporate and document that they have incorporated, each of the applicable Source Control and LID BMP strategies identified in provisions E.3.a.(2)-(3) to the MEP.

~~(c) New single family residences that meet the following criteria:~~

~~(i) Must not be constructed as part of a larger development or proposed subdivision; AND~~

~~(ii) Designed and constructed to be certified under the U.S. Green Building Council (USGCB) Leadership in Energy and Environmental Design (LEED) for Homes green building certification program, receiving at least four (4) Surface Water Management credits under the Sustainable Sites category[27] OR~~

~~Designed and constructed with structural BMPs that will achieve the~~

[24] USEPA. 2008. http://water.epa.gov/infrastructure/greeninfrastructure/upload/gi_munichandbook_green_streets.pdf and http://water.epa.gov/infrastructure/greeninfrastructure/gi_policy.cfm#municipalhandbook ~~See "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).~~

~~[26] Ibid.~~

~~[27] See LEED for Homes rating system at http://www.usgbc.org~~

~~performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite~~

~~(d) Redevelopment of existing single family residences that meet the following criteria:~~

~~(i) Designed and constructed to be certified under the USGCB LEED for Homes green building certification program, receiving at least four (4) Surface Water Management credits under the Sustainable Sites category;[28] OR~~

~~(ii) Designed and constructed with structural BMPs that will achieve the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite.~~

(d) Watershed Protection Projects that meet the following criteria:

(i) Projects undertaken to rehabilitate or prevent environmental, social, and economic damage to the watershed, including receiving waters, by providing one or more of the following:

- Water quality protection by the proper management of stormwater and floodplains
- Flood risk reduction to adjacent land uses, stored matter and stockpiled material
- Elimination of the comingling of stormwater and hazardous materials
- Erosion Mitigation
- Restoration of Rivers and Ecosystems
- Groundwater Recharge
- Creation of new open space and wetlands
- Programs for water conservation, stormwater capture and management
- Retrofit projects constructed to improve water quality or address hydromodification.

(ii) AND are not expected to be pollutant generating or are designed to reduce existing pollutant loads

(iii) AND incorporate and document that they have incorporated, each of the applicable Source Control and LID BMP strategies identified in provisions E.3.a.(2)-(3) to the MEP.

(e) Emergency public safety projects in any of the Priority Development Categories may be excluded if the delay caused due to the requirement for a SSMP compromises public safety, public health and/or environmental protection

[28] ~~See LEED for Homes rating system at http://www.usgbc.org~~

c. Priority Development Project Structural BMP Performance Requirements

In addition to the BMP requirements listed for all development projects under Provision E.3.a, Priority Development Projects must also implement structural BMPs that conform to performance requirements below. If watershed-specific performance requirements are ~~may be~~ developed as part of a Water Quality Improvement Plan; these requirements would take precedence over the general performance requirements below. The watershed-specific requirement must provide at least equal protection as the general performance requirements below.

(1) Storm Water Pollutant Control BMP Requirements

Comment [A94]: See discussion in section 3.8.2 of the comment letter.

Each Copermittee must require each Priority Development Project to implement onsite structural BMPs to control pollutants in storm water that may be discharged from a project as follows:

(a) Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite the pollutants contained in the design capture volume. The design capture volume is equivalent to:

(i) The volume of storm water runoff produced from a 24-hour 85th percentile storm event;[29] OR

(ii) The volume of storm water runoff produced from a 24-hour 85th percentile storm event, that would be retained onsite ~~if~~ in the pre-project condition. ~~site was fully undeveloped and naturally vegetated~~, ~~as determined using continuous simulation modeling techniques based on site-specific soil conditions and typical native vegetative cover.~~

(b) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of~~to~~ complying with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1)(a).

~~(c) If a Priority Development project is allowed to utilize alternative compliance pursuant to Provisions E.3.c.(1)(b), flow-thru conventional~~

[29] This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals. The volume is a single event-based volume that occurs after an extended dry period.

~~treatment control BMPs must be implemented to treat the portion of the design capture volume that is not retained onsite. Additionally, project applicants must mitigate for the portion of the pollutant load in the design capture volume that is not retained onsite through one or more alternative compliance options under Provision E.3.c.(3). Conventional treatment control BMPs must be sized and designed to:~~

~~(i) Remove pollutants from storm water to the MEP;~~

~~(ii) Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;~~

~~(iii) Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Conventional treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of conventional treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.~~

(2) Hydromodification Management BMP Requirements

Comment [A95]: See discussion in section 3.8.2 of the comment letter.

Each Copermittee must require each Priority Development Project disturbing greater than one acre to implement management measures~~onsite structural BMPs~~ to ensure ~~manage hydromodification~~ that ~~may be caused by~~ storm water runoff discharged from the~~a~~ project won't cause adverse Hydromodification impacts in the downstream receiving waters as follows:

The Copermittees in each Watershed Management Area may establish within the WQIP, watershed specific mitigation requirements that will apply to priority development projects, based on the susceptibility of the receiving waters to Hydromodification impacts caused by the project, and consistent with the priorities and strategies identified in the WQIP. Such requirements may be uniform across a Hydrologic Unit, or identified at an appropriate smaller scale to ensure that receiving waters are properly protected.

(a) Post-project runoff flow rates and durations must not exceed pre-project ~~development (naturally occurring)~~ runoff flow rates and durations by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat conditions downstream of Priority Development Projects~~)~~.

(i) In evaluating the range of flows that results in increased potential for

erosion of natural (non-hardened) channels, the lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks.

~~(ii) For artificially hardened channels, analysis to identify the lower boundary must use characteristics of a natural stream segment similar to that found in the watershed. The lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or erodes the toe of the channel banks.~~

~~(iii)~~(ii) The Copermittees may use monitoring results collected pursuant to Provision D.1.a.(2) to re-define the range of flows resulting in increased potential for erosion, or degraded instream habitat conditions, as warranted by the data.

(b) Priority Development Projects ~~Post-project runoff flow rates and durations~~ must implement appropriate measures to minimize the ~~compensate for~~ the loss of sediment supply delivered ~~due~~ to the Receiving Waters, consistent with WQIP priorities, ~~development project,~~ should loss of sediment supply be anticipated to occur as a result of the development project.

(c) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of~~to comply with~~ the performance requirements of Provisions E.3.c.(2)(a)-(b).

(d) Exemptions

Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provisions E.3.c.(2)(a)-(b) where the project:

(i) Discharges storm water runoff into existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;

(ii) Discharges of storm water into conveyance channels whose bed and bank are engineered and maintained for the 10-year ultimate development flow rate all the way from the point of discharge from the project to an water body that is sufficiently resistant to hydromodification (water storage reservoirs, lakes, enclosed embayments, pacific ocean, or other water bodies identified in the WQIP);

~~(ii)~~(iii) Is a redevelopment Priority Development Project that meets the alternative compliance requirements of Provision E.3.c.(3)(b)(ii); or

~~(iii)~~(iv) Discharges storm water runoff into other areas identified by the San Diego Water Board as exempt from the requirements of Provisions E.3.c.(2)(a)-(b), through an approved WQIP.

(3) Alternative Compliance to Onsite Structural BMP Performance Requirements

Comment [A96]: See discussion in section 3.8.2 of the comment letter.

(a) Applicability

At the discretion of each Copermittee, Priority Development Projects may be allowed to implement one or more of the alternative compliance project options described in E.3.c.(3)(b) below, in lieu of complying with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2), under the following conditions:

(i) The Copermittee must determine that implementation of the alternative compliance option will have an equal or greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite;

(ii) The alternative compliance options must be designed by a registered professional engineer, geologist, architect, biologist, hydrologist, landscape architect, or other appropriate certified professional;

(iii) The alternative compliance option must be consistent with the strategies developed within the WQIP, for the highest priority water quality conditions.

(iv) The alternative compliance options must be implemented within the same Watershed Management Area as the Priority Development Project, and preferably within the same hydrologic subarea;

(v) The alternative compliance options must have reliable sources of funding for operation and maintenance.

(b) Alternative Compliance Options

(i) *LID Biofiltration Treatment Control BMPs*

LID biofiltration treatment control BMPs may be used as an alternative compliance option if the BMPs are sized and designed to:

[a] Remove pollutants from storm water to the MEP; AND
[b] Have an appropriate surface loading rate to prevent erosion, scour and channeling; AND
[c] Biofilter at least 1.0 times the design capture volume that is not reliably retained onsite

(ii) *LEED Certified Redevelopment Projects*

Priority Development Projects that are designed and constructed to be certified under the USGCB LEED for New Construction and Major Renovations green building certification program, or other locally accepted certification of equivalent effectiveness, may be considered as an acceptable alternative compliance option if the project meets the following criteria:

[a] The project is designed to receive at least: One (1) Site Design credit, and Two (2) Stormwater Design credits under the Sustainable Sites category.[30] , and

[b] The existing and future configuration of the receiving water must not be unnaturally altered or adversely impacted by the project.

(iii) *Watershed-Based Planned Development Projects*

Priority Development Projects greater than 100 acres in total project size (or smaller than 100 acres in size yet part of a larger common plan of development that is over 100 acres) may be considered as an acceptable alternative compliance option if the project meets the following conditions:

[a] The Priority Development Project was planned utilizing watershed and/or subwatershed based water quality, hydrologic, and fluvial geomorphologic planning principles that implement regional LID BMPs in accordance with the performance and location criteria of this Order and acceptable to the San Diego Water Board;

[b] Regional LID BMPs may be used provided that the BMPs capture and retain the volume of runoff produced from the design capture volume defined in Provision E.3.c.(1)(a)(i) and that such controls are located upstream of receiving waters;

[c] Regional LID BMPs must clearly exhibit that they will not result in a net impact from pollutant loadings over and above the impact caused by capture and retention of the design capture volume;

[d] Any portion of the design capture volume that is not retained by the regional LID BMPs must be treated using biofiltration BMPs; and

[e] Where regional LID BMPs are demonstrated to the Copermittee as technically infeasible to retain the entire design capture volume, any volume up to and including the design capture volume not retained by regional LID BMPs, nor treated by biofiltration BMPs, must be treated using conventional treatment control BMPs and the project applicant must implement additional alternative compliance project, in-lieu fee and/or water quality

[30] See LEED for New Construction and Major Renovations rating system at http://www.usgbc.org

credit system options below.

(iv) *Offsite Projects*

Offsite Projects, such as but not limited to Regional BMPs; Retrofitting Projects; Channel, Stream or Habitat Rehabilitation Projects; Water Supply Augmentation Projects; or other Offsite Projects proposed by a project proponent, may be considered as an acceptable alternative compliance option if the offsite project meets the following requirements:

- The project must provide a net result of at least the same level of pollutant removal, and/or protection from potential downstream and upstream erosion in the receiving water as would be required to meet the performance requirements of Provision E.3.c.(1) and E.3.c.(2), as applicable.
- The project must be consistent with the strategies identified in the WQIP.
- The project must be constructed and operational prior to occupancy being granted for the PDP.

(v) *Conventional Treatment Control BMPs*

Onsite Conventional Treatment Control BMPs may be used as an alternative compliance option, only if the following criteria have been met:

[a] It has been demonstrated to the satisfaction of the Copermittee that it is technically infeasible to comply with the onsite requirements of E.3.c.(1), AND

[b] It has been demonstrated to the satisfaction of the Copermittee that it is technically infeasible to implement onsite Biofiltration Treatment Control BMPs, AND

[c] The Conventional Treatment Control BMPs will remove pollutants from storm water to the MEP; AND

[d] The Conventional Treatment Control BMPs will filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two; AND

[e] The Conventional Treatment Control BMPs are ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Conventional treatment control BMPs with a low removal

efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of conventional treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

~~(a) Applicability~~

~~At the discretion of each Copermittee, Priority Development Projects may be allowed to utilize an alternative option to comply with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) under the following conditions:~~

~~(i) The Copermittee must determine that implementation of the alternative compliance option will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite;~~

~~(ii) The alternative compliance options must be designed by a registered professional engineer, geologist, architector landscape architect;~~

~~(iii) The alternative compliance options must be implemented within the same hydrologichydrologic unit as the Priority Development Project, and preferably within the same hydrologic subarea;~~

~~(iv) Receiving waters must not be utilized to convey storm water runoff to the alternative compliance options;~~

~~(v) The pollutants in storm water runoff from the Priority Development Project must be treated to the MEP by the alternative compliance options prior to being discharged to receiving waters;~~

~~(vi) Unless otherwise allowed by Provision E.3.c.(3)(b), the alternative compliance options must have a net result of at least the same level of pollutant removal as would have been achieved if the Priority Development Project had fully complied with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1) onsite;~~

~~(vii) Unless otherwise allowed by Provision E.3.c.(3)(b), the alternative compliance options must have a net result of at least the same level of protection from potential downstream and upstream erosion in the receiving water as would have been achieved if the Priority Development Project had fully complied with the hydromodification management BMP performance requirements of Provision E.3.c.(2) onsite; and~~

~~(viii) The alternative compliance options utilized by the Priority Development Project must have reliable sources of funding for operation and maintenance.~~

~~(b) Alternative Compliance Project Options~~

~~The Copermittee may allow implementation of one or more of the following project options as part of an alternative approach to complying with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2):~~

~~(i) *Onsite LID Biofiltration Treatment Control BMPs*~~

~~The Copermittee may allow Priority Development Projects to utilize onsite LID biofiltration treatment control BMPs to comply with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1). Onsite LID biofiltration treatment control BMPs must be sized and designed to:~~

~~[a] Remove pollutants from storm water to the MEP; AND~~
~~[b] Have an appropriate surface loading rate to prevent erosion, scour and channeling within the BMP; AND~~
~~[c] Biofilter at least 1.5 times the design capture volume that is not reliably retained onsite; OR~~
~~[d] Biofilter up to the design capture volume that is not reliably retained onsite, AND 1) treat the remaining portion of the design capture volume not retained onsite with conventional treatment control BMPs in accordance with Provision E.3.c.(1)(c), and 2) if necessary, mitigate for the portion of the pollutant load in the design capture volume not retained onsite through one or more alternative compliance project, in-lieu fee and/or water quality credit system options below.~~

~~(ii) *LEED Certified Redevelopment Projects*~~

~~The Copermittee may allow redevelopment Priority Development Projects to comply with designed and constructed to be certified under the USGCB LEED for New Construction and Major Renovations green building certification program. The Priority Development Project must receive at least one (1) Site Design credit and two (2) Stormwater Design credits under the Sustainable Sites category.[31] In addition, the existing and future configuration of the receiving water must not be unnaturally altered or adversely impacted by storm water flow rates and durations discharged from the site.~~

~~(iii) *Watershed Based Planned Development Projects*~~

~~The Copermittee may allow Priority Development Projects greater than 100 acres in total project size (or smaller than 100 acres in size~~

~~[31] See LEED for New Construction and Major Renovations rating system at http://www.usgbc.org~~

~~yet part of a larger common plan of development that is over 100 acres) to comply with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2). The Priority Development Project must comply with the following conditions:~~

~~[a] The Priority Development Project was planned utilizing watershed and/or subwatershed based water quality, hydrologic, and fluvial geomorphologic planning principles that implement regional LID BMPs in accordance with the performance and location criteria of this Order and acceptable to the San Diego Water Board;~~

~~[b] Regional LID BMPs may be used provided that the BMPs capture and retain the volume of runoff produced from the design capture volume defined in Provision E.3.c.(1)(a)(i) and that such controls are located upstream of receiving waters;~~

~~[c] Regional LID BMPs must clearly exhibit that they will not result in a net impact from pollutant loadings over and above the impact caused by capture and retention of the design capture volume;~~

~~[d] Any portion of the design capture volume that is not retained by the regional LID BMPs must be treated using biofiltration BMPs; and~~

~~[e] Where regional LID BMPs are demonstrated to the Copermittee as technically infeasible to retain the entire design capture volume, any volume up to and including the design capture volume not retained by regional LID BMPs, nor treated by biofiltration BMPs, must be treated using conventional treatment control BMPs and the project applicant must implement additional alternative compliance project, in-lieu fee and/or water quality credit system options below.~~

~~(iv) *Offsite Regional BMPs*~~

~~[a] The Copermittee may allow Priority Development Projects to utilize offsite regional BMPs to comply with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1) if the offsite regional BMPs have the capacity to receive and retain at least 1.1 times the design capture volume that is not reliably retained onsite.~~

~~[b] The Copermittee may allow Priority Development Projects to utilize offsite regional BMPs to comply with the hydromodification management BMP performance requirements of Provision E.3.c.(2) if the offsite regional BMPs have the capacity to manage the storm water flows rates and durations from the site such that the receiving waters are protected from the potential for increased erosion that would be caused if the unmanaged portion of the runoff was discharged from the site.~~

~~(v) *Offsite Retrofitting Projects*~~

~~The Copermittee may allow Priority Development Projects to utilize offsite retrofitting projects to comply with the storm water pollutant control and hydromodification management BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) if the retrofitting projects have been identified within the strategies included in the Water Quality Improvement Plan, or identified as potential retrofitting projects by the Copermittee pursuant to Provision E.5.~~

~~(vi) *Offsite Channel, Stream, or Habitat Rehabilitation Projects*~~

~~The Copermittee may allow Priority Development Projects to utilize offsite channel, stream, or habitat rehabilitation projects to comply with the hydromodification management BMP performance requirements of Provision E.3.c.(2) if the rehabilitation projects have been identified within the strategies included in the Water Quality Improvement Plan, or identified as potential channel rehabilitation projects by the Copermittee pursuant to Provision E.5. The channel, stream, or habitat rehabilitation project cannot be utilized for pollutant treatmentexcept where artificial wetlands areand located upstream of receiving waters.~~

~~(vii) *Offsite Regional Water Supply Augmentation Projects*~~

~~The Copermittee may allow Priority Development Projects to utilize offsite regional water supply augmentation projects (i.e. groundwater recharge, recycled water, storm water harvesting) to comply with the storm water pollutant control and hydromodification management BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) if the projects have been identified within the strategies included in the Water Quality Improvement Plan.~~

~~(viii) *Project Applicant Proposed Alternative Compliance Projects*~~

~~The Copermittee may allow one or more Priority Development Project applicant(s) to propose and implement alternative compliance projects to comply with the storm water pollutant control and hydromodification management BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) if the alternative compliance projects are consistent with, and will address the highest water quality priorities of the Water Quality Improvement Plan, and comply with the requirements of Provision E.3.c.(3)(a).~~

(c) Alternative Compliance In-Lieu Fee Option

The Copermittee may develop and implement an alternative compliance in-lieu fee option, individually or with other Copermittees and/or entities, as a means for designing, developing, constructing, operating and/or maintaining offsite alternative compliance projects under Provision E.3.c.(3)(b). Priority Development Projects allowed to utilize the

alternative compliance in-lieu fee option must comply with the following conditions:

(i) The in-lieu fee must be collected and held in accordance with the Mitigation Fee Act and all other applicable development fee laws. ~~transferred to the Copermittee (for public projects) or an escrow account (for private projects) prior to the date construction of the Priority Development Project is initiated~~.

(ii) If the in-lieu fee is applied to the development, design, ~~and~~ construction, operation and maintenance of offsite alternative compliance projects, the following conditions must be met:

[a] The offsite alternative compliance projects must meet ~~allow~~ the criteria identified within E.3.c.(3)(b)-, for each Priority Development Project relying on~~to comply with~~ the alternative compliance project;~~onsite BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2);~~

[b] The offsite alternative compliance projects must be constructed as soon as possible, but no later than 4 years after the certificate of occupancy is granted for the first Priority Development Project that contributed funds toward the construction of the offsite alternative compliance projects, unless a longer period of time is provided for in an approved WQIP~~authorized by the San Diego Water Board Executive Officer~~;

~~[c] The in-lieu fee for the Priority Development Project must include mitigation of the pollutant loads and increased storm water flow rates and durations that are allowed to discharge from the site before the offsite alternative compliance projects are constructed; and~~

[d] The in-lieu fee must also include the cost to operate and maintain the offsite alternative compliance projects for the anticipated life of the constructed priority development project.

(iii) If the in-lieu fee applies only~~is applied~~ to the operation and maintenance of offsite alternative compliance projects that have already been constructed, the offsite alternative compliance projects must meet~~allow~~ the requirements of E.3.c.(3)(a)(iv) and (v) as applicable, for each Priority Development Project relying on~~to comply with~~ the alternative compliance project..~~onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2).~~

(d) Alternative Compliance Water Quality Credit System Option

The Copermittee may develop and implement an alternative compliance water quality credit system option, individually or with other Copermittees

Comment [A97]: Please see Legal Comments.

and/or entities, provided that such a credit system clearly exhibits that it will not allow discharges from Priority Development Projects to cause or contribute to a net impact over and above the impact caused by projects meeting the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2). Any credit system that a Copermittee chooses to implement must be submitted to the San Diego Water Board Executive Officer for review and acceptance as part of the Water Quality Improvement Plan.

(4) Long-Term Structural BMP Maintenance

Each Copermittee must require the project applicant to submit proof of the mechanism under which ongoing long-term maintenance of all structural BMPs will be conducted.

(5) Infiltration and Groundwater Protection

(a) Structural BMPs designed to primarily function as large, centralized infiltration devices (such as large infiltration trenches and infiltration basins) must not cause or contribute to an exceedance of an applicable groundwater quality objective. At a minimum, such infiltration BMPs must be in conformance with the design criteria listed below, unless the development project applicant demonstrates to the Copermittee that one or more of the specific design criteria listed below are not necessary to protect groundwater quality. The design criteria listed below do not apply to small infiltration systems dispersed throughout a development project.

(i) Runoff must undergo pretreatment such as sedimentation or filtration prior to infiltration;

(ii) Pollution prevention and source control BMPs must be implemented at a level appropriate to protect groundwater quality at sites where infiltration BMPs are to be used;

(iii) Infiltration BMPs must be adequately maintained to remove pollutants in storm water to the MEP;

(iv) The vertical distance from the base of any infiltration BMP to the seasonal high groundwater mark must be at least 10 feet. Where groundwater basins do not support beneficial uses, this vertical distance criteria may be reduced, provided groundwater quality is maintained;

(v) The soil through which infiltration is to occur must have physical and chemical characteristics (e.g., appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses;

(vi) Infiltration BMPs must not be used for areas of industrial or light

industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee, unless first treated or filtered to remove pollutants prior to infiltration; and

(vii) Infiltration BMPs must be located a minimum of 100 feet horizontally from any water supply wells.

(b) The Copermittee may develop, individually or with other Copermittees, alternative mandatory design criteria to that listed above for infiltration BMPs which are designed to primarily function as centralized infiltration devices. Before implementing the alternative design criteria in the development planning process the Copermitee(s) must:

(i) Notify the San Diego Water Board of the intent to implement the alternative design criteria submitted; and

(ii) Comply with any conditions set by the San Diego Water Board.

d. BMP DESIGN MANUAL UPDATE

Each Copermittee must update and implement its BMP Design Manual[32] pursuant to Provision F.2.b. ~~Until the Copermittee has updated its BMP Design Manual with the requirements of Provisions E.3.a-c, the Copermittee must continue implementing its current BMP Design Manual. Unless directed otherwise by the San Diego Water Board, the Copermittee must implement the BMP Design Manual within 180 days of completing the update.~~ The update of the BMP Design Manual must include the following:

Comment [A98]: This info was incorporated into F.2.b.

(1) Updated procedures to determine the nature and extent of storm water requirements applicable to a potential development or redevelopment projects. These procedures must inform project applicants of the storm water management requirements applicable to their project including, but not limited to, general requirements for all development projects, structural BMP design procedures and requirements, hydromodification management requirements, requirements specific to phased projects, and procedures specific to private developments and public improvement projects;

(2) Updated procedures to identify ~~pollutants and conditions of concern for selecting~~ the most appropriate structural BMPs that consider, at a minimum, the following:

(a) The requirements of E.3.c.(1) and (2)

~~(a)~~(b) Receiving water quality (including pollutants for which receiving waters are listed as impaired under the CWA section 303(d) List);

[32] The BMP Design Manual was formerly known as the Standard Storm Water Mitigation Plan under Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016.

~~(b)~~(c) Pollutants, stressors, and/or receiving water conditions that cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

~~(c)~~(d) Land use type of the project and pollutants associated with that land use type; and

~~(d)~~(e) Pollutants expected to be present onsite.

(3) Updated procedures for designing structural BMPs, including any updated performance requirements to be consistent with the requirements of Provision E.3.c for all structural BMPs listed in the BMP Design Manual;

(4) Long-term maintenance criteria for each structural BMP listed in the BMP Design Manual; and

(5) Alternative compliance criteria, in accordance with the requirements under Provision E.3.c.(3), if the Copermittee elects to allow Priority Development Projects within its jurisdiction to utilize alternative compliance.

e. PRIORITY DEVELOPMENT PROJECT BMP IMPLEMENTATION AND OVERSIGHT

Each Copermittee must implement a program that requires and confirms structural BMPs on all Priority Development Projects are designed, constructed, and maintained to remove pollutants in storm water to the MEP.

(1) Structural BMP Approval and Verification Process

(a) Each Copermittee must require and confirm that for all Priority Development Project applications that have not received prior lawful approval by the Copermittee by 18 months after the commencement of coverage under this Order, the requirements of Provision E.3 are implemented. For project applications that have received prior lawful approval by 18 months after the commencement of coverage under this Order, the Copermittee may allow previous land development requirements to apply.

(b) Each Copermittee must identify the roles and responsibilities of their various municipal departments in implementing the structural BMP requirements, including each stage of a project from application review and approval through BMP maintenance and inspections.

(c) Each Copermittee must require and confirm that appropriate easements and ownerships are properly recorded in public records and the information is conveyed to all appropriate parties when there is a change in project or site ownership.

(d) Each Copermittee must require and confirm that prior to occupancy and/or intended use of any portion of the Priority Development Project, each structural BMP is inspected to verify that it has been constructed and is operating in compliance with all of its specifications, plans, permits, ordinances, and the requirements of this Order.

(2) Priority Development Project Inventory and Prioritization

(a) Each Copermittee must develop, maintain, and update ~~at~~regularly~~at least annually~~, a watershed-based database to track and inventory all constructed Priority Development Projects and associated structural BMPs within its jurisdiction. Inventories must be accurate and complete beginning from January 2002 for the San Diego County Copermittees, February 2003 for the Orange County Copermittees, and July 2005 for the Riverside County Copermittees~~.~~, where data is available.~~.~~ The use of an automated database system, such as GIS, is highly recommended. The database must include, at a minimum, the following information:

(i) Priority Development Project location (address and hydrologic subarea);

(ii) Descriptions of structural BMP type(s);

(iii) Date(s) of construction;

(iv) Party responsible for structural BMP maintenance;

(v) Dates and findings of structural BMP maintenance verifications; and

(vi) Corrective actions and/or resolutions when applicable.

(b) Each Copermittee must prioritize the Priority Development Projects with structural BMPs within its jurisdiction. The designation of Priority Development Projects as high priority must consider the following:

(i) The highest water quality priorities identified in the Water Quality Improvement Plan;

(ii) Receiving water quality;

(iii) Number and sizes of structural BMPs;

(iv) Recommended maintenance frequency of structural BMPs;

(v) Likelihood of operation and maintenance issues of structural BMPs;

(vi) Land use and expected pollutants generated; and

(vii) Compliance record.

(3) Structural BMP Maintenance Verifications and Inspections

Each Copermittee is required to verify that structural BMPs on each Priority

Development Project are adequately maintained, and continue to operate effectively to remove pollutants in storm water to the MEP through inspections, self-certifications, surveys, or other equally effective approaches.

(a) All (100 percent) of the structural BMPs at Priority Development Projects that are designated as high priority must be inspected directly by the Copermittee annually prior to each rainy season;

(b) For verifications performed through a means other than direct Copermittee inspection, adequate documentation must be required by the Copermittee to provide assurance that the required maintenance of structural BMPs at each Priority Development Project has been completed; and

(c) Appropriate follow-up measures (including re-inspections, enforcement, etc.) must be conducted to ensure that structural BMPs at each Priority Development Project continue to reduce pollutants in storm water to the MEP as originally designed.

f. DEVELOPMENT PROJECT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all development projects, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

g. ~~STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS~~

Comment [A99]: This section was moved to the beginning of provision E.3.

~~Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the development planning program to address development and redevelopment projects that may become sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:~~

~~(5) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, increase frequency of verifications and/or inspections, alternative compliance options);~~

~~(6) Each Copermittee must identify areas within its jurisdiction where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting and/or stream, channel, or habitat rehabilitation projects;~~

~~(7) Each Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify regional alternative compliance projects that Priority Development Projects may be allowed or should be encouraged to implement or participate in implementing; and~~

~~(8) The strategies and/or activities must be consistent with the requirements of Provisions E.3.a-c and E.3.e-f and the strategies identified in the Water Quality Improvement Plan.~~

4. Construction Management

Each Copermittee must implement a construction management program in accordance with the strategies identified in the Water Quality Improvement Plan and includes, at a minimum, the following requirements:

STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Comment [A100]: This section was moved from provision E.4.f, Changes are shown in Redline

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the construction management program to address construction sites that the Copermittee has identified as potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, and/or increase/decrease frequency of inspections for specific types of sites and/or activities); and

(2) The strategies and/or activities must be consistent with the requirements of Provisions E.4.c-e and the strategies identified in the Water Quality Improvement Plan.

(3) The requirements of the programs as outlined in the following sub-provisions may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality improvement Plan(s).

a. PROJECT APPROVAL PROCESS

Prior to issuance of any local permit(s) that allows the commencement of construction projects that involve ground disturbance or soil disturbing activities that has the reasonable potential to discharge a pollutant load to and from the MS4, as defined in each Copermittees' JRMP~~can potentially generate pollutants in storm water runoff~~, each Copermittee must:

(1) Require a ~~site-specific~~ Pollution Control Plan~~pollution control~~, construction BMP, and/or erosion and sediment control plan, to be submitted by the project applicant to the Copermittee;

(2) Confirm the Pollution Control Plan~~pollution control~~, construction BMP, and/or erosion and sediment control plan, complies with the local grading ordinance, other applicable local ordinances, and the requirements of this Order;

(3) Confirm the Pollution Control Plan~~pollution control~~, construction BMP, and/or erosion and sediment control plan, includes seasonally appropriate and effective BMPs and management measures described in Provision E.4.c, as applicable to the project; and

(4) Verify that the project applicant has obtained coverage under ~~applicable permits, including, but not limited to~~ the Construction General Permit~~, Clean Water Act Section 401 Water Quality Certification and Section 404 Permit, and California Department of Fish and Game Streambed Alteration Agreement~~.

b. CONSTRUCTION SITE INVENTORY AND TRACKING

(1) Each Copermittee must maintain, and update ~~at least monthly~~regularly, a watershed-based inventory of all construction projects issued a local permit that allows ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff. The use of an automated database system, such as GIS, is highly recommended. The inventory must include:

(a) Relevant contact information for each site (e.g., name, address, phone, and email for the owner and contractor);

(b) The basic site information including location (address and hydrologic subarea), Waste Discharge Identification (WDID) number (if applicable), size of the site, and approximate area of disturbance;

(c) Whether or not the site is considered a high threat to water quality, as defined in Provision E.4.b.(2) below;

(d) The project start and ~~anticipated~~ completion dates;

~~(e) Current construction phase;~~

~~(f)~~(e) The required inspection frequency, as defined in the Copermittee's jurisdictional runoff management program document;

~~(g)~~(f) The date the Copermittee accepted and/or approved the ~~site-specific~~ pollution control plan, construction BMP, and/or erosion and sediment control plan; and

~~(h)~~(g) Whether or not there are ongoing enforcement actions administered to the site.

Comment [A101]: Some of the info can only be updated based on an inspection, which may or may not be monthly year round for all sites.

Comment [A102]: The anticipated completion date is often unknown and can fluctuate based on unpredictable and unforeseen circumstances. Keeping track of accurate dates in an inventory would be difficult and would not add significant value to the database. Construction Inspectors keep a close eye on the progress of projects and would not need to rely on inventory data to achieve effective stormwater management and oversight. Once a project is completed, the date can be entered into the database,.

(2) Each Copermittee must identify all construction sites within its jurisdiction that represent a high threat to downstream surface water quality. The designation of construction sites as high threat to water quality must consider the following:

(a) Sites located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Sites located within the same hydrologic subarea and tributary to a water body segment listed as impaired for sediment on the CWA section 303(d) List;

(c) Sites located within, directly adjacent to, or discharging directly to a receiving water within an ESA; and

(d) Other sites determined by the Copermittees or the San Diego Water Board as a high threat to water quality.

c. CONSTRUCTION SITE BMP IMPLEMENTATION

Comment [A103]: See discussion in section 3.9.1 of the comment letter.

Each Copermittee must implement, or require the implementation of effective BMPs (for Copermittee construction sites and private construction sites, respectively) to reduce discharges of pollutants in ~~storm water~~ runoff from construction sites to the MEP, and effectively prohibit~~prevent~~ non-storm water discharges from construction sites into the MS4. These BMPs must be site specific, seasonally appropriate, and construction phase appropriate. BMPs must be implemented at each construction site year round. Dry season BMP implementation must plan for and address unseasonal rain events that may occur during the dry season (May 1 through September 30). Copermittees must implement, or require the implementation of, BMPs in the following categories:

(1) Project Planning;

(2) Good Site Management “Housekeeping”, including waste management;

(3) Non-storm Water Management;

(4) Erosion Control;

(5) Sediment Control;

(6) Run-on and Run-off Control; and

(7) Active/Passive Sediment Treatment Systems, where applicable.

d. CONSTRUCTION SITE INSPECTIONS

Each Copermittee must conduct construction site inspections to require and confirm compliance with its local permits and applicable local ordinances, and the requirements of this Order. Priority for site inspections must consider threat to water quality pursuant to Provision E.4.b as well as the nature of the construction activity, topography, and the characteristics of soils and receiving water quality.

(1) Inspection Frequency

(a) Each Copermittee must conduct inspections at all inventoried sites, including high threat to water quality sites, at an appropriate frequency for each phase of construction to confirm~~ensure~~ the site reduces the discharge of pollutants in runoff~~storm water~~ from construction sites to the MEP, and effectively prevents non-storm water discharges from entering the MS4.

(b) Each Copermittee must establish appropriate inspection frequencies for high threat to water quality sites, and all other sites, for each phase of construction. Inspection frequencies appropriate for addressing the highest water quality priorities identified in the Water Quality Improvement Plan, and for complying with the requirements of this Order must be identified in each Copermittee's jurisdictional runoff management program document.

(c) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e., re-inspection, enforcement) necessary to require and confirm site compliance with its local permits and applicable local ordinances, and the requirements of this Order.

(2) Inspection Content

Inspections of construction sites by the Copermittee must include, at a minimum:

(a) Verification of coverage under the Construction General Permit (Notice of Intent (NOI) and/or WDID number) during initial inspections, when applicable;

(b) Assessment of compliance with its local permits and applicable local ordinances related to pollution prevention, including the implementation and maintenance of applicable BMPs;

(c) Assessment of BMP adequacy and effectiveness;

(d) Visual observations of actual non-storm water discharges;

(e) Visual observations of actual or potential discharge of sediment and/or construction related materials from the site;

(f) Visual observations of actual or potential illicit connections; and

(g) If any violations are found and BMP corrections are needed, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried construction sites. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Site name, location (address and hydrologic subarea), and WDID number (if applicable);

(b) Inspection date;

(c) Weather condition during~~Approximate amount of rainfall since last~~ inspection;

(d) Description of problems observed with BMPs and indication of need for BMP addition/repair/replacement and any scheduled re-inspection, and date of re-inspection;

(e) Descriptions of any other specific inspection comments which must, at a minimum, include rationales for longer compliance time;

(f) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(g) Resolution of problems noted and date problems fixed.

e. CONSTRUCTION SITE ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried construction sites, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

5. Existing Development Management

Comment [A104]: See discussion in section 3.10 of the comment letter.

Each Copermittee must implement an existing development management program in accordance with the strategies identified in the Water Quality Improvement Plan. and includes, at a minimum, the following requirements:

STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Comment [A105]: Moved from sub-provision e. Changes shown in redline

Each Copermittee must implement the water quality improvement strategies, where necessary, to address areas of existing development within its jurisdiction that are identified as sources of pollutants and/or stressors contributing to the highest priority water quality conditions in the Watershed Management Area. For the existing development management program, the following strategies must be implemented:

(1) Specific Existing Development Management Program Strategies

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented within its jurisdiction to address areas of existing development that the Copermittee has identified as sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(a) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, and/or increase/decrease frequency of inspections for specific types of facilities, areas and/or activities);

(b) The facilities and/or areas within the Copermittee's jurisdiction where the strategies and/or activities will be implemented; and

(2) The requirements of the programs as outlined in the following sub-provisions may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality improvement Plan(s).~~The strategies and/or activities must be consistent with the requirements of Provisions E.5.b-d and the strategies identified in the Water Quality Improvement Plan.~~

a. EXISTING DEVELOPMENT INVENTORY AND TRACKING

Each Copermittee must maintain, and update at least annually, a watershed-based inventory of the existing development within its jurisdiction that ~~may~~has the reasonable potential to~~may~~ discharge a high priority pollutant load to and from the MS4, as defined in the Copermittee's JRMP. The use of an automated database system, such as GIS, is highly recommended. The inventory must, at a minimum, evaluate and include the following if identified as a source of a high priority pollutant~~include~~:

(1) Name, location (hydrological subarea and address, if applicable) of the following types of existing development with its jurisdiction:

(a) Commercial facilities or areas;

(b) Industrial facilities;

(c) Copermittee owned Municipal facilities, including:

(i) MS4 and related structures,[33]

(ii) Roads, streets, and highways,

(iii) Parking facilities,

(iv) Municipal airfields,

(v) Parks and recreation facilities,

(vi) Flood management projects and flood control devices and structures,

(vii) Operating or closed municipal landfills,

(viii) Publicly owned treatment works (including water and wastewater treatment plants) and sanitary sewer collection systems,

(ix) Corporate yards, including maintenance and storage yards for materials, waste, equipment, and vehicles,

(x) Hazardous waste collection facilities,

(xi) Other treatment, storage or disposal facilities for municipal waste, and

(xii) Other Copermittee owned municipal facilities that the Copermittee determines may contribute a significant high priority pollutant load to the MS4; and

(d) Residential areas, which may be designated by one or more of the following:

(i) Residential management area,

(ii) Drainage basin or area,

(iii) Land use (e.g., single family, multi-family, rural),

(iv) Neighborhood,

[33] The inventory may refer to the MS4 map required to be maintained pursuant to Provision E.2.b.(1).

(v) Common Interest Area,

(vi) Home Owner Association,

(vii) Mobile home park, and/or

(viii) Other designations accepted by the San Diego Water Board Executive Officer.

(2) A description of the facility or area, including the following information:

(a) Classification as commercial, industrial, municipal, or residential;

(b) Status of facility or area as active or inactive;

(c) Identification if a business is a mobile business;

(d) SIC Code or NAICS Code, if applicable;

(e) Industrial General Permit NOI and/or WDID number, if applicable;

(f) Identification if a residential area is or includes a Common Interest Area / Home Owner Association, or mobile home park;

(g) Identification of pollutants generated and potentially generated by the facility or area;

(h) Whether the facility or area is adjacent to an ESA;

(i) Whether the facility or area is tributary to and within the same hydrologic subarea as a water body segment listed as impaired on the CWA section 303(d) List and generates pollutants for which the water body segment is impaired; and

(j) Whether the facility or area contributes or potentially contributes to the highest priority water quality conditions identified in the Water Quality Improvement Plan.

(3) An annually updated map showing the location of inventoried existing development, watershed boundaries, and water bodies.

b. EXISTING DEVELOPMENT BMP IMPLEMENTATION AND MAINTENANCE

Each Copermittee must designate a minimum set of BMPs required for all inventoried existing development, including special event venues. The designated minimum BMPs must be specific to facility or area types and pollutant generating activities, as appropriate.

(1) Commercial, Industrial, and Municipal Facilities and Areas

(a) Pollution Prevention

Each Copermittee must require the use of appropriate pollution prevention methods by the commercial, industrial, and municipal facilities and areas in its inventoried existing development, as determined necessary by the Copermittee to address the priorities and strategies addressed in the WQIP.

(b) BMP Implementation

Comment [A106]: See discussion in section 3.10.2 of the comment letter.

Each Copermittee must ~~implement, or~~ require the implementation of, designated BMPs at commercial facilities and areas, industrial facilities, and implement designated BMPs at municipal facilities in its inventoried existing development, as determined necessary by the Copermittee to address the priorities and strategies addressed in the WQIP.

(c) BMP Operation and Maintenance

(i) Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development.

(ii) Each Copermittee must implement a schedule of operation and maintenance activities for its MS4 and related structures (including but not limited to catch basins, storm drain inlets, detention basins, etc.), and verify proper operation of all its municipal structural treatment controls designed to reduce pollutants (including floatables) in storm water discharges to or from its MS4s and related drainage structures. Operation and maintenance activities may include, but is not limited to, the following:

[a] Inspections of the MS4 and related structures;
[b] Cleaning of the MS4 and related structures; and
[c] Proper disposal of materials removed from cleaning of the MS4 and related structures.

(iii) Each Copermittee must implement a schedule of operation and maintenance for public streets, unpaved roads, paved roads, and paved highways and freeways within its jurisdiction to minimize pollutants that can be discharged in storm water.

(iv) Each Copermittee must implement the following controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers:

[a]~~.~~ Copermittees that operate both a municipal sanitary sewer system and a MS4 must implement controls and measures to

prevent and eliminate seeping sewage from infiltrating the MS4.

[b]- Copermittees that do not operate both a municipal sanitary sewer system and a MS4 must coordinate with sewering agencies to keep themselves informed of relevant and appropriate maintenance activities and sanitary sewage projects in their jurisdiction that may cause or contribute to seepage of sewage into the MS4.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Comment [A107]: See discussion in section 3.10.2 of the comment letter.

Each Copermittee must implement BMPs, or require the implementation of BMPs, to reduce pollutants in runoffstorm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from commercial facilities and areas, industrial facilities;, and implement such BMPs at municipal facilities in its inventoried existing development. Such BMPs must include, as appropriate, educational activities, permits, certifications and other measures for applicators and distributors.

(2) Residential Areas

(a) Pollution Prevention

Each Copermittee must promote and encourage the use of pollution prevention methods, where appropriate, by the residential areas in its inventoried existing development.

(b) BMP Implementation

Each Copermittee must promote and encourage the implementation of designated BMPs at residential areas in its inventoried existing development.

(c) BMP Operation and Maintenance

Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at residential areas in its inventoried existing development.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must promote and encourage the implementation of BMPs to reduce pollutants in runoffstorm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from residential areas in its inventoried existing development.

c. Existing Development Inspections

Each Copermittee must conduct inspections of inventoried existing development that have been identified by the Copermittee as having the reasonable potential to discharge pollutant loads from their MS4, to ensure compliance with applicable local ordinances and permits, and the requirements of this Order.

(1) Inspection Frequency

(a) Each Copermittee must establish appropriate inspection frequencies for inventoried existing development in accordance with the following requirements:

(i) At a minimum, inventoried existing development must be inspected once every five years utilizing one or more of the following methods:

[a] Drive-by inspections by Copermittee municipal and contract staff,
[b] Onsite inspections by Copermittee municipal and contract staff, and/or
[c] Inspections by volunteer monitoring or patrol programs trained by the Copermittee;

(ii) The frequency of inspections must be appropriate to confirm that BMPs are being implemented to reduce the discharge of pollutants in runoff~~storm water~~ from the MS4 to the MEP and effectively prohibit non-storm water discharges to the MS4;

(iii) The frequency of inspections must be based on the potential for a facility or area to discharge non-storm water and pollutants in storm water, and should reflect the priorities set forth in the Water Quality Improvement Plan;

~~(iv) Each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development;[34] and~~

~~(v)~~(iv) Inventoried existing development must be inspected by the Copermittee, as needed, in response to valid public complaints and findings from the Copermittee's municipal and contract staff or volunteer monitoring or patrol program inspections.

(b) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e. education and outreach, re-inspection, enforcement) necessary to require and confirm compliance with its applicable local

Comment [A108]: Recommend keeping this instead of SD proposed 'during the permit term'. The 'during the permit term' language is problematic for businesses that are added to the inventory during the permit term. For example, if a business is added to the inventory one month before the expiration of the permit, it may not be reasonable to expect it to be immediately inspected. It is also problematic for Riverside (and OC?), who may be added to the permit less than two years before the end of the permit term.

Comment [A109]: See discussion in section 3.10.2 of the comment letter.

~~[34] If any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspection may count toward the total annual inspection requirement. This requirement excludes linear municipal facilities (i.e., MS4, streets, roads and highways).~~

ordinances and permits and the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

(2) Inspection Content

(a) Inspections of existing development by the Copermittee or volunteer monitoring or patrol programs must include, at a minimum:

(i) Visual inspections for actual non-storm water discharges, if present;

(ii) Visual inspections for actual or potential discharge of pollutants, if present;

(iii) Visual inspections for actual or potential illicit connections, if present; and

(iv) Verification that the description of the facility or area in the inventory, required pursuant to Provision E.5.a.(2), has not changed.

(b) Onsite inspections of existing development by the Copermittee must include, at a minimum:

(i) Assessment of compliance with its applicable local ordinances and permits related to non-storm water and storm water discharges and runoff;

(ii) Assessment of the implementation of the designated BMPs;

(iii) Verification of coverage under the Industrial General Permit, when applicable; and

(iv) If any problems or violations are found, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried existing development. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Name and location of facility or area (address and hydrologic subarea) consistent with the inventory name and location, pursuant to Provision E.5.a.(1);

(b) Inspection and re-inspection date(s);

(c) Inspection method(s) (i.e. drive-by, onsite);

(d) Observations and findings from the inspection(s);

(e) For onsite inspections of existing development by Copermittee municipal or contract staff, the records must also include, as applicable:

(i) Description of any problems or violations found during the inspection(s),

(ii) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6, and

(iii) The date problems or violations were resolved.

d. EXISTING DEVELOPMENT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried existing development, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

e. RETROFITTING AND REHABILITATION~~STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS~~

~~Each Copermittee must implement the water quality improvement strategies, where necessary, to address areas of existing development within its jurisdiction that are identified as sources of pollutants and/or stressors contributing to the highest priority water quality conditions in the Watershed Management Area. For the existing development management program, the following strategies must be implemented:~~

~~(3) Specific Existing Development Management Program Strategies~~

~~Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented within its jurisdiction to address areas of existing development that the Copermittee has identified as sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:~~

~~(a) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, and/or increase/decrease frequency of inspections for specific types of facilities, areas and/or activities);~~

~~(b) The facilities and/or areas within the Copermittee's jurisdiction where the strategies and/or activities will be implemented; and~~

~~(c)~~(a) ~~The strategies and/or activities must be consistent with the requirements of Provisions E.5.b-d and the strategies identified in the Water Quality Improvement Plan.~~

~~(4)~~(3) Retrofitting Areas of Existing Development

Where identified in the WQIP as a required strategy to address the highest priority water quality conditions, each~~Each~~ Copermittee must describe in its jurisdictional runoff management program document, a program to retrofit areas of existing development within its jurisdiction to address identified sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must, where necessary pursuant to the strategies identified in the WQIP, identify areas of existing development as candidates for retrofitting, focusing on areas where retrofitting will address pollutants and/or stressors that contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for retrofitting projects may be utilized to reduce pollutants that may be discharged in storm water from areas of existing development, and/or address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of retrofitting projects, where needed in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting projects; and

(e) Where retrofitting projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional retrofitting projects (i.e. projects that can receive and/or treat storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment) adjacent to and/or downstream of the areas of existing development.

~~(5)~~(4) Stream, Channel and/or Habitat Rehabilitation in Areas of Existing Development

Where identified in the WQIP as a required strategy to address the highest priority water quality conditions, each~~Each~~ Copermittee must describe in its jurisdictional runoff management program document, a program to rehabilitate streams, channels, and/or habitats in areas of existing development within its jurisdiction to address the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must, where necessary pursuant to the strategies identified in the WQIP, identify streams, channels, and/or habitats in areas of existing development as candidates for rehabilitation, focusing on areas where stream, channel, and/or habitat rehabilitation projects will address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for stream, channel, and/or habitat rehabilitation projects may be utilized to address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters, rehabilitate channelized or hydromodified streams, restore wetland and riparian habitat, restore watershed functions, and/or ~~restore~~ protect beneficial uses of receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of stream, channel, and/or habitat rehabilitation projects, where needed, in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance stream, channel, and/or habitat rehabilitation projects; and

(e) Where stream, channel, and/or habitat rehabilitation projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional stream, channel, and/or habitat rehabilitation projects (i.e. projects that can receive storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment).

(5) Upon Regional Board Executive Officer approval the Copermittees may reallocate resources in the WQIPs for retrofit and rehabilitation project(s).

6. Enforcement Response Plans

Each Copermittee must develop and implement an Enforcement Response Plan as part of its jurisdictional runoff management program document. The Enforcement Response Plan must describe the applicable approaches and options to enforce its legal authority established pursuant to Provision E.1, as necessary, to achieve compliance with the requirements of this Order. Copermittees may continue to utilize and implement established, equivalent guidelines and procedures for enforcement. If such equivalent guidelines and procedures have not been developed, ~~T~~the Enforcement Response Plan must include the following:

a. ENFORCEMENT RESPONSE PLAN COMPONENTS

The Enforcement Response Plan must include the following individual components:

(1) Illicit Discharge Detection and Elimination Enforcement Component;

(2) Development Planning Enforcement Component;

(3) Construction Management Enforcement Component; and

(4) Existing Development Enforcement Component.

b. ENFORCEMENT RESPONSE APPROACHES AND OPTIONS

Each component of the Enforcement Response Plan must describe the enforcement response approaches that the Copermittee will implement to compel compliance with its statutes, ordinances, permits, contracts, orders, or similar means, and the requirements of this Order. The description must include the protocols for implementing progressively stricter enforcement responses. The enforcement response approaches must include appropriate sanctions, as legally appropriate, to compel compliance, including, at a minimum, the following tools or their equivalent:

(1) Verbal and written notices of violation;

(2) Cleanup requirements;

(3) Fines;

(4) Bonding requirements;

(5) Administrative and criminal (if intentional or criminally negligent) penalties;

(6) Liens;

(7) Stop work orders; and

(8) Permit and occupancy denials.

c. CORRECTION OF VIOLATIONS

(1) Violations must be corrected in a timely manner with the goal of correcting the violations within 30 calendar days after the violations are discovered, or prior to the next predicted rain event, whichever is sooner.

(2) The status of the enforcement actions~~If more than 30 calendar days are required to achieve compliance, then a rationale~~ must be recorded and updated in the applicable electronic database or tabular system used to track violations.

Comment [A110]: This is just asking for paperwork violations if someone forgets to write a specific justification – even if all appropriate steps are being diligently pursued. Request alternatively to simply require that the status be updated as appropriate.

d. ~~ESCALATED~~ PROGRESSIVE ENFORCEMENT

Comment [A111]: See discussion in section 3.11.2 of the comment letter.

(1) The Enforcement Response Plan must include a definition of "~~escalated~~ progressive enforcement." ~~Escalated~~ Progressive enforcement must include a series of enforcement actions that match the severity of the violations and include distinct, progressive steps. ~~any enforcement scenario where a violation or other non-compliance is determined to cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan~~. ~~Escalated~~ Progressive enforcement may be defined differently for development planning, construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and/or residential areas.

(2) Where the Copermittee determines ~~escalated~~ the identified progressive enforcement steps ~~is~~are not required, a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

(3) ~~Escalated~~ Progressive enforcement actions must continue to increase in severity, as necessary, to compel compliance as soon as possible.

e. REPORTING OF NON-COMPLIANT SITES

(1) Each Copermittee must notify the San Diego Water Board in writing within ~~22~~5 calendar~~2 working~~ days of issuing escalated enforcement (as defined in the Copermittee's Enforcement Response Plan) to a construction site that poses a significant threat to water quality as a result of violations or other non-compliance with its permits and applicable local ordinances, and the requirements of this Order. Written notification may be provided electronically by email.

(2) Each Copermittee must notify the San Diego Water Board of non-filers under the Industrial General Permit and Construction General Permit by email to Nonfilers_R9@waterboards.ca.gov.

7. Public Education and Participation

Each Copermittee must implement, individually or with other Copermittees, a public education and participation program in accordance with the strategies identified in the Water Quality Improvement Plan to promote and encourage the development of programs, management practices, and behaviors that reduce the discharge of pollutants in runoff~~storm water~~ to the MEP, prevent controllable non-storm water discharges from entering the MS4, and protect water quality standards in receiving waters.

STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Comment [A112]: Recommended move from (c)

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented within its jurisdiction, as applicable, to educate the public and encourage public participation to address potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) The target audiences and/or areas within the Copermittee's jurisdiction where the strategies and/or activities will be implemented;

(2) Provide specific details about how the strategies and/or activities will be implemented (e.g. educational topics, materials and/or activities, public outreach and participation programs and/or opportunities);

(3) Each Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify and implement regional public education and participation activities, programs and opportunities;

(4) Each Copermittee must incorporate a mechanism for evaluating and assessing educational and other public outreach activities, as needed, to identify progress and incorporate modifications necessary to increase the effectiveness of the public education and participation program.

(5) The requirements of the programs as outlined in the following sub-provisions

may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality improvement Plan(s).

a. PUBLIC EDUCATION

The public education program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) Educational activities, public information activities, and other appropriate outreach activities intended to reduce pollutants associated with the ~~application of pesticides, herbicides and fertilizer- and other pollutants of concern in storm water discharges to and from its MS4 to the MEP, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed to address the~~ highest priority water quality conditions identified in the Water Quality Improvement Plan;

(2) Educational activities, public information activities, and other appropriate outreach activities to facilitate the proper management and disposal of used oil and toxic materials; and

(3) Appropriate education and training measures for specific target audiences, such as construction site operators, residents, underserved target audiences and school-aged children, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed, based on high risk behaviors and pollutants of concern.

b. PUBLIC PARTICIPATION

The public participation program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) A process for members of the public to participate in updating the highest priority water quality conditions, numeric goals, and water quality improvement strategies in the Water Quality Improvement Plan.

(2) Opportunities for members of the public to participate in providing the Copermittee recommendations for improving the effectiveness of the water quality improvement strategies implemented within its jurisdiction.

(3) Opportunities for members of the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in ~~storm wate~~r discharges from

the MS4, and/or ~~restoration and~~ protection of the quality of receiving waters.

8. Fiscal Analysis

a. ~~Each Copermittee must secure the resources necessary to meet all the requirements of this Order~~.

b. Each Copermittee must conduct an annual fiscal analysis of its jurisdictional runoff management program in its entirety. The fiscal analysis must include the following:

(1) Identification of the various categories of expenditures necessary to implement the requirements of this Order, including a description of the specific capital, operation and maintenance, and other expenditure items to be accounted for in each category of expenditures;

(2) The staff resources needed and allocated to meet the requirements of this Order, including any development, implementation, and enforcement activities required;

(3) The estimated expenditures for Provisions E.8.b.(1) and E.8.b.(2) for the current fiscal year; and

(4) The source(s) of funds that are proposed to meet the necessary expenditures described in Provisions E.8.b.(1) and E.8.b.(2), including legal restrictions on the use of such funds, for the current fiscal year and next fiscal year.

c. Each Copermittee must submit a summary of the annual fiscal analysis with each Annual Report required pursuant to Provision F.3.b.

d. Each Copermittee must provide the documentation used to develop the summary of the annual fiscal analysis upon request by the San Diego Water Board.

Comment [A113]: Since the monitoring period is different than a fiscal year, we won't be able to consistently and accurately report monitoring costs incurred by the Copermittees. (which are a big part of overall budgets)

Comment [A114]: Please see Legal Comments.

F. REPORTING

Comment [A115]: See discussion in section 3.14 of the comment letter.

The purpose of this provision is to determine and document compliance with the requirements set forth in this Order. The goal of reporting is to communicate to the San Diego Water Board and the people of the State of California the implementation status of each jurisdictional runoff management program and compliance with the requirements of this Order. This goal is to be accomplished through the submittal of specific deliverables to the San Diego Water Board by the Copermittees.

1. Water Quality Improvement Plans

Comment [A116]: See discussion in section 3.14.1 of the comment letter.

The Copermittees for each Watershed Management Area must develop and submit the Water Quality Improvement Plan in accordance with the following requirements:

a. WATER QUALITY IMPROVEMENT PLAN DEVELOPMENT

Each Water Quality Improvement Plan must be developed in accordance with the following process:

(1) Priority Water Quality Conditions and Numeric Goals

(a) The Copermittees must implement a public participation process to solicit data and information to be utilized in the development and identification of the priority water quality conditions for the Watershed Management Area.

(b) The Copermittees are encouraged to involve the public and key stakeholders as early and often as possible during the development of the priority water quality conditions and numeric goals to be included in the Water Quality Improvement Plan.

(c) Within 6 months after the commencement of coverage under this Order, the Copermittees must develop and submit the Water Quality Improvement Plan requirements of Provision B.2 to the San Diego Water Board. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of 60 days.

(d) The Copermittees must revise the priority water quality conditions and numeric goals based on comments received and/or recommendations or direction from the San Diego Water Board Executive Officer.

(2) Water Quality Improvement Strategies and Schedules

(a) The Copermittees are encouraged to involve the public and key stakeholders as early and often as possible during the development of the water quality improvement strategies and schedules to be included in the Water Quality Improvement Plan.

(b) Within 9 months after receipt~~the commencement~~ of public comments and/or recommendations from the Executive Officer per (1)(c) above~~coverage under this Order~~, the Copermittees must develop and submit the Water Quality Improvement Plan requirements of Provision B.3 to the San Diego Water Board. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of 60 days.

(c) The Copermittees must revise the water quality improvement strategies and schedules based on comments received and/or recommendations or direction from the San Diego Water Board Executive Officer.

b. WATER QUALITY IMPROVEMENT PLAN SUBMITTAL

(1) Within 6~~18~~ months after receipt~~the commencement~~ of public comments and/or recommendations from the Executive Officer per (2)(c) above~~coverage under this Order~~, the Copermittees for each Watershed Management Area must submit a complete Water Quality Improvement Plan in accordance with the requirements of Provision B to the San Diego Water Board. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of 30 days.

(2) Based on the comments received, the San Diego Water Board will determine whether to hold a public hearing or to limit public input to submittal of written comments. If no hearing is held the San Diego Water Board will notify the Copermittees within 6 months that the Water Quality Improvement Plan has been accepted as complete following its review and determination that the Water Quality Improvement Plan meets the requirements of this Order.

(3) The Copermittees must revise the Water Quality Improvement Plan based on comments received and/or recommendations or direction from the San Diego Water Board Executive Officer.

(4) The Water Quality Improvement Plan must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance by the San Diego Water Board.

(5) Copermittees must commence with implementation of the BMP strategies identified in the Water Quality Improvement Plan no later than the fiscal year (July 1) following San Diego Water Board approval of the Water Quality Improvement Plan, and the monitoring strategies identified in the Water Quality Improvement Plan no later than October 1st (or May 1st, whichever is sooner) following the San Diego Water Board approval of the Water Quality Improvement Plan.

2. Updates

Comment [A117]: See discussion in section 3.14.1 of the comment letter.

a. Jurisdictional Runoff Management Program Document Updates

Each Copermittee must update its jurisdictional runoff management program document in accordance with the following requirements:

(1) Each Copermittee is encouraged to involve the public and key stakeholders as early and often as possible to solicit recommendations for updates to its jurisdictional runoff management program document.

(2) Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E and the strategies identified in the applicable WQIPs no later than 6~~18~~ months after approval~~the commencement~~ of the applicable Water Quality Improvement Plans (or updates thereto).~~coverage under this Order.~~

(3) The updated JRMP document must be implemented beginning July 1st following completion of the update, unless directed otherwise by the Executive Officer.

~~(3)~~(4) Each Copermittee must submit any subsequent updates to its jurisdictional runoff management program, with a rationale for the modifications, either in the Annual Report required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge required pursuant to Provision F.5.b.

~~(4)~~(5) The Copermittee must revise the modifications as directed by the San Diego Water Board Executive Officer.

~~(5)~~(6) Updated jurisdictional runoff management program documents must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of submitting the Annual Report.

b. BMP Design Manual Updates

Each Copermittee must update its BMP Design Manual in accordance with the following requirements:

(1) Each Copermittee must update its BMP Design Manual to incorporate the requirements of Provisions E.3.a-d, and E.3.g. no later than 6~~18~~ months after approval~~the commencement~~ of the applicable Water Quality Improvement Plans..

Comment [A118]: This is necessary for the WQIP strategies to inform the Development Planning process

(2) Unless directed otherwise by the San Diego Water Board, the Copermittee must implement the updated BMP Design Manual within 180 days of

Comment [A119]: An implementation date was missing from the Tentative Order

completing updates to the BMP Design Manual.

~~(1)~~(3) Until the Copermittee begins implementation of its updated BMP Design Manual, the Copermittee must continue implementing its current BMP Design Manual~~coverage under this Order~~.

Comment [A120]: This was moved to here

~~(2)~~(4) Subsequent updates must be consistent with the requirements of Provisions E.3.a-d and must be submitted as part of the Annual Reports required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge required pursuant to Provision F.5.b.

~~(3)~~(5) Updated BMP Design Manuals must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of completing the update.

c. WATER QUALITY IMPROVEMENT PLAN UPDATES

The Water Quality Improvement Plans must be updated in accordance with the following process:

(1) The Copermittees must implement a public participation process to solicit data and information to be utilized in updating the Water Quality Improvement Plan.

(2) The Copermittees are encouraged to involve the public and key stakeholders as early and often as possible during the updates to the Water Quality Improvement Plan.

(3) The Copermittees for each Watershed Management Area must submit requested updates to the Water Quality Improvement Plan, with the public input received and the rationale for the requested updates, either in the Annual Reports required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The requested updates are considered accepted by the San Diego Water Board if no response is provided to the Copermittee after 3 months of submitting the request.

(4) The Copermittees must revise the requested updates as directed by the San Diego Water Board Executive Officer.

(5) Updated Water Quality Improvement Plans must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance of the requested updates by the San Diego Water Board.

3. Progress Reporting

Comment [A121]: See discussion in section 3.14.1 of the comment letter.

a. PROGRESS REPORT PRESENTATIONS

The Copermittees for each Watershed Management Area must appear before the San Diego Water Board, as requested by the San Diego Water Board, to provide progress reports on the implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs.

b. ANNUAL REPORTS

Comment [A122]: See discussion in section 3.14.1 of the comment letter.

(1) Transitional Period JRMP Reports: Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (Attachment D or accepted revision) no later than October 31 of each year prior to the implementation of updated JRMP programs pursuant to F.2.a. Each Copermittee must submit the information on the Jurisdictional Runoff Management Program Annual Report Form specific to the area within its jurisdiction in each Watershed Management Area.

(2) Transitional Period Monitoring Report: The transitional period monitoring conducted pursuant to D.1.a and D.2.a. shall be reported in a single report that covers the entire reporting period from the initiation of the transitional period monitoring (as described in D.1.a and D.2.a.), through September 30th following approval of the Water Quality Improvement Plan. The Transitional Period Monitoring Report shall include the assessments required per D.4.a.(1)(a), D.4.b.(1)(a) and D.4.b.(2)(a); and be submitted by January 31st following completion of the above mentioned transitional period.

~~(1)~~(3) Post-Transitional Annual Reports – Following the initial transitional period after enrollment into this Order, the~~The~~ Copermittees for each Watershed Management Area must submit an combined Annual Report for each reporting period no later than January 31 of the following year. The annual reporting period consists of two periods: 1) July 1 to June 30 of the following year for the jurisdictional runoff management programs, 2) October 1 to September 30 of the following year for the monitoring and assessment programs~~. The first Annual Report must be prepared for the reporting period beginning July 1 after commencement of coverage under this Order, and upon San Diego Water Board determination that the Water Quality Improvement Plan meets the requirements of this Order to June 30 in the following year for the jurisdictional runoff management programs, and September 30 in the following year for the monitoring and assessment programs.~~ Annual Reports must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Each Annual Report must include the following:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, summarized and presented in tabular and graphical form;

(b) Progress of the special studies required pursuant to Provision D.3, and the results or findings when a special study, or each phase of a special study, is completed;

(c) The findings from the applicable assessments required pursuant to Provision D.4;

Comment [A123]: Not all are required annually.

(d) The progress of implementing the Water Quality Improvement Plan, including, but not limited to, the following:

(i) The progress toward achieving the interim and final numeric goals for the highest water quality priorities for the Watershed Management Area,

(ii) The water quality improvement strategies that were implemented and/or no longer implemented by each of the Copermittees during the reporting period and previous reporting periods, and are planned to be implemented during the next reporting period,

(iii) Proposed modifications to the water quality improvement strategies, with public input received and rationale for the proposed modifications,

(iv) Previously proposed modifications or updates incorporated into the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document and implemented by the Copermittees in the Watershed Management Area, and

(v) Proposed modifications or updates to the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document;

(e) A completed Jurisdictional Runoff Management Program Annual Report Form (Attachment D or accepted revision) for each Copermittee in the Watershed Management Area, certified by a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative.

~~(2) Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (Attachment D or accepted revision) no later than October 31 of each year until the first Annual Report is required to be submitted. Each Copermittee must submit the information on the Jurisdictional Runoff Management Program Annual Report Form specific to the area within its jurisdiction in each Watershed Management Area.~~

Comment [A124]: Adapted into new section (1)

~~(3)~~(4) Each Copermittee must provide any data or documentation utilized in

developing the Annual Report upon request by the San Diego Water Board. ~~Any~~~~Any~~Copermittee~~Any~~ monitoring data utilized in developing the Annual Report must be uploaded to the California Environmental Data Exchange Network (CEDEN).[35] Any Copermittee monitoring and assessment data utilized in developing the Annual Report must be provided on the Regional Clearinghouse required pursuant to Provision F.4.

C. Regional Monitoring and Assessment Report

(1) The Copermittees must submit a Regional Monitoring and Assessment Report no later than 180 days in advance of the expiration date of this Order. The Regional Monitoring and Assessment Report may be submitted as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The Regional Monitoring and Assessment Report shall incorporate the Integrated Assessment of the Water Quality Improvement Plan per D.4.d.

~~(1) The Copermittees must review the receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, and findings from the assessments required pursuant to Provision D.4, to assess the following:~~

~~(2)~~

~~(3) The beneficial uses of the receiving waters within the San Diego Region that are protected or must be restored;~~

~~(4)~~

~~(5) The progress toward restoring impacted beneficial uses in the receiving waters within the San Diego Region; and~~

~~(6)~~

~~(7) Pollutants or conditions of emerging concern that may impact beneficial uses in the receiving waters within the San Diego Region.~~

~~(8)~~

~~(9) The Regional Monitoring and Assessment Report must include recommendations for improving the implementation and assessment of the Water Quality Improvement Plans and jurisdictional runoff management programs.~~

(2) Each Copermittee must provide any data or documentation utilized in developing the Regional Monitoring and Assessment Report upon request by the San Diego Water Board. Any monitoring and assessment data utilized in developing the Regional Monitoring and Assessment Report must be provided on the Regional Clearinghouse required pursuant to Provision F.4.

[35] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

4. Regional Clearinghouse

The Copermittees must develop, update, and maintain an internet-based Regional Clearinghouse that is made available to the public no later than 18 months after the effective date of this Order.[36]

a. The Copermittees, through the Regional Clearinghouse, must make the following documents and data available, organized by Watershed Management Area, which may be linked to other internet-based data portals and databases where the original documents are stored:

(1) Water Quality Improvement Plan for the Watershed Management Area, and all updated versions with date of update;

(2) Annual Reports for the Watershed Management Area;

(3) Jurisdictional Runoff Management Program document for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(4) BMP Design Manual for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(5) Reports from special studies (e.g. source identification, BMP effectiveness assessment) conducted in the Watershed Management Area;

(6) Monitoring data collected pursuant to Provision D for each Watershed Management Area must be uploaded to CEDEN,[37] with links to the uploaded data; and

(7) Available GIS data, layers, and/or shapefiles used to develop the maps generated and maintained by the Copermittees for the Water Quality Improvement Plans, Annual Reports, and jurisdictional runoff management program documents.

b. The Copermittees, through the Regional Clearinghouse, must make the following information and documents available:

(1) Contact information (point of contact, phone number, email address, and mailing address) for each Copermittee;

[36] The Copermittee may elect to develop and maintain the clearinghouse(s) provided by other Copermittees or agencies.

[37] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

(2) Public hotline number for reporting non-storm water and illicit discharges for each Copermittee;

(3) Email address for reporting non-storm water and illicit discharges for each Copermittee;

(4) Link to each Copermittee's website, if available, where the public may find additional information about the Copermittee's storm water management program and for requesting records for the implementation of its program;

(5) Information about opportunities for the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in ~~storm water~~ discharges from the MS4, and/or restoration and protection of the quality of receiving waters; and

(6) Reports from regional monitoring programs in which the Copermittees participate (e.g. Southern California Monitoring Coalition, Southern California Coastal Water Research Project Bight Monitoring);

(7) Regional Monitoring and Assessment Reports; and

(8) Any other information, data, and documents the Copermittees determine as appropriate for making available to the public.

5. Report of Waste Discharge

a. The Orange County Copermittees and the Riverside County Copermittees are required to submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders. The San Diego Water Board will review and consider the Reports of Waste Discharge to determine whether modification to this Order, pursuant to the requirements of Provision H, will be required prior the Orange County Copermittees and/or Riverside County Copermittees becoming covered under this Order. The current Orders for the Orange County Copermittees and Riverside County Copermittees are rescinded upon notification of coverage under this Order except for enforcement purposes.

b. The Copermittees subject to the requirements of this Order must submit to the San Diego Water Board a complete Report of Waste Discharge as an application for the re-issuance of this Order and NPDES permit. The Report of Waste Discharge must be submitted no later than 180 days in advance of the expiration date of this Order. The Report of Waste Discharge must contain the following minimum information:

(1) Names and addresses of the Copermittees;

(2) Names and titles of the primary contacts of the Copermittees;

(3) Proposed changes to the Copermittees' Water Quality Improvement Plans and the supporting justification;

(4) Proposed changes to the Copermittees' jurisdictional runoff management programs and the supporting justification;

(5) Any other information necessary for the re-issuance of this Order;

(6) Any information to be included as part of the Report of Waste Discharge pursuant to the requirements of this Order; and

(7) Any other information required by federal regulations for NPDES permit reissuance.

6. Application for Early Coverage

a. The Orange County Copermittees, collectively, or Riverside County Copermittees, collectively, may apply for early coverage under this Order by submitting a Report of Waste Discharge Form 200, with a written request for early coverage under this Order.

Comment [A125]: This form requests information that is not applicable to MS4s.

b. The San Diego Water Board will review the application for early coverage. A notification of coverage under this Order will be issued to the Copermittees in the respective county by the San Diego Water Board upon completion of the early coverage application requirements. The effective coverage date will be specified in the notification of coverage. The Copermittees in the respective county are authorized to have MS4 discharges pursuant to the requirements of this Order starting on the effective coverage date specified in the notification of coverage. The existing Order for the respective county is rescinded upon the effective coverage date specified in the notification of coverage except for enforcement purposes.

7. Reporting Provisions

Each Copermittee must comply with all the reporting and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

Riverside Copermittee Redlines

G. PRINCIPAL WATERSHED COPERMITTEE RESPONSIBILITIES

1. The Copermittees within each Watershed Management Area must designate a Principal Watershed Copermittee and notify the San Diego Water Board of the name of the Principal Watershed Copermittee. ~~An individual Copermittee should not be designated a Principal Watershed Copermittee for more than two Watershed Management Areas.~~ The notification may be submitted with the Water Quality Improvement Plan required pursuant to Provision F.1 of this Order.

2. The Principal Watershed Copermittee is responsible for, at a minimum, the following:

a. Serving as liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues, and when necessary and appropriate, representing the Copermittees in the Watershed Management Area before the San Diego Water Board.

b. Facilitating the development of the Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order

c. Coordinating the submittal of the deliverables required by Provisions F.1, F.2, F.3.a, and F.3.b of this Order.

d. Coordinating the development of~~and developing~~, with the other Principal Watershed Copermittees, the requirements of Provisions F.3.c, F.4, and F.5.b of this Order.

Riverside Copermittee Redlines

H. MODIFICATION OF PROGRAMS

1. Modifications of the Order may be initiated by the San Diego Water Board or by the Copermittees, including as part of the ROWD process applicable to the Orange County and Riverside County Copermittees. Requests by Copermittees must be made to the San Diego Water Board.

2. Minor modifications to the Order may be made by the San Diego Water Board Executive Officer, where the proposed modification complies with all the effective prohibitions and limitations, and other requirements of this Order.

3. Proposed modifications to the Order outside of the WQIP process that are not minor require amendment of this Order in accordance with this Order's rules, policies, and procedures.

4. The San Diego Water Board may re-open and modify this Order at any time prior to its expiration, after opportunity for public comment and a public hearing, if the State Water Board determines that revisions are warranted to those provisions of the Order addressing compliance with water quality standards in the receiving water and/or those provisions of the Order establishing an iterative process for implementation of management practices to assure compliance with water quality standards in the receiving water.

I. STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

Each Copermittee must comply with all the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

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ATTACHMENT A

DISCHARGE PROHIBITIONS AND SPECIAL PROTECTIONS

1. Basin Plan Waste Discharge Prohibitions

California Water Code Section 13243 provides that a Regional Water Board, in a water quality control plan, may specify certain conditions or areas where the discharge of waste or certain types of waste is not permitted. The following waste discharge effective prohibitions in the Water Quality Control Plan for the San Diego Basin (Basin Plan) are applicable to any person, as defined by Section 13050(c) of the California Water Code, who is a citizen, domiciliary, or political agency or entity of California whose activities in California could affect the quality of waters of the state within the boundaries of the San Diego Region.

1. The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in California Water Code Section 13050, is prohibited.

2. The discharge of waste to land, except as authorized by waste discharge requirements or the terms described in California Water Code Section 13264 is prohibited.

3. The discharge of pollutants or dredged or fill material to waters of the United States except as authorized by a National Pollutant Discharge Elimination System (NPDES) permit or a dredged or fill material permit (subject to the exemption described in California Water Code Section 13376) is prohibited.

4. Discharges of recycled water to lakes or reservoirs used for municipal water supply or to inland surface water tributaries thereto are prohibited, unless this San Diego Water Board issues a NPDES permit authorizing such a discharge; the proposed discharge has been approved by the State Department of Health Services (DHS) and the operating agency of the impacted reservoir; and the discharger has an approved fail-safe long-term disposal alternative.

5. The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the San Diego Water Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

6. The discharge of waste in a manner causing flow, ponding, or surfacing on lands not owned or under the control of the discharger is prohibited, unless the discharge is authorized by the San Diego Water Board.

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7. The dumping, deposition, or discharge of waste directly into waters of the state, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the San Diego Water Board.

8. Any discharge to a storm water conveyance system that is not composed entirely of "*storm water*" is effectively prohibited unless authorized by the San Diego Water Board. [The federal regulations, 40 CFR 122.26(b)(13), define storm water as storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from fire fighting activities.] [§122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

9. The unauthorized discharge of treated or untreated sewage to waters of the state or to a storm water conveyance system is prohibited.

10. The discharge of industrial wastes to conventional septic tank/subsurface disposal systems, except as authorized by the terms described in California Water Code Section 13264, is prohibited.

11. The discharge of radioactive wastes amenable to alternative methods of disposal into the waters of the state is prohibited.

12. The discharge of any radiological, chemical, or biological warfare agent into waters of the state is prohibited.

13. The discharge of waste into a natural or excavated site below historic water levels is prohibited unless the discharge is authorized by the San Diego Water Board.

14. The discharge of sand, silt, clay, or other earthen materials from any activity, including land grading and construction, in quantities which cause deleterious bottom deposits, turbidity or discoloration in waters of the state or which unreasonably affect, or threaten to affect, beneficial uses of such waters is prohibited.

15. The discharge of treated or untreated sewage from vessels to Mission Bay, Oceanside Harbor, Dana Point Harbor, or other small boat harbors is prohibited.

16. The discharge of untreated sewage from vessels to San Diego Bay is prohibited.

17. The discharge of treated sewage from vessels to portions of San Diego Bay that are less than 30 feet deep at mean lower low water (MLLW) is prohibited.

18. The discharge of treated sewage from vessels, which do not have a properly functioning US Coast Guard certified Type I or Type II marine sanitation device, to portions of San Diego Bay that are greater than 30 feet deep at mean lower low water (MLLW) is prohibited.

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2. Attachment B to State Water Board Resolution 2012-0012

Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges

I. PROVISIONS FOR POINT SOURCE DISCHARGES OF STORM WATER AND NONPOINT SOURCE WASTE DISCHARGES

The following terms, effective prohibitions, and special conditions (hereafter collectively referred to as special conditions) are established as limitations on point source storm water and nonpoint source discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in Areas of Special Biological Significance (ASBS), as required for State Water Quality Protection Areas pursuant to California Public Resources Code Sections 36700(f) and 36710(f). These Special Protections are adopted by the State Water Board as part of the California Ocean Plan (Ocean Plan) General Exception.

The special conditions are organized by category of discharge. The State Water Resources Control Board (State Water Board) and Regional Water Quality Control Boards (Regional Water Boards) will determine categories and the means of regulation for those categories [e.g., Point Source Storm Water National Pollutant Discharge Elimination System (NPDES) or Nonpoint Source].

A. PERMITTED POINT SOURCE DISCHARGES OF STORM WATER

1. General Provisions for Permitted Point Source Discharges of Storm Water

   a. Existing storm water discharges into an ASBS are allowed only under the following conditions:

      (1) The discharges are authorized by an NPDES permit issued by the State Water Board or Regional Water Board;

      (2) The discharges comply with all of the applicable terms, effective prohibitions, and special conditions contained in these Special Protections; and

      (3) The discharges:

         (i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

         (ii) Are designed to prevent soil erosion;

         (iii) Occur only during wet weather;

         (iv) Are composed of only storm water runoff.

   b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

   c. The discharge of trash is effectively prohibited.

d. Only discharges from existing storm water outfalls are allowed. Any proposed or new storm water runoff discharge shall be routed to existing storm water discharge outfalls and shall not result in any new contribution of waste to an ASBS (i.e., no additional pollutant loading). “Existing storm water outfalls” are those that were constructed or under construction prior to January 1, 2005. “New contribution of waste” is defined as any addition of waste beyond what would have occurred as of January 1, 2005. A change to an existing storm water outfall, in terms of re-location or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges are effectively prohibited except as provided below:

(1) The term “non-storm water discharges” means any waste discharges from a municipal separate storm sewer system (MS4) or other NPDES permitted storm drain system to an ASBS that are not composed entirely of storm water.

(2) (i) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability or occur naturally:

(a) Discharges associated with emergency fire fighting operations.

(b) Foundation and footing drains.

(c) Water from crawl space or basement pumps.

(d) Hillside dewatering.

(e) Naturally occurring groundwater seepage via a storm drain.

(f) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(ii) An NPDES permitting authority may authorize non-storm water discharges to an MS4 with a direct discharge to an ASBS only to the extent the NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

2. Compliance Plans for Inclusion in Storm Water Management Plans (SWMP) and Storm Water Pollution Prevention Plans (SWPPP).

The discharger shall specifically address the effective prohibition of non-storm water runoff and the requirement to maintain natural water quality for storm water discharges to an ASBS in an ASBS Compliance Plan to be included in its SWMP or a SWPPP, as appropriate to permit type. If a statewide permit includes a SWMP, then the discharger shall prepare a stand-alone compliance plan for ASBS discharges. The ASBS Compliance Plan is subject to approval by the Executive Director of the State Water Board (statewide permits) or

Executive Officer of the Regional Water Board (for permits issued by Regional Water Boards).

a. The Compliance Plan shall include a map of surface drainage of storm water runoff, showing areas of sheet runoff, prioritize discharges, and describe any structural Best Management Practices (BMPs) already employed and/or BMPs to be employed in the future. Priority discharges are those that pose the greatest water quality threat and which are identified to require installation of structural BMPs. The map shall also show the storm water conveyances in relation to other features such as service areas, sewage conveyances and treatment facilities, landslides, areas prone to erosion, and waste and hazardous material storage areas, if applicable. The SWMP or SWPPP shall also include a procedure for updating the map and plan when changes are made to the storm water conveyance facilities.

b. The ASBS Compliance Plan shall describe the measures by which all non-authorized non-storm water runoff (e.g., dry weather flows) has been eliminated, how these measures will be maintained over time, and how these measures are monitored and documented.

c. For Municipal Separate Storm Sewer System (MS4s), the ASBS Compliance Plan shall require minimum inspection frequencies as follows:

   (1) The minimum inspection frequency for construction sites shall be weekly during rainy season;

   (2) The minimum inspection frequency for industrial facilities shall be monthly during the rainy season;

   (3) The minimum inspection frequency for commercial facilities (e.g., restaurants) shall be twice during the rainy season; and

   (4) Storm water outfall drains equal to or greater than 18 inches (457 mm) in diameter or width shall be inspected once prior to the beginning of the rainy season and once during the rainy season and maintained to remove trash and other anthropogenic debris.

d. The ASBS Compliance Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff, that are necessary to comply with these special conditions, will be achieved through BMPs. Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that such installation would pose a threat to health or safety. BMPs to control storm water runoff discharges (at the end-of-pipe) during a design storm shall be designed to achieve on average the following target levels:

   (1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

   (2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges. The baseline for the reduction is the effective date of the Exception. The

baseline for these determinations is the effective date of the Exception, and the reductions must be achieved and documented within four (4) years of the effective date.

e. The ASBS Compliance Plan shall address erosion control and the prevention of anthropogenic sedimentation in ASBS. The natural habitat conditions in the ASBS shall not be altered as a result of anthropogenic sedimentation.

f. The ASBS Compliance Plan shall describe the non-structural BMPs currently employed and planned in the future (including those for construction activities), and include an implementation schedule. The ASBS Compliance Plan shall include non-structural BMPs that address public education and outreach. Education and outreach efforts must adequately inform the public that direct discharges of pollutants from private property not entering an MS4 are effectively prohibited. The ASBS Compliance Plan shall also describe the structural BMPs, including any low impact development (LID) measures, currently employed and planned for higher threat discharges and include an implementation schedule. To control storm water runoff discharges (at the end-of-pipe) during a design storm, permittees must first consider using LID practices to infiltrate, use, or evapotranspirate storm water runoff on-site.

g. The BMPs and implementation schedule shall be designed to ensure that natural water quality conditions in the receiving water are achieved and maintained by either reducing flows from impervious surfaces or reducing pollutant loading, or some combination thereof.

h. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents in storm water runoff that alter natural ocean water quality and the sources of these constituents.

(2) The report shall describe BMPs that are currently being implemented, BMPs that are identified in the SWMP or SWPPP for future implementation, and any additional BMPs that may be added to the SWMP or SWPPP to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the BMPs.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits), the discharger shall revise its ASBS Compliance Plan to incorporate any new or modified BMPs that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised SWMP or SWPPP, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural ocean water quality conditions due to the same constituent.

(5) Compliance with this section does not excuse violations of any term, effective prohibition, or condition contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within one year from the effective date of the Exception, the discharger shall submit a written ASBS Compliance Plan to the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that describes its strategy to comply with these special conditions, including the requirement to maintain natural water quality in the affected ASBS. The ASBS Compliance Plan shall include a time schedule to implement appropriate non-structural and structural controls (implementation schedule) to comply with these special conditions for inclusion in the discharger's SWMP or SWPPP, as appropriate to permit type.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these special conditions shall be implemented.

d. Within four (4) years of the effective date of the Exception, any structural controls identified in the ASBS Compliance Plan that are necessary to comply with these special conditions shall be operational.

e. Within four (4) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water, pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data, and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

(1) for municipalities, a demonstration of significant hardship to discharger ratepayers, by showing the relationship of storm water fees to annual household income for residents within the discharger's jurisdictional area, and the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or
(2) for other governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process.

B. NONPOINT SOURCE DISCHARGES

[NOT INCLUDED]
[PROVISIONS FOR NONPOINT SOURCE DISCHARGES NOT APPLICABLE]

II. ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES

[NOT INCLUDED]
[ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES NOT APPLICABLE]

III. ADDITIONAL REQUIREMENTS – WATERFRONT AND MARINE OPERATIONS

[NOT INCLUDED]
[ADDITIONAL REQUIREMENTS FOR WATERFRONT AND MARINE OPERATIONS NOT APPLICABLE]

IV. MONITORING REQUIREMENTS

Monitoring is mandatory for all dischargers to assure compliance with the Ocean Plan. Monitoring requirements include both: (A) core discharge monitoring, and (B) ocean receiving water monitoring. The State and Regional Water Boards must approve sampling site locations and any adjustments to the monitoring programs. All ocean receiving water and reference area monitoring must be comparable with the Water Boards' Surface Water Ambient Monitoring Program (SWAMP).

Safety concerns: Sample locations and sampling periods must be determined considering safety issues. Sampling may be postponed upon notification to the State and Regional Water Boards if hazardous conditions prevail.

Analytical Chemistry Methods: All constituents must be analyzed using the lowest minimum detection limits comparable to the Ocean Plan water quality objectives. For metal analysis, all samples, including storm water effluent, reference samples, and ocean receiving water samples, must be analyzed by the approved analytical method with the lowest minimum detection limits (currently Inductively Coupled Plasma/Mass Spectrometry) described in the Ocean Plan.

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A. CORE DISCHARGE MONITORING PROGRAM

1. General sampling requirements for timing and storm size:

   Runoff must be collected during a storm event that is greater than 0.1 inch and generates runoff, and at least 72 hours from the previously measurable storm event. Runoff samples shall be collected when post-storm receiving water is sampled, and analyzed for the same constituents as receiving water and reference site samples (see section IV B) as described below.

2. Runoff flow measurements

   a. For municipal/industrial storm water outfalls in existence as of December 31, 2007, 18 inches (457mm) or greater in diameter/width (including multiple outfall pipes in combination having a width of 18 inches, runoff flows must be measured or calculated, using a method acceptable to and approved by the State and Regional Water Boards.
   b. This will be reported annually for each precipitation season to the State and Regional Water Boards.

3. Runoff samples – storm events

   a. For outfalls equal to or greater than 18 inches (0.46m) in diameter or width:

      (1) samples of storm water runoff shall be analyzed during the same storm as receiving water samples for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination, ; and

      (2) samples of storm water runoff shall be analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS

      (3) If an applicant has no outfall greater than 36 inches, then storm water runoff from the applicant's largest outfall shall be further analyzed during the same storm as receiving water samples for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates).

   b. For outfalls equal to or greater than 36 inches (0.91m) in diameter or width:

      (1) samples of storm water runoff shall be analyzed during the same storm as receiving water samples for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

      (2) samples of storm water runoff shall be further analyzed during the same storm as receiving water samples for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides

(pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates) and

(3) samples of storm water runoff shall be analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

c. For an applicant not participating in a regional monitoring program [see below in Section IV (B)] in addition to (a.) and (b.) above, a minimum of the two largest outfalls or 20 percent of the larger outfalls, whichever is greater, shall be sampled (flow weighted composite samples) at least three times annually during wet weather (storm event) and analyzed for all Ocean Plan Table A constituents, Table B constituents for marine aquatic life protection (except for toxicity, only chronic toxicity for three species shall be required), DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, and Ocean Plan indicator bacteria. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one (the largest) such discharge shall be sampled annually in each Region.

4. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may reduce or suspend core monitoring once the storm runoff is fully characterized. This determination may be made at any point after the discharge is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

B. OCEAN RECEIVING WATER AND REFERENCE AREA MONITORING PROGRAM

In addition to performing the Core Discharge Monitoring Program in Section II.A above, all applicants having authorized discharges must perform ocean receiving water monitoring. In order to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS, dischargers may choose either (1) an individual monitoring program, or (2) participation in a regional integrated monitoring program.

1. Individual Monitoring Program: The requirements listed below are for those dischargers who elect to perform an individual monitoring program to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within the affected ASBS. In addition to Core Discharge Monitoring, the following additional monitoring requirements shall be met:

   a. Three times annually, during wet weather (storm events), the receiving water at the point of discharge from the outfalls described in section (IV)(A)(3)(c) above shall be sampled and analyzed for Ocean Plan Table A constituents, Table B constituents for marine aquatic life, DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, salinity, chronic toxicity (three species), and Ocean Plan indicator bacteria.

      The sample location for the ocean receiving water shall be in the surf zone at the point of discharges; this must be at the same location where storm water runoff is sampled. Receiving water shall be sampled at approximately the same time prior to (pre-storm) and during (or immediately after) the same storm (post storm). Reference water quality shall also be sampled and analyzed for the same constituents pre-storm and post-storm, during the same storms when receiving water is sampled. Reference stations will be

determined by the State Water Board's Division of Water Quality and the applicable Regional Water Board(s).

b. Sediment sampling shall occur at least three times during every five (5) year period. The subtidal sediment (sand or finer, if present) at the discharge shall be sampled and analyzed for Ocean Plan Table B constituents for marine aquatic life, DDT, PCBs, PAHs, pyrethroids, and OP pesticides. For sediment toxicity testing, only an acute toxicity test using the amphipod Eohaustorius estuarius must be performed.

c. A quantitative survey of intertidal benthic marine life shall be performed at the discharge and at a reference site. The survey shall be performed at least once every five (5) year period. The survey design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The results of the survey shall be completed and submitted to the State Water Board and Regional Water Board at least six months prior to the end of the permit cycle.

d. Once during each five (5) year period, a bioaccumulation study shall be conducted to determine the concentrations of metals and synthetic organic pollutants at representative discharge sites and at representative reference sites. The study design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The bioaccumulation study may include California mussels (Mytilus californianus) and/or sand crabs (Emerita analoga or Blepharipoda occidentalis). Based on the study results, the Regional Water Board and the State Water Board's Division of Water Quality, may adjust the study design in subsequent permits, or add or modify additional test organisms (such as shore crabs or fish), or modify the study design appropriate for the area and best available sensitive measures of contaminant exposure.

e. Marine Debris: Representative quantitative observations for trash by type and source shall be performed along the coast of the ASBS within the influence of the discharger's outfalls. The design, including locations and frequency, of the marine debris observations is subject to approval by the Regional Water Board and State Water Board's Division of Water Quality.

f. The monitoring requirements of the Individual Monitoring Program in this section are minimum requirements. After a minimum of one (1) year of continuous water quality monitoring of the discharges and ocean receiving waters, the Executive Director of the State Water Board (statewide permits) or Executive officer of the Regional Water Board (Regional Water Board permits) may require additional monitoring, or adjust, reduce or suspend receiving water and reference station monitoring. This determination may be made at any point after the discharge and receiving water is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

2. Regional Integrated Monitoring Program: Dischargers may elect to participate in a regional integrated monitoring program, in lieu of an individual monitoring program, to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS. This regional approach shall characterize natural water quality, pre- and post-storm, in ocean reference areas near the mouths of identified open space watersheds and the effects of the discharges on natural water quality (physical, chemical, and toxicity) in the ASBS receiving waters, and should include benthic marine aquatic life and bioaccumulation components. The design of the ASBS stratum of a regional integrated monitoring program may deviate from the otherwise prescribed individual

monitoring approach (in Section IV.B.1) if approved by the State Water Board's Division of Water Quality and the Regional Water Boards.

a. Ocean reference areas shall be located at the drainages of flowing watersheds with minimal development (in no instance more than 10% development), and shall not be located in CWA Section 303(d) listed waterbodies or have tributaries that are 303(d) listed. Reference areas shall be free of wastewater discharges and anthropogenic non-storm water runoff. A minimum of low threat storm runoff discharges (e.g. stream highway overpasses and campgrounds) may be allowed on a case-by-case basis. Reference areas shall be located in the same region as the ASBS receiving water monitoring occurs. The reference areas for each Region are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean reference water samples must be collected from each station, each from a separate storm. A minimum of one reference location shall be sampled for each ASBS receiving water site sampled per responsible party. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

b. ASBS ocean receiving water must be sampled in the surf zone at the location where the runoff makes contact with ocean water (i.e. at "point zero"). Ocean receiving water stations must be representative of worst-case discharge conditions (i.e. co-located at a large drain greater than 36 inches, or if drains greater than 36 inches are not present in the ASBS then the largest drain greater than18 inches.) Ocean receiving water stations are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean receiving water samples must be collected during each storm season from each station, each from a separate storm. A minimum of one receiving water location shall be sampled in each ASBS per responsible party in that ASBS. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

c. Reference and receiving water sampling shall commence during the first full storm season following the adoption of these special conditions, and post-storm samples shall be collected when annual storm water runoff is sampled. Sampling shall occur in a minimum of two storm seasons. For those ASBS dischargers that have already participated in the Southern California Bight 2008 ASBS regional monitoring effort, sampling may be limited to only one storm season.

d. Receiving water and reference samples shall be analyzed for the same constituents as storm water runoff samples. At a minimum, constituents to be sampled and analyzed in reference and discharge receiving waters must include oil and grease, total suspended solids, Ocean Plan Table B metals for protection of marine life, Ocean Plan PAHs, pyrethroids, OP pesticides, ammonia, nitrate, phosphates, and critical life stage chronic toxicity for three species. In addition, within the range of the southern sea otter, indicator bacteria or some other measure of fecal contamination shall be analyzed.

3. Waterfront and Marine Operations: In addition to the above requirements for ocean receiving water monitoring, additional monitoring must be performed for marinas and boat launch and pier facilities:

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a. For all marina or mooring field operators, in mooring fields with 10 or more occupied moorings, the ocean receiving water must be sampled for Ocean Plan indicator bacteria, residual chlorine, copper, zinc, grease and oil, methylene blue active substances (MBAS), and ammonia nitrogen.

   (1) For mooring field operators opting for an individual monitoring program (Section IV.B.1 above), this sampling must occur weekly (on the weekend) from May through October.

   (2) For mooring field operators opting to participate in a regional integrated monitoring program (Section IV.B.2 above), this sampling must occur monthly from May through October on a high use weekend in each month. The Water Boards may allow a reduction in the frequency of sampling, through the regional monitoring program, after the first year of monitoring.

b. For all mooring field operators, the subtidal sediment (sand or finer, if present) within mooring fields and below piers shall be sampled and analyzed for Ocean Plan Table B metals (for marine aquatic life beneficial use), acute toxicity, PAHs, and tributyltin. For sediment toxicity testing, only an acute toxicity test using the amphipod Eohaustorius estuarius must be performed. This sampling shall occur at least three times during a five (5) year period. For mooring field operators opting to participate in a regional integrated monitoring program, the Water Boards may allow a reduction in the frequency of sampling after the first sampling effort's results are assessed.

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ATTACHMENT B

STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

1. Standard Permit Provisions

Code of Federal Regulations Title 40 Section 122.41 (40 CFR 122.41) includes conditions, or provisions, that apply to all National Pollutant Discharge Elimination System (NPDES) permits. Additional provisions applicable to NPDES permits are in 40 CFR 122.42. All applicable provisions in 40 CFR 122.41 and 40 CFR 122.42 must be incorporated into this Order and NPDES permit. The applicable 40 CFR 122.41 and 40 CFR 122.42 provisions are as follows:

a. DUTY TO COMPLY [40 CFR 122.41(a)]

The Copermittee must comply with all of the provisions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

(1) The Copermittee must comply with effluent standards or effective prohibitions established under Section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or effective prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement. [40 CFR 122.41(a)(1)]

(2) The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to a civil penalty not to exceed $25,000 per day for each violation. The CWA provides that any person who *negligently* violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than 2 years, or both. Any person who *knowingly* violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both. Any person who knowingly violates Section 301, 302, 303, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, and who knows at that time that he thereby places another person in imminent danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of

not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.
[40 CFR 122.41(a)(2)]

(3) Any person may be assessed an administrative penalty by the San Diego Regional Water Quality Control Board (San Diego Water Board), State Water Resources Control Board (State Water Board), or United States Environmental Protection Agency (USEPA) for violating Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.
[40 CFR 122.41(a)(3)]

b. DUTY TO REAPPLY [40 CFR 122.41(b)]

If a Copermittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Copermittee must apply for and obtain a new permit.

c. NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE [40 CFR 122.41(c)]

It shall not be a defense for a Copermittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

d. DUTY TO MITIGATE [40 CFR 122.41(d)]

The Copermittee must take all reasonable steps to minimize or prevent any discharge or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

e. PROPER OPERATION AND MAINTENANCE [40 CFR 122.41(e)]

The Copermittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Copermittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by a Copermittee only when the operation is necessary to achieve compliance with the conditions of this permit.

f. PERMIT ACTIONS [40 CFR 122.41(f)]

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Copermittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

g. PROPERTY RIGHTS [40 CFR 122.41(g)]

This permit does not convey any property rights of any sort, or any exclusive privilege.

h. DUTY TO PROVIDE INFORMATION [40 CFR 122.41(h)]

The Copermittee must furnish to the San Diego Water Board, State Water Board, or USEPA within a reasonable time, any information which the San Diego Water Board, State Water Board, or USPEA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Copermittee must also furnish to the San Diego Water Board, State Water Board, or USPEA upon request, copies of records required to be kept by this permit.

i. INSPECTION AND ENTRY [40 CFR 122.41(i)]

The Copermittee must allow the San Diego Water Board, State Water Board, USEPA, and/or their authorized representative (including an authorized contractor acting as their representative), upon presentation of credentials and other documents as may be required by law, to:

(1) Enter upon the Copermittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit; [40 CFR 122.41(i)(1)]

(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit; [40 CFR 122.41(i)(2)]

(3) Inspect and photograph at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; [40 CFR 122.41(i)(3)] and

(4) Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location. [40 CFR 122.41(i)(4)]

j. MONITORING AND RECORDS [40 CFR 122.41(j)]

(1) Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity. [40 CFR 122.41(j)(1)]

(2) Except for records of monitoring information required by this permit related to the Copermittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five (5) years (or longer as required by 40 CFR Part 503), the

Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time. [40 CFR 122.41(j)(2)]

(3) Records for monitoring information must include: [40 CFR 122.41(j)(3)]

(a) The date, exact place, and time of sampling or measurements; [40 CFR 122.41(j)(3)(i)]
(b) The individual(s) who performed the sampling or measurements; [40 CFR 122.41(j)(3)(ii)]
(c) The date(s) analyses were performed; [40 CFR 122.41(j)(3)(iii)]
(d) The individual(s) who performed the analyses; [40 CFR 122.41(j)(3)(iv)]
(e) The analytical techniques or methods used; [40 CFR 122.41(j)(3)(v)] and
(f) The results of such analyses. [40 CFR 122.41(j)(3)(vi)]

(4) Monitoring must be conducted according to test procedures under 40 CFR Part 136 unless another method is required under 40 CFR Subchapters N or O. [40 CFR 122.41(j)(4)]

In the case of pollutants for which there are no approved methods under 40 CFR Part 136 or otherwise required under 40 CFR Subchapters N and O, monitoring must be conducted according to a test procedure specified in the permit for such pollutants. [40 CFR 122.44(i)(1)(iv)]

(5) The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. [40 CFR 122.41(j)(5)]

k. SIGNATORY REQUIREMENT [40 CFR 122.41(k)]

(1) All applications, reports, or information submitted to the San Diego Water Board, State Water Board, or USEPA must be signed and certified. (See 40 CFR 122.22) [40 CFR 122.41(k)(1)]

(a) *For a municipality, State, Federal, or other public agency.* [All applications must be signed] [b]y either a principal executive officer or ranking elected official. [40 CFR 122.22(a)(3)]

(b) All reports required by permits, and other information requested by the San Diego Water Board, State Water Board, or USEPA must be signed by a person described in paragraph (a) of this section, or by a duly authorized representative of that person. A person is a duly authorized representative only if: [40 CFR 122.22(b)]

Riverside Copermittee Redlines

(i) The authorization is made in writing by a person described in paragraph (a) of this section; [40 CFR 122.22(b)(1)]

(ii) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company, (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) [40 CFR 122.22(b)(2)] and,

(iii) The written authorization is submitted to the San Diego Water Board and State Water Board. [40 CFR 122.22(b)(3)]

(c) *Changes to authorization.* If an authorization under paragraph (b) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (b) of this section must be submitted to the San Diego Water Board prior to or together with any reports, information, or applications to be signed by an authorized representative. [40 CFR 122.22(c)]

(d) *Certification.* Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." [40 CFR 122.22(d)]

(2) The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both. [40 CFR 122.41(k)(2)]

I. REPORTING REQUIREMENTS [40 CFR 122.41(l)]

(1) *Planned changes.* The Copermittee must give notice to the San Diego Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when: [40 CFR 122.41(l)(1)]

(a) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); [40 CFR 122.41(l)(1)(i)] or

(b) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which

are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1).
[40 CFR 122.41(l)(1)(ii)]

(c) The alteration or addition results in a significant change in the Copermittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. [40 CFR 122.41(l)(1)(iii)]

(2) *Anticipated noncompliance*. The Copermittee must give advance notice to the San Diego Water Board or State Water Board of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.
[40 CFR 122.41(l)(2)]

(3) *Transfers*. This permit is not transferable to any person except after notice to the San Diego Water Board. The San Diego Water Board may require modification or revocation and reissuance of the permit to change the name of the Copermittee and incorporate such other requirements as may be necessary under the CWA.
[40 CFR 122.41(l)(3)]

(4) *Monitoring reports.* Monitoring results must be reported at the intervals specified elsewhere in this permit. [40 CFR 122.41(l)(4)]

(a) Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the San Diego Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices. [40 CFR 122.41(l)(4)(i)]

(b) If the Copermittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or another method required for an industry-specific waste stream under 40 CFR Subchapters N or O, the results of this monitoring must be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the San Diego Water Board or State Water Board.
[40 CFR 122.41(l)(4)(ii)]

(c) Calculations for all limitations which require averaging of measurements must utilize an arithmetic mean unless otherwise specified in the permit.
[40 CFR 122.41(l)(4)(iii)]

(5) *Compliance schedules*. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date. [40 CFR 122.41(l)(5)]

(6) *Twenty-four hour reporting.*

(a) The Copermittee must report any noncompliance that may endanger health or the environment. Any information must be provided orally within 24 hours from the time the Copermittee becomes aware of the circumstances. A written submission must also be provided within five (5) days of the time the Copermittee becomes aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6)(i)]

(b) The following must be included as information which must be reported within 24 hours under this paragraph: [40 CFR 122.41(l)(6)(ii)]

(i) Any unanticipated bypass that exceeds any effluent limitation in the permit (See 40 CFR 122.41(g)). [40 CFR 122.41(l)(6)(ii)(A)]
(ii) Any upset which exceeds any effluent limitation in the permit. [40 CFR 122.41(l)(6)(ii)(B)] and,
(iii) Violation of a maximum daily discharge limitation for any of the pollutants listed by the San Diego Water Board in the permit to be reported within 24 hours. (See 40 CFR 122.44(g)) [40 CFR 122.41(l)(6)(ii)(C)]

(c) The San Diego Water Board may waive the above-required written report on a case-by-case basis if the oral report has been received within 24 hours. [40 CFR 122.41(l)(6)(iii)]

(7) *Other noncompliance.* The Copermittee must report all instances of noncompliance not reported in accordance with the standard provisions required under 40 CFR 122.41(l)(4), (5), and (6), at the time monitoring reports are submitted. The reports must contain the information listed in the standard provisions required under 40 CFR 122.41(l)(6). [40 CFR 122.41(l)(7))]

(8) *Other information.* When the Copermittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the San Diego Water Board, State Water Board, or USEPA, the Copermittee must promptly submit such facts or information. [40 CFR 122.41(l)(8)]

~~**m. BYPASS** [40 CFR 122.41(m)]~~

~~(1) *Definitions.*~~

~~(a) "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. [40 CFR 122.41(m)(1)(i)] or~~

~~(b) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be~~

Comment [A126]: While this is a standard condition for NPDES permits, it is manifestly inapplicable to MS4 permits. Since BMPs constructed to comply with the Order include bypass provisions to protect their entirety, the Copermittees would have to notify the Regional Board whenever a storm was predicted. This provision should be deleted.

~~expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.~~
~~[40 CFR 122.41(m)(1)(ii)]~~

~~(2) *Bypass not exceeding limitations*. The Copermittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the standard provisions required under 40 CFR 122.41(m)(3) and (4).~~
~~[40 CFR 122.41(m)(2)]~~

~~(3) *Notice*.~~

~~(a) *Anticipated bypass*. If the Copermittee knows in advance of the need for a bypass, it must submit a notice, if possible at least ten days before the date of the bypass. [40 CFR 122.41(m)(3)(i)] or~~

~~(b) *Unanticipated bypass*. The Copermittee must submit notice of an unanticipated bypass in accordance with the standard provisions required under 40 CFR 122.41(l)(6) (24 hour notice).~~
~~[40 CFR 122.41(m)(3)(ii)]~~

~~(4) *Prohibition of Bypass*.~~

~~(a) Bypass is prohibited, and the San Diego Water Board may take enforcement action against a Copermittee for bypass, unless:~~
~~[40 CFR 122.41(m)(4)(i)]~~

~~(i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; [40 CFR 122.41(m)(4)(i)(A)]~~
~~(ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance;~~
~~[40 CFR 122.41(m)(4)(i)(B)] and,~~
~~(iii) The Copermittee submitted notice in accordance with the standard provisions required under 40 CFR 122.41(m)(3).~~
~~[40 CFR 122.41(m)(4)(i)(C)]~~

~~(b) The San Diego Water Board may approve an anticipated bypass, after considering its adverse effects, if the San Diego Water Board determines that it will meet the three conditions listed above.~~
~~[40 CFR 122.41(m)(4)(ii)]~~

~~n.~~m. **UPSET** [40 CFR 122.41(n)]

(1) *Definition.* "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Copermittee. An upset does not

include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. [40 CFR 122.41(n)(1)]

(2) *Effect of an upset*. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the standard provisions required under 40 CFR 122.41(n)(3) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. [40 CFR 122.41(n)(2)]

(3) *Conditions necessary for a demonstration of upset*. A Copermittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that: [40 CFR 122.41(n)(3)]

(a) An upset occurred and that the Copermittee can identify the cause(s) of the upset; [40 CFR 122.41(n)(3)(i)]
(b) The permitted facility was at the time being properly operated; [40 CFR 122.41(n)(3)(ii)] and
(c) The Copermittee submitted notice of the upset in accordance with the standard provisions required under 40 CFR 122.41(l)(6)(ii)(B) (24-hour notice). [40 CFR 122.41(n)(3)(iii)]
(d) The Copermittee complied with any remedial measures pursuant to the standard provisions required under 40 CFR 122.41(d). [40 CFR 122.41(n)(3)(iii)]

(4) *Burden of proof*. In any enforcement proceeding, the Copermittee seeking to establish the occurrence of an upset has the burden of proof. [40 CFR 122.41(n)(4)]

~~o.~~n. **STANDARD PERMIT PROVISIONS FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS**
[40 CFR 122.42(c)]

The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the San Diego Water Board or State Water Board under 40 CFR 122.26(a)(1)(v) must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report must include:

(1) The status of implementing the components of the storm water management program that are established as permit conditions; [40 CFR 122.42(c)(1)]

(2) Proposed changes to the storm water management programs that are established as permit conditions. Such proposed changes must be consistent with 40 CFR 122.26(d)(2)(iii); [40 CFR 122.42(c)(2)] and

(3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under 40 CFR 122.26(d)(2)(iv) and (v); [40 CFR 122.42(c)(3)]

(4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; [40 CFR 122.42(c)(4)]

(5) Annual expenditures and budget for year following each annual report; [40 CFR 122.42(c)(5)]

(6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; [40 CFR 122.42(c)(6)]

(7) Identification of water quality improvements or degradation. [40 CFR 122.42(c)(7)]

~~p.~~o. **STANDARD PERMIT PROVISIONS FOR STORM WATER DISCHARGES** [40 CFR 122.42(d)]

The initial permits for discharges composed entirely of storm water issued pursuant to 40 CFR 122.26(e)(7) must require compliance with the conditions of the permit as expeditiously as practicable, but in no event later than three years after the date of issuance of the permit.

2. General Provisions

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. The general provisions applicable to this Order and NPDES permit are as follows:

a. DISCHARGE OF WASTE IS A PRIVILEGE

No discharge of waste into the waters of the State, whether or not such discharge is made pursuant to waste discharge requirements, shall create a vested right to continue such discharge. All discharges of waste into waters of the State are privileges, not rights. [CWC Section 13263(g)]

b. DURATION OF ORDER AND NPDES PERMIT

(1) *Effective date*. This Order and NPDES permit becomes effective on the 50th day after its adoption provided the USEPA has no objection. If the USEPA objects to its issuance, this Order shall not become effective until such objection is withdrawn. This Order supersedes Order No. R9-2007-0001 upon the effective date of this Order, and supersedes Order Nos. R9-2009-0002 and R9-2010-0016 upon their expiration or earlier notice of coverage.

(2) *Expiration*. This Order and NPDES permit expires five years after its effective date. [40 CFR 122.46(a)]

(3) *Continuation of expired order*. After this Order and NPDES permit expires, the terms and conditions of this Order and NPDES permit are automatically continued pending issuance of a new permit if all requirements of the federal NPDES regulations on the continuation of expired permits (40 CFR 122.6) are complied with.

c. AVAILABILITY

A copy of this Order must be kept at a readily accessible location and must be available to on-site personnel at all times.

d. CONFIDENTIALITY OF INFORMATION

Except as provided for in 40 CFR 122.7, no information or documents submitted in accordance with or in application for this Order will be considered confidential, and all such information and documents shall be available for review by the public at the San Diego Water Board office.

Claims of confidentiality for the following information will be denied: [40 CFR 122.7(b)]

(1) The name and address of any permit applicant or Copermittee; [40 CFR 122.7(b)(1)] and

(2) Permit applications and attachments, permits, and effluent data. [40 CFR 122.7(b)(2)]

e. EFFLUENT LIMITATIONS

(1) *Interim effluent limitations*. The Copermittee must comply with any interim effluent limitations as established by addendum, enforcement action, or revised waste discharge requirements which have been, or may be, adopted by the San Diego Water Board.

(2) *Other effluent limitations and standards*. If any applicable toxic effluent standard or effective prohibition (including any schedule of compliance specified in such effluent standard or effective prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant and that standard or effective prohibition is more stringent than any limitation on the pollutant in the permit, the San Diego Water Board shall institute proceedings under these regulations to modify or revoke and reissue the permit to conform to the toxic effluent standard or effective prohibition. [40 CFR 122.44(b)(1~~)]~~)]. ~~)]~~

f. DUTY TO MINIMIZE OR CORRECT ADVERSE IMPACTS

The Copermittee must take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this Order, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the noncompliance.

g. PERMIT ACTIONS

The filing of a request by the Copermittee for modification, revocation and reissuance, or termination of this Order, or a notification of planned change in or anticipated

noncompliance with this Order does not stay any condition of this Order. (See 40 CFR 122.41(f)) In addition, the following provisions apply to this Order:

(1) Upon application by any affected person, or on its own motion, the San Diego Water Board may review and revise the requirements in this Order. All requirements must be reviewed periodically. [CWC Section 13263(e)]

(2) This Order may be terminated or modified for cause, including, but not limited to, all of the following: [CWC Section 13381]

(a) Violation of any condition contained in the requirements of this Order. [CWC Section 13381(a)]

(b) Obtaining the requirements in this Order by misrepresentation, or failure to disclose fully all relevant facts. [CWC Section 13381(b)]

(c) A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge. [CWC Section 13381(c)]

(3) When this Order is transferred to a new owner or operator, such requirements as may be necessary under the CWC may be incorporated into this Order.

h. NPDES PERMITTED NON-STORM WATER DISCHARGES

The San Diego Water Board has, in prior years, issued a limited number of individual NPDES permits for non-storm water discharges to MS4s. The San Diego Water Board or State Water Board may in the future, upon prior notice to the Copermittee(s), issue an NPDES permit for any non-storm water discharge (or class of non-storm water discharges) to an MS4. A Copermittee will not be held responsible for pollutants in its MS4 discharge originating from an NPDES-permitted non-storm water discharge.

Comment [A127]: This comment reflects the appropriate responsibility between NPDES dischargers.

i. MONITORING

In addition to the standard provisions required under 40 CFR 122.41(j) and (l)(4), the following general monitoring provisions apply to this Order:

(1) Where procedures are not otherwise specified in Order, sampling, analysis and quality assurance/quality control must be conducted in accordance with the Quality Assurance Management Plan (QAMP) for the State of California's Surface Water Ambient Monitoring Program (SWAMP), adopted by the State Water Resources Control Board (State Water Board).

(2) Pursuant to 40 CFR 122.41(j)(2) and CWC Section 13383(a), each Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five (5) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time.

Comment [A128]: This provision and the provision in Attachment B 1.j(2) conflict. The Water Board should reconcile these provisions or delete one.

(3) All chemical, bacteriological, and toxicity analyses must be conducted at a laboratory certified for such analyses by the California Department of Public Health or a laboratory approved by the San Diego Water Board.

(4) For priority toxic pollutants that are identified in the California Toxics Rule (CTR) (65 Fed. Reg. 31682), the Copermittees must instruct their laboratories to establish calibration standards that are equivalent to or lower than the Minimum Levels (MLs) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP). If a Copermittee can demonstrate that a particular ML is not attainable, in accordance with procedures set forth in 40 CFR Part 136, the lowest quantifiable concentration of the lowest calibration standard analyzed by a specific analytical procedure (assuming that all the method specified sample weights, volumes, and processing steps have been followed) may be used instead of the ML listed in Appendix 4 of the SIP. The Copermittee must submit documentation from the laboratory to the San Diego Water Board for approval prior to raising the ML for any priority toxic pollutant.

j. ENFORCEMENT

(1) The San Diego Water Board is authorized to enforce the terms of this Order under several provisions of the CWC, including, but not limited to, CWC Sections 13385, 13386, and 13387.

(2) Nothing in this Order shall be construed to protect the Copermittee from its liabilities under federal, state, or local laws.

(3) The CWC provides for civil and criminal penalties comparable to, and in some cases greater than, those provided for under the CWA.

(4) Except as provided in the standard conditions required under 40 CFR 122.41(m) and (n), nothing in this Order shall be construed to relieve the Copermittee from civil or criminal penalties for noncompliance.

(5) Nothing in this Order shall be construed to preclude the institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties to which the Copermittee is or may be subject to under Section 311 of the CWA.

(6) Nothing in this Order shall be construed to preclude institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authoring preserved by Section 510 of the CWA.

k. SEVERABILITY

The provisions of this Order are severable, and if any provision of this Order, or the application of any provisions of this Order to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this Order shall not be affected thereby.

l. APPLICATIONS

Riverside Copermittee Redlines

Any application submitted by a Copermittee for reissuance or modification of this Order must satisfy all applicable requirements specified in federal regulations as well as any additional requirements for submittal of a Report of Waste Discharge specified in the CWC and the California Code of Regulations.

m. IMPLEMENTATION

All plans, reports and subsequent amendments submitted in compliance with this Order must be implemented immediately (or as otherwise specified). All submittals by Copermittees must be adequate to implement the requirements of this Order.

n. REPORT SUBMITTALS

(1) All report submittals must include an executive summary, introduction, conclusion, recommendations, and signed certified statement.

(2) Each Copermittee must submit a signed certified statement covering its responsibilities for each applicable submittal.

(3) The Principal Watershed Copermittee(s) must submit a signed certified statement covering its responsibilities for each applicable submittal and the sections of the submittals for which it is responsible.

(4) Unless otherwise directed, the Copermittees must submit one hard copy and one electronic copy of each report required under this Order to the San Diego Water Board, and one electronic copy to the USEPA.

(5) The Copermittees must submit reports and provide notifications as required by this Order to the following:

EXECUTIVE OFFICER
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
9174 SKY PARK COURT, SUITE 100
SAN DIEGO CA 92123-4340
Telephone: (858) 467-2952 Fax: (858) 571-6972

EUGENE BROMLEY
US ENVIRONMENTAL PROTECTION AGENCY
REGION IX
PERMITS ISSUANCE SECTION (W-5-1)
75 HAWTHORNE STREET
SAN FRANCISCO CA 94105

ATTACHMENT C

ACRONYMS AND ABBREVIATIONS

AMAL	Average Monthly Action Level
ASBS	Area(s) of Special Biological Significance
BMP	Best Management Practice
Basin Plan	Water Quality Control Plan for the San Diego Basin
CEQA	California Environmental Quality Act
CCR	California Code of Regulations
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWC	California Water Code
CZARA	Coastal Zone Act Reauthorization Amendments of 1990
ESAs	Environmentally Sensitive Areas
GIS	Geographic Information System
IBI	Index of Biological Integrity
LID	Low Impact Development
MDAL	Maximum Daily Action Level
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
NAL	Non-Storm Water Action Level
NAICS	North American Industry Classification System
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
ROWD	Report of Waste Discharge (application for NPDES reissuance)
SAL	Storm Water Action Level
San Diego Water Board	California Regional Water Quality Control Board, San Diego Region
SIC	Standard Industrial Classification Code
State Water Board	State Water Resources Control Board
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
WDID	Waste Discharge Identification Number
WLA	Waste Load Allocation
WQBEL	Water Quality Based Effluent Limitation

DEFINITIONS

Active/Passive Sediment Treatment - Using mechanical, electrical or chemical means to flocculate or coagulate suspended sediment for removal from runoff from construction sites prior to discharge.

Anthropogenic Litter – Trash generated from human activities, not including sediment.

Automotive Repair Shop – a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539 or equivalent NAICS code.

Average Monthly Action Level – The highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month, or the geometric mean for bacteria, as applicable.

Beneficial Uses - The uses of water necessary for the survival or wellbeing of man, plants, and wildlife. These uses of water serve to promote tangible and intangible economic, social, and environmental goals. "Beneficial Uses" ~~of the waters of the State~~ that may be protected include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. Existing beneficial uses are uses that were attained in the surface or ground water on or after November 28, 1975; and potential beneficial uses are uses that would probably develop in future years through the implementation of various control measures. "Beneficial Uses" are equivalent to "Designated Uses" under federal law. [California Water Code Section 13050(f)].

Best Management Practices (BMPs) - Defined in 40 CFR 122.2 as schedules of activities, effective prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. In the case of municipal discharge permits, BMPs may be used in the place of numeric effluent limits.

Bioassessment - The use of biological community information to evaluate the biological integrity of a water body and its watershed. With respect to aquatic ecosystems, bioassessment is the collection and analysis of samples of the benthic macroinvertebrate community together with physical/habitat quality measurements associated with the sampling site and the watershed to evaluate the biological condition (i.e. biotic integrity) of a water body.

Biofiltration - Practices that use vegetation and amended soils to detain and treat runoff from impervious areas. Treatment is through filtration, infiltration, adsorption, ion exchange, and biological uptake of pollutants.

Biological Integrity - Defined in Karr J.R. and D.R. Dudley. 1981. Ecological perspective on water quality goals. *Environmental Management* 5:55-68 as: "A balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitat of the region." Also referred to as ecosystem health.

BMP Design Manual – A plan developed to eliminate, reduce, or mitigate the impacts of runoff from development projects, including Priority Development Projects.

Channel Rehabilitation and Improvement – Remedial measures or activities for the purpose of improving or restoring the environmental health of streams, channels or river systems. Techniques may vary from in-stream restoration techniques to off-line stormwater management practices installed in the system corridor or upland areas. Rehabilitation techniques may include, but are not limited to the following: riparian zone restoration, constructed wetlands, bank stabilization, channel modifications, and day lighting of drainage systems.

Comment [A129]: This term should be defined in Attachment C given its use in the Order.

Clean Water Act Section 303(d) Water Body - An impaired water body in which water quality does not meet applicable water quality standards and/or is not expected to meet water quality standards, even after the application of technology based pollution controls required by the CWA. The discharge of runoff to these water bodies by the Copermittees is significant because these discharges can cause or contribute to violations of applicable water quality standards.

Construction Site – Any project, including projects requiring coverage under the Construction General Permit, that involves soil disturbing activities greater than 10,000 square feet including, but not limited to, clearing, grading, disturbances to ground such as stockpiling, and excavation. This does not include interior construction activities such as interior remodeling, plumbing, electrical, or mechanical work.

Contamination - As defined in the Porter-Cologne Water Quality Control Act, contamination is "an impairment of the quality of waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste whether or not waters of the State are affected."

Copermittee – An incorporated city within the County of Orange, County of Riverside, or County of San Diego in the San Diego Region~~,~~ (Region 9), the County of Orange, the County of Riverside, the County of San Diego, the Orange County Flood Control District, the Riverside County Water Conservation and Flood Control District, the San Diego Regional Airport Authority, or the San Diego Unified Port District. See also "Municipal Copermittee" and "Special District Copermittee".

Comment [A130]: As set forth above, the Riverside County Copermittees make a distinction in these classes of Copermittees based on their respective legal authorities.

Copermittees – All of the individual Copermittees, collectively, unless the obligation in question is directed to one or a sub-group of Copermittees.

Comment [A131]: This clarifies that not all obligations in the Order directed to "Copermittees" are in fact applicable to all Copermittees.

Critical Channel Flow (Qc) – The channel flow that produces the critical shear stress that initiates bed movement or that erodes the toe of channel banks. When measuring Qc, it should be based on the weakest boundary material – either bed or bank.

Daily Discharge – Defined as either: (1) the total mass of the constituent discharged over the calendar day or any 24 hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g. concentration.)

The Daily Discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day, or other 24 hour period other than a day), or by the arithmetic mean of analytical results from one or more grab samples taken over the course of a

day.

Development Projects - Construction, rehabilitation, redevelopment, or reconstruction of any public or private residential project, industrial~~,~~ or commercial facility, or any other projects designed for post-construction human activity or occupation and involving land disturbance activities.

Comment [A132]: This definition clarifies the nature of Development Projects covered under the Order.

Direct Discharge to an Environmentally Sensitive Area – refers to outflow from a drainage conveyance system that collects runoff from the subject development or redevelopment site and terminates at or in receiving waters within the ESA, and is not commingled with flows from adjacent or other upstream lands.

Dry Season –May 1 to September 30.

Dry Weather – Weather is considered dry if the preceding 72 hours has been without measurable precipitation (>0.1 inch).

Enclosed Bays – Enclosed bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost bay works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays do not include inland surface waters or ocean waters.

Erosion – When land is diminished or worn away due to wind, water, or glacial ice. Often the eroded debris (silt or sediment) becomes a pollutant via storm water runoff. Erosion occurs naturally but can be intensified by land clearing activities such as farming, development, road building, and timber harvesting. This permit is concerned particularly with non-naturally occurring Erosion that eventually results in a Sediment discharge from MS4s into Receiving Waters.

Environmentally Sensitive Areas (ESAs) - Areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; areas designated as preserves or their equivalent under the Natural Communities Conservation Program within the Cities and County of Orange; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.

Estuaries – Waters, including coastal lagoons, located at the mouth of streams that serve as areas of mixing fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and ocean water. Estuaries do not include inland surface waters or ocean waters.

Existing Development – Any area that has been developed and exists for municipal, commercial, industrial, or residential purposes, uses, or activities. May include areas that are not actively used for its originally developed purpose, but may be re-purposed or redeveloped

for another use or activity.

Flow Duration – The long-term period of time that flows occur above a threshold that causes significant sediment transport and may cause excessive erosion damage to creeks and streams (not a single storm event duration). The simplest way to visualize this is to consider a histogram of pre- and post-project flows using long-term records of hourly data. To maintain pre-development flow duration means that the total number of hours (counts) within each range of flows in a flow-duration histogram cannot increase between the pre- and post-development condition. Flow duration within the range of geomorphologically significant flows is important for managing erosion.

Grading - The cutting and/or filling of the land surface to a desired slope or elevation.

Hazardous Material – Any substance that poses a threat to human health or the environment due to its toxicity, corrosiveness, ignitability, explosive nature or chemical reactivity. These also include materials named by the USEPA in 40 CFR 116 to be reported if a designated quantity of the material is spilled into the waters of the U.S. or emitted into the environment.

Hazardous Waste - Hazardous waste is defined as "any waste which, under Section 600 of Title 22 of this code, is required to be managed according to Chapter 30 of Division 4.5 of Title 22 of this code" [CCR Title 22, Division 4.5, Chapter 11, Article 1].

Household Hazardous Waste – Paints, cleaning products, and other hazardous wastes generated during home improvement or maintenance activities.

Hydromodification – The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

Illicit Connection – Any connection to the MS4 that conveys an illicit discharge.

Illicit Discharge - Any discharge to the MS4 that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from fire fighting activities [40 CFR 122.26(b)(2)]. Discharges from natural sources or from conditionally exempt sources described in this Order are not considered Illicit Discharges.

Inactive Areas – Areas of construction activity that are not active and those that have been active and are not scheduled to be re-disturbed for at least 14 days.

Infiltration – Water other than wastewater that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow [40 CFR 35.2005(20)].

Comment [A133]: Wrong definition. Should be defining infiltration (of stormwater into soil)

Inland Surface Waters – Includes all surface waters of the U.S.~~State~~ that do not include the ocean, enclosed bays, or estuaries.

Riverside Copermittee Redlines

Jurisdictional Runoff Management Program Document – A written description of the specific jurisdictional runoff management measures and programs that each Copermittee will implement to comply with this Order and ensure that illicit discharges are effectively prohibited, and storm water pollutant discharges in runoff are reduced to the MEP and do not cause or contribute to a violation of water quality standards.

Low Impact Development (LID) – A storm water management and land development strategy that emphasizes conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions.

Low Impact Development Best Management Practices (LID BMPs) – LID BMPs include schedules of activities, effective prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States through storm water management and land development strategies that emphasize conservation ~~s~~and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions. LID BMPs include retention practices that do not allow runoff, such as infiltration, rain water harvesting and reuse, and evapotranspiration. LID BMPs also include flow-through practices such as biofiltration that may have some discharge of storm water following pollutant reduction.

Major Outfall – As defined in the Code of Federal Regulations, a major outfall is a MS4 outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (i.e. discharge from a single conveyance other than a circular pipe which is associated with a drainage area of more than 50 acres); or, for MS4s that receive storm water from lands zoned for industrial activity (based on comprehensive zoning plans or equivalent), a MS4 outfall that discharges from a single pipe with an inside diameter of 12 inches or more or from its equivalent (i.e. discharge from other than a circular pipe associated with a drainage area of 2 acres or more).

Maximum Daily Action Level (MDAL) –The highest allowable daily discharge of a pollutant, over a calendar day (or 24 hour period). For pollutants with action levels expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with action levels expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

Maximum Extent Practicable (MEP) – The technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) ~~for storm water~~ that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) in combination with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than BAT. A definition for MEP is not provided either in the statute or in the regulations. Instead the definition of MEP is dynamic and will be defined by the following process over time: municipalities propose their definition of MEP by way of their runoff management programs. Their total collective and individual activities conducted pursuant to the runoff management programs becomes their proposal for MEP as it applies both to their overall effort, as well as to specific activities (e.g., MEP for street sweeping, or MEP for MS4 maintenance). In the absence of a proposal acceptable to the San Diego Water Board, the San Diego Water Board

Riverside Copermittee Redlines

defines MEP.

In a memo dated February 11, 1993, entitled "Definition of Maximum Extent Practicable," Elizabeth Jennings, Senior Staff Counsel, SWRCB addressed the achievement of the MEP standard as follows:

> "*To achieve the MEP standard, municipalities must employ whatever Best Management Practices (BMPs) are technically feasible (i.e., are likely to be effective) and are not cost prohibitive. The major emphasis is on technical feasibility. Reducing pollutants to the MEP means choosing effective BMPs, and rejecting applicable BMPs only where other effective BMPs will serve the same purpose, or the BMPs would not be technically feasible, or the cost would be prohibitive. In selecting BMPs to achieve the MEP standard, the following factors may be useful to consider:*
>
> *a. Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?*
> *b. Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?*
> *c. Public Acceptance: Does the BMP have public support?*
> *d. Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?*
> *e. Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc.?*
>
> *The final determination regarding whether a municipality has reduced pollutants to the maximum extent practicable can only be made by the Regional or State Water Boards, and not by the municipal discharger. If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit derived, it would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs that would address a pollutant source, or to pick a BMP based solely on cost, which would be clearly less effective. In selecting BMPs the municipality must make a serious attempt to comply and practical solutions may not be lightly rejected. In any case, the burden would be on the municipal discharger to show compliance with its permit. After selecting a menu of BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented."*

Monitoring Year – October 1 to September 30

Municipal Copermittee – Any Copermittee, exclusive of Special District Copermittees.

Comment [A134]: This definition clarifies distinction between municipal and special district copermittees.

Municipal Separate Storm Sewer System (MS4) – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designated or used for collecting or conveying storm water;

Riverside Copermittee Redlines

(iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.2~~26~~. Copermittees need only comply with permit conditions relating to "discharges from the municipal separate storm sewers for which they are operators." 40 CFR 122.26(a)(vi).

Comment [A135]: These changes correct a citation and clarifies the responsibility of the copermittees as to other MS4s.

National Pollutant Discharge Elimination System (NPDES) - The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the CWA.

Non-Storm Water - All discharges to and from a MS4 that do not originate from precipitation events (i.e., all discharges from a MS4 other than storm water). ~~Non-storm water includes illicit discharges and NPDES permitted discharges.~~

Comment [A136]: This is overly limiting, There are other types of Non-storm discharges that do not fit these two categories (e.g. irrigated agriculture, natural flows, conditionally exempt flows, others). Rather than trying to identify all types of non-stormwater discharges, suggest just deleting this sentence.

Nuisance - As defined in the Porter-Cologne Water Quality Control Act, a nuisance is "anything which meets all of the following requirements: 1) Is injurious to health, or is indecent, or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. 2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. 3) Occurs during, or as a result of, the treatment or disposal of wastes."

Ocean Waters – the territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the State Board's California Ocean Plan.

Order – Unless otherwise specified, refers to this Order, Order No. R9-2013-0001 (NPDES No. CAS0109266)

Outfall – *Outfall* means a *point source* as defined by 40 CFR 122.2 at the point where a MS4 discharges to waters of the United States and does not include open conveyances connecting two MS4s, or pipes, tunnels or other conveyances which connect segments of the same stream or other waters of the United States and are used to convey waters of the United. 40 CFR 122.26(b)(9).

Comment [A137]: This federal regulatory definition clarifies the nature of an outfall.

Parking Lot – a land area or facility for the tempraory parking or storage of motor vehicles used personally, for business, or for commerce.

Comment [A138]: Definition placed in Attachment C for consistency.

Persistent Flow - Persistent flow is defined as the presence of an MS4 discharge that is hydraulically connected to a flowing~~, pooled, or ponded~~ receiving water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

Comment [A139]: Changes reflect the necessity of a connection to flowing receiving waters. Discharges that are pooled are not discharges to waters of the United States. Please see Comment Letter section 3.5.3.

Person - A person is defined as an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof [40 CFR 122.2].

Point Source - Any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, landfill leachate collection systems, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return

flows from irrigated agriculture or agricultural storm water runoff.

Pollutant - Any agent that may cause or contribute to the degradation of water quality such that a condition of pollution or contamination is created or aggravated.

Pollution - As defined in the Porter-Cologne Water Quality Control Act, pollution is "the alteration of the quality of the waters of the State by waste, to a degree that unreasonably affects the either of the following: 1) The waters for beneficial uses; or 2) Facilities that serve these beneficial uses." Pollution may include contamination.

Pollution Prevention - Pollution prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control BMPs, treatment control BMPs, or disposal.

Pre-Project~~Development~~ Runoff Conditions – Runoff conditions that exist~~existed~~ onsite immediately before the ~~existing development was constructed, or exists onsite before~~ planned development activities occur. Pre-development is not intended to be interpreted as that period before any human-induced land disturbance has occurred. 64 FR 68761.

Comment [A140]: This definition reflects the exact language used by U.S. EPA in the Federal Register. Moreover, it avoids the constitutional and statutory problems with requiring developers to mitigate for impacts not attributable to their project. It also is consistent with the CEQA standard for project impact mitigation.

Priority Development Projects - New development and redevelopment projects defined under Provision E.3.b of Order No. R9-2012-0011.

Properly Designed – Designed in accordance with the Copermittee's BMP Design Manual and/or any appropriate design requirements set forth by the Copermittee and based on widely accepted design criteria and in accordance with this Order.

Comment [A141]: This definition is required to address this standard, which is mentioned in the Order but not defined.

Rainy Season (aka Wet Season) –October 1 to April 30

Receiving Waters – Waters of the United States.

Receiving Water Limitations - Waste discharge requirements issued by the San Diego Water Board typically include both: (1) "Effluent Limitations" (or "Discharge Limitations") that specify the technology-based or water-quality-based effluent limitations; and (2) "Receiving Water Limitations" that specify the water quality objectives in the Basin Plan as well as any other limitations necessary to attain those objectives. In summary, the "Receiving Water Limitations" provision is the provision used to implement the requirements of CWA section 402(p)(3)(B).

Redevelopment - The creation, addition, and or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include trenching and resurfacing associated with utility work; parking lots; resurfacing existing roadways; cutting and reconfiguring of surface parking lots; new sidewalk construction, pedestrian ramps, or bike lane on existing roads; and routine replacement of damaged pavement, such as pothole repair and emergency restoration and public safety projects.

Comment [A142]: The changes requested in this definition appropriately exempts de minimis or emergency/public safety projects.

Reporting Period – The period of information that is reported in the Annual Report. The reporting period consists of two components: 1) July 1 to June 30, consistent with the fiscal

year, for the implementation of the jurisdictional runoff management programs, and 2) October 1 to September 30, consistent with the monitoring year for the monitoring and assessment programs. Together, these two time periods constitute the reporting year for the Annual Report due January 31 following the end of the monitoring year.

Restaurant – a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812).

Retail gasoline outlet (RGO) – a business that sells automotive or truck fuel to the general public with a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

Retain –Keep or hold in a particular place, condition, or position without discharge to ~~surface~~ Receiving W~~w~~aters.

Retrofitting – Storm water management practices put into place after development has occurred in watersheds where the practices previously did not exist~~.~~ or are ineffective.~~.~~ Retrofitting of developed areas is intended to improve water quality, protect downstream channels, reduce flooding, or meet other specific objectives. Retrofitting developed areas may include, but is not limited to replacing roofs with green roofs, disconnecting downspouts or impervious surfaces to drain to pervious surfaces, replacing impervious surfaces with pervious surfaces, installing rain barrels, installing rain gardens, and trash area enclosures.

Runoff - All flows in a storm water conveyance system that consists of the following components: (1) storm water (wet weather flows) and (2) non-storm water including dry weather flows.

San Diego Water Board – As used in this document the term "San Diego Water Board" is synonymous with the term "Regional Board" as defined in Water Code section 13050(b) and is intended to refer to the California Regional Water Quality Control Board for the San Diego Region as specified in Water Code Section 13200.

Sediment - Soil, sand, and minerals washed from land into water. Sediment resulting from anthropogenic sources (i.e. human induced land disturbance activities) that is discharged into Receiving Waters is considered a pollutant. This Order regulates only the discharges of sediment from anthropogenic sources into Receiving Waters and does not regulate naturally occurring sources of sediment. Sediment can destroy fish-nesting areas, clog animal habitats, and cloud waters so that sunlight does not reach aquatic plants.

Special District Copermittee – A separate legal entity that may own or operate MS4 systems, but has no land use authorities outside of their MS4. The Riverside County Flood Control and Water Conservation District [and Orange County Flood Control District?] is a [are] Special District Copermittee[s].

Source Control BMP – Land use or site planning practices, or structural or nonstructural measures that aim to prevent runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between pollutants and runoff.

Storm Water – Per 40 CFR 122.26(b)(13), means storm water runoff, snowmelt runoff and surface runoff and drainage. ~~Surface runoff and drainage pertains to runoff and drainage resulting from precipitation events.~~

Comment [A143]: Relocation of definition to Attachment C.

Comment [A144]: Definition added for clarity and consistency with prior redlines

Comment [A145]: Edit clarifies intent of definition.

Stream, Channel, or Habitat Rehabilitation – Measures or activities for the purpose of improving or restoring the environmental health (i.e. physical, chemical and biological integrity) of streams, channels, or river systems. Rehabilitation techniques may include, but are not limited to, riparian zone restoration, constructed wetlands, bank stabilization, channel reconfiguration, and daylighting drainage systems.

Street, Road, Highway, Freeway – Any paved impervious surface that is used for the transportation of automobiles, trucks, motorcycles, and other vehicles, with an ADT of at least 100 vehicles per day.

Comment [A146]: Definition relocated to Attachment C.

Comment [A147]: Consistent with RGO definition.

Structural BMPs - A subset of BMPs which detains, retains, filters, removes, or prevents the release of pollutants to surface waters from development projects in perpetuity, after construction of a project is completed.

Total Maximum Daily Load (TMDL) - The maximum amount of a pollutant that can be discharged into a water body from all sources (point and non-point) and still maintain water quality standards. Under CWA section 303(d), TMDLs must be developed for all water bodies that do not meet water quality standards after application of technology-based controls.

Toxicity - Adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies). The water quality objectives for toxicity provided in the Basin Plan, state in part…"All waters shall be free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life….The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge".

Treatment Control BMP – Any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media absorption or any other physical, biological, or chemical process.

Unpaved Road – Any long, narrow stretch without pavement used for traveling by motor passenger vehicles between two or more points. Unpaved roads are generally constructed of dirt, gravel, aggregate or macadam and may be improved or unimproved.

Waste - As defined in CWC Section 13050(d), "waste includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal."

Article 2 of CCR Title 23, Chapter 15 (Chapter 15) contains a waste classification system that applies to solid and semi-solid waste, which cannot be discharged directly or indirectly to water of the state and which therefore must be discharged to land for treatment, storage, or disposal in accordance with Chapter 15. There are four classifications of waste (listed in order of highest to lowest threat to water quality): hazardous waste, designated waste, non-hazardous solid waste, and inert waste.

Water Quality Objective - Numerical or narrative limits on constituents or characteristics of

water designated to protect designated beneficial uses of the water. [California Water Code Section 13050 (h)]. California's water quality objectives are established by the State and Regional Water Boards in the Water Quality Control Plans. Numeric or narrative limits for pollutants or characteristics of water designed to protect the beneficial uses of the water. In other words, a water quality objective is the maximum concentration of a pollutant that can exist in a receiving water and still generally ensure that the beneficial uses of the receiving water remain protected (i.e., not impaired). Since water quality objectives are designed specifically to protect the beneficial uses, when the objectives are violated the beneficial uses are, by definition, no longer protected and become impaired. This is a fundamental concept under the Porter Cologne Act. Equally fundamental is Porter Cologne's definition of pollution. A condition of pollution exists when the water quality needed to support designated beneficial uses has become unreasonably affected or impaired; in other words, when the water quality objectives have been violated. These underlying definitions (regarding beneficial use protection) are the reason why all waste discharge requirements implementing the federal NPDES regulations require compliance with water quality objectives. (Water quality objectives are also called water quality criteria in the CWA.)

Water Quality Standards - Water quality standards, as defined in Clean Water Act section 303(c) consist of the beneficial uses (e.g., swimming, fishing, municipal drinking water supply, etc.,) of a water body and criteria (referred to as water quality objectives in the California Water Code) necessary to protect those uses. Under the Water Code, the water boards establish beneficial uses and water quality objectives in water quality control or basin plans. Together with an anti-degradation policy, these beneficial uses and water quality objectives serve as water quality standards under the Clean Water Act. In Clean Water Act parlance, state beneficial uses are called "designated uses" and state water quality objectives are called "criteria." Throughout this Order, the relevant term is used depending on the statutory scheme.

Waters of the State - Any water, surface or underground, including saline waters within the boundaries of the State [CWC section 13050 (e)]. The definition of the Waters of the State is broader than that for the Waters of the United States in that all water in the State is considered to be a Waters of the State. ~~regardless of circumstances or condition.~~

Comment [A148]: The intent of the definition is to cover natural water sources, and not anthropogenic structures that collect runoff to reduce volume/velocity or pollutants.

Waters of the United States - As defined in the 40 CFR 122.2, the Waters of the U.S. are defined as: "(a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate "wetlands;" (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters otherwise defined as waters of the United States under this definition: (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial seas; and (g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA."

Riverside Copermittee Redlines

Watershed - That geographical area which drains to a specified point on a water course, usually a confluence of streams or rivers (also known as drainage area, catchment, or river basin).

Wet Season (aka Rainy Season) –October 1 to April 30

Wet Weather – Weather is considered wet if there is a storm event of 0.1 inches and greater and the following 72 hours, unless otherwise defined by the Copermittee for the purposes of monitoring consistent with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), or developed pursuant to another regulatory mechanism.

Comment [A149]: This is important as the monitoring requirements require you to sample the first 'Wet Weather' event. 0.1" of rainfall doesn't result in runoff in all watersheds. Copermittees should be able to define mobilization criteria to identify storms that are likely to produce runoff in that drainage area consistent with this EPA guidance.

LEGAL AND FACT SHEET COMMENTS ON TENTATIVE ORDER R9-2013-0001 MADE ON BEHALF OF THE RIVERSIDE COUNTY COPERMITTEES

This document provides comments on various legal issues raised by Tentative Order No. R9-2013-0001 (the "Draft Permit") and associated attachments, including Attachment F, the Fact Sheet/Technical Report ("Fact Sheet"), and are made on behalf of the Riverside County Flood Control & Water Conservation District ("District"), the County of Riverside and the Cities of Murrieta, Temecula and Wildomar (collectively, the "Riverside County Copermittees").

These legal comments are in addition to the other comments on the Draft Permit and attachments made by the Riverside County Copermittees (including the Comment Letter dated January 10, 2013 and signed by Jason E. Uhley, Chief of the District's Watershed Protection Division) and the redline attachment ("Redline"), as well as any comments or testimony which may be offered at the public hearing(s) on the Draft Permit. The Comment Letter and Redline also discuss legal issues. The Riverside County Copermittees appreciate this opportunity to comment and welcome any questions that Water Board staff may have.

These comments are submitted subject to the same reservations set forth in the Comment Letter regarding the Water Board's lack of authority, in the absence of agreement by the Riverside County Copermittees or the filing of a Report of Waste Discharge ("ROWD"), to issue a regional municipal separate storm sewer system ("MS4") permit to the Riverside County Copermittees. Submission of these comments does not waive this objection.

Request for Additional Public Comment

Before turning to comments on the Draft Permit, the Riverside County Copermittees wish to note that in view of the extensive comments made by them, as well as what we anticipate will be extensive comments by the South Orange County and San Diego County Copermittees, as well as from other stakeholders, it would greatly facilitate the permit adoption process if the Water Board were to release a revised Tentative Order for further review and comment prior to final adoption of the Permit. This will enable the Water Board staff to address the comments in a more orderly fashion and provide all parties with the opportunity to see how staff proposes to incorporate the comments in the Draft Permit.

Comments on Findings

Finding 2 and Fact Sheet Section VII.B: This finding recites that the Water Board "has the legal authority to issue a regional MS4 permit pursuant to its authority under Clean Water Act ("CWA") section 402(p)(3)(B) and 40 CFR 122.26(a)(i)(v)." Section VII.B of the Fact Sheet provides a more detailed rationale for this finding (at pages F-22-23).

The Riverside County Copermittees respectfully disagree with this finding and the analysis provided in the Fact Sheet. We do not believe that a regional MS4 permit is authorized under the CWA or the implementing regulations, absent agreement by the copermittees to be bound by such a MS4 permit (as is the case with the Bay Area MS4 permit covering discharges into the Bay).

The CWA itself does not explicitly authorize MS4 permits that, like the Draft Permit, cross county lines. CWA section 402(p)(3)(B) provides only that "[p]ermits for discharges from municipal storm sewers . . . may be issued on a system- or jurisdiction-wide basis." This language, contrary to the conclusion in Finding 2, indicates that a multi-county permit, covering several distinct non-interconnected municipal stormwater "systems" in multiple watersheds with multiple receiving waters, is not one issued on a "system-wide" basis and that an MS4 permit covering multiple jurisdictions in three different counties is not one issued on a "jurisdiction-wide basis." Because neither "system-wide" nor "jurisdiction-wide" are defined in the CWA, however, the CWA regulations must also be reviewed.

The regulatory provision cited in Finding 2, 40 CFR § 122.26(a)(1)(v), does not add clarity, since it merely repeats the "system-wide" and "jurisdiction-wide" language of the Act and the regulations define neither term. The regulations do, however, suggest that "system-wide" is not intended to cover multiple large MS4s in different jurisdictions. The regulations, at 40 CFR § 122.26(a)(1)(v) state that in making the determination to designate a system-wide or jurisdiction-wide basis" the permitting authority should consider the location of the "discharge" with respect to waters of the United States, the size of the discharge, the quantity and nature of the pollutants discharge and other relevant factors.

The Draft Permit covers multiple "discharges" into receiving waters located in three separate counties and the size, quality and nature of the discharges vary widely, due to varying hydrologic and climatic conditions in the three areas.

The Fact Sheet cites 40 CFR § 122.26(a)(3)(iv), which provides, in relevant part, that the Water Board "may issue one systemwide permit covering all, or a portion of all municipal separate storm systems in adjacent or interconnected large or medium municipal separate storm sewer systems." This provision does not, however, authorize issuance of a regional MS4 permit covering multiple counties and multiple watersheds that are not interconnected and which do not share a common receiving water. In fact, the only common fact uniting the various MS4s in the three counties under the Water Board's jurisdiction is that common jurisdiction.

First, even if the subject MS4 facilities otherwise met the criteria specified in the federal regulations (which, as noted below, they do not), the prospective permittees must apply for such a MS4 permit, as set forth in the first sentence of 40 CFR § 122.26(a)(3)(iv): "*One permit application may be submitted for all or a portion of all* municipal separate storm sewers within adjacent or interconnected large or medium municipal separate storm sewer systems." (emphasis supplied). No such application has been filed with respect to the Draft Permit. Only the San Diego County copermittees submitted a ROWD for MS4 facilities within that county.[1]

[1] Moreover, the fact that permittees have the ability to determine the geographic scope of the permit is reinforced by the language in 40 CFR § 122.26(a)(3)(iii)(B), which allows an individual municipality to submit "a distinct permit application which only covers discharges from the [MS4] for which the owner is responsible . . ." If a permittee can "opt out" of a multi-MS4 permit by submitting a individual permit application, a permitting authority such as a water board cannot impose a multi-MS4 permit on that permittee.

Second, this provision requires that the MS4s to be covered in the permit be "adjacent or interconnected." This is not true with respect to the MS4s proposed to be included within the Draft Permit. For example, the MS4 within the Santa Margarita Region of Riverside County is not "interconnected" with any other MS4s except those within that region. This is true also of the MS4s within South Orange County and San Diego County, which are not interconnected. Additionally, none of the MS4s in the three counties is "adjacent" to each other – each is separated by miles of non-urban area. In the SMR for example, the confluence of Temecula and Murrieta Creeks to form the Santa Margarita River is miles upstream of Rainbow Creek, the first discharge from San Diego County to the River. And, the confluence of Temecula and Murrieta Creeks is over 30 miles from the discharge of the Santa Margarita River to the Pacific Ocean.

The next inquiry is whether the three separate county MS4s could be considered, together, to form a single "large municipal separate storm sewer system." The federal MS4 regulations define this term as follows:

> *Large municipal separate storm sewer system* means all municipal separate storm sewers that are either:
>
> (i) Located in an incorporated place with a population of 250,000 or more . . . ."
>
> (ii) Located in the counties listed in Appendix H, except municipal separate storm sewers that are located in the incorporated places, townships or towns within such counties; or
>
> (iii) Owned or operated by a municipality other than those described [in paragraphs (i) and (ii)] . . . and that are designated by the Director as part of the large or medium municipal separate storm sewer system due to the interrelationship between the discharges of the designated storm sewer and the discharges from municipal separate storm sewers described [in paragraphs (i) and (ii)]. In making this determination the Director may consider the following factors:
>
> (A) Physical interconnections between the municipal separate storm sewers;
>
> (B) The location of discharges from the designated municipal separate storm sewer relative to discharges from municipal separate storm sewers described in [paragraph (i)];
>
> (C) The quantity and nature of pollutants discharged to waters of the United States;
>
> (D) The nature of the receiving waters; and
>
> (E) Other relevant factors, or
>
> (iv) The Director may, upon petition, designate as a large municipal separate storm sewer system, municipal separate storm sewers located within the boundaries of a region

> defined by a storm water management regional authority based on a jurisdictional, watershed, or other appropriate basis that includes one or more of the systems described [in paragraphs (i), (ii) or (iii)].

40 CFR § 122.26(b)(4).

None of paragraphs (i), (ii) or (iii) authorizes a regional MS4 permit such as that envisioned in the Draft Permit. The Draft Permit applies beyond a single incorporated place, County or municipality. Of these paragraphs, only paragraph (iv) could arguably be used to define the MS4s in the three Counties as a single MS4 and thus authorize a regional permit. The key limiting language is, however, "within the boundaries of a region **defined by a storm water management regional authority,** based on a jurisdictional, watershed, or other appropriate basis . . . ." A regional water board is not a stormwater management regional authority. This is clear from the MS4 regulations, which provide that a "**regional authority may be responsible for submitting a permit application"** under certain conditions. 40 CFR § 122.26(a)(3)(iii)(C). Clearly, a Water Board is not responsible for submitting MS4 permit applications.

U.S. EPA, in the Preamble to the final Phase I MS4 regulations (55 Fed Reg. 47990, November 16, 1990), further illuminated the meaning of the regulatory language. The Preamble indicates that commenters proposed eight different MS4 permitting options:

> Option 1 – systems owned or operated by incorporated places augmented by integrated discharges; Option 2 – systems owned or operated by incorporated places augmented with significant other municipal discharges; Option 3 – systems owned or operated by counties; Option 4 – systems owned and operated by States or State departments of transportation; Option 5 – systems within the boundaries of an incorporated place; Option 6 – systems within the boundaries of counties; Option 7 – systems in census designated urbanized areas; and Option 8 – systems defined by watershed boundaries.

55 Fed Reg. at 48039. None of these options encompasses the fact pattern presented by the Draft Permit, which covers multiple counties and multiple watersheds, are not interconnected, do not share common receiving waters and are located in separate census designated urbanized areas.

In explaining the derivation of 40 CFR 122.26(b)(4)(iv), U.S. EPA noted that it was "an outgrowth of comments on all options, especially Option 4 (State owned systems/State highways) and Option 8 (watersheds)." 55 Fed. Reg. at 48040. Thus, the Caltrans MS4 permit (which applies statewide) is authorized under paragraph (iv), since the "storm water management regional authority" defining the region to be covered is Caltrans itself. No such single authority exists for the three-county area proposed to be included in the Draft Permit, which also would encompass multiple watersheds.

Moreover, paragraph (iv) provides that the regional authority must "petition" the U.S. EPA Director to have a single MS4 designated within the boundaries of the region defined by the regional authority. Because California has been delegated NPDES permitting authority, a regional authority would presumably need to petition its Water Board to authorize such a regional permit. Since no such regional authority exists to establish the geographical basis for a

three-county MS4 permit, there is no such entity to "petition" the Water Board to establish a regional permit. This is clear from the Preamble to the Phase I regulations, which indicate that "regional storm water authorities" established by "some States or counties" may "petition the Director [or its state designee] to assume a regional role. 55 Fed. Reg. at 48042. It is clear from the Preamble that it is not the Water Board that has the authority to make such a petition, but rather the "storm water authorities" (i.e., municipalities, districts and Caltrans).

It should be noted that the Bay Area Regional MS4 Permit was a joint Bay Area Water Board and copermittee effort, coordinated by the Bay Area Stormwater Agencies Management Association ("BASMAA"). It is not the case that the Bay Area Water Board imposed this regional MS4 permit. The copermittees, coordinated by BASMAA, themselves determined to develop a regional MS4 permit. Further, all of the copermittees to the Bay Area Regional MS4 Permit discharge to a common receiving water, San Francisco Bay. Also, an Alaska MS4 permit cited in a letter from the Office of Chief Counsel to county counsel for Orange and Riverside Counties was issued to several municipalities and entities within a single "borough," which is equivalent in Alaska to a county.

Additionally, neither the Riverside County Copermittees nor those in South Orange County have filed ROWDs with the San Diego Water Board, which serve as the application for an NPDES MS4 permit in California. Water Code § 13260. The current Riverside County MS4 permit for the Santa Margarita Region provides that the ROWD is not required to be filed until May 2015, 180 days prior to the November 10, 2015 expiration date of that permit. Order R9-2010-0016, Part II.K.2.c.

> This ROWD must include:
>
> (1) Proposed changes to the Copermittees' runoff management programs; (2) Proposed changes to monitoring programs; (3) Justification for proposed changes; (4) Name and mailing addresses of the Copermittees; (5) Names and titles of primary contacts of the Copermittees; (6) Any other information necessary for the reissuance of this Order and (7) Any other information required by federal regulations for permit reapplications.

Id. It should be noted that several items of this ROWD are specifically intended to assist in the formulation of a new, SMR-specific MS4 permit, including proposed changes to the runoff management and monitoring programs, as well as justification for such changes, information necessary for "reissuance" of the SMR MS4 permit and information required by the federal regulations for MS4 permit reapplications.

As a simple jurisdictional matter, the Water Board cannot issue a regional MS4 permit to MS4 dischargers that have not applied for it. Moreover, as noted above, the SMR copermittees are entitled to apply for an MS4 permit applicable to their jurisdiction. Further, each individual copermittee has the right to apply for a MS4 permit covering only its discharges, as has the City of Long Beach in the Los Angeles Region.

Finding 3, Finding 15, in Fact Sheet Section VII.A and in Multiple Locations Throughout Draft Permit: In Finding 3, the Fact Sheet and in multiple locations throughout the Draft Permit (which are identified in the redline of the Draft Permit submitted with these comments by the Riverside County Copermittees ("Redline")), it is stated that the maximum extent practicable ("MEP") applies only to "storm water" discharges from the MS4. This is not correct.[2]

In fact, the Clean Water Act does not distinguish between non-stormwater and stormwater in terms of MS4 discharges which must be controlled to the MEP standard. *See* 33 U.S.C. § 1342(p)(3)(B)(iii)(the MS4 permit "shall require controls to reduce the discharge of pollutants to the maximum extent practicable . . . ." While the heading of 33 U.S.C. § 1342(p) refers to "Municipal and industrial stormwater discharges," this is not dispositive, as 33 U.S.C. § 1342(p)(3)(B)(ii), which requires the effective prohibition of "non-stormwater discharges" into the MS4. Thus, the language of this heading does not in fact support the argument that the MEP standard applies only to pollutants in stormwater discharges.

That both non-stormwater and stormwater must be controlled to the MEP standard was made clear by U.S. EPA itself in the preamble to the final Phase I stormwater regulations. In that preamble, U.S. EPA made it clear that "MEP control measures" would be implemented to address not only pollutants in "storm water" but also from "non-storm water discharges." As the preamble states:

> "Permittees are required to develop management programs for four types of pollutant sources which discharge to large and medium municipal storm sewer systems. Discharges from [such systems] are usually expected to be composed primarily of: (1) Runoff from commercial and residential areas; (2) storm water runoff from industrial areas; (3) runoff from construction sites; and (4) *non-storm water discharges*. Part 2 of the permit application has been designed to allow [permittees] the opportunity to propose *MEP control measures for each* of these components of the discharge."

55 Fed. Reg. at 48052 (emphasis supplied).

This language sets forth USEPA's understanding of the plain language of the CWA: "pollutants" must be controlled to the MEP from any MS4 "discharge," not merely pollutants in stormwater.

Finding 11: This finding, in relevant part, states that "[h]istoric and current development makes use of natural drainage patterns and features as conveyances for runoff. Rivers, streams and creeks in developed areas used in this manner are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and receiving water." This conclusion is legally incorrect.

First, under no circumstance can a natural stream constitute an MS4. The definition of "MS4" in the CWA regulations (a definition found in Attachment C of the Draft Permit) refers to a

[2] Finding 15 also states, erroneously, that the MEP standard "is explicitly for "Municipal . . . *Stormwater Discharges* (emphasis added)" from the MS4.

"conveyance or system of conveyances" "owned or operated" by a municipality. 40 CFR §122.26(b)(8). In California, natural rivers and streams are not "owned" nor "operated" by the municipality through which they flow. Moreover, a municipality obviously cannot "operate" a natural creek or stream. In further support of the point that a MS4 is an artificial, not natural, watercourse, the types of "conveyances" identified in the regulation ("roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains") all refer to anthropogenic structures, not natural streams. 40 CFR § 122.26(b)(8).

Second, a "receiving water" cannot also be an MS4, as is plain from the CWA regulations. An MS4 is itself defined as discharging to waters of the United States. 40 C.F.R. §122.26(b)(8). An MS4 cannot, in essence, discharge to itself. Moreover, an "outfall" from an MS4 (the point at which the discharge enters a receiving water) does not, pursuant to 40 C.F.R §122.26 (b)(9), include conveyances connecting "segments of the same stream or other waters of the United States and are used to convey waters of the United States."

Moreover, U.S. EPA, in the Preamble to the initial version of the MS4 regulations (53 Fed. Reg. 49416 (Dec. 7, 1988)) expressly determined that "streams, wetlands and other water bodies that are waters of the United States are not storm sewers for the purposes of this rule" and that "stream channelization, and stream bed stabilization, which occur in waters of the United States" were not subject to National Pollutant Discharge Elimination System ("NPDES") permits under Section 402 of the CWA. 53 Fed. Reg. at 49442.

Additionally, the United States Supreme Court recently reversed the Ninth Circuit Court of Appeals and ruled that flows from sections of the Los Angeles and San Gabriel Rivers that are comprised of concrete flood control channels are not a "discharge" under the CWA, confirming that such rivers, even if improved, are "receiving waters" along with any natural portions of those rivers. *Los Angeles County Flood Control Dist. v. Natural Resources Defense Council*, 568 U.S. __(January 8, 2013) (slip op.).

The above-cited statement in the finding is incorrect and should be stricken, as recommended in the Redline.

Finding 12: This finding states, in relevant part, that "[a]s operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not prohibit or otherwise control." This statement is legally incorrect, and ignores the salient point that the "discharger" of a pollutant is primarily responsible for controlling/permitting that discharge, under both the CWA and the Porter-Cologne Act. For example, under the Porter-Cologne Act, any persons discharging or proposing to discharge "waste" into waters of the state must file a report of waste discharge and obtain a waste discharge requirement. Water Code §§ 13260, 13263. The operator of the MS4 into which that water eventually flows is not "essentially accepting" responsibility for the discharge. The responsibility of the MS4 operator is established under the CWA, and that is to effectively prohibit non-stormwater discharges into [the MS4] and to control the discharge of pollutants from the MS4 to the MEP.

Moreover, the statement ignores the fact that in California, downstream property owners (including municipalities owning and operating MS4 facilities) must accept the flow of upstream waters. In fact, for a downstream municipality to block such flow would constitute an inverse condemnation or the creation of a nuisance under California law. *See Arreola v. County of Monterey* (2002) 99 Cal.App.4th 722 (obstruction of flood waters by improperly designed highway constituted inverse condemnation and nuisance).

Finding 28 and Fact Sheet Section VI: In the Finding, it is stated that the Water Board "finds that the requirements in this permit are not more stringent than the minimum federal requirements" and that therefore "a CWC section 13241 analysis is not required." The Finding further recites that notwithstanding this fact, "the San Diego Water Board has developed an economic analysis of the requirements in this Order."

For the reasons set forth in the comments of the Riverside County Copermittees, numerous provisions in the Draft Permit are in fact more stringent than the requirements of the CWA and its implementing regulations and therefore require an adequate Water Code § 13241 analysis. Unfortunately, this analysis is not provided in the Fact Sheet.

First, the economic analysis set forth in the Fact Sheet does not meet the requirements of Section 13241, as it does not analyze the six specific factors required to be analyzed under the section. Second, the analysis uses cost data from other sources, only a few of which were from the municipalities proposed to be included under the Draft Permit. These data are also a number of years old; the most recent study referenced in the Fact Sheet, the one done for the State Board by Cal State Sacramento, was dated January 2005 and included decade-old cost data from the City of Encinitas that dated from 2002-2003.

Third, the section of the Fact Sheet discussing the benefits of water quality notes that "there have been no studies for the San Diego Region to quantify the added value that surface waters with healthy water quality can provide." Thus, the Water Board has no evidence with which to compare the costs and benefits of the programs set forth in the Draft Permit. Moreover, the discussion makes the incorrect assumption that the alternative to the programs in the Draft Permit would be no controls on pollutants in urban runoff. As the Fact Sheet correctly notes, the Draft Permit is the fifth term MS4 permit for the copermittees. The previous four permits all contained increasingly complex and expensive control requirements, both structural and non-structural, designed to improve the quality of MS4 discharges. Thus, an appropriate cost analysis must compare the incremental costs of the programs set forth in the Draft Permit and the incremental benefits attributable to that permit. This has not been done in the Fact Sheet. Finally, the analysis does not recognize that the receiving waters provided economic benefits to residents of the San Diego Region long before issuance of the first MS4 permits in 1990. It is thus illogical to suggest that these pre-existing economic benefits would be lost if the Draft Permit is not adopted.

Finding 29 and Fact Sheet Section VII.F: The finding and the supporting argument in the Fact Sheet represents an attempt by Water Board staff to address whether the requirements of the Draft Permit represent an unfunded state mandate. That attempt, however, is beyond the scope of the Water Board's powers, since the *only* agency charged by the Legislature with determining

the presence of a state mandate, and whether that mandate is unfunded, is the Commission on State Mandates. Govt. Code § 17552; *Kinlaw v. State of California* (1991) 54 Cal.3d 326, 333. The Water Board has no jurisdiction to make a legal finding or discuss in the Fact Sheet that the Draft Permit, in whole or in part, does not constitute an unfunded state mandate.

Additionally fact sheets are required, under the CWA regulations, to provide the legal authority and reasons for each substantive permit provision (40 CFR § 124.8(a)(4); 40 CFR § 124.56(a)). *See also City of Rancho Cucamonga v. Regional Water Quality Control Board-Santa Ana Region* (2006), 135 Cal.App.4th 1377, 1382 (stating that fact sheets contains "the legal and factual grounds for the Water Board's recommendation to adopt the . . . permit"). Finding 29 and the discussion in Section VII.F of the Fact Sheet do not relate to any Draft Permit provision, nor provide legal authority or justification for the Draft Permit's adoption. As such, the finding and Fact Sheet discussion are surplussage and should be deleted.

The Riverside County Copermittees disagree with each of the arguments set forth in the Finding and Fact Sheet as to why the Draft Permit does not constitute an unfunded state mandate. Nevertheless, because the exclusive arena for such disagreements is the Commission on State Mandates, whose jurisdiction does not commence unless and until a test claim is filed before the Commission, the Copermittees need not and will not address those arguments.

Comments on Provisions in Draft Permit

Provision A and Fact Sheet Section VIII.A:

Lack of True Iterative Compliance Process

As set forth in the Redline and in the Comment Letter, the Riverside County Copermittees believe that to effectuate the iterative approach to compliance with water quality standards and other discharge prohibitions in the Draft Permit, the copermittees must be provided with the means to be in compliance. Based on monitoring, exceedances of water quality standards are occurring in the receiving waters subject to the Draft Permit, as set forth in Table G-14 to the latest 2011-2012 monitoring report submitted by the Riverside County Copermittees. Thus, if the copermittees are not provided an iterative means to be in compliance, which was contemplated by State Board's Order No. 2001-15, the copermittees will be issued an illegal MS4 permit, since it is a permit with which they cannot comply. This violates the intent of Congress in the CWA, which "is presumed not to have intended absurd (impossible) results." *Hughey v. JMS Development Corp.*, 78 F.3d 1523, 1529 (11th Cir. 1996); *accord, Mississippi River Revival v. City of Minneapolis*, 319 F.3d 1013, 1017-1018 (8th Cir. 2003).

With regard to the iterative process, Water Board staff has indicated numerous times during the workshop process that achievement of water quality standards is expected to take many years. The entire WQIP approach is aimed at the eventual attainment of such standards, as are the TMDLs issued to other copermittees, which have final compliance dates years into the future.

This approach is, however, put into jeopardy by the requirement, as expressed in the Fact Sheet at F-39, that the discharge prohibition and receiving water limitation provisions are

"independently applicable, meaning that compliance with one provision does not provide a 'safe harbor' where there is non-compliance with another provision (i.e., compliance with Provision A.4 does not shield a Copermittee who may have violated Provision A.1.a, A.1.c, or A.2.a from an enforcement action." While the Fact Sheet appropriately notes how this process should work through Provision A.4 (which "essentially requires the Copermittees to implement additional BMPs until MS4 discharges no longer cause or contribute to a violation of water quality standards") it also states that despite this iterative process, "the San Diego Water Board retains the discretion to take other appropriate enforcement and the iterative process does not shield dischargers from citizen suits under the CWA." Fact Sheet at F-40.

The consequences of this approach cannot be overemphasized. Despite the copermittees' good faith undertaking to follow the iterative process outlined in Provision A.4, a Water Board enforcement proceeding or a citizen suit can be brought for violations of water quality standards and, if the citizen plaintiff is successful, a federal judge is empowered to use his/her injunctive powers under Section 505(a) of the CWA to throw out the WQIP, JRMP or other compliance efforts of the copermittees and require other efforts. In such a case, the time and money spent by the copermittees in trying to comply with the Draft Permit, as well as the effort spent by the copermittees and Water Board staff in developing the Draft Permit's terms, are completely wasted.

Thus, the essential conundrum of Provision A, as presently drafted, is clearly exposed. Even though a copermittee may spend significant sums and undertake significant tasks under its WQIP or JRMP, be conducting expensive monitoring and special studies, and be in *full compliance* with all of the programmatic requirements of the Draft Permit, it would still face either a Water Board enforcement action or a citizen suit under Section 505 of the CWA. And, such a suit would allege exceedances of water quality standards (some of which are hardly capable of laboratory detection, much less control) that the Water Board acknowledges cannot be achieved for years.

Provision A is not, however, required by the CWA, as held by the Ninth Circuit in *Defenders of Wildlife v. Browner*, 191 F.3d 1159 (9th Cir. 1999). The holding in *Browner* is further reflected in State Board Order WQ 2001-15 (which the Fact Sheet acknowledges incorporates an "iterative process") which states:

> [O]ur [receiving water limitation] language, similar to the U.S. EPA's permit language discussed in the Browner case, **does not require strict compliance with water quality standards.** Our language requires that **storm water management plans be designed to achieve compliance with water quality standards**. **Compliance is to be achieved over time, through an iterative approach requiring improved BMPs**. As pointed out by the Browner court, there is nothing inconsistent between this approach and the determination that the Clean Water Act does not mandate strict compliance with water quality standards.

Order WQ 2001-15 at 7 (emphasis added). Thus, Provision A is inconsistent with the State Board's own precedential order, which requires the iterative approach effectuated by the suggested Redline changes.[3]

In further support, it may be noted that the U.S. EPA-drafted MS4 permit for the District of Columbia does not contain the type of language found in Provision A, but rather requires "an iterative and an adaptive management process for pollutant reduction and for achieving applicable water quality standard and/or total maximum daily load (TMDL) compliance." DC MS4 Permit Fact Sheet, page 5 (attached as Exhibit A).

Also, despite the assertion in the Fact Sheet that the copermittees are seeking a "safe harbor" from liability, this is incorrect. Every provision of an MS4 permit is subject to enforcement; given the complexity of the Draft Permit, the failure by a copermittee to comply with any provision could lead to such enforcement.

As noted above, MS4 discharges may not be achieving compliance with strict water quality standards, as recognized by the Issue Paper released by State Board staff in preparation for a November 20, 2012 workshop on receiving water limitation issues raised by *NRDC v. County of Los Angeles*. That Issue Paper stated that as "the storm water management programs of municipalities have matured, **an increasing body of monitoring data indicates that water quality standards are in fact not being met by many MS4s.**" (State Board Issue Paper, Page 2, emphasis supplied) (*see* Exhibit B.)

Perhaps most importantly, requiring strict and immediate compliance with discharge prohibition and receiving water limitations inhibits, not supports, the philosophy of the Draft Permit, which is to encourage the copermittees to focus on the most significant problems in their watersheds and to prioritize their resources to address those problems. Provision A, by contrast, discourages innovative approaches or prioritization, since all pollutants exceeding water quality standards create liability. Moreover, as discussed above, in the event of a citizen suit being brought such as that in the *NRDC* case, a federal judge could award injunctive relief to a successful plaintiff that could completely ignore or supplant the WQIP and other permit terms.

For additional discussion of receiving water limitations issues, please see Exhibit C, a letter submitted by the District to the State Board in connection with the recent workshop held by the State Board on receiving water limitations language. The Riverside County Copermittees hereby reference and incorporate this Exhibit into these comments.

The Riverside County Copermittees support a true iterative process that requires refinement and amendment of the WQIP and associated BMPs when receiving water limitation violations are recorded. That is the essence of the iterative process; the identification of problems and the development of BMPs to attempt to address those problems.

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[3] While the Fact Sheet cites as authority *Natural Resources Defense Council v. County of Los Angeles*, discussed above, the Ninth Circuit was simply responding to language in the former Los Angeles County MS4 permit, and did not determine that such non-iterative language was required by the CWA.

The Redline proposes a means to achieve compliance using the WQIPs, which are intended to bring the copermittees into compliance with the discharge prohibition and receiving water limitation provisions of the Draft Permit over time. The Redline links compliance with Provisions A.1, A.2 and A.3 to A.4, which indicates that compliance is obtained through the preparation and updating of the WQIPs.

It must be noted, however, that the Riverside County Copermittees do not agree with the approach suggested by others, that any WQIP-based compliance approach be necessarily accompanied by a "Reasonable Assurance Analysis." Such an analysis could be extremely complex, expensive and time intensive to develop. Generally, such analyses are developed in the preparation of TMDLs and take a number of years to develop and refine. Given that the Santa Margarita Watershed has no adopted TMDLs, there are no comprehensive pollutant transport or BMP models available for the suite of constituents that might be considered for prioritization within a WQIP for that watershed. In the context of a TMDL, such models would be developed by the combined resources of the Water Board, stakeholders and dischargers. Requiring such an exercise to be undertaken solely with the public resources of the residents of the SMR is beyond the Copermittees' financial ability and would shift responsibility for development of TMDLs from the Water Board to the Copermittees.

Discussion in Fact Sheet

The Fact Sheet discussion also contains a number of legal and factual errors. First, the statement on page F-34 that non-stormwater discharges from the MS4 are subject to NPDES permitting requirements is unsupported by the plain language of the CWA, which (as noted above) applies the MEP standard to *all* discharges of pollutants from the MS4, not just those in stormwater. Also, such discharges are not subject to separate requirements under the NPDES program, as suggested on F-34, and non-storm water discharges are not the same, legally, as "illicit discharges." Please see discussion below.

Similarly, the Fact Sheet's conclusion that "Regional Water Boards are not limited by the iterative MEP approach to storm water regulation in crafting appropriate regulations for non-storm water discharges" is incorrect. The Fact Sheet correctly states that MEP has not been defined in the CWA or by U.S. EPA in the CWA regulations. However, the Fact Sheet incorrectly concludes that MEP is "ultimately defined" by the Water Boards or the State Board. What constitutes "MEP" is a question of federal law under the CWA, not a matter for definition by agencies which merely have been delegated the authority to enforce the CWA in California. The only source for such a finding is a memorandum from a State Board attorney, not case authority.

Moreover, Provisions B-E of the Draft Permit, far from establishing a "minimum framework" for the copermittees to achieve the MEP standard, sets forth in many cases requirements that far exceed the plain requirements of the CWA, the implementing regulations and in some cases even state law, or which require the copermittees to undertake steps that are not "practicable." These requirements are identified in the comments of the Riverside County Copermittees. In such respects, those requirements do not represent a "minimum framework" for MEP.

Other Issues

The Riverside County Copermittees also object to the provision in A.1.a and other portions of the Draft Permit that prohibit certain discharges into "waters of the state." The CWA regulates discharges into waters of the United States, which are surface waters. Expanding the prohibition to cover waters of the state expands the scope of the Draft Permit to protect groundwater, as a matter of state law. It should be noted that the recent Los Angeles County MS4 Permit appropriately applies this prohibition to waters of the United States.

Provision B.5: As noted in the Comment Letter, the CWA requires that illegal discharges into the MS4 be addressed by a program of steps taken to address such discharges. The Redline emphasizes that this program be guided by WQIP priorities, which is consistent with the overall intent of the Draft Program.

Provision E.2.a and E.2.a.(7): These provisions require the Copermittees to, as a part of their Illicit Discharge Detection and Elimination (IDDE) program, address all non-stormwater discharges as "illicit discharges," thus requiring the copermittees to "reduce or eliminate non-stormwater discharges" whether or not the discharges have been identified as "illicit."

The Fact Sheet asserts that "Provision E.2.a.(7) is consistent with the requirements of the CWA section 402(p)(3)(B)(ii) and 40CFR 122.26(d)(1)(v)(B). That assertion is not correct. Section 402(p)(3)(B)(ii) of the CWA states that MS4 permits "shall include a requirement to *effectively prohibit* non-stormwater discharges into the storm sewers" (emphasis supplied). The CWA regulations include two provisions designed to begin implementation of the "effective prohibition." The first provision requires MS4 permittees to perform a screening analysis, intended to provide sufficient information to develop priorities for a program to detect and remove illicit discharges. 40 CFR 122.26(d)(1)(iv)(D). The second requires MS4 permittees to develop a recommended site-specific management plan to detect and remove illicit discharges (or ensure they are covered by an NPDES permit) and to control improper disposal to MS4s. 40 CFR 122.26(d)(1)(iv)(D) and 122.26(d)(2)(B). The MS4 permittees are required to identify the non-stormwater discharge as an illicit discharge prior to having an obligation to effectively prohibit it. There is not otherwise a presumption to reduce or eliminate it.

40 CFR 122.26(d)(1)(v)(B), cited in the Fact Sheet, requires "[a] description of the existing program to identify illicit connections to the municipal storm sewer system. The description should include inspection procedures and methods for detecting and preventing illicit discharges, and describe areas where this program has been implemented."

The provision and rationale within the Fact Sheet blur the distinction between the copermittees' need to "effectively" prohibit non-stormwater discharges and to detect and eliminate illicit discharges.

- The requirement is "effectively prohibit" non-stormwater discharges, not "reduce or eliminate" non-stormwater discharges.
- Although copermittees are required to have a program to prevent illicit discharges to the MS4, non-stormwater discharges should only be addressed as illicit discharges where

such discharges are identified as sources of pollutants that may cause or contribute to an exceedance of a water quality objective.

- The IDDE program is established to detect and eliminate "illicit discharges", not non-stormwater discharges in general.

Please see the Redline for modifications to Provision E.2 addressing these issues.

Provision E.2.a.(3): In the Redline, the Riverside County Copermittees request that categories of irrigation runoff discharges (landscape irrigation, irrigation water and lawn watering) be considered as conditionally exempt discharges (not subject to treatment as illicit discharges).

The rationale for not including irrigation runoff discharges lacks a legal and factual basis. As noted in the Comment Letter, the only factual basis for this provision with respect to the Riverside County Copermittees is discussion in a public information informational brochure, which was itself based on a similar document from Orange County. Fact Sheet F-76. Despite assertions to the contrary in the Fact Sheet, this brochure does not represent a determination by the Riverside County Copermittees that irrigation runoff is a category of non-stormwater discharge that must be effectively prohibited. The other evidence in support of prohibiting the conditional exemption for irrigation runoff is entirely from different areas of the region, with different urban development patterns, lithology and hydrology. No specific determination has been made by the Copermittees (or the Water Board) that irrigation runoff in the Santa Margarita Region has actually been shown to be significant source of pollutants to receiving waters in the SMR.

EPA, in the preamble to the federal MS4 regulations, required that a *permittee* must make a finding that the "irrigation water" discharges must be a "source of pollutants to waters of the United States . . . ." 55 Fed. Reg. 48037. Moreover, such discharges must represent a "significant" source of pollutants to waters of the United States "under certain conditions." U.S. EPA, *Guidance Manual for the Preparation of Part 2 of the NPDES Permit Application for Discharges from Municipal Separate Storm Sewer Systems,* November 1992 ("EPA Part 2 Guidance Manual"), at p. 6-33. These conditions require a focus not on an entire category of discharges, but rather a discharger-by-discharger examination.

In the MS4 regulatory preamble, EPA stated that "[i]n general, municipalities will not be held responsible for prohibited some specific components of discharges or flows listed below through their [MS4], even though such components may be considered non-storm water discharges, unless such discharges *are specifically identified on a case-by-case basis as needing to be addressed."* 55 Fed. Reg. 47995 (emphasis supplied). In the Guidance Manual, EPA states:

> If an applicant knows . . . that landscape irrigation water from a ***particular site*** flows through and picks up pesticides **or *excess*** nutrients from fertilizer applications, there may be a reasonable potential for a storm water discharge to result in a water quality impact. In such an event, the applicant should contact the NPDES permitting authority to request that the authority order ***the discharger*** . . . to obtain a separate NPDES permit (or in this case, the discharge could be controlled through the storm water management program of the MS4).

EPA Part 2 Guidance Manual, p. 6-33 (emphasis added). Read in this context of this language, the Water Board has no power greater than a municipality in terms of its ability to identify non-stormwater discharges as "illicit" and thus required to be regulated, and must identify specific discharges, and not entire categories of discharges. *See* 55 Fed. Reg. 48037. This has not been done in the Fact Sheet.

Provision E.3(c): This provision requires the Copermittees to compel development projects that may not result in a hydromodification impact to the applicable receiving waters, to implement on-site or "alternative compliance" hydromodification mitigation measures and to use using "pre-development (naturally occurring)" runoff reference condition as applied to sites that are, in fact, developed.

The Riverside County Copermittees are concerned that implementing these requirements would subject the Copermittees to liability under the takings clauses of the U.S. and California Constitutions as well as under the Mitigation Fee Act because of the questionable nexus between such a project's lack of actual hydromodification impacts upon the receiving waters, and the hydromodification management measures required in the Draft Permit.

When imposing a condition on a development permit, a local government is required under the federal and state constitutions to establish that the condition bears a reasonable relationship to the impacts of the development project. This rule applies even to legislatively enacted requirements and impact fees or exactions.[4] Moreover, fees imposed on a discretionary ad hoc basis are subject to heightened scrutiny under a two-part test. First, local governments must show that there is a substantial relationship between the burden created by the impact of development and any fee or exaction.[5] Second, a development project's impacts must bear a "rough proportionality" to any development fee or exaction.[6] Under California law, the *Nollan/Dolan* heightened scrutiny test also applies to in-lieu fees.[7]

The Legislature has memorialized these requirements in the Mitigation Fee Act, which establishes procedures that local governments must follow to impose impact fees.[8] Irrespective of whether the hydromodification management requirements are implemented by legislative act or on an ad hoc basis, the copermittees' attempt to enforce them as proposed in the Draft Permit would likely result in claims by developers and property owners alleging unconstitutional takings of private property and violations of the Mitigation Fee Act. This is because a developer could argue that limiting hydromodification impacts of already developed property to its "naturally occurring" state, or requiring hydromodification mitigation measures for impacts not imposed by the project, would not have a legally sufficient nexus to the impact of the development project.

In addition, the Copermittees wish to bring the Water Board's attention to a recent case, *Virginia Dept. of Transportation v. United States Environmental Protection Agency*, Civ. Action No.

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[4] *Building Indus. Ass'n v. City of Patterson* (2009)171 Cal. App. 4th 886, 898.
[5] *Nollan v. California Coastal Comm'n*, 483 U.S. 825, 837 (1987).
[6] *Dolan v. City of Tigard*, 512 U.S. 374, 391 (1994).
[7] *Ehrlich v. City of Culver City* (1996) 12 Cal. 4th 854, 876.
[8] Cal. Gov't Code §§ 66000-66025.

1:12-CV-775 (E.D. Va. January 3, 2013) (slip op.), which is attached for the Water Board's convenience as Exhibit D. In this case, a federal district judge found that the CWA did not authorize U.S. EPA to regulate stormwater itself as a pollutant. The impact of this case is not known at this time, as it will probably be appealed to the Fourth Circuit Court of Appeals. Still, any approach to hydromodification which focuses on flows *per se*, as opposed to pollutants, may not withstand legal scrutiny.

Provision E.3.c.(3)(c)(i): This provision requires the entire alternative compliance in-lieu fee to be transferred to the copermittee or an escrow account prior to construction of a Priority Development Project (PDP). This provision is problematic, as development fees (which would include the in-lieu fees) are collected at the time of building permit issuance. In large-scale projects, permits may be issued (and development fees collected) in phases. Further, for master-planned developments, fees are generally negotiated through a development agreement to be collected based on certain development milestones. Therefore, collecting and holding the entire in-lieu fee prior to construction interferes with the development practice and may violate the Mitigation Fee Act and local development ordinances. The Redline requests that in-lieu fees be collected in accordance with state and local law.

Provision E.5: In addition to other comments on this provision and others in the Draft Permit relating to retrofitting, any requirements in Draft Permit relating to the retrofitting of engineered channels and other structures employed for flood control purposes must be consistent with the judgment of the flood control districts, to which the Legislature has assigned sole authority for the protection of the lives and property of their citizens from flooding. (Please see Comment Letter and proposed new findings in Redline for further discussion). Due to the urbanization of the counties over the past 150 years, as well as the particular topography and weather conditions found in Southern California, there is a great risk of flooding and hence the need for flood control structures and channels. The flood control districts have both the expertise and the sole legal authority to determine whether retrofitting of flood control structures can be accomplished in light of their statutory obligations, and that expertise and authority must be recognized in the Draft Permit.

Provision E.8: As noted in the Redline, the first requirement under Fiscal Analysis, that each "Copermittee must secure the resources necessary to meet all the requirements of this Order" has been deleted. This requirement is not found in the CWA regulations, which require only the conduct of a fiscal analysis. Moreover, this requirement intrudes on the home rule power of cities and counties by requiring, in essence, that municipal budgets must reflect the priority of compliance with the Order over any competing obligation, including police, fire protection and public health. A key issue in complying with stormwater and MS4 obligations is the ability of municipalities to afford the increasing costs associated with those obligations. In California, of course, the ability to raise taxes to pay for such obligations has been severely curtailed through several voter-approved propositions.

The Riverside County Copermittees request that Provision E.8.a be deleted.

EXHIBIT A

NPDES Permit No. DC0000221

AUTHORIZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM MUNICIPAL SEPARATE STORM SEWER SYSTEM PERMIT

In compliance with the provisions of the Clean Water Act, 33 U.S.C. §§ 1251 *et seq.*

Government of the District of Columbia
The John A. Wilson Building
1350 Pennsylvania Avenue, N.W.
Washington, D.C. 20004

is authorized to discharge from all portions of the municipal separate storm sewer system owned and operated by the District of Columbia to receiving waters named:

Potomac River, Anacostia River, Rock Creek and stream segments tributary to each such water body

in accordance with the Stormwater Management Program(s) dated February 19, 2009, subsequent updates, and related reports, strategies, effluent limitations, monitoring requirements and other conditions set forth in Parts I through IX herein.

The effective issuance date of this permit is: October 7, 2011.

This permit and the authorization to discharge shall expire at midnight, on: October 7, 2016.

Signed this 30th day of September, 2011.

Jon M. Capacasa, Director
Water Protection Division
U.S. Environmental Protection Agency
Region III

1. DISCHARGES AUTHORIZED UNDER THIS PERMIT

1.1 Permit Area

This permit covers all areas within the jurisdictional boundary of the District of Columbia served by, or otherwise contributing to discharges from, the Municipal Separate Storm Sewer System (MS4) owned or operated by the District of Columbia. This permit also covers all areas served by or contributing to discharges from MS4s owned or operated by other entities within the jurisdictional boundaries of the District of Columbia unless those areas have separate NPDES MS4 permit coverage or are specifically excluded herein from authorization under the District's stormwater program. Hereinafter these areas collectively are referred to as "MS4 Permit Area".

1.2 Authorized Discharges

This permit authorizes all stormwater point source discharges to waters of the United States from the District of Columbia's MS4 that comply with the requirements of this permit. This permit also authorizes the discharge of stormwater commingled with flows contributed by process wastewater, non-process wastewater, or stormwater associated with industrial activity provided such discharges are authorized under separate NPDES permits.

This permit authorizes the following non-stormwater discharges to the MS4 when appropriate stormwater activities and controls required through this permit have been applied and which are: (1) discharges resulting from clear water flows, roof drainage, dechlorinated water line flushing, landscape irrigation, ornamental fountains, diverted stream flows, rising ground waters, uncontaminated ground water infiltration to separate storm sewers, uncontaminated pumped ground water, discharges from potable water sources, foundation drains, air conditioning condensation, irrigation waters, springs, footing drains, lawn watering, individual resident car washing, flows from riparian habitats and wetlands, dechlorinated swimming pool discharges, wash water, fire fighting activities, and similar types of activities; and (2) which are managed so that water quality is not further impaired and that the requirements of the federal Clean Water Act, 33 U.S.C. §§ 1251 *et seq.*, and EPA regulations are met.

1.3 Limitations to Coverage

1.3.1 Non-stormwater Discharges

The permittee, as defined herein, shall effectively prohibit non-stormwater discharges into the MS4, except to the extent such discharges are regulated with an NPDES permit.

1.3.2 Waivers and Exemptions

This permit does not authorize the discharge of any pollutant from the MS4 which arises from or is based on any existing waivers and exemptions that may otherwise apply and are not consistent with the Federal Clean Water Act and other pertinent guidance, policies, and regulations. This narrative prohibition on the applicability of such waivers and exemptions extends to any activity that would otherwise be authorized under District law, regulations or

ordinance but which impedes the reduction or control of pollutants through the use of stormwater control measures and/or prevents compliance with the narrative /numeric effluent limits of this permit. Any such discharge not otherwise authorized may constitute a violation of this permit.

1.4 Discharge Limitations

The permittee must manage, implement and enforce a stormwater management program (SWMP) in accordance with the Clean Water Act and corresponding stormwater NPDES regulations, 40 C.F.R. Part 122, to meet the following requirements:

1.4.1. Effectively prohibit pollutants in stormwater discharges or other unauthorized discharges into the MS4 as necessary to comply with existing District of Columbia Water Quality Standards (DCWQS);

1.4.2. Attain applicable wasteload allocations (WLAs) for each established or approved Total Maximum Daily Load (TMDL) for each receiving water body, consistent with 33 U.S.C. § 1342(p)(3)(B)(iii); 40 C.F.R. § 122.44(k)(2) and (3); and

1.4.3. Comply with all other provisions and requirements contained in this permit, and in plans and schedules developed in fulfillment of this permit.

Compliance with the performance standards and provisions contained in Parts 2 through 8 of this permit shall constitute adequate progress toward compliance with DCWQS and WLAs for this permit term.

2. LEGAL AUTHORITY, RESOURCES AND STORMWATER PROGRAM ADMINSTRATION

2.1 Legal Authority

2.1.1 The permittee shall use its existing legal authority to control discharges to and from the Municipal Separate Storm Sewer System in order to prevent or reduce the discharge of pollutants to achieve water quality objectives, including but not limited to applicable water quality standards. To the extent deficiencies can be addressed through regulation or other Executive Branch action, the permittee shall remedy such deficiencies within 120 days. Deficiencies that can only be addressed through legislative action shall be remedied within 2 years of the effective date of this permit, except where otherwise stipulated, in accordance with the District's legislative process. Any changes to or deficiencies in the legal authority shall be explained in each Annual Report.

2.1.2 No later than 18 months following the effective date of this permit, the District shall update and implement Chapter 5 of Title 21 of District of Columbia Municipal Regulations (Water Quality and Pollution) ("updated DC Stormwater Regulations"), to address the control of stormwater throughout the MS4 Permit Area. Such regulations shall be consistent with this

FACT SHEET

National Pollutant Discharge Elimination System (NPDES)
Municipal Separate Storm Sewer System (MS4)
Permit No. DC0000221 (Government of the District of Columbia)

NPDES PERMIT NUMBER: DC0000221 (Reissuance)

FACILITY NAME AND MAILING ADDRESS:

Government of the District of Columbia
The John A. Wilson Building
1350 Pennsylvania Avenue, N.W.
Washington, D.C. 20004

MS4 ADMINISTRATOR NAME AND MAILING ADDRESS:

Director, District Department of the Environment
1200 First Street, N.E., 6th Floor
Washington, D.C. 20002

FACILITY LOCATION:

District of Columbia's Municipal Separate Storm Sewer System (MS4)

RECEIVING WATERS:

Potomac River, Anacostia River, Rock Creek, and Stream Segments Tributary
To Each Such Water Body

INTRODUCTION:

Today's action finalizes reissuance of the District of Columbia Municipal Separate Storm Sewer System (MS4) Permit. In the Final Permit EPA has continued to integrate the adaptive management approach with enhanced control measures to address the complex issues associated with urban stormwater runoff within the corporate boundaries of the District of Columbia, where stormwater discharges via the Municipal Separate Storm Sewer System (MS4).

Since the United States Environmental Protection Agency, Region III (EPA) issued the District of Columbia (the District) its first MS4 Permit in 2000, the Agency has responded to a number of legal challenges involving both that Permit (as well as amendments thereto) and the second-round MS4 Permit issued in 2004. For the better part of ten years, the Agency has worked with various parties in the litigation, including the District and two non-governmental organizations, Defenders of Wildlife and Friends of the Earth, to address the concerns of the various parties. The Agency has engaged in both litigation and negotiation, including formal

mediation.[1] These activities ultimately led to an enhanced stormwater management strategy in the District, consisting of measurable outputs for addressing the issues raised during the litigation and mediation process.

FACILITY BACKGROUND AND DESCRIPTION:

The Government of the District of Columbia owns and operates its own MS4, which discharges stormwater from various outfall locations throughout the District into its waterways.[2]

On April 21, 2010 EPA public noticed the Draft Permit. The Draft Fact Sheet published with that Draft Permit contains more extensive permit background information, and the reader is referred to that document for the history of the District of Columbia MS4 permit.

The public comment period closed on June 4, 2010. EPA received comments from 21 individual commenters and an additional 53 form letters. The Draft Permit, Draft Fact Sheet, and comments received on those documents are all available at: http://www.epa.gov/reg3wapd/npdes/draft_permits.html. The Final Permit reflects many of the comments received. EPA is simultaneously releasing a responsiveness summary responding to these comments.

ACTION TO BE TAKEN:

EPA is today reissuing the District of Columbia NPDES MS4 Permit. The Final Permit replaces the 2004 Permit, which expired on August 18, 2009 and has been administratively extended since that time. The Final Permit incorporates concepts and approaches developed from studies and pilot projects that were planned and implemented by the District under the 2000 and 2004 MS4 permits and modifying Letters of Agreement, and implements Total Maximum Daily Loads (TMDLs) that have been finalized since the prior permit was issued, including the Chesapeake Bay TMDL. A number of applicable measurable performance standards have been incorporated into the Final Permit. These and other changes between the 2004 Permit and today's Final Permit are reflected in a Comparison Document that is part of today's Permit issuance.

WATER QUALITY IN DISTRICT RECEIVING WATERS:

The District's *2008 Integrated Report to the Environmental Protection Agency and U.S. Congress Pursuant to Sections 305(b) and 303(d) Clean Water Act*[3] documents the serious water

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1 A procedural history of Permit appeals can be viewed at the EPA Environmental Appeals Board web: http://yosemite.epa.gov/oa/EAB_Web_Docket.nsf/77355bee1a56a5aa8525711400542d23/b5e5b68e89edabe98525714f00731c6f!OpenDocument&Highlight=2.municipal.

2 Portions of the District are served by a combined sanitary and storm sewer system. The discharges from the combined sewer system are not subject to the MS4 permit, but are covered under NPDES Permit No. xxxx issued to the District of Columbia Water and Sewer Authority.

3 District Department of the Environment, *The District of Columbia Water Quality Assessment, 2008 Integrated Report to the Environmental Protection Agency and U.S. Congress Pursuant to Sections 305(b) and 303(d) Clean Water Act* (hereinafter "2008 Integrated Report").

quality impairments in the surface waters in and around the District. A number of the relevant designated uses are not being met, *e.g.*, aquatic life, fish consumption, and full body contact, and there are a number of specific pollutants of concern that have been identified (for additional discussion on relevant TMDLs *see* Section 4.10 of this Final Fact Sheet).

Commenters on the Draft Permit expressed some frustration over very slow progress or even lack of progress after a decade of implementation of the MS4 program and even longer for other water quality programs. EPA appreciates this concern. Although the District's receiving waters are affected by a range of discharge sources, discharges from the MS4 are a significant contributor of pollutants and cause of stream degradation. EPA also recognizes, however, that stormwater management efforts that achieve a reversal of the ongoing degradation of water quality caused by urban stormwater discharges entail a long term, multi-faceted approach.

Consistent with the federal stormwater regulations for characterizing discharges from the MS4 (40 C.F.R. §122.26(d)(2)(iii)), the first two permit terms for the District's MS4 program required end-of-pipe monitoring to determine the type and severity of pollutants discharging via the system. The monitoring program was not designed to evaluate receiving water quality *per se*, therefore detection of trends or patterns was not reasonably possible. Today's Final Permit includes requirements for a Revised Monitoring Program, and one of the objectives for the program is to use a suite of approaches and indicators to evaluate and track water quality over the long-term (*see* discussion of Section 5.1 in this Final Fact Sheet).
There have been identified improvements in some areas. For example the *2008 Integrated Report* noted improvements in the diversity of submerged aquatic vegetation in the Potomac River, as well as improvements in fish species richness in Rock Creek. Biota metrics are often the best indicators of the integrity of any aquatic system.

EPA also notes that there are a variety of indirect measures indicative of improvement. The federal stormwater regulations foresaw the difficulty, especially in the near-term, of detecting measurable improvement in receiving waters, and relied instead on indirect measures, such as estimates of pollutant load reductions (40 C.F.R. §122.26(d)(2)(v)). The District documents these types of indirect measures in its annual reports, *e.g.*, tons of solids collected from catch basin clean-outs, amount of household hazardous waste collected, number of trees planted, square footage of green roofs installed, and many other measures of success.[4]

EPA believes that documenting trends in water quality, whether improvements, no change, or even further degradation, is an important element of a municipal water quality program. Today's Final Permit recognizes this principle, both in the types of robust measures required as well as the transition to new monitoring paradigms. EPA encourages all interested parties to provide the District with input during the development of these program elements.

THIS FACT SHEET:

(http://ddoe.dc.gov/ddoe/frames.asp?doc=/ddoe/lib/ddoe/information2/water.reg.leg/DC_IR_2008_Revised_9-9-2008.pdf)

4 District MS4 Annual Reports can be found at: http://ddoe.dc.gov/ddoe/cwp/view,a,1209,q,495855.asp

This Final Fact Sheet is organized to correspond with the chronological organization and numbering in today's Final Permit. Where descriptions or discussions may be relevant to more than one element of the Final Permit the reader will be referred to the relevant section(s).

To keep today's Final Fact Sheet of readable length, many of the elements included in the fact sheet published with the Draft Permit (Draft Fact Sheet) on April 21, 2010 have not been repeated, but are referenced. Readers are referred to the Draft Fact Sheet published with the Draft Permit for additional discussion on provisions that have been finalized as proposed.[5] The Final Fact Sheet does discuss significant changes since the 2004 Permit (even if discussed in the Draft Fact Sheet). The Final Fact Sheet also contains additional explanation of the Final Permit where commenters requested additional clarification. In addition, this Final Fact Sheet explains modifications to the Final Permit where provisions were changed in response to comments.

In many cases EPA made a number of very simple modifications to the Final Permit, *e.g.*, a word, phrase, or minor reorganization, simply for purposes of clarification. These modifications were not intended to change the substance of the permit provisions, only to clarify them. Most of those types of edits are not discussed in this Final Fact Sheet, but EPA has provided a Comparison Document of the Draft and Final Permits for readers who would like that level of detail.

Many commenters noted that the Draft Permit was not logically organized. EPA agrees. The major reorganization principles include:

1) There is a new Section 3, Stormwater Management Program (SWMP) Plan consolidating the various plans, strategies and other documents developed in fulfillment of permit requirements.
2) All implementation measures, *i.e.*, those stipulating management measures and implementation policies, are included in Section 4 of today's Final Permit. This includes "Source Identification" elements (Section 3 in the Draft Permit) and "Other Applicable Provisions" elements (Section 8 in the Draft Permit), which included TMDL requirements.
3) All monitoring requirements are consolidated in Section 5 of the Final Permit.
4) All reporting requirements are consolidated in Section 6 of the Final Permit.

EPA also refers readers to the Responsiveness Summary released today along with the Final Permit and Final Fact Sheet, for responses to comments and questions received on the Draft Permit. That document contains additional detailed explanations of the rationale for changes made to the Draft Permit in the Final Permit.

Finally, EPA made significant effort to avoid appending or incorporating by reference other documents containing permit requirements into the Final Permit. In the interest of clarity

5 The Permit and Fact Sheet proposed on April 21, 2010 can be viewed at: http://www.epa.gov/reg3wapd/npdes/draft_permits.html

and transparency EPA, to the extent possible, has included all requirements directly in the permit. Thus, EPA reviewed a variety of documents with relevant implementation measures, *e.g.*, TMDL Implementation Plans and the 2008 Modified Letter of Agreement to the 2004 permit[6], and translated elements of those plans and strategies into specific permit requirements that are now contained in the Final Permit. This Fact Sheet provides an explanation of the sources of provisions that are significant and are a direct result of one of those strategies.

1. DISCHARGES AUTHORIZED UNDER THIS PERMIT

(1.2 Authorized Discharges): The Final Permit authorizes certain non-stormwater discharges, including discharges from water line flushing. One commenter noted that many of these discharges, especially from potable water systems, contain concentrations of chlorine that may exceed water quality standards. EPA agrees, and has therefore clarified that dechlorinated water line flushing is authorized to be discharged under the Final Permit.

(1.4 Discharge Limitations): Comments on the language in Part 1.4 varied widely. Some commenters did not believe it was reasonable to require discharges to meet water quality standards. Other commenters believed this to be an unambiguous requirement of the Clean Water Act.

Today's Final Permit is premised upon EPA's longstanding view that the MS4 NPDES permit program is both an iterative and an adaptive management process for pollutant reduction and for achieving applicable water quality standard and/or total maximum daily load (TMDL) compliance. *See generally,* "National Pollutant Discharge Elimination System Permit Application Regulations for Stormwater Discharges," 55 F.R. 47990 (Nov. 16, 1990).

EPA is aware that many permittees, especially those in highly urbanized areas such as the District, likely will be unable to attain all applicable water quality standards within one or more MS4 permit cycles. Rather the attainment of applicable water quality standards as an incremental process is authorized under section 402(p)(3)(B)(iii) of the Clean Water Act, 33 U.S.C. § 1342(p)(3)(B)(iii), which requires an MS4 permit "to reduce the discharge of pollutants to the maximum extent practicable" (MEP) "and such other provisions" deemed appropriate to control pollutants in municipal stormwater discharges. To be clear, the goal of EPA's stormwater program is attainment of applicable water quality standards, but Congress expected that many municipal stormwater dischargers would need several permit cycles to achieve that goal.

Specifically, the Agency expects that attainment of applicable water quality standards in waters to which the District's MS4 discharges, requires staged implementation and increasingly more stringent requirements over several permitting cycles. During each cycle, EPA will continue to review deliverables from the District to ensure that its activities constitute sufficient progress toward standards attainment. With each permit reissuance EPA will continue to increase

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6 District Department of the Environment, *Modification to the Letter of Agreement dated November 27, 2007 for the NPDES Municipal Separate Storm Sewer (MS4) Permit DC0000222* (2008) http://www.epa.gov/reg3wapd/npdes/pdf/DCMS4/Letter.PDF

stringency until such time as standards are met in all receiving waters. Therefore today's Final Permit is clear that attainment of applicable water quality standards and consistency with the assumptions and requirements of any applicable WLA are requirements of the Permit, but, given the iterative nature of this requirement under CWA Section 402(p)(3)(B)(iii), the Final Permit is also clear that "compliance with all performance standards and provisions contained in the Final Permit shall constitute adequate progress toward compliance with DCWQS and WLAs for this permit term" (Section 1.4).

EPA believes that permitting authorities have the obligation to write permits with clear and enforceable provisions and thus the determination of what is the "maximum extent practicable" under a permit is one that must be made by the permitting authority and translated into provisions that are understandable and measurable. In this Final Permit EPA has carefully evaluated the maturity of the District stormwater program and the water quality status of the receiving waters, including TMDL wasteload allocations. In determining whether certain measures, actions and performance standards are practicable, EPA has also looked at other programs and measures around the country for feasibility of implementation. Therefore today's Final Permit does not qualify any provision with MEP thus leaving this determination to the discretion of the District. Instead each provision has already been determined to be the maximum extent practicable for this permit term for this discharger.

EPA modified the language in the Final Permit to provide clarity on the expectations consistent with the preceding explanation. Specifically Section 1.4.2 of the Final Permit requires that discharges 'attain' applicable wasteload allocations rather than just 'be consistent' with them, since the latter term is somewhat ambiguous.

In addition, the general discharge limitation 'no increase in pollutant loadings from discharges from the MS4 may occur to receiving waters' was removed because of the difficulty in measuring, demonstrating and enforcing this provision. Instead, consistent with EPA's belief that the Final Permit must include all of the enforceable requirements that would achieve this principle, the following discharge limitation is substituted: "comply with all other provisions and requirements contained in this permit, and in plans and schedules developed in fulfillment of this permit."

In addition, EPA made the following modifications: "Compliance with <u>the</u> performance standards and provisions contained in <u>Parts 2 through 8 of</u> this permit shall constitute adequate progress towards compliance with DCWQS <u>and WLAs for this permit term</u>" (*underlined text added*) (Section 1.4 of the Final Permit). EPA eliminated circularity with the addition of "Parts 2 through 8", clarifying that this requirement does not circle back to include the statements in 1.4.1 and 1.4.2, but rather interprets them. Also, although WLAs are a mechanism for attainment of water quality standards, EPA added the specific language "and WLAs" to make this concept explicit rather than just implicit. In addition this revised language emphasizes that the specific measures contained in the Final Permit, while appropriate for this permit term, will not necessarily constitute full compliance in subsequent permit terms. It is the expectation that with each permit reissuance, additional or enhanced requirements will be included with the objective

of ensuring that MS4 discharges do not cause or contribute to an exceedance of applicable water quality standards, including attainment of relevant WLAs.

2. LEGAL AUTHORITY, RESOURCES, AND STORMWATER PROGRAM ADMINISTRATION

(2.1 Legal Authority): Several commenters pointed out that there were a number of requirements in the Draft Permit without clear compliance schedules or deadlines, or with deadlines that did not correspond well to others in the permit. In the Final Permit, EPA has made several revisions to address these comments. For example, EPA changed a requirement that deficiencies in legal authority must be remedied "as soon as possible" to a 120-day requirement for deficiencies that can be addressed through regulation, and two years for deficiencies that require legislative action (Section 2.1.1). Also, EPA increased the compliance schedule for updating the District's stormwater regulation from twelve months to eighteen months, *id.,* so that this action could be adequately coordinated with the development of the District's new offsite mitigation/payment-in-lieu program (for more discussion see Section 4.1.3 below).

(2.2 Fiscal Resources): One commenter suggested eliminating the reference to the District's Enterprise Fund since funding was likely to come from a number of different budgets within the District. EPA agrees with this comment and has removed this reference.

On the other hand, many commenters noted that the implementation costs of the District's stormwater program will be significant. EPA agrees. The federal stormwater regulations identify the importance of adequate financial resources [40 C.F.R. §122.26(d)(1)(vi) and (d)(2)(vi)]. In addition, after seeing notable differences in the caliber of stormwater programs across the country, EPA recognizes that dedicated funding is critical for implementation of effective MS4 programs.[7,8,9] In 2009 the District established, and in 2010 revised, an impervious-based surface area fee for service to provide core funding to the stormwater program[10] (understanding that stormwater-related financing may still come from other sources as they fulfill multiple purposes, *e.g.,* street and public right-of-way retrofits). In conjunction with the 2010 rule-making to revise the fee the District issued a Frequently Asked Questions document[11] that indicates the intent to restrict this fee to its original purpose, *i.e.*, dedicated funding to implement the stormwater program and comply with MS4 permit requirements. EPA believes this action is essential, and he expects that the District will maintain a dedicated source of funding for the stormwater program.

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7 National Research Council, *Urban Stormwater Management in the United States* (2009) National Academy of Sciences http://www.nap.edu/catalog.php?record_id=12465

8 National Association of Flood and Stormwater Agencies, Funded by EPA, *Guidance for Municipal Stormwater Funding* (2006) http://www.nafsma.org/Guidance%20Manual%20Version%202X.pdf

9 EPA, *Funding Stormwater Programs* (2008) http://www.epa.gov/npdes/pubs/region3_factsheet_funding.pdf

10 District of Columbia, Rule 21-566 Stormwater Fees, http://www.dcregs.dc.gov/Gateway/RuleHome.aspx?RuleID=474056

11 District of Columbia, FAQ Document *Changes to the District's Stormwater Fee* (2010) http://ddoe.dc.gov/ddoe/frames.asp?doc=/ddoe/lib/ddoe/information2/water.reg.leg/Stormwater_Fee_FAQ_10-5-10_-final.pdf

EXHIBIT B

CALIFORNIA Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

State Water Resources Control Board

State Water Resources Control Board

Issue Paper
Municipal Storm Water Permit Receiving Water Limitations
Board Workshop
November 20, 2012

ISSUE:

The State Water Resources Control Board (State Water Board) has been asked, in public comments received on National Pollutant Discharge Elimination System (NPDES) permits for Municipal Separate Storm Sewer Systems (MS4s), to adopt permit provisions that create a partial or complete exemption from enforcement for violations of water quality standards while a discharger engages in an iterative process of improving controls (commonly referred to as a "safe harbor" provision). The State Water Board has scheduled a public workshop to consider the issue.

DISCUSSION:

Background:

The Clean Water Act generally requires NPDES permits to include technology-based effluent limitations and any more stringent limitations necessary to meet water quality standards. In the context of NPDES permits for MS4s, however, the Clean Water Act does not reference the requirement to meet water quality standards. MS4 discharges must meet a technology-based standard of reducing pollutants in the discharge to the Maximum Extent Practicable (MEP), but requirements to meet water quality standards are at the discretion of the permitting agency.[1] Further, under the Porter-Cologne Water Quality Control Act, waste discharge requirements must implement applicable water quality control plans, including water quality objectives; however, the Porter-Cologne Act also affords the State Water Board and regional water quality control boards (collectively, Water Boards) flexibility to consider other factors, such as economics, when establishing any NPDES permit requirements that are more stringent than required by the Clean Water Act.[2]

The State Water Board has exercised its discretion with regard to requiring compliance with water quality standards in MS4 permits by directing, in precedential orders, that MS4 permits contain provisions requiring discharges to be controlled so as not to cause or contribute to exceedances of water quality standards in receiving waters.[3] However, consistent with federal

[1] 33 U.S.C. § 1342(p); *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159.

[2] Wat. Code, §§ 13241, 13263; *City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613.

[3] SWRCB Order WQ 98-01 (*Environmental Health Coalition*), WQ 99-05 (*Environmental Health Coalition)*.

law, the State Water Board has found it appropriate to implement Best Management Practices (BMPs) in lieu of numeric water quality-based effluent limitations to meet water quality standards.[4] Additionally, in lieu of "strict compliance" with water quality standards, the State Water Board has prescribed an iterative process whereby an exceedance of a water quality standard triggers a process of BMP improvements: reporting of the violation, submission of a report describing proposed improvements to BMPs expected to better meet water quality standards, and implementation of these new BMPs.

While the Water Boards have generally directed dischargers to achieve compliance with water quality standards by improving control measures through the iterative process, the iterative process does not provide a "safe harbor" to MS4 permittees: that is, when a discharger is shown to be causing or contributing to an exceedance of water quality standards, that discharger is in violation of the relevant discharge prohibitions and receiving water limitations of the permit and potentially subject to enforcement by the Water Boards or through a citizen suit, even if the discharger is actively engaged in the iterative process. Despite the lack of a safe harbor provision, however, the Water Boards have, as a matter of practice, declined to initiate enforcement actions against MS4 permittees who have been actively engaged in the iterative process. The Water Boards' decisions to decline to include a safe harbor in MS4 permits have been upheld by courts of appeal.[5]

Need for and Purpose of Workshop:

The lack of a safe harbor in the iterative process was recently highlighted by the Ninth Circuit's decision in a citizen suit brought by the Natural Resources Defense Council (NRDC) against the County of Los Angeles and the Los Angeles County Flood Control District for violations of the receiving water limitations of their MS4 permit. The Ninth Circuit confirmed that, as the receiving water limitations of the Water Boards' MS4 permits are currently drafted, engagement in the iterative process does not excuse liability for violations of water quality standards.[6]

As the storm water management programs of municipalities have matured, an increasing body of monitoring data indicates that water quality standards are in fact not being met by many MS4s. MS4s accordingly assert that the receiving water limitations and iterative process provisions of the Water Boards' permits do not afford them with a viable path to compliance for these violations, which may take years of technical efforts to correct, especially for wet weather discharges. MS4s argue that they are increasingly vulnerable to citizen suits and/or Water Board enforcement. This concern has been raised by the California Stormwater Quality Association (CASQA) in comments on the proposed Phase II MS4 permit and by the California Department of Transportation (Caltrans) in comments on the Caltrans MS4 permit adopted

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[4] *See* SWRCB Orders WQ 91-03 (*Citizens for a Better Environment)*, WQ 98-01 (*Environmental Health Coalition*), WQ 2001-15 (*Building Industry Association of San Diego County*); *See also* 40 C.F.R. § 122.44(k); Interim Permitting Approach for Water Quality-Based Effluent Limitations In Storm Water Permits, USEPA, September 1995. In such orders and guidance, the State Water Board and Environmental Protection Agency acknowledge that the storm water program may evolve over time to incorporate stricter limitations, including improved BMPs to meet water quality standards or numeric water quality based effluent limitations.

[5] *Building Industry Assn. of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866; *City of Rancho Cucamonga v. Regional Water Quality Control Bd.* (2006) 135 Cal.App.4th 1377; see also *Natural Resources Defense Council v. County of Los Angeles* (9th Cir. 2011) 673 F.3d 880, 897, n.7.

[6] *Natural Resources Defense Council v. County of Los Angeles, supra*, 673 F.3d at p. 897. On July 13, 2012, the United States Supreme Court granted review of this case on other grounds.

September 19, 2012, as well as by numerous MS4s and interested persons in comments on both permits. The issue is additionally relevant to the Phase I MS4 permits issued by the regional water quality control boards.[7]

At the same time, the environmental community has commented that the iterative process has been underutilized and ineffective to date in bringing MS4 discharges into compliance with water quality standards. Environmental parties argue that direct enforcement of water quality standards is necessary to protect water quality, especially in such second- or third-generation permits where dischargers have already had a number of years to come into compliance.

Because of the broad applicability of any policy decisions regarding the receiving water limitations and iterative process provisions, the State Water Board is holding a public workshop to consider several alternatives in addressing the issue and to seek public input on these alternatives. Following the workshop, the State Water Board may propose revisions to the receiving water limitations in the Caltrans MS4 and Phase II MS4 permits, and as necessary, re-open those permits after public review and comment, to make the revisions.

ALTERNATIVES FOR CONSIDERATION:

The State Water Board may consider the alternatives below, individually or in combination, to address concerns with the receiving water limitations in the Caltrans or Phase II MS4 permits. While the listed alternatives attempt to capture the range of alternatives before the State Water Board, the Board welcomes comments proposing other options and will not be limiting its consideration to the alternatives as listed in this issue paper.

The receiving water limitations language prescribed by State Water Board Order WQ 99-05 is attached as Attachment 1 and forms the basis of Alternative 1. CASQA has submitted specific proposed language for the Receiving Water Limitations provision of the proposed Phase II MS4 permit (CASQA Proposal). The CASQA Proposal is attached as Attachment 2 and is referenced as appropriate in the discussion of the alternatives below.

Alternative 1: Keep the status quo of no safe harbor.

This alternative makes no changes to the existing State Water Board approach or to the current language of the adopted Caltrans MS4 permit or the proposed Phase II MS4 permit. As stated previously, the current MS4 permit provisions laying out the iterative process are based on language set forth in precedential State Water Board orders. (See Attachment 1.) Alternative 1 adheres to the prescribed language. Under this alternative, the Water Boards may choose to exercise their enforcement discretion to refrain from taking action against dischargers engaged in good faith implementation of the iterative process; however, they would not be constrained from enforcing the receiving water limitations when an MS4 causes or contributes to exceedances of water quality standards. As a limitation within an NPDES permit, dischargers who cause or contribute to an exceedance of water quality standards could be subject to citizen suits.

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[7] Note that the issue is not relevant to any other NPDES permits, including permits for storm water discharges associated with industrial activity, because all other NPDES permits must include technology-based effluent limitations and any more stringent limitations necessary to meet water quality standards. (33 U.S.C. § 1311(b)(1)(C).)

Alternative 2: No safe harbor, but provide greater clarity and specificity for iterative process implementation and wet weather data analysis.

Greater clarity and specificity in the MS4 permits as to the iterative process requirements may result in increased efforts to improve controls and achieve compliance. Such clarity and specificity may include:

1. Clarification on how compliance with the relevant discharge prohibitions and receiving water limitations is determined, including type and frequency of monitoring;
2. Clarification that dischargers must begin the iterative process after documentation of violations without waiting to be directed to do so by the Water Boards;
3. Specification of the minimum efforts that will constitute meaningful compliance with the iterative process;
4. Specification of the scope of any corrective action, including whether it applies only at the location where exceedances are measured or throughout the relevant watershed;
5. Specification of additional wet weather data analysis to better define and assess the impact of municipal storm water discharges on receiving waters, as well as the efficacy of specific best management practices.

As the MS4 program continues to mature and more data becomes available, this alternative may be enhanced by the development of water quality-based effluent limitations for pollutants, as appropriate, as a means of determining compliance with receiving water limitations. In addition, the enhanced wet weather data could be used to identify surrogates that could be used as a measure of protecting beneficial uses. In time, the data could be used to develop actual wet weather water quality standards or wet weather implementation provisions for existing water quality standards that could be applied consistently on a statewide basis.

Given the nature of storm water discharges and of MS4s, questions such as where and how compliance with water quality standards should be measured and how narrowly or broadly corrective actions should be applied, pose complicated technical issues that require careful study and consideration. These challenges notwithstanding, water quality improvements are more likely to be achieved as the iterative process becomes automatic and dischargers follow clear guidelines for determining and addressing non-compliance with permit terms. Such improvements may dissuade the Water Boards and the public from bringing enforcement actions/citizen suits for all except the most egregious and repeated violations.

In addition to being a stand-alone alternative, Alternative 2 may be considered in combination with Alternatives 3 through 5. The CASQA Proposal incorporates some greater specificity in the iterative process requirements as a component of its proposed receiving water limitations.

Alternative 3: Safe harbor that applies only if a discharger is in compliance with the implementation provisions of an approved TMDL.

Under Alternative 3, the receiving water limitations would be amended to provide a safe harbor for permittees that are in compliance with the implementation provisions of a TMDL. In effect, as long as the permittee is in compliance with the TMDL (including any compliance schedule) the terms of the TMDL would replace the requirement to comply with water quality standards for the pollutants that are covered by the TMDL.

The CASQA Proposal contemplates a safe harbor for dischargers in compliance with a TMDL as a component of the receiving water limitations.

Alternative 4: Safe harbor that applies if a discharger is in compliance with the implementation provisions of an approved TMDL, as in Alternative 3, and, in addition, that applies when the discharger engages in good faith compliance with the iterative process for exceedances caused by wet weather discharges.

In addition to the safe harbor for TMDL implementation, Alternative 4 would provide a safe harbor when dischargers engage in the iterative process in good faith to address violations of permit terms caused by wet weather discharges. Thus, if a storm water discharge from an MS4 is causing or contributing to an exceedance of a water quality standard in the receiving water, the exceedance would not constitute a violation of the permit as long as the discharger was engaged in good faith efforts to address the exceedance through improved controls. Alternative 4 recognizes that wet weather discharges from MS4s frequently cause or contribute to violations of water quality standards and allows the MS4s time to address these violations by improving control measures.

However, the safe harbor would not extend to dry weather discharges. Non-storm water discharges are generally prohibited in MS4 permits and only a few categories of non-storm water discharges are exempted from the prohibition, with the condition that these exempted discharges also be prohibited if they are identified as sources of pollutants to receiving waters.

Alternative 5: Full safe harbor.

This alternative would provide a full safe harbor to dischargers complying with the implementation provisions of a TMDL or engaging in the iterative process to address exceedances caused by wet or dry weather discharges.

The CASQA Proposal attached provides for a full safe harbor.

Attachments Removed

EXHIBIT C

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RIVERSIDE COUNTY FLOOD CONTROL
AND WATER CONSERVATION DISTRICT

November 13, 2012

Honorable Members of the State Water Resources Control Board
Attn: Ms. Jeanine Townsend, Clerk to the Board
State Water Resources Control Board
1001 I Street, 24th Floor
Sacramento, CA 95814

Dear Honorable Board Members and Ms. Townsend:

Re: Comment Letter – Receiving Water Limitations Language Workshop

I am writing on behalf of the Riverside County Flood Control and Water Conservation District ("District") regarding the State Water Resources Control Board's consideration of Receiving Water Limitations ("RWL") language in MS4 permits. This review was triggered by a decision of the Ninth Circuit United States Court of Appeals in *Natural Resources Defense Council v. County of Los Angeles* (9th Cir. 2011) 673 F.3d 880, *cert granted,* __ U.S. __ (June 25, 2012) ("*NRDC*"). This letter is being submitted in advance of the State Board's November 20, 2012 workshop on reform of the RWL language to be incorporated into MS4 permits as a matter of statewide policy.

The District is the Principal Permittee for three Phase I MS4 permits applicable to municipalities across Riverside County: Order R8-2010-0033, issued by the Santa Ana Regional Water Board to municipalities within the Santa Ana River Region of Riverside County; Order R9-2010-016, issued by the San Diego Regional Water Board to municipalities within the Santa Margarita Region of Riverside County; and Order R7-2008-0001, issued by the Colorado River Regional Water Board to municipalities within the Whitewater River Region of Riverside County. Given our unique perspective as the manager of three Phase 1 MS4 permits, the District and its staff thus, have considerable experience and expertise in developing and administering MS4 permits, and a keen understanding of the issues that the above mentioned court case creates.

The District strongly supports reform of the RWL language to make clear the State Board's often-expressed intention that MS4 Permittees' compliance with RWL be effectuated through an iterative process. However, under the Ninth Circuit's interpretation, any MS4 discharge that causes or contributes to an exceedance of a Water Quality Standard subjects the MS4 Permittee to civil penalty liability, injunctive relief and the payment of attorneys' fees in an action brought by a citizen plaintiff, even where the Permittee is fully implementing the programmatic requirements of their MS4 Permit.

The District supports the California Stormwater Quality Association's ("CASQA") efforts to obtain RWL language that ensures that the iterative process favored by the State Board is honored. The District also supports the comments of the California State Association of Counties, and believes the proposed RWL language attached to those comments is a step in the right direction.

This letter contains additional District comments about the RWL language and the iterative process. We believe that they are best expressed in terms of correcting misperceptions regarding the current RWL language, as interpreted by the Ninth Circuit.

Misperception Number One: Strict compliance with Water Quality Standards is required of MS4 Permittees by the Clean Water Act.

The Clean Water Act provides that MS4 discharges must control pollutants in discharges from the MS4 to the "Maximum Extent Practicable" (33 U.S.C. § 1342(p)(3)(B)(iii)). Unlike the case with other NPDES Permittees, the Clean Water Act does not require that municipalities strictly comply with Water Quality Standards, as determined by the Ninth Circuit in *Browner v. Defenders of Wildlife*. The State Board's own precedential Order WQ 2001-15 recognizes this fact and states that the RWL language was intended to be consistent with the *Browner* case. In that Order, which interpreted RWL language similar to that in *NRDC*, the Board stated:

> *[O]ur language, similar to the U.S. EPA's permit language discussed in the Browner case, does not require strict compliance with water quality standards. Our language requires that storm water management plans be designed to achieve compliance with water quality standards. Compliance is to be achieved over time, through an iterative approach requiring improved BMPs. As pointed out by the Browner court, there is nothing inconsistent between this approach and the determination that the Clean Water Act does not mandate strict compliance with water quality standards. [Order WQ 2001-15 at 7 (emphasis added)].*

Unfortunately, the Ninth Circuit completely disregarded this language, and the Order, in holding that strict compliance was required of MS4 Permittees.

USEPA itself has issued MS4 permits (in non-delegated states) that do not contain RWL language requiring strict compliance with Water Quality Standards. Therefore, it is clear that such compliance is not required by the Clean Water Act nor is such compliance established by USEPA policy. The most prominent example of a recent MS4 permit promulgated by USEPA is that for the District of Columbia ("DC Permit") (relevant portions of which are attached as Exhibit A), which was adopted in 2011.

Part 1.4 of the DC Permit contains the requirements relating to Water Quality Standards and provides, in relevant part: "Compliance with the performance standards and provisions contained in Parts 2 through 8 of the permit shall constitute adequate progress towards compliance with DCWQS [water quality standards] and WLAs [established under TMDLs] for this permit term." The DC Permit Fact Sheet explains the rationale for that language as follows [DC Permit Fact Sheet, Pages 5-6, emphasis added, attached as Exhibit B]:

> *Comments on the language in Part 1.4 varied widely. Some commenters did not believe it was reasonable to require discharges to meet water quality standards. Other commenters believed this to be an unambiguous requirement of the Clean Water Act.*

Today's Final Permit is premised upon **EPA's longstanding view that the MS4 NPDES permit program is both an iterative and an adaptive management process for pollutant reduction and for achieving applicable water quality standard and/or total maximum daily load (TMDL) compliance.** *See generally, "National Pollutant Discharge Elimination System Permit Application Regulations for Stormwater Discharges," 55 F.R. 47990 (Nov. 16, 1990).*

EPA is aware that many Permittees, especially those in highly urbanized areas such as the District, likely will be unable to attain all applicable water quality standards within one or more MS4 permit cycles. *Rather the attainment of applicable water quality standards* **as an incremental process** *is authorized under section 402(p)(3)(B)(iii) of the Clean Water Act, 33 U.S.C. § 1342(p)(3)(B)(iii), which requires an MS4 permit "to reduce the discharge of pollutants to the maximum extent practicable" (MEP) "and such other provisions" deemed appropriate to control pollutants in municipal stormwater discharges.* **To be clear, the goal of EPA's stormwater program is attainment of applicable water quality standards, but Congress expected that many municipal stormwater dischargers would need several permit cycles to achieve that goal.**

Specifically, the Agency expects that attainment of applicable water quality standards in waters to which the District's MS4 discharges, requires staged implementation and increasingly more stringent requirements over several permitting cycles. During each cycle, EPA will continue to review deliverables from the District to ensure that its activities constitute sufficient progress toward standards attainment. With each permit reissuance EPA will continue to increase stringency until such time as standards are met in all receiving waters. **Therefore today's Final Permit is clear that attainment of applicable water quality standards and consistency with the assumptions and requirements of any applicable WLA are requirements of the Permit, but, given the iterative nature of this requirement under CWA Section 402(p)(3)(B)(iii), the Final Permit is also clear that "compliance with all performance standards and provisions contained in the Final Permit shall constitute adequate progress toward compliance with DCWQS and WLAs for this permit term" (Section 1.4).**

USEPA is now proposing clarifying changes to this language and to other sections of the DC Permit as the result of a settlement with various parties. However, those changes do not require strict compliance with Water Quality Standards, but rather compliance through the programs developed under the Permit.

The State Board is thus, free to adopt new RWL language that effectuates its previously expressed intent that MS4 permits not require strict compliance with Water Quality Standards with regard to contributions from discharges from MS4s.

Misperception Number Two: The MS4 Permittees are Seeking a "Safe Harbor" that would Insulate them from Responsibility Under the Clean Water Act.

While State Board staff's "Issue Paper" uses the term "safe harbor" in describing the iterative process, the District believes that this is fundamentally misleading. Even a cursory review of the terms of a typical MS4 permit in California reveals that it is full of compliance points. In the three MS4 Permits in which the District serves as Principal Permittee, literally every sentence is a separate point of compliance.

This fact is supported by the language of the Permits themselves. For example, in Order R8-2010-0033 Part XX.G provides: **"The Permittees must comply with all terms, requirements, and conditions of this Order. Any violation of this Order constitutes a violation of the CWA, its regulations and the California Water Code, and is grounds for enforcement action . . . ."** (emphasis added). Similar provisions are contained in the other two Riverside County MS4 Permits. Even without the strict Water Quality Standard language imposed under the Ninth Circuit's opinion, there is no "safe harbor" from liability under the Clean Water Act or, where applicable, the California Water Code, for any Permittee that fails to fully implement each the detailed and prescriptive requirements of its MS4 Permit.

There is a fundamental difference however, between fully complying with activities within the control and responsibility of the Permittees, such as monitoring, implementing BMPs and performing other programmatic requirements of the MS4 Permit; and being forced to guarantee that MS4 discharges will not cause or contribute to exceedances of Water Quality Standards in Receiving Waters, a guarantee that the Permittees' have no ability to make.

What the District and other MS4 Permittees seek is relief from what is essentially "guaranteed non-compliance" where a Permittee can be found in violation of their MS4 Permit even if the exceedance occurs at no fault of or failure by the Permittee, or put another way, even in circumstances where there is nothing a Permittee could have done to prevent that exceedance from occurring. In such a case, the Permittee can be held liable for potentially millions of dollars in legal costs, penalties and other expenses. We note that the City of Malibu, a city of only 13,000 residents, spent more than $2 million in defending against a citizen suit filed with respect to its MS4 Permit and more than $6 million to settle the case, including payment of $750,000 in attorney fees to plaintiffs. Given the tremendous financial challenges faced by every California municipality, including the District, the County of Riverside and the Permittee cities within the County, such a diversion of resources that otherwise would be directed at clean water programs or other vital municipal programs is a poor policy choice. And, as noted, it is not a policy choice that is required by the Clean Water Act, nor is it required by USEPA in their own Permits.

The District recognizes that regulatory enforcement actions and citizen suits are authorized by the Clean Water Act and that such suits may be an appropriate remedy where, for example, a Permittee has failed to comply with the programmatic requirements of its MS4 Permit. Where, however, the Permittees are complying with those requirements in good faith but, due to circumstances beyond

their control, their MS4 discharge causes or contributes to a Water Quality Standard exceedance in Receiving Waters, a citizen suit based on those exceedances potentially throws away the work done by the Permittees and the Water Boards under the MS4 Permit, as discussed below.

Misperception Number Three: MS4 can achieve compliance with strict Water Quality Standards.

MS4 Permittees cannot guarantee that discharges from their MS4s will in fact, not cause or contribute to an exceedance of Water Quality Standards in a Receiving Water. The monitoring conducted under our MS4 Permits reflects exceedances of various Water Quality Standards in Receiving Waters, and we understand that such results are typical for MS4 discharges around the state (please see Pages 2-3 of the CASQA comment letter dated November 2, 2012). The extreme variability of stormwater quality and quantity itself (which, in Southern California, arrives infrequently and from widely varying storm sizes) combined with a multitude of potential pollutant sources beyond a Permittee's ability to truly "control", make it impossible for a municipality to ensure that no discharges from its MS4 will ever cause or contribute to exceedances of Water Quality Standards in Receiving Waters. This was recognized by the Issue Paper released by State Board staff in preparation for the November 20th workshop, which found that as "the storm water management programs of municipalities have matured, **an increasing body of monitoring data indicates that water quality standards are in fact not being met by many MS4s**" (Issue Paper, Page 2 (emphasis supplied)).

Thus, even if municipal Permittees are to be held strictly liable for the ensuring that no discharges from their MS4s cause or contribute to an exceedance of Water Quality Standards, as the Ninth Circuit has interpreted the current RWL language, those Permittees have no ability to attain those standards. The reasons are several-fold and include the following:

1) Unlike an industrial NPDES Permittee, a municipal Permittee is not typically the source of the pollutants in the MS4 discharge (whether wet or dry). The municipality can regulate sources to some degree (through, for example, the operation of structural and non-structural BMPs and implementation of an Illegal Connection/Illicit Discharge program), but the municipality cannot guarantee that pollutants will not enter the MS4 and then be discharged into the Receiving Waters.

2) Municipalities cannot control natural sources of pollutants that are discharged through the MS4. Monitoring has indicated that many pollutants are likely from natural and not anthropogenic sources.

3) While Permittees conduct extensive public education programs as part of their MS4 programs, municipalities cannot "control" human behavior, or "prevent" an individual from taking an action that might cause pollution to enter the MS4. As an example, a resident may, despite all ordinances, regulations, potential penalties or enforcement, public outreach, available BMPs, etc., choose not to pick up after their pets, and

stormwater may, through no fault of the Permittee, pick up animal waste and deposit into the MS4.

4) MS4 Permittees cannot "prevent" flows from entering their MS4. To protect the health and property of their residents, MS4 operators must allow the legitimate flows of water into their drains. This is especially true for the District, which is charged directly by the Legislature [in Water Code App. §48-9] with the task of taking necessary steps to protect the people, properties and watersheds of Riverside County from the negative impacts of flooding. The District cannot, in effect, cause flooding by preventing flows from entering their storm drain, simply because such flows may contain pollutants that cause a violation of the Receiving Waters Limitation provisions of their MS4 Permits. In fact, California law requires downstream property owners (such as MS4 operators) to accept flows from upstream property owners.

5) Further, the authorities granted to flood control districts, such as this District, by the Legislature are narrow and do not include the authority to condition or regulate the quality or nature of stormwater runoff discharged from up gradient properties. This responsibility is appropriately assigned by the Legislature to the Regional Boards.

Similarly, MS4 Permittees cannot guarantee compliance with Water Quality Standards in dry weather. "Alternative 4" in the staff's Issue Paper suggests an alternative RWL approach that would not extend the iterative approach to dry weather discharges. The District submits that this alternative does not reflect the reality of urban runoff. Monitoring conducted under the Riverside County MS4 Permits reflects exceedances of Water Quality Standards during dry weather as well as wet weather. There is no justification for imposition of strict liability for exceedances during such conditions, for the following reasons:

1) During dry weather, other NPDES-permitted discharges continue to flow into the Receiving Waters. For example, much of the flow in the Santa Ana River during dry weather conditions is from non-MS4 sources, such as publicly owned treatment works. Additionally, numerous other separate NPDES-permitted discharges will occur, potentially at concentrations of pollutants that exceed Water Quality Standards. Evidence generated during the *NRDC* case involving the County of Los Angeles, for example, indicated that NPDES permits covering hundreds of these dischargers, including POTWs allowed the discharge of pollutants at concentrations *greater* than Water Quality Standards. Because of these discharges, which are legal and authorized by the Regional Boards, the MS4 Permittees have essentially no more control over compliance with Water Quality Standards in dry weather than they would have during wet weather conditions.

2) Accidental or even intentional illicit discharges by third parties into the MS4 obviously can occur during dry weather as well as wet weather. Such discharges would potentially have an even greater impact on sampling, since they are not diluted by large volumes of stormwater. For example, a vehicular accident recently caused hundreds of gallons of

asphalt tar to enter Sandia Creek, a Receiving Water in Riverside County. While this spill was not discharged through an MS4, if the vehicular accident had occurred in another portion of the watershed, the spill could feasibly have entered into and been discharged from an MS4. Similarly in many places throughout the State, sanitary sewer systems are owned and operated by special districts that have no relation to the MS4 Permittees that own or operate the MS4 systems. Nevertheless, an overflow of such sanitary sewer systems may cause an unavoidable discharge into, and from a Permittee-owned MS4. Such accidental or illicit discharges cannot be "prevented" or "controlled" by the Permittees except to the extent that they can be cleaned up or blocked if promptly reported. However, if the discharge has reached Receiving Waters and caused a measured exceedance of Water Quality Standards, under the Ninth Circuit's interpretation, liability for civil penalties, injunctive relief and attorneys fees will attach to the MS4 Permittee.

3) Enforcing strict Water Quality Standard limits in dry or wet weather is counter-productive to the watershed planning-based MS4 Permits currently being promulgated by many regional water boards. Enforcing such limits will divert Permittee attention and resources from watershed-based, monitoring-heavy compliance programs, as will be discussed in greater detail below.

In essence, under the Ninth Circuit's interpretation of the current RWL language, the District, and potentially every other MS4 Permittee in the state, is in violation of its Permit any time that an exceedance of a Water Quality Standard is recorded and attributed to a discharge from its MS4. This means that the Regional Water Boards have issued, and continue to adopt permits that include RWL language **which cannot be complied with**. The Clean Water Act, however, does not require Permittees to achieve the impossible. *See, e.g., Hughey v. JMS Development Corp.* (11th Cir. 1996) 78 F.3d 1523, 1530 ("In interpreting the liability provisions of the CWA, we realize that Congress is presumed not to have intended absurd (impossible) results.").

Misperception Number Four: The Current RWL Language is more Protective of Receiving Water Quality.

This statement is not only untrue but maintaining the current RWL language actually **impedes** efforts to protect Receiving Water Quality.

We understand that some stakeholders believe that there should be Numeric Effluent Limitations (NELs) contained in the MS4 Permits for purposes of accountability. In response, we note that many MS4 permits now contain numeric Stormwater and Non-stormwater Action Levels ("SALs" and "NALs") or other numeric targets or goals, the exceedance of which trigger specific compliance responses by the Permittees. It is these action levels (which were advocated by the Blue Ribbon Panel established by the State Board to investigate the appropriateness of NELs in MS4 permits) which provide such "numeric" accountability. This is in addition to the numerous other compliance documentation and reporting provisions required of MS4 Permittees that also provide measures of accountability.

More importantly, the current RWL language as interpreted by the Ninth Circuit actually impedes efforts by municipalities to protect water quality. First, by requiring immediate compliance, the language undermines efforts to bring Water Quality Standard-impaired waterbodies into compliance through the Total Maximum Daily Load ("TMDL") program. TMDLs are designed with the recognition that, due to the complexity of the issues causing the waterbody to be impaired in the first place, meeting these requirements cannot be achieved immediately. Therefore, TMDL compliance plans include timelines to achieve such compliance over periods of years and sometimes decades.

Second, most MS4 permits have begun incorporating sophisticated watershed management plans, which prioritize pollutants by waterbody and attempt, through aggressive monitoring and source identification efforts, to identify and address the sources of those prioritized pollutants. Municipalities subject to strict RWL language will have no ability to prioritize pollutants, since they must address any pollutant that exceeds a Water Quality Standard, irrespective of the relative impact that that discharge may have had upon the environment or beneficial uses. Moreover, these watershed management plan approaches employ cooperative monitoring and other watershed-based approaches. Permittees faced with potential liability for any exceedance of Water Quality Standards in Receiving Waters that may be caused or contributed to by discharges of their MS4s, will not likely volunteer to cooperate on any watershed-based approach, if cooperation could subject them to additional unnecessary liability.

Third, in a citizen suit brought under the Clean Water Act, a federal judge is free to impose any appropriate injunctive relief to enforce a permit (33 U.S.C. § 1365(a)). Thus, for example, a court could ignore the provisions of a MS4 permit in ordering municipal defendants to address Water Quality Standard exceedances in Receiving Water. This means that the thousands of people-hours invested in the Permit's development, implementation and oversight by municipalities, the Regional Water Boards and other stakeholders would be wasted. In essence, under the Ninth Circuit's reading of the RWL language, all other language in an MS4 permit appears to be superfluous, since the RWL language would control all compliance efforts. This result, of course, is not required by plain language of the Clean Water Act.

Fourth, if a municipality is in unavoidable and automatic non-compliance with the requirements of its MS4 Permit, it will be unable to justify budgeting for water quality management programs and BMPs otherwise required by the Permit as the municipality will simply receive no benefit from making compliance investments. To gain public support for stormwater programs, a municipality must demonstrate to its residents that such investments will constitute compliance with the Permit.

Discussion of Alternatives

The State Board staff's Issue Paper sets forth five alternatives for consideration. Alternative 1, no change in the current RWL language, is completely unacceptable to the District (and, we believe, to other municipalities across the state) because it fails to address the "guaranteed non-compliance" problem of the current language.

Alternative 2, which proposes to maintain the language that puts the MS4 Permittees in a situation of unavoidable and potentially "guaranteed" non-compliance, but would add greater specification as to how the iterative process might be carried out, is also unacceptable as the MS4 Permittees will still have no viable means to ensure their compliance with the RWL language. While the District does not object in principle to RWL language that spells out clearly, and in achievable terms, what is required of MS4 Permittees when exceedances are recorded, such a change alone does not address the fundamental issues identified in this letter.

Alternative 3, which proposes to provide an iterative process for compliance with the RWL only for pollutants being addressed by dischargers in compliance with an approved TMDL, is better than the first two alternatives, but is still entirely insufficient. By failing to provide a viable means for compliance with the RWL language for non-TMDL pollutants, this alternative language would force Permittees into unavoidable non-compliance, and require them to redirect their efforts and resources away from the TMDL activities, to those other pollutants, due to the strict liability attached to those exceedances. This would be a poor policy choice, as pollutants that are not subject to a TMDL may have significantly less, or even no impact on beneficial uses in the Receiving Waters, as noted in the CASQA comment letter.

Alternative 4, which excludes dry weather discharges from the iterative process to comply with the RWL, is unacceptable for the reasons previously set forth regarding an MS4 Permittees inability to truly "prevent" or "control" accidental or illegal dry weather discharges.

Alternative 5, which provides viable means for compliance with the RWL, for all types of MS4 discharges, is the only viable solution among the alternatives presented by State Board staff. In an era of limited budgets, the only and best way to make progress toward improving the quality our Receiving Waters, is to provide MS4 Permittees the ability to prioritize their efforts, as required in the Watershed Management Plan provisions contained in the most recent MS4 Permits, including the Los Angeles County Permit and the proposed Regional Permit for the San Diego Regional Water Board. As previously discussed, such prioritization cannot occur in the context of strict liability for the exceedance of Water Quality Standards in the Receiving Waters. For all of the reasons set forth in this letter, no other alternative makes policy sense or is congruent with the Maximum Extent Practicable standard in the Clean Water Act.

The District would add that Alternative 5 should additionally incorporate the concept of achieving RWL compliance through watershed management plans, and requests the Board to direct staff to work with stakeholders to ensure that any revised RWL language does not force intermittent or minor exceedances of Water Quality Standards to become de-facto higher priorities than those set by the watershed stakeholders.

In summary, the District supports CASQA, the California State Association of Counties and other municipal stakeholders in advocating for a fully iterative and viable approach to compliance with RWL language in both wet and dry weather conditions. Only when such an approach is in place and endorsed by the State Board will Permittees, including the District, feel confident that they can focus

fully on efforts to address pollutants in discharges into and from their MS4s, and not on preparing for costly and pointless litigation.

The District therefore, respectfully requests the State Board direct its staff to commence development of new language providing for an enforceable, iterative and viable process for MS4 Permittees to comply with the RWL language included in MS4 permits.

We wish to thank you and State Board staff for your consideration of these comments and any further comments, written or oral, that the District may make on these important issues.

Very truly yours,

Steve Thomas

for WARREN D. WILLIAMS
General Manager-Chief Engineer

CP:cw
P8/150189

EXHIBIT D

FILED
JAN - 3 2013
CLERK, U.S. DISTRICT COURT
ALEXANDRIA, VIRGINIA

IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF VIRGINIA
Alexandria Division

VIRGINIA DEPARTMENT OF TRANSPORTATION, ET AL, Plaintiffs, -v- UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, ET AL, Defendants.	Civil Action No. 1:12-CV-775

Memorandum Opinion

Before the Court is the Plaintiffs' motion for judgment on the pleadings under Federal Rule of Civil Procedure 12(c). The Defendants opposed the motion, and the Plaintiffs replied. The Court heard oral arguments on December 14, 2012 and now issues this memorandum opinion and accompanying order granting the Plaintiffs' motion.

Background

The Clean Water Act, 33 U.S.C. § 1251 et seq., establishes the basic structure for regulating discharge of pollutants into the waters of the United States, and provides certain mechanisms to improve and maintain the quality of surface waters.

One such mechanism is the requirement that states identify "designated uses" for each body of water within their borders, as well as "water quality criteria" sufficient to support those uses. 33 U.S.C. § 1313(c)(2)(A). The Environmental Protection Agency ("EPA") evaluates the uses and criteria developed by the states, and either approves them or else proposes and

promulgates its own set of standards. § 1313(c)(3).

Once the standards are in place, each state is required to maintain a list—also subject to approval or modification by EPA—of its waterbodies that are "impaired" because they do not meet their respective water quality criteria. 33 U.S.C. § 1313(d)(1)(A). For each waterbody on the impaired list, the state is required to establish a set of total maximum daily loads ("TMDLs") sufficient to bring the body back into compliance with its water quality criteria. § 1313(d)(1)(C). Each TMDL establishes the maximum amount of a pollutant that may be added to the waterbody daily from all sources (runoff, point sources, etc.). EPA is required to publish a list of pollutants suitable for maximum daily load measurement, § 1314(a)(2)(D), and it has determined that *all* pollutants are suitable for TMDLs, *see* Total Maximum Daily Loads Under Clean Water Act, 43 Fed. Reg. 60,662. Therefore, any pollutant that falls within the relatively broad definition of "pollutant" set forth in § 1362(6) may be regulated via TMDL. EPA can approve or modify as it sees fit TMDLs proposed by the states. § 1313(d)(2).

Here the state in question is Virginia, and the waterbody is a 25-mile long tributary of the Potomac River, located in Fairfax County, called Accotink Creek. The creek has been the subject of litigation in the past that is not relevant to this matter except the result: EPA was required to set TMDLs for Accotink Creek once Virginia failed to do so by a certain date. Specifically, the creek had been identified as having "benthic impairments," which is to say the community of organisms that live on or near the bottom of the creek were not as numerous or healthy as they should be. EPA was to set appropriate TMDLs to improve the health of the benthic community in Accotink Creek.

On April 18, 2011, EPA established a TMDL for Accotink Creek which limited the flow rate of stormwater into Accotink Creek to 681.8 ft^3/acre-day. The TMDL was designed to

regulate the amount of sediment in the Accotink, because EPA believed sediment was a primary cause of the benthic impairment. Both parties agree that sediment is a pollutant, and that stormwater is not. EPA refers to stormwater flow rate as a "surrogate" for sediment.

The Plaintiffs are now challenging the TMDL on multiple grounds, but presently before the Court is a single issue: Does the Clean Water Act authorize the EPA to regulate the level of a pollutant in Accotink Creek by establishing a TMDL for the flow of a nonpollutant into the creek?

Analysis

I. Standard of Review

Count I of the complaint, at issue here, is brought under the Administrative Procedures Act. *See* Comp. ¶ 169. The APA "confines judicial review of executive branch decisions to the administrative record of proceedings before the pertinent agency." *Shipbuilders Council of Am. V. U.S. Dept. of Homeland Sec.*, 770 F. Supp. 2d 793, 802 (E.D. Va. 2011). As such, the district court "sits as an appellate tribunal," and APA claims can be resolved equally well in the context of Rule 12 or Rule 56. *Univ. Med. Ctr. Of S. Nev. V. Shalala*, 173 F.3d 438, 441 n. 3 (D.C. Cir. 1999).

Because Count I presents a question of statutory interpretation, the Court reviews EPA's decision using the two-step analysis set forth in *Chevron, U.S.A., Inc. v. NRDC, Inc.*, 467 U.S. 837 (1984). For a given question of statutory interpretation, the first step under *Chevron* is to determine whether Congress addressed the "precise question at issue." 467 U.S. at 842. "If the intent of Congress is clear, that is the end of the matter . . . ." *Id.* If the Court cannot find that Congress has squarely addressed the question, the Court must move to Chevron's second step. In

the second step of statutory construction under *Chevron*, the Court must determine whether the agency's interpretation of the statute is "permissible." *Id.* at 843. The agency's construction is permissible if it is reasonable, but it need not be what the Court considers the *best* or *most reasonable* construction. *See id.* at 845. The Court is not to simply impose its own construction on the statute, but instead it gives deference to any reasonable statutory construction by the agency. *Id.* at 843.

II. Chevron Step One

Whether statutory ambiguity exists so that the issue cannot be settled at *Chevron's* first step is for the Court to decide, and the Court "owe[s] the agency no deference on the existence of ambiguity." *Am. Bar Ass'n v. FTC*, 430 F.3d 457, 468 (D.C. Cir. 2005). The Court begins the inquiry by "employing traditional tools of statutory construction." *Chevron*, 467 U.S. at 843 n.9. As always, the analysis begins with the text of the statute. *Nat'l Elec. Mfrs. Ass'n v. U.S. Dept'l of Energy*, 654 F.3d 496, 504 (4th Cir. 2011).

The text of the statute that requires states to establish their own TMDLs, 33 U.S.C. § 1313(d)(1)(C), is:

> Each State shall establish for the waters identified in paragraph (1)(A) of this subsection, and in accordance with the priority ranking, **the total maximum daily load, for those pollutants which the Administrator identifies** under section 1314(a)(2) of this title as suitable for such calculation. Such load shall be established at a level necessary to implement the applicable water quality standards with seasonal variations and a margin of safety which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality. (emphasis added)

The next subsection, § 1313(d)(2), grants EPA the authority to set TMDLs when the state

has not done so adequately. "Pollutant" is a statutorily defined term. 33 U.S.C. § 1362(6).

The Court sees no ambiguity in the wording of this statute. EPA is charged with establishing TMDLs for the appropriate pollutants; that does not give them authority to regulate nonpollutants. The parties agree that sediment is a pollutant under 33 U.S.C. § 1362(6), and stormwater is not. Then how does EPA claim jurisdiction over setting TMDLs for stormwater?

EPA frames the stormwater TMDL as a surrogate. EPA's research apparently indicates that the "[sediment] load in Accotink Creek is a function of the amount of stormwater runoff generated within the watershed." Def. Opp. at 8. And EPA believes that framing the TMDL in terms of stormwater flow rate is superior to simply expressing it in terms of maximum sediment load.

The DC Circuit has considered and rejected a similar attempt by EPA to take liberties with the way Congress intended it to express its TMDLs. In *Friends of the Earth, Inc. v. Env. Protection Agency*, EPA had promulgated TMDLs for the Anacostia River that expressed the maximum load of certain pollutants in terms of annual and seasonal amounts. 446 F.3d 140, 143 (D.C. Cir. 2006). The court found that expressing a TMDL in terms of annual or seasonal maximums was not allowed, because the statute granted authority only for daily loads. *Id.* at 148. The court reached its conclusion even though EPA apparently made a strong argument that expressing TMDLs in terms of annual or seasonal loads was an effective and reasonable approach. *See id.* Presumably a daily load could have been derived by simply dividing the annual load by 365, yet the court still required expression in the terms dictated by Congress.

Here too, EPA hopes to express a TMDL in terms other than those contemplated by the statute, arguing that such an expression is the most effective method. But, as *Friends of the Earth* illustrates, EPA may not regulate something over which it has no statutorily granted power—

annual loads or nonpollutants—as a proxy for something over which it *is* granted power—daily loads or pollutants.

EPA's argument that its surrogate approach should be allowed because the statute does not specifically forbid it fails. EPA is not explicitly forbidden from establishing total maximum *annual* loads any more than they are explicitly barred from establishing TMDLs for nonpollutants. The question is whether the statute grants the agency the authority it is claiming, not whether the statute explicitly withholds that authority. And in this case, as in *Friends of the Earth*, the statute simply does not grant EPA the authority it claims.

The dicta in *Weyerhaeuser Co. v. Costle* is not as helpful to EPA's case as it would like. 590 F.2d 1011, 1022 n.6 (D.C. Cir. 1978). It is true that the court said in a footnote "[i]t is well recognized that EPA can use pollution parameters that are not harmful in themselves, but act as indicators of harm." *Id.* But in that case, the non-harmful pollution parameters the EPA sought to regulate were components of the effluent commonly discharged from paper mills, *id.* at 1022, making them effluents themselves. And power to regulate effluents is expressly granted to the EPA in the relevant statutory section. *See* 33 U.S.C. § 1314(b).

EPA would like to create the impression that Congress has given it loose rein to determine exactly what it could and could not regulate. On page 16 of its opposition to this motion, EPA points out that "Congress authorized EPA to determine which pollutants were suitable for TMDL calculation and measurement." (Internal quotes removed). While this may be true, EPA glosses over the fact that 33 U.S.C. § 1314(a)(2)(D) only gives EPA the power to regulate pollutants as that term is defined—by Congress—elsewhere in the statute. And, as discussed above, sediment is a pollutant for these purposes, but stormwater is not.

In a similar vein, EPA regulations which imply that the agency has discretion to set the

TMDL as it sees fit do not bear on the question now before the Court. EPA has promulgated a regulation allowing TMDLs to be "expressed in terms of either mass per time, toxicity, or other appropriate measure," 40 C.F.R. § 130.2(i), and another that allows TMDLs to be expressed as a "property of pollution," 50 Fed. Reg. 1774, 1776 (Jan. 11, 1985). But, EPA citing these regulations to demonstrate that the surrogate TMDL approach is permissible is mere bootstrapping. To the extent the regulations allow EPA to set TMDLs for nonpollutants, they exceed the statutory authority of EPA.

The plain language of the statute trumps all, but legislative history also supports Plaintiffs' argument. Congress's intent to limit EPA's discretion in this context is evidenced by the committee record cited by Plaintiffs, which has also been used by the Ninth Circuit, in which Senator Randolph, Chairman of the Senate committee that amended the act in 1972, explained, "We have written into law precise standards and definite guidelines on how the environment should be protected. We have done more than just provide broad directives [for] administrators to follow." Pl. Mot. 7, *citing Nw. Envtl. Def. Ctr. v. Brown*, 640 F.3d 1063, 1072 (9th Cir. 2011). Congress created a statutory scheme that included a precise definition of the word "pollutant," and then gave EPA authority to set TMDLs for those pollutants. Senator Randolph's comments strongly imply that Congress did not intend anything more or less than what is written in the statute.

The Court considers the language of 33 U.S.C. § 1313(d)(1)(C) to be unambiguous. Congress has spoken directly on the question at issue, and its answer is that EPA's authority does not extend to establishing TMDLs for nonpollutants as surrogates for pollutants. The legislative history of the CWA is consistent with this reading. Therefore, this Court finds EPA's interpretation of § 1313 and the related provisions to be impermissibly broad based on analysis

under the first step of *Chevron* analysis.

III. Chevron Step Two

Because the Court considers Congress's intent to be clear and unambiguously expressed by the language of the statute, it need not move to the second step of *Chevron* analysis. But the Court notes that there is substantial reason to believe EPA's motives go beyond "permissible gap-filling."

Page 9 of EPA's opposition says, "stormwater flow rates as a surrogate would more effectively address the process by which sediment impairs aquatic life in Accontink Creek." If the sediment levels in Accotink Creek have become dangerously high, what better way to address the problem than by limiting the amount of sediment permitted in the creek? If sediment level is truly "a function of" the amount of stormwater runoff, as EPA claims, then the TMDL could just as easily be expressed in terms of sediment load.

In fact, the Board of Supervisors of Fairfax County argued at the December 14th hearing (without objection from EPA) that EPA has approved 3,700 TMDLs for sediment nationwide, and in Virginia has addressed 111 benthic impairments with TMDLs. None of them regulated the flow rate of stormwater. By comparison, EPA has tried out its novel approach of regulating sediment via flow in only four instances nationwide, and all four attempts were challenged in court. One has settled, the other three are still pending.

The Court suspects that the decision to regulate stormwater flow as a surrogate for sediment load would not constitute a permissible construction of § 1313(d)(1)(C), even given the deference due at *Chevron's* second step. This is especially likely because EPA is attempting to increase the extent of its own authority via flow TMDLs, which courts must examine carefully.

See Brown & Williamson Tobacco Corp. v. Food & Drug Admin., 153 F.3d 155, 161-62 (4th Cir. 1998). EPA's attempt to set TMDLs for nonpollutants probably goes beyond "permissible gap-filling" and is instead an impermissible construction of the statute.

Conclusion

The language of § 1313(d)(1)(C) is clear. EPA is authorized to set TMDLs to regulate pollutants, and pollutants are carefully defined. Stormwater runoff is not a pollutant, so EPA is not authorized to regulate it via TMDL. Claiming that the stormwater maximum load is a surrogate for sediment, which is a pollutant and therefore regulable, does not bring stormwater within the ambit of EPA's TMDL authority. Whatever reason EPA has for thinking that a stormwater flow rate TMDL is a better way of limiting sediment load than a sediment load TMDL, EPA cannot be allowed to exceed its clearly limited statutory authority. For these reasons, the Plaintiffs' motion for Rule 12(c) judgment on the pleadings on Count I of their complaint is granted.

January 3, 2013
Alexandria, Virginia

/s/ LOG
Liam O'Grady
United States District Judge

FILED
JAN - 3 2013
CLERK, U.S. DISTRICT COURT
ALEXANDRIA, VIRGINIA

IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF VIRGINIA
Alexandria Division

VIRGINIA DEPARTMENT OF TRANSPORTATION, ET AL, Plaintiffs, -v- UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, ET AL, Defendants.	Civil Action No. 1:12-CV-775

Order

In accordance with the memorandum opinion that accompanies this order, it is now **ORDERED**:

1. Plaintiffs' motion (Dkt. No. 29) for judgment on the pleadings as to Count I of the complaint is **GRANTED**.
2. The clerk shall enter judgment in favor of the Plaintiffs.
3. The Accotink Creek TMDL is remanded to EPA for reconsideration consistent with this order.

January 3, 2013
Alexandria, Virginia

/s/
Liam O'Grady
United States District Judge

Scott A. Mann
Mayor

John V. Denver
Mayor Pro Tem

Greg August
Councilmember

Matthew Liesemeyer
Councilmember

Vacant
Councilmember
District 3

September 10, 2015

Wayne Chiu
California Regional Water Quality Control Board, San Diego Region
2375 Northside Drive, Suite 100
San Diego, CA 92108

Subject: Comment - Tentative Order No. R9-2015-0100, Place ID: 786088WChiu

Dear Mr. Chiu,

The City of Menifee (the "City") would like to thank the San Diego Regional Water Quality Control Board ("San Diego Water Board") for the opportunity to comment on Tentative Order No. R9-2015-0100, an Order amending Order No. R9-2013-0001 as amended by Order No. R9-2015-0001 ("Tentative Order"). The City is committed to developing and implementing jurisdictional and regional programs and strategies that will improve overall water quality.

The City has been working hard to meet the requirements of the Santa Ana Region Permit under Order No. R8-2010-0033. The Report of Waste Discharge (ROWD) submitted to the Santa Ana Board in July 2015 highlights the Santa Ana Region's major water quality accomplishments since the Permit issuance. The City has been an active participant in the region, including in the development and implementation of the Comprehensive Nutrient Reduction Plan (CNRP) (approved July 2013) to address nutrient Total Maximum Daily Loads (TMDL) for Canyon Lake and Lake Elsinore and in the development of the Watershed Action Plan (WAP) (pending Santa Ana Regional Board approval). The City has also developed a Local Implementation Plan (LIP), which details the day-to-day jurisdictional storm water program to meet Permit requirements.

As stated in the Tentative Order, the City is located partially within the jurisdiction of both the San Diego Water Board and the Santa Ana Regional Water Quality Control Board ("Santa Ana Water Board"). More specifically, less than 1.3 square miles in the City is located in the Santa Margarita Watershed Management Area (WMA). To date, the San Diego Water Board and the Santa Ana Water Board have maintained agreements that designate the Santa Ana Water Board as the single Regional Water Board to regulate the City on matters pertaining to Phase I municipal separate storm sewer system (MS4) permits. The Tentative Order proposes continuing this practice, following past agreements, with the significant exception of now requiring the City to participate in the development and implementation of the Santa Margarita WMA Water Quality Improvement Plan (WQIP).

Both the City and the Riverside County Flood Control and Water Conservation District (RCFCWCD) maintain GIS layers of MS4 infrastructure that they own and

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operate within the City. Since the release of the Tentative Order, the City of Menifee has coordinated with RCFCWCD to investigate ownership of MS4 within the small portion of the City that is within the Santa Margarita WMA. As shown on the attached maps, MS4 within the portion of the City in the Santa Margarita WMA is owned and operated exclusively by RCFCWCD. The City of Menifee does not own or operate MS4 within the Santa Margarita WMA.

It is the City's understanding, according to the Code of Federal Regulations, title 40, section 122.1(b)(1), that "[t]he NPDES program requires permits for the discharge of 'pollutants' from any 'point source' into 'waters of the United States'". The City does not own or operate any "point sources," as defined in 40 C.F.R. § 122.2 or section 502(14) of the Clean Water Act, within the Santa Margarita WMA. Because the City is not responsible for any MS4 within the Santa Margarita

WMA, it should not be required to develop and implement the Santa Margarita WMA WQIP. For this reason, the City respectfully requests removal of language in the Tentative Order that requires the City to participate in the development and implementation of the Santa Margarita WMA WQIP. Suggested edits to the text of the Tentative Order are shown below:

- Attachment 1, Finding 29(b): "...the City of Menifee is largely regulated by the Santa Ana Water Board under Order No. R8-2010-0033 as it may be amended or reissued, including those portions of the City of Menifee within the San Diego Water Board's jurisdiction, upon the effective date of this Order. ~~The agreement also requires the City of Menifee to actively participate during development and implementation of the Santa Margarita River Watershed Management Area Water Quality Improvement Plan required pursuant to this Order~~..."
- Attachment 1, Table B-1 "Watershed Management Areas": Please strike the City of Menifee from the table and remove the associated footnote.
- Attachment 2, Provision B.1: "~~Footnote 3 to Table B-1 has been included to specify that Phase I MS4 discharges within the jurisdictional boundaries of the City of Menifee located within the San Diego Region will be regulated under Santa Ana Water Board Order No. R8-2010-0033 (NPDES No. CAS618033) and any reissuance thereof. At this time, the City of Menifee is not identified as a responsible Copermittee for any TMDLs established by the San Diego Water Board. Under the terms of the agreement, the City of Menifee must actively participate in the development and implementation of the Santa Margarita River Watershed Management Area Water Quality Improvement Plan required pursuant to Order No. R9-2013-0001, and any reissuance thereof.~~"
- Attachment 2: "The City of Menifee is not regulated as a Copermittee under this Order because it <u>does not own or operate</u> ~~Phase I~~ MS4 ~~discharges~~ <u>within the portion of the City that is located within the San Diego Region.</u> ~~Are regulated by Santa Ana Water Board Order No. R8-2010-0033 as it may be amended or issued pursuant to Water Code section 13228 designation. The requirements of this Order that apply to the City of Menifee for the duration of this Order, consistent with the Water Code section 13228 written agreement dated [Month][Day], 2015, are described in Finding 29 and Footnote 3 to Table B-1.~~"

Wayne Chiu
San Diego Water Board
September 9, 2015

Thank you for your consideration. Please feel free to contact me or Yolanda Macalalad at 951-639-1368 extension 169 if you have any questions regarding the above comments.

Sincerely,

Jonathan Smith, PE, QSD
Director of Public Works/City Engineer

Cc (by email):
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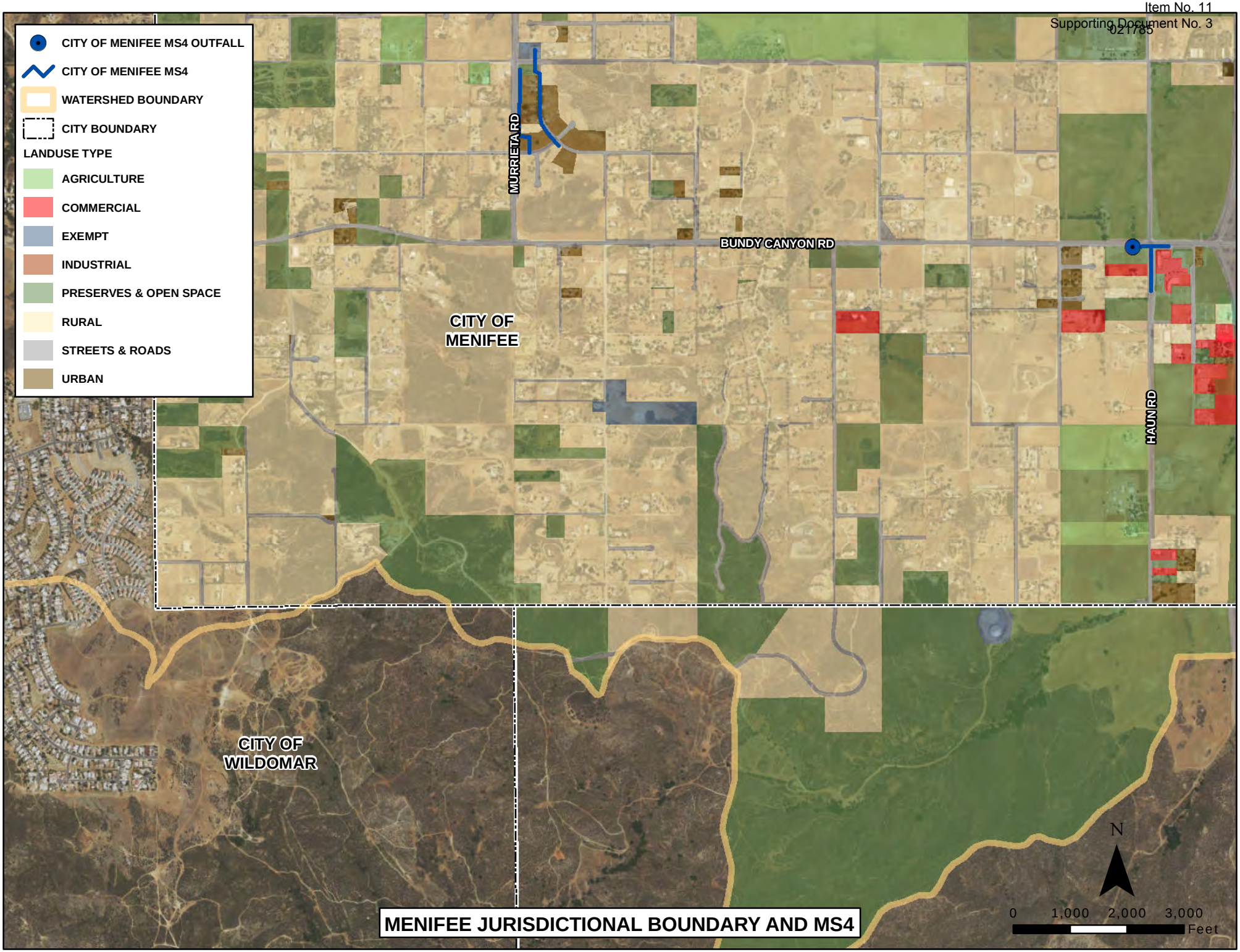

MENIFEE JURISDICTIONAL BOUNDARY AND MS4

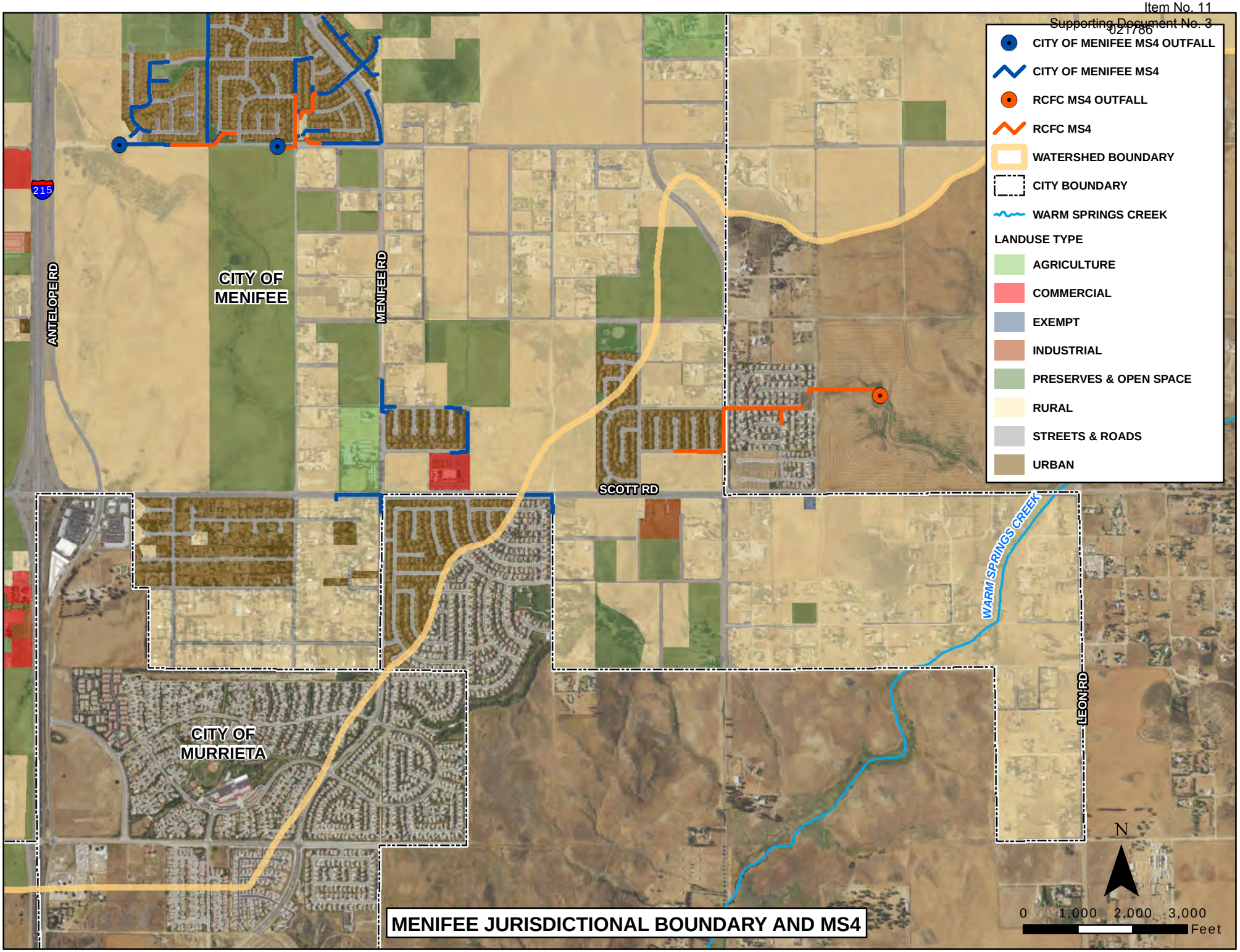

MENIFEE JURISDICTIONAL BOUNDARY AND MS4

OC Public Works
Integrity, Accountability, Service, Trust
Shane L. Silsby, Director

September 14, 2015

By E-Mail

Mr. Wayne Chiu
California Regional Water Quality Control Board, San Diego Region
2375 Northside Drive, Suite 100
San Diego, CA 92108

Dear Mr. Chiu

The County of Orange, as Principal Permittee of the Orange County Stormwater Program, and the Orange County Flood Control District (collectively, "County"), appreciate the opportunity to provide comments on Tentative Order No. R9-2015-0100 ("Tentative Order") proposing to amend the National Pollutant Discharge Elimination System (NPDES) Permit for *Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region, Order No. R9-2013-0001, as amended by Order No. R9-2015-0001 (Regional MS4 Permit)* ("Regional MS4 Permit" or "Permit"). In addition to the County, the Cities of Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Mission Viejo and San Juan Capistrano (collectively, "Permittee") were involved in the development of these comments and hereby concur with the issues herein. Where a Copermittee has more specific comments relevant to its jurisdiction, these will be expressed in separate written comments provided by the individual Copermittee.

The County supports vigorous implementation of programs and projects that will further water quality improvements in south Orange County. The County hereby submits these comments in belief that modifications to the Regional MS4 Permit are needed in order to better effectuate improvements to water quality as well as balance the role and obligations of the MS4s under the Clean Water Act and Porter-Cologne Water Quality Control Act.[1]

[1] In addition to these supplemental comments, the County by this reference incorporates all prior letters, comments, reports, presentations, oral and written testimony, data, communications, and other evidence made by, on behalf of, and in support of the County and the Permittees during the various workshops, hearings, and meetings relevant to the adoption of Order No. R9-2013-0001, as amended by Order No. R9-2015-0001 and Tentative Order No. R9-2015-0100. The County and Permittees reserve the right to provide further comment as applicable.

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I. Stakeholder Workshops Have Been Effective.

The Permittee laud the efforts of Regional Board staff to collaboratively engage the Permittee and other stakeholders through the use of mediated, roundtable workshops. This manner of comment has worked well in allowing all viewpoints to be expressed with sufficient time provided to allow for vigorous discussion of issues regarding the Regional MS4 Permit.

II. The Alternative Compliance Pathway for Prohibitions and Limitations Is Necessary, But It Must Contain Compliance During the Planning Period Along With Workable Implementation Milestones.

The Tentative Order proposes to include an alternative compliance pathway that would offer the Permittees compliance with the prohibitions and limitations provisions of the Regional MS4 Permit. The Permittees generally support this approach, and believe that an alternative compliance pathway is necessary in light of the difficulties in achieving water quality standards, the strict liability regime created by the Ninth Circuit's decision in *Los Angeles County Flood Control District v. NRDC*,[2] and recent clarification on receiving water limitations language by the State Water Resources Control Board ("State Board") on the LA MS4 Permit.[3]

As has been stated in prior comments by the Permittee, federal law does not require MS4 dischargers to strictly comply with water quality standards. In the Ninth Circuit Court of Appeals decision in *Defenders of Wildlife v. Browner*,[4] the court held that Congress only intended MS4 dischargers to meet the maximum extent practicable standard and that compliance with numeric effluent limitations was not required.[5] In fact, EPA has not promulgated any binding regulation requiring strict compliance with numeric limits, but has only issued guidance

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[1]In addition, for the reasons provided by the Permittees in prior oral and written comments, the Permittees continue to assert that the Regional Board has no system-wide, jurisdiction-wide, watershed or other basis by which to enroll the Permittees in the Regional MS4 Permit. By virtue of filing this comment letter, the Permittees do not waive any argument with respect to this issue, and have enrolled in the Regional MS4 Permit under protest.

[2] *NRDC v. County of Los Angeles* 673 F.3d 880, 886 (9th Cir. 2011) (revd. on other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013)) ("NRDC II).

[3] Order WQ 2015-0075, *In the Matter of Review of Order No. R4-2012-0175, NPDES Permit No. CAS004001, Waste Discharge Requirements for Municipal Separate Storm Sewer System (MS4) Discharges within the Coastal Watersheds of Los Angeles County, Except Those Discharges Originating from the City of Long Beach MS4*. ("State Board Order").

[4] 191 F.3d 1159 (9th Cir. 1999); *see also* 33 U.S.C. § 1342(p)(3)(B).

[5] This interpretation of the Clean Water Act has recently been upheld in the State of Maryland, and is thus, not unique to the Ninth Circuit. *Chesapeake Bay Foundation v. Md. Dep't of the Envt.*, Case No. 02-C-14-186144 (Anne Arundel Cir. Ct., Dec. 2, 2014); *In re Baltimore County MS4 Permit*, Case No. 03-C-14-000761 (Baltimore Cir. Ct., Oct. 7, 2014).

encouraging EPA regions and the States to adopt and require strict compliance with numeric effluent limits where feasible.[6] Thus, compliance with receiving water limitations is a State and Regional Board requirement. To further emphasize this point, the Ninth Circuit Court of Appeals in *NRDC II* interpreted the LA MS4 Permit's receiving water limitations language as a contract requiring the LA permittees to strictly meet numeric standards in that any exceedance was a violation of the permit.[7]

Regional Board staff has interpreted the Regional MS4 Permit as requiring strict compliance with water quality standards, noting at the Regional Board's May 8, 2013 adoption hearing on Order No. R9-2013-0001 that the Permittees were in immediate noncompliance with the Permit and that compliance would not be achieved within the 5-year Permit term.[8] The State Board, too, has clarified and mandated that regional water boards require strict compliance with water quality standards.[9]

As noted in Comments 13 through 15 in the County's November 19, 2014 comment letter and in various presentations by the Permittee and others throughout the adoption proceedings for the Permit, the Permittee have demonstrated that compliance with certain of the Permit's prohibitions, receiving water limitations and numeric effluent limits is not yet achievable, and may not be achievable in certain environmental conditions. This is due to the long-time urbanization of certain watersheds, the need to extensively retrofit this urbanization, the nature of stormwater transport, the lack of control municipalities have over certain pollutants, the technical and economic infeasibility of meeting certain numeric standards, and the need to change certain standards. Indeed, the Permittee have previously noted in testimony the key finding in *Pathogens In Urban Stormwater Systems* (American Society of Civil Engineers, 2014) that current recreational water quality criteria may likely be unattainable in wet weather. Therefore, in light of the State's mandate that water quality standards be strictly adhered to and the difficulties in attaining standards, an alternative compliance pathway is needed so that the

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[6] *See, e.g.*, Letter from Andrew D. Sawyers, Office of Wastewater Management, and Benita Best-Wong, Office of Wetlands, Ocean and Watersheds, United States Environmental Protection Agency, to Water Division Directors, Regions 1-10, United States Environmental Protection Agency, *Revisions to the November 22, 2002 Memorandum "Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on LA*s*"* (Nov. 26, 2014) ("EPA recommends . . . where feasible and appropriate, numeric requirements that attempt to maintain pre-development runoff conditions." "This memorandum is guidance. It is not a regulation and does not impose legally binding requirements on EPA or States.").

[7] *NRDC v. County of Los Angeles*, 673 F.3d at 892.

[8] Transcript vol. II, 75:15-19 (May 8, 2013).

[9] Order WQ 2015-0075, *In the Matter of Review of Order No. R4-2012-0175, NPDES Permit No. CAS004001, Waste Discharge Requirements for Municipal Separate Storm Sewer System (MS4) Discharges within the Coastal Watersheds of Los Angeles County, Except Those Discharges Originating from the City of Long Beach MS4*. ("State Board Order").

Permittee can continue to diligently plan, fund and rigorously implement their watershed programs without the trepidation of open-ended enforcement that follows from a strict liability regime. If the Regional Board is to require strict compliance with the prohibitions and limitations provisions of the Regional MS4 Permit, the Permittee support the addition of an alternative compliance pathway where it is robust, provides for regulatory certainty, and its implementation is technically and economically feasible.

A. The Permittee Support The Flexibility Of The Alternative Compliance Pathway

The proposed alternative compliance pathway at Provision B.3.c provides flexibility

B. Alternative Compliance Should Be Provided During The WQIP Planning Process.

The Permittees fundamental issue with the proposed alternative compliance pathway is that it does not address compliance during the WQIP planning process. It is only after a plan has been submitted and approved by the Executive Officer of the Regional Board that a Permittee is in compliance with the Permit's prohibitions and limitations.[10] This is directly contrary to the State Board's Order directing regional water boards to establish alternative compliance pathways and is in conflict with the findings and conclusions on which the Order is predicated. It is also raises questions of the Permit's fairness as well as its legal validity. The Permittees request that the Regional Board include a provision that allows compliance during the planning phase of the WQIP consistent with the State Board Order.

In the State Board Order, the State Board recognized that strict compliance with receiving water limitations "may result in many years of permit noncompliance, because it may take years of technical efforts to achieve compliance with the receiving water limitations, especially for wet weather discharges."[11] This statement is also referenced in the Tentative Order.[12] In recognizing the difficulties with attaining water quality standards, the State Board not only directed regional water boards to adopt alternative compliance pathways, it also upheld the interim compliance provisions of the LA Permit that allow the LA County Permittees to maintain compliance during the planning process for the WMP/EWMP (the functional equivalent of the Regional MS4 Permit's WQIP), so long as the planning process "is clearly constrained in a manner that sustains incentives to move on to approval and implementation and is structured with clear, enforceable provisions."[13] In fact, the State Board thought that there should have been more flexibility during the planning period than what was initially in the LA Permit, and allowed interim compliance

[10] Tentative Order, Provision B.3(c)(2).

[11] State Board Order, pg. 15.

[12] Tentative Order, Finding 10, pg. 4. The Tentative Order attributes this to the Permittees, but it is actually a direct quote from the State Board Order. The Permittees assert there are broader grounds by which strict compliance is unwarranted and, in some cases, unachievable.

[13] State Board Order, pp. 48-50.

even when there were deviations to the development schedule.[14] The State Board went even further and directed regional water boards to consider and adopt the WMP/EWMP approach unless regional differences dictated variances.[15]

The Tentative Order does not incorporate interim compliance during the planning phase of a WQIP, and the accompanying Fact Sheet does not indicate any region-specific or permit-specific reason why a material variance is warranted. The only justification that has been given during workshops on the alternative compliance option is that EPA has supported San Diego's proposed approach and that the San Diego Region "is not L.A." This insufficiently addresses the issue of why the Permittee should not be afforded a basic threshold of compliance during the 18-month planning period. It is also in direct conflict with the State Board Order, which describes in detail the issues with meeting water quality standards and the need for compliance over time. It is also the County's understanding that other regional water boards are following the State Board Order's compliance directive, such as the forthcoming MS4 permit by the Santa Ana Water Board for North Orange County where staff has indicated that the alternative compliance option will allow for interim compliance.

The absence of interim compliance when a Copermittee is diligently undergoing WQIP planning is patently unfair. As explained above, it undermines the State Board Order as well as the Tentative Order's recognition that compliance with water quality standards may take years to achieve.16 It is unreasonable to insist on strictly meeting water quality standards and establishing a compliance pathway, but not extending such compliance to the point at which a Copermittee most needs it.

The WQIP planning process is a significant financial undertaking. In Los Angeles County, preparation of equivalent watershed management plans has cost approximately $250,000 per watershed and these plans have identified final implementation costs per watershed in the range of $300 million to $6 billion.[17] It also unnecessarily exposes the Permittee to potentially

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[14] *Id.* at pg. 50 (adding Part VI.C.4.g. to the LA Permit allowing deviation from the WMP/EWMP development schedule).

[15] *Id.* at pg. 51 ("We direct all regional water boards to consider the WMP/EWMP approach to receiving water limitations compliance when issuing Phase I MS4 permits going forward. In doing so, we acknowledge that regional differences may dictate a variation on the WMP/EWMP approach, but believe that such variations must nevertheless be guided by a few principles. We expect the regional water boards to follow these principles unless a regional water board makes a specific showing that application of a given principle is not appropriate for region-specific or permit-specific reasons.").

[16] State Board Order, Conclusion 2, pg. 76. ("However, we find that municipal storm water dischargers may not be able to achieve water quality standards in the near term and therefore that it is appropriate for municipal storm water permits to incorporate a well-defined, transparent, and finite alternative path to permit compliance that allows MS4 dischargers that are willing to pursue significant undertakings beyond the iterative process to be deemed in compliance with the receiving water limitations.").

[17] County of Los Angeles Cost Study, *Projected WMP/EWMP Implementation Costs* (attached hereto).

unnecessary enforcement when significant resources and expenditures are underway to develop a long-term plan to improve water quality, particularly when a pollutant that is being addressed through the planning process is now the subject of an enforcement action or third party challenge. In other words, it would be unjustifiable to allow enforcement of a standard when the plan for attaining that standard is being developed and being reviewed by Regional Board staff. Furthermore, if the Regional MS4 Permit does not contain interim compliance, for the reasons set forth in the County's prior comments on the Regional MS4 Permit, it is unlawful. A permit that does not contain a compliance pathway or that is impossible to comply with is not in accordance with federal and state law.[18]

C. The Annual Milestone Requirement in the Alternative Compliance Pathway Is Arbitrary and Unworkable, and Should be Modified to Correspond to the Term of the MS4 Permit.

The alternative compliance pathway proposed in the Tentative Order includes Provision B.3.c(1)(a)(vii), recommended by certain stakeholders, requiring an annual milestone in the WQIP for each numeric goal. The Permittee believe that an annual milestone requirement is arbitrary, unworkable and may put the Permittee in a position to violate the California Constitution.

As has been expressed by the Permittee and Regional Board staff in the workshops leading up to the Tentative Order, the proposed alternative compliance pathway essentially requires the Permittee to develop an implementation plan and time schedule for each and every waterbody pollutant combination that exceeds or is likely to exceed a numeric limit. Thus, the alternative compliance pathway essentially requires the Permittee to develop a total maximum daily load (TMDL) and be under a Time Schedule Order for each pollutant to be deemed in compliance with the Permit.[19] When EPA or the State establish a TMDL, Section 303(d) of the Clean Water Act does not require implementation plans, but instead, implementation plans are left to a State's discretion as to whether one will be established as part of the MS4 permit. When an implementation plan is established by a State, it is a document or section of a document detailing the suite of corrective actions needed to reduce pollution and remediate an impaired waterbody.[20]

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[18] See County Comment Letter, Comments 13-15. See also, *Atlantic States Legal Fdn., Inc. v. Eastman Kodak Co.* 12 F.3d 353, 357 (2nd Cir, 1994); *Hughey v. JMS Development Corp.* 78 F.3d 1523, 1530 (11th Cir. 1996); *Divers Envt'l Conservation Organization v. State Water Resources Control Board*, 145 Cal.App.4th 246, 256 and 258 (2006).

[19] The County has previously commented on the Regional MS4 Permit that the imposition of an implementation plan and a time schedule sidesteps the procedures called for in the Clean Water Act and shifts the Regional Board's regulatory obligations to the Permittees. See County Comments, Comment 17, pg. 26, fn. 35 (Jan. 11, 2013).

[20] US EPA, Total Maximum Daily Loads, Glossary http://water.epa.gov/lawsregs/lawsguidance/cwa/tmdl/glossary.cfm#implementationplan ("Current 303(d)

Section 130.33(b)(10) of the Code of Federal Regulations sets forth certain criteria that an implementation plan must include, such as a description of actions and/or management measures and a general timeline for implementing those actions or measures along with interim milestones. There is no federal (or state) legal requirement, or EPA guidance, regarding the specific timing of the milestone or even that the milestone be anything more than a suggested target to attain.

It has been consistently recognized that the WQIPs will develop plans over a multi-year period that may span 10, 20 or 30 years in order to attain standards. It is inconceivable that an implementation plan will contain 20 annual milestones or even that a Copermittee could identify what that milestone might be in year 16, for example, in either the development or early implementation of the plan. WQIPs will focus on studies, monitoring, and review of data to inform the Copermittee as to what corrective actions are necessary, which will result in revisions to the plan. To imbed a milestone into a WQIP for each and every year is arbitrary. It is simply not how project or program development works from a planning perspective. For instance, in developing a project for the benefit of multiple MS4s across a watershed, a few years can be spent applying for grant funding and encumbering monies for the project. Oftentimes, environmental studies and the design of a project are being prepared concurrent with funding planning. A watershed-based program or project involves the letting of multiple contracts with various partners and stakeholders. Contracts include grant agreements; right-of-way dedications and other real property agreements; cooperative agreements with state, municipal and developer partners; architect-engineer agreements; construction contracts; operations and maintenance agreements; and procurement contracts. Although a general schedule is put together, project milestones often span multiple years and can fluctuate as new information is obtained or in the event of changing circumstances. Based on the robustness of the planning and development process, it is simply arbitrary to imbed an annual milestone for each and every numeric goal into an enforceable regulatory document. It also has Regional Board staff micro-managing the implementation process whereby unnecessary time will be spent developing an annual milestone and getting Regional Board staff's re-approval for any slippage in the timeline.

In many cases, WQIPs will be predicated on finding the necessary funds for carrying out implementation. The costs to address the numeric goals contemplated in a WQIP will be significant. Many of years of planning funding will go into even one numeric goal where monies will be allocated by the legislative body on a fiscal year basis and encumbered over many years. In addition to outside grant funds, a program or project's source of revenue will also be derived from taxes and fees, which fluctuate annually depending on factors like the market, inflation and cost indices, income, development, and other factors. Taxes and fees are further constrained in California by Propositions 218 and 26. Most fee programs, for instance, are designed for 10 or

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regulations do not require implementation plans, though some state regulations do require an implementation plan for a TMDL."); *see also*, 40 CFR § 130.

more years of fee collection in order to fund the necessary infrastructure or housing improvements needed. Therefore, a long-term implementation plan utilizing rigid annual milestones that include the funding and financing of projects is unworkable.

While an annual milestone may be the norm for a 5-year TSO that focuses on BMPs for a specific pollutant where final numeric limits are close to being attained, as demonstrated above, annual milestones for a 10 or 20-year plan for a difficult regulatory problem are arbitrary and unworkable. Instead, the Regional Board should consider a time period already used by state and federal law, which is the 5-year term of the Permit. When a TMDL implementation plan is developed, the plan is reported on in the annual report and then again in the Report of Waste Discharge. The next permit is fashioned based on the progress the Copermittee has made in that 5-year permit term.[21] The Regional Board should not deviate then from the established timelines already set forth in the law as the appropriate place to review progress is at the renewal of the Regional MS4 Permit. Compliance should not hinge on whether an individual action has occurred, but should be predicated on the collective actions of the Permit term, such that a Copermittee can demonstrate that reasonable progress has been made in attaining water quality standards.

D. The Prohibitions and Limitations Language of Provision A Should Specify That Compliance Can Be Determined By Utilizing The Alternative Compliance Pathway At Provision B.3.c.

The Prohibitions and Limitations language in Provision A should be aligned with the Water Quality Improvement Planning process described in Provision B. The Permittee appreciate the efforts to clarify the compliance determination in Provision B.3.c by linking it back to Provision A. However, as currently incorporated into the Tentative Order, Provision A makes no reference to Provision B.3.c, and thus, the Prohibitions and Limitations language may still be interpreted as stand-alone provisions that could subject the Permittee to state and federal enforcement actions as well as third party actions under the Clean Water Act's citizen suit provisions. To prevent this from occurring, a clear linkage between the compliance provisions in Provision B and the prohibitions, receiving water limitations, and effluent limitations must be established. Compliance with Provisions A.1, A.2 and A.3 should be linked to Provision B so that it is clear that the compliance mechanism for A.4 is the Water Quality Improvement Plan (Provision B) and/or the TMDL (Attachment E), as applicable. Permits are construed as contracts, and such a change would be a routine matter of contract drafting whereby contract provisions refer to one another for ease of reading and interpretation.

This change has been requested throughout the workshop and adoption proceedings for the Regional MS4 Permit, but no reason has been given for why this change could not be made. The

[21] This is also how air quality laws work under the Clean Air Act where a state implementation plan must demonstrate reasonable progress towards national ambient air quality standards, and is revisited on an 8-year basis.

Provision A language is not sacrosanct, and could be modified accordingly without changing the substance of the prohibitions and limitations set forth therein.

III. Provision E.2 Should Be Clarified That Implementation of A Copermittee's Illicit Discharge Detection and Elimination Program Constitutes Compliance with Effectively Prohibiting Non-Stormwater Discharges.

Section 402(p)(3)(B)(ii) of the Clean Water Act imposes a requirement to "effectively prohibit" non-storm water discharges. The State Board Order acknowledged that preventing all non-stormwater runoff into an MS4 can be a nearly impossible standard to meet at times, since third parties—such as residents watering their lawns in a reasonable manner—are likely to cause at least some incidental runoff to enter a Copermittee's MS4.[22] Other regional water boards have determined that Permittee are in compliance with the Clean Water Act's mandate to "effectively prohibit" all dry weather discharges when the Copermittee is implementing its illicit discharge prevention program. However, the Tentative Order in Provision E.2 could be interpreted to impose strict liability on the Permittee even where: (1) all or most dry weather flows are diverted before the water reaches a water of the State, (2) the discharge to the MS4 resulted from actions that the Copermittee may have very limited ability to control, and (3) the Copermittee was fully implementing its illicit discharge prevention program.

Provision E.2 of the Tentative Order should be amended to clarify that implementation of a Copermittee's illicit discharge, detection and elimination constitutes compliance with the requirement to effectively prohibit non-stormwater discharges.

IV. Compliance Dates For The Bacteria TMDL Should Be Changed.

Attachment E notes that the Responsible Permittee for MS4 discharges to waterbodies listed in Table 6.0 must be in compliance with final TMDL compliance requirements. However, the TMDL includes language stating that specific waterbody or beach segments included in the TMDL that have been delisted from the 2008 303(d) list are not subject to any further action as long as monitoring data continues to support compliance with water quality standards. Thus, the language in Attachment E is in conflict with the TMDL, and should be revised to reflect that no action is needed for delisted waterbody segments.

V. Exemption For Self Remediating Priority Development Projects

The list Priority Development Exemptions (Section E.3.b.(3)) should be revised to include projects that are effectively self remediating (i.e. all rainfall is retained) including, but not limited to, reservoirs and swimming pools.

[22] State Board Order, pg. 48, fn. 133 ("We recognize that even the most comprehensive efforts to address unauthorized non-storm water discharges may not eliminate all such discharges.").

Thank you for your attention to our comments. Please contact each of the undersigned directly if you have questions. For technical questions please also contact Chris Crompton at (714)955-0630 or Richard Boon at (714)955-0670.

Sincerely,

Mary Anne Skorpanich, Deputy Director
OC Environmental Resources

Ryan Baron, Senior Deputy County Counsel
Office of the County Counsel

Attachments: A - Summary of Projected WMP/EWMP Costs

Attachments: A - Summary of Projected WMP/EWMP Costs

Watershed	Project Type	Capital Costs	O/M Costs	TOTAL
Upper Santa Clara River	EWMP	$623.7 Million	-	$623.7 Million
Upper LA River	EWMP	$6.097 Billion	$210.84 Million (Annually)	$6.308 Billion
Rio Hondo/San Gabriel River	EWMP	$1.417 Billion	-	$1.417 Billion
Upper San Gabriel River	EWMP			$2.14 Billion
Malibu Creek	EWMP	$194.6 Million	$3.7 Million	$198.3 Million
Marina Del Rey	EWMP	$347.4 Million	$44.5 Million (Total)	$391.9 Million
North Santa Monica Bay Coastal Watersheds	EWMP	$32.5 Million	$21.7 Million (20-year life cycle)	$52.2 Million (20-year life Cycle)
Santa Monica Bay Jurisdictions 2 & 3	EWMP	$648.7 Million	$94.7 Million (20-year life cycle)	$743.4 Million
Santa Monica Bay and Dominguez Channel (Beach Cities)	EWMP	$89 Million	$3.1 Million (Annually)	$150 Million (20-year life cycle)
Palos Verdes Peninsula Agencies	EWMP	$129.5 Million	$1.52 Million (Annually)	$131.02 Million
Ballona Creek	EWMP	$2.723 Billion (by year 2021)	$77.74 Million (annually)	$2.8 Billion
Dominguez Channel	EWMP	$1.294 Billion	$12.4 Million (in year 2041)	$1.3064 Billion
Los Angeles River Upper Reach 2	WMP	$311 Million	-	$311 Million
Lower Los Angeles River	WMP	$293 Million	-	$293 Million
East San Gabriel Valley	WMP	$646.5 Million	-	$646.5 Million
Lower San Gabriel River	WMP	$64.63 Million	-	$64.63 Million
Los Cerritos Channel	WMP	$332 Million?		$332 Million?

CITY OF DANA POINT

CITY COUNCIL

Carlos N. Olvera
Mayor

John A. Tomlinson
Mayor Pro Tem

Joseph L. Muller

J. Scott Schoeffel

Richard A. Viczorek

September 14, 2015

Via Electronic Submission to sandiego@waterboards.ca.gov, Attn: Wayne Chiu

Honorable Henry Abarbanel, Chair
Honorable Board Members
Attn: Mr. Wayne Chiu
California Regional Water Quality Control Board
San Diego - Region 9
2375 Northside Drive, Suite 100
San Diego, California 92108

Dear Chairman Abarbanel, Honorable Board Members, and Mr. Chiu:

Subject: Comment Letter — Tentative Order No. R9-2015-0100 Place ID: 786088WChiu

As the Mayor of the City of Dana Point, I write to express the City's serious concerns with certain aspects of the proposed amendments to San Diego Regional Water Quality Control Board ("Board") Tentative Order No. R9-2015-0100 (Tentative Order) amending Order No. R9-2013-0001, as amended by Order No. R9-2015-0001 ("Regional Permit"). I understand from my staff that the current revisions to the Regional Permit, if they are not amended to address the concerns raised in this letter, put the City of Dana Point (and other southern Orange County Cities) at risk of large unfunded liabilities without a meaningful path to obtain "compliance" with the Regional Permit (and by extension the Clean Water Act) for up to 18 months (and potentially longer). Of even greater concern, the open ended liability potentially created by the Regional Permit in its current form is likely to lead to litigation and piecemeal development of projects in response to specific federal court orders rather than a careful and collaborative process to develop and implement achievable watershed-wide water quality improvement plans ("WQIPs") for southern Orange County that will protect water quality within the City. I hope that the Board will seriously consider the City's comments provided in this letter and make revisions to the Regional Permit accordingly. I'd also ask that you carefully consider the comments provided by the legal counsel (attached to this letter as Exhibit A) in making needed changes to the Regional Permit prior to approval.

1. *The City is Already an Environmental Leader With a Strong Ethos for Clean Water*

I would not have sent this letter unless I was convinced the current approach advocated in the Regional Permit is likely to do more harm than good for the City's and Region's water quality improvements. I also realize that the City owes much of its success and economic prosperity to its high quality water resources and beaches. A clean environment is one of the things that draws people to the City of Dana Point. Dana Point citizens want clean water, but they also want regulations that achieve desired environmental outcomes in a reasonable manner, and at a cost that is proportional to benefits

received. The City's ethos of practical and proactive water quality regulation owes much to the City's former Mayor, Wayne Rayfield, a long-time advocate for ocean water quality, who served on the San Diego Regional Board from 2007 until 2012 and currently serves as the President of the Board for South Coast Water District, the City's main water and sewer agency. During Mr. Rayfield's tenure in City leadership, the City became a pioneer in efforts to eliminate stormwater pollution, and the City's extensive program to systematically improve and maintain water quality can be found on the City's website at www.danapoint.org/waterquality.

In addition to implementing source control management strategies and a robust illicit discharge control program, the City championed watershed-based management and elimination/diversion of dry weather discharges long before the City was directed to do so by the Regional Board. The City's approach to water quality is catalogued in the City's Strategic Plan (www.danapoint.org/index.aspx?page=54) and in the City's Guidance Document entitled "Protect Our Earth, Protect Our Ocean, a Paradigm for Water Quality." The Guidance Document is available online at www.danapoint.org/Modules/ShowDocument.aspx?documentid=3195, and it describes on pages 6-7 the City's 18 existing dry weather diversions that effectively capture most of the dry weather flows attributable to non-stormwater discharges of human origin within the City. These sanitary sewer diversion facilities were constructed at a cost of approximately 12 million dollars—primarily funded by City residents. The City also has pioneered innovative and extensive dry weather treatment Best Management Practices, such as the award-winning Salt Creek ozone Treatment Facility, bans on styrofoam and other types of plastics likely to wind up in City waters, a robust street sweeping program, and partnerships with local water districts to curb and eliminate excess irrigation that leads to runoff. Dana Point, as its Guidance Document and extensive list of water quality improvement projects can attest, is a City that is willing to do its share to address stormwater pollution and maximize water quality. Unfortunately, as addressed below, it does not appear that the Regional Permit (as proposed) is likely to lead to measurable water quality improvements within the City, only new costs and potential liabilities.

2. *Areas of Concern and Recommendations for Improvement*

a. The City Needs Interim Compliance While it Develops the Required WQIP for Southern Orange County. Dana Point supports in principle the WQIP concept as a practical vehicle for solving difficult water quality problems on a watershed-wide basis. The County and City staff have already demonstrated success in working collaboratively with other southern Orange County stakeholders, public and private, as evidenced by the South Orange County Watershed Management Area (SOCWMA), and will build on this experience and success to develop a scientifically defensible plan and associated projects that have the potential for enhanced protection of City waters. However, the proposed Regional Permit's departure from the previous best management practice ("BMP") based iterative approach to water quality improvement in favor of a strict liability framework during WQIP development is likely to pose severe compliance challenges for the City—making it far more difficult to adopt a collaborative problem solving posture.

Under the current language proposed by Board staff, the City will be potentially liable for a violation of the Regional Permit, and thus the Clean Water Act, every time it rains. While the City has

already diverted the vast majority of dry weather flows to the sanitary sewer (at great expense), it is not feasible to do so during wet weather due to sanitary sewer facility capacity and cost, and indeed trying to do so would risk drying up existing beneficial uses in San Juan Creek and other drainages within the City (indeed the drought has had a severe effect on riparian habitat in some locations—a condition that removing all runoff from the City MS4s could exacerbate). Because the San Diego Board has some of the most stringent water quality objectives in the state for bacteria, nutrients, and other contaminants that are in many cases caused by natural processes, it is likely that wet weather discharges from the City's MS4, at least some of the time, will contain pollutant concentrations in excess of the very stringent receiving water limitations contained in the San Diego Basin Plan. When that happens, if the Regional Permit is not amended, the City will presumably be strictly liable to third parties under the CWA—notwithstanding that any exceedances may have little or no nexus to controllable pollution within the City's boundaries. This is not a fair outcome, and we believe that it is not what Congress intended when it required regulation of municipal stormwater under the CWA in 1987.

It is my understanding that other Regional Boards around the state are also developing alternative compliance options ("ACOs") that would avoid the potentially harsh results associated with exceedances of receiving water limitations described in the last paragraph. Under the approach sanctioned by the State Water Resources Control Board ("State Board") in June of this year, municipal stormwater permittees that agree to participate in development of a WQIP, or a WQIP like plan for improving water quality, are deemed to be in compliance during the preparation and implementation of the WQIP if the permittee otherwise complies with the terms and timelines of its MS4 Permit (and the WQIP once it is developed/approved). The ACOs proposed in the current version of the Regional Permit, on the other hand, would leave the City strictly liable for any exceedance of basin plan standards (whether the result of City culpability or not), even as the City continues to aggressively implement its water pollution prevention efforts—leaving it vulnerable, potentially on a permanent basis, to third party lawsuits for any random exceedance even as it aggressively implements its robust clean water program.

Fundamentally, the City is most concerned with the current framework because it mandates the development of expensive projects and the City's extensive regulation of the day to day behavior of City residents where such actions may do very little to actually achieve water quality objectives (since impairment in the San Diego Region may be a result of non-point sources of pollution or non-controllable sources), while at the same time providing no assurances that the City will ever obtain compliance during and after WQIP development. At minimum, the current proposed ACOs proposed in the Regional Permit would have the City out of compliance with the Regional Permit, and subject to increasingly frequent CWA litigation, for a period of up to two years while the WQIP is in development, and this assumes that the Regional Board quickly acts to approve a southern Orange County WQIP. To be successful in improving water quality and maximizing the likelihood of obtaining numeric water quality objectives, the WQIP needs to be a data intensive and collaborative effort between the City, environmental advocates, the Regional Board and all of the other south Orange County stormwater permittees (and recycled water producers—who themselves may contribute significant loading to area streams). The WQIP, in order to obtain the reductions in non-point source pollution that are likely to be required, will have to be creative—with opportunities for offsets and other "credits" that provide compliance to municipal dischargers in exchange for undertaking projects that reduce or eliminate non-

point sources of pollution that the dischargers did not cause. The WQIP for southern Orange County, if it is to be effective, will not be a plan that can be developed quickly, or in a vacuum. Thus, the ability of the City to have interim compliance while working with its neighbors to develop a scientifically rigorous and effective WQIP—a plan that will accomplish what it was intended to do—becomes all the more important.

The City understands that most of the other Regional Boards around the state appear intent on providing ACOs for municipal dischargers that include some form of interim compliance while watershed based plans are in development. The San Diego Board should follow suit. Failure to provide interim compliance is fundamentally unfair for Cities like Dana Point that are already aggressively combatting stormwater pollution. The City would rather work collaboratively with the Regional Board (and the City's neighbors), as a full partner in the development of a robust WQIP that will result in significant and meaningful reductions in water pollution throughout southern Orange County. However, the current Regional Permit language that imposes strict liability for exceedances of water quality objectives—exceedances that appear inevitable no matter what action the City takes or doesn't take—will, because of the likelihood of liability to third parties , push the City away from collaborative efforts and towards a more defensive posture associated with litigation defense. This outcome is not good for the Regional Board, the City, or for southern Orange County watersheds. I accordingly ask you to strongly consider adding to the Regional Permit a mechanism for interim compliance for southern Orange County agencies who aggressively pursue WQIP development and implementation. It is the right thing to do, and the Regional Board can only gain by providing such a provision.

b. *It is Unfair to Impose Strict Liability for Non-Stormwater Discharges to the MS4 Where Nuisance Flows Are Diverted, and the Permittee Is Aggressively Implementing Its Illicit Discharge Program:* As the SWRCB acknowledged in its recent LA MS4 precedential order, preventing all non-stormwater runoff into an MS4 system can be a nearly impossible standard to meet at times since third parties—such as residents watering their lawns in a reasonable manner— may cause at least some incidental runoff to enter the City's MS4. Other Regional Boards have determined that permittees are in compliance with the CWA's direction to "effectively prohibit" all dry weather discharges when the City is implementing its illicit discharge prevention program and diverting, where feasible, residual "nuisance" flows to the sanitary sewer prior to entering a stream or the ocean. However, the Regional Permit in proposed paragraph E.2 of the Regional Permit, would arguably impose liability on the City even where: (1) all or most dry weather flows are diverted before the water reaches a Water of the State; (2) the discharge to the MS4 resulted from actions that the City may have very limited ability to control (such as sewer spills that are the responsibility of separate sewer agencies and runoff from irrigation of the steep slopes that predominate in Dana Point); (3) the City was fully implementing its illicit discharge prevention program. I respectfully ask that the Board direct its staff to work with the City to develop clarifying language, such as that recommended by our legal counsel in Exhibit A, that explains liability for non-stormwater discharges entering the MS4 is only appropriate when discharges are the result of culpability on the part of the City.

The City has other concerns that are reflected in Exhibit A, all of which the City incorporates herein by reference and formally requests that the Board consider. The City also reincorporates and reiterates here all of the comments it previously made on prior iterations of the Regional Permit and the

comments provided by the County of Orange submitted under separate cover. However, resolution of the issues discussed in this letter would go a long way towards resolving the City's concerns with the Regional Permit on a permanent basis.

I thank you for your consideration, and I look forward to a productive dialogue between our respective staffs that produces a win-win outcome for the City, the Regional Board and water quality in the San Diego Region.

Sincerely,

Carlos N. Olvera
Mayor

Attachment: Exhibit A

CC: David Gibson, Executive Officer, SDRWQCB
Patrick Munoz, Jeremy Jungreis, Rutan & Tucker LLP
Doug Chotkevys, Brad Fowler, Lisa Zawaski, Dana Point
Orange County Copermittees

Exhibit A

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Jeremy N. Jungreis
Direct Dial: (714) 338-1882

September 14, 2015

VIA ELECTRONIC MAIL

Mr. Wayne Chiu
Regional Water Quality Control Board, San Diego Region
2375 Northside Drive, Suite 100
San Diego, CA 92108
sandiego@waterboards.ca.gov

Re: Comments of the Cities of Dana Point and Laguna Beach on Proposed Tentative Order No. R9-2015-0100, Place ID: 786088

Dear Mr. Chiu:

This letter, which supplements and augments the letters submitted concurrently by the Mayors of the Cities of Dana Point and Laguna Beach, constitutes the further legal and technical comments of the Cities of Laguna Beach and Dana Point (the "Cities") to proposed amendments to San Diego Regional Water Quality Control Board ("Board") Order No. R9-2013-0001 (as amended by Order No. R9-2015-0001), proposed as Tentative Order No. R9-2015-0100 (the "Regional Permit"). The Cities also incorporate by reference, and assert as if separately stated herein, the comments submitted by the County of Orange ("County") on September 14, 2015, and the previous comments on the Regional Permit submitted by, or on behalf of, the City of Dana Point.[1]

The Cities appreciate the efforts of Regional Board staff to collaboratively engage the Permittees and other stakeholders in workshops where a variety of views on the question of receiving water limitations ("RWLs"), and how they should be achieved, were expressed. This manner of comment and stakeholder participation worked well in allowing all viewpoints to be expressed with sufficient time for vigorous discussion of issues with the Regional MS4 Permit. The Cities are hopeful that the issues addressed in this letter can be resolved via further

[1] The Cities by this reference incorporate, to the maximum extent allowed by law, all prior letters, comments, reports, presentations, oral and written testimony, data, communications, and other evidence made by, on behalf of, and in support of the County of Orange during the various workshops, hearings, and meetings relevant to the adoption of Order No. R9-2013-0001, as amended by Order No. R9-2015-0001 and Tentative Order No. R9-2015-0100. The Cities reserve the right to provide further comment as applicable.

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productive dialogue prior to the approval hearing for the Regional Permit scheduled for November 18.

1. LEGAL CONCERNS WITH RECEIVING WATER LIMITATIONS AND ALTERNATIVE COMPLIANCE OPTIONS.

a. IT IS LIKELY IMPOSSIBLE, AND CERTAINLY NOT "PRACTICABLE," TO COMPLY WITH ALL OF THE DISCHARGE PROHIBITIONS IN THE REGIONAL PERMIT UNDER ALL CIRCUMSTANCES

Part II.A.2 (a) of the Regional Permit strictly prohibits discharges of municipal stormwater to Waters of the U.S. that do not meet all water quality objectives—notwithstanding that such discharges may in fact control pollutants to the "maximum extent practicable," and notwithstanding that exceedances of numeric objectives in the San Diego Basin Plan may be the result of factors that the Cities have no ability to control. In other words, as currently drafted, the Regional Permit will impose strict liability on the Cities for regulatory requirements that will, in some cases, be impossible to meet,[2] no matter how robust or aggressive the WQIP ultimately developed. Imposing strict liability on the Cities and thereby subjecting them to CWA Citizen Suits and Regional Board enforcement every time it rains,[3] when there is no realistic possibility of ever achieving the currently applicable numeric RWLs, is inconsistent with both state and federal law. Neither requires municipal stormwater permittees, who unlike private businesses do not have the option to "go out of business" (or otherwise shut down non-compliant stormwater facilities), to achieve the impossible, or to control what MS4 permittees have no ability or authority to control. (*See* CA Civ. Code, § 3531 ["The law never requires impossibilities"]; CA

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[2] As Regional Board staff is aware, some of the existing water quality objectives in the San Diego Basin Plan which give rise to the receiving water limitations referenced in Section II.A.2, may be at or below natural background levels, or be set at levels so low that they cannot be achieved without diverting all of the water in the MS4 to a reverse osmosis ("RO") treatment plant—thereby in most cases removing the water from the watershed altogether and changing its composition in ways that could be harmful to the watershed if reintroduced post-treatment (*See, e.g.*,http://news.stanford.edu/news/2015/september/arsenic-mystery-solved-090215.html [Stanford study showing association between rising arsenic levels and water treated with RO]. Even with RO treatment, it still would not be possible to reliably meet the current default San Diego Basin Plan standard for total nitrogen in surface waters of 1 part per million. (*See, e.g.*, *U.S. v. Eastern Municipal Water District* Case. No. CV 04-8182 (C.D. Ca 2010) (noting infeasibility of meeting 1 ppm total nitrogen standard required for NPDES issuance).

[3] (*See, e.g.*, *NRDC v. County of Los Angeles* (C.D. Cal. Mar. 30, 2015) 2015 U.S. Dist. LEXIS 40761 ["Defendants are liable for the 147 exceedances described in Defendants' monitoring reports, which the Ninth Circuit found were conclusively demonstrated to be Permit violations by Defendants' own pollution monitoring."].)

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Civ. Code, § 3526 [“No man is responsible for that which no man can control”]; *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159, 1162; *Hughey v. JMS Dev. Corp.*, (11th Cir. 1996) 78 F.3d 1523, 1527-29; *Atlantic States Legal Foundation, Inc. v. Eastman Kodak Co.*, (2d Cir. 1993) 12 F.3d 353.)

The *Hughey* case referenced above is material to the scenario faced by the Cities with regard to the Regional Permit. In *Hughey*, the Plaintiff sued Defendant JMS for an alleged failure to obtain a storm water permit for the discharge of storm water from its construction project. The Plaintiff argued JMS had no authority to discharge any quantity or type of storm water from the project, i.e. a "zero discharge standard." until JMS had first obtained an NPDES permit. (*Id.* at 1527.) JMS did not dispute that storm water was discharged from its property and that it had not obtained an NPDES permit (allegedly in contravention of 33 U.S.C. § 1311), but claimed it was not in violation of the Clean Water Act because the Georgia Environmental Protection Division, the NPDES permitting authority, was not yet able to issue such permits. As a result, it was impossible for JMS to comply. (*Id.)* The Eleventh Circuit Court of Appeal held that the CWA does not require a permittee to achieve the impossible, finding that "Congress is presumed not to have intended an absurd (impossible) result." (*Id.* at 1529.) Specifically, the 11th Circuit found that: “***Congress could not have intended a strict application of the zero discharge standard in section 1311 (a) when compliance is factually impossible***. The evidence was uncontroverted that whenever it rained in Gwinnett County some discharge was going to occur; nothing JMS could do would prevent all rain water discharge. . . Lex non cogit ad impossibilia: The law does not compel the doing of impossibilities.") (*Id.*)

b. **IT IS PARAMOUNT THAT THE REGIONAL PERMIT PROVIDE INTERIM COMPLIANCE**

The ultimate outcome of imposing an unachievable discharge prohibition during the preparation and implementation of WQIPs will not be to improve water quality, but instead to increase litigation and costs incurred by public agencies in fighting enforcement actions and citizen suits, an opportunity not lost on entrepreneurial plaintiffs’ attorneys. As the Regional Board is aware, the State Water Resources Control Board (“SWRCB”) issued WQ 2015-0075 (hereinafter LA MS4 Order) in June of 2015. The LA MS4 Order is a precedential order that provides an alternative compliance option (“ACO”) to permittees that would at least permit the Cities to remain in compliance with the CWA notwithstanding the current inability to demonstrate current attainment of all water quality standards in receiving waters at all times. Under the approach approved by the SWRCB, a city that agrees to participate in the development of the LA Regional Board’s equivalent of a WQIP is deemed to be in compliance during the preparation of the WQIP if the city otherwise complies with the terms and timelines of its MS4 Permit. The “in compliance” status remains for as long as the city continues to diligently perform its obligations under the ACO in furtherance of projects and management actions that

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result in the ultimate achievement of water quality objectives (which the LA Regional Board admitted would likely take decades in some cases). The ACO proposed in the current version of the Regional Permit, on the other hand, would hold the Cities strictly liable immediately for any exceedance (whether the result of the Cities' culpability or not), even as the Cities continue to spend substantial sums to develop projects that reduce pollution.

Perhaps more significantly, the approach proposed in the Regional Permit is, from what the Cities have learned, different from the approach currently being considered by other Regional Board in the state, in that the WQIP provides no interim compliance of any kind while the WQIP is in development (a period of 18 months in Orange County assuming no extensions are granted), and indeed the proposed ACO provides no compliance to any MS4 until such time as all of the watersheds within southern Orange County can demonstrate to a level of certainty that implementation of the WQIP will actually result in the complete achievement of all numeric water quality objectives—a task in and of itself that, as previously referenced, may not be physically possible in some locations for certain naturally occurring constituents such as bacteria, nutrients and metals. To be successful in improving water quality to the maximum extent within the Cities, the WQIP needs to be deliberate, scientifically rigorous, and a collaborative effort between the Cities, concerned citizens, the Regional Board and all of the other south Orange County stormwater permittees.

The current version of the Regional Permit would make such an effort difficult to achieve. All of the Orange County Co-Permittees, being currently out of compliance (and unlike the San Diego County permittees having no draft plan already completed), and facing CWA citizen suits at any time during plan development, will be forced to rush to develop a plan that may have little chance of being funded (Prop 218 and Prop 26 limitations) or implemented, while at the same time Co-Permittee funds that would otherwise go to collaboratively developing scientifically validated projects with immediate water quality benefits will need to be held back to facilitate ability to defend against filed by environmental groups seeking to impose strict liability.. Meanwhile, the Regional Board will presumably have less and less influence over the process of improving water quality as collaborative efforts break down and decisions about water quality projects, improvement plans, and pertinent timelines, shift to Federal Judges and environmental plaintiffs rather than the Regional Board. All sides would benefit from a carefully tailored interim compliance option that ensures rapid preparation of the WQIP while also ensuring the WQIP effort is not rendered superfluous by Federal Court decisions and consent decrees that may impose disparate and conflicting obligations on different permittees throughout the San Diego Region.

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c. THE REGIONAL PERMIT SHOULD PROVIDE FOR THE DEVELOPMENT OF SITE SPECIFIC OBJECTIVES

The impossibility/impracticability of ever attaining RWLs in San Diego Region watersheds could be mitigated by specific reference in the Regional Permit to the potential development of site specific objectives that would potentially be attainable while also ensuring full protection of existing beneficial uses in southern Orange County. However, the San Diego Regional Board Staff has historically resisted stakeholder efforts to develop attainable site specific objectives for bacteria, nutrients and toxics, and has not offered the possibility of site specific objective development as a potential mechanism for the Cities to obtain long term compliance in conjunction with WQIP development. Taken to its logical conclusion, the Regional Board's current position on strict liability of MS4s for non-attainment of existing numeric objectives could result in development moratoria, and inability of local water agencies to undertake any kind of significant recycled water project requiring storage or conveyance of recycled water (or otherwise resulting in increased nutrient or salinity loading to southern Orange County streams).

San Juan Creek, which has been discussed as a potential site for a large scale indirect potable reuse ("IPR") project to recharge the depleted San Juan Groundwater Basin (classified as a surface water by the SWRCB), is already listed as being impaired for total nitrogen and phosphorous according to the 2012 SWRCB 303 (d) list. Since RO cannot reliably take recycled water below 1 ppm total nitrogen, and the 303 (d) listing indicates that there is no current assimilative capacity in San Juan Creek, it is unclear how such a project could ever be permitted by the Regional Board—notwithstanding the San Diego Region's dire need for additional local water supplies, and the Regional Board's desire to curtail existing ocean outfall discharges whenever practicable. Accordingly, the Cities, both of whom could benefit from the development of additional recycled water supplies in the Region, recommend that the Regional Permit and Staff Report specifically acknowledge the potential wisdom of developing site specific objectives in concert with the mandated WQIP development—even where site specific development may extend the period required to complete the WQIP process.

2. DISCHARGES OF NON-STORMWATER SHOULD NOT GIVE RISE TO LIABILITY UNDER THE PERMIT WHERE THE PERMITTEE IS FULLY IMPLEMENTING ITS ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM.

The Cities understand the desire of the Regional Board to prohibit discharges of non-stormwater "dry weather" or "nuisance" flows to the MS4. Such flows may, at times, contain significant amounts of pollutants that impair beneficial uses, so diversion of such flows where feasible makes sense. And that is precisely what both Cities have done in their respective service areas with the installation of dry weather flow diversion units that divert nuisance flows

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whenever feasible.[4] However, language in Section E.2 can be read to hold the owner of the MS4 strictly liable under the Regional Permit where non-permitted discharges enter the MS4 and the owner of the MS4 did not otherwise prevent them from occurring. Indeed, it is often difficult for an MS4 operator to even identify the source of the broad universe of what the Regional Permit defines as illicit discharges on a given day (e.g., numerous houses in a neighborhood may be the cumulative cause of small amounts of runoff entering an MS4 with the "source" of the "non-stormwater discharge" varying each day according to residential irrigation patterns).[5] As the SWRCB acknowledged in footnote 133 of its recent decision in the LA MS4 Decision, Order No. WQ 2015-0075 , "[w]e recognize that even the most comprehensive efforts to address unauthorized non-storm water discharges may not eliminate all such discharges."

Because of the apparent intention of some environmental groups, as evidenced by recent Federal Court filings initiating Clean Water Act citizen suits (and seeking strict liability for alleged violations of MS4 permits), to impose liability on cities who are otherwise fully implementing their illicit detection programs (and diverting non-stormwater flows, whenever feasible, to the sanitary sewer),[6] the Cities urge the Regional Board to clarify that it does not intend to impose liability on MS4 permittees who are not otherwise complicit or culpable in dry weather flows entering the MS4 (and subsequently a Water of the U.S.). Accordingly, the Cities respectfully request that the Regional Board amend Section II.E.2 of the Regional Permit to read as follows:

"Each Copermittee must implement a program to actively detect and eliminate illicit discharges and improper disposal into the MS4, or otherwise require the discharger to apply for and obtain a separate NPDES permit. Compliance with the terms of this Provision E.2 shall constitute compliance with the requirement under Provision A.1.b to "effectively prohibit" non-

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[4] Dry weather diversions may be infeasible within the Cities where inadequate sewer line or wastewater treatment plant capacity exists, where the flows are a mix of non-stormwater runoff and rising groundwater, or where the geography or hydrology of the location makes installation of the units impracticable to install or maintain.

[5] It will also be very difficult for the Cities to determine on any given day what volume of dry weather (and wet weather) discharges are derived from separately permitted activities, or activities that fall outside of the CWA altogether such as agricultural return flows. To the extent that such identification is even physically possible, it may nevertheless be impossible for the Cities to determine which sources of dry weather flows are benign and which ones contain pollutants above RWLs.

[6] On at least two occasions within the past six months, the environmental group River Watch has sued MS4 operators for allegedly violating the prohibitions on municipal stormwater discharges that exceed RWLs, and for allegedly permitting non-stormwater discharges to enter the MS4 from non-permitted sources. The concerns expressed herein regarding third party liability associated with the Regional Permit are far from theoretical.

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storm discharges into the MS4, provided the Copermittee is in full compliance with all requirements in this Provision E.2 or is otherwise working diligently to address any identified deficiency. The illicit discharge detection and elimination program must be implemented in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include, at a minimum, the following requirements . . ."

It would also be beneficial for the Regional Board to clarify the definition of "discharges from potable water sources" in Section II.E.2.a (3)(f). Potable water used for residential irrigation that runs off in small quantities (and not otherwise invoking an issue of wasteful water use) would potentially be appropriate for exclusion from treatment as an illicit discharge (allowing permittees to focus on illicit discharges with significant water quality ramifications). However, as currently drafted, it is not clear whether "potable discharges" are intended to include runoff derived from turf or ornamental plant irrigation.

Thank you for the opportunity to comment. Both Cities look forward to working with Regional Board staff to develop language that will address the concerns expressed herein.

Very truly yours,

RUTAN & TUCKER, LLP

Jeremy N. Jungreis

JNJ:nd

Electronic Submission to sandiego@waterboards.ca.gov
Honorable Chairman Henry Abarbanel and Board Members
Attn: Mr. Wayne Chiu
San Diego Regional Water Quality Control Board
2375 Northside Drive, Suite 100
San Diego, California 92108

Dear Chairman Abarbanel, Honorable Board Members, and Mr. Chiu:

Subject: Comment Letter — Tentative Order No. R9-2015-0100 Place ID: 786088WChiu

I am writing at the direction of a unanimous City Council of the City of Laguna Beach (the "City") to urge you to make certain changes to the language being proposed by staff to the Regional Board as amendments to the City's Regional Permit. This is a matter of great importance to the City. Specifically, we are concerned that the proposed amendments create undue liability for the City during the interim period prior to the adoption of a water quality improvement plan, and creates strict liability for the City for third party actions that it cannot control.

First, let me assure you that the City Council is fully committed to aggressively pursuing improvements in water quality. As demonstrated by our past actions, Laguna Beach is a community where water quality is taken very seriously, and we generally support the actions of the Board to make our beaches and watersheds cleaner. We are a leader in efforts to protect and improve water quality through a vigorous source control program and active investigation and enforcement of illicit discharges. As one of many examples of the City's strong commitment to improving water quality, the City has broadly invested in urban stormwater diversion units. These costly diversion units collect dry weather runoff and divert it to the sanitary sewer system. To date, 25 urban water diversion units have been installed and divert approximately 83% of the City's urban drainage area (all of the areas where diversion is feasible). This aggressive approach to stormwater pollution prevention has earned the City a summer and winter dry weather "grade" from Heal the Bay of an "A" or higher at all beaches within the City.

We understand Board staff is proposing to amend the Regional Permit with revisions that would impose strict liability on cities for any non-attainment of water quality standards, no matter what the cause, and irrespective of the feasibility of achieving numeric standards (at all times) in a water body. While we applaud the efforts of the Board to improve water quality in

the region, there are several aspects of what is being proposed that are likely to have adverse consequences. Accordingly, the City Council respectfully asks you and your staff to carefully consider the comments and recommendations in this letter, as well as those provided by our legal counsel (Exhibit A), and to work with the City to develop a fair resolution of our concerns.

The Proposed Amendments Unequivocally Should Require Interim Compliance While the City Develops a Water Quality Improvement Plan ("WQIP"). The draft language requires the City to develop a WQIP as a practical vehicle for improving water quality on a watershed basis but appears to impose strict liability on the City for discharges while the WQIP is being developed. A watershed approach to water quality improvement makes sense, and the City is generally supportive of the WQIP concept. However, the proposed Regional Permit's departure from the previous best management practice ("BMP") based approach in favor of a strict liability regime that mandates immediate attainment of numeric water quality objectives (some of which may be lower than natural background levels) poses a severe compliance challenge for the City. Under the proposed amendment, the City will be potentially liable for a violation of the Regional Permit, and thus the Clean Water Act, every time it rains. While the City has already diverted the vast majority of dry weather flows to the sanitary sewer, it is not feasible (nor good for the environment) to divert all wet weather flows. Because of the extremely stringent standards for bacteria, nutrients, and metals—constituents that the City may have little to no ability to control—wet weather flows from the City's MS4 are likely, no matter what actions the City takes, to contain pollutants in excess of receiving water limitations. When exceedances occur, the City will face fines/penalties from the Board (and the likelihood of Clean Water Act citizen suits) whether the City caused exceedances of receiving water limitations or not. This is not a fair result, and arbitrarily imposing liability without culpability will not lead to cleaner water.

To be successful in improving water quality to the maximum extent within the City, the WQIP needs to be a deliberate, scientifically rigorous, and collaborative effort between all interested stakeholders ***that recognizes the need for interim and long term compliance by the City*** while the WQIP is developed and implemented. A hastily compiled plan, speedily prepared because of fear of immediate strict liability, will not be the sort of plan that will accomplish the Board's objectives or the needs of City residents. It will only lead to litigation and uncertainty for all involved. We urge you to add some form of interim compliance for southern Orange County agencies who aggressively pursue WQIP development and implementation.

The Regional Permit Should not Impose Strict Liability Where the City Fully Implements a Robust Illicit Discharge Prevention Program and Diverts All Feasible Dry Weather Flows. The Regional Permit amendments would create what amounts to a ban on runoff into the MS4 when it is not raining (except for separately authorized discharges). Unfortunately, as the State Water Board recently acknowledged in its LA MS4 decision, preventing all runoff into an MS4 system can be nearly impossible since third parties—such as residents watering their lawns in a

reasonable manner—may nevertheless cause at least some incidental runoff to enter the MS4. The City has limited ability to stop third party sewage spills or other third party actions (e.g., washing of vehicles) that may result in small amounts of runoff entering the MS4 when it is not raining (even where the City is fully implementing and enforcing its illicit discharge program). The City will follow the Clean Water Act and "effectively prohibit" all dry weather discharges to receiving waters with its illicit discharge prevention program and diversion of dry weather flows. What the City cannot do is guarantee that runoff or illicit discharges never reach the City's MS4 (as the amended permit can be read to require). Please strongly consider revising the Regional Permit to eliminate any inference of strict liability where the City fully implements its illicit discharge program by adding the clarifying language recommended by our legal counsel.

Thank you for considering our requests. Our staff is available to assist in crafting language to address City concerns while facilitating the Board's continued improvement of water quality. If you have any questions please feel free to contact our Director of Water Quality, David Shissler at (949) 497-0328.

Sincerely,

Bob Whalen, Mayor

CC: David Gibson, Executive Officer, SDRWQCB
Jeremy Jungreis, Rutan & Tucker, LLP

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Jeremy N. Jungreis
Direct Dial: (714) 338-1882

September 14, 2015

EXHIBIT A

VIA ELECTRONIC MAIL

Mr. Wayne Chiu
Regional Water Quality Control Board, San Diego Region
2375 Northside Drive, Suite 100
San Diego, CA 92108
sandiego@waterboards.ca.gov

Re: Comments of the Cities of Dana Point and Laguna Beach on Proposed Tentative Order No. R9-2015-0100, Place ID: 786088

Dear Mr. Chiu:

This letter, which supplements and augments the letters submitted concurrently by the Mayors of the Cities of Dana Point and Laguna Beach, constitutes the further legal and technical comments of the Cities of Laguna Beach and Dana Point (the "Cities") to proposed amendments to San Diego Regional Water Quality Control Board ("Board") Order No. R9-2013-0001 (as amended by Order No. R9-2015-0001), proposed as Tentative Order No. R9-2015-0100 (the "Regional Permit"). The Cities also incorporate by reference, and assert as if separately stated herein, the comments submitted by the County of Orange ("County") on September 14, 2015, and the previous comments on the Regional Permit submitted by, or on behalf of, the City of Dana Point.[1]

The Cities appreciate the efforts of Regional Board staff to collaboratively engage the Permittees and other stakeholders in workshops where a variety of views on the question of receiving water limitations ("RWLs"), and how they should be achieved, were expressed. This manner of comment and stakeholder participation worked well in allowing all viewpoints to be expressed with sufficient time for vigorous discussion of issues with the Regional MS4 Permit. The Cities are hopeful that the issues addressed in this letter can be resolved via further

[1] The Cities by this reference incorporate, to the maximum extent allowed by law, all prior letters, comments, reports, presentations, oral and written testimony, data, communications, and other evidence made by, on behalf of, and in support of the County of Orange during the various workshops, hearings, and meetings relevant to the adoption of Order No. R9-2013-0001, as amended by Order No. R9-2015-0001 and Tentative Order No. R9-2015-0100. The Cities reserve the right to provide further comment as applicable.

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productive dialogue prior to the approval hearing for the Regional Permit scheduled for November 18.

1. LEGAL CONCERNS WITH RECEIVING WATER LIMITATIONS AND ALTERNATIVE COMPLIANCE OPTIONS.

a. IT IS LIKELY IMPOSSIBLE, AND CERTAINLY NOT "PRACTICABLE," TO COMPLY WITH ALL OF THE DISCHARGE PROHIBITIONS IN THE REGIONAL PERMIT UNDER ALL CIRCUMSTANCES

Part II.A.2 (a) of the Regional Permit strictly prohibits discharges of municipal stormwater to Waters of the U.S. that do not meet all water quality objectives—notwithstanding that such discharges may in fact control pollutants to the "maximum extent practicable," and notwithstanding that exceedances of numeric objectives in the San Diego Basin Plan may be the result of factors that the Cities have no ability to control. In other words, as currently drafted, the Regional Permit will impose strict liability on the Cities for regulatory requirements that will, in some cases, be impossible to meet,[2] no matter how robust or aggressive the WQIP ultimately developed. Imposing strict liability on the Cities and thereby subjecting them to CWA Citizen Suits and Regional Board enforcement every time it rains,[3] when there is no realistic possibility of ever achieving the currently applicable numeric RWLs, is inconsistent with both state and federal law. Neither requires municipal stormwater permittees, who unlike private businesses do not have the option to "go out of business" (or otherwise shut down non-compliant stormwater facilities), to achieve the impossible, or to control what MS4 permittees have no ability or authority to control. (*See* CA Civ. Code, § 3531 ["The law never requires impossibilities"]; CA

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[2] As Regional Board staff is aware, some of the existing water quality objectives in the San Diego Basin Plan which give rise to the receiving water limitations referenced in Section II.A.2, may be at or below natural background levels, or be set at levels so low that they cannot be achieved without diverting all of the water in the MS4 to a reverse osmosis ("RO") treatment plant—thereby in most cases removing the water from the watershed altogether and changing its composition in ways that could be harmful to the watershed if reintroduced post-treatment (*See, e.g.*,http://news.stanford.edu/news/2015/september/arsenic-mystery-solved-090215.html [Stanford study showing association between rising arsenic levels and water treated with RO]. Even with RO treatment, it still would not be possible to reliably meet the current default San Diego Basin Plan standard for total nitrogen in surface waters of 1 part per million. (*See, e.g.*, *U.S. v. Eastern Municipal Water District* Case. No. CV 04-8182 (C.D. Ca 2010) (noting infeasibility of meeting 1 ppm total nitrogen standard required for NPDES issuance).

[3] (*See, e.g.*, *NRDC v. County of Los Angeles* (C.D. Cal. Mar. 30, 2015) 2015 U.S. Dist. LEXIS 40761 ["Defendants are liable for the 147 exceedances described in Defendants' monitoring reports, which the Ninth Circuit found were conclusively demonstrated to be Permit violations by Defendants' own pollution monitoring."].)

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Civ. Code, § 3526 [“No man is responsible for that which no man can control”]; *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159, 1162; *Hughey v. JMS Dev. Corp.*, (11th Cir. 1996) 78 F.3d 1523, 1527-29; *Atlantic States Legal Foundation, Inc. v. Eastman Kodak Co.*, (2d Cir. 1993) 12 F.3d 353.)

The *Hughey* case referenced above is material to the scenario faced by the Cities with regard to the Regional Permit. In *Hughey*, the Plaintiff sued Defendant JMS for an alleged failure to obtain a storm water permit for the discharge of storm water from its construction project. The Plaintiff argued JMS had no authority to discharge any quantity or type of storm water from the project, i.e. a "zero discharge standard." until JMS had first obtained an NPDES permit. (*Id.* at 1527.) JMS did not dispute that storm water was discharged from its property and that it had not obtained an NPDES permit (allegedly in contravention of 33 U.S.C. § 1311), but claimed it was not in violation of the Clean Water Act because the Georgia Environmental Protection Division, the NPDES permitting authority, was not yet able to issue such permits. As a result, it was impossible for JMS to comply. (*Id.)* The Eleventh Circuit Court of Appeal held that the CWA does not require a permittee to achieve the impossible, finding that "Congress is presumed not to have intended an absurd (impossible) result.” (*Id.* at 1529.) Specifically, the 11th Circuit found that: “***Congress could not have intended a strict application of the zero discharge standard in section 1311 (a) when compliance is factually impossible***. The evidence was uncontroverted that whenever it rained in Gwinnett County some discharge was going to occur; nothing JMS could do would prevent all rain water discharge. . . Lex non cogit ad impossibilia: The law does not compel the doing of impossibilities.") (*Id.*)

b. **<u>IT IS PARAMOUNT THAT THE REGIONAL PERMIT PROVIDE INTERIM COMPLIANCE</u>**

The ultimate outcome of imposing an unachievable discharge prohibition during the preparation and implementation of WQIPs will not be to improve water quality, but instead to increase litigation and costs incurred by public agencies in fighting enforcement actions and citizen suits, an opportunity not lost on entrepreneurial plaintiffs’ attorneys. As the Regional Board is aware, the State Water Resources Control Board (“SWRCB”) issued WQ 2015-0075 (hereinafter LA MS4 Order) in June of 2015. The LA MS4 Order is a precedential order that provides an alternative compliance option (“ACO”) to permittees that would at least permit the Cities to remain in compliance with the CWA notwithstanding the current inability to demonstrate current attainment of all water quality standards in receiving waters at all times. Under the approach approved by the SWRCB, a city that agrees to participate in the development of the LA Regional Board’s equivalent of a WQIP is deemed to be in compliance during the preparation of the WQIP if the city otherwise complies with the terms and timelines of its MS4 Permit. The “in compliance” status remains for as long as the city continues to diligently perform its obligations under the ACO in furtherance of projects and management actions that

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result in the ultimate achievement of water quality objectives (which the LA Regional Board admitted would likely take decades in some cases). The ACO proposed in the current version of the Regional Permit, on the other hand, would hold the Cities strictly liable immediately for any exceedance (whether the result of the Cities' culpability or not), even as the Cities continue to spend substantial sums to develop projects that reduce pollution.

Perhaps more significantly, the approach proposed in the Regional Permit is, from what the Cities have learned, different from the approach currently being considered by other Regional Board in the state, in that the WQIP provides no interim compliance of any kind while the WQIP is in development (a period of 18 months in Orange County assuming no extensions are granted), and indeed the proposed ACO provides no compliance to any MS4 until such time as all of the watersheds within southern Orange County can demonstrate to a level of certainty that implementation of the WQIP will actually result in the complete achievement of all numeric water quality objectives—a task in and of itself that, as previously referenced, may not be physically possible in some locations for certain naturally occurring constituents such as bacteria, nutrients and metals. To be successful in improving water quality to the maximum extent within the Cities, the WQIP needs to be deliberate, scientifically rigorous, and a collaborative effort between the Cities, concerned citizens, the Regional Board and all of the other south Orange County stormwater permittees.

The current version of the Regional Permit would make such an effort difficult to achieve. All of the Orange County Co-Permittees, being currently out of compliance (and unlike the San Diego County permittees having no draft plan already completed), and facing CWA citizen suits at any time during plan development, will be forced to rush to develop a plan that may have little chance of being funded (Prop 218 and Prop 26 limitations) or implemented, while at the same time Co-Permittee funds that would otherwise go to collaboratively developing scientifically validated projects with immediate water quality benefits will need to be held back to facilitate ability to defend against filed by environmental groups seeking to impose strict liability. Meanwhile, the Regional Board will presumably have less and less influence over the process of improving water quality as collaborative efforts break down and decisions about water quality projects, improvement plans, and pertinent timelines, shift to Federal Judges and environmental plaintiffs rather than the Regional Board. All sides would benefit from a carefully tailored interim compliance option that ensures rapid preparation of the WQIP while also ensuring the WQIP effort is not rendered superfluous by Federal Court decisions and consent decrees that may impose disparate and conflicting obligations on different permittees throughout the San Diego Region.

c. <u>THE REGIONAL PERMIT SHOULD PROVIDE FOR THE DEVELOPMENT OF SITE SPECIFIC OBJECTIVES</u>

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The impossibility/impracticability of ever attaining RWLs in San Diego Region watersheds could be mitigated by specific reference in the Regional Permit to the potential development of site specific objectives that would potentially be attainable while also ensuring full protection of existing beneficial uses in southern Orange County. However, the San Diego Regional Board Staff has historically resisted stakeholder efforts to develop attainable site specific objectives for bacteria, nutrients and toxics, and has not offered the possibility of site specific objective development as a potential mechanism for the Cities to obtain long term compliance in conjunction with WQIP development. Taken to its logical conclusion, the Regional Board's current position on strict liability of MS4s for non-attainment of existing numeric objectives could result in development moratoria, and inability of local water agencies to undertake any kind of significant recycled water project requiring storage or conveyance of recycled water (or otherwise resulting in increased nutrient or salinity loading to southern Orange County streams).

San Juan Creek, which has been discussed as a potential site for a large scale indirect potable reuse ("IPR") project to recharge the depleted San Juan Groundwater Basin (classified as a surface water by the SWRCB), is already listed as being impaired for total nitrogen and phosphorous according to the 2012 SWRCB 303 (d) list. Since RO cannot reliably take recycled water below 1 ppm total nitrogen, and the 303 (d) listing indicates that there is no current assimilative capacity in San Juan Creek, it is unclear how such a project could ever be permitted by the Regional Board—notwithstanding the San Diego Region's dire need for additional local water supplies, and the Regional Board's desire to curtail existing ocean outfall discharges whenever practicable. Accordingly, the Cities, both of whom could benefit from the development of additional recycled water supplies in the Region, recommend that the Regional Permit and Staff Report specifically acknowledge the potential wisdom of developing site specific objectives in concert with the mandated WQIP development—even where site specific development may extend the period required to complete the WQIP process.

2. <u>DISCHARGES OF NON-STORMWATER SHOULD NOT GIVE RISE TO LIABILITY UNDER THE PERMIT WHERE THE PERMITTEE IS FULLY IMPLEMENTING ITS ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM</u>.

The Cities understand the desire of the Regional Board to prohibit discharges of non-stormwater "dry weather" or "nuisance" flows to the MS4. Such flows may, at times, contain significant amounts of pollutants that impair beneficial uses, so diversion of such flows where feasible makes sense. And that is precisely what both Cities have done in their respective service areas with the installation of dry weather flow diversion units that divert nuisance flows whenever feasible.[4] However, language in Section E.2 can be read to hold the owner of the MS4

[4] Dry weather diversions may be infeasible within the Cities where inadequate sewer line or wastewater treatment plant capacity exists, where the flows are a mix of non-stormwater runoff

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strictly liable under the Regional Permit where non-permitted discharges enter the MS4 and the owner of the MS4 did not otherwise prevent them from occurring. Indeed, it is often difficult for an MS4 operator to even identify the source of the broad universe of what the Regional Permit defines as illicit discharges on a given day (e.g., numerous houses in a neighborhood may be the cumulative cause of small amounts of runoff entering an MS4 with the "source" of the "non-stormwater discharge" varying each day according to residential irrigation patterns).[5] As the SWRCB acknowledged in footnote 133 of its recent decision in the LA MS4 Decision, Order No. WQ 2015-0075 , "[w]e recognize that even the most comprehensive efforts to address unauthorized non-storm water discharges may not eliminate all such discharges."

Because of the apparent intention of some environmental groups, as evidenced by recent Federal Court filings initiating Clean Water Act citizen suits (and seeking strict liability for alleged violations of MS4 permits), to impose liability on cities who are otherwise fully implementing their illicit detection programs (and diverting non-stormwater flows, whenever feasible, to the sanitary sewer),[6] the Cities urge the Regional Board to clarify that it does not intend to impose liability on MS4 permittees who are not otherwise complicit or culpable in dry weather flows entering the MS4 (and subsequently a Water of the U.S.). Accordingly, the Cities respectfully request that the Regional Board amend Section II.E.2 of the Regional Permit to read as follows:

"Each Copermittee must implement a program to actively detect and eliminate illicit discharges and improper disposal into the MS4, or otherwise require the discharger to apply for and obtain a separate NPDES permit. Compliance with the terms of this Provision E.2 shall constitute compliance with the requirement under Provision A.1.b to "effectively prohibit" non-storm discharges into the MS4, provided the Copermittee is in full compliance with all requirements in this Provision E.2 or is otherwise working diligently to address any identified deficiency. The illicit discharge detection and elimination program must be implemented in

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and rising groundwater, or where the geography or hydrology of the location makes installation of the units impracticable to install or maintain.

[5] It will also be very difficult for the Cities to determine on any given day what volume of dry weather (and wet weather) discharges are derived from separately permitted activities, or activities that fall outside of the CWA altogether such as agricultural return flows. To the extent that such identification is even physically possible, it may nevertheless be impossible for the Cities to determine which sources of dry weather flows are benign and which ones contain pollutants above RWLs.

[6] On at least two occasions within the past six months, the environmental group California River Watch has sued MS4 operators for allegedly violating the prohibitions on municipal stormwater discharges that exceed RWLs, and for allegedly permitting non-stormwater discharges to enter the MS4 from non-permitted sources. The concerns expressed herein regarding third party liability associated with the Regional Permit are far from theoretical.

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accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include, at a minimum, the following requirements . . ."

It would also be beneficial for the Regional Board to clarify the definition of "discharges from potable water sources" in Section II.E.2.a (3)(f). Potable water used for residential irrigation that runs off in small quantities (and not otherwise invoking an issue of wasteful water use) would potentially be appropriate for exclusion from treatment as an illicit discharge (allowing permittees to focus on illicit discharges with significant water quality ramifications). However, as currently drafted, it is not clear whether "potable discharges" are intended to include runoff derived from turf or ornamental plant irrigation.

Thank you for the opportunity to comment. Both Cities look forward to working with Regional Board staff to develop language that will address the concerns expressed herein.

Very truly yours,

RUTAN & TUCKER, LLP

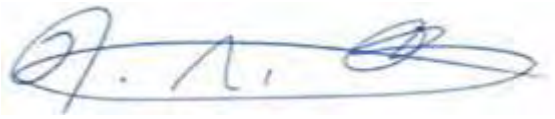

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September 14, 2015

VIA E-MAIL [SANDIEGO@WATERBOARDS.CA.GOV]

David Gibson, Executive Officer
c/o Wayne Chiu
San Diego Regional Water Quality Control Board
2375 Northside Drive, Suite 100,
San Diego, CA 92108

Re: Comment - Tentative Order No. R9-2015-0100, Place ID:786088WChiu

Dear Mr. Gibson and Mr. Chiu:

Best Best & Krieger represents the City of Lake Forest ("City"). The City submits the following comments on the California Regional Water Quality Control Board, San Diego Region ("SDRWQCB"), Tentative Order No. R9-2015-0100 ("Tentative Order") amending Order No. R9-2013-0001, NPDES No. CAS010266, as amended by Order No. R9-2015-0001, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4) Draining the Watersheds within the San Diego Region ("MS4 Permit"). The City is committed to improving and sustaining water quality in the San Diego region and has undertaken extensive efforts to further these goals. The City is aware that the County of Orange has prepared and submitted comments on the Tentative Order. The City would like to express its support for the County's comment letter and join with the County in the submission of those comments. The comments in this letter supplement the County's letter and are intended to allow the City and other Co-permittees to continue working toward the common goal of improving water quality in the region.

1. THE CITY SUPPORTS INCORPORATION OF THE ALTERNATIVE COMPLIANCE PATHWAY FOR PROHIBITIONS AND LIMITATIONS

The City appreciates the efforts of SDRWQCB staff to develop an alternative compliance pathway for incorporation into the MS4 Permit. MS4s face special challenges in attaining water quality objectives and immediate compliance with many of the objectives is not feasible. An alternative to strict compliance is consistent with the Ninth Circuit Court's recognition that the Clean Water Act "does not require municipal storm-sewer discharges to comply strictly with 33 U.S.C. § 1311(b)(1)(C)" regarding limitations. (*Defenders of Wildlife v. Browner* (9th Cir. 1999)

191 F.3d 1159, 1165.) The WQIP process establishes a rigorous, flexible and transparent pathway for compliance with Provisions A.1.a, A.1.c, A.1.d, A.2.a, and A.3.b. The City joins with other Co-Permittees in expressing its support for an alternative compliance pathway.

2. CLARIFY PROVISION A TO STATE THAT COMPLIANCE WITH PROVISION B.3 CONSTITUTES COMPLIANCE WITH PROVISIONS A.1.a, A.1.C, A.1.D, A.2, AND A.3.b OF THE MS4 PERMIT

The City is concerned that the prohibitions and limitations in Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b, as currently written, may be interpreted independent of the alternative compliance pathway in Provision B.3. The Ninth Circuit Court's decision in *Los Angeles County Flood Control District v. NRDC* interpreted an MS4 permit as a contract, with each provision as a stand-alone requirement. A stand-alone reading of the prohibitions and limitations, without any reference to the compliance pathway provision may expose the Co-Permittees to unintended liability, despite our rigorous efforts to successfully implement the alternative compliance pathway. The City joins with Co-Permittees in requesting the simple solution of adding language to Provision A that clarifies intent of the alternative compliance pathway is to create an alternative means of complying with Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b. In other words, the City requests adding language in Provision A simply referencing and linking the alternative compliance pathway in Provision B.

The City also seeks this clarification from its unique position pursuant to the Water Code section 13228 designation agreement between the San Diego and Santa Ana Regional Water Quality Control Boards. The City will actively participate in the development and implementation of the Aliso Creek Watershed Area Water Quality Improvement Plan even though its discharges within the SDRWQCB's jurisdiction are regulated by the Santa Ana Regional Water Quality Control Board. The City will invest substantial time and resources into the Water Quality Improvement Plan and seeks assurance that its efforts will not increase its exposure to liability rather than decrease exposure.

3. INCLUDE THE WQIP PLANNING PROCESS IN THE ALTERNATIVE COMPLIANCE PATHWAY

In light of the direction from the State Water Resources Control Board ("State Board"), the alternative compliance pathway should be extended to include the WQIP planning phase. The alternative compliance pathway currently begins after the WQIP has been completed and is being implemented. It does not extend to the WQIP planning process. The Permit establishes a structure, with timelines over two years, for the WQIP planning process. During the planning process, Co-Permittees will, among other activities, identify water quality priorities, identify and prioritize known and suspected sources of pollutants and stressors, identify potential strategies to improve water quality, create an integrated monitoring and assessment program, and develop

stormwater action levels and non-stormwater action levels into the WQIP. Each of these steps, and others, including the public participation process, occurs on a schedule and requires a substantial investment of time and resources.

Even though the City will participate in the Aliso Creek Watershed Area Water Quality Improvement Plan and anticipates meeting all Permit-established planning requirements, the City and other Co-Permittees remain open to liability for prohibitions and limitations violations, especially from third parties, during the planning process. The ultimate goal of the planning process is to create a WQIP designed to address prioritized water quality conditions. If the City is forced to divert funds away from the planning process to defend a third-party lawsuit during the planning period, such diversion will impede the City's ability to develop a thorough WQIP and undercuts the ultimate goal of the Permit.

Recognizing the need for a long-term approach to addressing water quality conditions, the State Board directed regional boards to "incorporate an ambitious, rigorous, and transparent alternative compliance path that allows permittees appropriate time to come into compliance with receiving water limitations without being in violation of the receiving water limitations during full implementation of the compliance alternative." (State Water Resources Control Board, Order WQ 2015-0075, p. 52.) With direction from the State Board to create a space and time for Co-Permittees to come into compliance with receiving water limitation without being in violation of the Permit, it is imperative that the Board extend the Permit's alternative compliance pathway to the planning phase. Because the planning process is integral to addressing water quality conditions, the City joins with the Co-Permittees in requesting that the alternative compliance pathway include the WQIP planning process.

4. REVISE ANNUAL MILESTONE REQUIREMENT TO INCLUDE MEANINGFUL MILESTONES (PROVISION B.3.c.(1)(a)(vii), B.3.c.(1)(d), B.3.c.(2)(c), B.3.c.(2)(d) and footnote 9)

The Tentative Order's alternative compliance pathway requires Water Quality Improvement Plans to set annual milestones for each numeric goal. These milestones must build on previous milestones and lead to the achievement of a final numeric goal. While improvements to water quality may be more difficult to attain in the absence of clear goals and milestones, an artificial annual milestone for each goal does not account for the complicated and long-term nature of the strategies designed to attain water quality objectives. Further, requiring annual milestones for every water body – pollutant combination restricts the Co-Permittees' ability to prioritize water quality conditions and dedicate limited resources to the highest priority milestones. In order to establish meaningful milestones over time, the milestones should be developed as part of the adaptive management process. The City therefore joins with the Co-Permittees in requesting a revision to the annual milestone requirement in Provisions B.3.c.(1)(a)(vii), B.3.c.(1)(d), B.3.c.(2)(c), B.3.c.(2)(d) and footnote 9.

BEST BEST & KRIEGER LLP
ATTORNEYS AT LAW

The City is grateful for SDRWQCB staff's efforts in drafting a fair and workable alterative compliance pathway. We believe that with the minor modifications requested in this comment letter and those of the County on behalf of the City and other Co-Permittees, the City will be a position to move forward with confidence in attaining water quality improvements in the region.

Sincerely,

Rebecca Andrews

Rebecca Andrews
for BEST BEST & KRIEGER LLP

cc: Tom Wheeler, P.E., Director of Public Works/City Engineer, City of Lake Forest
Devin Slaven, Environmental Manager, City of Lake Forest
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September 14, 2015

VIA E-MAIL [SANDIEGO@WATERBOARDS.CA.GOV]

David Gibson, Executive Officer
c/o Wayne Chiu
San Diego Regional Water Quality Control Board
2375 Northside Drive, Suite 100,
San Diego, CA 92108

Re: Comment - Tentative Order No. R9-2015-0100, Place ID:786088WChiu

Dear Mr. Gibson and Mr. Chiu:

Best Best & Krieger represents the City of San Clemente ("City"). The City submits the following comments on the California Regional Water Quality Control Board, San Diego Region ("SDRWQCB"), Tentative Order No. R9-2015-0100 ("Tentative Order") amending Order No. R9-2013-0001, NPDES No. CAS010266, as amended by Order No. R9-2015-0001, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4) Draining the Watersheds within the San Diego Region ("MS4 Permit"). The City is committed to improving and sustaining water quality in the San Diego region and has undertaken extensive efforts to further these goals. The City is aware that the County of Orange has prepared and submitted comments on the Tentative Order. The City would like to express its support for the County's comment letter and join with the County in the submission of those comments. The comments in this letter supplement the County's letter and are intended to allow the City and other Co-permittees to continue working toward the common goal of improving water quality in the region.

1. THE CITY SUPPORTS INCORPORATION OF THE ALTERNATIVE COMPLIANCE PATHWAY FOR PROHIBITIONS AND LIMITATIONS

The City appreciates the efforts of SDRWQCB staff to develop an alternative compliance pathway for incorporation into the MS4 Permit. MS4s face special challenges in attaining water quality objectives and immediate compliance with many of the objectives is not feasible. An alternative to strict compliance is consistent with the Ninth Circuit Court's recognition that the Clean Water Act "does not require municipal storm-sewer discharges to comply strictly with 33 U.S.C. § 1311(b)(1)(C)" regarding limitations. (*Defenders of Wildlife v. Browner* (9th Cir. 1999)

191 F.3d 1159, 1165.) The WQIP process establishes a rigorous, flexible and transparent pathway for compliance with Provisions A.1.a, A.1.c, A.1.d, A.2.a, and A.3.b. The City joins with other Co-Permittees in expressing its support for an alternative compliance pathway.

2. CLARIFY PROVISION A TO STATE THAT COMPLIANCE WITH PROVISION B.3 CONSTITUTES COMPLIANCE WITH PROVISIONS A.1.a, A.1.C, A.1.D, A.2, AND A.3.b OF THE MS4 PERMIT

The City is concerned that the prohibitions and limitations in Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b, as currently written, may be interpreted independent of the alternative compliance pathway in Provision B.3. The Ninth Circuit Court's decision in *Los Angeles County Flood Control District v. NRDC* interpreted an MS4 permit as a contract, with each provision as a stand-alone requirement. A stand-alone reading of the prohibitions and limitations, without any reference to the compliance pathway provision may expose the Co-Permittees to unintended liability, despite our rigorous efforts to successfully implement the alternative compliance pathway. The City joins with Co-Permittees in requesting the simple solution of adding language to Provision A that clarifies intent of the alternative compliance pathway is to create an alternative means of complying with Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b. In other words, the City requests adding language in Provision A simply referencing and linking the alternative compliance pathway in Provision B.

3. INCLUDE THE WQIP PLANNING PROCESS IN THE ALTERNATIVE COMPLIANCE PATHWAY

In light of the direction from the State Water Resources Control Board ("State Board"), the alternative compliance pathway should be extended to include the WQIP planning phase. The alternative compliance pathway currently begins after the WQIP has been completed and is being implemented. It does not extend to the WQIP planning process. The Permit establishes a structure, with timelines over two years, for the WQIP planning process. During the planning process, Co-Permittees will, among other activities, identify water quality priorities, identify and prioritize known and suspected sources of pollutants and stressors, identify potential strategies to improve water quality, create an integrated monitoring and assessment program, and develop stormwater action levels and non-stormwater action levels into the WQIP. Each of these steps, and others, including the public participation process, occurs on a schedule and requires a substantial investment of time and resources.

Even though the City will participate in a Water Quality Improvement Plan and anticipates meeting all Permit-established planning requirements, the City and other Co-Permittees remain open to liability for prohibitions and limitations violations, especially from third parties, during the planning process. The ultimate goal of the planning process is to create a WQIP designed to address prioritized water quality conditions. If the City is forced to divert funds away from the

planning process to defend a third-party lawsuit during the planning period, such diversion will impede the City's ability to develop a thorough WQIP and undercuts the ultimate goal of the Permit.

Recognizing the need for a long-term approach to addressing water quality conditions, the State Board directed regional boards to "incorporate an ambitious, rigorous, and transparent alternative compliance path that allows permittees appropriate time to come into compliance with receiving water limitations without being in violation of the receiving water limitations during full implementation of the compliance alternative." (State Water Resources Control Board, Order WQ 2015-0075, p. 52.) With direction from the State Board to create a space and time for Co-Permittees to come into compliance with receiving water limitation without being in violation of the Permit, it is imperative that the Board extend the Permit's alternative compliance pathway to the planning phase. Because the planning process is integral to addressing water quality conditions, the City joins with the Co-Permittees in requesting that the alternative compliance pathway include the WQIP planning process.

4. REVISE ANNUAL MILESTONE REQUIREMENT TO INCLUDE MEANINGFUL MILESTONES (PROVISION B.3.c.(1)(a)(vii), B.3.c.(1)(d), B.3.c.(2)(c), B.3.c.(2)(d) and footnote 9)

The Tentative Order's alternative compliance pathway requires Water Quality Improvement Plans to set annual milestones for each numeric goal. These milestones must build on previous milestones and lead to the achievement of a final numeric goal. While improvements to water quality may be more difficult to attain in the absence of clear goals and milestones, an artificial annual milestone for each goal does not account for the complicated and long-term nature of the strategies designed to attain water quality objectives. Further, requiring annual milestones for every water body – pollutant combination restricts the Co-Permittees' ability to prioritize water quality conditions and dedicate limited resources to the highest priority milestones. In order to establish meaningful milestones over time, the milestones should be developed as part of the adaptive management process. The City therefore joins with the Co-Permittees in requesting a revision to the annual milestone requirement in Provisions B.3.c.(1)(a)(vii), B.3.c.(1)(d), B.3.c.(2)(c), B.3.c.(2)(d) and footnote 9.

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BEST BEST & KRIEGER LLP
ATTORNEYS AT LAW

The City is grateful for SDRWQCB staff's efforts in drafting a fair and workable alterative compliance pathway. We believe that with the minor modifications requested in this comment letter and those of the County on behalf of the City and other Co-Permittees, the City will be a position to move forward with confidence in attaining water quality improvements in the region.

Sincerely,

Rebecca Andrews

Rebecca Andrews
for BEST BEST & KRIEGER LLP

cc: Mary Vondrak, City of San Clemente

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September 14, 2015

VIA E-MAIL [SANDIEGO@WATERBOARDS.CA.GOV]

David Gibson, Executive Officer
c/o Wayne Chiu
San Diego Regional Water Quality Control Board
2375 Northside Drive, Suite 100,
San Diego, CA 92108

Re: Comment - Tentative Order No. R9-2015-0100, Place ID:786088WChiu

Dear Mr. Gibson and Mr. Chiu:

The City of San Juan Capistrano (City) is committed to improving and sustaining water quality in the San Diego region and has undertaken extensive efforts to further these goals. The City is aware that the County of Orange has prepared and submitted comments on the Tentative Order No. R9-2015-0100. The City would like to express its support for the County's comment letter and join with the County in the submission of those comments. The comments in the enclosed letter from BEST BEST & KRIEGER LLP supplement the County's letter and are intended to allow the City and other Co-permittees to continue working toward the common goal of improving water quality in the region.

Sincerely,

Hossein Ajideh, Ph.D., P.E.
Senior Civil Engineer

cc: Richard Boon, County of Orange
Rebecca Andrews, BEST BEST & KRIEGER LLP
Keith Till, Interim City Manager
Thom Coughran, P.E., Interim Public Works & Utilities Director
George Alvarez, P.E., City Engineer

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September 14, 2015

VIA E-MAIL [SANDIEGO@WATERBOARDS.CA.GOV]

David Gibson, Executive Officer
c/o Wayne Chiu
San Diego Regional Water Quality Control Board
2375 Northside Drive, Suite 100,
San Diego, CA 92108

Re: Comment - Tentative Order No. R9-2015-0100, Place ID:786088WChiu

Dear Mr. Gibson and Mr. Chiu:

Best Best & Krieger represents the City of San Juan Capistrano ("City"). The City submits the following comments on the California Regional Water Quality Control Board, San Diego Region ("SDRWQCB"), Tentative Order No. R9-2015-0100 ("Tentative Order") amending Order No. R9-2013-0001, NPDES No. CAS010266, as amended by Order No. R9-2015-0001, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4) Draining the Watersheds within the San Diego Region ("MS4 Permit"). The City is committed to improving and sustaining water quality in the San Diego region and has undertaken extensive efforts to further these goals. The City is aware that the County of Orange has prepared and submitted comments on the Tentative Order. The City would like to express its support for the County's comment letter and join with the County in the submission of those comments. The comments in this letter supplement the County's letter and are intended to allow the City and other Co-permittees to continue working toward the common goal of improving water quality in the region.

1. THE CITY SUPPORTS INCORPORATION OF THE ALTERNATIVE COMPLIANCE PATHWAY FOR PROHIBITIONS AND LIMITATIONS

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The City is concerned that the prohibitions and limitations in Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b, as currently written, may be interpreted independent of the alternative compliance pathway in Provision B.3. The Ninth Circuit Court's decision in *Los Angeles County Flood Control District v. NRDC* interpreted an MS4 permit as a contract, with each provision as a stand-alone requirement. A stand-alone reading of the prohibitions and limitations, without any reference to the compliance pathway provision may expose the Co-Permittees to unintended liability, despite our rigorous efforts to successfully implement the alternative compliance pathway. The City joins with Co-Permittees in requesting the simple solution of adding language to Provision A that clarifies intent of the alternative compliance pathway is to create an alternative means of complying with Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b. In other words, the City requests adding language in Provision A simply referencing and linking the alternative compliance pathway in Provision B.

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BEST BEST & KRIEGER
ATTORNEYS AT LAW

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Sincerely,

Rebecca Andrews

Rebecca Andrews
for BEST BEST & KRIEGER LLP

cc: Richard Boon, County of Orange

County of San Diego

RICHARD E. CROMPTON
DIRECTOR

DEPARTMENT OF PUBLIC WORKS
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September 14, 2015

Wayne Chiu, WRC Engineer
Regional Water Quality Control Board, San Diego Region
2375 Northside Drive, Suite 100
San Diego, CA 92108

Electronic Submission: sandiego@waterboards.ca.gov

Dear Mr. Chiu:

COMMENT LETTER – TENTATIVE ORDER NO. R9-2015-0100 PLACE ID:786088WCHIU

The San Diego Copermittees (Copermittees) appreciate the opportunity to comment on the Regional Water Board's *Tentative Order R9-2015-0100, an Order Amending Order No. R9-2013-0001, NPDES No. CAS010266, as amended by Order No. R9-2015-0001, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4) Draining the Watersheds within the San Diego Region* (Tentative Order). The County of San Diego submits this letter on behalf of the San Diego Copermittees. The Copermittees include the Cities of Carlsbad, Chula Vista, Coronado, Del Mar, El Cajon, Encinitas, Escondido, Imperial Beach, La Mesa, Lemon Grove, National City, Oceanside, Poway, San Diego, San Marcos, Santee, Solana Beach, Vista, the County of San Diego, the San Diego County Regional Airport Authority, and the San Diego Unified Port District.

The Copermittees support water quality improvements in our watersheds through implementation of the MS4 Permit. We request modifications of specified elements of the Tentative Order that we believe will clarify the Permit requirements and facilitate Permit implementation. The comments include the Copermittees' requests for modifications of the Tentative Order, followed by rationale for the requests, and then specific suggested modifications to the language in the Tentative Order. The noted references and page numbers are based on a review of the redline strikeout version of the Tentative Order provided on the Regional Water Board's website[1].

[1] http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/docs/2015-0731_Tentative_Order_Attachment%201_(Amended_Order).pdf, accessed on August 24, 2015

These comments were developed jointly and represent a general consensus among the San Diego Copermittees. Where individual Copermittees have specific concerns relevant to their jurisdictions, these will be expressed in separate written comments provided by individual Copermittees.

1. Receiving Water Limitations Provision A. Prohibitions and Limitations (page 16/138)
Request: Add sentence to Provision A to clarify its link to Provision B.
Rationale: The Prohibitions and Limitations language in Provision A should be aligned with the Water Quality Improvement Planning process described in Provision B. We appreciate the efforts to date to align the two provisions, as Provision B does currently link back to Provision A. However, as currently incorporated into the Tentative Order, the proposed Prohibitions and Limitations provisions may still be interpreted as stand-alone provisions that could subject the Copermittees to state and federal enforcement actions, as well as to third party actions under the federal Clean Water Act's citizen suit provisions. To prevent this from occurring, a clear linkage between the compliance provisions in Provision B and the prohibitions, receiving water limitations, and effluent limitations must be established. Compliance with Provisions A.1, A.2 and A.3 should be linked to Provision B so that it is clear that the compliance mechanism for A.4 is the Water Quality Improvement Plan (Provision B) and/or the TMDL (Attachment E), as applicable.

Recommendation: Include streamlined language in Provision A to indicate that compliance can be achieved through implementation of the Water Quality Improvement Plan, specifically through the Alternative Compliance Pathway added as Provision B.3.c. Add a sentence at end of first paragraph:

Implementation of the Alternative Compliance Option described in Provision B.3.c of this Order shall constitute compliance with the Discharge Prohibitions (A.1.a, A.1.c, A.1.d), Receiving Water Limitations (A.2), and Effluent Limitations (A.3.b) Provisions of this Order.

2. Provision B.3.c. Prohibitions and Limitations Compliance Option (page 33/138)
Request: Restructure the annual milestone requirements in the Compliance Option to be more meaningful.

Rationale: The Tentative Order was revised to include an option for prohibitions and limitations compliance through the implementation of the Water Quality Improvement Plan, subject to conditions specified in Provision B.3.c.(1) and (2). Provision B.3.c.(1)(a)(vii) that requires at least one annual milestone to be established for each numeric goal. Footnote (9) states:
Annual milestones for each final numeric goal must build upon previous milestones and lead to the achievement of the final numeric goal. The annual milestones may consist of water quality improvement strategy implementation phases, interim numeric goals, and other acceptable metrics.

The Copermittees appreciate that the Regional Board has included the additional language for compliance through Water Quality Improvement Plan implementation. However, the Copermittees are concerned that the specific requirement for annual milestones will be overly constrictive and burdensome. Each Copermittee would potentially need to establish and track annual milestones for multiple goals within multiple waterbodies in each watershed

management area, resulting in dozens of annual milestones. Furthermore, it would likely be difficult to establish meaningful milestones for such a high number of goals over each year, especially far into the future. Practically speaking, it is reasonable to identify concrete milestones in Years 1 – 5 of a 30 year effort. More than five years into the future, milestones identified today lose significant meaning and value; milestones would be more meaningful if they were developed adaptively, based on the results of previous efforts.

The Copermittees recognize that milestones would benefit accountability for working towards their goals, but feel that the milestones would be more meaningful if they focus on the priority water quality conditions and were based on the permit cycle (i.e., one milestone per 5 year permit term for each waterbody pollutant combination to be covered under the alternative compliance pathway).

The Copermittees request that the Regional Board consider the following modifications to the language to make the milestone requirement more meaningful.

Recommendation: Modify Provision B.3.c.(1)(a)(vii) , footnote 9, B.3.c.(2)(c), and B.3.c.(2)(d) as follows:

B.3.c.(1)(a) (vii): For each final numeric goal developed pursuant to Provisions B.3.a and B.3.c.(1)(a)(i)-(v), at least one annual milestone[9] and date for its achievement must be included **for the permit term** within each Water Quality Improvement Plan **and progress towards attaining the milestone(s) reported upon during each** Annual Report reporting period**. Further, for each final numeric goal developed pursuant to Provisions B.3.a and B.3.c.(1)(a)(i)-(v), at least one milestone forecasted to be achieved in subsequent permit terms must be included within each Water Quality Improvement Plan. This process will continue** until the final numeric goal is achieved.

Footnote 9: Milestones for each final numeric goal must build upon previous milestones and **cumulatively result in** lead to the achievement of the final numeric goal. The annual milestones may consist of water quality improvement strategy implementation phases, interim numeric goals, and other acceptable metrics. **The milestones may also address multiple numeric goals and/or multiple waterbodies, as applicable and appropriate.**

B.3.c.(2)(c): The Copermittee's assessments in the Water Quality Improvement Plan Annual Report submitted pursuant to Provision F.3.b.(3) support a conclusion that: 1) the Copermittee is in compliance with the annual **milestones** and dates for achievement developed pursuant to Provision B.3.c.(1)(a)(vii), OR 2) the Copermittee has provided acceptable rationale and recommends appropriate modifications to the interim numeric goals, and/or water quality improvement strategies, and/or schedules to improve the rate of progress toward achieving the final numeric goals developed pursuant to Provisions B.3.a and B.3.c.(1)(a)(i)-(vi); AND

B.3.c.(2)(d): Any proposed modifications to the numeric goals, schedules, and/or annual milestones are accepted by the San Diego Water Board as part of subsequent updates to the Water Quality Improvement Plan pursuant to Provision F.2.c; AND

3. Provision B.5. Iterative Approach and Adaptive Management Process (page 37/138)
Request: Clarify timing and conditions for watershed model/analysis updates.

Rationale: Provision B.5 requires annual performance of the adaptive management process. As drafted, the new Provision B.3.c language could be interpreted to mean that the watershed model/analysis must be updated annually (B.3.c.(1)(b)(iv)). To add clarity, Provision B.5 should specify that updates to the watershed modeling/analysis are to be performed as determined through the adaptive management process.

Recommendation: Add a new Provision B.5.d to clarify that updates to watershed model/analysis are required only if it is determined through the adaptive management process that conditions have changed significantly such that they would alter the results of the previously completed model. As part of the Report of Waste Discharge, the Copermittees would conduct an analysis to determine whether conditions have sufficiently changed to warrant an update to the watershed model/analysis and if so, provide a schedule for conducting the updated analysis.[2]

B.5.d. Updates to Optional Watershed Analysis [B.3.c.(1)(b)]
Updates to the optional watershed analysis included in Provision B.3.c.(1)(b) are required only if conditions have changed significantly within the watershed or where new information is available that would significantly alter the model results.

4. Provision F.2.b. BMP Design Manual Updates (Page 126/138)
Request: Allow adequate time for Copermittees to update and implement their BMP Design Manuals.

Rationale: The current Order establishes the Effective Date of the BMP Design Manual (and therefore of the requirements of Permit Section E.3.a-d) as December 24, 2015. This date was appropriate at the time of initial Permit adoption because it provided sufficient time for the development of updated content and for the modification of Copermittee programs and regulatory authorities needed for implementation. The Tentative Order would require the Copermittees to update their BMP Design Manuals to incorporate the amended Provisions E.3.a-d within 90 days after the amended Provisions E.3.a-d are adopted by the Regional Board. Given that critical new modifications are now proposed in the Tentative Order, additional time should be provided to allow for their completion and implementation. The first of these are the changes in the definition of redevelopment Priority Development Projects (PDPs) proposed in Section II.E.3.b.(1)(c) through (e). The second is the addition of a modified process for establishing Prior Lawful Approval (PLA) under Section E.3.e.(1). The Copermittees appreciate the work that Regional Board staff put into working with stakeholders and crafting these PLA provisions, and we support their adoption. However, we must also note that the current implementation schedule for implementing updated BMP Design Manual provisions under the Tentative Order severely limits their potential application. In both instances, additional time is requested to: allow Copermittees to ensure regional consistency; modify local BMP Design Manuals; develop updated policies, procedures, and other program documentation; conduct outreach to industry and project proponents; and modify local ordinances.

At a minimum, six months from the adoption of new requirements should be allowed to complete and implement these tasks. However, if these provisions are adopted as proposed at

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[2] Consistent with CASQA recommendations to SWRCB. California Stormwater Quality Association, Letter to Ms. Jeanine Townsend, Clerk to the Board, State Water Resources Control Board, Subject: SWRCB/OCC Files A-2236(a) through (kk); Comments on Proposed Order *In Re Petitions Challenging 2012 Los Angeles Municipal Separate Storm Sewer System Permit (Order No. R4-2012-0175)*, January 19, 2015.

the November 18, 2015 Regional Board hearing, Copermittees would have just 90 days to implement them.

Please note the following inconsistency in the Tentative Order and Technical Report regarding the extension of dates. The Technical Report (page F-110) states "Provisions E.3.e.(1)(a)[a]-[d] are dependent on the effective date of the BMP Design Manual. Unless otherwise directed by the San Diego Water Board, the effective date of the BMP Design Manual is December 24, 2015 for the San Diego County Copermittees ..." This is in contrast to Provision F.2.b.(4), which requires that revision of the updated BMP Design Manual be completed not later than 90 days after the date the San Diego Water Board adopts the amendments (i.e., by February 16, 2016). Since it is not possible for the BMP Design Manual effective date to precede its revision date, it must be assumed that the intent of Provision F.2.b.(4) is to also extend the effective date.

In recent correspondence on this issue, Regional Board staff has indicated their intent to explicitly extend the effective date by the same 90 days allowed for the BMP Design Manual revision using the discretion granted the Executive Officer under other proposed amendments to Section E.3.d. However, this is problematic for three reasons. First, since any such extension granted by the Executive Officer could only be executed after the hearing, Copermittees would have no assurances that it would actually occur. Second, extending the effective date by 90 days would merely make the revision and effective dates concurrent rather than rectifying the inconsistencies causing the confusion. Third, a 90-day extension of the effective date simply does not provide adequate time to both complete and implement the BMP Design Manual update. For these reasons, the Copermittees request that the effective date of the BMP Design Manual for the Copermittees be extended 180 days from the adoption of the Tentative Order (i.e., May 14, 2016). Modifying the Permit to specifically incorporate this this new effective date, rather than relying on the ability of the RWQCB Executive Officer to do so after the fact, would both provide the time necessary for critical program updates and the certainty needed to plan for them. It would also ensure that these critical changes are fully vetted in an open public forum.

We also recommend that Provision E.3.d. be modified to clarify that the date the BMP Design Manual is implemented (rather than revised) is the same as the "effective date". This will help to prevent any future confusion regarding the applicability of dates.

Since Copermittees have already modified their ordinances to reflect existing Permit content in anticipation of the December 24, 2015 effective date, most will now need to repeat this process for these new provisions. Depending on each Copermittees' process, the time needed to modify ordinances alone can greatly exceed the 90 days currently proposed in the Tentative Order. Moreover, even if ordinance revisions can be completed within 90 days, there would still not be sufficient time to complete all of the other required tasks described above. While Regional Board staff has suggested that Copermittees can start this process now, it is unrealistic to expect that they do so based only on the proposed requirements of a this Tentative Order. It would be speculative to assume that the Tentative Order will be adopted as currently drafted, and Copermittees should not be expected to initiate specific program changes or ordinance revisions based on speculation. We therefore request that the BMP Design Manual effective date be extended by 180 days in the adopted Order.

Recommendations: The Copermittees recommend that the Regional Board modify the requirement to specify that the updates be made to the BMP Design Manual within 180 days, as follows:

Provision E.3.d
Each Copermittee must update its BMP Design Manual pursuant to Provision F.2.b. Until the Copermittee has updated its BMP Design Manual pursuant to Provision F.2.b.(1), the Copermittee must continue implementing its current BMP Design Manual. The Copermittee must implement the updated BMP Design Manual within 180 days following completion of the update pursuant to Provision F.2.b.(1), unless directed otherwise by the San Diego Regional Water Board Executive Officer. The date the BMP Design Manual is implemented is the "effective date" of the BMP Design Manual. The update of the BMP Design Manual required pursuant to Provision F.2.b.(1) must include the following:

Provision F.2.b.(4)
If the San Diego Water Board amends Provisions E.3.a-d during the permit term but after the Copermittee has completed the update pursuant to Provision F.2.b.(1), the Copermittee must revise its BMP Design Manual to incorporate the amended Provision E.3.a-d requirements as soon as possible but no later than **180** days after the date the San Diego Water Board adopts the amendments to Provisions E.3.a-d, unless otherwise directed by the San Diego Water Board Executive Officer. **Under these circumstances, the effective date of the BMP Design Manual is 180 days after the date the San Diego Water Board adopts the amendments to Provisions E.3.a-d.**

5. **Attachment E-6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek) (Page 227/236)**

Request: Modify draft Tentative Order Attachment E Tables 6.1 and 6.4 for consistency with the TMDL.

Rationale: The proposed addition of a 10-year wet-weather compliance deadline of April 4, 2021, to Table 6.1 for water bodies in a WQIP that do not include load reductions for pollutants besides bacteria is inconsistent with the adopted TMDL and thereby violates the Clean Water Act regulations at 40 C.F.R. § 122.44(d)(1)(vii)(B). This proposed amendment would subject the segments of beaches and creeks that were removed from the 303(d) list to requirements from which the de-listed segments are specifically exempt under the adopted TMDL. Under the TMDL, no BLRP or CLRP is required for the de-listed segments. The WQIP is a requirement of the MS4 Permit, not the TMDL, and it is not a BLRP. Thus, there is no justification to require a 10-year compliance schedule for the de-listed segments, and the proposed amendment is not consistent with the TMDL.

Recommendation: Delete proposed language in Table 6.1 and footnote.

The Copermittees submit the foregoing comments with respect to Tentative Order R9-2015-0100. These comments should not be construed as amending or modifying any of the Copermittees' positions with respect to any prior Regional Board order or action. Each of the

Copermittees reserves its right to continue to pursue any and all of its positions, arguments, challenges, petitions, and appeals with respect to any such prior Regional Board order or action.

The San Diego Copermittees thank you for your consideration of these comments. If you have questions or require additional information, please contact Jo Ann Weber at (858) 495-5317 or e-mail at JoAnn.Weber@sdcounty.ca.gov.

Sincerely,

Jo Ann Weber, Planning Program Manager
Watershed Protection Program

cc: Elaine, Lukey, City of Carlsbad
Boshra Salem, City of Chula Vista
Kim Goodby, City of Coronado
Kathleen Garcia, City of Del Mar
Jaime Campos, City of El Cajon
Erik Steenblock, City of Encinitas
Helen Perry, City of Escondido
Chris Helmer, City of Imperial Beach
Joe Kuhn, City of La Mesa
Malik Tamimi, City of Lemon Grove
Kuna Muthusamy, City of National City
Mo Lahsaie, City of Oceanside
Steve Strapac, City of Poway
Clem Brown, City of San Diego
Reed Thornberry, City of San Marcos
Cecilia Tipton, City of Santee
Dan Goldberg, City of Solana Beach
Cheryl Filer, City of Vista
Allison Vosskuhler, Port of San Diego
Richard Gilb, San Diego County Regional Airport Authority

ESCONDIDO
City of Choice

Emailed to: sandiego@waterboards.ca.gov
San Diego Regional Water Quality Control Board (RWQCB)
2375 Northside Drive, Suite 100
San Diego, CA 92108
Attention: Mr. Wayne Chiu
September 14, 2015

RE: Comment - Tentative Order No. R9-2015-0100, Place ID:786088WChiu.

Thank you for the opportunity to comment on the above-referenced permit. The City of Escondido is working with other San Diego County Copermittees in developing regional comments. This letter has been prepared to address an additional item of concern to staff.

In Attachment C, page C-3 a definition of construction activities has been added. Although staff understands that it may be useful to clarify what is considered construction activities, there is concern at the description of some of the types of activities as "phases." Phases of construction are significant as they are required to be considered when defining inspection frequencies for construction. The permit requires Copermittees to conduct inspections "at an appropriate frequency for each phase of construction."

This definition as written introduces additional phases (Preliminary Phase, Land Development Phase and Streets and Utility Phase) that are not necessarily discrete. Utilities and streets can be installed during any part of the construction project. The "Preliminary Phase" as described would be covered under the grading phase. It is not clear what the "Land Development Phase" covers. At present the City of Escondido tracks construction in two phases, grading and vertical which covers all construction activities.

The use of the word "Phase" to describe these aspects of construction activities introduces unnecessary complication to the inventorying and inspection of construction sites as it introduces artificial phases that will not be readily tracked. City of Escondido staff have just completed a two year process of updating their inspection programs to include systems to track construction sites through the grading and vertical phases and trained staff to follow these requirements. Adding the phase to these terms will require a reworking of the program to introduce artificial "phases" that are not discrete from what is already being addressed.

Recommendation: Eliminate the use of the term phase when describing construction activities as presented below.

> **Construction Activities** – Actions implemented during construction of development or redevelopment projects during the Preliminary Tasks~~Phase~~ (including rough grading and/or disking, clearing and grubbing operations, or any soil disturbance prior to mass grading), Grading or Land Development ~~Phase~~ (including topography and slope reconfiguration, alluvium removals, canyon cleanouts, rock undercuts,

keyway excavations, land form grading, and stockpiling of select material for capping operations), Streets and Utility Installation~~Phase~~ (including excavation and street paving, lot grading, curbs, gutters and sidewalks, public utilities, public water facilities including fire hydrants, public sanitary sewer systems, storm sewer systems and/or other drainage improvements), or Vertical Construction ~~Phase~~ (including the build out of structures from foundations to roofing, including rough landscaping).

I appreciate the opportunity to comment on the draft Tentative Order. I can be contacted at hdavies@escondido.org or at (760) 839-6315.

Helen M. Davies

Helen M. Davies, M.S, CPSWQ
Environmental Programs Manager

THE CITY OF SAN DIEGO

September 14, 2015

VIA EMAIL TO: Laurie.Walsh@waterboards.ca.gov

Laurie Walsh, Water Resource Control Engineer
San Diego Regional Water Quality Control Board
2375 Northside Drive, Suite 100
San Diego, CA 92108

Subject: Comment Letter – Tentative Order No. R9-2015-0100

Dear Ms. Walsh:

The City of San Diego (City) appreciates the opportunity to provide comments on the Amendment to the Regional Municipal Separate Storm Sewer System (MS4) Permit for the San Diego Region (Tentative Order No. R9-2015-0100, herein referred to as the "Draft Tentative Order"). The City is committed to protecting and improving water quality in the San Diego Region. From this perspective, the City provides the following comments below. More detailed comments are included in the attached table (Attachment 1).

- *The Draft Tentative Order should include revisions to Provision B.3.c to align requirements with a once per permit term approach to milestones.* The City appreciates the inclusion of a Water Quality Improvement Plan (WQIP)-based alternative for complying with the receiving water limitations and discharge prohibitions in Provision A. In its recent order upholding a similar compliance alternative in the Los Angeles MS4 permit, the State Water Board recognized that allowing permit compliance to be based on implementation of watershed plans provide an opportunity to achieve greater water quality improvement than the status quo compliance approach. The City recommends several revisions to ensure an effective alternative compliance approach that is consistent with the State Water Board's guidance. Milestones and interim goals provide opportunities to achieve key outcomes, measure progress to final goals, and support the adaptive management process. The City understands that the transparency that goals and milestones create is important for the Regional Water Board and the public to track progress and evaluate compliance. However, the annual milestones proposed may be counterproductive because they do not allow the City enough time to reprogram activities and secure funding the following fiscal year to make any necessary adaptations to implement the WQIPs. While the shift to implementing programs and building water quality improvement projects is our primary focus moving forward, effective adaptive management, which allows for adequate time and consideration, is a key component of successful WQIP implementation.

Transportation & Storm Water Department
9370 Chesapeake Drive, Suite 100, MS 1900 • San Diego, CA 92123
Hotline (619) 235-1000 Fax (858) 541-4350

- *The Draft Tentative Order should include revisions to Provision B.3.c to include alternative compliance coverage for Provision A.2.b.* The City supports the inclusion of the receiving water limitations in the alternative compliance pathway of Provision B.3.c. As proposed, however, Provision B.3.c. omits alternative compliance coverage for the receiving water limitations regarding the Area of Special Biological Significance (ASBS) in Provision A.2.b. To be consistent with the intent of the alternative compliance pathway approach, the ASBS provisions should be included in the alternative compliance provisions similar to the other receiving water limitations provisions.

- *Draft Tentative Order Attachment E Tables 6.1 and 6.4 should be modified for consistency with the TMDL.* The proposed addition of a 10-year wet-weather compliance deadline of April 4, 2021 to Table 6.1, for water bodies in a WQIP that does not include load reductions for pollutants besides bacteria, is inconsistent with the adopted TMDL and thereby violates the Clean Water Act regulations at 40 C.F.R. § 122.44(d)(1)(vii)(B). This proposed amendment would subject the segments of beaches and creeks that were removed from the 303(d) list to requirements from which the de-listed segments are specifically exempt under the adopted TMDL. Under the TMDL, no BLRP or CLRP is required for the de-listed segments. The WQIP is a requirement of the MS4 Permit, not the TMDL, and is not a BLRP. Thus, there is no justification to require a 10-year compliance schedule for the de-listed segments, and the proposed amendment is not consistent with the TMDL.

- *Draft Tentative Order Attachment E should be modified to allow individual jurisdictional compliance with the TMDLs.* The City is committed to protecting and improving water quality and achieving compliance with TMDLs via the implementation of Water Quality Improvement Plans. However, language throughout Attachment E appears to preclude any Copermittee from using the WQIP compliance pathway unless all other Copermittees also are in compliance. The City has no authority to compel other Copermittees to comply and cannot be held liable for the actions or inactions of other agencies. Under federal Clean Water Act regulations that have been incorporated into the MS4 Permit, a Copermittee is responsible only for conditions relating to the discharges for which it is an operator.

- *Draft Tentative Order, Section E.3.e.(1), should be modified to include for development approvals.* The City supports the inclusion of the language proposed in the Draft Tentative Order which provides clarifications when a development project should be subject to the Priority Development Projects Requirements. However, the City recommends incorporating additional language allowing for development approvals as suggested in the language submitted by the City of San Diego to Regional Board staff on June 10, 2015 (Attachment 2).

Thank you for your time and consideration of these comments. If you have questions, please contact Ruth Kolb at (858) 541-4328 or at rkolb@sandiego.gov.

Sincerely,

for

Drew Kleis
Deputy Director

DK\rk

Attachments: 1. City of San Diego Comment Table
2. June 10, 2015 proposed permit language regarding applicability of Priority Development Project requirements

cc: Paz Gomez, Deputy Chief Operating Officer
Mike Hansen, Director of Land Use and Environmental Policy, Office of the Mayor
Kris McFadden, Director, Transportation & Storm Water Department
Heather Stroud, Deputy City Attorney, City Attorney's Office
Ruth Kolb, Program Manager, Transportation & Storm Water Department
Sumer Hasenin, Senior Engineer, Transportation & Storm Water Department
Clem Brown, Program Manager, Transportation & Storm Water Department

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Permit Section	Permit Page	Section Title	Reason for Proposed Changes/Comments	Proposed Changes
General Comment	NA	NA	NA	The proposed amendments do not address the issues raised in the City's Petition for Review of San Diego Regional Water Quality Control Board (Regional Board) Order No. R9-2013-0001, filed on June 7, 2013. The City does not waive any of those arguments, and urges the Regional Board to address those issues as part of this permit amendment.
Provision A. Prohibitions and Limitations				
II.A.1.d	16	Prohibitions and Limitations	Correction to updated ASBS resolution number.	Change reference from State Water Board Resolution No. 2012-0012, to Resolution No. 2012-0031.
Provision B. Water Quality Improvement Plans				
II.B.1	17	Watershed Management Areas	This NPDES Permit is applicable to discharges from Copermittee MS4s as stated in Section A.1. Discharges from other NPDES permits are governed by requirements within those permits.	Modify Section B.1 as follows: The Copermittees must develop a WQIP for <u>their MS4 discharges within</u> each of the Watershed Management Areas in Table B-1<u>.</u>
II.B.3.c.(1)(a)(ii)	33-34	Prohibitions and Limitations	Correction to updated ASBS resolution number.	Change reference from State Water Board Resolution No. 2012-0012, to Resolution No. 2012-0031.
II.B.3.c.(1)(a)(iii) through (vii)	33-34	Prohibitions and Limitations Compliance Option	The "and/or" in subsection (iii) creates confusion regarding whether the categories of numeric goals that follow are mandatory or optional. The proposed revision and renumbering adds clarity and is consistent with the City's understanding of Regional Board staff's intent.	(a) Numeric goals, water quality improvement strategies, and schedules developed pursuant to Provisions B.3.a and B.3.b that include the following: (i) Interim and final WQBELs established by the TMDLs in Attachment E to this Order applicable to the Copermittee's jurisdiction within the Watershed Management Area; AND (ii) Interim and final numeric goals for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 applicable to the Copermittee's jurisdiction within the Watershed Management Area; AND (iii) Interim and final numeric goals applicable to the Copermittee's MS4 discharges within the Watershed Management Area expressed as numeric concentration-based or load-based goals for all pollutants and conditions listed on the Clean Water Act Section 303(d) List of Water Quality

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Permit Section	Permit Page	Section Title	Reason for Proposed Changes/Comments	Proposed Changes
				Impaired Segments for the receiving waters in the Watershed Management Area that do not have a TMDL incorporated into Attachment E to this Order; ~~AND/~~OR ~~(iv)~~ Interim and final numeric goals for pollutants and conditions identified as receiving water priorities in the Water Quality Improvement Plan that will result in chemical, physical, and biological conditions protective of the beneficial uses of the receiving waters impacted by the Copermittee's MS4 discharges within the Watershed Management Area; AND (iv) The Copermittee has the option to include interim and final numeric goals applicable to the Copermittee's MS4 discharges and/or receiving waters within the Watershed Management Area for any pollutants or conditions in addition to those described in Provisions B.3.c.(1)(a)(i)-(iii); AND (v~~i~~) Schedules for achieving each final numeric goal that reflect a realistic assessment of the shortest practicable time needed for achievement; AND (vi~~i~~) For each final numeric goal developed pursuant to Provisions B.3.a and B.3.c.(1)(a)(i)-(iv), at least one annual milestone and date for its achievement must be included within each Water Quality Improvement Plan Annual Report reporting period until the final numeric goal is achieved.
II.B.3.c, II.B.3.c.(1), and II.B.3.c.(2)	33, 35	Prohibitions and Limitations Compliance Option	State Board Order No. WQ 2015-0075 (p. 52) requires the Regional Board to "incorporate an ambitious, rigorous, and transparent alternative compliance path that allows permittees appropriate time to come into compliance with receiving water limitations without being in violation of the receiving water limitations during full implementation of the compliance alternative." The City appreciates the inclusion of most of the receiving water limitations in the alternative	**c. Prohibitions and Limitations Compliance Option** Each Copermittee has the option to utilize the implementation of the Water Quality Improvement Plan to demonstrate compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2~~.a~~, and A.3.b within a Watershed Management Area subject to the following conditions: (1) A Copermittee is eligible to be deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2~~.a~~, and A.3.b within a Watershed Management Area when the Water Quality Improvement Plan for a Watershed Management Area incorporates the following:

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Permit Section	Permit Page	Section Title	Reason for Proposed Changes/Comments	Proposed Changes
			compliance pathway of Provision B.3.c. As proposed, however, Provision B.3.c. omits alternative compliance coverage for the receiving water limitations regarding the ASBS in Provision A.2.b, which states that "Discharges from MS4s composed of storm water runoff must not alter natural ocean water quality in an ASBS." Without inclusion in the alternative compliance pathway, the City does not have appropriate time to come into compliance with this provision.	. . . . (2) Each Copermittee that voluntarily completes the requirements of Provision B.3.c.(1) is deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2~~.a~~, and A.3.b for the pollutants and conditions for which numeric goals are developed when the Water Quality Improvement Plan, incorporating the requirements of Provision B.3.c.(1), is accepted by the San Diego Water Board pursuant to Provision F.1.b or F.2.c. The Copermittee is considered to be in compliance during the term of this Order as long as:
II.B.3.c.(1)(a)(vii) II.B.3.c.(1)(d) II.B.3.c.(2)(c)-(d)	34, 35, 36	Prohibitions and Limitations Compliance Option	Milestones and interim goals provide opportunities to achieve key outcomes, measure progress to final goals, and support the adaptive management process. The transparency that goals and milestones create is important for the Regional Water Board and the public to track progress and evaluate compliance as well as for the Copermittees to secure funding to implement the WQIPs. As the Copermittees complete the WQIP development/planning phase we are shifting to implementation. Upon completion of WQIPs, Copermittees will require much effort to transition from plan development to implementation, capital improvement planning, and seeking of funding sources to ensure that projects can be scheduled within the short planning periods. With the uncertainty of much of these efforts, Copermittee staff will	The following changes to Provision II.B.3.c are proposed to align requirements with a once per permit term approach to milestones: II.B.3.c.(1)(a)(vii) For each final numeric goal developed pursuant to Provisions B.3.a and B.3.c.(1)(a)(i)-(v), at least one ~~annual~~ milestone[9] and date for its achievement must be included within the permit term ~~each Water Quality Improvement Plan Annual Report reporting period~~ until the final numeric goal is achieved. Footnote 9 ~~Annual m~~Milestones for each final numeric goal must build upon previous milestones and lead to the achievement of the final numeric goal. The ~~annual~~ milestones may consist of water quality improvement strategy implementation phases, interim numeric goals, and other acceptable metrics. II.B.3.c.(1)(d) Documentation showing that the numeric goals, schedules, and ~~annual~~ milestones proposed pursuant to Provision B.3.c.(1)(a), the analysis performed pursuant to Provision B.3.c.(1)(b), and the specific monitoring and

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Permit Section	Permit Page	Section Title	Reason for Proposed Changes/Comments	Proposed Changes
			be creating internal planning mechanisms and systems to restructure procedures and operations to facilitate this process. As part of the shift, Copermittees will work to secure funding via the budgeting process, which for the City is on two to five year planning horizons. The City submits annual budget requests the year before the funds are approved for implementation. . A five year planning horizon allows for implementation of more effective adaptive management. While the shift to implementing programs and building water quality improvement projects is our primary focus moving forward, adaptive management is a key component of WQIP implementation. As part of annual reporting Copermittees are required to describe the progress of implementing the WQIPs as well as identify modifications to the WQIP. These requirements include, but are not limited to reporting on the following: 1. Progress toward achieving the interim and final numeric goals; 2. The water quality improvement strategies that were implemented and/or no longer implemented; 3. The water quality improvement strategies planned for implementation during the next reporting period;	assessments proposed pursuant to Provision B.3.c.(1)(c) have been reviewed by the Water Quality Improvement Consultation Panel (see Provision F.1.a.(1)(b)). Updates must be reviewed by the Water Quality Improvement Consultation Panel for any recommendations. II.B.3.c.(2)(c) The Copermittee's assessments in the Water Quality Improvement Plan Annual Report submitted pursuant to Provision F.3.b.(3) support a conclusion that: 1) the Copermittee is in compliance with the ~~annual~~ milestones and dates for achievement developed pursuant to Provision B.3.c.(1)(a)(vii), OR 2) the Copermittee has provided acceptable rationale and recommends appropriate modifications to the interim numeric goals, and/or water quality improvement strategies, and/or schedules to improve the rate of progress toward achieving the final numeric goals developed pursuant to Provisions B.3.a and B.3.c.(1)(a)(i)-(vi); AND II.B.3.c.(2)(d) Any proposed modifications to the numeric goals, schedules, and/or ~~annual~~ milestones are accepted by the San Diego Water Board as part of subsequent updates to the Water Quality Improvement Plan pursuant to Provision F.2.c;10 AND

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Permit Section	Permit Page	Section Title	Reason for Proposed Changes/Comments	Proposed Changes
			4. Proposed modifications to the water quality improvement strategies, the public comments received and the supporting rationale for the proposed modifications; 5. Previous modifications or updates incorporated into the WQIP and/or jurisdictional runoff management program document, which have been implemented; and 6. Proposed modifications or updates to the WQIPs and/or jurisdictional runoff management program document. These requirements, in conjunction with additional adaptive management provisions of the Permit, ensure a transparent measure of progress and meaningful modifications to the program are considered and implemented. However, requiring the identification and achievement of specific annual milestones as part of the Prohibitions and Limitations Compliance Options effectively keeps City staff within the planning framework with a major focus on reporting that dilutes resources for the shift to implementation. Additionally, the annual milestone requirement effectively accelerates the adaptive management process, lessening the ability to evaluate	

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Permit Section	Permit Page	Section Title	Reason for Proposed Changes/Comments	Proposed Changes
			meaningful information and creatively adapt programs without risking non-compliance with the Permit. Because the City operates on two to five year planning horizons (described earlier, above), obtaining funding to significantly modify programs in response to information on an annual basis is not feasible. Furthermore, as required by the Permit, modifications must be reviewed and revised based on separate reviews by the Water Quality Improvement Consultation Panel, the public review, and Regional Water Board staff. Given this lengthy process, the City could identify modifications, but not be able to implement those modifications within the construct and compliance coverage of the Prohibitions and Limitations Compliance Options on an annual basis. While the City understands the desire to utilize milestones and supports interim measures of progress, the City feels that consideration should be given to an alternative approach or timeframe. Such an alternative should meet the goal of providing a transparent measure of progress (which is already supported by the Permit's annual reporting and adaptive management requirements) and support a determination of compliance while also supporting the shift to implementation in a manner consistent with both WQIP revision and review	

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Permit Section	Permit Page	Section Title	Reason for Proposed Changes/Comments	Proposed Changes
			requirements and internal Copermittee processes. The 2013 Permit's approach of permit term interim limits and corresponding strategies with annual and permit term adaptive management requirements are manageable and appropriate. The approach was an improvement over the Los Angeles Region's disparate approach of requiring some water quality priorities to follow a schedule based on unrelated TMDLs and requiring others to meet annual milestones. The San Diego Region's approach provided opportunity to gather sufficient information to adapt where possible annually and approach more complex modifications on a permit term basis. This approach ~~9~~provides essential time for responsible agencies to shift planning and operational procedures, while seeking funding opportunities. A single milestone within the permit term also provides sufficient time to not only plan and implement projects, but to develop reporting procedures that demonstrate reasonable assurance and quantitative documentation of the progress towards meeting milestones. As such, the City proposes that the Regional Water Board maintain the balance set forth in the 2013 Permit and require the establishment of a single milestone within the permit term that measures progress towards meeting the interim or final goals set	

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Permit Section	Permit Page	Section Title	Reason for Proposed Changes/Comments	Proposed Changes
			for the permit term.	
Provision E.3. Development Planning				
E.3.b.(1)	91, 92	Definition of Priority Development Projects	Sub-sections c and e should be combined to improve clarity of the requirements. Both sections have the same requirements for new and redevelopment projects but list different categories under each one.	Combine sub-sections (c) and (e). If sub-sections are not combined, add "collectively over the entire project site" to sub-section e, for consistency.
		Definition of Priority Development Projects	To provide clarity regarding redevelopment projects. There has been confusion of what is considered redevelopment vs. maintenance on "not redevelopment".	
E.3.d.	101	BMP Design Manual Update	This section should define the implementation date of the BMP Design Manual as the "effective date of the BMP Design Manual", to avoid confusion. Section E.3.e(1)(a)(i) references the "effective date of the BMP Design Manual".	Add the following clarifying language to Provision E.3.d: **d. BMP DESIGN MANUAL UPDATE** Each Copermittee must update its BMP Design Manual pursuant to Provision F.2.b. Until the Copermittee has updated its BMP Design Manual pursuant to Provision F.2.b.(1), the Copermittee must continue implementing its current BMP Design Manual. The Copermittee must implement the updated BMP Design Manual within 180 days following completion of the update pursuant to Provision F.2.b.(1), unless directed otherwise by the San Diego Water Board Executive Officer. <u>The date the BMP Design Manual is implemented is the "effective date" of the BMP Design Manual.</u> The update of the BMP Design Manual required pursuant to Provision F.2.b.(1) must include the following:
E.4		Construction Management	To streamline the requirements, minimize confusion and improve readability, sub-sections E.4.b. and E.4.d.(3) should be combined and duplicates deleted. Both sections contain information that needs to be collected, inventoried and tracked.	Combine sections E.4.b and E.4.d.(3).
Attachment	c-9	Definitions	The Redevelopment Definition is not	Revise the definition as follows to provide clarity:

Attachment 1: City of San Diego Comment Table Regarding Tentative Order No. R9-2015-0100
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Permit Section	Permit Page	Section Title	Reason for Proposed Changes/Comments	Proposed Changes
C			easily understood.	Redevelopment – The creation and/or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, ~~and creation or addition of impervious surfaces.~~ Replacement of impervious surfaces includes any activity ~~that is not part of a routine maintenance activity~~ where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include routine maintenance activities; trenching and resurfacing associated with utility work; resurfacing existing roadways and parking lots; new sidewalk construction, pedestrian ramps, or bike lane on existing roads; and routine replacement of damaged pavement, such as pothole repair, overlay and pavement grinding.
F.2.b.(4)	126, 127	BMP Design Manual Update	It is unclear whether the 90 days to incorporate permit amendments changes the BMP Design Manual implementation date, which is also its effective date for the purpose of applicability of the development project requirements. There is a lot of confusion related to the initial effective date of Dec 24, 2015 and the update date anticipated to be Feb 18, 2016. If the intent is to change the implementation date (the "effective date") of all of the requirements of the BMP Design Manual to February 18, 2016, which appears to be the case based on correspondence with Regional Board staff, then clarifying language is needed.	Add the following clarifying language to Provision F.2.b.(4): (4) If the San Diego Water Board amends Provisions E.3.a-d during the permit term but after the Copermittee has completed the update pursuant to Provision F.2.b.(1), the Copermittee must revise its BMP Design Manual to incorporate the amended Provision E.3.a-d requirements as soon as possible but not later than 90 days after the date the San Diego Water Board adopts the amendments to Provisions E.3.a-d, unless otherwise directed by the San Diego Water Board Executive Officer. Under these circumstances, the effective date of the BMP Design Manual is 90 days after the date the San Diego Water Board adopts the amendments to Provisions E.3.a-d.

Attachment 1: City of San Diego Comment Table Regarding Tentative Order No. R9-2015-0100
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Permit Section	Permit Page	Section Title	Reason for Proposed Changes/Comments	Proposed Changes
Attachment E. Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2015-0001				
Attachment E, Sections 1.b(3)(d) 1.b(3)(d)(iv) 1.b(3)(d)(v) 2.b(3)(d)(iv) 2.b(3)(d)(v) 3.b(3)(d)(iv) 3.b(3)(d)(v) 4.b(3)(d) 4.b(3)(d)(iv) 4.b(3)(d)(v) 5.b(1)(a) 5.b(3)(d) 5.b(3)(e) 5.b(3)(f) 4.b(3)(g) 4.b(3)(g)(iv) 4.b(3)(g)(v) 5.c(1)(b)(iv) 5.c(1)(b)(v) 5.c(1)(b)(vi) 5.c(1)(b)(vii) 5.c(1)(b)(viii) 6.b(2)(b)(ii) 6.b(3)(d) 6.b(3)(e) 6.b(3)(f) 6.b(3)(f)(iv) 6.b(3)(f)(v) 6.c(2)(a)(i) 6.c(2)(a)(ii) 6.c(3)(d) 6.c(3)(e) 6.c(3)(f) 6.c(3)(g) 6.c(3)(h)	E-4 E-8 E-11 E-16 E-19 E-23 E-24 E-25 E-34 E-36 E-37 E-41 E-42 E-47	Final TMDL Compliance Determination	Compliance language requires all Copermittees to implement a WQIP for any of the Copermittees to utilize the WQIP based compliance approach for TMDLs. Copermittees have no authority to compel other Copermittees to implement BMPs and should not be held liable for the actions or inactions of others. Under 40 C.F.R. §§ 122.26(a)(3)(vi) and 122.26(b)(1), a Copermittee is responsible only for conditions relating to the discharges for which it is the operator.	Revise Attachment E Provisions to allow independent jurisdictional compliance. For example, revise Provisions E.1.b(3)(d) as follows: (d) The Responsible ~~Copermittees~~ Copermittee ~~develop~~ develops and ~~implement~~ implements the Water Quality Improvement Plan as follows: . . . . (iv) The Responsible ~~Copermittees~~ Copermittee ~~continue~~ continues to implement the BMPs required under Specific Provision 1.b.(2)(c), AND (v) The Responsible ~~Copermittees~~ Copermittee ~~continue~~ continues to perform the specific monitoring and assessments specified in Specific Provision 1.d, to demonstrate compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c).

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Permit Section	Permit Page	Section Title	Reason for Proposed Changes/Comments	Proposed Changes
Attachment E. 6.	E-31	Final TMDL Compliance Requirement, Table 6.1	The proposed addition of a 10-year wet-weather compliance deadline of April 4, 2021 to Table 6.1, for water bodies in a Water Quality Improvement Plan (WQIP) that does not include load reductions for pollutants besides bacteria, is inconsistent with the adopted TMDL and thereby violates the Clean Water Act regulations at 40 C.F.R. § 122.44(d)(1)(vii)(B). This proposed amendment would subject the segments of beaches and creeks that were removed from the 303(d) list to requirements from which the de-listed segments are specifically exempt under the adopted TMDL. The adopted TMDL states in multiple instances (pp. A-2; A-12; A-65; and A-66) that for these delisted shorelines of the Pacific Ocean, no further action is required as long as monitoring data continues to support compliance with water quality standards, i.e., the beaches remain off future iterations of the 303(d) list: "Specific beach segments from some of the Pacific Ocean shorelines listed in the above table have been delisted from the 2008 303(d) list that was approved by the San Diego Board on December 16, 2009, <u>and therefore are not subject to any further action</u> as long as monitoring data continues to support compliance with water quality standards." Reso. No. R9-2010-0001 at	Delete proposed language in Table 6.1 and footnote.

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Permit Section	Permit Page	Section Title	Reason for Proposed Changes/Comments	Proposed Changes
			A-2 [emphasis added]. Accordingly, the adopted TMDL specifies that for the de-listed segments, no Comprehensive Load Reduction Plan or Bacteria Load Reduction Plan is required: "For watersheds in [Insert table number] [sic]where there are no longer any impairments listed on the 2008 303(d) List, <u>the Phase I MS4s and Caltrans are not required to submit a BLRP or CLRP within 18 months of the effective date of these TMDLs</u>. If, however, any segment of a waterbody for the watershed (Pacific Ocean shoreline, creek, or mouth as shown in Table 11-5) is re-listed on a future 303(d) List for any type of indicator bacteria, the Phase I MS4s and Caltrans will be required to submit a BLRP or CLRP within 6 months of the adoption of the 303(d) List by the San Diego Regional Board." Reso. No. R9-2010-0001 at A-66 [emphasis added]. Under the TMDL, no BLRP or CLRP is required for the de-listed segments. The WQIP is a requirement of the MS4 Permit, not the TMDL, and is <u>not</u> a BLRP. Thus, there is no justification to require a 10-year compliance schedule for the de-listed segments, and the proposed amendment is not consistent with the TMDL and should not be adopted.	
Attachment	E-38	Interim TMDL	See above comment.	Delete proposed language in Table 6.4 and footnote.

Attachment 1: City of San Diego Comment Table Regarding Tentative Order No. R9-2015-0100
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Permit Section	Permit Page	Section Title	Reason for Proposed Changes/Comments	Proposed Changes
E. 6.	through E-40	Compliance Requirements, Table 6.4		
Attachment F. Fact Sheet/Technical Report				
Applicable Statutes, Regulations, Plans and Policies	F-30 – F-32	Antidegradation Policy & Anti-Backsliding Policy	The City supports the proposed amendments to the discussion on the MS4 Permit's consistency with the antidegradation policy and anti-backsliding policy.	NA
Provisions	F-60	Provision B.3 (Water Quality Improvement Plan Goals, Strategies and Schedules)	Finding no. 3 is not accurate as the MS4 Permit is currently drafted. Finding no. 3 states: "3. Provision B.3.c is an ambitious, rigorous, and transparent alternative compliance pathway that allows a Copermittee appropriate time to come into compliance with receiving water limitations without being in violation of the receiving water limitations during implementation of the compliance alternative." As currently drafted, Provision B.3.c does not allow the City appropriate time to come into compliance with the ASBS receiving water limitations in Provision A.2.b.	No changes are needed to this portion of the Fact Sheet so long as the City's proposed change to Provision B.3.c. to include compliance coverage for Provision A.2.b is accepted.

Revise May 14, 2015, Draft of Provision E.3.e.(1)(a) as follows:

e. **PRIORITY DEVELOPMENT PROJECT BMP IMPLEMENTATION AND OVERSIGHT**

Each Copermittee must implement a program that requires and confirms structural BMPs on all Priority Development Projects are designed, constructed, and maintained to remove pollutants in storm water to the MEP.

(1) Structural BMP Approval and Verification Process

(a) Each Copermittee must require and confirm that all Priority Development Projects implement the requirements of Provision E.3, except that the Copermittee may allow previous land development requirements to apply to a Priority Development Project if all of the following conditions are met:

(i) The Copermittee has, prior to the effective date of the BMP Design Manual required to be developed pursuant to Provision E.3.d, approved[1] a design that incorporates the storm water drainage system for the Priority Development Project in its entirety, including all applicable structural pollutant treatment control and hydromodification management BMPs, and that complies with the Priority Development Project requirements of the Previous Term MS4 permit;[2] AND

(ii) For private projects, the Copermittee has, prior to the effective date of the BMP Design Manual required to be developed pursuant to Provision E.3.d, issued a development approval or construction permit based on a design that incorporates the approved storm water drainage system for the Priority Development Project in its entirety; AND

(iii) All subsequent development approvals and construction permits, or equivalent approvals for public projects, that are needed to implement the initial approval, must be issued within 5 years of the effective date of the BMP Design Manual pursuant to Provision E.3.d. BMP installation must remain in substantial conformity with the design of the storm water drainage system included in the initial approval.

(b) Alternatively, the Copermittee may allow previous land development requirements to apply to a Priority Development Project if application of Provision E.3 would be legally infeasible.

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[1] For public projects, approval means that the design of the storm water drainage system for the project in its entirety has been stamped by the City or County Engineer, or engineer of record for the project.

[2] Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016 for San Diego, Orange, and Riverside Counties, respectively.

CITY OF SANTEE

MAYOR
Randy Voepel

CITY COUNCIL
Jack E. Dale
Ronn Hall
Rob McNelis
John W. Minto

September 11, 2015

Via E-Mail [sandiego@waterboards.ca.gov]

David Gibson, Executive Officer
c/o Wayne Chiu
San Diego Regional Water Quality Control Board
2375 Northside Drive, Suite 100
San Diego, CA 92108

Re: Comment - Tentative Order No. R9-2015-0100, Place ID:786088WChiu

Dear Mr. Gibson and Mr. Chiu:

The City of Santee ("City") appreciates the opportunity to provide comments on San Diego Regional Water Quality Control Board ("Regional Board") Tentative Order No. R9-2015-0100 ("Tentative Order") amending Order No. R9-2013-0001, NPDES No. CAS010266, as amended by Order No. R9-2015-0001, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4) Draining the Watersheds within the San Diego Region ("MS4 Permit"). The City is committed to improving and sustaining water quality in the San Diego region and has undertaken extensive efforts to further these goals. The City is aware that the County of San Diego has prepared and submitted comments on the Tentative Order on behalf of Co-Permittees. The City would like to express its support for the County's comment letter and join with the County in the submission of those comments. The comments in this letter supplement the County's letter and are intended to allow the City and other Co-Permittees to continue working toward the common goal of improving water quality in the region.

1. THE CITY SUPPORTS INCORPORATION OF THE ALTERNATIVE COMPLIANCE PATHWAY FOR PROHIBITIONS AND LIMITATIONS

The City recognizes and appreciates the efforts of Regional Board staff to develop an alternative compliance pathway for incorporation into the MS4 Permit. Attaining water quality objectives is a long term commitment that poses special challenges for MS4s. Incorporation of an alternative compliance pathway recognizes the special challenges and long-term commitments necessary to make measurable steps in reaching water quality objectives. Use of the Water Quality Improvement Plan process establishes a rigorous and transparent pathway for compliance with Provisions A.1.a, A.1.c, A.1.d, A.2.a, and A.3.b. The City joins with other Co-Permittees in expressing its support for the alternative compliance pathway.

2. CLARIFY PROVISION A TO STATE THAT COMPLIANCE WITH PROVISION B.3 CONSTITUTES COMPLIANCE WITH PROVISIONS A.1.a, A.1.c, A.1.d, A.2, AND A.3.b OF THE MS4 PERMIT

The City is concerned that the prohibitions and limitations in Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b, as currently written, may be interpreted independent of the alternative compliance pathway in Provision B.3. A stand-alone reading of the prohibitions and limitations, without any reference to the compliance pathway provision, may expose the Co-Permittees to unintended liability, despite our rigorous efforts to successfully implement the alternative compliance pathway. The City joins with Co-Permittees in requesting that language be added to Provision A to clarify that the intent of the alternative compliance pathway is to create an alternative means of complying with Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b.

3. REVISE ANNUAL MILESTONE REQUIREMENT TO INCLUDE MEANINGFUL MILESTONES (PROVISION B.3.c.(1)(a)(vii), B.3.c.(1)(d), B.3.c.(2)(c), B.3.c.(2)(d) and footnote 9)

The Tentative Order's alternative compliance pathway requires Water Quality Improvement Plans to set annual milestones for each numeric goal. These milestones must build on previous milestones and lead to the achievement of a final numeric goal. While improvements to water quality may be more difficult to attain in the absence of clear goals and milestones, an artificial annual milestone for each goal does not account for the complicated and long-term nature of the strategies designed to attain water quality objectives. To establish meaningful milestones over time, the milestones should be developed as part of the adaptive management process. The City therefore joins with the Co-Permittees in requesting a revision to the annual milestone requirement in Provisions B.3.c.(1)(a)(vii), B.3.c.(1)(d), B.3.c.(2)(c), B.3.c.(2)(d) and footnote 9.

The City is grateful for Regional Board staff's extensive efforts in drafting a fair and workable alterative compliance pathway. We believe that with the minor modifications requested in this comment letter and those of the County on behalf of the City and other Co-Permittees, the City will be a position to move forward with confidence in attaining water quality improvements in the region.

Sincerely,

Melanie Kush

Melanie Kush, AICP
Acting Director of Development Services

C: Paul Malone, Interim City Manager
Scott Johnson, Principal Civil Engineer
Cecilia Tipton, Storm Water Program Manager
City Attorney

County of San Diego

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September 14, 2015

Wayne Chiu, WRC Engineer
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Electronic Submission: sandiego@waterboards.ca.gov

Dear Mr. Chiu:

COMMENT LETTER – TENTATIVE ORDER NO. R9-2015-0100 PLACE ID:786088WCHIU

The County of San Diego (County) appreciates the opportunity to comment on the Regional Water Board's *Tentative Order R9-2015-0100, an Order Amending Order No. R9-2013-0001, NPDES No. CAS010266, as amended by Order No. R9-2015-0001, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4) Draining the Watersheds within the San Diego Region* (Tentative Order or Permit). Comments are followed by specific recommendations for modifications to the language in the Tentative Order. The noted references and page numbers refer to the redline strikeout version of the Tentative Order provided on the Regional Water Board's website.

County comments on the Tentative Order address the following general areas of concern:

- Receiving Water Limitations and the Alternative Compliance Pathway in Provisions A and B;
- BMP Design Manual Updates; and
- Total Maximum Daily Loads (TMDLs), specifically for Indicator Bacteria Project I and Los Peñasquitos Lagoon.

The County respectfully submits the following comments with respect to Tentative Order R9-2015-0100. These comments should not be construed as amending or modifying any of the County's positions with respect to any prior Regional Board order or action. The County reserves its right to continue to pursue any and all of its positions, arguments, challenges, petitions, and appeals with respect to any such prior Regional Board order or action.

1. Provision A.2. Receiving Water Limitations (page 17/138)
Receiving Water Limitations Provisions are not required in the Tentative Order

The County appreciates the inclusion of a Compliance Option in Provision B.3.c of the Tentative Order; however, we continue to believe that the Regional Board has ultimate discretion in regards to requiring strict numeric compliance with water quality standards as noted in the State Board Order addressing receiving water limitations[1]. The County respectfully requests that the Regional Board use its discretion to remove the requirement to comply with receiving water limitations in Provision A.2 of the Tentative Order. While the County recognizes that the State Board has issued an order on the Los Angeles MS4 Permit that includes findings about the receiving water limitations language, the County feels that the San Diego Regional Water Board should utilize the discretion discussed in the order:

> "Although it would be inconsistent with USEPA's general practice of requiring compliance with water quality standards over time through an iterative process, we may even have the flexibility to reverse our own precedent regarding receiving water limitations and receiving water limitations provisions and make a policy determination that, going forward, we will either no longer require compliance with water quality standards in MS4 permits, or will deem good faith engagement in the iterative process to constitute such compliance." (Footnotes omitted).[2]

While the State Board Order declined to reverse course and discontinue including receiving water limitations provisions in MS4 permits, the County respectfully submits that this is not a sound policy decision. The State Board broadly concluded that "the iterative process has been underutilized and ineffective to date in bringing MS4 discharges into compliance with water quality standards."[3] To the contrary, significant advances in reducing pollutants in receiving waters have been made and will continue to be made as science and technology improve and watershed management approaches are implemented. The County feels the Regional Water Board should allow the comprehensive and prioritized watershed planning efforts to be implemented and the effectiveness evaluated prior to incorporating receiving water limitations.

The inclusion of receiving water limitations language seems to overlook the intent of Congress in enacting §402(p) of the Clean Water Act, the Chief Counsel 1993 Memorandum explaining the rationale for the separate Maximum Extent Practicable (MEP) standard for MS4 systems, and Congress' recognition of the unique challenges that an MS4 faces with an open system.[4]

For example, the Caltrans Permit (Order 2012-0011 DWQ) contains language that is more consistent with Clean Water Act §402(p).[5] It recognizes the infeasibility of setting

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[1] Order WQ 2015-0075, p. 13; http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/docs/2015-0731_Tentative_Order_Attachment%201_(Amended_Order).pdf.
[2] *Id* at 14
[3] *Ibid.*
[4] 1993 Memorandum of Chief Counsel, p. 2
[5] Order 2012-0011 DWQ, Finding 20, p. 11; Provision A.1., p. 18.

numeric effluent criteria for municipal BMPs and urban discharges. Setting a policy consistent with these realities and using language that reflects the appropriate MEP standard and iterative process would advance improvement of water quality by creating a climate of cooperation and innovative solutions.

The County requests that the Regional Water Board use the discretion noted to remove the receiving water limitations from this MS4 permit. However, should the Board decide to keep the receiving water limitations language, we have recommended some modifications for consideration in the specific comments below.

SPECIFIC COMMENTS ON RECEIVING WATER LIMITATIONS

2. **Provision A. Prohibitions and Limitations (page 16/138)**
   ***Request:* Add sentence to Provision A to clarify its link to Provision B.**

   Rationale: The Prohibitions and Limitations language in Provision A should be aligned with and reference the compliance alternatives provided through the Water Quality Improvement Planning process described in Provision B.

   The proposed Prohibitions and Limitations provisions may be construed as standalone provisions that could expose the Copermittees to state and federal enforcement actions, as well as to third-party actions under the federal Clean Water Act's citizen suit provisions. A clear linkage between the compliance provisions and the prohibitions, receiving water limitations, and effluent limitations must be established. Compliance with Provisions A.1, A.2, and A.3 should be linked to Provision B so that it is clear that the compliance mechanism for A.4 is the Water Quality Improvement Plan (Provision B) and/or the TMDL (Attachment E), as applicable.

   Recommendation: *Include language in Provision A to indicate that compliance can be achieved through implementation of the Water Quality Improvement Plan, specifically through the Alternative Compliance Pathway added as Provision B.3.c. Add a sentence at end of first paragraph:*

   Implementation of the Compliance Option described in Provision B.3.c of this Order shall constitute compliance with the Discharge Prohibitions (A.1.a, A.1.c, A.1.d), Receiving Water Limitations (A.2), and Effluent Limitations (A.3.b) Provisions of this Order.

3. **Provision B.3.c. Prohibitions and Limitations Compliance Option (page 33/138)**
   Request: Restructure the annual milestone requirements in the Compliance Option so they are meaningful and realistic.

   Rationale: Provision B.3.c.(1)(a)(vii) requires annual milestones to be established for each numeric goal. Further, footnote #9 requires the following:

   "Annual milestones for each final numeric goal must build upon previous milestones and lead to the achievement of the final numeric goal. The annual

milestones may consist of water quality improvement strategy implementation phases, interim numeric goals, and other acceptable metrics."
While the County appreciates the desire to establish additional accountability toward the attainment of final numeric goals, the approach proposed in the Tentative Order is unrealistic and will not provide meaningful goals beyond the first few years. The County has three specific issues with the annual milestone approach:

Issue 3A: The process of implementing BMPs is often not linear in such a manner that actions would consistently "build upon" previous milestones. Copermittees may proceed with the implementation of one BMP (or packages of BMPs), but may later determine that a change of course is needed (e.g., a BMP's not effective, a better approach is identified). This concept has been recognized many times by the Regional Board in discussing the approach to Water Quality Improvement Plans. The County requests that this language be modified to reflect that course corrections may be warranted.

> ***Recommendation:*** *Replace "build upon previous milestones" with "cumulatively." (For complete proposed text revisions, see the Overall Recommendation at the end of this comment that integrates all suggested revisions for Comment #3.)*

Issue 3B: Annual milestones lose meaning after a certain timeframe. For example, it is reasonable to foresee milestones in the first several years of implementing a project, or even to foresee bigger picture milestones over a longer timeframe. Indeed, it is important to forecast the amount of time needed to implement projects to obtain the final goals. However, in forecasting longer-term efforts, milestones are typically not annual, but are at a much larger scale (e.g., multi-year periods). Practically speaking, it is reasonable to identify concrete milestones in Years 1 – 5 of a 30 year effort, whereas the milestones identified today for Year 10, 15, 20, etc. lose significant meaning and value.

> ***Recommendation:*** *Revise the annual milestones to require establishment of committed milestones for the permit term (e.g., Years 1 -5) and the forecasting of additional milestones for the next permit term (e.g., Years 6 – 10). This approach will result in firm commitments for each permit term and ensure that Copermittees are planning ahead in a meaningful way for the following permit term. This process continues until the final numeric goals are achieved. (For complete proposed text revisions, see the Overall Recommendation at the end of this comment that integrates all suggested revisions for Comment #3.)*

Issue 3C: While a requirement to identify annual milestones for each numeric goal may initially sound reasonable, the realistic number of annual milestones generated by such a requirement is unrealistic to measure and track. Take for example an estimate of the number of milestones that would be required just of the County:

8 Watershed Management Areas (WMA) x
2 waterbodies (assuming 1 creek and 1 beach) per WMA x
3 to 5 numeric goals per waterbody x
5 years in a permit term =
48 to 80 annual goals; 240 to 400 goals per permit term

The intent of the milestones is to increase accountability. However, tracking 48 to 80 milestones each year just for the County of San Diego would create an administratively intensive process that far outweighs the benefit. Alternatively, milestones could be established based on the permit term, rather than on an annual basis. Further, the Tentative Order should also explicitly acknowledge and allow for a specific milestone to apply to multiple numeric goals and/or waterbodies (as justified to be applicable and appropriate). This approach would streamline the process and create a more meaningful and clearer process of accountability.

Recommendations: *(1) Replace the requirement for annual milestones with a requirement to establish at least one milestone per permit term. This would result in approximately 48 – 80 goals in a permit term (based upon the estimate above), still providing significant accountability. (2) Explicitly allow a milestone to apply to more than one numeric goal and/or waterbody (as applicable and appropriate). (For complete proposed text revisions, see the Overall Recommendation at the end of this comment that integrates all suggested revisions for Comment #3.)*

Overall Recommendation for Comment #3: *Modify Provision B.3.c.(1)(a)(vii) , footnote 9,* B.3.c.(2)(c), and B.3.c.(2)(d) *as follows:*

B.3.c.(1)(a) (vii): For each final numeric goal developed pursuant to Provisions B.3.a and B.3.c.(1)(a)(i)-(v), at least one ~~annual~~ milestone[9] and date for its achievement must be included **for the permit term** within each Water Quality Improvement Plan **and progress toward attaining the milestone(s) reported upon during each** Annual Report reporting period**. Further, for each final numeric goal developed pursuant to Provisions B.3.a and B.3.c.(1)(a)(i)-(v), at least one milestone forecasted to be achieved in the next subsequent permit term must be included within each Water Quality Improvement Plan. This process will continue** until the final numeric goal is achieved.

Footnote 9: ~~Annual~~ ~~m~~**M**ilestones for each final numeric goal must ~~build upon previous milestones and~~ **cumulatively result in** ~~lead to~~ the achievement of the final numeric goal. The ~~annual~~ milestones may consist of water quality improvement strategy implementation phases, interim numeric goals, and other acceptable metrics. **The milestones may also address multiple numeric goals and/or multiple waterbodies, as applicable and appropriate.**

B.3.c.(2)(c): The Copermittee's' assessments in the Water Quality Improvement Plan Annual Report submitted pursuant to Provision F.3.b.(3) support a conclusion that: 1) the Copermittee is in compliance with the ~~annual~~ milestones and dates for achievement developed pursuant to Provision B.3.c.(1)(a)(vii), OR 2) the Copermittee has provided acceptable rationale and recommends appropriate modifications to the interim numeric goals, and/or water quality improvement strategies, and/or schedules to improve the rate of progress toward achieving the final numeric goals developed pursuant to Provisions B.3.a and B.3.c.(1)(a)(i)-(vi); AND

B.3.c.(2)(d): Any proposed modifications to the numeric goals, schedules, and/or ~~annual~~ milestones are accepted by the San Diego Water Board as part of subsequent updates to the Water Quality Improvement Plan pursuant to Provision F.2.c; AND

4. **Provision B.3.c. Prohibitions and Limitations Compliance Option (page 36/138)**
Request: **Add a compliance pathway to Provision B.3.c during development of or updates to the WQIP.**

Rationale: While developing a plan to comply with the Alternative Compliance Pathway, Copermittees should be deemed in compliance with Receiving Water Limitations where all Permit-required milestones related to development and/or implementation of the Water Quality Improvement Plan is met.

Recommendation: *Add language consistent with former recommendations provided during the reissuance process in 2013[6], consistent with the Los Angeles MS4 Permit[7], and consistent with the recently adopted State Board Order[8] upholding the alternative compliance approach used in the Los Angeles MS4 Permit. This would require: (1) language to require a Notice of Intent to utilize a WQIP-based compliance option, and (2) all deadlines for development and implementation of a WQIP pursuant to Provision F.1.(a) and (b), and Provision B are met AND the WQIP, or revised WQIP, ultimately receives approval. The following language should be added as Provision B.3.c.(3):*

(3) For cases when applicable discharge prohibitions (A.1.a, A.1.c, A.1.d), receiving water limitations (A.2.a), or effluent limitations (A.3.b) are not attained during the time period between a Copermittee's notification of intent to utilize a Water Quality Improvement Plan based compliance option and San Diego Water Board executive officer acceptance of the Water Quality Improvement Plan, a Copermittee is in compliance with Provision A.1.a, A.1.c,, A.1.d, A.2.a, and A.3.b if all of the following conditions are met:

a. All deadlines for development of a Water Quality Improvement Plan pursuant to Provision F.1.(a) and (b) or implementation of an existing Water Quality Improvement Plan pursuant to Provision B are met;
b. For the areas of the watershed to be covered by the alternative compliance option, the Copermittee(s) must initiate targeted implementation of programs through the agencies' existing programs that focus on the watershed's priority pollutants to effectively prohibit non-stormwater discharges to the MS4 and to reduce pollutants in stormwater discharges from the MS4 to the MEP;
c. Receives acceptance of the Water Quality Improvement Plan or updated Water Quality Improvement Plan within the time periods specified in Provision F.

[6] "SDCopermitteeFinal R9-2013-0001 Tentative Order DRAFT Strikeout_010413 –comments_3_27_TO_Copy.doc"
[7] Order No. R4-2012-0175, Part VI.C.2.d
[8] Order WQ-2015-0075, B.6, page 48

5. **Provision B.3.c.(1)(a)(iii) Prohibitions and Limitations Compliance Option (page 34/138)**

Request: Numeric goals developed for 303(d) listed constituents should be applicable only if the MS4 is determined to be a source of the pollutant causing the impairment.

Rationale: Provision B.3.c.(1)(a)(iii) appears to include all 303(d) listings in receiving waters without specifying that the impairment must be linked to MS4 discharges. There may be instances where MS4 discharges are not causing or contributing to the impairment. While that situation would result in a Permittee complying with Provision A without the need for the alternative compliance pathway in Provision B.3.c, clarity would avoid future confusion as to whether or not interim and final numeric goals need to be developed.[9]

Recommendation: *Modify Provision B.3.c.(1)(a)(iii) as follows:*

(iii) Interim and final numeric goals applicable to the Copermittee's MS4 discharges within the Watershed Management Area expressed as numeric concentration-based or load-based goals for all pollutants and conditions listed on the Clean Water Act Section 303(d) List of Water Quality Impaired Segments for the receiving waters in the Watershed Management Area that do not have a TMDL incorporated into Attachment E to this Order **<u>and where MS4 discharges are causing or contributing to the impairment;</u>** AND/OR

6. **Provision B.5. Iterative Approach and Adaptive Management Process (page 37/138)**

Request: Permit language should address a trigger for updates to the watershed modeling/analysis as part of the adaptive management process.

Rationale: Provision B.5 requires that the adaptive management process is performed annually. As drafted, the language could be interpreted to mean that the watershed model/analysis would have to be updated annually.

Recommendation: *Include a new Provision B.5.d to clarify that updates to the watershed model/analysis within the adaptive management process are required only if conditions have changed significantly such that they would alter the model results. As part of the ROWD, the watersheds would conduct an analysis of whether conditions have changed sufficiently to warrant an update to the watershed model/analysis and, if so, provide a schedule for conducting the updated analysis.*[10]

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[9] Consistent with CASQA recommendations to SWRCB. California Stormwater Quality Association, Letter to Ms. Jeanine Townsend, Clerk to the Board, State Water Resources Control Board, Subject: SWRCB/OCC Files A-2236(a) through (kk); Comments on Proposed Order *In Re Petitions Challenging 2012 Los Angeles Municipal Separate Storm Sewer System Permit (Order No. R4-2012-0175)*, January 19, 2015.

[10] Consistent with CASQA recommendations to SWRCB. California Stormwater Quality Association, Letter to Ms. Jeanine Townsend, Clerk to the Board, State Water Resources Control Board, Subject: SWRCB/OCC Files A-2236(a) through (kk); Comments on Proposed Order *In Re Petitions Challenging 2012 Los Angeles Municipal Separate Storm Sewer System Permit (Order No. R4-2012-0175)*, January 19, 2015.

B.5.d. Updates to Optional Watershed Analysis [B.3.c.(1)(b)]
Updates to the optional watershed analysis included in Provision B.3.c.(1)(b) are required only if conditions have changed significantly within the watershed or where new information is available that would significantly alter the model results.

7. Provision F.2.b. BMP Design Manual Updates (Page 126/138)

Request: Allow adequate time for Copermittees to update and implement their BMP Design Manuals.

Rationale: The current Order establishes the Effective Date of the BMP Design Manual (and therefore of the requirements of Permit Section E.3.a-d) as December 24, 2015. This date was appropriate at the time of initial Permit adoption because it provided Copermittees sufficient time to develop updated content and modify the programs and regulatory authorities needed for implementation. The Tentative Order would now require Copermittees to *update* their BMP Design Manuals to incorporate the amended Provisions E.3.a-d within 90 days after the amended Provisions E.3.a-d are adopted by the Regional Board. Given that the Tentative Order proposes critical new modifications, additional time is requested to allow for their completion *and implementation*. The first of these are the changes in the definition of redevelopment Priority Development Projects (PDPs) proposed in Section II.E.3.b.(1)(c) through (e). The second is the addition of a modified process for establishing Prior Lawful Approval (PLA) under Section E.3.e.(1). We appreciate the work that Regional Board staff put into working with stakeholders and crafting these PLA provisions, and we support their adoption. However, we must also note that the current schedule for implementing updated BMP Design Manual provisions under the Tentative Order severely limits their potential application. Additional time is needed to: allow Copermittees to ensure regional consistency; modify local BMP Design Manuals; update policies, procedures, and other program documentation; conduct outreach to industry and project proponents; and modify local ordinances.

At a minimum, the Regional Board should allow six months from the adoption of new requirements to complete and implement these tasks. As currently written, if these provisions are adopted as proposed on November 18, Copermittees would have just 90 days to implement them. Please note the following inconsistencies in the Tentative Order and Technical Report regarding the extension of dates. First, the Technical Report (page F-110) states "Provisions E.3.e.(1)(a)[a]-[d] are dependent on the effective date of the BMP Design Manual. Unless otherwise directed by the San Diego Water Board, the effective date of the BMP Design Manual is December 24, 2015 for the San Diego County Copermittees ..." This is in contrast to Provision F.2.b.(4), which requires that *revision* of the updated BMP Design Manual be completed not later than 90 days after the date the San Diego Water Board adopts the amendments (i.e., by February 16, 2016). Since it is not possible for the BMP Design Manual effective date to precede its revision date, it must be assumed that the intent of Provision F.2.b.(4) is to also extend the effective date.

In recent correspondence on this issue, Regional Board staff has indicated their intent to explicitly extend the effective date by the same 90 days allowed for the BMP Design Manual revision using the discretion granted the Executive Officer under other proposed amendments to Section E.3.d. However, this is problematic for three reasons. First, since any extension granted by the Executive Officer could only be executed after the hearing,

Copermittees would have no assurances that it would actually occur. Second, extending the effective date by 90 days would merely make the revision and effective dates concurrent rather than rectifying the inconsistencies causing the confusion. Third, a 90-day extension of the effective date simply does not provide adequate time for both completing and implementing the BMP Design Manual update. We recommend that the *effective* date of the BMP Design Manual for the Copermittees be extended 180 days from the adoption of the Tentative Order (i.e., May 14, 2016). Modifying the Permit to specifically incorporate this effective date, rather than relying on the ability of the RWQCB Executive Officer to do so after the fact, would both provide the time necessary for critical program updates and the certainty needed to plan for them. It would also ensure that these critical changes are fully vetted in an open public forum.
We also recommend that Provision E.3.d. be modified to clarify that the date the BMP Design Manual is implemented (rather than revised) is the same as the "effective date". This will help to prevent any future confusion regarding the applicability of dates.

Since the County has already modified its Watershed Protection Ordinance (WPO) to reflect existing Permit content in anticipation of the December 24, 2015 BMP Design Manual effective date, we will now need to repeat this process to incorporate the modified PDP definition and the updated PLA process. The schedule below illustrates an anticipated *best case scenario* for updating and obtaining Board of Supervisors approval of the WPO.

12/06/15	Deadline for first draft Board letter and supporting materials (incl. update Watershed Protection Ordinance)
12/30/15	File the public notice with the Clerk of the Board
12/31/15	Official Public Notice Period
01/05/16	Board of Supervisors Hearing, 1st reading
01/26/16	Board of Supervisors Hearing, 2nd reading and approval
02/16/16	BMP Design Manual Effective Date if Extended by RWQCB Executive Officer
02/25/16	Revised WPO effective date (30 days after approval of amendments)
05/16/16	BMP Design Manual Effective Date proposed by County and Copermittees

As shown, completion of a WPO update alone would exceed the 90 days currently allowed by the Tentative Order. This means that even if the County is able to move another WPO update forward on the most aggressive possible schedule (which we cannot guarantee since this item would have to compete with other potential content on the Board agenda), the anticipated effective date of the WPO revisions would be after the BMP Design Manual effective date. We expect that other Copermittees will experience similar problems with the timing of their ordinance updates. While a nine-day discrepancy might not initially sound significant, it's important to emphasize that this could be much more, depending on actual WPO hearing schedules. This means, for instance, that the County would lack the legal authority to require that redevelopment projects under the updated PDP definition be considered PDPs during that interim period. It is not sound policy to knowingly impose updated Permit requirements on a schedule that the County or any other Copermittee

cannot meet. The RWQCB has been responsive to such concerns in the past, and we are requesting the same consideration here.

Even if ordinance revisions could be completed within 90 days, it is still insufficient time for completing other critical tasks (updating the County BMP Design Manual, then training staff and conducting industry outreach, etc.), all of which are required to responsibly and legally impose updated requirements on public and private projects. While Regional Board staff has suggested that Copermittees can start this process now, it is unrealistic to expect that they do so based only on the proposed requirements of this Tentative Order. It would be speculative to assume that the Tentative Order will be adopted as currently drafted, and Copermittees should not be expected to initiate specific program changes or ordinance revisions based on speculation. Moreover, asking project proponents to implement updated requirements without sufficient time to consider and design to them is unreasonable. We therefore request that the BMP Design Manual effective date be extended by 180 days in the adopted Order. As shown in the table above, this would provide additional time that necessary to avoid imposing a de facto condition of Copermittee non-compliance, and that is critical to getting these new requirements right.

Recommendations: *The County recommends that the Regional Board modify the requirement to specify that the updates be made to the BMP Design Manual, as follows:*

Provision E.3.d
Each Copermittee must update its BMP Design Manual pursuant to Provision F.2.b. Until the Copermittee has updated its BMP Design Manual pursuant to Provision F.2.b.(1), the Copermittee must continue implementing its current BMP Design Manual. The Copermittee must implement the updated BMP Design Manual within 180 days following completion of the update pursuant to Provision F.2.b.(1), unless directed otherwise by the San Diego Regional Water Board Executive Officer. **The date the BMP Design Manual is implemented is the "effective date" of the BMP Design Manual**. The update of the BMP Design Manual required pursuant to Provision F.2.b.(1) must include the following:

Provision F.2.b.(4)
If the San Diego Water Board amends Provisions E.3.a-d during the permit term but after the Copermittee has completed the update pursuant to Provision F.2.b.(1), the Copermittee must revise its BMP Design Manual to incorporate the amended Provision E.3.a-d requirements as soon as possible but no later than **180** days after the date the San Diego Water Board adopts the amendments to Provisions E.3.a-d, unless otherwise directed by the San Diego Water Board Executive Officer. **Under these circumstances, the effective date of the BMP Design Manual is 180 days after the date the San Diego Water Board adopts the amendments to Provisions E.3.a-d**.

8. Provision E.3.c.(2)(b) – Requirements to Manage Critical Coarse Sediment Yield

Request: Allow adequate time for Copermittees to study and collaboratively develop approaches to compensate for the loss of critical sediment supply.

Rationale: Section E.3.c.(2)(b) of the Order requires that each development project conduct studies and compensate for the loss of onsite sediment supply. In our January 11,

2013, comment letter on the initial adoption of this Permit, the County noted that the imposition of these requirements is speculative and premature given the current state of science and technology regarding these impacts and potential mitigation options. While the County and others continue to work to meet these requirements, we reiterate our previous comments. Until the impact of individual development projects on receiving water coarse sediment supply is better understood, the ability of Copermittees to require sediment compensation on a project-by-project basis in a technically and legally defensible manner will remain severely limited. Moreover, pursuing a longer-term, study-based approach will help to avoid unintended environmental impacts.

Recommendations: *We recommend the language be removed from Section E.c.3.(2)(b) and moved to Section E.3.d as line item (6) so that it can be addressed regionally instead of at a project level.*

9. Provision E.3.c. Priority Development Project Structural BMP Performance Requirements

Request: Clarify the intent and applicability of TCBMP treatment requirements to flow-thru BMP designs.

Rationale: Provision E.3.c.(1)(a)(i) describes performance requirements for biofiltration BMPs where retention of the full design capture volume is not feasible. Proposed revisions would clarify that option [a] under this Provision is intended for flow-based BMPs and that option [b] is intended for volume-based BMPs. Removal of the reference to "flow-thru design" would eliminate any unintended implications that the flow-thru treatment requirements of Provision E.3.c.(1)(a)(ii)[b] apply to BMPs addressed by the design criteria of Provision E.3.c.(1)(a)(i)[b]. The addition of "static storage" language clarifies this volume based BMP is not subject to flow routing requirements.

Recommendation: *Modify Provision E.3.c.(1)(a)(i)[b] as follows:*

[b] Treat the design capture volume not reliably retained onsite with a ~~flow thru design that has a~~ total **static storage** volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained

SPECIFIC COMMENTS ON TMDL PROVISIONS

10. Attachment E-6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

Request: Issue 10A: Modify wet weather compliance timelines for delisted 303(d) waterbodies to 20 years to be consistent with the TMDL Resolution.

Rationale: **Issue 10A:** Footnotes and dates were added to Tables 6.1 and 6.4 to note earlier final and interim wet weather compliance dates, respectively, if the Water Quality Improvement Plans do not include "load reduction programs" to address other constituents.

Draft Tentative Order Attachment E Tables 6.1 and 6.4 should be modified for consistency with the TMDL. The proposed addition of a 10-year wet-weather compliance deadline of April 4, 2021, to Table 6.1, for water bodies in a WQIP that does not include load reductions for pollutants besides bacteria, is inconsistent with the adopted TMDL and thereby violates the Clean Water Act regulations at 40 C.F.R. § 122.44(d)(1)(vii)(B). This proposed amendment would subject the segments of beaches and creeks that were removed from the 303(d) list to requirements from which the de-listed segments are specifically exempt under the adopted TMDL. Under the TMDL, no BLRP or CLRP is required for the de-listed segments. The WQIP is a requirement of the MS4 Permit, not the TMDL, and is not a BLRP. Thus, there is no justification to require a 10-year compliance schedule for the de-listed segments, and the proposed amendment is not consistent with the TMDL.

Recommendation: *Delete proposed language in Table 6.1 and footnote.*
However, should the Regional Water Board decide to keep the footnote, we recommend modifications to be consistent with the adopted TMDL:

Recommendations:

Table 6.1 Footnote: **Except for segments removed from the 303(d) list,** ~~T~~the Wet Weather TMDL Compliance Date in parenthesis applies if the applicable Water Quality Improvement Plan does not include **anticipated** load reductions ~~programs~~ for other constituents **analogous to the Comprehensive Load Reduction Plan** together with bacteria load reduction requirements of this TMDL.

Table 6.4: Remove dates included in parentheses for segments removed from the 303(d) list.

Table 6.4 Footnote: The Interim Compliance Dates to achieve the Interim Wet Weather WQBELs in parenthesis apply if the applicable Water Quality Improvement Plan does not include **anticipated** load reductions ~~programs~~ for other constituents **analogous to the Comprehensive Load Reduction Plan** together with bacteria load reduction requirements of this TMDL.

Request: Issue 10B: Clarify that compliance with receiving water limitations will be assessed at the compliance points identified in the TMDL Monitoring Plan.

Rationale: **Issue 10B:** Compliance with the final and interim receiving water limitations as allowed by Attachment E-6.b.(3)(b), E-6.c.(3)(b), and E-6.c.(3)(f) should be consistent with the TMDL, Basin Plan Amendment, and approved TMDL Monitoring Plan. The Basin Plan Amendment defines the points for compliance in the receiving waters as follows:

"For beaches addressed by these TMDLs, monitoring locations should consist of, at a minimum, the same locations used to collect data required under MS4 NPDES monitoring requirements and beach monitoring for Health and Safety Code section 115880" and "[f]or creeks addressed by these TMDLs, monitoring locations should consist of, at a minimum, a location at or near the mouth of the creek (e.g., Mass

Loading Station or Mass Emission Station) and one or more locations upstream of the mouth (e.g., Watershed Assessment Stations)." [11]

The approved monitoring plans have defined monitoring compliance points consistent with the language in the Basin Plan Amendment. For consistency, the language in Attachment E-6 should be modified.

Recommendation: *Modify the appropriate language in the final and interim compliance pathways in Attachment E-6 as follows:*

E-6.b.(3) Final TMDL Compliance Determination

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at~~, or downstream of the Responsible Copermittee's MS4 outfalls~~ **the compliance point in the receiving water as defined in the approved TMDL monitoring plan**; OR

E-6.c.(3) Interim TMDL Compliance Determination

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at~~, or downstream of the Responsible Copermittee's MS4 outfalls~~ **the compliance point in the receiving water as defined in the approved TMDL monitoring plan**; OR

(f) There are no exceedances of the interim receiving water limitations under Specific Provision 6.c.(2)(a) in the receiving water at~~, or downstream of the Responsible Copermittee's MS4 outfalls~~ **the compliance point in the receiving water as defined in the approved TMDL monitoring plan**; OR

11. Attachment E-7. Total Maximum Daily Load for Sediment in Los Peñasquitos Lagoon

Request: Incorporate a land use-based compliance pathway that is consistent with the approach used to develop the TMDL[12].

Rationale: Attachment E-7 incorporates Los Peñasquitos Sediment TMDL (Sediment TMDL) requirements for Phase I MS4 Permittees. Both the TMDL and its incorporation into the MS4 Permit through Revised Tentative Order R9-2015-0100 provide multiple pathways for the responsible parties to demonstrate compliance. The County supports the flexibility provided by these options and, based on the following rationale, requests that the Regional Board also include an option for land use-based TMDL compliance.

The Sediment TMDL provides the framework and milestones to restore lagoon

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[11] California Regional Water Quality Control Board, San Diego Region. *Resolution No. R9-2010-0001, Attachment A. Amendment to the Water Quality Control Plan for the San Diego Basin (9) to Incorporate Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek).* Chapter 7(h)(7)(i) – Monitoring for TMDL Compliance and Compliance Assessment, p. A50.

[12] California Regional Water Quality Control Board, San Diego Region. *Resolution No. R9-2012-0033* and *Sediment TMDL for Los Penasquitos Lagoon, Staff Report, June 13, 2012.*
http://www.waterboards.ca.gov/sandiego/water_issues/programs/tmdls/los_penasquitos_lagoon.shtml

saltmarsh habitat to 80% of the acreage that existed in 1973 through numeric targets for sediment loading during the critical wet period based on 1970s conditions, when the sediment water quality standard was met.

The Sediment TMDL provides the following support for this approach:

- The numeric targets section finds that the water quality objective for sediment in the Lagoon was attained and beneficial uses were supported under 1970s land use conditions, and that the Lagoon was capable of assimilating 1970s sediment loads.

- The source assessment section links hydromodification caused by land development within the watershed to increased scouring and sediment transport. Phase I MS4s are noted as the main point source of sediment, primarily through the increased volume, velocity, frequency and discharge duration of runoff from developed areas, which transports built-up sediment, and accelerates downstream erosion. Hydromodification, the change in natural runoff characteristics caused by urbanization or other land use changes, is named as the driver for increased sediment loads from MS4s.

- The linkage analysis section relies on results from a computer model that relates sediment loading to land use, and notes that the 1970s condition represents a time period prior to major land development in the watershed.

Consequently, if the land use of a TMDL Responsible Party has not changed significantly since the 1970s baseline, the sediment loads from that Party's MS4 outfalls are expected to be approximately the same as the baseline level and within the amount allowed as part of the approved wasteload allocation. Therefore, since wasteload allocations are based on achieving 1970s sediment loads, if it can be demonstrated that limited land use change has resulted in sediment loads from a Responsible Party that have remained the same since the 1970s, and within the levels allowed by the wasteload allocation, the Party should be deemed in compliance with the Sediment TMDL.

> ***Recommendation:*** *The County requests that a land use-based TMDL compliance pathway be incorporated into Attachment E-7 through the following amendments (<u>underlined</u> text to be inserted):*

7.b.(2).(c) Best Management Practices

(i) The Water Quality Improvement Plan for the Los Penasquitos Watershed Management Area must incorporate the Sediment Load Reduction Plan required to be developed pursuant to Resolution No. R9-2012-0033. <u>Areas within the Los Penasquitos Watershed Management Area where it can be demonstrated that sediment loading has not increased beyond the allowable wasteload allocation as a result of limited or no land use changes since the 1973 baseline may be excluded from the Sediment Load Reduction Plan or Water Quality Improvement Plan.</u>

(ii) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 7.b.(2)(a) and/or the Copermittee's portion of the effluent limitations under Specific Provision 7.b.(2)(b) for Los Penasquitos Lagoon, unless it can be shown pursuant to Specific Provision 7.b.(2)(c)(i) that sediment loading has not increased beyond the allowable wasteload allocation as a result of limited or no land use changes since the 1973 baseline.

7.b.(3) Final TMDL Compliance Determination

(b) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 7.b.(2)(c)(ii) for land areas with significant land use changes from the TMDL baseline, or other implementation actions achieve compliance with Specific Provision 7.b.(3)(a).

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 7.d to demonstrate compliance with Specific Provision 7.b.(3)(a). Responsible Copermittees that can demonstrate land use-based TMDL compliance per the requirements in provision 7.b.(2)(c)(i) , and any jurisdictional areas with changes that are demonstrated to be in compliance with the TMDL as specified in Specific Provision 7.b.(3)(b)(ii), are exempt from Specific Provision 7.d, as they are fully attaining the final TMDL requirements.

7.c.(2) Interim TMDL Compliance Determination

(e) The Responsible Copermittees have demonstrated they are in compliance with the final TMDL as specified in Specific Provision 7.b.(3).

If you have questions or require additional information, please contact Jo Ann Weber, Planning Program Manager at (858) 495-5317 or e-mail at JoAnn.Weber@sdcounty.ca.gov.

Sincerely,

Todd Snyder

TODD E. SNYDER, Manager
Watershed Protection Program

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WATER QUALITY
CONTROL BOARD
2015 SEP 14 AM 10 10

September 14, 2015

San Diego Regional Water Quality Control Board
2375 Northside Drive, Suite 100
San Diego, CA 92108
Attn: Wayne Chiu

Subject: **Comment - Tentative Order No. R9-2015-0100, Place ID:786088WChiu**

Dear Mr. Chiu:

The San Diego Unified Port District (District) submits the following comments to Tentative Order No. R9-2015-0100 (Tentative Order), which proposes to amend the *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4) Draining the Watersheds within the San Diego Region* (the Permit). The District continues to support the San Diego Regional Water Quality Control Board's (Regional Board) efforts to develop a Permit that appropriately regulates MS4 discharges in a manner protective of human and ecological health and that addresses the substantial economic and feasibility constraints faced by the Copermittees. The District also appreciates the workshops held by the Regional Board to consider and develop proposed language prior to the issuance of the Tentative Order.

The District reiterates the comments it has made on Order No. R9-2013-001 and Order No. R9-2015-001 and repeats and incorporates by reference these previously submitted comments, which were set forth in letters dated September 14, 2012, January 11, 2013, November 19, 2014, and in the transcript from the hearing that took place before the Regional Board on April 10 and 11 and on May 8, 2013. The District also incorporates by reference its position on the provision identified and addressed in its petition to the State Board, submitted on June 7, 2013 (Petition No. A-2254(o)).

As set forth in these previously submitted comments, the District continues to request that the Regional Board add language to the Permit clarifying that the location of an MS4 facility within the District's jurisdictional boundaries does not, without more, render the District an owner or operator of that facility. Though obvious, this concept is singularly important to the District given its unique status as the trustee of tidelands resources with boundaries that overlap with the Cities of San Diego, National City, Chula Vista, Imperial Beach, and Coronado (member cities). MS4 facilities owned and operated by the member cities traverse District boundaries, many without any storm water contribution from the District. These MS4 facilities were reserved by the member cities in the 1962 conveyances of tidelands properties to the District, and continue to be owned and operated by the member cities (and not the District) to this day. Attachment A includes the 1962 conveyance document for the record.

The law is clear: the District is not responsible for discharges from an MS4 that it does not own or operate, even if a portion of the MS4 falls within its boundaries. *See* 33 U.S.C. 1316(a)(4) ("owner or operator" defined as "any person who owns, leases, operates, controls, or supervises a source"); 40 C.F.R. 122.26(a)(3)(vi) ("Co-permittee need only comply with permit conditions relating to discharges from the municipal separate storm sewers *for which they are operators*.") (emphasis added); State Board, Order No. WQ 2015-0075, at 66 ("Permittees that have commingled MS4 discharges need only comply with permit conditions relating to discharges from the MS4 *for which they are owners or operators*.") (emphasis added). Indeed, as the Permit recognizes, "[t]he federal regulations make it clear that the Copermittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators (40 CFR 122.26(a)(3)(vi))."

Despite the clarity of the law, there has been substantial confusion as to the District's responsibility for MS4 facilities within its boundaries that are owned and operated by other Copermittees. For example, the District has been named to Draft Investigative Order R9-2015-0058, which pertains to an investigation of sediment quality in the Mouth of Chollas Creek, based on its status as an MS4 Copermittee—despite the fact that the District does not own or operate any portion of the MS4 that discharges into Chollas Creek.[1] As stated above, it would be improper to name the District to an investigative order based solely on its status as MS4 Copermittee. Yet it has become clear that without the clarifying language requested by the District, the Regional Board and others may look to the District to take responsibility for MS4 facilities that it does not own or operate and, thus, cannot legally control.

Thank you again for this opportunity to provide comments on the Tentative Order. If you have any questions please contact Karen Holman at (619) 725-6073 or via email at kholman@portofsandiego.org.

Respectfully,

Jason H. Giffen

D2#1035048
cc: Randa Coniglio, John Bolduc, John Carter, Karen Holman, Paul Brown
Attachments:
Attachment A: February 16, 1963, City of San Diego Conveyance Document and Drawings (CD)
Attachment B: July 30, 2015 District Comment Letter on Mouth of Chollas Creek Draft Investigative Order R9-2015-0058

[1] The District attaches and incorporates by reference its July 30, 2015 comments on Draft Investigative Order R9-2015-0058 (Attachment B to this letter).

Unified Port
of San Diego

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July 30, 2015

Sean McClain
California Regional Water Quality Control Board
San Diego Region
2375 Northside Drive, Suite 100
San Diego, CA 92108

Subject: San Diego Unified Port District Comments on Mouth of Chollas Creek-Draft Investigative Order R9-2015-0058

Dear Mr. McClain,

The San Diego Unified Port District ("District") appreciates the opportunity to submit comments on Investigative Order No. R9-2015-0058, Pertaining to an Investigation of Sediment Quality in the Mouth of Chollas Creek, dated June 1, 2015 ("draft Order").

The District supports the Regional Board's continued efforts to identify and eliminate sources of contamination impacting San Diego Bay (the "Bay"), including those that might exist within the Mouth of Chollas Creek and the Chollas Creek Tidal Prism ("Investigation Area"). As you know, the District acts as the public trustee and steward of its tidelands properties located in and adjacent to the Bay and works collaboratively with the Regional Board to ensure the health of Bay's ecosystems and their ability to sustain beneficial uses.

As set forth below, the District disputes the draft Order's findings regarding the District's responsibility for waste discharges to sediment within the Mouth of Chollas Creek and the Tidal Prism. Contrary to the draft Order's findings, the District does not own or operate the municipal separate storm sewer system ("MS4") that discharges storm water runoff to the Investigation Area, and does not own or operate any facilities that could reasonably be viewed as a source of Investigation Area contamination. Though the District fully supports the investigation of Chollas Creek Mouth and Tidal Prism sediments and asks that the Regional Board ensure contamination is eliminated, the parties responsible for the contamination should bear the cost and burden of its investigation and removal.

The District is submitting the following comments regarding factual findings of land ownership[1], corrections to the draft Order, and general points which have been coordinated with the other stakeholders on the draft Order's structure and timing.

1. <u>The Order Should Not Be Directed To The District.</u>

   a. The District Does Not Own Or Operate Any MS4 That Discharges Into the Investigation Area

[1] The District previously provided the Regional Board with information detailing the ownership and control over the Mouth of Chollas Creek and discharges to the same in the District's comment letters and technical report submitted to the Regional Board on April 8 and December 20, 2013 The District's expert, Robert Collacott, also testified to the fact that the District does not own or operate any portion of the Municipal Separate Storm Sewer system ("MS4") that discharges to this area during the administrative proceedings leading up to Regional Board Order No R9-2012-0024 These prior submissions and related briefs and petitions are incorporated by reference

The draft Order incorrectly states that the Mouth of Chollas Creek "receives discharges from the municipal separate storm sewer systems (MS4s) of ... the [District]" and that the District "own[s] and/or operate[s] MS4s that discharge storm water runoff directly into Chollas Creek." (draft Order Findings 7 & 10). Additionally, the draft Order (Finding 3) incorrectly identifies the Chollas Creek Tidal Prism area as "immediately adjacent to San Diego Bay under the jurisdiction of the San Diego Unified Port District and the U.S. Navy (Naval Base San Diego)."

The District does not own or operate any portion of the MS4 that discharges into the Investigation Area. Rather, the only MS4 located within the District's jurisdiction that discharges into Chollas Creek is owned and operated by the City of San Diego ("City"), which runs beneath 28th Street to outfall SW9. The City, which maintains overlapping jurisdictional boundaries within this area, retained this MS4 facility in the 1963 Conveyance of certain tideland property from the City to the District. This Conveyance excluded from the property transfer "all existing water, sewer and drainage facilities, known or unknown, the location ... being designated by engineering drawings" referenced in the Conveyance and to be "more specifically located by survey and location maps" at a later date. Attachment A, Page 6 (emphasis added). In fact, the City's own engineering drawings referenced in the Conveyance and City engineering drawings created years later identify this line as a City drainage facility (Attachments B and C). Furthermore, the City conceded that it owns this portion of the MS4 during the Shipyard Sediment Site administrative proceedings. Attachment D ("[T]he City storm drain system enters the NASSCO leasehold at the foot of 28th Street and terminates at the southeasterly corner" where it "discharges into Chollas Creek" at the SW9 outfall). The City's ownership and operation of this MS4 is beyond dispute.[1] Additionally, the Tidal Prism area lies upstream of the tidelands boundary and is within the City of San Diego and U.S. Navy jurisdictions.

It is possible that the Regional Board named the District due to the District's status as a Co-permittee on the municipal MS4 permit, Order No. R9-2013-0001 ("MS4 Permit"). However, this is inappropriate. The law is clear: the District is not responsible for discharges from portions of an MS4 that it does not own or operate, even if portions of those facilities fall within its jurisdiction. *See* 33 U.S.C. 1316(a)(4) ("owner or operator" defined as "any person who owns, leases, operates, controls, or supervises a source"); 40 C.F.R. 122.26(a)(3)(vi) ("Co-permittee need only comply with permit conditions relating to discharges from the municipal separate storm sewers *for which they are operators*.") (emphasis added); State Board Order No. WQ 2015-0075, at 66 ("Permittees that have commingled MS4 discharges need only comply with permit conditions relating to discharges from the MS4 *for which they are owners or operators*.") (emphasis added). Thus, Co-permittee status without more does not render the District an owner or operator of all MS4 covered by the permit and does not constitute a valid reason to direct the District to conduct an investigation within Chollas Creek. *See* MS4 Permit Paragraph 2 ("The federal regulations make it clear that the Co-permittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators (40 CFR 122.26(a)(3)(vi))"; State Board, Order No. WQ 2015-0075, at 67 ("joint responsibility in an MS4 Order is only appropriate if the ultimate responsibility for addressing an exceedance rests with those permittees

[1] The District has identified a single minor storm drain within its jurisdiction that drains approximately 870 ft² of non-industrial property in the vicinity of Chollas Creek. The drain appears to lead to a storm water line underneath Harbor Drive owned by the City that appears to be non-operational or potentially abandoned. In any event, the location of this drain does not render the District an owner or operator of an MS4 relevant to the investigation directed by the Order.

that actually cause or contribute to the exceedance in question."). Requiring the District to participate in this investigation would improperly require the District to address contamination caused by others.

Because the District does not own or operate any portion of the MS4 discharging to the Mouth of Chollas Creek, it should not be named to the Order. The draft Order should be revised to reflect the true ownership of MS4 facilities discharging to Chollas Creek and directed to those responsible for Investigation Area contamination.

b. The Regional Board Should Look To NASSCO To Address Any Contamination Caused By Its Operations

The draft Order identifies NASSCO as a source of pollutant discharges in Chollas Creek (Finding 12). NASSCO has been the exclusive operator of the shipbuilding and repair facilities at the current location since before the District came into existence. *See* Cleanup and Abatement Order No. R9-2012-0024, Finding 2. If NASSCO is in fact responsible for contamination within the Investigation Area, the Regional Board should look to NASSCO to address that contamination.

It is the long-established practice of the State Board to hold a non-discharging public entity landlord responsible for compliance only after the primary discharger has failed to perform or comply with its administrative obligations. *See* Petition of Wenwest, WQ 92-13; Petition of Schmidl, WQ 89-1; Petition of Forest, WQ 87-5. It has also been the Regional Board's practice not to order the District to participate in investigations of contamination caused by others, even if located within the District's jurisdiction. *See* Attachment E, Letter from James G. Smith, Regional Board to Gene Matsushita, Lockheed Martin (November 19, 2012). Indeed, it would be improper for the Regional Board to assign liability for contamination caused by private parties to the public trustee, especially if the only basis for this liability shift were the fact that the location of the contamination is land held in trust.

Comments Submitted With Other Stakeholders:
The following comments have been discussed with the other stakeholders identified on the draft Order; the District is in general agreement with these points.

2. Limit The Investigative Order To Phase One Elements Only. The District is in agreement with other stakeholders that this draft Order should be limited to Phase One elements. It is recommended that all actions and deadlines relating to Phase Two be removed. Including Phase Two in this initial Order appears to be premature, as the stakeholder roles, phase design, and implementation efforts in the second phase are reliant on Phase One findings. As such, determination of potential work elements and the stakeholder roles in Phase Two cannot be determined at this time.

3. Proposed Timelines Should Be Extended. The District agrees with the other stakeholders that the timeline for Phase One deliverables be extended. Developing a well-designed and comprehensive Phase One Work Plan and Quality Assurance Project Plan (QAPP) is a complex process that involves collaboration amongst the stakeholders on work products, contracting mechanisms and cost sharing, as well as

discussions with the Regional Board. The timeline in the Order does not provide adequate time to develop the aforementioned documents and incorporate any revisions suggested by Regional Board staff.

In addition, the Order's timeline should be extended to take into account field efforts, time to perform data analysis, and development of a report. The Order currently states that the Work Plan is due on November 19, 2015, and the Sediment Chemistry Assessment Report (Report) is due on August 31, 2016. The District respectfully requests that the timeline be extended as follows:

- Work Plan due March 30, 2016;
- Report due March 30, 2017.

This request is based on the understanding that the most appropriate time to assess ambient conditions is during summer months (May September). Monitoring in the summer of 2016 would then enable stakeholders to obtain monitoring results in the fall of 2016, and present findings in a report the following spring (2017).

4. Identify A Work Plan Approval Process. The District recommends that the final Order include language clarifying the Regional Board approval process for the Phase One Work Plan. The final Order should specify the review process and time period by which the Regional Board will review and approve the Work Plan. To avoid potential confusion or unnecessary delay, the District strongly recommends that the final Order provide at least a 90-day Work Plan review and approval process. In addition, the Order should clarify that the Regional Board will indicate concurrence with the Work Plan if no comments are received by the end of the 90-day period so the Work Plan implementation can begin.

5. Provide Clear Delineation of the Tidal Prism. The District agrees with the other stakeholders that the Order should define the geographical extent of the Chollas Creek Tidal Prism, similarly to the delineation of the Mouth of Chollas Creek. While the draft Order discusses the Chollas Creek Tidal Prism, the description of the geographical extent of the investigation does not clearly identify that the tidal prism is part of the overall Chollas Creek study area.

   The Investigation Area is comprised of two distinct segments: 1) the Mouth of Chollas Creek and 2) the Chollas Creek Tidal Prism. Because the Order calls for an investigation of the Tidal Prism, the tidal prism area should be clarified in the final Order and include a figure depicting the boundaries of the Chollas Creek Tidal Prism.

Factual Corrections to the Order

The District has reviewed the draft Order and the information relating to land ownership, leases, and jurisdictional authorities within the Chollas Creek drainage area. Based upon review of records of land ownership and leases, the District requests that the items below be corrected as detailed herein.

6. MS4 Ownership Operation. Findings 7 and 10 should be revised to reflect the fact that the District does not own or operate the MS4 discharging to Chollas Creek.

7. Tidal Prism. The District requests that Finding 3 be revised to correct the statements relating to the Tidal Prism, as follows:

   a) Replace the "San Diego Unified Port District" with the "City of San Diego" for jurisdictional ownership.

   b) Include a map of the Tidal Prism area within the body of the draft Order.

8. U.S. Navy and Nassco Leased Parcels. The draft Order (Findings 12 and 13) identifies the land owners for portions of the Chollas Creek Mouth. In particular it states that the Nassco facility is leased from the District. The draft Order does not state that Nassco also leases a portion of their facility from the U.S. Navy. The U.S. Navy is the land owner for areas on both sides of the Chollas Creek Mouth. The portion of U.S. Navy property on the northern side of the Chollas Creek Mouth is leased to Nassco. The District requests the following corrections to the draft Order:

   a) Revise the draft Order to identify that Nassco leases land from both the District and the U.S. Navy(Page 7), and

   b) Include correlating language on page 9 to indicate that the U.S. navy leases land to Nassco.

The District remains firm in its commitment to conduct operations and manage resources in an environmentally sensitive and responsible manner. As such, the District believes that efforts such as this Chollas Creek investigation supports the Regional Board's overarching efforts to develop a strategy that will achieve healthy waters in San Diego Bay. The District, as an interested party, is encouraged by the Regional Board's desire to investigate and address contamination within this area. We encourage you to continue to move these investigations forward in a manner that is consistent with the San Diego Bay Strategy.

Thank you again for this opportunity to provide comments on this important project. If you have any questions please contact Karen Holman at (619) 725-6073.

Sincerely,

Jason H. Giffen
Director, Environmental and Land Use Management

Attachments

Attachment A	February 16, 1963. City of San Diego Conveyance Document
Attachments B and C	City of San Diego Engineering Dept. Drainage Drawings
Attachment D	July 15, 2004 Report for the Investigation of Exceedances of the Sediment Quality Objectives at National Steel and Shipbuilding Company Shipyard
Attachment E	November 19, 2012. Letter from James G Smith Regional Board to Gene Matsushita Lockheed Martin

D2#965199 cc: John Carter, Jason H Giffen, Karen Holman, Paul Brown

Attachment A

PORT OF SAN DIEGO
P.O. Box 488
San Diego 12, Calif.

(86)
ORIGINAL

CONVEYANCE

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 75
FILED FEB 15 1963
MICROFILM NO. 8
OFFICE OF THE CLERK

THE CITY OF SAN DIEGO, a municipal corporation, in the County of San Diego, State of California, hereby conveys, without warranty, to the SAN DIEGO UNIFIED PORT DISTRICT, a Public Corporation established pursuant to the provisions of the San Diego Unified Port District Act, all those lands situate within the City of San Diego, County of San Diego, State of California, which are more particularly described as follows:

PARCEL I:

All those lands lying between the line of mean high tide of San Diego Bay and the pierhead line of said bay, and between the prolongation into said bay to the pierhead line of the northerly line of the United States military reservation on Point Loma and the prolongation into said bay to the pierhead line of the southwesterly line of the United States Naval Training Center and reserving therefrom such roadways and easements as hereinafter described, such boundaries, roadways and easements being shown in detail upon engineering drawings Nos. 1, 2, 2a, 2b, 2c, 3, 3a, 3b, 3c, 3d, 3e, 3f, 3g, 4, 4a, 4b, 14a, 14b, 14c, & 15a, 15b, 15c, 16a, 16b, 16c.

PARCEL II:

All those lands lying between the line of mean high tide of San Diego Bay and the pierhead line of said bay, and between an irregular westerly boundary being an irregular line beginning at Government Station 488 on the combined pierhead and bulkhead line and proceeding northerly; thence easterly; thence northerly; thence easterly; thence northeasterly along the boundary of the United States Marine Corps Base to the point where such boundary intersects the mean high tide line in the vicinity of Washington Street and Pacific Highway, and the northwesterly boundary lines of the United States Naval Station between the mean high tide line and the United States Pierhead Line being an irregular line, omitting therefrom the United States Coast Guard Base lying southerly of North Harbor Drive and in the vicinity of Lindbergh Field; and the Civic Center lying between North Harbor Drive and Pacific Highway and between Grape and Ash Streets; and the United States Naval Supply Center consisting of four parcels, (1) the block lying between Broadway and "E" Street and between North Harbor Drive and Pacific Highway, (2) the block lying between "B" and "F" Streets and between North Harbor Drive and Pacific Highway, (3) a portion of a block between "F" and Market Streets and North Harbor Drive and Pacific

I hereby certify that, if impressed with the seal of the San Diego Unified Port District, this is a true copy of the original record filed in the Office of the District Clerk of the San Diego Unified Port District as Document No. 75.

By _____ Date 9/22/2010 No. Pages: 8
Timothy A. Deubl
Deputy District Clerk

Highway, (4) The United States Naval Pier at the foot of "G" Street; and adding portions of fractional blocks 18 and 19, New San Diego, according to the Map thereof No. 456, lying above the mean high tide line; such boundaries, roadways, easements and omissions being shown in detail upon engineering drawings Nos. 4, 5, 6, 6a, 6b, 6c, 7, 8, 8a, 8b, 9, 9a, 9b, 9c, 9d, 9e, 10, 10a, 10b, 10c, 10d, 10e, 10f, 10g, 10h, 11, 12, 12a, 13, 13a, 13b, 13c, 14c, 14d, 14e, 14f, 15c, 15d, 15e, 15f, 16e, 16f, 14g, 15g, 16c, 16d, 16g.

The City retains from the conveyance of Parcel II the right of control and possession of that block surrounded by Pacific Highway on the west, Kettner Boulevard on the east, Market Street on the north, and Harbor Drive on the south, for a Police Station and for so long as the City continues to use it for that purpose.

PARCELS III through XIV:

The following described uplands lying above the line of mean high tide of San Diego Bay:

(Parcel III):

Lot 8, Block 135, La Playa, Couts Miscellaneous Map No. 37, lying above mean high tide line, and as shown on engineering drawing No. 2a.

(Parcel IV):

Portion Closed Street, Adjacent Lot 2, Block 154, La Playa, Couts Miscellaneous Map No. 37, lying above mean high tide line, and as shown on engineering drawing No. 2b.

(Parcel V):

Portions of Right of Way Lots 73 and 74 of Middletown, according to Jackson's Map of Middletown, and as shown on engineering drawing No. 8a.

(Parcel VI):

Portion of Lot 6, Block 272 of Middletown, according to Jackson's Map of Middletown, and as shown on engineering drawing No. 8b.

(Parcel VII):

Lot E, Block 22, New SanDiego, according to the Map thereof No. 456, lying above the mean high tide line.

(Parcel VIII):

Lot E, Block 23, New San Diego, according to the Map thereof No. 456, filed in the office of the County Recorder, said County of San Diego, excepting therefrom that portion, if any, lying below the mean high tide line of the Bay of San Diego, and excepting therefrom the Right of Way of the Atchison, Topeka and Santa Fe Railway Company.

(Parcel IX):

Portion of Lot F, Block 23, New San Diego, lying above the mean high tide line, and as shown on engineering drawing No. 10e.

(Parcel X):

All of Block 31, New San Diego, Map No. 458.

(Parcel XI):

Portion of Pueblo Lot 1164 northwesterly of Sampson Street, as shown on engineering drawing No. 12a.

(Parcel XII):

All of Block 45, Roseville, Map No. 155, lying above the mean high tide line.

(Parcel XIII):

Lot 6, Block 67 of Roseville, according to Map No. 155 of Roseville, lying above the mean high tide line, as shown on engineering drawing No. 13a.

(Parcel XIV):

The portions of Fractional Block 64 and the Unnumbered Fractional Block in San Diego Land and Town Company's Addition, according to record map thereof No. 379, lying between the mean high tide line of the Bay of San Diego, and the southerly right of way line of the Atchison, Topeka and Santa Fe Railroad, as shown on engineering drawing No. 13b.

ROADWAYS RESERVED

The City of San Diego specifically reserves easements for street purposes, as more particularly set forth hereinafter, including within such reservations the right to construct, maintain and operate all utilities and the right to grant franchises on such streets and to require franchise payments to The City of San Diego as authorized by the Charter of The City of San Diego:

PARCEL A: (Roads within Parcel I described above)

For San Antonio Avenue - an easement over that portion included between the mean high tide line and the prolongation of the easterly line of San Antonio Avenue as it now exists, as shown on engineering drawing No. 2.

For Talbot Street - an easement 70' in width extending from the mean high tide line to the southeasterly line of Anchorage Lane, as shown on engineering drawing No. 3f.

For Canyon Street - an easement 70' in width extending from the mean high tide line to the southeasterly line of the most southeasterly line of Anchorage Lane, as shown on engineering drawing No. 3g.

For Anchorage Lane - an easement 48' in width between the northeasterly line of Talbot Street and the southwesterly line of Canyon Street, and an easement 55' in width between the northeasterly line of Canyon Street and the southwesterly line of Byron Street, as shown on engineering drawings Nos. 3e and 3f.

For Byron Street - an easement 60' in width between the mean high tide line and the traffic circle at Byron Street and Yacht Harbor Drive, as shown on engineering drawings Nos. 3c, 3d.

For Yacht Harbor Drive - an easement of variable widths as shown on engineering drawings Nos. 2c, 2d, 2e, 4b.

For the traffic circle at Byron Street and Yacht Harbor Drive - easements of variable widths as shown on engineering drawing No. 2c.

For the traffic circle at the southwesterly end of Yacht Harbor Drive - easements of variable widths as shown on engineering drawing No. 2c.

For Garrison Street - an easement 70' in width extending from the mean high tide line to the northwesterly line of Scott Street, as shown on engineering drawing No. 3g.

For Scott Street - an easement 70' in width extending from the point where the mean high tide line intersects the southeasterly line of Scott Street to the southwesterly boundary of North Harbor Drive, the variable widths of such easement as shown on engineering drawing No. 3g.

For North Harbor Drive - an easement 167.5' in width extending easterly from the mean high tide line to the southwesterly line of the United States Naval Training Center, as shown on engineering drawing No. 4a.

For Lowell Street - an easement 73.5' in width extending southeasterly from the mean high tide line to the northerly line of North Harbor Drive, as shown on engineering drawing No. 4a.

PARCEL B: (Roads within Parcel II described above)

For 28th Street - an easement 126' in width extending from the mean high tide line to the northerly line of Harbor Drive, as shown on engineering drawing No. 13d.

For 8th Avenue - an easement 80' in width extending from the mean high tide line to the northeasterly line of Harbor Drive, as shown on engineering drawing No. 11.

For 5th Avenue - an easement 80' in width extending from the mean high tide line to the northeasterly line of Harbor Drive, as shown on engineering drawing No. 11.

For Kettner Boulevard - an easement 75' in width extending southerly from the mean high tide line to the northeasterly line of Harbor Drive, as shown on engineering drawing No. 10.

Broadway - an easement 125' in width extending from the westerly line of Pacific Highway to a line parallel to and 200' easterly from the United States bulkhead lines, as shown on engineering drawing No. 10a.

For Ash Street - an easement 80' in width extending from the westerly line of Pacific Highway to the easterly line of North Harbor Drive, as shown on engineering drawing No. 9a.

For Grape Street - an easement 80' in width extending from the westerly line of Pacific Highway to the easterly line of North Harbor Drive, as shown on engineering drawing No. 9b.

For Hawthorn Street - an easement 80' in width extending from the mean high tide line to the easterly line of Pacific Highway; an easement 80' in width extending from the northwesterly line of Pacific Highway to the northeasterly line of North Harbor Drive, as shown on engineering drawing No. 9.

For Ivy Street - an easement 80' in width extending from the mean high tide line to the easterly line of Pacific Highway, as shown on engineering drawing No. 9.

For Laurel Street - an easement 80' in width extending from the mean high tide line to the northeasterly line of Pacific Highway; an easement 80' in width extending from the southwesterly line of Pacific Highway to the northerly line of North Harbor Drive with a variable width at the Harbor Drive end of said easement, as shown on engineering drawings Nos. 9b, 9a.

For Palm Street - an easement 80' in width extending from the mean high tide line to the northeasterly line of Pacific Highway, as shown on engineering drawing No. 8.

For Sassafras Street - an easement 80' in width extending from the mean high tide line to the northeasterly line of Pacific Highway, as shown on engineering drawing No. 8.

For Vine Street - an easement 80' in width extending from the mean high tide line to the northeasterly line of Pacific Highway, as shown on engineering drawing No. 8.

For North Harbor Drive - an easement 200' in width extending from the westerly boundary line of Parcel II to the easterly line of the United States Coast Guard Base; an easement 179' in width extending from the easterly line of the United States Coast Guard Base to the vicinity of the prolongation of Date Street; an easement 165' in width extending from the vicinity of the prolongation of Date Street to the southerly line of Ash Street, as shown on engineering drawings Nos. 4, 5, 6, 7, 9.

For Harbor Drive - an easement of variable widths extending from the easterly line of Pacific Highway to where said street intersects the mean high tide line in

the vicinity of the prolongation of 16th Street; an easement providing for a right of way 120' in width from the vicinity of Schley Street to the vicinity of the United States Naval Repair Base; the variable widths of such easements as shown on engineering drawings Nos. 10, 11, 13.

For Pacific Highway - an easement providing for a right of way of variable widths between that point where the mean high tide line intersects the southwesterly line of Pacific Highway in the vicinity of Washington Street and the southerly line of Harbor Drive, as shown on engineering drawings Nos. 8, 9, 10.

For all the above-mentioned streets - an easement of such width for intersection purposes at the intersection of any of the aforementioned streets with each other or with any other roadway and as shown on the appropriate engineering drawings in Exhibit "A."

OTHER EASEMENTS RESERVED

City reserves easements in Parcels I through XIV for all existing water, sewer and drainage facilities, known or unknown, the location of known existing utilities being designated by engineering drawings Nos. 14a - 14g; 15a - 15g; 16a - 16g; unknown easements shall be more specifically located by survey and location maps of such easements shall be prepared, which maps shall become a part of this conveyance as a subsequent exhibit when approved by District and City.

QUITCLAIM

Parcel XV:

City quitclaims all its right, title and interest in all those submerged lands in the Bay of San Diego bayward of the pierhead line within the city limits of said city, excepting those lying easterly of the jetty and southerly of the peninsular of San Diego; and southerly of the common boundary of the City of San Diego and the City of National City as shown on engineering drawing No. 1.

EXHIBITS

All engineering drawing numbers referred to in this document under Parcels I through XIV; Roadways Parcels A and B; and Easements, by reference thereto are incorporated herein and attached hereto as Exhibit "A".

IN WITNESS WHEREOF, The City of San Diego has caused this conveyance to be executed by its Mayor and City Clerk, pursuant to resolution of the Council authorizing such execution, this 14th day of February, 1963.

THE CITY OF SAN DIEGO

By [signature]
Mayor of said City

ATTEST:

[signature]
City Clerk of said City

STATE OF CALIFORNIA)
) ss.
COUNTY OF SAN DIEGO)

900

On this 14th day of February, 19 63, before me, the undersigned, a Notary Public in and for said County and State, residing therein, duly commissioned and sworn, personally appeared CHARLES C. DAIL, known to me to be the Mayor, and PHILLIP ACKER, known to me to be the City Clerk of The City of San Diego, the municipal corporation that executed the within instrument, and known to me to be the persons who executed the within instrument on behalf of the municipal corporation therein named, and acknowledged to me that such municipal corporation executed the same.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal, in the County of San Diego, State of California, the day and year in this certificate first above written.

Helen M. Willig
Notary Public in and for the County of San Diego, State of California
HELEN M. WILLIG

(SEAL)
My Commission Expires
Sept. 11, 1966

FILE/PAGE NO. 28389
RECORDED REQUEST OF

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OFFICIAL RECORDS
SAN DIEGO COUNTY, CALIF.
A. S. GRAY, RECORDER
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Attachment B

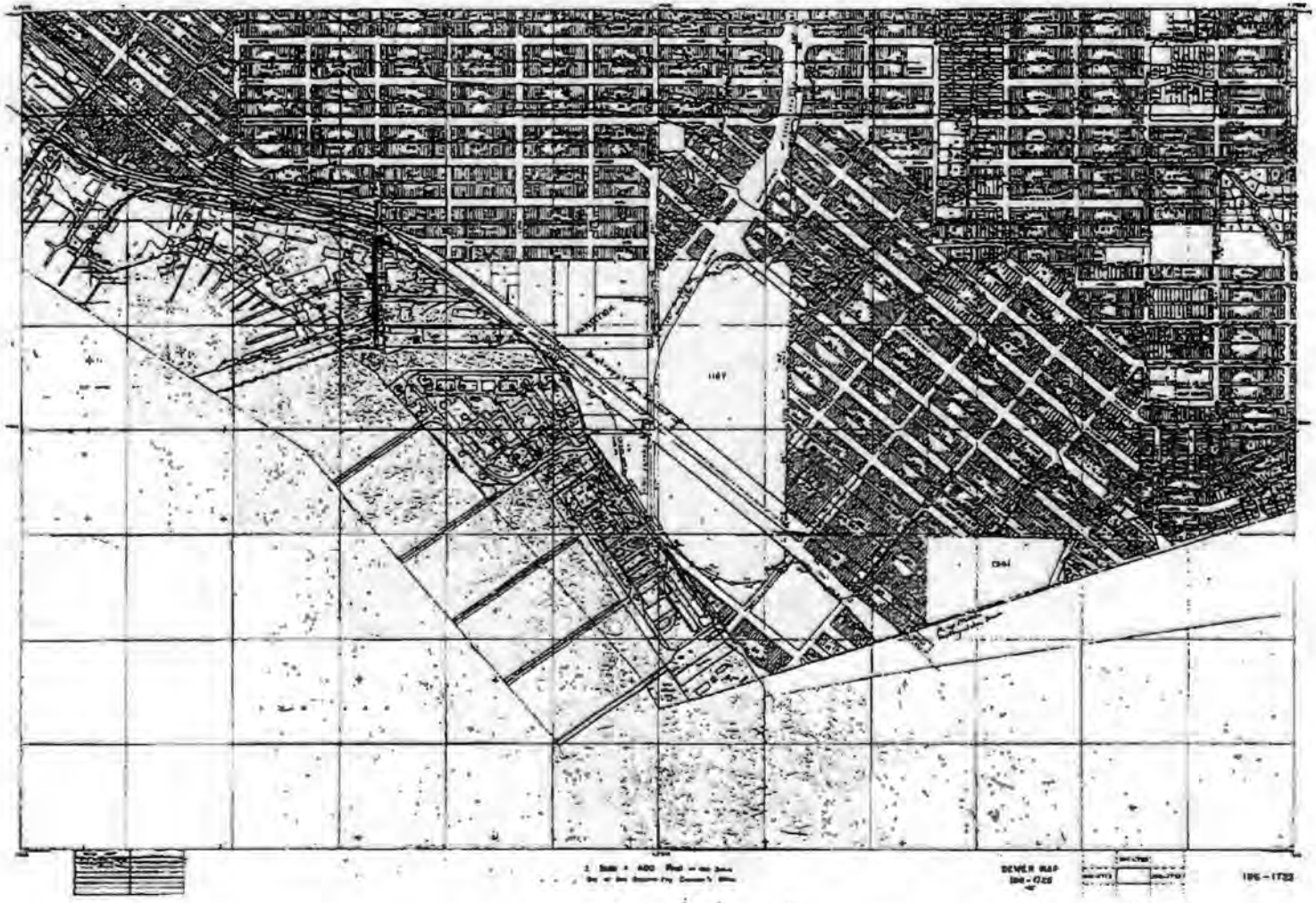

Attachment C

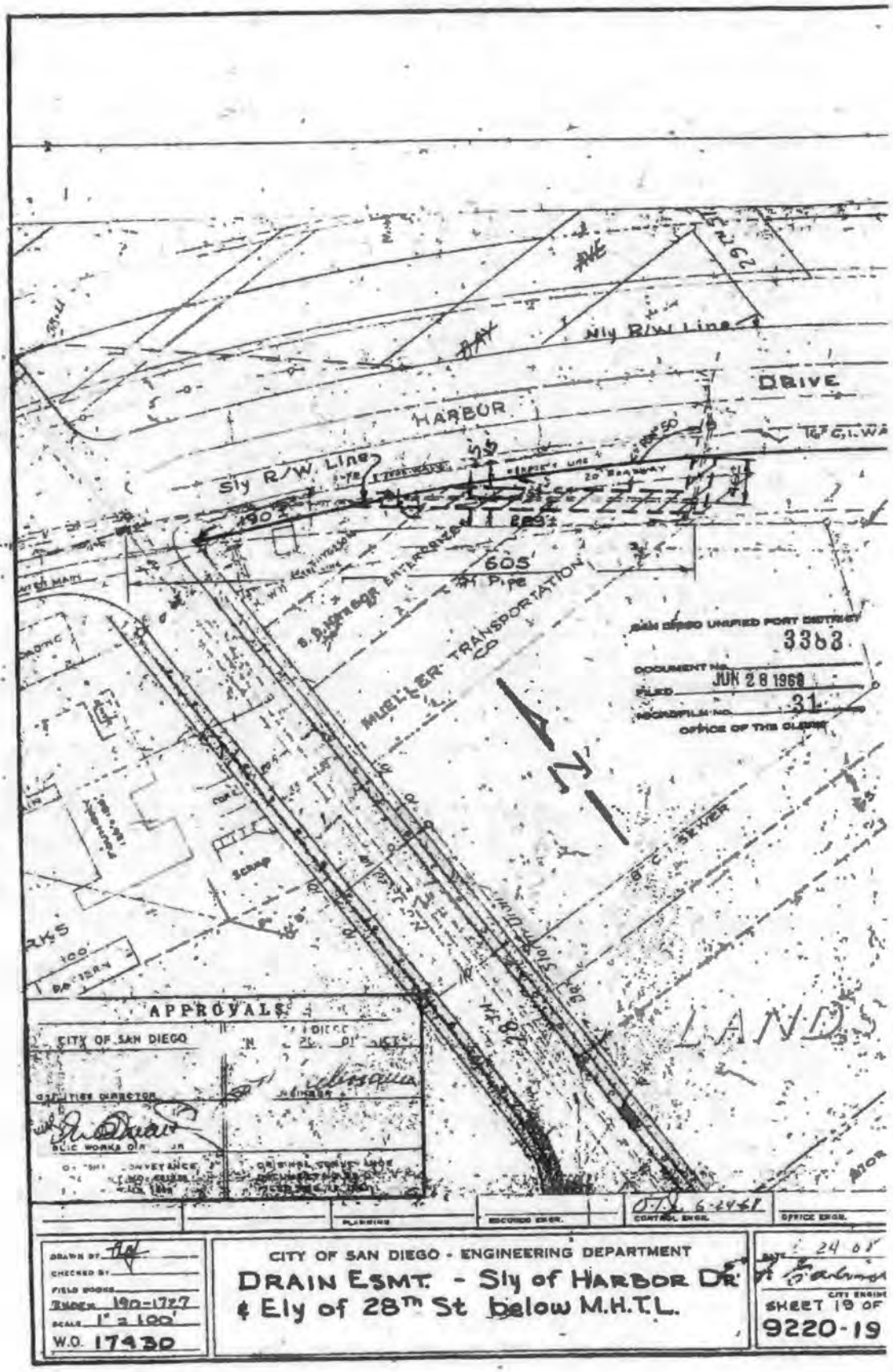
Nly R/W Line
DRIVE
HARBOR
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Pipe
MUELLER TRANSPORTATION CO
SAN DIEGO UNIFIED PORT DISTRICT
3363
DOCUMENT NO.
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CITY OF SAN DIEGO
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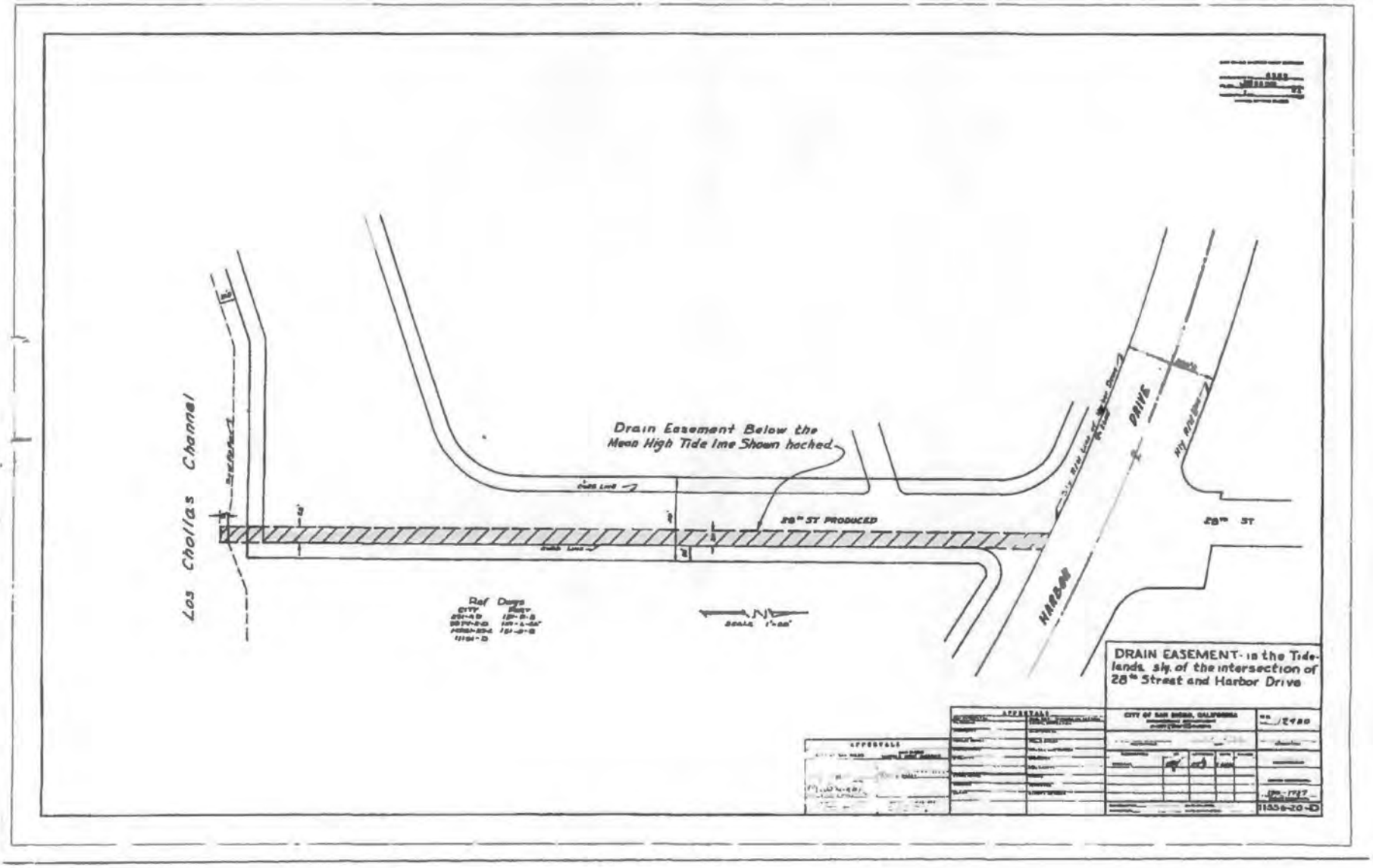
Los Chollas Channel
Drain Easement Below the
Mean High Tide line Shown hached
28th ST PRODUCED
28th ST
HARBOR
DRIVE
Ref Dwgs
DRAIN EASEMENT - is the Tidelands s/y of the intersection of 28th Street and Harbor Drive

Attachment D

City of San Diego

REPORT FOR THE INVESTIGATION OF EXCEEDANCES OF THE SEDIMENT QUALITY OBJECTIVES AT NATIONAL STEEL AND SHIPBUILDING COMPANY SHIPYARD

July 15, 2004

Storm Water Pollution Prevention Program
1970 B Street, MS 27A
San Diego, CA 92102

City's records do not contain all storm drain system information from the beginning of the twentieth century. The only historical map available is from 1942 (Attachment 4) The storm drain system is shown as a 4 x 3.5 foot reinforced concrete box along the southerly side of Belt Street in this drawing.

A current storm drain system map is enclosed for your reference as Attachment 5. This map indicates that the City storm drain system enters the NASSCO leasehold at the foot to 28th Street and terminates at the southeasterly corner and discharges into Chollas Creek. This storm drain outfall is referred to as SW9 in NASSCO sediment report map prepared by Exponent, a private company, dated September 23, 2003 (Attachment 6). Our research did not validate the Exponent report that storm drain SW3 is part of the City of San Diego storm drain conveyance system.

Scaled figures delineating tenant boundaries are enclosed as Attachment 7 and entitled NASSCO Shipyard Tenant Information Parcel Animation Supplement. The maps start at with the first tenant on record through 1962. There is a map for every year that a change in boundaries was recorded. Included with each map is a table providing information on the business name, parcel size, business code and lease start and end dates. The Shipyard Business Code spreadsheet (Attachment 8) was developed for color coding of parcel types for viewing of these maps on the enclosed CD (Attachment 9). This CD has instructions on how to open and view the maps in any ArcView program.

3. Monitoring Data Analysis

In order to link sediment to wet weather one should rely on multiple lines of evidence and one of those lines of evidence is to look at gradients to see if a strong gradient signal indicates that sediments are moving out from or into the river channel. The data collected offshore as dry weight concentrations do not provide evidence of this gradient. Second we would expect to see some correlation in the chemistry collected in the urban runoff program monitored samples (wet and dry weather sampling) and the contaminants observed in the sediments.

Historical urban runoff monitoring data both wet and dry seasons suggest signals of copper, zinc, and diazinon in Chollas Creek. Therefore, if there is a link between offshore contaminant of sediments and creek inputs one might reasonably expect to find a gradient of contamination of offshore sediments of these contaminants. Review of the historical sediment monitoring data collected at offshore station locations shows no evidence of a gradient of contamination.

Monitoring data from the Co-Permittee monitoring program was reviewed for this analysis and included sediment samples collected upstream in Chollas Creek and at the mouth of Chollas Creek in San Diego Bay from 1996 to 2000, wet weather data from the mass loading station in Chollas Creek from 1996 to 2004, dry weather data within the Chollas Creek watershed areas MS4 system from 2002 to 2003 (Table 1 and Table 2).

Water Boards

California Regional Water Quality Control Board, San Diego Region

November 19, 2012

In reply refer to / attn:
T10000002642:Janderson

Mr. Gene Matsushita
Sr. Manager, Environmental Remediation
Lockheed Martin Enterprise Business Services
2950 North Hollywood Way, Suite 125
Burbank, CA 91505

Subject: Lockheed Request to Direct the San Diego Unified Port District to Participate in the Investigation at the Marine Terminal and Railway

Mr. Matsushita:

Your letter dated June 18, 2012 requested that the San Diego Unified Port District (Port) be directed to participate in the investigation at the Lockheed Marine Terminal and Railway property. The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) does not routinely add a property owner to an enforcement order as a matter of course unless the Board determines that the property owner had discharged, or caused or permitted a discharge of waste. In this case the Lockheed Martin Corporation, as the owner and operator of the Marine Terminal and Railway facility, and lessee of the property, is primarily responsible for any discharges of waste to soil, groundwater, and to bay sediment from its operation of the Marine Terminal and Railway facility. The Port, as the lessor, did not discharge or cause or permit the discharges of waste from the Marine Terminal and Railway facility to the environment. Therefore, the San Diego Water Board will not direct the Port to participate in the investigation at this property

You also requested that the San Diego Water Board investigate the 48-inch storm water outfall that drains into the Harbor Island East Basin (East Basin). At this time, the San Diego Water Board does not intend to require further investigation of the 48-inch storm drain and outfall. Other than the Tow Basin property, which has been cleaned up, the San Diego Water Board has no knowledge of any other contaminated properties that are or were connected to the 48-inch storm drain that could have contributed contaminated sediment to the East Basin.

In the subject line of any response, please include the reference number **T10000002642:Janderson**. For questions or comments, please contact Mr. John Anderson by phone at (858) 467-2975, or by email Janderson@waterboards ca gov

Respectfully,

James G. Smith
Assistant Executive Officer

JGS jc jpa

cc via email:

Ms Kara Edewaard, Lockheed Martin, Kara.l.edewaard@lmco com
Mr Bill Hays, Port of San Diego, Bhays@portofsandiego.org
Ms. Karen Holman, Port of San Diego, Kholman@portofsandiego.org

Tech Staff Info & Use	
Order No	**R9-2011-002**
Geotracker Place ID	**T10000002642**

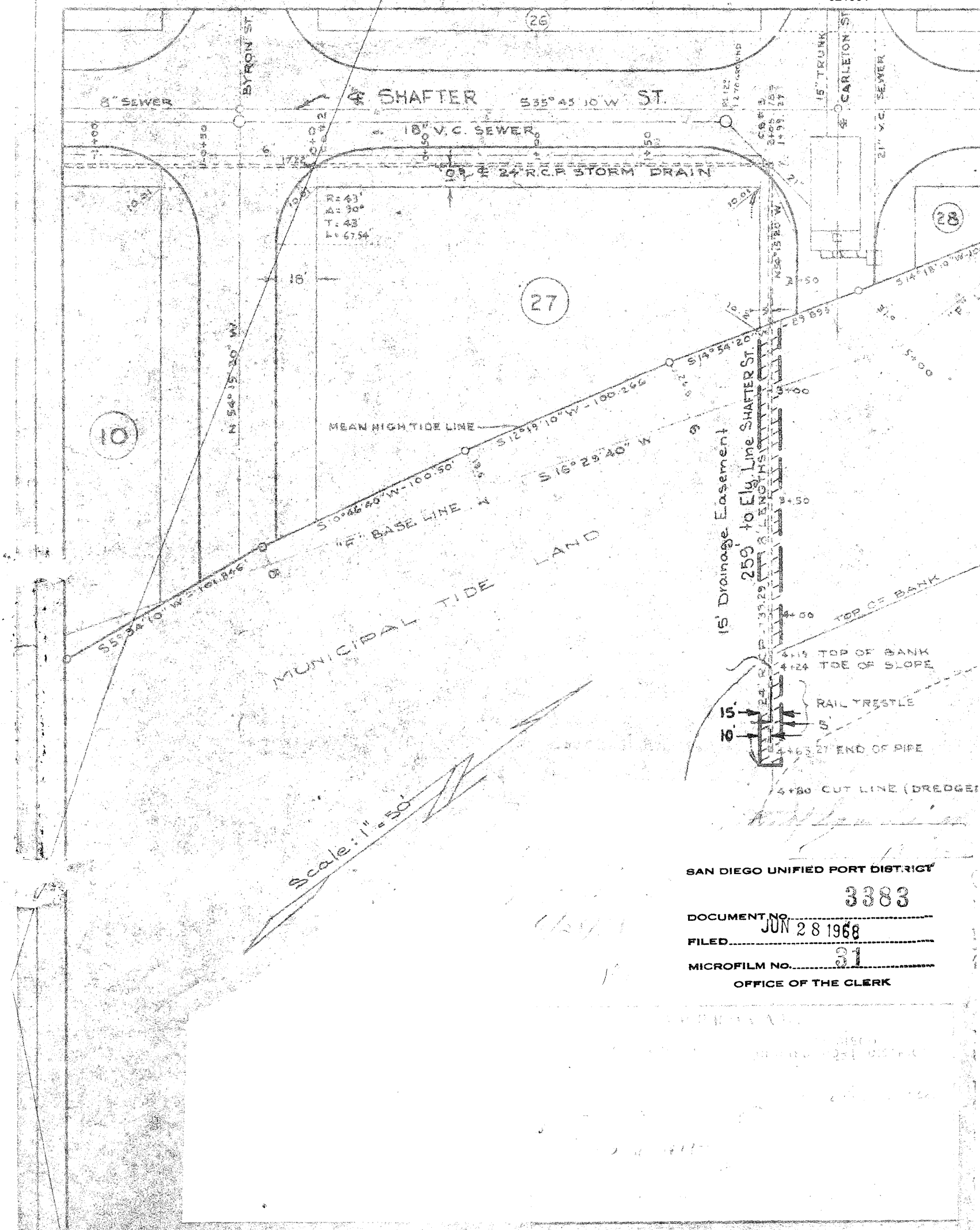

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 31
OFFICE OF THE CLERK

15' Drain Easement below M.H.T.L. shown hatched

		PLANNING	RECORDS ENGR	CONTROL ENGR	OFFICE ENGR
				6-24-68	

DRAWN BY J. P.
CHECKED BY
FIELD BOOKS 202-1699
SCALE 1" = 50'
WO 17430

CITY OF SAN DIEGO - ENGINEERING DEPARTMENT

DRAINAGE EASEMENT
Ext. Carleton St., below M.H.T.L.

TIDELANDS
HARBOR 220-MB

DATE 6/24/68
CITY ENGINEER
SHEET 1 OF
9220-1-

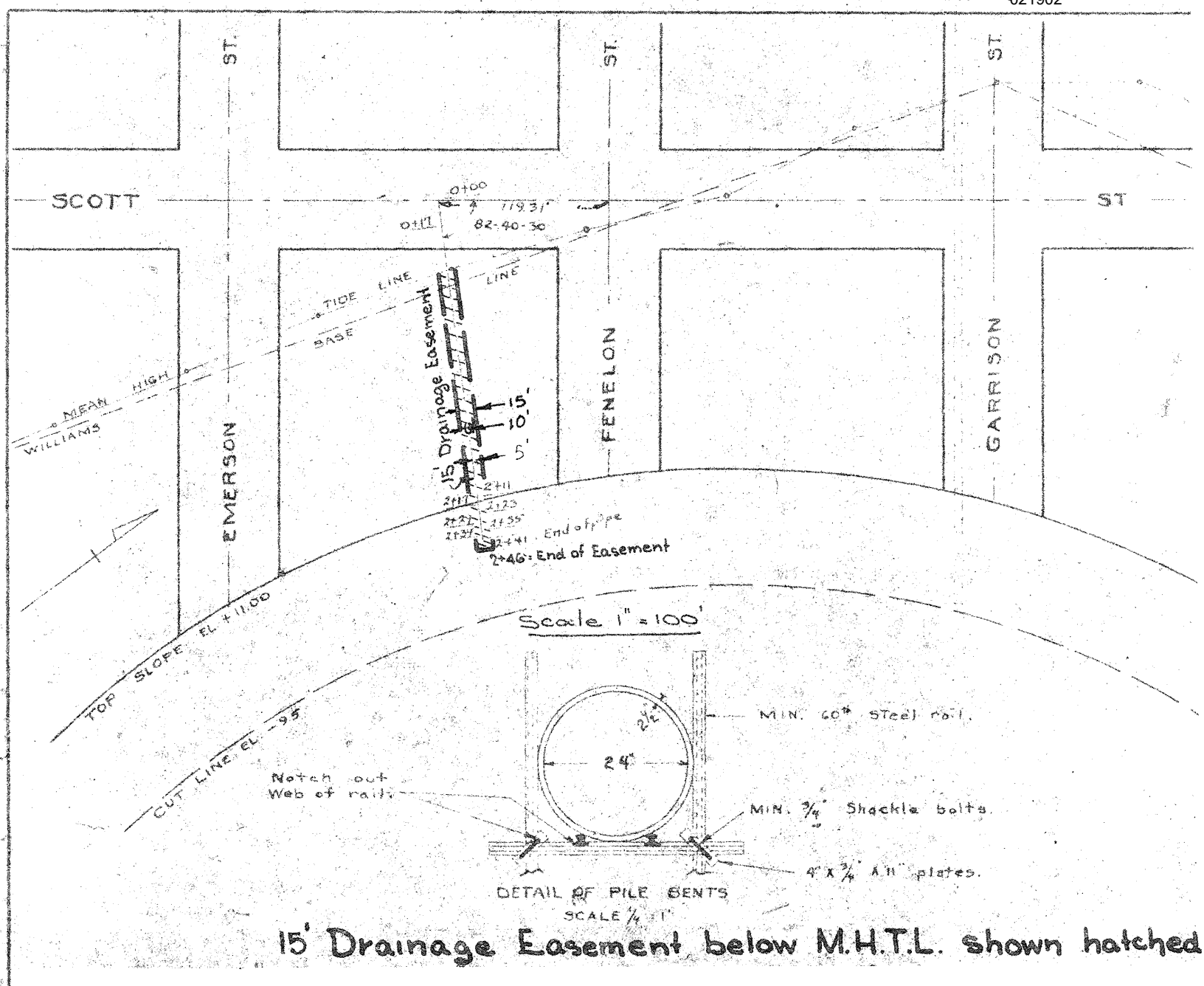

15' Drainage Easement below M.H.T.L. shown hatched

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 31
OFFICE OF THE CLERK

APPROVALS

PLANNING	RECORDS ENGR.	CONTROL ENGR.	OFFICE ENGR.
		O.J. 6-24-68	

DRAWN BY J.M.
CHECKED BY
FIELD BOOKS 204-1699
SCALE 1" = 100'
W.O. 17430

CITY OF SAN DIEGO - ENGINEERING DEPARTMENT
DRAINAGE EASEMENT
119Ft. South of Fenelon below M.H.T.L.
TIDELANDS

DATE 6/24/68
T. Gabriel
CITY ENGINEER
SHEET 2 OF 19
9220-2-B

HARBOR No. 219-MB

021903

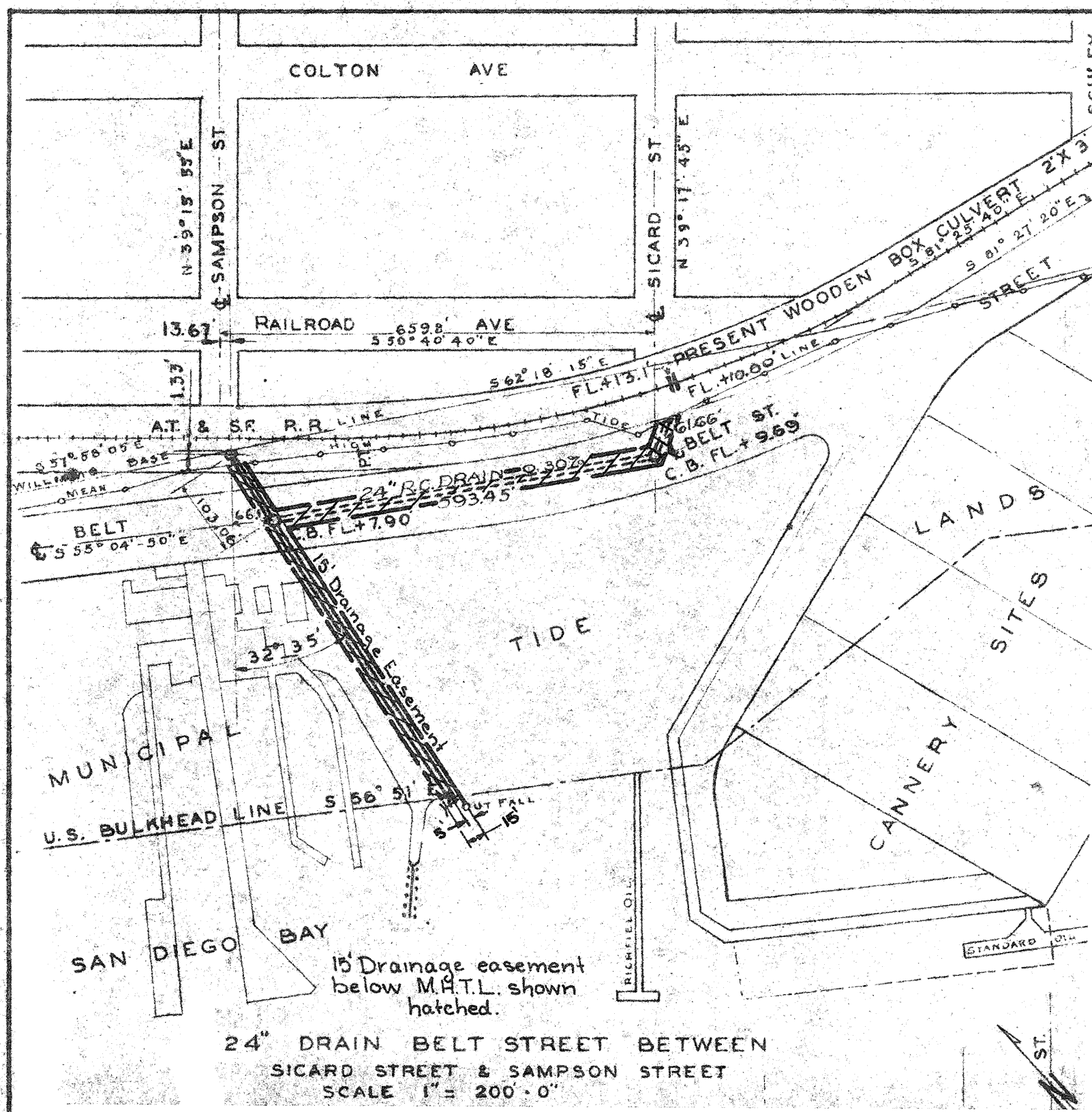

24" DRAIN BELT STREET BETWEEN
SICARD STREET & SAMPSON STREET
SCALE 1" = 200'-0"

APPROVALS

SAN DIEGO UNIFIED PORT DISTRICT
3383
DOCUMENT No.
FILED JUN 28 1968
MICROFILM No. 31
OFFICE OF THE CLERK

		PLANNING	RECORDS ENGR.	CONTROL ENGR. O.T.J. 6-24-68	OFFICE ENGR.

DRAWN BY J.A.
CHECKED BY
FIELD BOOKS 192-1725
SCALE 1" = 200'
W.O. 17430

CITY OF SAN DIEGO - ENGINEERING DEPARTMENT
DRAINAGE EASEMENT
S.Wly. of Sampson St. below M.H.T.L.
TIDELANDS

DATE 6/24/68
CITY ENGINEER
SHEET 3 OF
9220-3

HARBOR No. 68 MB

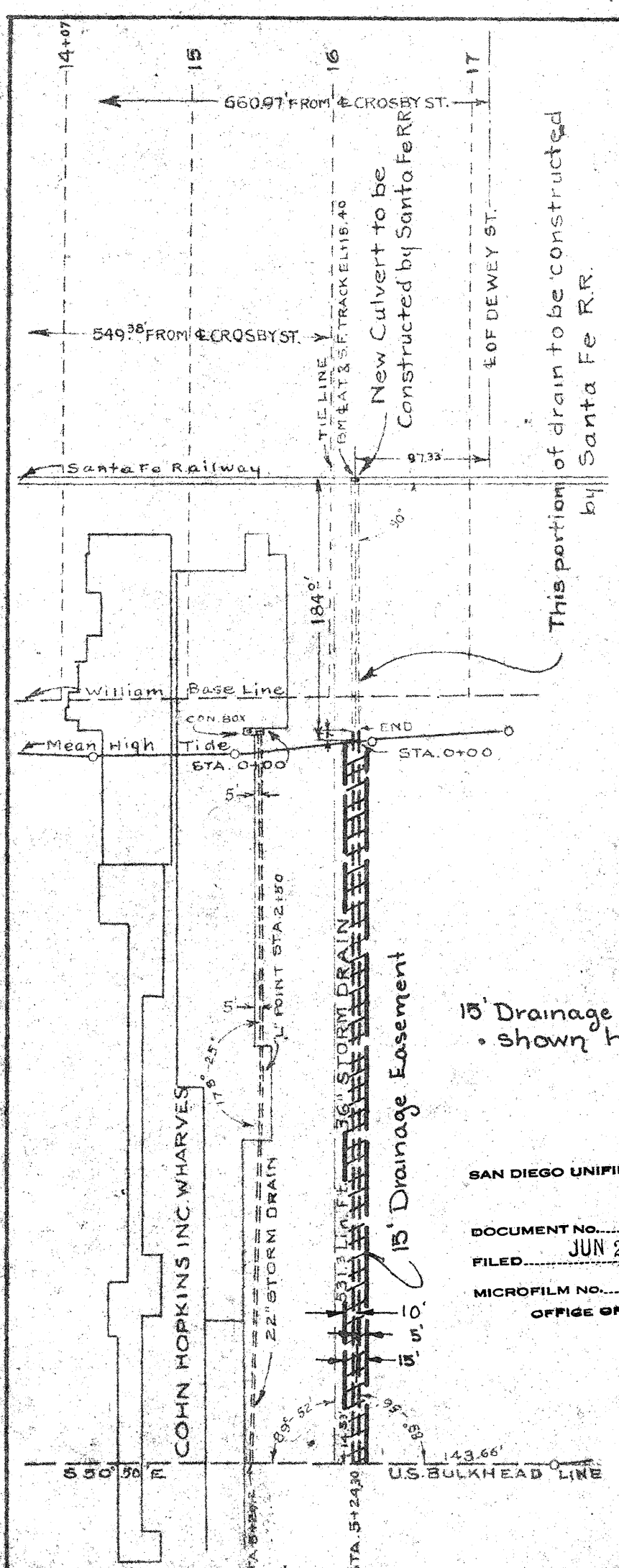

15' Drainage Easement shown hatched.

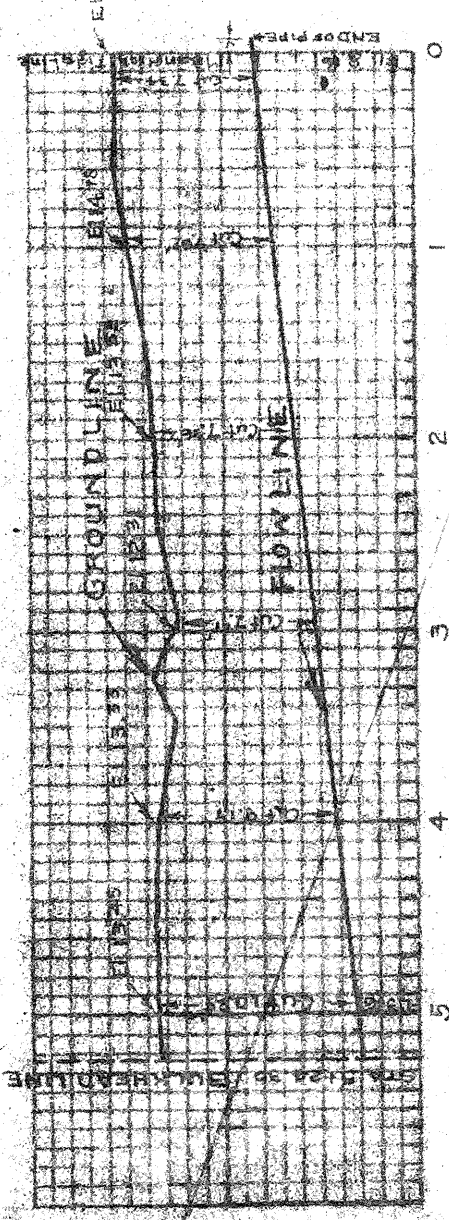

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 31
OFFICE OF THE CLERK

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
FOR PUBLIC WORKS DIRECTOR	CHIEF ENGINEER
ORIGINAL CONVEYANCE DOCUMENT NO. [illegible] FILED [illegible]	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 13, 1968

PLANNING	RECORDS ENGR.	CONTROL ENGR.	OFFICE ENGR.
		6-24-68	

DRAWN BY J.A.
CHECKED BY
FIELD BOOKS 192-1723
SCALE 1" = 100'
W.O. 17430

CITY OF SAN DIEGO - ENGINEERING DEPARTMENT

DRAINAGE EASEMENT
S'ly of Dewey St. & E'ly of Crosby St.

TIDELANDS

DATE 6-24-68

CITY ENGINEER

SHEET 4 OF 1[illegible]

9220-4-

HARBOR No. 49MB

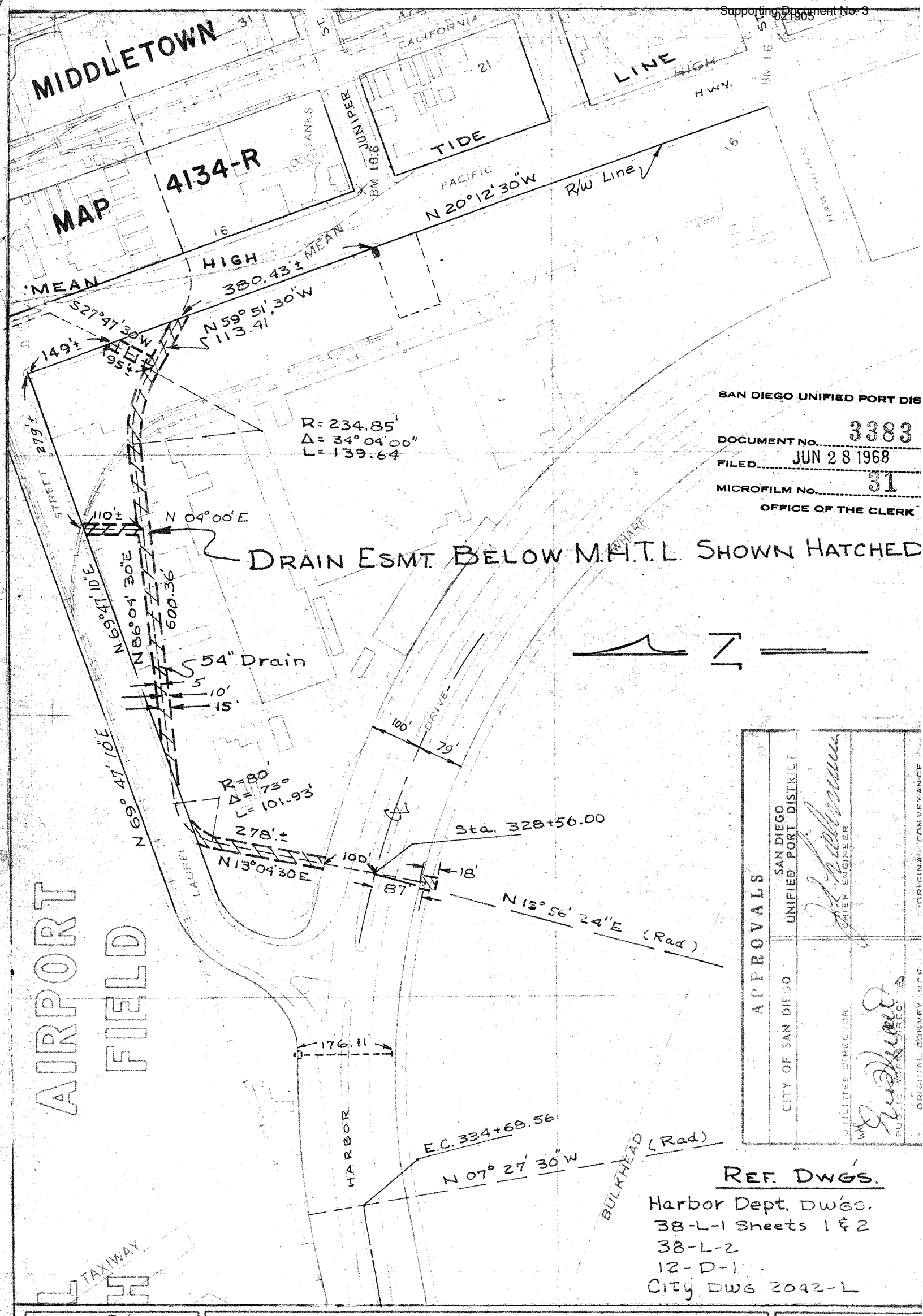

DRAWN BY O.T. 6-24-68
COORD. INDEX 204-1715
SCALE 1" = 200'
W.O. 17430

CITY OF SAN DIEGO - ENGINEERING DEPARTMENT

DRAIN ESMTS below M.H.T.L. s/y of Laural Street in Tidelands.

TIDELANDS

DATE 6-24-68
CITY ENGINEER
SHEET 5 OF 19
9220-5-1

November 18, 2015
Item No. 11
Supporting Document No. 3

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 31
OFFICE OF THE CLERK

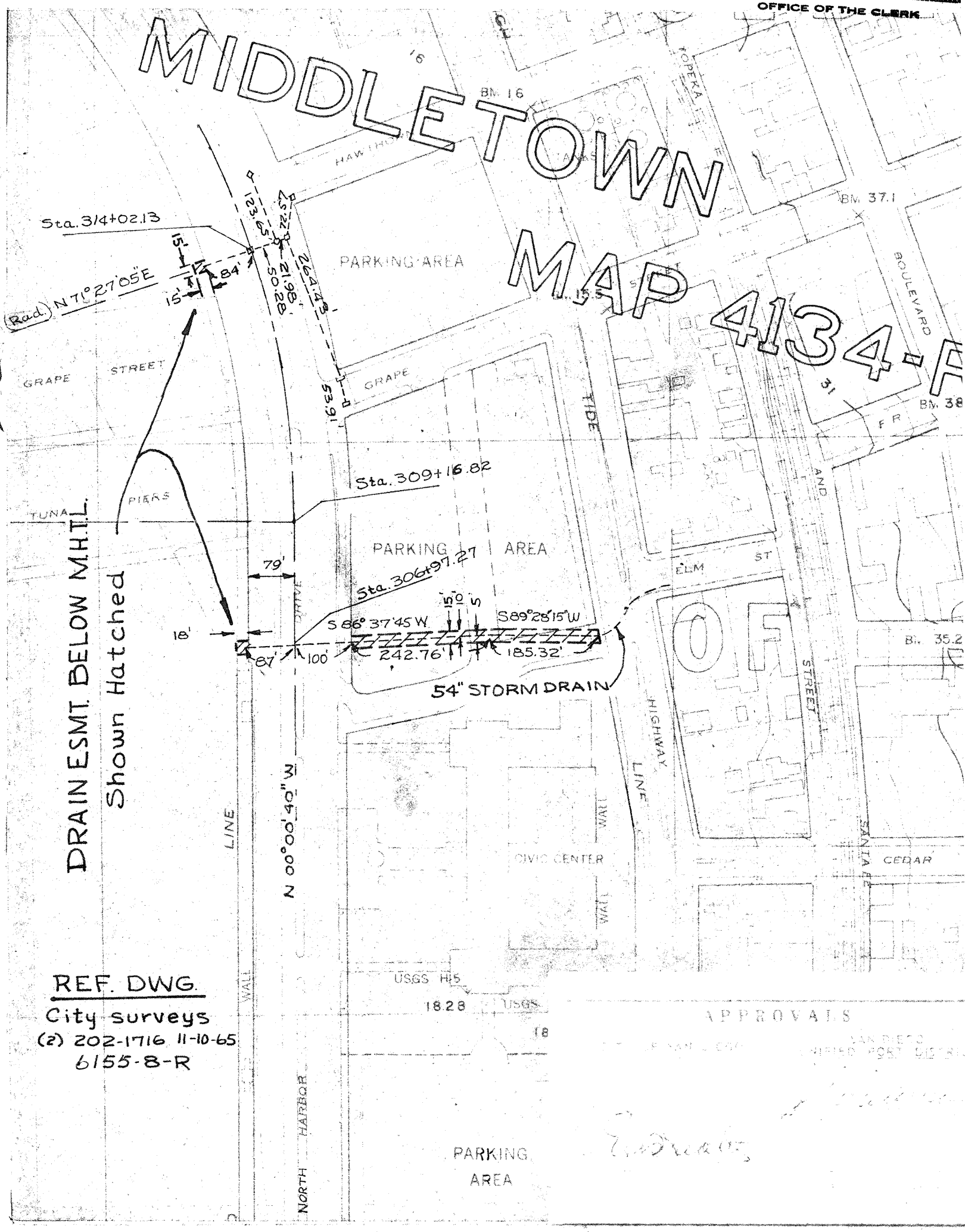

O.T.J. 6-24-68

INDEX 202-1716
1" = 200'
17430

DRAIN ESMT. in Tidelands wly of Pacific Hwy nly of Cedar St. & sly of Hawthorn St.

TIDELANDS

SHEET 6 OF

9220-6-

021907

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 31
OFFICE OF THE CLERK

NEW SAN DIEGO

MAP 456

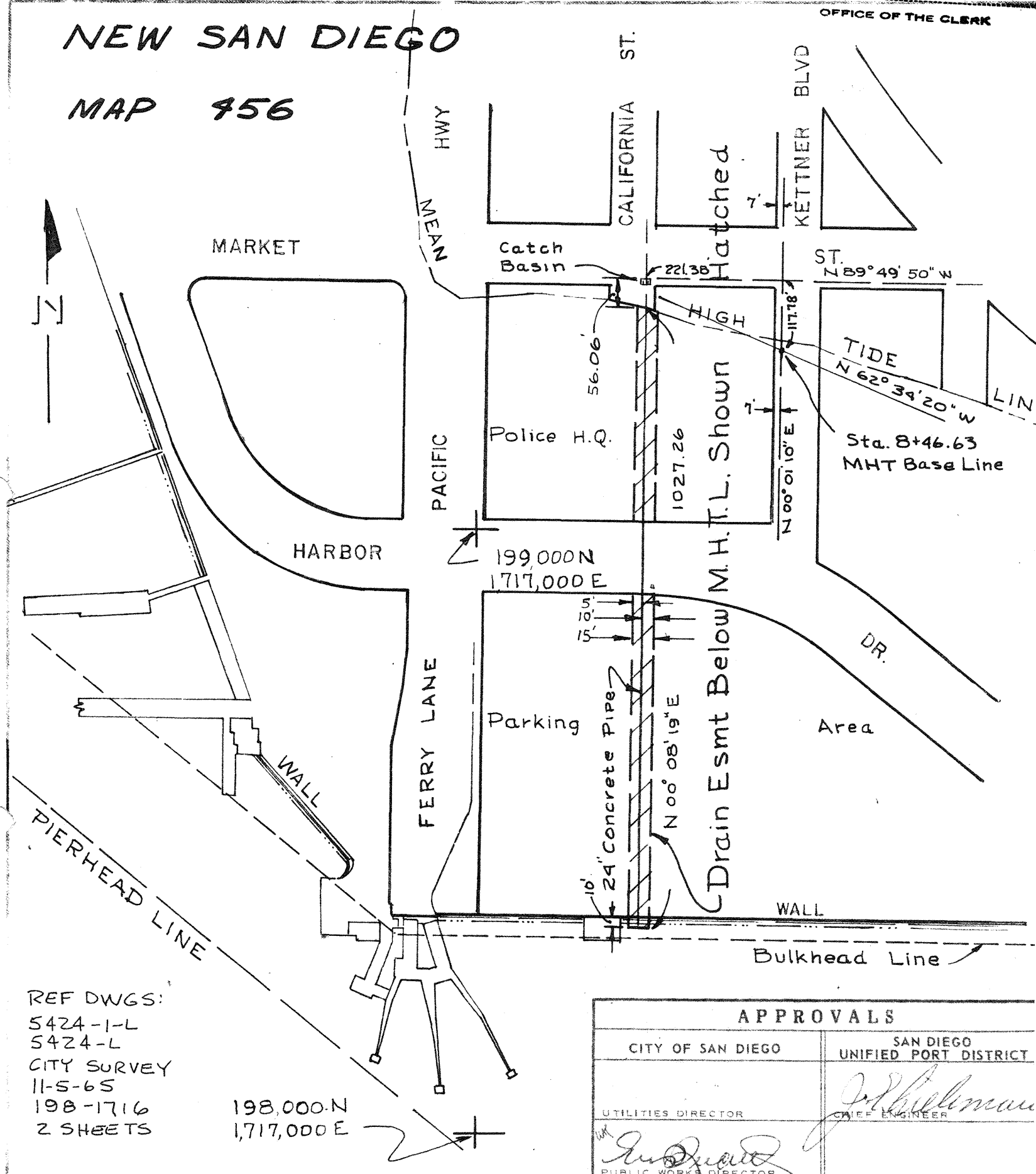

REF DWGS:
5424-1-L
5424-L
CITY SURVEY
11-5-65
198-1716
2 SHEETS

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
UTILITIES DIRECTOR	CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 651833 FILED FEB. 15, 1963	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 13, 1963

PLANNING | RECORDS ENGR. | CONTROL ENGR. 6-24-68 | OFFICE ENGR.

DRAWN BY
CHECKED BY
Coord Index 198-1717
SCALE 1" = 200'
W.O. 17430

CITY OF SAN DIEGO ENGINEERING DEPARTMENT

Drain Esmt. - in California St. Extended Below M.H.T.L.

TIDELANDS

DATE 6-24-68

SHEET 7 OF 19
9220-7-

SAN DIEGO UNIFIED PORT DI
DOCUMENT NO. 338
FILED JUN 28 1968
MICROFILM NO. 31
OFFICE OF THE CLERK

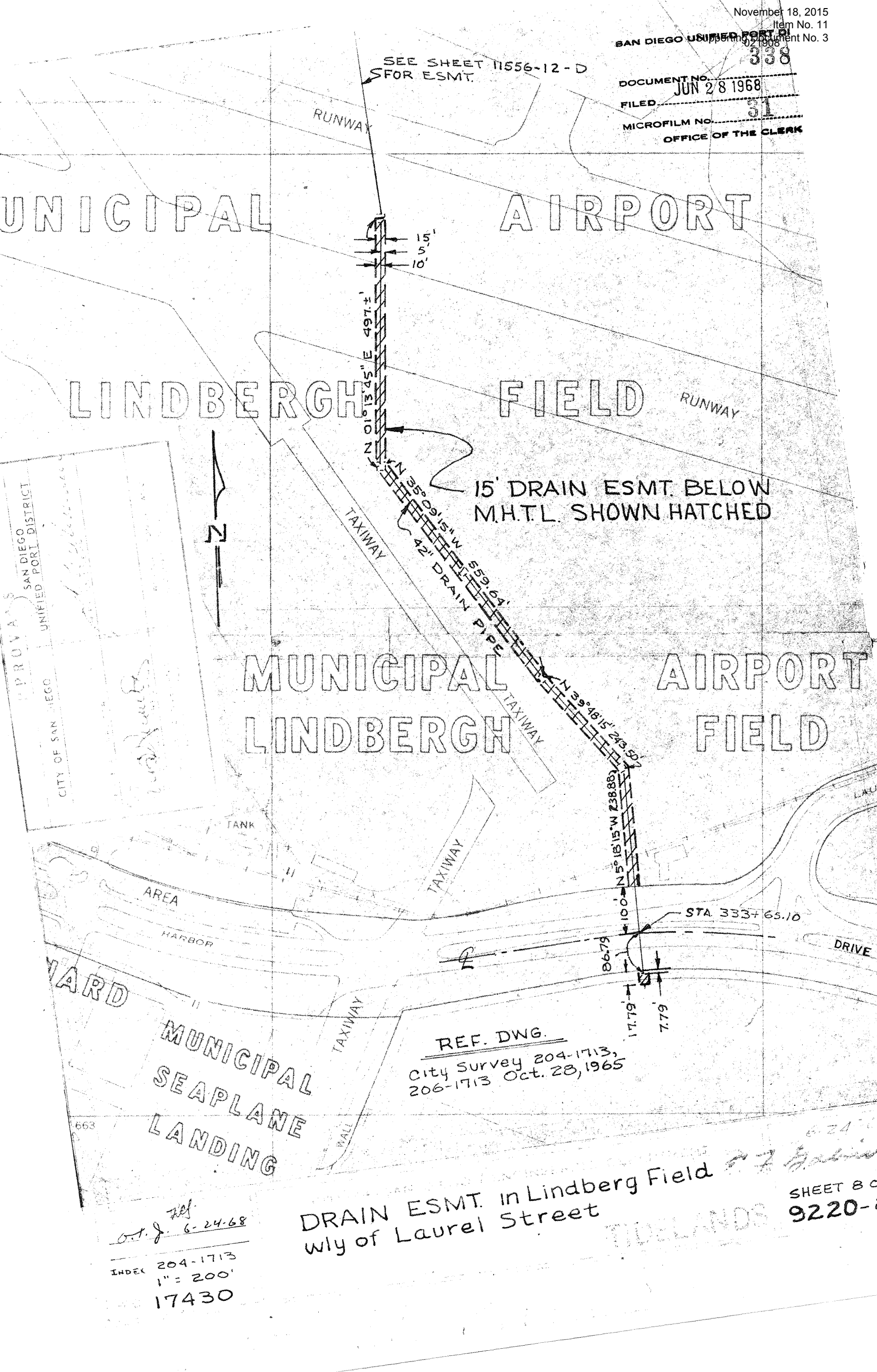

DRAIN ESMT. in Lindberg Field wly of Laurel Street

O.T.J. 6-24-68

INDEX 204-1713
1" = 200'
17430

SHEET 8 o
9220-

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 31
OFFICE OF THE CLERK

REF DWGS:

14370-L Sheet 12 of 12
City Survey Sheet 1 of 1 index
198-1695 Oct 22, 1965

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
UTILITIES DIRECTOR	CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 651833 FILED FEB. 15, 1963	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 13, 1963

		PLANNING	RECORDS ENGR	CONTROL ENGR. 6-24-68	OFFICE ENGR.

DRAWN BY RCJ
CHECKED BY
INDEX 198-1695
SCALE 1" = 50'
W.O. 17430

CITY OF SAN DIEGO - ENGINEERING DEPARTMENT

Drain Esmt. Ely. of LAWRENCE STREET termination, below M.H.T.L.

TIDELANDS

DATE

SHEET 9 OF 19
9220-9-1

SAN DIEGO UNIFIED PORT DI
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 31
OFFICE OF THE CLERK

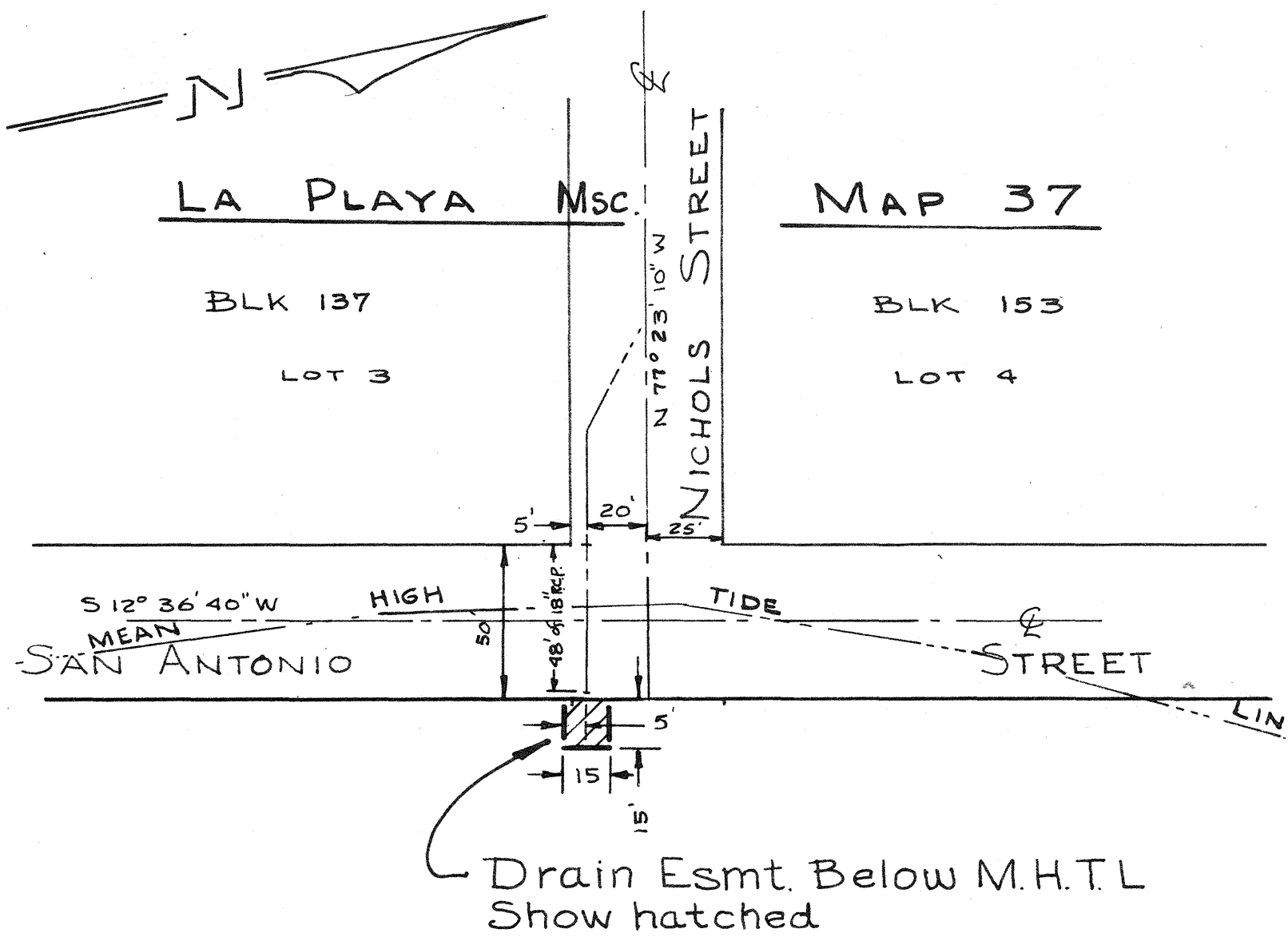

Ref Dwgs:

5657-D
14307-L Sh. 12 of 12

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
UTILITIES DIRECTOR	CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 651833 FILED FEB. 15, 1963	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 13, 1963

PLANNING	RECORDS ENGR	CONTROL ENGR.	OFFICE ENGR.
		O.J. 6-24-68	

DRAWN BY
CHEF
INDEX 198-1695
SCALE 1" = 50'
W.O. 17430

CITY OF SAN DIEGO - ENGINEERING DEPARTMENT

Drain Esmt Ely of the intersection of Nichols & San Antonio St's in tidelands

DATE
CITY ENGINEER

SHEET 10 OF 19
9220-10-E

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 31
OFFICE OF THE CLERK

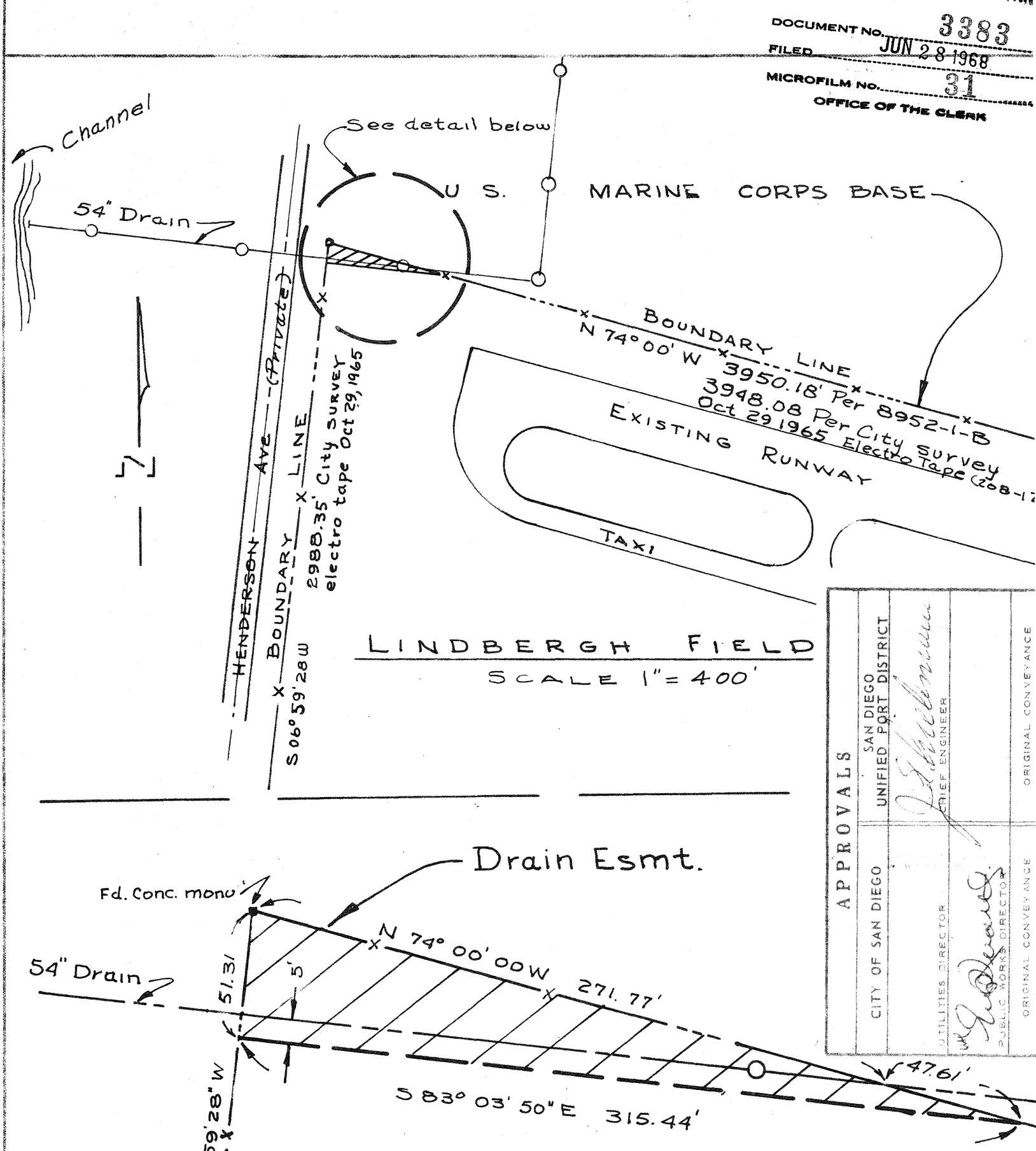

APPROVALS

CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
UTILITIES DIRECTOR	CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE	ORIGINAL CONVEYANCE

Ref. Dwgs:
Dept of Navy Dwg 624858 Sh
City 8952-1-B, City Survey o
54" Drain Oct 29, 1965 INDEX -
208-1707 Sh 1 of 1

PLANNING	RECORDS ENGR	CONTROL ENGR.	OFFICE ENGR.
		CT 6-24-68	

DRAWN BY
CHECKED BY
C. INDEX 208-1707
SCALE As Noted
W.O. 17430

CITY OF SAN DIEGO - ENGINEERING DEPARTMENT
Drain Esmt. in tidelands of Lindbergh Field at N'wly. end of runway
TIDELANDS

DATE
CITY ENGINEER
SHEET 11 OF 19
9220-11-

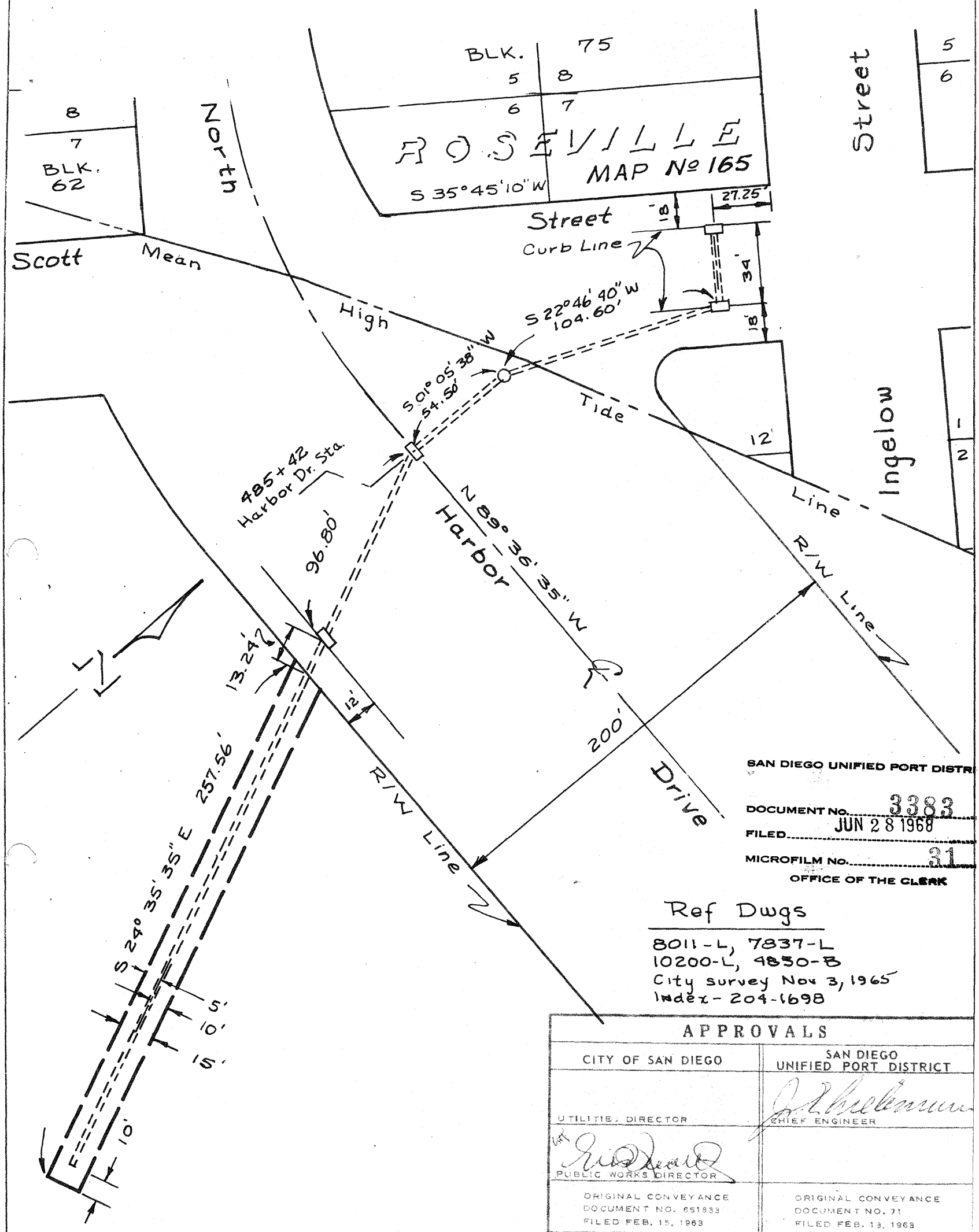

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 31
OFFICE OF THE CLERK

Ref Dwgs
8011-L, 7837-L
10200-L, 4850-B
City survey Nov 3, 1965
Index - 204-1698

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
UTILITIES DIRECTOR	CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 651833 FILED FEB. 15, 1963	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 13, 1963

PLANNING	RECORDS ENGR.	CONTROL ENGR.	OFFICE ENGR.
		CTJ 6-24-68	

DRAWN BY
CHECKED BY
INDEX: 204-1699
SCALE 1" = 50'
W.O. 17430

CITY OF SAN DIEGO - ENGINEERING DEPARTMENT

Drain Esmt. S'ly of the intersection of North Harbor Dr & Scott Street in Tideland

TIDELANDS

DATE 6-24-68
CITY ENGINEER
SHEET 12 OF 19
9220-12-B

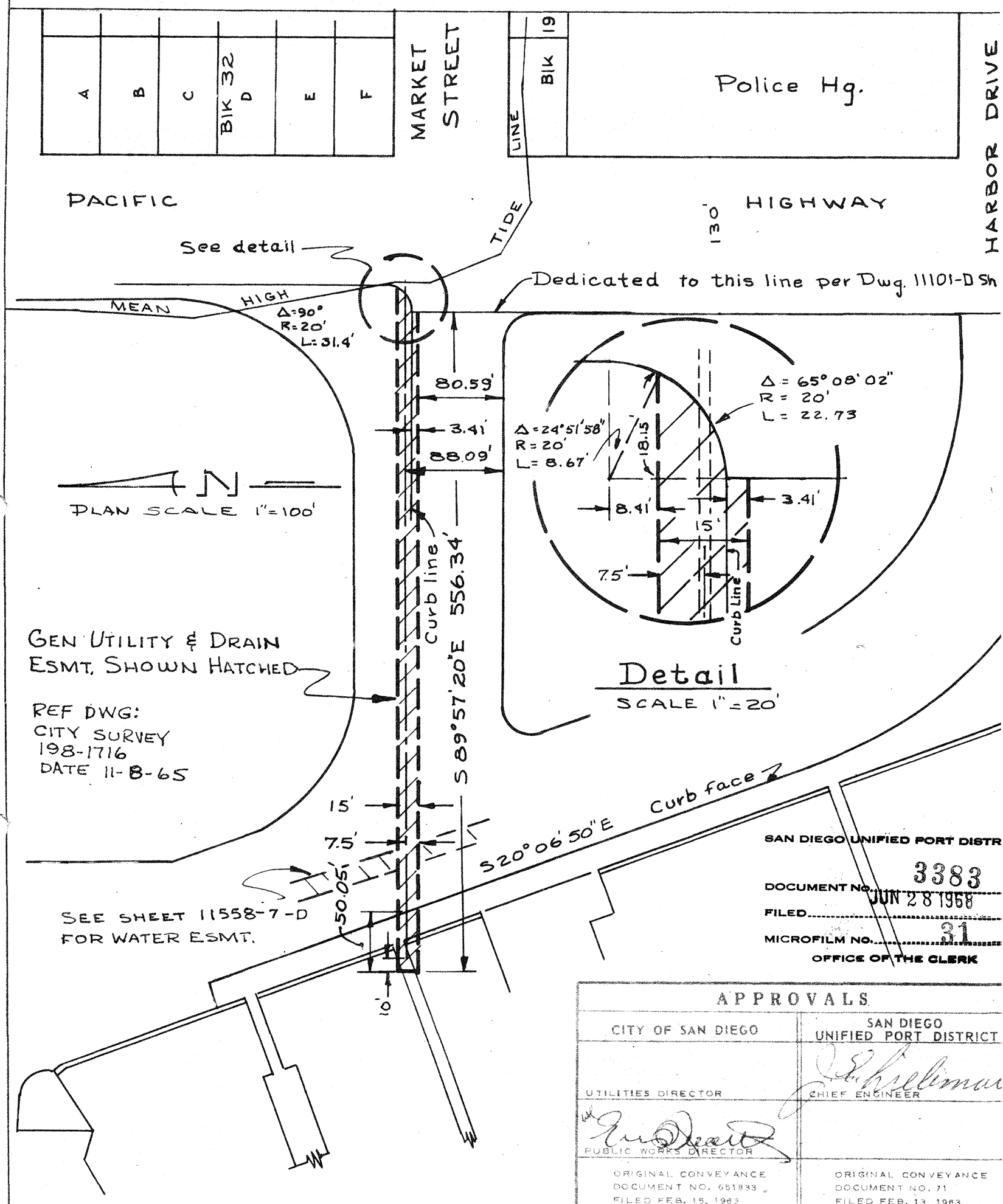

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 31
OFFICE OF THE CLERK

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
UTILITIES DIRECTOR	CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 651833 FILED FEB. 15, 1963	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 13, 1963

PLANNING	RECORDS ENGR.	CONTROL ENGR.	OFFICE ENGR.
		O.T.J. 6-24-68	

DRAWN BY
CHECKED BY
INDEX 198-1715
SCALE AS NOTED
W.O. 17430

CITY OF SAN DIEGO - ENGINEERING DEPARTMENT

GEN. UTILITY & DRAIN ESMT. - Wly of the intersection of Pacific Hwy. & Market Street, in TIDELANDS

DATE 6-24-68
CITY ENGINEER
SHEET 13 OF 19
9220-13-B

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 31
OFFICE OF THE CLERK

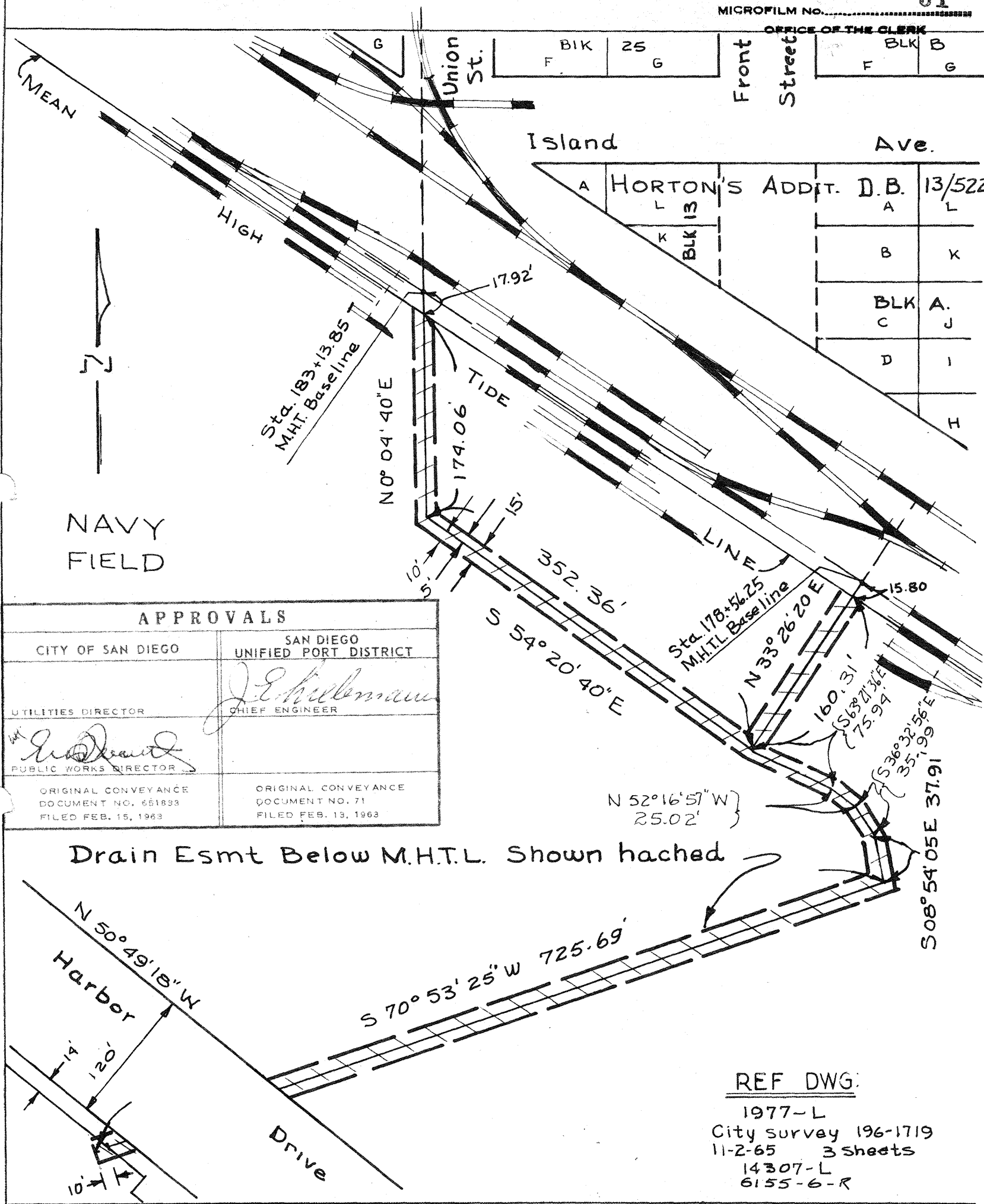

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
UTILITIES DIRECTOR	CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 651893 FILED FEB. 15, 1963	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 13, 1963

REF DWG:
1977-L
City survey 196-1719
11-2-65 3 sheets
14307-L
6155-6-R

PLANNING	RECORDS ENGR.	CONTROL ENGR.	OFFICE ENGR.
		O.T.A. 6-24-68	

DRAWN BY
CHECKED BY
INDEX 198-1716
SCALE 1" = 100'
W.O. 17430

CITY OF SAN DIEGO - ENGINEERING DEPARTMENT
Drain Esmt.-Below M.H.T.L.-Sly of Union & Front Streets-Thru Navy Field. in TIDELANDS

DATE
CITY ENGINEER
SHEET 14 OF 19
9220-14 B

SAN DIEGO UNIFIED PORT DISTRICT

DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 31
OFFICE OF THE CLERK

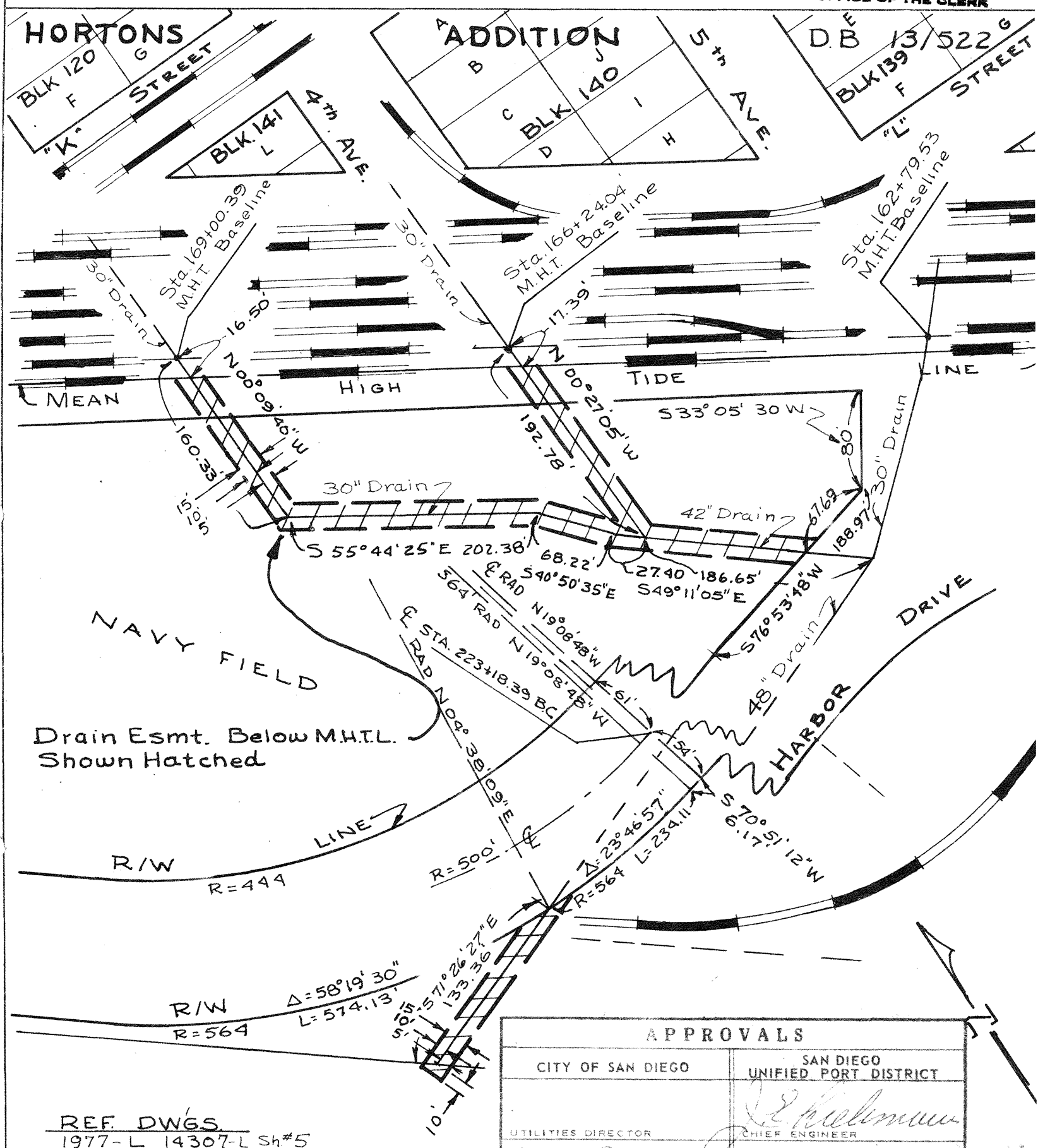

REF. DWGS.
1977-L 14307-L Sh#5
City survey 196, 198-1719
Date: 11-4-65 Two sheets
Harbor Dr. Opng - 6155-5-R
43-L Sheet 22 & 23

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
UTILITIES DIRECTOR	CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 051835 FILED FEB. 15, 1963	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 13, 1963

PLANNING	RECORDS ENGR.	CONTROL ENGR.	OFFICE ENGR.
		O.T.J. 6-24-68	

DRAWN BY
CHECKED BY
FIELD BOOKS INDEX 196-1719
SCALE 1" = 100'
W.O. 17430

CITY OF SAN DIEGO - ENGINEERING DEPARTMENT

Drain Esmts Below M.H.T.L. Sly. of 3RD & 4Th Streets. & Sly. of Harbor Drive, in Tidelands

DATE 6-24-
CITY ENGINEER
SHEET 15 OF 19
9220-15-B

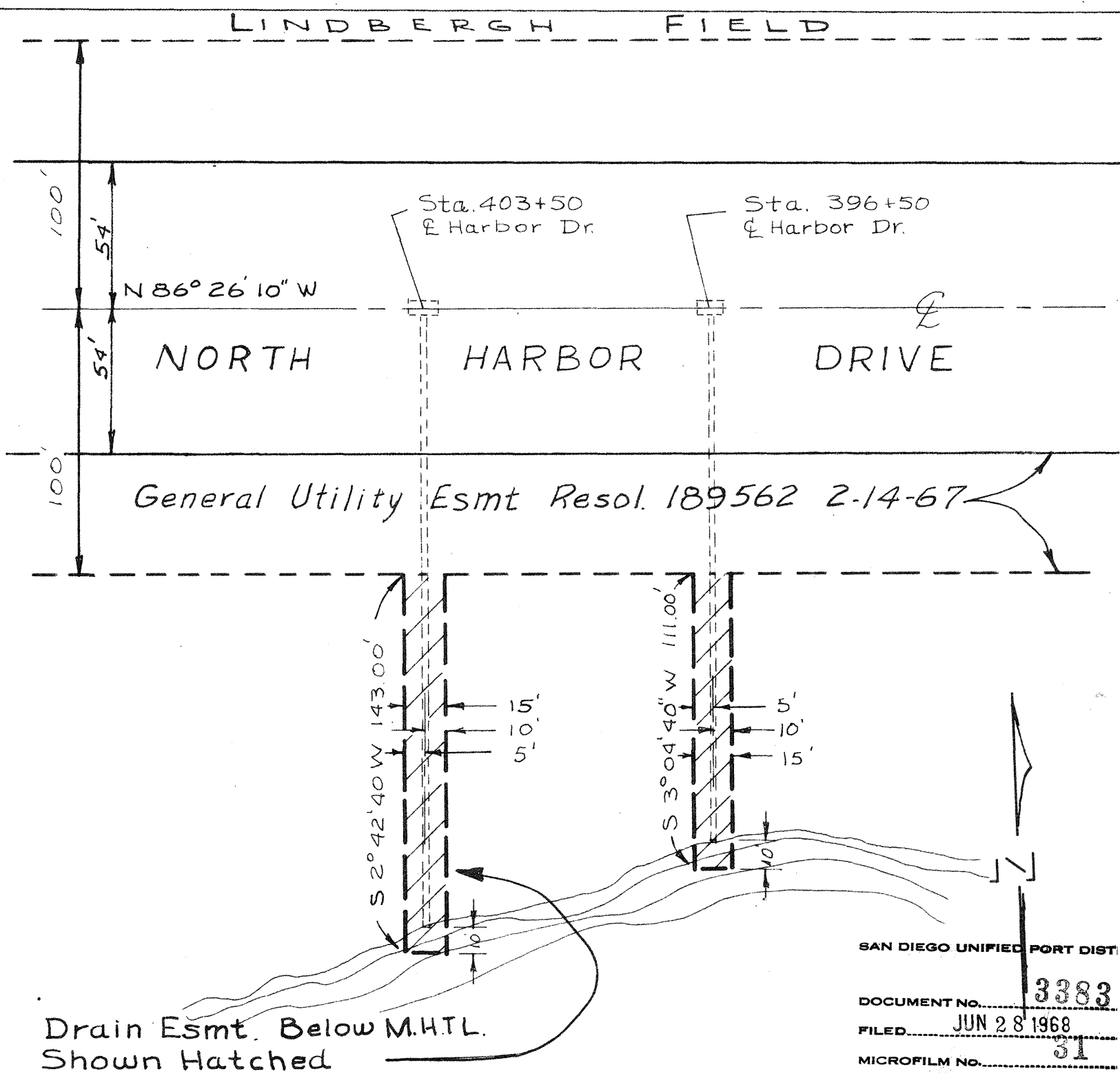

SAN DIEGO UNIFIED PORT DIST
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 31
OFFICE OF THE CLERK

Ref Dwg's
6155-9-R
City survey 204-1707 Oct. 29, 1965

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
UTILITIES DIRECTOR	CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 651833 FILED FEB. 15, 1963	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 13, 1968

PLANNING	RECORDS ENGR.	CONTROL ENGR.	OFFICE ENGR.
		6-24-68	

DRAWN BY
CHECKED BY
FIELD BOOKS
INDEX 204-1707
SCALE 1" = 50'
W.O. 17430

CITY OF SAN DIEGO - ENGINEERING DEPARTMENT
Drain Esmt. Below M.H.T.L Sly of Lindbergh Field in Tidelands

DATE 6-24-68
CITY ENGINEER
SHEET 16 OF 19
9220-16-E

021917

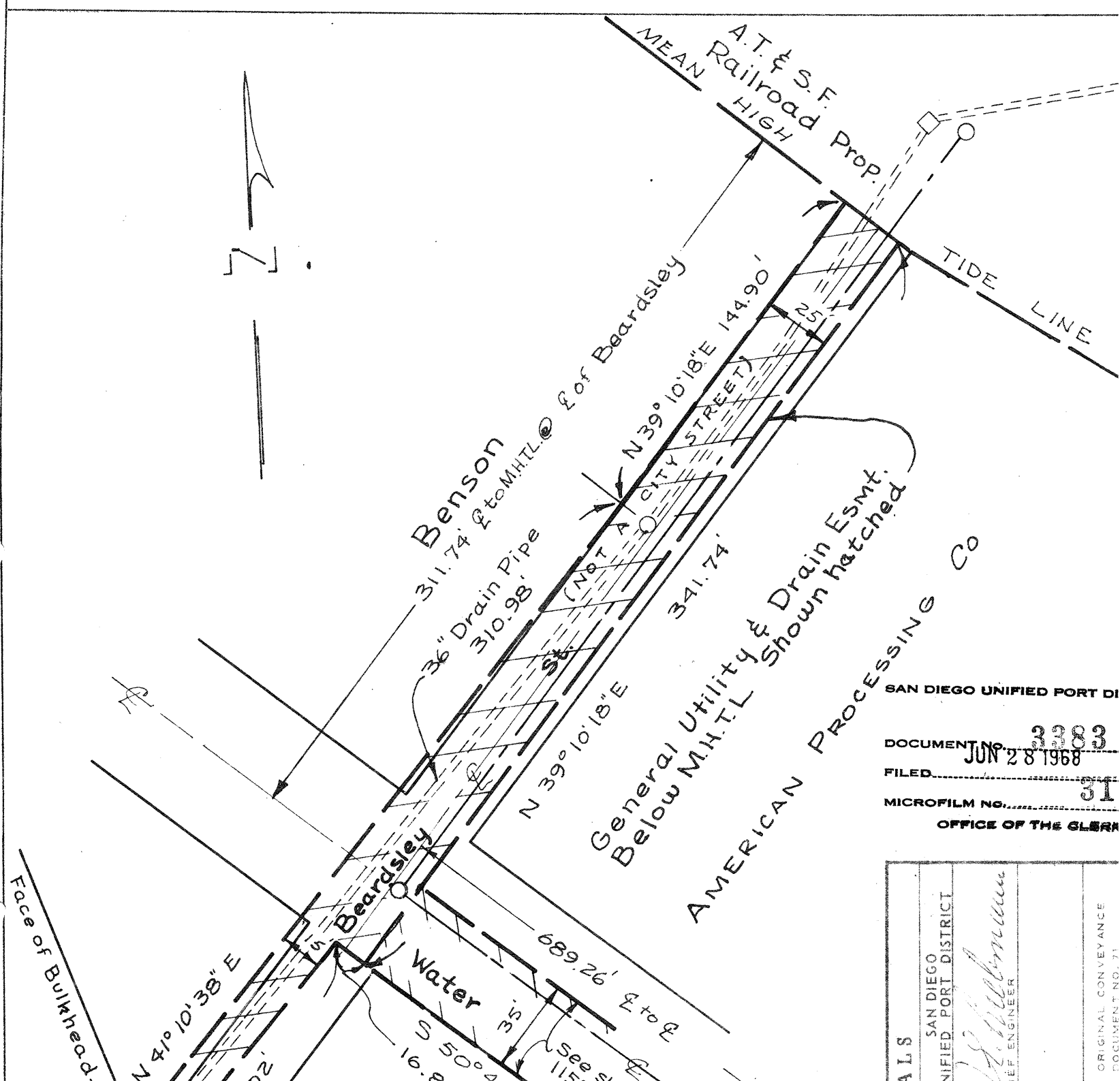

SAN DIEGO UNIFIED PORT DI

DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 31
OFFICE OF THE CLERK

APPROVALS

SAN DIEGO UNIFIED PORT DISTRICT	CITY OF SAN DIEGO
CHIEF ENGINEER	UTILITIES DIRECTOR / PUBLIC WORKS DIRECTOR
ORIGINAL CONVEYANCE DOCUMENT NO. 71	ORIGINAL CONVEYANCE DOCUMENT NO. 651833

PLANNING	RECORDS ENGR.	CONTROL ENGR.	OFFICE ENGR.
		O.T.J. 6-24-68	

DRAWN BY
CHECKED BY
FIELD BOOKS 194-1721
SCALE 1" = 50
W.O. 17430

CITY OF SAN DIEGO - ENGINEERING DEPARTMENT

General Utility & Drain Esmt. in Tidelands swly. of Beardsly St. & Harbor Dr. Below M.H.T.L.

DATE
CITY ENGINEER
SHEET 17 OF 19
9220-17-B

REF 206-D-2 HARBOR

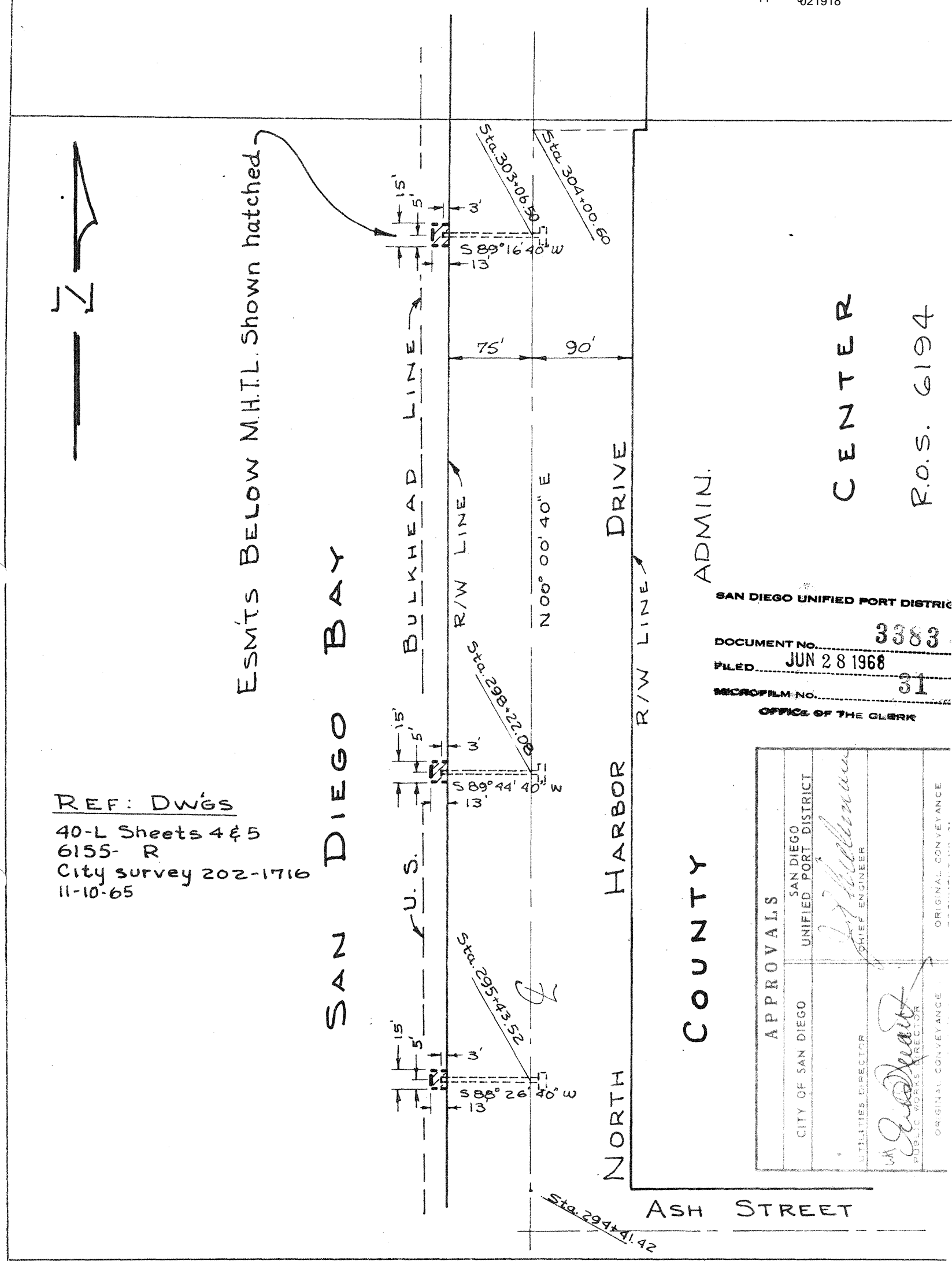

		Planning	Records Engr.	C.T. 6-24-68 Control Engr.	Office Engr.

Drawn by
Checked by
Field Books
Index 202-1716
Scale 1" = 100'
W.O. 17430

CITY OF SAN DIEGO - ENGINEERING DEPARTMENT

Drain Esmts Wly. of North Harbor Drive & Nly. of Ash St. in Tidelands

Date
City Engineer

Sheet 18 of 19

9220-18-E

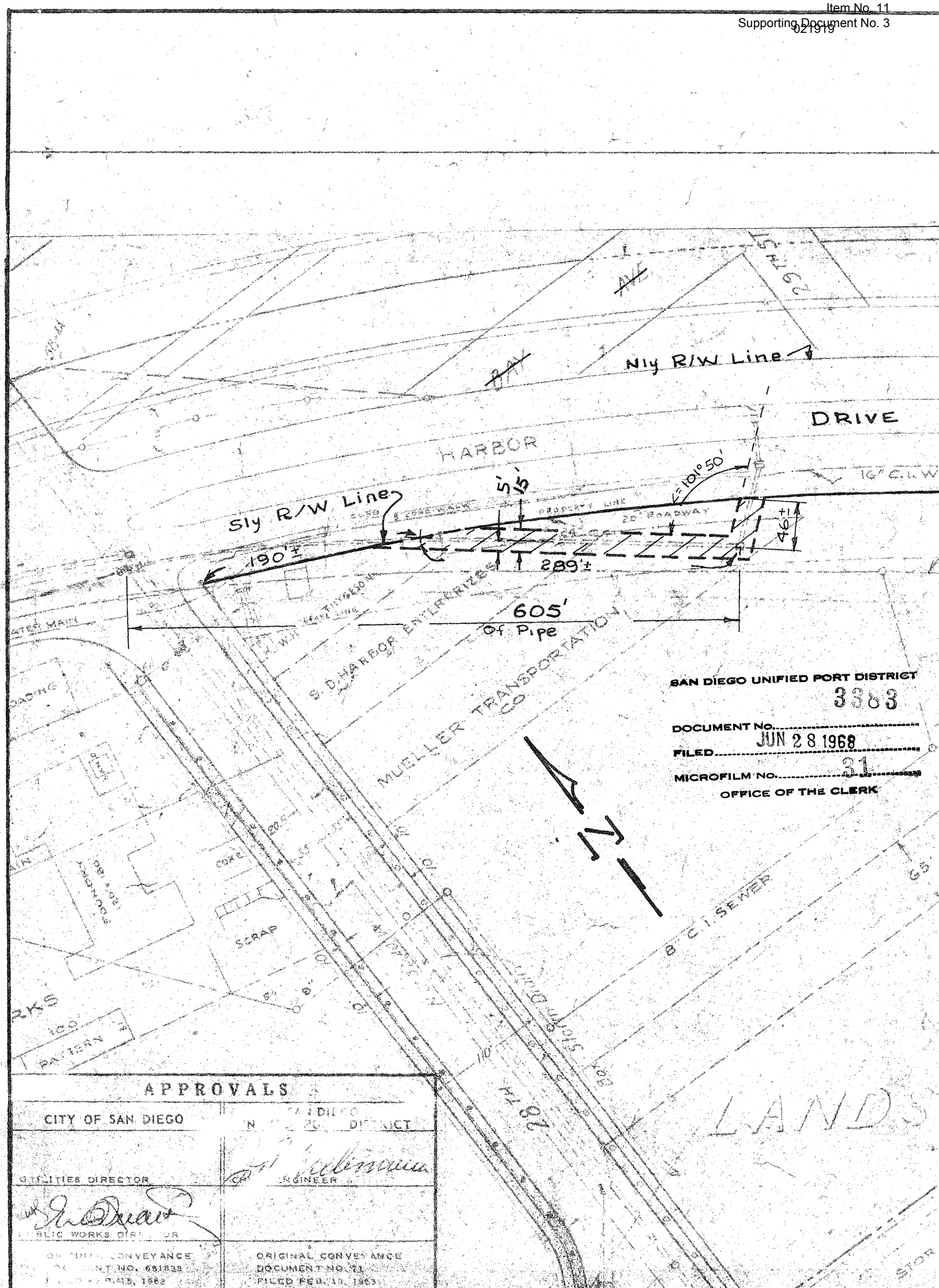

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
UTILITIES DIRECTOR	CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 651839 FILED FEB. 13, 1969	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 13, 1963

PLANNING	RECORDS ENGR.	CONTROL ENGR.	OFFICE ENGR.
		O.T.J. 6-24-68	

DRAWN BY Def
CHECKED BY
FIELD BOOKS
INDEX 190-1727
SCALE 1" = 100'
W.O. 17430

CITY OF SAN DIEGO - ENGINEERING DEPARTMENT

DRAIN ESMT. - Sly of HARBOR DR. & Ely of 28th St below M.H.T.L.

DATE 6-24-68
CITY ENGINEER
SHEET 19 OF
9220-19

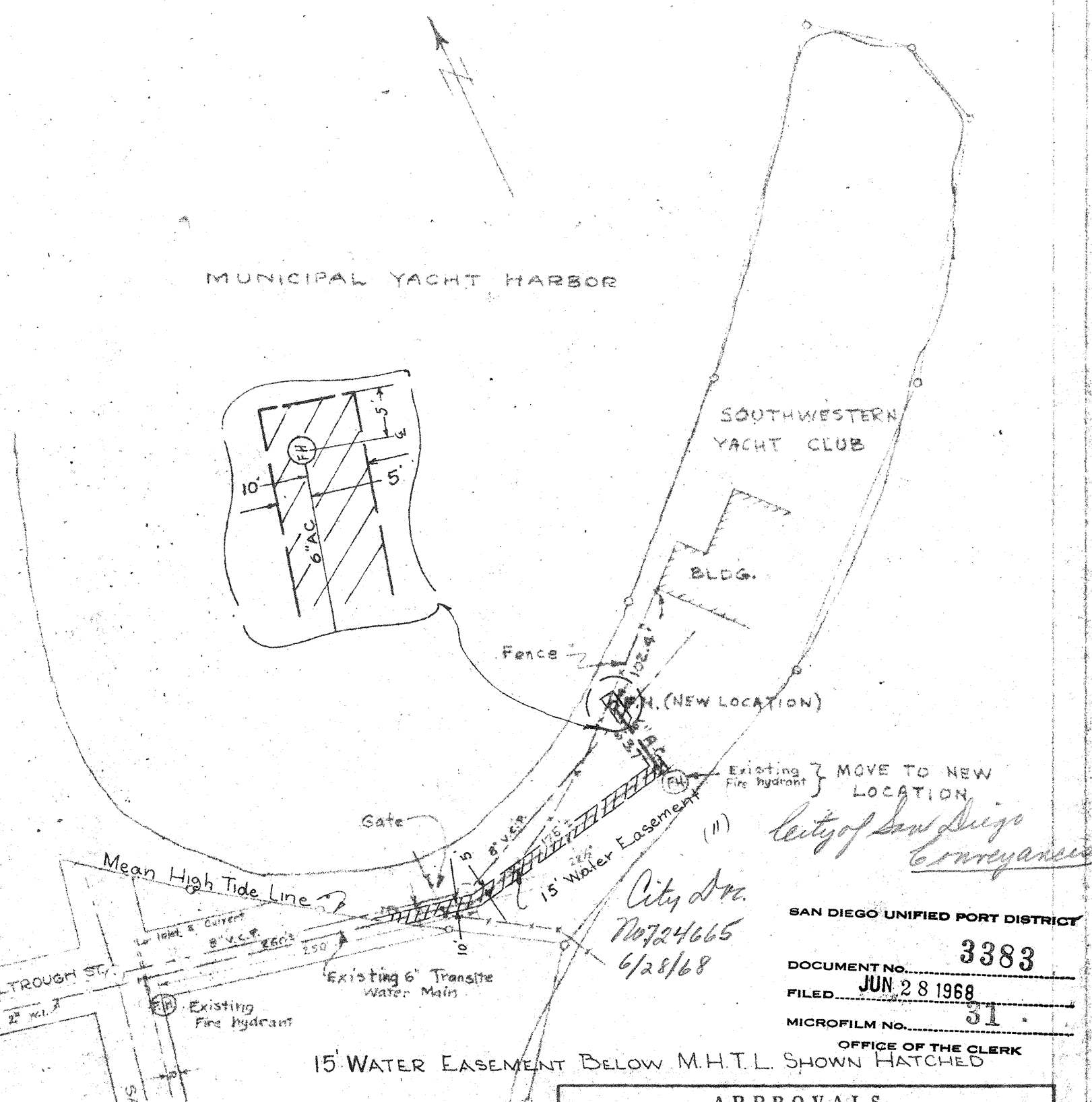

(11)

City of San Diego
Conveyance

City Doc.
No 724665
6/28/68

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 31
OFFICE OF THE CLERK

15' WATER EASEMENT BELOW M.H.T.L. SHOWN HATCHED

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R. E. Graham — UTILITIES DIRECTOR	J. R. Kuebemann — CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 651835 FILED FEB. 15, 1963	CONVEYANCE NO. 71 FILED FEB. 13, 1963

F.B. 191/48
250/13

Revised 4-21-59 by M.R.S.

PLANNING	RECORDS ENGR.	CONTROL ENGR.	OFFICE ENGR.
		O.T.J. 6-24-68	

DRAWN BY J.A.
CHECKED BY
FIELD BOOKS 200-1697
SCALE 1" = 100'
W.O. 17430

CITY OF SAN DIEGO - ENGINEERING DEPARTMENT
WATER EASEMENT
Qualtrough St. below M.H.T.L.
TIDELANDS

DATE 6/24/68
CITY ENGINEER
SHEET 1 OF 11
9222-1-B

HARBOR No. 297-MB

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM NO. 31
OFFICE OF THE CLERK

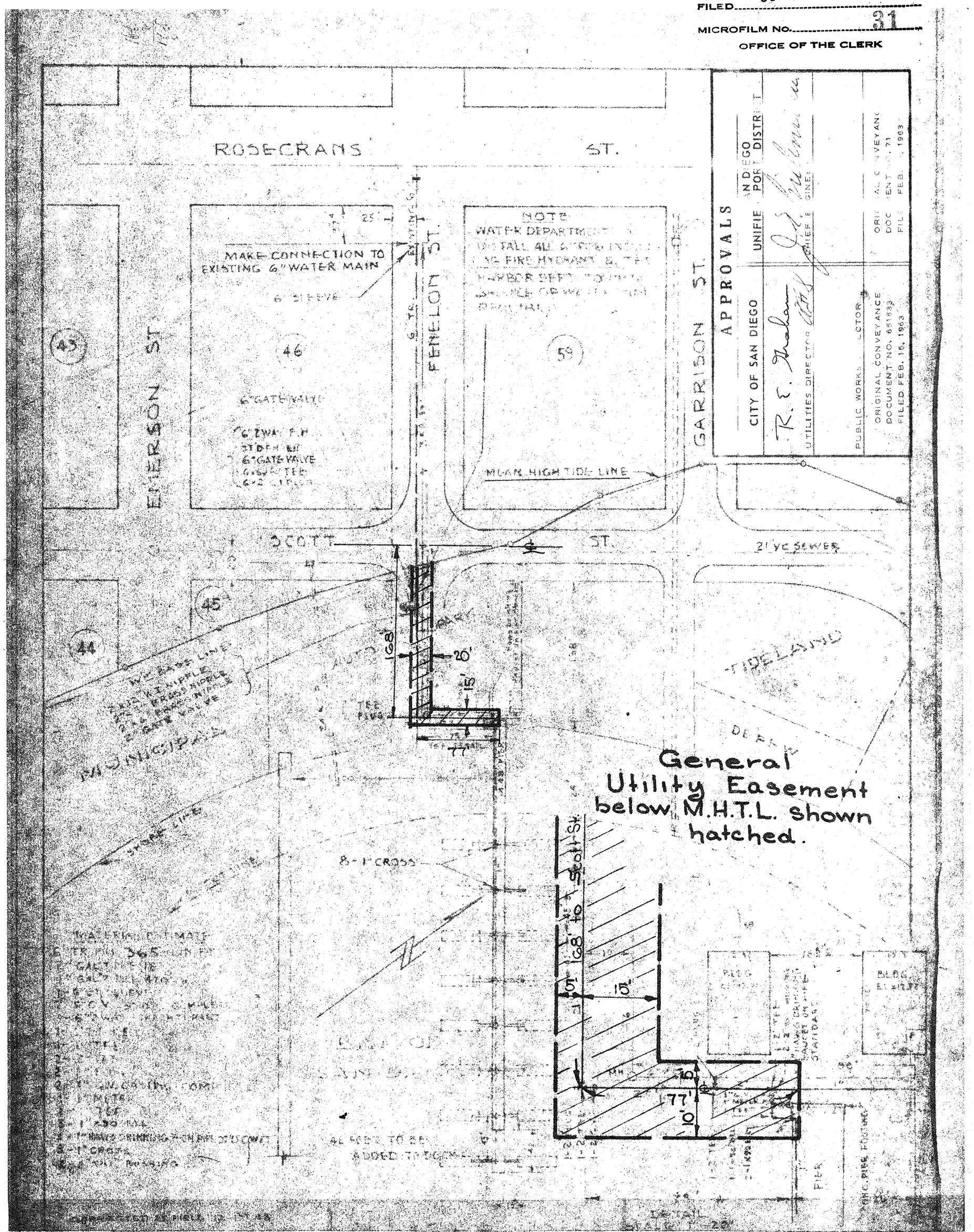

		PLANNING	RECORDS ENGR	O.T.J. 6-24-68 CONTROL ENGR.	OFFICE ENGR.

DRAWN BY JA
CHECKED BY
FIELD BOOKS 204-1699
SCALE 1" = 100'
W.O. 17430

CITY OF SAN DIEGO - ENGINEERING DEPARTMENT

WATER EASEMENT
Ext. Fenelon St. below M.H.T.L.

TIDELANDS

DATE 6-24-68
E. F. Galvin
CITY ENGINEER
SHEET 2 OF 11
9222-2-B

HARBOR Nº 237-MB

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 31
OFFICE OF THE CLERK

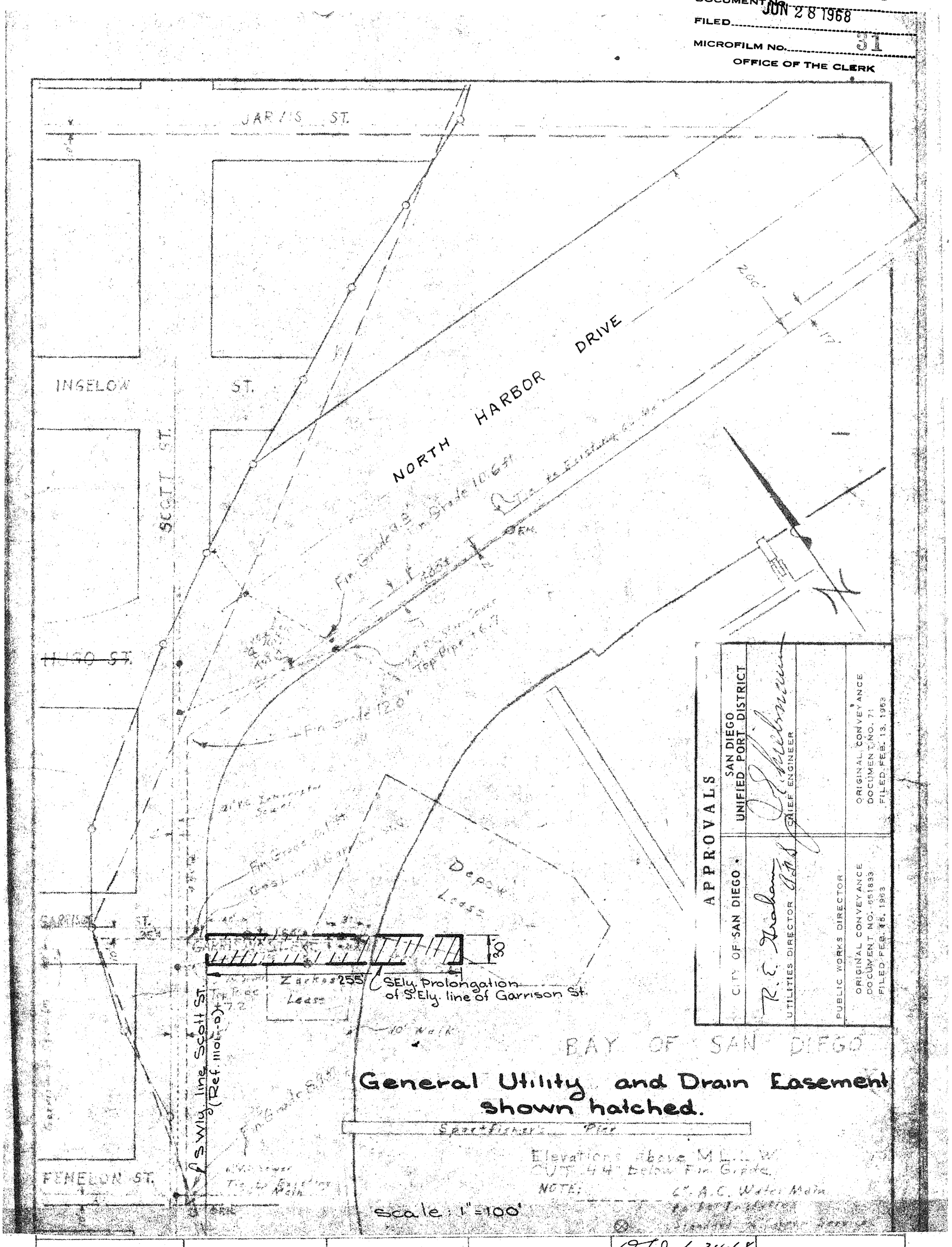

		PLANNING	RECORDS ENGR.	O.T.J. 6-24-68 CONTROL ENGR.	OFFICE ENGR.

DRAWN BY J.A.
CHECKED BY
FIELD BOOKS 204-1699
SCALE 1" = 100'
W.O. 17430

CITY OF SAN DIEGO - ENGINEERING DEPARTMENT

WATER EASEMENT

Ext. Garrison St. below M.H.T.L.

TIDELANDS

DATE 6-24-68
CITY ENGINEER
SHEET 3 OF 11
9222-3-B

HARBOR Nº 258-MB-1

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 31
OFFICE OF THE CLERK

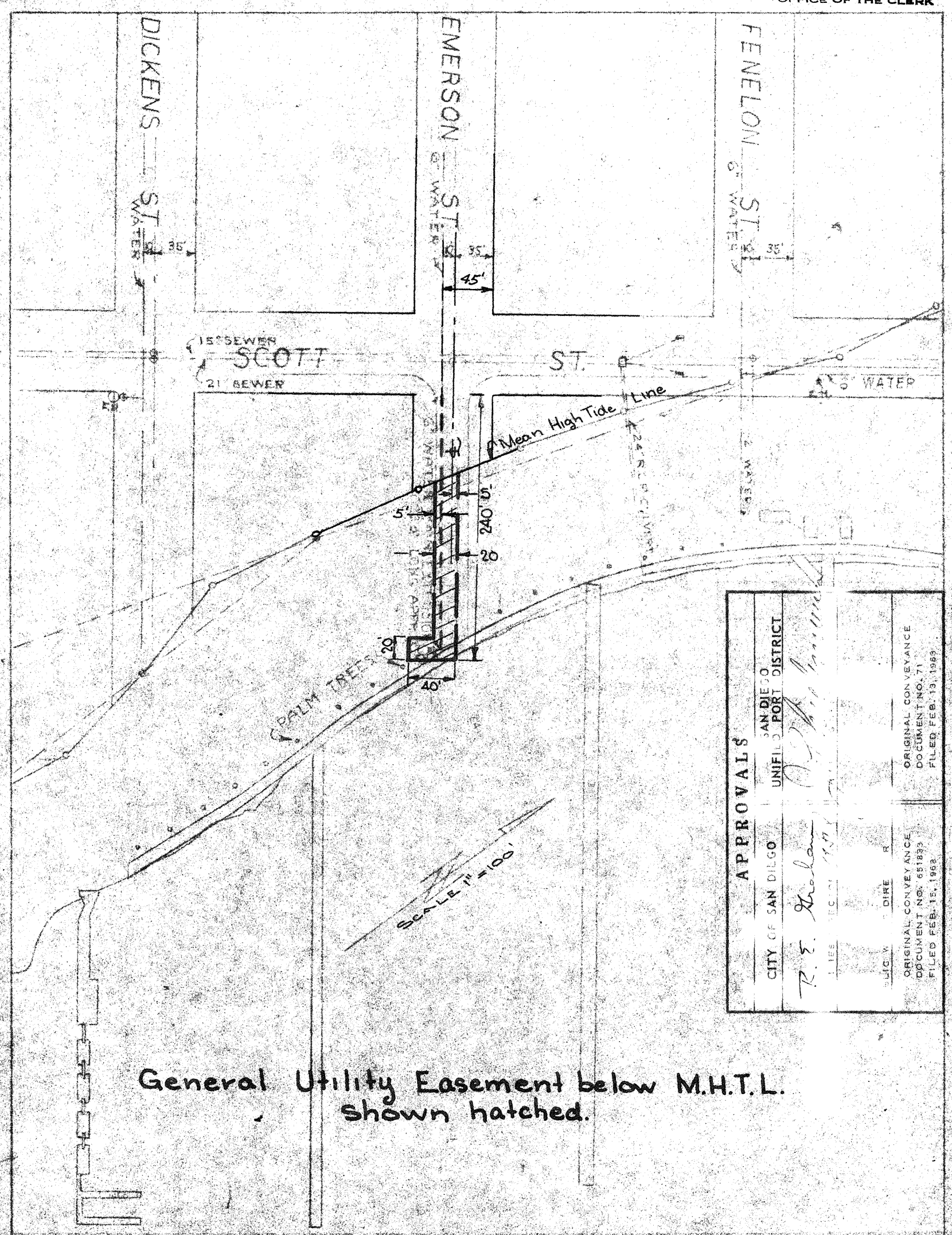

General Utility Easement below M.H.T.L. shown hatched.

PLANNING	RECORDS ENGR.	CONTROL ENGR.	OFFICE ENGR.
		O.T.J. 6-24-68	

DRAWN BY J.A.
CHECKED BY
FIELD BOOKS 202-1699
SCALE 1" = 100'
W.O. 17430

CITY OF SAN DIEGO - ENGINEERING DEPARTMENT
WATER EASEMENT
Ext. Emerson St. below M.H.T.L.
TIDELANDS

DATE 6-24-68
E. F. Gelnickoff
CITY ENGINEER
SHEET 4 OF 11
9222-4-B

HARBOR Nº 264-MB

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 31
OFFICE OF THE CLERK

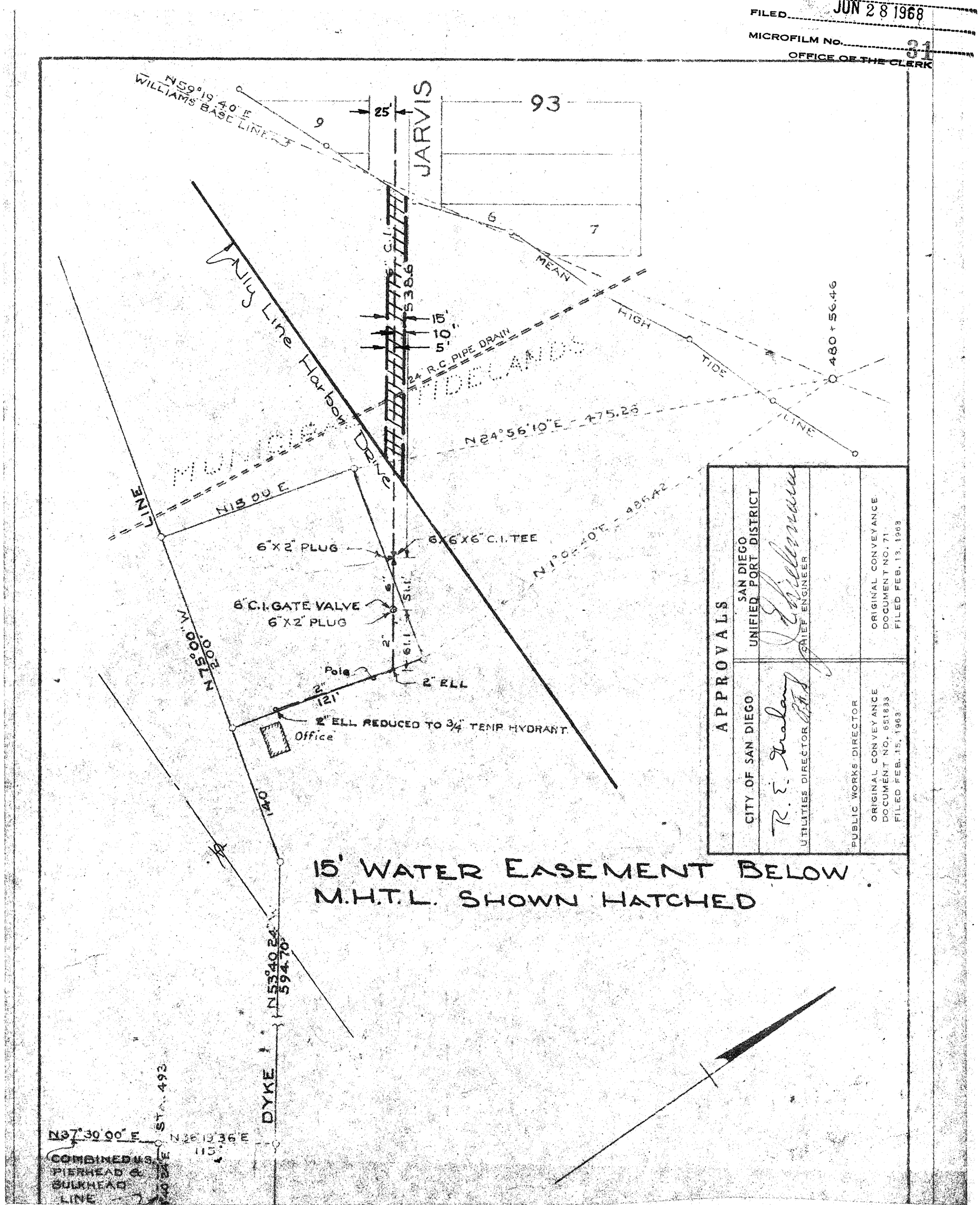

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R. E. Graham UTILITIES DIRECTOR	CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 651833 FILED FEB. 15, 1963	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 13, 1963

		PLANNING	RECORDS ENGR.	O.T.J. 6-24-68 CONTROL ENGR.	OFFICE ENGR.

DRAWN BY J.A.
CHECKED BY
FIELD BOOKS 204-1699
SCALE 1" = 100'
W.O. 17430

CITY OF SAN DIEGO - ENGINEERING DEPARTMENT
WATER EASEMENT
Ext. Jarvis Street
TIDELANDS

DATE 6-24-68
E. F. Gabrielson
CITY ENGINEER
SHEET 5 OF 11
9222-5-B

HARBOR No. 139-MB

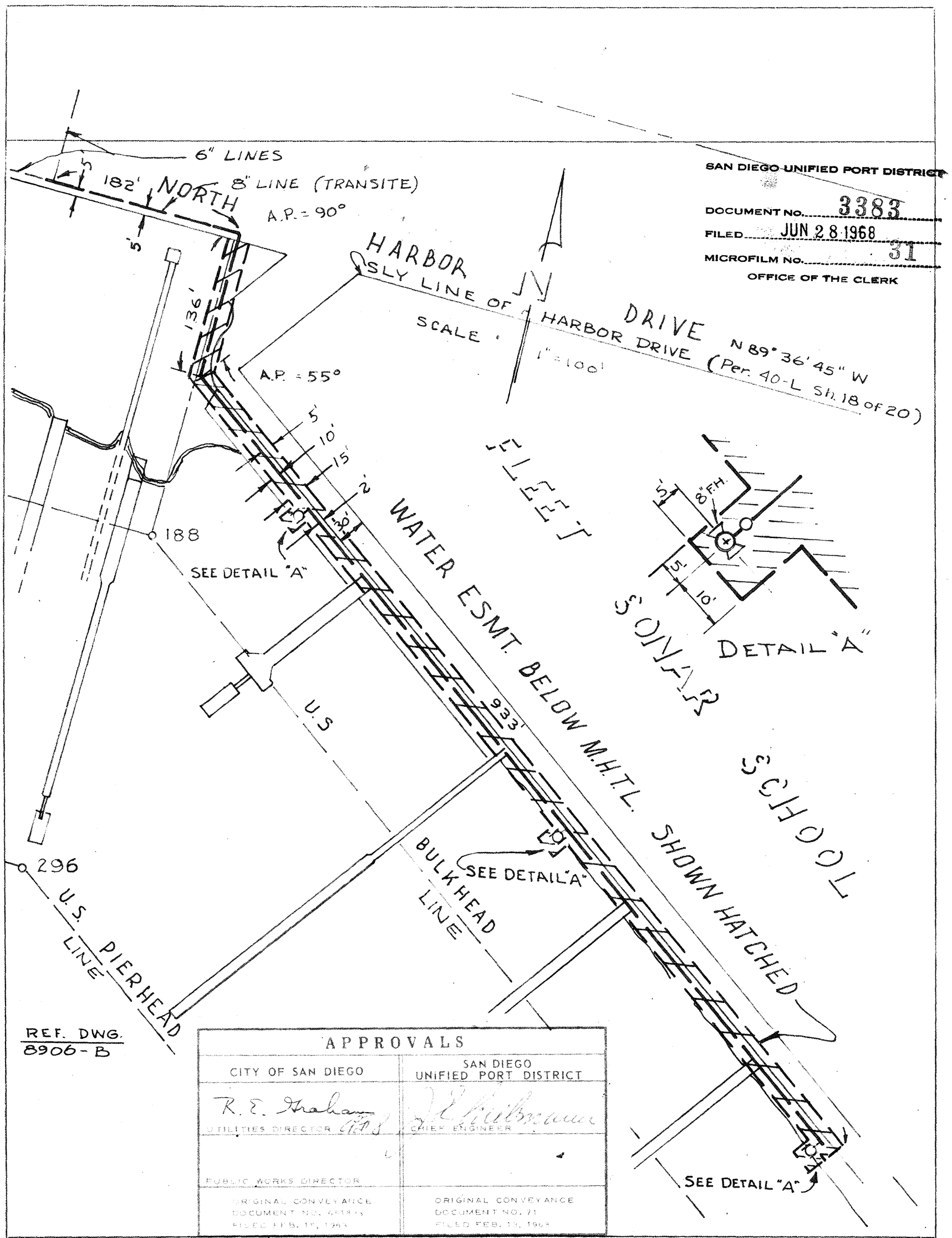

HARBOR No 292-MB

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 31
OFFICE OF THE CLERK

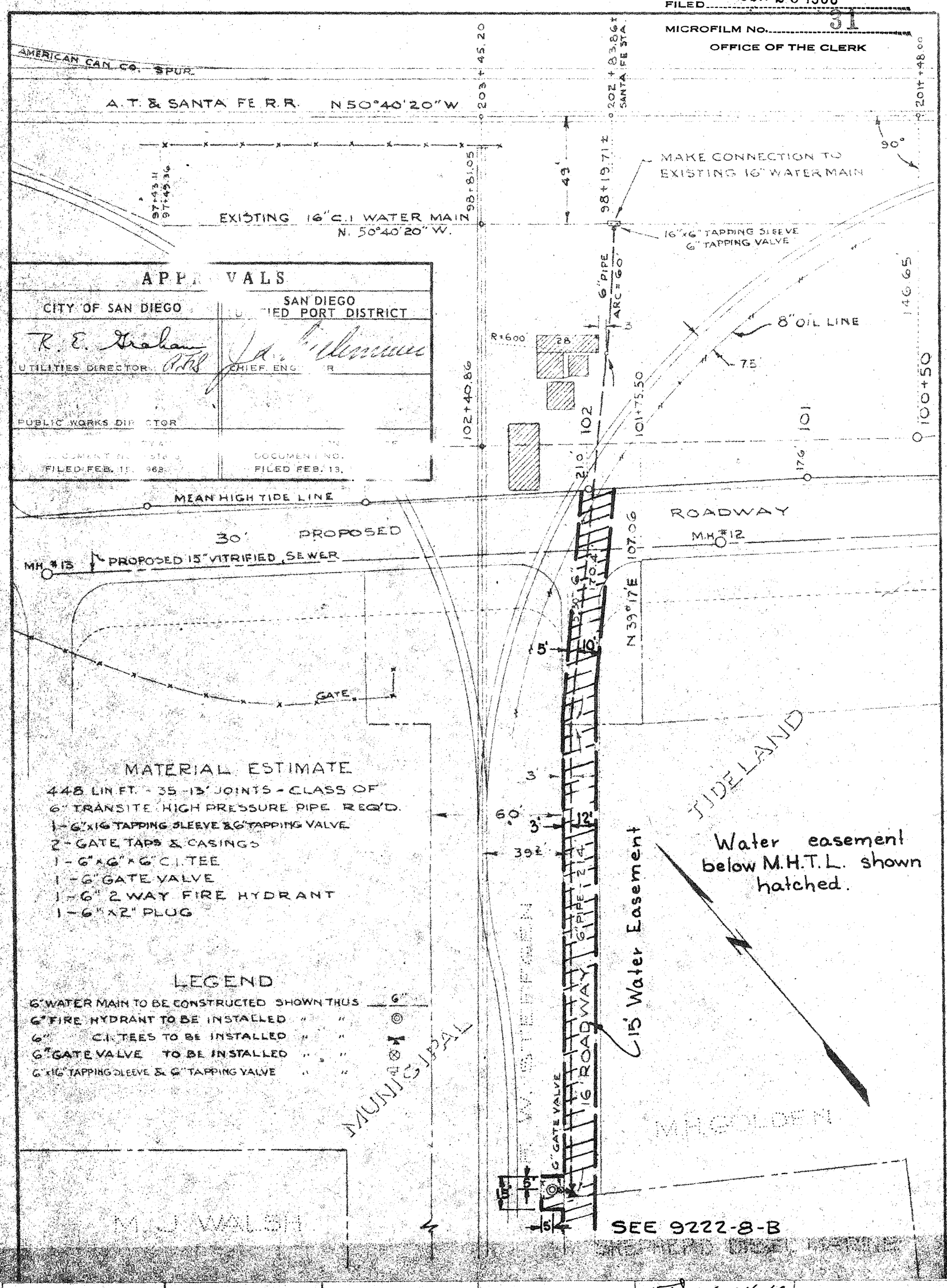

PLANNING	RECORDS ENGR	CONTROL ENGR.	OFFICE ENGR.
		O.T.J. 6-24-68	

DRAWN BY J.A.
CHECKED BY
FIELD BOOKS 192-1723
SCALE 1" = 50'
W.O. 17430

CITY OF SAN DIEGO - ENGINEERING DEPARTMENT
WATER EASEMENT
1127'± N.Wly. from foot of Sampson St. below M.H.T.L.
TIDELANDS

DATE 6-24-68
CITY ENGINEER
SHEET 7 OF 11
9222-7-B

HARBOR No 178-MB, Sht. 1 of 2

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM No. 31
OFFICE OF THE CLERK

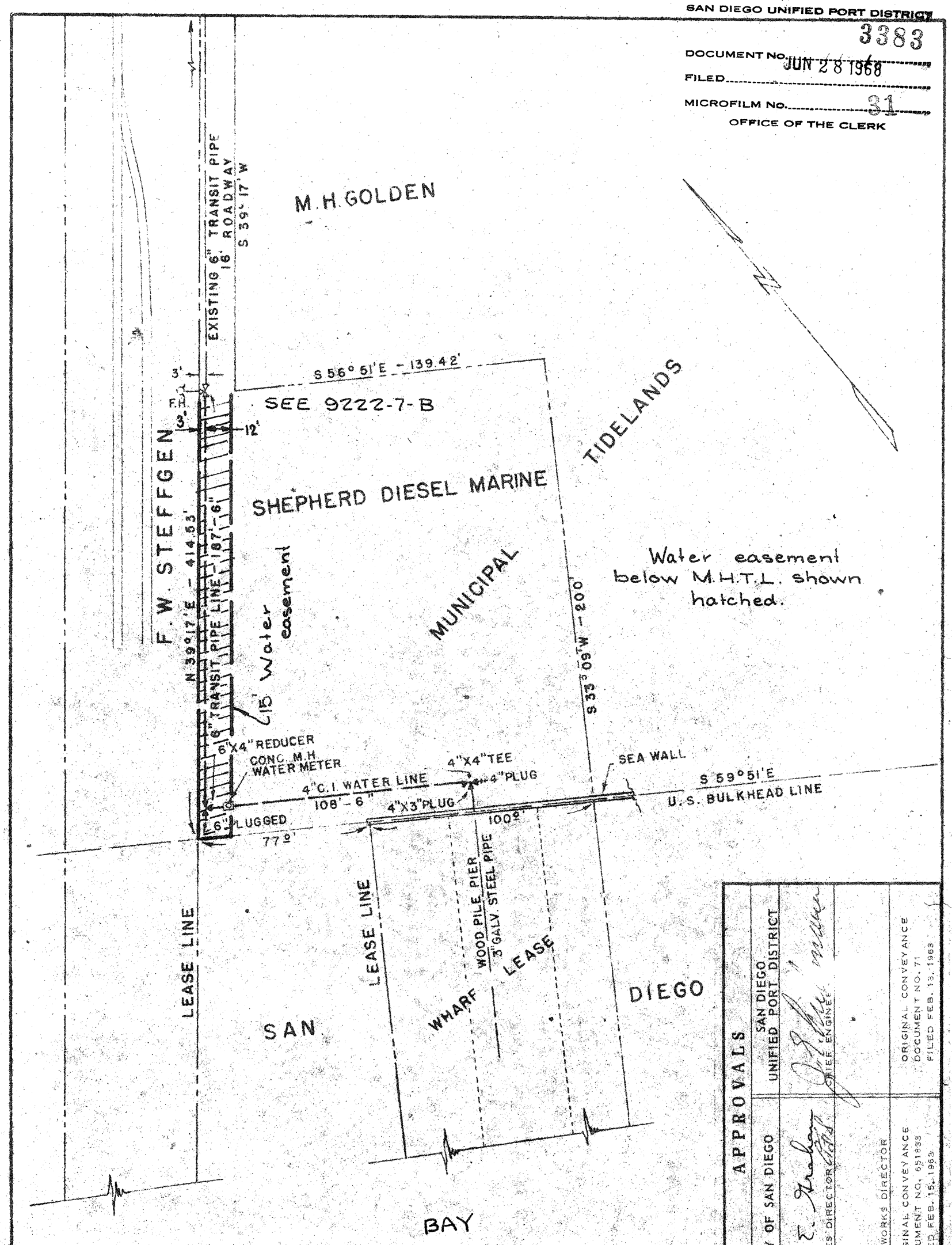

APPROVALS

CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
UTILITIES DIRECTOR	CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 651833 FILED FEB. 15, 1963	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 13, 1963

NOTE: INSTALLATION SOUTH OF FIRE PLUG MADE BY SHEPHERD DIESEL MARINE

SHEET 1 OF 2 SHEETS

PLANNING	RECORDS ENGR.	CONTROL ENGR.	OFFICE ENGR.
		O.T.J. 6-24-68	

DRAWN BY J.A
CHECKED BY
FIELD BOOKS 192-1723
SCALE 1" = 80'
W.O. 17430

CITY OF SAN DIEGO - ENGINEERING DEPARTMENT

WATER EASEMENT

1127'± N.Wly. from foot of Sampson St. below M.H.T.L.

DATE 6-24-68
CITY ENGINEER
SHEET 8 OF 11
9222-8-B

HARBOR No 178-MB, Sht. 1 of 2

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 31
OFFICE OF THE CLERK

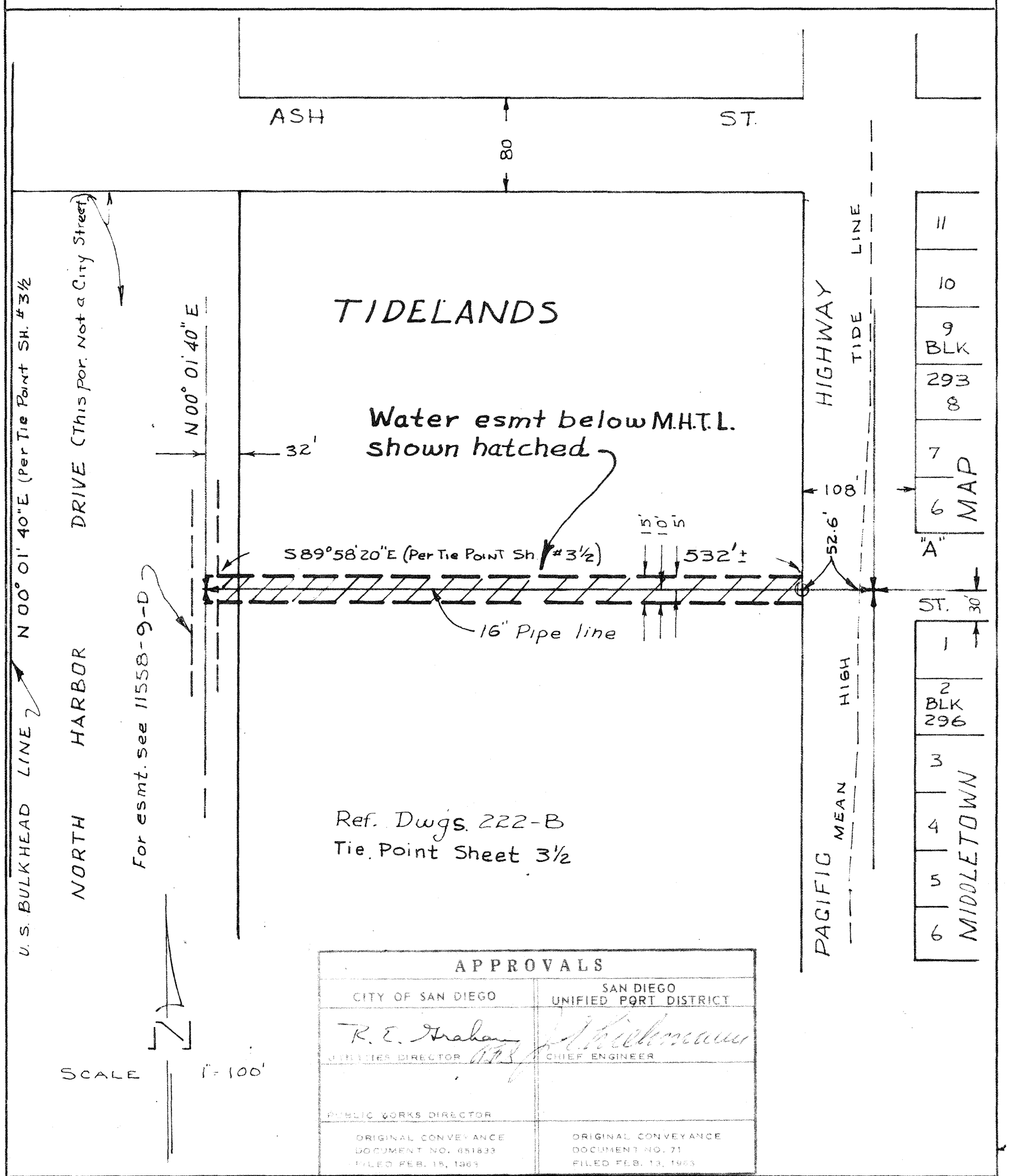

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R. E. Graham	J. Kuhlmann
UTILITIES DIRECTOR	CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 651833 FILED FEB. 15, 1963	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 13, 1963

PLANNING	RECORDS ENGR.	CONTROL ENGR.	OFFICE ENGR.
		6-24-68	

DRAWN BY R.G.J.
CHECKED BY
FIELD BOOKS
INDEX 202-1715
SCALE 1" = 100'
W.O. 17430

CITY OF SAN DIEGO - ENGINEERING DEPARTMENT

WATER ESMT. - Wly of "A" St. below M.H.T.L. bet. Pacific Hwy. & North Harbor Dr.

DATE
CITY ENGINEER
SHEET 9 OF 11
9222-9-B

SAN DIEGO UNIFIED PORT DISTRICT

DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 31
OFFICE OF THE CLERK

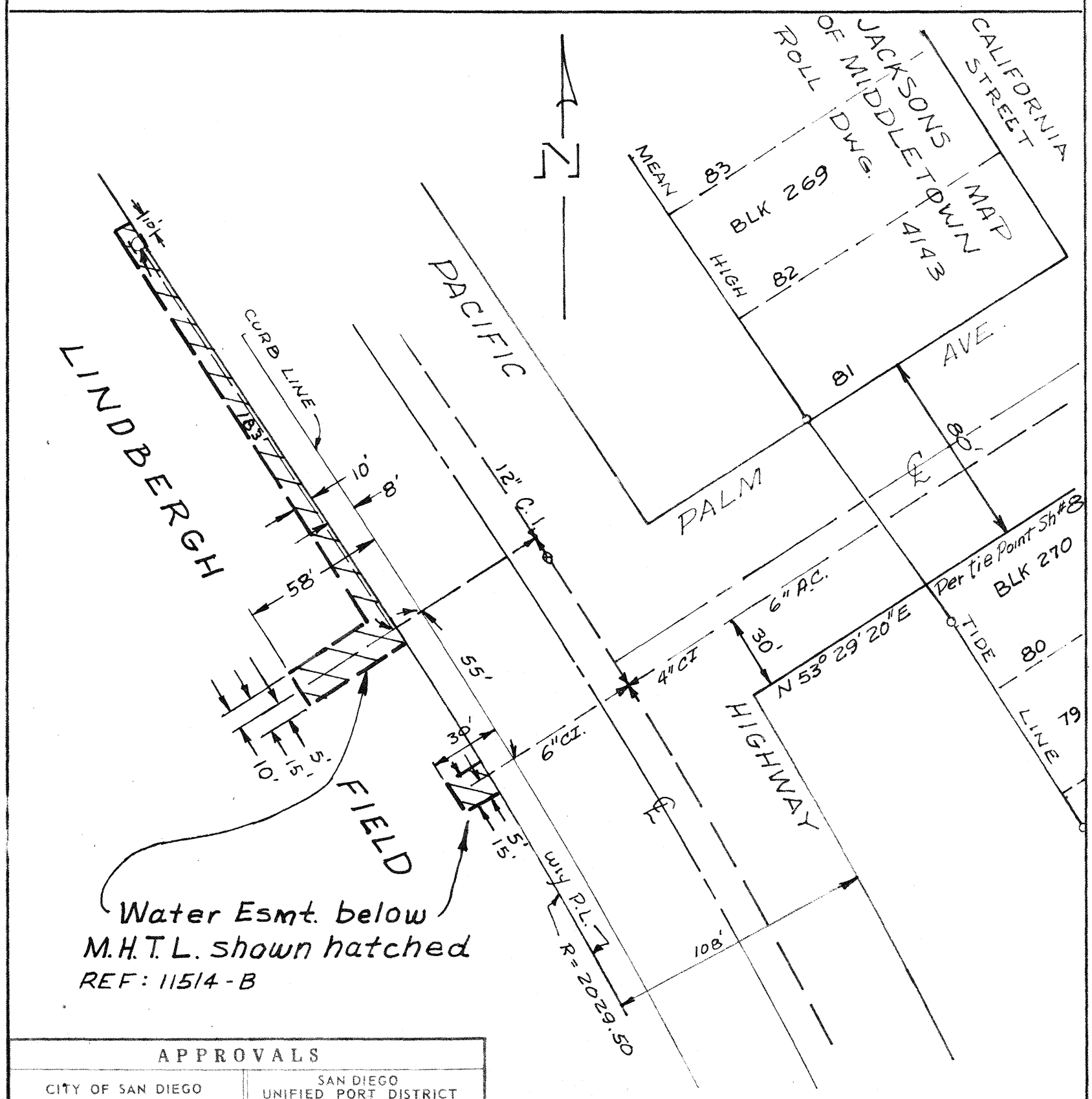

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R. E. Graham UTILITIES DIRECTOR	J. S. Kuhlemeier CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 651833 FILED FEB. 13, 1963	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 13, 1963

		PLANNING	RECORDS ENGR.	CONTROL ENGR.	OFFICE ENGR.
				O.T.J. 6-24-68	

DRAWN BY R.C.J.
CHECKED BY
FIELD BOOKS 206-1715
SCALE 1" = 50'
W.O. 17430

CITY OF SAN DIEGO - ENGINEERING DEPARTMENT

WATER EASEMENT - wly of Pacific Hwy at Palm Ave. in TIDELANDS

DATE
CITY ENGINEER

SHEET 10 OF 11
9222-10-B

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 31
OFFICE OF THE CLERK

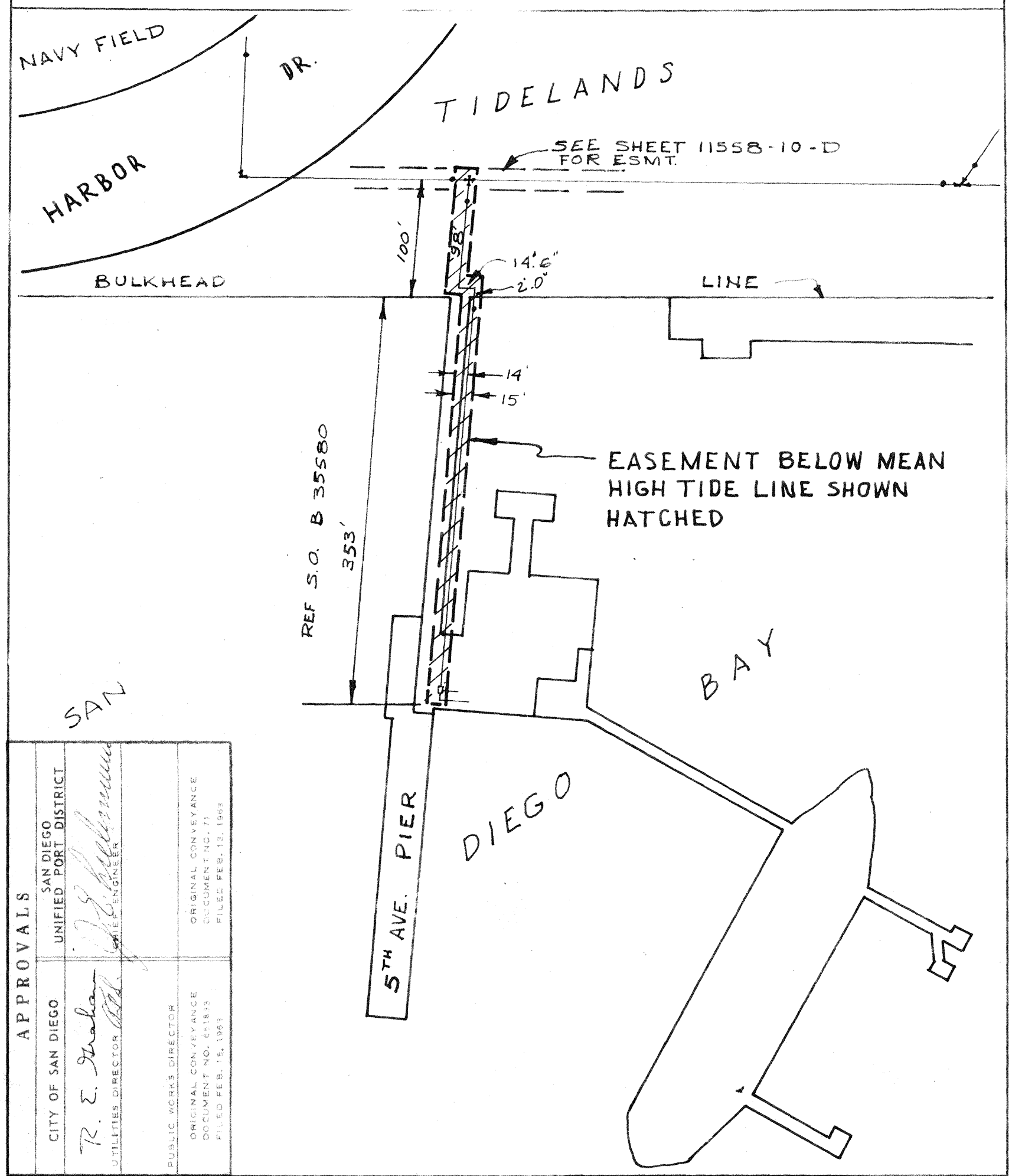

APPROVALS

CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R. E. Graham UTILITIES DIRECTOR	CHIEF ENGINEER
PUBLIC WORKS DIRECTOR ORIGINAL CONVEYANCE DOCUMENT NO. 651832 FILED FEB. 15, 1962	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 13, 1963

PLANNING	RECORDS ENGR.	CONTROL ENGR.	OFFICE ENGR.
		6-24-68	

DRAWN BY BCd
CHECKED BY
FIELD BOOKS 196-17/9
SCALE 1" = 100'
W.O. 17430

CITY OF SAN DIEGO - ENGINEERING DEPARTMENT

WATER EASEMENT- ON 5TH AVE PIER BELOW MEAN HIGH TIDE LINE TIDELANDS

DATE 6-20-68
CITY ENGINEER
SHEET 11 OF 11
9222-11-3

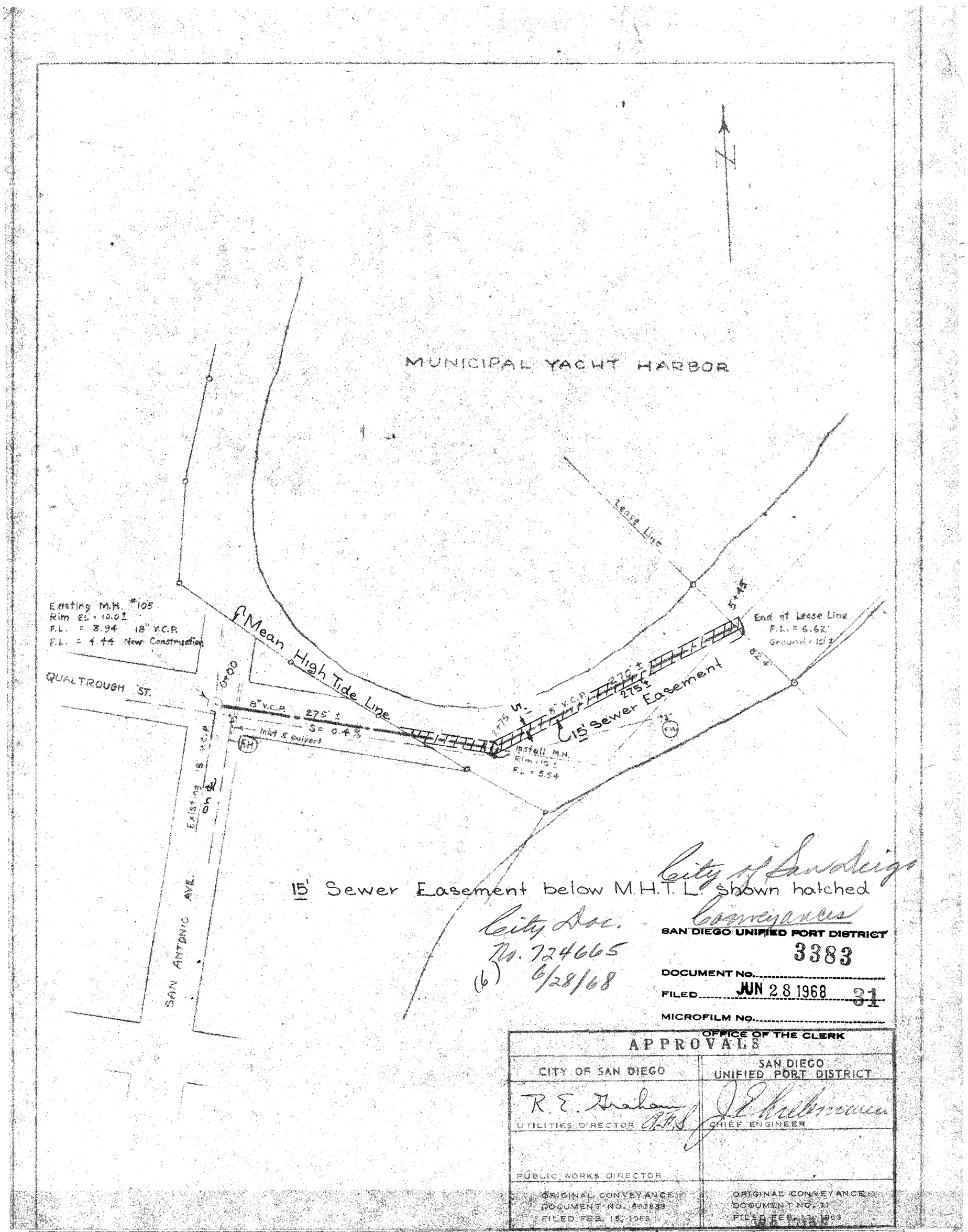
N
MUNICIPAL YACHT HARBOR
Lease Line
Existing M.H. #105
Rim El. = 10.0±
F.L. = 3.94 18" V.C.P.
F.L. = 4.44 New Construction
Mean High Tide Line
QUALTROUGH ST.
0+00
8" V.C.P. 275'±
S = 0.4%
Inlet & outlets
F.H.
Existing 18" V.C.P.
SAN ANTONIO AVE.
1+75 ±
8" V.C.P. 270'±
275'±
15' Sewer Easement
Install M.H.
Rim = 10'±
F.L. = 5.54
3+45
End at Lease Line
F.L. = 6.62'
Ground = 10'±
6+20
15' Sewer Easement below M.H.T.L. shown hatched
City Doc.
No. 724665
(6) 6/28/68
City of San Diego
Conveyances
SAN DIEGO UNIFIED PORT DISTRICT
3383
DOCUMENT No.
FILED JUN 28 1968 31
MICROFILM No.
OFFICE OF THE CLERK
APPROVALS
CITY OF SAN DIEGO
SAN DIEGO UNIFIED PORT DISTRICT
R. E. Graham
UTILITIES DIRECTOR
J. Kaltenmeier
CHIEF ENGINEER
PUBLIC WORKS DIRECTOR
ORIGINAL CONVEYANCE
DOCUMENT NO. 661833
FILED FEB. 15, 1968
ORIGINAL CONVEYANCE
DOCUMENT NO. 11
FILED FEB. 15, 1963
PLANNING
RECORDS ENGR.
O.T.J. 6-24-68
CONTROL ENGR.
OFFICE ENGR.
DRAWN BY J.P. RAF
CHECKED BY
FIELD BOOKS 200-1697
SCALE 1" = 100'
W.O. 17430
CITY OF SAN DIEGO - ENGINEERING DEPARTMENT
SEWER EASEMENT
Qualtrough St. below M.H.T.L.
TIDELANDS
DATE 6/24/68
CITY ENGINEER
SHEET 1 OF 6
9221-1-B
HARBOR No 296-MB

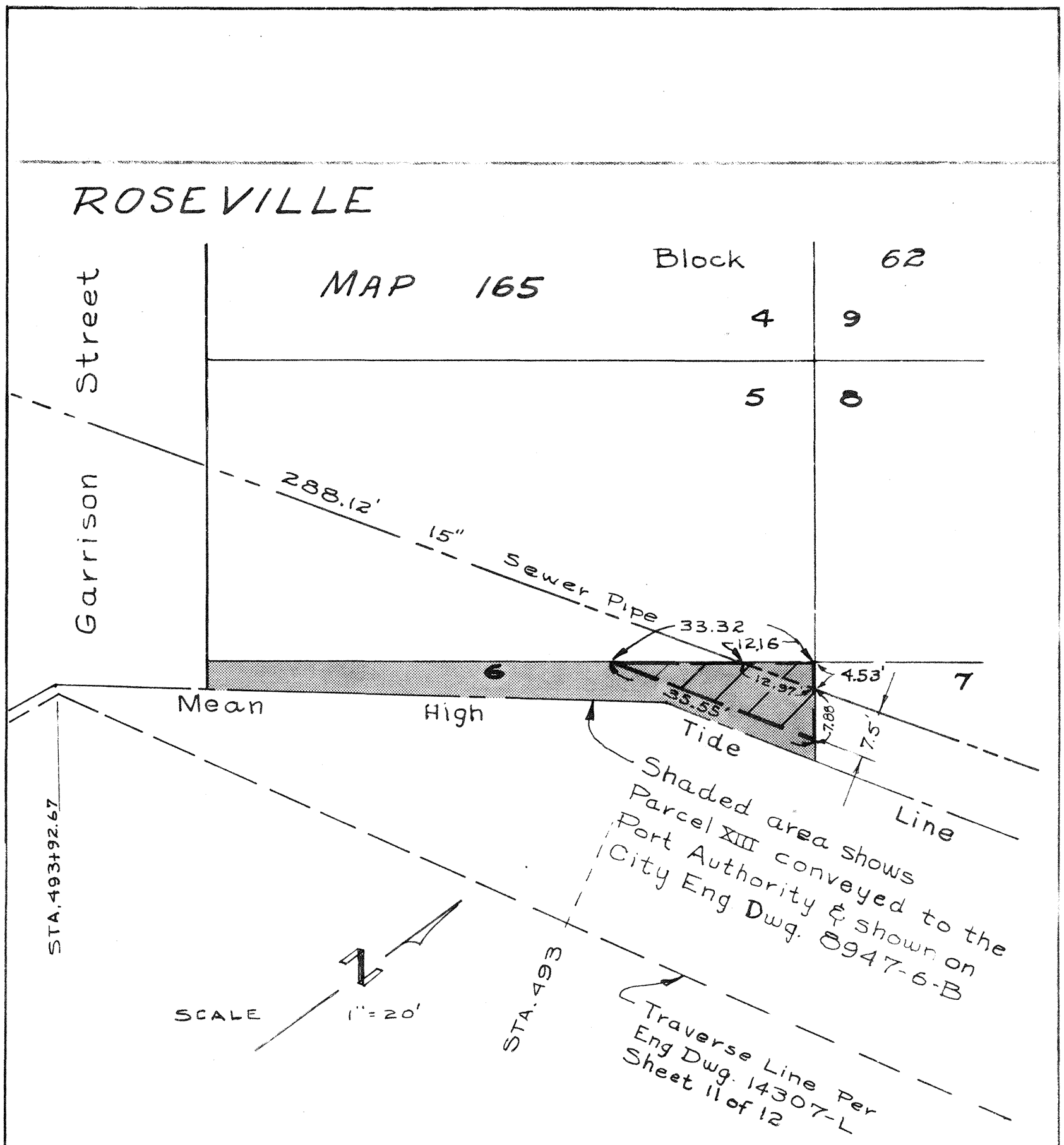

Sewer Esmt. Shown hatched thus

APPROVALS

CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R. E. Hudson	

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 31
OFFICE OF THE CLERK

6-24-68

R.C.D.
C. INDEX 204-1699
1" = 20'
W.O. 17430

CITY OF SAN DIEGO - ENGINEERING DEPARTMENT
Sewer Easement, in lot 6
Block 62 of Roseville Map 165

SHEET 2 OF 6
9221-2-B

APPROVALS

CITY OF SAN DIEGO
UTILITIES DIRECTOR
FILED FEB. 15, 19

SAN DIEGO UNIFIED PORT DISTRICT
CHIEF ENGINEER

PUBLIC WORKS DIRECTOR

ORIGINAL CONVEYANCE DOCUMENT NO. 6
FILED FEB. 15, 1963

ORIGINAL CONVEYANCE DOCUMENT NO. 11
FILED FEB. 1 1963

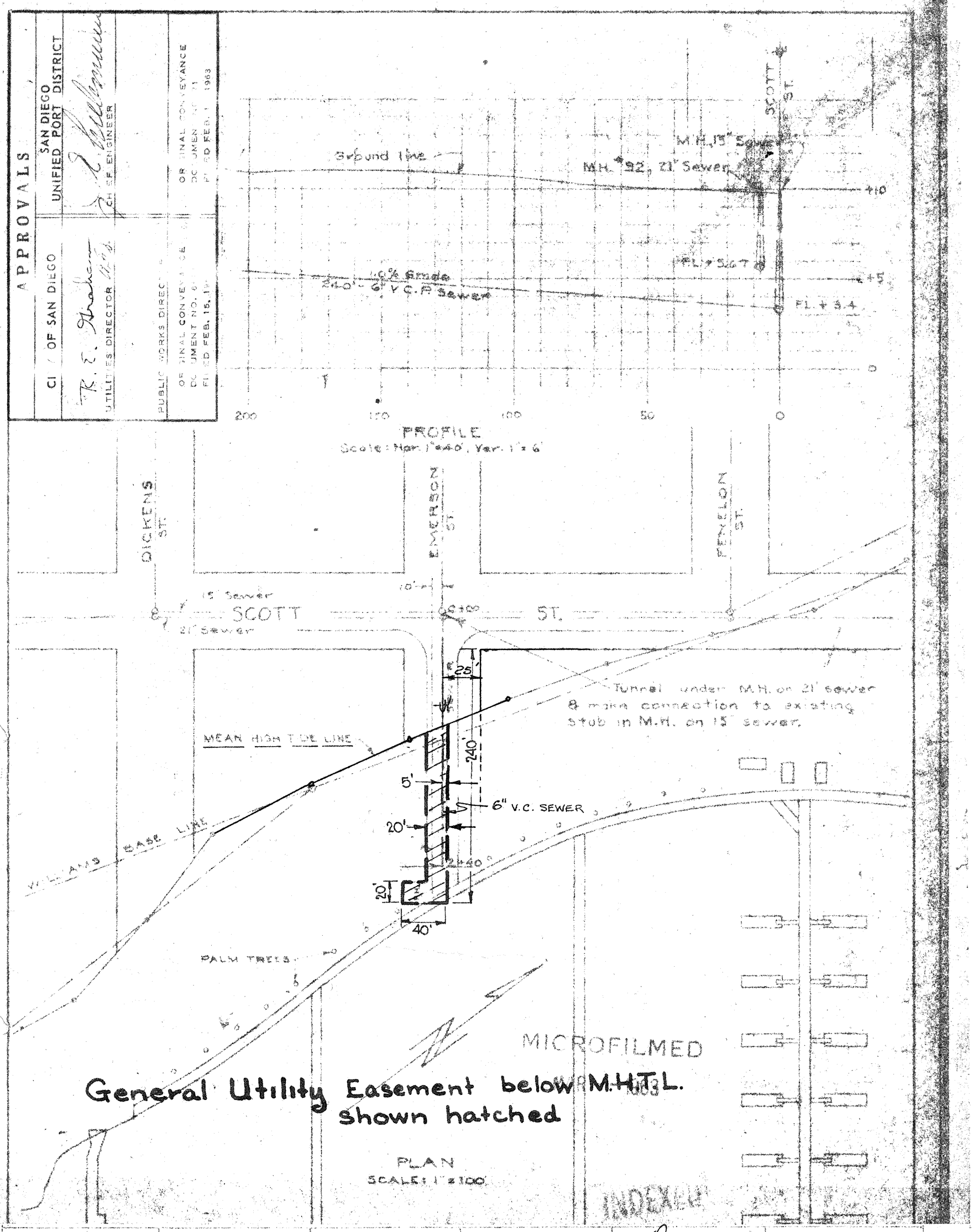

		PLANNING	RECORDS ENGR	O.J. 6-24-68 CONTROL ENGR	OFFICE ENGR

DRAWN BY J.A.
CHECKED BY
FIELD BOOKS 204-1699
SCALE AS SHOWN
W.O. 17430

CITY OF SAN DIEGO - ENGINEERING DEPARTMENT

SEWER EASEMENT
Ext. Emerson St. below M.H.T.L

TIDELANDS

DATE 6-24-68
CITY ENGINEER
SHEET 3 OF 6
9221-3-B

HARBOR No. 271-MB-1

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 31
OFFICE OF THE CLERK

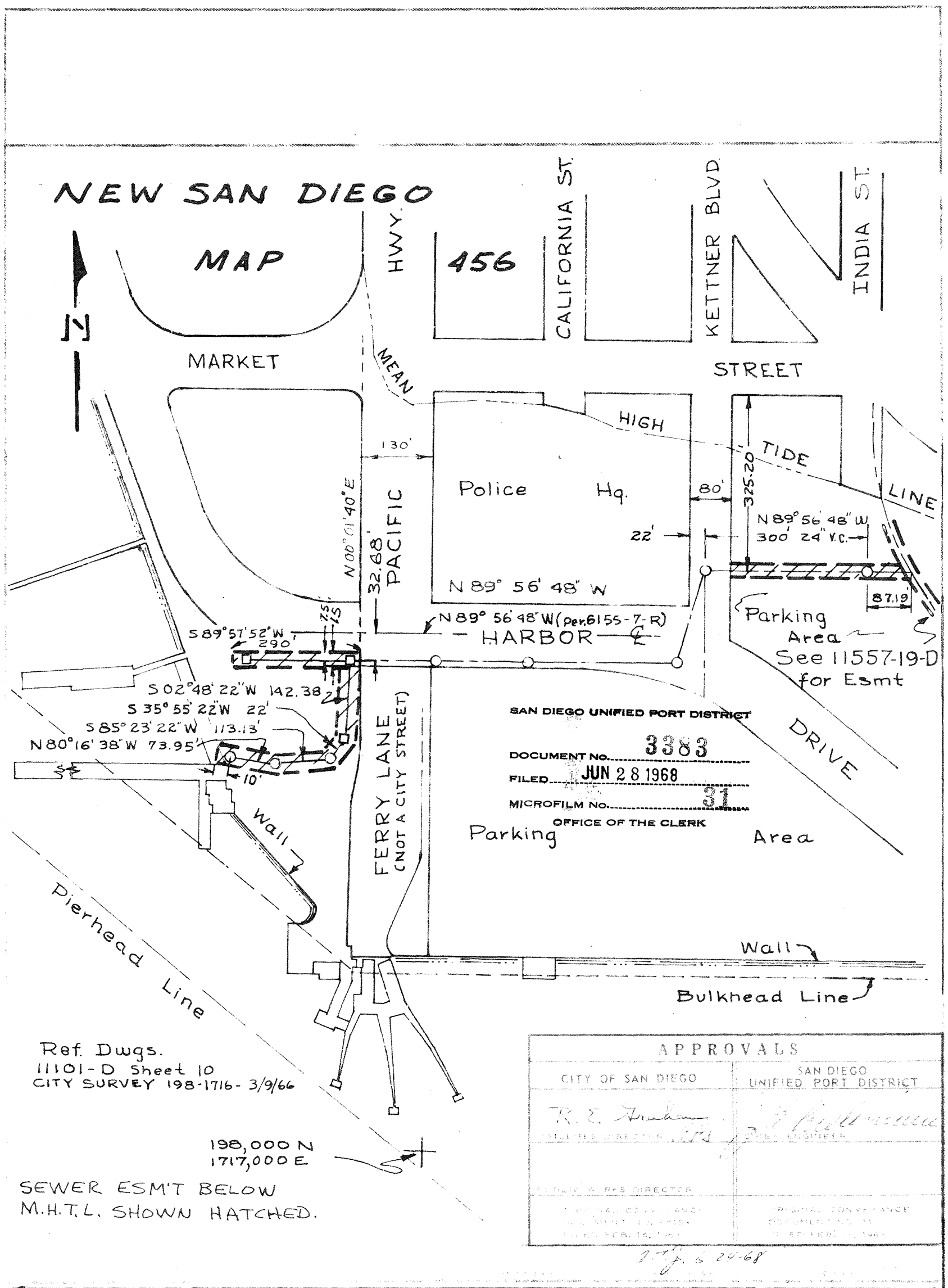
NEW SAN DIEGO
MAP
456
HWY.
CALIFORNIA ST.
KETTNER BLVD.
INDIA ST.
N
MARKET
STREET
MEAN
HIGH
TIDE
LINE
130'
Police
Hq.
80'
325.20
N 89° 56' 48" W
300' 24" V.C.
22'
N 00° 01' 40" E
32.68'
PACIFIC
N 89° 56' 48" W
87.19'
N 89° 56' 48" W (Per. 6155-7-R)
HARBOR
S 89° 57' 52" W
290'
Parking
Area
See 11557-19-D
for Esmt
S 02° 48' 22" W 142.38'
S 35° 55' 22" W 22'
S 85° 23' 22" W 113.13'
N 80° 16' 38" W 73.95'
10'
DRIVE
FERRY LANE
(NOT A CITY STREET)
Wall
Parking
Area
Pierhead Line
Wall
Bulkhead Line
Ref. Dwgs.
11101-D Sheet 10
CITY SURVEY 198-1716- 3/9/66
198,000 N
1717,000 E
SEWER ESM'T BELOW
M.H.T.L. SHOWN HATCHED.
APPROVALS
CITY OF SAN DIEGO
SAN DIEGO UNIFIED PORT DISTRICT
PUBLIC WORKS DIRECTOR
PORT ENGINEER
SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 31
OFFICE OF THE CLERK
C. INDEX 198-1717
1" = 200'
17430
Sewer Esmt Sly of Harbor Drive
& Wly of Ferry Lane. Also S.E'ly of
Kettner & Market Sts.
SHEET 4 OF 6
9221-4-

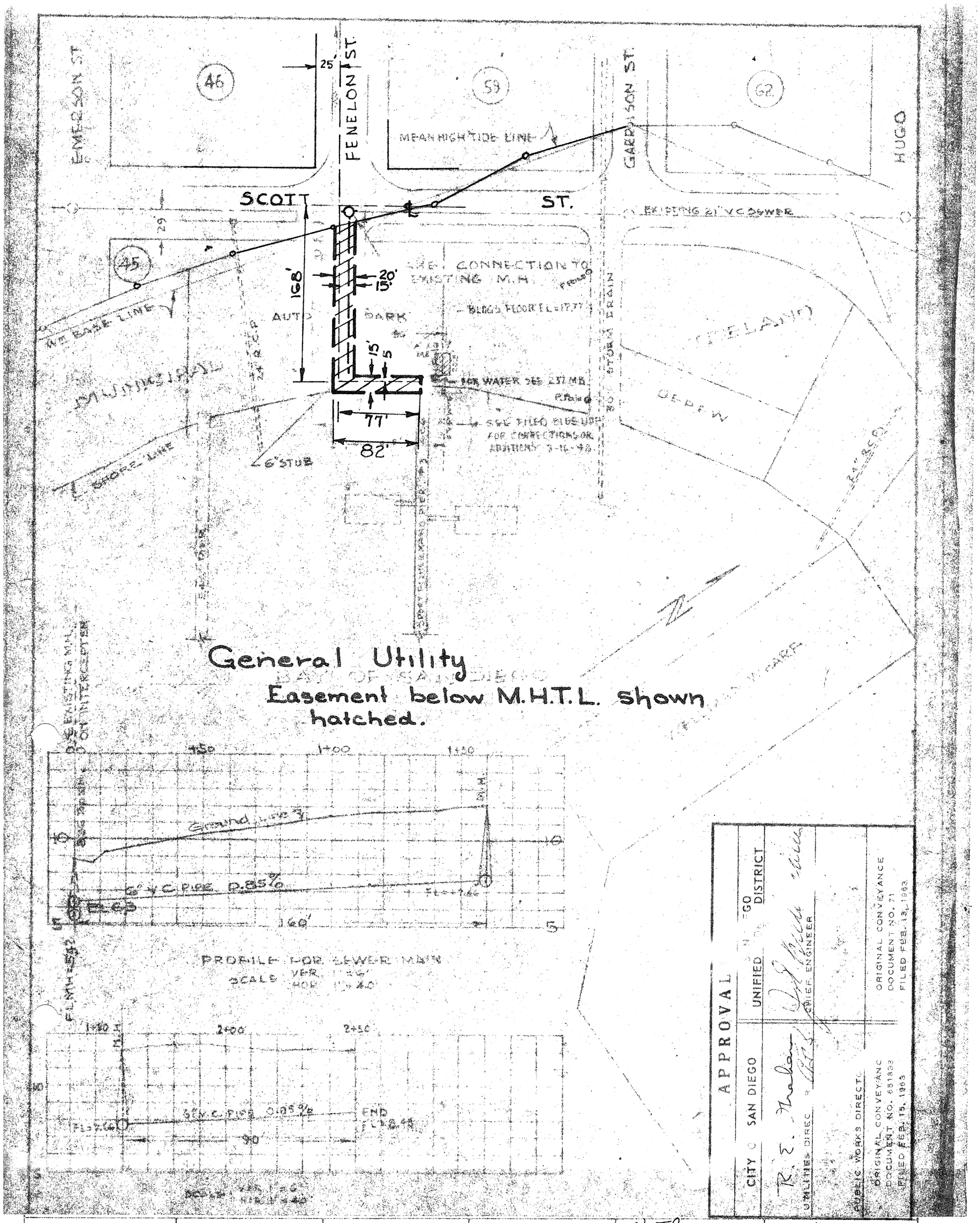

		PLANNING	RECORDS ENGR.	CONTROL ENGR. O.T.J. 6-24-68	OFFICE ENGR.

DRAWN BY J.A.
CHECKED BY
FIELD BOOKS 204-1699
SCALE 1" = 100'
W.O. 17430

CITY OF SAN DIEGO - ENGINEERING DEPARTMENT
SEWER EASEMENT
Ext. Fenelon St below M.H.T.L.
TIDELANDS

DATE 6-21-68
CITY ENGINEER
SHEET 5 OF 6
9221-5-B

HARBOR No 229-MB

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 31
OFFICE OF THE CLERK

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R. E. Graham UTILITIES DIRECTOR	J. Schuchmann CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 651-838 FILED FEB. 15, 1963	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 13, 1963

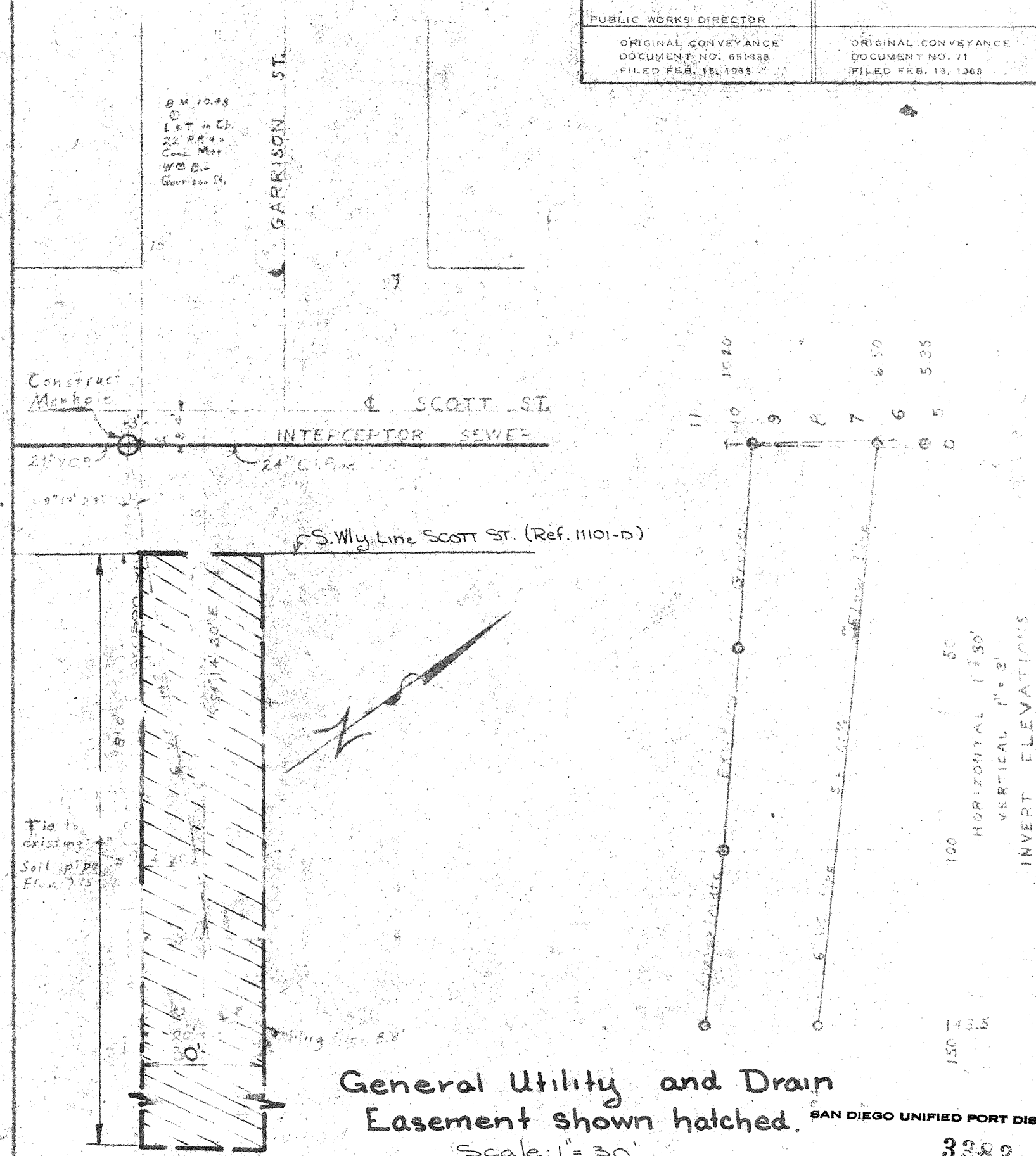

General Utility and Drain Easement shown hatched.

Scale: 1" = 30'

MANHOLE TO BE PLACED AT JUNCTION OF 24" C.I. PIPE & 21" V.C. PIPE
ELEVATION OF TOP OF MH = 10.20

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 31
OFFICE OF THE CLERK

		PLANNING	RECORDS ENGR.	CONTROL ENGR. O.T.J. 6-24-68	OFFICE ENGR.

DRAWN BY J.A.
CHECKED BY
FIELD BOOKS 204-1699
SCALE 1" = 30'
W.O. 17430

CITY OF SAN DIEGO - ENGINEERING DEPARTMENT
SEWER EASEMENT
Ext. Garrison St. below M.H.T.L.
TIDELANDS

DATE 6-24-68
J. Schuchmann
CITY ENGINEER
SHEET 6 OF 6
9221-6-8

HARPER NO. 256-MB

City of San Diego
Conveyance

City Doc No.
724665
6/28/68
(23)

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 21
OFFICE OF THE CLERK

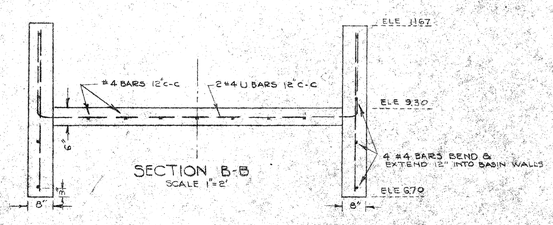

SECTION B-B
SCALE 1"=2'

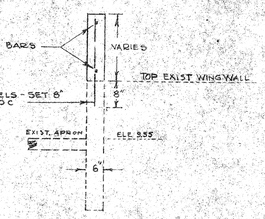

SECTION A-A
SCALE 1"=2'

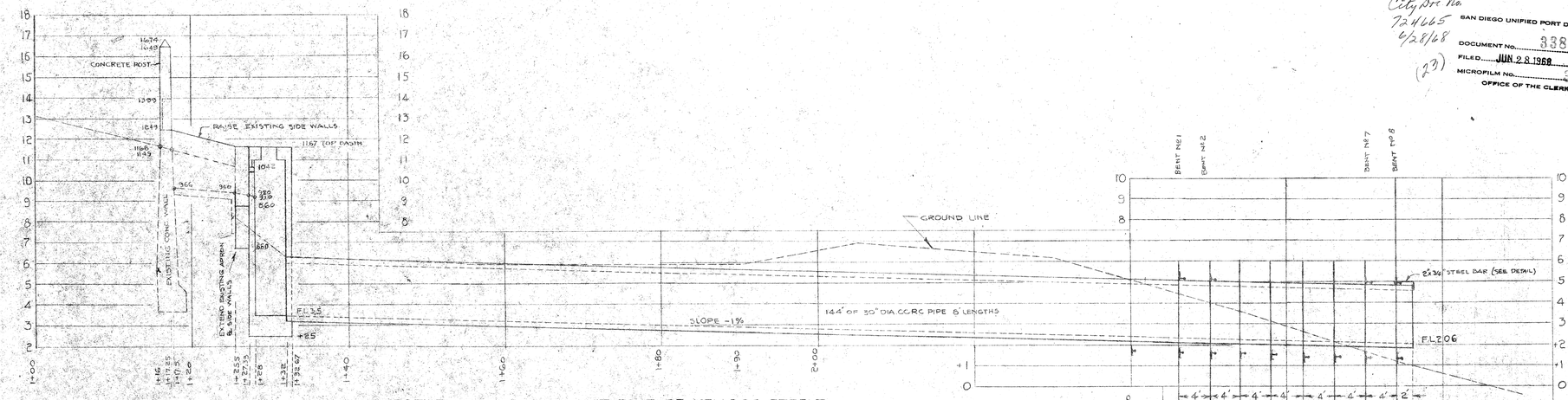

PROFILE OF STORM DRAIN AT FOOT OF KELLOGG STREET
SCALE HORIZ 1"=8'
VERT 1"=3'

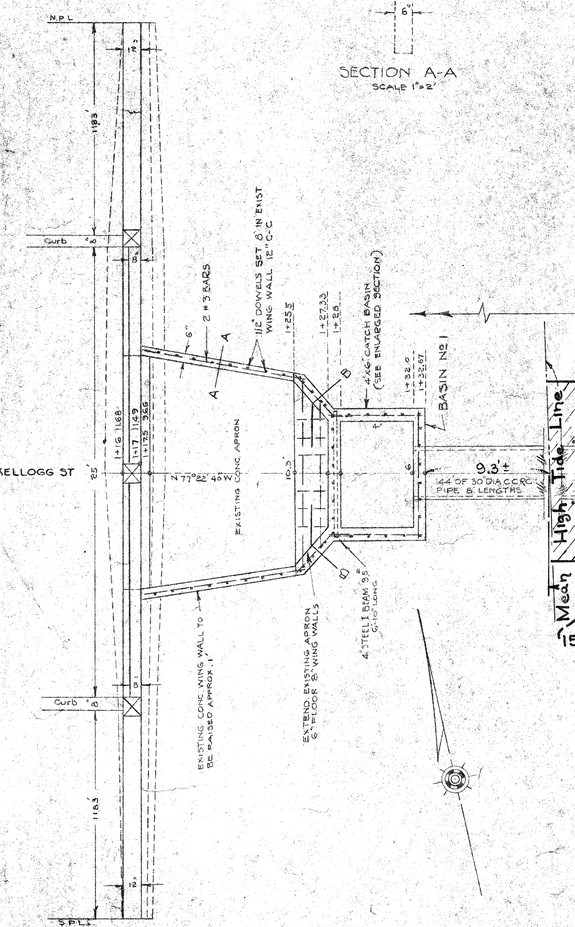

PLAN OF STORM DRAIN AT FOOT OF KELLOGG ST.
'15' Drainage Easement below M.H.T.L. shown hatched
(KELLOGG ST.)

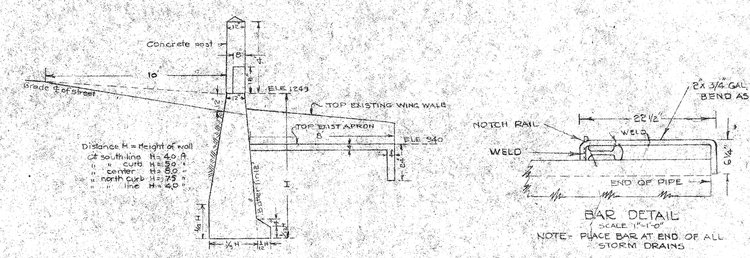

SECTION OF EXISTING CONCRETE WALL ON KELLOGG ST
SCALE 1"=4'-0"

BAR DETAIL
SCALE 1"=1'-0"
NOTE- PLACE BAR AT END OF ALL STORM DRAINS

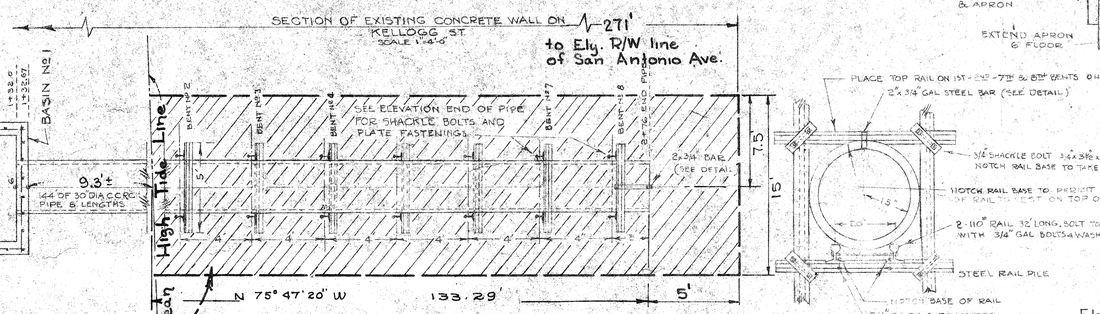

END ELEVATION OF PIPE
SCALE 1"=2'-0"

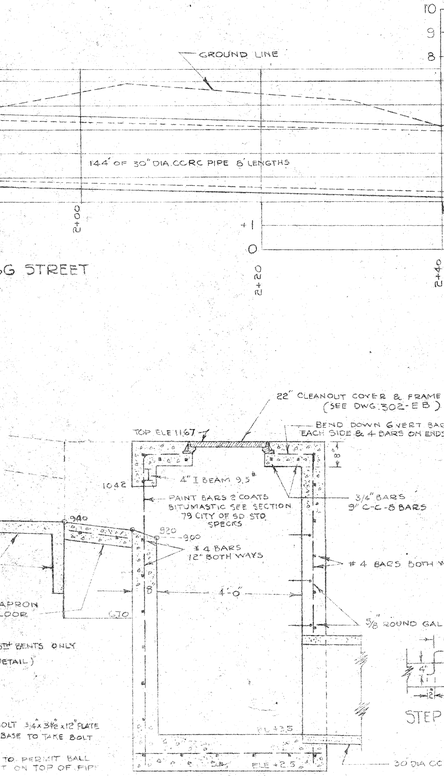

SECTION ON ℄ BASIN No 1
SCALE 1"=2'-0"

STEP DETAIL

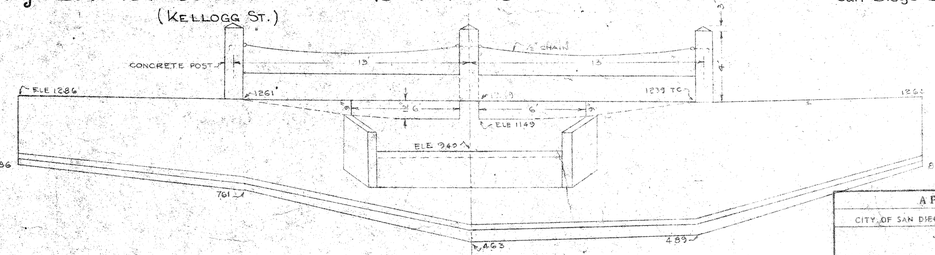

FRONT ELEVATION OF EXISTING WALL ON KELLOGG STREET
SCALE 1"=4'-0"

Elevations shown hereon are in feet and decimals of foot and are above or below mean lower low water or zero datum established for the Bay of San Diego by the U.S.C. & G. Survey.

WORK TO BE DONE

The improvement consists of the following work to be done according to these plans and the specifications prepared therefor by the Harbor Engineer of the City of San Diego. The construction of concrete box waterway, catch basin & 72 lin. ft. of 24" dia. c.c.r.c. pipe storm drain at the foot of McCall Street, The construction of wing walls, catch basin and 144 lin. ft. of 30" dia. c.c.r.c. pipe storm drain at the foot of Kellogg Street, The construction of Catch Basins approximately 23 lin. ft. of 18" dia. c.c.r.c. pipe and 72 lin. ft. of 24" dia. c.c.r.c. pipe storm drain at the foot of Owen Street including all other work appurtenant thereto.

DRAINAGE EASEMENT

Foot of Kellogg St. below M.H.T.L.
City Standard Dwg. No 302-E.B. accompanies these plans.

TIDELANDS

APPROVALS

CITY OF SAN DIEGO
UTILITIES DIRECTOR
PUBLIC WORKS DIRECTOR
ORIGINAL CONVEYANCE DOCUMENT NO. 681833 FILED FEB. 15, 1963

SAN DIEGO UNIFIED PORT DISTRICT
CHIEF ENGINEER
ORIGINAL CONVEYANCE DOCUMENT NO. 74 FILED FEB. 12, 1963

CITY OF SAN DIEGO ENGINEERING DEPARTMENT	SHEET 1 OF 23 SHEETS		W.O. No 17430
PLAN REVISION: CHANGE / BY / DATE / APPROVAL	CITY ENGINEER E. F. Gardner 6/24/68 DATE		OFFICE ENGINEER
	WATER DEPT	SEWERAGE	SUPERVISOR
	PLANNING DEPT	DRAINAGE	CHECKED
CONSTRUCTION RECORD	ELECTRICAL	HIGHWAY	DESIGNED J. Allen
DATE STARTED / DATE COMPLETED	STRUCTURAL	GRADES	11556-1-D
CONTR / INSP.	TRAFFIC	CONTROL 6-24-68	
FIELD BOOK 198 - 1695			

HARBOR No 440-D, SHT 1.

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 31
OFFICE OF THE CLERK

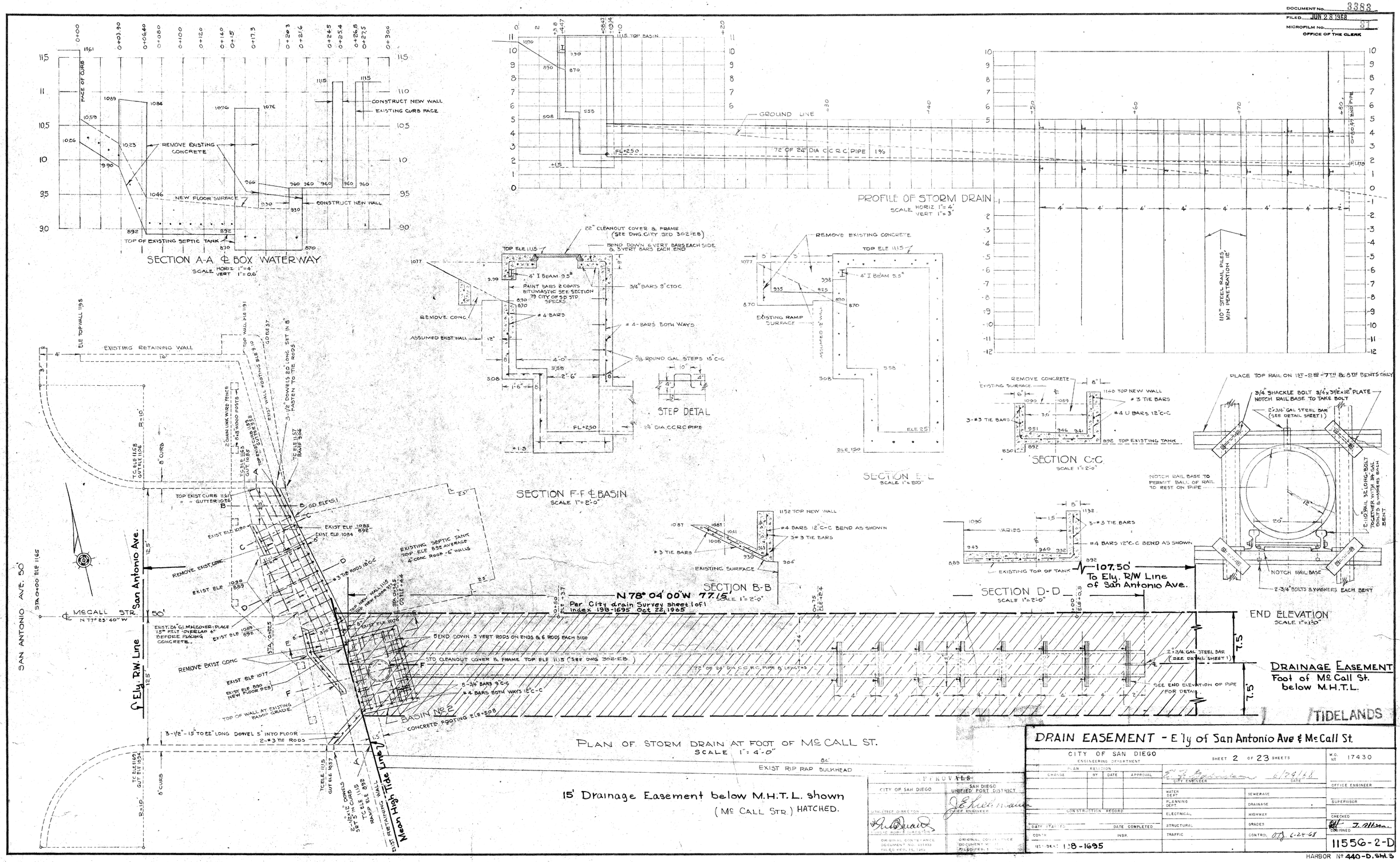

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 51
OFFICE OF THE CLERK

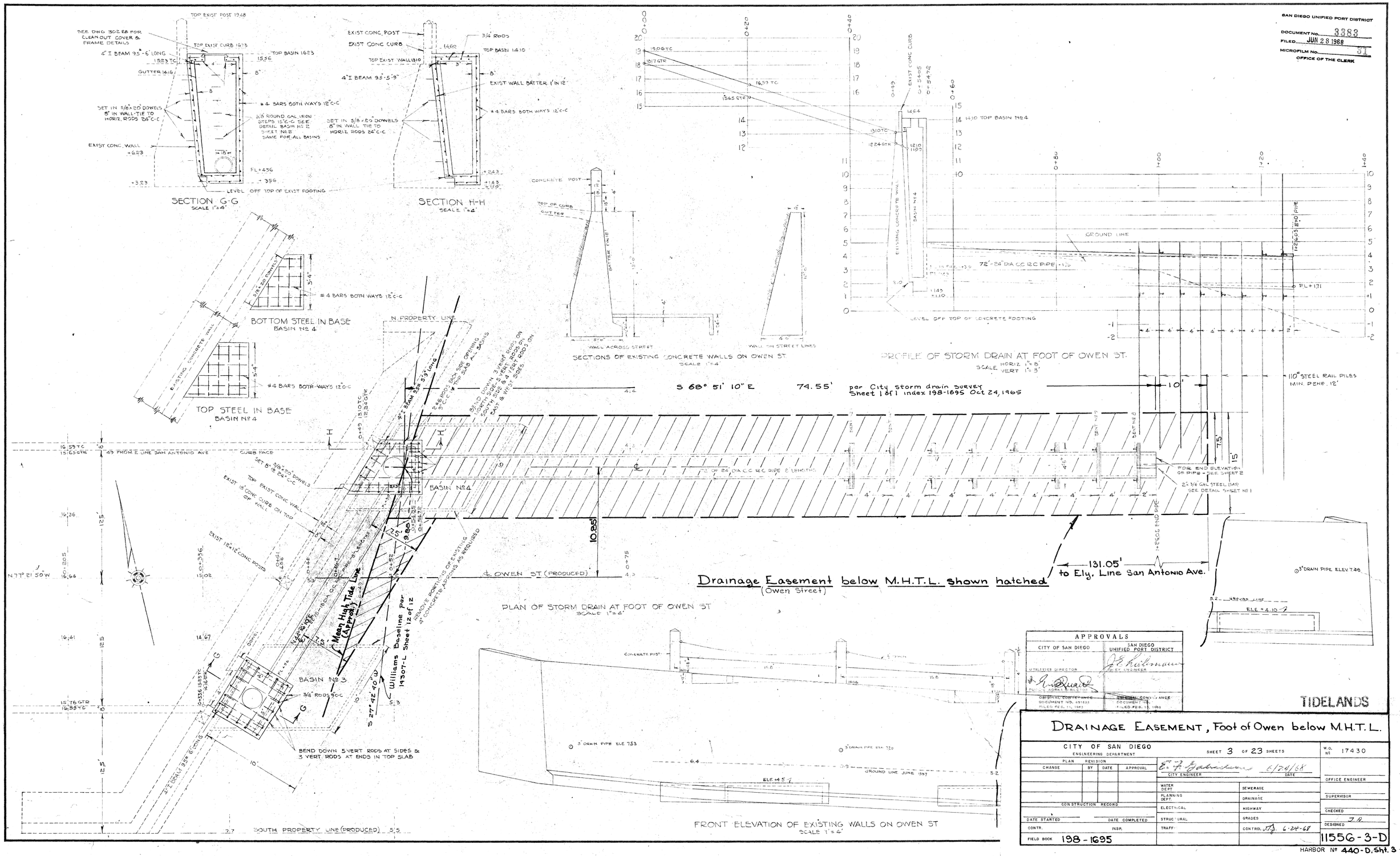

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
UTILITIES DIRECTOR	CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 451833 FILED FEB. 11, 1963	SUPPLEMENTAL CONVEYANCE DOCUMENT NO. FILED FEB. 13, 1963

DRAINAGE EASEMENT, Foot of Owen below M.H.T.L.

CITY OF SAN DIEGO
ENGINEERING DEPARTMENT

SHEET 3 OF 23 SHEETS

W.O. Nº 17430

PLAN REVISION			
CHANGE	BY	DATE	APPROVAL

CITY ENGINEER — DATE 6/24/68

OFFICE ENGINEER

WATER DEPT. — SEWERAGE
PLANNING DEPT. — DRAINAGE
ELECTRICAL — HIGHWAY
STRUCTURAL — GRADES
TRAFFIC — CONTROL

SUPERVISOR

CHECKED

DESIGNED J.A.

CONSTRUCTION RECORD
DATE STARTED — DATE COMPLETED
CONTR. — INSP.
FIELD BOOK 198-1695

11556-3-D

HARBOR Nº 440-D, Sht. 3

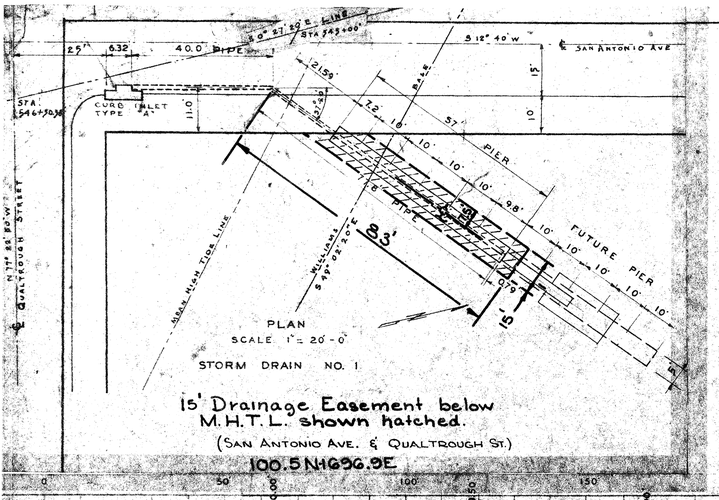

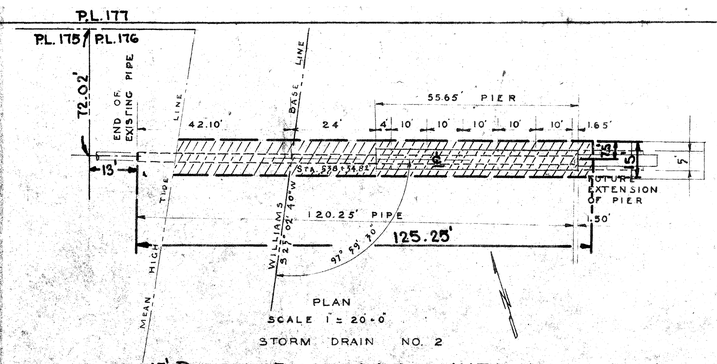

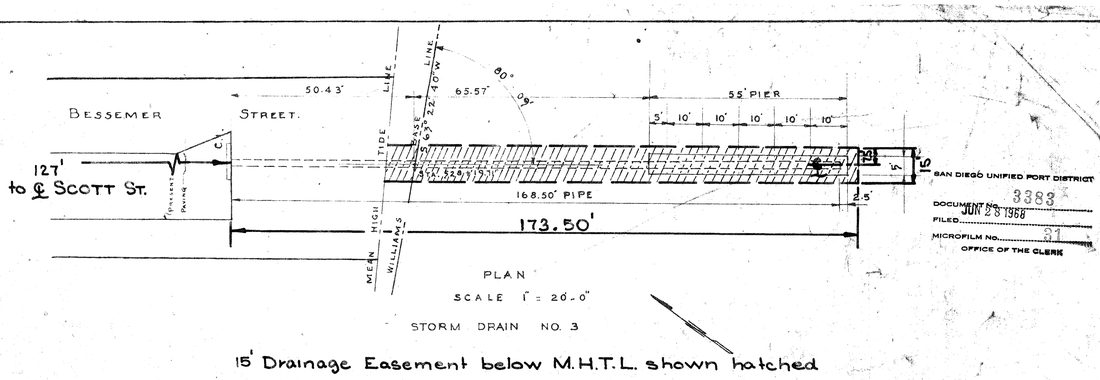

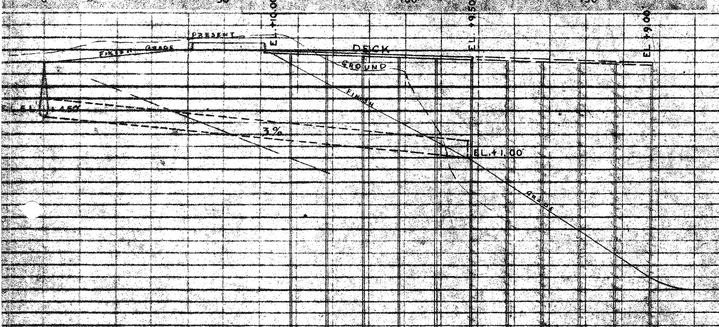

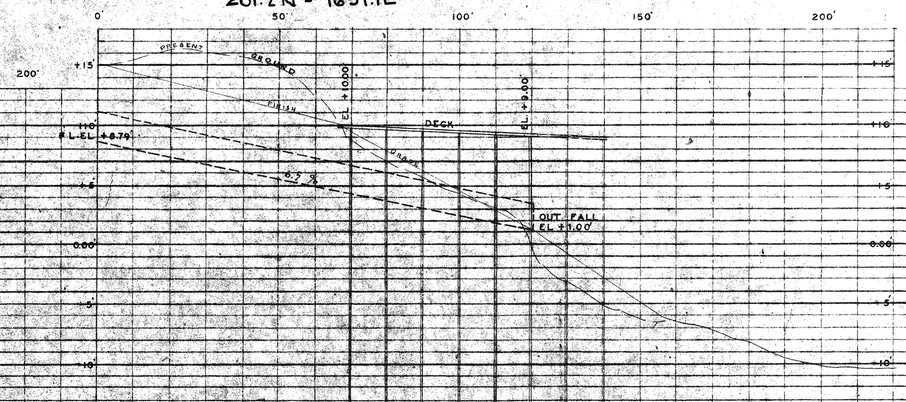

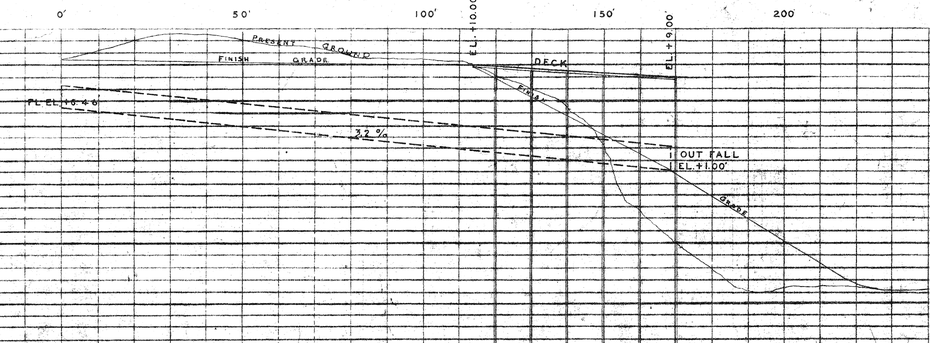

18" STORM DRAIN - QUALTROUGH STREET & SAN ANTONIO AVE.
SCALE HORIZONTAL 1" = 20'-0"
VERTICAL 1" = 6'-0"

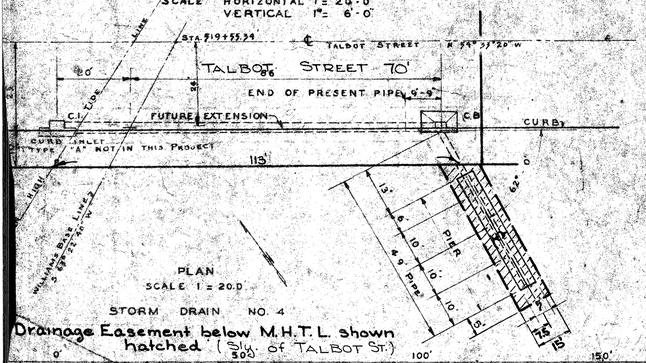

30" STORM DRAIN 421.60' NORTH OF ROGERS STREET MONUMENT.
SCALE HORIZONTAL 1" = 20'-0"
VERTICAL 1" = 6'-0"

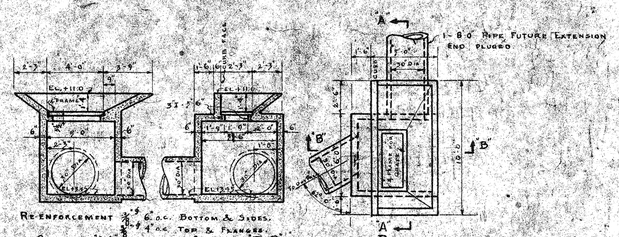

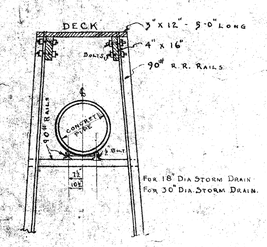

18" STORM DRAIN BESSEMER STREET
SCALE HORIZONTAL 1" = 20'-0"
VERTICAL 1" = 6'-0"

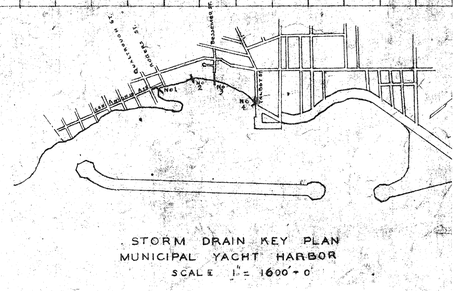

W.P.A. PROJECT # 9397 &
9873

DRAINAGE EASEMENTS
San Antonio Ave.
Bessemer St.
Talbot St. &
P.L. 176 below M.H.T.L.

TIDELANDS

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 4 OF 23 SHEETS

E. F. Quinlan 6/24/68

W.O. NO. 17430

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	JA		6-24-68	

APPROVALS
CITY OF SAN DIEGO
SAN DIEGO UNIFIED PORT DISTRICT
CHIEF ENGINEER
CHIEF ENGINEER-CITY
CHIEF ENGINEER-PORT DISTRICT
CHIEF ENGINEER-CITY
CHIEF ENGINEER-PORT DISTRICT
ORIGINAL CONVEYANCE DOCUMENT NO. 45-0-1-1-71
RE-ESTABLISHED 1-1-85

HARBOR No. 15-D-4

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

2881/1695
11556-4-D

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO.
OFFICE OF THE CLERK

15' Drainage Easement below M.H.T.L. shown hatched.

ADDISON ST
N 54° 15' 20" W
264.93'
Ref. 8752-1-B
Closed by Resol. 572 542, 3911-G2
CATCH BASIN
N54°15'20"W 185.5'
12" CONC. PIPE
CONCRETE PIT
EXISTING 12" PIPE
CATCH BASIN
43° 21' 42"
55'
122.7'
CONC. PIPE
N 10°53'38" W
ANCHORAGE LANE
HIGH SEAS TUNA PACKING COMPANY
75°45' 36"
N 54° 33' 50" W
120'
24" CONC. PIPE
47°54' 36"
85'
PROPOSED END OF FILL
LOKER SUB'D
Map № 5087
SHAFTER STREET
S 35° 45' 10" W
18" SEWER
S 63° 21' 40" W
BASE LINE
S 44° 26' 40" W
97.439'
N 63° 21' 40" W
S 44° 26' 40" W
105.008'
N 63° 33' 40" W
101.330'
S 63° 33' 55' 40" W
ADD APPROX. 10' V.C.P. TO MAKE CONNECTION WITH END OF EXISTING 10" V.C.P.
EXISTING 10" V.C.P.
32° 05' 24"
N 36° 39' 14" W
160'
24" CONC. PIPE
N 67° 14' 23" W
159.5'
12° 40' 33"
CAÑON STREET
N 54° 33' 50" W
4" C.I. WATER
6" C.I. WATER
8" V.C.P. SEWER
M.H. #3A
BM H #2
8" V.C.P. SEWER
4" C.I. TRANSITE WATER
S 63° 22' 40" W
Scale: None

APPROVALS

CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
UTILITIES DIRECTOR	PORT ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 69-1888 FILED FEB. 18, 1969	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 13, 1969

Drainage Easement below M.H.T.L.

(N.Wly and S.Ely. of Anchorage Lane)

TIDELANDS

CITY OF SAN DIEGO
ENGINEERING DEPARTMENT

SHEET 5 OF 23 SHEETS

W.O. № 17430

PLAN REVISION			
CHANGE	BY	DATE	APPROVAL

CITY ENGINEER — DATE 6/24/68

OFFICE ENGINEER

WATER DEPT. — SEWERAGE
PLANNING DEPT. — DRAINAGE
ELECTRICAL — HIGHWAY
STRUCTURAL — GRADES
TRAFFIC — CONTROL

SUPERVISOR

CHECKED

DESIGNED J. Dillon

CONSTRUCTION RECORD
DATE STARTED — DATE COMPLETED
CONTR. — INSP.
FIELD BOOK 202 - 1689

1155G-5-D

HARBOR № 15-D-35

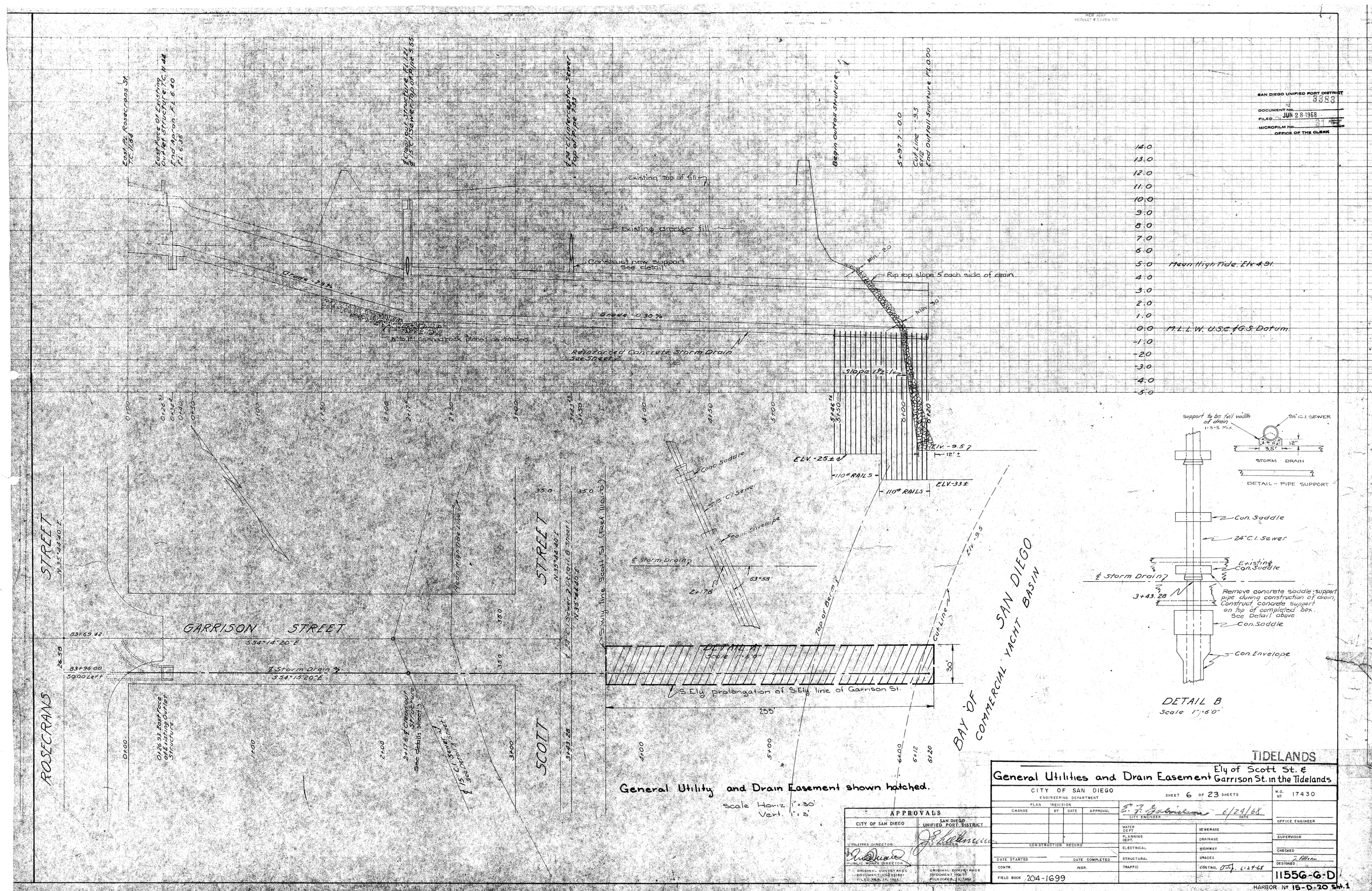
SAN DIEGO UNIFIED PORT DISTRICT
3383
DOCUMENT NO.
FILED JUN 28 1968
MICROFILM NO.
OFFICE OF THE CLERK
East Pl. Rosecrans St.
TC 11.84
East Face of Front Outlet Structure N 44
FL of Apron FL 6.30
FL 6.00
Existing top of fill
Existing dredger fill
Construct new support See detail
Grade -3.9%
Grade -0.30%
8" to 12" crushed rock (Type 1) as directed
Reinforced Concrete Storm Drain See Sheet 2
Begin Outfall Structure
5+97.7 - 0.0
Cut Line -9.5
End Outfall Structure FL 0.00
Min. 2.0
Rip rap slope 5' each side of drain
Min. 3.0
Mean High Tide Elv 4.91
M.L.L.W. U.S.C.&G.S. Datum
Slope 1½:1
ELV. -9.5
12' ±
ELV. -25 ±
110# RAILS
ELV. -33 ±
Conc. Saddle
24" C.I. Sewer
Conc. Envelope
℄ Storm Drain
63°58'
2+17.8
Top of Berm
Cut Line
ELV. -9.5
BAY OF SAN DIEGO
COMMERCIAL YACHT BASIN
DETAIL A
Scale 1" = 6'-0"
S.Ely prolongation of S.Ely line of Garrison St.
255'
30'
STREET
N 35°44'40" E
GARRISON STREET
S 54°14'20" E
℄ Storm Drain
S 54°15'20" E
83+69.42
83+96.00
50.00 Left
26.58
ROSECRANS
SCOTT
Pr. 20 high tide line
℄ 24" C.I. Sewer
See details, Sheet 2
Existing Outlet Structure
0+26.93 East Face
Sewer Manhole
Sewer Manhole
℄ Sewer
Sewer Manhole
Sewer Manhole
℄ Sewer
Sewer Manhole
Sewer Manhole
℄ 15" C.I. Sewer
See Detail, Sheet 2
S.W. Line Scott St. (Rec. 1161-D)
℄ 24" C.I. Sewer
N 35°44'40" E
Existing Conc. Saddle
Remove concrete saddle; support pipe during construction of drain. Construct concrete support on top of completed box. See Detail above
Con. Envelope
DETAIL B
Scale 1" = 6'-0"
Support to be full width of drain
1-3-5 Mix
24" C.I. SEWER
12"
3.5'
STORM DRAIN
DETAIL - PIPE SUPPORT
General Utility and Drain Easement shown hatched.
Scale Horiz. 1" = 30'
Vert. 1" = 3'
APPROVALS
CITY OF SAN DIEGO
SAN DIEGO UNIFIED PORT DISTRICT
UTILITIES DIRECTOR
PUBLIC WORKS DIRECTOR
ORIGINAL CONVEYANCE DOCUMENT NO. 93383 FILED FEB. 27, 1963
ORIGINAL CONVEYANCE DOCUMENT NO. 93 FILED FEB. 23, 1953
TIDELANDS
General Utilities and Drain Easement
Ely of Scott St. & Garrison St. in the Tidelands
CITY OF SAN DIEGO
ENGINEERING DEPARTMENT
SHEET 6 OF 23 SHEETS
W.O. Nº 17430
PLAN REVISION
CHANGE BY DATE APPROVAL
CITY ENGINEER
DATE 6/24/68
OFFICE ENGINEER
WATER DEPT.
SEWERAGE
PLANNING DEPT.
DRAINAGE
SUPERVISOR
CONSTRUCTION RECORD
ELECTRICAL
HIGHWAY
CHECKED
DATE STARTED
DATE COMPLETED
STRUCTURAL
GRADES
DESIGNED
CONTR.
INSP.
TRAFFIC
CONTROL
FIELD BOOK 204-1699
11556-G-D
HARBOR Nº 15-D-20 Sht. 1

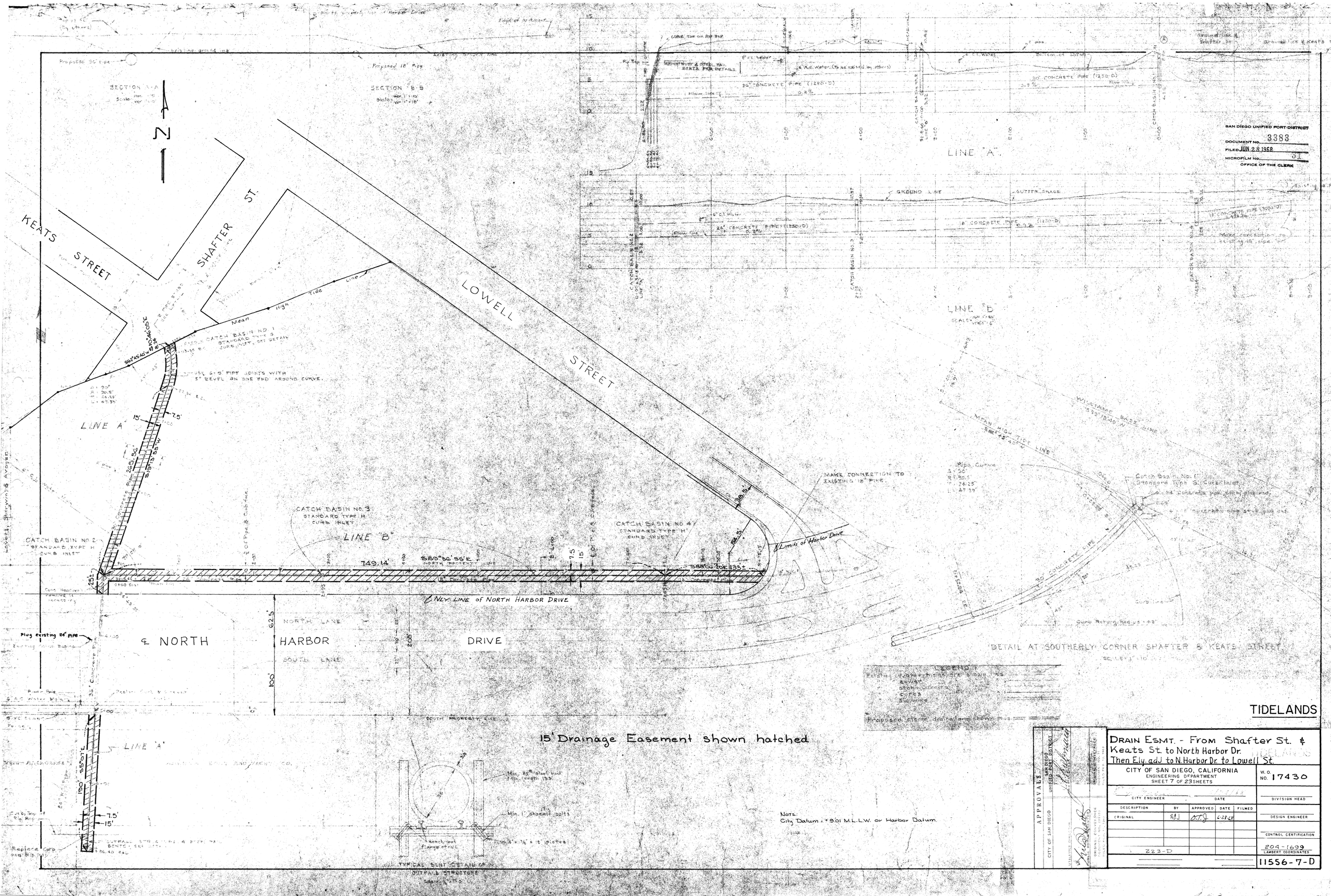
SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 31
OFFICE OF THE CLERK
KEATS STREET
SHAFTER ST.
LOWELL STREET
LINE "A"
LINE "B"
GROUND LINE
GUTTER GRADE
CURB TOP OR RIP RAP
30" CONCRETE PIPE (1250-D)
24" CONCRETE PIPE (1250-D)
18" CONCRETE PIPE
CATCH BASIN NO. 1
CATCH BASIN NO. 2
CATCH BASIN NO. 3
CATCH BASIN NO. 4
MEAN HIGH TIDE LINE
WILLIAMSON BASS LINE
MAKE CONNECTION TO EXISTING 18" PIPE
Limits of Harbor Drive
℄ NLY. LINE of NORTH HARBOR DRIVE
749.14'
S88°36'55"E
NORTH LANE
HARBOR
SOUTH LANE
DRIVE
100'
62.5'
Plug existing 24" PIPE
Replace curb
15' Drainage Easement shown hatched
DETAIL AT SOUTHERLY CORNER SHAFTER & KEATS STREET
TYPICAL BENT - STAIN OF OUTFALL STRUCTURE
Proposed storm drain pipe shown thus
Existing storm drain pipe shown thus
TIDELANDS
DRAIN ESMT. - From Shafter St. & Keats St. to North Harbor Dr. Then Ely. adj to N. Harbor Dr. to Lowell St.
CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 7 OF 23 SHEETS
W.O. NO. 17430
CITY ENGINEER
DATE
DIVISION HEAD
DESIGN ENGINEER
CONTROL CERTIFICATION
LAMBERT COORDINATES
DESCRIPTION
BY
APPROVED
DATE
FILMED
ORIGINAL
6-28-68
223-D
204-1699
11556-7-D
APPROVALS
SAN DIEGO UNIFIED PORT DISTRICT
CITY OF SAN DIEGO
Nota:
City Datum: +9.01 M.L.L.W. or Harbor Datum.

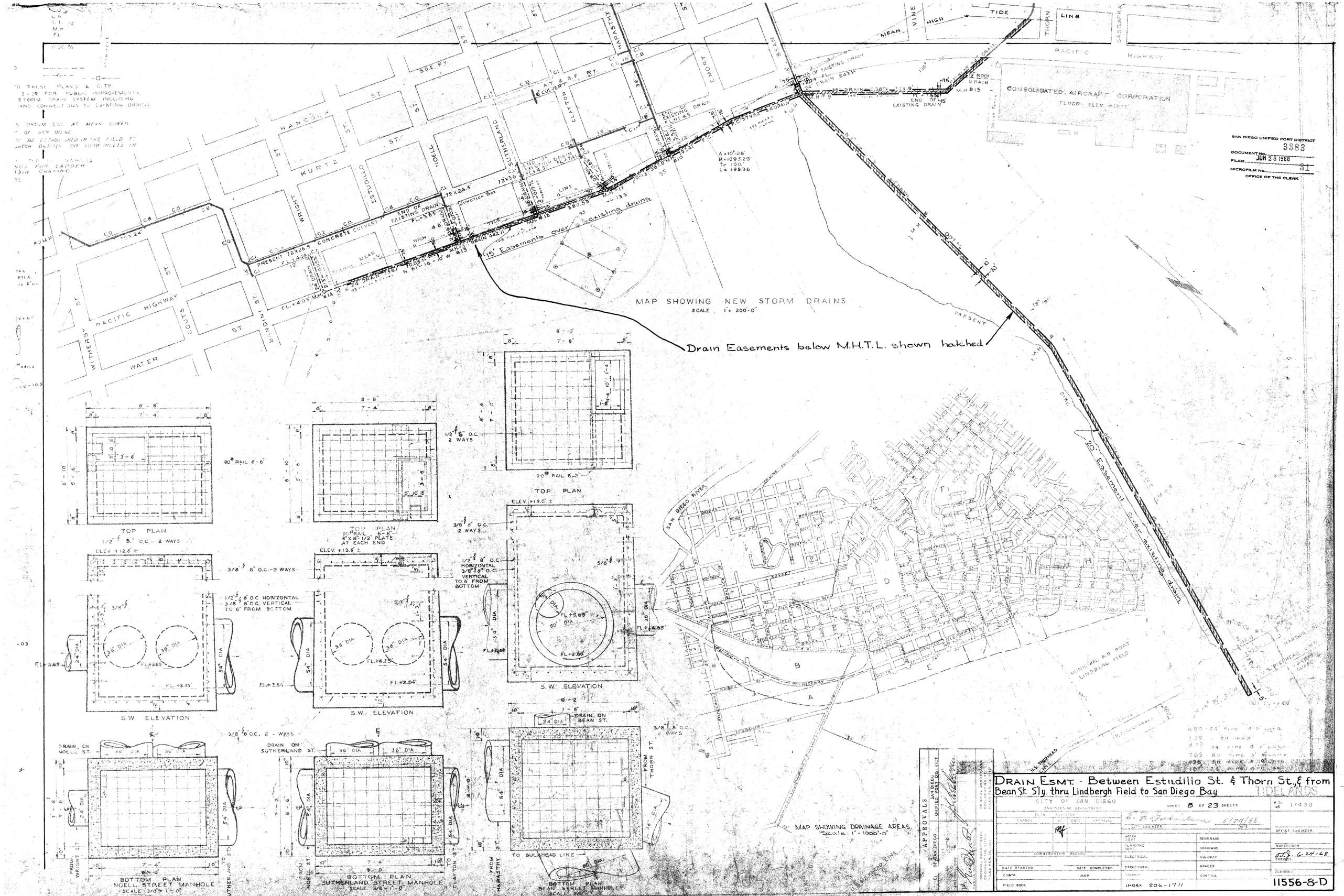
MAP SHOWING NEW STORM DRAINS
SCALE 1" = 200'-0"
Drain Easements below M.H.T.L. shown hatched
15' Easements over existing drains
20' Easement over existing drain
CONSOLIDATED AIRCRAFT CORPORATION
PACIFIC HIGHWAY
MEAN HIGH TIDE LINE
VINE
THORN
GASSAFRAS
HANCOCK
KURTZ
ESTUDILLO
NOELL
SUTHERLAND
CLAYTON
HARASTHY
BEAN
ENOBY
WRIGHT
BANCROFT
WATER
COURT
SAN DIEGO RIVER
MUNICIPAL AIR BOAT LINDBERG FIELD
U.S. PIERHEAD LINE
U.S. BULKHEAD LINE
TOP PLAN
S.W. ELEVATION
BOTTOM PLAN
NOELL STREET MANHOLE
SCALE 3/8" = 1'-0"
SUTHERLAND STREET MANHOLE
SCALE 3/8" = 1'-0"
BEAN STREET MANHOLE
SCALE 3/8" = 1'-0"
MAP SHOWING DRAINAGE AREAS
Scale: 1" = 1000'-0"
SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 31
OFFICE OF THE CLERK
APPROVALS
CITY OF SAN DIEGO
SAN DIEGO UNIFIED PORT DISTRICT
DRAIN ESMT. - Between Estudillo St. & Thorn St., & from Bean St. S'ly. thru Lindbergh Field to San Diego Bay
TIDELANDS
CITY OF SAN DIEGO
ENGINEERING DEPARTMENT
SHEET 8 OF 23 SHEETS
W.O. NO. 17430
CITY ENGINEER
DATE 6/20/68
OFFICE ENGINEER
SUPERVISOR
CHECKED 6-24-68
DESIGNED
DATE STARTED
DATE COMPLETED
CONTR.
INSP.
FIELD BOOK
INDEX 206-1711
11556-8-D

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO.
OFFICE OF THE CLERK

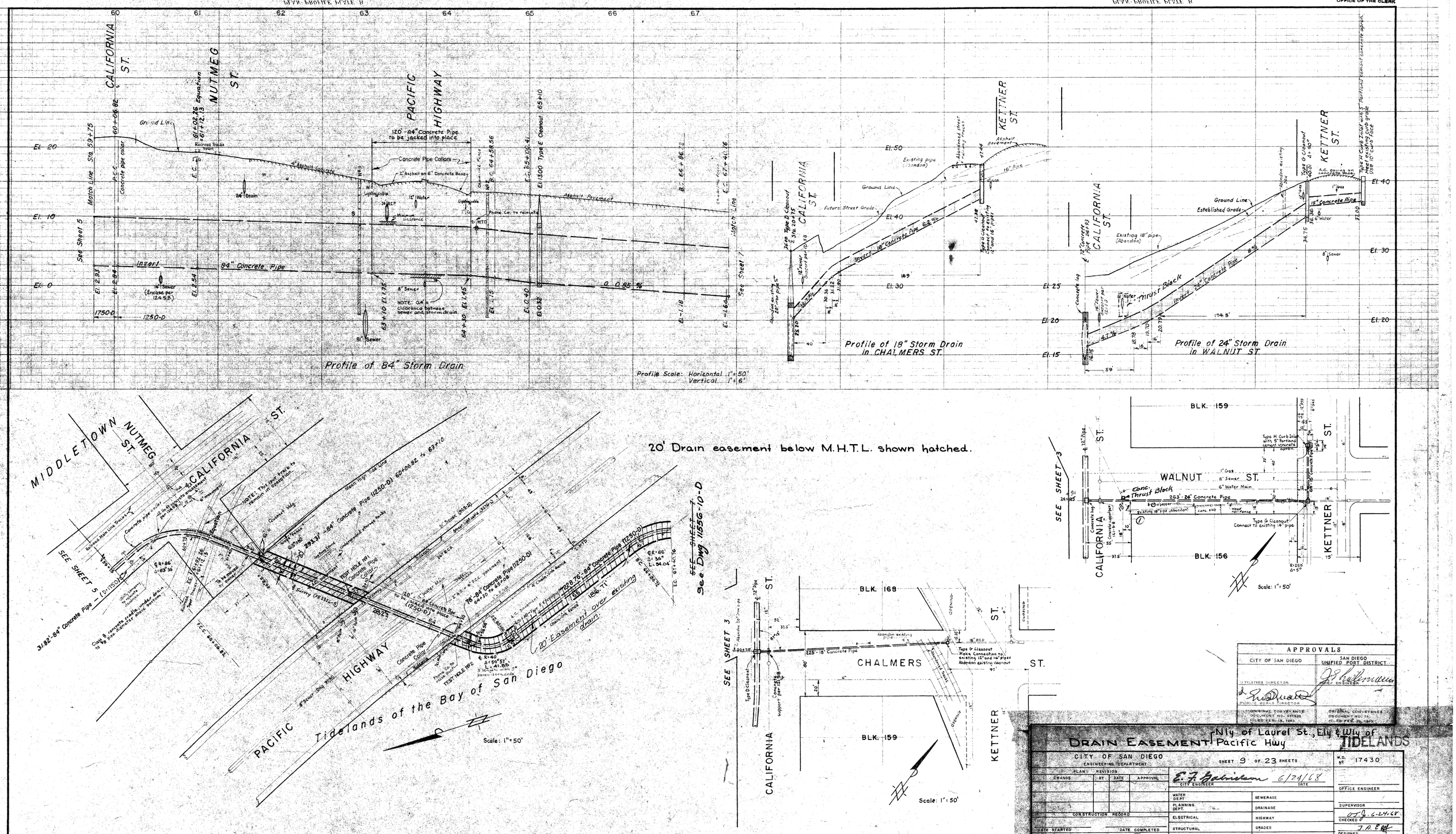

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 84
OFFICE OF THE CLERK

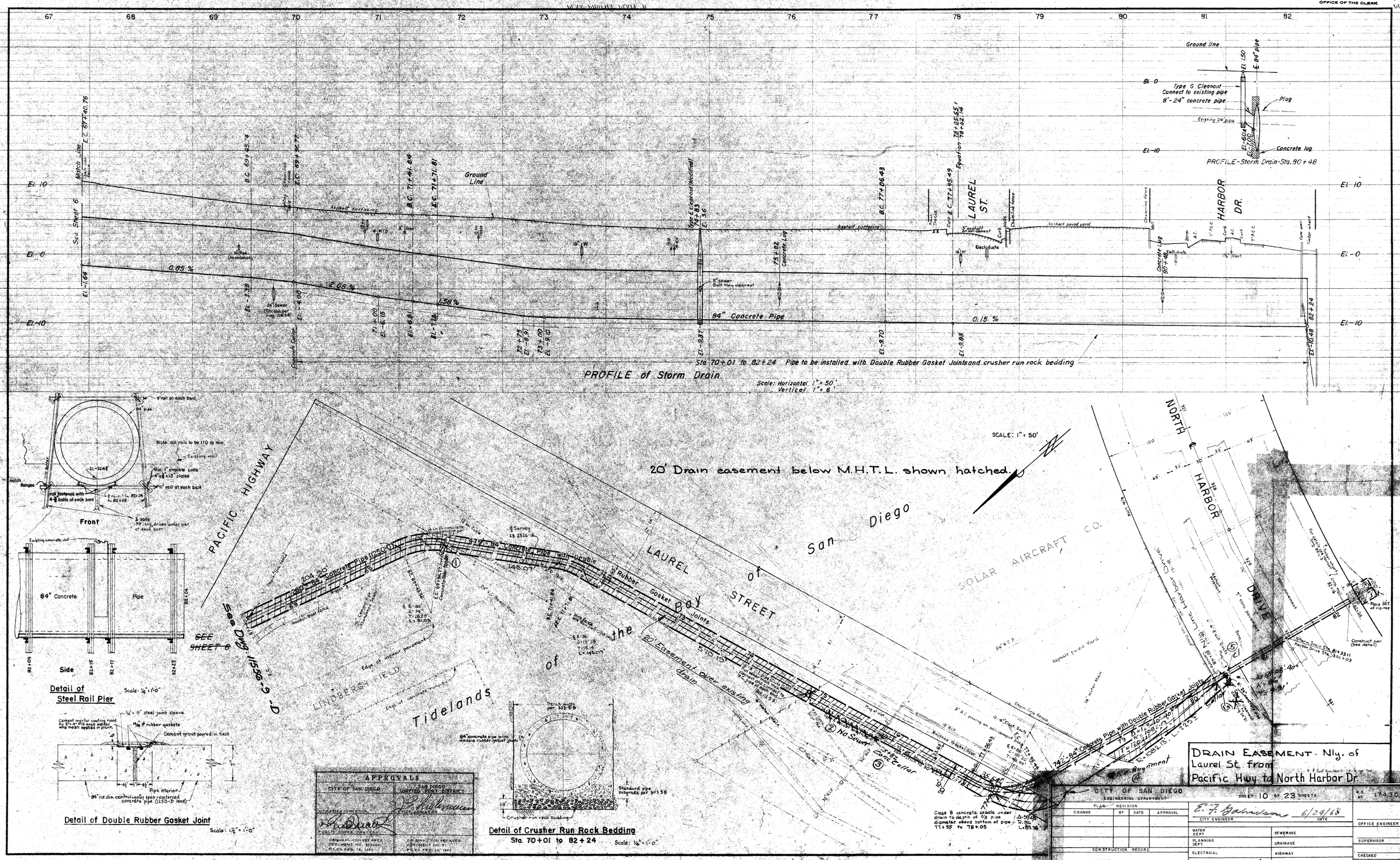

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 31
OFFICE OF THE CLERK

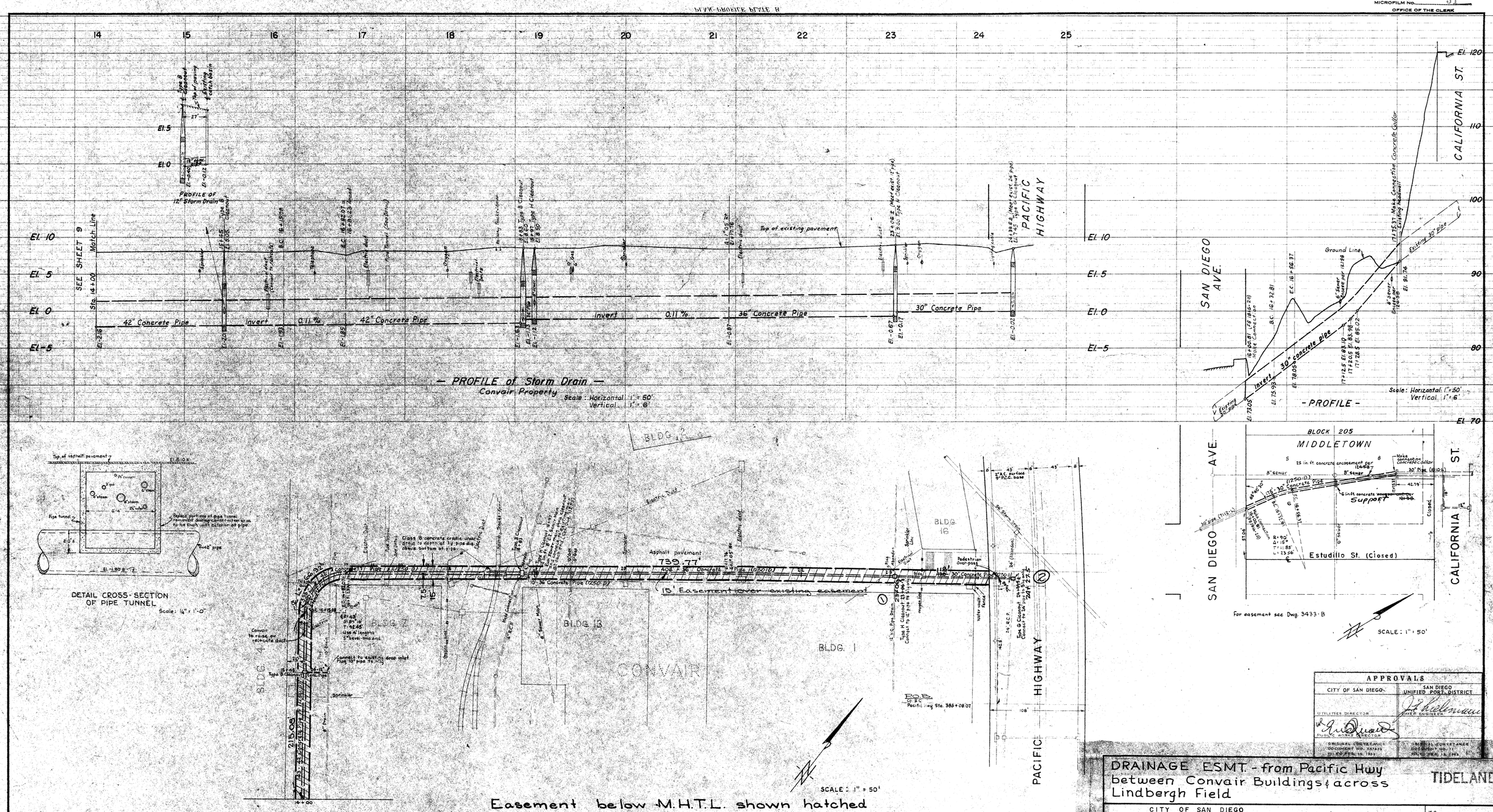

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
UTILITIES DIRECTOR	CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 157833 ON FILE APR. 15, 1965	ORIGINAL CONVEYANCE DOCUMENT NO. 11 ON FILE JUN. 18, 1965

DRAINAGE ESMT. - from Pacific Hwy between Convair Buildings & across Lindbergh Field

TIDELANDS

CITY OF SAN DIEGO
ENGINEERING DEPARTMENT

SHEET 11 OF 23 SHEETS

W.O. No. 17430

PLAN REVISION			
CHANGE	BY	DATE	APPROVAL

CITY ENGINEER — DATE 6/24/68

OFFICE ENGINEER

CONSTRUCTION RECORD	
DATE STARTED	DATE COMPLETED
CONTR.	INSP.
FIELD BOOK	

WATER DEPT.	SEWERAGE
PLANNING DEPT.	DRAINAGE
ELECTRICAL	HIGHWAY
STRUCTURAL	GRADES
TRAFFIC	CONTROL

INDEX 208-1713

SUPERVISOR

CHECKED.

DESIGNED R.C.V.

1155G-11-D

~~HARBOR No~~ Ref. Dwg. 2756-D

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 31
OFFICE OF THE CLERK

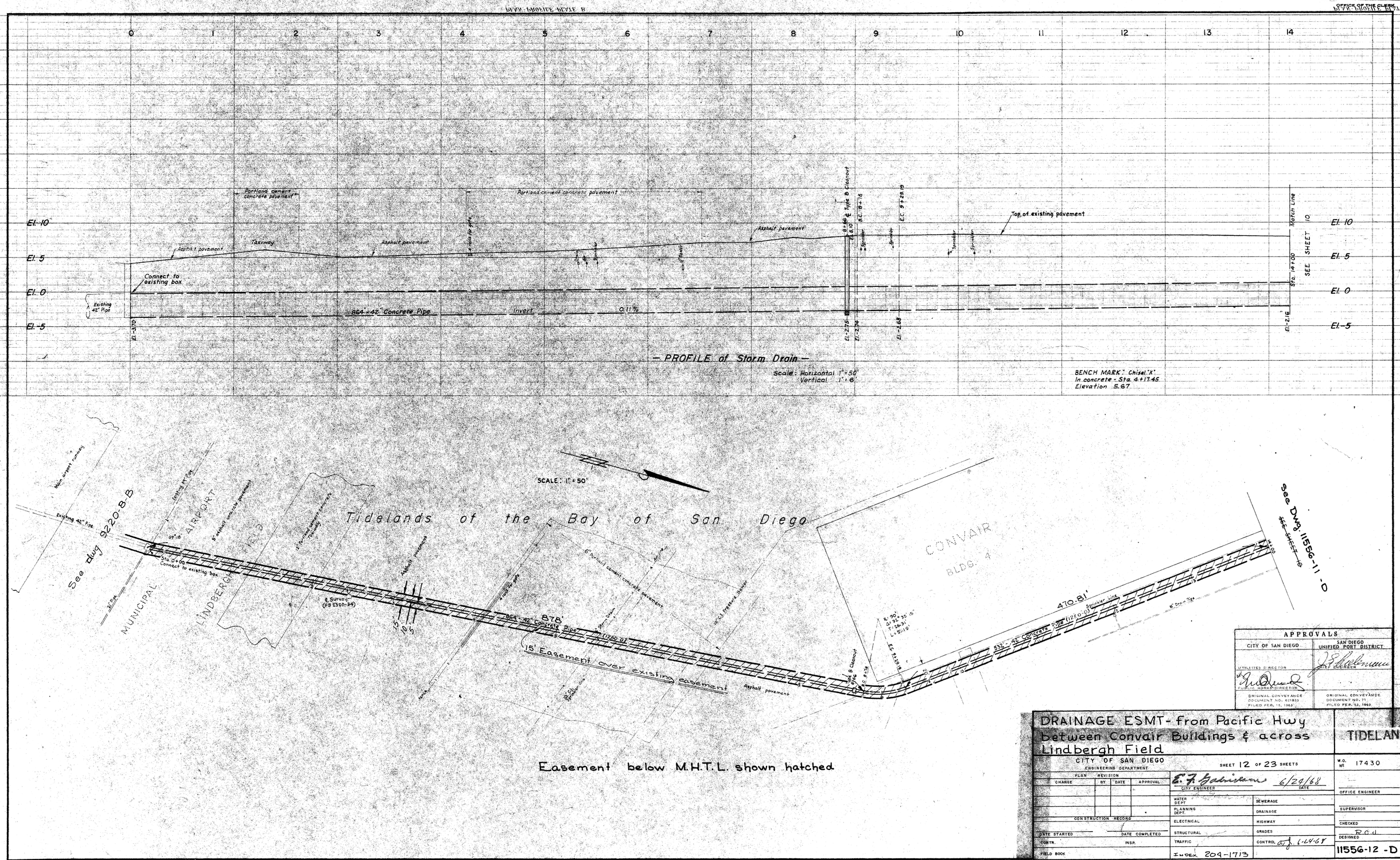

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
UTILITIES DIRECTOR	CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 601833 FILED FEB. 13, 1963	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 12, 1963

DRAINAGE ESMT- from Pacific Hwy between Convair Buildings & across Lindbergh Field

TIDELANDS

CITY OF SAN DIEGO
ENGINEERING DEPARTMENT

SHEET 12 OF 23 SHEETS

W.O. № 17430

PLAN REVISION				
CHANGE	BY	DATE	APPROVAL	

E. F. Gabrielsen 6/24/68
CITY ENGINEER DATE

OFFICE ENGINEER

SUPERVISOR

CHECKED

DESIGNED R.C.d

CONSTRUCTION RECORD
DATE STARTED DATE COMPLETED
CONTR. INSP.
FIELD BOOK

WATER DEPT.	SEWERAGE
PLANNING DEPT.	DRAINAGE
ELECTRICAL	HIGHWAY
STRUCTURAL	GRADES
TRAFFIC	CONTROL
INDEX 209-1713	

11556-12-D

~~HARBOR No~~
Rel City Dwg 2755-D

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3388
FILED JUN 28 1968
MICROFILM No.
OFFICE OF THE CLERK

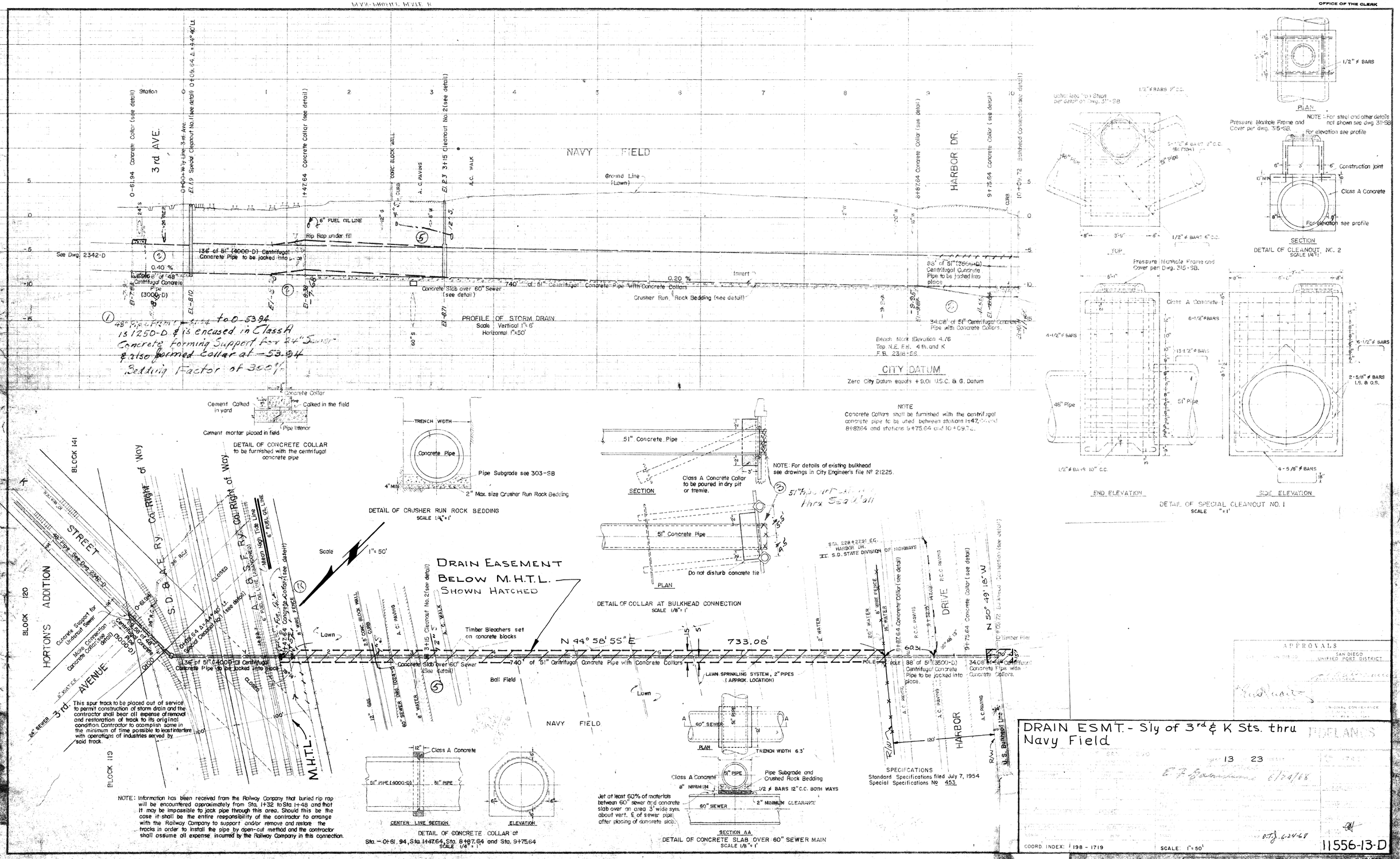

NOTE: Information has been received from the Railway Company that buried rip rap will be encountered approximately from Sta. 1+32 to Sta. 1+48 and that it may be impossible to jack pipe through this area. Should this be the case it shall be the entire responsibility of the contractor to arrange with the Railway Company to support and/or remove and restore the tracks in order to install the pipe by open-cut method and the contractor shall assume all expense incurred by the Railway Company in this connection.

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3283
FILED JUN 28 1968
MICROFILM NO. 31
OFFICE OF THE CLERK

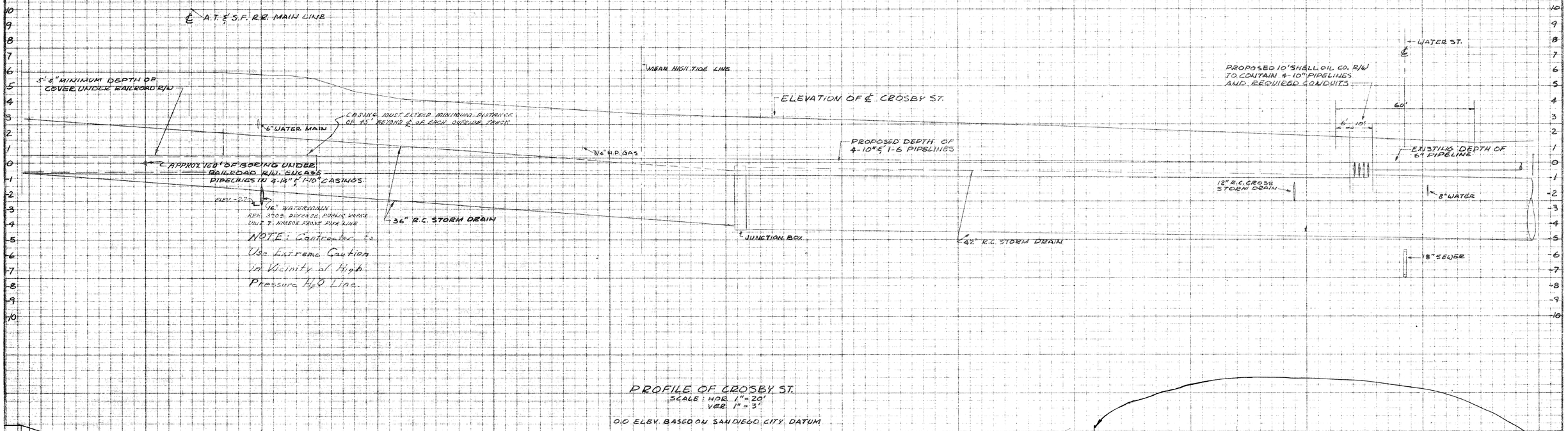

PROFILE OF CROSBY ST.
SCALE: HOR. 1" = 20'
VER. 1" = 3'
0.0 ELEV. BASED ON SAN DIEGO CITY DATUM

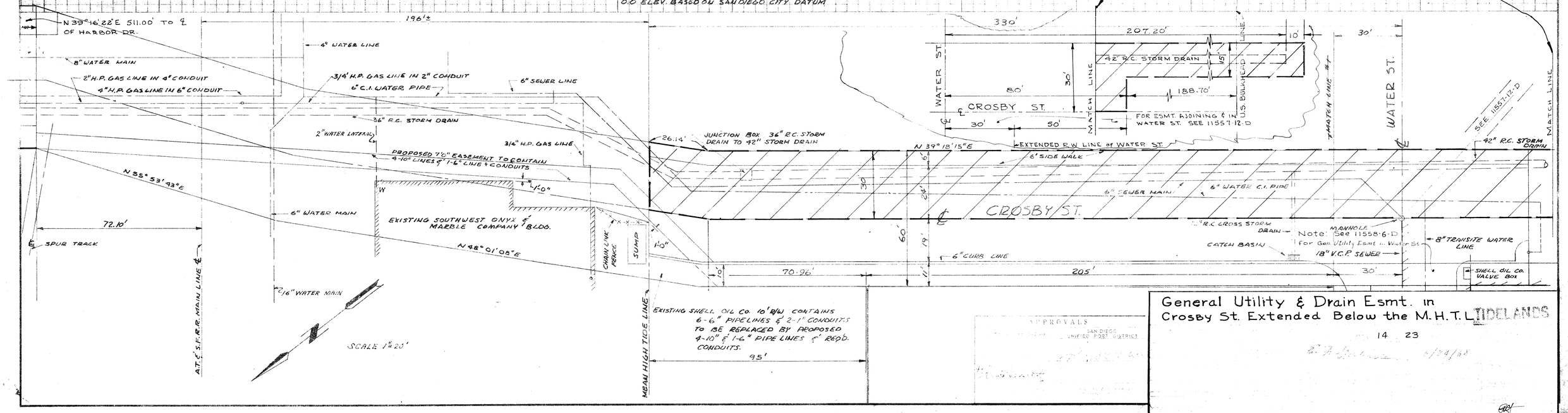

APPROVALS
SAN DIEGO UNIFIED PORT DISTRICT
DIRECTOR

General Utility & Drain Esmt. in Crosby St. Extended Below the M.H.T.L. TIDELANDS

14 23

COORD. INDEX 192-1743 SCALE 1" = 20'

REF 7811-D

11556-14-D

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No.
OFFICE OF THE CLERK

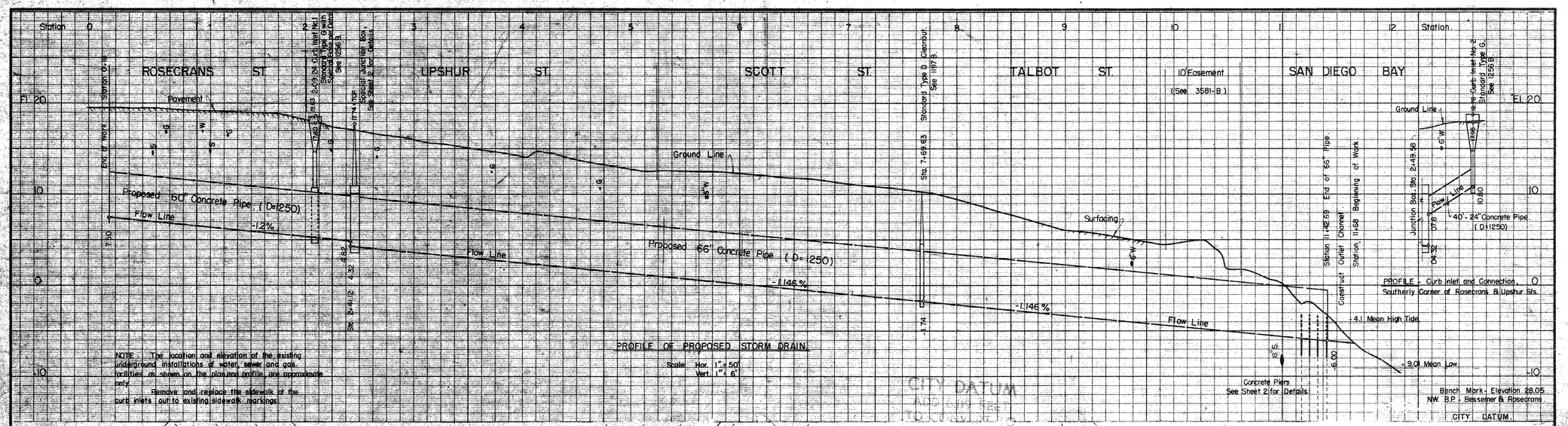

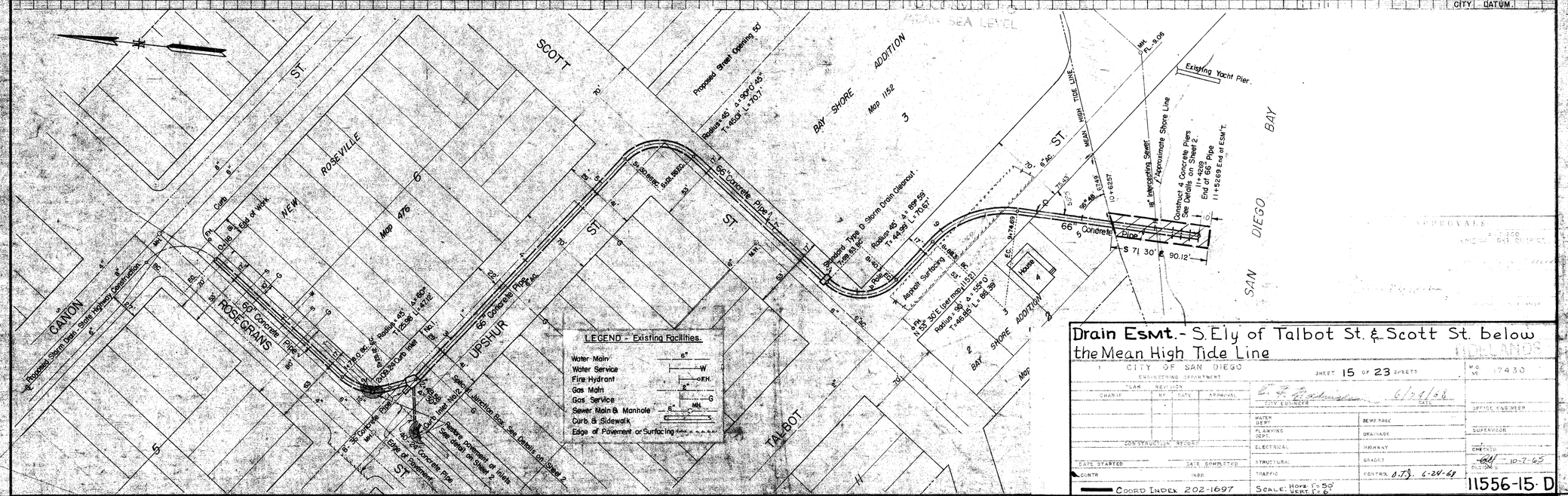

Drain Esmt. - S. Ely of Talbot St. & Scott St. below the Mean High Tide Line

CITY OF SAN DIEGO
ENGINEERING DEPARTMENT
SHEET 15 OF 23 SHEETS
W.O. No. 17430

CLAM REVISION				
CHANGE	BY	DATE	APPROVAL	

CITY ENGINEER — DATE — OFFICE ENGINEER
WATER DEPT. — SEWERAGE — SUPERVISOR
PLANNING DEPT. — DRAINAGE
ELECTRICAL — HIGHWAY — CHECKED
STRUCTURAL — GRADES — DESIGNED
TRAFFIC — CONTROL
CONSTRUCTION RECORD
DATE STARTED — DATE COMPLETED
CONTR. — NBP.
COORD INDEX 202-1697
SCALE: HORZ. 1" = 50' VERT. 1" = 6'
11556-15-D

(See dwg 73321 & 73331) REF 3581-B

CONSTRUCTION RECORD — W. O. No. 90666
CONTRACTOR: PAGE — INSPECTOR: STURAM
DATE STARTED: 1-26-49 — ASSIGNED: NONE — DATE: 5-2-49 — BY: M.O.
DATE COMPLETED: 4-26-49

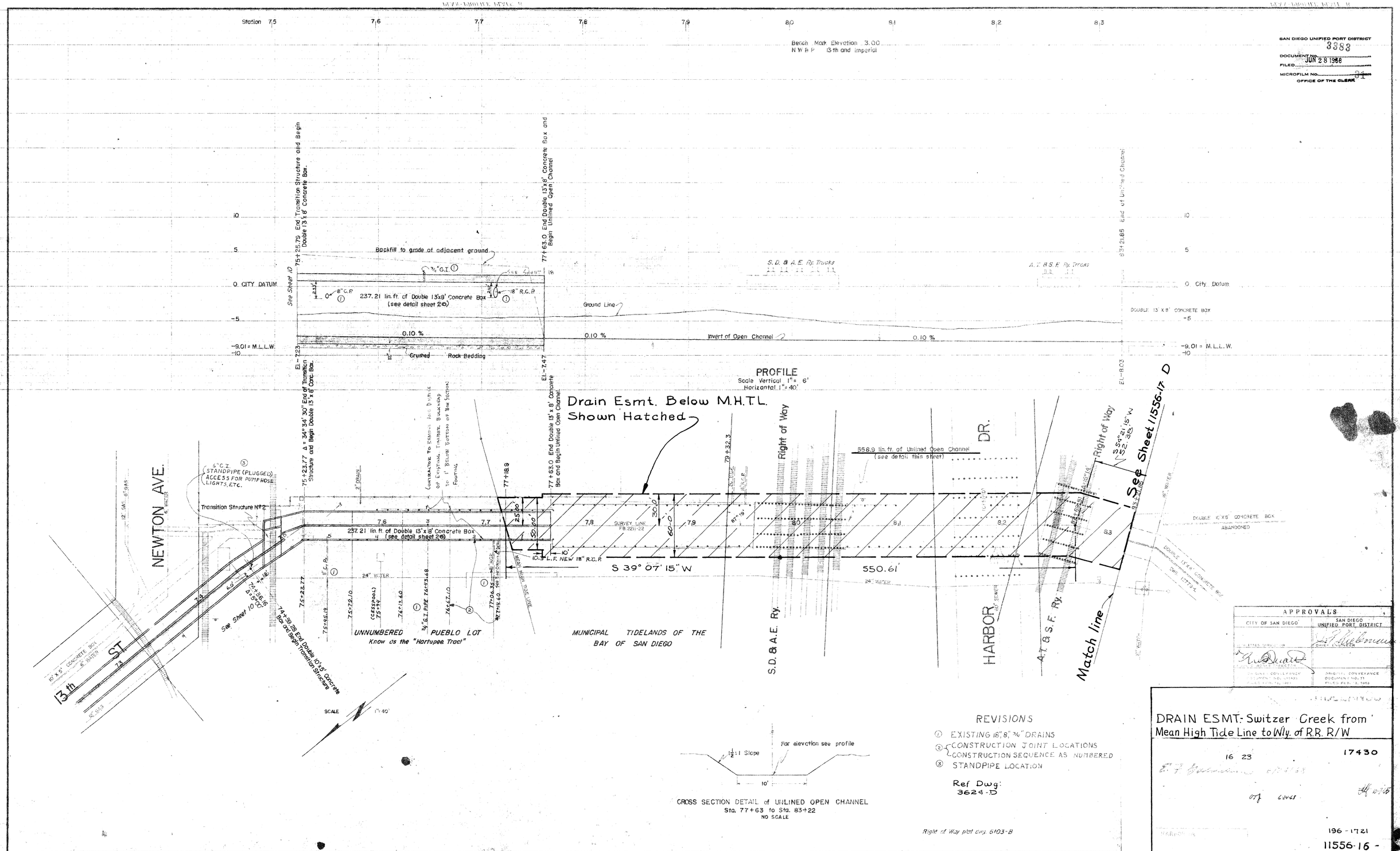
Station 7.5 7.6 7.7 7.8 7.9 8.0 8.1 8.2 8.3
Bench Mark Elevation 3.00
N.W.B.P. 13th and Imperial
SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1966
MICROFILM NO.
OFFICE OF THE CLERK
75+25.75 End Transition Structure and Begin Double 13'x8' Concrete Box.
77+63.0 End Double 13'x8' Concrete Box and Begin Unlined Open Channel
See Sheet 10
Backfill to grade of adjacent ground
3/4" G.I.
8" C.P.
237.21 lin. ft. of Double 13'x8' Concrete Box (see detail sheet 20)
18" R.C.P.
Ground Line
0.10 %
Invert of Open Channel
Crushed Rock Bedding
10
5
0 CITY DATUM
-5
-9.01 = M.L.L.W.
-10
S.D. & A.E. Ry. Tracks
A.T. & S.F. Ry. Tracks
834+21.85 End of Unlined Channel
DOUBLE 13' x 8' CONCRETE BOX
0 City Datum
PROFILE
Scale Vertical 1" = 6'
Horizontal 1" = 40'
Drain Esmt. Below M.H.T.L. Shown Hatched
El. -7.23
El. -7.47
El. -8.03
75+23.77 Δ = 34° 34' 30" End of Transition Structure and Begin Double 13'x8' Conc. Box.
77+63.0 End Double 13'x8' Concrete Box and Begin Unlined Open Channel.
6" C.I. STANDPIPE (PLUGGED) ACCESS FOR PUMP HOSE LIGHTS, ETC.
Transition Structure No. 2
2" DRAIN
CONTRACTOR TO REMOVE AND DISPOSE OF EXISTING TIMBER BULKHEAD TO 1' BELOW BOTTOM OF BOX SECTION FOOTING
77+18.9
25.00
30.00
30.0
60.0
79+32.3
Right of Way
558.9 lin. ft. of Unlined Open Channel (see detail this sheet)
DR.
Right of Way
S 34° 21' 15" W
52.33
See Sheet 11556-17 D
NEWTON AVE.
257.21 lin. ft. of Double 13'x8' Concrete Box (see detail sheet 20)
10.3 L.F. NEW 18" R.C.P.
S 39° 07' 15" W
550.61'
24" WATER
MEAN HIGH TIDE LINE
DOUBLE 10'x5' CONCRETE BOX ABANDONED
DOUBLE 13'x8' CONCRETE BOX
See Sheet 10
74+39.29 End Double 10'x5' Concrete Box and Begin Transition Structure
UNNUMBERED PUEBLO LOT
Know as the "Hartupee Tract"
MUNICIPAL TIDELANDS OF THE BAY OF SAN DIEGO
S.D. & A.E. Ry.
HARBOR
A.T. & S.F. Ry.
Match line
13th ST.
SCALE 1"=40'
APPROVALS
CITY OF SAN DIEGO
SAN DIEGO UNIFIED PORT DISTRICT
CHIEF ENGINEER
ORIGINAL CONVEYANCE DOCUMENT NO. 71
FILED FEB. 3, 1953
1½:1 Slope
For elevation see profile
10'
CROSS SECTION DETAIL of UNLINED OPEN CHANNEL
Sta. 77+63 to Sta. 83+22
NO SCALE
REVISIONS
① EXISTING 18", 8", 3/4" DRAINS
② CONSTRUCTION JOINT LOCATIONS
CONSTRUCTION SEQUENCE AS NUMBERED
③ STANDPIPE LOCATION
Ref Dwg: 3624-D
Right of Way plot dwg. 6103-B
DRAIN ESMT.- Switzer Creek from Mean High Tide Line to Wly. of R.R. R/W
16 23
17430
196 - 1721
11556-16 -
CONSTRUCTION RECORD
W. O. No 21269
A. P. Van Valkenburgh Co.
Walker & Parsons
9-24-57
10-21-58
As Built - 6-15-59

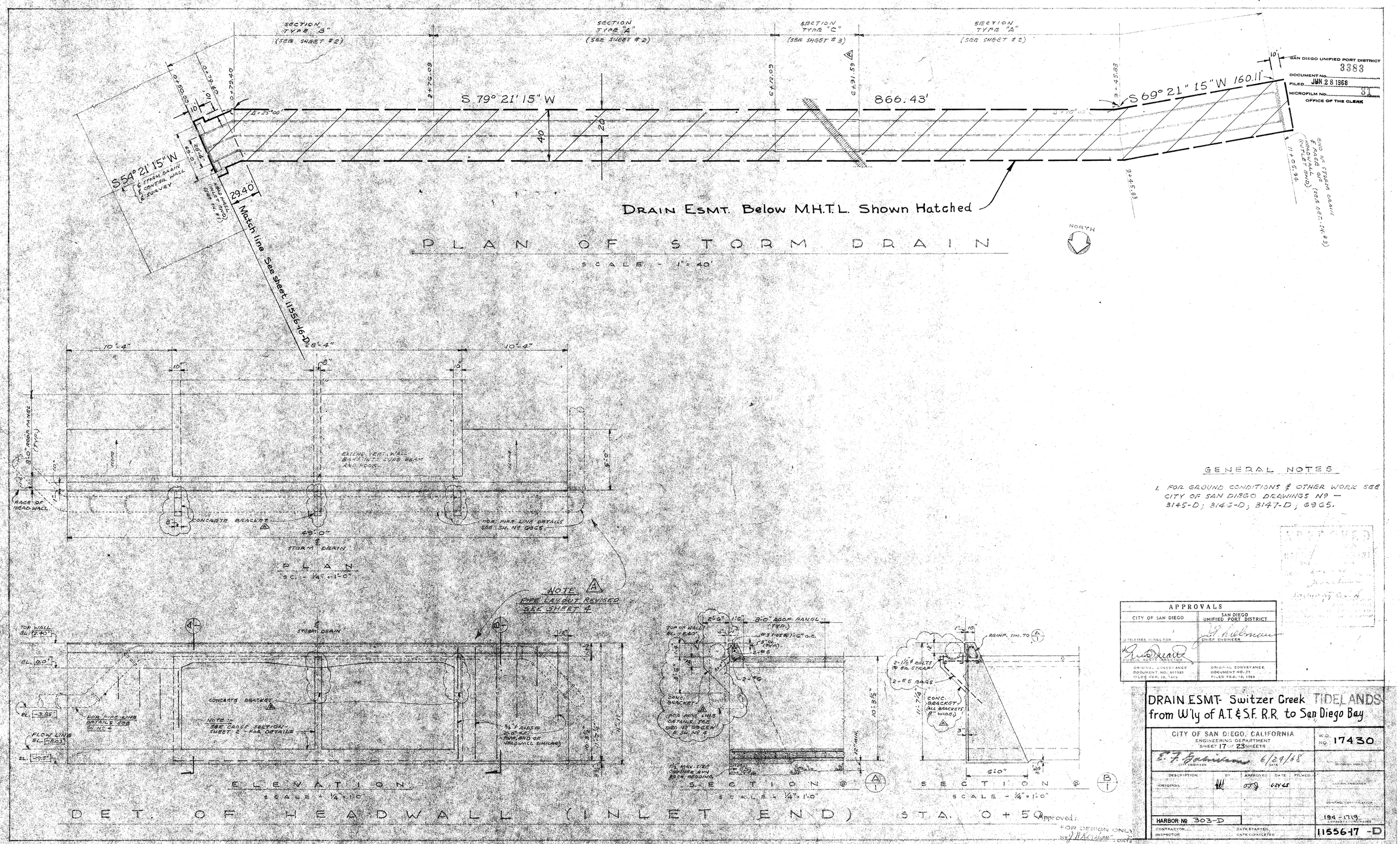
SECTION TYPE "B" (SEE SHEET #2)
SECTION TYPE "A" (SEE SHEET #2)
SECTION TYPE "C" (SEE SHEET #3)
SECTION TYPE "A" (SEE SHEET #2)
S 79° 21' 15" W
866.43'
S 69° 21' 15" W 160.11'
S 54° 21' 15" W
& STORM DRAIN & CONTROL WALL & SURVEY
Match line See sheet 11556-16-D
DRAIN ESMT. Below M.H.T.L. Shown Hatched
NORTH
PLAN OF STORM DRAIN
SCALE - 1" = 40'
SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 37
OFFICE OF THE CLERK
EXTEND VERT. WALL BEARING CURB BEAM AND HOOK
CONCRETE BRACKET
FOR PIPE LINE DETAILS SEE SH. No 6965
STORM DRAIN
PLAN
S.C. - 1/4" = 1'-0"
NOTE A
PIPE LAYOUT REVISED SEE SHEET 4
ELEVATION
SCALE - 1/4" = 1'-0"
SECTION @ A/1
SECTION @ B/1
SCALE - 1/4" = 1'-0"
DET. OF HEADWALL (INLET END) STA. 0 + 50
GENERAL NOTES
1. FOR GROUND CONDITIONS & OTHER WORK SEE CITY OF SAN DIEGO DRAWINGS No — 3145-D; 3146-D; 3147-D; 6965.
APPROVALS
CITY OF SAN DIEGO
SAN DIEGO UNIFIED PORT DISTRICT
UTILITIES DIRECTOR
CHIEF ENGINEER
PUBLIC WORKS DIRECTOR
ORIGINAL CONVEYANCE DOCUMENT NO. 561933 FILED FEB. 12, 1963
ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 15, 1963
DRAIN ESMT- Switzer Creek TIDELANDS from W'ly of A.T. & S.F. R.R. to San Diego Bay
CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 17 OF 23 SHEETS
W.O. No. 17430
6/24/68
DESCRIPTION
ORIGINAL
APPROVED
DATE
FILMED
HARBOR No 303-D
194-1719
1155617-D
CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED
Approved:
FOR DESIGN ONLY

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 34
OFFICE OF THE CLERK

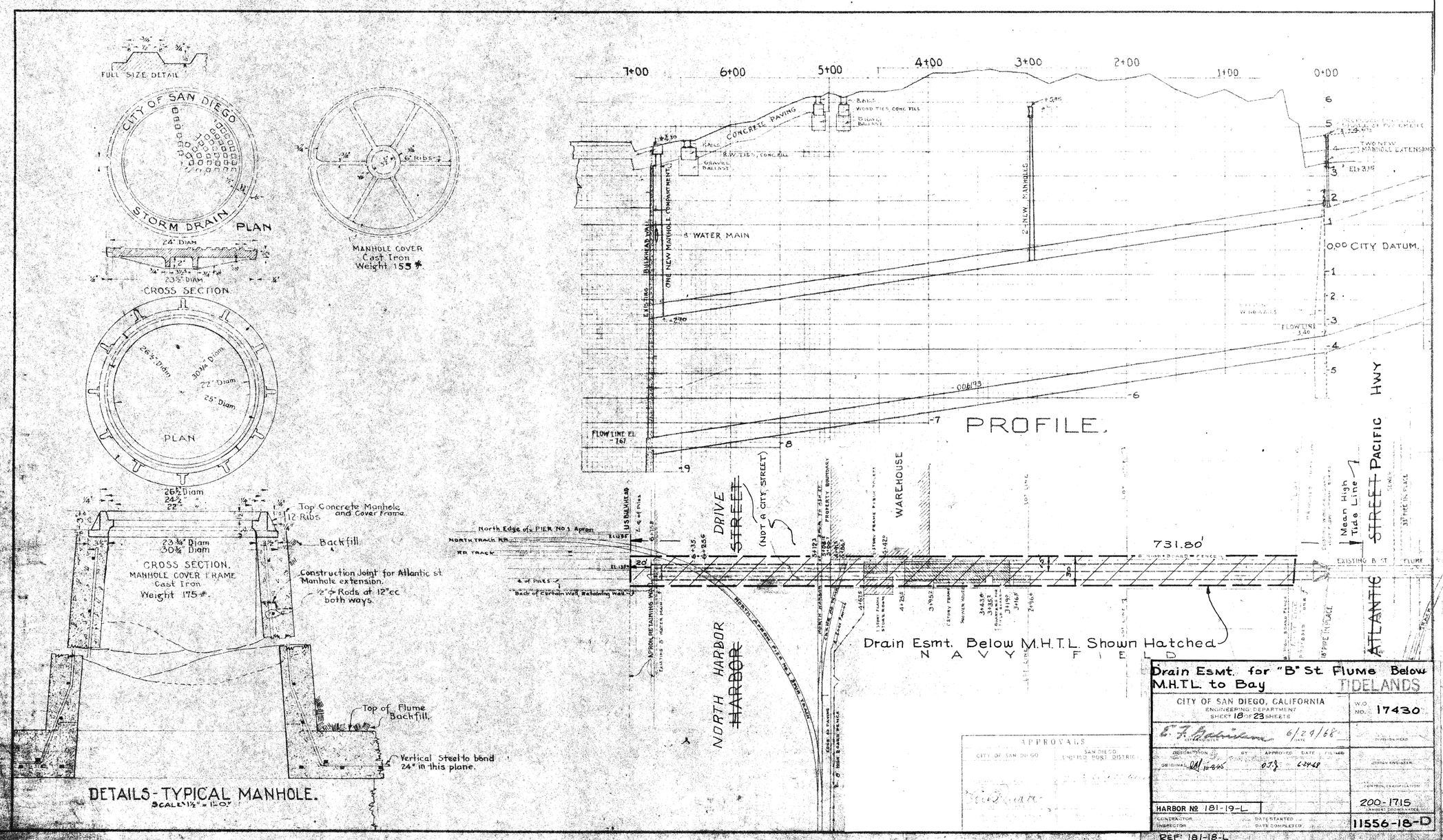

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 31
OFFICE OF THE CLERK

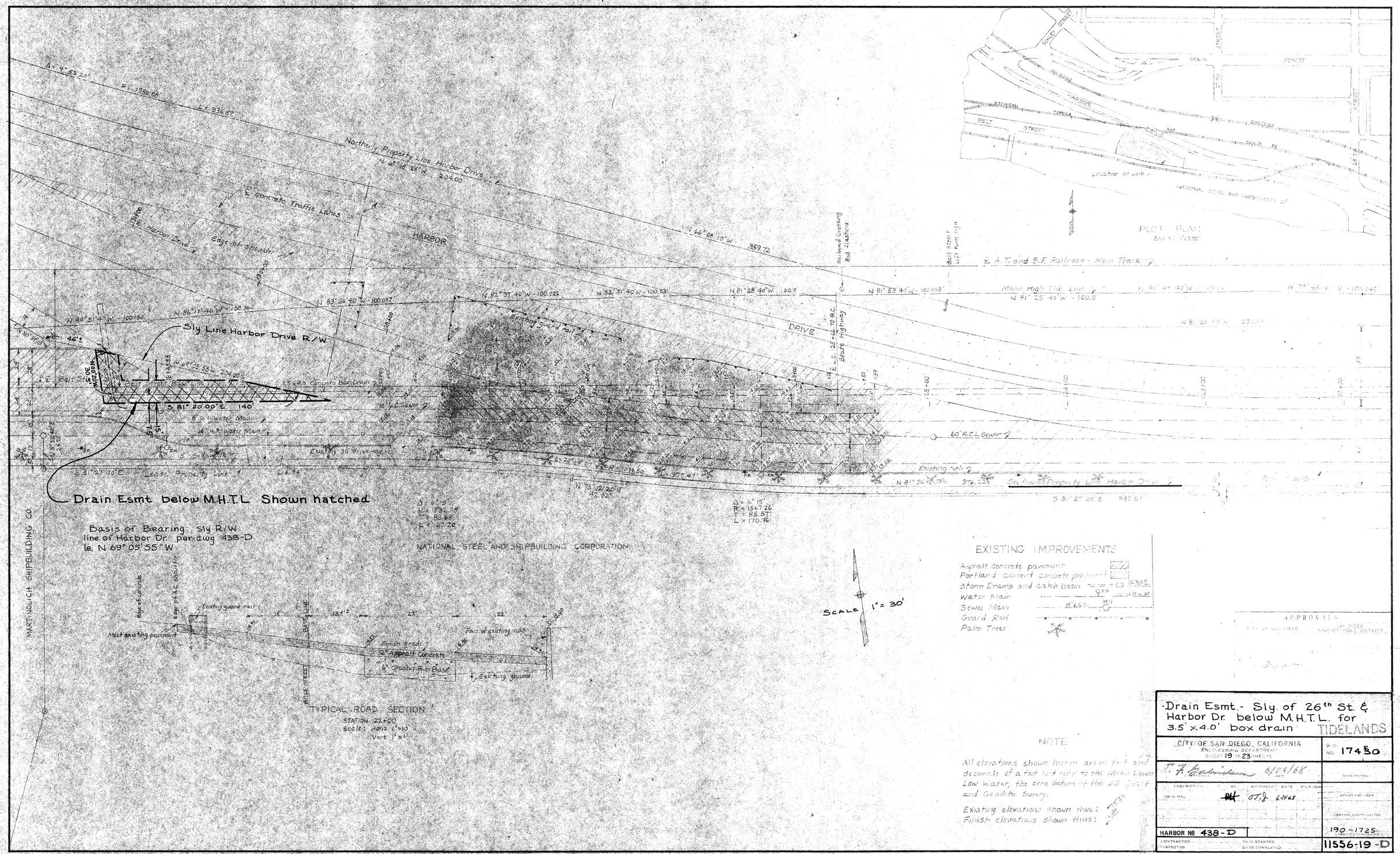

Drain Esmt.- Sly. of 26th St. & Harbor Dr. below M.H.T.L. for 3.5' x 4.0' box drain

TIDELANDS

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 19 OF 23 SHEETS

W.O. NO. 17430

T. F. Robinson 6/24/68
DRAWN DATE

DIVISION HEAD

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL		OJJ	6/24/68	

DESIGN ENGINEER

CONTROL CERTIFICATION

190-1725
SUBMITTED CONSIDERATION

HARBOR № 438-D

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

11556-19-D

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 31
OFFICE OF THE CLERK

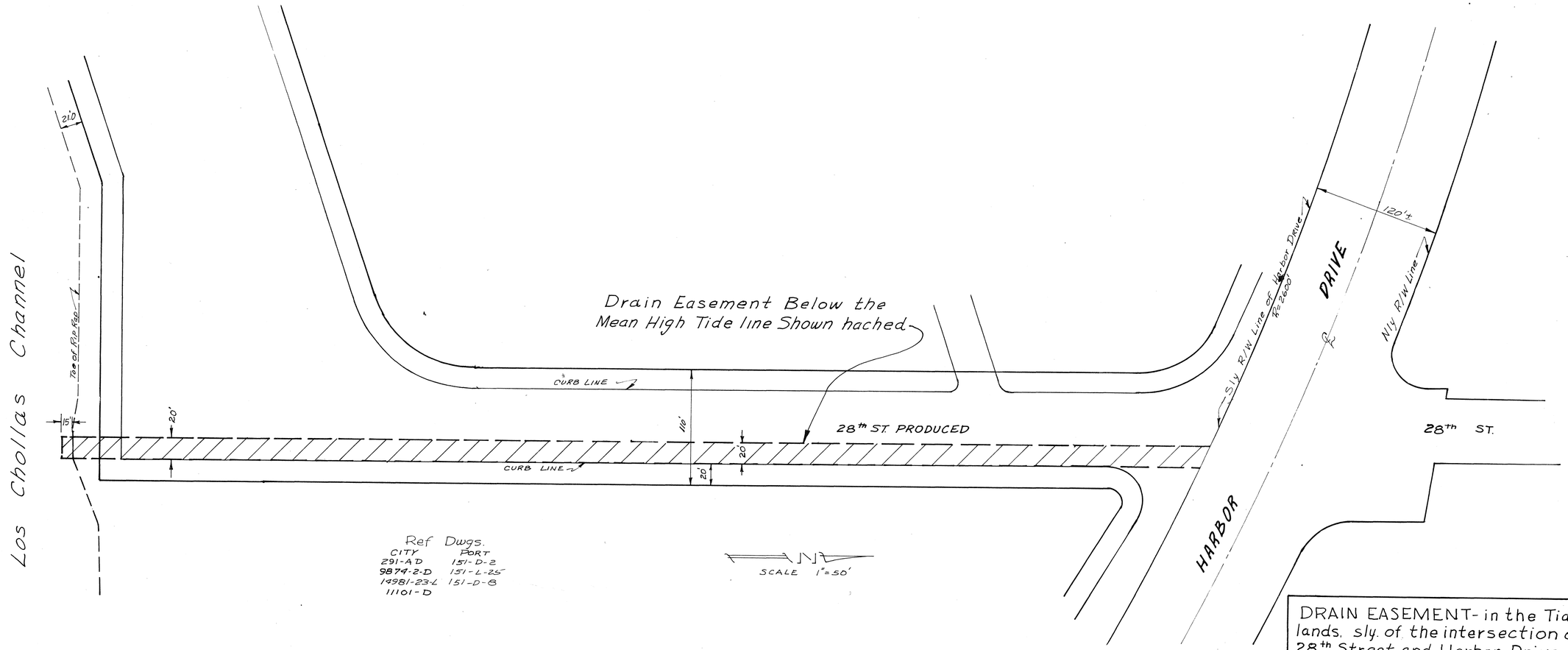

Ref Dwgs.

CITY	PORT
291-A D	151-D-2
9874-2-D	151-L-25
14981-23-L	151-D-8
11101-D	

DRAIN EASEMENT- in the Tidelands, sly. of the intersection of 28th Street and Harbor Drive

APPROVALS	
DEPARTMENTAL	ENG. DEPT. DIVISION OR SECTION
PLANNING	CONST. INSPECTION
PROPERTY	ELECTRICAL
PUBLIC WORKS	FIELD CHECK
RECREATION	GRADES AND DRAINS
UTILITIES	HIGHWAYS
	MONUMENTS
STRUCTURAL	PARKS
TRAFFIC	SEWERAGE
WATER	STREET ACTIONS

APPROVALS

CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
UTILITIES DIRECTOR	CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 60733 FILED FEB. 15, 1965	ORIGINAL CONVEYANCE DOCUMENT NO. 73 FILED FEB. 15, 1965

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 20 OF 23 SHEETS

W.O. NO. 17430

CITY ENGINEER — DATE — DIVISION HEAD

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL			6-24-68	

DESIGN ENGINEER

CONTROL CERTIFICATION

190-1727
LAMBERT COORDINATES

CONTRACTOR ..... DATE STARTED .....
INSPECTOR ..... DATE COMPLETED .....

11556-20-D

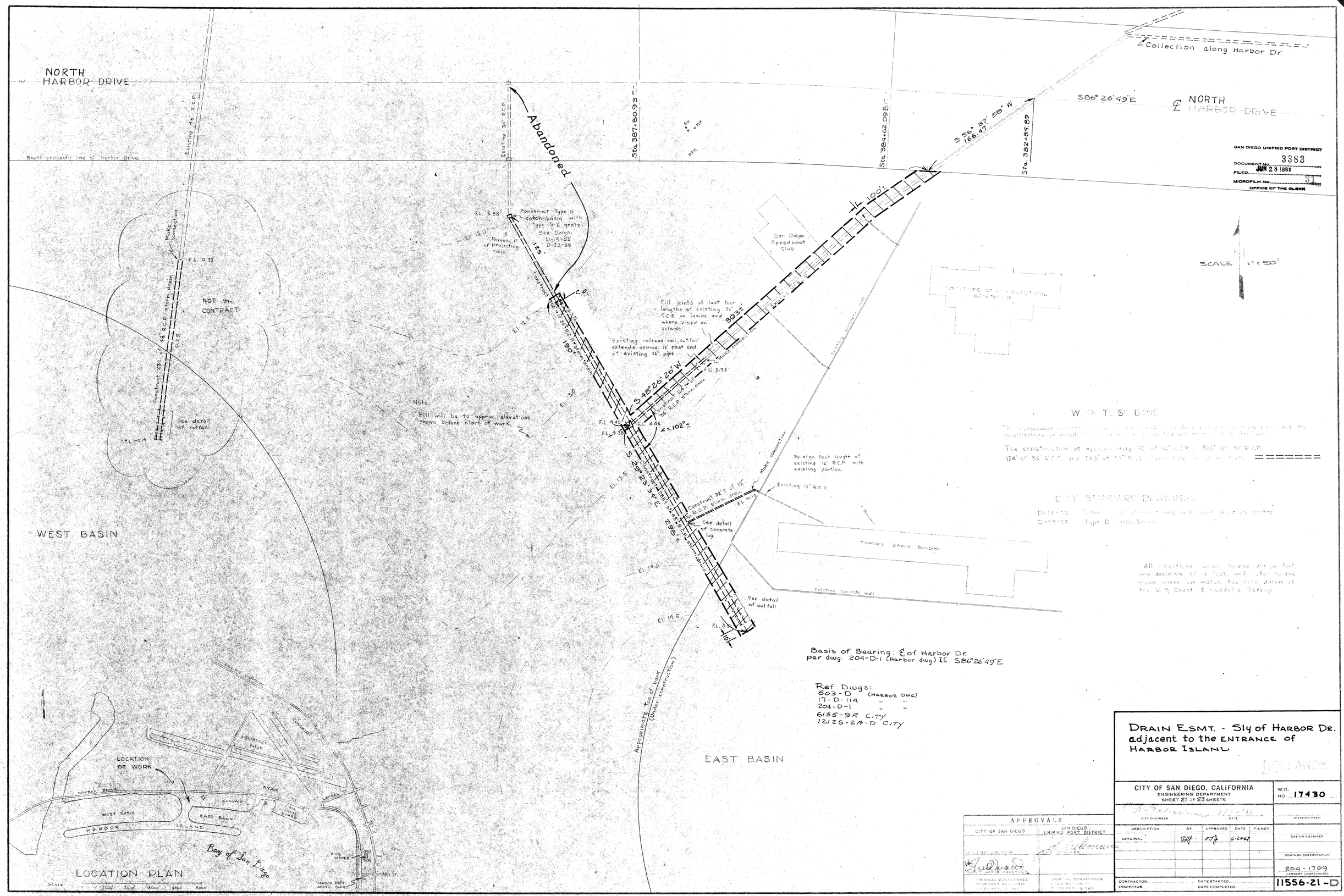

DRAIN ESMT. - Sly of HARBOR DR. adjacent to the ENTRANCE of HARBOR ISLAND

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 21 OF 23 SHEETS

W.O. NO. 17430

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL				

APPROVALS

CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
ASSISTANT DIRECTOR	
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 1828 FILED FEB. 1960	ORIGINAL CONVEYANCE DOCUMENT NO. 7371 FILED SEPT. 13, 1963

CITY ENGINEER DATE DIVISION HEAD

DESIGN ENGINEER

CONTROL CERTIFICATION

204-1709
LAMBERT COORDINATES

CONTRACTOR DATE STARTED
INSPECTOR DATE COMPLETED

11556-21-D

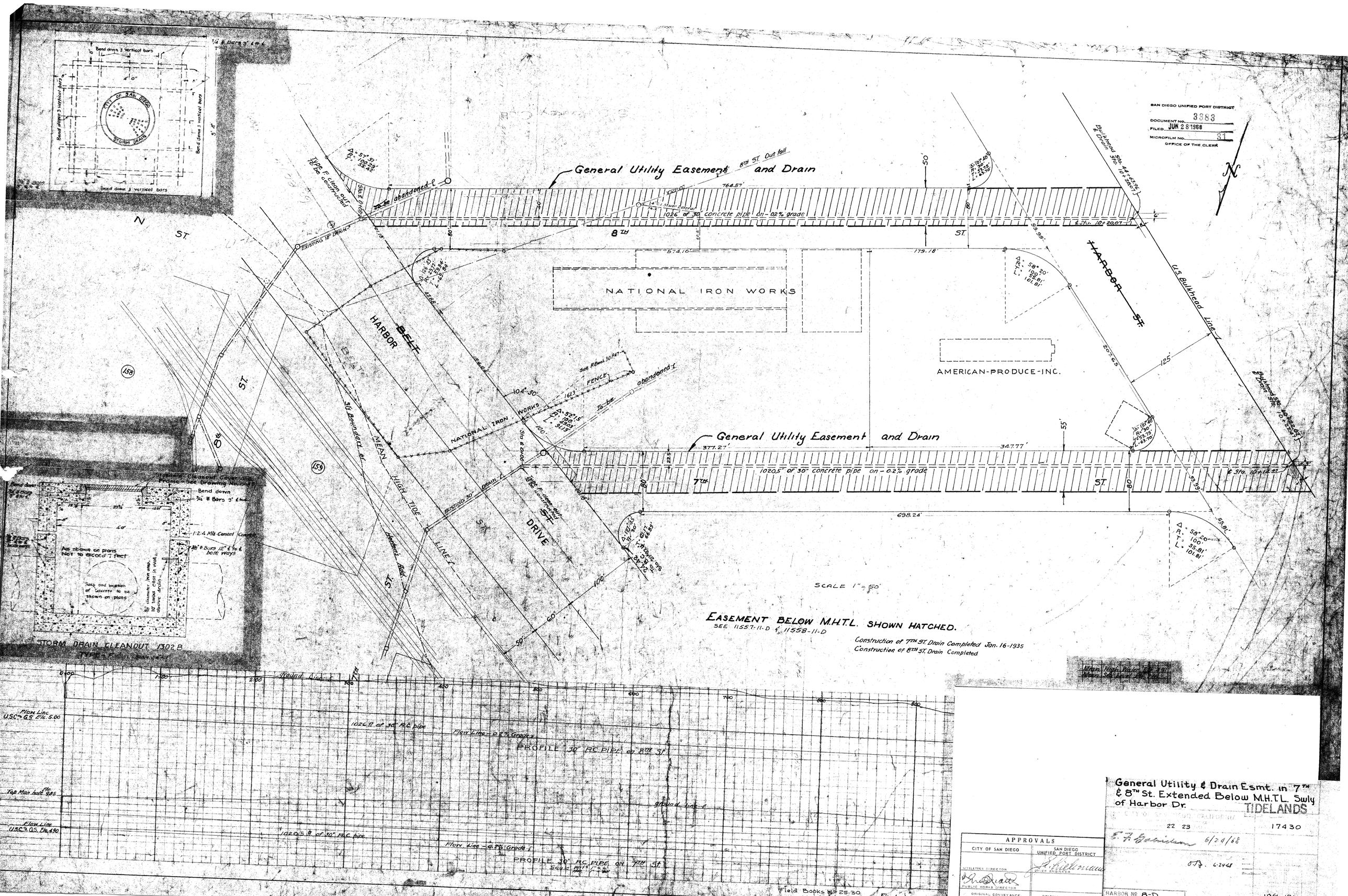
SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 31
OFFICE OF THE CLERK
General Utility Easement and Drain
8TH ST. Out fall
764.57'
1026' of 30" concrete pipe on - 0.2% grade
8TH ST.
NATIONAL IRON WORKS
AMERICAN-PRODUCE-INC.
HARBOR ST.
U.S. Bulkhead Line
HARBOR BELT
MEAN HIGH TIDE LINE
DRIVE
7TH ST.
377.27'
347.77'
1020.5' of 30" concrete pipe on - 0.2% grade
698.24'
SCALE 1" = 50'
EASEMENT BELOW M.H.T.L. SHOWN HATCHED.
SEE 11557-11-D & 11558-11-D
Construction of 7TH ST. Drain Completed Jan. 16-1935
Construction of 8TH ST. Drain Completed
STORM DRAIN CLEANOUT 1302 B
TYPE F
PROFILE 30" RC PIPE on 8TH ST.
PROFILE 30" RC PIPE on 7TH ST.
Flow Line U.S.C.&G.S. Ele. 5.00
Top Man hole Ele. 9.85
Flow Line U.S.C.&G.S. Ele. 4.90
Flow Line - 0.2% Grade
Flow line - 0.2% Grade
Field Books No. 25-30
Flowline Ele. 2.90
APPROVALS
CITY OF SAN DIEGO
SAN DIEGO UNIFIED PORT DISTRICT
UTILITIES DIRECTOR
CHIEF ENGINEER
PUBLIC WORKS DIRECTOR
ORIGINAL CONVEYANCE DOCUMENT NO. 181939 FILED FEB. 15, 1963
ORIGINAL CONVEYANCE DOCUMENT NO. FILED FEB. 13, 1963
General Utility & Drain Esmt. in 7TH & 8TH St. Extended Below M.H.T.L. Swly of Harbor Dr.
TIDELANDS
22 23
17430
6/24/68
HARBOR No. 8-D
196-1719
11556-33

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 31
OFFICE OF THE CLERK

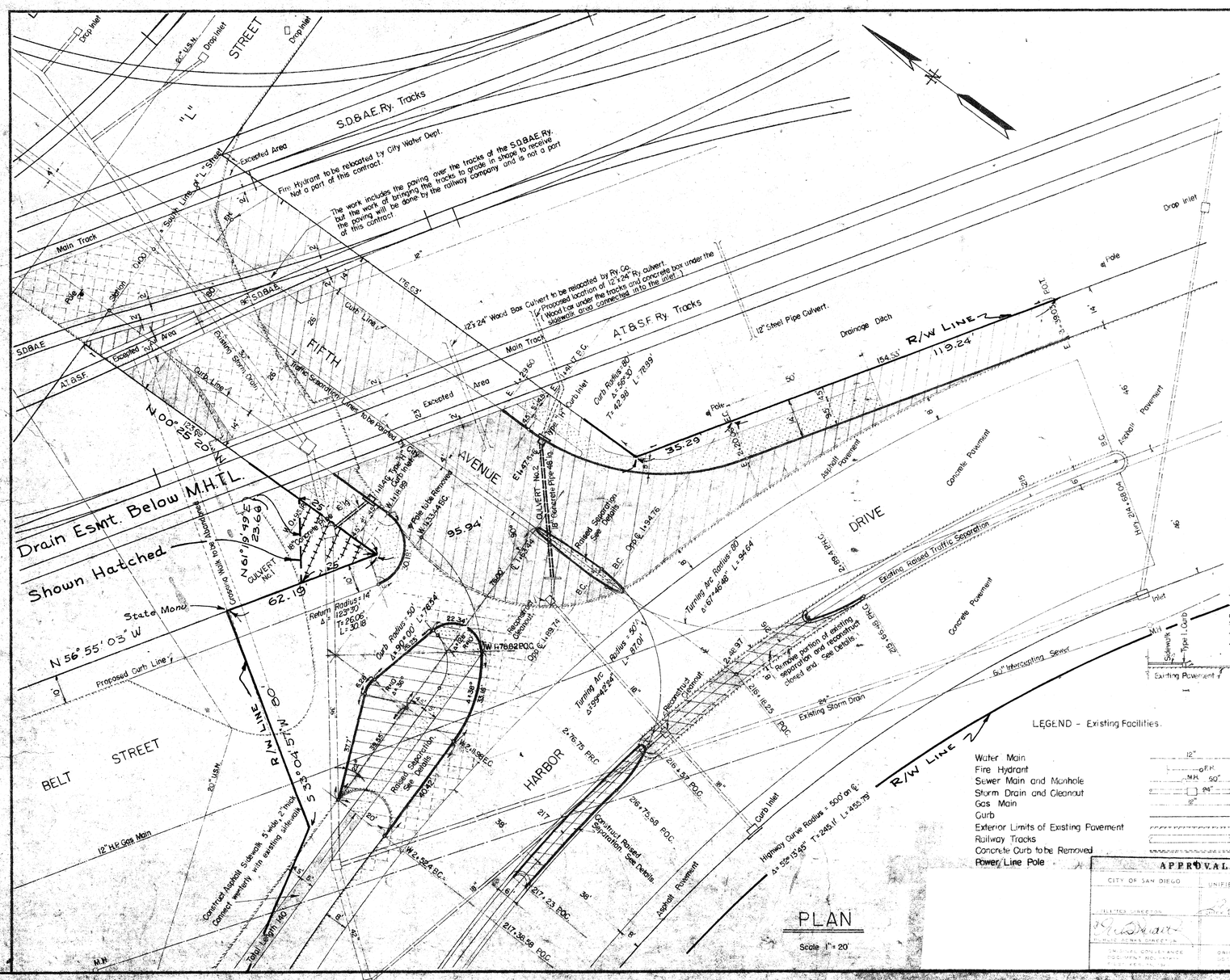

PLAN
Scale 1" = 20'

SECTION AT STATION C 1+70 - Looking North.
(Typical for the Improvement)
Scale 1" = 10'

WORK TO BE DONE.

The improvement consists of the following work to be done in accordance with these plans and the specifications hereto attached.

The grading of the portions of the streets shown hatched thus:
The preparation of subgrade and paving of the portions of the streets shown shaded thus:
The resurfacing of portions of the existing asphalt pavement with standard asphalt concrete surfacing material approximately two inches average thickness as shown by cross-hatched areas thus:
The construction of unplastered concrete curb, per sections as detailed, as shown by heavy solid lines thus:
The construction of standard one-course concrete sidewalk as shown by dotted areas thus:
The construction of asphalt sidewalk as noted on plan.
The construction of standard Type "H" Curb Inlets shown thus:
The construction of 18" concrete pipe culverts as shown thus:
The reconstruction of the tops of two existing storm drain cleanouts as noted and detailed.
The removal of portions of the existing curb and pavement as shown on plan.

NOTES.

The areas over the tracks of the AT&SF Ry and to 2' beyond the rails thereof, are excepted from this work and will be improved by the railway company.

The new pavement shall conform to City of San Diego standard specifications for Asphalt Concrete Pavement and shall consist of a 4" base course and 2" wearing surface.

The culvert pipe shall be Hume Centrifugal Pipe as manufactured by the American Pipe and Construction Company, or equal, and having "D" Load Classification 1250-D, or more, and conforming to specifications in Document 353857 on file in the office of the City Clerk of San Diego.

The painting of traffic lines and markings and the relocation of power line poles are not a part of this contract.

Fifth Avenue will be closed to vehicular traffic during the construction period.

See Sheet No. 2 for profiles showing grades of the proposed improvements and details of curbs and traffic separations, etc.

The pavement to be placed in Harbor Drive where the existing center separation is to be removed shall be laid uniformly between the edges of the existing concrete pavement sections.

LEGEND - Existing Facilities.

Water Main
Fire Hydrant
Sewer Main and Manhole
Storm Drain and Cleanout
Gas Main
Curb
Exterior Limits of Existing Pavement
Railway Tracks
Concrete Curb to be Removed
Power Line Pole

REF. DWG: 6639-L 3094-B 43 & L Sh 22 & 23

CITY CONTRACT.

Drain Esmt. @ Northwesterly corner of 5th Ave & Harbor Drive Below M.H.T.L.

TIDELANDS

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
CHIEF ENGINEER	
PUBLIC WORKS DIRECTOR	
PUBLIC CONVENIENCE AND ACCEPTANCE	ORIGINAL CONVENIENCE

CITY OF SAN DIEGO ENGINEERING DEPARTMENT	SHEET 23 OF 23 SHEETS	W.O. NO. 17430
PLAN REVISION: CHANGE / BY / DATE / APPROVAL	E. F. Gabrielson 6/29/68 CITY ENGINEER / DATE	OFFICE ENGINEER
	WATER DEPT. / SEWERAGE	
	PLANNING DEPT. / DRAINAGE	SUPERVISOR
CONSTRUCTION RECORD	ELECTRICAL / HIGHWAY	CHECKED
DATE STARTED / DATE COMPLETED	STRUCTURAL / GRADES	DESIGNED
CONTR. / INSP.	TRAFFIC / CONTROL	
COORD. INDEX: 196-1719	Scale: 1" = 20'	11556-23-D

HAZARD 6-27-47 12-23-47
WADE DARBY NONE 12-23-47
SEALED 8-8-49
W.O. 6015 2-01-49

November 18, 2015
Item No. 11
Supporting Document No. 5
021500

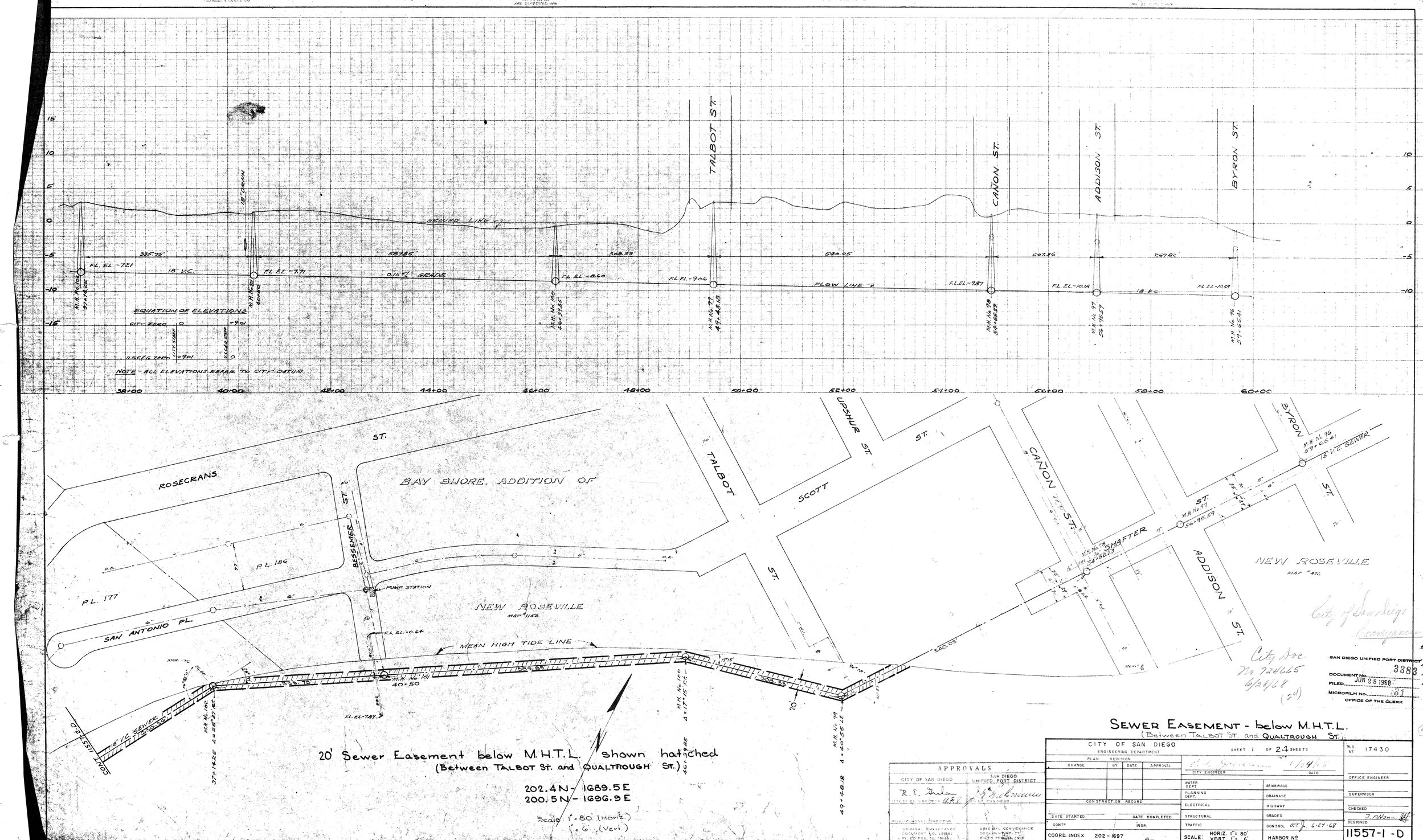

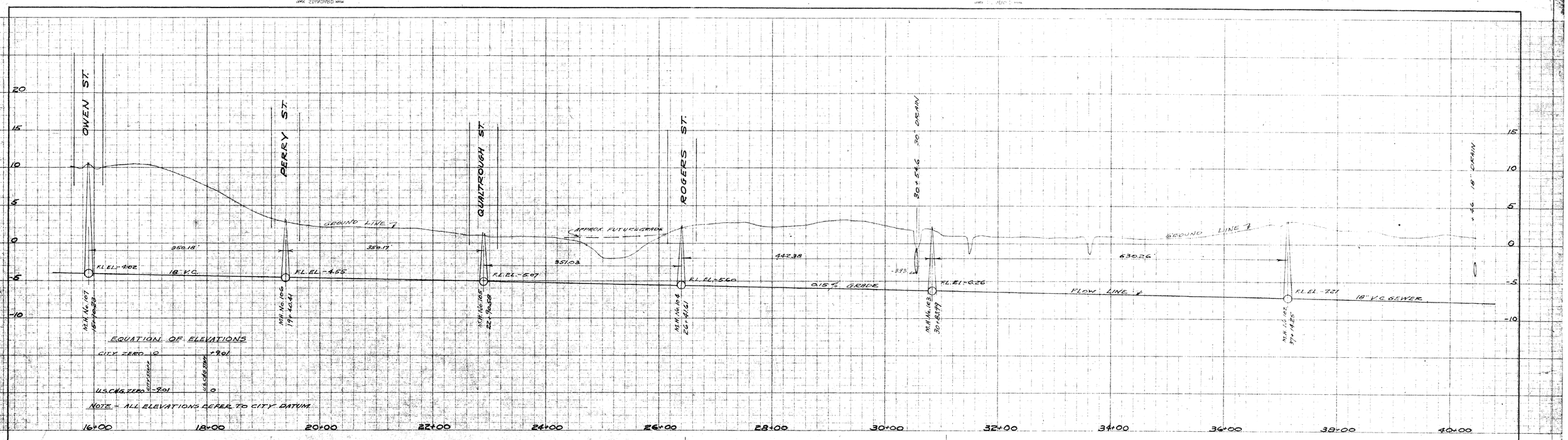

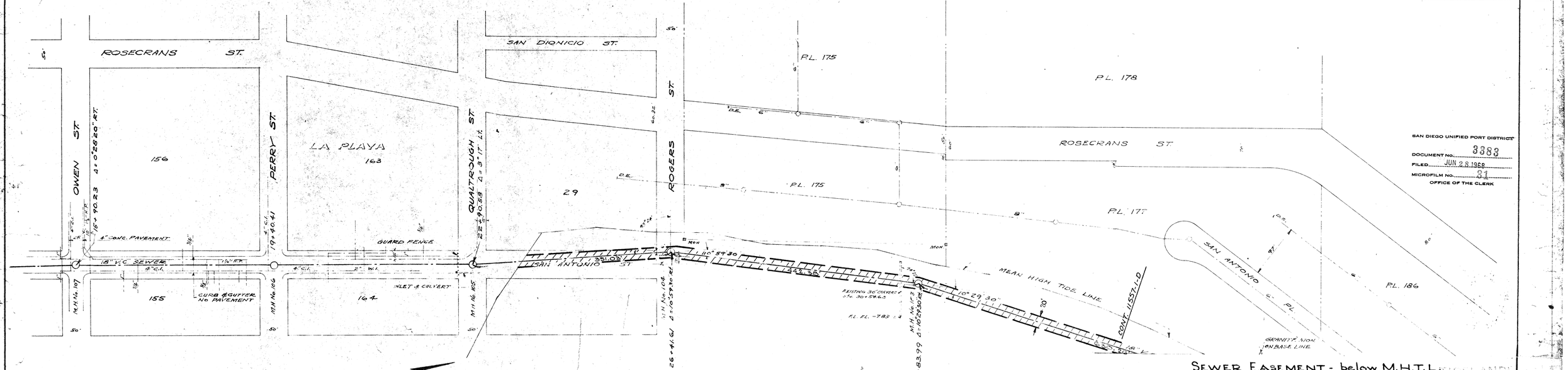

SEWER EASEMENT - below M.H.T.L.
(Between TALBOT ST. and QUALTROUGH ST.)

20' Sewer Easement below M.H.T.L. shown hatched
(Between TALBOT ST. and QUALTROUGH ST.)

202.4 N - 1689.5 E
200.5 N - 1696.9 E

Scale: 1" = 80' (Horiz)
1" = 6' (Vert.)

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R. E. Stalar	J. E. Lehmann
DIRECTOR	PORT ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 14242 FILED FEB. 14, 1962	ORIGINAL CONVEYANCE DOCUMENT NO. 14243 FILED FEB. 14, 1962

CITY OF SAN DIEGO ENGINEERING DEPARTMENT				SHEET 2 OF 24 SHEETS		W.O. No. 17430
PLAN REVISION						
CHANGE	BY	DATE	APPROVAL	CITY ENGINEER	DATE	OFFICE ENGINEER
				WATER DEPT.	SEWERAGE	
				PLANNING DEPT.	DRAINAGE	SUPERVISOR
CONSTRUCTION RECORD				ELECTRICAL	HIGHWAY	CHECKED
DATE STARTED		DATE COMPLETED		STRUCTURAL	GRADES	DESIGNED J. Pilone
CONTR.		INSP.		TRAFFIC	CONTROL 6-24-68	11557-2-D
COORD. INDEX 200-1695						

Ref. 981-D, Sht 19

November 18, 2015
Supplement Number 3

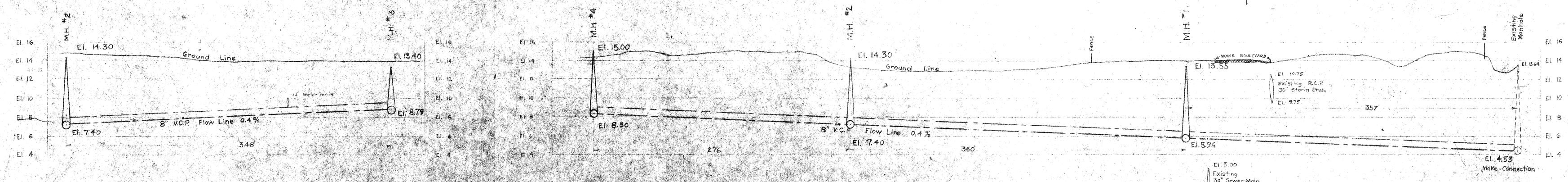

PROFILES OF SEWER

Scale: Horz. 1"=50' Vert. 1"=5'

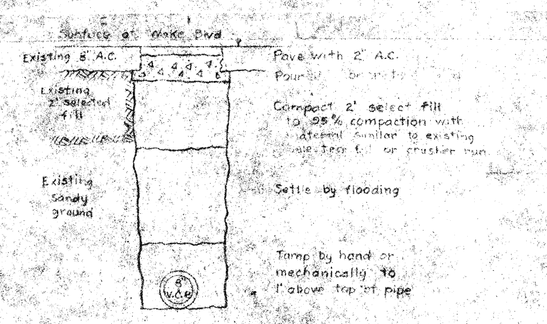

Cross section of trench crossing Wake Blvd.

Easement below M.H.T.L. shown hatched

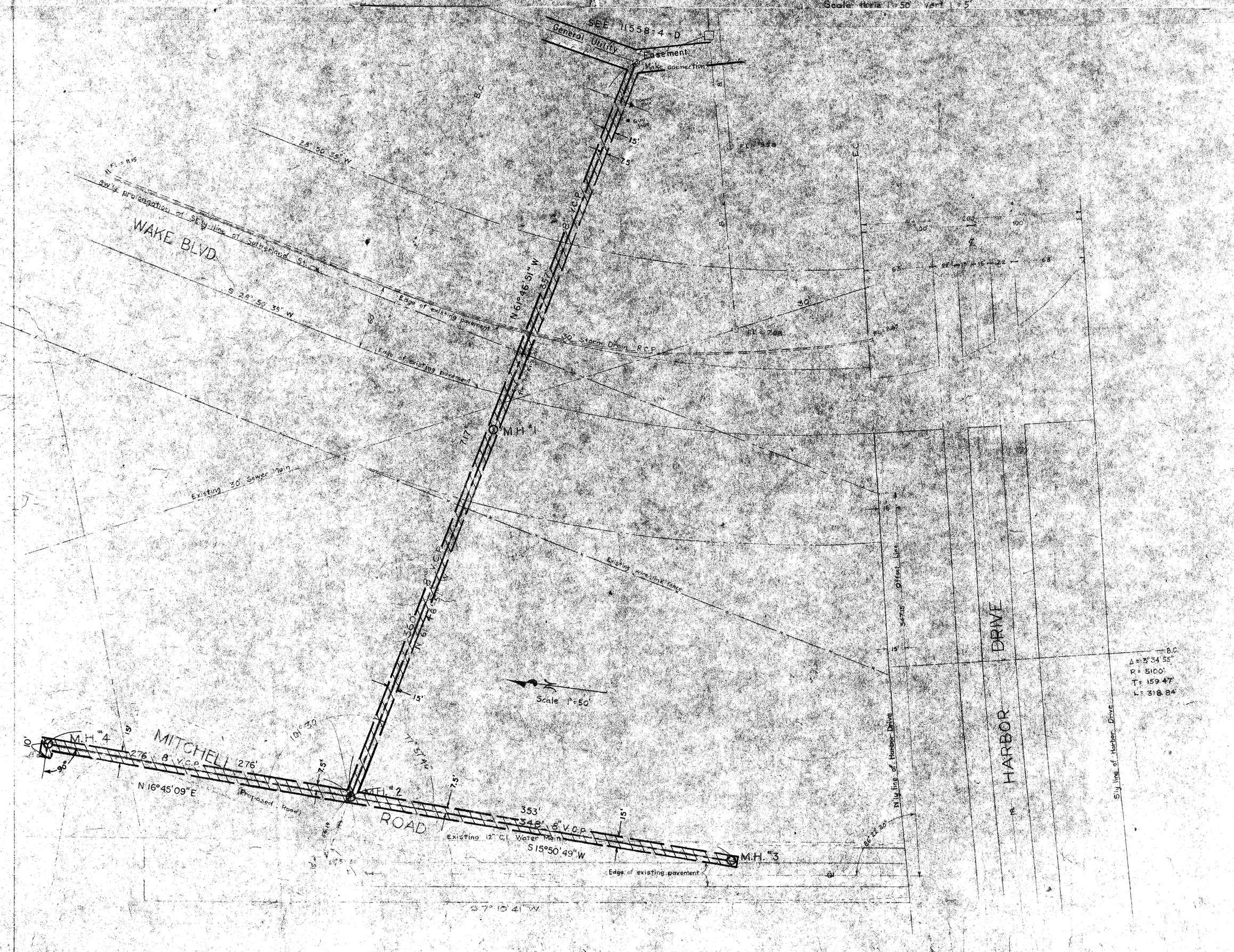

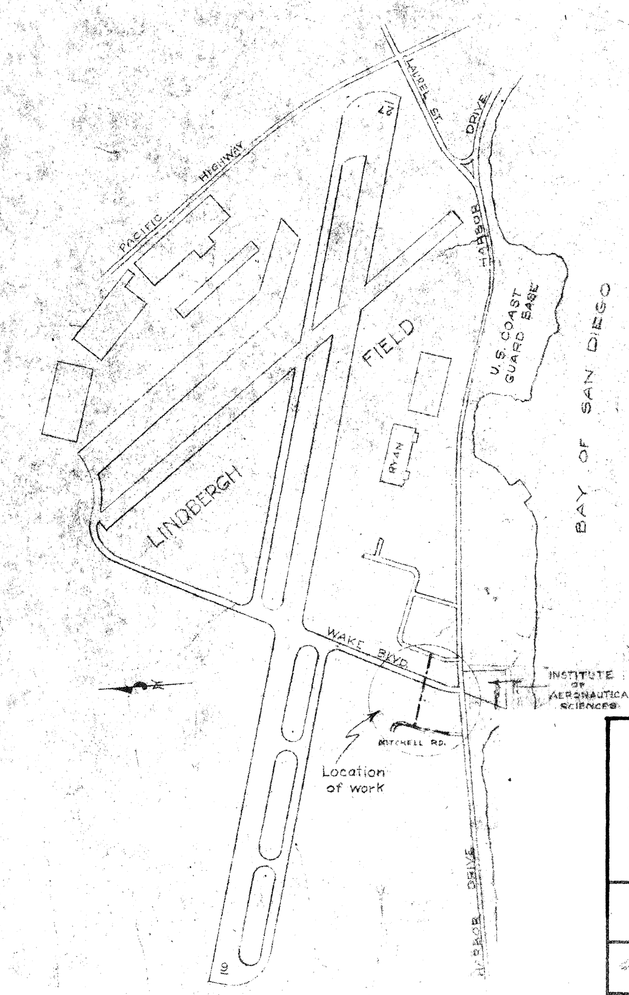

PLOT PLAN

SHOWING LOCATION OF WOR

Scale 1" = 1000'

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO.
OFFICE OF THE CLERK

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R. E. Hudson UTILITIES DIRECTOR 6-28-68	J. H. Kellemann CHIEF ENGINEER
PUBLIC WORKS INSPECTOR ORIGINAL CONVEYANCE DOCUMENT NO. 45883 FILED FEB. 17, 1953	ORIGINAL CONVEYANCE DOCUMENT NO. 11 FILED FEB. 13, 1953

SEWER ESMT. - Air freight area Lindbergh Field (E'ly of Wake Blvd to Mitchell Rd.) Below M.H.T.L.

TIDELANDS

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 3 OF 24 SHEETS

W.O. NO. 17430

CITY ENGINEER — DATE — DIVISION HEAD

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	MH Duff	[illegible]	6-28-68	

DESIGN ENGINEER

CONTROL CERTIFICATION

206-1709
LAMBERT COORDINATES

CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

11557-3 -D

HARBOR No 17-D-93

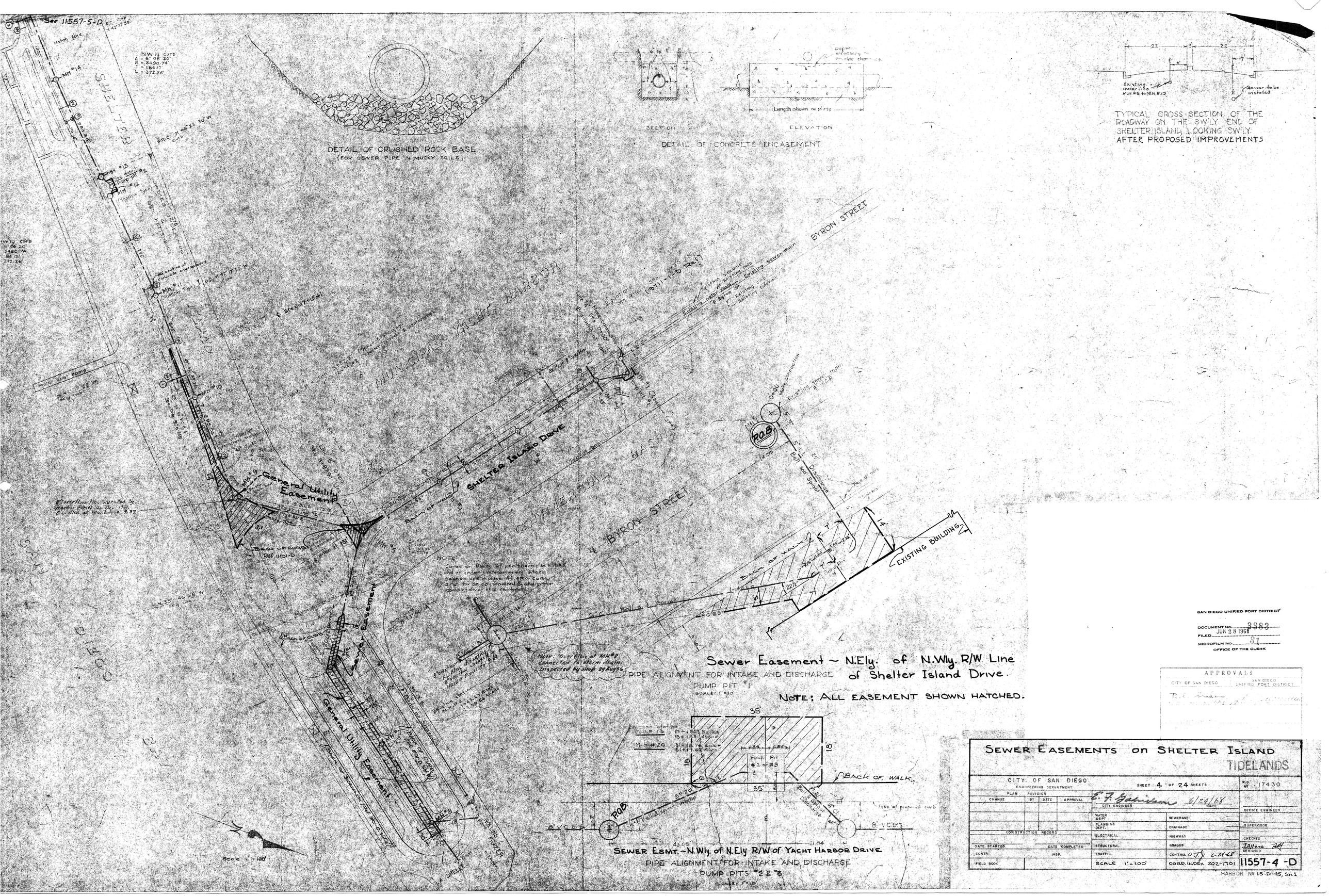

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 31
OFFICE OF THE CLERK

APPROVALS

CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R. C. Snider	

SEWER EASEMENTS on SHELTER ISLAND
TIDELANDS

CITY OF SAN DIEGO
ENGINEERING DEPARTMENT

SHEET 4 OF 24 SHEETS

W.O. NO. 17430

PLAN REVISION				
CHANGE	BY	DATE	APPROVAL	

CITY ENGINEER: E. F. Bednarczyk — DATE: 6/24/68

OFFICE ENGINEER

SUPERVISOR

CHECKED

DESIGNED: Jallona

CONSTRUCTION RECORD			
DATE STARTED		DATE COMPLETED	
CONTR.		INSP.	
FIELD BOOK			

WATER DEPT.	SEWERAGE
PLANNING DEPT.	DRAINAGE
ELECTRICAL	HIGHWAY
STRUCTURAL	GRADES
TRAFFIC	CONTROL D.J. 6-24-68
SCALE 1" = 100'	CORD. INDEX 202-1701

11557-4-D

HARBOR No 15-D-45, Sh 1

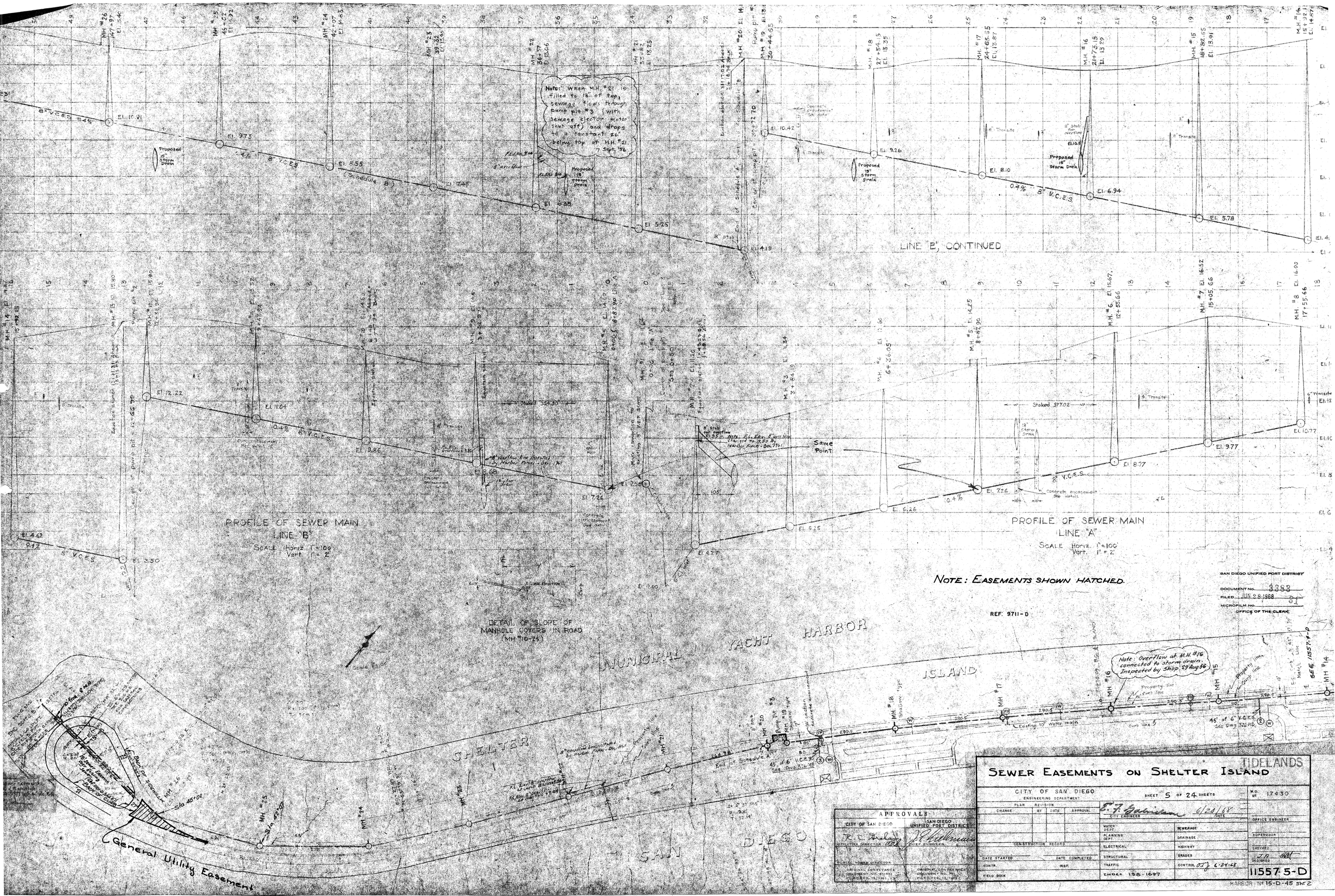
LINE "B", CONTINUED
PROFILE OF SEWER MAIN
LINE "B"
SCALE Horiz. 1"=100'
Vert. 1" = 2'
PROFILE OF SEWER MAIN
LINE "A"
SCALE Horiz. 1"=100'
Vert. 1" = 2'
Note: When M.H. #21 is filled to 18" of top, sewage flows through pump pit #3 (with sewage ejector motor shut off) and drops to a constant 26" below top of M.H. #21. 7 Sept. '56
Note: Overflow at M.H. #16 connected to storm drain. Inspected by Shop 29 Aug 56
Same Point
Proposed 15" Storm Drain
Staked 377.02
Staked 354.30
Concrete encasement See detail.
DETAIL OF SLOPE OF MANHOLE COVERS IN ROAD (MH #10-25)
MUNICIPAL YACHT HARBOR
SHELTER ISLAND
SAN DIEGO
General Utility Easement
Existing 10" Water main
45' of 6" V.C.E.S. See Dwg. 326-MB
SEE 11557-4-D
NOTE: EASEMENTS SHOWN HATCHED.
REF: 9711-D
SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 51
OFFICE OF THE CLERK
TIDELANDS
SEWER EASEMENTS ON SHELTER ISLAND
CITY OF SAN DIEGO
ENGINEERING DEPARTMENT
SHEET 5 OF 24 SHEETS
W.O. NO. 17430
PLAN REVISION
CHANGE BY DATE APPROVAL
CITY ENGINEER
DATE
OFFICE ENGINEER
WATER DEPT.
SEWERAGE
PLANNING DEPT.
DRAINAGE
SUPERVISOR
CONSTRUCTION RECORD
ELECTRICAL
HIGHWAY
CHECKED
DATE STARTED
DATE COMPLETED
STRUCTURAL
GRADES
DESIGNED
CONTR.
INSP.
TRAFFIC
CONTROL
FIELD BOOK
INDEX 198-1697
11557-5-D
HARBOR No 15-D-45 Sht 2
APPROVALS
CITY OF SAN DIEGO
SAN DIEGO UNIFIED PORT DISTRICT
UTILITIES DIRECTOR
CHIEF ENGINEER
PUBLIC WORKS DIRECTOR
ORIGINAL CONVEYANCE DOCUMENT NO. 85193 FILED FEB. 15, 1961
ORIGINAL CONVEYANCE DOCUMENT NO. FILED FEB. 13, 1963

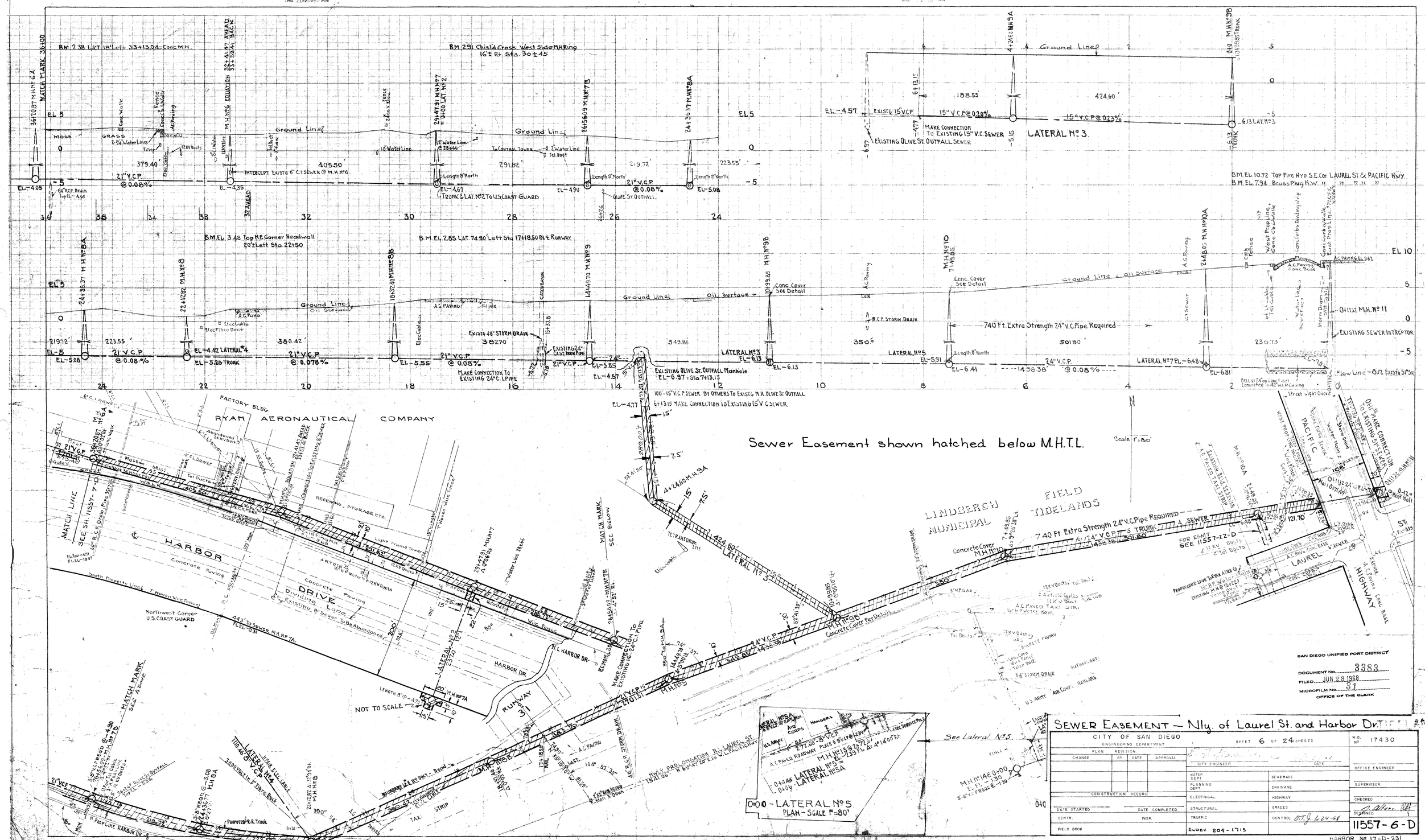
Sewer Easement shown hatched below M.H.T.L.
Scale 1" = 80'
SEWER EASEMENT — Nly. of Laurel St. and Harbor Dr.
CITY OF SAN DIEGO
ENGINEERING DEPARTMENT
SHEET 6 OF 24 SHEETS
W.O. Nº 17430
PLAN REVISION
CHANGE BY DATE APPROVAL
CITY ENGINEER DATE
OFFICE ENGINEER
WATER DEPT. SEWERAGE
PLANNING DEPT. DRAINAGE
SUPERVISOR
CONSTRUCTION RECORD
ELECTRICAL HIGHWAY
CHECKED
DATE STARTED DATE COMPLETED
STRUCTURAL GRADES
DESIGNED
CONTR. INSP.
TRAFFIC CONTROL
FIELD BOOK
INDEX 209-1715
11557-6-D
HARBOR Nº 17-D-231
SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 31
OFFICE OF THE CLERK
LATERAL Nº 3.
LATERAL Nº 5
LATERAL Nº 7
LATERAL Nº 4
LATERAL Nº 5A
LATERAL Nº 3
TRUNK & LAT. Nº 2 TO U.S. COAST GUARD
OLIVE ST. OUTFALL
EXISTING OLIVE ST. OUTFALL SEWER
MAKE CONNECTION TO EXISTING 15" V.C. SEWER
740 Ft. Extra Strength 24" V.C. Pipe Required
EXISTING SEWER INTERCEPTOR
RYAN AERONAUTICAL COMPANY
FACTORY BLDG.
HARBOR DRIVE
RUNWAY 31
LINDBERGH FIELD
MUNICIPAL TIDELANDS
LAUREL STREET
PACIFIC HIGHWAY
NOT TO SCALE
See Lateral Nº 5
0+00 - LATERAL Nº 5
PLAN - SCALE 1" = 80'

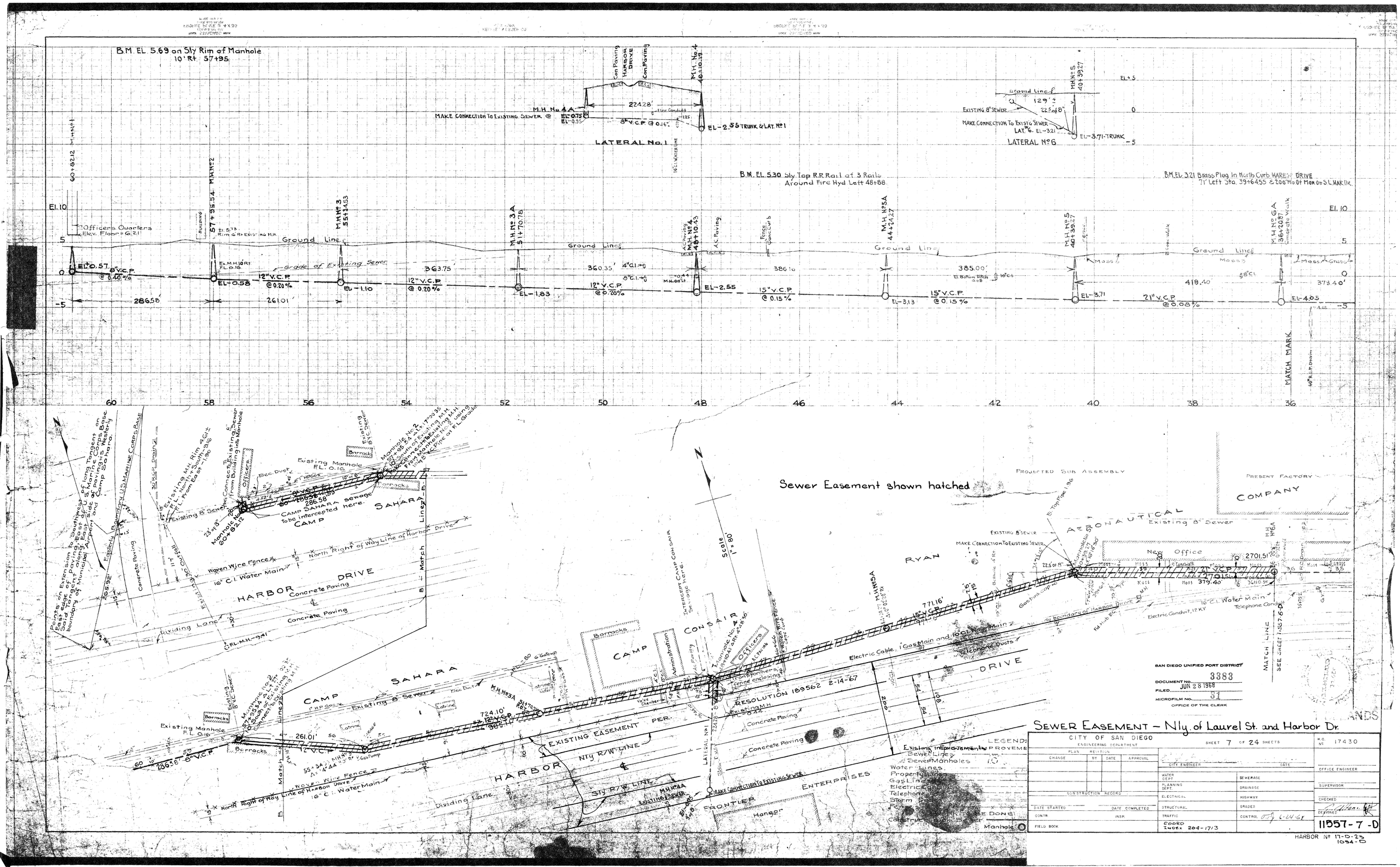
B.M. EL. 5.69 on Sly Rim of Manhole 10' Rt. 57+95
M.H. No 4A
MAKE CONNECTION TO EXISTING SEWER @ EL-0.75 EL-0.35
224.28'
8" V.C.P. @ 0.16%
EL-2.55 TRUNK & LAT. No 1
LATERAL No. 1
Con. Paving
HARBOR DRIVE
M.H. No 4
LATERAL No 6
EXISTING 8" SEWER
MAKE CONNECTION TO EXISTING SEWER
EL-3.71-TRUNK
B.M. EL. 5.30 Sly Top R.R. Rail of 3 Rails Around Fire Hyd Left 48+88
B.M. EL. 3.21 Brass Plug in North Curb HARBOR DRIVE 71' Left Sta. 39+64.55 & 200' No of Mon. on S.L. HARBOR DR.
Ground Line
Grade of Existing Sewer
Officers Quarters
Elev. Floor = 6.21
EL. 0.57
8" V.C.P. @ 0.40%
12" V.C.P. @ 0.20%
EL-0.58
EL-1.10
EL-1.83
EL-2.55
15" V.C.P. @ 0.15%
EL-3.13
EL-3.71
21" V.C.P. @ 0.08%
EL-4.05
286.58'
261.01'
363.75'
360.35'
386.10
385.00'
418.40'
373.40'
MATCH MARK
Sewer Easement shown hatched
Points of Extension to Southwest of Long Tangent on East Edge of Paving, East of Paving Case Said Tangent along Easterly boundary of Municipal Airport and Camp Sahara Westerly
Existing M.H. Rim 4.61 F.L. North 7.19 South 3.16 from Ea 6+ -1.96
Existing Boundary U.S. Marine Corps Base
Existing 8" Sewer
Connect Existing Sewer from Building into Manhole
Manhole No 2 57+95.54 Lt. 19.99 S. of Existing M.H. Connect to Existing M.H. Pipe Out F.L. 3.16
CAMP SAHARA sewage to be intercepted here.
CAMP SAHARA
Existing Manhole F.L. 0.16
Barracks
Officers
Woven Wire Fence
16" C.I. Water Main
North Right of Way Line of Harbor Drive
HARBOR DRIVE
Concrete Paving
Dividing Lane
FL. M.H. - 9.41
Existing 8" Sewer
Existing Manhole F.L. 0.16
Manhole No 2 57+95.54 Lt. 19.99 S. of Existing M.H. Connect to Existing M.H.
Existing 8" V.C.P.
Existing M.H. F.L. 0.44
EXISTING EASEMENT PER RESOLUTION 189562 2-14-67
Nly R/W LINE
Sly R/W LINE
M.H. No 4A
Existing Sewer
MAKE CONNECTION TO EXISTING SEWER
FRONTIER ENTERPRISES
Hangar
CAMP CONSAIR
Administration
Intercept Camp Consair Sewer here.
Manhole No 4 48+10.43
Manhole No 5 40+39.27
Existing 8" Sewer
MAKE CONNECTION TO EXISTING SEWER
RYAN AERONAUTICAL COMPANY
Present Factory
Projected Sub Assembly
New Office
Existing 8" Sewer
Manhole No 5 40+39.27
Manhole No 6 36+20.87
21" V.C.P.
16" C.I. Water Main
Telephone Conduit
Electric Conduit, 12 KV
Gas Main
Telephone Ducts
Electric Cable, Gas Main and 16" C.I. Water Main
Sly Boundary of Harbor Drive
Scale 1" = 80'
Legend:
Existing Improvements
Sewer Lines
Sewer Manholes
Water Lines
Property Lines
Gas Line
Electric Line
Telephone
Storm Drain
Construction Work Done
Manhole
SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 31
OFFICE OF THE CLERK
MATCH LINE
SEE SHEET 1-557-6-D
SEWER EASEMENT – Nly. of Laurel St. and Harbor Dr.
CITY OF SAN DIEGO
ENGINEERING DEPARTMENT
SHEET 7 OF 24 SHEETS
W.O. No 17430
PLAN REVISION
CHANGE BY DATE APPROVAL
CITY ENGINEER DATE
WATER DEPT. SEWERAGE
PLANNING DEPT. DRAINAGE
ELECTRICAL HIGHWAY
STRUCTURAL GRADES
TRAFFIC CONTROL
COORD INDEX 204-17/3
CONSTRUCTION RECORD
DATE STARTED DATE COMPLETED
CONTR INSP.
FIELD BOOK
OFFICE ENGINEER
SUPERVISOR
CHECKED
DESIGNED
11557-7-D
HARBOR No 17-D-23
1054-D

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 31
OFFICE OF THE CLERK

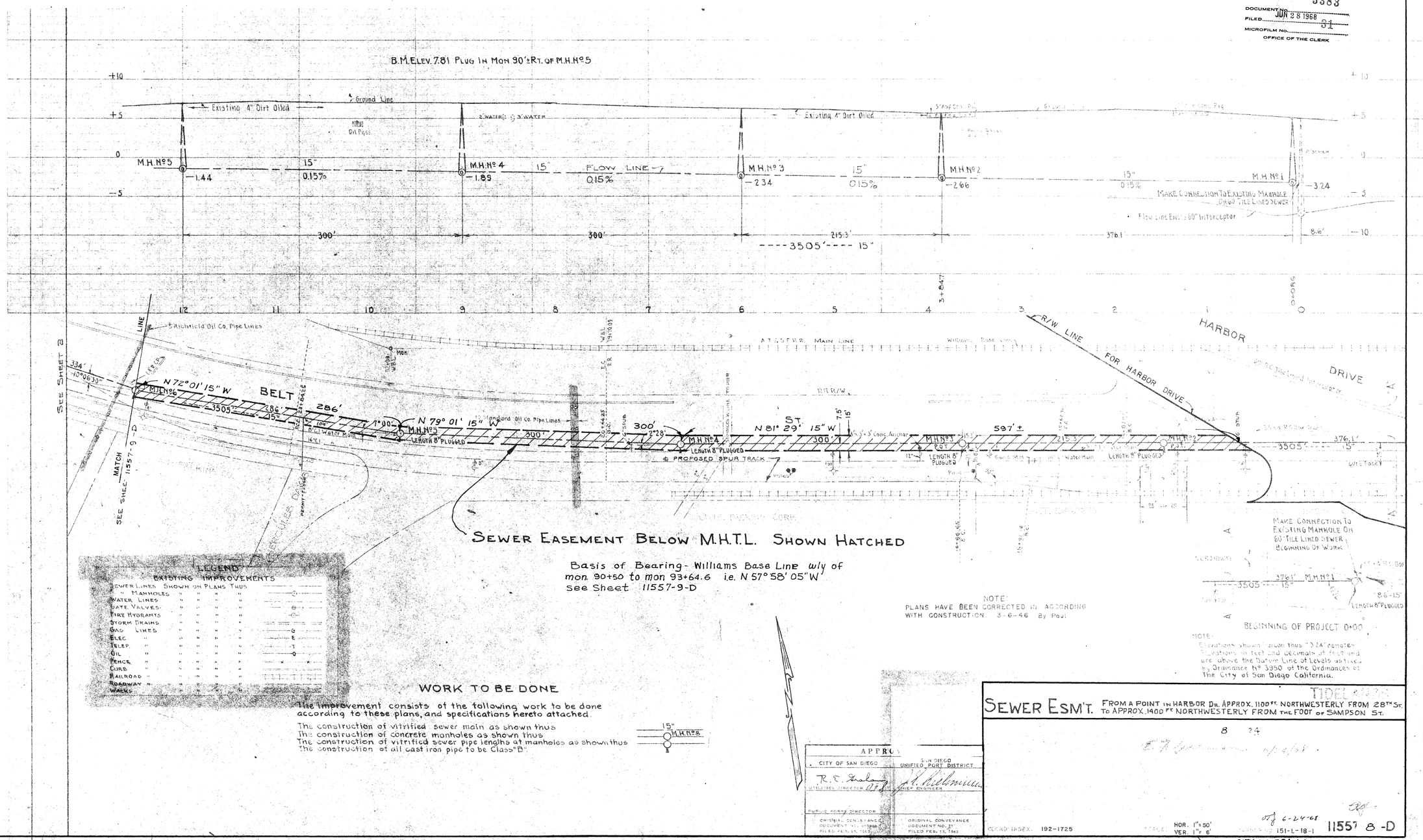

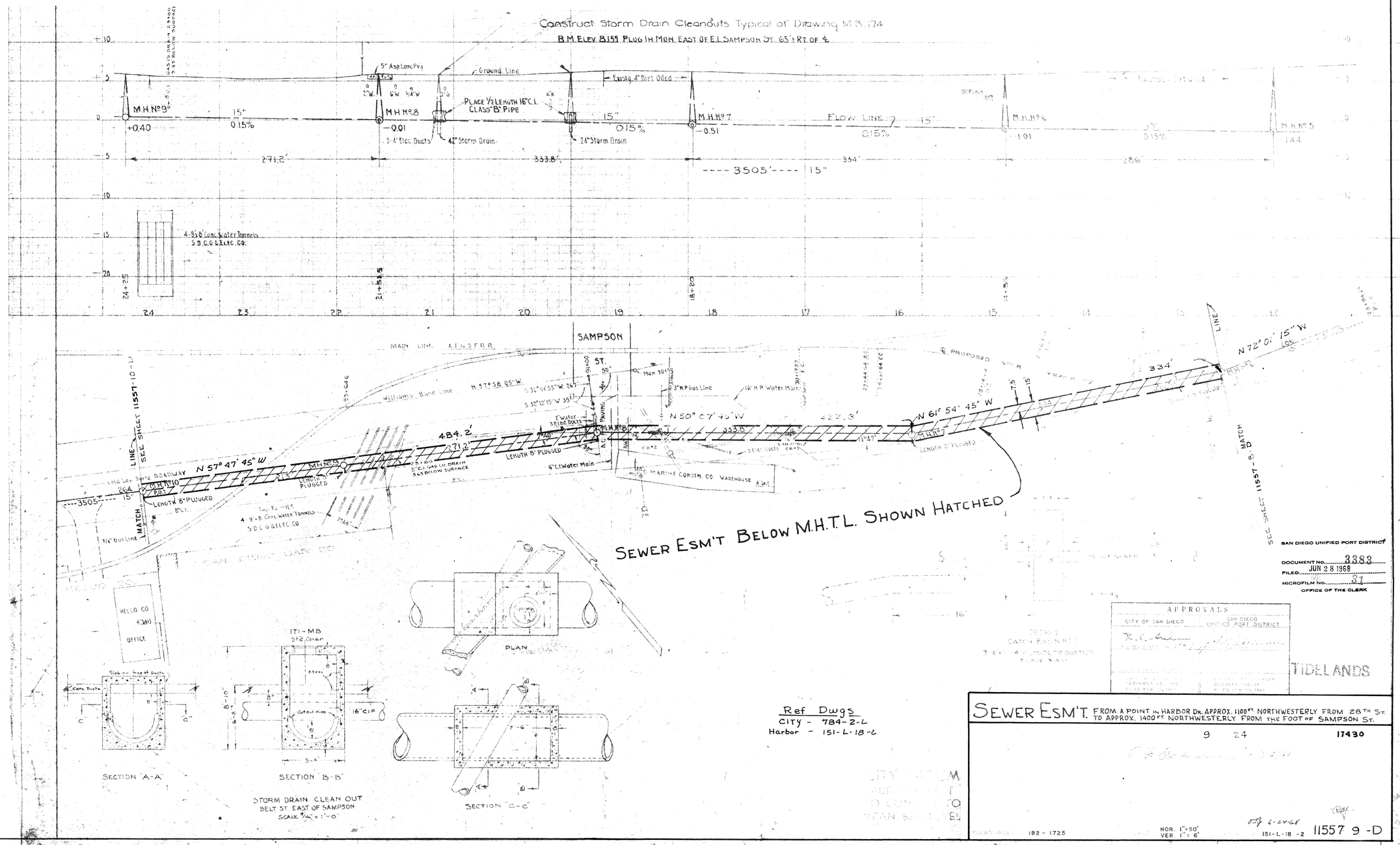
Construct Storm Drain Cleanouts Typical of Drawing M.B. 174
B.M. Elev. 8.159 Plug in Mon. East of E. L. Sampson St. 65' ± Rt. of ℄
M.H. No. 9
M.H. No. 8
M.H. No. 7
M.H. No. 6
M.H. No. 5
Flow Line
Ground Line
Existg. 4" Dirt Oiled
5" Asp. Conc. Pvg.
Place 1/2 Length 16" C.I. Class "B" Pipe
42" Storm Drain
24" Storm Drain
3-4" Elec. Ducts
15"
0.15%
+0.40
-0.01
-0.51
-1.01
1.44
271.2'
333.8'
334'
286'
3505'
4-8'x8' Conc. Water Tunnels S.D.G.&Elec. Co.
SAMPSON ST.
MAIN LINE A.T.&S.F.R.R.
Williams Blue Line
N 57° 58' 05" W
N 57° 47' 45" W
N 50° 07' 45" W
N 61° 54' 45" W
N 72° 01' 15" W
484.2'
333.3'
334'
Length 8' Plugged
6" C.I. Water Main
16" H.P. Water Main
3" M.P. Gas Line
Sewer Ducts
Sewer Esm't Below M.H.T.L. Shown Hatched
Match Line
See Sheet 11557-10-D
See Sheet 11557-8-D
Proposed Spur Track
Plan
Section "A-A"
Section "B-B"
Section "C-C"
Storm Drain Clean Out
Belt St. East of Sampson
Scale 3/4" = 1'-0"
Ref Dwgs
City - 784-2-L
Harbor - 151-L-18-2
San Diego Unified Port District
Document No. 3383
Filed JUN 28 1968
Microfilm No. 32
Office of the Clerk
Approvals
City of San Diego
San Diego Unified Port District
Tidlands
Sewer Esm't. From a point in Harbor Dr. approx. 1100 ft. northwesterly from 28th St. to approx. 1400 ft. northwesterly from the foot of Sampson St.
9 24
17430
192 - 1725
Hor. 1" = 50'
Ver. 1" = 6'
151-L-18-2
11557 9-D

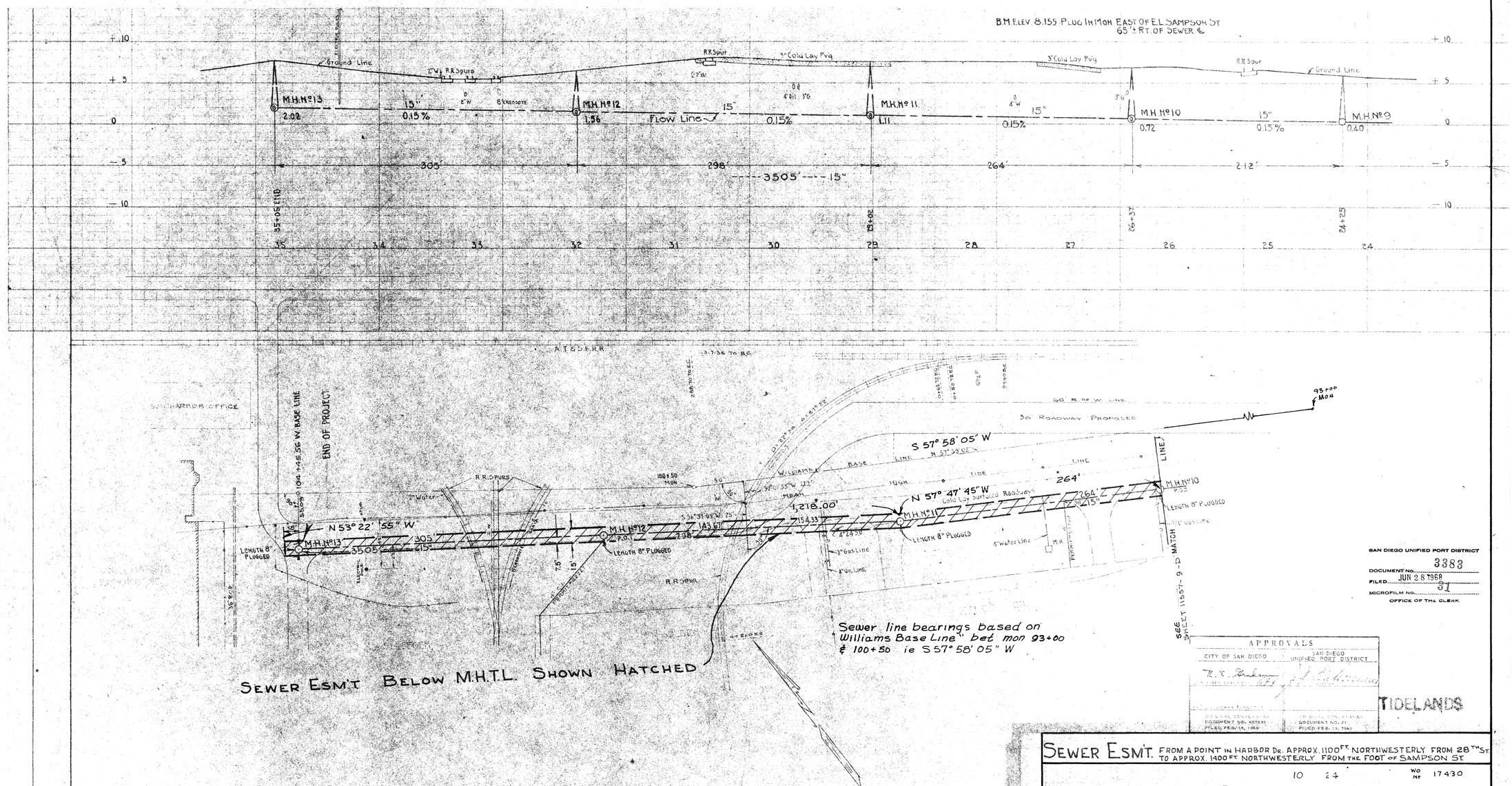

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 31
OFFICE OF THE CLERK

APPROVALS

CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
ORIGINAL CONTROL NO. DOCUMENT NO. 65583 FILED FEB 15, 1965	ORIGINAL CONTROL NO. DOCUMENT NO. 21 FILED FEB. 13, 1963

TIDELANDS

SEWER ESM'T. FROM A POINT IN HARBOR DR. APPROX. 1100 FT NORTHWESTERLY FROM 28TH ST TO APPROX. 1400 FT NORTHWESTERLY FROM THE FOOT OF SAMPSON ST

10 24 WO No 17430

E.T. Bainium 6/24/68

COORD. INDEX. 192-1723 SCALE HOR. 1" = 50' VER. 1" = 6' HARBOR No 151-L-18 -3 11557-10-D

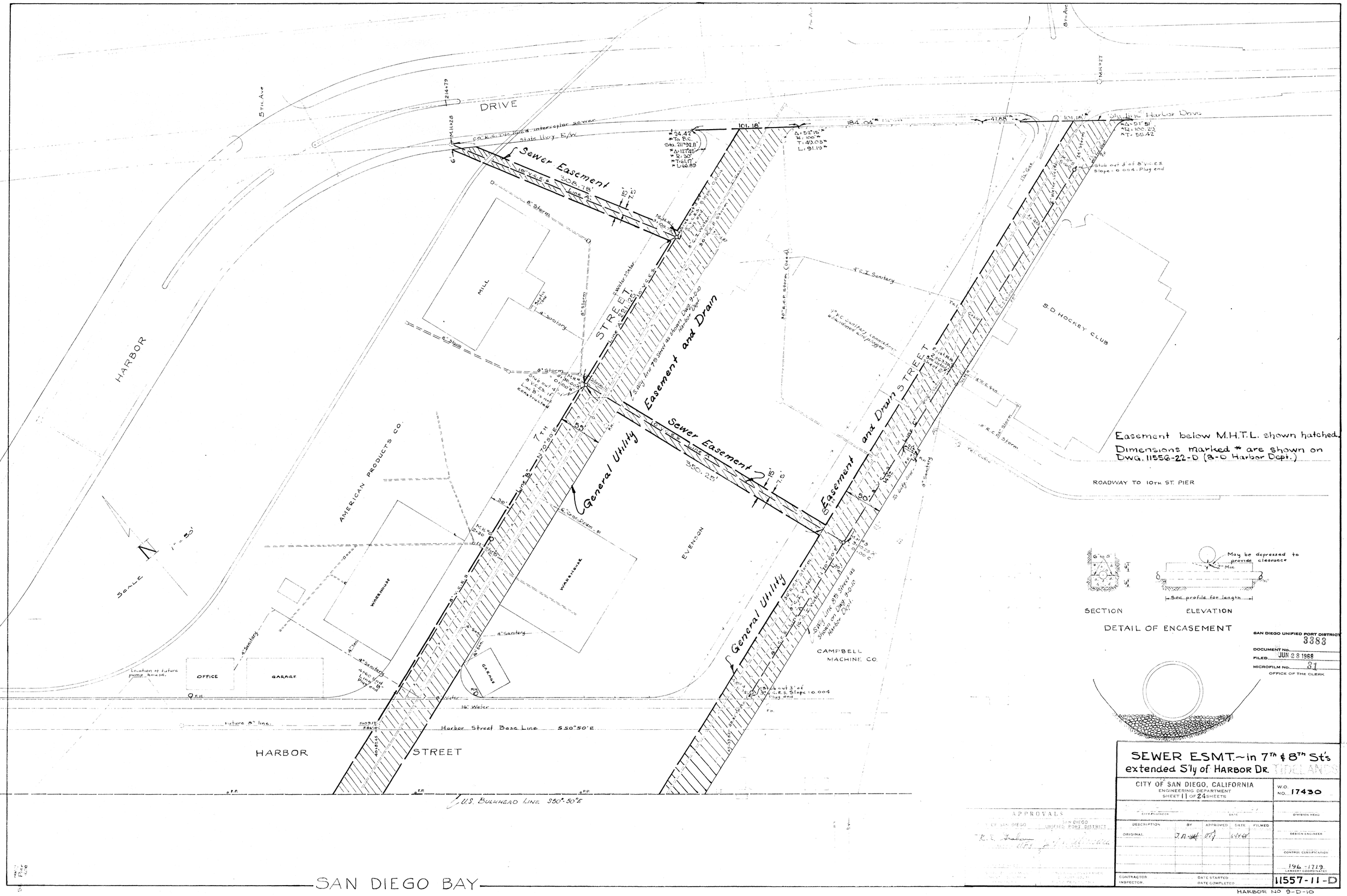
DRIVE
5TH. AVE.
7TH. AVE.
8TH. AVE.
HARBOR
STREET
Sewer Easement
Sewer Easement and Drain
General Utility
Easement and Drain
Sly line Harbor Drive
Sly line 7th Street as shown Dwg. 9-D-10 Harbor Dept.
Sly line 8th Street as shown Dwg. 9-D-10 Harbor Dept.
Harbor Street Base Line S 50°50' E
U.S. BULKHEAD LINE S50°-50'E
MILL
AMERICAN PRODUCTS CO.
WAREHOUSE
EVERSON
CAMPBELL MACHINE CO.
S.D. HOCKEY CLUB
OFFICE
GARAGE
ROADWAY TO 10TH. ST. PIER
SCALE 1" = 50'
SAN DIEGO BAY
Easement below M.H.T.L. shown hatched.
Dimensions marked * are shown on Dwg. 11556-22-D (B-D Harbor Dept.)
SECTION
ELEVATION
DETAIL OF ENCASEMENT
May be depressed to provide clearance
See profile for length
SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 31
OFFICE OF THE CLERK
SEWER ESMT.~in 7th & 8th St's extended S'ly of HARBOR DR.
CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 11 OF 24 SHEETS
W.O. NO. 17430
APPROVALS
DESCRIPTION
BY
APPROVED
DATE
FILMED
ORIGINAL
DESIGN ENGINEER
CONTROL CERTIFICATION
196-1719
LAMBERT COORDINATES
CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED
11557-11-D
HARBOR NO 9-D-10

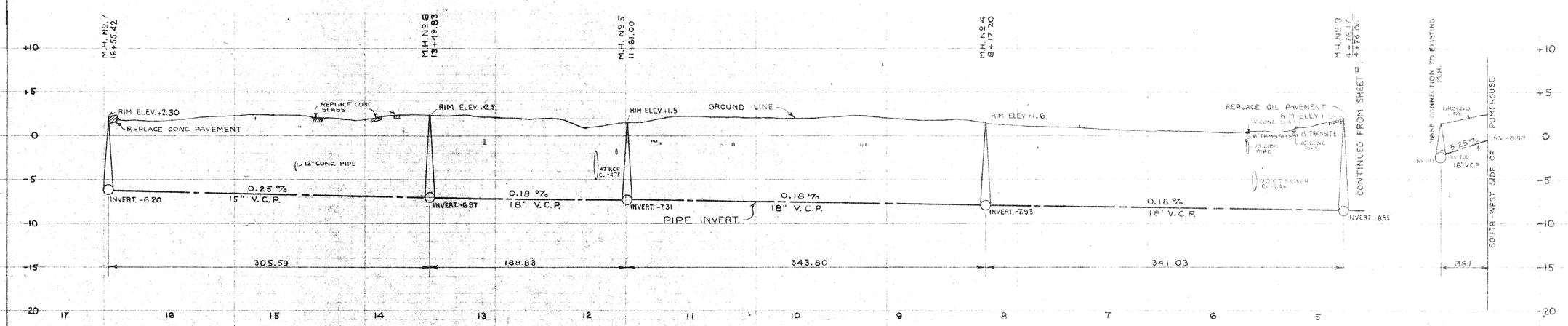

GRAVITY SECTION

OVERFLOW

(SEE SHEET # 1)

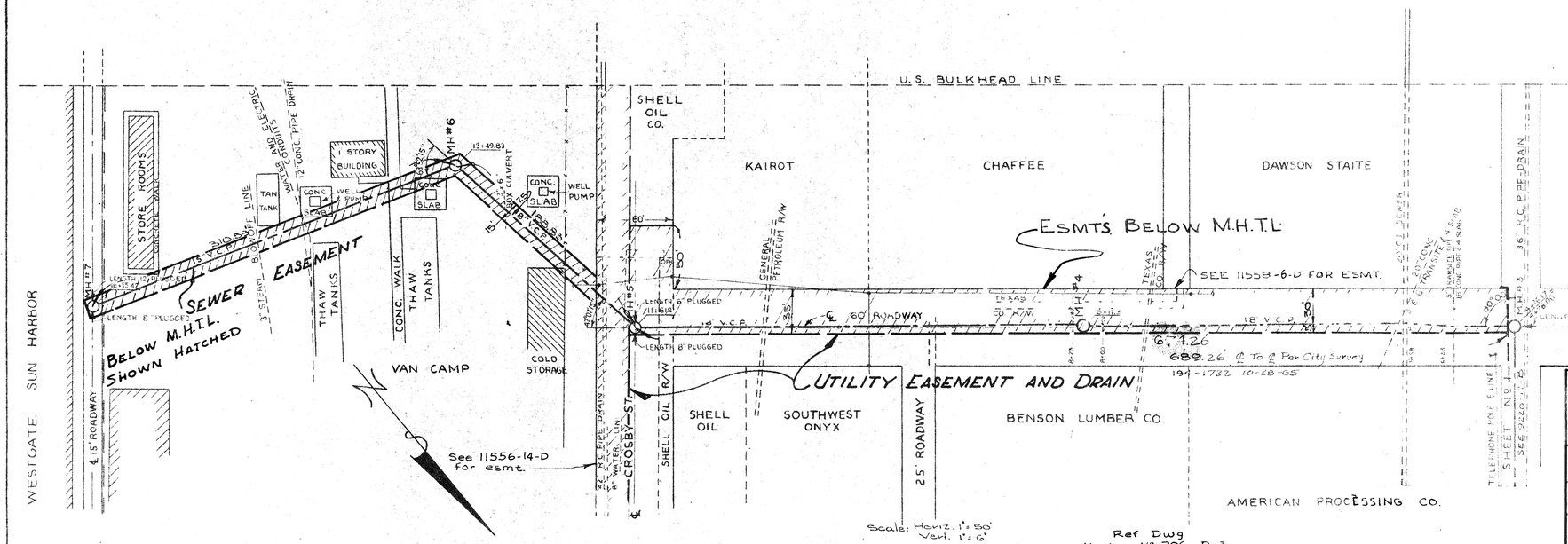

Scale: Horiz. 1" = 50'
Vert. 1" = 6'

Ref. Dwg
Harbor No 206-D-2

NOTE: ALL ELEVATIONS ARE ON CITY DATUM. M.L.L.W. = -9.01

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 31
OFFICE OF THE CLERK

APPROVALS
CITY OF SAN DIEGO
SAN DIEGO UNIFIED PORT DISTRICT

SEWER ESMT. - S'ely of Crosby St. & Water St (Not City Streets) in the TIDELANDS

CITY OF SAN DIEGO, CALIFORNIA ENGINEERING DEPARTMENT SHEET 12 OF 24 SHEETS	W.O. NO. 17430
CITY ENGINEER / DATE	DIVISION HEAD
DESCRIPTION / BY / APPROVED / DATE / FILMED ORIGINAL / J.A.Bell / DJ / 6-28-68	DESIGN ENGINEER
	CONTROL CERTIFICATION 194-1723
CONTRACTOR / DATE STARTED INSPECTOR / DATE COMPLETED	11557-12-D

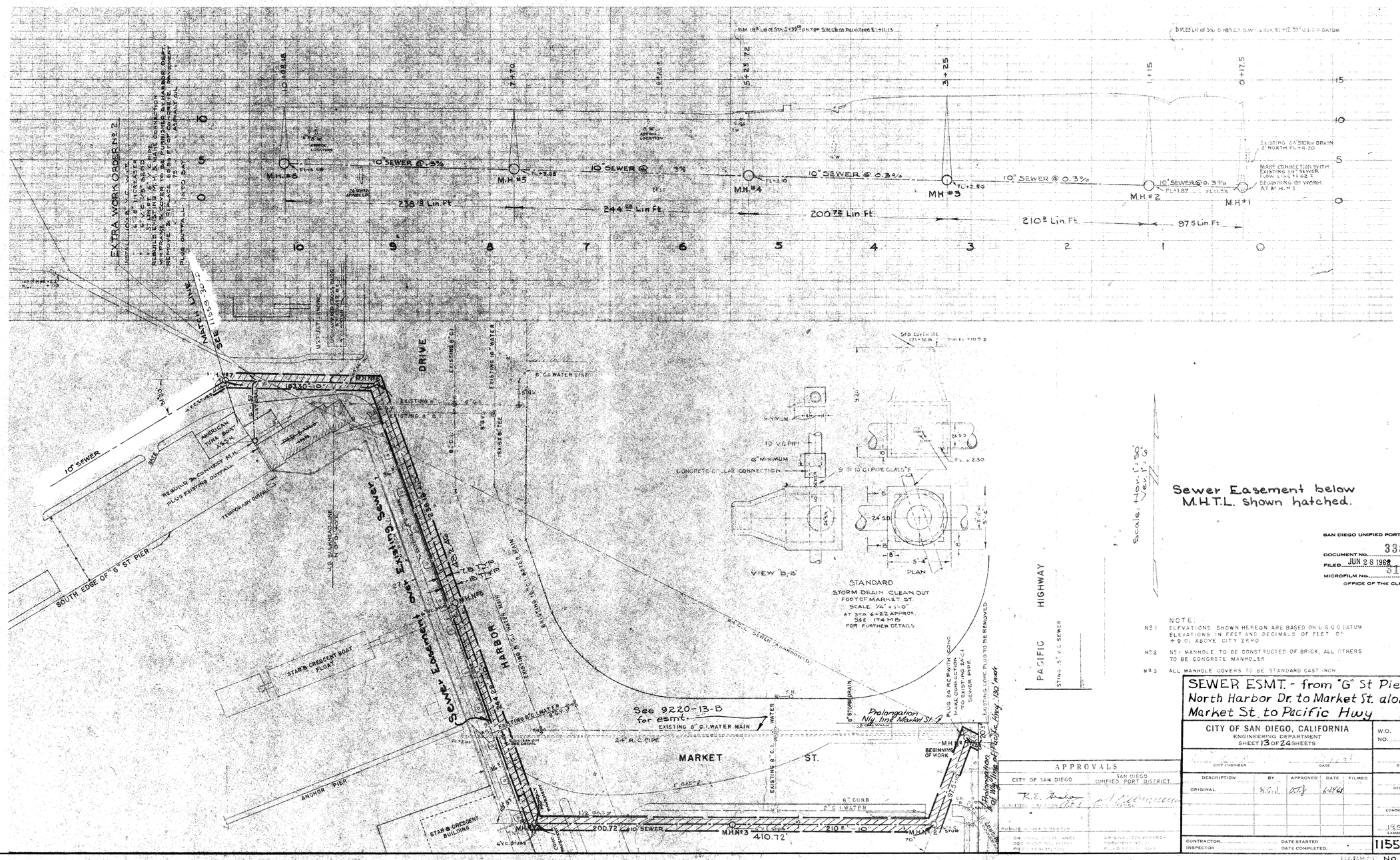
EXTRA WORK ORDER No 2
INSTALL 10" V.C. SEWER
REBUILD EXISTING M.H. CONNECTION
PLUG OUTFALL INTO BAY
10" SEWER @ 0.3%
M.H. #6
M.H. #5
M.H. #4
M.H. #3
M.H. #2
M.H. #1
238.13 Lin. Ft.
244.68 Lin. Ft.
200.72 Lin. Ft.
210.0 Lin. Ft.
97.5 Lin. Ft.
EXISTING 24" STORM DRAIN
MAKE CONNECTION WITH EXISTING 24" SEWER FLOW LINE ELEV. 8
BEGINNING OF WORK AT M.H. #1
DRIVE
NORTH HARBOR
MARKET ST.
PACIFIC HIGHWAY
Existing Sewer
Sewer Easement
SOUTH EDGE OF "G" ST PIER
10" SEWER
REBUILD & CONNECT M.H. PLUS EXISTING OUTFALL
TEMPORARY OUTFALL
AMERICAN TUNA BOAT "ASSN."
STAR & CRESCENT BOAT FLOAT
STAR & CRESCENT BUILDING
ANCHOR PIER
See 9220-13-B for esmt.
EXISTING 8" C.I. WATER MAIN
24" R.C. PIPE
Prolongation N'ly line of Market St.
BEGINNING OF WORK
410.72'
STANDARD
STORM DRAIN CLEAN OUT
FOOT OF MARKET ST
SCALE 1/4" = 1'-0"
AT STA. 6+22 APPROX.
SEE 174 MB
FOR FURTHER DETAILS
VIEW "B-B"
PLAN
Sewer Easement below M.H.T.L. shown hatched.
SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 91
OFFICE OF THE CLERK
NOTE:
No 1 ELEVATIONS SHOWN HEREON ARE BASED ON U.S.C.G. DATUM ELEVATIONS IN FEET AND DECIMALS OF FEET OR +9.01 ABOVE CITY ZERO
No 2 No 1 MANHOLE TO BE CONSTRUCTED OF BRICK, ALL OTHERS TO BE CONCRETE MANHOLES
No 3 ALL MANHOLE COVERS TO BE STANDARD CAST IRON
SEWER ESMT. - from "G" St Pier along North Harbor Dr. to Market St. along Market St. to Pacific Hwy
CITY OF SAN DIEGO
ENGINEERING DEPARTMENT
SHEET 13 OF 24 SHEETS
W.O. NO. 174.30
APPROVALS
CITY OF SAN DIEGO
SAN DIEGO UNIFIED PORT DISTRICT
DESCRIPTION
BY
APPROVED
DATE
FILMED
ORIGINAL
CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED
11557-13-D
NO 58-L-4

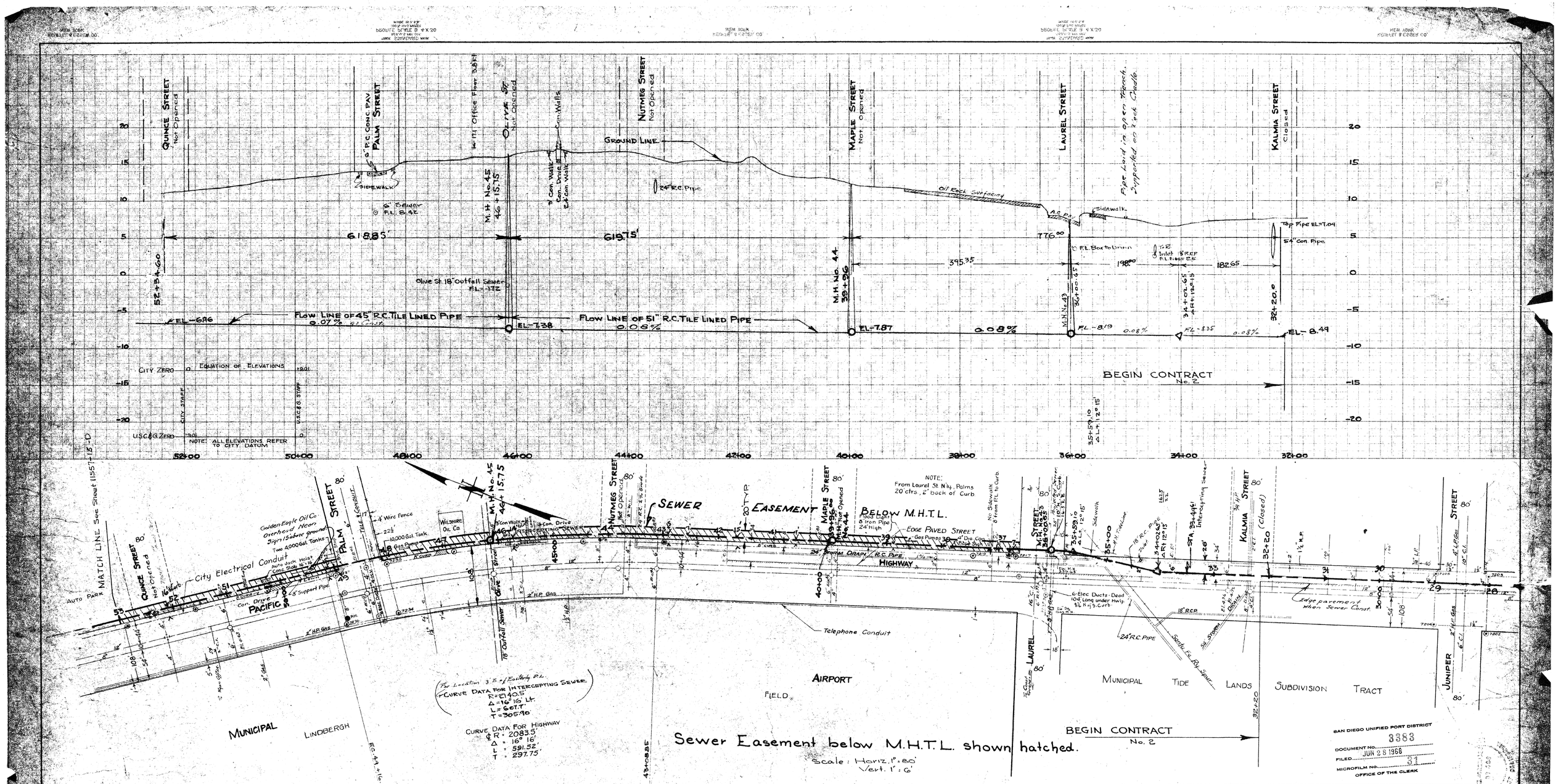

SEWER EASEMENT— TIDELANDS
Between Laurel and Bean St., below M.H.T.L.

CITY OF SAN DIEGO
ENGINEERING DEPARTMENT

SHEET 14 OF 24 SHEETS

W.O. No. 17430

PLAN REVISION			
CHANGE	BY	DATE	APPROVAL

CITY ENGINEER — DATE 6/24/68

WATER DEPT.	SEWERAGE
PLANNING DEPT.	DRAINAGE
ELECTRICAL	HIGHWAY
STRUCTURAL	GRADES
TRAFFIC	CONTROL 6-24-68

CONSTRUCTION RECORD
DATE STARTED — DATE COMPLETED
CONTR. — INSP.

COORD. INDEX: 206-1715

SCALE: HORIZ. 1" = 80' VERT. 1" = 6'

OFFICE ENGINEER
SUPERVISOR
CHECKED
DESIGNED

11557-14-D

~~HARBOR No~~
CITY No. 968-D, sht. 5. of 20

APPROVALS

CITY OF SAN DIEGO — SAN DIEGO UNIFIED PORT DISTRICT

PUBLIC WORKS DIRECTOR — CHIEF ENGINEER

ORIGINAL CONVEYANCE DOCUMENT NO. ___ RECORDED ___ FILED ___ MAP NO. ___

ORIGINAL CONVEYANCE DOCUMENT NO. ___ FILED ___ MAP NO. ___

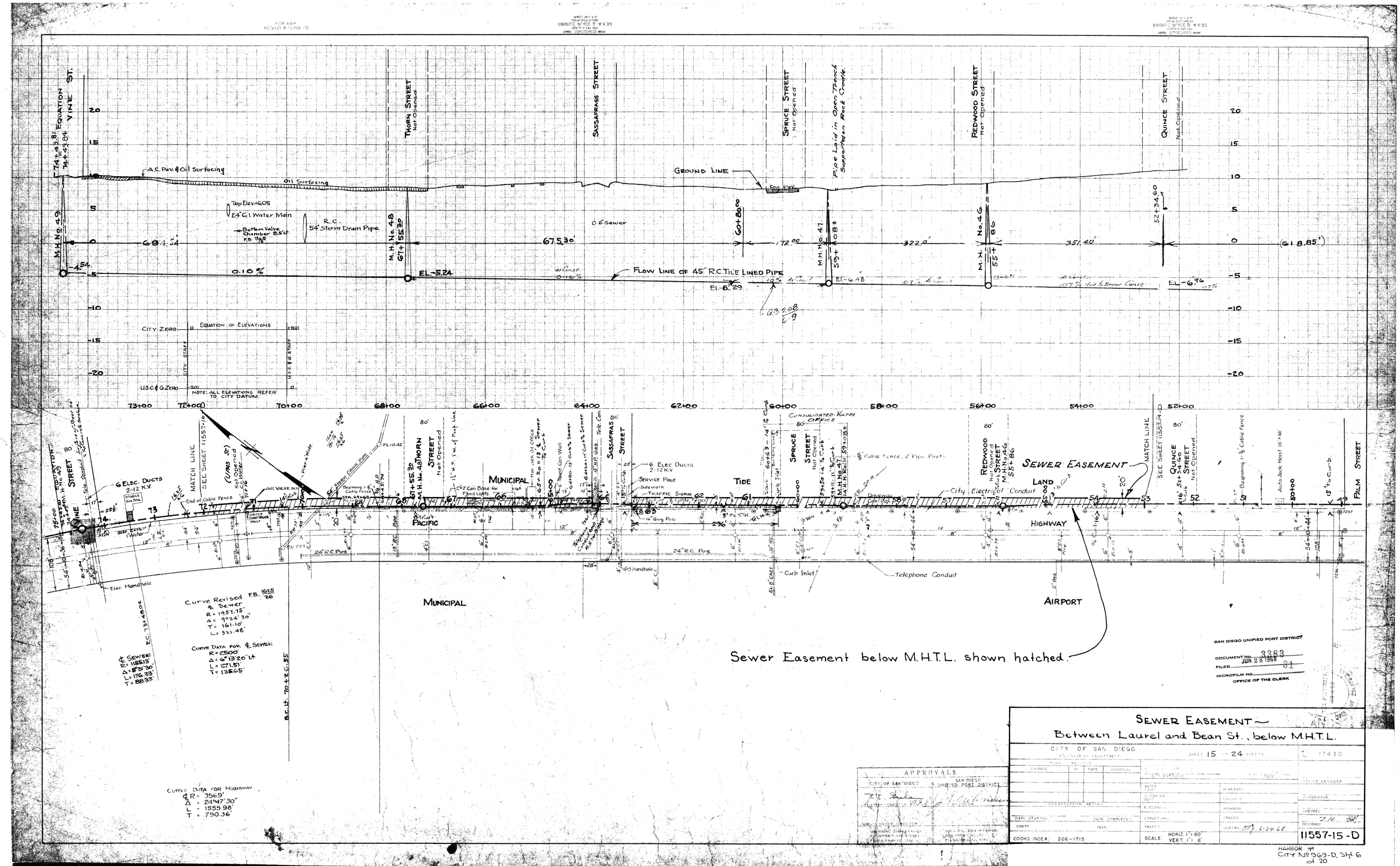

SEWER EASEMENT —
Between Laurel and Bean St., below M.H.T.L.

CITY OF SAN DIEGO
ENGINEERING DEPARTMENT

SHEET 15 OF 24 SHEETS

K 17430

CHANGE	PLAN NO.	BY	DATE	APPROVAL

CITY ENGINEER — DATE — OFFICE ENGINEER

WATER DEPT. — SEWERS — SUPERVISOR

PLANNING DEPT. — ENGINEER IC

ELECTRICAL — HIGHWAY — CHECKED

STRUCTURAL — GRADES — DESIGNED J.H.

TRAFFIC — CONTROL DJ 6-24-68

CONSTRUCTION RECORD

DATE STARTED — DATE COMPLETED

CONTR. — INSP.

COORD. INDEX: 206-1715

SCALE: HORIZ. 1" = 80' VERT. 1" = 6'

11557-15-D

APPROVALS
CITY OF SAN DIEGO — SAN DIEGO UNIFIED PORT DISTRICT
CITY ENGINEER — PORT ENGINEER

HARBOR No
CITY No 969-D, Sht. 6 of 20

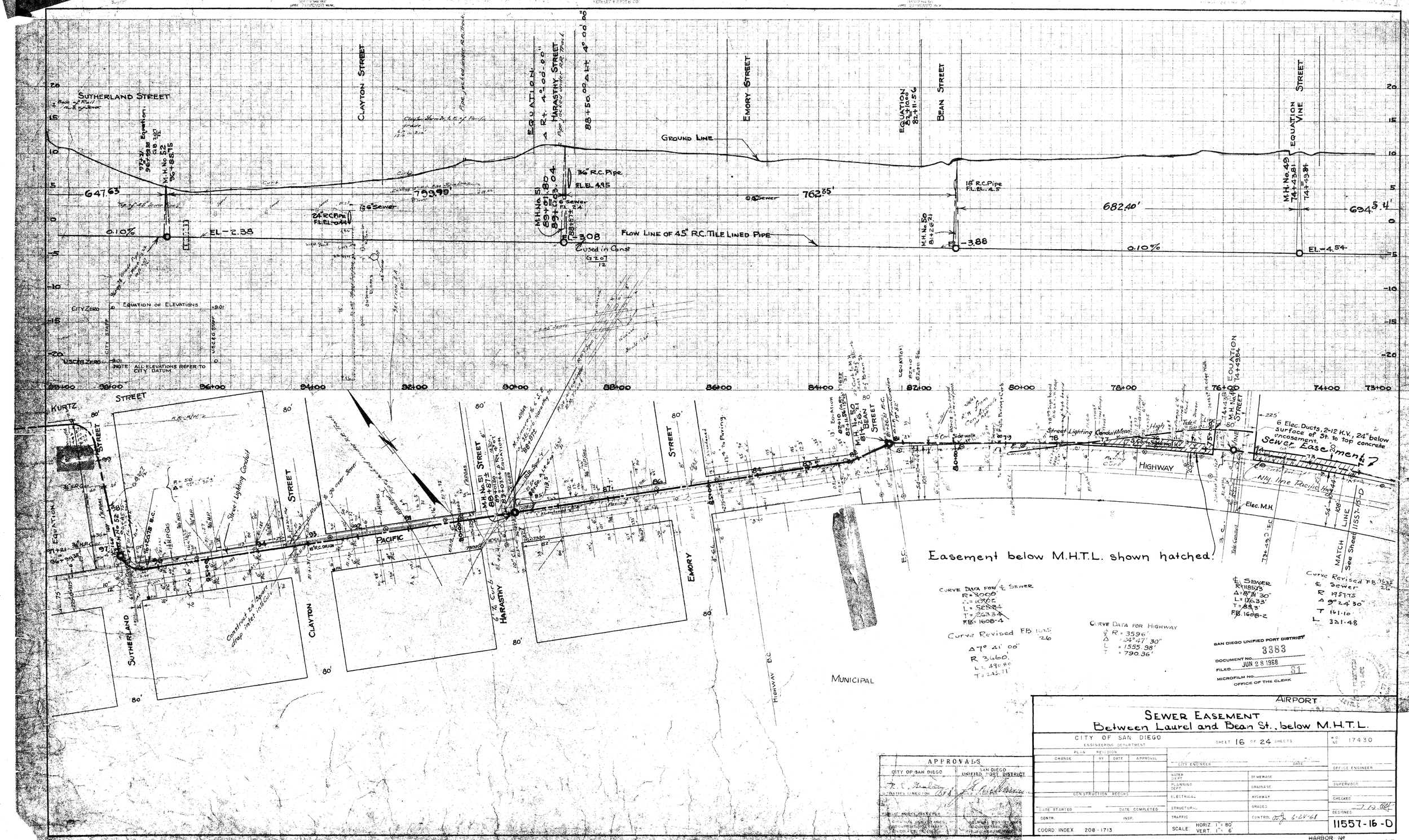
SUTHERLAND STREET
CLAYTON STREET
HARASTHY STREET
EMORY STREET
BEAN STREET
VINE STREET
EQUATION
GROUND LINE
647.63
0.10%
EL.-2.38
M.H. No. 52
M.H. No. 51
M.H. No. 50
M.H. No. 49
36" R.C. Pipe
EL. 4.95
24" R.C. Pipe
18" R.C. Pipe
FL. EL. 4.5
Flow Line of 45" R.C. Tile Lined Pipe
Cased in Conc.
762.35'
682.40'
694.54'
-3.88
EL.-4.54
CITY ZERO
EQUATION OF ELEVATIONS
NOTE: ALL ELEVATIONS REFER TO CITY DATUM
KURTZ STREET
PACIFIC HIGHWAY
MUNICIPAL AIRPORT
Street Lighting Conduit
6 Elec. Ducts, 2-12 K.V., 24" below surface of St. to top concrete encasement.
Sewer Easement
Elec. M.H.
MATCH LINE See Sheet 11557-15-D
Easement below M.H.T.L. shown hatched.
CURVE DATA FOR ℄ SEWER
R = 3000'
Δ = 10°00'
L = 525.24
T = 263.34
FB 1608-4
Curve Revised FB 1625 '26
Δ 7° 41' 00"
R 3660'
L = 490.80
T = 245.11
CURVE DATA FOR HIGHWAY
R = 3596'
Δ = 24°47' 30"
L = 1555.98'
T = 790.36'
℄ SEWER
R 1185.73
Δ 8°41' 30"
L 176.33
T 88.3
FB 1608-2
Curve Revised FB 1625 '26
℄ Sewer
R 1957.75
Δ 9°24' 30"
T 161.10
L 321.48
SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 31
OFFICE OF THE CLERK
APPROVALS
CITY OF SAN DIEGO
SAN DIEGO UNIFIED PORT DISTRICT
SEWER EASEMENT
Between Laurel and Bean St., below M.H.T.L.
CITY OF SAN DIEGO
ENGINEERING DEPARTMENT
SHEET 16 OF 24 SHEETS
W.O. No. 17430
PLAN REVISION
CHANGE BY DATE APPROVAL
CITY ENGINEER DATE
WATER DEPT.
PLANNING DEPT.
ELECTRICAL
STRUCTURAL
TRAFFIC
SEWERAGE
DRAINAGE
HIGHWAY
GRADES
CONTROL
OFFICE ENGINEER
SUPERVISOR
CHECKED
DESIGNED
CONSTRUCTION RECORD
DATE STARTED
DATE COMPLETED
CONTR.
INSP.
COORD. INDEX 208-1713
SCALE: HORIZ. 1" = 80' VERT. 1" = 6'
11557-16-D
HARBOR No. CITY No. 969-D. Sht. 7 of 20

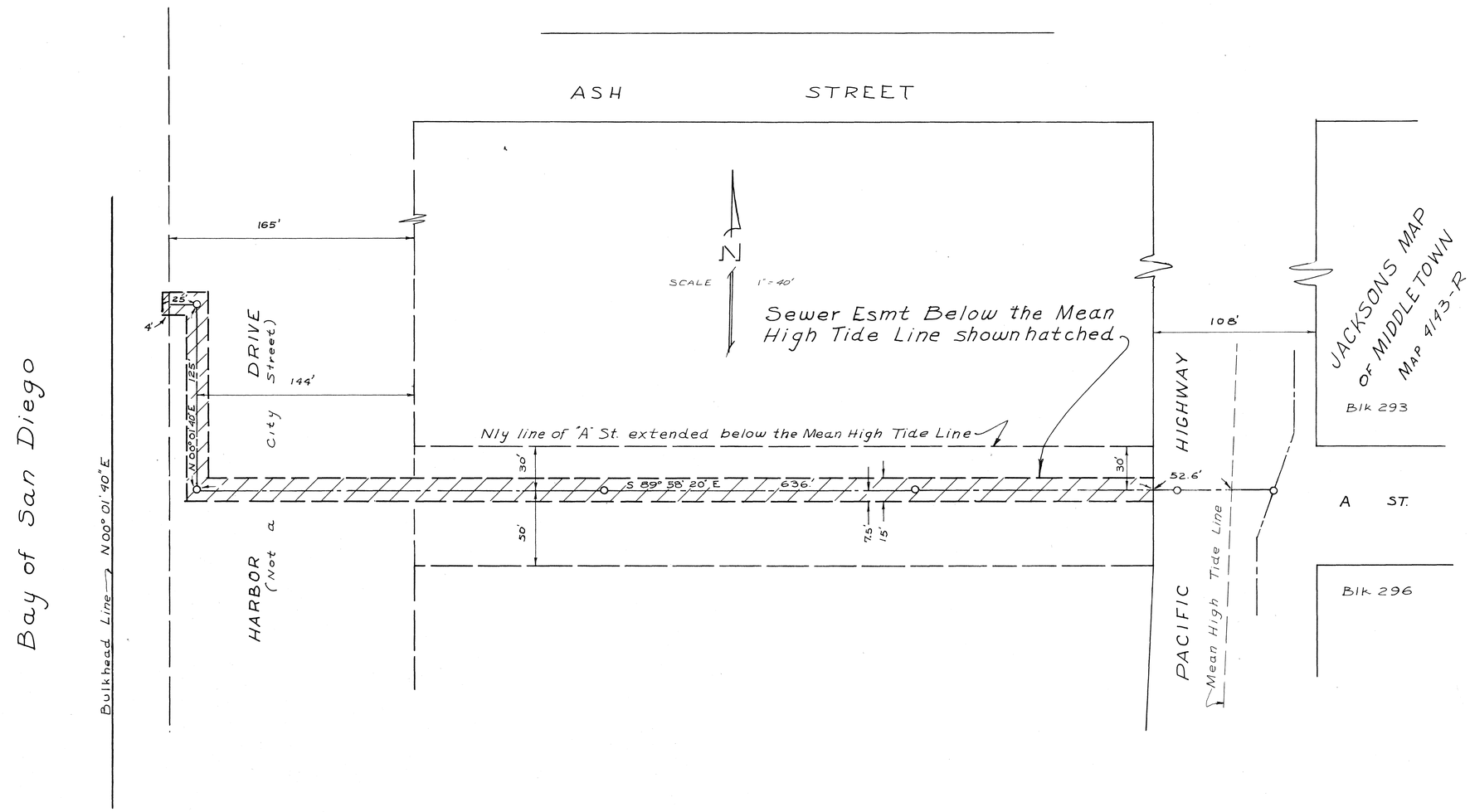

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 31
OFFICE OF THE CLERK

SEWER ESMT.- Wly of the intersection of Pacific Hwy. & "A" St. below the Mean High Tide Line (TIDELANDS)

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 17 OF 24 SHEETS

W.O. NO. 17430

CITY ENGINEER — DATE — DIVISION HEAD

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	R.C.J.	OTJ	6-24-68	

DESIGN ENGINEER

CONTROL CERTIFICATION

202 - 1715
LAMBERT COORDINATES

CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

11557-17-D

APPROVALS

CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R. E. Anderson	J. Fitzhugh
PUBLIC WORKS INSPECTION	
ORIGINAL CONVEYANCE DOCUMENT NO. 67-[illegible]	ORIGINAL CONVEYANCE DOCUMENT NO. 19

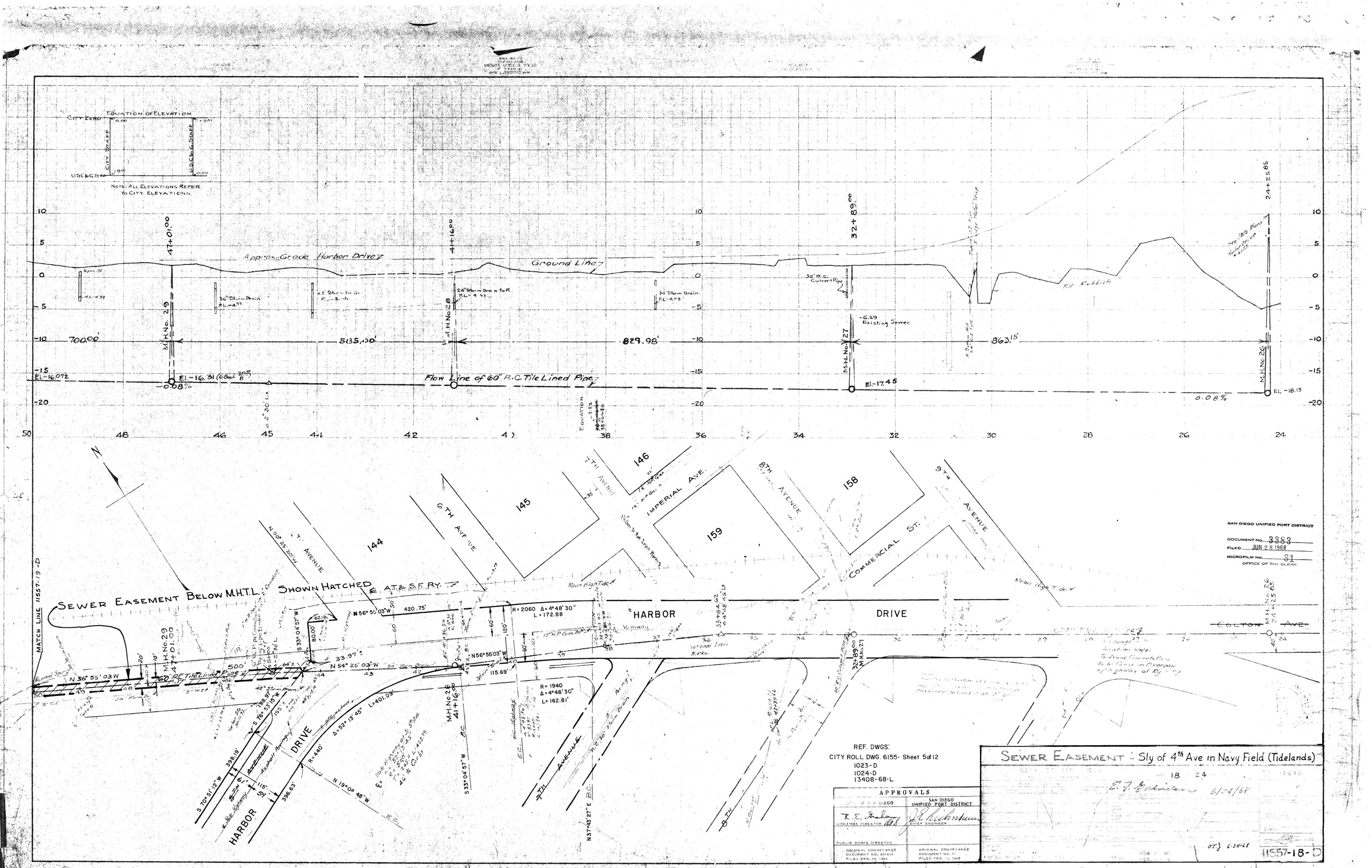
EQUATION OF ELEVATION
CITY ZERO
CITY STAFF
U.S.C.&G. STAFF
U.S.C.&G. ZERO
NOTE: ALL ELEVATIONS REFER TO CITY ELEVATIONS.
Approx. Grade Harbor Drive
Ground Line
Flow Line of 60" R.C. Tile Lined Pipe
M.H. No. 29
M.H. No. 28
M.H. No. 27
M.H. No. 26
47+01.00
41+16.00
32+89.00
24+25.85
700.00'
535.00'
829.98'
863.15'
El. -16.072
El. -16.31
El. -17.45
El. -18.13
-0.08%
0.08%
30" R.C. Culvert Pipe
-6.79 Existing Sewer
Fill Rubbish
SEWER EASEMENT BELOW M.H.T.L. SHOWN HATCHED
A.T.& S.F. RY.
Mean High Tide
HARBOR DRIVE
IMPERIAL AVE.
COMMERCIAL ST.
COLTON AVE.
6TH AVENUE
7TH AVENUE
8TH AVENUE
9TH AVENUE
145
146
144
159
158
MATCH LINE 11557-19-D
R=2060 Δ=4°48'30" L=172.88
R=1940 Δ=4°48'30" L=162.81'
Δ=52°13'45" L=401.09'
R=440'
N 56° 55' 03" W
N 54° 25' 03" W
S 70° 51' 12" W
N 19° 09' 48" W
N 37° 43' 27" E
REF. DWGS:
CITY ROLL DWG. 6155- Sheet 5 of 12
1023-D
1024-D
13408-68-L
APPROVALS
CITY OF SAN DIEGO
UTILITIES DIRECTOR
PUBLIC WORKS DIRECTOR
ORIGINAL CONVEYANCE DOCUMENT NO. 651833 FILED FEB. 15, 1963
SAN DIEGO UNIFIED PORT DISTRICT
CHIEF ENGINEER
ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 13, 1963
SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 31
OFFICE OF THE CLERK
SEWER EASEMENT - Sly of 4th Ave in Navy Field (Tidelands)
6/24/68
11557-18-D

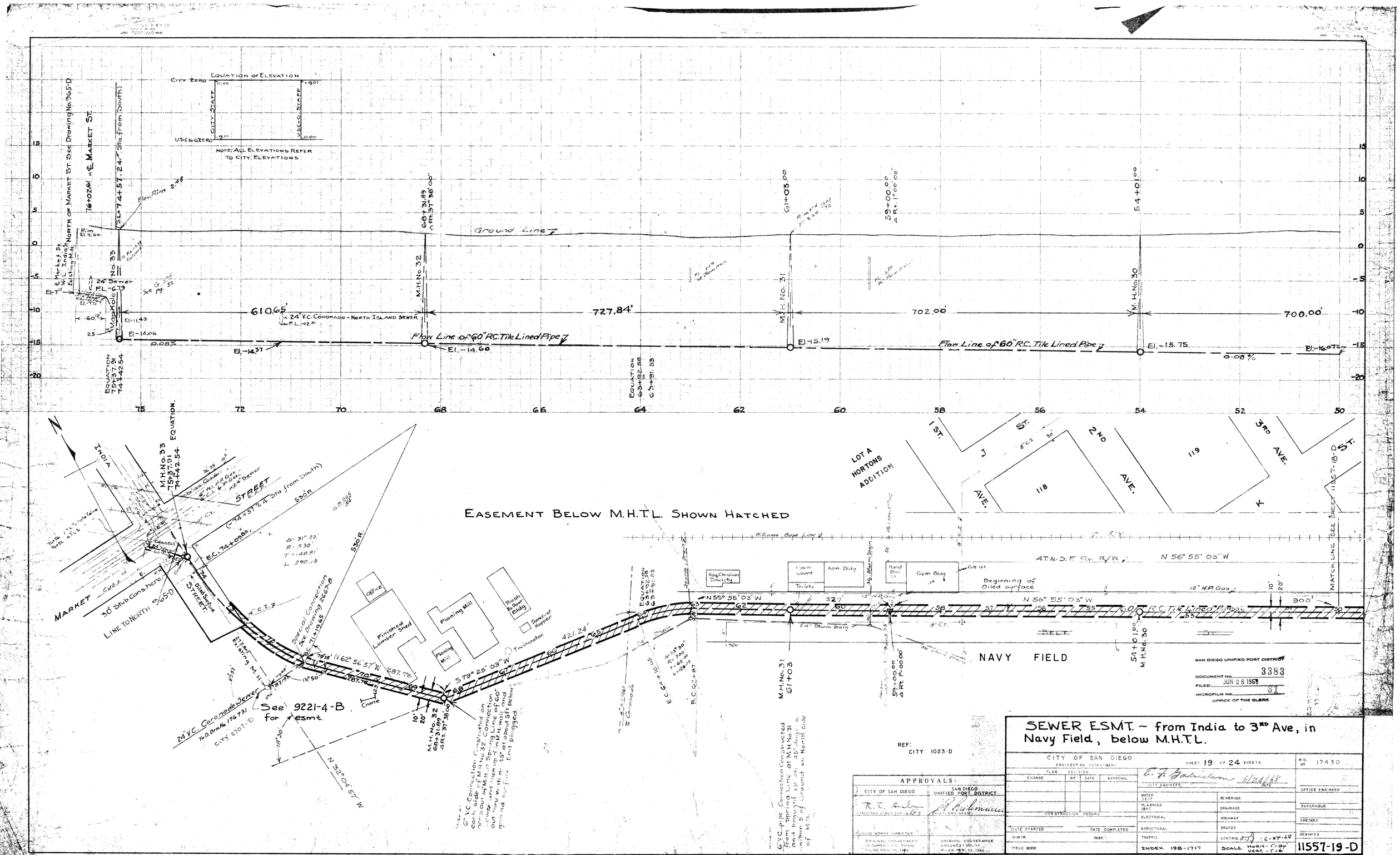
EQUATION OF ELEVATION
CITY ZERO
CITY STAFF
U.S.C.&G. ZERO
U.S.C.&G. STAFF
NOTE: ALL ELEVATIONS REFER TO CITY ELEVATIONS
NORTH OF MARKET ST. See Drawing No. 965-D
℄ MARKET ST.
Ground Line
Flow Line of 60" R.C. Tile Lined Pipe
24" V.C. CORONADO - NORTH ISLAND SEWER
M.H. No. 33
M.H. No. 32
M.H. No. 31
M.H. No. 30
610.65'
727.84'
702.00'
700.00'
0.08%
EQUATION
EASEMENT BELOW M.H.T.L. SHOWN HATCHED
INDIA
MARKET
STREET
LOT A HORTONS ADDITION
1ST. ST.
2ND AVE.
3RD AVE.
J
K
118
119
Office
Finished Lumber Shed
Planing Mill
Sash & Door Bldg.
Adm. Bldg.
Gym Bldg.
Hand Ball Ct.
Open Court
Toilets
Bldg. Christian Society
Beginning of Oiled surface
A.T.&S.F. Ry. R/W
N 56° 55' 03" W
N 55° 55' 03" W
NAVY FIELD
BELT
MATCH LINE SEE SHEET 11557-18-D
See 9221-4-B for Esmt.
24" V.C. Coronado Sewer
Special Connection See Drawing 2667-B
Trainerator
Crane
Flagstaff
Pole 123
12" H.P. Gas
24" Storm Drain
8" C.I.
36" Storm Drain
SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 93
OFFICE OF THE CLERK
APPROVALS
CITY OF SAN DIEGO
SAN DIEGO UNIFIED PORT DISTRICT
REF: CITY 1023-D
SEWER ESMT. - from India to 3RD Ave, in Navy Field, below M.H.T.L.
CITY OF SAN DIEGO
ENGINEERING DEPARTMENT
SHEET 19 OF 24 SHEETS
W.O. No. 17430
CITY ENGINEER
OFFICE ENGINEER
SUPERVISOR
CHECKED
DESIGNED
INDEX 198-1717
SCALE HORIZ. 1"=20' VERT. 1"=6'
11557-19-D
HARBOR No.

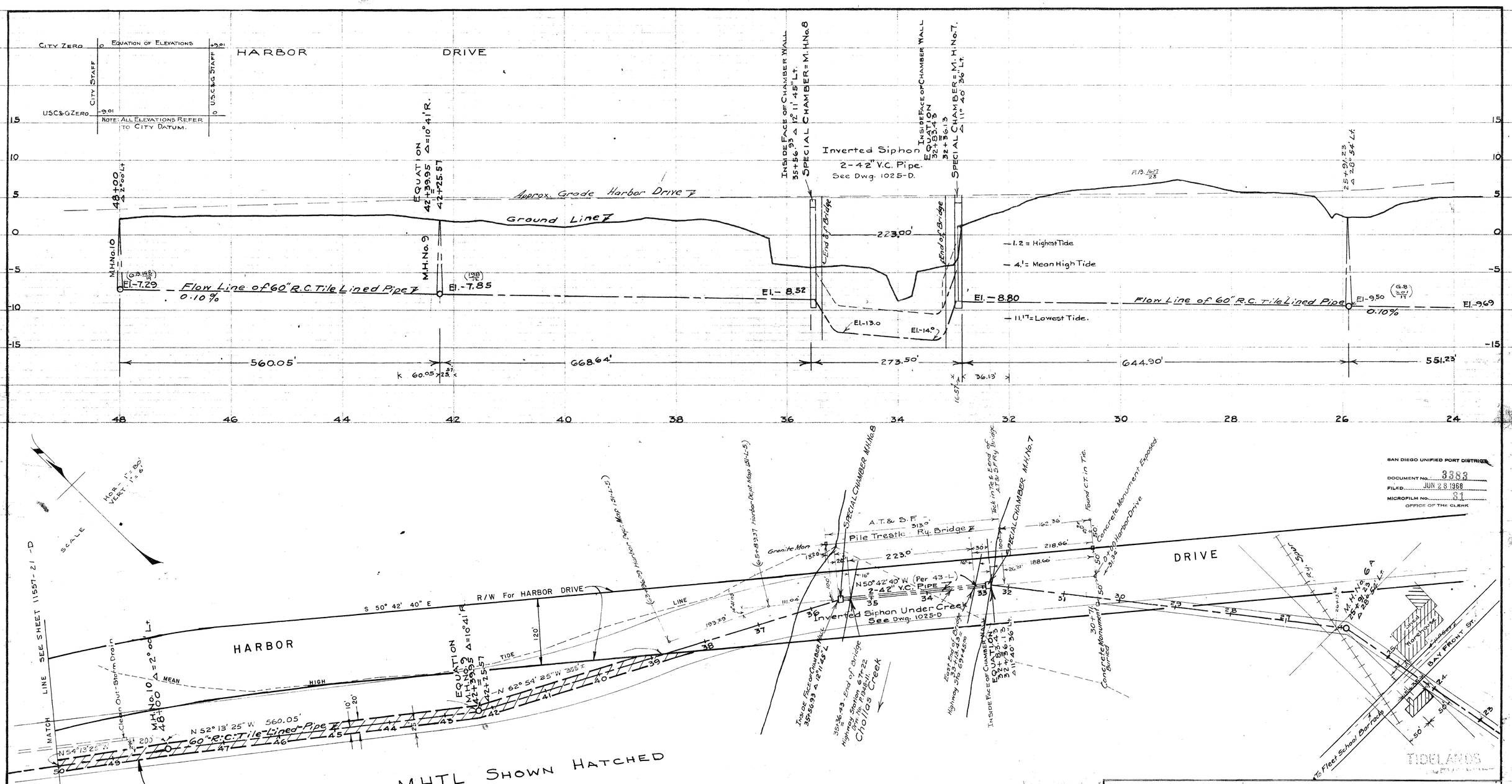
CITY ZERO
EQUATION OF ELEVATIONS
+9.01
CITY STAFF
U.S.C.&G. STAFF
USC&GZERO
-9.01
NOTE: ALL ELEVATIONS REFER TO CITY DATUM.
HARBOR DRIVE
48+00
Δ 2°00' Lt.
EQUATION 42+39.95 = 42+25.57
Δ=10°41' R.
INSIDE FACE OF CHAMBER WALL 35+56.93 Δ 12°11'45" Lt.
SPECIAL CHAMBER = M.H. No. 8
Inverted Siphon
2-42" V.C. Pipe.
See Dwg. 1025-D.
INSIDE FACE OF CHAMBER WALL EQUATION 32+83.45 = 32+36.13
SPECIAL CHAMBER = M.H. No. 7
Δ 11°40'36" Lt.
25+91.23
Δ 2°0'34" Lt.
Approx. Grade Harbor Drive
Ground Line
M.H. No. 10
M.H. No. 9
El.-7.29
Flow Line of 60" R.C. Tile Lined Pipe
0.10%
El.-7.85
El.-8.52
223.00'
End of Bridge
El.-13.0
El.-14.0
El.-8.80
1.2 = Highest Tide
4.1' = Mean High Tide
11.17' = Lowest Tide.
El.-9.50
El.-9.69
560.05'
668.64'
273.50'
644.90'
551.23'
60.05
25.57
16.57
36.13'
48 46 44 42 40 38 36 34 32 30 28 26 24
SCALE
HOR. 1" = 80'
VERT. 1" = 6'
SEE SHEET 11557-21-D
MATCH LINE
Clean Out-Storm Drain
M.H. No. 10 Δ = 2°00' Lt.
M.H. No. 9
EQUATION 42+39.95 = 42+25.57
Δ=10°41' R.
S 50° 42' 40" E
R/W For HARBOR DRIVE
HARBOR
MEAN HIGH TIDE LINE
N 52° 13' 25" W 560.05'
60" R.C. Tile-Lined-Pipe
N 54° 13' 25" W
N 62° 54' 25" W 355.5'
(G.S. 1+56.37 Harbor Dept. Map 151-L-5)
(G.S. 5+83.37 Harbor Dept. Map 151-L-5)
Granite Mon.
SPECIAL CHAMBER M.H. No. 8
A.T. & S.F. Ry. Bridge
Pile Trestle
313.0'
223.0'
N 50° 42' 40" W (Per 43-L)
2-42" V.C. PIPE
Inverted Siphon Under Creek
See Dwg. 1025-D
Trans. of Face of Chamber Wall 35+56.93 Δ 12°11'45" L
35+36.43 = End of Bridge
Highway Station 67+22
Highway No. 1 Pal. 11
Chollas Creek
East Face of Bridge 33+13.23
Highway Sta. 69+45.0
SPECIAL CHAMBER M.H. No. 7
INSIDE FACE OF CHAMBER WALL EQUATION 32+83.45 = 32+36.13
Δ 11°40'36" L
Tack in Top & End of Concr. A.T.&S.F. Ry. Bridge
162.36'
218.66'
188.66'
Found C.T. in Tie
Concrete Monument Exposed
Concrete Monument Buried
0+00 Harbor Drive
31.32'
DRIVE
Sign
R.R.
M.H. No. 6A
25+96.23
Δ 2°36'54" Lt.
Shed
Non-Potable
Laundry
BAY FRONT ST.
To Fleet School Barracks
50'
TIDELANDS
EASEMENT BELOW M.H.T.L SHOWN HATCHED
REF:
CITY DWGS 1018-D
6289-L
9391-B
RL 6155-1-R
13408-57-L
13408-58-L
43-L
APPROVALS
CITY OF SAN DIEGO
PUBLIC WORKS DIRECTOR
ORIGINAL CONVEYANCE DOCUMENT NO. 5184 FILED FEB. 15, 1949
SAN DIEGO UNIFIED PORT DISTRICT
CHIEF ENGINEER
ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 13, 1969
SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 31
OFFICE OF THE CLERK
SEWER ESMT-Sly of HARBOR DR. Bet. 28TH & 32ND Sts below M.H.T.L.
CITY OF SAN DIEGO
ENGINEERING DEPARTMENT
SHEET 20 OF 24 SHEETS
W.O. No. 17430
PLAN REVISION
CHANGE BY DATE APPROVAL
CITY ENGINEER
DATE 6/24/68
CONSTRUCTION RECORD
DATE STARTED
DATE COMPLETED
CONTR.
INSP.
FIELD BOOK
WATER DEPT.
PLANNING DEPT.
ELECTRICAL
STRUCTURAL
TRAFFIC
SEWERAGE
DRAINAGE
HIGHWAY
GRADES
CONTROL
INDEX 190-1727
OFFICE ENGINEER
SUPERVISOR
CHECKED
DESIGNED
11557-20-D
HARBOR No

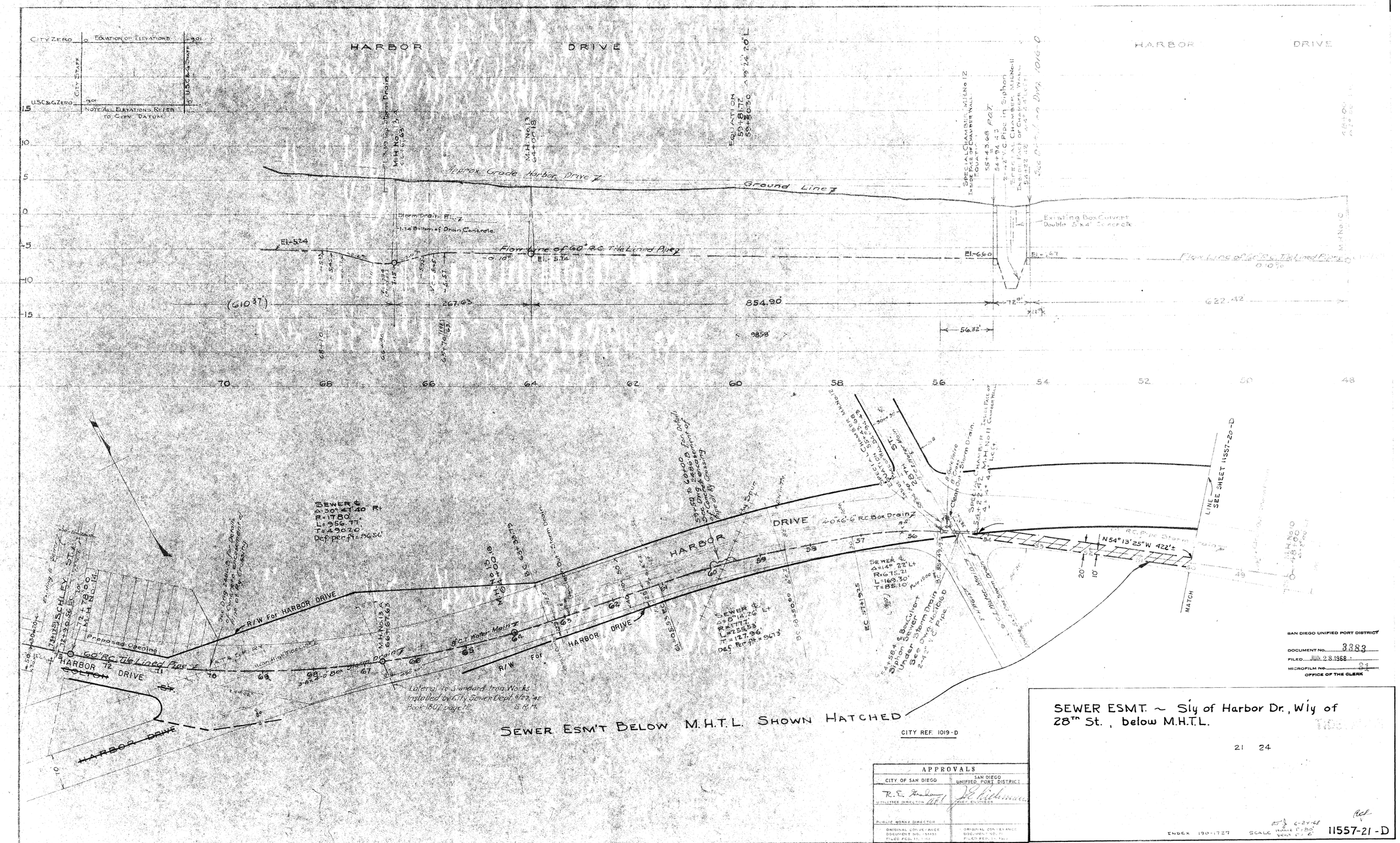

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No.
OFFICE OF THE CLERK

SEWER ESMT. ~ S'ly of Harbor Dr., W'ly of 28th St., below M.H.T.L.

21 24

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R. E. Shelby, UTILITIES DIRECTOR	J. E. Lichtman, CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 154143 FILED FEB. 15, 1968	ORIGINAL CONVEYANCE DOCUMENT NO. FILED FEB. 15, 1968

INDEX 190-1727 SCALE HORIZ 1"=50' VERT 1"=6' 6-27-68 11557-21-D

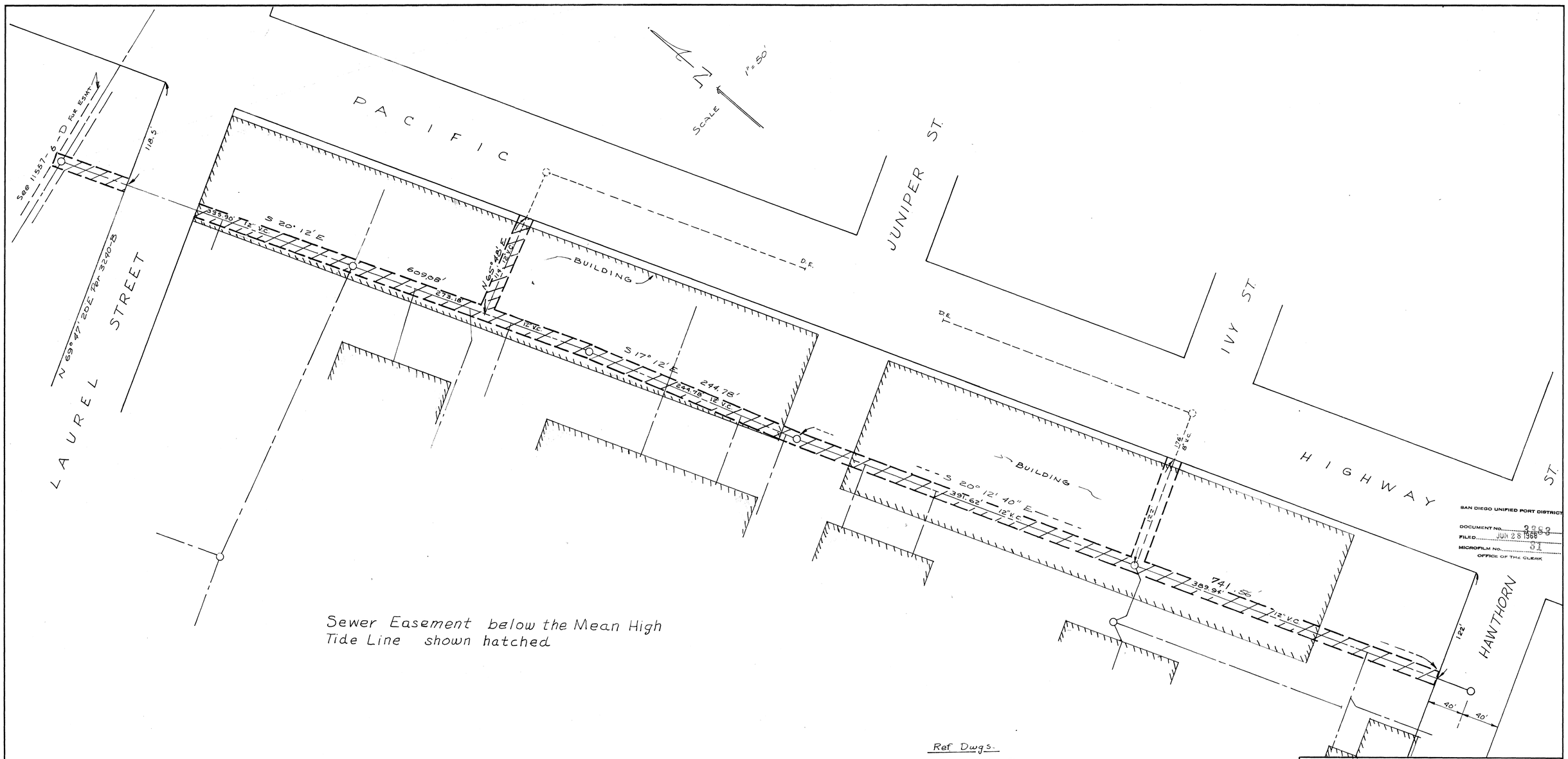
PACIFIC
HIGHWAY
ST.
JUNIPER ST.
IVY ST.
LAUREL STREET
HAWTHORN
SCALE 1" = 50'
See 11557-6-D for Esmt
118.5'
N 69° 47' 20" E Par 3240-B
333.90'
12" V.C.
S 20° 12' E
60.08'
273.18'
N 65° 48' E
12" V.C.
BUILDING
D.E.
S 17° 12' E
244.78'
244.78'
12" V.C.
S 20° 12' 40" E
397.62'
12" V.C.
BUILDING
175'
8" V.C.
12'
741.56'
389.94'
12" V.C.
12'
40'
40'
Sewer Easement below the Mean High Tide Line shown hatched
Ref Dwgs.
CITY - 1034-3-D
HARBOR - 17-D-23-2
SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3363
FILED JUN 28 1966
MICROFILM NO. 31
OFFICE OF THE CLERK
SEWER EASEMENT - sly of LAUREL & wly of Pacific Hwy in the TIDELANDS
CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 22 OF 24 SHEETS
W.O. NO. 17430
CITY ENGINEER
DATE
DIVISION HEAD
DESCRIPTION
BY
APPROVED
DATE
FILMED
ORIGINAL
R.C.J.
6-2-66
DESIGN ENGINEER
CONTROL CERTIFICATION
204-1716
LAMBERT COORDINATES
CONTRACTOR
DATE STARTED
INSPECTOR
DATE COMPLETED
11557-22-D
APPROVALS
CITY OF SAN DIEGO
SAN DIEGO UNIFIED PORT DISTRICT
UTILITIES DIRECTOR
CHIEF ENGINEER
PUBLIC WORKS DIRECTOR
ORIGINAL CONVEYANCE DOCUMENT NO. 141653 FILED FEB. 15, 1961
ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 17, 1965

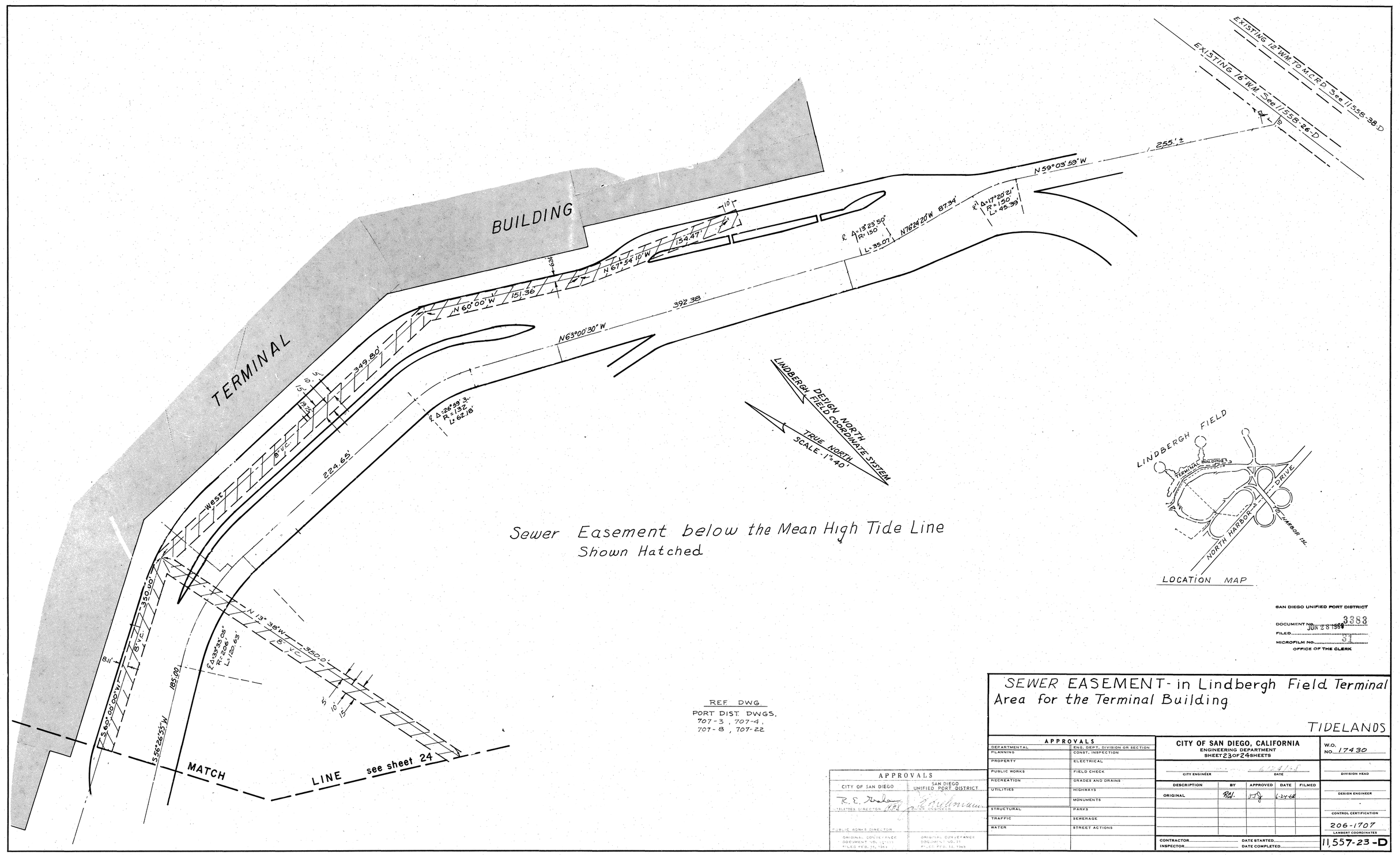
BUILDING
TERMINAL
EXISTING 12" W.M. TO M.C.R.D. See 11558-38-D
EXISTING 16" W.M. See 11558-26-D
255'±
N 59°03'59" W
N 76°24'20" W 87.34'
℄ Δ=17°20'21" R=150' L=45.39'
℄ Δ=13°23'50" R=150' L=35.07'
134.47'
N 67°54'10" W
N 60°00'W
151.36'
392.38'
N 63°00'30" W
349.80'
℄ Δ=26°59'3" R=132' L=62.18'
224.65'
West
350.00'
N 13° 38' W
350.0'
℄ Δ=33°33'05" R=226' L=128.83'
185.00'
S 60°00'00" W
S 56°26'55" W
MATCH LINE see sheet 24
LINDBERGH FIELD DESIGN NORTH
TRUE NORTH
SCALE - 1"=40'
LINDBERGH FIELD
TERMINAL BUILDING
DRIVE
HARBOR DR.
NORTH HARBOR
LOCATION MAP
Sewer Easement below the Mean High Tide Line
Shown Hatched
REF. DWG.
PORT DIST. DWGS.
707-3, 707-4,
707-8, 707-22
SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 31
OFFICE OF THE CLERK
APPROVALS
CITY OF SAN DIEGO
SAN DIEGO UNIFIED PORT DISTRICT
R. E. Hedges
UTILITIES DIRECTOR
PUBLIC WORKS DIRECTOR
ORIGINAL CONVEYANCE DOCUMENT NO. 12111 FILED FEB. 12, 1963
ORIGINAL CONVEYANCE DOCUMENT NO. 27 FILED FEB. 12, 1963
SEWER EASEMENT - in Lindbergh Field Terminal Area for the Terminal Building
TIDELANDS
APPROVALS
DEPARTMENTAL
PLANNING
PROPERTY
PUBLIC WORKS
RECREATION
UTILITIES
STRUCTURAL
TRAFFIC
WATER
ENG. DEPT. DIVISION OR SECTION
CONST. INSPECTION
ELECTRICAL
FIELD CHECK
GRADES AND DRAINS
HIGHWAYS
MONUMENTS
PARKS
SEWERAGE
STREET ACTIONS
CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 23 OF 24 SHEETS
CITY ENGINEER
DATE
DIVISION HEAD
DESCRIPTION
BY
APPROVED
DATE
FILMED
ORIGINAL
DESIGN ENGINEER
CONTROL CERTIFICATION
206-1707
LAMBERT COORDINATES
CONTRACTOR
DATE STARTED
INSPECTOR
DATE COMPLETED
W.O. NO. 17430
11,557-23-D

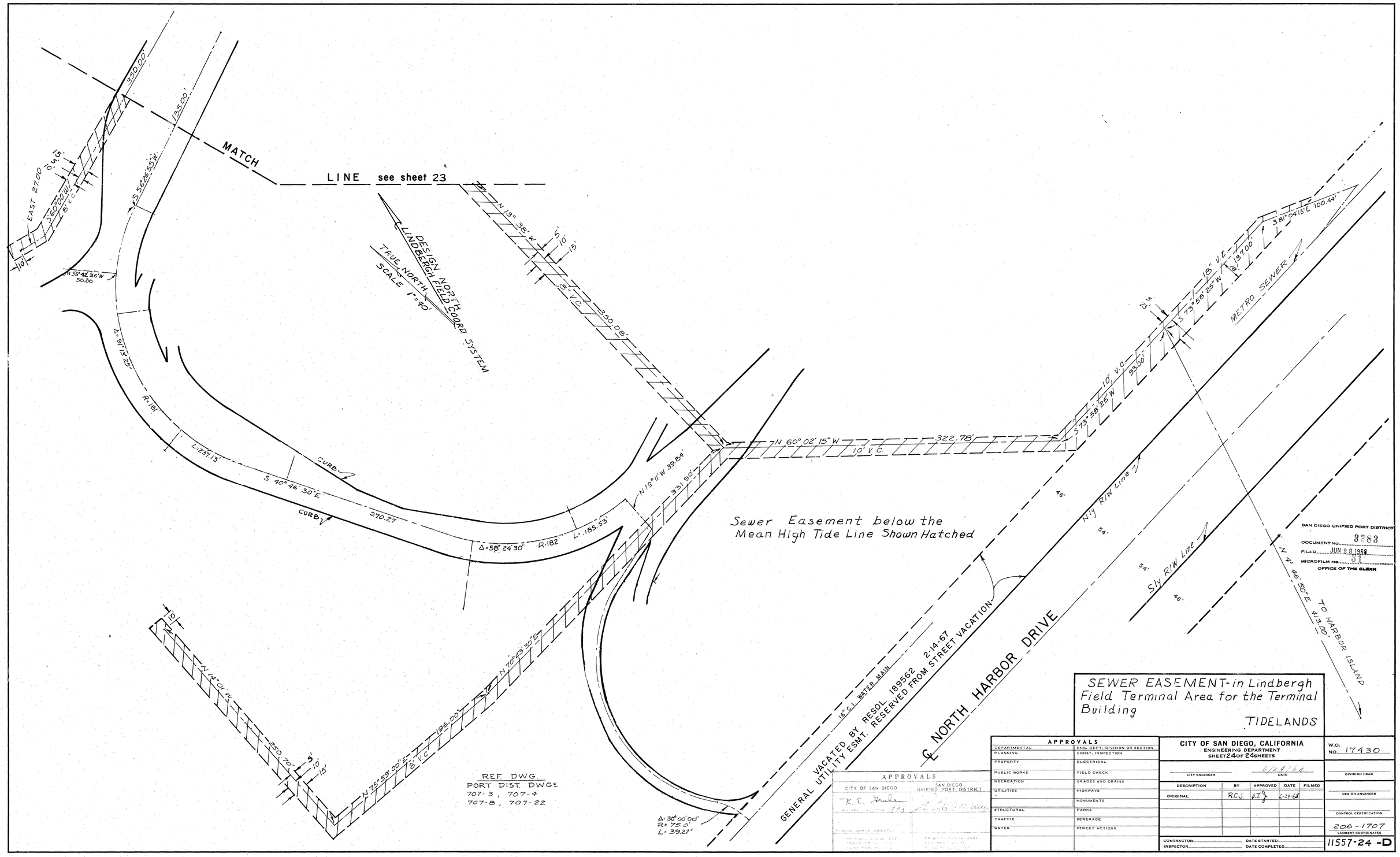
MATCH LINE see sheet 23
DESIGN NORTH
LINDBERGH FIELD COORD SYSTEM
TRUE NORTH
SCALE 1"=40'
EAST 2700 O.A.G.
S 56°26'55" W
N 55°42'36" W 50.00
Δ=91°13'25"
R=181
L=231.13'
CURB
S 40°46'50" E
270.27'
Δ=58°24'30"
R=182'
L=185.53'
N 19°11' W 39.64'
331.90'
N 13° 38' W
350.08'
N 60°02'15" W
322.78'
10' V.C.
18" V.C.
S 13°58'25" W
93.00'
S 73°58'25" W
S 81°04'13" E 100.44'
METRO. SEWER
N'ly R/W Line
S'ly R/W Line
46'
54'
N 4°46'50" E 413.00'
TO HARBOR ISLAND
Sewer Easement below the
Mean High Tide Line Shown Hatched
18" C.I. WATER MAIN
VACATED BY RESOL. 189562 2-14-67
GENERAL UTILITY ESMT. RESERVED FROM STREET VACATION
℄ NORTH HARBOR DRIVE
N 14°01' W
250.70'
N 75°59'00" E
195.00'
N 70°43'30" E
Δ=30°00'00"
R=75.0'
L=39.27'
REF. DWG.
PORT DIST. DWGS.
707-3, 707-4
707-8, 707-22
SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 31
OFFICE OF THE CLERK
SEWER EASEMENT-in Lindbergh Field Terminal Area for the Terminal Building
TIDELANDS
APPROVALS
DEPARTMENTAL
PLANNING
PROPERTY
PUBLIC WORKS
RECREATION
UTILITIES
STRUCTURAL
TRAFFIC
WATER
ENG. DEPT. DIVISION OR SECTION
CONST. INSPECTION
ELECTRICAL
FIELD CHECK
GRADES AND DRAINS
HIGHWAYS
MONUMENTS
PARKS
SEWERAGE
STREET ACTIONS
APPROVALS
CITY OF SAN DIEGO
SAN DIEGO UNIFIED PORT DISTRICT
CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 24 OF 24 SHEETS
W.O. NO. 17430
CITY ENGINEER
DATE 6/24/68
DIVISION HEAD
DESCRIPTION
BY
APPROVED
DATE
FILMED
ORIGINAL
R.C.J.
6-24-68
DESIGN ENGINEER
CONTROL CERTIFICATION
206-1707
LAMBERT COORDINATES
CONTRACTOR
DATE STARTED
INSPECTOR
DATE COMPLETED
11557-24-D

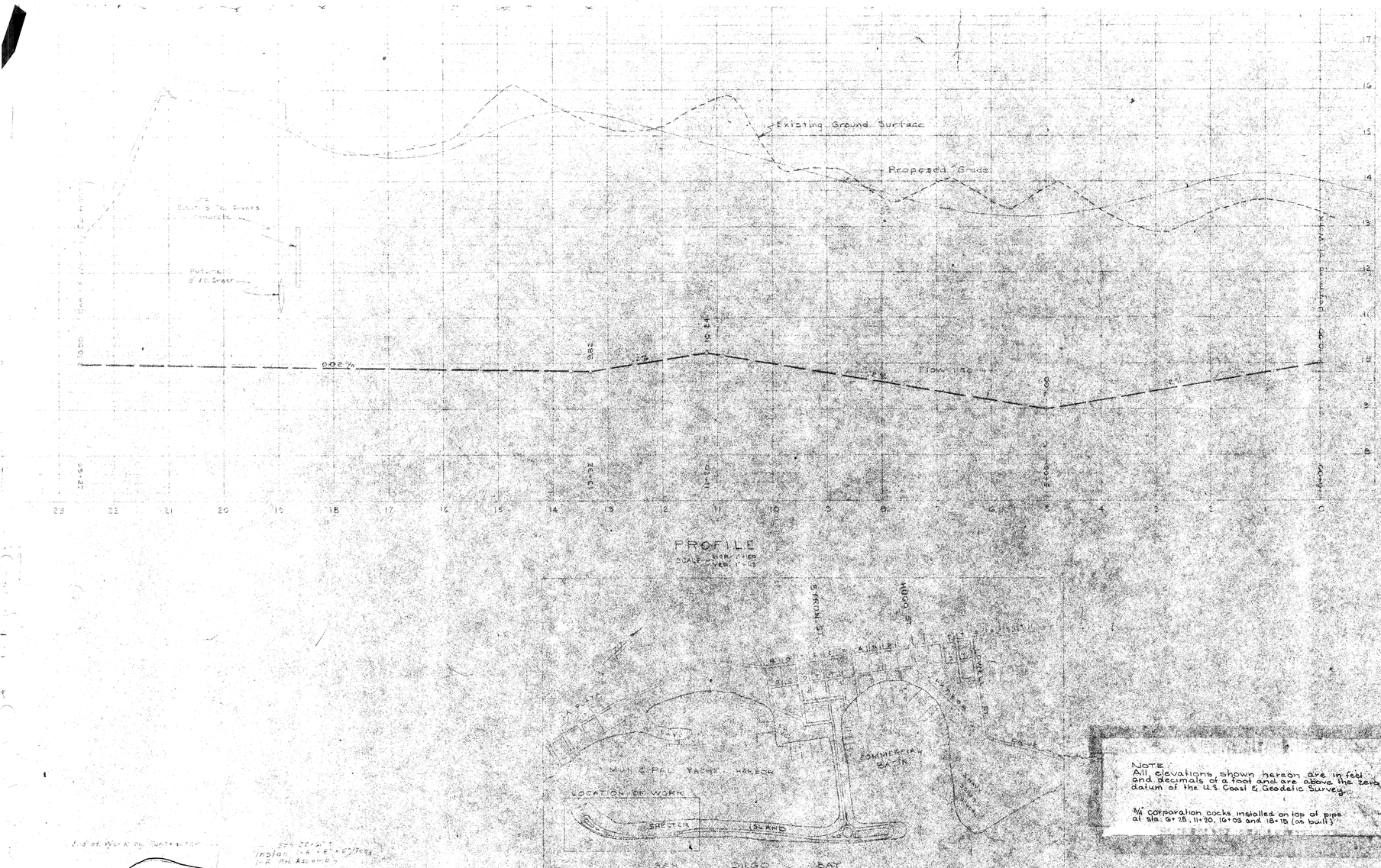

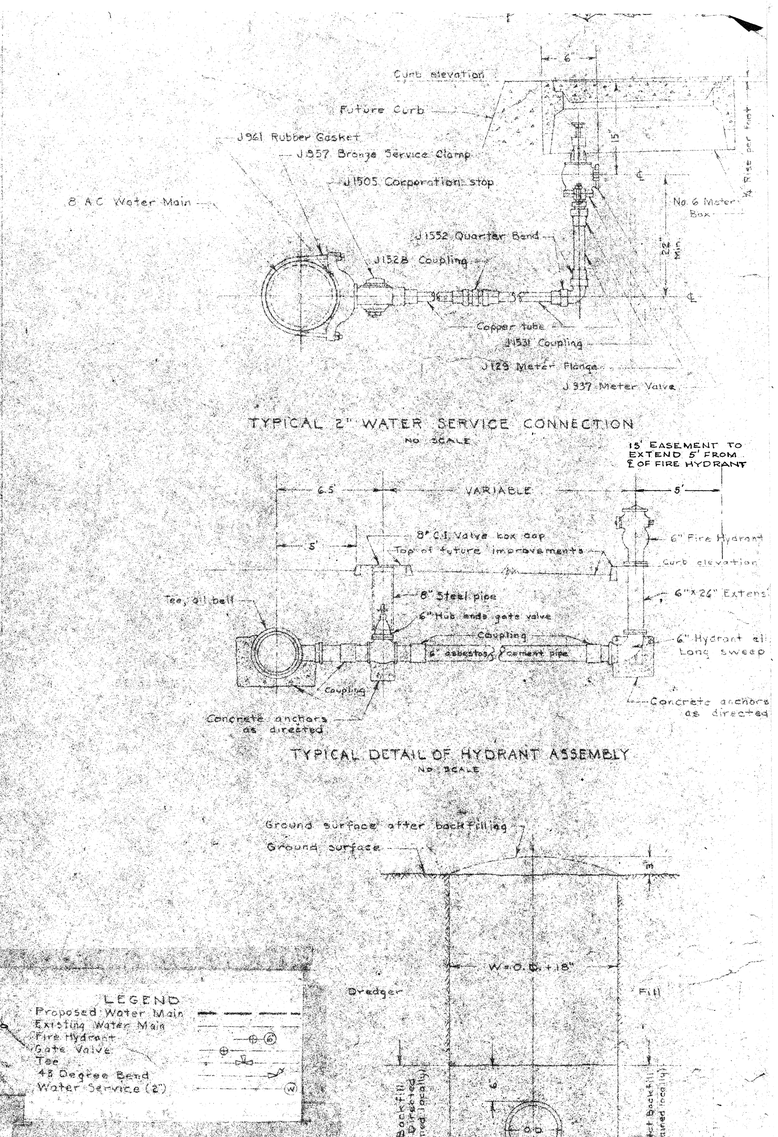

NOTE:
All elevations shown hereon are in feet and decimals of a foot and are above the zero datum of the U.S. Coast & Geodetic Survey.

3/4" corporation cocks installed on top of pipe at sta. 6+25, 11+20, 14+03 and 18+15 (as built)

LEGEND
- Proposed Water Main
- Existing Water Main
- Fire Hydrant
- Gate Valve
- Tee
- 45 Degree Bend
- Water Service (2")

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R. E. Graham (RAK) — UTILITIES DIRECTOR	J. P. Heidemann — CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT No. 695833 FILED FEB. 15, 1962	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 13, 1980

City Ord. No. 924665 6/28/68

City of San Diego Conveyances

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
OFFICE OF THE CLERK
MICROFILM NO.

Part 1 (20)

WATER EASEMENT ~ on Shelter Island

TIDELANDS

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 1 OF 39 SHEETS

W.O. NO. 17430

E. P. Jordan 6/24/68
CITY ENGINEER — DATE — DIVISION HEAD

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	J.H.Hann		6-24-68	

DESIGN ENGINEER

CONTROL CERTIFICATION

198-1697
LAMBERT COORDINATES

CONTRACTOR ____ DATE STARTED ____
INSPECTOR ____ DATE COMPLETED ____

11558-1 -D

HARBOR NO 15-D-49

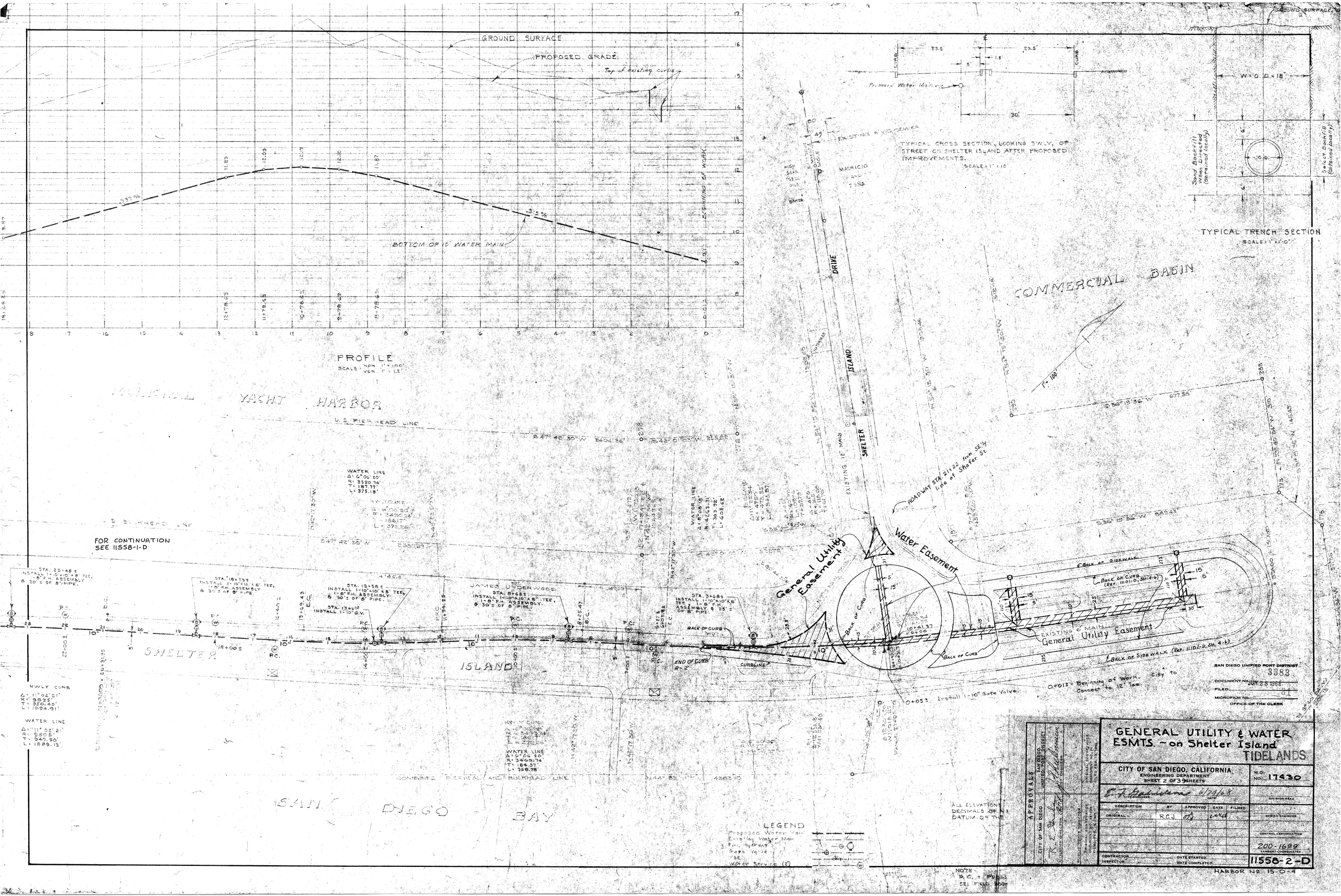
GROUND SURFACE
PROPOSED GRADE
Top of existing curb
BOTTOM OF 10" WATER MAIN
BEGINNING OF WORK
PROFILE
SCALE: HOR. 1" = 100'
VER. 1" = 12'
TYPICAL CROSS SECTION, LOOKING S'WLY, OF STREET ON SHELTER ISLAND AFTER PROPOSED IMPROVEMENTS.
SCALE: 1" = 10'
Proposed Water Main
TYPICAL TRENCH SECTION
SCALE: 1" = 1'-0"
Sand Backfill When Directed (Obtained Locally)
Select Backfill (Obtained Locally)
COMMERCIAL BASIN
1" = 100'
MARITIME YACHT HARBOR
U.S. PIERHEAD LINE
FOR CONTINUATION SEE 11558-1-D
SHELTER ISLAND DRIVE
ROADWAY STA. 214.22 from S'E'LY line of Shafter St.
Water Easement
General Utility Easement
EXISTING 6" MAIN
General Utility Easement
BACK OF SIDEWALK
BACK OF CURB
END OF CURB
CURBLINE
0+012± Beginning of Work. Connect to 12" Tee
0+05± Install 1-10" Gate Valve.
JAMES UNDERWOOD
SAN DIEGO BAY
BULKHEAD LINE
LEGEND
Proposed Water Main
Existing Water Main
Fire Hydrant
Gate Valve
Meter
Water Service (2)
ALL ELEVATIONS & DECIMALS OF FT. DATUM IS MLLW
NOTE: P.C. = PUBLIC SEE FIELD BOOK
APPROVALS
CITY OF SAN DIEGO
SAN DIEGO UNIFIED PORT DISTRICT
SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
OFFICE OF THE CLERK
GENERAL UTILITY & WATER ESMTS. - on Shelter Island
TIDELANDS
CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 2 OF 39 SHEETS
W.O. NO. 17430
DIVISION HEAD
DESIGN ENGINEER
CONTROL CERTIFICATION
200-1699
LAMBERT COORDINATES
11558-2-D
HARBOR No. 15-D-4

LINDBERGH FIELD

RUNWAY 9-27

TAXI STRIP

UNIT NO. II

UNIT NO. I

RYAN AERONAUTICAL CO.

BEGINNING OF WORK. CITY TO INSTALL & CONNECT TO 12"x8" CROSS, COST TO CONTRACTOR $206.00

INSTALL 1-8" BLOW OFF ASSEMBLY END OF WORK BY CONTRACTOR

Top of Storm Drain 7'± below surface

2" ROAD MIX

750'± 2455'± 750'± 550'± 555'±

INSTALL 1-8" GATE VALVE

8' Chain Link Fence

INSTALL 1-8"x8"x6" TEE, 1-6" F.H. ASSEMBLY, SEE DETAIL

INSTALL 1-8" GATE VALVE

INSTALL 1-8"x8"x6" TEE, 1-6" F.H. ASSEMBLY, SEE DETAIL

Top of Sewer 10'± below surface

INSTALL 1-8" BLOW OFF ASSEMBLY END OF WORK BY CONTRACTOR

Connection as built: Short length of Class 150 Transite Pipe and 11¾" Cast Iron F.H.'s & Wooden Valves and Cross.

CONVAIR BLVD.

WAKE BLVD.

McCRD

See 11558-20-D

SCALE 1" = 100'

℄ RUNWAY 9-27 LINDBERGH FIELD

Connection as built: Short length of Class 150 Transite Pipe, Cast Iron F.H.'s & Wooden Valves and Tees.

6" Reinforced Concrete Taxi Strips

Top of Storm Drain 6'± below surface

see sheet 11558-23-D for esmt for 16" C.I. water line

BEGINNING OF WORK CITY TO INSTALL & CONNECT TO 8" TEE, COST TO CONTRACTOR $100.00

INSTALL 1-8" GATE VALVE

750'± 1505'± 750'± 8"

Concr. Anchors 4"x4" Bracing Cedar Tower

8' Chain Link Fence

INSTALL 1-8"x8"x6" TEE, 1-6" F.H. ASSEMBLY & 17'± OF 6" PIPE SEE DETAIL

INSTALL 1-8"x8"x6" TEE, 1-6" F.H. ASSEMBLY & 17'± OF 6" PIPE SEE DETAIL

INSTALL 1-8" BLOW OFF ASSEMBLY END OF WORK BY CONTRACTOR

Water Easement SEE 11558-4-D

Ground surface or top of pavement

8" C.I. valve box cap

6" Fire hydrant

8' Chain link fence

8" MAIN

6" C.I. serrated extension

6" C.I. hydrant

Easement below M.H.T.L. shown hatched.

S.C.I. or equal tee

Tee, all C.I.

Wooden Backfill Adaptor Coupling

Concrete anchors as directed

Concrete anchor as directed

TYPICAL DETAIL OF HYDRANT ASSEMBLY
No SCALE

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 31
OFFICE OF THE CLERK

LEGEND

Proposed Water Main
Small Water Main
Fire Hydrant
Gate Valve
Tee
Sewer
Gas
Electric
Storm Drain
Cross

NOTE: ALL PIPE CLASS 200 TRANSITE EXCEPT AS NOTED

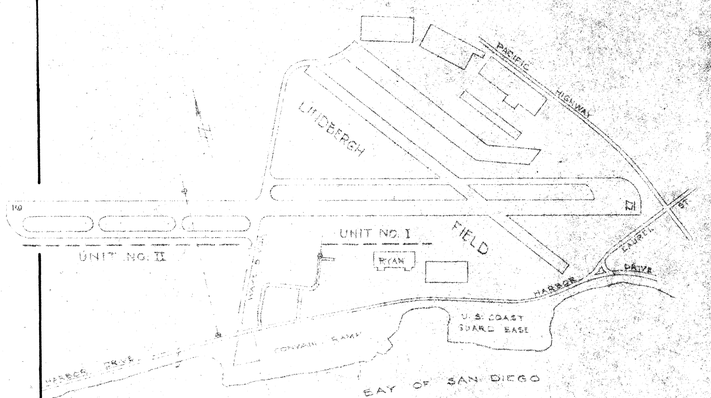

PLOT PLAN
SHOWING LOCATION OF WORK

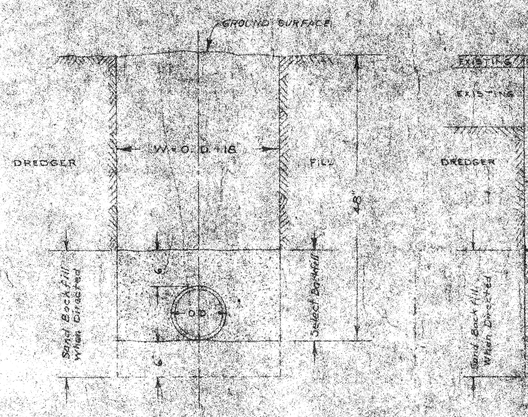

TYPICAL TRENCH SECTION
UNIT NO. I

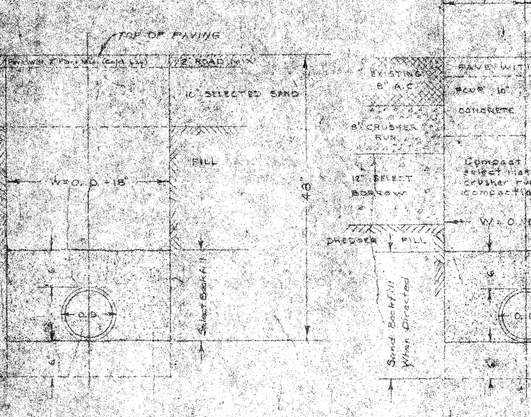

TYPICAL TRENCH SECTION
UNIT NO. II

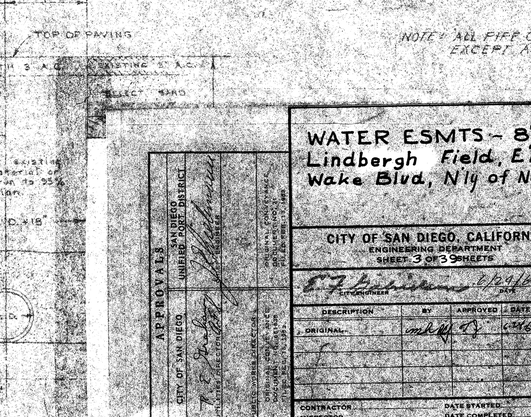

TYPICAL TRENCH SECTION
CROSSING A.C. PAVEMENT

WATER ESMTS - 8" fire line in Lindbergh Field, E'ly & W'ly of Wake Blvd, N'ly of North Harbor Dr.

TIDELANDS

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 3 OF 3 SHEETS

W.O. NO. 17430

DESCRIPTION	BY	APPROVED	DATE	FILED
ORIGINAL			6-24-68	

APPROVED CITY OF SAN DIEGO ENGINEER

APPROVED SAN DIEGO UNIFIED PORT DISTRICT ENGINEER

ORIGINAL TRACE DRAWN BY

DETAILS CHECKED BY

DIVISION HEAD

DESIGN ENGINEER

CONTROL CERTIFICATION

206-1707
LAMBERT COORDINATES

11558-3-D

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

HARBOR No. 17-D-100

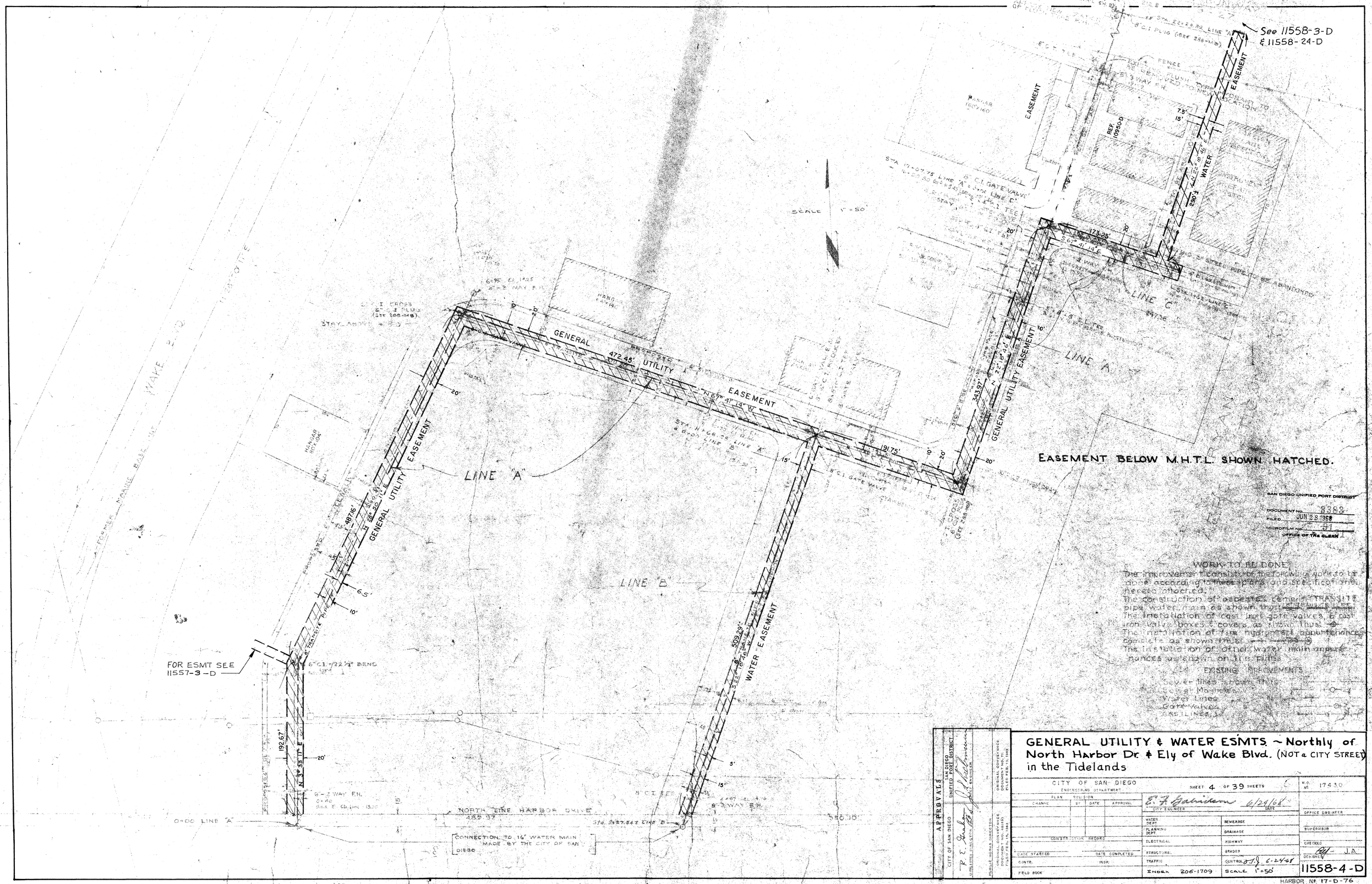
See 11558-3-D
& 11558-24-D
EASEMENT
REF 10950-D
WATER
230'±
173.25'
LINE "C"
LINE "A"
GENERAL UTILITY EASEMENT
343.97'
472.45'
N67° 41' 14" W
191.75'
GENERAL UTILITY EASEMENT
LINE "A"
LINE "B"
WATER EASEMENT
509.29'
FOR ESMT SEE 11557-3-D
192.67'
N 4° 55' E
NORTH LINE HARBOR DRIVE
485.37'
CONNECTION TO 16" WATER MAIN MADE BY THE CITY OF SAN DIEGO
℄ HARBOR DRIVE
N 86° 28' 28" W CITY
N 86° 28' 17" W STATE HIGHWAY
SCALE 1" = 50'
EASEMENT BELOW M.H.T.L. SHOWN HATCHED.
SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 9383
FILED JUN 28 1968
OFFICE OF THE CLERK
WORK TO BE DONE
The improvement consists of the following work to be done according to these plans and specifications hereto attached.
The construction of asbestos cement TRANSITE pipe water main as shown thus
The installation of cast iron gate valves, & cast iron valve boxes & covers as shown thus
The installation of fire hydrants and appurtenances complete as shown thus
The installation of other water main appurtenances as shown on the plans
EXISTING IMPROVEMENTS
Sewer lines shown thus
Sewer Manholes
Water Lines
Gate Valves
Gas Lines
APPROVALS
CITY OF SAN DIEGO
SAN DIEGO UNIFIED PORT DISTRICT
PUBLIC WORKS DIRECTOR
PORT ENGINEER
ORIGINAL CONVEYANCE DOCUMENT NO. 71
(STREETS, STREET SYSTEM)
(PUBLIC BEACHES, PARKS, ETC.)
GENERAL UTILITY & WATER ESMTS. ~ Northly of North Harbor Dr. & Ely of Wake Blvd. (NOT a CITY STREET) in the Tidelands
CITY OF SAN DIEGO
ENGINEERING DEPARTMENT
SHEET 4 OF 39 SHEETS
W.O. NO. 17430
PLAN REVISION
CHANGE
BY
DATE
APPROVAL
CITY ENGINEER
DATE 6/24/68
OFFICE ENGINEER
WATER DEPT.
SEWERAGE
PLANNING DEPT.
DRAINAGE
SUPERVISOR
CONSTRUCTION RECORD
ELECTRICAL
HIGHWAY
CHECKED
DATE STARTED
DATE COMPLETED
STRUCTURAL
BRIDGE
J.A.
DESIGNED
CONTR.
INSP.
TRAFFIC
CONTROL 6-24-68
FIELD BOOK
INDEX 206-1709
SCALE 1" = 50'
11558-4-D
HARBOR No. 17-D-76

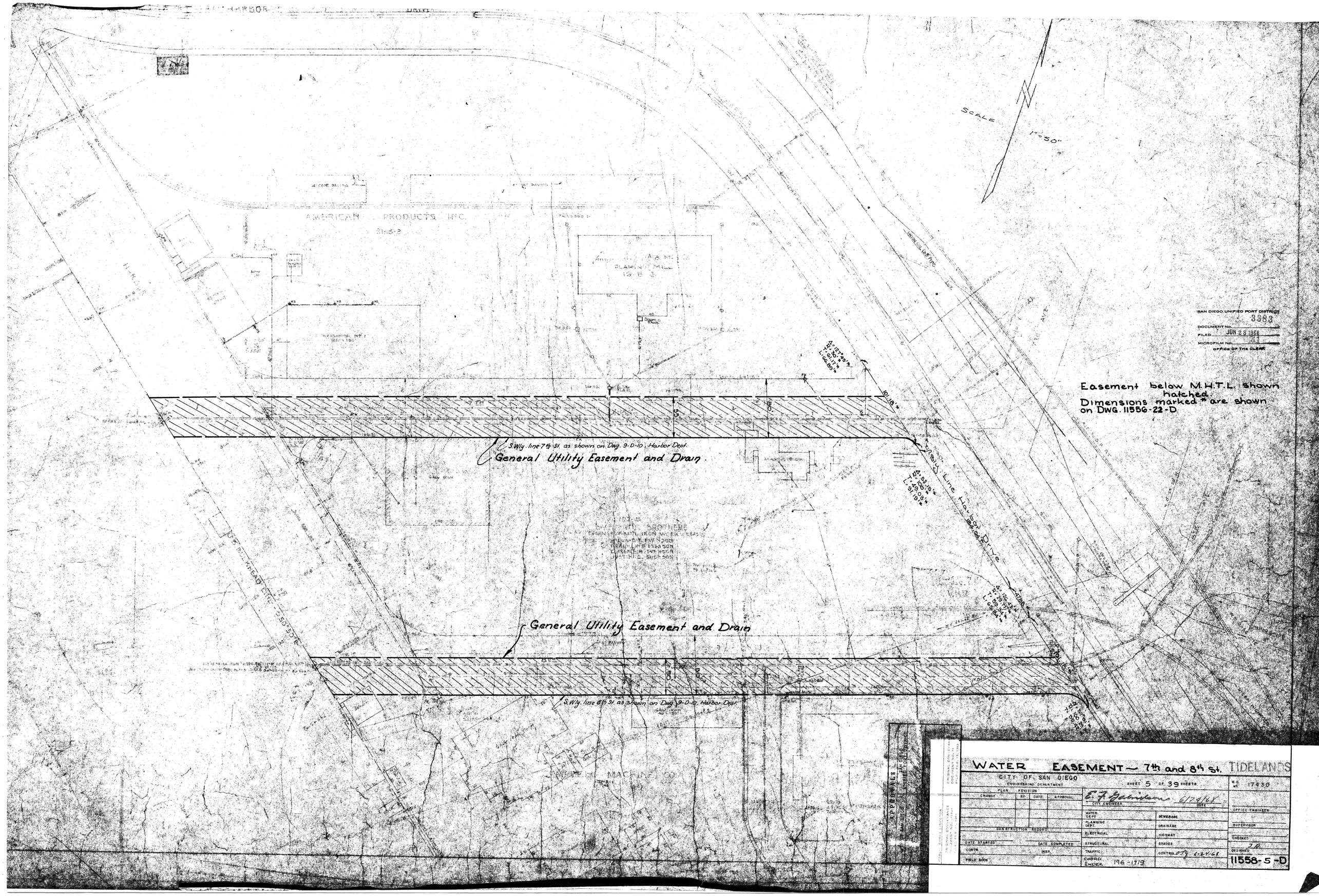
HARBOR DRIVE
SCALE
1" = 50'
AMERICAN PRODUCTS INC.
PLANING MILL
55'
80'
S.Wly. line 7th St. as shown on Dwg. 9-D-10, Harbor Dept.
General Utility Easement and Drain.
S.Wly. Line Harbor Drive
General Utility Easement and Drain
S.Wly. line 8th St. as shown on Dwg. 9-D-10, Harbor Dept.
Easement below M.H.T.L. shown hatched.
Dimensions marked * are shown on DWG. 11556-22-D.
SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO.
OFFICE OF THE CLERK
WATER EASEMENT ~ 7th and 8th St. TIDELANDS
CITY OF SAN DIEGO
ENGINEERING DEPARTMENT
SHEET 5 OF 39 SHEETS
W.O. NO. 17430
PLAN REVISION
CHANGE BY DATE APPROVAL
CITY ENGINEER
DATE 6/28/68
WATER DEPT.
PLANNING DEPT.
ELECTRICAL
STRUCTURAL
TRAFFIC
SEWERAGE
DRAINAGE
HIGHWAY
GRADES
CONSTRUCTION RECORD
DATE STARTED
DATE COMPLETED
CONTR.
INSP.
FIELD BOOK
COORD. INDEX 196-1719
OFFICE-ENGINEER
SUPERVISOR
CHECKED
DESIGNED
11558-5-D

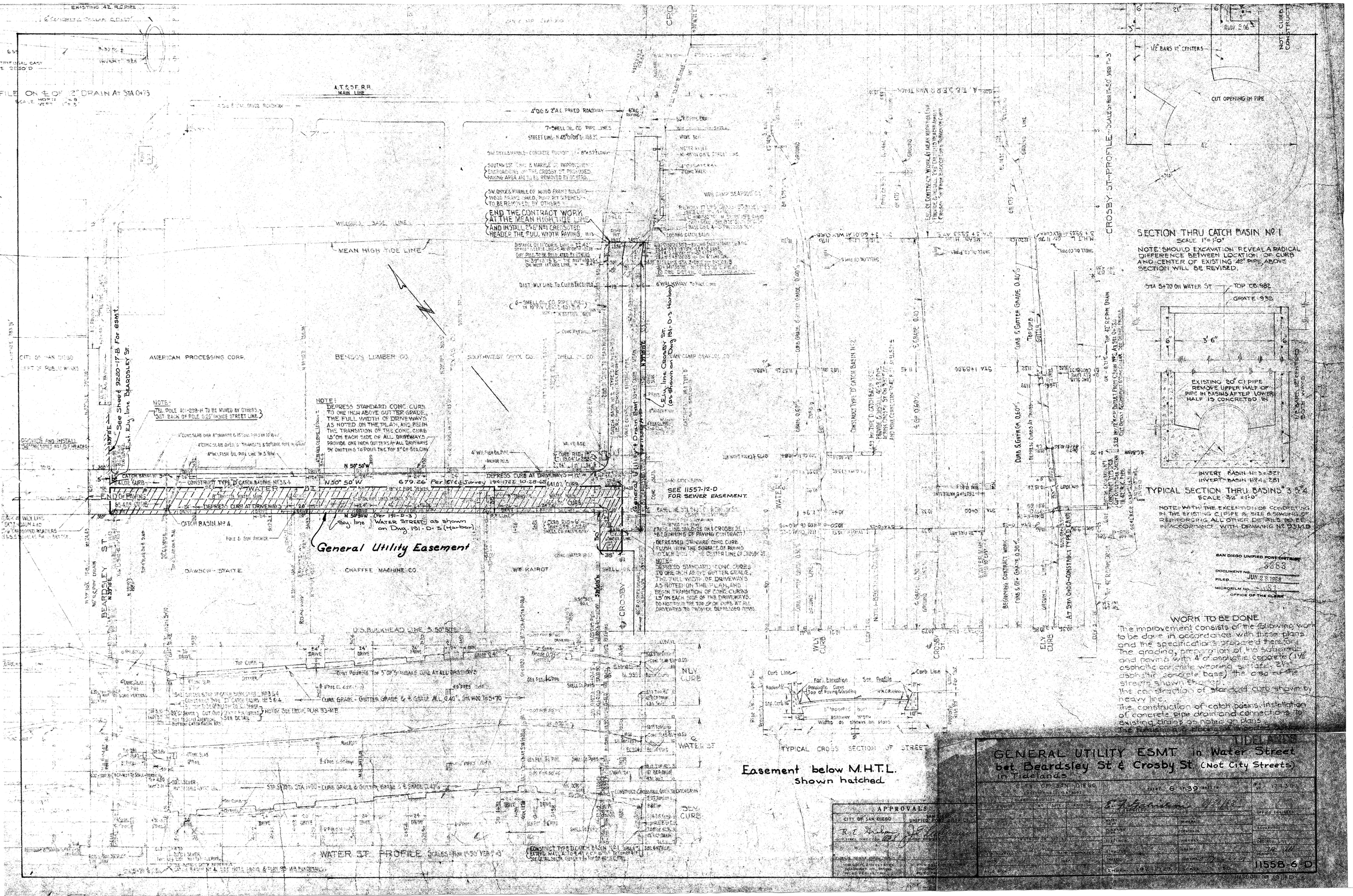
SECTION THRU CATCH BASIN No 1
SCALE 1"=1'0"
NOTE: SHOULD EXCAVATION REVEAL A RADICAL DIFFERENCE BETWEEN LOCATION OF CURB AND CENTER OF EXISTING 42" PIPE, ABOVE SECTION WILL BE REVISED.
TYPICAL SECTION THRU BASINS 3 & 4
SCALE 3/4"=1'-0"
NOTE: WITH THE EXCEPTION OF CONCRETING IN THE EXISTING C.I. PIPE & SIZE & SPACING OF REINFORCING ALL OTHER DETAILS TO BE IN ACCORDANCE WITH DRAWING No 93-M.D.
SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3883
FILED JUN 2 8 1968
OFFICE OF THE CLERK
WORK TO BE DONE
The improvement consists of the following work to be done in accordance with these plans and the specifications prepared therefor. The grading, preparation of the subgrade and paving with 4" of asphaltic concrete (1½" asphaltic concrete wearing surface, 2½" asphaltic concrete base) the area of the streets shown shaded.
The construction of standard curb shown by heavy line.
The construction of catch basins, installation of concrete pipe drain and connections to existing drains as noted on plans.
TYPICAL CROSS SECTION OF STREET
Easement below M.H.T.L. shown hatched
WATER ST. PROFILE
CROSBY ST. PROFILE
GENERAL UTILITY ESMT. in Water Street bet Beardsley St & Crosby St. (Not City Streets) in Tidelands
CITY OF SAN DIEGO
APPROVALS
CITY OF SAN DIEGO
UNIFIED PORT DISTRICT
11558-6-D

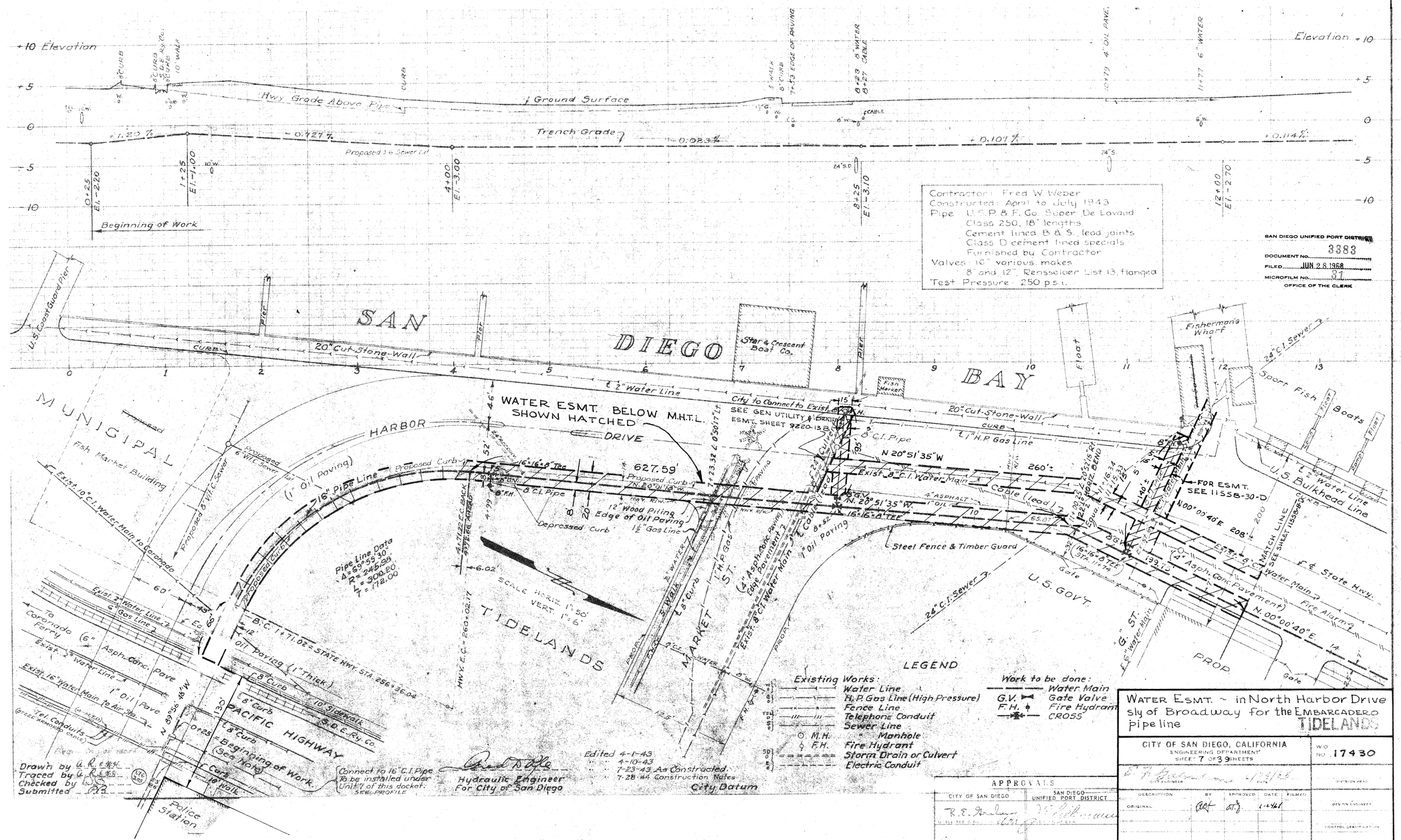
Elevation
Hwy. Grade Above Pipe
Ground Surface
Trench Grade
Proposed 3" Sewer Ld.
Beginning of Work
Contractor: Fred W. Weber
Constructed: April to July 1943
Pipe U.S.P.&F. Co. Super De Lavaud
Class 250, 18' lengths
Cement lined B.&S., lead joints
Class D cement lined specials
Furnished by Contractor
Valves 16" various makes
8" and 12" Rensselaer List 13, flanged
Test Pressure 250 p.s.i.
SAN DIEGO BAY
MUNICIPAL HARBOR
TIDELANDS
PACIFIC HIGHWAY
MARKET ST.
U.S. GOV'T
PROP
Fisherman's Wharf
Sport Fish Boats
Star & Crescent Boat Co.
Float
Fish Market Building
Police Station
WATER ESMT. BELOW M.H.T.L. SHOWN HATCHED
SEE GEN UTILITY & EASEMENT ESMT. SHEET 9220-13-B
FOR ESMT. SEE 11558-30-D
SEE SHEET 11558-30-D
Steel Fence & Timber Guard
Pipe Line Data
Δ = 89°55'30"
R = 246.00
L = 300.20
T = 172.00
Edited 4-1-43
4-10-43
7-23-43 As Constructed.
7-28-44 Construction Notes
City Datum
Hydraulic Engineer
For City of San Diego
Connect to 16" C.I. Pipe To be installed under Unit 17 of this docket. SEE PROFILE
Drawn by
Traced by
Checked by
Submitted
Existing Works:
Water Line
H.P. Gas Line (High Pressure)
Fence Line
Telephone Conduit
Sewer Line
M.H. Manhole
F.H. Fire Hydrant
Storm Drain or Culvert
Electric Conduit
Work to be done:
Water Main
G.V. Gate Valve
F.H. Fire Hydrant
CROSS
APPROVALS
CITY OF SAN DIEGO
SAN DIEGO UNIFIED PORT DISTRICT
PUBLIC WORKS DIRECTOR
ORIGINAL CONVEYANCE DOCUMENT NO. 81553 FILED FEB. 15, 1961
ORIGINAL CONVEYANCE DOCUMENT NO. 7 FILED FEB. 13, 1963
CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED
WATER ESMT. ~ in North Harbor Drive sly of Broadway for the EMBARCADERO pipe line
TIDELANDS
CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 7 OF 39 SHEETS
W.O. NO. 17430
DESCRIPTION
BY
APPROVED
DATE
FILMED
ORIGINAL
DIVISION HEAD
DESIGN ENGINEER
CONTROL CERTIFICATION
198-1715
11558-7-D
SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 31
OFFICE OF THE CLERK

REF 3712-2-W

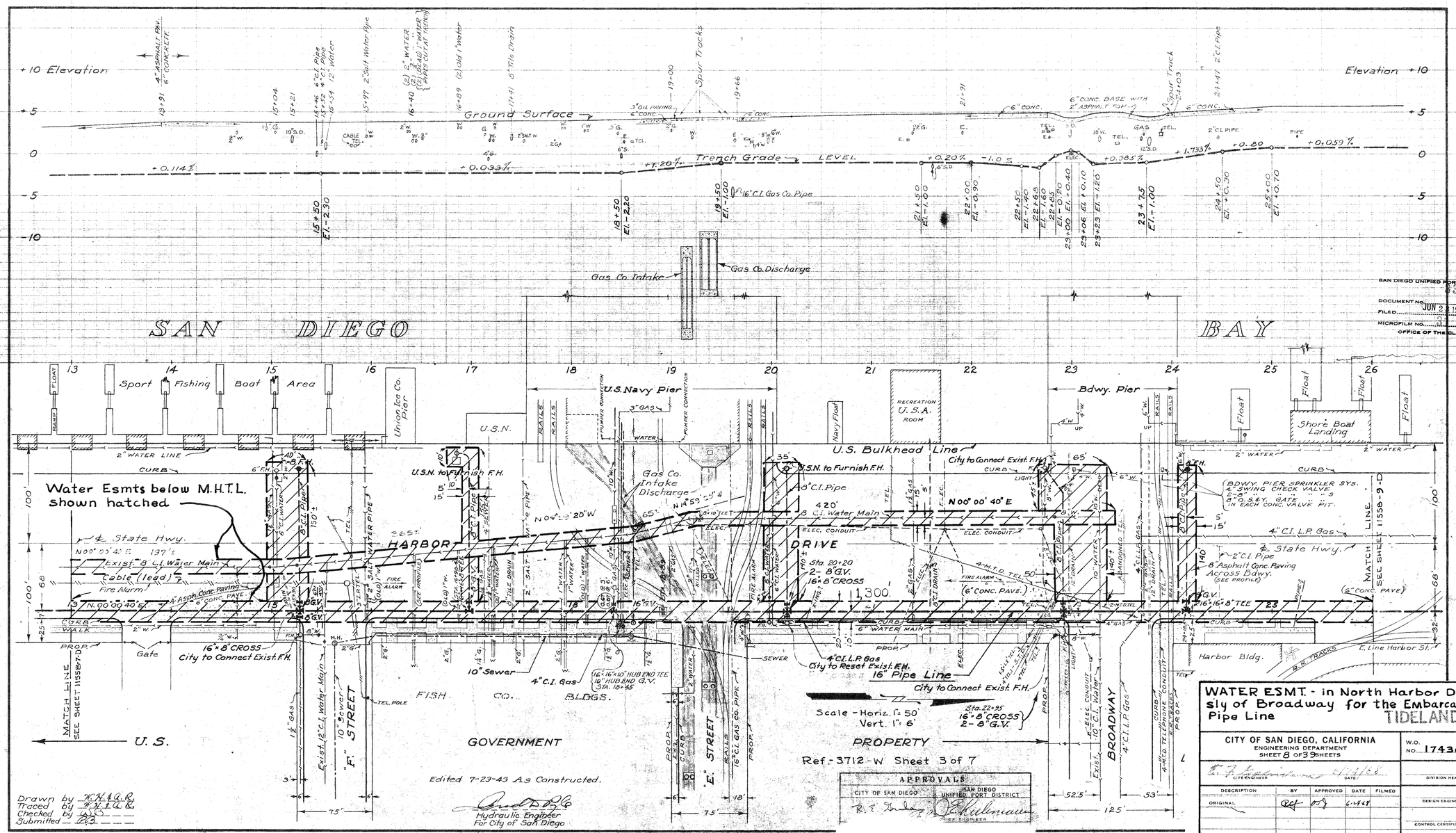
+10 Elevation
Elevation +10
Ground Surface
Trench Grade
LEVEL
Spur Tracks
Gas Co. Intake
Gas Co. Discharge
SAN DIEGO BAY
Sport Fishing Boat Area
Union Ice Co. Pier
U.S. Navy Pier
Bdwy. Pier
Shore Boat Landing
Float
U.S. Bulkhead Line
Water Esmts below M.H.T.L. shown hatched
HARBOR DRIVE
1,300'
N 00° 00' 40" E
N 04° 23' 20" W
420'
8" C.I. Water Main
Exist. 8" C.I. Water Main
Cable (lead)
Fire Alarm
16" Pipe Line
City to Connect Exist. F.H.
City to Reset Exist. F.H.
4" C.I. L.P. Gas
10" Sewer
4" C.I. Gas
16" C.I. Gas Co. Pipe
Sta. 20+20
2-8" G.V.
16"x8" CROSS
Sta. 22+25
16"x8" CROSS
2-8" G.V.
16"x16"x10" HUB END TEE
10" HUB END G.V.
STA. 18+45
16"x8" CROSS
City to Connect Exist. F.H.
U.S.N. to Furnish F.H.
BDWY. PIER SPRINKLER SYS.
4" SWING CHECK VALVE
2-8" O.S.&Y. GATE
IN EACH CONC. VALVE PIT.
8" Asphalt Conc. Paving Across Bdwy. (SEE PROFILE)
MATCH LINE SEE SHEET 11558-7-D
MATCH LINE SEE SHEET 11558-9-D
"F" STREET
"E" STREET
BROADWAY
FISH CO. BLDGS.
GOVERNMENT PROPERTY
Harbor Bldg.
C. Line Harbor St.
U. S.
Scale - Horiz. 1" = 50'
Vert. 1" = 6'
Ref.: 3712-W Sheet 3 of 7
Edited 7-23-43 As Constructed.
Hydraulic Engineer
For City of San Diego
Drawn by
Traced by
Checked by
Submitted
APPROVALS
CITY OF SAN DIEGO
SAN DIEGO UNIFIED PORT DISTRICT
CHIEF ENGINEER
PUBLIC WORKS DIRECTOR
ORIGINAL CONVEYANCE DOCUMENT NO. 68188
FILED FEB. 11, 1958
ORIGINAL CONVEYANCE DOCUMENT NO. 75
FILED FEB. 13, 1953
SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 8383
FILED JUN 2 2 1968
MICROFILM NO.
OFFICE OF THE CLERK
WATER ESMT. - in North Harbor Drive
sly of Broadway for the Embarcadero
Pipe Line
TIDELANDS
CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 8 OF 39 SHEETS
W.O. NO. 17430
CITY ENGINEER
DATE
DIVISION HEAD
DESCRIPTION
BY
APPROVED
DATE
FILMED
ORIGINAL
DESIGN ENGINEER
CONTROL CERTIFICATION
198-1715
LAMBERT COORDINATES
CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED
11558-8-D

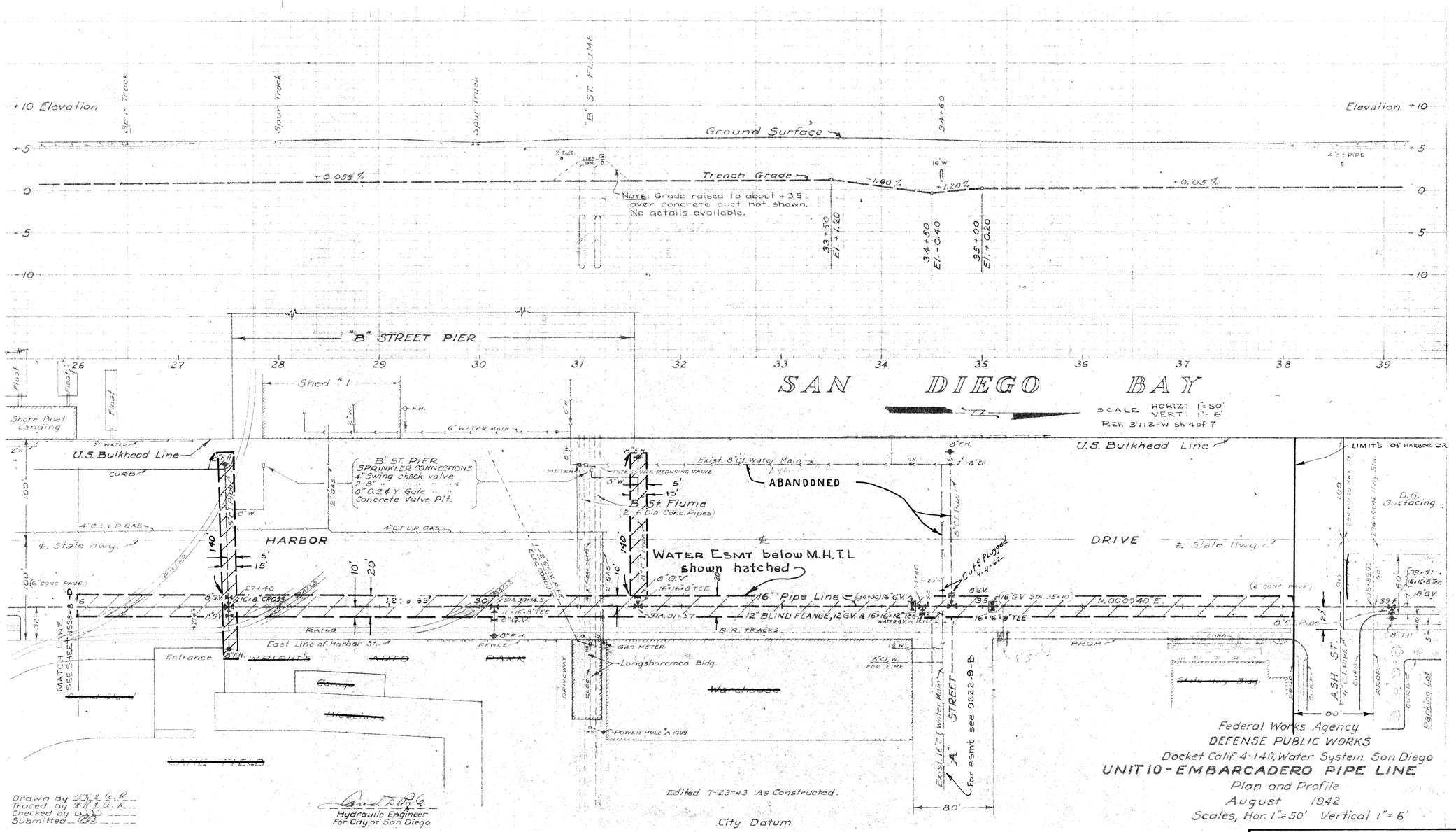

Drawn by
Traced by
Checked by
Submitted

Hydraulic Engineer
For City of San Diego

Edited 7-23-43 As Constructed.

City Datum

Federal Works Agency
DEFENSE PUBLIC WORKS
Docket Calif. 4-140, Water System San Diego
UNIT 10 - EMBARCADERO PIPE LINE
Plan and Profile
August 1942
Scales, Hor. 1"=50' Vertical 1"=6'

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 31
OFFICE OF THE CLERK

WATER ESMT. - in North Harbor Drive sly of Broadway for the EMBARCADERO pipe line
TIDELANDS

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 9 OF 39 SHEETS

W.O. NO. 17430

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL				

202-1715

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

11558 9 -D

APPROVALS

CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
UTILITIES DIRECTOR	CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 15, 1963	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 15, 1963

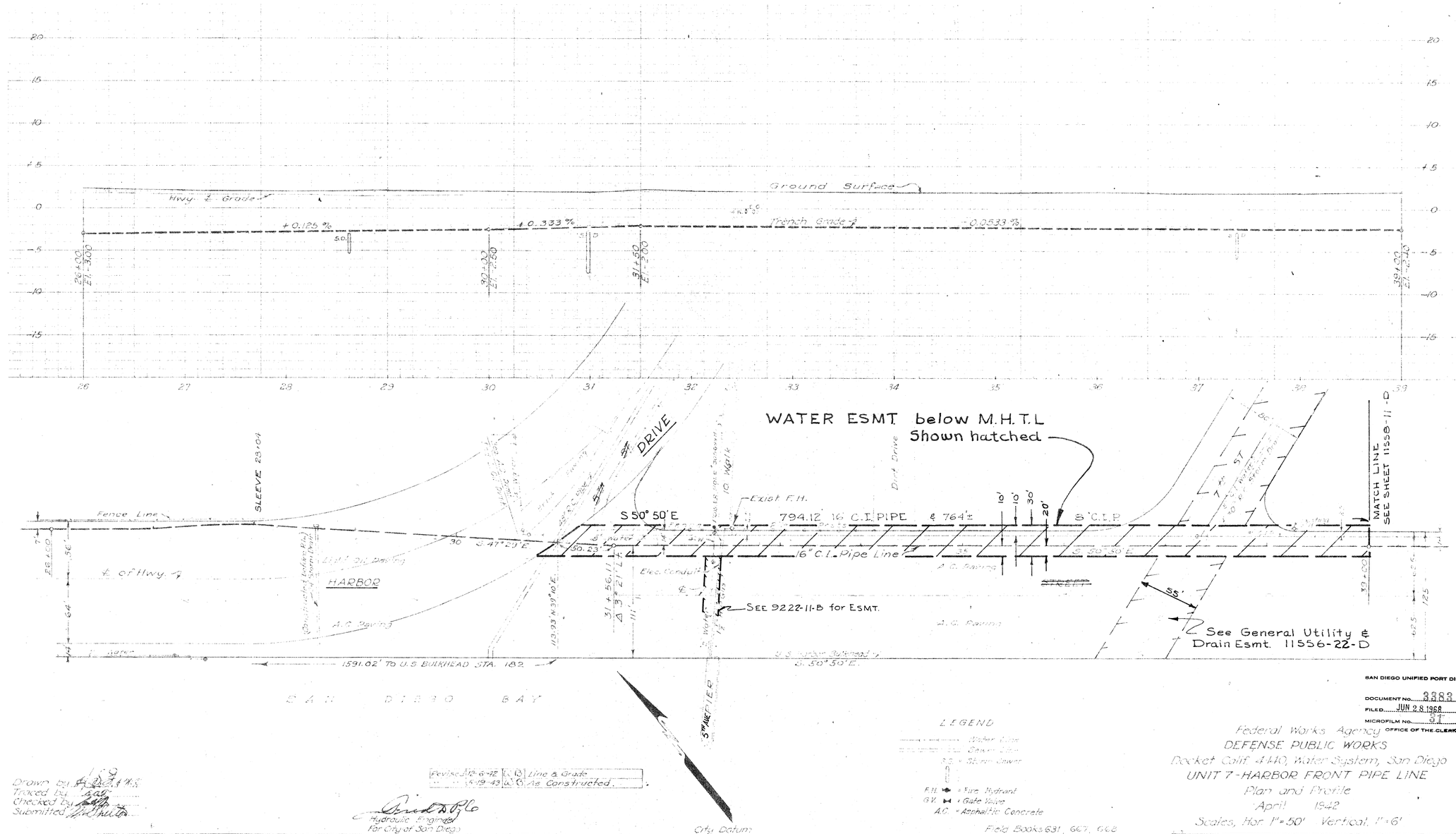

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 34
OFFICE OF THE CLERK

Federal Works Agency
DEFENSE PUBLIC WORKS
Docket Calif. 4440, Water System, San Diego
UNIT 7 - HARBOR FRONT PIPE LINE
Plan and Profile
April 1942
Scales, Hor. 1" = 50' Vertical 1" = 6'

Drawn by
Traced by
Checked by
Submitted

Revised	Date			
	6-22	W	B	Line & Grade
	4-19-43	W	B	As Constructed.

Hydraulic Engineer
For City of San Diego

LEGEND
Water Line
Sewer Line
S.D. = Storm Sewer
F.H. = Fire Hydrant
G.V. = Gate Valve
A.C. = Asphaltic Concrete

Field Books 631, 667, 668

Ref. Dwg.
3709-W 6 of 23

APPROVALS

CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT

WATER ESMT. - swly of 5th Ave & Harbor Drive
TIDELANDS

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 10 OF 39 SHEETS

W.O. NO. 17430

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL			1-2-42	

194-1719

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

11558-10-D

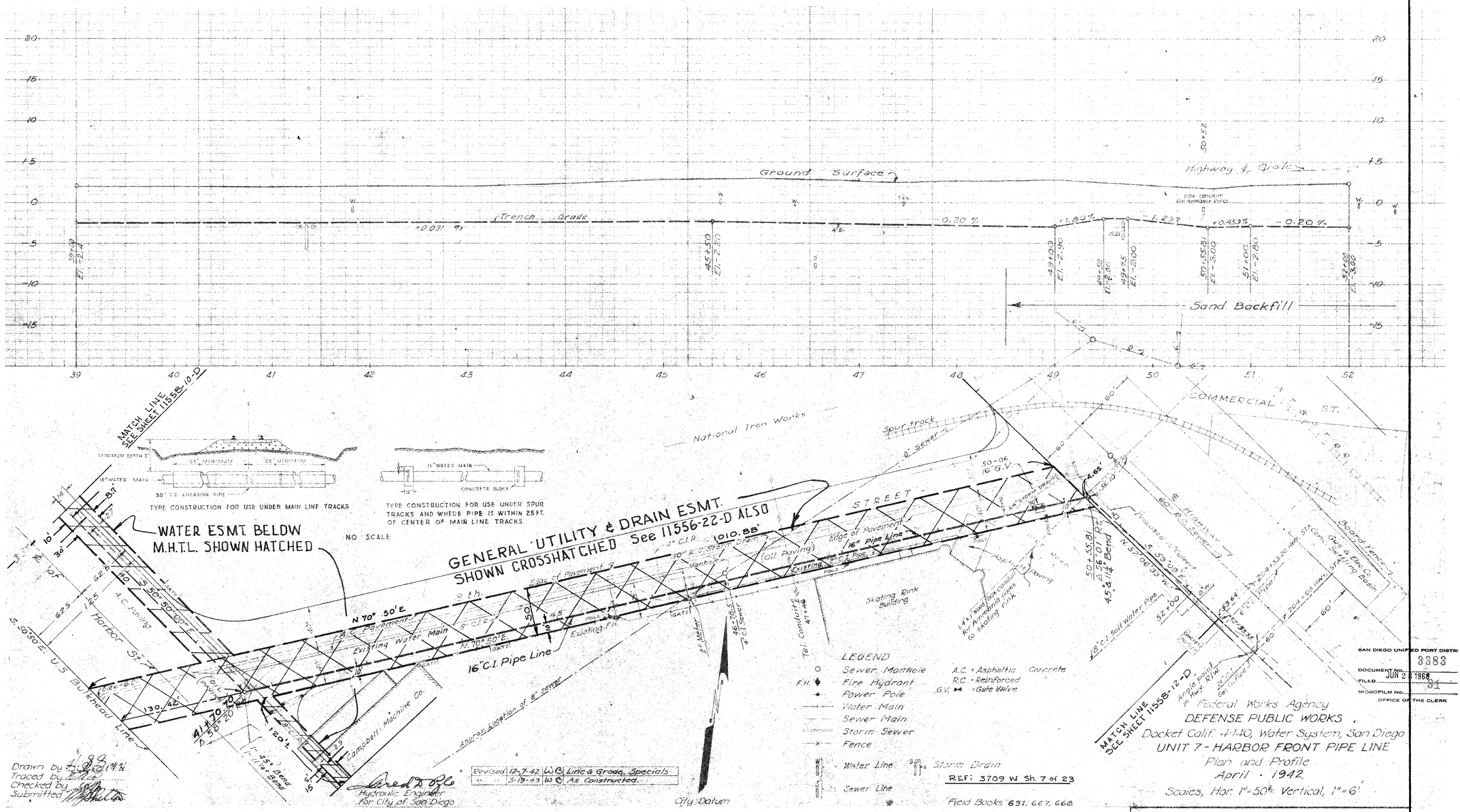

WATER ESMT. - Bet. 6th St & 8th St. sly of Harbor Drive, below M.H.T.L.

TIDELANDS

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 11 OF 39 SHEETS

W.O. NO. 17430

CITY ENGINEER — DATE 6/19/68 — DIVISION HEAD

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL			6-4-68	

DESIGN ENGINEER

CONTROL CERTIFICATION

194-1719
STANDARD COORDINATES

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

11558-11-D

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
UTILITIES DIRECTOR	CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 651833 FILED FEB. 12, 1963	ORIGINAL CONVEYANCE DOCUMENT NO. 77 FILED FEB. 13, 1963

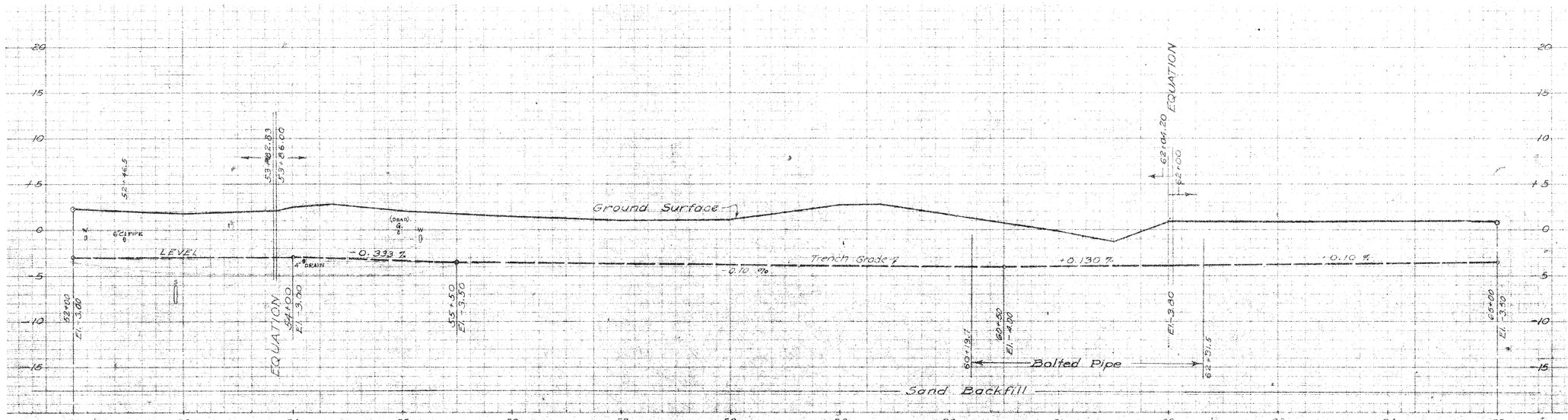

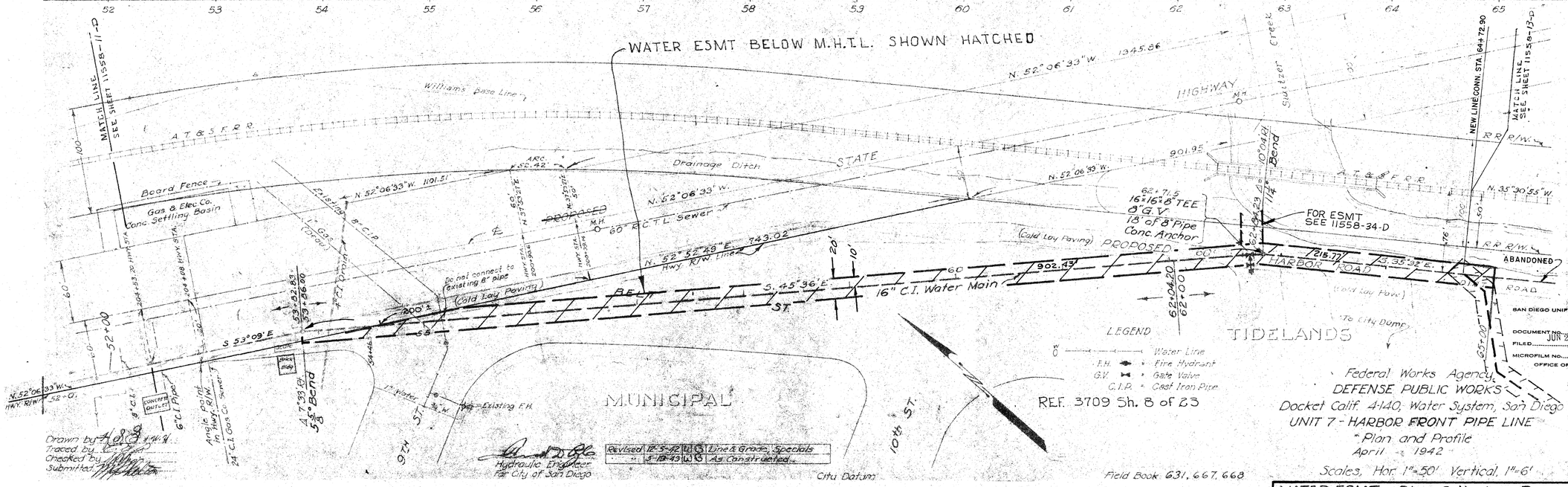

Drawn by
Traced by
Checked by
Submitted

Hydraulic Engineer
For City of San Diego

Revised	12-5-42	W.S.	Line & Grade, Specials
"	7-18-43	W.S.	As Constructed

Federal Works Agency
DEFENSE PUBLIC WORKS
Docket Calif. 4-140; Water System, San Diego
UNIT 7 - HARBOR FRONT PIPE LINE
Plan and Profile
April 1942
Scales, Hor. 1"=50' Vertical, 1"=6'

SAN DIEGO UNIFIED PORT DIST
DOCUMENT NO. 83383
FILED JUN 28 1968
MICROFILM NO. 82
OFFICE OF THE CLERK

APPROVALS

CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R. S. Drake, UTILITIES DIRECTOR	J. F. Rettenmaier, CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 631332 FILED FEB. 15, 1963	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 13, 1969

WATER ESMT. - Sly of Harbor Drive from 9th St. ely to Switzer Creek, below M.H.T.L. TIDELANDS

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 12 OF 39 SHEETS

W.O. NO. 17430

CITY ENGINEER — DATE — DIVISION HEAD

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	RJd	OTJ	6-24-68	

DESIGN ENGINEER

CONTROL CERTIFICATION

194-1721
LAMBERT COORDINATES

CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

11558-12-D

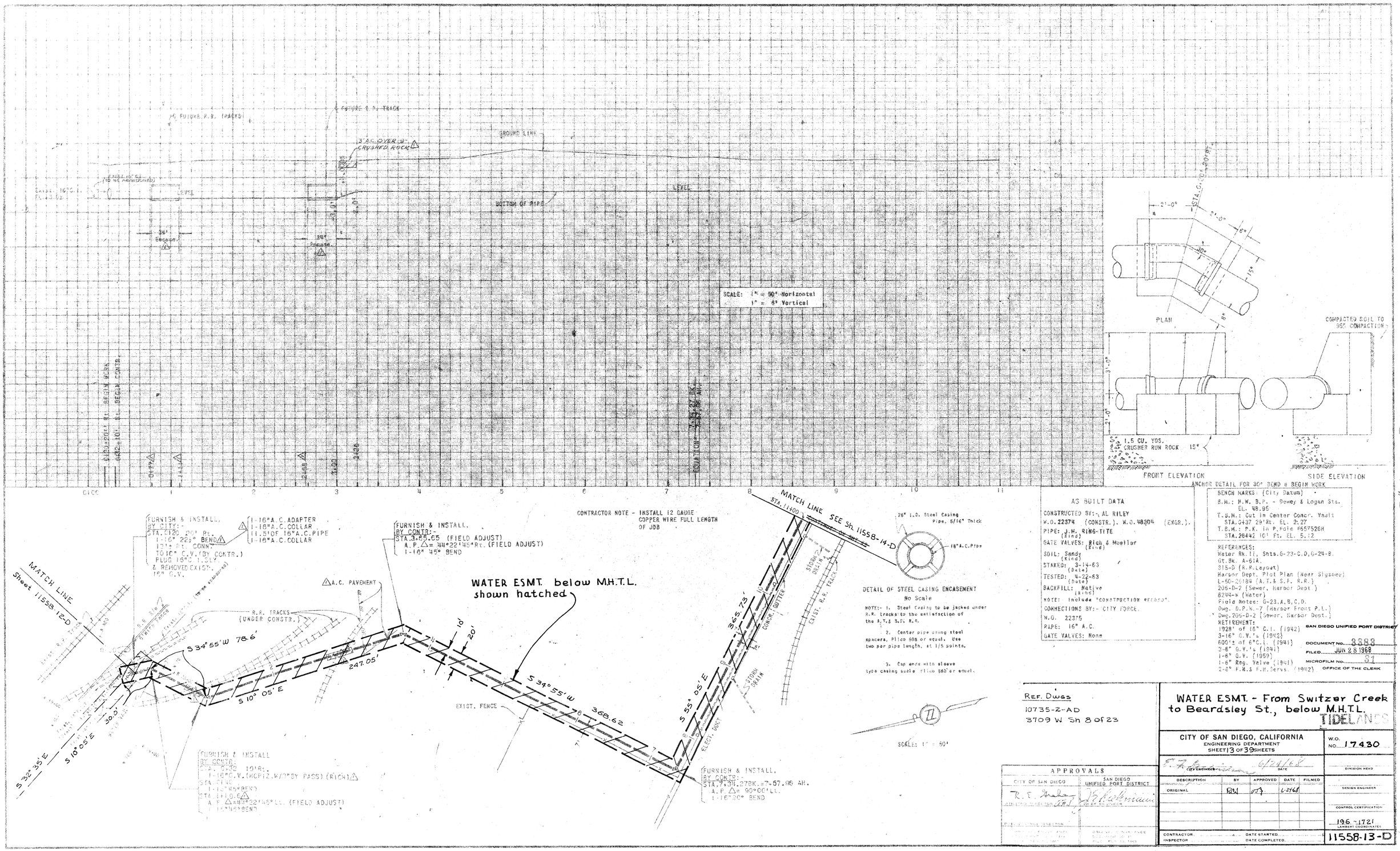
FUTURE R.R. TRACKS
FUTURE S.P. TRACK
3' 6" COVER @ CRUSHED ROCK
GROUND LINE
LEVEL
BOTTOM OF PIPE
SCALE: 1" = 50' Horizontal
1" = 6' Vertical
PLAN
FRONT ELEVATION
SIDE ELEVATION
COMPACTED SOIL TO 95% COMPACTION
1.5 CU. YDS. CRUSHER RUN ROCK
ANCHOR DETAIL FOR 30° BEND @ BEGIN WORK
MATCH LINE SEE Sh. 11558-14-D
MATCH LINE Sheet 11558-12-D
FURNISH & INSTALL, BY CITY:- STA. 0+20 90° Rt. 1-16" 22½° BEND 13½ Rt. CONN. TO 10" C.V. (BY CONTR.) PLUG 16" & 10" C.V. & REMOVED EXIST. 16" G.V.
1-16" A.C. ADAPTER 1-16" A.C. COLLAR 11.51' OF 16" A.C. PIPE 1-16" A.C. COLLAR
FURNISH & INSTALL, BY CONTR.:- STA. 3+65.65 (FIELD ADJUST) A.P. △ = 44°22'45" Rt. (FIELD ADJUST) 1-16" 45° BEND
CONTRACTOR NOTE - INSTALL 12 GAUGE COPPER WIRE FULL LENGTH OF JOB
A.C. PAVEMENT
WATER ESMT. below M.H.T.L. shown hatched
R.R. TRACKS (UNDER CONSTR.)
S 34°55' W 78.6'
S 10° 05' E
247.05'
S 34°55' W
368.62
S 55° 05' E
365.73'
S 32° 35' E
S 10° 05' E
30.0'
EXIST. FENCE
CONCR. GUTTER
STORM DRAIN
EXIST. R.R. TRACK
ELECT. DUCT
FURNISH & INSTALL BY CONTR.: STA. 7+30 (270BK. = 7+57.96 AH.) A.P. △ = 90°00' Lt. 1-16" 90° BEND
FURNISH & INSTALL BY CONTR.: STA. 7+30 90° Rt. 1-16" C.V. (ACP12 W/70" BY PASS) (RICH) △
STA. 1+40 1-16" 45° BEND
STA. 1+10.6 △ A.P. △ = 44°22'45" Lt. (FIELD ADJUST) 1-16" 45° BEND
28" I.D. Steel Casing Pipe, 5/16" Thick
18" A.C. Pipe
DETAIL OF STEEL CASING ENCASEMENT
No Scale
NOTE:- 1. Steel Casing to be jacked under R.R. tracks to the satisfaction of the A.T.& S.F. R.R.
2. Center pipe using steel spacers, Pilco 505 or equal. Use two per pipe length, at 1/5 points.
3. Cap ends with sleeve type casing seals Pilco 860 or equal.
SCALE: 1" = 50'
AS BUILT DATA
CONSTRUCTED BY:- AL RILEY
W.O. 22374 (CONSTR.), W.O. 48304 (ENGR.).
PIPE: J.H. RING-TITE (Kind)
GATE VALVES: Rich & Mueller (Kind)
SOIL: Sandy (Kind)
STAKED: 3-14-63 (Date)
TESTED: 4-22-63 (Date)
BACKFILL: Native (Kind)
NOTE: Include "CONSTRUCTION #FC050".
CONNECTIONS BY:- CITY FORCE.
W.O. 22375
PIPE: 16" A.C.
GATE VALVES: None
BENCH MARKS: (City Datum)
B.M.: H.W. B.P. - Dewey & Logan Sts. EL. 48.95
T.B.M.: Cut in Center Concr. Vault STA. 0+37 29' Rt. EL. 2.27
T.B.M.: P.K. in P. pole #657526H STA. 26+42 10' Ft. EL. 5.12
REFERENCES:
Water Rk. II, Shts. G-23-C,D, G-24-B.
Gt. Bk. A-614.
315-D (R.R. Layout)
Harbor Dept. Plot Plan (Near Stgaseo)
L-50-25184 (A.T.& S.F. R.R.)
206-D-2 (Sewer, Harbor Dept.)
8298-W (Water)
Field Notes: G-23.A,B,C,D.
Dwg. G.P.K.-7 (Harbor Front P.L.)
Dwg. 206-D-2 (Sewer, Harbor Dept.)
RETIREMENT:
1928' of 16" C.I. (1942)
3-16" G.V.'s (1942)
600'± of 6" C.I. (1941)
3-6" G.V.'s (1941)
1-6" G.V. (1959)
1-6" Reg. Valve (1941)
2-6" F.H.& F.H. Servs. (1942)
SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 51
OFFICE OF THE CLERK
REF. DWGS
10735-2-AD
3709 W Sh 8 of 23
APPROVALS
CITY OF SAN DIEGO
SAN DIEGO UNIFIED PORT DISTRICT
WATER ESMT. - From Switzer Creek to Beardsley St., below M.H.T.L.
TIDELANDS
CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 13 OF 39 SHEETS
W.O. NO. 17430
CITY ENGINEER
DATE 6/24/68
DIVISION HEAD
DESCRIPTION
BY
APPROVED
DATE
FILMED
ORIGINAL
6-24-68
DESIGN ENGINEER
CONTROL CERTIFICATION
196-1721
LAMBERT COORDINATES
CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED
11558-13-D
HARBOR FRONT 16" A.C. PL.

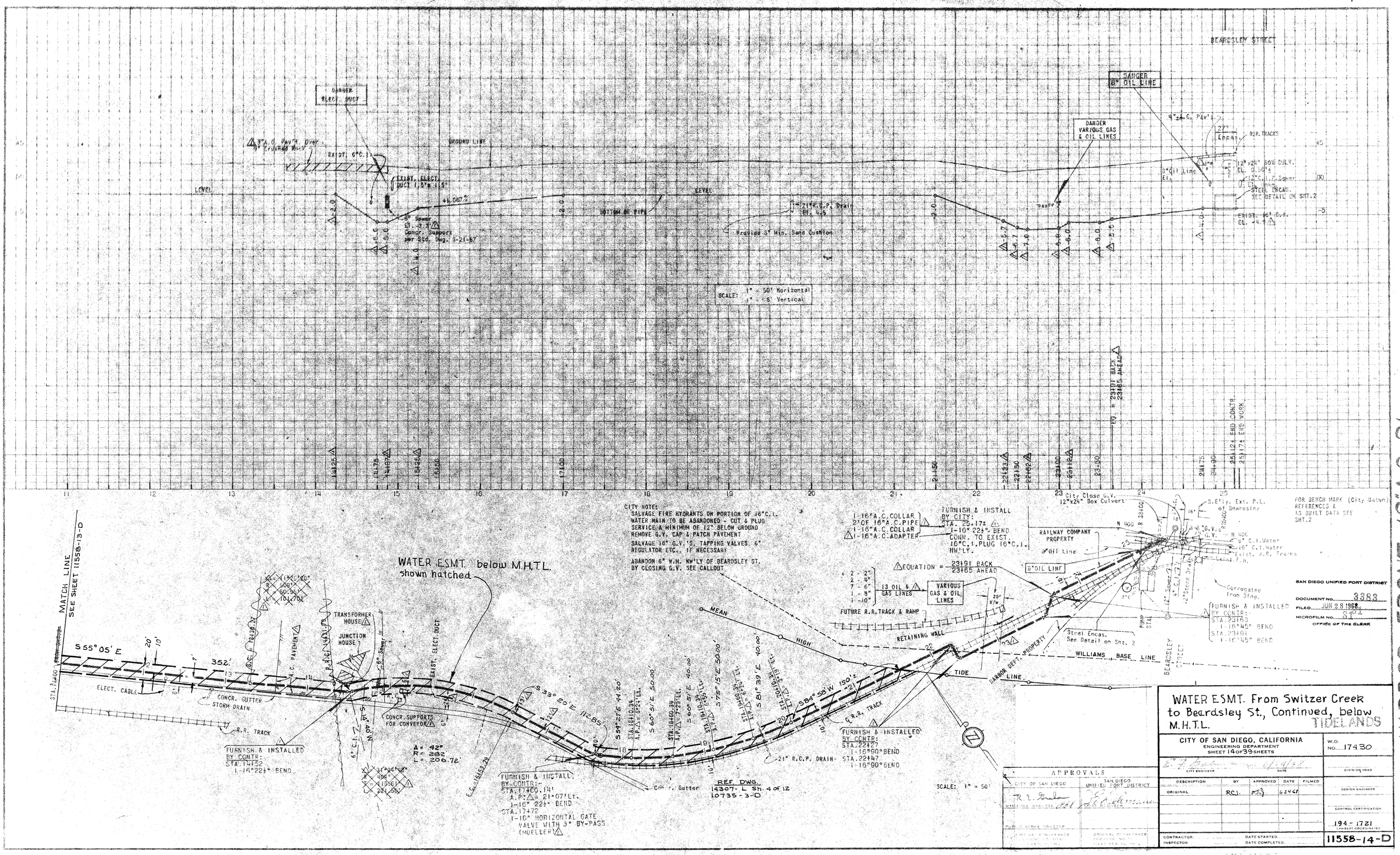
BEARDSLEY STREET
DANGER ELEC. DUCT
DANGER 8" OIL LINE
DANGER VARIOUS GAS & OIL LINES
GROUND LINE
EXIST. 6"C.I.
EXIST. ELECT. DUCT 1.2'x1.5'
LEVEL
BOTTOM OF PIPE
Provide 3" Min. Sand Cushion
RIP. TRACKS
8" Oil Line
Steel Encas. See Detail on Sht. 2
SCALE: 1" = 50' Horizontal
1" = 5' Vertical
City Close G.V.
12"x24" Box Culvert
S.Efly. Ext. P.L. of Beardsley
FOR BENCH MARK (City Datum) REFERENCES & AS BUILT DATA SEE SHT. 2
RAILWAY COMPANY PROPERTY
8" Off Line
8" OIL LINE
EQUATION = 23191 BACK 23465 AHEAD
13 OIL & GAS LINES
VARIOUS GAS & OIL LINES
FUTURE R.R. TRACK & RAMP
RETAINING WALL
Corrugated Iron Stag.
FURNISH & INSTALLED BY CONTR.: STA. 23163 1-16"45° BEND STA. 23191 1-16"45° BEND
WILLIAMS BASE LINE
HARBOR DEPT. PROPERTY
TIDE LINE
BEARDSLEY STREET
MEAN HIGH
MATCH LINE SEE SHEET 11558-13-D
S 55° 05' E
ELECT. CABLE
CONCR. GUTTER
STORM DRAIN
R.R. TRACK
TRANSFORMER HOUSE
JUNCTION HOUSE
EXIST. ELECT. DUCT
CONCR. SUPPORTS FOR CONVEYOR
WATER ESMT. below M.H.T.L. shown hatched
A = 42°
R = 282'
L = 206.72'
FURNISH & INSTALL BY CONTR.: STA. 17+52 1-16" 22½° BEND
FURNISH & INSTALL BY CONTR.:- STA. 17+60.14' A.P. = 21°07' Lt. 1-16" 22½° BEND STA. 17+72 1-16" HORIZONTAL GATE VALVE WITH 3" BY-PASS (MUELLER)
REF. DWG. 14307-L Sh. 4 of 12 10735-3-D
FURNISH & INSTALLED BY CONTR: STA. 22+27 1-16"90° BEND STA. 22+47 1-16"90° BEND
21" R.C.P. DRAIN
SCALE: 1" = 50'
CITY NOTE:
SALVAGE FIRE HYDRANTS ON PORTION OF 16"C.I. WATER MAIN TO BE ABANDONED - CUT & PLUG SERVICE A MINIMUM OF 12" BELOW GROUND REMOVE G.V. CAP & PATCH PAVEMENT
SALVAGE 16" G.V.'S, TAPPING VALVES, 6" REGULATOR ETC., IF NECESSARY
ABANDON 6" W.M. NW'LY OF BEARDSLEY ST. BY CLOSING G.V. SEE CALLOUT
1-16"A.C. COLLAR 2' OF 16"A.C. PIPE 1-16"A.C. COLLAR 1-16"A.C. ADAPTER
FURNISH & INSTALL BY CITY: STA. 25+17± 1-16" 22½° BEND CONN. TO EXIST. 16"C.I. PLUG 16"C.I. NW'LY.
SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 3271
OFFICE OF THE CLERK
WATER ESMT. From Switzer Creek to Beardsley St., Continued, below M.H.T.L.
TIDELANDS
CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 14 OF 39 SHEETS
W.O. NO. 17430
APPROVALS
CITY OF SAN DIEGO
SAN DIEGO UNIFIED PORT DISTRICT
DESCRIPTION BY APPROVED DATE FILMED
ORIGINAL RCL
DESIGN ENGINEER
CONTROL CERTIFICATION
194-1721
LAMBERT COORDINATES
CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED
11558-14-D
HARBOR FRONT 16"A.C. PL.

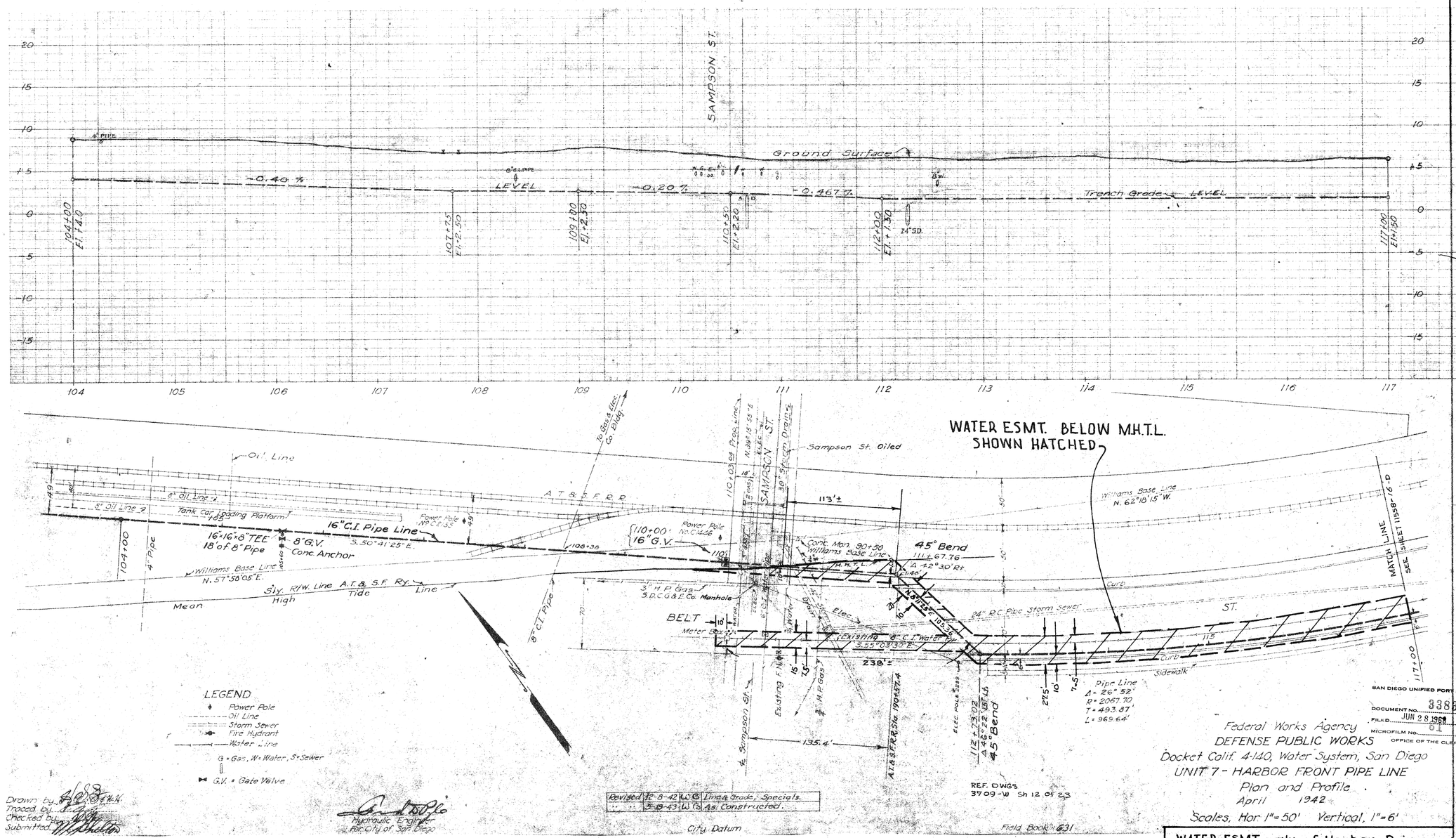
SAMPSON ST.
Ground Surface
Trench Grade
LEVEL
-0.40 %
-0.20 %
-0.46 %
4" PIPE
8" C.I. PIPE
8" W.
24" SD.
104+00 El. 14.0
107+75 El. 2.50
109+00 El. 2.50
110+50 El. 2.20
112+00 El. 1.50
117+00 El. 1.50
Oil Line
8" Oil Line
5" Oil Line
Tank Car Loading Platform
16"×16"×8" TEE
18' of 8" Pipe
8" G.V.
Conc. Anchor
16" C.I. Pipe Line
S. 50°41'25" E.
Power Pole No. C 1426
110+00
16" G.V.
Conc. Mon. 90+50
Williams Base Line
M.H.T.L.
45° Bend
111+67.76
Δ 42°30' Rt.
Williams Base Line
N. 57°58'05" E.
Sly R/W. Line A.T. & S.F. Ry.
Mean High Tide Line
A.T. & S.F. R.R.
8" C.I. Pipe
3" H.P. Gas
S.D.G.&E. Co. Manhole
BELT
Meter Box
Existing 8" C.I. Water Pipe
S. 55°03'30" E.
238'±
113'±
135.4'
Sampson St. Oiled
Sampson St. Drain
To Gas & Elec. Co. Bldg.
Williams Base Line
N. 62°18'15" W.
Curb
24" R.C. Pipe Storm Sewer
ST.
Curb
Sidewalk
Pipe Line
Δ = 26° 52'
R = 2067.70
T = 493.87'
L = 969.64'
112+23.02
Δ 46°22'18" Lt.
45° Bend
MATCH LINE
SEE SHEET 11558-16-D
WATER ESMT. BELOW M.H.T.L.
SHOWN HATCHED
LEGEND
Power Pole
Oil Line
Storm Sewer
Fire Hydrant
Water Line
G = Gas, W = Water, S = Sewer
G.V. = Gate Valve
Drawn by
Traced by
Checked by
Submitted
Revised 12-8-42 W.S. Lines & Grade, Specials.
5-19-43 W.S. As Constructed.
Hydraulic Engineer
For City of San Diego
City Datum
REF. DWGS
3709-W Sh 12 of 23
Field Book 631
SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 61
OFFICE OF THE CLERK
Federal Works Agency
DEFENSE PUBLIC WORKS
Docket Calif. 4-140, Water System, San Diego
UNIT 7 - HARBOR FRONT PIPE LINE
Plan and Profile
April 1942
Scales, Hor 1" = 50' Vertical, 1" = 6'
WATER ESMT. sly of Harbor Drive
between Sampson St. & Sicard St.
below M.H.T.L. (TIDELANDS)
CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 15 OF 39 SHEETS
W.O. NO. 17430
6/24/68
DIVISION HEAD
DESIGN ENGINEER
CONTROL CERTIFICATION
192-1725
LAMBERT COORDINATES
11558-15-D
APPROVALS
CITY OF SAN DIEGO
SAN DIEGO UNIFIED PORT DISTRICT
UTILITIES DIRECTOR
CHIEF ENGINEER
PUBLIC WORKS DIRECTOR
ORIGINAL CONVEYANCE DOCUMENT NO. 0918-2
FILED FEB. 13, 1959
ORIGINAL CONVEYANCE DOCUMENT NO. 71
FILED FEB. 13, 1962
DESCRIPTION
BY
APPROVED
DATE
FILMED
ORIGINAL
CONTRACTOR
DATE STARTED
INSPECTOR
DATE COMPLETED

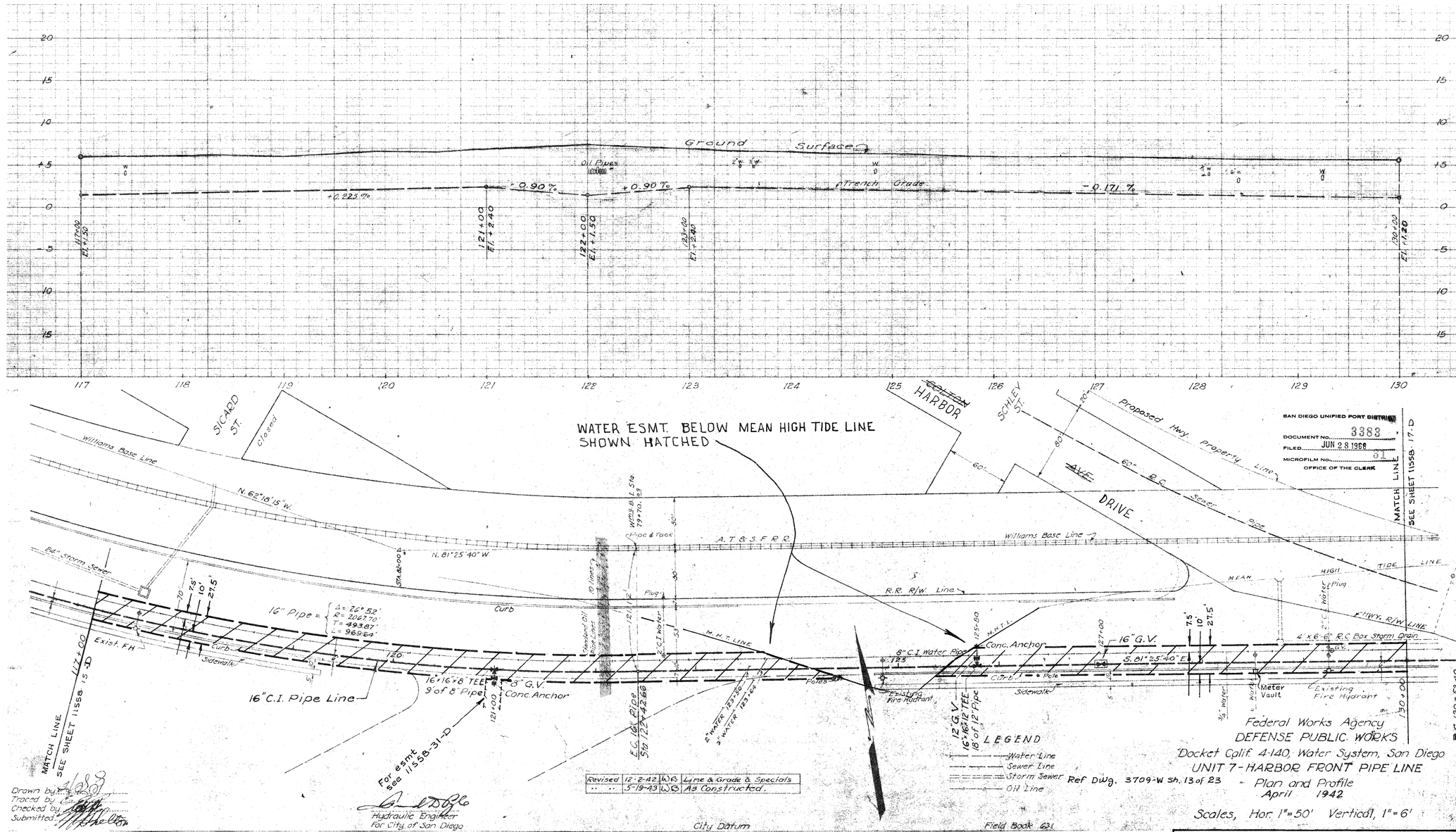

WATER ESMT. sly. of Harbor Drive from Sicard St. to 500' Ely of Schley St.

TIDELANDS

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 16 OF 39 SHEETS

W.O. NO. 17430

CITY ENGINEER — DATE 6/24/68

DIVISION HEAD

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	RCJ		6-24-68	

DESIGN ENGINEER

CONTROL CERTIFICATION

192-1725
LAMBERT COORDINATES

CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

11558-16-D

APPROVALS

CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
UTILITIES DIRECTOR	CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 451833 FILED FEB. 15, 1963	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 15, 1963

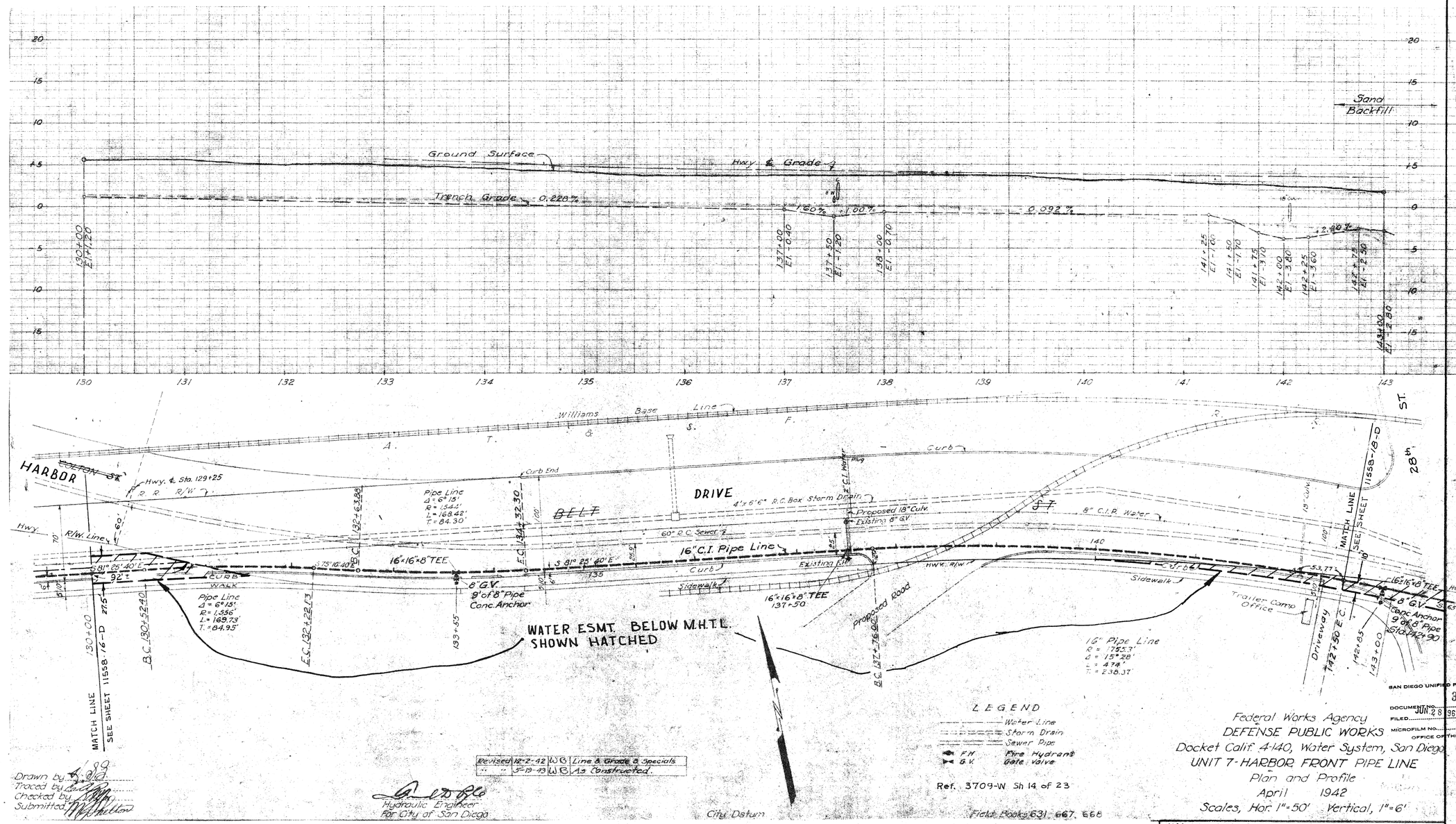

Revised	12-2-42	W.B.	Line & Grade & Specials
"	5-19-43	W.B.	As Constructed.

Drawn by
Traced by
Checked by
Submitted

Hydraulic Engineer
For City of San Diego

Federal Works Agency
DEFENSE PUBLIC WORKS
Docket Calif. 4-140, Water System, San Diego
UNIT 7-HARBOR FRONT PIPE LINE
Plan and Profile
April 1942
Scales, Hor. 1"=50' Vertical, 1"=6'

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT 3383
FILED JUN 28 1968
MICROFILM NO. 31
OFFICE OF THE CLERK

WATER ESMT. Sly of Harbor Drive from approx. 500' ely of Schley St to 28th St., Below M.H.T.L. TIDELANDS

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 17 OF 39 SHEETS

W.O. NO. 17430

City Engineer — Date 6/24/68 — Division Head

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	RCJ		6-27-68	

Design Engineer

Control Certification

190-1727
Lambert Coordinates

Contractor ..... Date Started .....
Inspector ..... Date Completed .....

11558-17-D

APPROVALS

CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
Utilities Director	Chief Engineer
Public Works Director	
Original Conveyance Document No. 65523 Filed Feb. 15, 1963	Original Conveyance Document No. 71 Filed Feb. 13, 1963

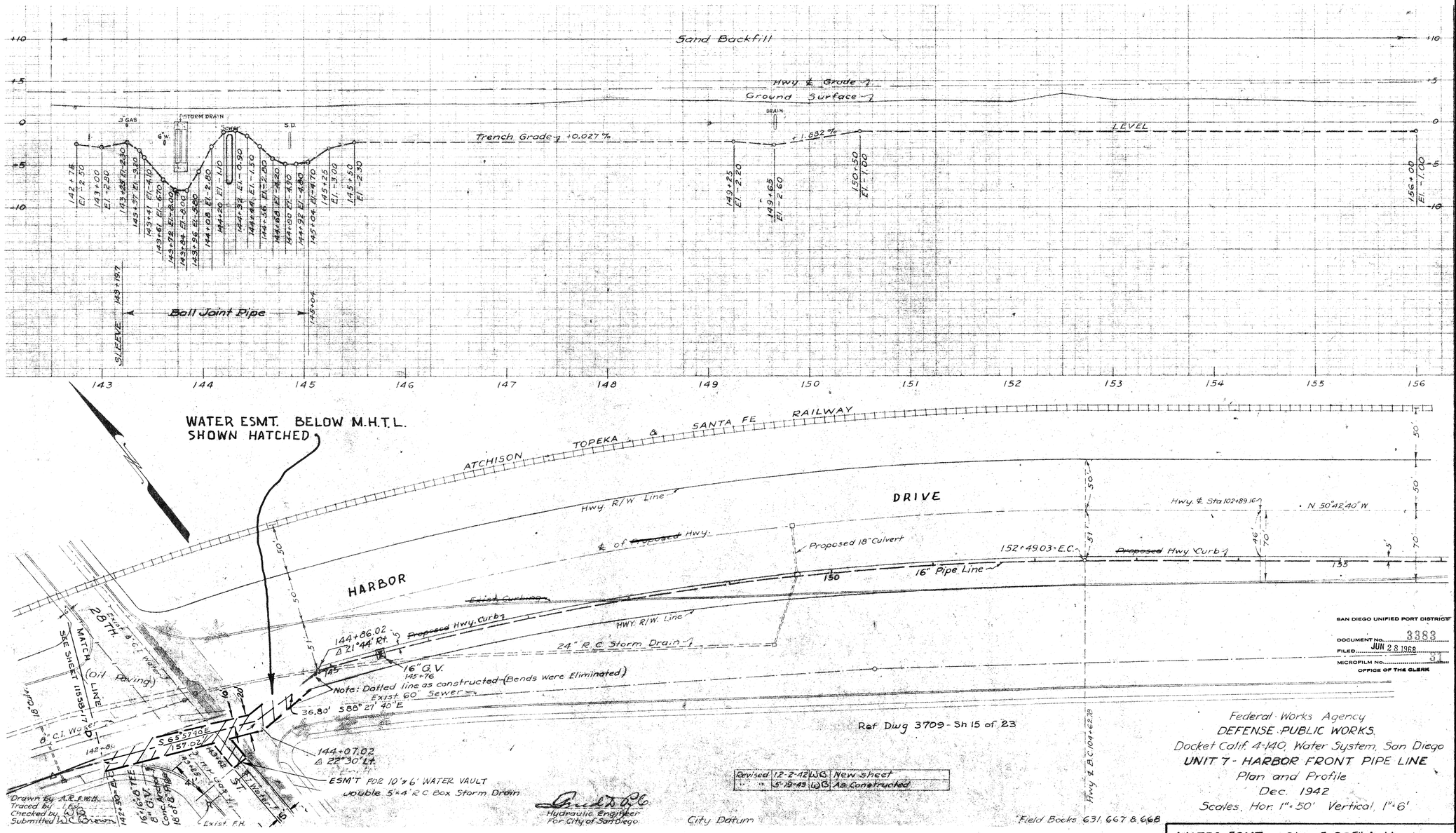

Revised	12-2-42	W.G.	New sheet
" "	5-19-43	W.G.	As Constructed

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No.
OFFICE OF THE CLERK

Federal Works Agency
DEFENSE PUBLIC WORKS
Docket Calif. 4-140, Water System, San Diego
UNIT 7 - HARBOR FRONT PIPE LINE
Plan and Profile
Dec. 1942
Scales, Hor. 1" = 50' Vertical 1" = 6'

WATER ESMT. - Sly of 28TH & Harbor Drive Below M.H.T.L. TIDELANDS

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 18 OF 39 SHEETS

W.O. NO. 17430

C.F. Salvinson 6/24/68
CITY ENGINEER DATE

DIVISION HEAD

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	R.C.J.		6-24-68	

DESIGN ENGINEER

CONTROL CERTIFICATION

190 - 1727
LAMBERT COORDINATES

CONTRACTOR DATE STARTED
INSPECTOR DATE COMPLETED

11558-18-D

APPROVALS

CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R.E. Shelley, UTILITIES DIRECTOR	J. Kilbourne, CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 41183 FILED FEB. 16, 1953	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 13, 1953

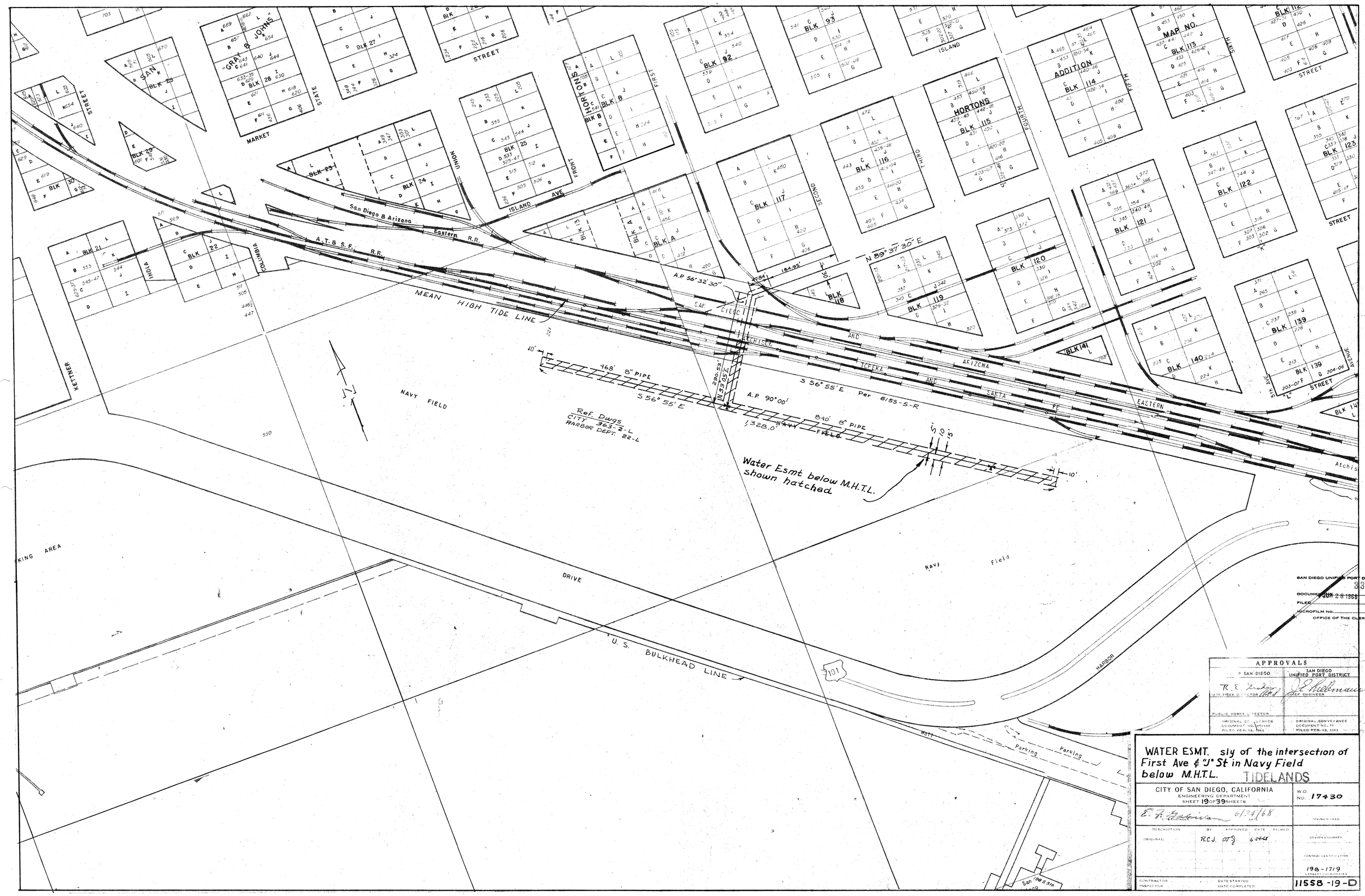
MEAN HIGH TIDE LINE
NAVY FIELD
Ref. Dwgs.
CITY 363.2-L
HARBOR DEPT. 22-L
Water Esmt below M.H.T.L.
shown hatched
A.P. 56°32'30"
A.P. 90°00'
S 56°55'E Per 6155-5-R
S 56°55'E
N 89°37'30" E
184.95'
468' 8" PIPE
840' 8" PIPE
1328.0'
290.53'
N 33°05'E
San Diego & Arizona Eastern R.R.
A.T.& S.F. R.R.
ATCHISON TOPEKA AND SANTA FE
ARIZONA EASTERN
Navy Field
HARBOR
DRIVE
U.S. BULKHEAD LINE
Parking
Parking
Wall
101
SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT 3383
FILED JUN 23 1968
MICROFILM NO. 31
OFFICE OF THE CLERK
APPROVALS
P. SAN DIEGO
SAN DIEGO UNIFIED PORT DISTRICT
UTILITIES DIRECTOR
CHIEF ENGINEER
PUBLIC WORKS DIRECTOR
ORIGINAL CONVEYANCE DOCUMENT NO. 71
FILED FEB. 13, 1963
WATER ESMT. sly of the intersection of First Ave & "J" St in Navy Field below M.H.T.L.
TIDELANDS
CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 19 OF 39 SHEETS
W.O. NO. 17430
6/24/68
DIVISION HEAD
DESCRIPTION
BY
APPROVED
DATE
FILMED
ORIGINAL
R.C.J.
6-24-68
DESIGN ENGINEER
CONTROL CERTIFICATION
198-1719
LAMBERT COORDINATES
CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED
11558-19-D

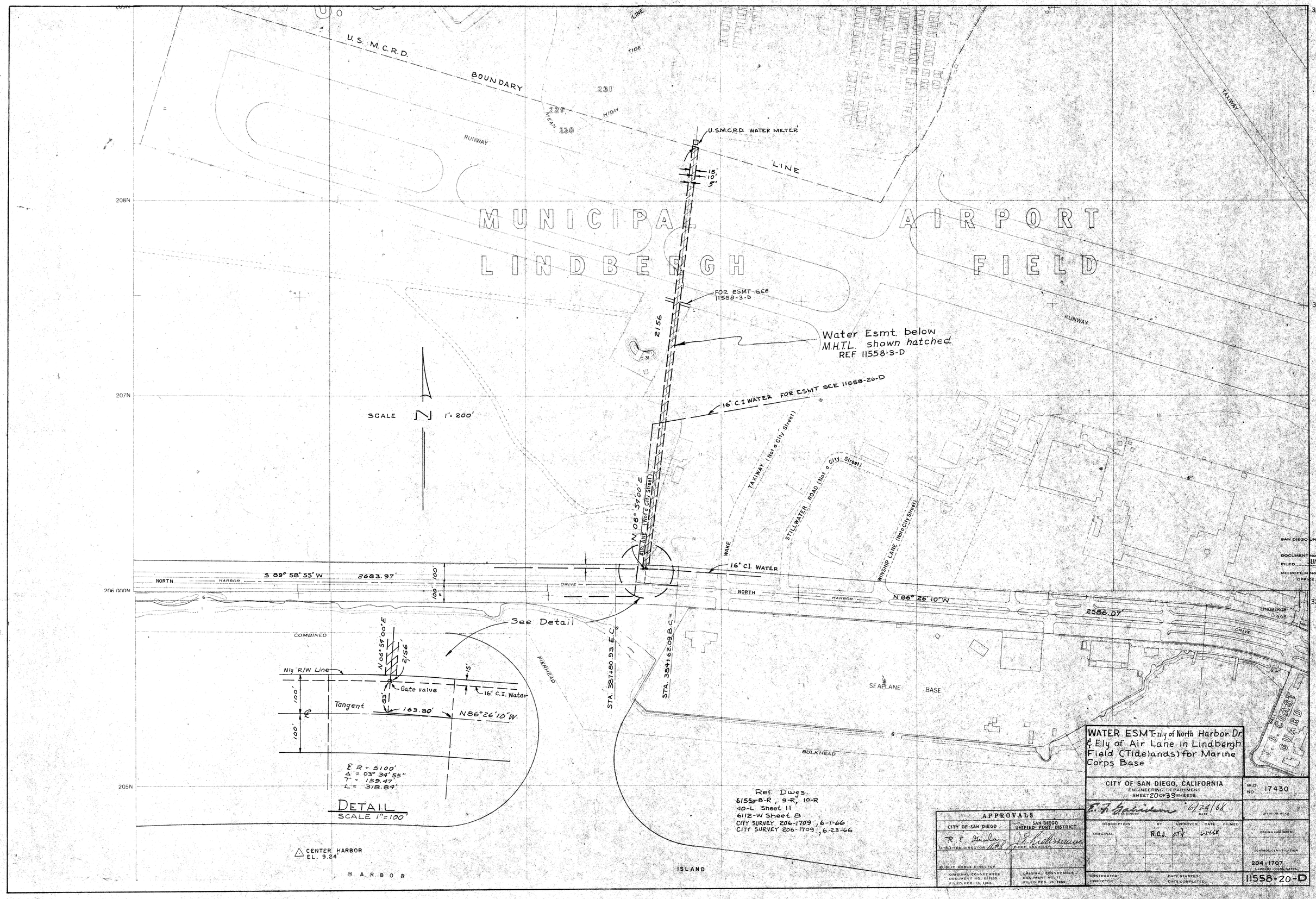

Ref. Dwgs.
6155-B-R, 9-R, 10-R
40-L Sheet 11
6112-W Sheet 8
CITY SURVEY 206-1709, 6-1-66
CITY SURVEY 206-1709, 6-23-66

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R. F. Dinda, CITY DIRECTOR	D. S. Kuhlmann, CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 65933 FILED FEB. 15, 1963	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 19, 1963

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3003
FILED JUN 28 1968
MICROFILM NO.
OFFICE OF THE CLERK

WATER ESMT. nly of North Harbor Dr. & Ely of Air Lane in Lindbergh Field (Tidelands) for Marine Corps Base

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 20 OF 39 SHEETS

W.O. NO. 17430

E. F. Gabelman 6/24/68
ENGINEER DATE

DIVISION HEAD

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	R.C.J.		6-24-68	

DESIGN ENGINEER

CONTROL CERTIFICATION
204-1707
LAMBERT COORDINATES

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

11558-20-D

City of San Diego
Conveyances

City Doc.
No. 224625
6/26/68

SAN DIEGO UNIFIED PORT DISTRICT
3383
DOCUMENT No.
FILED JUN 28 1968 31
MICROFILM No.
OFFICE OF THE CLERK

Page 2
1/1

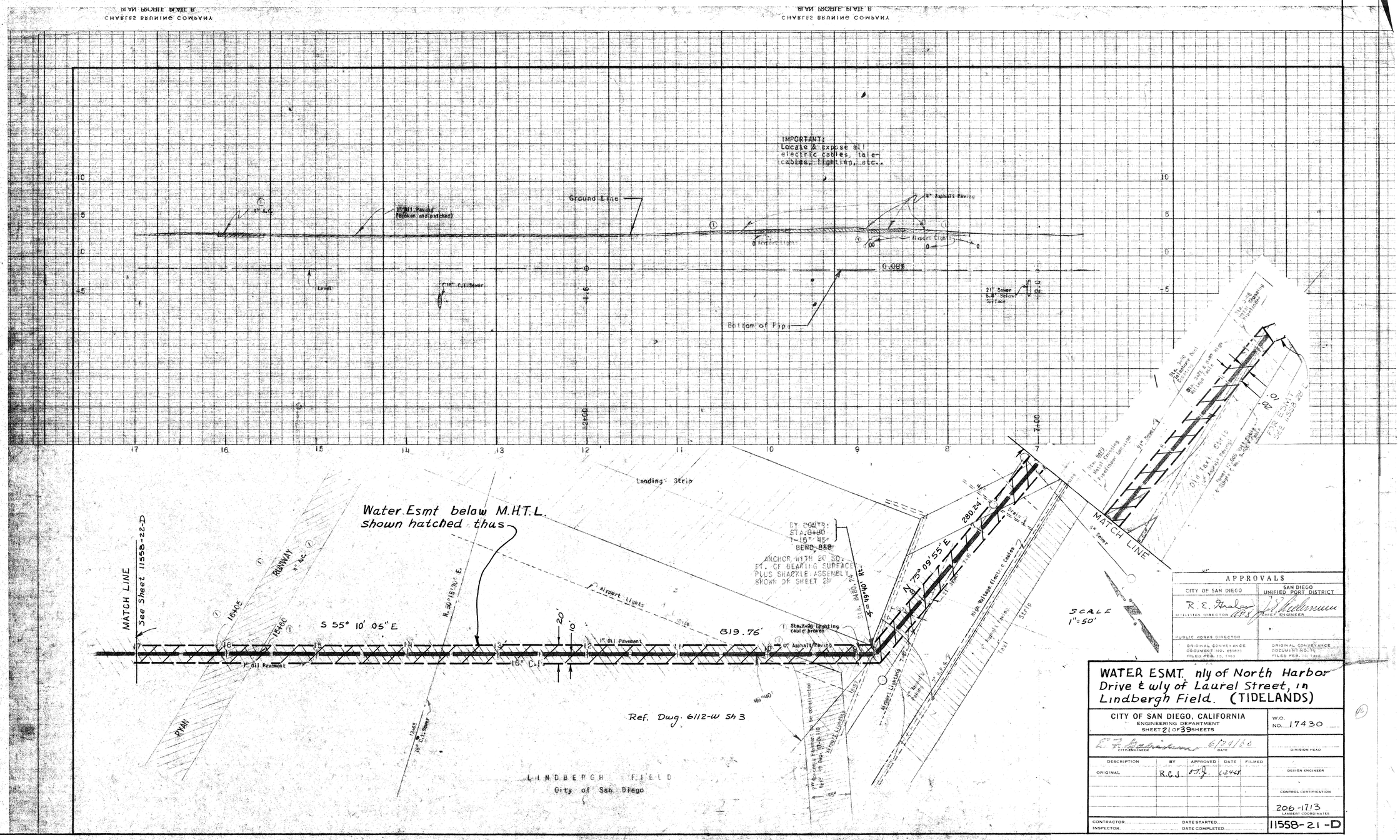

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R. E. Hinds — UTILITIES DIRECTOR	J. S. Wiedemann — CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 65181 FILED FEB. 15, 1963	ORIGINAL CONVEYANCE DOCUMENT NO. 74 FILED FEB. 15, 1963

WATER ESMT. nly of North Harbor Drive & wly of Laurel Street, in Lindbergh Field. (TIDELANDS)

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 21 OF 39 SHEETS

W.O. NO. 17430

E. A. Bauman — CITY ENGINEER — 6/24/68 DATE — DIVISION HEAD

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	R.C.J.	[illegible]	6-24-68	

DESIGN ENGINEER

CONTROL CERTIFICATION

206-1713
LAMBERT COORDINATES

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

11558-21-D

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 31
OFFICE OF THE CLERK

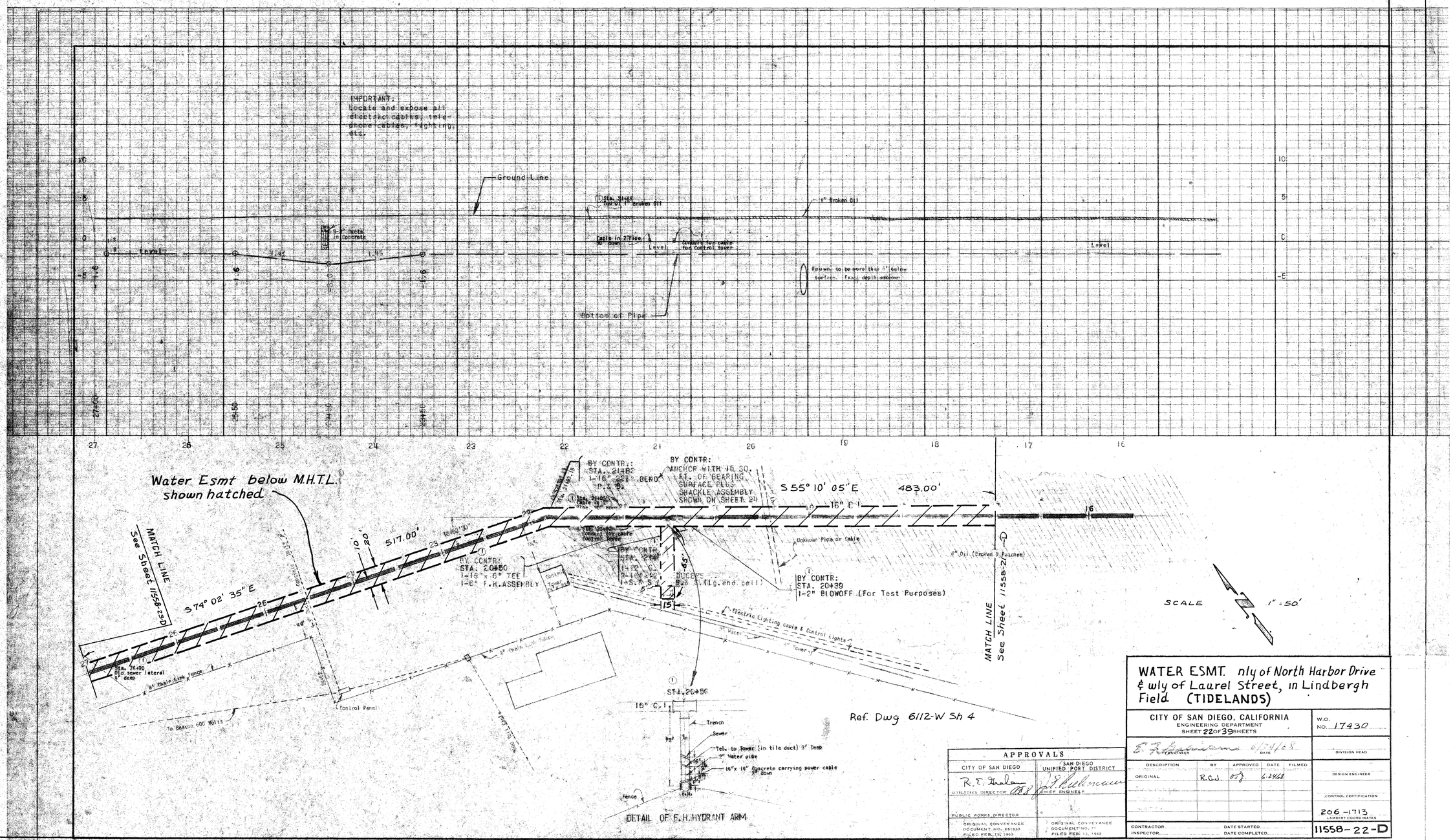

WATER ESMT. nly of North Harbor Drive & wly of Laurel Street, in Lindbergh Field (TIDELANDS)

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 22 OF 39 SHEETS

W.O. NO. 17430

CITY ENGINEER — DATE 6/24/68 — DIVISION HEAD

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	R.G.W.		6-24-68	

DESIGN ENGINEER

CONTROL CERTIFICATION

206-1713
LAMBERT COORDINATES

CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

11558-22-D

APPROVALS

CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
UTILITIES DIRECTOR	CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 641823 FILED FEB. 19, 1963	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 13, 1963

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 31
OFFICE OF THE CLERK

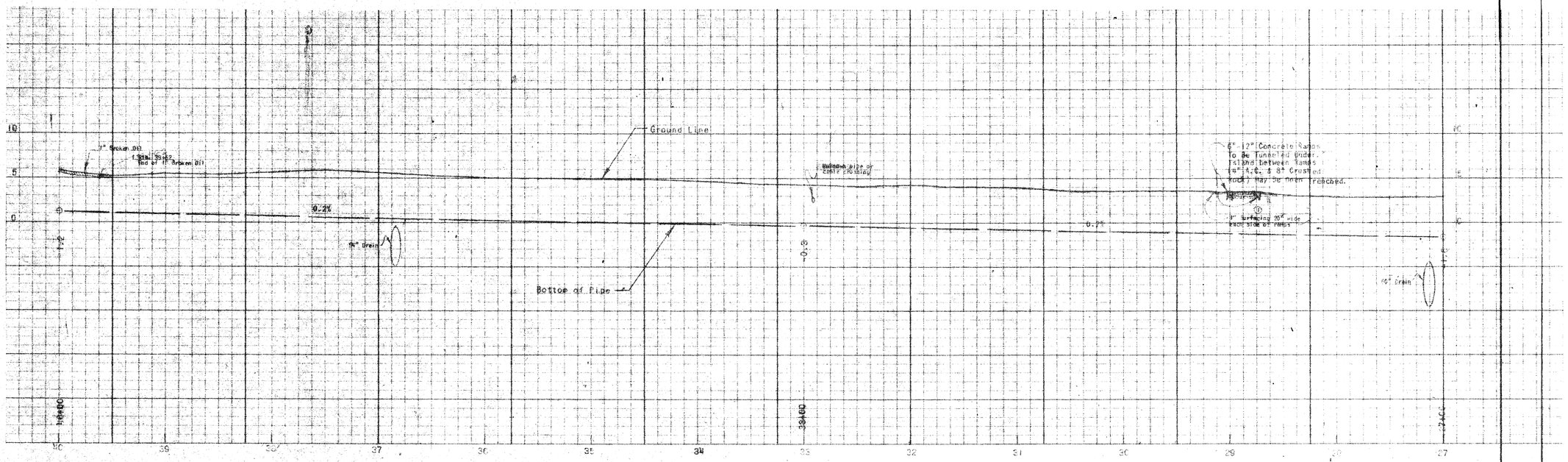

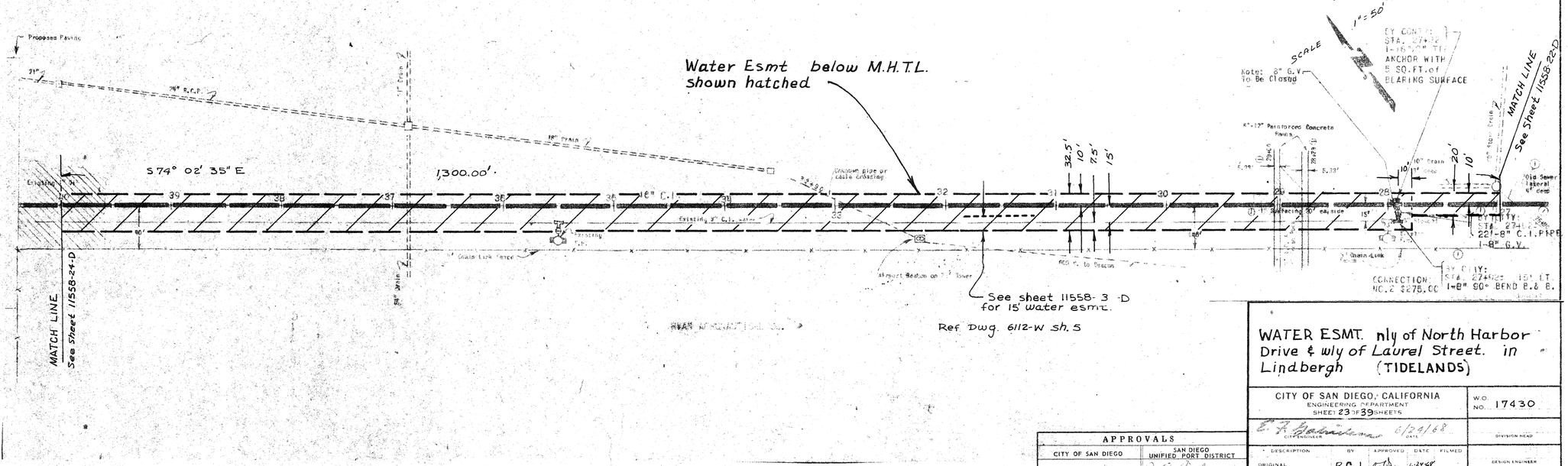

WATER ESMT. nly of North Harbor Drive & wly of Laurel Street. in Lindbergh (TIDELANDS)

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R. E. Grahm — UTILITIES DIRECTOR	E. E. Kuhnmuenz — CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 651833 FILED FEB. 15, 1963	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 13, 1963

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 23 OF 39 SHEETS

W.O. NO. 17430

E. R. Kuhnmuenz — CIVIL ENGINEER — DATE 6/24/68

DIVISION HEAD

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	R.G.J.		6-24-68	

DESIGN ENGINEER

CONTROL CERTIFICATION

206-1711
CARTESIAN COORDINATES

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

11558-23-D

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 01
OFFICE OF THE CLERK

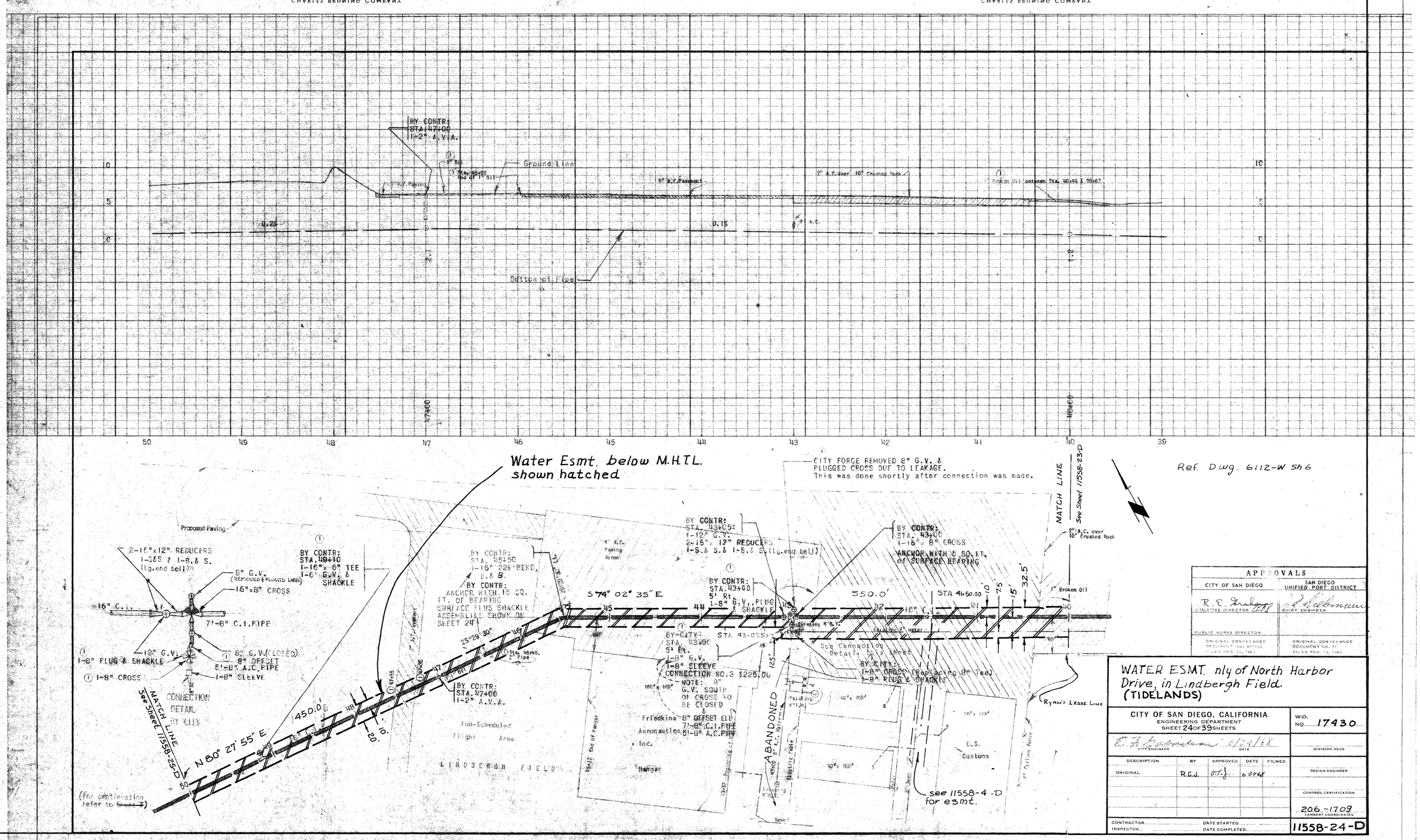

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R. E. Graham — UTILITIES DIRECTOR	R. F. Gilbreath — CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 857139 FILED FEB. 15, 1961	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 13, 1962

WATER ESMT. nly of North Harbor Drive, in Lindbergh Field. (TIDELANDS)

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 24 OF 39 SHEETS

W.O. NO. 17430

R. F. Gilbreath 6/24/68
CITY ENGINEER — DATE

DIVISION HEAD

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	R.C.J.	O.T.J.	6-24-68	

DESIGN ENGINEER

CONTROL CERTIFICATION

206-1709
LAMBERT COORDINATES

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

11558-24-D

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 31
OFFICE OF THE CLERK

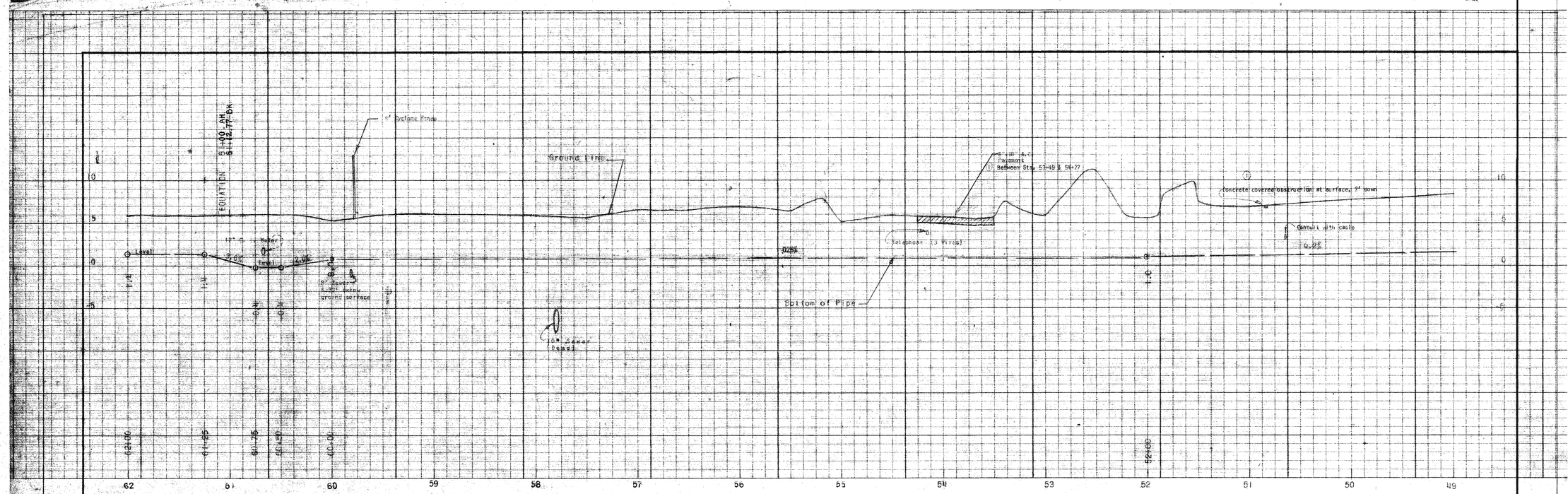

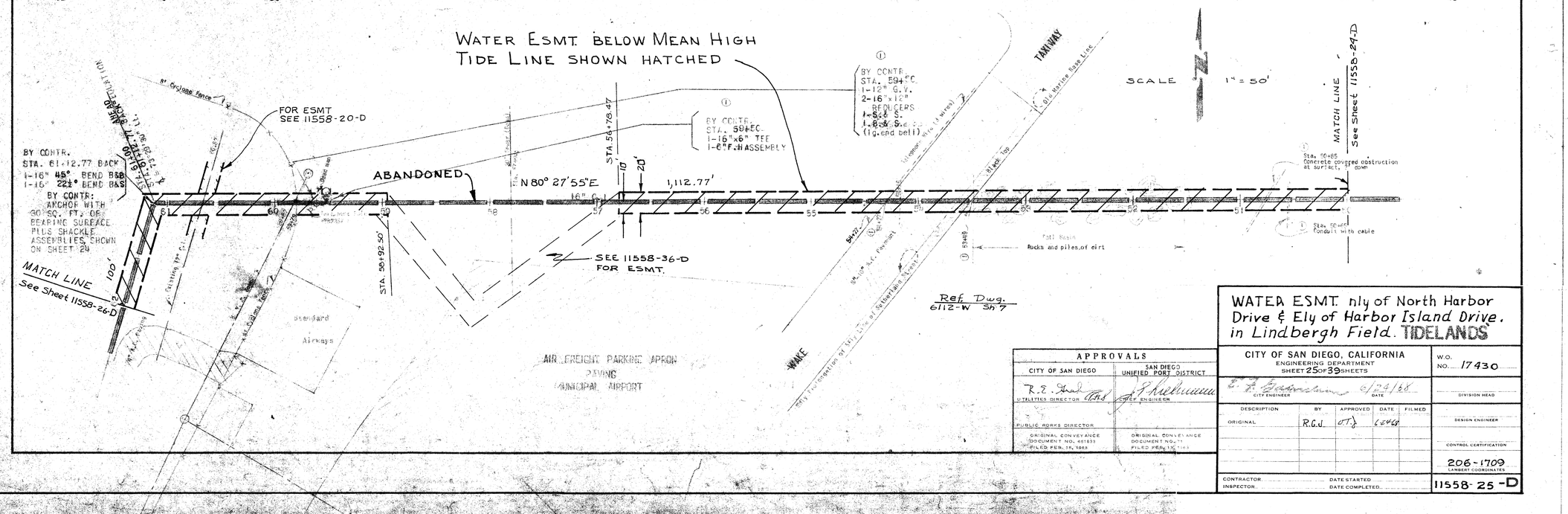

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R. E. Shad (Pro) UTILITIES DIRECTOR	J. Lichtenwald CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 65833 FILED FEB. 19, 1963	ORIGINAL CONVEYANCE DOCUMENT NO. FILED FEB. 19, 1963

WATER ESMT. nly of North Harbor Drive & Ely of Harbor Island Drive, in Lindbergh Field. TIDELANDS

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 25 OF 39 SHEETS

W.O. NO. 17430

C. F. Gardner 6/28/68
CITY ENGINEER DATE

DIVISION HEAD

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	R.G.J.	OTJ	6-28-68	

DESIGN ENGINEER

CONTROL CERTIFICATION

206-1709
LAMBERT COORDINATES

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

11558-25-D

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No. 91
OFFICE OF THE CLERK

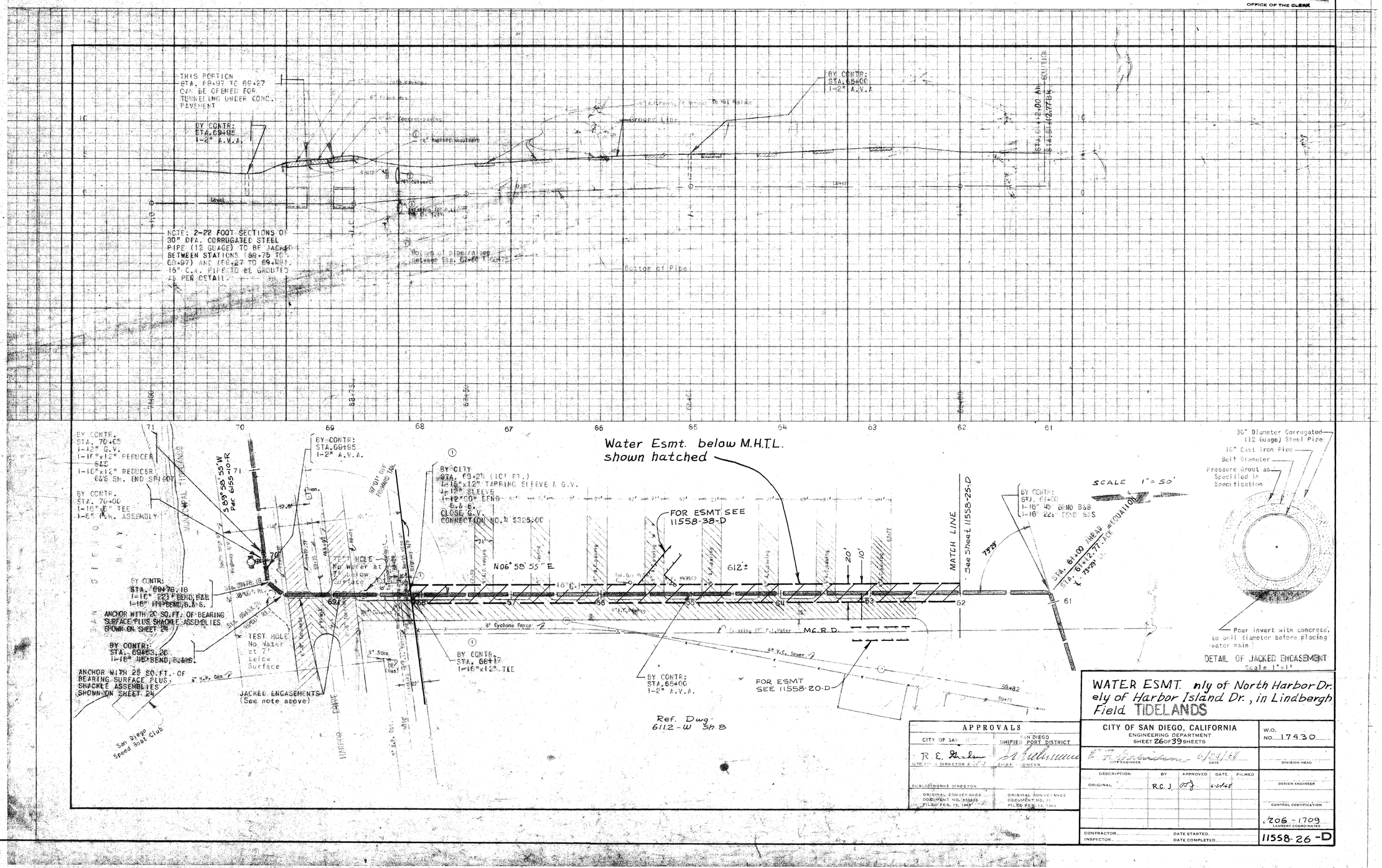

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO.
OFFICE OF THE CLERK

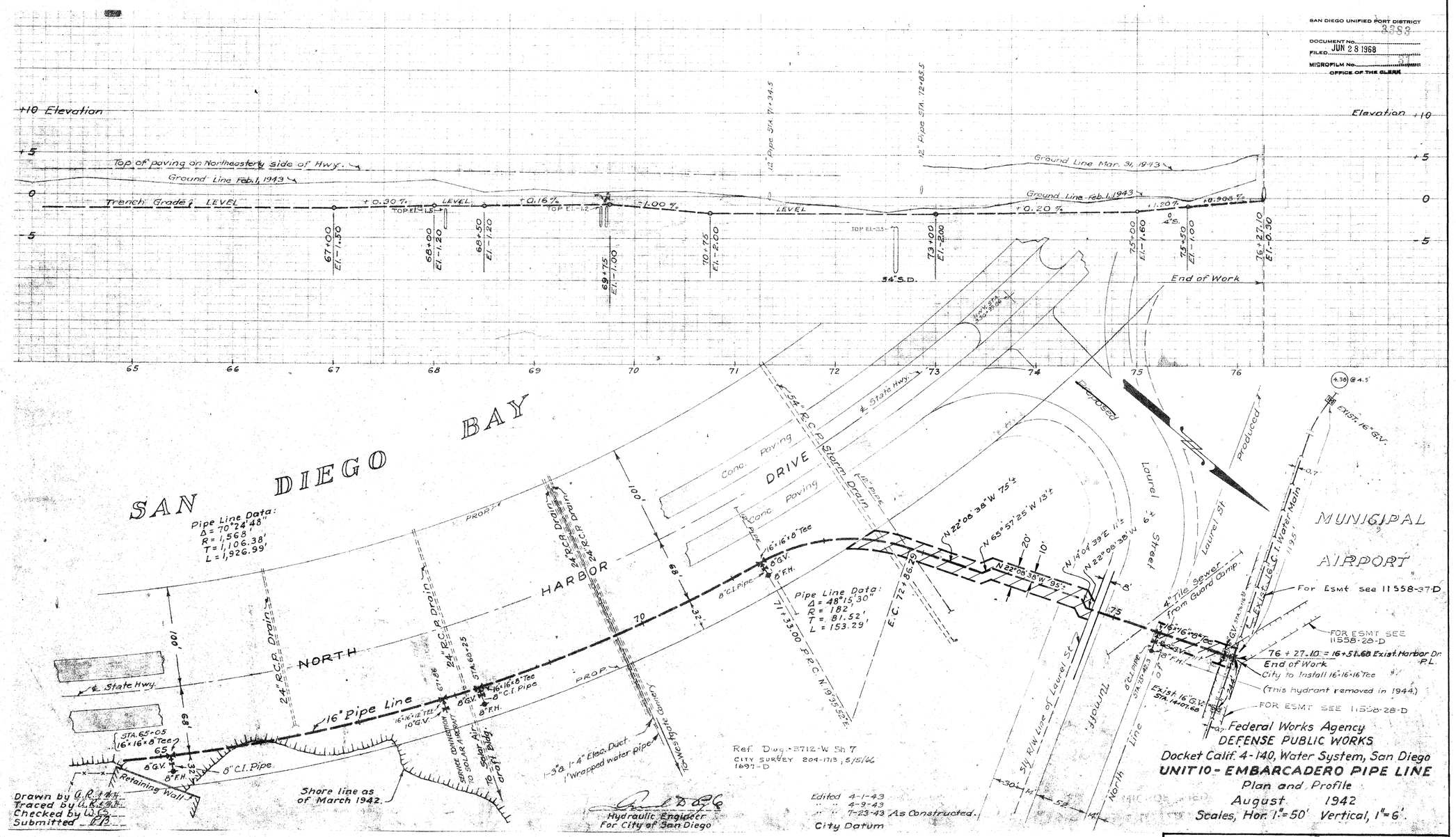

WATER ESMT. sly of Laurel Street & nly of North Harbor Drive

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R. S. Strahan UTILITIES DIRECTOR	CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 651833 FILED FEB. 15, 1943	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 13, 1948

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 27 OF 39 SHEETS

W.O. NO. 17430

E. F. Bernhardt 6/24/68
BY ENGINEER DATE

DIVISION HEAD

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	R.C.J.		6	

DESIGN ENGINEER

CONTROL CERTIFICATION

204-1715
LAMBERT COORDINATES

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

11558-27-D

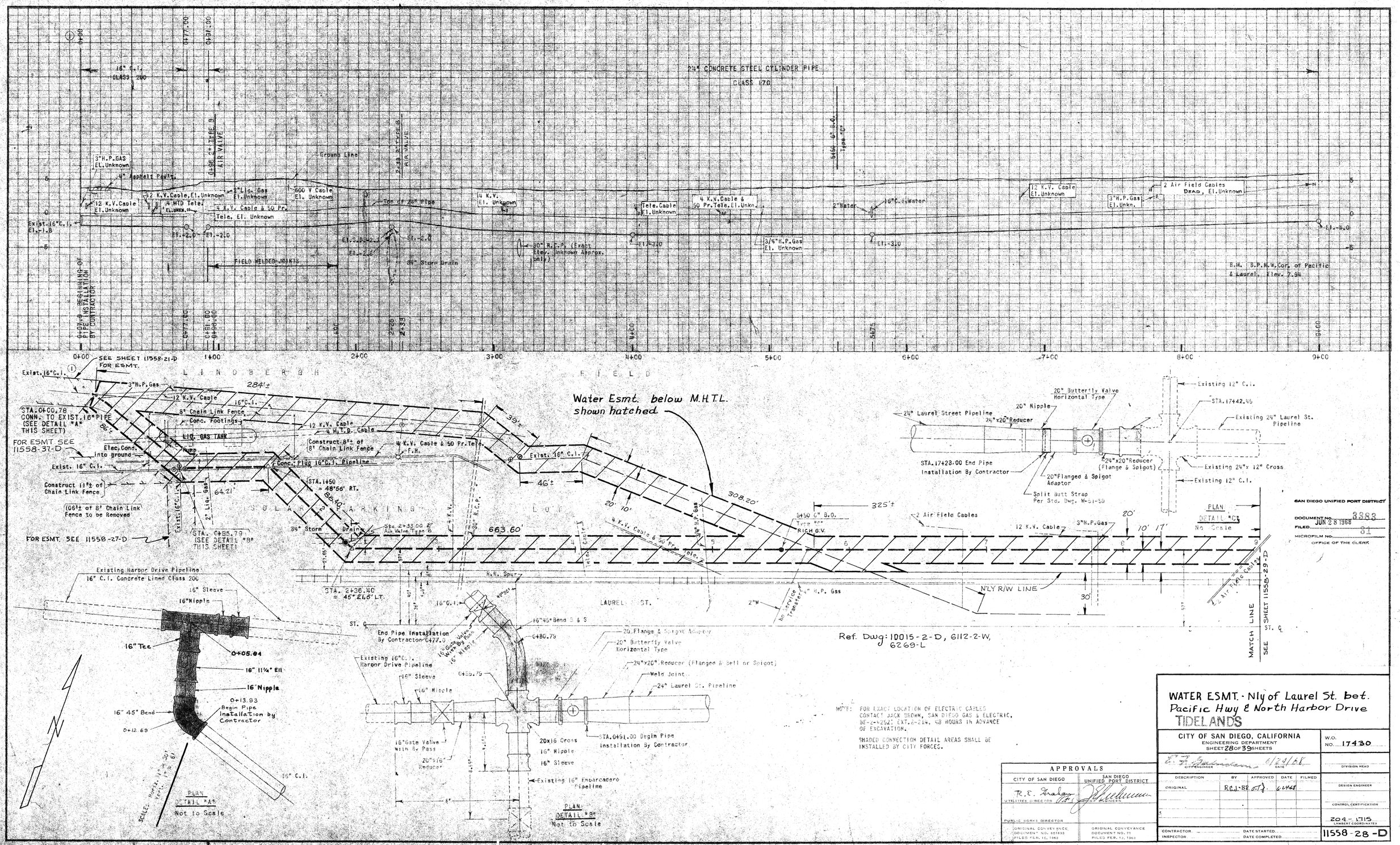

NOTE: FOR EXACT LOCATION OF ELECTRIC CABLES CONTACT JACK BROWN, SAN DIEGO GAS & ELECTRIC, BE-2-4252, EXT. 6-214, 48 HOURS IN ADVANCE OF EXCAVATION.

SHADED CONNECTION DETAIL AREAS SHALL BE INSTALLED BY CITY FORCES.

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R. E. Grahn UTILITIES DIRECTOR	J. Shelmerdine CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 85183 FILED FEB. 15, 1963	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 12, 1963

WATER ESMT. - N'ly of Laurel St. bet. Pacific Hwy & North Harbor Drive
TIDELANDS

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 28 OF 39 SHEETS

W.O. NO. 17430

CITY ENGINEER — DATE 6/23/68 — DIVISION HEAD

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	R.C.J.-BR	O.T.J.	6-6-68	

DESIGN ENGINEER

CONTROL CERTIFICATION

204-1715
LAMBERT COORDINATES

CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

11558-28-D

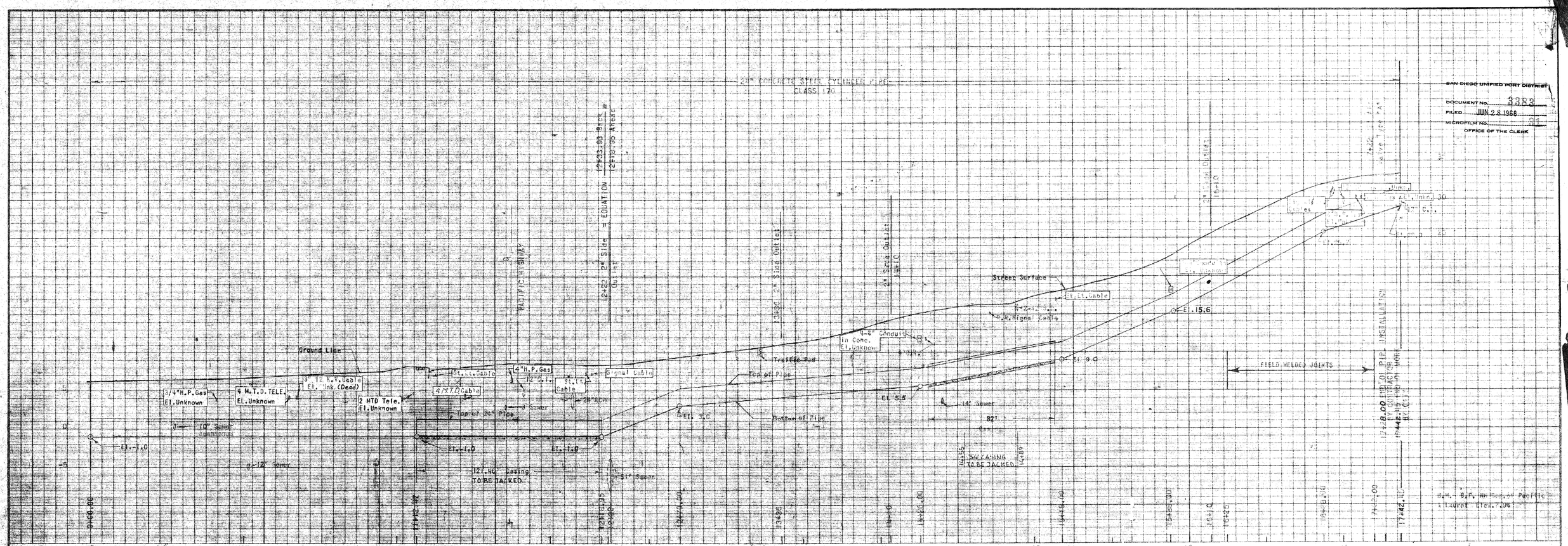

WATER ESMT.- Nly of Laurel Street from Pacific Hwy wly. TIDELANDS

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 29 OF 39 SHEETS

W.O. NO. 17430

E. F. Bonnickson 6/24/68
ENGINEER — DATE — DIVISION HEAD

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	R.C.J.		6-24-68	

DESIGN ENGINEER

CONTROL CERTIFICATION

204-1715
(CONTROL COORD. COORDS.)

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

11558-29-D

APPROVALS

CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R. F. Dalager / UTILITIES DIRECTOR	E. Hellmann / CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 655835 FILED FEB. 15, 1963	ORIGINAL CONVEYANCE DOCUMENT NO. 21 FILED FEB. 13, 1963

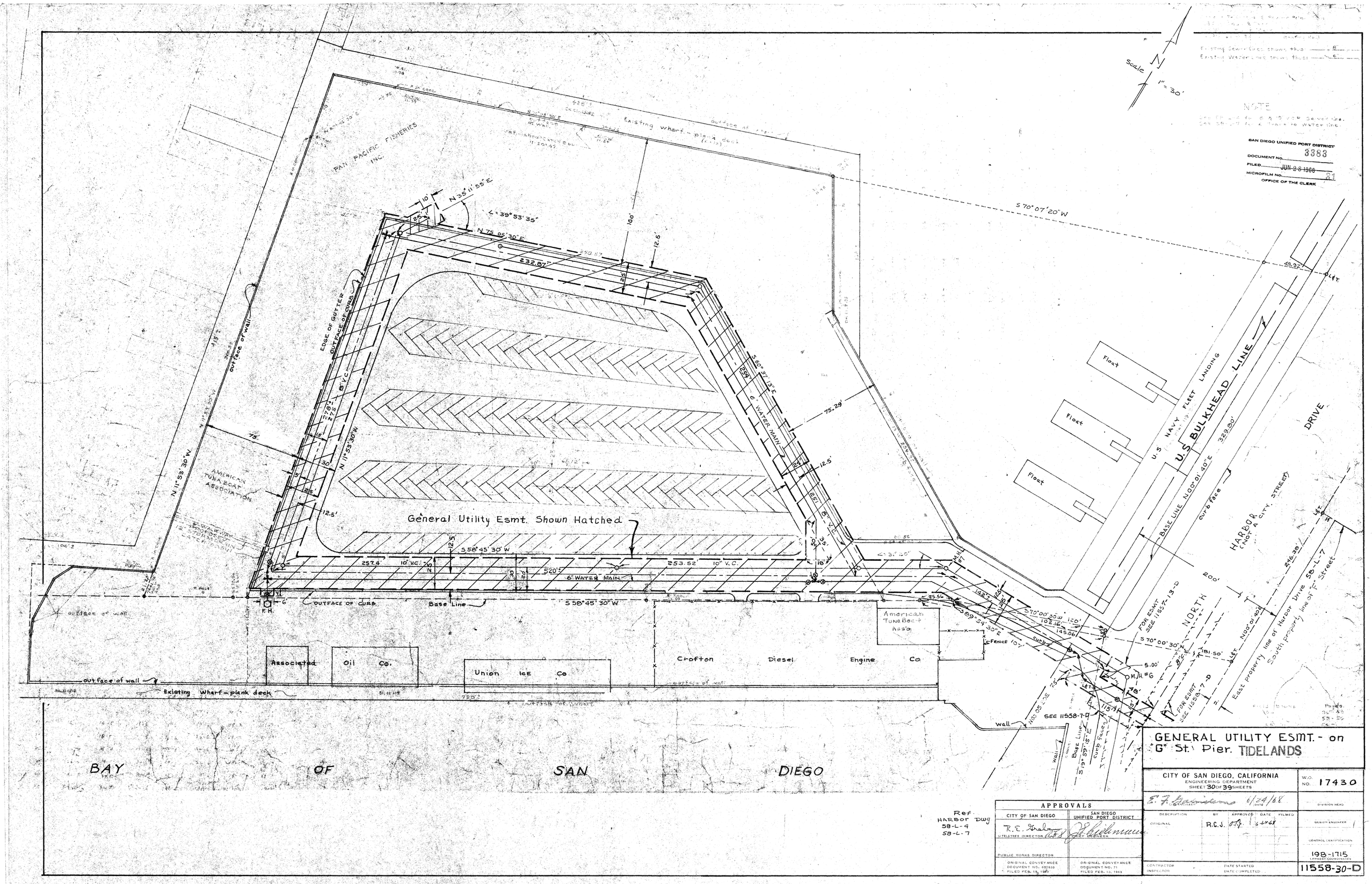
Scale 1" = 30'
N
Existing Sewer lines shown thus
Existing Water lines shown thus
NOTE
SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 81
OFFICE OF THE CLERK
PAN PACIFIC FISHERIES INC.
Existing wharf - plank deck
S 70° 07' 20" W
N 35° 11' 55" E
Δ = 39° 53' 35"
N 75° 05' 30" E
232.87'
100'
12.5'
EDGE OF GUTTER
OUTFACE OF CURB
S 62° 37' 13" E
6" WATER MAIN
75.29
N 11° 53' 30" W
AMERICAN TUNA BOAT ASSOCIATION
General Utility Esmt. Shown Hatched
S 58° 45' 30" W
257.4'
10" V.C.
520'
253.52'
6" WATER MAIN
OUTFACE OF CURB
Base Line
S 58° 45' 30" W
Associated Oil Co.
Union Ice Co
Crofton Diesel Engine Co
American Tuna Boat Ass'n
FENCE
out face of wall
Existing Wharf - plank deck
BAY OF SAN DIEGO
Float
U.S. NAVY FLEET LANDING
U.S. BULKHEAD LINE
BASE LINE N 00° 01' 40" E
329.30'
HARBOR DRIVE (NOT A CITY STREET)
NORTH
FOR ESMT SEE 11557-13-D
FOR ESMT SEE 11558-7-D
SEE 11558-7-D
East property line of Harbor Drive
South property line of "F" Street
Wall
Ref. HARBOR Dwg 58-L-4 58-L-7
GENERAL UTILITY ESMT. - on "G" St. Pier. TIDELANDS
CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 30 OF 39 SHEETS
W.O. NO. 17430
E. F. Lawrence 6/24/68
DIVISION HEAD
DESIGN ENGINEER
CONTROL IDENTIFICATION
198-1715
LAMBERT COORDINATES
11558-30-D
APPROVALS
CITY OF SAN DIEGO
R. E. Shaber
UTILITIES DIRECTOR
PUBLIC WORKS DIRECTOR
ORIGINAL CONVEYANCE DOCUMENT NO. 685833 FILED FEB. 15, 1965
SAN DIEGO UNIFIED PORT DISTRICT
CHIEF ENGINEER
ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 13, 1963
DESCRIPTION
BY
APPROVED
DATE
FILMED
ORIGINAL
R.C.J.
CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

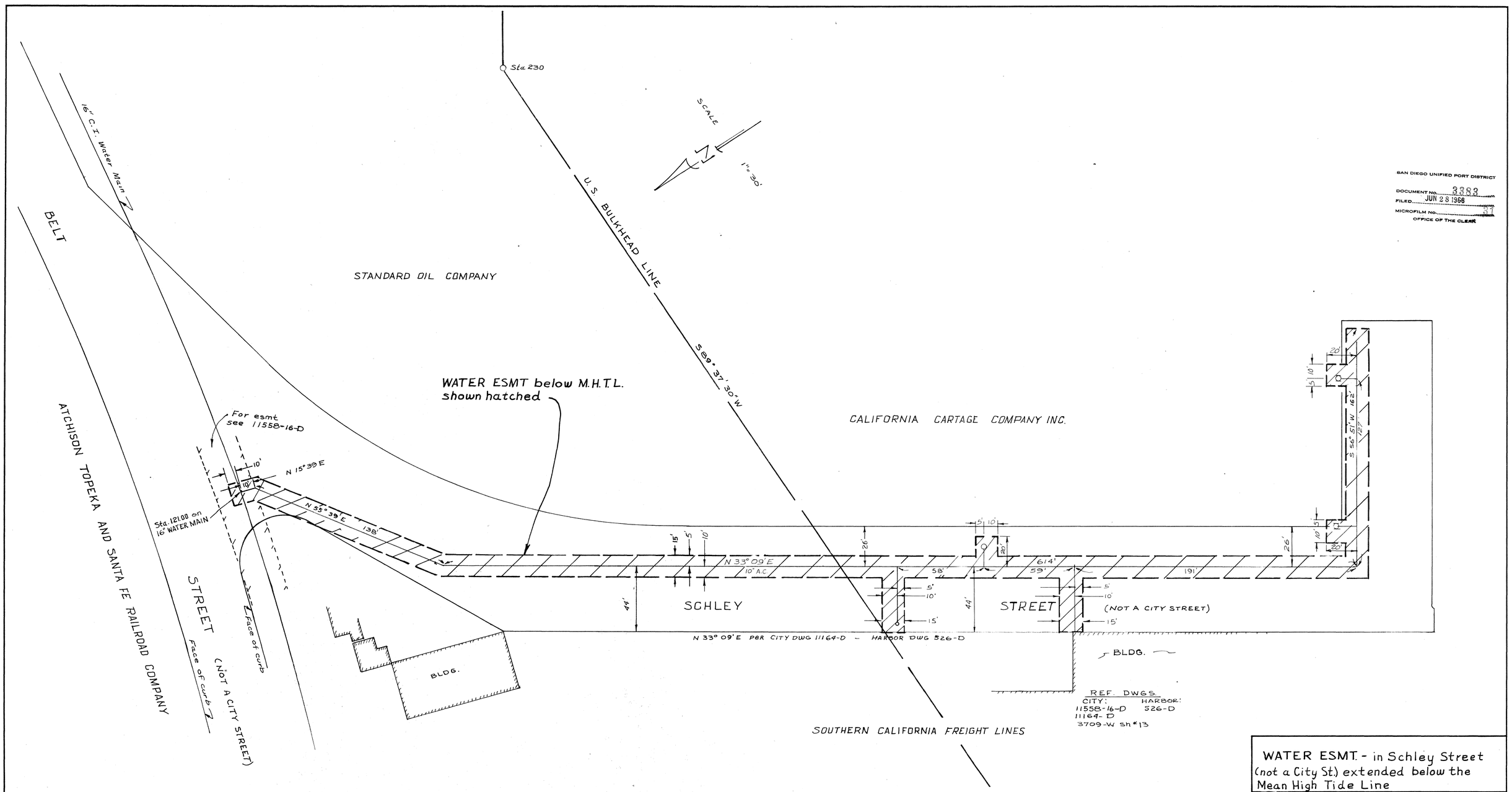

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1966
MICROFILM NO.
OFFICE OF THE CLERK

WATER ESMT. - in Schley Street (not a City St.) extended below the Mean High Tide Line

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 31 OF 39 SHEETS

W.O. NO. 17430

CITY ENGINEER — DATE — DIVISION HEAD

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	RCJ	O.H.J.	6-24-66	

DESIGN ENGINEER

CONTROL CERTIFICATION

192-1725
LAMBERT COORDINATES

CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

11558-31-D

APPROVALS

CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R. E. Graham — UTILITIES DIRECTOR	B. Kellemann — CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 851433 FILED FEB. 19, 1963	ORIGINAL CONVEYANCE DOCUMENT NO. 37 FILED FEB. 13, 1963

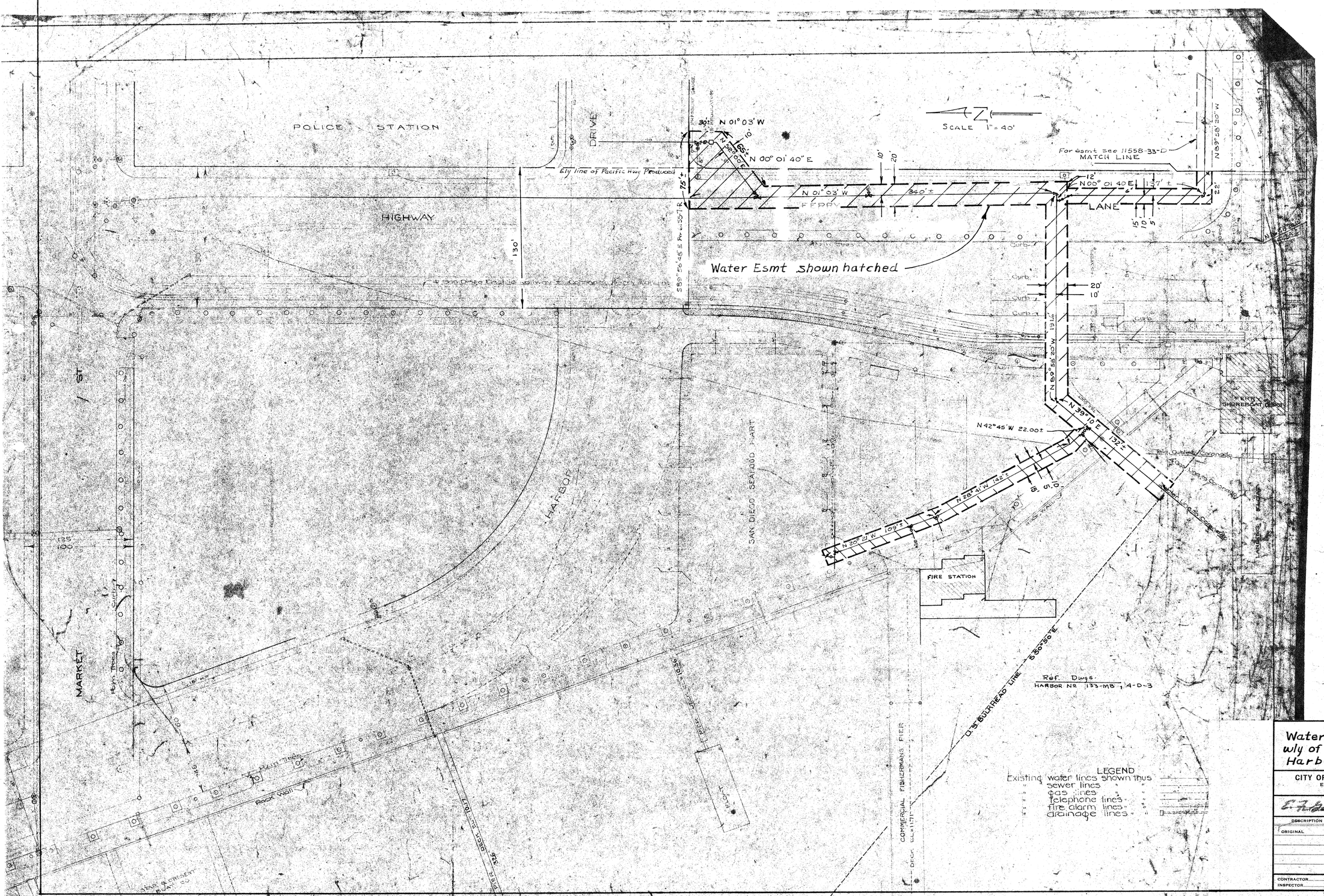

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No.
OFFICE OF THE CLERK

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R. E. Hendy — UTILITIES DIRECTOR	J. P. Guilmartin — CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. (4783) FILED FEB. 13, 1963	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 13, 1963

Water Esmt. - in Ferry Lane & wly of Ferry Lane, sly of North Harbor Drive TIDELANDS

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 32 OF 33 SHEETS

W.O. NO. 17430

E. J. Patrick — CITY ENGINEER — DATE 6/24/68

DIVISION HEAD

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	R.C.J.		6/24/68	

DESIGN ENGINEER

CONTROL CERTIFICATION

198-1715
LAMBERT COORDINATES

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

11558-32-D

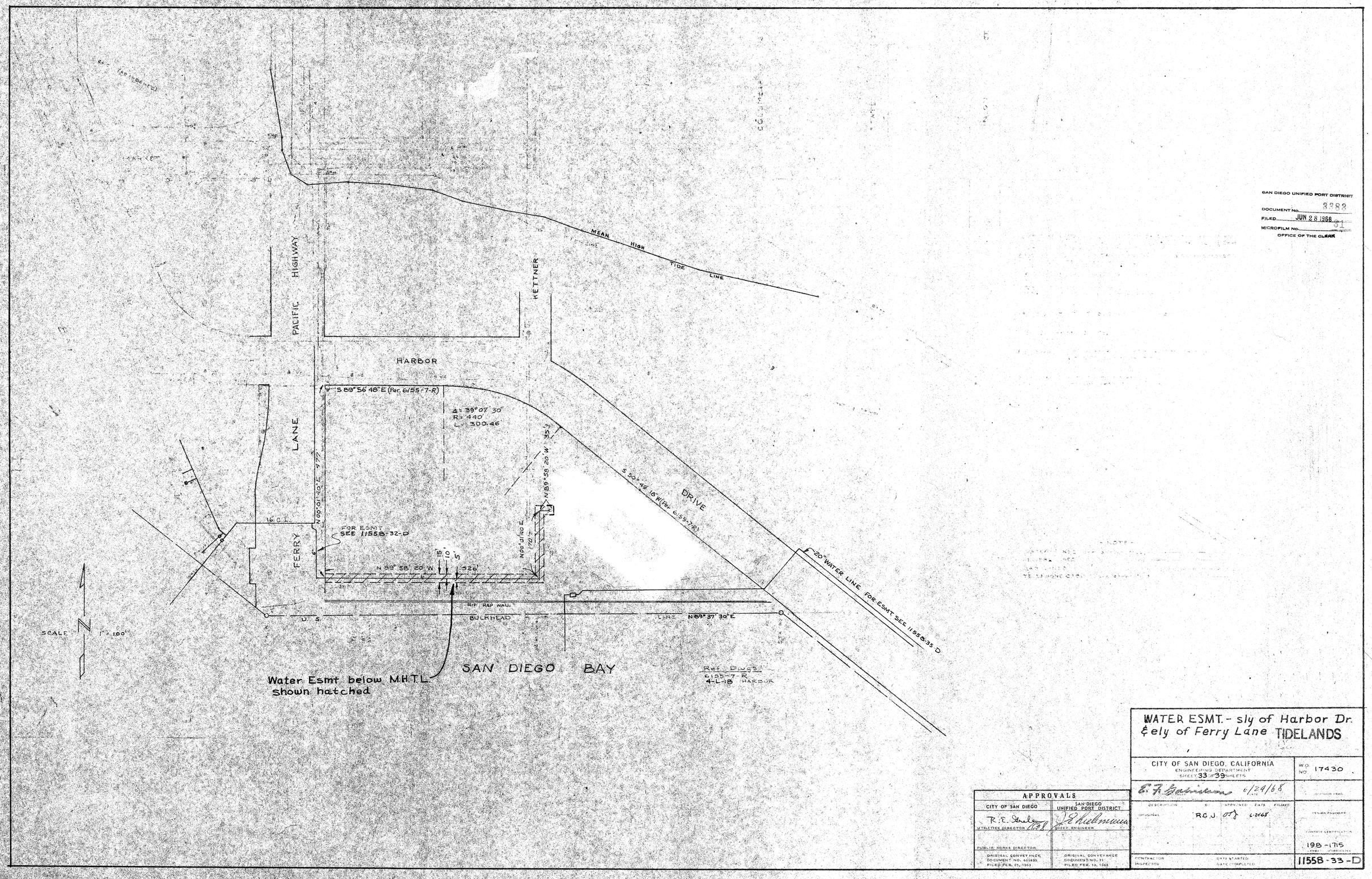

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT No. 3383
FILED JUN 28 1968
MICROFILM No.
OFFICE OF THE CLERK

WATER ESMT. - sly of Harbor Dr. & ely of Ferry Lane TIDELANDS

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R. E. Strahl — UTILITIES DIRECTOR	J. E. Kuehlmann — CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 65183 FILED FEB. 19, 1963	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 18, 1963

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 33 OF 39 SHEETS

W.O. NO. 17430

E. F. Gabrielson — 6/24/68 — DIVISION HEAD

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	RGJ	OTJ	6-24-68	

DESIGN ENGINEER
CONTROL CERTIFICATION
198-1715
NUMBER — DESIGNATION

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

11558-33-D

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3998
FILED JUN 28 1968
MICROFILM NO.
OFFICE OF THE CLERK

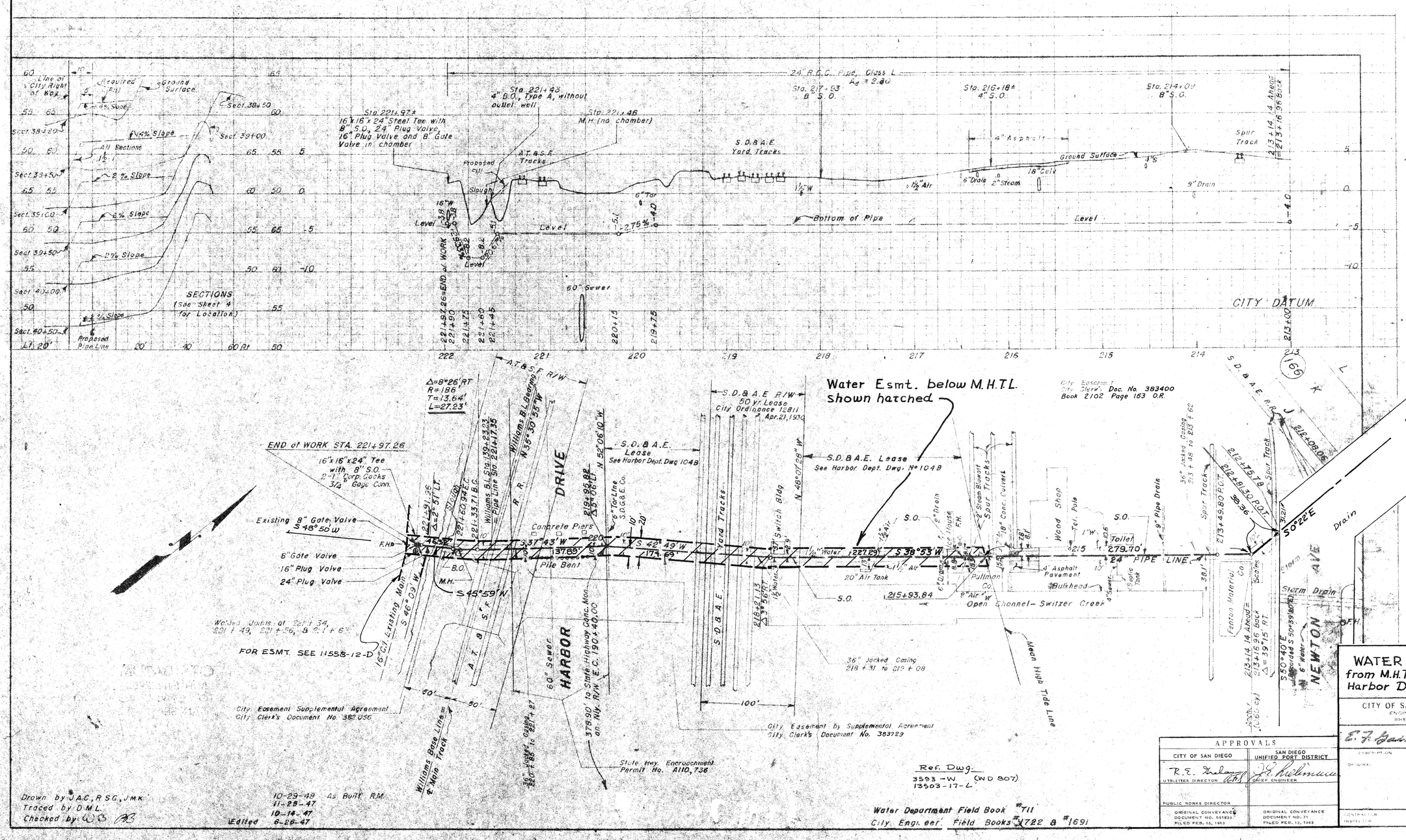

Drawn by J.A.C., R.S.G., J.M.K.
Traced by D.M.L.
Checked by W.B. R.B.

10-29-48 As Built R.M.
11-25-47
10-14-47
Edited 6-26-47

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R.E. Shelanu — UTILITIES DIRECTOR	J.K. Kelemen — CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 551833 FILED FEB. 15, 1963	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 13, 1963

WATER ESMT. - Switzer Creek from M.H.T.L. to 16" water main s/y of Harbor Drive. TIDELANDS

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 34-39 SHEETS

W.O. No. 17430

E.R. Gardiner 6/24/68 — DIVISION HEAD

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	R.G.J.		6-24-68	

DESIGN ENGINEER

CONTROL CERTIFICATION 194-1721

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

11558-34-D

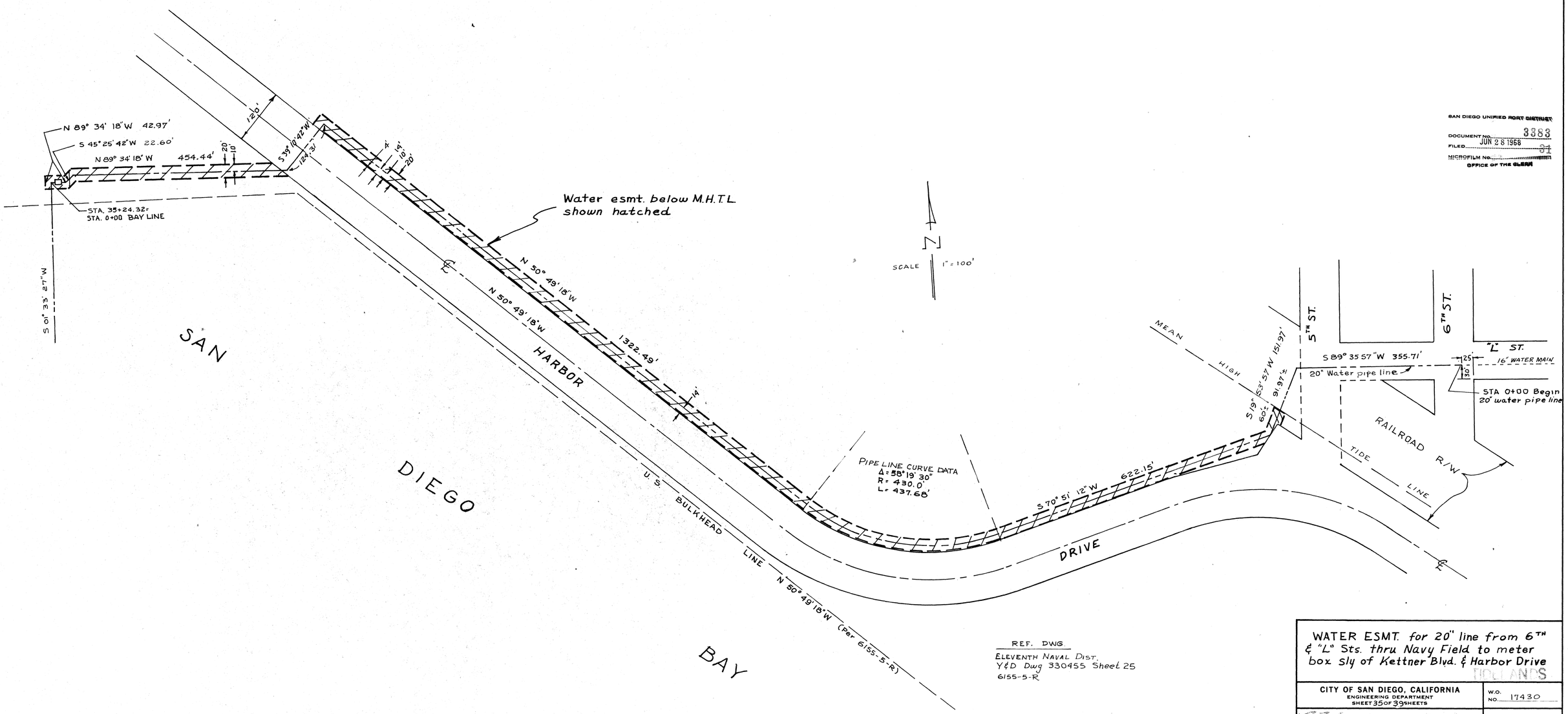

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM No. 31
OFFICE OF THE CLERK

REF. DWG.
ELEVENTH NAVAL DIST.
Y&D Dwg 330455 Sheet 25
6155-5-R

WATER ESMT. for 20" line from 6TH & "L" Sts. thru Navy Field to meter box Sly of Kettner Blvd. & Harbor Drive

HOLLANDS

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 35 OF 39 SHEETS

W.O. NO. 17430

CITY ENGINEER — DATE — DIVISION HEAD

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	R.C.J.		6-24-68	

DESIGN ENGINEER

CONTROL CERTIFICATION

198 - 1715
LAMBERT COORDINATES

CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

11558-35 -D

APPROVALS

CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R. E. Gaede — UTILITIES DIRECTOR	E. Hellmann — CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 651533 FILED FEB. 13, 1963	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 13, 1963

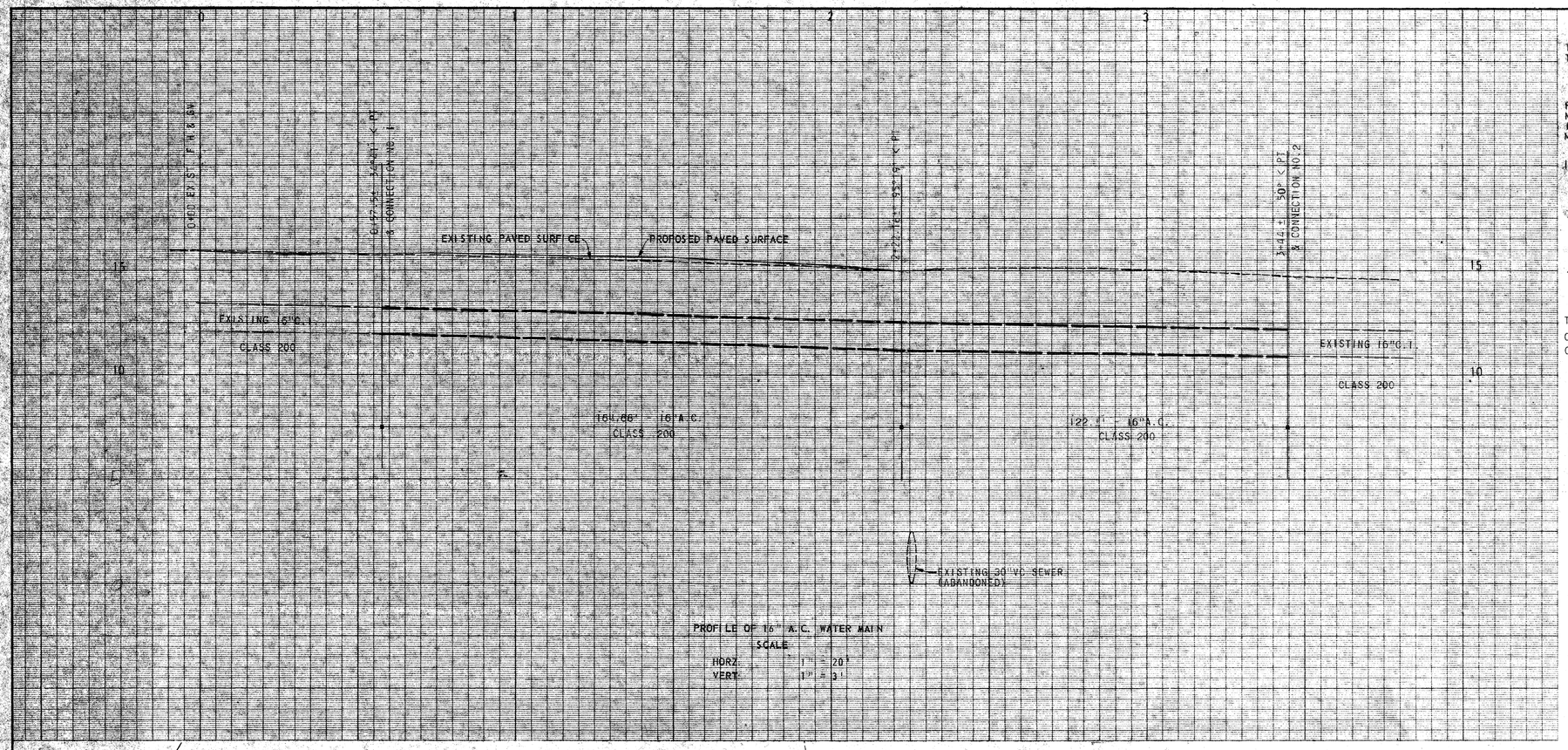

WORK TO BE DONE

THE IMPROVEMENTS CONSIST OF THE FOLLOWING WORK TO BE DONE ACCORDING TO THESE PLANS AND THE FOLLOWING STANDARD DRAWINGS AND SPECIFICATIONS OF THE CITY OF SAN DIEGO.

SPECIFICATIONS

PART I FILED APRIL 9, 1958 INCLUDING AMENDMENTS TO PART I FILED APRIL 8, 1959 AND NOVEMBER 29, 1952; PART I, SECTION I, FILED APRIL 5, 1957; PART II, FILED DECEMBER 14, 1966; PART III FILED FEBRUARY 16, 1966; PART IV FILED FEBRUARY 25, 1966; PART V FILED MARCH 1, 1966 SPECIAL CONDITIONS P-18 REVISED NOVEMBER 21, 1966, HERETO ATTACHED.

IMPROVEMENTS	STD DWGS	SYMBOL
A.C. WATER MAIN & APPURTENANCES	W-6-59; W-61-60	
LEGEND EXISTING WORK	P-1-56	

REFERENCE DRAWINGS

6112-7 W

THE COST OF WATER MAIN CONNECTIONS ON THESE PLANS ARE AS FOLLOWS:

CONNECTION NO. 1 $ 971.00
CONNECTION NO. 2 $ 971.00

SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 31
OFFICE OF THE CLERK

BENCH MARK

U.S.C.& G. DISC # K899 IN
NORTH FACE OF AEROSPACE BLDG.
ELEV: 15.851 (M.L.L.W. DATUM)

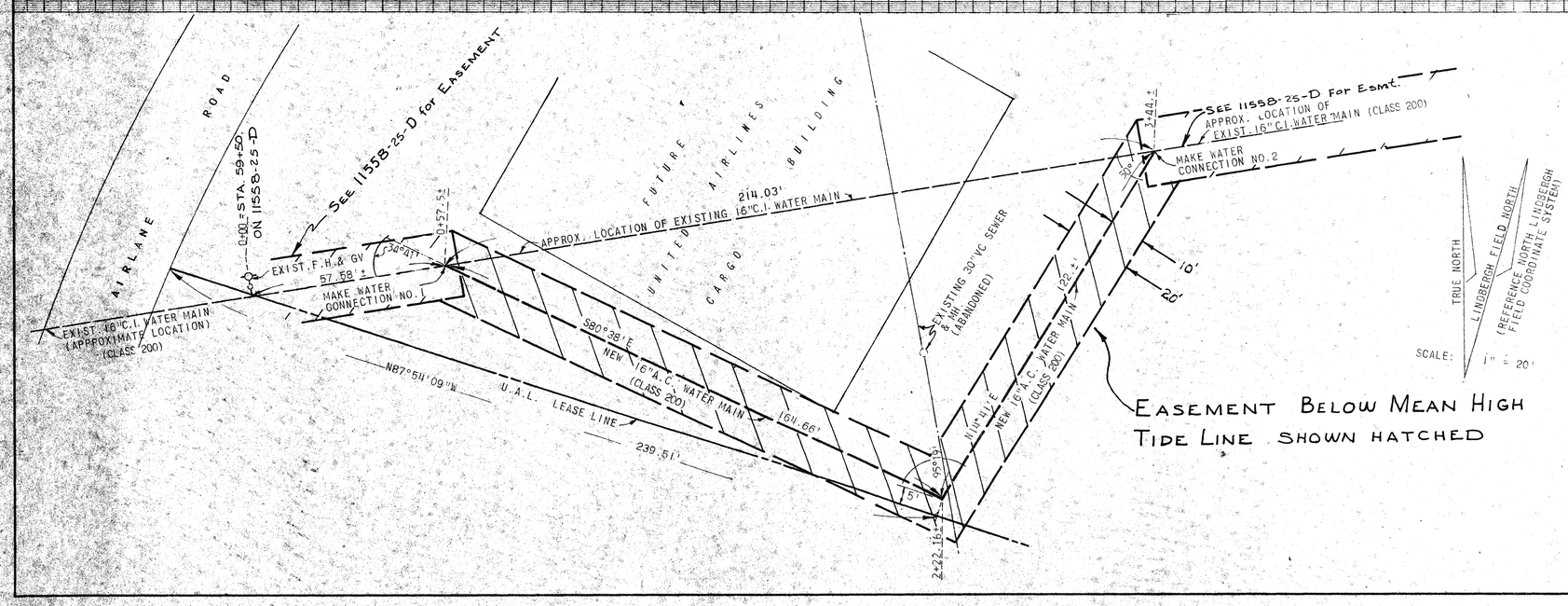

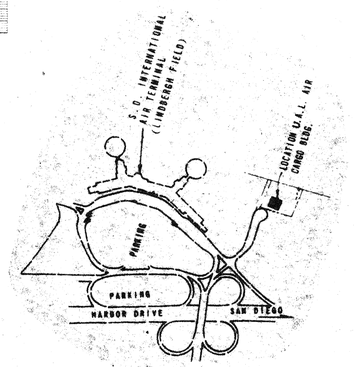

LOCATION MAP
NO SCALE

PRIVATE CONTRACT
ENGINEER OF DESIGN
CHRISTENSEN, EVENSON & ASSOCIATES
Bill K. Bramble
Bill K. Bramble, R.C.E 8102

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R. E. Gudonson — UTILITIES DIRECTOR	J. B. Lichtenauer — CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
DOCUMENT NO. 651932 FILED FEB. 15, 1963	CONVEYANCE DOCUMENT NO. 71 FILED FEB. 15, 1963

WATER EASEMENT- RELOCATION OF 16" LINE IN LINDBERGH FIELD N'ly of N. HARBOR DR. W'LY OF LAUREL ST. FOR UNITED AIRLINES CARGO BUILDING

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 36 OF 39 SHEETS

W.O. NO. 17430

CITY ENGINEER — DATE — DIVISION HEAD

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	R.C.J.		6-24-68	

DESIGN ENGINEER
CONTROL CERTIFICATION
206-1707
LAMBERT COORDINATES
CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

11558-36-D

A-5781

A-5781

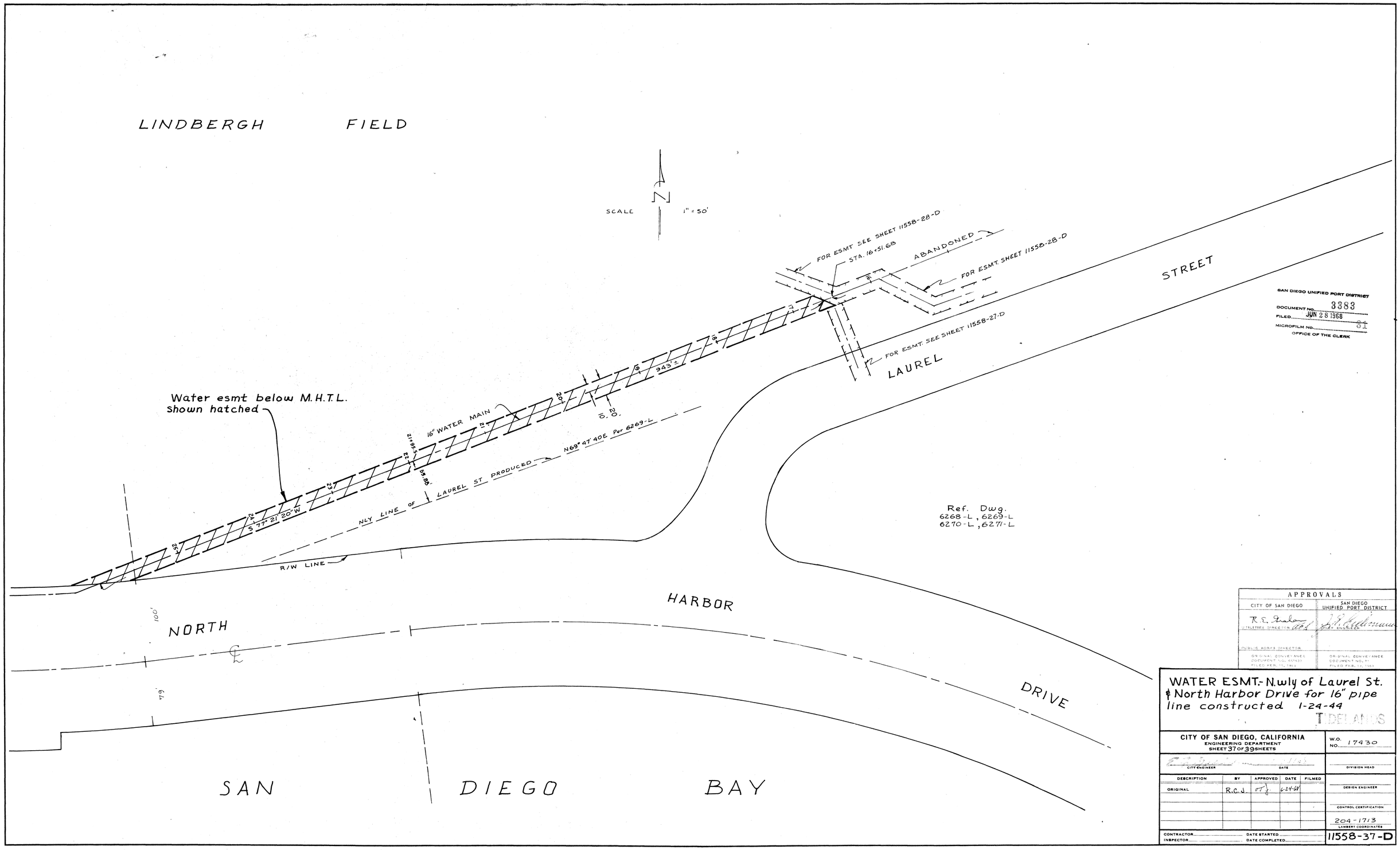
LINDBERGH FIELD
SCALE 1" = 50'
FOR ESMT SEE SHEET 11558-28-D
STA. 16+51.68
ABANDONED
FOR ESMT. SHEET 11558-28-D
FOR ESMT. SEE SHEET 11558-27-D
LAUREL STREET
Water esmt below M.H.T.L. shown hatched
16" WATER MAIN
N69° 47' 40E Per 6269-L
NLY LINE OF LAUREL ST PRODUCED
S 77° 21' 20" W
R/W LINE
NORTH HARBOR DRIVE
SAN DIEGO BAY
Ref. Dwg. 6268-L, 6269-L 6270-L, 6271-L
SAN DIEGO UNIFIED PORT DISTRICT
DOCUMENT NO. 3383
FILED JUN 28 1968
MICROFILM NO. 34
OFFICE OF THE CLERK
APPROVALS
CITY OF SAN DIEGO
SAN DIEGO UNIFIED PORT DISTRICT
UTILITIES DIRECTOR
CHIEF ENGINEER
PUBLIC WORKS DIRECTOR
ORIGINAL CONVEYANCE DOCUMENT NO. 657633 FILED FEB. 11, 1965
ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 10, 1965
WATER ESMT.- N.wly of Laurel St. & North Harbor Drive for 16" pipe line constructed 1-24-44
T. DELANEY
CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 37 OF 39 SHEETS
W.O. NO. 17430
CITY ENGINEER
DATE
DIVISION HEAD
DESCRIPTION
BY
APPROVED
DATE
FILMED
ORIGINAL
R.C.J.
6-24-61
DESIGN ENGINEER
CONTROL CERTIFICATION
204-1713
LAMBERT COORDINATES
CONTRACTOR
DATE STARTED
INSPECTOR
DATE COMPLETED
11558-37-D

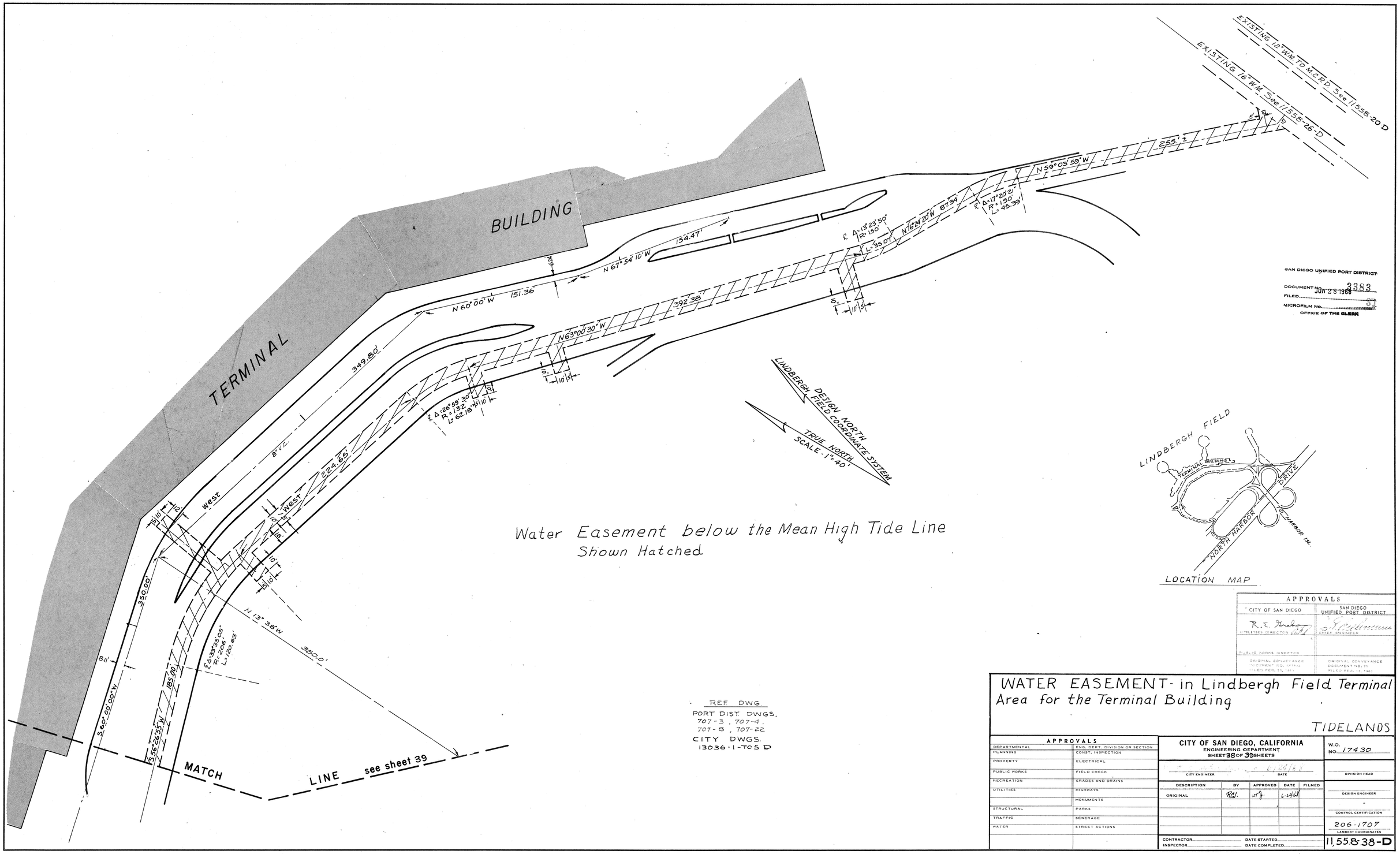

Water Easement below the Mean High Tide Line
Shown Hatched

REF DWG.
PORT DIST. DWGS.
707-3, 707-4,
707-8, 707-22
CITY DWGS.
13036-1-T05 D

APPROVALS	
CITY OF SAN DIEGO	SAN DIEGO UNIFIED PORT DISTRICT
R. E. Malone — UTILITIES DIRECTOR	J. Pylkinen — CHIEF ENGINEER
PUBLIC WORKS DIRECTOR	
ORIGINAL CONVEYANCE DOCUMENT NO. 3383 FILED FEB. 25, 1963	ORIGINAL CONVEYANCE DOCUMENT NO. 71 FILED FEB. 13, 1963

WATER EASEMENT - in Lindbergh Field Terminal Area for the Terminal Building

TIDELANDS

APPROVALS	
DEPARTMENTAL	ENG. DEPT., DIVISION OR SECTION
PLANNING	CONST. INSPECTION
PROPERTY	ELECTRICAL
PUBLIC WORKS	FIELD CHECK
RECREATION	GRADES AND DRAINS
UTILITIES	HIGHWAYS
	MONUMENTS
STRUCTURAL	PARKS
TRAFFIC	SEWERAGE
WATER	STREET ACTIONS

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 38 OF 39 SHEETS

CITY ENGINEER — DATE 6-24-63

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	RGL	JF	6-24-63	

CONTRACTOR
INSPECTOR
DATE STARTED
DATE COMPLETED

W.O. NO. 17430

DIVISION HEAD

DESIGN ENGINEER

CONTROL CERTIFICATION
206-1707

LAMBERT COORDINATES

11,558-38-D

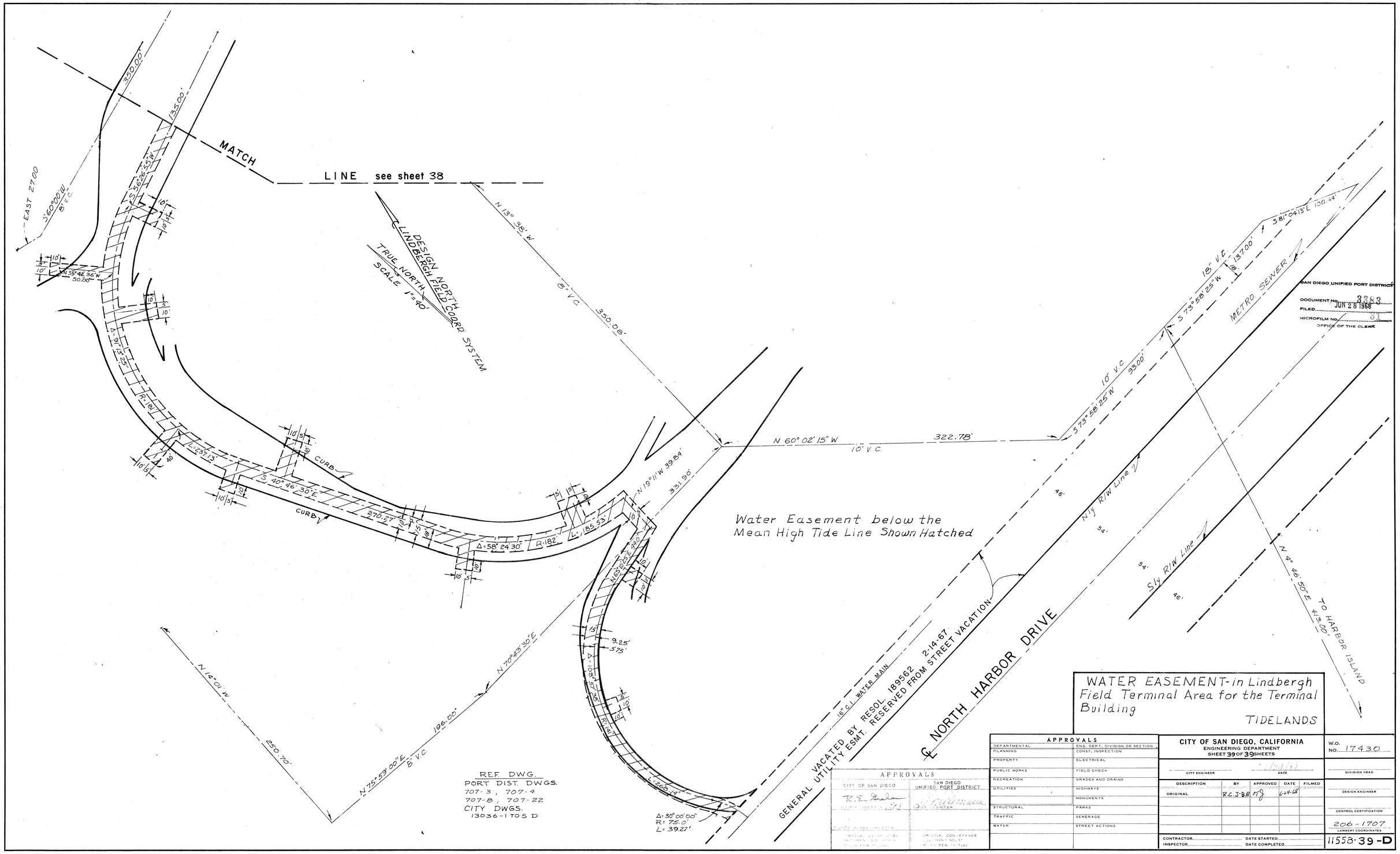

WATER EASEMENT-in Lindbergh Field Terminal Area for the Terminal Building

TIDELANDS

September 10, 2015

San Diego Regional Water Quality Control Board
2375 Northside Drive, Suite 100
San Diego, CA 92108-2700
Attn: Wayne Chiu
sandiego@waterboards.ca.gov

Sent via email

Re: Environmental Groups Comments on Tentative Order R9-2015-0100; Receiving Water Limitations Alternative Compliance Pathway

Dear Wayne Chiu, Laurie Walsh, and Christina Arias:

Thank you for the opportunity to comment on Tentative Order R9-2015-0100 ("Tentative Order", "San Diego Order", or "TO"). San Diego Coastkeeper, Coastal Environmental Rights Foundation, and Surfrider Foundation San Diego Chapter ("Environmental Groups") are local non-profit organizations dedicated to the protection and restoration of regional waters and related environmental issues in San Diego. Our groups represent numerous San Diegans, act through community involvement, regulatory participation, and legal action to ensure the protection and restoration of our region's ocean, bays, and inland waters.

I. Introduction

Since the passage of the 2013 MS4 permit with our support, Environmental Groups have maintained the position that our regional stormwater permit is one that, if properly implemented with the appropriate resources and political will, could - and perhaps would - result in significant improvements to our waterways. We appreciate that the 2013 permit was born out of a more collaborate approach to permit development with broad stakeholder involvement. And while no single interest group received each and every provision it had hoped for, most recognize that the 2013 permit at least has the potential to realize significant water quality improvements.

The proposed draft language on alternative compliance for receiving water limitations ("safe harbor"), however, instead takes us in a very different direction than the one contemplated by the existing permit. The San Diego Regional Board's objective for the safe harbor development process was to come up with an, "ambitious, rigorous and transparent alternative compliance path," that would allow Copermittees, "to come into compliance with receiving water limitations".[1] Instead, adoption of the Tentative Order as written would result in a safe harbor

[1] *See* Public Workshop Agendas, April 28, 2015, May 21, 2015 and June 30, 2015; and Attachment 2 to TO No. R9-2015-0100, page F-61.

protection lacking guidance, objectivity, and accountability, that is inconsistent with Order WQ 2015-0075 (or "State Board's Order") and its findings, that violates the Clean Water Act and its governing regulations, and that would likely simply mimic the failed iterative approach.

Importantly, the State Board's Order provided specific guiding principles for other regions to follow when developing safe harbor provisions.[2] The State Board's Order repeatedly points out the acceptable justifications for and mechanisms through which a safe harbor provision would be allowable. The Tentative Order as drafted, however, ignores several of the principles (as discussed in more detail below) and it fails to adopt mechanisms that assure the process and outcomes of the State Board's Order and the Clean Water Act are met. As such, the TO is inconsistent with the State Board's Order. The San Diego Regional Board could cure this defect by instead looking to the guidance and mechanisms established in the State Board's Order, and in particular by adopting the Reasonable Assurance Analysis and Enhanced Watershed Management Plan (EWMP) approaches taken in the LA region. Combined, these approaches allow for the ambitious, rigorous, and transparent pathway to compliance, while providing for multi-benefit best management practices.

Furthermore, as drafted the proposed TO would violate the Clean Water Act. Specifically, the safe harbor provision – one that would excuse compliance with Water Quality Standards (WQS) in the Permit's Receiving Water Limitations (RWL) section - is illegal for several principal reasons: 1) the safe harbor violates anti-backsliding requirements; 2) without a more detailed accompanying analysis, the safe harbor violates state and federal antidegradation requirements; 3) the safe harbor violates CTR compliance deadlines; and 4) the Regional Board has thus far failed to make sufficient findings or provide evidence to support the inclusion of the safe harbor in the Tentative Order.

To avoid this result and for the reasons we have expressed to date in workshops, previous public comments to both the Regional Board and State Board, and below, Environmental Groups respectfully request the Regional Board reconsider the adoption of this draft language and strike the entire draft provision that would adopt a safe harbor, and instead require implementation of watershed management programs as one way to achieve, rather than demonstrate, compliance with RWLs and WQSs. Should the Board choose to adopt safe harbor language despite these concerns, we respectfully request the TO be made consistent with the State Board's Order through an amendment that includes the following: (1) the Reasonable Assurance Analysis guidance, modeling, and standards that were expressly approved by the State Board's Order and that are the lynchpin of the safe harbor approach, (2) a requirement that multi-benefit projects that incorporate pollutant removal and water supply augmentation as envisioned by the Los Angeles EWMPs be a necessary element of compliance BMPs, and (3) removal of the iterative process from the safe harbor scheme.

II. The Tentative Order As Drafted Is Inconsistent With The State Board's Order

The State Board makes their intentions very clear in their Order when they state, quite simply, "we believe that the MS4 permits should incorporate a well-defined, transparent, and finite alternative path to permit compliance that allows MS4 dischargers that are willing to pursue

[2] Order WQO 2015-0075, pages 51-52.

significant undertakings beyond the iterative process to be deemed in compliance with the receiving water limitations."[3]

The State Board's Order provided specific guidance principles for other regions to follow when developing safe harbor provisions.[4] Of particular relevance to the Tentative Order, the following principles are to apply to any region's safe harbor provisions:

1. The receiving water limitations provisions…should not deem good faith engagement in the iterative process to constitute such compliance.[5]
2. Permits should incorporate an ambitious, rigorous, and transparent alternative compliance path.[6]
3. The safe harbor should encourage multi-benefit regional projects that capture, infiltrate, and reuse storm water and support a local sustainable water supply.[7]
4. The safe harbor should have rigor and accountability.[8]

In upholding the LA Order's safe harbor scheme, the State Board affirmed in particular the Reasonable Assurance Analysis and multi-benefit requirements and incentives in the LA Order. With regard to the principles, the Board specifically stated that they, "direct all regional water boards to consider the WMP/EWMP approach to receiving water limitations compliance when issuing Phase I MS4 permits going forward,"[9] and that, they, "expect the regional water boards to follow these principles unless a regional water board makes a specific showing that application of a given principle is not appropriate for region-specific or permit-specific reasons."[10] As discussed below the Tentative Order is inconsistent with the State Board's Order insofar as it fails to follow the principles listed above and provides no specific showing as to why a given principle is not appropriate for the San Diego MS4 permit.

a. The Tentative Order is Inconsistent with the State Board Order Because It Contains No Reasonable Assurance Analysis ("RAA"), Protocols, or Guidelines to Ensure the Copermittee's Analysis and Resulting Plans Will Actually Achieve RWLs and WQSs.

While Environmental Groups fully support the comments submitted on the LA Order and State Board Order by NRDC, LA Waterkeeper, and Heal the Bay regarding the deficiencies and illegalities of the LA Order, and we agree the L.A. Order is illegal, at the very least the State Board-approved Order contained a Reasonable Assurance Analysis (or "RAA") based on modeling, as well as associated guidelines and protocols under which watershed strategies and safe harbor analyses must be conducted. Together the RAA and guidelines and protocols add a considerable degree of objectivity, rigor, and accountability not present in the San Diego Tentative Order or 2013 MS4 permit. In fact, earlier San Diego draft language had contained

[3] Order WQO 2015-0075, at page 16.
[4] Order WQO 2015-0075, pages 51-52.
[5] Order WQO 2015-0075, page 51.
[6] Id, page 52.
[7] Id.
[8] Id.
[9] Id. At 51
[10] Id.

the word "model", but it has since been removed.[11] Besides lacking the guidance that exists in the L.A scenario, the Tentative Order before us requires no validation, peer review, or minimum data requirements, nor does it appear to consider such requirements necessary. In short, it offers no guidance or protocols whatsoever to Copermittees, the citizenry, the State, and Regional Board.[12] Despite its own claims in the Fact Sheet[13], the Tentative Order is not "transparent", nor is it "ambitious" or "rigorous", and it lacks "rigor and accountability" and is inconsistent with the State Board's Order.[14]

The State Board-approved LA permit scheme, on the other hand, includes the requirement to conduct a Reasonable Assurance Analysis ("RAA") for both WMPs and EWMPs. The relevant permit language describes:

> (5) Permittees shall conduct a Reasonable Assurance Analysis for each water body-pollutant combination addressed by the Watershed Management Program. A Reasonable Assurance Analysis (RAA) shall be quantitative and performed using an approved model in the public domain. Models to be considered for the RAA, without exclusion, are the Watershed Management Modeling System (WMMS), Hydrologic Simulation Program-FORTRAN (HSPF), and the Structural BMP Prioritization and Analysis Tool (SBPAT). The RAA shall commence with assembly of all available, relevant subwatershed data collected within the last 10 years, including land use and pollutant loading data, establishment of quality assurance/quality control (QA/QC) criteria, QA/QC checks of the data, and identification of the data set meeting the criteria for use in the analysis. Data on performance of watershed control measures needed as model input shall be drawn only from peer-reviewed sources. These data shall be statistically analyzed to determine the best estimate of performance and the confidence limits on that estimate for the pollutants to be evaluated. The objective of the RAA shall be to demonstrate the ability of Watershed Management Programs and EWMPs to ensure that Permittees' MS4 discharges achieve applicable water quality based effluent limitations and do not cause or contribute to exceedances of receiving water limitations.[15]

The guidelines issued by the LA Regional Board for conducting RAA's go on to discuss the rigor and transparency of the RAA requirements by highlighting the level of detail required in the RAA saying, "the RAA must be adequate to identify the required reduction for each water body-

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[11] Language from May 2015 Draft, found at http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/docs/2015-0514_Revised_Draft_RWL.pdf. While the May 2015 language itself was also inconsistent with the State Board Order for failure to include RAAs and other guidance, it did at the very least mention modeling as the acceptable methodology.

[12] See Tentative Order Section B.3.c.1.(b)(i), which calls only for, "an analysis, with clearly stated assumptions".

[13] Attachment 2 to TO No. R9-2015-0100, page F-60.

[14] State Board required principles, Order WQO 2015-0075 at p. 51-52.

[15] Order No. R4-2012-0175 as amended by Order WQ 2015-0075, page 65.

pollutant combination at each compliance deadline and analyze the BMP scenario to achieve that deadline."[16]

The RAA in the LA Order and approved by the State Board is a "well-defined, transparent", detailed, pre-reviewed and approved modeling exercise, which includes minimum data point considerations and quality assurance criteria, and which taken together are intended to ensure that Copermittee's plans implement stormwater pollution control measures of the correct type, location, and size to achieve compliance with WQSs in receiving water bodies. The RAA, in fact, forms the bedrock for the plan development, and therefore for pollution control and compliance with the CWA for those Permittees that chose to develop such plans. As noted by the State Board in Order WQ 2015-0075 with respect to the LA MS4 permit,

> …the requirement for a reasonable assurance analysis in particular is designed to ensure that Permittees are choosing appropriate controls and milestones for the WMP/EWMP. Competent use of the reasonable assurance analysis should facilitate achievement of final compliance within the specified deadlines[17].

In stark contrast to the requirements of the State Board-approved LA Order, the San Diego Tentative Order calls only for, "an analysis, with clearly stated assumptions"[18]. The existing WQIPs in the San Diego permit contain no RAA or equivalent, and largely lack any of the objective criteria and guidelines that are present in the RAA.[19] The Tentative Order, then, is neither "well-defined" nor "transparent".[20]

What results from the TO is a completely subjective, ad-hoc process and review without standards or guidance. Importantly the lack of an RAA, standards, and guidance exists not only as related to the actual *development* of watershed plans that would receive full protection under the safe harbor (see above discussion on RAA), but also to staff, Board, and public *review* of those plans. When Board staff were questioned by Environmental Groups at the June 2015 workshop as to whether guidelines, protocols, or other criteria would be developed to dictate how such analyses would be conducted or reviewed, the response was that no such guidance would be developed. In essence, copermittees would be free to devise whatever type or kind of analysis they wish, and if such a plan was acceptable to the Board the safe harbor would apply.

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[16] Guidelines For Conducting Reasonable Assurance Analysis In A Watershed Management Program, Including An Enhanced Watershed Management Program; March 25, 2014; Prepared by Nguyen, Lai, Ridgeway, and Zhu for the Los Angeles Regional Water Quality Control Board, page 4.

[17] Order, at p.37.

[18] Tentative Order, p. 34, Section B.3.c.1.(b).(i).

[19] This issue was brought to light recently in the Regional Board's review of the final submitted WQIPs by Copermittees. The Board staff found most, if not all, WQIPs to be noncompliant with the permit. See: http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/docs/wqip/comments/SDWB.pdf last accessed August 17, 2015. Copermittees continue to complain the regulations governing WQIP development are unclear and subjective. The approved RAA methodology that is lacking from the San Diego permit and TO is meant to provide objectivity to the Board, the public, and the Copermittees.

[20] To further illustrate that lack of rigor and transparency in the TO, while the draft TO does include annual milestones that show progress towards a final numeric goal, such milestones "may consist of…other acceptable means." What these means are or might be is entirely lacking in transparency or clarity to both the public and the Copermittees.

Unfortunately the Tentative Order fails to require rigorous or transparent methods for either the regular WQIP or the safe harbor plans. As written, the existing San Diego permit and Tentative Order fail to include a rigorous, proven, pre-reviewed, approved test, and further fail to include accompanying guidelines or standards that provide for assurances of compliance. **The result is that the Tentative Order ignores not only the justifications used for developing and supporting the LA Order[21], but also ignores the language and mechanisms by which the LA Order will be implemented and that were expressly approved by the State Board.** In both of these ways the Tentative Order fails to realize the circumstances under which, and justification for, adoption of a safe harbor *might* even be appropriate in San Diego.

The Tentative Order would adopt a process without a performance standard and with no analysis or evidence in the record to demonstrate that implementing the devised plans will actually achieve compliance with WQSs. And while the Tentative Order Fact Sheet professes to incorporate each of the State Board's seven principles[22] the proposed safe harbor, which lacks any form of guidance[23], cannot under any imaginable circumstances be said to be "ambitious, rigorous, and transparent". [24]

These shortcomings are fatal to the Tentative Order's safe harbor inclusion into the San Diego MS4 permit. As such the language should be substantially revised based on comments made to date and herein, or removed altogether. While we acknowledge San Diego is not Los Angeles, the legal and factual basis upon which the LA Order was approved by the State Board very much dictates the acceptable circumstances under which San Diego's safe harbor language might pass muster under the State Board's Order.[25] As written the TO is inconsistent with the State Board's Order and guidelines.

b. The Tentative Order Is Inconsistent with the State Board's Order Because It Allows Good Faith Engagement and Implementation of the Iterative Process to Constitute as Compliance with Receiving Water Limitations

While the Fact Sheet claims that the seven principles included in Order WQ 2015-0075 have been incorporated into this Tentative Order, the Tentative Order fails to assure that "good faith engagement in the iterative process" will not deem a Copermittee in compliance and thus is inconsistent with the State Board's Order.[26] For instance, while the Tentative Order requires the monitoring and assessment program of the safe harbor to demonstrate only, "whether the implementation of the water quality improvement strategies are making progress towards

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[21] See comments below, specifically sections III.A.(1)a.-c., for more on the failures of the TO to adequately justify a safe harbor be included in the San Diego MS4 permit.
[22] Attachment 2 to Tentative Order No. R9-2015-0100, page F-60.
[23] For an example of the type of guidance that would be required of any analysis, see Guidelines For Conducting Reasonable Assurance Analysis In A Watershed Management Program, Including An Enhanced Watershed Management Program; March 25, 2014; Prepared by Nguyen, Lai, Ridgeway, and Zhu for the Los Angeles Regional Water Quality Control Board.
[24] For similar reasons the safe harbor fails to incorporate Principle 7 of the State Board which requires "rigor and accountability", and a program that is "transparent". Without more, Environmental Groups and the public are left to guess what "acceptable rational" and "appropriate modifications" are.
[25] See Order WQO 2015-0075. "We expect the regional water boards to follow these principles", p. 51.
[26] Attachment 2 to Tentative Order, Page F-60.

achieving the numeric goals"[27], the TO language does not require achievement of those goals. In actuality, the approach proposed by the draft language mirrors the flawed iterative process from previous permits and will result in more delay and confusion.

While at first glance it might appear that the eventual achievement of WQS and RWL is required to be considered compliant with the safe harbor provision, upon further inspection it becomes clear that this is not the case. Section B.3.c.(1).(c). of the Tentative Order states that "The Copermittee is deemed in compliance during the term of this Order as long as…(a) The Copermittee is implementing the water quality improvement strategies with its jurisdiction developed pursuant to Provision B.3.b.(1) and in compliance with the schedules for implementing the strategies established…".[28] Section B.3.c.(2)(c) states, however, the Copermittee must submit annual report assessments that either, "support a conclusion that: 1) the Copermittee is in compliance with the annual milestones and dates for achievement…, **OR** 2) the Copermittee has provided acceptable rationale and recommends appropriate modifications."[29]

Taken together, it becomes clear that once Copermittees develop a plan that is acceptable to the Regional Board they need only continue to provide "acceptable rationale" and recommend "appropriate modifications" when they fail to implement strategies or achieve the goals set out in their plan, including WQS, RWLs, and perhaps even WQBELs. Such an approach is not "finite", as the State Board Order requires[30], and it fails to necessarily require "significant undertakings beyond the iterative process".

The State Board Order once again makes it clear that such an approach would not be acceptable when it states, "we…ultimately disagree with Permittee Petitioners that implementation of the iterative process does or should constitute compliance with receiving water limitations."[31] The State Board Order discusses at length their position, as follows:

> We can support an alternative approach to compliance with receiving water limitations only to the extent that that approach requires clear and concrete milestones and deadlines toward achievement of receiving water limitations and a rigorous and transparent process to ensure that those milestones and deadlines are in fact met. Conversely, we cannot accept a process that leads to a continuous loop of iterative WMP/EWMP implementation without ultimate achievement of receiving water limitations.[32]

The Tentative Order language itself includes language clarifying that the safe harbor provisions and requirements are little more than a continuation of the, "iterative approach and adaptive management process" in addition to requiring nothing more than an "acceptable rationale and appropriate modifications" to continue receiving protections. With no standards as to what would be considered "acceptable rational" or "appropriate modifications", The Tentative Order

[27] Tentative Order No. R9-2015-0100, Section B.3.c.(1).(c).
[28] Tentative Order No. R9-2015-0100, Section B.3.c.(2)-(a).
[29] Tentative Order No. R9-2015-0100, Section B.3.c.(2)(c), emphasis added.
[30] Order WQO 2015-0075, page 16.
[31] Order WQO 2015-0075, page 10.
[32] Order WQO 2015-0075, page 33.

may require nothing more than a good faith engagement in what, on its face, is a continuing iterative process.[33] In fact, in several places the safe harbor makes it explicitly clear that it embraces the iterative process.[34]

We note that Board staff rejected a proposal by Environmental Groups to include language that would remove a Copermittee from safe harbor protection if annual milestones were not met for two years in a row.[35] Our proposed language would have helped ensure that Copermittees were not deemed in compliance simply for good faith engagement in the iterative process and that strict measurable requirements would continue to be met. The end goal of this suggested language was meant to ensure that if the best laid plans of the jurisdictions were not being implemented for one reason or another, the safe harbor would once again allow for citizen oversight and accountability as the Clean Water Act has always done. That proposal was ignored and instead language was included that would allow the safe harbor to be another version of the existing iterative process so long as a Copermittee who is not meeting its annual milestones (or RWLs, WQSs, or WQBELs) offers an "acceptable rationale and recommends appropriate modifications". This approach is both inconsistent with the State Board's Order and unlawful.[36]

c. The Tentative Order Is Inconsistent with the State Board's Order Because It Does Not Include Requirements for Multi-Benefit Projects or Stormwater Resource Projects

The State Board's Order is based, in part, on a fundamental shift in how stormwater pollution is addressed and the transition of stormwater from a nuisance to an asset (see discussion below in Section III.A.1.). This idea is embodied in the principle that any safe harbor, "should encourage multi-benefit regional projects that capture, infiltrate, and reuse storm water and support a local sustainable water supply."[37]

There are, however, no provisions that encourage or require the inclusion or evaluation of multi-beneficial projects in the San Diego permit. In fact, Environmental Groups failed to find even a single reference to the world "multi-benefit" in the 2013 permit or the Tentative Order, and our review of the eight Water Quality Improvement Plans (WQIPs) found a near total lack of commitment to the development and incorporation of multi-benefit regional projects in the San Diego region. This may be, in part, because San Diego's WQIPs differ in at least one important way from LA's EWMPs. Specifically, the San Diego WQIPs do not require any evaluation of

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[33] In several sections of the safe harbor the Board goes through great pains to note that the safe harbor embraces the iterative process.

[34] c(1)(b): "The analysis must be updates as part of the iterative approach and adaptive management process" and c(1)(c): "The specific monitoring and assessments must be updated as part of the iterative approach and adaptive management process".

[35] The relevant language read, "Failure to comply with and to achieve the numeric goals, schedules, strategies, and/or dates under c(1)(a)(i)-(v) for any two consecutive reporting periods will automatically result in that Copermittee's forfeiture of RWL Alternative Compliance status." From SD Coastkeeper's proposed amendments, available at: http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/docs/2015-0603_Enviro_RWL_Proposed_Revisions.pdf. Last accessed August 6, 2015.

[36] *See* comments in Section III below.

[37] Order WQO 2015-0075, p. 52.

collaboration on multi-benefit projects in our region to retain all non-storm water runoff or to retain all storm water runoff from the 85th percentile, 24-hour storm event. Where retention requirements are present in the San Diego permit they exist only for development or redevelopment projects over a certain size. Unlike in the LA Order, then, the San Diego permit does not require, or even incentivize, such multi-benefit evaluations or considerations for general compliance strategies.

Thus, while the Fact Sheet claims this safe harbor incorporates the seven principles of the State Board's Order, it fails to ensure that, "the strategies required to be included in the Water Quality Improvement Plans encourage multi-benefit regional projects that capture, infiltrate, and reuse storm water and support a local sustainable water supply."[38] As such, the TO is inconsistent with the State Board's Order.

d. The Draft Language As Written Would Allow for a Safe Harbor During Plan Review Periods

The San Diego Regional Board staff have made it clear that the Board will not allow a compliance option during plan review. However, the draft as written does exactly that in at least one instance Environmental Groups can think of. Specifically, the safe harbor would still apply between the period where a Copermittee (who is not complying with its annual milestones and dates for achievement) provides to the Regional Board under section (c) an "acceptable rationale" and recommends "appropriate modifications" to their plan, and the period of acceptance by the Regional Board (since section (d) requires express approval by the Board). The lag time between these two instances, which could potentially be as long as a permit cycle, would allow for a safe harbor during the non-attainment and non-acceptance period/during each plan review period. Such an instance would allow for a safe harbor even where the Copermittee was not fulfilling its obligations of its approved plan. To remedy this, section (c)(2) and section (d) should be removed, and strict compliance deadlines with the plan should be required.

III. If Adopted, the Tentative Order Would Be Illegal

As discussed in detail below, the draft language fails to comply with federal and state anti-degradation and anti-backsliding requirements, and allows illegal compliance schedules for the TMDL-based limitations necessary to implement the California Toxics Rule ("CTR").

A. The Draft Language Violates Anti-Backsliding Provisions

The Clean Water Act, through its anti-backsliding provisions, prohibits a permit from being renewed, reissued, or modified with effluent limitations less stringent than the comparable limitations in the previous permit.[39] Water quality based effluent limits in NPDES permits can be revised to be less stringent only where consistent with a TMDL properly incorporated into that

[38] Attachment 2 to Tentative Order R9-2015-0100.
[39] 33 U.S.C. § 1342(o)(1).

permit.[40] And any TMDL implementation must be consistent with the requirements for compliance schedules in NPDES permits.[41]

Federal regulations further require that "when a permit is renewed or reissued, interim effluent limitations, standards, or conditions must be at least as stringent as the final effluent limitations, standards, or conditions in the previous permit."[42] The receiving water limitations in existing MS4 Permits have been required to be incorporated into permits across the state since 1999, and many MS4 permits have included this language for over a decade. Any attempt to now include safe harbors in those permits from the required receiving water limitations would violate anti-backsliding provisions.[43]

Quite simply stated, the draft language as proposed violates the anti-backsliding provisions of the Clean Water Act, and adoption of the safe harbor would be in violation of the law. Any arguments to the contrary or assertions of exceptions or exemptions to anti-backsliding provisions would fail in the context of the San Diego MS4 permit, as discussed in more detail below.

(1) State Board and Los Angeles Legal Justifications for LA Order Are Inapplicable to San Diego Region

The Tentative Order appears to rely exclusively on justifications offered by both the Los Angeles Regional Board and the State Water Board Order WQ 2015-0075 in seeking to include a safe harbor in the San Diego permit. As we did in our comments to the State Board on the LA Draft Order in oral comments on December 2014 and in written comments from January 2015, Environmental Groups finds the Tentative Order's use of information, justifications, and processes gained from permit development in LA (and a long overdue permit at that) and its seemingly wholesale extrapolation of that reasoning, interpretation, and justifications to our region unpersuasive. Below we explore the justifications put forth by the Board to demonstrate why they do not apply outside of the LA region and are why they are wholly inapplicable to San Diego[44].

As mentioned above, the application of a safe harbor that weakens the applicability of RWL language to the San Diego region would fail to meet minimum federal requirements and would constitute a violation of the Clean Water Act's anti-backsliding provisions. The Clean Water Act and associated Federal Regulations, specifically 40 CFR 122.44(l)(1), provide that except in a narrow set of enumerated circumstances, "when a permit is renewed or reissued, interim effluent limitations, standards, or conditions must be at least as stringent as the final effluent limitations, standards, or conditions in the previous permit."

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[40] Id.
[41] See *In the Matter of Star-Kist Caribe, Inc.*, 1989 EPA App. LEXIS 38, at *7 (E.A.B. 1989); 33 U.S.C. § 1313(e)(3)(F); 40 C.F.R. § 122.47.)
[42] 40 C.F.R. 122.44(l)(1).
[43] *See* also United States Environmental Protection Agency Region III letter, "Backsliding is prohibited in NPDES permits. . . . Allowing additional time to complete a task that was required by the previous permit constitutes a less stringent condition and violates the prohibition against anti-backsliding." August 8, 2012.
[44] We should note that Environmental Groups join our sister organizations in Los Angeles in the assertion that the LA permit and Order have similar legal defects.

San Diego's justification for the safe harbor is the same justification used in the LA Order; namely that an exception to anti-backsliding exists.[45] Thus, we turn to the LA Order itself for justification. The LA Order, like this SD Tentative Order, makes slight mention of why the LA permit *may* not violate anti-backsliding[46], but then without discussing the justification in detail the orders simply state that justification isn't necessary because an exception allowing for backsliding exists.[47]

The Tentative Order itself appears to base the bulk of its acceptance that the safe harbor does not constitute backsliding on the LA Regional Board's Response to Comments document, wherein an argument was made that an exception to backsliding exists. The Order includes little analysis as to whether anti-backsliding actually applies (and importantly, the Order does not find that anti-backsliding provisions *do not* apply here), and instead focuses its attention on finding that an exception to backsliding exists in the case of the LA permit. The SD Tentative Order more or less mirrors this language and the related justifications.

The SD Tentative Order Fact Sheet states:

> The alternative compliance pathway option in Provision B.3.c. of this Order was informed by new information available to the Board from experience and knowledge gained through the Los Angeles Water Board's process of developing over 30 watershed-based TMDLs and implementing several TMDLs since the adoption of the previous permits. In particular, the Los Angeles Water Board recognized the significance of allowing time to plan, design, fund, operate and maintain watershed-based BMPs necessary to attain water quality improvements and additionally recognized the potential for municipal storm water to benefit water supply. Thus, even if the receiving water limitations are subject to anti-backsliding requirements, they were revised based on new information that would support an exception to the anti-backsliding provisions.[48]

It is clear, then, that the entire justification for claiming that an anti-backsliding exception applies to the SD Tentative Order is based upon the justifications listed in the LA Order and State Board Order, as we found no additional data or information presented in the SD Tentative Order or accompanying documents.

a. Water Board Rationales Fail to Support an Anti-Backsliding Exception in San Diego: "New Information", Paradigm Shift, Prioritization, and Lessons Learned

The LA Regional Board's Response to Comments upon which the State Board's justification hinges (and upon which San Diego's justification also relies), in turn, states that an exception exists, "if the circumstances on which the previous permit was based have materially and substantially changed since the time the previous permit was issued and would constitute cause

[45] Attachment 2 to Tentative Order No. R9-2015-011, page F-32.
[46] The Fact Sheet states, "although the non-applicability is less clear with respect to regulatory anti-backsliding provisions in 40 CFR 122.44(l)…" Id, p. F-32.
[47] Id.
[48] Attachment 2 to Tentative Order No. R9-2015-0100, page F-32.

for permit modification or revocation or reissuance under 40 CFR section 122.2. Like section 122.41(l), section 122.62 includes new information not available at the time the previous permit was issued as a cause for modification" (p. 51 of Response). The Response then goes on to justify an exception based largely upon the differences between the 2001 and 2012 permits in Los Angeles, a paradigm shift towards treating stormwater as an asset, and information gained during that lengthy 10-plus year time frame.

In stark contrast, no such large time gap between permits and no such large-scale paradigm shifts or information downloads have occurred between any two MS4 permits in San Diego. To its credit, the San Diego Regional Board has continually updated MS4 permits based upon lessons learned and the result has been a series of permits increasingly aimed at integrated water management approaches and watershed-wide planning. So while we disagree with the State Board Order and the LA Regional Board that an exception to anti-backsliding exists in LA based on those lessons learned and shifts in thinking, it is even more plain to us that the justification for any such exception clearly does not apply to San Diego.

To illustrate, the San Diego MS4 permits have since 2001 incorporated the RWL language of Order 99-05. In fact, the San Diego region has adopted several iterations of MS4 permits since 2001, including one in 2007 and another in 2013. Each of these has gradually evolved to include the paradigm shift included in Los Angeles' permit, as well as the lessons learned via the iterative process and its monitoring and assessment. Low impact development provisions have been included since 2007 in the San Diego permit[49], and on-site retention requirements[50], as well as incentives and direction towards onsite capture and use, already exist.[51] Further, San Diego's newest permit includes provisions for on-site capture and infiltration for development projects over a certain threshold.[52] In addition to the onsite capture and use provisions of those permits, watershed-wide planning efforts aimed at prioritization of waterbodies or pollutants also are already present in our permit.[53] Thus, the San Diego region has already adopted over time a series of permits that have gradually embraced and incorporated the paradigm shift and new information sited as the justification for the anti-backsliding exception.

The most recent San Diego 2013 MS4 permit also incorporates a framework to achieve RWLs in our region through the utilization of Water Quality Improvement Plans (WQIPs) and an adaptive management process[54]. Like the Los Angeles WMPs and EWMPs, WQIPs include prioritization of watershed conditions and pollutants[55], and contain numeric interim and final goals aimed at achieving RWLs[56]. Unlike the LA permit, however, our existing WQIPs do not require RAAs or any type of pre-reviewed modeling, nor do they require proof that the chosen actions and timeframes of the Copermittees will result in the attainment of RWLs and WQSs.

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[49] Order No. R9-2007-0001, Section D.1.d.(4).
[50] Order No. R9-2007-0001, Section D.1.c.(2)., and Order No. R9-2015-001 Section E.3.a.(3)(h)
[51] Order No. R9-2015-0001 Section E.3.a.(3)(l).
[52] Order No. R9-2015-0001 Section E.3.c.(1).(a).
[53] Order No. R9-2015-0001 Section B.1.
[54] Id, Section B.
[55] Id, Section B.2.
[56] Id, Section B.3.

Importantly, the RWL provisions have remained in place throughout these processes and permitting schemes that included the paradigm shifts, watershed planning, and prioritization planning. Certainly the reasoning behind the LA exception - if applicable at all - is not applicable to San Diego, and any directive to include a safe harbor in an existing permit that already includes watershed-based planning and integrated water management would run afoul of the anti-backsliding provisions of the Clean Water Act. Quite simply, since the San Diego permit already incorporates the paradigm shift, already contains prioritization and plans for meeting RWL requirements, and has chosen *not* to have a safe harbor, any relaxing of the conditions of the permit would not be as stringent as our existing permit, and thus would constitute backsliding under the Clean Water Act.

b. Water Board Rationales Fail to Support an Anti-Backsliding Exception in San Diego: Multi-benefit Projects and Local Water Supply

To further illustrate the problem with relying solely on the justifications used for the LA MS4 permit, we note that one of the fundamental reasons both the State and LA Regional Board found this approach appropriate was the incorporation into the LA permit of multi-beneficial regional projects that capture and infiltrate the 85th percent storm.[57] Multi-benefit approaches that consider water supply benefits underlie a core justification for the shift in approaches in general, and for the safe harbor specifically.

The SD Tentative Order Fact Sheet recognizes this when it states part of its justification for an anti-backsliding exception:

> The alternative compliance pathway option in Provision B.3.c. of this Order was informed by new information available to the Board…In particular, the Los Angeles Water Board…recognized the potential for municipal storm water to benefit water supply. Thus, even if the receiving water limitations are subject to anti-backsliding requirements, they were revised based on new information that would support an exception to the anti-backsliding provisions.[58]

In San Diego, however, the 85th percent storm capture requirement applies only to individual Priority Development Projects[59], and not to regional compliance or alternative compliance projects aimed at achieving WQSs or RWLs and benefitting local water supply. There are no requirements or incentives for regional multi-beneficial projects in the San Diego permit. In fact, Environmental Groups failed to find even a single reference to the world "multi-benefit" in the 2013 permit or the Tentative Order, and our review of the eight Water Quality Improvement Plans (WQIPs) found a near total lack of commitment to the development and incorporation of multi-benefit regional projects in the San Diego region. As such, while the Fact Sheet claims this safe harbor incorporates the seven principles of the State Board's Order, it completely fails to ensure that, "the strategies required to be included in the Water Quality Improvement Plans

[57] Order No. R4-2012-0175 as amended by Order WQ 2015-0075, Section VI.C.1.g.
[58] Attachment 2 to Tentative Order No. R9-2015-0100, page F-32.
[59] Order R9-2015-0001, Section E.3.c(.1)(a)

encourage multi-benefit regional projects that capture, infiltrate, and reuse storm water and support a local sustainable water supply."[60]

From a practical perspective relative to water supply benefits in stormwater management, the San Diego region differs in some important and substantial ways from its neighbor up north. First, while Los Angeles and other regions in Southern California generally have the ability to utilize groundwater basins for infiltration and groundwater aquifer recharge for local water supply production in a large-scale integrated water management fashion, the San Diego region does not have available to it the larger underground basins for such storage. While our region's permit may seek to incentivize and strive for more water supply from stormwater, it may very well be that solutions to our serious and continuing water quality issues come in the form of more traditional source and treatment control technologies that have been part of the repertoire of stormwater management for many years. Once again, the justification proposed for an anti-backsliding exception is simply not applicable to the San Diego region and its permitting scheme and history.[61]

c. *Water Board Rationales Fail to Support an Anti-Backsliding Exception in San Diego: TMDL Incorporation into MS4 Permits and Lessons Learned*

To an equally large degree the justification for an anti-backsliding exception is based on the development, monitoring, and analysis of 33 TMDLs in Los Angeles, coupled with a paradigm shift. In fact, in justifying the exception the LA Regional Board mentions the importance of its TMDLs toward the achievement of fishable and swimmable waters in LA when it says, "the majority of pollutants of concern from the Los Angeles County MS4 are addressed by the 33 TMDLs that are included in the Permit," (p. 37, Response to Comments), and it recognizes the prioritization of TMDLs as highest priority issues (p. 40, Response to Comments). The San Diego Tentative Order itself points to the experience in LA for its own justifications.[62]

In contrast to the LA region, however, the San Diego region has only a handful of TMDLs and the San Diego Regional Board remains much more reluctant to develop new TMDLs, choosing instead to look towards alternatives to TMDLs. Two instances where TMDL alternatives have been developed in just the last few years are in Oceanside's Loma Alta Slough (for nitrate impairment), and the Tijuana River Valley (for impairments of sedimentation and trash). In these instances, the San Diego Regional Board has chosen to utilize processes, avenues, or

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[60] Attachment 2 to Tentative Order R9-2015-0100.

[61] Further, even if these approaches could be considered "new", it would still not justify backsliding. An improvement or development of new technology provides the Copermittee with *additional* options for meeting the requirements imposed on them by the prior permit and hence does not justify eliminating or delaying those requirements.

[62] "The alternative compliance pathway option in Provision B.3.c. of this Order was informed by new information available to the Board from experience and knowledge gained through the Los Angeles Water Board's process of developing over 30 watershed-based TMDLs and implementing several TMDLs since the adoption of the previous permits." Attachment 2 to Tentative Order No. R9-2015-0100, page F-32.

procedures that do not have the strict interim and final milestones and deadlines for achieving receiving water limitations and objectives that are found in TMDLs.[63]

Our own regional permit includes Water Quality Improvement Plans that aim to prioritize and address pollutants within the Region and those WQIPs contain interim and final measurable benchmarks to show progress of meeting the goals of achieving RWLs. Without the RWLs kept in place and with few TMDLs to fall back on, however, insufficient enforcement mechanisms would exist for citizens of our region if the WQIPs fail to meet the goals of the Clean Water Act. This regional variation in strict controls makes it all the more imperative that the RWLs be kept and no safe harbor provided. Arguments that, as the State Board makes, "TMDL requirements and receiving water limitations, which may be implemented through the WMP/EWMP provisions, will be the means for achieving water quality standards for the majority of degraded water bodies in the region,"[64] ring hollow when regions outside of the LA region have so few TMDLs and the implementation of TMDLs can be measured in decades.

Finally with respect to time allowances the appropriate way for our region, which lacks the suite of TMDLs present in LA to address RWL issues, is through the MS4 permit and Time Schedule or other Orders that include strict interim and final milestones for compliance rather than an excuse from RWLs.

Without the definitive requirements of TMDLs, Environmental Groups and our members are left with just one way to measure whether our Copermittees are meeting, or will meet, the requirements of the CWA. That measure is the Clean Water Act itself, and the receiving water limitations provisions of the permits under the Act.

To date few, if any, third party lawsuits have been filed in San Diego for MS4 noncompliance. And yet while the new permits for LA and for San Diego region contain "carrots" to incentivize certain plans and programs aimed at meeting RWLs and WQSs, the San Diego permit has, to date, maintained the "stick" of possible enforcement actions when and where necessary to ensure RWLs will be achieved. Without TMDLs or other time-certain measures, it is vital to our success that third-party enforcement actions for RWL requirements not be precluded.

B. The Tentative Order Would Violate Anti-Degradation Requirements and the Anti-Degradation Findings Are Unsupported by the Evidence

The Tentative Order's anti-degradation analysis and findings are improper and lack basis.

(1) The Revised Draft Order's Anti-Degradation Analysis Fails to Comply with EPA Requirements and Lack Support in the Record

[63] While the Fact Sheet, in discussing anti-degradation, states that for water bodies listed on the State's CWA Section 303(d) List, the "San Diego Water Board has established TMDLs to address the impairments", Environmental Groups find this statement to be disingenuous. In actuality the San Diego Board has adopted only a handful of TMDLs and has failed to adopt TMDLs for two known impairments for which the TMDL process had already begun.

[64] Order WQ 2015-0075, page 26.

The Tentative Order claims "allowing limited degradation of high quality water bodies through MS4 discharges is necessary to accommodate important economic or social development in the area and is consistent with the maximum benefit to the people of the state."[65] However, the Regional Board has not undertaken the required analysis necessary to support such a finding.

EPA's Economic Guidance for Water Quality Standards Workbook[66] ("EPA Workbook") establishes a test to determine if there might be interference with an important social and economic development. The EPA Workbook outlines three steps involved in performing an economic impact analysis as part of an anti-degradation review: (1) verify the project's costs and calculate annual costs of the pollution control project; (2) determine if maintaining high-quality waters will interfere with development; and (3) determine if development is economically and socially important.[67] The EPA Workbook provides several worksheets for addressing these factors.[68] Yet neither the State Board nor the Regional Board have addressed these basic factors or completed the EPA worksheets – or provided any evidence even remotely resembling such an analysis – in reaching their conclusion.

As a result, the Revised Draft Order and the 2012 MS4 Permit are inconsistent with the procedures established by the EPA.

(2) The Tentative Order and 2013 MS4 Permit's Anti-Degradation Findings Are Flawed and Lack Basis

The Tentative Order must "set forth findings that bridge the analytical gap between the raw evidence and ultimate decision."[69] The Board's findings must provide "the analytic route [it] traveled from evidence to action" to satisfy this requirement, so as to allow the reviewing court to satisfy its duty to "compare the evidence and ultimate decision to 'the findings.'"[70] And mere recitation of legal requirements - as here - is not sufficient.[71] The Tentative Order as drafted does meet the requirements of law.

As noted above, the Tentative Order fails to follow the procedures and requirements outlined in the EPA Workbook. Rather than following EPA procedures, the Order proceeds to conduct an anti-degradation analysis that is unsupported by the evidence and is inadequate.

First, the Tentative Order lacks any evidence supporting the findings that any degradation of San Diego area waters will in fact "assist with maintaining instream flows that support beneficial uses, may spur the development of multiple benefit projects, and may be necessary for flood control, and public safety, as well as to accommodate development in the area."[72]

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[65] Attachment 2 to Tentative Order No. R9-2015-0100.
[66] U.S. Environmental Protection Agency, *Interim Economic Guidance for Water Quality Standards Workbook* (March 1995), available at http://water.epa.gov/scitech/swguidance/standards/economics/chaptr5.cfm
[67] *Id*. at 5-2
[68] *Id*. at Worksheets AA, AB, and O-Y.
[69] *See Topanga Association for a Scenic Community v. County of Los Angeles* (1974) 11 Cal.3d, 506, 514-516.
[70] *Id*. at 515.
[71] *Id*. at 515, n.16.
[72] Attachment 2 to TO No. R9-2015-0100, page F-32.

Second, the Tentative Order's anti-degradation analysis is flawed and cannot support the finding that degradation of San Diego area waterbodies justified. The Order improperly omits from its anti-degradation analysis an evaluation of impacts on water quality from the discharge of *polluted* storm water regulated by the 2013 MS4 Permit.[73] The conclusion that discharge of storm water is to the maximum benefit of the people is therefore flawed. In fact, it is highly doubtful any discharges of *polluted* stormwater "can assist in maintaining instream flows that support beneficial uses" because, regardless of any contribution to instream flows, *polluted* stormwater, as shown by the record, uniformly degrades waterbodies' beneficial uses. Further, the anti-degradation findings improperly conclude that the alternative to allowing water quality degradation is "capturing all storm water from all storm events."[74] Capturing all storm water from all storm events is *not* the only alternative to ensure no degradation occurs as a result of *polluted* stormwater discharges. There may be other alternatives. The Tentative Order, however, improperly fails to mention, let alone analyze, other alternatives in its anti-degradation analysis. As a result, the anti-degradation findings lack basis.

Finally, the State Board Order expressly recognizes the important, if not paramount, role the LA TMDLs play in anti-degradation, stating, "where water quality is already impaired, the Order requires implementation of TMDL requirements to achieve water quality standards over time."[75] They go on to state, "we expect that the Los Angeles MS4 Order's TMDL requirements and receiving water limitations, which may be implemented through the WMP/EWMP provisions, will be the means for achieving water quality standards for the majority of degraded water bodies in the region".[76] As discussed above, however, the San Diego region has far fewer TMDLs and has failed to develop TMDLs for several identified 303(d) impairments in the region for which TMDLs are proper.[77] Instead, the San Diego Board rely on the MS4 permit as a substitute to address impairments. Thus, when the Tentative Order copies verbatim the language of the State Board Order and states regarding impaired water bodies that, "many such water bodies are listed on the State's CWA Section 303(d) List and the San Diego Water Board has established TMDLs to address these impairment", it is not entirely incorrect.

For these reasons and the reasons provided in our comments to date, the Tentative Order fails to comply with anti-degradation requirements.

(3) The Draft Language and the 2013 MS4 Permit Illegally Authorize Compliance Schedules for California Toxics Rule ("CTR")-based TMDLs Beyond May 18, 2010.

The Tentative Order fails to recognize the requirements of the Inland Surface Water Plan, which prohibits compliance schedules for CTR-based TMDLs past May 18, 2010.[78] Since the WLAs

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[73] *Id.*
[74] *Id.*
[75] WQO Order 2015-0075, p 25.
[76] WQO Order 2015-0075, p 26.
[77] See discussion infra, Section III.A.(1).(c).
[78] 40 C.F.R. 131.38(e)(8); *see also* California Toxics Rule Response to Comments Report, Volume 1 (December 1999), prepared by the U.S. Environmental Protection Agency, Response to Comment CTR-002-010b (explaining that compliance scheduled for CTR-based WQBELs may not exceed five years), available at http://water.epa.gov/lawsregs/rulesregs/ctr/upload/2009_03_26_standards_rules_ctr_responses.pdf.

for the metal TMDLs in the San Diego region are based on the CTR criteria, compliance schedules for these TMDLs are only authorized for a maximum of 10 years from the time the CTR criteria were first promulgated in 2001. Thus, no discharger can be given a compliance schedule to meet Permit provisions based on CTR criteria after May 18, 2010. As a result, to the extent the safe harbor provisions are characterized as compliance schedules for CTR pollutants, they are illegal.

IV. Conclusion

Environmental Groups appreciate the time and effort by Board staff in working with stakeholders to find acceptable solutions to ensuring discharges from MS4s do not cause or contribute to the violation of water quality standards. Despite that hard work, however, the Tentative Order as proposed is inconsistent with the State Board's Order and would violate the Clean Water Act for the reasons described above and in discussions and comments Environmental Groups have made to Board staff and the Board thus far.

The Regional Board could correct each of these fatal deficiencies in the draft TO language and the safe harbor by choosing to not adopt the proposed language and instead continue to require implementation of watershed management programs as one way to achieve, rather than demonstrate, compliance with RWLs and WQSs. Environmental Groups respectfully request the Regional Board remove the safe harbor language. Should the Board chose to adopt safe harbor language despite the TO's legal and practical deficiencies, we respectfully request the TO be made consistent with the State Board's Order through an amendment that includes the following requirements, at a minimum: (1) the Reasonable Assurance Analysis and EWMP guidance, modeling, and standards that were expressly approved by the State Board's Order and that are the lynchpin of the approved safe harbor approach, (2) regional multi-benefit projects be a necessary element of compliance BMPs, (3) language that automatically triggers an end to the safe harbor protections, as earlier proposed by Environmental Groups and referenced above, and (4) removal of the iterative process from the safe harbor scheme.

Thank you for the opportunity to comment.

Sincerely,

Matt O'Malley
Legal & Policy Director
San Diego Coastkeeper

Livia Borak
Legal Advisor
Coastal Environmental Rights Foundation

Julia Chunn-Heer
Policy Manager
Surfrider Foundation San Diego Chapter

cc:
David Gibson, Executive Officer
Cindy Lin, EPA

September 11, 2015

San Diego Regional Water Quality Control Board
2375 Northside Drive, Suite 100
San Diego, CA 92108-2700
Attn: Wayne Chiu
sandiego@waterboards.ca.gov

Sent via email

Re: Environmental Groups Comments on Tentative Order R9-2015-0100; Prior Lawful Approval Language

Dear Wayne Chiu, Laurie Walsh, and Christina Arias:

Thank you for the opportunity to comment on Tentative Order R9-2015-0100 ("Tentative Order", "San Diego Order", or "TO". San Diego Coastkeeper and Coastal Environmental Rights Foundation ("Environmental Groups") are local non-profit organizations dedicated to the protection and restoration of regional waters and related environmental issues in San Diego. Our groups represent numerous San Diegans, act through community involvement, regulatory participation, and legal action to ensure the protection and restoration of our region's ocean, bays, and inland waters.

The Tentative Order aims to more accurately define when land development requirements from earlier MS4 permits would apply to Priority Development Projects ("PDPs"). In doing so, the Order allows Copermittees to apply earlier permit requirements to PDPs under two scenarios.

The second scenario is straightforward in that it allows previous permit requirements if a, "Copermittee demonstrates that it lacks the land use authority or legal authority to require a Priority Development Project to implement the requirements of Provision E.3." Environmental Groups read this section, in conjunction with Section E.3.[1] and the TO Fact Sheet[2] to mean the Copermittee must be legally prevented from requiring compliance with the 2013 development requirements. Further, even if a Copermittee is legally prevented from requiring *some* development requirements under E.3., they must enforce those provisions that they are not legally prevented from requiring.

The first scenario, however, is more precise and includes a set of distinct conditions. That language reads:

[1] Order R9-2013-001 as amended by Order R9-2015-0001.
[2] Attachment 2 to TO R9-2015-0100, p. F-110.

(i) The Copermittee has, prior to the effective date of the BMP Design Manual required to be developed pursuant to Provision E.3.d:

[a] Approved a design that incorporates the storm water drainage system for the Priority Development Project in its entirety, including all applicable structural pollutant treatment control and hydromodification management BMPs consistent with the previous applicable MS4 permit requirements; AND

[b] Issued a private project permit or approval, or functional equivalent for public projects, that authorizes the Priority Development Project applicant to commence construction activities based on a design that incorporates the storm water drainage system approved in conformance with Provision E.3.e.(1)(a)(i)[a]; AND

[c] Confirmed that there have been construction activities on the Priority Development Project site within the 365 days prior to the effective date of the BMP Design Manual, *OR* the Copermittee confirms that construction activities have commenced on the Priority Development Project site within the 180 days after the effective date of the BMP Design Manual, where construction activities are undertaken in reliance on the permit or approval, or functional equivalent for public projects, issued by the Copermittee in conformance with Provision E.3.e.(1)(a)(i)[b]; AND

[d] Issued all subsequent private project permits or approvals, or functional equivalent for public projects, that are needed to implement the design initially approved in conformance with Provision E.3.e.(1)(a)(i)[a] within 5 years of the effective date of the BMP Design Manual. The storm water drainage system for the Priority Development Project in its entirety, including all applicable structural pollutant treatment control and hydromodification management BMPs must remain in substantial conformity with the design initially approved in conformance with Provision E.3.e.(1)(a)(i)[a].

The language essentially states that a PDP proponent must have received approval of its *specific* stormwater plans draft under the 2007 permit and must have begun construction activities within a year of the BMP manual taking effect or 180 after it takes effect. Finally, any additional approvals must be in substantial conformance and must be issued within 5 years of the BMP manual's effective date (December 24, 2015).

We appreciate the time and effort Board staff have put into researching and understanding the governing law on this issue. We believe the language has come a long way to more closely match the prevailing law that governs this issue. That said Environmental Groups continue to have a few concerns, discussed below in more detail.

Analysis

While more closely mirroring the governing law on this issue than previous drafts the Tentative Order, in seeking to reach a clear and concise definition, appears to some degree to back track on requirements of the existing MS4 permit and the law.

Avco remains the principal governing case law on the issue of judicial vested rights as applied to development. In *Avco*, the California Supreme Court held that no vested right existed where a

plaintiff had not *both* obtained a final building permit *and* begun grading. *Avco Cmty. Developers, Inc. v. S. Coast Reg'l Com.*, 17 Cal. 3d 785, 791 (1976). Courts of Appeal continue to follow the *Avco* model, holding that public entities may enforce changes in regulations notwithstanding prior subdivision approval unless the owner or developer "(1) has obtained a building permit for an identifiable structure, and (2) has performed substantial work in reliance thereon." *Hafen v. Cnty. of Orange*, 128 Cal. App. 4th 133, 143 (2005). A leading treatise further explains: "The vested rights rule requires that the government agency exercise its *final discretion* to issue a grant of authority or permit which *specifically describes* a particular approval or work of improvement. Thereafter, *if the developer begins to perform the work described* in the grant or permit, he or she may acquire a vested right to complete the *specific and particular* work that is described. The grant or permit does not give any rights to complete any work not specifically described." (emphasis added) *Miller & Starr, Cal. Real Estate* (3d ed.2001) § 25:70, pp. 324-325, 327-328.

If adopted, the proposed language would expand developers' rights beyond what is required by *Avco* and its progeny. By allowing for up to 6 months after the BMP manual, plus up to an additional 5 years for subsequent approvals, PDP proponents could have until 2021 to implement the requirements of the 2007 permit. The MEP standard is - and should be - more rigorous than a 14 year implementation schedule of an expired permit.

As written the Order's new provisions would be inconsistent with, and contrary to, the existing permit's requirements and federal law. While it certainly is legally permissible for the Regional Board to define prior lawful approval as requiring both a final permit and the commencement of work, it is actually inconsistent with other provisions of the MS4 to define it as anything short of that. Section E.1.a. requires each Copermittee to "establish, maintain, and enforce adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4," and adequate legal authority includes, at a minimum, "requiring the use of BMPs to prevent or reduce the discharge of pollutants into MS4s" *Order No. R9-2013-0001 E.1.a.(7)*. As explained above, it is well within all copermittees' legal authority to apply new BMPs to projects that have not begun substantial work and expended "hard costs"[3]. And, under the existing E.1.a. standard they would be required to use the full extent of that authority to apply updated requirements.

To that end Environmental Groups respectfully requests that the Tentative Order language be amended to require that construction activities have begun and substantial hard costs have been expended *prior* to the effective date of the BMP Design Manual. To achieve that result we respectfully request the removal of the following language, starting with [c]:

> *…OR* the Copermittee confirms that construction activities have commenced on the Priority Development Project site within the 180 days after the effective date of the BMP Design Manual, where construction activities are undertaken in reliance on the permit or approval, or functional equivalent for public projects, issued by the Copermittee in conformance with Provision E.3.e.(1)(a)(i)[b]; AND
> [d] Issued all subsequent private project permits or approvals, or functional equivalent for public projects, that are needed to implement the design initially approved in conformance with Provision E.3.e.(1)(a)(i)[a] within 5 years of the effective date of the BMP Design Manual. The storm water drainage system for the Priority Development Project in its entirety, including all applicable structural pollutant treatment control and

[3] *Hermosa Beach Stop Oil Coalition vs City of Hermosa Beach* (2001), 86 Cal.App.4th 534

hydromodification management BMPs must remain in substantial conformity with the design initially approved in conformance with Provision E.3.e.(1)(a)(i)[a].

This amendment would bring the new language in line with prevailing law on vested rights while preserving the requirements under the current permit for Copermittees to use their full legal authority to implement the Provisions of E.3.

Thank you for the opportunity to comment on the Tentative Order's Prior Lawful Approval amendments. Please feel free to contact me with any questions or for additional feedback.

Sincerely,

Livia Borak
Legal Advisor
Coastal Environmental Rights Foundation

Matt O'Malley
Legal & Policy Director
San Diego Environmental Groups

Via e-mail to *hwalsh@waterboards.ca.gov*

San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

September 15, 2015

RE: **PROPOSED AMENDMENTS TO ORDER NO. R9-2013-0001, TENTATIVE ORDER NO. R9-2015-0100**

The South Laguna Civic Association (SLCA), established in 1946, is the principle community most impacted in the Aliso Watershed by the Orange County MS4 Permit. While over $20 million in public funds have been devoted to monitoring activities and reports, Co-permittees still concede they are out of compliance with most of the previous and current water quality regulations under the jurisdiction of the SDRWQCB MS4 Permit.

Pursuant to CWA Section 402(p)(3)(B), previous Aliso Watershed NPDES permits for storm water discharges from MS4s must include requirements to effectively prohibit non-storm water discharges into MS4s. However, present requirements have yet to achieve this mandate. Lacking is clear enforcement measures to incentivize Co-permitee compliance. Despite clear and mounting evidence of accumulated impacts from non-compliance, Co-permitees do not face fines and penalties for a pattern of careless management of MS4 outfalls. Instead of compliance, Co-permitees have chosen legal measures to hold MS4 permit regulations in permanent abeyance.

Public expectations require regulatory enforcement from the SDRWQCB. Clean up and Abatement Orders will motivate prompt mitigation measures and alternatives to include:

a) Immediate MS4 dry weather diversion to Publically Owned Treatment Facilities (POTWs)
b) Penalties and fines directed to Supplemental Environmental Projects by Third Party water quality NGOs and experts.
c) Local native tree planting to re-direct flows for irrigation and groundwater replenishment.

Fortunately, the iterative process from previous permitting cycles appears to have incorporated recommendations from SLCA and others for comprehensive mapping of the entire watershed and regulated coastal receiving waters in the present Tentative Order.

Public education can be best achieved if all facts are presented in clear map layers to determine MS4 impacts to all mandated beneficial uses. Likewise, elected officials as Co-Permitees must become literate in local natural baseline conditions and protected species through maps indicating Environmentally Sensitive Areas (ESHAs) within the watershed creek, wetland, estuary and coastal habitats to understand how best to achieve MS4 Permit compliance. Maps are the first step in restoring native flow rates to support indigenous drought tolerant trees and vegetation among impaired creek and coastal waters regulated by SDRWQCB.

Issues and recommendations submitted by SLCA in April 11, 2007 (Tentative Order No. R9-2007-2002) and December 10, 2012 (Tentative Order No. R9-2012-0011) remain relevant as Public Comment in the refining the Proposed Amendments to Order NO. R9-2013-0001, Tentative Order NO. R9-2015-0100 and are re-submitted as attachments.

The Aliso Watershed is a compact 34 square mile area suffering decades of neglect and pollution originating from poorly engineered residential developments among inland cities. Plans to add 17,000 new houses to South Orange County in the coming years will exacerbate the water pollution crisis facing Laguna Beach. Runoff management plans fail to control dry weather urban runoff and knowingly contribute directly to increased flows and erosion during routine storm events.

The Aliso Creek Wilderness Park remains degraded from erosion impacts to streambed habitat and threatens to expose critical sewage infrastructure transporting 10 to 15 million gallons of secondary sewage to the Aliso Creek Ocean Outfall only 1.2 miles offshore. A recent study by TetraTech for the South Orange County Wastewater Authority (SOCWA) determined the integrity of creek infrastructure to be capable of failure in as little as 5 years. Coastal receiving waters at the mouth of Aliso Creek are impaired by polluted urban runoff flowing at 1 to 5 million gallons per day (GPD). Aliso Creek is listed as a 303(d) Impaired Water Body by the Clean Water Act and continues to fail to meet present and previous MS4 Permit requirements. (Exhibit B – Aliso Creek Watershed 303(d) Impaired Waterbodies)

All Co-Permitees, as signatories to the MS4 Permit, are legally responsible for water quality in terms of coastal receiving waters. The regulatory and legal nexus is clear between unpermitted discharges by inland Co-Permitees, creek erosion and infrastructure damage, ocean pollution and public health hazards associated with these contaminated daily flows.

Aliso Beach, at the mouth of the federally listed contaminated creek, is permanently posted as a Clean Water Act 303(d) Impaired Water Body. Daily flows of urban runoff pollutes coastal receiving waters protected as the Laguna Beach State Marine Conservation Area established unanimously by the California Fish & Game Commission on January 1, 2012. Recent MPA coastal receiving water quality protections are referenced in Amended Order 2013-001 on page 21 of 313 section 2, A, 3 : http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/docs/updates030415/2015-0303_Final_Amended_Attachment_No_1_Order_2013-0001.pdf

Known and persistent water quality violations at Aliso Beach continue due to a lack of enforcement of MS4 permit regulations.

Additional comments to the CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD SAN DIEGO REGION ORDER NO. R9-2013-0001, AS AMENDED BY ORDER NO. R9-2015-0001 NPDES NO. CAS0109266 NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION Amended February 11, 2015 are:

2. Priority Water Quality Conditions

The Co-permittees must identify the water quality priorities within each Watershed Management Area that will be addressed by the Water Quality Improvement Plan. Where appropriate, Watershed Management Areas may be separated into subwatersheds to focus water quality prioritization and

jurisdictional runoff management program implementation efforts by receiving water. However, the Co-permitees lack maps identifying Environmentally Sensitive Habitat Areas (ESHA) such as the degraded Aliso Coastal Wetlands Estuary and State Marine Conservation Areas as well as local coastal receiving water tide pools, kelp forests and recreational sites. Similarly, maps must incorporate current studies for the Aliso watershed urban runoff coastal plume.

ASSESSMENT OF RECEIVING WATER CONDITIONS

The Co-permittees must consider the following, at a minimum, to identify water quality priorities based on impacts of MS4 discharges on receiving water beneficial uses:

(1) Map all creek and coastal receiving waters listed as impaired on the CWA Section 303(d) List of Water Quality Limited Segments (303(d) List);

(2) TMDLs adopted and under development by the San Diego Water Board;

(3) Map all receiving waters recognized as sensitive or highly valued by the Co-permittees, including estuaries designated under the National Estuary Program under CWA section 320, marine protected areas to include the Laguna Beach State Marine Conservation Area (SMCA), wetlands defined by the State or U.S. Fish and Wildlife Service's National Wetlands Inventory as wetlands that include the Aliso Estuary, waters having the Preservation of Biological Habitats of Special Significance (BIOL) beneficial use designation, and receiving waters identified as ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012;

(4) The receiving water limitations of Provision A.2;

(5) Map and illustrate known historical versus current physical, chemical, and biological water quality conditions and coastal receiving water urban runoff plumes;

(6) Publish for Public Education available, relevant, and appropriately collected and analyzed physical, chemical, and biological receiving water monitoring data, including, but not limited to, data describing: (a) Chemical constituents, (b) Water quality parameters (i.e. pH, temperature, conductivity, etc.), (c) Toxicity Identification Evaluations for both receiving water column and sediment (pathogens, viruses, nitrogen, phosphorous, microbeads, pharmaceuticals, etc.), (d) Trash impacts. Include map overlays for protected species and habitats. (See Attachment No. 1 Order No. R9-2013-0001 Page 22 of 131 May 8, 2013 As amended by Order No. R9-2015-0001 Amended February 11, 2015 PROVISION B: WATER QUALITY IMPROVEMENT PLANS B.2. Priority Water Quality Conditions (e) Bioassessments, and (f) Physical habitat).

(7) Present available evidence of erosional impacts in receiving waters due to accelerated flows (i.e. hydromodification). Map and identify inland dry weather urban runoff storm drain flow rates and on-going MS4 Permit violations. Indicate storm water erosion impacts from Laguna Beach Fuel Modification goat grazing. Identify existing erosion threats to the South Orange County Wastewater Authority (SOCWA) Effluent Transmission Main alongside Aliso Creek.

(8) Map protected whale and dolphin migration and foraging areas, Tidewater goby estuaries, creek wetlands and coastal urban runoff plumes among available evidence of adverse impacts to the chemical, physical, and biological integrity of receiving waters; and

(9) The potential improvements in the overall condition of the Watershed Management Area that can be achieved.
b. ASSESSMENT OF IMPACTS FROM MS4 DISCHARGES The Co-permittees must consider the following, at a minimum, to identify the potential impacts to receiving waters that may be caused or contributed to by discharges from the Co-permittees' MS4s: (1) The discharge prohibitions of Provision A.1 and effluent limitations of Provision A.3; and (2) Available, relevant, and appropriately collected and analyzed storm water and non-storm water monitoring data from the Co-permittees' MS4 outfalls; (3) Mapped locations of each Co-permittee's MS4 outfalls that discharge to receiving waters; (4) Mapped locations of MS4 outfalls that are known to persistently discharge non-storm water to receiving waters likely causing or contributing to impacts on receiving water beneficial uses; (5) Mapped locations of MS4 outfalls that are known to discharge pollutants in storm water causing or contributing to impacts on receiving water beneficial uses; and (6) The potential improvements in the quality of discharges from the MS4 that can be achieved.

IDENTIFICATION OF PRIORITY WATER QUALITY CONDITIONS

(1) The Co-permittees must use the information gathered for Provisions B.2.a and B.2.b to develop a list of priority water quality conditions as pollutants, stressors and/or receiving water conditions that are the highest threat to receiving water quality or that most adversely affect the quality of receiving waters. The list must include the following information for each priority water condition (Attachment No. 1 Order No. R9-2013-0001 Page 23 of 131 May 8, 2013 As amended by Order No. R9-2015-0001 Amended February 11, 2015).

(2) PROVISION B: WATER QUALITY IMPROVEMENT PLANS B.2. Priority Water Quality Conditions quality condition: (a) The beneficial use(s) associated with the priority water quality condition; (b) The geographic extent of the priority water quality condition within the Watershed Management Area, if known; (c) The temporal extent of the

priority water quality condition (e.g., dry weather and/or wet weather); (d) The Co-permittees with MS4s discharges that may cause or contribute to the priority water quality condition; and (e) An assessment of the adequacy of missing ESHA and MPA maps, coastal receiving water plume maps and data gaps in the monitoring data to characterize the conditions causing or contributing to the priority water quality condition, including a consideration of spatial and temporal variation.

(3) The Co-permittees must identify the highest priority water quality conditions to be addressed by the Water Quality Improvement Plan, and provide a rationale for selecting a subset of the water quality conditions identified pursuant to Provision B.2.c.(1) as the highest priorities.

d. IDENTIFICATION OF MS4 SOURCES OF POLLUTANTS AND/OR STRESSORS The Co-permittees must identify and prioritize known and suspected sources of storm water and non-storm water pollutants and/or other stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c. The identification of known and suspected sources of pollutants and/or stressors that cause or contribute to the highest priority water quality conditions as identified for Provision B.2.c must consider the following: (1) Pollutant generating facilities, areas, and/or activities within the Watershed Management Area, including: (a) Each Co-permittee's inventory of construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas, (b) Publicly owned parks and/or recreational areas, (c) Open space areas and goat grazed Fuel Modification Zones, (d) All currently operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste, and (e) Areas not within the Co-permittees' jurisdictions.

Priority Water Quality Conditions lands, state lands, federal lands including the Irvine Desalter Project that are known or suspected to be discharging to the Co-permittees' MS4s; (2) Mapped locations of the Co-permittees' MS4s, including the following: (a) All MS4 outfalls mapped plumes that discharge to receiving waters, and (b) Locations of major structural controls for storm water and non-storm water (e.g., retention basins, detention basins, major infiltration devices, etc.); (3) Other known and suspected sources of non-storm water or pollutants in storm water discharges to receiving waters within the Watershed Management Area, including the following: (a) Other MS4 outfalls (e.g., Phase II Municipal and Caltrans), (b) Other NPDES permitted discharges, (c) Any other discharges that may be considered point sources (e.g., private outfalls), and (d) Any other discharges that may be considered non-point sources (e.g., agriculture, wildlife or other natural sources);

(4) Review of available data, including but not limited to: (a) Findings from the Co-permittees' illicit discharge detection and elimination programs, (b) Findings from the Co-permittees' MS4 outfall discharge monitoring, (c) Findings from the Co-permittees' receiving water monitoring, (d) Findings from the Co-permittees' MS4 outfall discharge and receiving water assessments, and (e) Other available, relevant, and appropriately collected data, information, or studies related to pollutant sources and/or stressors that contribute to the highest priority water quality conditions as identified for Provision B.2.c. (5) The adequacy of the available data to identify and prioritize sources and/or stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c. for timely Cleanup and Abatement Orders from the SDRWQCB.

Recommended Actions

Poorly engineered projects can be re-engineered to achieve mandated water quality objectives.

1. Maps of all creek and coastal receiving waters indicating water quality impacts can be created by SCCWRP, Scripps, NOAA or any number of competent university or regulatory groups. A Bioregional Watershed Map will identify degraded land elements, offending storm drain outlets and candidate areas for re-forestation and estuarine/coastal restoration.

2. On an annual basis, citations against the primary six known storm drain point sources in each watershed can incrementally compel clean-up and abatement throughout a given watershed bioregion without the burden of costs to abate all points of contamination at once. Enforcement is a powerful economic incentive to achieve MS4 permit compliance. Failed Best Management Practices (BMPs) among urban runoff facilities, required as a Condition of Approval for inland residential developments, can be retrofitted with dry weather diversions to local Publically Owned Treatment Works (POTWs) or, alternatively, re-engineered with deep groundwater injection wells.

3. Fines must be allocated to re-vegetate impaired watersheds and kelp forests to restore the native functions of semi-arid creeks and protected coastal receiving waters. A re-forested Aliso Canyon with a canopy similar to San Mateo Creek will qualify for California Cap and Trade funding to offset costs. Restoration of natural habitats is demonstrated to be the best, most cost effective measure for improving watershed water quality.

4. Restoration of high value coastal wetlands and estuaries will guarantee protection of natural beach sand berms and provide measurable improvement to coastal receiving waters. Funds from the California Coastal Conservancy and other wetland recovery resources can offset costs.

5. Watershed restoration will offer multiple community benefits by reducing destructive stormwater flows, eliminating pollutants and increasing eco-tourist revenues to surrounding cities. Large street cisterns incorporating designs proposed by GeoSynTech for the re-development of the Aliso Golf Course can serve as a model for extensive rainwater

harvest/reuse systems. Street cisterns common throughout San Francisco since 1906, can capture and mitigate storm water flows for local beneficial reuse. Restoration of some or all of the 1500 foot Aliso Creek Ox Bow in Laguna Niguel will assist in restoring hydric soils to reduce stormwater impacts.

6. Increased use of recycled water for wildland fire suppression along the entire Highway 73 Toll Road bisecting the Laguna Greenbelt will maintain a healthy, fire safe wilderness area. Orange County Measure M and State Proposition funds are available to offset costs. Increased use of recycled water reduces ocean discharges to the Laguna State Marine Conservation Area.

7. A citywide network of recycled water for all of Laguna Beach will reduce imported water demand significantly and increase water security, disaster preparedness and fire suppression resources. Revenues from routine use for irrigation mandated Fuel Modification Zones will provide new revenue streams. Laguna Beach is the only Orange County city without a comprehensive recycled water program and remains a "once use" community of valuable imported water.

The MS4 Permit Renewal process offers the opportunity to advance beyond failed measures and begin the renewal of the region's unique watershed and coastal ecology. All Stakeholders can benefit through proactive initiatives and, as the overall watershed ecology improves, the cost savings from stormwater damage, water pollution, protracted litigation and public health threats will become evident. The South Laguna Civic Association has offered constructive, critical information and suggestions during the previous MS4 Permit cycle which have been often ignored to the public's detriment.

Cooperation and courage are essential and the South Laguna Civic Association remains committed to working towards real, measurable, sustainable solutions. On behalf of our community and the many visitors from throughout the world to our shores, we thank you for your review and support of our recommended actions.

Michael Beanan
Vice President
South Laguna Civic Association

mike@southlaguna.org

Attachments

SLCA Comments to Tentative Order No. R9-2007-0002 NPDES, No. CAS0108740
SLCA Comments to Tentative Order No. R9-2012-0011

July 7, 2014

Laurie,

Please convey my thanks and appreciation for SDRWQCB staff's willingness to host a workshop in South Orange County.

While many important issues were covered, I would like to supplement my comments and recommendations with a few useful images, links and docs.

"The Regional MS4 Permit will regulate MS4 discharges to inland surface waters, bays and estuaries and **coastal waters** throughout the three counties within the San Diego Region." http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/

MS4 Coastal Receiving Waters & Federally Protected Marine Mammals

Relative to regulated coastal receiving waters, federally protected migrating California Grey Whales and young calves frequent coves along South Laguna and immediately at the mouth of Aliso Creek - a CWA listed 303(d) Impaired Water Body with urban runoff dry weather summer flows averaging 1 MGD. Protected coastal dolphins suffer compromised immune systems from urban runoff plumes. Coastal receiving waters at Aliso Beach are part of a designated Laguna State Marine Conservation Area (SMCA).

The Laguna State Marine Conservation Area and Laguna State Marine Reserve are mapped marine life protection zones similar to an Area of Special Biological Significance (ASBS). Incorporation of coastal receiving waters among Co-Permittee documents represent a threshold requirement to determine MS4 impacts to protected State waters. Layed maps can illustrate Grey whale migration routes and local resting areas. Additional layers will map protected Coastal dolphin habitats and birthing grounds. Important recreational sites such as the Aliso Beach World Skimboard Championships, popular SCUBA diving sites and surfing beaches might constitute another map layer for stakeholder and public education of areas impacted by dry weather and stormwater runoff.

Co-permittees have a variety of resources to properly map and post coastal receiving waters with layered features to illustrate protected resources and beneficial uses. http://www.dfg.ca.gov/marine/mpa/scmpas_list.asp

Likewise, SCCWRP has dynamic mapping capabilities available to Co-permitees. http://www.sccwrp.org/Data/SearchAndMapData.aspx

Sound science and public education require a better understanding of coastal receiving waters. Dry weather urban runoff transports illicit MS4 discharges and pollutants to coastal waters. Daily ocean upwelling transports these constituents to nearshore waters and promotes summer long Harmful Algae Blooms (HABs) and localized eutrophication presently omitted from Co-permitee monitoring maps (See attached). Essential Fish Habitats (EFH) recognized by NOAA include local kelp forests and tidepools receiving inland urban runoff plumes.

An Integrated Watershed Management Plan must fully comply with mapping and monitoring of all regulated waters including coastal receiving waters. Land Development topics lacking mapped coastal receiving waters reflect a disconnect among Co-permitees and suggest omission of the very foundation of the regional economy, i.e., a healthy ocean. Images similar to those developed by OC Sanitation District of coastal plumes can correlate with improvements or shortcomings of inland MS4 management efforts to reduce flow rates of urban runoff. Mapping is the first step in monitoring water quality impacts. Proper mapping and monitoring establishes baseline data for effective restoration projects.

Restoration of Natural Flow Rates

Orange County ROWD goals to "restore to natural flows" represent a useful shift in understanding flow rates as a key transport of inland contaminates to regulated receiving waters. Achieving zero tolerance of discharges from inland MS4 stormdrains can be achieved by mapping and posting for public education offending stormdrains and implementing Clean-up and Abatement Orders as well as fines where necessary to shift the economic incentives towards compliance. The top three offending stormdrains in each watershed are well documented in annual reports and serve as immediate target sites for abatement (See attached).

An 85% retention of stormwater flows can be achieved by segmenting into rational units. For instance, one tree on site can hypothetically retain 5% of stormwater with another 10% retained by bioswales. Rainwater harvesting might retain another 10% to achieve a total net retention of 25% on site. The remaining 60% can be achieved with local mitigation programs such as subwatershed re-forestation of public lands, parking lot stormwater cisterns, street cisterns, etc.

"The restoration of riparian forests has subsequently become a major focus of watershed initiatives to improve degraded stream ecosystems."
http://link.springer.com/article/10.1023/A:1006495805300

Aliso Canyon & Wood's Canyon Wilderness Park is a stream ecosystem degraded by centuries of careless cattle grazing and erosion flows from faulty USACOE projects and inland developments. Reforestation of grazed habitats throughout the region is likely the most cost effective long range measure available to communities. Reforestation projects, funded as mitigation to help achieve a proposed development's 85% compliance, will engage local schools and civic groups to improve public stewardship of fragile ecosystems while protecting creek and coastal receiving waters.

Geochemistry is determined in large measure by degraded riparian ecosystems. Widespread regional deforestation represents systematic ecocide destruction of critical tree and vegetation biomass. Without vegetated biomass to provide soil cover and hillside stabilization, annual stormwater flows remove the protective soil mantle to expose clay substrate...a natural water filter for groundwater recharge. There are no "bad soils", only degraded habitats.

Wise use of biomass mulch, small bioswales around trees and reforestation of native vegetation will restore the soil mantle and reduce the intensification of erosion flows during storm events. Added benefits include improved air quality from plant photosynthesis, a reduction in the urban heat sink and improved property values associated with landscaped tree areas and forested reserves. Restored forested stream ecosystems are key to fish and wildlife recovery efforts.

Stormwater Cisterns

Although some stakeholders are unfamiliar with cisterns, major developments utilize these flow rate control systems to mitigate urban runoff volumes while ensuring local water reliability. http://www.pelicanhill.com/pdf/PelicanHillGolfClub.pdf

Golf courses are known point sources of contaminates polluting regulated receiving waters. Grants and incentives to re-engineer golf courses will achieve multiple community benefits including runoff reduction, less use of fertilizers and compliment State water conservation mandates. Educating Co-Permitees and developers about a variety of stormwater capture systems can greatly facilitate a "can do" attitude to combat a prevailing "can't do" strategy by staff and developers.
http://www.conteches.com/products/stormwater-management.aspx

A thorough cost-benefit analysis of the value of stormwater capture/reuse as an untapped water resource over a 30 year time horizon will reveal substantial savings in imported water as well as regulatory compliance costs. Unsubstantiated allegations of cost prohibitions for basic watershed improvements must be accompanied by a detailed financial report to enable the public an opportunity to challenge inflated cost estimates which are often used as unscientific justification for non-compliance.

The Athens Aliso Redevelopment Project, Page 53, Figure 29 depicts a Roadway Subsurface Cistern Design Concept to offer an engineered alternative for large street cisterns capable of replenishment with local groundwater, dry weather urban runoff or hi-purity 250 tds recycled water (See attached). The City of San Francisco among others, including medieval San Gimignano in Italy, have networks of street, plaza and park cisterns. Stormwater cisterns can be recharged and managed in summer months with local recycled water to retain usefulness as irrigation water, wildfire suppression, etc.

Going Forward

There are numerous opportunities to collaborate in improving Region 9 water quality. Partnering with the South Coast Water District, the all volunteer South Laguna Civic Association motivated the City of Laguna Beach, County of Orange and surrounding golf courses to gain funds for the Aliso Creek Urban Runoff Recovery, Reuse and Conservation
Project http://www.scwd.org/projects/alisocreek.asp

As a useful template, capturing urban runoff is now a viable alternative to creek, estuary and ocean pollution. Engaging private and public innovators will break the artificial barriers manufactured by some Co-permittees and developers to block progress in restoring the region's natural stream flows. The way forward is not impossible nor difficult when considering the alternatives of doing nothing or the barest of minimums to assure compliance. Water, especially during prolonged drought conditions, can no longer be carelessly wasted as a source of regional water quality impairment.

Going forward, let's continue to promote timely workshops and encourage if not require Co-permitees and stakeholders to collaborate with knowledgeable NGOs, academics and individuals in implementing productive water quality projects. Thank you again for staff efforts by the SDRWQCB to improve the next MS4 Permit to achieve measurable, lasting improvements.

Michael Beanan
Vice President
South Laguna Civic Association

Construction Industry Coalition on Water Quality

September 14, 2015

Mr. Wayne Chiu, Senior Engineer
San Diego Regional Water Quality Control Board
2375 Northside Drive, Suite 100
San Diego, Ca 92108

Via Email: sandiego@waterboards.ca.gov

RE: Comment - Tentative Order No. R9-2015-0100, Place ID: 686088WChiu

Dear Mr. Chiu:

The Construction Industry Coalition on Water Quality (CICWQ) is submitting comments concerning Tentative Order No. R9-2015-0100 (National Pollutant Discharge Elimination System (NPDES) Permit for Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region, Order No R9-2013-0001, as amended by Order No. R9-2015-0001 (Regional MS4 Permit)). We are submitting this letter on behalf of the CICWQ membership, which is described below.

CICWQ is an advocacy, education, and research 501(c)(6) non-profit group of trade associations representing builders and trade contractors, home builders, labor unions, landowners, and project developers. CICWQ membership is comprised of members of four construction and building industry trade associations in southern California: The Associated General Contractors of California, Building Industry Association of Southern California, Engineering Contractors Association, and Southern California Contractors Association, as well as the United Contractors located in San Ramon in northern California. Collectively, members of these associations build a significant portion of the transportation, public and private infrastructure, and commercial and residential land development projects in California.

We present two main points for Regional Board consideration regarding the Draft Regional MS4 Permit:

I. The Regional Board is requiring increasingly stringent on-site stormwater retention requirements without evidence the existing, 2010 Southwest Riverside County MS4 permit water quality requirements are not working to protect water quality and maintain beneficial uses.

With the release of the Draft Regional MS4 Permit to incorporate watersheds in Southwest Riverside County within the San Diego Regional Water Quality Control Board (Regional Board) jurisdiction, the Regional Board is proposing to enact the most

stringent on-site requirements for stormwater runoff anywhere in California. Despite the demonstrable improvements in water quality runoff noted by the Riverside County permittees in their Report of Waste Discharge, Regional Board staff continues to require additional and less flexible on-site prescriptive performance measures for retaining stormwater runoff.

The program changes proposed in the Draft Regional MS4 Permit are being made without presenting any factual evidence that the existing low impact development water quality performance standards are not working, which the County of Riverside has required since the requirements became effective in 2012. We believe that because the current Southwest Riverside County Permit requirements are working well to protect water quality, presenting any evidence to the contrary is not actually possible. We note no Findings in the Draft Regional Permit that would suggest a need for any changes to program implementation and management.

II. The Regional Board is eliminating exemptions for hydromodification control, even when stormwater runoff is conveyed in the MS4 system to significantly hardened or engineered channels.

CICWQ and its membership believe that the regulations are tending, at some point, to require hydromodification control for all priority development projects regardless of receiving water susceptibility to hydromodification effects. This regulatory direction is undoubtedly driven by environmental NGO advocacy for removal of all concrete lined channels and receiving waters and complete restoration of all significantly or completely lined channels to "natural" conditions, regardless of the existing land uses and feasibility. This effort ignores the vital role flood control facilities play in urban infrastructure and the protection of life and property, and it ignores the significant public investment in these systems. Loss of hardened channel exemptions will result undoubtedly in increased costs for new and redevelopment of most public and private properties within the Regional Board's jurisdiction, and require project proponents to engage in a potentially costly and cumbersome bureaucratic process to "mitigate" for the effects (even the lack of) of hydromodification with no environmental benefit.

According to the Regional Board, hydromodification control requirements are being required to maintain geomorphic stability in receiving waters in southern California. However, it is clear that the alignment, grade and cross section of many urban streams has been irrevocably altered. A regulatory requirement to return flows to pre-development conditions will not allow stream restoration to occur. For urban areas, the Permit should support projects that enhance the functions and values of the receiving water within the constraints of the urban environment. Removing exemptions without consideration, or requiring extensive additional study to support exemptions that have been granted for years, appears to be a poor policy decision and one that is not supported technically.

Specifically, nowhere in the Draft Regional MS4 Permit is the lack of clear evidence for program changes more evident than the requirements for installing

hydromodification controls at priority development sites in Provision E.3.c.(2). In particular, we note the Regional Board is on a path to remove long-standing exemptions from hydromodification control requirements for certain projects whose discharge is conveyed to receiving waters via significantly or completely hardened and engineered channels. In the Draft Regional MS4 Permit for Southwest Riverside County, the Regional Board has provided "interim" exemptions that, while welcome in the interim, should be granted outright and without any additional study or consideration. Nor should additional updates or study be required on the part of the co-permittees to support granting exemptions, as required in the BMP Design Manual update referenced in Provision E.3.c.(2)(e).

And, as we have commented on during the adoption process for the San Diego County Regional MS4 permit in 2012 and 2013 and for the South Orange County Regional MS4 permit in 2014, new hydromodification control requirements that require a priority project to "avoid critical sediment yield areas" are unnecessarily restrictive, and do not reflect the dynamic and variable nature of the sediment supply that is delivered to stream systems in southern California. Our membership continues to report instances where priority development projects are being significantly delayed or stopped all together, because of the inability to comply with the requirement to avoid critical sediment yield areas. The most prevalent reason given is lack of engineering tools and techniques to comply with such a sweeping provision.

In summary, we have commented to the Regional Board about hydromodification control requirements in MS4 permits within its jurisdiction in a number of instances in the recent past, and many of our concerns and comments remain relevant in the current proceedings. While we note many of our suggestions have been ignored or discounted, we incorporate nonetheless those comments by reference here and cite specifically:

1) Comment Letter --Administrative Draft Regional Municipal Separate Storm Sewer System (Tentative Order No. R9-2012-0011); submitted September 14, 2012. See Item No. 3, page 6.

2) Comment Letter -- Tentative Order No.R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu; submitted January 13, 2013; See Items 3 and 4, pages 4-6.

3) San Diego Regional Water Quality Control Board's Draft MS4 Permit: A case study; submitted May, 2013. See pages 3-8.

These documents are included as attachments to this comment letter.

CICWQ's membership is in the forefront of water quality regulation, providing to water quality regulators practical ideas and solutions that are implementable and that have as their goal clean water outcomes. If you have any questions or want to discuss the content of our comment letter, please feel free to contact me at (951) 781-7310, ext. 210, (909) 525-0623, cell phone, or mgrey@biasc.org.

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Respectfully submitted,

Mark Grey, Ph.D.
Technical Director
Construction Industry Coalition on Water Quality

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VIA E-MAIL

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January 11, 2013
Mr. Wayne Chiu, P.E.
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, Ca 92123-4340

Re: Comment Letter– Tentative Order No.R9-2013-0001, Regional MS4 Permit, Place ID: 786088Wchiu."

Dear: Mr. Chiu,

On behalf of Building Industry Association of Southern California, Inc. (BIASC), Construction Industry Coalition on Water Quality (CICWQ) and the members of both, we appreciate the opportunity to provide comments on the San Diego Regional Water Quality Control Board Tentative Order No. R9-2013-0001; NPDES No. CAS0109266, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems ("MS4s") Draining the Watersheds within the San Diego Region (the "Tentative Order"). In addition, we respectfully request that our comment letter submitted to the Regional Board on September 14, 2012 be made a part of our overall comments to the Tentative Order and admitted into the formal administrative record, because the constructive suggestions for permit improvement remain relevant at this point in the Tentative Order development.

BIASC is a nonprofit trade association representing nearly 1,000 member companies, which together have nearly 100,000 employees. For decades, BIASC's members have built the majority of the new homes in Ventura, Los Angeles, Orange, Riverside, and San Bernardino Counties in southern California. CICWQ is an education, research, and advocacy water quality coalition comprised of representatives from five industry trade associations (in addition to BIASC) which are involved in the development of public and private building, infrastructure and roads throughout California (Associated General Contractors, Engineering Contractors Association, Southern California Contractors Association, Engineering and General Contractors Association, and United Contractors). All of the above trade associations, their members and the union labor work force are affected by the post-construction runoff control requirements proposed in the Tentative Order, and this letter is meant to provide the San Diego Regional Board with constructive suggestions for improvement.

We appreciate the Regional Board's earlier release of a precursor to the Tentative Order as an Administrative Draft, and the extensive stakeholder involvement process that ensued over the summer and autumn of 2012. Unfortunately, the Tentative Order does not reflect critically important changes to the Tentative Order's Development Planning requirements which we and many other public and private stakeholders recommended, both during the focused stakeholder meetings and in comments submitted to the Regional Board. Moreover, Regional Board staff does not provide sufficient findings of fact to support the priority project water quality and hydromodification control design criteria and performance standards in the Tentative Order. The requirements proposed in the Tentative Order are vastly different from those contained in the 2010 South Orange and South Riverside County MS4 permits, and there is simply insufficient performance data to demonstrate the need for any change.

We are concerned that key water quality and hydromodification control provisions within the Development Planning section (Section C.3) are (i) unsupported by substantial evidence, (ii) very bad public policy, and (iii) not properly considered as legally required. Specifically, certain provisions: (i) lack sufficient auditing or performance data showing the need for or advisability of such requirements, (ii) lack technical or scientific basis, and (iii) depart without any justification from required and approved technical documents that have been issued by the San Diego Regional Board for priority development projects in San Diego, Orange, and Riverside Counties. In addition, the hydromodification control provisions illuminate the Regional Board's failure to consider the factors required by California Water Code section 13241 – especially subsection (b) thereof.

1. There are no findings of fact to support changes in the requirements to evaluate, design and install LID BMPs (Section E.3.c) when comparing the proposed requirements in the Tentative Order with that of the requirements in the 2010 adopted South Orange and South Riverside County MS4 permits.

The Orange and Riverside County permits have been in effect for a short period of time (<2 years); and there is no data (program audits or annual report data, for example) that we can find that would support any changes to priority development project water quality control design criteria (found in Section E.3.C of the Tentative Order). Moreover, in one particular instance concerning which we and others have repeatedly commented to Regional Board staff, there is no technical justification provided by staff for requiring biofiltration LID BMP to be sized at 1.5 times the remaining design capture volume not reliably retained on-site. Section E.3.c.(3)(b)(i)[c] requires that if biofiltration is used as an alternative compliance method the biofiltration BMP is required to be sized to 1.5 times the design capture volume, which is an increase from the existing South Orange County permit. The permit and the fact sheet provide no technical justification for the 1.5 factor and therefore this requirement should be deleted from the permit. BIASC and CICWQ comment letter submitted to the Regional Board on September

14, 2012 and attachments including suggested permit redline remains relevant in this matter. We have provided this here as Attachment1.

2. There are no findings of fact or supporting technical and scientific data indicating the need for changes in hydromodification control requirements for priority development projects.

As we have commented before, there needs to be (i) an in-stream hydromodification control performance standard using the erosion potential (EP) approach; and (ii) the permit must recognize that there are a number of different types of channel hardening that have been used for armoring in stream systems besides concrete. In Attachment 1, we again make suggestions for improving the consistency of hydromodification control standards with those identified and allowed in the South Orange County MS4 permit.

The Tentative Order provides an "on-site" option for addressing hydromodification through flow duration control. This is an important element of the hydromodification control standard. However the Tentative Order is incomplete in that it lacks an option to assess and demonstrate hydromodification control through in-stream metrics. In many cases, significant development within a watershed has already caused hydromodification impacts. Requiring project-by-project flow duration control for each new project may not address the existing issue as effectively as a regionally-coordinated approach that combines upland control with in-stream remedies. Including the EP standard—as BIASC and CICWQ urge--would enable the development of more comprehensive approaches that include both upland controls and stream modifications (i.e., restoration). This option is critical for more effectively and efficiently protecting the region's aquatic resources.

Additionally, the Tentative Order includes an unnecessarily narrow definition of hardened channels that includes only those channels lined with concrete. Other forms of artificial hardening may be comparably resistant to hydromodification impacts, such as channels that are lined with rip rap, armored with soil cement, or armored with other practices. While the co-permittees or the project proponent should be responsible for demonstrating that a specific channel material is sufficiently stable, the narrow definition currently provided by the Tentative Order does not allow the use of sound engineering judgment and does not allow for use of innovative materials.

The comment letter submitted by BIASC and CICWQ to the Regional Board on September 14, 2012 remains relevant here, as the Regional Board staff did not make any changes to the hydromodification control requirements except for minor exemption allowances for using USGB council's LEED for redevelopment program standards. Exemptions, generally, are welcome and appropriate. But, in practice, referencing a voluntary, national green building and

development certification program for use as part of a NPDES permit does not provide a viable pathway for most priority development projects that are located in already urbanized areas that are served by existing MS4 infrastructure. Exemptions identified in the adopted San Diego Hydromodification Management Plan are appropriate and should be cited and referenced in the Tentative Order, and any reference to USGB LEED standards deleted.

3. Preserve the 2010 adopted San Diego County Hydromodification Management Plan elements

The Regional Board staff has provided no technical justification for the new hydromodification provisions. The HMPs for San Diego and South Orange County are based on sound science and should be allowed time to understand if they are adequate for mitigating hydromodification impacts. The Regional Board adopted the San Diego Hydromodification Management Plan (HMP) in July 2010. Significant work, technical analysis and stakeholder input have gone into the development of the HMP and these requirements have been in effect for just 16 months. Rather than providing separate criteria, the permit should acknowledge implementation of the Regional Board approved HMP as a sufficient mechanism for meeting hydromodification requirements. Of particular note and concern is the removal of exemptions for certain priority development projects (projects in urban areas with greater than 70% existing impervious surface, for example) that discharge to an MS4 system that then discharges into a significantly hardened channel system. It is unquestionably bad public policy to require installation of controls (or payment of in-lieu fees to compensate for the inability to install controls) when there is no threat to the receiving water.

To this end--and for sake of brevity, we support and encourage the Regional Board to accept comments from Orange County Public Works which pertain to the hydromodification control requirements. Changes in permit language as indicated in the County's redline of the Tentative Order would sufficiently address our concerns about the tentative hydromodification control requirements, and we urge the Regional Board to accept these changes.

Regional Board staff has publically stated that the proposed hydromodification control requirements in the Tentative Order are consistent with the 2010 adopted HMP and that only minor adaptation is necessary. That assertion is simply not true and in fact adoption of the Tentative Order requirements will render the HMP obsolete and require a total overhaul. According to the County of San Diego and the co-permittees within the County (and private developer stakeholders), more than $1.5 million have been spent to date developing the plan and conducting required monitoring. By changing the performance standards, requiring hydromodification controls at all priority development projects, and removing standard exemptions that are found in all other 4th term MS4 permits in California, the Regional Board is sweeping away years of program development activities and turning program implementation on

its head. The Tentative Order should explicitly recognize the findings of hydromodification management plans (HMPs) that have been previously approved by this Regional Board. The South Orange County HMP and the San Diego County HMPs were both the products of rigorous technical analysis based on the state of the practice, which were reviewed in detail by Regional Board Staff. The findings of these efforts must not be jeopardized under the new terms of the Tentative Order. *S*pecifically, findings regarding exempt water bodies must be appreciated and upheld, and they should be explicitly recognized in the Tentative Order.

4. The Tentative Order's proposed hydromodification control measures betray the Regional Board's failure to take into account the considerations required by California Water Code section 13241

For years, BIASC and CICWQ have been urging the water boards when developing MS4 permit requirements to address and respect their longstanding legal obligation to take into account the six, specified, non-exclusive factors which are set forth in California Government Code section 13241. The water boards have persistently refused. Most recently (just months ago), the Los Angeles Regional Board dismissed its obligation to consider the Section 13241 factors by noting that it had, in fact, more or less considered two of them (economics and some technical considerations). If the Regional Board here were to adhere to such a position, it would act in violation of California law and without justification.

There is perhaps no greater example of a permit condition written pursuant to a failure to consider the Section 13241 factors than the hydromodification control measures in the Tentative Order – particularly those which impose heroic, expensive engineering standards on development that drains into hardened flood control channels. Section 13241, subsection (b), requires consideration of the "[e]nvironmental characteristics of the hydrological unit under consideration…." By imposing expensive hydromodification control measures even where a receiving flood control system is already firmly hardened, the Tentative Order ignores this Section 13241, subsection (b), factor (obviously so, and regrettably consistent with the Regional Board's general refusal to take into account all six Section 13241 considerations).

BIASC and CICWQ believe that the water boards' persistent refusal to take demonstrably and meaningfully into account the Section 13241 required considerations results from a mistaken view of the applicable law. Specifically, the water boards' seemingly hold to the belief that the "maximum extent practicable" standard in federal law absolves the state agencies of any obligation to apply Section 13241when issuing MS4 permits. If indeed the water boards' legal position is thus, then it reflects a mistaken view of the degree of "federalism" reflected in the Clean Water Act and its interplay with the California Water Code. Moreover, such a position would reflect a failure to apply basic "federal preemption principles," which apply any time a party claims that federal law displaces state law.

BIASC and CICWQ urge the Regional Board to reconsider and reverse its refusal to apply meaningfully all six Section 13241 considerations, and to correct the Tentative Order accordingly.

Concluding Remarks:

BIASC and CICWQ have been active participants and contributors to the creation of improved MS4 permits across southern California. We continue to believe that rational, *implementable*, and *effective* permit requirements are critical to achieving great progress concerning water quality and our environment. We hope that these comments are received in the manner in which they are intended – to create a workable permit that improves water quality to the maximum extent practicable. We remain committed to a positive dialog with the Regional Board and its staff – one that will result in an informed, balanced and effective permit.

If you have any questions or want to discuss the content of our comment letter, please feel free to contact me at (951) 781-7310, ext. 213, (909) 525-0623, cell phone, or mgrey@biasc.org.

Sincerely,

Mark Grey, Ph.D.
Director of Environmental Affairs and Technical Director
Building Industry Association of Southern California and
Construction Industry Coalition on Water Quality

Enclosures:
Attachment 1

cc. Andy Henderson, Esq., Building Industry Legal Defense Foundation

VIA E-MAIL

Building Industry Association of Southern California, Inc.

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September 14, 2012
Ms. Laurie Walsh, Senior Engineer
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, Ca 92123-4340

Re: ADMINISTRATIVE DRAFT REGIONAL MUNICIPAL SEPARATE STORM SEWER SYSTEM (Tentative Order No. R9-2012-0011)

Dear: Ms. Walsh

On behalf of the Building Industry Association of Southern California, Inc. (BIA/SC) and the Construction Industry Coalition on Water Quality (CICWQ) and the members of both, we appreciate the opportunity to provide comments on the Administrative Draft of the San Diego County Regional MS4 Permit (Administrative Draft Permit). We submit these comments in addition to and in support of comments made by our affiliate in San Diego County, the Building Industry Association of San Diego and its coalition partners, and comments submitted by Rancho Mission Viejo.

BIA/SC is a nonprofit trade association representing nearly 1,000 member companies, which together have nearly 100,000 employees. BIA/SC's members have, for decades, built the majority of the homes in Ventura, Los Angeles, Orange, Riverside, and San Bernardino Counties in southern California. CICWQ is a water quality coalition comprised of representatives from five industry trade associations (in addition to BIA/SC) involved in the development of public and private building, infrastructure and roads throughout California (Associated General Contractors, Engineering Contractors Association, Southern California Contractors Association, Engineering and General Contractors Association, and United Contractors). All of the above trade associations and their members and the union labor work force are affected by the post-construction runoff control requirements proposed in the Draft Permit, and this letter and supporting attachments are intended to provide the San Diego Regional Board staff with constructive suggestions for improvement.

We appreciate the Regional Board's release of the Administrative Draft Permit in April 2012, and the extensive stakeholder involvement process that ensued over the summer of 2012. The comments provided here are intended to further meet the permit's underlying objective of protecting and improving water quality within the watersheds administered by the San Diego Regional Board. Our comments, supporting attachments, and suggested redline permit language

modifications reflect years of working not only on MS4 permits issued by the San Diego Board, but other MS4 permits administered by the Los Angeles, Santa Ana, and San Francisco Bay Regional Water Quality Control Boards.

We have four primary concerns with the Administrative Draft Permit content and the following discussion summarizes those concerns and provides the technical basis for those concerns including supporting attachments:

1. **Administrative Draft Permit Provision E. 3.c.(2)(c) establishes a zero discharge standard for biofiltration-type LID BMPs that are designed with an outlet/underdrain. This type of LID BMP cannot meet the on-site design capture volume standard as it is written. Such a zero discharge standard is scientifically and technically unsound and unsupported.**

Biofiltration is an established LID BMP for use in attempting to mimic pre-development hydrology. The US EPA, in multiple guidance documents produced since 2006, have recognized the use of biofiltration-type systems such as curb contained biofilters, bioswales, rain gardens, and using landscape areas for impervious area disconnection as essential LID BMP elements to include in land development projects, a few of which are cited below. The inclusion of biofiltration BMPs in US EPA's menu is a reflection of the practical limitations to retention of stormwater – retention practices are not universally feasible or desirable. When appropriately selected and designed, biofiltration BMPs achieve high levels of pollutant removal, which may exceed pollutant removal achieved in retention BMPs, particularly in cases where retention BMPs are inappropriately applied.

The retention requirement is contrary to EPA's definition of LID because it disfavors development strategies designed to appropriately "filter" runoff, such as bioretention cells or other vegetated LID BMPs. There are five principal EPA documents regarding LID; and four of them identify the appropriate roles of biotreatment-type BMP, such as detention (i.e., slow down, treat through vegetation, and then release across property lines), filtration, and surface release of stormwater.

In a compilation of case studies by EPA, most of 17 exemplary projects included biotreatment elements, such as bioretention, swales, and wetlands. *See* U.S. EPA 841-F-07-006. Each of two case studies described in another EPA document (s*ee* Attachment 1 at pp. 1-2, EPA 841-B-00-005) included the use of underdrains, and the example in one of the two specifically fed into the MS4 system at issue. Another EPA document updated in January 2009 refers to the many practices used to adhere to LID principles of promoting a watershed's hydrologic and ecological functions, such as bioretention facilities and rain gardens. *See* Attachment 2 at p. 2, EPA-560-F-07-231 (describing "an under-drain system to release treated stormwater off site," permitting planted areas to "safely allow filtration and evapotranspiration of stormwater");

http://www.epa.gov/owow/nps/lid/ (fact sheet describing under-drains used to release treated stormwater off site and permitting planted areas to safely allow filtration of stormwater). Thus, EPA's literature and guidance clearly recognize the important and even necessary role that biofiltration/biotreatment approaches play in real-world implementation of LID principles.

The National Research Council, in their 2008 Report to Congress titled "Urban Stormwater Management in the United States" cite the use of biofiltration and bioretention systems in improving water quality and in attempting to mimic predevelopment hydrology at many different site contexts and locations across the United States. The 2008 NRC report contains and cites numerous examples of using biofiltration type systems to reduce runoff volume and pollutant loads. The 2008 NRC Report clearly recognizes the role that biofiltration systems play in the LID BMP feasibility and selection process, and in achieving runoff management goals. The report states "In some situations ARCD (Aquatic Resources Conservation Design) practices will not be feasible, at least not entirely, and the SCMs [stormwater control measures] conventionally used now and in the recent past (e.g., retention/detention basins, biofiltration without soil enhancement, and sand filters) should be integrated into the overall system to realize the highest management potential." Note that the NRC report definition of ARCD includes both retention and biofiltration elements.

From a management perspective, a review of 4th Term Phase I MS4 permits within California (San Francisco Bay Area, Sacramento Area, North and South Orange County, Western and Southern Riverside County, and San Bernardino County) shows that the use of biofiltration to meet water quality volume and flow control performance standards is clearly allowed (See matrices submitted by BIA/SC_CICWQ at the August 22, 2012 Stakeholder Meeting and provided to the Regional Board by Mark Grey on August 24, 2012). These Regional Boards in California recognize that biofilter-type LID BMPs are an integral component of applying site design principles which seek to mimic pre-development hydrology. Furthermore, these permits implement a clear LID BMP feasibility and selection process, one that first requires examination of on-site retention systems (infiltration, harvest and use, and evapotranspiration), before moving to the evaluation and potential selection of bioinfiltration (some infiltration achieved) and biofiltration systems. This feasibility evaluation hierarchy, which is clearly explained in the South Orange County and South Riverside County MS4 permits adopted by the San Diego Regional Board in 2009 and 2010, respectively, must be preserved and included in the next version of the Administrative Draft Permit.

In summary, the zero discharge standard established by the Administrative Draft Permit significantly narrows the definition of LID, which is contrary to US EPA guidance, the 2008 NRC Report, and the standards established in recently-adopted Permits by the San Diego Regional Board and other Regional Boards. In essence, the proposed provisions would establish a standard that (i) will be impracticable in a relatively large proportion of sites, and (ii) has not

been demonstrated to be necessary to protect receiving water quality. We provide in Attachment 3 suggested permit language to address the continued use of biofiltration.

2. **A mitigation requirement is established when using flow-thru biofiltration-type LID BMPs to manage that portion of the SWQDv that is not retained on-site. This requirement is inconsistent with all other adopted Phase I MS4 permits in California and nationally. Biofiltration and bioretention BMPs are established LID practices; requiring accompanying mitigation of SWQDv that has already been biofiltered penalizes and dis-incentivizes use of these controls.**

Equally problematic, because it does not allow biofiltration type LID BMPs to meet the on-site storm water quality design volume (SWQDv) standard, is the current requirement in Administrative Draft Permit Provision E. 3.c.(2)(c) to "perform mitigation for the portion of the pollutant load that is not retained on-site." In other words, the draft provisions would require that, if a project proponent cannot retain 100 percent of the SWQDv on-site, and must therefore use biofiltration LID BMPs (with a treated discharge), then the use and installation of these systems will trigger an off-site mitigation or in-lieu fee program participation requirement. This provision in the Administrative Draft Permit is technically unjustified, disfavors the use of all types of recognized biofiltration LID BMPs, and could theoretically require a project proponent to not only pay for the installation and O&M of a biofiltration LID BMP, but also require mitigation or fee payment for that portion of runoff managed by it.

Biofiltration BMPs including natural treatment systems such as those that are part of the Irvine Ranch Water District's Natural Treatment System in Orange County (a regional example) can remove vast quantities of pollutant load, and provide other benefits such as habitat, flood control, and aesthetic, recreational and educational value. To relegate multi-benefit biofiltration or biotreatment BMPs applied at a site scale to a status inferior to on-site retention BMPs is not justified on a water quality basis, and is poor public policy, essentially depriving the region of an extremely important and effective approach to managing water quality.

While we agree that project proponents should be required to retain stormwater where technically and economically feasible, there are numerous conditions beyond a project's control that make retention infeasible, undesirable and/or ineffective. For example, in achieving a zero discharge standard, it is necessary to either maintain pre-project ET (which is generally impracticable) or increase the volume of stormwater that is infiltrated (which is the common result). Over-infiltrating rainwater can have adverse consequences such as altering the natural flow regime of the receiving waters such that riparian habitat changes, mobilizing pre-existing contamination in shallow groundwater, increasing inflow and infiltration to sanitary sewers, causing damage from rising groundwater, and other potential effects. By discouraging the use of biofiltration LID BMPs where there are more appropriate than retention, the Administrative

Draft Permit irresponsibly encourages the use of retention where it may have adverse consequences.

Retention BMPs are not necessarily more effective than biofiltration BMPs as the Administrative Draft Permit implies, especially considering the back-to-back-to-back nature of storm systems that arrive in southern California during winter months and deliver the majority of total rainfall volume. The Administrative Draft Permit establishes a SWQDv that must be retained, but does not specify the time over which this volume must be drawn down (i.e., drained) in order to have capacity for the volume from subsequent storms. The rate at which the SWQDv can be drained is a function of the infiltration rates of soils and the demand for harvested water. Where soils are not sufficiently permeable and/or where harvested water demands are moderate to low, the drawdown time of retention BMPs can be in the range of several days to several weeks.

In comparison, biofiltration BMPs are designed with engineered soils that can generally drain the SWQDv much more quickly, on the order of several hours. In cases where retention opportunities are limited, this results in a higher level of capture and treatment by biofiltration BMPs than retention BMPs, which can more than offset the lower "treatment efficiency" afforded by biofiltration compared to full retention. For example, based on rigorous technical analysis contained in the Orange County Technical Guidance Document (Figure III.2, Page III-11), a hypothetical biofiltration BMP draining in 12 hours would achieve approximately 25 percent greater treatment of average annual stormwater runoff volume than an equivalently sized retention BMP that drains in 72 hours and approximately 60 percent greater treatment than a retention BMP that drains in 10 days.

Because drawdown time is an important factor in (i) assessing BMP effectiveness and (ii) evaluating the site-specific determination of whether retention or biofiltration are preferable, we strongly recommend (in addition to allowing the use of biofiltration or biotreatment systems to meet the retention standard) including a secondary performance metric of managing 80 percent of annual runoff volume using continuous simulation modeling. This provides a means of accounting for the performance of strictly on-site retention BMPs versus the addition of biofiltration or biotreatment BMPs which can be designed to manage a greater volume of average annual runoff volume than retention BMPs of the same size. The total amount of water captured and treated and associated pollutant load reduction should be a primary deciding factor in whether retention or biofiltration BMPs are selected for a given project. As written, the Administrative Draft Permit strongly discourages an entire group of effective practices which have the potential to provide better protection of water quality, when compared to retention, in a wide range of cases. Attachment 3 provides suggestions for permit language which corrects these deficiencies.

3. Hydromodification control measures should allow use of the EP method to meet in stream standards; recognize multiple types of channel hardening when evaluating applications for hydromodification control exemptions

In Attachment 3, we also make suggestions for improving the consistency of hydromodification control standards with those identified and allowed in the South Orange County MS4 permit. Specifically, we recommend providing for an in-stream hydromodification control performance standard using the erosion potential (EP) approach and recognizing that there are a number of different types of channel hardening that have been used for armoring in stream systems besides concrete.

The Administrative Draft Permit provides an "on-site" option for addressing hydromodification through flow duration control. This is an important element of the hydromodification control standard. However the Administrative Draft Permit is incomplete without an option to assess and demonstrate hydromodification control through in-stream metrics. In many cases, significant development within a watershed has already caused hydromodification impacts. Requiring project-by-project flow duration control for each new project may not address the existing issue as effectively as a regionally-coordinated approach that combines upland control with in-stream remedies. Including the EP standard enables the development of more comprehensive approaches that include both upland controls and stream modifications (i.e., restoration). This option is critical for more effectively and efficiently protecting the region's aquatic resources.

Additionally, the Administrative Draft Permit includes an unnecessarily narrow definition of hardened channels that includes only those channels lined with concrete. Other forms of artificial hardening may be comparably resistant to hydromodification impacts, such as channels that are lined with rip rap, armored with soil cement, or armored with other practices. While the Permittees or the project proponent should be responsible for demonstrating that a specific channel material is sufficiently stable, the narrow definition currently provided by the Administrative Draft Permit does not allow the use of sound engineering judgment and does not allow for use of innovative materials.

Finally, the Administrative Draft Permit should explicitly recognize the findings of hydromodification management plans (HMPs) that have been previously approved by this Board. The South Orange County HMP and the San Diego County HMPs were both the products of rigorous technical analysis based on the state of the practice, which were reviewed in detail by Board Staff. The findings of these efforts must not be jeopardized under the new terms of the Administrative Draft Permit. Specifically, findings regarding exempt water bodies must be appreciated and upheld, and they should be explicitly recognized in the Administrative Draft Permit per our suggested redline.

4. The Permit must preserve important provisions for watershed level design and implementation of LID BMPs.

The proposed development project criteria and requirements in the Administrative Draft Permit do not include the language in the current South Orange County Permit that provides for Alternative Compliance for Watershed-Based Planning (See page 40-41 of the 2009 Permit). We ask that the Regional Board continue to recognize the protections to water quality and enhancements to water bodies which are achieved through watershed-based projects such as the Rancho Mission Viejo Ranch Plan, as it has in the current South County MS4 permit, and define Watershed Planning as an alternative and co-equal approach to the project-specific requirements. Attachment 3 to this submittal contains suggested redline language for addition to the Administrative Draft Permit.

Concluding Remarks:

BIA/SC and CICWQ have been active participants and contributors to the creation of improved MS4 permits across southern California. We continue to believe that rational, *implementable*, and *effective* permit requirements are critical to achieving great progress concerning water quality and our environment. We hope that these comments are received in the manner in which they are intended – to continue the discussion of how we can create a workable permit that improves water quality to the maximum extent practicable. We remain committed to a positive dialog with the Board and its staff – one that will result in an informed, balanced and effective permit.

If you have any questions or want to discuss the content of our comment letter, please feel free to contact me at (951) 781-7310, ext. 213, (909) 525-0623, cell phone, or mgrey@biasc.org.

Sincerely,

Mark Grey, Ph.D.
Director of Environmental Affairs and Technical Director
Building Industry Association of Southern California and
Construction Industry Coalition on Water Quality

SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD DRAFT MS4 PERMIT: A CASE STUDY

Dennis Bowling, PE, MS; Mark Grey, Ph.D; Luis Parra, Ph.D, PE, MS, CPSWQ, ToR, D.WRE; Tory Walker, PE, CFM; Shawn Foy Weeden, GE, PE

On March 27, 2013, the San Diego Regional Water Quality Control Board (Region 9) ("RWQCB") released its Revised Tentative Order No. R9-2013-0001 (National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region) (hereafter, "Revised Draft Permit"). This article analyzes four components of the Revised Draft Permit, and identifies concerns with the Revised Draft Permit's treatment of those components based on the evidence that was before the RWQCB during its crafting of the Revised Draft Permit. The four components of the Revised Draft Permit are: hydromodification BMP requirements, the identification of a "pre-development" condition, Low Impact Development and the removal of pollutants in lieu of retaining stormwater onsite, and sediment transport requirements.

I. Hydromodification BMP Requirements

The Revised Draft Permit's Requirements

The Revised Draft Permit mandates that Copermittees require Priority Development Projects[1] to implement onsite Best Management Practices[2] ("BMPs") to manage hydromodification that may be caused by storm water runoff discharged from a project such that post-project runoff conditions must not exceed pre-development runoff conditions by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat downstream of Priority Development Projects). (Revised Draft Permit, Provision E.3.c.(2)(a).)

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[1] Priority Development Projects include: new development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site), or redevelopment projects that create or replace 5,000 square feet or more of impervious surface (collectively over the entire project site); new projects that create 5,000 square feet or more of impervious surface (collectively over the entire project site), and support restaurant, hillside development project, parking lot, or street, road, highway, freeway and driveway uses; new or redevelopment projects that create or replace 2,500 square feet or more of impervious surface (collectively over the entire project site), and discharge directly to an Environmentally Sensitive Area; new development projects that support use of an automotive repair shop or retail gasoline outlet, and new or redevelopment projects that result in the disturbance of one or more acre of land and are expected to generate pollutants post construction. (Revised Draft Permit, Provision E.3.b.(1))

[2] The Revised Draft Permit defines Best Management Practices as "Defined in 40 CFR 122.2 as schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage." (Revised Draft Permit, Attachment C, p. C-2.)

Copermittees have the discretion to exempt a Priority Development Project from Provision E.3.c.(2)(a)'s hydromodification management BMP performance requirements in three limited circumstances: where the project discharges storm water runoff to existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; where the project discharges stormwater runoff to conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific ocean; where the project discharges storm water runoff to an area identified by the Copermitee as appropriate for an exemption by the Watershed Management Area Analysis incorporated into the Water Quality Improvement Plan pursuant to Provision B.3.b.(4). (Revised Draft Permit, Provision E.3.c.(2)(d).) The Fact Sheet in support of the Revised Draft Permit ("Fact Sheet') states that, other than the projects exempted through the Watershed Management Area Analysis, the exemptions are considered appropriative because there is no threat of erosion to downstream receiving waters. (Fact Sheet, page F-102.)

The RWQCB describes its position regarding its ability to include the hydromodification management requirements in the Revised Draft Permit in its Response to Comments on Tentative Order No. R9-2013-0001 ("Response to Comments"). Specifically, the Board states that federal law mandates that MS4 permits require management practices that will result in reducing pollutants to the maximum extent possible. The RWQCB states that the Revised Draft Permit's requirement that Copermittees require Priority Development Projects to control post-project runoff flow rates and durations so that they do not exceed pre-development runoff flow rates and durations by more than ten percent is appropriate and necessary to reduce erosion and the discharge of pollutants into receiving waters. (Response to Comments, pages 43-45.) In response to concerns regarding the potential requirement of hydromodification management BMPs in instances where hydromodification would not take place, the RWQCB included in the Revised Draft Permit the exemption described above for projects that discharge to conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to the receiving waters. (*Id*.) The RWQCB, however, did not identify the extent to which such channels exist and would be a practical response to the challenge presented by complying with the hydromodification requirements in various venues.

In response to comments regarding the RWQCB's ability to regulate storm flow through hydromodification management requirements, the RWQCB states that the hydromodification management BMP requirements are for the control of pollutants in storm water discharges from the MS4. (Response to Comments, pages. 58-60.) While storm flow itself may be regulated as a result of the regulation of the pollutants within those flows, the RWQCB states that the hydromodification management BMP requirements are necessary to control the discharge of pollutants generated by new development and significant redevelopment projects in storm water discharges from the MS4 to the MEP. (*Id*.)

The Revised Draft Permit's Requirements are Unsupported

Both the Fact Sheet in support of the Revised Draft Permit and the RWQCB's Response to Comments cite to certain evidence that the RWQCB claims supports the hydromodification BMP requirements included in the Revised Draft Permit. However, as described below, this evidence

does not support the manner in which the RWQCB has incorporated hydromodification BMP requirements, particularly in regard to the Revised Draft Permit's failure to categorically exempt from compliance with the Hydromodification BMP requirements those projects that will discharge to a hardened channel that is not lined with concrete.

The Fact Sheet cites Assessing the Health of Southern California Streams, Stormwater Monitoring Coalition, Fact Sheet (Fact Sheet page F-89, Footnote 29[3]) ("SWMC Fact Sheet") in support of its claim that hydromodification is largely responsible for stream system degradation in San Diego County and that steam stressors including percent sands and fines present, channel alteration, and riparian disturbance are related to physical habitat changes caused by hydromodification. In the preparation of the SWMC Fact Sheet, more than 120 sites were sampled to provide data to make this determination, and the Southern California index of biotic integrity used to differentiate stream biological condition. The determination of relative degradation of stream (as compared to minimally disturbed reference sites) was made using a statistical method known as relative risk analysis. However, the SWMC Fact Sheet contains no discussion or presentation of the stream channel conditions found at the more than 120 sites used for the risk analysis.

Further, the SWMC Fact Sheet does not provide any data or support for modifying the existing hydromodification control requirements for significantly hardened channels defined in the 2007 version of the San Diego County MS4 Permit, or the process for obtaining a waiver from onsite compliance per the 2009 approved San Diego Hydromodification Management Program. The SWMC Fact Sheet describes an on-going study of Southern California streams and their biological characteristics relative to changes potentially caused by hydromodification. However, the SWMC Fact Sheet makes no distinction in stream susceptibility to hydromodification for those systems that are already significantly hardened. Accordingly, the SWMC Fact Sheet does not support any conclusions regarding the specific effects of or susceptibility to hydromodification on creeks, streams and associated habitats in San Diego County, or limiting the Draft Revised Permit's hydromodification exemption to only concrete lined channels.

The Fact Sheet cites Schueler and Holland, 2000, Storm Water Strategies for Arid and Semi-Arid Watersheds (article 66) The Practice of Watershed Protection (Fact Sheet page F-90, Footnote 30) to support its finding that increases in watershed imperviousness of 9-22% can result in increased peak flow rates and that these increased flow rates have an effect on channel morphology. This article describes climatalogical and hydrological variables that influence stormwater runoff generation in the arid west, in general, and provides recommendations for managing stormwater runoff using best practices to control pollutants in runoff and protect receiving waters from geomorphological changes. It does not include or address any issue related to already hardened channels systems or their susceptibility to the effects of hydromodification as a result of urban development.

[3] All references to footnotes within the Fact Sheet are in reference to the footnotes as they appear in the March 27, 2013 strikeout version of the Fact Sheet, recognizing that footnote references may change in the final version of the Fact Sheet.

The Fact Sheet cites Stein, E. and Zaleski S., 2005. Technical Report 475. Managing Runoff to Protect Natural Streams: The Latest Developments on Investigation and Management of Hydromodification in California. December 30, 2005. (Fact Sheet page F-90, Footnote 31) for the proposition that increases in uncontrolled imperviousness of as little as 3-10% can result in physical degradation of intermittent and ephemeral streams, and that stream systems in California are more susceptible to morphological changes than other areas in the US. However, the technical paper itself contains qualifying findings, not addressed by RWQCB in the Fact Sheet, concerning management of hydromodification effects. Specifically, Stein and Zaleski conclude that "not all streams will respond in the same manner [to the effects of hydromodification]" and that "Certain management strategies need to account for differences in stream type, stage of channel adjustment, current and expected amount of basin impervious cover, and existing or planned BMPs." (*Stein & Zaleski*, at page 15.)

Further, from a planning perspective, the authors of the technical report recommend that hydromodification should be addressed in both General and Specific Plans in terms of the location and design of new development, as site-by-site or project-specific approaches tend to be less effective and more costly to implement. (*Id.*, pages 11-12.) The authors go on to recommend that streams be surveyed and classified in order to identify areas with the greatest risk of impact from hydromodification. (*Id.*, page 15.) Taken collectively, these statements support recognition of the nature of channel condition in establishing the need for protection from hydromodification effects, which the Draft Revised Permit does not do. To rely on this article for support, the RWQCB would need to defer the proposed hydromodification provision to watershed specific implementation under each WQIP rather than the broad implementation proposed in the Draft Revised Permit.

The Fact Sheet further cites the USEPA, Reducing Stormwater Costs through Low Impact Development Strategies and Practices, December 2007 (Fact Sheet, page F-90 Footnote 32) to support the use of water quality and hydromodification control approaches using Low Impact Development ("LID") type controls, applied at a site scale regardless of receiving water or watershed condition. This USEPA study includes conclusions drawn from case studies done throughout the United States. The Fact Sheet cites the study to support and justify the development of hydromodification control requirements for all projects in San Diego County, yet the document does not include citation to specific evidence as to the need for or effectiveness of controls or whether they would be effective in the San Diego region as opposed to the specific case studies. The study highlights seventeen case studies of the implementation of LID principles into urban stormwater runoff management, with an emphasis on comparing the cost of installing LID BMPs to traditional or conventional stormwater management controls. However, there is no data or analysis presented concerning hydromodification; rather, LID principles are emphasized generally.

The Fact Sheet cites the website www.lowimpactdevelopment.org (Fact Sheet, page F-92 Footnote 34) in support of the Revised Draft Permit's use of the definition of Low Impact Development as crafted by the Low Impact Development Center, located in Maryland. However, this general citation offers no specific evidence or support other than to bolster the RWQCB's emphasis on LID BMPs applied at the site scale as a minimum compliance measure with MS4 permit conditions.

The Fact Sheet cites Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets (USEPA 2008) (Fact Sheet, page F-95 Footnote 38) to support the use of USEPA Green Streets Guidance to design and construct new roadways or significant roadway re-construction, which, if followed, allows project proponents to be exempted from Priority Development Project status. (Fact Sheet, pages F-94-F-95.) It is also cited in support of granting exemptions for construction of new or retrofit paved sidewalks, bicycle lanes, or trails that are designed to direct runoff to vegetated pervious areas (biofiltration systems, for example). According to the Fact Sheet, the exemptions are provided to "encourage these types of projects because they provide multiple environmental benefits such as promoting walking rather than driving, which will in turn improve air quality." (Fact Sheet, page F-94.)

However, the data in the publication do not address any specific requirement related to hydromodification control, but highlight the necessary consideration of the nature of the existing built environment encountered when building in urban areas. The publication's intent is clearly stated in its introduction: "This paper will evaluate programs and policies that have been used to successfully integrate green infrastructure into roads and right-of-ways." Integration of runoff controls into the context of the existing built environment is an essential consideration.

In fact, the logic cited by the RWQCB in the Fact Sheet in allowing exemptions for projects in dense urban areas that use green infrastructure techniques to the maximum extent practicable must be considered and extended to exemptions for hydromodification control when the ultimate receiving waters are significantly hardened using concrete or other armoring techniques. The Fact Sheet finds that by retrofitting the urban landscape with roadways using green infrastructure, it "recognizes that there are spatial constraints associated with these projects, and implementation of structural BMPs are not always feasible." (Fact Sheet, page F-95.) This recognition must be made equally with the need to consider or install hydromodification controls, especially when there is no threat to receiving water channel stability, and/or space constraints may preclude installation of large structural controls.

Housing, retail, and commercial development are now regulated to occur primarily in existing urban areas in order to concentrate population and employment in already dense or increasingly dense urban areas. *See* SANDAG 2050 Regional Transportation Plan, p.3-3 ["[The San Diego] region will meet or exceed [the SB 375] targets by, among other means, using land in ways that make developments more compact, conserving open space, and investing in a transportation network…"]; California Gov't Code § 65584.04(d)(2)(B) [California's metropolitan planning organizations are directed by SB 375 to consider the "availability of land suitable for urban development" -- including "opportunities for infill development and increased residential densities."]; California: A Primer on AB 32 and SB 375, Partnership for Sustainable Communities [an "[I]ncreasing the number of people living in cities and compact suburbs where transit and amenities are already in place may have a bigger impact on regional emissions, because those people will tend to walk to stores and take transit to work.".) Projects located in urban areas must comply with water quality LID treatment control requirements to the MEP, which will provide multiple environmental benefits, including improving receiving water quality for those runoff events up to the 85th percentile 24-hour storm. As urban areas are already served by hardened storm drain systems and flood control channels, there will be no effect on beneficial

uses in the receiving water from runoff greater than the water quality design capture volume. In fact, water quality would be expected to improve through the implementation of LID BMPs, and other benefits will be realized including decreases in traffic and associated pollutant load production, improved air quality through a reduction in vehicle traffic, and an overall increase in urban vegetation through the introduction of vegetated bioretention devices and urban street vegetation plantings as recommended in the Green Streets Guidance document.

Both the Fact Sheet and the Response to Comments cite E.D. Stein, F. Federico, D.B. Booth, B.P. Bledsoe, C. Bowles, Z. Rubin, G.M. Kondolf, A. Sengupta. Technical Report 667. Southern California Coastal Water Research Project. Costa Mesa, CA (2012) (Fact Sheet page F-101 Footnote 41; Response to Comments, pages 171, 183-184). The Fact Sheet cites Technical Report 667 in support of the development and use of an Alternative Compliance Program for those Priority Development Projects that cannot manage the applicable hydromodification control volume onsite, and instead require an off-site location in order to provide equivalent control or in-lieu payments to a fund providing resources to upstream or across watershed boundary projects. (Fact Sheet, page 101.) In addition, the RWQCB's Response to Comments cites the Technical Report in response to stakeholder comments in support of the very limited granting of exemptions to Priority Development Projects for installing onsite hydromodification control.

An Alternative Compliance Program is an established element of fourth term Phase I MS4 permits in California. However, with respect to considering and granting limited hydromodification control exemptions as described in the Response to Comments, at pages 171, 183-184, and 190, the RWQCB misinterprets the Technical Report's findings and the findings of an underlying scientific study cited in the report, and it does not consider other important findings and statements made in the report to support consideration of such exemptions.

In responding to comments regarding Hydromodification BMP requirements, the RWQCB cites two of the Technical Report's findings to support the statement that it "disagrees conceptually that blanket exemptions should be granted to all redevelopment projects that discharge to hardened channels." (Response to Comments, pages 183-184). First, the Regional Board incorrectly cites the Technical Report's finding that "the exemption of many small projects from hydromodification controls can result in cumulative impacts to downstream waterbodies...." (Technical Report 667, page 26; see Response to Comments, pages 183 and 190) This finding was made relative to receiving waters that are known to be susceptible to the additive effects of hydromodification, not with specific respect to receiving waters that are already concrete lined or otherwise significantly hardened. Moreover, the quotation's placement in the report is (i) found within a discussion of watershed scale hydromodification management concepts (especially as it applies to known or potentially susceptible receiving waters), not with specific respect to receiving waters that are already significantly hardened, and (ii) within a specific discussion of how current management strategies in municipal stormwater permits apply hydromodification standards; the author's note that requiring LID at all projects is positive measure for hydromodification, but the RWQCB's citation to Technical Report 667 does not appear to acknowledge this point.

The RWQCB cites the Technical Report work done by Booth and Jackson (1997) in King County, Washington to support its position that blanket exemptions not be granted to Priority Development Projects. This peer reviewed article described work done in an area undergoing rapid urbanization in east King County, Washington, where stream hydromodification sensitivity to land development was being recognized and measured. The empirical underpinning of the article was the changes noted in watershed imperviousness as a result of land development and corresponding changes in receiving water geomorphology as a result of development induced hydromodification. The watersheds and streams draining those watersheds were predominately under forest cover (see Booth and Jackson (1997) Table 1), which is unlike any receiving water system in San Diego County, and the specific stream systems were "natural" in channel condition. The article did not mention or address watersheds containing hardened receiving water channels. The conditions described by Booth and Jackson (1997) are much different and not representative of the conditions experienced by projects being developed within urban areas served by already hardened channel systems, and therefore do not support the RWQCB's position.

Technical Report 667 addresses the fact that stormwater permits may offer exemptions "for projects discharging to hardened channels or waterbodies," and cautions that "these exemptions may not be supportive of future stream restoration possibilities." Yet, its authors hedge such statements by stating that "a further limitation of the current permit structure is that there is no consideration of project characteristics such as position within the watershed and sensitivity of the receiving water reach....." (Technical Report 667, page 26.)

Second, the RWQCB repeatedly quotes Technical Report 667's finding that "an effective management program will likely include combinations of onsite measures (e.g., low-impact development techniques), in-stream measures (e.g., stream habitat restoration), and off-site measures. Off-site measures may include compensatory mitigation measures at upstream locations that are designed to help restore and manage flow and sediment yield in the watershed." (Technical Report 667, Page 26; see Response to Comments, pages 171, 184, 190; Fact Sheet, Page F-101).

The RWQCB cites to this quote to (i) support inclusion of the Alternative Compliance Program (Response to Comments, page 171), and (ii) support granting limited exemptions to Priority Development Projects for hydromodification control (Response to Comments, pages 184 and 190). While it is true that alternative compliance options should exist for those projects that drain to receiving waters known or believed to be susceptible to hydromodification effects, it is inappropriate to consider such options for projects that drain to already hardened channel systems because there is no threat, now or in the future, to downstream beneficial uses as a result of redevelopment. There is no scientific or technical nexus between the impact on the receiving water and the need for control. At worst case, any redevelopment project qualifying as a Priority Development Projects will contribute at least the same amount of runoff to the receiving water and likely much less if LID BMPs are feasible for implementation.

In the same section of comprehensive approaches to hydromodification management described in Technical Report 667 from where the quotation is derived, Technical Report 667's authors state that "the variety of types and conditions of receiving waters should result in a range of

requirements. This also means that objectives, and the management strategies employed to reach them, will need to acknowledge pre-existing impacts associated with historical land uses." The RWQCB must also consider this type of information in establishing appropriate exemptions for already hardened channel systems in urban areas within its jurisdiction.

The Revised Draft Permit's treatment of hydromodification management BMPs represents a significant change from the Final Hydromodification Plan for San Diego County, dated March 2011 ("San Diego HMP"). For redevelopment projects, these performance requirements are more stringent than the performance requirements of the San Diego HMP because they require evaluation of pre-development runoff conditions rather than pre-project runoff conditions.[4] Pre-development runoff conditions are defined as approximate flow rates and durations that exist or existed onsite before land development occurs. (Revised Draft Permit, Attachment C, page C-9.) For redevelopment projects, this equates to runoff conditions from the project footprint assuming infiltration characteristics of the underlying soil, and existing grade (i.e., using the parameters of a pervious area rather than an impervious area).

For many redevelopment projects, the difference between pre-development conditions and pre-project conditions is significant. This would require redevelopment projects on sites that are fully built to size hydromodification management BMPs as large as they would have been sized for a new development based on an estimate of the pre-project condition, yet they must be fit within the constraints of an already developed site. Furthermore, the change from a pre-project condition to pre-development condition requirement effectively invalidates some of the potential exemptions that certain redevelopment projects could have applied for under the approved San Diego HMP. Those approved exemptions could have facilitated the redevelopment process, encouraging redevelopment over new development. The exemptions are reasonable and are supported by extensive science and evidence. For example, under the San Diego HMP, projects that reduce impervious areas and reduce 2-year and 10-year peak flows to all outlets would be exempt. This exemption was a simple way to encourage redevelopment by removing the significant burden of hydromodification management BMPs, while achieving a net improvement to the watershed. Under the Revised Draft Permit, if adopted, this exemption would be effectively invalidated by the requirement to consider pre-development condition instead of pre-project condition because no project can reduce imperviousness below a pre-development condition. (Brown and Caldwell, Final Hydromodification Management Plan, prepared for County of San Diego, California, January 13, 2011.)

The other San Diego HMP exemption that may be invalidated or made more difficult to achieve by the Revised Draft Permit requirement to consider pre-development condition is its urban infill exemption. In the case of the urban infill exemption, a considerable effort was expended by the Copermittees, the San Diego HMP consultant, and the Technical Advisory Committee to prepare a cumulative impacts analysis to determine the thresholds and criteria for this exemption, and it was approved by the RWQCB as part of the San Diego HMP.

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[4] The State Water Resources Control Board recently concluded that determining pre-development conditions and using them as the baseline was not feasible at this time. (See e.g. SWRCB California Department of Transportation Municipal Separate Storm Sewer System (MS4) Permit Comment Response Report (April 27, 2012), at page 4.).

The Revised Draft Permit also presents a list of criteria for exemptions from hydromodification management BMP performance requirements. (Provision E.3.c.(2)(d)) This list of criteria omits certain exemptions that were included in the RWQCB's 2007 MS4 permit, pursuant to Order No. R9-2007-0001. Exemptions available under R9-2007-0001 that are not included in the Revised Draft Permit are: channels that are "significantly hardened (e.g., with rip-rap, sackcrete, etc.)" (note this means channels hardened with materials other than concrete – channels that are concrete lined to the Ocean will still be exempt), and projects where "the sub-watersheds below the projects' discharge points are highly impervious (e.g., >70%) and the potential for single-project and/or cumulative impacts is minimal." The list also does not include exempt river reaches that were approved as part of the Final HMP dated March 2011 (portions of Otay River, San Diego River, San Dieguito River, San Luis Rey River, and Sweetwater River). These exemptions were based on extensive studies. (*See* Brown and Caldwell, Final Hydromodification Management Plan, prepared for County of San Diego, California, January 13, 2011.) While the Revised Draft Permit does not preclude these previously exempt channels, rivers, or highly impervious watershed areas from being exempt under a Water Quality Improvement Plan (WQIP), it requires a complete new analysis ("Watershed Management Area Analysis" defined in Provision B.3.b.(4)(a)), and vetting through the public review and approval process of the WQIP in order to re-establish the exemptions through the WQIP. Copermittees, the San Diego HMP consultant, and the Technical Advisory Committee have already expended considerable efforts to identify criteria for exempt river reaches. The Revised Draft Permit does not identify any evidence that supports this change. Copermittees should not have to prepare a new study to maintain these exemptions, as they have already been reviewed and approved during the development of the San Diego HMP.

Finally, pursuant to Provision E.3.(d) of the Revised Draft Permit, the updated performance requirements for hydromodification management BMPs must be incorporated into the BMP Design Manual (formerly Standard Urban Stormwater Mitigation Plan). Based on Provision F.2.b, this will be due three months following approval of the WQIPs. Pursuant to Provision E.3.d, until a Copermittee has updated its BMP Design Manual, the Copermittee must continue implementing its current BMP Design Manual. On this basis, until the BMP Design Manual is updated and implemented, a pre-project condition rather than pre-development condition will be the standard for curve-matching to meet the San Diego HMP criteria, and all exemptions currently available in the approved San Diego HMP will remain available. New HMP exemptions may be created where appropriate through the WQIP process.

II. **Hydromodification Baseline: Pre-Development Runoff Conditions**

The Revised Draft Permit's Requirements

The Revised Draft Order requires that post-project runoff conditions mimic "pre-*development* runoff conditions", as opposed to pre-*project* runoff conditions. (Revised Draft Order, Provision E.3.c.(2)(a); Fact Sheet, p. F-99.) The Revised Draft Order defines Pre-Development Runoff Conditions as "Approximate flow rates and durations that exist or existed onsite before land development occurs. For new development projects, this equates to runoff conditions immediately before project construction. For redevelopment projects, this equates to runoff conditions from the project footprint assuming infiltration characteristics of the underlying soil,

and existing grade. Runoff coefficients of concrete or asphalt must not be used. A redevelopment Priority Development Project must use available information pertaining to existing underlying soil type and onsite existing grade to estimate pre-development runoff conditions." (Revised Draft Permit, p. C-8.)

The RWQCB stated, without evidence, that using a hydrology baseline that approximates that of an undeveloped, natural watershed is the only way to facilitate the return of more natural hydrological conditions to already built-out watersheds, and ultimately improved stream health, and that using pre-*project* hydrology as a baseline for redevelopment projects would result in propagating the unnatural hydrology of urbanized areas, which would not support conditions for restoring degraded or channelized stream segments. Furthermore, reducing the volume of storm water runoff associated with the urbanized flow regime will also result in reducing the discharge of pollutants into receiving waters, since storm water runoff from impervious surfaces contains untreated pollutants. (Fact Sheet, page F-99.)

The Revised Draft Permit indicates that the RWQCB understands that approximating the pre-development runoff condition associated with a redevelopment site is not straightforward because factors such as natural grade and native vegetation for the site cannot be precisely known. (Fact Sheet, page F-99) For this reason, the RWQCB expects project designers and the Copermittees to approximate pre-development runoff conditions using existing onsite grade and assuming the infiltration characteristics of the underlying soil. (Fact Sheet, pages F-99 – F-100). Redevelopment projects are to use available information pertaining to existing underlying soil types (such as soil maps published by the National Resource Conservation Service), onsite existing grade, and any other readily available pertinent information to estimate pre-development runoff conditions. (*Id*.) The RWQCB asserts that an area's pre-development hydrology can only be roughly estimated and cannot be precisely known, but that using the hydrology of a natural condition, even if not precisely known, will provide significant benefit to receiving waters over using the hydrology associated with developed surfaces. The RWQCB finds that in order to achieve the goals of the Clean Water Act to "restore and maintain the chemical, physical, and biological integrity of the nation's waters [emphasis added]," the most appropriate standard to use for hydromodification management is the standard associated with the pre-development condition. (Fact Sheet, pages F-99-F-100.)

The Revised Draft Permit's Requirements are Unsupported

The RWQCB's findings in support of these hydromodification requirements are contradicted, however, by the California State Water Resources Control Board's ("SWRCB") statements as part of the 2012 renewal of the California Department of Transportation's multiple separate storm sewer system permit. In its April 27, 2012 response to comments regarding hydromodification, the SWRCB stated that the use of a "pre-development" standard for hydromodification is not feasible at this time. (See SWRCB California Department of Transportation Municipal Separate Storm Sewer System (MS4) Permit Comment Response Report (April 27, 2012), at page 4.) Specifically, the Board stated:

> It is not possible to develop a mutually agreed-upon standard for pre-development hydrology without a lengthy stakeholder process.

> One of the biggest complicating factors is that our hydrology has been significantly altered by the addition of dry weather flows, sometimes in volumes that are 3-5 times the volume of stormwater flows. Biocriteria need to be developed for the state and the ecological limits of flow alteration that can be tolerated and still have some favorable biological outcome need to be determined. This is still 5-10 years away. The pre-project standard is appropriate at this time.

The RWQCB should not take action to implement an approach that the SWRCB has determined to be infeasible. (See United States v. California (SWRCB) (1986) 182 Cal.App.3d 82, 109.)

III. LID and Onsite Retention of Stormwater

The Revised Draft Permit's Requirements

The Revised Draft Permit modifies its prior provisions relating to structural BMP performance requirements for Priority Development Projects, requiring that those projects implement onsite structural BMPs to control pollutants in storm water that may be discharged from a project. Specifically, under Provision E.3.c.(1)(a) of the Revised Draft Permit, Priority Development Projects are required to implement Low Impact Development (LID) BMPs that are designed to retain onsite 100 percent of the pollutants contained in the volume of storm water runoff produced from a 24-hour 85th percentile storm event.[5] (Revised Draft Permit, p. 93.)

The Fact Sheet for the Revised Draft Permit indicates that the 85th percentile storm event is the design capture volume that has been used for treatment control BMPs previously, and that it is the MEP standard recognized by the RWQCB and is consistent with the Fourth Term MS4 permits for Los Angeles, Orange, Riverside and Ventura Counties. (Fact Sheet, page F-96.)

Under Provision E.3.c.(1)(a)'s onsite retention requirements, the designer of a Priority Development Project would select a system of BMPs that would retain onsite – through interception, storage, infiltration or evaporation – 100 percent of the pollutants in the 85th percentile storm event design capture volume. (See Fact Sheet, page F-97.) The Fact Sheet for the Revised Draft Permit states that such retention BMPs are necessary to capture and retain the pollutants generated from a Priority Development Project. (*Id.*) Pursuant to Provision E.3.c.(1)(b), in the event a Priority Development Project determines that onsite retention is not

[5] The Revised Draft Permit describes a 24-hour 85th percentile storm event as follows: "This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals." (Revised Draft Permit, page. 93, former Footnote 27.)

feasible, it may utilize flow-through treatment control BMPs to achieve the equivalent pollutant load removal that would have been achieved if the design capture volume were fully retained onsite. However, "In any event, no matter what types of BMPs (or combination of BMPs) are chosen, 100 percent of the pollutants contained in the design capture volume must not be allowed to be discharged from the Priority Development Project." (*Id*.)

Finally, if onsite retention is found to be cost prohibitive or not to provide the water quality benefit to the watershed as would implementing BMPs elsewhere in the watershed, Provision E.3.c.(1)(c) allows for the use of a combination of onsite retention BMPs, and the implementation of an Alternative Compliance Program described in Provision E.3.c.(3).

The Revised Draft Permit's Requirements are Infeasible within the Region

As described below, the requirement is infeasible and not supported by evidence cited to in the Revised Draft Permit, the Fact Sheet that supports it, the RWQCB's Response to Comment, or elsewhere.

Infiltration is Largely Infeasible in Region 9

The soil types in Region 9, and particularly San Diego County, are likely infeasible for infiltration where stormwater could eventually reach the underground aquifer. More than 70 percent of the soil types found in San Diego County possess a Soil Hydrologic Group classification of C and D (USDA, 1973). A large majority of the land area possesses a classification of C or D (SANDAG, 2007) and soft/hard rock (CGS, 2007). Using infiltration as a preferred method of stormwater remediation county-wide, therefore, is unsupported. Clearly stated, in the appropriate soil type, infiltration is a preferred alternative. In the wrong soil type the results could be catastrophic. (See photos 1 & 2).

Photo 1 – La Jolla Landslide (Ardath Shale Formation, Claystone, Hydrologic Group D)

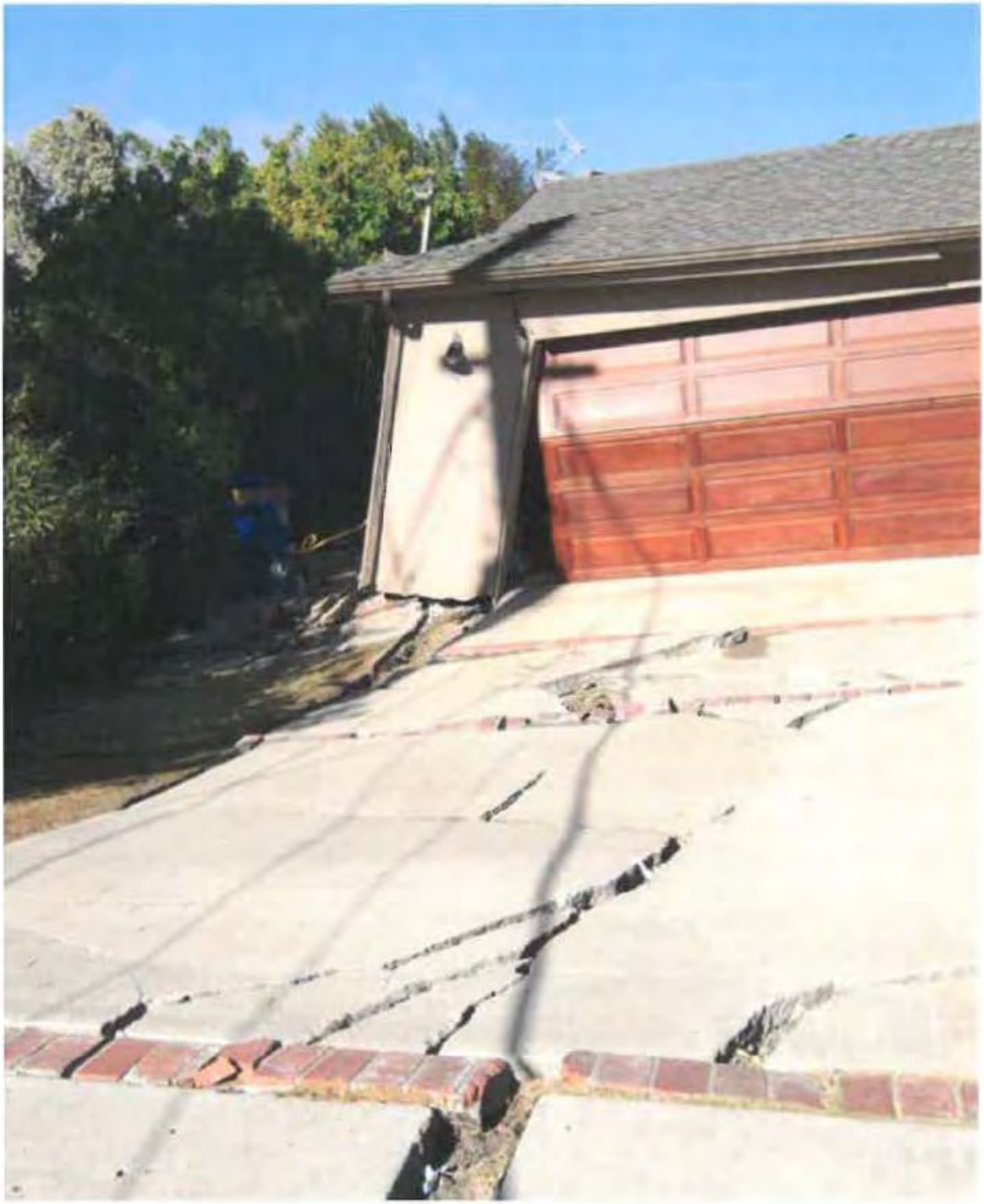

Photo 2 – La Jolla landslide (Ardath Shale Formation, Claystone, Hydrologic D)

For 70 years or more, both geotechnical engineers and civil engineers have designed projects to minimize water infiltration into the soils around and adjacent to buildings. A majority of geotechnical construction litigation is water intrusion related. (See Das, Braja M., Principles of

Geotechnical Engineering, 1994.) Water in clay based soils causes heaving, settling and failure of pavement, retaining walls and buildings. In extreme cases, these soils are prone to slippage, sinkholes or landslides. Additionally, when water enters these soil types it can travel laterally until it finds a utility trench, water or sewer line and then can undermine those systems. (Living with Expansive Soils, Marshall Addison, PhD. http://milliondollarstudent.com/ramjack/PDF/Living_with_Expansive_Soils.pdf; Low Impact Development Handbook, Stormwater Management Strategies, December 31, 2007, Page 39.) The water in these soils cannot infiltrate deep into the ground but moves as it can find voids and areas of better permeability. (Low Impact Development Handbook, Stormwater Management Strategies, December 31, 2007, Page 39.) (See photo 3, below.)

Photo 3 – Perched water visible on lower half of hillside (water migration)

Additionally, there are areas of the County where the soils are hard rock and infiltration cannot occur because water does not easily infiltrate into rock. (United States Department of Agriculture (USDA), Soil Survey, San Diego Area, California, December, 1973; SANDAG, County of San Diego Hydrology Manual Soil Hydrologic Group Map, 2007. California Geologic Survey (CGS), Preliminary Surface Geologic Materials Map, 2007.)

Since much of the construction within San Diego County is slab on grade construction, retaining water onsite through infiltration can even cause minor health and safety problems. Cured

concrete is still a porous material. If water is present in the soil, the slab can wick up water into the building (photos 4, 5 & 6). As buildings are well insulated and energy efficient, this water can lead to mold growth and damage anything placed on the slab (floor coverings, cabinets, furnishings). (Uniform Building Code, Title 24[6].) Water in a warm environment, without sufficient airflow exchange (because of better insulation, windows, etc.) provides the ideal conditions that lead to mold growth. This could create a major construction defect litigation problem for a builder or developer. Again, the geotechnical engineers and civil engineers have stressed the importance of moving water away from building as efficiently and quickly as possible for just this reason. (Building Code Requirements for Structural Concrete (ACI 318-08) and Commentary, American Concrete Institute [requires water barriers below slabs].) While ACI requires this, typically the entire footing doesn't receive a water barrier. Additionally, during construction the water barrier often may be punctured or moved and may not be as effective as called for in the ACI standard.

Photo 4- water migration through slab into cabinetry

[6] This section of the Uniform Building Code includes energy conservation measures, including requirements for better windows, improved weatherstripping, and additional insulation, which all lead to "tighter" and more energy efficient buildings. This is contrasted with older buildings, which "breathe" meaning that they have sufficient air flow to evaporate water wicking up through the slab before it becomes a problem. In newer buildings, water cannot evaporate and problem, such as mold, result.

Photo 5 – water migration through slab (mold under vinyl flooring)

Photo 6 – water migration through slab (white coating is efflorescence)

Retention and Re-use Requirements Raise Additional Concerns

Where onsite infiltration is not feasible, the next option is the capture and storage of stormwater for re-use. If a project will capture water in order to store it, a storage container must be constructed. Since an 85th percentile, 24 hour duration rain event can produce between ½" to ¾" of rainfall in a given area of San Diego (and up to 1-½" in mountainous areas, according to the 85th Percentile Precipitation Isopluvial Map of the San Diego County Hydrology Manual; see also http://www.projectcleanwater.org/html/wg_susmp.html), the amount of water to be stored could be considerable.

The Revised Draft Permit does not effectively address what happens with the retained water or how quickly it needs to be used, since the storage capacity would need to be utilized again for future rain events. Rain barrels are often mentioned as a solution, but care must be taken with regard to water breeding insects. Additionally, most commercially available rain barrels are made of plastic which degrades in the UV from sunlight. After a few years they become brittle and are prone to failure, putting water into the surrounding soils next to the building. Additionally, utilizing the optimum number of rain barrels is impractical, as it is too large to have a significant impact on water usage due to the erratic and clustered nature of the precipitation in San Diego County. According to a continuous simulation study prepared with hourly precipitation data of Lindbergh Airport in San Diego (the best precipitation data set in the County), the optimum rain barrel volume for retention purposes is about 12 – 50 gallon barrels for every 1,000 sq-ft of roof, using the theory of Diminishing Returns. (Parra, StormCon 2010.) Cisterns are another option mentioned as a potentially viable solution. Burying a tank in the ground may not be feasible for infill and redevelopment projects due to various Building Code issues.

Unintended Consequences

Both California AB 32 and SB 375 are landmark environmental laws addressing climate change and land use adaptation to reduce production of greenhouse gases. The intent of this legislation is to:

1. Use the regional transportation planning process to achieve reductions in greenhouse gas emissions consistent with AB 32's goals;
2. Offer California Environmental Quality Act incentives to encourage projects that are consistent with a regional plan that achieves greenhouse gas emission reductions; and
3. Coordinate the regional housing needs allocation process with the regional transportation process while maintaining local authority over land use decisions

The result is to encourage growth to occur inwards into the existing urban footprint. This is defined as "in-fill" development. An unintended consequence of the Revised Draft Permit is that its requirements actually make it more attractive and cost effective to build away from the existing urban footprint because of the land necessary to comply with the new requirements in the Revised Draft Permit. The 100% pollutant capture requirement and the removal of

hydromodification exemptions on infill development render these projects both technically and financially infeasible. (Refer to photograph 7.)

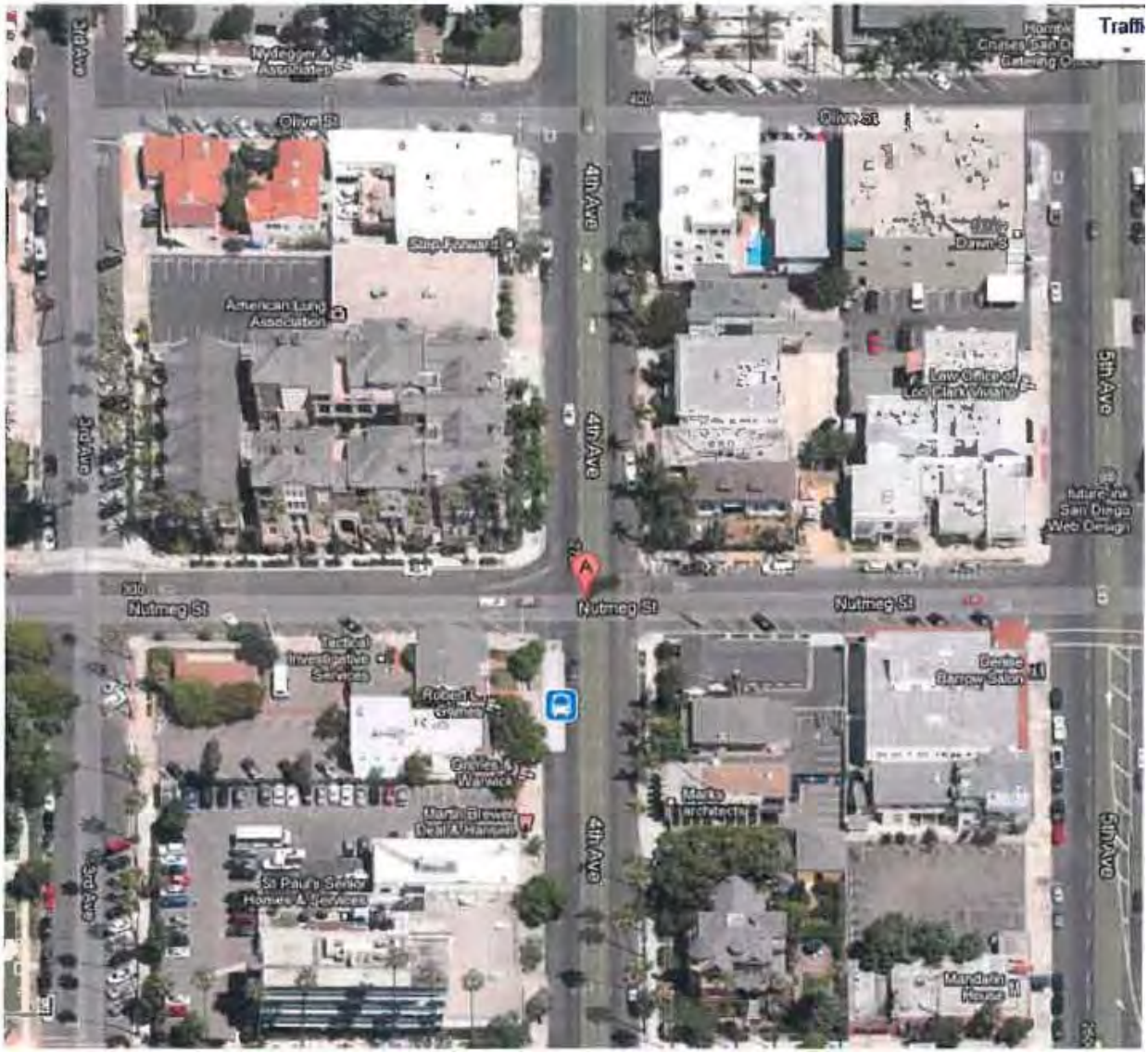

Photo 7 mid-rise condo project at the NW corner of 4th and Nutmeg, San Diego

Photo 7 shows a smart growth project on the northwest corner of 4th & Nutmeg in San Diego's highly urbanized Banker's Hill neighborhood: transit friendly (transit oriented development, TOD); walkable neighborhood; near parks, shopping and recreation (2 blocks from Balboa Park); near San Diego's airport; near Downtown/Hillcrest/Mission Valley work environments; and within the Smart Car (car 2 go) user footprint. Under the Revised Draft Permit, this project would become infeasible because of the 100% pollutant capture (infiltration/reuse) requirement and the loss of the hydromodification exemption previously included in the HMP.

The soil type at this location will not allow for infiltration. Additionally, to achieve the requisite density there is not enough land available to allow for supersizing of BMPs. There is no place to put a retention tank except under the building's parking structure. It may be infeasible to place a

tank under a building for a number of reasons: the difficulty or repairing a tank located below a building; the cost to integrate the tank into the building's foundation; if the tank were to leak, the entire building is subject to settlement issues, or failure, based on the water leaking into the surrounding soils; the added cost to operate and maintain the tank in perpetuity.

Photo 8 (street level) shows the building and that parking is located underneath the building. This is "podium" type construction and next to high-rise development, the most expensive type of construction for "smart growth" infill development. Complying with the Revised Draft Permit means this type of project becomes infeasible, both technically and financially. The Revised Draft Permit is silent on this issue and has not addressed this concern. The current language, whether intended or not, seems to eliminate this type of development project which is mandated and encouraged under SB 375.

Photo 8 – Street view: 4th and Nutmeg, San Diego (notice living units at ground level)

Whether or not water is infiltrated or stored onsite for reuse, the Revised Draft Permit includes no consideration of the fate of the pollutants existent in that water. In a storage tank or cistern, like a septic tank, gravity will cause most of the pollutants to fall to the bottom of the tank where they will remain and build up. Over time, the tank would gather year's worth of pollutants. If the tank owner is drawing the water for re-use, the water typically in any tank is drawn from the bottom, so the pollutants could be redistributed onsite. This raises questions of whether compliance with the Revised Draft Permit requirements would cause a health and safety concern to the person re-using the water, how often such a tank or cistern be emptied for cleaning, whether the mass of pollutants at the bottom of the tank would be considered a regulated waste,

and how and where a property owner could dispose of such a waste. An infiltration trench or basin would have the same pollutant disposal issues. The media (soil, sand gravel, etc.) in the trench or basin would need to be excavated and disposed of.

Another major concern with the new permit standard (infiltration or retention) is that it will deprive watersheds of the water that feeds riparian ecosystems. As the Revised Draft Permit offers creek and stream restoration or rehabilitation as an alternative compliance option to onsite hydromodification management, this raises the question of how can one restore those watercourses without the water that supplies them. (33 U.S.C. §1251(a) [the Clean Water Act was enacted "to restore and maintain the chemical, physical, and biological integrity of Nation's waters"].)

The Revised Draft Permit Includes no Support for the Ability to Comply with its Requirements

As described above, the phrase "retain onsite 100% of the pollutants" was recently added to the water quality management performance standard contained in the Revised Draft Permit (San Diego Regional MS4 permit Section E.3.c.(1)(a)). Unless a Priority Development Project can infiltrate the entire design capture volume, or reliably use the runoff collected in a harvest and use cistern system, retention of 100% of pollutants is impossible, and this is especially true for several pollutants of concern including bacteria or nutrients such as nitrogen or phosphorus.

The Revised Draft Permit offers no technical support for such a standard, including studies or data cited in the Fact Sheet, Response to Comments, or otherwise, that demonstrate 100% of pollutant can be prevented from being discharged from Priority Development Projects into the MS4 and into receiving waters. On the surface, such a requirement is conceptually feasible: no discharge equals no pollutants. However, the selection and application of retention type LID BMPs, principally soil infiltration systems and rainfall harvest and use systems, are subject to a myriad of technical infeasibility constraints, of which the RWQCB and others have identified (See for example, Orange County Model WQMP requirements and supporting Technical Guidance Document--TGD). In the absence of feasible application of infiltration or harvest and use, such a standard is unachievable. Rather, Regional Boards in California use water quality treatment design criteria that require project proponents to demonstrate that it cannot reliably retain 100% of the storm water quality design volume onsite before allowing the proponent to use biofiltration or biotreatment type LID BMPs. Only until the feasibility of these systems is exhausted may the proponent be allowed to use other types of management practices.

In the discussion in the Staff Report regarding justification for using the runoff created by the 24-hr 85th percentile rainfall event as the basis for a project's design capture volume, the RWQCB cites a Southern California Coastal Water Research Project ("SCCWRP") report prepared in 2007. This report includes findings that show the majority of pollutants from urban locations in the Los Angeles area of southern California arrive in receiving waters during the "early" part of storm events, and that the "highest constituent loading was observed early in the storm season, with inter-annual variability driven more by antecedent dry period that amount of rainfall."

The SCCWRP 2007 report also found that the "first flush" effect at land use sites was a function of watershed size. In other words, the smaller the watershed, the more pronounced the first flush

effect. Therefore, the author's note that "capturing constituent loads should focus on more than just the initial portion of the storm at moderate to large catchments". This statement, therefore, supports using the entire suite of LID type BMPs to manage urban runoff, including biofiltration systems, and supports using a secondary metric of sizing LID BMPs for retaining and treating 80% of the annual runoff volume in addition to capturing and treating individual rainfall events. In no case or instance cited in the SCCWRP 2007 report is there a recommendation or finding that supports a retention standard that achieves 100% pollutant containment. The aforementioned Orange County Model WQMP and TGD describe the LID BMP selection process and sizing criteria in detail (using both the 24-hr 85th percentile design storm and 80% annual runoff volume as sizing metrics), and provide several case study examples for support.

Such a restrictive and narrow definition of allowable LID BMPs is inconsistent with U.S. EPA guidance which promotes biofiltration and biotreatment as part of LID. Of five U.S. EPA sources regarding LID, four included biotreatment-type terms, such as detention (i.e., slow down, treat, then release), filtration, and surface release of storm water. In a compilation of case studies by U.S. EPA, most of 17 exemplary projects included biotreatment elements, such as bioretention, swales, wetlands, and green roofs. *See* U.S. EPA 841-F-07-006, discussed in a 2009 submittal from Mr. Eric Strecker, Geosyntec Consultants for the Construction Industry Coalition on Water Quality. In Mr. Strecker's analysis, each of two case studies described in another EPA document, s*ee* EPA 841-B-00-005, included the use of under-drains, and one of them specifically fed into the main storm drain system. A U.S. EPA document updated in January 2009 references additional resources, one of which refers to the many practices used to adhere to LID principles of promoting a watershed's hydrologic and ecological functions, such as bioretention facilities, rain gardens, vegetated rooftops, rain barrels, and permeable pavements. *See* EPA-560-F-07-231. A fact sheet used in conjunction with that document describes under-drains used to release treated storm water off site, permitting planted areas to safely allow filtration of storm water.

The State Water Resources Control Board (SWRCB) identifies LID as a sustainable practice that benefits water supply and contributes to water quality protection, stating that, "The <u>goal</u> of LID is to mimic a site's predevelopment hydrology by using design techniques that infiltrate, <u>filter</u>, store, evaporate, and <u>detain</u> runoff close to the source of rainfall" (emphasis added). SWRCB also states that, "LID practices include; <u>bioretention</u> facilities or rain gardens, grass swales and channels, vegetated rooftops, rain barrels, cisterns, vegetated filter strips, and permeable pavements" (emphasis added). As can be seen, SWRCB defines LID as including filtration, detention, and bioretention, and other practices, each of which produce runoff and would not be part of the LID standard under the tentative order and instead moves a project into "Alternative Compliance". In addition, SWRCB characterizes mimicking pre-development hydrology as a "goal," not an enforceable standard. *Found at*: http://www.waterboards.ca.gov/water_issues/programs/low_impact_development/.

The language in the current tentative Order, while clearly specifying a volume capture approach to sizing LID BMPs, introduces an incorrect definition of LID through restrictive application of BMPs to only those that infiltrate, harvest and use rainwater, and/or evapotranspire all of the captured water. In other words, permit language now requires that projects would be limited to zero discharge of a design storm volume with no runoff whatsoever allowed.

The US EPA defines LID as follows:

> *A comprehensive stormwater management and site-design technique. Within the LID framework, the goal of any construction project is* ***to design a hydrologically functional site that mimics predevelopment conditions.*** *This is achieved by using design techniques that infiltrate,* **filter***, evaporate, and store runoff close to its source.* (emphasis added)

http://cfpub1.epa.gov/npdes/greeninfrastructure/information.cfm#glossary .

Mandating the complete onsite retention of any sizable storm volume (i.e. runoff that never leaves as surface flows) is not a reasonable approach and the tentative Order attempts in places to redefine the allowable site design elements necessary to implement this concept. The tentative Order may implement LID in a way that is contrary to the EPA definition of LID by restricting BMPs to those that only achieve zero discharge—not allowing any BMPs that appropriately "filter" runoff, such as bioretention cells or other vegetated LID BMPs. Total, 100-percent retention remains impractical and unwise in most circumstances, and is not a goal that can be achieved for most projects within reasonable costs, despite best efforts. Moreover, such a mandate abandons the goal to mimic predevelopment conditions to the extent practicable, as EPA encourages.

The retention BMPs of infiltration, harvesting, and evapotranspiration ("ET") may be described as a first tier of LID BMPs, but they should not be universally mandated to the exclusion of all other options. As the EPA definition of LID indicates, biofiltration, bioretention, filter strips, and other BMPs based on using vegetation to promote stormwater treatment via filtration are fundamental to LID implementation. These BMPs may be specified as second tier options (although they best mimic pre-development conditions), but project proponents should have considerable discretion to use these BMPs, and should not be required to apply for a feasibility exception to do so.

The use of conventional BMPs (structural treatment installations) as the principal approach for stormwater management should be a last resort, available only when objective infeasibility criteria are satisfied, and when off-site opportunities are not readily available. When LID BMPs are infeasible, and nearby off-site options are not available, the use of conventional BMPs that have been demonstrated to be effective on the pollutants of concern should be a compliance option.

IV. Sediment Transport Requirements

The Revised Draft Permit's Requirements

The Revised Draft Permit requires Priority Development Projects to avoid known critical sediment yield areas or implement measures that allow coarse sediment to be discharged to receiving waters, such that the sediment supply is unaffected by the project. (Revised Draft Permit, Provision E.3.c.(2)(b).) The Revised Draft Permit does not define "coarse sediment"[7] as

[7] According to the technical literature, the beginning of sediment motion is not defined by the term "coarse sediment" but by more specific terms such as (1) Nearly Uniform Cohesionless

it is used in this section. The Fact Sheet supporting the Revised Draft Permit states that the requirement is necessary because coarse sediment supply is as much an issue for causing erosive conditions to receiving streams as are accelerated flows.[8] (Fact Sheet, page F-100.)

All development involves some loss of sediment. The Revised Draft Permit requires that "critical sediment yield areas" will be identified by studying the watersheds (through the Watershed Management Area Analyses[9]). These analyses would then be incorporated into the Water Quality Improvement Plans for each watershed. Thus, a new category of "Environmentally Sensitive Areas" will be identified and protected. This would be incompatible with development on that property. To understand why introducing a new category of sensitive area into the development planning process is such a concern requires an explanation of hydromodification basics and impacts on receiving waters.

Hydromodification Basics regarding Sediment Transport

Hydromodification is primarily understood within the context of impacts, potential or realized; that is, the effects of changes within a watershed on downstream fluvial systems (i.e., canyons, creeks, streams, rivers, lakes, lagoons, etc.). A change, or a number of changes, can cause or contribute to an imbalance within a fluvial system that has been in a state of dynamic equilibrium (relative stability within a range of erosivity/degradation and sedimentation/aggradation). Related secondary impacts (secondary as a consequence, not necessarily in importance) include habitat degradation, slope failures, infrastructure failures, and increased flooding risks, among others. (ADWR, 1996, 1998; USACOE, 1994).

The most common example of hydromodification is the covering of land with impervious surfaces, which deprives the waterways of naturally occurring sediment yield, while increasing runoff volumes, durations and peaks in those same waterways. Another example is the presence of a flood control dam upstream, which tends to trap sediment but also reduces damaging peak flows and volumes. (Aspen Environmental, 2006.) For the purposes of this paper, hydromodification will be understood as a direct consequence of urbanization, the covering over of land with impervious surfaces.

Sediment (Shields, 1936; Maidment, 1992), (2) Incipient Motion on Ripple and Dune Beds (Chabery et al, 1963; Mantz, 1977) ; Mixture of Nonuniform Cohesionless Sediment Sizes (Egiazoroff, Little and Meyer, Hayashi et al, among many others), and Cohesive Sediment (Mehta, (3 studies, 1986, 1989 and 1989)).

[8] This statement oversimplifies a complex issue, as in some watersheds, fine sands, dunes and ripples, and cohesive sediments can be an important geomorphic factor. (*See* Lane and Carson; Shen and Liu; Task Committee; previous studies).

[9] The Revised Draft Permit is silent as to the method to determine such critical yield areas, which could conceivably be established based upon the USLE equation (Wischmeier et al, 1971), by sediment-delivery ratio equations (Roehl, 1962), by sediment yield empirical formulas based on real measurements (Dendy and Bolton, 1976), or by more complex mathematical formulations (Ponce, 1989).

Understanding Fluvial Processes

Lane's Stream Balance Relationship states that dynamic equilibrium exists between stream power and the discharge of bed material sediment. (Lane, 1947.) It is usually stated as:

$$Q_s * D_{50} \alpha Q_w * S$$

Where Q_s is the sediment discharge, D_{50} is the sediment size, Q_w is the (water) discharge, and S is the bed slope. This proportional relationship is often graphically illustrated with a balance, as shown below, and it is not intended to be used as an equation. Some attempts to convert this relationship into an equation have been carried out. (Ponce, 1999.) The Lane relationship shows that where adjustments or modifications occur in the watershed or in the channel (in terms of Q_w, for example), another adjustment will begin to occur to preserve the equilibrium (in terms of S or Qs, for example).

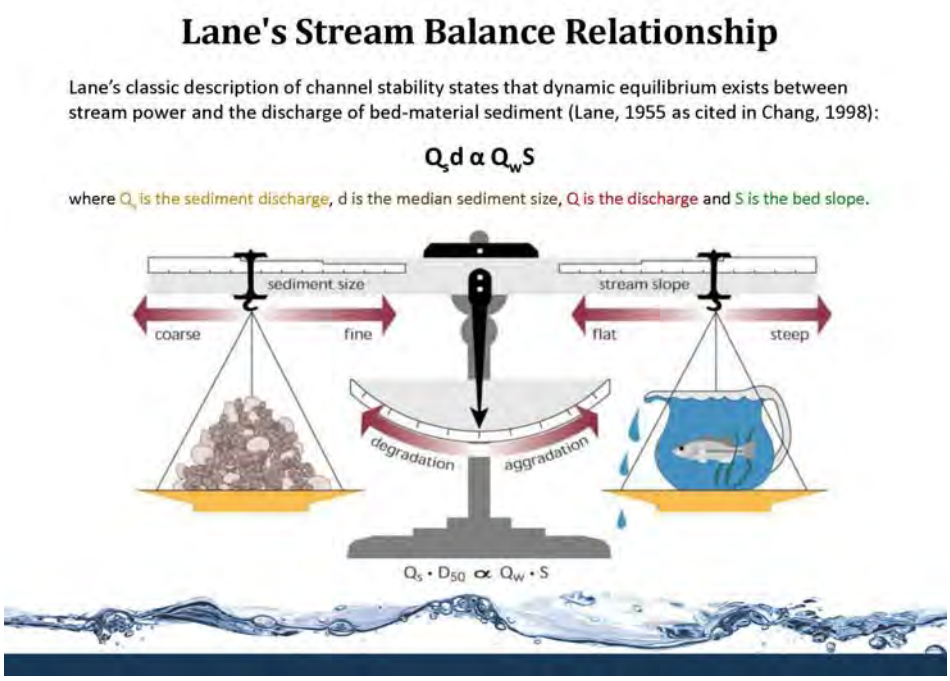

Three Local Examples

Hydromodification impacts vary, sometimes by orders of magnitude. (Hastings, 2005; Hecht, 2000.) The following three examples of fluvial systems within our region illustrate this well. Each is different, and each only represents one reach of the creek. As one travels upstream or downstream each of these creeks, impacts will vary widely.

<u>Oso Creek</u>

The photo below shows a portion of Oso Creek, approximately 1 kilometer (0.7 miles) downstream of a hardened channel. The severe degradation evident in this photo has occurred

within the past 20 years, due to development of a master planned community upstream. The composition of the bed and banks is primarily loose alluvium, so erosion has not been halted. The sediment from this reach is deposited in downstream reaches and has resulted in slope failures, biological degradation and flooding impacts downstream.

Oso Creek, approximately 1 kilometer (0.7 miles) downstream of a hardened channel

Escondido Creek

By contrast, the photo below indicates a creek in dynamic equilibrium 0.7 kilometers downstream of a hardened channel. The City of Escondido, incorporated in 1888, has certainly experienced its share of development, with most of the city draining to this natural channel for more than 100 years. This photo is typical of Escondido Creek for the remaining 23 kilometers (14 miles) to the ocean. That is not to say this creek is not subject to any degradation, only that over the decades the creek has mostly adjusted to a new state of dynamic equilibrium.

Escondido Creek in dynamic equilibrium 0.7 kilometers downstream of a hardened channel

Agua Hedionda Creek

The Agua Hedionda Creek watershed is in portions of several north San Diego jurisdictions. A 2008 Watershed Management Plan (TetraTech, 2008) identified a reach of the creek as a high priority project; Tory R. Walker Engineering, Inc. assembled a multi-disciplined team, which prepared a Preliminary Design Report for the rehabilitation of that reach. (Tory R. Walker Engineering, 2010.) The photo below illustrates the typical impacts of hydromodification within the reach, where an established Oak woodland is threatened.

Agua Hedionda Creek in Buena Vista Park near Melrose Avenue

The figures below illustrate the effects of hydromodification over time on hypothetical stream systems. (TRWE, 2010.)

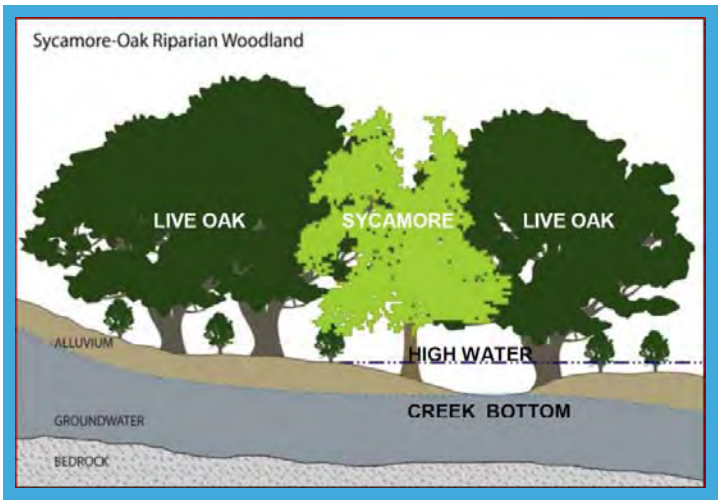

Stable System (circa 1900)

- High Groundwater Recharge
- Equilibrium Sediment Transport
- High Floodplain Function
- Low Discharge Velocities
- Dynamic and Broad Riparian Zone
- Diverse Riparian Habitat
- Sustainable Vegetation Mosaic
- Cool Seasonal Aquatic System

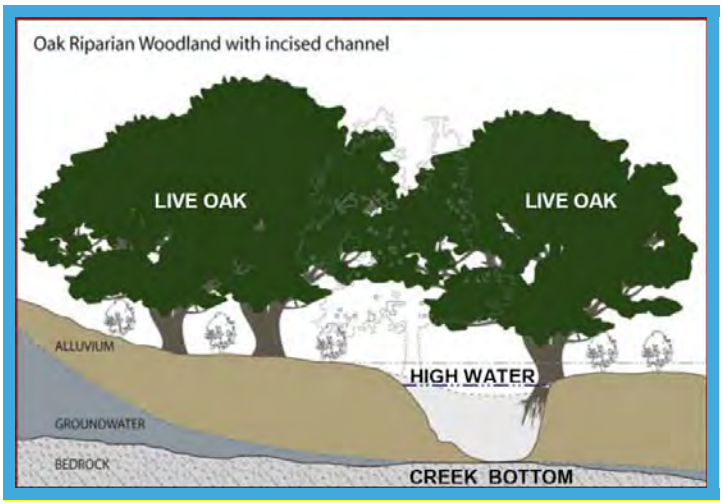

Early Incised System (Present)

- Depressed Groundwater Table
- High Groundwater Export
- Low Groundwater Recharge
- High Channel Bank Erosion
- Confined Low Floodplain Function
- High Discharge Velocities
- Diminishing Riparian Zone Width
- Low Diversity Riparian Habitat
- Poor Riparian Plant Recruitment
- Cool Seasonal/Perennial Aquatic System

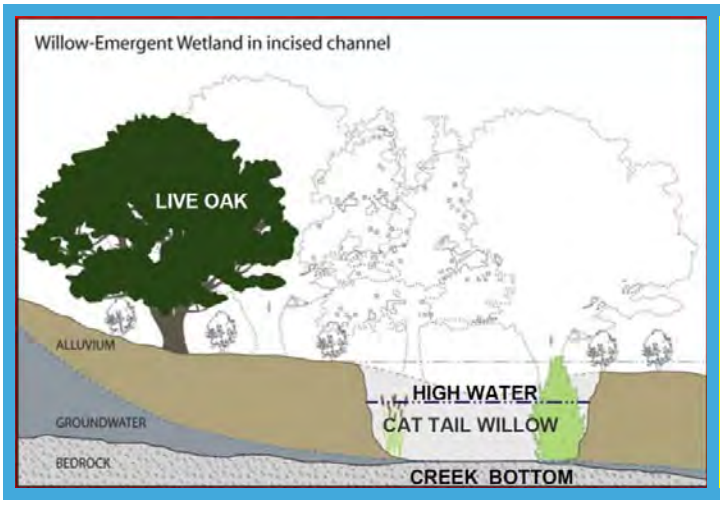

Mature Incised System (circa 2040)

- Groundwater Conditions Same as Now
- High Channel Bank Erosion
- Confined Low Floodplain Function
- High Discharge Velocities
- Diminishing Riparian Zone Width
- Low Diversity, Narrow Riparian Habitat
- High Scour Plant Loss
- Opportunistic Exotic Plant Recruitment
- Warm Seasonal/Perennial Aquatic System

Restoration of ecosystem functions that have been lost due to hydromodification may be accomplished through different mechanisms. The figure below illustrates two paths to the restoration of ecosystem functions over time – with and without human intervention to restore the lost functions. The shorter length of the "blue path" demonstrates the value of restoration/rehabilitation in a creek, whereas the length of the "red path" shows how a much longer period of time is needed for recovery of ecosystem functions when no human restorative action is taken. In the case of Agua Hedionda Creek, those ecosystem functions would be different.

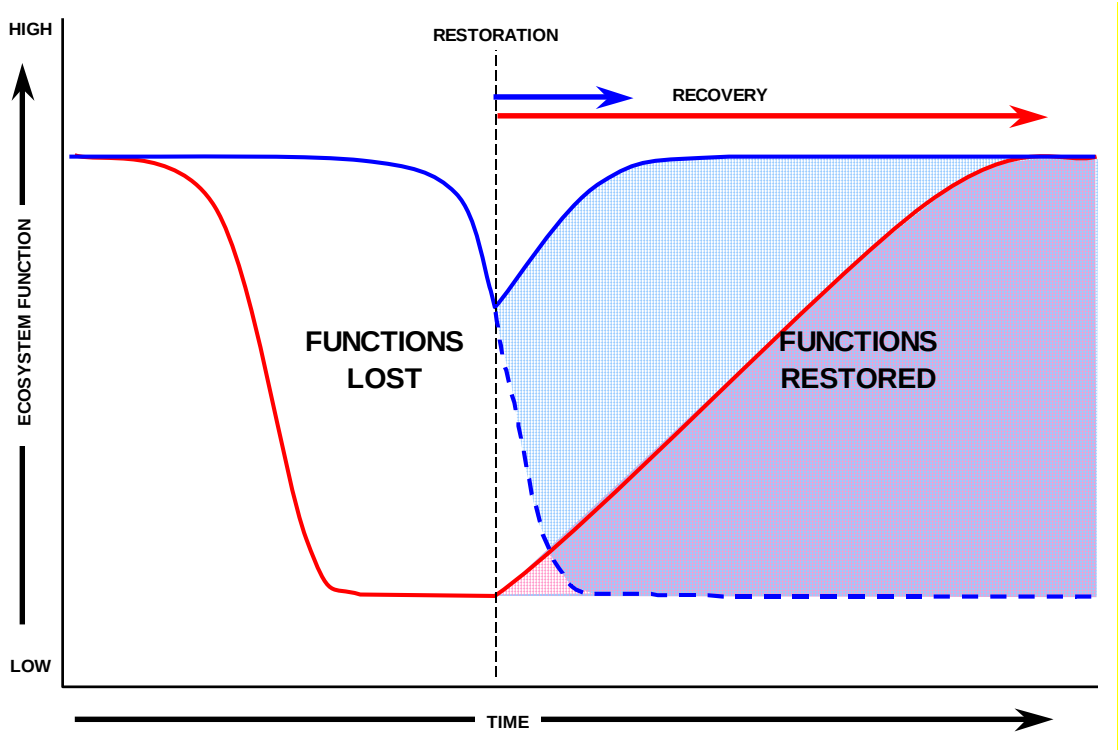

Effects of Ecosystem Trajectory on Restoration Values (TRWE, 2010.)

Stabilization

Stabilization of fluvial systems has generally been considered the typical "fix" to hydromodification. (USACOE, 1994.) Stabilization can be understood very broadly to include everything from concrete lining and piping underground to streambed or bank stabilization utilizing bioengineering techniques exclusively. Between these two "ends of the spectrum" are quite a number of techniques and types of materials, used in combination or separately, to "stabilize" these dynamic systems. Common techniques include grading of new "stable" channels, creating "benches" beside channels (thus increasing flood capacity and stability), constructing drop structures to flatten the longitudinal slopes, or meandering the stream channel to lengthen it. In addition to concrete lining, materials have typically included rock riprap, natural stone, concrete block systems, turf reinforcement mats, vegetation, imported sediment and/or cobbles of a certain gradation, gabion baskets, logs, and root wads. (NRCS, 2002; WSAHGP, 2003.)

Restoration and Rehabilitation

"Restoration" usually refers to attempts to restore a system back to a previous condition, while "rehabilitation" usually refers to attempts to improve a system while accounting for mostly irreversible changes (like a hydromodified watershed). This should not be understood as "giving up" on all efforts to lessen impacts within a watershed; rather, it should be understood within the context of the graph above. Time marches on, as the saying goes, so intervention requires an understanding of where a fluvial system is currently, along with an understanding of the current and future conditions of the watershed. For this reason, most work within fluvial systems is no longer described as "restoration," but rather "rehabilitation."

Onsite Approach Presented in Draft Permit

Attempts to address sediment balance through a directive within a permit will almost always fail; the complexity of the issue defies such an approach. The desire to compensate for the loss of course sediment due to development (even LID), or to avoid sediment yield areas altogether (both of which have been put forth in revisions of the Revised Draft Permit) shows a misunderstanding and a wrong focus on the issue by attempting to address it at the source. The currently proposed language in Section E.3.c.(2)(b) introduces a further complication, in that its implementation must necessarily prohibit the use of land for any compatible use other than allowing erosion to occur so that the downstream system has a supply of coarse sediment. This then becomes a land use decision.

Natural areas have produced sediment as part of a natural cycle of random precipitation events, vegetative cover and burns for millennia. Urbanization introduces a sudden and sometimes dramatic change to an equilibrium that has existed for a very long time (as in Oso Creek). In almost all cases throughout the San Diego Region, the effects of urbanization have already done most of the "work" on the downstream systems, so an onsite approach to the problem is much like closing the barn door after the horse has escaped. With that consideration, attempting to identify critical sediment yield areas within most of the watersheds will be an exercise in futility, as such areas would not typically be able to provide even a fraction of the amount of course sediment required to balance sediment through downstream reaches.

Another unintended consequence of the Revised Draft Permit Provision E.3.c.(2)(b) is that it will create a new land use restriction. The way this will likely proceed is that "critical sediment yield areas" will be identified by studying the watersheds (through the Watershed Management Area Analyses). Specifically, Copermittees will be required to prepare sediment yield studies of watersheds based on watershed-wide models and criteria that will approximately identify these critical sediment yield areas. These analyses would then be incorporated into the Water Quality Improvement Plans for each watershed. Thus, a new category of "Environmentally Sensitive Areas" will be identified and protected. After all, there is no other compatible use of such property, not even roads, so such property will become open space.

Sediment Balance Summary

In summary, sediment balance is very complicated and requires careful study of each watershed and fluvial system to understand how best to approach the issue. Fluvial systems, to transport the same amount of incoming sediment to downstream reaches, and eventually to the ocean, must often be modified. Many such systems are already modified, either as part of a natural process (degradation) or as the result of man-made modification. Attempts to address sediment balance through a directive within a permit will almost always fail; the complexity of the issue defies such an approach. The desire to compensate for the loss of coarse sediment due to development (even LID), or to avoid sediment yield areas altogether (both of which have been put forth in revisions of the Revised Draft Permit) shows a misunderstanding and a wrong focus on the issue by attempting to address it at the source. The currently proposed language in Section E.3.c.(2)(b) of the Revised Draft Permit introduces a further complication, in that its implementation must necessarily prohibit the use of land for any compatible use other than allowing erosion to occur so that the downstream system has a supply of coarse sediment. This

then becomes a land use decision. The best focus for this issue remains the water bodies themselves on a watershed by watershed and reach by reach basis.

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California Regional Water Quality Control Board
San Diego Region

Response to Comments Report

Tentative Order No. R9-2015-0100

An Order Amending Order No. R9-2013-0001, NPDES No. CAS010266, As Amended by Order No. R9-2015-0001 National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region

November 4, 2015

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Responses to Comments on Tentative Order No. R9-2015-0100

November 4, 2015

Introduction

This report contains responses to written comments timely received on Tentative Order No. R9-2015-0100, *An Order Amending Order No. R9-2013-0001, NPDES No. CAS010266*, *as Amended by Order No. R9-2015-0001, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Tentative Order). The Tentative Order and its attachments were available for public review and comment for 46 days, with the comment period ending on September 14, 2015. Specifically, the San Diego Water Board requested comments on the following three documents:

- Tentative Order No. R9-2015-0100;
- Attachment No. 1 – Revised Order No. R9-2013-0001; and
- Attachment No. 2 – Revised Fact Sheet to Order No. R9-2013-0001.

The phrases "Tentative Order" and "Regional MS4 Permit" in the following response to comments table refers to both Tentative Order No. R9-2015-0100 and the two attachments. Comments and responses are organized by the section of either Attachment 1 or Attachment 2 that is being referenced. Wherever possible, comments are grouped based on content and summarized by the San Diego Water Board. The actual comment letters can be accessed on the San Diego Water Board website at: http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

List of Commenters:
Comments were submitted by the following organizations, public agencies, or individuals (listed alphabetically):

1. City of Dana Point
2. City of Escondido
3. City of Laguna Beach
4. City of Lake Forest
5. City of Menifee
6. City of San Clemente
7. City of San Diego
8. City of San Juan Capistrano
9. City of Santee
10. Construction Industry Coalition on Water Quality (CICWQ)
11. County of San Diego
12. Environmental Groups (San Diego Coastkeeper, Coastal Environmental Rights Foundation, and Surfrider Foundation San Diego Chapter)
13. Orange County Copermittees
14. Riverside County Copermittees
15. San Diego Coastkeeper and Coastal Environmental Rights Foundation
16. San Diego County Copermittees
17. San Diego Unified Port District
18. South Laguna Civic Association

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RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2015-0100

November 4, 2015

Gnl-1	GENERAL COMMENTS	
	COMMENT: *Request to incorporate previous written comments and testimony in the record for this Tentative Order.* The Copermittees and other stakeholders requested that previous written comments and testimony be incorporated into the record for this Tentative Order. The comment letters also included copies of the written comments previously submitted during the proceedings to adopt Order No. R9-2013-0001, and the proceedings to adopt Order No. R9-2015-0001 to amend Order No. R9-2013-0001.	Riverside County Copermittees Orange County Copermittees City of Dana Point City of San Diego San Diego Unified Port District South Laguna Civic Association Construction Industry Coalition on Water Quality
	RESPONSE: The San Diego Water Board is incorporating the previous written comments and testimony provided during the proceedings to adopt Order No. R9-2013-0001, and the proceedings to adopt Order No. R9-2015-0001 to amend Order No. R9-2013-0001 into the record for this Tentative Order. The San Diego Water Board reviewed Tentative Order No. R9-2015-0100 and its Attachments and has determined that the March 27, 2013 responses to comments document prepared during the 2013 adoption process of Order No. R9-2013-0001, the January 21, 2015 responses to comments document prepared during the adoption process of Order No. R9-2015-0001, and the oral responses to comments during the workshops and hearings during those proceedings address the previously submitted comments and testimony. The San Diego Water Board is incorporating by this reference as if set forth in full herein its written responses to comments and oral responses to comments raised during the workshops and hearings on Order Nos. R9-2013-0001 and R9-2015-0001 into these responses. To the extent commenters incorporate issues and objections raised in petitions for review of Order No. R9-2013-0001 filed with the State Water Board in SWRCB/OCC File A-2254(a)-(p), or in petitions for review of Order No. R9-2015-0001, amending Order No. R9-2013-0001 (SWRCB/OCC File A-2367(a)-(i)), the San Diego Water Board notes that it has not yet had an opportunity to submit written responses to those petitions for review and is not specifically addressing those petitions for review in these responses to comments. The San Diego Water Board will submit written responses to the petitions for review at the appropriate time in the State Water Board's petition proceeding. No changes to the Tentative Order or its Attachments were made based on the renewed comments.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2015-0100

November 4, 2015

Gnl-2	GENERAL COMMENTS	
	COMMENT: *Request for clarification of implementation requirements for the Riverside County Copermittees as a result of late entry into the Regional MS4 Permit.* The Riverside County Copermittees noted that several provisions of the Regional MS4 Permit, including requirements to submit certification of legal authority, assessment and subsequent Water Quality Improvement Plan revision requirements, and requirements to submit a regional monitoring and assessment report, which either require data gathered under a Water Quality Improvement Plan that has been accepted by the San Diego Water Board, or are due for submittal outside of the Regional MS4 Permit's term. The Riverside County Copermittees wanted clarification that: 1) the certification of legal authority which was submitted by the Riverside County Copermittees under Order No. R9-2010-0016 will remain effective until a new certification is submitted with the first Water Quality Improvement Plan Annual Report (after the current Regional MS4 Permit term has ended), 2) any provisions regarding assessments or requiring data gathered under an accepted Water Quality Improvement Plan will not be due until such time that the necessary data are gathered and the assessments made under time periods described in the Regional MS4 Permit, and 3) the regional monitoring and assessment report for the current Regional MS4 Permit term should be completed utilizing data gathered during the transitional monitoring period, as these will be the only data that will be available at that time.	Riverside County Copermittees
	RESPONSE: The San Diego Water Board agrees that: 1) the certification of legal authority which was submitted by the Riverside County Copermittees under Order No. R9-2010-0016 will remain effective until a new certification is submitted with the first Water Quality Improvement Plan Annual Report (after the current Regional MS4 Permit term has ended), 2) any provisions regarding assessments or requiring data gathered under an accepted Water Quality Improvement Plan will not be due until such time that the necessary data are gathered and the assessments made under time periods described in the Regional MS4 Permit, and 3) the regional monitoring and assessment report for the current Regional MS4 Permit term should be completed utilizing data gathered during the transitional monitoring period, as these will be the only data that will be available at that time.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2015-0100

November 4, 2015

Gnl-3	GENERAL COMMENTS	
	COMMENT: *Request to remove the City of Menifee from Water Quality Improvement Plan development and implementation.* The Riverside County Copermittees and the City of Menifee requested several modifications to the Regional MS4 Permit that would remove the City of Menifee from the requirement to develop and implement the Water Quality Improvement Plan for the Santa Margarita River Watershed Management Area. The Riverside County Copermittees and the City of Menifee assert that the City of Menifee does not own or operate any MS4 within the Santa Margarita River Watershed Management Area, and provided a map showing the City's jurisdictional boundary and MS4.	Riverside County Copermittees City of Menifee
	RESPONSE: The San Diego Water Board reviewed the information provided by the commenters and disagrees that the City of Menifee does not own or operate any MS4 within the Santa Margarita Watershed Management Area. The maps provided by the commenters show a portion of MS4 along Scott Road within the Santa Margarita Watershed Management Area that is indicated to be owned by the City of Menifee. In addition, the maps provided by the commenters show that there is a residential area within the City of Menifee and within the Santa Margarita River Watershed Management Area with streets, curb, and gutter that drain to MS4 owned by the Riverside County Flood Control and Water Conservation District, which discharges to a tributary of Warm Springs Creek. Warm Springs Creek is an impaired water body in the Santa Margarita River Watershed Management Area and may become subject to the requirements of a TMDL in the future. The streets, curb, and gutter in the residential area are also considered part of the City of Menifee's MS4. The maps provided confirm that it is appropriate for the City of Menifee to be required to participate in the development and implementation of the Water Quality Improvement Plan for the Santa Margarita River Watershed Management Area. No changes were made to the Tentative Order as a result of this comment.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2015-0100

November 4, 2015

Gnl-4	GENERAL COMMENTS	
	COMMENT: *Stakeholder workshops have been effective.* The Orange County Copermittees expressed appreciation for the efforts of the San Diego Water Board staff to collaboratively engage the Copermittees and other stakeholders through the use of mediated workshops. The workshop format allowed all viewpoints to be expressed with sufficient time provided for discussion of issues regarding the Regional MS4 Permit.	Orange County Copermittees City of Dana Point City of Laguna Beach
	RESPONSE: The San Diego Water Board agrees that the collaborative approach utilized during the Regional MS4 Permit development and amendment processes has been beneficial for the San Diego Water Board staff to better understand the issues of concern to the stakeholders.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2015-0100

November 4, 2015

Gnl-5	GENERAL COMMENTS	
	COMMENT: *Requests for the Regional MS4 Permit to acknowledge the potential benefit of developing site specific water quality objectives in concert with development of the Water Quality Improvement Plan.* The Cities of Dana Point and Laguna Beach requested that the Regional MS4 Permit and Fact Sheet specifically acknowledge the benefit of developing site specific objectives in concert with the development of the Water Quality Improvement Plans, even if development of the site specific objectives may extend the period to complete development of the Water Quality Improvement Plans.	City of Dana Point City of Laguna Beach
	RESPONSE: The San Diego Water Board acknowledges that developing site specific water quality objectives (site specific objectives) may be appropriate where there are data that are available to support site specific objectives. The San Diego Water Board, however, disagrees that it is appropriate to delay development and implementation of any Water Quality Improvement Plans with an expectation that site specific objectives will be developed. Any action taken by the San Diego Water Board to establish site specific objectives would require amendment of the Basin Plan to incorporate the site specific objectives before they could be implemented in any NPDES permits or waste discharge requirements issued by the San Diego Water Board. The Basin Planning process requires separate proceedings that need to include the public, the San Diego Water Board, the State Water Board, the Office of Administrative Law, and the USEPA. This process will take much longer to complete than developing the Water Quality Improvement Plan. However, the San Diego Water Board encourages the Copermittees to utilize the Water Quality Improvement Plan development process to identify areas within the Watershed Management Area where developing site specific objectives may be appropriate and include special studies to collect data that can be used to support development of site specific objectives.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2015-0100

November 4, 2015

Gnl-6	GENERAL COMMENTS	
	COMMENT: *Request for clarification that location of a MS4 within the Port's jurisdictional boundaries does not render the Port an owner or operator of the MS4.* The San Diego Unified Port District (Port) asserts that just because a MS4 facility falls within its jurisdictional boundaries, which overlap with the Cities of San Diego, National City, Chula Vista, Imperial Beach, and Coronado (Member Cities), that does not mean the Port owns or operates the MS4 facility, and thus the Port would not be responsible for discharges from those MS4 facilities. Therefore, the Port requested revisions to the Tentative Order that clarify this distinction.	San Diego Unified Port District
	RESPONSE: The San Diego Water Board disagrees that the Tentative Order should be revised to include additional clarification. The Port owns and operates MS4 facilities (streets, curbs and gutters, catch basins, etc.) and lands within the tidelands that either convey or discharge storm water runoff into MS4 facilities owned or operated by Member Cities, or directly to receiving waters. The Port is responsible for complying with permit conditions pertaining to discharges from MS4 facilities and lands the Port owns or operates that discharge into MS4 facilities of Member Cities or directly to receiving waters. The Port must provide the evidence to demonstrate that it does not own or operate MS4 facilities or lands that discharge storm water runoff directly or indirectly into the MS4 facilities owned by the Member Cities. No changes were made to the Tentative Order as a result of this comment.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2015-0100

November 4, 2015

Gnl-7	GENERAL COMMENTS	
	COMMENT: *Compliance with all the discharge prohibitions in the Regional MS4 Permit under all circumstances is likely impossible.* The Cities of Dana Point and Laguna Beach asserts that compliance with all the discharge prohibitions in the Regional MS4 Permit under all circumstances is not practicable and likely impossible. The Cities go on to assert that the Cities are in a position of being required to comply with the discharge prohibitions under all circumstances, or are being required to meet a "zero discharge standard," both of which are impossible to achieve.	City of Dana Point City of Laguna Beach
	RESPONSE: The San Diego Water Board does not disagree with the assertion that the Copermittees are not in compliance with all the discharge prohibitions in the Regional MS4 Permit under all circumstances. The San Diego Water Board disagrees that it is not practicable and likely impossible to comply with all of the discharge prohibitions under all circumstances. The cases cited in support of the commenters' argument are inapposite and factually distinguishable from Order No. R9-2013-0001 (as amended) and the discharge prohibitions and receiving water limitations provisions therein. To date, the Copermittees have not implemented programs that are capable of complying with all of the discharge prohibitions under all circumstances, but that does not mean it is not practicable nor impossible. The assertion that complying with all the discharge prohibitions in the Regional MS4 Permit under all circumstances is not practicable and impossible cannot be supported without first demonstrating that the Copermittees have implemented all of their programs to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges to the maximum extent practicable (MEP). Moreover, several audits conducted recently by the San Diego Water Board indicate that the Copermittees may not be adequately implementing their basic jurisdictional runoff management program (JRMP) requirements to reduce pollutants in storm water discharges to the MEP standard. Even if the Copermittees implemented the basic JRMP requirements to the MEP standard, the Copermittees can also implement additional practicable actions or programs to comply with all of the discharge prohibitions in the Regional MS4 Permit.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2015-0100

November 4, 2015

Gnl-8	GENERAL COMMENTS	
	COMMENT: *Request for clarification by City of Lake Forest for applicability of the Water Quality Improvement Plan development requirements.* The City of Lake Forest requested clarification on its participation in development of the Water Quality Improvement Plan, based on the agreement that discharges from its MS4 in the San Diego Region will be regulated by the Santa Ana Water Board.	City of Lake Forest
	RESPONSE: The San Diego Water Board expects the City of Lake Forest to contribute to development of the Water Quality Improvement Plan and describe the water quality improvement strategies that will be implemented by the City to comply with TMDL requirements. The strategies implemented by the City of Lake Forest are only expected to implement the requirements of the Phase I MS4 Permit issued by the Santa Ana Water Board, except when and where additional strategies (known as optional jurisdictional strategies or Watershed Management Area strategies in the Regional MS4 Permit) may be necessary to achieve TMDL requirements. Likewise, if the Water Quality Improvement Plan includes final numeric goals that are not based on TMDL requirements, the City of Lake Forest is expected to include descriptions of the water quality improvement strategies that the City may implement to contribute toward achieving those final numeric goals.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2015-0100

November 4, 2015

Gnl-8	GENERAL COMMENTS	
	COMMENT: *Recommendations for actions that can be implemented to improve water quality.* The South Laguna Civic Association provided several recommended actions that may result in improvements to water quality.	South Laguna Civic Association
	RESPONSE: The San Diego Water Board appreciates the recommendations. The recommendations, however, appear to be actions that could be implemented as part of water quality improvement strategies by the Copermittees, and not necessarily appropriate to include into the requirements of the Tentative Order. The recommended actions provided by the commenter can be brought to the attention of the south Orange County Copermittees during the development of the Water Quality Improvement Plan. No changes were made to the Tentative Order as a result of this comment.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2015-0100

November 4, 2015

Gnl-10	GENERAL COMMENTS	
	COMMENT: *The Regional MS4 Permit illegally authorizes compliance schedules for CTR-based TMDLs beyond May 18, 2010.* The Environmental Groups assert the Tentative Order and the Regional MS4 Permit illegally authorize compliance schedules for TMDLs to achieve compliance with the CTR as required by the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP).	Environmental Groups
	RESPONSE: The San Diego Water Board disagrees that the Tentative Order or the Regional MS4 Permit are in conflict with the SIP. The Tentative Order and Regional MS4 Permit are consistent with the TMDLs and the SIP. The Regional MS4 Permit establishes requirements for the regulation of storm water discharges, and the compliance schedule requirements of the SIP do not apply to storm water discharges. Please refer to footnote 1 on page 3 of the SIP which states, "*This Policy does not apply to regulation of storm water discharges. The SWRCB has adopted precedential decisions addressing regulation of municipal storm water discharges in Orders WQ 91-03, 91-04, 96-13, 98-01, 99-05, and 2001-15.*"	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2015-0100

November 4, 2015

A-1	PROVISION A: PROHIBITIONS AND LIMITATIONS	
	COMMENT: *Requests to include language in the prohibitions and limitations of Provision A that is linked to the alternative compliance pathway under Provision B.3.c.* The Orange County and San Diego County Copermittees, as well as several individual Copermittees, requested the addition of language to Provision A that explicitly states the implementation of the alternative compliance pathway under Provision B.3.c constitutes compliance with the discharge prohibitions and receiving water limitations in Provision A.	Orange County Copermittees City of Lake Forest City of San Clemente City of San Juan Capistrano San Diego County Copermittees City of Santee County of San Diego
	RESPONSE: The San Diego Water Board disagrees that it is appropriate or necessary to include additional language to Provision A. Provision A is consistent with the precedential language that was issued under State Water Board Order WQ 99-05. State Water Board Order WQ 2015-0075, which supports the inclusion of the alternative compliance pathway under Provision B.3.c, also states that Phase I MS4 permits should continue to use the receiving water limitations provisions as directed by Order WQ 99-05. No changes were made to the Tentative Order as a result of this comment.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2015-0100

November 4, 2015

A1-1	PROVISION A.1: Discharge Prohibitions	
	COMMENT: *Request to correct State Water Board Resolution No. 2012-0012 reference in Provision A.1.d to Resolution No. 2012-0031.* The City of San Diego requested that the reference to State Water Board Resolution No. 2012-0012 in Provision A.1.d be changed to Resolution No. 2012-0031.	City of San Diego
	RESPONSE: The San Diego Water Board agrees that the correction is appropriate. The reference to "State Water Board Resolution No. 2012-0012" under Provision A.1.d has been revised to "State Water Board Resolution No. 2012-0012, as amended by State Water Board Resolution No. 2012-0031."	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2015-0100

November 4, 2015

A2-1	PROVISION A.2: Receiving Water Limitations	
	COMMENT: *Request for removal of receiving water limitations language from Regional MS4 Permit.* The County of San Diego requested that the San Diego Water Board use its discretion to remove the requirements to comply with receiving water limitations in Provision A.2 of the Regional MS4 Permit.	County of San Diego
	RESPONSE: The San Diego Water Board disagrees that it is appropriate to remove the requirements to comply with receiving water limitations in Provision A.2 of the Regional MS4 Permit. The receiving water limitations are consistent with precedential State Water Board Orders WQ 99-05 and WQ 2015-0075. No changes were made to the Tentative Order as a result of this comment.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2015-0100

November 4, 2015

B-1	PROVISION B: WATER QUALITY IMPROVEMENT PLANS	
	COMMENT: *Request to revise the language in Provision B.1 to specify the Water Quality Improvement Plans are to address discharges from the MS4.* The City of San Diego requested Provision B.1 be revised to state that the Copermittees must develop a Water Quality Improvement Plan for their MS4 discharges within each of the Watershed Management Areas in Table B-1.	City of San Diego
	RESPONSE: The San Diego Water Board disagrees that the Water Quality Improvement Plans should be specific to just addressing discharges from the MS4. The Regional MS4 Permit is for the regulation of the Copermittees' MS4 discharges, but the Water Quality Improvement Plan is a planning document that requires the Copermittees to evaluate and identify all water quality conditions of concern within a Watershed Management Area. The Copermittees then determine what conditions of concern are the priorities that should be addressed by their individual jurisdictional strategies and/or through watershed-wide strategies. The Water Quality Improvement Plan development process provides the Copermittees flexibility in determining how to address priority issues through establishment of goals that directly improve receiving water quality impacted by MS4 discharges, instead of only limiting goals to MS4 discharges. No changes were made to the Tentative Order as a result of this comment.	

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B2-1	PROVISION B.2: Priority Water Quality Conditions	
	COMMENT: *Request for revisions to the requirements for identifying priority water quality conditions under Provision B.2.* The South Laguna Civic Association provided proposed revisions to the requirements for identifying priority water quality conditions under Provision B.2. The proposed revisions appeared to include mapping of areas, incorporating areas of concern specific to south Orange County, and identifying issues that may be a concern specific to south Orange County.	South Laguna Civic Association
	RESPONSE: The San Diego Water Board reviewed the requested revisions to the requirements for identifying priority water quality conditions under Provision B.2. The San Diego Water Board did not identify any proposed revisions that were appropriate or necessary. The information requested to be included as part of the proposed revisions is information that should be brought to the attention of the south Orange County Copermittees during the development of the Water Quality Improvement Plan. No changes were made to the Tentative Order as a result of this comment.	

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B3c-1	PROVISION B.3.c: Prohibitions and Limitations Compliance Option	
	COMMENT: *Support for the inclusion of the receiving water limitations alternative compliance pathway in the Regional MS4 Permit.* The Riverside County, Orange County, and San Diego County Copermittees, as well as several individual Copermittees submitted comments that support the inclusion of the receiving water limitations alternative compliance pathway proposed to be incorporated into the Regional MS4 Permit as Provision B.3.c.	Riverside County Copermittees Orange County Copermittees City of Lake Forest City of San Clemente City of San Juan Capistrano City of San Diego City of Santee County of San Diego
	RESPONSE: The San Diego Water Board appreciates the support to include the receiving water limitations alternative compliance pathway into the Regional MS4 Permit.	

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B3c-2	PROVISION B.3.c: Prohibitions and Limitations Compliance Option	
	COMMENT: *Requests for revisions to the requirement for developing and incorporating annual milestones into the schedules for the alternative compliance pathway.* The Riverside County, Orange County, and San Diego County Copermittees, as well as several individual Copermittees requested revisions to the requirement to develop and incorporate annual milestones into the schedules for the alternative compliance pathway under Provision B.3.c. The Copermittees assert that annual milestones are burdensome, unworkable, and not meaningful. The Copermittees requested that milestones be limited to one or two milestones per permit term.	Riverside County Copermittees Orange County Copermittees City of Lake Forest City of San Clemente City of San Juan Capistrano San Diego County Copermittees City of San Diego City of Santee
	RESPONSE: The San Diego Water Board considered the proposed revisions and rationale provided and determined that revisions to the requirement for developing and incorporating annual milestones are appropriate. However, the San Diego Water Board does not agree that milestones should be limited to just one or two per permit term. The development and incorporation of annual milestones into the alternative compliance pathway is necessary for a Copermittee to be able to demonstrate to the San Diego Water Board and the public that there is a commitment to implementing a credible, rigorous, ambitious, and transparent plan to improve the quality of its MS4 discharges and/or receiving waters within its jurisdiction. The San Diego Water Board agrees, however, that annual milestones may become less meaningful after 5 or 10 years. Therefore, Provision B.3.c.(1)(a)(vii) and footnote 9 have been revised as follows: Provision B.3.c.(1)(a)(vii) For each final numeric goal developed pursuant to Provisions B.3.a and B.3.c.(1)(a)(i)-(v), ~~at least one~~ annual milestones[9] and the dates for ~~its~~ their achievement must be included within each of the next five (5) Water Quality Improvement Plan Annual Report reporting periods, or until the final numeric goal is achieved. Annual milestones and the dates for their achievement for the 5 Water Quality Improvement Plan Annual Report reporting periods of the next permit term, or until the final numeric goal is achieved, must be provided as part of the Report of Waste Discharge required pursuant to Provision F.5. Footnote 9 Annual milestones for each final numeric goal must ~~build upon previous milestones and lead to~~ be clearly and directly linked to, or demonstrate progress is being made toward, the achievement of the final numeric	

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B3c-2	PROVISION B.3.c: Prohibitions and Limitations Compliance Option	
	goal. The annual milestones may consist of water quality improvement strategy implementation phases, interim numeric goals, and other acceptable metrics. <u>The annual milestones may address multiple numeric goals and/or multiple water bodies, as applicable and appropriate.</u>	

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B3c-3	PROVISION B.3.c: Prohibitions and Limitations Compliance Option	
	COMMENT: *Requests for revisions to provide additional clarifying language for when a Copermittee is deemed in compliance with receiving water limitations.* The Riverside County Copermittees requested revisions to the alternative compliance pathway requirements under Provision B.3.c.(2) and the iterative process requirements under Provision A.4 to clarify when a Copermittee is deemed in compliance with receiving water limitations, especially relative to other Copermittees if updates are needed. The Environmental Groups requested revisions to Provision B.3.c.(2) to strictly require achievement of annual milestones and remove the potential for updates as a clearer way of determining when a Copermittee is no longer deemed in compliance.	Riverside County Copermittees Environmental Groups
	RESPONSE: The San Diego Water Board disagrees that revisions to Provision B.3.c.(2) are necessary to clarify when a Copermittee is deemed in compliance. The requirements under Provision B.3.c.(2) are clear criteria that the San Diego Water Board will use to determine if a Copermittee can be deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b. The commenters did, however, identify a scenario during the period of time a Copermittee has submitted "acceptable rationale and recommends appropriate modifications" and the San Diego Water Board accepts the rationale and recommended modifications where it may not be clear if a Copermittee is or is not in compliance. The intent was to continue deeming the Copermittee in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b during this period of time. To clarify this intent, the following has been added to the last paragraph of the discussion of Provision B.3.c on page F-62 in the Fact Sheet: The Copermittee continues to be deemed in compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b during the time the San Diego Water Board reviews the rationale and recommended modifications to the interim numeric goals, and/or water quality improvement strategies, and/or schedules. If and when the San Diego Water Board determines that it does not accept the rationale or recommendations, the Copermittee will be notified they are no longer deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b.	

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B3c-4	PROVISION B.3.c: Prohibitions and Limitations Compliance Option	
	COMMENT: *Requests to include compliance with receiving water limitations during the Water Quality Improvement Plan planning and development process.* The Riverside County and Orange County Copermittees, several Orange County cities, as well as the County of San Diego requested that the requirements under Provision B.3.c be revised to include compliance with the prohibitions and limitations of Provision A during the development of the Water Quality Improvement Plans. Several of the comments also assert that including compliance during development of the Water Quality Improvement Plan is consistent with State Water Board Order WQ 2015-0075.	Riverside County Copermittees Orange County Copermittees City of Dana Point City of Laguna Beach City of Lake Forest City of San Clemente City of San Juan Capistrano County of San Diego
	RESPONSE: The San Diego Water Board disagrees that it is appropriate to deem a Copermittee in compliance with any of the prohibitions and limitations under Provision A before a Water Quality Improvement Plan has been submitted and accepted by the San Diego Water Board. The San Diego Water Board also disagrees that State Water Board Order WQ 2015-0075 communicates that the State Water Board expects or requires in any way that Regional Water Boards allow for compliance with receiving water limitations during development of watershed management plans. The San Diego Water Board is concerned that allowing for compliance during the development of the Water Quality Improvement Plan would remove the motivation or incentive for Copermittees to develop a credible, rigorous, ambitious, and transparent plan. Before the San Diego Water Board can make a determination that a Copermittee has a credible, rigorous, ambitious, and transparent plan that can demonstrate discharges from a Copermittee's MS4 will not cause or contribute to exceedances of water quality standards in receiving waters, or that receiving waters will be protected from MS4 discharges, the San Diego Water Board must first have an opportunity to review the proposed plan. In response to the assertion that State Water Board Order WQ 2015-0075 encourages or mandates alternative compliance pathways to include compliance during development of the Water Quality Improvement Plan, the commenters failed to provide a clear citation of this direction. There is nothing within the State Water Board Order that explicitly requires the inclusion of an alternative compliance pathway in Phase I MS4 Permit, let alone compliance during development of the plan for alternative compliance. State Water Board Order WQ 2015-0075 only requires the San Diego Water Board to consider inclusion of an alternative compliance pathway, and include findings in the permit if the San Diego Water Board chooses not to include the alternative compliance pathway. In this case, the San Diego Water Board has chosen to incorporate an alternative compliance	

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B3c-4	PROVISION B.3.c: Prohibitions and Limitations Compliance Option	
	pathway, but without compliance during the development of the Water Quality Improvement Plan. Furthermore, the San Diego Water Board notes that USEPA has provided written comments to the Los Angeles Water Board (click here for link to letter), the Santa Ana Water Board (click here for link to letter), and the State Water Board click here for link to letter) that support the San Diego Water Board's approach to alternative compliance with receiving water limitations, specifically supporting the San Diego Water Board's decision not to include compliance during the development period for the Water Quality Improvement Plan. Based on this expressed support from USEPA, and the other reasons cited above, the San Diego Water Board is not allowing for a Copermittee to be deemed in compliance with the prohibitions and limitations under Provision A during the development of the Water Quality Improvement Plans. No changes were made to the Tentative Order as a result of this comment.	

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B3c-5	PROVISION B.3.c: Prohibitions and Limitations Compliance Option	
	COMMENT: *Request to include receiving water limitations for ASBS under Provision A.2.b as part of alternative compliance pathway.* The City of San Diego requested that the alternative compliance pathway be revised to also include compliance with the ASBS receiving water limitations required under Provision A.2.b.	City of San Diego
	RESPONSE: The San Diego Water Board considered the request to include the receiving water limitations for ASBS under Provision A.2.b as part of the alternative compliance pathway under Provision B.3.c and agree it is appropriate. References to "Provisions A.1.a, A.1.c, A.1.d, A.2.a, and A.3.b" under Provision B.3.c have been revised to "Provisions A.1.a, A.1.c, A.1.d, A.2~~.a~~, and A.3.b."	

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B3c-6	PROVISION B.3.c: Prohibitions and Limitations Compliance Option	
	COMMENT: *Requests for revisions to alternative compliance pathway numeric goal requirements proposed under Provision B.3.c.(1)(a)(iii).* The City of San Diego requested a revision to combine Provisions B.3.c.(1)(a)(iii) and B.3.c.(1)(a)(iv) to reduce confusion regarding whether the categories of numeric goals are mandatory or optional. The County of San Diego requested additional language to be added to Provision B.3.c.(1)(a)(iii) to limit the numeric goals for MS4 discharges only to pollutants or conditions where MS4 discharges are causing or contributing to the impairment.	City of San Diego County of San Diego
	RESPONSE: The San Diego Water Board disagrees that the revisions requested are appropriate or necessary. The City of San Diego's requested revision does not provide more clarity, and actually reduces the available options for numeric goals. Provisions B.3.c.(1)(a)(iii) and B.3.c.(1)(a)(iv) allow a Copermittee to choose interim and final numeric goals applicable to the Copermittee's MS4 outfalls, OR interim and final numeric goals applicable to the receiving waters, OR a combination of both. The City's proposed revisions would only allow a Copermittee to choose interim and final numeric goals applicable to the Copermittee's MS4 outfalls, OR interim and final numeric goals applicable to the receiving waters, but NOT a combination of both. The San Diego Water Board disagrees that the County's proposed revision is necessary because if a Copermittee's MS4 discharges do not contain pollutants that are causing or contributing to an impairment listed on the Clean Water Act Section 303(d) List of Water Quality Impaired Segments, the Copermittee should not have difficulty developing and including final numeric goals that can demonstrate their discharges are not causing or contributing to the impairment. The Copermittee will also have to collect data to demonstrate that the final numeric goals have been achieved and continue to be achieved. The data collected, assessed, and reported will demonstrate that the Copermittee is not causing or contributing to the impairment listed on the Clean Water Action Section 303(d) List. No changes were made to the Tentative Order as a result of this comment.	

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B3c-7	PROVISION B.3.c: Prohibitions and Limitations Compliance Option	
	COMMENT: *The alternative compliance pathway would result in safe harbor protection and should be removed from the Regional MS4 Permit.* The Environmental Groups assert that providing the alternative compliance pathway provides the Copermittees with safe harbor protection, and requested the alternative compliance pathway be removed from the Regional MS4 Permit.	Environmental Groups
	RESPONSE: The San Diego Water Board does not agree that the alternative compliance pathway provides the Copermittees with safe harbor protection that "simply mimics the failed iterative approach." Compliance with the alternative compliance pathway means, for compliance determination purposes, that the San Diego Water Board would deem a Copermittee that has fulfilled the requirements of the alternative compliance pathway as in compliance with the receiving water limitations. As long as the Copermittee is in compliance with the requirements under Provision B.3.c, the San Diego Water Board can consider the Copermittee in compliance with the prohibitions and limitations. Complying with the requirements of Provision B.3.c, however, will require a significant commitment, level of effort, and resources from any Copermittee that chooses to implement it. Any Copermittee that can comply with the requirements of Provision B.3.c will also be demonstrating a well defined and transparent commitment to improve water quality. Please also see responses to comments Gnl-10 and B3c-8. No changes were made to the Tentative Order as a result of this comment.	

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B3c-8	PROVISION B.3.c: Prohibitions and Limitations Compliance Option	
	COMMENT: *The alternative compliance pathway is inconsistent with the State Water Board's Order.* The Environmental Groups assert that the alternative compliance pathway in the Tentative Order is inconsistent with State Water Board Order WQ 2015-0075. The Environmental Groups assert that the alternative compliance pathway proposed in the Tentative Order is inconsistent because a) it does not contain specific guidance or protocols for a "well defined" and "transparent" analysis, b) it does not require a "finite" period of time to achieve receiving water limitations, and c) it does not include requirements for multi-benefit or storm water resource projects.	Environmental Groups
	RESPONSE: The San Diego Water Board disagrees that the alternative compliance pathway proposed in the Tentative Order is inconsistent with the State Water Board Order. The alternative compliance pathway in the Tentative Order is consistent with the State Water Board Order for the following reasons: a) In response to the assertion that the alternative compliance pathway in the Tentative Order does not include specific guidance or protocols for a "well defined" and "transparent analysis, the approach of the alternative compliance pathway in the Tentative Order is actually more "well defined" and "transparent" than the example provided by the commenter. The commenter provides permit language from the Los Angeles MS4 Permit as an example of specific guidance and protocols for a reasonable assurance analysis. While there is more description as to what components the reasonable assurance analysis must include, fundamentally the analysis is based on a computer model consisting of equations with assumptions which utilize data that are entered into and processed by a computer. Many of the variables in the equations will be based on assumptions, and members of the public may not know or understand how those variables may impact the results. The Los Angeles MS4 Permit does not include provisions that allows for or requires public participation or review of the model, its assumptions, and inputs. In contrast, the alternative compliance pathway in the Tentative Order does require an analysis with "clearly stated assumptions" which must go through a public participation process that allows the public to review and provide comments on the analysis methodology and the assumptions included in the analysis. The main difference in the approaches is that the Copermittee has more flexibility with how to do the analysis, and as long as there is understanding and support from the public and the San Diego Water Board. The Copermittee is not just limited to one or two "acceptable" models, but also is not precluded from the use of those models. The Tentative Order alternative compliance pathway is a truly transparent process for the public and provides for the public to participate in how the analysis is defined. Based on these	

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B3c-8	PROVISION B.3.c: Prohibitions and Limitations Compliance Option	
	considerations, the analysis requirement is "well defined" and "transparent" consistent with the State Water Board Order. b) In response to the assertion that the alternative compliance pathway in the Tentative Order does not require a "finite" period of time to achieve compliance with receiving water limitations, the alternative compliance pathway requires a Copermittee to provide a schedule for when receiving water limitations are expected to be achieved. Any schedule with an expected end date is "finite." However, "finite" should not mean there is not room for making adjustments to the schedule if conditions warrant it. Absent the alternative compliance pathway, no assessments would necessarily be conducted to determine if or when receiving water limitations have been fully achieved. The San Diego Water Board prefers a permit that will provide support, incentive, and motivation for the Copermittees to achieve compliance with receiving water limitations within a foreseeable future rather than a permit that only has the threat of enforcement in the present and the foreseeable future. However, while the alternative compliance pathway removes the immediate threat of enforcement for violations of receiving water limitations, it also includes additional requirements that can be used to hold the Copermittee more accountable for implementing strategies to achieve compliance with receiving water limitations. In the end, the San Diego Water Board believes that the alternative compliance pathway provides a path to compliance with receiving water limitations that is "finite" compared to the "iterative process" that was previously required, consistent with the State Water Board Order. c) In response to the assertion that the alternative compliance pathway in the Tentative Order does not include requirements for multi-benefit or storm water resource projects, the San Diego Water Board acknowledges there is no text in Provision B.3.c that includes the term "multi-benefit." However, the Tentative Order does include several provisions that encourage multi-benefit and regional storm water resource projects without using the term "multi-benefit." The commenter should first review Provisions B.3.b.(1)(b) and B.3.b.(2). While these provisions are not specifically mentioned under Provision B.3.c, they are required to be included in the Water Quality Improvement Plan, which is where the alternative compliance pathway requirements of Provision B.3.c must be included. Provision B.3.b.(1)(b) requires each Copermittee to identify strategies to retrofit areas of existing development and rehabilitate conditions of channels or habitats within its jurisdiction, which are considered multi-benefit strategies. Provision B.3.b.(2) also requires the Copermittees in the Watershed Management Area to identify strategies to retrofit areas of existing development and rehabilitate conditions of	

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B3c-8	PROVISION B.3.c: Prohibitions and Limitations Compliance Option	
	channels or habitats that are regional or multi-jurisdictional. Tied to Provisions B.3.b.(1)(b) and B.3.b.(2) are also the jurisdictional runoff management program (JRMP) requirements under Provisions E.3.c.(3) and E.5.e. Provision E.5.e requires each Copermittee to identify areas of existing development within its jurisdiction for retrofit and rehabilitation projects, and to identify strategies to facilitate implementation of those projects. Provision E.3.c.(3) provides each Copermittee the option to allow development projects to implement candidate projects identified as part of the optional Watershed Management Area Analysis allowed pursuant to Provision B.3.b.(4), also included in the Water Quality Improvement Plan. The candidate projects include several types of multi-benefit and storm water resource type projects, including but not limited to stream or riparian area rehabilitation, retrofitting existing infrastructure to incorporate storm water retention or treatment, regional BMPs, groundwater recharge projects, water supply augmentation, and land purchases to preserve floodplain functions. Therefore, while the alternative compliance pathway requirements under Provision B.3.c do not include the term “multi-benefit” in the text, the Tentative Order includes several provisions that require or encourage the implementation of multi-benefit and storm water resource projects consistent with the State Water Board Order.	

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B3c-9	PROVISION B.3.c: Prohibitions and Limitations Compliance Option	
	COMMENT: *The Tentative Order violates anti-backsliding requirements and the rationale provided does not support an anti-backsliding exception.* The Environmental Groups assert that the Tentative Order violates the anti-backsliding provisions of the Clean Water Act and its implementing regulations because the San Diego Water Board's findings related to the alternative compliance pathway fail to support the use of anti-backsliding exceptions.	Environmental Groups
	RESPONSE: The San Diego Water Board disagrees that the Tentative Order violates anti-backsliding provisions of the Clean Water Act and the federal regulations. The Clean Water Act generally prohibits the relaxation of effluent limitations in a reissued permit. However, as discussed in the Fact Sheet, it remains unresolved whether anti-backsliding provisions are applicable to the incorporation of an alternative compliance pathway into a regional MS4 permit. (please see page F-32 of the Fact Sheet; *please also see* State Board Order WQ 2015-0075 at pp 18-21, stating "it is unnecessary, however, to resolve the ultimate applicability of the regulatory anti-backsliding provisions"). Even if the anti-backsliding provisions do apply, the alternative pathway provisions fit squarely within an exception. There are numerous exceptions to the Clean Water Act's backsliding provisions based on new information. See, e.g., 33 U.S.C. § 1342(o)(2)(B)(i), 40 C.F.R. § 122.44(l)(i(B)(1). Additionally, Under 40 C.F.R. section 122.44(l), anti-backsliding provision do not apply if the circumstances on which the previous permit was based have materially and substantially changed since the time the previous permit was issued and would constitute cause for permit modification or revocation or reissuance under 40 C.F.R. section 122.62. Section 122.62 in turn states that new information not available at the time the previous permit was issued is cause for modification. 40 C.F.R. § 122.62(a)(2). Furthermore, the San Diego Water Board disagrees with the assertion that the new information from the lessons learned and experiences of the Los Angeles Water Board are somehow "unique" to the Los Angeles Region. To the extent that the permitting history in Los Angeles may be considered "unique" in any way, it is still consistent with the San Diego Water Board's experience with storm water permitting over the last decade. The transition to a Regional MS4 Permit in the Fifth Term Permit was driven, in part, by a growing recognition that a watershed management approach required regional action. In the Regional MS4 permit, the San Diego Water Board seeks to provide a consistent set of permit requirements for all of the Copermittees and to promote the efficiencies gained from collective action in jurisdictional runoff management.	

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B3c-9	PROVISION B.3.c: Prohibitions and Limitations Compliance Option	
	The San Diego Water Board structured the Regional MS4 Permit to incorporate new information because there has been a statewide paradigm shift with respect to stormwater management. In June 2015, the State Water Board issued a precedential water quality order, Order WQ 2015-0075. This Order directed all of the Regional Water Boards to consider the Los Angeles Water Board's alternative compliance path to receiving water limits in all Phase I MS4 permits going forward (State Water Board Order WQ 2015-0075 at p 51). Moreover, the State Water Board made it clear that all regional water boards had been informed by the lessons learned in Los Angeles, stating "[f]urther, we [the State Water Board] find that all regional water boards are informed by the information gained in the Los Angeles Region, so that any regional water board that adopts an alternative compliance path in a subsequent Phase I permit would not be in violation of anti-backsliding requirements, regardless of the particular storm water permitting history of that region." Id. at p. 22 fn. 74. Thus, while the State Water Board Order relies heavily on the information and evidence related to the Los Angeles County MS4 Permit and its version of an alternative compliance pathway, the information and evidence are also applicable to and are expected to be utilized in the San Diego Region if an alternative compliance pathway is incorporated into the San Diego Regional MS4 Permit. For all of the reasons stated above, the alternative compliance path provisions do not violate federal anti-backsliding provisions. To clarify, however, the discussion on Anti-Backsliding Requirements on page F-32 in the Fact Sheet has been revised as follows: CWA sections 402(o) and 303(d)(4) and federal regulations at 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations or conditions may be relaxed. While this Order allows implementation of an alternative compliance pathway option in Provision B.3.c to constitute compliance with receiving water limitations under certain circumstances, the availability of that alternative and the corresponding availability of additional time to come into compliance with receiving water limitations does not violate the antibacksliding provisions. The receiving water limitations provisions of this Order are imposed under section 402(p)(3)(B) of the Clean Water Act rather than based on best professional judgment, or based on section 301(b)(1)(C) or sections 303(d) or (e), and are accordingly not subject to the anti-backsliding requirements of section 402(o). Although the non-applicability is less clear with respect to the regulatory anti-backsliding provisions in 40 CFR 122.44(l), the regulatory history suggests that USEPA's intent was to establish the anti-backsliding regulations with respect to evolving technology standards for traditional point sources. (See, e.g., 44 Fed.Reg. 32854, 32864 (Jun. 7, 1979)). It	

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B3c-9	PROVISION B.3.c: Prohibitions and Limitations Compliance Option	
	is unnecessary, however, to resolve the ultimate applicability of the regulatory anti-backsliding provisions, because the alternative compliance pathway option in Provision B.3.c qualifies for an exception to backsliding as based on new information. The alternative compliance pathway option in Provision B.3.c of this Order was informed by new information available to the Board from experience and knowledge gained through storm water permitting at the Regional Water Boards in the last ten years. There has been a statewide paradigm shift in storm water management. State Water Board Order WQ 2015-0075 directed all of the Regional Water Boards to consider the Los Angeles Water Board's alternative compliance path to receiving water limitations in all Phase I MS4 permits going forward (State Water Board Order WQ 2015-0075 at page 51). T~~t~~he Los Angeles Water Board's process of developing over 30 watershed-based TMDLs and implementing several TMDLs since the adoption of the previous permits. In particular, the Los Angeles Water Board recognized the significance of allowing time to plan, design, fund, operate and maintain watershed-based BMPs necessary to attain water quality improvements and additionally recognized the potential for municipal storm water to benefit water supply. Similarly, the San Diego Water Board's experience developing and implementing the Fourth Term MS4 Permits and TMDLs that apply on a regionwide scale (i.e. TMDLs for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region) has resulted in a similar recognition of the need for a watershed-based approach that allows time to plan, design, fund, operate and maintain BMPs to address impaired waters that have been impacted by MS4 discharges. Thus, even if the receiving water limitations are subject to anti-backsliding requirements, they were revised based on new information that would support an exception to the anti-backsliding provisions. (33 U.S.C. § 1342(o)(2)(B)(i); 40 C.F.R. § 122.44(l)(1); 40 C.F.R. §122.44(l)(2)(i)(B)(1)).	

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B3c-10	PROVISION B.3.c: Prohibitions and Limitations Compliance Option	
	COMMENT: *The Tentative Order violates anti-degradation requirements and the anti-degradation findings are unsupported by evidence.* The Environmental Groups assert that the Tentative Order violates anti-degradation requirements and there is no evidence to support the anti-degradation findings. The Environmental Groups generally assert that anti-degradation findings from State Water Board Order WQ 2015-0075 are not applicable to the Tentative Order and the findings in the Tentative Order are unsupported by evidence.	Environmental Groups
	RESPONSE: Consistent with the direction of the State Water Board Order WQ 2015-0075 adopted in June 2015, the San Diego Water Board considered the inclusion of an alternative compliance pathway into the Regional MS4 Permit. With the inclusion of this new permit component, the federal and state antidegradation policies were considered in light of the evidence in the record and information about the nature of municipal storm water discharges, evolving municipal storm water permits and the State Water Board's precedential order. The Regional MS4 Permit and Fact Sheet were revised to be consistent with all of these considerations. The San Diego Water Board disagrees that the antidegradation findings in the Tentative Order are inadequate and unsupported by evidence in the record. The San Diego Water Board considered relevant information unique to the San Diego Region such as its own storm water permitting history and TMDL adoption and implementation through municipal storm water permits. The San Diego Water Board has adopted seven TMDL Basin Plan amendments that cover at least 30 waterbody-pollutant combinations, similar to the Los Angeles Region. The implementation of these 7 TMDLs through the Regional MS4 Permit is essential for achieving water quality standards in the region. Moreover, the State Water Board's discussion of appropriate antidegradation considerations for the Los Angeles MS4 Permit is equally applicable in the context of the San Diego Water Board's Tentative Order that incorporates an alternative compliance pathway. In its consideration of antidegradation, the State Water Board acknowledges that the Los Angeles MS4 permit "improves on past practices that have been inadequate to protect water quality, and includes a monitoring and assessment program that will identify any changes in water quality. [fn.] In general, under the Los Angeles MS4 Order, we expect to see a trajectory away from any past degradation, even if there may be some continued short-term degradation." (Order WQ 2015-0075, p. 26.) Likewise, the Regional MS4 Permit now requires Copermittees to design watershed based monitoring and assessment programs that promote and track progress towards meeting the relevant water quality objectives. As such, were the State Water Board considering the Tentative Order, it likely would reach the same conclusion about the San Diego Regional MS4 Permit.	

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B3c-10	PROVISION B.3.c: Prohibitions and Limitations Compliance Option	
	The commenters incorrectly assert that the San Diego Water Board is required, but has failed, to follow procedures and requirements set forth in a USEPA document titled "*Interim Economic Guidance for Water Quality Standards Workbook"* (March 1995) (Workbook). USEPA's Workbook provides guidance that states may choose, but are not required, to follow. Although the Workbook does provide some information that states *may* use to consider whether degradation of high-quality waters is warranted from an economic impacts perspective, the guidance was not crafted to be used in the context of permitting of MS4 discharges. (See USEPA Workbook, cover memo, pp. 1-2 and Workbook, p. 1-1.) Instead, the San Diego Water Board has considered available guidance provided by the State Water Board in the Administrative Procedures Update (APU) 90-004 in conjunction with, among other things, available evidence about the quality of the receiving waters for discharges of storm water in finding that the Tentative Order complies with federal and state anti-degradation policies[1]. The antidegradation findings in the Tentative Order, like those adopted in the State Water Board Order for the final Los Angeles MS4 Permit, are supported by substantial evidence in the record for the Regional MS4 Permit. In the stormwater context, a generalized antidegradation analysis is appropriate. As the State Water Board acknowledges, guidance provided in the APU 90-004 "may be construed to exempt [a regional water board] from conducting an extensive pollutant by pollutant analysis for each water body in the region" where, as here, there is insufficient data available to carry out a complete antidegradation analysis for each water body-pollutant combination." (See Order WQ 2015-0075, p. 25.) The State Water Board notes the APU-90-004 "contemplates the appropriate antidegradation analysis for a discrete discharge or facility. It has limited value when considering anti-degradation in the context of storm water discharges from diffuse sources, conveyed through multiple outfalls, with multiple pollutants impacting multiple water bodies within a municipality, or in this case, a region, especially given that reliable data on the baseline water quality from 1968 is not available." (Id., p. 27; see also id., p. 27, n. 90 ["We note that USEPA did not conduct a detailed antidegradation analysis in issuing NPDES Permit No. DC00000221 for MS4 discharges to the District of Columbia, presumably for similar reasons. The court in *Asociacion de Gente Unida* also relied on APU 90-004 in part in rejecting an antidegradation analysis conducted by the Central Valley Regional Water Quality Control Board for discharges of pollutants to groundwater from dairy facilities region-wide, but the court's objection was to the regional water board's reliance on an illusory prohibition of discharge to groundwater in finding that no antidegradation analysis	

[1] See, e.g., 1996, 1998, 2002, 2006, 2010 Clean Water Action section 303(d) Lists for the San Diego Region, and monitoring reports from the San Diego County, Orange County, and Riverside County Copermittees since the First Term MS4 Permits issued in 1990.

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B3c-10	PROVISION B.3.c: Prohibitions and Limitations Compliance Option	
	was required, not to the sufficiency of any generalized antidegradation analysis the Board might have conducted in lieu of its reliance on the prohibition. (210 Cal.App.4th at pp. 1271-1273.]" Despite the commenters' assertions, the San Diego Water Board provides a clear statement of the basis for finding that the Tentative Order is consistent with the federal and state antidegradation policies. No revisions to the Tentative Order were made in response to these comments.	

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B5-1	PROVISION B.5: Iterative Approach and Adaptive Management Process	
	COMMENT: *Request for clarification of timing and conditions for alternative compliance pathway analysis updates.* The San Diego County Copermittees and the County of San Diego requested the addition of a provision under the Iterative Approach and Adaptive Management Process requirements of Provision B.5 to clarify the timing and conditions for when the analysis required for the alternative compliance pathway under Provision B.3.c.(1)(b) has to be updated.	San Diego County Copermittees County of San Diego
	RESPONSE: The San Diego Water Board has considered the requested additional language and determined that adding clarifying language is appropriate. The following text has been added as Provision B.5.d: **d. ADAPTATION OF PROHIBITIONS AND LIMITATIONS COMPLIANCE OPTION** If a Copermittee has implemented the Prohibitions and Limitations Compliance Option allowed to be included in the Water Quality Improvement Plan pursuant to Provision B.3.c, the Copermittee must re-evaluate and adapt the numeric goals, water quality improvement strategies, schedules, and annual milestones required under Provision B.3.c.(1) when significant new information becomes available, or with the Report of Waste Discharge required pursuant to Provision F.5. Significant changes in the numeric goals, water quality improvement strategies, schedules, or annual milestones requires an update to the analysis required under Provision B.3.c.(2).	

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D4a-1	PROVISION D.4.a: Receiving Waters Assessments	
	COMMENT: *Recommended revisions to transitional assessment requirements under Provision D.4.a.(1)(a).* The Riverside County Copermittees noted that Provision D.4.a.(1)(a) prescribes that assessments required to be made under Provision D.4.a.(2) must be included in each Copermittees' transitional monitoring and assessment reports; however, Provision D.4.a.(2)(e) requires determination of whether strategies identified in the Copermittees' Water Quality Improvement Plan are progressing towards achieving interim and final numeric goals described in the Water Quality Improvement Plan. The Riverside County Copermittees provided their understanding that transitional monitoring and assessment applies to the time period when the Copermittees' Water Quality Improvement Plan is being developed, and therefore assessments made during this time period cannot provide information on the progress of the Water Quality Improvement Plan. Based on their observations, the Riverside County Copermittees recommended revisions to Provision D.4.a.(1)(a).	Riverside County Copermittees
	RESPONSE: The San Diego Water Board disagrees that the revisions to Provision D.4.a.(1)(a) are necessary. It is true that the transitional monitoring and assessment applies to the time period when the Water Quality Improvement Plan is being developed. The commenters can fulfill the assessment requirement of Provision D.4.a.(2)(e) by either stating that they cannot make a determination until the Water Quality Improvement Plan is accepted and implemented, or assess the strategies that are currently being implemented at the time of the assessment and are expected to be included in the Water Quality Improvement Plan. The San Diego Water Board expects the assessments reported during the transitional period to serve as a baseline for improvements in water quality as the Water Quality Improvement Plans are implemented over time. No changes were made to the Tentative Order as a result of this comment.	

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E2-1	PROVISION E.2: Illicit Discharge Detection and Elimination	
	COMMENT: *Requests for revisions to clarify implementation of the illicit discharge and detection program under Provision E.2 is compliance with the requirement to effectively prohibit non-storm water discharges to the MS4.* The Orange County Copermittees, as well as the Cities of Dana Point and Laguna Beach, requested revisions to Provision E.2 to explicitly state that implementation of the illicit discharge detection and elimination requirements under Provision E.2 constitutes compliance with effective prohibition of non-storm water discharges to the MS4 required under Provision A.1.b.	Orange County Copermittees City of Dana Point City of Laguna Beach
	RESPONSE: The San Diego Water disagrees that revisions to Provision E.2 are necessary. Provision A.1.b explicitly states that Copermittees are required to effectively prohibit non-storm water discharges to the MS4 "*through the implementation of Provision E.2*." The Copermittees are already expected to demonstrate compliance with Provision A.1.b through the implementation of Provision E.2. If a Copermittee has not adequately implemented Provision E.2, then the Copermittee is not only, not in compliance with the requirements of Provision E.2, but by default will also not be in compliance with Provision A.1.b. The San Diego Water Board, however, recognizes that additional clarification may be helpful in understanding that implementing the requirements of Provision E.2 is how the San Diego Water Board will assess a Copermittee's compliance with the requirement to effectively prohibit non-storm water discharges to the MS4 under Provision A.1.b. Therefore, the San Diego Water Board has revised the opening paragraph of the discussion for Provision E.2 in the Fact Sheet (page F-81) to the following: Provision E.2.(Illicit Discharge Detection and Elimination) requires each Copermittee to implement an illicit discharge detection and elimination program to effectively prohibit non-storm water discharges to the MS4 by actively detecting and eliminating illicit discharges and disposal into its MS4. <u>If the San Diego Water Board finds that a Copermittee is fully implementing the requirements of Provision E.2, then the Copermittee is deemed in compliance with the effective prohibition of non-storm water discharges to the MS4 required under Provision A.1.b.</u>	

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E2-2	PROVISION E.2: Illicit Discharge Detection and Elimination	
	COMMENT: *Request for clarification of discharges of potable water sources under Provision E.2.a.(3)(f).* The Cities of Dana Point and Laguna Beach requested a clarification of the definition of "discharges from potable water sources" under Provision E.2.a.(3)(f). It is not clear to the Cities whether "potable discharges" are intended to include runoff derived from turf or ornamental plant irrigation.	City of Dana Point City of Laguna Beach
	RESPONSE: Discharges from potable water sources are sources of water that have been treated to drinking water standards and discharged to the MS4. Discharges of potable water that are applied to turf or ornamental plant irrigation before running off to the MS4 are not qualified as discharges of potable water under Provision E.2.a.(3)(f).	

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E3b1-1	PROVISION E.3.b.(1): Definition of Priority Development Project	
	COMMENT: *Request for revisions to the definition of Priority Development Projects under Provision E.3.b.(1).* The City of San Diego requested revisions to combine Provisions E.3.b.(1)(c) and E.3.b.(1)(e) under the provisions defining Priority Development Projects.	City of San Diego
	RESPONSE: The San Diego Water Board disagrees that combining sub-sections (c) and (e) of Provision E.3.b.(1) is appropriate. Sub-section (c) has a minimum square footage trigger for both new development projects and redevelopment projects. In contrast, subsection (e) has a minimum square footage trigger for redevelopment projects only; new development projects consisting of automotive repair shops and retail gasoline outlets are considered Priority Development Projects regardless of size.	

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E3b3-1	PROVISION E.3.b.(3): Priority Development Project Exemptions	
	COMMENT: *Request for Priority Development Project exemption for "self-remediating" projects.* The Orange County Copermittees requested that the list of Priority Development Project Exemptions under Provision E.3.b.(3) be revised to include projects that are effectively self-remediating (i.e. all rainfall is retained) including, but not limited to, reservoirs and swimming pools.	Orange County Copermittees
	RESPONSE: The San Diego Water Board disagrees that the requested change is necessary. If all rainfall is retained on a project, then the project has met the design standard, and an exemption is not needed. No changes were made to the Tentative Order as a result of this comment.	

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E3c1-1	PROVISION E.3.c.(1): Storm Water Pollutant Control BMP Requirements	
	COMMENT: *Request for revisions to clarify the biolfiltration storm water pollutant control BMP performance criteria.* The County of San Diego requested a revision to Provision E.3.c.(1)(a)(i)[b] to clarify the intent and applicability of the biolfiltration BMP design criteria.	County of San Diego
	RESPONSE: The San Diego Water Board disagrees that the proposed change is necessary. The wording describing the design requirements adequately describe the intent and applicability of the biofiltration BMP design criteria. Any proposed change incorporated during the adoption proceedings of the Tentative Order could be interpreted as a change in the requirement, when in fact there is no change. No changes were made to the Tentative Order as a result of this comment.	

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E3c1-2	PROVISION E.3.c.(1): Storm Water Pollutant Control BMP Requirements	
	COMMENT: *The San Diego Water Board is requiring increasingly stringent on-site storm water retention without evidence that the 2010 Southwest Riverside MS4 Permit requirements are not working.* CICWQ asserts that the Tentative Order has more stringent on-site storm water retention requirements than the 2010 Southwest Riverside County MS4 Permit (Order No. R9-2010-0016) requirements without any evidence that the requirements of Order No. R9-2010-0016 are not working to protect water quality and maintain beneficial uses.	Construction Industry Coalition on Water Quality (CICWQ)
	RESPONSE: The San Diego Water Board disagrees with the assertion that the Tentative Order has more stringent on-site storm water retention requirements over and above the requirements of Order No. R9-2010-0016. The purpose of the on-site retention requirement in both the Tentative Order and Order No. R9-2010-0016 is to retain on-site the pollutants contained in the volume of storm water runoff produced from a 24-hour 85th percentile storm event. This requirement has not changed from Order No. R9-2010-0016, and therefore the commenter is incorrect in stating that the San Diego Water Board is requiring additional prescriptive performance measures for retaining storm water runoff. This is the maximum extent practicable (MEP) standard recognized by the San Diego Water Board and is consistent with the Fourth Term MS4 Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), as well as Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), Los Angeles Water Board Order Nos. R4-2010-0108 and R4-2012-0175 (Ventura County and Los Angeles County MS4 Permits, respectively). Additionally, the storm water pollutant control and hydromodification management BMP requirements in the Tentative Order are more flexible than in Order No. R9-2010-0016 by providing an optional Alternative Compliance Program under Provision E.3.c.(3) of the Regional MS4 Permit. The Alternative Compliance Program, if developed by a Copermittee, would allow Priority Development Projects to fully comply with storm water pollutant control and hydromodification management BMP requirements either on-site, offsite, or a combination of both, if doing so would provide greater water quality benefit to the watershed.	

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E3c2-1	PROVISION E.3.c.(2): Hydromodification Management BMP Requirements	
	COMMENT: *Request for revisions to requirements to manage critical coarse sediment yield areas.* CICWQ asserts that the Tentative Order requirements for Priority Development Projects to "avoid critical sediment yield areas" are unnecessarily restrictive. The County of San Diego requested that the requirement to manage critical course sediment yield areas be moved from the hydromodification management BMP performance standard requirements under Provision E.3.c.(2)(b) to Provision E.3.d as part of the BMP Design Manual update to be addressed regionally.	County of San Diego Construction Industry Coalition on Water Quality (CICWQ)
	RESPONSE: The San Diego Water Board disagrees that the requirements to avoid critical sediment yield areas are unnecessarily restrictive or that they should be moved from under Provision E.3.c.(2)(b) to Provision E.3.d. The requirements are necessary to protect receiving waters from erosive flows caused by land development. As explained in the Fact Sheet to the Tentative Order, hydromodification, which is caused by both altered storm water flow and altered sediment flow regimes, is largely responsible for degradation of creeks, streams, and associated habitats in the San Diego Region. In an ongoing study by the Stormwater Monitoring Coalition to assess the health of streams throughout Southern California, researchers found that three of the four highest risk stressors to creeks (percent sands and fines present, channel alteration, and riparian disturbance) were related to physical habitat (*Assessing the Health of Southern California Streams, Stormwater Monitoring Coalition*, Fact Sheet). Researchers studying flood frequencies in Riverside County have found that increases in watershed imperviousness of only 9-22 percent can result in increases in peak flow rates for the two-year storm event of up to 100 percent (Schueler and Holland, 2000. *Storm Water Strategies for Arid and Semi-Arid Watersheds*, (Article 66). The Practice of Watershed Protection). Such changes in runoff have significant impacts on channel morphology, and given the current state of science the San Diego Water Board has included these requirements to reduce these potential impacts to receiving waters that may be caused by development projects. Placement of impervious surfaces as a result of urbanization is largely responsible for erosional impacts to streams because placement of impervious surfaces encapsulates "good" sediment (such as sand, gravel, rocks and cobbles) that would normally replenish creek beds and banks to help stabilize them. For this reason, the Tentative Order requires Priority Development Projects to avoid critical sediment yield areas, as defined by the	

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E3c2-1	PROVISION E.3.c.(2): Hydromodification Management BMP Requirements	
	Copermittees, or implement measures to allow coarse sediment to be discharged to receiving waters, such that there is no net impact to the receiving water. Such measures are designed to protect receiving waters and avoid impacts experienced as a result of past land development practices. The San Diego Water Board recognizes that implementation of new requirements is challenging, and is supportive of the Copermittees' efforts to develop guidance for land developers in meeting this requirement. Until this guidance is widely available, Copermittees and land developers should recognize that strict avoidance of critical sediment yield areas is not mandated and that compliance may be achieved by other methods, provided that the stream experiences "no net impact." No changes were made to the Tentative Order as a result of this comment.	

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E3c2-2	PROVISION E.3.c.(2): Hydromodification Management BMP Requirements	
	COMMENT: *Request for interim timeframe exemptions for hydromodification management BMP requirements to be granted outright without any additional study or consideration.* CICWQ asserts that the Tentative Order is eliminating exemptions for hydromodification control, even when stormwater runoff is conveyed in the MS4 system to significantly hardened or engineered channels. CICWQ requested that the San Diego Water Board revise the Tentative Order to make the interim timeframe exemptions under Provision E.3.c.(2)(e) part of the exemptions under Provision E.3.c.(2)(d) without any additional study or consideration.	Construction Industry Coalition on Water Quality (CICWQ)
	RESPONSE: The San Diego Water Board disagrees that the interim timeframe exemptions for hydromodification management BMP requirements should be granted outright without any additional study or consideration. The commenter correctly deduced that the driver behind the requirement to use the pre-development performance standard is the sustainability of geomorphically stable channels and the ability to return urbanized streams to a more natural state. The requirement to use pre-development runoff conditions as the performance standard is needed because using a hydrology baseline that approximates that of an undeveloped, natural watershed is the only way to facilitate the return of more natural hydrological conditions to already built-out watersheds, which in turn supports conditions for rehabilitating degraded or channelized stream segments. Contrary to what the commenter asserts, the Tentative Order does not require Copermittees to remove concrete from channels that are engineered to relieve flooding and protect life and property. The Tentative Order provides exemptions for Priority Development Projects that discharge to receiving waters where there is little threat of erosion, and subsequently implementing BMPs on-site would do little to protect the beneficial uses of such receiving waters. The commenter correctly states that the exemption for engineered channels is temporary. However, the commenter should note that there is a high likelihood that exemptions for engineered channels can become accepted as applicable for a Watershed Management Area. The Tentative Order allows for the Copermittees to recommend exemptions based on completion of an optional Watershed Management Area Analysis pursuant to Provision B.3.b.(4). As part of this effort, the Copermittees would identify, for example, areas of existing development in the watershed suitable for retrofitting, and areas suitable for stream rehabilitation. The Copermittees would also identify areas suitable for exemptions for hydromodification management, such as engineered channels that are needed for the protection of life and property. The interim	

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E3c2-2	PROVISION E.3.c.(2): Hydromodification Management BMP Requirements	
	timeframe exemption for engineered channels is not granted outright as permanent exemptions because the areas have not yet been analyzed in the context of stream rehabilitation opportunities. No changes were made to the Tentative Order as a result of this comment.	

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E3d-1	PROVISION E.3.d: BMP Design Manual Update	
	COMMENT: *Request for additional time for San Diego County Copermittees to update and implement their BMP Design Manuals.* The San Diego County Copermittees and the County of San Diego requested revisions to Provision E.3.d which would grant Copermittees up to 180 days to incorporate corrections to the definition of Priority Development Projects under Provision E.3.b.(1) and begin implementing their BMP Design Manuals.	San Diego County Copermittees County of San Diego
	RESPONSE: The San Diego Water Board disagrees that more time is needed to update and implement the BMP Design Manuals. In a letter dated May 29, 2015, the San Diego Water Board forewarned the San Diego County Copermittees that changes to the Priority Development Project categories were necessary in order to clearly reflect the intended definitions. At that time, the San Diego Water Board provided the language that is now proposed in the Tentative Order. The Copermittees have had ample opportunity to initiate and complete their local adoption processes in order to meet the BMP Design Manual implementation date. For this reason, more time is not necessary and a delay in BMP Design Manual implementation is not warranted. However, the San Diego Water Board will use Provision F.2.b.(4) to grant the Copermittees an extra 90 days beyond the original BMP Design Manual implementation date of December 24, 2015 to complete the update and begin implementation of the BMP Design Manual. Please also see response to comment F2b-1.	

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E3d-2	PROVISION E.3.d: BMP Design Manual Update	
	COMMENT: *Request for revisions to clarify the effective date of the BMP Design Manual is the same as the implementation date.* The San Diego County Copermittees, the City of San Diego, and the County of San Diego requested revisions to Provision E.3.d to include language that clarifies the effective date of the BMP Design Manual is the same as when the BMP Design Manual begins implementation.	San Diego County Copermittees City of San Diego County of San Diego
	RESPONSE: The San Diego Water Board agrees that the proposed modification would clarify the San Diego Water Board's intention. Provision E.3.d has been modified as follows: a. Each Copermittee must update its BMP Design Manual pursuant to Provision F.2.b. Until the Copermittee has updated its BMP Design Manual pursuant to Provision F.2.b.(1), the Copermittee must continue implementing its current BMP Design Manual. The Copermittee must implement the updated BMP Design Manual within 180 days following completion of the update pursuant to Provision F.2.b.(1), unless directed otherwise by the San Diego Water Board Executive Officer. The date the BMP Design Manual is implemented is the "effective date" of the BMP Design Manual.	

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E3e1-1	PROVISION E.3.e.(1): Structural BMP Approval and Verification Process	
	COMMENT: *Requests for revisions to the proposed language to define projects with prior lawful approval under Provision E.3.e.(1)(a).* The City of San Diego requested a revision to the proposed language to define projects with prior lawful approval to also include projects that have received development approvals. San Diego Coastkeeper and Coastal Environmental Rights Foundation requested revisions that would allow a Priority Development Project to proceed under previous land development requirements only if the Copermittee demonstrates that, among other required conditions, construction activities on the Priority Development Project commenced prior to the effective date of the new BMP Design Manual and that all approvals and permits necessary to complete the implementation of the initially approved design also be obtained prior to the effective date of the new BMP Design Manual.	City of San Diego San Diego Coastkeeper and Coastal Environmental Rights Foundation
	RESPONSE: The San Diego Water Board disagrees that any changes are needed to the proposed language in Provision E.3.e.(1)(a). Specifically, reliance on issuance of a development approval alone is not consistent with the San Diego Water Board's goal of requiring most new Priority Development Projects to be subject to the requirements in the new BMP Design Manual unless limited conditions are met. Nor is it consistent with the *Avco* line of cases, which requires commencement of construction and substantial reliance on the permit as the determining factors for grandfathering projects under previous development requirements. Reliance on issuance of a development approval alone may also result in many fewer Priority Development Projects implementing projects based on the new BMP Design Manual required in Order No. R9-2013-0001 as amended. With regard to the Environmental Groups' comment, the San Diego Water Board believes it is appropriate for the Copermitees to have the ability to allow a Priority Development Project meeting all other required conditions in Provision E.3.e.(1)(a) to proceed under previous land use development requirements if the Copermittee demonstrates that construction activities have commenced before, or within 180 days after, the effective date of the new BMP Design Manual. The Board believes it is appropriate to include a grace period of 180 days after the effective date of the BMP Design Manual in order to provide certainty of requirements for projects in process, and allow for scheduling of construction activities under optimal conditions, such as outside of nesting season, or during the dry season, when impacts from storm water runoff are minimized. And, as long as development projects complete construction of all phases in substantial conformity with the approved design, which includes storm water pollutant control and hydromodification management BMPs approved by the	

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E3e1-1	PROVISION E.3.e.(1): Structural BMP Approval and Verification Process	
	municipality, it is appropriate that prior lawful approval (the ability to proceed with development in accordance with the previous land use development requirements) remain valid during issuance of subsequent permits that may be necessary to complete the project within 5 years after the effective date of the new BMP Design Manual. Five years is an appropriate and reasonable period of time for those projects meeting all other conditions to be completed. No changes were made to the Tentative Order as a result of these comments.	

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E4-1	PROVISION E.4: Construction Management	
	COMMENT: *Request for revisions to construction management program inventory and tracking requirements.* The City of San Diego requested that Provisions E.4.b and E.4.d.(3) be combined because both sections contain information that needs to be collected, inventoried, and tracked.	City of San Diego
	RESPONSE: The San Diego Water Board considered the requested revision and determined that it was not necessary. The Copermittees can implement an inventory and tracking system that may be utilized to manage the data that are collected and needed to fulfill the requirements of both Provision E.4.b and E.4.d.(3). No changes were made to the Tentative Order as a result of this comment.	

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E5c-1	PROVISION E.5.c: Existing Development Inspections	
	COMMENT: *Request to include an optional third-party certification program into the existing development inspection provisions.* Section F.3.b.(4)(c) of Order No. R9-2010-0016 allowed the Riverside County Copermittees the option to propose a third-party certification program for commercial and industrial inspection programs, subject to San Diego Water Board Executive Officer acceptance. The Riverside County Copermittees noted that a similar provision does not exist in the Tentative Order, and requested inclusion of this option in the Regional MS4 Permit.	Riverside County Copermittees
	RESPONSE: At this time the San Diego Water Board does not support the inclusion of a third-party certification program as part of the existing development inspection provisions. The San Diego Water Board has conducted audits of several Copermittees' existing development and post construction BMP inspection programs in the San Diego Region that utilize self certifications or third-party certifications to verify the proper operation and maintenance of post construction BMPs. These audits have found such programs have not adequately confirmed that BMPs are being properly operated and maintained so they are effective at removing pollutants in storm water discharges from commercial and industrial sites to the MEP. However, the Regional MS4 Permit provides the Copermittees significant flexibility in the implementation of their existing development inspection programs, and does not preclude the use of third-party certification programs during years where inspections are not necessarily required. If the Copermittees can develop a third-party certification program that can demonstrate such a program can be implemented in a way that will ensure BMPs are being properly operated and maintained so they are effective at removing pollutants in storm water discharges from commercial and industrial sites to the MEP, the San Diego Water Board may reconsider including such an option into the Regional MS4 Permit during the renewal process anticipated to begin in early 2018. No changes were made to the Tentative Order as a result of this comment.	

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F2b-1	PROVISION F.2.b: BMP Design Manual Updates	
	COMMENT: *Request for revisions to clarify the effective date of the BMP Design Manual.* The San Diego County Copermittees, the City of San Diego, and the County of San Diego requested revisions to Provision F.2.b.(4) to include language that clarifies the effective date of the BMP Design Manual if an update to the BMP Design Manual is required.	San Diego County Copermittees City of San Diego County of San Diego
	RESPONSE: The San Diego Water Board agrees that the proposed modification to the text in Provision F.2.b.(4) would clarify that the BMP Design Manual effective date is no later than 90 days after the San Diego Water Board adopts amendments to Provisions E.3.a-d. Provision F.2.b.(4) will be modified as follows: (4) If the San Diego Water Board amends Provisions E.3.a-d during the permit term but after the Copermittee has completed the update pursuant to Provision F.2.b.(1), the Copermittee must revise its BMP Design Manual to incorporate the amended Provision E.3.a-d requirements as soon as possible but not later than 90 days after the date the San Diego Water Board adopts the amendments to Provisions E.3.a-d, unless otherwise directed by the San Diego Water Board Executive Officer. Under these circumstances, the effective date of the BMP Design Manual is not later than 90 days after the date the San Diego Water Board adopts the amendments to Provisions E.3.a-d, unless otherwise directed by the San Diego Water Board Executive Officer.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2015-0100

November 4, 2015

AttC-1	ATTACHMENT C: Acronyms, Abbreviations, and Definitions	
	COMMENT: *Request for revisions to definition of Construction Activities.* The City of Escondido requested revisions to the definition of Construction Activities in Attachment C to the Regional MS4 Permit. The commenter requested the removal of the term "phase" from the definition because the term introduces artificial phases during a construction project that cannot be readily tracked.	City of Escondido
	RESPONSE: The San Diego Water Board agrees that the revisions are appropriate. The definition of Construction Activities in Attachment C has been revised as follows: **Construction Activities** – Actions implemented during construction of development or redevelopment projects during the Preliminary Tasks ~~Phase~~ (including rough grading and/or disking, clearing and grubbing operations, or any soil disturbance prior to mass grading), Grading or Land Development ~~Phase~~ (including topography and slope reconfiguration, alluvium removals, canyon cleanouts, rock undercuts, keyway excavations, land form grading, and stockpiling of select material for capping operations), Streets and Utility Installation ~~Phase~~ (including excavation and street paving, lot grading, curbs, gutters and sidewalks, public utilities, public water facilities including fire hydrants, public sanitary sewer systems, storm sewer systems and/or other drainage improvements), or Vertical Construction ~~Phase~~ (including the build out of structures from foundations to roofing, including rough landscaping).	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2015-0100

November 4, 2015

AttC-2	ATTACHMENT C: Acronyms, Abbreviations, and Definitions	
	COMMENT: *Request for revisions to definition of Redevelopment.* The City of San Diego requested revisions to the definition of Redevelopment in Attachment C to the Regional MS4 Permit to improve the clarity of the definition.	City of San Diego
	RESPONSE: The San Diego Water Board agrees that revisions would provide additional clarity in the definition of Redevelopment. The definition of Redevelopment in Attachment C has been revised as follows: **Redevelopment** – The creation and/or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure~~, and creation or addition of impervious surfaces~~. Replacement of impervious surfaces includes any activity ~~that is not part of a routine maintenance activity~~ where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include routine maintenance activities, such as trenching and resurfacing associated with utility work; pavement grinding; resurfacing existing roadways,~~; new~~ sidewalks ~~construction~~, pedestrian ramps, or bike lanes on existing roads; and routine replacement of damaged pavement, such as pothole repair.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2015-0100

November 4, 2015

AttE-1	ATTACHMENT E: Specific Provisions for Total Maximum Daily Loads	
	COMMENT: *Request for revisions to TMDL requirements in Attachment E to the Regional MS4 Permit to allow independent jurisdictional compliance with TMDLs.* The City of San Diego requested revisions to the TMDL requirements in Attachment E to the Regional MS4 Permit that would allow independent jurisdictional compliance instead of requiring all the Copermittees named as responsible to comply with the TMDL requirements.	City of San Diego
	RESPONSE: The San Diego Water Board disagrees that modifications are needed to the language pertaining to TMDL compliance determination. The commenter correctly asserts that the intent of the language, and in fact, the intent of the Water Quality Improvement Plan concept, is that the Copermittees develop the Water Quality Improvement Plans collectively and evaluate water quality improvement strategies on a watershed basis. The San Diego Water Board recognizes that the Copermittees have no authority over other Copermittees to compel TMDL compliance; therefore, the Tentative Order has multiple compliance determination pathways available to each Copermittee to achieve compliance. The final compliance determination pathways are presented in Attachment E Specific (TMDL) Provisions 1.b.(3), 2.b.(3), 3.b.(3), 4.b.(3), 5.b.(3), 6.b.(3), and 7.b.(3). There are several compliance determination pathways that allow a Copermittee to demonstrate independent jurisdictional compliance with water quality based effluent limitations (WQBELs). No changes were made to the Tentative Order as a result of this comment.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2015-0100

November 4, 2015

AttE6-1	ATTACHMENT E.6: Beaches and Creeks Bacteria TMDLs	
	COMMENT: *Requests for revisions to clarify that water bodies de-listed from the 303(d) List are not subject to the Beaches and Creeks TMDL requirements.* The Orange County Copermittees requested revisions to the Beaches and Creeks Bacteria TMDLs requirements in Attachment E to state that specific water bodies or beach segments included in Table 6.0 that have been delisted from the 2008 Clean Water Act Section 303(d) List of Water Quality Impaired Segments are not subject to any further action as long as monitoring data continues to support compliance with water quality standards.	Orange County Copermittees
	RESPONSE: The San Diego Water Board disagrees that any revisions are necessary or appropriate. The Orange County Copermittees correctly state that the water bodies listed in Table 6.0 must be in compliance with the final TMDL compliance requirements (and WQBELs). If a water body or beach segment has been de-listed, then the MS4 discharge WQBELs and/or receiving water WQBELs should already be achieved, but the BMP WQBELs and the monitoring and assessment requirements are still required to be implemented to maintain the achievement of the MS4 discharge WQBELs and/or receiving water WQBELs in the de-listed water body or beach segment. No changes were made to the Tentative Order as a result of this comment.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2015-0100

November 4, 2015

AttE6-2	ATTACHMENT E.6: Beaches and Creeks Bacteria TMDLs	
	COMMENT: *Request for revisions to compliance dates for the Beaches and Creeks Bacteria TMDLs.* The San Diego County Copermittees, the City of San Diego, and the County of San Diego requested that the compliance dates proposed to be added to Tables 6.1 and 6.4 be removed. The commenters assert that the compliance dates proposed to be added are inconsistent with the requirements of the Beaches and Creeks Bacteria TMDLs. The commenters also assert that the Beaches and Creeks Bacteria TMDLs do not require the development of a Bacteria Load Reduction Plan (BLRP) or Comprehensive Load Reduction Plan (CLRP) for segments of beaches or creeks de-listed from the Clean Water Act Section 303(d) List of Water Quality Limited Segments.	San Diego County Copermittees City of San Diego County of San Diego
	RESPONSE: The San Diego Water Board disagrees that the addition of the compliance dates is inconsistent with the Beaches and Creeks Bacteria TMDLs requirements. The San Diego Water Board also disagrees that segments of beaches or creeks de-listed from the Clean Water Act Section 303(d) List of Water Quality Limited Segments are not required to develop a BLRP or CLRP. The compliance date for the Beaches and Creeks Bacteria TMDLs is specified on page 7-107 of the Basin Plan as follows: *"Full implementation of the TMDLs for indicator bacteria shall be completed as soon as possible, but no later than 10 years from the effective date for both the dry weather and wet weather TMDLs, unless an alternative compliance schedule is approved as part of a Comprehensive Load Reduction Plan, as described in the following section. The effective date of these TMDLs is April 4, 2011.* *The San Diego Water Board will require the Phase I MS4s to submit Bacteria Load Reduction Plan (BLRPs) outlining the proposed BMP program that will be capable of achieving the necessary load reduction required to attain the bacteria TMDLs in the receiving water, acceptable to the Regional Board within 18 months after the effective date of these TMDLs…."* Tables 7-53 and 7-54 on page 7-108 in Chapter 7 of the Basin Plan present the compliance schedules that apply if the Copermittees develop a BLRP. Page 7-109 of the Basin Plan describes the potential for the Copermittees to develop CLRPs. If the Copermittees choose to develop a CLRP, the compliance date and schedule for the Beaches and Creeks Bacteria TMDLs is specified on page 7-109 of the Basin Plan in Table 7-55 and as follows:	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2015-0100

November 4, 2015

AttE6-2	ATTACHMENT E.6: Beaches and Creeks Bacteria TMDLs	
	"….the dischargers may develop and submit a CLRP for all constituents of concern in lieu of the BLRP, and to propose an appropriately tailored alternative compliance schedule. Proposed alternative compliance schedules tailored under this provision may not extend beyond 10 years for the dry weather bacteria TMDLs and 20 years for the wet weather bacteria TMDLs from the effective date …." Tables 6.1 and 6.4 were revised in the Tentative Order to be consistent with the compliance schedules of Tables 7-53, 7-54, and 7-55 of the Beaches and Creeks Bacteria TMDLs in the Basin Plan. Therefore, the addition of the compliance dates proposed to be added to Tables 6.1 and 6.4 are consistent with the requirements of the Beaches and Creeks Bacteria TMDLs. As for the assertion that the Beaches and Creeks Bacteria TMDLs do not require BLRPs or CLRPs for segments of beaches or creeks de-listed from the Clean Water Act Section 303(d) List of Water Quality Limited Segments, the commenters appear to be citing text from the TMDL Compliance Schedule section instead of the TMDL Implementation Plan section of the Beaches and Creeks Bacteria TMDLs. It is true that on page 7-107 of the Basin Plan, includes a statement that: "*For watersheds in Table 7-52 where there are no longer any impairments listed on the 2008 303(d) List, the Phase I MS4s and Caltrans are not required to submit a BLRP or CLRP within 18 months of the effective date of the TMDLs.*" However, this statement is under the TMDL Compliance Schedule requirements and was only included to indicate that the San Diego Water Board would not require a BLRP or CLRP to be submitted within 18 months of the effective date. It was not intended to mean that a BLRP or CLRP would never be required. If the commenters look under the TMDL Implementation Plan requirements for Phase I MS4s, which begins on page 7-85 of the Basin Plan, there is no statement that a BLRP or CLRP will not be required for "*watersheds … where there are no longer any impairments listed on the 2008 303(d) List."* The TMDL Implementation Plan for Phase I MS4 does, however, state the following on page 7-86 of the Basin Plan: "*The WQBELs will likely consist of receiving water limitations (based on the numeric targets) and require the implementation of a BMP program to achieve the TMDLs in receiving waters. The Phase I MS4s will be required to submit Bacteria Load Reduction Plans (BLRPs) or Comprehensive Load Reduction Plans (CLRPs) outlining a proposed BMP program capable of achieving the necessary load reductions required to attain the TMDLs in receiving waters, acceptable to the San Diego Water, within 18 months after the effective date of these TMDLs. The San Diego Water Board will require the BLRPs or CLRPs to be developed on a watershed or region wide scale. The BLRPs or CLRPs should be developed and*	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2015-0100

November 4, 2015

AttE6-2	ATTACHMENT E.6: Beaches and Creeks Bacteria TMDLs	
	incorporated as part of the Watershed Runoff Management Programs required under the Phase I MS4 NPDES requirements…." The TMDL Implementation Plan requirements clearly state the BLRPs or CLRPs are required and do not have any exceptions. The TMDL Compliance Schedule requirements do allow an exception from submitting a BLRP or CLRP within 18 months of the effective date, but do not state that a BLRP or CLRP will never be required. Specific Provision 6.b.(2)(c)(i) is consistent with the TMDL Implementation Plan requirements in the Basin Plan by requiring a CLRP to be on a watershed scale and incorporated into the Water Quality Improvement Plans (i.e. Watershed Runoff Management Program), which includes a BMP implementation program capable of achieving the necessary load reductions required to attain the TMDLs in receiving waters for all the applicable Watershed Management Areas in Table 6.0. Table 6.0 lists all the beaches and areas included in the Beaches and Creeks Bacteria TMDLs from the Basin Plan. Please also see the response to comment AttE6-1. However, the San Diego Water Board recognizes that Specific Provision 6.b.(2)(c)(i) only allows for the Copermittees to incorporate CLRPs into the Water Quality Improvement Plans. Therefore, to be consistent with the Beaches and Creeks Bacteria TMDLs, which allows for BLRPs to be developed and submitted, Specific Provision 6.b.(2)(c)(i) has been revised as follows: (i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 6.0 must incorporate the <u>Bacteria Load Reduction Plans (BLRPs) or</u> Comprehensive Load Reduction Plans (CLRPs) required to be developed pursuant to Resolution No. R9-2010-0001.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2015-0100

November 4, 2015

AttE6-3	ATTACHMENT E.6: Beaches and Creeks Bacteria TMDLs	
	COMMENT: *Request for revisions to clarify that compliance with receiving water limitations in the Beaches and Creek Bacteria TMDLs will be assessed at the compliance points identified in the TMDL Monitoring Plan.* The County of San Diego requested revisions to the Beaches and Creeks Bacteria TMDLs requirements to specify that compliance with receiving water limitations can be determined at the compliance points identified in the TMDL Monitoring Plans that are included in the Water Quality Improvement Plans.	County of San Diego
	RESPONSE: The San Diego Water Board disagrees that the revision is necessary. The Beaches and Creeks Bacteria TMDLs interim and final compliance determination requirements includes a pathway that allows the Copermittees to demonstrate that there are no exceedances of the final (or interim) receiving water limitations in the receiving water "*at, or downstream of the Responsible Copermittee's MS4 outfalls*." The Specific Monitoring and Assessment Requirements of the Beaches and Creeks Bacteria TMDLs specifies the locations where monitoring is required to determine compliance. For beaches, the required monitoring locations are "*at, or downstream of the Responsible Copermittee's MS4 outfalls*." For creeks, the monitoring locations are required to be at or near the mouth and one or more locations upstream of the mouth, both of which should be "*at, or downstream of the Responsible Copermittee's MS4 outfalls*." If the receiving waters are not exceeding the final (or interim) receiving water limitations expressed as exceedance frequencies at the required receiving water monitoring locations, then the Copermittees have demonstrated compliance with the receiving water WQBELs "*at, or downstream of the Responsible Copermittee's MS4 outfalls*." If, however, there are exceedances at a receiving water monitoring location, then the upstream Copermittees will need to demonstrate compliance with another compliance determination pathway. No changes were made to the Tentative Order as a result of this comment.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2015-0100

November 4, 2015

AttE7-1	ATTACHMENT E.7: Los Penasquitos Lagoon Sediment TMDL	
	COMMENT: *Request for revisions to incorporate a land use-based compliance pathway into the Los Penasquitos Lagoon Sediment TMDL.* The County of San Diego requested revisions to the Total Maximum Daily Load for Sediment in Los Penasquitos Lagoon (Los Penasquitos Sediment TMDL) in Attachment E to incorporate a land use-based compliance pathway.	County of San Diego
	RESPONSE: The San Diego Water Board disagrees that changes are needed to accommodate a land use-based compliance pathway for the Los Penasquitos Lagoon Sediment TMDL. The commenter states that if the land use has not changed significantly from the 1970s baseline, the timeframe at which water quality standards in the lagoon were met, then the sediment loads from the Copermittee's MS4s are expected to be approximately the same as the baseline levels and within the amount allowed in the wasteload allocation. The San Diego Water Board agrees that under this scenario in which land use has not changed significantly, the sediment levels would be approximately the same as baseline levels. If this is confirmed through water quality monitoring, then the Copermittee has likely met its portion of the final effluent limit described in Provision 7.b.(2)(b) and has achieved compliance. For this reason, changes to the TMDL compliance pathways are not needed or warranted. No changes were made to the Tentative Order as a result of this comment.	

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

Errata Sheet
November 4, 2015

TENTATIVE ORDER NO. R9-2015-0100

AN ORDER AMENDING ORDER NO. R9-2013-0001, NPDES NO. CAS010266, AS AMENDED BY ORDER NO. R9-2015-0001 NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The following changes are proposed to the revised version of Tentative Order No. R9-2015-0100 and its Attachments included as Supporting Document No. 1 for Item No. 11 on the San Diego Water Board November 18, 2015 Board Meeting Agenda.

1. Tentative Order No. R9-2015-0100 Errata

Revise the beginning of Finding 6 as follows:

6. **Regional Water Board Agreement.** The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated ~~[Month][Day]~~ October 26, 2015 to:

2. Attachment No. 1 to Tentative Order No. R9-2015-0100 Errata

a) Revise Finding 29.b as follows:

b. Pursuant to CWC section 13228, the Cities of Murrieta, Wildomar, and Menifee submitted written requests that one Regional Water Board be designated to regulate Phase I MS4 discharges for each of the Cities. The Santa Ana Water Board and the San Diego Water Board have entered into an agreement dated ~~[Month][Day]~~ October 26, 2015, whereby the Cities of Murrieta and Wildomar are largely regulated by the San Diego Water Board under this Order, including those portions of the Cities of Murrieta and Wildomar not within the San Diego Water Board's jurisdiction, upon the effective date of this Order….

b) Revise Provision A.1.d as follows:

d. Storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012, as amended by State Water Board Resolution No. 2012-0031, applicable to these discharges, included in Attachment A to this Order. All other discharges from the Copermittees' MS4s to ASBS are prohibited.

c) Revise the beginning of Provision B.3.c as follows:

c. PROHIBITIONS AND LIMITATIONS COMPLIANCE OPTION

Each Copermittee has the option to utilize the implementation of the Water Quality Improvement Plan to demonstrate compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2~~.a~~, and A.3.b within a Watershed Management Area subject to the following conditions:

d) Revise Provision B.3.c.(1) as follows:

(1) A Copermittee is eligible to be deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2~~.a~~, and A.3.b within a Watershed Management Area when the Water Quality Improvement Plan for a Watershed Management Area incorporates the following:

e) Revise Provision B.3.c.(1)(a)(vii) as follows:

(vii) For each final numeric goal developed pursuant to Provisions B.3.a and B.3.c.(1)(a)(i)-(v), ~~at least one~~ annual milestones[9] and the dates for ~~its~~ their achievement must be included within each of the next five (5) Water Quality Improvement Plan Annual Report reporting periods, or until the final numeric goal is achieved. Annual milestones and the dates for their achievement for the 5 Water Quality Improvement Plan Annual Report reporting periods of the next permit term, or until the final numeric goal is achieved, must be provided as part of the Report of Waste Discharge required pursuant to Provision F.5.

f) Revise Footnote 9 as follows:

[9] Annual milestones for each final numeric goal must ~~build upon previous milestones and lead to~~ be clearly and directly linked to, or demonstrate progress is being made toward, the achievement of the final numeric goal. The annual milestones may consist of water quality improvement strategy implementation phases, interim numeric goals, and other acceptable metrics. The annual milestones may address multiple numeric goals and/or multiple water bodies, as applicable and appropriate.

g) Revise Provision B.3.c.(2) as follows:

(2) Each Copermittee that voluntarily completes the requirements of Provision B.3.c.(1) is deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2~~.a~~, and A.3.b for the pollutants and conditions for which numeric goals are developed when the Water Quality Improvement Plan, incorporating the requirements of Provision B.3.c.(1), is accepted by the San Diego Water Board pursuant to Provision F.1.b or F.2.c. The Copermittee is deemed in compliance during the term of this Order as long as:

h) Revise Provision B.3.c.(2)(d) as follows:

(d) Any proposed modifications to the numeric goals, strategies, schedules, and/or annual milestones are accepted by the San Diego Water Board as part of subsequent updates to the Water Quality Improvement Plan pursuant to Provision F.2.c;[10] AND

i) Add Provision B.5.d as follows:

d. ADAPTATION OF PROHIBITIONS AND LIMITATIONS COMPLIANCE OPTION

If a Copermittee has implemented the Prohibitions and Limitations Compliance Option allowed to be included in the Water Quality Improvement Plan pursuant to Provision B.3.c, the Copermittee must re-evaluate and adapt the numeric goals, water quality improvement strategies, schedules, and annual milestones required under Provision B.3.c.(1) when significant new information becomes available, or with the Report of Waste Discharge required pursuant to Provision F.5. Significant changes in the numeric goals, water quality improvement strategies, schedules, or annual milestones requires an update to the analysis required under Provision B.3.c.(2).

j) Revise Provision E.3.d as follows:

(d) Each Copermittee must update its BMP Design Manual pursuant to Provision F.2.b. Until the Copermittee has updated its BMP Design Manual pursuant to Provision F.2.b.(1), the Copermittee must continue implementing its current BMP Design Manual. The Copermittee must implement the updated BMP Design Manual within 180 days following completion of the update pursuant to Provision F.2.b.(1), unless directed otherwise by the San Diego Water Board Executive Officer. The date the BMP Design Manual is implemented is the "effective date" of the BMP Design Manual.

k) Revise Provision F.2.b.(4) as follows:

(4) If the San Diego Water Board amends Provisions E.3.a-d during the permit term but after the Copermittee has completed the update pursuant to Provision F.2.b.(1), the Copermittee must revise its BMP Design Manual to incorporate the amended Provision E.3.a-d requirements as soon as possible but no~~t~~ later than 90 days after the date the San Diego Water Board adopts the amendments to Provisions E.3.a-d, unless otherwise directed by the San Diego Water Board Executive Officer. Under these circumstances, the effective date of the BMP Design Manual is no later than 90 days after the date the San Diego Water Board adopts the amendments to Provisions E.3.a-d, unless otherwise directed by the San Diego Water Board Executive Officer.

l) Revise the definition of Construction Activities in Attachment C as follows:

Construction Activities – Actions implemented during construction of development or redevelopment projects during the Preliminary Tasks ~~Phase~~ (including rough grading and/or disking, clearing and grubbing operations, or any soil disturbance prior to mass grading), Grading or Land Development ~~Phase~~ (including topography and slope reconfiguration, alluvium removals, canyon cleanouts, rock undercuts, keyway excavations, land form grading, and stockpiling of select material for capping operations), Streets and Utility Installation ~~Phase~~ (including excavation and street paving, lot grading, curbs, gutters and sidewalks, public utilities, public water facilities including fire hydrants, public sanitary sewer systems, storm sewer systems and/or other drainage improvements), or Vertical Construction ~~Phase~~ (including the build out of structures from foundations to roofing, including rough landscaping).

m) Revise the definition of Redevelopment in Attachment C as follows:

Redevelopment – The creation and/or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, and the addition to or replacement of a structure~~, and creation or addition of impervious surfaces~~. Replacement of impervious surfaces includes any activity ~~that is not part of a routine maintenance activity~~ where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include routine maintenance activities, such as trenching and resurfacing associated with utility work; pavement grinding; resurfacing existing roadways,~~; new~~ sidewalks ~~construction~~, pedestrian ramps, or bike lanes on existing roads; and routine replacement of damaged pavement, such as pothole repair.

n) Revise Specific Provision 6.b.(2)(c)(i) in Attachment E as follows:

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 6.0 must incorporate the Bacteria Load Reduction Plans (BLRPs) or Comprehensive Load Reduction Plans (CLRPs) required to be developed pursuant to Resolution No. R9-2010-0001.

3. Attachment No. 2 to Tentative Order No. R9-2015-00100 Errata

a) Revise the text on page F-5 of the Fact Sheet as follows:

b. Continue designation of the San Diego Water Board to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Murrieta and Wildomar, including areas within the Santa Ana Region; and, agree to continue designation of the Santa Ana Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the City of Menifee, including areas within the San Diego Region, subject to the terms of the ~~[Month][Day]~~ October 26, 2015 agreement between San Diego Water Board and the Santa Ana Water Board described in Finding 29 of this Order;

c. Incorporate Provision B.3.c, which provides an option that allows a Copermittee to utilize the watershed-based Water Quality Improvement Plan to be deemed in compliance with the prohibitions and limitations of Provisions A.1.a, A.1.c, A.1.d, A.2~~.a~~, and A.3.b;

b) Revise the text on page F-7 of the Fact Sheet as follows:

** The City of Menifee is not regulated as a Copermittee under this Order because its Phase I MS4 discharges are regulated by Santa Ana Water Board Order No. R8-2010-0033 as it may be amended or issued pursuant to Water Code section 13228 designation. The requirements of this Order that apply to the City of Menifee for the duration of this Order, consistent with the Water Code section 13228 written agreement dated ~~[Month][Day]~~ October 26, 2015, are described in Finding 29 and Footnote 3 to Table B-1.

c) Revise the text on page F-32 of the Fact Sheet as follows:

Anti-Backsliding Requirements

CWA sections 402(o) and 303(d)(4) and federal regulations at 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations or conditions may be relaxed. While this Order allows implementation of an alternative compliance pathway option in Provision B.3.c to constitute compliance with receiving water limitations under certain circumstances, the availability of that alternative and the corresponding availability of additional time to come into compliance with receiving water limitations does not violate the antibacksliding provisions. The receiving water limitations provisions of this Order are imposed under section 402(p)(3)(B) of the Clean Water Act rather than based on best professional judgment, or based on section 301(b)(1)(C) or sections 303(d) or (e), and are accordingly not subject to the anti-backsliding requirements of section 402(o). Although the non-applicability is less clear with respect to the regulatory anti-backsliding provisions in 40 CFR 122.44(l), the regulatory history suggests that USEPA's intent was to establish the anti-backsliding regulations with respect to evolving technology standards for traditional point sources. (See, e.g., 44 Fed.Reg. 32854, 32864 (Jun. 7, 1979)). It is unnecessary, however, to resolve the ultimate applicability of the regulatory anti-backsliding provisions, because the alternative compliance pathway option in Provision B.3.c qualifies for an exception to backsliding as based on new information.

The alternative compliance pathway option in Provision B.3.c of this Order was informed by new information available to the Board from experience and knowledge gained through storm water permitting at the Regional Water Boards in the last ten years. There has been a statewide paradigm shift in storm water management. State Water Board Order WQ 2015-0075 directed all of the Regional Water Boards to consider the Los Angeles Water Board's alternative compliance path to receiving water limitations in all Phase I MS4 permits going forward (State Water Board Order WQ 2015-0075 at page 51). T~~t~~he Los Angeles Water Board's process of developing over 30 watershed-based TMDLs and implementing several TMDLs since the adoption of the previous permits. In particular, the Los Angeles Water Board recognized the significance of allowing time to plan, design, fund, operate and maintain watershed-based BMPs necessary to attain water quality improvements and additionally recognized the potential for municipal storm water to benefit water supply. Similarly, the San Diego Water Board's experience developing and implementing the Fourth Term MS4 Permits and TMDLs that apply on a region-wide scale (e.g. TMDLs for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region) has resulted in a similar recognition of the need for a watershed-based approach that allows time to plan, design, fund, operate and maintain BMPs to address impaired waters that have been impacted by MS4 discharges. Thus, even if the receiving water limitations are subject to anti-backsliding requirements, they were revised based on new information that would support an exception to the anti-backsliding provisions. (33 U.S.C. § 1342(o)(2)(B)(i); 40 C.F.R. § 122.44(l)(1); 40 C.F.R. §122.44(l)(2)(i)(B)(1)).

d) Revise the text on page F-51 of the Fact Sheet as follows:

The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated February 10, 2015 to designate the San Diego Water Board to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Laguna Woods and Laguna Hills, including the portions of the jurisdictions within the Santa Ana Region, upon the later effective date of Order No. R9-2015-0001 or Santa Ana Water Board Tentative Order No. R8-2015-0001. The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated ~~[Month][Day]~~ October 26, 2015 to designate the San Diego Water Board to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Murrieta and Wildomar, including the portions of the jurisdictions within the Santa Ana Region upon the effective date of Order R9-2015-0100.

e) Revise the text on page F-52 of the Fact Sheet as follows:

The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated February 10, 2015 to designate the San Ana Water Board to regulate Phase I MS4 discharges within the jurisdiction of the City of Lake Forest, including portions of the jurisdiction within the Santa Diego Region, upon the later date of Order No. R9-2015-0001 or Santa Ana Water Board Tentative Order No. R8-2015-0001. The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated ~~[Month][Day]~~ October 26, 2015 to designate the San Ana Water Board to regulate Phase I MS4 discharges within the jurisdiction of the City of Menifee, including portions of the jurisdiction within the San Diego Region, under Order No. R8-2010-0033 (NPDES No. CAS618030) as it may be amended or reissued upon the effective date of Order No. R9-2015-0100.

f) Revise the text on pages F-60 through F-62 of the Fact Sheet as follows:

Replace the references to "Provisions A.1.a, A.1.c, A.1.d, A.2.a, and A.3.b" with "Provisions A.1.a, A.1.c, A.1.d, A.2~~.a~~, and A.3.b."

g) Revise the text on page F-62 of the Fact Sheet as follows:

Compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2~~.a~~, and A.3.b begins when the Water Quality Improvement Plan, incorporating the requirements of Provision B.3.c.(1), is accepted by the San Diego Water Board. Each Copermittee that chooses to implement and continues to implement this option will be deemed in compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2~~.a~~, and A.3.b as long as the Copermittee continues to implement the strategies, monitoring and assessments as incorporated in the Water Quality Improvement Plan in accordance with Provision B.3.c.(1), and the Copermittee reports the achievement of the annual milestones each year, or provides acceptable rationale and recommends appropriate modifications to the interim numeric goals, and/or water quality improvement strategies, and/or schedules to improve the rate of progress toward achieving the final numeric goals. The Copermittee continues to be deemed in compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b during the time the San Diego Water Board reviews the rationale and recommended modifications to the interim numeric goals, and/or water quality improvement strategies, and/or schedules. If and when the San Diego Water Board determines that it does not accept the rationale or recommendations, the Copermittee will be notified they are no longer deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b.

h) Revise the text on page F-81 of the Fact Sheet as follows:

Provision E.2.(Illicit Discharge Detection and Elimination) requires each Copermittee to implement an illicit discharge detection and elimination program to effectively prohibit non-storm water discharges to the MS4 by actively detecting and eliminating illicit discharges and disposal into its MS4. If the San Diego Water Board finds that a Copermittee is fully implementing the requirements of Provision E.2, then the Copermittee is deemed in compliance with the effective prohibition of non-storm water discharges to the MS4 required under Provision A.1.b.

STATE OF CALIFORNIA

STATE WATER RESOURCES CONTROL BOARD

ORDER WQ 2015-0075

In the Matter of Review of

Order No. R4-2012-0175, NPDES Permit No. CAS004001

WASTE DISCHARGE REQUIREMENTS FOR MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) DISCHARGES WITHIN THE COASTAL WATERSHEDS OF LOS ANGELES COUNTY, EXCEPT THOSE DISCHARGES ORIGINATING FROM THE CITY OF LONG BEACH MS4

Issued by the
California Regional Water Quality Control Board,
Los Angeles Region

SWRCB/OCC FILES A-2236 (a)-(kk)

BY THE BOARD:

In this order, the State Water Resources Control Board (State Water Board) reviews Order No. R4-2012-0175 (NPDES Permit No. CAS004001) adopted by the Los Angeles Regional Water Quality Control Board (Los Angeles Water Board) on November 8, 2012. Order No. R4-2012-0175 regulates discharges of storm water and non-storm water from the municipal separate storm sewer systems (MS4s) located within the coastal watersheds of Los Angeles County, with the exception of the City of Long Beach MS4, and is hereinafter referred to as the "Los Angeles MS4 Order" or the "Order." We received 37 petitions challenging various provisions of the Los Angeles MS4 Order. For the reasons discussed herein, we generally uphold the Los Angeles MS4 Order, but with a number of revisions to the findings and provisions in response to issues raised in the petitions and as a result of our own review of the Order.

I. BACKGROUND

The Los Angeles MS4 Order regulates discharges from the MS4s operated by the Los Angeles County Flood Control District, Los Angeles County, and 84 municipal permittees (Permittees) in a drainage area that encompasses more than 3,000 square miles and multiple watersheds. The Order was issued by the Los Angeles Water Board in

accordance with section 402(p)(3)(B) of the Clean Water Act[1] and sections 13263 and 13377 of the Porter-Cologne Water Quality Control Act (Porter-Cologne Act),[2] as a National Pollutant Discharge Elimination System (NPDES) permit to control storm water and non-storm water discharges that enter the area's water bodies from the storm sewer systems owned or operated by the multiple governmental entities named in the Order. The Los Angeles MS4 Order superseded Los Angeles Water Board Order No. 01-182 (2001 Los Angeles MS4 Order), and is the fourth iteration of the NPDES permit for MS4 discharges in the relevant area.

The Los Angeles MS4 Order incorporates most of the pre-existing requirements of the 2001 Los Angeles MS4 Order, including the water quality-based requirement to not cause or contribute to exceedances of water quality standards in the receiving water. The Los Angeles MS4 Order also requires Permittees to comply with new water quality-based requirements to implement 33 watershed-based total maximum daily loads (TMDLs) for the region. The Order links both of these water quality-based requirements to the programmatic elements of the Order by allowing Permittees to comply with the water quality-based requirements, in part, by developing and implementing a watershed management program (WMP) or enhanced watershed management program (EWMP), as more specifically defined in the Order.

Following adoption of the Los Angeles MS4 Order, we received 37 timely petitions challenging various provisions of the Order and, in particular, the provisions implementing TMDLs and integrating water quality-based requirements and watershed-based program implementation. Several petitioners asked that their petitions be held in abeyance;[3] however, due to the number of active petitions also seeking review, we declined to hold those petitions in abeyance at that time.[4] Five petitioners additionally requested that we partially stay the Los Angeles MS4 Order. Following review, the Executive Director of the State Water Board denied the stay requests for failure to comply with the prerequisites for a stay as specified in California Code of Regulations, title 23, section 2053.

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[1] 33 U.S.C. § 1342(p)(3)(B).

[2] Wat. Code, §§ 13263, 13377.

[3] See Cal. Code Regs., tit. 23, § 2050.5, subd. (d).

[4] By letter dated January 30, 2013, we provided an opportunity for petitioners to submit an explanation for why a petition should be held in abeyance notwithstanding the existence of the active petitions. In response, two petitioners, City of Signal Hill and the City of Claremont, argued that their petitions raised unique issues not common to the remaining petitions and therefor appropriate for abeyance. We thereafter denied their requests on July 29, 2013, finding that the unique issues could nevertheless be resolved concurrently with the issues in the other petitions. On October 9, 2013, the City of Claremont withdrew two of the claims in its petition.

We deemed the petitions complete by letter dated July 8, 2013, and, as permitted under our regulations,[5] consolidated the petitions for review.

An issue front and center in the petitions is the appropriateness of the approach of the Los Angeles MS4 Order in addressing what we generally refer to as "receiving water limitations." Receiving water limitations in MS4 permits are requirements that specify that storm water and non-storm water discharges must not cause or contribute to exceedances of water quality standards in the waters of the United States that receive those discharges. In precedential State Water Board Order WQ 99-05 (*Environmental Health Coalition*), we directed that all MS4 permits contain specific language that explains how the receiving water limitations will be implemented. (For clarity, we refer to MS4 permit language that relates to implementation of the permit's receiving water limitations as "receiving water limitations provisions.") We held a workshop on November 20, 2012, concerning receiving water limitations in MS4 permits. The purpose of the workshop was to receive public comment on an issue paper discussing several alternatives to the receiving water limitations provisions currently included in MS4 permits as directed by Order WQ 99-05 (Receiving Water Limitations Issue Paper).[6]

Because the Los Angeles MS4 Order contains new provisions that authorize the Permittees to develop and implement WMP/EWMPs in lieu of requiring compliance with the receiving water limitations provisions, we view our review of the Order as an appropriate avenue for resolving some of the issues raised in our November 20, 2012 workshop. Through notice to all interested persons, we bifurcated the responses to the petitions and solicited two separate sets of responses: (1) Responses to address issues related to whether the WMP/EWMP alternatives contained in the Los Angeles MS4 Order are an appropriate approach to revising the receiving water limitations provisions in MS4 permits (August 15, 2013 Receiving Water Limitations Submissions); and (2) Responses to address all other issues raised in the petitions (October 15, 2013 Responses).[7] We held a workshop on October 8, 2013, to hear public comment on the first set of responses.

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[5] Cal. Code Regs., tit. 23, § 2054.

[6] Information on that workshop is available at <http://www.waterboards.ca.gov/water_issues/programs/stormwater/rwl.shtml> (as of Nov 18, 2014).

[7] We requested the bifurcated responses initially by letter dated July 15, 2013. Subsequent letters on July 29, 2013, and September 18, 2013, clarified the nature of the submissions and extended the submission deadline for the second response.

State Water Board regulations generally require final disposition on petitions within 270 days of the date a petition is deemed complete.[8] However, in this case, we required additional time to review the large number of issues raised in the petitions. When the State Water Board anticipates addressing a petition on the merits after the review period passes, it may indicate that it will review the matter on its own motion.[9] On April 1, 2014, we adopted Order WQ 2014-0056 taking up review of the issues in the petitions on our own motion.[10]

We now resolve the issues in the petitions with this order.

II. ISSUES AND FINDINGS

The 37 petitions raise over sixty contentions claiming deficiencies in the Los Angeles MS4 Order. This Order addresses the most significant contentions. To the extent petitioners raised issues that are not discussed in this Order, such issues are dismissed as not raising substantial issues appropriate for State Water Board review.[11]

Before proceeding to the merits of the petitions, we will resolve several procedural issues.

Requests to Take Official Notice or Supplement the Record with Additional Evidence

We received a number of requests to take official notice of documents not in the administrative record of the adoption of the Los Angeles MS4 Order by the Los Angeles Water Board (hereinafter Administrative Record)[12] and a number of requests to admit supplemental evidence not considered by the Los Angeles Water Board.[13] We reviewed the requests with

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[8] Cal. Code Regs., tit. 23, § 2050.5, subd. (b).

[9] See Wat. Code, § 13320, subd. (a); Cal. Code Regs., tit. 23, § 2050.5, subd. (c).

[10] To avoid premature litigation on the petition issues as a result of our review extending past the 270 day-regulatory review period, at our suggestion most of the petitioners asked that their petitions be placed in abeyance until adoption by the State Water Board of a final order. We granted those requests. Simultaneously with adopting this order, we are removing the petitions from abeyance and acting upon them.

[11] *People v. Barry* (1987) 194 Cal.App.3d 158, 175-177; *Johnson v. State Water Resources Control Bd.* (2004) 123 Cal.App.4th 1107, 1114; Cal. Code Regs., tit. 23, § 2052, subd. (a)(1).

[12] The Administrative Record was prepared by the Los Angeles Water Board and is available at <http://www.waterboards.ca.gov/losangeles/water_issues/programs/stormwater/municipal/AdminRecordOrderNoR4_2012_0175/index.shtml> (as of Nov. 18, 2014).

[13] Several requests for official notice or to admit supplemental evidence were received concurrently with submission of the petitions, with the August 15, 2013 Receiving Water Limitations Submissions, and with the October 15, 2013 Responses. Additional requests for official notice were submitted concurrently with comments on first and revised public drafts of this order and were opposed by several parties. (Request for Official Notice, Natural Resources Defense Council, Los Angeles Waterkeeper, and Heal the Bay, Jan. 21, 2015; Request for Official Notice, Natural Resources Defense Council, Los Angeles Waterkeeper and Heal the Bay, June 2, 2015.) Although we have reviewed these additional requests for official notice, we have not granted the requests for the various reasons articulated in this section, in Section II.B.8, and in footnote 74.

consideration of whether they were appropriate for notice or admission based on the legal standards governing our proceedings[14] and whether the documents would materially aid in our review of the issues in the proceedings. We grant the requests with regard to documents 1-7 below, and additionally take official notice on our own motion of documents 8, 9, and 10:[15]

1. Order No. 2013-0001-DWQ, NPDES Permit for Storm Water Discharges from Small MS4s, adopted by State Water Board, February 5, 2013;[16]
2. Modified NPDES Permit No. DC0000022 for the MS4 for the District of Columbia issued by the United States Environmental Protection Agency (USEPA), November 9, 2012, and a responsiveness summary issued in support of its original adoption of the permit, October 7, 2011;[17]
3. Administrative Procedures Update Number 90-004 on Antidegradation Policy Implementation for NPDES Permitting, issued by the State Water Board, July 2, 1990;[18]
4. Chapter 7 of the NPDES Permit Writers' Manual, updated by USEPA, September 2010;[19]
5. Letter to the Water Management Administration, Maryland Department of the Environment, issued by USEPA, August 8, 2012;[20]

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[14] For official notice see Cal. Code Regs., tit. 23, § 648.2; Gov. Code, § 11515; Evid. Code, § 452. For admission of supplemental evidence see Cal. Code Regs., tit. 23, § 2050.6.

[15] We note that two documents for which we received requests for official notice are already in the administrative record: USEPA, Memorandum Setting Forth Revisions to the November 22, 2002 Memorandum Establishing Total Maximum Daily Load Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs (Nov. 12, 2010) (Administrative Record, section 10.II, RB-AR23962-23968); USEPA, Chapter 6 of the NPDES Permit Writers' Manual (updated Sept. 2010) (Administrative Record, section 10.IV, RB-AR24905-24932).

[16] County of Los Angeles October 15, 2013 Response, Att. C; also available at <http://www.waterboards.ca.gov/water_issues/programs/stormwater/docs/phsii2012_5th/order_final.pdf> (as of Nov. 18, 2014).

[17] Los Angeles Water Board Request for State Water Board to Take Official Notice of Or Accept as Supplemental Evidence Exhibit A through SS (Oct. 15, 2013) (Los Angeles Water Board Request for Official Notice), Exh.'s A, B; also available at <http://www.epa.gov/reg3wapd/pdf/pdf_npdes/stormwater/DCMS4/MS4FinalLimitedModDocument/FinalModifiedPermit_10-25-12.pdf> and <http://www.epa.gov/reg3wapd/pdf/pdf_npdes/stormwater/DCMS4/FinalPermit2011/DCMS4FINALResponsivenessSummary093011.pdf> (as of Nov. 18, 2014).

[18] Los Angeles Water Board Request for Official Notice, Exh.C; also available at <http://www.swrcb.ca.gov/water_issues/programs/npdes/docs/apu_90_004.pdf> (as of Nov.18, 2014).

[19] Chapter 7 of USEPA's NPDES Permit Writers' Manual, EPA-833-K-10-001, September 2010 (NPDES Permit Writers' Manual) was submitted as Exhibit C to Natural Resources Defense Council, Los Angeles Waterkeeper and Heal the Bay Request for Official Notice (Dec. 10, 2012) (Environmental Petitioners' Request for Official Notice). The chapter may additionally be accessed through links at <http://water.epa.gov/polwaste/npdes/basics/NPDES-Permit-Writers-Manual.cfm> (as of Nov.18, 2014).

6. Memorandum to the Water Management Division Directors, Regions I-X, and NPDES State Directors, issued by USEPA, 1989;[21]
7. "Guidance on Implementing the Antidegradation Provisions of 40 C.F.R. 131.12," issued by USEPA, Region 9, June 3, 1987;[22]
8. Order WQ 2014-0077-DWQ, amending NPDES Statewide Storm Water Permit for State of California Department of Transportation, Order 2012-0011-DWQ, adopted by State Water Board, May 20, 2014;[23]
9. Statement from USEPA soliciting comments on the USEPA Memorandum Setting forth Revisions to the November 22, 2002 Memorandum Establishing Total Maximum Daily Load Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs (November 12, 2010), issued March 17, 2011.[24]
10. Memorandum, "Revisions to the November 22, 2002 Memorandum 'Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs,'" issued by USEPA, November 26, 2014.[25]

In addition, we are incorporating the administrative record of the November 20, 2012 workshop on receiving water limitations, including the Receiving Water Limitations Issue Paper and comments by interested persons, into our record for the petitions on the Los Angeles MS4 Order.[26]

(continued from previous page)

[20] Environmental Petitioners' Request for Official Notice, Exh.B, available at <http://www.waterboards.ca.gov/public_notices/petitions/water_quality/docs/a2236/a2236m_rfon.pdf> (as of Nov. 18, 2014).

[21] Environmental Petitioners' Request for Official Notice, Exh.D; also available at <http://www.epa.gov/npdes/pubs/owm0231.pdf> (as of Nov. 18, 2014).

[22] Environmental Petitioners' Request for Official Notice, Exh.E; available at <http://www.waterboards.ca.gov/public_notices/petitions/water_quality/docs/a2236/a2236m_rfon.pdf> (as of Nov. 18, 2014).

[23] Available at <http://www.waterboards.ca.gov/board_decisions/adopted_orders/water_quality/2014/wqo2014_0077_dwq.pdf> (as of Nov. 18, 2014).

[24] Available at <http://water.epa.gov/polwaste/npdes/stormwater/upload/sw_tmdlwla_comments.pdf> (as of Nov. 18, 2014).

[25] Available at <http://water.epa.gov/polwaste/npdes/stormwater/upload/EPA_SW_TMDL_Memo.pdf> (as of March 30, 2015).

[26] The Receiving Water Limitations Issue Paper and comments and workshop presentations by interested person are available at <http://www.waterboards.ca.gov/water_issues/programs/stormwater/rwl.shtml>.

Among other requests, we are not granting the requests to take official notice of or supplement the Administrative Record with the notices of intent, workplans, draft programs, and other documents filed by Permittees toward development of WMPs/EWMPs and associated monitoring programs following adoption of the Los Angeles MS4 Order or comments submitted on those documents, or the conditional approvals of several of the programs. With regard to factual evidence regarding actions taken by Permittees to comply with the Los Angeles MS4 Order after it was adopted, we believe it appropriate to close the record with the adoption of the Los Angeles MS4 Order. However, we are keenly aware that the success of the Los Angeles MS4 Order in addressing water quality issues depends primarily on the careful and effective development and implementation of programs consistent with the requirements of the Order; we speak to that issue later in our discussion.

City of El Monte's Amended Petition

Petitioner City of El Monte (El Monte) timely filed a petition on December 10, 2012, challenging a number of provisions of the Los Angeles MS4 Order. Thereafter, on February 19, 2013, El Monte filed an amended petition, based on information it asserted was not available prior to the deadline for submission of the petition.

Water Code section 13320, subdivision (a) provides that a petition for review of a regional water quality control board (regional water board) action must be filed within 30 days of the regional water board's action.[27] The State Water Board interprets that requirement strictly and petitions filed more than 30 days from regional water board action are rejected as untimely. El Monte asserted that the two additional arguments raised in the amended petition were based on information that was not available prior to the deadline for submitting the petition and were therefore appropriate for State Water Board consideration.

Even if we were required by statute or regulation to accept amended petitions based on new information, here, El Monte's new arguments are not supported by information previously unavailable. First, El Monte argues that the Supreme Court's decision in *Los Angeles County Flood Control District v. Natural Resources Defense Council* (2013) 133 S.Ct. 710 invalidated certain provisions of the Los Angeles MS4 Order that require compliance with water quality standards and total maximum daily load requirements through receiving water monitoring. Contrary to El Monte's assertion, the decision by the Supreme Court did not invalidate any requirements of the Los Angeles MS4 Order and did not result in any changes to

[27] See also Cal. Code Regs., tit. 23, § 2050.

the Order. The Supreme Court decision, to the extent it applies to the legal issues before us in this matter, constitutes precedential case law and must be considered in our review of the Los Angeles MS4 Order, but it does not constitute new information that supports an amended petition.[28]

Second, El Monte argues that the Los Angeles Water Board failed to consider various provisions of the California Watershed Improvement Act of 2009[29] when it adopted the Los Angeles MS4 Order. To the extent El Monte believed that the California Watershed Improvement Act was relevant to adoption of the Los Angeles MS4 Order, El Monte had the opportunity to raise that issue in comments before the Los Angeles Water Board and in its timely petition to the State Water Board. Having failed to raise the issue before the Los Angeles Water Board and in its timely petition, El Monte cannot raise the issue in an amended petition.[30]

We reject El Monte's amended petition as untimely.

Environmental Petitioners' Motion to Strike

Petitioners Natural Resources Defense Council, Los Angeles Waterkeeper, and Heal the Bay (Environmental Petitioners), submitted a motion on November 11, 2013, requesting that the State Water Board strike sections of the October 15, 2013 Responses by six petitioners (Motion to Strike). The relevant sections respond to a collateral estoppel argument made by the Environmental Petitioners in their August 15, 2013 Receiving Water Limitations Submission to the State Water Board. Several parties asserted in their petitions that requiring compliance with water quality standards in MS4 permits violates federal law or conflicts with prior State Water Board precedent. The Environmental Petitioners responded in their August 15, 2013 Receiving Water Limitations Submission that these arguments were barred by collateral estoppel because the claims were settled in prior court cases challenging the 2001 Los Angeles MS4 Order. Six of the October 15, 2013 Responses, namely those by the Cities of

[28] We note that the State Water Board has the option of allowing additional briefing when there are material legal developments concerning issues raised in a petition, but we did not find such briefing would aid review of the petitions in this case.

[29] Wat. Code, § 16100 et seq.

[30] In addition to being untimely, El Monte's argument lacks merit. The California Watershed Improvement Act of 2009 grants authority to local government permittees regulated by an MS4 permit to develop and implement watershed improvement plans, but does not limit the authority of a regional water board to impose terms related to watershed management in an MS4 permit. Further, the terms of the WMPs/EWMPs are largely consistent with the watershed improvement plans authorized by the Act, so a permittee can comply with the Los Angeles MS4 Order while also using the authority provided by the California Watershed Improvement Act of 2009 if it so chooses.

Arcadia, Claremont, Covina, Duarte and Huntington Park, San Marino et al.,[31] and Sierra Madre, incorporated a response to the collateral estoppel argument.

We stated in a July 15, 2013 letter that"[i]nterested persons may not use the [October 15] [32] deadline for responses on the remaining petition issues as an opportunity to respond to comments filed on the receiving water limitations approach." We clarified further in a July 29, 2013 letter: "[W]hen submitting subsequent responses to the petitions in accordance with the [October 15] deadline, petitioners and interested persons should not raise new issues related to the specific questions regarding the watershed management program/enhanced watershed management program or respond to any August 15, 2013, submissions; however petitioners and interested persons will not be precluded from responding to specific issues raised in the original petitions on grounds that the issues are related to the receiving water limitations language."

We find that the collateral estoppel responses by the six petitioners are disallowed by the direction we provided in our July 15 and July 29, 2013 letters. However, as will be apparent in our discussion in section II.A, we do not rely on the Environmental Petitioners' collateral estoppel argument in resolving the petitions. Our determination that portions of the October 15, 2013 Responses are disallowed is, therefore, immaterial to the resolution of the issues.[33]

Having resolved the procedural issues, we turn to the merits of the Petitions.

A. Implementation of the Iterative Process as Compliance with Receiving Water Limitations

The Los Angeles MS4 Order includes receiving water limitations provisions that are consistent with our direction in Order WQ 99-05 in Part V.A of the Los Angeles MS4 Order. Part V.A. provides, in part, as follows:

1. Discharges from the MS4 that cause or contribute to the violation of receiving water limitations are prohibited.

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[31] The cities of San Marino, Rancho Palos Verdes, South El Monte, Norwalk, Artesia, Torrance, Beverly Hills, Hidden Hills, Westlake Village, La Mirada, Vernon, Monrovia, Agoura Hills, Commerce, Downey, Inglewood, Culver City, and Redondo Beach submitted a joint October 15, 2013 Response.

[32] The July 15, 2013 letter set a deadline of September 20, 2013, which was subsequently extended to October 15, 2013.

[33] In a November 21, 2013 letter, we indicated that we would consider the Motion to Strike concurrently with drafting of this Order, but that we would not accept any additional submissions in this matter, including any responses to the Motion to Strike. City of San Marino objected to the letter and submitted an opposition to the Motion to Strike. Several petitioners submitted joinders in City of San Marino's motion. For the same reasons articulated above, we are not accepting these submissions; they would not affect our resolution of the issues.

2. Discharges from the MS4 of storm water, or non-storm water, for which a Permittee is responsible [footnote omitted], shall not cause or contribute to a condition of nuisance.
3. The Permittees shall comply with Parts V.A.1 and V.A.2 through timely implementation of control measures and other actions to reduce pollutants in the discharges in accordance with the storm water management program and its components and other requirements of this Order including any modifications. . . .[34]

The petitioners that are permittees (hereinafter referred to as "Permittee Petitioners")[35] argue that the above language either means, or should be read and/or clarified to mean, that good faith engagement in the requirements of Part V.A.3, traditionally referred to as the "iterative process," constitutes compliance with Parts V.A.1. and V.A.2. The position put forth by Permittee Petitioners is one we took up when we initiated a process to re-examine the receiving water limitations and iterative process in MS4 permits statewide with our Receiving Water Limitations Issue Paper and the November 20, 2012 workshop. We summarize the law and policy regarding Permittee Petitioners' position again here and ultimately disagree with Permittee Petitioners that implementation of the iterative process does or should constitute compliance with receiving water limitations.

The Clean Water Act generally requires NPDES permits to include technology-based effluent limitations and any more stringent limitations necessary to meet water quality standards.[36] In the context of NPDES permits for MS4s, however, the Clean Water Act does not explicitly reference the requirement to meet water quality standards. MS4 discharges must meet a technology-based standard of prohibiting non-storm water discharges and reducing pollutants in the discharge to the Maximum Extent Practicable (MEP) in all cases, but requiring strict compliance with water quality standards (e.g., by imposing numeric effluent limitations) is at the discretion of the permitting agency.[37] Specifically the Clean Water Act states as follows:

> Permits for discharges from municipal storm sewers –
>
> . . .
>
> (ii) shall include a requirement to effectively prohibit non-stormwater discharges into the storm sewers; and

[34] Los Angeles MS4 Order, Part V.A, pp. 38-39.

[35] For ease of reference, where an argument is made by multiple Permittee Petitioners, even if not by all, we attribute that argument to Permittee Petitioners generally, and do not list which of the 37 Permittee Petitioners in fact make the argument. Where only one or two Permittee Petitioners make a particular argument, we have identified the specific Permittee Petitioner(s).

[36] 33 U.S.C. §§ 1311, 1342(a).

[37] 33 U.S.C. § 1342(p)(3)(B); *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159.

> (iii) shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as . . . the State determines appropriate for the control of such pollutants.[38]

Thus, a permitting agency imposes requirements related to attainment of water quality standards where it determines that those provisions are "appropriate for the control of [relevant] pollutants" pursuant to the Clean Water Act municipal storm water provisions.

Under the Porter-Cologne Act, waste discharge requirements must implement applicable water quality control plans, which include the beneficial uses to be protected for a given water body and the water quality objectives reasonably required for that protection.[39] In this respect, the Porter-Cologne Act treats MS4 dischargers and other dischargers even-handedly and anticipates that all waste discharge requirements will implement the water quality control plans. However, when implementing requirements under the Porter-Cologne Act that are not compelled by federal law, the State Water Board and regional water boards (collectively, "water boards") have some flexibility to consider other factors, such as economics, when establishing the appropriate requirements.[40] Accordingly, since the State Water Board has discretion under federal law to determine whether to require strict compliance with the water quality standards of the water quality control plans for MS4 discharges, the State Water Board may also utilize the flexibility under the Porter-Cologne Act to decline to require strict compliance with water quality standards for MS4 discharges.

We have previously exercised the discretion we have under federal law in favor of requiring compliance with water quality standards, but have required less than strict compliance. We have directed, in precedential orders, that MS4 permits require discharges to be controlled so as not to cause or contribute to exceedances of water quality standards in receiving waters,[41] but have prescribed an iterative process whereby an exceedance of a water quality standard triggers a process of BMP improvements. That iterative process involves reporting of the violation, submission of a report describing proposed improvements to BMPs

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[38] 33 U.S.C. § 1342(p)(3)(B).

[39] Wat. Code, § 13263. The term "water quality standards" encompasses the beneficial uses of the water body and the water quality objectives (or "water quality criteria" under federal terminology) that must be met in the waters of the United States to protect beneficial uses. Water quality standards also include the federal and state antidegradation policy.

[40] Wat. Code, §§ 13241, 13263; *City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613.

[41] State Water Board Orders WQ 98-01 (*Environmental Health Coalition*), WQ 99-05 (*Environmental Health Coalition)*, WQ 2001-15 (*Building Industry Association of San Diego*).

expected to better meet water quality standards, and implementation of these new BMPs.[42] The current language of the existing receiving waters limitations provisions was actually developed by USEPA when it vetoed two regional water board MS4 permits that utilized a prior version of the State Water Board's receiving water limitations provisions.[43] In State Water Board Order WQ 99-05, we directed that all regional boards use USEPA's receiving water limitations provisions.

There has been significant confusion within the regulated MS4 community regarding the relationship between the receiving water limitations and the iterative process, in part because the water boards have commonly directed dischargers to achieve compliance with water quality standards by improving control measures through the iterative process. But the iterative process, as established in our precedential orders and as generally written into MS4 permits adopted by the water boards, does not provide a "safe harbor" to MS4 dischargers. When a discharger is shown to be causing or contributing to an exceedance of water quality standards, that discharger is in violation of the permit's receiving water limitations and potentially subject to enforcement by the water boards or through a citizen suit, regardless of whether or not the discharger is actively engaged in the iterative process.[44]

The position that the receiving water limitations are independent from the provisions that establish the iterative process has been judicially upheld on several occasions. The receiving water limitations provisions of the 2001 Los Angeles MS4 Order specifically have been litigated twice, and in both cases, the courts upheld the provisions and the Los Angeles Water Board's interpretation of the provisions. In a decision resolving a challenge to the 2001 Los Angeles MS4 Order, the Los Angeles County Superior Court stated: "[T]he Regional [Water] Board acted within its authority when it included [water quality standards compliance] in

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[42] State Water Board Order WQ 99-05, pp. 2-3; see also State Water Board Order WQ 2001-15, pp. 7-9. Additionally, consistent with federal law, we found it appropriate to require implementation of BMPs in lieu of numeric water quality-based effluent limitations to meet water quality standards. *See* State Water Board Orders WQ 91-03 (*Citizens for a Better Environment)*, WQ 91-04 (*Natural Resources Defense Council*), WQ 98-01, WQ 2001-15. This issue is discussed in greater detail in Section II.C. of this order.

[43] See State Water Board Orders WQ 99-05, WQ 2001-15.

[44] Several Permittee Petitioners have argued that the State Water Board's opinion in State Water Board Order WQ 2001-15 must be read to endorse a safe harbor in the iterative process. We disagree. Regardless, the State Water Board's position that the iterative process of the subject permit did not create a "safe harbor" from compliance with receiving water limitations was clearly established in subsequent litigation on that order. (See *Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (Super. Ct. 2003, No. GIC780263), affd. *Building Industry Assn. of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866.)

the Permit without a 'safe harbor,' whether or not compliance therewith requires efforts that exceed the 'MEP' standard."[45] The lack of a safe harbor in the iterative process of the 2001 Los Angeles MS4 Order was again acknowledged in 2011 and 2013, this time by the Ninth Circuit Court of Appeal. In these instances, the Ninth Circuit was considering a citizen suit brought by the Natural Resources Defense Council against the County of Los Angeles and the Los Angeles County Flood Control District for alleged violations of the receiving water limitations of that order. The Ninth Circuit held that, as the receiving water limitations of the 2001 Los Angeles MS4 Order (and accordingly as the precedential language in State Water Board Order WQ 99-05) was drafted, engagement in the iterative process does not excuse liability for violations of water quality standards.[46] The California Court of Appeal has come to the same conclusion in interpreting similar receiving water limitations provisions in MS4 Orders issued by the San Diego Regional Water Quality Control Board in 2001 and the Santa Ana Regional Water Quality Control Board in 2002.[47]

While we reiterate that the judicial rulings have been consistent with the water boards' intention and position regarding the relationship between the receiving water limitations and the iterative process, we acknowledge that some in the regulated community perceived the 2011 Ninth Circuit opinion in particular as a re-interpretation of that relationship. Our Receiving Water Limitations Issue Paper and subsequent workshop reflected our desire to re-examine the issue in response to concerns expressed by the regulated community in the aftermath of that ruling.

As stated above, both the Clean Water Act and the Porter-Cologne Act afford some discretion to not require strict compliance with water quality standards for MS4 discharges. In each of the discussed court cases above, the court's decision is based on the specific permit language; thus the cases do not address our authority with regard to requiring compliance with water quality standards in an MS4 permit as a threshold matter, and they do not require us to continue to exercise our discretion as we decided in State Water Board Order

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[45] *In re Los Angeles County Municipal Storm Water Permit Litigation* (L.A. Super. Ct., No. BS 080548, Mar. 24, 2005) Statement of Decision from Phase I Trial on Petitions for Writ of Mandate, pp. 4-5, 7. The decision was affirmed on appeal (*County of Los Angeles v. State Water Resources Control Board* (2006) 143 Cal.App.4th 985); however, this particular issue was not discussed in the court of appeal's decision.

[46] *Natural Resources Defense Council v. County of Los Angeles* (9th Cir. 2011) 673 F.3d. 880, rev'd on other grounds sub nom. *Los Angeles County Flood Control Dist. v. Natural Resources Defense Council* (2013) 133 S.Ct. 710, mod. by *Natural Resources Defense Council v. County of Los Angeles* (9th Cir. 2013) 725 F.3d 1194, cert. den. *Los Angeles County Flood Control Dist. v. Natural Resources Defense Council* (2014) 134 S.Ct. 2135.

[47] *Building Industry Assn. of San Diego County, supra*,124 Cal.App.4th 866; *City of Rancho Cucamonga v. Regional Water Quality Control Bd.* (2006) 135 Cal.App.4th 1377.

WQ 99-05. Although it would be inconsistent with USEPA's general practice of requiring compliance with water quality standards over time through an iterative process,[48] we may even have the flexibility to reverse[49] our own precedent regarding receiving water limitations and receiving water limitations provisions and make a policy determination that, going forward, we will either no longer require compliance with water quality standards in MS4 permits, or will deem good faith engagement in the iterative process to constitute such compliance.[50]

However, with this Order, we now decline to do either. As the storm water management programs of municipalities have matured, an increasing body of monitoring data indicates that many water quality standards are in fact not being met by many MS4s. The iterative process has been underutilized and ineffective to date in bringing MS4 discharges into compliance with water quality standards. Compliance with water quality standards is and should remain the ultimate goal of any MS4 permit. We reiterate and confirm our determination that provisions requiring compliance with receiving water limitations are "appropriate for the control of . . . pollutants" addressed in MS4 permits and that therefore, consistent with our authority under the Clean Water Act, we will continue to require compliance with receiving water limitations.[51]

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[48] See, e.g. Modified NPDES Permit No. DC0000022 for the MS4 for the District of Columbia, *supra*, fn. 17.

[49] Of course any change of direction would be subject to ordinary principles of administrative law. (See Code Civ. Proc., § 1094.5, subd. (b).)

[50] As such, it is not necessary to address the collateral estoppel arguments raised by the Environmental Petitioners and opposed by Permittee Petitioners. We agree that it is settled law that we have the discretion to require compliance with water quality standards in an MS4 permit under federal and state law. We also agree that it is settled law that the receiving water limitations provisions currently spelled out in our MS4 permits do not carve out a safe harbor in the iterative process. But the question for us is whether we should continue to exercise our discretion to utilize the same approach to receiving water limitations established under our prior precedent, or proceed in a new direction.

[51] Several Permittee Petitioners argued in comments submitted on the first draft of this order that, because we find that we have some discretion under Clean Water Act section 402(p)(3) to not require compliance with receiving water limitations, the Los Angeles Water Board's action in requiring such compliance -- and our action in affirming it -- is pursuant to state authority. (See, e.g., Cities of Arcadia, Claremont, and Covina, Comment Letter, Jan. 21, 2015.) The Permittee Petitioners argue that the action is therefore subject to evaluation in light of the factors set out in Water Code section 13263 and 13241 pursuant to *City of Burbank, supra,* 35 Cal.4th 613. Under *City of Burbank,* a regional water board must consider the factors specified in section 13241 when issuing waste discharge requirements under section 13263, subdivision (a), but only to the extent those waste discharge requirements exceed the requirements of the federal Clean Water Act. (35 Cal.4th at 627.) Nowhere in our discussion in this section do we mean to disavow either that the Los Angeles Water Board acted under federal authority to impose "such other provisions as . . .determine[d] appropriate for the control of . . . pollutants" in adopting the receiving water limitations provisions of the Los Angeles MS4 Order in the first instance or that we are acting under federal authority in upholding those provisions. (33 U.S.C. § 1342(p)(3)(B)(iii).) The receiving water limitations provisions do not exceed the requirements of federal law. We nevertheless also point out that the Los Angeles Water Board engaged in an analysis of the factors under section 13241 when adopting the Order. (See Los Angeles MS4 Order, Att. F, Fact Sheet, pp. F-139 to F-155.)

As we explained in 2001, "[u]rban runoff is causing and contributing to impacts on receiving waters throughout the state and impairing their beneficial uses."[52] More than a decade later, this is still true. By definition, many of our urban waterways will never attain water quality standards and fully realize their beneficial uses if municipal runoff is allowed to continue to cause or contribute to exceedances of water quality standards. Further, the efforts of other dischargers who are required to not cause or contribute to exceedances of water quality standards would be largely in vain if we did not regulate MS4 dischargers with a somewhat even hand.

Such an approach is additionally consistent with the Porter-Cologne Act's emphasis on water quality control plans as the cornerstone of water quality planning and regulation and the act's expectation that all waste discharge requirements will implement the water quality control plans. We believe that direct enforcement of water quality standards is necessary to protect water quality, at a minimum as a back-stop where dischargers fail to meet requirements of the Order designed to achieve progress toward meeting the standards. We will not reverse our precedential determination in State Water Board Order WQ 99-05 that established the receiving water limitations provisions for MS4 permits statewide and reiterate that we will continue to read those provisions consistent with how the courts have: engagement in the iterative process does not excuse exceedances of water quality standards. We accordingly also decline to direct any revisions to the receiving water limitations provisions of the Los Angeles MS4 Order, which are consistent with our precedential language.[53]

Yet, we are sympathetic to the assertions made by MS4 dischargers that the receiving water limitations provisions mandated by our Order WQ 99-05 may result in many years of permit noncompliance, because it may take years of technical efforts to achieve compliance with the receiving water limitations, especially for wet weather discharges.

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[52] State Water Board Order WQ 2001-15, p. 7.

[53] We disagree with Permittee Petitioners' argument that the receiving water limitations in Part V.A of the Los Angeles MS4 Order are confusing, unclear, or overbroad, because they prohibit causing or contributing to a violation of a receiving water limitation rather than a violation of water quality standards. The Los Angeles Water Board defines "receiving water" as "[a] 'water of the United States' in to which waste and/or pollutants are or may be discharged." (Los Angeles MS4 Order, Att. A., p. A-16.) The Los Angeles Water Board further defines "receiving water limitations" as "[a]ny applicable numeric or narrative water quality objective or criterion, or limitation to implement the applicable water quality objective or criterion, for the receiving water as contained in Chapter 3 or 7 of the Water Quality Control Plan for the Los Angeles Region (Basin Plan), water quality control plans or policies adopted by the State Water Board, or federal regulations, including but not limited to, 40 CFR §131.38." (*Ibid.*) Receiving water limitations are therefore the water quality standards, including water quality objectives and criteria, that apply to the receiving water as expressed in the water quality control plan for the region, statewide water quality control plans that specify objectives for water bodies in the region, State Water Board policies for water quality control, and federal regulations.

Accordingly, we believe that the MS4 permits should incorporate a well-defined, transparent, and finite alternative path to permit compliance that allows MS4 dischargers that are willing to pursue significant undertakings beyond the iterative process to be deemed in compliance with the receiving water limitations.

With the WMP/EWMP provisions of the Los Angeles MS4 Order, the Los Angeles Water Board is striving to allow one such alternative compliance path. As such, the fundamental issue for review before us in this matter is whether the Los Angeles MS4 Order's WMP/EWMP provisions constitute a legal and technically sound compliance alternative for achieving receiving water limitations. We discuss and resolve this issue in the next section.

B. WMP/EWMP as Alternative Compliance Options for Complying with Receiving Water Limitations

The WMP/EWMP provisions allow Permittees to choose an integrated and collaborative watershed-based approach to meeting the requirements of the Los Angeles MS4 Order, including the receiving water limitations. Permittees develop a plan, either collaboratively or individually, that addresses water quality priorities within a watershed. Permittees first prioritize water quality issues within each watershed. Permittees may use the WMP/EWMP to address water body-pollutant combinations for which a TMDL has been developed, giving highest priority to those with interim and final compliance deadlines within the permit term. Permittees may also address water body-pollutant combinations for which no TMDL has been developed, but where the water body is impaired or shows exceedances of the standards for the relevant pollutant from an MS4 source. Once prioritization is completed, Permittees assess the sources of the pollutants and select watershed strategies that are designed to eliminate non-storm water discharges to the MS4 that are a source of pollutants, that meet all applicable TMDL-derived interim and final water quality-based effluent limitations (WQBELs) and/or limitations to be met in the receiving water (referred to herein as "other TMDL-specific limitations")[54] pursuant to corresponding compliance schedules, and that ensure that discharges from the MS4 do not cause or contribute to exceedances of receiving water limitations. Except as described below for storm water retention projects, Permittees conduct a "reasonable assurance analysis" for each water body-pollutant combination incorporated into the

[54] Some of the TMDL limitations of the Los Angeles MS4 Order are expressed not as WQBELs but as standards to be met in the receiving water. The Los Angeles MS4 Order refers to these limitations as "receiving water limitations;" however, in order to avoid confusion with the general receiving water limitations in Part V.A., we will use the term "other TMDL-specific limitations." Accordingly, while the Los Angeles MS4 Order uses the term "receiving water limitations" to refer to both the receiving water limitations in part V.A and some of the TMDL-based requirements in Attachments L-R, when we use the term we refer only to the receiving water limitations in part V.A.

WMP/EWMP to demonstrate the ability of the program to meet those objectives. Permittees additionally implement an integrated monitoring and assessment program to determine progress, adapting strategies and measures as necessary.[55]

In addition to all the requirements above, for those Permittees that choose to develop and implement an EWMP, the EWMP provisions also require that Permittees collaborate on multi-benefit regional projects and, wherever feasible, retain all non-storm runoff, as well as all storm water runoff from the 85th percentile 24-hour storm event (hereinafter "storm water retention approach") for the drainage areas tributary to the projects.[56]

The primary controversy concerning the WMP/EWMP provisions of the Los Angeles MS4 Order is the manner in which they interact with the receiving water limitations and the WQBELs and other TMDL-specific limitations. Under certain conditions detailed in the Order, Permittees may be deemed in compliance with the receiving water limitations and the WQBELs and other TMDL-specific limitations by fully implementing the WMP/EWMP, rather than by demonstrating that the receiving water limitations and the WQBELs and other TMDL-specific limitations have actually been achieved. Specifically:

1. Permittees that develop and implement a WMP/EWMP and fully comply with all requirements and dates of achievement for the WMP/ EWMP as established in the Los Angeles MS4 Order, are deemed to be in compliance with the receiving water limitations in Part V.A for the water body-pollutant combinations addressed by the WMP/EWMP.[57]

2. Permittees fully in compliance with the requirements and dates of achievement of the WMP/EWMP are deemed in compliance with the *interim* WQBELs and other TMDL-specific limitations in Attachments L-R for the water body-pollutant combinations addressed by the WMP/EWMP.[58]

3. Permittees implementing an EWMP and utilizing the storm water retention approach in a drainage area tributary to the applicable water body are deemed in compliance with the *final* WQBELs and other TMDL-specific limitations in Attachments L-R for the water body-pollutant combinations addressed by the storm water retention approach.[59]

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[55] Los Angeles MS4 Order, Part VI.C., pp. 49-67.

[56] *Id.*, Part VI.C.1.g., pp. 48-49.

[57] *Id.*, Part VI.C.2.b., p. 52.

[58] *Id.*, Parts VI.C.3.a., p. 53, VI.E.2.d.i.4., pp. 143-44. The Los Angeles MS4 Order establishes separate requirements for Trash TMDLs and the WMP/EWMP are not a means of achieving compliance with the Trash TMDL provisions. (See Part VI.E.5, pp. 147-154.) References to TMDLs in this section exclude the Trash TMDLs.

[59] *Id.*, Part VI.E.2.e.i.(4), p. 145. As with Part VI.E.2.d.i.4, this Part does not apply to Trash TMDLs.

4. Because the Order additionally provides that full compliance with the general TMDL requirements in Part VI.E and the WQBELs and other TMDL-specific limitations in Attachments L through R constitutes compliance with the receiving water limitations in V.A for the specific pollutants addressed by the relevant TMDL,[60] provisions 2 and 3 above also constitute compliance with the receiving water limitations for the particular water body-pollutant combinations.

5. Finally, Permittees that have declared their intention to develop a WMP/EWMP may be deemed in compliance with receiving water limitations and with interim WQBELs with compliance deadlines occurring prior to approval of the WMP/EWMP if they meet certain conditions during the development phase.[61]

Both Environmental Petitioners and Permittee Petitioners put forth a number of arguments to the effect that the WMP/EWMP provisions of the Los Angeles MS4 Order are contrary to federal and state law or reflect poor policy. We discuss each argument below.

1. Anti-backsliding

The Environmental Petitioners argue that the inclusion of the WMP/EWMP in the Los Angeles MS4 Order violates the anti-backsliding provisions of the Clean Water Act and of the federal regulations.[62] The Clean Water Act generally prohibits the relaxation of an effluent limitation established in an NPDES permit when that permit is renewed; the federal regulations include similar provisions. The Environmental Petitioners argue that the WMP/EWMP of the Los Angeles MS4 Order, by allowing a discharger to be deemed in compliance with receiving water limitations, even where a discharger may in fact be causing or contributing to an exceedance of a water quality standard, represent a relaxation of the receiving water limitations provisions contained in the 2001 Los Angeles MS4 Order.[63]

We do not agree with the Environmental Petitioners that the WMP/EWMP provisions of the Los Angeles MS4 Order violate the anti-backsliding provisions of either the Clean Water Act or the federal regulations. Anti-backsliding provisions are an important aspect

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[60] *Id.*, Part VI.E.2.c.ii., p. 143. Although this provision reflects a departure from provisions in previous MS4 permits, the provision has not generated controversy and has not been contested in the petitions. The State Water Board supports this provision in MS4 permits, as discussed at section II.B.5.b. of this order.

[61] *Id.*, Parts VI.C. 2.d., pp. 52-53, VI.E.2.d.i.(4)(d), p. 144.

[62] 33 U.S.C. § 1342(o); 40 C.F.R. §122.44(*l*).

[63] The receiving water limitations of the 2001 Los Angeles MS4 Order (like the receiving water limitations in Section V.A. of the Los Angeles MS4 Order) were modeled on the precedential language in State Water Board Order WQ 99-05.

of the Clean Water Act that generally promote continued progress toward clean water, but the provisions do not apply in all circumstances and are subject to certain exceptions. The 2001 Los Angeles MS4 Order required compliance with receiving water limitations, directed Permittees to achieve those limitations through the iterative process, but retained the Los Angeles Water Board's discretion to enforce compliance with the receiving water limitations at any time. The Los Angeles MS4 Order requires compliance with receiving water limitations, but allows implementation of control measures through the WMPs/EWMPs to constitute such compliance, and reserves direct enforcement of the receiving water limitations to situations where a permittee fails to comply with the WMP/EWMP provisions. The approaches under the prior and current orders are designed to achieve the same results – compliance with receiving water limitations – but through distinct paths that are not easily comparable for purposes of the specific, technical anti-backsliding requirements laid out in federal law.[64] We nevertheless discuss the provisions below.

The Clean Water Act contains both statutory anti-backsliding provisions in section 402(o) and regulatory anti-backsliding provisions in 40 C.F.R. section 122.44(*l*). The Clean Water Act's statutory prohibition against backsliding applies under a narrow set of criteria specified in Clean Water Act section 402(o). First, section 402(o) prohibits relaxing effluent limitations originally established based on best professional judgment, when there is a newly revised effluent limitation guideline.[65] The WMP/EWMP is not derived from an effluent limitation guideline, so this first prohibition is inapplicable. Second, section 402(o) prohibits relaxing effluent limitations imposed pursuant to Clean Water Act sections 301(b)(1)(C) or 303(d) or (e).[66] The receiving water limitations provisions in the 2001 Los Angeles MS4 Order were not

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[64] Responding to an argument that NPDES Permit No. DC00000221 for MS4 discharges to the District of Columbia violated anti-backsliding requirements by removing certain numeric limitations in the prior permit, USEPA stated: "The Commenter implies that a Permit that replaces a numeric effluent limit with a non-numeric one is somehow automatically less stringent on that parameter. However, the narrative requirement only violates the anti-backsliding prohibition if the two provisions are comparable. . . . In this case, the two provisions are not comparable: EPA has determined that compliance with the performance standards in the Final Permit will result in more water quality protections for the DC MS4's receiving streams than did the previous aggregate numeric limit." (Responsiveness Summary, p. 84, *supra,* fn.17, citing *Communities for a Better Environment v. State Water Resources Control Bd.* (2005) 132 Cal. App. 4th 1313.)

[65] 33 U.S.C. § 1342(o)(1) ("In the case of effluent limitations established on the basis of subsection (a)(1)(B) of this section, a permit may not be renewed, reissued, or modified on the basis of effluent guidelines promulgated under section 1314 (b) of this title subsequent to the original issuance of such permit, to contain effluent limitations which are less stringent than the comparable effluent limitations in the previous permit.").

[66] *Ibid.* ("In the case of effluent limitations established on the basis of section 1311 (b)(1)(C) or section 1313 (d) or (e) of this title, a permit may not be renewed, reissued, or modified to contain effluent limitations which are less stringent than the comparable effluent limitations in the previous permit except in compliance with section 1313 (d)(4) of this title.").

established based on either section 301(b)(1)(C) or section 303(d) or (e), so this prohibition on backsliding is inapplicable.[67] The receiving water limitations provisions in MS4 permits are imposed under section 402(p)(3)(B) of the Clean Water Act rather than under section 301(b)(1)(C),[68] and are accordingly not subject to the anti-backsliding requirements of section 402(o).

With respect to the regulatory anti-backsliding provisions in 40 Code of Federal Regulations section 122.44(*l*), the non-applicability is less clear cut. USEPA promulgated 40 Code of Federal Regulations section 122.44(*l*)(1) and its predecessor anti-backsliding regulations prior to the Water Quality Act of 1987, which established the municipal permitting requirements of section 402(p)(3)(B). There is ample regulatory history to demonstrate USEPA's intent in establishing the anti-backsliding policy and regulations with respect to evolving technology standards for traditional point sources.[69] We have found no definitive guidance, however, since that time from USEPA or the courts applying the general provisions of section 122.44(*l*) in the context of municipal storm water permits.[70] Further, we have previously noted that anti-backsliding principles may be difficult to assess in the context of non-

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[67] The Environmental Petitioners do not argue that the Los Angeles MS4 Order is contrary to Clean Water Act section 303(d)(4) (33 U.S.C. § 1313(d)(4)), which also sets out anti-backsliding requirements. Section 303(d)(4) sets out the conditions under which effluent limitations based on TMDL wasteload allocations may be relaxed. Specifically, effluent limitations for a discharge impacting an impaired water body where standards have not yet been attained may only be relaxed if either the cumulative effect of the revisions still assures the attainment of the water quality standards or the designated use that is not being attained is removed. (33 U.S.C. § 1313(d)(4)(A).) Where a water body has attained standards, effluent limitations may only be relaxed consistent with the federal antidegradation policy. (33 U.S.C. § 1313(d)(4)(B).)

[68] *Defenders of Wildlife*, *supra*, 191 F.3d at pp. 1165-1166.

[69] See, e.g., 44 Fed.Reg. 32854, 32864 (Jun. 7, 1979) (describing codification of predecessor regulation codified at 40 C.F.R. 122.15(i).) In the context of municipal storm water, the MEP standard is the technology standard; the record here supports that MEP, as reflected in the permit conditions, has evolved since the issuance of the 2001 Los Angeles MS4 Order to become more stringent. (See, e.g., Los Angeles MS4 Order, Part VI.D.9.h.vii., p.132, compared to 2001 Los Angeles MS4 Order, Part 4.F.5.c., pp.48-49 [trash controls]; Los Angeles MS4 Order, Part VI.D.7.c., pp. 97-109, as compared to 2001 Los Angeles MS4 Order, Part 4.D.3., pp.36-37 [new development/redevelopment project performance criteria]; Los Angeles MS4 Order, Part VI.D.8.d., pp.113-114, as compared to 2001 Los Angeles MS4 Order, Part 4.E., pp.42-45 [requirements for construction sites less than one acre].)

[70] As requested by the Environmental Petitioners, we took official notice of a Letter to the Water Management Administration, Maryland Department of the Environment, issued by USEPA Region III on August 8, 2012. (See fn. 19). We acknowledge that the letter states at page 3 that a provision in the Prince George County, Maryland, Phase I MS4 draft permit allowing for more time to complete tasks that were required under the previous permit constituted backsliding. The letter refers in passing to section 122.44(*l*)(1), but the letter has no regulatory effect and, further, is devoid of any analysis. The Environmental Petitioners have also pointed us to discussion of the regulatory anti-backsliding provisions in the NPDES Permit Writers' Manual. (NPDES Permit Writers' Manual, p. 7-4.) The relevant section of the NPDES Permit Writers' Manual does not explicitly distinguish between municipal storm water permits and traditional NPDES Permits in its discussion of the applicability of regulatory anti-backsliding provisions; however, nor does it specifically direct application of the anti-backsliding regulatory provisions to municipal storm water permits. We do not find this discussion to be to be determinative on the issue.

quantitative, non-numeric requirements such as BMPs and plans.[71] It is unnecessary, however, to resolve the ultimate applicability of the regulatory anti-backsliding provisions, because, assuming for the sake of argument they do apply, the WMP/EWMP provisions would qualify for an exception to backsliding as discussed below.

Even if the receiving water limitations in MS4 permits could be considered subject to the anti-backsliding requirements of the Clean Water Act or the federal regulations, backsliding would be permissible based on the new information available to the Los Angeles Water Board when it developed and adopted the Los Angeles MS4 Order. The Clean Water Act and federal regulations contain exceptions to the anti-backsliding requirements where new information is available to the permitting authority that was not available at the time of the issuance of the prior permit and that would have justified the imposition of less stringent effluent limitations at that time.[72] The Los Angeles Water Board makes a compelling argument in its October 15, 2013 Response that the development of 33 watershed-based TMDLs adopted since 2001, the inclusion and implementation of three of those TMDLs in the 2001 Los Angeles MS4 Order, and the TMDL-specific and general monitoring and analysis during implementation, have made new information available to the Los Angeles Water Board that fundamentally shaped the WMP/EWMP alternative of the Los Angeles MS4 Order. The Los Angeles Water Board states that the new information resulted in a new understanding that "time to plan, design, fund, operate and maintain [best management practices (BMPs)] is necessary to attain water quality improvements, and these BMPs are best implemented on a watershed scale."[73] The Los Angeles Water Board further points out that, in terms of water supply, there has been a paradigm shift in the last decade from viewing storm water as a liability to viewing it as a regional asset, and that the Los Angeles MS4 Order was drafted to incorporate this new paradigm into its structure.

The WMP/EWMP approach represents a comprehensive attempt to implement the Board's new understanding regarding how to make progress toward achieving water quality

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[71] See Order WQ 96-13 (*Save San Francisco Bay Association*) at pp. 8-10. Although the relevant portion of that decision primarily concerned Clean Water Act section 402(o), its analysis is equally instructive with respect to 40 C.F.R. section 122.44(*l*). (In passing, we note that the order appears to assume that the permit's water quality-based requirements for the MS4 permit were derived pursuant to section 301(b)(1)(C); however, that assumption is in error based on the *Defenders of Wildlife* decision and subsequent State Water Board precedent.)

[72] See 33 U.S.C. § 1342(o)(2)(B)(i); 40 C.F.R. § 122.44(*l*)(1) (anti-backsliding does not apply if the circumstances on which the previous permit was based have materially and substantially changed and would constitute cause for permit modification under 40 C.F.R. section 122.62); 40 C.F.R. § 122.62(a)(2) (stating that new information not available at the time the previous permit was issued is cause for modification); see also 40 C.F.R. §122.44(*l*)(2)(i)(B)(1).

[73] Los Angeles Water Board October 15, 2013 Response, p. 51.

standards as well as supporting the development of new water supplies.[74] The anti-backsliding requirements of the Clean Water Act and the federal regulations thus did not foreclose the incorporation of the WMP/EWMP alternatives into the Los Angeles MS4 Order even though the alternatives allow additional time to achieve receiving water limitations as compared to the immediate compliance required under the 2001 Los Angeles MS4 Order.

We shall amend Finding II.N. and Part III.D.4, page F-20, of Attachment F, Fact Sheet, as follows:

> **Finding II.N:**
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> **N. Anti-Backsliding Requirements.** Section 402(o)(2) of the CWA and federal regulations at 40 CFR section 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations may be relaxed. All effluent limitations in this Order are at least as stringent as the effluent limitations in the previous permit. **The Fact Sheet of this Order contains further discussion regarding anti-backsliding.**
>
> **Attachment F, Fact Sheet, Part III.D.4:**
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> **4. Anti-Backsliding Requirements.** Sections 402(o)(2) and 303(d)(4) of the CWA and federal regulations at 40 CFR section 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations may be relaxed. ~~All effluent limitations in this Order are at least as stringent as the effluent limitations in the previous permit.~~ **While this Order allows implementation of Watershed Management Plans/EWMPs to constitute compliance with receiving water limitations under certain circumstances, the availability of that alternative and the corresponding availability of additional time to come into compliance with receiving water limitations, does not violate the anti-backsliding provisions. The receiving**

[74] The Environmental Petitioners argue that information relied on to develop the WMP/EWMP approach was available to the Los Angeles Water Board at the time of the issuance of the 2001 Los Angeles MS4 Order, since regional and watershed based strategies and technologies in storm water planning, as well as the potential benefits of storm water for water supply, were considered prior to the last permit cycle. Similarly, the Environmental Petitioners argue that some of the data gathered through TMDL development was through the process of assessing impairments and through preparing drafts of the TMDL and was therefore available to the Los Angeles Water Board in 2001. (Environmental Petitioners, Written Comments, Jan. 21, 2015, pp. 15-17, 23-25.) The Environmental Petitioners have asked us to take official notice of several documents that support these assertions. It is not necessary for us to do so because we do not disagree with the Environmental Petitioners that some of the information that the Los Angeles Water Board has cited in support of an exception to the anti-backsliding requirements was available at the time of the adoption of the 2001 Los Angeles MS4 Order. We nevertheless concur with the Los Angeles Water Board that the more than a decade of implementation of storm water requirements, as well as the development and implementation of TMDL requirements, since 2001, has, as a whole, fundamentally reshaped our understanding of the physical and time scale on which such measures must be implemented to bring MS4s into compliance with receiving water limitations. Further, we find that all regional water boards are informed by the information gained in the Los Angeles region, so that any regional water board that adopts an alternative compliance path in a subsequent Phase I permit would not be in violation of anti-backsliding requirements, regardless of the particular storm water permitting history of that region.

water limitations provisions of this Order are imposed under section 402(p)(3)(B) of the Clean Water Act rather than based on best professional judgment, or based on section 301(b)(1)(C) or sections 303(d) or (e), and are accordingly not subject to the anti-backsliding requirements of section 402(o). Although the non-applicability is less clear with respect to the regulatory anti-backsliding provisions in 40 Code of Federal Regulations section 122.44(*l*), the regulatory history suggests that USEPA's intent was to establish the anti-backsliding regulations with respect to evolving technology standards for traditional point sources. (See, e.g., 44 Fed.Reg. 32854, 32864 (Jun. 7, 1979)). It is unnecessary, however, to resolve the ultimate applicability of the regulatory anti-backsliding provisions, because the WMP/EWMP provisions qualify for an exception to backsliding as based on new information. The Watershed Management Plan/EWMP provisions of this Order were informed by new information available to the Board from experience and knowledge gained through the process of developing 33 watershed-based TMDLs and implementing several of the TMDLs since the adoption of the previous permit. In particular, the Board recognized the significance of allowing time to plan, design, fund, operate and maintain watershed-based BMPs necessary to attain water quality improvements and additionally recognized the potential for municipal storm water to benefit water supply. Thus, even if the receiving water limitations are subject to anti-backsliding requirements, they were revised based on new information that would support an exception to the anti-backsliding provisions. (33 U.S.C. § 1342(o)(2)(B)(i); 40 C.F.R. § 122.44(l)(1); 40 C.F.R. §122.44(l)(2)(i)(B)(1)).

2. Antidegradation

The Environmental Petitioners argue that the WMP/EWMP provisions of the Los Angeles MS4 Order violate the federal and state antidegradation policies.[75] The federal and state antidegradation policies generally require that the existing quality of water bodies be maintained, unless degradation is justified through specific findings. At a minimum, any degradation may not lower the quality of the water below the water quality standards.[76]

The federal and state antidegradation policies are not identical; however, where the federal antidegradation policy is applicable, the State Water Board has interpreted State Water Board Resolution No. 68-16, the state antidegradation policy, to incorporate the federal antidegradation policy.[77] In the context of the Los Angeles MS4 Order, a federal NPDES permit, compliance with the federal antidegradation policy would require consideration of the following: First, the Los Angeles MS4 Order must ensure that "existing instream uses and the level of

[75] 40 C.F.R. § 131.12; State Water Board Resolution No. 68-16, Statement of Policy with Respect to Maintaining High Quality Waters in California (State Water Board Resolution No. 68-16).

[76] *Ibid.*

[77] State Water Board Order WQ 86-17 (*Fay*), pp. 16-19.

water quality necessary to protect the existing uses" is maintained and protected.[78] Second, if the baseline quality of a water body for a given constituent "exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water, that quality shall be maintained and protected" through the requirements of the Los Angeles MS4 Order unless the Los Angeles Water Board makes findings that (1) any lowering of the water quality is "necessary to accommodate important economic or social development in the area in which the waters are located;" (2) "water quality adequate to protect existing uses fully" is assured; and (3) "the highest statutory and regulatory requirements for all new and existing point sources and all cost-effective and reasonable best management practices for nonpoint source control" are achieved.[79]

The Los Angeles MS4 Order must also comply with any requirements of State Water Board Resolution No. 68-16 beyond those imposed through incorporation of the federal antidegradation policy.[80] In particular, the Los Angeles Water Board must find that not only present, but also anticipated future uses of water are protected, and must ensure "best practicable treatment or control" of the discharges."[81] The baseline quality considered in making the appropriate findings is the best quality of the water since 1968, the year of the adoption of Resolution No. 68-16, or a lower level if that lower level was allowed through a permitting action that was consistent with the federal and state antidegradation policies.[82]

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[78] 40 C.F.R. § 131.12(a)(1). This provision has been interpreted to mean that, "[i]f baseline water quality is equal to or less than the quality as defined by the water quality objective, water quality shall be maintained or improved to a level that achieves the objectives." (State Water Board, Administrative Procedures Update, Antidegradation Policy Implementation for NPDES Permitting, 90-004 (APU 90-004), p. 4.) This provision is completely consistent with, and implemented by, the receiving water limitations provisions discussed above.

[79] 40 C.F.R. § 131.12(a)(2); see also State Water Board Resolution No. 68-16, Resolve 2. The federal regulations additionally require strict maintenance of water quality for "outstanding national resources." (40 C.F.R. § 131.12(a)(3).) There are no designated outstanding national resource waters covered by the Los Angeles MS4 Order.

[80] See State Water Board Order WQ 86-17 (*Fay)*, p. 23, fn. 11.

[81] State Water Board Resolution No. 68-16, Resolve 2. Best practicable treatment or control is not defined in Resolution No. 68-16; however, the State Water Board has evaluated what level of treatment or control is technically achievable using "best efforts." (See State Water Board Orders WQ 81-5 (*City of Lompoc*), WQ 82-5 (*Chino Basin Municipal Water District)*, WQ 90-6 (*Environmental Resources Protection Council*).) A Questions and Answers document on Resolution No. 68-16 by the State Water Board states as follows: "To evaluate the best practicable treatment or control method, the discharger should compare the proposed method to existing proven technology; evaluate performance data, e.g. through treatability studies; compare alternative methods of treatment or control; and/or consider the method currently used by the discharger or similarly situated dischargers . . .The costs of the treatment or control should also be considered . . . ." (Questions and Answers, Resolution No. 68-16, State Water Board (Feb. 16, 1995), pp. 5-6.)

[82] APU 90-004, p.4. The baseline for application of the federal antidegradation policy is 1975. For state antidegradation requirements, see also *Asociacion de Gente Unida por el Agua v. Central Valley Water Board* (2012) 210 Cal.App.4th 1255,1270. The baseline for the application of the state antidegradation policy is generally the highest water quality achieved since 1968. However, where a water quality objective for a particular constituent was adopted after 1968, the baseline for that constituent is the highest water quality achieved since the adoption of the
(Continued)

The Los Angeles MS4 Order contains a conclusory antidegradation finding, but the Fact Sheet contains additional discussion.[83] The Fact Sheet discussion essentially conveys that, where there are high quality waters in the region, the antidegradation requirements are met because the Order requires best practicable treatment or control in the form of MEP and water quality standards compliance and, further, where the water quality is already impaired, the Order requires implementation of TMDL requirements to achieve water quality standards over time. The Fact Sheet also finds that the Los Angeles MS4 Order does not authorize an increase in waste discharges. The Los Angeles Water Board argues that it was not required to make more detailed findings because, using its best professional judgment and available data, it concluded that the Los Angeles MS4 Order would prevent any degradation. For this proposition, the Los Angeles Water Board cites to State Water Board guidance from 1990 (APU 90-004).[84] The guidance may be construed to exempt the Los Angeles Water Board from conducting an extensive pollutant by pollutant analysis for each water body in the region, but it does not exempt the Board from clearly stating its basis for finding that its action is consistent with the antidegradation policies.

The Los Angeles Water Board has provided a more extensive analysis of why the Los Angeles MS4 Order complies with the antidegradation policies in its October 15, 2013 Response. The Los Angeles Water Board argues that most of the water bodies impacted by the Los Angeles MS4 Order are already impaired for multiple constituents and that, even if some of these water bodies may have been higher quality in 1968, a scenario largely contradicted by the available data,[85] the appropriate baseline for the quality of such waters is the level of control achieved under the prior permit. The Los Angeles Water Board further argues that the Los Angeles MS4 Order has provisions that are equally or more stringent than those of the

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(continued from previous page)
objective. Resolution 68-16 requires a comparison of the existing quality to "the quality established in policies as of the date on which such policies become effective." (Resolution 68-16, Resolve 1.)

[83] Los Angeles MS4 Order, Finding II.M; Fact Sheet, Att. F, pp. F19-F20.

[84] APU 90-004, p. 2.

[85] We reviewed the Administrative Record, including the 1998 Clean Water Act section 303(d) List (May 12, 1999) (Administrative Record, section 10.VI.E., RB-AR35684-35733), the 2010 Clean Water Act section 303(d) List (Oct.11, 2011) (Administrative Record, section 10.VI.E., RB-AR35734-35785), Santa Monica Bay Restoration Project, An Assessment of Inputs of Fecal Indication Organisms and Human Enteric Viruses from Two Santa Monica Bay Storm Drains (1990) (Administrative Record, section 10.VI.E, RB-AR43363-43413), Toxic Substances Monitoring Program, 10 Year Summary Report 1978-1987 (Administrative Record, Order No. 01-182, R0044602-0045053) and comments submitted by interested persons to the Los Angeles Water Board (Administrative Record RB-AR1006-1038, RB-AR1100-1128, RB-AR1768-2119, RB-AR2653-2847, RB-AR5642-17888). We found no specific evidence presented to the Los Angeles Water Board of high quality waters in the region with regard to pollutants typically associated with storm water discharges; however, we also recognize that in the absence of specific evidence of high quality waters, a blanket statement that there are no high quality water body-pollutant combinations may be overbroad.

2001 Los Angeles MS4 Order and therefore will not allow water quality to degrade below the level of control achieved under the prior permit.

We agree with the Los Angeles Water Board that the Los Angeles MS4 Order maintains and improves the level of control achieved under the 2001 Los Angeles MS4 Order. We expect that the Los Angeles MS4 Order's TMDL requirements and receiving water limitations, which may be implemented through the WMP/EWMP provisions, will be the means for achieving water quality standards for the majority of degraded water bodies in the region. To assert, as the Environmental Petitioners do, that compliance with the receiving water limitations provisions of the 2001 Los Angeles Order is more stringent than establishing specific implementation requirements with clear deadlines for TMDL and receiving water limitations compliance is misguided. We are concerned with the totality of the provisions in the two permits and find that, viewed from that broader perspective, the Los Angeles MS4 Order is at least as stringent in addressing degradation as its predecessor.[86] The Los Angeles MS4 Order improves on past practices that have been inadequate to protect water quality, and includes a monitoring and assessment program that will identify any changes in water quality.[87] In general, under the Los Angeles MS4 Order, we expect to see a trajectory away from any past degradation, even if there may be some continued short-term degradation.

We are not persuaded, however, that the level of control achieved under the 2001 Los Angeles MS4 Order necessarily represents the baseline for purposes of an antidegradation analysis. The 2001 Los Angeles MS4 Order had only minimal findings regarding antidegradation and it is not apparent that any degradation that may have continued under the conditions of the 2001 Los Angeles MS4 Order was anticipated by the Los Angeles Water Board and supported with appropriate analysis regarding economic and social benefits[88] and best practicable treatment or control. We therefore find that the appropriate baseline remains 1968 or the highest quality of receiving waters attained since 1968. We acknowledge

[86] In making this finding we also recognize that the Permittees may be deemed in compliance with receiving water limitations prior to approval of the WMP/EWMP. (Los Angeles MS4 Order Parts VI.C.2.d., pp. 52-53, VI.E.2.d.i.(4)(d), p. 144.) As discussed further under section II.B.6., we find that the Los Angeles Water Board reasonably exercised its discretion in allowing for compliance during the program development phase and further that the program development phase does not detract from the overall effectiveness of the permit provisions.

[87] *See Asociacion de Gente Unida, supra*, 210 Cal.App.4th at p. 1278.

[88] We note that the administrative record provides evidence that some discharge of storm water is to the maximum benefit of the people of the state because such discharge is necessary for flood control and public safety and helps accommodate development. (See, e.g., Administrative Record, section 10.VI.C, RB-AR30101; RB-AR32557-32558.)

that the evidence in the record indicates that it is unlikely that many water bodies were high quality even as far back as 1968, but we cannot make a blanket statement to that effect.[89]

Despite this conclusion, we will not remand the antidegradation issue to the Los Angeles Water Board for further consideration, but will make the findings ourselves based on the record before us. Our findings are necessarily made at a generalized level. Even if the directive of APU 90-004 to carry out a complete antidegradation analysis for each water body-pollutant combination is applicable here, there is simply insufficient data available (to us or the Los Angeles Water Board) to make such findings. The APU 90-004 contemplates the appropriate antidegradation analysis for a discrete discharge or facility. It has limited value when considering antidegradation in the context of storm water discharges from diffuse sources, conveyed through multiple outfalls, with multiple pollutants impacting multiple water bodies within a municipality, or in this case, region, especially given that reliable data on the baseline water quality from 1968 is not available.[90]

The Environmental Petitioners propose that antidegradation be addressed in subsequent actions of the Los Angeles Water Board by requiring that the reasonable assurance analysis (discussed in greater detail in section II.B.4.c. of this Order) supporting a WMP/EWMP also demonstrate that the proposed control measures will maintain high quality of waters with regard to pollutants for which they are not impaired. We reject this approach for two reasons. First, the Los Angeles Water Board was required under the federal and state antidegradation policies to evaluate whether permit conditions would lead to degradation of high quality waters at the time of permit issuance. Second, requiring Permittees to incorporate an evaluation of all water body-pollutant combinations, including those where there are no impairments or exceedances, would require them to expand the reasonable assurance analysis beyond its useful function and manageable scope.

We shall amend Finding II.M and Part D.3 at pages F-19 to F-20 of Attachment F, the Fact Sheet, as follows:

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[89] See fn. 85.

[90] We note that USEPA did not conduct a detailed antidegradation analysis in issuing NPDES Permit No. DC00000221 for MS4 discharges to the District of Columbia, presumably for similar reasons. The court in *Asociacion de Gente Unida* relied on APU 90-004 in part in rejecting an antidegradation analysis conducted by the Central Valley Regional Water Quality Control Board for discharges of pollutants to groundwater from dairy facilities region-wide, but the court's objection was to the regional water board's reliance on an illusory prohibition of discharge to groundwater in finding that no antidegradation analysis was required, not to the sufficiency of any generalized antidegradation analysis the Board might have conducted in lieu of its reliance on the prohibition. (210 Cal.App.4th at pp. 1271-1273.)

Finding II. M.

M. Antidegradation Policy
40 CFR section 131.12 requires that state water quality standards include an antidegradation policy consistent with the federal antidegradation policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16 ("Statement of Policy with Respect to Maintaining the Quality of the Waters of the State"). Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. Resolution No. 68-16 requires that existing water quality be maintained unless degradation is justified based on specific findings. The Regional Water Board's Basin Plan implements, and incorporates by reference, both the state and federal antidegradation policies. The permitted discharge is consistent with the antidegradation provision of section 131.12 and State Water Board Resolution No. 68-16 **as set out in the Fact Sheet.**

Attachment F, Fact Sheet Part III.D.3.

3. Antidegradation Policy. 40 CFR section 131.12[4] requires that the state water quality standards include an antidegradation policy consistent with the federal antidegradation policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16 ("Statement of Policy with Respect to Maintaining the Quality of the Waters of the State"). Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. The Regional Water Board's Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies. Resolution No. 68-16 and 40 CFR section 131.12 require the Regional Water Board to maintain high quality waters of the State **unless degradation is justified based on specific findings. First, the Board must ensure that "existing instream uses and the level of water quality necessary to protect the existing uses" are maintained and protected. Second, if the baseline quality of a water body for a given constituent exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water, that quality shall be maintained and protected through the requirements of the Order unless the Board makes findings that (1) any lowering of the water quality is necessary to accommodate important economic or social development in the area in which the waters are located; (2) water quality adequate to protect existing uses fully is assured; and (3) the highest statutory and regulatory requirements for all new and existing point sources and all cost-effective and reasonable best management practices for nonpoint source control are achieved. The Board must also comply with any requirements of State Water Board Resolution No. 68-16 beyond those imposed through incorporation of the federal antidegradation policy. In particular, the Board must find that not only present, but also anticipated future uses of water are protected, and must ensure best practicable treatment or control of the discharges. The baseline quality considered in making the appropriate findings is the best quality of the water since 1968, the year of the adoption of Resolution No. 68-16, or a lower level if that lower level was allowed through a permitting action that was consistent with the federal and state antidegradation policies.** ~~until it is demonstrated that any change in quality will~~

~~be consistent with maximum benefit to the people of the State, will not unreasonably affect beneficial uses, and will not result in water quality less than that described in the Regional Water Board's policies. Resolution 68-16 requires that discharges of waste be regulated to meet best practicable treatment or control to assure that pollution or nuisance will not occur and the highest water quality consistent with the maximum benefit to the people of the State be maintained.~~

The discharges permitted in this Order are consistent with the antidegradation provisions of 40 CFR section 131.12 and Resolution 68-16 **as set out in the Findings below:**~~.~~

1. ~~Many of the water bodies within the area covered by this Order are of high quality. The Order requires the Permittees to meet best practicable treatment or control to meet water quality standards. As required by 40 CFR section 122.44(a), the Permittees must comply with the "maximum extent practicable" technology-based standard set forth in CWA section 402(p).~~ Many of the waters within the area covered by this Order are impaired ~~and~~ **for multiple pollutants discharged through MS4s and are not high quality waters with regard to these pollutants. In most cases, there is insufficient data to determine whether these water bodies were impaired as early as 1968, but the limited available data shows impairment dating back for more than two decades. Many such water bodies are** listed on the State's CWA Section 303(d) List and either the Regional Water Board or USEPA has established TMDLs to address the impairments. **This Order ensures that existing instream (beneficial) water uses and the level of water quality necessary to protect the existing uses is maintained and protected**. This Order requires the Permittees to comply with permit provisions to implement the WLAs set forth in the TMDLs in order to restore the beneficial uses of the impaired water bodies consistent with the assumptions and requirements of the TMDLs. **This Order further requires compliance with receiving water limitations to meet water quality standards in the receiving water either by demonstrating compliance pursuant to Part V.A and the Permittee's monitoring and reporting program pursuant to Part VI.B or by implementing Watershed Management Programs/EWMPs with a compliance schedule.** This Order includes requirements to develop and implement storm water management programs, achieve water quality-based effluent limitations, and effectively prohibit non-storm water discharges through the MS4.

2. To the extent that some of the water bodies within the jurisdiction are high quality waters with regard to some constituents, this Order finds as follows:

a. Allowing limited degradation of high quality water bodies through MS4 discharges is necessary to accommodate important economic or social development in the area and is consistent with the maximum benefit to the people of the state. The discharge of storm water in certain circumstances is to the maximum benefit to the people of the state because it can assist with maintaining instream flows that support beneficial uses, may spur the development of multiple-benefit projects, and may be necessary for flood control, and public safety as well as to accommodate development in the

area. The alternative – capturing all storm water from all storm events – would be an enormous opportunity cost that would preclude MS4 permittees from spending substantial funds on other important social needs. The Order ensures that any limited degradation does not affect existing and anticipated future uses of the water and does not result in water quality less than established standards. The Order requires compliance with receiving water limitations that act as a floor to any limited degradation.

b. The Order requires the highest statutory and regulatory requirements and requires that the Permittees meet best practicable treatment or control. The Order prohibits all non-storm water discharges, with a few enumerated exceptions, through the MS4 to the receiving waters. As required by 40 CFR section 122.44(a), the Permittees must comply with the "maximum extent practicable" technology-based standard set forth in CWA section 402(p), and implement extensive minimum control measures in a storm water management program. Recognizing that best practicable treatment or control may evolve over time, the Order includes new and more specific requirements as compared to Order No. 01-182. The Order incorporates options to implement Watershed Management Programs or EWMPs that must specify concrete and detailed structural and non-structural storm water controls that must be implemented in accordance with an approved time schedule. The Order contains provisions to encourage, wherever feasible, retention of the storm water from the 85th percentile 24-hour storm event.

~~The issuance of this Order does not authorize an increase in the amount of discharge of waste. The Order includes new requirements to implement WLAs assigned to Los Angeles County MS4 discharges that have been established in 33 TMDLs, most of which were not included in the previous Order.~~

3. Compliance Schedules and the Appropriateness of Enforcement Orders

The Environmental Petitioners concede that immediate compliance with receiving water limitations is not achievable in many instances and that some additional time to reach compliance is warranted. They have proposed an alternative to the WMP/EWMP that would incorporate many of the provisions of those programs but require implementation through the mechanism of a time schedule order or other enforcement order rather than as permit conditions. The Los Angeles MS4 Order already provides that Permittees who are out of compliance with final WQBELs and other TMDL-specific limitations may request a time schedule order.[91] Under the alternative proposed by the Environmental Petitioners, all Permittees that are currently out of compliance with receiving water limitations not addressed by a TMDL as well as with interim TMDL requirements with passed compliance deadlines, would be issued a time schedule order or other enforcement order not to exceed the five year term of

[91] Los Angeles MS4 Order, Part VI.E.4., pp.146-147.

the permit. The Permittees would then implement a WMP/EWMP type plan to achieve compliance with the appropriate limitations within the confines of the enforcement order.

In the prior two sections, we found that the WMP/EWMP provisions are not contrary to the anti-backsliding or antidegradation requirements of federal and state law. We therefore disagree with the Environmental Petitioners that the relevant provisions must be stricken from the Order and incorporated instead into an enforcement order for those reasons. We also find that, given that strict compliance with water quality standards is discretionary in MS4 permits, the Los Angeles Water Board was not restricted to limiting the schedule for compliance with receiving water limitations to the term of the Los Angeles MS4 Order.

Further, from a policy perspective, we find that the MS4 Permittees that are developing and implementing a WMP/EWMP should be allowed additional time to come into compliance with receiving water limitations and interim and final TMDLs through provisions built directly into their permit, rather than through enforcement orders. Building a time schedule into the permit itself, as the Los Angeles MS4 Order does, is appropriate because it allows a more efficient regulatory structure compared to having to issue multiple enforcement orders. More importantly, it is appropriate to regulate Permittees in a manner that allows them to strive for compliance with the permit terms, provided no provision of law otherwise precludes including the schedule in the NPDES permit. For example, for traditional point source discharges subject to strict compliance with water quality standards pursuant to section 301(b)(1)(C), the terms of a compliance schedule are dictated by our compliance schedule policy (State Water Board Resolution 2008-0025) and any additional time for compliance could only be under the auspices of an enforcement order outside the permit.[92]

The WMP/EWMP provisions constitute an effort to set ambitious, yet achievable, targets for Permittees; receiving water limitations, on the other hand, while the ultimate goal of MS4 permitting, may not in all cases be achievable within the five-year permit cycle. Generally, permits are best structured so that enforcement actions are employed when a discharger shows some shortcoming in achieving a realistic, even if ambitious, permit condition and not under circumstances where even the most diligent and good faith effort will fail to achieve the required condition. We add that it is our intention to encourage a watershed-based approach to addressing storm water issues going forward and that it would be contrary to that intention to

[92] We also note that the State Water Board's Policy for the Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (2005) (State Implementation Policy) and the CTR itself (40 C.F.R. § 131.38(e)) restrict the scope of compliance schedules for effluent limitations addressing the discharge of toxic pollutants; however the policy does not apply to storm water discharges. (State Implementation Policy, p.3, fn.1.)

structure the watershed-based requirements as an enforcement order. We will not require Permittees that propose and timely implement a WMP/EWMP to request time schedule orders or other enforcement orders as a precondition of being in compliance with the receiving water limitations or interim TMDL requirements of the Los Angeles MS4 Order.

While declining to structure the WMP/EWMP provisions generally as an enforcement order, we acknowledge that time schedule orders are appropriate under some circumstances. We have already noted that the Los Angeles MS4 Order allows a Permittee to request a time schedule order where a final compliance deadline for a state-adopted TMDL has passed and the Permittee believes that additional time to comply with the requirement is necessary.[93] We expect that a Permittee will request a time schedule order also if the Permittee fails to meet a final compliance deadline for a TMDL after the adoption date of the Los Angeles MS4 Order. We will also provide that a Permittee may request a time schedule order if the Permittee fails to meet a final compliance deadline for a receiving water limitation set in the Permittee's WMP/EWMP.

We shall add a new Part VI.C.6.b and revise Part VI.E.4.b as follows:

Part VI.C.6

b. Where a Permittee believes that additional time to comply with a final receiving water limitation compliance deadline set within a WMP/EWMP is necessary, and the Permittee fails to timely request or is not granted an extension by the Executive Officer, a Permittee may, no less than 90 days prior to the final compliance deadline, request a time schedule order pursuant to California Water Code section 13300 for the Regional Water Board's consideration.

Part VI.E.4

b. Where a Permittee believes that additional time to comply with the final water quality-based effluent limitations and/or receiving water limitations is necessary, a Permittee may within 45 days of Order adoption**, or no less than 90 days prior to the final compliance deadline if after adoption of the Order,** request a time schedule order pursuant to California Water Code section 13300 for the Regional Water Board's consideration.

4. Rigor and Accountability in the WMPs/EWMPs

We now turn to a consideration, from a technical as well as policy lens, as to whether the WMPs/EWMPs are structured in a manner that will maximize the likelihood of

[93] *Ibid.*

reaching the ultimate goal of the compliance alternative – achieving receiving water limitations.[94] We can support an alternative approach to compliance with receiving water limitations only to the extent that that approach requires clear and concrete milestones and deadlines toward achievement of receiving water limitations and a rigorous and transparent process to ensure that those milestones and deadlines are in fact met. Conversely, we cannot accept a process that leads to a continuous loop of iterative WMP/EWMP implementation without ultimate achievement of receiving water limitations.

We find below that the WMP/EWMP provisions generally ensure the appropriate rigor, transparency, and accountability, and that, with the few revisions we direct, are designed to lead to achievement of receiving water limitations.[95]

a. Milestones and Compliance Deadlines

We first consider whether the WMP/EWMP provisions require clear, concrete, and finite milestones and deadlines.

For water body-pollutant combinations addressed by TMDLs, the Los Angeles MS4 Order requires the Permittees to incorporate the compliance schedules found in Attachments L through R of the Order, which reflect previously adopted TMDL-based requirements, into the WMP/EWMP, and, as necessary, to develop interim milestones and dates for their achievement.[96] A Permittee that does not thereafter comply with the approved compliance schedule must instead demonstrate compliance with the WQBELs and other TMDL-specific limitations of the Order.[97] For water body-pollutant combinations not addressed by a TMDL, but where the relevant pollutant is one for which the water body is identified as impaired on the Clean Water Act section 303(d) List and the pollutant is in the same class as a TMDL pollutant, the Order requires that the WMP/EWMP incorporate a schedule consistent with the TMDL schedule for the same class pollutant.[98] A Permittee that does not thereafter comply with

[94] From a legal standpoint, our analysis serves to verify that the Los Angeles MS4 Order's alternative compliance approach through WMPs/EWMPs is supported by the findings and by evidence in the record. (*Topanga Assn. for a Scenic Community v. County of Los Angeles* (1974) 11 Cal.3d 506.)

[95] We do not agree with Permittee Petitioners that the WMP/EWMP provisions are precluded by the program requirements of 40 Code of Federal Regulations section 122.26. Nor do we agree that the requirements are vague or lack definition. The WMP/EWMP provisions of the Order are guidelines for development of a subsequent program with more specificity to be approved by the Los Angeles Water Board or its Executive Officer.

[96] Los Angeles MS4 Order, Part VI.C.5.c., pp.64-65.

[97] *Id.*, Part VI.E.2.d.i(4)(c), p.144.

[98] *Id.*, Part VI.C.2.a.i., pp. 49-50.

the approved compliance schedule must instead demonstrate immediate compliance with the receiving water limitations in Part V.A.[99] We will not disturb these provisions.

With regard to exceedances of receiving water limitations not addressed by a TMDL, and where the pollutant is not in the same class as a pollutant addressed by a TMDL, the Order requires that the WMP/EWMP include milestones based on measurable criteria or indicators and a schedule for achieving the milestones. The WMP/EWMP must also incorporate a final date for achievement of receiving water limitations, but that date is circumscribed simply as "as soon as possible."[100] Parts VI.C.2.a.ii.(4) and VI.C.2.a.iii.(2)(c) help clarify the meaning of "as soon as possible:"

> Permittees shall identify enforceable requirements and milestones and dates for their achievement to control MS4 discharges such that they do not cause or contribute to exceedances of receiving water limitations within a timeframe(s) that is as short as possible, taking into account the technological, operation, and economic factors that affect the design, development, and implementation of the control measures that are necessary. The time between dates shall not exceed one year. Milestones shall relate to a specific water quality endpoint (e.g., x% of the MS4 drainage area is meeting the receiving water limitations) and dates shall relate either to taking a specific action or meeting a milestone.[101]

We will make a revision to the compliance schedule provisions to make it clear that the term "as soon as possible" is to be interpreted consistent with the more specific direction cited above. However, because the WMP/EWMP, and therefore the proposed compliance schedule, is subject to public review and comment and approval by the Los Angeles Water Board or its

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[99] *Id.*, Part VI.C.2.c., p.52.

[100] *Id.*, Part VI.C.5.c.iii.(3), p. 65. If the pollutant is not in the same class as those addressed in a TMDL, but the water body is still identified as impaired for that pollutant, the WMP/EWMP must either have a final compliance deadline within the 5 year permit term or Permittees are expected to initiate development of a stakeholder-proposed TMDL and incorporate a compliance schedule consistent with the TMDL. (*Id.*, Part VI.C.2.a. ii., pp. 50-51) (If the exceedances are in a drainage area implementing the storm water retention approach, there is no requirement to initiate the TMDL development process.) The requirement to address receiving water limitations is ongoing. As exceedances are found through monitoring for water body-pollutant combinations not identified on the 303(d) List, Permittees must either meet receiving water limitations or include the water body-pollutant combination in the WMP/EWMP and set enforceable requirements and milestones and dates for their achievement within a time frame that is as short as possible. (*Id.*, Part VI.C.2.a.iii, pp. 51-52.) Permittees are deemed in compliance with receiving water limitations only for water body-pollutant combinations addressed in the WMP/EWMPs. Thus, as pointed out by several interested parties, for lower priority water body-pollutant combinations not incorporated into a WMP/EWMP for which exceedances are detected, Permittees may be in violation of the receiving water limitations. A Permittee always has the ability to reprioritize a water body-pollutant combination from low priority to high priority and amend its WMP/EWMP to incorporate measures to address that water body-pollutant combination.

[101] *Id.*, Parts VI.C.2.a.ii.4, p. 50, VI.C.2.a.iii.(2)(c), p. 51 (identical language).

Executive Officer,[102] we do not find it necessary to constrain the determination of milestones and dates for the achievement of receiving water limitations any further.

We shall amend Part VI.C.5.c.iii.(3)(b) as follows:

(b) A final date for achieving the receiving water limitations as soon as possible**, consistent with Parts VI.C.2.a.ii.(4) & VI.C.2.a.iii.(2)(c)**.

b. Constraints on Extension of Deadlines

The fact that the Los Angeles MS4 Order requires the establishment of concrete and rigorous deadlines within the WMP/EWMP for the achievement of receiving water limitations is critical to ensuring progress on such achievement; however, the Order also contemplates that the deadlines, with the exception of those compliance deadlines established in a TMDL, may be extended.[103] The WMP/EWMP is subject to an adaptive management process. Based on the results of that process the Permittees may propose modifications, including modifications to compliance deadlines and interim milestones, in the Annual Report.[104]

The potential for multiple extensions is nevertheless ameliorated by the fact that extensions of compliance deadlines and interim milestones require Los Angeles Water Board Executive Officer approval,[105] and are accordingly, subject to a 30-day public comment period.[106] The public comment period will allow all other interested persons to weigh in on the appropriateness of any requested extensions. If thereafter dissatisfied with the determination made by the Executive Officer, interested persons may additionally seek review of the Executive Officer's decision by the Los Angeles Water Board.[107] Of course, in cases where no extension

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[102] *Id.*, Part VI.C.4.c., p.56, Table 9, p. 54, Part VI.A.5.b., p. 42, Att. F, Fact Sheet, p. F-42. Under Part VI.A.5.b, "[a]ll documents submitted to the Regional Water Board Executive Officer for approval shall be made available to the public for a 30-day period to allow for public comment."

[103] *Id.*, Parts VI.C.7, p.66, VI.C.8, pp.66-67.

[104] *Id.*, Part, VI.C.8, p.67. Under another provision of the Order, Permittees may at any time request an extension of deadlines for achievement of interim milestones established to address exceedances of receiving water limitations not otherwise addressed by a TMDL. (*Id.*, Part VI.C.6.a., p.65.) (We note that the cited provision refers to "milestones established pursuant to Part VI.C.4.c.ii.(3)," but the intent appears to have been to reference Part VI.C.5.c.iii.(3).) But as we read the Los Angeles MS4 Order, extensions of not just interim deadlines for achievement of milestones but also final compliance deadlines to achieve receiving water limitations are already allowed under the adaptive management provisions of Part VI.C.8.a.ii.: "Based on the results of the adaptive management process, Permittees shall report any modifications, including where appropriate *new compliance deadlines* and interim milestones, with the exception of those compliance deadlines established in a TMDL, necessary to improve the effectiveness of the Watershed Management Program or EWMP, in the Annual Report . . . ." (Emphasis added.)

[105] *Id.*, Parts VI.C.8, p.67, VI.C.6.a., p.65. We recognize that as currently written the adaptive management provisions in effect deem any modifications to the WMPs/EWMPs approved if the Executive Officer "expresses no objections" within 60 days. (*Id.,* Part VI.C.8.a.iii., p. 67.) With our revisions, any deadline extensions must be affirmatively approved by the Executive Officer.

[106] *Id.*, Part VI.A.5.b, p. 42.

[107] *Id.*, Part VI.A.6, p.42.

is available, as with final deadlines established in TMDLs,[108] or where no extension is requested or granted, failure to meet a deadline means that the Permittee will have to comply from that time forward with the receiving water limitations or WQBELs and other TMDL-specific limitations or request a time schedule order. Therefore, Permittees cannot rely on the certainty of a deadline extension, and Permittees have a strong incentive to implement control measures that will in fact get them to compliance by the established deadline. Given that the Permittees and the Los Angeles Water Board are working with limited data regarding storm water impacts and control measure performance, especially where TMDLs have not been developed, we are hesitant to remove all flexibility for deadline extensions, and find that the Order strikes an appropriate balance.

Permittee Petitioners seek even greater flexibility under the WMP/EWMP provisions for adjusting approved control measures and time lines. They advocate for amendments that would allow a Permittee to propose alternative controls or time lines upon a demonstration that required controls for timely achievement of a limitation are either technically infeasible or otherwise constitute a substantial hardship to the Permittee. We have found above that, in the case of final deadlines set in the WMP/EWMP for achievement of receiving water limitations not otherwise addressed in a TMDL, the Los Angeles MS4 Order already provides for an opportunity to propose new deadlines through the adaptive management process. We will make a clarifying revision below to confirm that Permittees may ask for extensions in meeting receiving water limitations not addressed by a TMDL. Technical infeasibility or substantial hardship may be grounds for such a request. The Los Angeles Water Board Executive Officer, in turn, may, after allowing for public review and comment, choose to (1) extend the deadline, (2) decline the extension but approve any time schedule order requested by the Permittee, or (3) decline the extension and not approve a time schedule order, with the result that the Permittee will be out of compliance with the provision of the WMP/EWMP and therefore the receiving water limitations of Part V.A. As stated previously, interested persons may thereafter ask the Los Angeles Water Board to review the Executive Officer's determination.[109]

With regard to final deadlines for WQBELs and other TMDL-specific limitations, we will not amend the WMP/EWMP provisions to add flexibility for extensions. We find that the only option appropriately available to a Permittee unable to meet final deadlines that are set out in a TMDL and incorporated into the Los Angeles MS4 Order and the WMP/EWMPs, is to

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[108] *Id.*, Part VI.C.8.a.ii., p.67.

[109] *Id.*, Part VI.A.6, p.42.

request a time schedule order, consistent with Part VI.E.2.e. of the Order, as that Part was amended in section II.B.3. above.[110]

We shall amend Part VI.C.6.a as follows:

a. Permittees may request an extension of deadlines for achievement of interim milestones **and final compliance deadlines** established pursuant to Part VI.C.4**5**.c.iii.~~(3) only~~**, with the exception of those final compliance deadlines established in a TMDL**. Permittees shall provide requests in writing at least 90 days prior to the deadline and shall include in the request the justification for the extension. Extensions ~~shall be subject to approval by~~ **must be affirmatively approved by** the Regional Water Board Executive Officer, **notwithstanding Part VI.C.8.a.iii.**

c. Rigor and Accountability in the Process

We see three additional components of the WMPs/EWMPs as essential to ensuring that the proposed WMPs/EWMPs are in fact designed to achieve receiving water limitations within the appropriate time frame.

First, as documents to be approved by either the Los Angeles Water Board or its Executive Officer, the WMPs/EWMPs are subject to a public review and comment period.[111] Such review includes consideration of proposed control measures, deadlines for achievement of final limitations, and the reasonable assurance analysis that supports the WMP/EWMP. We expect this public process to vet the proposed WMPs/EWMPs and facilitate revisions to strengthen the programs as needed, thereby providing some assurance that approved WMPs/EWMPs will achieve the water quality targets set out.

Second, the requirement for a reasonable assurance analysis in particular is designed to ensure that Permittees are choosing appropriate controls and milestones for the WMP/EWMP.[112] Competent use of the reasonable assurance analysis should facilitate achievement of final compliance within the specified deadlines.[113]

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[110] Final TMDL deadlines are established and incorporated into the Basin Plans during the TMDL development process. That process invites stakeholder participation and the proposed schedule is subject to public review and comment and approval by the relevant regional water board, the State Water Board, and USEPA. The deadlines are established with consideration of the time needed for compliance for all dischargers contributing to an impairment, including industrial and construction storm water dischargers and traditional NPDES dischargers. Although we recognize that it may not always be feasible for municipal storm water dischargers to meet final TMDL deadlines, short of amending the Basin Plan to modify the deadlines (see *California Association of Sanitation Agencies v. State Water Resources Control Board* (2012) 208 Cal.App.4th 1438), we find it appropriate for the dischargers to request time schedule orders rather than be granted an extension within the provisions of the Los Angeles MS4 Order.

[111] See Los Angeles MS4 Order, Parts VI.C.4.d., p. 57, VI.C.6, p. 65, Table 9, p.54; see also id., Part VI.A.5., p. 42.

[112] *Id.*, Part VI.C.5.b.iv.(5), pp. 63-64.

[113] We note that the Los Angeles Water Board has released guidance on the development of a reasonable assurance analysis. The guidance was released after adoption of the Los Angeles MS4 Order and accordingly is not *(Continued)*

Third, the adaptive management provisions of the Order ensure that the Permittees will evaluate monitoring data and other new information every two years and consider progress up to that point on achieving WQBELs and other TMDL-specific limitations. Permittees are required as part of the adaptive management process to propose modifications to improve the effectiveness of the WMP/EWMP and implement those modifications.[114]

While we are supportive of all of these measures, we find that they should be strengthened. As a preliminary matter, we will require the Permittees to submit specific information, concurrently with the two-year adaptive management process, that will assist the Los Angeles Water Board in determining how effective the WMP/EWMP path is in spurring the completion of on-the-ground structural control measures that lead to measurable water quality improvement. As we discuss further in Section II.B.8 of this Order, we will direct the Los Angeles Water Board to report to the State Water Board periodically on the effectiveness of the WMP/EWMP approach and expect the additional information submitted by the Permittees to inform that report.

More significantly, we will add a provision that requires Permittees to comprehensively update the reasonable assurance analysis and the WMP/EWMP, following an opportunity to implement the adaptive management process. Given the limitations inherent in models, as well as the potential incentive to choose the lowest effort and cost level predicted by the model to achieve receiving water limitations,[115] we are concerned that reliance on one initial reasonable assurance analysis is insufficient to ensure that in the long term WMPs/EWMPs will

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part of the Administrative Record. We nevertheless take this opportunity to state that we expect any revisions and updates to the guidance to be subject to a public process as part of reissuance of the Los Angeles MS4 Order.

[114] Los Angeles MS4 Order, Part VI.C.8., pp. 66-67. We add that the adaptive management process will also allow Permittees to revise their WMPs/EWMPs to take advantage of funding opportunities as they arise in the future, including funding opportunities through Assembly Bill 2403 (approved by Governor, June 28, 2014 (2013-2014 Reg. Sess.)) and Proposition 1 (approved by ballot Nov. 4, 2014). We are cognizant of criticism that the adaptive management process is just another version of the ineffective iterative process of the receiving water limitations. These arguments are misplaced. Unlike the iterative process of the receiving water limitations, the adaptive management process is only one component of a series of actions required under the WMP/EWMP and acts as a periodic check to ensure that all the other requirements are achieving the stated goals of the WMP/EWMP within clearly stated deadlines. As our discussion above makes clear, we would not endorse an alternative compliance path with the sole requirement to adaptively manage implemented control measures. Further, the adaptive management process in the Los Angeles MS4 Order differs from the iterative process in that Permittees must carry out the adaptive management process every two years, limiting any discretionary determination as to when the program must be evaluated. (Los Angeles MS4 Order, Part VI.C.8.a.)

[115] The numerical analysis methods and models approved for use by Permittees for estimating hydrologic conditions and contaminant fate and transport in the watersheds should, in principle, be able to propagate any and all known uncertainty to the outputs and results. It is in the public interest that the Los Angeles Water Board communicate this uncertainty to all stakeholders, as the results in most cases will affect the beneficial uses of California waters. Moreover, it is highly desirable that, to the extent possible, the Los Angeles Water Board define a minimum level of uncertainty (or level of confidence) acceptable for a reasonable assurance analysis to be approved.

achieve relevant water quality goals. . Currently, as stated above, the Permittees are required to implement the adaptive management process every two years from the date of program approval. Under the provision we add, the Permittees will be required to comprehensively update the reasonable assurance analysis (including potentially considering whether the model itself and its assumptions require updating) and the WMP/EWMP after several years of adaptive management, based on previous years' monitoring data and other performance measures. The Permittee will submit a full revised package to the Los Angeles Water Board Executive Officer for approval, following public review.

Given that the WMPs/EWMPs in many cases address water quality targets that are to be achieved a decade or more in the future, a periodic, complete re-consideration and recalibration of the assumptions and predictions that support the proposed control measures and implementation schedule in light of new data, above and beyond the two-year adaptive management requirements of the Los Angeles MS4 Order, is essential, notwithstanding the additional time and effort that Permittees must expend on the update. We also recognize that such review is a staff intensive process for the Los Angeles Water Board, but addressing storm water impacts is a priority for that Board. Although we expect that the update will be necessary in most cases, the new requirements provide that the Executive Officer of the Los Angeles Water Board may waive the requirement for an update if the Permittee demonstrates through water quality monitoring that the WMP/EWMP is meeting appropriate targets. Our direction to require a comprehensive update of the reasonable assurance analyses and the WMPs/EWMPs after several cycles of adaptive management should in no way be construed as limiting the Los Angeles Water Board Executive Officer's discretion to request such updates earlier in the implementation process or the obligation of the Permittees to initiate such updates earlier in the implementation process based on the ongoing adaptive management process.

The second added provision will not be relevant for the permit term of the order before us; however, we anticipate that the next iteration of an MS4 Order for the Los Angeles area will closely track the Los Angeles MS4 Order to allow for continued implementation of the WMP/EWMPs.

We shall amend Part VI.C.8 by adding new subsections a.iv. and b. as follows:

a.

iv. Permittees shall report the following information to the Regional Water Board concurrently with the reporting for the adaptive management process:

(1) On-the-ground structural control measures completed;

(2) Non-structural control measures completed;

(3) Monitoring data that evaluates the effectiveness of implemented control measures in improving water quality;

(4) Comparison of the effectiveness of the control measures to the results projected by the RAA;

(5) Comparison of control measures completed to date with control measures projected to be completed to date pursuant to the Watershed Management Program or EWMP;

(6) Control measures proposed to be completed in the next two years pursuant to the Watershed Management Program or EWMP and the schedule for completion of those control measures;

(7) Status of funding and implementation for control measures proposed to be completed in the next two years.

b. Watershed Management Program Resubmittal Process

i. In addition to adapting the Watershed Management Program or EWMP every two years as described in Part VI.C.8.a., Permittees must submit an updated Watershed Management Program or EWMP with an updated Reasonable Assurance Analysis by June 30, 2021, or sooner as directed by the Regional Water Board Executive Officer or as deemed necessary by Permittees through the Adaptive Management Process, for review and approval by the Regional Water Board Executive Officer. The updated Reasonable Assurance Analysis must incorporate both water quality data and control measure performance data, and any other information informing the two-year adaptive management process, gathered through December 31, 2020. As appropriate, the Permittees must consider any new numeric analyses or other methods developed for the reasonable assurance analysis. The updated Watershed Management Program or EWMP must comply with all provisions in Part VI.C. The Regional Water Board Executive Officer will allow a 60-day public review and comment period with an option to request a hearing. The Regional Water Board Executive Officer must approve or disapprove the updated Watershed Management Program or EWMP by June 30, 2022. The Executive Officer may waive the requirement of this provision, following a 60-day public review and comment period, if a Permittee demonstrates through water quality monitoring data that the approved Watershed Management Program or EWMP is meeting appropriate water quality targets in accordance with established deadlines.

5. Determination of Compliance with Final Requirements

a. Compliance with Final TMDL Requirements[116]

Part VI.E.2.e.i.4. of the Los Angeles MS4 Order provides that Permittees will be deemed in compliance with the final WQBELs and other TMDL-specific limitations if "[i]n drainage areas where Permittees are implementing an EWMP, (i) all non-storm water and (ii) all storm water runoff up to and including the volume equivalent to the 85th percentile, 24 hour event is retained for the drainage area tributary to the applicable receiving water."[117] Part VI.E.2.e.i.4 is one of four options available to the Permittee in Part VI.E.2.e. to be deemed in compliance with WQBELs and other TMDL-specific limitations. The other three options allow a Permittee to establish compliance with a final WQBEL or other TMDL-specific limitation by showing that (1) there are no violations of the final WQBEL; (2) there are no exceedances of the receiving water limitation for the specific pollutant in the receiving water at or downstream of the Permittee's outfall, or (3) there is no direct or indirect discharge from the Permittee's MS4 to the receiving water during any relevant time period.[118] These three options ensure that either the receiving water limitations or WQBELs and other TMDL-specific limitations are in fact being complied with. In contrast, the storm water retention approach assumes compliance with *final* WQBELs and other TMDL-specific limitations, and accordingly, compliance with the receiving water limitations in Part V for the relevant water body-pollutant combinations,[119] even if the final WQBELs and other TMDL-specific limitations are not actually being achieved. The Environmental Petitioners argue that the Los Angeles Water Board has failed to establish through findings and record evidence that the storm water retention approach will in fact achieve compliance with the WQBELs and other TMDL-specific limitations and that the Los Angeles

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[116] The Los Angeles MS4 Order additionally deems compliance with *interim* WQBELs and other TMDL-specific limitations if the "Permittee has submitted and is fully implementing an approved" WMP/EWMP. (Los Angeles MS4 Order, Part VI.E.2.d.i.(4), p. 143; see also *id.*, Part VI.C.3.a., p. 53.) Because Permittees are required to incorporate into the WMP/EWMP compliance schedules "compliance deadlines occurring within the permit term for all applicable interim . . . water quality-based effluent limitations and/or receiving water limitations in Part VI.E and Attachments L through R," we expect that in most cases full implementation of the WMP/EWMP necessarily results in compliance with interim WQBELs and other TMDL-specific limitations. However, to the extent this is not the result reached, we find that requiring implementation of the WMP/EWMP with control measures designed to achieve interim WQBELs and other TMDL-specific limitations, in lieu of showing actual compliance with any *interim* numeric requirements, is consistent with the assumptions and requirements of the wasteload allocations of the relevant TMDLs. (40 C.F.R. § 122.44(d)(1)(vii)(B).)

[117] Los Angeles MS4 Order, Part VI.E.2.e.i.(4), p. 145.

[118] *Id.*, Part VI.E.2.e.i.(1)-(3), pp. 144-45.

[119] We note again that Part VI.E.2.c.i. states that Part VI.E establishes the manner of achieving compliance with the receiving water limitations in Part V.A where the receiving water limitations are associated with water body-pollutant combinations addressed in a TMDL.

MS4 Order's reliance on the storm water retention approach for final compliance determination is therefore contrary to the law.

We are supportive of the EWMP's use of the storm water retention approach as a technical requirement. Retention of storm water is likely to be an effective path to water quality improvement. Furthermore, in addition to preventing pollutants from reaching the receiving water except as a result of high precipitation events (which also generally result in significant dilution in the receiving water), the storm water retention approach has additional benefits including recharge of groundwater, increased water supply, reduced hydromodification effects, and creation of more green space to support recreation and habitat.[120]

We have some concerns, however, with the lack of verification in the Los Angeles MS4 Order that final WQBELs and other TMDL-specific limitations or receiving water limitations will in fact be met as a result of implementation of the storm water retention approach. We acknowledge that, in most cases, the final TMDLs have deadlines outside of the permit term for the Los Angeles MS4 Order and that, therefore, with regard to those, our concerns are more theoretical at this point than immediate. Nevertheless, we agree with the Environmental Petitioners that the evidence in the Administrative Record is not sufficient to establish that the storm water retention approach will in all cases result in achievement of final WQBELs and other TMDL-specific limitations and, more importantly, are concerned that the Order itself does not incorporate clear requirements that would provide for such verification in the process of implementation.

With regard to evidence in the Administrative Record, it is clear that the storm water retention approach is a promising approach for achieving compliance with receiving water limitations, with multiple additional environmental benefits. But the research regarding the storm water retention approach is still in early stages and we cannot say with certainty at this point that implementation will lead to compliance with receiving water limitations in all cases.[121]

With that conclusion in mind, we look to the Los Angeles MS4 Order itself to determine if there are sufficient additional provisions to assure that, in the long run, the storm water retention approach will achieve the ultimate goal of compliance with receiving water limitations. We first note that the Order does not require a reasonable assurance analysis when

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[120] See e.g. Administrative Record, section 10.VI.C, RB-AR29263-29311, RB-AR32318-32350.

[121] We reviewed the citations to the Administrative Record provided in the Los Angeles Water Board October 15, 2013 Response and in the October 15, 2013 Responses of many of the Petitioners. We find that the cited studies show the storm water retention to be a promising approach to meeting water quality standards, but do not establish, at a sufficiently high level of confidence, that the storm water retention approach will definitively achieve compliance with the receiving water limitations.

a Permittee opts for the storm water retention approach. Permittees are required to conduct a reasonable assurance analysis for each water body-pollutant combination addressed by a WMP, with the objective of demonstrating the ability of the controls to ensure that MS4 discharges achieve applicable WQBELs and do not cause or contribute to exceedances of receiving water limitations.[122] The relevant provisions reference EWMPs, but elsewhere the Order states that the reasonable assurance analysis is only required for areas covered by the EWMP where retention of the 85th percentile, 24-hour storm event is not feasible.[123] The Fact Sheet also implies that the requirement for a reasonable assurance analysis is confined to situations where the storm water retention approach is not feasible.[124] In sum, then, Permittees that choose to develop and implement an EWMP are required to conduct a reasonable assurance analysis for each waterbody-pollutant combination addressed by the EWMP, except in the drainage areas that are tributary to the storm water retention projects.

The fact that the storm water retention approach does not require a reasonable assurance analysis prior to implementation to demonstrate the ability of the approach to achieve compliance with the limitations is mitigated in part by required monitoring and adaptive management to verify compliance following implementation. Although the provision could be clearer, we read the language "[i]n drainage areas where Permittees are implementing an EWMP" in Part VI.E.2.e.i.(4) to require Permittees to be in compliance with all aspects of the EWMP, including the monitoring and adaptive management provisions of Parts VI.C.7 and 8, to be deemed in compliance with final limitations through the storm water retention approach. As we read the Order, a Permittee's showing that it has retained all non-storm water and all storm water up to and including the volume equivalent to the 85th percentile, 24-hour event, establishes compliance, but only if the Permittee continues to conduct monitoring and adapt the EWMP in response to the monitoring. The Los Angeles Water Board appears to read the Order the way we do, as it states in its October 15, 2013 Response that "the Permit requires monitoring and adaptive management, which will continue to inform the Los Angeles Water Board regarding the efficacy of this storm water retention approach in conjunction with implementation of the other storm water management program elements and any needed

[122] Los Angeles MS4 Order, Part VI.C.5.b.iv.(5), pp. 63-64.

[123] *Id.*, Part VI.C.1.g., p. 48.

[124] *Id.*, Att. F, Fact Sheet, p. F-39.

modifications to the approach."[125] The Los Angeles Water Board further states in comments submitted on a draft of this order, as follows:

> The Los Angeles MS4 Order does not exclude EWMPs or areas within an EWMP where the stormwater retention standard is achieved from the integrated watershed monitoring, assessment and adaptive management processes. Neither does the Los Angeles MS4 Order specify or contemplate an end to the monitoring, assessment and adaptive management processes in the case of a Watershed Management Program (WMP) or EWMP. These required elements, including receiving water and outfall monitoring, evaluation of these monitoring data, and modification of the EWMP to improve its effectiveness, will be continually conducted throughout the Watershed Management Area addressed by the EWMP. . . . The Los Angeles Water Board understood that these regional multi-benefit projects would take time to implement and that Permittees needed to be afforded this time in the Los Angeles MS4 Order. The Los Angeles Water Board will continually evaluate progress during the implementation period. If, as full implementation nears, some Receiving Water Limitations are still not achieved, the Los Angeles Water Board and State Water Board have a variety of tools that can be used at a regional or statewide level including reconsideration of TMDLs, Basin Planning actions, policy development and permitting, among others.[126]

We will make a revision to Part VI.E.2.e.i. to make it clear that the Permittee must be in compliance with all other requirements of the EWMP in addition to implementation of the storm water retention approach in order to be deemed in compliance with the final WQBELs and other TMDL-specific limitations.

With no definitive evidence in the record establishing that the storm water retention approach will achieve final requirements, no reasonable assurance analysis required at the outset, and reliance only on subsequent monitoring and adaptive management to improve results if final limitations are not in fact achieved, the storm water retention approach does not provide a level of assurance of success that would lead us to conclude that its implementation, with nothing else, is sufficient to constitute compliance with final WQBELs and other TMDL-specific limitations. We understand that there are nevertheless very good reasons to encourage its use. Certainly for all non-storm water and for all storm water generated in storms up to the 85th percentile storm, the storm water retention approach achieves compliance because there is no discharge. And there are significant benefits beyond water quality, including most importantly benefits to water supply. We also believe that public projects requiring investment of this magnitude are unlikely to be carried out without a commitment from the water boards that Permittees will be considered in compliance even if the resulting improvement in water quality

[125] Los Angeles Water Board, October 15, 2013 Response, p. 62.

[126] Los Angeles Water Board, Comment Letter, January 21, 2015, pp. 2-3.

does not rise all the way to complete achievement of the final WQBELs and other TMDL-specific limitations.

We are not willing to go as far as saying that compliance with the storm water retention approach alone constitutes compliance with final WQBELs and other TMDL-specific limitations for all time, regardless of the actual results.[127] Nonetheless, we anticipate that implementation of such projects will bring the drainage area most and, in many cases, all of the way to achievement of water quality standards. Where there is still a gap in required water quality improvement, we expect the Executive Officer of the Los Angeles Water Board to require appropriate actions, consistent with the provisions of the Los Angeles MS4 Order and the Los Angeles Water Board's stated interpretation of those provisions,[128] to close that gap with additional control measures in order for the Permittee to be considered in compliance with the WQBEL or other TMDL-specific limitation. There are various mechanisms to provide assurances that additional control measures will be implemented to achieve the WQBEL or other TMDL-specific limitation, and in some instances, it may be appropriate for the Los Angeles Water Board to issue a time schedule order governing the implementation of further control measures. Further, as acknowledged by the Los Angeles Water Board in its comments, in some circumstances, reconsideration of the underlying TMDLs and the final deadlines within those TMDLs may instead be warranted.[129] We additionally recognize that municipal storm water management is an area of continued development and, with continued research and data evaluation, water quality standards may evolve and become more nuanced or sophisticated over time.

While we decline to interpret the storm water retention approach to, in and of itself, constitute compliance with final WQBELs and other TMDL-specific limitations, we emphasize here that any additional control measures to reach compliance that may be required by the Los Angeles Water Board must not require changes to installed storm water retention projects. Any revisions should be prospective in nature and should not disturb projects that Permittees have already installed in good faith to comply with the provisions of their EWMP.

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[127] Further, Permittees still have substantial incentive to develop and implement an EWMP. If a permittee pursues an EWMP, it will be deemed in compliance with the receiving water limitations during the EWMP development phase, and it may also recognize significant non-water quality benefits.

[128] Los Angeles Water Board, Comment Letter, January 21, 2015, pp. 2-3. As explained in footnote 110, at this time we see limited options available to the Los Angeles Water Board in addressing compliance with final deadlines for WQBELs and other TMDL-specific limitations.

[129] We also acknowledge the need for and commit to supporting state-wide solutions for source reduction as appropriate, similar to the brake pad legislation adopted to address copper discharges. (Senate Bill 346 (approved by the Governor September 27, 2010).)

Ultimately, we must set out to verify through appropriate monitoring that final WQBELs and other TMDL-specific limitations can be achieved through the storm water retention approach, or be willing to revise that approach. However, new or additional measures required at that point should be additive to the storm water retention approach measures already installed.

In sum, despite the uncertainty inherent in allowing the storm water retention approach, we concur in its use in the Los Angeles MS4 Order, with the clarification that ultimate compliance is subject to continued planning, monitoring and adaptive management. We shall amend Part VI.E.2.e.i. as follows:

> i. A Permittee shall be deemed in compliance with an applicable final water quality-based effluent limitation and final receiving water limitation for the pollutant(s) associated with a specific TMDL if any of the following is demonstrated:
>
> . . .
>
> (4) In drainage areas where Permittees are implementing an EWMP, (i) all non-storm water and (ii) all storm water runoff up to and including the volume equivalent to the 85th percentile, 24 hour event is retained for the drainage area tributary to the applicable receiving water**, and the Permittee is implementing all requirements of the EWMP, including, but not limited to, Parts VI.C.7 and VI.C.8 of this Order**. This provision (4) shall not apply to final trash WQBELs.

b. Compliance with Final Receiving Water Limitations

The Los Angeles MS4 Order states that for receiving water limitations associated with water-body pollutant combinations addressed in a TMDL, compliance with the TMDL requirements of the Order in Part VI.E and Attachments L through R constitutes compliance with the receiving water limitations in Part V.A.[130] In other words, if there is an exceedance for a pollutant in a water body that has a TMDL addressing that pollutant, as long as the Permittee is complying with the requirements for the TMDL, the Permittee is deemed in compliance with the receiving water limitation. No petitioner has contested this provision and we find that it constitutes an appropriate approach to compliance with receiving water limitations for water body-pollutant combinations that are addressed by a TMDL.

For exceedances of receiving water limitations for a water body-pollutant combination not addressed by a TMDL, as previously discussed, the Permittee must either incorporate control measures to address the exceedances into the Permittee's WMP/EWMP or comply directly with the receiving water limitations provisions of Part V.A of the Order. For

[130] Los Angeles MS4 Order, Part VI.E.2.c.ii., p. 143.

Permittees that choose the WMP/EWMP approach, the WMP/EWMP must incorporate "a final date for achieving the receiving water limitation."[131] To the extent the Permittee does not achieve the limitation by that final date and does not request and receive an extension, the Permittee has "fail[ed] to meet [a] requirement or date for its achievement in an approved Watershed Management Program or EWMP"[132] and is immediately subject to the receiving water limitations provisions of the Order, with the same result that it is out of compliance. In other words, implementation of non-structural and structural control measures in accordance with the timelines established in the WMP/EWMP constitutes compliance with the receiving water limitations up until the final deadline for achievement of the relevant receiving water limitation; however, at the deadline for final compliance, there must be verification of achievement based on the receiving water limitation itself. While we find that the Order provisions lead to this result as written, for the sake of greater clarity, we will specifically state that final compliance with receiving water limitations must be determined through verification that the receiving water limitation is actually being achieved.

We shall amend Part VI.C.2.c. as follows:

c. If a Permittee fails to meet any requirement or date for its achievement in an approved Watershed Management Program or EWMP, the Permittee shall be subject to the provisions of Part V.A. for the waterbody-pollutant combination(s) that were to be addressed by the requirement. **For water body-pollutant combinations that are not addressed by a TMDL, final compliance with receiving water limitations is determined by verification through monitoring that the receiving water limitation provisions in Part V.A.1 and 2 have been achieved.**

c. Compliance with the Non-Storm Water Discharge Prohibition

The Environmental Petitioners suggest that the Los Angeles MS4 Order is unclear as to whether compliance with the WMP/EWMP may also constitute compliance with the non-storm water discharge prohibition of the Order. We disagree that the Los Angeles MS4 Order is unclear on this issue. The Permittees' obligation to comply with the receiving water limitations and WQBELs and other TMDL-specific limitations in Parts V.A and VI.E is independent of the Permittees' obligation to comply with the effective prohibition of non-storm water discharges in Part III.A. The several provisions stating that Permittees will be deemed to be in compliance with the receiving water limitations of the Los Angeles MS4 Order for implementing the WMP/EWMP specifically reference Parts V.A and VI.E of the Order and not

[131] *Id.*, Part VI.C.5.c.iii.(3)(b), p. 65.

[132] *Id.*, Part VI.C.2.c., p. 52.

III.A.[133] This notwithstanding, Parts VI.C.1.d and VI.C.5.b.iv.(2) require that a Permittee's WMP/EWMP include program elements and control measures to effectively prohibit non-storm water discharges consistent with Part III.A and Part VI.D.4.d or VI.D.10. Therefore, a Permittee's implementation of program elements and control measures consistent with Part III.A and Part VI.D.4.d or VI.D.10, through its approved WMP/EWMP, may provide a mechanism for compliance with Part III.A. Although we accordingly see no need to direct revisions to the Order, we provide this clarification here to respond to the Environmental Petitioners' concern and address any confusion that may exist.

6. "Safe Harbor" During the Planning Phase for the WMP/EWMP

Under the Los Angeles MS4 Order, a Permittee that has declared its intention to develop a WMP/EWMP is deemed in compliance with the receiving water limitations and with interim WQBELs with due dates prior to approval of the WMP/EWMP for the water body-pollutant combinations the WMP/EWMP addresses, provided it meets certain conditions, even though the Permittee is developing, not implementing the WMP/EWMP. Specifically, the Permittee is deemed in compliance if the Permittee (1) provides timely notice of its intent to develop a WMP/EWMP; (2) meets all interim and final deadlines for development of a WMP/EWMP; (3) targets implementation of watershed control measures in the existing program

[133] Los Angeles MS4 Order, Parts VI.C.2.b., p. 52, VI.C.3.a., p. 53, VI.E.2.c.ii., p. 143, VI.C. 2.d., pp. 52-53, VI.E.2.d.i.(4)(d), p. 144. To the extent that a non-storm water discharge authorized by Part III.A may be causing or contributing to an exceedance of receiving water limitations in V.A, compliance with the WMP/EWMP provisions would constitute compliance with the receiving water limitations and any relevant interim WQBELs and other TMDL-specific limitations, as long as the WMP/EWMP addresses the water body-pollutant combination for that water body. However, the discharger would have to additionally comply with requirements in Part III.A. and Part VI.D.4.d or VI.D.10 through its approved WMP/EWMP for conditionally exempt non-storm water discharges that are found to cause or contribute to an exceedance in the receiving water. (See *id.*, Part III.A.4.c.-e., pp. 31-32.) We disagree that every discharge from a Permittee's MS4 to the receiving water of non-storm water that is not specifically authorized under Part III.A will necessarily be subject to enforcement under the Los Angeles MS4 Order. Section 402(p)(3)(B)(ii) of the Clean Water Act imposes a requirement to "effectively prohibit" non-storm water discharges. Part III.A of the Los Angeles MS4 Order effectuates that requirement with a requirement for the Permittee to prohibit non-storm water discharges: "Each Permittee shall, for the portion of the MS4 for which it is an owner or operator, prohibit non-storm water discharges through the MS4 to receiving waters, except where such discharges are . . . [listing exceptions]." (Los Angeles MS4 Order, Part III.A.1, p. 27.) The Los Angeles MS4 Order incorporates a specific and detailed programmatic requirement – the Illicit Connections and Illicit Discharges Elimination Program – for the Permittees to achieve their obligation to effectively prohibit non-storm water discharges. (Los Angeles MS4 Order, Parts VI.D.4.d., pp. 81-86, VI.D.10, pp. 137-141.) We recognize that even the most comprehensive efforts to address unauthorized non-storm water discharges may not eliminate all such discharges. Where a Permittee is fully implementing its Illicit Connections and Illicit Discharges Elimination Program, either pursuant to Parts VI.D.4.d. or VI.D.10, or by incorporation of customized actions into a WMP/EWMP as approved by the Los Angeles Water Board (see Los Angeles MS4 Order Part VI.D.1.a., p. 67), we would expect any enforcement action under Part III.A to be supported by a fact-specific analysis of the nature and source of the unauthorized non-storm water discharge and the efforts of the Permittee to prohibit the discharge.

to address known contributions of pollutants; and (4) receives approval of the WMP/EWMP within the specified time periods.[134]

The Environmental Petitioners object to the availability of a "safe harbor" during the planning phase. We disagree with the Environmental Petitioners that providing a "safe harbor" in the planning phase is disallowed by applicable law -- see our discussion of anti-backsliding requirements in section II.B.1. and antidegradation requirements in section II.B.2. However, we understand that deeming a discharger in compliance with receiving water limitations during the planning phase, not just the implementation phase, could weaken the incentive for Permittees to efficiently and timely seek approval of a WMP/EWMP and to move on to implementation. It is the implementation of the WMP/EWMP that will in fact lead to progress toward compliance with receiving water limitations; the planning phase is essential, but should be only as long as necessary for a well-planned program with carefully analyzed controls to be developed. Given the significance of the water quality issues addressed by the WMP/EWMPs, it is paramount that implementation begin as soon as feasible. Accordingly, the "safe harbor" in the planning phase is appropriate only if it is clearly constrained in a manner that sustains incentives to move on to approval and implementation and is structured with clear, enforceable provisions.

Having reviewed the planning sections of the WMP/EWMP provisions carefully, we find that the Los Angeles MS4 Order does sufficiently constrain the planning phase, so that the "safe harbor" provided is not unreasonable. As already stated, compliance is deemed only if the Permittee is meeting the relevant deadlines for development and approval of the WMP/EWMP.[135] There are no provisions in the Order that allow for extensions to these deadlines. If a Permittee fails to obtain approval within the allowed number of months for the development of a WMP/EWMP, the Order states that the Permittee must then instead demonstrate actual compliance with receiving water limitations and with applicable interim WQBELs.[136] The Los Angeles MS4 Order is also clear that achievement of any TMDL-associated final deadlines occurring prior to the approval deadlines for the WMP/EWMP cannot be excused through commitment to planning for a WMP/EWMP.[137]

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[134] *Id.*, Parts VI.C.2.d., p. 52, VI.C.3.b., p. 53, VI.E.2.d.i.(4)(d), p. 144.

[135] *Id.*, Parts VI.C.2.d., p. 52, VI.C.3.b., p. 53, VI.E.2.d.i.(4)(d), p. 144.

[136] *Id.*, Part VI.C.4.e., p. 58.

[137] *Id.*, Parts VI.C.3.c., p. 53, VI.C.4.d.iii, p. 58. Under Part VI.C.4.d.iii., Permittees must ensure that MS4 discharges achieve compliance with interim, in addition to final, trash WQBELs during the planning phase.

Further, Permittees are subject to a number of conditions during the planning phase that will ensure that progress toward achievement of receiving water limitations is not put on hold pending approval of the plan. These include requirements to put in place Low Impact Development (LID) ordinances and green streets policies[138] and to continue to implement watershed control measures in the existing storm water management programs, including those to eliminate non-storm water discharges,[139] but in a manner that is targeted to address known pollutants.[140]

Given the clear, enforceable requirements limiting the planning phase of the WMP/EWMP provisions, we find that the Los Angeles MS4 Order's inclusion of provisions deeming compliance with the receiving water limitations and with interim WQBELs during development of the programs is reasonable.

In fact, we are concerned that the Los Angeles Water Board has left no room for any deviation from the prescribed development schedule for WMP/EWMPs. A Permittee working in good faith to develop a WMP/EWMP over multiple months may encounter an issue that requires it to ask for a short extension on an interim or final deadline. Under such circumstances, the Los Angeles Water Board should be able to consider the request for the extension, rather than have its hands tied and have to reject a WMP/EWMP based on lack of timeliness. We will add a provision to the Order that provides the Los Angeles Water Board or its Executive Officer discretion in granting such extensions, but the Permittee will not be deemed in compliance with the applicable receiving water limitations and WQBELs during the period of the extension.

We shall add a new Part VI.C.4.g. as follows:

> **g. Permittees may request an extension of the deadlines for notification of intent to develop a Watershed Management Program or EWMP, submission of a draft plan, and submission of a final plan. The extension is subject to approval by the Regional Water Board or the Executive Officer. Permittees that are granted an extension for any deadlines for development of the WMP/EWMP shall be subject to the baseline requirements in Part VI.D and shall demonstrate compliance with receiving water limitations pursuant to Part V.A. and with applicable interim water quality-based effluent limitations in Part VI.E pursuant to subparts VI.E.2.d.i.(1)-(3) until the Permittee has an approved WMP/EWMP in place.**

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[138] *Id.*, Part VI.C.4.c., pp. 56-57.

[139] *Id.*, Part VI.C.4.d.i.-ii., pp. 57-58.

[140] *Id.*, Parts VI.C.2.d.iii., pp. 52-53, VI.C.3.b.iii., p. 53, VI.E.2.d.i.(4)(d)(3), p. 144.

7. Conclusion

In conclusion, we uphold the WMP/EWMP provisions as a reasonable alternative compliance option for meeting receiving water limitations and uphold the WMP/EWMP provisions in all other aspects, except as specifically stated above. We find that the WMP/EWMP approach is a clearly defined, implementable, and enforceable alternative to the receiving water limitations provisions that we mandated in Order WQ 99-05, and that the alternative provides Permittees an ambitious, yet achievable, path forward for steady and efficient progress toward achievement of those limitations while remaining in compliance with the terms of the permit.

We direct all regional water boards to consider the WMP/EWMP approach to receiving water limitations compliance when issuing Phase I MS4 permits going forward.[141] In doing so, we acknowledge that regional differences may dictate a variation on the WMP/EWMP approach, but believe that such variations must nevertheless be guided by a few principles.[142] We expect the regional water boards to follow these principles unless a regional water board makes a specific showing that application of a given principle is not appropriate for region-specific or permit-specific reasons.

1. The receiving water limitations provisions of Phase I MS4 permits should continue to require compliance with water quality standards in the receiving water and should not deem good faith engagement in the iterative process to constitute such compliance. The Phase I MS4 permits should therefore continue to use the receiving water limitations provisions as directed by State Water Board Order WQ 99-05.

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[141] We acknowledge that small MS4s permitted under the statewide General Permit for WDRs for Storm Water Discharges from Small MS4s (Order No. 2013-0001-DWQ) (General Phase II MS4 Permit) have similar practical issues as Phase I permittees in complying with receiving water limitations. Nevertheless, because the General Phase II MS4 Permit is issued by the State Water Board, not the regional water boards, we limit our guidance to regional water boards to the Phase I permits. The State Water Board is committed to working with small MS4s, the regional water boards, and interested persons in developing an alternative compliance option for the General Phase II MS4 Permit.

[142] In considering appropriate guidance for regional water boards drafting alternative compliance paths in municipal storm water permits, we have reviewed the proposed “strategic compliance program” model language that was submitted by the California Stormwater Quality Association (CASQA) and supported in whole or in part by a number of interested persons. (CASQA August 15, 2013 Receiving Water Limitations Submission, Attachment A, Section E.) While we have not in these proceedings adopted the CASQA language, or, for that matter, any specific language, for alternative compliance path provisions, regional water boards remain free to consider and incorporate the CASQA approach into their municipal storm water permits to the extent they determine and document that the approach, including any modifications, satisfies the principles we set out in this section as well as all other direction we have provided in this order.

2. The Phase I MS4 permits should include a provision stating that, for water body-pollutant combinations with a TMDL, full compliance with the requirements of the TMDL constitutes compliance with the receiving water limitations for that water body-pollutant combination.
3. The Phase I MS4 permits should incorporate an ambitious, rigorous, and transparent alternative compliance path that allows permittees appropriate time to come into compliance with receiving water limitations without being in violation of the receiving water limitations during full implementation of the compliance alternative.
4. The alternative compliance path should encourage watershed-based approaches, address multiple contaminants, and incorporate TMDL requirements.
5. The alternative compliance path should encourage the use of green infrastructure and the adoption of low impact development principles.
6. The alternative compliance path should encourage multi-benefit regional projects that capture, infiltrate, and reuse storm water and support a local sustainable water supply.
7. The alternative compliance path should have rigor and accountability. Permittees should be required, through a transparent process, to show that they have analyzed the water quality issues in the watershed, prioritized those issues, and proposed appropriate solutions. Permittees should be further required, again through a transparent process, to monitor the results and return to their analysis to verify assumptions and update the solutions. Permittees should be required to conduct this type of adaptive management on their own initiative without waiting for direction from the regional water board.

8. Direction to the Los Angeles Water Board to Report to the State Water Board on Implementation

We recognize that our review has been limited to the provisions of the Los Angeles MS4 Order. The success of the WMP/EWMP approach depends in large part on the steps that follow adoption of these provisions, i.e., the effort invested by Permittees in developing WMPs/EWMPs that truly address the stringent provisions of the Order, the precision with which the Los Angeles Water Board reviews the draft programs and requires revisions, and, most importantly, the actual implementation and appropriate enforcement of the programs once approved. The work going forward must ensure that the WMPs/EWMPs in fact exhibit the rigor and accountability the provisions of the Los Angeles MS4 Order demand. We expect that the Los Angeles Water Board will make careful oversight and enforcement a priority and that they will be aided in this process by the public review and comment opportunities built into the terms of the Order.

The process of developing the WMPs/EWMPs is currently ongoing -- the Los Angeles Water Board has been reviewing draft and revised draft WMPs and workplans for EWMPs – and, although we have been asked by the Environmental Petitioners to take official notice of some of the submissions and conditional approvals in the process, it is premature for the State Water Board to speak to the sufficiency of the resulting WMPs/EWMPs until the Los Angeles Water Board, with full input from the stakeholders, has had the opportunity to consider, revise, and finally approve the programs. We note again that all documents submitted to the Los Angeles Water Board Executive Officer for approval are subject to a 30-day public comment period[143] and that any formal determination or approval by the Executive Officer may be reviewed by the Los Angeles Water Board upon request by an interested person.[144] And an interested person may petition the State Water Board to review an action or failure to act of the Los Angeles Water Board.[145]

Once the WMPs/EWMPs are approved, ensuring that they are diligently and timely implemented must remain a top priority for the Los Angeles Water Board. We expect that the Los Angeles Water Board will continue to work cooperatively and closely with the Permittees, the Environmental Petitioners, and other interested persons in this process, but that the Board will also use its enforcement authority to ensure that appropriate progress is made toward water quality goals. We intend to remain involved in this process, as we must learn statewide from the successes and shortcomings of the approach we are endorsing with this order. We accordingly direct the Los Angeles Water Board to report to us on progress in implementation of the WMPs/EWMPs, and progress in improving water quality during this and the next permit term by February 28, 2018, by February 29, 2020, and by March 31, 2022. Specifically, we ask that the Los Angeles Water Board report on region-wide data for the following:

- On-the-ground structural control measures completed;
- Non-structural control measures completed;
- Monitoring data that evaluates the effectiveness of implemented control measures in improving water quality;

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[143] Los Angeles MS4 Order, Part V.A.5.b, p. 42.

[144] *Id*., Part V.A.6, p. 42.

[145] Wat. Code, § 13320. On April 28, 2015, the Executive Officer of the Los Angeles Water Board conditionally approved several submitted WMPs. On May 28, 2015, the Environmental Petitioners filed a petition challenging the conditional approvals and requesting review by the Los Angeles Water Board and by the State Water Board of the Executive Officer's determination.

- Comparison of the effectiveness of the control measures to the results projected by the reasonable assurance analyses;
- Comparison of control measures completed to date with control measures projected to be completed to date pursuant to the WMPs/EWMPs;
- Control measures proposed to be completed in the next two years pursuant to the WMPs/EWMPs and the schedule for completion of those control measures;
- Status of funding and implementation for control measures proposed to be completed in the next two years;
- Trends in receiving water quality related to pollutants typically associated with storm water;
- Available permit compliance data, including requests for compliance extensions;
- Enforcement actions taken and results.

In addition to covering the above information, the third report shall summarize and reflect the comprehensive information gathered through the updates of the reasonable assurance analyses and WMPs/EWMPs conducted by the Permittees in the second permit term.

C. Appropriateness of TMDL Requirements

Section 303(d) of the Clean Water Act requires the water boards to identify impaired water bodies that do not meet water quality standards after applying required technology-based effluent limitations.[146] TMDLs are developed by either the regional water boards or by USEPA in response to section 303(d) listings of impaired water bodies. A TMDL is defined as the sum of the individual wasteload allocations for point sources of pollution, the load allocations for nonpoint sources of pollution, and the contribution from background sources of pollution,[147] and represents the maximum amount of a pollutant that a water body may receive and still achieve water quality standards. TMDLs developed by regional water boards include implementation provisions[148] and are typically incorporated into the regional water board's water quality control plan.[149] TMDLs developed by USEPA typically contain the total load and load allocations required by section 303(d), but do not set out comprehensive implementation provisions.[150] Most TMDLs are not self-executing, but instead rely upon subsequently-issued permits to impose requirements on discharges that implement the TMDLs' wasteload

[146] 33 U.S.C. § 1313(d).

[147] 40 C.F.R. § 130.2(i).

[148] Wat. Code, §§ 13050, subd. (j), 13242.

[149] See 40 C.F.R. §§ 130.6(c)(1).

[150] *Am. Farm Bureau Fed'n v. U.S. E.P.A.* (M.D. Pa. 2013) 984 F. Supp. 2d 289, 314.

allocations.[151] The Los Angeles MS4 Order includes TMDL-specific requirements that implement 33 TMDLs (twenty-five adopted by the Los Angeles Water Board, seven established by USEPA, and one adopted by the Santa Ana Regional Water Quality Control Board that assigned requirements to two Permittees of the Los Angeles MS4 Order) in Part VI.E and in Attachments L-R.

Petitioners raise a number of challenges to the TMDL-based requirements of the Los Angeles MS4 Order. We take up several of those arguments in this section.[152]

1. Inclusion of Numeric WQBELs

Permittee Petitioners argue that the numeric WQBELs incorporated into the Los Angeles MS4 Order as TMDL-based limitations are contrary to the Clean Water Act and to state law and policy. We disagree.

Under the federal regulations implementing the Clean Water Act, effluent limitations in NPDES permits developed to achieve water quality standards must be consistent with the assumptions and requirements of any available wasteload allocation for the discharge.[153] In addition, the Porter-Cologne Act requires that waste discharge requirements implement any relevant water quality control plans,[154] including TMDL requirements that have been incorporated into the water quality control plans. The Los Angeles MS4 Order incorporates numeric WQBELs and other limitations that the Los Angeles Water Board found are consistent with the TMDL requirements applicable to the Permittees.

Permittee Petitioners argue that there is no requirement under federal law for incorporation of TMDL requirements into an MS4 permit and that the inclusion of the requirements in Part VI.E and in Attachments L-R was therefore at the discretion of the Los Angeles Water Board. They point out, as we acknowledged in section II.A, that MS4 discharges must meet a technology-based standard of prohibiting non-storm water discharges and reducing pollutants in the discharge to the MEP, but that requirements to strictly meet water quality standards are at the discretion of the permitting agency.[155] Because TMDL requirements are a path to achieving water quality standards, the Permittee Petitioners argue, the Los Angeles Water Board had the discretion not to include them in the Los Angeles MS4 Order.

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[151] *City of Arcadia v. EPA* (N.D. Cal. 2013) 265 F.Supp.2d 1142, 1144-1145.

[152] We note that we do not take up any arguments that challenge the terms of the TMDLs. Those arguments should have been made during the public process when the TMDLs were adopted. They are untimely now.

[153] 40 C.F.R. § 122.44(d)(1)(vii)(B).

[154] Wat. Code, § 13263, subd. (a).

[155] 33 U.S.C. § 1342(p); *Defenders of Wildlife*, *supra*, 191 F.3d 1159.

Answering the question of whether the Los Angeles Water Board was required under federal law to strictly effectuate TMDL compliance through the Los Angeles MS4 Order is a largely irrelevant exercise because we have already reaffirmed in this order that we will continue to require water quality standards compliance in MS4 permits. Further, given the back-stop nature of TMDLs, and the fact that each set of dischargers must meet their share of the allocation to reach the total reductions set out, a regime in which municipal storm water dischargers were given a pass on TMDL obligations would render the promise of water quality standards achievement through TMDLs illusory. This is especially true in a large urbanized area where pollutants in storm water constitute a significant share of the impairment and where other dischargers would be disproportionately burdened if MS4s were not held to their allocations. Although not dispositive, we also note that USEPA has assumed in guidance (discussed in more detail below) issued on storm water and TMDL implementation that MS4 permits must incorporate effluent limitations consistent with the assumptions and requirements of relevant wasteload allocations.[156] To the extent the TMDL provisions of the Clean Water Act and the federal regulations could be read to preclude mandatory incorporation of wasteload allocations into an MS4 permit, effluent limitations consistent with those load allocations should nevertheless be required under Clean Water Act section 402, subsection (p)'s direction that the MS4 permit shall require "such other controls" as the permitting authority determines "appropriate for the control of such pollutants."[157] Finally, for TMDLs incorporated into water quality control plans, the implementation plan associated with the TMDL applies to all dischargers named, including MS4 permittees, and the MS4 permits must be consistent with the direction in the water quality control plan.[158]

Having found that the Los Angeles Water Board acted in a manner consistent with federal and state law when it developed WQBELs to address applicable TMDLs, we next turn to whether *numeric* WQBELs were appropriate. We find that the Los Angeles Water Board

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[156] USEPA, Memorandum, "Establishing Total Maximum Daily Load Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs," (Nov. 22, 2002) (2002 USEPA Memorandum); see also USEPA, Memorandum, "Revisions to the November 22, 2002 Memorandum 'Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs,' " (Nov. 26, 2014) (2014 USEPA Memorandum). The 2014 USEPA Memorandum replaced a memorandum with the same title issued on November 12, 2010, which was subsequently opened to public comment. (USEPA Statement (March 17, 2011), available at <http://water.epa.gov/polwaste/npdes/stormwater/upload/sw_tmdlwla_comments.pdf> (as of Nov. 18, 2014).)

[157] 33 U.S.C. § 1342(p)(3)(B)(iii). See, e.g., State Water Board Orders WQ 91-03, WQ 91-04, WQ 98-01, WQ 99-05, WQ 2001-15.

[158] Wat. Code, § 13263, subd. (a); see also *State Water Res. Control Bd. Cases* (2006) 136 Cal. App. 4th 674, 730 (noting the obligation of the water boards to follow the program of implementation included in a water quality control plan).

acted within its legal authority when establishing numeric WQBELs, and further that its choice of numeric WQBELs was a reasonable exercise of its policy discretion.

In the context of MS4 discharges, effluent limitations in NPDES permits may be expressed in the form of either numeric limitations or best management practices (BMPs). The federal regulations specifically state that BMP-based effluent limitations may be used to control pollutants for storm water discharges.[159] USEPA has issued two memoranda, on November 22, 2002 (2002 USEPA Memorandum), and on November 26, 2014 (2014 USEPA Memorandum), providing guidance to the states on translating wasteload allocations for storm water into effluent limitations in NPDES Permits.[160] The 2002 USEPA Memorandum contemplated that "the NPDES permitting authority will review the information provided by the TMDL . . . and determine whether the effluent limit is appropriately expressed using a BMP approach (including an iterative BMP approach) or a numeric limit."[161] The 2002 USEPA Memorandum further stated that "EPA expects that most WQBELs for NPDES-regulated municipal . . . storm water discharges will be in the form of BMPs, and that numeric limits will be used only in rare instances."[162] The 2014 USEPA Memorandum, after noting the increased information available to the permitting agencies after more than a decade of experience with setting wasteload allocations and effluent limitations, explained that:

> Where the TMDL includes WLAs for stormwater sources that provide numeric pollutant loads, the WLA should, where feasible, be translated into effective, measurable WQBELs that will achieve this objective. This could take the form of a numeric limit, or of a measurable, objective BMP-based limit that is projected to achieve the WLA. . . . The permitting authority's decision as to how to express the WQBEL(s), either as numeric effluent limitations or as BMPs, with clear, specific, and measurable elements, should be based on an analysis of the specific facts and circumstances surrounding the permit, and/or the underlying

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[159] 40 C.F.R. § 122.44(k)(2); see also 33 U.S.C. § 1342(p)(3)(B)(iii). 40 Code of Federal Regulations section 122.44(k)(3) further contemplates that BMP-based effluent limitations are appropriate where it is infeasible to develop a numeric effluent limitation.

[160] 2002 USEPA Memorandum; 2014 USEPA Memorandum. In addition to the two memoranda, USEPA published guidance titled "Interim Permitting Approach for Water Quality-Based Effluent Limitations in Storm Water Permits" ((Sept. 1996) 61 Federal Register 57425), which recommended inclusion of BMPs in first-round permits, and expanded or better-tailored BMPs in subsequent permits. In 2005, the State Water Board assembled a blue ribbon panel to address the feasibility of including numeric effluent limits as part of NPDES municipal, industrial, and construction storm water permits. The panel issued a report dated June 19, 2006, which included recommendations as to the feasibility of including numeric limitations in storm water permits. The report concluded that it was not feasible, at that time, to set enforceable numeric effluent limitations for municipal storm water discharges.

[161] 2002 USEPA Memorandum, p. 5.

[162] *Id*., p. 2.

> WLA, including the nature of the stormwater discharge, available data, modeling results, and other relevant information.[163]

Both options – to choose BMP-based WQBELs or to choose numeric WQBELs – were legally available to the Los Angeles Water Board. In adopting numeric WQBELs, the Los Angeles Water Board analyzed the specific facts and circumstances surrounding storm water discharges in the region and reasonably concluded that numeric WQBELs were warranted because storm water discharges constituted a significant contributor to the water quality standards exceedances in the area and the exceedances had not been to date resolved through BMP-based requirements. Moreover, the Los Angeles Water Board concluded that it could feasibly develop numeric WQBELs following the extensive work already conducted to develop the TMDLs, which involved analyzing pollutant sources and allocating loads using empirical relationships or quantitative models. We will not second-guess the determination of the Los Angeles Water Board, given its extensive and unique role in developing the TMDLs and the permit to implement the TMDLs, that numeric WQBELs were appropriate for the Los Angeles MS4 Order.[164]

We emphasize, however, that we are not taking the position that numeric WQBELs are appropriate in all MS4 permits or even with respect to certain TMDLs within an MS4 permit. In a recent amendment to State Water Board Order 2011-0011-DWQ, NPDES Statewide Storm Water Permit for State of California Department of Transportation (Caltrans),[165] we found BMP-based TMDL requirements to be "consistent with the assumptions and requirements of the WLAs" of the TMDLs applicable to Caltrans. That determination was based on a number of factors including the fact that Caltrans, a single discharger, was named in over 80 TMDLs statewide, the fact that Caltrans had relatively little contribution to the exceedances in each of those TMDLs, and the consideration that there was significant efficiency to be gained by streamlining and standardizing control measure implementation throughout Caltrans' statewide storm water program. Similarly, regional water boards may find BMP-based requirements to be appropriate based on TMDL-specific, region-specific, or permittee-specific

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[163] 2014 USEPA Memorandum, p. 6.

[164] The Los Angeles Water Board incorporated a discussion in the Fact Sheet of how the TMDL wasteload allocations were translated into numeric WQBELs in order to implement the TMDLs in the Los Angeles MS4 Order. (Los Angeles MS4 Order, Att.F, Fact Sheet, pp. F-89-F-100). See 40 C.F.R. § 124.8. We are not independently reviewing the calculations and analyses underlying the specific numeric limitations arrived at by the Los Angeles Water Board; rather, our review has been limited to a determination of whether the choice of numeric rather than BMP-based limitations was reasonable. To the extent any petitioners asked us to independently review the issue in their petitions seeking review of the Order, the issue is dismissed. See fn. 11.

[165] State Water Board Order WQ 2014-0077-DWQ.

considerations. In many ways, the Los Angeles MS4 Order was uniquely positioned to incorporate numeric WQBELs because of the extensive TMDL development in the region in the past decade and the documented role of MS4 discharges in contributing to the impairments addressed by those TMDLs. Thus, while we decline to remove the numeric WQBELs from the Los Angeles MS4 Order, we also decline to urge the regional water boards to use numeric WQBELs in all MS4 permits.[166]

2. Requirement for Reasonable Potential Analysis

The federal regulations implementing NPDES permitting require the permitting authority to establish WQBELs for point source discharges when those discharges cause, have the "reasonable potential" to cause, or contribute to an excursion above water quality standards.[167] Permittee Petitioners argue that the Los Angeles Water Board did not conduct an appropriate reasonable potential analysis prior to imposing numeric WQBELs. The argument is misguided. The Los Angeles Water Board established that the MS4 discharges can cause or contribute to exceedances of water quality standards through the process of developing TMDLs and assigning wasteload allocations. At the permitting stage, the Los Angeles Water Board's legal obligation was to develop WQBELs "consistent with the assumptions and requirements of any wasteload allocation" in the TMDLs,[168] and not to reconsider reasonable potential.[169]

3. USEPA-Established TMDLs

USEPA has established seven TMDLs that include wasteload allocations for MS4 discharges covered by the Los Angeles MS4 Order. In contrast to state-adopted TMDLs, USEPA-established TMDLs do not contain an implementation plan or schedule for achievement of the wasteload allocations,[170] with the effect that Permittees must comply with wasteload allocations immediately. To avoid this result, the regional water board may either adopt a

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[166] Relying on the 2014 USEPA Memorandum, Permittee Petitioners also argue that the Los Angeles Water Board was required to disaggregate storm water sources within applicable TMDLs. The 2014 USEPA Memorandum only encourages permit writers to assign specific shares of the wasteload allocation to specific permittees during the permitting process, reasoning that permit writers may have more detailed information than the TMDL writers to assign reductions for specific sources. (2014 USEPA Memorandum, p.8.) In an MS4 system as complex and interconnected as that covered under the Los Angeles MS4 Order, we do not expect the permitting authority to be able to disaggregate wasteload allocations by discharger. Further, as discussed in section II.F. on joint responsibility, the Los Angeles MS4 Order has provided a means for Permittees with commingled discharges to demonstrate that they are not responsible for any given exceedance of a limitation.

[167] 40 C.F.R. § 122.44(d)(1)(iii).

[168] 40 C.F.R. § 122.44(d)(1)(vii)(B).

[169] See USEPA, NPDES Permit Writers Manual (updated September 2010), Chapter 6, section 6.3.3.

[170] See, e.g., *Am. Farm Bureau Fed'n v. U.S. E.P.A., supra,* 984 F. Supp. 2d at p. 314.

separate implementation plan as a water quality control plan amendment[171] or issue the Permittee a compliance order with a compliance schedule.[172] For the seven USEPA-established TMDLs applicable to the Permittees, the Los Angeles Water Board authorizes Permittees subject to a wasteload allocation in a USEPA-established TMDL to propose control measures that will be effective in meeting the wasteload allocation, and a schedule for their implementation that is as short as possible, as part of a WMP/EWMP.[173] Permittees that do not submit an adequate WMP/EWMP are required to demonstrate compliance with the wasteload allocations immediately.[174]

Permittee Petitioners argue that the Los Angeles Water Board has acted inconsistently in requiring BMP-based compliance with the USEPA-established TMDLs but requiring numeric WQBELs for the state-established TMDLs. We have already stated above in section C.1 that the permitting authority has discretion to choose between BMP-based and numeric effluent limitations depending on fact-specific considerations. The Los Angeles Water Board was not restricted to choosing one single uniform approach to implementing all 33 TMDLs in the Los Angeles MS4 Order. In fact, straight-jacketing NPDES permit writers to choose one approach to the exclusion of another, even within the confines of a single MS4 permit, would run afoul of USEPA's expectations in the 2014 USEPA Memorandum for a fact-specific, documented justification for the permit requirements included to implement a wasteload allocation.

The Environmental Petitioners argue that the provisions are contrary to law because they excuse Permittees from complying with final numeric wasteload allocations as long as they are implementing the BMPs proposed in the WMP/EWMP. The approach taken by the Los Angeles MS4 Order to compliance here is similar to the provisions for compliance with receiving water limitations that are not otherwise addressed by a TMDL: The Permittee proposes control measures and a timeline that is as short as possible and is considered in compliance with the final numeric limitations while implementing the control measures consistent with the schedule. We find that, given the absence of an implementation plan with final compliance deadlines specified in the Los Angeles Water Board's water quality control

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[171] Wat. Code, § 13242.

[172] *Id.*, See, e.g., § 13300.

[173] The Los Angeles MS4 Order's Fact Sheet states that the Los Angeles Water Board may choose to adopt implementation plans or issue enforcement orders in the future. (Los Angeles MS4 Order, Att. F, Fact Sheet, p. F-111.)

[174] Los Angeles MS4 Order, Part VI.E.3., pp. 145-146.

plan, this approach is consistent with the assumptions and requirements of the relevant wasteload allocations. We will not revise the provisions.

D. Non-Storm Water Discharge Provisions

Permittee Petitioners argue that the non-storm water discharge provisions of the Los Angeles MS4 Order are contrary to the Clean Water Act. Specifically, Permittee Petitioners assert that the Los Angeles MS4 Order improperly regulates non-storm water discharges from the MS4 to the receiving waters by imposing the prohibition of discharge "through the MS4 to the receiving waters" and by imposing WQBELs and other numeric limitations, rather than the MEP standard, on dry weather discharges.

The Los Angeles MS4 Order states that "[e]ach Permittee shall, for the portion of the MS4 for which it is an owner or operator, prohibit non-storm water discharges through the MS4 to receiving waters" with certain exceptions including discharges separately regulated under an NPDES permit and discharges conditionally exempt from the prohibition consistent with the federal regulations.[175] Permittee Petitioners take issue with the imposition of the prohibition "through the MS4 to receiving waters" because the language does not track the specific requirement of the Clean Water Act that the MS4 permit "include a requirement to effectively prohibit non-stormwater discharges *into the storm sewer."* (Emphasis added.)[176]

We find the variation in language to be a distinction without a difference. Whether the Los Angeles MS4 Order prohibits non-storm water discharges *into* the MS4 or *through* the MS4 to receiving waters, the intent and effect of the prohibition is to prevent non-exempt non-storm water discharges from reaching the receiving waters.[177] The legal standard governing non-storm water – effective prohibition -- is not altered because the Los Angeles MS4 Order imposes the prohibition at the point of entry into the receiving water rather than the point of entry into the MS4 itself. Instructively, USEPA has used the terms "into," "from," and "through" interchangeably when describing the prohibition.[178]

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[175] *Id.*, Part III.A, pp 27-33.

[176] 33 U.S.C. § 1342(p)(3)(B)(ii).

[177] The Los Angeles Water Board notes that the language in the Los Angeles MS4 Order is not significantly changed from the version in the 2001 Los Angeles MS4 Order, which prohibited non-storm water discharges "into the MS4 and watercourses." The Board additionally asserts that phrasing the prohibition as "through the MS4 to receiving waters" provides Permittees with greater flexibility to use measures that control non-storm water after it enters the MS4, including regional solutions such as low-flow diversions and catch-basin inserts.

[178] See, e.g., 55 Fed. Reg. 47990, 47995-47996 ("Section 402(p)(B)(3) of the CWA requires that permits for discharges *from municipal separate storm sewer systems* require the municipality to 'effectively prohibit' non-storm water discharges *from the municipal separate storm sewer*…Ultimately, such non-storm water discharges *through a municipal separate storm sewer* must either be removed from the system or become subject to an NPDES permit. . . . *(Continued)*

Permittee Petitioners' objection to the phrasing of the prohibition in the Los Angeles MS4 Order appears to be based largely on the assumption that prohibiting non-storm water discharges at the point of entry into the receiving water rather than at the point of entry into the MS4 allows the Los Angeles Water Board to impose requirements on those discharges that would otherwise not be available under the Clean Water Act and federal regulations. We disagree.

As a preliminary matter, regardless of the phrasing of the non-storm water discharge prohibition, MEP is not the standard that governs non-storm water discharges. Permittee Petitioners have asserted that, for non-storm water discharges that enter the MS4, MEP is the governing standard just as it is for storm water discharges. This assertion misinterprets the statute. The Clean Water Act imposes two separate standards for regulation of non-storm water and storm water in an MS4 permit: The MS4 permit "shall include a requirement to effectively prohibit non-stormwater discharges" into the MS4, and "shall require controls to reduce the discharge of pollutants to the maximum extent practicable. . . ."[179] Although the statute imposes the MEP standard to control of "pollutants" rather than specifically to "pollutants in storm water," any reading of section 402(p)(3)(B)(iii) to apply generally to both non-storm water and storm water would render the effective prohibition of non-storm water in section 402(p)(3)(B)(ii) meaningless. The federal regulations confirm the distinction between the treatment of storm water and non-storm water by establishing requirements to prevent illicit discharges from entering the MS4.[180] While the regulations have no definition for "non-storm water discharges," illicit discharges most closely represent the statutory term and are defined as "any discharge to a municipal separate storm sewer that is not composed entirely of storm water except discharges pursuant to a NPDES permit . . . and discharges resulting from firefighting activities."[181] Further, contrary to assertions by Permittee Petitioners, the definition of storm water in the federal regulations is not inclusive of dry weather discharges. The federal regulations define storm water as "storm water runoff, snow melt runoff, and surface runoff and

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The CWA prohibits the point source discharge of non-storm water not subject to an NPDES permit *through municipal separate storm sewers to waters of the United States.*" (Emphasis added.))

[179] 33 U.S.C. § 1342(p)(3)(b)(iii).

[180] 40 C.F.R. § 122.26(d)(2)(iv)(B).

[181] *Id.*, § 122.26(b)(2). The preamble to the regulations states: "Today's rule defines the term 'illicit discharge' to describe any discharge through a municipal separate storm sewer system that is not composed entirely of storm water and that is not covered by an NPDES permit." (55 Fed. Reg. 47990, 47995 (Nov. 16, 1990).)

drainage."[182] Surface runoff and drainage cannot be understood to refer to dry weather discharges where USEPA has specifically stated in the preamble to the relevant regulations that it would not expand the definition of storm water to include "a number of classes of discharges which are not in any way related to precipitation events."[183] Accordingly, dry weather discharges are not a component of storm water discharges subject to the MEP standard.[184]

Second, the Los Angeles Water Board's legal authority to impose TMDL-based WQBELs and other limitations on dry weather discharges is derived not from the phrasing of the discharge prohibition in the statute but from the TMDLs themselves, as well as the Clean Water Act direction to require "such other provisions" as the permitting authority "determines appropriate for the control of such pollutants." We have already found that the Los Angeles MS4 Order reasonably (and legally) incorporated numeric WQBELs and other limitations to implement the TMDLs. The Los Angeles Water Board's authority to impose the limitations for dry weather conditions is accordingly independent of the provisions establishing the non-storm water effective prohibition.

Permittee Petitioners also assert that requiring compliance with the non-storm water discharge prohibition through and from the MS4 would frustrate enforcement of the illicit connection and illicit discharge elimination programs of the Los Angeles MS4 Order, which continue to require the Permittee to prohibit illicit discharges and connections *to* the MS4.[185] On this point, we agree with the Los Angeles Water Board that the illicit connection and illicit discharge elimination program is a means to implement the non-storm water prohibition and independently implementable and enforceable. We are more sympathetic to the argument by Permittee Petitioners that, in the context of a complex MS4 system with commingled discharges, the prohibition of discharges through the MS4 to the receiving waters poses greater compliance challenges than a prohibition of discharges into the MS4; however, the Los Angeles MS4 Order's Monitoring and Reporting Program contains a procedure by which a Permittee will notify the Board and the upstream jurisdiction when non-exempted, non-storm water discharges pose an issue in commingled discharges.[186] Further, the Los Angeles Water Board states in its

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[182] 40 C.F.R. § 122.26(b)(13).

[183] 55 Fed. Reg. 47990, 47995 (Nov. 16, 1990).

[184] We disagree that the phrasing of the non-storm water discharge prohibition in the Los Angeles MS4 Order means that *any* dry weather discharges from the MS4 could be construed as a violation of the Clean Water Act for the same reasons articulated in footnote 133 of this order.

[185] Los Angeles MS4 Order, Parts VI.A.2.a.iii, p. 40, VI.D.4.d., p. 81-86, VI.D.10, p. 137-141.

[186] Los Angeles MS4 Order, Att. E, Monitoring and Reporting Program, Part IX.F.6, p. E-27.

October 15, 2013 Response that the upstream jurisdiction would then have the responsibility to further investigate and address the discharge.[187] The challenge of addressing compliance and enforcement in the context of interconnected MS4s and commingled discharges is a challenge pervasive in the MS4 regulatory structure and not unique to non-storm water discharges. We are not sufficiently persuaded by Permittee Petitioners' arguments regarding compliance to disturb the non-storm water prohibitions as currently established in the Los Angeles MS4 Order.

E. Monitoring Provisions

Relying on Water Code sections 13165, 13225, and 13267, Permittee Petitioners argue that the Los Angeles Water Board was required to conduct a cost-benefit analysis to support the monitoring and reporting requirements of the Los Angeles MS4 Order. Because the monitoring and reporting provisions of the Los Angeles MS4 Order are incorporated pursuant to federal law, the cited provisions are inapplicable here. The monitoring and reporting provisions of the Los Angeles MS4 Order were established under the Clean Water Act and USEPA's regulations.[188] Further, under state law, Water Code section 13383, rather than Water Code section 13267, controls monitoring and reporting requirements in the context of NPDES permitting, and that provision does not include a requirement to ensure that the burden, including costs of the report, bear a reasonable relationship to the need for the report.[189]

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[187] Los Angeles Water Board, October 15, 2013 Response, p. 33 & fn. 116.

[188] See 33 U.S.C. §§ 1318, 1342(a)(2); 40 C.F.R. §§ 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)D), 122.41(h), 122.41(j), 122.41(*l*), 122.42(c),122.44(i), 122.48.

[189] Permittee Petitioners argue that the cost considerations of Water Code sections 13225 and 13267 are relevant to the Los Angeles MS4 Order notwithstanding the fact that it was issued under federal authority because the requirements of those section are not inconsistent with the requirements of section 13383. (See Water Code, §13372, subd. (a) ("To the extent other provisions of this division are consistent with the requirements for state programs . . . those provisions apply . . . ").) This exact assertion was taken up by the trial court in litigation challenging the 2001 Los Angeles MS4 Order and decided in favor of the Los Angeles Water Board. The trial court stated: "As noted in *Silkwood v. Kerr-McGee Corp.* (1984) 464 U.S. 238, the Court held, in part: 'state law is still preempted. . . where the state law stands as an obstacle to the accomplishment of the full purposes and objectives of Congress.' (464 U.S. at p. 248.) Applying Water Code sections 13225 and 13267 would stand, in the words of *Silkwood* as: 'an obstacle to the accomplishment of the full purposes and objectives of [the federal law].' (Ibid)." (*In re Los Angeles County Municipal Storm Water Permit Litigation* (L.A. Super. Ct., No. BS 080548, Mar. 24, 2005) Statement of Decision from Phase II Trial on Petitions for Writ of Mandate, at pp.19-20 (Administrative Record, section 10.II., RB-AR23197-23198.). Further, we note that Water Code section 13383, subdivision (c) specifically references subdivision (c) of section 13267 when establishing facility inspection requirements; in contrast, section 13383, subdivision (a) does not reference subdivision (b) of section 13267, which incorporates the requirement that "[t]he burden, including costs, of these reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports." Water Code section 13383, subdivision (a), was therefore arguably intended to stand in place of the requirements in section 13267(b). Finally, even where authority to impose a monitoring and reporting requirement is clearly derived from Water Code section 13267, the provision requires consideration of the costs and benefits of monitoring and reporting, but not a full cost-benefit analysis. We therefore find that the Los Angeles Water Board did not fail to meet its legal obligations by not carrying out a full cost-benefit analysis specific to the monitoring and reporting requirements of the Los Angeles MS4 Order. However, in making this finding, in no way do we mean to disavow the significance of cost consideration in permitting actions, even where not specifically required by law. We note again that the Los Angeles Water Board carefully considered the costs of
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Moreover, the monitoring and reporting requirements of the Los Angeles MS4 Order do not exceed the requirements of the Clean Water Act and the federal regulations.[190] In particular, we find that the receiving water monitoring requirements of the Order are reasonable in light of the need to identify water quality exceedances and evaluate progress in compliance with water quality standards. The argument made by several Permittee Petitioners that the federal regulations allow only two types of monitoring – effluent and ambient – for compliance is without support in the relevant regulations. The relevant law is clear that the permitting authority is required to incorporate monitoring and reporting requirements sufficient to determine compliance with the permit conditions.[191] In contrast, nothing in the Clean Water Act or the regulations states that requiring wet weather receiving water monitoring is beyond the authority of the permitting agency.[192] Further, accepting such a constrained interpretation of the Clean Water Act's monitoring requirements would undermine storm water permitting assessment. Excluding wet weather receiving water monitoring would preclude storm water dischargers from assessing the impacts of their discharges on waters of the United States during the events for which they are primarily being permitted—storm events. We find nothing in the text or preamble of the federal regulations to support a narrow interpretation of monitoring to exclude wet weather receiving monitoring.

To the extent Permittee Petitioners are arguing that the MEP standard, applied at the outfall, constrains the permitting authority's discretion to require monitoring beyond the outfall, we also find no support in the law for that proposition. We have already stated that we will continue to require compliance with water quality standards in MS4 permits. Wet weather receiving water monitoring is fundamental to assessing the effects of storm water discharges on water quality and determining the trends in water quality as Permittees implement control

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compliance with the Los Angeles MS4 Order generally as summarized in the Fact Sheet. (See Los Angeles MS4 Order, Att. F, Fact Sheet, pp. F-144-F-149.) Further, the Los Angeles Water Board considered monitoring costs-related comments on earlier drafts of the Los Angeles MS4 Order, and, in a number of cases, where presented with an argument that a cost related to a particular monitoring requirement was not commensurate with the benefits to be received from that requirement, made revisions to the requirement. (See, e.g., Administrative Record, section 8, RB-AR19653-19654, RB-AR19666, RB-AR19674, RB-AR19681.)

[190] The Los Angeles Water Board provided its rationale for the receiving water monitoring requirements in the Fact Sheet of the Los Angeles MS4 Order. (Los Angeles MS4 Order, Att. F, Fact Sheet, F-113-F-137.)

[191] See 33 U.S.C. § 1318(a)(2); 40 C.F.R. § 122.26(d)(2)(i)(F). While we do not interpret these requirements to mean that each and every permit condition must have a corresponding monitoring and reporting requirement, neither do we see any constraints on the water boards' authority to establish monitoring and reporting requirements.

[192] Permittee Petitioners reference language in the federal regulations concerning "effluent and ambient monitoring" (40 C.F.R. § 122.44(d)(1)(vi)(C)(3)) and appear to be using the phrase as support for their argument. That section is inapposite as it applies to situations where a State has not established a water quality objective for a pollutant present in the effluent and instead establishes effluent limitations on an indicator parameter for the pollutant of concern.

measures. Compliance may be determined at the outfall – for example, where a permittee determines that the discharge does not exceed an applicable WQBEL or receiving water limitation – but outfall monitoring alone cannot provide the broader data related to trends in storm water discharge impacts on the receiving water. Accordingly, receiving water monitoring is a legal and reasonable component of the monitoring and reporting program. Further, because Permittees are responsible for impacts to the receiving waters resulting from their MS4 discharges, Permittees may be required to participate in monitoring not only in receiving waters within their jurisdiction but also in monitoring all receiving waters that their discharges impact.

We will make no revisions to the Monitoring and Reporting provisions of the Order.

F. Joint Responsibility

In the extensive and interconnected system regulated by the Los Angeles MS4 Order, discharges originating from one Permittee's MS4 frequently commingle with discharges from other Permittees' MS4s within or outside of the Permittee's jurisdiction. Permittee Petitioners argue that the Los Angeles MS4 Order improperly ascribes responsibility to all Permittees with commingled discharges where those commingled discharges exceed a WQBEL or cause or contribute to exceedances of receiving water limitations. Specifically, Permittee Petitioners take issue with the fact that the Los Angeles MS4 Order ascribes "joint responsibility"[193] to the co-Permittees without a showing that a particular Permittee has in fact discharged the pollutant causing or contributing to the exceedance.

The Los Angeles Water Board counters that the joint responsibility regime is consistent with the intent of the Clean Water Act and further that it does not compel a Permittee to clean up the discharge of another Permittee. The Los Angeles Water Board points to two provisions for this latter proposition. First, even with joint responsibility, Permittees that have commingled MS4 discharges need only comply with permit conditions relating to discharges from the MS4 for which they are owners or operators.[194] Second, even where joint responsibility is presumed, a Permittee may subsequently counter the presumption of joint responsibility by

[193] "Joint responsibility" is the term used in the Los Angeles MS4 Order. (See Los Angeles MS4 Order, Part II.K.1, p. 23 ("'Joint responsibility' means that the Permitttees that have commingled MS4 discharges are responsible for implementing programs in their respective jurisdictions, or within the MS4 for which they are an owner and/or operator, to meet the water quality-based effluent limitations and/or receiving water limitations assigned to such commingled MS4 discharges.") As defined by the Los Angeles Water Board and as discussed below, this term does not have the same meaning and scope as the legal doctrine of "joint liability."

[194] Los Angeles MS4 Order, Parts II.K.1, pp. 23-24, VI.A.4.a., p. 41; 40 C.F.R. § 122.26(a)(3)(vi); see also, *id*., Part VI.E.2.b.ii., p. 142 (stating in the context of TMDL requirements that, where discharges are commingled and assigned a joint WLA, "each Permittee is only responsible for discharges from the MS4 for which they are owners and/or operators.")

affirmatively demonstrating that its MS4 discharge did not cause or contribute to the relevant exceedances.[195]

Given the size and complexity of the MS4s regulated under the Los Angeles MS4 Order and the challenges inherent in designing a monitoring program that could parse out responsibility for each individual Permittee, we find that a joint responsibility regime is a reasonable approach to assigning initial responsibility for an exceedance. The Los Angeles MS4 Order provisions addressing TMDLs also appropriately take a joint responsibility approach, given that the wasteload allocations from which the WQBELs and other TMDL-specific limitations are derived are most frequently expressed as joint allocations shared by all MS4 dischargers in the watershed. We further agree with the Los Angeles Water Board that the regime is one that is permissible under applicable law. The Clean Water Act contemplates that MS4 permits may be issued on a system-wide or jurisdiction-wide basis[196] and the federal regulations anticipate the need for inter-governmental cooperation.[197] Further, the United States Court of Appeal, Ninth Circuit, recently stated in *Natural Resources Defense Council v. County of Los Angeles* (2013) 725 F.3d 1194 that the permitting authority has wide discretion concerning the terms of a permit, including the manner in which permittees share liability.[198]

Yet, we also find that joint responsibility in an MS4 Order is only appropriate if the ultimate responsibility for addressing an exceedance rests with those permittees that actually cause or contribute to the exceedance in question. The re-issued Los Angeles MS4 Order contains additional specificity and monitoring, beyond that contained in the 2001 Los Angeles MS4 Order, to document compliance and the presence or absence of an individual municipality's contribution of pollutants to the storm water. For this reason, the general reasoning of the Ninth Circuit's 2013 *Natural Resources Defense Council v. County of Los Angeles* decision finding liability based solely on the presence of pollutants above water quality standards in the receiving waters is of limited forward-looking importance. Generally, in the context of MS4 permits, we do not sanction joint responsibility to the extent that that joint

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[195] *Id.*, Part VI.E.2., pp.141-42; see also id., Part II.K.1, pp. 23-24.

[196] 33 U.S.C. § 1342(p)(3)(B)(i).

[197] See 40 C.F.R. §§ 122.26(d)(2)(i)(D), 122.26(d)(2)(iv), 122.26(d)(2)(vii).

[198] *Natural Resources Defense Council v. County of Los Angeles* (9th Cir. 2013) 725 F.3d 1194, 1205, fn. 16, cert. den. *Los Angeles County Flood Control Dist. v. Natural Resources Defense Council* (2014) 134 S.Ct. 2135. The Ninth Circuit went on to find that, based on the specific language of the 2001 Los Angeles MS4 Order, the Permittees were jointly liable for exceedances detected by mass emissions monitoring.

responsibility would require each Permittee to take full responsibility for addressing violations, regardless of whether, and to what extent, each permittee contributed to the violation.[199]

The Los Angeles MS4 Order does not impose such a joint responsibility regime where each Permittee must take full responsibility for addressing other Permittees' violations. In addition to clearly stating that permittees are responsible only for their contribution to the commingled discharges, the Los Angeles MS4 Order provides that Permittees may affirmatively show that their discharge did not cause or contribute to an exceedance. Joint responsibility, as applied by the Los Angeles MS4 Order, is thus consistent with our expectation that ultimate responsibility for addressing an exceedance rests with those Permittees that actually cause or contribute to the exceedance and consistent with the regulatory direction that co-permittees need only comply with permit conditions relating to discharges from the MS4 for which they are owners or operators.

While the result is that the burden rests on the Permittee to demonstrate that its commingled discharge is not the source of an exceedance, rather than on the Los Angeles Water Board to demonstrate that a Permittee's commingled discharge is causing or contributing to the exceedance, the result is not contrary to law. The Los Angeles Water Board has the initial burden to show that a violation of the Los Angeles MS4 Order has occurred,[200] but the Board can do so by establishing an exceedance of a limitation by jointly responsible Permittees and need not identify the exact source of the exceedance. This scheme represents a reasonable policy approach to a complicated compliance question where the Permittees are more closely familiar than the Los Angeles Water Board with their outfalls and their discharges in the extensive and interconnected MS4 network.

We are, however, concerned that the Los Angeles MS4 Order's treatment of the joint responsibility issue is too narrow. The Los Angeles Water Board addresses the issue of joint responsibility primarily in the context of compliance with the TMDL requirements of the Order. Commingled discharges pose the same questions of assigning responsibility where receiving water limitations are exceeded in water bodies receiving MS4 discharges from multiple jurisdictions, but where the pollutant is not addressed by a TMDL. A similar approach to

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[199] In a "joint and several liability" scheme, a plaintiff may collect his or her entire damages from any one defendant, and the defendants must then rely on principles of indemnity or contribution to apportion ultimate liability amongst themselves. (See *American Motorcycle Assn. v. Superior Court of Los Angeles County* (1978) 20 Cal. 3d 578, 586-590.) Because the Los Angeles MS4 Order's joint responsibility scheme does not equate to joint liability, and because we do not find such liability appropriate from a policy perspective, we do not address Petitioners' legal arguments as to whether joint or joint and several liability in the storm water context would be consistent with applicable law.

[200] See e.g. *Sackett v. E.P.A.* (9th Cir. 2010) 622 F.3d 1139 rev'd on other grounds *Sackett v. E.P.A.* (2012) 132 S. Ct. 1367.

assigning responsibility for addressing the exceedances is appropriate there. We will add new language to the Los Angeles MS4 Order mirroring Part VI.E.2.b., but applying the principles more generally.

We also take this opportunity to emphasize that all MS4 permits should be drafted to avoid one potential, but likely unintended, result arising from *Natural Resources Defense Council v. County of Los Angeles*. The broadest reading of the Ninth Circuit's holding following remand from the U.S. Supreme Court would assign joint liability to all Permittees for any exceedance at a monitoring location designated for the purpose of compliance determination, even if the particular pollutant is not typically found in storm water and has a likely alternative source such as an industrial discharger or waste water treatment plan. Providing municipalities an opportunity to demonstrate that they did not contribute to a pollutant present in receiving waters above standards will prevent this outcome.

We shall amend Part VI.B. as follows:

B. Monitoring and Reporting Program (MRP) Requirements

1. Dischargers shall comply with the MRP and future revisions thereto, in Attachment E of this Order or may, in coordination with an approved Watershed Management Program per Part VI.C, implement a customized monitoring program that achieves the five Primary Objectives set forth in Part II.A. of Attachment E and includes the elements set forth in Part II.E. of Attachment E.

2. Compliance Determination for Commingled Discharges

a. For commingled discharges addressed by a TMDL, a Permittee shall demonstrate compliance with the requirements of Part E as specified at Part E.2.b.

b. For commingled discharges not addressed by a TMDL, a Permittee shall demonstrate compliance with the requirements of Part V.A as follows:

i. Pursuant to 40 CFR section 122.26(a)(3)(vi), each Permittee is only responsible for discharges from the MS4 for which they are owners and/or operators.

ii. Where Permittees have commingled discharges to the receiving water, or where Permittees' discharges commingle in the receiving water, compliance in the receiving water shall be determined for the group of Permittees as a whole unless an individual Permittee demonstrates that its discharge did not cause or contribute to the exceedance, pursuant to subpart iv. below.

iii. For purposes of compliance determination, each Permittee is responsible for demonstrating that its discharge did not cause or contribute to an exceedance of the receiving water limitation in the target receiving water.

iv. A Permittee may demonstrate that its discharge did not cause or contribute to an exceedance of a receiving water limitation in one of the following ways:

(1) Demonstrate that there was no discharge from the Permittee's MS4 into the applicable receiving water during the relevant time period;

(2) Demonstrate that the discharge from the Permittee's MS4 was controlled to a level that did not cause or contribute to the exceedance in the receiving water;

(3) Demonstrate that there is an alternative source of the pollutant that caused the exceedance, that the pollutant is not typically associated with MS4 discharges, and that the pollutant was not discharged from the Permittee's MS4; or

(4) Demonstrate that the Permittee is in compliance with the Watershed Management Programs provisions under VI.C.

G. Separation of Functions in Advising the Los Angeles Water Board

Petitioners Cities of Duarte and Huntington Park (Duarte and Huntington Park) argue that their rights to due process of law were violated when the same attorneys advised both the Los Angeles Water Board staff and the Board itself in the course of the proceedings to adopt the Los Angeles MS4 Order. We disagree and reaffirm our position that permitting actions do not require the water boards to separate functions when assigning counsel to advise in development and adoption of a permit.

A water board proceeding to adopt a permit, including an NPDES permit, waste discharge requirements, or a waiver of waste discharge requirements, is an adjudicative proceeding subject to the Administrative Procedure Act's administrative adjudication statutes in Government Code section 11400 et seq.[201] Section 11425.10, part of the "Administrative Adjudication Bill of Rights," provides that "[t]he adjudicative function shall be separated from the investigative, prosecutorial, and advocacy functions with the agency . . . ."[202] In accordance with

[201] See Cal. Code Regs., tit. 23, § 648, subd. (b).

[202] Gov. Code, § 11425.10, subd. (a)(4). Subdivision (a)(4) references section 11425.30, which addresses disqualification of a presiding officer that has served as "investigator, prosecutor, or advocate" in the proceeding or its preadjudicative stage or is subject to "the authority, direction, or discretion" of a person who has served in such roles.

this directive, the water boards separate functions in all enforcement cases, assigning counsel and staff to prosecute the case, and separate counsel and staff to advise the board.

In a permitting action, water board counsel have an advisory role, not an investigative, prosecutorial, or advocacy role. Permitting actions are not investigative in nature and there is no consideration of liability or penalties that would make the action prosecutorial in nature. Further, while both counsel and staff are expected to develop recommendations for their boards, the role of counsel and staff is not to act as an advocate for one particular position or party concerning the permitting action, but to advise the board as neutrals, with consideration of the legal, technical, and policy implications of all options before the board. In the case of counsel, such consideration and advice includes not just legal evaluation of the substantive options for permitting but also of procedural issues such as admissibility of the evidence, conduct of the hearing, and avoidance of board member conflicts. Because counsel and staff are advisors to the board rather than advocates for a particular position, the same counsel may advise staff in the course of development of the permit and the board in the adoption proceedings.

A primary purpose of separation of functions in adjudicatory proceedings is the need to prevent improper ex parte communications.[203] The exceptions to the ex parte communications rules further support the position that counsel advising board staff may also advise the board itself. While section 11430.10 of the Government Code generally prohibits communications concerning issues in a pending administrative proceeding between the presiding officer and an employee of the agency that is a party,[204] one exception provides that a communication "for the purpose of assistance and advice to the presiding officer," in this case the board, "from a person who has not served as investigator, prosecutor, or advocate in the proceeding or its preadjudicative stage" is permissible. Even if board counsel could be considered an advocate in the proceeding, another provision (specifically referencing the water boards) excepts the communication from the general ex parte communications rules. A communication is not an ex parte communication if:

> (c) The communication is for the purpose of advising the presiding officer concerning any of the following matters in an adjudicative hearing that is nonprosecutorial in character:

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[203] See *Dept. of Alcoholic Beverage Control v. Alcoholic Beverage Control Appeals Bd.* (2006) 40 Cal.4th 1, 9-10.

[204] Government Code section 11430.10 prohibits communications between an employee that is a "party" to a pending proceeding and the presiding officer. We disagree that Los Angeles Water Board staff, as an advisor to the Board, was a "party" to the proceedings for adoption of the Los Angeles MS4 Order, but, even if staff could be considered a party, the cited exceptions to the ex parte communications rules would apply.

> . . .
> (2) The advice involves an issue in a proceeding of the San Francisco Bay Conservation and Development Commission, California Tahoe Regional Planning Agency, Delta Protection Commission, Water Resources Control Board, or a regional water quality control board.[205]

The fact that communications that would otherwise be considered prohibited ex parte communications are specifically permitted in non-prosecutorial adjudicative proceedings of the water boards further supports the position that the water boards are not obligated by law to separate functions in permitting actions.

We acknowledge that there may be some unique factual circumstances under which a permitting proceeding could violate due process or the Administrative Procedure Act because board counsel either acted or gave the appearance of acting as a prosecutor or advocate. Duarte and Huntington Park point to a writ of mandate issued by the Los Angeles Superior Court in 2010,[206] holding that a 2006 proceeding to incorporate provisions of the Santa Monica Bay Beaches TMDL into the 2001 Los Angeles MS4 Order was not fairly conducted because Los Angeles Water Board counsel had acted as an advocate for Board staff, directly examining Board staff witnesses, cross-examining witnesses called by permittees, objecting to questions asked by permittees, and making a closing argument on behalf of Board staff, while simultaneously advising the Board. The proceedings to adopt the Los Angeles MS4 Order did not follow the type of adversarial structure that led the Superior Court to find a violation of separation of functions in the 2006 proceedings.[207] Further, nothing in the conduct of the Los Angeles Water Board attorneys in the Los Angeles MS4 Order proceedings leads us to find that they acted as advocates for a particular position or party, rather than as advisors to the Board.

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[205] Gov. Code, § 11430.30. We note that the Law Revision Commission comments on section 11430.30, subdivision (c), state that "[s]ubdivision (c) applies to nonprosecutorial types of administrative adjudications, such as . . . proceedings . . . setting *water quality protection…requirements."* (Emphasis added.) The notes further state that "[t]he provision recognizes that the length and complexity of many cases of this type may as a practical matter make it impossible for any agency to adhere to the restrictions of [ex parte communications], given limited staffing and personnel." (25 Cal.L.Rev.Comm. Reports 711 (1995).) We agree that the lengthy and complex nature of permitting proceedings, and the limited staffing resources of the water boards, caution against an expansive interpretation of separation of functions in non-prosecutorial adjudications.

[206] *County of Los Angeles v. State Water Resources Control Board* (Super. Ct., Los Angeles Co. (June 2, 2010, Minute Order) No. BS122724) (Administrative Record, section 10.II, RB-AR23665-23667.)

[207] We also note that, although the writ directed that petitioners were entitled to a new hearing "in which the same person does not act as both an advocate before the Board and an advisor to the Board," the writ had no direct bearing on the separate proceedings to adopt the Los Angeles MS4 Order. In any case, as discussed, Board attorneys did not act as advocates in the proceedings to adopt the Los Angeles MS4 Order.

The two specific cases pointed to by Duarte and Huntington Park – advice by Board counsel to Board member Mary Ann Lutz regarding recusal due to ex parte communications and advice to the Board generally on the lack of a cost-benefit analysis requirement in federal law – may be contrary to the legal position held by Duarte and Huntington Park, but there is nothing in the record to suggest that the advice was driven by biased advocacy for a Board staff position.[208] In the absence of such evidence, we find no reason to depart from the general rule that separation of functions is not required in a permitting proceeding[209] and find that Los Angeles Water Board counsel acted in accordance with applicable laws in advising Board staff and the Board itself.

H. Signal Hill's Inclusion in the Order

The City of Signal Hill (Signal Hill) argues that the Los Angeles Water Board acted contrary to relevant law when it issued the system-wide Los Angeles MS4 Order that included Signal Hill, even though Signal Hill had submitted an application for an individual permit.[210] We disagree.

Signal Hill points out that the federal regulations allow an operator of an MS4 to choose between submitting an application jointly with one or more other operators for a joint permit or individually for a distinct permit.[211] However, the choice of application does not necessarily dictate the type of permit that the permitting authority ultimately deems appropriate. The permitting authority in turn has discretion to determine if the permit should be issued on a

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[208] See Administrative Record, section 7, RB-AR18309-18316, RB-AR18397-18400 (Transcript of Proceedings on Oct. 4, 2012), section 7, RB-AR18892-18894 (Transcript of Proceedings on Oct. 5, 2012).

[209] Although *Morongo Band of Mission Indians v. State Water Resources Control Board* (2009) 45 Cal.4th 731 concerned an enforcement proceeding and therefore is not on point for our legal determination above, we take note of the direction by the California Supreme Court that separation of functions in an administrative tribunal should not be expanded beyond its appropriate scope: "In construing the constitutional due process right to an impartial tribunal, we take a more practical and less pessimistic view of human nature in general and of state administrative agency adjudicators in particular . . . [and where proper procedure is followed and in the absence of a specific demonstration of bias or unacceptable risk of bias] we remain confident that state administrative agency adjudicators will evaluate factual and legal arguments on their merits, applying the law to the evidence in the record to reach fair and reasonable decisions." (*Morongo Band of Mission Indians, supra*, at pp. 741-742.)

[210] Signal Hill was one of several permittees under the 2001 Los Angeles MS4 Order that elected not to submit an application jointly with the other permittees for the renewed permit. The other parties have not challenged their inclusion under the Los Angeles MS4 Order. The Los Angeles Water Board rejected Signal Hill's application as incomplete; however, our determination that the Los Angeles Water Board had the discretion to issue the system-wide Los Angeles MS4 Order is not dependent on that fact.

[211] 40 C.F.R. § 122.26(a)(3)(iii). Signal Hill has also cited regulations applicable to Small MS4s at 40 Code of Federal Regulations sections 122.30 through 122.37. These regulations are not applicable here because the Los Angeles Water Board has designated the Greater Los Angeles County MS4, which includes the incorporated cities and the unincorporated areas of Los Angeles County within coastal watersheds, as a large MS4 pursuant to 40 Code of Federal Regulations section 122.26(b)(4).

jurisdictional or system-wide basis.[212] While the federal regulations do not specifically state that, in exercising that discretion, the permitting authority may override the permit applicant's preference for an individual permit, nothing in the regulations constrains its authority to do so. Section 122.26(a)(3)(iii) of 40 Code of Federal Regulations does not require the permitting authority to take any specific action in response to the submission of an individual application. And sections 122.26(a)(3)(ii) and 122.26(a)(3)(iv) provide that the permitting authority "may issue" system-wide or distinct permits. The preamble to the regulations similarly contemplates wide discretion for the permitting authority to choose system-wide permits, including a permit that would allow an entire system in a geographical region to be designated under one permit.[213] Particularly because the option of a system-wide permit would be significantly frustrated if MS4 operators were allowed to opt out at their discretion, the most reasonable reading of the regulations is that the permitting authority, not the applicant, makes the ultimate decision as to the scope of the permit that will be issued. Accordingly, we find that the Los Angeles Water Board had the discretion under the relevant law to issue the Los Angeles MS4 Order with Signal Hill as a permittee.

We also find that the Los Angeles Water Board's decision regarding Signal Hill was appropriately supported by findings in the Order and in the Fact Sheet.[214] Finding C of the Los Angeles MS4 Order, as well as discussion in the Fact Sheet,[215] establishes that the Los Angeles Water Board found a system-wide permit to be appropriate for a number of reasons, including that Permittees' MS4s comprise a large interconnected system with frequently commingled discharges, that the TMDLs to be implemented apply to the jurisdictional areas of multiple Permittees, that the passage of Assembly Bill 2554[216] in 2010 provided a potential means for funding collaborative water quality improvement plans among Permittees, and that the results of an online survey conducted by Los Angeles Water Board staff showed that the

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[212] 33 U.S.C. § 1342(p)(3)(B)(i); 40 C.F.R. § 122.26(a)(1)(v), (a)(3)(ii), (a)(3)(iv).

[213] See 55 Fed. Reg. 47990, 48039-48043 (preamble to the Phase I regulations noting that section 122.26(a)(3)(iv) would allow an entire system in a geographical region to be designated under one permit and further discussing that sections 122.26(a)(1)(v) and (a)(3)(ii) allow the permitting authority broad discretion in issuing system-wide permits).

[214] *Topanga Assn.*, *supra*, 11 Cal.3d at 515.

[215] Los Angeles MS4 Order, Part II.C., pp. 14-15; id., Att. F, Fact Sheet, pp. F-15-F-18.

[216] Assembly Bill No. 2554, Chapter 602, an act to amend sections 2 and 16 of the Los Angeles County Flood Control Act (Chapter 755 of the Statutes of 1915), relating to the Los Angeles County Flood Control District, Sept. 30, 2010 (Administrative Record, section 10.VI.C., RB-AR29172-29179). The Bill allows the Los Angeles County Flood Control District to assess a property-related fee or charge, subject to voter approval in accordance with proposition 218, for storm water and clean water programs.

majority of Permittees favored either a single MS4 permit for Los Angeles County or several watershed-based permits.

Signal Hill points out that the reasons enumerated by the Los Angeles Water Board as grounds for issuance of a system-wide permit did not preclude the Los Angeles Water Board from issuing an individual permit to the City of Long Beach (Long Beach).[217] The Los Angeles Water Board has provided the rationale for distinguishing Signal Hill and Long Beach in its October 15, 2013 Response. The Los Angeles Water Board explains that Long Beach has had an individual permit for more than a decade and that, unlike Signal Hill, it was not permitted under the 2001 Los Angeles MS4 Order. The Board's decision to issue a separate permit to Long Beach was originally the result of a settlement agreement that resolved litigation on the MS4 permit issued by the Los Angeles Water Board in 1996, and Long Beach has a proven track record in implementing the individual permit while cooperating with Permittees under the Los Angeles MS4 Order.[218] We find that the Los Angeles Water Board reasonably distinguished between Long Beach and the Permittees under the Los Angeles MS4 Order in making determinations as to individual permitting. We will not reverse its determination but we will add a brief statement reflecting that reasoning to the Fact Sheet.

We shall amend section III.D.1.a. at page F-18, Attachment F, Fact Sheet, as follows:

> The Regional Water Board determined that the cities of Signal Hill and Downey, the five upper San Gabriel River cities, and the LACFCD are included as Permittees in this Order. **In making that determination, the Regional Water Board distinguished between the permitting status of those cities and the permitting status of the City of Long Beach at this time because the City of Long Beach has a proven track record in implementing an individual permit and developing a robust monitoring program under that individual permit, as well as in cooperation with other MS4 dischargers on watershed based implementation. While all other incorporated cities with discharges within the coastal watersheds of Los Angeles County, as well as Los Angeles County and the Los Angeles County Flood Control District, are permitted under this Order**, ~~I~~individually tailored permittee requirements are provided in this Order, where appropriate.

[217] Signal Hill is located in the geographical middle of Long Beach and is entirely surrounded by that city.

[218] Los Angeles Water Board, October 15, 2013 Response, p. 25, fn. 78.

III. CONCLUSION

Based on the above discussion, we conclude as follows:

1. Although we are not bound by federal law or state law to require compliance with water quality standards in municipal storm water permits, we will not depart from our prior precedent regarding compliance with water quality standards. The regional water boards shall continue to require compliance with receiving water limitations in municipal storm water permits through incorporation of receiving water limitations provisions consistent with State Water Board Order WQ 99-05.

2. However, we find that municipal storm water dischargers may not be able to achieve water quality standards in the near term and therefore that it is appropriate for municipal storm water permits to incorporate a well-defined, transparent, and finite alternative path to permit compliance that allows MS4 dischargers that are willing to pursue significant undertakings beyond the iterative process to be deemed in compliance with the receiving water limitations.

3. We find that the WMP/EWMP provisions of the Los Angeles MS4 Order, with minor revisions that we incorporate herein, are an appropriate alternative to immediate compliance with receiving water limitations. The WMP/EWMP provisions are ambitious, yet achievable, and include clear and enforceable deadlines for the achievement of receiving water limitations and a rigorous and transparent process for development and implementation of the WMPs/EWMPs.

4. We find that the WMP/EWMP provisions do not violate anti-backsliding requirements.

5. We find that the WMP/EWMP provisions do not violate antidegradation requirements; however, we find that the antidegradation findings made by the Los Angeles Water Board are too cursory and revise those findings consistent with the federal and state antidegradation policies.

6. We find that issuance of time schedule orders is appropriate where a final receiving water limitations deadline set in the WMP/EWMP or a final TMDL-related deadline is not met; however we find that the WMP/EWMP compliance schedule need not otherwise be structured as an enforcement order.

7. We clarify the WMP/EWMP provisions to make it clear that final compliance with receiving water limitations and final WQBELs and other TMDL-specific limitations must be verified through monitoring.

8. We clarify the WMP/EWMP provisions to make it clear that Permittees may request extensions of deadlines incorporated into the WMPs/EWMPs except those final deadlines established in a TMDL. However, any deadline extensions must be approved by the Executive Officer after public review and comment.

9. In order to add greater rigor and accountability to the process of achieving receiving water limitations, we revise the WMP/EWMP provisions to add that the Permittees must comprehensively evaluate new data and information and revise the WMPs/EWMPs, including the supporting reasonable assurance analysis, by June 30, 2021, for approval by the Executive Officer.

10. We find that the storm water retention approach is a promising approach to achieving receiving water limitations, but also find that the Administrative Record does not support a finding that the approach will necessarily lead to achievement of water quality standards in all cases. We revise the WMP/EWMP provisions to clarify that, in the case of implementation of an EWMP with the storm water retention approach, if compliance with a final WQBEL or other TMDL-specific limitation is not in fact achieved in the drainage area, a Permittee will be considered in compliance with the relevant limitation only if the Permittee continues to adaptively manage the EWMP to achieve ultimate compliance with the WQBEL or other TMDL limitation.

11. We find reasonable the WMP/EWMP provisions that allow permittees to be deemed in compliance with receiving water limitations during the planning and development phase of the WMP/EWMP. We revise the WMP/EWMP provisions to state that, if a Permittee fails to meet one of the deadlines, the Permittee may still develop a WMP/EWMP for approval by the Los Angeles Water Board or its Executive Officer; however, the Permittee will not be deemed in compliance with receiving water limitations or WQBELs and other TMDL-specific limitations during the subsequent WMP/EWMP development period.

12. We recognize that the Los Angeles MS4 Order WMP/EWMP compliance path alternative may not be appropriate in all MS4 permits. In order to provide guidance to regional water boards preparing Phase I MS4 permits, we lay out several principles to be followed in drafting receiving water limitations compliance alternatives: Phase I MS4 permits should (1) continue to require compliance with water quality standards in accordance with our Order WQ 99-05; (2) allow compliance with TMDL requirements to constitute compliance with receiving water limitations; (3) provide for a compliance

alternative that allows permittees to achieve compliance with receiving water limitations over a period of time as described above; (4) encourage watershed-based approaches, address multiple contaminants, and incorporate TMDL requirements; (5) encourage the use of green infrastructure and the adoption of low impact development principles; (6) encourage the use of multi-benefit regional projects that capture, infiltrate, and reuse storm water; and (7) require rigor, accountability, and transparency in identification and prioritization of issues in the watershed, in proposal and implementation of control measures, in monitoring of water quality, and in adaptive management of the program. We expect the regional water boards to follow these principles unless the regional water board makes a specific showing that application of a given principle is not appropriate for region-specific or permit-specific reasons.

13. We recognize that the success of the WMP/EWMP approach depends in large part on the steps that follow adoption of the provisions, including the development and approval of rigorous WMPs/EWMPs and the implementation and appropriate enforcement of the programs once approved. We direct the Los Angeles Water Board to periodically report specific information to the State Water Board regarding implementation of the WMPs/EWMPs, including on-the-ground structural control measures completed, monitoring data evaluating the effectiveness of such measures, control measures proposed to be completed and proposed funding and schedule, trends in receiving water quality related to storm water discharges, and compliance and enforcement data.

14. We find that the Los Angeles Water Board acted in a manner consistent with the law when establishing numeric WQBELs. We further find that the development of numeric WQBELs was a reasonable exercise of the Los Angeles Water Board's policy discretion, given its experience in developing the relevant TMDLs and the significance of storm water impacts in the region. However, we find that numeric WQBELs are not necessarily appropriate in all MS4 permits or for all parameters in any single MS4 permit.

15. We find that the Los Angeles Water Board's choice of BMP-based WQBELs, to be proposed by the Permittee in the WMP/EWMP to address USEPA-established TMDLs was reasonable.

16. We find that the Los Angeles Water Board did not act contrary to federal law when it prohibited the discharge of non-storm water "through the MS4 to receiving water" instead of "into" the MS4. Regardless of the exact wording of the prohibition, the standard that applies to non-storm water is the requirement of "effective prohibition." However, the Los Angeles Water Board also has authority to regulate any dry weather discharges from the MS4s under the applicable TMDLs.

17. We find that the monitoring and reporting provisions of the Los Angeles MS4 Order are consistent with applicable law and reasonable.

18. We find that assigning joint responsibility for commingled discharges that cause exceedances is not contrary to applicable law. Given the size and complexity of the MS4s regulated under the Los Angeles MS4 Order, the joint responsibility regime also constitutes a reasonable policy choice. The Los Angeles MS4 Order specifically allows a permittee to avoid joint responsibility by demonstrating that its commingled discharge is not the source of an exceedance.

19. We find that representation of the Los Angeles Water Board and the Los Angeles Water Board staff by the same attorneys in the proceedings to adopt the Los Angeles MS4 Order was lawful and reasonable.

20. We find that the Los Angeles Water Board acted in a manner consistent with applicable law and reasonably when it issued a system-wide permit that included Signal Hill.

Addressing the water quality impacts of municipal storm water is a complex and difficult undertaking, requiring innovative approaches and significant investment of resources. We recognize and appreciate the commendable effort of the Los Angeles Water Board to come up with a workable and collaborative solution to the difficult technical, policy, and legal issues, as well as the demonstrated commitment of many of the area's MS4 dischargers and of the environmental community to work with the Los Angeles Water Board in the development and implementation of the proposed solution. We also recognize the extensive work that interested persons from across the state, including CASQA, have invested in assisting us in understanding how the watershed-based alternative compliance approach developed by the Los Angeles Water Board may inform statewide approaches to addressing achievement of water quality requirements. While storm water poses an immediate water quality problem, we believe that a rigorous and transparent watershed-based approach that emphasizes low impact development, green infrastructure, multi-benefit projects, and capture, infiltration, and reuse of storm water is

a promising long-term approach to addressing the complex issues involved. We must balance requirements for and enforcement of immediate, but often incomplete, solutions with allowing enough time and leeway for dischargers to invest in infrastructure that will provide for a more reliable trajectory away from storm water-caused pollution and degradation. We believe that the Los Angeles MS4 Order, with the revisions we have made, strikes that balance at this stage in our storm water programs, but expect that we will continue to revisit the question of the appropriate balance as the water boards' experience in implementing watershed-based solutions to storm water grows.

IV. ORDER

IT IS HEREBY ORDERED that the Los Angeles MS4 Order is amended as described above in this order. The Los Angeles Water Board is directed to prepare a complete version of the Los Angeles MS4 Order (including any necessary non-substantive conforming corrections), post the conformed Los Angeles MS4 Order on its website, and distribute it as appropriate.

CERTIFICATION

The undersigned, Clerk to the Board, does hereby certify that the foregoing is a full, true, and correct copy of an order duly and regularly adopted at a meeting of the State Water Resources Control Board held June 16, 2015.

AYE:	Chair Felicia Marcus Vice Chair Frances Spivy-Weber Board Member Tam M. Doduc Board Member Steven Moore Board Member Dorene D'Adamo
NAY:	None
ABSENT:	None
ABSTAIN:	None

Jeanine Townsend

Jeanine Townsend
Clerk to the Board

CALIFORNIA Water Boards

EDMUND G. BROWN JR. GOVERNOR

MATTHEW RODRIQUEZ SECRETARY FOR ENVIRONMENTAL PROTECTION

San Diego Regional Water Quality Control Board

October 26, 2015

Via Email Only

In reply refer to / attn:
Place ID 786088:WChiu

Mr. Robert K. Moehling
City Engineer
City of Murrieta
1 Town Square
Murrieta, CA 92562

Mr. Jonathan G. Smith
Public Works Director
City of Menifee
29714 Haun Road
Menifee, CA 92586

Mr. Daniel A. York
Public Works Director/City Engineer
City of Wildomar
23873 Clinton Keith Road, Suite 201
Wildomar, CA 92595

Subject: Regional Water Board Designation for Regulating Municipal Separate Storm Sewer System Discharges in the Cities of Murrieta, Wildomar, and Menifee in Riverside County

Messrs. Moehling, York, and Smith:

This is in response to your separately submitted requests seeking designation of a single Regional Water Board to regulate matters pertaining to Phase I municipal separate storm sewer system (MS4) discharges in the Cities of Murrieta, Wildomar, and Menifee (jointly referred to herein as Cities). The requests were consolidated for review and this letter is being issued in response to all three requests.

As provided in Water Code section 13228(a), this letter constitutes the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) agreement (Agreement) to the Regional Water Board designations specified below.

1. Except as otherwise provided in this Agreement, the Santa Ana Regional Water Quality Control Board (Santa Ana Water Board) is designated to regulate the entire jurisdictional area of the City of Menifee under the Santa Ana Water Board's *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for the Riverside County Flood Control and Water Conservation District, the County of Riverside, and the Incorporated Cities of Riverside within the Santa Ana Region* (Order No. R8-2010-0033, NPDES No. CAS618033, as it may be amended or reissued) (Santa Ana Phase I MS4 Permit), including those areas of the City located within the San Diego Water Board's geographic jurisdiction; *and*

2. Except as otherwise provided in this Agreement, the San Diego Water Board is designated to regulate the entire jurisdictional areas of the City of Murrieta and the City of Wildomar

under the San Diego Water Board's *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds Within the San Diego Region* (Order No. R9-2013-0001, as amended by Order Nos. R9-2015-0001 and R9-2015-0100, NPDES No. CAS0109266, as it may be further amended or reissued) (San Diego Phase I MS4 Permit), including those areas of each City located within the Santa Ana Water Board's geographic jurisdiction.

This Agreement is based upon the written request submitted by each City, factual considerations and other conditions as summarized below. To the extent of any inconsistencies between the terms of this Agreement and the permit provisions implementing the Agreement, the permit provisions shall prevail.

Regional Water Board Designation Request
Written requests for designation of a single Regional Water Board to regulate matters pertaining to permitting of Phase I MS4 discharges were submitted to the San Diego Water Board by the City of Murrieta by letter dated June 22, 2015 (attached hereto as Exhibit 1), the City of Wildomar by letter dated June 23, 2015 (attached hereto as Exhibit 2), and the City of Menifee by letter dated June 25, 2015 (attached hereto as Exhibit 3). The City of Murrieta and the City of Wildomar requested designation of the San Diego Water Board, and the City of Menifee requested designation of the Santa Ana Water Board. Water Code section 13228 specifies the circumstances that allow, and the process for, designation of a single Regional Water Board as the sole regulatory entity for any matter which may be submitted to more than one Regional Water Board.

Factual Considerations
The Cities each lay partially within the geographic jurisdictional boundaries of the San Diego Water Board and the Santa Ana Water Board. Phase I MS4 discharges in the Cities of Murrieta and Wildomar, including areas within the Santa Ana Region, are currently regulated by the San Diego Water Board under Order No. R9-2010-0016. Phase I MS4 discharges in the City of Menifee, including areas within the San Diego Region, are currently regulated by the Santa Ana Water Board under Order No. R8-2010-0033.

The Santa Ana Water Board and San Diego Water Board establish generally consistent requirements for MS4 dischargers. However due to the unique nature of watersheds and water quality issues in the San Diego Region and Santa Ana Region, MS4 permit requirements between the two Regional Water Boards may also vary to address region specific pollutant discharges and watershed conditions. The Cities report that requiring management and implementation of municipal programs to comply with two different MS4 permits would create a significant administrative and financial burden that would not contribute to greater overall water quality improvements with the respective City.

The San Diego Water Board is scheduled to hold a public hearing on November 18, 2015 to consider adoption of Tentative Order No. R9-2015-0100, *An Order Amending Order No. R9-2013-0001 as amended by Order No. R9-2015-0001, NPDES No. CAS0109266, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Tentative Order). The Tentative Order proposes to amend the San Diego Phase I MS4 Permit for a variety of reasons including incorporation of the Riverside County Flood Control and Water Conservation District, the County of Riverside, and the Cities of Murrieta, Temecula, and Wildomar as MS4 dischargers responsible for compliance

with the terms and the conditions of the San Diego Phase I MS4 Permit. The Tentative Order also proposes limited permit provisions addressing Regional Water Board designation to consolidate regulation of the Cities of Murrieta, Wildomar, and Menifee pursuant to Water Code section 13228, in accordance with the terms of this Agreement.

The Santa Ana Water Board is currently in the process of reissuing the Santa Ana Phase I MS4 Permit. The Santa Ana Water Board has not yet released a draft of the Santa Ana Phase I MS4 Permit for public comment, and expects to hold a hearing to consider adoption of the Santa Ana Phase I MS4 Permit in 2016.

San Diego Water Board Conditions for Regional Water Board Designation

This Agreement is conditional upon the following:

1. **Effective Date.** The effective date of this agreement is the effective date of the amended San Diego Phase I MS4 Permit, currently scheduled for a public hearing on November 18, 2015. Phase I MS4 discharges in the Cities of Murrieta and Wildomar, including areas within the Santa Ana Region, will be regulated by the San Diego Water Board under Order No. R9-2013-0001, as amended by Order Nos. R9-2015-0001 and R9-2015-0100 (as it may be amended or reissued) upon the effective date of the amended San Diego Phase I MS4 Permit, except for the regulation of provisions related to the implementation of any applicable Total Maximum Daily Load (TMDL) as provided below. Phase I MS4 discharges in the City of Menifee, including areas within the San Diego Region, are regulated by the Santa Ana Water Board under Order No. R8-2010-0033 (as it may be amended or reissued) and will continue to be regulated by the Santa Ana Water Board upon the effective date of the amended San Diego Phase I MS4 Permit, except for the regulation of provisions related to the implementation of any applicable Total Maximum Daily Load (TMDL) as provided below.

2. **Applicability of Designation.** Except as otherwise provided herein, this Agreement enables each City to be regulated under a single Phase I MS4 Permit.

3. **Conformance with Written Request.** Upon the effective date of this Agreement, each City shall implement the water quality protection measures described in its written request for designation and attached as Exhibits 1, 2 and 3 hereto and as reflected in the San Diego and Santa Ana Phase I MS4 Permits. These water quality protection measures are incorporated by reference into this Agreement as if fully stated herein. The conditions of this Agreement shall supersede any conflicting provisions in the Cities' written requests.

4. **Enforcement Authority.** Each Regional Water Board reserves its right to take any enforcement action against a City, as authorized by law, for any violations of the terms and conditions of the applicable Phase I MS4 Permit which affects that Regional Water Board pursuant to Water Code section 13228(b). Responsibility for undertaking enforcement to compel compliance with permit conditions will generally be assumed by the Regional Water Board that issued the Phase I MS4 Permit.

5. **Total Maximum Daily Load Requirements for the City of Murrieta or the City of Wildomar.** The Santa Ana Water Board shall continue to regulate the Cities of Wildomar and Murrieta under the Santa Ana Phase I MS4 Permit for the limited purpose of implementing any applicable TMDL. The Cities of Murrieta and Wildomar are expected to continue to participate in the Lake Elsinore and Canyon Lake TMDL Task Force and

continue to implement the approved Comprehensive Nutrient Reduction Plan (Resolution No. R8-2013-0044). The Cities of Murrieta and Wildomar shall also be required to comply with any provisions related to TMDL-implementation contained in the San Diego Phase I MS4 Permit.

6. **Total Maximum Daily Load Requirements for the City of Menifee.** Any TMDL and associated Phase I MS4 permit requirements issued by the San Diego Water Board and applicable to the City of Menifee will be incorporated into the appropriate Phase I MS4 permit by reference and remain applicable. The San Diego Water Board shall continue to regulate the City of Menifee under the San Diego Phase I MS4 Permit for the limited purpose of implementing any applicable TMDL. The City of Menifee shall also be required to comply with any provisions related to TMDL-implementation contained in the Santa Ana Phase I MS4 Permit.

7. **Construction Site Storm Water Program.** Construction sites in the Cities regulated under the statewide *General Permit for Construction Discharges of Storm Water Associated with Construction Activities,* Order No. 2009-0009-DWQ and any subsequent reissuance (Construction General Storm Water Permit) will continue to be subject to regulation by the San Diego Water Board or the Santa Ana Water Board as determined by the geographical jurisdictional area of each Regional Water Board. The Santa Ana Water Board will notify the San Diego Water Board of any incidents of noncompliance discovered during inspections of construction sites within its geographic jurisdictional boundary that discharge into an MS4 owned or operated by the City of Murrieta or the City of Wildomar. The San Diego Water Board will notify the Santa Ana Water Board of any incidents of noncompliance discovered during inspections of construction sites within its geographic jurisdictional boundary that discharge into an MS4 owned or operated by the City of Menifee.

8. **Industrial Site Storm Water Program.** Industrial sites in the Cities subject to regulation under the statewide *General Permit for Storm Water Discharges Associated with Industrial Activities,* Order No. 2014-0057-DWQ and any subsequent reissuance (Industrial General Storm Water Permit) will continue to be subject to regulation by the San Diego Water Board or the Santa Ana Water Board as determined by the geographical jurisdictional area of each Regional Water Board. The Santa Ana Water Board will notify the San Diego Water Board of any incidents of noncompliance discovered during inspections of industrial sites within its geographic jurisdictional boundary that discharge into an MS4 owned or operated by the City of Murrieta or the City of Wildomar. The San Diego Water Board will notify the Santa Ana Water Board of any incidents of noncompliance discovered during inspections of industrial sites within its geographic jurisdictional boundary that discharge into an MS4 owned or operated by the City of Menifee.

9. **Municipal Construction Projects.** For all municipal construction projects, including those projects located within the jurisdictional area of the Santa Ana Water Board, the City of Murrieta and the City of Wildomar will submit Permit Registration Documents (PRDs) in the form of a Notice of Intent (NOI) with appropriate fees in accordance with the manner prescribed in the statewide Construction General Storm Water Permit. For all municipal construction projects, including those projects located within the jurisdictional area of the San Diego Water Board, the City of Menifee will use the process established by the Santa Ana Water Board for obtaining coverage under the Construction General Storm Water Permit.

10. **Water Quality Improvement Plan.** The San Diego Phase I MS4 Permit requires responsible agencies within designated Watershed Management Areas to develop and implement a Water Quality Improvement Plan. The Water Quality Improvement Plan is a comprehensive watershed plan that identifies priority water quality conditions, water quality improvement goals, pollutant control strategies, and implementation schedules to achieve the goals. The requirements of TMDLs adopted by the San Diego Water Board have been incorporated into the requirements of the Water Quality Improvement Plan allowing the City of Menifee and the other responsible agencies within the Santa Margarita River Watershed Management Area to develop a single plan to coordinate their non-storm water and storm water runoff management programs. The City of Menifee is required to participate in the development and implementation of the Water Quality Improvement Plan for the Santa Margarita River Watershed Management Area.

11. **Citizen Complaints.** Citizen complaints received regarding discharges from municipal, construction, industrial, and commercial sites to MS4s within the jurisdiction of the City of Murrieta or the City of Wildomar will be referred to the San Diego Water Board for review. Citizen complaints received regarding discharges from municipal, construction, industrial, and commercial sites to MS4s within the City of Menifee will be referred to the Santa Ana Water Board for review.

12. **Annual Reports.** Annual Reports prepared by each City pursuant to its Phase I MS4 Permit requirements shall be a single report encompassing the entire geographic jurisdictional area of the City, using the format prescribed in the applicable Phase I MS4 Permit. The Annual Reports shall be submitted to the Regional Water Board that issued the applicable Phase I MS4 NPDES Permit.

13. **Periodic Review of Agreement.** The basis supporting the Cities of Murrieta, Wildomar, and Menifee's requests to designate a single Regional Water Board for regulatory oversight may change under future conditions and circumstances. Therefore the San Diego Water Board will periodically review the effectiveness of this Agreement during each Phase I MS4 Permit reissuance. Based on this periodic review the San Diego Water Board may terminate the Agreement with the Santa Ana Water Board or otherwise modify the Agreement subject to the approval of the Santa Ana Water Board.

Please send any written correspondence in response to this letter to SanDiego@waterboards.ca.gov. These electronic documents must be submitted as a single file, in Portable Document Format (PDF) format, and converted to text searchable format using Optical Character Recognition (OCR). All electronic documents must also include scanned copies of all signature pages; electronic signatures will not be accepted. Electronic documents submitted to the San Diego Water Board must include the following identification numbers in the header or subject line **Place ID 786088:WChiu**.

For questions or comments, please contact Wayne Chiu by phone at (619) 521-3354 or by email at Wayne.Chiu@waterboards.ca.gov.

Respectfully,

DAVID W. GIBSON
Executive Officer

DWG:dtb:cgh:law:wc

Enclosures: Exhibit 1: City of Murrieta, June 22, 2015 Written Request
Exhibit 2: City of Wildomar, June 23, 2015 Written Request
Exhibit 3: City of Menifee, June 25, 2015 Written Request

cc: Kurt Berchtold, Executive Officer, Santa Ana Water Board

Tech Staff Info & Use	
Tentative Order No.	R9-2015-0100 (amending R9-2013-0001)
NPDES No.	CAS0109266
CIWQS PIN	CW-768088 (Regional MS4 Permit) CW-749045 (Riverside County Copermittees) CW-214653 (Murrieta) CW-762396 (Wildomar) CW-792120 (Menifee)

Exhibit 1

City of Murrieta
June 22, 2015 Written Request

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CITY OF MURRIETA

June 22, 2015

Mr. Kurt Berchtold
Executive Officer
California Regional Water Quality
Control Board - Santa Ana Region
3737 Main Street, Suite 500
Riverside, CA 92501-3339

Mr. David W. Gibson
Executive Officer
California Regional Water Quality
Control Board – San Diego Region
2375 Northside Drive, Suite 100
San Diego, CA 92108

Dear Messrs. Berchtold and Gibson:

Re: Request for Designating the San Diego Regional Board as Regulating Discharges from MS4 owned by the City of Murrieta

The City of Murrieta is located within southwestern Riverside County, and covers an area of approximately 33.6 square miles. While the city is located primarily within the Santa Margarita Watershed and therefore is under the jurisdiction of the San Diego Regional Board, approximately 0.58 square miles (or 1.7%) of the city extends into the Santa Ana Watershed which is under the jurisdiction of the Santa Ana Regional Board. Attached for your reference is a map of the city, overlaid with the jurisdictional boundary between the two Regional Boards. Because of this situation, the city is subject to two Municipal Separate Storm Sewer System (MS4) Permits issued by the respective Regional Boards.

Pursuant to discussions with staff at both Regional Boards and consistent with California Water Code section 13228, the City of Murrieta hereby requests that the Santa Ana Regional Board designate the San Diego Regional Board for regulation of all portions of the city, regardless of Regional Board jurisdictional boundaries, for matters pertaining to MS4 permitting.

The remainder of this letter contains a discussion of the basis for this request; a description of the understood limitations of this designation; a description of the additional portion of the city that, pursuant to this designation, would be regulated by the San Diego Regional Board, and any other associated requests.

1 Town Square • Murrieta, California 92562
phone: 951.304.CITY (2489) • fax: 951.698.4509 • web: murrieta.org

Mr. Kurt Berchtold
Santa Ana Regional Water Quality Control Board
Mr. David W. Gibson
San Diego Regional Water Quality Control Board
Re: Request for Area Exchange

Basis for the request

The City is currently a named permittee on order R8-2010-0033 issued by the Santa Ana Regional Board (Santa Ana Permit), and order R9-2010-0016 with the San Diego Regional Board (San Diego Permit) – both of which are currently up for renewal. While having the same goal of reducing the discharge of pollutants from the MS4 system, these two orders include requirements that accomplish that goal in different ways. As a result, programs designed to be in compliance with the Santa Ana Permit are similar, but necessarily different than programs designed for compliance with the San Diego Permit. When this situation is applied within a single city, such as the City of Murrieta, having two differing programs creates significant confusion among both city staff and the public, which can lead to inefficient and inconsistent implementation of the programs and less effective protection of water quality. Additionally, and no less significant, there is a duplicative administrative and financial burden that is inherent in complying with two MS4 permits: two sets of programs have to be developed; staff have to be trained to two sets of requirements, and at differing frequencies; business inspections must inspect for and track different information, at differing frequencies; two sets of annual reports have to be created, with each report being required to include different information; etc.

The purpose of the City's request is to reduce the aforementioned complexity to allow for the more effective and focused utilization of the City's resources to the benefit of water quality.

Understood Limitations

This request by the City of Murrieta is made with the understanding that:

- For the purposes of MS4 permitting only, the San Diego Regional Board would regulate the entirety of the City of Murrieta. As a result, the City of Murrieta would be subject to a single MS4 permit, which would be issued by the San Diego Regional Board.
- Enforcement of any provisions of the MS4 permit issued to the City of Murrieta would be performed by the San Diego Regional Board.
- Any TMDLs and associated MS4 permit requirements issued by the Santa Ana Regional Board, which include the City of Murrieta as a responsible party, will be incorporated into the MS4 permit issued by the San Diego Regional Board by reference, including reference to any associated provisions, findings or elements of the fact sheet.
- Enforcement of any TMDL will remain with the Regional Board that has jurisdiction over the targeted impaired water body.
- Other Waste Discharge Requirements, or other Orders issued or enforced by the San Diego Regional Board would remain wholly under the jurisdiction of the San Diego Regional Board.

June 22, 2015

Mr. Kurt Berchtold
Santa Ana Regional Water Quality Control Board
Mr. David W. Gibson
San Diego Regional Water Quality Control Board
Re: Request for Area Exchange

Description of the area of the City subject to the designation:

Some facts about the City of Murrieta and the portion within the jurisdiction of the Santa Ana Regional Board are described below. Also enclosed with this letter is a map of the City with the subject area highlighted.

- Total Area of the city = 33.6 square miles
- Area within the Santa Ana Region Watershed = 0.58 square miles (or 375 acres)
- Percent of City in the Santa Ana Region Watershed = 1.7%

In conclusion, the requested designation of regulatory authority to the San Diego Regional Board will not only reduce the complexity and administrative burden upon the City of Murrieta, but will allow the City to better focus and effectively utilize their available resources to the best benefit to water quality in both regions.

If you have any questions regarding this request, please contact Robert K. Moehling at 951-304-2489.

Very truly yours,

Robert K. Moehling
City Engineer
CITY OF MURRIETA

Attachments:

Map of the City of Murrieta

cc:

Bill Woolsey, City of Murrieta
James Ozouf, City of Murrieta
Stuart McKibbin, Riverside County Flood Control
Scott Bruckner, Riverside County Flood Control

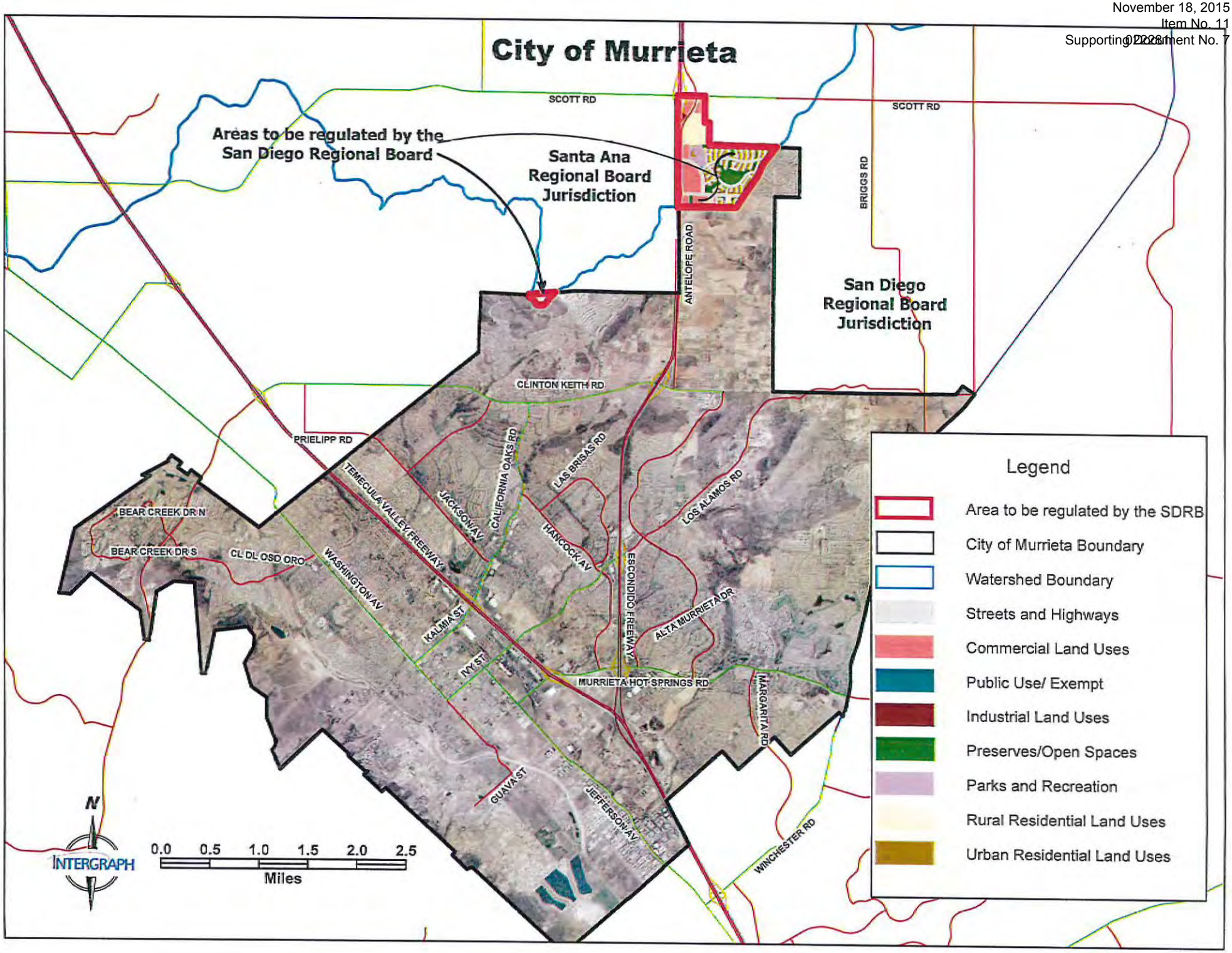
City of Murrieta
Areas to be regulated by the San Diego Regional Board
Santa Ana Regional Board Jurisdiction
San Diego Regional Board Jurisdiction
SCOTT RD
SCOTT RD
BRIGGS RD
ANTELOPE ROAD
CLINTON KEITH RD
PRIELIPP RD
TEMECULA VALLEY FREEWAY
JACKSON AV
CALIFORNIA OAKS RD
LAS BRISAS RD
HANCOCK AV
ESCONDIDO FREEWAY
LOS ALAMOS RD
ALTA MURRIETA DR
MURRIETA HOT SPRINGS RD
MARGARITA RD
WINCHESTER RD
JEFFERSON AV
GUAVA ST
IVY ST
KALMIA ST
WASHINGTON AV
CL DL OSO ORO
BEAR CREEK DR N
BEAR CREEK DR S
Legend
Area to be regulated by the SDRB
City of Murrieta Boundary
Watershed Boundary
Streets and Highways
Commercial Land Uses
Public Use/ Exempt
Industrial Land Uses
Preserves/Open Spaces
Parks and Recreation
Rural Residential Land Uses
Urban Residential Land Uses
N
INTERGRAPH
0.0 0.5 1.0 1.5 2.0 2.5
Miles

Exhibit 2

City of Wildomar
June 23, 2015 Written Request

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Ben Benoit, Mayor
Bridgette Moore, Mayor Pro Tem
Timothy Walker, Council Member
Bob Cashman, Council Member
Marsha Swanson, Council Member

23873 Clinton Keith Rd, Suite 201
Wildomar, CA 92595
951/677-7751 Phone
951/698-1463 Fax
www.CityofWildomar.org

June 23, 2015

Mr. Kurt Berchtold
Executive Officer
California Regional Water Quality
Control Board - Santa Ana Region
3737 Main Street, Suite 500
Riverside, CA 92501-3339

Mr. David W. Gibson
Executive Officer
California Regional Water Quality
Control Board – San Diego Region
2375 Northside Drive, Suite 100
San Diego, CA 92108

Re: Request for Designating the San Diego Regional Board as Regulating Discharges from MS4 owned by the City of Wildomar

Dear Messrs. Berchtold and Gibson:

The City of Wildomar is located within southwestern Riverside County, and covers an area of approximately 24 square miles. While the city is located primarily within the Santa Margarita Watershed and therefore is under the jurisdiction of the San Diego Regional Board, approximately 5,000 acres (or 33%) of the city extends into the Santa Ana Watershed which is under the jurisdiction of the Santa Ana Regional Board. Attached for your reference is a map of the city, overlaid with the jurisdictional boundary between the two Regional Boards. Because of this situation, the city is subject to two Municipal Separate Storm Sewer System (MS4) Permits issued by the respective Regional Boards.

Pursuant to discussions with staff at both Regional Boards and consistent with California Water Code section 13228, the City of Wildomar hereby requests that the Santa Ana Regional Board designate the San Diego Regional Board for regulation of all portions of the city, regardless of Regional Board jurisdictional boundaries, for matters pertaining to MS4 permitting.

The remainder of this letter contains a discussion of the basis for this request; a description of the understood limitations of this designation; a description of the additional portion of the city that, pursuant to this designation, would be regulated by the San Diego Regional Board, and any other associated requests.

Basis for the request

The City is currently a named permittee on order R8-2010-0033 issued by the Santa Ana Regional Board (Santa Ana Permit) and order R9-2010-0016 with the San Diego Regional Board (San Diego Permit) – both of which are currently up for renewal. While having the same goal of reducing the discharge of pollutants from the MS4 system, these two orders include requirements that accomplish that goal in different ways. As a result, programs designed to be in compliance with the Santa Ana Permit are similar, but necessarily different than programs designed for compliance with the San Diego Permit. When this situation is applied within a single city, such as the City of Wildomar, having two differing programs creates significant confusion among both city staff and the public, which can lead to inefficient and inconsistent implementation of the programs and less effective protection of water quality. Additionally, and no less significant, there is a duplicative administrative and financial burden that is inherent in complying with two MS4 permits: two sets of programs have to be developed; staff have to be trained to two sets of requirements, and at differing frequencies; business inspections must inspect for and track different information, at differing frequencies; two sets of annual reports have to be created, with each report being required to include different information; etc.

The purpose of the City's request is to reduce the aforementioned complexity to allow for the more effective and focused utilization of the City's resources to the benefit of water quality.

Understood Limitations

This request by the City of Wildomar is made with the understanding that:

- For the purposes of MS4 permitting only, the San Diego Regional Board would regulate the entirety of the City of Wildomar. As a result, the City of Wildomar would be subject to a single MS4 permit, which would be issued by the San Diego Regional Board.
- Enforcement of any provisions of the MS4 permit issued to the City of Wildomar would be performed by the San Diego Regional Board.
- Any TMDLs and associated MS4 permit requirements issued by the Santa Ana Regional Board, which include the City of Wildomar as a responsible party, will be incorporated into the MS4 permit issued by the San Diego Regional Board by reference, including reference to any associated provisions, findings or elements of the fact sheet.
- Enforcement of any TMDL will remain with the Regional Board that has jurisdiction over the targeted impaired water body.
- Other Waste Discharge Requirements, or other Orders issued or enforced by the Santa Ana Regional Board would remain wholly under the jurisdiction of the Santa Ana Regional Board.

Description of the area of the City subject to the designation:

Some facts about the City of Wildomar and the portion within the jurisdiction of the Santa Ana Regional Board are described below. Also enclosed with this letter is a map of the City with the subject area highlighted.

- Total Area of the city = 24 square miles
- Area within the Santa Ana Region Watershed = 7.8 square miles
- Percent of City in the Santa Ana Region Watershed = 33%

In conclusion, the requested designation of regulatory authority to the San Diego Regional Board will not only reduce the complexity and administrative burden upon the City of Wildomar, but will allow the City to better focus and effectively utilize their available resources to the best benefit to water quality in both regions.

If you have any questions regarding this request, please contact Matt Bennett at 951.677.7751 x208.

Very truly yours,

Daniel A. York
Assistant City Manager
Public Works Director/City Engineer
City of Wildomar

Attachments:

Map of the City of Wildomar

ec: Matt Bennett, City of Wildomar
Scott Bruckner, Riverside County Flood Control
Stuart McKibbin, Riverside County Flood Control
Wayne Chiu, California Regional Water Quality Control Board San Diego Region

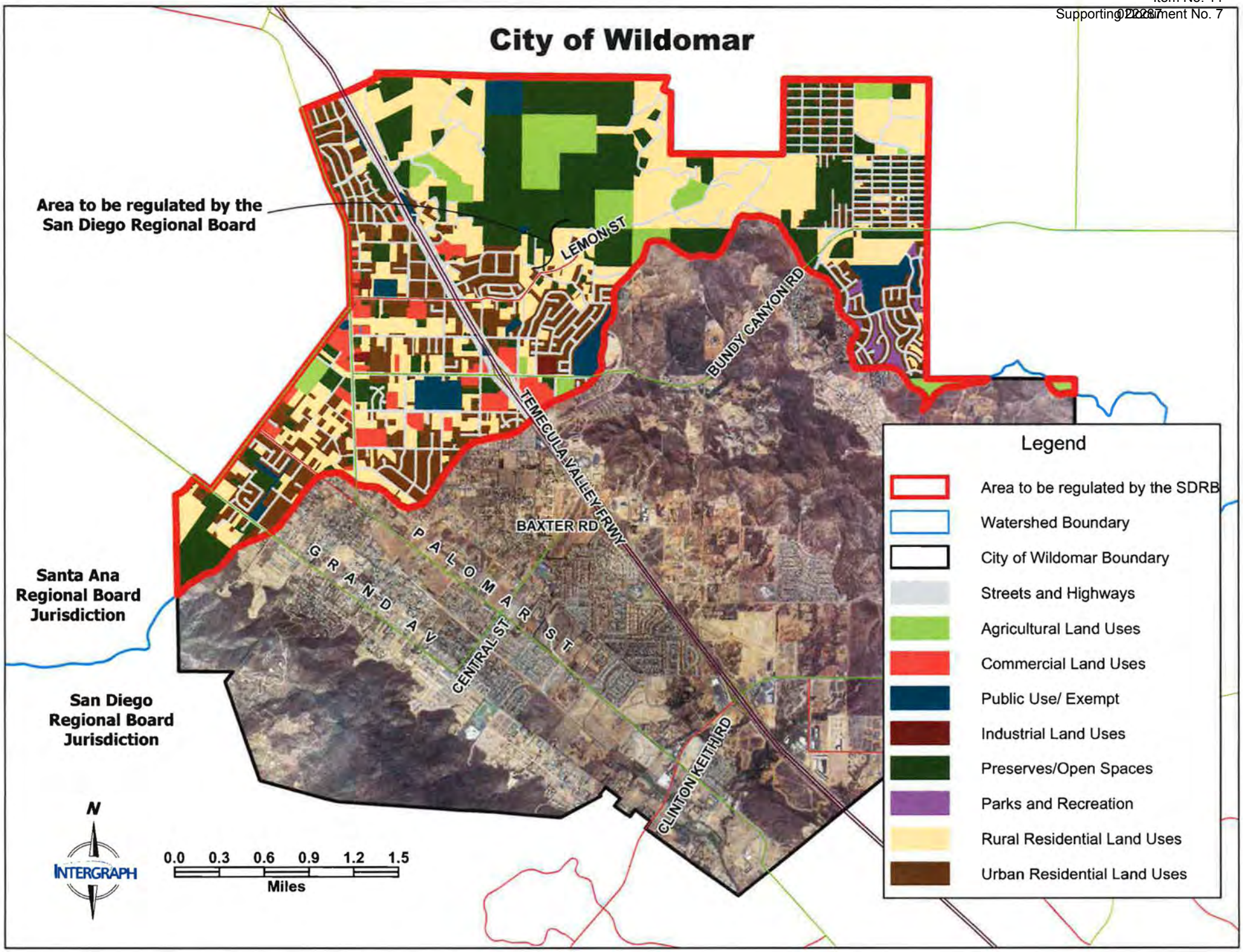
City of Wildomar
Area to be regulated by the San Diego Regional Board
Santa Ana Regional Board Jurisdiction
San Diego Regional Board Jurisdiction
LEMON ST
BUNDY CANYON RD
TEMECULA VALLEY FRWY
BAXTER RD
GRAND AV
PALOMAR ST
CENTRAL ST
CLINTON KEITH RD
N
INTERGRAPH
0.0 0.3 0.6 0.9 1.2 1.5
Miles
Legend
Area to be regulated by the SDRB
Watershed Boundary
City of Wildomar Boundary
Streets and Highways
Agricultural Land Uses
Commercial Land Uses
Public Use/ Exempt
Industrial Land Uses
Preserves/Open Spaces
Parks and Recreation
Rural Residential Land Uses
Urban Residential Land Uses

Exhibit 3

City of Menifee

June 25, 2015 Written Request

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Scott A. Mann
Mayor

John V. Denver
Mayor Pro Tem

Wallace W. Edgerton
Councilmember

Greg August
Councilmember

Matthew Liesemeyer
Councilmember

29714 Haun Road
Menifee, CA 92586
Phone 951.672.6777
Fax 951.676.3843
www.cityofmenifee.us

June 25, 2015

Mr. Kurt Berchtold
Executive Officer
California Regional Water Quality
Control Board - Santa Ana Region
3737 Main Street, Suite 500
Riverside, CA 92501-3339

Mr. David W. Gibson
Executive Officer
California Regional Water Quality
Control Board – San Diego Region
2375 Northside Drive, Suite 100
San Diego, CA 92108

Dear Messrs. Berchtold and Gibson:

Re: Request for Designating the Santa Ana Regional Board as Regulating Discharges from MS4 owned by the City of Menifee

The City of Menifee is located within southwestern Riverside County, and covers an area of approximately 47 square miles. While the city is located primarily within the Santa Ana Watershed and therefore is under the jurisdiction of the Santa Ana Regional Board, approximately 737acres (or 2.5%) of the city extends into the Santa Margarita Watershed which is under the jurisdiction of the San Diego Regional Board. Attached for your reference is a map of the city, overlaid with the jurisdictional boundary between the two Regional Boards. Because of this situation, the city is subject to two Municipal Separate Storm Sewer System (MS4) Permits issued by the respective Regional Boards.

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Pursuant to discussions with staff at both Regional Boards and consistent with California Water Code section 13228, the City of Menifee hereby requests that the San Diego Regional Board designate the Santa Ana Regional Board for regulation of all portions of the city, regardless of Regional Board jurisdictional boundaries, for matters pertaining to MS4 permitting.

The remainder of this letter contains a discussion of the basis for this request; a description of the understood limitations of this designation; a description of the additional portion of the city that, pursuant to this designation, would be regulated by the Santa Ana Regional Board, and any other associated requests.

Basis for the request

The City is currently a named permittee on order R8-2010-0033 issued by the Santa Ana Regional Board (Santa Ana Permit), and order R9-2010-0016 with the San Diego Regional Board (San Diego Permit) - which is currently up for renewal. While having the same goal of reducing the discharge of pollutants from the MS4 system, these two orders include requirements that accomplish that goal in different ways. As a result, programs designed to be in compliance with the Santa Ana Permit are similar, but necessarily different than programs designed for compliance with the San Diego Permit. When this situation is applied within a single city, such as the City of Menifee, having two differing programs creates significant confusion among both city staff and the public, which can lead to inefficient and inconsistent implementation of the programs and less effective protection of water quality. Additionally, and no less significant, there is a duplicative administrative and financial burden that is inherent in complying with two MS4 permits: two sets of programs have to be developed; staff have to be trained to two sets of requirements, and at differing frequencies; business inspections must inspect for and track different information, at differing frequencies; two sets of annual reports have to be created, with each report being required to include different information; etc.

The purpose of the City's request is to reduce the aforementioned complexity to allow for the more effective and focused utilization of the City's resources to the benefit of water quality.

Understood Limitations

This request by the City of Menifee is made with the understanding that:

- For the purposes of MS4 permitting only, the Santa Ana Regional Board would regulate the entirety of the City of Menifee. As a result, the City of Menifee would be subject to a single MS4 permit, which would be issued by the Santa Ana Regional Board.
- Enforcement of any provisions of the MS4 permit issued to the City of Menifee would be performed by the Santa Ana Regional Board.
- Any TMDLs and associated MS4 permit requirements issued by the San Diego Regional Board, which include the City of Menifee as a responsible party, will be incorporated into the MS4 permit issued by the Santa Ana Regional Board by reference, including reference to any associated provisions, findings or elements of the fact sheet.
- Enforcement of any TMDL will remain with the Regional Board that has jurisdiction over the targeted impaired water body.
- Other Waste Discharge Requirements, or other Orders issued or enforced by the San Diego Regional Board would remain wholly under the jurisdiction of the San Diego Regional Board.

Description of the area of the City subject to the designation:

Some facts about the City of Menifee and the portion within the jurisdiction of the San Diego Regional Board are described below. Also enclosed with this letter is a map of the City with the subject area highlighted.

- Total Area of the city = 47 square miles
- Area within the Santa Margarita Region Watershed = 1.15 square miles
- Percent of City in the Santa Margarita Region Watershed = 2.5%

Other Requests:

Understanding that the requested designation applies to the MS4 permit requirements, the Santa Ana Permit incorporates a simplified process in section XIV.G.1. for applying for coverage under the General Construction Permit (Order 2009-0009-DWQ) for municipal projects. This process includes submission of the NOI or Permit Registration Documents (PRDs) directly to the Executive Officer, and waived application fees. To avoid unnecessary confusion among staff, and potential for inadvertent non-compliance, the City of Menifee specifically requests that this portion of the MS4 permit would be applicable within the entire City, including those portions of the city within the jurisdiction of the San Diego Regional Board.

In conclusion, the requested designation of regulatory authority to the Santa Ana Regional Board will not only reduce the complexity and administrative burden upon the City of Menifee, but will allow the City to better focus and effectively utilize their available resources to the best benefit to water quality in both regions.

If you have any questions regarding this request, please contact Nino Abad at 951.672.6777.

Very truly yours,

JONTHAN G SMITH, PE
PUBLIC WORKS DIRECTOR
CITY OF MENIFEE

Attachments:

Map of the City of Menifee

ec:

Nino Abad, City of Menifee

Stuart McKibbin, Riverside County Flood Control

Julianna Gonzalez, Riverside County Flood Control

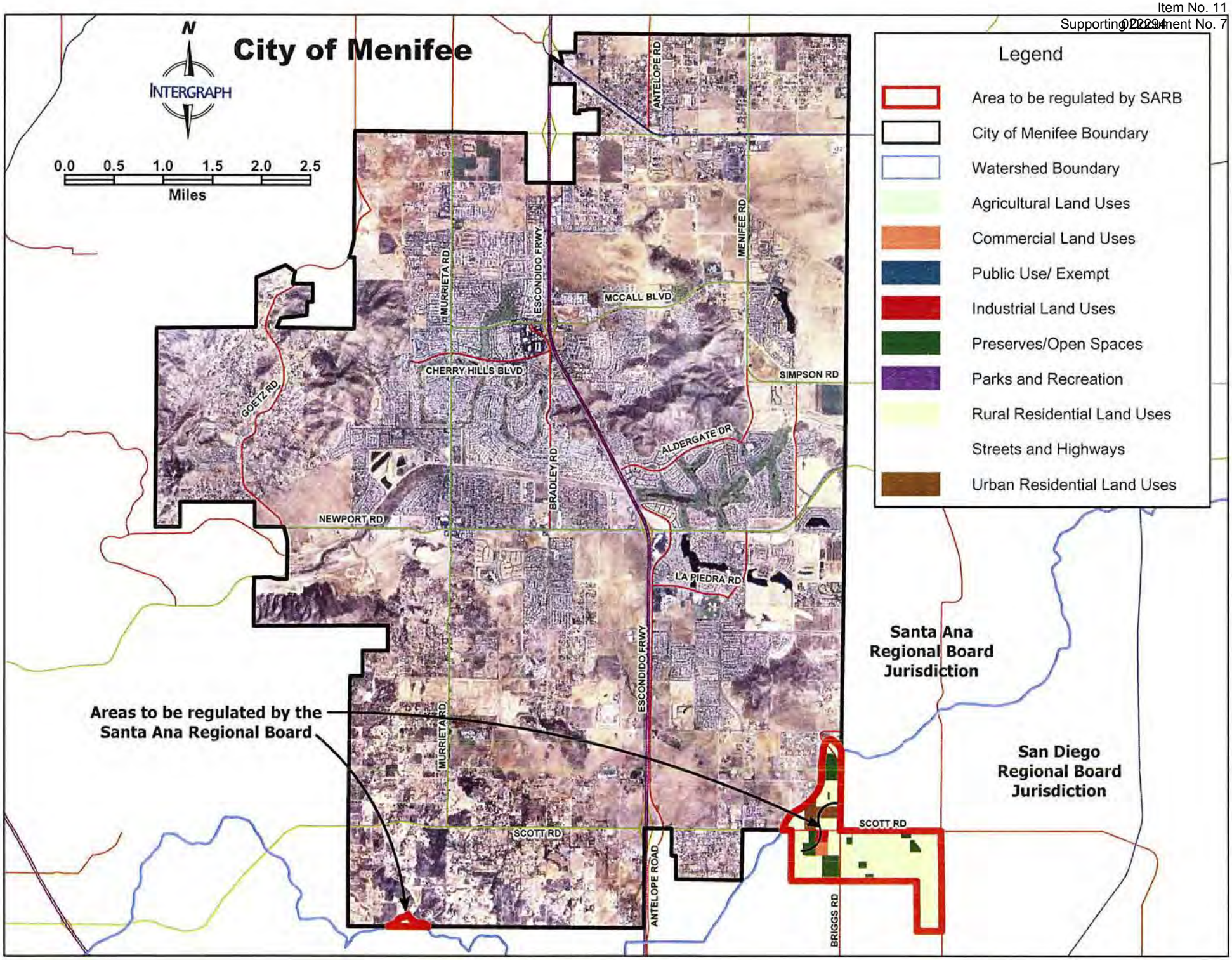
City of Menifee
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Miles
Legend
Area to be regulated by SARB
City of Menifee Boundary
Watershed Boundary
Agricultural Land Uses
Commercial Land Uses
Public Use/ Exempt
Industrial Land Uses
Preserves/Open Spaces
Parks and Recreation
Rural Residential Land Uses
Streets and Highways
Urban Residential Land Uses
ANTELOPE RD
MENIFEE RD
MURRIETA RD
ESCONDIDO FRWY
MCCALL BLVD
CHERRY HILLS BLVD
SIMPSON RD
GOETZ RD
ALDERGATE DR
BRADLEY RD
NEWPORT RD
LA PIEDRA RD
Santa Ana Regional Board Jurisdiction
San Diego Regional Board Jurisdiction
Areas to be regulated by the Santa Ana Regional Board
SCOTT RD
ANTELOPE ROAD
BRIGGS RD

CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

Santa Ana Regional Water Quality Control Board

October 26, 2015

Via Email Only

Mr. Robert K. Moehling
City Engineer
City of Murrieta
1 Town Square
Murrieta, CA 92562
bmoehling@murrieta.org

Mr. Daniel A. York
Public Works Director/City Engineer
City of Wildomar
23873 Clinton Keith Road, Suite 201
Wildomar, CA 92595
dyork@cityofwildomar.org

Mr. Jonathan G. Smith
Public Works Director
City of Menifee
29714 Haun Road
Menifee, CA 92586
jsmith@cityofmenifee.us

Regional Water Board Designation for Regulating Municipal Separate Storm Sewer System Discharges in the Cities of Murrieta (Place ID 792058), Wildomar (Place ID 792079), and Menifee (Place ID 792120) in Riverside County

Messrs. Moehling, York, and Smith:

This is in response to your separately submitted requests seeking designation of a single Regional Water Board to regulate matters pertaining to Phase I municipal separate storm sewer system (MS4) discharges in the Cities of Murrieta, Wildomar, and Menifee (jointly referred to herein as Cities). The requests were consolidated for review and this letter is being issued in response to all three requests.

As provided in Water Code section 13228(a), this letter constitutes the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board) agreement (Agreement) to the Regional Water Board designations specified below.

1. Except as otherwise provided in this Agreement, the Santa Ana Regional Water Quality Control Board (Santa Ana Water Board) is designated to regulate the entire jurisdictional area of the City of Menifee under the Santa Ana Water Board's *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for the Riverside County Flood Control and Water Conservation District, the County of Riverside, and the Incorporated Cities of Riverside within the Santa Ana Region* (Order No. R8-2010-0033, NPDES No. CAS618033, as it may be

amended or reissued) (Santa Ana Phase I MS4 Permit), including those areas of the City located within the San Diego Water Board's geographic jurisdiction; *and*

2. Except as otherwise provided in this Agreement, the San Diego Water Board is designated to regulate the entire jurisdictional areas of the City of Murrieta and the City of Wildomar under San Diego Water Board's *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds Within the San Diego Region* (Order No. R9-2013-0001, as amended by Order Nos. R9-2015-0001 R9-2015-0100, NPDES No. CAS0109266, as it may be further amended or reissued) (San Diego Phase I MS4 Permit), including those areas of each City located within the Santa Ana Water Board's geographic jurisdiction.

This Agreement is based upon the written request submitted by each City, factual considerations and other conditions as summarized below. If there are any inconsistencies between the terms of this Agreement and the permit provisions implementing the Agreement, the permit provisions shall prevail.

Regional Water Board Designation Request
Written requests for designation of a single Regional Water Board to regulate matters pertaining to permitting of Phase I MS4 discharges were submitted to the Santa Ana Water Board by the City of Murrieta by letter dated June 22, 2015 (attached hereto as Exhibit 1), the City of Wildomar by letter dated June 23, 2015 (attached hereto as Exhibit 2), and the City of Menifee by letter dated June 25, 2015 (attached hereto as Exhibit 3). The City of Murrieta and the City of Wildomar requested designation of the San Diego Water Board, and the City of Menifee requested designation of the Santa Ana Water Board. Water Code section 13228 specifies the circumstances that allow, and the process for, designation of a single Regional Water Board as the sole regulatory entity for any matter which may be submitted to more than one Regional Water Board.

Factual Considerations
The Cities each lay partially within the geographic jurisdictional boundaries of the San Diego Water Board and the Santa Ana Water Board. Phase I MS4 discharges in the Cities of Murrieta and Wildomar, including areas within the Santa Ana Region, are currently regulated by the San Diego Water Board under Order No. R9-2010-0016. Phase I MS4 discharges in the City of Menifee, including areas within the San Diego Region, are currently regulated by the San Ana Water Board under Order No. R9-2010-0033.

The Santa Ana Water Board and San Diego Water Board establish generally consistent requirements for MS4 dischargers. However due to the unique nature of watersheds and water quality issues in the San Diego Region and Santa Ana Region, MS4 permit requirements between the two Regional Water Boards may also vary to address region specific pollutant discharges and watershed conditions. The Cities report that requiring

management and implementation of municipal programs to comply with two different MS4 permits would create a significant administrative and financial burden that would not contribute to greater overall water quality improvements with the respective City.

The San Diego Water Board is scheduled to hold a public hearing on November 18, 2015 to consider adoption of Tentative Order No. R9-2015-0100, *An Order Amending Order No. R9-2013-0001 as amended by Order No. R9-2015-0001, NPDES No. CAS0109266, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Tentative Order). The Tentative Order proposes to amend the San Diego Phase I MS4 Permit for a variety of reasons including incorporation of the Riverside County Flood Control and Water Conservation District, the County of Riverside, and the Cities of Murrieta, Temecula, and Wildomar as MS4 dischargers responsible for compliance with the terms and the conditions of the San Diego Phase I MS4 Permit. The Tentative Order also proposes limited permit provisions addressing Regional Water Board designation to consolidate regulation of the Cities of Murrieta, Wildomar, and Menifee pursuant to Water Code section 13228, in accordance with the terms of this Agreement.

The Santa Ana Water Board is currently in the process of reissuing the Santa Ana Phase I MS4 Permit. The Santa Ana Water Board has not yet released a draft of the Santa Ana Phase I MS4 Permit for public comment, and expects to hold a hearing to consider adoption of the Santa Ana Phase I MS4 Permit in 2016.

Santa Ana Water Board Conditions for Regional Water Board Designation

This Agreement is conditional upon the following:

1. **Effective Date.** The effective date of this agreement is the effective date of the amended San Diego Phase I MS4 Permit, currently scheduled for a public hearing on November 18, 2015. Phase I MS4 discharges in the Cities of Murrieta and Wildomar, including areas within the Santa Ana Region, will be regulated by the San Diego Water Board under Order No. R9-2013-0001, as amended by Order Nos. R9-2015-0001 and R9-2015-0100 (as it may be amended or reissued) upon the effective date of the amended San Diego Phase I MS4 Permit, except for the regulation of provisions related to the implementation of any applicable Total Maximum Daily Load (TMDL) as provided below. Phase I MS4 discharges in the City of Menifee, including areas within the San Diego Region, are regulated by the Santa Ana Water Board under Order No. R8-2010-0033 (as it may be amended or reissued) and will continue to be regulated by the Santa Ana Water Board upon the effective date of the amended San Diego Phase I MS4 Permit, except for the regulation of provisions related to the implementation of any applicable Total Maximum Daily Load (TMDL) as provided below.

2. **Applicability of Designation.** Except as otherwise provided herein, this Agreement enables each City to be regulated under a single Phase I MS4 Permit.

3. **Conformance with Written Request.** Upon the effective date of this Agreement, each City shall implement the water quality protection measures described in its written request for designation and attached as Exhibits 1, 2 and 3 hereto and as reflected in the San Diego and Santa Ana Phase I Permits. These water quality protection measures are incorporated by reference into this Agreement as if fully stated herein. The conditions of this Agreement shall supersede any conflicting provisions in the Cities' written requests.

4. **Enforcement Authority.** Each Regional Water Board reserves its right to take any enforcement action against a City, as authorized by law, for any violations of the terms and conditions of the applicable Phase I MS4 Permit which affects that Regional Water Board pursuant to Water Code section 13228(b). Responsibility for undertaking enforcement to compel compliance with permit conditions will generally be assumed by the Regional Water Board that issued the Phase I MS4 Permit.

5. **Total Maximum Daily Load Requirements for the City of Murrieta or the City of Wildomar.** The Santa Ana Water Board shall continue to regulate the Cities of Wildomar and Murrieta under the Santa Ana Phase I MS4 Permit for the limited purpose of implementing any applicable TMDL. The Cities of Murrieta and Wildomar are expected to continue to participate in the Lake Elsinore and Canyon Lake TMDL Task Force and continue to implement the approved Comprehensive Nutrient Reduction Plan (R8-2013-0044). The Cities of Murrieta and Wildomar shall also be required to comply with any provisions related to TMDL - implementation contained in the San Diego Phase I MS4 Permit.

6. **Total Maximum Daily Load Requirements for the City of Menifee.** The San Diego Water Board shall continue to regulate the City of Menifee under the San Diego Phase I MS4 Permit for the limited purpose of implementing any applicable TMDL. The City of Menifee shall also be required to comply with any provisions related to TMDL - implementation contained in the Santa Ana Phase I MS4 Permit.

7. **Construction Site Storm Water Program.** Construction sites in the Cities regulated under the statewide *General Permit for Construction Discharges of Storm Water Associated with Construction Activities,* Order No. 2009-0009-DWQ and any subsequent reissuance (Construction General Storm Water Permit) will continue to be subject to regulation by the San Diego Water Board or the Santa Ana Water Board as determined by the geographical jurisdictional area of each Regional Water Board. The Santa Ana Water Board will notify the San Diego Water Board of any incidents of noncompliance discovered during inspections of construction sites within its geographic jurisdictional boundary that discharge into an MS4 owned or operated by the City of Murrieta or the City of Wildomar. The San Diego Water Board will notify the Santa Ana Water Board of any incidents of noncompliance discovered during inspections of construction sites within its geographic jurisdictional boundary that discharge into an MS4 owned or operated by the City of Menifee.

8. **Industrial Site Storm Water Program.** Industrial sites in the Cities subject to regulation under the statewide *General Permit for Storm Water Discharges Associated with Industrial Activities,* Order No. 2014-0057-DWQ and any subsequent reissuance (Industrial General Storm Water Permit) will continue to be subject to regulation by the San Diego Water Board or the Santa Ana Water Board as determined by the geographical jurisdictional area of each Regional Water Board. The Santa Ana Water Board will notify the San Diego Water Board of any incidents of noncompliance discovered during inspections of industrial sites within its geographic jurisdictional boundary that discharge into an MS4 owned or operated by the City of Murrieta or the City of Wildomar. The San Diego Water Board will notify the Santa Ana Water Board of any incidents of noncompliance discovered during inspections of industrial sites within its geographic jurisdictional boundary that discharge into an MS4 owned or operated by the City of Menifee.

9. **Municipal Construction Projects.** For all municipal construction projects, including those projects located within the jurisdictional area of the Santa Ana Water Board, the City of Murrieta and the City of Wildomar will submit Permit Registration Documents (PRDs) in the form of a Notice of Intent (NOI) with appropriate fees in accordance with the manner prescribed in the statewide Construction General Storm Water Permit. For all municipal construction projects, including those projects located within the jurisdictional area of the San Diego Water Board, the City of Menifee will use the process established by the Santa Ana Water Board for obtaining coverage under the Construction General Storm Water Permit.

10. **Water Quality Improvement Plan.** The San Diego Phase I MS4 Permit requires responsible agencies within designated Watershed Management Areas to develop and implement a Water Quality Improvement Plan. The Water Quality Improvement Plan is a comprehensive watershed plan that identifies priority water quality conditions, water quality improvement goals, pollutant control strategies, and implementation schedules to achieve the goals. The requirements of TMDLs adopted by the San Diego Water Board have been incorporated into the requirements of the Water Quality Improvement Plan allowing the City of Menifee and the other responsible agencies within the Santa Margarita River Watershed Management Area to develop a single plan to coordinate their non-storm water and storm water runoff management programs. The City of Menifee is required participate in the development and implementation of the Water Quality Improvement Plan for the Santa Margarita River Watershed Management Area.

11. **Citizen Complaints.** Citizen complaints received regarding discharges from municipal, construction, industrial, and commercial sites to MS4s within the jurisdiction of the City of Murrieta or the City of Wildomar will be referred to the San Diego Water Board for review. Citizen complaints received regarding discharges from municipal, construction, industrial, and commercial sites to MS4s within the City of Menifee will be referred to the Santa Ana Water Board for review.

12. **Annual Reports.** Annual Reports prepared by each City pursuant to its Phase I MS4 Permit requirements shall be a single report encompassing the entire geographic jurisdictional area of the City, using the format prescribed in the applicable Phase I MS4 Permit. The Annual Reports shall be submitted to the Regional Water Board that issued the applicable Phase I MS4 NPDES Permit.

13. **Periodic Review of Agreement.** The basis supporting the Cities of Murrieta, Wildomar, and Menifee's requests to designate a single Regional Water Board for regulatory oversight may change under future conditions and circumstances. Therefore the Santa Ana Water Board will periodically review the effectiveness of this Agreement during each Phase I MS4 Permit reissuance. Based on this periodic review the Santa Ana Water Board may terminate the Agreement with the San Diego Water Board or otherwise modify the Agreement subject to the approval of the San Diego Water Board.

Please send any written correspondence in response to this letter to SantaAna@waterboards.ca.gov. These electronic documents must be submitted as a single file, in Portable Document Format (PDF) format, and converted to text searchable format using Optical Character Recognition (OCR). All electronic documents must also include scanned copies of all signature pages; electronic signatures will not be accepted. Electronic documents submitted to the San Diego Water Board must include the appropriate Place ID identification numbers in the header or subject line related to the City(ies) in question Murrieta (Place ID 792058), Wildomar (Place ID 792079), and Menifee (Place ID 792120).

For questions or comments, please contact Keith L. Elliott by phone at (951) 782-4925 or by email at kelliott@waterboards.ca.gov.

Respectfully,

Kurt V. Berchtold
Executive Officer
Santa Ana Regional Water Quality Control Board

cc: David W. Gibson, Executive Officer, San Diego Water Board

Exhibit 1
City of Murrieta

CITY OF MURRIETA

June 22, 2015

Mr. Kurt Berchtold
Executive Officer
California Regional Water Quality
Control Board - Santa Ana Region
3737 Main Street, Suite 500
Riverside, CA 92501-3339

Mr. David W. Gibson
Executive Officer
California Regional Water Quality
Control Board – San Diego Region
2375 Northside Drive, Suite 100
San Diego, CA 92108

Dear Messrs. Berchtold and Gibson:

Re: Request for Designating the San Diego Regional Board as Regulating Discharges from MS4 owned by the City of Murrieta

The City of Murrieta is located within southwestern Riverside County, and covers an area of approximately 33.6 square miles. While the city is located primarily within the Santa Margarita Watershed and therefore is under the jurisdiction of the San Diego Regional Board, approximately 0.58 square miles (or 1.7%) of the city extends into the Santa Ana Watershed which is under the jurisdiction of the Santa Ana Regional Board. Attached for your reference is a map of the city, overlaid with the jurisdictional boundary between the two Regional Boards. Because of this situation, the city is subject to two Municipal Separate Storm Sewer System (MS4) Permits issued by the respective Regional Boards.

Pursuant to discussions with staff at both Regional Boards and consistent with California Water Code section 13228, the City of Murrieta hereby requests that the Santa Ana Regional Board designate the San Diego Regional Board for regulation of all portions of the city, regardless of Regional Board jurisdictional boundaries, for matters pertaining to MS4 permitting.

The remainder of this letter contains a discussion of the basis for this request; a description of the understood limitations of this designation; a description of the additional portion of the city that, pursuant to this designation, would be regulated by the San Diego Regional Board, and any other associated requests.

1 Town Square • Murrieta, California 92562
phone: 951.304.CITY (2489) • fax: 951.698.4509 • web: murrieta.org

 June 22, 2015

Mr. Kurt Berchtold
Santa Ana Regional Water Quality Control Board
Mr. David W. Gibson
San Diego Regional Water Quality Control Board
Re: Request for Area Exchange

Basis for the request

The City is currently a named permittee on order R8-2010-0033 issued by the Santa Ana Regional Board (Santa Ana Permit), and order R9-2010-0016 with the San Diego Regional Board (San Diego Permit) – both of which are currently up for renewal. While having the same goal of reducing the discharge of pollutants from the MS4 system, these two orders include requirements that accomplish that goal in different ways. As a result, programs designed to be in compliance with the Santa Ana Permit are similar, but necessarily different than programs designed for compliance with the San Diego Permit. When this situation is applied within a single city, such as the City of Murrieta, having two differing programs creates significant confusion among both city staff and the public, which can lead to inefficient and inconsistent implementation of the programs and less effective protection of water quality. Additionally, and no less significant, there is a duplicative administrative and financial burden that is inherent in complying with two MS4 permits: two sets of programs have to be developed; staff have to be trained to two sets of requirements, and at differing frequencies; business inspections must inspect for and track different information, at differing frequencies; two sets of annual reports have to be created, with each report being required to include different information; etc.

The purpose of the City's request is to reduce the aforementioned complexity to allow for the more effective and focused utilization of the City's resources to the benefit of water quality.

Understood Limitations

This request by the City of Murrieta is made with the understanding that:

- For the purposes of MS4 permitting only, the San Diego Regional Board would regulate the entirety of the City of Murrieta. As a result, the City of Murrieta would be subject to a single MS4 permit, which would be issued by the San Diego Regional Board.
- Enforcement of any provisions of the MS4 permit issued to the City of Murrieta would be performed by the San Diego Regional Board.
- Any TMDLs and associated MS4 permit requirements issued by the Santa Ana Regional Board, which include the City of Murrieta as a responsible party, will be incorporated into the MS4 permit issued by the San Diego Regional Board by reference, including reference to any associated provisions, findings or elements of the fact sheet.
- Enforcement of any TMDL will remain with the Regional Board that has jurisdiction over the targeted impaired water body.
- Other Waste Discharge Requirements, or other Orders issued or enforced by the San Diego Regional Board would remain wholly under the jurisdiction of the San Diego Regional Board.

June 22, 2015

Mr. Kurt Berchtold
Santa Ana Regional Water Quality Control Board
Mr. David W. Gibson
San Diego Regional Water Quality Control Board
Re: Request for Area Exchange

Description of the area of the City subject to the designation:

Some facts about the City of Murrieta and the portion within the jurisdiction of the Santa Ana Regional Board are described below. Also enclosed with this letter is a map of the City with the subject area highlighted.

- Total Area of the city = 33.6 square miles
- Area within the Santa Ana Region Watershed = 0.58 square miles (or 375 acres)
- Percent of City in the Santa Ana Region Watershed = 1.7%

In conclusion, the requested designation of regulatory authority to the San Diego Regional Board will not only reduce the complexity and administrative burden upon the City of Murrieta, but will allow the City to better focus and effectively utilize their available resources to the best benefit to water quality in both regions.

If you have any questions regarding this request, please contact Robert K. Moehling at 951-304-2489.

Very truly yours,

Robert K. Moehling
City Engineer
CITY OF MURRIETA

Attachments:

Map of the City of Murrieta

cc:
Bill Woolsey, City of Murrieta
James Ozouf, City of Murrieta
Stuart McKibbin, Riverside County Flood Control
Scott Bruckner, Riverside County Flood Control

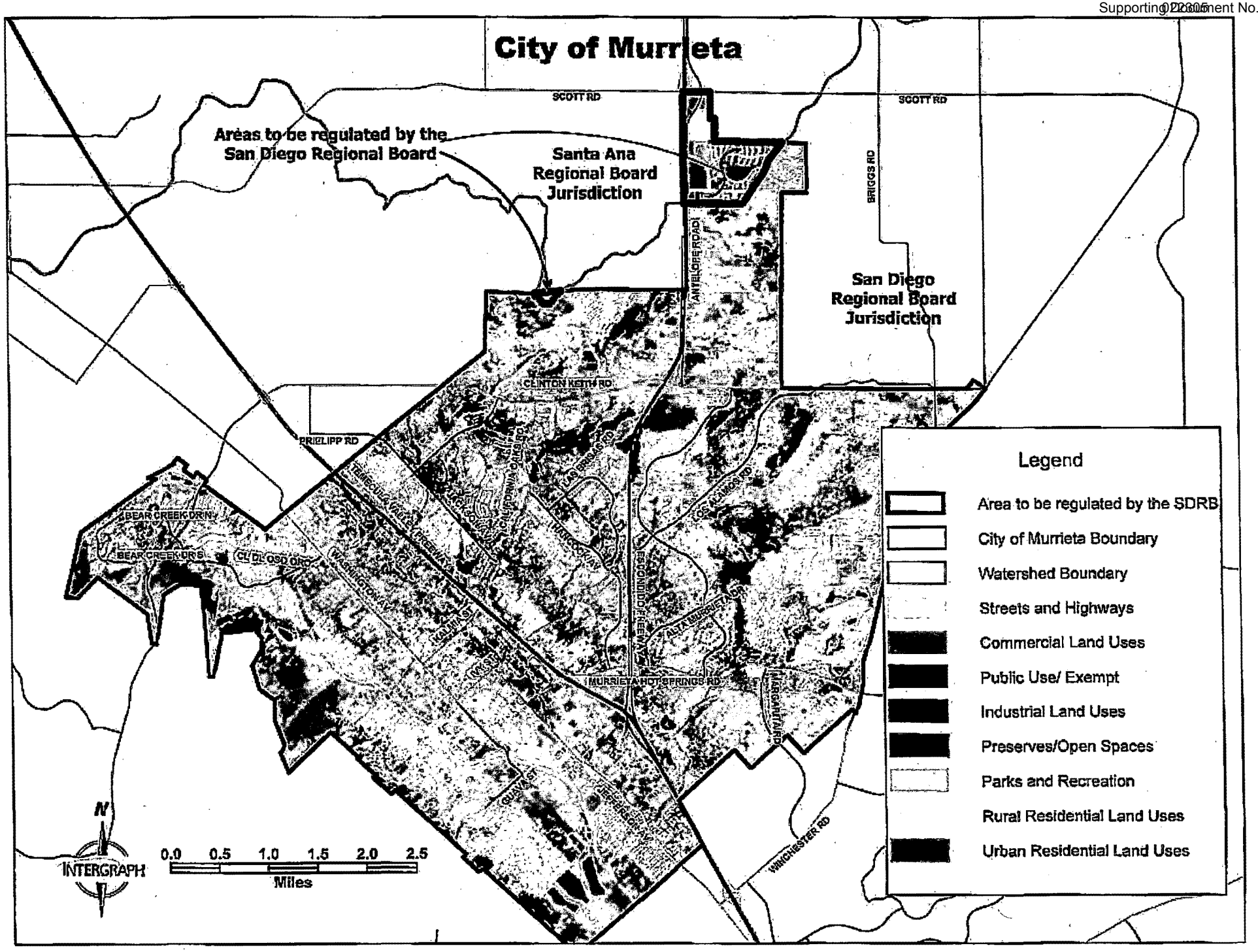
City of Murrieta
Areas to be regulated by the San Diego Regional Board
Santa Ana Regional Board Jurisdiction
San Diego Regional Board Jurisdiction
SCOTT RD
SCOTT RD
BRIGGS RD
MANTELOFF ROAD
CLINTON KEITH RD
PRIELIPP RD
LAS BRISAS RD
LOS ALAMOS RD
WASHINGTON AVE
TEMECULA VALLEY FREEWAY
CALIFORNIA OAKS RD
BEAR CREEK DR N
BEAR CREEK DR S
EL DORADO DR
KALMIA ST
MURRIETA HOT SPRINGS RD
ALTA MURRIETA RD
MARGARITA RD
WINCHESTER RD
N
INTERGRAPH
0.0 0.5 1.0 1.5 2.0 2.5
Miles
Legend
Area to be regulated by the SDRB
City of Murrieta Boundary
Watershed Boundary
Streets and Highways
Commercial Land Uses
Public Use/ Exempt
Industrial Land Uses
Preserves/Open Spaces
Parks and Recreation
Rural Residential Land Uses
Urban Residential Land Uses

Exhibit 2
City of Wildomar

Ben Benoit, Mayor
Bridgette Moore, Mayor Pro Tem
Timothy Walker, Council Member
Bob Cashman, Council Member
Marsha Swanson, Council Member

23873 Clinton Keith Rd, Suite 201
Wildomar, CA 92595
951/677-7751 Phone
951/698-1463 Fax
www.CityofWildomar.org

June 23, 2015

Mr. Kurt Berchtold
Executive Officer
California Regional Water Quality
Control Board - Santa Ana Region
3737 Main Street, Suite 500
Riverside, CA 92501-3339

Mr. David W. Gibson
Executive Officer
California Regional Water Quality
Control Board – San Diego Region
2375 Northside Drive, Suite 100
San Diego, CA 92108

Re: Request for Designating the San Diego Regional Board as Regulating Discharges from MS4 owned by the City of Wildomar

Dear Messrs. Berchtold and Gibson:

The City of Wildomar is located within southwestern Riverside County, and covers an area of approximately 24 square miles. While the city is located primarily within the Santa Margarita Watershed and therefore is under the jurisdiction of the San Diego Regional Board, approximately 5,000 acres (or 33%) of the city extends into the Santa Ana Watershed which is under the jurisdiction of the Santa Ana Regional Board. Attached for your reference is a map of the city, overlaid with the jurisdictional boundary between the two Regional Boards. Because of this situation, the city is subject to two Municipal Separate Storm Sewer System (MS4) Permits issued by the respective Regional Boards.

Pursuant to discussions with staff at both Regional Boards and consistent with California Water Code section 13228, the City of Wildomar hereby requests that the Santa Ana Regional Board designate the San Diego Regional Board for regulation of all portions of the city, regardless of Regional Board jurisdictional boundaries, for matters pertaining to MS4 permitting.

The remainder of this letter contains a discussion of the basis for this request; a description of the understood limitations of this designation; a description of the additional portion of the city that, pursuant to this designation, would be regulated by the San Diego Regional Board, and any other associated requests.

Basis for the request

The City is currently a named permittee on order R8-2010-0033 issued by the Santa Ana Regional Board (Santa Ana Permit) and order R9-2010-0016 with the San Diego Regional Board (San Diego Permit) – both of which are currently up for renewal. While having the same goal of reducing the discharge of pollutants from the MS4 system, these two orders include requirements that accomplish that goal in different ways. As a result, programs designed to be in compliance with the Santa Ana Permit are similar, but necessarily different than programs designed for compliance with the San Diego Permit. When this situation is applied within a single city, such as the City of Wildomar, having two differing programs creates significant confusion among both city staff and the public, which can lead to inefficient and inconsistent implementation of the programs and less effective protection of water quality. Additionally, and no less significant, there is a duplicative administrative and financial burden that is inherent in complying with two MS4 permits: two sets of programs have to be developed; staff have to be trained to two sets of requirements, and at differing frequencies; business inspections must inspect for and track different information, at differing frequencies; two sets of annual reports have to be created, with each report being required to include different information; etc.

The purpose of the City's request is to reduce the aforementioned complexity to allow for the more effective and focused utilization of the City's resources to the benefit of water quality.

Understood Limitations

This request by the City of Wildomar is made with the understanding that:

- For the purposes of MS4 permitting only, the San Diego Regional Board would regulate the entirety of the City of Wildomar. As a result, the City of Wildomar would be subject to a single MS4 permit, which would be issued by the San Diego Regional Board.
- Enforcement of any provisions of the MS4 permit issued to the City of Wildomar would be performed by the San Diego Regional Board.
- Any TMDLs and associated MS4 permit requirements issued by the Santa Ana Regional Board, which include the City of Wildomar as a responsible party, will be incorporated into the MS4 permit issued by the San Diego Regional Board by reference, including reference to any associated provisions, findings or elements of the fact sheet.
- Enforcement of any TMDL will remain with the Regional Board that has jurisdiction over the targeted impaired water body.
- Other Waste Discharge Requirements, or other Orders issued or enforced by the Santa Ana Regional Board would remain wholly under the jurisdiction of the Santa Ana Regional Board.

Description of the area of the City subject to the designation:

Some facts about the City of Wildomar and the portion within the jurisdiction of the Santa Ana Regional Board are described below. Also enclosed with this letter is a map of the City with the subject area highlighted.

- Total Area of the city = 24 square miles
- Area within the Santa Ana Region Watershed = 7.8 square miles
- Percent of City in the Santa Ana Region Watershed = 33%

In conclusion, the requested designation of regulatory authority to the San Diego Regional Board will not only reduce the complexity and administrative burden upon the City of Wildomar, but will allow the City to better focus and effectively utilize their available resources to the best benefit to water quality in both regions.

If you have any questions regarding this request, please contact Matt Bennett at 951.677.7751 x208.

Very truly yours,

Daniel A. York
Assistant City Manager
Public Works Director/City Engineer
City of Wildomar

Attachments:

Map of the City of Wildomar

ec: Matt Bennett, City of Wildomar
Scott Bruckner, Riverside County Flood Control
Stuart McKibbin, Riverside County Flood Control
Wayne Chiu, California Regional Water Quality Control Board San Diego Region

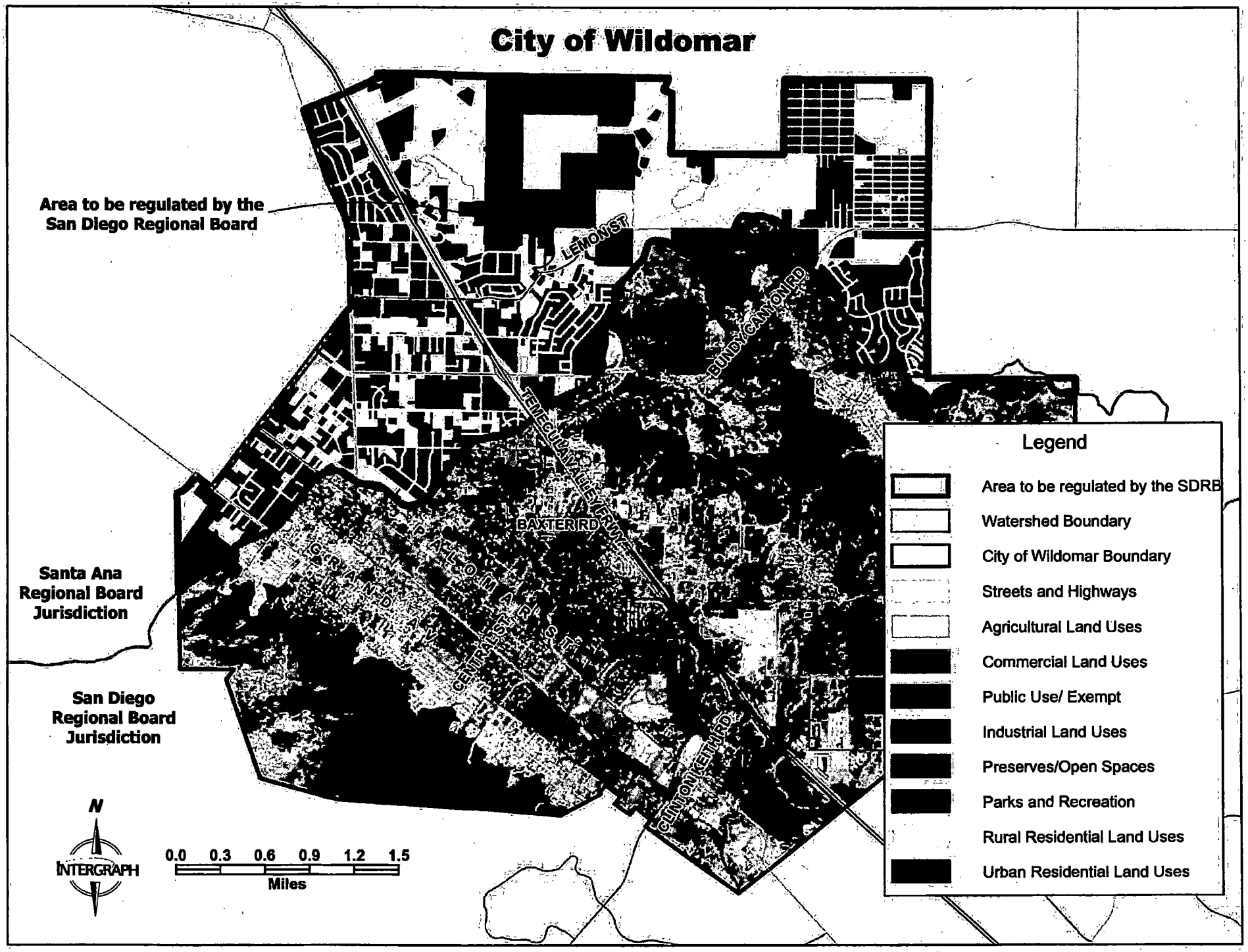
City of Wildomar
Area to be regulated by the San Diego Regional Board
Santa Ana Regional Board Jurisdiction
San Diego Regional Board Jurisdiction
LEMON ST
BUNDY CANYON RD
TEMECULA VALLEY FWY
BAXTER RD
PALOMA RD
GRAND AVE
CENTRAL ST
CLINTON KEITH RD
Legend
Area to be regulated by the SDRB
Watershed Boundary
City of Wildomar Boundary
Streets and Highways
Agricultural Land Uses
Commercial Land Uses
Public Use/ Exempt
Industrial Land Uses
Preserves/Open Spaces
Parks and Recreation
Rural Residential Land Uses
Urban Residential Land Uses
N
INTERGRAPH
0.0 0.3 0.6 0.9 1.2 1.5
Miles

Exhibit 3
City of Menifee

Scott A. Mann
Mayor

John V. Denver
Mayor Pro Tem

Wallace W. Edgerton
Councilmember

Greg August
Councilmember

Matthew Liesemeyer
Councilmember

29714 Haun Road
Menifee, CA 92586
Phone 951.672.6777
Fax 951.676.3843
www.cityofmenifee.us

June 25, 2015

Mr. Kurt Berchtold
Executive Officer
California Regional Water Quality
Control Board - Santa Ana Region
3737 Main Street, Suite 500
Riverside, CA 92501-3339

Mr. David W. Gibson
Executive Officer
California Regional Water Quality
Control Board – San Diego Region
2375 Northside Drive, Suite 100
San Diego, CA 92108

Dear Messrs. Berchtold and Gibson:

Re: Request for Designating the Santa Ana Regional Board as Regulating Discharges from MS4 owned by the City of Menifee

The City of Menifee is located within southwestern Riverside County, and covers an area of approximately 47 square miles. While the city is located primarily within the Santa Ana Watershed and therefore is under the jurisdiction of the Santa Ana Regional Board, approximately 737acres (or 2.5%) of the city extends into the Santa Margarita Watershed which is under the jurisdiction of the San Diego Regional Board. Attached for your reference is a map of the city, overlaid with the jurisdictional boundary between the two Regional Boards. Because of this situation, the city is subject to two Municipal Separate Storm Sewer System (MS4) Permits issued by the respective Regional Boards.

DH# 1981457 6/29/15
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B. Davila Time: 4:19

Pursuant to discussions with staff at both Regional Boards and consistent with California Water Code section 13228, the City of Menifee hereby requests that the San Diego Regional Board designate the Santa Ana Regional Board for regulation of all portions of the city, regardless of Regional Board jurisdictional boundaries, for matters pertaining to MS4 permitting.

The remainder of this letter contains a discussion of the basis for this request; a description of the understood limitations of this designation; a description of the additional portion of the city that, pursuant to this designation, would be regulated by the Santa Ana Regional Board, and any other associated requests.

Basis for the request

The City is currently a named permittee on order R8-2010-0033 issued by the Santa Ana Regional Board (Santa Ana Permit), and order R9-2010-0016 with the San Diego Regional Board (San Diego Permit) - which is currently up for renewal. While having the same goal of reducing the discharge of pollutants from the MS4 system, these two orders include requirements that accomplish that goal in different ways. As a result, programs designed to be in compliance with the Santa Ana Permit are similar, but necessarily different than programs designed for compliance with the San Diego Permit. When this situation is applied within a single city, such as the City of Menifee, having two differing programs creates significant confusion among both city staff and the public, which can lead to inefficient and inconsistent implementation of the programs and less effective protection of water quality. Additionally, and no less significant, there is a duplicative administrative and financial burden that is inherent in complying with two MS4 permits: two sets of programs have to be developed; staff have to be trained to two sets of requirements, and at differing frequencies; business inspections must inspect for and track different information, at differing frequencies; two sets of annual reports have to be created, with each report being required to include different information; etc.

The purpose of the City's request is to reduce the aforementioned complexity to allow for the more effective and focused utilization of the City's resources to the benefit of water quality.

Understood Limitations

This request by the City of Menifee is made with the understanding that:

- For the purposes of MS4 permitting only, the Santa Ana Regional Board would regulate the entirety of the City of Menifee. As a result, the City of Menifee would be subject to a single MS4 permit, which would be issued by the Santa Ana Regional Board.
- Enforcement of any provisions of the MS4 permit issued to the City of Menifee would be performed by the Santa Ana Regional Board.
- Any TMDLs and associated MS4 permit requirements issued by the San Diego Regional Board, which include the City of Menifee as a responsible party, will be incorporated into the MS4 permit issued by the Santa Ana Regional Board by reference, including reference to any associated provisions, findings or elements of the fact sheet.
- Enforcement of any TMDL will remain with the Regional Board that has jurisdiction over the targeted impaired water body.
- Other Waste Discharge Requirements, or other Orders issued or enforced by the San Diego Regional Board would remain wholly under the jurisdiction of the San Diego Regional Board.

Description of the area of the City subject to the designation:

Some facts about the City of Menifee and the portion within the jurisdiction of the San Diego Regional Board are described below. Also enclosed with this letter is a map of the City with the subject area highlighted.

- Total Area of the city = 47 square miles
- Area within the Santa Margarita Region Watershed = 1.15 square miles
- Percent of City in the Santa Margarita Region Watershed = 2.5%

Other Requests:

Understanding that the requested designation applies to the MS4 permit requirements, the Santa Ana Permit incorporates a simplified process in section XIV.G.1. for applying for coverage under the General Construction Permit (Order 2009-0009-DWQ) for municipal projects. This process includes submission of the NOI or Permit Registration Documents (PRDs) directly to the Executive Officer, and waived application fees. To avoid unnecessary confusion among staff, and potential for inadvertent non-compliance, the City of Menifee specifically requests that this portion of the MS4 permit would be applicable within the entire City, including those portions of the city within the jurisdiction of the San Diego Regional Board.

In conclusion, the requested designation of regulatory authority to the Santa Ana Regional Board will not only reduce the complexity and administrative burden upon the City of Menifee, but will allow the City to better focus and effectively utilize their available resources to the best benefit to water quality in both regions.

If you have any questions regarding this request, please contact Nino Abad at 951.672.6777.

Very truly yours,

JONTHAN G SMITH, PE
PUBLIC WORKS DIRECTOR
CITY OF MENIFEE

Attachments:

Map of the City of Menifee

ec:

Nino Abad, City of Menifee

Stuart McKibbin, Riverside County Flood Control

Julianna Gonzalez, Riverside County Flood Control

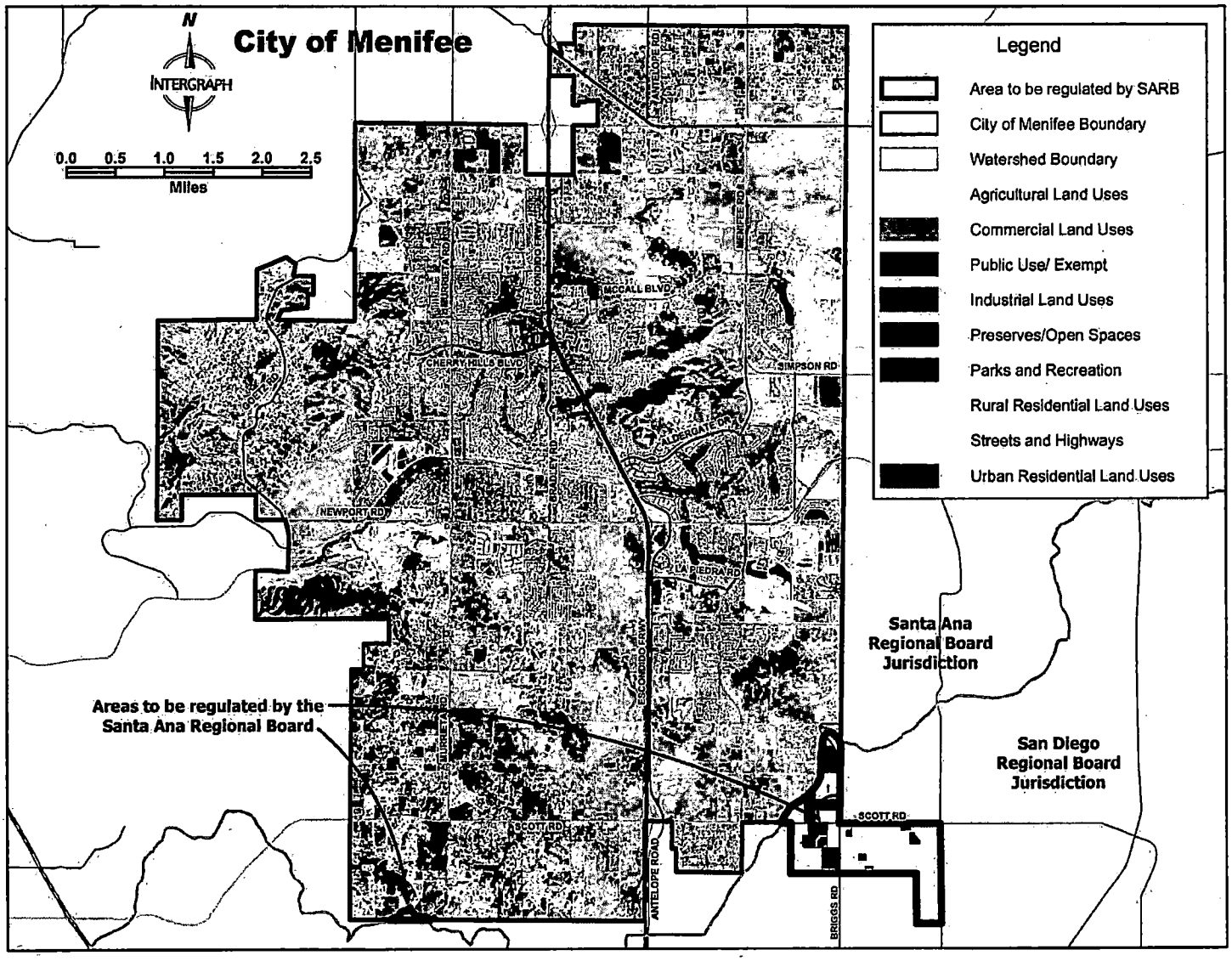
City of Menifee
N
INTERGRAPH
0.0 0.5 1.0 1.5 2.0 2.5
Miles
Legend
Area to be regulated by SARB
City of Menifee Boundary
Watershed Boundary
Agricultural Land Uses
Commercial Land Uses
Public Use/ Exempt
Industrial Land Uses
Preserves/Open Spaces
Parks and Recreation
Rural Residential Land Uses
Streets and Highways
Urban Residential Land Uses
Santa Ana Regional Board Jurisdiction
San Diego Regional Board Jurisdiction
Areas to be regulated by the Santa Ana Regional Board
MCCALL BLVD
CHERRY HILLS BLVD
SIMPSON RD
NEWPORT RD
LA PIEDRA RD
SCOTT RD
ANTELOPE ROAD
BRIGGS RD

Edmund G. Brown Jr.
Governor

Matthew Rodriquez
Secretary for
Environmental Protection

California Regional Water Quality Control Board, San Diego Region

NOTICE OF OPPORTUNITY TO COMMENT AND PUBLIC HEARING

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) is scheduled to hold a public hearing to consider adoption of Tentative Order No. R9-2015-0100 (Tentative Order). The Tentative Order proposes to amend the National Pollutant Discharge Elimination System (NPDES) Permit for *Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region, Order No. R9-2013-0001, as amended by Order No. R9-2015-0001 (Regional MS4 Permit).* Notice is hereby given that the San Diego Water Board will accept written comments on the Tentative Order and proposed changes to the Regional MS4 Permit in accordance with title 40 Code of Federal Regulations (CFR) section 124.10 and Water Code section 13167.5. Notice is also given that the San Diego Water Board will consider adoption of the Tentative Order at a public hearing on November 18, 2015.

The Tentative Order and attachments thereto, are available on the San Diego Water Board website at:
http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

The Tentative Order proposes to amend the Regional MS4 Permit to address a variety of issues including coverage for Copermittees in Riverside County consisting of the County of Riverside, the Riverside County Cities of Murrieta, Temecula, and Wildomar, and the Riverside County Flood Control and Water Conservation District and incorporation of limited permit provisions applicable to the City of Menifiee. If adopted, the Tentative Order will supersede the Riverside County Copermittees' current Fourth Term MS4 Permit, Order No. R9-2010-0016.

All written comments pertaining to the terms and conditions of the Tentative Order to be considered by the San Diego Water Board at the November 18, 2015 public hearing must be received no later than **5:00 p.m. on Monday September 14, 2015**. Written comments must be sent to the San Diego Water Board's office at 2375 Northside Drive, Suite 100, San Diego, CA 92108, faxed to (619) 516-1994, or e-mailed to sandiego@waterboards.ca.gov Attn: Wayne Chiu. Please indicate in the subject line of all written comments "Comment - Tentative Order No. R9-2015-0100, Place ID:786088WChiu." The early submission of written comments on the Tentative Order is encouraged.

The San Diego Water Board will prepare written responses to significant comments that are timely received. Consistent with State Water Resources Control Board regulations that apply to this proceeding, written comments received after 5:00 p.m. on Monday, September 14, 2015 will not be accepted and will not be incorporated into the administrative record if doing so would prejudice any party.

The public hearing on this matter will be held during the San Diego Water Board meeting scheduled for **November 18, 2015 in the Board Room of the San Diego Water Board Office, located at 2375 Northside Drive, San Diego, CA 92108**. The item will be heard during the meeting that starts at 9:00 a.m. The meeting notice and agenda, which will indicate any changes in the meeting location and may provide other specific information concerning this hearing, will be posted at least two weeks prior to the meeting date at http://www.waterboards.ca.gov/sandiego/board_info/agendas/.

Oral testimony at the public hearing will be allowed. The scope of oral testimony at the public hearing will be strictly limited to summarizing the previously submitted written comments, comments on revisions to the Tentative Order made in response to comments, and making policy statements. Oral testimony will be limited in time by the Board Chair.

The procedures governing San Diego Water Board meetings may be found at title 23, California Code of Regulations, section 647, et seq. and are available upon request. The hearing facilities will be accessible to persons with disabilities. The meeting notice and agenda for this meeting will provide contact information for persons requesting special accommodations.

Information related to this matter, including revisions made to the Tentative Order in response to written comments timely submitted, as well as the San Diego Water Board's responses to written comments timely submitted, will be available at the San Diego Water Board's office and the San Diego Water Board's storm water web page in advance of the public hearing. A separate notice will be sent announcing the availability of the revised Tentative Order and the responses to comments upon website posting of the documents.

Please contact Wayne Chiu at (619) 521-3354 or by email at Wayne.Chiu@waterboards.ca.gov for information regarding the above listed proposed permit action. Please bring the foregoing to the attention of any person known to you who would be interested in this matter.

DAVID W. GIBSON
Executive Officer
July 31, 2015

State of California
Regional Water Quality Control Board
San Diego Region

SUPPLEMENTAL
EXECUTIVE OFFICER SUMMARY REPORT
November 18, 2015

ITEM: 11

SUBJECT: NPDES Permit Amendment: An Order to amend Order No. R9-2013-0001, as Amended by Order No. R9-2015-0001, NPDES No. CAS0109266, *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Regional MS4 Permit). The amendment includes, but is not limited to, incorporation of the County of Riverside, the Cities of Murrieta, Temecula, and Wildomar, and the Riverside County Flood Control and Water Conservation District as Copermittees under the Regional MS4 Permit. (Tentative Order No. R9-2015-0100) (*Wayne Chiu and Christina Arias*)

PURPOSE: *To consider adoption of Tentative Order No. R9-2015-0100 to amend Order No. R9-2013-0001, as amended by Order No. R9-2015-0001* **(Supporting Document No. 1)**.

RECOMMENDATION: Adoption of Tentative Order No. R9-2015-0100 (**Supporting Document No. 1**) with revised errata (**Supporting Document No. 13**) is recommended.

DISCUSSION: This Executive Officer Summary Report (EOSR) supplements the EOSR provided for Item 11 of the November 18, 2015 San Diego Water Board meeting.

Supporting Materials from Environmental Groups

Subsequent to the distribution of the agenda package, San Diego Coastkeeper contacted the San Diego Water Board with a request to provide supporting materials that were referenced but inadvertently omitted as part of the September 10, 2015 comment letter submitted by the Environmental Groups (San Diego Coastkeeper, Surfrider Foundation San Diego Chapter, and Coastal Environmental Rights Foundation). The supporting materials include the *Guidelines for Conducting Reasonable Assurance Analysis*

in a Watershed Management Program, Including Enhanced Watershed Management Program and accompanying presentation issued by the Los Angeles Regional Water Quality Control Board (Los Angeles Water Board). The supporting materials are provided as **Supporting Document No. 9**.

Additional Supporting Materials Response to Comment B3c-4

The response to comment B3c-4 in the Responses to Comments Report (**Supporting Document No. 4**) addresses the request from the Copermittees to include compliance with receiving water prohibitions and limitations during the alternative compliance pathway preparation process. In the response, the San Diego Water Board declined to include compliance with receiving water prohibitions and limitations during the alternative compliance pathway preparation process based in part on comments the USEPA submitted to the State Water Resources Control Board (State Water Board) and other Regional Water Quality Control Boards.

The response to comment B3c-4 included links to USEPA letters submitted to the Los Angeles Water Board on January 15, 2014 regarding their City of Long Beach MS4 Permit, the Santa Ana Regional Water Quality Control Board (Santa Ana Water Board) on June 20, 2014 regarding their Orange County MS4 Permit, and the State Water Board on January 20, 2015 regarding the draft of State Water Board Order WQ 2015-0075. San Diego Coastkeeper requested that the response to comment B3c-4 also include a link to a USEPA letter submitted to the Los Angeles Water Board on July 23, 2012 regarding the Los Angeles County MS4 Permit. A link to the July 23, 2012, USEPA letter has been added in response to comment B3c-4. For ease of reference, copies of these four USEPA comment letters are provided as **Supporting Document No. 10**.

Late Comment Letter

The San Diego Water Board also received a comment letter on November 3, 2015 from Safari Highlands Ranch. The comment letter was submitted more than six weeks after the public comment period closing date of September 14, 2015. The comment letter asserts that the requirement in the Regional MS4 Permit for Priority Development Projects to avoid coarse sediment yield areas results in a “total taking of

the land value" from their Safari Highlands Ranch development project.

Though the comment letter was submitted well after the close of the public comment period for the Tentative Order, the letter is being provided to the San Diego Water Board because there is sufficient time for the Board and interested persons to consider the letter in advance of the hearing such that no party is prejudiced by its late submittal. The November 3, 2015 Safari Highlands Ranch comment letter is provided as **Supporting Document No. 11**. The Responses to Comments Report (**Supporting Document No. 4**) has been revised to include a response to this comment.

Revised Responses to Comments and Errata Sheet

As a result of the request from San Diego Coastkeeper and the late comment letter from Safari Highlands Ranch, revisions to the Responses to Comments Report were made.

The response to comment B3c-4 was revised to include a link to the USEPA comment letter submitted to the Los Angeles Water Board on July 23, 2012. Comment E3c2-3 and a response to the comment were added to the Response to Comments Report to respond to the late comment letter from Safari Highlands Ranch. In addition, the San Diego Water Board identified and corrected typographical errors in the responses to comments B3c-7 and B3c-9. The revision to the response to comment B3c-9 also required a revision to the Errata Sheet. The revised Responses to Comments Report is provided as **Supporting Document No. 12**, and the revised Errata Sheet is provided as **Supporting Document No. 13**. The revisions in the revised Responses to Comments Report and revised Errata Sheet are highlighted in yellow.

LEGAL CONCERNS: Responses to legal comments received are included in the revised Response to Comments Report under comments Gnl-10, B3c-3, B3c-5, B3c-7 through B3c-10, and E3c2-3 in **Supporting Document No. 12**.

SUPPORTING DOCUMENTS:

Supporting Document Nos. 1 through 8 previously provided

9. Supporting materials for September 10, 2015 Environmental Groups comment letter

10. USEPA comment letters submitted to:
    a. Los Angeles Water Board on July 23, 2012,
    b. Los Angeles Water Board on January 15, 2014,
    c. Santa Ana Water Board on June 20, 2014, and
    d. State Water Board on January 20, 2015

11. November 3, 2015 Safari Highlands Ranch comment letter

12. Revised San Diego Water Board Response to Comments Report

13. Revised Errata Sheet listing additional changes to the Tentative Order and Attachments

GUIDELINES FOR CONDUCTING REASONABLE ASSURANCE ANALYSIS IN A WATERSHED MANAGEMENT PROGRAM, INCLUDING AN ENHANCED WATERSHED MANAGEMENT PROGRAM

The Regional Board adopted Waste Discharge Requirements for Municipal Separate Storm Sewer System (MS4) Discharges within the Coastal Watersheds of Los Angeles County, Order No. R4-2012-0175 (NPDES Permit No. CAS004001). As required in the permit, Part VI.C.5.b.iv.(5), permittees electing to develop a watershed management program (WMP) or enhanced watershed management program (EWMP) are required to submit a Reasonable Assurance Analysis (RAA) as part of their draft E/WMP to demonstrate that applicable water quality based effluent limitations and receiving water limitations shall be achieved through implementation of the watershed control measures proposed in the E/WMP. This guidance document is prepared to provide information and guidance to assist permittees in development of the RAA. This document provides clarification of the regulatory requirements of the RAA along with recommended criteria for the permittees to follow to prepare an appropriate RAA for Regional Board approval.

A. APPLICABLE INTERIM AND FINAL REQUIREMENTS:

Per Part VI.C.5.a of the permit, and based on an evaluation of existing water quality conditions, permittees shall classify and list water body-pollutant combinations into one of the following three categories within their draft E/WMP:

- Category 1 (Highest Priority): Water body-pollutant combinations for which water quality-based effluent limitations and/or receiving water limitations are established in Part VI.E TMDL Provisions and Attachments L through R of the MS4 Permit.
- Category 2 (High Priority): Pollutants for which data indicate water quality impairment in the receiving water according to the State Board's Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List (State Listing Policy) and for which MS4 discharges may be causing or contributing to the impairment.
- Category 3 (Medium Priority): Pollutants for which there are insufficient data to indicate water quality impairment in the receiving water according to the State's Listing Policy, but which exceed applicable receiving water limitations contained in this Order and for which MS4 discharges may be causing or contributing to the exceedance.

Permittees shall identify the water quality priorities within each watershed management area (WMA) that will be addressed by the E/WMP in order to achieve applicable water quality limitations (i.e., WQBELs and RWLs) within the timeframes established by the corresponding compliance schedules set forth in Attachments L-R, or where there is no specific compliance schedule contained in Attachments L-R, the compliance schedule set forth in the E/WMP. For watershed priorities related to addressing exceedances of RWLs in Part V.A and not otherwise addressed by Part VI.E, proposed compliance schedules must adhere to the requirements of Part VI.C.5.c.iii.(3). For watershed priorities related to achieving WLAs in USEPA established TMDLs, proposed compliance schedules must adhere to the requirements of Part VI.E.3.c.iii-v.

Permittees may choose to further subcategorize water body-pollutant combinations within the three main categories above for purposes of sequencing implementation of watershed control measures in the most effective manner possible, taking into consideration compliance deadlines and opportunities to address multiple pollutants within a water body with similar watershed control measures. This is consistent with the

permit provisions in Parts VI.C.2 and VI.C.3, which group pollutants for purposes of complying with the RWLs Provisions according to whether the pollutant is being addressed by a TMDL, is similar in its fate/transport characteristics and effective implementation measures to a pollutant being addressed by a TMDL, is currently listed on the 303(d) list, or exhibits only occasional exceedances in the receiving water. For example, permittees may wish to identify which water body-pollutant combinations in Categories 2 and 3 above are similar to a water body-pollutant combination in Category 1, and could therefore be addressed simultaneously with the water body-pollutant combination in Category 1. Permittees are invited to discuss with Regional Board staff, and solicit early input on, approaches to further subcategorization of water body-pollutant combinations.

B. CURRENT/EXISTING POLLUTANT LOADING ASSOCIATED WITH CURRENT BEST MANAGEMENT PRACTICES (BMPs)/MINIMUM CONTROL MEASURES (MCMs)

- Permittees shall provide a list and map of known and suspected storm water and non-storm water pollutant sources discharging to MS4 and from the MS4 to receiving waters and any other stressors related to MS4 discharges causing or contributing to the impairments. The map must include all MS4 "major outfalls"[1], major structural controls of storm and non-storm water[2] (including, but not limited to, low flow diversions, urban runoff treatment facilities, detention and retention basins used for storm water treatment, VSS devices, other catch basin inserts/screens) that discharge to receiving waters within the watershed management area. A separate tabular list of major structural controls should also be provided. Permittees shall also provide list of non-structural controls that are currently implemented within the area(s), the results of which will be assumed to be reflected in the baseline pollutant loading.[3]
- Permittees shall provide an initial assessment of current/baseline pollutant loading for water body-pollutant combinations identified in Section A. Current/baseline pollutant loading shall based on relevant subwatershed data and the best available representative land use and pollutant loading data collected within the last 10 years. Appropriate data sources for use in assessment of baseline pollutant loading are identified in the tables below. At a minimum, baseline pollutant loadings shall be assessed and reported considering variability in pollutant loading at a spatial and temporal (including critical condition) scale consistent with that used in the TMDL and in the approved monitoring plan (i.e., for each subwatershed that was identified/analyzed/modeled in the TMDL and for each compliance monitoring location identified in the approved monitoring plan).
- Baseline loading shall be estimated using metrics derived from long-term historical data (e.g., annual rainfall, flow/runoff volume, pollutant loading, pollutant concentrations over the past 10 years) using calibrated dynamic model results for each subwatershed area. Such baseline loading estimates shall be generated for both (1) critical conditions (consistent with applicable TMDLs) and (2) average conditions for metrics related to quantity and quality (see examples of metrics, above). Critical conditions for baseline estimates shall be based on:
    I. Baseline flow rates/runoff volumes shall be based on one of the following:
        a) 90th percentile of long term estimated/modeled flow rates; or
        b) Other established critical condition in the applicable TMDL; or
        c) Runoff volume from the 85th percentile, 24-hour rainfall event (for modeled drainage areas where retention based BMPs will capture 100% of the required volume).

[1] Per definition in federal regulations.
[2] Spatial metadata must include delineation of drainage area treated where available, maximum volume of non-stormwater/stormwater treated, type of control, pollutants addressed, name and contact information of owner and, if different, operator in charge of O&M.
[3] It is assumed that these BMPs include full implementation of the 2001 Permit Storm Water Management Program elements as well as the structural BMPs identified in the first bullet.

II. Baseline pollutant loading shall be based on one of the following:

a) 90th percentile of long term pollutant loading/concentration (considering at least the most recent 10 years of available data); or

b) Long term average pollutant loading/concentration (considering at least the most recent 10 years of available data) that also incorporates the coefficient of variation so as to take the variability of pollutant loading into account. Consideration of variability must be sufficient to capture the baseline condition and required pollutant reductions under the critical condition. Where long-term average pollutant loading/concentration is used, critical conditions may be described using the long-term average loading with a coefficient of variation (CV) to take the variability of pollutant loading into account. For this type of critical condition, the reported pollutant loading in each subwatershed should be established by using a variability factor (VF) for model-predicted volumes, concentrations, and/or loads obtained from the long-term average and CV with the selected probability distribution of the pollutant loading. Procedures for the detailed calculation of variability factors for different probability distributions are described in Appendix E of the Technical Support Document for Water Quality-based Toxics Control (EPA/505/2-90-001, March 1991). It is anticipated that log-normal distributions will be assumed. If a different type of critical condition is applied (e.g. 90th percentile wet year), then CV and VF calculations are not required.

c) Pollutant event mean concentrations (EMCs) based on land use types from recommended data sources as referenced in table below may be used to estimate baseline pollutant loading; however, they must be used in combination with one of the critical conditions for flow rate/runoff volume identified in Part I, above.

- The estimated pollutant loading and/or concentrations shall be consistent with event mean concentrations (EMCs) obtained from different land use site as referenced in dependable sources, some of which are listed below:

Source No.	Reference
1.	**Sources, patterns and mechanisms of storm water pollutant loading from watersheds and land uses of the greater Los Angeles area, California, USA.** 2007. ED Stein, LL Tiefenthaler, KC Schiff. Technical Report 510. Southern California Coastal Water Research Project. Costa Mesa
2.	**Levels and patterns of fecal indicator bacteria in stormwater runoff from homogenous land use sites and urban watersheds. Request Only.** 2011. LL Tiefenthaler, ED Stein, KC Schiff. Journal of Water and Health 9:279-290
3.	Los Angeles County 2006 EMC Report

If a permittee(s) selects to use other independent sources of pollutant loading data in the RAA, the permittee(s) shall assure that the source(s) selected has appropriate documentation, is current, and is publicly available. The permittee(s) shall be required to provide the rationale used to support their

selection of baseline pollutant loading data as well as the raw data and all associated QA/QC information for Regional Board review and approval.

- Baseline pollutant loading should be expressed on a pollutant-by-pollutant basis consistent with the relevant averaging period(s) / duration as expressed in the TMDL and Attachments L-Q. If the pollutant is not addressed by a TMDL, but TMDLs for that pollutant exist for other water bodies, permittees should express pollutant loading in terms of averaging period(s) / duration consistent with those other TMDLs.

C. ESTIMATED REQUIRED POLLUTANT REDUCTIONS TO MEET THE INTERIM AND/OR FINAL ALLOWABLE POLLUTANT LOADING(S)

- Permittees shall provide estimated allowable loadings from MS4 discharges expressed as concentration-based or mass-based in consideration of critical conditions. Mass-based allowable loading will be calculated based on a permittee's proportion of the watershed management area for required WQBELs. Mass-based allowable loading should be calculated for each subwatershed area identified in Section B, above.
- The difference between the current and allowable pollutant loading at each implementation deadline is the required pollutant reduction at each implementation deadline. The required pollutant reduction should be calculated based on both long-term average annual condition and the selected critical condition (as described in Section B). For modeled drainage areas where 100% of the runoff volume from the 85th percentile, 24-hour storm event is not retained, the required pollutant reduction shall be used to set targets/goals for BMPs/watershed control measures within that subwatershed area. The percent reductions to be used to set targets/goals will be dependent on the phase(s) of implementation to be addressed, as described in Section E.
- Estimated allowable loading and required reductions should be expressed on a pollutant-by-pollutant basis consistent with the relevant averaging period(s)/duration (including the selected critical condition) consistent with the TMDL and Attachments L-Q. Where a TMDL has not been developed for the water body-pollutant combination, permittees should select an averaging period/duration/critical condition consistent with that used in other TMDLs that have been developed for the pollutant in other water bodies within the region.

D. SELECTED IMPLEMENTATION/BMPs OPTIONS

Permittees shall identify strategies, control measures, and BMPs to implement through their selected storm water management programs as listed below. As a starting point, selected control measurements should be designed and maintained to treat storm water runoff from the 85th percentile, 24-hour storm where feasible and necessary to achieve applicable WQBELs and receiving water limitations.

I. ENHANCED WATERSHED MANAGEMENT PROGRAM (EWMP)

a) DETAILED DESCRIPTION OF DRAINAGE AND RETENTION SYSTEMS

If the permittees select to develop a EWMP that includes projects that retain all non-storm water runoff and all storm water runoff from the 85th percentile, 24-hour storm event for the drainage areas tributary to the projects, the permittees are required to provide a detailed description of each regional multi-benefit retention system including type (bioretention system, sub-surface chamber, etc.), drainage area addressed, storage volume, and approximate system size as well as a description and quantification, where possible, of other benefits (e.g., amount of water recharged to groundwater for water supply, etc.).

b) PROPOSED WATERSHED CONTROL MEASURES TO CONTROL STORM AND NON-STORM WATER DISCHARGES

In drainage areas within the EWMP area where retention of 85th percentile, 24-hour storm event is not pursued, the permittees are required to identify watershed control measures that will be implemented in addition to existing BMPs to prevent or eliminate non-storm water discharges that are a source of pollutants to receiving waters, and to achieve all applicable interim and final water quality-based effluent limitations and all receiving water limitations. Watershed control measures may include:

- **i.** Structural and/or non-structural controls and operation and maintenance procedures that are designed to achieve applicable water quality-based effluent limitations and receiving water limitations;
- **ii.** Retrofitting areas of existing development known or suspected to contribute to the highest water quality priorities with regional or sub-regional controls or management measures; and
- **iii.** Stream and/or habitat rehabilitation or restoration projects where stream and/or habitat rehabilitation or restoration are necessary for, or will contribute to, demonstrable improvements in the physical, chemical, and biological receiving water conditions and restoration and/or protection of water quality standards in receiving waters.

c) STORM WATER MANAGEMENT PROGRAM MINIMUM CONTROL MEASURES (MCMs), NON-STORM WATER DISCHARGE CONTROLS, AND OTHER STRUCTURAL CONTROL MEASURES

Per Part VI.C.5.b.iv.(1), permittees shall assess the MCMs as defined in Part VI.D.4, Part VI.D.5, Part VI.D.6, Part VI.D.8, Part VI.D.9 and Part VI.D.10 of the MS4 Permit and potential modifications that will most effectively address priority issues in each watershed. Based on this assessment, permittees may choose to propose customized actions and corresponding schedules within each of the abovementioned minimum control measure categories. (Alternatively, permittees may choose to implement the baseline provisions within one or more of the abovementioned MCM categories.)

Per Part VI.C.5.b.iv.(2), where non-storm water discharges from the MS4 are identified as source of pollutants, permittees shall identify and list control measures, BMPs, and other strategies to effectively eliminate the source of pollutants consistent with the requirements of Part III.A and Part VI.D.4.d (for the LACFCD) and Part VI.D.10 (for all other permittees).

For TMDL related control measures, per Part VI.C.5.b.iv.(3), permittees shall also compile a list of control measures that have been identified in TMDLs and corresponding implementation plans, and identify those control measures within these TMDLs/implementation plans to be modified, if any, to most effectively address TMDL requirements in Part VI.E and Attachments L-Q. If actions identified in the E/WMP are wholly replacing the control measures identified in the TMDL implementation plan, it can be noted as such and this list is not necessary. If not sufficiently identified in previous documents (TMDLs/implementation plans), the permittees shall evaluate and identify the control measures that will be implemented to achieve the applicable WQBELs/WLAs/RWLs associated with these TMDLs. Initially, control measures should be designed to address the volume within the drainage area associated with the 85th percentile, 24-hour storm event at the correspondence compliance point.

II. WATERSHED MANAGEMENT PROGRAM (WMP)/INDIVIDUAL WMP

a) PROPOSED WATERSHED CONTROL MEASURES TO ADDRESS CONTRIBUTIONS OF STROM WATER DISCHARGES TO RECEIVING WATER

The permittees are required to identify watershed control measures that will be implemented in addition to existing BMPs to prevent or eliminate non-storm water discharges that are a source of pollutants to receiving waters, and to achieve all applicable interim and final water quality-based effluent limitations and all receiving water limitations. (See section D.I.b. for detail.)

b) STORM WATER MANAGEMENT PROGRAM MINIMUM CONTROL MEASURES (MCMs)

See section D.I.c. for detail.

E. SPECIFIED SCHEDULE OF SELECTED WATERSHED MANAGEMENT STRATEGIES

Permittees shall translate corresponding schedules for selected BMPs into a combined schedule for achievement of the applicable interim and final water quality-based effluent limitations and/or receiving water limitations per the water body classification/prioritization above. Permittees shall align the combined schedule with interim milestones and interim and final compliance deadlines specified in the permit and demonstrate that the required loading reduction and timeline specified are expected to be achieved.

- Permittees shall identify interim milestones and dates for their achievement to ensure adequate progress toward achieving interim and final water quality-based effluent limitations and/or receiving water limitations deadlines identified in TMDL provisions in Part VI.E and attachments L - Q. If selected BMPs will address multiple pollutants then BMPs must be implemented within time frame that is consistent with the most critical/closest deadline.
- Where the TMDL does not include interim or final water quality-based effluent limitations and/or receiving water limitations with compliance deadlines *during the permit term*, Permittees shall identify interim milestones and dates for their achievement to ensure adequate progress toward achieving interim and final water quality-based effluent limitations and/or receiving water limitations with deadlines beyond the permit term.
- For interim WQBELs and/or receiving water limitations, the percent reduction based on annual average baseline loading may be used to set targets/goals for BMPs/watershed control measures where such percent reduction based on the annual average baseline loading is consistent with interim requirements as set forth in Part VI.E and Attachments L-Q. A gradual phasing of percent load reduction for interim WQBELs/RWLs to final WQBELs/RWLs shall be applied over the course of the implementation schedule. For areas to be addressed through retention of the runoff volume from the 85th percentile, 24-hour storm, volume reductions over time shall be related to the interim and final deadlines.
- Permittees shall demonstrate that the activities and control measures identified in the Watershed Control Measures will achieve applicable receiving water limitations for water body-pollutant combinations not addressed by TMDLs as soon as possible. Per Part VI.C.5.c.ii and Part VI.C.4.c.iii.(3), Permittees must propose milestones based on measurable criteria and a schedule with dates for achieving the milestones that will allow progress to be measured once every two years.

F. POLLUTANT REDUCTION PLAN

a) COMPLIANCE DETERMINATION

- Compliance points shall be located at all compliance points required in the TMDLs that are within the area covered by the E/WMP.
- For a Permittee implementing an individual WMP, appropriate compliance point(s) within their jurisdiction shall be identified for Regional Board approval.

- Permittees shall include an appropriate compliance point(s) to assess the MS4 discharge(s) from the area covered by the Watershed Management Program to the Receiving Water(s)

b) EVALUATION OF SELECTED MANAGEMENT PROGRAM/BMPs PERFORMANCE

- Permittees shall provide a detailed description of individual BMPs performance and /or suite of selected BMPs performance to reduce pollutant loadings that are used as model inputs. Data on performance of watershed control measures shall be drawn only from peer-reviewed sources.
- The estimated effectiveness of BMPs in pollutant removal and/or reduction will served as a default value that can be updated through the adaptive management process with BMP monitoring data and outfall monitoring data when they become available.

c) ANALYSIS TO DEMONSTRATE SELECTED BMPs HAVE REASONABLE ASSURANCE TO MEET INTERIM/FINAL REQUIREMENTS

Based on the analysis of BMP performance using the selected modeling system, Permittees shall demonstrate that:

- Implementation of current/selected activities and control measures identified in section D above will achieve applicable water quality-based effluent limitations and/or receiving water limitations in Part VI.E and Attachments L-Q.

  Although the Permit only requires the RAA to consider WQBELs and receiving water limitations with interim and final deadlines/milestones that fall within the Permit term, it is strongly recommended that the RAA assess WQBELs and RWLs with deadlines occurring between program approval and December 28, 2022. Additionally, Where the TMDL does not include interim or final water quality-based effluent limitations and/or receiving water limitations with compliance deadlines *during the permit term*, Permittees must identify interim milestones and dates for their achievement to ensure adequate progress toward achieving interim and final water quality-based effluent limitations and/or receiving water limitations with deadlines beyond the permit term and must include these in the RAA.

- For water-body pollutant combinations not addressed by TMDLs, the activities and control measures identified in the Watershed Control Measures will achieve applicable receiving water limitations per Part V.A.

Permittees shall provide model output for each deadline specified in Attachments L-Q within the permit term to demonstrate compliance with each deadline will be achieved.

d) PROCESS OF INCORPORATING ADDITIONAL BMPs IF MILESTONE ARE NOT MET AS SCHEDULED

- Permittees in each WMA shall develop an integrated monitoring program or coordinated integrated monitoring program to assess progress toward achieving the water quality-based effluent limitations and/or receiving water limitations per the compliance schedules, and progress toward addressing the water quality priorities for each WMA.
- Permittees in each WMA shall implement an adaptive management process every two years after program approval to assess progress toward (i) achieving interim and/or final water quality-based effluent limitations and/or receiving water limitations; (ii) achievement of interim milestones; (iii) re-evaluation of the water quality priorities identified for the WMA based on more recent water quality data and reassessment of sources of pollutants in MS4 discharges; and (iv) evaluation of effectiveness of the control measures based on new information and data.

- Permittees shall report and then implement any modifications to the WMP or EWMP based on the results of the adaptive management process to improve the effectiveness of WMP or EWMP in reducing pollutant loading upon approval by the Regional Executive Officer, or within 60 days of submittal if the Regional Water Board Executive Officer expresses no objections.

G. MODELING REQUIREMENTS FOR REASONABLE ASSURANCE ANALYSIS TO SUPPORT ESTIMATION OF CURRENT LOADINGS, REQUIRED LOAD REDUCTIONS AND ANALYSIS OF WATER QUALITY OUTCOMES OF SELECTED BMPs OPTIONS

Permittees shall provide a modeling system to support the estimation of baseline loadings, required load reductions that are used to set targets/goals for selected BMPs/watershed control measures, and to demonstrate that the activities and watershed control measures identified/selected in the E/WMP will achieve applicable water quality-based effluent limitations and receiving water limitations.

The models appropriate for conducting the required RAA described above are listed in **Table 1.** These models are selected based on the following model capabilities:

(1) Dynamic continuous long-term simulation for modeling pollutant loadings, flows, and concentrations in receiving water from lands in a watershed system.
(2) Can represent rainfall and runoff processes above soil surface, and baseflow contributions in subsurfaces of urban and natural watershed systems.
(3) Can represent variability in pollutant loadings, based on land use, soil hydrologic group, and slope.
(4) BMP process based approach or empirically based BMP approach.
(5) Decision support to evaluate BMP performance
Permittees may select a combination of the models listed in model type 1.1-1.3 of Table 1 for land/watershed, receiving water, and BMP performance models, or select one of the modeling systems from integrated modeling systems listed in model type 1.4 of Table 1.

Table 1. List of Available Models

Model Type	Available Models
1.1 Land/Watershed Models	
	HSPF, LSPC, SWMM, WARMF
1.2 Receiving Water Models	
	EFDC, CE-QUAL-ICM/TOXI, QUAL2K, WASP, HSPF, LSPC, SWMM
1.3 BMP Performance Models	
* Process based models	SWMM BMP model BASINS BMP model EPA SUSTAIN model
* Empirically based models	International Stormwater BMP Database

Model Type	Available Models
1.4 Integrated BMP Modeling Systems	
* Process based models	EPA SUSTAIN model Los Angeles County WMMS model EPA TMDL Modeling Toolbox
* Empirical based models	City of Los Angeles SBPAT model

The modeling requirements consist of four primary components which are described as in the following Tables. The four components of modeling requirements are general model input data (Table 2), model parameters (Tables 3.1-3.3), BMP performance parameters (Tables 4.1-4.2), and model output (Table 5). For model parameters and BMP performance parameters, two separate tables are provided for a process based BMP model and an empirically based BMP model. It should be noted that the model requirements are the minimum requirements for a BMP performance evaluation since the specific performance measures vary depending on the designated use of the water body and the condition of the water body. Permittees shall cover all necessary requirements for a BMP performance evaluation based on input and recommendations from the TAC as approved by the Regional Board. With regard to the spatial scale, the highest resolution GIS layers should be used to satisfy the homogeneous assumption in a computational/modeled subwatershed. For temporal scale, the model should use varying time steps with a minimum 1-hour or shorter time step during rainfall events to capture peak flow and a daily or shorter time step between rainfall events.

The RAA associated with the permittee(s) draft E/WMP should include a detailed description/itemization of model inputs and outputs as indicated in Table 2 through Table 5 and should include model input files (in an electronic format that can be manipulated) as part of the draft E/WMP package submitted to Regional Board for review and approval.

Table 2. General Model Input Data for Both Process Based BMP Models and Empirically Based BMP Models

For General Model	Data Source	Data Period
2.1 Geometric Data		
• GIS Data Layer	State of California GeoPortal, Cal-Atlas Geospatial Data Library (previously CalSIL – California Spatial Information Library)/CERES and other public agencies	Most recent
• Topography Layer (DEM Data)	USGS National Elevation Dataset (NED) or	Most recent

For General Model	Data Source	Data Period
	locally derived data	
• Land Use/Land Cover Layer[5]	SCAG Land use data; Multi-Resolution Land Characteristics Consortium (MRLC) National Land Cover Database (NLCD) or locally derived data	SCAG Land use data (2005 or most recent); NLCD (2006 or most recent)
• Stream Network	USGS National Hydrography Dataset (NHD) or locally derived data	Most recent
• Drainage areas	USGS Watershed Boundary Dataset (WBD) or locally derived data	Most recent
2.2 Meteorological Data		
• Precipitation	NOAA National Climatic Data Center (NCDC) or locally derived data	at least 10 years hourly
• Evaporation	NCDC or locally derived data	at least 10 years daily/monthly
2.3 Soil Hydrologic Data		
• Hydrologic soil groups	USDA/NRCS - Soil Survey Geographic Database (SSURGO)/ STATSGO2 or locally derived data	Most recent
• Percent of area distribution for different soil groups.	SSURGO or locally derived data	Most recent
• Fraction of sand, silt, and clay for different soil groups.	SSURGO or locally derived data	Most recent
• Average Slope	SSURGO or locally derived data	Most recent
• Vegetative cover for different soil groups.	SSURGO or locally derived data	Most recent

[5] Satellite imagery may be utilized but is not required.

For General Model	Data Source	Data Period
2.4 Hydrologic Data		
• In-stream Flow	USGS and locally derived data	Daily/monthly/hourly based on availability
• In-stream Depth	USGS and locally derived data	Daily/monthly/hourly based on availability
2.5 Point Source Data		
• Point Source Location	EPA STORET data CIWQS/SMARTS or local sampling	All available data
• Point Source Discharge	EPA STORET data CIWQS/SMARTS or local sampling	Daily/monthly
• Point Source Concentration	EPA STORET data CIWQS/SMARTS or local sampling	Daily/monthly

To demonstrate the ability to predict the effect of watershed processes and management on land, soil, and receiving water body, model calibration and validation are necessary and critical steps in model application. The acceptable model calibration criteria as listed in Table 3.0 are provided to ensure the calibrated model properly assesses all the model parameters and modeling conditions that can affect model results. In addition, some valuable sources of initial starting values for many of the key calibration parameters are provided in Table 3.1 through Table 4.2 to facilitate model calibration efforts.

Table 3.0 Model Calibration Criteria

Model calibration is necessary to ensure that the calibrated model properly assesses all the variables and conditions in a watershed system. Calibration should result in model parameter values that produce the best overall agreement between simulated and observed values throughout the calibration period. Table 3.0 is a list of model calibration tolerances for different levels of agreement or accuracy based on extensive past experience with the HSPF model. The lower bound of “fair” level of agreement listed in Table 3.0 is considered a target tolerance for the model calibration process. If model calibration results do not satisfy the target tolerances, additional efforts should be completed to investigate possible errors in, and the accuracy of, input data, model formulations, and field observations. The findings of this investigation should be presented in the RAA description, along with any immediate remedial actions to address the issues and/or recommended approaches to improve the calibration in the future. Permittees are strongly encouraged to engage Regional Board staff prior to the draft E/WMP submittal, in order to facilitate review and approval.

Model parameters	% Difference between simulated and observed values		
	Very Good	**Good**	**Fair (lower bound, upper bound)**
Hydrology/Flow	<10	10-15	15-25
Sediment	<20	20-30	30-45
Water Temperature	<7	8-12	13-18
Water Quality/Nutrients	<15	15-25	25-35
Pesticides/Toxics	<20	20-30	30-40

Based on HSPF experience by A.S. Donigian, Jr., prepared for USEPA (2000)

Table 3.1 Model Parameters for Process Based BMP Models

Model Parameters	Data Source[6]	Range of Initial Values
3.1.1 Hydrology Parameters		
• Fraction forest cover	EPA BTN#6	0-0.95
• Interception storage capacity (in)	EPA BTN#6	0.01-0.40
• Retention storage capacity (in)	EPA BTN#6	0.01-0.30
• Manning's n for overland flow	EPA BTN#6	0.01-0.15
• Upper zone nominal soil moisture storage (in)	EPA BTN#6	0.05-2.0
• Saturated hydraulic conductivity (in/hr)	Green-Ampt Parameters	0.01-4.74
• Wetting front suction head (in)	Green-Ampt Parameters	1.93-12.6
• Upper zone soil porosity (fraction)	Green-Ampt Parameters	0.398-0.501
• Field capacity (fraction)	Green-Ampt Parameters	0.062-0.378

[6] EPA BTN # : EPA Basins Technical Note #

• Wilting point (fraction)	Green-Ampt Parameters	0.024-0.265
• Temp below which ET is reduced by half (^{o}F)	EPA BTN#6	32.0-48.0
• Temp below which ET is set to zero (^{o}F)	EPA BTN#6	30.0-40.0
• Fraction of GW inflow to deep recharge	EPA BTN#6	0.0-0.50
• Fraction of remaining ET from baseflow	EPA BTN#6	0.0-0.20
• Fraction of remaining ET from active GW	EPA BTN#6	0.0-0.20
• Lower zone nominal soil moisture storage (in)	EPA BTN#6	2.0-15.0
• Interflow inflow parameter	EPA BTN#6	1.0-10.0
• Interflow recession parameter	EPA BTN#6	0.3-0.85
• Lower zone ET parameter	EPA BTN#6	0.1-0.9
3.1.2 Water Quality Parameters		
• Initial storage of water quality constituent on land surface (lb)	LA County Report[7]	0.0-0.0005
• Wash-off potency factor for sediment associated constituent (lb/ton)	EPA BTN#6	0.0-10.0
• Scour potency factor for sediment associated constituent (lb/ton)	EPA BTN#6	NA
• Accumulation rate of water quality constituent of land surface(lb/acre/day)	EPA BTN#6	0.0-0.0005
• Maximum storage of water quality • constituent on land surface(lb/acre/day)	EPA BTN#6	0.0-0.0005
• Rate of surface runoff that removes 90% of stored water quality constituent (in/hr)	EPA BTN#6	0.0-0.5
• General first order in-stream loss rate of constituent (1/day)	SUSTAIN manual	0.2-0.2
3.1.3 Sediment Parameters		

[7] LA County Report*: "Evaluation of Existing Watershed Models for the County of Los Angeles", August 29, 2008

• For pervious land		
• Coefficient in the soil detachment equation	EPA BTN#8	0.05-0.75
• Exponent in the soil detachment equation	EPA BTN#8	1.0-3.0
• Coefficient in the sediment wash-off equation	EPA BTN#8	0.1-10.0
• Exponent in the sediment wash-off equation	EPA BTN#8	1.0-3.0
• Coefficient in the sediment scour equation	EPA BTN#8	0.0-10.0
• Exponent in the sediment scour equation	EPA BTN#8	1.0-5.0
• For impervious land		
• Coefficient in the solids wash-off equation	EPA BTN#8	0.1-10.0
• Exponent in the solids wash-off equation	EPA BTN#8	1.0-3.0
• Solids accumulation rate on the land surface (lb/ac-day)	EPA BTN#8	0.0-30.0
• Fraction of solids removed from land surface per day (1/day)	EPA BTN#8	0.01-1.0

Table 3.2 Model Parameters for Empirically Based BMP Models

Model Parameters	Data Source	Range of Values
3.2.1 Hydrology Parameters		
• Interception storage capacity (in)	EPA BTN#6	0.01-0.40
• Retention storage capacity (in)	EPA BTN#6	0.01-0.30
• Manning's n for overland flow	EPA BTN#6	0.05-0.5
• Upper zone nominal soil moisture storage (in)	EPA BTN#6	0.05-2.0
• Saturated hydraulic conductivity (in/hr)	Green-Ampt Parameters	0.01-4.74
• Wetting front suction head (in)	Green-Ampt Parameters	1.93-12.6
• Upper zone soil porosity (fraction)	Green-Ampt Parameters	0.398-0.501
• Field capacity (fraction)	Green-Ampt Parameters	0.062-0.378
• Wilting point (fraction)	Green-Ampt Parameters	0.024-0.265
• Temp below which ET is reduced by half (^{o}F)	EPA BTN#6	32.0-48.0
• Temp below which ET is set to zero (^{o}F)	EPA BTN#6	30.0-40.0
• Fraction of remaining ET from baseflow	EPA BTN#6	0.0-0.20
• Lower zone nominal soil moisture Storage (in)	EPA BTN#6	2.0-15.0
• Interflow inflow parameter	EPA BTN#6	1.0-10.0
• Interflow recession parameter	EPA BTN#6	0.3-0.85
• Lower zone ET parameter	EPA BTN#6	0.1-0.9
B.3.2.2 Water Quality Parameters		
• Event Mean Concentration (EMC)	SBPAT User's Guide t	See Table 3.3
B3.2.3 Sediment Parameters		
For pervious land		

• Coefficient in the soil detachment equation	EPA BTN#8	0.05-0.75
• Exponent in the soil detachment equation	EPA BTN#8	1.0-3.0
• Coefficient in the sediment wash off equation	EPA BTN#8	0.1-10.0
• Exponent in the sediment wash-off equation	EPA BTN#8	1.0-3.0
• Coefficient in the sediment scour equation	EPA BTN#8	0.0-10.0
• Exponent in the sediment scour equation	EPA BTN#8	1.0-5.0
For impervious land		
• Coefficient in the solids wash-off equation	EPA BTN#8	0.1-10.0
• Exponent in the solids wash-off equation	EPA BTN#8	1.0-3.0
• Solids accumulation rate on the land surface (lb/ac-day)	EPA BTN#8	0.0-30.0
• Fraction of solids removed from land surface per day (1/day)	EPA BTN#8	0.01-1.0

Table 3.3 Suggested Average[i] EMC by land use for selected pollutants

Land Use	Nitrate (mg/L)	Total Copper (µg/L)	Total Lead (µg/L)	Total Zinc (µg/L)	Fecal Coliform (MPN/100ml)	TSS (mg/L)
Agriculture	34.4	100.1	30.2	274.8	6.03E+4	999
Commercial	0.55	31.4	12.4	237.1	7.99E+4	67.0
Educational	0.61	19.9	3.6	117.6	7.99E+4	99.6
Industrial	0.87	34.5	16.4	537.6	3.76E+3	219
Transportation	0.74	52.2	9.2	292.9	1.68E+3	77.8
Open Space	1.17	10.6	3.0	26.3	6.31E+3	216.6
SF Residential	0.78	18.7	11.3	71.9	3.11E+4	124.2
MF Residential	1.51	12.1	4.5	125.1	1.18E+4	39.9

Source: Technical Appendices "A User's Guide for the Structural BMP Prioritization and Analysis Tool (SBPAT v1.0)" for Los Angeles City, County, and Heal the Bay, December 2008

Note: These suggested average EMC values can be adjusted based on calibration studies by using more recently collected Southern California data.

Table 4.1 Suggested BMP Performance Parameters for Process Based BMP Model

4.1 BMP Performance Parameters	Rain Barrel	Bio-Retention	Porous Pavement	Dry Infiltration Basin
• Media final constant infiltration rate (in/h)	NA	0.5-0.5	0.5-1.0	1.0-1.0
• Substrate layer porosity	NA	0.4-0.5	0.45-0.5	0.3-0.4
• Substrate layer field capacity	NA	0.25-0.3	0.055-0.2	0.06-0.3
• Substrate layer wilting point	NA	0.1-0.15	0.05-0.05	0.02-0.15
• Underdrain gravel layer porosity	NA	0.5	0.5	0.5
• Vegetative parameter, A	NA	0.6-1.0	1.0	0.6
• Underdrain background infiltration Rate (in/hr)	NA	0.1-0.3	0.1	0.25-0.3
• TSS 1st order decay rate (1/day)	0.2-0.8	0.2-0.8	0.2-0.8	0.2-0.8
• Fecal Coliform 1st order decay rate (1/day)	0.5	0.5	0.5	0.5
• TSS Filtration removal rate (%)	NA	85	60	85

* Source: PA Report "SUSTAIN-A Framework for Placement of Best Management Practices in Urban Watersheds to Protect Water Quality, September 2009, EPA/600/R-09/095
Note that values in this Table can be adjusted based on calibration studies with recently collected Southern California data.

Table 4-2: Suggested BMP Performance Parameters for Empirically Based BMP Model

Median (95% Conf. Interval) Statistics of BMP Effluent Concen.	Bio-Retention	Bio-Swale	Detention Basin	Filter Strip	Manu-fractured Device	Media Filter	Porous Pavement	Retention Pond	Wetland Basin	Wetland Channel
Fecal Coliform # Per 100 mL	NA	2600-6200	500-1900	300-39600	(10,20)-D (200-3000)-F (1400-5000)-P	200-625	NA	200-1160	230-11800	NA
Enterococcus # Per 100 mL	58-437	NA	NA	NA	(10,10)-D (1750-12000)-F NA-P	NA	NA	NA	56-300	NA
E. Coli # Per 100 mL	6-137	1200-5900	82-720	NA	NA	NA	NA	31-387	199-1160	NA
TSS (mg/L)	5.0-9.0	11.8-15.3	19.0-26.0	16.0-21.5	15.0-19.9	7.4-10.0	11.0-14.4	12.0-15.0	7.0-10.9	10.0-16.0
Total Phosphorus	0.07-	0.17-	0.19-0.24	0.15-	0.10-0.13	0.08-	0.08-0.09	0.12-0.14	0.07-	0.13-

Median (95% Conf. Interval) Statistics of BMP Effluent Concen.	Bio-Retention	Bio-Swale	Detention Basin	Filter Strip	Manu-fractured Device	Media Filter	Porous Pavement	Retention Pond	Wetland Basin	Wetland Channel
(mg/L)	0.1	0.20		0.20		0.10			0.09	0.17
Dissolved Phosphorus (mg/L)	0.05-0.18	0.05-0.11	0.08-012	0.16-0.26	0.04-0.07	0.06-0.09	0.04-0.05	0.06-0.07	0.03-0.06	0.07-0.10
Total Nitrogen (mg/L)	0.74-0.99	0.63-0.82	1.75-2.69	1.0-1.23	1.90-2.41	0.68-0.99	1.28-1.65	1.19-1.36	1.04-1.21	1.05-1.56
Total Kjeldahl Nitrogen (mg/L)	0.46-0.72	0.50-0.70	1.16-1.78	0.97-1.12	1.32-1.55	0.50-0.61	0.74-0.90	0.98-1.10	0.92-1.09	1.10-1.30
NOx(NO2+NO3,andNO3) (mg/L)	0.19-0.25	0.20-0.28	0.24-0.45	0.24-0.31	0.35-0.44	0.46-0.57	0.59-0.77	0.15-0.20	0.05-0.11	0.15-0.22
Total Copper (µg/L)	4.6-9.85	5.7-7.7	4.0-6.80	6.4-7.9	7.94-11.0	5.1-6.6	6.8-8.1	4.06-5.0	3.0-4.0	3.61-5.20
Total Lead (µg/L)	2.5-2.5	1.8-2.29	2.15-4.3	1.3-2.2	3.8-5.16	1.3-2.0	1.38-2.21	2.0-3.0	1.0-1.55	1.40-3.11
Total Zinc (µg/L)	7.7-25.0	20-26.6	17.1-38.2	16.0-26.0	52.8-63.5	15.0-20.0	12.5-16.8	20.0-23.0	16.7-24.3	11.0-20.0
Total Arsenic (µg/L)	NA	0.95-1.30	1.29-1.80	0.55-1.20	1.0-2.4	0.61-1.0	2.5-2.5	0.54-1.15	NA	NA
Total Cadmium (µg/L)	0.25-1.0	0.27-0.34	0.25-0.35	0.09-0.20	0.20-0.31	0.1-0.2	0.25-0.25	0.20-0.29	0.10-0.20	0.19-0.50
Total Nickel (µg/L)	NA	2.3-4.2	2.2-3.75	2.4-3.1	3.11-5.0	2.0-2.6	1.40-1.80	2.0-2.60	NA	2.0-2.40

Source: International Stormwater BMP Database (BMPDB), July 2012

Note that for bacteria, manufactured devices are broken down into three subcategories: disinfection devices (Manufactured Device – D), inlet insert/filtration devices (Manufactured Device – F), and physical settling/straining devices (Manufactured Device – P)

Note that values in this Table can be adjusted based on calibration studies with recently collected Southern California data.

Table 5: Model Output for both Process Based BMP Models and Empirically Based BMP Models

Model Output	Output Content	Output Format
5.1 Current/Existing Pollutant Loadings		
	Current pollutant loadings at each modeled sub-watershed and each land use, under range of temporal conditions (i.e., average and critical conditions)	Tables
5.2 Load Reduction Output		
	Pollutant load reduction at each modeled sub-watershed for each BMP scenario (corresponding to applicable compliance deadlines) in dry and wet weather conditions (i.e., average and critical conditions)	Tables
	Time series plots of pollutant load reduction for each BMP scenario at compliance points	Graphics
5.3 Surface Runoff Output		

Model Output	Output Content	Output Format
	Surface runoff volume at each modeled subwatershed for each BMP scenario in dry and wet weather conditions (i.e., average and critical conditions)	Tables
	Absolute and percent reduction in runoff volume at each modeled subwatershed for each BMP scenario	Tables
5.4 Hydrographs and Pollutographs		
	Flow hydrographs at compliance points within the EWMP/WMP for each BMP scenario	Graphics
	Pollutographs at compliance points within the EWMP/WMP for each BMP scenario	Graphics
5.5 BMP Performance Summary		
	Load comparison for with and without BMPs and graphs for each BMP scenario	Tables and Graphics
	BMP storage distribution for each BMP scenario	Tables and Graphics

[i] Log-transformed arithmetic mean values shown

GUIDANCE ON CONDUCTING REASONABLE ASSURANCE ANALYSIS

Los Angeles County MS4 Permit

TAC Meeting

August 27, 2013

OBJECTIVES OF REASONABLE ASSURANCE ANALYSIS

OVERARCHING PURPOSE

- USEPA: Need to have adequate demonstration that, *"…where a BMP-based approach to permit limitations is selected, the BMPs required by the permit will be sufficient to implement applicable WLAs."* (USEPA 2010)
- Regional Board: *"Permittees shall conduct a Reasonable Assurance Analysis for each water body-pollutant combination addressed by the Watershed Management Program … The objective of the RAA shall be to demonstrate the ability of Watershed Management Programs and EWMPs to ensure that Permittees' MS4 discharges achieve applicable water quality based effluent limitations and do not cause or contribute to exceedances of receiving water limitations."* (Part VI.C.5.b.iv.(5), pp. 63-64)

SPECIFIC OBJECTIVES FOR RAA GUIDANCE

- Ensure appropriate and robust analysis
- Provide clear direction to WMP/EWMP groups and their consultants regarding requirements/expectations
- Promote consistency among WMP/EWMP groups
- Facilitate agency and public review of draft WMPs/EWMPs

TECHNICAL OBJECTIVES OF RAA GUIDANCE

MODELING

- Identify required scope of RAA
- Identify acceptable models for RAA
- Establish simulation time period(s)
- Establish standardized criteria for model input
- Establish standardized model output requirements
- Establish standardized criteria for sensitivity analysis

SELECTED WATERSHED CONTROL MEASURES

- Identify acceptable BMP performance databases/literature for model input
- Identify acceptable statistical thresholds for BMP performance for model input
- Identify key hydrologic and physiographic parameters that impact BMP performance and ensure that these parameters are accurately represented in the model
- Identify O&M practices that impact BMP performance and ensure that model assumptions are carried out in Permittees' O&M procedures

SPECIFIC PERMIT REQUIREMENTS RELATED TO RAA

RAA PERMIT REQUIREMENTS (PART VI.C.5.b.iv.(5), pp.63-64)

- Quantitative
- Performed using peer-review model(s) in the public domain
  - Watershed Management Modeling System (WMMS)
  - Structural BMP Prioritization and Analysis Tool (SBPAT)
  - Hydrologic Simulation Program-FORTRAN (HSPF)*
  - Others? (e.g., SUSTAIN)
- Includes all available, relevant subwatershed data collected within the last 10 years that meets QA/QC criteria for use in RAA
  - land use
  - pollutant loading
- BMP performance data from peer-reviewed sources
- Use of best statistical estimate of BMP performance for the pollutants to be addressed

REQUIRED SCOPE OF RAA

- WATER BODY-POLLUTANT COMBINATIONS
  - Category 1
    - Analysis of water body-pollutant combinations with interim or final TMDL compliance deadlines during the permit term (through December 28, 2017)*
    - Analysis of water body-pollutant combinations with TMDL compliance deadlines beyond the permit term (after December 28, 2017) [based on proposed interim milestones to ensure progress during permit term]
  - Categories 2 & 3 (Part VI.C.5.a.ii, p. 59)
    - Analysis of water body-pollutant combinations not addressed by TMDLs [to ensure progress to controlling MS4 discharges within a timeframe that is as short as possible such that they do not cause or contribute to exceedance(s) of RWLs]

STEPS IN RAA

- Permittees shall classify and list water body-pollutant combinations into one of the following three categories:
  - Category 1: Water body-pollutant combinations subject to a TMDL
  - Category 2: Water body-pollutant combinations identified on the 303(d) List
  - Category 3: Water body-pollutant combinations with exceedances of receiving water limitations

STEPS IN RAA (CONT.)

QUANTIFY

- Current/baseline pollutant loading and runoff volume from MS4
- Allowable MS4 pollutant loading (allocation/WQBEL)
- Required pollutant reduction to attain applicable interim/final WQBEL(s)
- Pollutant removal/effectiveness for individual watershed control measures selected for implementation
- The full suite of watershed control measures to be implemented to attain applicable WQBELs/milestones
- The water quality outcomes associated with implementation of the full suite of watershed control measures, above
  - That is, the cumulative effectiveness of the watershed control measures implemented in the subwatershed area

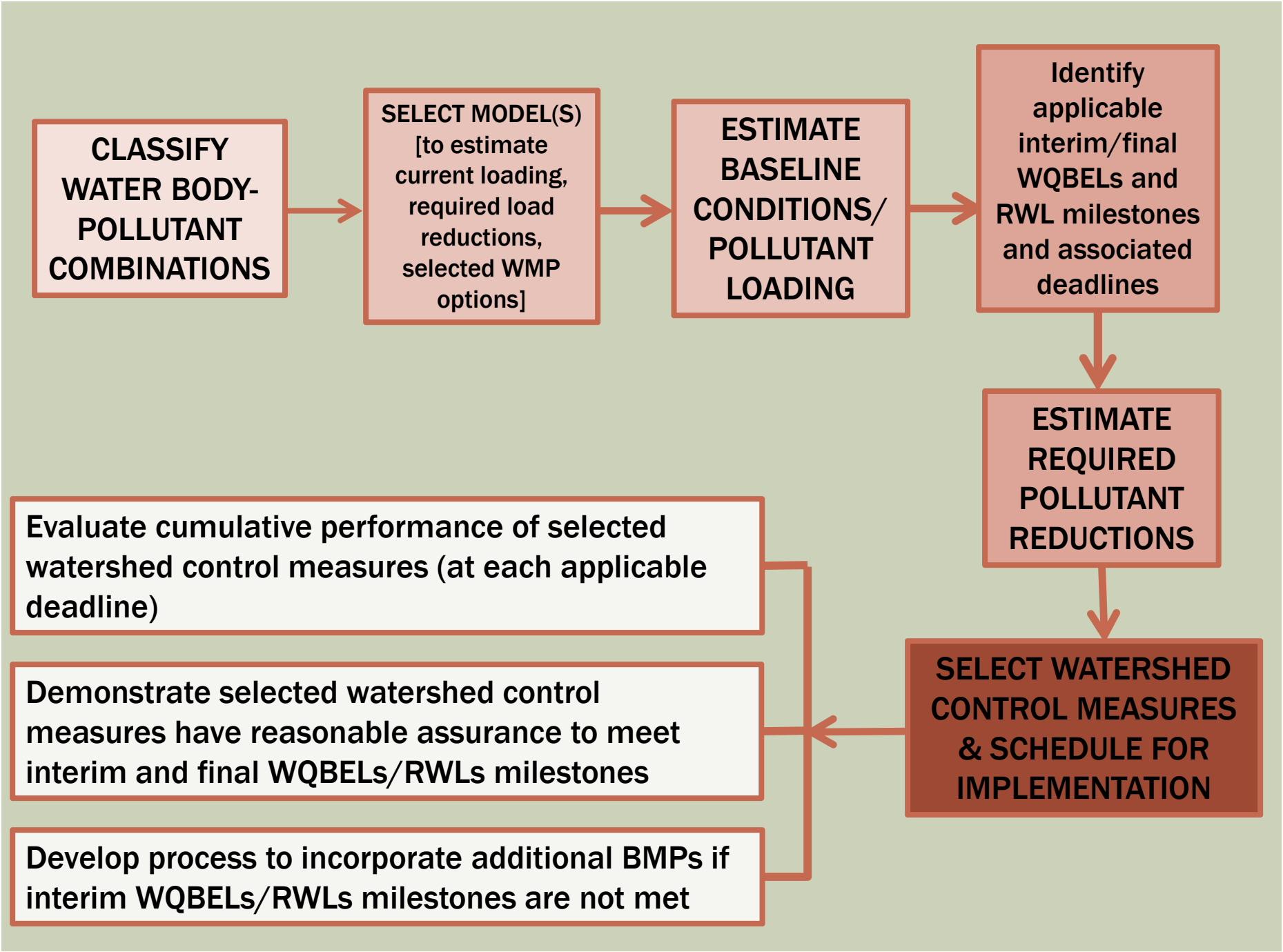
CLASSIFY WATER BODY-POLLUTANT COMBINATIONS
SELECT MODEL(S) [to estimate current loading, required load reductions, selected WMP options]
ESTIMATE BASELINE CONDITIONS/ POLLUTANT LOADING
Identify applicable interim/final WQBELs and RWL milestones and associated deadlines
ESTIMATE REQUIRED POLLUTANT REDUCTIONS
SELECT WATERSHED CONTROL MEASURES & SCHEDULE FOR IMPLEMENTATION
Evaluate cumulative performance of selected watershed control measures (at each applicable deadline)
Demonstrate selected watershed control measures have reasonable assurance to meet interim and final WQBELs/RWLs milestones
Develop process to incorporate additional BMPs if interim WQBELs/RWLs milestones are not met

MODELING

EXPECTED MODEL CAPABILITIES

- Dynamic continuous long-term simulation for modeling runoff and pollutant loadings and concentrations in discharges and receiving waters from lands in a watershed system
- Can represent rainfall, runoff, and groundwater processes of urban and natural watershed systems
- Can represent variability in pollutant loadings, based on land use, soil hydrologic group, and slope among other parameters
- Employs a BMP process based approach or empirically based BMP approach
- Includes decision support to evaluate cumulative BMP performance on a watershed scale

MODEL TYPE	MODEL NAME
E.1 Land/Watershed Models	
	HSPF, LSPC, SWMM, SWAT, WARMF
E.2 Receiving Water Models	
	HSPF, LSPC, SWMM, EFDC, CE-QUAL-ICM/TOXI, QUAL2K, WASP
E.3 BMP Performance Models	
* Process based models	SWMM BMP module BASINS BMP module EPA TMDL Modeling Toolbox
* Empirically based models	International Stormwater BMP Database
E.4 Integrated BMP Modeling Systems	
* Process based models	EPA SUSTAIN model Los Angeles County WMMS model
* Empirically based models	City of Los Angeles SBPAT model

AVAILABLE PUBLIC DOMAIN MODELS FOR RAA

Models in E.1 - E.3 must be used in combination

Models in E.4 may be used as single, integrated model system

PRIMARY COMPONENTS OF MODELING REQUIREMENTS

- Model input data
- Model parameters
- BMP performance parameters
- Model output

MODEL OUTPUT REQUIRE-MENTS

MODEL OUTPUT	CONTENT	FORMAT
5.1 Current/Baseline Pollutant Loadings and Runoff Volume		
	Current pollutant loadings and runoff volume (by subwatershed)	Tables
5.2 Surface Runoff Output		
	Surface runoff (by subwatershed for each BMP scenario under representative conditions)	Tables
	Percent reduction (by subwatershed for each BMP scenario)	Tables
5.3 Load Reduction Output		
	Pollutant load reductions (by subwatershed for each BMP scenario/phase under representative conditions)	Tables
	Time series plots of pollutant load reductions for each BMP scenario at compliance points	Graphics
5.4 Hydrographs and Pollutographs		
	Flow hydrographs at compliance points for each BMP scenario	Graphics
	Pollutographs at compliance points (outfall and/or receiving water) for each BMP scenario	Graphics
5.5 BMP Performance Summary		
	Load comparison for with and without BMP and graphs for each BMP scenario/phase	Tables/Graphics
	BMP retention volume for each BMP scenario/phase	Tables/Graphics

MODEL TYPE /MODEL NAME	MODEL FACT SHEETS
E.1 Land/Watershed Models	
HSPF	Hydrological Simulation Program-Fortran , Model Distribution Coordinator: USEPA Center for Exposure Assessment Modeling Model is available at http://www2.epa.gov/exposure-assessment-models/surface-water-models
LSPC	Loading Simulation Program in C++, Model Distribution Coordinator: USEPA Ecosystems Research, Athens, GA Model is available at http://www.epa.gov/athens/wwqtsc/html/lspc.html
SWMM	Storm Water Management Model, Model Distribution Coordinator: USEPA Ecosystems Research, Athens, GA, Model is available at http://www.epa.gov/athens/wwqtsc/html/lspc.html
SWAT	Soil and Water Assessment Tool , Model Distributor Coordinator: USDA Agriculture Department, Model is available at http://swat.tamu.edu/software/
WARMF	Watershed Analysis Risk Management Framework, Model Distribution Coordinator: USEPA Ecosystems Research, Athens, GA , Model is available at http://www.epa.gov/athens/wwqtsc/html/lspc.html

MODEL TYPE /MODEL NAME	MODEL FACT SHEETS
E.2 Receiving Water Models	
HSPF	Hydrological Simulation Program-Fortran , Model Distribution Coordinator: USEPA Center for Exposure Assessment Modeling Model is available at http://www2.epa.gov/exposure-assessment-models/surface-water-models
LSPC	Loading Simulation Program in C++, Model Distribution Coordinator: USEPA Ecosystems Research, Athens, GA Model is available at http://www.epa.gov/athens/wwqtsc/html/lspc.html
SWMM	Storm Water Management Model, Model Distribution Coordinator: USEPA Ecosystems Research, Athens, GA, Model is available at http://www.epa.gov/athens/wwqtsc/html/lspc.html
EFDC	Environmental Fluid Dynamic Code , Model Distribution Coordinator: USEPA Ecosystems Research, Athens, GA, Model is available at http://www.epa.gov/athens/wwqtsc/html/lspc.html
CE-QUAL-ICM/TOXI	A Multi-Dimensional, Water Quality Model for Surface Water Model Distribution Coordinator: US Army Corps of Engineer Environmental Laboratory, Model is available at http://el.erdc.usace.army.mil/products.cfm?Topic=model&Type=watqual

MODEL TYPE /MODEL NAME	MODEL FACT SHEETS
E.2 Receiving Water Models	
QUAL2K	River and Stream Water Quality Model , Model Distribution Coordinator: USEPA, Ecosystems Research, Athens, GA Model is available at http://www.epa.gov/athens/wwqtsc/html/lspc.html
WASP	Water Quality Analysis Simulation Program, Model Distribution Coordinator: USEPA Ecosystems Research, Athens, GA Model is available at http://www.epa.gov/athens/wwqtsc/html/lspc.html

MODEL TYPE /MODEL NAME	MODEL FACT SHEETS
E.3 BMP Performance Models	
SWMM BMP model	Storm Water Management Model (SWMM) Version 5.0.022 with Low Impact Development (LID) Controls , Model Distribution Coordinator: USEPA Risk Management Research, Model is available at http://www.epa.gov/nrmrl/wswrd/wq/models/swmm/
BASINS BMP model	BASINS (Better Assessment Science Integrating point & Non-point Sources), Model Distribution Coordinator: USEPA Water Science Technology, Model is available at http://water.epa.gov/scitech/datait/models/basins/index.cfm
EPA TMDL Modeling Toolbox	EPA TMDL Modeling Toolbox contains BMP assessment tools, watershed models, receiving water models, Model Distribution Coordinator: USEPA Ecosystems Research, Athens, GA, Model is available at http://www.epa.gov/athens/wwqtsc/Toolbox-overview.pdf

MODEL TYPE /MODEL NAME	MODEL FACT SHEETS
E.4 Integrated BMP Modeling Systems	
EPA SUSTAIN model	System for Urban Stormwater Treatment and Analysis IntegratioN Model, Model Distribution Coordinator: USEPA Risk Management Research, Model is available at http://www.epa.gov/nrmrl/wswrd/wq/models/sustain/
Los Angeles County WMMS model	The Los Angeles County Watershed Management Modeling System, Regional Optimization, Model Distribution Coordinator: Los Angeles County Flood Control District. Model is available at http://dpw.lacounty.gov/wmd/wmms/
City of Los Angeles SBPAT model	Structural BMP Prioritization and Analysis Tool. Model Distribution Coordinator: City of Los Angles and County of Los Angeles. Model is available at http://www.sbpat.net/downloads.html

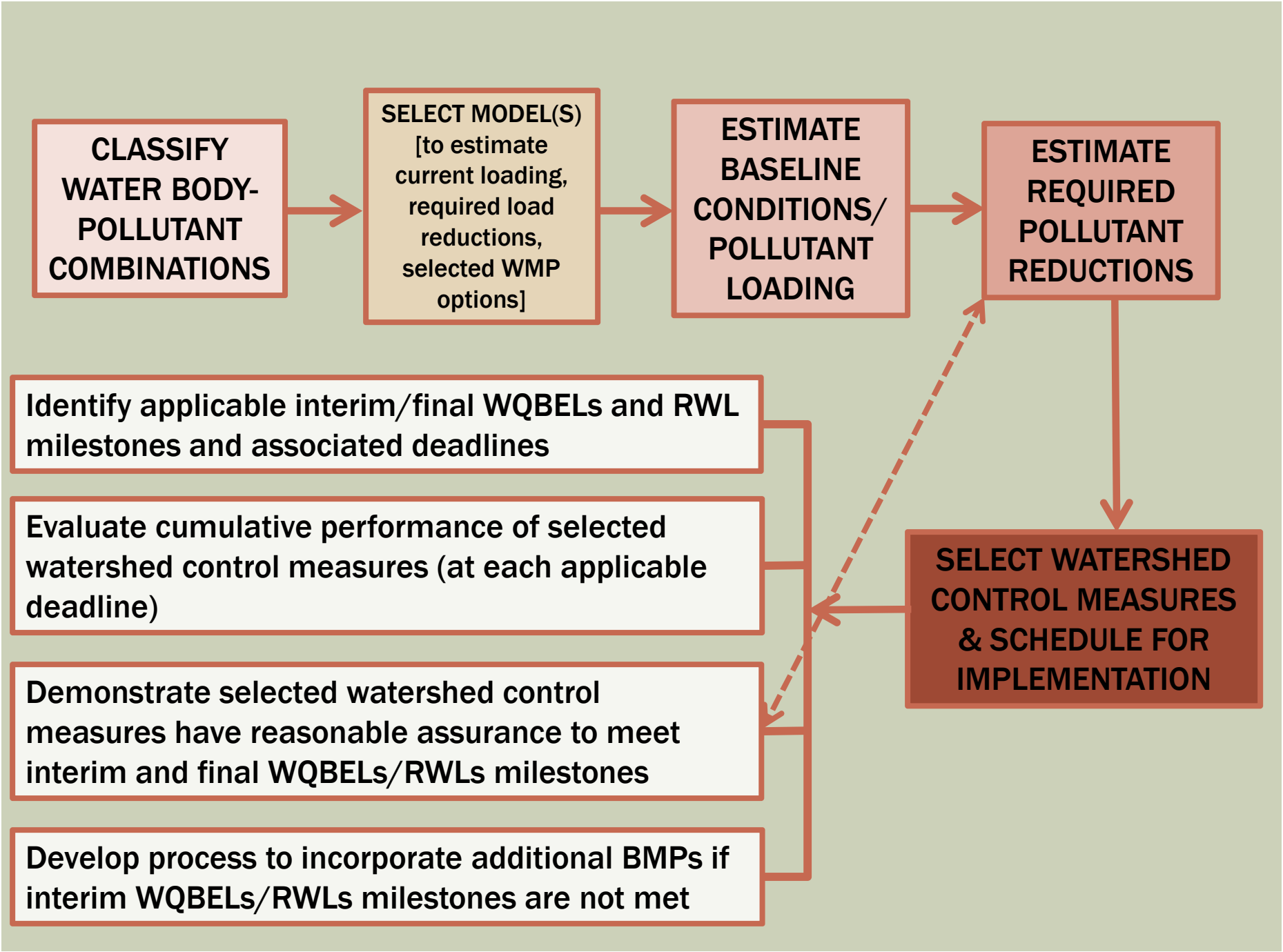
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Identify applicable interim/final WQBELs and RWL milestones and associated deadlines
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Demonstrate selected watershed control measures have reasonable assurance to meet interim and final WQBELs/RWLs milestones
Develop process to incorporate additional BMPs if interim WQBELs/RWLs milestones are not met
SELECT WATERSHED CONTROL MEASURES & SCHEDULE FOR IMPLEMENTATION

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

JUL 23 2012

Ivar Ridgeway
Chief, Stormwater Permitting Unit
Los Angeles Regional Water Quality Control Board
320 West 4th Street, Suite 200
Los Angeles, CA 90013

Re: Draft MS4 Permit for Los Angeles County (NPDES Permit No. CAS004001)

Dear Mr. Ridgeway:

The following are EPA Region 9's comments on the draft NPDES permit for discharges from the municipal separate storm sewer system (MS4) serving Los Angeles County and incorporated cities therein, which the Los Angeles Regional Board proposed on June 6, 2012. As you know, Region 9 has invested in the development of this draft permit, providing contract support for permit development, attending public workshops, and reviewing and commenting on early drafts of the permit. We are pleased with the draft permit that has emerged from these efforts and we urge the Board to adopt the permit at its meeting in September 2012. We also offer the following comments for the Board's consideration:

A. Total Maximum Daily Load (TMDL) Requirements

For the last several years, Region 9 has been encouraging the Regional Boards to incorporate applicable wasteload allocations (WLAs) from TMDLs as numeric effluent limits in MS4 permits. This practice improves the clarity and enforceability of the permits, and ensures consistency with the WLAs. We are pleased to see that applicable WLAs have been identified and incorporated as numeric effluent limits in Appendices K through R to the permit.

We also recognize the permit provides an opportunity for a permittee to demonstrate compliance with interim WLAs via Watershed Management Program Plans providing reasonable assurance that documented best management practices (BMPs) will achieve interim WLAs. We agree with this approach. Based on available information, it is appropriate that compliance with final WLAs (except for those associated with trash TMDLs) will be determined based on achievement of applicable numeric final water quality-based effluent limits and/or final receiving water limits. This is consistent with EPA guidance in its updated memorandum of November 10, 2010 concerning the incorporation of WLAs into stormwater permits, available at:
http://www.epa.gov/npdes/pubs/establishingtmdlwla_revision.pdf. This memorandum

recommends the use of numeric effluent limits when feasible, and notes that BMP-based approaches are appropriate in cases where the administrative record for the permit quantitatively demonstrates the BMPs required by the permit will be sufficient to ensure compliance with the WLAs. This has also been a long-standing EPA policy dating back to EPA's previous 2002 guidance memorandum concerning the incorporation of WLAs into stormwater permits, available at: http://www.epa.gov/npdes/pubs/final-wwtmdl.pdf.

We agree that the BMP-based approach this permit takes for trash TMDLs is appropriate given the record that has been compiled on the use of BMPs to address trash, and also agree that numeric limits are appropriate for determining compliance with final WLAs for the rest of the TMDLs incorporated into this permit. These procedures and requirements set forth in the draft permit are consistent with EPA guidance.

Section VI.A 5 of the draft permit notes that all documents submitted to the Regional Board for approval shall be made available for public review and comment for 30 days. This includes the important Watershed Management Programs (WMPs) developed by permittees in which BMPs may be selected to comply with applicable WLAs, along with a reasonable assurance analysis (RAA) to demonstrate compliance with the WLAs. The RAAs will likely be complex and we believe public review is critical to ensuring that any WMP approved by the Board is adequate to ensure compliance with applicable WLAs. We found no mention of public review of WMPs in the fact sheet, and we recommend this be mentioned and stressed to ensure the public is fully aware of this opportunity and to encourage public review. For example, page F-40 of the fact sheet notes that a draft WMP must be submitted to the Board for approval within one year of adoption of the permit, but no mention is made of any opportunity for public review and comment.

We note that separate and somewhat different provisions were developed for the EPA-established TMDLs than for the State-established TMDLs. The fact sheet correctly points out that unlike the State TMDLs, the EPA TMDLs do not include implementation plans or schedules, but they do typically include implementation recommendations. We believe the Board has discretion in developing permit requirements for the EPA TMDLs, and we believe the draft permit requirements are appropriate for the EPA TMDLs, and consistent with the implementation recommendations. EPA also supports the requirement of Watershed Management Program Plans, with the shortest possible implementation schedule, to achieve WLAs defined in the EPA-established TMDLs. EPA further supports language concluding that if the Board determines a plan or schedule is inadequate, then compliance with the numeric WLAs and water quality objectives, as defined in the TMDL, must be met immediately. We believe such provisions will best assure water quality improvements. To reinforce the permit expectations as we understand them, we'd suggest the following specific changes:

- Page 114, section VI.E.3. next to last sentence should be revised to "In lieu of inclusion of numeric water quality based effluent limitations at this time, this Order requires the Permittees subject to WLAs in USEPA established TMDLs to propose and implement best management practices (BMPs) that will be effective in achieving compliance with USEPA established numeric WLAs."

- Page 115, section VI.E.3.c.ii. should be revised to: "A detailed time schedule of specific actions the Permittee will take in order to achieve compliance with the applicable WLA."

B. Low Impact Development (LID) Requirements

As we've pointed out previously, implementation of LID requirements in MS4 permits is one of Region 9's priorities, along with implementation of TMDL requirements. And as in the case of TMDLs we are seeking clear, measurable LID requirements in MS4 permits to ensure enforceability of the requirements. We have reviewed the LID requirements of the proposed permit and we concur with these requirements. Importantly, we note that numeric sizing criteria for a design storm to be managed via LID have been included in the draft permit (section VI.D.6.c.i.(2)) which are comparable to other recent MS4 permits adopted in the State.

To a considerable degree, the LID requirements of the proposed Los Angeles County MS4 permit were derived from the requirements developed for the Board's MS4 permit for Ventura County which was adopted in 2010. However, there are also a few differences based on new information which has become available since 2010 and as discussed below, we would concur with the changes made from the Ventura County MS4 permit.

First, we note that the draft Los Angeles County MS4 permit omits the provision in the Ventura County permit which allows the runoff from 5% of the effective impervious area (EIA) of a new development to be excluded from the LID management requirements. We found the EIA concept to be confusing to many parties and excluding 5% of the EIA makes little difference from an engineering standpoint. The removal of this EIA provision will also align the Los Angeles County MS4 permit with other recent MS4 permits such as the North Orange County MS4 permit adopted by the Santa Ana Regional Board in 2009 (NPDES permit No. CAS0108740) in which the runoff from the full design storm must be managed using LID techniques. By requiring LID management of the full design storm runoff, the Los Angeles County permit will also be somewhat more protective of water quality than the Ventura County permit.

We support provisions in the draft Los Angeles County permit which provide specificity on the implementation of LID, for example Attachment H's Bioretention/Biofiltration Design Criteria. This is an improved approach over the Ventura County permit's reliance on a Technical Guidance Manual which had to be updated subsequent to issuance of the Ventura County permit to provide these design criteria. By providing specifications in the permit the draft Los Angeles County permit provides clear expectations to the public on how the LID requirements will be implemented and eliminates the delays associated with reaching agreement on a Technical Guidance Manual.

Another difference from the Ventura County permit is that special alternative compliance provisions have been included in the Los Angeles County permit which allow the use of offsite regional groundwater recharge sites without a showing of LID technical infeasibility onsite (section VI.D.6.c.iii). The benefits of increased stormwater infiltration for

the purpose of the groundwater recharge in Southern California have been highlighted in several recent studies such as the 2010 Los Angeles Basin Water Augmentation Study, available at:
http://watershedhealth.org/Files/document/522_WAS_StrategyDocument_web.pdf and NRDC's 2009 study entitled "A Clear Blue Future: How Greening California Cities Can Address Water Resources and Climate Change in the 21st Century." We did not find an explanation in the fact sheet for the special provisions related to groundwater recharge; we suggest adding an explanation, citing studies such as those mentioned above. These studies show the benefits stemming from increased groundwater recharge in Southern California would be substantial, and we believe they merit the special consideration provided in the draft permit. However, we would recommend that the permit limit this alternative compliance option to recharge sites where the groundwater can actually be used for a beneficial purpose. To this end, we'd suggest the following specific revision:

- Page 70, section VI.D.6.c.ii.(1) should be revised to, "In instances of technical infeasibility or where a project has been determined to provide an opportunity to replenish regional ground water supplies at an offsite location where ground water can be used for beneficial purposes, each Permittee may…"

Also, we have a minor suggestion to clarify the circumstances where technical infeasibility exists:

- Page 71, section VI.D.6.c.ii.(2)(d) should be revised to, "Brownfield development sites where infiltration poses a risk of causing pollutant mobilization."

Note also that the citation on page 71 at the end of section VI.D.6.c.ii.(3) should be "VI.D.6.c.i."

We support the option for achieving compliance via implementation of Offsite Projects which Retrofit Existing Development (page 72, section VI.D.6.c.iii.(3)). This provides added flexibility to the permittees as a means for complying with LID requirements, and has the potential of achieving valuable water quality benefits.

In addition to the provisions in the LID requirements, we also support the provisions on page 94 (section VI.D.8.d) requiring the development of an Inventory of Existing Development for Retrofitting Opportunities. These provisions are similar to those in MS4 permits issued by the San Diego Regional Water Quality Control Board, and should result in valuable consideration of retrofit projects that can contribute to water quality improvements. They are also supported by EPA's 2010 MS4 Permit Improvement Guide (EPA 833-R-10-001) which recommends such provisions be considered.

Lastly, there are three documents cited on page F-62 of the fact sheet where a reference citation was not included – the study by "Hawley et al.", the USGS study and the Grand River TMDL. We suggest footnotes which would provide the reference information.

C. *Receiving Water Limitations*

We understand that concerns have been raised regarding the receiving water limitations (RWL) language (Section V.A) in the draft permit. We would note that the State Board adopted standard RWL language to be used in all California MS4 permits in WQ Order 99-05 dated June 17, 1999. The State Board provided further clarification of its intent in WQ Order 2001-15, but it generally retained the substance of WQ Order 99-05. WQ Order 99-05 also allowed minor variations in the language to ensure consistency with the terminology in a particular permit. We have reviewed the RWL language in the draft MS4 permit for Los Angeles County and we believe it is consistent with WQ Order 99-05, and we would urge the Regional Board to retain the proposed language in the final permit. We also believe the permit is consistent with the Clean Water Act as interpreted by the Ninth Circuit Court of Appeals in *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159, in which the Court determined that the Board has discretion in setting these requirements.

We also understand that concerns have been raised regarding compliance determinations with RWLs and WLAs under the proposed permit, and that concerns have been raised about requiring instream/receiving water monitoring. First of all, we support instream as well as outfall monitoring since they both may provide useful information; both are also well established and supported by EPA's 1990 Phase I stormwater regulations (40 CFR 122.26(d)(2)(iii)(D)) and EPA's Part 2 MS4 permit application guide (EPA 833-B-92-002). NPDES regulations at 40 CFR 122.44(i)(1) also provide broad authority to the Board in determining monitoring requirements, including "other measurements as appropriate" (40 CFR 122.44(i)(1)(iii)). Lastly, we believe the fact sheet provides a solid rationale for the instream monitoring which is consistent with the applicable regulations and EPA guidance on this matter.

Section II.E of Attachment E (Monitoring and Reporting Program) summarizes how compliance determinations would be made, and what the points of compliance would be; we support the draft permit on this matter. NPDES regulations at 40 CFR 122.44(d)(1)(vii)(B) require that NPDES permits be consistent with assumptions and requirements of applicable WLAs. We believe it is appropriate for the Board to incorporate the WLAs as they were adopted, including provisions for compliance determination.

Section II.E of Attachment E also notes that instream monitoring locations may be used to assess compliance with the RWL requirements of the permit. However, the discussion in the fact sheet (Section XIII.C) clarifies that the Board would use outfall monitoring in conjunction with instream monitoring to identify particular MS4s which may be responsible for exceedances at the instream location. As such, we believe the concerns about the permit's compliance determinations are not warranted.

D. *Non-Stormwater Discharges*

We support the draft permit's approach for regulating non-stormwater discharges. We've heard criticism of these provisions on the grounds that they are somehow inconsistent with the Clean Water Act. Section 402 (p)(3)(B)(ii) requires that MS4 permits "shall include

a requirement to effectively prohibit non-stormwater discharges into the storm sewers." The draft permit implements this statutory provision by a number of means, including comparison of effluent concentrations to non-stormwater action levels. We find that the approaches used in the draft permit are appropriate and practical means to implement the CWA's requirement that non-stormwater discharges into the MS4 are effectively prohibited. We also believe they are consistent with NPDES regulations at 40 CFR 122.26(d)(2)(iv)(B) which describe what a stormwater management program should include to address non-stormwater discharges.

We understand that concerns have been raised specifically on Section III.A.1 of the draft permit which requires that the permittee prohibit certain non-stormwater discharges "through" the MS4 while Section 402(p)(3)(B)(ii) of the Clean Water Act requires that the permittee prohibit discharges "into" the MS4. We support the Board's proposed language on this issue. We would note that the preamble to EPA's 1990 stormwater regulations (55 FR 47995) itself uses the word "through" in describing the discharges which are to be prohibited. We believe this is in recognition of the fact that a discharge "into" the MS4 is tantamount to a discharge "through" the MS4 to receiving waters since the principal purpose of an MS4 is conveyance of water.

We also support the exception to the non-stormwater discharge prohibition for temporary discharges authorized by USEPA pursuant to CERCLA (page 26, Section III.A.1.b.). EPA Region 9 worked closely with LA Regional Board staff on this provision. These discharges are authorized in narrow circumstances when an alternative means for handling these waters is not practical in the performance of necessary actions to remediate contaminated groundwater. This by no means results in any expansion of CERCLA liability for permittees as has been alleged during public workshops.

E. Watershed Management Programs

We support the permit's establishment of voluntary Watershed Management Programs. However we have two specific comments about the draft permit's provisions in this area.

- Page 51, Section VI.C.3.b. iv.(1)(c) should be revised to: "If the Permittee(s) elects to eliminate a control measure identified in Part VI.D.4 to Part VI.D.9 because that specific control measure is not applicable to them, the Permittee(s) shall provide a justification for its elimination."

- Page 55, Section VI.C.6.b.ii. should be revised to clarify that the reference to modifying compliance deadlines or interim milestones does not apply to deadlines or milestones associated with TMDLs, but rather applies to new deadlines and milestones that are not including in this permit, but are developed pursuant to the Permittee(s)' Watershed Management Program.

We appreciate the opportunity to provide comments on the draft permit. It's been many years since the Los Angeles County MS4 permit was last reissued in 2001, and much

has happened since then, particularly the approval of a large number of TMDLs with applicable WLAs. While this necessarily complicates the 2012 permit, it also provides a major opportunity for water quality improvement via the implementation of these TMDLs. Our understanding of the benefits of LID has also increased since 2001 and this proposed permit provides another substantial opportunity of water resource benefits. The process for the development of the new draft permit has also been lengthy, but we believe the permit is ready for adoption and again we urge the Board to adopt the permit at its September 2012 meeting. If you would like to discuss this matter further, please contact Eugene Bromley of the NPDES Permits Office at (415) 972-3510.

Sincerely,

Eugene Bromley
for David Smith, Manager
NPDES Permits Office (WTR-5)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

JAN 1 5 2014

Mr. Ivar Ridgeway
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, CA 90013

Re: Draft MS4 Permit for the City of Long Beach (Permit No. CAS004003)

Dear Mr. Ridgeway:

The following are EPA Region 9's comments on the draft NPDES permit (permit No. CAS004003) for discharges from the municipal separate storm sewer system (MS4) serving the City of Long Beach, which the Los Angeles Regional Board released for public comment on November 22, 2013.

We are supportive of many aspects of the draft permit. For example, the draft permit's Planning and Land Development Program (section VII.J) contains valuable provisions for ensuring that when new development and redevelopment activities are planned there are efforts to reduce pollutant impacts from impervious surfaces and make beneficial use of stormwater. We also strongly endorse the Public Agency Activities Program, which incorporates a requirement to develop an Inventory of Existing Development for Retrofitting Opportunities (section VII.K.4). We're also supportive of the draft permit's incorporation of TMDL Waste Load Allocations (WLAs) as numeric effluent limits (section VIII). In addition, we support the monitoring program (Attachment E), particularly the requirement for outfall monitoring in addition to instream monitoring since this will help identify which outfalls may be contributing to exceedances of WLAs or receiving water limitations. Finally, we support the watershed-based approach used in the permit (section VII.C) which we believe will maximize water quality improvement overall by ensuring that best management practices are appropriately customized to the needs of individual watersheds.

Although we're strongly supportive of much of the draft permit, we have concerns with three areas, each of which we raised in testimony at the November 8, 2012 adoption hearing for the Los Angeles County MS4 permit. These concerns, and our recommendations to address them, are discussed below:

A. Compliance with TMDL-based Water Quality-Based Effluent Limits Via Retention of the 85th percentile, 24-Hour Storm

Section VIII.F.1.d of the draft permit provides that a permittee implementing an enhanced watershed management plan (EWMP) will be deemed in compliance with applicable water quality-based effluent limits associated with TMDLs if the runoff from

the 85th percentile 24-hour storm within drainage areas covered by the EWMP is retained. While we recognize the multiple benefits of retaining stormwater, we're concerned that this retention may not necessarily attain the water quality benefits associated with the incorporated TMDLs. Among our concerns are that retention facilities designed to retain the 85th percentile, 24-hour storm could be sited within drainage areas in locations that do not control runoff containing elevated pollutants, and therefore the water quality expectations established by TMDLs may not be achieved. Absent further justification or explanation in the fact sheet of how this retention can be relied upon to achieve the water quality benefits associated with the TMDLs, we recommend that section VIII.F.1.d of the draft permit be deleted.

B. Compliance with Receiving Water Limitations (RWLs) Via a WMP or EWMP

Pursuant to section VII.C.1.d of the draft permit, a permittee is deemed to be in compliance with RWLs upon notification of the Regional Board that the permittee intends to develop and implement a watershed management plan (WMP) or EWMP. We would prefer retaining the RWLs language consistent with State Board WQ Order 99-05. However, we could accept an alternative in which a permittee would be deemed in compliance with RWLs *after* approval of a WMP or EWMP by the Regional Board. Such a provision was drafted and considered by the San Diego Regional Board for the San Diego Regional MS4 Permit (NPDES permit No. CAS0109266), but was ultimately not included in the final San Diego permit adopted in May 2013. We recommend that such a provision be included in the City of Long Beach permit (if the Regional Board deviates from the requirements of WQ Order 99-05). A permittee would be deemed in compliance with RWLs only after approval of a WMP or EWMP, since a much clearer picture of the path to ultimate compliance would be available at that time.

C. Implementation of Minimum Control Measures (MCMs)

The provisions in section VII.D.1 of the draft permit concern the timing for implementation of MCMs. If the City of Long Beach chooses not to implement a WMP or EWMP, the permit requires implementation of the permit's updated MCMs within six months of the permit's effective date. However, if the City of Long Beach chooses to develop a WMP or EWMP, only the BMPs required by the previous 1999 permit would be required pending approval of the WMP or EWMP by the Regional Board. To avoid delays in the implementation of updated MCMs, it's our preference that section VII.D.1.ii of the draft permit be revised to require implementation of the updated MCMs within six months of the effective date of the permit regardless of whether the City of Long Beach elects to develop a WMP or EWMP. We recognize that the City of Long Beach's circumstances will lessen some delays in the implementation of updated MCMs. For example, the fact that the City of Long Beach adopted a protective Low Impact Development Ordinance in November, 2010 means that there will not be a significant impact if implementation of the new permit's Planning and Land Development Programs is delayed. Also, we understand that the City of Long Beach is currently participating in

the preparation of WMPs with permittees under the LA County MS4 permit which will be completed relatively soon, and therefore there may not be lengthy delays in implementation of updated MCMs for drainages covered by these WMPs. We recommend seeking means for ensuring that the outdated 1999 MCMs can be replaced by updated provisions as soon as is practical.

We appreciate the opportunity to provide our views on the draft permit. If you have any questions regarding this matter, please contact Eugene Bromley of the NPDES Permits Office at (415) 972-3510.

Sincerely,

Elizabeth Sablad

Elizabeth Sablad, Acting Manager
NPDES Permits Office (WTR-5)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

JUN 20 2014

Adam Fischer
Santa Ana Regional Water Quality Control Board
3737 Main Street, Suite 500
Riverside, CA 92501.

Re: Draft MS4 Permit for Orange County (Permit No. CAS618030)

Dear Mr. Fischer:

The following are EPA Region 9's comments on the draft NPDES permit (permit No. CAS618030) for discharges from the municipal separate storm sewer system (MS4) serving the portion of Orange County under the jurisdiction of the Santa Ana Regional Water Quality Control Board (Regional Board), which the Regional Board released for public comment on May 2, 2014. In an email dated January 31, 2014, we provided comments on an earlier "administrative draft" of this permit. We appreciate the opportunity to provide early input during the permit development process. However, we are disappointed that the May 2, 2014 draft permit contains problematic new provisions allowing for compliance with water-quality provisions based on Permittee submittal of draft plans (or providing a notice of intent to submit a plan) to the Executive Officer. Following below are our comments on the latest draft permit.

A. Total Maximum Daily Load (TMDL) Requirements

We have concerns with the draft permit's new options for complying with permit requirements associated with approved TMDLs upon the Permittees' written notification to the Executive Officer of their intent to develop a plan to comply with applicable wasteload allocations (WLAs). Each of the TMDLs listed in Appendices B through H of the draft permit was incorporated into the Santa Ana Regional Board's 2009 Orange County MS4 Permit (R8-2009-0030), so implementation of these TMDLs should be ongoing. We'd prefer that the draft permit be revised to retain the same approach for compliance with WLAs as the 2009 permit, and as is incorporated into the San Diego Regional Board's 2013 Regional MS4 permit (NPDES Permit No.CAS0109266). It's our conclusion that basing TMDL compliance on plans limits enforceability and makes it difficult to confirm that the TMDL water quality targets are being attained. If a plan-based compliance approach is to be included, it's important for the draft permit to be revised to include a more rigorous analysis including how specifically identified BMPs will directly result in achievement of WLAs, and the expectations that interim milestones be provided to track progress towards achieving WLAs. Also, contrary to the draft permit, this option for compliance should only be available upon approval of the plan (following opportunity for public comment) by the Executive Officer.

Per Clean Water Act and federal regulations at 40 CFR 122.44 regarding TMDLs, permit language must be modified in several places to accurately describe that Permittee's discharges must comply with water quality-based effluent limits (WQBELs), not the TMDL WLAs. Specifically, we recommend/request these language changes be made within permit section XVIII – TMDL Implementation and in each of the TMDL Appendices B-H. For example, the responsible Permittees must comply with WQBELs established in this permit; those WQBELs are consistent with WLAs within approved TMDLs.

In our emailed comments of January 31, 2014, we expressed concern that compliance with WLAs (established as WQBELs in the permit as noted above) would be determined in accordance with a schedule (yet-to-be determined) where such determinations could be as infrequent as once every five years. We had recommended WLA compliance determinations at least once/year; we noted this would consistent with the implementation language in at least one TMDL adopted by the Regional Board (organochlorine compounds TMDL). The monitoring requirements of the latest draft permit (Attachment A) have been revised to require monitoring consistent with TMDL assessment periods, but do not specify in detail the monitoring frequency that would be necessary for consistency. To clarify the requirements and to avoid any misunderstandings of the TMDL requirements, we recommend that the permit either include the monitoring frequency that would be required for consistency with each TMDL, or direct the Permittee to a specific document where it could be found.

Furthermore, the permit should be revised to include action levels as part of the permits monitoring and reporting program and, if appropriate, the Permittees' water quality improvement plans. The goal of including both non-stormwater and stormwater action levels is to guide implementation efforts and measure progress towards the protection of water quality and designed beneficial uses of the state from adverse impacts caused or contributed to by MS4 discharges. Notably, action levels were included in the Riverside County MS4 permit (2010, Santa Ana Regional Board) and the San Diego Regional permit (2013).

Section XVIII.B.4 of the draft permit would allow exceedances of a WLA at a frequency that is less than or equal to a site-specific exceedance frequency found in the State's policy guide for developing the CWA section 303(d) list. If retained, this provision should be further discussed and supported in the fact sheet. Our understanding is that the exceedance frequency in the section 303(d) listing guide does not affect the applicability of approved WLAs, and would not justify the proposed exceedances that would be allowed under the permit. Absent adequate justification for section XVIII.B.4, we recommend it be removed from the permit.

The draft permit does not currently include any requirements related to TMDLs that may be approved during the term of the permit. To expedite implementation of additional controls that may be necessary for compliance with such TMDLs, we recommend the permit include a provision similar to section O of the 2012 MS4 permit

for the City of Salinas (permit No. CA0049981) issued by the Central Coast Regional Board. The Salinas permit requires development and submittal within one year of final TMDL approval of a plan for complying with newly approved TMDLs. This is preferable to waiting for the next permit renewal to incorporate newly approved TMDLs. We understand that the Santa Ana Regional Board is currently developing a TMDL for selenium for the Newport Bay Watershed; our recommended provision would expedite compliance with the selenium TMDL and any others that may be approved during the term of the permit.

In Appendix G, we recommend that the second paragraph be modified to clarify that the metals and selenium TMDLs were only promulgated by EPA, and were not developed nor adopted by the Santa Ana Regional Board. We recommend the following edits to the paragraph:

> "The WLAs in this Appendix are based on the Toxic Pollutants (Metals and Se) TMDLs. ~~The Toxic Pollutants TMDL has been approved by Santa Ana Regional Water Quality Control Board, the State Water Resources Control Board, the Office of Administrative Law ("OAL") and USEPA. The Toxic Pollutants TMDL was adopted by the Santa Ana Regional Water Quality Control Board in Resolution No. R8-2003-0039.~~ The metals and Se TMDLs were promulgated by USEPA on June 17, 2002."

B. New Development (Including Significant Redevelopment)

Section XII.A.7 requires the Principal Permittee to submit retrofit studies. While this is a step in the right direction, it falls far short of the retrofit provisions included in the San Diego Regional Board's Regional MS4 permit (CAS019266). We recommend incorporation of the San Diego permit's section II.E.5.(e)(1) "Retrofitting and Rehabilitating Areas of Existing Development." The San Diego permit requires each Co-permittee to identify areas of existing development as candidates for retrofitting, focusing on areas where retrofitting will address pollutants and/or stressors that contribute to the highest priority water quality conditions. This more comprehensive approach will better identify areas within the built environment where retrofits would result in water quality improvements. The San Diego permit also requires a strategy to facilitate implementation of projects identified as potential candidates for retrofits, which is lacking in the draft Orange County permit. Moreover, many of the potential retrofit BMPs (such as bioretention) would provide additional benefits such as groundwater recharge which would help alleviate current and future drought conditions; this factor increases the importance of an effective retrofit program.

Section XII.K discusses off-site treatment controls. We recognize that in some cases off-site projects can effectively address the post-construction control requirements for new development and significant redevelopment projects. This is particularly the case where off-site controls are located to optimize infiltration to replenish groundwater

supplies. However, it is necessary that water quality protections are in place at the site of the triggering development/redevelopment project, and the draft permit should be revised to make this explicitly clear. We recommend the Los Angeles County MS4 permit (CAS004001), which effectively addresses this issue in section VI.D.7.c.iii(7) by specifying Water Quality Mitigation Criteria that must be met for New and Redevelopment Projects that have been approved for offsite projects.

It is not clear whether regional or sub-regional biotreatment facilities would be required to treat 1½ times the capture volume required for retention facilities, as would be the case when on-site biotreatment replaces on-site retention. This requirement should be included in the permit. We further recommend that in situations where there may be a choice in using off-site retention or off-site biotreatment that the permit include a preference for retention (similar to the preference for retention over biotreatmemt for on-site controls).

The draft permit appears to lack any requirements for off-site mitigation when on-site LID is determined to be infeasible and regional or sub-regional facilities are not being used. We recommend that mitigation using off-site LID be required for any portion of the design capture volume for which retention or biotreatment is determined to be infeasible onsite. Such a requirement would be consistent with the 2012 Los Angeles County permit.

Finally, section XII.L of the draft permit provides for a waiver of structural controls under certain circumstances. For example, a waiver could be available if the costs are shown to disproportionately outweigh the benefits. The waiver provisions are not explained in the fact sheet and further explanation and justification should be included. Given the experience throughout California implementing LID controls pursuant to MS4 permits, which has shown the widespread feasibility of implementing LID measures in connection with new development and redevelopment projects, we're very skeptical that this waiver provision is necessary.

C. Receiving Water Limitations

In our emailed comments of January 31, 2014, we expressed support for the receiving water limitations (RWLs) language that had been included in the administrative draft. At the time, this language closely tracked State Water Board WQ Order 99-05 and the Regional Board's 2009 MS4 permit for Orange County. Unfortunately, the May 2, 2014 draft permit (section IV) includes a new provision under which a Permittee would be deemed in compliance with RWLs upon submittal of a draft plan for compliance to the Executive Officer. As an alternative to this new draft permit language, it's our preference that the permit retain the same RWLs language contained in your 2009 Orange County MS4 permit. As you are no doubt aware, at a November 2012 workshop, the State Water Board indicated it may consider revising WQ Order 99-05. The State Board has recommended that MS4 permits include a permit reopener to address potential revisions

to WQ Order 99-05. We suggest incorporation of such a reopener in the Orange County permit; section II.H.4.a of the San Diego permit provides appropriate language.

We are aware that while the State Board considers revisions to WQ Order 99-05, some stakeholders have been urging Regional Boards to develop new approaches for determining how RWLs compliance is determined. While our strong preference is to stick with the approach used in your 2009 permit, we have reviewed one alternative that we could support. During the development of the San Diego Regional Board's Regional MS4 permit, RB9 staff developed an option (referred to as Option 2) that would have made use of detailed Water Quality Improvement Plans to demonstrate measurable progress to achieve RWLs (included in the RB9 staff's Revised Tentative Order posted March 27, 2013). Under Option 2, after Water Quality Improvement Plan approval, its implementation would be the vehicle for achievement of RWLs. Ultimately at its May, 2013 hearing, the San Diego Regional Board chose not to adopt Option 2, and instead, with EPA's full support, adopted its Regional MS4 permit with RWLs language consistent with WQ Order 99-05. The Los Angeles MS4 permit also lays out a thorough, rigorous planning process for determining compliance with RWLs. However, we have gone on record as opposing this approach used by the Los Angeles Regional Board, given that the alternative compliance approach is available before the Plans are approved.

Unlike the San Diego Regional Board's staff proposal (Option 2) or the Los Angeles County MS4 permit, the draft Orange County permit does not provide necessary details on Permittee programs to demonstrate rigorous efforts to achieve RWLs. The deficiencies in the draft permit include the absence of measurable interim milestones and modeling efforts supporting assurances that BMPs will achieve RWLs. Again, our preference is to retain the RWLs language of the 2009 permit, but if a plan-based compliance approach is being seriously considered it should use the methodology developed by the San Diego and Los Angeles Regional Board staff, and should be available for compliance purposes only after plan approval.

D. Other Comments

1. Whole Effluent Toxicity (WET) Requirements

In our emailed comments of January 31, 2014, we had recommended that the Orange County MS4 permit include WET requirements (using EPA's Test for Significant Toxicity (TST) procedure) modeled after those in the 2012 Los Angeles County MS4 permit. The Los Angeles County permit requires tests using 100% effluent and 100% receiving water. However, the Orange County permit requires tests on a series of dilutions (section F.3 of Attachment A), and the selection of these dilutions should be explained in the fact sheet. We note the dilution series in the draft permit was commonly used in the WET data analysis methods used prior to the TST and may have been inadvertently carried over from previous permits.

2. Monitoring Program

The list of parameters in the monitoring program for pesticides appears incomplete (Table 4 of Attachment A), in that only a limited number of organophosphate pesticides would be sampled. We recommend the list be broadened to include a wider variety of pesticide compounds in current use, such as pyrethroids (e.g., bifenthrin, cypermithrin, esfenvalerate, gamma cyhalothrin, permithrin, etc.) and neonicotinoides (e.g., clothianidin, imidocloprid, thiamethoxam).

Section II.D of Attachment A requires monitoring at representative "MS4 outfalls" but does not provide any guidance concerning the required number of locations to be sampled, or the specific locations themselves. We recommend the permit at least clarify that representative sampling locations must be selected that would allow a compliance determination with each applicable WLA. The fact sheet also notes that the intent of the permit is largely to continue the existing monitoring program, and it appears the Regional Board has generally been satisfied with the program in previous years. Nevertheless, we recommend the fact sheet further describe the program (e.g., number and location of sampling sites, frequency of sampling) to provide the public with a better sense of the scope of the program.

Based on information contained in Orange County's 2011-2012 Unified Annual Report, the County did not adequately compare dry weather receiving water composite sample results against the California Toxics Rule (CTR), specifically the chronic criteria, as required by section III.1(a) of the monitoring and reporting program requirements of the 2009 permit. Sampling results reported by Orange County were compared to the CTR acute toxicity criteria only. The lack of adequate sampling and/or analysis of dry weather composite samples against the chronic CTR criteria limits the County's ability to identify trends, potential sources, and appropriate responses to exceedances of applicable water quality standards. For the new permit, the Regional Board should ensure that the County clearly understands it responsibilities on this matter.

Finally, we note that bacteria sampling (section II.I.1.c of Attachment A) is not allowed on days when rain has occurred. The basis for this condition should be explained in the fact sheet.

3. Public Review of Updated Monitoring Program

Section II.B.6 of Attachment A provides that the Executive Officer wlll provide the opportunity for public comment on changes to the initial monitoring program which is submitted, but this opportunity seems missing for the initial submittal itself. We recommend the Executive Officer ensure such an opportunity for the initial submittal as well since it will likely be of greater interest than any changes in subsequent years.

We appreciate the opportunity to provide our views on the draft permit. If you have any questions regarding this matter, please contact Eugene Bromley of the NPDES Permits Office at (415) 972-3510.

Sincerely,

Eugene Bromley

for David Smith, Manager
NPDES Permits Office (WTR-5)

Public Comment
LA MS4 Permit A-2236(a)-(kk)
Deadline: 01/21/15 by 12:00 noon

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

RECEIVED
1-20-15
SWRCB Clerk

JAN 20 2015

Ms. Jeanine Townsend
Clerk to the Board
State Water Resources Control Board
1001 I Street, 24th Floor (95814)
P.O. Box 100
Sacramento, CA 95812-0100

Re: Comments to A-2236(a)-(kk)

Dear Ms. Townsend:

The following are EPA Region 9's comments on the State Water Board's draft WQ Order released on November 21, 2014, responding to the petitions (SWRCB/OCC files A-2236(a) through (kk)) submitted challenging NPDES permit No. CAS004001. This permit was issued in November 2012 by the Los Angeles Regional Board and authorizes discharges from the municipal separate storm sewer system (MS4) serving most of Los Angeles County. Region 9 offers the following comments on certain aspects of the Order.

A. "Safe Harbor" During the Planning Phase for a WMP/EWMP

Section VI.C.3.b of the LA MS4 permit provides that permittees are deemed in compliance with receiving water limitations (RWLs) upon notification to the Regional Board of their intent to develop a watershed management program (WMP) or enhanced watershed management program (EWMP). In our testimony at the November 2012 adoption hearing for the permit (and in a subsequent August 14, 2013 letter to the State Water Board), we recommended a change in the timing of when a permittee would be deemed in compliance. Rather than being deemed in compliance upon notification of intent to prepare a WMP/EWMP, we recommended that a permittee be deemed in compliance only after approval of a WMP/EWMP.

Section II.B.6 of the draft WQ Order supports the LA MS4 permit with regards to the timing of when the "safe harbor" period would begin. Establishing a safe harbor during this planning phase is not warranted. The requirement that LA County permittees meet RWLs was in place for over eleven years prior to the issuance of this permit. We disagree that permittees should be considered in compliance with these limits solely based on a notification of intent to prepare a plan.

A provision consistent with our recommendation was drafted as one option for the draft Regional MS4 permit (NPDES permit No. CAS0109266) proposed by the San Diego Regional Board in April 2013. The San Diego Regional Board chose to stick with

an approach for compliance with RWLs that closely aligned with State Board Order WQ 99-05 (i.e., not this draft WQ Order's proposed option). In conclusion, the San Diego Board's option for finding permittees in compliance with RWLs only when a plan is approved should be incorporated into the State Water Board's final WQ Order responding to the LA MS4 permit petitions.

B. Compliance with RWLs Via Retention of the 85%, 24-Hour Storm for Drainage Areas with EWMPs

Section VI.E.2.e.i.4 of the LA MS4 permit provides that for drainage areas where a EWMP is developed, retention of the runoff from the 85%, 24-hour storm would constitute compliance with applicable Water Quality Based Effluent Limits (WQBELs) and RWLs for pollutants associated with TMDL Waste Load Allocations (WLAs). We raised concerns with this provision in our testimony at the November 2012 adoption hearing. It has been a long-standing EPA policy that where a MS4 permit does not incorporate TMDL WLAs as numeric limits, the permit's administrative record must demonstrate that specified control measures will be sufficient to ensure compliance with WLAs. In a December 4, 2012 letter, we requested that the Los Angeles Regional Board identify documents in the permit's administrative record which are the basis for the conclusion that the specified retention would result in achieving WLAs. Based on the Regional Board's April 11, 2013 response, we do not believe that the permit's record supports the conclusion that this retention will result in achievement of WLAs.

The draft WQ Order in section II.B.5 recognizes that the LA MS4 permit does not verify that TMDL-specific limitations will be met as a result of retention of the 85%, 24-hour storm. The draft WQ Order addresses this issue by requiring the submittal of a plan of additional control measures if the specified volume is retained, but water quality monitoring shows that RWLs and WQBELs associated with TMDLs are not in fact being achieved. While this is a step in the right direction, we are concerned that only requiring submittal of a plan could lead to an ineffective iterative process without any assurance that water quality will be protected. We recommend that the provision be strengthened to specify that the expectations for this plan must include: (1) a quantitative analysis demonstrating that proposed additional control measures will result in attainment of WLAs, and (2) a provision for the Executive Officer to have the option to require strict compliance with numeric WLAs if continued progress is not being made towards achieving these water quality limitations.

C. Applicability of the WQ Order to All Regional Boards

We note that some commenters on the draft WQ Order recommended that the State Water Board require that all Regional Boards follow the WMP/EWMP approach in the LA MS4 permit when issuing MS4 permits. As drafted, the proposed WQ Order (section II.B.7) directs all Regional Boards to consider the approach in the LA MS4 permit, but does not require its use. We believe it would be premature and inappropriate

to require the LA MS4 permit approach throughout the State, especially considering the previous two issues we've identified in this letter.

We appreciate the opportunity to provide our views on the draft WQ Order. If you have any questions regarding this matter, please contact Eugene Bromley of the NPDES Permits Section at (415) 972-3510.

Sincerely,

David Smith, Manager
NPDES Permits Section (WTR-2-3)

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Sent Via Electronic Transmission – November 3, 2015 @ 8:22 pm PST
(rb9agenda@waterboards.ca.gov)

November 3, 2015

Mr. David Gibson,
Executive Officer
Regional Water Quality Control Board
San Diego Region
Board Meeting Room
2375 Northside Drive, Suite 108
San Diego, California

Notice of Potential 'Taking' of Private Property – Safari Highlands Ranch, Pending Subdivision Map and Related Entitlements - Escondido California
Directed to San Diego Regional Water Quality Control Board (RWQCB)

Scheduled Meeting of November 18, 2015 – 2375 Northside Drive, Suite 108, San Diego, California

Dear Mr. Gibson:

This firm represents Safari Highlands Ranch, LLC, the owner of approximately 1100 acres of land in the General Plan and Specific Plan Area #4, of the City of Escondido, California, more specifically described in the attached exhibits.

This correspondence is not intended to fully state all arguments or law relevant to the RWQCB's potential decision at its forthcoming meeting on November 18, 2015, but is offered as 'Notice' of exposure to liability.

An analysis of the Potential Critical Coarse Sediment Yield Areas, as indicated on the attached exhibits and illustrated by our engineers of work, Hunsacker & Associates, proves to show that if the Hydromodification Management BMP Requirements considered by the RWQCB are adopted and applied to the Safari Highlands Ranch, such action will constitute in a total taking of the land value.

C. Samuel Blick
Attorney at Law

This action by the RWQCB will render the land and pending Subdivision Tract Map without value, as defined in Federal and State law, including but not limited to the well supported decision in *Lucas v. South Carolina Coastal Council, 424 S.E.2d 484, 486 (S.C. 1992).*

We urge you review the attached exhibit of the Safari Highland Ranch pending Subdivision Tract Map and related entitlements, noted as "REGIONAL WMAA – Safari Highland Ranch." This exhibit illustrates via the red triangles, areas identified as potential critical coarse sediment areas by the City of San Diego as lead agency to develop the new BMP Design Manual to implement the 2013 water quality permit.

This evidences the total taking of the land value, in that the manual requires complete avoidance of actual CCSYAs, offering no mitigation for developing any of the red triangles.

The Safari Highland Ranch development project is valued at completion of entitlements in excess of $500,000,000.00, and, since all value would be 'taken' by implementation of the proposed regulations, the exposure of the RWQCB and relevant agencies might easily exceed that figure.

We urge you to consider these statements of fact and law and decline to proceed with these unreasonable critical coarse sediment regulations.

Please accept this letter as part of the administrative record regarding the adoption of the proposed regulations.

Sincerely,

/s/ *C. Samuel Blick*

C. Samuel Blick
Attorney at Law

CSB: sh

Cc: Don Underwood, President, Concordia Communities,
San Diego Association of Governments
California Coastal Commission
United States Fish & Wildlife Service

California Department of Fish & Wildlife

C. Samuel Blick
Attorney at Law

United States Army Corps of Engineers

Enclosures:

REGIONAL WMAA – Map of Safari Highland Ranch
PROVISION E: JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS

LEGEND

POTENTIAL CRITICAL COARSE SEDIMENT YIELD AREAS

DATE OF PREPARATION 7/21/15

PREPARED BY:

HUNSAKER & ASSOCIATES
SAN DIEGO, INC

PLANNING
ENGINEERING
SURVEYING

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REGIONAL WMAA
SAFARI HIGHLANDS RANCH

CITY OF ESCONDIDO, CALIFORNIA

W.O. 2374-0017

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(b) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1)(a). The Priority Development Project must mitigate for the portion of the pollutant load in the design capture volume not retained onsite if Provision E.3.c.(3) is utilized. If a Priority Development Project is allowed to utilize alternative compliance, flow-thru treatment control BMPs must be implemented to treat the portion of the design capture volume that is not reliably retained onsite. Flow-thru treatment control BMPs must be sized and designed in accordance with Provisions E.3.c.(1)(a)(ii)[a]-[c].

(2) Hydromodification Management BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite BMPs to manage hydromodification that may be caused by storm water runoff discharged from a project as follows:

(a) Post-project runoff conditions (flow rates and durations) must not exceed pre-development runoff conditions by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat downstream of Priority Development Projects).

(i) In evaluating the range of flows that results in increased potential for erosion of natural (non-hardened) channels, the lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks.

(ii) The Copermittees may use monitoring results collected pursuant to Provision D.1.a.(2) to re-define the range of flows resulting in increased potential for erosion, or degraded instream habitat conditions, as warranted by the data.

(b) Each Priority Development Project must avoid critical sediment yield areas known to the Copermittee or identified by the optional Watershed Management Area Analysis pursuant to Provision B.3.b.(4), or implement measures that allow critical coarse sediment to be discharged to receiving waters, such that there is no net impact to the receiving water.

(c) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the performance requirements of Provision E.3.c.(2)(a). The Priority Development Project must mitigate for the post-project runoff conditions not fully managed onsite if Provision E.3.c.(3) is utilized.

The San Diego Water Board understands, indeed asserts, that the pre-development hydrology of an area in question can only be roughly estimated and cannot be precisely known. However, using the hydrology of a natural condition, even if not precisely known, will provide significant benefit to receiving waters over using the hydrology associated with pervious (developed) surfaces. Therefore in order to achieve the goals of the Clean Water Act, which are to "*restore and maintain the chemical, physical, and biological integrity of the nation's waters* [emphasis added]," the most appropriate standard to use for hydromodification management is the standard associated with the pre-development condition.

Provision E.3.c.(2)(b) requires Priority Development Projects to avoid known critical sediment yield areas or implement measures that would allow coarse sediment to be discharged to receiving waters, such that the natural sediment supply is unaffected by the project. This is necessary because coarse sediment supply is as much an issue for causing erosive conditions to receiving streams as are accelerated flows.

The San Diego Water Board recognizes that in some situations implementing the hydromodification management BMP requirements fully onsite may not be technically feasible, may be cost prohibitive, or may not provide any overall water quality benefits to the Watershed Management Area. Thus, Provision E.3.c.(2)(c) allows for the use of a combination of onsite hydromodification management BMPs and alternative compliance options described in Provision E.3.c.(3).

Provision E.3.c.(3) allows for alternative compliance in instances where the Copermittee determines that offsite measures will have a greater overall water quality benefit for the Watershed Management Area than if the Priority Development Project were to implement structural BMPs onsite. Consequently, watershed-specific structural BMP requirements are present in this Order in the form of allowable compliance offsite. The Alternative Compliance Program to Onsite Structural BMP Implementation Provision is intended to integrate with the Copermittees' planning efforts in the Water Quality Improvement Plans.

The Alternative Compliance Program is an option for Priority Development Projects where the governing Copermittee has participated in the development of a Watershed Management Area Analysis as part of the Water Quality Improvement Plan (described in Provision B.3.b.(4)). Such an approach is consistent with the latest findings in hydromodification management by the scientific community. In a Technical Report entitled *Hydromodification Assessment and Management in California,*[38] the report states:

> *"An effective [hydromodification] management program will likely include combinations of on-site measures (e.g., low-impact development techniques, flow-control basins), in-stream measures (e.g., stream habitat restoration), floodplain*

[38] 2012. ED Stein, F Federico, DB Booth, BP Bledsoe, C Bowles, Z Rubin, GM Kondolf, A Sengupta. Technical Report 667. Southern California Coastal Water Research Project. Costa Mesa, CA.

California Regional Water Quality Control Board
San Diego Region

Response to Comments Report

Tentative Order No. R9-2015-0100

An Order Amending Order No. R9-2013-0001, NPDES No. CAS010266, As Amended by Order No. R9-2015-0001 National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region

November 4, 2015
Revised November 10, 2015

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
2375 Northside Drive, Suite 100, San Diego, California 92108
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Documents are available at: http://www.waterboards.ca.gov/sandiego

California Regional Water Quality Control Board
San Diego Region

Henry Abarbanel, *Chair*
Gary Strawn, *Vice Chair*
Eric Anderson
Tomas Morales
Stefanie Warren
Betty Olson
Vacant

David W. Gibson, *Executive Officer*
James Smith, *Assistant Executive Officer*

Catherine Hagan, *Senior Staff Counsel, Office of Chief Counsel*

This report was prepared under the direction of

David T. Barker, *P.E., Supervising Water Resource Control Engineer, Surface Water Protection Branch*
Laurie Walsh, *P.E., Senior Water Resource Control Engineer, Storm Water Management Unit*

By

Wayne Chiu, *P.E., Water Resource Control Engineer*
Christina Arias, *P.E., Water Resource Control Engineer*

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Responses to Comments on Tentative Order No. R9-2015-0100

November 4, 2015

Revised November 10, 2015

Introduction

This report contains responses to written comments timely received on Tentative Order No. R9-2015-0100, *An Order Amending Order No. R9-2013-0001, NPDES No. CAS010266*, *as Amended by Order No. R9-2015-0001, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Tentative Order). The Tentative Order and its attachments were available for public review and comment for 46 days, with the comment period ending on September 14, 2015. Specifically, the San Diego Water Board requested comments on the following three documents:

- Tentative Order No. R9-2015-0100;
- Attachment No. 1 – Revised Order No. R9-2013-0001; and
- Attachment No. 2 – Revised Fact Sheet to Order No. R9-2013-0001.

The phrases "Tentative Order" and "Regional MS4 Permit" in the following response to comments table refers to both Tentative Order No. R9-2015-0100 and the two attachments. Comments and responses are organized by the section of either Attachment 1 or Attachment 2 that is being referenced. Wherever possible, comments are grouped based on content and summarized by the San Diego Water Board. The actual comment letters can be accessed on the San Diego Water Board website at: http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

List of Commenters:
Comments were submitted by the following organizations, public agencies, or individuals (listed alphabetically):

1. City of Dana Point
2. City of Escondido
3. City of Laguna Beach
4. City of Lake Forest
5. City of Menifee
6. City of San Clemente
7. City of San Diego
8. City of San Juan Capistrano
9. City of Santee
10. Construction Industry Coalition on Water Quality (CICWQ)
11. County of San Diego
12. Environmental Groups (San Diego Coastkeeper, Coastal Environmental Rights Foundation, and Surfrider Foundation San Diego Chapter)
13. Orange County Copermittees
14. Riverside County Copermittees
15. San Diego Coastkeeper and Coastal Environmental Rights Foundation
16. San Diego County Copermittees
17. San Diego Unified Port District
18. South Laguna Civic Association
19. Safari Highlands Ranch

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Gnl-1	GENERAL COMMENTS	
	COMMENT: *Request to incorporate previous written comments and testimony in the record for this Tentative Order.* The Copermittees and other stakeholders requested that previous written comments and testimony be incorporated into the record for this Tentative Order. The comment letters also included copies of the written comments previously submitted during the proceedings to adopt Order No. R9-2013-0001, and the proceedings to adopt Order No. R9-2015-0001 to amend Order No. R9-2013-0001.	Riverside County Copermittees Orange County Copermittees City of Dana Point City of San Diego San Diego Unified Port District South Laguna Civic Association Construction Industry Coalition on Water Quality
	RESPONSE: The San Diego Water Board is incorporating the previous written comments and testimony provided during the proceedings to adopt Order No. R9-2013-0001, and the proceedings to adopt Order No. R9-2015-0001 to amend Order No. R9-2013-0001 into the record for this Tentative Order. The San Diego Water Board reviewed Tentative Order No. R9-2015-0100 and its Attachments and has determined that the March 27, 2013 responses to comments document prepared during the 2013 adoption process of Order No. R9-2013-0001, the January 21, 2015 responses to comments document prepared during the adoption process of Order No. R9-2015-0001, and the oral responses to comments during the workshops and hearings during those proceedings address the previously submitted comments and testimony. The San Diego Water Board is incorporating by this reference as if set forth in full herein its written responses to comments and oral responses to comments raised during the workshops and hearings on Order Nos. R9-2013-0001 and R9-2015-0001 into these responses. To the extent commenters incorporate issues and objections raised in petitions for review of Order No. R9-2013-0001 filed with the State Water Board in SWRCB/OCC File A-2254(a)-(p), or in petitions for review of Order No. R9-2015-0001, amending Order No. R9-2013-0001 (SWRCB/OCC File A-2367(a)-(i)), the San Diego Water Board notes that it has not yet had an opportunity to submit written responses to those petitions for review and is not specifically addressing those petitions for review in these responses to comments. The San Diego Water Board will submit written responses to the petitions for review at the appropriate time in the State Water Board's petition proceeding. No changes to the Tentative Order or its Attachments were made based on the renewed comments.	

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Gnl-2	GENERAL COMMENTS	
	COMMENT: *Request for clarification of implementation requirements for the Riverside County Copermittees as a result of late entry into the Regional MS4 Permit.* The Riverside County Copermittees noted that several provisions of the Regional MS4 Permit, including requirements to submit certification of legal authority, assessment and subsequent Water Quality Improvement Plan revision requirements, and requirements to submit a regional monitoring and assessment report, which either require data gathered under a Water Quality Improvement Plan that has been accepted by the San Diego Water Board, or are due for submittal outside of the Regional MS4 Permit's term. The Riverside County Copermittees wanted clarification that: 1) the certification of legal authority which was submitted by the Riverside County Copermittees under Order No. R9-2010-0016 will remain effective until a new certification is submitted with the first Water Quality Improvement Plan Annual Report (after the current Regional MS4 Permit term has ended), 2) any provisions regarding assessments or requiring data gathered under an accepted Water Quality Improvement Plan will not be due until such time that the necessary data are gathered and the assessments made under time periods described in the Regional MS4 Permit, and 3) the regional monitoring and assessment report for the current Regional MS4 Permit term should be completed utilizing data gathered during the transitional monitoring period, as these will be the only data that will be available at that time.	Riverside County Copermittees
	RESPONSE: The San Diego Water Board agrees that: 1) the certification of legal authority which was submitted by the Riverside County Copermittees under Order No. R9-2010-0016 will remain effective until a new certification is submitted with the first Water Quality Improvement Plan Annual Report (after the current Regional MS4 Permit term has ended), 2) any provisions regarding assessments or requiring data gathered under an accepted Water Quality Improvement Plan will not be due until such time that the necessary data are gathered and the assessments made under time periods described in the Regional MS4 Permit, and 3) the regional monitoring and assessment report for the current Regional MS4 Permit term should be completed utilizing data gathered during the transitional monitoring period, as these will be the only data that will be available at that time.	

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Gnl-3	GENERAL COMMENTS	
	COMMENT: *Request to remove the City of Menifee from Water Quality Improvement Plan development and implementation.* The Riverside County Copermittees and the City of Menifee requested several modifications to the Regional MS4 Permit that would remove the City of Menifee from the requirement to develop and implement the Water Quality Improvement Plan for the Santa Margarita River Watershed Management Area. The Riverside County Copermittees and the City of Menifee assert that the City of Menifee does not own or operate any MS4 within the Santa Margarita River Watershed Management Area, and provided a map showing the City's jurisdictional boundary and MS4.	Riverside County Copermittees City of Menifee
	RESPONSE: The San Diego Water Board reviewed the information provided by the commenters and disagrees that the City of Menifee does not own or operate any MS4 within the Santa Margarita Watershed Management Area. The maps provided by the commenters show a portion of MS4 along Scott Road within the Santa Margarita Watershed Management Area that is indicated to be owned by the City of Menifee. In addition, the maps provided by the commenters show that there is a residential area within the City of Menifee and within the Santa Margarita River Watershed Management Area with streets, curb, and gutter that drain to MS4 owned by the Riverside County Flood Control and Water Conservation District, which discharges to a tributary of Warm Springs Creek. Warm Springs Creek is an impaired water body in the Santa Margarita River Watershed Management Area and may become subject to the requirements of a TMDL in the future. The streets, curb, and gutter in the residential area are also considered part of the City of Menifee's MS4. The maps provided confirm that it is appropriate for the City of Menifee to be required to participate in the development and implementation of the Water Quality Improvement Plan for the Santa Margarita River Watershed Management Area. No changes were made to the Tentative Order as a result of this comment.	

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Gnl-4	GENERAL COMMENTS	
	COMMENT: *Stakeholder workshops have been effective.* The Orange County Copermittees expressed appreciation for the efforts of the San Diego Water Board staff to collaboratively engage the Copermittees and other stakeholders through the use of mediated workshops. The workshop format allowed all viewpoints to be expressed with sufficient time provided for discussion of issues regarding the Regional MS4 Permit.	Orange County Copermittees City of Dana Point City of Laguna Beach
	RESPONSE: The San Diego Water Board agrees that the collaborative approach utilized during the Regional MS4 Permit development and amendment processes has been beneficial for the San Diego Water Board staff to better understand the issues of concern to the stakeholders.	

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Gnl-5	GENERAL COMMENTS	
	COMMENT: *Requests for the Regional MS4 Permit to acknowledge the potential benefit of developing site specific water quality objectives in concert with development of the Water Quality Improvement Plan.* The Cities of Dana Point and Laguna Beach requested that the Regional MS4 Permit and Fact Sheet specifically acknowledge the benefit of developing site specific objectives in concert with the development of the Water Quality Improvement Plans, even if development of the site specific objectives may extend the period to complete development of the Water Quality Improvement Plans.	City of Dana Point City of Laguna Beach
	RESPONSE: The San Diego Water Board acknowledges that developing site specific water quality objectives (site specific objectives) may be appropriate where there are data that are available to support site specific objectives. The San Diego Water Board, however, disagrees that it is appropriate to delay development and implementation of any Water Quality Improvement Plans with an expectation that site specific objectives will be developed. Any action taken by the San Diego Water Board to establish site specific objectives would require amendment of the Basin Plan to incorporate the site specific objectives before they could be implemented in any NPDES permits or waste discharge requirements issued by the San Diego Water Board. The Basin Planning process requires separate proceedings that need to include the public, the San Diego Water Board, the State Water Board, the Office of Administrative Law, and the USEPA. This process will take much longer to complete than developing the Water Quality Improvement Plan. However, the San Diego Water Board encourages the Copermittees to utilize the Water Quality Improvement Plan development process to identify areas within the Watershed Management Area where developing site specific objectives may be appropriate and include special studies to collect data that can be used to support development of site specific objectives.	

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Gnl-6	GENERAL COMMENTS	
	COMMENT: *Request for clarification that location of a MS4 within the Port's jurisdictional boundaries does not render the Port an owner or operator of the MS4.* The San Diego Unified Port District (Port) asserts that just because a MS4 facility falls within its jurisdictional boundaries, which overlap with the Cities of San Diego, National City, Chula Vista, Imperial Beach, and Coronado (Member Cities), that does not mean the Port owns or operates the MS4 facility, and thus the Port would not be responsible for discharges from those MS4 facilities. Therefore, the Port requested revisions to the Tentative Order that clarify this distinction.	San Diego Unified Port District
	RESPONSE: The San Diego Water Board disagrees that the Tentative Order should be revised to include additional clarification. The Port owns and operates MS4 facilities (streets, curbs and gutters, catch basins, etc.) and lands within the tidelands that either convey or discharge storm water runoff into MS4 facilities owned or operated by Member Cities, or directly to receiving waters. The Port is responsible for complying with permit conditions pertaining to discharges from MS4 facilities and lands the Port owns or operates that discharge into MS4 facilities of Member Cities or directly to receiving waters. The Port must provide the evidence to demonstrate that it does not own or operate MS4 facilities or lands that discharge storm water runoff directly or indirectly into the MS4 facilities owned by the Member Cities. No changes were made to the Tentative Order as a result of this comment.	

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Gnl-7	GENERAL COMMENTS	
	COMMENT: *Compliance with all the discharge prohibitions in the Regional MS4 Permit under all circumstances is likely impossible.* The Cities of Dana Point and Laguna Beach asserts that compliance with all the discharge prohibitions in the Regional MS4 Permit under all circumstances is not practicable and likely impossible. The Cities go on to assert that the Cities are in a position of being required to comply with the discharge prohibitions under all circumstances, or are being required to meet a "zero discharge standard," both of which are impossible to achieve.	City of Dana Point City of Laguna Beach
	RESPONSE: The San Diego Water Board does not disagree with the assertion that the Copermittees are not in compliance with all the discharge prohibitions in the Regional MS4 Permit under all circumstances. The San Diego Water Board disagrees that it is not practicable and likely impossible to comply with all of the discharge prohibitions under all circumstances. The cases cited in support of the commenters' argument are inapposite and factually distinguishable from Order No. R9-2013-0001 (as amended) and the discharge prohibitions and receiving water limitations provisions therein. To date, the Copermittees have not implemented programs that are capable of complying with all of the discharge prohibitions under all circumstances, but that does not mean it is not practicable nor impossible. The assertion that complying with all the discharge prohibitions in the Regional MS4 Permit under all circumstances is not practicable and impossible cannot be supported without first demonstrating that the Copermittees have implemented all of their programs to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges to the maximum extent practicable (MEP). Moreover, several audits conducted recently by the San Diego Water Board indicate that the Copermittees may not be adequately implementing their basic jurisdictional runoff management program (JRMP) requirements to reduce pollutants in storm water discharges to the MEP standard. Even if the Copermittees implemented the basic JRMP requirements to the MEP standard, the Copermittees can also implement additional practicable actions or programs to comply with all of the discharge prohibitions in the Regional MS4 Permit.	

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Gnl-8	GENERAL COMMENTS	
	COMMENT: *Request for clarification by City of Lake Forest for applicability of the Water Quality Improvement Plan development requirements.* The City of Lake Forest requested clarification on its participation in development of the Water Quality Improvement Plan, based on the agreement that discharges from its MS4 in the San Diego Region will be regulated by the Santa Ana Water Board.	City of Lake Forest
	RESPONSE: The San Diego Water Board expects the City of Lake Forest to contribute to development of the Water Quality Improvement Plan and describe the water quality improvement strategies that will be implemented by the City to comply with TMDL requirements. The strategies implemented by the City of Lake Forest are only expected to implement the requirements of the Phase I MS4 Permit issued by the Santa Ana Water Board, except when and where additional strategies (known as optional jurisdictional strategies or Watershed Management Area strategies in the Regional MS4 Permit) may be necessary to achieve TMDL requirements. Likewise, if the Water Quality Improvement Plan includes final numeric goals that are not based on TMDL requirements, the City of Lake Forest is expected to include descriptions of the water quality improvement strategies that the City may implement to contribute toward achieving those final numeric goals.	

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Gnl-8	GENERAL COMMENTS	
	COMMENT: *Recommendations for actions that can be implemented to improve water quality.* The South Laguna Civic Association provided several recommended actions that may result in improvements to water quality.	South Laguna Civic Association
	RESPONSE: The San Diego Water Board appreciates the recommendations. The recommendations, however, appear to be actions that could be implemented as part of water quality improvement strategies by the Copermittees, and not necessarily appropriate to include into the requirements of the Tentative Order. The recommended actions provided by the commenter can be brought to the attention of the south Orange County Copermittees during the development of the Water Quality Improvement Plan. No changes were made to the Tentative Order as a result of this comment.	

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Gnl-10	GENERAL COMMENTS	
	COMMENT: *The Regional MS4 Permit illegally authorizes compliance schedules for CTR-based TMDLs beyond May 18, 2010.* The Environmental Groups assert the Tentative Order and the Regional MS4 Permit illegally authorize compliance schedules for TMDLs to achieve compliance with the CTR as required by the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP).	Environmental Groups
	RESPONSE: The San Diego Water Board disagrees that the Tentative Order or the Regional MS4 Permit are in conflict with the SIP. The Tentative Order and Regional MS4 Permit are consistent with the TMDLs and the SIP. The Regional MS4 Permit establishes requirements for the regulation of storm water discharges, and the compliance schedule requirements of the SIP do not apply to storm water discharges. Please refer to footnote 1 on page 3 of the SIP which states, "*This Policy does not apply to regulation of storm water discharges. The SWRCB has adopted precedential decisions addressing regulation of municipal storm water discharges in Orders WQ 91-03, 91-04, 96-13, 98-01, 99-05, and 2001-15.*"	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2015-0100

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A-1	PROVISION A: PROHIBITIONS AND LIMITATIONS	
	COMMENT: *Requests to include language in the prohibitions and limitations of Provision A that is linked to the alternative compliance pathway under Provision B.3.c.* The Orange County and San Diego County Copermittees, as well as several individual Copermittees, requested the addition of language to Provision A that explicitly states the implementation of the alternative compliance pathway under Provision B.3.c constitutes compliance with the discharge prohibitions and receiving water limitations in Provision A.	Orange County Copermittees City of Lake Forest City of San Clemente City of San Juan Capistrano San Diego County Copermittees City of Santee County of San Diego
	RESPONSE: The San Diego Water Board disagrees that it is appropriate or necessary to include additional language to Provision A. Provision A is consistent with the precedential language that was issued under State Water Board Order WQ 99-05. State Water Board Order WQ 2015-0075, which supports the inclusion of the alternative compliance pathway under Provision B.3.c, also states that Phase I MS4 permits should continue to use the receiving water limitations provisions as directed by Order WQ 99-05. No changes were made to the Tentative Order as a result of this comment.	

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A1-1	PROVISION A.1: Discharge Prohibitions	
	COMMENT: *Request to correct State Water Board Resolution No. 2012-0012 reference in Provision A.1.d to Resolution No. 2012-0031.* The City of San Diego requested that the reference to State Water Board Resolution No. 2012-0012 in Provision A.1.d be changed to Resolution No. 2012-0031.	City of San Diego
	RESPONSE: The San Diego Water Board agrees that the correction is appropriate. The reference to "State Water Board Resolution No. 2012-0012" under Provision A.1.d has been revised to "State Water Board Resolution No. 2012-0012, as amended by State Water Board Resolution No. 2012-0031."	

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November 4, 2015 / Revised November 10, 2015

A2-1	PROVISION A.2: Receiving Water Limitations	
	COMMENT: *Request for removal of receiving water limitations language from Regional MS4 Permit.* The County of San Diego requested that the San Diego Water Board use its discretion to remove the requirements to comply with receiving water limitations in Provision A.2 of the Regional MS4 Permit.	County of San Diego
	RESPONSE: The San Diego Water Board disagrees that it is appropriate to remove the requirements to comply with receiving water limitations in Provision A.2 of the Regional MS4 Permit. The receiving water limitations are consistent with precedential State Water Board Orders WQ 99-05 and WQ 2015-0075. No changes were made to the Tentative Order as a result of this comment.	

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B-1	PROVISION B: WATER QUALITY IMPROVEMENT PLANS	
	COMMENT: *Request to revise the language in Provision B.1 to specify the Water Quality Improvement Plans are to address discharges from the MS4.* The City of San Diego requested Provision B.1 be revised to state that the Copermittees must develop a Water Quality Improvement Plan for their MS4 discharges within each of the Watershed Management Areas in Table B-1.	City of San Diego
	RESPONSE: The San Diego Water Board disagrees that the Water Quality Improvement Plans should be specific to just addressing discharges from the MS4. The Regional MS4 Permit is for the regulation of the Copermittees' MS4 discharges, but the Water Quality Improvement Plan is a planning document that requires the Copermittees to evaluate and identify all water quality conditions of concern within a Watershed Management Area. The Copermittees then determine what conditions of concern are the priorities that should be addressed by their individual jurisdictional strategies and/or through watershed-wide strategies. The Water Quality Improvement Plan development process provides the Copermittees flexibility in determining how to address priority issues through establishment of goals that directly improve receiving water quality impacted by MS4 discharges, instead of only limiting goals to MS4 discharges. No changes were made to the Tentative Order as a result of this comment.	

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B2-1	PROVISION B.2: Priority Water Quality Conditions	
	COMMENT: *Request for revisions to the requirements for identifying priority water quality conditions under Provision B.2.* The South Laguna Civic Association provided proposed revisions to the requirements for identifying priority water quality conditions under Provision B.2. The proposed revisions appeared to include mapping of areas, incorporating areas of concern specific to south Orange County, and identifying issues that may be a concern specific to south Orange County.	South Laguna Civic Association
	RESPONSE: The San Diego Water Board reviewed the requested revisions to the requirements for identifying priority water quality conditions under Provision B.2. The San Diego Water Board did not identify any proposed revisions that were appropriate or necessary. The information requested to be included as part of the proposed revisions is information that should be brought to the attention of the south Orange County Copermittees during the development of the Water Quality Improvement Plan. No changes were made to the Tentative Order as a result of this comment.	

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B3c-1	PROVISION B.3.c: Prohibitions and Limitations Compliance Option	
	COMMENT: *Support for the inclusion of the receiving water limitations alternative compliance pathway in the Regional MS4 Permit.* The Riverside County, Orange County, and San Diego County Copermittees, as well as several individual Copermittees submitted comments that support the inclusion of the receiving water limitations alternative compliance pathway proposed to be incorporated into the Regional MS4 Permit as Provision B.3.c.	Riverside County Copermittees Orange County Copermittees City of Lake Forest City of San Clemente City of San Juan Capistrano City of San Diego City of Santee County of San Diego
	RESPONSE: The San Diego Water Board appreciates the support to include the receiving water limitations alternative compliance pathway into the Regional MS4 Permit.	

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November 4, 2015 / Revised November 10, 2015

B3c-2	PROVISION B.3.c: Prohibitions and Limitations Compliance Option	
	COMMENT: *Requests for revisions to the requirement for developing and incorporating annual milestones into the schedules for the alternative compliance pathway.* The Riverside County, Orange County, and San Diego County Copermittees, as well as several individual Copermittees requested revisions to the requirement to develop and incorporate annual milestones into the schedules for the alternative compliance pathway under Provision B.3.c. The Copermittees assert that annual milestones are burdensome, unworkable, and not meaningful. The Copermittees requested that milestones be limited to one or two milestones per permit term.	Riverside County Copermittees Orange County Copermittees City of Lake Forest City of San Clemente City of San Juan Capistrano San Diego County Copermittees City of San Diego City of Santee
	RESPONSE: The San Diego Water Board considered the proposed revisions and rationale provided and determined that revisions to the requirement for developing and incorporating annual milestones are appropriate. However, the San Diego Water Board does not agree that milestones should be limited to just one or two per permit term. The development and incorporation of annual milestones into the alternative compliance pathway is necessary for a Copermittee to be able to demonstrate to the San Diego Water Board and the public that there is a commitment to implementing a credible, rigorous, ambitious, and transparent plan to improve the quality of its MS4 discharges and/or receiving waters within its jurisdiction. The San Diego Water Board agrees, however, that annual milestones may become less meaningful after 5 or 10 years. Therefore, Provision B.3.c.(1)(a)(vii) and footnote 9 have been revised as follows: Provision B.3.c.(1)(a)(vii) For each final numeric goal developed pursuant to Provisions B.3.a and B.3.c.(1)(a)(i)-(v), ~~at least one~~ annual milestones[9] and the dates for ~~its~~ their achievement must be included within each of the next five (5) Water Quality Improvement Plan Annual Report reporting periods, or until the final numeric goal is achieved. Annual milestones and the dates for their achievement for the 5 Water Quality Improvement Plan Annual Report reporting periods of the next permit term, or until the final numeric goal is achieved, must be provided as part of the Report of Waste Discharge required pursuant to Provision F.5. Footnote 9 Annual milestones for each final numeric goal must ~~build upon previous milestones and lead to~~ be clearly and directly linked to, or demonstrate progress is being made toward, the achievement of the final numeric	

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	goal. The annual milestones may consist of water quality improvement strategy implementation phases, interim numeric goals, and other acceptable metrics. The annual milestones may address multiple numeric goals and/or multiple water bodies, as applicable and appropriate.	

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B3c-3	PROVISION B.3.c: Prohibitions and Limitations Compliance Option	
	COMMENT: *Requests for revisions to provide additional clarifying language for when a Copermittee is deemed in compliance with receiving water limitations.* The Riverside County Copermittees requested revisions to the alternative compliance pathway requirements under Provision B.3.c.(2) and the iterative process requirements under Provision A.4 to clarify when a Copermittee is deemed in compliance with receiving water limitations, especially relative to other Copermittees if updates are needed. The Environmental Groups requested revisions to Provision B.3.c.(2) to strictly require achievement of annual milestones and remove the potential for updates as a clearer way of determining when a Copermittee is no longer deemed in compliance.	Riverside County Copermittees Environmental Groups
	RESPONSE: The San Diego Water Board disagrees that revisions to Provision B.3.c.(2) are necessary to clarify when a Copermittee is deemed in compliance. The requirements under Provision B.3.c.(2) are clear criteria that the San Diego Water Board will use to determine if a Copermittee can be deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b. The commenters did, however, identify a scenario during the period of time a Copermittee has submitted "acceptable rationale and recommends appropriate modifications" and the San Diego Water Board accepts the rationale and recommended modifications where it may not be clear if a Copermittee is or is not in compliance. The intent was to continue deeming the Copermittee in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b during this period of time. To clarify this intent, the following has been added to the last paragraph of the discussion of Provision B.3.c on page F-62 in the Fact Sheet: The Copermittee continues to be deemed in compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b during the time the San Diego Water Board reviews the rationale and recommended modifications to the interim numeric goals, and/or water quality improvement strategies, and/or schedules. If and when the San Diego Water Board determines that it does not accept the rationale or recommendations, the Copermittee will be notified they are no longer deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b.	

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B3c-4	PROVISION B.3.c: Prohibitions and Limitations Compliance Option	
	COMMENT: *Requests to include compliance with receiving water limitations during the Water Quality Improvement Plan planning and development process.* The Riverside County and Orange County Copermittees, several Orange County cities, as well as the County of San Diego requested that the requirements under Provision B.3.c be revised to include compliance with the prohibitions and limitations of Provision A during the development of the Water Quality Improvement Plans. Several of the comments also assert that including compliance during development of the Water Quality Improvement Plan is consistent with State Water Board Order WQ 2015-0075.	Riverside County Copermittees Orange County Copermittees City of Dana Point City of Laguna Beach City of Lake Forest City of San Clemente City of San Juan Capistrano County of San Diego
	RESPONSE: The San Diego Water Board disagrees that it is appropriate to deem a Copermittee in compliance with any of the prohibitions and limitations under Provision A before a Water Quality Improvement Plan has been submitted and accepted by the San Diego Water Board. The San Diego Water Board also disagrees that State Water Board Order WQ 2015-0075 communicates that the State Water Board expects or requires in any way that Regional Water Boards allow for compliance with receiving water limitations during development of watershed management plans. The San Diego Water Board is concerned that allowing for compliance during the development of the Water Quality Improvement Plan would remove the motivation or incentive for Copermittees to develop a credible, rigorous, ambitious, and transparent plan. Before the San Diego Water Board can make a determination that a Copermittee has a credible, rigorous, ambitious, and transparent plan that can demonstrate discharges from a Copermittee's MS4 will not cause or contribute to exceedances of water quality standards in receiving waters, or that receiving waters will be protected from MS4 discharges, the San Diego Water Board must first have an opportunity to review the proposed plan. In response to the assertion that State Water Board Order WQ 2015-0075 encourages or mandates alternative compliance pathways to include compliance during development of the Water Quality Improvement Plan, the commenters failed to provide a clear citation of this direction. There is nothing within the State Water Board Order that explicitly requires the inclusion of an alternative compliance pathway in Phase I MS4 Permit, let alone compliance during development of the plan for alternative compliance. State Water Board Order WQ 2015-0075 only requires the San Diego Water Board to consider inclusion of an alternative compliance pathway, and include findings in the permit if the San Diego Water Board chooses not to include the alternative compliance pathway. In this case, the San Diego Water Board has chosen to incorporate an alternative compliance	

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	pathway, but without compliance during the development of the Water Quality Improvement Plan. Furthermore, the San Diego Water Board notes that USEPA has provided written comments to the Los Angeles Water Board (click here and here for links to letters), the Santa Ana Water Board (click here for link to letter), and the State Water Board click here for link to letter) that support the San Diego Water Board's approach to alternative compliance with receiving water limitations, specifically supporting the San Diego Water Board's decision not to include compliance during the development period for the Water Quality Improvement Plan. Based on this expressed support from USEPA, and the other reasons cited above, the San Diego Water Board is not allowing for a Copermittee to be deemed in compliance with the prohibitions and limitations under Provision A during the development of the Water Quality Improvement Plans. No changes were made to the Tentative Order as a result of this comment.	

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B3c-5	PROVISION B.3.c: Prohibitions and Limitations Compliance Option	
	COMMENT: *Request to include receiving water limitations for ASBS under Provision A.2.b as part of alternative compliance pathway.* The City of San Diego requested that the alternative compliance pathway be revised to also include compliance with the ASBS receiving water limitations required under Provision A.2.b.	City of San Diego
	RESPONSE: The San Diego Water Board considered the request to include the receiving water limitations for ASBS under Provision A.2.b as part of the alternative compliance pathway under Provision B.3.c and agree it is appropriate. References to "Provisions A.1.a, A.1.c, A.1.d, A.2.a, and A.3.b" under Provision B.3.c have been revised to "Provisions A.1.a, A.1.c, A.1.d, A.2~~.a~~, and A.3.b."	

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B3c-6	PROVISION B.3.c: Prohibitions and Limitations Compliance Option	
	COMMENT: *Requests for revisions to alternative compliance pathway numeric goal requirements proposed under Provision B.3.c.(1)(a)(iii).* The City of San Diego requested a revision to combine Provisions B.3.c.(1)(a)(iii) and B.3.c.(1)(a)(iv) to reduce confusion regarding whether the categories of numeric goals are mandatory or optional. The County of San Diego requested additional language to be added to Provision B.3.c.(1)(a)(iii) to limit the numeric goals for MS4 discharges only to pollutants or conditions where MS4 discharges are causing or contributing to the impairment.	City of San Diego County of San Diego
	RESPONSE: The San Diego Water Board disagrees that the revisions requested are appropriate or necessary. The City of San Diego's requested revision does not provide more clarity, and actually reduces the available options for numeric goals. Provisions B.3.c.(1)(a)(iii) and B.3.c.(1)(a)(iv) allow a Copermittee to choose interim and final numeric goals applicable to the Copermittee's MS4 outfalls, OR interim and final numeric goals applicable to the receiving waters, OR a combination of both. The City's proposed revisions would only allow a Copermittee to choose interim and final numeric goals applicable to the Copermittee's MS4 outfalls, OR interim and final numeric goals applicable to the receiving waters, but NOT a combination of both. The San Diego Water Board disagrees that the County's proposed revision is necessary because if a Copermittee's MS4 discharges do not contain pollutants that are causing or contributing to an impairment listed on the Clean Water Act Section 303(d) List of Water Quality Impaired Segments, the Copermittee should not have difficulty developing and including final numeric goals that can demonstrate their discharges are not causing or contributing to the impairment. The Copermittee will also have to collect data to demonstrate that the final numeric goals have been achieved and continue to be achieved. The data collected, assessed, and reported will demonstrate that the Copermittee is not causing or contributing to the impairment listed on the Clean Water Action Section 303(d) List. No changes were made to the Tentative Order as a result of this comment.	

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B3c-7	PROVISION B.3.c: Prohibitions and Limitations Compliance Option	
	COMMENT: *The alternative compliance pathway would result in safe harbor protection and should be removed from the Regional MS4 Permit.* The Environmental Groups assert that providing the alternative compliance pathway provides the Copermittees with safe harbor protection, and requested the alternative compliance pathway be removed from the Regional MS4 Permit.	Environmental Groups
	RESPONSE: The San Diego Water Board does not agree that the alternative compliance pathway provides the Copermittees with safe harbor protection that "simply mimics the failed iterative approach." Compliance with the alternative compliance pathway means, for compliance determination purposes, that the San Diego Water Board would deem a Copermittee that has fulfilled the requirements of the alternative compliance pathway as in compliance with the receiving water limitations. As long as the Copermittee is in compliance with the requirements under Provision B.3.c, the San Diego Water Board can consider the Copermittee in compliance with the prohibitions and limitations. Complying with the requirements of Provision B.3.c, however, will require a significant commitment, level of effort, and resources from any Copermittee that chooses to implement it. Any Copermittee that can comply with the requirements of Provision B.3.c will also be demonstrating a well defined and transparent commitment to improve water quality. Please also see response~~s~~ to comment~~s~~ ~~Gnl-10 and~~ B3c-8. No changes were made to the Tentative Order as a result of this comment.	

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B3c-8	PROVISION B.3.c: Prohibitions and Limitations Compliance Option	
	COMMENT: *The alternative compliance pathway is inconsistent with the State Water Board's Order.* The Environmental Groups assert that the alternative compliance pathway in the Tentative Order is inconsistent with State Water Board Order WQ 2015-0075. The Environmental Groups assert that the alternative compliance pathway proposed in the Tentative Order is inconsistent because a) it does not contain specific guidance or protocols for a "well defined" and "transparent" analysis, b) it does not require a "finite" period of time to achieve receiving water limitations, and c) it does not include requirements for multi-benefit or storm water resource projects.	Environmental Groups
	RESPONSE: The San Diego Water Board disagrees that the alternative compliance pathway proposed in the Tentative Order is inconsistent with the State Water Board Order. The alternative compliance pathway in the Tentative Order is consistent with the State Water Board Order for the following reasons: a) In response to the assertion that the alternative compliance pathway in the Tentative Order does not include specific guidance or protocols for a "well defined" and "transparent analysis, the approach of the alternative compliance pathway in the Tentative Order is actually more "well defined" and "transparent" than the example provided by the commenter. The commenter provides permit language from the Los Angeles MS4 Permit as an example of specific guidance and protocols for a reasonable assurance analysis. While there is more description as to what components the reasonable assurance analysis must include, fundamentally the analysis is based on a computer model consisting of equations with assumptions which utilize data that are entered into and processed by a computer. Many of the variables in the equations will be based on assumptions, and members of the public may not know or understand how those variables may impact the results. The Los Angeles MS4 Permit does not include provisions that allows for or requires public participation or review of the model, its assumptions, and inputs. In contrast, the alternative compliance pathway in the Tentative Order does require an analysis with "clearly stated assumptions" which must go through a public participation process that allows the public to review and provide comments on the analysis methodology and the assumptions included in the analysis. The main difference in the approaches is that the Copermittee has more flexibility with how to do the analysis, and as long as there is understanding and support from the public and the San Diego Water Board. The Copermittee is not just limited to one or two "acceptable" models, but also is not precluded from the use of those models. The Tentative Order alternative compliance pathway is a truly transparent process for the public and provides for the public to participate in how the analysis is defined. Based on these	

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	considerations, the analysis requirement is "well defined" and "transparent" consistent with the State Water Board Order. b) In response to the assertion that the alternative compliance pathway in the Tentative Order does not require a "finite" period of time to achieve compliance with receiving water limitations, the alternative compliance pathway requires a Copermittee to provide a schedule for when receiving water limitations are expected to be achieved. Any schedule with an expected end date is "finite." However, "finite" should not mean there is not room for making adjustments to the schedule if conditions warrant it. Absent the alternative compliance pathway, no assessments would necessarily be conducted to determine if or when receiving water limitations have been fully achieved. The San Diego Water Board prefers a permit that will provide support, incentive, and motivation for the Copermittees to achieve compliance with receiving water limitations within a foreseeable future rather than a permit that only has the threat of enforcement in the present and the foreseeable future. However, while the alternative compliance pathway removes the immediate threat of enforcement for violations of receiving water limitations, it also includes additional requirements that can be used to hold the Copermittee more accountable for implementing strategies to achieve compliance with receiving water limitations. In the end, the San Diego Water Board believes that the alternative compliance pathway provides a path to compliance with receiving water limitations that is "finite" compared to the "iterative process" that was previously required, consistent with the State Water Board Order. c) In response to the assertion that the alternative compliance pathway in the Tentative Order does not include requirements for multi-benefit or storm water resource projects, the San Diego Water Board acknowledges there is no text in Provision B.3.c that includes the term "multi-benefit." However, the Tentative Order does include several provisions that encourage multi-benefit and regional storm water resource projects without using the term "multi-benefit." The commenter should first review Provisions B.3.b.(1)(b) and B.3.b.(2). While these provisions are not specifically mentioned under Provision B.3.c, they are required to be included in the Water Quality Improvement Plan, which is where the alternative compliance pathway requirements of Provision B.3.c must be included. Provision B.3.b.(1)(b) requires each Copermittee to identify strategies to retrofit areas of existing development and rehabilitate conditions of channels or habitats within its jurisdiction, which are considered multi-benefit strategies. Provision B.3.b.(2) also requires the Copermittees in the Watershed Management Area to identify strategies to retrofit areas of existing development and rehabilitate conditions of	

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	channels or habitats that are regional or multi-jurisdictional. Tied to Provisions B.3.b.(1)(b) and B.3.b.(2) are also the jurisdictional runoff management program (JRMP) requirements under Provisions E.3.c.(3) and E.5.e. Provision E.5.e requires each Copermittee to identify areas of existing development within its jurisdiction for retrofit and rehabilitation projects, and to identify strategies to facilitate implementation of those projects. Provision E.3.c.(3) provides each Copermittee the option to allow development projects to implement candidate projects identified as part of the optional Watershed Management Area Analysis allowed pursuant to Provision B.3.b.(4), also included in the Water Quality Improvement Plan. The candidate projects include several types of multi-benefit and storm water resource type projects, including but not limited to stream or riparian area rehabilitation, retrofitting existing infrastructure to incorporate storm water retention or treatment, regional BMPs, groundwater recharge projects, water supply augmentation, and land purchases to preserve floodplain functions. Therefore, while the alternative compliance pathway requirements under Provision B.3.c do not include the term “multi-benefit” in the text, the Tentative Order includes several provisions that require or encourage the implementation of multi-benefit and storm water resource projects consistent with the State Water Board Order.	

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B3c-9	PROVISION B.3.c: Prohibitions and Limitations Compliance Option	
	COMMENT: *The Tentative Order violates anti-backsliding requirements and the rationale provided does not support an anti-backsliding exception.* The Environmental Groups assert that the Tentative Order violates the anti-backsliding provisions of the Clean Water Act and its implementing regulations because the San Diego Water Board's findings related to the alternative compliance pathway fail to support the use of anti-backsliding exceptions.	Environmental Groups
	RESPONSE: The San Diego Water Board disagrees that the Tentative Order violates anti-backsliding provisions of the Clean Water Act and the federal regulations. The Clean Water Act generally prohibits the relaxation of effluent limitations in a reissued permit. However, as discussed in the Fact Sheet, it remains unresolved whether anti-backsliding provisions are applicable to the incorporation of an alternative compliance pathway into a regional MS4 permit. (please see page F-32 of the Fact Sheet; *please also see* State Board Order WQ 2015-0075 at pp 18-21, stating "it is unnecessary, however, to resolve the ultimate applicability of the regulatory anti-backsliding provisions"). Even if the anti-backsliding provisions do apply, the alternative pathway provisions fit squarely within an exception. There are numerous exceptions to the Clean Water Act's backsliding provisions based on new information. See, e.g., 33 U.S.C. § 1342(o)(2)(B)(i), 40 C.F.R. § 122.44(l)(i(B)(1). Additionally, Under 40 C.F.R. section 122.44(l), anti-backsliding provision do not apply if the circumstances on which the previous permit was based have materially and substantially changed since the time the previous permit was issued and would constitute cause for permit modification or revocation or reissuance under 40 C.F.R. section 122.62. Section 122.62 in turn states that new information not available at the time the previous permit was issued is cause for modification. 40 C.F.R. § 122.62(a)(2). Furthermore, the San Diego Water Board disagrees with the assertion that the new information from the lessons learned and experiences of the Los Angeles Water Board are somehow "unique" to the Los Angeles Region. To the extent that the permitting history in Los Angeles may be considered "unique" in any way, it is still consistent with the San Diego Water Board's experience with storm water permitting over the last decade. The transition to a Regional MS4 Permit in the Fifth Term Permit was driven, in part, by a growing recognition that a watershed management approach required regional action. In the Regional MS4 permit, the San Diego Water Board seeks to provide a consistent set of permit requirements for all of the Copermittees and to promote the efficiencies gained from collective action in jurisdictional runoff management.	

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	The San Diego Water Board structured the Regional MS4 Permit to incorporate new information because there has been a statewide paradigm shift with respect to stormwater management. In June 2015, the State Water Board issued a precedential water quality order, Order WQ 2015-0075. This Order directed all of the Regional Water Boards to consider the Los Angeles Water Board's alternative compliance path to receiving water limits in all Phase I MS4 permits going forward (State Water Board Order WQ 2015-0075 at p 51). Moreover, the State Water Board made it clear that all regional water boards had been informed by the lessons learned in Los Angeles, stating "[f]urther, we [the State Water Board] find that all regional water boards are informed by the information gained in the Los Angeles Region, so that any regional water board that adopts an alternative compliance path in a subsequent Phase I permit would not be in violation of anti-backsliding requirements, regardless of the particular storm water permitting history of that region." Id. at p. 22 fn. 74. Thus, while the State Water Board Order relies heavily on the information and evidence related to the Los Angeles County MS4 Permit and its version of an alternative compliance pathway, the information and evidence are also applicable to and are expected to be utilized in the San Diego Region if an alternative compliance pathway is incorporated into the San Diego Regional MS4 Permit. For all of the reasons stated above, the alternative compliance path provisions do not violate federal anti-backsliding provisions. To clarify, however, the discussion on Anti-Backsliding Requirements on page F-32 in the Fact Sheet has been revised as follows: CWA sections 402(o) and 303(d)(4) and federal regulations at 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations or conditions may be relaxed. While this Order allows implementation of an alternative compliance pathway option in Provision B.3.c to constitute compliance with receiving water limitations under certain circumstances, the availability of that alternative and the corresponding availability of additional time to come into compliance with receiving water limitations does not violate the antibacksliding provisions. The receiving water limitations provisions of this Order are imposed under section 402(p)(3)(B) of the Clean Water Act rather than based on best professional judgment, or based on section 301(b)(1)(C) or sections 303(d) or (e), and are accordingly not subject to the anti-backsliding requirements of section 402(o). Although the non-applicability is less clear with respect to the regulatory anti-backsliding provisions in 40 CFR 122.44(l), the regulatory history suggests that USEPA's intent was to establish the anti-backsliding regulations with respect to evolving technology standards for traditional point sources. (See, e.g., 44 Fed.Reg. 32854, 32864 (Jun. 7, 1979)). It	

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	is unnecessary, however, to resolve the ultimate applicability of the regulatory anti-backsliding provisions, because the alternative compliance pathway option in Provision B.3.c qualifies for an exception to backsliding as based on new information. The alternative compliance pathway option in Provision B.3.c of this Order was informed by new information available to the Board from experience and knowledge gained through storm water permitting at the Regional Water Boards in the last ten years. There has been a statewide paradigm shift in storm water management. State Water Board Order WQ 2015-0075 directed all of the Regional Water Boards to consider the Los Angeles Water Board's alternative compliance path to receiving water limitations in all Phase I MS4 permits going forward (State Water Board Order WQ 2015-0075 at page 51). Tt, and the Los Angeles Water Board's process of developing over 30 watershed-based TMDLs and implementing several TMDLs since the adoption of the previous permits. In particular, the Los Angeles Water Board recognized the significance of allowing time to plan, design, fund, operate and maintain watershed-based BMPs necessary to attain water quality improvements and additionally recognized the potential for municipal storm water to benefit water supply. Similarly, the San Diego Water Board's experience developing and implementing the Fourth Term MS4 Permits and TMDLs that apply on a regionwide scale (i.e. TMDLs for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region) has resulted in a similar recognition of the need for a watershed-based approach that allows time to plan, design, fund, operate and maintain BMPs to address impaired waters that have been impacted by MS4 discharges. Thus, even if the receiving water limitations are subject to anti-backsliding requirements, they were revised based on new information that would support an exception to the anti-backsliding provisions. (33 U.S.C. § 1342(o)(2)(B)(i); 40 C.F.R. § 122.44(l)(1); 40 C.F.R. §122.44(l)(2)(i)(B)(1)).	

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B3c-10	PROVISION B.3.c: Prohibitions and Limitations Compliance Option	
	COMMENT: *The Tentative Order violates anti-degradation requirements and the anti-degradation findings are unsupported by evidence.* The Environmental Groups assert that the Tentative Order violates anti-degradation requirements and there is no evidence to support the anti-degradation findings. The Environmental Groups generally assert that anti-degradation findings from State Water Board Order WQ 2015-0075 are not applicable to the Tentative Order and the findings in the Tentative Order are unsupported by evidence.	Environmental Groups
	RESPONSE: Consistent with the direction of the State Water Board Order WQ 2015-0075 adopted in June 2015, the San Diego Water Board considered the inclusion of an alternative compliance pathway into the Regional MS4 Permit. With the inclusion of this new permit component, the federal and state antidegradation policies were considered in light of the evidence in the record and information about the nature of municipal storm water discharges, evolving municipal storm water permits and the State Water Board's precedential order. The Regional MS4 Permit and Fact Sheet were revised to be consistent with all of these considerations. The San Diego Water Board disagrees that the antidegradation findings in the Tentative Order are inadequate and unsupported by evidence in the record. The San Diego Water Board considered relevant information unique to the San Diego Region such as its own storm water permitting history and TMDL adoption and implementation through municipal storm water permits. The San Diego Water Board has adopted seven TMDL Basin Plan amendments that cover at least 30 waterbody-pollutant combinations, similar to the Los Angeles Region. The implementation of these 7 TMDLs through the Regional MS4 Permit is essential for achieving water quality standards in the region. Moreover, the State Water Board's discussion of appropriate antidegradation considerations for the Los Angeles MS4 Permit is equally applicable in the context of the San Diego Water Board's Tentative Order that incorporates an alternative compliance pathway. In its consideration of antidegradation, the State Water Board acknowledges that the Los Angeles MS4 permit "improves on past practices that have been inadequate to protect water quality, and includes a monitoring and assessment program that will identify any changes in water quality. [fn.] In general, under the Los Angeles MS4 Order, we expect to see a trajectory away from any past degradation, even if there may be some continued short-term degradation." (Order WQ 2015-0075, p. 26.) Likewise, the Regional MS4 Permit now requires Copermittees to design watershed based monitoring and assessment programs that promote and track progress towards meeting the relevant water quality objectives. As such, were the State Water Board considering the Tentative Order, it likely would reach the same conclusion about the San Diego Regional MS4 Permit.	

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B3c-10	PROVISION B.3.c: Prohibitions and Limitations Compliance Option	
	The commenters incorrectly assert that the San Diego Water Board is required, but has failed, to follow procedures and requirements set forth in a USEPA document titled "*Interim Economic Guidance for Water Quality Standards Workbook"* (March 1995) (Workbook). USEPA's Workbook provides guidance that states may choose, but are not required, to follow. Although the Workbook does provide some information that states *may* use to consider whether degradation of high-quality waters is warranted from an economic impacts perspective, the guidance was not crafted to be used in the context of permitting of MS4 discharges. (See USEPA Workbook, cover memo, pp. 1-2 and Workbook, p. 1-1.) Instead, the San Diego Water Board has considered available guidance provided by the State Water Board in the Administrative Procedures Update (APU) 90-004 in conjunction with, among other things, available evidence about the quality of the receiving waters for discharges of storm water in finding that the Tentative Order complies with federal and state anti-degradation policies[1]. The antidegradation findings in the Tentative Order, like those adopted in the State Water Board Order for the final Los Angeles MS4 Permit, are supported by substantial evidence in the record for the Regional MS4 Permit. In the stormwater context, a generalized antidegradation analysis is appropriate. As the State Water Board acknowledges, guidance provided in the APU 90-004 "may be construed to exempt [a regional water board] from conducting an extensive pollutant by pollutant analysis for each water body in the region" where, as here, there is insufficient data available to carry out a complete antidegradation analysis for each water body-pollutant combination." (See Order WQ 2015-0075, p. 25.) The State Water Board notes the APU-90-004 "contemplates the appropriate antidegradation analysis for a discrete discharge or facility. It has limited value when considering anti-degradation in the context of storm water discharges from diffuse sources, conveyed through multiple outfalls, with multiple pollutants impacting multiple water bodies within a municipality, or in this case, a region, especially given that reliable data on the baseline water quality from 1968 is not available." (Id., p. 27; see also id., p. 27, n. 90 ["We note that USEPA did not conduct a detailed antidegradation analysis in issuing NPDES Permit No. DC00000221 for MS4 discharges to the District of Columbia, presumably for similar reasons. The court in *Asociacion de Gente Unida* also relied on APU 90-004 in part in rejecting an antidegradation analysis conducted by the Central Valley Regional Water Quality Control Board for discharges of pollutants to groundwater from dairy facilities region-wide, but the court's objection was to the regional water board's reliance on an illusory prohibition of discharge to groundwater in finding that no antidegradation analysis	

[1] See, e.g., 1996, 1998, 2002, 2006, 2010 Clean Water Action section 303(d) Lists for the San Diego Region, and monitoring reports from the San Diego County, Orange County, and Riverside County Copermittees since the First Term MS4 Permits issued in 1990.

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	was required, not to the sufficiency of any generalized antidegradation analysis the Board might have conducted in lieu of its reliance on the prohibition. (210 Cal.App.4th at pp. 1271-1273.]" Despite the commenters' assertions, the San Diego Water Board provides a clear statement of the basis for finding that the Tentative Order is consistent with the federal and state antidegradation policies. No revisions to the Tentative Order were made in response to these comments.	

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B5-1	PROVISION B.5: Iterative Approach and Adaptive Management Process	
	COMMENT: *Request for clarification of timing and conditions for alternative compliance pathway analysis updates.* The San Diego County Copermittees and the County of San Diego requested the addition of a provision under the Iterative Approach and Adaptive Management Process requirements of Provision B.5 to clarify the timing and conditions for when the analysis required for the alternative compliance pathway under Provision B.3.c.(1)(b) has to be updated.	San Diego County Copermittees County of San Diego
	RESPONSE: The San Diego Water Board has considered the requested additional language and determined that adding clarifying language is appropriate. The following text has been added as Provision B.5.d: **d. ADAPTATION OF PROHIBITIONS AND LIMITATIONS COMPLIANCE OPTION** If a Copermittee has implemented the Prohibitions and Limitations Compliance Option allowed to be included in the Water Quality Improvement Plan pursuant to Provision B.3.c, the Copermittee must re-evaluate and adapt the numeric goals, water quality improvement strategies, schedules, and annual milestones required under Provision B.3.c.(1) when significant new information becomes available, or with the Report of Waste Discharge required pursuant to Provision F.5. Significant changes in the numeric goals, water quality improvement strategies, schedules, or annual milestones requires an update to the analysis required under Provision B.3.c.(2).	

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D4a-1	PROVISION D.4.a: Receiving Waters Assessments	
	COMMENT: *Recommended revisions to transitional assessment requirements under Provision D.4.a.(1)(a).* The Riverside County Copermittees noted that Provision D.4.a.(1)(a) prescribes that assessments required to be made under Provision D.4.a.(2) must be included in each Copermittees' transitional monitoring and assessment reports; however, Provision D.4.a.(2)(e) requires determination of whether strategies identified in the Copermittees' Water Quality Improvement Plan are progressing towards achieving interim and final numeric goals described in the Water Quality Improvement Plan. The Riverside County Copermittees provided their understanding that transitional monitoring and assessment applies to the time period when the Copermittees' Water Quality Improvement Plan is being developed, and therefore assessments made during this time period cannot provide information on the progress of the Water Quality Improvement Plan. Based on their observations, the Riverside County Copermittees recommended revisions to Provision D.4.a.(1)(a).	Riverside County Copermittees
	RESPONSE: The San Diego Water Board disagrees that the revisions to Provision D.4.a.(1)(a) are necessary. It is true that the transitional monitoring and assessment applies to the time period when the Water Quality Improvement Plan is being developed. The commenters can fulfill the assessment requirement of Provision D.4.a.(2)(e) by either stating that they cannot make a determination until the Water Quality Improvement Plan is accepted and implemented, or assess the strategies that are currently being implemented at the time of the assessment and are expected to be included in the Water Quality Improvement Plan. The San Diego Water Board expects the assessments reported during the transitional period to serve as a baseline for improvements in water quality as the Water Quality Improvement Plans are implemented over time. No changes were made to the Tentative Order as a result of this comment.	

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E2-1	PROVISION E.2: Illicit Discharge Detection and Elimination	
	COMMENT: *Requests for revisions to clarify implementation of the illicit discharge and detection program under Provision E.2 is compliance with the requirement to effectively prohibit non-storm water discharges to the MS4.* The Orange County Copermittees, as well as the Cities of Dana Point and Laguna Beach, requested revisions to Provision E.2 to explicitly state that implementation of the illicit discharge detection and elimination requirements under Provision E.2 constitutes compliance with effective prohibition of non-storm water discharges to the MS4 required under Provision A.1.b.	Orange County Copermittees City of Dana Point City of Laguna Beach
	RESPONSE: The San Diego Water disagrees that revisions to Provision E.2 are necessary. Provision A.1.b explicitly states that Copermittees are required to effectively prohibit non-storm water discharges to the MS4 "*through the implementation of Provision E.2*." The Copermittees are already expected to demonstrate compliance with Provision A.1.b through the implementation of Provision E.2. If a Copermittee has not adequately implemented Provision E.2, then the Copermittee is not only, not in compliance with the requirements of Provision E.2, but by default will also not be in compliance with Provision A.1.b. The San Diego Water Board, however, recognizes that additional clarification may be helpful in understanding that implementing the requirements of Provision E.2 is how the San Diego Water Board will assess a Copermittee's compliance with the requirement to effectively prohibit non-storm water discharges to the MS4 under Provision A.1.b. Therefore, the San Diego Water Board has revised the opening paragraph of the discussion for Provision E.2 in the Fact Sheet (page F-81) to the following: Provision E.2.(Illicit Discharge Detection and Elimination) requires each Copermittee to implement an illicit discharge detection and elimination program to effectively prohibit non-storm water discharges to the MS4 by actively detecting and eliminating illicit discharges and disposal into its MS4. <u>If the San Diego Water Board finds that a Copermittee is fully implementing the requirements of Provision E.2, then the Copermittee is deemed in compliance with the effective prohibition of non-storm water discharges to the MS4 required under Provision A.1.b.</u>	

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E2-2	PROVISION E.2: Illicit Discharge Detection and Elimination	
	COMMENT: *Request for clarification of discharges of potable water sources under Provision E.2.a.(3)(f).* The Cities of Dana Point and Laguna Beach requested a clarification of the definition of "discharges from potable water sources" under Provision E.2.a.(3)(f). It is not clear to the Cities whether "potable discharges" are intended to include runoff derived from turf or ornamental plant irrigation.	City of Dana Point City of Laguna Beach
	RESPONSE: Discharges from potable water sources are sources of water that have been treated to drinking water standards and discharged to the MS4. Discharges of potable water that are applied to turf or ornamental plant irrigation before running off to the MS4 are not qualified as discharges of potable water under Provision E.2.a.(3)(f).	

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E3b1-1	PROVISION E.3.b.(1): Definition of Priority Development Project	
	COMMENT: *Request for revisions to the definition of Priority Development Projects under Provision E.3.b.(1).* The City of San Diego requested revisions to combine Provisions E.3.b.(1)(c) and E.3.b.(1)(e) under the provisions defining Priority Development Projects.	City of San Diego
	RESPONSE: The San Diego Water Board disagrees that combining sub-sections (c) and (e) of Provision E.3.b.(1) is appropriate. Sub-section (c) has a minimum square footage trigger for both new development projects and redevelopment projects. In contrast, subsection (e) has a minimum square footage trigger for redevelopment projects only; new development projects consisting of automotive repair shops and retail gasoline outlets are considered Priority Development Projects regardless of size.	

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E3b3-1	PROVISION E.3.b.(3): Priority Development Project Exemptions	
	COMMENT: *Request for Priority Development Project exemption for "self-remediating" projects.* The Orange County Copermittees requested that the list of Priority Development Project Exemptions under Provision E.3.b.(3) be revised to include projects that are effectively self-remediating (i.e. all rainfall is retained) including, but not limited to, reservoirs and swimming pools.	Orange County Copermittees
	RESPONSE: The San Diego Water Board disagrees that the requested change is necessary. If all rainfall is retained on a project, then the project has met the design standard, and an exemption is not needed. No changes were made to the Tentative Order as a result of this comment.	

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E3c1-1	PROVISION E.3.c.(1): Storm Water Pollutant Control BMP Requirements	
	COMMENT: *Request for revisions to clarify the biolfiltration storm water pollutant control BMP performance criteria.* The County of San Diego requested a revision to Provision E.3.c.(1)(a)(i)[b] to clarify the intent and applicability of the biolfiltration BMP design criteria.	County of San Diego
	RESPONSE: The San Diego Water Board disagrees that the proposed change is necessary. The wording describing the design requirements adequately describe the intent and applicability of the biofiltration BMP design criteria. Any proposed change incorporated during the adoption proceedings of the Tentative Order could be interpreted as a change in the requirement, when in fact there is no change. No changes were made to the Tentative Order as a result of this comment.	

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E3c1-2	PROVISION E.3.c.(1): Storm Water Pollutant Control BMP Requirements	
	COMMENT: *The San Diego Water Board is requiring increasingly stringent on-site storm water retention without evidence that the 2010 Southwest Riverside MS4 Permit requirements are not working.* CICWQ asserts that the Tentative Order has more stringent on-site storm water retention requirements than the 2010 Southwest Riverside County MS4 Permit (Order No. R9-2010-0016) requirements without any evidence that the requirements of Order No. R9-2010-0016 are not working to protect water quality and maintain beneficial uses.	Construction Industry Coalition on Water Quality (CICWQ)
	RESPONSE: The San Diego Water Board disagrees with the assertion that the Tentative Order has more stringent on-site storm water retention requirements over and above the requirements of Order No. R9-2010-0016. The purpose of the on-site retention requirement in both the Tentative Order and Order No. R9-2010-0016 is to retain on-site the pollutants contained in the volume of storm water runoff produced from a 24-hour 85th percentile storm event. This requirement has not changed from Order No. R9-2010-0016, and therefore the commenter is incorrect in stating that the San Diego Water Board is requiring additional prescriptive performance measures for retaining storm water runoff. This is the maximum extent practicable (MEP) standard recognized by the San Diego Water Board and is consistent with the Fourth Term MS4 Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), as well as Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), Los Angeles Water Board Order Nos. R4-2010-0108 and R4-2012-0175 (Ventura County and Los Angeles County MS4 Permits, respectively). Additionally, the storm water pollutant control and hydromodification management BMP requirements in the Tentative Order are more flexible than in Order No. R9-2010-0016 by providing an optional Alternative Compliance Program under Provision E.3.c.(3) of the Regional MS4 Permit. The Alternative Compliance Program, if developed by a Copermittee, would allow Priority Development Projects to fully comply with storm water pollutant control and hydromodification management BMP requirements either on-site, offsite, or a combination of both, if doing so would provide greater water quality benefit to the watershed.	

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E3c2-1	PROVISION E.3.c.(2): Hydromodification Management BMP Requirements	
	COMMENT: *Request for revisions to requirements to manage critical coarse sediment yield areas.* CICWQ asserts that the Tentative Order requirements for Priority Development Projects to "avoid critical sediment yield areas" are unnecessarily restrictive. The County of San Diego requested that the requirement to manage critical course sediment yield areas be moved from the hydromodification management BMP performance standard requirements under Provision E.3.c.(2)(b) to Provision E.3.d as part of the BMP Design Manual update to be addressed regionally.	County of San Diego Construction Industry Coalition on Water Quality (CICWQ)
	RESPONSE: The San Diego Water Board disagrees that the requirements to avoid critical sediment yield areas are unnecessarily restrictive or that they should be moved from under Provision E.3.c.(2)(b) to Provision E.3.d. The requirements are necessary to protect receiving waters from erosive flows caused by land development. As explained in the Fact Sheet to the Tentative Order, hydromodification, which is caused by both altered storm water flow and altered sediment flow regimes, is largely responsible for degradation of creeks, streams, and associated habitats in the San Diego Region. In an ongoing study by the Stormwater Monitoring Coalition to assess the health of streams throughout Southern California, researchers found that three of the four highest risk stressors to creeks (percent sands and fines present, channel alteration, and riparian disturbance) were related to physical habitat (*Assessing the Health of Southern California Streams, Stormwater Monitoring Coalition*, Fact Sheet). Researchers studying flood frequencies in Riverside County have found that increases in watershed imperviousness of only 9-22 percent can result in increases in peak flow rates for the two-year storm event of up to 100 percent (Schueler and Holland, 2000. *Storm Water Strategies for Arid and Semi-Arid Watersheds*, (Article 66). The Practice of Watershed Protection). Such changes in runoff have significant impacts on channel morphology, and given the current state of science the San Diego Water Board has included these requirements to reduce these potential impacts to receiving waters that may be caused by development projects. Placement of impervious surfaces as a result of urbanization is largely responsible for erosional impacts to streams because placement of impervious surfaces encapsulates "good" sediment (such as sand, gravel, rocks and cobbles) that would normally replenish creek beds and banks to help stabilize them. For this reason, the Tentative Order requires Priority Development Projects to avoid critical sediment yield areas, as defined by the	

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E3c2-1	PROVISION E.3.c.(2): Hydromodification Management BMP Requirements	
	Copermittees, or implement measures to allow coarse sediment to be discharged to receiving waters, such that there is no net impact to the receiving water. Such measures are designed to protect receiving waters and avoid impacts experienced as a result of past land development practices. The San Diego Water Board recognizes that implementation of new requirements is challenging, and is supportive of the Copermittees' efforts to develop guidance for land developers in meeting this requirement. Until this guidance is widely available, Copermittees and land developers should recognize that strict avoidance of critical sediment yield areas is not mandated and that compliance may be achieved by other methods, provided that the stream experiences "no net impact." No changes were made to the Tentative Order as a result of this comment.	

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E3c2-2	PROVISION E.3.c.(2): Hydromodification Management BMP Requirements	
	COMMENT: *Request for interim timeframe exemptions for hydromodification management BMP requirements to be granted outright without any additional study or consideration.* CICWQ asserts that the Tentative Order is eliminating exemptions for hydromodification control, even when stormwater runoff is conveyed in the MS4 system to significantly hardened or engineered channels. CICWQ requested that the San Diego Water Board revise the Tentative Order to make the interim timeframe exemptions under Provision E.3.c.(2)(e) part of the exemptions under Provision E.3.c.(2)(d) without any additional study or consideration.	Construction Industry Coalition on Water Quality (CICWQ)
	RESPONSE: The San Diego Water Board disagrees that the interim timeframe exemptions for hydromodification management BMP requirements should be granted outright without any additional study or consideration. The commenter correctly deduced that the driver behind the requirement to use the pre-development performance standard is the sustainability of geomorphically stable channels and the ability to return urbanized streams to a more natural state. The requirement to use pre-development runoff conditions as the performance standard is needed because using a hydrology baseline that approximates that of an undeveloped, natural watershed is the only way to facilitate the return of more natural hydrological conditions to already built-out watersheds, which in turn supports conditions for rehabilitating degraded or channelized stream segments. Contrary to what the commenter asserts, the Tentative Order does not require Copermittees to remove concrete from channels that are engineered to relieve flooding and protect life and property. The Tentative Order provides exemptions for Priority Development Projects that discharge to receiving waters where there is little threat of erosion, and subsequently implementing BMPs on-site would do little to protect the beneficial uses of such receiving waters. The commenter correctly states that the exemption for engineered channels is temporary. However, the commenter should note that there is a high likelihood that exemptions for engineered channels can become accepted as applicable for a Watershed Management Area. The Tentative Order allows for the Copermittees to recommend exemptions based on completion of an optional Watershed Management Area Analysis pursuant to Provision B.3.b.(4). As part of this effort, the Copermittees would identify, for example, areas of existing development in the watershed suitable for retrofitting, and areas suitable for stream rehabilitation. The Copermittees would also identify areas suitable for exemptions for hydromodification management, such as engineered channels that are needed for the protection of life and property. The interim	

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E3c2-2	PROVISION E.3.c.(2): Hydromodification Management BMP Requirements	
	timeframe exemption for engineered channels is not granted outright as permanent exemptions because the areas have not yet been analyzed in the context of stream rehabilitation opportunities. No changes were made to the Tentative Order as a result of this comment.	

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E3c2-3	PROVISION E.3.c.(2): Hydromodification Management BMP Requirements	
	COMMENT: *The requirement in the Regional MS4 Permit for Priority Development Projects to avoid coarse sediment yield areas results in a potential "taking" of private property.* Safari Highlands Ranch asserts that the requirement under Provision E.3.c.(2)(b) of the Regional MS4 Permit for Priority Development Projects to avoid critical coarse sediment yield areas known to the Copermittees or identified by the optional Watershed Management Area Analysis will result in a "taking" of the total land value of private property that is located in areas identified as critical coarse sediment yield areas.	Safari Highlands Ranch
	RESPONSE: The San Diego Water Board disagrees with the assertion that the requirements under Provision E.3.c.(2)(b) results in a "taking" of private property if the development project is located in area identified by the Copermittees as a critical coarse sediment area. Provision E.3.c.(2)(b) does not require the Copermittees to prohibit a development project from going forward if it cannot avoid critical coarse sediment yield areas. Provision E.2.c.(2)(b) states that Priority Development Projects are required to avoid critical sediment yield areas *OR* implement measures that allow critical coarse sediment to be discharged to receiving water, such that there is *no net impact* to the receiving waters. Provision E.3.c.(2)(b) provides the Copermittees the ability to allow Priority Development Projects to implement measures other than avoiding coarse sediment yield areas to achieve *no net impact* to the receiving waters. The Copermittees allows this is through the requirements in their BMP Design Manuals. The San Diego Water Board has reviewed the San Diego County Copermittees' Final Model BMP Design Manual (click here for link), dated June 2015, and found that it allows for a development project proponent to "*propose project-specific onsite measures to ensure that critical coarse sediment can be discharged to receiving waters, such that threre is no net impact to the receiving water*" (see section 6.2.4.2 of Model BMP Design Manual). The Final Model BMP Design Manual does not require avoidance of critical coarse sediment areas as the only option for Priority Development Projects and is in compliance with Provision E.3.c.(2)(b) of the Regional MS4 Permit. Please also see response to comment E3c2-1. No changes were made to the Tentative Order as a result of this comment.	

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E3d-1	PROVISION E.3.d: BMP Design Manual Update	
	COMMENT: *Request for additional time for San Diego County Copermittees to update and implement their BMP Design Manuals.* The San Diego County Copermittees and the County of San Diego requested revisions to Provision E.3.d which would grant Copermittees up to 180 days to incorporate corrections to the definition of Priority Development Projects under Provision E.3.b.(1) and begin implementing their BMP Design Manuals.	San Diego County Copermittees County of San Diego
	RESPONSE: The San Diego Water Board disagrees that more time is needed to update and implement the BMP Design Manuals. In a letter dated May 29, 2015, the San Diego Water Board forewarned the San Diego County Copermittees that changes to the Priority Development Project categories were necessary in order to clearly reflect the intended definitions. At that time, the San Diego Water Board provided the language that is now proposed in the Tentative Order. The Copermittees have had ample opportunity to initiate and complete their local adoption processes in order to meet the BMP Design Manual implementation date. For this reason, more time is not necessary and a delay in BMP Design Manual implementation is not warranted. However, the San Diego Water Board will use Provision F.2.b.(4) to grant the Copermittees an extra 90 days beyond the original BMP Design Manual implementation date of December 24, 2015 to complete the update and begin implementation of the BMP Design Manual. Please also see response to comment F2b-1.	

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E3d-2	PROVISION E.3.d: BMP Design Manual Update	
	COMMENT: *Request for revisions to clarify the effective date of the BMP Design Manual is the same as the implementation date.* The San Diego County Copermittees, the City of San Diego, and the County of San Diego requested revisions to Provision E.3.d to include language that clarifies the effective date of the BMP Design Manual is the same as when the BMP Design Manual begins implementation.	San Diego County Copermittees City of San Diego County of San Diego
	RESPONSE: The San Diego Water Board agrees that the proposed modification would clarify the San Diego Water Board's intention. Provision E.3.d has been modified as follows: a. Each Copermittee must update its BMP Design Manual pursuant to Provision F.2.b. Until the Copermittee has updated its BMP Design Manual pursuant to Provision F.2.b.(1), the Copermittee must continue implementing its current BMP Design Manual. The Copermittee must implement the updated BMP Design Manual within 180 days following completion of the update pursuant to Provision F.2.b.(1), unless directed otherwise by the San Diego Water Board Executive Officer. The date the BMP Design Manual is implemented is the "effective date" of the BMP Design Manual.	

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E3e1-1	PROVISION E.3.e.(1): Structural BMP Approval and Verification Process	
	COMMENT: *Requests for revisions to the proposed language to define projects with prior lawful approval under Provision E.3.e.(1)(a).* The City of San Diego requested a revision to the proposed language to define projects with prior lawful approval to also include projects that have received development approvals. San Diego Coastkeeper and Coastal Environmental Rights Foundation requested revisions that would allow a Priority Development Project to proceed under previous land development requirements only if the Copermittee demonstrates that, among other required conditions, construction activities on the Priority Development Project commenced prior to the effective date of the new BMP Design Manual and that all approvals and permits necessary to complete the implementation of the initially approved design also be obtained prior to the effective date of the new BMP Design Manual.	City of San Diego San Diego Coastkeeper and Coastal Environmental Rights Foundation
	RESPONSE: The San Diego Water Board disagrees that any changes are needed to the proposed language in Provision E.3.e.(1)(a). Specifically, reliance on issuance of a development approval alone is not consistent with the San Diego Water Board's goal of requiring most new Priority Development Projects to be subject to the requirements in the new BMP Design Manual unless limited conditions are met. Nor is it consistent with the *Avco* line of cases, which requires commencement of construction and substantial reliance on the permit as the determining factors for grandfathering projects under previous development requirements. Reliance on issuance of a development approval alone may also result in many fewer Priority Development Projects implementing projects based on the new BMP Design Manual required in Order No. R9-2013-0001 as amended. With regard to the Environmental Groups' comment, the San Diego Water Board believes it is appropriate for the Copermitees to have the ability to allow a Priority Development Project meeting all other required conditions in Provision E.3.e.(1)(a) to proceed under previous land use development requirements if the Copermittee demonstrates that construction activities have commenced before, or within 180 days after, the effective date of the new BMP Design Manual. The Board believes it is appropriate to include a grace period of 180 days after the effective date of the BMP Design Manual in order to provide certainty of requirements for projects in process, and allow for scheduling of construction activities under optimal conditions, such as outside of nesting season, or during the dry season, when impacts from storm water runoff are minimized. And, as long as development projects complete construction of all phases in substantial conformity with the approved design, which includes storm water pollutant control and hydromodification management BMPs approved by the	

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E3e1-1	PROVISION E.3.e.(1): Structural BMP Approval and Verification Process	
	municipality, it is appropriate that prior lawful approval (the ability to proceed with development in accordance with the previous land use development requirements) remain valid during issuance of subsequent permits that may be necessary to complete the project within 5 years after the effective date of the new BMP Design Manual. Five years is an appropriate and reasonable period of time for those projects meeting all other conditions to be completed. No changes were made to the Tentative Order as a result of these comments.	

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E4-1	PROVISION E.4: Construction Management	
	COMMENT: *Request for revisions to construction management program inventory and tracking requirements.* The City of San Diego requested that Provisions E.4.b and E.4.d.(3) be combined because both sections contain information that needs to be collected, inventoried, and tracked.	City of San Diego
	RESPONSE: The San Diego Water Board considered the requested revision and determined that it was not necessary. The Copermittees can implement an inventory and tracking system that may be utilized to manage the data that are collected and needed to fulfill the requirements of both Provision E.4.b and E.4.d.(3). No changes were made to the Tentative Order as a result of this comment.	

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E5c-1	PROVISION E.5.c: Existing Development Inspections	
	COMMENT: *Request to include an optional third-party certification program into the existing development inspection provisions.* Section F.3.b.(4)(c) of Order No. R9-2010-0016 allowed the Riverside County Copermittees the option to propose a third-party certification program for commercial and industrial inspection programs, subject to San Diego Water Board Executive Officer acceptance. The Riverside County Copermittees noted that a similar provision does not exist in the Tentative Order, and requested inclusion of this option in the Regional MS4 Permit.	Riverside County Copermittees
	RESPONSE: At this time the San Diego Water Board does not support the inclusion of a third-party certification program as part of the existing development inspection provisions. The San Diego Water Board has conducted audits of several Copermittees' existing development and post construction BMP inspection programs in the San Diego Region that utilize self certifications or third-party certifications to verify the proper operation and maintenance of post construction BMPs. These audits have found such programs have not adequately confirmed that BMPs are being properly operated and maintained so they are effective at removing pollutants in storm water discharges from commercial and industrial sites to the MEP. However, the Regional MS4 Permit provides the Copermittees significant flexibility in the implementation of their existing development inspection programs, and does not preclude the use of third-party certification programs during years where inspections are not necessarily required. If the Copermittees can develop a third-party certification program that can demonstrate such a program can be implemented in a way that will ensure BMPs are being properly operated and maintained so they are effective at removing pollutants in storm water discharges from commercial and industrial sites to the MEP, the San Diego Water Board may reconsider including such an option into the Regional MS4 Permit during the renewal process anticipated to begin in early 2018. No changes were made to the Tentative Order as a result of this comment.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2015-0100

November 4, 2015 / Revised November 10, 2015

F2b-1	PROVISION F.2.b: BMP Design Manual Updates	
	COMMENT: *Request for revisions to clarify the effective date of the BMP Design Manual.* The San Diego County Copermittees, the City of San Diego, and the County of San Diego requested revisions to Provision F.2.b.(4) to include language that clarifies the effective date of the BMP Design Manual if an update to the BMP Design Manual is required.	San Diego County Copermittees City of San Diego County of San Diego
	RESPONSE: The San Diego Water Board agrees that the proposed modification to the text in Provision F.2.b.(4) would clarify that the BMP Design Manual effective date is no later than 90 days after the San Diego Water Board adopts amendments to Provisions E.3.a-d. Provision F.2.b.(4) will be modified as follows: (4) If the San Diego Water Board amends Provisions E.3.a-d during the permit term but after the Copermittee has completed the update pursuant to Provision F.2.b.(1), the Copermittee must revise its BMP Design Manual to incorporate the amended Provision E.3.a-d requirements as soon as possible but not later than 90 days after the date the San Diego Water Board adopts the amendments to Provisions E.3.a-d, unless otherwise directed by the San Diego Water Board Executive Officer. Under these circumstances, the effective date of the BMP Design Manual is not later than 90 days after the date the San Diego Water Board adopts the amendments to Provisions E.3.a-d, unless otherwise directed by the San Diego Water Board Executive Officer.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2015-0100

November 4, 2015 / Revised November 10, 2015

AttC-1	ATTACHMENT C: Acronyms, Abbreviations, and Definitions	
	COMMENT: *Request for revisions to definition of Construction Activities.* The City of Escondido requested revisions to the definition of Construction Activities in Attachment C to the Regional MS4 Permit. The commenter requested the removal of the term "phase" from the definition because the term introduces artificial phases during a construction project that cannot be readily tracked.	City of Escondido
	RESPONSE: The San Diego Water Board agrees that the revisions are appropriate. The definition of Construction Activities in Attachment C has been revised as follows: **Construction Activities** – Actions implemented during construction of development or redevelopment projects during the Preliminary Tasks ~~Phase~~ (including rough grading and/or disking, clearing and grubbing operations, or any soil disturbance prior to mass grading), Grading or Land Development ~~Phase~~ (including topography and slope reconfiguration, alluvium removals, canyon cleanouts, rock undercuts, keyway excavations, land form grading, and stockpiling of select material for capping operations), Streets and Utility Installation ~~Phase~~ (including excavation and street paving, lot grading, curbs, gutters and sidewalks, public utilities, public water facilities including fire hydrants, public sanitary sewer systems, storm sewer systems and/or other drainage improvements), or Vertical Construction ~~Phase~~ (including the build out of structures from foundations to roofing, including rough landscaping).	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2015-0100

November 4, 2015 / Revised November 10, 2015

AttC-2	ATTACHMENT C: Acronyms, Abbreviations, and Definitions	
	COMMENT: *Request for revisions to definition of Redevelopment.* The City of San Diego requested revisions to the definition of Redevelopment in Attachment C to the Regional MS4 Permit to improve the clarity of the definition.	City of San Diego
	RESPONSE: The San Diego Water Board agrees that revisions would provide additional clarity in the definition of Redevelopment. The definition of Redevelopment in Attachment C has been revised as follows: **Redevelopment** – The creation and/or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure~~, and creation or addition of impervious surfaces~~. Replacement of impervious surfaces includes any activity ~~that is not part of a routine maintenance activity~~ where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include routine maintenance activities, such as trenching and resurfacing associated with utility work; pavement grinding; resurfacing existing roadways,~~; new~~ sidewalks ~~construction~~, pedestrian ramps, or bike lanes on existing roads; and routine replacement of damaged pavement, such as pothole repair.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2015-0100

November 4, 2015 / Revised November 10, 2015

AttE-1	ATTACHMENT E: Specific Provisions for Total Maximum Daily Loads	
	COMMENT: *Request for revisions to TMDL requirements in Attachment E to the Regional MS4 Permit to allow independent jurisdictional compliance with TMDLs.* The City of San Diego requested revisions to the TMDL requirements in Attachment E to the Regional MS4 Permit that would allow independent jurisdictional compliance instead of requiring all the Copermittees named as responsible to comply with the TMDL requirements.	City of San Diego
	RESPONSE: The San Diego Water Board disagrees that modifications are needed to the language pertaining to TMDL compliance determination. The commenter correctly asserts that the intent of the language, and in fact, the intent of the Water Quality Improvement Plan concept, is that the Copermittees develop the Water Quality Improvement Plans collectively and evaluate water quality improvement strategies on a watershed basis. The San Diego Water Board recognizes that the Copermittees have no authority over other Copermittees to compel TMDL compliance; therefore, the Tentative Order has multiple compliance determination pathways available to each Copermittee to achieve compliance. The final compliance determination pathways are presented in Attachment E Specific (TMDL) Provisions 1.b.(3), 2.b.(3), 3.b.(3), 4.b.(3), 5.b.(3), 6.b.(3), and 7.b.(3). There are several compliance determination pathways that allow a Copermittee to demonstrate independent jurisdictional compliance with water quality based effluent limitations (WQBELs). No changes were made to the Tentative Order as a result of this comment.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2015-0100

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AttE6-1	ATTACHMENT E.6: Beaches and Creeks Bacteria TMDLs	
	COMMENT: *Requests for revisions to clarify that water bodies de-listed from the 303(d) List are not subject to the Beaches and Creeks TMDL requirements.* The Orange County Copermittees requested revisions to the Beaches and Creeks Bacteria TMDLs requirements in Attachment E to state that specific water bodies or beach segments included in Table 6.0 that have been delisted from the 2008 Clean Water Act Section 303(d) List of Water Quality Impaired Segments are not subject to any further action as long as monitoring data continues to support compliance with water quality standards.	Orange County Copermittees
	RESPONSE: The San Diego Water Board disagrees that any revisions are necessary or appropriate. The Orange County Copermittees correctly state that the water bodies listed in Table 6.0 must be in compliance with the final TMDL compliance requirements (and WQBELs). If a water body or beach segment has been de-listed, then the MS4 discharge WQBELs and/or receiving water WQBELs should already be achieved, but the BMP WQBELs and the monitoring and assessment requirements are still required to be implemented to maintain the achievement of the MS4 discharge WQBELs and/or receiving water WQBELs in the de-listed water body or beach segment. No changes were made to the Tentative Order as a result of this comment.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2015-0100

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AttE6-2	ATTACHMENT E.6: Beaches and Creeks Bacteria TMDLs	
	COMMENT: *Request for revisions to compliance dates for the Beaches and Creeks Bacteria TMDLs.* The San Diego County Copermittees, the City of San Diego, and the County of San Diego requested that the compliance dates proposed to be added to Tables 6.1 and 6.4 be removed. The commenters assert that the compliance dates proposed to be added are inconsistent with the requirements of the Beaches and Creeks Bacteria TMDLs. The commenters also assert that the Beaches and Creeks Bacteria TMDLs do not require the development of a Bacteria Load Reduction Plan (BLRP) or Comprehensive Load Reduction Plan (CLRP) for segments of beaches or creeks de-listed from the Clean Water Act Section 303(d) List of Water Quality Limited Segments.	San Diego County Copermittees City of San Diego County of San Diego
	RESPONSE: The San Diego Water Board disagrees that the addition of the compliance dates is inconsistent with the Beaches and Creeks Bacteria TMDLs requirements. The San Diego Water Board also disagrees that segments of beaches or creeks de-listed from the Clean Water Act Section 303(d) List of Water Quality Limited Segments are not required to develop a BLRP or CLRP. The compliance date for the Beaches and Creeks Bacteria TMDLs is specified on page 7-107 of the Basin Plan as follows: *"Full implementation of the TMDLs for indicator bacteria shall be completed as soon as possible, but no later than 10 years from the effective date for both the dry weather and wet weather TMDLs, unless an alternative compliance schedule is approved as part of a Comprehensive Load Reduction Plan, as described in the following section. The effective date of these TMDLs is April 4, 2011.* *The San Diego Water Board will require the Phase I MS4s to submit Bacteria Load Reduction Plan (BLRPs) outlining the proposed BMP program that will be capable of achieving the necessary load reduction required to attain the bacteria TMDLs in the receiving water, acceptable to the Regional Board within 18 months after the effective date of these TMDLs…."* Tables 7-53 and 7-54 on page 7-108 in Chapter 7 of the Basin Plan present the compliance schedules that apply if the Copermittees develop a BLRP. Page 7-109 of the Basin Plan describes the potential for the Copermittees to develop CLRPs. If the Copermittees choose to develop a CLRP, the compliance date and schedule for the Beaches and Creeks Bacteria TMDLs is specified on page 7-109 of the Basin Plan in Table 7-55 and as follows:	

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AttE6-2	ATTACHMENT E.6: Beaches and Creeks Bacteria TMDLs	
	"….the dischargers may develop and submit a CLRP for all constituents of concern in lieu of the BLRP, and to propose an appropriately tailored alternative compliance schedule. Proposed alternative compliance schedules tailored under this provision may not extend beyond 10 years for the dry weather bacteria TMDLs and 20 years for the wet weather bacteria TMDLs from the effective date …." Tables 6.1 and 6.4 were revised in the Tentative Order to be consistent with the compliance schedules of Tables 7-53, 7-54, and 7-55 of the Beaches and Creeks Bacteria TMDLs in the Basin Plan. Therefore, the addition of the compliance dates proposed to be added to Tables 6.1 and 6.4 are consistent with the requirements of the Beaches and Creeks Bacteria TMDLs. As for the assertion that the Beaches and Creeks Bacteria TMDLs do not require BLRPs or CLRPs for segments of beaches or creeks de-listed from the Clean Water Act Section 303(d) List of Water Quality Limited Segments, the commenters appear to be citing text from the TMDL Compliance Schedule section instead of the TMDL Implementation Plan section of the Beaches and Creeks Bacteria TMDLs. It is true that on page 7-107 of the Basin Plan, includes a statement that: "*For watersheds in Table 7-52 where there are no longer any impairments listed on the 2008 303(d) List, the Phase I MS4s and Caltrans are not required to submit a BLRP or CLRP within 18 months of the effective date of the TMDLs.*" However, this statement is under the TMDL Compliance Schedule requirements and was only included to indicate that the San Diego Water Board would not require a BLRP or CLRP to be submitted within 18 months of the effective date. It was not intended to mean that a BLRP or CLRP would never be required. If the commenters look under the TMDL Implementation Plan requirements for Phase I MS4s, which begins on page 7-85 of the Basin Plan, there is no statement that a BLRP or CLRP will not be required for "*watersheds … where there are no longer any impairments listed on the 2008 303(d) List."* The TMDL Implementation Plan for Phase I MS4 does, however, state the following on page 7-86 of the Basin Plan: "*The WQBELs will likely consist of receiving water limitations (based on the numeric targets) and require the implementation of a BMP program to achieve the TMDLs in receiving waters. The Phase I MS4s will be required to submit Bacteria Load Reduction Plans (BLRPs) or Comprehensive Load Reduction Plans (CLRPs) outlining a proposed BMP program capable of achieving the necessary load reductions required to attain the TMDLs in receiving waters, acceptable to the San Diego Water, within 18 months after the effective date of these TMDLs. The San Diego Water Board will require the BLRPs or CLRPs to be developed on a watershed or region wide scale. The BLRPs or CLRPs should be developed and*	

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AttE6-2	ATTACHMENT E.6: Beaches and Creeks Bacteria TMDLs	
	incorporated as part of the Watershed Runoff Management Programs required under the Phase I MS4 NPDES requirements…." The TMDL Implementation Plan requirements clearly state the BLRPs or CLRPs are required and do not have any exceptions. The TMDL Compliance Schedule requirements do allow an exception from submitting a BLRP or CLRP within 18 months of the effective date, but do not state that a BLRP or CLRP will never be required. Specific Provision 6.b.(2)(c)(i) is consistent with the TMDL Implementation Plan requirements in the Basin Plan by requiring a CLRP to be on a watershed scale and incorporated into the Water Quality Improvement Plans (i.e. Watershed Runoff Management Program), which includes a BMP implementation program capable of achieving the necessary load reductions required to attain the TMDLs in receiving waters for all the applicable Watershed Management Areas in Table 6.0. Table 6.0 lists all the beaches and areas included in the Beaches and Creeks Bacteria TMDLs from the Basin Plan. Please also see the response to comment AttE6-1. However, the San Diego Water Board recognizes that Specific Provision 6.b.(2)(c)(i) only allows for the Copermittees to incorporate CLRPs into the Water Quality Improvement Plans. Therefore, to be consistent with the Beaches and Creeks Bacteria TMDLs, which allows for BLRPs to be developed and submitted, Specific Provision 6.b.(2)(c)(i) has been revised as follows: (i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 6.0 must incorporate the <u>Bacteria Load Reduction Plans (BLRPs) or</u> Comprehensive Load Reduction Plans (CLRPs) required to be developed pursuant to Resolution No. R9-2010-0001.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2015-0100

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AttE6-3	ATTACHMENT E.6: Beaches and Creeks Bacteria TMDLs	
	COMMENT: *Request for revisions to clarify that compliance with receiving water limitations in the Beaches and Creek Bacteria TMDLs will be assessed at the compliance points identified in the TMDL Monitoring Plan.* The County of San Diego requested revisions to the Beaches and Creeks Bacteria TMDLs requirements to specify that compliance with receiving water limitations can be determined at the compliance points identified in the TMDL Monitoring Plans that are included in the Water Quality Improvement Plans.	County of San Diego
	RESPONSE: The San Diego Water Board disagrees that the revision is necessary. The Beaches and Creeks Bacteria TMDLs interim and final compliance determination requirements includes a pathway that allows the Copermittees to demonstrate that there are no exceedances of the final (or interim) receiving water limitations in the receiving water "*at, or downstream of the Responsible Copermittee's MS4 outfalls*." The Specific Monitoring and Assessment Requirements of the Beaches and Creeks Bacteria TMDLs specifies the locations where monitoring is required to determine compliance. For beaches, the required monitoring locations are "*at, or downstream of the Responsible Copermittee's MS4 outfalls*." For creeks, the monitoring locations are required to be at or near the mouth and one or more locations upstream of the mouth, both of which should be "*at, or downstream of the Responsible Copermittee's MS4 outfalls*." If the receiving waters are not exceeding the final (or interim) receiving water limitations expressed as exceedance frequencies at the required receiving water monitoring locations, then the Copermittees have demonstrated compliance with the receiving water WQBELs "*at, or downstream of the Responsible Copermittee's MS4 outfalls*." If, however, there are exceedances at a receiving water monitoring location, then the upstream Copermittees will need to demonstrate compliance with another compliance determination pathway. No changes were made to the Tentative Order as a result of this comment.	

RESPONSES TO COMMENTS RECEIVED ON TENTATIVE ORDER NO. R9-2015-0100

November 4, 2015 / Revised November 10, 2015

AttE7-1	ATTACHMENT E.7: Los Penasquitos Lagoon Sediment TMDL	
	COMMENT: *Request for revisions to incorporate a land use-based compliance pathway into the Los Penasquitos Lagoon Sediment TMDL.* The County of San Diego requested revisions to the Total Maximum Daily Load for Sediment in Los Penasquitos Lagoon (Los Penasquitos Sediment TMDL) in Attachment E to incorporate a land use-based compliance pathway.	County of San Diego
	RESPONSE: The San Diego Water Board disagrees that changes are needed to accommodate a land use-based compliance pathway for the Los Penasquitos Lagoon Sediment TMDL. The commenter states that if the land use has not changed significantly from the 1970s baseline, the timeframe at which water quality standards in the lagoon were met, then the sediment loads from the Copermittee's MS4s are expected to be approximately the same as the baseline levels and within the amount allowed in the wasteload allocation. The San Diego Water Board agrees that under this scenario in which land use has not changed significantly, the sediment levels would be approximately the same as baseline levels. If this is confirmed through water quality monitoring, then the Copermittee has likely met its portion of the final effluent limit described in Provision 7.b.(2)(b) and has achieved compliance. For this reason, changes to the TMDL compliance pathways are not needed or warranted. No changes were made to the Tentative Order as a result of this comment.	

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

Errata Sheet
November 4, 2015
Revised November 10, 2015

TENTATIVE ORDER NO. R9-2015-0100

AN ORDER AMENDING ORDER NO. R9-2013-0001, NPDES NO. CAS010266, AS AMENDED BY ORDER NO. R9-2015-0001 NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The following changes are proposed to the revised version of Tentative Order No. R9-2015-0100 and its Attachments included as Supporting Document No. 1 for Item No. 11 on the San Diego Water Board November 18, 2015 Board Meeting Agenda.

1. Tentative Order No. R9-2015-0100 Errata

Revise the beginning of Finding 6 as follows:

6. Regional Water Board Agreement. The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated ~~[Month][Day]~~ October 26, 2015 to:

2. Attachment No. 1 to Tentative Order No. R9-2015-0100 Errata

a) Revise Finding 29.b as follows:

b. Pursuant to CWC section 13228, the Cities of Murrieta, Wildomar, and Menifee submitted written requests that one Regional Water Board be designated to regulate Phase I MS4 discharges for each of the Cities. The Santa Ana Water Board and the San Diego Water Board have entered into an agreement dated ~~[Month][Day]~~ October 26, 2015, whereby the Cities of Murrieta and Wildomar are largely regulated by the San Diego Water Board under this Order, including those portions of the Cities of Murrieta and Wildomar not within the San Diego Water Board's jurisdiction, upon the effective date of this Order….

b) Revise Provision A.1.d as follows:

d. Storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012, as amended by State Water Board Resolution No. 2012-0031, applicable to these discharges, included in Attachment A to this Order. All other discharges from the Copermittees' MS4s to ASBS are prohibited.

c) Revise the beginning of Provision B.3.c as follows:

c. PROHIBITIONS AND LIMITATIONS COMPLIANCE OPTION

Each Copermittee has the option to utilize the implementation of the Water Quality Improvement Plan to demonstrate compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2~~.a~~, and A.3.b within a Watershed Management Area subject to the following conditions:

d) Revise Provision B.3.c.(1) as follows:

(1) A Copermittee is eligible to be deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2~~.a~~, and A.3.b within a Watershed Management Area when the Water Quality Improvement Plan for a Watershed Management Area incorporates the following:

e) Revise Provision B.3.c.(1)(a)(vii) as follows:

(vii) For each final numeric goal developed pursuant to Provisions B.3.a and B.3.c.(1)(a)(i)-(v), ~~at least one~~ annual milestones[9] and the dates for ~~its~~ their achievement must be included within each of the next five (5) Water Quality Improvement Plan Annual Report reporting periods, or until the final numeric goal is achieved. Annual milestones and the dates for their achievement for the 5 Water Quality Improvement Plan Annual Report reporting periods of the next permit term, or until the final numeric goal is achieved, must be provided as part of the Report of Waste Discharge required pursuant to Provision F.5.

f) Revise Footnote 9 as follows:

[9] Annual milestones for each final numeric goal must ~~build upon previous milestones and lead to~~ be clearly and directly linked to, or demonstrate progress is being made toward, the achievement of the final numeric goal. The annual milestones may consist of water quality improvement strategy implementation phases, interim numeric goals, and other acceptable metrics. The annual milestones may address multiple numeric goals and/or multiple water bodies, as applicable and appropriate.

g) Revise Provision B.3.c.(2) as follows:

(2) Each Copermittee that voluntarily completes the requirements of Provision B.3.c.(1) is deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2~~.a~~, and A.3.b for the pollutants and conditions for which numeric goals are developed when the Water Quality Improvement Plan, incorporating the requirements of Provision B.3.c.(1), is accepted by the San Diego Water Board pursuant to Provision F.1.b or F.2.c. The Copermittee is deemed in compliance during the term of this Order as long as:

h) Revise Provision B.3.c.(2)(d) as follows:

(d) Any proposed modifications to the numeric goals, strategies, schedules, and/or annual milestones are accepted by the San Diego Water Board as part of subsequent updates to the Water Quality Improvement Plan pursuant to Provision F.2.c;[10] AND

i) Add Provision B.5.d as follows:

d. ADAPTATION OF PROHIBITIONS AND LIMITATIONS COMPLIANCE OPTION

If a Copermittee has implemented the Prohibitions and Limitations Compliance Option allowed to be included in the Water Quality Improvement Plan pursuant to Provision B.3.c, the Copermittee must re-evaluate and adapt the numeric goals, water quality improvement strategies, schedules, and annual milestones required under Provision B.3.c.(1) when significant new information becomes available, or with the Report of Waste Discharge required pursuant to Provision F.5. Significant changes in the numeric goals, water quality improvement strategies, schedules, or annual milestones requires an update to the analysis required under Provision B.3.c.(2).

j) Revise Provision E.3.d as follows:

(d) Each Copermittee must update its BMP Design Manual pursuant to Provision F.2.b. Until the Copermittee has updated its BMP Design Manual pursuant to Provision F.2.b.(1), the Copermittee must continue implementing its current BMP Design Manual. The Copermittee must implement the updated BMP Design Manual within 180 days following completion of the update pursuant to Provision F.2.b.(1), unless directed otherwise by the San Diego Water Board Executive Officer. The date the BMP Design Manual is implemented is the "effective date" of the BMP Design Manual.

k) Revise Provision F.2.b.(4) as follows:

(4) If the San Diego Water Board amends Provisions E.3.a-d during the permit term but after the Copermittee has completed the update pursuant to Provision F.2.b.(1), the Copermittee must revise its BMP Design Manual to incorporate the amended Provision E.3.a-d requirements as soon as possible but no~~t~~ later than 90 days after the date the San Diego Water Board adopts the amendments to Provisions E.3.a-d, unless otherwise directed by the San Diego Water Board Executive Officer. Under these circumstances, the effective date of the BMP Design Manual is no later than 90 days after the date the San Diego Water Board adopts the amendments to Provisions E.3.a-d, unless otherwise directed by the San Diego Water Board Executive Officer.

l) Revise the definition of Construction Activities in Attachment C as follows:

Construction Activities – Actions implemented during construction of development or redevelopment projects during the Preliminary Tasks ~~Phase~~ (including rough grading and/or disking, clearing and grubbing operations, or any soil disturbance prior to mass grading), Grading or Land Development ~~Phase~~ (including topography and slope reconfiguration, alluvium removals, canyon cleanouts, rock undercuts, keyway excavations, land form grading, and stockpiling of select material for capping operations), Streets and Utility Installation ~~Phase~~ (including excavation and street paving, lot grading, curbs, gutters and sidewalks, public utilities, public water facilities including fire hydrants, public sanitary sewer systems, storm sewer systems and/or other drainage improvements), or Vertical Construction ~~Phase~~ (including the build out of structures from foundations to roofing, including rough landscaping).

m) Revise the definition of Redevelopment in Attachment C as follows:

Redevelopment – The creation and/or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, and the addition to or replacement of a structure~~, and creation or addition of impervious surfaces~~. Replacement of impervious surfaces includes any activity ~~that is not part of a routine maintenance activity~~ where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include routine maintenance activities, such as trenching and resurfacing associated with utility work; pavement grinding; resurfacing existing roadways,~~; new~~ sidewalks ~~construction~~, pedestrian ramps, or bike lanes on existing roads; and routine replacement of damaged pavement, such as pothole repair.

n) Revise Specific Provision 6.b.(2)(c)(i) in Attachment E as follows:

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 6.0 must incorporate the Bacteria Load Reduction Plans (BLRPs) or Comprehensive Load Reduction Plans (CLRPs) required to be developed pursuant to Resolution No. R9-2010-0001.

3. Attachment No. 2 to Tentative Order No. R9-2015-00100 Errata

a) Revise the text on page F-5 of the Fact Sheet as follows:

b. Continue designation of the San Diego Water Board to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Murrieta and Wildomar, including areas within the Santa Ana Region; and, agree to continue designation of the Santa Ana Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the City of Menifee, including areas within the San Diego Region, subject to the terms of the ~~[Month][Day]~~ October 26, 2015 agreement between San Diego Water Board and the Santa Ana Water Board described in Finding 29 of this Order;

c. Incorporate Provision B.3.c, which provides an option that allows a Copermittee to utilize the watershed-based Water Quality Improvement Plan to be deemed in compliance with the prohibitions and limitations of Provisions A.1.a, A.1.c, A.1.d, A.2~~.a~~, and A.3.b;

b) Revise the text on page F-7 of the Fact Sheet as follows:

** The City of Menifee is not regulated as a Copermittee under this Order because its Phase I MS4 discharges are regulated by Santa Ana Water Board Order No. R8-2010-0033 as it may be amended or issued pursuant to Water Code section 13228 designation. The requirements of this Order that apply to the City of Menifee for the duration of this Order, consistent with the Water Code section 13228 written agreement dated ~~[Month][Day]~~ October 26, 2015, are described in Finding 29 and Footnote 3 to Table B-1.

c) Revise the text on page F-32 of the Fact Sheet as follows:

Anti-Backsliding Requirements

CWA sections 402(o) and 303(d)(4) and federal regulations at 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations or conditions may be relaxed. While this Order allows implementation of an alternative compliance pathway option in Provision B.3.c to constitute compliance with receiving water limitations under certain circumstances, the availability of that alternative and the corresponding availability of additional time to come into compliance with receiving water limitations does not violate the antibacksliding provisions. The receiving water limitations provisions of this Order are imposed under section 402(p)(3)(B) of the Clean Water Act rather than based on best professional judgment, or based on section 301(b)(1)(C) or sections 303(d) or (e), and are accordingly not subject to the anti-backsliding requirements of section 402(o). Although the non-applicability is less clear with respect to the regulatory anti-backsliding provisions in 40 CFR 122.44(l), the regulatory history suggests that USEPA's intent was to establish the anti-backsliding regulations with respect to evolving technology standards for traditional point sources. (See, e.g., 44 Fed.Reg. 32854, 32864 (Jun. 7, 1979)). It is unnecessary, however, to resolve the ultimate applicability of the regulatory anti-backsliding provisions, because the alternative compliance pathway option in Provision B.3.c qualifies for an exception to backsliding as based on new information.

The alternative compliance pathway option in Provision B.3.c of this Order was informed by new information available to the Board from experience and knowledge gained through storm water permitting at the Regional Water Boards in the last ten years. There has been a statewide paradigm shift in storm water management. State Water Board Order WQ 2015-0075 directed all of the Regional Water Boards to consider the Los Angeles Water Board's alternative compliance path to receiving water limitations in all Phase I MS4 permits going forward (State Water Board Order WQ 2015-0075 at page 51). ~~It~~, and the Los Angeles Water Board's process of developing over 30 watershed-based TMDLs and implementing several TMDLs since the adoption of the previous permits. In particular, the Los Angeles Water Board recognized the significance of allowing time to plan, design, fund, operate and maintain watershed-based BMPs necessary to attain water quality improvements and additionally recognized the potential for municipal storm water to benefit water supply. Similarly, the San Diego Water Board's experience developing and implementing the Fourth Term MS4 Permits and TMDLs that apply on a region-wide scale (e.g. TMDLs for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region) has resulted in a similar recognition of the need for a watershed-based approach that allows time to plan, design, fund, operate and maintain BMPs to address impaired waters that have been impacted by MS4 discharges. Thus, even if the receiving water limitations are subject to anti-backsliding requirements, they were revised based on new information that would support an exception to the anti-backsliding provisions. (33 U.S.C. § 1342(o)(2)(B)(i); 40 C.F.R. § 122.44(l)(1); 40 C.F.R. §122.44(l)(2)(i)(B)(1)).

d) Revise the text on page F-51 of the Fact Sheet as follows:

The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated February 10, 2015 to designate the San Diego Water Board to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Laguna Woods and Laguna Hills, including the portions of the jurisdictions within the Santa Ana Region, upon the later effective date of Order No. R9-2015-0001 or Santa Ana Water Board Tentative Order No. R8-2015-0001. The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated ~~[Month][Day]~~ October 26, 2015 to designate the San Diego Water Board to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Murrieta and Wildomar, including the portions of the jurisdictions within the Santa Ana Region upon the effective date of Order R9-2015-0100.

e) Revise the text on page F-52 of the Fact Sheet as follows:

The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated February 10, 2015 to designate the San Ana Water Board to regulate Phase I MS4 discharges within the jurisdiction of the City of Lake Forest, including portions of the jurisdiction within the Santa Diego Region, upon the later date of Order No. R9-2015-0001 or Santa Ana Water Board Tentative Order No. R8-2015-0001. The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated ~~[Month][Day]~~ October 26, 2015 to designate the San Ana Water Board to regulate Phase I MS4 discharges within the jurisdiction of the City of Menifee, including portions of the jurisdiction within the San Diego Region, under Order No. R8-2010-0033 (NPDES No. CAS618030) as it may be amended or reissued upon the effective date of Order No. R9-2015-0100.

f) Revise the text on pages F-60 through F-62 of the Fact Sheet as follows:

Replace the references to "Provisions A.1.a, A.1.c, A.1.d, A.2.a, and A.3.b" with "Provisions A.1.a, A.1.c, A.1.d, A.2~~.a~~, and A.3.b."

g) Revise the text on page F-62 of the Fact Sheet as follows:

Compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2~~.a~~, and A.3.b begins when the Water Quality Improvement Plan, incorporating the requirements of Provision B.3.c.(1), is accepted by the San Diego Water Board. Each Copermittee that chooses to implement and continues to implement this option will be deemed in compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2~~.a~~, and A.3.b as long as the Copermittee continues to implement the strategies, monitoring and assessments as incorporated in the Water Quality Improvement Plan in accordance with Provision B.3.c.(1), and the Copermittee reports the achievement of the annual milestones each year, or provides acceptable rationale and recommends appropriate modifications to the interim numeric goals, and/or water quality improvement strategies, and/or schedules to improve the rate of progress toward achieving the final numeric goals. The Copermittee continues to be deemed in compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b during the time the San Diego Water Board reviews the rationale and recommended modifications to the interim numeric goals, and/or water quality improvement strategies, and/or schedules. If and when the San Diego Water Board determines that it does not accept the rationale or recommendations, the Copermittee will be notified they are no longer deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b.

h) Revise the text on page F-81 of the Fact Sheet as follows:

Provision E.2.(Illicit Discharge Detection and Elimination) requires each Copermittee to implement an illicit discharge detection and elimination program to effectively prohibit non-storm water discharges to the MS4 by actively detecting and eliminating illicit discharges and disposal into its MS4. If the San Diego Water Board finds that a Copermittee is fully implementing the requirements of Provision E.2, then the Copermittee is deemed in compliance with the effective prohibition of non-storm water discharges to the MS4 required under Provision A.1.b.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

BOARD MEETING PARTICIPATION SIGN IN SHEET

NOVEMBER 18, 2015 - 9:00 A.M. - SAN DIEGO

PLEASE PRINT CLEARLY, AS THIS WILL BECOME PART OF THE BOARD'S OFFICIAL RECORD

Please Print Name	Representing	Phone or Email
✓ David Renfrew	Alta Environmental	David.Renfrew@altaenviron.com
✓ Kimberly O'Connell	UC San Diego / SIO	koconnell@ucsd.edu
✓ Rebecca Andrews	Airport Authority National City, Chula Vista	~~[illegible]~~ rebecca.andrews@bbklaw.com
✓ Wayne Rosenkranz	Coalition	SWRO@Envirodynamics.com
✓ Tracy Ingebrigtsen	City of Laguna Beach	949.497.0787
✓ David Garcia	RCFC & WCD	
✓ Stuart McKibben	"	
✓ Scott Bruckner	"	
✓ Ghina Yamout	Alta environmental	ghina.yamout@altaenviron.com
✓ Jerry Jurkiewicz	Dana Point / Laguna Beach	jurkiewicz@rutan.com 760 277 4618
✓ Joe Ames	City of Mission Viejo	JAMES@CITYOFMISSIONVIEJO.ORG
✓ Bouthna Salem	City of Chula Vista	bsalem@chulavistaca.gov
✓ Michelle Mattson	Western	michelle.mattson@westernsolution.com
✓ Ray Rivera	Voice of San Diego	RY@VOSD.ORG
✓ Scott Graves	Citizen	sgravesucd@hotmail.com
✓ Kathryn Kriozere	San Diego City Attorney	kkriozere@sandiego.gov
✓ Sean Tourles	City of SD	SATOURLES@SANDIEGO.GOV
✓ Brad Fowler	City of Dana Point	bfowler@danapoint.org
✓ Mayor Carlos N Olvera	City of Dana Point	colvera@danapoint.org
✓ Bill Green	SCWD	bgreen@scwd@gmail.com
✓ Steve Horn	County of Riverside	shorn@rcwo.org

022469

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

BOARD MEETING PARTICIPATION SIGN IN SHEET

NOVEMBER 18, 2015 - 9:00 A.M. - SAN DIEGO

PLEASE PRINT CLEARLY, AS THIS WILL BECOME PART OF THE BOARD'S OFFICIAL RECORD

Please Print Name	Representing	Phone or Email
✓ Edward Corwin		edward.corwin@lewisbrisbois.com
✓ Billy Walker		billy@buccolaeng.com
✓ LAURA Hunter	ESC Neighbor United	laura@escandidoneighbors.org
✓ JEROME PENDZICK	SURFRIDER	619 823 2129
✓ Lisa Kay	Alta	lisa.kay@altaenviron.com
✓ Kathryn Horning		khorning@allenmatkins.com
✓ Nick Doenges		nick@jwhalen.net
✓ Jeff O'CONNOR	HOMEFED	joconnor@hfc-ca.com
✓ Jim Whalen	JWA	james@jwhalen.net
✓ Sumer Hasenin	City of San Diego	SyHasenin@Sandiego.gov
✓ Jim KILGORE	LATITUDE 33	JIM.KILGORE@LATITUDE33.COM
✓ Michael McSweeney	BIA	MMCSWEENEY@BIASANDIEGO.ORG
✓ Jeff Waldman	US Navy Region SW	jeff.waldman@navy.mil
✓ SAM BLICK	SHR	sblicklawsd@gmail.com
✓ Clem Brown	City of San Diego	cmbrown@sandiego.gov
✓ Malik Tamimi	city of Lemon Grove	mtamimi@lemongrove.ca.gov
✓ Jessica Palmer	Navy - NAVFAC SW	jessica.palmer@navy.mil
✓ MARK BAKER	Coutech	mbaker@coutechcs.com
✓ Debby Reece	Project Design Consultants	debby@projectdesign.com

022470

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

BOARD MEETING PARTICIPATION SIGN IN SHEET

NOVEMBER 18, 2015 - 9:00 A.M. - SAN DIEGO

PLEASE PRINT CLEARLY, AS THIS WILL BECOME PART OF THE BOARD'S OFFICIAL RECORD

Please Print Name	Representing	Phone or Email
✓ EMIR WILLIAMS	CITY OF S.D.	EWILLIAMS@SANDIEGO.GOV
✓ SHELBY HULL	CONTECH	SHULL@CONTECHES.COM
✓ Aaron Lund	Hanson Aggregates	aaron.lund@lehighhanson.com
✓ Matt O'Malley	SD Coastkeeper	matt@sdcoastkeeper.org
✓ Venkat Gummadi		vgummadi@geosyntec.com
✓ Tony Walker	Tony R Walker Engineering	tony@trwengineering.com
✓ MICHAEL WELCH		mwelch1@san.rr.com
✓ BEN LARRIER	SAN DIEGO CITY ATTY	BLARRIER@SANDIEGO.GOV
✓ Ryan Wann	County of SD, AWM	ryan.wann@sdcounty.ca.gov
✓ JO Ann Weber	Co " DPW	joann.weber@sdcounty.ca.gov
✓ TOM STINSON	Asm. Marie Waldron	Tom.Stinson@asm.ca.gov
✓ J. Harry Jones	Union-Tribune	760 785-4731
✓ Adrienne Gibor	Nautilus	adrienne@nautilusenvironmental.com
✓ Jason Golumbfskie-Jones	NB Coronado	jason.golumbfskie@navy.mil
✓ ROMEO HACINAS	NB CORONADO	romeo.hacinas@navy.mil
✓ Ryan Anson	NB CORONADO	ryan.anson@navy.mil
✓ Edwin Medina	de maximis	619-991-9074
✓ Christian Brown	City of Del Mar	cbrown@mogawaeng.com
✓ John Crow	U.S. Navy	John.Crow@navy.mil
✓ DEVIN SLAVEN	CITY OF LAKE FOREST	DSLAVEN@LAKEFORESTCA.GOV

022471

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

BOARD MEETING PARTICIPATION SIGN IN SHEET

NOVEMBER 18, 2015 - 9:00 A.M. - SAN DIEGO

PLEASE PRINT CLEARLY, AS THIS WILL BECOME PART OF THE BOARD'S OFFICIAL RECORD

Please Print Name	Representing	Phone or Email
✓ MATT RICH	AMEC FOSTER WHEELER	MATT.RICH@AMEC.COM
✓ MARY ANNE SLORPANICH	COUNTY OF ORANGE	714 955 0601
✓ RICHARD BOON	" " "	714 955 0670
✓ Jamie Richards	City of Menifee	jrichards@dmaxinc.com.
✓ Catherine Ferguson	SD Coastkeeper	cferguson@sdcoastkeeper.org
✓ Scott Taylor	M. Baker International	staylor@mbakerintl.com

022472

San Diego Water Board Meeting – November 18, 2015

Name	Affiliation	Contact Info
Ruth Kolb	City SD	rkolb@sandiego.gov
Steve Strapac	Poway	SSTRAPAC@POWAY.ORG
Rosanna Lacarva	City of Coronado/LaRoc Env.	Rosanna@LaRocEnvironmental.com
Julia Chunn-Heer	Surfrider	julia@surfridersd.org
Andrea Crumpacker	Weston	andrea.crumpacker@westonsolutions.com
Cheryl Filan	Vista	cfilan@cityofvista.com
John Quenzer	City of National City	jquenzer@dmexinc.com
Todd Snyder	County of S.D.	todd.snyder@sdcounty.ca.gov
Tom Deak	County of SD	thomas.deak@sdcounty.ca.gov
Mark West	S.D. Surfrider	mark_west@yahoo.com
Mandy Sackett	Surfrider	mandy@surfridersd.org
Jayne Janda-Tinka	Rick Engr. Co	jjanda-tinka@rickengineering.com
James Wood	City of Carlsbad	james.wood@carlsbadca.gov
David Shissler	City of Laguna Beach	dshissler@lagunabeachcity.net
Greg Hopkins	City of San Diego	GHOPKINS@SANDIEGO.GOV
Curtis Crompton	County of Orange	CURTIS.CROMPTON@OCPW.OCGOV.COM

022474

NAME: BRAD FOWLER

AGENDA ITEM NO. 11

REQUEST TO ADDRESS REGIONAL BOARD

DURING PUBLIC FORUMS, STATUS REPORTS, WORKSHOPS, AND OTHER NON-ACTION ITEMS

*****PLEASE PRINT LEGIBLY*****

SUBJECT OF TESTIMONY: SDRWQCB NPDES PERMIT ADOPTION

IS WRITTEN TESTIMONY BEING SUBMITTED? YES [ ] NO [X]

TITLE/AFFILIATION: DIRECTOR OF PUBLIC WORKS - CITY OF DANA POINT

ADDRESS: 33282 GOLDEN LANTERN, D.P. TELEPHONE: 949 337 0512

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

Meeting Date: NOV 18, 2015

Signature: [illegible]

NAME: Scott Graves

AGENDA ITEM NO. 11

REQUEST TO ADDRESS REGIONAL BOARD

DURING PUBLIC FORUMS, STATUS REPORTS, WORKSHOPS, AND OTHER NON-ACTION ITEMS

PLEASE PRINT LEGIBLY

SUBJECT OF TESTIMONY: Safari Highlands Ranch

IS WRITTEN TESTIMONY BEING SUBMITTED? YES ☐ NO ☒

TITLE/AFFILIATION: Citizen

ADDRESS: 2797 Escondido CA TELEPHONE: 858-248-7653

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

Meeting Date: 11/16/15 Signature:

022476

NAME: Stuart McKibbin

AGENDA ITEM NO. 11

REQUEST TO ADDRESS REGIONAL BOARD

DURING PUBLIC FORUMS, STATUS REPORTS, WORKSHOPS, AND OTHER NON-ACTION ITEMS

*****PLEASE PRINT LEGIBLY*****

SUBJECT OF TESTIMONY: Suggestions to improve MS4 permit

IS WRITTEN TESTIMONY BEING SUBMITTED? YES [X] previously NO [ ]

TITLE/AFFILIATION: Chief of Watershed Protection, Riverside County Flood Control & Water Conservation District

ADDRESS: 1995 Market Street, Riverside CA 92501 TELEPHONE: 951.955.1200

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

Meeting Date: 11/18/2015 Signature: Stuart McKibbin

NAME: REBECCA ANDREWS **AGENDA ITEM NO.** 11

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

SUBJECT OF TESTIMONY: R9-2015-0100 Airport Authority / National City

IS WRITTEN TESTIMONY BEING SUBMITTED? YES ☐ NO ☒

TITLE/AFFILIATION: Best Best & Krieger representing Chula Vista

ADDRESS: 655 W. Broadway TELEPHONE: 619-525-1300

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Rebecca Andrews hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: Nov. 18, 2015 Signature: [signature]

022478

NAME: Jeremy Jungreis **AGENDA ITEM NO.** 11

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: LAGUNA BEACH / DANA POINT / co-permittees of OC

ADDRESS: RUTAN + TUCKER TELEPHONE: 7602774690

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Jeremy Jungreis hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 18 NOV 15 Signature:

022479

NAME: Sam Blick **AGENDA ITEM NO.** 11

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION*** ~~BOA~~

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: SAFARI Highlands Ranch

ADDRESS: PO 9477, Rancho Santa Fe TELEPHONE: 858-395-1554

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Sam Blick hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/18/15 Signature:

022480

NAME: CARLOS OLVERA - elected official **AGENDA ITEM NO.** 11

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Mayor, Dana Point

ADDRESS: _____ TELEPHONE: _____

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, _____ hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: _____ Signature: _____

For Mayor Olvera

NAME: BILL GREEN - Elected official **AGENDA ITEM NO.** 11

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Board member, South Coast Water District

ADDRESS: _____ TELEPHONE: _____

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, _____ hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: _____ Signature: _____

For Board member Green

NAME: Laura Hunter **AGENDA ITEM NO.** 11

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Escondido Neighbors United

ADDRESS: 744 Quiet Hollow Dr Esc TELEPHONE: 6199979943

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, _____ hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 11-18-15 Signature: _____

NAME: JEROME PENDZICK **AGENDA ITEM NO.** 11

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: SURFRIDER

ADDRESS: 14245 DALHOUSIE RD, S.D. 92129 TELEPHONE: 619 823-2129

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, JEROME PENDZICK hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 11/18/2015 Signature: Jerome C. Pendzick

NAME: MICHAEL MCSWEENEY - BIA **AGENDA ITEM NO.** 11

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

SUBJECT OF TESTIMONY: NPDES PERMIT

IS WRITTEN TESTIMONY BEING SUBMITTED? YES [X] NO [ ]

TITLE/AFFILIATION: BIA / COALITION — POWERPOINT

ADDRESS: 9201 SPECTRUM CENTER BLVD TELEPHONE:

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Michael McSweeney hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 11/18/15 Signature: [signature]

NAME: Clem Brown **AGENDA ITEM NO.** 11

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

SUBJECT OF TESTIMONY: San Diego County Copermittees Comments

IS WRITTEN TESTIMONY BEING SUBMITTED? YES ☐ NO ☑

TITLE/AFFILIATION: Program Manager, City of San Diego

ADDRESS: 9370 Chesapeake Drive Suite 100 TELEPHONE: 858-541-4336
San Diego, CA ~~92102~~ 92123

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Clem Brown hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 11/18/15 Signature: Clem Brown

NAME: Matt O'Malley **AGENDA ITEM NO.** 11

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Legal + Policy Director SD Coastkeeper

ADDRESS: 2825 Dewey Rd, SD, CA TELEPHONE: 619 758 7743

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Matt O'Malley hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 11/18/15 Signature: [illegible]

NAME: Jo Ann Weber **AGENDA ITEM NO.** 11

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION*** Electrical Time under County of San Diego

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Planning Program Manager/County of San Diego

ADDRESS: ~~ST~~ 5510 Overland Dr., Ste 410 San Diego, CA 92123 TELEPHONE: 858-495-5317

State your name and address (spell your last name) for the record prior to beginning your presentation. Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Jo Ann Weber hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: Nov. 18, 2015 Signature: Jo Ann T. Weber

NAME: Mary Anne Skorpanich Orange County

AGENDA ITEM NO. 11

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

SUBJECT OF TESTIMONY: NPDES permit – Alternative Compliance

IS WRITTEN TESTIMONY BEING SUBMITTED? YES [ ] NO [X]

TITLE/AFFILIATION: County of Orange, Director of Environmental Resources

ADDRESS: 2301 N. Glassell St. TELEPHONE: 714 955-0681

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, M.A. Skorpanich hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 11-18-2015 Signature: [signature]

NAME: Julia Chunn-Heer **AGENDA ITEM NO.** 11

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Policy Manager, Surfrider Foundation

ADDRESS: _____ TELEPHONE: 619-246-8881

State your name and address (spell your last name) for the record prior to beginning your presentation. Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Julia Chunn-Heer hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 11/18/2015 Signature: [signature]

022490

NAME: Mark West Had to leave early **AGENDA ITEM NO.** 11

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Chair Surfrider San Diego

ADDRESS: 521 Daisy Ave IB CA 91932 TELEPHONE: 619 307-9242

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Mark West hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 11/18/15 Signature: MW

NAME: Mandy Sackett **AGENDA ITEM NO.** 11

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Chapter Manager Surfrider Foundation

ADDRESS: 9883 Pacific Hgts Blvd. San Diego 92121 TELEPHONE: 4407496845

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Amanda Sackett hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 4/18/15 Signature: A. Sackett

022492

NAME: DAVID SHISSLER

AGENDA ITEM NO. 11

REQUEST TO ADDRESS REGIONAL BOARD

DURING PUBLIC FORUMS, STATUS REPORTS, WORKSHOPS, AND OTHER NON-ACTION ITEMS

*****PLEASE PRINT LEGIBLY*****

SUBJECT OF TESTIMONY: MS4 Permit

IS WRITTEN TESTIMONY BEING SUBMITTED? YES ☐ NO ☒

TITLE/AFFILIATION: City of Laguna Beach

ADDRESS: 505 Forest Ave TELEPHONE: 9494970328

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

Meeting Date: 11/18/15 Signature:

022493

Orange County

NAME: Ryan Baron **AGENDA ITEM NO.** 11

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

Orange County

SUBJECT OF TESTIMONY: MS4 Permit - Alternative Compliance

IS WRITTEN TESTIMONY BEING SUBMITTED? YES ☐ NO ☒

TITLE/AFFILIATION: Senior Deputy County Counsel

ADDRESS: _____ TELEPHONE: 714-834-5206

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Ryan Baron hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 11/18/5 Signature: _____

022494

NAME: Jennifer Olin **AGENDA ITEM NO.** 11

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: Surfrider

ADDRESS: 12158 Mannix Rd., SD TELEPHONE: 858-538-6089

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Jennifer Olin hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: Nov. 18/15 Signature: [signature]

022495

NAME: Summer Struth **AGENDA ITEM NO.** 11

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: ~~Ced~~ Cede time to Julia Chunn-Heer

ADDRESS: _____ TELEPHONE: _____

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Summer Struth hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 11/18/15 Signature: _____

022496

NAME: Jon Van Rhyn **AGENDA ITEM NO.** 11

REQUEST TO SPEAK ***IN SUPPORT OF RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

SUBJECT OF TESTIMONY: Land development comments for San Diego County Copermittees

IS WRITTEN TESTIMONY BEING SUBMITTED? YES [✓] NO [ ]

TITLE/AFFILIATION: Water Resource Manager

ADDRESS: 5510 Overland Ave TELEPHONE: 858-495-5133

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Jon Van Rhyn hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 11/10/15 Signature: [signature]

NAME: Marco Gonzalez **AGENDA ITEM NO.** 11

REQUEST TO SPEAK ***IN OPPOSITION TO RECOMMENDED ACTION***

*****PLEASE PRINT LEGIBLY*****

TITLE/AFFILIATION: CERF

ADDRESS: _____ TELEPHONE: _____

State your name and address (spell your last name) for the record prior to beginning your presentation.
Three minutes is the time normally allotted to each speaker.

PLEASE GIVE THIS COMPLETED FORM TO THE EXECUTIVE ASSISTANT

OATH: I, Marco Gonzalez hereby affirm that the testimony that I will present to the California Regional Water Quality Control Board, San Diego Region, orally or in writing, will be the truth, the whole truth, and nothing but the truth under penalty of perjury under the laws of the State of California.

Meeting Date: 11/18/15 Signature: M. Gonzalez

Tentative Order No. R9-2015-0100

An Order Amending the Regional MS4 Permit to incorporate the Riverside County Copermittees

California Regional Water Quality Control Board
San Diego Region

November 18, 2015

022499

Municipal Separate Storm Sewer System (MS4)
National Pollutant Discharge Elimination System (NPDES) Permit

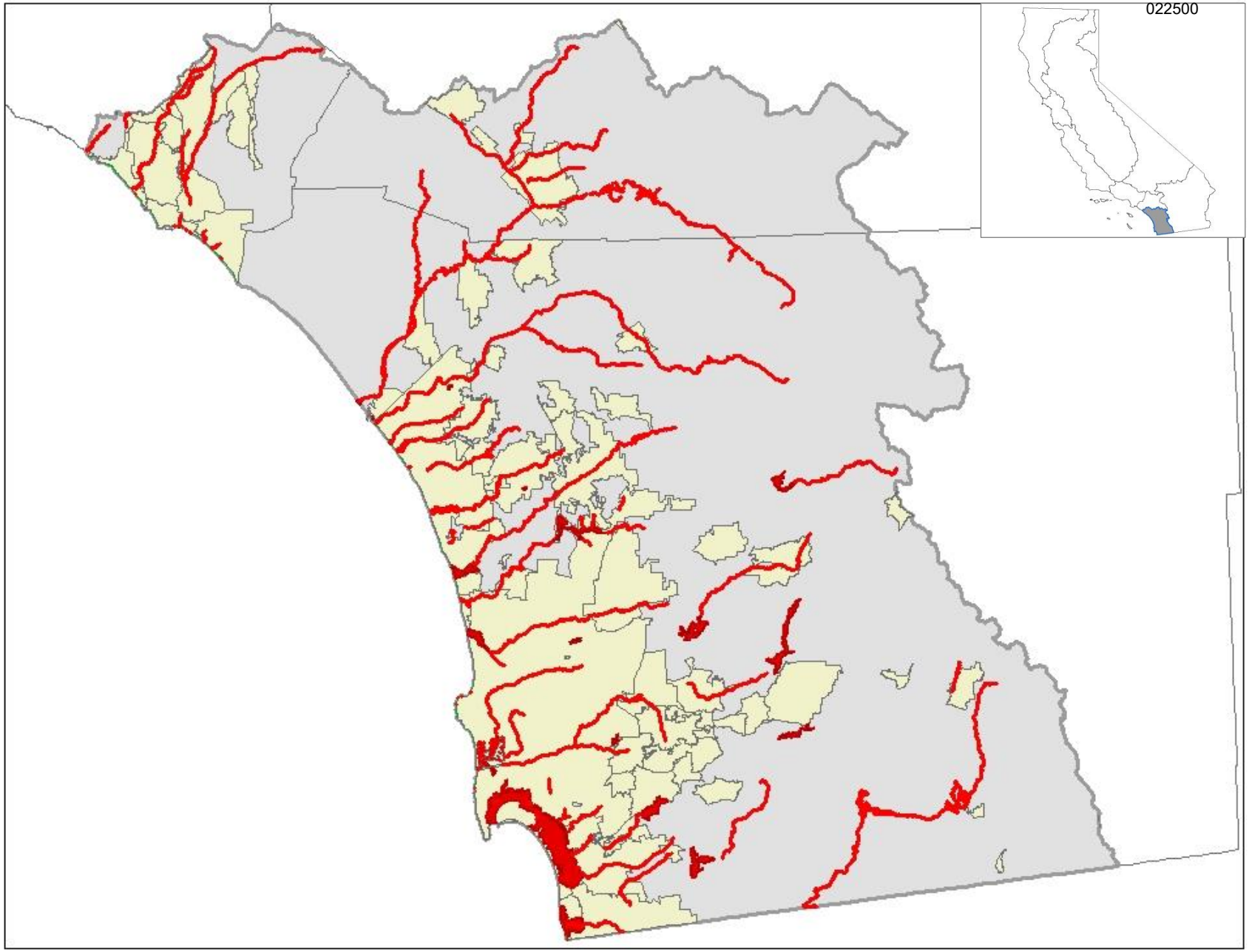
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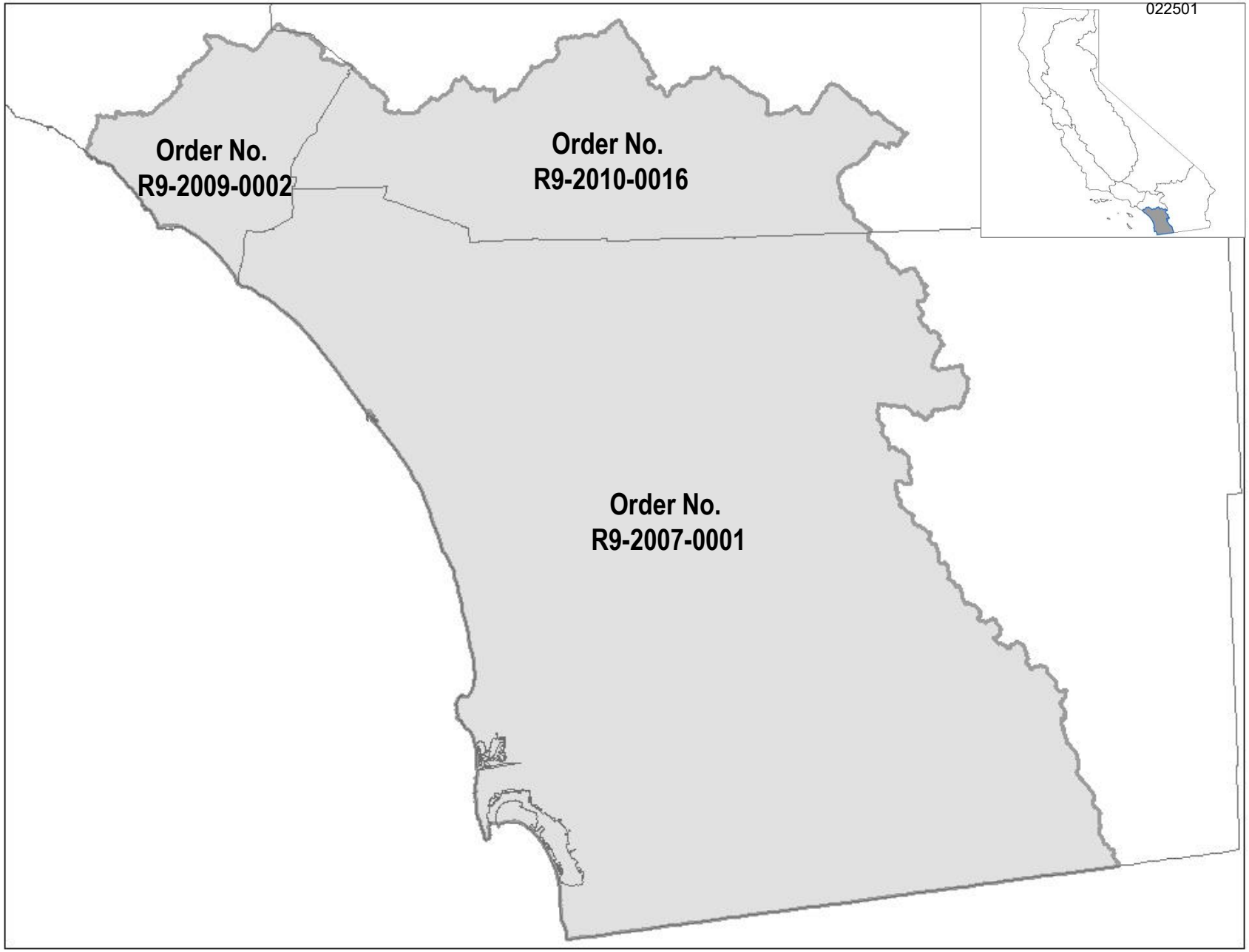
022501
Order No.
R9-2009-0002
Order No.
R9-2010-0016
Order No.
R9-2007-0001

San Diego Water Board Practical Vision

Healthy Waters, Healthy People

Healthy Waters, Healthy People

REGIONAL MS4 PERMIT

Order No. R9-2013-0001

Paradigm Shift…

Action oriented

Outcome oriented

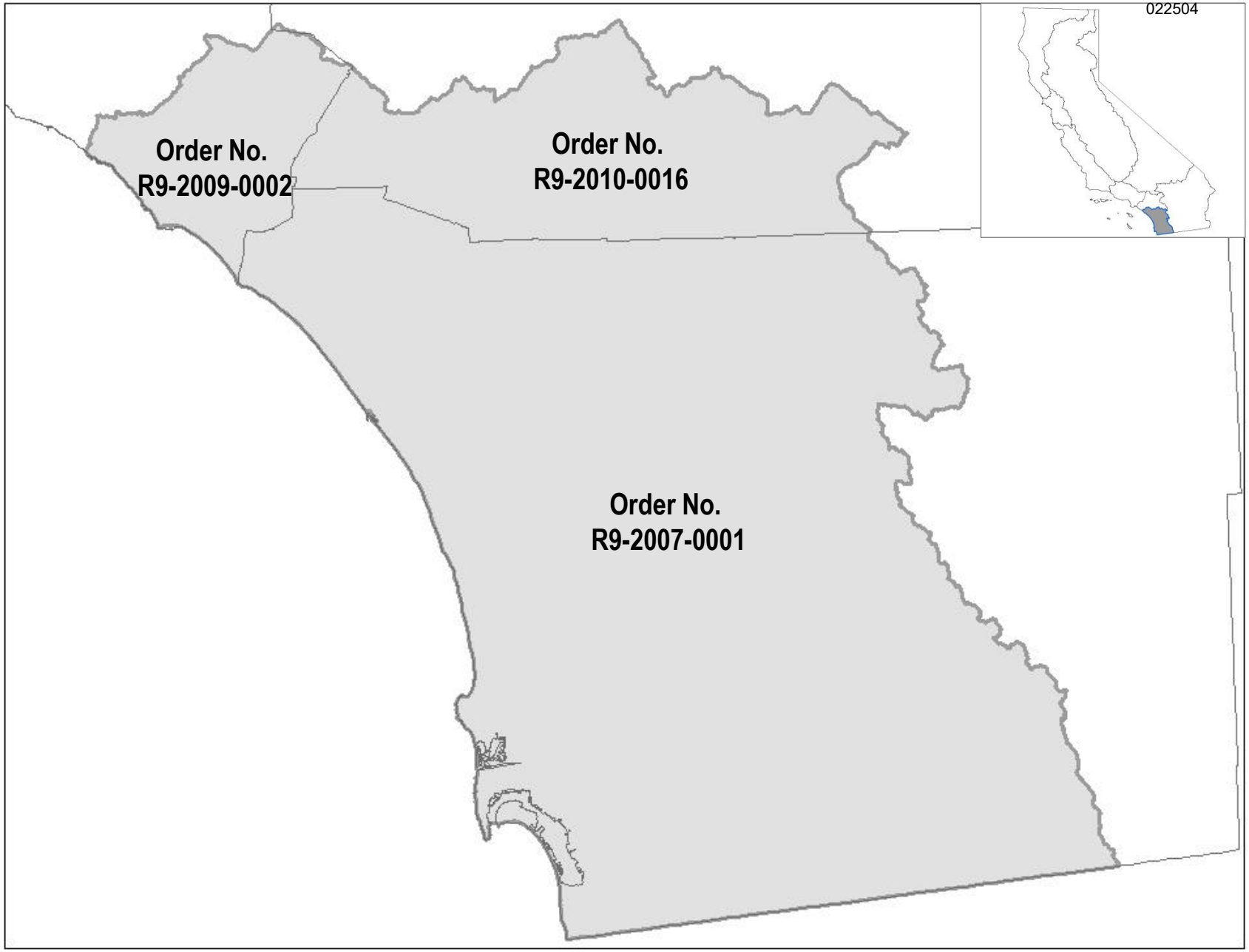
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Order No.
R9-2010-0016
Order No.
R9-2007-0001

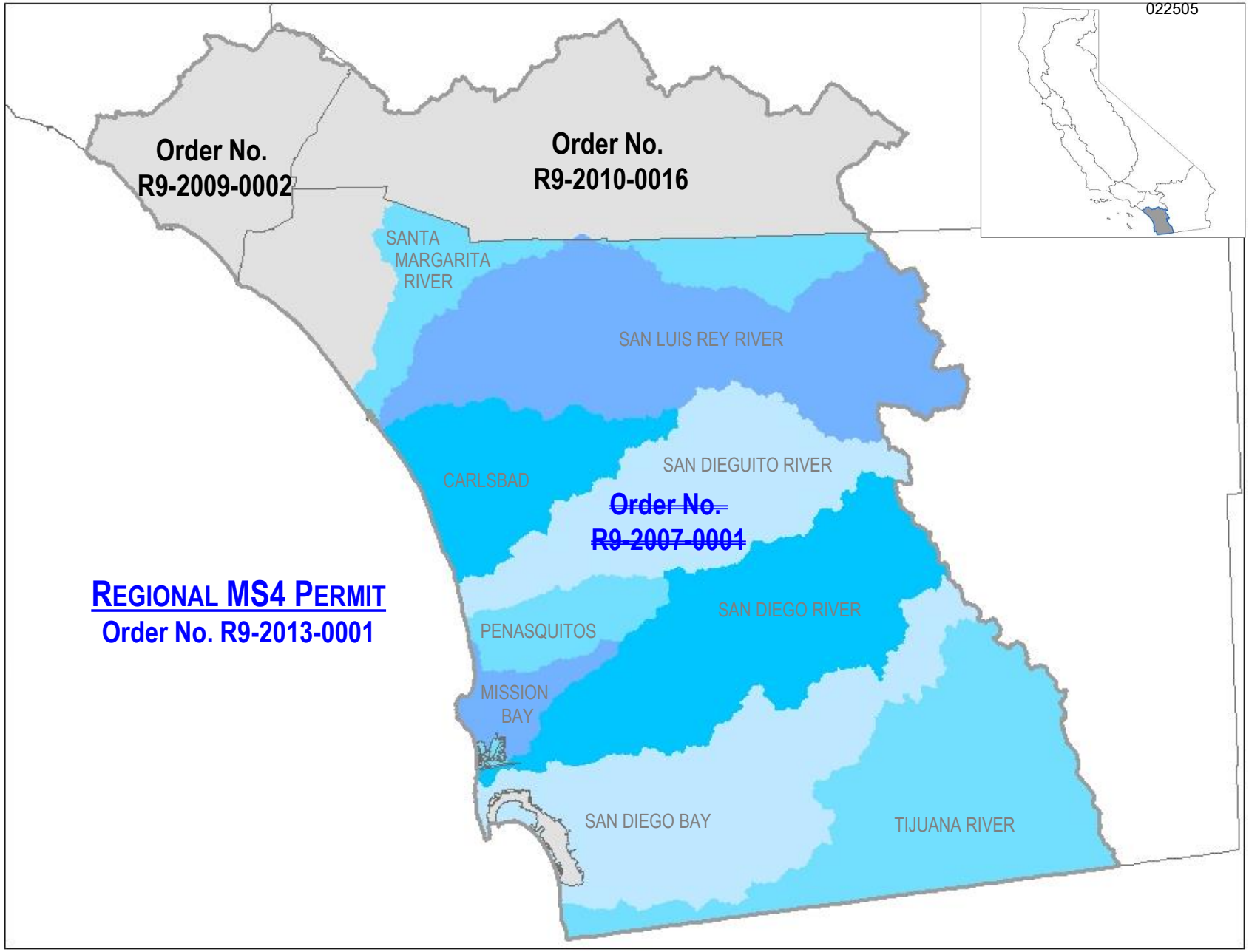
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R9-2009-0002
Order No.
R9-2010-0016
SANTA
MARGARITA
RIVER
SAN LUIS REY RIVER
CARLSBAD
SAN DIEGUITO RIVER
~~Order No.~~
~~R9-2007-0001~~
REGIONAL MS4 PERMIT
Order No. R9-2013-0001
PENASQUITOS
SAN DIEGO RIVER
MISSION
BAY
SAN DIEGO BAY
TIJUANA RIVER

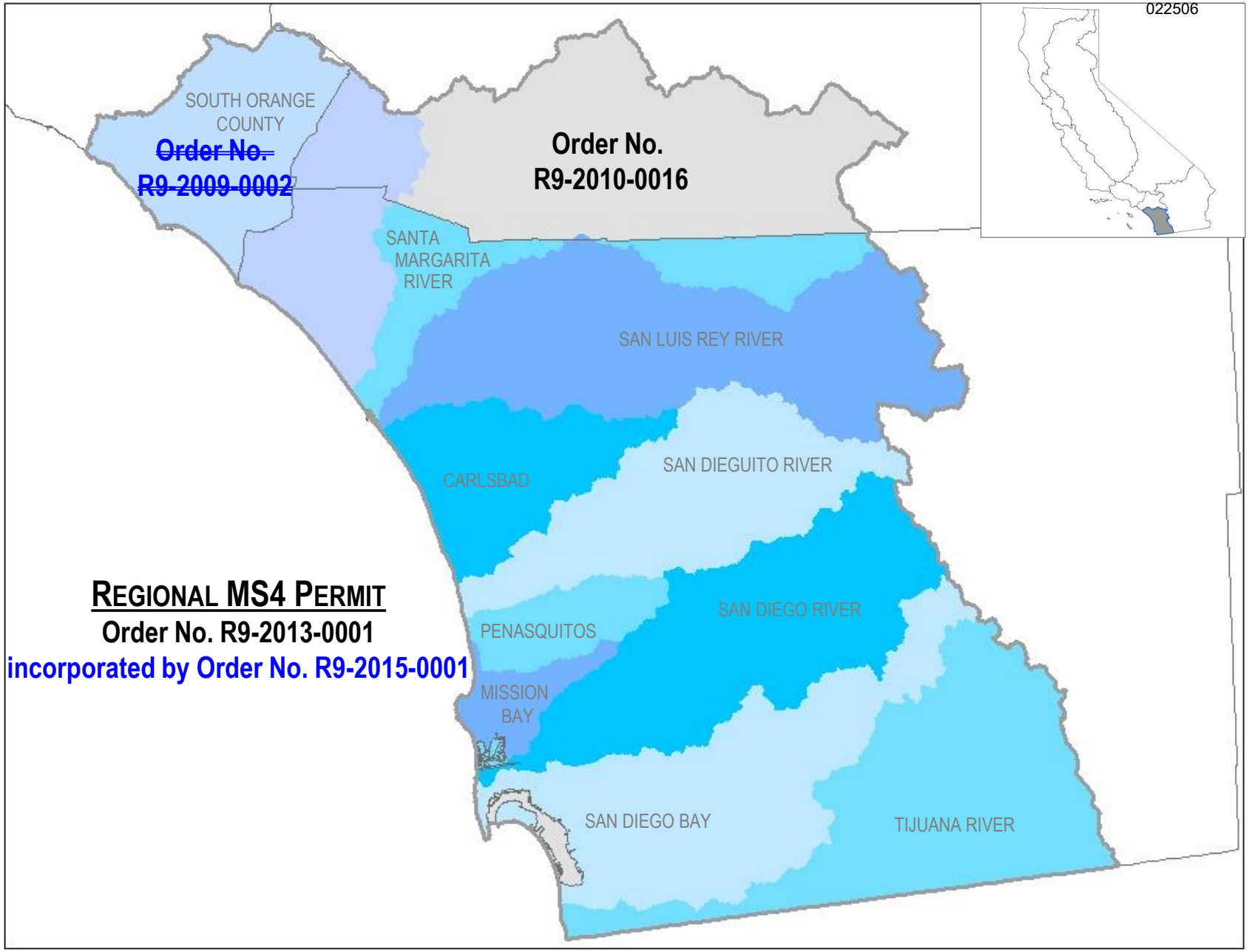
022506
SOUTH ORANGE COUNTY
~~Order No. R9-2009-0002~~
Order No. R9-2010-0016
SANTA MARGARITA RIVER
SAN LUIS REY RIVER
CARLSBAD
SAN DIEGUITO RIVER
SAN DIEGO RIVER
PENASQUITOS
MISSION BAY
SAN DIEGO BAY
TIJUANA RIVER
REGIONAL MS4 PERMIT
Order No. R9-2013-0001
incorporated by Order No. R9-2015-0001

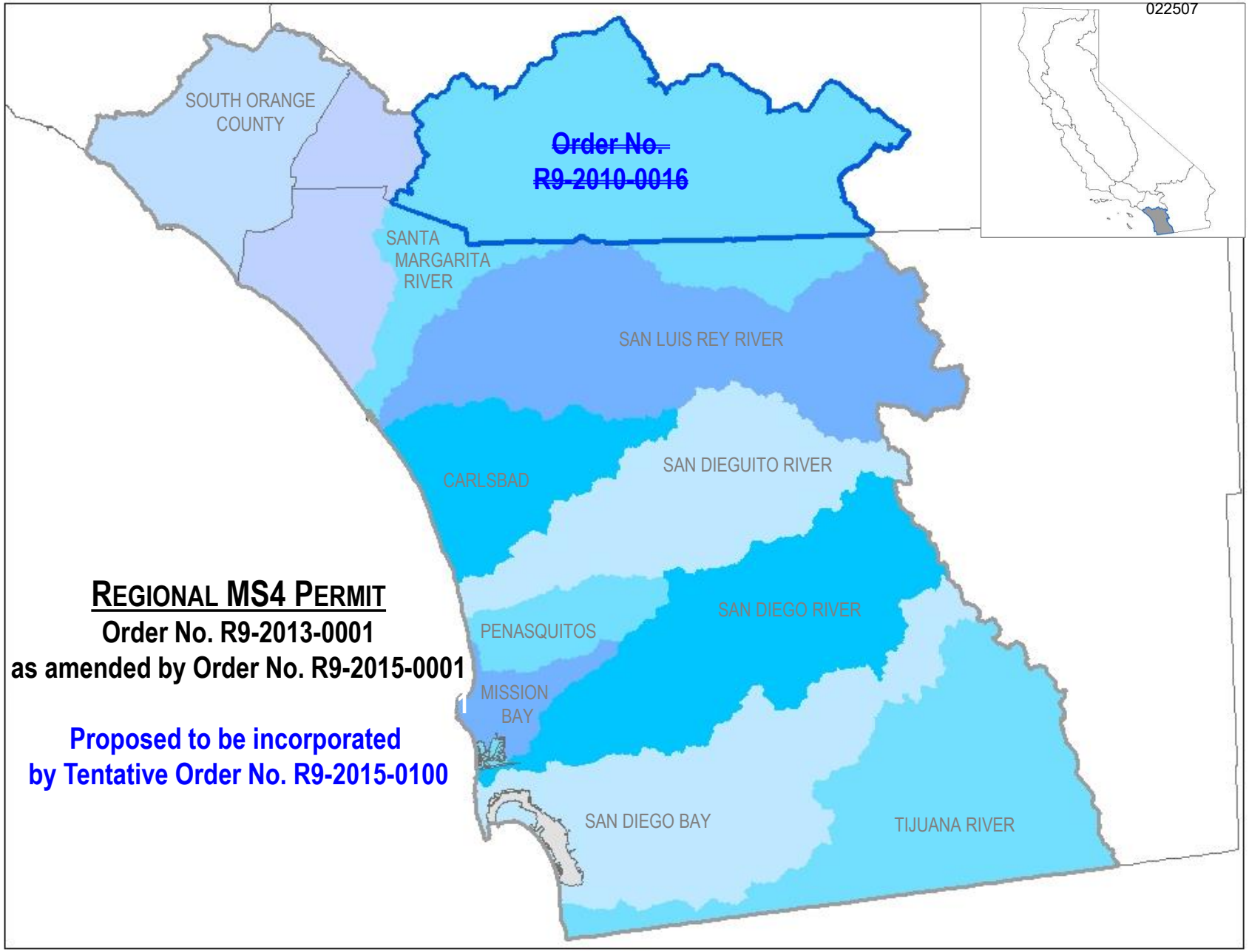
022507
SOUTH ORANGE COUNTY
~~Order No. R9-2010-0016~~
SANTA MARGARITA RIVER
SAN LUIS REY RIVER
CARLSBAD
SAN DIEGUITO RIVER
SAN DIEGO RIVER
PENASQUITOS
MISSION BAY
SAN DIEGO BAY
TIJUANA RIVER
REGIONAL MS4 PERMIT
Order No. R9-2013-0001
as amended by Order No. R9-2015-0001
Proposed to be incorporated
by Tentative Order No. R9-2015-0100

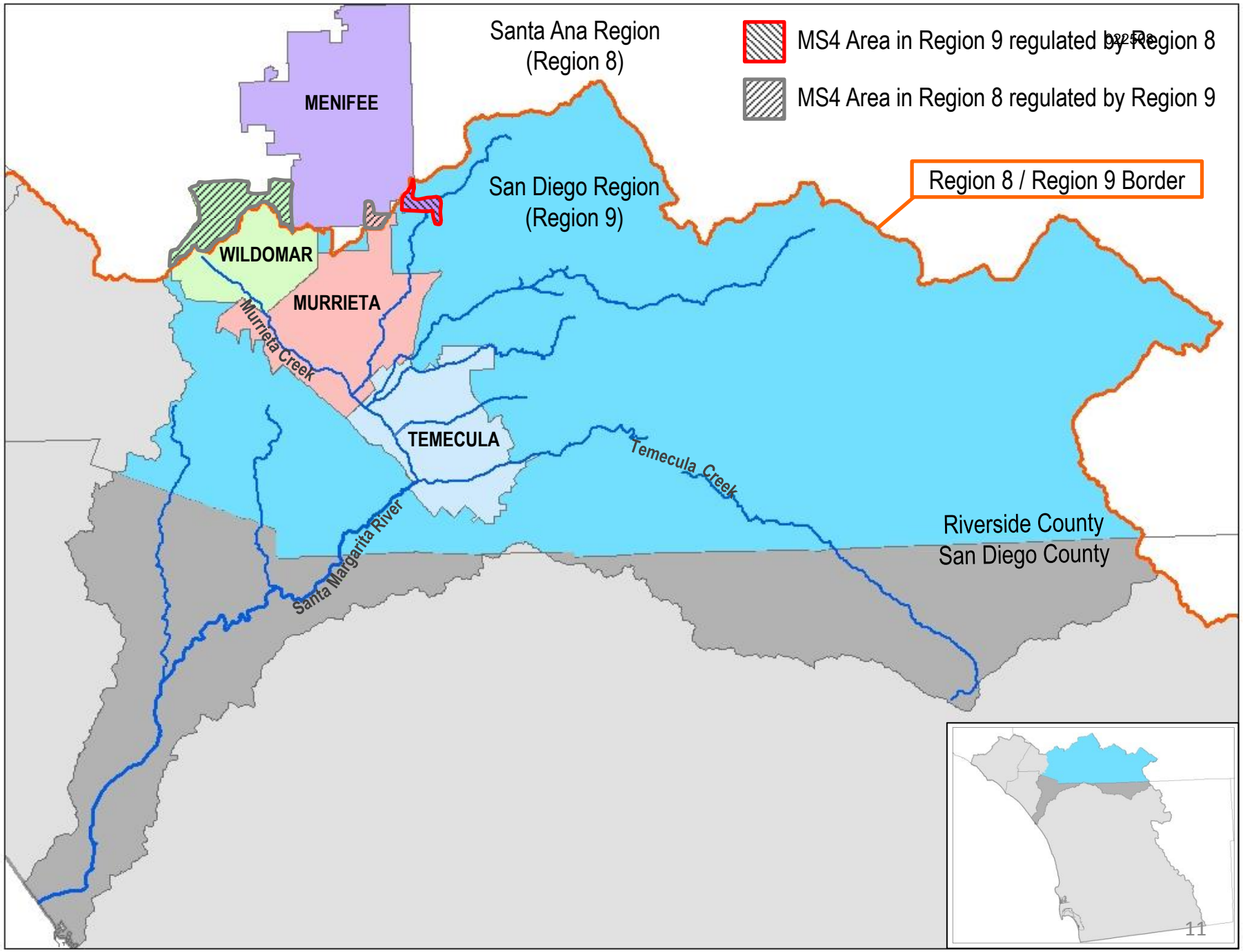
Santa Ana Region
(Region 8)
MS4 Area in Region 9 regulated by Region 8
MS4 Area in Region 8 regulated by Region 9
MENIFEE
San Diego Region
(Region 9)
Region 8 / Region 9 Border
WILDOMAR
MURRIETA
Murrieta Creek
TEMECULA
Temecula Creek
Santa Margarita River
Riverside County
San Diego County

Tentative Order No. R9-2015-0100

Development Process

April 28, 2015 **May 21, 2015** **June 30, 2015**	Public Workshops for Prior Lawful Approval language and Alternative Compliance Pathway Option
May 8, 2015	Riverside County Report of Waste Discharge submitted
July 31, 2015	**Tentative Order No. R9-2015-0100** released
September 14, 2015	Public comment period closed
November 4, 2015	Responses to Comments and Errata Sheet released
November 10, 2015	Revised Responses to Comments and Errata Sheet
November 18, 2015	Public Hearing for Board to consider adoption of **Tentative Order No. R9-2015-0100**

Tentative Order No. R9-2015-0100

Proposed Amendments

- Include Riverside County Copermittees
- Continue Single Board Regulation
- Prior Lawful Approval Language
- Alternative Compliance Pathway Option
- Corrections / Updates / Clarifications

Tentative Order No. R9-2015-0100

Proposed Amendments

Prior Lawful Approval Language

- Requested by San Diego County Copermittees and development community
- Comments from City of San Diego and SD Coastkeeper/Coastal Environmental Rights Foundation
- No comments from development community

Response to Comments

No changes

Tentative Order No. R9-2015-0100

Proposed Amendments

Alternative Compliance Pathway Option

- Requested by Copermittees, but strongly opposed by environmental community
- State Water Board Order WQ 2015-0075 (June 16, 2015)
- Comments from Copermittees and environmental community
- No comments from development community

Response to Comments

Revised annual milestone requirements

Tentative Order No. R9-2015-0100

Proposed Amendments

Corrections / Updates / Clarifications

TMDL Requirements

- Bacteria Load Reduction Plans for Beaches and Creeks Indicator Bacteria TMDLs
- Compliance determination requirements for Los Peñasquitos Lagoon Sediment TMDL

Tentative Order No. R9-2015-0100

Proposed Amendments

Corrections / Updates / Clarifications

Non-Storm Water Requirements

- References to recently adopted permits applicable to non-storm water discharges

Response to Comments

- Illicit Discharge Detection and Elimination program compliance & compliance with effective prohibition of non-storm water discharges to MS4

Tentative Order No. R9-2015-0100

Proposed Amendments

Corrections / Updates / Clarifications

Development Planning Requirements

- Definition of Priority Development Projects
- Process to update BMP Design Manual

Response to Comments

- Effective date of BMP Design Manual
- Definition of Construction Activities
- Definition of Redevelopment

Recommendation:

022516

Adopt
Tentative Order No. R9-2015-0100 with Errata

Wayne Chiu, P.E.
Water Resource Control Engineer
Regional Water Quality Control Board
San Diego Region

State Water Board Order WQ 2015-0075

Seven Principles to include in Alternative Compliance Pathway

1. State Water Board Order WQ 99-05
2. TMDL compliance / RWL compliance
3. Ambitious, rigorous, and transparent pathway
4. Watershed-based, multiple pollutants, and TMDLs
5. Green Infrastructure / Low Impact Development
6. Regional projects to support sustainable water supply
7. Adaptively manage: prioritize, monitor, and update

022521

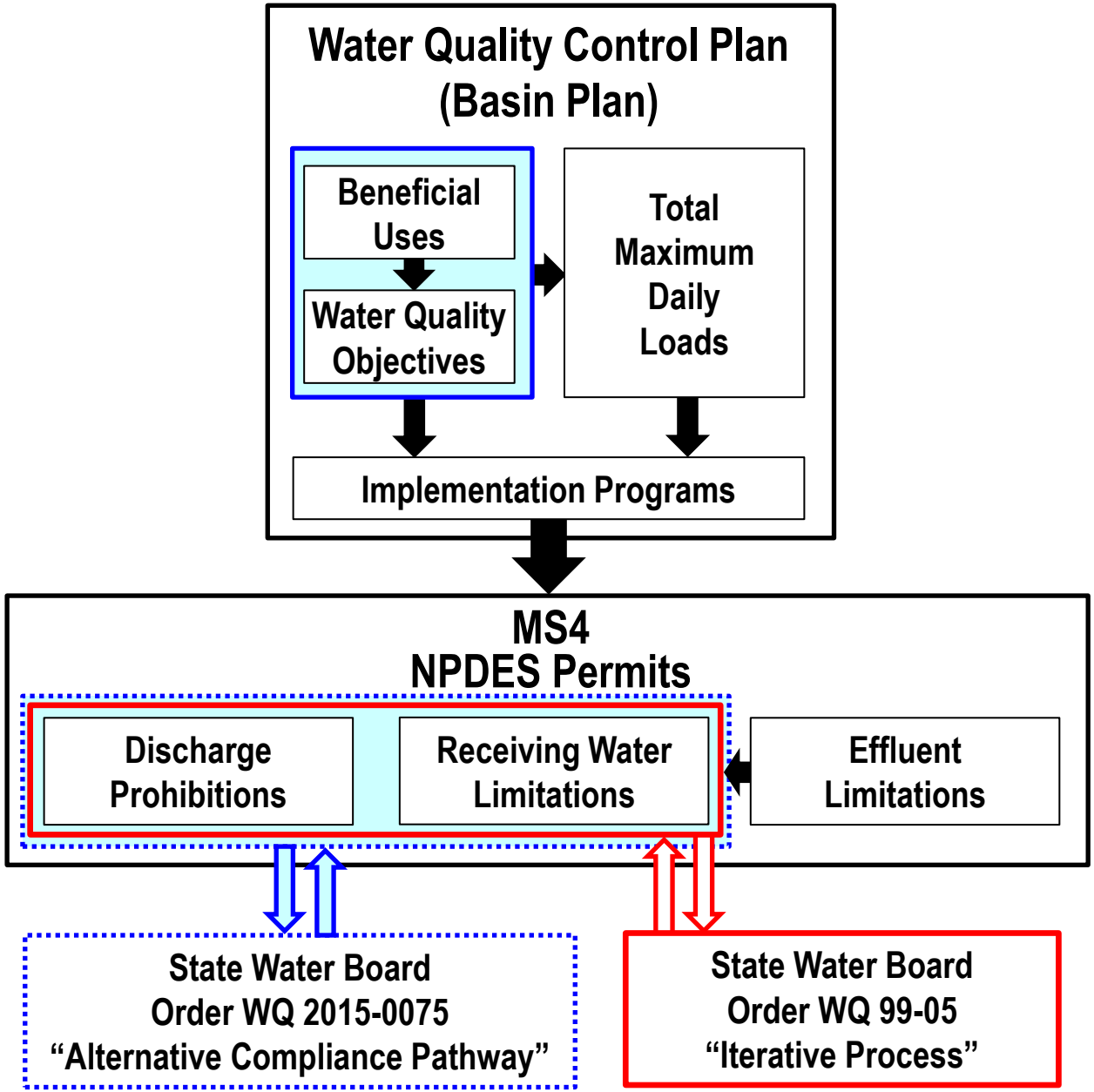
Water Quality Control Plan
(Basin Plan)
Beneficial Uses
Water Quality Objectives
Total Maximum Daily Loads
Implementation Programs
MS4
NPDES Permits
Discharge Prohibitions
Receiving Water Limitations
Effluent Limitations
State Water Board
Order WQ 2015-0075
"Alternative Compliance Pathway"
State Water Board
Order WQ 99-05
"Iterative Process"

022523

COMMENTS OF ORANGE COUNTY CO-PERMITTEES

Tentative Order No. R9-2015-0100
Adoption Hearing
Nov. 18, 2015

Mary Anne Skorpanich, County of Orange
Ryan Baron, County of Orange
Jeremy Jungreis, Rutan & Tucker, LLP

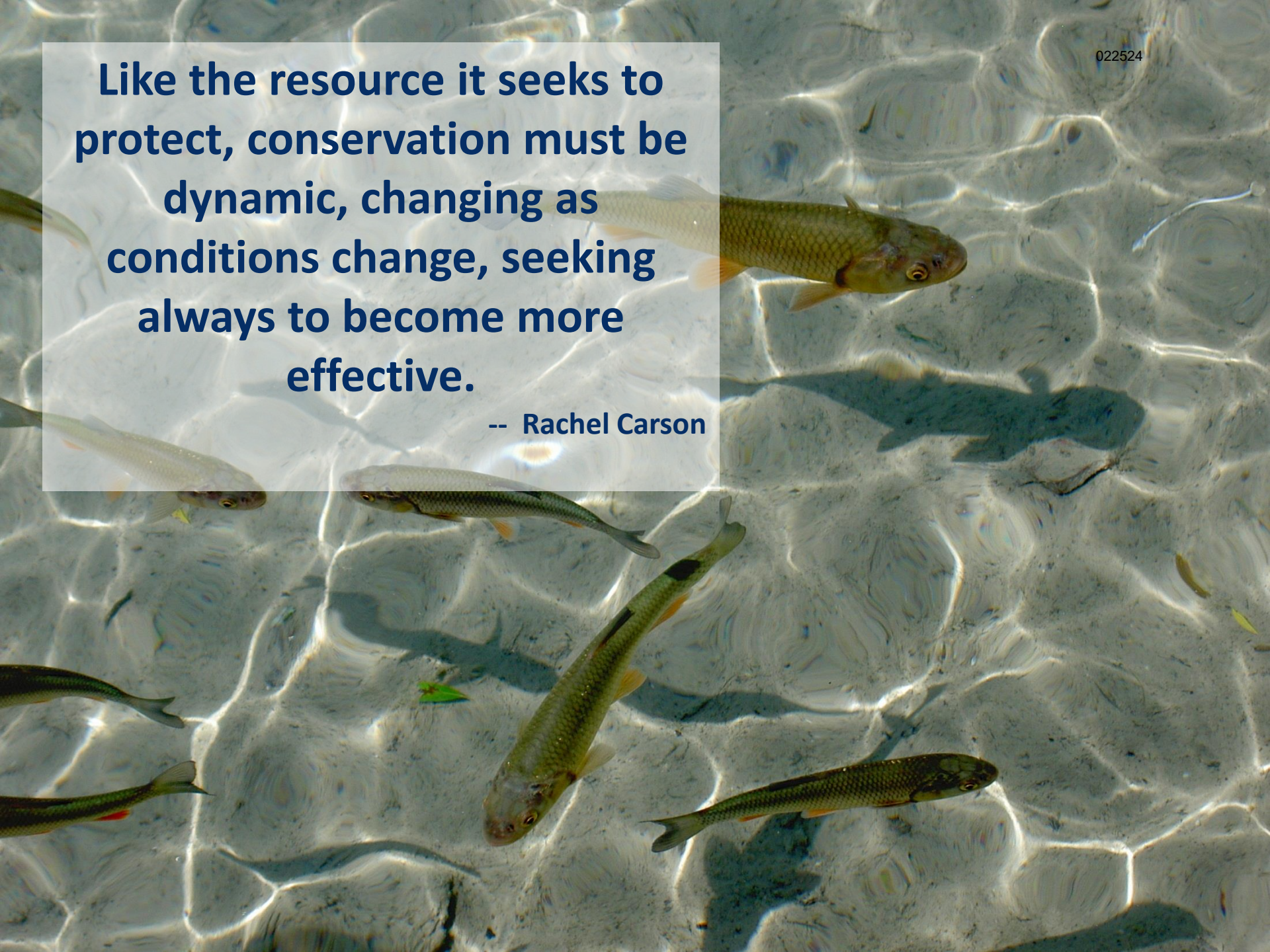
022524
Like the resource it seeks to protect, conservation must be dynamic, changing as conditions change, seeking always to become more effective.
-- Rachel Carson

Water Board's Permit Intent

022525

- Flexibility
- Innovation
- Strategic prioritization
- Outcomes focused
- Incentivizing
- Integrated
- Tools to achieve success

Compliance During WQIP Development

- Tentative Order needs to deem a permittee in compliance with the permit's prohibitions and numeric limitations during the WQIP planning and development period (Provision B.3.c)

Roadmap

- Development & Implementation Background
- Assumptions and implications about WQIP planning and development
- State Board Order on LA Permit
- EPA Comments
- Recent litigation in South OC

The WQIP Development Process

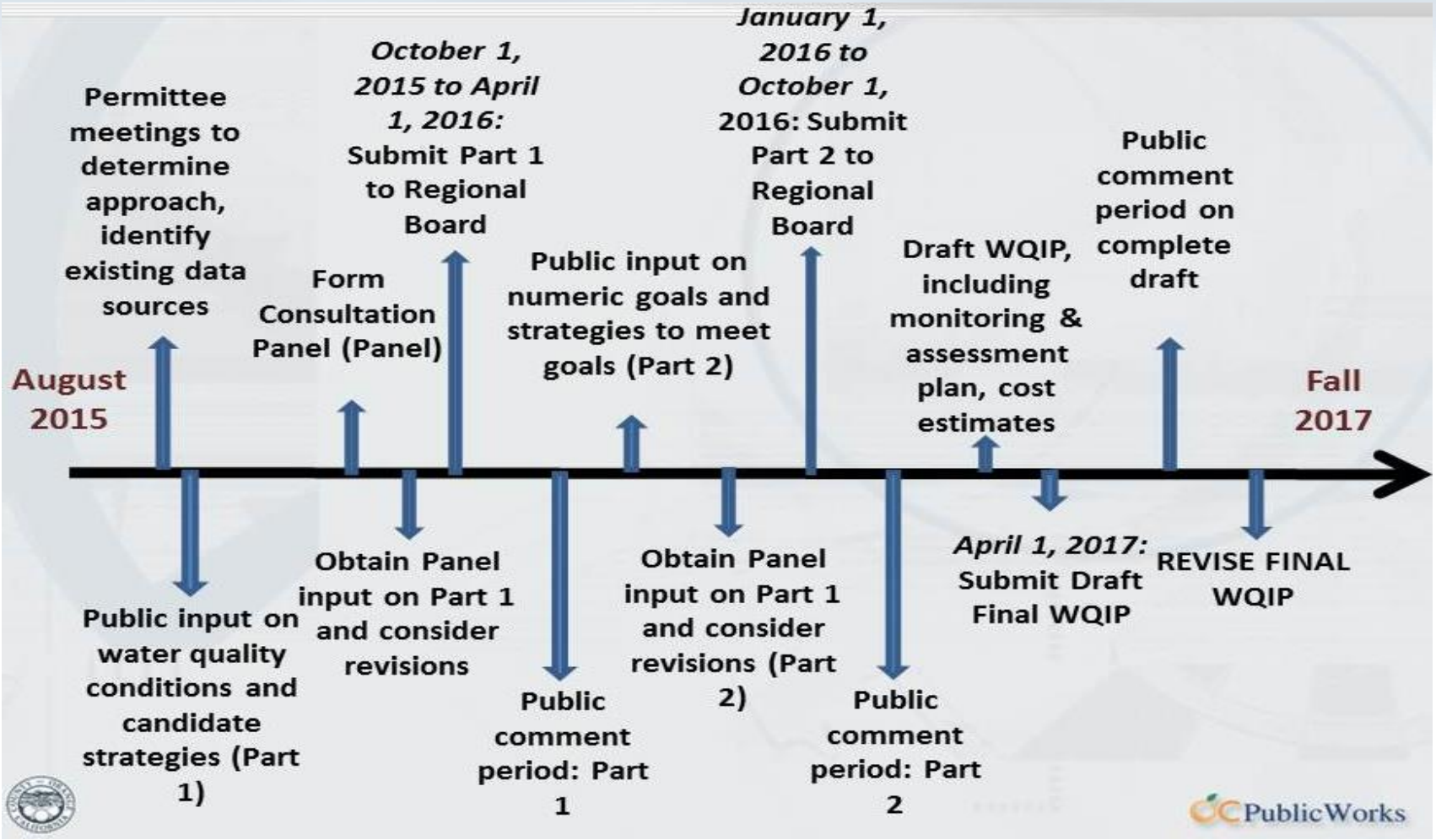

Pollutants of Concern

303(d) Impairments		
Enterococcus:	9	
Total Coliform:	9	
Toxicity:	8	
Phosphorus:	5	
Indicator Bacteria:	5	
Selenium:	5	
Total Nitrogen as N:	3	
Turbidity:	2	
Fecal Coliform:	2	
Sediment Toxicity:	2	
Cadmium:	1	
Nickel:	1	
Copper:	1	
Zinc:	1	
Dieldrin:	1	
Benzo[b]flouranthene:	1	
Chloride:	1	
Sulfates:	1	
TDS:	1	
Diazinon:	1	
DDE:	1	

Attaining Numeric Limits: South OC Implementation Costs

022530

Estimates of Cost by Impervious Area per Subwatershed				
Subwatershed	Total Area (ac)	Impervious Area (ac)	Cost ($55,000/ac)	Cost ($70,000/ac)
Aliso Creek	22,283	7,798	428,890,000	545,860,000
Dana Point	6,571	2,374	130,570,000	166,180,000
Laguna Coast	12,362	1,771	97,405,000	123,970,000
San Clemente	12,254	3,906	214,830,000	273,420,000
San Juan River	101,928	13,656	751,080,000	955,920,000
San Mateo Creek	12,241	436	23,980,000	30,520,000
Totals	167,639	29,941	**1,646,755,000**	**2,095,870,000**

State Policy Issue

- Courts have held that MS4s are not required by CWA to strictly comply with numeric effluent limitations.
  - *Defenders of Wildlife v. Browner* (9th Cir. 1999); *Chesapeake Bay Found. v. Md. Dep't of the Envt.* (Anne Arundel Cir. Ct., Dec. 2014)
- EPA has not promulgated binding regulations, only issued non-binding guidance encouraging States to require strict compliance with numeric limits, where feasible.
  - 2014 EPA Stormwater Memo Est. TMDL WLAs (Nov. 2014) ("This memorandum is guidance. It is not a regulation and does not impose legally binding requirements on EPA or States.").
- State Water Board clarified that regional water boards should require strict compliance with WQS.
  - Order WQ 2015-0075, State Board Order on LA Permit (July 2015).

Implications of Alternative Compliance Pathway

022532

- Permittees shall develop watershed improvement plans.
- Tentative Order provides option to develop interim/final numeric goals, strategies, compliance schedules, annual milestones.
- Effectively requires development of TMDLs, compliance schedules, TSOs by permittees in exchange for compliance.
- Assuming the State's responsibility.

Compliance During Development

- Extensive planning + State requirement + State obligations (cost & resources) = Full Compliance.
- Planning and development is fundamental to implementation.
- Bright line for compliance should not be drawn at approval of the WQIP.

State Board Order 2015-075

- Recognized compliance with RWLs will take many years of technical efforts.
- Reasonable to provide for an alt compliance process if 7 Principles followed.
- Principle 3 – "Phase I permits should provide for a compliance alternative that allows permittees to achieve compliance with RWLs over a period of time."
- RBs should "consider" LA WMP/EWMP pathway (also CASQA if consistent with 7 principles).
- Region-specific or permit-specific reason if a principle is not followed.

State Board Order 2015-075

- Found compliance during development period sufficiently constrained and reasonable (pp.48-50).
  - Must meet relevant deadlines for WMP development
  - Other actions were not put on hold – implementation of LID, green streets and other watershed control measures
  - State Board was concerned there was no room for deviation and allowed deadlines to be adjusted or extended.

Tentative Order

- Does not follow Principle 3.
- Instead of allowing compliance with numeric limits over time, it requires permittees to strictly comply with prohibitions and limitations immediately upon enrollment and throughout the 2+ year planning period.
- No ability to prioritize until WQIP approval.
- No permit-specific or region-specific finding or reason provided in the permit.

EPA Comments

- EPA comment letters
- No citation to federal regulations
- Federal “preference” = State Issue
- EPA did not disapprove the LA Permit
- State Board did not adopt EPA’s position

EPA Guidance

- EPA recommends immediate attainment of numeric water quality objectives as final numeric effluent limits—a noble but, in many cases, infeasible—goal for municipal stormwater.
  - EPA not focused on attainability, practicability or multi-billion dollar cost of attaining current numeric limits in each watershed.
  - **<u>But they should be:</u>**
    - State and federal law require such consideration.
    - Action this Board will take is based on state, not federal, law.
    - If Co-Permittees are reducing pollution to the MEP while developing WQIPs, then EPA has no basis for objection.

City of Laguna Beach

022539

- Risk of lawsuits prior to WQIP approval.
- Laguna Beach is proactive beachfront community. Water quality matters.
- Most dry weather MS4 flows already diverted to sanitary sewer.
- Robust and well-funded stormwater program.
- Riverwatch sues Laguna Beach for sewage collection system spills.
  - Alleges strict liability for any non-stormwater discharge into the MS4
  - Demands substantial infrastructure overhaul
  - Demands a future role in managing the City's wastewater and stormwater systems.
  - Demands large award of attorneys' fees.
  - $400,000 spent in City transaction costs

Other Examples

- Not an isolated incident. RiverWatch has sued multiple So Cal cities (e.g., Carlsbad, Monterey).
  - Many of the "targets" are considered "green" cities and have robust (and well funded) pollution prevention programs
- Change in tactics: RiverWatch is now going after alleged municipal MS4 violations associated with discharges to/from MS4s.
  - Laguna Beach, San Luis Obispo, and Whittier
  - Also suing other small MS4s such as Universal Studios

Effect of Wrongful Lawsuits

022541

- Citizen suit settlements can take authority out of Regional Board hands and put resolution of MS4 issues in the hands of a judge.
- Potential for inconsistent judicial decisions adverse to Regional Board priorities.
- Each settlement diverts large amounts of staff time away from Clean Water programs—often for little to no water quality benefit.
- Incongruent with a watershed based approach to improving water quality.

Regional Board Intervention

022542

- Regional Board initiating enforcement or intervening in citizen suit proceeding does not solve the problem.
- RWL exceedances can result in Mandatory Minimum Penalties and, at minimum, the stigma of enforcement.
- Intervention or enforcement requires filing of lawsuit by Regional Board to cut off citizen suit.

Regional Board Should Determine Compliance

022543

- Permittees recognize the role third parties have in enforcement.
- But, Regional Board should have initial authority to determine MS4 compliance.

Full Compliance Adopted by Other Regions

022544

- San Diego region would be the only region without compliance during WQIP development.

Incentivizes Planning

022545

- Regional Board concern that compliance during development won't incentivize permittees
- Solution = require rigorous development efforts that includes:
  - Meeting all development deadlines,
  - Public data solicitation process,
  - Review of priority water quality conditions with a consultation panel,
  - Draft agreements with watershed partners, and
  - Continued implementation of existing control measures

Proposed Language

- New Provision B.3.c.(3)
  - Any Copermittee who wishes to utilize the implementation of the Water Quality Improvement Plan to demonstrate compliance with the requirements of Provisions A.1.a., A.1.c. A.1.d., A.2 and A.3.b within a Watershed Management Area will also be deemed in compliance with such requirements during the development of the Water Quality Improvement Plan, so long as the Copermittee complies, either individually or with other Copermittees, with the Water Quality Improvement Plan development schedule in Provision F.1.a and F.1.b.

Closing

- Need for compliance during development
- Questions?

"Hard-Out"

022548

- Regional Board should have initial discretion to determine compliance.
- State Board rejected "hard out" in LA Permit.
- Permittee would need to be afforded notice and opportunity to be heard (informal adjudication) before compliance determination could be revoked. *Saleeby v. State Bar of California* (1985).
- Findings & record must provide meaningful judicial review.

SEPARATE COMMENTS OF CITIES OF DANA POINT AND LAGUNA BEACH

Tentative Order No. R0-2015-0100
Adoption Hearing
Nov. 18, 2015

Technical Comment:

022550

Disconnect with Current Interpretation of Requirements for Delisted Waterbodies & TMDL CLRPS/BLRPS

- Response to comment AttE6-2: Staff indicates that even delisted waterbodies were always envisioned to have BLRP/CLRP, "just not within 18 months."
  - Conflicts w/specific direction given by Chairman King & Board Members Anderson & Rayfield in 2010 to not spend additional resources on delisted waterbodies.
  - Prior Board concerned about ambiguity in permit language in 2010; now response to comments utilized that ambiguity to reach a different conclusion.
  - Dana Point requests that the Response to Comments and/or Staff Report be updated to reflect the actual intent and direction given by previous Board Members. *Please refer and review: Transcript of Proceedings, February 10, 2010, Pages 14-31, Job No.: B3908WQSD, Kennedy Court Reporters*

- Illustrates why clarity of language in permit is so important, and why clarification of "effectively prohibit" language in Section E.2 is needed.

Requested Revision to Staff Report

- Revise Staff Report to state:

"**Where a** Copermittee is fully implementing the requirements of Provision E.2, then the Copermittee is deemed in compliance with the effective prohibition of non-storm water discharges to the MS4 required under Provision A.1.b."

- Replaces "If the San Diego Water Board finds that" with "Where a."

- Requiring "prior finding" by the Board eliminates presumption of compliance associated with full, and good faith, implementation of illicit discharge and prevention program.

Requested Revision to Permit

- Revise Permit to add footnote to prohibition language in Section II.A.1.b (page 16) reading:

*"**Where a** Copermittee fully implements the requirements of Provision E.2, then the Copermittee is deemed in compliance with the effective prohibition of non-storm water discharges to the MS4 required under Provision II.A.1.b."*

- This will provide protection against third party allegations that every non-permitted discharge by third parties to the MS4 is a permit violation by the Co-Permittee.

Strict Compliance with Numbers in Current Permit Raises Concerns

- Laguna Beach and Dana Point have strong programs. They will continue during the WQIP process.
- Cities generally support the goals of the Regional Board's practical vision—but the means chosen to achieve the vision may cause unintended harms.
- The draft permit raises concerns with utilizing RWLs as final numeric effluent limits.
  - Permit terms must be attainable and consider cost of implementation.
  - For example, numbers for nutrients and bacteria may not be attainable in some locations

Strict Compliance with Numbers in Current Permit not Required by State or Federal Law

- The Board has flexibility on how it can achieve water quality objectives in the SD Region.
- Strict compliance with numbers in municipal permits is a choice the Board can make (per State Board order), but it is not the only choice.
- Action taken today on Permit is taken under state law.
- Additional policy considerations for Current Approach:
  - Has the potential to send mixed messages. Good actors are lumped in with the bad. All are assumed out of compliance.
  - The WQIP process is helpful, but it requires greater certainty on when a permittee will be deemed in compliance.

Strict Compliance with Numbers in Current Permit Not Required by State or Federal Law

- Cost: Cost of attainment of RWLs estimated at $1.6-$2.1 billion dollars for southern Orange County.
  - With eleven cities in SOC costs to individual cities changes from tens of millions to hundreds of millions.
  - No assurances that beneficial uses will be significantly enhanced.
  - At end of WQIP and $1.6-$2B in expenditures, no greater assurance of "compliance."
  - Co-Permittees need such assurances. It is only fair.
- Dana Point & Laguna Beach will nevertheless aggressively pursue WQIP Development, and continue to improve water quality, because it is the right thing to do.

San Diego Area Copermittees

Comments on Tentative Order No. R9-2015-0100

Jon Van Rhyn
County of San Diego
Watershed Protection Program
858-495-5133
jon.vanrhyn@sdcounty.ca.gov

November 18, 2015

San Diego Area Copermittee Comments/Requests

A. Support RWQCB staff's recommendation to clarify that the BMPDM effective and implementation dates are the same (i.e., 90 days from this hearing, or Feb. 16, 2016)

- November 4 Errata Sheet Item 2.j
- Permit Provision E.3.d

B. Support RWQCB staff's stated intent to further extend the BMPDM effective date for the San Diego County Copermittees by 90 days from the current effective date of Dec. 24, 2015 (i.e., to March 23, 2016)

- Nov. 4 Response to Comments, E3d-1, p. 56

C. Request the following additional changes regarding the extension of BMPDM effective dates:

1. Generally allow the extension of BMPDM effective dates by 180 days (instead of 90 days) when new or modified land development requirements are adopted

2. AND Specifically allow the proposed extension of the San Diego County Copermittees' BMPDM effective date to be 180 days (rather than 90 days) from the current effective date of Dec. 24, 2015 (i.e., June 21, 2016)

3. AND Execute the requested extension of the San Diego County Copermittees' BMPDM effective date to June 21, 2016 (item #2) by amendment of this Order (first preference)

   OR (second preference) as part of the public record for adoption of this Tentative Order, direct the RWQCB Executive Officer to administratively extend the BMPDM effective date

Item C. Additional Requested Changes (First of 3)

1. Generally allow the extension of BMPDM effective dates by 180 days (instead of 90 days) when new or modified land development requirements are adopted

Modify Provision F.2.b.(4) as follows:

(4) If the San Diego Water Board amends Provisions E.3.a-d during the permit term but after the Copermittee has completed the update pursuant to Provision F.2.b.(1), the Copermittee must revise its BMP Design Manual to incorporate the amended Provision E.3.a-d requirements as soon as possible but not later than 90 days after the date the San Diego Water Board adopts the amendments to Provisions E.3.a-d, unless otherwise directed by the San Diego Water Board Executive Officer. Under these circumstances, the effective date of the BMP Design Manual is no later than ~~90~~ 180 days after the date the San Diego Water Board adopts the amendments to Provisions E.3.a-d, unless otherwise directed by the San Diego Water Board Executive Officer.

Item C. Additional Requested Changes (First of 3)

Actions Typically Required in Response to BMPDM Updates

Completion of Updates

- Completion of BMPDM updates (incl. Copermittee collaboration)
- Ordinance updates (including hearings)
- Development of policies, procedures, and technical guidance

Public Process

- Industry outreach
- Stakeholder review and comment (ordinance and BMPDM)
- Potential revisions

Application of Changes to Projects

- Identification of affected projects (new and existing)
- Outreach/coordination with applicants
- Re-submittal, review, and approval of pipeline projects; etc.

Item C. Additional Requested Changes (Second of 3)

2. Specifically allow the proposed extension of the San Diego County Copermittees' BMPDM effective date to be 180 days (rather than 90 days) from the current effective date of Dec. 24, 2015 (i.e., June 21, 2016)

Further modify Provision F.2.b.(4) as follows:

(4) If the San Diego Water Board amends Provisions E.3.a-d during the permit term but after the Copermittee has completed the update pursuant to Provision F.2.b.(1), the Copermittee must revise its BMP Design Manual to incorporate the amended Provision E.3.a-d requirements as soon as possible but not later than 90 days after the date the San Diego Water Board adopts the amendments to Provisions E.3.a-d, unless otherwise directed by the San Diego Water Board Executive Officer. Under these circumstances, the effective date of the BMP Design Manual is no later than ~~90~~ 180 days after the date the San Diego Water Board adopts the amendments to Provisions E.3.a-d, unless otherwise specified in this Order or directed by the San Diego Water Board Executive Officer. For the San Diego Area Copermittees, the effective date of updates to Provisions E.3.a-d adopted on November 18, 2015 is June 21, 2016.

Item C. Additional Requested Changes (Second of 3)

Significant Changes in Tentative Order affecting Land Development Requirements

Provision E.3.b.(1)(c) through (e): PDP Categories

(c) New and redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site), and support one or more of the following uses:

(i) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812).

(ii) Hillside development projects. This category includes development on any natural slope that is twenty-five percent or greater.

(iii) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce.

(iv) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

(d) New or redevelopment projects that create and/or replace 2,500 square feet or more of impervious surface (collectively over the entire project site), and discharging directly to an Environmentally Sensitive Area (ESA). "Discharging directly to" includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands).

(e) New development projects, or redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface, that support one or more of the following uses:

Provision E.3.d: Grandfathering

(1) Structural BMP Approval and Verification Process

(a) Each Copermittee must require and confirm that ~~for~~ all Priority Development Projects ~~applications that have not received prior lawful approval by the Copermittee by the effective date of the BMP Design Manual pursuant to Provision E.3.d,~~ implement the requirements of Provision E.3. ~~must be implemented. For project applications that have received prior lawful approval before the effective date of the BMP Design Manual pursuant to Provision E.3.d, the Copermittee may allow previous land development requirements to apply~~ except that the Copermittee may allow previous land development requirements to apply to a Priority Development Project if the conditions of Provision E.3.e.(1)(a)(i) or Provision E.3.e.(1)(a)(ii) are met:

(i) The Copermittee has, prior to the effective date of the BMP Design Manual required to be developed pursuant to Provision E.3.d:

[a] Approved[31] a design that incorporates the storm water drainage system for the Priority Development Project in its entirety, including all applicable structural pollutant treatment control and hydromodification management BMPs consistent with the previous applicable MS4 permit requirements;[32] AND

[b] Issued a private project permit or approval, or functional equivalent for public projects, that authorizes the Priority Development Project applicant to commence construction activities based on a design that incorporates the storm water drainage system approved in conformance with Provision E.3.e.(1)(a)(i)[a]; AND

[c] Confirmed that there have been construction activities on the Priority Development Project site within the 365 days prior to the effective date of the BMP Design Manual, *OR* the Copermittee confirms that construction activities have commenced on the Priority Development Project site within the 180 days after the effective date of the BMP Design Manual, where construction activities are undertaken in reliance on the permit or approval, or functional equivalent for public projects, issued by the Copermittee in conformance with Provision E.3.e.(1)(a)(i)[b]; AND

[d] Issued all subsequent private project permits or approvals, or functional equivalent for public projects, that are needed to implement the design initially approved in conformance with Provision E.3.e.(1)(a)(i)[a] within 5 years of the effective date of the BMP Design Manual. The storm water drainage system for the Priority Development Project in its entirety, including all applicable structural pollutant treatment control and hydromodification management BMPs must remain in substantial conformity with the design initially approved in conformance with Provision E.3.e.(1)(a)(i)[a].

(ii) The Copermittee demonstrates it lacks the land use authority or legal authority to require a Priority Development Project to implement the requirements of Provision E.3.

Attachment C: Definition of Redevelopment

Redevelopment – The creation and/or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, and the addition to or replacement of a structure~~, and creation or addition of impervious surfaces~~. Replacement of impervious surfaces includes any activity ~~that is not part of a routine maintenance activity~~ where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include routine maintenance activities, such as trenching and resurfacing associated with utility work; pavement grinding; resurfacing existing roadways,~~; new~~ sidewalks ~~construction~~, pedestrian ramps, or bike lanes on existing roads; and routine replacement of damaged pavement, such as pothole repair.

Item C. Additional Requested Changes (Second of 3)

Actions Typically Required in Response to BMPDM Updates

Completion of Updates

- Completion of BMPDM updates (incl. Copermittee collaboration)
- **Ordinance updates (including hearings)**
- **Development of policies, procedures, and technical guidance**

Public Process

- Industry outreach
- Public review and comment (ordinance and BMPDM)
- Potential revisions

Application of Changes to Projects

- Identification of affected projects (new and existing)
- Outreach/coordination with applicants
- Re-submittal, review, and approval of pipeline projects; etc.

Item C. Additional Requested Changes (Second of 3)

Requirements to Manage Areas of Critical Coarse Sediment Yield (from May 2013 Adoption)

Provision E.3.c.(2)(b)

(b) Each Priority Development Project must avoid critical sediment yield areas known to the Copermittee or identified by the optional Watershed Management Area Analysis pursuant to Provision B.3.b.(4), or implement measures that allow critical coarse sediment to be discharged to receiving waters, such that there is no net impact to the receiving water.

Item C. Additional Requested Changes (Second of 3)

Technical Specifications, Guidance, and Policy Direction Needed

- **Local mapping revisions** to Regional WMMA CCSY Maps
- Methods for **avoidance** of coarse sediment
- Methods for **routing and pass-through** of sediment
- **Mitigation** options and guidance
- Guidance for Conducting **site-specific mapping analysis**

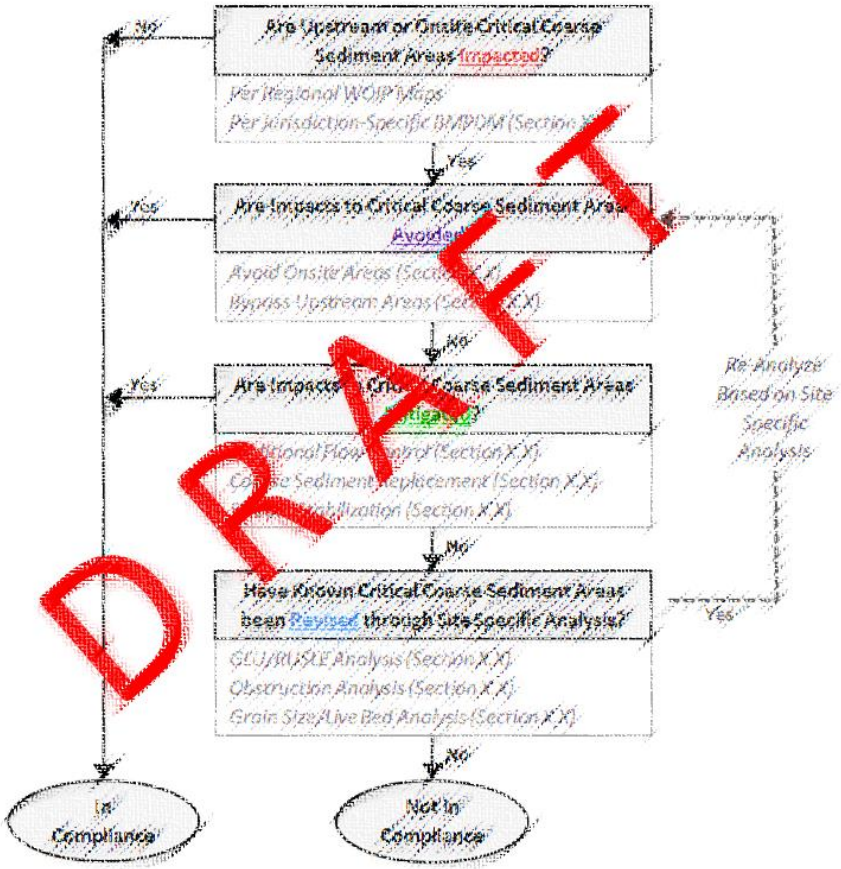

Item C. Additional Requested Changes (Second of 3)

Joint County-City effort to develop guidelines for complying with CCSY (Draft Schedule)

TAC #1 (~ 12/31/15)

- Overall Process
- Mapping Revisions
- Mitigation efforts (flow control, sediment replenishment, stream restoration)

TAC #2 (~ 2/29/16)

- Avoidance, Routing/Pass-thru, Site-specific mapping analysis

TAC #3 (~ 4/11/16 if needed)

- Follow-up discussion of previous or newly identified topics

Public Workshop (~ 4/26/16)

Final Guidance to be completed by 5/24/16

Item C. Additional Requested Changes (Third of 3)

3. Execute the requested extension of the San Diego County Copermittees' BMPDM effective date to June 21, 2016 (item #2) by amendment of this Order (as shown in item #2)

(4) If the San Diego Water Board amends Provisions E.3.a-d during the permit term but after the Copermittee has completed the update pursuant to Provision F.2.b.(1), the Copermittee must revise its BMP Design Manual to incorporate the amended Provision E.3.a-d requirements as soon as possible but not later than 90 days after the date the San Diego Water Board adopts the amendments to Provisions E.3.a-d, unless otherwise directed by the San Diego Water Board Executive Officer. Under these circumstances, the effective date of the BMP Design Manual is no later than ~~90~~ 180 days after the date the San Diego Water Board adopts the amendments to Provisions E.3.a-d, unless otherwise specified in this Order or directed by the San Diego Water Board Executive Officer. For the San Diego Area Copermittees, the effective date of updates to Provisions E.3.a-d adopted on November 18, 2015 is June 21, 2016.

Item C. Additional Requested Changes (Third of 3)

OR (second preference) as part of the public record for adoption of this Tentative Order, direct the RWQCB Executive Officer to administratively extend the BMPDM effective date

Thank You

B.3.c.(1)(a) (vii): For each final numeric goal developed pursuant to Provisions B.3.a and B.3.c.(1)(a)(i)-(v), at least one ~~annual~~ milestone[9] and date for its achievement must be included **for the permit term** within each Water Quality Improvement Plan **and progress towards attaining the milestone(s) reported upon during each** Annual Report reporting period**. Further, for each final numeric goal developed pursuant to Provisions B.3.a and B.3.c.(1)(a)(i)-(v), at least one milestone forecasted to be achieved in subsequent permit terms must be included within each Water Quality Improvement Plan. This process will continue** until the final numeric goal is achieved

Footnote 9: ~~Annual~~ ~~m~~**M**ilestones for each final numeric goal must ~~build upon previous milestones and~~ **cumulatively result in** ~~lead to~~ the achievement of the final numeric goal. The ~~annual~~ milestones may consist of water quality improvement strategy implementation phases, interim numeric goals, and other acceptable metrics. **The milestones may also address multiple numeric goals and/or multiple waterbodies, as applicable and appropriate.**

B.3.c.(2)(c): The Copermittee's assessments in the Water Quality Improvement Plan Annual Report submitted pursuant to Provision F.3.b.(3) support a conclusion that: 1) the Copermittee is in compliance with the ~~annual~~ milestones and dates for achievement developed pursuant to Provision B.3.c.(1)(a)(vii), OR 2) the Copermittee has provided acceptable rationale and recommends appropriate modifications to the interim numeric goals, and/or water quality improvement strategies, and/or schedules to improve the rate of progress toward achieving the final numeric goals developed pursuant to Provisions B.3.a and B.3.c.(1)(a)(i)-(vi); AND

B.3.c.(2)*(d):* Any proposed modifications to the numeric goals, schedules, and/or ~~**annual**~~ milestones are accepted by the San Diego Water Board as part of subsequent updates to the Water Quality Improvement Plan pursuant to Provision F.2.c; AND

022573

RWQCB NOVEMBER 2015 MEETING

BIA's Presentation on Behalf of the Coalition

November 18, 2015

BiA
BUILDING INDUSTRY ASSOCIATION OF SAN DIEGO COUNTY

022574

A Trip Back in Time to 2007

Mr. Peabody & Sherman's WABAC Machine

A Contrast in Approach Regarding MS4 Permits

PRIOR MS4 PERMITS

- RWQCB and regulated community did not successfully engage with one another.
- BIA and Coalition members opposed MS4 Permit
- BIA sued, spending $ 1.5 million dollars and lost

2013 PERMIT

- BIA commits to collaborate, and organizes private sector
- BIA decides to use it's expertise to help solve MS4 pollution problem
- BIA members work collaboratively with Co-permittees and Environmentalists to make permit work for all parties
- BIA members work closely with RWQCB staff on specific changes to ensure Permit works for all parties
- Coalition spends over $ 1 million dollars (ongoing) working on refining permit, WQE, WQIP's, PLA, WMMA, BMP Design Manual and Coarse Sediment Yield

Joint Letter with Coastkeeper Recognized Constraints

- The Water Quality Improvement Planning process should have more robust stakeholder input.
- Each Water Quality Improvement Plan should have a stakeholder advisory group that sits in Water Quality Improvement Plan meetings, consisting of an environmental representative with knowledge of the watershed, an independent engineer/hydrologist/scientist, and a regional board staff member.
- Water Quality Improvement Plans should be done consecutively, starting with the worst watershed first.
- Because infiltration may not be feasible everywhere in San Diego County, reasonable "off-ramps" for infiltration requirements are appropriate.
- The Water Quality Improvement Plan development process must solicit and include a menu of alternative compliance options developers could use within a watershed.
- Copermittees should create and publish a schedule of public input opportunities for Water Quality Improvement Plans.
- The Permit should specify that Copermittees must accept quality-controlled data received from third parties provided that the data has been development in conformity with the lasted version of Standard Methods of Water and Waste Water Analysis.

8 WQIPS in 24 months was a monumental task

- Limited pool of experts and consultants
- This has never been done before-no template to follow
- Each component had to be completed before the next component could be started
- Each component started relied on the previous component's information
- As technical problems or questions arose, it added time demands to an already tight time schedule

BIA Agrees with RWQCB's Practical Vision

The Practical Vision is a planning tool to focus our limited resources onto our region's highest priorities for the next 7 years. This follows our agency's mission to protect, enhance and restore the quality of California waters so that our communities can use and enjoy the waters. It sets a plan to achieve healthy waters through collaboration, reliance on the latest science, prioritization of issues and actions, and prudent use of our authorities in service to the people of California.

BIA Agrees with RWQCB Vision Statement ($1,059,377 reasons worth)

- $265,000 paid consultant studies, reviews, and policy work
- $183,432 in paid BIA staff time over the past 42 months
- $295,400 in donated legal time over the past 42 months
- $315,545 in donated consultant time over the past 42 months

The Coalition Requests Additional 90 Days* to Address:

* Beyond time offered by RWQCB staff

Issues still in play:

- BMP Design Manuals—a little more work here
- Coarse Sediment Yield—working on tools for permit compliance and practicality
- WQIPs—add'l science based data now available
- Public Education—*many* false narratives out there to debunk and straighten out
- Alternative Compliance—is a critical component to the success of RWQCB goals. A lot of work still needed on this one

BMP Design Manual(s)

- Making sure they are easily understood
- Development staffs at Cities need proper training—this takes time
- Once complete, the development industry needs to be trained as well!
- Most work is 95% complete
- Need a clear procedure so that when problems arise, stakeholders/co-permittees can revise manual(s) in a timely manner

Coarse Sediment Yield (CSY)

- This area was not well understood during the WQIP process
- Even after WMMA was done, nobody sensed the magnitude of the issue surrounding avoidance
- Understanding where sediment lies was poorly transmitted – transparency
- Once map was available, the subject took on great importance
- Need a variety of tools to address the permit's goal of "no net loss"

Coarse Sediment Yield (CSY)

COMPLIANCE CHALLENGES

- *How are you (applicant & co-permittee) going to document the permit requirements are met?*

Practicality on meeting the permit requirement

We suggest a workshop similar to how the Hydromodification issue was handled after the 2007 permit was adopted

COMPLIANCE CHALLENGES

- *Drainage boundaries aren't necessarily the project boundaries.*

How does one allow sediment from somewhere else to flow through your project? How can your sediment flow through other properties to the receiving water?

Practicality on meeting the permit requirement

Why Did This Become an Issue So Late in the Game?

LACK OF TRANSPARENCY

- During WQIPs an 8 ½ x 11 diagram showed coarse sediment mainly in east county where little development occurs
- Original link crashed your computer (file too large) even city engineers couldn't load it
- Needed GIS software to view map
- Public couldn't find it easily
- Perhaps final map should have "smoothed the curve out"
- No workshop to explain map

HIGH ANXIETY AFTER MAP RELEASED

- Projects and property owners panicked by sediment on their projects
- Permit stressed avoidance—more panic
- Everyone assumed the worst—extreme panic
- Permit timeline pressures—maximum panic

BIA Member's Reactions After the Coarse Sediment Map was Released

Engineer

Hydrologist

Developer

Even our children panicked when we came home from work, stressed over sediment

So What Did We Do

CALLED RWQCB STAFF FOR GUIDANCE

Our Collective anxiety

THEIR RESPONSE WAS

They explained their intent:
NO NET IMPACT TO RECEIVING WATERS

Work on Coarse Sediment Yield

- Meeting with RWQCB staff for clarification and understanding the Permit's intent
- 3 meetings w/RWQCB staff and stakeholders (co-permittees, Coastkeeper)
- Produced academic paper on sediment yield
- Produced dimensionless equation to demonstrate no net impact
- Working collaboratively to provide tools for BMP Manuals to meet permit requirements

Co-permittees Need Additional Time To:

- Provide public workshops to educate, solicit input on Coarse Sediment Yield
- Coordinate CSY solutions into their BMP Design Manuals
- Review all available, sound science that was not given due consideration when preparing the WQIPs, and include where applicable
- Time to schedule Council committee hearings, planning commission & City Council approval
- Concurrent training for Development Services staff and industry professionals

How Do We Get to the Goal?

- Allow an additional 180 days for RWQCB, Copermittees and the Community to:
  - Come together to agree on standards that achieve the goals of the permit including:
    - CSY--avoidance
    - Reduction in hydromification impacts
    - Supplementing coarse sediments where avoidance or reduction is not possible
  - Incorporate a fully developed and workable CSY program into the BMP design manual
  - Allow the Copermittees to adopt the BMP design manual into an enforceable ordinance
  - Due to unresolved issues with the some WQIPs, we respectfully request that WQIPs receive a public hearing before the full Board

Final Thoughts

- During discussions on CSY, RWQCB staff agreed that other options could be proposed to demonstrate no net impact
- Our intent is to have as many tools in our tool box to achieve the goals of the permit.
- It is important and *necessary* for RWQCB staff to be available to answer questions as we move forward to ensure permit goals are met

022591

What We All Want and Need

A Permit That Works for All Stakeholders and Gets Results

RWQCB

Environment

Co-Permitees

The Coalition

022592

MS4 Safe Harbor Provisions

MATT O'MALLEY
WATERKEEPER AND LEGAL & POLICY DIRECTOR
SAN DIEGO COASTKEEPER

SAN DIEGO COASTKEEPER®

Safe Harbors

The Ninth Circuit defined a "safe harbor" as "the proposition that compliance with certain provisions shall forgive non-compliance with the discharge prohibitions." (NRDC vs County of LA, 673 F.3d 880).

The TO creates Safe Harbors deeming a Permittee to be in compliance with the Permit's RWL once a plan to address pollutants has been approved by the Regional Board.

I. The TO's Safe Harbor provisions violate anti-backsliding requirements

II. TO is Inconsistent with State Board's Order and Directives

I. The Safe Harbor violates anti-backsliding

CWA and federal regulations prohibit backsliding, or weakening of permit terms, from the previous permit:

"A permit may not be renewed, reissued, or modified to contain effluent limitations which are less stringent than the comparable effluent limitations in the previous permit." (CWA Section 402(o)(1)), and

"When a permit is renewed or reissued, interim effluent limitations, standards, or conditions must be at least as stringent as the final effluent limitations, standards, or conditions in the previous permit…" (40 CFR 122.44(l)(1))

The Safe Harbor waives requirements to meet Water Quality Standards, is less stringent than existing permit and previous permit, and violates anti-backsliding requirements.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

AUG 0 8 2012

Mr. Jay Sakai, Director
Water Management Administration
Maryland Department of the Environment
1800 Washington Boulevard
Baltimore, Maryland 21230

Re: Specific Objection to Prince George's County Phase I Municipal Separate Storm Sewer System (MS4) Permit MD0068284

Dear Mr. Sakai:

On May 18, 2012, the U. S. Environmental Protection Agency (EPA or the Agency), received the latest draft of the above-referenced National Pollutant Discharge Elimination System (NPDES) permit (Prince George's County permit) which was reviewed pursuant to 40 nd EPA Region III

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(CWA), and its
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ed before EPA can

Federal regulations require that all NPDES permits contain limitations to control discharges which may cause, have the reasonable potential to cause or contribute to an excursion above water quality standards. 40 C.F.R. §122.44(d)(1)(i). Part VI of the draft Prince George's County permit (Enforcement and Penalties) contains general language

Printed on 100% recycled/recyclable paper with 100% post-consumer fiber and process chlorine free.
Customer Service Hotline: 1-800-438-2474

"Backsliding is prohibited in NPDES permits. . . . Allowing additional time to complete a task that was required by the previous permit constitutes a less stringent condition and violates the prohibition against anti-backsliding."

SWRCB-Approved Justifications for Backsliding in LA

SWRCB found exceptions based on "new information since previous permit", "paradigm shifts", and TMDL "lessons learned" in LA

- "Paradigm Shift" (stormwater as asset/water supply vs liability)
- TMDL development & implementation and "Lessons learned"
- Watershed planning and regional solutions
- LID benefits

Justifications Don't Apply in SD

Response to comments states that exception exists because "circumstances on which the previous permit was based have materially and substantially changed since the time the previous permit was issues and would constitute cause for permit modification…." (Response, p. 38)

In SD, little to no "new information", and no substantial and material changes to justify anti-backsliding

Only material change here is adding the Safe Harbor

TMDLs as backstop

Justification: "We expect that the Los Angeles MS4 Order's TMDL requirements and receiving water limitations…will be the means for achieving water quality standards for the majority of degraded water bodies in the region" (Order 2015-0075, p. 26).

"…the majority of pollutants of concern from the LA County MS4 are addressed by the 33 TMDLs that are included in the Permit." (LARWQCB Response to Comments, Oct 2013, p.37).

BUT: SD has 5 TMDLs, and significant pollutants here are not addressed by TMDLs and are not expressly included in the permit.

Stormwater as a Water Supply

Justification: "…in terms of water supply, there has been a paradigm shift in the last decade from viewing storm water as a liability to viewing it as a regional asset…" (Order 2015-0075 at 21)

BUT:

"Groundwater production…is limited by a number of elements, including lack of storage capacity in local aquifers, availability of groundwater recharge, and degraded water quality," and, "groundwater supplies are less plentiful in the San Diego region than in some other areas of California…" (SDCWA website)

AND:

SD MS4 does not require (as LA does) analysis of multi-benefit regional water supply projects that capture, retain, and use.

Watershed Planning and Prioritization

Justification: Watershed-based plans are the preferred stormwater planning mechanism

BUT: 2007 SD Permit already incorporated this:

"Watershed-based urban runoff management can greatly enhance the protection of receiving waters within a watershed. Such management provides a means to focus on the most important water quality problems in each watershed….**Watershed management requires the Copermittees within a watershed to develop a watershed-based management strategy**…" (Order R9-2007-0001)

II. TO is Inconsistent with State Board's Order and Directives

The Safe Harbor amendments are inconsistent with the SWRCB's Order and directives for adopting Safe Harbors

- No Reasonable Assurance Analysis (RAA), Guidelines, or Objective Standards in Permit
- No Regional Multi-benefit capture and use compliance provision
- Endless iterative loop without objective standards

SWRCB Order and the SD Tentative Order

SWRCB Order lays out a pathway for a Safe Harbors

The Problem:

The TO **borrows the justifications** used in Los Angeles, but **ignores the approach and methodology** (in particular the RAA) that was specifically approved by the SWRCB's Order and that is the lynchpin of the Safe Harbor mechanism. In doing so, it fails to comply with the Order.

Principles of SWRCB Order

SWRCB's Order states the following principles must apply to any region's safe harbor provisions (Order WQO 2015-0075):

- Permits should incorporate an **ambitious, rigorous, and transparent** alternative compliance path.
- The safe harbor should encourage **multi-benefit water supply compliance projects** that capture, infiltrate, and use storm water and support a local sustainable water supply.
- The safe harbor should have **rigor and accountability**.
- The RWL provisions should not deem good faith engagement in the iterative process to constitute such compliance.

Reasonable Assurance Analysis (RAA)

Approved of in SWRCB Order as a "well defined, transparent", detailed, pre-reviewed and approved modeling mechanism.

"…the requirement for a reasonable assurance analysis in particular is designed to ensure that Permittees are choosing appropriate controls and milestones for the WMP/EWMP. Competent use of the RAA should facilitate achievement of final compliance within the specific deadlines." (Order WQO 2015-0075).

SWRCB-Approved RAA Language

"Permittees shall conduct a Reasonable Assurance Analysis for each water body-pollutant combination addressed by the Watershed Management Program. A Reasonable Assurance Analysis (RAA) shall be quantitative and performed using an approved model in the public domain. Models to be considered for the RAA, without exclusion, are the Watershed Management Modeling System (WMMS), Hydrologic Simulation Program-FORTRAN (HSPF), and the Structural BMP Prioritization and Analysis Tool (SBPAT). The RAA shall commence with assembly of all available, relevant subwatershed data collected within the last 10 years, including land use and pollutant loading data, establishment of quality assurance/quality control (QA/QC) criteria, QA/QC checks of the data, and identification of the data set meeting the criteria for use in the analysis. Data on performance of watershed control measures needed as model input shall be drawn only from peer-reviewed sources. These data shall be statistically analyzed to determine the best estimate of performance and the confidence limits on that estimate for the pollutants to be evaluated. The objective of the RAA shall be to demonstrate the ability of Watershed Management Programs and EWMPs to ensure that Permittees' MS4 discharges achieve applicable water quality based effluent limitations and do not cause or contribute to exceedances of receiving water limitations." (Order No. R4-2012-0175, as amended by Order WQ 2015-0075).

RAA Guidelines

LA's RAA is accompanied by guidelines detailing objective standards for conducting the required analyses, and criteria for doing so, leading to rigor, transparency, and accountability.

"The RAA must be adequate to identify the required reduction for each water body–pollutant combination at each compliance deadline and analyze the BMP scenario to achieve that deadline." ("Guidelines for Conducting RAA…", March 25, 2014).

Guidelines for RAAs

Stated intent: "Permittees shall provide a modeling system to support the estimation of baseline loadings, required load reductions that are used to set targets/goals for selected BMPs/watershed control measures…" (Guidelines, March 2015)

"The models appropriate for conducting the required RAA…are selected based on the following model capabilities:

1. Dynamic continuous long-term simulation for modeling pollutant loadings, flows, and concentrations in receiving water from lands in a watershed system.
2. Can represent rainfall and runoff processes above soil surface, and baseflow contributions in subsurfaces of urban and natural watershed systems.
3. Can represent variability in pollutant loadings, based on land use, soil hydrologic group, and slope.
4. BMP process based approach or empirically based BMP approach.
5. Decision support to evaluate BMP performance." (Guidelines)

TO Language on Analysis

"**An analysis, with clearly stated assumptions**" (TO, Section B.3.c.1.(b)(i)).

TO allows noncompliance with Safe Harbor with "**acceptable rationale**" (TO, Section B.3.c.2.(c)).

- TO contains no RAA or equivalent and lacks objective criteria and guidelines present in RAA and approved by SWRCB Order.
- As proposed, the Safe Harbor lacks objectivity and accountability and is not well-defined or transparent

Continuous iterative loop

"…we cannot accept a process that leads to a continuous loop of iterative WMP/EWMP implementation without ultimate achievement of receiving water limitations…." (State Board Draft Order)

TO has no guidance or objective measure as to what "acceptable rationale" would be, and so lacks transparency and accountability.

EPA: Amendments "Provide Only Limited Direction"; Need Guidance

- "The proposed permit modifications…provide only limited direction concerning the Regional Board's specific technical, analytical, and planning expectations that must be met by permittees pursuing this alternative compliance pathway." (Dave Smith email to SDRWQCB, 11/16/15).
- Recommend prompt development of guidance
- "It will best serve everyone's interests if there are clear understandings about the level of technical rigor necessary to demonstrate reasonable assurance and the specificity of implementation commitments necessary in the associated implementation plans to secure approval." (Dave Smith email to SDRWQCB, 11/16/15).

Where Are We?

Not rigorous, transparent, or well-defined

- No RAA or other established objective methodology or guidance.
- Allows for non-achievement of RWLs based on nebulous "acceptable rationale".

Not ambitious

- Does not embrace the paradigm shift by failing to include regional multi-benefit water supply projects as part of compliance mechanism.

Water Quality Safety Nets

In LA you have 33 TMDLs incorporated into MS4 Permit as a safety net and assurance WQS will be met

In LA you have the objective RAA requirements and associated guidance docs as a safety net and assurance plans will meet RWLs

Neither exist in SD

EPA: "Inappropriate" to apply Safe Harbor to regions outside LA

"The WQ Order directs all Regional Boards to consider the approach in the LA MS4 permit, but does not require its use. **We believe it would be premature and inappropriate to require the LA MS4 permit approach throughout the State**…" (EPA letter to SWRCB, Jan 2015).

Our Proposal

A. Remove Safe Harbor Language and substitute with Time Schedule Orders or other compliance mechanism, *or*

B. Delay Safe Harbor until statewide EPA/SWRCB guidance developed and reconsider at next permit renewal (2018)

If choose to adopt despite legal and practical problems:

- **Rigor Up Front** – RAA and guidance in permit, *or*
- **Rigor on Back End** - Miss goals two years in a row and no longer covered ("hard out")
- Add requirement for 85th-percentile storm capture for multi-benefit water supply compliance projects
- Ramp up legal obligation to develop TMDLs that are on hold or not yet developed to act as backdrop

EPA: Safe Harbor Grace Period

"**establishing a safe harbor during this phase is not warranted**…we disagree that permittees should be considered in compliance with these limits solely based on a notification of intent to prepare a plan." (David Smith letter to SWRCB, Jan 2015)

"Prior to a determination by the Regional Board that the submitted plan contains specific implementation commitments that are sufficient to provide reasonable assurance that TMDL and other relevant water quality based requirements will be met, **there is insufficient basis to conclude that the permittees are or will be in compliance**." (David Smith email to SDRWQCB, 11/16/15).

2013 Permit – Where Are We?

Submitted WQIPs have shown that without clear, rigorous, and strict guidelines and directives the outputs and plans were trial-and-error and (in some cases woefully) inadequate.

MS4 Enforcement actions taken by SDRWQCB since 2013:

Escondido (multiple), City of SD (multiple), Carlsbad, Chula Vista, Lemon Grove, Unified Port

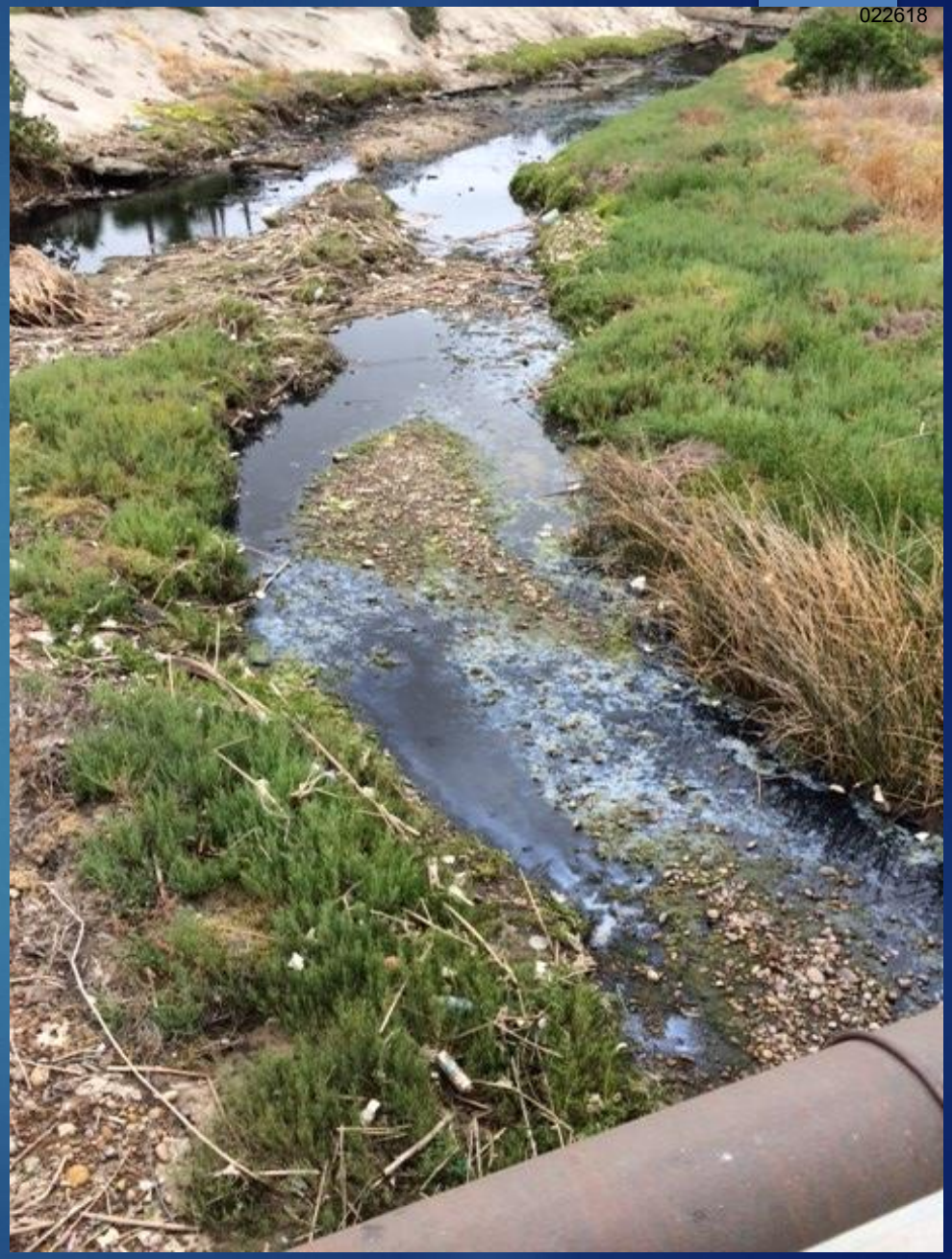
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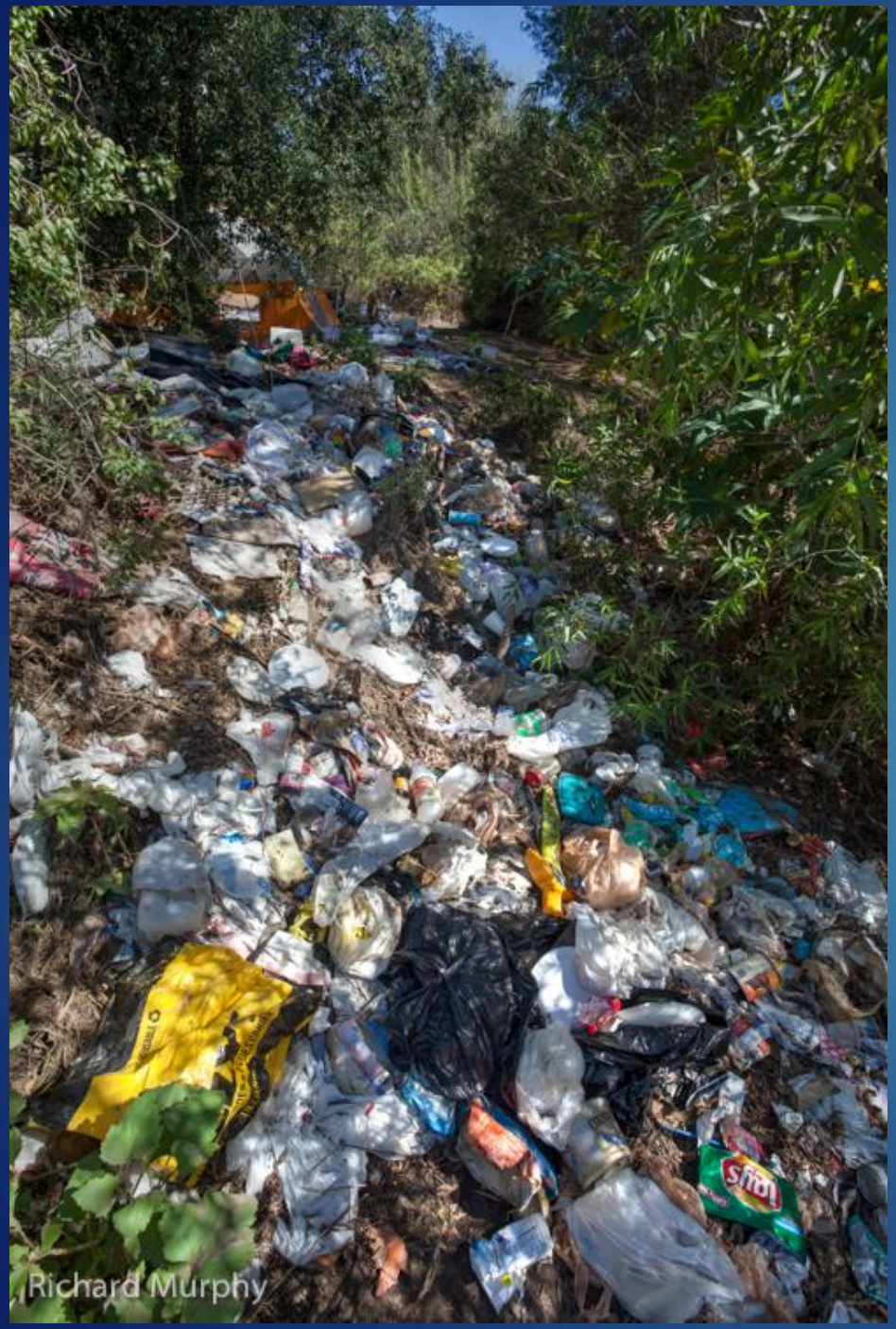

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CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
2375 Northside Drive, Suite 100
San Diego, California

MINUTES OF MEETING
NOVEMBER 18, 2015

At 9:00 a.m., Chairman Abarbanel called to order the meeting of the California Regional Water Quality Control Board, San Diego Region (SDRWQCB) at the Regional Water Quality Control Board, 2375 Northside Drive, San Diego, California.

Item 1 – Roll Call and Introductions

Board Members present: Henry Abarbanel, Eric Anderson, Tomás Morales, Gary Strawn, Betty Olson, and Stefanie Warren.

Staff Present: David Gibson, James Smith, Lori Costa, Julie Chan, David Barker, Jeremy Haas, Craig Carlisle, John Odermatt, Cynthia Gorham, Chiara Clemente, Barry Pulver, Tony Felix, Chad Loflen, Jody Ebsen, Frank Melbourn, Sarah Mearon, Alan Monji, Kimberly McMurray-Cathcart, Lalitha Thotakura, Laurie Walsh, Erica Ryan, Wayne Chiu, Deborah Jayne, Eric Becker, Chris Means, Ben Neill, Dat Quach, Brandi Outwin-Beals, Christina Arias, Lucas Lima, Sheila Christine McQuaid-Moran, Kelly Dorsey, Alex Cali, Kristin Schwall, Joann Lim, and Tino Gamboa.

Others present on behalf of the San Diego Water Board: State Water Resources Control Board – Catherine Hagan and Adriana Nuñez.

Public Attendance: David Renfrew, Ghina Yamout, Lisa Kay – Alta Environmental; Kimberly O'Connell – UC San Diego; Rebecca Andrews – Airport Authority; Wayne Rosenbaum – Coalition; Tracy Ingebrigtsen, David Shissler – City of Laguna Beach; David Garcia, Stuart McKibbin, Scott Bruckner – Riverside County Flood Control District; Jeremy Jungreis – Rutan & Tucker, LLP; Joe Ames – City of Mission Viejo; Boushia Salem – City of Chula Vista; Michelle Mattson, Andrea Crumpacker – Weston Solutions; Ry Rivard – Voice of San Diego; Scott Gravos – Citizen; Kathryn Kriozere – San Diego City Attorney; Sean Torres, Sumer Hasenin, Clem Brown, Emir Williams, Ruth Kolb, Greg Hopkins – City of San Diego; Brad Fowler, Mayor Carlos Olvera – City of Dana Point; Bill Green – South Coast Water District; Steve Horn – County of Riverside; Edward Corwin – Lewis Brisbois Bisgaard & Smith LLP; Billy Walker – Citizen; Laura Hunter – Escondido Neighbors United; Jerome Pendzick, Julia Chunn-Heer, Summer Strutt, Mark West, Mandy Sackett, Jennifer Olim – Surfrider Foundation; Kathryn Horning – Allen Matkins; Nick Doenges, Jim Whalen – J. Whalen Associates; Jeff O'Connor – Homefed; Jim Kilgore – Latitude 33; Michael McSweeney – BIA; Jeff Waldman – US Navy Region SW; Sam Blick – Law Offices of C. Samuel Blick; Malik Tamimi – City of Lemon Grove; Jessica Palmer – NAVFAC SW; Mark Baker – Coutech; Debby Reece – Project Design Consultants; Shelby Hull – Contech; Aaron Lund – Hanson Aggregates; Matt O'Malley, Catherine Ferguson – SD Coastkeeper; Venkat Gummadi – Geosyntec; Tory Walker – Tory R. Walker Engineering, Inc.; Michael Welch

– Citizen; Ben Carrier – San Diego City Attorney; Ryan Wann, Jo Ann Weber, Todd Snyder, Thomas Deak, Jon Van Rhyn – County of San Diego; Tom Stinson – ASM Marie Waldron; J. Harry Jones – San Diego Union Tribune; Adrienne Cibor – Nautilus; Jason Golumbfskie, Romeo Hacinas, Ryan Anson, John Crow – US Navy; Edward Modiano – de maximis; Christian Braun – City of Del Mar; Devin Slaven – City of Lake Forest; Matt Rich – Amel Foster Wheeler; Mary Anne Skorpanich, Richard Boon, Ryan Baron, Chris Crompton – County of Orange; Jamie Richards – City of Menifee; Scott Taylor – M. Baker International; Steve Strapac – City of Poway; Rosanna Lacarra – City of Coronado; Cheryl Filar – City of Vista; John Quenzer – City of National City; Jayne Janda-Timba – Rick Engineering; James Wood – City of Carlsbad; Marco Gonzalez – CERF.

Item 2 – Public Forum

Jim Whalen-Whalen Associates, Tory Walker-TRWE, Nick Doenges-Whalen Associates, Jeff O'Connor-HomeFed, all requested that a public hearing be held before the Board to discuss unresolved issues on the San Diego Bay Water Quality Improvement Plan.

Laura Hunter, Escondido Neighbors United, requested that a public hearing be held at a future Board meeting to discuss the 401 water quality certification for the Oak Creek Development Project.

Item 3 – Minutes of Board Meeting: September 9, 2015

Mr. Anderson moved to approve the minutes, and Mr. Strawn seconded the motion. A roll call vote was taken, and Board Members Abarbanel, Anderson, Morales, Olson, Strawn, and Warren voted "aye." The motion passed.

Item 4 – Chairman's, Board Members', State Water Board Liaison's, and Executive Officer's Reports. These items are for Board discussion only. No public testimony will be allowed, and the Board will take no formal action.

Board Member Warren asked for more details regarding the public meeting held at the Magnolia Elementary School in El Cajon *(EO Report, Part A, number 2)*. Staff member Julie Chan responded. Ms. Warren asked for another update after the January meeting.

Board Member Strawn reported that at a recent San Diego River Conservancy meeting he attended they began to allocate Prop 1 money to various projects along the San Diego River and gave details.

Executive Officer Gibson reported that the State Water Board approved the Basin Plan Amendment for the onsite waste treatment system and ground water nitrate concentration of water quality objectives. He introduced new staff members Erica Ryan, Anayeli Picasso, and Faith Moore. Mr. Gibson also reported that he would be attending a meeting later in the afternoon with U.S. Commissioner Drusina and Mexican

Commissioner Salmon and the Minute 320 Binational Core Group to discuss managing water quality, sediment, and trash.

Item 5 – Future Agenda Items: Board members may discuss items for possible inclusion on future agendas. *(David Gibson)*

Chairman Abarbanel suggested making visits to the water districts again in 2016. He said it had been three years since Mr. Gibson and Mr. Strawn visited them.

Item 6 – Approval of 2016 Meeting Schedule. *(David Gibson)*

Mr. Morales moved to approve the 2016 meeting schedule, and Ms. Olson seconded the motion. A roll call vote was taken, and Board Members Abarbanel, Anderson, Morales, Olson, Strawn, and Warren voted "aye." The motion passed.

Consent Calendar: Items 7 through 9 are considered non-controversial issues. (NOTE: If there is public interest, concern, or discussion regarding any consent calendar item or a request for a public hearing, then the item(s) will be removed from the Consent Calendar and considered after all other agenda items have been completed.)

Item 7 – Rescission of WDRs: An Order Rescinding Order Nos. 88-65, 94-06, 94-34, and 94-63, Individual Waste Discharge Requirements for Hanson Aggregates Sand and Gravel Operations in Escondido, Lakeside, and San Diego (Tentative Order No. R9-2015-0105). *(Roger Mitchell)*

Item 8 – NPDES Permit Reissuance: University of California, San Diego - Scripps Institution of Oceanography Discharge to the Pacific Ocean (Tentative Order No. R9-2015-0070, NPDES No. CA0107239). *(Joann Lim)*

Item 9 – U.S. Department of the Navy, Naval Base Coronado. *(Kristin Schwall)*

a. NPDES Permit Reissuance: Discharge to the Pacific Ocean, San Diego Bay and the Tijuana River Estuary (Tentative Order No. R9-2015-0117, NPDES No. CA0109185).

b. Time Schedule Order: A Time Schedule Order Requiring the US Department of the Navy to Comply with Requirements Prescribed in Tentative Order No. R9-2015-0117, NPDES No. CA0109185 (Tentative Order No. R9-2015-0118).

Chairman Abarbanel recused himself from voting on Item 8 because of his relationship with the Discharger and stepped away from the dais. Chairman Abarbanel did not participate in the vote on items 7 and 9.

Mr. Morales moved to approve consent items 7-9, and Mr. Anderson seconded the motion. A roll call vote was taken, and Board Members Anderson, Morales, Olson, Strawn, and Warren voted "aye." The motion passed.

Item 10 – Information Item: Presentation on the San Ysidro Land Port of Entry Wastewater Treatment and Reuse Facility as a Model Facility for Sustainability. *(Alex Cali)*

Item 10 was postponed.

Item 11 – NPDES Permit Amendment: An Order to amend Order R9-2013-0001, as amended by Order No. R9-2015-0001, NPDES No. CAS0109266, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region. The amendment includes, but is not limited to, incorporation of the County of Riverside, the Cities of Murrieta, Temecula, and Wildomar, and the Riverside County Flood Control and Water Conservation District as Copermittees (Tentative Order No. R9-2015-0100). *(Wayne Chiu and Christina Arias)*

Chairman Abarbanel read the order of proceedings.

Board Member Warren recused herself from participating in the item due to her law firm's unrelated work with Orange County and Orange County Flood Control District. Board Member Warren left the room during consideration of Item 11.

Staff member Wayne Chiu began the presentation. Board Members asked questions of staff.

Speakers – Elected Officials:

- Mayor Carlos Olvera, City of Dana Point
- Bill Green, South Coast Water District

Staff member Christina Arias continued the presentation.

Speakers – Orange County Copermittees:

- Stuart McKibbin, Riverside County Flood Control & Water Conservation District
- Mary Anne Skorpanich, County of Orange

The Board Members asked questions of Ms. Skorpanich and Mr. Chiu.

- Ryan Baron, County of Orange
- Richard Boone, County of Orange
- Jeremy Jungreis, Rutan & Tucker, LLP representing the County of Orange

Board Member Morales asked questions of Mr. Jungreis.

The meeting was recessed for lunch and closed sessions at 12:25 pm.

Item 12 – Closed Session-Discussion of Ongoing Litigation [Authorized under Government Code Section 11126, subd. (e)]. The San Diego Water Board may meet in closed session to discuss ongoing litigation.

Wayne Chiu made closing remarks. Board Members asked questions of Mr. Chiu.

Chairman Abarbanel closed the public hearing.

Assistant Executive Officer, James Smith, recommended that the Board adopt the permit with errata as proposed by staff.

After Board Member discussion, Mr. Morales moved to approve Tentative Order No. R9-2015-0100 with errata, and Mr. Anderson seconded the motion. A roll call vote was taken, and Board Members Anderson, Morales, Olson and Strawn voted "aye." Chairman Abarbanel voted "no." The motion passed.

Item 16 – Arrangements for Next Meeting and Adjournment:

Wednesday, December 16, 2015 - 9:00 a.m.
Padre Dam Municipal Water District
Advanced Water Purification Visitor's Center
12001 Fanita Parkway
Santee, California

There being no further business, the meeting adjourned at 4:39 p.m.

These minutes were prepared by:

Lori Costa
Administrative Officer

Signed by:

David Gibson
Executive Officer

During the closed session, the following item was discussed:

F. Coastal Environmental Rights Foundation, a CA non-profit public benefit corporation v. California Regional Water Quality Control Board, San Diego Region. Petition for Writ of Administrative Mandamus. San Diego County Superior Court, Case No. 37-2014-00038672-CU-WM-CTL (filed November 2014) (Challenging NPDES General Permit for Residual Firework Pollutant Waste Discharges to Waters of the United States, San Diego Region, Order No R9-2011-0022). (*Ben Neill*)

Item 15 – Closed Session-Personnel. The San Diego Water Board may meet in closed session to consider the appointment, employment, evaluation of performance, or dismissal of a public employee or to hear complaints or charges brought against that employee by another person or employee unless the employee requests a public hearing [Authorized under Government Code Section 11126(a)].

Item 15 was discussed.

The meeting reconvened at 1:25 pm. Executive Officer Gibson excused himself from the meeting.

Item 11 – Continued

Speakers – Orange County Copermittees:

- Dave Shissler, City of Laguna Beach
- Brad Fowler, City of Dana Point
- Bill Green, South Coast Water District
- Jeremy Jungreis, representing the Cities of Dana Point and Laguna Beach

Speakers – San Diego County Copermittees:

- Jon Van Rhyn, County of San Diego
- Jo Ann Weber, County of San Diego
- Clem Brown, City of San Diego

Additional Speakers:

- Michael McSweeny, Building Industry Association
- Matt O'Malley, San Diego Coastkeeper
- Marco Gonzalez, CERF
- Laura Hunter, Escondido Neighbors United
- Mandy Sackett, Surfrider Foundation, spoke on behalf of herself and Mark West.
- Julia Chunn-Heer, Surfrider Foundation, spoke on behalf Jennifer Olim
- Sam Blick, Law Offices of C. Samuel Blick
- Scott Graves, resident
- Rebecca Andrews – representing the Airport Authority
- Jerome Pendzick, Surfrider Foundation and resident
- Julia Chunn-Heer, Surfrider Foundation

Mary Anne Skorpanich and Michael McSweeny made closing remarks.

1 MEETING

2 STATE OF CALIFORNIA

3 SAN DIEGO REGIONAL WATER QUALITY BOARD

4 PARTIAL TRANSCRIPT

5

6

7 SAN DIEGO REGIONAL

8 WATER QUALITY CONTROL BOARD

9 2375 NORTHSIDE DRIVE, SUITE 100

10 SAN DIEGO, CALIFORNIA

11

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15 REPORTED BY: KASEY L. MOBLEY, CSR 13407

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22 California Reporting, LLC

23 52 Longwood Drive

24 San Rafael, CA 94901

25 (415)457-4417

APPEARANCES

BOARD MEMBERS:

Henry Abarbanel, Chair

Gary Strawn, Vice Chair

Betty Olson

Stefanie Warren

Eric Andersen

Tomas Morales

OTHER STAFF PRESENT:

David W. Gibson, Executive Officer

James G. Smith, Assistant Executive Officer

Catherine Hagan, Regional Board Attorney

Wayne Chiu, Water Resource Control Engineer

Christina Arias, Water Resource Control Engineer

Julie Chan, Supervising Engineering Geologist

NOVEMBER 18, 2015, SAN DIEGO, CALIFORNIA

9:03 A.M.

CHAIRMAN ABARBANEL: Good morning. I'd like to call to order the regular meeting of the San Diego Regional Water Quality Control Board on November 18th, 2015.

May we have a roll call.

(Roll call done.)

CHAIRMAN ABARBANEL: The first item on the agenda after being here is our public forum. Anybody can address the Board on any issue that is not on the agenda. So plenty of time to speak to the agenda items as they arise, but very often, the public has important and interesting things to say that I didn't get -- manage to get on the agenda.

Did anybody wish to speak to items not on the agenda?

And you've given Gary a blue card or whatever?

You've given him four?

JIM WHALEN: Yeah, that's how entrenched it is.

CHAIRMAN ABARBANEL: Okay.

JIM WHALEN: Thank you very much. Is this thing on?

Good morning, Mr. Chair, members of the Board. My name is Jim Whalen of J. Whalen Associates, 1660 Hotel Circle, here in Mission Valley. I'm the president of J. Whalen Associates, a land use consulting firm, and chair of the Building associations Legislative Committee.

I've been monitoring the progress of the MS4 permit implications, and I'm concerned that the biological consequences of reducing runoff into certain water bodies, especially the Otay River --

CHAIRMAN ABARBANEL: Excuse me. I believe that is the subject of Item No. 11.

MR. WHALEN: We did talk to your counsel about this is the greatest level of detail you're going to get. I'm done in one second.

MS. HAGAN: Mr. Whalen is talking about the water quality improvement plan process, but he's not going to talk about any details of the specific water quality improvement plan.

CHAIRMAN ABARBANEL: I'm sorry for interrupting, but I --

1 MR. WHALEN: That's okay. We were
2 careful to make sure we talked to folks in
3 advance, to make sure we didn't --
4 CHAIRMAN ABARBANEL: Okay. You can
5 start from the beginning, but I think we know who
6 you are now.
7 MR. WHALEN: I think you do. I've
8 been monitoring the progress of the MS4 permit
9 implication, and I am concerned that the
10 consequences of reducing runoff into certain water
11 bodies for biological reasons may have been
12 overlooked during the permitting process, and I'm
13 simply requesting that the Executive Officer
14 Gibson schedule a public hearing on the San Diego
15 Bay Water Quality Improvement Plan to consider
16 this issue before the full Board. Thank you.
17 That's it.
18 CHAIRMAN ABARBANEL: Do you have
19 specific requests of the executive officer?
20 MR. WHALEN: Simply to calendar it.
21 We can't do specific requests. Simply to
22 calendar.
23 CHAIRMAN ABARBANEL: Okay.
24 Please. I wouldn't interrupt you.
25 TORY WALKER: Good morning, Chair and

board members. My name is Tory Walker. I'm at 2559 Vista de Palomar, Fallbrook, California. I'm the principal of Tory R. Walker Engineering, a water resources firm, and I prepared a hydro modification study for the Otay River.

I believe the San Diego Bay Water Quality Improvement Plan does not take into account all the available science --

MS. HAGAN: Excuse me. You need to limit this to no details whatsoever. I was under the impression that folks would be asking for a hearing, but getting into any details is not appropriate today. That's a process for the water quality improvement plan.

MR. WALKER: All right. Thank you. So I would like it to be vetted at a public hearing before the Board.

CHAIRMAN ABARBANEL: Is that enough details?

BOARD MEMBER STRAWN: I think the next one is Nick Dangus.

NICK DANGUS: Good morning, Chair, Board members and Executive Officer. My name is Nick Dangus, 1660 Hotel Circle North, J. Whalen Associates, land use consultants.

I believe there are significant issues with San Diego Bay Water Quality Improvement Plan, and I request that Extensive Officer Gibson schedule a public hearing before this Board to address these issues.

Thank you.

BOARD MEMBER STRAWN: Mr. O'Connor?

JEFF O'CONNOR: Good morning Chair, Board members and staff. My name is Jeff O'Connor. I work for Home Fed Corporation in Carlsbad. We have significant property holdings in Otay Mesa. I've been working with staff over the past several years over the storm water permit and will continue to do so. We believe that San Diego Bay Water Quality Improvement Plan has unresolved issues and should be subject to a public hearing before this Board.

Thank you.

BOARD MEMBER STRAWN: Next, Laura, I have a card from somebody that says they want to follow you, but I have your card for Item 11.

MS. HUNTER: I had to take my card out because I was advised not to speak.

BOARD MEMBER STRAWN: That explains the other mystery of what happened to your card.

1 Come up to the microphone. Identify
2 yourself.
3 BOARD MEMBER WARREN: Can I step down
4 before you go.
5 MS. HAGAN: The matter is a pending
6 matter. It's a 401 certification that's pending.
7 Ms. Hunter wanted to talk about some of the
8 details at the site, and it's not proper for this
9 forum, so I told her that.
10 CHAIRMAN ABARBANEL: Before we go on,
11 I want to ask Dave if the requests of the first
12 four speakers are sufficient for you to put
13 together a public forum that would meet their
14 various --
15 EXECUTIVE OFFICER GIBSON:
16 Mr. Chairman, members of the Board, good morning.
17 Their requests are sufficient for me
18 to look at the issues, the Watershed Water Quality
19 Improvement Plan for San Diego Bay, and to make a
20 determinate, as you have delegated me to do, as to
21 whether or not to schedule that, and I would do so
22 in conference with you, Mr. Chairman, and look at
23 the calendar when that would happen.
24 Optimistically, it would be into next
25 year, and I think there should be some concerns as

to certain aspects of the permit that would not come into play until that happened.

So I think it would be best to look at this issue and discuss it before making this decision.

CHAIRMAN ABARBANEL: I wanted to ensure the people who were present that it was clear enough.

BOARD MEMBER MORALES: Out of curiosity -- maybe we don't know yet -- is it something that would be scheduled in a regular meeting or.

CHAIRMAN ABARBANEL: Board Member Morales, if we determine the best course of action is to consider it, we would plan it for a regularly scheduled Board meeting in 2016.

CHAIRMAN ABARBANEL: That would be February?

EXECUTIVE OFFICER GIBSON: That would be the earliest it could be.

CHAIRMAN ABARBANEL: Okay. Sorry for keeping you waiting. I wanted to make sure --

MR. MODIANO: That's fine. Ed Modiano, project coordinator for Chatham site, PRP

1 Group.

2 BOARD MEMBER WARREN: I need to recuse

3 myself if we're going to talk about the Chatham

4 site.

5 MR. MODIANO: We're not. Essentially,

6 we're here -- we have a humble relationship with

7 Escondido Neighbors United. I've always been

8 directed to attend these meetings in case the

9 Chatham site does come up. Apparently, Laura is

10 not going to be talking about the Chatham site, so

11 I remove my card.

12 MS. HUNTER: I put my card back in.

13 From now on, I'm going to put in a request to be

14 after Ed.

15 Anyway, I'm just going to be asking

16 for a request for a public hearing on the 401

17 certification for the Oak Creek development

18 project. Thank you.

19 CHAIRMAN ABARBANEL: Now, we've had

20 several public hearings here on that issue. Are

21 there additional issues that would merit having a

22 hearing of the Board, or would it be a separate

23 occasion?

24 EXECUTIVE OFFICER GIBSON: Mr.

25 Chairman, this concerns a water quality

1 certification under Section 401 that's a pending
2 project right now. I will confer with staff to
3 determine whether I should act on that
4 ministerially, as you have delegated me to do, or
5 if indeed it does rise to the occasion where the
6 Board should consider it.
7 As you know, I have two basic metrics
8 for making that determination, independent of
9 public forum. One is that the impacts are
10 significant, and the other is that there's
11 significant public interest.
12 We've heard perhaps two requests, if I
13 can interpret it that way, and I'll take that
14 under advisement.
15 CHAIRMAN ABARBANEL: Thank you.
16 Anyone else wish to speak on an item
17 that is not on the agenda?
18 Thank you. We will move on to Item 3.
19 (Minutes of Board meeting
20 approved.)
21 CHAIRMAN ABARBANEL: Move on to Item
22 No. 4, which are comments by the Board members.
23 I guess Fran is not with us today.
24 EXECUTIVE OFFICER GIBSON: Correct,
25 Mr. Chairman. She is attending a State Board

meeting today.

CHAIRMAN ABARBANEL: She will not have any comments.

Board members and executive officer -- Board members have any comments, reports?

BOARD MEMBER WARREN: I just had a question on the executive officer's report. On Item No. 2, the public meeting at Magnolia Elementary School, if we could take a few minutes to share more details.

Is it our impression that the parents and teachers are getting the answers that they want, and they're feeling that they're in the loop?

CHAIRMAN ABARBANEL: Thank you, Board Member Warren. I will ask if Craig Carlisle or Sean McClain is available -- or Julie Chan. I see Julie is closer to the microphone.

Julie, would you please?

MS. CHAN: Hi. Julie Chan with the Groundwater Protection Unit. I did attend the meeting. I believe the parents and teachers of the school are getting the information that they're looking for, and another public meeting is scheduled for January. DTSC presented -- the DTSC

1 schools group has installed a pilot remediation
2 system in one of the classrooms, and based on the
3 outcome of the pilot study, they will expand it to
4 the entire school.
5 Then we continue to work aggressively
6 with Amitech to get the groundwater cleaned up. I
7 would say the discussion at the meeting quickly
8 moved away from the school and to the residents'
9 down gradient of the plume. So at that meeting,
10 it was arranged that we would beef up our public
11 information plan, and since then, we met with
12 Amitech and directed them to prepare a public
13 information plan that deals with the residents not
14 just the school.
15 Are there any other questions?
16 BOARD MEMBER WARREN: Will you come
17 back to us and let us know how the January meeting
18 goes.
19 MS. CHAN: Absolutely.
20 CHAIRMAN ABARBANEL: Thank you.
21 BOARD MEMBER STRAWN: As you know, I
22 represent this Board on the San Diego River
23 Conservancy, and we had a really interesting
24 meeting here last week where we began to allocate
25 some of the Prop 1 money for various projects

1 along the San Diego River. The first increments
2 that's designated for the San Diego River will be
3 $3 million out of a total of 17 for this
4 watershed. This is exclusive of the area-wide
5 money that's being administrated by Coastal
6 Keepers.
7 The three projects that were presented
8 are worthy of some discussion here. The first one
9 is Mass Park. The City has had a plan, been
10 working on a plan for several years to restore
11 that park. Under Prop 1, they added to that and
12 divided out a section that's going to specifically
13 restore -- I think it's about nine and a half
14 acres of repairing habitat, wetland restoration.
15 They're moving the old asphalt trail.
16 They're tearing that up and moving it back away
17 from the bank of the river, restoring that bank
18 and adding to the flood plan, replacing the trail
19 with a permeable surface. And they're planting
20 some native grasses and flowers. It's going to be
21 a really nice project.
22 I was particularly mindful of the idea
23 that that can be a good example of some of the
24 urban projects that can be done under Prop 1,
25 where they take some urban city parks and, at

1 least, modify them or add to them in such a way
2 we're also taking care of the watershed.
3 This particular park is surrounded by
4 a lot of high-density, low-income housing. All
5 those parking lots have drained down into the
6 park. So they're building a big bioswale, and
7 they take that and duct it into a gravel bed that
8 actually augments the playground. It will be a
9 big boulder field for the kids to play on when
10 it's dry, and it helps act as an attachment that
11 can recharge the groundwater.
12 The other project was the County of
13 San Diego had a trash removal pilot project. I
14 think it was 12 sites, and they're -- they worked
15 with some of the other cities in the state to look
16 at some of the other projects that are going on to
17 remove trash from the storm water. In these 12
18 sites, they'll put a high-tech catchment down in
19 the storm drain catchment area to filter out
20 anything bigger than a cigarette butt, or
21 including a cigarette butt, I guess.
22 Then they'll pick that up and analyze
23 it, and they're going to match this with some
24 public outreach and education BMPs to look at --
25 and volunteer cleanups to see how do you decide

where to put these things, what are you catching, what are the big concerns, and how does this physical trap work compared to the other alternatives, which is volunteer cleanups and education.

That one was particularly of interest because the areas of interest are probably the most low-income high-density urban areas that the county's got responsibility for: out in Lakeside, Bostonia, and I don't remember; a couple other sites.

It's going to be an interesting project. It wasn't a whole lot of money but we would hope to expand there, and I think it's safe to say that the impetece behind that is the new State Board mandate on trash removal and going forward with the idea that will probably become incorporated in the MS4 at some future point.

So they're doing a pilot project that I think can be beneficial to all the cities in our area to look at methods of removing trash from the storm water.

San Diego state put in a request to -- for watershed restoration along Alvarado Creek adjacent to Interstate 8 and alongside the new

1 student housing areas in there. That's kind of a
2 bad area of the stream, so just the physical work
3 of clearing that out, removing some concrete and
4 invasive plants and improving that whole wetland
5 area and watershed is important from a flood
6 avoidance aspect, but the really cool part about
7 that project is Prop 1 has some serious mandates
8 in there that it's targeted for shovel-ready
9 dirt-moving projects, physical restoration
10 projects, and there's not a lot of allowance for
11 data collection and evaluations and studies of the
12 long-range effects. This particular project,
13 because it's sponsored by San Diego State, there's
14 a consortion of four or five professors and their
15 graduate students that doing water monitoring in
16 there, hydrology, absorption studies, bio
17 assessments, and I think they're already working
18 with Chad's team, if that's correct -- or we're
19 providing historical data in there.
20 So we should, in addition to fixing up
21 a bad part of that watershed, I think we're going
22 to gain a lot of data out of that and be useful in
23 evaluating and selecting future projects like
24 that.
25 The one thing at this -- going

1 forward, they've got the another half of that 3
2 million will probably come up in the next couple
3 months. One of those projects had to do with
4 irration in some of the urban ponds along the San
5 Diego river, to try to raise the DO levels. I had
6 previously asked that to be a future agenda item
7 and information item. I suggest we hold that in
8 abeyance a little bit until we see how this
9 project pans out. Maybe we can get a briefing on
10 what they're doing and how they expect it to work.
11 I want to tie that in with the rigging issue.
12 I've kind of segued into the next
13 agenda item. I'll leave it at that.
14 CHAIRMAN ABARBANEL: In a modest break
15 with tradition, the State Board has agreed to
16 consult with the regions on the disposition of the
17 resources that the State gives to the water boards
18 as a whole. And to discuss priorities, as seen by
19 the regions in consultation with the State Board.
20 That is going to happen three times in
21 three sessions during the coming year, 2016, and
22 the agreement was the chair and one other Board
23 member, as well as the executive officer, and, if
24 available, the assistant executive officer, be in
25 these discussions. We will have, in January, a

1 staff-and-Board-only discussion of how we will
2 present ourselves in that occasion. And we will
3 also have a public discussion of what is important
4 to the public that you would like us to bring
5 forward with discussion with the regions. That
6 will probably be in February.
7 Everything is open to discussion. I
8 have no idea what the experiment will result in,
9 but it's an opportunity for everybody, with
10 whatever views you hold on whatever issues are
11 important to you, to come forward and see what we
12 can do statewide.
13 In particular, cooperation with other
14 regions, I think, should be strongly encouraged.
15 We have many, many overlapping issues. Gary has
16 talked often about the homeless issue. It's a
17 complicated issue. It's not just the water
18 quality issue. It's an ethical issue. It's a
19 legal issue. We don't expect the State Board to
20 solve it. But the other regions, San Francisco
21 and L.A. in particular, probably have a much more
22 severe problem than we, so we'll talk to them
23 about a cooperative activity. There may be many,
24 many others. We don't in any way claim to have
25 figured them out yet.

1 Anyway, we're going to do that. I
2 think that's all I wanted to say for myself.
3 Dave, do you want to say anything more
4 about the executive officer's report?
5 EXECUTIVE OFFICER GIBSON: Thank you,
6 Mr. Chairman. I'd be very happy to. First of
7 all, are there any other questions on this month's
8 report? It is a rather extensive report.
9 Seeing none at this time, I have a
10 couple of updates for you. First of all, I'm
11 happy to announce that yesterday, the State Water
12 Resources Control Board did act on and approve the
13 basin plan amendment this Board adopted this year
14 for the on-site waste treatment system and
15 groundwater nitrate concentration water quality
16 objectives. That was approved. It's on its way
17 not to EPA and OAL. I think it will ultimately be
18 approved.
19 We have several new staff. Erica
20 Ryan.
21 Erica, will you please stand up.
22 Erica joins us as a water resource
23 control engineer, in the topic du jour. Welcome,
24 Erica. Baptism by fire, as they say -- or ice
25 water bucket, maybe.

We have two new scientific aids with us Anayeli Picasso and Kate Moore. I know Kate is at a class today.

Anayeli, are you here?

She's not here either. Probably hard at work, no doubt.

Today the Commissioner Drusina is convening with Commissioner Salmon at a Minute 320 Binational Corps Group, this afternoon, of course, from 2:00 to 5:00 p.m. If it pleases the Board, I will excuse myself at 1 o'clock to attend on its behalf on that work group to discuss how we're going to manage water quality, sediment and trash bi-nationally under that treaty. That runs today from 2:00 to 5:00 p.m., and I will update you periodically in the executive officer's report.

The operations plan and budget for our office for our next calendar year is under preparation, and I plan to bring that to you for discussion on the plan, the priorities, and indeed our budget, as we did this year, in February of next year.

Just a reminder, Item No. 10 on the San Ysidro point of entry wastewater treatment and reuse, we decided to have that with the recycled

1 wastewater item on December 16th at Padre Damn
2 Municipal Water District.
3 I'm very happy to also report, no
4 doubt you know, the City of San Diego approved the
5 significant rate increase, which is very important
6 for the recycled water efforts. So we will be
7 able to count on the City of San Diego to
8 participate in that very important discussion next
9 month.
10 That concludes my report unless there
11 are any follow-up questions.
12 Thank you very much.
13 CHAIRMAN ABARBANEL: Item 5 is the
14 opportunity for Board members to request or
15 suggest future agenda items. Gary is ahead of us
16 by an item or two.
17 Tom?
18 CHAIRMAN ABARBANEL: I have one, which
19 is kind of a recycled item. I'm pretty sure it
20 was in 2013 that the executive officer and Board
21 members made many visits to water districts,
22 municipalities, the three counties. I don't know
23 if we got to Riverside county.
24 BOARD MEMBER ANDERSON: We did indeed.
25 Mr. Strawn and I went several times.

1 CHAIRMAN ABARBANEL: Good. I would
2 like to suggest that we do that again in 2016.
3 It's been three years. We've had multiple very
4 significant permit modifications and new permits.
5 By the end of the day, we will
6 possibly -- I think it's time to go back and see
7 how things are going. I personally found those
8 visits to be very productive. And I had a sense
9 that the municipalities, surprised as they were
10 that we showed up on their doorstep, found it
11 productive.
12 EXECUTIVE OFFICER GIBSON: Yes,
13 indeed, Mr. Chairman, I agree. Debra Jane, our
14 outreach coordinator, and I are working up a plan
15 for next year for that. I am going to suggest
16 that we perhaps have several small group meetings
17 rather than individual meetings, as far as
18 practical for those, in Riverside and Orange
19 Counties to make use of our travel time and of
20 their time to be available. Small groups rather
21 than large groups and emphasis on discussion and
22 listening rather than lecturing.
23 CHAIRMAN ABARBANEL: That sounds like
24 a good start.
25 We're now going to move on to Item 6.

(2016 meeting schedule approved.)

CHAIRMAN ABARBANEL: We're going to move on to the consent calendar. I have a potential conflict of interest with Item No. 8. I'm going to turn it over to Vice Chair Strawn and step aside.

BOARD MEMBER STRAWN: First we ask if there's any comments from the Board about the consent item. If not, I would entertain a motion to approve the consent calendar.

BOARD MEMBER MORALES: I move that we approve the consent calendar for Items 7 through 9.

BOARD MEMBER STRAWN: We have a motion and a second.

MS. HAGAN: May I ask a question? Mr. Abarbanel, because you've stepped aside for Item 8, you're not participating in the vote for Items 7 or 9, either?

CHAIRMAN ABARBANEL: That is correct.

MS. HAGAN: Okay.

Ms. Warren?

BOARD MEMBER WARREN: Aye.

MS. HAGAN: Ms. Olson?

BOARD MEMBER OLSON: Aye.

MS. HAGAN: Mr. Anderson?

BOARD MEMBER ANDERSON: Aye.

MS. HAGAN: Mr. Morales?

BOARD MEMBER MORALES: Aye.

MS. HAGAN: Mr. Strawn?

BOARD MEMBER STRAWN: Aye.

MS. HAGAN: Chairman Abarbanel -- excuse me.

BOARD MEMBER STRAWN: Did you get your coffee, Mr. Chairman?

EXECUTIVE OFFICER GIBSON: Mr. Vice Chairman, if I could, I would like to thank and acknowledge the U.S. Navy for coming today and being prepared to engage on Item No. 9, had there been any discussion. And I'd like to observe this is a nice bookend in terms of our relationship with the Navy as to how this permit was handled in 2008 and where we got today. Their assistance was very much appreciated, as was the staff's preparation for this item today, which was not insignificant.

BOARD MEMBER STRAWN: Thank you. I'll

1 add it's good to see the Navy was here and
2 prepared, as usual. Thank you.
3 CHAIRMAN ABARBANEL: Okay. We'll now
4 move on to Item 11. As mentioned, Item 10 has
5 been postponed until next month.
6 I have a formal statement I will read:
7 Now is the time and place for a public hearing on
8 tentative order R92015-0100. If adopted, the
9 tentative order will amend Order NO. R92013 --
10 0001. The NPDES permit and waste discharge
11 requirements for discharges in municipal separate
12 storm sewer systems -- that's why we call them
13 "MS4" -- draining the watersheds within the San
14 Diego region, also known as Regional MS4.
15 The purpose of this hearing is for the
16 Board to hear testimony and comments about the
17 tentative order from staff, the co-electees and
18 their elected officials, the environmental
19 organizations, the building industry and other
20 interested persons.
21 At this time, I want to allow any
22 Board member to make any disclosures if they have
23 received any ex parte communications or disclose
24 if they have a conflict of interest.
25 BOARD MEMBER WARREN: Thank you. I

1 will not be participating in this matter based on
2 work that my firm conducts.
3 CHAIRMAN ABARBANEL: All right. I do
4 want to clarify, this is a tentative order to
5 amend the existing permit, the regional MS4
6 permit. The regional MS4 permit was adopted after
7 two days of public hearing with extensive public
8 comment and testimony. The Board also held a
9 public hearing in February of this year to amend
10 the regional MS4 permit to incorporate
11 Copermittees. For the most part, the parties have
12 incorporated their comments from the 2013 comments
13 into this action. And the staff prepared
14 responsive comments that also incorporate the
15 Board's 2013 responses.
16 Given that, I want to make sure people
17 know that comments and responses to comments from
18 the initial adoption of the regional MS4 permit
19 from 2013 and the February amendment from this
20 year are part of the record, and they don't have
21 to reargue all the points they made earlier to
22 make them part of the record.
23 Procedures will be the following: The
24 Board will conduct this hearing in a relatively
25 informal matter. We have received several

advanced requests for blocks of presentation time, which we plan to allow, and I will indicate at the end of this formal presentation today. Although, due to time constraints, we will not give Orange County Copermittees all of the time they requested, they will have time to address their issues.

We will consider requests for more time as the hearing moves forward. Interested persons will generally have three minutes each. As noted below, we have set a time for elected officials to speak. Do we have any elected officials that are here?

Then we will have a specific time for that. Elected officials wishing to address the Board, if so, at about 10 o'clock. It may happen before that. Please don't leave.

We also received a request from Orange County and Orange County Flood Control District to ask clarifying questions of staff. We will accommodate the request within their 30-minute block of time.

If other parties want to ask questions of staff or other parties, they may do so within their time of allotment. If any speaker wants to

1 reserve time for closing arguments or rebuttal,
2 they should indicate the request at the beginning
3 of their presentation.
4 As always, Board members and counsel
5 can ask questions at any time. Questions and
6 responses won't count against the speaker's time.
7 Finishing up the formal structure, if
8 you haven't already, all persons wishing to the
9 address the Board must full out a speaker card.
10 Either color?
11 We're colorblind as to the cards
12 today. Speaker cards are available on the table
13 at the back of the room. And as a reminder, if
14 you're using an electronic presentation, be sure
15 to give the board's executive assistant a copy so
16 it can be included in the record.
17 General order of presentations will be
18 as follows: The staff will begin in about 25
19 minutes.
20 Wayne, are you leading the staff
21 discussion?
22 MR. CHIU: I am.
23 CHAIRMAN ABARBANEL: As the EPA could
24 not attend today, a staff member will speak, in
25 effect, in their place. Elected officials will

1 get three minutes each, and then we will move on
2 to Riverside County Copermitees, then Orange
3 County Copermittees. The cities of Laguna Beach
4 and Dana Point will have 20 minutes out of the San
5 Diego County time, and San Diego County will have
6 10 minutes. The Building Association will have 15
7 minutes. The Coast Keeper and Coast Environmental
8 Rights Foundation, 30 minutes, and additional
9 interested persons not associated with any of the
10 organizations will have three minutes each after
11 about 1 o'clock.
12 Somewhere in there, we are likely to
13 need a lunch break, and at about 10:30 or so,
14 we'll also have a biological break.
15 MS. HAGAN: Mr. Chair, I want to
16 clarify. I may have misheard you. The San Diego
17 County Copermittees have 20 minutes. I think you
18 might have said 10.
19 CHAIRMAN ABARBANEL: I thought 10
20 minutes of their time went to Laguna Beach and
21 Dana Point.
22 MS. HAGAN: And then they have the
23 remaining 20.
24 CHAIRMAN ABARBANEL: All right.
25 Apologies to the County of San Diego.

1 Each person who was planning to
2 testify at this hearing will need to take the same
3 oath that you will take if you were in a court of
4 law.
5 Each person testifying shall begin by
6 stating his or her name and affiliation and that
7 they have taken the oath.
8 All persons who may testify at this
9 hearing, please stand and raise your right hand.
10 Do you swear that the testimony you
11 will provide is true and correct. If you do, say
12 "I do."
13 (Simultaneous I do.)
14 CHAIRMAN ABARBANEL: Thank you very
15 much. We actually don't have an option. Maybe we
16 should.
17 Okay. With all of that formal stuff
18 over, we will turn this over to staff who will
19 have approximately 25 minutes.
20 Please come in and have a seat. As
21 long as Wayne is standing there's at least one
22 seat.
23 MR. CHIU: Feel free to take my seat.
24 I'll leave the room after this.
25 BOARD MEMBER STRAWN: For your

1 information, I will have the time there.
2 MR. CHIU: You're only going to give
3 me only 25 minutes?
4 BOARD MEMBER STRAWN: I just want you
5 to be able to know how you're doing.
6 MR. CHIU: Okay.
7 Good morning, Chair Abarbanel, members
8 of the Board. My name is Wayne Chiu. I'm a water
9 resource control engineer in the storm water
10 management unit, and on the regional MS4 permit
11 team.
12 On the team with me are Christina
13 Arias -- she's not here right now. She'll come
14 back shortly. Our newest member, Erica Ryan, and,
15 of course, our supervisor, Laurie Walsh.
16 Today we bring to you for your
17 consideration, tentative order No. R9-2015-0100,
18 an order amending the regional MS4 permit to
19 incorporate the Riverside County Copermittees, and
20 the last piece in an effort that began in 2011 to
21 cover all the Copermittees in the San Diego region
22 under one MS4 permit.
23 At this time, I'd like to enter the
24 files into the record. Before I go over what
25 you'll be considering today, I'd like to go over

where we came from to get here.

To start, let's review what the regional MS4 permit is regulating. "MS4" is short for municipal separate storm sewer system. It's a mouthful. For most people, the only part of the MS4 they see are the roads, the curbs and gutters and the storm drain inlets. But the storm water and the liquids and materials that go into these storm drain inlets contain pollutants that discharge into creeks, streams and rivers. Those discharges can have a significant impact on the physical, biological and chemical integrity of those waters. Like the trash, that can have -- or an impact on the chemical and biological integrity of the water in the Tijuana River watershed or the impacts that hydro modification can have on these creeks in Temecula and Murrieta in Riverside County.

These creeks, streams and rivers convey and transport the pollutants to downstream water bodies like reservoirs, lakes, estuaries and the ocean. And those pollutants can also have a significant impact on the physical, biological and chemical integrity of the downstream water bodies, which impacts the quality of those downstream

1 waters for our use and the environment's health.
2 Now, because these pollutants in the
3 discharges from the MS4s are recognized as a
4 significant source of pollutants, the Federal
5 Clean Water Act requires that the discharges be
6 regulated under the National Pollutant Discharge
7 Elimination.
8 So MS4 discharges are regulated by an
9 NPS permit, and in California, the state water
10 board and regional water boards issue NPS permits
11 for MS4 discharges. In the San Diego region,
12 we've been issuing MS4 NPS permits since 1990.
13 So here's an overview of our region:
14 Our region consists of a large watershed that
15 drains the western part of San Diego county, the
16 southern part of Orange County and the
17 southwestern part of Riverside County. The areas
18 in yellow are areas with the highest
19 concentrations of developed areas and MS4s. Red
20 shows the water bodies that have been identified
21 as impaired by pollutants like bacteria, heavy
22 metals, pesticides and trash, among others.
23 As you can see, most of these impaired
24 water bodies are located within or downstream of
25 these developed areas, where there is the highest

1 concentration of MS4 discharges.
2 So there's a strong link between
3 discharges from the MS4s and the impaired water in
4 our region. The MS4 permitting program is one of
5 our most important regulatory programs to address
6 a significant source of pollutants causing our
7 contributing to these impairments.
8 Beginning in 1990, the San Diego Water
9 Board began issuing MS4 permits, which were based
10 on county and political boundaries. MS4 permits
11 are issued on five-year terms and are supposed to
12 be renewed every five years. The last MS4
13 permits, based on the political boundaries, were
14 the fourth term MS4 permits issued between 2007
15 and 2010.
16 After the renewal of the fourth term
17 Riverside County MS4 permit in November of 2010,
18 we are about to begin the cycle again with renewal
19 of the fifth term of San Diego County MS4 permits.
20 However, we decided at that time is was time to
21 try a new approach to regulating MS4 discharges
22 and water equality improvements faster.
23 Around the time the fourth term
24 Riverside County MS4 permit was being completed,
25 the San Diego Water Board staff started forming

its practical vision. During the formation of our practical vision, as an organization, we realized we were only focused on the work we were doing today, like the numbers of inspections we had to do, the numbers of reports we had to review or the number of permits we had to issue, but not really knowing if those actions were going to result in improvements to water quality.

So our practical vision focuses our work on water outcomes. We want to achieve through our actions. We want to utilize our resources in the best way possible to improve water quality where it's needed most. We want all the monitoring in our region to be coordinated to allow us to better assess the conditions in our receiving waters, in the most cost-effect possible way for us. We want to recover lost and degraded streams, wetlands and riparian habitats. We want sustainable local water supply, and we want to reach out and better communicate with public about the water quality in our regions so people understand improving water quality improves our future. We believe if we can achieve these outcomes, we will have healthy waters and healthy people.

1 So while we were forming that
2 practical vision, we began the process of
3 developing the regional MS4 permit. The regional
4 MS4 permit is the embodiment of our practical
5 vision. We shifted the MS4 paradigm from
6 requiring implementation of actions like minimum
7 numbers of inspections and miles of streets swept.
8 On a jurisdictional scale, to
9 prioritize water quality conditions of concern,
10 require the coordination and implementation
11 strategies on a watershed scale to achieve
12 outcomes that will improve water quality. By
13 threat to obtain areas that are sources of
14 pollutants with BMPs that can remove those
15 pollutants before they get in our waters or
16 restoring and rehabilitating channels and
17 habitats, or implementing projects that can
18 capture storm water to be used as a local water
19 supply resource.
20 And finally, the watershed base
21 monitoring assessment program to determine if the
22 strategies are working to improve water quality
23 over time. This paradigm shift was supported by
24 San Diego County, Orange County and Riverside
25 County Copermittees, as well as the environmental

1 counsel.

2 To transition from regulating MS4

3 discharges primarily on a jurisdictional scale,

4 under three separate MS4 permits based on county

5 and political boundaries, we began the paradigm

6 shift in May 2013, we got another regional MS4

7 permit, which superceded the fourth term San Diego

8 County MS4 permit.

9 Next, the Board amended the regional

10 MS4 permit in February of this year to the extend

11 coverage to the Orange County Copermittees and

12 superceded their regional MS4 permit. Today,

13 we're proposing to amend the MS4 permit to extend

14 coverage to the Riverside County Copermittees and

15 supercede their fourth term MS4 permit and

16 complete the process of having one MS4 discharges

17 in the San Diego region.

18 This is a portion of Riverside county

19 and the San Diego region that will be covered by

20 the MS4 permit if you adopt the tentative order

21 today. This map is provided, Supporting Document

22 No. 2, in your agenda package.

23 There are four incorporated cities in

24 Riverside County with all or part of their

25 boundaries within the San Diego region: Temecula,

1 Murrieta, Wildomar and Menifee.
2 The remaining area in blue is the
3 unincorporated area in our region. And the creeks
4 shown in that dark blue area are operated and
5 maintained by the Riverside County Flood Control
6 and Water Conservation District.
7 The cities of Wildomar, Murrieta and
8 Menifee also have parts of their jurisdictions in
9 the Santa Ana region, regulated by our neighboring
10 water boards to the north.
11 During the development of the fourth
12 term MS4 permit, the San Diego Water Board and the
13 Santa Ana Water Board entered into an agreement to
14 have a single water board regulate the MS4
15 discharges in the cities. So the tentative order
16 will continue that agreement for the cities of
17 Murrieta and Wildomar to be regulated by the San
18 Diego Water Board, and for the city of Menifee to
19 be regulated by the Santa Ana Water Board. So
20 this is the part of the Menifee that will be
21 regulated by the Santa Ana region, and these are
22 the parts that will be regulated by San Diego
23 Water Board.
24 At the Orange County amendment
25 adoption hearing in February, the Board requested

1 we investigate two issues and consider including
2 them as amendments to the regional MS4 permit
3 during the proceedings to extend coverage to the
4 Riverside County Copermittees.
5 The first issue was language that will
6 define when a development project will be subject
7 to the development planning requirements for the
8 regional MS4 permit or the fourth term MS4
9 permits, known as prior lawful approval language.
10 The second issue was including an
11 alternative compliance pathway option that a
12 Copermittee could implement to be deemed in
13 compliance with water prohibitions and limitations
14 in the permit, even if they are actually not in
15 compliance. We held three workshops to discuss
16 these issues of key stakeholders, the
17 Copermittees, the environmental community and the
18 development community.
19 Board Member Olson attended the
20 workshop in April. Board Member Morales attended
21 the workshop in May, and in June, we provided a
22 final draft for the proposed amendments to the
23 stakeholders.
24 In May, the Riverside County
25 Copermittees submitted their reported waste

1 discharge to apply for renewal of their fourth
2 term MS4 permit. We released the tentative order
3 on July 31st for public comment, and that
4 tentative order and attachments are included as
5 supporting Document 1 in your agenda package.
6 The comment period closed September 14
7 for a 40 day comment period. We received 18
8 comment letters before the end of the comment
9 period, included as supporting document three in
10 your agenda package, and one late comment letter
11 which we provided in your supplemental package as
12 supporting document 11. We released a response to
13 comments report and errata sheet on November four,
14 included as supporting documents four and five in
15 your agenda package, and we released a revised
16 responses to comments report and revised errata
17 sheet on November 10 provided in your supplemental
18 agenda package as supporting documents 12 and 13.
19 Today we are ready for you to consider
20 options of the tentative order. When we released
21 the tentative order in July, the proposed
22 amendments to the MS4 permit can be categorized in
23 five areas. The primary reason for the tentative
24 order was to amend the regional MS4 permits to
25 include the Riverside County Copermittees as well

1 as continuing the agreement to allow the cities of
2 measure yet, which will do mar and men fee to be
3 regulated by one single water board. The
4 tentative order also proposes to include the prior
5 lawful approval language and alternative
6 compliance pathway option, developed as a result
7 of the public workshops we conducted, and I'll
8 discuss those in a little more detail, and finally
9 we amendment to see make corrections updates and
10 clarifications in the permit, which I'll summarize
11 later for you.
12 So let's start with the prior lawful
13 approval language. This language was requested by
14 the San Diego Copermittees and the development
15 community. We discussed this topic at length it
16 at the public workshops everyone freeze the permit
17 language should provide a clear understanding for
18 when a development project should be subject to
19 the development requirements of the regional MS4
20 permit. The project that meets the conditions of
21 prior lawful approval would not be subject to the
22 conditions of the regional MS4 permit but would be
23 allowed to implement the development requirements
24 of the fourth term MS4 permit.
25 After we released the tentative order

1 in July, we received two comment letters about
2 this issue. The City of San Diego supported
3 inclusion of the language but requested a
4 significant change that would remove the
5 requirement for the commencement of construction
6 activities as a condition for a project to have
7 prior lawful approval.
8 San Diego Coast Keeper and the Coastal
9 Environmental Rights Foundation expressed some
10 reservations with the language, and they also
11 requested some significant changes which would
12 remove prior lawful approval for projects that had
13 not begun construction activities -- or have --
14 for projects that have begun construction
15 activities after the effective date of the BMP
16 design manual and also require a development
17 project to have all approvals and permits in hand
18 to complete a project prior to the effective date.
19 We doesn't receive any comments from the
20 development community on this.
21 After carefully considering the
22 comments, we decided the conditions for the
23 project to have prior lawful approval developed
24 from the public workshops were reasonable and the
25 language was clear and easy to enforce, so we

1 didn't make any changes
2 Next I'll cover the proposed
3 alternative compliance pathway options. This
4 issue is related to an optional compliance pathway
5 that would allow a key to be deemed in compliance
6 with the receiving water prohibitions and
7 limitations of the permit. This is not part of
8 the offsite alternative compliance program that is
9 applicable to development projects; it's part of a
10 completely different discussion. Now, at this
11 point in time the Copermittees are not in
12 compliance with the receiving water prohibitions
13 and limitations and the or at least nobody thinks
14 they are. San Diego County, Riverside County and
15 Orange County Copermittees have repeatedly
16 requested the inclusion of an alternative
17 compliance pathway option they can implement to be
18 deemed in compliance of the receiving water
19 prohibitions and limitations. And even if they
20 are actually not in compliance with those
21 prohibitions and limitations. In contrast, the
22 the environmental community strongly opposes the
23 alternative compliance pathway because their
24 concern that it removes the potential for
25 enforcement for existing violations of receiving

1 water prohibitions. The version of the
2 alternative compliance pathway was considered by
3 this board at the may 2013 regional MS4 permit
4 adoption hearing. At the Orange County adoption
5 hearing, amendment adoption hearing, the board was
6 very interested in adding the optional compliance
7 pathway to the permit but agreed the issue
8 required additional discussion before it could be
9 included, so we thoroughly discussed topic at the
10 public workshops held in April, May and June of
11 this year with the Copermittees and the
12 environmental community.
13 At the workshops, the discussions
14 began based on the version of the optional
15 compliance pathway that was considered in May
16 2013. At the workshop, the Copermittees strongly
17 supported incorporating the optional compliance
18 pathway, but also wanted compliance during the
19 pathway process as well as more language that
20 would clearly state they were in compliance with
21 receiving water prohibitions and limitations.
22 At the workshop, the environmental
23 community was strongly opposed to putting the
24 optional compliance pathway in the permit, but for
25 discussion, if it had to be included, they wanted

1 provisions that clearly specified when a
2 Copermittee was no longer in compliance and they
3 were strongly opposed to the pathway preparation
4 process because they believe that compliance
5 during the preparation process would remove the
6 intention to propose a rigorous and comprehensive
7 alternative optional compliance pathway.
8 Based on the information we received
9 at the workshops, we chose to include the optional
10 compliance pathway into the regional MS4 permit
11 but not to include compliance during the
12 preparation process. As it so happens, on June
13 15th, the state water board adopted an order,
14 2015-00075, a presidential order which directs all
15 the regional water boards to consider including an
16 optional compliance pathway in all MS4 permits
17 going forward.
18 Now, if a regional water board chooses
19 not to include an optional compliance pathway,
20 then they would have to provide findings in the
21 permit that support not including it. If a
22 regional water board chooses to include an
23 optional compliance pathway in the permit, then
24 the optional compliance pathway is expected
25 incorporate certain principals in the order.

1 Fortunately the requirements of the regional MS4
2 permit and the optional compliance pathway option
3 we developed as a result of those public workshops
4 are consistent with the state water board's order
5 and incorporates the seven principals. The fact
6 sheet, which is attachment two to the tentative
7 order provided as supporting document one in your
8 agenda package have the requirements of the
9 regional MS4 permit and the optional compliance
10 pathway that incorporated seven principles of the
11 state water board's order starting on page F60 on
12 the fact sheet.
13 On this topic we received the most
14 written comments. We received comments from the
15 San Diego county, Orange County and Riverside
16 County Copermittees as groups as well as from
17 several individual Copermittees. The Copermittees
18 requested several modifications that, generally,
19 from our point of view, affect the rigor and
20 transparency of the alternative compliance pathway
21 options and would make the conditions much easier
22 to be able to have the privilege of being deemed
23 in compliance with the receiving water
24 prohibitions and limitations.
25 In particular, the Copermittees

1 requested a reduction in the number of milestones
2 that were required to be proposed for the
3 alternative compliance pathway schedules from one
4 milestone per year until a numeric goal is
5 achieved to just one or two milestones in a
6 five-year permit term. And they requested
7 language that would deem them to be in compliance
8 during the pathway preparation process.
9 The environmental community, again,
10 objected to the inclusion of the alternative
11 compliance pathway and asserted there were several
12 legal issues as well as the inconsistencies with
13 the state water board order that justified the
14 removal of the alternative compliance pathway
15 option from the regional MS4 permit.
16 There were no comments from the
17 development community.
18 So after carefully considering the
19 comments, they made a few minor modifications to
20 the alternative compliance pathway, but the most
21 significant change was reducing the number of
22 annual milestones required to be included in the
23 alternative compliance pathway schedules from one
24 milestone per year until a final numeric goal was
25 achieved, which we agreed was difficult to project

1 for 10 or 20 years, to just having five annual
2 milestones per permit term, to be revised and
3 updated with each permit term.
4 Now, the tentative order also includes
5 several amendments, corrections, updates, and
6 clarifications to the permit language.
7 CHAIRMAN ABARBANEL: Will you review
8 as well as you can the thought process of the
9 State Board in requiring alternative compliance
10 pathways?
11 MR. CHIU: Well, okay. The State
12 Board's order doesn't actually require us to have
13 an alternative compliance pathway. It requires
14 that we consider including an alternative
15 compliance pathway into the permit. Now, it is a
16 very strong encouragement that we include it in
17 the permit, and that's why, if we don't include it
18 in the permit, we have to provide good reason for
19 not including it in the permit. That's why we
20 have to provide findings in the permit that say
21 this is why we are not including it in the permit.
22 Now, on the flip side, for reasons
23 including it in the permit, I think they --
24 there's a recognition that -- it's unlikely that
25 the dischargers are going to be able to achieve

1 within our limitations within a five-year period,
2 and there's a recognition that it's probably going
3 to take multiple permit terms in order to get to
4 that end point.
5 But, you know, I think they wanted to
6 have some fairly rigorous and controlled process
7 in which the regional boards can oversee
8 implementation of some sort of process that will
9 provide some assurance that we can achieve those
10 limitations within a limited period of time, not
11 an unknown period of time.
12 EXECUTIVE OFFICER GIBSON: Mr. Chair,
13 if I could also offer a point of view another way
14 of looking, I think, at the state board's approach
15 at this is putting some meat on the bones of the
16 process the State Board set out in 1998 and 1999
17 for achieving water quality objectives through the
18 municipal separate storm sewer system permits and
19 program. That process was open-ended. It had not
20 been exactly clear the across the spectrum of the
21 environmental advocates and municipalities exactly
22 how the process was to be structured, where it
23 starts and stops, et cetera. Our approach in this
24 region permit is for that order and the order
25 itself I believe is to put structure to that

1 iterative process and to identify a particular
2 target or goals and achieve those.
3 In this case, with the alternative
4 compliance, we would be looking at all of the
5 outstanding water quality objectives that are not
6 being met that we have impaired water bodies for.
7 It's an option. Not every watershed or
8 municipality may take that approach, but that is
9 the basis for the State Board's approach in the
10 regional permit itself.
11 CHAIRMAN ABARBANEL: What are the
12 impediments for achieving those water quality
13 objectives in a five-year period?
14 EXECUTIVE OFFICER GIBSON: Mr.
15 Chairman, I think you will hear there are many
16 reasons why those are hard impediments. Number
17 one will be cost.
18 CHAIRMAN ABARBANEL: So there's no --
19 it doesn't violate the laws of physics?
20 EXECUTIVE OFFICER GIBSON: Not being a
21 physicist --
22 CHAIRMAN ABARBANEL: They don't have
23 to invent new physical laws in order to make
24 miracles happen. It's a matter of implementing
25 what they know how to do?

EXECUTIVE OFFICER GIBSON: It is a question of technology and function.

BOARD MEMBER MORALES: Maybe to put it in different terms, it's not a matter of impossibility, it's impracticability.

EXECUTIVE OFFICER GIBSON: I am nodding my head in agreement.

CHAIRMAN ABARBANEL: Well, you mentioned technology. If we are unable to implement something that remediates the water quality issue, then it doesn't matter how much money we spend on it, it's not possible. It may be possible in 50 years with different equipment, I don't know. Is that a kind of technical issue?

EXECUTIVE OFFICER GIBSON: I think that's pushing it out to the edge of the envelope, Mr. Chairman. I do think it's practical for us to achieve our water quality objectives. In some cases you may want to consider how those objectives have been set historically in the basin plan, and our permitting approach allows us and the Copermittees to address that question while working on the attainable goals.

The alternative compliance is an option wherein, perhaps, a particular watershed or

with a particular storm water Copermittee, we might actually be able to define the process for getting there, know we've gotten there, and be able to do so in such a way as to merit the significant increase of the costs among one or more Copermittees to achieve that.

And as a evaluation or approach for that, municipalities would like to see some assurance that they would not be held in violation of water quality objectives while they are undertaking that effort both in terms of the implementation of the plan, which will certainly take many years in some cases, and the development of that plan, as you will hear testimony today, what they want in terms of assurances on those.

I will simply point out in summation that this issue has been with us for over 25 years. The federal regulations were issued in 1990, and if there was any ambiguity about the obligation to comply with water quality objectives, those were erased in late 1990s, certainly with state board's order of 9801 to 9805.

Going forward, we have significantly improved our capacity to manage our storm water

1 systems, far above and beyond what they were 15
2 years ago. It's now taking those tools and
3 applying them in the watershed and obtaining those
4 goals we are here to talk about today again.
5 Moving forward with that in a
6 practical way is our next step, whether or not the
7 Board considers the alternative compliance, you
8 have significant testimony on that, and I will be
9 glad to provide a recommendation during the course
10 of the day, but I'd invite you to hear the
11 testimony first.
12 CHAIRMAN ABARBANEL: I have one more
13 question.
14 EXECUTIVE OFFICER GIBSON: I hope that
15 I am not stealing Mr. Chiu's thunder for the rest
16 of his presentation.
17 CHAIRMAN ABARBANEL: Repetition will
18 not be harmful.
19 In assessing costs of achieving the
20 water quality, is the benefit of having achieved
21 it republic in many dimensions, including health
22 accounted for.
23 EXECUTIVE OFFICER GIBSON: At the
24 present time, I'm going to say that is an
25 imperfect science an incomplete science.

CHAIRMAN ABARBANEL: So I'll take that as a no.

BOARD MEMBER OLSON: I'd like to ask you, in terms of these milestones, how prescriptive are they?

MR. CHIU: Certainly. The way it's laid out in the permit, a milestone can be almost anything. It's just a way to mark progress. So it could be as simple as saying we need to develop some sort of program. As part of that program, we need to have, you know, a plan developed by such-and-such time.

It could consist of some sort of numeric interim goal for the final goal. It could be implementation of a certain number of BMPs by a certain date.

BOARD MEMBER OLSON: Can it be part of a program that has alternatives?

MR. CHIU: The milestones are simply a way for us and the public to be able to see what the Copermittees are proposing to implement, if they implement it within the time period they have proposed, and then if that implementation is going to move the needle towards achieving the final goal.

1 BOARD MEMBER OLSON: Well, if you try
2 something, and it doesn't work, then is that
3 allowable, or do you try things that you're
4 guaranteed a success?
5 MR. CHIU: With the water quality
6 improvement plan, there is an aspect to have
7 adaptive management. If things change, you have
8 the ability to adaptively manage the program and
9 your milestones. That's why we changed the
10 milestones from, you know, one milestone per every
11 year until you achieve your goal, which, like I
12 said, 20 years down, you have 20 annual milestones
13 for one goal, it could get a little bit hard to
14 project 20 years out.
15 So we reduced it down to a five-year
16 period, which, then every five years, they
17 re-evaluate their milestones and then project the
18 milestones they plan to achieve within the next
19 five-year period.
20 BOARD MEMBER OLSON: If I understood
21 your language, they still need a milestone a year?
22 MR. CHIU: Correct.
23 BOARD MEMBER OLSON: So it's 20 in a
24 20-year period?
25 MR. CHIU: No, five. They only have

1 to propose five that they will try to achieve.
2 BOARD MEMBER OLSON: Five milestones?
3 MR. CHIU: Within a permit term.
4 BOARD MEMBER OLSON: So there's one
5 milestone per five years?
6 MR. CHIU: No, there's five milestones
7 per five years.
8 BOARD MEMBER OLSON: I'm confused.
9 Maybe you can repeat it one more time.
10 MR. CHIU: Initially, the language says
11 you must have an annual milestone for each annual
12 period until you achieve your numeric goal, and
13 you set up a numeric goal that you plan on
14 achieving, say, 25 years from now, you would have
15 to have 25 annual milestones. Now, what we
16 changed it to is instead of saying you have to
17 have 25 annual milestones, you have to have five
18 annual milestones and that final goal.
19 BOARD MEMBER OLSON: So you still have
20 to have -- I don't see what the difference is.
21 MR. CHIU: You start out with five, and
22 then as you learn something during those five,
23 when you submit your next five with your report of
24 waste discharge, you have learned something with
25 the first five, hopefully, and then you can

1 project your next five.
2 BOARD MEMBER OLSON: But you still
3 require the same number of milestones. What
4 you're saying is different in that you don't have
5 to lay out all 25 milestones.
6 MR. CHIU: Correct.
7 BOARD MEMBER OLSON: So -- I'm
8 struggling with this. So we are learning as we
9 go. So we have more knowledge at the end of five
10 years.
11 MR. CHIU: Hopefully.
12 BOARD MEMBER OLSON: Hopefully. So it
13 may be just as difficult to obtain an objective
14 after five years even with more knowledge, we may
15 realize there is more natural influence, and there
16 may be issues that we find out, too.
17 So what is the advantage -- I mean, I
18 can understand, but you could have three
19 milestones for five years. I'm not quite sure
20 exactly what the difference is except you think if
21 you have one milestone every two years, people
22 will not be working toward that milestone?
23 MR. CHIU: Well, I think, you know,
24 most of our permits -- I should say, the regional
25 permit has an annual reporting cycle, and I think

1 when it comes to showing progress, they want to
2 have something each year to show the Copermittee
3 or Copermittees as a group are implementing things
4 that are progress. That's why there is some
5 flexibility in what those annual milestones can
6 be, because we understand that implementing some
7 of these projects can take some time. But that
8 doesn't mean that, you know, we should wait five
9 years to hear whether or not it was completed.
10 There are interim steps in any project, so we
11 would like to see that there are ways to see how
12 things are moving along.
13 BOARD MEMBER OLSON: We all agree the
14 most important outcome is to achieve the
15 objective.
16 MR. CHIU: I agree.
17 BOARD MEMBER OLSON: And I want to
18 make sure that what we do doesn't become over
19 burdensome because you would like, and I would
20 like, and I believe the public would like money
21 spent to review the problems, and not hiring a
22 consultant to write a report that you have to --
23 MR. CHIU: I agree with that. That
24 speaks to the permit that we have tried to change
25 relative to previous permits. We have one annual

1 report per year now for the entire watershed
2 versus, you know, 50 annual reports that we had
3 the previous permits. So we reduced the amount of
4 paperwork that is necessary in order to record
5 everything.
6 BOARD MEMBER OLSON: Didn't you just
7 make a larger report? So in that report, you get
8 one big report instead of 60 little reports?
9 MR. CHIU: I would say we reduced the
10 areas that are unnecessary and increased the areas
11 that are necessary. So what we had in the past
12 was a lot of reports that were provided, a lot of
13 unnecessary information that was very difficult to
14 boil down into useful information. What we've
15 done with the reports now is we've reduced a lot
16 of the jurisdictional reporting requirements such
17 as a set of numbers and focused a lot of the
18 reporting on the monitoring data that is collected
19 and how the information from those assessments can
20 be used to improve the jurisdictional programs and
21 the strategies that are being implemented.
22 In the past we had a lot of
23 monitoring, but it wasn't really connected to the
24 programs and outcomes, and the programs and
25 outcomes were reporting a lot of the action they

1 were implementing without seeing how they would
2 improve water quality or contribute towards the
3 improvement of water quality.
4 We try to strike a balance between
5 what's necessary to report and what's unnecessary.
6 BOARD MEMBER OLSON: And we'll be
7 evaluating ourselves during this period?
8 MR. CHIU: Absolutely. This whole
9 process is intended to get everybody involved on
10 trying to achieve outcomes, not just the
11 dischargers, but us as well. We have to figure
12 out how to make our programs more effective, how
13 to make the permit more effective, because we have
14 permits in the past that, while they did move the
15 needle a little bit to improve water quality, it's
16 really hard for us to tell how or where they
17 improved or what actually did the improvements.
18 With what we've done with this permit, we've
19 really tried to change it so that we can figure
20 out what is working and what is not working, and
21 where things work, expand on that, where things
22 don't work, let's decrease that. It's trying to
23 maximize the efficiency that we all want with our
24 resources and our time. That's really what we're
25 trying to do with this permit.

1 The milestones are part of that. It's
2 hard to track how things are moving if you don't
3 have a way to track. That's partially why we
4 recognize that 25 years of milestones all upfront
5 is difficult. So let's break it down into smaller
6 chunks that are a little more manageable, but
7 let's really use that to think about how that can
8 help us in the future. That's why it's a
9 five-year process can spring from.
10
11 BOARD MEMBER MORALES: Staff, anybody
12 out in the audience, feel free to correct me if
13 you think I'm wrong, but in terms of what may have
14 been going through the State Board's head, I
15 wasn't in there, but as I see it, what they may
16 have been thinking is "Regional boards, we are not
17 going to micromanage you. An alternative
18 compliance pathway is something that you don't
19 have to have, but if you do not, it's incumbent
20 upon you to explain to us why you didn't include
21 one. We're not going to give you the benefit of
22 the doubt.
23 "On the other hand, if you get people
24 together and you adopt an alternative compliance
25 pathway, we'll give the benefit of the doubt."

1 That's kind of what I took from it.
2 So if anybody disagrees with that, please tell me
3 when you all speak.
4 MR. CHIU: I'll agree with you.
5 BOARD MEMBER STRAWN: I stopped the
6 clock when they started asking questions.
7 MR. CHIU: Thank you.
8 CHAIRMAN ABARBANEL: The Copermittees
9 that are going to be speaking later, I'm going to
10 ask you -- you heard staff's intentions of
11 reducing the paperwork load and making the
12 reporting more meaningful -- is that a good way to
13 describe it?
14 I would be very interested in hearing
15 your comment to that, specifically what you think
16 we put here, what we're putting together is going
17 to, in fact, reduce your paperwork load, or are we
18 still dumping some rather useless requirements
19 onto you?
20 We're not trying to kill trees or burn
21 up ink here. So please let us know your honest
22 belief on how we're doing. I think the proper
23 goal that Wayne stressed, let us know if we're
24 going in the right direction.
25 MR. CHIU: Can I make a comment on

1 that particular aspect?

2 At least for the last two years, we've

3 had these transitional jurisdictional runoff

4 management program annual reports. In the past,

5 we used to get 20 binders about that this thick

6 that we would have a hard time really

7 understanding what's in there. And now each

8 Copermittee has provided to us a two-page annual

9 report.

10 Going into the future -- we've also

11 been receiving their monitoring reports for the

12 watershed. And where we had one monitoring report

13 for the entire region, we now have eight

14 monitoring reports that are broken up by

15 watershed. So it's a little more watershed

16 specific. Like I said, we've increased some

17 reporting but decreased some reporting, as well.

18 CHAIRMAN ABARBANEL: It appears to me

19 you have about three minutes left.

20 MR. CHIU: That should be plenty.

21 BOARD MEMBER STRAWN: Take what you

22 need up to three minutes.

23 MR. CHIU: I will. I think I should

24 get three minutes and 14 seconds.

25 CHAIRMAN ABARBANEL: Take three

1 minutes and fifteen seconds.

2 MR. CHIU: Thank you for your

3 generosity.

4 BOARD MEMBER STRAWN: You're welcome.

5 MR. CHIU: The amendments included

6 several corrections, updates and clarifications to

7 the permit language. I'll summarize those for

8 you.

9 The amendments included revisions to

10 the requirements for two TMDLs in the permit. We

11 identified an inadvertent omission of an option to

12 develop a bacterial load reduction plan instead of

13 a comprehensive load reduction plan for the

14 beaches and creeks bacteria TMDLs. So we

15 corrected those TMDL requirements to allow for

16 bacteria load reduction plan to be developed. And

17 then we added some language to the Los Penasquitos

18 lagoon present TMDLs to help compliance.

19 We also amended the permit to update

20 the requirements for non-storm-water discharges to

21 reference a recently-adopted State Water Board

22 permit which regulates discharges from water line

23 flushing and water main breaks, and then, also,

24 change a reference to a San Diego Water Board

25 permit to a more recently adopted permit for

1 discharges for groundwater extraction.
2 And then we also added some language
3 to the fact sheet and response to comment to
4 clarify that if a Copermittee is in compliance
5 with the elicit discharge, detection and
6 elimination requirements, then the Copermittee
7 would be deemed in compliance with the effective
8 prohibition of non-storm-water discharges to the
9 MS4.
10 Finally, we will made a few amendments
11 to the development and planning requirements.
12 After the amendment to incorporate the Orange
13 County Copermittees into the MS4 permit, we
14 identified an inconsistency in the definition of
15 priority development projects compared to the
16 fourth term Orange County and Riverside County MS4
17 permits. So we corrected the definition to be
18 consistent with those previous definitions.
19 And as a result of those corrections,
20 we needed to include some clarifications on how a
21 Copermittee was expected to update their BMP
22 design manual with the corrected definitions.
23 After reviewing the written comments we received,
24 we decided a few initial revisions were warranted,
25 including language to clarify the effective date

of the BMP design manual and the definitions of construction activities and redevelopment. So those revisions we made in response to the comments, along with the other revisions made to the tentative order included in your revised errata sheet provided in Supporting Document 13.

So to conclude, we recommend that you adopt Tentative Order R9-2015-0100 with the revised errata and Supporting Document 13 of the MS4 permit to incorporate the Riverside County Copermittees, as well as incorporate the prior lawful approval language and the alternative compliance pathway option.

BOARD MEMBER STRAWN: 26 seconds.

MR. CHIU: I'm available to answer any questions you may have now.

BOARD MEMBER MORALES: No.

CHAIRMAN ABARBANEL: Thanks to Mr. Chiu and staff for all of their hard work. I really hope that the public -- I know a lot of you that were part of the process will understand what they've done. It's a lot of work that went into this. A lot of effort.

MR. CHIU: Thank you.

Christina is going to read into the

1 record a statement from the EPA.
2 CHAIRMAN ABARBANEL: In a second.
3 Because of the time, and the mission of the Water
4 Board, physical, chemical, and biological
5 improvements, I'm going to declare a seven-minute
6 physical, chemical and biological break, after
7 which we will hear from elected officials and
8 Christina. Thank you.
9 (Recess taken.)
10 CHAIRMAN ABARBANEL: Are there any
11 elected officials who wish to speak to the
12 information discussion of Item 11?
13 BOARD MEMBER STRAWN: We have two
14 cards. Mr. Olvera, Mayor of Dana Point.
15 MR. OLVERA: Thank you very much.
16 Good morning. Carlos Olvera, Mayor of the City of
17 Dana Point, registered mechanical engineer with
18 the state of California.
19 We are trying to solve a problem, all
20 of us going in the same direction. I would ask
21 you not to give me a box wrench that you do not
22 know the size of the nut that has to be turned.
23 If you give me an adjustable wrench, I can use
24 that and get the job done. So give me the tools
25 that I can do and accomplish the job you want me

to do.

Thank you very much.

BOARD MEMBER STRAWN: Mr. Green.

MR. GREEN: South Coast Water District, Bill Green.

BOARD MEMBER STRAWN: I recognize that face.

MR. GREEN: Good morning, honorable Board. It's good to be here once again.

As a resident of Dana Point, we live in very water-conscious community, and we focus and pride ourselves on water quality. To remind the Board, I started surfing over 50 years ago. I love clean water.

However, I have five unique dimensional perspectives on water quality in California. The first is, my vantage point was from your position. As the governors of the appointed water quality member of this Board, serving with Gary and Eric to establish just policies for the citizens of California.

My perspective has also been when the USA EPA dictates to the state, CAL EPA lawyers interprets them and renders opinions to the regional staff, and the regional staff further

1 finds and recommends and interprets to your view
2 of the body to set policy and water quality
3 issues.
4 However, not all regions are setting
5 like policies. If not, why not are all regions
6 not the same in one state? Perhaps all counties
7 are not the same, as well, in one region. No
8 matter, it is a difficult question and a complex
9 answer.
10 As a second dimension, as a
11 supervisorial appointed commissioner to the
12 Riverside County Flood and Water Conservation
13 District, I have the privilege of implementing
14 policies and mandates and/or CIP programs.
15 As a third dimension, being an elected
16 official for the South Coast Water District by the
17 people representing them, and having to explain
18 why their taxes and fees are increasing as a
19 result of those mandates.
20 Four, as a state president for the
21 American Counsel of Engineering Companies, working
22 with the State Water Board to develop water
23 quality certifications for professional engineers.
24 My fifth dimension of water quality is
25 33 years as an avocado farmer, a member of the

1 Riverside County Farm Bureau, and a member of the
2 San Bernardino Irrigated Land where I personally
3 managed BMPs and do reports.
4 As a coastal community and entity of
5 the water district, water quality is our top
6 priority. Many beach cities work together to
7 implement water quality. Clean beaches mean happy
8 visitors to our community; therefore, we are
9 motivated to keep our constituents satisfied.
10 The South Coast Water District has
11 reduced water usage by 30 percent this summer,
12 well above the 20 percent target mandated by the
13 state. Aggressive sewer line inspections, as a
14 result of numerous sewer line (inaudible) have
15 included the state park at Doheny and the Dana
16 Point Harbor. We've done our fair share in our
17 community to preserve water quality.
18 Thank you very much for your time.
19 BOARD MEMBER STRAWN: Do we have any
20 other elected officials that I missed cards to?
21 Thank you. We'll go to San Diego
22 County.
23 CHAIRMAN ABARBANEL: No, we're going to
24 hear from Christina appearing for the EPA.
25 MS. ARIAS: Good morning, members of

1 the Board. My name is Christina Arias. I
2 actually stepped out of the room when you were
3 issuing the oath, so I believe I need to take the
4 oath.
5 CHAIRMAN ABARBANEL: Do you swear the
6 testimony you provide is true and correct. If so,
7 say "I do."
8 MS. ARIAS: I do.
9 We've been in contact with U.S. EPA
10 region 9 over the last several weeks, and,
11 specifically, David Smith has sent his regrets
12 he's not able to be here today, but he did ask us
13 to share some thoughts for you to consider.
14 There's two main items.
15 Number one, alternative compliance
16 pathway. Consistent with our prior comments on
17 proposed MS4 permits developed by the San Diego,
18 Los Angeles and Santa Ana region, EPA strongly
19 supports the proposed provision that permittees
20 would not be considered in compliance with the
21 water quality improvement plan provisions prior to
22 plan approval. Prior to a determination by the
23 regional board that the submitted plan contains
24 specific implementation commitments that are
25 sufficient to provide reasonable assurance that

1 TMDL and other relevant water quality based
2 requirements will be met. There is insufficient
3 basis to conclude that the permittees are or will
4 be in compliance.
5 Number two, this has to do with
6 clarifying expectations for the analysis and
7 planning under the alternative compliance pathway.
8 The proposed permit modifications include
9 additional language recognizing the availability
10 of an alternative compliance pathway based on
11 reasonable assurance analysis but provide only
12 limited direction concerning the regional board's
13 technical, analytical inclined expectations that
14 must be met my permittees pursuing this
15 alternative compliance pathway.
16 We have learned through our
17 observation of other regional board's experiences
18 with implementing this approach that more detailed
19 explanation of the regional board's expectations
20 greatly assists development of analyses and plans
21 that meet permit requirements.
22 If the Board adopts the proposed
23 language providing for this alternative compliance
24 pathway, we recommend you commit to promptly
25 develop a follow-up guidance to assist permittees

1 and other stakeholders in interpreting the
2 permit's provisions concerning this pathway.
3 It will best serve everyone's interest
4 if there are clear understandings about the level
5 of technical rigor necessary to demonstrate
6 reasonable assurance and the specificity of
7 implementation commitment necessary in the
8 associated implementation plans to secure
9 approval.
10 As EPA is currently working with the
11 state board on reasonable assurance analysis
12 guidance, we may be able to help the regional
13 board in developing guidelines to assist in
14 consistent, effective implementation of the
15 proposed permit alternative compliance pathway.
16 Thank you for considering these
17 comments. David Smith, manager NPDES, permit
18 section, U.S. EPA, Region 9.
19 CHAIRMAN ABARBANEL: Thank you. The
20 next speakers listed are the Riverside County
21 Copermittees. You'll have 15 minutes.
22 MR. MCKIBBON: Thanks. I won't need
23 that long.
24 Good morning, Mr. Chairman, fellow
25 Board members, I'm Stewart McKibbon with the

1 Riverside County Flood Control Conservation
2 District.
3 Our district is the lead permittee for
4 the Riverside County Copermittees, which consist
5 of the cities of Murrieta, Wildomar, Temecula and
6 the unincorporated county.
7 The first thing I want to do is say
8 we're pleased the staff and the board took this
9 opportunity of our enrollment in the regional
10 permit to include the alternative compliance
11 pathway. It's something we've been asking for for
12 many years, and to see it now is a very good
13 thing.
14 I also want to say, we are very
15 pleases with how staff has conducted the
16 introduction of the language to the community. I
17 want to say that Lorry Walsh and Wayne Chiu and
18 Mr. Gibson have been extremely helpful in
19 clarifying things that we -- we were trying to
20 understand, and they helped straighten us out a
21 little bit.
22 We have written comments on the
23 record, but what I want to take this 15 minutes to
24 do is just to focus on three issues that mean
25 quite a bit to our Copermittees. And you also

1 find out that it may mean something to our other
2 permittee friends in Orange County and San Diego.
3 The first thing, we believe the permit
4 should include compliance language for receiving
5 waters during the time the WQIP is being
6 developed. I'll be calling this "interim
7 compliance" while developing our plan.
8 In our conversations with the
9 executive officer and staff, they let us know that
10 they had concerns about it, and we just heard from
11 the EPA know that they had a concern that they
12 don't know people are going to follow through and
13 actually commit to improving water quality.
14 What I want to propose today, and I
15 provided this in writing to staff, but in more
16 detail is an approach that would provide for rigor
17 and accountability to the Copermittees during that
18 preparation phase. In short, what it is, is
19 simply -- you already have milestones for the WQIP
20 development in the permit. What we propose is
21 simply add deadlines for each one of those
22 milestones. If they're natural check-in points
23 that are already in the permit -- for example, we
24 have to start a public process or public
25 participation process to develop the model. We

1 have to have a committee, the consultation
2 committee. We have to submit an interim WQIP to
3 the regional board.
4 What we suggest is that we give
5 specific timeframes for when that has to be done.
6 And consistent with what's in the rest of the
7 permit, if we miss those timeframes and we're not
8 able to provide a rationale why we missed it, for
9 example, "We didn't have the meeting because
10 people were on vacation," instead of day 60, we
11 had it on day 72, that the regional board can say,
12 "That's a good rationale, and you're okay," and we
13 also have to provide some sort of plan to get back
14 on track if we're off track.
15 But if we don't make it on track, we
16 would recommend that the regional board can look
17 at this and then take away our compliance, because
18 we haven't performed like we said we would. What
19 we want to do is increase our accountability. We
20 want to increase our transparency, and we want to
21 increase our rigor during that formation process.
22 So like I said earlier, I provided
23 draft language to regional staff. I don't want to
24 go through it now and bog down the hearing, but
25 it's there if this Board is interested in

1 providing interim compliance to Copermittees.
2 The second issue I want to bring up is
3 a major issue. We did not include it in our
4 written comments, although I did bring it up in
5 our workshops, and that's the time available to
6 prepare the water quality improvement plan. Right
7 now, it's two years from the time of this adoption
8 that we have to complete the plan.
9 What I do for a living is I prepare
10 master drainage plans. That's what I do for a
11 living. I've done it six times in my life. Never
12 done one in two years. Never happened. We just
13 did one recently near Lake Elsinore. They only
14 covered 13 square miles. We ended up proposing
15 nine miles of channel and, probably, the total
16 cost of improvements was 50 million dollars. That
17 took us several years, like five, including
18 environment review, and over 9,000 hours of staff.
19 To try to compress that into two
20 years, my experience says that's going to be
21 really, really tough; it's not practical.
22 The second thing on why we want more
23 time and we should get more time is we want to
24 have a good plan. The best way to have a good
25 plan is community involvement, public

1 participation. If we have more time, then there
2 can actually be give and take. They can make a
3 suggestion; we can look at different alternatives.
4 If you only have two years, you have
5 to be very focused on getting to the finish line.
6 You can't look at better options. You might have
7 already made up your mind or you don't have the
8 time to really investigate what other people are
9 suggesting to you. So as a matter of having a
10 better plan, we recommend more time.
11 Third just another issue that -- this
12 permit originally came out in 2013. It was
13 recently readopted with our friends in Orange
14 County. This permit adds a public participation
15 process for the modeling, but there was no
16 additional time given. There was two years
17 before, now even more you have to do, you still
18 have two years. It simply was probably not fair,
19 is the right way to put it.
20 What we think would be a good time
21 period -- it would be tough but 36 to 40 months
22 from the adoption of this permit. That's similar
23 to what L.A. has; I think they have 40 months in
24 their permit. But we think 36- to 40-month,
25 something like that, will give that time

1 particularly for the interaction with the public,
2 get their input, incorporate their, ideas give it
3 a real shot, real alternative analysis.
4 The last thing I had is, Mr. Chiu,
5 when he was talking during the presentation talked
6 about the City of Menifee, and that the City of
7 Menifee is going to be governed by Region 8. They
8 need to participate in the process. The City of
9 Menifee has 1.3 square miles that is in the
10 watershed, and has no MS4 major outfalls. We have
11 the only one that's in the city. We control it
12 already.
13 They do have some curb and gutter, but
14 for the vast majority of the land that is in the
15 city, that is owned by private hands. So it makes
16 senses to us as a practical matter to excuse the
17 City from participation in the WQIP preparation
18 process. They really have nothing to do. They
19 don't even have an MS4 outfall. There's nothing
20 going on, really.
21 So the City of Menifee wrote a letter
22 that's in your written comments. We support their
23 letter. Also, support the -- there's discussion
24 earlier about milestones. We support having five
25 when we adopt our WQIP -- having the next five

1 years of milestones laid out. That's something,
2 as publics works agencies, we have capital
3 improvement plans, which normally apply to
4 horizons. Those can be easily foretold. Trying
5 to predict something, year 15, year 20, 10, you're
6 going to end up changing it anyway. It's better
7 if you keep it close where you really have a good
8 control and can protect it better.
9 Finally, whether the actual reporting
10 increases our load, that was your question. That
11 came up, Ms. Olson. We believe there's some
12 consolidation, and there's a benefit from having
13 all of the information in one watershed and one
14 report. As far as the burden, Riverside county
15 permittees are only in one watershed.
16 We can definitely see if some of our
17 friends in San Diego -- the county has six or
18 seven watersheds -- this could be a burden on
19 them. For our own particular purposes, it
20 wouldn't be that much.
21 So I don't know. I've got six minutes
22 left. I can reserve that time for later in case
23 something comes up. I'd like to reserve that time
24 if there's any questions you have, I'm available.
25 BOARD MEMBER MORALES: Unfortunately,

1 you're the first speaker from the Copermittees so
2 I'm cutting right to it. Is the reason that the
3 Copermittees want, basically, to be deemed in
4 compliance while they're working on the WQIP so
5 they feel they're shielded from attack or
6 litigation or something like that? Are there
7 other reasons besides that?
8 MR. MCKIBBON: That's one reason.
9 Another reason is there is going to be a
10 substantial expense. We're talking a million
11 dollars to prepare a model and do all the meetings
12 that are necessary and all the alternatives that
13 we might have to accomplish. To have coverage --
14 that's real money; real commitment. Since we're
15 making that real commitment, there should be
16 coverage at the same time.
17 BOARD MEMBER MORALES: This will be a
18 question for everybody. You gave an estimate of
19 36 to 40 months as the timeframe for Riverside. I
20 am assuming that estimate is based on your
21 understanding for the availability of staff to put
22 into the process, and that will differ from
23 Riverside to San Diego to Orange County. So their
24 window timeframe may be different, may be the
25 same, may be wildly -- they may come in and say

"We can do it in two years." Some may say, "We can't do it for eight. We don't have the resources to get it done." That's a tough one for me.

But I guess the last question I ha?ve -- again, this will be for everybody is, having anticipated that we were going to reach this point today, have you all done any advanced work on the WQIP process? Have any of your staff --

MR. MCKIBBON: Absolutely. We've already gotten inventories, we're working on our outfalls, determining whether they're persistent flows or not; staff is working on that. They're working to have a scope ready so I can go by Thursday to consultants to do the modeling and do the support work for the WQIP. We developed this scope. We developed timelines. We've done a lot of work already.

I've been talking to people that would sit on the consultation panel. What we would like to have is a public works director for the City of Wildomar on this panel, and the city engineer for Temecula on this panel. Why is that? Because we have to make commitments to spending real dollars. You need people to make decisions to do that.

1 That's not lower-level staff. Nothing against
2 lower-level staff, but they don't have the
3 authority and these people do.
4 So we have been doing work to do that.
5 We've also been talking to the water districts
6 here at the same time that we're doing this
7 regional planning effort, we should be doing
8 something that's not in the permit, which is storm
9 water recharge. I want to invite the Rancho
10 California Water District and Western Municipal
11 Water District to sit on the consultation panel so
12 we can examine and do storm water recharge at the
13 same time. It may not be in the WQIP, but it
14 would be in an adopted plan that's going to be
15 adopted by our Board.
16 And then going back to your middle
17 question, which was -- it's not just the fact that
18 the resources -- money is not the only resource;
19 time is an important resource. To have
20 interaction with people, you can't throw money at
21 them and think that's interaction. You have to
22 talk to them; you have to analyze what they
23 propose and have some give-and-take. You can't
24 sit there and say "I know what's best." It won't
25 fly. We want a plan that has community buy-in.

1 You won't get community buy-in if you stiff-arm
2 them on this process.
3 BOARD MEMBER MORALES: Maybe it was
4 inartfully phrased but I equated money with staff
5 positions.
6 MR. MCKIBBON: Right now I've got --
7 anticipating five people in house, working on it,
8 plus two consultants on the outside. It's going
9 to be a substantial investment in money for
10 Riverside County.
11 BOARD MEMBER MORALES: Thank you.
12 BOARD MEMBER STRAWN: I was going to --
13 with your permission, I'm going to add 30 seconds.
14 I don't want to charge people for answering the
15 question about the paperwork. I want to encourage
16 you.
17 CHAIRMAN ABARBANEL: Just for the
18 public's information, we bought Gary an atomic
19 clock.
20 MR. MCKIBBON: Appreciate your
21 consideration.
22 CHAIRMAN ABARBANEL: I have a
23 question. I understand your argument for
24 extending the time fully creating -- creating a
25 full-blown WQIP. Would an interesting or

1 acceptable middle position be that in a two-year
2 period, you have to come up with a draft of where
3 you're going but not come up -- that you may still
4 be working, but a final plan would come 12 to 14
5 months later.
6 MR. MCKIBBON: That's workable. I
7 want to point out there's no mention of getting
8 SEQA approval in the permit. That takes time as
9 well.
10 I want to say yes to your middle
11 ground -- I also want to say if you want the
12 permittees, you want them to build BMPs to
13 actually impact water quality, go to places that
14 have been hydomodified, if that's a word, we're
15 going to need a SEQA document, and you're going to
16 have to consider all these things together because
17 one of those SEQA things is the cumulative impact.
18 What is the cumulative impact do in all this?
19 You don't know until you have that
20 whole plan. And then we can go adopt it. That
21 plan, once adopted, is our Board authority to go
22 get right of way, to build these things, for us to
23 spend funds. So the SEQA is an important element
24 of this plan for the way it's being envisioned.
25 At no timeframe has been accounted

1 for. Some of these facilities may come later
2 because we need to do the SEQA, as well.
3 Thank you.
4 BOARD MEMBER OLSON: I just wanted to
5 understand this a little better. You have
6 submitted to the staff a plan that would have
7 certain requirements, but would give you -- but
8 would put the agency in compliance during the time
9 period that they're developing the water quality
10 plan.
11 MR. MCKIBBON: Yes, we developed
12 specific language, looks just like your permit,
13 that can be inserted to the permit. Here are the
14 check-in points. Here are the time frames when
15 we'll check in. We have to have a rationale and
16 plan to get back on track. Then the executive
17 officer can say you're out or whatever. I imagine
18 the executive officer would recommend to this
19 board our compliance be terminated until we adopt
20 a WQIP.
21 BOARD MEMBER OLSON: So I guess the
22 end of the time for comments was on September
23 14th. So you -- can you give me a timeframe about
24 when --
25 MR. MCKIBBON: I submitted it to Lorry

on Monday, and we developed it last week because we knew that -- I don't know how this Board feels about compliance during this time period, but we wanted to have, if this board thought it was acceptable, an option, something you could choose from. "Heres something that's already been thought about to incorporate into the permit." So that's the idea.

We've always been asking for interim compliance, but this is specific language that could make that work, more than just saying: "We want interim compliance," something more. Something more accountable.

BOARD MEMBER OLSON: Thank you.

CHAIRMAN ABARBANEL: The next group of speakers or individual speakers is the Orange County Copermittees. You'll have 30 minutes. Given the time, we will follow that with the cities of Laguna Beach and Dana Point and the San Diego County Copermittees, and then we will have a lunch break.

MS. CORPANICH: Good morning, Mr. Chair, members of the Board. I'm Mary Anne Skorpanich from the County of Orange. I want to thank you for the opportunity to speak with you

once again today and thank you in advance for consideration of our comments and the kickoff for a three-part presentation, to be followed by Ryan Baron, County Counsel, and Jeremy Jungreis, representing some of the city Copermittees. And I did want to make note that our comments are on behalf of all the permittees in South Orange County, and that we would like to save whatever remainder of time we have at the end for questions and answers that may come later.

You may have noticed, but I did the green card today because I'm here to say "Yay for alternative compliance options and thank you." Let me just -- I should also note you won't have the pleasure of hearing from Richard Boon from our staff today. He usually presents many witty insights into the issues that we're talking about, and always ends with quotes. I did begin with a quote from one of my personal heroes.

So I've addressed your Board a number of times asking that we have a permit with which we can be in compliance. This has been a big issue for us over the years. It's something that we take as a point of pride in our careers that we are operating a program, and we have a permit with

which we are in compliance. So we very much do appreciate what you have included in the permit today.

For as much as there's been progress by the Orange County permittees improving water quality in south Orange County, what we have achieved over the years, even if we could achieve a hundred times more than that, we would not be in compliance if there was a single excuse in a single water body on a single day, coming from any discharge, whether it's our own MS4 system or otherwise.

This issue of having a pathway to compliance to extremely important to us. No other area of environmental regulation, to my knowledge, imposes new requirements where the onus is to be in compliance upon adoption. Air quality regulations, for example, there are always targets out in the future are saying "You need to change vehicle fleets by this year. You need to reduce vehicle emissions by this source out in the future." I think this may be unique in the realm of environmental regulations. I think it's a big step forward that permits today are being processed and adopted that have a means by which

1 we can achieve compliance.
2 The amendments before you are critcal
3 for the regulated community for a number of
4 reasons. First, this permit establishes a pardigm
5 shift, and it places the permittees in the
6 position of being responsible and being stewards
7 of the entire watershed, including not only our
8 own discharges but the discharges from other
9 parties, and also naturally-occurring conditions.
10 We do have instances that I think you
11 may be aware of where we have reference streams in
12 the region where numbers are higher than what the
13 basin plan objectives are. There are
14 naturally-occurring conditions or things that come
15 from non-anthropogenic sources that cause
16 exceedances that have nothing to do with what the
17 MS4s do or do not do, or how fast they do it, or
18 how well they do it.
19 In some cases, the solutions are
20 exceptionally long-term, and you were asked
21 earlier about impediments. We fundamentally need
22 to remake the structure of our communities that
23 have been developed over a hundred years and more
24 including the very patterns that underlie those
25 communities, and that's not something we can

1 achieve.

2 I think logistics is probably the

3 biggest impediment. Cost, of course, goes along

4 with that, but we couldn't achieve that in a day

5 or year or permit term. So having that pathway to

6 compliance helps us work around that type of

7 impediment. I would also say it's a long-term

8 process to achieve water quality standards,

9 complicated by vagueries in the science, lack of

10 technology, with some of the issues like

11 wet-weather bacteria, for example, what technology

12 we can use and logistics we can employ getting

13 back to the pure physics of how do you deal with

14 that volume and velocity of water that comes with

15 a storm. We don't have the means to achieve that

16 today. There's also shortfalls in funding and

17 education and development and so on.

18 You heard us say before the current

19 state of the environmental conditions was not

20 reflected in the permit, which we see as a

21 necessary starting point for what the permit

22 should have in it. Fortunately, with the water

23 quality improvement plan, with alternative

24 pathways we can now use those current conditions

25 going forward as the basis for the water quality

1 improvement plan. I think we achieved a great
2 deal of progress in that.
3 Finally, the Clean Water Act does not
4 require MS4s to meet effluent limits, and there
5 are many numbers that I mentioned earlier from
6 naturally-occurring or non-anthropogenic sources
7 that we cannot meet. If we're going to be
8 required to do so under this permit, then we need
9 to have a way to be in compliance.
10 This watershed planning, the water
11 quality improvement plan now provides the means to
12 achieve this, and the permit finally provides this
13 pathway for us, and is generally supported by the
14 permittees from South Orange County. It provides
15 a measurable profit for attaining compliance with
16 numeric standards, and it allows us permittees to
17 focus our resources on implementation rather than
18 checklists and, potentially, third-party lawsuits.
19 I'm going to be followed up today by
20 Ryan Baron from County Counsel to talk some more
21 about how we think we can make this better.
22 Thank you.
23 CHAIRMAN ABARBANEL: Any questions of
24 Mary?
25 BOARD MEMBER MORALES: What is Orange

1 County's response to, say, if somebody were to ask
2 that question, "If you're given this field during
3 that period you're developing the WQIP, what's the
4 incentive for you all to hurry or get it right?"
5 You know, in fact it could also be
6 phrased as if there's no downside to not hurrying
7 up or not doing it, what's the disincentive to
8 doing very little?
9 MS. CORPANICH: As I understand it,
10 you have two parts of your question; one is the
11 time urgency, and the one is the level of effort
12 or the degree of effort that we put into it, the
13 rigor with which we approach.
14 I would say in terms of the timeline,
15 you already have that built into the permits. You
16 already have a deadline for us to prepare this and
17 submit it to your staff.
18 BOARD MEMBER MORALES: Could Orange
19 County do it in two years?
20 MS. CORPANICH: We are are going to
21 make every effort to do that in two years. I will
22 say that my colleagues from Riverside County made
23 a very good point that you have better engagement
24 with the public, if you have a little bit more
25 time. I don't know that we would be asking for

1 more time if we aren't going to have an interim
2 compliance. It just stretches out the amount of
3 time that we are out there.
4 The other is the rigor with which we
5 prepare these WQIPs. I would say there the
6 incentive is already built in for us. We need to
7 submit something to your staff that your staff
8 will accept, so we also are having to submit
9 something that we believe that we can implement
10 and that we believe from our best analysis that
11 will get us to the finish line. So I really think
12 that incentive is already built into what you have
13 in the permit today.
14 BOARD MEMBER MORALES: I'm trying to
15 play on all the scenarios.
16 MS. CORPANICH: In fact, we've had our
17 permit now since February, I believe it was.
18 We've already started our public process. We've
19 already sort of laid out how we're going to attack
20 the work. We are well underway because we know
21 two years is not a lot of time. But I will tell
22 you that, probably, the most criticism we hear
23 from the public is that we're having these public
24 meetings, we're asking for their input, but we're
25 rushing to the next step because we don't have a

1 lot of time to grind through alternatives, as
2 Mr. McKibbon was pointing out, and to consider
3 that for more discussion and things of that
4 nature.
5 So we do hear that complaint a lot
6 from the public when we're on a timeline, as with
7 the water quality management plan, as well. We
8 had, I believe it was, two years to do that, and
9 it was a very aggressive schedule, but we did it.
10 CHAIRMAN ABARBANEL: May I ask you the
11 same question I asked Mr. McKibbon. I have never
12 prepared a WQIP, neither have you, yet there are
13 many things one might be able to do with a longer
14 time period. I think 40 months might be a good
15 time. What would be your response to having a
16 draft of the WQIP in two years to be discussed
17 with the staff but a final a year later, in which
18 you could respond to that, have more public input,
19 whatever you deem.
20 MS. CORPANICH: I think that would be
21 preferable. I think that would be good, and I
22 think, based on the -- from what I know, the
23 experience with the San Diego permittees has been,
24 it takes some time once they're submitted, until
25 we can get to final approval.

CHAIRMAN ABARBANEL: I wonder if I can ask Mr. Chiu a question in that regard.

MR. CHIU: Yes.

CHAIRMAN ABARBANEL: Suppose the County of Orange came in in two years with a WQIP and came in with a modification, is there a provision to accept that modification in place of the two-year WQIP?

MR. CHIU: The way the process is set up, they are provided up to two years to develop the water quality improvement plan. The water quality improvement plans are given two years to be developed. The permit also allows those water quality improvement plans to be updated on an annual basis, so there's every opportunity to make improvements to the plan itself, on an annual basis, but they have to do it at least once every five years in a report of waste discharge.

CHAIRMAN ABARBANEL: So there's a path to do what I've been trying to explore. Come to you in two years, "This is where we've gotten, but we're not yet satisfied. We want more public input. We want more time for new ideas and so forth," and choose on their own to proceed for another year, for example, and come back and say

1 "This is where we are after three years."
2 MR. CHIU: There's -- with the water
3 quality improvement plans, there's the water
4 quality improvement plan process, which has
5 elements that are required be included in the
6 plan, elements that need to be discussed, vetted
7 through the public participation process. There
8 are submittal requirements for us to review and
9 for the public to review along the way, and at the
10 end of the process, we have to determine whether
11 or not they're in compliance with the permit.
12 The plans themselves, I don't know
13 that we ever call them final plans, right, because
14 they're meant to be adapted over time, and they're
15 intended to be living documents, essentially. So
16 the first plan that they submit may be considered
17 final in terms of what we would accept as a
18 starting point, but it is never considered the end
19 point until water quality has been fully restored
20 and achieved in the watershed and/or region,
21 relevant to MS4 discharges, of course.
22 If you are looking to have some
23 opportunity for the Copermittees to submit a draft
24 plan of some sort, which we can then allow them to
25 begin implements or -- I'm not exactly sure how we

1 would transition from planning to implementation.
2 The way we have permits set up, again, once we
3 accept the plan, that is the starting point for
4 implementation. We've seen enough in the plan to
5 understand how they intend to implement their
6 program to achieve their goals.
7 Now, a plan does not necessarily have
8 to have every single water body combination under
9 the sun be part of the plan in order for it to be
10 accepted. At least for the water quality
11 improvement plan, only under the alternative
12 compliance pathway, there is a certain subset of
13 pollutants that need to be incorporated in the
14 plan, namely that is not every pollutant under the
15 sun, but it is a fairly large set of pollutants.
16 I understand there are other
17 pollutants that are currently in exceedance of
18 water quality objectives that are not on the 303
19 list, and they would also like to have coverage
20 for those pollutants, as well. The permit allows
21 for that, or the alternative pathway compliance
22 language allows for that. But that doesn't
23 require them to have every pollutant under the sun
24 under their water quality improvement plan.
25 They can focus a lot of their work on

1 those 303 listed to begin with and then adapt
2 their plan in the future to incorporate the other
3 pollutants that they are concerned with, as well,
4 in future generations of the plan.
5 We need to have someplace where they
6 begin implementation, and that is the part I'm not
7 quite will clear how we would do that if we had a
8 draft plan that would have some additional time
9 for a final plan.
10 CHAIRMAN ABARBANEL: Lest it leak out
11 that we're looking to the Los Angeles region for
12 leadership, do you understand why they have a
13 longer period than 24 months, as I understand one
14 of the speakers to say.
15 MR. CHIU: My recollection of their
16 language was that they had 24 months to develop
17 the plan, but it could have been because of their
18 rather long review period, and they had, I guess,
19 some back and forth with the plan developers as to
20 how the final plan should look. May have been
21 extended to 36 to 40 months, but my understanding
22 is they were given 24 months to begin with. And
23 similarly with the Santa Ana region, they've
24 proposed an alternative compliance pathway, as
25 well in their draft permit. That similarly

1 provides 18 months with an option to extend it an
2 additional 6 months for their plan. I think we
3 are right in there in terms of the amount of time
4 we're allotting to the development of a plan.
5 If you think about a permit term being
6 five years, if we were to have 40 months of plan
7 development, you would only have you know 20-some
8 months of actual implementation before you would
9 have to start relooking at a plan. I'm a firm
10 believer that planning has its place but
11 implementation is where you get results. I would
12 much rather have a plan that may have been rushed
13 a little bit but has great potential to improve
14 water quality and begin the implementation and
15 start learning from implementation and the
16 mistakes that you may make along the way.
17 MS. SKORPANICH: If I could just
18 elaborate on what Mr. Chiu said, our permit
19 expires in 2018. So we won't be talking to you
20 next year but it's not going to be a full five
21 years.
22 CHAIRMAN ABARBANEL: I understand the
23 transition to incorporating all three counties in
24 the same permit, but we'll see you in 2018.
25 BOARD MEMBER OLSON: I just had one

1 question. So if you had to say the greatest
2 hardship with meeting what the staff has proposed
3 and what the negatives are for you, can you sort
4 of elaborate on that for us.
5 MS. SKORPANICH: I think not having
6 that compliance option, and you'll hear more from
7 my fellow speakers on this presentation about what
8 not only can happen but what has happened when we
9 don't have some means of being in compliance with
10 the permit.
11 BOARD MEMBER OLSON: Do you also have
12 CEQA requirements.
13 MS. SKORPANICH: We're still sorting
14 out how exactly that would happen. While you're
15 the ones approving the plan, we're the ones
16 implementing it. Who's the lead agency? There's
17 some finite details we need to work out on that.
18 BOARD MEMBER OLSON: Have you had a
19 chance to look at what Riverside has proposed for
20 an interim compliance where you go -- where you
21 have coverage over the interim compliance which,
22 right now, the proposal before the Board is no
23 interim compliance.
24 MS. SKORPANICH: Right. So the three
25 counties actually met with your executive officer

1 two weeks ago or so, two to three weeks ago, and
2 talked about this very point. What we heard from
3 the staff at the time was that they had nothing --
4 no means by which they could enforce compliance
5 during the period of time the WQIP was being
6 developed, and we suggested that if there were
7 sort of reporting in milestones, deadlines that we
8 had to meet during the development process, that
9 they would then have a clear enforceability built
10 in.
11 We would agree that milestones during
12 development of the water quality improvement plan
13 should meet the needs of what your staff is
14 looking for.
15 BOARD MEMBER OLSON: Mr. Chiu, could
16 you comment?
17 MR. CHIU: I'm sorry, exactly what was
18 the topic we were talking about?
19 BOARD MEMBER OLSON: What we were
20 talking about was there was a proposal brought
21 forward by, as I understand it, by Riverside and
22 the three counties met with our executive director
23 and it was said that you couldn't have interim
24 compliance because there would be no way to
25 enforce it. They're saying if you had certain

1 things built into the interim compliance...
2 I'd like to hear your view on that or
3 what the staff concluded.
4 MR. CHIU: So we received a proposed
5 set of language from Mr. McKibbon early this week.
6 We reviewed it. The way they have structured
7 their compliance pathway during the plan
8 preparation process essentially boils down to
9 document submittals or process completions. It's
10 not really having to do with improvements to water
11 quality. It is all about process, and as long as
12 they have met some process requirements in the
13 interim time between those processes being
14 completed, they would be deemed in compliance.
15 But compliance would being, essentially, with
16 their submittal of a notice of intent to develop a
17 plan.
18 For us, at least in this region, we
19 didn't think it was appropriate to be granting the
20 Copermittees -- what we consider a real privilege.
21 I mean, this compliance pathway is not a right.
22 This ability to be deemed in compliance is not a
23 right; it is a privilege. We strongly believe
24 that in order to have a privilege like this, to be
25 deemed in compliance, there has to be something to

1 show us compliance with receiving water
2 limitations will, in fact, be achieved at some
3 point in the future.
4 Until we can see a plan and the
5 content of that plan, it's very difficult for us
6 to make that determination. So, you know, in a
7 lot of ways, what we consider as a compliance
8 pathway, it's kind of like a real -- it's kind of
9 like a club. It's a club of very special
10 Copermittees that have made a real commitment to
11 improve water quality.
12 The way we formed our club is to have
13 some things that need to be completed before you
14 can actually enter the club. In other regions,
15 they make their club a little less exclusive than
16 our club, and we think that to earn a place in our
17 club, you have to show us that you deserve that
18 spot. And for us to say that anybody can be in
19 the club as long as you hand in a slip of paper,
20 we just don't think that rises to the level of an
21 exclusive club that we want.
22 BOARD MEMBER OLSON: I get confused.
23 Do you not -- do you think people are somehow not
24 serious about trying to improve the water quality?
25 If they meet their goal, continue to meet their

1 goal, make the environment better, their lives are
2 much easier to deal with. So I understand that
3 you want people to be very serious about what they
4 do. It's my intention or my belief people are
5 serious.
6 So maybe I'm missing something, and
7 you'll have time to speak, and maybe you can
8 explain it a little better to me because I really
9 would like to be able to be able to understand
10 your viewpoint.
11 MR. CHIU: I understand how it seems a
12 little odd that we keep on making it seem like
13 there's no real dedication to improving water
14 quality. We see the efforts the Copermittees have
15 gone to in order to improve water quality. At the
16 same time, we have also seen the Copermittees have
17 not taken the opportunity that they've already had
18 to improve water quality. We've had this interim
19 process in place since our 2001 permit, the third
20 term permits.
21 That interim process was intended to
22 be self-implementing by the Copermittees. They
23 were supposed to tell us when there were
24 exceedances caused by their MS4 discharges, and
25 they were to prepare a plan to tell us how they

1 would address those exceedances.
2 Since we've put that language into the
3 permit, not one Copermittee has come forward to
4 say "We are causing this." In fact, it was always
5 the opposite. It is -- there are problems in the
6 receiving water, we acknowledge that. But we
7 don't have data to show we are causing it. We
8 don't believe we should be doing much more than
9 what we're doing today.
10 It's hard for us, at this point in
11 time, to really believe that they have a true
12 commitment to improving water quality to the level
13 we believe is necessary, because this board has
14 been mandated and given the great responsibility
15 of protecting the waters of this state -- not just
16 protecting, preserving, restoring and enhancing
17 the waters of this state.
18 We're not just trying to make it was
19 good as it was today. We want to make it as great
20 as it was before and we want to make it better for
21 tomorrow. So it's not that we want to keep the
22 status quo. That's our mission. So in a lot of
23 ways, what we've seen and heard from the
24 Copermittees is they agree with our mission, but
25 they don't agree that they have to help us in our

1 mission.

2 The water quality improvement plan was

3 our way of saying, "Well, we've heard from you on

4 many occasions that you know a better way. That

5 can happen, but you need to give us the

6 flexibility to do it because these permit

7 requirements are tying our hands. It's making us

8 do things that are not necessary."

9 So we changed it. We said, "Here's

10 the flexibility you're looking for, but we want

11 the outcomes."

12 We've tried to align our objectives as

13 much as possible but the water quality improvement

14 plan and the alternative compliance pathway,

15 again -- the alternative compliance pathway is, in

16 our mind, a privilege. It is something that is

17 going to say you are in compliance. We will

18 consider you in compliance knowing full well that

19 your discharges are actually causing or

20 contributing to impairments, right?

21 So we need to have some assurance that

22 we will get credible plans, durable plans,

23 rigorous and transparent plans that everybody,

24 including the public, can understand how we will

25 get from today's water quality conditions to water

1 quality conditions we say we want, and what this
2 Board wants.
3 I think we're getting a lot by
4 including this alternative compliance pathway to
5 begin with. To actually offer compliance during
6 the preparation process, I think that is asking a
7 little much when we have not seen a record.
8 BOARD MEMBER OLSON: Thank you very
9 much.
10 *Mr. Chairman, members of the Board,
11 we're going to hear a range of discussions on this
12 today, and this is a good opportunity to hear from
13 other folks on this very different subject.
14 CHAIRMAN ABARBANEL: Moving on with
15 Orange County.
16 MR. BARON: Good morning, Chairman
17 Abarbanel, honorable Board members, Ryan Baron,
18 County Counsel's Office, County of Orange. I
19 think the shot clock is at 25:30, for the record,
20 but who is counting. I'll try to be brief.
21 I want to begin by saying that we join
22 in the comments of Riverside and San Diego County,
23 but we come with one issue today on behalf of the
24 Orange County permittees. That's been the biggest
25 issue for us since 2013, when the regional permit

1 was adopted. It's been the biggest issue up and
2 down the state that was dealt with by the state
3 Board order this summer; that is compliance during
4 development and during implementation.
5 Just to give you a little road map
6 where I'm going. First I'll talk about the
7 background for development and implementation in
8 Orange County. Some of the assumptions and
9 implications about the WQIP planning and
10 development process. A little background on the
11 State Board order on the LA permit, and then some
12 response on EPAs comments, and then Mr. Youngrice
13 is going to follow up with some of the recent
14 litigation of an MS4 permit in South Orange
15 County.
16 In order to understand our request --
17 I'm going to refer to as "full compliance" --
18 compliance during the development process, I want
19 to first talk about the process that's going on
20 right now. Orange County enrolled in the regional
21 permit in February of 2015. It began the WQIP
22 process in August 2015 to, as you'll see there
23 from the first arrow, to determine an approach,
24 identify existing data sources, obtain public
25 input and form a consultation panel.

1 Under the tentative order, this is
2 over a two-, two-and-a-half-year process from
3 February 2015 or August 2015 when it began to the
4 fall of 2017. The next few years, spent
5 developing a detailed and rigorous implementation
6 plan with the input of 12 Copermittees, various
7 stakeholders and the public. It's a fairly
8 significant effort, which I'll talk about in a
9 second.
10 The technical consultant costs alone
11 are estimated to be about $500,000 for this
12 two-year period. That does not include internal
13 staff costs, which are usually from 20 to 50
14 percent of a project, CEQA review and the need for
15 negative declaration or programatic EIR. Those
16 can cost a half million dollars by themselves.
17 And attorney review of the WQIP, looking for
18 compliance, which is going on in L.A., and all the
19 cooperative agreements that both sides might have
20 in house get involved in, trying to put together,
21 multi-party contracts, take them to the 12 city
22 councils and and district boards to enter into
23 these agreements and change scopes of work and
24 consultant contracts and so forth.
25 So it's a fairly significant effort in

1 this two-and-a-half-year process. This is a list
2 of the pollutants of concern from 303 impairment
3 that Orange County will be dealing with and south
4 Orange County, that will be preparing final
5 numeric goals for, compliance schedules, other
6 implementation strategies and control measures.
7 So without compliance during the
8 two-and-a-half-year period of development, the
9 Orange County permittees will need to strictly
10 comply with the numeric limits for each of these
11 pollutants during this development period.
12 Now, normally when a pollutant has --
13 or a water body is on the 303D list, the state is
14 required to prepare or establish a total maximum
15 daily load, TMDL. If the state does not do that,
16 they can be sued to be establish the TMDL. If the
17 state fails to do so, the EPA must establish one.
18 In my opinion, when a county and the
19 permittees are putting together interim and final
20 numeric goals, implementation plans, control other
21 strategies, these are the things that typically go
22 into a TMDL, and it's accompanied by an
23 implementation plan that goes into the permit
24 later on when it's adopted.
25 Essentially, the permittees through

1 the WQIP process are preparing TMDLs, time
2 schedule, orders compliance schedules on behalf of
3 the state during this time. TMDLs typically take
4 several years to develop. They can take a decade
5 or more to implement. And we are sort of taking
6 on this responsibility in order to improve water
7 quality and hopefully obtain full compliance
8 during development and during implementation.
9 Now, most what I'm going to focus on
10 is development, but I will touch briefly on
11 projected implementation costs for coloform in
12 south Orange County. Geo Syntech, the county's
13 consultant, did a rough analysis including that.
14 Inplementation costs alone will be somewhere
15 between 1.6 billion to 2.1 billion for the south
16 Orange County watershed. This will include some
17 other combinations as well, but it's primarily
18 looking at coloform bacteria.
19 CHAIRMAN ABARBANEL: These are five
20 year costs or annual costs?
21 MR. BARON: I believe this is the
22 total projected cost for a 10, 20 or 30-year
23 period.
24 BOARD MEMBER MORALES: That makes a
25 difference.

BOARD MEMBER OLSON: That makes a big difference.

BOARD MEMBER MORALES: Could you give us the background on one of those numbers so we know what went into the reason.

MR. BARON: If I could call up Richard Moon.

MR. MOON: Richard Moon with the County of Orange. I've not taken the oath.

CHAIRMAN ABARBANEL: We can fix that.

Do you swear the testimony you will provide is true and correct. If so, say "I do."

MR. MOON: I do.

So we had we asked Geo Syntech to look at the cost projections prepared for Los Angeles County, and the costs that were available for the WQIPs that have been prepared for San Diego county. And this, as Ryan said, focused principally on bacteria, but they calculated a range of cost for meeting water quality objectives, standardized on impervious areas. So the costs have been pulled from all of these different plans, and I think they looked at between nine and 12 of these watershed management plans.

1 From those, we arrived at a range, so
2 at the low end, 1.6 billion. The top end of the
3 range, 2 billion, based on figures called from
4 these other plans.
5 CHAIRMAN ABARBANEL: Did those plans
6 take into account the financial benefits from
7 having implemented the plans?
8 MR. MOON: No.
9 CHAIRMAN ABARBANEL: So one can assume
10 there will be benefits, and the numbers will be
11 comensurably smaller.
12 MR. MOON: That's correct.
13 BOARD MEMBER MORALES: Again, is it
14 based on per year? Per 10 years? Per 100 years?
15 MR. MONN: It's the total projected
16 cost. So we would need to spend if we --
17 regardless, whether you do it over one year or 40
18 years or 20 years, yes.
19 CHAIRMAN ABARBANEL: Other questions?
20 BOARD MEMBER STRAWN: Now year
21 dollars?
22 MR. MOON: Yes.
23 MR. BARON: The second issue I wanted
24 to bring up before I get to the punch line, I want
25 to discuss some of the assumptions and legal

1 issues involving the WQIP process. It's been said
2 compliance is not a right, but, in fact, the way
3 environmental law works, you're deemed to be in
4 compliance until you're out of compliance, and
5 when you're out of compliance there come
6 significant civil penalties and even criminal
7 sanctions under the Clean Water Act. We take
8 compliance as a big deal, and it's sort of my job
9 to worry about it.
10 By way of legal background, Courts
11 have held that MS4s are not required by the Clean
12 Water Act to strictly comply with the numeric
13 effluent limitations, and the State Board order
14 went through a thorough analysis in this case. It
15 came to the same conclusion. That was also
16 reiterated in an opinion in a circuit court in
17 Maryland, that federal law does not require MS4s
18 to meet strict numeric standards.
19 Now, EPA has not promulgated any
20 binding regulations to that effect. When EPS has
21 encouraged states to require strict compliance for
22 numeric limits, where feasible, it has been
23 through guidance documents; the most significant
24 of which was 2014 EPA storm water memo on the
25 establishment of TMDL waste load allocations where

1 it said "This memorandum is guidance and does not
2 impose legally binding requirements on EPA or the
3 states.
4 The state boards also analyzed this
5 particular memo and came to the same conclusion
6 that I'm articulating today. However, the State
7 Water Board clarified its prior order on receiving
8 water limitations, and it said that regional water
9 boards should require strict compliance with water
10 quality standards.
11 So, in essence, what I'm trying is say
12 is, it's not a federal issue; it's a state law and
13 policy issue to basically go through the WQIP
14 process, which is premised on meeting numeric
15 limitations at the end of that process. The third
16 point I'd like to discuss is the implications of
17 alternative compliance pathway. The permittees
18 are required to develop watershed improvement
19 plans. They have the option under the tentative
20 order to develop interim compliance and final
21 numeric goals, strategies, compliance schedules,
22 annual milestones, if they choose in order to
23 obtain compliance at the Executive Officer
24 approval of the implementation plan.
25 So, again, we've talked about this

1 many times in the workshops last summer: This
2 effectively requires permittees to not just to put
3 together a plan, but to put together a very
4 rigorous, expensive development implementation
5 plan, that is almost identical to developing a
6 TMDL, compliance schedules, time schedule orders
7 by the permittees in this two to
8 two-and-a-half-year period.
9 Those are typically obligations of the
10 state. The state typically has the responsibility
11 with collaboration of the permittee to establish
12 those.
13 In this case, the permittees will be
14 taking on all of those costs and responsibilities
15 and submitting it to executive officer, hopefully
16 for approval of these TMDL compliant-schedule-like
17 improvement plans. So we feel, and as Richard
18 Moon has said, you're becoming the ultimate
19 stewards of the watershed in taking on a lot of
20 these obligations.
21 So I guess with a fear of sounding
22 like my 5-year-old kindergarten daughter, we feel
23 there's a fundamental fairness that should be with
24 being deemed in compliance at the time we tender a
25 notice of intent to develop one of these plans.

1 This is the path followed in LA. It's also the
2 path being proposed in Santa Ana, and I believe
3 it's the path being heard today in the Bay Area,
4 as well.
5 If there's extensive planning to deal
6 with state requirements and taking on a lot of the
7 state's obligations, in costs and resources, there
8 should be an incentive to have full compliance
9 from the start of the development process to the
10 end of implementation, so long as the permittee is
11 diligently and rigorously adibing by that
12 development schedule and meeting all those
13 milestones.
14 Planning and development is
15 fundamental to implementation. I don't believe it
16 can be bifurcated or sort of have this line drawn
17 as to where that approval should be. The planning
18 and development process will include prioritizing
19 pollutants, extensive modeling, setting interim
20 goals, assessing strategies, et cetera.
21 I wanted to give some background on
22 the State Board order, because that came up early
23 on. The State Board, on page 15 of the order,
24 started out, "We are sympathetic that receiving
25 water limitations may result in many years of

1 noncompliance."

2 So the State Board rightfully

3 understood the position that the MS4s were in as

4 transporters of water and not actual dischargers

5 -- industrial dischargers discharge pollutants in

6 their chemical manufacturing process.

7 But as transporters of water, it would

8 take years, many years of technical efforts to

9 comply with receiving water limitations. It said

10 it was reasonable to provide for an alternative

11 compliance process if seven principles were

12 followed.

13 The fact sheet states the regional

14 water board is to consider an alternative

15 compliance option. But actually, in my

16 interpretation of the State Board order, which I

17 think is probably with Mr. Morales's

18 interpretation, is Principal 3 says phase 1

19 permits should provide for a compliance

20 alternative that allows permittees to achieve

21 compliance with receiving water limitations over a

22 period of time. Consider is used on page 51, as

23 part of that "should implement."

24 To consider the L.A. WMP, EWMP pathway

25 as a potential option. In a footnote, the State

1 Board order also says you can look at (inaudible)
2 options, so long as those meet the several
3 principles set out.
4 The idea is that an alternative
5 compliance pathway should be implemented to
6 achieve compliance over a period of time, and if
7 one is not, or one of the other principles aren't
8 followed the region specific or permit specific,
9 the reason should be are articulated. The
10 regional board found that compliance during the
11 development period was sufficiently constraint and
12 reasonable because the permittees were still
13 having to meet the relevant deadlines for
14 watershed management, planning and development.
15 They were still having to implement low-impact
16 development, green streets policies, and other
17 watershed control measures. Those measures were
18 not allowed to be put on hold during that 18-month
19 or 24-month period.
20 In fact, the initial version of the LA
21 permit was so stringent that if a permittee did
22 not hit one of those development milestones, it
23 was found out of compliance and could not come
24 back into compliance until the implementation plan
25 was approved by the executive officer at the end

1 of the period.

2 The State Board found that was too

3 stringent and changed the L.A. permit and allowed

4 dead lines to be adjusted or extended for good

5 cause.

6 So we believe the tentative order, as

7 written, does not follow their principle 3.

8 Instead of allowing compliance to (inaudible) over

9 time, it requires permittees to strictly comply

10 with the prohibitions and limitations immediately

11 upon enrollment and throughout the two,

12 two-and-a-half-year planning period, or four

13 years, whatever this Board decides to set.

14 There's no ability right now to

15 prioritize pollutants. WQIPs are premised on

16 prioritizing pollutants so that you are chasing

17 the biggest pollutants of concern. However, that

18 prioritization doesn't come into affect until the

19 WQIP is approved by the executive officer. So

20 there really is a status quo period during this

21 two to two-and-a-half-year time period where we

22 have to worry about each and every one.

23 We also believe that there's no permit

24 specific or region specific finding for this

25 partial compliance option that's being offered in

1 the permit and would ask that if the Board chooses
2 not to, then we would need to amend the fact sheet
3 or permit to articulate that reason, consistent
4 with Principle 3 and 4.
5 I'm going to talk a little bit about
6 the EPA's comment letters. They were mentioned in
7 the response to comments EPA filed --
8 CHAIRMAN ABARBANEL: Before you go
9 into that, I want to ask you a question.
10 It seems to me we've been struggling
11 -- I've heard today that we as concerned citizens
12 about water quality, have been struggling for at
13 least 25 years to find a way to achieve what we
14 have in mind as far as water quality. It hasn't
15 worked really well so we're trying different ways.
16 Region 4, Los Angeles, is trying one way. Our MS4
17 permit gives a lot of responsibility to the
18 individual Copermittees and asks them to develop
19 water quality improvement plans.
20 In 2018, do you anticipate that the
21 board -- I don't know what the Board composition
22 will be then -- are going to ask you for new water
23 quality improvement plans or relatively simple
24 modifications, which will not be on a new path but
25 a step along that path?

1 I'm trying to understand whether you
2 see this as a long-term issue in which you will be
3 deemed out of compliance or whether it's a
4 short-term issue from transition to a new method
5 that that we hope is much more effective.
6 MR. BARON: I think it's definitely a
7 long-term problem. I'm not a scientist, but I
8 believe that there have been improvements in the
9 water quality. And I think there have been
10 significant improvements in dry-weather
11 conditions. The problems still remain with
12 pollutants like bacteria and other wet-weather
13 conditions.
14 I think that there will be one
15 implementation plan -- now to the WQIP, that will
16 be hopefully approved in 2017, when the permit is
17 renewed, and it will be subject to modification as
18 folks go through an adaptive management process
19 and monitoring gives them the data they need to
20 adjust their programs.
21 So I think the problem itself is
22 long-term, based on science, technology, funding.
23 Municipalities like Orange County talk about
24 funding because we have to look at budgets. But I
25 think the real issue -- not the real issue but

1 subsequent to that is also how do you tackle
2 things like bacteria? What types of technology
3 are there for selenium when it's naturally
4 occurring?
5 So I think the problem is long-term.
6 The compliance issue is definitely short term in
7 the sense that this is a two, two-and-a-half-year
8 period that we fear we will be out of compliance
9 for. If we develop a rigorous plan, we'll be
10 deemed in compliance.
11 Overall I think it's a long-term
12 issue. I don't for foresee a new plan being
13 developed in 2018 unless they're so poorly
14 fashioned.
15 BOARD MEMBER MORALES: I hear it's
16 going to be a two, two-and-a-half-year period in
17 which you all will be out of compliance. You're
18 probably, today, not in compliance, correct?
19 MR. BARON: It was said on the record
20 at the May 2013 hearing that we were out of
21 compliance.
22 BOARD MEMBER MORALES: And how long
23 has that been?
24 MR. BARON: I would argue under the
25 federal Clean Water Act, you go through the best

1 management practice and that is NEP. So to the
2 extent that we're not meeting numeric numbers,
3 yes, that is a compliance issue. I see where
4 you're going. It's not necessarily --
5 BOARD MEMBER MORALES: Is this
6 anything new, is the basic question. It's being
7 pitched as "Going forward, we're going to be out
8 of compliance for two years." We're just
9 continuing what it is until compliance or the
10 government WQIP is --
11 MR. BARON: But there --
12 BOARD MEMBER MORALES: I don't want us
13 to fall into the trap of it being so easy to talk
14 about it in those terms. We all want the same
15 thing; I truly believe that.
16 MR. BARON: I think that -- I think
17 there was a perception in the storm water
18 community that if you were going through the
19 process and you were implementing your program,
20 the water boards would not enforce against you.
21 And then NRGC versus L.A. County
22 litigation came about and turned that on its head.
23 It said the permits have receiving water
24 limitations in there, and therefore, the state has
25 determined that you're strictly liable with that

1 language and you view the permit like a contract.
2 From that point on, the storm water
3 community woke up and said "We thought we had sort
4 of compliance if we were making reasonable
5 progress."
6 I don't know if the question has been
7 "You're still out of compliance. You've been out
8 of compliance all this time." It's sort of a
9 pathway forward, and we can articulate that it is
10 impracticable to meet numbers. In some cases,
11 right now it is impossible to do so. So it isn't
12 reasonable under federal or even state law that
13 there shouldn't be some kind of alternative
14 compliance pathway built into that, to light a
15 fire underneath MS4s but also incentivize them to
16 continue these plans and programs.
17 So I think that strict liability -- I
18 don't mean to sound like a broken record after two
19 years -- but it doesn't really exist anywhere in
20 other parts of the law except with oil spills and
21 things of that nature.
22 The Clean Air Act and Clean Water Act,
23 that's not the way it was set up to be. I think
24 that's the aftermath of the L.A. litigation, and,
25 sort of, the storm water community is struggling

1 with that. And Jeremy is going to talk about some
2 of these issues. It is a very real issue for us.
3 I don't want to be perceived as
4 Chicken Little or "The sky is falling." "We're
5 gonna get sued." We're a very large county. We
6 get sued every other day. But in terms of its
7 impact on the storm water programs, I think --
8 CHAIRMAN ABARBANEL: You were here in
9 May 2013, and by what you said, you said you
10 weren't in compliance? What happened to you in
11 the last two-and-a-half years because of that?
12 MR. BARON: Jeremy is going to talk
13 about that after this.
14 CHAIRMAN ABARBANEL: I wasn't asking
15 for a review of lawsuits every other day. I
16 assume that's just business.
17 All right. Let's hear the answer.
18 Are you ready to turn over?
19 MR. BARON: I've got 30 more seconds.
20 So the major premise as to why not to
21 provide a compliance option, the way I read the
22 response to comments to letters from EPA
23 disapproving of this notion of compliance during
24 the development process. In my opinion, it's sort
25 of a ball conclusion. That bright line should be

1 drawn there. There's no citation to any federal
2 regulations because there aren't any. So EPA is
3 commenting as a federal preference. It's a state
4 issue, not a federal mandate. I want to point out
5 the State Board did not adopt the EPA's position.
6 It disregarded it. And EPA did not disapprove of
7 the L.A. permit.
8 So these letters carry a lot of weight
9 because it is the EPA, but at the same time,
10 legally speaking, this Board does not have to give
11 deference to them.
12 With that, I will conclude. Thank
13 you.
14 MR. JUNGREIS: Honorable chair, I'm
15 going to go quickly because I know you folks want
16 to go to lunch.
17 I think Ryan already covered it: The
18 EPA, one of the reasons they would have trouble
19 objecting is because fundamentally, you're still
20 operating under the MEP standard, and you've got
21 the case law Ryan pointed to.
22 EPA doesn't necessarily have to worry
23 about costs; they don't have to worry about
24 attainability. What they do worry about is "We
25 want to see massive improvements in water

1 quality." And that's great. We get that. We do,
2 too. But just take the EPA's guidance for what it
3 is. It's guidance; not a requirement.
4 So the question that's been asked by a
5 couple board members just now is, you've been out
6 of compliance for awhile, and the world has not
7 ended. Big deal. In fact, it really has been,
8 and it started to be a real (inaudible), and the
9 big issue is are we worried about getting sued?
10 Is a Clean Water Act lawsuit that big a deal?
11 The answer is yes. It's not just a Clean Water
12 Act lawsuit. The fact is that being out of
13 compliance is not something -- I represent Laguna
14 Beach and Dana Point. They care deeply about
15 water quality. It's part of their livelihoods.
16 The idea of being out of compliance, of
17 potentially criminal responsibility for not being
18 in compliance, that's a big deal. But the
19 specific issue of lawsuits -- so Laguna Beach was
20 sued by River Watch. Seems like they're picking
21 up the pace of their lawsuits. One of the things
22 they included in their amended complaint was
23 illegal discharges into the MS4 and discharges
24 from the MS4. So they have now brought storm
25 water and storm water compliance into the realm.

1 So what did that do? Strict liability
2 for non-storm-water discharges, demanded a
3 substantial infrastructure overhaul.
4 Now why is that significant? Each
5 city is going to have its own capital improvements
6 plan. They're going to prioritize. Does the
7 police department need new police cars? They
8 wanted every pipe over age four years, or whatever
9 it was, they've all got to be replaced within "X"
10 number of years. It gets into -- rather than the
11 regional board, who in many cases understands the
12 systems they're regulating, citizen's groups don't
13 necessarily.
14 If you look at the River Watch
15 complaints, they all tend to be cookie cutter.
16 Same approach. There's attorneys' fees. The
17 whole thing cost the City about $400,000 for 16
18 months to settle it.
19 The bigger issues were staff time.
20 Tracey Inglebrits, who is here today from Laguna
21 Beach, it's practically all she did for a year.
22 Daycia, who you'll hear from later, it was half
23 the stuff she did. She's the water quality
24 administrator. It's a huge amount of staff time.
25 Not only that, the other issue is with

1 the regional board, you work things out. Regional
2 boards understand how to interface with cities.
3 Environmental groups, one of the risks with River
4 Watch or others is that you wind up having an
5 environmental group who doesn't understand your
6 city and is not accountability to the voters
7 running your public works department.
8 So that is the kind of thing that
9 troubles cities. It's one of the things the Board
10 should think about.
11 Other examples -- as I said, River
12 Watch is one group that seems to be getting more
13 advanced in their tactics. They're not going after
14 bad actors. They're going after cities that
15 presumably have a reputation of being pretty
16 conscientious: Monterey, Carlsbad, Laguna Beach.
17 They're not the top of the list of being bad
18 actors. They're all they serious about their
19 storm water programs.
20 And lately, the last three permits,
21 Laguna Beach, San Luis Obispo, in the last month,
22 alleging storm water violations and Whittier.
23 It's not just sewage spills.
24 So is it a risk? Absolutely. Maybe
25 from the regional board's perspective, you figure

1 out it's another enforcement. I think it's worked
2 really well historically over time, but in this
3 circumstance where everyone is deemed out of
4 compliance, it can cause some problems. Let me
5 talk about that.
6 I will say right now, the word
7 wrongful should be taken out. Lawsuits, there's a
8 time and place for citizens using the Clean Water
9 Act, no doubt.
10 Why is it bad for the regional board
11 not to provide interim compliance? One,
12 potentially, the settlement -- each individual
13 settlement is individual. You can have one
14 federal district judges who are very conservative,
15 some who are very liberal. You can go to the same
16 watershed and have very different results and it
17 makes it very tough to implement a water quality
18 improvement plan, to have the kind of synergistic
19 effect that gets you to water quality.
20 For Laguna Beach, it took up so much
21 time in order to deal with the lawsuit. With the
22 regional board, there's a set program. If you get
23 an NOV, you deal with it; it's a process. You
24 have to go to federal district court. The
25 $400,000, that was one motion. If they had gone

1 to trial, who knows.
2 So it's incongruent with the
3 watershed-based approach that the board's
4 practical vision talks about.
5 One of the things that came up as well
6 as and I've heard suggested is a citizen's suit
7 comes up, the regional board can jump in and
8 intervene and -- because there is a provision in
9 the Clean Water Act that says if there is a
10 current enforced action, that a citizen's suit
11 cannot proceed. Unfortunately, it's not a good
12 fit here. What the regional board would need to
13 do is go to federal court and file a lawsuit.
14 There's case law, the California Sportsfishers
15 Association, which limits what regional boards can
16 do. Does a regional board, a state agency, want
17 to go to federal court and subject itself to the
18 authority of a federal court to begin with. So
19 could it work under some circumstances,
20 potentially. But it's definitely not a clean-cut
21 way of doing business.
22 What should the regional board do?
23 This regional board, by providing interim
24 compliance, you talk about a hammer hanging over
25 permittees' heads. "You're in compliance now, but

if you don't make that milestone, if you don't provide everything in good faith you've suggested you're going to do, it will be taken away from you." And everybody is out of compliance right now already. Everybody.

So I would suggest to the Board that, one, this provides the Board with much greater control and is a much greater incentive for people to giddy up. "Hey, let's get this thing going. We don't want to lose compliance."

One thing Ryan mentioned, and we believe this to be true -- we checked through other parts of the state. It appears the only region not providing interim compliance, at least considering it, is San Diego. It's really a fairness issue. So I'd ask you to consider that. If there was a particularly compelling reason to do it differently here, I understand, but there really isn't. It's a great incentive.

The idea of losing compliance if you don't do everything you're supposed to do is a huge disincentive to wait around and not do the things we should be doing.

I talked about that incentivizing planning. What the Board should do is what it's

1 already requiring, requiring data, requiring
2 deadlines, review prior quality water conditions
3 to the consultation panel, draft agreements with
4 watershed partners. Be part of the process.
5 So I will leave you with our proposed
6 language. We would also be amenable to the
7 proposed language Riverside County has provided.
8 Bottom line is, while we're going through this
9 process that shifts the burden to do what would
10 essentially be done with TMDLs by the state to the
11 Copermittees, allow us to be in compliance while
12 going through that process. If we fail, if we
13 don't do it properly, take it away from us.
14 That's the language we would propose.
15 With that, I will give one minute back
16 to Mary Anne.
17 BOARD MEMBER MORALES: Just a few
18 questions. Let me see if I have this correct:
19 Right now you're not in compliance. So what
20 you're asking is "Please revise this and deem us
21 in compliance while we were doing whatever we do
22 to come up with a WQIP."
23 So it's a change in status that you're
24 requesting to obtain -- one of the reasons is a
25 protection from -- of suits of this type. I think

as you mentioned, somebody presented those facts to me, was that settlement. Was it -- what was the main allegations? Did an attorney just throw in an MS4 violation as one of 50 allegations?

So I'm not going to read into that there was a lawsuit against Laguna Beach for a sewage spill or something that came out of their MS4 system, and they paid $400,000 without more facts.

MR. JUNGREIS: The actual payments were several million dollars. I don't know what the prime claims were.

BOARD MEMBER MORALES: Finally at least there is one lawsuit that you all can point to. I've been asking. Are you claiming this is the sort of data breach (inaudible). But there isn't this rush of lawsuits that have been filed that I'm aware of. It's been years where -- I wouldn't say years -- where conceivably you have not been in compliance and they could have filed these lawsuits.

I also, personally, think it would be a risk for anybody that wanted to file a lawsuit for -- against any of you all because it appears to me that he you're diligently working at

1 developing (inaudible). And if they had to claim
2 to a judge -- it would be either declaratory
3 relief where they might say "change out all their
4 pipes." Basically, they'd be asking the judge
5 "Make them fix." You all could go to the judge
6 and say, "We have been diligently" -- before they
7 file their 60-day whatever -- "been in the process
8 of fixing this and quite likely there's a
9 possibility it gets fixed during dependency of
10 this lawsuit."
11 If there are organizations or
12 attorneys out there that are simply interested in
13 making a quick buck, they're going to think long
14 and hard because the judge will have the
15 discretion to tell them "Thank you, but you didn't
16 cause the cities to do what they are doing. It is
17 because of their own nature, their better angles.
18 They're in process. They're doing what everybody
19 would like them do."
20 And I believe that. I believe you all
21 are -- that's why I asked the question. I was not
22 surprised to hear you've been diligently starting
23 the process in advance.
24 Am I wrong that what you're requesting
25 is, basically, for us to vote and give a

1 protection that you don't currently have?
2 MR. JUNGREIS: I would couch it
3 somewhat differently, Mr. Morales -- Board Member
4 Morales. I'm sorry.
5 Two things, one is in 2013 --
6 certainly the cities I represent, Dana Point and
7 Laguna Beach, they've had all sorts of systems --
8 they thought they were in compliance. We all did.
9 It was certainly a surprise when we found out that
10 the receiving water limitations, the numbers that
11 were in -- from the basin plan of the permit --
12 that we were going to be held liable and deemed
13 out of compliance.
14 That's a real seat change for us.
15 We've been following this interim process, and we
16 thought we were improving. I can tell you what
17 we've done in the meantime. At least in the
18 cities of Laguna Beach and Dana Point, they've put
19 in massive amounts of dry weather diversions.
20 They're diverting 80, 90 percent of their nuisance
21 flows. They're all going to the sanitary sewer at
22 very large cost.
23 Are they doing things? Absolutely.
24 And I think a lot of cities are the same way. The
25 current approach seems troubling because it treats

1 everyone the same. It treats everyone as if
2 they're bad actors; they're all out of compliance.
3 Whereas, you've got some cities who really went
4 for it, and you have some who have done very
5 little.
6 In answer to your direct question, I
7 would say I don't think we thought we were out of
8 compliance, and we certainly want to be deemed in
9 compliance. If we're going to go forward and
10 spend, as a region, up to 2 billion dollars, we
11 should be doing it in partnership with the
12 regional board, and we should be doing it without
13 worrying about people suing us.
14 Just another point: And that was you
15 mentioned the complaints that were seen. I don't
16 know what drives River Watch. I can't speak to
17 their motivation. I can tell you their complaints
18 are nearly identical. So are there cities who
19 probably are legitimately sued? Absolutely. I
20 don't doubt it. I'm not sure that the ones I just
21 listed are legitimately sued. If you look at any
22 city or department, you're always going to find
23 noncompliance somewhere.
24 Anyway, I hope I answered your
25 question, sir.

1 CHAIRMAN ABARBANEL: It seems to me
2 that one conclusion, logical but not necessarily
3 practical discussion that we've heard from you and
4 others is that you're out of compliance, you ought
5 to take your water quality improvement plan, work
6 on it really hard and submit it in four months,
7 and not expose yourself for two years. Why don't
8 you do that?
9 MR. JUNGREIS: That goes back to a
10 point that Mr. McKibbon made from Riverside
11 County. These are the equivalent of TMDLs except
12 you're doing them for multiple pollutants. I sat
13 on a water quality improvement plan. The level of
14 complexity associated with trying to figure out
15 what are the sources and how do you reduce them
16 all? What are the projects you can actually
17 achieve without having undesirable environmental
18 effects? If you can do that in four months, I'd
19 say hire that consultant right away. But if you
20 want to do it right where you can actually
21 implement it, at the end you're confident you can
22 get the numbers you're told to hit, I would be
23 inclined to agree with Mr. McKibbon.
24 So your point is well taken. We
25 should hustle. We should go as fast as we can.

1 At the end of that plan, if we don't have
2 something scientifically defensible, what did we
3 achieve?
4 CHAIRMAN ABARBANEL: And my other is a
5 semi-question. If you're asking the board to
6 identify something as being compliant, when
7 everybody agrees no one is compliant, doesn't that
8 undercut the moral authority of this Board.
9 MR. JUNGREIS: I would argue it
10 doesn't because I would argue that we -- at least
11 municipalities because the way we are treated
12 under the Clean Water Act, we shouldn't be -- I
13 noticed we would be deemed out of compliance. We
14 heard Mr. Gibson acknowledge he feels differently
15 about different watersheds, but at least in some
16 there's places where of re-evaluation of numbers
17 may be appropriate.
18 Do I think you lose moral authority?
19 I don't. The state board didn't seem to think so.
20 The other regional boards don't seem to think so.
21 Fundamentally, I don't think you lose moral
22 authority because what you gain in the process is
23 the ability to ensure with about as great a
24 leverage tool as you could ever get by ensuring
25 people have the chance of losing that compliance.

I don't think you loss any moral authority. I understand where you're coming from, but I don't think you do. I don't think the public would perceive it that way.

MS. SKORPANICH: Could I add to that answer very quickly?

How to define compliance is a policy matter that's in your hands. So it is within your purview and your judgment to decide how to define compliance, just as the State Board did with the precedential order. I don't think you lose any moral authority by how you choose to resolve that policy question.

CHAIRMAN ABARBANEL: Thank you.

It's 12:25. We're going to break for lunch and come back with the cities of Laguna Beach and and Dana Point.

(Lunch recess taken.)

CHAIRMAN ABARBANEL: The regional Board's permit is a matter of great importance to the City. Specifically, we are concerned the permit, as currently drafted, will provide no compliance to the City during the interim period prior the adoption of the water quality improvement plan.

1 The Laguna Beach city council is fully
2 committed to pursuing improvements in water
3 quality. As one of the many examples of the
4 City's strong commitment to improving water
5 quality, will the City has installed 25 water
6 diversion units that divert approximately 83
7 percent of our entire watershed of the city's
8 drainage area.
9 This program has consistently earned
10 the City a summer dry weather report card of a
11 grade of A by Heal The Bay at all of our beaches
12 within the City. We are proud of that
13 accomplishment; however, we're concerned the
14 permit proposed for approval today will actually
15 frustrate others improvement programs in the
16 future. Our specific concerns and recommendations
17 are as follows:
18 Number one, the permit should provide
19 for interim compliance while the City develops a
20 water quality improvement plan for southern Orange
21 County. We think the regional board's mandate to
22 develop the WQIP has positive attributes. To be
23 successful in improving water quality to the
24 maximum extent practicable within the city, the
25 WQIP needs to be a deliberate, scientifically

1 rigorous collaborative effort between all parties
2 and interested stakeholders that recognize the
3 need for interim compliance and for long-term
4 compliance.
5 Secondly, the permit should clarify
6 that implementation of the City's elicit
7 prevention and detection program constitutes
8 compliance even when unauthorized discharges enter
9 the City's MS4. As Orange County presented, they
10 illustrated perhaps River Watch and other
11 environmental organizations are going after cities
12 for discharges into the MS4 that may occur
13 notwithstanding a city's full and rigorous
14 implementation of its elicit discharge and
15 protection program. The proposed errata changes
16 in the staff report gave a response to the City's
17 prior comments are a step in the right direction
18 but she should be given the force of the law by
19 placement in Section E.2 of the permit itself.
20 Accordingly the City asks the Board
21 revise the regional permit to eliminate any
22 inference of strict liability where the City fully
23 implements it's elicit program by adding the
24 clarifying language requested by our legal counsel
25 to Section E.2 of the permit.

1 Thank you for your consideration of
2 the City's comments. We know the regional board's
3 task is not easy, and the city of Laguna Beach
4 appreciates what this board is doing a balanced
5 need -- is doing to balance needed water quality
6 improvement with the realities of managing a
7 complex municipal storm drain program.
8 To that, I conclude and state that our
9 city is extremely comitted to water quality. I
10 think no one can argue that as our community
11 demands it. Our city council expects it, and we
12 work every single day to the maximum extent
13 practical.
14 CHAIRMAN ABARBANEL: Do you agree with
15 an earlier speaker that you are out of compliance?
16 UNIDENTIFIED SPEAKER: I agree with
17 Mary Ann Skorpanich's response. I think that's a
18 bigger picture. I think we run under a maximum
19 extent practical on a daily basis. From a
20 boots-on-the-ground perspective, which is where we
21 are from a very small community, that's all we
22 have.
23 If I carry over my six minutes, it's
24 going to be Dana Point and Laguna Beach together,
25 if that's okay.

BOARD MEMBER STRAWN: Together you have 20 minutes. We will not stand at the boundary between your cities and tell you how to do it.

MR. FALLER: My name is Brad Faller. I'm the director of public works for the City of Dana Point. Thank you very much for allowing us to speak today. Both our Dana Point mayor and our South Coast Water District board member that does our water sewer district, Mr. Bill Green spoke this morning. We are a team. Many cities have those entities in one city, but we have both different entities working together.

Many beach cities are working hard to improve water quality. Clean beaches equals happy citizens and visitors. So we're already motivated to meet the needs of our constituents Dana Point has invested heavily in storm water catch basin filters on public streets, we installed 18 diversions to help control dry-weather runoff, and we're the first to use ozone treatment to kill pathogens at Salt Creek and North Creek. The only place where we have untreated runoff during the dry season that goes into the ocean is San Juan Creek. We've banned Styrofoam and plastic bags in

town. We have reduced the cities potable water consumption by 40 percent this summer, well above the 20 percent goal. Three beaches in South Orange County have been delisted through our efforts. We haven't met the final goal yet, it's in the basin plan. Hopefully this tells you we're working hard, and we are making progress.

Moving forward with your concern of the possible lack of interim compliance during the WQIP development and the initial cost between 1.6 and 2.1 billion to reach effective compliance, you're really talking a difference between us spending, over the last 20 years, 20 billion or 30 billion, you're really taking a magnitude up as we move forward to hundreds of millions of dollars. It's daunting for us. It's got everyone's attention.

Regarding interim compliance, what happened in Laguna Beach has been a wakeup call for all of us. Laguna also takes its environmental responsibilities very seriously and has a robust water quality program, so when they were sued by River Watch, it surprised us, and it is great cause for concern. If you look at River Watch's website, they have 8 cities in 2015 that

1 they're litigating or bringing suit against.
2 So what we see that's happened, the
3 change that start with the NRDC has now made it
4 relatively easy to say "You're not in compliance."
5 When we see great cities getting hit,
6 that's a source of concern. We're trying very
7 hard to meet the goals of the Board as well as the
8 requirements of our citizens?
9 Please give us the opportunity to
10 develop a water quality improvement plan without
11 having to worry about being sued while developing
12 that plan. We think the focus needs to be on
13 developing the water quality improvement plans,
14 not fighting lawsuits. So why penalize the good
15 performers with opportunistic lawsuits.
16 I'm asking for your help in making
17 sure our taxpayers' dollars are going to effective
18 and beneficial water quality improvements.
19 We understand the Board's need for
20 leveraging bad performers. But what we're saying
21 is, try and realize that you don't penalize the
22 good with the bad. You have to make that
23 distinction. Where you have bad performers, we're
24 suggesting that you put into the permit that says,
25 "If you aren't producing the plan, and you aren't

1 making progress over the next few years, then you
2 aren't meeting those requirements."
3 And remember that this compliance
4 protection does not include compliance enforcement
5 for other areas, such as new development,
6 construction and existing development. The Board
7 staff still has the ability to enforce compliance
8 there. And, also, we're not asking that you take
9 out, for example, A.3(a) in the permit, which
10 still requires, and I quote, "pollutants in storm
11 water discharged from MS4s must be reduced to the
12 maximum extent practicable."
13 So we're not given a pass. What we're
14 asking you to do is make the choices. Help us
15 that are trying to help you, and you still have
16 the stick if you need it for somebody who's not
17 meeting the requirements.
18 So we're appealing to the Board to
19 adjust the permit interim compliance protection
20 for both storm water and non-storm-water
21 discharges similar to what the L.A. Board and
22 Santa Ana Board are doing.
23 Thank you very much for allowing me
24 the time to comment. And to Mr. Strawn's query
25 earlier, we very much think that the

1 administrative requirements in the permit have
2 been reduced, and that's been helpful.
3 BOARD MEMBER STRAWN: Can I get a card
4 from you when you get a chance? Just for the
5 record, to make sure she gets your name spelled
6 right.
7 CHAIRMAN ABARBANEL: Mr. Green from
8 South Coast Water District.
9 MR. GREEN: Well, thank you. This
10 morning I had to rush through my three minutes'
11 presentation, and I felt a little like the Federal
12 Express presenter this morning. So I'm here.
13 This will be short. I appreciate your time.
14 We really feel at South Coast Water
15 District, as well as at the City worked very hard
16 in the area to do our best for water quality. In
17 fact, South Coast Water District adopted, a few
18 years ago, a zero tolerance for any kind of spills
19 in your district, and I want to believe we've done
20 a very good job of maintaining that goal.
21 My message here is, please consider
22 providing -- or providing for the interim
23 compliance, which seems to be reasonable and fair.
24 Make it more like the other regions in the area.
25 So with this closing, I ask,

1 respectfully, the Board would be mindful of
2 setting the water quality improvement policies,
3 and do the right thing for the tentative order.
4 Thank you so much.
5 CHAIRMAN ABARBANEL: Mr. Green, may I
6 ask you a question?
7 We've learned this morning that there
8 are really two times where the water quality
9 improvement plans have deadlines: One is their
10 submission, and one is their acceptance by the
11 Board. Which period do you have in mind for what
12 you call "interim compliance"?
13 MR. GREEN: I would say from now until
14 the final completion of the -- the final WQIP is
15 completed; that would be the period. I can't
16 dictate the timeframe I heard Mr. McKibbon mention
17 up to 40 months might be a reasonable time.
18 CHAIRMAN ABARBANEL: I thought that
19 was actually an extension of the first submission
20 of the plan, additional time.
21 MR. GREEN: I can't answer that
22 question for him. Sorry about that.
23 CHAIRMAN ABARBANEL: Thank you.
24 MR. GREEN: But I think perhaps Jerry
25 might have an answer for you.

1 I'd be happy to answer. I think the
2 Board has a great deal of discretion as to when
3 they would want to start interim compliance. I
4 think, as of today -- you don't have to start from
5 scratch. You can look at other models from around
6 the state and see how they've done it.
7 I think from the approval of the
8 permit would be fair, but I think look at the
9 other processes that have been put out there by
10 the other Boards, and that may provide some
11 guidance, as well.
12 Does that answer your question, sir?
13 CHAIRMAN ABARBANEL: Not really, but
14 it's okay.
15 UNIDENTIFIED SPEAKER: Okay. At this
16 point, we have a short presentation, a short
17 PowerPoint, if we can -- I'm going to go through
18 this very quickly. Just a couple quick points.
19 So just for a technical comment, this
20 was raised by Dana Point: They've been pretty
21 active participants because it is so important.
22 This slide is meant to illustrate the importance
23 of why it's important to have clear language in
24 the permit itself in 2010, so there's an issue
25 about -- apparently the response to comments, and

1 this wasn't originally an issue, but in response
2 to comments, it indicates d-listed water bodies
3 are still going to have to have these BLRPs and
4 CLRPs.
5 That was contrary to what had been the
6 Board's direction in 2010, and there was some
7 ambiguity that might be problematic. We'd like
8 the Board to address that. It should be a pretty
9 minor issue and just clarify -- we can look at the
10 transcript from 2010 as to what the Board's
11 direction was. But also, it illustrates the
12 importance of why the next thing I'm going to ask
13 for for Laguna Beach is so important. The issue
14 for Laguna Beach, one of the allegations that
15 River Watch made in their complaint is,
16 essentially, that if third-party spills or your
17 own spills make it's into your MS4, you own it and
18 you're liable.
19 So it would be helpful to have some
20 clarification that is not the case. With the
21 language we requested would provide that. Now,
22 staff has been helpful, and has met with Laguna
23 Beach and tried to address some of the concerns.
24 So it just needs to be tweaked a little bit. I'm
25 asking to change the language of the -- it would

1 be as amended it would read "where a Copermittee
2 is implementing requirements" it would clarify if
3 you're implementing your program fully, you're in
4 compliance. If something gets in it, and you're
5 doing everything reasonable under the permit to
6 prevent spills, you're in compliance and shouldn't
7 be held liable. Otherwise it requires a prior
8 finding by the Board that make it's more
9 difficult.
10 BOARD MEMBER MORALES: Who gets to
11 decide?
12 UNIDENTIFIED SPEAKER: Well, it's
13 unclear at this point. You have a requirement
14 under E.2 to do a variety of things under Section
15 E.2 to carry out the requirements of your elicit
16 detection.
17 BOARD MEMBER MORALES: If the San
18 Diego Water Board -- currently it's the water
19 board or probably staff that makes the finding,
20 the determination. If we revise it to say "when
21 you're in compliance," that's fine, but who
22 decides when you're in compliance or when you're
23 not in compliance.
24 UNIDENTIFIED SPEAKER: Under the
25 approach we've asked for, staff would essentially

1 make the finding. They would be deeming you in
2 compliance. Arguably -- this is in the staff
3 report, so it's meant to provide guidance. It
4 provides additional verification you don't need
5 the Board to actually find someone is fully
6 implementing their program. That's one area where
7 clarification would be helpful.
8 CHAIRMAN ABARBANEL: I was going to
9 ask you about a historical example in this region.
10 The City of San Diego runs a pump station at the
11 edge of Penasquitos Lagoon, which is near Torrey
12 Pines Beach State Park. That pump station is runs
13 when electricity is delivered to it by SDG&E.
14 There was a ground out or power outage in which
15 SDG&E did not deliver power and there was a spill.
16 Everybody was in compliance, but there was a spill
17 and somebody was held responsible.
18 UNIDENTIFIED SPEAKER: That's a great
19 point. I guess my response to that would be did
20 they have backup generators in place? Did they
21 have a system in place to prevent spills? I don't
22 know anything about the scenario.
23 CHAIRMAN ABARBANEL: Of course. Only
24 to suggest the unexpected may happen. You could
25 be trying your best and still this went into the

lagoon rather than the MS4 system. These things happen. And I only throw that into the conversation.

UNIDENTIFIED SPEAKER: It's a good point. The point is raised because of the issue. Laguna Beach wasn't frequently appearing before this Board before because they were busy trying to improve water quality. It's been a seat change. They haven't wanted to get into this business they've been dragged into it. Now that they're here, it makes sense to -- to the extent they do what they're supposed to do in the future, they don't wind up in court again. That's what this effort is, an effort to make minor tweaks to help address the concerns. Pleasure of the board, obviously, but that would be our recommendation. The staff report is helpful but I think that clarification would be beneficial. Also similar clarification to the permit itself.

I wanted -- I'm not going to spend much time -- good, my time is back on.

This is the question raised by Board Member Morales about aren't you already out of compliance? Haven't you been out of compliance for a couple years? This summarizes the responses

that Mr. Baron. It's really a question of are we out of compliance and we wish for the privilege of being in compliance, or are we already implementing programs trying to do our best with the interim process and then a regulatory change to put us in a posture where everybody is deemed to be out of compliance. If everybody is in violation of the Clean Water Act, how do you tell the good from the bad?

Anyway, so I think those are just the points I wanted to make. I think Ryan made most of them. It's very expensive. Dana Point, regardless of what you do today, Dana Point, Laguna Beach, the people I'm here on behalf of, they're going to pull out the stops to improve water quality. It's important to them, and it will continue to be. Their citizens demand it. But I think it will -- first of all, it's the fair thing to do but also not having to worry about "are we going to have to devote one person here to dealing with" -- I don't want to malign environmental groups here, either. They're good people. They're trying to do the right thing, too. I get that. But it does make it difficult to try to get the mission accomplished when you

1 had things that went down in Laguna Beach.
2 I think that interim compliance -- the
3 task you've given us is very steep. We've got to
4 come up with a lot of money. It will be a big
5 step in the right direction if we have interim.
6 If I could reserve my time -- if you'll permit me
7 to do that.
8 CHAIRMAN ABARBANEL: Does that end the
9 presentations by the cities of Laguna Beach and
10 Dana Point?
11 MR. BARON: Yes. We're good to go.
12 CHAIRMAN ABARBANEL: Before we move
13 on, then, to the San Diego county permittees who
14 have three minutes, I would like to ask a question
15 of Mr. Chiu.
16 CHAIRMAN ABARBANEL: We have heard
17 that the Copermittees have two years to submit for
18 the inspection of the board, water quality
19 improvement plans. When does that two years
20 begin?
21 MR. CHIU: Well, it varies, depending
22 on the group, so depends on when they come into
23 the permit, but we set an effective date that is
24 50 days after you adopt the permit or adopt the
25 amendment to the permit. Orange County when they

1 came in February, their effective date became two
2 years from April 1st.
3 CHAIRMAN ABARBANEL: April 1st, 2017.
4 MR. CHIU: For Riverside county
5 Copermittees, the effective date would be January
6 7.
7 CHAIRMAN ABARBANEL: 2018.
8 MR. CHIU: January 7, 2018.
9 CHAIRMAN ABARBANEL: San Diego?
10 MR. CHIU: San Diego went through
11 their water quality improvement plan, and they
12 submitted theirs back in June 26th of this year.
13 CHAIRMAN ABARBANEL: San Diego county.
14 MR. VAN RYAN: Good afternoon, members
15 of the Board. I'm John van Ryan. I'm with the
16 County of San Diego. I'm here to represent the 21
17 Copermittees of the San Diego region portion of
18 the permit. I'm going to be speaking exclusively
19 to the land development requirements of the permit
20 that are in Section E.4.
21 CHAIRMAN ABARBANEL: Before you do
22 that and without loss of time, your time San Diego
23 county Copermittees went through a two-year
24 process to develop the water quality improvement
25 plans. During that time, you had no alternative

compliance capabilities; is that right -- interim compliance protection; is that correct?

MR. VAN RYAN: That's my understanding.

CHAIRMAN ABARBANEL: What happened?

MR. VAN RYAN: I'm not the best person to ask. I don't deal with that portion of the program.

CHAIRMAN ABARBANEL: Is there somebody who can answer?

UNIDENTIFIED SPEAKER: John is dealing with the development issues.

CHAIRMAN ABARBANEL: Is it a long answer, or is it nothing?

UNIDENTIFIED SPEAKER: We were very busy at work trying to meet the requirements of the permit. We were doing several plans at the same time. I think we worked very hard and diligently.

CHAIRMAN ABARBANEL: During that time when you were exposed and potentially not in compliance with the new MS4 permit, did anything unusual happen to you?

UNIDENTIFIED SPEAKER: We continued running our program, sir.

MR. VAN RYAN: So behind you is a summary of the issues I'll be speaking to. I have a handout that summarizes what we'll be asking for.

So basically, we've got three issues I want to address. First are essentially support. Issue A was support for the fact that staff in the November 4th errata clarified an inconsistency in the dates for the effective date of the BMP design manual, and the updates to that. Thanks to staff for fixing that. We agree with the fix.

B, we also support staff's stated intent to further extend the date of the BMP design manual for San Diego COunty permittees by 90 days from the current effective date of December 24th of this year.

As I'll talk about in a little while, that's something that's only in the response to comment. That's not part of this permit and that's not part of this adoption. We'll have some thoughts how we prefer to see that move forward. The rest of these are the issues I'll be concentrating on for the rest of this presentation. They primarily deal with time, and the time needed to complete updates.

The first is the permit should generally allow the extension of BMP design manual effective date by 180 days instead of 90 days anytime new or modified land development requirements are adopted, which would be the case today.

We specifically would like to see the proposed extensions that are in the tentative order today. The effective dates for those to actually be June 21st, so in other words, 180 days on top of what's already being suggested by staff in response to the comments.

So it would give us a full 180 days beyond the existing December 24th effective date.

So number one, first of all, we just want to see when new requirements are brought in after the initial permit, which is the case now, that we have enough time to do what we need to do to bring those into our programs and implement them. What we're suggesting here is a full 180 days when new requirements come in, instead of 90, which is currently in the draft. The simple edit we're suggesting is the bottom of the slide. Simply change F.2(b)(4) to be 180 days instead of 90 days. Simple edit.

So anytime we have to make modifications to our BMP design manual, a whole lot of other things have to go along with that. This slide breaks it up into three major pieces. We have updates we have to complete. We have a public process we have to go through, and that's fairly well defined. And then we have to actually work with applicants to identify where those changes are going to be applicable, whether it's new applicants or applicants with projects in the pipeline, to work with them to make sure the correct requirements are being applied.

Under the completion of updates, the critical things for us are updates to the BMP design manual. The lion's share of BMP design manual updates have been completed over the last two years.

So, arguably, the new things that are being brought in under this tentative order are, in comparison, not a lot. Keep in mind we have to go through the same process. The critical thing here -- any of these things can take months, sometimes years depending on what it is. We can try to keep the timeframes as collapsed as possible, but for the county of San Diego, as I'm

1 used to illustrate, our board updates take at a
2 minimum, if all the dates lined up, for us to
3 basically do our administrative process, get an
4 ordinance update through our administrative
5 process to our board, for the first hearing,
6 second hearing and then 30 days for that to be
7 effective. In the best of all possible scenarios,
8 that is 90 days, which is currently provided for
9 updates.
10 We have to update our watershed
11 protection ordinance to implement the requirements
12 of the BMP design manual. I can't speak for all
13 Copermittees, but some will have the same process,
14 some will have more process. Realistically, if
15 we're being given 90 days to do it all, and this
16 one piece of it ignores the fact we need to reach
17 out to industry, work with people, develop the
18 requirements up front, it's just enough to get us
19 to squeak in.
20 We're certainly not concerned if we're
21 a few weeks behind the deadline, staff is going to
22 come after us. That's not the case. But we're
23 really concerned this isn't a realistic timeframe.
24 We're not going to be squeaking in. We're going
25 to be much behind it. But that's generally what

1 we have to go through.
2 Our second request is -- so in
3 addition to making the general extension of design
4 manual effective dates to 180 days, in this
5 particular case, for the changes that are imposed
6 through today's hearing, we would like the
7 extension date to be 90 days, in addition to what
8 staff suggested in the response to comments. An
9 additional 90 days to what they're suggesting
10 would be a total of 180 days from the current
11 December 24 date. That would take it to June 21,
12 2016.
13 I'm providing specific edits at the
14 bottom of this slide. All you would really be
15 doing here is putting a sentence at the end that
16 says "For these specific updates, San Diego
17 Copermittees, the effective date for these
18 requirements will be June 21, 2016" and this
19 slight edit up in the previous sentence to clarify
20 you have the authority to do that. We think
21 that's fair. Let me go through why that's
22 necessary at this point.
23 So these are the major things -- I'm
24 not going to go through -- these are the major
25 things in the land development requirements right

now that effect what we have to implement. PDP categories have been modified. The definition of redevelopment has been modified, and more importantly, grandfathering or prior lawful approval provisions have been added.

Going back to the timeline I just described, we need that 90-plus days to get through the minimum administrative and adoptive process for our ordinances.

I want to go back to grandfathering provisions here. These are important provisions. We're very happy with staff for where we got with these. We got a reasonable set of provisions moving forward. These are much more useful to the Riverside and Orange County Copermittees. We have very little time to work with applicants to utilize them.

When I worked on this process, Board Member Morales was there, and I think you'll recall one of the things you said when we brought up the issue of timing was you'd have staff look into it. I think staff did will look into it, but unfortunately we didn't come up with anything other than the current schedule. It's not enough to take advantage of these new grandfather

provisions. If we were provided the additional 90 days that are we're suggesting on top of what staff is suggesting, we would be satisfied that's enough to do that. I won't belabor that issue except that was an outstanding issue for us.

CHAIRMAN ABARBANEL: Pardon me. I have a question.

These changes to your ordinances and the design manual must occur every time the MS4 permit changes?

MR. VAN RYAN: Yes.

CHAIRMAN ABARBANEL: The MS4 permit, as we learned from executive officer, has been issued since 1990. And this is the fifth. You've done this four times before in the past?

MR. VAN RYAN: This is the second time. The BMP design manual revision was called Sue Sump and Lass [phonetic] manual, and why bother spelling it out.

It was basically a change in title. What the permit required this time because there were significant changes in the land development requirements you said you guys have a certain period of time to update those after the board accepts those updates, you have half a year to

1 implement them.

2 CHAIRMAN ABARBANEL: Under the

3 assumption that the 2018 MS4 permit will be less

4 of a big change from the previous permit --

5 present one, would you accept the fact that this

6 is a necessity only this time and not in the

7 future?

8 MR. VAN RYAN: If I agreed with that

9 assumption. We've assumed it every time the

10 permit has been reissued and we've been wrong.

11 I'm not sure that would be the case.

12 So, again, going back to where we are

13 right now with this particular iteration of the

14 land development requirements, you saw the things

15 that are changing. To go back to the slide you

16 saw a minute ago, the updates are relevant, so we

17 need at least the 90 days plus to get the

18 ordinance updates and all these other things that

19 need to be done.

20 In addition, there are other

21 outstanding issues that we haven't completed yet

22 at this point. I want to talk about critical

23 coarse sediment yield. These are requirements

24 that were in the 2013 permit when it was adopted.

25 They think we are hot and heavy into

1 really trying to come up with reasonable
2 guidelines for developers to implement. As it
3 turns out, they're much, much harder than what we
4 had anticipated. I know the first reaction to
5 this particular thing is, "you had two years."
6 But keep in mind for the first year of this
7 permit, we were doing something called the
8 Watershed Management Area Analysis, where we were
9 figuring out even how these things applied. We
10 didn't know until a year into it the gravity of
11 what these requirements were going to be imposing.
12 In addition to that, the second year,
13 we were doing things like starting to develop
14 offsite alternative compliance programs. We
15 updated our terms. We updated all of our
16 programs. There's a lot of stuff going on here.
17 The reality is this is where we are right now:
18 We're getting closer, but we're not there yet, and
19 if we don't extend the effective date on these,
20 we're going to be in a position of not having the
21 right requirements in place to be able to
22 implement them.
23 What I want to point out to you is,
24 we're committed and well into the process of
25 developing these requirements. The county and the

city of San Diego are working cooperatively right now to develop guidance.

Keep in mind, this is not straight engineering; this is environmental science. We're being asked to do really new stuff and it's more than you can simply rely on the applicants to turn in a proposed design and review it to see if we got it right.

The major issues on the left side of this slide, these are the things we will have to develop. I purposely blurred that diagram so it wouldn't evoke any discussion. It's a flowchart to illustrate what the process is applicants will go through once we figure out how to guide them through all these decision points.

We are making progress. I wanted you to see that. It shows we've done something. What we are committing to right now, what we've already started to initiate, the city and county together are taking the draft content that we developed so far, we're are going to put it through a public process. First, we're putting together a technical advisory committee that will include your staff, will include somebody from the industry, NGOs. It will include secular people

1 that need to be okay with this stuff.
2 We're thinking two to three tack
3 meetings, and we're thinking a public workshop
4 sometime in April. This, I think, is a fairly
5 aggressive schedule, but we think that we can do
6 it. If we were to do that, we would basically be
7 final guidance by late May. What we asked for is
8 an extension of the effective date that would take
9 us a little bit into June. So with that, we feel
10 like we could be there. It's not going to be
11 perfect but realize what we need to do before we
12 start releasing guidelines and requirements on
13 developers is, we have to have methods that are
14 fully baked. They have to be basically
15 technically and legally defensible.
16 And to come back to Mr. Chiu's point
17 from earlier, they have to be able to support not
18 action-oriented implementation but
19 results-oriented implementation. And the danger
20 we run if we don't work out these methodologies
21 and they're not scientifically valid, is that all
22 we're doing is basically putting people through a
23 routine of generating results rather than what the
24 permit asked for, which is no-net impact to
25 receiving waters.

1 That's what we're asking for.
2 What we would prefer, in terms of how
3 to get the extension, would be that you just make
4 the amendments to the tentative order today. Just
5 put that date in there as we're asking for it. So
6 we provided the language so the staff doesn't have
7 to write it.
8 If you can't do that or disagree, but
9 you do agree that the effective date should be
10 extended to some date, whatever you agree with,
11 then please, as part of the public record for this
12 proceeding, direct your executive officer to make
13 that change so that we know in leaving this area
14 what we're working with.
15 That's all. Thank you.
16 CHAIRMAN ABARBANEL: San Diego has
17 six-and-a-half more minutes.
18 MS. WEBER: I do have a question.
19 CHAIRMAN ABARBANEL: Go ahead.
20 MS. WEBER: Thank you. I'm JoAnn
21 Weber, planning and project manager for the County
22 of San Diego, and I also speak on behalf the San
23 Diego's Copermittees.
24 The Copermittees, we appreciate the
25 Regional Board has included additional language to

have the ability to have this alternative compliance option. We thank the staff for several changes made in the errata sheet, which make it a more implemental option. Despite these (unintelligible), the San Diego Copermittees are concerned that the specific requirements for annual milestones will still be overly constrictive and burdensome. Each Copermittee could potentially need to establish and track annual milestones for multiple goals within multiple water bodies in each of their Watershed Management areas which could result in dozens of annual milestones.

The Copermittees recognize that milestones would benefit accountability for working toward their goals. These specific milestones would be more meaningful if they would focus on priority water quality conditions and were actually based on a permit cycle, as they currently are in our water quality statement plan, so that would be one milestone per five-year permit term, period, from each water body, including combinations to be covered under the alternative compliance pathway.

The San Diego Copermittees are

1 requesting the Regional Board to consider
2 modifications to the language to restructure this
3 annual milestone requirement to make it more
4 meaningful. And I have a draft errata sheet that
5 I can hand out to your staff, and it's exactly the
6 same thing that they proposed in our September 14
7 comment letter.
8 Thank you.
9 BOARD MEMBER OLSON: I just wanted to
10 ask a question.
11 So for your group, the interim
12 compliance is not an issue?
13 UNIDENTIFIED SPEAKER: We did not have
14 that option on the table when we did our water
15 quality improvement plans. That's just something
16 we're coming in now.
17 BOARD MEMBER OLSON: So you didn't
18 have any suits or -- I mean, that's what I kind of
19 understood you to say in relationship to the
20 Chair's question.
21 UNIDENTIFIED SPEAKER: That's correct.
22 BOARD MEMBER OLSON: You said, well,
23 you were out of compliance, or you --
24 UNIDENTIFIED SPEAKER: None that I
25 know of.

BOARD MEMBER OLSON: Okay. Thank you very much.

MR. WILE: Good afternoon, Board Chairman, Board member. My name is Clint Wile. I'm with the City of San Diego Transportation and Storm Water Department. I'm the program manager for our Watershed Planning Group. We oversaw the development and took over the lead for three of the new water quality improvement plans here in San Diego, and we participated in another three. So the last two-and-a-half years I have the scars to show putting these plans together. But I think they're good plans.

Let me say for the record that the city of San Diego, our overall goal is improvements to water quality, and we think the WQIPs are going to be our roadmap on how we are collectively here going to get there down the road.

I also want to speak here, generally, in support of the permit amendment but offer a few suggestions for some modifications that I think and the City thinks will make implementation of water quality plant more effective, more achievable and will result in faster and better

1 improvements to water quality.
2 I'd also like to quickly thank Board
3 staff for their efforts in working with the
4 Copermittees over the past two years on the
5 development of the of Water Quality Improvement
6 Plans and through this entire permit amendment
7 process.
8 First, the City of San Diego supports
9 inclusion of the prior lawful approval definition
10 in the permit. Again, we want to acknowledge and
11 thank Board staff efforts in working with us, and
12 other stakeholders, through a public participation
13 workshop that led to developing this definition.
14 We support the San Diego program
15 chief's comments as presented by the County of San
16 Diego related to changing prohibition and
17 limitations compliance option in the annual
18 milestone requirement to one milestone per permit
19 term.
20 I wanted to further elaborate on what
21 JoAnn mentioned about why I think that's important
22 from a planner in a city that has to implement
23 these water quality improvement plans and I think
24 with the importance we can see here. The City
25 supports the concept of milestones. It's never

1 that we didn't agree with them, and we support
2 that for many reasons. They provide opportunity
3 to achieve the outcomes, and they also provide
4 accountability and transparency. They also help
5 me communicate to my management and city leaders
6 budget requests that we need more funding to
7 improve water quality. And so to have milestones
8 and numerical provides that accountability and
9 that justification for increased budget requests
10 that we all know we need to meet these challenging
11 water quality requirements.
12 However, the annual milestones do not
13 allow the City and the other Copermittees and the
14 MS4s in this room enough time to reprogram
15 activities and secure those necessary fundamental
16 resources that you make program adaptation. So
17 what I mean is, these active management process,
18 cities are just too big to be able to do that on
19 an annual basis. We do our budgeting process a
20 year in advance, so if we find that we don't make
21 annual milestone, it takes us a year to request
22 the necessary resources to make that correction.
23 And that's why during the permit workshops we had
24 advocated for a less frequent annual milestone
25 whether or not we were against milestones, an

1 annual is just not practical for how cities' --
2 their budget process works and how we reprogram
3 and implement.
4 CHAIRMAN ABARBANEL: City of San Diego
5 does not carry a reserve for unexpected expenses?
6 UNIDENTIFIED SPEAKER: We certainly
7 do. But as far as for the Water Quality
8 Improvement Plans and we're talking about the
9 compliance option that's on the table right, now
10 we are trying new BMPs all the time and we have
11 forecasted out what we think we need to do to meet
12 those numeric goals.
13 CHAIRMAN ABARBANEL: No, I understood
14 what you said, and I appreciate the answer to the
15 question.
16 MR. WILE: Okay. The City also
17 supports the San Diego Copermittees' comments
18 about the six-month extension for the effective
19 date of the BMPs design.
20 Now, as a followup to our written
21 comments, the City of San Diego requests that
22 Board staff amend the permit to allow for
23 individual jurisdictional compliance with TMDLs.
24 Let me elaborate that really quickly because I
25 only have a minute left.

1 Specifically, language and attachments
2 of the permit precludes any Copermittee from using
3 the WQIP implementation compliance pathway for
4 that TMDLs unless all Copermittees in that
5 watershed are effectively implementing their Water
6 Quality Improvement Plan commitments. This is
7 problematic for two reasons: One, individual
8 Copermittees, or MS4s, have no authority to compel
9 other Copermittees to comply with these
10 requirements.
11 And second, and more important in my
12 mind as an implementer, is in order to justify and
13 clearly defend requests for additional budget and
14 the resources necessary to implement these BMPs,
15 we, I, the City, Copermittees, need assurance that
16 our compliance is not going to be determined by
17 the actions or inactions of other agencies.
18 So in closing, I want to thank again
19 Board staff for working with us and the
20 stakeholders during this long process, and we, and
21 I particularly, look forward to transitioning from
22 Water Quality Improvement Plan planning to
23 implementation so that we can start to move toward
24 our collective goal of improving water quality.
25 Thank you.

1 CHAIRMAN ABARBANEL: So I note -- are
2 there any questions of Mr. Brown? I know -- this
3 is a question -- the City of the San Diego -- all
4 the San Diego Copermittees are now two and a bit,
5 almost two-and-a-half years into the process of
6 the WQIP's process.
7 I think this Board, and I think the
8 staff, were very pleased with the idea of Fiori,
9 that allowing the Copermittees to figure out how
10 to achieve the goals was a good one, rather than
11 our sitting up here and telling you what to do.
12 You've been through six out of the seven, 84
13 percent of the WQIPs. Is that happening? Were we
14 simply too optimistic? Are you and the other on
15 Copermittees happy that you get to decide how to
16 do it?
17 UNIDENTIFIED SPEAKER: I think it was
18 a -- at the end of the day, at the end of the two
19 years, it was a compromised approach. I think
20 most guys have issues that they can be happy with,
21 and then these plans are not perfect. And I think
22 Mr. Chiu talked about that earlier, about their
23 dynamic documents. We look to improve them and
24 work on the things that maybe didn't work so well
25 for the first two years, we're going to have an

1 opportunity to do that.
2 But to specifically answer your
3 question, I think the Copermittees appreciated the
4 flexibility to establish numeric goals, but we had
5 to work in tandem with our stakeholders and with
6 the Regional Board and they pushed back on us and
7 it was a collaborative process.
8 CHAIRMAN ABARBANEL: If in the future
9 we decide the plans must be perfect, these meeting
10 would be much shorter.
11 Okay. Mr. Brown, I think there's a
12 question for you.
13 BOARD MEMBER OLSON: Could you tell
14 me, then, since you're asking that the milestones
15 be changed, so you were happy you didn't have to
16 do them all up front, correct?
17 MR. BROWN: Yes. So I actually didn't
18 even acknowledge. I agreed with JoAnn's comment
19 that we do appreciate the change in the errata
20 sheet, that we don't have to extrapolate annual
21 milestones out 20, 25 years.
22 BOARD MEMBER OLSON: But you found it
23 burdensome that you have to do them?
24 MR. BROWN: My personal feeling, or
25 the City's, I don't know if I would use

"burdensome." The point I was trying to make is simply if we don't attain an annual milestone, the City's internal adaptive management approach -- we're not able to turn on a dime, and doing that on an annual basis is difficult for a large city. And so we were hoping that there could be a little bit longer time between milestones with better alignment with our internal budgeting process.

BOARD MEMBER OLSON: So meeting them doesn't slow down the process, or it doesn't coincide with your budget process, but overtime would you --

MR. BROWN: If we don't meet an annual milestone and we realize that we need to retool or reprogram our storm water program to meet that next annual milestone. We need a longer time to do -- we need more time to do that. That that was the point I was trying to make.

BOARD MEMBER OLSON: Or you need a designated reserve to allow you to you meet those?

MR. BROWN: Yeah.

CHAIRMAN ABARBANEL: So if the City of San Diego decided that they would form a five-year budget and let the city counsel have four years of vacation, would you be asking us for one milestone

1 every 25 years?

2 MR. BROWN: I don't know if I can

3 answer that question. I don't think the San Diego

4 city counsel can either.

5 CHAIRMAN ABARBANEL: Do you have a

6 question you wanted to ask?

7 BOARD MEMBER MORALES: I have a

8 question for staff, actually.

9 On the request that we push out a 180

10 days -- and I think originally, and correct me if

11 I'm wrong, we had said 30 days, and then there was

12 some back and forth, and currently what we've got

13 in the tentative order and recommendation is 90

14 days. I understand the argument 180 days gives

15 them opportunity to go through public process and

16 that takes set amount of time, 25 years, even the

17 best-case scenario. What does that do to the

18 grandfathering?

19 BOARD MEMBER MORALES: So we're

20 basically -- they're saying give the

21 grandfathering (intelligible) three more months?

22 UNIDENTIFIED SPEAKER: That would be

23 how the process would work out, yes.

24 CHAIRMAN ABARBANEL: Thank you very

25 much.

1 The next set of speakers are the
2 Building Association, 15 minutes. We understand
3 that there's been a request on the part of some of
4 the speakers in Group 9, the environmentalist
5 group, to speak earlier because of time. In
6 fairness, we set the schedule and we're going to
7 try to keep to it. So if you can please ask other
8 people to make their remarks, that would be
9 helpful.
10 MR. STRAWN: We can add your time to
11 the other speakers and make a record that you were
12 here, but we really prefer to not change the
13 schedule around.
14 MR. MCSWEENEY: Before we proceed,
15 Mr. Chairman, I need to be sworn.
16 CHAIRMAN ABARBANEL: Oh, my goodness.
17 Anybody else not yet sworn in?
18 Okay. Do you swear that the testimony
19 you will provide is true and correct? If so, say
20 "I do."
21 MR. MCSWEENEY: I do.
22 CHAIRMAN ABARBANEL: Thank you.
23 MR. MCSWEENEY: I'm Michael McSweeney.
24 I'm senior policy advisor to the BIA representing
25 the coalition --

1 CHAIRMAN ABARBANEL: Is the mic on? I
2 just want to make sure everybody hears you and the
3 record hears you.
4 MICHAEL MCSWEENEY: I'm Michael
5 McSweeney. I'm senior policy advisor to the BIA.
6 I'm representing the coalition.
7 Right off the bat I wanted to correct
8 one thing that my friend Wayne Chiu said. When
9 you pointed out about the watershed approach, that
10 is something we also bought into.
11 MR. CHIU: My omission. I apologize.
12 MICHAEL MCSWEENEY: Okay. So Board
13 members, I want to use a cultural reference as we
14 start. And I want you to join me, if you could
15 look at the slide. And we'll go back to
16 Mr. Peabody's way-back machine, and we'll go back
17 to 2007.
18 In 2007, the relationship between my
19 industry and the board was nonexistent. We really
20 didn't engage each other. We opposed the permit
21 in 2007. I didn't work for the BIA at that time,
22 but my understanding was we felt we were singled
23 out; most the requirements were on us. There
24 wasn't any dialogue. It was, "Here's the permit.
25 We're going to do this."

We felt it was unfair. We sued. We spent a million and a half dollars. We lost.

I want to contrast that to what we've done in this permit cycle. At the very beginning, we overcame our fear and decided we wanted to commit to collaborate with all the stakeholders. We decided to help solve this problem by utilizing the engineering skills of our members. We worked collaboratively with the Copermittees, your staff, and the environmentalists. That was a first. We worked closely with Regional Board staff to make specific changes to the plan, and we've spent over a million dollars in hard cash and hours donated to help try and make this permit better and comply.

Well, I talked about the fear. The next thing that comes up is trust. And the first example I think you saw of that is our joint letter with Coast Keeper. And if you look at No. 3, the point there, the one thing that I think both our organizations feared. And you heard it today from two sets of Copermittees that had one watershed they were talking about. We were in fear of doing eight of these plans simultaneously. And why were we in fear of that? Because eight

1 WQIPs in 24 months -- I'm going to use "WQIPs"
2 because I only have so much time.
3 There's a limited pool of experts and
4 consultants. So it's hard enough to do one really
5 well, but if you've got a limited pool of
6 brainpower, to do eight simultaneously is a huge
7 challenge. This had never been done before, so
8 there was no template to follow. This was a
9 learn-as-you-went-along. The interesting thing
10 is, each component builds on the next. So in
11 building terms, the first thing is the foundation,
12 and then you set up the walls, and you set the
13 floor joints. That's how you build a building.
14 So each one of these had to be completed.
15 If there was any hiccup in that
16 schedule, then you're under that much more
17 pressure to try to get it done.
18 And as technical problems arose, it
19 took additional time to figure those out, and that
20 put already more demands on a tight timeframe.
21 We agree with your practical vision.
22 And I'm not going to read it to you because you
23 all memorized. So I want you to know that we
24 spent, as of yesterday, $1,059,000. The first
25 line there is actual hard dollars spent on

1 consultant studies, reviews, policy work. The
2 rest is the people at work at the BIA, and the
3 other two are what our members have donated.
4 Basically, we've put our money on the table behind
5 what it is that your executive officer and your
6 Board is behind.
7 We're requesting 90 days beyond what
8 the staff had asked you to consider, to do some of
9 the following things:
10 The BMP Design Manuals, we spent a lot
11 of time on this. We're about 95 percent of the
12 way there. We need a little more time to work out
13 a few bugs, including how coarse sediment plays
14 into that.
15 The coarse sediment yield, we're
16 working on tools that will give us the ability to
17 practically comply with the requirements in the
18 permit.
19 The Water Quality Improvement Plans,
20 there's additional science data that is coming
21 online that hasn't been included in those plans,
22 and we want to see that included in those plans.
23 Public education. There are so many
24 misconceptions out there of when, who, and what
25 takes place where, so much so that I will

1 illustrate this. The City of Oceanside, we have
2 developers building houses, under construction,
3 and they're being told that if those houses aren't
4 done by the end of December, you're going to have
5 to comply with the new permits. That's completely
6 factually false. But there's so much that nobody
7 really knows what's happening, and so there needs
8 to be more time to educate through both the
9 industry and the city and, basically, all your
10 stakeholders to know when will things go live.
11 Finally, in 180 days we're not going
12 to get alternative compliance figured out, but we
13 need more time to get that up and running because
14 that's going to be, I feel -- I don't want to say
15 the "silver bullet," but that's what's going to
16 help get us to where we want to end up.
17 So when you look at the design manual,
18 we want to make sure -- and what we've been
19 working on -- is to make sure that it's easily
20 understood. This is the Bible, the how-to
21 document in each city of how you will comply, what
22 you have to do to comply, development staffs of
23 the cities.
24 Now, these aren't the storm water
25 managers. These are the people that actually

process plans. They need to understand and get trained on what does all this mean. Because right now they have something of an understanding, but they don't know the specifics. Once complete, we need to make sure that all the people on our side of the table are trained and understand now whatever is basically in cement, codified, going forward.

Most of the work is 95 percent complete, and we need -- and Wayne touched on this in his presentation -- we need a clear procedure so that when problems come up stakeholders and Copermittees can get together with Regional board staff and get it fixed, which brings us to coarse sediment yield.

This area was not well-understood going in. There's not much in the permit about it; it talks about avoidance. Even after the watershed mapping analysis was done, we really didn't understand what that was. And in one of the forums they passed around an 8-and-a-half-by-11 piece of paper with where we think sediment is, and it all looked like it was in east county and everybody figured out, "Ed, we're not building there."

1 So once we understood where the
2 sediment is -- and if I could just show you, this
3 is the map that came out in June of this year.
4 It's a GIS map. So once we were able to actually
5 see it, it became nicknamed "The Rash Map" because
6 it looks like the county has a rash. So once you
7 started looking at it, it's hard to see -- you can
8 see all in east county, but even down in here
9 there's still pieces of red. So when we start to
10 blow this up -- now, here's a perfect example.
11 Can you see this is Fanita Ranch down here in
12 Otay. So how do you comply?
13 And so needless to say, when this map
14 came up and property owners and developers looked
15 at it and they honed in on where their red dot
16 was, it was an "Oh, my God" moment. You talk
17 about the anxiety level, my phone and my e-mail
18 blew up.
19 We have compliance challenges. How
20 are you, meaning an applicant or a Copermittee,
21 going to document the permit so that permit
22 requirements are met? There's practicality on
23 doing this.
24 So we're suggesting -- and I think
25 John talked about it -- we should have some sort

of a workshop similar to what they did for Hydromodification in 2007 so everybody gets on the same page and we all know what it means.

The other thing is drainage boundaries. Sediment transport is based on drainage boundaries not project boundaries. So your project could be in the middle of something and you gotta figure out on two pieces of property, upstream and downstream of yours, how are you going to get your sediment to the tributary?

So why did this become an issue so late in the process? Well, there was a lack of transparency. And it's not anybody's fault, but when there wasn't an understanding where they talked about there was a small map that went around. And you can see if you reduced that to an 8-and-a-half-by-11 slide, you couldn't see any of those small mounds. All you saw was what looked like the mountains.

The original link that was released, if you had GIS software on your computer and you tried to download the map, it crashed. It was so large a file.

We asked, after three or four weeks of

the map being on the site, for the County to figure out a better way to make it more user-friendly, maybe put in Google Earth, so if you had Google Earth then you could see it. The public couldn't find it easily.

And so what did that do at our end? As soon as we figured it out, my phone blew up. People started to panic. Everybody assumed the worst, which extremed the panic. And then finally, once you factor in the permit timeline, now it's maximum panic. And this is what happens: The engineers freaked out. The hydrologists started sweating profusely. The developers are pulling their hair out, and even our children were stressed because we became overstressed all of a sudden.

So what do we do next? On the left is pretty much what our industry looked like. We freaked out. I called Laurie. Laurie put together a meeting with Wayne and Christina. And their message to us was, "Look, don't panic."

What we were looking for from the permit -- and this is the benefit of the collaboration. I will say right now, a year and a half, two years ago, there was a lot of anxiety.

1 We've been working with your staff. Whenever we
2 have a question, they answer it. My boss meets
3 with the executive officer on a regular basis.
4 And so what they told us was, "Look, this is what
5 our intent was, was no net impact."
6 So then what we did was we went to
7 work. We had the meeting with them, then we
8 helped, and we were at other stakeholder meetings.
9 We met at Coastkeeper Inn. We met a couple times
10 with Copermittees. How are we going to get this
11 to work? One of our academics put together a
12 white paper on sediment yield. He developed a
13 dimensional index. I know that the County's
14 consultant was developing something. We went to
15 work. We freaked out, but we got some
16 clarification and we went to work because the time
17 is ticking. And we worked collaboratively because
18 at the end of the day what we want is, we want to
19 have the tools in the toolbox so that we can
20 comply with the permit.
21 So the Copermittees need additional
22 time to do the following things:
23 They've got to do public work
24 workshops to educate, solicit input on this
25 particular topic.

We need to coordinate the solutions and then get them into the BMP Design Manuals. Remember, each city has one of these.

Then we've got to review all available sudden since that was not given during consideration on the Water Quality Improvement Plans and include that where applicable.

They've got to have time to schedule counsel meeting and counsel approval, and then we have to conduct concurrent training for development industry staff, as well as the people that work for the different Copermittees.

So how do we get to the goal? We think by adding 180 days total -- the 90 that staff said that they will give, plus an additional 90 -- starting up the December 24th due date, that we can come together and agree on standards and get the course sediment yield figured out, codified, and into the BMP Design Manuals.

We also think that we can get some additional work done on the Water Quality Improvement Plans where they've been deficient.

We can incorporate a fully developed workable model into all the manuals, and we can allow the various jurisdictions to have the time

to adopt what they need to adopt. At the end of the day, this is what we're looking for.

The staff agreed that with sediment with no net impact there's not, like, one answer. There can be other options proposed that demonstrate no impact. We want to have as many of those tools in our toolbox as possible. And it's important and necessary for you as the Board to understand that there is a need to have your staff available to answer questions as we move forward, not to play referee, but there are legitimate questions. "Okay. How are we going to figure this out?" Sometimes they come from us. Sometimes they come from the Copermittee. Sometimes they come from the environmental community. Because at the end of the day, this is what we want: We want a permit that works for everybody. Not necessarily everybody is going to be happy, but we want something that works for everybody. And by doing that, at the end of the day we want results.

Finally, I think that our Copermittees in both Riverside and Orange County touched upon CEQA, and I know that with doing eight of these plans at the same time the City of San Diego

adopted an approach that they said they had a mitigated negative declaration. But most of the other Copermittees have it, and there are definite CEQA requirements, and nobody calculated that into their timeframes as well. So I just wanted to put that out there.

But I appreciate your time. If you have any questions, I'd answer them.

BOARD MEMBER MORALES: Mike, one very quick question.

When you suggested that you would want staff or it's necessary to have staff available to answer questions, were you envisioning something along the lines of the folks on your end designate one person to contact staff? Or are you suggesting that they take calls from everybody who has a question?

No. Typically -- let's use the coarse sediment as the example. That's exactly what we've been doing.

As we've had problems, typically it falls to me. People call me and then I usually call Laurie or one of the staff members. And that's what I do. I think I called you and said, "Hey, we've got a problem with this. We need to

meet with you. How soon can we get in to talk?"

BOARD MEMBER MORALES: Okay. So you're just asking to continue the --

MR. MCSWEENY: Collaborative relationship.

BOARD MEMBER MORALES: -- working relationship that we appear to have now, as opposed to something more.

MR. MCSWEENY: Right, yeah. No, the intent was never to have project applicants calling them, saying "Can we do this? What about this?" Not at all. Not at all. Not at all.

What we're really trying to do is work and have them as a resource. Let's work with the Copermittees to make sure that everybody's on the same page, that we understand what's required in the BMP Design Manual, and then we sell that and educate our folks.

On the other hand, they've got a job of making sure that everybody on their end knows what does all this mean. And it is extremely -- coarse sediment is unbelievably technical. And so at the end of the day when somebody is trying to get a project processed at the City, if they don't understand, they just kind of throw their hands

1 up, "No," or they go do a study and spend $25,000,
2 which may or may not answer a question, and they
3 don't even know the right question to ask.
4 So that's why it's important to have
5 time to educate both groups of people.
6 BOARD MEMBER MORALES: Okay.
7 CHAIRMAN ABARBANEL: We will move on
8 to the next group.
9 Mr. O'Malley?
10 MR. O'MALLEY: Thank you. I also have
11 presentations I'd like to make.
12 CHAIRMAN ABARBANEL: And you organized
13 it in groups of people?
14 MR. O'MALLEY: Yeah, actually just one
15 other in our 30-minute time slot. And I'll
16 hopefully cover about 20 minutes.
17 CHAIRMAN ABARBANEL: You have 30
18 minutes. You have somebody who will be very
19 friendly until 29.9 minutes.
20 MR. O'MALLEY: Actually, I would
21 request that Board members shall perhaps give me
22 30 seconds to respond to Board Member Morales'
23 question up front before we begin.
24 CHAIRMAN ABARBANEL: Anytime you
25 respond to questions, I try to turn the clock off.

MR. MORALES: I asked a lot of questions.

CHAIRMAN ABARBANEL: Go ahead.

MR. O'MALLEY: This it the -- Excuse me. Matt O'Malley, legal and policy director of San Diego Coastkeeper. First, thank you for having me today.

I want to kind of respond because it seemed like from staff and what you spoke to this morning as far as the interpretation of the State's Board and Order, I want to read the language specific to that you talked about because I interpret it as a very different sort of instruction.

The idea, it seems like --

CHAIRMAN ABARBANEL: The State Board and Order and Alternative Compliance?

MR. O'MALLEY: Correct, yes. And I will be addressing just alternative compliance.

BOARD MEMBER STRAWN: May I ask you -- when you know you have a tendency --

MR. O'MALLEY: Okay. And I'm sorry.

BOARD MEMBER STRAWN: We have a recorder, that if you get ahead of her --

MR. O'MALLEY: I have a tendency, and

1 I apologize. I have a lot to say, and I'm trying
2 to cover it all.
3 So the idea was that -- the thinking
4 was that the State Board says you should consider
5 this, but if you don't do it, we need you to
6 justify why.
7 And obviously, if you read the
8 language, it's pretty clear that that's not
9 exactly what they meant. So I think instead what
10 they're saying is -- and I can read it to you --
11 but they say, "We direct all Regional Water Boards
12 to consider our approach to receiving water
13 limitations compliance when issuing these permits.
14 "In doing so, we acknowledge that
15 reasonable differences may dictate a variation in
16 this approach but believe that such variations
17 must nevertheless be guided by a few principles.
18 We expect the Regional Boards to follow these
19 principles, unless a Regional Water Board makes a
20 specific showing that application of a given
21 principle is not appropriate for a region-
22 specific permit."
23 So instead of saying, "Do this or show
24 us why not," they're saying, "Follow these
25 principles, and if they're not applicable to your

1 region, then tell us why not."
2 That's, I think, a very different
3 interpretation. It's very much -- it's a
4 direction or tell us why you're not going to do
5 it. Or, "If you don't follow each these seven
6 principles, if you decide to do it, explain why
7 not," because they want you to follow those
8 principles. And I'll go through some of those
9 later in my presentation. But hopefully, that's
10 just a different take on what the State Board is
11 saying and how he interpreted it versus sort of
12 what I've heard thus far.
13 So again, I'm going to just cover the
14 alternative compliances. You know we called on
15 Safe Harbors, which is most of us, and our groups,
16 our lawyers, and we get that right from the Ninth
17 Circuit. But this general idea is that this is a
18 provision that gives some sort of out or, you
19 know, compliance of certain provisions or plans,
20 forgive noncompliance and discharge. And that's
21 essentially -- in fact, that's exactly what it
22 says, and that's why the Copermittees are
23 supportive of it. You know, once your compliance
24 has been processed, you're deemed as compliant.
25 I know that we are looking for

1 outcomes based permanently. In our opinion, this
2 very much goes back to the model-something plan,
3 get a plan approved and now you're in compliance.
4 It's sort of the opposite. It's sort of more of a
5 process-based approach.
6 But that's kind of just to sort of
7 give a start-out where I may intend to go here.
8 And I want to hit two main points in
9 the brief time I have here, but the first is that
10 -- for those of you who were here in 2013, we
11 discussed this, that we do believe that the Safe
12 Harbor approach violates anti-backsliding
13 requirements of the Clean Water Act and federal
14 regulations.
15 The second is that the tentative order
16 -- and this is something that L.A. didn't have to
17 go through -- the tentative order here, we
18 believe, is fairly inconsistent, if not very
19 inconsistent, with State Board's order and
20 directives. I want to hit each these sort of
21 together here.
22 The first, again, it goes back to
23 basically the idea of what is anti-backsliding?
24 I've thrown out a lot of language here, but the
25 idea is that federal regulations and Clean Water

1 Act prohibits backsliding, where we can have
2 permits from previous permits.
3 The way we look at the Safe Harbors is
4 -- because they no longer require an actual
5 meeting of water quality standards, they are less
6 stringent than existing permits and previous
7 permits, and in fact, they violent this.
8 Now, Reason 3 has actually spoken to
9 this, especially with time constraints when they
10 say backsliding is permitted, allowing additional
11 time to complete a task that was required in the
12 previous permit constitutes a less stringent
13 condition to violate the provision against
14 anti-backsliding.
15 So I don't want to go too far into the
16 legalities here because what the L.A. board order
17 did, as well as the San Diego board, what it's
18 saying is, "You know, we're not actually sure if
19 we're violating this or not. But even if we are,
20 there's an exception here and we're going to claim
21 the exception."
22 So they give this sort of
23 justification as to why they're not violating
24 anti-backsliding, "They do this in L.A., and we're
25 doing it here."

1 So I really want to talk about more of
2 what those claims exceptions are. I believe that
3 this issue is probably going to be dealt with in
4 court. I think it's already being petitioned up
5 to courts in L.A. on that very issue. And so I
6 really want to talk about the justifications here,
7 what we're claiming here in San Diego, and why, in
8 L.A., what worked in L.A., what's claimed in L.A.
9 is not applicable to us one way or the other.
10 There is two sort of ways it's not.
11 It's either what exists there on the ground
12 doesn't exist here and so we can't claim this is
13 this new information, or, of course, substantial
14 change, or we've already been doing these things
15 for a while so we can't claim they're new.
16 But essentially what they're saying is
17 the justification for backsliding there was this
18 new information for the previous permit. But you
19 can imagine they waited 11 years between permits.
20 Of course there's going to be plenty of new
21 information. So you're correct in assuming that,
22 oh, one or seven or 13 and several amendments in
23 between.
24 But the idea was that we have these
25 paradigm shifts that they want to treat storm

1 water as an asset rather than a liability. There
2 was a lot they've learned in TMDL. They have
3 something like I think totals about 40-something
4 plus in L.A. region, actual TMDL which serve as
5 sort of a backstop incorporated. So then as far
6 as permit, really will get at the gist of water
7 quality issues. Then the large sort of planning
8 of regional solutions which we've already
9 implemented, and LID benefits, which we've already
10 implemented.
11 So for a number of reasons, I don't
12 think those exceptions at all apply to San Diego.
13 The response to comments here
14 basically says, you know, the circumstances have
15 changed here materially substantially, so that
16 should allow us to get around the
17 anti-backsliding.
18 I would say very clearly the only
19 material change here is that we're adopting a safe
20 harbor. All the rest of the provisions have
21 already been in place, some of them since 2007.
22 And the main justification for what has been in
23 play -- and I'll go through those right now --
24 really don't apply here either. So I think
25 claiming this new information it just doesn't

1 apply.

2 And I'll say this numerous times: We

3 sort of copy and paste justifications sometimes,

4 but we didn't then look to see if those

5 justifications apply here, nor did we copy the

6 methods on the permits, and there are some

7 specifics things I'll address there.

8 So what are the main things that were

9 said, Look, we expect the L.A. orders TMDL

10 requirements, they're going to be the means to

11 achieve water quality standards for the majority.

12 They have -- I know some places state 33,

13 depending on how you look at it, over 40 I heard

14 the other day. The L.A. board said the exact same

15 thing. They said the majority of pollutants

16 concerned are addressed by 33 TMDLs that are

17 included in the permit. So the whole idea here of

18 part of the justification of doing this up there,

19 we have an enormous amount of TMDL. It wasn't

20 just the fact that they learned lessons from the

21 TMDLs, but that they have them as a backstop to

22 incorporate them. Just to contrast, we have five

23 of them here, right? And then more and more we're

24 looking toward alternatives to TMDLs here, and

25 some of those alternatives are expressly this MS4

1 permanent, like we're doing in Loma Alta slew and
2 up in Oceanside.
3 (Court reporter interrupts to slow down the
4 speaker.)
5 MR. O'MALLEY: So like we're doing in
6 Loma Alta slew, we're looking at the MS4 permits
7 as an implementation measure rather than the TMDL.
8 So we really need that rigorous accountability
9 that we were talking about earlier.
10 The second justification -- one of the
11 main justifications is, in terms of water supply
12 -- and we all would agree to this -- there's
13 really been this paradigm shift. Look to water as
14 a water supply as an asset rather than a
15 liability. But practically and legally there's a
16 couple of problems with part of that justification
17 here.
18 One, we just do not have underground
19 basins and recharge basins like we have up north.
20 I would love it if we do. I think we have some
21 great projects here. So it may be that we're
22 instead relying on more traditional storm water
23 measures to deal with storm water. They're saying
24 lack of availability of ground water recharge
25 storage capacity.

1 The legal problem with that is that
2 our MS4 permit -- and actually, the gentleman from
3 Riverside said this earlier -- it doesn't require
4 the analysis like L.A. permit does, to look into
5 the multi-benefit regional water supply for water
6 supply. There's actually provisions in the L.A.
7 permit that have that. We don't have that. Maybe
8 we should. I would argue we definitely should.
9 But again, that's a problem with copying the
10 justification but not actually having the means in
11 place to deal with that.
12 And the last two that I think were
13 major justification changes were for
14 anti-backsliding exceptions was that we should
15 adopt this watershed approach. And we also agreed
16 that that is the right approach. And we agreed,
17 actually, in 2007 and took that approach. And
18 this is language from the 2007 permit that says,
19 "The Copermittees within a watershed; there are
20 two developed watershed-based management
21 strategies."
22 So it was not new information, not
23 anything that's materially and substantially
24 changed here. We've actually been doing this
25 since 2007. And I would say to some degree we've

1 been doing it with LID, as well. And those really
2 were the main justifications for anti-backsliding.
3 So I think before I go on, I just want
4 to say, you know, you have -- I think this is the
5 example of where we're copying the justifications
6 from L.A., getting around anti-backsliding, if we
7 do agree that's a problem. And the permit
8 actually doesn't say it is or not. It admits it
9 may be a problem, but we're not actually moving
10 forward with the measures that either exists in
11 L.A. or were recommended in the State Board order.
12 And I'll get to those next.
13 So then we're asserting at this point
14 that this order as it stands -- and I'll go
15 through, really, three main ways that it is.
16 I'm going to go through what the RA
17 is. It's pretty important. It's actually sort of
18 the lynchpin of what the State Board agreed to in
19 the L.A. permit.
20 There is also, as I mentioned, none of
21 these regional multi-benefit capture and use
22 compliance provisions. We may see them with
23 alternative compliance. But as far as just
24 complying, out there they have an 86 percentile,
25 24-hour storm capture use and provision, which we

1 don't have.

2 And then because of these lack of

3 extensive standards, we want to be able to go back

4 and tweak it, amend it. That's kind of what we

5 have now, and now they're asking for protection of

6 that.

7 So I just want to go through -- again,

8 I'll reiterate this, that State Board really lays

9 out a very specific pathway to these safe harbors.

10 But what does is it bars the justification in ours

11 but not the approach and methodology, which is

12 RAA, and I'll talk about that moving forward.

13 It lays out the principles, which

14 you've heard. These are those seven principles

15 which I talked about that says if you're not going

16 to follow these, explain why you didn't, so more

17 specific. What it says is, these things have to

18 be ambitious, rigorous, transparent. Again, they

19 want to encourage multi-benefit water supply

20 projects, compliance projects. There must be

21 rigor and accountability, which I think we all

22 agree, and there really shouldn't deem good-faith

23 engagement from the process as compliance.

24 So what's the backbone of that whole

25 program is something called the "Reasonable

1 Assurance Analysis," or RAA. This is really a
2 point of contention in L.A., and in a very big way
3 for anybody following it. I've become much more
4 familiar with the L.A. permit process than I've
5 ever wanted to. My jurisdiction pretty much ends
6 in San Diego, but not anymore, I guess.
7 So what they -- the people who
8 approved it said, "Look. We need a well-defined
9 transparent way of moving forward."
10 And we actually heard earlier John van
11 Ryan saying, Look. We're critical. We need the
12 sort of time-tested -- we need ways of moving
13 forward.
14 All we're saying is the same thing
15 here. There is some groundwork laid for us in the
16 L.A. permit which we did not copy. And really the
17 State Board order gets it and says, Look. The
18 requirement for these things is really just to
19 show that when Copermittees choose a pathway, that
20 the way they site them, the way they design them,
21 their the BMPs, it's just going to work. We have
22 a really good idea that it's going to work that
23 way.
24 Besides that -- oh, and I will not
25 raise this, but I want you to know this is just

1 one section of the L.A. permit that talks about
2 what this safe harbor looks like out there. It
3 goes about which models are accessible, all data
4 collected the last 10 years. This is actually not
5 even the whole entire section, but it's very
6 specific in the permit itself saying, "If we're
7 going to accept this, this is the level of rigor
8 that we want to see, at the bare minimum."
9 On top of that, they have something
10 like 37 to 50 pages of guidelines that were
11 developed. "Now as you're moving forward, these
12 are the detailed, objective criteria that you need
13 to follow moving forward."
14 Again, this adds to this level of
15 rigor, transparency, and accountability that this
16 State Board order saying we need to see. I'll
17 just read from this section as well: "It must be
18 adequate to identify the required reduction of
19 each water body combination at each compliance
20 deadline and analyze the BMP scenario to achieve
21 that deadline."
22 So these are guidelines that are very
23 strict, very rigid in moving forward. We just
24 don't have something like that.
25 The guidelines here, again, this is

1 really just to show you. And the point of this
2 slide -- I'm not going to read it -- shows some of
3 the type of things that are considered in
4 developing these plans. But the idea is that with
5 this type of guidance anyone in this group,
6 whether it's myself or the consultant, or anyone
7 in this room, or your staff or even you, could
8 look at this stuff and say, "This is what is
9 expected of you. These are the objective,
10 rigorous transparent criteria. Move forward using
11 those," and then you might be okay. But we at
12 least have some sort of criteria with which to
13 gauge that compliance is on, not just "show us
14 what you got," which I'll contrast with our
15 language, "an analysis with clearly stated
16 assumption."
17 So we go from this, with something of
18 50 pages of guidance, to this. And I think it's,
19 by argument, very clearly this is not rigorous,
20 it's not transparent. We are trying to be
21 flexible, and I get that. But we're taking
22 flexibility and sacrificing transparency and
23 accountability. Because transparency doesn't just
24 mean at some point the public gets to look at this
25 plan. It means there are objective criteria up

1 front with which we can then review it together.
2 Your job and my job are not that dissimilar at
3 times, to see our water is safe and clean for
4 people.
5 The other lack of objective measure
6 here is if they're not in compliance -- the only
7 thing that won't -- I mean, they won't get kicked
8 out right away. They just need to give what's
9 called "acceptable rationale." I don't know what
10 that means. I've got staff that won't know what
11 that means. I don't know that you know what that
12 means, what that "acceptable rationale" would be.
13 So I think what's happening here is
14 because there's no RAA or guidance we just don't
15 have this objective criteria. We don't have this
16 rigor or transparency or accountability that the
17 State Board order saying we need to have if we're
18 going to do this.
19 Despite all the problems, at the very
20 least, we need some of these processes. Also,
21 because there is this sort of acceptable
22 rationale, how do we know, then, are we compliant
23 or are just in this inner loop?
24 I mean, I don't know at what point I
25 will then be able to come up here and say that's

1 not really acceptable. That's not really a
2 standard that I can point to. I can point to
3 standards in the CFR or Clean Water Act, but
4 "acceptable rationale" or an analysis without more
5 is difficult.
6 The EPA has actually spoke about this
7 specific issue, and they did so Monday. I know
8 Christina represented their letter earlier. But
9 what they said is, "Look. These proposed permit
10 modifications provide only limited direction
11 concerning specific technical, analytical, and
12 planning expectations. They didn't recommend
13 prompt development of guidance," since what I'm
14 also recommending, "built into the permit." And
15 they say, "It best serves everyone's interest if
16 there's clear understanding about the level of
17 technical rigor necessary to demonstrate
18 reasonable assurance."
19 And they go on to say, "Look. You
20 guys need to come up with a way -- we all need to
21 come up with a way in this permit, if we're taking
22 this approach -- despite this problem -- that has
23 this rigor and accountability, these guidelines
24 and guidance built in to moving forward."
25 So just to kind of recap what I very

1 quickly breezed through -- sorry. We see this as,
2 if not rigorous, transparent, or well-defined
3 without either RAA or upfront guidance built into
4 this permit that we can point to. You know, it
5 allows for non-achievement of PWLs based on what
6 I'm seeing as this nebulous, sensible rationale.
7 And as long as there's acceptable rationale, which
8 I don't know what that is, and I don't know
9 anybody in this room that can clearly tell me what
10 that is.
11 And then we see this not as ambitious.
12 I think we all agree. But let's put something in
13 the permit that actually is like L.A. that says,
14 "Look, we want to get towards them and so we want
15 to actually have that be part of the analysis.
16 Can you capture, infiltrate, or somehow or other
17 make this water supply as part of this permit?"
18 We'd love to see it. And I think the
19 gentleman from Riverside said earlier the same
20 thing; they'd love to see it. It might be
21 available in certain parts of north county, as
22 well.
23 Just the background again. Some of
24 the main justifications is where this has been
25 implemented there's numerous, numerous TMDLs as

1 backstops to ensure water supply standards will be
2 met. And they also have this much more rigorous
3 RAA requirement moving forward, and neither of
4 those exist here.
5 You know, this is something from
6 earlier this year -- and they sort of shared the
7 interpretation that I have. That Water Quality
8 Board directs all regional boards to consider the
9 approach but does not require its use. We believe
10 that it would be premature and inappropriate to
11 require the L.A. permit approach throughout the
12 state."
13 I am mimicking their language and
14 saying the exact same thing.
15 Now, I want to have a couple proposals
16 here for you. We can remove the safe harbor
17 language and come up with something like a time
18 schedule order and compliance list.
19 Now, as I understand it, earlier today
20 you guys adopted a time schedule order for the
21 Navy without any, you know, any discussion, kind
22 of went through it. And it's way that -- because
23 the Navy says, you know, "We can't comply with
24 this in this timeframe." You do have mechanisms
25 to deal with that.

1 You can actually have a couple come up
2 and say, "Look. Yes, we are not in compliance."
3 You can actually have one of them admit, "We are
4 not in compliance. We want to get into
5 compliance. Let's work this out. We have
6 protection from third party lawsuits," if that
7 really is the position that they're worried about,
8 is myself or someone else in this room coming
9 after them.
10 You can do it another way, and it
11 still lays out the same, you know, protections and
12 methodology forward, if that is what they want.
13 If you're dead-set on adopting this,
14 what I would say is, I know that the San Diego
15 Water Board are working on statewide guidance
16 issues on the RAA, essentially to say what really
17 is reasonable assurance, what are the basic
18 criteria, how do we calibrate these models.
19 They're working on it right now, and I expect it
20 will probably be done within a year or two.
21 Why don't we wait until someone
22 actually has developed all of the guidance and
23 methodology first. Or we can look at L.A. and
24 say, "Yes, that's the method we want to do moving
25 forward."

By then, you'll probably have the L.A. lawsuits panned out to determine if this backsliding data is important or not. But it actually gives us a very clear way.

Lastly, and this is not a proposal; this is just if you're going to move forward it's sort of a "Look. Let's add in this RAA language into the permit." We have this L.A. language we can pretty much cut and paste, as we've done that with the justification. And since the whole idea that sort of annual milestones came up, partly in the workshops because I asked for them, but what I asked for, let's say they are not meeting two years in a row, let's just bring them back to status quo. They don't need protection anymore. Well, that language wasn't excessive, for whatever reason. But I'm just calling it the hard out.

If we're going to move forward without guidance, if we're going to move forward giving us protection in any sort of scheme, at least let's have something that says, "But if you keep blowing it, you're out." And it's now out of the permit, it's just out to where we are today, which is not such a bad place. We have these W2 MPs which are moving forward. They are going to be implemented.

1 On top of that, I would just say, if we are going
2 to move forward that way, we should add the water
3 supply provisions, as well as ramp up some of our
4 allocations in TMDLs, if they really are the
5 backstop in L.A.
6 I knew that this issue would come up
7 so I just kind of let the EPA speak for myself and
8 my organization. We call this the grace period.
9 Essentially, they want the safe harbor to develop
10 a phase.
11 Establishing a safe harbor during this
12 phase is not warranted. That's from January this
13 year of Jay Smith, the head of NCDS permits up in
14 San Francisco. And two days ago, "There is
15 insufficient basis to conclude that permit fees
16 are or will be in compliance." I share those
17 sentiments. I echo them. I very certainly agree
18 with them. I just see no reason why, if we are --
19 you know, it's one of those things where the gift
20 horse in front of us, seeing how we want to put
21 teeth whitening on it. It just doesn't make sense
22 at this point.
23 So where are we? We've seen the
24 WQIPs, and I've reviewed all of them on this, as
25 close as I can. You know, I think our permit is

1 pretty good, as far as laying out this path
2 forward. It had some good stuff there, but there
3 was differences in things on how it read. I think
4 we've seen -- and I think you heard recently, and
5 I think you probably heard from your own staff how
6 happy they were with the first draft and the
7 submitted draft of the water quality improvement
8 plan. Without the clear sort of strict guidelines
9 upfront, you're going to get woefully inadequate
10 plans, especially if you're giving people
11 protection. That becomes a main problem. I also
12 want to remind us since 2013 what you have done
13 and what your staff has done.
14 Since 2013, there have been multiple
15 MS enforcement actions against the City of San
16 Diego, multiple against the City of Escondido,
17 Carlsbad, Chula Vista and Lemon Grove. So now
18 we're talking about having protection when you're
19 still issuing them enforcement actions under MS4.
20 Since we're considering new
21 information since 2013, these are pictures I took
22 recreating in our water bodies two months ago, any
23 given day. I didn't even pick a special day.
24 This is what we're still looking at. These were
25 pictures sent to me -- on the left, Escondido

1 Creek Conservancy called me furious after their
2 water check looked this way. These are fish kills
3 up in Oceanside, I think, due to up to nutrient
4 pollution earlier this year in January.
5 So this is just to point out this is
6 still ongoing. This is since the 2013 permit has
7 been implemented. There's a huge gamble we're
8 taking if you pass this. These guys are going to
9 do everything they need to, and they're going to
10 do it with this level of protection, but they're
11 not going to have the strict guidance that they
12 need moving forward.
13 I think, you know -- I mentioned the
14 legal issues. We think they're very serious. We
15 don't think there's exceptions to backsliding that
16 apply here. But, also, we think the way moving
17 forward, we're going to copy the justifications,
18 we absolutely have to copy the kind of guidance
19 that's moving forward in L.A.
20 With that, I think I'm finished, other
21 than just to say, obviously, this tentative order,
22 we cannot and will not support it without at least
23 some of the changes made. I think regardless,
24 there are issues. If you are dead set on passing
25 this sort of alternative compliance, let's put it

1 off until 2018 when there is statewide guidance on
2 this.
3 Thank you. Appreciate it.
4 CHAIRMAN ABARBANEL: Questions?
5 BOARD MEMBER MORALES: I have just
6 one. You've seen the QWIPs that have been
7 prepared over the last several months here. Are
8 any of them woefully inadequate?
9 UNIDENTIFIED SPEAKER: I think upon
10 first submittal, yes. I don't know that staff --
11 I'm not going to point fingers, but I will say I
12 think some of them failed to meet even the minimum
13 requirements of the permit, absolutely.
14 I don't know that staff or even other
15 Copermittees would disagree with me. There was a
16 period to go back and do some adjustments. I've
17 started looking at those, as well. Some of them
18 are bad and some of them are a way moving forward.
19 MS. HAGAN: We really need to try not
20 to talk about the separate water qualities. It's
21 a little hard to divorce but there are separate
22 proceedings that are going to be coming before the
23 Board, in terms of the detail. The general
24 question --
25 CHAIRMAN ABARBANEL: What is that

1 procedure? Once a QWIP is submitted for
2 consideration by the staff, does it come back to
3 the Board to be approved?
4 MS. HAGAN: I believe the permit
5 language roughly reads that if "After a process
6 and they have been submitted, if there don't
7 appear to be significant unresolved issues, the
8 executive officer can go ahead and approve them.
9 If there appear to be significant unresolved
10 issues, in his determination, he'll schedule them
11 for a Board hearing.
12 CHAIRMAN ABARBANEL: Thank you.
13 MR. GONZALEZ: Mr. Chair, members of
14 the Board, Marco Gonzales of Coast Law Group on
15 behalf Coastal Environmental Rights Foundation.
16 I've been before this Board a lot over
17 the last 20 years on storm water. It's somewhat
18 interesting to see some of the same players making
19 the arguments that have evolved but come down to
20 the same thing "Don't make me do it or don't make
21 me do it right now."
22 I'm going to be talking about -- I
23 took the oath earlier. So I'm going to be talking
24 about prior lawful approval. This notion that an
25 applicant, a developer, has done something such

1 that these equities would result in us giving them
2 the ability to take advantage of the 2007 BMP
3 manual or the storm water control and not require
4 them to comply with the new BMP manual.
5 That notion of equity is interesting
6 because I heard John Van Ryan, one of those guys
7 who has been doing this as long as I have, come up
8 here and say, "I want even more time" I'm jumping
9 ahead on my comments. "I want more time because
10 we need time to work with the applicants to
11 utilize this."
12 That's not the point of the prior
13 lawful approval. It's not to say "Give us six
14 more months so we can jam as many people into the
15 pipeline and get them to that point of compliance
16 and get them out of having to comply with the 2013
17 permit."
18 Now, fundamentally, before we even
19 start talking about this, we ask ourselves "Why
20 are we doing this? Why are we doing a new permit?
21 Why are we amending our permit? Why did we
22 require, in 2013, the hydromodification changes
23 and new BMP handbook?" Because we said 2007
24 wasn't good enough.
25 We know that because we're not in

1 compliance with the Basin Plan. We haven't done
2 our TMDL. We're still violating water quality
3 standards every single day in every single
4 jurisdiction after 20 years of trying to regulate
5 storm water.
6 And so at the base, what Mr. Van Ryan
7 is up here saying, "Give us a chance to not have
8 to do more, to not have to do what we already know
9 is required to meet the basic standards."
10 If you read the language starting at
11 page 102 of the tentative order dealing with the
12 prior lawful approval, we could actually end up
13 five years down the road even more. So we're
14 talking 2007 to the summer of 2013 to the summer
15 of 2018. We're talking 2007 to 2018 before we
16 finally implement the 2013 BMP manual? You've got
17 to be kidding me.
18 Another interesting comment today,
19 when Wayne got up early on and did his
20 presentation, he said, "We think this is a great
21 change to the permit because it makes it clear and
22 easy to enforce."
23 Go back and read what the prior lawful
24 approval standard looks like now compared to what
25 it was before. When you look at the footnote in

1 the 2013 permit that talks about what qualifies as
2 a prior lawful approval, it tracks directly on
3 what the status of the law is.
4 There's one case that controls this.
5 It's very clear. It says you need two things:
6 You need a permit, and you need to break ground.
7 That's easy. There's nothing easier. As a matter
8 of fact, when I'm not up here representing
9 environmental groups, do you know who I represent?
10 Developers.
11 And for over a year now, those
12 developers have been asking me -- that's what they
13 do when they get these crazy regulations coming
14 down through the Board to the City. They come to
15 me and say, "What do I need to do?" Since January
16 of last year I've been saying, "You need to comply
17 with the 2013 manual. It's being devised. Here's
18 a draft of it. Design your project to comply with
19 that."
20 The manual was approved in June of
21 this year. Let's talk about -- anybody that
22 hasn't planned their project to comply with that
23 manual, the price should be paid by that applicant
24 not by the community, who should be able to rely
25 on these ratcheted-down standards that just bring

us to swimmable and fishable waters.

So these clients that I have, they design their projects not knowing for sure when they're going to get final grading approval. I'll tell you what, we just finished a year-and-a-half lawsuit on one of them. We got the ruling last month. We can finally pull a grading permit, and they're saying "Are we going to get our grading permit by December 31st?"

I said, "Go back and look at your engineering. We designed the project to comply with the new manual. We don't even have to worry about it." That's what a prudent, responsible developer would have been doing for the last year that we've been talking about this.

Instead, it's not just December 24th. It's an additional 90 days, as per staff. And if we give into the BIA and the County, we're talking another 180 days so they can shoe-horn as many development projects as possible into a standard that we know doesn't protect water quality standards.

Mr. McSweeny got up here and talked about the BIA folks who call him up, who blow up his phone, people up in Oceanside who don't know

1 what the standard is.

2 I'm sorry, but the developers I

3 represent aren't part of the BIA, and maybe we've

4 identified the problem. When they call me up, and

5 they say "What's the standard," I say, "Do you

6 have your grading permit? Have you broken

7 ground?"

8 Afco is a very clear legal standard.

9 It's a very bright-line standard that gives us all

10 certainty. The reality is, there are very few

11 projects, but they are very big, who really need

12 this prior lawful approval language.

13 During the workshops, we had a very

14 simple request from the environmental community.

15 We said, "You know what, you guys are the best to

16 tell us how many projects you have in the pipeline

17 who might potentially take advantage of the prior

18 lawful approval language." "Just give us a

19 database so that we can talk apples and oranges.

20 Big projects, small projects, 10 projects, 100

21 projects. Give us some answers."

22 How many months later are we still

23 saying we don't even know how many projects would

24 be affected by this. And per the County's

25 representation today, the next six months or

1 actually the next nine months -- seven, eight,
2 nine months, we're going to shoehorn as many
3 projects as we can in there. That is not what
4 this was intended to do. The notion of prior
5 lawful approval is to say, "If you've contributed
6 significant dollars and you have diligently
7 pursued your project, we're not going to pull the
8 rug out from under you."
9 But the fact that the 2013 permit had
10 such a huge tail to produce this BMP manual, and
11 we had so much time after approval in June of this
12 year to vet it and bring it to effective date in
13 December, I'm sorry but we have given you enough
14 time.
15 So I would leave you with the simple
16 notion that the easiest, most simple, most
17 legally-viable solution to this is to go back to
18 Afco and tell the world "If you've got your
19 grading permit, and if you've broken ground by
20 December, you can take advantage of the 2007
21 hydromod BMP requirements." "If not, it's on you.
22 Redesign your project."
23 We all went through the recession. My
24 clients did. A lot of the people who are trying
25 to take advantage of this, the law changes

1 sometimes. Planning changes and regulations
2 change.
3 This is not a circumstance where we're
4 can say we're protecting water quality standards
5 by allowing an untold number of applicants to take
6 advantage of a standard that, coming up on 10
7 years now, we've already decided isn't good
8 enough.
9 CHAIRMAN ABARBANEL: I've heard what
10 you said, and I'd like you, if you would, to
11 repeat your suggestion of what in the tentative
12 order, putting aside the typos and changes, do you
13 recommend that we do not approve?
14 MR. GONZALEZ: Section big E(3)e
15 1(a)12. It's entitled structural BMP approval
16 process under priority --
17 CHAIRMAN ABARBANEL: These are the two
18 items that Mr. Chiu recommended approval of, or
19 his staff did in addition to the time --
20 MR. GONZALEZ: It's the prior lawful
21 approval language. It's the generic, easy way to
22 describe it.
23 CHAIRMAN ABARBANEL: I have to say,
24 I've gotten a little bit of cross-talk between
25 prior lawful approval and the alternative

compliance.

Are you speaking to both of those?

MR. GONZALEZ: The alternative compliance has to do with your development of an alternative to meeting water quality standards. That is the big picture. I'm talking about individual projects being able to take advantage of the old BMP manual.

CHAIRMAN ABARBANEL: Okay. Thank you.

Last but absolutely not least, we have interested persons, and I would say tenacious persons, having waited all this time. For each of those persons who have submitted a card, we would offer you three minutes to speak.

Unless there's a particular order here, I was going to start with Ms. Hunter.

MR. MCSWEENY: I have a question. For those of us that had a little bit of time left for rebuttal, when would we be able to do that?

MS. HUNTER: Good late afternoon. Laura Hunter representing Escondido Neighbors United, and yes, I did take the oath. I have a couple points I wanted to mention today.

I agree with my cohorts at Coast Keeper and would urge you to adopt their

1 recommendation. First thing I want to touch on, I
2 want to offer a realty check on this really
3 ridiculous letter that you received about Safari
4 Highlands Ranch. It basically was a not-so-veiled
5 threat, completely inappropriate attempt to
6 intimidate you out of doing a lot of your job.
7 CHAIRMAN ABARBANEL: This is not on
8 the specific item that they're discussing?
9 MS. HAGAN: It refers to a comment
10 letter.
11 MS. HUNTER: Yeah, and I do think it's
12 instructive.
13 So first of all, they don't have a
14 project approved of 550 units. It doesn't have a
15 value of 500 million dollars, which they're
16 threatening you have to pay them back. They don't
17 have an annexation approval. They don't have an
18 environment document. They have nothing. They
19 have ink on a piece of paper, really. And they
20 own the land.
21 They don't even have the entitlement
22 for the 26 homes they could build under their
23 current zoning, which is the County's general
24 plan. They have a lot of fantasy based on pure
25 speculation. But I think it's very instructive

1 because if you want an example -- one of the
2 reasons you should abandon this whole safe harbor
3 situation, here's Exhibit A. This is how they
4 view it.
5 I want to say that, in this case,
6 anyway, a short leash with clear direction is the
7 way to deal with these kinds of entities. The
8 second thing I wanted to speak to is, I have been
9 a member of the San Diego River Water Quality
10 Improvement Consultation Committee, and I would
11 like to touch on a couple things.
12 Regional Board Member Olson, I would
13 like to speak to your request of "Do you think
14 people aren't serious about it?" I've got to tell
15 you, there's a whole lot of RBA, a lot of really
16 bad attitude about it. Up in Escondido, you need
17 to know a majority of the City Council directed
18 their staff to deliberately weaken their
19 recommendation for the water quality improvement
20 plan to make them the minimum to get by for
21 compliance.
22 One of them said, "Let's just not even
23 comply and see what happens." Another one of them
24 says "Mother nature will take care of it."
25 Bunches of name calling and that kind of thing.

Not everybody is serious about doing it, I'm telling you.

More flexibility is not going to help us get to where we need to go. We really have to say focused on those water quality improvement plans. We need to focus on that. This safe harbor business is a distraction. It's confusing. It betrays the promise of what we were trying to get.

I've been around a long time, too, and I think it's probably bad news, but the entities are not innocent victims that are being promulgated on. These are the entities with land use authority. They make the decisions about whether they should put these developments here, should they issue business licenses again and again to companies that don't comply. They have a responsibility here, and it's not just, you know, something that they're bystanders to.

Thank you very much and please remove the safe harbor.

BOARD MEMBER STRAWN: Mark West. And that will be followed with Jennifer Olm.

MS. SACKETT: Hi. My name is Mandy Sackett. I'm here to speak on behalf of Mark

West. He fractured his C-4 and had to go get an X-ray today. I also have a speaker card. I don't know if you want to add my time here, as well, to do my own. I'll start with Mark's comments here. "Esteemed Board members, ladies and gentlemen of the public, good afternoon. My name is Mark West. I'm a retired naval officer, chair of Surfrider San Diego and resident of Imperial Beach.

"I appreciate the opportunity to speak with you today on behalf of SurfriderSan Diego. Surfrider is dedicated to the protection and enjoyment of oceans, waves and beaches through a powerful activist network. When I say 'activist,' I mean people who take the time off to miss work and to miss time with their family to be here today.

"Our membership is served by volunteers who dedicate their free time to continue to voice their approval of the 2014 MS4 storm water permit as it was originally designed. Our members do not support an alterative compliance without specific time limits and hard outs. We need more guidance and we need it in the permit. Clean water compliance, in our eyes and through the eyes of water users throughout San

Diego, means water safe to swim, fish in and recreate in and on.

"Our members are comitted to preserving water in San Diego. Surfrider encourages people to get involved with projects like these because we believe in the promise of the democratic process.

"The permit and inclusion of alternative compliance which you are discussing today is one that will receive taxpayer money and the public input needs to be respected throughout the process.

"In 2013, we passed a landmark permit. Please do not allow us to backslide on it. Surfrider San Diego enjoys our working relationship with staff from the city and counties associated with managing out coastline and multitude of issues associated with clean water in iconic the San Diego coastline.

"I've participated in conferences that have attracted people from all over the world to discuss items that threaten waves. One very interesting topic that is continually discussed is surfonomics. It's a funny word but a growing area of study relating to economic impact surfing has

on surfing communities. Studies being conducted worldwide found the industry associated with surfing are the biggest on local economy.

"Do we want to jeopardize the water quality of San Diego? I think not. Surfrider San Diego objects to any situation where Copermittees are allowed to come up with a plan, implement and adopt it, and be deemed in compliance with water quality standards. Clean water is clean water and nothing less. We take protection of the ocean waves and beaches seriously.

"Lastly, as a resident of IB, where clean water is a constant battle, please do not take the teeth out of this permit. Our waterways are dirty, and they will get dirtier if we do not hold Copermittees accountable. So thank you very much and have a great day."

BOARD MEMBER STRAWN: Do you want to take your time now?

MS. SACKETT: My name is Mandy Sackett. I am a resident of the City of San Diego. I live in Point Loma. I'm the chapter manager at Surfrider San Diego and also an avid and recreational of the coast -- should I start over? I know the clock hasn't started?

I spend the vast majority of my free time in the ocean. I spend all my time in the water at Sunset Cliffs every possible chance that I get. So I'm always very well aware of the water quality at any given time, especially in Point Loma. As someone with continual health problems. I consider myself a canary in a coma. Because I'm sick immediately. So thank you very much for your time and for listening to me today.

I have four main points I want to make here. I'd like to applaud the regional board for their wisdom and prudent decision-making regarding the 2013 storm water permit and the elimination of safe harbor clause. If you do feel like the State is mandating a means for alternative compliance, I would also encourage you to stand firm and please acknowledge the differences between San Diego and the Los Angeles region. We don't have the same level of TMDLs. Please make sure there are strong limits and automatic outs in the alternative compliance methods so applicants cannot hang out in this interim process forever.

My second point is, we object to any situation where simply coming up with a plan and implementing and adopting it is deemed in

compliance with water quality compliance. Compliance means water are safe and clean to recreate in, period.

Copermittees continue to have the same complaints they have had for the last permit cycles. Including things like cost considerations and difficulty yet we're still not in compliance with the Clean Water Act. There's no room for leeway and we do not see any real water quality improvements. We, the public, are here demanding protection and actual improvement of our water quality.

As the agency is tasked with protecting the use of our water, I urge you to please hold the line in protecting water quality. Lastly, as I mentioned, I rely quite heavily on the coast. I surf, swim kayak, eat fish, and we need strong controls to protect our water bodies and to make sure the water quality standards are (inaudible), not a plan in place to kick the can further down the road.

Hold the line today and amend the alternative compliance to make sure it's not a safe harbor. We need strict guidance and hard outs. Thank you very much.

BOARD MEMBER STRAWN: Jennifer Olm.

UNIDENTIFIED SPEAKER: I will read Jennifer Olm's comments. Jennifer Olm is a resident of Rancho Penasquitos, a Surfrider volunteer, and also a mom. She was here to ask that you make sure alternative compliance is not a safe harbor, while a Surfrider volunteer, I am first a mother. My family likes to swim at to Torrey Pines, kayak in mission bay and care very much about all of our beaches.

I congratulate the Board on developing a watershed permit that allows for focus, time, enforcement and education. We need to ensure that any alternative means of compliance specific, measurable and transparent. Trying isn't enough. We are capable of rigorously ensuring our quality. Don't take the back bone out of this permit.

She's also a volunteer who has read her local water quality improvement plan in detail and has comments for that. That's it for her.

BOARD MEMBER STRAWN: Next I think I have Sam Blick.

MR. BLICK: My name is Sam Blick. I'm the author of the letter Laura was referencing. I didn't mean to offend you. I had about an hour to

1 get that letter in. The situation I was presented
2 with was "what happens if you can't build at all
3 on the property?" And my engineer was telling me
4 you can't build at all. It's not a matter of
5 complying with the law. That's what our rash map
6 look like on this property. You get nothing. I
7 think if someone told Laura she couldn't use her
8 house at all, she wouldn't like it. The law says
9 it's not fair if you take it all.
10 All right. I bought this property
11 with my partner, and our approach was simply
12 "We're going to comply with the law, whatever it
13 is." We're envisioning a house that might cost 5-
14 or $600,000. We know if we comply with all the
15 provisions -- the house might cost a million; who
16 knows after it's all done. But that's all right.
17 We're going to comply with the law whatever it is.
18 We looked at the general plan, what
19 does it allow. We looked at the specific plan,
20 what does it allow. We're about three years into
21 our process with the City. Our tentative map and
22 our EIR process is being considered. It's not
23 approved; it's true. But the project is virtually
24 designed by the City, everything they want, every
25 curb, the way it's designed is what they want. We

did what they want. We took 70 percent of the property and gave it to the public. We're left with 30.

It's all right. We still get to build the houses. People still get to buy those houses; they're just going to cost more. That's how I've approached it. That's the way we have to approach it. So we run across this condition. We look at this. I submitted a letter to you. That's the rash map. That condition says if you abide by those coarse sediment standards, you get to build nothing. Nothing is very different than a 500,000-dollar house. We can live that. If the conditions are so bad it doubles the price of the house, we can deal with that. People will buy it. They need the housing. If it's worth nothing, you can't build. So I had to submit a letter. I'm sorry it was so rough, but it's kind of a rough statement because it's a rough result.

I know you don't want to do that. I've been here all day. Nobody is thinking anything but clear water. You're not thinking of destroying property value. You're not thinking anything along that line. You're doing your job. That's how we designed it, too. I'll say, in

closing, we've contemplated all the water gets reused, each house gets its own water recycling. We've tried everything. It's expensive, but we've done it all. We've done it with water quality in mind. So I would urge you to consider that and not deny any use of the property whatsoever. That's not right. Thank you.

BOARD MEMBER STRAWN: Scott Graves.

MR. GRAVES: Thank you, Board members, for allowing me to speak. I'm a resident that lives in Sanpas Falls, speaking as a concerned citizen who would like to respond to Mr. Blick's late submission. I found it ironic he said he only had an hour to compose his letter when there was a 45-day comment period. I think that theme of "too little, too late" or "I want more time. Want more time" has been seen throughout the day. In my opinion, the veiled threat of litigation has no merit. Sifting through the data of looking up parcel numbers and previous sales and assessor tax information available to the public, Concordia purchased over 1,000 acres for approximately $7 million, based on the tax assessor's taxable values.

When they purchased this property, and

as it currently stands, they're entitled to build 26 or 27 homes. The property has not been annexed by the City of Escondido. The final EIR has not been completed, so their claims of work based on Safari Highlands Ranch completed value, in his words, $500 million are quite a stretch, especially in the light of the exorbitant number of exceptions in hopes of getting approval.

Mr. Blick said they're in compliance. The City hasn't looked at their plans. The City's regs are you can't build anything on a grade steeper than 12 percent. They're asking to do it on a 15-percent grade, which is extremely steep. There's all sort of waivers they're asking for, grading waivers. All the different ratios of grading exceptions. I find it difficult to believe this is in compliance.

The developers' gamble was especially high risk similar development on this land was previously looked at and the project was withdrawn because they rejected the development and the general plan. The general plan and the development of the general plan cost the county about $18 million with significant public input. Please don't let developers intimidate best

1 practice when it comes to water.
2 BOARD MEMBER STRAWN: Next I have
3 Rebecca Andrews.
4 MS. ANDREWS: Good afternoon, Chair,
5 members of the Board. I'm an attorney with the
6 law firm of Best, Best and Krieger. We represent
7 the San Diego Airport Authority, the cities of
8 National City and Chula Vista. The cities and the
9 Airport Authority have a pending petition before
10 the State Board regarding the 2013 permit, and its
11 lack of a compliance pathway.
12 So we submitted a green card today in
13 support of the amendment and would like to thank
14 the Board and Board staff for all the effort
15 that's gone into developing the compliance
16 pathway. We believe the compliance pathway will
17 enable the Copermittees to work together and
18 develop a prioritized approach to addressing water
19 quality challenges and to coordinate their efforts
20 towards improving water quality.
21 Thorough planning is essential to
22 developing an effective water quality improvement
23 plan. Developing an effective water quality
24 improvement plan takes time. The State Water
25 Board's recent order reflects an intent to include

that time to develop an effective plan within the compliance pathway.

So as you can imagine, the cities of National City and Chula Vista and the Airport Authority are requesting what they call an "interim compliance pathway," by one of the environment groups has been called a "grace period," as part of the safe harbor. Whatever we call it, including that period of time within the compliance pathway recognizes the importance of the development of the WQIP.

The Airport Authority, Chula Vista and National City, as part of the San Diego Copermittees, join with Orange County and Riverside County in requesting that this Board extend the compliance pathway to cover the time period where the WQIP is being developed.

BOARD MEMBER STRAWN: Thank you. I'm sorry I didn't get you in with the Copermittees earlier.

Mr. Penzick.

MR. PENZICK: Good afternoon, Board members. My name is Jerome Penzick, 14245 Dalhousie Road, San Diego California. I'm also a member of the Surfrider Foundation. I would like

1 to thank the Board for your work and allowing me
2 the opportunity to address you. I recently
3 retired from the federal aviation administration.
4 I have extensive experience with methods of
5 alternative compliance. In aviation, alternative
6 compliance is a very, very serious issue.
7 Typically, a certificate holder will request
8 something like an air-worthiness directive or
9 relief from a regulation. They have to go through
10 an extremely extensive and rigorous process based
11 on two important concepts: Is the alternative
12 method of compliance in the public interest? And
13 does the alternative method of compliance
14 establish an equivalent level of safety?
15 Now, trying to stress the
16 applicability, would the equivalent level of
17 alternate pathway provide for an equivalent level
18 that the original requirements would meet. That
19 would be the task before the Board and staff.
20 I would like to compliment Mr. Chiu in
21 his earlier remarks today; it shows he's focused
22 on the issue in the work he's already established.
23 Hard criteria must exist for realistic acceptance
24 of milestones; there's no way around that.
25 Alternative methods, in order to be successful,

milestones must be are meaningful. They must show real progress. The end result is not reports. The end result is not steps to get there. The end result is clean water at the beach, things that we can surf in.

What I would offer to you is what would look like failure would be for San Diego to turn into New York. I lived, for a while, in Long Island for work. I can't describe how poor the quality of water at the beaches are at someplace like Rockaway Beach in Queens, Point Lookout in Nassau. My son got contact dermatitis there. We came back to California, and I fulfilled a longtime dream to learn to surf with my boys. And I can't describe to you how pleasant it was to surf in Solana Beach at Beacons in clean water with good friends. So these are the tasks before you.

I thank you for your work and thank you for the opportunity to speak today.

BOARD MEMBER STRAWN: Next, I think I have a card from Summer -- maybe it's Smith. She has ceded her time to Julie Chunher.

MS. CHUNHER: Good afternoon. I'm Julie Chunher. I'm the policy manager for

Surfrider San Diego. Thank you for your time. And I wanted to call your attention to our 10 members and volunteers who took time away from work to be here and show their concern for this important issue.

I'd also like to take a minute to sincerely applaud your staff. This has been time-consuming. They have been professional. They have been very thorough, and I've been thoroughly impressed. Whatever decision is made today, they deserve a round of applause. And I want to applaud you for your decision in 2013. That was a hard decision to come to.

And instead of my talking points, I'd like to respond to some of the things we've heard today. We heard early that the purpose of alternative compliance is to provide clarification and structure to this interim process to figure out when it starts and stops.

Unfortunately, as it's currently written today, I don't think that happens. I think it continues that iterative process. And, you know, we heard a lot about the cost of compliance. I think we should all be much more concerned about the cost of noncompliance.

I said it in 2013, and I'll say it again today. Where is the number of lawsuits that everybody is so afraid of? These are meaningful steps in the right direction, but at the same time, we need to maintain accountability to increase motivation to make hard and expensive steps.

I'm a parent now, as well. I have a 14-month-old, and he's starting to learn to test his limits. He likes to see what he can get away with. It's better for him, his safety, and my sanity to have certain limits with him, set clear boundaries. And I see today we're hearing a little bit of limit-testing. What can we get away with? So I would encourage you to hold to those limits; it's better for everyone.

You also heard in the comments today that people need more time for plans. They want compliance while they're planning, and they want compliance if the plan doesn't work out. Where does that leave the public?

History is the best indicator of future behavior. For history, we have to look at what's happened in the previous permit cycle. We have to look at what happened in the WQIP process

recently, and we have the tendency, as city council is saying, to do the bare minimum. So we need to be able to keep everyone motivated.

We also heard today that it's going to take years to come into compliance. Guess what? It hasn't been in years. We need to maintain that accountability. That's exactly why there was a paradigm shift in 2013, so I hope we can maintain that.

We also heard, "Hey, don't worry about it. Water quality is important to us, too. We will take care of it. But we also have lots of priorities, whether its police cars or other things."

I think that's exactly the point. You guys are charged with maintaining water quality. We're trying to make that more of a priority. Decision-makers have to make hard and expensive decisions, and not just to look at storm water and "Oh, well whatever is left over, that's an expensive problem we have to deal with."

If you look at it in a different context away from storm water, when you're trying to protect something, the regulations and laws usually increase. For protecting children, we

1 have Megan's Law. I don't see how relaxing the
2 process is going to be make water cleaner.
3 At this point, there's not enough
4 guidance in the permit to do proper analysis. We
5 need that guidance in the permit and not after the
6 fact. I ask you to remove the safe harbor
7 alternative compliance today. Postpone it until
8 the EPA has done a reasonable assurance analysis,
9 and wait until 2018.
10 If you're going to do it, I suggest it
11 be really thorough and done right. That's our
12 request.
13 Thank you for your time and
14 consideration.
15 CHAIRMAN ABARBANEL: I believe there
16 are some speakers that have some additional time.
17 If anyone would like to speak, Gary will tell you
18 how much additional time you have, if you come up
19 and you request that.
20 County of Orange had a minute. I'll
21 extend that to a 1:10 just for you.
22 MS. SKORPANICH: So it's not 7:00 p.m.
23 that's a good thing. I just wanted to close up
24 and kind of wrap up a very brief period of time.
25 Harping back to 2013, 2011 when your staff

1 undertook the initial workshops to develop this
2 permit and what they've been saying all along, and
3 what I think they actually have achieved with this
4 permit is a permit that's aspirational. It's
5 something to inspire, to motivate, to incentivize
6 the permittees to do even more, to take on even
7 more than what the Clean Water Act requires of us.
8 Along with that was a desire on your
9 part as well as your staff to allow for a permit
10 that allows creativity and innovation, but most
11 importantly for the permittees, it allows
12 prioritization. I know we touched on this
13 earlier, but I don't know that we really drew a
14 fine point with prioritization.
15 If we have the interim compliance,
16 then we have the freedom to prioritize what those
17 really important water quality objectives are we
18 need to work on and focus on. Without that, we
19 really can't sort of leave the low priority, the
20 things that we know are above natural conditions
21 and so forth.
22 So I'd like to just draw that point
23 that it ties our hands considerably on being able
24 to do that prioritization process and focus on
25 those most important objectives. It's not unlike

1 what the State of California did, actually. Back
2 two governors ago, the state set up the Clean
3 Beaches Initiative. They said we know beaches are
4 a high-priority water body. They where are people
5 recreate the most. We want to put emphasis on
6 that. They directed grant programs there. To
7 this day, the beach water quality task force is
8 meeting today. It's made tremendous difference,
9 not only in Southern California but up and down
10 the coast of California. It shows you what you
11 can achieve if you are able to do that
12 prioritization.
13 The second point I would like to make
14 is that your staff is looking to have a credible,
15 durable and transparent water quality improvement
16 plan developed. This will not be a safe harbor,
17 if you will, a get out of jail free card. The
18 permit also establishes some meritocracy. How do
19 you earn interim compliance? The permittees, they
20 have proposed some enforceable milestones during
21 the development of the water quality improvement
22 plans, but I that addresses those concerns.
23 What we really all want is one of the
24 other issues that you and your staff set out on
25 this permit, which was to make it so we could have

collaboration. We want to work together and begin to make more progress on water quality.

I thank you very much for your time and consideration today.

MR. MCKIBBON: If I didn't say it in my original comments, I want to thank the staff again. It's been comforting to me as the point person of my industry to know if we have concerns, I can get on the phone or e-mail and get an answer or get an appointment. I appreciate working with you folks and your professionalism.

Matt O'Malley talked about the water quality improvement plans. Just so each you know, each one of those came in between 700 and 1200 pages each, so that's like Warren Peace times eight. I know you've got a limited number of folks in your organization, same thing with us. To try to go through every one of those, it's time consuming.

Both the Copermittees and myself, we laid out for you a reasonable rationale for why we needed more time, to get tools finished, put them in the tool box, and get the job done right. For us, it's more important to get it done right than to just get it done.

1 As far as the need to time, we, like
2 the environmentalists, believe in the CEQA
3 process. The environmentalists know that for
4 CEQA, you have to adopt ordinances and those take
5 time.
6 I thought John Van Ryan did a very
7 good job of laying out exactly, in the perfect
8 scenario for them, how long it takes to do that.
9 Finally, the Afco decision was mentioned here, and
10 that decision was 40 years ago, and land use has
11 gotten significantly more complex since that time
12 with development groups and grandfathering
13 provisions.
14 Again, I appreciate your time.
15 CHAIRMAN ABARBANEL: Thank you very
16 much. We now have time for staff response,
17 closing remarks. For me, it would be helpful if
18 you could put up the slide with the very specific
19 indicated changes in the tentative order. You had
20 one that addressed alternative compliance, one
21 that addressed -- and then at the bottom was
22 errors, and these are things, if I understand, are
23 in addition to the main theme of the day, about
24 which we've heard very little, which is the
25 enrolling of the County of Riverside as part of

1 the regional MS4.
2 What was in the box.
3 MR. CHIU: So this was the summary.
4 CHAIRMAN ABARBANEL: I think we have
5 heard primarily about items in the box. Riverside
6 county didn't show up here and say "we don't want
7 to play." I didn't hear any objections. I
8 thought I heard somebody say you did it right.
9 You had very specific language for these two
10 items, if you could put that up.
11 MR. CHIU: I didn't really put any
12 language more than a kind of a summary of how we
13 responded. So I think you were looking at
14 somebody else's presentation. There were a lot of
15 more dense slides than mine. In this particular
16 situation, I think you heard from both sides on
17 this: What you heard today was actually very
18 similar to what we went through during the public
19 workshops. You heard a lot of lot of positions
20 being put forward, a lot of rationale for those
21 positions, a lot of justification for making
22 specific types of changes or incorporating certain
23 provisions into the permit. We did our best to
24 try to find the proper balance between the
25 different perspectives, and what we came up with

1 during or after the workshops or as a result of
2 the workshops or for the prior lawful approval
3 language, we felt that we had done our job right.
4 It's not exactly as the environmental
5 community would like. It's not exactly like the
6 way the development community and the Copermittees
7 would like. Obviously, the Copermittees are now
8 willing to accept it, but the environmental
9 community is still asking for some of the changes
10 that they requested. Even during those workshops,
11 I think our position is still and our
12 recommendation is still to maintain the language
13 that we've put forward for you to consider for
14 adoption today.
15 I'm going to take this opportunity to
16 kind of touch upon the BMP design manual issues
17 that have been raised by the County and the
18 development community, and it touches upon the
19 prior lawful approval language, as well.
20 The Copermittees are asking for
21 additional time to make changes, and I think they
22 provided a slide that shows the justification for
23 that is they will need all this time for their
24 process, the changes that they're going to need to
25 make are fairly significant. It's because we're

1 changing the definition of prior party development
2 process. We've changes the definition of
3 redevelopment and we added prior lawful approval
4 definition language in there.
5 We informed the Copermittees of this
6 upcoming language back in June. We issued a
7 letter to them informing them of the language that
8 we knew would be incorporated into the permit, and
9 it was also at their request that we move this
10 board meeting up sooner so they could have more
11 time to make changes to their BMP design manuals.
12 The redevelopment definition was not
13 changed; it was clarified. And the prior lawful
14 approval definition, that simply gives them the
15 parameters in which they would apply the fourth
16 term or 2007 MS4 requirements for developments
17 versus the regional MS4 permit requirements for
18 developments. So they're just basically trying to
19 delay, in our estimation, the effectiveness of
20 these new requirements. I think we're being very
21 reasonable when we said we would provide them an
22 additional 90 days to make those changes, and it's
23 90 days from the date of the adoption of the
24 permit changes, not 90 days from the December
25 expected effective date. It would make it

1 February 2016 by which they would have the
2 effective date of their BMP design manuals in San
3 Diego county.
4 So I understand that everybody wants
5 more time, but we have actually provided them
6 quite a bit of time to prepare and time to get
7 things in place in order to have this adopted. So
8 simply asking for more time is, I think, a default
9 position that many people take. I think you've
10 heard it throughout most of the requests today for
11 more time for everything.
12 I think in this situation we were very
13 reasonable. We plan on issuing a letter from RGO
14 directing the Copermittees to push back their
15 effective date for the BMP design manual to
16 February 16, which is 90 days from today and that
17 should be sufficient time to make changes to the
18 definition of prior development project. I
19 counted the words that actually is or will be.
20 They have to add 20 words to the definitions. So
21 they're not going to have to have to do a song and
22 dance and go on a road show in order to tell
23 everybody exactly what it needs to be. It's 20
24 words.
25 The redevelopment definition, I think

we changed, like, six words. It's not a whole lot. The prior lawful approval is really just giving them some parameters now to work with.

So that is the prior lawful approval language. Let's talk about the coarse sediment yield issue. The coarse sediment yield issue has come to light in recent months. As you've heard, we've had several discussions with the development community, with Copermittees on this issue. From the compliance standpoint, their BMP design manuals are in compliance with out permit requirements. It includes all the language necessary to allow prior redevelopment projects to implement measures to address coarse sediment yield areas, such that there is no net impact to the receiving water. Avoidance is the first and preferred method of providing no net impact to the receiving water, but there are alternatives, and they are currently developing those. There is one being proposed for the City of San Diego's BMP design manual that could be used as a model for other jurisdictions.

That doesn't mean there aren't other methods that can be developed. The guidance that can be developed in future months or future years,

1 is simply going to be an addition or attachment to
2 the BMP design manuals. I don't think we need to
3 delay the effective date to allow for guidance to
4 be developed, but if they're looking for
5 additional clarity and they want to delay the BMP
6 design manual for clarity, we wouldn't recommend
7 that. We believe we need to have these BMP
8 performance standards and criteria in place as
9 soon as possible and implemented on development
10 projects as soon as possible in order to be
11 protective as possible for water quality going
12 forward.
13 I will move on to the alternative
14 compliance pathway option. Again, you've heard a
15 lot of things about this particular issue, both
16 sides, and, again, it's very similar to what we've
17 heard during the workshops. I think Board Member
18 Olson heard a lot of this. Board Member Morales
19 has heard a lot of it, and now the rest of the
20 Board has heard pretty much the same things,
21 couple tweaks here and there. And you know, I
22 think there's -- this is one of those issues where
23 the stakeholders are looking to us to provide the
24 leadership on this issue and looking to us to make
25 a decision on how to move forward on this

1 particular issue.
2 In listening to what we heard today
3 and during the workshops, I think I fully agree
4 with what the environmental community says. I
5 really do. But then I also agree with a lot of
6 what the Copermittees say, and so we're trying to
7 strike a balance, again, of what we could do as a
8 board to provide a middle ground, a pathway
9 forward that could be workable. And the language
10 that we came up with was what we thought was the
11 path forward. You may have heard annual
12 milestones, the environmental community ask for
13 that. We didn't have it there before. That was
14 to provide that additional level of accountability
15 but the way they would like to see it is those
16 milestones are essentially are your ticket out of
17 the program. If you don't meet a milestone, do it
18 for two years or three years or whatever, you're
19 automatically kicked out, and you have to figure a
20 way to get back in.
21 But we agreed there needed to be some
22 additional level of accountability and a way to
23 track progress that we as regulators are given the
24 awesome responsibility of trying to make sure that
25 our water quality is going to be protected,

1 preserved, restored, and enhanced. We needed to
2 figure out how to make sure that we could keep our
3 finger on the pulse, and those annual milestones
4 were our way of doing that. Giving in a little
5 bit to what the environmental community requested,
6 and, again, every time we give something to
7 someone, somebody else doesn't want it. Trying to
8 figure out what we could do. What we have given
9 to the Copermittees is the alternative compliance
10 pathway.
11 What we have added, which they don't
12 necessarily want, is additional milestone
13 requirements that creates that additional
14 transparency and rigor. I think we've struck the
15 balance. I hope you agree.
16 And that's the milestone issue, but I
17 also want to get to this being deemed in
18 compliance during preparation. Again, this is one
19 of those things where we try to find the balance.
20 On the one hand, we have the environmental
21 community saying "We don't want it at all. It's
22 not fair to us. You put this in there. We lost
23 all ability to drive the conversation."
24 On the other hand, Copermittees are
25 telling us "We are always at risk. We need to

1 figure out a way where we reduce that risk."
2 We agree. We know there's a lot of
3 risk. We agree there has to be a middle ground.
4 So we provided an alternative compliance pathway
5 as that middle ground. We thought it was a
6 balanced approach by providing compliance during
7 plan implementation but not during plan
8 development, and so that's where we came down on
9 that issue. We thought that was the right
10 approach. And while we have other examples of
11 alternative compliance pathway options in the
12 state, I like to think we lead rather than follow.
13 So I think we need to set the pace.
14 We need to figure out what we, as a board, believe
15 is the right course, not necessarily believing
16 that other boards should dictate our way of doing
17 things. The State Board order that does not
18 dispute the path that L.A. took does not say we
19 have to use L.A.'s approach. It simply says L.A.
20 can do it in the way they want. That doesn't say
21 all boards must do it this way. I just want to
22 make sure we understand that what we do here is
23 not what L.A. does.
24 And that kind of takes me to my other
25 point about the analysis portion of it. I know

1 there's a lot -- there is some concern as to the
2 lack of specifics as what L.A. had, but I think
3 our approach also provides a more flexible
4 approach that allows the public, then, to be part
5 of the process and part of the discussion, where
6 the L.A. approach doesn't quite lend itself to
7 that as much, because of the specifics that have
8 been incorporated and the very specific methods in
9 which they are allowed to do their analyses.
10 The other aspect of that is, these
11 particular analysis methods or these models are
12 really for fluid and water body. Our permit
13 actually aspires to more. We're not talking about
14 the chemical integrity of our waters. We're
15 talking about the physical, biological and
16 chemical integrity. These water quality models
17 don't lend themselves to restoring a beneficial
18 use. A beneficial use is not just chemical.
19 There could be a physical, biological or toxicity
20 component, which is partially related to chemical
21 constituents, but there are other aspects, as
22 well.
23 We believe having an analysis with
24 clearly stated assumptions is very clear guidance
25 in that we will not accept an analysis that is

1 just high in the sky. There has to be something
2 behind it. There has to be something where we can
3 understand how they came to a conclusion and the
4 public as well. The public is part of the
5 process. L.A. does not include that aspect in
6 their particular paradigm.
7 So, you know -- and you we're not
8 opposed to developing guidance. L.A. didn't have
9 guidance in their permit. They developed guidance
10 after the permit was issued. I think you heard
11 from us and our stakeholders here that we have
12 engaged with our constituents frequently. We
13 communicate with them often. We lend them our
14 expertise on the matter, our regulatory
15 perspective. And once we issue this permit, it's
16 not like we're going to hide in our offices and
17 not engage anymore. We will continue to have
18 these conversations and make sure there's a clear
19 understanding among everyone what our expectations
20 are.
21 So guidance can be forthcoming, and if
22 you would like to see very specific guidance, we
23 can do that. But if we want to give the
24 Copermittees some flexibility in terms of how they
25 want to approach water quality improvement -- if

they want to go after hydromodification improvements, make sure those hydromodified channels are restored, you can't do it with a model. If you want to improve or increase the amount of wetland area, you can map it but I don't know how a model is going to get you there.

So that brings us to the question of prioritization and I wasn't quite clear how being deemed in compliance during preparation of the pathway would lend itself to prioritizing your water quality concerns. The whole idea of the water quality improvement plan is to prioritize, and the idea of the alternative compliance pathway is to figure out how long is it going to take to get there. You don't have to have the same schedule for every single constituent. It would be staggered schedules for constituents.

So I'm not sure if I should touch on the backsliding. I think we already addressed it through our comments.

MS. HAGAN: I think the response comments addresses that adequately.

MR. CHIU: And then the last thing I want to -- there were three other issues I wanted to cover that I heard that I just wanted -- there

1 seemed to be some muddling of what permit
2 requirements are and how they're being applied to
3 the alternative compliance pathway.
4 First Laguna Beach and Dana Point,
5 they were bringing up that lawsuit that was
6 brought against the City of Laguna Beach. That
7 was a lawsuit specific to dry-weather discharges
8 going into their MS4, which is very different than
9 storm water discharges. The permit has a specific
10 requirement to effectively prohibit
11 non-storm-water discharges into the MS4.
12 Then there is a provision, an effluent
13 limitation. One is a prohibition; one is an
14 effluent limitation. Effluent limitation os
15 discharges from the MS4 shall -- the pollutants
16 shall be reduced to the maximum extent
17 practicable. Those are very different. The
18 alternative compliance pathway doesn't address
19 either one of those. The alternative compliance
20 pathway is for receiving water limitations. The
21 receiving water limitations state discharges from
22 the MS4 shall not cause or contribute to
23 exceedances in the receiving water.
24 So, you know, when I heard, I think it
25 was Mr. Baron, saying the Clean Water Act -- MS4s

1 aren't required to meet numeric effluent
2 limitations, that's true. And we don't have
3 numeric effluent limitations that need to be met.
4 We have a narrative of maximum extent practicable
5 standard. But the receiving water limitation is
6 different than a effluent limitations. The
7 receiving water limitation is a condition in the
8 water that needs to be protected or restored, such
9 that the beneficial use is supported.
10 That's the ultimate end goal that
11 we're trying to achieve. That is a numeric goal
12 that can be proposed as part of the water quality
13 improvement plan but they have the option of
14 proposing effluent limits of some sort that would
15 be self-imposed, and they're not in our permit.
16 We have nothing in our permit that actually
17 requires them to be in compliance with a numeric
18 effluent imitation.
19 I think, again, it was Mr. Baron who
20 said the permit is placing upon the Copermittees
21 the responsibility of -- placing on the
22 Copermittees responsibilities typically taken by
23 the regional Board, such as developing TMDLs or
24 time schedule orders and those types of things. I
25 would agree. I think we have placed a lot of

these things in their realm of responsibility if they so choose. And we don't require them to develop these things. This is an optional pathway, but the benefit of it is that they get to develop it. They get to develop the model. They will get to develop the numeric goal. They will get to propose it to us for us to buy into it. If it was all us, it would be us doing the modeling. It would be us going to them and trying to convince them, and, typically, it was not an easy convincing process. Trying to convince them this was the best thing for water quality.

This allows them to tell us what is best for water quality, and to avoid TMDLs, which then hand cuffs everybody in the process because then we have things in the basin plan we cannot change easily. This process, it does place a little bit more on the Copermittees, but it's up to them if they want to take on that challenge, and there are a lot of benefits to it. To realize those benefits does take more time and a few more resources.

I think that covers, hopefully, all the comments we heard. Last one: The language request for changing -- if the San Diego Water

1 Board finds to where a Copermit. I think we're
2 talking semantics at this time. I don't think
3 it's a necessary change. I will leave that to the
4 Board if they would like to see that change.
5 CHAIRMAN ABARBANEL: Final question?
6 BOARD MEMBER OLSON: I just have one
7 question. It goes back to what you said. So now
8 I'm confused. It's been referred to many times
9 today that the Copermittees are out of compliance.
10 Are they out of compliance or are they in
11 compliance? The receiving waters maybe out of
12 compliance.
13 MR. CHIU: So in every permit, there's
14 a set of discharge prohibitions, receiving water
15 limitations and effluent limitations. Effluent
16 limitations are in there, typically, to achieve
17 your discharge prohibitions. In storm water
18 permits, we have what's called a maximum extent
19 practicable standard. Every permit cycle, the
20 maximum extent practical was supposed to get
21 better and better and get to the point where it
22 actually achieves the receiving water limitations
23 and prohibitions, but we're not there.
24 There is this disconnect in MS4
25 permits, in particular, where the maximum extent

1 practicable standard, where they maybe in
2 compliance with that, does not mean they are in
3 compliance with receiving water limitations. I
4 think the Copermittees are in compliance with the
5 maximum extent practicable standard but they can't
6 say they're in compliance with the receiving water
7 limitations.
8 Any other questions?
9 BOARD MEMBER STRAWN: This one has to
10 do with the questions for extra time. One part of
11 that argument that the Copermittees made that
12 struck a note with me is the desirability of more
13 public input and having hearings, having more
14 reviews, opening it up more for the public.
15 Rather than this, giving them more time blankly,
16 if, hypothetically, one of the groups had
17 diligently had their WQIP all set for some
18 watershed and came to you and said, "We've drafted
19 this document. We think it's right, but we want
20 60 days to have three sets of public hearings over
21 a certain period of time," would our Board be in a
22 position to allow that extra time if they were
23 to -- if it was a specific request like that?
24 MR. CHIU: I don't think that we would
25 be precluded from doing that. Part of the process

is when they submit their water quality improvement plan, before we accept it, we have to review it. If there are things they propose to improve, we can certainly give them more time if it means that we wouldn't accept it. Part of the acceptance means implementation. It kind of starts the implementation process, so providing more time is great if you want to --

BOARD MEMBER STRAWN I'm just looking at an alternative. If you got a specific need for something you think is going to add value, come talk to us.

MR. CHIU: We can still accept something, but give them the ability to obviously improve, if they feel it's necessary.

BOARD MEMBER STRAWN: They can always come to us and ask for that too.

MR. CHIU: Absolutely. I think this board seems to be very receptive to our community.

CHAIRMAN ABARBANEL: Thank you very much. We will close the hearing and open this up to board discussion.

MS. HAGAN: Your acting executive officer --

MR. SMITH: Thank you, Chair

1 Abarbanel. Jimmy Smith, acting executive officer.
2 I won't recap what Wayne said, but I do want to
3 offer a little perspective. I'll give way my
4 recommendation. I do support staff's
5 recommendation to move forward with the permit as
6 drafted with the errata they proposed. I saw that
7 not lightly. I remind the board this is largely
8 the same permit heard in 2013 and again earlier
9 this year, and I think it's a good sign we've come
10 down to a place with a lot fewer issues. I think
11 it's a sign we are working together with the
12 Copermittees, with the environmental groups, with
13 the USEPA, and some of the other developers that
14 are out there.
15 Staff has navigated a rather
16 conscientious pathway on these issues with public
17 input and input from Copermittees. What they put
18 forth, I think is reasonable as the water code
19 calls us to be. The big issue for them is more
20 time, and time is always something that is a
21 challenge for us as a board and for the public, as
22 well. As you saw the slides, and we all know, we
23 are not achieving fishable and swimable waters in
24 many areas in our region.
25 This pathway to compliance, this

alternative compliance pathway, that is a very high bar that staff has set forth, and one that can save the Copermittees time and money and not have to worry about additional TMDLs coming down on them every few years, to allow us as staff to work with them and the public on actual improvements and BMPs that will make water quality better in our region.

With the time issue, the term that comes to mind is don't let the perfect be the enemy of the good. Where we are now is an opportunity to be move forward. The permit is not perfect. We sometimes joke that maybe we achieve a good outcome when nobody likes what we're doing. But in this case I don't think that's the case. I think everybody likes where we're headed but they're have issues with how we're headed there.

This permit will be back before the Board, and we may be back here again for a lengthy hearing, but in the interim, time will be better spent with staff not reworking the permit but getting out there working with staff to make improvements to water quality. The only way that can happen is if we get this permit adopted.

So I reaffirm my recommendation that

1 the Board adopt it as originally put forth.
2 CHAIRMAN ABARBANEL: Okay. I think
3 it's time for board discussion.
4 Tom, I know you have a deadline if
5 you'd like to start here are my thoughts.
6 BOARD MEMBER MORALES: I think
7 everybody here doesn't want much, you just want
8 more, but at some point we need to move on. It's
9 really only two issues that have been talked about
10 when it comes to this permit. The first is the
11 alternative compliance pathway. That seems to be
12 the biggest of the two. And back when we issued
13 our first MS4 in 2013, that applied to the San
14 Diego folks, we had a lot of the same discussion,
15 and then there was a lot of discussion about safe
16 harbor back then. We didn't give it to the San
17 Diego folks. It wasn't because personally I had
18 anything against them. It was quite the opposite.
19 I had great faith they would do what they need to
20 do in a fairly short order, and they have.
21 They've risen to the task.
22 If there is an instance where they'll
23 get a plan, it has to pass (unintelligible). If
24 it doesn't, that's going to be another discussion
25 that we have. So I hope that allays some of the

1 fears that people are going to submit poor plans.
2 I don't expect that will be the norm at all. It
3 seemed to work okay for the San Diego folks. I'm
4 not saying you've got all these great protections
5 and while you're working on this --I think it will
6 work as well the Riverside permittees.
7 And those of you working on these
8 plans, I know you are deep in the throws of
9 working on that, and I know you're working on
10 these things diligently. So I am comfortable with
11 that portion of the tentative order. With respect
12 to the grandfathering, again, that's no surprise.
13 If it were up to me I would say December 24th.
14 It's no secret. We've been talking about this for
15 years. I will support staff in their
16 recommendation to allow another 60 days, maybe 90
17 days from the date of adoption. I will, again,
18 support the order even though my personal
19 preference would be December. But as you all did
20 in your meetings, we'll make an accommodation, and
21 that is pretty much where I come down on this
22 stuff.
23 I'll end by saying when we came up
24 with this whole notion of an outcomes-based MS4,
25 we were trying to get out of the business of

1 micromanaging you all. I think this alternative
2 compliance pathway is very much in keeping with
3 that. You're all grown ups. You know what works
4 best for you. We're giving you that opportunity.
5 I have great faith, and when I am long
6 gone from this board, I hope to be able to look
7 back and say great waters we have in Southern
8 California are in a small part due to mostly in
9 large part to the role you all played.
10 BOARD MEMBER OLSON: I wasn't here in
11 2013, so I find that there's a lot of history on
12 every Board and every position that you take. I'd
13 like to start by commending the staff. I was on
14 the Board in February when we decided we would
15 look at the alternative pathway and try to pursue
16 it. I heard in my meeting, environmentalists
17 express a viewpoint but I have a very long history
18 of looking at water quality. And so if you look
19 back to where I came in at water quality, we saw
20 our rivers were burning and there were massive
21 fish kills, and thanks to the environmental
22 community and organizations like the regional
23 board and the state board, there have been massive
24 improvements. But I also, in working on a number
25 of standards, have seen taking a little more time

1 can sometimes reap benefits for everyone.
2 In this case, I tend to believe that
3 what's been put forward by the staff is probably
4 attainable. We hear this issue of milestones
5 arising from the one group that is working on
6 their water quality improvement plan, and
7 expresses concerns, and so my concern is, if those
8 -- if we now, a year from now or two years from
9 now, see all the agencies with these concerns, how
10 can this board respond?
11 What I really don't want to see in not
12 giving interim compliance is suits that will take
13 money away from the goals and objectives that
14 everyone in this room is trying to obtain. So I
15 was given assurance from the staff that if we see
16 anything coming forward that looks like extensive
17 legal action, there will be action or this will
18 come back to the Board. I just want to ask again,
19 is that feasible within the manner that the Board
20 operates? That's one of the my biggest concerns,
21 to see money go away from our water quality
22 objectives because people are changing the
23 timetable.
24 Is there an answer to that?
25 CHAIRMAN ABARBANEL: I think you're

1 asking Jimmy.

2 JIMMY: Yes, I think we can given the

3 option to reopen the permit at any time should the

4 Board direct us to or should staff make that

5 recommendation, we could come back and change the

6 provisions there to open it back up. 2018 isn't

7 that far away. That would be five years after San

8 Diego was first enrolled, so we would be starting

9 on that in 2017 anyway, and that's a little over a

10 year away.

11 BOARD MEMBER OLSON: One of the things

12 we're trying to get away with is to have people in

13 constant permit in changing and renewals. With

14 reservation, I'm going to support. I would like

15 to see interim compliance given, but I will

16 support the -- the action of the staff in this

17 case, and I would like to thank everyone. I know

18 everyone worked really hard and I really want to

19 stress I appreciate that.

20 BOARD MEMBER ANDERSEN: I'm very happy

21 that bringing Riverside was not that

22 controversial. It's a tribute to the staff, the

23 Copermittees and the stake holders involved in the

24 process here working together and working hard on

25 it. I'm going to agree with Jimmy's

1 recommendation and it's not that I didn't
2 consider, carefully, your input on all those paths
3 to alternative compliance. I agree with the EPAs
4 comment and Jimmy's recommendation that we should
5 commit to and follow-up guidance and that would be
6 a good thing. And my only other comment is on the
7 course sediment yield. That stuff should be dealt
8 with within the BMP manuals. It was great to have
9 the input on it, but I think the Copermittees can
10 probably work that out with everybody. So with
11 that, I'm supporting your recommendation.
12 BOARD MEMBER STRAWN: I'll try to be
13 quick. I want to thank everybody. The staff, the
14 Copermittees, the NGOs. I'm not even going to get
15 into the alternative compliance. It seems to me
16 the Copermittees are all good people, just leave
17 them alone, let them do their job. The
18 environmental groups are we don't need to keep
19 threatening to sue them I don't think anybody here
20 would believe that's true. That's certainly what
21 it sounds like when you get the bickering that
22 went on here today. I want to address one comment
23 and I know it's not even really part of this
24 because it's going to be in the BMP manuals but
25 the comment that we're trying to make somebody's

private property worthless is offensive to me. We don't want to zero out anybody's property. We also don't want what you do on your property to effect the property below you or somebody above you to do something that affects your property. Are when you're dealing with water quality, you're dealing with everybody in the watershed.

Everybody wants to say "my private property." It affects everybody up and down and we have to look at it from that big picture. I'm sure the Copermittees, when you get into the detail of the BMP manual, can work out something that, in effect, takes care of the all of the property owners and all the public in each given watershed. With that, I'm done talking and I will go along with Mr. Smiths recommendation.

CHAIRMAN ABARBANEL: I come from the only city in California that instead of a general plan, the community is taken into account on all decisions, and I see that Gary Strawn is our honorary member.

I was convinced by Mr. Gonzales that prior lawful approval issue is a trivial one. I see no reason to approve it. That isn't what it sounds like is the consensus of my colleagues, and

that's okay. I have, as indicated in one of my questions, I have a moral problem with the alternative compliance pathway announcing as a public agency that somebody is in compliance when we know and they agree they are not. I think it cuts into the moral stature of an agency that is supposed to speak truth.

Do I think those things will make major impediments in the achievement of water quality improvement? I actually don't, but they trouble me. I think what we really heard was the idea the adoption of the methodology of water quality improvement plans is a way to have the Copermittees who join us in a goal tell us how they want to achieve the goal. I thought that was a great idea in 2013. Two and a half years later, it may even be a greater idea. The city of San Diego has done extremely well. Sounds like the County of Orange is well on its way. Laguna Beach and Dana Point and Laguna Niguel, all slightly differently and that's fine. That's what we wanted. The fact it puts more responsibilities on the Copermittees is absolutely one of the goals. So I will -- having said that, I will call for motion. And I will see where I am. Is there a

1 motion?

2 BOARD MEMBER MORALES: I will move to

3 adopt Tentative Order No. R9-20150-0100 with the

4 proposed errata.

5 CHAIRMAN ABARBANEL: Is there a

6 second?

7 BOARD MEMBER ANDERSEN: I'll second.

8 CHAIRMAN ABARBANEL: Is there further

9 discussion?

10 Then I will say that I'm going to vote

11 against it, not because I don't want to include

12 Riverside County Copermittees as part of the

13 overall project, but for the reasons I mentioned.

14 I find them troubling because of that one

15 triviality Mr. Gonzalez has explained, that it's

16 very easy to get a lawful approval by doing what

17 the law says.

18 I'll call for a vote -- I'm sorry. I

19 can't call for that. I'll call for a roll call

20 vote.

21 MS. HAGAN: Ms. Olson?

22 BOARD MEMBER OLSON: Aye.

23 MS. HAGAN: Mr. Andersen?

24 BOARD MEMBER ANDERSEN: Aye.

25 MS. HAGAN: Mr. Strawn?

1 BOARD MEMBER STRAWN: Aye.
2 MS. HAGAN: Chair Abarbanel?
3 CHAIRMAN ABARBANEL: No.
4 So let me point out that actually
5 saves us having to send our executive officer, in
6 the next six months, off to Sacramento to explain
7 to the State Board why we hummed our nose at them
8 because we didn't. There's no more business
9 before us. We are adjourned.
10 (Proceedings concluded at 4:39 p.m.)
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REPORTER'S CERTIFICATE

I, the undersigned, a Certified Shorthand Reporter of the State of California, do hereby certify:

That the foregoing proceedings were taken before me at the time and place herein set forth; that any witnesses in the foregoing proceedings, prior to testifying, were placed under oath; that a verbatim record of the proceedings was made by me using machine shorthand which was thereafter transcribed under my direction; further, that the foregoing is an accurate transcription thereof.

I further certify that I am neither financially interested in the action nor a relative or employee of any attorney of any of the parties.

IN WITNESS WHEREOF, I have this date subscribed my name.

Dated:_____

_____
KASEY L. MOBLEY
CSR NO. 13407

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

2375 Northside Drive, Suite 100, San Diego, CA 92108
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http://www.waterboards.ca.gov/sandiego

ORDER NO. R9-2015-0100

AN ORDER AMENDING ORDER NO. R9-2013-0001, NPDES NO. CAS010266, AS AMENDED BY ORDER NO. R9-2015-0001 NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The California Regional Water Quality Control Board, San Diego Region (hereinafter San Diego Water Board), finds that:

ENROLLMENT OF RIVERSIDE COUNTY COPERMITTEES

1. **Enrollment Process.** On May 8, 2013, the San Diego Water Board adopted Order No. R9-2013-0001, NPDES No. CAS019266, *National Pollutant Discharge Elimination System Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Order No. R9-2013-0001, or Regional MS4 Permit). Provision F.5 of that Order (as amended by Order No. R9-2015-0001) outlines a process to designate (enroll) the County of Riverside, the Riverside County Cities of Murrieta, Temecula, and Wildomar, and the Riverside County Flood Control and Water Conservation District as Copermittees under Order No. R9-2013-0001, responsible for compliance with the terms and the conditions of the Regional MS4 Permit. Provision F.5 provides that prior to such enrollment, the San Diego Water Board must first review and consider a Report of Waste Discharge (ROWD) submitted by the Riverside County Copermittees under their current MS4 Permit, Order No. R9-2010-0016, to determine whether the Copermittees should be enrolled under Order No. R9-2013-0001, and what changes to Order No. R9-2013-0001 proposed in the ROWD are appropriate.

2. **Report of Waste Discharge.** By letter dated May 8, 2015, the Riverside County Copermittees jointly submitted a ROWD in application for the reissuance of waste discharge requirements, pursuant to the requirements of section K.2.c of Order No. R9-2010-0016. The San Diego Water Board reviewed the ROWD and determined it is complete.

3. **Riverside County Copermittees Enrollment.** After consideration of the Riverside County Copermitees' ROWD and changes needed to Order No. R9-2013-0001, the San Diego Water Board determined that the County of Riverside, the Cities of Murrieta, Temecula, and Wildomar, and the Riverside County Flood Control and Water Conservation District should be enrolled as Copermittees under Order No. R9-2013-0001 and be responsible for compliance with the terms and the conditions of the Regional MS4 Permit. Enrolling the Riverside County Copermittees into Order No. R9-2013-0001 will provide regulatory consistency in the implementation of MS4 permit requirements throughout the San Diego Region, improve communication and coordination among Copermittees within watersheds crossing multiple jurisdictions, and maximize efficiency and economy of resources for the San Diego Water Board achieved through the redirection of staff permitting resources to better advance the storm water program. Enrollment of the Cities of Murrieta and Wildomar is subject to a California Water Code section 13228 agreement as set forth in the findings of this Order.

DESIGNATION OF A REGIONAL WATER BOARD

4. **Regional Water Board Designation.** The Cities of Menifee, Murrieta, and Wildomar are located partially within the jurisdictions of both the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board) and the San Diego Water Board. California Water Code section 13228 provides a way to streamline the regulation of entities whose jurisdictions straddle the border of two or more Regional Water Boards.

   As allowed by California Water Code section 13228, during the proceedings for Order No. R9-2010-0016, the Fourth Term Riverside County MS4 Permit, written requests for designation of a single Regional Water Board to regulate matters pertaining to Phase I MS4 discharges were submitted to the San Diego Water Board and Santa Ana Water Board by the City of Murrieta by letter dated July 20, 2010, the City of Wildomar by letter dated July 21, 2010, and the City of Menifee by letter dated July 22, 2010. The Cities of Murrieta and Wildomar requested designation of the San Diego Water Board, and the City of Menifee requested designation of the Santa Ana Water Board.

   As authorized by California Water Code section 13228 and pursuant to written agreements dated September 28, 2010 between the San Diego Water Board and the Santa Ana Water Board, the San Diego Water Board is designated under Order No. R9-2010-0016 to regulate Phase I MS4s within the entire jurisdictional area of the Cities of Murrieta and Wildomar, including those areas of each City located within the Santa Ana Water Board's geographic jurisdiction. The Santa Ana Water Board is designated under Order No. R8-2010-0033 to regulate the Phase I MS4s within the entire jurisdictional area of the City of Menifee, including those areas of the City located within the San Diego Water Board's geographic jurisdiction. Written requests to continue these Regional Water Board designations were submitted to the San Diego Water Board and Santa Ana Water Board by the City of Murrieta by

letter dated June 22, 2015, the City of Wildomar by letter dated June 23, 2015, and the City of Menifee by letter dated June 25, 2015.

5. **Factual Considerations.** The Santa Ana Water Board and San Diego Water Board establish generally consistent requirements for MS4 discharges to meet the technology-based standard of reducing pollutants in the discharge to the maximum extent practicable (MEP), a related iterative process to ensure MS4 discharges meet receiving water quality standards, and for non-storm water discharges to be effectively prohibited from entering the MS4. However due to the unique nature of watersheds and water quality issues in the San Diego Region and Santa Ana Region, MS4 permit requirements between the two Regional Water Boards may also vary to address region specific pollutant discharges and watershed conditions. The Cities of Menifee, Murrieta, and Wildomar report that management and implementation of municipal programs to comply with two different MS4 permits creates a significant administrative and financial burden that is not contributing to greater overall water quality improvements in either region.

6. **Regional Water Board Agreement.** The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated October 26, 2015 to:

   a. Continue designation of the San Diego Water Board to regulate Phase I MS4 discharges within the entire jurisdictional area of the Cities of Murrieta and Wildomar, including those areas of each City located within the Santa Ana Region upon the effective date of Order R9-2015-0100, *and*

   b. Continue designation of the San Ana Water Board to regulate Phase I MS4 discharges within the entire jurisdictional area of the City of Menifee, including those areas of the City located within the San Diego Region, under Order No. R8-2010-0033 (NPDES No. CAS618030) as it may be amended or reissued upon the effective date of Order No. R9-2015-0100.

7. **Periodic Review of Regional Water Board Agreement.** The basis supporting the Cities of Menifee, Murrieta, and Wildomar requests to designate a specific Regional Water Board for regulatory oversight of MS4 discharges may change under future conditions and circumstances. Therefore the San Diego Water Board and Santa Ana Water Board will periodically review the effectiveness of the agreement during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate the agreement with the Santa Ana Water Board or otherwise modify the agreement subject to the approval of the Santa Ana Water Board.

AMENDMENTS TO ORDER NO. R9-2013-0001

8. **Effect of this Order.** Order No. R9-2013-0001 is not being reopened for any other purpose than the amendments contained herein. Except as contradicted or superseded by the findings and directives set forth in this Order, all of the previous findings and directives of Order No. R9-2013-0001 (as amended by Order No. R9-2015-0001) shall remain in full force and effect.

9. **Enroll Riverside County Copermittees.** This Order amends Order No. R9-2013-0001 to incorporate the County of Riverside, the Riverside County Cities of Murrieta, Temecula, and Wildomar, and the Riverside County Flood Control and Water Conservation District as Copermittees responsible for compliance with the terms and the conditions of Order No. R9-2013-0001, as amended by Order No. R9-2015-0001 and this Order.

10. **Alternative Compliance Pathway for Prohibitions and Limitations.** The San Diego County, Orange County, and Riverside County Copermittees have asserted that the prohibitions and limitations under Provision A of Order No. R9-2013-0001 may result in many years of noncompliance because years of technical efforts may ultimately be required to achieve compliance with the prohibitions and limitations, especially for wet weather discharges.

    The San Diego Water Board considered the incorporation of an alternative pathway to compliance during the adoption proceedings for Order No. R9-2013-0001 in May 2013, but chose not to include it at that time. During the proceedings for Order No. R9-2015-0001, amending Order No. R9-2013-0001 to extend coverage of the Regional MS4 Permit to the Orange County Copermittees and as reflected in Order No. R9-2015-0001, the San Diego Water Board committed to considering the incorporation of a well-defined, transparent, and finite alternative pathway to compliance in Order No. R9-2013-0001 during the MS4 permit reissuance proceedings for the Riverside County Copermittees.

    On June 16, 2015, the State Water Resources Control Board (State Water Board) adopted Order WQ 2015-0075, *In the Matter of Review of Order No. R4-2012-0175, NPDES Permit No. CAS004001, Waste Discharge Requirements for Municipal Separate Storm Sewer System (MS4) Discharges within the Coastal Watersheds of Los Angeles County, Except Those Discharges Originating from the City of Long Beach MS4,* which directs all Regional Water Boards to consider a watershed-based planning and implementation approach to compliance with receiving water limitations when issuing Phase I MS4 permits going forward. Consistent with the principles set forth in Order WQ 2015-0075, this Order amends Order No. R9-2013-0001 to incorporate an alternative compliance pathway that allows a Copermittee to utilize the watershed-based Water Quality Improvement Plan to be deemed in compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2.a, and A.3.b which are included in the prohibitions and limitations under Provision A of the Regional MS4 Permit.

    This Order amends the Fact Sheet of Order No. R9-2013-0001, Attachment F, section VII.E, Antidegradation Policy, to provide an expanded analysis consistent with the principles set forth in State Water Board Order WQ 2015-0075, demonstrating why the incorporation of an alternative compliance pathway for prohibitions and limitations in Order No. R9-2013-0001 complies with federal and state antidegradation policies. This Order also amends the Fact Sheet of Order No. R9-2013-0001, Attachment F, section VII.E, Anti-Backsliding Requirements, with an expanded analysis consistent with State Water Board Order WQ 2015-0075 demonstrating that the anti-backsliding requirements of the Clean Water Act and the

federal regulations do not foreclose the incorporation of an alternative compliance pathway into Order No. R9-2013-0001.

11. **Update to Non-Storm Water Discharges.** Since Order No. R9-2013-0001 was adopted, the State Water Board adopted Order 2014-0194-DWQ (*Statewide National Pollutant Discharge Elimination System (NPDES) Permit for Drinking Water System Discharges to Waters of the United States*) and the San Diego Water Board adopted Order No. R9-2015-0013 (*General Waste Discharge Requirements for Groundwater Extraction Discharges to Surface Waters within the San Diego Region*). These orders are NPDES permits regulating non-storm water discharges that may be discharged to the Copermittees' MS4s. This Order amends Order No. R9-2013-0001 to incorporate State Water Board Order 2014-0194-DWQ and San Diego Water Board Order No. R9-2015-0013 into the requirements for addressing non-storm water discharges.

12. **Priority Development Project Definition Consistency.** The Fact Sheet of the Regional MS4 Permit as modified by Order No. R9-2015-0001, describes on Page F-98 the San Diego Water Board's intent that the Priority Development Project categories in Provision E.3.b.(1) be consistent with the categories in the Riverside County MS4 Permit (Order No. R9-2010-0016) and the Orange County MS4 Permit (Order No. R9-2009-0002). The San Diego Water Board's intention reflected in the Fact Sheet was not explicitly incorporated in some of the Priority Development Project categories described in Provision E.3.b.(1) and this Order amends the provision with clarifying language to better describe these categories consistent with the Fact Sheet. The Order also has been amended to include the requirements for updating the BMP Design Manual as a result of the corrections to the Priority Development Project categories in Provision E.3.b.(1).

13. **Definition of Prior Lawful Approval.** During the proceedings for Order No. R9-2015-0001, amending Order No. R9-2013-0001 to extend coverage of the Regional MS4 Permit to the Orange County Copermittees, the land development community asserted that the lack of a definition for the term "prior lawful approval" in the Regional MS4 Permit had created significant uncertainty for the San Diego County Copermittees, the land development community, and the general public about when the development planning requirements are applicable. The San Diego Water Board committed to considering the incorporation of additional guidance for prior lawful approval in Order No. R9-2013-0001 during the MS4 permit reissuance proceedings for the Riverside County Copermittees. This Order amends Order No. R9-2013-0001 to incorporate additional clarification describing when the structural BMP performance requirements are applicable to Priority Development Projects.

14. **Los Peñasquitos Lagoon Sediment TMDL.** During the proceedings for Order No. R9-2015-0001, amending Order No. R9-2013-0001 to extend coverage of the Regional MS4 Permit to the Orange County Copermittees, the San Diego County Copermittees responsible for implementing the TMDLs for Sediment in Los Peñasquitos Lagoon requested several minor revisions to make the TMDL requirements consistent with the Basin Plan amendment adopted by the San Diego

Water Board. This Order amends Attachment E to Order No. R9-2013-0001 to incorporate minor revisions to the Los Peñasquitos Lagoon Sediment TMDL to make the requirements consistent with the adopted Basin Plan amendment.

15. **Compliance Dates for TMDLs Beaches and Creeks Indicator Bacteria TMDLs.** A review of the interim and final compliance dates for the Revised TMDLs for Indicator Bacteria, Project I – Beaches and Creeks (Beaches and Creeks Indicator Bacteria TMDLs) in the San Diego Region in Attachment E to the Order revealed an inconsistency with the adopted Basin Plan amendment. This Order amends Attachment E to Order No. R9-2013-0001 to incorporate minor revisions to the Beaches and Creeks Indicator Bacteria TMDLs to make the requirements consistent with the adopted Basin Plan amendment.

16. **Removal of Application for Early Coverage Provisions.** Order No. R9-2013-0001, as amended by Order No. R9-2015-0001 included several provisions that allowed the Riverside County Copermittees to apply for early coverage under the Regional MS4 Permit prior to the expiration of Order No. R9-2010-0016. These provisions are no longer necessary once the Riverside County Copermittees are covered by the requirements of the Regional MS4 Permit with the adoption of this Order. This Order amends Order No. R9-2013-0001 to remove provisions related to applying for early coverage under the Regional MS4 Permit.

ADMINISTRATIVE FINDINGS

17. **California Environmental Quality Act**. This action is exempt from the requirement of preparation of environmental documents under the California Environmental Quality Act [Public Resources Code, Division 13, Chapter 3, Section 21000 et seq.] in accordance with California Water Code section 13389.

18. **Public Notice.** In accordance with State and federal laws and regulations, the San Diego Water Board has notified San Diego County, Orange County and Riverside County Copermittees, and all known interested agencies and persons of its intent to adopt this Order and has provided them with an opportunity to submit their written comments.

19. **Public Hearing.** The San Diego Water Board held a public hearing on November 18, 2015 and heard and considered all comments pertaining to the adoption of this Order.

20. **Notification.** Any person aggrieved by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with California Water Code section 13320 and California Code of Regulations, title 23, sections 2050 et seq. The State Water Board must receive the petition by 5:00 p.m., 30 days after the adoption date of this Order. Copies of the law and regulations applicable to filing petitions may be found on the Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

THEREFORE, IT IS HEREBY ORDERED,

1. This Order amends Order No. R9-2013-0001 and Fact Sheet as amended by Order No. R9-2015-0001 (Regional MS4 Permit and Fact Sheet). The revisions to the Regional MS4 Permit and Fact Sheet are shown Attachments 1 and 2 to this Order. Added text to the Regional MS4 Permit and Fact Sheet is displayed in blue-underline text and deleted text is displayed as red-strikeout text.

2. The amended Regional MS4 Permit and Fact Sheet included as Attachments 1 and 2 to this Order shall become effective on January 7, 2016.

3. The amended Regional MS4 Permit and Fact Sheet included as Attachments 1 and 2 to this Order shall supersede Order No. R9-2010-0016 for the Riverside County Copermittees except for enforcement purposes.

4. San Diego Water Board staff is directed to prepare and post a conformed copy of the Regional MS4 Permit and Fact Sheet, as amended by this Order, incorporating the revisions made by this Order.

I, David W. Gibson, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on November 18, 2015.

David W. Gibson
Executive Officer

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

ORDER NO. R9-2013-0001,
AS AMENDED BY ORDER NOS. R9-2015-0001 AND R9-2015-0100
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The San Diego County Copermittees in Table 1a are subject to waste discharge requirements set forth in this Order.

Table 1a. San Diego County Copermittees

City of Carlsbad	City of Oceanside
City of Chula Vista	City of Poway
City of Coronado	City of San Diego
City of Del Mar	City of San Marcos
City of El Cajon	City of Santee
City of Encinitas	City of Solana Beach
City of Escondido	City of Vista
City of Imperial Beach	County of San Diego
City of La Mesa	San Diego County Regional Airport Authority
City of Lemon Grove	San Diego Unified Port District
City of National City	

The Orange County Copermittees in Table 1b are subject to waste discharge requirements set forth in this Order.

Table 1b. Orange County Copermittees[1]

City of Aliso Viejo	City of Rancho Santa Margarita
City of Dana Point	City of San Clemente
City of Laguna Beach	City of San Juan Capistrano
City of Laguna Hills	City of Laguna Woods
City of Laguna Niguel	County of Orange
City of Mission Viejo	Orange County Flood Control District

~~After the San Diego Water Board receives and considers the Riverside County Copermittees' Report of Waste Discharge and makes any necessary changes to this Order, t~~The Riverside County Copermittees in Table 1c ~~will become~~ are subject to waste

[1] While not listed in Table 1b., the City of Lake Forest remains a Copermittee under this Order until the later effective date of this Order or the effective date of Santa Ana Water Board Tentative Order No. R8-2015-0001. Thereafter, the City of Lake Forest will no longer be considered a Copermittee under this Order because its Phase I MS4 discharges will be regulated by the Santa Ana Water Board pursuant to Water Code section 13228 designation. The requirements of this Order that apply to the City of Lake Forest for the duration of this Order, however, are described in Finding 29 and Footnote 2 to Table B-1.

discharge requirements set forth in this Order ~~after expiration of Order No.R9-2010-0016, NPDES No. CAS0108766 on or after November 10, 2015~~.

Table 1c. Riverside County Copermittees

City of Murrieta	County of Riverside
City of Temecula	Riverside County Flood Control and Water Conservation District
City of Wildomar	

~~The Riverside County Copermittees may become subject to the requirements of this Order at a date earlier than the expiration date of their current Order subject to the conditions described in Provision F.6 of this Order if the Riverside County Copermittees receive notification of coverage from the San Diego Water Board.~~

The term Copermittee in this Order refers to any San Diego County, Orange County, or Riverside County Copermittee covered under this Order, unless specified otherwise.

This Order provides permit coverage for the Copermittee discharges described in Table 2.

Table 2. Discharge Locations and Receiving Waters

Discharge Points	Locations throughout San Diego Region
Discharge Description	Municipal Separate Storm Sewer System (MS4) Discharges
Receiving Waters	Inland Surface Waters, Enclosed Bays and Estuaries, and Coastal Ocean Waters of the San Diego Region

Table 3. Administrative Information

This Order was adopted by the San Diego Water Board on:	**May 8, 2013**
Order No. R9-2013-0001 became effective on:	**June 27, 2013**
This Order as amended by R9-2015-0001 became effective on:	**April 1, 2015**
This Order as amended by R9-2015-0100 became effective on:	**January 7, 2016**
This Order will expire on:	**June 27, 2018**
The Copermittees must file a Report of Waste Discharge in accordance with Title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than 180 days in advance of the Order expiration date.	

I, David W. Gibson, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on May 8, 2013, as amended by adoption of Order No. R9-2015-0001 on February 11, 2015, and as amended by adoption of Order No. R9-2015-0100 on November 18, 2015.

TENTATIVE

David W. Gibson
Executive Officer

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ATTACHMENTS
Attachment A: Discharge Prohibitions and Special Protections A-1
Attachment B: Standard Permit Provisions and General Provisions B-1
Attachment C: Acronyms, Abbreviations and Definitions C-1
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Attachment F: Fact Sheet / Technical Report for Order No. R9-2013-0001 as amended by Order Nos. R9-2015-0001 and R9-2015-0100 ..... F-1

I. FINDINGS

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), finds that:

JURISDICTION

1. **MS4 Ownership or Operation.** Each of the Copermittees owns or operates an MS4, through which it discharges storm water and non-storm water into waters of the U.S. within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the U.S.

2. **Legal and Regulatory Authority.** This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]) adopted by the United States Environmental Protection Agency (USEPA), and chapter 5.5, division 7 of the California Water Code (CWC) (commencing with section 13370). This Order serves as an NPDES permit for discharges from MS4s to surface waters. This Order also serves as waste discharge requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

   The San Diego Water Board has the legal authority to issue a regional MS4 permit pursuant to its authority under CWA section 402(p)(3)(B) and 40 CFR 122.26(a)(1)(v). The USEPA also made it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide permits (55 Federal Register [FR] 47990, 48039-48042). The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees and San Diego Water Board.

   The federal regulations make it clear that the Copermittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators (40 CFR 122.26(a)(3)(vi)). This Order does not require the Copermittees to manage storm water outside of their jurisdictional boundaries, but rather to work collectively to improve storm water management within watersheds.

3. **CWA NPDES Permit Conditions.** Pursuant to CWA section 402(p)(3)(B), NPDES permits for storm water discharges from MS4s must include requirements to effectively prohibit non-storm water discharges into MS4s, and require controls to reduce the discharge of pollutants in storm water to the maximum extent practicable (MEP), and to require other provisions as the San Diego Water Board determines are appropriate to control such pollutants. This Order prescribes conditions to assure compliance with the CWA requirements for owners and operators of MS4s to effectively prohibit non-storm water discharges into the MS4s, and require controls to reduce the discharge of pollutants in storm water from the MS4s to the MEP.

4. **CWA and CWC Monitoring Requirements.** CWA section 308(a) and 40 CFR 122.41(h),(j)-(l) and 122.48 require that NPDES permits must specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s also specify additional monitoring and reporting requirements in 40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c). CWC section 13383 authorizes the San Diego Water Board to establish monitoring, inspection, entry, reporting and recordkeeping requirements. This Order establishes monitoring and reporting requirements to implement federal and State requirements. This Order also includes requirements for the Orange County Copermittees to participate in, and together with South Orange County Wastewater Authority and Orange County Health Care Agency, share responsibility for implementing the unified approach to beach water quality monitoring and assessment program set forth in the October 2014 report, *Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County*, issued pursuant to CWC section 13383 in the San Diego Water Board December 5, 2014 Letter Directive.

5. **Total Maximum Daily Loads.** CWA section 303(d)(1)(A) requires that "[e]ach state shall identify those waters within its boundaries for which the effluent limitations are not stringent enough to implement any water quality standard applicable to such waters." The CWA also requires states to establish a priority ranking of impaired water bodies known as Water Quality Limited Segments and to establish Total Maximum Daily Loads (TMDLs) for such waters. This priority list of impaired water bodies is called the Clean Water Act Section 303(d) List of Water Quality Limited Segments, commonly referred to as the 303(d) List. The CWA requires the 303(d) List to be updated every two years.

   TMDLs are numerical calculations of the maximum amount of a pollutant that a water body can assimilate and still meet water quality standards. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point sources (waste load allocations or WLAs) and non-point sources (load allocations or LAs), background contribution, plus a margin of safety. Discharges from MS4s are point source discharges. The federal regulations (40 CFR 122.44(d)(1)(vii)(B)) require that NPDES permits incorporate water quality based effluent limitations (WQBELs) developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, consistent with the assumptions and requirements of any available WLA for the discharge. Requirements of this Order implement the TMDLs established by the San Diego Water Board or USEPA as of the date this Order was amended in 2015. This Order establishes WQBELs consistent with the assumptions and requirements of all available TMDL WLAs assigned to discharges from the Copermittees' MS4s.

6. **Non-Storm Water Discharges.** Pursuant to CWA section 402(p)(3)(B)(ii), this Order requires each Copermittee to effectively prohibit discharges of non-storm water into its MS4. Nevertheless, non-storm water discharges into and from the

MS4s continue to be reported to the San Diego Water Board by the Copermittees and other persons. Monitoring conducted by the Copermittees, as well as the 303(d) List, have identified dry weather, non-storm water discharges from the MS4s as a source of pollutants causing or contributing to receiving water quality impairments in the San Diego Region. The federal regulations (40 CFR 122.26(d)(2)(iv)(B)(1)) require the Copermittees to have a program to prevent illicit discharges to the MS4. The federal regulations, however, allow for specific categories of non-storm water discharges or flows to be addressed as illicit discharges only where such discharges are identified as sources of pollutants to waters of the U.S.

7. **In-Stream Treatment Systems.** Pursuant to federal regulations (40 CFR 131.10(a)), in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S. Authorizing the construction of a runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to accepting waste assimilation as an appropriate use for that water body. Runoff treatment must occur prior to the discharge of runoff into receiving waters. Treatment control best management practices (BMPs) must not be constructed in waters of the U.S. Construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body.

DISCHARGE CHARACTERISTICS AND RUNOFF MANAGEMENT

8. **Point Source Discharges of Pollutants.** Discharges from the MS4s contain waste, as defined in the CWC, and pollutants that adversely affect the quality of the waters of the state. A discharge from an MS4 is a “discharge of pollutants from a point source” into waters of the U.S. as defined in the CWA. Storm water and non-storm water discharges from the MS4s contain pollutants that cause or threaten to cause a violation of surface water quality standards, as outlined in the Water Quality Control Plan for the San Diego Basin (Basin Plan). Storm water and non-storm water discharges from the MS4s are subject to the conditions and requirements established in the Basin Plan for point source discharges.

9. **Potential Beneficial Use Impairment.** The discharge of pollutants and/or increased flows from MS4s may cause or threaten to cause the concentration of pollutants to exceed applicable receiving water quality objectives and impair or threaten to impair designated beneficial uses resulting in a condition of pollution, contamination, or nuisance.

10. **Pollutants Generated by Land Development.** Land development has created and continues to create new sources of non-storm water discharges and pollutants in storm water discharges as human population density increases. This brings higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash. Pollutants from these sources are dumped or washed off the surface by non-storm water or storm water flows into

and from the MS4s. When development converts natural vegetated pervious ground cover to impervious surfaces such as paved highways, streets, rooftops, and parking lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving a developed area without BMPs that can maintain pre-development runoff conditions will contain greater pollutant loads and have significantly greater runoff volume, velocity, and peak flow rate than pre-development runoff conditions from the same area.

11. **Runoff Discharges to Receiving Waters.** The MS4s discharge runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within the eleven hydrologic units comprising the San Diego Region. Historic and current development makes use of natural drainage patterns and features as conveyances for runoff. Rivers, streams and creeks in developed areas used in this manner are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and receiving water. Numerous receiving water bodies and water body segments have been designated as impaired by the San Diego Water Board pursuant to CWA section 303(d).

12. **Pollutants in Runoff.** The most common pollutants in runoff discharged from the MS4s include total suspended solids, sediment, pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., cadmium, copper, lead, and zinc), petroleum products and polynuclear aromatic hydrocarbons, synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus), oxygen-demanding substances (e.g., decaying vegetation, animal waste), detergents, and trash. As operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not prohibit or otherwise control. These discharges may cause or contribute to a condition of pollution or a violation of water quality standards.

13. **Human Health and Aquatic Life Impairment.** Pollutants in runoff discharged from the MS4s can threaten and adversely affect human health and aquatic organisms. Adverse responses of organisms to chemicals or physical agents in runoff range from physiological responses such as impaired reproduction or growth anomalies to mortality. Increased volume, velocity, rate, and duration of storm water runoff greatly accelerate the erosion of downstream natural channels. This alters stream channels and habitats and can adversely affect aquatic and terrestrial organisms.

14. **Water Quality Effects.** The Copermittees' water quality monitoring data submitted to date documents persistent exceedances of Basin Plan water quality objectives for runoff-related pollutants at various watershed monitoring stations. Persistent toxicity has also been observed at several watershed monitoring stations. In addition, bioassessment data indicate that the majority of the monitored receiving waters have

Poor to Very Poor Index of Biological Integrity (IBI) ratings. These findings indicate that runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in the San Diego Region. Non-storm water discharges from the MS4s have been shown to contribute significant levels of pollutants and flow in arid, developed Southern California watersheds, and contribute significantly to exceedances of applicable receiving water quality objectives.

15. **Non-Storm Water and Storm Water Discharges.** Non-storm water discharges from the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard of CWA section 402(p)(3)(B)(iii), which is explicitly for "Municipal … *Stormwater Discharges* (emphasis added)" from the MS4s. Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s must be effectively prohibited.

16. **Best Management Practices.** Waste and pollutants which are deposited and accumulate in MS4 drainage structures will be discharged from these structures to waters of the U.S. unless they are removed. These discharges may cause or contribute to, or threaten to cause or contribute to, a condition of pollution in receiving waters. For this reason, pollutants in storm water discharges from the MS4s can be and must be effectively reduced in runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Pollution prevention is the reduction or elimination of pollutant generation at its source and is the best "first line of defense." Source control BMPs (both structural and non-structural) minimize the contact between pollutants and runoff, therefore keeping pollutants onsite and out of receiving waters. Treatment control BMPs remove pollutants that have been mobilized by storm water or non-storm water flows.

17. **BMP Implementation.** Runoff needs to be addressed during the three major phases of development (planning, construction, and use) in order to reduce the discharge of storm water pollutants to the MEP, effectively prohibit non-storm water discharges, and protect receiving waters. Development which is not guided by water quality planning policies and principles can result in increased pollutant load discharges, flow rates, and flow durations which can negatively affect receiving water beneficial uses. Construction sites without adequate BMP implementation result in sediment runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. Existing development can generate substantial pollutant loads which are discharged in runoff to receiving waters. Retrofitting areas of existing development with storm water pollutant control and hydromodification management BMPs is necessary to address storm water discharges from existing development that may cause or contribute to a condition of pollution or a violation of water quality standards.

18. **Water Quality Improvements.** Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit

non-storm water discharges to the MS4s and control pollutants in storm water discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the CWA.

19. **Long Term Planning and Implementation.** Federal regulations require municipal storm water permits to expire 5 years from adoption, after which the permit must be renewed and reissued. The San Diego Water Board recognizes that the degradation of water quality and impacts to beneficial uses of the waters in the San Diego Region occurred over several decades. The San Diego Water Board further recognizes that a decade or more may be necessary to realize demonstrable improvement to the quality of waters in the San Diego Region. This Order includes a long term planning and implementation approach that will require more than a single permit term to complete.

WATER QUALITY STANDARDS

20. **Basin Plan.** The San Diego Water Board adopted the Water Quality Control Plan for the San Diego Basin (Basin Plan) on September 8, 1994, that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for receiving waters addressed through the plan. The Basin Plan was subsequently approved by the State Water Resources Control Board (State Water Board) on December 13, 1994. Subsequent revisions to the Basin Plan have also been adopted by the San Diego Water Board and approved by the State Water Board. Requirements of this Order implement the Basin Plan.

    The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Process Supply (PROC), Industrial Service Supply (IND), Ground Water Recharge (GWR), Contact Water Recreation (REC1), Non-contact Water Recreation (REC2), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Freshwater Replenishment (FRSH), Hydropower Generation (POW), and Preservation of Biological Habitats of Special Significance (BIOL). The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region: Navigation (NAV), Commercial and Sport Fishing (COMM), Estuarine Habitat (EST), Marine Habitat (MAR), Aquaculture (AQUA), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN), and Shellfish Harvesting (SHELL).

21. **Ocean Plan.** The State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, and 2005. The State Water Board adopted the latest amendment on ~~April 21, 2005~~ October 16, 2012 and it became effective on ~~February 14, 2006~~ August 19, 2013. The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean. Requirements of this Order implement the Ocean Plan.

    The Ocean Plan identifies the following beneficial uses of ocean waters of the state to be protected: Industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture; preservation and enhancement of designated Areas of Special Biological Significance; rare and endangered species; marine habitat; fish spawning and shellfish harvesting.

22. **Sediment Quality Control Plan**. On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes: 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

23. **National Toxics Rule and California Toxics Rule.** USEPA adopted the National Toxics Rule (NTR) on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the NTR applied in California. On May 18, 2000, USEPA adopted the California Toxics Rule (CTR). The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants.

24. **Antidegradation Policy.** This Order is in conformance with the federal Antidegradation Policy described in 40 CFR 131.12, and State Water Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality Waters in California*. Federal regulations at 40 CFR 131.12 require that the State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. State Water Board Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies. The Fact Sheet of this Order contains additional discussion about antidegradation.

25. **Anti-Backsliding Requirements.** Section 402(o)(2) of the CWA and federal regulations at 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations may be relaxed. All effluent limitations in this Order are at least as stringent as effluent limitations in the previous permits. The Fact Sheet of this Order contains additional discussion about anti-backsliding.

CONSIDERATIONS UNDER FEDERAL AND STATE LAW

26. **Coastal Zone Act Reauthorization Amendments.** Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states with approved coastal zone management programs to address non-point source pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point source pollution: agriculture, silviculture, urban, marinas, and hydromodification. This Order addresses the management measures required for the urban category, with the exception of septic systems. The runoff management programs developed pursuant to this Order fulfills the need for coastal cities to develop a runoff non-point source plan identified in the Non-Point Source Program Strategy and Implementation Plan. The San Diego Water Board addresses septic systems through the administration of other programs.

27. **Endangered Species Act.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 USC sections 1531 to 1544). This Order requires compliance with receiving water limits, and other requirements to protect the beneficial uses of waters of the State. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

28. **Report of Waste Discharge Process.** The waste discharge requirements set forth in this Order are based upon the Report of Waste Discharge submitted by the San Diego County Copermittees prior to the expiration of Order No. R9-2007-0001 (NPDES No. CAS0109266), ~~and~~ the Report of Waste Discharge submitted by the Orange County Copermittees prior to the expiration of Order No. R9-2009-0002 (CAS0108740), and the Report of Waste Discharge submitted by the Riverside County Copermittees prior to the expiration of Order No. R9-2010-0016 (CAS0108766). ~~The Riverside County Copermittees are not immediately covered by the waste discharge requirements in this Order. The San Diego Water Board understands that each municipality is unique although the Counties share watersheds and/or geographical boundaries. The Order will continue to use the Report of Waste Discharge process prior to initially making Riverside County Copermittees subject to the requirements of this Order.~~

The federal regulations (40 CFR 122.21(d)(2)) and CWC section 13376 impose a duty on the Copermittees to reapply for continued coverage through submittal of a Report of Waste Discharge no later than 180 days prior to expiration of a currently effective permit. The expiration date of this Order as shown in Table 3, and requirement to file a Report of Waste Discharge no later than 180 days prior to the expiration date of the Order, applies jointly to the San Diego County, Orange County, and Riverside County Copermittees. ~~This requirement is set forth in the Riverside County Copermittees' currently effective permit at ProvisionK.2.c. The Riverside County MS4 Permit, Order No. R9-2010-0016 (NPDES No. CAS0108766) expires on November 10, 2015.~~

~~Unless the Riverside County Copermittees apply for and receive early coverage under this Order, the Riverside County Copermittees' permit will be superseded by this Order upon expiration of their permit, subject to any necessary revisions to the requirements of this Order made after the San Diego Water Board considers their Report of Waste Discharge through the public process provided in 40 CFR Part 124.~~

29. Regional Water Board Designation. The Cities of Laguna Hills, Laguna Woods, ~~and~~ Lake Forest, Menifee, Murrieta, and Wildomar are located partially within the jurisdictions of the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board) and the San Diego Water Board and their discharges are subject to regulation by both Regional Water Boards. CWC section 13228 provides a way to streamline the regulation of entities whose jurisdictions straddle the border of two or more Regions. CWC section 13228 is implemented in this Order at the request of these six cities and to ease the regulatory burden of municipalities that lie in both the San Diego Water Board's and the adjacent Santa Ana Water Board's jurisdiction. MS4 discharges from these municipalities are regulated by the San Diego Water Board and Santa Ana Water Board as follows:

a. Pursuant to CWC section 13228, the Cities of Laguna Hills, Laguna Woods, and Lake Forest submitted written requests that one Regional Water Board be designated to regulate Phase I MS4 discharges for each of the Cities. The Santa Ana Water Board and the San Diego Water Board have entered into an agreement dated February 10, 2015, whereby the Cities of Laguna Woods and Laguna Hills are largely regulated by the San Diego Water Board under this Order, including those portions of the Cities of Laguna Woods and Laguna Hills not within the San Diego Water Board's jurisdiction, upon the effective date of this Order or Santa Ana Water Board Order No. R8-2015-0001, whichever is later. Similarly, the City of Lake Forest, including those portions of the City of Lake Forest within the San Diego Water Board's jurisdiction, is largely regulated by the Santa Ana Water Board under Order No. R8-2015-0001 (NPDES No. CAS618030) upon the later effective date of this Order or Order No. R8-2015-0001. The agreement provides that the City of Lake Forest is required to retain, and continue implementation of, its over-irrigation discharge prohibition in Title 15, Chapter 14.030, List (b) of the City Municipal Code for regulating storm water quality throughout its jurisdiction. The agreement also requires the City of Lake Forest to actively participate during development and implementation of the Aliso

Creek Watershed Management Area Water Quality Improvement Plan required pursuant to this Order. Each Regional Water Board retains the authority to enforce provisions of its Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee under the terms of the agreement (Water Code section 13228 (b)). Under the terms of the agreement, any TMDL and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Laguna Woods, Laguna Hills or Lake Forest as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement of the applicable TMDL will remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's San Diego Creek/Newport Bay TMDL and the San Diego Water Board's Indicator Bacteria Project I Beaches and Creeks TMDL. The San Diego Water Board will periodically review the effectiveness of the agreement during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate the agreement with Santa Ana Water Board or otherwise modify the agreement subject to the approval of the Santa Ana Water Board.

b. Pursuant to CWC section 13228, the Cities of Murrieta, Wildomar, and Menifee submitted written requests that one Regional Water Board be designated to regulate Phase I MS4 discharges for each of the Cities. The Santa Ana Water Board and the San Diego Water Board have entered into an agreement dated October 26, 2015, whereby the Cities of Murrieta and Wildomar are largely regulated by the San Diego Water Board under this Order, including those portions of the Cities of Murrieta and Wildomar not within the San Diego Water Board's jurisdiction, upon the effective date of this Order. Similarly, the City of Menifee is largely regulated by the Santa Ana Water Board under Order No. R8-2010-0033 as it may be amended or reissued, including those portions of the City of Menifee within the San Diego Water Board's jurisdiction, upon the effective date of this Order. The agreement also requires the City of Menifee to actively participate during development and implementation of the Santa Margarita River Watershed Management Area Water Quality Improvement Plan required pursuant to this Order. Each Regional Water Board retains the authority to enforce provisions of its Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee under the terms of the agreement (Water Code section 13228 (b)). Under the terms of the agreement, any TMDL and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Menifee, Murrieta, or Wildomar as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement of the applicable TMDL will remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's Lake Elsinore/Canyon Lake Nutrient

TMDLs. The San Diego Water Board will periodically review the effectiveness of the agreement during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate the agreement with Santa Ana Water Board or otherwise modify the agreement subject to the approval of the Santa Ana Water Board.

30. **Integrated Report and Clean Water Act Section 303(d) List.** The San Diego Water Board and State Water Board submit an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. USEPA issued its *Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act* on July 29, 2005, which advocates the use of a five category approach for classifying the attainment status of water quality standards for water bodies in the Integrated Report. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 in the Integrated Report are placed on the 303(d) List.

    Water bodies with available data and/or information that indicate at least one beneficial use is not being supported or is threatened, but a TMDL is not required, are included in Category 4 in the Integrated Report. Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

    Implementation of the requirements of this Order may allow the San Diego Water Board to include surface waters impaired by discharges from the Copermittees' MS4s in Category 4 in the Integrated Report for consideration during the next 303(d) List submittal by the State to USEPA.

31. **Economic Considerations.** The California Supreme Court has ruled that although CWC section 13263 requires the State and Regional Water Boards (collectively Water Boards) to consider factors set forth in CWC section 13241 when issuing an NPDES permit, the Water Board may not consider the factors to justify imposing pollutant restrictions that are less stringent than the applicable federal regulations require. (*City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 618, 626-627.) However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

    As noted in the following finding, the San Diego Water Board finds that the requirements in this Order are not more stringent than the minimum federal

requirements. Therefore, a CWC section 13241 analysis is not required for permit requirements that implement the effective prohibition on the discharge of non-storm water into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determined appropriate to control such pollutants, as those requirements are mandated by federal law. Notwithstanding the above, the San Diego Water Board has developed an economic analysis of the requirements in this Order. The economic analysis is provided in the Fact Sheet.

32. **Unfunded Mandates.** This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following:

    a. This Order implements federally mandated requirements under CWA section 402 (33 USC section 1342(p)(3)(B)).

    b. The local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental and new dischargers who are issued NPDES permits for storm water and non-storm water discharges.

    c. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order.

    d. The Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)) and in lieu of numeric restrictions on their MS4 discharges (i.e. effluent limitations).

    e. The local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under State law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

    f. The provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state develops a TMDL, federal law requires that permits must contain water quality based effluent limitations consistent with the assumptions and requirements of any applicable wasteload allocation (40 CFR 122.44(d)(1)(vii)(B)).

    See the Fact Sheet for further discussion of unfunded mandates.

33. **California Environmental Quality Act.** The issuance of waste discharge requirements and an NPDES permit for the discharge of runoff from MS4s to waters of the U.S. is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 et seq.) in accordance with CWC section 13389.

STATE WATER BOARD DECISIONS

34. **Compliance with Prohibitions and Limitations.** The receiving water limitation language specified in this Order is consistent with language recommended by the USEPA and established in State Water Board Order WQ 99-05, *Own Motion Review of the Petition of Environmental Health Coalition to Review Waste Discharge Requirements Order No. 96-03, NPDES Permit No. CAS0108740*, adopted by the State Water Board on June 17, 1999. The receiving water limitation language in this Order requires storm water discharges from MS4s to not cause or contribute to a violation of water quality standards, which is to be achieved through an iterative approach requiring the implementation of improved and better-tailored BMPs over time. Implementation of the iterative approach to comply with receiving water limitations based on applicable water quality standards is necessary to ensure that storm water discharges from the MS4 will not ultimately cause or contribute to violations of water quality standards and will not create conditions of pollution, contamination, or nuisance.

The San Diego, Orange County, and Riverside County Copermittees have asserted that the prohibitions and limitations may result in many years of noncompliance because years of technical efforts may ultimately be required to achieve compliance with the prohibitions and limitations, especially for wet weather discharges. To address this concern, this Order includes an option that allows a Copermittee to be deemed in compliance with the prohibitions and limitations where more than one permit term may be necessary to achieve full compliance with the prohibitions and limitations. One or more Copermittees within a Watershed Management Area can choose to implement this option.

An alternative compliance pathway option has been included in this Order consistent with the approach described in Order WQ 2015-0075, *In the Matter of Review of Order No. R4-2012-0175, NPDES Permit No. CAS004001, Waste Discharge Requirements for Municipal Separate Storm Sewer System (MS4) Discharges within the Coastal Watersheds of Los Angeles County, Except Those Discharges Originating from the City of Long Beach MS4*, adopted by the State Water Board on June 16, 2015. State Water Board Order WQ 2015-0075 directs the Regional Water Boards to consider a watershed-based planning and implementation approach to compliance with receiving water limitations when issuing Phase I MS4 permits going forward. Order WQ 2015-0075 included seven principles that the Regional Water Boards are expected to follow when incorporating an alternative compliance pathway into an MS4 permit. The Fact Sheet discusses the incorporation of the seven principles stipulated in State Water Board Order WQ 2015-0075 into the alternative compliance pathway option in this Order.

35. **Special Conditions for Areas of Special Biological Significance.** On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving a general exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and

NPDES permitted municipal storm water discharges (General Exception). On June 19, 2012, the State Water Board adopted Order No. 2012-0031, amending the General Exception to require pollutant reductions to be achieved within six years in accordance with ASBS Compliance Plans and ASBS Pollution Prevention Plans. The General Exception requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject to the terms and conditions of the General Exception as amended. The Special Protections contained in Attachment B to the General Exception as amended are applicable to these discharges, and are hereby incorporated into Attachment A of this Order.

ADMINISTRATIVE FINDINGS

36. **Executive Officer Delegation of Authority.** The San Diego Water Board by prior resolution has delegated all matters that may legally be delegated to its Executive Officer to act on its behalf pursuant to CWC section 13223. Therefore, the Executive Officer is authorized to act on the San Diego Water Board's behalf on any matter within this Order unless such delegation is unlawful under CWC section 13223 or this Order explicitly states otherwise.

37. **Standard Provisions.** Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR 122.42, are provided in Attachment B to this Order.

38. **Fact Sheet.** The Fact Sheet for this Order contains background information, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of this Order. The Fact Sheet is hereby incorporated into this Order and constitutes part of the Findings of this Order.

39. **Public Notice.** In accordance with State and federal laws and regulations, the San Diego Water Board notified the Copermittees, and interested agencies and persons of its intent to prescribe waste discharge requirements for the control of discharges into and from the MS4s to waters of the U.S. and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet.

40. **Public Hearings.** The San Diego Water Board held a public hearing on April 10 and 11, 2013, that was continued to May 8, 2013 and heard and considered all comments pertaining to the terms and conditions of this Order. The San Diego Water Board also held a public workshop on October 8, 2015, and a public hearing

on February 11, 2015, and heard and considered all comments pertaining to the amendment of this Order through Order No. R9-2015-0001. The San Diego Water Board also held a public hearing on November 18, 2015, and heard and considered all comments pertaining to the amendment of this Order through Order No. R9-2015-0100. Details of these public hearings are provided in the Fact Sheet.

41. **Effective Date.** This Order serves as an NPDES permit pursuant to CWA section 402 or amendments thereto, and as to the San Diego County Copermittees listed in Table ~~2.~~1a~~.~~, became effective fifty (50) days after the date of its adoption, and as to the Orange County Copermittees listed in Table ~~2.~~1b~~.~~, ~~becomes~~ became effective on April 1, 2015, after Order No. R9-2015-0001 was ~~is~~ adopted, and as to the Riverside County Copermittees listed in Table 1c, became effective on January 7, 2016, after Order No. R9-2015-0100 was adopted, provided that the Regional Administrator, USEPA, Region IX, does not object to this Order.

42. **Review by the State Water Board.** Any person aggrieved by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with CWC section 13320 and California Code of Regulations, title 23, sections 2050, and following. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date of this Order, except that if the thirtieth day following the date of this Order falls on a Saturday, Sunday or State holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

THEREFORE, IT IS HEREBY ORDERED that the Copermittees, in order to meet the provisions contained in division 7 of the CWC (commencing with section 13000) and regulations adopted thereunder, and the provisions of the CWA and regulations adopted thereunder, must each comply with the requirements of this Order. This action in no way prevents the San Diego Water Board from taking enforcement action for past violations of the previous Order applicable to the Copermittees. If any part of this Order is subject to a temporary stay of enforcement, unless otherwise specified, the Copermittees must comply with the analogous portions of the previous Order, which will remain in effect for all purposes during the pendency of the stay.

II. PROVISIONS

A. PROHIBITIONS AND LIMITATIONS

The purpose of this provision is to describe the conditions under which storm water and non-storm water discharges into and from MS4s are prohibited or limited. The goal of the prohibitions and limitations is to protect the water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through the implementation of water quality improvement strategies and runoff management programs that effectively prohibit non-storm water discharges into the Copermittees' MS4s, and reduce pollutants in storm water discharges from the Copermittees' MS4s to the MEP.

1. Discharge Prohibitions

a. Discharges from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the state are prohibited.

b. Non-storm water discharges into MS4s are to be effectively prohibited, through the implementation of Provision E.2, unless such discharges are authorized by a separate NPDES permit.

c. Discharges from MS4s are subject to all waste discharge prohibitions in the Basin Plan, included in Attachment A to this Order.

d. Storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012, as amended by State Water Board Resolution No. 2012-0031, applicable to these discharges, included in Attachment A to this Order. All other discharges from the Copermittees' MS4s to ASBS are prohibited.

2. Receiving Water Limitations

a. Discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters, including but not limited to all applicable provisions contained in:

(1) The San Diego Water Board's Basin Plan, including beneficial uses, water quality objectives, and implementation plans;

(2) State Water Board plans for water quality control including the following:

(a) Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries (Thermal Plan), and

(b) The Ocean Plan, including beneficial uses, water quality objectives, and implementation plans;

(3) State Water Board policies for water and sediment quality control including the following:

(a) Water Quality Control Policy for the Enclosed Bays and Estuaries of California,

(b) Sediment Quality Control Plan which includes the following narrative objectives for bays and estuaries:

(i) Pollutants in sediments shall not be present in quantities that, alone or in combination, are toxic to benthic communities, and

(ii) Pollutants shall not be present in sediments at levels that will bioaccumulate in aquatic life to levels that are harmful to human health,

(c) The Statement of Policy with Respect to Maintaining High Quality of Waters in California;[2]

(4) Priority pollutant criteria promulgated by the USEPA through the following:

(a) National Toxics Rule (NTR)[3] (promulgated on December 22, 1992 and amended on May 4, 1995), and

(b) California Toxics Rule (CTR).[4,5]

b. Discharges from MS4s composed of storm water runoff must not alter natural ocean water quality in an ASBS.

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[2] State Water Board Resolution No. 68-16
[3] 40 CFR 131.36
[4] 65 Federal Register 31682-31719 (May 18, 2000), adding Section 131.38 to 40 CFR
[5] If a water quality objective and a CTR criterion are in effect for the same priority pollutant, the more stringent of the two applies.

3. Effluent Limitations

a. Technology Based Effluent Limitations

Pollutants in storm water discharges from MS4s must be reduced to the MEP.[6]

b. Water Quality Based Effluent Limitations

Each Copermittee must comply with applicable WQBELs established for the TMDLs in Attachment E to this Order, pursuant to the applicable TMDL compliance schedules.

4. Compliance with Discharge Prohibitions and Receiving Water Limitations

Each Copermittee must achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order through timely implementation of control measures and other actions as specified in Provisions B and E of this Order, including any modifications. The Water Quality Improvement Plans required under Provision B must be designed and adapted to ultimately achieve compliance with Provisions A.1.a, A.1.c and A.2.a.

a. If exceedance(s) of water quality standards persist in receiving waters notwithstanding implementation of this Order, the Copermittees must comply with the following procedures:

(1) For exceedance(s) of a water quality standard in the process of being addressed by the Water Quality Improvement Plan, the Copermittee(s) must implement the Water Quality Improvement Plan as accepted by the San Diego Water Board, and update the Water Quality Improvement Plan, as necessary, pursuant to Provision F.2.c;

(2) Upon a determination by either the Copermittees or the San Diego Water Board that discharges from the MS4 are causing or contributing to a new exceedance of an applicable water quality standard not addressed by the Water Quality Improvement Plan, the Copermittees must submit the following updates to the Water Quality Improvement Plan pursuant to Provision F.2.c or as part of the Water Quality Improvement Plan Annual Report required under Provision F.3.b, unless the San Diego Water Board directs an earlier submittal:

(a) The water quality improvement strategies being implemented that are effective and will continue to be implemented,

[6] This does not apply to MS4 discharges which receive subsequent treatment to reduce pollutants in storm water discharges to the MEP prior to entering receiving waters (e.g., low flow diversions to the sanitary sewer). Runoff treatment must occur prior to the discharge of runoff into receiving waters per Finding 7.

(b) Water quality improvement strategies (i.e. BMPs, retrofitting projects, stream and/or habitat rehabilitation projects, adjustments to jurisdictional runoff management programs, etc.) that will be implemented to reduce or eliminate any pollutants or conditions that are causing or contributing to the exceedance of water quality standards,

(c) Updates to the schedule for implementation of the existing and additional water quality improvement strategies, and

(d) Updates to the monitoring and assessment program to track progress toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a of this Order;

(3) The San Diego Water Board may require the incorporation of additional modifications to the Water Quality Improvement Plan required under Provision B. The applicable Copermittees must submit any modifications to the update to the Water Quality Improvement Plan within 90 days of notification that additional modifications are required by the San Diego Water Board, or as otherwise directed;

(4) Within 90 days of the San Diego Water Board determination that the modifications to the Water Quality Improvement Plan required under Provision A.4.a.(3) meet the requirements of this Order, the applicable Copermittees must revise the jurisdictional runoff management program documents to incorporate the modified water quality improvement strategies that have been and will be implemented, the implementation schedule, and any additional monitoring required; and

(5) Each Copermittee must implement the updated Water Quality Improvement Plan.

b. The procedure set forth above to achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order do not have to be repeated for continuing or recurring exceedances of the same water quality standard(s) following implementation of scheduled actions unless directed to do otherwise by the San Diego Water Board.

c. Nothing in Provisions A.4.a and A.4.b prevents the San Diego Water Board from enforcing any provision of this Order while the applicable Copermittees prepare and implement the above update to the Water Quality Improvement Plan and jurisdictional runoff management programs.

B. WATER QUALITY IMPROVEMENT PLANS

The purpose of this provision is to develop Water Quality Improvement Plans that guide the Copermittees' jurisdictional runoff management programs towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plans is to further the Clean Water Act's objective to protect, preserve, enhance, and restore the water quality and designated beneficial uses of waters of the state. This goal will be accomplished through an adaptive planning and management process that identifies the highest priority water quality conditions within a watershed and implements strategies through the jurisdictional runoff management programs to achieve improvements in the quality of discharges from the MS4s and receiving waters.

1. Watershed Management Areas

The Copermittees must develop a Water Quality Improvement Plan for each of the Watershed Management Areas in Table B-1. A total of ten Water Quality Improvement Plans must be developed for the San Diego Region.

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
San Juan (901.00)	South Orange County	- Aliso Creek - San Juan Creek - San Mateo Creek - Pacific Ocean - Heisler Park ASBS	- City of Aliso Viejo - City of Dana Point - City of Laguna Beach - City of Laguna Hills[1] - City of Laguna Niguel - City of Laguna Woods[1] - City of Lake Forest[2] - City of Mission Viejo - City of Rancho Santa Margarita - City of San Clemente - City of San Juan Capistrano - County of Orange - Orange County Flood Control District
Santa Margarita (902.00)	Santa Margarita River	- Murrieta Creek - Temecula Creek - Santa Margarita River - Santa Margarita Lagoon - Pacific Ocean	- City of Menifee[3] - City of Murrieta[~~3~~4] - City of Temecula[~~3~~] - City of Wildomar[~~3~~4] - County of Riverside[~~3~~] - County of San Diego[4] - Riverside County Flood Control and Water Conservation District[~~3~~]
San Luis Rey (903.00)	San Luis Rey River	- San Luis Rey River - San Luis Rey Estuary - Pacific Ocean	- City of Oceanside - City of Vista - County of San Diego

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
Carlsbad (904.00)	Carlsbad	- Loma Alta Slough - Buena Vista Lagoon - Agua Hedionda Lagoon - Batiquitos Lagoon - San Elijo Lagoon - Pacific Ocean	- City of Carlsbad - City of Encinitas - City of Escondido - City of Oceanside - City of San Marcos - City of Solana Beach - City of Vista - County of San Diego
San Dieguito (905.00)	San Dieguito River	- San Dieguito River - San Dieguito Lagoon - Pacific Ocean	- City of Del Mar - City of Escondido - City of Poway - City of San Diego - City of Solana Beach - County of San Diego
Penasquitos (906.00)	Penasquitos	- Los Penasquitos Lagoon - Pacific Ocean	- City of Del Mar - City of Poway - City of San Diego - County of San Diego
	Mission Bay	- Mission Bay - Pacific Ocean - San Diego Marine Life Refuge ASBS	- City of San Diego
San Diego (907.00)	San Diego River	- San Diego River - Pacific Ocean	- City of El Cajon - City of La Mesa - City of San Diego - City of Santee - County of San Diego
Pueblo San Diego (908.00) Sweetwater (909.00) Otay (910.00)	San Diego Bay	- Sweetwater River - Otay River - San Diego Bay - Pacific Ocean	- City of Chula Vista - City of Coronado - City of Imperial Beach - City of La Mesa - City of Lemon Grove - City of National City - City of San Diego - County of San Diego - San Diego County Regional Airport Authority - San Diego Unified Port District
Tijuana (911.00)	Tijuana River	- Tijuana River - Tijuana Estuary - Pacific Ocean	- City of Imperial Beach - City of San Diego - County of San Diego

Notes:

1. By agreement dated February 10, 2015, pursuant to Water Code section 13228, the Phase I MS4 discharges within the jurisdiction of the City of Laguna Hills and the City of Laguna Woods located in the Santa Ana Region are regulated by San Diego Water Board Order No. R9-2013-0001 as amended by Order No. R9-2015-0001, upon the later effective date of Order No. R9-2015-0001 or Santa Ana Water Board Tentative Order No. R8-2015-0001. The City of Laguna Hills and Laguna Woods must also comply with the requirements of the San Diego Creek/Newport Bay TMDL in section XVIII of Santa Ana Water Board Order No. R8-2015-0001.
2. By agreement dated February 10, 2015, pursuant to Water Code section 13228, Phase I MS4 discharges within the City of Lake Forest located within the San Diego Water Board Region are regulated by the Santa Ana Water Board Order No. R8-2015-0001 (NPDES No. CAS618030) upon the later effective date of this Order or Santa Ana Water Board Tentative Order No. R8-2015-0001. In accordance with the terms of the agreement between the San Diego Water Board and the Santa Ana Water Board, the City of Lake Forest must implement the requirements of the Bacteria TMDL in Attachment E of this Order, participate in preparation and implementation of the Water Quality Improvement Plan for the Aliso Creek Watershed Management Area as described in Provision B of this Order and continue implementation of its over-irrigation discharge prohibition in its City Ordinance, Title 15, Chapter 15, section 14.030, List (b).
3. By agreement dated October 26, 2015, pursuant to Water Code section 13228, Phase I MS4 discharges within the City of Menifee located within the San Diego Water Board Region are regulated by the Santa Ana Water Board Order No. R8-2010-0033 as it may be amended or reissued (NPDES No. CAS618033) upon the later effective date of this Order. In accordance with the terms of the agreement between the San Diego Water Board and the Santa Ana Water Board, the City of Menifee must participate in preparation and implementation of the Water Quality Improvement Plan for the Santa Margarita River Watershed Management Area as described in Provision B of this Order.~~The Riverside County Copermittees will be covered under this Order after expiration of Order No. R9-2010-0016 or earlier if the Riverside County Copermittees meet the conditions in Provision F.6, upon further amendment of this Order.~~
4. By agreement dated October 26, 2015, pursuant to Water Code section 13228, the Phase I MS4 discharges within the jurisdiction of the City of Murrieta and the City of Wildomar located in the Santa Ana Region are regulated by San Diego Water Board Order No. R9-2013-0001 as amended by Orders No. R9-2015-0001 and R9-2015-0100. The City of Murrieta and City of Wildomar must also comply with the requirements of the Lake Elsinore/Canyon Lake Nutrient TMDLs in section VI.D.2 of Santa Ana Water Board Order No. R8-2010-0033, or corresponding section as it may be amended or reissued.~~The County of San Diego is not required to implement the requirements of Provision B for its jurisdiction within the Santa Margarita River Watershed Management Area~~

~~until the Riverside County Copermittees have been notified of coverage under this Order. The County of San Diego is required to implement the requirements of Provisions D, F.3.b, and Attachment E until the Riverside County Copermittees have been notified of coverage under this Order.~~

2. Priority Water Quality Conditions

The Copermittees must identify the water quality priorities within each Watershed Management Area that will be addressed by the Water Quality Improvement Plan. Where appropriate, Watershed Management Areas may be separated into subwatersheds to focus water quality prioritization and jurisdictional runoff management program implementation efforts by receiving water.

a. Assessment of Receiving Water Conditions

The Copermittees must consider the following, at a minimum, to identify water quality priorities based on impacts of MS4 discharges on receiving water beneficial uses:

(1) Receiving waters listed as impaired on the CWA Section 303(d) List of Water Quality Limited Segments (303(d) List);

(2) TMDLs adopted and under development by the San Diego Water Board;

(3) Receiving waters recognized as sensitive or highly valued by the Copermittees, including estuaries designated under the National Estuary Program under CWA section 320, marine protected areas, wetlands defined by the State or U.S. Fish and Wildlife Service's National Wetlands Inventory as wetlands, waters having the Preservation of Biological Habitats of Special Significance (BIOL) beneficial use designation, and receiving waters identified as ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(4) The receiving water limitations of Provision A.2;

(5) Known historical versus current physical, chemical, and biological water quality conditions;

(6) Available, relevant, and appropriately collected and analyzed physical, chemical, and biological receiving water monitoring data, including, but not limited to, data describing:

(a) Chemical constituents,

(b) Water quality parameters (i.e. pH, temperature, conductivity, etc.),

(c) Toxicity Identification Evaluations for both receiving water column and sediment,

(d) Trash impacts,

(e) Bioassessments, and

(f) Physical habitat;

(7) Available evidence of erosional impacts in receiving waters due to accelerated flows (i.e. hydromodification);

(8) Available evidence of adverse impacts to the chemical, physical, and biological integrity of receiving waters; and

(9) The potential improvements in the overall condition of the Watershed Management Area that can be achieved.

b. ASSESSMENT OF IMPACTS FROM MS4 DISCHARGES

The Copermittees must consider the following, at a minimum, to identify the potential impacts to receiving waters that may be caused or contributed to by discharges from the Copermittees' MS4s:

(1) The discharge prohibitions of Provision A.1 and effluent limitations of Provision A.3; and

(2) Available, relevant, and appropriately collected and analyzed storm water and non-storm water monitoring data from the Copermittees' MS4 outfalls;

(3) Locations of each Copermittee's MS4 outfalls that discharge to receiving waters;

(4) Locations of MS4 outfalls that are known to persistently discharge non-storm water to receiving waters likely causing or contributing to impacts on receiving water beneficial uses;

(5) Locations of MS4 outfalls that are known to discharge pollutants in storm water causing or contributing to impacts on receiving water beneficial uses; and

(6) The potential improvements in the quality of discharges from the MS4 that can be achieved.

c. IDENTIFICATION OF PRIORITY WATER QUALITY CONDITIONS

(1) The Copermittees must use the information gathered for Provisions B.2.a and B.2.b to develop a list of priority water quality conditions as pollutants, stressors and/or receiving water conditions that are the highest threat to receiving water quality or that most adversely affect the quality of receiving waters. The list must include the following information for each priority water quality condition:

(a) The beneficial use(s) associated with the priority water quality condition;

(b) The geographic extent of the priority water quality condition within the Watershed Management Area, if known;

(c) The temporal extent of the priority water quality condition (e.g., dry weather and/or wet weather);

(d) The Copermittees with MS4s discharges that may cause or contribute to the priority water quality condition; and

(e) An assessment of the adequacy of and data gaps in the monitoring data to characterize the conditions causing or contributing to the priority water quality condition, including a consideration of spatial and temporal variation.

(2) The Copermittees must identify the highest priority water quality conditions to be addressed by the Water Quality Improvement Plan, and provide a rationale for selecting a subset of the water quality conditions identified pursuant to Provision B.2.c.(1) as the highest priorities.

d. IDENTIFICATION OF MS4 SOURCES OF POLLUTANTS AND/OR STRESSORS

The Copermittees must identify and prioritize known and suspected sources of storm water and non-storm water pollutants and/or other stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c. The identification of known and suspected sources of pollutants and/or stressors that cause or contribute to the highest priority water quality conditions as identified for Provision B.2.c must consider the following:

(1) Pollutant generating facilities, areas, and/or activities within the Watershed Management Area, including:

(a) Each Copermittee's inventory of construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas,

(b) Publicly owned parks and/or recreational areas,

(c) Open space areas,

(d) All currently operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste, and

(e) Areas not within the Copermittees' jurisdictions (e.g., Phase II MS4s, tribal lands, state lands, federal lands) that are known or suspected to be discharging to the Copermittees' MS4s;

(2) Locations of the Copermittees' MS4s, including the following:

(a) All MS4 outfalls that discharge to receiving waters, and

(b) Locations of major structural controls for storm water and non-storm water (e.g., retention basins, detention basins, major infiltration devices, etc.);

(3) Other known and suspected sources of non-storm water or pollutants in storm water discharges to receiving waters within the Watershed Management Area, including the following:

(a) Other MS4 outfalls (e.g., Phase II Municipal and Caltrans),

(b) Other NPDES permitted discharges,

(c) Any other discharges that may be considered point sources (e.g., private outfalls), and

(d) Any other discharges that may be considered non-point sources (e.g., agriculture, wildlife or other natural sources);

(4) Review of available data, including but not limited to:

(a) Findings from the Copermittees' illicit discharge detection and elimination programs,

(b) Findings from the Copermittees' MS4 outfall discharge monitoring,

(c) Findings from the Copermittees' receiving water monitoring,

(d) Findings from the Copermittees' MS4 outfall discharge and receiving water assessments, and

(e) Other available, relevant, and appropriately collected data, information, or studies related to pollutant sources and/or stressors that contribute to the highest priority water quality conditions as identified for Provision B.2.c.

(5) The adequacy of the available data to identify and prioritize sources and/or stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c.

e. IDENTIFICATION OF POTENTIAL WATER QUALITY IMPROVEMENT STRATEGIES

The Copermittees must evaluate the findings identified under Provisions B.2.a-d, and identify potential strategies that can result in improvements to water quality in MS4 discharges and/or receiving waters within the Watershed Management Area. Potential water quality improvement strategies that may be implemented within the Watershed Management Area must include the following:

(1) Structural BMPs, non-structural BMPs, incentives, or programs that can potentially be implemented to address the highest priority water quality conditions identified under Provision B.2.c, or MS4 sources of pollutants or stressors identified under Provision B.2.d,

(2) Retrofitting projects in areas of existing development within the Watershed Management Area that can potentially be implemented to reduce MS4 sources of pollutants or stressors identified under Provision B.2.d causing or contributing to the highest priority water quality conditions identified under Provision B.2.c, and

(3) Stream, channel, and/or habitat rehabilitation projects within the Watershed Management Area that can potentially be implemented to protect and/or improve conditions in receiving waters from MS4 pollutants and/or stressors identified under Provision B.2.d causing or contributing to the highest priority water quality conditions identified under Provision B.2.c.

3. Water Quality Improvement Goals, Strategies and Schedules

The Copermittees must identify and develop specific water quality improvement goals and strategies to address the highest priority water quality conditions identified within a Watershed Management Area. The water quality improvement goals and strategies must address the highest priority water quality conditions by effectively prohibiting non-storm water discharges to the MS4, reducing pollutants in storm water discharges from the MS4 to the MEP, and protecting the water quality standards of receiving waters.

a. WATER QUALITY IMPROVEMENT GOALS AND SCHEDULES

(1) Numeric Goals

The Copermittees must develop and incorporate numeric goals[7] into the

[7] Interim and final numeric goals may take a variety of forms such as TMDL established WQBELs, action levels, pollutant concentration, load reductions, number of impaired water bodies delisted from the List of Water Quality Impaired Segments, Index of Biotic Integrity (IBI) scores, or other appropriate metrics. Interim and final numeric goals are not necessarily limited to one criterion or indicator, but may include multiple criteria and/or indicators. Except for TMDL established WQBELs, interim and final numeric goals and corresponding schedules may be revised through the adaptive management process under Provision B.5.

Water Quality Improvement Plan. Numeric goals must be used to support Water Quality Improvement Plan implementation and measure reasonable progress towards addressing the highest priority water quality conditions identified under Provision B.2.c. The Copermittees must establish and incorporate the following numeric goals in the Water Quality Improvement Plan:

(a) Final numeric goals must be based on measureable criteria or indicators capable of demonstrating one or more of the following:

(i) Discharges from the Copermittees' MS4s will not cause or contribute to exceedances of water quality standards in receiving waters, AND/OR

(ii) The conditions of receiving waters and associated habitat are protected from MS4 discharges, AND/OR

(iii) Beneficial uses of receiving waters are protected from MS4 discharges and will be supported.

(b) Interim numeric goals must be based on measureable criteria or indicators capable of demonstrating reasonable incremental progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges as follows:

(i) One or more interim numeric goals may be established to demonstrate progress toward achieving each final numeric goal,

(ii) For each final numeric goal, at least one interim numeric goal must be expressed as a reasonable increment toward achievement of the final numeric goal,

(iii) For each final numeric goal, reasonable interim numeric goals must be established to be accomplished during each 5 year period between the acceptance of the Water Quality Improvement Plan and the achievement of the final numeric goals.

(2) <u>Schedules for Achieving Numeric Goals</u>

The Copermittees must develop and incorporate schedules for achieving the numeric goals into the Water Quality Improvement Plan. The schedules must demonstrate reasonable progress toward achieving the final numeric goals required for Provision B.3.a.(1). The Copermittees must incorporate the schedules for achieving the numeric goals into the Water Quality Improvement Plan based on the following considerations:

(a) Final dates for achieving all final numeric goals must be established considering the following:

(i) Final compliance dates for any applicable TMDLs in Attachment E to this Order;

(ii) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(iii) Achievement of the final numeric goals for the highest water quality priorities must be as soon as possible;

(iv) Final dates for achieving the final numeric goals must reflect a realistic assessment of the shortest practicable time required based on the temporal and spatial extent and factors associated with the highest priority water quality conditions identified under Provision B.2.c, and taking into account the time reasonably required to implement the water quality improvement strategies required pursuant to Provision B.3.b.

(b) Interim dates for achieving all interim numeric goals must be established considering the following:

(i) Interim compliance dates for any applicable TMDLs in Attachment E to this Order;

(ii) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(iii) Interim dates for achieving the interim numeric goals must reflect a realistic assessment of the shortest practicable time reasonably required, taking into account the time needed to implement new or significantly expanded programs and securing financing, if necessary; and

(iv) For each final numeric goal, at least one interim numeric goal must be established that the Copermittees will work toward achieving within the term of this Order.

b. WATER QUALITY IMPROVEMENT STRATEGIES AND SCHEDULES

Based on the likely effectiveness and efficiency of the potential water quality improvement strategies identified under Provision B.2.e to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a, the Copermittees must identify the strategies that will be implemented in each Watershed Management Area as follows:

(1) Jurisdictional Strategies

(a) Each Copermittee in the Watershed Management Area must identify the strategies that will be implemented within its jurisdiction as part of its jurisdictional runoff management program requirements under Provisions E.2 through E.7, including descriptions of the following:

(i) For each of the inventories developed for its jurisdiction, as required under Provisions D.2.a.(1), E.3.e.(2), E.4.b, and E.5.a, each Copermittee must identify the known and suspected areas or sources causing or contributing to the highest priority water quality conditions in the Watershed Management Area that the Copermittee will focus on in its efforts to effectively prohibit non-storm water discharges to its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, and achieve the interim and final numeric goals identified under Provision B.3.a;

(ii) BMPs that each Copermittee will implement, or require to be implemented, as applicable, for those areas or sources within its jurisdiction;

(iii) Education programs that each Copermittee will implement, as applicable, for those areas or sources within its jurisdiction;

(iv) Frequencies that each Copermittee will conduct inspections on those areas or sources within its jurisdiction;

(v) Incentive and enforcement programs that each Copermittee will implement, as applicable, for those areas or sources within its jurisdiction; and

(vi) Any other BMPs, incentives, or programs that each Copermittee will implement for those areas or sources within its jurisdiction.

(b) Identify the optional jurisdictional strategies that each Copermittee will implement within its jurisdiction, as necessary, to effectively prohibit non-storm water discharges to its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. Descriptions of the optional jurisdictional strategies must include:

(i) BMPs, incentives, or programs that may be implemented by the Copermittee within its jurisdiction in addition to the requirements of Provisions B.3.b.(1)(a);

(ii) Incentives or programs that may be implemented by the Copermittee to encourage or implement projects to retrofit areas of existing development within its jurisdiction;

(iii) Incentives or programs that may be implemented by the Copermittee to encourage or implement projects that will rehabilitate the conditions of channels or habitats within its jurisdiction;

(iv) The funds and/or resources that must be secured by the Copermittee to implement the optional strategies described for Provisions B.3.b.(1)(b)(i)-(iii) within its jurisdiction; and

(v) The circumstances necessary to trigger implementation of the optional jurisdictional strategies, in addition to the requirements of Provision B.3.b.(1)(a), to achieve the interim and final numeric goals within the schedules established under Provision B.3.a.

(c) Identify the strategies that will be implemented by the Copermittee in coordination with or with the cooperation of other agencies (e.g. Caltrans, water districts, school districts) and/or entities (e.g. non-governmental organizations) within its jurisdiction.

(2) Watershed Management Area Strategies

The Copermittees must identify the optional regional or multi-jurisdictional strategies that will be implemented in the Watershed Management Area, as necessary, to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. Descriptions of the optional regional or multi-jurisdictional strategies must include:

(a) Regional or multi-jurisdictional BMPs, incentives, or programs that may be implemented by the Copermittees in the Watershed Management Area;

(b) Incentives or programs that may be implemented by the Copermittees in the Watershed Management Area to encourage or implement regional or multi-jurisdictional projects to retrofit areas of existing development;

(c) Incentives or programs that may be implemented by the Copermittees to encourage or implement regional or multi-jurisdictional projects that will rehabilitate the conditions of channels, streams, or habitats within the Watershed Management Area;

(d) The funds and/or resources that must be secured by the Copermittees to implement the optional strategies described for Provisions B.3.b.(2)(a)-(c) within the Watershed Management Area; and

(e) The circumstances necessary to trigger implementation of the optional regional or multi-jurisdictional strategies to achieve the interim and final numeric goals within the schedules established under Provision B.3.a.

(3) Schedules for Implementing Strategies

The Copermittees must develop reasonable schedules for implementing the water quality improvement strategies identified under Provisions B.3.b.(1) and B.3.b.(2) to achieve the interim and final numeric goals identified and schedules established under Provision B.3.a. The Copermittees must incorporate the schedules to implement the water quality improvement strategies into the Water Quality Improvement Plan as follows:

(a) Each Copermittee must develop schedules for the jurisdictional strategies identified pursuant to Provisions B.3.b.(1)(a)-(b). Each schedule must specify:

(i) If each jurisdictional strategy identified pursuant to Provision B.3.b.(1)(a) will or will not be initiated upon acceptance of the Water Quality Improvement Plan;

(ii) For each jurisdictional strategy identified pursuant to Provision B.3.b.(1)(a) that will not be initiated upon acceptance of the Water Quality Improvement Plan, the shortest practicable time in which each jurisdictional strategy will be initiated after acceptance of the Water Quality Improvement Plan;

(iii) For each optional jurisdictional strategy identified pursuant to Provision B.3.b.(1)(b), a realistic assessment of the shortest practicable time required to:

[a] Secure the resources needed to fund the optional jurisdictional strategy, and
[b] Procure the resources, materials, labor, and applicable permits necessary to initiate implementation of the optional jurisdictional strategy;

(iv) If each jurisdictional strategy identified pursuant to Provisions B.3.b.(1)(a)-(b) is expected to be continuously implemented (e.g. inspections) or completed within a schedule (e.g. construction of structural BMP); and

(v) If a jurisdictional strategy identified pursuant to Provisions B.3.b.(1)(a)-(b) is expected to be completed within a schedule, the anticipated time to complete based on a realistic assessment of the shortest practicable time required.

(b) The Copermittees in the Watershed Management Area must develop schedules for the regional or multi-jurisdictional strategies identified pursuant to Provision B.3.b.(2). Each schedule must specify:

(i) A realistic assessment of the shortest practicable time to:

[a] Secure the resources needed to fund the optional regional or multi-jurisdictional strategy, and
[b] Procure the resources, materials, labor, and permits necessary to initiate the implementation of the optional regional or multi-jurisdictional strategy;

(ii) If each regional or multi-jurisdictional strategy identified pursuant to Provision B.3.b.(2) is expected to be continuously implemented (e.g. inspections) or completed within a schedule (e.g. construction of structural BMP); and

(iii) If a regional or multi-jurisdictional strategy and/or activity identified pursuant to Provisions B.3.b.(2) is expected to be completed within a schedule, the anticipated time to complete based on a realistic assessment of the shortest practicable time required.

(4) Optional Watershed Management Area Analysis

(a) For each Watershed Management Area, the Copermittees have the option to perform a Watershed Management Area Analysis for the purpose of developing watershed-specific requirements for structural BMP implementation, as described in Provision E.3.c.(3). The Watershed Management Area Analysis must include GIS layers (maps) as output. The analysis must include the following information, to the extent it is available, in order to characterize the Watershed Management Areas:

(i) A description of dominant hydrologic processes, such as areas where infiltration or overland flow likely dominates;

(ii) A description of existing streams in the watershed, including bed material and composition, and if they are perennial or ephemeral;

(iii) Current and anticipated future land uses;

(iv) Potential coarse sediment yield areas; and

(v) Locations of existing flood control structures and channel structures, such as stream armoring, constrictions, grade control structures, and hydromodification or flood management basins.

(b) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify and compile a list of candidate projects that could potentially be used as

alternative compliance options for Priority Development Projects, to be implemented in lieu of onsite structural BMP performance requirements described in Provisions E.3.c.(1) and E.3.c.(2)(a). Specifically, the Copermittees must identify opportunities to be included in the list of candidate projects in each Watershed Management Area, such as:

(i) Stream or riparian area rehabilitation;

(ii) Retrofitting existing infrastructure to incorporate storm water retention or treatment;

(iii) Regional BMPs;

(iv) Groundwater recharge projects;

(v) Water supply augmentation projects; and

(vi) Land purchases to preserve floodplain functions.

(c) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify areas within the Watershed Management Area where it is appropriate to allow Priority Development Projects to be exempt from the hydromodification management BMP performance requirements described in Provision E.3.c.(2), including supporting rationale.

c. Prohibitions and Limitations Compliance Option

Each Copermittee has the option to utilize the implementation of the Water Quality Improvement Plan to demonstrate compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b within a Watershed Management Area subject to the following conditions:

(1) A Copermittee is eligible to be deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b within a Watershed Management Area when the Water Quality Improvement Plan for a Watershed Management Area incorporates the following:

(a) Numeric goals, water quality improvement strategies, and schedules developed pursuant to Provisions B.3.a and B.3.b that include the following:

(i) Interim and final WQBELs established by the TMDLs in Attachment E to this Order applicable to the Copermittee's jurisdiction within the Watershed Management Area; AND

(ii) Interim and final numeric goals for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012

(included as Attachment A to this Order) applicable to the Copermittee's jurisdiction within the Watershed Management Area; AND

(iii) Interim and final numeric goals applicable to the Copermittee's MS4 discharges within the Watershed Management Area expressed as numeric concentration-based or load-based goals for all pollutants and conditions listed on the Clean Water Act Section 303(d) List of Water Quality Impaired Segments[8] for the receiving waters in the Watershed Management Area that do not have a TMDL incorporated into Attachment E to this Order; AND/OR

(iv) Interim and final numeric goals for pollutants and conditions identified as receiving water priorities in the Water Quality Improvement Plan that will result in chemical, physical, and biological conditions protective of the beneficial uses of the receiving waters impacted by the Copermittee's MS4 discharges within the Watershed Management Area; AND

(v) The Copermittee has the option to include interim and final numeric goals applicable to the Copermittee's MS4 discharges and/or receiving waters within the Watershed Management Area for any pollutants or conditions in addition to those described in Provisions B.3.c.(1)(a)(i)-(iv); AND

(vi) Schedules for achieving each final numeric goal that reflect a realistic assessment of the shortest practicable time needed for achievement; AND

(vii) For each final numeric goal developed pursuant to Provisions B.3.a and B.3.c.(1)(a)(i)-(v), annual milestones[9] and the dates for their achievement must be included within each of the next five (5) Water Quality Improvement Plan Annual Report reporting periods, or until the final numeric goal is achieved. Annual milestones and the dates for their achievement for the 5 Water Quality Improvement Plan Annual Report reporting periods of the next permit term, or until the final numeric goal is achieved, must be provided as part of the Report of Waste Discharge required pursuant to Provision F.5.

(b) An analysis that meets all of the following conditions:

(i) The analysis, with clearly stated assumptions included in the analysis, must quantitatively demonstrate that the implementation of

[8] 2010 and subsequent 303(d) Lists
[9] Annual milestones for each final numeric goal must be clearly and directly linked to, or demonstrate progress is being made toward the achievement of the final numeric goal. The annual milestones may consist of water quality improvement strategy implementation phases, interim numeric goals, and other acceptable metrics. The annual milestones may address multiple numeric goals and/or multiple water bodies, as applicable and appropriate.

the water quality improvement strategies required under Provision B.3.b will achieve the final numeric goals within the schedules developed pursuant to Provisions B.3.a and B.3.c.(1)(a).

(ii) The development of the analysis must include a public participation process which allows the public to review and provide comments on the analysis methodology utilized and the assumptions included in the analysis. Public comments and responses must be included as part of the analysis documentation included in the Water Quality Improvement Plan.

(iii) The analysis may be performed by an individual Copermittee or jointly by two or more Copermittees choosing to utilize this compliance option for their jurisdictions within the Watershed Management Area.

(iv) The analysis must be updated as part of the iterative approach and adaptive management process required under Provisions B.5.a-b.

(c) Specific monitoring and assessments required pursuant to Provision B.4.a that will be performed by the Copermittee capable of 1) demonstrating whether the implementation of the water quality improvement strategies are making progress toward achieving the numeric goals in accordance with the established schedules developed pursuant to Provisions B.3.a and B.3.c.(1)(a), and 2) determining whether interim and final numeric goals have been achieved. The specific monitoring and assessments must be updated as part of the iterative approach and adaptive management process required under Provision B.5.c.

(d) Documentation showing that the numeric goals, schedules, and annual milestones proposed pursuant to Provision B.3.c.(1)(a), the analysis performed pursuant to Provision B.3.c.(1)(b), and the specific monitoring and assessments proposed pursuant to Provision B.3.c.(1)(c) have been reviewed by the Water Quality Improvement Consultation Panel (see Provision F.1.a.(1)(b)). Updates must be reviewed by the Water Quality Improvement Consultation Panel for any recommendations.

(2) Each Copermittee that voluntarily completes the requirements of Provision B.3.c.(1) is deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b for the pollutants and conditions for which numeric goals are developed when the Water Quality Improvement Plan, incorporating the requirements of Provision B.3.c.(1), is accepted by the San Diego Water Board pursuant to Provision F.1.b or F.2.c. The Copermittee is deemed in compliance during the term of this Order as long as:

(a) The Copermittee is implementing the water quality improvement strategies within its jurisdiction developed pursuant to Provision B.3.b.(1) and in

compliance with the schedules for implementing the strategies established pursuant to Provisions B.3.b.(3)(a) and B.3.c.(1)(a)(vii); AND

(b) The Copermittee is performing the monitoring and assessments developed pursuant to Provision B.3.c.(1)(c); AND

(c) The Copermittee's assessments in the Water Quality Improvement Plan Annual Report submitted pursuant to Provision F.3.b.(3) support a conclusion that: 1) the Copermittee is in compliance with the annual milestones and dates for achievement developed pursuant to Provision B.3.c.(1)(a)(vii), OR 2) the Copermittee has provided acceptable rationale and recommends appropriate modifications to the interim numeric goals, and/or water quality improvement strategies, and/or schedules to improve the rate of progress toward achieving the final numeric goals developed pursuant to Provisions B.3.a and B.3.c.(1)(a)(i)-(vi); AND

(d) Any proposed modifications to the numeric goals, strategies, schedules, and/or annual milestones are accepted by the San Diego Water Board as part of subsequent updates to the Water Quality Improvement Plan pursuant to Provision F.2.c;[10] AND

(e) The Copermittee is implementing the requirements of Provision A.4.a.

4. Water Quality Improvement Monitoring and Assessment Program

a. The Copermittees in each Watershed Management Area must develop and incorporate an integrated monitoring and assessment program into the Water Quality Improvement Plan that assesses: 1) the progress toward achieving the numeric goals and schedules, 2) the progress toward addressing the highest priority water quality conditions for each Watershed Management Area, and 3) each Copermittee's overall efforts to implement the Water Quality Improvement Plan.

b. The monitoring and assessment program must incorporate the monitoring and assessment requirements of Provision D, which may allow the Copermittees to modify the program to be consistent with and focus on the highest priority water quality conditions for each Watershed Management Area.

c. For Watershed Management Areas with applicable TMDLs, the monitoring and assessment program must incorporate the specific monitoring and assessment requirements of Attachment E.

[10] A request for proposed changes to the Water Quality Improvement Plan does not stay any permit condition.

d. For Watershed Management Areas with any ASBS, the water quality monitoring and assessment program must incorporate the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

5. Iterative Approach and Adaptive Management Process

The Copermittees in each Watershed Management Area must implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a, and must include the following:

a. RE-EVALUATION OF PRIORITY WATER QUALITY CONDITIONS

The priority water quality conditions and potential water quality improvement strategies included in the Water Quality Improvement Plan pursuant to Provisions B.2.c and B.2.e may be re-evaluated by the Copermittees as needed during the term of this Order as part of the Water Quality Improvement Plan Annual Report. Re-evaluation and recommendations for modifications to the priority water quality conditions and potential water quality improvement strategies must be provided in the Report of Waste Discharge, and must consider the following:

(1) Achieving the outcome of improved water quality in MS4 discharges and receiving waters through implementation of the water quality improvement strategies identified in the Water Quality Improvement Plan;

(2) New information developed when the requirements of Provisions B.2.a-c have been re-evaluated;

(3) Spatial and temporal accuracy of monitoring data collected to inform prioritization of water quality conditions and implementation strategies to address the highest priority water quality conditions;

(4) Availability of new information and data from sources other than the jurisdictional runoff management programs within the Watershed Management Area that informs the effectiveness of the actions implemented by the Copermittees;

(5) San Diego Water Board recommendations; and

(6) Recommendations for modifications solicited through a public participation process.

b. ADAPTATION OF GOALS, STRATEGIES AND SCHEDULES

The water quality improvement goals, strategies and schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.3, must be re-evaluated and adapted as new information becomes available to result in more effective and efficient measures to address the highest priority water quality conditions identified pursuant to Provision B.2.c. Re-evaluation of and modifications to the water quality improvement goals, strategies and schedules must be provided in the Water Quality Improvement Plan Annual Report, and must consider the following:

(1) Modifications to the priority water quality conditions based on Provision B.5.a;

(2) Progress toward achieving interim and final numeric goals in receiving waters and MS4 discharges for the highest priority water quality conditions in the Watershed Management Area,

(3) Progress toward achieving outcomes according to established schedules;

(4) New policies or regulations that may affect identified numeric goals;

(5) Measurable or demonstrable reductions of non-storm water discharges to and from each Copermittee's MS4;

(6) Measurable or demonstrable reductions of pollutants in storm water discharges from each Copermittee's MS4 to the MEP;

(7) New information developed when the requirements of Provisions B.2.b and B.2.d have been re-evaluated;

(8) Efficiency in implementing the Water Quality Improvement Plan;

(9) San Diego Water Board recommendations; and

(10) Recommendations for modifications solicited through a public participation process.

c. ADAPTATION OF MONITORING AND ASSESSMENT PROGRAM

The water quality improvement monitoring and assessment program, included in the Water Quality Improvement Plan pursuant to Provision B.4, must be re-evaluated and adapted when new information becomes available. Re-evaluation and recommendations for modifications to the monitoring and assessment program, pursuant to the requirements of Provision D, may be provided in the Water Quality Improvement Plan Annual Report, but must be provided in the Report of Waste Discharge.

d. ADAPTATION OF PROHIBITIONS AND LIMITATIONS COMPLIANCE OPTION

If a Copermittee has implemented the Prohibitions and Limitations Compliance Option allowed to be included in the Water Quality Improvement Plan pursuant to Provision B.3.c, the Copermittee must re-evaluate and adapt the numeric goals, water quality improvement strategies, schedules, and annual milestones required under Provision B.3.c.(1) when significant new information becomes available, or with the Report of Waste Discharge required pursuant to Provision F.5. Significant changes in the numeric goals, water quality improvement strategies, schedules, or annual milestones requires an update to the analysis required under Provision B.3.c.(2).

6. Water Quality Improvement Plan Submittal, Updates, and Implementation

a. The Copermittees must submit and commence implementation of the Water Quality Improvement Plans in accordance with the requirements of Provision F.1.

b. The Copermittees must submit proposed updates to the Water Quality Improvement Plan for acceptance by the San Diego Water Board Executive Officer in accordance with the requirements of Provision F.2.c.

C. ACTION LEVELS

The purpose of this provision is for the Copermittees to incorporate numeric action levels in the Water Quality Improvement Plans. The goal of the action levels is to guide Water Quality Improvement Plan implementation efforts and measure progress towards the protection of water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through monitoring and assessing the quality of the MS4 discharges during the implementation of the Water Quality Improvement Plans.

1. Non-Storm Water Action Levels[11]

The Copermittees must develop and incorporate numeric non-storm water action levels (NALs) into the Water Quality Improvement Plan to: 1) support the development and prioritization of water quality improvement strategies for effectively prohibiting non-storm water discharges to the MS4s, 2) assess the effectiveness of the water quality improvement strategies toward addressing MS4 non-storm water discharges, required pursuant to Provision D.4.b.(1), and 3) support the detection and elimination of non-storm water and illicit discharges to the MS4, required pursuant to Provision E.2.[12]

a. The following NALs must be incorporated:

(1) Non-Storm Water Discharges from MS4s to Ocean Surf Zone

Table C-1. Non-Storm Water Action Levels for Discharges from MS4s to Ocean Surf Zone

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Total Coliform	MPN/100 ml	1,000	-	10,000/1,000[1]	OP
Fecal Coliform	MPN/100 ml	200[2]	-	400	OP
Enterococci	MPN/100 ml	35	-	104[3]	OP

Abbreviations/Acronyms
AMAL – average monthly action level
MDAL – maximum daily action level
OP – Ocean Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Total coliform density NAL is 1,000 MPN/100 ml when the fecal/total coliform ratio exceeds 0.1.
2. Fecal coliform density NAL is 200 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas."

[11] NALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, unless the NAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed.
[12] The Copermittees may utilize NALs or other benchmarks currently established by the Copermittees as interim NALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

(2) Non-Storm Water Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Table C-2. Non-Storm Water Action Levels for Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Turbidity	NTU	75	-	225	OP
pH	Units	Within limit of 6.0 to 9.0 at all times			OP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	35	-	104[3]	BP
Priority Pollutants	µg/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
OP – Ocean Plan water quality objective
NTU – Nephelometric Turbidity Units
µg/L – micrograms per liter
MDAL – maximum daily action level
BP – Basin Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas" and is not applicable to water bodies that are not designated with the water contact recreation (REC-1) beneficial use.

Table C-3. Non-Storm Water Action Levels for Priority Pollutants

Parameter	Units	Freshwater (CTR)		Saltwater (CTR)	
		MDAL	AMAL	MDAL	AMAL
Cadmium	µg/L	**	**	16	8
Copper	µg/L	*	*	5.8	2.9
Chromium III	µg/L	**	**	-	-
Chromium VI	µg/L	16	8.1	83	41
Lead	µg/L	*	*	14	2.9
Nickel	µg/L	**	**	14	6.8
Silver	µg/L	*	*	2.2	1.1
Zinc	µg/L	*	*	95	47

Abbreviations/Acronyms:
CTR – California Toxic Rule
AMAL – average monthly action level
µg/L – micrograms per liter
MDAL – maximum daily action level

Notes:
* Action levels developed on a case-by-case basis (see below)
** Action levels developed on a case-by-case basis (see below), but calculated criteria are not to exceed Maximum Contaminant Levels (MCLs) under the California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64431

The Cadmium, Copper, Chromium (III), Lead, Nickel, Silver and Zinc NALs for MS4 discharges to freshwater receiving waters will be developed on a case-by-case basis based on site-specific water quality data (receiving water hardness). For these priority pollutants, refer to 40 CFR 131.38(b)(2).

(3) Non-Storm Water Discharges from MS4s to Inland Surface Waters

Table C-4. Non-Storm Water Action Levels for Discharges from MS4s to Inland Surface Waters

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Dissolved Oxygen	mg/L	Not less than 5.0 in WARM waters and not less than 6.0 in COLD waters			BP
Turbidity	NTU	-	20	See MDAL	BP
pH	Units	Within limit of 6.5 to 8.5 at all times			BP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	33	-	61[3]	BP
Total Nitrogen	mg/L	-	1.0	See MDAL	BP
Total Phosphorus	mg/L	-	0.1	See MDAL	BP
MBAS	mg/L	-	0.5	See MDAL	BP
Iron	mg/L	-	0.3	See MDAL	BP
Manganese	mg/L	-	0.05	See MDAL	BP
Priority Pollutants	µg/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
BP – Basin Plan water quality objective
COLD – cold freshwater habitat beneficial use
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
MDAL – maximum daily action level
WARM – warm freshwater habitat beneficial use
MBAS – Methylene Blue Active Substances
MPN/100 ml – most probable number per 100 milliliters
µg/L – micrograms per liter

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for freshwater "designated beach areas" and is not applicable to water bodies that are not designated with the water contact recreation (REC-1) beneficial use.

b. If not identified in Provision C.1.a, NALs must be identified, developed and incorporated in the Water Quality Improvement Plan for any pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in receiving waters associated with the highest priority water quality conditions related to non-storm water discharges from the MS4s. NALs must be based on:

(1) Applicable water quality standards which may be dependent upon site-specific or receiving water-specific conditions or assumptions to be identified by the Copermittees; or

(2) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the NALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary NALs specific to the Watershed Management Area at levels greater than the NALs required by Provisions C.1.a and C.1.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for effectively prohibiting non-storm water discharges to the MS4s, as well as the detection and

elimination of non-storm water and illicit discharges to and from the MS4. The secondary NALs may be developed using an approach acceptable to the San Diego Water Board.

d. Dry weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.b may be utilized to develop or revise NALs based on watershed-specific data, subject to San Diego Water Board Executive Officer approval.

2. Storm Water Action Levels[13]

The Copermittees must develop and incorporate numeric storm water action levels (SALs) in the Water Quality Improvement Plans to: 1) support the development and prioritization of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s, and 2) assess the effectiveness of the water quality improvement strategies toward reducing pollutants in storm water discharges, required pursuant to Provision D.4.b.(2).[14]

a. The following SALs for discharges of storm water from the MS4 must be incorporated:

Table C-5. Storm Water Action Levels for Discharges from MS4s to Receiving Waters

Parameter	Units	Action Level
Turbidity	NTU	126
Nitrate & Nitrite (Total)	mg/L	2.6
Phosphorus (Total P)	mg/L	1.46
Cadmium (Total Cd)*	µg/L	3.0
Copper (Total Cu)*	µg/L	127
Lead (Total Pb)*	µg/L	250
Zinc (Total Zn)*	µg/L	976

Abbreviations/Acronyms:
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
µg/L – micrograms per liter

Notes:
* The sampling must include a measure of receiving water hardness at each MS4 outfall. If a total metal concentration exceeds the corresponding metals SAL in Table C-5, that concentration must be compared to the California Toxics Rule criteria and the USEPA 1-hour maximum concentration for the detected level of receiving water hardness associated with that sample. If it is determined that the sample's total metal concentration for that specific metal exceeds that SAL, but does not exceed the applicable USEPA 1-hour maximum concentration criterion for the measured level of hardness, then the sample result will not be considered above the SAL for that measurement.

[13] SALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, unless the SAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed.

[14] The Copermittees may utilize SALs or other benchmarks currently established by the Copermittees as interim SALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

b. If not identified in Provision C.2.a, SALs must be identified, developed and incorporated in the Water Quality Improvement Plan for pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in receiving waters associated with the highest priority water quality conditions related to storm water discharges from the MS4s. SALs must be based on:

(1) Federal and State water quality guidance and/or water quality standards; and

(2) Site-specific or receiving water-specific conditions; or

(3) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the SALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary SALs specific to the Watershed Management Area at levels greater than the SALs required by Provisions C.2.a and C.2.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s. The secondary SALs may be developed based on the approaches recommended by the State Water Board's Storm Water Panel[15] or using an approach acceptable to the San Diego Water Board.

d. Wet weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.c may be used to develop or revise SALs based upon watershed-specific data, subject to San Diego Water Board Executive Officer approval.

[15] Storm Water Panel Recommendations to the California State Water Resources Control Board: The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities (June 2006)

D. MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS

The purpose of this provision is for the Copermittees to monitor and assess the impact on the conditions of receiving waters caused by discharges from the Copermittees' MS4s under wet weather and dry weather conditions. The goal of the monitoring and assessment program is to inform the Copermittees about the nexus between the health of receiving waters and the water quality condition of the discharges from their MS4s. This goal will be accomplished through monitoring and assessing the conditions of the receiving waters, discharges from the MS4s, pollutant sources and/or stressors, and effectiveness of the water quality improvement strategies implemented as part of the Water Quality Improvement Plans.

1. Receiving Water Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the condition of the receiving waters in each Watershed Management Area during dry weather and wet weather. Following San Diego Water Board acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct long-term receiving water monitoring during implementation of the Water Quality Improvement Plan to assess the long term trends and determine if conditions in receiving waters are improving. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following receiving water monitoring procedures:

a. TRANSITIONAL RECEIVING WATER MONITORING

Until the monitoring requirements and schedules of Provisions D.1.b-e are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following receiving water monitoring in the Watershed Management Area:

(1) Continue the receiving water monitoring programs required in Order Nos. R9-2007-0001 (Monitoring and Reporting Program No. R9-2007-0001 Sections II.A.1-A.5), R9-2009-0002, and R9-2010-0016, unless the Executive Officer provides conditional approval for Copermittees to proceed with implementation of the proposed monitoring and assessment program developed in accordance with Provision B.4;

(2) Continue the monitoring in the Hydromodification Management Plans approved by the San Diego Water Board;

(3) Participate in the following regional receiving water monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring,

(b) Southern California Bight Regional Monitoring, and

(c) Sediment Quality Monitoring;

(4) Implement the monitoring programs developed as part of any implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) for the TMDLs in Attachment E to this Order; and

(5) For Watershed Management Areas with ASBS, implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

b. LONG-TERM RECEIVING WATER MONITORING STATIONS

The Copermittees must select at least one long-term receiving water monitoring station from among the existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees to be representative of the receiving water quality in the Watershed Management Area. Additional long-term receiving water monitoring stations must be selected where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

c. DRY WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three dry weather monitoring events at each of the long-term receiving water monitoring stations. At least one monitoring event must be conducted during the dry season (May 1 – September 30) and at least one monitoring event must be conducted during a dry weather period during the wet season (October 1 – April 30), after the first wet weather event of the season, with an antecedent dry period of at least 72 hours following a storm event producing measureable rainfall of greater than 0.1 inch.

(1) Dry Weather Receiving Water Field Observations

For each dry weather monitoring event, the Copermittees must record field observations consistent with Table D-1 at each long-term receiving water monitoring station.

Table D-1. Field Observations for Receiving Water Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) • Station description (i.e. deposits or stains, vegetation condition, structural condition, and observable biology) • Presence and assessment of trash in and around station

(2) Dry Weather Receiving Water Field Monitoring

For each dry weather monitoring event, if conditions allow the collection of the data, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

Table D-2. Field Monitoring Parameters for Receiving Water Monitoring Stations

Parameters
• pH • Temperature • Specific conductivity • Dissolved oxygen • Turbidity

(3) Dry Weather Receiving Water Analytical Monitoring

For each dry weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable NAL constituents, and

(v) Constituents listed in Table D-3.

Table D-3. Analytical Monitoring Constituents for Receiving Water Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Pesticides	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Mercury • Nickel • Selenium • Thallium • Zinc	• Organophosphate Pesticides • Pyrethroid Pesticides	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(4) Dry Weather Receiving Water Toxicity Monitoring

For each dry weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for aquatic toxicity in accordance with Table D-4. When the State Water Board's Policy for Toxicity Assessment and Control (Toxicity Policy) is approved and in effect, the San Diego Water Board Executive Officer may direct the Copermittees to replace current toxicity program elements with standardized procedures in the Toxicity Policy.

Table D-4. Dry Weather Chronic[1] Toxicity Testing for Receiving Water Monitoring Stations

Organism	Units	Test	USEPA Protocol
Freshwater			
Pimephales promelas (Fathead Minnow)	Pass / Fail	Larval Survival and Growth	EPA-821-R-02-013
Ceriodaphnia dubia (*Daphnid*)	Pass / Fail	Survival and Production	EPA-821-R-02-013
Selenastrum capricornutum (Green Algae)	Pass / Fail	Growth	EPA-821-R-02-013
Marine and Estuarine			
Strongylocentrotus purpuratus *(Purple Sea Urchin)*	Pass / Fail	Embryo-Larval Development	EPA-600-R-95-136

Notes:
1. Chronic toxicity testing is not required at receiving water monitoring stations located at mass loading stations if the channel flows are diverted year-round during dry weather conditions to the sanitary sewer for treatment.

(a) Freshwater Test Species and Methods: If samples are collected in receiving waters with salinity less than 1 ppt, the Copermittees must follow the methods for chronic toxicity tests as established in 40 CFR 136.3 using a single-concentration test design for routine monitoring, or a five-concentration test design for additional toxicity testing if the limitation is exceeded. The Copermittees must estimate the critical life stage chronic toxicity on undiluted samples in accordance with species and short term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms (EPA-821-R-02-013; Table IA, 40 CFR 136). Additional test species may be used by the Copermittees if approved by the San Diego Water Board Executive Officer. The Copermittees must conduct:

(i) A static renewal toxicity test with the fathead minnow, *Pimephales promelas* (Larval Survival and Growth Test Method 1000.0);

(ii) A static renewal toxicity test with the daphnid, *Ceriodaphnia dubia* (Survival and Reproduction Test Method 1002.0); and

(iii) A static renewal toxicity test with the green alga, *Selenastrum capricornutum* (also named *Raphidocelis subcapitata*) (Growth Test Method 1003.0).

(b) Marine and Estuarine Test Species and Methods: If samples are collected in receiving waters with salinity greater or equal to 1 ppt, the Copermittees must follow the methods for chronic toxicity tests as established in 40 CFR 136.3 using a single-concentration test design for routine monitoring, or a five-concentration test design for additional toxicity testing if the limitation is exceeded. The Copermittees must conduct the following critical life state chronic toxicity tests on undiluted samples in accordance with species and short term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms (EPA-600-R-95-136; 1995). Artificial sea salts must be used to increase sample salinity. The Copermittees must conduct a static non-renewal toxicity test with the purple sea urchin, *Strongylocentrotus purpuratus* (Embryo-larval Development Test Method). Additional species may be used by the Copermittees if approved by the San Diego Water Board Executive Officer.

(c) Holding Times: All toxicity tests must be conducted as soon as possible following sample collection. The 36-hour sample holding time for test initiation shall be targeted. However, no more than 72 hours shall elapse before the conclusion of sample collection and test initiation.

(d) Test Species Sensitivity Screening: To determine the most sensitive test species for freshwater, the Copermittees must screen 2 wet weather and 2 dry weather toxicity tests with a vertebrate, an invertebrate, and a plant species. After this screening period, subsequent monitoring must be conducted using the most sensitive test species. Alternatively, if a sensitive test species has already been determined, or if there is prior knowledge of potential toxicant(s) and a test species is sensitive to such toxicant(s), then monitoring must be conducted using only that test species. Sensitive test species determinations must also consider the most sensitive test species used for proximal receiving water monitoring. Rescreening must occur once each permit term.

(e) Chronic toxicity test biological endpoint data must be analyzed using the Test of Significant Toxicity t-test approach specified in *National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document* (USEPA, Office of Wastewater Management, Washington, D.C., EPA-833-R-10-003, 2010). For this monitoring program, the critical chronic instream waste concentration (IWC) is set at 100 percent receiving water (i.e. no dilution) for receiving water samples. A 100 percent receiving water and a control must be tested.

(f) Toxicity Identification Evaluation (TIE) / Toxicity Reduction Evaluation (TRE): If chronic toxicity is detected in receiving waters, the Copermittees must discuss the need for conducting a TIE/TRE in the assessments

required under Provision D.4.a.(2), and develop a plan for implementing the TIE/TRE to be incorporated in the Water Quality Improvement Plan.

(5) Dry Weather Receiving Water Bioassessment Monitoring

Bioassessment monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must conduct bioassessment monitoring during at least one dry weather monitoring event at each long-term receiving water monitoring station as follows:

(a) The following bioassessment samples and measurements must be collected:

(i) Macroinvertebrate samples must be collected in accordance with the "Reachwide Benthos (Multihabitat) Procedure" in the most current Surface Water Ambient Monitoring Program (SWAMP) Bioassessment Standard Operating Procedures (SOP), and amendments, as applicable;[16]

(ii) The "Full" suite of physical habitat characterization measurements must be collected in accordance with the most current SWAMP Bioassessment SOP, and as summarized in the SWAMP Stream Habitat Characterization Form – Full Version;[17] and

(iii) Freshwater algae samples must be collected in accordance with the SWAMP Standard Operating Procedures for Collecting Algae Samples.[18] Analysis of samples must include algal taxonomic composition (diatoms and soft algae) and algal biomass.

(b) The bioassessment samples, measurements, and appropriate water chemistry data must be used to calculate the following:

(i) An Index of Biological Integrity (IBI) for macroinvertebrates for each monitoring station where bioassessment monitoring was conducted, based on the most current calculation method;[19] and

[16] Ode, P.R.. 2007. Standard operating procedures for collecting macroinvertebrate samples and associated physical and chemical data for ambient bioassessments in California. California State Water Resources Control Board Surface Water Ambient Monitoring Program (SWAMP) Bioassessment SOP 001. http://www.swrcb.ca.gov/water_issues/programs/swamp/tools.shtml#monitoring
[17] Available at: http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/reports/fieldforms_fullversion052908.pdf
[18] Fetscher et al. 2009. Standard Operating Procedures for Collecting Stream Algae Samples and Associated Physical Habitat and Chemical Data for Ambient Bioassessments in California.
[19] The most current calculation method at the time the Order was adopted is outlined in "A Quantitative Tool for Assessing the Integrity of Southern California Coastal Streams" (Ode, et al. 2005. Environmental Management. Vol. 35, No. 1, pp. 1-13). If an updated or new calculation method is developed, either both

(ii) An IBI for algae for each monitoring station where bioassessment monitoring was conducted, when a calculation method is developed.[20]

(c) In lieu of the requirements of Provision D.1.c.(5)(a), the Copermittees may conduct the bioassessment monitoring in accordance with the "Triad" assessment approach[21] to calculate the IBIs required for Provision D.1.c.(5)(b). The Copermittees must conduct sampling, analysis, and reporting of specified in-stream biological and habitat data according to the protocols specified in the SCCWRP Technical Report No. 539, or subsequent protocols, if developed.

(6) Dry Weather Receiving Water Hydromodification Monitoring

In addition to the hydromodification monitoring conducted as part of the Copermittees' Hydromodification Management Plans, hydromodification monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must collect the following hydromodification monitoring observations and measurements within an appropriate domain of analysis during at least one dry weather monitoring event for each long-term receiving water monitoring station:

(a) Channel conditions, including:

(i) Channel dimensions,

(ii) Hydrologic and geomorphic conditions, and

(iii) Presence and condition of vegetation and habitat;

(b) Location of discharge points;

(c) Habitat integrity;

(d) Photo documentation of existing erosion and habitat impacts, with location (i.e. latitude and longitude coordinates) where photos were taken;

(e) Measurement or estimate of dimensions of any existing channel bed or bank eroded areas, including length, width, and depth of any incisions; and

(i.e. current and updated/new) methods must be used, or historical IBIs must be recalculated with the updated or new calculation method.

[20] When a calculation method is developed, IBIs must be calculated for all available and appropriate historical data.

[21] Stormwater Monitoring Coalition Model Monitoring Technical Committee, 2004. Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California. Technical Report #419. August 2004.

(f) Known or suspected cause(s) of existing downstream erosion or habitat impact, including flow, soil, slope, and vegetation conditions, as well as upstream land uses and contributing new and existing development.

d. WET WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three wet weather monitoring events at each long-term receiving water monitoring station. At least one wet weather monitoring event must be conducted during the first wet weather event of the wet season (October 1 – April 30), and at least one wet weather monitoring event during a wet weather event that occurs after February 1.

(1) Wet Weather Receiving Water Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each long-term receiving water monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event;

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(d) Presence and assessment of trash in and around station.

(2) Wet Weather Receiving Water Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

(3) Wet Weather Receiving Water Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) Constituents listed in Table D-3.

(4) Wet Weather Receiving Water Toxicity Monitoring

For each wet weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for chronic aquatic toxicity in accordance with Provisions D.1.c.(4)(a)-(f).

e. OTHER RECEIVING WATER MONITORING REQUIREMENTS

(1) Regional Monitoring

The Copermittees must participate in the following regional receiving waters monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring; and

(b) Southern California Bight Regional Monitoring and

(c) Unified Beach Water Quality Monitoring and Assessment Program. The Orange County Copermittees shall participate in and, together with South Orange County Wastewater Authority and Orange County Health Care Agency, shall share responsibility for implementation of a unified regional beach water quality monitoring and assessment program in south Orange County, as set forth in the October 2014 report, *Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County* , issued pursuant to CWC section 13383 and subject to future revision in the San Diego Water Board December 5, 2014 Letter Directive.

(2) Sediment Quality Monitoring

The Copermittees must perform sediment monitoring to assess compliance with sediment quality receiving water limits applicable to MS4 discharges to enclosed bays and estuaries. The monitoring may be performed either by individual or multiple Copermittees to assess compliance with receiving water limits, or through participation in a water body monitoring coalition. A Sediment Monitoring Plan which satisfies the requirements of the State Water Board's Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part 1 Sediment Quality (Sediment Control Plan) must be submitted as part of the monitoring and assessment program in the Water Quality Improvement Plan.

(a) The Sediment Monitoring Plan design must include the following:

(i) The elements required under Section VII.D (Receiving Water Limits Monitoring Frequency) and Section VII.E (Sediment Monitoring) of the Sediment Control Plan;

(ii) A Quality Assurance Project Plan (QAPP) describing the project objectives and organization, functional activities, and quality assurance/quality control protocols for the water and sediment monitoring; and

(iii) A schedule for completion of all sample collection and analysis activities and submission of Sediment Monitoring Reports.

(b) The Copermittees must implement the Sediment Monitoring Plan in accordance with the schedule contained in the Sediment Monitoring Plan, unless otherwise directed in writing by the San Diego Water Board Executive Officer.

(c) The Copermittees must incorporate a Sediment Monitoring Report as part of the Water Quality Improvement Plan Annual Report in accordance with the schedule contained in the Sediment Monitoring Plan, unless otherwise directed in writing by the San Diego Water Board Executive Officer. The Sediment Monitoring Report must contain the following information:

(i) Analysis: An evaluation, interpretation and tabulation of the water and sediment monitoring data, including interpretations and conclusions as to whether applicable Receiving Water Limitations in this Order have been attained at each sample station;

(ii) Sample Location Map: The locations, type, and number of samples must be identified and shown on a site map; and

(iii) California Environmental Data Exchange Network: A statement certifying that the monitoring data and results have been uploaded into the California Environmental Data Exchange Network (CEDEN).

(d) Based on the Sediment Monitoring Report conclusions the San Diego Water Board may require a human health risk assessment to determine if the human health objective contained in Receiving Water Limitations in Provision A.2.a.(3)(b)(ii) has been attained at each sample station. In conducting a risk assessment, the Copermittees must consider any applicable and relevant information, including California Environmental Protection Agency's (Cal/EPA) Office of Environmental Health Hazard Assessment (OEHHA) policies for fish consumption and risk assessment, Cal/EPA's Department of Toxic Substances Control (DTSC) Risk Assessment, and USEPA Human Health Risk Assessment policies.

(3) ASBS Monitoring

For Watershed Management Areas with ASBS, the Copermittees must implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

f. ALTERNATIVE WATERSHED MONITORING REQUIREMENTS

The San Diego Water Board may direct the Copermittees to participate in an effort to develop alternative watershed monitoring with other regulated entities, other interested parties, and the San Diego Water Board to refine, coordinate, and implement regional monitoring and assessment programs to determine the status and trends of water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams.

2. MS4 Outfall Discharge Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the discharges from the MS4 outfalls in each Watershed Management Area during dry weather and wet weather. Following San Diego Water Board acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct MS4 outfall discharge monitoring during implementation of the Water Quality Improvement Plan to assess the effectiveness of their jurisdictional runoff management programs toward effectively prohibiting non-storm water discharges into the MS4 and reducing pollutants in storm water discharges from their MS4s to the MEP. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following MS4 outfall monitoring procedures:

a. TRANSITIONAL MS4 OUTFALL DISCHARGE MONITORING

Until the monitoring requirements and schedules of Provisions D.2.b-c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following MS4 outfall discharge monitoring in the Watershed Management Area:

(1) MS4 Outfall Discharge Monitoring Station Inventory

Each Copermittee must identify all major MS4 outfalls that discharge directly to receiving waters within its jurisdiction and geo-locate those outfalls on a map of the MS4 pursuant to Provision E.2.b.(1). This information must be compiled into a MS4 outfall discharge monitoring station inventory, and must include the following information:

(a) Latitude and longitude of MS4 outfall point of discharge;

(b) Watershed Management Area;

(c) Hydrologic subarea;

(d) Outlet size;

(e) Accessibility (i.e. safety and without disturbance of critical habitat);

(f) Approximate drainage area; and

(g) Classification of whether the MS4 outfall is known to have persistent dry weather flows, transient dry weather flows, no dry weather flows, or unknown dry weather flows.

(2) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Until the monitoring requirements and schedules of Provision D.2.b are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, each Copermittee must perform dry weather MS4 outfall field screening monitoring to identify non-storm water and illicit discharges within its jurisdiction in accordance with Provision E.2.c, to determine which discharges are transient flows and which are persistent flows, and prioritize the dry weather MS4 discharges that will be investigated and eliminated in accordance with Provision E.2.d.

(a) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Frequency

Each Copermittee must field screen the MS4 outfalls in its inventory developed pursuant to Provision D.2.a.(1) as follows:

(i) For Copermittees with less than 125 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 80 percent of the outfalls must be visually inspected two times per year during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv).

(ii) For Copermittees with 125 major MS4 outfalls or more, but less than or equal to 500 that discharge to receiving waters within a Watershed Management Area, all the outfalls must be visually inspected at least annually during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv).

(iii) For Copermittees with more than 500 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 500 outfalls must be visually inspected at least annually during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv). Copermittees with more than 500 major MS4 outfalls within a Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;

[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(iv) For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major MS4 outfalls within its jurisdiction, at least 500 major MS4 outfalls within its inventory must be visually inspected at least annually during dry weather conditions. Copermittees with more than 500 major MS4 outfalls in more than one Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(v) Inspections of major MS4 outfalls conducted in response to public reports and staff or contractor reports and notifications may count toward the required visual inspections of MS4 outfall discharge monitoring stations.

(b) Transitional Dry Weather MS4 Outfall Discharge Field Screening Visual Observations

(i) An antecedent dry period of at least 72 hours following any storm event producing measurable rainfall greater than 0.1 inch is required prior to conducting field screening visual observations during a field screening monitoring event.

(ii) During the field screening monitoring event, each Copermittee must record visual observations consistent with Table D-5 at each MS4 outfall discharge monitoring station inspected.

Table D-5. Field Screening Visual Observations for MS4 Outfall Discharge Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) - Flow source(s) suspected or identified from non-storm water source investigation - Flow source(s) eliminated during non-storm water source identification • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) - Known or suspected source(s) of pooled or ponded water • Station description (i.e. deposits or stains, vegetation condition, structural condition, observable biology) • Presence and assessment of trash in and around station • Evidence or signs of illicit connections or illegal dumping

(iii) Each Copermittee must implement the requirements of Provisions E.2.d.(2)(c)-(e) based on the field observations required pursuant to Provision D.2.a.(2)(b)(ii).

(iv) Each Copermittee must evaluate field observations together with existing information available from prior reports, inspections and monitoring results to determine whether any observed flowing, pooled, or ponded waters are likely to be transient or persistent flow.[22]

(c) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Records

Based upon the results of the transitional dry weather MS4 outfall discharge field screening monitoring conducted pursuant to Provisions D.2.a.(2)(a)-(b), each Copermittee must update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow.

(3) Transitional Wet Weather MS4 Outfall Discharge Monitoring

Until the monitoring requirements and schedules of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the

[22] Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(a) Transitional Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees must select wet weather MS4 outfall discharge monitoring stations from the inventories developed pursuant to Provision D.2.a.(1) for each Watershed Management Area as follows:

(i) At least five wet weather MS4 outfall discharge monitoring stations that are representative of storm water discharges from areas consisting primarily of residential, commercial, industrial, and typical mixed-use land uses present within the Watershed Management Area;

(ii) At least one wet weather MS4 outfall discharge monitoring station for each Copermittee within the Watershed Management Area; and

(iii) The County of San Diego may select at least two (2) wet weather MS4 outfall discharge monitoring stations for the portion of the Santa Margarita River Watershed Management Area within its jurisdiction to be monitored during the transitional period until the Riverside County Copermittees are notified of coverage under this Order. After the Riverside County Copermittees are notified of coverage under this Order, the Copermittees in the Watershed Management Area must select wet weather MS4 outfall discharge monitoring stations consistent with the requirements above.

(b) Transitional Wet Weather MS4 Outfall Discharge Monitoring Frequency

Each wet weather MS4 outfall discharge monitoring station selected pursuant to Provision D.2.a.(3)(a) must be monitored once during the wet season (October 1 – April 30). The wet weather monitoring events must be selected to be representative of the range of hydrological conditions experienced in the region. At least 10 percent of samples must be conducted during the first wet weather event of the wet season, to include at least one such sample in each Watershed Management Area..

(c) Transitional Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(i) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(ii) The flow rates and volumes measured or estimated from the MS4 outfall (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(d) Transitional Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(e) Transitional Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, and indicator bacteria;

(iv) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

[a] Time-weighted composites collected over the length of the storm event or the first 24 hour period whichever is shorter, composed of discrete samples, which may be collected through the use of automated equipment, or

[b] Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

[c] If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during

the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours;

(v) Only one analysis of the composite of aliquots is required;

(vi) The samples must be analyzed for the following constituents:

[a] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

[b] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and

[c] Constituents listed in Table D-6.

Table D-6. Analytical Monitoring Constituents for Wet Weather MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Nickel • Selenium • Thallium • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(f) Other Transitional Wet Weather MS4 Outfall Discharge Monitoring

The San Diego County Copermittees must continue the wet weather MS4 outfall monitoring program developed under Order No. R9-2007-0001, as approved by the San Diego Water Board, through its planned completion.

b. Dry Weather MS4 Outfall Discharge Monitoring

Each Copermittee must perform dry weather MS4 outfall monitoring to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision

E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. Each Copermittee must conduct the following dry weather MS4 outfall discharge monitoring within its jurisdiction:

(1) Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Each Copermittee must continue to perform the dry weather MS4 outfall discharge field screening monitoring in accordance with the requirements of Provision D.2.a.(2). The Copermittee may adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of persistent flow non-storm water discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of visual inspections performed is equivalent to the number of visual inspections required under Provision D.2.a.(2)(a).

(2) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring

Each Copermittee must perform non-storm water persistent flow MS4 outfall discharge monitoring to determine which persistent non-storm water discharges contain concentrations of pollutants below NALs, and which persistent non-storm water discharges impact receiving water quality during dry weather. Each Copermittee must conduct the following non-storm water persistent flow MS4 outfall discharge monitoring within its jurisdiction:

(a) Prioritization of Non-Storm Water Persistent Flow MS4 Outfalls

Based upon the dry weather MS4 outfall discharge field screening monitoring records developed pursuant to Provision D.2.a.(2)(c), each Copermittee must identify and prioritize the MS4 outfalls with persistent flows based on the highest priority water quality conditions identified in the Water Quality Improvement Plan and any additional criteria developed by the Copermittee, which may include historical data and data from sources other than what the Copermittee collects.

(b) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring Frequency

(i) Based on the prioritization of major MS4 outfalls developed under Provision D.2.b.(2)(a), each Copermittee must identify, at a minimum, the 5 highest priority major MS4 outfalls with non-storm water persistent flows that the Copermittee will monitor within its jurisdiction in each Watershed Management Area. For Responsible Copermittees identified by a TMDL in Attachment E to this Order, if the 5 chosen outfall locations are not sufficient to determine compliance with the TMDL(s), then each Responsible Copermittee

must identify additional MS4 outfall monitoring locations within its jurisdiction sufficient to address compliance with the TMDL(s). If a Copermittee has less than 5 major outfalls within a Watershed Management Area, then the Copermittee must monitor all of its major MS4 outfalls with persistent flows within each Watershed Management Area. The location of the highest priority non-storm water persistent flow MS4 outfall monitoring stations must be identified on the map required pursuant to Provision E.2.b.(1). The map must specify which MS4 outfalls are being monitored for compliance with a TMDL.

(ii) Each of the highest priority non-storm water persistent flow MS4 outfall monitoring stations identified pursuant to Provision D.2.b.(2)(b)(i) must be monitored under dry weather conditions at least semi-annually until one of the following occurs:

[a] The non-storm water discharges have been effectively eliminated (i.e. no flowing, pooled, or ponded water) for three consecutive dry weather monitoring events; or

[b] The source(s) of the persistent flows has been identified as a category of non-storm water discharges that does not require an NPDES permit and does not have to be addressed as an illicit discharge because it was not identified as a source of pollutants (i.e. constituents in non-storm water discharge do not exceed NALs), and the persistent flow can be re-prioritized to a lower priority; or

[c] The constituents in the persistent flow non-storm water discharge do not exceed NALs, and the persistent flow can be re-prioritized to a lower priority; or

[d] The source(s) of the persistent flows has been identified as a non-storm water discharge authorized by a separate NPDES permit.

(iii) Where the criteria under Provision D.2.b.(2)(b)(ii) are not met, but the threat to water quality has been reduced by the Copermittee, the highest priority persistent flow MS4 outfall monitoring stations may be reprioritized accordingly for continued dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1).

(iv) Each Copermittee must document removal or re-prioritization of the highest priority persistent flow MS4 outfall monitoring stations identified under Provision D.2.b.(2)(a) in the Water Quality Improvement Plan Annual Report. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized major MS4 outfall in the Watershed Management Area within its jurisdiction, unless there are no remaining qualifying major MS4 outfalls within the Copermittee's jurisdiction in the Watershed Management Area.

(c) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Observations

During each semi-annual monitoring event, each Copermittee must record field observations consistent with Table D-5 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(d) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Monitoring

During each semi-annual monitoring event, if conditions allow the collection of the data, each Copermittee must monitor and record the parameters in Table D-2 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(e) Non-Storm Water Persistent Flow MS4 Outfall Discharge Analytical Monitoring

During each semi-annual monitoring event in which measurable flow is present, each Copermittee must collect and analyze samples from each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Collect grab or composite samples to be analyzed at a qualified laboratory for the following constituents:

[a] Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,
[b] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,
[c] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,
[d] Applicable NAL constituents, and
[e] Constituents listed in Table D-7. The Copermittees may adjust the list of constituents for the Watershed Management Area if historical data or supporting information can be provided that demonstrates or justifies the analysis of a constituent is not necessary.

Table D-7. Analytical Monitoring Constituents for Persistent Flow MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Total Hardness • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Cadmium • Copper • Lead • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(iv) If the Copermittee identifies and eliminates the source of the persistent flow non-storm water discharge, analysis of the sample is not required.

c. WET WEATHER MS4 OUTFALL DISCHARGE MONITORING

The Copermittees must perform wet weather MS4 outfall monitoring to identify pollutants in storm water discharges from the MS4s, to guide pollutant source identification efforts, and to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order. The Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(1) Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees may adjust the wet weather MS4 outfall discharge monitoring locations in the Watershed Management Area, as needed, to identify pollutants in storm water discharges from MS4s, to guide pollutant source identification efforts, and to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of stations is at least equivalent to the number of stations required under Provision D.2.a.(3)(a). Additional outfall monitoring locations, above the minimum per jurisdiction, may be required to demonstrate compliance with the WQBELs associated with the applicable TMDLs in Attachment E.

(2) Wet Weather MS4 Outfall Discharge Monitoring Frequency

The Copermittees must monitor the wet weather MS4 outfall discharge monitoring stations in the Watershed Management Area at least once (1) per year. The Copermittees may need to increase the frequency of monitoring in order to identify pollutants in storm water discharges from the MS4s causing or contributing to the highest priority water quality conditions, to guide pollutant source identification efforts, or to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order.

(3) Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(4) Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(5) Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites collected over the length of the storm event or the first 24 hour period, whichever is shorter , composed of discrete samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

(iii) If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours.

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) The Copermittees may adjust the analytical monitoring required for the Watershed Management Area, if the Copermittees have historical data or supporting information that can demonstrate or provide justification that the analysis of a constituent is not necessary.

3. Special Studies

a. Within the term of this Order, the Copermittees must initiate the following special studies:

(1) At least two special studies in each Watershed Management Area to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that cause or contribute to highest priority water quality conditions identified in the Water Quality Improvement Plan.

(2) At least one special study for the San Diego Region to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that are impacting receiving waters on a regional basis in the San Diego Region.

(3) One of the two special studies in each Watershed Management Area required pursuant to Provision D.3.a.(1) may be replaced by a special study implemented pursuant to Provision D.3.a.(2).

b. The special studies must, at a minimum, be in conformance with the following criteria:

(1) The special studies must be related to the highest priority water quality conditions identified by the Copermittees in the Watershed Management Area and/or for the entire San Diego Region;

(2) The special studies developed pursuant to Provision D.3.a.(1) must:

(a) Be implemented within the applicable Watershed Management Area, and

(b) Require some form of participation by all the Copermittees within the Watershed Management Area;

(3) The special studies developed pursuant to Provision D.3.a.(2) must:

(a) Be implemented within the San Diego Region, and

(b) Require some form of participation by all Copermittees covered under the requirements of this Order.

(4) The Copermittees are encouraged to partner with environmental groups or third parties knowledgeable of watershed conditions to complete the required special studies.

c. Special studies developed to identify sources of pollutants and/or stressors should be pollutant and/or stressor specific and based on historical monitoring data and monitoring performed pursuant to Provisions D.1 and D.2. Development of source identification special studies should include the following:

(1) A compilation of known information on the specific pollutant and/or stressor, including data on potential sources and movement of the pollutant and/or stressor within the watershed. Data generated by the Copermittees and others, as well as information available from a literature research on the pollutant and/or stressor should be compiled and analyzed as appropriate.

(2) An identification of data gaps, based on the compiled information generated on the specific pollutant and/or stressor identified in Provision D.3.c.(1). Source identification special studies should be developed to fill identified data gaps.

(3) A monitoring plan that will collect and provide data the Copermittees can utilize to do the following:

(a) Quantify the relative loading or impact of a pollutant and/or stressor from a particular source or pollutant generating activity;

(b) Improve understanding of the fate of a pollutant and/or stressor in the environment;

(c) Develop an inventory of known and suspected sources of a pollutant and/or stressor in the Watershed Management Area; and/or

(d) Prioritize known and suspected sources of a pollutant and/or stressor based on relative magnitude in discharges, geographical distribution (i.e., regional or localized), frequency of occurrence in discharges, human health risk, and controllability.

d. Special studies initiated prior to the effective date of this Order that meet the requirements of Provision D.3.b and are implemented during the term of this Order as part of the Water Quality Improvement Plan may be utilized to fulfill the special study requirements of Provision D.3.a. Special studies completed before the effective date of this Order cannot be utilized to fulfill the special study requirements of Provision D.3.a.

e. The Copermittees must submit the monitoring plans for the special studies in the Water Quality Improvement Plans required pursuant to Provision F.1.

f. The Copermittees are encouraged to share the results of the special studies regionally among the Copermittees to provide information useful in improving and adapting the management of non-storm water and storm water runoff through the implementation of the Water Quality Improvement Plans.

4. Assessment Requirements

Each Copermittee must evaluate the data collected pursuant to Provisions D.1, D.2 and D.3, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E, to assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a. Assessments must be performed as described in the following provisions:

a. Receiving Waters Assessments

(1) The Copermittees must assess and report the conditions of the receiving waters in the Watershed Management Area as follows:

(a) Based on data collected pursuant to Provision D.1.a, the assessments under Provision D.4.a.(2) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(b) Based on the data collected pursuant to Provisions D.1.a-e, the assessments required under Provision D.4.a.(2) must be included in the Report of Waste Discharge required pursuant to Provision F.5.b.

(2) The Copermittees must assess the status and trends of receiving water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under dry weather and wet weather conditions. For each of the three types of receiving waters in each Watershed Management Area the Copermittees must:

(a) Determine whether or not the conditions of the receiving waters are meeting the numeric goals established pursuant to Provision B.3.a;

(b) Identify the most critical beneficial uses that must be protected to ensure overall health of the receiving water;

(c) Determine whether or not those critical beneficial uses are being protected;

(d) Identify short-term and/or long-term improvements or degradation of those critical beneficial uses;

(e) Determine whether or not the strategies established in the Water Quality Improvement Plan contribute towards progress in achieving the interim and final numeric goals of the Water Quality Improvement Plan; and

(f) Identify data gaps in the monitoring data necessary to assess Provisions D.4.a.(2)(a)-(e).

b. MS4 OUTFALL DISCHARGES ASSESSMENTS

(1) Non-Storm Water Discharges Reduction Assessments

(a) Each Copermittee must assess and report the progress of its illicit discharge detection and elimination program, required to be implemented pursuant to Provision E.2, toward effectively prohibiting non-storm water and illicit discharges into the MS4 within its jurisdiction as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(2), the assessments under Provision D.4.b.(1)(b) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(ii) Based on the data collected pursuant to Provisions D.2.b, the assessments required under Provision D.4.b.(1)(c) must be included in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

(iii) Based on the data collected pursuant to Provisions D.2.b, the assessment required under Provision D.4.b.(1)(c) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.a.(2), each Copermittee must assess and report the following:

(i) Identify the known and suspected controllable sources (e.g. facilities, areas, land uses, pollutant generating activities) of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area;

(ii) Identify sources of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area that have been reduced or eliminated; and

(iii) Identify modifications to the field screening monitoring locations and frequencies for the MS4 outfalls in its inventory necessary to identify and eliminate sources of persistent flow non-storm water discharges pursuant to Provision D.2.b.

(c) Based on the dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1), each Copermittee must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(1)(b);

(ii) Based on the data collected and applicable NALs in the Water Quality Improvement Plan, rank the MS4 outfalls in the Copermittee's jurisdiction according to potential threat to receiving water quality, and produce a prioritized list of major MS4 outfalls for follow-up action to update the Water Quality Improvement Plan, with the goal of eliminating persistent flow non-storm water discharges and/or pollutant loads in order of the ranked priority list through targeted programmatic actions and source investigations;

(iii) For the highest priority major MS4 outfalls with persistent flows that are in exceedance of NALs, identify the known and suspected sources within the Copermittee's jurisdiction in the Watershed Management Area that may cause or contribute to the NAL exceedances;

(iv) Each Copermittee must analyze the data collected pursuant to Provision D.2.b, and utilize a model or other method, to calculate or estimate the non-storm water volumes and pollutant loads collectively discharged from all the major MS4s outfalls in its jurisdiction identified as having persistent dry weather flows during the monitoring year. These calculations or estimates must be updated annually.

[a] Each Copermittee must calculate or estimate the annual non-storm water volumes and pollutant loads collectively discharged from the Copermittee's major MS4 outfalls to receiving waters within the Copermittee's jurisdiction, with an estimate of the percent contribution from each known source for each MS4 outfall;

[b] Each Copermittee must annually identify and quantify (i.e. volume and pollutant loads) sources of non-storm water not subject to the Copermittee's legal authority that are discharged from the Copermittee's major MS4 outfalls to downstream receiving waters.

(v) Each Copermittee must review the data collected pursuant to Provision D.2.b and findings from the assessments required pursuant to Provision D.4.b.(1)(c)(i)-(iv) at least once during the term of this Order to:

[a] Identify reductions and progress in achieving reductions in non-storm water and illicit discharges to the Copermittee's MS4 in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction, with an estimate, if possible, of the non-storm water volume and/or pollutant load reductions attributable to specific water quality strategies implemented by the Copermittee; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittee in the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction.

(vi) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(1)(c)(i)-(v).

(2) Storm Water Pollutant Discharges Reduction Assessments

(a) The Copermittees must assess and report the progress of the water quality improvement strategies, required to be implemented pursuant to Provisions B and E, toward reducing pollutants in storm water discharges from the MS4s within the Watershed Management Area as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(3), the assessments under Provision D.4.b.(2)(b) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(ii) Based on the data collected pursuant to Provisions D.2.c, the assessments required under Provision D.4.b.(2)(c) must be included in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

(iii) Based on the data collected pursuant to Provisions D.2.c, the assessment required under Provisions D.4.b.(2)(c)-(d) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.a.(3) the Copermittees must assess and report the following:

(i) The Copermittees must analyze the monitoring data collected pursuant to Provision D.2.a.(3), and utilize a watershed model or other method, to calculate or estimate the following for each monitoring year:

[a] The average storm water runoff coefficient for each land use type within the Watershed Management Area;
[b] The volume of storm water and pollutant loads discharged from each of the Copermittee's monitored MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch;
[c] The total flow volume and pollutant loadings discharged from the Copermittee's jurisdiction within the Watershed Management Area over the course of the wet season, extrapolated from the data produced from the monitored MS4 outfalls; and
[d] The percent contribution of storm water volumes and pollutant loads discharged from each land use type within each hydrologic subarea with a major MS4 outfall to receiving waters or within each major MS4 outfall to receiving waters in the Copermittee's jurisdiction within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch.

(ii) Identify modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify pollutants in storm water discharges from the MS4s in the Watershed Management Area pursuant to Provision D.2.c.(1).

(c) Based on the wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.c the Copermittees must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(2)(b);

(ii) Based on the data collected and applicable SALs in the Water Quality Improvement Plan, analyze and compare the monitoring data to the analyses and assumptions used to develop the Water Quality Improvement Plans, including strategies developed pursuant to Provision B.3, and evaluate whether those analyses and assumptions should be updated as a component of the adaptive management efforts pursuant to Provision B.5 for follow-up action to update the Water Quality Improvement Plan;

(iii) The Copermittees must review the data collected pursuant to Provision D.2.c and findings from the assessments required pursuant to Provisions D.4.b.(2)(c)(i)-(ii) at least once during the term of this Order to:

[a] Identify reductions or progress in achieving reductions in pollutant concentrations and/or pollutant loads from different land uses and/or drainage areas discharging from the Copermittees' MS4s in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters within the Watershed Management Area to the MEP, with an estimate, if possible, of the pollutant load reductions attributable to specific water quality strategies implemented by the Copermittees; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittees in the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters in the Watershed Management Area to the MEP.

(iv) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(iii).

(d) The Copermittees must evaluate all the data collected pursuant to Provision D.2.c, and incorporate new outfall monitoring data into time series plots for each long-term monitoring constituent for the Watershed Management Area, and perform statistical trends analysis on the cumulative long-term wet weather MS4 outfall discharge water quality data set.

c. Special Studies Assessments

The Copermittees must annually evaluate the results and findings from the special studies developed and implemented pursuant to Provision D.3, and assess their relevance to the Copermittees' efforts to characterize receiving water conditions, understand sources of pollutants and/or stressors, and control and reduce the discharges of pollutants from the MS4 outfalls to receiving waters in the Watershed Management Area. The Copermittees must report the results of the special studies assessments applicable to the Watershed Management Area, and identify any necessary modifications or updates to the Water Quality Improvement Plan based on the results in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

d. Integrated Assessment of Water Quality Improvement Plan

As part of the iterative approach and adaptive management process required for the Water Quality Improvement Plan pursuant to Provision B.5, the Copermittees in each Watershed Management Area must integrate the data collected pursuant to Provisions D.1-D.3, the findings from the assessments required pursuant to

Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to assess the effectiveness of, and identify necessary modifications to, the Water Quality Improvement Plan as follows:

(1) The Copermittees must re-evaluate the priority water quality conditions and numeric goals for the Watershed Management Area, as needed, during the term of this Order pursuant to Provision B.5.a. The re-evaluation and recommendations for modifications to the priority water quality conditions, and/or numeric goals and corresponding schedules may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The priority water quality conditions and numeric goals for the Watershed Management Area must be re-evaluated as follows:

(a) Re-evaluate the receiving water conditions in the Watershed Management Area in accordance with Provision B.2.a;

(b) Re-evaluate the impacts on receiving waters in the Watershed Management Area from MS4 discharges in accordance with Provision B.2.b;

(c) Re-evaluate the identification of MS4 sources of pollutants and/or stressors in accordance with Provision B.2.d;

(d) Identify beneficial uses of the receiving waters that are protected in accordance with Provision D.4.a;

(e) Evaluate the progress toward achieving the interim and final numeric goals for protecting impacted beneficial uses in the receiving waters.

(2) The Copermittees must re-evaluate the water quality improvement strategies for the Watershed Management Area during the term of this Order pursuant to Provision B.5.b. The re-evaluation and recommendations for modifications to the water quality improvement strategies and schedules may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The water quality improvement strategies for the Watershed Management Area must be re-evaluated as follows:

(a) Identify the non-storm water and storm water pollutant loads from the Copermittees' MS4 outfalls in the Watershed Management Area, calculated or estimated pursuant to Provisions D.4.b;

(b) Identify the non-storm water and storm water pollutant load reductions, or other improvements to receiving water or water quality conditions, that are necessary to attain the interim and final numeric goals identified in the Water Quality Improvement Plan for protecting beneficial uses in the receiving waters;

(c) Identify the non-storm water and storm water pollutant load reductions, or other improvements to the quality of MS4 discharges, that are necessary for the Copermittees to demonstrate that non-storm water and storm water discharges from their MS4s are not causing or contributing to exceedances of receiving water limitations;

(d) Evaluate the progress of the water quality improvement strategies toward achieving the interim and final numeric goals identified in the Water Quality Improvement Plan for protecting beneficial uses in the receiving waters.

(3) The Copermittees must re-evaluate and adapt the water quality monitoring and assessment program for the Watershed Management Area when new information becomes available to improve the monitoring and assessment program pursuant to Provision B.5.c. The re-evaluation and recommendations for modifications to the monitoring and assessment program may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. Modifications to the water quality monitoring and assessment program must be consistent with the requirements of Provision D.1-D.3. The re-evaluation of the water quality monitoring and assessment program for the Watershed Management Area must consider the data gaps identified by the assessments required pursuant to Provisions D.4.a-b, and results of the special studies implemented pursuant to Provision D.4.c.

5. Monitoring Provisions

Each Copermittee must comply with all the monitoring, reporting, and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

E. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS

The purpose of this provision is for each Copermittee to implement a program to control the contribution of pollutants to and the discharges from the MS4 within its jurisdiction. The goal of the jurisdictional runoff management programs is to implement strategies that effectively prohibit non-storm water discharges to the MS4 and reduce the discharge of pollutants in storm water to the MEP. This goal will be accomplished through implementing the jurisdictional runoff management programs in accordance with the strategies identified in the Water Quality Improvement Plans.

Each Copermittee must update its jurisdictional runoff management program document, in accordance with Provision F.2.a, to incorporate all the requirements of Provision E. Until the Copermittee has updated its jurisdictional runoff management program document with the requirements of Provision E, the Copermittee must continue implementing its current jurisdictional runoff management program.

1. Legal Authority Establishment and Enforcement

a. Each Copermittee must establish, maintain, and enforce adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 through statute, ordinance, permit, contract, order, or similar means. This legal authority must, at a minimum, authorize the Copermittee to:

(1) Prohibit and eliminate all illicit discharges and illicit connections to its MS4;

(2) Control the contribution of pollutants in discharges of runoff associated with industrial and construction activity to its MS4 and control the quality of runoff from industrial and construction sites, including industrial and construction sites which have coverage under the statewide General Permit for Discharges of Storm Water Associated with Industrial Activities (Industrial General Permit) or General Permit for Discharges of Storm Water Associated with Construction Activities (Construction General Permit), as well as to those sites which do not;

(3) Control the discharge of spills, dumping, or disposal of materials other than storm water into its MS4;

(4) Control through interagency agreements among Copermittees the contribution of pollutants from one portion of the MS4 to another portion of the MS4;

(5) Control, by coordinating and cooperating with other owners of the MS4 such as Caltrans, the U.S. federal government, or sovereign Native American Tribes through interagency agreements, where possible, the contribution of pollutants from their portion of the MS4 to the portion of the MS4 within the Copermittee's jurisdiction;

(6) Require compliance with conditions in its statutes, ordinances, permits, contracts, orders, or similar means to hold dischargers to its MS4 accountable for their contributions of pollutants and flows;

(7) Require the use of BMPs to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(8) Require documentation on the effectiveness of BMPs implemented to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(9) Utilize enforcement mechanisms to require compliance with its statutes, ordinances, permits, contracts, orders, or similar means; and

(10) Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with its statutes, ordinances, permits, contracts, orders, or similar means and with the requirements of this Order, including the prohibition of illicit discharges and connections to its MS4; the Copermittee must also have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from industrial facilities, including construction sites, discharging into its MS4.

b. With the first Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3), each Copermittee must submit a statement certified by its Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative that the Copermittee has taken the necessary steps to obtain and maintain full legal authority within its jurisdiction to implement and enforce each of the requirements contained in this Order.

2. Illicit Discharge Detection and Elimination

Each Copermittee must implement a program to actively detect and eliminate illicit discharges and improper disposal into the MS4, or otherwise require the discharger to apply for and obtain a separate NPDES permit. The illicit discharge detection and elimination program must be implemented in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include, at a minimum, the following requirements:

a. Non-Storm Water Discharges

Each Copermittee must address all non-storm water discharges as illicit discharges unless a non-storm water discharge is either identified as a discharge authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to the following requirements:

(1) Discharges of non-storm water to the MS4 from the following categories must be addressed as illicit discharges unless the discharge has coverage or meets the exception criteria under NPDES Permit No. CAG919003~~1 (Order No. R9-2007-0034, or subsequent order) for discharges to San Diego Bay, or NPDES Permit No. CAG919002~~ (Order No. R9-2015-0013 ~~2008-0002~~, ~~or subsequent order~~ as it may be amended or reissued) for discharges to surface waters within the San Diego Region ~~other than San Diego Bay~~:

(1) Uncontaminated pumped ground water;

(2) Discharges from foundation drains;[23]

(3) Water from crawl space pumps; and

(4) Water from footing drains.[20]

(2) Discharges of non-storm water from water line flushing and water main breaks to the MS4 must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG679001 (Order No. R9-2010-0003, ~~or subsequent order~~ as it may be amended or reissued) or NPDES General Permit No. CAG140001 (Order 2014-0194-DWQ, as it may be amended or reissued). This category includes water line flushing and water main break discharges from water purveyors issued a water supply permit by the California Department of Public Health or federal military installations. Discharges from recycled or reclaimed water lines to the MS4 must be addressed as illicit discharges, unless the discharges have coverage under a separate NPDES permit.

(3) Discharges of non-storm water to the MS4 from the following categories must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a source of pollutants to receiving waters:

(a) Diverted stream flows;

(b) Rising ground waters;

(c) Uncontaminated ground water infiltration to MS4s;

(d) Springs;

(e) Flows from riparian habitats and wetlands;

[23] Provision E.2.a.(1) only applies to this category of non-storm water if the system is designed to be located at or below the groundwater table to actively or passively extract groundwater during any part of the year.

(f) Discharges from potable water sources;

(g) Discharges from foundation drains;[24] and

(h) Discharges from footing drains.[21]

(4) Discharges of non-storm water to the MS4 from the following categories must be controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means. Discharges of non-storm water to the MS4 from the following categories not controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means must be addressed by the Copermittee as illicit discharges.

(a) Air conditioning condensation

The discharge of air conditioning condensation should be directed to landscaped areas or other pervious surfaces, or to the sanitary sewer, where feasible.

(b) Individual residential vehicle washing

(i) The discharge of wash water should be directed to landscaped areas or other pervious surfaces where feasible; and

(ii) The minimization of water, washing detergent and other vehicle wash products used for residential vehicle washing, and the implementation of other practices or behaviors that will prevent the discharge of pollutants associated with individual residential vehicle washing from entering the MS4 must be encouraged.

(c) Dechlorinated swimming pool discharges

(i) Residual chlorine, algaecide, filter backwash, or other pollutants from swimming pools must be eliminated prior to discharging to the MS4; and

(ii) The discharge of saline swimming pool water must be directed to the sanitary sewer, landscaped areas, or other pervious surfaces that can accommodate the volume of water, unless the saline swimming pool water can be discharged via a pipe or concrete channel directly to a naturally saline water body (e.g. Pacific Ocean).

(5) Firefighting discharges to the MS4 must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board

[24] Provision E.2.a.(3) only applies to this category of non-storm water discharge if the system is designed to be located above the groundwater table at all times of the year, and the system is only expected to discharge non-storm water under unusual circumstances.

identifies the discharge as a significant source of pollutants to receiving waters. Firefighting discharges to the MS4 not identified as a significant source of pollutants to receiving waters, must be addressed, at a minimum, as follows:

(a) Non-emergency firefighting discharges

(i) Building fire suppression system maintenance discharges (e.g. sprinkler line flushing) to the MS4 must be addressed as illicit discharges unless BMPs are implemented to prevent pollutants associated with such discharges to the MS4.

(ii) Non-emergency firefighting discharges (i.e., discharges from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems) must be addressed by a program, to be developed and implemented by the Copermittee, to reduce or eliminate pollutants in such discharges from entering the MS4.

(b) Emergency firefighting discharges

Each Copermittee should develop and encourage implementation of BMPs to reduce or eliminate pollutants in emergency firefighting discharges to the MS4s and receiving waters within its jurisdiction. During emergency situations, priority of efforts should be directed toward life, property, and the environment (in descending order). BMPs should not interfere with immediate emergency response operations or impact public health and safety.

(6) If the Copermittee or San Diego Water Board identifies any category of non-storm water discharges listed under Provisions E.2.a.(1)-(4) as a source of pollutants to receiving waters, the category must be prohibited through ordinance, order, or similar means and addressed as an illicit discharge. Alternatively, the Copermittee may propose controls to be implemented for the category of non-storm water discharges as part of the Water Quality Improvement Plan instead of prohibiting the category of non-storm water discharges, and implement the controls if accepted by the San Diego Water Board as part of the Water Quality Improvement Plan.

(7) Each Copermittee must, where feasible and priorities and resources allow, reduce or eliminate non-storm water discharges listed under Provisions E.2.a.(1)-(4) into its MS4, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit.

b. PREVENT AND DETECT ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to prevent and detect illicit discharges to the MS4:

(1) Each Copermittee must maintain an updated map of its entire MS4 and the corresponding drainage areas. The accuracy of the MS4 map must be confirmed during the field screening required pursuant to Provision E.2.c. The MS4 map must be included as part of the jurisdictional runoff management program document. Any geographic information system (GIS) layers or files used by the Copermittee to maintain the MS4 map must be made available to the San Diego Water Board upon request. The MS4 map must identify the following:

(a) All segments of the MS4 owned, operated, and maintained by the Copermittee;

(b) All known locations of inlets that discharge and/or collect runoff into the Copermittee's MS4;

(c) All known locations of connections with other MS4s not owned or operated by the Copermittee (e.g. Caltrans MS4s);

(d) All known locations of MS4 outfalls and private outfalls that discharge runoff collected from areas within the Copermittee's jurisdiction;

(e) All segments of receiving waters within the Copermittee's jurisdiction that receive and convey runoff discharged from the Copermittee's MS4 outfalls;

(f) Locations of the MS4 outfalls, identified pursuant to Provision D.2.a.(1), within its jurisdiction; and

(g) Locations of the non-storm water persistent flow MS4 outfall discharge monitoring stations, identified pursuant to Provision D.2.b.(2), within its jurisdiction.

(2) Each Copermittee must use Copermittee personnel and contractors to assist in identifying and reporting illicit discharges and connections during their daily employment activities.

(3) Each Copermittee must promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges to or from the MS4, including the following methods for public reporting:

(a) Operate a public hotline, which can be Copermittee-specific or shared by the Copermittees, and must be capable of receiving reports in both English and Spanish 24 hours per day and seven days per week; and

(b) Designate an e-mail address for receiving electronic reports from the public, which can be Copermittee-specific or shared by the Copermittees, and must be prominently displayed on the Copermittee's webpage and the Regional Clearinghouse required pursuant to Provision F.4.

(4) Each Copermittee must implement practices and procedures (including a notification mechanism) to prevent, respond to, contain, and clean up any spills that may discharge into the MS4 within its jurisdiction from any source. The Copermittee must coordinate, to the extent possible, with spill response teams to prevent entry of spills into the MS4, and prevent contamination of surface water, ground water, and soil. The Copermittee must coordinate spill prevention, containment, and response activities throughout all appropriate Copermittee departments, programs, and agencies.

(5) Each Copermittee must implement practices and procedures to prevent and limit infiltration of seepage from sanitary sewers (including private laterals and failing septic systems) to the MS4.

(6) Each Copermittee must coordinate, when necessary, with upstream Copermittees and/or entities to prevent illicit discharges from upstream sources into the MS4 within its jurisdiction.

c. FIELD SCREENING

Each Copermittee must conduct field screening (i.e. visual observations, field testing, and/or analytical testing) of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4 in accordance with the dry weather MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

d. INVESTIGATE AND ELIMINATE ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to investigate and eliminate illicit discharges to the MS4:

(1) Each Copermittee must prioritize and determine when follow-up investigations will be performed in response to visual observations and/or water quality monitoring data collected during an investigation of a detected non-storm water or illicit discharge to or from the MS4. The criteria for prioritizing investigations must consider the following:

(a) Pollutants identified as causing or contributing to the highest water quality priorities identified in the Water Quality Improvement Plan;

(b) Pollutants identified as causing or contributing, or threatening to cause or contribute to impairments in water bodies on the 303(d) List and/or in environmentally sensitive areas (ESAs), located within its jurisdiction;

(c) Pollutants identified from sources or land uses known to exist within the area, drainage basin, or watershed that discharges to the portion of the MS4 within its jurisdiction included in the investigation;

(d) Pollutants identified as causing or contributing to an exceedance of a NAL in the Water Quality Improvement Plan; and

(e) Pollutants identified as a threat to human health or the environment.

(2) Each Copermittee must implement procedures to investigate and inspect portions of its MS4 that, based on reports or notifications, field screening, or other appropriate information, indicate a reasonable potential of receiving, containing, or discharging pollutants due to illicit discharges, illicit connections, or other sources of non-storm water. The procedures must include the following:

(a) Each Copermittee must develop criteria to:

(i) Assess the validity of each report or notification received; and

(ii) Prioritize the response to each report or notification received.

(b) Each Copermittee must prioritize and respond to each valid report or notification (e.g., public reports, staff or contractor reports and notifications, etc.) of an incident in a timely manner.

(c) In accordance with the requirements of Provision E.2.d.(1), each Copermittee must investigate and seek to identify the source(s) of discharges of non-storm water where flows are observed in and from the MS4 during the field screening required pursuant to Provision D.2.b.(1) as follows:

(i) Obvious illicit discharges must be immediately investigated to identify the source(s) of non-storm water discharges;

(ii) The investigation must include field investigations to identify sources or potential sources for the discharge, unless the source or potential source has already been identified during previous investigations; and

(iii) The investigation may include follow-up field investigations and/or reviewing Copermittee inventories and other land use data to identify potential sources of the discharge.

(d) Each Copermittee must maintain records and a database of the following information:

(i) Location of incident, including hydrologic subarea, portion of MS4 receiving the non-storm water or illicit discharge, and point of discharge or potential discharge from MS4 to receiving water;

(ii) Source of information initiating the investigation (e.g., public reports, staff or contractor reports and notifications, field screening, etc.);

(iii) Date the information used to initiate the investigation was received;

(iv) Date the investigation was initiated;

(v) Dates of follow-up investigations;

(vi) Identified or suspected source of the illicit discharge or connection, if determined;

(vii) Known or suspected related incidents, if any;

(viii) Result of the investigation; and

(ix) If a source cannot be identified and the investigation is not continued, document the response pursuant to the requirements of Provision E.2.d.(4).

(e) Each Copermittee must maintain records and, in accordance with the priorities of the Water Quality Improvement Plan, seek to identify the source(s) of non-storm water discharges from the MS4 where there is evidence of non-storm water having been discharged into or from the MS4 (e.g., pooled water), in accordance with MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

(3) Each Copermittee must initiate the implementation of procedures, in a timely manner, to eliminate all detected and identified illicit discharges and connections within its jurisdiction. The procedures must include the following responses:

(a) Each Copermittee must enforce its legal authority, as required under Provision E.1, to eliminate illicit discharges and connections to the MS4.

(b) If the Copermittee identifies the source as a controllable source of non-storm water or illicit discharge or connection, the Copermittee must implement its Enforcement Response Plan pursuant to Provision E.6 and enforce its legal authority to prohibit and eliminate illicit discharges and connections to its MS4.

(c) If the Copermittee identifies the source of the discharge as a category of non-storm water discharges in Provision E.2.a, and the discharge is in exceedance of NALs in the Water Quality Improvement Plan, then the Copermittee must determine if: (1) this is an isolated incident or set of

circumstances that will be addressed through its Enforcement Response Plan pursuant to Provision E.6, or (2) the category of discharge must be addressed through the prohibition of that category of discharge as an illicit discharge pursuant to Provision E.2.a.(6).

(d) If the Copermittee suspects the source of the non-storm water discharge as natural in origin (i.e. non-anthropogenically influenced) and in conveyance into the MS4, then the Copermittee must document and provide the data and evidence necessary to demonstrate to the San Diego Water Board that it is natural in origin and does not require further investigation.

(e) If the Copermittee is unable to identify and document the source of a recurring non-storm water discharge to or from the MS4, then the Copermittee must address the discharge as an illicit discharge and update its jurisdictional runoff management program to address the common and suspected sources of the non-storm water discharge within its jurisdiction in accordance with the Copermittee's priorities.

(4) Each Copermittee must submit a summary of the non-storm water discharges and illicit discharges and connections investigated and eliminated within its jurisdiction with each Water Quality Improvement Plan Annual Report required under Provision F.3.b.(3) of this Order.

3. Development Planning

Each Copermittee must use their land use and planning authorities to implement a development planning program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. BMP Requirements for All Development Projects

Each Copermittee must prescribe the following BMP requirements during the planning process (i.e. prior to project approval and issuance of local permits) for all development projects (regardless of project type or size), where local permits are issued, including unpaved roads and flood management projects:

(1) General Requirements

(a) Onsite BMPs must be located so as to remove pollutants from runoff prior to its discharge to any receiving waters, and as close to the source as possible;

(b) Structural BMPs must not be constructed within waters of the U.S.

(c) Onsite BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors (e.g. mosquitos, rodents, or flies).

(2) Source Control BMP Requirements

The following source control BMPs must be implemented at all development projects where applicable and feasible:

(a) Prevention of illicit discharges into the MS4;

(b) Storm drain system stenciling or signage;

(c) Protect outdoor material storage areas from rainfall, run-on, runoff, and wind dispersal;

(d) Protect materials stored in outdoor work areas from rainfall, run-on, runoff, and wind dispersal;

(e) Protect trash storage areas from rainfall, run-on, runoff, and wind dispersal; and

(f) Any additional BMPs determined to be necessary by the Copermittee to minimize pollutant generation at each project.

(3) Low Impact Development (LID) BMP Requirements

The following LID BMPs must be implemented at all development projects where applicable and feasible:

(a) Maintenance or restoration of natural storage reservoirs and drainage corridors (including topographic depressions, areas of permeable soils, natural swales, and ephemeral and intermittent streams);[25]

(b) Buffer zones for natural water bodies (where buffer zones are technically infeasible, require project applicant to include other buffers such as trees, access restrictions, etc.);

(c) Conservation of natural areas within the project footprint including existing trees, other vegetation, and soils;

(d) Construction of streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided public safety is not compromised;

[25] Development projects proposing to dredge or fill materials in waters of the U.S. must obtain a CWA Section 401 Water Quality Certification. Projects proposing to dredge or fill waters of the state must obtain waste discharge requirements.

(e) Minimization of the impervious footprint of the project;

(f) Minimization of soil compaction to landscaped areas;

(g) Disconnection of impervious surfaces through distributed pervious areas;

(h) Landscaped or other pervious areas designed and constructed to effectively receive and infiltrate, retain and/or treat runoff from impervious areas, prior to discharging to the MS4;

(i) Small collection strategies located at, or as close as possible to, the source (i.e. the point where storm water initially meets the ground) to minimize the transport of runoff and pollutants to the MS4 and receiving waters;

(j) Use of permeable materials for projects with low traffic areas and appropriate soil conditions;

(k) Landscaping with native or drought tolerant species; and

(l) Harvesting and using precipitation.

b. PRIORITY DEVELOPMENT PROJECTS

Priority Development Projects are land development projects that fall under the planning and building authority of the Copermittee for which the Copermittee must impose specific requirements, in addition to those described in Provision E.3.a, including the implementation of structural BMPs to meet the performance requirements described in Provision E.3.c.

(1) Definition of Priority Development Project

Priority Development Projects include the following:

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(b) Redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site on an existing site of 10,000 square feet or more of impervious surfaces). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(c) New and redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site), and support one or more of the following uses:

(i) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812).

(ii) Hillside development projects. This category includes development on any natural slope that is twenty-five percent or greater.

(iii) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce.

(iv) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

(d) New or redevelopment projects that create and/or replace 2,500 square feet or more of impervious surface (collectively over the entire project site), and discharging directly to an Environmentally Sensitive Area (ESA). "Discharging directly to" includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands).

(e) New development projects, or redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface, that support one or more of the following uses:

(i) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

(ii) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

(f) New or redevelopment projects that result in the disturbance of one or more acres of land and are expected to generate pollutants post construction.

(2) Special Considerations for Redevelopment Projects

The structural BMP performance requirements of Provision E.3.c are applicable to redevelopment Priority Development Projects, as defined in E.3.b.(1), as follows:

(a) Where redevelopment results in the creation or replacement of impervious surface in an amount of less than fifty percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provision E.3.c apply only to the creation or replacement of impervious surface, and not the entire development; or

(b) Where redevelopment results in the creation or replacement of impervious surface in an amount of more than fifty percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provision E.3.c apply to the entire development.

(3) Priority Development Project Exemptions

Each Copermittee has the discretion to exempt the following projects from being defined as Priority Development Projects:

(a) New or retrofit paved sidewalks, bicycle lanes, or trails that meet the following criteria:

(i) Designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas; OR

(ii) Designed and constructed to be hydraulically disconnected from paved streets or roads; OR

(iii) Designed and constructed with permeable pavements or surfaces in accordance with USEPA Green Streets guidance.[26]

(b) Retrofitting or redevelopment of existing paved alleys, streets or roads that are designed and constructed in accordance with the USEPA Green Streets guidance.[27]

c. Priority Development Project Structural BMP Performance Requirements

In addition to the BMP requirements listed for all development projects under Provision E.3.a, Priority Development Projects must also implement structural BMPs that conform to performance requirements described below.

[26] See "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).
[27] Ibid.

(1) Storm Water Pollutant Control BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite structural BMPs to control pollutants in storm water that may be discharged from a project as follows:

(a) Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite the pollutants contained in the volume of storm water runoff produced from a 24-hour 85th percentile storm event (design capture volume);[28]

(i) If a Copermittee determines that implementing BMPs to retain the full design capture volume onsite for a Priority Development Project is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize biofiltration BMPs. Biofiltration BMPs must be designed to have an appropriate hydraulic loading rate to maximize storm water retention and pollutant removal, as well as to prevent erosion, scour, and channeling within the BMP,[29] and must be sized to:

[a] Treat 1.5 times the design capture volume not reliably retained onsite, OR

[b] Treat the design capture volume not reliably retained onsite with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite.

(ii) If a Copermittee determines that biofiltration is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize flow-thru treatment control BMPs to treat runoff leaving the site, AND mitigate for the design capture volume not reliably retained onsite pursuant to Provision E.3.c.(1)(b). Flow thru treatment control BMPs must be sized and designed to:

[28] This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals.

[29] As part of the Copermittee's update to its BMP Design Manual, pursuant to Provision E.3.d, the Copermittee must provide guidance for hydraulic loading rates and other biofiltration design criteria necessary to maximize storm water retention and pollutant removal.

[a] Remove pollutants from storm water to the MEP;
[b] Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;
[c] Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Flow-thru treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of flow-thru treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

(b) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1)(a). The Priority Development Project must mitigate for the portion of the pollutant load in the design capture volume not retained onsite if Provision E.3.c.(3) is utilized. If a Priority Development Project is allowed to utilize alternative compliance, flow-thru treatment control BMPs must be implemented to treat the portion of the design capture volume that is not reliably retained onsite. Flow-thru treatment control BMPs must be sized and designed in accordance with Provisions E.3.c.(1)(a)(ii)[a]-[c].

(2) Hydromodification Management BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite BMPs to manage hydromodification that may be caused by storm water runoff discharged from a project as follows:

(a) Post-project runoff conditions (flow rates and durations) must not exceed pre-development runoff conditions by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat downstream of Priority Development Projects).

(i) In evaluating the range of flows that results in increased potential for erosion of natural (non-hardened) channels, the lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks.

(ii) The Copermittees may use monitoring results collected pursuant to Provision D.1.a.(2) to re-define the range of flows resulting in

increased potential for erosion, or degraded instream habitat conditions, as warranted by the data.

(b) Each Priority Development Project must avoid critical sediment yield areas known to the Copermittee or identified by the optional Watershed Management Area Analysis pursuant to Provision B.3.b.(4), or implement measures that allow critical coarse sediment to be discharged to receiving waters, such that there is no net impact to the receiving water.

(c) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the performance requirements of Provision E.3.c.(2)(a). The Priority Development Project must mitigate for the post-project runoff conditions not fully managed onsite if Provision E.3.c.(3) is utilized.

(d) Exemptions

Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provisions E.3.c.(2) where the project discharges storm water runoff to:

(i) Existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;

(ii) Conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; or

(iii) An area identified by the Copermittees as appropriate for an exemption by the optional Watershed Management Area Analysis incorporated into the Water Quality Improvement Plan pursuant to Provision B.3.b.(4).

(e) Interim Timeframe Exemptions

Until the Copermittees have updated their BMP Design Manual in accordance with Provision F.2.b with the requirements of Provision E, the Copermittees have the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provision E.3.c.(2) where the project discharges storm water runoff directly to:

(i) An engineered channel conveyance system with a capacity to convey peak flows generated by the 10-year storm event all the way from the

point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; and

(ii) Large river reaches with a drainage area larger than 100 square miles and a 100-year flow capacity in excess of 20,000 cubic feet per second, provided that properly sized energy dissipation is included at all Priority Development Project discharge points.

(3) Alternative Compliance Program to Onsite Structural BMP Implementation

At the discretion of each Copermittee, Priority Development Projects may be allowed to participate in an alternative compliance program in lieu of implementing the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a), provided that the Water Quality Improvement Plan includes the optional Watershed Management Area Analysis described in Provision B.3.b.(4), and Water Quality Equivalency calculations have been accepted by the San Diego Water Board's Executive Officer pursuant to Provision E.3.c.(3)(a). The alternative compliance program is available to a Priority Development Project only if the Priority Development Project applicant enters into a voluntary agreement with the Copermittee authorizing this arrangement. In addition to the voluntary agreement, relief from implementing structural BMPs onsite may be authorized by the Copermittee under the following conditions:

(a) Water Quality Equivalency

Copermittees must submit Water Quality Equivalency calculations for acceptance by the San Diego Water Board's Executive Officer prior to administering an alternative compliance program in order to establish a regional and technical basis for determining the water quality benefits associated with alternative compliance projects. Accepted Water Quality Equivalency calculations must be incorporated as part of any Copermittee's alternative compliance program necessary for evaluating Watershed Management Area Analysis candidate projects, project applicant-proposed alternative compliance projects, alternative compliance in lieu fee structures, and alternative compliance water quality credit systems as described in Provisions E.3.c.(3)(b)-(e).

(b) Watershed Management Area Analysis Candidate Projects

The Priority Development Project applicant agrees to fund, contribute funds to, or implement a candidate project identified by the Copermittees in the Watershed Management Area Analysis included in the Water Quality Improvement Plan, pursuant to Provisions B.3.b.(4) subject to the following conditions:

(i) The Copermittee must determine that implementation of the candidate project will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a) onsite;

(ii) If the Priority Development Project applicant chooses to fully or partially fund a candidate project, then the in-lieu fee structure described in Provision E.3.c.(3)(c) must be followed;

(iii) If the Priority Development Project applicant chooses to fully or partially fund a candidate project, then the Copermittee must ensure that the funds to be obtained from the Priority Development Project applicant are sufficient to mitigate for impacts caused by not fully implementing structural BMPs onsite, pursuant to the performance requirements described in Provisions E.3.c.(1) and E.3.c.(2)(a);

(iv) If the Priority Development Project applicant chooses to implement a candidate project, then the Copermittee must ensure that pollutant control and/or hydromodification management within the candidate project are sufficient to mitigate for impacts caused by not implementing structural BMPs fully onsite, pursuant to the performance requirements described in Provisions E.3.c.(1) and E.3.c.(2)(a);

(v) The voluntary agreement to fund, partially fund, or implement a candidate project must include reliable sources of funding for operation and maintenance of the candidate project;

(vi) Design of the candidate project must be conducted under an appropriately qualified engineer, geologist, architect, landscape architect, or other professional, licenses where applicable, and competent and proficient in the fields pertinent to the candidate project design;

(vii) The candidate project must be constructed as soon as possible, but no later than 4 years after the certificate of occupancy is granted for the first Priority Development Project that contributed funds toward the construction of the candidate project, unless a longer period of time is authorized by the San Diego Water Board Executive Officer; and

(viii) If the candidate project is constructed after the Priority Development Project is constructed, the Copermittee must require temporal mitigation for pollutant loads and altered flows that are discharged from the Priority Development Project.

(c) Project Applicant Proposed Alternative Compliance Projects

The Copermittee may allow a Priority Development Project applicant to propose and fund, contribute funds to, or implement an alternative compliance project not identified by the Watershed Management Area Analysis included in the Water Quality Improvement Plan pursuant to Provisions B.3.b.(4). This option is allowed provided the Copermittee determines that implementation of the alternative compliance project will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a) onsite, and is subject to the requirements described in Provisions E.3.c.(3)(a)(ii)-(viii).

(d) Alternative Compliance In-Lieu Fee Structure

If a Copermittee chooses to allow a Priority Development Project applicant to fund, or partially fund a candidate project or an alternative compliance project, then the Copermittee must develop and implement an in-lieu fee structure. This may be developed individually or with other Copermittees and/or entities, as a means for designing, developing, constructing, operating and maintaining offsite alternative compliance projects. The in-lieu fee must be transferred to the Copermittee (for public projects) or an escrow account (for private projects) prior to the construction of the Priority Development Project.

(e) Alternative Compliance Water Quality Credit System Option

The Copermittee may develop and implement an alternative compliance water quality credit system option, individually or with other Copermittees and/or entities, provided that such a credit system clearly exhibits that it will not allow discharges from Priority Development Projects to cause or contribute to a net impact over and above the impact caused by projects meeting the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a). Any credit system that a Copermittee chooses to implement must be submitted to the San Diego Water Board Executive Officer for review and acceptance as part of the Water Quality Improvement Plan.

(4) Long-Term Structural BMP Maintenance

Each Copermittee must require the project applicant to submit proof of the mechanism under which ongoing long-term maintenance of all structural BMPs will be conducted.

(5) Infiltration and Groundwater Protection

(a) Structural BMPs designed to primarily function as large, centralized infiltration devices (such as large infiltration trenches and infiltration basins) must not cause or contribute to an exceedance of an applicable groundwater quality objective. At a minimum, such infiltration BMPs must be in conformance with the design criteria listed below, unless the development project applicant demonstrates to the Copermittee that one or more of the specific design criteria listed below are not necessary to protect groundwater quality. The design criteria listed below do not apply to small infiltration systems dispersed throughout a development project.

(i) Runoff must undergo pretreatment such as sedimentation or filtration prior to infiltration;

(ii) Pollution prevention and source control BMPs must be implemented at a level appropriate to protect groundwater quality at sites where infiltration BMPs are to be used;

(iii) Infiltration BMPs must be adequately maintained to remove pollutants in storm water to the MEP;

(iv) The vertical distance from the base of any infiltration BMP to the seasonal high groundwater mark must be at least 10 feet. Where groundwater basins do not support beneficial uses, this vertical distance criteria may be reduced, provided groundwater quality is maintained;

(v) The soil through which infiltration is to occur must have physical and chemical characteristics (e.g., appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses;

(vi) Infiltration BMPs must not be used for areas of industrial or light industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee, unless source control BMPs to prevent exposure of high threat activities are implemented, or runoff from such activities is first treated or filtered to remove pollutants prior to infiltration; and

(vii) Infiltration BMPs must be located a minimum of 100 feet horizontally from any water supply wells.

(b) The Copermittee may develop, individually or with other Copermittees, alternative mandatory design criteria to that listed above for infiltration BMPs which are designed to primarily function as centralized infiltration devices. Before implementing the alternative design criteria in the development planning process the Copermitee(s) must:

(i) Notify the San Diego Water Board of the intent to implement the alternative design criteria submitted; and

(ii) Comply with any conditions set by the San Diego Water Board.

d. BMP DESIGN MANUAL UPDATE

Each Copermittee must update its BMP Design Manual[30] pursuant to Provision F.2.b. Until the Copermittee has updated its BMP Design Manual pursuant to Provision F.2.b.(1) ~~with the requirements of Provisions E.3.a-c~~, the Copermittee must continue implementing its current BMP Design Manual. ~~Unless directed otherwise by the San Diego Water Board, t~~The Copermittee must implement the updated BMP Design Manual within 180 days following completion of ~~completing~~ the update pursuant to Provision F.2.b.(1), unless directed otherwise by the San Diego Water Board Executive Officer. The date the BMP Design Manual is implemented is the "effective date" of the BMP Design Manual. The update of the BMP Design Manual required pursuant to Provision F.2.b.(1) must include the following:

(1) Updated procedures to determine the nature and extent of storm water requirements applicable to a potential development or redevelopment projects. These procedures must inform project applicants of the storm water management requirements applicable to their project including, but not limited to, general requirements for all development projects, structural BMP design procedures and requirements, hydromodification management requirements, requirements specific to phased projects, and procedures specific to private developments and public improvement projects;

(2) Updated procedures to identify pollutants and conditions of concern for selecting the most appropriate structural BMPs that consider, at a minimum, the following:

(a) Receiving water quality (including pollutants for which receiving waters are listed as impaired under the CWA section 303(d) List);

(b) Pollutants, stressors, and/or receiving water conditions that cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(c) Land use type of the project and pollutants associated with that land use type; and

(d) Pollutants expected to be present onsite.

(3) Updated procedures for designing structural BMPs, including any updated

[30] The BMP Design Manual was formerly known as the Standard Storm Water Mitigation Plan under Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016.

performance requirements to be consistent with the requirements of Provision E.3.c for all structural BMPs listed in the BMP Design Manual;

(4) Long-term maintenance criteria for each structural BMP listed in the BMP Design Manual; and

(5) Alternative compliance criteria, in accordance with the requirements under Provision E.3.c.(3), if the Copermittee elects to allow Priority Development Projects within its jurisdiction to utilize alternative compliance.

e. PRIORITY DEVELOPMENT PROJECT BMP IMPLEMENTATION AND OVERSIGHT

Each Copermittee must implement a program that requires and confirms structural BMPs on all Priority Development Projects are designed, constructed, and maintained to remove pollutants in storm water to the MEP.

(1) Structural BMP Approval and Verification Process

(a) Each Copermittee must require and confirm that ~~for~~ all Priority Development Projects ~~applications that have not received prior lawful approval by the Copermittee by the effective date of the BMP Design Manual pursuant to Provision E.3.d,~~ implement the requirements of Provision E.3, ~~must be implemented. For project applications that have received prior lawful approval before the effective date of the BMP Design Manual pursuant to Provision E.3.d, the Copermittee may allow previous land development requirements to apply.~~ except that the Copermittee may allow previous land development requirements to apply to a Priority Development Project if the conditions of Provision E.3.e.(1)(a)(i) or Provision E.3.e.(1)(a)(ii) are met:

(i) The Copermittee has, prior to the effective date of the BMP Design Manual required to be developed pursuant to Provision E.3.d:

[a] Approved[31] a design that incorporates the storm water drainage system for the Priority Development Project in its entirety, including all applicable structural pollutant treatment control and hydromodification management BMPs consistent with the previous applicable MS4 permit requirements;[32] AND

[b] Issued a private project permit or approval, or functional equivalent for public projects, that authorizes the Priority Development Project applicant to commence construction activities based on a design that incorporates the storm water

[31] For public projects, a design stamped by the City or County Engineer, or engineer of record for the project is considered an approved design.

[32] Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016 for San Diego County, Orange County, and Riverside County Copermittees, respectively

drainage system approved in conformance with Provision E.3.e.(1)(a)(i)[a]; AND

[c] Confirmed that there have been construction activities on the Priority Development Project site within the 365 days prior to the effective date of the BMP Design Manual, *OR* the Copermittee confirms that construction activities have commenced on the Priority Development Project site within the 180 days after the effective date of the BMP Design Manual, where construction activities are undertaken in reliance on the permit or approval, or functional equivalent for public projects, issued by the Copermittee in conformance with Provision E.3.e.(1)(a)(i)[b]; AND

[d] Issued all subsequent private project permits or approvals, or functional equivalent for public projects, that are needed to implement the design initially approved in conformance with Provision E.3.e.(1)(a)(i)[a] within 5 years of the effective date of the BMP Design Manual. The storm water drainage system for the Priority Development Project in its entirety, including all applicable structural pollutant treatment control and hydromodification management BMPs must remain in substantial conformity with the design initially approved in conformance with Provision E.3.e.(1)(a)(i)[a].

(ii) The Copermittee demonstrates it lacks the land use authority or legal authority to require a Priority Development Project to implement the requirements of Provision E.3.

(b) Each Copermittee must identify the roles and responsibilities of its various municipal departments in implementing the structural BMP requirements, including each stage of a project from application review and approval through BMP maintenance and inspections.

(c) Each Copermittee must require and confirm that appropriate easements and ownerships are properly recorded in public records and the information is conveyed to all appropriate parties when there is a change in project or site ownership.

(d) Each Copermittee must require and confirm that prior to occupancy and/or intended use of any portion of the Priority Development Project, each structural BMP is inspected to verify that it has been constructed and is operating in compliance with all of its specifications, plans, permits, ordinances, and the requirements of this Order.

(2) Priority Development Project Inventory and Prioritization

(a) Each Copermittee must develop, maintain, and update at least annually, a watershed-based database to track and inventory all Priority Development

Projects and associated structural BMPs within its jurisdiction. Inventories must be accurate and complete beginning from December 2002 for the San Diego County Copermittees, February 2003 for the Orange County Copermittees, and July 2005 for the Riverside County Copermittees. The use of an automated database system, such as GIS, is highly recommended. The database must include, at a minimum, the following information:

(i) Priority Development Project location (address and hydrologic subarea);

(ii) Descriptions of structural BMP type(s);

(iii) Date(s) of construction;

(iv) Party responsible for structural BMP maintenance;

(v) Dates and findings of structural BMP maintenance verifications; and

(vi) Corrective actions and/or resolutions, when applicable.

(b) Each Copermittee must prioritize the Priority Development Projects with structural BMPs within its jurisdiction. The designation of Priority Development Projects as high priority must consider the following:

(i) The highest water quality priorities identified in the Water Quality Improvement Plan;

(ii) Receiving water quality;

(iii) Number and sizes of structural BMPs;

(iv) Recommended maintenance frequency of structural BMPs;

(v) Likelihood of operation and maintenance issues of structural BMPs;

(vi) Land use and expected pollutants generated; and

(vii) Compliance record.

(3) Structural BMP Maintenance Verifications and Inspections

Each Copermittee is required to verify that structural BMPs on each Priority Development Project are adequately maintained, and continue to operate effectively to remove pollutants in storm water to the MEP through inspections, self-certifications, surveys, or other equally effective approaches.

(a) All (100 percent) of the structural BMPs at Priority Development Projects that are designated as high priority must be inspected directly by the Copermittee annually prior to each rainy season;

(b) For verifications performed through a means other than direct Copermittee inspection, adequate documentation must be required by the Copermittee

to provide assurance that the required maintenance of structural BMPs at each Priority Development Project has been completed; and

(c) Appropriate follow-up measures (including re-inspections, enforcement, etc.) must be conducted to ensure that structural BMPs at each Priority Development Project continue to reduce pollutants in storm water to the MEP as originally designed.

f. DEVELOPMENT PROJECT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all development projects, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

4. Construction Management

Each Copermittee must implement a construction management program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. PROJECT APPROVAL PROCESS

Prior to issuance of any local permit(s) that allows the commencement of construction projects that involve ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff, each Copermittee must:

(1) Require a pollution control plan, construction BMP plan, and/or an erosion and sediment control plan, to be submitted by the project applicant to the Copermittee;

(2) Confirm the pollution control plan, construction BMP plan, and/or erosion and sediment control plan, complies with the local grading ordinance, other applicable local ordinances, and the requirements of this Order;

(3) Confirm the pollution control, construction BMP, and/or erosion and sediment control plan, includes seasonally appropriate and effective BMPs and management measures described in Provision E.4.c, as applicable to the project; and

(4) Verify that the project applicant has obtained coverage under the statewide Construction General Permit (Order 2009-0009-DWQ or subsequent Order), if applicable.

b. Construction Site Inventory and Tracking

(1) Each Copermittee must maintain and update, at least quarterly, a watershed-based inventory of all construction projects issued a local permit that allows ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff. The use of an automated database system, such as GIS, is highly recommended. The inventory must include:

(a) Relevant contact information for each site (e.g., name, address, phone, and email for the owner and contractor);

(b) The basic site information including location (address and hydrologic subarea), Waste Discharge Identification (WDID) number (if applicable), size of the site, and approximate area of disturbance;

(c) Whether or not the site is considered a high threat to water quality, as defined in Provision E.4.b.(2) below;

(d) The project start and completion dates;

(e) The required inspection frequency, as defined in the Copermittee's jurisdictional runoff management program document;

(f) The date the Copermittee accepted or approved the pollution control plan, construction BMP plan, and/or erosion and sediment control plan; and

(g) Whether or not there are ongoing enforcement actions administered to the site.

(2) Each Copermittee must identify all construction sites within its jurisdiction that represent a high threat to downstream surface water quality. The designation of construction sites as high threat to water quality must consider the following:

(a) Sites located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Sites located within the same hydrologic subarea and tributary to a water body segment listed as impaired for sediment on the CWA section 303(d) List;

(c) Sites located within, directly adjacent to, or discharging directly to a receiving water within an ESA; and

(d) Other sites determined by the Copermittees or the San Diego Water Board as a high threat to water quality.

c. CONSTRUCTION SITE BMP IMPLEMENTATION

Each Copermittee must implement, or require the implementation of effective BMPs to reduce discharges of pollutants in storm water from construction sites to the MEP, and effectively prohibit non-storm water discharges from construction sites into the MS4. These BMPs must be site specific, seasonally appropriate, and construction phase appropriate. BMPs must be implemented at each construction site year round. Dry season BMP implementation must plan for and address unseasonal rain events that may occur during the dry season (May 1 through September 30). Copermittees must implement, or require the implementation of, BMPs in the following categories:

(1) Project Planning;

(2) Good Site Management "Housekeeping", including waste management;

(3) Non-storm Water Management;

(4) Erosion Control;

(5) Sediment Control;

(6) Run-on and Run-off Control; and

(7) Active/Passive Sediment Treatment Systems, where applicable.

d. CONSTRUCTION SITE INSPECTIONS

Each Copermittee must conduct construction site inspections to require and confirm compliance with its local permits and applicable local ordinances, and the requirements of this Order. Priority for site inspections must consider threat to water quality pursuant to Provision E.4.b as well as the nature of the construction activity, topography, and the characteristics of soils and receiving water quality.

(1) <u>Inspection Frequency</u>

(a) Each Copermittee must conduct inspections at all inventoried sites, including high threat to water quality sites, at an appropriate frequency for each phase of construction to confirm the site reduces the discharge of pollutants in storm water from construction sites to the MEP, and effectively prohibits non-storm water discharges from entering the MS4.

(b) Each Copermittee must establish appropriate inspection frequencies for high threat to water quality sites, and all other sites, for each phase of construction. Inspection frequencies appropriate for addressing the

highest water quality priorities identified in the Water Quality Improvement Plan, and for complying with the requirements of this Order must be identified in each Copermittee's jurisdictional runoff management program document.

(c) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e., re-inspection, enforcement) necessary to require and confirm site compliance with its local permits and applicable local ordinances, and the requirements of this Order.

(2) Inspection Content

Inspections of construction sites by the Copermittee must include, at a minimum:

(a) Verification of coverage under the Construction General Permit (Notice of Intent (NOI) and/or WDID number) during initial inspections, when applicable;

(b) Assessment of compliance with its local permits and applicable local ordinances related to pollution prevention, including the implementation and maintenance of applicable BMPs;

(c) Assessment of BMP adequacy and effectiveness;

(d) Visual observations of actual non-storm water discharges;

(e) Visual observations of actual or potential discharge of sediment and/or construction related materials from the site;

(f) Visual observations of actual or potential illicit connections; and

(g) If any violations are found and BMP corrections are needed, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried construction sites. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Site name, location (address and hydrologic subarea), and WDID number (if applicable);

(b) Inspection date;

(c) Approximate amount of rainfall since last inspection;

(d) Description of problems observed with BMPs and indication of need for BMP addition/repair/replacement and any scheduled re-inspection, and date of re-inspection;

(e) Descriptions of any other specific inspection comments which must, at a minimum, include rationales for longer compliance time;

(f) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(g) Resolution of problems noted and date problems fixed.

e. CONSTRUCTION SITE ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried construction sites, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

5. Existing Development Management

Each Copermittee must implement an existing development management program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. EXISTING DEVELOPMENT INVENTORY AND TRACKING

Each Copermittee must maintain, and update at least annually, a watershed-based inventory of the existing development within its jurisdiction that may discharge a pollutant load to and from the MS4. The use of an automated database system, such as GIS, is highly recommended. The inventory must, at a minimum, include:

(1) Name, location (hydrological subarea and address, if applicable) of the following types of existing development with its jurisdiction:

(a) Commercial facilities or areas;

(b) Industrial facilities;

(c) Municipal facilities, including:

(i) MS4 and related structures;[33]

(ii) Roads, streets, and highways;

(iii) Parking facilities;

(iv) Municipal airfields;

(v) Parks and recreation facilities;

(vi) Flood management facilities, flood control devices and structures;

(vii) Operating or closed municipal landfills;

(viii) Publicly owned treatment works (including water and wastewater treatment plants) and sanitary sewer collection systems;

(ix) Corporate yards, including maintenance and storage yards for materials, waste, equipment, and vehicles;

(x) Hazardous waste collection facilities;

(xi) Other treatment, storage or disposal facilities for municipal waste; and

(xii) Other municipal facilities that the Copermittee determines may contribute a significant pollutant load to the MS4.

(d) Residential areas, which may be designated by one or more of the following:

(i) Residential management area;

(ii) Drainage basin or area;

(iii) Land use (e.g., single family, multi-family, rural);

(iv) Neighborhood;

(v) Common Interest Area;

(vi) Home Owner Association;

(vii) Mobile home park; and/or

(viii) Other designations accepted by the San Diego Water Board Executive Officer.

(2) A description of the facility or area, including the following information:

(a) Classification as commercial, industrial, municipal, or residential;

[33] The inventory may refer to the MS4 map required to be maintained pursuant to Provision E.2.b.(1).

(b) Status of facility or area as active or inactive;

(c) Identification if a business is a mobile business;

(d) SIC Code or NAICS Code, if applicable;

(e) Industrial General Permit NOI and/or WDID number, if applicable;

(f) Identification if a residential area is or includes a Common Interest Area / Home Owner Association, or mobile home park;

(g) Identification of pollutants generated and potentially generated by the facility or area;

(h) Whether the facility or area is adjacent to an ESA;

(i) Whether the facility or area is tributary to and within the same hydrologic subarea as a water body segment listed as impaired on the CWA section 303(d) List and generates pollutants for which the water body segment is impaired; and

(3) An annually updated map showing the location of inventoried existing development, watershed boundaries, and water bodies.

b. EXISTING DEVELOPMENT BMP IMPLEMENTATION AND MAINTENANCE

Each Copermittee must designate a minimum set of BMPs required for all inventoried existing development, including special event venues. The designated minimum BMPs must be specific to facility or area types and pollutant generating activities, as appropriate.

(1) Commercial, Industrial, and Municipal Facilities and Areas

(a) Pollution Prevention

Each Copermittee must require the use of pollution prevention methods by the commercial, industrial, and municipal facilities and areas in its inventoried existing development to address the priorities and strategies in the Water Quality Improvement Plan.

(b) BMP Implementation

Each Copermittee must require the implementation of designated BMPs at commercial facilities and areas, industrial facilities, and implement designated BMPs at municipal facilities in its inventoried existing development.

(c) BMP Operation and Maintenance

(i) Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development.

(ii) Each Copermittee must implement a schedule of operation and maintenance activities for its MS4 and related structures (including but not limited to catch basins, storm drain inlets, detention basins, etc.), and verify proper operation of all its municipal structural treatment controls designed to reduce pollutants (including floatables) in storm water discharges to or from its MS4s and related drainage structures. Operation and maintenance activities may include, but is not limited to, the following:

[a] Inspections of the MS4 and related structures;
[b] Cleaning of the MS4 and related structures; and
[c] Proper disposal of materials removed from cleaning of the MS4 and related structures.

(iii) Each Copermittee must implement a schedule of operation and maintenance for public streets, unpaved roads, paved roads, and paved highways within its jurisdiction to minimize pollutants that can be discharged in storm water.

(iv) Each Copermittee must implement controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers. Copermittees that operate both a municipal sanitary sewer system and a MS4 must implement controls and measures to prevent and eliminate seeping sewage from infiltrating the MS4. Copermittees that do not operate both a municipal sanitary sewer system and a MS4 must coordinate with sewering agencies to keep themselves informed of relevant and appropriate maintenance activities and sanitary sewage projects in their jurisdiction that may cause or contribute to seepage of sewage into the MS4.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must require the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from commercial facilities and areas and industrial facilities, and implement BMPs at municipal facilities in its inventoried existing development. Such BMPs must include, as appropriate, educational activities, permits, certifications and other measures for applicators and distributors.

(2) Residential Areas

(a) Pollution Prevention

Each Copermittee must promote and encourage the use of pollution prevention methods, where appropriate, by the residential areas in its inventoried existing development.

(b) BMP Implementation

Each Copermittee must promote and encourage the implementation of designated BMPs at residential areas in its inventoried existing development.

(c) BMP Operation and Maintenance

Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at residential areas in its inventoried existing development.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must promote and encourage the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from residential areas in its inventoried existing development.

c. EXISTING DEVELOPMENT INSPECTIONS

Each Copermittee must conduct inspections of inventoried existing development to ensure compliance with applicable local ordinances and permits, and the requirements of this Order.

(1) Inspection Frequency

(a) Each Copermittee must establish appropriate inspection frequencies for inventoried existing development in accordance with the following requirements:

(i) At a minimum, inventoried existing development must be inspected once every five years utilizing one or more of the following methods:

[a] Drive-by inspections by Copermittee municipal and contract staff;

[b] Onsite inspections by Copermittee municipal and contract staff; and/or

[c] Visual inspections of publicly accessible inventoried facilities or areas by volunteer monitoring or patrol programs that have been trained by the Copermittee;

(ii) The frequency of inspections must be appropriate to confirm that BMPs are being implemented to reduce the discharge of pollutants in storm water from the MS4 to the MEP and effectively prohibit non-storm water discharges to the MS4;

(iii) The frequency of inspections must be based on the potential for a facility or area to discharge non-storm water and pollutants in storm water, and should reflect the priorities set forth in the Water Quality Improvement Plan;

(iv) Each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development;[34] and

(v) Inventoried existing development must be inspected by the Copermittee, as needed, in response to valid public complaints.

(b) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e. education and outreach, re-inspection, enforcement) necessary to require and confirm compliance with its applicable local ordinances and permits and the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

(2) <u>Inspection Content</u>

(a) Inspections of existing development must include, at a minimum:

(i) Visual inspections for the presence of actual non-storm water discharges;

(ii) Visual inspections for the presence of actual or potential discharge of pollutants;

(iii) Visual inspections for the presence of actual or potential illicit connections; and

(iv) Verification that the description of the facility or area in the inventory, required pursuant to Provision E.5.a.(2), has not changed.

[34] If any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspection may count toward the total annual inspection requirement. This requirement excludes linear municipal facilities (i.e., MS4 linear channels, sanitary sewer collection systems, streets, roads and highways).

(b) Onsite inspections of existing development by the Copermittee must include, at a minimum:

(i) Assessment of compliance with its applicable local ordinances and permits related to non-storm water and storm water discharges and runoff;

(ii) Assessment of the implementation of the designated BMPs;

(iii) Verification of coverage under the Industrial General Permit, when applicable; and

(iv) If any problems or violations are found, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried existing development. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Name and location of the facility or area (address and hydrologic subarea) consistent with the inventory name and location, pursuant to Provision E.5.a.(1);

(b) Inspection and re-inspection date(s);

(c) Inspection method(s) (i.e. drive-by, onsite);

(d) Observations and findings from the inspection(s);

(e) For onsite inspections of existing development by Copermittee municipal or contract staff, the records must also include, as applicable:

(i) Description of any problems or violations found during the inspection(s);

(ii) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(iii) The date problems or violations were resolved.

d. EXISTING DEVELOPMENT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried existing development, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

e. RETROFITTING AND REHABILITATING AREAS OF EXISTING DEVELOPMENT

(1) Retrofitting Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to retrofit areas of existing development within its jurisdiction to address identified sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify areas of existing development as candidates for retrofitting, focusing on areas where retrofitting will address pollutants and/or stressors that contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for retrofitting projects may be utilized to reduce pollutants that may be discharged in storm water from areas of existing development, and/or address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of retrofitting projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting projects; and

(e) Where retrofitting projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional retrofitting projects (i.e. projects that can receive and/or treat storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment) adjacent to and/or downstream of the areas of existing development.

(2) Stream, Channel and/or Habitat Rehabilitation in Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to rehabilitate streams, channels, and/or habitats in areas of existing development within its jurisdiction to address the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify streams, channels, and/or habitats in areas of existing development as candidates for rehabilitation, focusing on areas where stream, channel, and/or habitat rehabilitation projects will address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for stream, channel, and/or habitat rehabilitation projects may be utilized to address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters, rehabilitate channelized or hydromodified streams, restore wetland and riparian habitat, restore watershed functions, and/or restore beneficial uses of receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of stream, channel, and/or habitat rehabilitation projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance stream, channel, and/or habitat rehabilitation projects; and

(e) Where stream, channel, and/or habitat rehabilitation projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional stream, channel, and/or habitat rehabilitation projects (i.e. projects that can receive storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment).

6. Enforcement Response Plans

Each Copermittee must develop and implement an Enforcement Response Plan as part of its jurisdictional runoff management program document. The Enforcement Response Plan must describe the applicable approaches and options to enforce its legal authority established pursuant to Provision E.1, as necessary, to achieve compliance with the requirements of this Order. The Enforcement Response Plan must be in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include the following:

a. Enforcement Response Plan Components

The Enforcement Response Plan must include the following individual components:

(1) Illicit Discharge Detection and Elimination Enforcement Component;

(2) Development Planning Enforcement Component;

(3) Construction Management Enforcement Component; and

(4) Existing Development Enforcement Component.

b. Enforcement Response Approaches and Options

Each component of the Enforcement Response Plan must describe the enforcement response approaches that the Copermittee will implement to compel compliance with its statutes, ordinances, permits, contracts, orders, or similar means, and the requirements of this Order. The description must include the protocols for implementing progressively stricter enforcement responses. The enforcement response approaches must include appropriate sanctions to compel compliance, including, at a minimum, the following tools or their equivalent:

(1) Verbal and written notices of violation;

(2) Cleanup requirements;

(3) Fines;

(4) Bonding requirements;

(5) Administrative and criminal penalties;

(6) Liens;

(7) Stop work orders; and

(8) Permit and occupancy denials.

c. Correction of Violations

(1) Violations must be corrected in a timely manner with the goal of correcting the violations within 30 calendar days after the violations are discovered, or prior to the next predicted rain event, whichever is sooner.

(2) If more than 30 calendar days are required to achieve compliance, then a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

d. Escalated Enforcement

(1) The Enforcement Response Plan must include a definition of "escalated enforcement." Escalated enforcement must include any enforcement scenario where a violation or other non-compliance is determined to cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan. Escalated enforcement may be defined differently for development planning, construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas.

(2) Where the Copermittee determines escalated enforcement is not required, a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

(3) Escalated enforcement actions must continue to increase in severity, as necessary, to compel compliance as soon as possible.

e. Reporting of Non-Compliant Sites

(1) Each Copermittee must notify the San Diego Water Board in writing within five (5) calendar days of issuing escalated enforcement (as defined in the Copermittee's Enforcement Response Plan) to a construction site that poses a significant threat to water quality as a result of violations or other non-compliance with its permits and applicable local ordinances, and the requirements of this Order. Written notification may be provided electronically by email to the appropriate San Diego Water Board staff.

(2) Each Copermittee must notify the San Diego Water Board of any persons required to obtain coverage under the statewide Industrial General Permit and Construction General Permit and failing to do so, within five (5) calendar days from the time the Copermittee become aware of the circumstances. Written notification may be provided electronically by email to RB9_Nonfilers@waterboards.ca.gov.

7. Public Education and Participation

Each Copermittee must implement, individually or with other Copermittees, a public education and participation program in accordance with the strategies identified in the Water Quality Improvement Plan to promote and encourage the development of programs, management practices, and behaviors that reduce the discharge of pollutants in storm water to the MEP, prevent controllable non-storm water discharges from entering the MS4, and protect water quality standards in receiving waters. The public education and participation program must be implemented in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include, at a minimum, the following requirements:

a. PUBLIC EDUCATION

The public education program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) Educational activities, public information activities, and other appropriate outreach activities intended to reduce pollutants associated with the application of pesticides, herbicides and fertilizer and other pollutants of concern in storm water discharges to and from its MS4 to the MEP, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed to address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(2) Educational activities, public information activities, and other appropriate outreach activities to facilitate the proper management and disposal of used oil and toxic materials; and

(3) Appropriate education and training measures for specific target audiences, such as construction site operators, residents, underserved target audiences and school-aged children, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed, based on high risk behaviors and pollutants of concern.

b. PUBLIC PARTICIPATION

The public participation program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) A process for members of the public to participate in updating the highest priority water quality conditions, numeric goals, and water quality improvement strategies in the Water Quality Improvement Plan;

(2) Opportunities for members of the public to participate in providing the Copermittee recommendations for improving the effectiveness of the water quality improvement strategies implemented within its jurisdiction; and

(3) Opportunities for members of the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or protection of the quality of receiving waters.

8. Fiscal Analysis

a. Each Copermittee must secure the resources necessary to meet all the requirements of this Order.

b. Each Copermittee must conduct an annual fiscal analysis of its jurisdictional runoff management program in its entirety. The fiscal analysis must include the following:

(1) Identification of the various categories of expenditures necessary to implement the requirements of this Order, including a description of the specific capital, operation and maintenance, and other expenditure items to be accounted for in each category of expenditures;

(2) The staff resources needed and allocated to meet the requirements of this Order, including any development, implementation, and enforcement activities required;

(3) The estimated expenditures for Provisions E.8.b.(1) and E.8.b.(2) for the current fiscal year; and

(4) The source(s) of funds that are proposed to meet the necessary expenditures described in Provisions E.8.b.(1) and E.8.b.(2), including legal restrictions on the use of such funds, for the current fiscal year and next fiscal year.

c. Each Copermittee must submit a summary of the annual fiscal analysis with each Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3).

d. Each Copermittee must provide the documentation used to develop the summary of the annual fiscal analysis upon request by the San Diego Water Board.

F. REPORTING

The purpose of this provision is to determine and document compliance with the requirements set forth in this Order. The goal of reporting is to communicate to the San Diego Water Board and the people of the State of California the implementation status of each jurisdictional runoff management program and compliance with the requirements of this Order. This goal is to be accomplished through the submittal of specific deliverables to the San Diego Water Board by the Copermittees.

1. Water Quality Improvement Plans

The Copermittees for each Watershed Management Area must develop and submit the Water Quality Improvement Plan in accordance with the following requirements:

a. WATER QUALITY IMPROVEMENT PLAN DEVELOPMENT

Each Water Quality Improvement Plan must be developed in accordance with the following process:

(1) Public Participation Process

The Copermittees must implement a public participation process to solicit data, information, and recommendations to be utilized in the development of the Water Quality Improvement Plan. The public participation process must include the following:

(a) The Copermittees must develop a publicly available and noticed schedule of the opportunities for the public to participate and provide comments during the development of the Water Quality Improvement Plan. The schedule may be adjusted as necessary by the Copermittees, provided the public is provided timely notification of the changes to the schedule.

(b) The Copermittees must form a Water Quality Improvement Consultation Panel to provide recommendations during the development of the Water Quality Improvement Plan. The Water Quality Improvement Consultation Panel must consist of at least the following members:

(i) A representative of the San Diego Water Board;

(ii) A representative of the environmental community familiar with the water quality conditions of concern of the receiving waters in the Watershed Management Area, preferably from an environmental interest group associated with a water body within the Watershed Management Area; and

(iii) A representative of the development community familiar with the opportunities and constraints for implementing structural BMPs,

retrofitting projects, and stream, channel or habitat rehabilitation projects in the Watershed Management Area, preferably with relevant engineering, hydrology, and/or geomorphology experience in the Watershed Management Area.

(c) The Copermittees must coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public time and opportunity to participate during the development of the Water Quality Improvement Plans.

(2) Priority Water Quality Conditions

(a) The Copermittees must solicit data, information and recommendations from the public to be utilized in the development and identification of the priority water quality conditions and potential water quality improvement strategies for the Watershed Management Area.

(b) The Copermittees must review the priority water quality conditions the Copermittees plan on including in the Water Quality Improvement Plan with the Water Quality Improvement Consultation Panel to receive recommendations or concurrence.

(c) The Copermittees must consider revisions to the priority water quality conditions based on recommendations from the Water Quality Improvement Consultation Panel.

(d) The Copermittees must include all the potential water quality improvement strategies identified by the public and the Water Quality Improvement Consultation Panel with the submittal of the priority water quality conditions to the San Diego Water Board.

(e) The Copermittees must submit the Water Quality Improvement Plan requirements of Provision B.2 to the San Diego Water Board as early as 6 months and no later than 12 months after the commencement of coverage under this Order. Upon receipt, the San Diego Water Board will issue a public notice and release the proposed priority water quality conditions and potential water quality improvement strategies for public review and comment for a minimum of 30 days.

(f) The Copermittees must consider revisions to the priority water quality conditions and potential water quality improvement strategies developed pursuant to Provision B.2 based on public comments received by the close of the comment period.

(3) Water Quality Improvement Goals, Strategies and Schedules

(a) The Copermittees must solicit recommendations from the public on potential numeric goals for the highest priority water quality conditions identified for the Watershed Management Area, and recommendations on the strategies that should be implemented to achieve the potential numeric goals.

(b) The Copermittees must consult with the Water Quality Improvement Consultation Panel and consider revisions to the following items based on the Panel's recommendations:

(i) The numeric goals and schedules the Copermittees propose to include in the Water Quality Improvement Plan;

(ii) The water quality improvement strategies and schedules the Copermittees propose to implement in the Watershed Management Area and include in the Water Quality Improvement Plan; and

(iii) If the Copermittees choose to implement Provision B.3.b.(4), the results of the Watershed Management Area Analysis the Copermittees proposed to incorporate into the Water Quality Improvement Plan.

(c) The Copermittees must submit the Water Quality Improvement Plan requirements of Provision B.3 to the San Diego Water Board as early as 9 months and no later than 18 months after the commencement of coverage under this Order. Upon receipt, the San Diego Water Board will issue a public notice and release the proposed water quality improvement goals, strategies and schedules for public review and comment for a minimum of 30 days.

(d) The Copermittees must consider revisions to the water quality improvement goals, strategies and schedules developed pursuant to Provision B.3 based on public comments received by the close of the comment period.

b. WATER QUALITY IMPROVEMENT PLAN SUBMITTAL AND IMPLEMENTATION

(1) Within 24 months after the commencement of coverage under this Order, the Copermittees for each Watershed Management Area must submit a complete Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order to the San Diego Water Board. The San Diego Water Board will issue a public notice and release the Water Quality Improvement Plan for public review and comment for a minimum of 30 days.

(2) The Copermittees must consider revisions to the Water Quality Improvement Plan based on written comments received by the close of the public comment period.

(3) The Copermittees must promptly submit any revisions to the Water Quality Improvement Plan to the San Diego Water Board no later than 60 days after the close of the public comment period.

(4) If issues concerning the Water Quality Improvement Plan are resolved informally through discussions among the Copermittees, the San Diego Water Board and interested parties, the San Diego Water Board Executive Officer may provide written notification of acceptance to the Copermittees that the Water Quality Improvement Plan meets the requirements of Provision B. However, if the Executive Officer determines that significant issues with the Water Quality Improvement Plan remain, the matter will be scheduled for San Diego Water Board consideration at a public meeting.

(5) The Copermittees must commence with implementation of the Water Quality Improvement Plan, in accordance with the water quality improvement strategies and schedules therein, upon written notification of acceptance with the Water Quality Improvement Plan by the San Diego Water Board Executive Officer.

(6) During implementation of the Water Quality Improvement Plan the Copermittees must correct any deficiencies in the Plan identified by the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report following a request by the Board to do so.

(7) The Water Quality Improvement Plan must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of receiving notification of acceptance with the Water Quality Improvement Plan by the San Diego Water Board Executive Officer.

2. Updates

a. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATES

Each Copermittee must update its jurisdictional runoff management program document in accordance with the following requirements:

(1) Each Copermittee is encouraged to seek public and key stakeholder participation and comments, as early and often as possible during the process of developing updates to its jurisdictional runoff management program document;

(2) Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E concurrent with the submittal of the Water Quality Improvement Plan. Each Copermittee must correct any deficiencies in the jurisdictional runoff management program document based on comments received from the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report;

(3) Each Copermittee must submit updates to its jurisdictional runoff management program, with the supporting rationale for the modifications, either in the Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b;

(4) The Copermittee must revise proposed modifications to its jurisdictional runoff management program as directed by the San Diego Water Board Executive Officer; and

(5) Updated jurisdictional runoff management program documents must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of submitting the Water Quality Improvement Plan Annual Report.

b. BMP DESIGN MANUAL UPDATES

Each Copermittee must update its BMP Design Manual in accordance with the following requirements:

(1) Each Copermittee must update its BMP Design Manual to incorporate the requirements of Provisions E.3.a-d concurrent with the submittal of the Water Quality Improvement Plan. Each Copermittee must correct any deficiencies in the BMP Design Manual based on comments received from the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report;

(2) ~~Subsequent~~ Any future updates to the BMP Design Manual made after its update pursuant to Provision F.2.b.(1) is completed must be consistent with the requirements of Provisions E.3.a-d and must be submitted as part of the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b; and

(3) ~~Updated~~ BMP Design Manuals must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of completing the update.

(4) If the San Diego Water Board amends Provisions E.3.a-d during the permit term but after the Copermittee has completed the update pursuant to

Provision F.2.b.(1), the Copermittee must revise its BMP Design Manual to incorporate the amended Provision E.3.a-d requirements as soon as possible but not later than 90 days after the date the San Diego Water Board adopts the amendments to Provisions E.3.a-d, unless otherwise directed by the San Diego Water Board Executive Officer. Under these circumstances, the effective date of the BMP Design Manual is no later than 90 days after the date the San Diego Water Board adopts the amendments to Provisions E.3.a-d, unless otherwise directed by the San Diego Water Board Executive Officer.

c. Water Quality Improvement Plan Updates

(1) The Water Quality Improvement Plans must be updated in accordance with the following process:

(a) The Copermittees must develop and implement a public participation process to obtain data, information and recommendations for updating the Water Quality Improvement Plan. The public participation process must provide for a publicly available and noticed schedule of opportunities for the public to participate and provide comments during the development of updates to the Water Quality Improvement Plan;

(b) The Copermittees must consult with the Water Quality Improvement Consultation Panel on proposed updates of the Water Quality Improvement Plan, and consider the Water Quality Improvement Consultation Panel's recommendations in finalizing the proposed updates;

(c) The Copermittees for each Watershed Management Area must submit 1) proposed updates to the Water Quality Improvement Plan and supporting rationale, and 2) recommendations received from the public and the Water Quality Improvement Consultation Panel and the rationale for the requested updates, either in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The updates submitted will be deemed accepted for inclusion in the Water Quality Improvement Plan ninety (90) days after submission unless otherwise directed in writing by the San Diego Water Board Executive Officer;

(d) The Copermittees must revise the requested updates as directed by the San Diego Water Board Executive Officer; and

(e) Updated Water Quality Improvement Plans must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance of the requested updates by the San Diego Water Board.

(2) No later than six months following Office of Administrative Law and USEPA approval of any TMDL Basin Plan amendment with wasteload allocations (WLAs) assigned to the Copermittees during the term of this Order, the Copermittees must initiate an update to the applicable Water Quality Improvement Plans in accordance with Provision F.1 or Provision F.2.c.(1) to incorporate the requirements of the TMDL WLAs.

3. Progress Reporting

a. Progress Report Presentations

The Copermittees for each Watershed Management Area must periodically appear before the San Diego Water Board, as requested by the Board, to provide progress reports on the implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs.

b. Annual Reports

(1) Transitional Jurisdictional Runoff Management Program Annual Reports

(a) Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) no later than October 31 of each year for each jurisdictional runoff management program reporting period (i.e. July 1 to June 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted.

(b) Each Copermittee must submit the information on the Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) specific to the area within its jurisdiction in each Watershed Management Area.

(c) In addition to submitting the Jurisdictional Runoff Management Program Annual Report Form during the transitional reporting period, each Copermittee may continue to utilize and submit the jurisdictional runoff management program annual reporting format of its previous NPDES permit until the first Water Quality Improvement Plan Annual Report is required to be submitted.

(2) Transitional Monitoring and Assessment Program Annual Reports

The Copermittees for each Watershed Management Area must submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment

program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted under this Order. The Transitional Monitoring and Assessment Program Annual Reports must include:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1.a and D.2.a, summarized and presented in tabular and graphical form; and

(b) The findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

(3) Water Quality Improvement Plan Annual Reports

The Copermittees for each Watershed Management Area must submit a Water Quality Improvement Plan Annual Report for each reporting period no later than January 31 of the following year. The annual reporting period consists of two different periods: 1) July 1 to June 30 of the following year for the jurisdictional runoff management programs, 2) October 1 to September 30 of the following year for the monitoring and assessment programs. The Water Quality Improvement Plan Annual Reports must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Each Annual Report must include the following:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, summarized and presented in tabular and graphical form;

(b) The progress of the special studies required pursuant to Provision D.3, and the findings, interpretations and conclusions of a special study, or each phase of a special study, upon its completion;

(c) The findings, interpretations and conclusions from the assessments required pursuant to Provision D.4;

(d) The progress of implementing the Water Quality Improvement Plan, including, but not limited to, the following:

(i) The progress toward achieving the interim and final numeric goals for the highest water quality priorities for the Watershed Management Area;

(ii) The water quality improvement strategies that were implemented and/or no longer implemented by each of the Copermittees during the reporting period and previous reporting periods;

(iii) The water quality improvement strategies planned for implementation during the next reporting period;

(iv) Proposed modifications to the water quality improvement strategies, the public comments received and the supporting rationale for the proposed modifications;

(v) Previous modifications or updates incorporated into the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document and implemented by the Copermittees in the Watershed Management Area; and

(vi) Proposed modifications or updates to the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document;

(e) A completed Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) for each Copermittee in the Watershed Management Area, certified by a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative; and

(f) Each Copermittee must provide any data or documentation utilized in developing the Water Quality Improvement Plan Annual Report upon request by the San Diego Water Board. Any Copermittee monitoring data utilized in developing the Water Quality Improvement Plan Annual Report must be uploaded to the California Environmental Data Exchange Network (CEDEN).[35] Any Copermittee monitoring and assessment data utilized in developing the Water Quality Improvement Plan Annual Report must be available for access on the Regional Clearinghouse required pursuant to Provision F.4.

c. Regional Monitoring and Assessment Report

(1) The Copermittees must submit a Regional Monitoring and Assessment Report no later than 180 days prior to the expiration date of this Order. The Regional Monitoring and Assessment Report may be submitted as part of the Report of Waste Discharge required pursuant to Provision F.5.b. In preparing the report the Copermittees must consider the receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, and the findings, interpretations, and conclusions from the assessments required pursuant to Provision D.4. Based on these considerations the report must assess the following:

[35] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

(a) The beneficial uses of the receiving waters within the San Diego Region that are supported and not adversely affected by the Copermittees' MS4 discharges;

(b) The beneficial uses of the receiving waters within the San Diego Region that are adversely impacted by the Copermittees' MS4 discharges;

(c) The progress toward protecting the beneficial uses in the receiving waters within the San Diego Region from the Copermittees' discharges; and

(d) Pollutants or conditions of emerging concern that may impact beneficial uses in the receiving waters within the San Diego Region.

(2) The Regional Monitoring and Assessment Report must include recommendations for improving the implementation and assessment of the Water Quality Improvement Plans and jurisdictional runoff management programs.

(3) Each Copermittee must provide any data or documentation utilized in developing the Regional Monitoring and Assessment Report upon request by the San Diego Water Board. Any Copermittee monitoring and assessment data utilized in developing the Regional Monitoring and Assessment Report must be available for access on the Regional Clearinghouse required pursuant to Provision F.4.

4. Regional Clearinghouse

The Copermittees must develop, update, and maintain an internet-based Regional Clearinghouse that is made available to the public no later than 18 months after the effective date of this Order.[36]

a. The Copermittees, through the Regional Clearinghouse, must make the following documents and data available for access, and organized by Watershed Management Area. The documents and data may be linked to other internet-based data portals and databases where the original documents are stored:

(1) Water Quality Improvement Plan for the Watershed Management Area, and all updated versions with date of update;

(2) Annual Reports for the Watershed Management Area;

(3) Jurisdictional Runoff Management Program document for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

[36] The Copermittees may develop, update and maintain the clearinghouse(s) of other Copermittees or agencies.

(4) BMP Design Manual for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(5) Reports from special studies (e.g. source identification, BMP effectiveness assessment) conducted in the Watershed Management Area;

(6) Monitoring data collected pursuant to Provision D for each Watershed Management Area must be uploaded to CEDEN,[37] with links to the uploaded data; and

(7) Available GIS data, layers, and/or shapefiles used to develop the maps generated and maintained by the Copermittees for the Water Quality Improvement Plans, Annual Reports, and jurisdictional runoff management program documents.

b. The Copermittees, through the Regional Clearinghouse, must make the following information and documents available for access:

(1) Contact information (point of contact, phone number, email address, and mailing address) for each Copermittee;

(2) Public hotline number for reporting non-storm water and illicit discharges for each Copermittee;

(3) Email address for reporting non-storm water and illicit discharges for each Copermittee;

(4) Link to each Copermittee's website, if available, where the public may find additional information about the Copermittee's storm water management program and for requesting records for the implementation of its program;

(5) Information about opportunities for the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or protection of the quality of receiving waters; and

(6) Reports from regional monitoring programs in which the Copermittees participate (e.g. Southern California Monitoring Coalition, Southern California Coastal Water Research Project Bight Monitoring);

(7) Regional Monitoring and Assessment Reports; and

(8) Any other information, data, and documents the Copermittees determine as appropriate for making available to the public.

[37] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

5. Report of Waste Discharge

~~a. The Riverside County Copermittees are required to submit a complete Report of Waste Discharge pursuant to the requirements of their current Order. The San Diego Water Board will review and consider the Report of Waste Discharge to determine whether modification to this Order, pursuant to the requirements of Provision H, will be required prior to the Riverside County Copermittees obtaining coverage under this Order. The current Order for Riverside County Copermittees is rescinded upon the date of effective coverage under this Order except for enforcement purposes.~~

~~b.~~
The Copermittees subject to the requirements of this Order must submit to the San Diego Water Board a complete Report of Waste Discharge as an application for the re-issuance of this Order and NPDES permit. The Report of Waste Discharge must be submitted no later than 180 days in advance of the expiration date of this Order. The Report of Waste Discharge must contain the following minimum information:

~~(1)~~
a. Names and addresses of the Copermittees;
~~(2)~~
b. Names and titles of the primary contacts of the Copermittees;
~~(3)~~
c. Proposed changes to the Copermittees' Water Quality Improvement Plans and the supporting justification;
~~(4)~~
d. Proposed changes to the Copermittees' jurisdictional runoff management programs and the supporting justification;
~~(5)~~
e. Any other information necessary for the re-issuance of this Order;
~~(6)~~
f. Any information to be included as part of the Report of Waste Discharge pursuant to the requirements of this Order; and
~~(7)~~
g. Any other information required by federal regulations for NPDES permit reissuance.

~~6. Application for Early Coverage~~

~~a. The Riverside County Copermittees may apply for early coverage under this Order by submitting a Report of Waste Discharge Form 200, with a written request for early coverage under this Order.~~

~~b. The San Diego Water Board will review the application for early coverage. A notification of coverage under this Order will be issued to the Copermittees in the respective county by the San Diego Water Board upon completion of the early coverage application requirements. The effective coverage date will be specified~~

~~in the notification of coverage. The Copermittees in the respective county are authorized to have MS4 discharges pursuant to the requirements of this Order starting on the effective coverage date specified in the notification of coverage. The existing Order for the respective county is rescinded upon the effective coverage date specified in the notification of coverage except for enforcement purposes.~~

~~7.~~

6. Reporting Provisions

Each Copermittee must comply with all the reporting and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

G. PRINCIPAL WATERSHED COPERMITTEE RESPONSIBILITIES

1. The Copermittees within each Watershed Management Area must designate a Principal Watershed Copermittee and notify the San Diego Water Board of the name of the Principal Watershed Copermittee. An individual Copermittee should not be designated a Principal Watershed Copermittee for more than two Watershed Management Areas. The notification may be submitted with the Water Quality Improvement Plan required pursuant to Provision F.1 of this Order.

2. The Principal Watershed Copermittee is responsible for, at a minimum, the following:

a. Serving as liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues, and when necessary and appropriate, representing the Copermittees in the Watershed Management Area before the San Diego Water Board;

b. Facilitating the development of the Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order;

c. Coordinating the submittal of the deliverables required by Provisions F.1, F.2, F.3.a, and F.3.b of this Order; and

d. Coordinating and developing, with the other Principal Watershed Copermittees, the requirements of Provisions F.3.c, F.4, and F.5.b of this Order.

3. The Principal Watershed Copermittee is not responsible for ensuring that the other Copermittees within the Watershed Management Area are in compliance with the requirements of this Order. Each Copermittee within the Watershed Management Area is responsible for complying with the requirements of this Order.

H. MODIFICATION OF ORDER

1. Modifications of the Order may be initiated by the San Diego Water Board or by the Copermittees. Requests by Copermittees must be made to the San Diego Water Board.

2. Minor modifications to the Order may be made by the San Diego Water Board where the proposed modification complies with all the prohibitions and limitations, and other requirements of this Order.

3. This Order may also be re-opened and modified, revoked and, reissued or terminated in accordance with the provisions of 40 CFR 122.44, 122.62 to 122.64, and 124.5. Causes for taking such actions include, but are not limited to, failure to comply with any condition of this Order and permit, and endangerment to human health or the environment resulting from the permitted activity.

4. This Order may be re-opened for modification for cause including but not limited to the following:

   ~~a. The State Water Board determines that revisions are warranted, and the San Diego Water Board concurs that revisions are necessary to those provisions of the Order addressing compliance with water quality standards in the receiving water and/or those provisions of the Order establishing an iterative process for implementation of management practices to assure compliance with water quality standards in the receiving water;~~

   ~~b. An application for early coverage under this Order is received pursuant to Provision F.6;~~

   ~~c.~~

   a. Any of the TMDLs in Attachment E to this Order are amended in the Basin Plan by San Diego Water Board, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA;

   ~~d.~~

   b. The Basin Plan is amended by the San Diego Water Board to incorporate a new TMDL, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA; or

   ~~e.~~

   c. Updating or revising the monitoring and reporting requirements is determined to be necessary, at the discretion of the San Diego Water Board. Such modification(s) may include, but is (are) not limited to, revision(s) to: (i) implement recommendations from Southern California Coastal Water Research Project (SCCWRP), (ii) develop, refine, implement, and/or coordinate a regional monitoring program, (iii) develop and implement improved monitoring and assessment programs in keeping with San Diego Water Board Resolution No. R9-2012-0069, Resolution in Support of a Regional Monitoring Framework, and/or (iv) add provisions to require the Copermittees to evaluate and provide information on cost and values of the monitoring and reporting program.

~~**5.** The San Diego Water Board, after opportunity for public comment and a public hearing, will re-open and consider modifications to this Order when the Riverside County Copermittees submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders.~~

I. STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

Each Copermittee must comply with all the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

ATTACHMENT A

DISCHARGE PROHIBITIONS AND SPECIAL PROTECTIONS

1. Basin Plan Waste Discharge Prohibitions

California Water Code Section 13243 provides that a Regional Water Board, in a water quality control plan, may specify certain conditions or areas where the discharge of waste or certain types of waste is not permitted. The following waste discharge prohibitions in the Water Quality Control Plan for the San Diego Basin (Basin Plan) are applicable to any person, as defined by Section 13050(c) of the California Water Code, who is a citizen, domiciliary, or political agency or entity of California whose activities in California could affect the quality of waters of the state within the boundaries of the San Diego Region.

1. The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in California Water Code Section 13050, is prohibited.

2. The discharge of waste to land, except as authorized by waste discharge requirements or the terms described in California Water Code Section 13264 is prohibited.

3. The discharge of pollutants or dredged or fill material to waters of the United States except as authorized by a National Pollutant Discharge Elimination System (NPDES) permit or a dredged or fill material permit (subject to the exemption described in California Water Code Section 13376) is prohibited.

4. Discharges of recycled water to lakes or reservoirs used for municipal water supply or to inland surface water tributaries thereto are prohibited, unless this San Diego Water Board issues a NPDES permit authorizing such a discharge; the proposed discharge has been approved by the State Department of Health Services (DHS) and the operating agency of the impacted reservoir; and the discharger has an approved fail-safe long-term disposal alternative.

5. The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the San Diego Water Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

6. The discharge of waste in a manner causing flow, ponding, or surfacing on lands not owned or under the control of the discharger is prohibited, unless the discharge is authorized by the San Diego Water Board.

7. The dumping, deposition, or discharge of waste directly into waters of the state, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the San Diego Water Board.

8. Any discharge to a storm water conveyance system that is not composed entirely of "*storm water*" is prohibited unless authorized by the San Diego Water Board. [The federal regulations, 40 CFR 122.26(b)(13), define storm water as storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from firefighting activities.] [§122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

9. The unauthorized discharge of treated or untreated sewage to waters of the state or to a storm water conveyance system is prohibited.

10. The discharge of industrial wastes to conventional septic tank/subsurface disposal systems, except as authorized by the terms described in California Water Code Section 13264, is prohibited.

11. The discharge of radioactive wastes amenable to alternative methods of disposal into the waters of the state is prohibited.

12. The discharge of any radiological, chemical, or biological warfare agent into waters of the state is prohibited.

13. The discharge of waste into a natural or excavated site below historic water levels is prohibited unless the discharge is authorized by the San Diego Water Board.

14. The discharge of sand, silt, clay, or other earthen materials from any activity, including land grading and construction, in quantities which cause deleterious bottom deposits, turbidity or discoloration in waters of the state or which unreasonably affect, or threaten to affect, beneficial uses of such waters is prohibited.

15. The discharge of treated or untreated sewage from vessels to Mission Bay, Oceanside Harbor, Dana Point Harbor, or other small boat harbors is prohibited.

16. The discharge of untreated sewage from vessels to San Diego Bay is prohibited.

17. The discharge of treated sewage from vessels to portions of San Diego Bay that are less than 30 feet deep at mean lower low water (MLLW) is prohibited.

18. The discharge of treated sewage from vessels, which do not have a properly functioning US Coast Guard certified Type I or Type II marine sanitation device, to portions of San Diego Bay that are greater than 30 feet deep at mean lower low water (MLLW) is prohibited.

2. Attachment B to State Water Board Resolution 2012-0012, as amended by State Water Board Resolution No. 2012-0031.

Special Protections for Areas of Special Biological Significance (ASBS), Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges

I. PROVISIONS FOR POINT SOURCE DISCHARGES OF STORM WATER AND NONPOINT SOURCE WASTE DISCHARGES

The following terms, prohibitions, and special conditions (hereafter collectively referred to as special conditions) are established as limitations on point source storm water and nonpoint source discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in Areas of Special Biological Significance (ASBS), as required for State Water Quality Protection Areas pursuant to California Public Resources Code Sections 36700(f) and 36710(f). These Special Protections are adopted by the State Water Board as part of the California Ocean Plan (Ocean Plan) General Exception.

The special conditions are organized by category of discharge. The State Water Resources Control Board (State Water Board) and Regional Water Quality Control Boards (Regional Water Boards) will determine categories and the means of regulation for those categories [e.g., Point Source Storm Water National Pollutant Discharge Elimination System (NPDES) or Nonpoint Source].

A. PERMITTED POINT SOURCE DISCHARGES OF STORM WATER

1. General Provisions for Permitted Point Source Discharges of Storm Water

   a. Existing storm water discharges into an ASBS are allowed only under the following conditions:

      (1) The discharges are authorized by an NPDES permit issued by the State Water Board or Regional Water Board;

      (2) The discharges comply with all of the applicable terms, prohibitions, and special conditions contained in these Special Protections; and

      (3) The discharges:

         (i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

         (ii) Are designed to prevent soil erosion;

         (iii) Occur only during wet weather;

         (iv) Are composed of only storm water runoff.

   b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

c. The discharge of trash is prohibited.

d. Only discharges from existing storm water outfalls are allowed. Any proposed or new storm water runoff discharge shall be routed to existing storm water discharge outfalls and shall not result in any new contribution of waste to an ASBS (i.e., no additional pollutant loading). "Existing storm water outfalls" are those that were constructed or under construction prior to January 1, 2005. "New contribution of waste" is defined as any addition of waste beyond what would have occurred as of January 1, 2005. A change to an existing storm water outfall, in terms of re-location or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges are prohibited except as provided below:

(1) The term "non-storm water discharges" means any waste discharges from a municipal separate storm sewer system (MS4) or other NPDES permitted storm drain system to an ASBS that are not composed entirely of storm water.

(2) (i) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability or occur naturally:

(a) Discharges associated with emergency fire fighting operations.

(b) Foundation and footing drains.

(c) Water from crawl space or basement pumps.

(d) Hillside dewatering.

(e) Naturally occurring groundwater seepage via a storm drain.

(f) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(ii) An NPDES permitting authority may authorize non-storm water discharges to an MS4 with a direct discharge to an ASBS only to the extent the NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

2. Compliance Plans for Inclusion in Storm Water Management Plans (SWMP) and Storm Water Pollution Prevention Plans (SWPPP).

The discharger shall specifically address the prohibition of non-storm water runoff and the requirement to maintain natural water quality for storm water discharges to an ASBS in an ASBS Compliance Plan to be included in its SWMP or a SWPPP, as appropriate to permit type. If a statewide permit includes a SWMP, then the discharger shall prepare a stand-alone compliance plan for ASBS discharges. The ASBS Compliance Plan is subject to approval by

the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (for permits issued by Regional Water Boards).

a. The Compliance Plan shall include a map of surface drainage of storm water runoff, showing areas of sheet runoff, prioritize discharges, and describe any structural Best Management Practices (BMPs) already employed and/or BMPs to be employed in the future. Priority discharges are those that pose the greatest water quality threat and which are identified to require installation of structural BMPs. The map shall also show the storm water conveyances in relation to other features such as service areas, sewage conveyances and treatment facilities, landslides, areas prone to erosion, and waste and hazardous material storage areas, if applicable. The SWMP or SWPPP shall also include a procedure for updating the map and plan when changes are made to the storm water conveyance facilities.

b. The ASBS Compliance Plan shall describe the measures by which all non-authorized non-storm water runoff (e.g., dry weather flows) has been eliminated, how these measures will be maintained over time, and how these measures are monitored and documented.

c. For Municipal Separate Storm Sewer System (MS4s), the ASBS Compliance Plan shall require minimum inspection frequencies as follows:

(1) The minimum inspection frequency for construction sites shall be weekly during rainy season;

(2) The minimum inspection frequency for industrial facilities shall be monthly during the rainy season;

(3) The minimum inspection frequency for commercial facilities (e.g., restaurants) shall be twice during the rainy season; and

(4) Storm water outfall drains equal to or greater than 18 inches (457 mm) in diameter or width shall be inspected once prior to the beginning of the rainy season and once during the rainy season and maintained to remove trash and other anthropogenic debris.

d. The ASBS Compliance Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff, that are necessary to comply with these special conditions, will be achieved through BMPs. Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that such installation would pose a threat to health or safety. BMPs to control storm water runoff discharges (at the end-of-pipe) during a design storm shall be designed to achieve on average the following target levels:

(1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

(2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges.

The baseline for these determinations is the effective date of the Exception, except for those structural BMPs installed between January 1, 2005 and adoption of these Special Protections, and the reductions must be achieved and documented within six (6) years of the effective date.

e. The ASBS Compliance Plan shall address erosion control and the prevention of anthropogenic sedimentation in ASBS. The natural habitat conditions in the ASBS shall not be altered as a result of anthropogenic sedimentation.

f. The ASBS Compliance Plan shall describe the non-structural BMPs currently employed and planned in the future (including those for construction activities), and include an implementation schedule. The ASBS Compliance Plan shall include non-structural BMPs that address public education and outreach. Education and outreach efforts must adequately inform the public that direct discharges of pollutants from private property not entering an MS4 are prohibited. The ASBS Compliance Plan shall also describe the structural BMPs, including any low impact development (LID) measures, currently employed and planned for higher threat discharges and include an implementation schedule. To control storm water runoff discharges (at the end-of-pipe) during a design storm, permittees must first consider, and use where feasible, LID practices to infiltrate, use, or evapotranspirate storm water runoff on-site, if LID practices would be the most effective at reducing pollutants from entering the ASBS.

g. The BMPs and implementation schedule shall be designed to ensure that natural water quality conditions in the receiving water are achieved and maintained by either reducing flows from impervious surfaces or reducing pollutant loading, or some combination thereof.

h. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents in storm water runoff that alter natural ocean water quality and the sources of these constituents.

(2) The report shall describe BMPs that are currently being implemented, BMPs that are identified in the SWMP or SWPPP for future implementation, and any additional BMPs that may be added to the SWMP or SWPPP to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the BMPs.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits), the discharger shall revise its ASBS Compliance Plan to incorporate any new or modified BMPs that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised SWMP or SWPPP, the discharger does not have to repeat

the same procedure for continuing or recurring exceedances of natural ocean water quality conditions due to the same constituent.

(5) The requirements of this section are in addition to the terms, prohibitions, and conditions contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within eighteen (18) months from the effective date of the Exception, the discharger shall submit a draft written ASBS Compliance Plan to the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that describes its strategy to comply with these special conditions, including the requirement to maintain natural water quality in the affected ASBS. The ASBS Compliance Plan shall include a description of appropriate non-structural controls and a time schedule to implement structural controls (implementation schedule) to comply with these special conditions for inclusion in the discharger's SWMP or SWPPP, as appropriate to permit type. The final ASBS Compliance Plan, including a description and final schedule for structural controls based on the results of runoff and receiving water monitoring, must be submitted within thirty (30) months from the effective date of the Exception.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these special conditions shall be implemented.

d. Within six (6) years of the effective date of the Exception, any structural controls identified in the ASBS Compliance Plan that are necessary to comply with these special conditions shall be operational.

e. Within six (6) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water, pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data, and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in

compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. for municipalities, a demonstration of significant hardship to discharger ratepayers, by showing the relationship of storm water fees to annual household income for residents within the discharger's jurisdictional area, and the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or

2. for other governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

B. NONPOINT SOURCE DISCHARGES

1. General Provisions for Nonpoint Sources

a. Existing nonpoint source waste discharges are allowed into an ASBS only under the following conditions:

(1) The discharges are authorized under waste discharge requirements, a conditional waiver of waste discharge requirements, or a conditional prohibition issued by the State Water Board or a Regional Water Board.

(2) The discharges are in compliance with the applicable terms, prohibitions, and special conditions contained in these Special Protections.

(3) The discharges:

(i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

(ii) Are designed to prevent soil erosion;

(iii) Occur only during wet weather;

(iv) Are composed of only storm water runoff.

b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

c. The discharge of trash is prohibited.

d. Only existing nonpoint source waste discharges are allowed. "Existing nonpoint source waste discharges" are discharges that were ongoing prior to January 1, 2005. "New nonpoint source discharges" are defined as those that commenced on or after January 1, 2005. A change to an existing nonpoint source discharge, in terms of relocation or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges from nonpoint sources (those not subject to an NPDES Permit) are prohibited except as provided below:

(1) The term "non-storm water discharges" means any waste discharges that are not composed entirely of storm water.

(2) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability, or occur naturally:

(i) Discharges associated with emergency fire fighting operations.

(ii) Foundation and footing drains.

(iii) Water from crawl space or basement pumps.

(iv) Hillside dewatering.

(v) Naturally occurring groundwater seepage via a storm drain.

(vi) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

f. At the San Clemente Island ASBS, discharges incidental to military training and research, development, test, and evaluation operations are allowed. Discharges incidental to underwater demolition and other in-water explosions are not allowed in the two military closure areas in the vicinity of Wilson Cove and Castle Rock. Discharges must not result in a violation of the water quality objectives, including the protection of the marine aquatic life beneficial use, anywhere in the ASBS.

g. At the San Nicolas Island and Begg Rock ASBS, discharges incidental to military research, development, testing, and evaluation of, and training with, guided missile and other weapons systems, fleet training exercises, small-scale amphibious warfare training, and special warfare training are allowed. Discharges incidental to underwater demolition and other in-water explosions are not allowed. Discharges must not result in a violation of the water quality objectives, including the protection of the marine aquatic life beneficial use, anywhere in the ASBS.

h. All other nonpoint source discharges not specifically authorized above are prohibited.

2. Planning and Reporting

a. The nonpoint source discharger shall develop an ASBS Pollution Prevention Plan, including an implementation schedule, to address storm water runoff and any other nonpoint source discharges from its facilities. The ASBS Pollution Prevention Plan must be equivalent in contents to an ASBS Compliance Plan as described in I (A)(2) in this document. The ASBS Pollution Prevention Plan is subject to approval by the Executive Director of the State Water Board (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements).

b. The ASBS Pollution Prevention Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff that are necessary to comply with these special conditions, will be achieved through Management Measures and associated Management Practices (Management Measures/Practices). Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director or Regional Water Board Executive Officer that such installation would pose a threat to health or safety. Management Measures to control storm water runoff during a design storm shall achieve on average the following target levels:

(1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

(2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges.

The baseline for these determinations is the effective date of the Exception, except for those structural BMPs installed between January 1, 2005 and adoption of these Special Protections, and the reductions must be achieved and documented within six (6) years of the effective date.

c. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff or other nonpoint source pollution is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and the Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents that alter natural water quality and the sources of these constituents.

(2) The report shall describe Management Measures/Practices that are currently being implemented, Management Measures/Practices that are identified in the ASBS Pollution Prevention Plan for future implementation, and any additional Management Measures/Practices that may be added to the Pollution Prevention Plan to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the Management Measures/Practices.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge

requirements), the discharger shall revise its ASBS Pollution Prevention Plan to incorporate any new or modified Management Measures/Practices that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised ASBS Pollution Prevention Plan, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural water quality conditions due to the same constituent.

(5) The requirements of this section are in addition to the terms, prohibitions, and conditions contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within eighteen (18) months from the effective date of the Exception, the discharger~~s~~ shall submit a draft written ASBS Pollution Prevention Plan to the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) that describes its strategy to comply with these special conditions, including the requirement to maintain natural ocean water quality in the affected ASBS. The Pollution Prevention Plan shall include a description of appropriate non-structural controls and a time schedule to implement structural controls to comply with these special conditions for inclusion in the discharger's Pollution Prevention Plan. The final ASBS Pollution Prevention Plan, including a description and final schedule for structural controls based on the results of runoff and receiving water monitoring, must be submitted within thirty (30) months from the effective date of the Exception.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these Special Protections shall be implemented.

d. Within six (6) years of the effective date of the Exception, any structural controls identified in the ASBS Pollution Prevention Plan that are necessary to comply with these special conditions shall be operational.

e. Within six (6) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) may only authorize additional time to comply

with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in (d.) or (e.). The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. a demonstration that the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or

2. for governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

II. ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES

In addition to the provisions in Section I (A) or I (B), respectively, a discharger with parks and recreation facilities shall comply with the following:

A. The discharger shall include a section in an ASBS Compliance Plan (for NPDES dischargers) or an ASBS Pollution Prevention Plan (for nonpoint source dischargers) to address storm water runoff from parks and recreation facilities.

1. The plan shall identify all pollutant sources, including sediment sources, which may result in waste entering storm water runoff. Pollutant sources include, but are not limited to, roadside rest areas and vistas, picnic areas, campgrounds, trash receptacles, maintenance facilities, park personnel housing, portable toilets, leach fields, fuel tanks, roads, piers, and boat launch facilities.

2. The plan shall describe BMPs or Management Measures/Practices that will be implemented to control soil erosion (both temporary and permanent erosion controls) and reduce or eliminate pollutants in storm water runoff in order to achieve and maintain natural water quality conditions in the affected ASBS. The plan shall include BMPs or Management Measures/Practices to ensure that trails and culverts are maintained to prevent erosion and minimize waste discharges to ASBS.

3. The plan shall include BMPs or Management Measures/Practices to prevent the discharge of pesticides or other chemicals, including agricultural chemicals, in storm water runoff to the affected ASBS.

4. The plan shall include BMPs or Management Measures/Practices that address public education and outreach. The goal of these BMPs or Management Measures/Practices is to ensure that the public is adequately informed that waste discharges to the affected ASBS are prohibited or limited by special conditions in these Special Protections. The BMPs or Management Measures/Practices shall include signage at camping, picnicking, beach and roadside parking areas, and visitor centers, or other appropriate measures, which notify the public of any applicable requirements of these Special Protections and identify the ASBS boundaries.

5. The plan shall include BMPs or Management Measures/Practices that address the prohibition against the discharge of trash to ASBS. The BMPs or Management Measures/Practices shall include measures to ensure that adequate trash receptacles are available for public use at visitor facilities, including parking areas, and that the receptacles are adequately maintained to prevent trash discharges into the ASBS. Appropriate measures include covering trash receptacles to prevent trash from being wind blown and periodically emptying the receptacles to prevent overflows.

6. The plan shall include BMPs or Management Measures/Practices to address runoff from parking areas and other developed features to ensure that the runoff does not alter natural water quality in the affected ASBS. BMPs or Management Measures/Practices shall include measures to reduce pollutant loading in runoff to the ASBS through installation of natural area buffers (LID), treatment, or other appropriate measures.

B. Maintenance and repair of park and recreation facilities must not result in waste discharges to the ASBS. The practice of road oiling must be minimized or eliminated, and must not result in waste discharges to the ASBS.

III. ADDITIONAL REQUIREMENTS – WATERFRONT AND MARINE OPERATIONS

In addition to the provisions in Section I (A) or I (B), respectively, a discharger with waterfront and marine operations shall comply with the following:

A. For discharges related to waterfront and marine operations, the discharger shall develop a Waterfront and Marine Operations Management Plan (Waterfront Plan). This plan shall contain appropriate Management Measures/Practices to address nonpoint source pollutant discharges to the affected ASBS.

1. The Waterfront Plan shall contain appropriate Management Measures/Practices for any waste discharges associated with the operation and maintenance of vessels, moorings, piers, launch ramps, and cleaning stations in order to ensure that beneficial uses are protected and natural water quality is maintained in the affected ASBS.

2. For discharges from marinas and recreational boating activities, the Waterfront Plan shall include appropriate Management Measures, described in The Plan for California's Nonpoint Source Pollution Control Program, for marinas and recreational boating, or equivalent practices, to ensure that nonpoint source pollutant discharges do not alter natural water quality in the affected ASBS.

3. The Waterfront Plan shall include Management Practices to address public education and outreach to ensure that the public is adequately informed that waste discharges to the affected ASBS are prohibited or limited by special conditions in these Special Protections. The management practices shall include appropriate signage, or similar measures, to inform the public of the ASBS restrictions and to identify the ASBS boundaries.

4. The Waterfront Plan shall include Management Practices to address the prohibition against trash discharges to ASBS. The Management Practices shall include the provision of adequate trash receptacles for marine recreation areas, including parking areas, launch ramps, and docks. The plan shall also include appropriate Management Practices to ensure that the receptacles are adequately maintained and secured in order to prevent trash discharges into the ASBS. Appropriate Management Practices include covering the trash receptacles to prevent trash from being windblown, staking or securing the trash receptacles so they don't tip over, and periodically emptying the receptacles to prevent overflow.

5. The discharger shall submit its Waterfront Plan to the by the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) within six months of the effective date of these special conditions. The Waterfront Plan is subject to approval by the State Water Board Executive Director or the Regional Water Board Executive Officer, as appropriate. The plan must be fully implemented within 18 months of the effective date of the Exception.

B. The discharge of chlorine, soaps, petroleum, other chemical contaminants, trash, fish offal, or human sewage to ASBS is prohibited. Sinks and fish cleaning stations are point source discharges of wastes and are prohibited from discharging into ASBS. Anthropogenic accumulations of discarded fouling organisms on the sea floor must be minimized.

C. Limited-term activities, such as the repair, renovation, or maintenance of waterfront facilities, including, but not limited to, piers, docks, moorings, and breakwaters, are authorized only in accordance with Chapter III.E.2 of the Ocean Plan.

D. If the discharger anticipates that the discharger will fail to fully implement the approved Waterfront Plan within the 18 month deadline, the discharger shall submit a technical report as soon as practicable to the State Water Board Executive Director or the Regional Water Board Executive Officer, as appropriate. The technical report shall contain reasons for failing to meet the deadline and propose a revised schedule to fully implement the plan.

E. The State Water Board or the Regional Water Board may, for good cause, authorize additional time to comply with the Waterfront Plan. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in Section III.A.5. The notice shall

describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality. The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. a demonstration of significant hardship by showing that the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate.

2. for governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

IV. MONITORING REQUIREMENTS

Monitoring is mandatory for all dischargers to assure compliance with the Ocean Plan. Monitoring requirements include both: (A) core discharge monitoring, and (B) ocean receiving water monitoring. The State and Regional Water Boards must approve sampling site locations and any adjustments to the monitoring programs. All ocean receiving water and reference area monitoring must be comparable with the Water Boards' Surface Water Ambient Monitoring Program (SWAMP).

Safety concerns: Sample locations and sampling periods must be determined considering safety issues. Sampling may be postponed upon notification to the State and Regional Water Boards if hazardous conditions prevail.

Analytical Chemistry Methods: All constituents must be analyzed using the lowest minimum detection limits comparable to the Ocean Plan water quality objectives. For metal analysis, all samples, including storm water effluent, reference samples, and ocean receiving water samples, must be analyzed by the approved analytical method with the lowest minimum detection limits (currently Inductively Coupled Plasma/Mass Spectrometry) described in the Ocean Plan.

A. CORE DISCHARGE MONITORING PROGRAM

1. General sampling requirements for timing and storm size:

   Runoff must be collected during a storm event that is greater than 0.1 inch and generates runoff, and at least 72 hours from the previously measurable storm event. Runoff samples shall be collected during the same storm and at approximately the same time when post-storm receiving water is sampled, and analyzed for the same constituents as receiving water and reference site samples (see section IV B) as described below.

2. Runoff flow measurements

   a. For municipal/industrial storm water outfalls in existence as of December 31, 2007,

18 inches (457mm) or greater in diameter/width (including multiple outfall pipes in combination having a width of 18 inches, runoff flows must be measured or calculated, using a method acceptable to and approved by the State and Regional Water Boards.

b. This will be reported annually for each precipitation season to the State and Regional Water Boards.

3. Runoff samples – storm events

a. For outfalls equal to or greater than 18 inches (0.46m) in diameter or width:

(1) samples of storm water runoff shall be collected during the same storm as receiving water samples and analyzed for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

(2) samples of storm water runoff shall be collected and analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

(3) If an applicant has no outfall greater than 36 inches, then storm water runoff from the applicant's largest outfall shall be further collected during the same storm as receiving water samples and analyzed for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates).

b. For outfalls equal to or greater than 36 inches (0.91m) in diameter or width:

(1) samples of storm water runoff shall be collected during the same storm as receiving water samples and analyzed for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

(2) samples of storm water runoff shall be further collected during the same storm as receiving water samples and analyzed for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates); and

(3) samples of storm water runoff shall be collected and analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

c. For an applicant not participating in a regional monitoring program [see below in Section IV (B)] in addition to (a.) and (b.) above, a minimum of the two largest outfalls or 20 percent of the larger outfalls, whichever is greater, shall be sampled (flow weighted composite samples) at least three times annually during wet weather (storm event) and analyzed for all Ocean Plan Table A constituents, Table B constituents for marine

aquatic life protection (except for toxicity, only chronic toxicity for three species shall be required), DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, and Ocean Plan indicator bacteria. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one (the largest) such discharge shall be sampled annually in each Region.

4. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may reduce or suspend core monitoring once the storm runoff is fully characterized. This determination may be made at any point after the discharge is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

B. Ocean Receiving Water and Reference Area Monitoring Program

In addition to performing the Core Discharge Monitoring Program in Section II.A above, all applicants having authorized discharges must perform ocean receiving water monitoring. In order to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS, dischargers may choose either (1) an individual monitoring program, or (2) participation in a regional integrated monitoring program.

1. Individual Monitoring Program: The requirements listed below are for those dischargers who elect to perform an individual monitoring program to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within the affected ASBS. In addition to Core Discharge Monitoring, the following additional monitoring requirements shall be met:

   a. Three times annually, during wet weather (storm events), the receiving water at the point of discharge from the outfalls described in section (IV)(A)(3)(c) above shall be sampled and analyzed for Ocean Plan Table A constituents, Table B constituents for marine aquatic life, DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, salinity, chronic toxicity (three species), and Ocean Plan indicator bacteria.

      The sample location for the ocean receiving water shall be in the surf zone at the point of discharges; this must be at the same location where storm water runoff is sampled. Receiving water shall be sampled prior to (pre-storm) and during (or immediately after) the same storm (post storm). Post storm sampling shall be during the same storm and at approximately the same time as when the runoff is sampled. Reference water quality shall also be sampled three times annually and analyzed for the same constituents pre-storm and post-storm, during the same storm seasons when receiving water is sampled. Reference stations will be determined by the State Water Board's Division of Water Quality and the applicable Regional Water Board(s).

   b. Sediment sampling shall occur at least three times during every five (5) year period. The subtidal sediment (sand or finer, if present) at the discharge shall be sampled and analyzed for Ocean Plan Table B constituents for marine aquatic life, DDT, PCBs, PAHs, pyrethroids, and OP pesticides. For sediment toxicity testing, only an acute toxicity test using the amphipod *Eohaustorius estuarius* must be performed.

c. A quantitative survey of intertidal benthic marine life shall be performed at the discharge and at a reference site. The survey shall be performed at least once every five (5) year period. The survey design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The results of the survey shall be completed and submitted to the State Water Board and Regional Water Board at least six months prior to the end of the permit cycle.

d. Once during each five (5) year period, a bioaccumulation study shall be conducted to determine the concentrations of metals and synthetic organic pollutants at representative discharge sites and at representative reference sites. The study design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The bioaccumulation study may include California mussels (*Mytilus californianus*) and/or sand crabs (*Emerita analoga* or *Blepharipoda occidentalis*). Based on the study results, the Regional Water Board and the State Water Board's Division of Water Quality, may adjust the study design in subsequent permits, or add or modify additional test organisms (such as shore crabs or fish), or modify the study design appropriate for the area and best available sensitive measures of contaminant exposure.

e. Marine Debris: Representative quantitative observations for trash by type and source shall be performed along the coast of the ASBS within the influence of the discharger's outfalls. The design, including locations and frequency, of the marine debris observations is subject to approval by the Regional Water Board and State Water Board's Division of Water Quality.

f. The monitoring requirements of the Individual Monitoring Program in this section are minimum requirements. After a minimum of one (1) year of continuous water quality monitoring of the discharges and ocean receiving waters, the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may require additional monitoring, or adjust, reduce or suspend receiving water and reference station monitoring. This determination may be made at any point after the discharge and receiving water is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

2. Regional Integrated Monitoring Program: Dischargers may elect to participate in a regional integrated monitoring program, in lieu of an individual monitoring program, to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS. This regional approach shall characterize natural water quality, pre- and post-storm, in ocean reference areas near the mouths of identified open space watersheds and the effects of the discharges on natural water quality (physical, chemical, and toxicity) in the ASBS receiving waters, and should include benthic marine aquatic life and bioaccumulation components. The design of the ASBS stratum of a regional integrated monitoring program may deviate from the otherwise prescribed individual monitoring approach (in Section IV.B.1) if approved by the State Water Board's Division of Water Quality and the Regional Water Boards.

a. Ocean reference areas shall be located at the drainages of flowing watersheds with minimal development (in no instance more than 10% development), and shall not be located in CWA Section 303(d) listed waterbodies or have tributaries that are 303(d) listed. Reference areas shall be free of wastewater discharges and anthropogenic non- storm water runoff. A minimum of low threat storm runoff discharges (e.g.

stream highway overpasses and campgrounds) may be allowed on a case-by-case basis. Reference areas shall be located in the same region as the ASBS receiving water monitoring occurs. The reference areas for each Region are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean reference water samples must be collected from each station, each from a separate storm during the same storm season that receiving water is sampled. A minimum of one reference location shall be sampled for each ASBS receiving water site sampled per responsible party. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

b. ASBS ocean receiving water must be sampled in the surf zone at the location where the runoff makes contact with ocean water (i.e. at "point zero"). Ocean receiving water stations must be representative of worst-case discharge conditions (i.e. co-located at a large drain greater than 36 inches, or if drains greater than 36 inches are not present in the ASBS then the largest drain greater than18 inches.) Ocean receiving water stations are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean receiving water samples must be collected during each storm season from each station, each from a separate storm. A minimum of one receiving water location shall be sampled in each ASBS per responsible party in that ASBS. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

c. Reference and receiving water sampling shall commence during the first full storm season following the adoption of these special conditions, and post-storm samples shall be collected during the same storm event when storm water runoff is sampled. Sampling shall occur in a minimum of two storm seasons. For those ASBS dischargers that have already participated in the Southern California Bight 2008 ASBS regional monitoring effort, sampling may be limited to only one storm season.

d. Receiving water and reference samples shall be analyzed for the same constituents as storm water runoff samples. At a minimum, constituents to be sampled and analyzed in reference and discharge receiving waters must include oil and grease, total suspended solids, Ocean Plan Table B metals for protection of marine life, Ocean Plan PAHs, pyrethroids, OP pesticides, ammonia, nitrate, phosphates, and critical life stage chronic toxicity for three species. In addition, within the range of the southern sea otter, indicator bacteria or some other measure of fecal contamination shall be analyzed.

3. Waterfront and Marine Operations: In addition to the above requirements for ocean receiving water monitoring, additional monitoring must be performed for marinas and boat launch and pier facilities:

a. For all marina or mooring field operators, in mooring fields with 10 or more occupied moorings, the ocean receiving water must be sampled for Ocean Plan indicator bacteria, residual chlorine, copper, zinc, grease and oil, methylene blue active substances (MBAS), and ammonia nitrogen.

(1) For mooring field operators opting for an individual monitoring program (Section IV.B.1 above), this sampling must occur weekly (on the weekend) from May through October.

(2) For mooring field operators opting to participate in a regional integrated monitoring program (Section IV.B.2 above), this sampling must occur monthly from May through October on a high use weekend in each month. The Water Boards may allow a reduction in the frequency of sampling, through the regional monitoring program, after the first year of monitoring.

b. For all mooring field operators, the subtidal sediment (sand or finer, if present) within mooring fields and below piers shall be sampled and analyzed for Ocean Plan Table B metals (for marine aquatic life beneficial use), acute toxicity, PAHs, and tributyltin. For sediment toxicity testing, only an acute toxicity test using the amphipod *Eohaustorius estuarius* must be performed. This sampling shall occur at least three times during a five (5) year period. For mooring field operators opting to participate in a regional integrated monitoring program, the Water Boards may allow a reduction in the frequency of sampling after the first sampling effort's results are assessed.

Glossary

At the point of discharge(s) – Means in the surf zone immediately where runoff from an outfall meets the ocean water (a.k.a., at point zero).

Areas of Special Biological Significance (ASBS) – Those areas designated by the State Water Board as ocean areas requiring protection of species or biological communities to the extent that alteration of natural water quality is undesirable. All Areas of Special Biological Significance are also classified as a subset of State Water Quality Protection Areas.

Design storm – For purposes of these Special Protections, a design storm is defined as the volume of runoff produced from one inch of precipitation per day or, if this definition is inconsistent with the discharger's applicable storm water permit, then the design storm shall be the definition included in the discharger's applicable storm water permit.

Development – Relevant to reference monitoring sites, means urban, industrial, agricultural, grazing, mining, and timber harvesting land uses.

Higher threat discharges - Permitted storm drains discharging equal to or greater than 18 inches, industrial storm drains, agricultural runoff discharged through an MS4, discharges associated with waterfront and marina operations (e.g., piers, launch ramps, mooring fields, and associated vessel support activities, except for passive discharges defined below), and direct discharges associated with commercial or industrial activities to ASBS.

Low Impact Development (LID) – A sustainable practice that benefits water supply and contributes to water quality protection. Unlike traditional storm water management, which entails collecting and conveying storm water runoff through storm drains, pipes, or other conveyances to a centralized storm water facility, LID focuses on using site design and storm water management to maintain the site's pre-development runoff rates and volumes. The goal of LID is to mimic a site's predevelopment hydrology by using design techniques that infiltrate, filter, store, evaporate, and detain runoff close to the source of rainfall.

Marine Operations – Marinas or mooring fields that contain slips or mooring locations for 10 or more vessels.

Management Measure (MM) - Economically achievable measures for the control of the addition of pollutants from various classes of nonpoint sources of pollution, which reflect the greatest degree of pollutant reduction achievable through the application of the best available nonpoint pollution control practices, technologies, processes, siting criteria, operating methods, or other alternatives. For example, in the "marinas and recreational boating" land- use category specified in the Plan for California's Nonpoint Source Pollution Control Program (NPS Program Plan) (SWRCB, 1999), "boat cleaning and maintenance" is considered a MM or the source of a specific class or type of NPS pollution.

Management Practice (MP) - The practices (e.g., structural, non-structural, operational, or other alternatives) that can be used either individually or in combination to address a specific MM class or classes of NPS pollution. For example, for the "boat cleaning and maintenance" MM, specific MPs can include, but are not limited to, methods for the selection of environmentally sensitive hull paints or methods for cleaning/removal of hull copper anti- fouling paints.

Municipal Separate Storm Sewer System (MS4) – A municipally-owned storm sewer system regulated under the Phase I or Phase II storm water program implemented in compliance with Clean Water Act section 402(p). Note that an MS4 program's boundaries are not necessarily congruent with the permittee's political boundaries.

Natural Ocean Water Quality - The water quality (based on selected physical, chemical and biological characteristics) that is required to sustain marine ecosystems, and which is without apparent human influence, *i.e.*, an absence of significant amounts of: (a) man-made constituents (*e.g.,* DDT); (b) other chemical (*e.g.,* trace metals), physical (temperature/thermal pollution, sediment burial), and biological (*e.g.*, bacteria) constituents at concentrations that have been elevated due to man's activities above those resulting from the naturally occurring processes that affect the area in question; and (c) non-indigenous biota (*e.g.,* invasive algal bloom species) that have been introduced either deliberately or accidentally by man. Discharges "*shall not alter natural ocean water quality*" as determined by a comparison to the range of constituent concentrations in reference areas agreed upon via the regional monitoring program(s). If monitoring information indicates that *natural ocean water quality* is not maintained, but there is sufficient evidence that a discharge is not contributing to the alteration of natural water quality, then the Regional Water Board may make that determination. In this case, sufficient information must include runoff sample data that has equal or lower concentrations for the range of constituents at the applicable reference area(s).

Nonpoint source – Nonpoint pollution sources generally are sources that do not meet the definition of a point source. Nonpoint source pollution typically results from land runoff, precipitation, atmospheric deposition, agricultural drainage, marine/boating operations or hydrologic modification. Nonpoint sources, for purposes of these Special Protections, include discharges that are not required to be regulated under an NPDES permit.

Non-storm water discharge – Any runoff that is not the result of a precipitation event. This is often referred to as "dry weather flow."

Non-structural control – A Best Management Practice that involves operational, maintenance, regulatory (e.g., ordinances) or educational activities designed to reduce or eliminate pollutants in runoff, and that are not structural controls (i.e. there are no physical structures involved).

Physical impossibility - Means any act of God, war, fire, earthquake, windstorm, flood or natural catastrophe; unexpected and unintended accidents not caused by discharger or its employees' negligence; civil disturbance, vandalism, sabotage or terrorism; restrain by court order or public authority or agency; or action or non-action by, or inability to

obtain the necessary authorizations or approvals from any governmental agency other than the permittee.

Representative sites and monitoring procedures – Are to be proposed by the discharger, with appropriate rationale, and subject to approval by Water Board staff.

Sheet-flow – Runoff that flows across land surfaces at a shallow depth relative to the cross- sectional width of the flow. These types of flow may or may not enter a storm drain system before discharge to receiving waters.

Storm Season – Also referred to as rainy season, means the months of the year from the onset of rainfall during autumn until the cessation of rainfall in the spring.

Structural control – A Best Management Practice that involves the installation of engineering solutions to the physical treatment or infiltration of runoff.

Surf Zone - The surf zone is defined as the submerged area between the breaking waves and the shoreline at any one time.

Surface Water Ambient Monitoring Program (SWAMP) comparable – Means that the monitoring program must 1) meet or exceed 2008 SWAMP Quality Assurance Program Management Plan (QAPP) Measurement Quality Objectives, or 2) have a Quality Assurance Project Plan that has been approved by SWAMP; in addition data must be formatted to match the database requirements of the SWAMP Information Management System. Adherence to the measurement quality objectives in the Southern California Bight 2008 ASBS Regional Monitoring Program QAPP and data base management comprises being SWAMP comparable.

Waterfront Operations - Piers, launch ramps, and cleaning stations in the water or on the adjacent shoreline.

Attachment 1
Special Protections Sections I(A)(3)(e) and I(B)(3)(e)
Flowchart to Determine Compliance with natural Water Quality

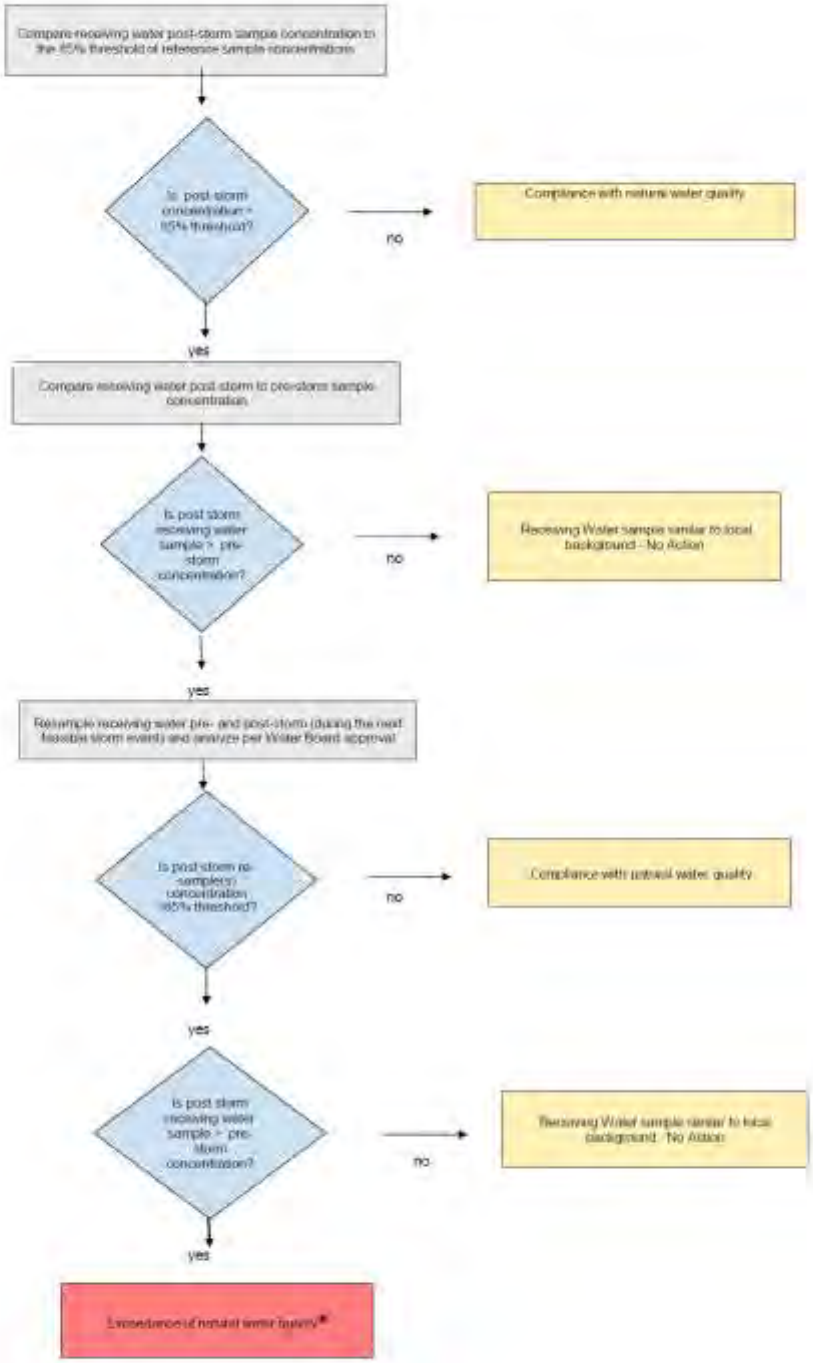

* When an exceedance of natural water quality occurs, the discharger must comply with section I.A.2.h (for permitted storm water) or section I.B.2.c (for nonpoint sources). Note, when sampling data is available, end-of-pipe effluent concentrations will be considered by the Water Boards in making this determination.

ATTACHMENT B

STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

1. Standard Permit Provisions

Code of Federal Regulations Title 40 Section 122.41 (40 CFR 122.41) includes conditions, or provisions, that apply to all National Pollutant Discharge Elimination System (NPDES) permits. Additional provisions applicable to NPDES permits are in 40 CFR 122.42. All applicable provisions in 40 CFR 122.41 and 40 CFR 122.42 must be incorporated into this Order and NPDES permit. The applicable 40 CFR 122.41 and 40 CFR 122.42 provisions are as follows:

a. DUTY TO COMPLY [40 CFR 122.41(a)]

The Copermittee must comply with all of the provisions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

(1) The Copermittee must comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement. [40 CFR 122.41(a)(1)]

(2) The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to a civil penalty not to exceed $25,000 per day for each violation. The CWA provides that any person who *negligently* violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than 2 years, or both. Any person who *knowingly* violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both. Any person who knowingly violates Section 301, 302, 303, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, and who knows at that time that he thereby places another person in imminent

danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.
[40 CFR 122.41(a)(2)]

(3) Any person may be assessed an administrative penalty by the San Diego Regional Water Quality Control Board (San Diego Water Board), State Water Resources Control Board (State Water Board), or United States Environmental Protection Agency (USEPA) for violating Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.
[40 CFR 122.41(a)(3)]

b. DUTY TO REAPPLY [40 CFR 122.41(b)]

If a Copermittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Copermittee must apply for and obtain a new permit.

c. NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE [40 CFR 122.41(c)]

It shall not be a defense for a Copermittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

d. DUTY TO MITIGATE [40 CFR 122.41(d)]

The Copermittee must take all reasonable steps to minimize or prevent any discharge or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

e. PROPER OPERATION AND MAINTENANCE [40 CFR 122.41(e)]

The Copermittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Copermittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by a Copermittee only when the operation is necessary to achieve compliance with the conditions of this permit.

f. PERMIT ACTIONS [40 CFR 122.41(f)]

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Copermittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

g. PROPERTY RIGHTS [40 CFR 122.41(g)]

This permit does not convey any property rights of any sort, or any exclusive privilege.

h. DUTY TO PROVIDE INFORMATION [40 CFR 122.41(h)]

The Copermittee must furnish to the San Diego Water Board, State Water Board, or USEPA within a reasonable time, any information which the San Diego Water Board, State Water Board, or USPEA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Copermittee must also furnish to the San Diego Water Board, State Water Board, or USPEA upon request, copies of records required to be kept by this permit.

i. INSPECTION AND ENTRY [40 CFR 122.41(i)]

The Copermittee must allow the San Diego Water Board, State Water Board, USEPA, and/or their authorized representative (including an authorized contractor acting as their representative), upon presentation of credentials and other documents as may be required by law, to:

(1) Enter upon the Copermittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit; [40 CFR 122.41(i)(1)]

(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit; [40 CFR 122.41(i)(2)]

(3) Inspect and photograph at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; [40 CFR 122.41(i)(3)] and

(4) Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location. [40 CFR 122.41(i)(4)]

j. MONITORING AND RECORDS [40 CFR 122.41(j)]

(1) Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity. [40 CFR 122.41(j)(1)]

(2) Except for records of monitoring information required by this permit related to the Copermittee's sewage sludge use and disposal activities, which shall be retained for

a period of at least five (5) years (or longer as required by 40 CFR Part 503), the Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time. [40 CFR 122.41(j)(2)]

(3) Records for monitoring information must include: [40 CFR 122.41(j)(3)]

(a) The date, exact place, and time of sampling or measurements; [40 CFR 122.41(j)(3)(i)]
(b) The individual(s) who performed the sampling or measurements; [40 CFR 122.41(j)(3)(ii)]
(c) The date(s) analyses were performed; [40 CFR 122.41(j)(3)(iii)]
(d) The individual(s) who performed the analyses; [40 CFR 122.41(j)(3)(iv)]
(e) The analytical techniques or methods used; [40 CFR 122.41(j)(3)(v)] and
(f) The results of such analyses. [40 CFR 122.41(j)(3)(vi)]

(4) Monitoring must be conducted according to test procedures under 40 CFR Part 136 unless another method is required under 40 CFR Subchapters N or O. [40 CFR 122.41(j)(4)]

In the case of pollutants for which there are no approved methods under 40 CFR Part 136 or otherwise required under 40 CFR Subchapters N and O, monitoring must be conducted according to a test procedure specified in the permit for such pollutants. [40 CFR 122.44(i)(1)(iv)]

(5) The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. [40 CFR 122.41(j)(5)]

k. SIGNATORY REQUIREMENT [40 CFR 122.41(k)]

(1) All applications, reports, or information submitted to the San Diego Water Board, State Water Board, or USEPA must be signed and certified. (See 40 CFR 122.22) [40 CFR 122.41(k)(1)]

(a) *For a municipality, State, Federal, or other public agency.* [All applications must be signed] by either a principal executive officer or ranking elected official. [40 CFR 122.22(a)(3)]

(b) All reports required by permits, and other information requested by the San Diego Water Board, State Water Board, or USEPA must be signed by a person described in paragraph (a) of this section, or by a duly authorized

representative of that person. A person is a duly authorized representative only if: [40 CFR 122.22(b)]

(i) The authorization is made in writing by a person described in paragraph (a) of this section; [40 CFR 122.22(b)(1)]

(ii) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company, (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) [40 CFR 122.22(b)(2)] and,

(iii) The written authorization is submitted to the San Diego Water Board and State Water Board. [40 CFR 122.22(b)(3)]

(c) *Changes to authorization.* If an authorization under paragraph (b) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (b) of this section must be submitted to the San Diego Water Board prior to or together with any reports, information, or applications to be signed by an authorized representative. [40 CFR 122.22(c)]

(d) *Certification.* Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." [40 CFR 122.22(d)]

(2) The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both. [40 CFR 122.41(k)(2)]

I. REPORTING REQUIREMENTS [40 CFR 122.41(l)]

(1) *Planned changes.* The Copermittee must give notice to the San Diego Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when: [40 CFR 122.41(l)(1)]

(a) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); [40 CFR 122.41(l)(1)(i)] or

(b) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1). [40 CFR 122.41(l)(1)(ii)]

(c) The alteration or addition results in a significant change in the Copermittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. [40 CFR 122.41(l)(1)(iii)]

(2) *Anticipated noncompliance*. The Copermittee must give advance notice to the San Diego Water Board or State Water Board of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements. [40 CFR 122.41(l)(2)]

(3) *Transfers*. This permit is not transferable to any person except after notice to the San Diego Water Board. The San Diego Water Board may require modification or revocation and reissuance of the permit to change the name of the Copermittee and incorporate such other requirements as may be necessary under the CWA. [40 CFR 122.41(l)(3)]

(4) *Monitoring reports.* Monitoring results must be reported at the intervals specified elsewhere in this permit. [40 CFR 122.41(l)(4)]

(a) Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the San Diego Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices. [40 CFR 122.41(l)(4)(i)]

(b) If the Copermittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or another method required for an industry-specific waste stream under 40 CFR Subchapters N or O, the results of this monitoring must be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the San Diego Water Board or State Water Board. [40 CFR 122.41(l)(4)(ii)]

(c) Calculations for all limitations which require averaging of measurements must utilize an arithmetic mean unless otherwise specified in the permit. [40 CFR 122.41(l)(4)(iii)]

(5) *Compliance schedules*. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date. [40 CFR 122.41(l)(5)]

(6) *Twenty-four hour reporting.*

(a) The Copermittee must report any noncompliance that may endanger health or the environment. Any information must be provided orally within 24 hours from the time the Copermittee becomes aware of the circumstances. A written submission must also be provided within five (5) days of the time the Copermittee becomes aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6)(i)]

(b) The following must be included as information which must be reported within 24 hours under this paragraph: [40 CFR 122.41(l)(6)(ii)]

(i) Any unanticipated bypass that exceeds any effluent limitation in the permit (See 40 CFR 122.41(g)). [40 CFR 122.41(l)(6)(ii)(A)]
(ii) Any upset which exceeds any effluent limitation in the permit. [40 CFR 122.41(l)(6)(ii)(B)] and,
(iii) Violation of a maximum daily discharge limitation for any of the pollutants listed by the San Diego Water Board in the permit to be reported within 24 hours. (See 40 CFR 122.44(g)) [40 CFR 122.41(l)(6)(ii)(C)]

(c) The San Diego Water Board may waive the above-required written report on a case-by-case basis if the oral report has been received within 24 hours. [40 CFR 122.41(l)(6)(iii)]

(7) *Other noncompliance.* The Copermittee must report all instances of noncompliance not reported in accordance with the standard provisions required under 40 CFR 122.41(l)(4), (5), and (6), at the time monitoring reports are submitted. The reports must contain the information listed in the standard provisions required under 40 CFR 122.41(l)(6). [40 CFR 122.41(l)(7))]

(8) *Other information.* When the Copermittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the San Diego Water Board, State Water Board, or USEPA, the Copermittee must promptly submit such facts or information. [40 CFR 122.41(l)(8)]

m. BYPASS [40 CFR 122.41(m)]

(1) *Definitions.*

(a) "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. [40 CFR 122.41(m)(1)(i)] or

(b) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or

substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
[40 CFR 122.41(m)(1)(ii)]

(2) *Bypass not exceeding limitations*. The Copermittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the standard provisions required under 40 CFR 122.41(m)(3) and (4).
[40 CFR 122.41(m)(2)]

(3) *Notice.*

(a) *Anticipated bypass*. If the Copermittee knows in advance of the need for a bypass, it must submit a notice, if possible at least ten days before the date of the bypass. [40 CFR 122.41(m)(3)(i)] or

(b) *Unanticipated bypass*. The Copermittee must submit notice of an unanticipated bypass in accordance with the standard provisions required under 40 CFR 122.41(l)(6) (24-hour notice).
[40 CFR 122.41(m)(3)(ii)]

(4) *Prohibition of Bypass.*

(a) Bypass is prohibited, and the San Diego Water Board may take enforcement action against a Copermittee for bypass, unless:
[40 CFR 122.41(m)(4)(i)]

(i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; [40 CFR 122.41(m)(4)(i)(A)]
(ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance;
[40 CFR 122.41(m)(4)(i)(B)] and,
(iii) The Copermittee submitted notice in accordance with the standard provisions required under 40 CFR 122.41(m)(3).
[40 CFR 122.41(m)(4)(i)(C)]

(b) The San Diego Water Board may approve an anticipated bypass, after considering its adverse effects, if the San Diego Water Board determines that it will meet the three conditions listed above.
[40 CFR 122.41(m)(4)(ii)]

n. UPSET [40 CFR 122.41(n)]

(1) *Definition.* "Upset" means an exceptional incident in which there is unintentional and

temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Copermittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. [40 CFR 122.41(n)(1)]

(2) *Effect of an upset*. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the standard provisions required under 40 CFR 122.41(n)(3) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. [40 CFR 122.41(n)(2)]

(3) *Conditions necessary for a demonstration of upset*. A Copermittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that: [40 CFR 122.41(n)(3)]

(a) An upset occurred and that the Copermittee can identify the cause(s) of the upset; [40 CFR 122.41(n)(3)(i)]
(b) The permitted facility was at the time being properly operated; [40 CFR 122.41(n)(3)(ii)] and
(c) The Copermittee submitted notice of the upset in accordance with the standard provisions required under 40 CFR 122.41(l)(6)(ii)(B) (24-hour notice). [40 CFR 122.41(n)(3)(iii)]
(d) The Copermittee complied with any remedial measures pursuant to the standard provisions required under 40 CFR 122.41(d). [40 CFR 122.41(n)(3)(iii)]

(4) *Burden of proof*. In any enforcement proceeding, the Copermittee seeking to establish the occurrence of an upset has the burden of proof. [40 CFR 122.41(n)(4)]

o. STANDARD PERMIT PROVISIONS FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS [40 CFR 122.42(c)]

The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the San Diego Water Board or State Water Board under 40 CFR 122.26(a)(1)(v) must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report must include:

(1) The status of implementing the components of the storm water management program that are established as permit conditions; [40 CFR 122.42(c)(1)]

(2) Proposed changes to the storm water management programs that are established as permit conditions. Such proposed changes must be consistent with 40 CFR 122.26(d)(2)(iii); [40 CFR 122.42(c)(2)] and

(3) Revisions, if necessary, to the assessment of controls and the fiscal analysis

reported in the permit application under 40 CFR 122.26(d)(2)(iv) and (v); [40 CFR 122.42(c)(3)]

(4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; [40 CFR 122.42(c)(4)]

(5) Annual expenditures and budget for year following each annual report; [40 CFR 122.42(c)(5)]

(6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; [40 CFR 122.42(c)(6)]

(7) Identification of water quality improvements or degradation. [40 CFR 122.42(c)(7)]

p. STANDARD PERMIT PROVISIONS FOR STORM WATER DISCHARGES [40 CFR 122.42(d)]

The initial permits for discharges composed entirely of storm water issued pursuant to 40 CFR 122.26(e)(7) must require compliance with the conditions of the permit as expeditiously as practicable, but in no event later than three years after the date of issuance of the permit.

2. General Provisions

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. The general provisions applicable to this Order and NPDES permit are as follows:

a. DISCHARGE OF WASTE IS A PRIVILEGE

No discharge of waste into the waters of the State, whether or not such discharge is made pursuant to waste discharge requirements, shall create a vested right to continue such discharge. All discharges of waste into waters of the State are privileges, not rights. [CWC Section 13263(g)]

b. DURATION OF ORDER AND NPDES PERMIT

(1) *Effective date*. This Order supersedes Order No. R9-2007-0001 for the San Diego County Copermittees listed in Table ~~2.~~1a and became effective on June 27, 2013~~ for those Copermittees~~. This Order as amended by Order R9-2015-0001 supersedes Order No. R9-2009-0002 for the Orange County Copermittees listed in Table 1b and its amendments through Order No. R9-2015-0001 ~~becomes~~ became effective April 1, 2015~~, following the date Order No. R9-2015-0001 is adopted~~. This Order as amended by Order Nos. R9-2015-0001 and R9-2015-0100 supersedes Order No. R9-2010-0016 for the Riverside County Copermittees listed in Table 1c and its amendments through Order No. R9-2015-0100 became effective January 7, 2016. ~~upon further amendment or earlier notice of coverage.~~

(2) *Expiration*. This Order and NPDES permit expires five years after June 27, 2013, its initial effective date. [40 CFR 122.46(a)]

(3) *Continuation of expired order*. After this Order and NPDES permit expires, the terms and conditions of this Order and NPDES permit are automatically continued pending issuance of a new permit if all requirements of the federal NPDES regulations on the continuation of expired permits (40 CFR 122.6) are complied with.

c. AVAILABILITY

A copy of this Order must be kept at a readily accessible location and must be available to on-site personnel at all times.

d. CONFIDENTIALITY OF INFORMATION

Except as provided for in 40 CFR 122.7, no information or documents submitted in accordance with or in application for this Order will be considered confidential, and all such information and documents shall be available for review by the public at the San Diego Water Board office.

Claims of confidentiality for the following information will be denied:
[40 CFR 122.7(b)]

(1) The name and address of any permit applicant or Copermittee; [40 CFR 122.7(b)(1)] and

(2) Permit applications and attachments, permits, and effluent data. [40 CFR 122.7(b)(2)]

e. EFFLUENT LIMITATIONS

(1) *Interim effluent limitations*. The Copermittee must comply with any interim effluent limitations as established by addendum, enforcement action, or revised waste discharge requirements which have been, or may be, adopted by the San Diego Water Board.

(2) *Other effluent limitations and standards*. If any applicable toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant and that standard or prohibition is more stringent than any limitation on the pollutant in the permit, the San Diego Water Board shall institute proceedings under these regulations to modify or revoke and reissue the permit to conform to the toxic effluent standard or prohibition. [40 CFR 122.44(b)(1)]

f. DUTY TO MINIMIZE OR CORRECT ADVERSE IMPACTS

The Copermittee must take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this Order, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the noncompliance.

g. PERMIT ACTIONS

The filing of a request by the Copermittee for modification, revocation and reissuance, or termination of this Order, or a notification of planned change in or anticipated noncompliance with this Order does not stay any condition of this Order. (See 40 CFR 122.41(f)) In addition, the following provisions apply to this Order:

(1) Upon application by any affected person, or on its own motion, the San Diego Water Board may review and revise the requirements in this Order. All requirements must be reviewed periodically. [CWC Section 13263(e)]

(2) This Order may be terminated or modified for cause, including, but not limited to, all of the following: [CWC Section 13381]

(a) Violation of any condition contained in the requirements of this Order. [CWC Section 13381(a)]

(b) Obtaining the requirements in this Order by misrepresentation, or failure to disclose fully all relevant facts. [CWC Section 13381(b)]

(c) A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge. [CWC Section 13381(c)]

(3) When this Order is transferred to a new owner or operator, such requirements as may be necessary under the CWC may be incorporated into this Order.

h. NPDES PERMITTED NON-STORM WATER DISCHARGES

The San Diego Water Board has, in prior years, issued a limited number of individual NPDES permits for non-storm water discharges to MS4s. The San Diego Water Board or State Water Board may in the future, upon prior notice to the Copermittee(s), issue an NPDES permit for any non-storm water discharge (or class of non-storm water discharges) to an MS4.

i. MONITORING

In addition to the standard provisions required under 40 CFR 122.41(j) and (l)(4), the following general monitoring provisions apply to this Order:

(1) Where procedures are not otherwise specified in Order, sampling, analysis and quality assurance/quality control must be conducted in accordance with the Quality Assurance Management Plan (QAMP) for the State of California's Surface Water Ambient Monitoring Program (SWAMP), adopted by the State Water Resources Control Board (State Water Board).

(2) Pursuant to 40 CFR 122.41(j)(2) and CWC Section 13383(a), each Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring

instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five (5) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time.

(3) All chemical, bacteriological, and toxicity analyses must be conducted at a laboratory certified for such analyses by the California Department of Public Health or a laboratory approved by the San Diego Water Board.

(4) For priority toxic pollutants that are identified in the California Toxics Rule (CTR) (65 Fed. Reg. 31682), the Copermittees must instruct their laboratories to establish calibration standards that are equivalent to or lower than the Minimum Levels (MLs) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP). If a Copermittee can demonstrate that a particular ML is not attainable, in accordance with procedures set forth in 40 CFR Part 136, the lowest quantifiable concentration of the lowest calibration standard analyzed by a specific analytical procedure (assuming that all the method specified sample weights, volumes, and processing steps have been followed) may be used instead of the ML listed in Appendix 4 of the SIP. The Copermittee must submit documentation from the laboratory to the San Diego Water Board for approval prior to raising the ML for any priority toxic pollutant.

j. ENFORCEMENT

(1) The San Diego Water Board is authorized to enforce the terms of this Order under several provisions of the CWC, including, but not limited to, CWC Sections 13385, 13386, and 13387.

(2) Nothing in this Order shall be construed to protect the Copermittee from its liabilities under federal, state, or local laws.

(3) The CWC provides for civil and criminal penalties comparable to, and in some cases greater than, those provided for under the CWA.

(4) Except as provided in the standard conditions required under 40 CFR 122.41(m) and (n), nothing in this Order shall be construed to relieve the Copermittee from civil or criminal penalties for noncompliance.

(5) Nothing in this Order shall be construed to preclude the institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties to which the Copermittee is or may be subject to under Section 311 of the CWA.

(6) Nothing in this Order shall be construed to preclude institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authoring preserved by Section 510 of the CWA.

k. SEVERABILITY

The provisions of this Order are severable, and if any provision of this Order, or the application of any provisions of this Order to any circumstance, is held invalid, the

application of such provision to other circumstances and the remainder of this Order shall not be affected thereby.

l. APPLICATIONS

Any application submitted by a Copermittee for reissuance or modification of this Order must satisfy all applicable requirements specified in federal regulations as well as any additional requirements for submittal of a Report of Waste Discharge specified in the CWC and the California Code of Regulations.

m. IMPLEMENTATION

All plans, reports and subsequent amendments submitted in compliance with this Order must be implemented immediately (or as otherwise specified). All submittals by Copermittees must be adequate to implement the requirements of this Order.

n. REPORT SUBMITTALS

(1) All report submittals must include an executive summary, introduction, conclusion, recommendations, and signed certified statement.

(2) Each Copermittee must submit a signed certified statement covering its responsibilities for each applicable submittal.

(3) The Principal Watershed Copermittee(s) must submit a signed certified statement covering its responsibilities for each applicable submittal and the sections of the submittals for which it is responsible.

(4) Unless otherwise directed, the Copermittees must submit ~~one hard copy and~~ one electronic copy of each report required under this Order to the San Diego Water Board at SanDiego@waterboards.ca.gov~~, and one electronic copy to the USEPA~~.

(5) When hard copies are requested or required, ~~T~~the Copermittees must submit reports and provide notifications as required by this Order to ~~the following~~:

EXECUTIVE OFFICER
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
2375 NORTHSIDE DRIVE, SUITE 100
SAN DIEGO CA 92108
Telephone: (619) 516-1990 Fax: (619) 516-1994

~~EUGENE BROMLEY~~
~~US ENVIRONMENTAL PROTECTION AGENCY~~
~~REGION IX~~
~~PERMITS ISSUANCE SECTION (W-5-1)~~
~~75 HAWTHORNE STREET~~
~~SAN FRANCISCO CA 94105~~

ATTACHMENT C

ACRONYMS AND ABBREVIATIONS

AMAL	Average Monthly Action Level
ASBS	Area(s) of Special Biological Significance
BMP	Best Management Practice
Basin Plan	Water Quality Control Plan for the San Diego Basin
CEQA	California Environmental Quality Act
CCR	California Code of Regulations
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWC	California Water Code
CZARA	Coastal Zone Act Reauthorization Amendments of 1990
ESAs	Environmentally Sensitive Areas
GIS	Geographic Information System
IBI	Index of Biological Integrity
LID	Low Impact Development
MDAL	Maximum Daily Action Level
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
NAL	Non-Storm Water Action Level
NAICS	North American Industry Classification System
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
ROWD	Report of Waste Discharge (application for NPDES reissuance)
SAL	Storm Water Action Level
San Diego Water Board	California Regional Water Quality Control Board, San Diego Region
SIC	Standard Industrial Classification Code
State Water Board	State Water Resources Control Board
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
WDID	Waste Discharge Identification Number
WLA	Waste Load Allocation
WQBEL	Water Quality Based Effluent Limitation

DEFINITIONS

Active/Passive Sediment Treatment - Using mechanical, electrical or chemical means to flocculate or coagulate suspended sediment for removal from runoff from construction sites prior to discharge.

Anthropogenic Litter – Trash generated from human activities, not including sediment.

Average Monthly Action Level – The highest allowable average of daily discharges over a calendar month.

Beneficial Uses - The uses of water necessary for the survival or wellbeing of man, plants, and wildlife. These uses of water serve to promote tangible and intangible economic, social, and environmental goals. "Beneficial Uses" of the waters of the State that may be protected include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. Existing beneficial uses are uses that were attained in the surface or ground water on or after November 28, 1975; and potential beneficial uses are uses that would probably develop in future years through the implementation of various control measures. "Beneficial Uses" are equivalent to "Designated Uses" under federal law. [California Water Code Section 13050(f)].

Best Management Practices (BMPs) - Defined in 40 CFR 122.2 as schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Bioassessment - The use of biological community information to evaluate the biological integrity of a water body and its watershed. With respect to aquatic ecosystems, bioassessment is the collection and analysis of samples of the benthic macroinvertebrate community together with physical/habitat quality measurements associated with the sampling site and the watershed to evaluate the biological condition (i.e. biotic integrity) of a water body.

Biofiltration - Practices that use vegetation and amended soils to detain and treat runoff from impervious areas. Treatment is through filtration, infiltration, adsorption, ion exchange, and biological uptake of pollutants.

Biological Integrity - Defined in Karr J.R. and D.R. Dudley. 1981. Ecological perspective on water quality goals. *Environmental Management* 5:55-68 as: "A balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitat of the region." Also referred to as ecosystem health.

BMP Design Manual – A plan developed to eliminate, reduce, or mitigate the impacts of runoff from development projects, including Priority Development Projects.

Chronic Toxicity – A measurement of sublethal effect (e.g. reduced growth, reproduction) to experimental test organisms exposed to an effluent or receiving waters compared to that of the control organisms.

Clean Water Act Section 303(d) Water Body - An impaired water body in which water quality does not meet applicable water quality standards and/or is not expected to meet water quality standards, even after the application of technology based pollution controls required by the CWA. The discharge of runoff to these water bodies by the Copermittees is significant because these discharges can cause or contribute to violations of applicable water quality standards.

Construction Activities – Actions implemented during construction of development or redevelopment projects during the Preliminary Task (including rough grading and/or disking, clearing and grubbing operations, or any soil disturbance prior to mass grading), Grading or Land Development (including topography and slope reconfiguration, alluvium removals, canyon cleanouts, rock undercuts, keyway excavations, land form grading, and stockpiling of select material for capping operations), Streets and Utility Installation (including excavation and street paving, lot grading, curbs, gutters and sidewalks, public utilities, public water facilities including fire hydrants, public sanitary sewer systems, storm sewer systems and/or other drainage improvements), or Vertical Construction (including the build out of structures from foundations to roofing, including rough landscaping).

Construction Site – Any project, including projects requiring coverage under the Construction General Permit, that involves soil disturbing activities including, but not limited to, clearing, grading, disturbances to ground such as stockpiling, and excavation.

Contamination - As defined in the Porter-Cologne Water Quality Control Act, contamination is "an impairment of the quality of waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste whether or not waters of the State are affected."

Copermittee – A permittee to a NPDES permit that is only responsible for permit conditions relating to the discharge for which it is operator [40 CFR 122.26(b)(1)]. For the purposes of this Order, a Copermittee is one of the individual permittees identified in Tables 1a-1c of this Order.

Copermittees – All of the individual Copermittees, collectively.

Critical Channel Flow (Qc) – The channel flow that produces the critical shear stress that initiates bed movement or that erodes the toe of channel banks. When measuring Qc, it should be based on the weakest boundary material – either bed or bank.

Daily Discharge – Defined as either: (1) the total mass of the constituent discharged over the calendar day or any 24 hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g. concentration.)

The Daily Discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day, or other 24 hour period other than a day), or by the arithmetic mean of analytical results from one or more grab samples taken over the course of a day.

Development Projects - Construction, rehabilitation, redevelopment, or reconstruction of any public or private projects.

Dry Season –May 1 to September 30.

Dry Weather – Weather is considered dry if the preceding 72 hours has been without measurable precipitation (>0.1 inch).

Enclosed Bays – Enclosed bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost bay works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays do not include inland surface waters or ocean waters.

Erosion – When land is diminished or worn away due to wind, water, or glacial ice. Often the eroded debris (silt or sediment) becomes a pollutant via storm water runoff. Erosion occurs naturally but can be intensified by land clearing activities such as farming, development, road building, and timber harvesting.

Environmentally Sensitive Areas (ESAs) - Areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; areas designated as preserves or their equivalent under the Natural Communities Conservation Program within the Cities and County of Orange; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.

Estuaries – Waters, including coastal lagoons, located at the mouth of streams that serve as areas of mixing fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and ocean water. Estuaries do not include inland surface waters or ocean waters.

Existing Development – Any area that has been developed and exists for municipal, commercial, industrial, or residential purposes, uses, or activities. May include areas that are not actively used for its originally developed purpose, but may be re-purposed or redeveloped for another use or activity.

Flow Duration – The long-term period of time that flows occur above a threshold that causes significant sediment transport and may cause excessive erosion damage to creeks and streams (not a single storm event duration). The simplest way to visualize this is to consider a histogram of pre- and post-project flows using long-term records of hourly data. To maintain pre-development flow duration means that the total number of hours (counts) within each range of flows in a flow-duration histogram cannot increase between the pre- and post-development condition. Flow duration within the range of geomorphologically significant flows is important for managing erosion.

Grading - The cutting and/or filling of the land surface to a desired slope or elevation.

Groundwater – Subsurface water that occurs beneath the water table in soils and geologic formations that are fully saturated.

Hazardous Material – Any substance that poses a threat to human health or the environment due to its toxicity, corrosiveness, ignitability, explosive nature or chemical reactivity. These also include materials named by the USEPA in 40 CFR 116 to be reported if a designated quantity of the material is spilled into the waters of the U.S. or emitted into the environment.

Hazardous Waste - Hazardous waste is defined as "any waste which, under Section 600 of Title 22 of this code, is required to be managed according to Chapter 30 of Division 4.5 of Title 22 of this code" [CCR Title 22, Division 4.5, Chapter 11, Article 1].

Household Hazardous Waste – Paints, cleaning products, and other hazardous wastes generated during home improvement or maintenance activities.

Hydromodification – The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

Illicit Connection – Any man-made conveyance or drainage system through which a non-storm water discharge to the storm water drainage system occurs or may occur. Any connection to the MS4 that conveys an illicit discharge.

Illicit Discharge - Any discharge to the MS4 that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from firefighting activities [40 CFR 122.26(b)(2)].

Inactive Areas – Areas of construction activity that are not active and those that have been active and are not scheduled to be re-disturbed for at least 14 days.

Infiltration – In the context of low impact development, infiltration is defined as the percolation of water into the ground. Infiltration is often expressed as a rate (inches per hour), which is determined through an infiltration test. In the context of non-storm water, infiltration is water other than wastewater that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow [40 CFR 35.2005(20)].

Inland Surface Waters – Includes all surface waters of the State that do not include the ocean, enclosed bays, or estuaries.

Jurisdictional Runoff Management Program Document – A written description of the specific jurisdictional runoff management measures and programs that each Copermittee will implement to comply with this Order and ensure that storm water pollutant discharges in runoff are reduced to the MEP and do not cause or contribute to a violation of water quality standards.

Low Impact Development (LID) – A storm water management and land development strategy that emphasizes conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions.

Low Impact Development Best Management Practices (LID BMPs) – LID BMPs include schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States through storm water management and land development strategies that emphasize conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions. LID BMPs include retention practices that do not allow runoff, such as infiltration, rain water harvesting and reuse, and evapotranspiration. LID BMPs also include flow-through practices such as biofiltration that may have some discharge of storm water following pollutant reduction.

Major Outfall – As defined in the Code of Federal Regulations, a major outfall is a MS4 outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (i.e. discharge from a single conveyance other than a circular pipe which is associated with a drainage area of more than 50 acres); or, for MS4s that receive storm water from lands zoned for industrial activity (based on comprehensive zoning plans or equivalent), a MS4 outfall that discharges from a single pipe with an inside diameter of 12 inches or more or from its equivalent (i.e. discharge from other than a circular pipe associated with a drainage area of 2 acres or more).

Maximum Daily Action Level (MDAL) –The highest allowable daily discharge of a pollutant, over a calendar day (or 24 hour period). For pollutants with action levels expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with action levels expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

Maximum Extent Practicable (MEP) – The technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) for storm water that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) in combination with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than BAT. A definition for MEP is not provided either in the statute or in the regulations. Instead the definition of MEP is dynamic and will be defined by the following process over time: municipalities propose their definition of MEP by way of their runoff management programs. Their total collective and individual activities conducted pursuant to the runoff management programs becomes their proposal for MEP as it applies both to their overall effort, as well as to specific activities (e.g., MEP for street sweeping, or MEP for MS4 maintenance). In the absence of a proposal acceptable to the San Diego Water Board, the San Diego Water Board defines MEP.

In a memo dated February 11, 1993, entitled "Definition of Maximum Extent Practicable," Elizabeth Jennings, Senior Staff Counsel, SWRCB addressed the achievement of the MEP standard as follows:

"*To achieve the MEP standard, municipalities must employ whatever Best Management Practices (BMPs) are technically feasible (i.e., are likely to be effective) and are not cost prohibitive. The major emphasis is on technical feasibility. Reducing pollutants to the MEP means choosing effective BMPs, and rejecting applicable BMPs only where other effective BMPs will serve the same purpose, or the BMPs would not be technically feasible, or the cost would be prohibitive. In selecting BMPs to achieve the MEP standard, the following factors may be useful to consider:*

a. Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?
b. Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?
c. Public Acceptance: Does the BMP have public support?
d. Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?
e. Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc.?

The final determination regarding whether a municipality has reduced pollutants to the maximum extent practicable can only be made by the Regional or State Water Boards, and not by the municipal discharger. If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit derived, it would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs that would address a pollutant source, or to pick a BMP based solely on cost, which would be clearly less effective. In selecting BMPs the municipality must make a serious attempt to comply and practical solutions may not be lightly rejected. In any case, the burden would be on the municipal discharger to show compliance with its permit. After selecting a menu of BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented."

Monitoring Year – October 1 to September 30

Municipal Separate Storm Sewer System (MS4) – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designated or used for collecting or conveying storm water; (iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.26.

National Pollutant Discharge Elimination System (NPDES) - The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the CWA.

Non-Storm Water - All discharges to and from a MS4 that do not originate from precipitation events (i.e., all discharges from a MS4 other than storm water). Non-storm water includes illicit discharges and NPDES permitted discharges.

Nuisance - As defined in the Porter-Cologne Water Quality Control Act, a nuisance is "anything which meets all of the following requirements: 1) Is injurious to health, or is indecent, or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. 2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. 3) Occurs during, or as a result of, the treatment or disposal of wastes."

Ocean Waters – The territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the State Board's California Ocean Plan.

Order – Unless otherwise specified, refers to this Order, Order No. R9-2013-0001 (NPDES No. CAS0109266)

Outfall - Outfall means a point source as defined by 40 CFR 122.2 at the point where a municipal separate storm sewer discharges to waters of the US and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels or other conveyances which connect segments of the same stream or other waters of the US and are used to convey waters of the US.

Persistent Flow - Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

Person - A person is defined as an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof [40 CFR 122.2].

Point Source - Any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, landfill leachate collection systems, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

Pollutant - Any agent that may cause or contribute to the degradation of water quality such that a condition of pollution or contamination is created or aggravated.

Pollution - As defined in the Porter-Cologne Water Quality Control Act, pollution is "the alteration of the quality of the waters of the State by waste, to a degree which unreasonably affects either of the following: 1) The waters for beneficial uses; or 2) Facilities that serve these beneficial uses." Pollution may include contamination.

Pollution Prevention - Pollution prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control BMPs, treatment control BMPs, or disposal.

Pre-Development Runoff Conditions – Approximate flow rates and durations that exist or existed onsite before land development occurs. For new development projects, this equates to runoff conditions immediately before project construction. For redevelopment projects, this equates to runoff conditions from the project footprint assuming infiltration characteristics of the underlying soil, and existing grade. Runoff coefficients of concrete or asphalt must not be used. A redevelopment Priority Development Project must use available information pertaining to existing underlying soil type and onsite existing grade to estimate pre-development runoff conditions.

Priority Development Projects - New development and redevelopment projects defined under Provision E.3.b of Order No. R9-2013-0001, as amended by Order Nos. R9-2015-0001 and R9-2015-0100.

Rainy Season (aka Wet Season) –October 1 to April 30

Receiving Waters – Waters of the United States.

Receiving Water Limitations - Waste discharge requirements issued by the San Diego Water Board typically include both: (1) "Effluent Limitations" (or "Discharge Limitations") that specify the technology-based or water-quality-based effluent limitations; and (2) "Receiving Water Limitations" that specify the water quality objectives in the Basin Plan as well as any other limitations necessary to attain those objectives. In summary, the "Receiving Water Limitations" provision is the provision used to implement the requirements of CWA section 402(p)(3)(B).

Redevelopment - The creation and/or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure~~, and creation or addition of impervious surfaces~~. Replacement of impervious surfaces includes any activity ~~that is not part of a routine maintenance activity~~ where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include routine maintenance activities, such as trenching and resurfacing associated with utility work; pavement grinding; resurfacing existing roadways,~~;~~ ~~new~~ sidewalks~~ construction~~, pedestrian ramps, or bike lanes on existing roads; and routine replacement of damaged pavement, such as pothole repair.

Regional Clearinghouse – A central location for the collection and distribution of information developed and maintained by the Copermittees including, but not limited to, plans, reports, manuals, data, contact information, and/or links to such documents and information.

Rehabilitation - Remedial measures or activities for the purpose of improving or restoring the beneficial uses of streams, channels or river systems. Techniques may vary from in-stream restoration techniques to off-line storm water management practices installed in the system corridor or upland areas, or a combination of in-stream and out of stream techniques. Rehabilitation techniques may include, but are not limited to the following: riparian zone restoration, constructed wetlands, channel modifications that improve habitat and stability, and daylighting of drainage systems.

Reporting Period – The period of information that is reported in the Water Quality Improvement Plan Annual Report. The reporting period consists of two components: 1) July 1 to June 30, consistent with the fiscal year, for the implementation of the jurisdictional runoff management programs, and 2) October 1 to September 30, consistent with the monitoring year for the monitoring and assessment programs. Together, these two time periods constitute the reporting year for the Water Quality Improvement Plan Annual Report due January 31 following the end of the monitoring year.

Retain – Keep or hold in a particular place, condition, or position without discharge to surface waters.

Retrofitting – Storm water management practice put into place after development has occurred in watersheds where the practices previously did not exist or are ineffective. Retrofitting of developed areas is intended to improve water quality, protect downstream channels, reduce flooding, or meet other specific objectives. Retrofitting developed areas may include, but is not limited to replacing roofs with green roofs, disconnecting downspouts or impervious surfaces to drain to pervious surfaces, replacing impervious surfaces with pervious surfaces, installing rain barrels, installing rain gardens, and trash area enclosures.

Runoff - All flows in a storm water conveyance system that consists of the following components: (1) storm water (wet weather flows) and (2) non-storm water including dry weather flows.

San Diego Water Board – As used in this document the term "San Diego Water Board" is synonymous with the term "Regional Board" as defined in Water Code section 13050(b) and is intended to refer to the California Regional Water Quality Control Board for the San Diego Region as specified in Water Code Section 13200.

Sediment - Soil, sand, and minerals washed from land into water. Sediment resulting from anthropogenic sources (i.e. human induced land disturbance activities) is considered a pollutant. This Order regulates only the discharges of sediment from anthropogenic sources and does not regulate naturally occurring sources of sediment. Sediment can destroy fish-nesting areas, clog animal habitats, and cloud waters so that sunlight does not reach aquatic plants.

Source Control BMP – Land use or site planning practices, or structural or nonstructural measures that aim to prevent runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between pollutants and runoff.

Storm Water – Per 40 CFR 122.26(b)(13), means storm water runoff, snowmelt runoff and surface runoff and drainage. Surface runoff and drainage pertains to runoff and drainage resulting from precipitation events.

Structural BMPs - A subset of BMPs which detains, retains, filters, removes, or prevents the release of pollutants to surface waters from development projects in perpetuity, after construction of a project is completed.

Test of Significant Toxicity (TST) - A statistical approach used to analyze toxicity test data. The TST incorporates a restated null hypothesis, Welch's t-test, and biological effect thresholds for chronic and acute toxicity.

Total Maximum Daily Load (TMDL) - The maximum amount of a pollutant that can be discharged into a water body from all sources (point and non-point) and still maintain water quality standards. Under CWA section 303(d), TMDLs must be developed for all water bodies that do not meet water quality standards after application of technology-based controls.

Toxicity - Adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies. The water quality objectives for toxicity provided in the Basin Plan, state in part…"All waters shall be

free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life….The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge."

Toxicity Identification Evaluation (TIE) - A set of procedures for identifying the specific chemical(s) responsible for toxicity. These procedures are performed in three phases (characterization, identification, and confirmation) using aquatic organism toxicity tests.

Toxicity Reduction Evaluation (TRE) - A study conducted in a step-wise process designed to identify the causative agents of effluent or ambient toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in toxicity. The first steps of the TRE consist of the collection of data relevant to the toxicity, including additional toxicity testing, and an evaluation of facility operations and maintenance practices, and best management practices. A Toxicity Identification Evaluation (TIE) may be required as part of the TRE, if appropriate.

Treatment Control BMP – Any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media absorption or any other physical, biological, or chemical process.

Unpaved Road – Any long, narrow stretch without pavement used for traveling by motor passenger vehicles between two or more points. Unpaved roads are generally constructed of dirt, gravel, aggregate or macadam and may be improved or unimproved.

Waste - As defined in CWC Section 13050(d), "waste includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal."

Article 2 of CCR Title 23, Chapter 15 (Chapter 15) contains a waste classification system that applies to solid and semi-solid waste, which cannot be discharged directly or indirectly to water of the state and which therefore must be discharged to land for treatment, storage, or disposal in accordance with Chapter 15. There are four classifications of waste (listed in order of highest to lowest threat to water quality): hazardous waste, designated waste, non-hazardous solid waste, and inert waste.

Water Quality Objective - Numerical or narrative limits on constituents or characteristics of water designated to protect designated beneficial uses of the water. [California Water Code Section 13050 (h)]. California's water quality objectives are established by the State and Regional Water Boards in the Water Quality Control Plans. Numeric or narrative limits for pollutants or characteristics of water designed to protect the beneficial uses of the water. In other words, a water quality objective is the maximum concentration of a pollutant that can exist in a receiving water and still generally ensure that the beneficial uses of the receiving water remain protected (i.e., not impaired). Since water quality objectives are designed specifically to protect the beneficial uses, when the objectives are violated the beneficial uses are, by definition, no longer protected and become impaired. This is a fundamental concept under the Porter Cologne Act. Equally fundamental is Porter Cologne's definition of pollution. A condition of pollution exists when the water quality needed to support designated beneficial uses has

become unreasonably affected or impaired; in other words, when the water quality objectives have been violated. These underlying definitions (regarding beneficial use protection) are the reason why all waste discharge requirements implementing the federal NPDES regulations require compliance with water quality objectives. (Water quality objectives are also called water quality criteria in the CWA.)

Water Quality Standards - Water quality standards, as defined in Clean Water Act section 303(c) consist of the beneficial uses (e.g., swimming, fishing, municipal drinking water supply, etc.,) of a water body and criteria (referred to as water quality objectives in the California Water Code) necessary to protect those uses. Under the Water Code, the water boards establish beneficial uses and water quality objectives in water quality control or basin plans. Together with an anti-degradation policy, these beneficial uses and water quality objectives serve as water quality standards under the Clean Water Act. In Clean Water Act parlance, state beneficial uses are called "designated uses" and state water quality objectives are called "criteria." Throughout this Order, the relevant term is used depending on the statutory scheme.

Waters of the State - Any water, surface or underground, including saline waters within the boundaries of the State [CWC section 13050 (e)]. The definition of the Waters of the State is broader than that for the Waters of the United States in that all water in the State is considered to be a Waters of the State regardless of circumstances or condition.

Waters of the United States - As defined in the 40 CFR 122.2, the Waters of the U.S. are defined as: "(a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate "wetlands;" (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters otherwise defined as waters of the United States under this definition: (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial seas; and (g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA."

Watershed - That geographical area which drains to a specified point on a water course, usually a confluence of streams or rivers (also known as drainage area, catchment, or river basin).

Wet Season (aka Rainy Season) – October 1 to April 30

Wet Weather – Weather is considered wet up to 72 hours after a storm event of 0.1 inches and greater, unless otherwise defined by another regulatory mechanism (e.g. a TMDL).

ATTACHMENT D

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

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JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

FY _____

I. COPERMITTEE INFORMATION

Copermittee Name:

Copermittee Primary Contact Name:

Copermittee Primary Contact Information:
Address:
City: County: State: Zip:
Telephone: Fax: Email:

II. LEGAL AUTHORITY

Has the Copermittee established adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐
A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority?	**YES**	☐
	NO	☐

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

Was an update of the jurisdictional runoff management program document required or recommended by the San Diego Water Board?	**YES**	☐
	NO	☐
If YES to the question above, did the Copermittee update its jurisdictional runoff management program document and make it available on the Regional Clearinghouse?	**YES**	☐
	NO	☐

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

Has the Copermittee implemented a program to actively detect and eliminate illicit discharges and connections to its MS4 that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

Number of non-storm water discharges reported by the public	
Number of non-storm water discharges detected by Copermittee staff or contractors	
Number of non-storm water discharges investigated by the Copermittee	
Number of sources of non-storm water discharges identified	
Number of non-storm water discharges eliminated	
Number of sources of illicit discharges or connections identified	
Number of illicit discharges or connections eliminated	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

V. DEVELOPMENT PLANNING PROGRAM

Has the Copermittee implemented a development planning program that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐
Was an update to the BMP Design Manual required or recommended by the San Diego Water Board?	**YES**	☐
	NO	☐
If YES to the question above, did the Copermittee update its BMP Design Manual and make it available on the Regional Clearinghouse?	**YES**	☐
	NO	☐

Number of proposed development projects in review	
Number of Priority Development Projects in review	
Number of Priority Development Projects approved	
Number of approved Priority Development Projects exempt from any BMP requirements	
Number of approved Priority Development Projects allowed alternative compliance	
Number of Priority Development Projects granted occupancy	

Number of completed Priority Development Projects in inventory	
Number of high priority Priority Development Project structural BMP inspections	
Number of Priority Development Project structural BMP violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

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VI. CONSTRUCTION MANAGEMENT PROGRAM

Has the Copermittee implemented a construction management program that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

Number of construction sites in inventory	
Number of active construction sites in inventory	
Number of inactive construction sites in inventory	
Number of construction sites closed/completed during reporting period	
Number of construction site inspections	
Number of construction site violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

Has the Copermittee implemented an existing development management program that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

	Municipal	Commercial	Industrial	Residential
Number of facilities or areas in inventory				
Number of existing development inspections				
Number of follow-up inspections				
Number of violations				
Number of enforcement actions issued				
Number of escalated enforcement actions issued				

VIII. PUBLIC EDUCATION AND PARTICIPATION

Has the Copermittee implemented a public education program component that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐
Has the Copermittee implemented a public participation program component that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

IX. FISCAL ANALYSIS

Has the Copermittee attached to this form a summary of its fiscal analysis that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

X. CERTIFICATION

I [☐ Principal Executive Officer ☐ Ranking Elected Official ☐ Duly Authorized Representative] certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature	Date
Print Name	Title
Telephone Number	Email

ATTACHMENT E

SPECIFIC PROVISIONS FOR TOTAL MAXIMUM DAILY LOADS APPLICABLE TO ORDER NO. R9-2013-0001, AS AMENDED BY ORDER NOS. R9-2015-0001 AND R9-2015-0100

These provisions implement load allocations (LAs) and wasteload allocations (WLAs) of the Total Maximum Daily Loads (TMDLs) established by the San Diego Water Board or USEPA under Clean Water Act section 303(c), applicable to discharges regulated under this Order. The provisions and schedules for implementation of the TMDLs described below must be incorporated into the Water Quality Improvement Plans, required pursuant to Provision B of this Order, for the specified Watershed Management Areas.

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed
2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin
3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed
4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek
5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay
6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)
7. Total Maximum Daily Load for Sediment in Los Peñasquitos Lagoon

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2002-0123

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	August 14, 2002
State Water Board Approval Date:	July 16, 2003
Office of Administrative Law Approval Date:	September 11, 2003
US EPA Approval Date:	November 3, 2003

(3) TMDL Effective Date: September 11, 2003

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final diazinon TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must be in compliance with the final TMDL compliance requirements as of December 31, 2010.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations:

Table 1.1
Final Receiving Water Limitations Expressed as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Diazinon	Acute	0.08 µg/L	1 hour
	Chronic	0.05 µg/L	4 days

(b) Final Effluent Limitations

Discharges from the MS4s containing concentrations that do not exceed the following effluent limitations will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 1.b.(2)(a):

Table 1.2
Final Effluent Limitations Expressed as Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation	Averaging Period
Diazinon	Acute	0.072 µg/L	1 hour
	Chronic	0.045 µg/L	4 days

(c) Best Management Practices

The following BMPs for Chollas Creek must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area and implemented by the Responsible Copermittees:

(i) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 1.b.(2)(a) and/or the effluent limitations under Specific Provision 1.b.(2)(b) for Chollas Creek.

(ii) The Responsible Copermittees must implement the Diazinon Toxicity Control Plan and Diazinon Public Outreach/Education Program as described in the report titled, *Technical Report for Total Maximum Daily Load for Diazinon in Chollas Creek Watershed, San Diego County*, dated August 14, 2002, including subsequent modifications, in order to achieve the receiving water limitations under Specific Provision 1.b.(2)(a) and/or the effluent limitations under Specific Provision 1.b.(2)(b).

(iii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 1.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 1.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 1.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 1.b.(2)(c) achieves compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 1.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 1.d, to demonstrate compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The Responsible Copermittees must be in compliance with the final diazinon TMDL compliance requirements as of December 31, 2010.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls for diazinon within the Chollas Creek watershed, and calculate or estimate the annual diazinon loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment

Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 1.b.(2)(b), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0019

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	September 22, 2005
Office of Administrative Law Approval Date:	December 2, 2005
US EPA Approval Date:	February 8, 2006

(3) TMDL Effective Date: December 2, 2005

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Shelter Island Yacht Basin

(6) Responsible Copermittee: City of San Diego

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final dissolved copper TMDL compliance requirements for Shelter Island Yacht Basin consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittee must be in compliance with the final TMDL compliance requirements as of December 2, 2005.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations:

Table 2.1
Final Receiving Water Limitations Expressed as Concentrations in Shelter Island Yacht Basin

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Dissolved Copper	Acute	4.8 µg/L x WER*	1 hour
	Chronic	3.1 µg/L x WER*	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 2.b.(2)(a):

Table 2.2
Final Effluent Limitations as Expressed as Annual Loads in MS4 Discharges to Shelter Island Yacht Basin

Constituent	Effluent Limitation
Dissolved Copper	30 kg/yr*

* If the water quality objectives for dissolved copper in Shelter Island Yacht Basin are changed in the future, then the margin of safety (MOS), TMDL and allocations will be recalculated using the *Method for Recalculation of the Total Maximum Daily Load for Dissolved Copper in the Shelter Island Yacht Basin, San Diego Bay* in the Basin Plan (p. 7-14).

(c) Best Management Practices

The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 2.b.(2)(a) and/or the effluent limitations under Specific Provision 2.b.(2)(b) for Shelter Island Yacht Basin. The BMPs must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 2.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 2.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittee develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 2.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 2.b.(2)(c) achieves compliance with Specific Provisions 2.b.(3)(a), 2.b.(3)(b) and/or 2.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 2.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 2.d, to demonstrate compliance with Specific Provisions 2.b.(3)(a), 2.b.(3)(b) and/or 2.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The Responsible Copermittees must be in compliance with the final dissolved copper TMDL compliance requirements as of December 2, 2005.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

The Responsible Copermittee must monitor the effluent of its MS4 outfalls for dissolved copper, and calculate or estimate the monthly and annual dissolved copper loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.(b)(2)of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0036

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	November 16, 2005
Office of Administrative Law Approval Date:	February 1, 2006
US EPA Approval Date:	March 22, 2006

(3) TMDL Effective Date: February 1, 2006

(4) Watershed Management Area: Santa Margarita River

(5) Water Body: Rainbow Creek

(6) Responsible Copermittee: County of San Diego

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final total nitrogen and total phosphorus TMDL compliance requirements for Rainbow Creek consist of the following

(1) Final TMDL Compliance Date

The Responsible Copermittee must comply with final TMDL compliance requirements by December 31, 2021.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance date under Specific Provision 3.b.(1):

Table 3.1
Final Receiving Water Limitations Expressed as Concentrations in Rainbow Creek

Constituent	Receiving Water Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing concentrations that do not exceed the following effluent limitations by the compliance date under Specific Provision 3.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 3.b.(2)(a):

Table 3.2
Final Effluent Limitations Expressed as Concentrations in MS4 Discharges to Rainbow Creek

Constituent	Effluent Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(ii) Annual pollutant loads from given land uses discharging to and from the MS4s that do not exceed the following annual loads by the compliance date under Specific Provision 3.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 3.b.(2)(a):

Table 3.3
Final Effluent Limitations Expressed as Annual Loads in MS4 Discharges to Rainbow Creek

Land Use	Total N	Total P
Commercial nurseries	116 kg/yr	3 kg/yr
Park	3 kg/yr	0.1 kg/yr
Residential areas	149 kg/yr	12 kg/yr
Urban areas	27 kg/yr	6 kg/yr

(c) Best Management Practices

(i) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 3.b.(2)(a) and/or the effluent limitations under Specific Provision 3.b.(2)(b) for Rainbow Creek.

(ii) The Responsible Copermittee should coordinate any BMPs implemented to address this TMDL with Caltrans and other sources as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under

Specific Provision 3.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 3.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the final effluent limitations under Specific Provision 3.b.(2)(b)(ii); OR

(e) The Responsible Copermittee develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 3.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Specific Provision 3.b.(2)(c) achieves compliance with Specific Provisions 3.b.(3)(a), 3.b.(3)(b), 3.b.(3)(c) and/or 3.b.(3)(d),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 3.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 3.d, to demonstrate compliance with Specific Provisions 3.b.(3)(a), 3.b.(3)(b), 3.b.(3)(c) and/or 3.b.(3)(d).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim total nitrogen and total phosphorus TMDL compliance requirements for Rainbow Creek consist of the following:

(1) Interim Compliance Dates and WQBELs

The Responsible Copermittee must comply with the interim WQBELs, expressed as annual loads, by December 31 of the interim compliance year given in Table 3.4.

Table 3.4
Interim Water Quality Based Effluent Limitations Expressed as Annual Loads in MS4 Discharges from Specific Land Uses to Rainbow Creek

	Total N Interim Effluent Limitations (kg/yr)			Total P Interim Effluent Limitations (kg/yr)		
	Interim Compliance Date			Interim Compliance Date		
Land Use	**2009**	**2013**	**2017**	**2009**	**2013**	**2017**
Commercial nurseries	390	299	196	20	16	10
Park	5	3	3	0.15	0.10	0.10
Residential areas	507	390	260	99	74	47
Urban areas	40	27	27	9	6	6

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 3.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 3.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the final effluent limitations under Specific Provision 3.b.(2)(b)(ii); OR

(e) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the interim effluent limitations under Specific Provision 3.c.(1); OR

(f) The Responsible Copermittee has submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

d. Specific Monitoring and Assessment Requirements

(1) The Responsible Copermittee must incorporate into the Water Quality Improvement Plan and implement the Sampling and Analysis Plan for Rainbow Creek Nutrient Reduction TMDL Implementation Water Quality Monitoring, dated January 2010.

(2) The results of any monitoring conducted during the reporting period, and assessment of whether the interim and final TMDL compliance requirements have been achieved must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 3.b.(2)(b)(i), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2007-0043

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2007
State Water Board Approval Date:	July 15, 2008
Office of Administrative Law Approval Date:	October 22, 2008
US EPA Approval Date:	December 18, 2008

(3) TMDL Effective Date: October 22, 2008

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final dissolved copper, lead, and zinc TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must comply with the final TMDL compliance requirements by October 22, 2028.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance date under Specific Provision 4.b.(1):

Table 4.1
Final Receiving Water Limitations Expressed as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$(0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$(0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$(0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$(0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations by the compliance date under Specific Provision 4.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 4.b.(2)(a):

Table 4.2
Final Effluent Limitations as Expressed Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(c) Best Management Practices

(i) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 4.b.(2)(a) and/or the effluent limitations under Specific Provision 4.b.(2)(b) for Chollas Creek.

(ii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans and the U.S. Navy as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 4.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 4.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 4.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 4.b.(2)(c) achieves compliance with Specific Provisions 4.b.(3)(a), 4.b.(3)(b) and/or 4.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 4.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 4.d, to demonstrate compliance with Specific Provisions 4.b.(3)(a), 4.b.(3)(b) and/or 4.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim dissolved copper, lead, and zinc TMDL compliance requirements for Chollas Creek consist of the following:

(1) Interim Compliance Date and WQBELs

The Responsible Copermittee must comply with the interim WQBELs, expressed as concentrations, by the interim compliance date given in Table 4.3:

Table 4.3
Interim Water Quality Based Effluent Limitations Expressed as Concentrations in MS4 Discharges to Chollas Creek

Interim Compliance Date	Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
October 22, 2018	Dissolved Copper	Acute	$1.2 \times 90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
	Dissolved Lead	Acute	$1.2 \times 90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
	Dissolved Zinc	Acute	$1.2 \times 90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 4.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 4.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) There are no exceedances of the interim effluent limitations under Specific

Provision 4.c.(1) at the Responsible Copermittee's MS4 outfalls; OR

(e) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance date.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*, when it is amended to include monitoring requirements for the Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls discharging to Chollas Creek for dissolved copper, lead, and zinc, and calculate or estimate the monthly and annual dissolved copper, lead, and zinc loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 4.b.(2)(b) or 4.c.(1), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2008-0027

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 11, 2008
State Water Board Approval Date:	June 16, 2009
Office of Administrative Law Approval Date:	September 15, 2009
US EPA Approval Date:	October 26, 2009

(3) TMDL Effective Date: September 15, 2009

(4) Watershed Management Areas: See Table 5.0

(5) Water Bodies: See Table 5.0

(6) Responsible Copermittees: See Table 5.0

Table 5.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County	Dana Point Harbor	Baby Beach	-City of Dana Point -County of Orange
San Diego Bay	San Diego Bay	Shelter Island Shoreline Park	- San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final indicator bacteria TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Final TMDL Compliance Dates

(a) Baby Beach in Dana Point Harbor

The Responsible Copermittees for MS4 discharges to Baby Beach must be in compliance with the final TMDL compliance requirements according to the following compliance dates:

Table 5.1
Compliance Dates to Achieve Final TMDL Compliance Requirements For Baby Beach in Dana Point Harbor

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform	September 15, 2014	September 15, 2009
Fecal Coliform		September 15, 2009
Enterococcus		September 15, 2019

(b) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park must be in compliance with the final TMDL compliance requirements as of December 31, 2012.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance dates under Specific Provision 5.b.(1):

Table 5.2
Final Receiving Water Limitations Expressed as Bacteria Densities in the Water Body

	Receiving Water Limitations	
Constituent	Single Sample Maximum[1,2]	30-Day Geometric Mean[2]
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing indicator bacteria densities that do not exceed the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.3a
Final Effluent Limitations as Expressed as Bacteria Densities in MS4 Discharges to the Water Body

	Effluent Limitations	
Constituent	**Single Sample Maximum[1,2]**	**30-Day Geometric Mean[2]**
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.

(ii) Discharges from the MS4s containing indicator bacteria loads that do not exceed the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.4a
Final Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to the Baby Beach in Dana Point Harbor

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0.86×10^9 MPN/day	$3{,}254 \times 10^9$ MPN/30days
Fecal Coliform	0.17×10^9 MPN/day	112×10^9 MPN/30days
Enterococcus	0.03×10^9 MPN/day	114×10^9 MPN/30days

Table 5.4b
Final Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to the Shelter Island Shoreline Park in San Diego Bay

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0 MPN/day	198×10^9 MPN/30days
Fecal Coliform	0 MPN/day	8×10^9 MPN/30days
Enterococcus	0 MPN/day	26×10^9 MPN/30days

(iii) Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.5a
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to Baby Beach in Dana Point Harbor*

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	90.4%	0%
Fecal Coliform	82.7%	0%
Enterococcus	96.2%	62.2%

Notes:
* The percent load reductions are relative to data collected between 1996-2002. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittees' MS4s must not exceed the loads in Table 5.4a, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the water body.

Table 5.5b
*Final Effluent Limitations Expressed as Percent Load Reductions** in MS4 Discharges to Shelter Island Shoreline Park in San Diego Bay*

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0%	0%
Fecal Coliform	0%	0%
Enterococcus	0%	0%

Notes:
* The percent load reductions are relative to data collected between 1999-2004. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittee's MS4s must not exceed the loads in Table 5.4b, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the water body.

(c) Best Management Practices

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 5.0 must incorporate the Bacteria Load Reduction Plan (BLRP) required to be developed pursuant to Resolution No. R9-2008-0027.

(ii) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 5.b.(2)(a) and/or the effluent limitations under Specific Provision 5.b.(2)(b) for the segments or areas of the water bodies listed in Table 5.0

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.b.(2)(b)(ii); OR

(e) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 5.b.(2)(b)(iii); OR

(f) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(g) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 5.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 5.b.(2)(c) achieves compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 5.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 5.d, to demonstrate compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim indicator bacteria TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Baby Beach in Dana Point Harbor

(a) Interim TMDL Compliance Dates and WQBELs

The Responsible Copermittees for MS4 discharges to Baby Beach must comply with the following interim WQBELs by the interim compliance dates given in Tables 5.6a and/or 5.6b:

Table 5.6a
Interim Water Quality Based Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to Baby Beach in Dana Point Harbor

Constituent	Interim Compliance Dates	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	4.93×10^9 MPN/day	$3{,}254 \times 10^9$ MPN/30days*
Fecal Coliform	September 15, 2012	0.59×10^9 MPN/day	112×10^9 MPN/30days*
Enterococcus	September 15, 2012	0.42×10^9 MPN/day	301×10^9 MPN/30days
	September 15, 2016	0.03×10^9 MPN/day *	207×10^9 MPN/30days

Notes:
* Same as the final effluent limitations in Table 5.4a.

Table 5.6b
Interim Water Quality Based Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to Baby Beach in Dana Point Harbor*

Constituent	Interim Compliance Dates	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	45.2%	0%**
Fecal Coliform	September 15, 2012	41.4%	0%**
Enterococcus	September 15, 2012	48.1%	0%
	September 15, 2016	96.2%**	31.1%

Notes:
* The percent load reductions are relative to data collected between 1996-2002. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittees' MS4s must not exceed the loads in Table 5.6a, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the waterbody.
** Same as the final effluent limitations in Table 5.5a.

(b) Interim Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(i) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(ii) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(iii) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(iv) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.b(2)(b)(ii); OR

(v) The Responsible Copermittees can demonstrate that exceedances of the applicable receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(vi) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the interim effluent limitations under Table 5.6a of Specific Provision 5.c.(1)(a); OR

(vii) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the interim effluent limitations under Table 5.6b of Specific Provision 5.c.(1)(a); OR

(viii) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

(2) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park must be in compliance with the final indicator bacteria TMDL requirements as of December 31, 2012.

d. Specific Monitoring and Assessment Requirements

(1) Monitoring Stations

Monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[38] If discharges of bacteria from the MS4 exceed the applicable interim or final WQBELs, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(2) Monitoring Procedures

(a) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) The Responsible Copermittees must collect wet weather monitoring samples within the first 24 hours of a storm event[39] of the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(c) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

[38] Commonly referred to as AB 411 monitoring

[39] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs have been achieved.

(b) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 5.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(c) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to correlate elevated bacteria levels with known or suspected sewage spills from wastewater collection systems and treatment plants or boats.

(d) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2010-0001

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 10, 2010
State Water Board Approval Date:	December 14, 2010
Office of Administrative Law Approval Date:	April 4, 2011
US EPA Approval Date:	June 22, 2011

(3) TMDL Effective Date: April 4, 2011

(4) Watershed Management Areas: See Table 6.0

(5) Water Bodies: See Table 6.0

(6) Responsible Copermittees: See Table 6.0

Table 6.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	-City of Laguna Beach -County of Orange -Orange County Flood Control District
		at Heisler Park - North	
	Pacific Ocean Shoreline	at Main Laguna Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Woods -County of Orange -Orange County Flood Control District
		Laguna Beach at Ocean Avenue	
		Laguna Beach at Cleo Street	
		Arch Cove at Bluebird Canyon Road	
		Laguna Beach at Dumond Drive	
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Hills -City of Laguna Niguel -City of Laguna Woods -City of Lake Forest -City of Mission Viejo -County of Orange -Orange County Flood Control District
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	
	Aliso Creek Mouth	at mouth	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	-City of Dana Point -City of Laguna Beach -City of Laguna Niguel -County of Orange -Orange County Flood Control District
		Aliso Beach at Table Rock Drive	
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)	
		at Salt Creek (large outlet)	
		Salt Creek Beach at Salt Creek service road	
		Salt Creek Beach at Strand Road	
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	-City of Dana Point -City of Laguna Hills -City of Laguna Niguel -City of Mission Viejo -City of Rancho Santa Margarita -City of San Juan Capistrano -County of Orange -Orange County Flood Control District
	San Juan Creek	lower 1 mile	
	San Juan Creek Mouth	at mouth	
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	-City of Dana Point -City of San Clemente -County of Orange -Orange County Flood Control District
		Ole Hanson Beach Club Beach at Pico Drain	
		San Clemente City Beach at El Portal Street Stairs	
		San Clemente City Beach at Mariposa Street	
		San Clemente City Beach at Linda Lane	
		San Clemente City Beach at South Linda Lane	
		San Clemente City Beach at Lifeguard Headquarters	
		under San Clemente Municipal Pier	
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	
		San Clemente State Beach at Riviera Beach	
		Can Clemente State Beach at Cypress Shores	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	-City of Oceanside -City of Vista -County of San Diego
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	-City of Carlsbad -City of Encinitas -City of Escondido -City of San Marcos -County of San Diego
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	-City of Del Mar -City of Escondido -City of Poway -City of San Diego -City of Solana Beach -County of San Diego
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	-City of Del Mar -City of Poway -City of San Diego -County of San Diego
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	-City of San Diego
		La Jolla Shores Beach at Caminito del Oro	
		La Jolla Shores Beach at Vallecitos	
		La Jolla Shores Beach at Avenida de la Playa	
		at Casa Beach, Children's Pool	
		South Casa Beach at Coast Boulevard	
		Whispering Sands Beach at Ravina Street	
		Windansea Beach at Vista de la Playa	
		Windansea Beach at Bonair Street	
		Windansea Beach at Playa del Norte	
		Windansea Beach at Palomar Avenue	
		at Tourmaline Surf Park	
		Pacific Beach at Grand Avenue	
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I- Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	-City of El Cajon -City of Santee -County of San Diego
	San Diego River	lower 6 miles	-City of El Cajon -City of La Mesa -City of San Diego -City of Santee -County of San Diego
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	-City of La Mesa -City of Lemon Grove -City of San Diego -County of San Diego - San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final indicator bacteria TMDL compliance requirements for the water bodies listed in Table 6.0 consist of the following:

(1) Final TMDL Compliance Dates

The Responsible Copermittees for MS4 discharges to the water bodies listed in Table 6.0 must be in compliance with the final TMDL compliance requirements according to the following compliance dates:

Table 6.1
Compliance Dates to Achieve Final TMDL Compliance Requirements

Constituent	Dry Weather TMDL Compliance Date	Wet Weather TMDL Compliance Date*
Total Coliform	April 4, 2021	April 4, 2031 (April 4, 2021)
Fecal Coliform		
Enterococcus		

* The Wet Weather TMDL Compliance Date in parenthesis applies if the applicable Water Quality Improvement Plan does not include load reduction programs for other constituents (e.g. metals, pesticides, trash, nutrients, sediment, etc.) together with bacteria load reduction requirements of these TMDLs.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance dates under Specific Provision 6.b.(1):

Table 6.2a
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Beaches

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform	10,000	22%	1,000	0%
Fecal Coliform	400	22%	200	0%
Enterococcus	104	22%	35	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan.

Table 6.2b
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Creeks

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Fecal Coliform	400	22%	200	0%
Enterococcus	61 (104)	22%	33	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Basin Plan.
d. A single sample maximum of 104 MPN/100ml for *Enterococcus* may be applied as a receiving water limitation for creeks, instead of 61 MPN/100mL, if one or more of the creeks addressed by these TMDLs (San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek, San Diego River, and/or Chollas Creek) is designated with a "moderately to lightly used area" or less frequent usage frequency in the Basin Plan. Otherwise, the single sample maximum of 61 MPN/100mL for *Enterococcus* must be used to assess compliance with the allowable exceedance frequency.

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing indicator bacteria densities that do not exceed the following effluent limitations by the compliance dates under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a):

Table 6.2c
Final Effluent Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies in MS4 Discharges to the Water Body

Constituent	Concentration-Based Effluent Limitations			
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform[d]	10,000	22%	1,000	0%
Fecal Coliform	400	22%	200	0%
Enterococcus	104[e] / 61[f]	22%	35[e] / 33[f]	0%

Notes:
a. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan for discharges to beaches, and the Basin Plan for discharges to creeks and creek mouths.
d. Total coliform effluent limitations only apply to MS4 outfalls that discharge to the Pacific Ocean Shorelines and creek mouths listed in Table 6.0.
e. This *Enterococcus* effluent limitation applies to MS4 discharges to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
f. This *Enterococcus* effluent limitation applies to MS4 discharges to segments or areas of creeks or creek mouths listed in Table 6.0.

(ii) Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the compliance dates under Specific Provision 6.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a):

Table 6.3
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watershed and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
South Orange County	**San Joaquin Hills HSA** (901.11) and **Laguna Hills HSA** (901.12) - Pacific Ocean Shoreline	91.78%	91.72%	98.28%	46.85%	52.07%	51.26%
	Aliso HSA (901.13) - Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	95.47%	95.58%	99.13%	25.29%	26.62%	27.52% (27.37%)**
	Dana Point HSA (901.14) - Pacific Ocean Shoreline	95.04%	95.03%	98.98%	13.15%	14.86%	15.16%
	Lower San Juan HSA (901.27) - Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	72.96%	74.21%	94.94%	19.21%	12.82%	27.12% (26.90%)**
	San Clemente HA (901.30) - Pacific Ocean Shoreline	94.28%	94.23%	98.83%	23.85%	24.58%	25.26%
San Luis Rey River	**San Luis Rey HU** (903.00) - Pacific Ocean Shoreline	38.13%	39.09%	87.38%	5.62%	3.12%	11.69%

Table 6.3 (Cont'd)
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watershed and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
Carlsbad	**San Marcos HA** (904.50) - Pacific Ocean Shoreline	82.82%	82.55%	96.03%	18.47%	18.98%	20.19%
San Dieguito River	**San Dieguito HU** (905.00) - Pacific Ocean Shoreline	14.39%	20.72%	83.48%	4.29%	1.46%	7.72%
Penasquitos	**Miramar Reservoir HA** (906.10) - Pacific Ocean Shoreline	96.50%	96.59%	99.42%	1.61%	1.99%	1.93%
Mission Bay	**Scripps HA** (906.30) - Pacific Ocean Shoreline	96.44%	96.42%	99.25%	16.32%	21.14%	18.82%
	Tecolote HA (906.50) - Tecolote Creek	94.51%	94.59%	98.94%	16.51%	20.47%	18.15% (18.08%)**
San Diego River	**Mission San Diego HSA** (907.11) and **Santee HSA** (907.12) - Pacific Ocean Shoreline - Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles)	74.03%	69.44%	93.96%	38.14%	53.22%	42.74% (42.47%)**
San Diego Bay	**Chollas HSA** (908.22) - Chollas Creek	92.06%	92.15%	98.46%	17.82%	24.84%	21.46% (21.36%)**

Notes:
* The percent load reductions are based on reducing loads compared to pollutant loads from 2001 to 2002.
** The alternative *Enterococcus* percent load reduction was calculated based on a numeric target of 104 MPN/100mL instead of 61 MPN/100mL, protective of the REC-1 "moderately to lightly used area" usage frequency that is protective of freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative pollutant load reductions can be utilized.

(c) Best Management Practices

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 6.0 must incorporate the Bacteria Load Reduction Plans (BLRPs) or Comprehensive Load Reduction Plans (CLRPs) required to be developed pursuant to Resolution No. R9-2010-0001.

(ii) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 6.b.(2)(a) and/or the effluent limitations under Specific Provision 6.b.(2)(b) for the segments or areas of the water bodies listed in Table 6.0.

(iii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans, owners/operators of small MS4s, and agricultural dischargers as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(f) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 6.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 6.b.(2)(c) achieves compliance with Specific Provisions 6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), and/or 6.b.(3)(e),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 6.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 6.d, to demonstrate compliance with Specific Provisions 6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), 6.b.(3)(e) and/or 6.b.(3)(f).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim indicator bacteria TMDL compliance requirements for the water bodies listed in Table 6.0 consist of the following:

(1) Interim TMDL Compliance Dates

The Responsible Copermittees must achieve compliance with the interim TMDL compliance requirements, as determined in accordance with Specific Provision 6.c.(3), by the interim compliance dates given in Table 6.4, unless alternative interim compliance dates are accepted by the San Diego Water Board Executive Officer as part of the Water Quality Improvement Plan.

Table 6.4
Interim Compliance Dates to Achieve Interim TMDL Compliance Requirements

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs*
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	April 4, 2016	April 4, 2021 (April 4, 2016)
		at Heisler Park - North		
	Pacific Ocean Shoreline	at Main Laguna Beach	April 4, 2016	April 4, 2021 (April 4, 2016)
		Laguna Beach at Ocean Avenue		
		Laguna Beach at Cleo Street		
		Arch Cove at Bluebird Canyon Road		
		Laguna Beach at Dumond Drive		
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	April 4, 2016	April 4, 2021 (April 4, 2016)
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	April 4, 2018	April 4, 2021 (April 4, 2018)
	Aliso Creek Mouth	at mouth	April 4, 2018	April 4, 2021 (April 4, 2018)
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	April 4, 2016	April 4, 2021 (April 4, 2016)
		Aliso Beach at Table Rock Drive		
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)		
		at Salt Creek (large outlet)		
		Salt Creek Beach at Salt Creek service road	April 4, 2017	April 4, 2021 (April 4, 2017)
		Salt Creek Beach at Strand Road	April 4, 2017	April 4, 2021 (April 4, 2017)

Table 6.4 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs*
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	April 4, 2016	April 4, 2021 (April 4, 2016)
	San Juan Creek	lower 1 mile	April 4, 2018	April 4, 2021 (April 4, 2018)
	San Juan Creek Mouth	at mouth	April 4, 2016	April 4, 2021 (April 4, 2016)
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	April 4, 2016	April 4, 2021 (April 4, 2016)
		Ole Hanson Beach Club Beach at Pico Drain	April 4, 2016	April 4, 2021 (April 4, 2016)
		San Clemente City Beach at El Portal Street Stairs	April 4, 2017	April 4, 2021 (April 4, 2017)
		San Clemente City Beach at Mariposa Street		
		San Clemente City Beach at Linda Lane	April 4, 2016	April 4, 2021 (April 4, 2016)
		San Clemente City Beach at South Linda Lane	April 4, 2018	April 4, 2021 (April 4, 2018)
		San Clemente City Beach at Lifeguard Headquarters	April 4, 2017	April 4, 2021 (April 4, 2017)
		under San Clemente Municipal Pier		
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	April 4, 2018	April 4, 2021 (April 4, 2018)
		San Clemente State Beach at Riviera Beach	April 4, 2016	April 4, 2021 (April 4, 2016)
		Can Clemente State Beach at Cypress Shores	April 4, 2017	April 4, 2021 (April 4, 2017)
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	April 4, 2017	April 4, 2021 (April 4, 2017)
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	April 4, 2016	April 4, 2021 (April 4, 2016)
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	April 4, 2016	April 4, 2021 (April 4, 2016)

Table 6.4 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs*
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	April 4, 2016	April 4, 2021 (April 4, 2016)
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	April 4, 2016	April 4, 2021 (April 4, 2016)
		La Jolla Shores Beach at Caminito del Oro		
		La Jolla Shores Beach at Vallecitos		
		La Jolla Shores Beach at Avenida de la Playa		
		at Casa Beach, Children's Pool		
		South Casa Beach at Coast Boulevard		
		Whispering Sands Beach at Ravina Street		
		Windansea Beach at Vista de la Playa		
		Windansea Beach at Bonair Street		
		Windansea Beach at Playa del Norte		
		Windansea Beach at Palomar Avenue		
		at Tourmaline Surf Park		
		Pacific Beach at Grand Avenue		
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries		
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	April 4, 2018	April 4, 2021 (April 4, 2018)
	San Diego River	lower 6 miles		
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach		
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	April 4, 2018	April 4, 2021 (April 4, 2018)

* The Interim Compliance Dates to achieve the Interim Wet Weather WQBELs in parenthesis apply if the applicable Water Quality Improvement Plan does not include load reduction programs for other constituents (e.g. metals, pesticides, trash, nutrients, sediment, etc.) together with bacteria load reduction requirements of these TMDLs.

(2) Interim Water Quality Based Effluent Limitations

The Responsible Copermittees for discharges to the water bodies in Table 6.0 must comply with the following interim WQBELs by the interim compliance dates given in Specific Provision 6.c.(1):

(a) Interim Receiving Water Limitations

(i) *Interim Dry Weather Receiving Water Limitations*

The Responsible Copermittee must calculate the "existing" exceedance frequencies of the 30-day geometric mean water quality objectives for each of the indicator bacteria by analyzing the available monitoring data collected between January 1, 1996 and December 31, 2002. "Existing" exceedance frequencies may be calculated by water body and/or by Watershed Management Area listed in Table 6.0. Separate "existing" exceedance frequencies must be calculated for beaches and creeks/creek mouths.

The Responsible Copermittees must achieve a 50 percent reduction in the "existing" exceedance frequency of the 30-day geometric mean WQBELs for the water bodies listed in Table 6.0 by the interim compliance dates given in Table 6.4. A 50 percent reduction in the "existing" exceedance frequency is equivalent to half of the "existing" exceedance frequency of the 30-day geometric mean WQBELs.

The "existing" exceedance frequencies and the interim dry weather allowable exceedance frequencies (i.e. interim dry weather receiving water limitations) calculated by the Responsible Copermittees must be included in the Water Quality Improvement Plans for the applicable Watershed Management Areas.

(ii) *Interim Wet Weather Receiving Water Limitations*

The Responsible Copermittees must achieve the interim wet weather receiving water limitations in Table 6.5, expressed as interim wet weather allowable exceedance frequencies, by the interim compliance dates given in Table 6.4.

Table 6.5
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	38%	37%	39%
		at Heisler Park - North			
	Pacific Ocean Shoreline	at Main Laguna Beach			
		Laguna Beach at Ocean Avenue			
		Laguna Beach at Cleo Street			
		Arch Cove at Bluebird Canyon Road			
		Laguna Beach at Dumond Drive			
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	41%	41%	42%
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	41%	41%	42%
	Aliso Creek Mouth	at mouth	41%	41%	42%
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	36%	36%	36%
		Aliso Beach at Table Rock Drive			
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)			
		at Salt Creek (large outlet)			
		Salt Creek Beach at Salt Creek service road			
		Salt Creek Beach at Strand Road			

Table 6.5 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	44%	44%	48%
	San Juan Creek	lower 1 mile	44%	44%	47%
	San Juan Creek Mouth	at mouth	44%	44%	47%
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	35%	35%	36%
		Ole Hanson Beach Club Beach at Pico Drain			
		San Clemente City Beach at El Portal Street Stairs			
		San Clemente City Beach at Mariposa Street			
		San Clemente City Beach at Linda Lane			
		San Clemente City Beach at South Linda Lane			
		San Clemente City Beach at Lifeguard Headquarters			
		under San Clemente Municipal Pier			
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)			
		San Clemente State Beach at Riviera Beach			
		Can Clemente State Beach at Cypress Shores			
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	45%	44%	47%
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	40%	40%	41%
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	33%	33%	36%

Table 6.5 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	26%	26%	26%
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	37%	37%	37%
		La Jolla Shores Beach at Caminito del Oro			
		La Jolla Shores Beach at Vallecitos			
		La Jolla Shores Beach at Avenida de la Playa			
		at Casa Beach, Children's Pool			
		South Casa Beach at Coast Boulevard			
		Whispering Sands Beach at Ravina Street			
		Windansea Beach at Vista de la Playa			
		Windansea Beach at Bonair Street			
		Windansea Beach at Playa del Norte			
		Windansea Beach at Palomar Avenue			
		at Tourmaline Surf Park			
		Pacific Beach at Grand Avenue			
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries	49%	49%	51%
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	46%	43%	49%
	San Diego River	lower 6 miles	46%	43%	49%
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	46%	43%	51%
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	41%	41%	43%

(b) Interim Effluent Limitations

Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the interim compliance dates under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.c.(2)(a):

Table 6.6
Interim Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watersheds and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
South Orange County	**San Joaquin Hills HSA** (901.11) and **Laguna Hills HSA** (901.12) - Pacific Ocean Shoreline	45.89%	45.86%	49.14%	23.43%	26.04%	25.63%
	Aliso HSA (901.13) - Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	47.74%	47.79%	49.57%	12.65%	13.31%	13.76% (13.69%)**
	Dana Point HSA (901.14) - Pacific Ocean Shoreline	47.52%	47.52%	49.49%	6.58%	7.43%	7.58%
	Lower San Juan HSA (901.27) - Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	36.48%	37.11%	47.47%	9.61%	6.41%	13.56% (13.45%)**
	San Clemente HA (901.30) - Pacific Ocean Shoreline	47.14%	47.12%	49.42%	11.93%	12.29%	12.63%
San Luis Rey River	**San Luis Rey HU** (903.00) - Pacific Ocean Shoreline	19.07%	19.55%	43.69%	2.81%	1.56%	5.85%
Carlsbad	**San Marcos HA** (904.50) - Pacific Ocean Shoreline	41.41%	41.28%	48.02%	9.24%	9.49%	10.10%

Table 6.6 (Cont'd)
Interim Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watersheds and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
San Dieguito River	**San Dieguito HU** (905.00) - Pacific Ocean Shoreline	7.20%	10.36%	41.74%	2.15%	0.73%	3.86%
Penasquitos	**Miramar Reservoir HA** (906.10) - Pacific Ocean Shoreline	48.25%	48.30%	49.71%	0.81%	1.00%	0.97%
Mission Bay	**Scripps HA** (906.30) - Pacific Ocean Shoreline	48.22%	48.21%	49.63%	8.16%	10.57%	9.41%
	Tecolote HA (906.50) - Tecolote Creek	47.26%	47.30%	49.47%	8.26%	10.24%	9.08% (9.04%)**
San Diego River	**Mission San Diego HSA** (907.11) and **Santee HSA** (907.12) - Pacific Ocean Shoreline - Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles)	37.02%	34.72%	46.98%	19.07%	26.61%	21.37% (21.24%)**
San Diego Bay	**Chollas HSA** (908.22) - Chollas Creek	46.03%	46.08%	49.23%	8.91%	12.42%	10.73% (10.68%)**

Notes:
* The percent load reductions are based on reducing loads compared to pollutant loads from 2001 to 2002.
** The alternative *Enterococcus* percent load reduction was calculated based on a numeric target of 104 MPN/100mL instead of 61 MPN/100mL, protective of the REC-1 "moderately to lightly used area" usage frequency that is protective of freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative pollutant load reductions can be utilized.

(3) Interim TMDL Compliance Determination

Compliance with the interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(f) There are no exceedances of the interim receiving water limitations under Specific Provision 6.c.(2)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(g) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the interim effluent limitations under Specific Provision 6.c.(2)(b); OR

(h) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

d. Specific Monitoring and Assessment Requirements

(1) Monitoring and Assessment Requirements for Beaches

(a) Monitoring Stations

For beaches addressed by the TMDL, monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[40] If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source

[40] Commonly referred to as AB 411 monitoring

identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations at least once within the first 24 hours of the end of a storm event[41] during the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer in exceedance of the allowable exceedance frequencies in the receiving waters.

(iii) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(iv) For Pacific Ocean Shoreline segments or areas listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the dry weather and

[41] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

wet weather monitoring data to assess whether the interim and final WQBELs for the Pacific Ocean Shoreline segments or areas listed in Table 6.0 have been achieved.

(ii) Dry weather exceedance frequencies must be calculated as follows:

[a] 30-day geometric means must be calculated from the results of any dry weather samples collected from the segments or areas for each water body listed in Table 6.0;
[b] The method and number of samples need for calculating the 30-day geometric means must be consistent with the number of samples required by the Ocean Plan;
[c] Where there are multiple segments or areas associated with a water body listed in Table 6.0, the Copermittees may calculate geometric means for each segment or area, or combine the dry weather monitoring data from all the segments or areas to calculate geometric means for the water body;
[d] The exceedance frequency must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the dry season.

(iii) Wet weather exceedance frequencies must be calculated as follows:

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;
[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;
[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria densities reported from each storm event sampled; and
[d] The single sample maximum exceedance frequency must be calculated by dividing the number of wet weather days that exceed the single sample maximum receiving water limitations in Table 6.2 by the total number of wet weather days during the rainy season.
[e] The data collected for dry weather must be used in addition to the data collected for wet weather to calculate the wet weather 30-day geometric means. The exceedance frequency of the wet weather 30-day geometric means must be calculated by dividing the number of geometric means that exceed the geometric mean

receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the wet season.

(iv) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(v) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) Monitoring and Assessment Requirements for Creeks and Creek Mouths

(a) Monitoring Stations

For creeks addressed by the TMDL, monitoring locations should consist of, at a minimum, a location at or near the mouth of the creek (e.g. Mass Loading Station or Mass Emission Station) and one or more locations upstream of the mouth (e.g. Watershed Assessment Station). If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations in accordance with the requirements of Provision D.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations within the first 24 hours of the end of a storm event[42] during the rainy season (i.e. October 1 through April 30).

[42] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(iii) Samples collected from receiving water monitoring stations must be analyzed for fecal coliform and *Enterococcus* indicator bacteria.

(iv) For creeks or creek mouths listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the receiving water monitoring data to assess whether the interim and final receiving water WQBELs for the creeks and creek mouths listed in Table 6.0 have been achieved.

(ii) Dry weather exceedance frequencies must be calculated as follows:

[a] 30-day geometric means must be calculated from the results of any dry weather samples collected from the segment or area for each water body listed in Table 6.0;
[b] The method and number of samples need for calculating the 30-day geometric means must be consistent with the number of samples required by the Basin Plan;
[c] The exceedance frequency must be calculated by dividing the number of 30-day geometric means that exceed the 30-day geometric mean receiving water limitations in Table 6.2 by the total number of 30-day geometric means calculated from samples collected during the dry season.

(iii) Wet weather exceedance frequencies must be calculated as follows:

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;
[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;
[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria densities reported from each of the storm events sampled; and

[d] The exceedance frequency must be calculated by dividing the number of wet weather days that exceed the single sample maximum receiving water limitations in Table 6.2 by the total number of wet weather days during the rainy season.

[e] The data collected for dry weather must be used in addition to the data collected for wet weather to calculate the wet weather 30-day geometric means. The exceedance frequency of the wet weather 30-day geometric means must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the wet season.

(iv) The Responsible Copermittee must identify and incorporate additional MS4 outfall and receiving water monitoring stations and/or adjust monitoring frequencies to identify sources causing exceedances of the receiving water WQBELs.

(v) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(vi) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

7. Total Maximum Daily Loads for Sediment in Los Peñasquitos Lagoon

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2012-0033

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2012
State Water Board Approval Date:	January 21, 2014
Office of Administrative Law Approval Date:	July 14, 2014
US EPA Approval Date:	October 30, 2014

(3) TMDL Effective Date: July 14, 2014

(4) Watershed Management Area: ~~Los~~ Peñasquitos

(5) Water Body: Los Peñasquitos Lagoon

(6) Responsible Copermittees: County of San Diego, City of San Diego, City of Del Mar, and City of Poway

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final sediment TMDL compliance requirements for Los Peñasquitos Lagoon consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must be in compliance with the final TMDL compliance requirements by December 31, 2034.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not prohibit the sustainable restoration of tidal and non-tidal saltmarsh vegetation of at least 346 acres.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations by the compliance date under Provision 7.b(1) will not cause or contribute to a failure of the receiving water condition specified under Specific Provision 7.b.(2)(a):

Table 7.1
*Final Effluent Limitations as Expressed as Wet Season Loads in MS4 Discharges to Los Peñasquitos Lagoon**

Constituent	Effluent Limitation
Sediment	2,580 tons/wet season

* Final effluent limitations are to be achieved by the following Responsible Parties: County of San Diego, City of San Diego, City of Del Mar, City of Poway, Phase II MS4 permittees, Caltrans, general construction storm water NPDES permittees, and general industrial storm water NPDES permittees.

(c) Best Management Practices

(i) The Water Quality Improvement Plan for the Los Peñasquitos Watershed Management Area must incorporate the Sediment Load Reduction Plan required to be developed pursuant to Resolution No. R9-2012-0033.

(ii) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 7.b.(2)(a) and/or the Copermittee's portion of the effluent limitations under Specific Provision 7.b.(2)(b) for Los Peñasquitos Lagoon.

(3) Final TMDL Compliance Determination

Compliance determination with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) Successful restoration of 80 percent of the 1973 acreage of tidal and non-tidal lagoon salt marsh (346 acres) as described in Attachment A of Resolution No. R9-2010-0033; OR

(b) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 7.b.(2)(c)(ii) and/or other implementation actions to achieve compliance with Specific Provision 7.b.(3)(a) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 7.b.(2)(c)(ii) or other implementation actions to achieve compliance with Specific Provision 7.b.(3)(a),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 7.b.(2)(c)(ii) or other implementation actions, AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 7.d to demonstrate compliance with Specific Provision 7.b.(3)(a).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim sediment TMDL compliance requirements for Los Penasquitos Lagoon consist of the following:

(1) Interim Compliance Dates and WQBELs

The Responsible Copermittees must comply with the interim WQBELs, expressed as wet season loads, by December 31 of the interim compliance year set forth in Table 7.2.

Table 7.2
*Interim Water Quality Based Effluent Limitations Expressed as Wet Season Loads in MS4 Discharges**

Interim Compliance Date	Interim Effluent Limitations (tons/wet season)
December 31, 2019	6,691
December 31, 2023	5,663
December 31, 2027	4,636
December 31, 2029	3,608

* Interim effluent limitations are to be achieved by the following Responsible Parties: County of San Diego, City of San Diego, City of Del Mar, City of Poway, Phase II MS4 permittees, Caltrans, general construction storm water NPDES permittees, and general industrial storm water NPDES permittees.

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) The final receiving water limitation under Specific Provision 7.b.(2)(a) is met; OR

(c) There are no exceedances of the Copermittee's portion of interim effluent limitations under Table 7.2 at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the Copermittee's portion of the interim TMDL compliance requirements described in Attachment A of Resolution No. R9-2010-0033 will be achieved by the interim compliance date.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) Watershed Monitoring

The Responsible Copermittees must conduct suspended sediment, bed load, and flow monitoring to calculate total sediment loading to the Los Peñasquitos Lagoon for each wet season (October 1 thru April 30) as set forth below:

(a) The Responsible Copermittees must monitor enough storm events throughout the season to quantify sediment loading over each wet season, and

(b) The Responsible Copermittees must monitor at least 3 stations to quantify cumulative sediment loading into Los Peñasquitos Lagoon. Stations must be located within the Los Peñasquitos, Carroll Canyon, and Carmel Creek tributaries prior to discharging into Los Peñasquitos Lagoon.

(2) Lagoon Monitoring

The Responsible Copermittees must monitor Los Peñasquitos Lagoon each Fall for changes in the extent of the vegetation types as set forth below:

(a) The Responsible Copermittees must acquire aerial photos of Los Peñasquitos Lagoon and digitize them at an approximate scale of 1:2,500,

(b) The Responsible Copermittees must appropriately interpret the vegetation and classify the various types as saltmarsh, non-tidal saltmarsh, freshwater marsh, non-tidal saltmarsh –*Lolium perrene* infested, southern willow scrub/mulefat scrub, herbaceous wetland, or upland land cover.

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the monitoring data collected under Specific Provision 7.d(1) and 7.d(2) to assess whether the interim and final WQBELs have been achieved.

(b) For assessing and determining compliance with the final receiving water limitations under Specific Provision 7.b.(2)(a), the Responsible

Copermittees must use the data acquired under Specific Provision 7.d.(2) to estimate the acreage of tidal and non-tidal saltmarsh actually restored.

(c) For assessing and determining compliance with the final effluent limitations under Specific Provision 7.b.(2)(b), the Responsible Copermittees must use the data acquired under Specific Provision 7.d.(1) to estimate sediment loading into Los Peñasquitos Lagoon. Sediment loading must be evaluated using a 3-year, weighted rolling average. The first reported average shall be calculated using data collected in the year, 2015-2016, 2016-2017, and 2017-2018 wet seasons.

(d) The monitoring and assessment results must be submitted as part of the Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

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ATTACHMENT F

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

FACT SHEET / TECHNICAL REPORT

FOR

ORDER NO. R9-2013-0001
AS AMENDED BY ORDER NOS. R9-2015-0001 AND R9-2015-0100
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

May 8, 2013
Amended ~~on~~ February 11, 2015
and November 18, 2015

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I. FACT SHEET FORMAT

This Fact Sheet briefly sets forth the principal facts and the significant factual, legal, methodological, and policy questions that the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) considered in preparing Order No. R9-2013-0001 (Order), as amended by Order Nos. R9-2015-0001 and R9-2015-0100. In accordance with the Code of Federal Regulations (CFR) Title 40 Parts 124.8 and 124.56 (40 CFR 124.8 and 40 CFR 124.56), this Fact Sheet includes, but is not limited to, the following information:

1. Contact information
2. Public process and notification procedures
3. Background of municipal storm water permits
4. Regional MS4 Permit approach
5. Economic considerations
6. Applicable statutes, regulations, plans and policies
7. Discussion of the provisions in the Order

Tentative Order No. R9-2013-0001 was distributed for public review on October 31, 2012. The San Diego Water Board accepted written comments on ~~the~~ Tentative Order No. R9-2013-0001 until January 11, 2013. A public hearing was subsequently held on April 10 and 11, 2013, that was continued to May 8, 2013 to receive oral comments from interested persons. The San Diego Water Board adopted Order No. R9-2013-0001 on May 8, 2013.

Tentative Order No. R9-2015-0001, an Order amending Order No. R9-2013-0001, was distributed for public review on September 19, 2014. The San Diego Water Board accepted written comments on Tentative Order No. R9-2015-0001 until November 19, 2014. A public hearing was held on February 11, 2015, to receive oral comments from Copermittees and interested persons. The San Diego Water Board adopted Order No. R9-2015-0001 amending Order No. R9-2013-0001 on February 11, 2015. Order No. R9-2015-0001 amended the findings and provisions of Order No. R9-2013-0001 to:

a. Enroll the County of Orange, the Orange County Flood Control District and the south Orange County Cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano as Copermittees responsible for compliance with the terms and conditions of Order No. R9-2013-0001, as amended by Order No. R9-2015-0001;

b. Designate the San Diego Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the Cities of Laguna Woods and Laguna Hills and agree to the designation of the Santa Ana Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the City of Lake Forest, subject to the

terms of the February 10, 2015 agreement between San Diego Water Board and the Santa Ana Water Board described in Finding 29 of this Order, upon the later effective date of Order No. R9-2015-0001 or Order No. R8-2015-0001 (superseding Order No. R8-2009-0030);

c. Establish interim exceptions to land development requirements for those priority development projects that discharge to engineered channels and large river reaches as described in Provision E.3.c.(2)(e) of this Order;

d. Incorporate the amended requirements of the State Water Resources Control Board's (State Water Board) General Exception to require that pollutant reductions be achieved within 6 years for storm water and nonpoint source discharges to ASBS within the Region;

e. Incorporate applicable requirements of the Los Peñasquitos Lagoon Sediment TMDL; and

f. Require the Orange County Copermittees to implement the "*Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County*," dated October 2014, made effective in the Monitoring and Reporting Program/Order issued pursuant to California Water Code section 13383 in the December 5, 2014 San Diego Water Board Letter Directive and subject to future revisions by the Executive Officer after appropriate public input.

~~A public hearing was held on February 11, 2015, to receive oral comments from Copermittees and interested persons. The San Diego Water Board adopted Order No. R9-2015-0001 amending Order No. R9-2013-0001 on February 11, 2015.~~

Tentative Order No. R9-2015-0100, an Order amending Order No. R9-2013-0001 as amended by Order No. R9-2015-0001, was distributed for public review on July 31, 2015. The San Diego Water Board accepted written comments on Tentative Order No. R9-2015-0100 until September 14, 2015. A public hearing was held on November 18, 2015, to receive oral comments from Copermittees and interested persons. The San Diego Water Board adopted Order No. R9-2015-0100 amending Order No. R9-2013-0001 as amended by Order No. R9-2015-0001, on November 18, 2015. Order No. R9-2015-0100 amended the findings and provisions of Order No. R9-2013-0001 as amended by Order No. R9-2015-0001 to:

a. Enroll the County of Riverside, the Cities of Murrieta, Temecula, and Wildomar, and the Riverside County Flood Control and Water Conservation District as Copermittees responsible for compliance with the terms and conditions of Order No. R9-2013-0001, as amended by Order Nos. R9-2015-0001 and R9-2015-0100;

b. Continue designation of the San Diego Water Board to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Murrieta and Wildomar, including areas within the Santa Ana Region; and, agree to continue designation of the Santa Ana Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the City of Menifee, including areas within the San Diego Region, subject to the terms of the October 26, 2015 agreement between San Diego Water Board and the Santa Ana Water Board described in Finding 29 of this Order;

d. Incorporate Provision B.3.c, which provides an option that allows a Copermittee to utilize the watershed-based Water Quality Improvement Plan to be deemed in compliance with the prohibitions and limitations of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b;

e. Incorporate minor revisions to Provisions E.2.a.(1) and E.2.a.(2) to include San Diego Water Board Order No. R9-2015-0013 and State Water Board Order 2014-0194-DWQ into the requirements for addressing non-storm water discharges to a Copermittee's MS4;

e. Incorporate minor revisions to Provision E.3.b.(1) to correct inconsistencies in the definition of a Priority Development Project as compared to the definitions in Order No. R9-2009-0002 (Fourth Term Orange County MS4 Permit) and Order No. R9-2010-0016 (Fourth Term Riverside County MS4 Permit), and requirements for incorporating the corrected definitions into the BMP Design Manual;

f. Incorporate revisions to Provision E.3.e.(1)(a) to provide additional clarity on when the structural BMP performance requirements of Provision E.3.c are applicable to Priority Development Projects;

e. Incorporate minor revisions to the Revised TMDLs for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region and the TMDLs for Sediment in Los Peñasquitos Lagoon in Attachment E to the Order to make the requirements consistent with the Basin Plan amendments adopted by the San Diego Water Board; and

f. Remove provisions related to allowing the Riverside County Copermittees to apply for early coverage under the Regional MS4 Permit.

The San Diego Water Board files applicable to the issuance of Order No. R9-2013-0001 and amendments thereto are incorporated into the administrative record in support of the findings and requirements of the Order.

II. CONTACT INFORMATION

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The Order and other related documents can be downloaded from the San Diego Water Board website at

http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

The documents referenced in this Fact Sheet and in Order No. R9-2013-0001 and amendments thereto are available for public review at the San Diego Water Board office, located at the address listed above. Public records are available for inspection during regular business hours, from 8:00 am to 5:00 pm Monday through Friday. To schedule an appointment to inspect public records, contact the San Diego Water Board Records Management Officer at 619-516-1990.

COPERMITTEES

Orange County Copermittees

- County of Orange
  - City of Aliso Viejo
  - City of Dana Point
  - City of Laguna Beach
  - City of Laguna Hills
  - City of Laguna Niguel
  - City of Laguna Woods
  - City of Lake Forest *
  - City of Mission Viejo
  - City of Ranch Santa Margarita
  - City of San Clemente
  - City of San Juan Capistrano
  - Orange County Flood Control District

* While not listed in the above table, the City of Lake Forest remains a Copermittee under this Order until the later effective date of this Order or Santa Ana Water Board Tentative Order No. R8-2015-0001. Thereafter, the City of Lake Forest will no longer be considered a Copermittee under this Order because its Phase I MS4 discharges will be regulated by the Santa Ana Water Board pursuant to Water Code section 13328 designation. The requirements of this Order that apply to the City of Lake Forest for the duration of this Order, consistent with the Water Code section 13228 agreement dated February 10, 2015, are described in Finding 29 and Footnote 2 to Table B-1.

Riverside County Copermittees

- County of Riverside
  - City of Menifee**
  - City of Murrieta
  - City of Temecula
  - City of Wildomar
  - Riverside County Flood Control and Water Conservation District

** The City of Menifee is not regulated as a Copermittee under this Order because its Phase I MS4 discharges are regulated by Santa Ana Water Board Order No. R8-2010-0033 as it may be amended or issued pursuant to Water Code section 13228 designation. The requirements of this Order that apply to the City of Menifee for the duration of this Order, consistent with the Water Code section 13228 written agreement dated October 26, 2015, are described in Finding 29 and Footnote 3 to Table B-1.

San Diego County Copermittees

- County of San Diego
  - City of Carlsbad
  - City of Chula Vista
  - City of Coronado
  - City of Del Mar
  - City of El Cajon
  - City of Encinitas
  - City of Escondido
  - City of Imperial Beach
  - City of La Mesa
  - City of Lemon Grove
  - City of National City
  - City of Oceanside
  - City of Poway
  - City of San Diego
  - City of San Marcos
  - City of Santee
  - City of Solana Beach
  - City of Vista
  - San Diego County Regional Airport Authority
  - San Diego Unified Port District

III. PUBLIC PROCESS AND NOTIFICATION PROCEDURES

The San Diego Water Board followed the schedule listed below for the preparation of Order No. R9-2013-0001 and amendments thereto:

San Diego County Copermittee Permit Reissuance Process

1. On February 8, 2011, the San Diego Water Board met with the San Diego County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No. R9-2007-0001.

2. Between February and May 2011, the San Diego Water Board met with select San Diego County, Orange County, and Riverside County Copermittees, as well as representatives of the environmental community to discuss concepts and receive recommendations for elements to be incorporated in a Regional Municipal Separate Storm Sewer System Permit (Regional MS4 Permit).

3. On June 27, 2011 the San Diego Water Board received the Report of Waste Discharge from the San Diego County Copermittees for the renewal of their NPDES permit, Order No. R9-2007-0001.

4. On April 9, 2012, the San Diego Water Board released an administrative draft of Tentative Order No. R9-2013-0001 for preliminary informal comments and feedback.

5. On April 25, 2012, the San Diego Water Board held an informal public workshop to present the administrative draft of Tentative Order No. R9-2013-0001 and receive verbal comments.

6. Between June and August 2012, the San Diego Water Board held four (4) focused meetings with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community, and USEPA) to discuss and receive preliminary comments and feedback about specific elements in the administrative draft of Tentative Order No. R9-2013-0001.

7. On September 5, 2012, the San Diego Water Board held an informal public workshop to present the modifications that were expected to be incorporated into the Tentative Order based on the preliminary comments and feedback received during the focused meetings held between June and August 2012.

8. Informal written comments on the administrative draft of Tentative Order No. R9-2013-0001 were accepted until September 14, 2012.

9. On October 12, 2012, the San Diego Water Board released a revised administrative draft of Tentative Order No. R9-2013-0001.

10. On October 24, 2012, the San Diego Water Board held a focused meeting with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community, and USEPA) to discuss modifications incorporated into the administrative draft of Tentative Order No. R9-2013-0001.

11. On October 31, 2012, the San Diego Water Board released Tentative Order No. R9-2013-0001 for formal public review and comment.

12. On November 13, 2012 and December 12, 2012, the San Diego Water Board held a formal public Board workshop to present the public draft of Tentative Order No. R9-2013-0001 and receive verbal comments.

13. Formal written comments on the public draft of Tentative Order No. R9-2013-0001 were accepted until January 11, 2013.

14. A public hearing of Tentative Order No. R9-2013-0001 was conducted on April 10 and 11, 2013, that was continued to May 8, 2013.

Orange County Copermittee Permit Reissuance Process

15. On May 20, 2014 the San Diego Water Board received the Report of Waste Discharge from the Orange County Copermittees for the renewal of their MS4 NPDES permit, Order No. R9-2009-0002.

16. On June 24, 2014, the San Diego Water Board met with the Orange County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No.R9-2009-0002 and the process for enrollment as Copermittees under Regional MS4 Permit Order No. R9-2013-0001.

17. On July 1, 2014, the San Diego Water Board held a public meeting to discuss the Orange County Report of Waste Discharge and receive comments on potential modifications to Order No. R9-2013-0001. Based on comments received from the Orange County Copermittees and other interested persons at this meeting, the San Diego Water Board determined that additional public meetings were not needed prior to release of Tentative Order No. R9-2015-0001, amending Order No. R9-2013-0001 in redlined – strikeout format for public review and comment.

18. On September 19, 2014, the San Diego Water Board released Tentative Order No. R9-2015-0001 for a 60 day public review and comment period.

19. On October 8, 2014, the San Diego Water Board held a formal public workshop at a regular board meeting to receive information and discuss the proposed amendments to Order No. R9-2013-0001 described in Tentative Order No. R9-2015-0001.

20. In accordance with State and federal laws and regulations, the San Diego Water Board notified San Diego County, Orange County and Riverside County Copermittees, and all known interested agencies and persons of its intent to adopt Tentative Order No. R9-2015-0001 and provided them with an opportunity to submit their written comments and recommendations. Written comments and recommendations on Tentative Order No. R9-2015-0001 were accepted until November 19, 2014.

21. The San Diego Water Board held a public workshop on October 8, 2014, and a public hearing on February 11, 2015, and heard and considered all comments pertaining to the adoption of Tentative Order No. R9-2015-0001 on February 11, 2015.

Riverside County Copermittee Permit Reissuance Process

22. Between April and June 2015, the San Diego Water Board held three (3) public workshops with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community) to discuss and receive comments and feedback about amending Order No. R9-2013-0001 to incorporate a definition of prior lawful approval for Priority Development Projects, and an alternative compliance pathway for prohibitions and limitations in Provision A of the Order. A San Diego Water Board member attended the April and May 2015 public workshops, but no actions or voting took place.

23. On April 15, 2015, the San Diego Water Board met with the Riverside County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No.R9-2010-0016 and the process for enrollment as Copermittees under Order No. R9-2013-0001 (Regional MS4 Permit).

24. On May 8, 2015 the San Diego Water Board received a Report of Waste Discharge from the Riverside County Copermittees for the renewal of their MS4 NPDES permit, Order No. R9-2010-0016.

25. On July 31, 2015, the San Diego Water Board released Tentative Order No. R9-2015-0100 for a formal public review and comment period.

26. Formal written comments on the public draft of Tentative Order No. R9-2015-0100 were accepted until September 14, 2015, a formal public written comment period of 46 days.

27. A public hearing to receive oral comments on Tentative Order No. R9-2015-0100 was conducted on November 18, 2015.

IV. BACKGROUND OF THE SAN DIEGO REGION MUNICIPAL STORM WATER PERMITS

In developed and developing areas, storm water runoff is commonly transported through municipal separate storm sewer systems (MS4s) and discharged into local receiving water bodies. As the storm water runs off and flows over the land or impervious surfaces (e.g., paved streets, parking lots, and building rooftops), it accumulates debris, chemicals, sediment, and other pollutants that can adversely affect receiving water quality if discharged untreated. The United States Environmental Protection Agency (USEPA) recognizes wet weather flows from urban areas as the number one source of estuarine pollution in coastal communities,[1] such as those within the San Diego Region.

The federal Clean Water Act (CWA) was amended in 1987 to address and regulate discharges of storm water associated with industrial activities and from municipal storm sewers. With the amendments, many municipalities throughout the United States were obligated for the first time to obtain National Pollutant Discharge Elimination System (NPDES) permits for discharges of storm water from their MS4s.

In response to the CWA 1987 amendment, as well as the pending federal NPDES regulations which would implement the amendment, the San Diego Water Board issued "early" MS4 permits. The San Diego Water Board adopted and issued Order Nos. 90-38, 90-42, and 90-46 to regulate storm water discharges from the MS4s in Orange County, San Diego County, and Riverside County, respectively, within the San Diego Region on July 16, 1990.

The "early" MS4 permits, or First Term Permits, were issued prior to the November 1990 promulgation of the final federal NPDES storm water regulations. By issuing these First Term Permits before the federal regulations took effect, the San Diego Water Board was able to provide the Copermittees additional flexibility in addressing and managing storm water discharges. The First Term Permits contained the essentials of the 1990 regulations, and required the Copermittees to develop and implement runoff management programs, but provided little specificity about what was required to be included in or actually achieved by those programs.

The flexibility provided in the First Term Permits was generally continued through the Second Term Permits. The combination of the lack of specificity in the First and Second Term Permits, a general lack of meaningful action by the Copermittees and a general lack of corresponding reaction (i.e. enforcement) by the San Diego Water Board during the first ten years of the storm water program, resulted in few substantive steps towards achieving improvements in the quality of receiving waters or storm water discharges from the MS4s.

[1] US EPA. 1999. 40 CFR Parts 9, 122, 123, and 124. National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. 64 FR 68727.

From 2001, the regulatory approach incorporated into Third Term Permits was a significant departure from the regulatory approach of the First and Second Term Permits. The Third Term Permits issued by the San Diego Water Board included more detailed requirements that outlined the minimum level of implementation required for the Copermittees' programs to meet the maximum extent practicable (MEP) standard for storm water. The Third Term Permits included more detail to emphasize and enhance the jurisdictional runoff management programs developed by the Copermittees and introduced requirements for developing and implementing watershed-based programs.

The Third Term Permits also incorporated two precedent setting decisions by the State Water Board. In Order WQ 99-05, the State Water Board established receiving water limitation language to be included in all MS4 permits. The State Water Board's precedential language clarified that municipal storm water permits must include provisions requiring discharges to be controlled to attain water quality standards in receiving waters. Unlike previously adopted versions of the receiving water limitation language in the First and Second Term Permits, the language no longer stated that "*violations of water quality standards are not violations of the municipal storm water permit under certain conditions*." In addition, the receiving water limitation language no longer indicated that the "*implementation of best management practices is the 'functional equivalent' of meeting water quality standards*." State Water Board Order WQ 99-05 specifically requires language in MS4 permits for the Copermittees to comply with water quality standards based discharge prohibitions and receiving water limitations through timely implementation of control measures and other actions to reduce pollutants in discharges. (See State Water Board Order WQ 99-05 (*Environmental Health Coalition*)).

In Order WQ 2000-11, also a precedential decision, the State Water Board addressed design standards for structural post-construction best management practices (BMPs) for new development and significant redevelopment. The State Water Board found that the design standards, which require that runoff generated by 85 percent of storm events from specific development categories be infiltrated or treated, reflect the MEP standard. State Water Board Order WQ 2000-11 also found that the post-construction BMP provisions, or Standard Storm Water Mitigation Plan (SSMP) provisions, constitute MEP for addressing storm water pollutant discharges resulting from specific development categories.

The Third Term San Diego County and Orange County Permits (Order Nos. 2001-01 and R9-2002-0001, respectively) were appealed to the State Water Board. Minor modifications were made by the State Water Board, but the requirements were largely upheld. In State Water Board Order WQ 2001-15, the State Water Board upheld the Third Term San Diego County Permit requirements with certain modifications. The State Water Board removed the prohibition of storm water discharges *into* the MS4 that cause or contribute to exceedances of water quality objectives. The revision allows for treatment of pollutants in storm water runoff after the pollutants have entered the MS4.

State Water Board Order WQ 2001-15 otherwise upheld all the other requirements of the permit.

In addition to the modification to the discharge prohibition in Order WQ 2001-15, the State Water Board refined Order WQ 99-05 by making clear that the Copermittees may use an iterative approach to achieving compliance with water quality standards that involves ongoing assessments and revisions. Thus, the language for the discharge prohibitions and receiving water limitations was revised to explicitly require the Copermittees to implement an iterative process of assessments and revisions to comply with the discharge prohibitions and receiving water limitations. The San Diego Water Board retained the authority to enforce receiving water limitations and discharge prohibitions even if the Copermittee is engaged in the iterative process.

The Third Term San Diego County Permit was subsequently challenged in the Superior Court of the State of California and the Court of Appeal, Fourth Appellate District. The Court of Appeal, Fourth Appellate District, found that the approach of the Third Term San Diego County Permit to regulating discharges into the MS4 was appropriate (*Building Industry Ass'n. v. State Water Resources Control Bd., et al.,* 124 Cal.App.4th 866 (2004)). The State of California Supreme Court denied review sought by the Building Industry Association in March 2005.

The Fourth Term Permits~~, or current MS4 permits,~~ began with the adoption of Order No. R9-2007-0001 issued to the Copermittees of San Diego County in January 2007. Order Nos. R9-2009-0002 and R9-2010-0016 were subsequently issued to the Copermittees of Orange County and Riverside County. The Fourth Term Permits continued to include more detailed requirements to be implemented by each Copermittee's jurisdictional runoff management program. The Fourth Term Permits also included requirements to further emphasize a watershed management approach and for more coordination among jurisdictional runoff management programs. In addition, the Fourth Term Permits included more requirements for assessing the effectiveness of the runoff management programs being implemented by the Copermittees. The intent of the inclusion of additional requirements was to enhance and better define elements of the permit that were expected to be incorporated into the iterative process for managing runoff from each Copermittee's jurisdiction and within the watersheds of the San Diego Region.

The Fourth Term Permits included several new and emerging approaches for managing storm water runoff and discharges. Low impact development (LID) requirements are included for development and significant redevelopment to reduce pollutants in storm water runoff from sites through more natural processes such as infiltration and biofiltration closer to the source, rather than utilizing conventional mechanical end-of-pipe treatment systems. Hydrograph modification (hydromodification) management requirements also are included to mitigate the potential for increased erosion in receiving waters due to increased runoff rates and durations often caused by development and increased impervious surfaces. The Fourth Term Orange County and Riverside County Permits introduced requirements to identify areas of existing

development where retrofitting with LID projects would be feasible and could be implemented to reduce storm water runoff and pollutants in storm water discharges.

The Fourth Term Orange County and Riverside County Permits included a clearer distinction between storm water and non-storm water discharges. The term "urban runoff" was completely removed, and a distinction between storm water (wet weather) runoff and non-storm water (dry weather) runoff was emphasized. This clarification was made to prevent any potential misunderstanding that regulation under the MS4 permits is limited only to urbanized areas, and to prevent non-storm water runoff from being managed in the same manner as storm water runoff. The term "urban runoff" is not defined in the Code of Federal Regulations (CFR) or Federal Register (FR) in the regulation of MS4 discharges. According to the CWA 402(p)(3)(B)(ii), MS4 permits must include a requirement to effectively prohibit non-storm water discharges into the MS4s.

Finally, for the Fourth Term Orange County and Riverside County Permits the San Diego Water Board found that non-storm water discharges to the MS4 from over application of irrigation water are sources of pollutants. The San Diego Water Board found that non-storm water discharges resulting from over-irrigation must be prohibited from entering the MS4 in accordance with the requirements of the CWA and pursuant to 40 CFR 122.26(d)(2)(iv)(B)(1).

The requirements of the Fourth Term Permits issued to the Copermittees in each county within the San Diego Region now have substantively the same core requirements such as discharge prohibitions, receiving water limitations, jurisdictional runoff management program components, and monitoring program requirements. There are, however, several inconsistencies that exist among the three Fourth Term Permits which complicate oversight and implementation of the permits by the San Diego Water Board.

The Fourth Term San Diego County Permit expired in January 2012. The Fourth Term Orange County permit expired in December 2014 and the Fourth Term Riverside County Permit ~~will~~ expired in November 2015. Issuing the Fifth Term Permits within five years for three counties under three different permits would have required the San Diego Water Board to expend significant time and resources for the issuance of the permits through three separate public proceedings, thereby greatly reducing the time and resources available to oversee implementation and compliance. Multiple permits also create confusion for determining compliance among regulated entities, especially for the land development community.

The San Diego Water Board ~~has~~ acknowledged that issuing a single MS4 permit for all the Copermittees in the San Diego Region can and is expected to result in more consistent implementation, improve communication among agencies within watersheds crossing multiple jurisdictions, and minimize resources spent with each permit renewal process. Within the findings of the Fourth Term Riverside County Permit issued in November 2010, the San Diego Water Board notified the public of its intent to develop and issue a single Regional MS4 Permit.

V. REGIONAL MS4 PERMIT APPROACH

The Fifth Term Permit, or Regional MS4 Permit, shifts the focus of the permit requirements from a minimum level of actions to be implemented by the Copermittees to identifying outcomes to be achieved by those actions. Order No. R9-2013-0001 represents an important paradigm shift in the approach for MS4 permits within the San Diego Region.

Historical Permitting Approach

The First and Second Term Permits were very broad and provided little specificity about what was required to be developed and implemented by the Copermittees. The Third Term Permits began to become more specific about the minimum level of implementation required by the Copermittees. The Fourth Term Permits subsequently increased in specificity. The MS4 permits have progressively become more detailed and focused on specifying the minimum level of actions expected to be implemented by the Copermittees. As detailed and specific as the MS4 permits have become, however, they include very little detail about what the desired outcomes of the required actions are expected to achieve. Compliance with the permit requirements has essentially been tracking numbers of actions and reporting, not tracking progress or actual improvements in the quality of receiving waters or discharges from the MS4s. The result has been an increase in actions being implemented by the Copermittees with little or no ability or expectations to determine whether or not improvements in water quality are being achieved.

The Fourth Term Permits result in significant resource expenditure by the Copermittees to report permit compliance information to the San Diego Water Board in the form of annual jurisdictional runoff management program, watershed program, and monitoring program reports. The San Diego Water Board ~~must then~~ was required to expend much of its limited resources on reviewing more than 50 voluminous reports submitted annually by the Copermittees. The information ~~currently~~ reported by the Copermittees ~~is~~ was of limited value when trying to measure progress toward achieving improvements in the quality of receiving waters or discharges from the MS4s. Oversight of the MS4 permits ~~is~~ was further complicated by the inconsistencies among the requirements issued to the Orange County, San Diego County, and Riverside County Copermittees under three separate MS4 permits.

Under the Fourth Term Permits, the Copermittees ~~must~~ were required to expend a significant portion of their limited resources collecting data of limited value, and putting together reports to submit that information to the San Diego Water Board. Likewise, the San Diego Water Board ~~must~~ was required to expend most of its limited resources reviewing reports, and developing permits instead of working directly with the Copermittees to identify solutions to problems causing impacts to water quality. This ~~is~~ was an unsustainable course that ~~will~~ would have continued to demand more

resources from the Copermittees and the San Diego Water Board, and would have continued to result in unknown water quality benefits.

New Permitting Approach

The goal of the Regional MS4 Permit is twofold: 1) bring a consistent set of MS4 permit requirements to all of the Copermittees within the San Diego Region; and, 2) provide an MS4 permit with requirements that will allow the Copermittees to focus their efforts and resources on achieving goals and desired outcomes toward the improvement of water quality rather than completing specific actions.

The overall approach included in the Regional MS4 Permit with respect to the jurisdictional runoff management programs will not differ significantly from the current permits. The general requirements for the jurisdictional runoff management program components and compliance with those requirements will remain and be applied consistently throughout the San Diego Region under the Regional MS4 Permit.

The most significant difference in the new permitting approach is the specific manner of implementation for those jurisdictional runoff management programs. Implementation will be based on decisions made by the Copermittees in accordance with what they have identified as their highest priority water quality conditions. In other words, the Copermittees will have significant control in how to implement the jurisdictional runoff management programs to best utilize their available resources in addressing a specific set of priorities effectively, instead of trying to address all the water quality priorities ineffectively.

The Copermittees are given the responsibility of identifying their highest priority water quality conditions that they intend to address. The Copermittees will develop goals that can be used to measure and demonstrate progress or improvements toward addressing those priorities. In addition to the goals, the Copermittees will provide a schedule for achieving the goals for those highest priorities. The measurement of progress toward achieving the goals for those highest priorities requires a better defined and more focused program of monitoring and assessment than under the Fourth Term Permits.

The monitoring and assessment program must be designed to inform the Copermittees of their progress, and the need for modifications in their jurisdictional runoff management programs and schedules to achieve their goals to improve water quality. The monitoring and assessment program requirements will have a more central role in the Regional MS4 Permit than in earlier permits. The monitoring and assessment requirements must also be designed to enable the Copermittees to focus and direct their efforts in implementing their jurisdictional runoff management programs toward their stated desired outcomes to improve the quality of receiving waters and/or discharges from the MS4s.

By providing an MS4 permit that allows the Copermittees to make more decisions about how to utilize and focus their resources, along with a better defined monitoring and assessment program to inform their water quality management decisions, the Copermittees ~~will~~ have the opportunity to:

1) *Plan strategically*. The Copermittees must have the ability to identify their available resources and develop and implement long term plans that can organize, collect, and use those resources in the most strategically advantageous and efficient manner possible. This ability to develop long term plans will allow the Copermittees to focus and utilize their resources in a more concerted way over the short term and long term to address specific water quality priorities through stated desired outcomes.

2) *Manage adaptively*. The Copermittees must be given the ability to modify their plans as additional information and data are collected from the monitoring and assessment programs. The Copermittees' plans may require modifications to the programs, priorities, goals, strategies, and/or schedules in order for the Copermittees to achieve a stated desired outcome.

3) *Identify synergies*. The Copermittees must be given more flexibility to identify efficiencies within and among their jurisdictional runoff management programs as the strategies are developed and implemented to increase the Copermittees' collective effectiveness. The Copermittees must also be able to identify and utilize resources available from other agencies and entities to further augment and enhance their jurisdictional runoff management programs and/or to collectively work with those other agencies and entities toward achieving a stated desired outcome.

The Regional MS4 Permit requirements ~~will~~ provide the Copermittees the flexibility and responsibility to decide what actions will be necessary to achieve an outcome that is tailored and designed by the Copermittees to improve specific prioritized water quality conditions. The San Diego Water Board expects the approach of the Regional MS4 Permit to give the Copermittees a greater sense of ownership for restoring the quality of receiving waters in the San Diego Region by becoming an integral part of the decision making process in identifying water quality conditions to be addressed, as well as determining the best use of their resources.

VI. ECONOMIC CONSIDERATIONS

Statutory Considerations

California Water Code (CWC) section 13241 requires the San Diego Water Board to consider certain factors, including economic considerations, in the adoption of water quality objectives. CWC section 13263 requires the San Diego Water Board to take into consideration the provisions of CWC section 13241 in adopting waste discharge requirements.

In *City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, the California Supreme Court considered whether Regional Water Boards must comply with CWC section 13241 when issuing waste discharge requirements under CWC section 13263(a) by taking into account the costs a permittee will incur in complying with the permit requirements. The Court concluded that whether it is necessary to consider such cost information "*depends on whether those restrictions meet or exceed the requirements of the federal Clean Water Act.*" (*Id.* at p. 627.) The Court ruled that Regional Water Boards may not consider the factors in CWC section 13241, including economics, to justify imposing pollutant restrictions that are less stringent than applicable federal law requires. (*Id.* At pp. 618, 626-627 ["*[Water Code section 13377 specifies that [ ] discharge permits issued by California's regional boards must meet the federal standards set by federal law. In effect, section 13377 forbids a regional board's consideration of any economic hardship on the part of the permit holder if doing so would result in the dilution of the requirements set by Congress in the Clean Water Act...Because CWC section 13263 cannot authorize what federal law forbids, it cannot authorize a regional board, when issuing a [ ] discharge permit, to use compliance costs to justify pollutant restrictions that do not comply with federal clean water standards*."]). However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Regional Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

As discussed in Section VII.F, Unfunded State Mandates, the San Diego Water Board finds that the requirements in this Order are not more stringent than the minimum federal requirements. Among other requirements, federal law requires MS4 permits to include requirements to effectively prohibit non-storm water discharges into the MS4s, in addition to requiring controls to reduce the discharge of pollutants in storm water to the MEP, and other provisions as USEPA or the State determines are appropriate for the control of pollutants in MS4 discharges.

The requirements in this Order may be more specific or detailed than those enumerated in federal regulations under 40 CFR 122.26 or in the USEPA guidance. However, the requirements have been designed to be consistent with and within the federal statutory mandates described in CWA section 402(p)(3)(B)(ii) and (iii) and the related federal regulations and guidance. Consistent with federal law, all of the

conditions in this Order could have been included in a permit adopted by USEPA in the absence of the in lieu authority of California to issue NPDES permits.

Moreover, the inclusion of numeric WQBELs in this Order does not cause this Order to be more stringent than federal law. Federal law authorizes both narrative and numeric effluent limitations to meet state water quality standards. The inclusion of WQBELs as discharge specifications in an NPDES permit in order to achieve compliance with water quality standards is not a more stringent requirement than the inclusion of BMP based permit limitations to achieve water quality standards (State Water Board Order No. WQ 2006-0012 (*Boeing*)). Therefore, consideration of the factors set forth in CWC section 13241 is not required for permit requirements to implement the effective prohibition on the discharge of non-storm water discharges into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determine appropriate to control such pollutants, as those requirements are mandated by federal law.

Included in the provisions of the Order are monitoring and reporting requirements that are designed to demonstrate that the Copermittees are implementing programs to comply with the CWA municipal storm water requirements. CWA section 308(a) and 40 CFR 122.41(h), (j)-(l), 122.44(i) and 122.48 require that all NPDES permits specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s (40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c)) also specify additional monitoring and reporting requirements. In addition to the federal requirements of the CWA, the San Diego Water Board also has the authority in CWC 13383 to establish monitoring, reporting, and recordkeeping requirements that implement federal and state laws and regulations through NPDES permits.

The monitoring and assessment information that will be reported to the San Diego Water Board is necessary to determine if the Copermittees are making progress toward achieving compliance with the discharge prohibitions, receiving water limitations, and effluent limitations under Provision A of the Order. The monitoring and assessment information that will be reported is also expected to be key to the iterative approach and adaptive management process that is required to be implemented by the Copermittees if they cannot meet the discharge prohibitions and receiving water limitations under the present conditions, which is also part of the requirements under Provision A of the Order.

Notwithstanding the above, the San Diego Water Board has considered cost information in issuing this Order, as discussed below. The San Diego Water Board has also considered all of the evidence that has been presented to the San Diego Water Board regarding the CWC section 13241 factors in adopting this Order. The San Diego Water Board finds that the requirements in this Order are reasonably necessary to protect beneficial uses identified in the Basin Plan and the economic information related to costs of compliance and other CWC section 13241 factors are not sufficient to justify failing to protect those beneficial uses. Where appropriate, the

San Diego Water Board has provided or will consider providing the Copermittees with additional time to implement control measures to achieve final WQBELs and/or water quality standards.

Cost Information

Discussions of the financial and economic ramifications of municipal storm water management programs tend to focus on the significant costs incurred by municipalities in developing and implementing the programs. When considering the cost of implementing the programs, however, it is also important to consider the alternative costs that are incurred when programs are not fully implemented, as well as the economic benefits which result from effective program implementation.

The recent financial and economic conditions have amplified the concerns about the costs incurred by the municipalities in developing and implementing their programs. The reduction in resources resulting from the recent financial and economic conditions has been cited by many of the Copermittees as a justification for reducing the requirements that must be met by their programs. While the recent conditions are a cause for concern in the short term, these programs also have an opportunity to identify and implement improvements and efficiencies before the next period of growth and development, resulting in more effective and sustainable programs over the long term.

In addition, it is very difficult to ascertain the true cost of implementation of the Copermittees' management programs because of inconsistencies in reporting by the Copermittees. Reported costs of compliance for the same program element can vary widely from city to city, often by a very wide margin that is not easily explained.[2] Despite these problems, efforts have been made to identify management program costs, which can be helpful in understanding the costs of program implementation.

The San Diego Water Board recognizes that the Copermittees will incur costs in implementing this Order, potentially above and beyond the costs from the Copermittees' prior permits. The San Diego Water Board also recognizes that, due to California's current economic condition, many Copermittees currently have limited staff and resources to implement actions to address its MS4 discharges. Based on the economic considerations below, the San Diego Water Board has provided the Copermittees a significant amount of flexibility to choose how to implement the requirements of the Order.

The Order also allows the Copermittees to customize their plans, programs, and monitoring requirements. In the end, it is up to the Copermittees to determine the effective BMPs and measures necessary to comply with this Order. The Copermittees can choose to implement the least expensive measures that are effective in meeting

[2] Los Angeles Water Board, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.

the requirements of this Order. This Order also does not require the Copermittees to fully implement all requirements within a single permit term. Where appropriate, the Board has provided the Copermittees with additional time outside of the permit term to implement control measures to achieve final WQBELs and/or water quality standards.

The San Diego Water Board has considered available cost information associated with compliance with this Order. It is not possible to predict accurately the cost impact of the requirements that involve an unknown level of implementation or that depend on environmental variables that are as yet undefined. Only general conclusions can be drawn from this information.

Estimated Municipal Storm Water Program Implementation Costs

The USEPA, the State Water Board, and the California Regional Water Quality Control Boards (Regional Water Boards) have attempted to evaluate the costs of implementing municipal storm water programs. The assessments have demonstrated that the true costs are difficult to ascertain and reported costs vary widely. In addition, reported fiscal analyses tend to neglect the costs incurred to municipalities when storm water and non-storm water runoff is not effectively managed, which are incurred as a result of pollution, contamination, nuisance, and damage to ecosystems, property, and human health. Nonetheless, they provide a useful context for considering the costs of requirements within Order No. R9-2013-0001.

In 1999, the USEPA reported on multiple studies it conducted to determine the cost of management programs. A study of Phase II municipalities determined that the annual cost of the Phase II program was expected to be $9.16 per household. The USEPA also studied 35 Phase I municipalities, finding costs to be $9.08 per household annually, similar to those anticipated for Phase II municipalities.[3]

The State Water Board commissioned a study by the California State University, Sacramento to assess costs of the Phase I MS4 program. This study includes an assessment of costs incurred by Phase I MS4s throughout the state to implement their programs. Annual cost per household in the study ranged from $18 to $46, with the Fresno-Clovis Metropolitan Area representing the lower end of the range, and the City of Encinitas (in San Diego County) representing the upper end of the range.[4]

A study on Phase I MS4 program costs was also conducted by the California Regional Water Quality Control Board, Los Angeles Region (Los Angeles Water Board), where program costs reported in the municipalities' annual reports were assessed. The Los

[3] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791-68792.
[4] State Water Board, 2005. NPDES Stormwater Cost Survey. P. ii.

Angeles Water Board estimated that average per household cost to implement the MS4 program in Los Angeles County was $12.50. [5]

It is important to note that reported program costs are not all attributable to solely complying with MS4 permits. Many program components, and their associated costs, existed before any MS4 permits were ever issued. For example, street sweeping and trash collection costs cannot be solely or even principally attributable to MS4 permit compliance, since these practices have long been expected from and implemented by municipalities.

Therefore, true program cost resulting from MS4 permit requirements is some fraction of reported costs. The California State University, Sacramento study found that only 38 percent of program costs are new costs fully attributable to MS4 permits. The remainder of the program costs was either pre-existing or resulted from enhancement of pre-existing programs.[6] In 2000, the County of Orange found that even lower amounts of program costs are solely attributable to MS4 permit compliance, reporting that the amount attributable to implement the County or Orange Drainage Area Management Plan (DAMP), was less than 20 percent of the total budget. The remaining 80 percent was attributable to pre-existing programs.[7] More current data from the County of Orange is not used in this discussion because the County of Orange no longer reports such information.

Estimated Value of Healthy Water Quality

Economic considerations of municipal storm water management programs cannot be limited only to program costs. Evaluation of programs must also consider information on the benefits derived from environmental protection and improvement.[8] Attention is often focused on municipal storm water management program costs, but the programs must also be viewed in terms of their value to the public.

Placing a value on healthy receiving waters is very difficult. Often the value of receiving waters with good water quality manifests in other forms, such as tourism, recreational opportunities, and/or increased property values. When surface water bodies are degraded, thereby degrading the habitat within and adjacent to the water bodies, the public loses the value and benefits associated with being able to use the area in and around the water bodies. Surface waters that are able to support the beneficial uses designated in the Basin Plan can sustain plants and wildlife that can attract visitors and residents, providing aesthetic, recreational, as well as monetary value to the public. At this time, however, there have been no studies for the San

[5] Los Angeles Water Board, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.
[6] State Water Board, 2005. NPDES Stormwater Cost Survey. P. 58.
[7] County of Orange, 2000. A NPDES Annual Progress Report. P. 60.
[8] Ribaudo M.O. and D. Heelerstein. 1992, *Estimating Water Quality Benefits: Theoretical and Methodological Issues.* U.S. Department of Agriculture. Technical Bulletin No. 1808.

Diego Region to quantify the added value that surface waters with healthy water quality can provide.

USEPA has estimated that household willingness to pay for improvements in fresh water quality for fishing and boating is approximately $158-$210.[9] This estimate can be considered conservative, since it does not include important considerations such as marine waters benefits, wildlife benefits, or flood control benefits. Another study conducted by California State University, Sacramento reported that the annual household willingness to pay for statewide clean water is approximately $180.[10]

A study conducted by the University of Southern California and University of California, Los Angeles assessed the costs and benefits of implementing various approaches for achieving compliance with the MS4 permits in the Los Angeles region. The study found that non-structural systems would cost $2.8 billion but provide $5.6 billion in benefit. If structural systems were determined to be needed, the study found that total costs would be $5.7 to $7.4 billion, while benefits could reach $18 billion.[11] Costs are anticipated to be borne over many years, probably at least ten years.

As can be seen, the benefits of the municipal storm water management programs are expected to considerably exceed their costs. Such findings are corroborated by USEPA, which found that the benefits of implementation of its Phase II storm water rule would also outweigh the costs.[12]

[9] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68793.
[10] State Water Board, 2005. NPDES Stormwater Cost Survey. P. iv.
[11] Los Angeles Water Board, 2004. Alternative Approaches to Stormwater Control.
[12] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791.

VII. APPLICABLE STATUTES, REGULATIONS, PLANS AND POLICIES

A. Legal Authorities – Federal Clean Water Act and California Water Code

This Order is issued pursuant to section 402 of the CWA and implementing regulations adopted by the USEPA and chapter 5.5, division 7 of the CWC (commencing with section 13370). This Order serves as an NPDES permit for point source discharges to surface waters. This Order also serves as waste discharge requirements pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

The objective of the CWA is "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*." To carry out this objective, the CWA requires the implementation of permit programs to regulate the discharge of pollutants and dredged or fill material to the navigable waters of the U.S. and to regulate the use and disposal of sewage sludge. CWA section 402 provides the legal authority to issue a permit for the discharge of pollutants to waters of the U.S. under the NPDES. The CWA provides that NPDES permits may be issued by states which are authorized to implement the provisions of that act. California became authorized to implement the NPDES permit program on May 14, 1973.

The Porter-Cologne Water Quality Control Act (Division 7, commencing with CWC section 13000) established the State Water Resources Control Board (State Water Board) and nine Regional Water Quality Control Boards (Regional Water Boards) as the principal state agencies with primary responsibility for the coordination and control of water quality. CWC section 13200(f) established the San Diego Water Board, which has the primary responsibility for the coordination and control of water quality in the San Diego Region, which includes all the basins draining into the Pacific Ocean between the southern boundary of the Santa Ana Region and the California-Mexico boundary. The San Diego Water Board implements the CWA through Chapter 5.5 of the CWC, commencing with section 13370. CWC section 13377 provides the San Diego Water Board the legal authority to issue waste discharge requirements to ensure compliance with all applicable provisions of the CWA and acts amendatory thereof or supplementary, thereto, to implement water quality control plans, or for the protection of beneficial uses, or to prevent nuisance.

CWA section 402(p) requires the USEPA or authorized state to issue NPDES permits for storm water discharges from MS4s to waters of the U.S. CWA section 402(p)(3)(B)(ii) requires that NPDES permits for storm water discharges from MS4s "*effectively prohibit non-storm water discharges*" into the MS4s. CWA section 402(p)(3)(B)(iii) requires that NPDES permits for storm water discharges from MS4s to "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable* [MEP], *including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*."

The USEPA published implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]), which prescribe permit application requirements for storm water discharges from MS4s pursuant to CWA 402(p), on November 16, 1990. The USEPA published an Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems, which provided guidance on permit application requirements for regulated MS4s, on May 17, 1996. The federal regulations in 40 CFR 122 and guidance issued by USEPA serve as the foundation for the provisions of Order No. R9-2013-0001. The legal authorities provided by the above statutes and regulations are included as part of the discussions in Section VIII of this Fact Sheet.

B. Legal Authority for the Permit Issued on a Region-wide Basis

CWA section 402(p)(3)(B) provides the San Diego Water Board the legal authority to issue an NPDES permit for the San Diego Region as compared to separate MS4 permits based upon County- and partial County-wide boundaries as they existed within the San Diego Region. CWA section 402(p)(3)(B) states that "*Permits for discharges from municipal storm sewers- (i) may be issued on a system- or jurisdiction-wide basis* ...." The federal regulations in 40 CFR 122.26(a)(1)(v) also state that the San Diego Water Board "*may designate dischargers from municipal separate storm sewers on a system-wide or jurisdiction-wide basis. In making this determination, the [San Diego Water Board] may consider the following factors: (A) the location of the discharge with respect to waters of the United States; (B) the size of the discharge; (C) the quantity and nature of the pollutants discharged to waters of the United States; and (D) other relevant factors*."

More specifically, the federal regulations provide that for large and medium MS4 systems, the San Diego Water Board may issue a regional permit. Specifically, the federal regulation in 40 CFR 122.26(a)(3) provide:

"*(ii) The Director may either issue one system-wide permit covering all discharges from municipal separate storm sewers within a large or medium municipal storm sewer system or issue distinct permits for appropriate categories of discharges within a large or municipal separate storm sewer system including, but not limited to: all discharges owned or operated by the same municipality; located within the same jurisdiction; all discharges within a system that discharge to the same watershed; discharges within a system that are similar in nature; or for individual discharges from municipal separate storm sewers within the system.*

(iii) The operator of a discharge from a municipal separate storm sewer which is part of a large or medium municipal separate storm sewer system must either: (A) Participate in a permit application (to be a permittee or a co-permittee) with one or more other operator of discharges from the large or medium municipal storm sewer system which covers all, or a portion of all, discharges from the municipal separate storm sewer system; (B) Submit a distinct permit application which only covers discharges from the municipal separate storm sewers for

which the operator is responsible; or (C) A regional authority may be responsible for submitting a permit application under the following guidelines....

(iv) One permit application may be submitted for all or a portion of all municipal separate storm sewers within adjacent or interconnected large or medium municipal separate storm sewer systems. The Director may issue one systemwide permit covering all, or a portion of all municipal separate storm sewers in adjacent or interconnected large or medium municipal separate storm sewer systems.

(v) Permits for all or a portion of all discharges from large or medium municipal separate storm sewer systems that are issued on a system-wide, jurisdiction-wide, watershed or other basis may specify different conditions relating to different discharges covered by the permit, including different management programs for different drainage areas which contribute storm water to the system."

Based on these regulations, the San Diego Water Board may issue a region-wide MS4 permit. The regulations also clarify that the permit may include different conditions for separate discharges covered by the permit. This allows the San Diego Water Board to ensure that suitable water quality conditions and provisions are identified for each watershed.

The USEPA's responses to comments in the Final Rule for the above-mentioned regulations also make it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide, permits. In the Final Rule published in the Federal Register and containing the responses to comments, USEPA notes that 40 CFR 122.26(a)(3)(iv) would allow an entire system in a geographical region under the purview of a State agency to be designated under a permit.[13] USEPA also states that many commenters wanted to allow the permitting authority broad discretion to establish system-wide permits, and that EPA believes that paragraphs 40 CFR 122.26 (a)(1)(v) and (a)(3)(ii) allow for such broad discretion.[14]

This Order creates watershed requirements that apply to multiple counties. The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees. Managing storm water on a regional and watershed basis is expected to result in improved water quality, as the Order focuses on monitoring and management practices necessary to improve each watershed rather than political boundaries. A single permit also allows the San Diego Water Board staff to expend fewer resources developing successive multiple permits and allows more resources to be devoted to working cooperatively with all three current groups of Copermittees to ensure implementation of this Order results in improved water quality.

[13] 55 Federal Register 47990-01, 48042.
[14] Ibid.

C. Federal and California Endangered Species Acts

This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2115.5) or the Federal Endangered Species Act (16 United States Code [USC] sections 1531 to 1544). This Order requires compliance with requirements to protect the beneficial uses of waters of the U.S. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

D. California Environmental Quality Act

The action to adopt an NPDES Permit is exempt from the provisions of Chapter 3 of the California Environmental Quality Act (CEQA) (Public Resources Code section 21100, et seq.) pursuant to CWC section 13389. (*County of Los Angeles v. Cal. Water Boards* (2006) 143 Cal.App.4th 985.)

E. State and Federal Regulations, Plans and Policies

The legal authority provided by the following regulations, plans, and policies are also included as part of the discussions in Section VIII of this Fact Sheet.

Water Quality Control Plan for the San Diego Basin

The CWA requires the San Diego Water Board to establish water quality standards for each water body in its region. Water quality standards include beneficial uses, water quality objectives and criteria that are established at levels sufficient to protect beneficial uses, and an antidegradation policy to prevent degrading of waters. On September 8, 1994, the San Diego Water Board adopted the *Water Quality Control Plan for the San Diego Basin* (Basin Plan). The Basin Plan designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters in the San Diego Region. The San Diego Water Board has amended the Basin Plan on multiple occasions since 1994. In addition, the Basin Plan implements State Water Board Resolution No. 88-63, which established state policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply. Beneficial uses applicable to the surface water bodies that receive discharges from the MS4s within the San Diego Region generally include those listed below:

The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region:

- Municipal and Domestic Supply (MUN)
- Agricultural Supply (AGR)
- Industrial Process Supply (PROC)

- Industrial Service Supply (IND)
- Ground Water Recharge (GWR)
- Contact Water Recreation (REC1)
- Non-contact Water Recreation (REC2)
- Warm Freshwater Habitat (WARM)
- Cold Freshwater Habitat (COLD)
- Wildlife Habitat (WILD)
- Rare, Threatened, or Endangered Species (RARE)
- Freshwater Replenishment (FRSH)
- Hydropower Generation (POW)
- Preservation of Biological Habitats of Special Significance (BIOL)

The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region:

- Navigation (NAV)
- Commercial and Sport Fishing (COMM)
- Estuarine Habitat (EST)
- Marine Habitat (MAR)
- Aquaculture (AQUA)
- Migration of Aquatic Organisms (MIGR)
- Spawning, Reproduction, and/or Early Development (SPWN)
- Shellfish Harvesting (SHELL)

Pursuant to Water Code sections 13263 and 13377, the requirements of this Order implement the Basin Plan.

Water Quality Control Plan for Ocean Waters of California, California Ocean Plan

In 1972, the State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan). The State Water Board adopted the most recent amended Ocean Plan on October 16, 2012 ~~September 15, 2009~~. The Office of Administrative Law approved it on July 3, 2013 ~~March 10, 2010~~. ~~On October 8, 2010, USEPA approved the 2009 Ocean Plan.~~ The amended Ocean Plan became effective on August 19, 2013. The Ocean Plan is applicable, in its entirety, to ocean waters of the State. In order to protect beneficial uses, the Ocean Plan establishes water quality objectives and a program of implementation. Pursuant to Water Code sections 13263 and 13377, the requirements of this Order implement the Ocean Plan. The Ocean Plan identifies the beneficial uses of ocean waters of the State to be protected as summarized below:

- Industrial water supply
- Water contact and non-contact recreation, including aesthetic enjoyment; navigation

- Commercial and sport fishing
- Mariculture
- Preservation and enhancement of designated Areas of Special Biological Significance
- Rare and endangered species
- Marine habitat
- Fish spawning and shellfish harvesting

On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving an exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges. On June 19, 2012, the State Water Board adopted Order No. 2012-0031, amending Order No. 2012-0012 to require pollutant load reductions to be achieved within six years for the ASBS Compliance Plans, section A.2.d(2) and ASBS Pollution Prevention Plans, section B.2.b(2). The State Water Board Resolution No. 2012-0012, as amended requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject terms and conditions of State Water Board Resolution No. 2012-0012, as amended. The Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012, as amended, applicable to these discharges, are incorporated in Attachment A of this Order. Requirements of this Order implement the Ocean Plan.

Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality

On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

Antidegradation Policy

Federal regulations (40 CFR 131.12) require that the state water quality standards include an antidegradation policy consistent with the federal antidegradation policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16 ("Statement of Policy with Respect to Maintaining the Quality of

the Waters of the State"). State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law.

The San Diego Water Board's Basin Plan implements and incorporates by reference both the State and federal antidegradation policies. State Water Board Resolution No. 68-16 and 40 CFR 131.12 require the San Diego Water Board to maintain high quality waters of the State unless degradation is justified based on specific findings. First, the Board must ensure that "existing instream uses and the level of water quality necessary to protect the existing uses" are maintained and protected. Second, if the baseline quality of a water body for a given constituent exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water, that quality shall be maintained and protected through the requirements of the Order unless the Board makes findings that (1) any lowering of the water quality is necessary to accommodate important economic or social development in the area in which the waters are located; (2) water quality adequate to protect existing uses fully is assured; and (3) the highest statutory and regulatory requirements for all new and existing point sources and all cost-effective and reasonable best management practices for nonpoint source control are achieved. The San Diego Water Board must also comply with any requirements of State Water Board Resolution No. 68-16 beyond those imposed through incorporation of the federal antidegradation policy. In particular, the Board must find that not only present, but also anticipated future uses of water are protected, and must ensure best practicable treatment or control of the discharges. The baseline quality considered in making the appropriate findings is the best quality of the water since 1968, the year of the adoption of Resolution No. 68-16, or a lower level if that lower level was allowed through a permitting action that was consistent with the federal and state antidegradation policies. ~~until it is demonstrated that any change in quality will be consistent with maximum benefit to the people of the State, will not unreasonably affect beneficial uses, and will not result in water quality less than that described in the San Diego Water Boards' policies. State Water Board Resolution No. 68-16 requires that discharges of waste be regulated to meet best practicable treatment or control to assure that pollution or nuisance will not occur and the highest water quality consistent with the maximum benefit to the people of the State be maintained.~~

The discharges permitted in this Order are consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Board Resolution No. 68-16 as set forth below~~.~~: ~~Many of the water bodies within the area covered by this Order are of high quality. The Order requires the Copermittees to meet best practicable treatment or control to meet water quality standards. As required by 40 CFR 122.44(a), the Copermittees must comply with the "maximum extent practicable" technology-based standard set forth in CWA section 402(p) for discharges of pollutants in storm water from the MS4s.~~

1. Many of the waters within the area covered by this Order are impaired for multiple pollutants discharged through MS4s and are not high quality waters with regard to these pollutants. In most cases, there is insufficient data to determine whether these water bodies were impaired as early as 1968, but the limited available data shows

impairment dating back for more than two decades. Many such water bodies are ~~and~~ listed on the State's CWA Section 303(d) List and the San Diego Water Board has established TMDLs to address the impairments. This Order ensures that existing instream (beneficial) water uses and the level of water quality necessary to protect the existing uses is maintained and protected. This Order requires the Copermittees to comply with permit provisions to implement the WLAs set forth in the TMDLs in order to restore the beneficial uses of the impaired water bodies consistent with the assumptions and requirements of the TMDLs. This Order further requires compliance with receiving water limitations to meet water quality standards in the receiving water either by demonstrating compliance pursuant to Provision A and the Copermittees' monitoring and assessment program pursuant to Provision D of this Order, or by implementing Provision B.3.c with a schedule to achieve compliance with receiving water limitations. This Order includes requirements to develop and implement storm water management programs, achieve WQBELs, and effectively prohibit non-storm water discharges into the MS4. The issuance of this Order does not authorize an increase in the amount of discharge of waste.

2. To the extent that water bodies within the area covered by this Order are high quality waters with regard to some constituents, this Order finds as follows:

   a. Allowing limited degradation of high quality water bodies through MS4 discharges is necessary to accommodate important economic or social development in the area and is consistent with the maximum benefit to the people of the state. The discharge of storm water in certain circumstances is to the maximum benefit to the people of the state because it can assist with maintaining instream flows that support beneficial uses, may spur the development of multiple-benefit projects, and may be necessary for flood control, and public safety as well as to accommodate development in the area. The alternative – capturing all storm water from all storm events – would be an enormous opportunity cost that would preclude MS4 permittees from spending substantial funds on other important social needs. The Order ensures that any limited degradation does not affect existing and anticipated future uses of the water and does not result in water quality less than established standards. The Order requires compliance with receiving water limitations that act as a floor to any limited degradation.

   b. The Order requires the highest statutory and regulatory requirements and requires that the Copermittees meet best practicable treatment or control. The Order prohibits all non-storm water discharges, with a few enumerated exceptions, through the MS4 to the receiving waters. As required by 40 CFR section 122.44(a), the Copermittees must comply with the "maximum extent practicable" technology-based standard set forth in CWA section 402(p), and implement extensive minimum control measures in a storm water management program. Recognizing that best practicable treatment or control may evolve over time, the Order includes new and more specific requirements as compared to the prior Phase I MS4 permits for the San Diego County, Orange County and Riverside County Copermittees. The Order incorporates options to implement

Water Quality Improvement Plans that must specify detailed structural and non-structural storm water controls that must be implemented in accordance with an accepted proposed time schedule. The Order contains provisions to encourage, wherever feasible, retention of the storm water from the 85th percentile 24-hour storm event.

Anti-Backsliding Requirements

CWA sections 402(o) and 303(d)(4) and federal regulations at 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations or conditions may be relaxed. ~~All effluent limitations and other conditions in this Order are at least as stringent as the effluent limitations in the previous permits issued to the San Diego County Copermittees, the Orange County Copermittees, and the Riverside County Copermittees.~~ While this Order allows implementation of an alternative compliance pathway option in Provision B.3.c to constitute compliance with receiving water limitations under certain circumstances, the availability of that alternative and the corresponding availability of additional time to come into compliance with receiving water limitations~~,~~ does not violate the anti-backsliding provisions. The receiving water limitations provisions of this Order are imposed under section 402(p)(3)(B) of the Clean Water Act rather than based on best professional judgment, or based on section 301(b)(1)(C) or sections 303(d) or (e), and are accordingly not subject to the anti-backsliding requirements of section 402(o). Although the non-applicability is less clear with respect to the regulatory anti-backsliding provisions in 40 CFR 122.44(l), the regulatory history suggests that USEPA's intent was to establish the anti-backsliding regulations with respect to evolving technology standards for traditional point sources. (See, e.g., 44 Fed.Reg. 32854, 32864 (Jun. 7, 1979)). It is unnecessary, however, to resolve the ultimate applicability of the regulatory anti-backsliding provisions, because the alternative compliance pathway option in Provision B.3.c qualifies for an exception to backsliding as based on new information.

The alternative compliance pathway option in Provision B.3.c of this Order was informed by new information available to the Board from experience and knowledge gained through storm water permitting at the Regional Water Boards in the last ten years. There has been a statewide paradigm shift in storm water management. State Water Board Order WQ 2015-0075 directed all of the Regional Water Boards to consider the Los Angeles Water Board's alternative compliance path to receiving water limitations in all Phase I MS4 permits going forward (State Water Board Order WQ 2015-0075 at page 51), and the Los Angeles Water Board's process of developing over 30 watershed-based TMDLs and implementing several TMDLs since the adoption of the previous permits. In particular, the Los Angeles Water Board recognized the significance of allowing time to plan, design, fund, operate and maintain watershed-based BMPs necessary to attain water quality improvements and additionally recognized the potential for municipal storm water to benefit water supply. Similarly, the San Diego Water Board's experience developing and implementing the Fourth Term MS4 Permits and TMDLs that apply on a region-wide scale (e.g. TMDLs for Indicator

Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region) has resulted in a similar recognition of the need for a watershed-based approach that allows time to plan, design, fund, operate and maintain BMPs to address impaired waters that have been impacted by MS4 discharges. Thus, even if the receiving water limitations are subject to anti-backsliding requirements, they were revised based on new information that would support an exception to the anti-backsliding provisions. (33 U.S.C. § 1342(o)(2)(B)(i); 40 C.F.R. § 122.44(l)(1); 40 C.F.R. §122.44(l)(2)(i)(B)(1)).

Clean Water Act Section 303(d) List

CWA section 303(d)(1) requires each State to identify specific water bodies within its boundaries where water quality standards are not being met or are not expected to be met after implementation of technology-based effluent limitations on point sources. Water bodies that do not meet water quality standards are considered impaired and are placed on the state's "303(d) List." Periodically, USEPA approves the State's 303(d) List.

Most recently, USEPA approved the State's 2010 303(d) List of impaired water bodies on October 11, 2011, which includes certain receiving waters in the San Diego Region. For each listed water body, the state or USEPA is required to establish a TMDL of each pollutant impairing the water quality standards in that water body. A TMDL is a tool for implementing water quality standards and is based on the relationship between pollution sources and in-stream water quality conditions. The TMDL establishes the allowable pollutant loadings for a water body and thereby provides the basis to establish water quality-based controls. These controls should provide the pollution reduction necessary for a water body to meet water quality standards.

A TMDL is the sum of the allowable pollutant loads of a single pollutant from all contributing point sources (the waste load allocations or WLAs) and non-point sources (load allocations of LAs) plus the contribution from background sources and a margin of safety (40 CFR 130.2(i)). MS4 discharges are considered point source discharges. For 303(d)-listed water bodies and pollutants in the San Diego Region, the San Diego Water Board or USEPA develops and adopts TMDLs that specify these requirements.

Since 2002, the San Diego Water Board has established seven (7) TMDLs to remedy water quality impairments in various water bodies within the San Diego Region (see Attachment E to the Order). These TMDLs identify MS4 discharges as a source of pollutants to these water bodies, and, as required, establish WLAs for MS4 discharges to reduce the amount of pollutant discharged to receiving waters. CWA section 402(p)(3)(B)(iii) requires the San Diego Water Board to impose permit conditions, including: "management practices, control techniques and system, design and engineering methods, and *such other provisions as the Administrator or the State determines appropriate for the control of such pollutants."* (Emphasis added.) CWA section 402(a)(1) also requires states to issue permits with conditions necessary to carry out the provisions of the CWA. Federal regulations also require that NDPES permits contain WQBELs consistent with the assumptions and requirements of all available WLAs (40 CFR 122.44(d)(1)(vii)(B)). CWC section 13377 also requires that

NPDES permits include limitations necessary to implement water quality control plans. Therefore, this Order includes WQBELs and other provisions to implement the TMDL WLAs assigned to Copermittees regulated by this Order.

Other Regulations, Plans and Policies

This Order implements all other applicable federal regulations and State regulations, plans and policies, including the California Toxics Rule at 40 CFR 131.38 (Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California Rule [California Toxics Rule or CTR]), and State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP).

F. Unfunded State Mandates

Article XIII B, Section 6(a) of the California Constitution provides that whenever "*any state agency mandates a new program or higher level of service on any local government, the state shall provide a subvention of funds to reimburse that local government for the costs of the program or increased level of service*." The requirements of this Order do not constitute state mandates that are subject to a subvention of funds for several reasons, including, but not limited to, the following.

First, the requirements of this Order do not constitute a new program or a higher level of service as compared to the requirements contained in the previous Fourth Term Permits. The overarching requirement to impose controls to reduce the pollutants in discharges from MS4s is dictated by the CWA and is not new to this permit cycle (33 USC section 1342(p)(3)(B)). The inclusion of new and advanced measures as the MS4 programs evolve and mature over time is anticipated under the CWA (55 FR 47990, 48052 (Nov. 16, 1990)), and to the extent requirements in this Order are interpreted as new advanced measures, they do not constitute a new program or higher level of service.

Second, and more broadly, mandates imposed by federal law, rather than by a state agency, are exempt from the requirement that the local agency's expenditures be reimbursed (Cal. Const., art. XIII B, section 9, subd. (b)). This Order implements federally mandated requirements under the CWA and its requirements are therefore not subject to subvention of funds. This includes federal requirements to effectively prohibit non-storm water discharges, to reduce the discharge of pollutants in storm water to the MEP, and to include such other provisions as the Administrator or the State determines appropriate for the control of such pollutants (33 USC section 1342(p)(3)(B)). Federal cases have held these provisions require the development of permits and permit provisions on a case-by-case basis to satisfy federal requirements. (*Natural Resources Defense Council, Inc., v. USEPA* (9th Cir. 1992) 966 F.2d 1292, 1308, fn. 17.)

The authority exercised under this Order is not reserved state authority under the CWA's savings clause (cf. *Burbank v. State Water Resources Control Bd.* (2005) 35

Cal.4th 613, 627-628 [relying on 33 USC section 1370, which allows a state to develop requirements which are not "less stringent" than federal requirements]), but instead is part of a federal mandate to develop pollutant reduction requirements for municipal separate storm sewer systems. To this extent, it is entirely federal authority that forms the legal basis to establish the permit provisions. (See, *City of Rancho Cucamonga v. Regional Water Quality Control Board, Santa Ana Region* (2006) 135 Cal.App.4th 1377, 1389; *Building Industry Ass'n of San Diego Co. v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 882-883.)

The MEP standard is a flexible standard that balances a number of considerations, including technical feasibility, cost, public acceptance, regulatory compliance, and effectiveness. (*Building Ind. Ass'n., supra,* 124 Cal.App.4th at pp. 873-874, 889.) Such considerations change over time with advances in technology and with experience gained in storm water management (55 FR 47990, 48052 (Nov. 16, 1990)). Accordingly, a determination of whether the conditions contained in this Order exceed the requirements of federal law cannot be based on a point by point comparison of the permit conditions and the minimum control measures that are required "at a minimum" to reduce pollutants to the maximum extent practicable and to protect water quality (40 CFR 122.34). Rather, the appropriate focus is whether the permit conditions, as a whole, exceed the MEP standard.

In recent months, the County of Los Angeles and County of Sacramento Superior Courts have granted writs setting aside decisions of the Commission on State Mandates that held certain requirements in Phase I permits constituted unfunded mandates. In both cases, the courts have found that the correct analysis in determining whether an MS4 permit constituted a state mandate was to evaluate whether the permit as a whole exceeds the MEP standard. (*State of Cal. v. Comm. on State Mandates* (Super. Ct. Sacramento County, 2012, No. 34-2010-80000604), *State of California v. County of Los Angeles* (Super. Ct. Los Angeles County, 2011, No. BS130730.) Both cases are currently pending appeal.

The requirements of the Order, taken as a whole rather than individually, are necessary to reduce the discharge of pollutants to the MEP and to protect water quality. The San Diego Water Board finds that the requirements of the Order are practicable, do not exceed federal law, and thus do not constitute an unfunded mandate. These findings are the expert conclusions of the principal state agency charged with implementing the NPDES program in California (CWC sections 13001, 13370).

It should also be noted that the provisions in this Order to effectively prohibit non-storm water discharges are also mandated by the CWA (33 USC section 1342(p)(3)(B)(ii)). Likewise, the provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state establishes or adopts a TMDL, federal law requires that permits must contain effluent limitations consistent with the assumptions and requirements of any applicable waste load allocation in a TMDL (40 CFR 122.44(d)(1)(vii)(B)).

Third, the local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental dischargers who are issued NPDES permits for storm water discharges. With a few inapplicable exceptions, the CWA regulates the discharge of pollutants from point sources (33 USC section 1342) and the Porter-Cologne Act regulates the discharge of waste (CWC section 13263), both without regard to the source of the pollutant or waste. As a result, the "costs incurred by local agencies" to protect water quality reflect an overarching regulatory scheme that places similar requirements on governmental and non-governmental dischargers. (See *County of Los Angeles v. State of California* (1987) 43 Cal.3d 46, 57-58 [finding comprehensive workers' compensation scheme did not create a cost for local agencies that was subject to state subvention].)

The CWA and the Porter-Cologne Act largely regulate storm water with an even hand, but to the extent there is any relaxation of this even-handed regulation, it is in favor of the local agencies. Generally, the CWA requires point source dischargers, including dischargers of storm water associated with industrial or construction activity, to comply strictly with water quality standards (33 USC section 1311(b)(1)(C); *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159, 1164-1165 [noting that industrial discharges must strictly comply with water quality standards]). As discussed in prior State Water Board decisions, certain provisions of this Order do not require strict compliance with water quality standards (State Water Board Order No. WQ 2001-0015, p. 7). Those provisions of this Order regulate the discharge of waste in municipal storm water under the CWA's MEP standard, not the BAT/BCT standard that applies to other types of discharges. These provisions, therefore, regulate the discharge of waste in municipal storm water more leniently than the discharge of waste from non-governmental sources.

Fourth, the Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)). To the extent that the local agency Copermittees have voluntarily availed themselves of the permit, the program is not a state mandate. (Accord, *County of San Diego v. State of California* (1997) 15 Cal.4th 68, 107-108.)

Fifth, the local agency Copermittees' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under state law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

Finally, even if any of the permit provisions could be considered unfunded mandates, under Government Code section 17556, subdivision (d), a state mandate is not subject to reimbursement if the local agency has the authority to charge a fee. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order, subject to certain voting requirements contained in the California Constitution. (See Cal. Const., Art. XIII D, section 6, subd. (c); see also *Howard Jarvis Taxpayers Ass'n v. City of Salinas* (2002) 98 Cal.App.4th

1351, 1358-1359.) The Fact Sheet demonstrates that numerous activities contribute to the pollutant loading in the MS4. Local agencies can levy service charges, fees, or assessments on these activities, independent of real property ownership. (See, e.g., *Apartment Ass'n of Los Angeles County, Inc., v. City of Los Angeles* (2001(24 Cal.4th 830, 842 [upholding inspection fees associated with renting property].) The authority and ability of a local agency to defray the cost of a program without raising taxes indicates that a program does not entail a cost subject to subvention. (*Clovis Unified School Dist. V. Chiang* (2010) 188 Cal.App.4th 794, 812, citing *Connell v. Sup. Ct.* (1997) 59 Cal.App.4th 382, 401; *County of Fresno v. State of California* (1991) 53 Cal. 3d. 482, 487-488.)

VIII. PROVISIONS

The provisions (i.e. NPDES permit requirements) of the Order are discussed below.

A. Prohibitions and Limitations

Purpose: Provision A includes the prohibitions and limitations requirements that are the foundation of all the subsequent requirements included in the Order. Compliance with the prohibitions and limitations will restore and protect receiving waters from impacts that may be caused by discharges into and from the Copermittees' MS4s and ultimately achieve the objective of the CWA.

In meeting the requirements set forth in the Order, the Copermittees must be cognizant that the prohibitions and limitations exist and will be the standard by which the San Diego Water Board will be measuring the progress and success of their implementation of the NPDES permit requirements.

***Discussion*:** The objective of the CWA is to "*restore and maintain the chemical, physical, and biological integrity of the Nation's waters*." The CWA requires the implementation of NPDES permit programs to regulate discharges of pollutants and dredged or fill material to the navigable waters of the U.S. For discharges into and from MS4s, the CWA requires the NPDES permits to "*effectively prohibit non-stormwater discharges into the storm sewers*" and "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable.*"

Provision A includes limitations, consistent with the requirements of the CWA for discharges from MS4s. Provision A expresses these limitations as discharge prohibitions, receiving water limitations, and effluent limitations. Compliance with the discharge prohibitions and receiving water limitations is also explicitly described, in conformance with precedential State Water Board Orders.

More specific and detailed discussions of the requirements of Provision A are provided below.

Provision A.1 (Discharge Prohibitions) prohibits the discharge of specific types of waste into and/or from the Copermittees' MS4s.

Provision A.1.a restates and reiterates Basin Plan Waste Discharge Prohibition 1, by prohibiting discharges into and from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the

state. The terms pollution,[15] contamination,[16] and nuisance[17] are defined under CWC 13050. Provision A.1.c incorporates all the waste discharge prohibitions of the Basin Plan into the requirements of the Order. The waste discharge prohibitions from the Basin Plan have been reproduced and provided in Attachment A to the Order.

Provision A.1.b requires non-storm water discharges into the MS4s to be effectively prohibited, consistent with the requirements of the CWA for MS4 permits to "*effectively prohibit non-stormwater discharges into the storm sewers*." The effective prohibition is required to be implemented by each Copermittee within its jurisdiction through the illicit discharge detection and elimination requirements under Provision E.2. The prohibition does not apply to NPDES permitted discharges into the Copermittees' MS4s.

The CWA employs the strategy of prohibiting the discharge of any pollutant from a point source into waters of the United States unless the discharger of the pollutant(s) obtains an NPDES permit pursuant to CWA Section 402. The 1987 amendment to the CWA includes provision 402(p) that specifically addresses NPDES permitting requirements for storm water discharges from MS4s. CWA section 402(p) prohibits the discharge of pollutants from specified MS4s to waters of the U.S. except as authorized by an NPDES permit and identifies two substantive standards for MS4 storm water permits. MS4 permits (1) "*shall include a requirement to effectively prohibit non-stormwater discharges into the storm sewers*" and (2) "*shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or State determines appropriate for the control of such pollutants*." (CWA section 402(p)(3)(B)(ii)-(iii).)

In November 1990, the USEPA published regulations addressing storm water discharges from MS4s (55 FR 47990 and following (Nov. 16, 1990) (Phase I Final Rule)). The regulations establish minimum requirements for MS4 permits, and generally focus on the requirement that MS4s implement programs to reduce the amount of pollutants found in storm water discharges to the MEP. The CWA's municipal storm water MEP standard does not require storm water discharges to strictly meet water quality standards, as is required for other NPDES permitted

[15] CWC 13050(l): "(1) 'Pollution' means an alteration of the quality of waters of the state by waste to a degree which unreasonably affects either of the following: (A) The water for beneficial uses. (B) Facilities which serve beneficial uses. (2) 'Pollution' may include 'contamination.'
[16] CWC 13050(k): "Contamination' means an impairment of the quality of waters of the state by waste to a degree which creates a hazard to public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste, whether or not waters of the state are affected."
[17] CWC 13050(m): 'Nuisance' means anything which meets all of the following requirements: (1) Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. (2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. (3) Occurs during, or as a result of, the treatment or disposal of wastes."

discharges. Compliance is achieved through an iterative approach of continuous implementation of improved BMPs. This distinction reflects Congress's recognition that variability in flow and intensity of storm events render difficult strict compliance with water quality standards by MS4 permittees. In describing the controls that permits must include to reduce pollutants in storm water discharges to the MEP, the statute (CWA section 402(p)(3)(B)(iii)) states that the controls shall include: "*management practices, control techniques and system, design and engineering methods, and such other provisions as the [permit writer] determines appropriate for the control of such pollutants*."

In contrast, non-storm water discharges from the MS4 that are not authorized by separate NPDES permits are subject to requirements under the NPDES program, including discharge prohibitions, technology based effluent limitations and water quality-based effluent limitations (40 CFR 122.44). The regulations also require the Copermittee's program to include an element to detect and remove illicit discharges and improper disposal into the storm sewer (40 CFR 122.26(d)(2)(iv)(B)).

While "non-storm water" is not defined in the CWA or federal regulations, the federal regulations (at 40 CFR 122.26(b)(2)) define "*illicit discharge*" as *"any discharge to a municipal separate storm sewer that is not composed entirely of storm water and that is not covered by an NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer and discharges resulting from fire fighting activities)*." This definition is the most closely applicable definition of "non-storm water" contained in federal law. As stated in the Phase I Final Rule, USEPA added the illicit discharge program requirement to begin implementation of the 'effective prohibition' requirement to detect and control non-storm water discharges to their municipal system.

Thus, federal law mandates that permits issued to MS4s must require management practices that will result in reducing storm water pollutants to the MEP yet at the same time requires that non-storm water discharges be effectively prohibited from entering the MS4. "Effectively" prohibit does not mean that non-storm water discharges are authorized to be discharged into and from the Copermittees' MS4s. The Phase I Final Rule clarifies what "effectively prohibit" means (55 FR 47995):

> "*Section 402(p)(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…<u>Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit</u> (other than the permit for the discharge from the municipal separate storm sewer)*" [Emphasis added].

Consistent with federal law, unless non-storm water discharges to the MS4 are authorized by a separate NPDES permit, non-storm water discharges are

appropriately subject to the effective prohibition requirement in the CWA and Regional Water Boards are not limited by the iterative MEP approach to storm water regulation in crafting appropriate regulations for non-storm water discharges.

The federal regulations (40CFR122.26(d)(2)(i)(B)) require the Copermittees to establish the legal authority which authorizes or enables the Copermittees to prohibit illicit discharges to the MS4s. The federal regulations (40 CFR 122.26(d)(2)(vi)(B)(1)) require the Copermittees to "*implement and enforce an ordinance, order or similar means*" to prevent non-storm water discharges to their MS4s. Thus, the Copermittees are required to "*effectively*" prohibit non-storm water discharges to their MS4s through enforcing their legal authority established under "*ordinance, order or similar mean*s" and either remove those discharges to their MS4s, or require those discharges to obtain coverage under a separate NPDES permit. More detail about the program that must be implemented to "*effectively*" prohibit non-storm water discharges to the Copermittees' MS4s is provided under the discussion for Provision E.2.

Provision A.1.d was included to be consistent with Resolution No. 2012-0012, adopted by the State Water Board on March 20, 2012. Provision A.1.d prohibits discharges from MS4s to Areas of Special Biological Significance (ASBS), except for storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach to the Heisler Park ASBS subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012. The pertinent Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 are provided in Attachment A to the Order.

<u>Provision A.2 (Receiving Water Limitations)</u> specifies the condition of the receiving waters that must be achieved when there are discharges from the Copermittees' MS4s. Receiving water limitations are included in all NPDES permits issued pursuant to the CWA section 402. CWA section 402(p)(3)(B)(iii) authorizes the inclusion of "*such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." This requirement gives USEPA or the State permitting authority, in this case the San Diego Water Board, discretion to determine what permit conditions are necessary to control pollutants.

In its Phase I Final Rule (see 55 FR 47990, 47994 (Nov. 16, 1990)), USEPA elaborated on these requirements, stating that, "*permits for discharges from municipal separate storm sewer systems must require controls to reduce the discharge of pollutants to the maximum extent practicable, and where necessary water quality-based controls*." USEPA reiterated in its Phase II Final Rule (64 FR 68722, 68737), that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL*." CWC section 13377 also requires that NPDES permits include limitations necessary to implement water quality control plans. Both the State Water Board and the San Diego Water Board have previously concluded that discharges from the MS4 contain pollutants that have

the reasonable potential to cause or contribute to excursions above water quality standards. As such, inclusion of receiving water limitations is appropriate to control MS4 discharges.

The inclusion of receiving water limitations is also consistent with the Ninth Circuit Court of Appeals' ruling in *Defenders of Wildlife v. Browner* (191 F.3d 1159, 1166 (1999)) that the permitting authority has discretion regarding the nature and timing of requirements that it includes as MS4 permit conditions to attain water quality standards. The Ninth Circuit Court of Appeals recently explained that, "*[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*" (*Natural Resources Defense Council v. County of Los Angeles* (9th Cir. 2011) 673 F.3d 880, 886 (revd. On other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013)))

The receiving water limitations included in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan or in water quality control plans or policies adopted by the State Water Board, including State Water Board Resolution No. 68-16, or in federal regulations, including but not limited to 40 CFR 131.12 and 131.38. The water quality objectives in the Basin Plan and other State Water Board plans and policies have been approved by USEPA and combined with designated beneficial uses constitute the water quality standards required under federal law.

Provision A.2.a requires that discharges from the Copermittees' MS4s must not cause or contribute to the violation of water quality standards in receiving waters. The water quality standards of the receiving waters must be protected from the impacts that may be caused by the Copermittees' MS4 discharges. Water quality standards applicable to the surface waters in the San Diego Region must be achieved through meeting the technology based standard of MEP through an iterative process of improved management actions. Provision A.2.a is also consistent with State Water Board Order WQ 99-05 precedent-setting language requiring discharges from MS4s to attain receiving water quality standards. The water quality control plans and policies with water quality standards applicable to the waters in the San Diego Region are included under Provision A.2.a.

Provisions A.2.b was included to be consistent with the requirements of State Water Board Resolution No. 2012-0012, adopted on March 20, 2012.

<u>Provision A.3 (Effluent Limitations)</u> specifies the condition of the discharges from the Copermittees' MS4s that must be achieved if and when there are discharges.

Consistent with CWA section 301(b)(1)(A) and 40 CFR 122.44(a), Provision A.3.a includes the technology-based effluent limitations that must be included in the Order. The technology-based effluent limits, representing the minimum level of control that must be imposed in a permit under CWA section 402, requires that pollutants in discharges of storm water from the Copermittees' MS4s be reduced to the MEP. This provision applies specifically to storm water discharges. Non-storm water discharges must be effectively prohibited, as required under Provision A.1.b. Non-storm water (dry weather) discharges from the MS4 are not considered storm water (wet weather) discharges and therefore are not subject to the MEP standard.

The technology-based MEP standard is an ever-evolving, flexible, and advancing concept. Neither Congress nor USEPA has specifically defined the term "maximum extent practicable." Congress established this flexible MEP standard so that the administrative bodies would have "*the tools to meet the fundamental goals of the Clean Water Act in the context of storm water pollution*." (*Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 884.) As knowledge about controlling storm water runoff and discharges continues to evolve, so does the knowledge which constitutes MEP. Reducing the discharge of pollutants in storm water from the MS4 to the MEP requires the Copermittees to assess each program component and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP.

The San Diego Water Board or the State Water Board ultimately define MEP, and may include requirements that provide specific guidance on what is expected to demonstrate MEP. It is the responsibility of the Copermittees to propose actions that implement BMPs to reduce storm water pollution to the MEP. In other words, the Copermittees' runoff management programs developed and implemented under the Order are the Copermittees' proposals for achieving MEP. Their total collective and individual activities conducted pursuant to their runoff management programs become their proposal for achieving MEP as it applies both to their overall effort, as well as to specific activities. Provisions B through E of the Order provides a minimum framework to guide the Copermittees in achieving the MEP standard for discharges of pollutants in storm water.

Provision A.3.b incorporates any water quality based effluent limitations (WQBELs) applicable to the MS4s established for TMDLs adopted and approved for the San Diego Region and requires the Copermittees to comply with those WQBELs. This is consistent with 40 CFR 122.44(d)(1)(vii)(B), which requires that NPDES permits to incorporate WQBELs "*developed to protect a narrative water quality criterion, a numeric water quality criterion, or both…consistent with the assumptions and requirements of any available wasteload allocation for the discharge...*"

Pursuant to CWA section 303(d), for surface water bodies identified as impaired by one or more pollutants, the San Diego Water Board is required to establish TMDLs "*at a level necessary to implement the applicable water quality standards with seasonal variations and a margin of safety which takes into account any lack of knowledge*

concerning the relationship between effluent limitations and water quality." The TMDLs identify sources of the pollutants causing the impairments and assign portions of the TMDL as WLAs to point sources, which include MS4s.

WLAs must be expressed in NPDES permits as WQBELs, which may include one or more numeric components such as numeric effluent limits, and/or receiving water limitations, and/or BMP requirements. Because numeric targets for TMDLs typically include a component that will be protective of water quality standards, a TMDL will likely include one or more numeric receiving water limitations and/or effluent limitations as part of the assumptions or requirements of the TMDL. Any numeric receiving water limitations and/or effluent limitations developed as part of the assumptions or requirements of a TMDL must be incorporated and included as part of WQBELs for the MS4s.

Because the development and approval of new TMDLs, or modification of existing TMDLs, may occur during the term of this Order, the specific provisions of those TMDLs, including effluent limitations applicable to MS4s are provided within Attachment E to the Order. Attachment E will be updated with new TMDLs and modifications to existing TMDLs in a timely manner as they occur.

Provision A.4 (Compliance with Discharge Prohibitions and Receiving Water Limitations) describes the process required to be implemented by the Copermittees if compliance with the discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a are not being achieved under current conditions.

In its Phase II Stormwater Regulations, Final Rule, USEPA states that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL.*"[18] In a series of comment letters on MS4 permits issued by various Regional Water Boards, USEPA has also reiterated that MS4 discharges must meet water quality standards.[19] In addition, the Ninth Circuit Court of Appeals explained in a recent ruling that, *"[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*"[20]

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[18] Phase II Stormwater Regulations, Final Rule, 64 Fed. Reg. 68722, 68737.

[19] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.

[20] NRDC v. County of Los Angeles (9th Cir. 2011), 673 F.3d 880, 886 (revd. on other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013))). See also, *Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 884-886, citing *Defenders of Wildlife v. Browning,* (9th Cir. 1999) 191 F.3d 1159.)

Water quality standards for the San Diego Region are established in the Basin Plan. The water quality standards of the Basin Plan are incorporated into this Order as the discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a. The discharge prohibitions and receiving water limitations in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations or prohibitions to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan, water quality control plans or policies adopted by the State Water Board, including Resolution No. 68-16, or federal regulations, including but not limited to, 40 CFR 131.12 and 131.38. The waste discharge prohibitions and water quality objectives in the Basin Plan have been approved by USEPA and combined with the designated beneficial uses constitute the water quality standards required under federal law.

Under federal law (CWA section 402(p)(3)(B)(iii)), an MS4 permit must include "*controls to reduce the discharge of pollutants to the maximum extent practicable...and such other provision as...the State determines appropriate for control of such pollutants*." The State Water Board has previously determined that limitations necessary to meet water quality standards are appropriate for the control of pollutants discharged by MS4s and must be included in MS4 permits. (State Water Board Orders WQ 91-03, 98-01, 99-05, 2001-15; see also *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159.) This Order prohibits discharges that cause or contribute to violations of water quality standards.

The discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a are included in this Order to ensure that discharges from the MS4s do not cause or contribute to exceedances of water quality objectives necessary to protect the beneficial uses of the receiving waters.

Provision A.4 is consistent with the precedent-setting language in State Water Board Order WQ 99-05 required to be included in municipal storm water permits. State Water Board Order WQ 2001-15 refined Order WQ 99-05 by requiring an iterative approach to compliance with water quality standards involving ongoing assessments and revisions, referred to as the "iterative process." The "iterative process" is a fundamental NPDES requirement for municipal storm water permits to achieve the objectives of the CWA.

The State Water Board and Regional Water Boards have stated that the provisions under Provisions A.1.a, A.1.c, A.2.a, and A.4 are independently applicable, meaning that compliance with one provision does not provide a "safe harbor" where there is non-compliance with another provision (i.e., compliance with the Provision A.4 does not shield a Copermittee who may have violated Provision A.1.a, A.1.c, or A.2.a from an enforcement action). The intent of Provision A.4 is to ensure that the Copermittees have the necessary storm water management programs and controls in place, and that they are modified by the Copermittees in a timely fashion when necessary, so that compliance with Provisions A.1.a, A.1.c, and/or A.2.a is achieved as soon as possible. USEPA expressed the importance of this independent applicability in a series of

comment letters on MS4 permits proposed by various Regional Water Boards. At that time, USEPA expressly objected to certain MS4 permits that included language stating, *"permittees will not be in violation of this [receiving water limitation] provision … [if certain steps are taken to evaluate and improve the effectiveness of the jurisdictional runoff management programs],"* concluding that this phrase would not comply with the CWA.[21]

The Ninth Circuit held in *Natural Resources Defense Council v. County of Los Angeles* (2011) 673 F3d. 880, 886 (revd. on other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013))) that engagement in the iterative process does not provide a safe harbor from liability for violations of permit terms prohibiting exceedances of water quality standards. The Ninth Circuit holding is consistent with the position of the State and Regional Water Boards that exceedances of water quality standards in an MS4 permit constitute violations of permit terms subject to enforcement by the Water Boards or through a citizen suit. While the Water Boards have generally directed dischargers to achieve compliance by improving control measures through the iterative process, the San Diego Water Board retains the discretion to take other appropriate enforcement and the iterative process does not shield dischargers from citizen suits under the CWA.

The requirements of Provision A.4, therefore, are required to be implemented until the water quality standards expressed under Provisions A.1.a, A.1.c, and A.2.a are achieved. The CWA requires MS4 permits to "*require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." The requirements of this Order have been deemed or determined to be "appropriate" to achieve water quality standards in receiving waters.

Part of the "*controls*" required by the Order is the process described in Provision A.4. Provision A.4 includes the process that is ultimately expected to achieve compliance with the requirement that discharges from the MS4 do not cause or contribute to violations of water quality standards in the receiving waters. The implementation of Provision A.4 is required when the Copermittees or the San Diego Water Board have determined that discharges from the MS4 are causing or contributing to violations of water quality standards in the receiving waters.

The Copermittees must effectively prohibit non-storm water discharges into the MS4s, reduce the discharge of pollutants in storm water from the MS4s to the MEP, and ensure that their MS4 discharges do not cause or contribute to violations of water quality standards. If the Copermittees have effectively prohibited non-storm water

[21] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.

discharges and reduced storm water pollutant discharges to the MEP, but their discharges are still causing or contributing to violations of water quality standards, Provision A.4 provides a clear "iterative process" for the Copermittees to follow.

Provision A.4 essentially requires the Copermittees to implement additional BMPs until MS4 discharges no longer cause or contribute to a violation of water quality standards.

In assessing compliance and potential enforcement actions, the San Diego Water Board looks at the Copermittees' efforts in total to meet the requirements of Provisions A.1.a, A.1.c, A.2.a and Provision A.4. The Copermittees need to demonstrate that they are making improvements to their programs and making progress toward achieving the discharge prohibitions and receiving water limitations in Provisions A.1.a, A.1.c, and A.2.a by implementing the requirements of Provision A.4. The San Diego Water Board would consider these efforts prior to strictly enforcing the requirements of Provisions A.1.a, A.1.c, and A.2.a. Causes of exceedances of the receiving water limitations can often be more difficult to identify and attribute solely to the Copermittees' MS4s. The intent of the Order is to provide the Copermittees more clarity and flexibility in addressing these exceedances through the iterative approach and adaptive management process until the requirements under Provisions A.1.a, A.1.c, and A.2.a are fully achieved.

An exception to the iterative approach and adaptive management process would be in receiving waters subject to adopted and approved TMDLs. For TMDLs that are incorporated into the Order, there is a specific date for compliance to be achieved, after which the iterative approach and adaptive management process required under Provision A.4 no longer provides the flexibility to achieve compliance. Where compliance dates for a TMDL have passed, compliance with the WQBELs incorporated into the Order established by a TMDL in Attachment E to protect water quality standards is required. Thus, after the interim or final compliance dates for a TMDL have passed, if the discharges from the Copermittees' MS4s are causing or contributing to a violation of WQBELs, exceedances of WQBELs must be strictly enforced by the San Diego Water Board. In the meantime, however, the Copermittees are in compliance with the interim or final TMDL requirements in Attachment E as long as the interim or final WQBELs are being achieved in accordance with the interim or final compliance dates.

In addition, this Order includes an optional pathway that incorporates the requirements of Provision A.4 and would allow a Copermittee to be deemed in compliance with the requirements under Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b during implementation of a Water Quality Improvement Plan that incorporates specific additional requirements. This alternative compliance pathway and the additional specific requirements are described below under the discussion for Provision B.3.c.

B. Water Quality Improvement Plans

Purpose: Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges to the MS4s and control pollutants in storm water discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the Clean Water Act.

Provision B includes requirements for the Copermittees to develop and implement Water Quality Improvement Plans to ultimately comply with the prohibitions and limitations under Provision A. The Water Quality Improvement Plans will provide the Copermittees a comprehensive program that can achieve the requirements and further the objectives of the CWA. Implementation of the Water Quality Improvement Plans will also improve the quality of the receiving waters in the San Diego Region.

The Water Quality Improvement Plan is the backbone of the Regional MS4 Permit requirements. Provision B provides the guidance, criteria, and minimum expectations and requirements for the elements of the Water Quality Improvement Plan to be developed and implemented by the Copermittees. The Water Quality Improvement Plans will be implemented in the Watershed Management Area by the Copermittees within their jurisdictions through their jurisdictional runoff management programs.

The Water Quality Improvement Plan also incorporates a program to monitor and assess the progress of the Copermittees' jurisdictional runoff management programs toward improving the quality of discharges from the MS4s, as well as tracking improvements to the quality of receiving waters. A process to adapt and improve the effectiveness of the Water Quality Improvement Plans has also been incorporated into the requirements of Provision B to be consistent with the "iterative approach" required to achieve compliance with discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a, pursuant to the requirements of Provision A.4.

The Water Quality Improvement Plans have also been structured to incorporate the requirements of any TMDLs that have been adopted for the San Diego Region. Incorporating the requirements of the TMDLs into the requirements of Provision B allows the Copermittees to develop a single plan, instead of separate plans, to coordinate their non-storm water and storm water runoff management programs. The Water Quality Improvement Plans allow the Copermittees to meet the requirements of this Order, as well as fulfill the requirements of the TMDLs.

As an added benefit, if the Copermittees demonstrate that impaired water bodies within the Watershed Management Area listed on the 303(d) List will be addressed with their Water Quality Improvement Plans in a reasonable period of time, the San Diego Water Board may be able to remove the water bodies from the 303(d) List, which would greatly reduce the need for the San Diego Water Board to develop additional TMDLs that would have to be incorporated into the Order and implemented by the Copermittees.

***Discussion*:** The federal NPDES regulations require the Copermittees to develop a proposed management program (40 CFR 122.26(d)(2)(iv)). The proposed management program must include "*a comprehensive planning process*" and "*where necessary intergovernmental coordination*" for the "*duration of the permit.*" The Water Quality Improvement Plan is the Copermittees' "*comprehensive planning process*" document for the proposed management program that will be implemented within a Watershed Management Area. Implementation of the Water Quality Improvement Plan requires "*intergovernmental coordination*" among the Copermittees for at least the "*duration of the permit*," and likely into and beyond the next iteration of the permit.

Developing Water Quality Improvement Plans based upon watersheds is consistent with federal regulations that support the development of permit conditions, as well as implementation of storm water management programs, at a watershed scale (40 CFR 122.26(a)(3)(ii), 122.26(a)(3)(v), and 122.26(d)(2)(iv)). In 2003, USEPA issued a Watershed-Based NPDES Permitting Policy Statement (USEPA, 2003) that defines watershed-based permitting as an approach that produces NPDES permits that are issued to point sources on a geographic or watershed basis. In this policy statement, USEPA explains that "*[t]he utility of this tool relies heavily on a detailed, integrated, and inclusive watershed planning process*." USEPA identifies a number of important benefits of watershed permitting, including more environmentally effective results, the ability to emphasize measuring the effectiveness of targeted actions on improvements in water quality, reduced cost of improving the quality of the nation's waters and more effective implementation of watershed plans, including TMDLs, among others.

An emphasis on watersheds is appropriate at this stage in the San Diego Region's MS4 program to shift the focus to more targeted, water quality driven planning and implementation. Addressing discharges on a watershed scale focuses on water quality results by emphasizing the receiving waters in the watershed. The conditions of the receiving waters drive management actions, which in turn focus measures to address pollutant contributions from MS4 discharges.

The Water Quality Improvement Plan gives the Copermittees the responsibility of developing a comprehensive plan to coordinate the efforts of their jurisdictional runoff management programs for addressing the problems related to MS4 discharges causing impacts to water quality in the Watershed Management Area. The development of the plan provides the Copermittees the opportunity to provide

significant input on how to implement their jurisdictional runoff management programs, and how to best utilize their available resources in addressing a focused set of priorities that they believe will result in measureable improvements to water quality within the Watershed Management Area.

The Copermittees are encouraged to separate the Watershed Management Area into subwatersheds, as appropriate. This allows the Copermittees to identify priorities applicable to a subset of the Copermittees or specific water bodies or areas within the Watershed Management Area.

Included in the requirements for the elements to be included in the Water Quality Improvement Plan are monitoring and assessment requirements that are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order. In addition to the federal requirements of the CWA section 308(a) and 40 CFR 122.26(d), the San Diego Water Board has the authority to establish monitoring, reporting, and recordkeeping requirements for NPDES permits under CWC 13383.

More specific and detailed discussions of the requirements of Provision B are provided below.

Provision B.1 (Watershed Management Areas) requires the Copermittees to develop a Water Quality Improvement Plan for each of the Watershed Management Areas defined by the San Diego Water Board.

Pursuant to 40 CFR 122.26(d)(2)(iv), proposed management programs "*may impose controls on a…watershed basis…*" The Water Quality Improvement Plan is the Copermittees' proposed management program. A Water Quality Improvement Plan must be developed for each Watershed Management Area identified in the Order.

The Watershed Management Areas are identified in Table B-1. Table B-1 establishes ten (10) Watershed Management Areas, and identifies the Copermittees that are responsible for developing and implementing the Water Quality Improvement Plan for each Watershed Management Area.

The Copermittees from each of the three counties within the San Diego Region ~~are~~ were ~~expected to be~~ phased in as their respective NPDES municipal storm water permits expired. ~~Because~~ Order No. R9-2007-0001 expired in January 2012, and the San Diego County Copermittees ~~were~~ became covered under the Regional MS4 Permit on June 27, 2013, the effective date of the Order. ~~Because~~ Order No. R9-2009-0002 expired in December 2014, and the Orange County Copermittees ~~are~~ became covered under the Regional MS4 Permit on April 1, 2015, the effective date of Order No. R9-2013-0001 as amended by Order No. R9-2015-0001. Order No. R9-2010-0016 expired in November 2015, and the Riverside County Copermittees became covered under the Regional MS4 Permit on January 7, 2016, the effective

date of Order No. R9-2013-0001 as amended by Order No. R9-2015-0100.

~~After the San Diego Water Board receives and considers the Report of Waste Discharge required to be submitted by the Riverside County Copermittees pursuant to the requirements of their current permit, and makes any necessary changes to the Order, the Riverside County Copermittees will be covered under the Regional MS4 Permit after Order No. R9-2010-0016 expires in December 2015.~~

~~The Riverside County Copermittees also have the option to obtain coverage under the Regional MS4 Permit earlier than their respective permit expiration dates. The process to apply for early coverage is described Provision F.6.~~

~~Because the Santa Margarita River Watershed Management Area includes Copermittees from both San Diego County and Riverside County, a footnote to Table B-1 has been included to specify that the requirements of Provision B are not required to be implemented by the County of San Diego until the Riverside County Copermittees have received a notice of coverage under the Order. Until the Riverside County Copermittees are notified of coverage under the Order, the County of San Diego is subject to the prohibitions and limitations under Provision A, responsible for continuing to implement its existing jurisdictional runoff management program, and responsible for implementing the transitional monitoring and assessment requirements of Provision D, the transitional annual reporting requirements of Provision F.3.b, and the TMDL requirements of Attachment E to the Order.~~

The Cities~~y~~ of Laguna Woods, ~~and~~ Laguna Hills, Murrieta, and Wildomar are located partially within the jurisdictions of both the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board) and the San Diego Water Board. Written requests for designation of a single Regional Water Board to regulate matters pertaining to permitting of Phase I MS4 discharges were submitted to the San Diego Water Board and the Santa Ana Water Board by the City of Laguna Woods by letter dated September 8, 2014, ~~and~~ the City of Laguna Hills by letter dated March 12, 2014, the City of Murrieta by letter dated June 22, 2015, and the City of Wildomar by letter dated June 23, 2015. The Cities of Laguna Woods, ~~and~~ Laguna Hills, Murrieta, and Wildomar requested designation of the San Diego Water Board pursuant to CWC section 13228.

The Cities of Laguna Woods, ~~and~~ Laguna Hills, Murrieta, and Wildomar reported that management and implementation of municipal programs to comply with two different Phase I MS4 permits creates a significant administrative and financial burden and inhibits their ability to contribute to greater overall water quality improvements in either Region. In an effort to address these concerns, the San Diego Water Board and the Santa Ana Water Board have entered into ~~an~~ written agreements ~~dated February 10, 2015~~, whereby the San Diego Water Board is designated to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Laguna Woods, ~~and~~ Laguna Hills, Murrieta, and Wildomar including ~~areas~~ the portions of the jurisdictions within the

Santa Ana Region. The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated February 10, 2015 to designate the San Diego Water Board to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Laguna Woods and Laguna Hills, including the portions of the jurisdictions within the Santa Ana Region, upon the later effective date of ~~this~~ Order No. R9-2015-0001 or Santa Ana Water Board Tentative Order No. R8-2015-0001. The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated October 26, 2015 to designate the San Diego Water Board to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Murrieta and Wildomar, including the portions of the jurisdictions within the Santa Ana Region upon the effective date of Order R9-2015-0100.

Under the terms of the agreements, each Regional Water Board retains the authority to enforce provisions of the Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee (Water Code section 13228 (b)). Also under the terms of the agreements, any TMDL and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Laguna Woods, ~~or~~ Laguna Hills, Murrieta, or Wildomar as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement of the applicable TMDL would remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's San Diego Creek/Newport Bay TMDL and Lake Elsinore/Canyon Lake Nutrient TMDLs, and the San Diego Water Board's Indicator Bacteria Project I Beaches and Creeks TMDL.

In conformance with the~~is~~ agreements, ~~a~~ footnotes to Table B-1 ~~has been~~ are included to specify coverage under Order No. R9-2013-0001 for those Phase I MS4 discharges within the jurisdictional boundaries of the Cities of Laguna Woods, ~~and~~ Laguna Hills, Murrieta, and Wildomar within the Santa Ana Region. ~~The f~~Footnote 1 to Table B-1 specifies that the Cities~~y~~ of Laguna Woods and Laguna Hills are identified as responsible Copermittees in the San Diego Creek/Newport Bay TMDL in the Santa Ana Region and remain obligated to comply with the San Diego Creek/Newport Bay TMDL pursuant to section XVIII of Tentative Order No. R8-2015-0001 (NPDES No. CAS618030) and any reissuance thereof. Footnote 4 to Table B-1 specifies that the Cities of Murrieta and Wildomar are identified as responsible Copermittees in the Lake Elsinore/Canyon Lake Nutrient TMDLs in the Santa Ana Region and remain obligated to comply with the Lake Elsinore/Canyon Lake Nutrient TMDLs pursuant to section VI.D.2 of Order No. R8-2010-0033 (NPDES No. CAS618030) or corresponding section as it may be amended or reissued.

The Cities~~y~~ of Lake Forest and Menifee ~~is~~ are located partially within the jurisdictions of both the Santa Ana Water Board and the San Diego Water Board. Written requests for designation of a single Regional Water Board to regulate matters pertaining to

permitting of Phase I MS4 discharges were submitted to the San Diego Water Board and the Santa Ana Water Board by the City of Lake Forest by letters dated January 14, 2013 and April 4, 2014, and the City of Menifee by letter dated June 25, 2015. The Cities of Lake Forest and Menifee requested designation of the San Ana Water Board pursuant to CWC section 13228. ~~By letters dated January 14, 2013 and April 4, 2014 the City of Lake Forest submitted a written request, pursuant to CWC section 13228, to the San Diego Water Board and the Santa Ana Water Board requesting the Santa Ana Water Board be designated to regulate matters within the City of Lake Forest pertaining to permitting of their Phase I MS4 discharges.~~

The Cities~~y~~ of Lake Forest and Menifee reported that management and implementation of municipal programs to comply with two different Phase I MS4 permits creates a significant administrative and financial burden and inhibits their ability to contribute to greater overall water quality improvements in either Region. In an effort to address these concerns, the San Diego Water Board and the Santa Ana Water Board have entered into ~~an~~ written agreements ~~dated February 10, 2015~~, whereby the Santa Ana Water Board is designated to regulate Phase I MS4 discharges within the jurisdictions of the Cities~~y~~ of Lake Forest and Menifee including the portions of the jurisdictions within the San Diego Region. The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated February 10, 2015 to designate the San Ana Water Board to regulate Phase I MS4 discharges within the jurisdiction of the City of Lake Forest, including portions of the jurisdiction within the Santa Diego Region, upon the later date of ~~this~~ Order No. R9-2015-0001 or Santa Ana Water Board Tentative Order No. R8-2015-0001. The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated October 26, 2015 to designate the San Ana Water Board to regulate Phase I MS4 discharges within the jurisdiction of the City of Menifee, including portions of the jurisdiction within the San Diego Region, under Order No. R8-2010-0033 (NPDES No. CAS618030) as it may be amended or reissued upon the effective date of Order No. R9-2015-0100.

Under the terms of the agreements, each Regional Water Board retains the authority to enforce provisions of the Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee (Water Code section 13228 (b)). Also under the terms of the agreements, any TMDL and associated Phase I MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities~~y~~ of Lake Forest or Menifee as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement authority for the applicable TMDL would remain with the Regional Water Board which has the jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's San Diego Creek/Newport Bay TMDL and Lake Elsinore/Canyon Lake Nutrient TMDLs, and the San Diego Water Board's Indicator Bacteria Project I Beaches and Creeks TMDL.

In conformance with the~~is~~ agreements, ~~a f~~Footnote 2 to Table B-1 has been included to specify that Phase I MS4 discharges within the jurisdictional boundaries of the City of Lake Forest located within the San Diego Region will be regulated under Santa Ana Water Board Order No. R8-2015-0001 (NPDES No. CAS618030) and any reissuance thereof. The footnote specifies that the City of Lake Forest is an identified responsible Copermittee in the Indicator Bacteria Project I Beaches and Creeks TMDL (Bacteria TMDL) in the San Diego Region and remains obligated to comply with the Bacteria TMDL pursuant to Attachment E of Order No. R9-2013-0001 and any reissuance thereto. The City of Lake Forest is also identified as a responsible Copermittee in the San Diego Creek/Newport Bay TMDL established by the Santa Ana Water Board. The City remains obligated to comply with the San Diego Creek/New Port Bay TMDL pursuant to the Santa Ana Water Board's Phase I MS4 Permit (Tentative Order No. R8-2015-0001 (NPDES No. CAS618030), as it may be amended or reissued). Under the terms of the agreement, the City of Lake Forest must retain and continue implementation of the over irrigation prohibition in Title 15, Chapter 15, Section 14.030, List (b) of the City Municipal Code throughout its jurisdiction. Also under the terms of the agreement, the City of Lake Forest must actively participate in the development and implementation of the ~~Aliso Creek~~ South Orange County Watershed Management Area Water Quality Improvement Plan required pursuant to Order No. R9-2013-0001, and any reissuance thereof.

Footnote 3 to Table B-1 has been included to specify that Phase I MS4 discharges within the jurisdictional boundaries of the City of Menifee located within the San Diego Region will be regulated under Santa Ana Water Board Order No. R8-2010-0033 (NPDES No. CAS618033) and any reissuance thereof. At this time, the City of Menifee is not identified as a responsible Copermittee for any TMDLs established by the San Diego Water Board. Under the terms of the agreement, the City of Menifee must actively participate in the development and implementation of the Santa Margarita River Watershed Management Area Water Quality Improvement Plan required pursuant to Order No. R9-2013-0001, and any reissuance thereof.

The basis supporting the Cities of Laguna Woods, Laguna Hills, ~~and~~ Lake Forest, Menifee, Murrieta, and Wildomar requests to designate a specific Regional Water Board for regulatory oversight of Phase I MS4 discharges may change under future conditions and circumstances, therefore the San Diego Water Board will periodically review the effectiveness of the agreements during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate ~~the~~ one or both of the agreements with the Santa Ana Water Board or otherwise modify the agreements subject to the approval of the Santa Ana Water Board.

Provision B.2 (Priority Water Quality Conditions) requires the Copermittees in each Watershed Management Area to identify the highest priority water quality conditions which will be the focus of the Water Quality Improvement Plan implementation.

Provisions B.2.a and B.2.b provide the criteria that must be assessed when

characterizing the receiving water quality and potential impacts from MS4 discharges of the receiving waters within the Watershed Management Area. The criteria are based primarily on the requirements in 40 CFR 122.26(d)(1)(iv)(C) and (C)(1)-(9). Characterizing the receiving water quality and identifying the potential impacts caused by MS4 discharges to receiving waters in the Watershed Management Area is necessary to identify the impacts to receiving waters associated with MS4 discharges that are of the most concern to the Copermittees.

Based on the information required to be considered under Provisions B.2.a and B.2.b, Provision B.2.c requires to Copermittees to identify the highest priority water quality conditions related to discharges from the MS4s that will be the primary focus of the Water Quality Improvement Plan in the Watershed Management Area. Addressing and improving these highest priority water quality conditions will become the focus of each Copermittee's jurisdictional runoff management program as the Water Quality Improvement Plan is implemented in the Watershed Management Area. The highest priority water quality conditions are expected to include sources of pollutants and/or stressors, and/or receiving water conditions, that the Copermittees consider the highest threats or most likely to have adverse impacts on the physical, chemical, and biological integrity of receiving waters. Addressing these threats and/or adverse impacts should restore the physical, chemical, and biological integrity of receiving waters, and result in the restoration and protection of the beneficial uses of the receiving waters in the Watershed Management Area.

Provision B.2.d requires the Copermittees to identify known and suspected sources of pollutants and/or stressors contributing to the highest priority water quality conditions. The requirements of Provision B.2.d are based primarily on the requirements in 40 CFR 122.26(d)(1)(iii)(B)(1)-(6). The Copermittees are required to evaluate several factors in the identification of those sources. The Copermittees must consider and evaluate the following: (1) the land uses that may contribute toward impacts to receiving waters, (2) the locations of the Copermittees' MS4s that can convey and discharge runoff and pollutants to receiving waters, (3) other sources that discharge into the Copermittees' MS4s and receiving waters, and (4) other information and data that can help the Copermittees to evaluate the relative importance of or contribution from those sources toward the highest priority water quality conditions. Identifying the known and suspected sources, and their relative contribution toward the highest priority water quality conditions, will help the Copermittees to focus, direct, and prioritize their resources and implementation efforts within their jurisdictions.

Provision B.2.e requires the Copermittees to identify potential strategies that can result in improvements to water quality in MS4 discharges and/or receiving waters within the Watershed Management Area. Potential water quality improvement strategies will not necessarily be implemented by the Copermittees, but provide a "menu" of options that the Copermittees will consider for implementation. The public participation process that will be implemented during the development of the Water Quality Improvement Plan is where the potential water quality improvement strategies will be identified.

Provision B.3 (Water Quality Improvement Goals, Strategies and Schedules) requires the Copermittees in each Watershed Management Area to identify the goals that the Copermittees' jurisdictional runoff management programs will work toward achieving to address and improve the highest priority water quality conditions identified under Provision B.2.c; the strategies that will be implemented by the Copermittees within their jurisdictions and the Watershed Management Area to achieve the goals; and, the schedules for implementing the strategies and achieving the goals. The element of the Water Quality Improvement Plan required under Provision B.3 is where the "*comprehensive planning*" and "*intergovernmental coordination*" [40 CFR 122.26(d)(2)(iv)] of the Copermittees' actions for the proposed management programs within the Watershed Management Area is required to be described.

Provision B.3.a requires the Copermittees to identify interim and final numeric goals, and schedules to achieve those goals as part of the Water Quality Improvement Plans. Provision B.3.a.(1) requires the Copermittees to identify two types of numeric goals to be achieved:

(1) Final numeric goals in the receiving waters and/or MS4 discharges that will result in the protection of the water quality standards of the receiving waters for the highest priority water quality conditions identified by the Copermittees for Provision B.2.c. These final numeric goals are the ultimate goals for the Water Quality Improvement Plan, and the achievement and maintenance of these final numeric goals will indicate that one or more beneficial uses have been successfully restored and/or protected from MS4 discharges.

(2) Interim numeric goals that can be used by the Copermittees to demonstrate progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges for the highest priority water quality conditions in the Watershed Management Area. Achievement of the interim numeric goals will demonstrate to the San Diego Water Board that the Copermittees' implementation efforts are progressing toward achieving the final numeric goals.

Provision B.3.a.(1) does not specify what the interim and final numeric goals must be based on, but they essentially must be designed to achieve compliance with water quality standards in the receiving waters. To that end, the interim goals must be based on measureable criteria or indicators capable of demonstrating progress toward achieving the numeric goals.

The interim and final numeric goals can be based on the water quality objectives in the Basin Plan. The water quality objectives in the Basin Plan, however, consist of numeric and narrative water quality objectives. Numeric water quality objectives can be directly used as numeric goals. Narrative water quality objectives, on the other hand, will require some interpretation to identify numeric goals. The achievement of multiple numeric goals based on the water quality objectives, used in combination,

may be necessary to demonstrate that beneficial uses have been restored and/or protected.

The Copermittees could also propose other numeric goals that are not necessarily water quality objectives from the Basin Plan. For example, the Copermittees could propose a numeric goal that consists of achieving some percent improvement of a measureable indicator, such as acreage of a specific habitat or increase in a specific plant or animal species population. Other examples may include pollutant load reductions, number of impaired waterbodies delisted from the List of Water Quality Impaired Segments, Index of Biological Integrity (IBI) scores, etc.

The Copermittees may choose to develop interim numeric goals based on the final numeric goals they develop, such as incremental steps toward ultimately achieving the final numeric goals. The Copermittees may also choose to develop interim numeric goals that are based on other measureable indicators that can indirectly indicate improvements and progress toward the final numeric goals.

There are no limits to the types of interim numeric goals that could be proposed by the Copermittees, other than the goals must be based on measureable criteria or indicators capable of demonstrating progress toward achieving the numeric goals. Likewise, there are no limits to the types of final numeric goals that could be proposed by the Copermittees, other than the goals must "*restore and protect the water quality standards of the receiving waters.*"

Finally, Provision B.3.a.(2) also requires the Copermittees to develop schedules for measuring progress and achieving the interim and final numeric goals. Several criteria are included for the development of the schedules, but the Copermittees are required to achieve the numeric goals as soon as possible, consistent with federal NPDES regulations (40 CFR 122.47(a)(1)).

The Copermittees are also required to incorporate any compliance schedules for applicable ASBS or TMDL requirements. Applicable ASBS and TMDL compliance schedules are set forth in Attachment A and Attachment E to the Order, respectively. The information provided by the Copermittees under Provision B.3.a.(2) will be used by the Copermittees and the San Diego Water Board to gauge and track the progress of the Copermittees' efforts in addressing the highest priority water quality conditions identified in the Water Quality Improvement Plan.

Provision B.3.b requires the Copermittees to identify the strategies and schedules to implement those strategies as part of the Water Quality Improvement Plans. Provision B.3.b requires the Copermittees to identify the water quality improvement strategies that will be and may be implemented within the Watershed Management Area to 1) reduce pollutants in storm water discharged from the MS4 to the MEP, 2) effectively prohibit non-storm water discharges from entering the MS4, 3) protect water quality standards in receiving waters by controlling MS4 discharges so that they do not cause

or contribute to exceedances of receiving water limitations, and 4) achieve applicable WQBELs that implement TMDLs. The Copermittees will select the strategies to be implemented based on the likely effectiveness and efficiency of the potential water quality improvement strategies identified under Provision B.2.e to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, and/or achieve the interim and final numeric goals identified under Provision B.3.a.

Provision B.3.b.(1) requires each Copermittee to identify the strategies that will be or may be implemented within its jurisdiction. Each Copermittee is required to describe the strategies it is committed to implementing as part of its jurisdictional runoff management requirements under Provisions E.2 through E.7, and the optional jurisdictional strategies that the Copermittee will implement, as necessary, to achieve the numeric goals.

Each Copermittee is expected to implement the optional jurisdictional strategies identified under Provisions B.3.b.(1)(b) when the jurisdictional strategies it has committed to implement under Provision B.3.b.(1)(a) are not making adequate progress toward the interim and final numeric goals in accordance with the schedules established under Provision B.3.a. Provision B.3.b.(1)(b)(v) requires each Copermittee to describe the circumstances necessary to trigger implementation of the optional jurisdictional strategies, in addition to the requirements of Provisions B.3.b.(1)(a).

The San Diego Water Board recognizes that there may be optional jurisdictional strategies that will likely require funding and/or resources for planning, permitting, procurement of labor and materials, and implementation. Thus, Provision B.3.b.(1)(b)(iv) requires each Copermittee to describe the funding and/or resources that are necessary to implement these optional jurisdictional strategies. This information may provide interested groups and members of the public an understanding of the resources that they could provide or assist in obtaining to implement these optional jurisdictional strategies.

Provision B.3.b.(2) requires the Copermittees in the Watershed Management Area to identify the regional or multi-jurisdictional strategies that may be implemented, as necessary, to achieve the numeric goals. Similar to the requirements of Provision B.3.b.(1)(b), these regional or multi-jurisdictional strategies will likely require funding and/or resources for planning, permitting, procurement of labor and materials, and implementation, and San Diego Water Board recognizes that these strategies may be difficult to implement with only Copermittee resources. Thus, Provision B.3.b.(2)(d) requires the Copermittees to describe the funding and/or resources necessary to implement these optional regional or multi-jurisdictional strategies. This information may provide interested groups and members of the public an understanding of the resources that they could provide or assist in obtaining to implement these optional regional or multi-jurisdictional strategies.

Provision B.3.b.(3) requires the Copermittees to develop and include schedules in the Water Quality Improvement Plan for implementing the water quality improvement strategies identified under Provisions B.3.b.(1) and B.3.b.(2). The schedule for implementing the water quality improvement strategies will be used by the Copermittees and San Diego Water Board to measure and demonstrate the progress of the Copermittees' implementation efforts toward reducing pollutants in storm water discharged from the MS4 to the MEP, and eliminating illicit non-storm water discharges from entering the MS4.

Provision B.3.b.(4) provides the Copermittees in each Watershed Management Area the option of implementing watershed-specific structural BMP requirements for Priority Development Projects. Historically, storm water permits have included very specific performance standards for permanent, structural BMPs. These standards describe the expectation for the capture or treatment of pollutants and control of excessive flow before storm water is discharged from a site. The Copermittees were also allowed to develop waiver programs for Priority Development Projects to avoid implementing the structural BMPs; however, the waiver programs were not necessarily tied into any sort of holistic watershed strategy. The result is that implementation of BMP requirements is largely done on a site-by-site basis. This requires proper design on the part of the Priority Development Project and strict oversight on the part of the Copermittee.

Provision B.3.b.(4) promotes the evaluation of multiple strategies for water quality improvement, in addition to the implementation of permanent structural BMPs, on a watershed-scale versus the site-by-site approach. In a report issued by the Southern California Coastal Water Research Project (SCCWRP) and several other research institutions, the report emphasized that a successful hydromodification management program will involve watershed analysis as a first step, and that integrating multiple watershed-based strategies is preferable over a site-by-site approach. Indeed, the report states that the watershed analysis "…*should lead to identification of existing opportunities and constraints that can be used to help prioritize areas of greater concern, areas of restoration potential, infrastructure constraints, and pathways for potential cumulative effects*."[22] Provision B.3.b.(4) promotes the findings and recommendations of the report by providing a pathway for Copermittees to develop an integrated approach to their land development programs.

Under Provision B.3.b.(4), the Copermittees in a Watershed Management Area must first perform an analysis by gathering as much information pertaining to the physical characteristics of the Watershed Management Area as possible. This includes, for example, identifying potential areas of coarse sediment supply, present and anticipated future land uses, and locations of physical structures within receiving streams and upland areas that affect the watershed hydrology (such as bridges,

[22] 2012. ED Stein, F Federico, DB Booth, BP Bledsoe, C Bowles, Z Rubin, GM Kondolf, A Sengupta. Technical Report 667. Southern California Coastal Water Research Project. Costa Mesa, CA.

culverts, and flood management basins). Once this information is collected, the Copermittees must produce GIS layers (maps) that include this information.

From there, the Copermittees must use the results of the Watershed Management Area Analysis to identify and compile a list of candidate projects that could potentially be used as alternative compliance options for Priority Development Projects. Such projects include, for example, opportunities for stream or riparian area rehabilitation, opportunities for retrofitting existing infrastructure to incorporate storm water retention or treatment, and opportunities for regional BMPs, among others. Once these candidate projects are identified, Copermittees may allow Priority Development Projects to fund, partially fund, or completely implement these candidate projects. The Copermittees must first find that implementing such a candidate project would provide greater overall benefit to the watershed than requiring implementation of the structural BMPs onsite, and also enter into a voluntary agreement with the Priority Development Project that authorizes this arrangement. The Copermittees may use Provision B.3.b.(4) as both 1) a mechanism to reach their stated goals of the Water Quality Improvement Plan by using Priority Development Projects to either fund or implement projects that will provide water quality benefit, and 2) an alternative to requiring strict adherence to the structural BMP design standards.

Additionally, Provision B.3.b.(4) allows the Copermittees to use the results of the Watershed Management Area Analysis to identify areas within the Watershed Management Area where it is appropriate to allow Priority Development Projects to be exempt from the hydromodification management BMP performance requirements. Provision E.3.c.(2) already allows exemptions for Priority Development Projects that discharge to a conveyance channel whose bed and bank are concrete lined from the point of discharge to an enclosed embayment or the Pacific Ocean. However, there may be cases where further exemptions are warranted. The Copermittees may identify such cases on a watershed basis and include them in the Watershed Management Area Analysis; however, they must provide the supporting rationale to support all claims for exemptions.

Provision B.3.b.(4) provides an innovative pathway for Copermittees to regulate their land development programs by allowing alternative compliance in lieu of implementing structural BMPs on each and every Priority Development Project. This approach facilitates the integration of watershed-scale solutions for improving overall water quality and assisting Copermittees to achieve their stated goals of the Water Quality Improvement Plan. The San Diego Water Board understands, however, that undertaking this approach, which involves extensive planning, could be resource intensive for the Copermittees. Therefore, the Watershed Management Area Analysis is optional and not a requirement. The Copermittees can choose not to perform the watershed planning and mapping exercise described in Provision B.3.b.(4), and instead choose to require strict implementation of the structural BMPs onsite, pursuant to Provision E.3.c.

Provision B.3.c is included to provide the Copermittees an option that allows the Copermittees to be deemed in compliance with the prohibitions and limitations (receiving water limitations) of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b. One or more Copermittees within a Watershed Management Area can choose to implement this option. This option is only expected to be utilized by a Copermittee that wishes to be deemed in compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b.

The alternative compliance pathway option included in Provision B.3.c is consistent with the approach described in Order WQ 2015-0075, *In the Matter of Review of Order No. R4-2012-0175, NPDES Permit No. CAS004001, Waste Discharge Requirements for Municipal Separate Storm Sewer System (MS4) Discharges within the Coastal Watersheds of Los Angeles County, Except Those Discharges Originating from the City of Long Beach MS4,* adopted by the State Water Board on June 16, 2015. State Water Board Order WQ 2015-0075 directs the Regional Water Boards to consider a watershed-based planning and implementation approach to compliance with receiving water limitations when issuing Phase I MS4 permits going forward. Order WQ 2015-0075 included seven principles that the Regional Water Boards are expected to follow when incorporating an alternative compliance pathway into a MS4 permit. The San Diego Water Board incorporated the seven principles stipulated in State Water Board Order WQ 2015-0075 into the Regional MS4 Permit as follows:

1. Provision A of this Order continues to require compliance with water quality standards in the receiving water and does not deem good faith engagement in the iterative process to constitute compliance with receiving water limitations. Provision A of this Order continues to be consistent with the receiving water limitations provisions from State Water Board Order WQ 99-05.

2. Compliance with Provision B.3.c constitutes compliance with the requirements of the Provision A.3.b, which requires compliance with the WQBELs of the TMDLs in Attachment E to the Order, and is considered compliance with receiving water limitations for those TMDL water body-pollutant combinations.

3. Provision B.3.c is an ambitious, rigorous, and transparent alternative compliance pathway that allows a Copermittee appropriate time to come into compliance with receiving water limitations without being in violation of the receiving water limitations during implementation of the compliance alternative.

4. Provision B.3.c requirements are incorporated into a Water Quality Improvement Plan. Water Quality Improvement Plans are a watershed-based planning and implementation approach, which address multiple contaminants, and incorporate TMDL requirements.

5. The strategies required to be included in the Water Quality Improvement Plans promote and incentivize the use of green infrastructure and requires the implementation of low impact development principles.

6. The strategies required to be included in the Water Quality Improvement Plans encourage multi-benefit regional projects that capture, infiltrate, and reuse storm water and support a local sustainable water supply.

7. The alternative compliance pathway of Provision B.3.c includes rigor and accountability. The Copermittee is required, through a transparent public process, to demonstrate that water quality issues in the watershed have been analyzed and prioritized, and that appropriate solutions are proposed. The Copermittee is also required, through a transparent process, to monitor the results and return to their analysis to verify assumptions and update the solutions. The Copermittee is required to conduct this type of adaptive management on its own initiative without waiting for direction from the San Diego Water Board.

In order for a Copermittee to utilize this option, the Copermittee is required to include three components in the Water Quality Improvement Plan. The first component is a comprehensive set of numeric goals and schedules that will demonstrate the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b will be achieved within a specified period of time. The criteria provided in the Order will require the Copermittee to demonstrate that the discharges from its MS4s will not cause or contribute to exceedances of water quality objectives in the receiving waters, and/or the receiving waters will be adequately protected from adverse impacts attributable to the Copermittee's MS4 discharges. The Copermittee is also required to specify annual milestones to be achieved each year, which adds rigor, accountability, and transparency to the process. The annual milestones may consist of water quality improvement strategy implementation phases, interim numeric goals, and other acceptable metrics, which are expected to build upon previous milestones and lead to the achievement of the final numeric goals.

The second component is an analysis to demonstrate that implementation of the water quality improvement strategies required under Provision B.3.b will achieve the numeric goals within the established schedules required under Provisions B.3.a and B.3.c.(1). Because the development of the analysis may require significant resources, the Order allows the Copermittees in each Watershed Management Area that choose to implement this option to perform the analysis individually, or pool their resources for the analysis collectively.

The analysis must "reasonably" and "quantitatively" demonstrate that the implementation of the water quality improvement strategies can achieve the numeric goals within the established schedules. However, as more data and information are collected during implementation of the Water Quality Improvement Plan to demonstrate progress toward achieving the numeric goals, the numeric goals, water quality improvement strategies and schedules may need to be modified. If the data and information indicate that modification is needed, the Copermittee must also update the analysis. With the exception of numeric goals and schedules associated with

TMDLs from Attachment E to the Order, the modification to the analysis would be allowed as part of the adaptive management process of the Water Quality Improvement Plan. For TMDLs, modification of numeric goals or schedules would likely require an amendment to the Basin Plan and Attachment E to the Order before the analysis and Water Quality Improvement Plan could include such modifications.

Thus, the third component is the key component that allows a Copermittee to demonstrate the implementation of the water quality improvement strategies within its jurisdiction is making progress toward achieving the final numeric goals. Each Copermittee must specify the monitoring and assessments that will be performed to confirm that implementation of the water quality improvement strategies are making progress toward achieving the numeric goals within the established schedules, and whether the interim and final numeric goals have been achieved.

These three components must then be reviewed by the Water Quality Improvement Consultation Panel. The Water Quality Improvement Consultation Panel is required to be formed as part of the public participation process for the development of the Water Quality Improvement Plans. The Water Quality Improvement Consultation Panel is described under Provision F.1.a.(1)(b). Review by the Water Quality Improvement Consultation Panel is included to provide an additional layer of input, support, and accountability for the implementation of this option.

Compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b begins when the Water Quality Improvement Plan, incorporating the requirements of Provision B.3.c.(1), is accepted by the San Diego Water Board. Each Copermittee that chooses to implement and continues to implement this option will be deemed in compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b as long as the Copermittee continues to implement the strategies, monitoring and assessments as incorporated in the Water Quality Improvement Plan in accordance with Provision B.3.c.(1), and the Copermittee reports the achievement of the annual milestones each year, or provides acceptable rationale and recommends appropriate modifications to the interim numeric goals, and/or water quality improvement strategies, and/or schedules to improve the rate of progress toward achieving the final numeric goals. The Copermittee continues to be deemed in compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b during the time the San Diego Water Board reviews the rationale and recommended modifications to the interim numeric goals, and/or water quality improvement strategies, and/or schedules. If and when the San Diego Water Board determines that it does not accept the rationale or recommendations, the Copermittee will be notified they are no longer deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b.

Provision B.4 (Water Quality Improvement Monitoring and Assessment) requires the Copermittees to develop an integrated monitoring and assessment program to track the progress of the Water Quality Improvement Plan toward meeting the implementation goals and schedules, and improving the water quality of the

Watershed Management Area. Provision B.4 is the part of the Water Quality Improvement Plan where the Copermittees describe the monitoring data that will be collected, which is not only necessary to implement the "iterative approach" required by Provision A.4, but inform the adaptive management and "*comprehensive planning process*" that allows the Copermittees to make adjustments and modifications to the Water Quality Improvement Plans and the jurisdictional runoff management programs.

Provision B.4 requires the Copermittees, at a minimum, to include the requirements of Provision D as part of the water quality improvement monitoring and assessment program for the Water Quality Improvement Plan. The Copermittees, however, are not limited to the requirements of Provision D and may include additional monitoring and assessment methods to track progress toward improving water quality in the Watershed Management Area.

In addition to incorporating the requirements of Provision D, the water quality improvement monitoring and assessment program must incorporate any monitoring and assessment requirements specified for any applicable TMDLs included in Attachment E to the Order, and the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 for Watershed Management Areas with ASBS.

The monitoring and assessments required to be incorporated into the Water Quality Improvement Plan are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order.

Provision B.5 (Iterative Approach and Adaptive Management Process) requires the Copermittees to implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a.

Provision B.5 requires the Copermittees in each Watershed Management Area to re-evaluate the highest priority water quality conditions and potential water quality improvement strategies, the water quality improvement goals, strategies and schedules, and the water quality improvement monitoring and assessment program and provide recommendations for modifying those elements to improve the effectiveness of the Water Quality Improvement Plan. The re-evaluation of the Water Quality Improvement Plan is part of the assessment requirements of Provision D.

Provision B.6 (Water Quality Improvement Plan Submittal, Updates, and Implementation) requires to Copermittees to submit, update, and implement the Water Quality Improvement Plans.

The requirements for the process to develop and submit the Water Quality Improvement Plans is described in more detail under the discussion for Provision F.1. The process will include several opportunities for the public to provide input during the

development of the Water Quality Improvement Plans. The process for updating the Water Quality Improvement Plans is described in more detail under the discussion for Provision F.3.c. Upon acceptance of the Water Quality Improvement Plan and updates, the Copermittees are required to immediately begin implementing the Water Quality Improvement Plan and subsequent updates.

The Water Quality Improvement Plan is expected to be a dynamic document that will evolve over time. The Water Quality Improvement Plan is also expected to be a long term plan that focuses the Copermittees' efforts and resources on a limited set of priority water quality conditions, with the ultimate goal of protecting all the beneficial uses of the receiving waters within the Watershed Management Area from impacts that may be caused or contributed to by MS4 discharges. As the Copermittees collect data, implement their jurisdictional runoff management programs, and review the results from their water quality improvement monitoring and assessment program, the Water Quality Improvement Plan is expected to be continually reviewed and updated until compliance with Provisions A.1.a, A.1.b, and A.2.a is achieved.

However, in specific cases supported by robust analytical documentation the implementation of the Water Quality Improvement Plans may demonstrate that TMDLs are not necessary for identified impaired water bodies within the Watershed Management Area if the analytical record demonstrates that technology-based effluent limitations required by the CWA, more stringent effluent limitations required by state, local, or federal authority, and/or other pollution control requirements (e.g., best management practices) required by local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time.[23]

The San Diego Water Board submits an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. According to USEPA guidance for the Integrated Report,[24] water bodies are placed in one of five categories. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 are placed on the 303(d) List.

Category 4 in the Integrated Report is for water bodies where available data and/or information indicate that at least one beneficial use is not being supported or is threatened, but a TMDL is not needed.[25] Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality

[23] 40 CFR 130.7(b)(1)
[24] USEPA, 2005. Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act
[25] Ibid

standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

Impaired water bodies can be included in Category 4a if a TMDL has been adopted and approved. The TMDLs in Attachment E to the Order implement the requirements of the TMDLs adopted by the San Diego Water Board, and approved by the State Water Board and USEPA. The water bodies in Attachment E will be included in Category 4a in the Integrated Report and removed from the 303(d) List.

Impaired water bodies can be included in Category 4b if there are *acceptable* "pollution control requirements" required by a local, state or federal authority stringent enough to implement applicable water quality standards within a reasonable period of time (e.g., a compliance date is set). When evaluating whether a particular set of pollution controls are "requirements," the USEPA considers a number of factors, including: (1) the authority (local, state, federal) under which the controls are required and will be implemented with respect to sources contributing to the water quality impairment (examples may include: self-executing state or local regulations, permits, and contracts and grant/funding agreements that require implementation of necessary controls), (2) existing commitments made by the sources and completion or soon to be completed implementation of the controls (including an analysis of the amount of actual implementation that has already occurred), (3) the certainty of dedicated funding for the implementation of the controls, and (4) other relevant factors as determined by USEPA depending on case-specific circumstances.[26]

Impaired water bodies can be included in Category 4c if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution. Pollution, as defined by the CWA is "the man-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of water."[27] In other cases, pollution does not result from a pollutant and a TMDL is not required. Examples of circumstances where an impaired segment may be placed in Category 4c include segments impaired solely due to lack of adequate flow, stream channelization, or hydromodification. In these situations, there may be water quality management actions that can address the cause(s) of the impairment, but a TMDL may not be required to implement the actions.

The Water Quality Improvement Plans will require the implementation of pollution controls and water quality management actions (i.e. water quality improvement strategies) which can result in the attainment of water quality standards in water bodies impaired by discharges from the Copermittees' MS4s. The Water Quality Improvement Plans also include requirements that are expected to attain water quality standards in a reasonable period of time. The San Diego Water Board considers the Water Quality Improvement Plans to be a commitment by the Copermittees to

[26] Ibid
[27] CWA section 502(19)

develop, plan, budget for, and implement pollution controls that will attain water quality standards in receiving waters in a reasonable period of time, or as soon as possible. The results of the Copermittees' efforts in implementing the Water Quality Improvement Plans can be used to re-evaluate the condition of the impaired water bodies during the next update to the 303(d) List.

After the Copermittees submit the Water Quality Improvement Plans and demonstrate that water quality standards are being attained or will be attained in a reasonable period of time, the San Diego Water Board may re-evaluate the water bodies on the 303(d) List. These water bodies on the 303(d) List may be re-evaluated and placed into Category 4b or Category 4c in the Integrated Report. The water bodies placed in Category 4b or Category 4c in the Integrated Report must show a record that the water bodies are attaining water quality standards or supporting the identified beneficial uses, or will attain water quality standards or support identified beneficial uses in a reasonable period of time, in order for the water bodies to be appropriately removed from the 303(d) List.

C. Action Levels

Purpose: Provision C includes requirements for the Copermittees to identify and include numeric action levels in the Water Quality Improvement Plan to direct and focus the Copermittees' jurisdictional runoff management program implementation efforts for controlling MS4 discharges to receiving waters.

***Discussion*:** Under Provision C, the numeric action levels required are for non-storm water discharges and storm water discharges. The non-storm water action levels (NALs) are applicable to non-storm water discharges from the Copermittees' MS4s, which can occur year-round. The storm water action levels (SALs) are applicable to storm water discharges from the Copermittees' MS4s, which occur during the rainy season defined as the period between October 1 and April 30.

The action levels required by Provision C are based on the action level requirements that were developed and incorporated into Order Nos. R9-2009-0002 and R9-2010-0016, the Orange County and Riverside County MS4 Permits, respectively. The Fact Sheets for these Orders provide detailed discussions about the development of the numeric NALs and SALs included in this Order.

Order Nos. R9-2009-0002 and R9-2010-0016 required the Copermittees to perform prescribed actions if the NALs or SALs are exceeded. The actions required under Order Nos. R9-2009-0002 and R9-2010-0016 generally included conducting additional monitoring and source investigations when a discharge from the MS4 is observed to exceed one or more NALs and/or SALs.

For this Order, however, the action levels of Provision C are to be used by the Copermittees to prioritize the actions to be implemented as part of the Water Quality Improvement Plan. Monitoring data collected by the Copermittees from MS4 outfalls will be compared with the NALs and SALs. Exceedances of the NALs and SALs will not require the Copermittees to immediately identify sources causing exceedances, but will provide some numeric indicator levels that can give the Copermittees a way to measure the relative severity of a pollutant contributing to receiving water quality impacts.

NALs and SALs must be included in the Water Quality Improvement Plans to be used by the Copermittees in directing and focusing their water quality improvement strategies. The Copermittees are expected to utilize the NALs and SALs to help focus their implementation efforts on addressing pollutants that have the most significant potential or observed impacts to receiving waters. The NALs and SALs will be used as part of the MS4 discharges assessments required under Provision D.4.b. The NALs and SALs may also be used by the Copermittees as the numeric goals to be achieved in MS4 discharges and/or receiving waters as the Water Quality Improvement Plans are implemented.

More specific and detailed discussions of the requirements of Provision C are provided below.

Provision C.1 (Non-storm Water Action Levels) requires the Copermittees to incorporate NALs into the Water Quality Improvement Plan for pollutants and/or constituents that are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions identified in the Water Quality Improvement Plan related to non-storm water discharges from the MS4s. NALs generally must be consistent with the water quality objectives found within the Basin Plan.

The NALs have been included to ensure that the Copermittees are implementing and complying with several requirements of the MS4 permit. The federal CWA requires permits for municipal storm sewer systems to "*effectively prohibit non-storm water discharges into the storm sewers*." The federal NPDES regulations, which were promulgated to implement the CWA requirements for discharges from municipal storm sewers, require a program to address illicit discharges, which are non-storm water discharges. Provision A.1.b prohibits "*[n]on-storm water discharges into MS4s*" unless the non-storm water discharge authorized by a separate NPDES permit. The NALs will be used as part of the illicit discharge detection and elimination program required pursuant to Provision E.2, as well as part of the MS4 discharges assessments required pursuant to Provision D.4.b.

Provision A.1.a prohibits non-storm water discharges from the MS4 from "*causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state.*" In addition, pursuant to Provision A.2.a, non-storm water discharges "*must not cause or contribute to the violation of water quality standards in any receiving waters*."

Ideally, the Copermittees' jurisdictional runoff management programs will eliminate all non-storm water discharges entering the MS4s within their jurisdictions. The complete elimination of non-storm water discharges to the Copermittees' MS4s would be in compliance with the CWA requirements for non-storm water discharges, as well as the prohibitions and limitations of Provisions A.1.a and A.2.a.

The federal regulations, however, also refer to several non-storm water discharge categories that must be addressed as illicit discharges if they are found to be a source of pollutants. The federal regulations thus identify some non-storm water discharges that are not required to be addressed as illicit discharges if they are not a source of pollutants (e.g. non-storm water discharges specified in Provisions E.2.a.(1)-(5)). Thus, these regulations imply that some non-storm water discharges into and from the MS4 may occur even if non-storm water discharges are "effectively" prohibited by the Copermittees.

If the source of a non-storm water discharge is identified as a category of non-storm water specified in Provisions E.2.a.(1)-(5), the NALs can be used to determine if the category of non-storm water discharges is a source of pollutants. For other non-storm water discharges not specified in Provisions E.2.a.(1)-(5), the CWA requires those discharges to be "*effectively"* prohibited by removing the discharge to the MS4 through enforcement of the Copermittees' legal authority established under "*ordinance, order or similar means*" to prohibit illicit discharges to the MS4s.

If there are non-storm water discharges that are not required to be addressed as illicit discharges, those discharges must comply, at a minimum, with the discharge prohibitions and receiving water limitations of Provision A. Thus, the non-storm water discharges from the MS4 must be at levels that will not cause or contribute to a condition of pollution, contamination, or nuisance (Provision A.1.a), and must not cause or contribute to a violation of water quality standards in receiving waters (Provision A.2.a) to be consistent with the discharge prohibitions and receiving water limitations of Provisions A.1.a and A.2.a.

Furthermore, the San Diego Region has predominantly intermittent and ephemeral rivers and streams which vary in flow volume and duration at spatial and temporal scales. For most of these river and stream systems, non-storm water discharges from the MS4 are likely to be the most significant or the only source contributing to surface flows present within the receiving water, especially during the dry season.

Therefore, because of the prohibitions and limitations of Provision A.1.a and A.2.a, and the likelihood that non-storm water discharges from the MS4 are the most significant or only source contributing to surface flows present within the receiving water, NALs generally must be consistent with the water quality objectives found within the Basin Plan. Non-storm water discharges that are meeting the NALs would not be expected to cause or contribute to an exceedance of water quality objectives in receiving waters, which would be consistent with the discharge prohibitions and receiving water limitations of Provisions A.1.a and A.2.a.

Exceedances of the NALs would then provide an indication of the relative severity of a pollutant in non-storm water discharges from the MS4 contributing to potential or observed receiving water quality impacts. The relative severity or significance of a pollutant in non-storm water discharges from the MS4 will provide the Copermittees a valuable source of information that can be used to identify priority water quality conditions within a Watershed Management Area and within each Copermittee's jurisdiction.

Tables C-1 through C-4 under Provision C.1.a specify numeric NALs for several parameters or pollutant constituents for non-storm water discharges from the MS4 to several water body types. The NALs for MS4 discharges given under Provision C.1.a are based on the water quality objectives for inland surface waters in the Basin Plan, and the water quality objectives for ocean waters in the Ocean Plan. The NALs for

most of the metals were calculated based on the State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP). The NALs provided in Tables C-1 through C-4 must be included in the Water Quality Improvement Plans required to be developed pursuant to Provision B.

Provision C.1.b requires the Copermittees to identify NALs for pollutants and/or constituents, not specified in Provision C.1.a, which are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions of the Watershed Management Area related to non-storm water discharges from the MS4s. The NALs must be based on the water quality objectives in the Basin Plan. The NALs identified under Provision C.1.b must be included in the Water Quality Improvement Plan.

The San Diego Water Board recognizes that some of the NALs required pursuant to Provisions C.1.a and C.1.b may be exceeded more frequently than not. Thus, Provision C.1.c has been included in the Order to provide the Copermittees the option to develop secondary NALs that are set at levels greater than the levels required pursuant to Provisions C.1.a and C.1.b to further refine the prioritization and assessment of water quality improvement strategies for addressing non-storm water discharges to and from the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and from the MS4.

Provision C.2 (Storm Water Action Levels) requires the Copermittees to incorporate SALs into the Water Quality Improvement Plan for pollutants and/or constituents causing or contributing, or may be causing or contributing, to the highest priority water quality conditions identified in the Water Quality Improvement Plan related to storm water discharges from the MS4s.

The SALs have been included to ensure that the Copermittees are implementing and complying with several requirements of the MS4 permit. Provision A.1.a prohibits storm water discharges from the MS4 from "*causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state.*" In addition, pursuant to Provision A.2.a, storm water discharges "*must not cause or contribute to the violation of water quality standards in any receiving waters*."

Provision A.3.a, however, implicitly acknowledges that compliance with Provisions A.1.a and A.2.a cannot be achieved immediately for discharges of storm water from the MS4 by applying the MEP standard. Thus, Provision A.4 requires the Copermittees to implement an iterative approach to demonstrate that MEP is being achieved. This approach is supported by USEPA.

The federal CWA requires permits for municipal storm sewer systems to "*require controls to reduce the discharge of pollutants [in storm water] to the maximum extent*

practicable, *including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants.*" MEP is an ever-evolving, flexible, and advancing concept. As knowledge about controlling storm water runoff and discharges evolves, so does the knowledge which constitutes MEP. Reducing the discharge of storm water pollutants from the MS4 to the MEP requires the Copermittees to assess their jurisdictional runoff management programs and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP. The SALs provide the Copermittees measureable goals that may be used to demonstrate the achievement of MEP for reducing pollutants in storm water discharges from the MS4. The SALs will be used as part of the MS4 discharges assessments required under Provision D.4.a.

In June of 2006, the State Water Board's Blue Ribbon Storm Water Panel released its report titled "*The Feasibility of Numerical Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities*." In the recommendations, the Blue Ribbon panel proposed storm water effluent limitations which are computed using statistical based population approaches. The SALs specified in Table C-5 under Provision C.2.a were developed from a regional subset of nationwide Phase I MS4 data by using USEPA Rain Zone 6 (arid west) data.[28] Additionally, utilization of regional data is appropriate due to the addition of data into the nationwide Phase I MS4 monitoring dataset in February 2008. This additional data increased the number of USEPA Rain Zone 6 samples to more than 400, and included additional monitoring events within Southern California.

Utilizing data from USEPA Rain Zone 6 resulted in SALs which closely reflect the environmental conditions experienced in the San Diego Region. The localized subset of data includes sampling events from multiple Southern California locations including Orange, San Diego, Riverside, Los Angeles, and San Bernardino Counties. The dataset includes samples taken from highly built-out impervious areas and from storm events representative of Southern California conditions.

The SALs for cadmium, copper, lead and zinc require the measurement of hardness and to provide more specificity in the assessment of samples with SALs for total metal concentrations. While USEPA Rain Zone 6 data include a large sample size for concentrations of total metals, the impact the concentration will have on receiving waters will vary with receiving water hardness. Since it is the goal of the SALs, through the iterative process and MEP standard, to have MS4 storm water discharges meet all applicable water quality objectives, the hardness of the receiving water should be used when assessing the total metal concentration of a sample.

Thus, when there is an exceedance of a SAL for a metal, the Copermittee must determine if that exceedance is above the existing applicable water quality objectives

[28] Data used to develop SAL were obtained from http://rpitt.eng.ua.edu/Research/ms4/mainms4.shtml

based upon the hardness of the receiving water. The water quality objectives Copermittees must use to assess total metal SAL exceedances are the California Toxic Rule (CTR) and USEPA National Recommended Water Quality Criteria for Freshwater Aquatic Life 1 hour maximum concentrations. The 1-hour maximum concentration is to be used for comparison since it is expected to most replicate the impacts to waters of the State from the first flush following a precipitation event.

The statistically calculated SALs given in Table C-5 are at levels greater than the water quality objectives in the Basin Plan or Ocean Plan. Because the objective of the CWA is to "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*", meaning eventually pollutants in storm water discharges must be reduced to a level that cannot cause or contribute to an exceedance of water quality objectives in receiving waters, over time the SALs are expected to be reduced to a level that is based on the water quality objectives rather than statistical calculations. The San Diego Water Board will review the SALs as more data for discharges of storm water from the MS4s are collected, and revise them as conditions improve and the MEP standard advances. For the Water Quality Improvement Plans required under this Order, the SALs identified under Provision C.2.a must be included.

Provision C.2.b requires the Copermittees to identify SALs for pollutants and/or constituents, not specified in Provision C.2.a, which are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions of the Watershed Management Area related to storm water discharges from the MS4s. The SALs identified under Provision C.2.b must be included in the Water Quality Improvement Plan.

The San Diego Water Board recognizes that some of the SALs required pursuant to Provisions C.2.a and C.2.b may be exceeded more frequently than not. Thus, Provision C.2.c has been included in the Order to provide the Copermittees the option to develop secondary SALs that are set at levels greater than the levels required pursuant to Provisions C.2.a and C.2.b to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s.

D. Monitoring and Assessment Program Requirements

Purpose: Provision D includes minimum monitoring and assessment requirements that must be developed and implemented by the Copermittees as part of the Water Quality Improvement Plans. Implementation of the monitoring and assessment requirements of Provision D will allow the Copermittees to demonstrate that the requirements of the CWA to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP are being achieved. Implementation of the monitoring and assessment requirements of Provision D will also allow the Copermittees and the San Diego Water Board to track improvements to the water quality in the San Diego Region. The monitoring and assessment program requirements are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order.

***Discussion*:** The San Diego Water Board recognized that changes to the monitoring and assessment requirements of the Fourth Term Permit were necessary to improve the usefulness and usability of monitoring data collected by the Copermittees to support their jurisdictional storm water programs more efficiently and with increased effectiveness. The data collected are needed to better inform the Copermittees' understanding of the physical, chemical, and biological condition of the receiving waters and the quality of the MS4 discharges. The monitoring program needs to provide opportunities for the Copermittees to integrate regional monitoring efforts into municipal storm water monitoring requirements to provide a cost-effective approach to monitoring and avoid duplication of efforts.

The requirements in Provision D were largely recommended by the Copermittees as an outcome of the San Diego Water Boards Focused Meeting process. The monitoring and assessment program requirements now require collection of more specific information necessary for each Copermittee to adapt its jurisdictional runoff management program in such a way that focuses resources on a watershed's highest priority water quality conditions. The monitoring and assessment program will require the Copermittees to collect data that can be utilized to answer both watershed level management questions (e.g. Are the chemical, physical, and biological conditions of a receiving water protective, or likely protective of beneficial uses?), and specific jurisdictional runoff management program activity questions (e.g. Are the water quality improvement strategies of the jurisdictional program effectively eliminating non-storm water discharges to the MS4?).

The monitoring data collected and assessment information that will be reported to the San Diego Water Board are necessary to determine if the Copermittees are complying with the prohibitions and limitations of Provision A. The required monitoring and assessments that must be reported to the San Diego Water Board will be utilized for three purposes:

(1) Inform the Copermittees, San Diego Water Board, and the public on the progress of the Copermittees' efforts to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP;

(2) Inform the Copermittees, San Diego Water Board, and the public on the condition of water bodies receiving discharges from the Copermittees' MS4, and the progress of the Copermittees' water quality improvement implementation efforts toward improving the receiving water quality; and

(3) Inform the Copermittees, the San Diego Water Board, and the public on the effectiveness of the Water Quality Improvement Plan toward achieving (1) and (2).

The monitoring and assessment information reported pursuant to Provision F is also expected to be key to the iterative approach and adaptive management process required under Provision A.4 and implemented through the Water Quality Improvement Plan required under Provision B. As required by Provision A.4, the iterative approach and adaptive management process is required if the Copermittees cannot meet the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c, and/or A.2.a under the present conditions.

Provision D provides the minimum monitoring and assessment requirements that must be included in each Water Quality Improvement Plan to be developed and implemented by the Copermittees. The Copermittees, however, are not limited to the requirements of Provision D and may include additional methods to track progress toward improving water quality in a Watershed Management Area.

More specific and detailed discussions of the requirements of Provision D are provided below.

Provision D.1 (Receiving Water Monitoring Requirements) specifies the minimum receiving water monitoring that the Copermittees must conduct within the Watershed Management Area and include as part of the Water Quality Improvement Plan.

Provision D.1 establishes minimum monitoring requirements that must be conducted by the Copermittees within each Watershed Management Area. Provision D.1 requires the Copermittees to collect and develop the data and information necessary to determine potential impacts to the beneficial uses in the receiving waters due to discharges from the MS4s. The monitoring required under Provision D.1 will also provide the data that will allow the Copermittees to gauge the effectiveness and progress of its Water Quality Improvement Plan implementation efforts toward improving the quality of receiving waters.

The receiving water monitoring requirements of Provision D.1 are focused primarily on monitoring the conditions and response of the receiving waters to the Copermittees'

collective implementation efforts to reduce receiving water impacts that may be caused by the discharges from the MS4s. The preference of the San Diego Water Board is for the Copermittees to spend their resources achieving tangible and observable improvements in receiving water conditions instead of collecting samples and analyzing data that has consistently indicated that receiving water conditions are degraded and require improvement. In general, the ability to measure potential improvements in receiving water conditions due to any actions implemented by the Copermittees as part of the Water Quality Improvement Plan may require several years before a response can be observed. Thus, the frequency of collecting receiving water monitoring data has been kept to a minimum.

During the transitional period between adoption of this Order and San Diego Water Board acceptance of a Water Quality Improvement Plan, the Copermittees must conduct receiving water monitoring in accordance with Provision D.1.a. This approach to collecting receiving water data is different from what was required in the Fourth Term Permits, but one that truly embraces the concept of an integrated, cost-effective, streamlined receiving water monitoring approach.

Provision D.1.a requires Copermittees to continue performing the receiving water monitoring programs required in Order Nos. R-2007-0001, R9-2009-002, and R9-2010-0016; plus participation in: hydromodification management plan monitoring approved by the San Diego Water Board, monitoring plans as part of load reduction plans (either Bacteria Load Reduction Plans or Comprehensive Load Reduction Plans) for TMDLs in Attachment E of the Order, Storm Water Monitoring Coalition Regional Monitoring, Southern California Bight Regional Monitoring, Sediment Quality Monitoring, and ASBS Monitoring as applicable to a Watershed Management Area.

Provision D.1.a also provides an opportunity for the Copermittees to use third party data to meet receiving water monitoring requirements where feasible. Allowing the Copermittees to use the data currently collected through its participation in existing regional receiving water programs and that of third parties provides an efficiency of resources in obtaining the data necessary to inform the Copermittees and the San Diego Water Board about the physical, chemical, and biological conditions of the receiving waters, which can also help to focus the receiving water monitoring during the implementation of the Water Quality Improvement Plan. Once a Water Quality Improvement Plan is developed for a Watershed Management Area in compliance with Provision B of this Order, the transitional period is over and Copermittees are required to conduct receiving water monitoring according to the requirements of Provisions D.1.b-e.

Provision D.1.b requires each Copermittee to identify at least one long term receiving water monitoring station to be representative of receiving water quality within each Watershed Management Area. Long term receiving water monitoring stations can be located at any existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees. The requirements under Provision D.1.b. are

consistent with 40 CFR 122.26(d)(2)(iii)(D), which specifies that a "*monitoring program for representative data collection for the term of the permit*" may include "*instream locations.*" For each Watershed Management Area, at least one long term watershed monitoring station is required to be established and monitored. The Copermittees may choose to establish additional long term monitoring stations where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

Provision D.1.b. requires the Copermittees to locate the long term receiving water monitoring station at one of these existing receiving water monitoring stations to provide the Copermittees an opportunity to experience monitoring cost savings while continuing to collect the necessary data to assess the status and trends of receiving water quality conditions in 1) coastal water, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under both dry weather and wet weather conditions. Ideally these stations will continue to be monitored as part of the receiving water monitoring for each Watershed Management Area to maintain a consistent set of locations and a period of data that can be built upon with the monitoring required under this Order.

The receiving water monitoring requirements are separated into monitoring required during dry weather conditions pursuant to Provision D.1.c, and wet weather conditions pursuant to Provision D.1.d.

At each long term monitoring station the Copermittees must conduct at least three dry weather monitoring events as required pursuant to Provision D.1.c and at least three wet weather monitoring events as required pursuant to Provision D.1.d per permit term. Provisions D.1.c and D.1.d require the Copermittees to monitor priority water quality conditions identified in the Water Quality Improvement Plan, constituents listed as causing impairment of receiving waters in the Watershed Management Area, applicable NALs, toxicity, constituents listed in Tables D-2 and D-3, and constituents for implementation plans (e.g. Bacteria Load Reduction Plans and Comprehensive Load Reduction Plans). Required toxicity monitoring was changed to reflect an updated understanding of the unique challenges associated with sampling storm water for toxicity. Copermittees are required to sample receiving water for toxicity during each dry weather and each wet weather event pursuant to Provision D.1.c.(4) and D.1.d.(4). Required toxicity monitoring is now consistent with the State Water Resources Control Board Policy for Toxicity Assessment and Control (Draft June 2012) and recently adopted MS4 permits for Caltrans and Los Angeles Water Board. Receiving water monitoring efforts in this Order have been streamlined to redirect resources to monitoring efforts that better support pollutant reduction solutions with an increasing emphasis on MS4 outfall monitoring, source identification, and source abatement activities.

In addition to the receiving water monitoring requirements under Provisions D.1.b-d, Provision D.1.e requires the Copermittees participate in and/or conduct other types of receiving water monitoring. As recommended and requested by the Copermittees, Provision D.1.e.(1) requires the Copermittees to participate in existing regional monitoring, as applicable to each Watershed Management Area. Existing regional

monitoring includes monitoring conducted by the Storm Water Monitoring Coalition and for the Southern California Bight. Participation in and use of monitoring data collected from these existing regional water quality monitoring programs provide the Copermittees a greater opportunity for efficiency in the use of their resources to manage their storm water programs and those controllable discharges under their authority.

Provision D.1.e.(1)(c) requires the south Orange County MS4 Copermittees to participate in "unified regional beach water quality monitoring." This monitoring replaces requirements to conduct "core monitoring" of beach water quality, as provided for in Appendix III of the Ocean Plan.

Several different public agencies currently conduct routine, ongoing beach water quality monitoring in south Orange County in accordance with several different sets of requirements. The monitoring programs implemented to meet those requirements overlap temporally and spatially. These monitoring programs are partially but not fully integrated. In November 2010, the State Water Board adopted Resolution No. 2010-0053, which directed Regional Water Boards to work with dischargers to modify beach water quality monitoring programs required by Regional Water Board-issued permits in order to eliminate redundancies and incorporate beach water quality monitoring required by beach water quality statutes, where appropriate.

In April 2012, the San Diego Water Board requested that its staff review beach water quality monitoring conducted in south Orange County. To assist in responding to that request, staff of the Board convened a workgroup that included representatives of the three public agencies that currently conduct almost all of the routine, ongoing beach water quality monitoring in south Orange County, i.e., South Orange County Wastewater Authority (SOCWA), Orange County Public Works, and Orange County Health Care Agency (OCHCA). The workgroup also included other interested parties, including representatives of the Sierra Club and Surfrider Foundation. In December 2012, the San Diego Water Board adopted Resolution No. R9-2012-0069, which endorsed the San Diego Water Board staff report entitled "A Framework for Monitoring and Assessment in the San Diego Region," dated November 2012.

The unified program is consistent with and will meet or exceed the minimum requirements for beach water quality monitoring and related public notification and reporting established by State law, including the Ocean Plan. The unified program is consistent with State Water Board Resolution No. 2010-0053. The unified program is also consistent with and will help implement, "A Framework for Monitoring and Assessment in the San Diego Region," which emphasizes the need for question-driven, beneficial use-oriented monitoring and assessment. The primary purpose of the unified program will be to answer the question "Does beach water quality meet standards for the beneficial use of water contact recreation?"

The unified program is intended to be protective; it will help protect the health of swimmers, surfers, and others who use south Orange County beach waters for water

contact recreational activities. The unified program is also intended to be reasonable; it will eliminate duplicative monitoring and will include triggers for public notification and additional sampling at all sampling stations year-round. The unified program is intended to be equitable; responsibility for implementation of the unified program will be shared and the responsible agencies will jointly make arrangements to implement the program and will have the flexibility to jointly make short and/or long term changes in those arrangements.

The San Diego Water Board Executive Officer issued a written directive on December 5, 2014, pursuant to California Water Code section 13383, for SOCWA and the south Orange County MS4 Copermittees to implement the unified program in cooperation with OCHCA. The Executive Officer may make revisions to the unified program, provided that the unified program, as revised, continues to be consistent with and meet the requirements of State law, including the Ocean Plan, for beach water quality monitoring and related public notification and reporting. Following a thirty day public comment period, and subject to a request for a hearing before the San Diego Water Board, any such revision shall take effect as specified in a written directive issued by the Executive Officer pursuant to CWC section 13383. The program and any Executive Officer issued revisions to the program are subject to CWC section 13320 right of review from the date of issuance.

The unified program will supersede the existing routine, ongoing, beach water quality monitoring programs in south Orange County that are conducted in accordance with the existing requirements of the NPDES permits for discharges from the SOCWA ocean outfalls and the south Orange County MS4s. The requirement to participate in "regional monitoring" of beach water quality replaces requirements to conduct "core monitoring" of beach water quality, as provided for in Appendix III of the Ocean Plan.

The State Water Resources Control Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part 1 Sediment Quality which became effective August 25, 2009 (Sediment Quality Monitoring Policy). Provision D.1.e.(2) requires any Copermittees with MS4 discharges to an enclosed bay or estuary to monitoring the sediments in the enclosed bay or estuary receiving water in accordance with the sediment quality monitoring procedures as prescribed in the Sediment Quality Monitoring Policy.

The State Water Board adopted Resolution No. 2012-0012 which approved exceptions to the California Ocean Plan for selected discharges into Areas of Special Biological Significance (ASBS), including special protections for beneficial uses. State Board Resolution No. 2012-0012 became effective on March 20, 2012, and Attachment B to the Resolution established limitations on point source storm water discharges to ASBS. Copermittees with MS4s that discharge to an ASBS must monitor its discharge to assure compliance with State Board Resolution No. 2012-0012 as required pursuant to Provision D.1.e.(3).

The San Diego Water Board is developing a regional monitoring strategy to assess the conditions of receiving waters in the San Diego Region. The monitoring requirements of Provision D.1 are expected to be incorporated or serve as a foundation of this regional monitoring strategy, but may require some modifications. When the San Diego Water Board develops an alternative regional monitoring strategy, the Copermittees will be required to participate in the development and implementation of the alternative regional monitoring program pursuant to Provision D.1.f.

Provision D.2 (MS4 Outfall Discharge Monitoring Requirements) specifies the minimum MS4 outfall discharge monitoring requirements that the Copermittees must incorporate and implement as part of the Water Quality Improvement Plan.

The dry weather MS4 outfall discharge monitoring requirements are included under Provisions D.2.a.(2) and D.2.b. The dry weather MS4 outfall discharge monitoring requirements are part of the "*program, including a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer*" required by 40 CFR 122.26(d)(2)(iv)(B), which is expected to achieve compliance with the CWA section 402(p)(3)(B)(ii) statutory requirement for municipal storm water permits to require the Copermittees to "*effectively prohibit non-storm water discharges into the storm sewers*." The dry weather MS4 outfall discharge monitoring data collection requirements are based on requirements under 40 CFR 122.26(d)(1)(iv)(D) and 122.26(d)(2)(iv)(B)(3).

The dry weather MS4 outfall discharge monitoring requirements are designed to provide wide spatial and temporal coverage of each jurisdiction to better understand the extent and magnitude of non-storm water discharges to receiving waters, and make a distinction between persistent and transient non-storm water flows. This information is expected to allow each Copermittee to focus its resources on eliminating and controlling the highest priority threats to receiving water quality, as well as integrating other elements of the storm water programs (e.g. complaint call response) and third party data to efficiently and effectively assist in efforts to eliminate non-storm water discharges.

The dry weather MS4 outfall discharge monitoring requirements of Provision D.2.a.(2) and D.2.b are separated into monitoring required before and after the San Diego Water Board accepts the Copermittees' Water Quality Improvement Plan. Outfall monitoring conducted prior to acceptance of the Water Quality Improvement Plan is referred to in the Order as Transitional MS4 Outfall Discharge Monitoring. Provision D.2.a.(2) includes the transitional dry weather MS4 outfall discharge monitoring requirements.

The requirements under Provision D.2.a.(2) are based on the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B), which include the requirements for a monitoring program to identify, detect, and eliminate illicit connections and illegal discharges to the MS4s. The federal regulations (40 CFR 122.26(d)(1)(iv)(D)) require

the monitoring program to include "*a field screening analysis for illicit connections and illegal dumping [that]…[a]t a minimum, include[s] a narrative description, for either each field screening point or major outfall, of visual observations made during dry weather periods.*" The federal regulations (40 CFR 122.26(d)(1)(v)(B)) require the monitoring program to include "*inspection procedures and methods for detecting and preventing illicit discharges, and describe areas where this program has been implemented.*" Furthermore, the monitoring program is required by federal regulations (40 CFR 122.26(d)(2)(iv)(B)) to include "*a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer.*"

Dry weather transitional MS4 outfall discharge monitoring requires each Copermittee to field screen (inspect) its major MS4 outfalls to classify the MS4 outfall locations as having persistent dry weather flows, transient dry weather flows, or no dry weather flows. To account for the variance in size of the 39 jurisdictions covered under this Order, the Copermittees recommended a tiered approach to the number of major MS4 outfalls that must be inspected. Provision D.2.a.(2)(a) provides a tiered approach to the number of major MS4 outfalls that must be visually inspected per jurisdiction as well as a minimum frequency each Copermittee must inspect each major MS4 outfall per year. This tiered approach is based on the total number of major MS4 outfalls within a Copermittees jurisdiction within each Watershed Management Area.

Based on the field screening, each Copermittee is required to make a determination whether any observed flowing, pooled, or ponded waters are transient or persistent flows. Based on this field screening information, other jurisdictional program information, and third party information, each Copermittee is required to prioritize the MS4 outfalls within its jurisdiction for follow up investigation and elimination of the non-storm water discharge, as part of its illicit discharge detection and elimination program required pursuant to Provision E.2. In accordance with the requirements of Provision E.2, each Copermittee is required to immediately investigate obvious illicit discharges (e.g. outfall discharges with unusual color, unusual odor, or high flows).

This approach allows a Copermittee to use all of its resources, as well as leverage resources and information provided by third parties, to effectively eliminate non-storm water discharges from its MS4 outfalls. If the source of the non-storm water discharge cannot be immediately eliminated, the Copermittee uses the persistent flow or transient flow classification along with other programmatic implementation data to prioritize the MS4 outfalls for future investigation. In accordance with the adaptive management approach deployed throughout this Order, Provision D.2.a.(2)(c) requires each Copermittee to update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow. The requirement of Provision D.2.a.(2)(c) assures that each Copermittee is collecting data that can be used to demonstrate compliance with the CWA requirement that each Copermittee must implement a program to "*effectively*

prohibit non-storm water discharges into the [MS4]" and with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

Provision D.2.b describes the dry weather MS4 outfall discharge monitoring required to be incorporated and implemented as part of the Water Quality Improvement Plan. Dry weather MS4 outfall discharge monitoring must be performed by each Copermittee to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. The emphasis of the dry weather MS4 outfall discharge monitoring required pursuant to Provision D.2.b is consistent with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

Provision D.2.b.(1) requires each Copermittee to continue field screening its major MS4 outfalls and identifying those with persistent flows and transient flows, as conducted during the transitional period (i.e. before the Water Quality Improvement Plan was developed). However, each Copermittee now has the flexibility to adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of non-storm water persistent flow discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan. In order to ensure a minimum number of outfalls are inspected, Provision D.2.b.(1) requires the number of visual inspections be equal to the number of visual inspections required in the tiered inspection program pursuant to Provision D.2.a.(2)(a).

Provision D.2.b.(2)(b) requires each Copermittee to monitor a minimum of 5 major MS4 outfalls with persistent flows identified as the highest priorities within a Copermittee's jurisdiction, within each Watershed Management Area. In other words, Copermittees located in more than one Watershed Management Area must identify at least 5 major MS4 outfalls with persistent flows in its jurisdiction in each Watershed Management Area. If a Copermittee is located in more than one Watershed Management Area, and they have less than 5 major MS4 outfalls with persistent flows per jurisdictional area per Watershed Management Area, all of the major MS4 outfalls must be identified as high priority dry weather persistent flow MS4 outfalls. The Copermittees identified as Responsible Copermittees by a TMDL in Attachment E of the Order may need to monitor more than 5 dry weather major MS4 outfall locations to determine compliance with the requirements of the TMDL(s).

Monitoring must occur at the highest priority outfall locations at least semi-annually until the non-storm water discharges have been eliminated for three consecutive dry weather monitoring events; identified to be authorized by a separate NPDES Permit; or reprioritized to a lower priority. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized MS4 major outfall in the Copermittee's jurisdiction within the Watershed Management Area, unless there are no remaining qualifying major MS4 outfalls within the Copermittees jurisdiction. The Copermittees must continually update their dry weather persistent

flow MS4 outfall discharge monitoring locations with the next highest priority non-storm water flow that have yet to be eliminated until all persistent and transient flows are eliminated or its threat reduced.

Non-storm water persistent flow MS4 outfall discharge monitoring data collected during each semi-annual monitoring event, must be collected and analyzed according to the requirements of Provision D.2.b.(2)(b)-(e). These monitoring requirements are consistent with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

The wet weather MS4 outfall discharge monitoring requirements are included under Provisions D.2.a.(3) and D.2.c. The wet weather MS4 outfall discharge monitoring requirements are necessary for the Copermittees to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable, using management practices, control techniques and system, design and engineering methods, and such other provisions which are appropriate*" required by 40CFR 122.26(d)(2)(iv), which is expected to achieve compliance with the CWA section 402(p)(3)(B)(iii) statutory requirement for municipal storm water permits to require "*controls to reduce the discharge of pollutants [in storm water] to the maximum extent practicable*." The wet weather MS4 outfall discharge monitoring data collection requirements are based on requirements under 40 CFR 122.26(d)(2)(iii), 122.26(d)(2)(iii)(A) and 122.26(d)(2)(iii)(A)(1)-(4), and 40 CFR 122.21(g)(7)(i)-(ii).

The wet weather MS4 outfall discharge monitoring requirements of Provision D.2.a.(3) and D.2.c are separated into monitoring required before and after the San Diego Water Board accepts the Copermittees' Water Quality Improvement Plan. Outfall monitoring conducted prior to acceptance of the Water Quality Improvement Plan is referred to in the Order as Transitional MS4 Outfall Discharge Monitoring. Provision D.2.a.(3) includes the transitional wet weather MS4 outfall discharge monitoring requirements.

Until the wet weather MS4 outfall discharge monitoring requirements of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board, the Copermittees must comply with the requirements of transitional wet weather MS4 outfall monitoring requirements pursuant to Provision D.2.a.(3). Provision D.2.a.(3) requires the Copermittees in each Watershed Management Area to sample, at least five of the major MS4 outfalls inventoried pursuant to Provision D.2.a.(1) once per wet season for the monitoring data required to be collected pursuant to Provision D.2.a.(3)(c)-(e). Provision D.2.a.(3) further requires at least one major MS4 outfall monitoring station be located in each Copermittee's jurisdiction within the Watershed Management Area.

At a minimum, the five sampling locations chosen must be representative of storm water discharges from residential, commercial, industrial, and typical mixed-use land uses present within a Watershed Management Area. The San Diego Water Board expects the Copermittees to extrapolate from these data to similar land uses

throughout the Watershed Management Area to better inform the Water Quality Improvement Plan development process by prioritizing drainages for implementation of storm water control efforts required pursuant to Provision E.

Provision D.2.c describes the wet weather MS4 outfall discharge monitoring required to be included and implemented as part of the Water Quality Improvement Plan. Provision D.2.c provides the Copermittees the flexibility to adjust the wet weather MS4 outfall discharge monitoring locations and frequencies in the Watershed Management Area, as needed, to identify sources of pollutants in storm water discharges from MS4s in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan.

Although Provision D.2.c.(1) allows the Copermittees to adaptively manage the wet weather MS4 outfall discharge monitoring locations and frequencies, the provision requires a minimum of at least five wet weather outfall stations to be monitored. Provision D.2.c.(2) further allows the Copermittees to modify the monitoring frequency at each wet weather MS4 outfall station to meet the goals of the Water Quality Improvement Plan as long as the monitoring frequency occurs at least once per year and is at an appropriate frequency to identify sources of pollutants in storm water discharges, guide pollutant source identification efforts, or determine compliance with the requirements of the applicable TMDLs in Attachment E to the Order.

The wet weather MS4 outfall discharge monitoring requirements of Provisions D.2.c.(3) and D.2.c.(4) are the same as the transitional wet weather MS4 outfall discharge monitoring. In contrast, the requirements of Provision D.2.c.(5) are focused on collecting analytical data specific to the highest priority water quality conditions in the Watershed Management Area identified in the Water Quality Improvement Plan. The wet weather MS4 outfall discharge monitoring data collection requirements are consistent with the requirements under 40 CFR 122.26(d)(2)(iii), 122.26(d)(2)(iii)(A) and 122.26(d)(2)(iii)(A)(1)-(4), and 40 CFR 122.21(g)(7)(i)-(ii).

Provision D.3 (Special Studies) requires the Copermittees to develop special studies that will be conducted for each Watershed Management Area and the entire San Diego Region. Data collected pursuant to Provision D.3 is to be used by the Copermittees to improve the effectiveness of the strategies implemented by the jurisdictional runoff management programs toward achieving the numeric goals identified in the Water Quality Improvement Plans and ultimately achieve compliance with the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c, and A.2.a, which is consistent with the requirements of Provision A.4.

Special studies are often necessary to fill data gaps or provide more refined information that allow the Copermittees to better manage the generation or elimination of pollutants and discharges to and from the MS4. In the Fourth Term Permits, the Copermittees have been required to implement special studies as directed by the San Diego Water Board. The special studies required by this Order provide the Copermittees more flexibility to identify and implement special studies that will be most

useful to improving the effectiveness of their jurisdictional runoff management programs.

Provision D.3.a.(1) requires the Copermittees to develop and conduct at least two special studies per Watershed Management Area, to be determined by the Copermittees. One of the two special studies may be accomplished through participation in a Regional Special Study required under Provision D.3.a.(2). The requirements provide the Copermittees great latitude in identifying and developing the special studies. Watershed Management Area special studies are required, at a minimum, to: (a) relate in some way to the highest water quality priorities identified by the Copermittees in the Water Quality Improvement Plan, (b) be conducted within the Watershed Management Area, and (c) include some form of participation (e.g. contribution of funds, personnel services, project management) by all the responsible Copermittees within the Watershed Management Area.

Examples of Watershed Management Area special studies might include, but are not limited to: (1) focused pollutant source identification studies, (2) BMP effectiveness and/or comparison studies, (3) pilot tests for new or emerging pollutant control methods, (4) receiving water pollutant or stressor source identification and/or mitigation studies, or (5) pollutant fate and transport studies. The Watershed Management Area special studies are expected to provide data that can be utilized by the Copermittees to improve the Water Quality Improvement Plan or implementation of the Copermittees' jurisdictional runoff management programs to address the highest priority water quality conditions.

Provision D.3.a.(2) requires the Copermittees to develop at least one special study that will be conducted for the entire San Diego region. The regional special study is expected to provide data that can be utilized by the Copermittees to improve the Water Quality Improvement Plan or implementation of the Copermittees' jurisdictional runoff management programs to identify or address regional water quality concerns and priorities.

An example of a regional special study would be to develop and establish allowable exceedance frequencies of the bacteria water quality objectives for several types of water bodies, during different wet and dry weather conditions the San Diego region. The special study would be related to bacteria, which is a priority for the San Diego region due to the adoption of "*Bacteria TMDL Project I – Beaches and Creeks in the San Diego Region*." The study results could be used to inform the Copermittees and the San Diego Water Board about the indictor bacteria water quality objective exceedance frequencies that occur in natural or reference watersheds.

<u>Provision D.4 (Assessment Requirements)</u> specifies the assessments that the Copermittees are required to perform, based on the monitoring data collected, and will be reported as part of the Annual Report for the Water Quality Improvement Plan implementation. Provision D.4 requires the Copermittees assess the progress of the

water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c, and A.2.a.

Provision D.4 specifies the assessments that Copermittees must perform for each Watershed Management Area to assess the effectiveness of each Copermittee's jurisdictional runoff management program and the Water Quality Improvement Plan. The effectiveness of each Copermittee's jurisdictional runoff management program and Water Quality Improvement Plan is measured through these types of assessments: (a) Receiving Waters Assessments (b) MS4 Outfall Discharges Assessments, (c) Special Studies Assessments, and (d) Integrated Assessment of Water Quality Improvement Plan.

Provision D.4.a requires the Copermittees to assess the status of receiving water conditions annually during the transitional monitoring period (during development of the Water Quality Improvement Plan) and after acceptance of the Water Quality Improvement Plan. The monitoring data collected pursuant to Provision D.1 will be evaluated, among other information, to assess the condition of a Watershed Management Area's streams, coastal waters, enclosed bays, harbors, estuaries, and lagoons. The focus of the receiving waters assessments is to measure progress toward the objective of the CWA to "*restore and maintain the chemical, physical, and biological integrity of the Nation's waters*" as the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program are implemented within a Watershed Management Area. Provision D.4.a is consistent with 40 CFR 122.42(c)(7) which requires the Copermittees to annually report the *"[i]dentification of water quality improvements or degradation."*

Provision D.4.b includes the MS4 outfall discharges assessment requirements. The focus of MS4 outfall discharges assessments is to determine if the Copermittees' are implementing programs that comply with the requirements of the CWA for MS4 permits to "*effectively prohibit non-stormwater discharges into the storm sewers*" and "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable.*" The monitoring data collected pursuant to Provisions D.2 will be evaluated, among other information, to assess the effectiveness of the transitional MS4 outfall field screening monitoring, the implementation of the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program. The MS4 outfall discharge assessments consist of Non-Storm Water Discharges Reduction Assessments and Storm Water Pollutant Discharges Reduction Assessments.

The Non-Storm Water Discharges Reduction Assessments are how each Copermittee will demonstrate that its jurisdictional runoff management program implementation efforts are achieving the CWA requirement to "*effectively prohibit non-stormwater discharges into the storm sewers.*" Provision D.4.b.(1) requires each Copermittee to assess and report on its illicit discharge detection and elimination program required pursuant to Provision E.2 to reduce and effectively prohibit non-storm water and illicit discharges into the MS4 within its jurisdiction. The Non-Storm Water Discharges

Reduction Assessments include specific assessment requirements applicable to each Copermittee.

As each Copermittee collects and analyzes the data collected pursuant to dry weather MS4 outfall discharges monitoring requirements of Provisions D.2.a.(2) and D.2.b, Provision D.4.b.(1) requires each Copermittee to assess the progress, assess the effectiveness of its current actions, and identify modifications necessary to increase the effectiveness of its actions toward reducing and eliminating non-storm water and illicit discharges to its MS4. The findings from these assessments are expected to be utilized by the Copermittee as part of its procedures to prioritize the non-storm water discharges that will be addressed by its Illicit Discharge Detection and Elimination program required pursuant to Provision E.2.

The assessment requirements of Provision D.4.a.(1) are consistent with 40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(3) which require "*procedures…to investigate portions of the separate storm sewer system that, <u>based on the results of the field screen, or other appropriate information</u> [emphasis added], indicate a reasonable potential of contain illicit discharges or other sources of non-storm water*" as part of a "*program…to detect and remove…illicit discharges and improper disposal into the storm sewer.*" The assessment requirements of Provision D.4.a.(1) are also consistent with 40 CFR122.42(c)(1) requires the Copermittees to annually report the "*status of implementing the components of the storm water management program that are established as permit conditions.*"

The Storm Water Pollutant Discharges Reduction Assessment is how the Copermittees in each Watershed Management Area will demonstrate that their jurisdictional runoff management program implementation efforts are achieving the CWA requirement to "*reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable*." Provision D.4.b.(2) requires the Copermittees in each Watershed Management Area to assess and report the progress of the Copermittees' efforts to reduce pollutants in storm water discharges from the MS4s to the MEP. The Storm Water Pollutant Discharges Reduction Assessments include specific assessment requirements during both the transitional monitoring period and after acceptance of the Water Quality Improvement Plan applicable to the Watershed Management Area and each Copermittee.

As the Copermittees collect and analyze the data collected pursuant to wet weather MS4 outfall discharges monitoring requirements of Provisions D.2.a.(3) and D.2.c, Provision D.4.b.(2) requires the Copermittees to assess runoff conditions during the transitional period, and the progress of the Water Quality Improvement Plan strategies toward reducing pollutants in storm water from the MS4 to the MEP. The findings from these assessments are expected to be utilized by the Copermittees to identify any modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify sources of pollutants in storm water discharges from the MS4s, as well as focus, modify, and improve the water quality improvement

strategies implemented by each Copermittee within its jurisdiction to reduce pollutants in storm water discharges to the MEP.

The assessment requirements of Provision D.4.b.(2) are consistent with 40 CFR 122.26(d)(2)(iii)(B) which requires "*[e]stimates of the annual pollutant load of the cumulative discharges to waters of the United States from all identified municipal outfalls…during a storm event…accompanied by a description of the procedures for estimating constituent loads and concentrations, including any modeling, data analysis, and calculation methods.*" The assessment requirements of Provision D.4.a.(2) are consistent with 40 CFR 122.26(d)(2)(v) which requires that each Copermittee assesses the *"estimated reductions in loadings of pollutants from discharges of municipal storm sewer constituents from municipal storm sewer systems expected as the result of the municipal storm water quality management program."* The assessment requirements of Provision D.4.b.(2) are also consistent with 40 CFR122.42(c)(1) requires the Copermittees to annually report the "*status of implementing the components of the storm water management program that are established as permit conditions.*"

Provision D.4.c includes the special studies assessment requirements. Performing special studies are how the Copermittees will address data gaps identified during the development of and updates to the Water Quality Improvement Plan. The relevant findings from the special studies assessments are expected to be incorporated as part of the applicable receiving water assessments, MS4 outfall discharge assessments, and integrated water quality improvement assessments required in Provision D.4.a, D.4.b, and D.4.d, respectively.

The assessment requirements in Provision D.4.d are part of the iterative approach and adaptive management process required by Provision A.4. The Copermittees are required to integrate the data collected pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to re-evaluate the Water Quality Improvement Plan.

The monitoring data collected pursuant to Provisions D.1 and D.2, and the results of the assessment required pursuant to Provisions D.4.a-c, will be used to determine whether the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program are effective, or require modifications or improvements to become more effective to achieve the requirements of the CWA. The assessments required by Provision D.4.d are consistent with 40 CFR 122.42(c)(1) which requires that the Copermittees to report the *"[t]he status of implementing the components of the storm water management program that are established as permit conditions."*

E. Jurisdictional Runoff Management Programs

Purpose: Provision E includes the requirements for the jurisdictional runoff management programs to be implemented by each of the Copermittees. Compliance with the requirements for the jurisdictional runoff management programs will allow the Copermittees to demonstrate that they are implementing programs to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP. The jurisdictional runoff management program document prepared by each Copermittee will also provide the details for implementing the water quality improvement strategies identified in the Water Quality Improvement Plan specifically within its jurisdiction.

***Discussion*:** Implementation of the jurisdictional runoff management program requirements under Provision E is how the Copermittees "*effectively prohibit non-stormwater discharges into the storm sewer,*" and outlines the "*controls to reduce the discharge of pollutants to the maximum extent practicable"* consistent with the federal regulations under 40 CFR 122.26. The jurisdictional runoff management program is part of the "*comprehensive planning process*" that is required pursuant to 40 CFR 122.26(d)(2)(iv). Where the Water Quality Improvement Plan is the "*comprehensive planning process*" on a Watershed Management Area scale, requiring "*intergovernmental coordination,*" the jurisdictional runoff management program document is the "*comprehensive planning process*" on a jurisdictional scale that should be coordinated with the other Copermittees in the Watershed Management Area to achieve the goals of the Water Quality Improvement Plan.

The jurisdictional runoff management program requirements are included to provide each Copermittee criteria that can be used to demonstrate that its storm water management program is implementing the "*comprehensive planning process*" within its jurisdiction to "*effectively prohibit non-stormwater discharges into the storm sewers,*" and to identify and implement the most effective "*controls to reduce the discharge of pollutants to the maximum extent practicable"* in accordance with the performance standards given in the CWA.

Provision E includes the requirements for each of the components that must be included in the Copermittee's jurisdictional runoff management program document that will be implemented by the Copermittee within its jurisdiction. Implementation of the components of each Copermittee's jurisdictional runoff management program must incorporate the water quality improvement strategies identified by each Copermittee in the Water Quality Improvement Plans, described pursuant to Provision B.3.b.(1)(a).

More specific and detailed discussions of the requirements of Provision E are provided below.

Provision E.1 (Legal Authority Establishment and Enforcement) requires each Copermittee to establish and enforce sufficient legal authority to control discharges to the MS4 within its jurisdiction.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system*" and be able to demonstrate that it can "*operate pursuant to legal authority established by statute, ordinance or series of contracts.*" Provision E.1.a describes the minimum legal authorities each Copermittee must establish for itself within its jurisdiction to control discharges to its MS4. The requirements of Provision E.1.a are consistent with the requirements set forth in 40 CFR 122.26(d)(2)(i)(A)-(F).

The certification statement required from each Copermittee by Provision E.1.b is included to provide the San Diego Water Board additional documentation that each Copermittee has established the legal authorities consistent with Provision E.1.a and 40 CFR 122.26(d)(2)(i)(A)-(F), and the Copermittee can "*operate pursuant to legal authority established by statute, ordinance or series of contracts.*"

Provision E.2 (Illicit Discharge Detection and Elimination) requires each Copermittee to implement an illicit discharge detection and elimination program to effectively prohibit non-storm water discharges to the MS4 by actively detecting and eliminating illicit discharges and disposal into its MS4. If the San Diego Water Board finds that a Copermittee is fully implementing the requirements of Provision E.2, then the Copermittee is deemed in compliance with the effective prohibition of non-storm water discharges to the MS4 required under Provision A.1.b.

Provision E.2 establishes the minimum requirements that each Copermittee must implement within its jurisdiction to effectively prohibit non-storm water discharges from entering its MS4. The federal CWA requires permits for municipal storm sewer systems to "*effectively prohibit non-storm water discharges into the storm sewers*." The federal regulations (40CFR122.26(d)(2)(i)(B)) require each Copermittee to establish the legal authority to prohibit illicit discharges to its MS4s. Under 40 CFR 122.26(d)(2)(iv)(B), each Copermittee must implement a "*program…to detect and remove…illicit discharges and improper disposal into the storm sewer.*" The federal NPDES regulations, under 40 CFR 122.26(b)(2), define illicit discharges as "*any discharge to a municipal separate storm sewer that is not composed entirely of storm water*." Thus, non-storm water discharges are not authorized to enter the MS4 and are considered to be illicit discharges, unless authorized by a separate NPDES permit.

The Phase I Final Rule clarifies that non-storm water discharges through an MS4 are not authorized under the CWA (55 FR 47995):

> "*Today's rule defines the term "illicit discharge" to describe any discharge through a municipal separate storm sewer system that is not composed entirely of storm water and that is not covered by an NPDES permit. Such illicit discharges are not*

> *authorized under the Clean Water Act. Section 402(p)(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit*."

The federal NPDES requirements for the program to address illicit discharges must include "*inspections, to implement and enforce an ordinance, orders, or other similar means to prevent illicit discharges to the MS4*." The federal NPDES regulations also reference several categories of "*non-storm water discharges or flows* [which] *shall be addressed where such discharges are identified…as sources of pollutants to waters of the United States*." The Phase I Final Rule (55 FR 48037) further clarified the requirements of 40 CFR 122.26(d)(2)(iv)(B)(1) as follows:

> "*EPA is clarifying that section 402(p)(3)(B) of the CWA (which requires permits for municipal separate storm sewers to 'effectively' prohibit non-storm water discharges) does not require permits for municipalities to prohibit certain discharges or flows of nonstorm water to waters of the United States through municipal separate storm sewers in all cases*."

In previous iterations of the municipal storm water permits for the San Diego Region, these categories were simply listed and referred to as categories of non-storm water discharges "not prohibited" unless identified as a source of pollutants. The Copermittees have often referred to these categories as "exempt" discharges. In both cases, however, the language is inconsistent with the federal CWA and NPDES regulations. And, the clarification provided in the Phase I Final Rule does not specifically state that such discharges are "not prohibited" or "exempt" or in any way authorized. The federal NPDES regulations do, however, state that specific categories of non-storm water discharges must be "*addressed*" if identified as "*sources of pollutants to waters of the United States*."

The language of Provision E.2.a has been revised to be fully consistent with the language of the CWA and the requirements of the federal regulations under 40 CFR 122.26(d)(2)(iv)(B)(1). Provision E.2.a requires each Copermittee to address <u>all</u> types of non-storm water discharges into its MS4 as illicit discharges, <u>unless</u> the discharge is authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to Provisions E.2.a.(1) through E.2.a.(5). Only non-NPDES-permitted non-storm water discharges identified as a category of non-storm water discharges under Provisions E.2.a.(1) through E.2.a.(5) <u>and</u> *not identified as a source of pollutants* do not have to be addressed as illicit discharges. Categories of non-storm water discharges that meet the requirements of Provisions E.2.a.(1) through E.2.a.(5) do not have to be addressed by the Copermittee as illicit discharges.

Several of the non-storm water categories listed in 40 CFR 122.26(d)(2)(iv)(B)(1) have not been included in Provisions E.2.a.(1) through E.2.a.(5), including: street wash water, landscape irrigation, irrigation water, and lawn watering. Because these are no longer included within the categories listed under Provisions E.2.a.(1) through E.2.a.(5), the Copermittees must prohibit these types of non-storm water discharges from entering the MS4. This is consistent with the clarification of 40 CFR 122.26(d)(2)(iv)(B)(1) in the Phase I Final Rule (55 FR 48037), which states:

> "*[T]he Director may include permit conditions that either require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*."

Street wash water is a category of non-storm water discharges that was removed when the Third Term Permits were issued. Street wash water is a source of several pollutants (e.g., metals, oil and grease, petroleum hydrocarbons, chlorinated solvents, sediment) which are generated during the street washing process. The removal of this category requires the Copermittees to prohibit this type of non-storm water discharge from entering the MS4.

The landscape irrigation, irrigation water, and lawn watering categories, collectively referred to hereafter as "over-irrigation" discharges, were removed from the list of non-storm water discharge categories in the Fourth Term Orange County and Riverside County Permits. Non-storm water discharges resulting from over-irrigation have been found to be a source of several types of pollutants (e.g., nutrients, bacteria, pesticides, sediment) in receiving waters. The San Diego Water Board and the Copermittees have identified categories of non-storm water discharges associated with over-irrigation as a source of pollutants and conveyance of pollutants to the MS4 and waters of the United States in the following documents:

- **SmartTimer/Edgescape Evaluation Program (SEEP) Grant Application**

  The State Water Board allocated grant funding to the SEEP project grant application submitted in 2006, which targeted irrigation runoff by retrofitting areas of existing development and documenting the conservation and runoff improvements. The basis of this grant project is that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 is a source and conveyance of pollutants. In addition, the grant application indicated that this alteration of natural flows is impacting the beneficial uses of waters of the state and U.S. Results from the study indicate that that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 *is* a source and conveyance of pollutants. The results of this study can be applied broadly to any area where over-irrigation takes place. The grant application included the following statements:

  > "*Irrigation runoff contributes flow & pollutant loads to creeks and beaches that are 303(d) listed for bacteria indicators.*"

"*Regional program managers agree that the reduction and/or elimination of irrigation-related urban flows and associated pollutant loads may be key to successful attainment of water quality and beneficial use goals as outlined in the San Diego Basin Plan and Bacteria TMDL over the long term.*"

"*Elevated dry-weather storm drain flows, composed primarily … of landscape irrigation water wasted as runoff, carry pollutants that impair recreational use and aquatic habitats all along Southern California's urbanized coastline. Storm drain systems carry the wasted water, along with landscape derived pollutants such as bacteria, nutrients and pesticides, to local creeks and the ocean. Given the local Mediterranean climate, excessive perennial dry season stream flows are an unnatural hydrologic pattern, causing species shifts in local riparian communities and warm, unseasonal contaminated freshwater plumes in the near-shore marine environment.*"

- **2006-2007 Orange County Watershed Action Plan Annual Reports**

The Watershed Action Plan Annual Reports for the 2006-2007 reporting period were submitted by the County of Orange, Orange County Flood Control District and Copermittees within the San Juan Creek, Laguna Coastal Streams, Aliso Creek, and Dana Point Coastal Streams Watersheds. San Juan Creek, Laguna Coastal Streams, Aliso Creek and Dana Point Coastal Streams are all currently 303(d) listed as impaired for indicator bacteria within their watersheds and/or in the Pacific Ocean at the discharge points of their watersheds. The Orange County Copermittees, within their Watershed Action Strategy Table for fecal indicator bacteria included the following:

"*Support programs to reduce or eliminate the discharge of anthropogenic dry weather nuisance flow throughout the…watershed. Dry weather flow is the transport medium for bacteria and other 303(d) constituents of concern.*"

Additionally, they state that "*conditions in the MS4 contribute to high seasonal bacteria propagation in-pipe during warm weather. Landscape irrigation is a major contributor to dry weather flow, both as surface runoff due to over-irrigation and overspray onto pavements; and as subsurface seepage that finds its way into the MS4.*"

- **Fiscal Year 2008 Carlsbad Watershed Urban Runoff Management Program Annual Report**

The Carlsbad Watershed Urban Runoff Management Program Annual Report for Fiscal Year 2008 was submitted by the Carlsbad Watershed Copermittees (Cities of Carlsbad, Encinitas, Escondido, Oceanside, San Marcos, Solana Beach, and Vista, and the County of San Diego). In the Annual Report, the Carlsbad Watershed Copermittees stated the following:

"The Carlsbad Watershed Management Area (WMA) collective watershed strategy identifies bacteria, sediment, and nutrients as high priority water quality pollutants in the Agua Hedionda (904.3 – bacteria and sediment), Buena Vista (904.2 – bacteria), and San Marcos Creek (904.5 – nutrients) Hydrologic Areas. Bacteria, sediment, and nutrients have been identified as potential discharges from over-irrigation."

- **2007-2008 San Diego Bay Watershed Urban Runoff Management Program Annual Report**

  The San Diego Bay Watershed Urban Runoff Management Program 2007-2008 Annual Report was submitted by the San Diego Bay Watershed Copermittees (Cities of Chula Vista, Coronado, Imperial Beach, La Mesa, Lemon Grove, National City, and San Diego, the County of San Diego, the Port of San Diego, and the San Diego County Airport Authority). In Appendix D of the Annual Report, titled "Likely Sources of Pollutants," the San Diego Bay Watershed Copermittees identified over-irrigation of lawns as a pollutant generating activity from business and/or residential land uses for bacteria, pesticides, and sediment.

- **Copermittee Public Education Materials**

  The Orange County Public Works *Tips for Landscape & Gardening* public education brochure states: "*Fertilizers, pesticides and other chemicals that are left on yards or driveways can be blown or washed into storm drains that flow to the ocean. Overwatering lawns can also send materials into storm drains*."

  The Riverside County Flood Control and Water Conservation District *Landscape and Garden* public education brochure states: *"Soil, yard wastes, over-watering and garden chemicals become part of the urban runoff mix that winds its way through streets, gutters and storm drains before entering lakes, rivers, streams, etc. Urban runoff pollution contaminates water and harms aquatic life!"*

- **Los Peñasquitos Lagoon Sedimentation/Siltation TMDL Technical Report**

  The Los Peñasquitos Lagoon Sedimentation/Siltation TMDL technical report was prepared for the City of San Diego and USEPA in October 2010. The technical report was included as a technical supporting document attached to the Sediment TMDL for Los Peñasquitos Lagoon staff report prepared by the San Diego Water Board, dated June 13, 2012. Under the Source Assessment section, the technical report states the following:

  "*Dry weather loading is dominated by nuisance flows from urban land use activities such as car washing, sidewalk washing, and lawn over-irrigation, which pick up and transport sediment into receiving waters.*"

These documents confirm that non-storm water discharges associated with over-irrigation are a source of pollutants and should be addressed as illicit discharges to the MS4. Prohibiting non-storm water discharges associated with over-irrigation, however, is not a new requirement for the Copermittees because it is also consistent with and required by the Water Conservation in Landscaping Act (AB 1881, Laird).

The Water Conservation in Landscaping Act required the Department of Water Resources (DWR) to prepare a Model Water Efficient Landscape Ordinance for use by local agencies (e.g. the Copermittees). All local agencies were required to adopt a water efficient landscape ordinance by January 1, 2010. Local agencies could adopt the Water Efficient Landscape Ordinance developed by DWR, or an ordinance considered at least as effective as the Model Ordinance. The Water Efficient Landscape Ordinance includes a requirement that local agencies prohibit runoff from irrigation (§ 493.2):

> "*Local agencies shall prevent water waste resulting from inefficient landscape irrigation by <u>prohibiting runoff from leaving the target landscape</u> [emphasis added] due to low head drainage, overspray, or other similar conditions where water flows onto adjacent property, non-irrigated areas, walks, roadways, parking lots, or structures. Penalties for violation of these prohibitions shall be established locally*."

Furthermore, non-storm water discharges from over-irrigation not only transport and discharge pollutants to receiving waters, but are also a likely source of the dry weather flows causing changes to habitat within and along the receiving water bodies. Examples of habitat changes from the dry weather flows include perennialization of ephemeral streams, and conversion of saltwater and brackish water marsh habitats to freshwater marsh habitats (e.g. Los Peñasquitos Lagoon). Both of these examples have resulted in the promotion of invasive species in several areas of the San Diego Region.

The removal of the over-irrigation discharges categories does not require the Copermittees to strictly prohibit lawn and landscape irrigation, but does require the prohibition of excessive irrigation water that results in non-storm water discharges to the MS4. Non-storm water discharges to the MS4 from over-irrigation must be addressed as illicit discharges by the Copermittees pursuant to the requirements of Provision E.2.

The remaining non-storm water categories listed in 40 CFR 122.26(d)(2)(iv)(B)(1) are listed under Provisions E.2.a.(1) through E.2.a.(5) and generally fall into four categories: (1) non-storm water discharges subject to existing San Diego Water Board waste discharge requirements and NPDES permits; (2) non-storm water discharges generally not expected to be a source of pollutants to receiving waters; (3) non-storm water discharges likely to contain pollutants requiring some form of control to address

the pollutants prior to discharging to the MS4; and (4) non-storm water discharges or flows associated with firefighting.

Provisions E.2.a.(1) and E.2.a.(2) include several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) for which the San Diego Water Board already has developed general waste discharge requirements and NPDES permits to address the discharges. The Copermittees are only required to address these types of non-storm water discharges as illicit discharges if the Copermittees or the San Diego Water Board identifies these non-storm water discharges not having coverage under the applicable NPDES permit.

Provision E.2.a.(3) includes several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) which are generally not expected to be a source of pollutants to receiving waters, many of which originate from what are typically natural, uncontrollable sources. The Copermittees are only required to address these types of non-storm water discharges as illicit discharges if the Copermittees or the San Diego Water Board identifies these non-storm water discharges as a source of pollutants to receiving waters. Because many of these sources are generally uncontrollable, enforcing a prohibition may not be a possibility for the Copermittees. The Copermittees would be able to address these non-storm water discharges by preventing these non-storm water discharges from entering the MS4. This could potentially be achieved by sealing their MS4 structures so the discharges cannot enter the MS4.

Provision E.2.a.(4) includes several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) that are likely to contain pollutants requiring some form of control to address the pollutants prior to discharging to the MS4. At this time, an outright prohibition of these types of non-storm water discharges does not yet appear to be warranted. Thus, Provision E.2.a.(4) includes several requirements for the Copermittees to control the pollutants from these types of non-storm water discharges. This is consistent with the clarification of the federal regulations in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board has the authority to require the Copermittees to "*control any of these types of discharges where appropriate*."

Unlike non-storm water discharges from over-irrigation, these types of non-storm water discharges are not expected to occur in close proximity to each other or very frequently. Provided these types of non-storm water discharges are controlled as required in Provision E.2.a.(4), the Copermittees would only be required to address these types of non-storm water discharges as illicit discharges if the Copermittee or the San Diego Water Board identifies these non-storm water discharges as a source of pollutants to receiving waters.

Provision E.2.a.(5) includes specific requirements for fire fighting discharges and flows. The requirements for non-storm water discharges and flows associated with fire

fighting have been separated into requirements for: a) non-emergency fire fighting discharges and flows, and b) emergency fire fighting discharges and flows.

The San Diego Water Board has found that discharges from building fire suppression system maintenance (e.g. fire sprinklers) contain waste and potentially a significant source of pollutants to receiving waters. As such, the San Diego Water Board is requiring these discharges be addressed as illicit discharges by the Copermittees. Thus, the discharges to the MS4 are to be prohibited via ordinance, order or similar means. For other non-emergency firefighting discharges and flows (i.e. flows from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems), the Copermittees are required to develop and implement a program to address pollutants in these non-storm water discharges and flows. This is consistent with the clarification of the federal regulations in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board has the authority to require the Copermittees to "*control any of these types of discharges where appropriate*."

For emergency firefighting discharges and flows, the Phase I Final Rule (55 FR 48037) has clarified the requirements of 40 CFR 122.26(d)(2)(iv)(B)(1) pertaining to emergency firefighting flows and discharges, which states:

> "*In the case of firefighting it is not the intention of these rules to prohibit in any circumstances the protection of life and public or private property through the use of water or other fire retardants that flow into separate storm sewers*."

Thus, the requirements have been made to be consistent with the guidance provided by the Phase I Final Rule. The Order recommends that the Copermittees develop and encourage implementation of BMPs to reduce or eliminate the discharge of pollutants from emergency firefighting flows to the MS4s and receiving waters. The Order does not include any requirements that should be interpreted as requiring the implementation of BMPs for emergency firefighting flows to the MS4s and receiving waters.

The Copermittees are expected to review the dry weather MS4 outfall discharge monitoring data they collect to determine if and when there are non-storm water discharges to or from their MS4s that are a source of pollutants to receiving waters. If the Copermittees identify one of the types of non-storm water discharges listed in Provisions E.2.a.(1) through E.2.a.(4) as a source of pollutants to receiving waters based on the review and evaluation of monitoring data, Provision E.2.a.(6) requires the Copermittees to prohibit those categories of discharges from entering the MS4 through ordinance, order or similar means. In addition, Provision E.2.a.(6) clarifies that the San Diego Water Board may identify categories of non-storm water discharges or flows listed under Provisions E.2.a.(1) through E.2.a.(4) that must be prohibited.

Provision E.2.a.(6) also provides the Copermittees an option to propose controls to be implemented for the category of non-storm water discharges as part of the Water Quality Improvement Plan instead of prohibiting the category of non-storm water discharges. If the Water Quality Improvement Plan is accepted by the San Diego Water Board with the proposed controls, the Copermittees will not be required to prohibit the category of non-storm water discharges to their MS4s as long as the controls are implemented. This is consistent with the clarification of 40 CFR 122.26(d)(2)(iv)(B)(1) in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board may "*require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*."

Finally, Provision E.2.a.(7) has been included in the requirements for non-storm water discharges to clarify that any non-storm water discharges to the Copermittee's MS4, even those identified pursuant to Provisions E.2.a.(1) through E.2.a.(4), must be reduced or eliminated, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit. Provision E.2.a.(7) is consistent with the requirements of CWA section 402(p)(3)(B)(ii) and 40 CFR 122.26(d)(1)(v)(B), as clarified in the Phase I Final Rule (55 FR 47995) that "*[u]ltimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit*." However, the reduction or elimination of those non-storm water discharges are expected to be achieved as feasible, in accordance with the priorities in the Water Quality Improvement Plan and when the resources are available to the Copermittee.

Consistent with 40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(1), each Copermittee must implement a "*program…to prevent illicit discharges to the municipal storm sewer system*" and "*detect…illicit discharges and improper disposal into the storm sewer.*" Provision E.2.b requires each Copermittee to implement measures to prevent and detect illicit discharges and connections to its MS4 as part of its illicit discharge detection and elimination program.

As part of the program to prevent and detect illicit discharges to the MS4, 40 CFR 122.26(d)(2)(iv)(B)(2) requires "*procedures to conduct on-going field screening activities during the life of the permit, including areas or locations that will be evaluated by such field screens*." As part of the procedures, each Copermittee is required to maintain an updated map of its entire MS4 and the corresponding drainage areas within its jurisdiction. Having knowledge about where inlets, access points, connections with other MS4s, and outfalls are located is necessary for each Copermittee to track, identify, and eliminate illicit discharges and connections. Thus, Provision E.2.b.(1) of the Order specifies that the map must include the segments of the storm sewer system owned, operated, and maintained by the Copermittee, and include locations of all known inlets, connections with other MS4s, and outfalls to the Copermittee's MS4. The remaining requirements of Provision E.2.b are consistent with the requirements of 40 CFR 122.26(d)(2)(iv)(B)(3)-(7) related to implementing measures to prevent and detect illicit discharges and connections to the MS4.

Provision E.2.c requires each Copermittee to conduct field screening and monitoring of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4. Field screening is a required element of the program to detect and eliminate illicit discharges and connections to the MS4, pursuant to 40 CFR 122.26(d)(2)(iv)(B)(2). The field screening requirement will be implemented through the dry weather MS4 outfall discharge monitoring required under Provisions D.2.a.(2) and D.2.b.(1).

Provision E.2.d specifies the measures each Copermittee must implement to eliminate illicit discharges and connections to its MS4. Elimination of illicit discharges and connections to the MS4 is consistent with the requirement of 40 CFR 122.26(d)(2)(iv)(B) "*to detect and remove [emphasis added]…illicit discharges and improper disposal into the storm sewer*" and will achieve the CWA requirement for MS4 permits to "*effectively prohibit non-storm water discharges into the storm sewers*."

Generally, each Copermittee is responsible for prioritizing its efforts to eliminate non-storm water and illicit discharges or connections to its MS4 based on field screening and monitoring data, NALs, illicit discharge investigation records, and the known or suspected sources. Sources of non-storm water and illicit discharges or connections must be eliminated by enforcing the legal authority established by each Copermittee pursuant to Provision E.1.

Provision E.3 (Development Planning) requires each Copermittee to use its land use and planning authority to implement a development planning program to control and reduce the discharge of pollutants in storm water from new development and significant redevelopment to the MEP. Proper implementation of the development planning program will also contribute toward effectively prohibiting non-storm water discharges from development projects to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." As part of the management program, 40 CFR 122.26(d)(2)(iv)(A)(2) requires "*planning procedures including a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment*."

Land development generally alters the natural conditions of the land by removing vegetative cover, compacting soil, and/or placement of concrete, asphalt, or other impervious surfaces. These impervious surfaces concentrate urban pollutants (such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not found in high concentrations in the natural environment. Pollutants that

accumulate on impervious surfaces are not easily biodegraded nor subject to natural treatment processes.

Impervious surfaces greatly affect the natural hydrology of the land because they do not allow natural infiltration and treatment of storm water runoff to take place. Instead, storm water runoff from impervious surfaces is typically directed through pipes, curbs, gutters, and other hardscape into receiving waters, with little treatment, at significantly increased volumes and accelerated flow rates over what would occur naturally. The increased pollutant loads, storm water volume, discharge rates and velocities, and discharge durations from the MS4 adversely impact stream habitat by causing accelerated, unnatural erosion and scouring within creek bed and banks. Placement of impervious surfaces also encapsulates "good" sediment (such as sand, gravel, rocks and cobbles) that would normally replenish creek beds and banks to help stabilize them. Collectively, these changes to natural hydrologic processes are termed hydrograph modification, or hydromodification.

Hydromodification, which is caused by both altered storm water flow and altered sediment flow regimes, is largely responsible for degradation of creeks, streams, and associated habitats in the San Diego Region. In an ongoing study by the Stormwater Monitoring Coalition to assess the health of streams throughout Southern California, researchers found that three of the four highest risk stressors to creeks (percent sands and fines present, channel alteration, and riparian disturbance) were related to physical habitat.[29] Researchers studying flood frequencies in Riverside County have found that increases in watershed imperviousness of only 9-22 percent can result in increases in peak flow rates for the two-year storm event of up to 100 percent.[30] Such changes in runoff have significant impacts on channel morphology.

In addition, a technical report issued by the Southern California Coastal Water Research Project (SCCWRP) stated that "*[r]ecent studies indicate that California's intermittent and ephemeral streams are more susceptible to the effects of hydromodification than streams from other parts of the United States. Physical degradation of stream channels in the central and eastern United States can initially be detected when watershed impervious cover approaches 10 percent, although biological effects (which may be more difficult to detect) may occur at lower levels. In contrast, initial response of streams in the semi-arid portions of California appears to occur between 3 and 5 percent impervious cover.*"[31] These studies highlight the extent to which impacts originating from impervious surfaces created by land development are responsible for the degradation of creek and stream habitat.

[29] Assessing the Health of Southern California Streams, Stormwater Monitoring Coalition, Fact Sheet
[30] Schueler and Holland, 2000. Storm Water Strategies for Arid and Semi-Arid Watersheds (Article 66). The Practice of Watershed Protection.
[31] Stein, E. and Zaleski, S., 2005. Technical Report 475, Managing Runoff to Protect Natural Streams: The Latest Development on Investigation and Management of Hydromodification in California. December 30, 2005.

This is consistent with what USEPA has noted, that "*[m]ost stormwater runoff is the result of the man-made hydrologic modifications that normally accompany development. The addition of impervious surfaces, soil compaction, and tree and vegetation removal result in alterations to the movement of water through the environment. As interception, evapotranspiration, and infiltration are reduced and precipitation is converted to overland flow, these modifications affect not only the characteristics of the developed site but also the watershed in which the development is located. Stormwater has been identified as one of the leading sources of pollution for all waterbody types in the United States. Furthermore, the impacts of stormwater pollution are not static; they usually increase with more development and urbanization*."[32]

Reducing the impact from the increased pollutant loads and flows generated by impervious surfaces within a watershed is essential to protecting and restoring the integrity of the receiving waters. Provision E.3 includes the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment*." The requirements of Provision E.3 will 1) minimize the generation and discharge of pollutants in storm water from the MS4, and 2) minimize the potential of storm water discharges from the MS4 from causing altered flow regimes and excessive downstream erosion in receiving waters.

The requirements of Provision E.3.a include the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment*" applicable to all development projects, regardless of size or purpose of development. In general, all development projects must implement onsite BMPs to remove pollutants from runoff prior to its discharge to any receiving waters, as close to the pollutant generating source as possible, and structural BMPs must not be constructed within waters of the U.S.

Furthermore, the onsite BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors (e.g. mosquitos, rodents, and flies). If not properly designed or maintained, certain BMPs implemented or required by municipalities may create a habitat for vectors. Monitoring studies conducted by the California Department of Public Health (CDPH) have documented that mosquitoes opportunistically breed in structural storm water BMPs, particularly those that hold standing water for over 96 hours. Certain site design features that hold standing water may similarly produce mosquitoes.

[32] USEPA, 2007. Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices, December 2007.

Structural BMPs and site design features should incorporate design, construction, and maintenance principles to promote drainage within 96 hours to minimize standing water available to mosquitoes. Nuisances and public health impacts resulting from vector breeding can be prevented with close collaboration and cooperative effort between municipalities and local vector control agencies and the CDPH during the development and implementation of storm water runoff management programs. The CDPH also has issued guidance for BMP implementation that will minimize potential nuisances and public health impacts resulting from vector breeding.[33]

All development projects are required to implement source control BMPs that will minimize the generation of pollutants. Additionally, each development project must implement, where applicable and feasible, low impact development (LID) BMPs to mimic the natural hydrology of the site and retain and/or treat pollutants in storm water runoff prior to discharging to and from the MS4.

The LID Center defines LID as "*a comprehensive land planning and engineering design approach with a goal of maintaining and enhancing the pre-development hydrologic regime of urban and developing watersheds.*"[34] LID designs seek to control storm water at the source, using small-scale integrated site design and management practices to mimic the natural hydrology of a site, retain storm water runoff by minimizing soil compaction and impervious surfaces, and disconnect storm water runoff from conveyances to the storm drain system.

LID BMPs may utilize interception, storage, evaporation, evapotranspiration, infiltration, and filtration processes to retain and/or treat pollutants in storm water before it is discharged from a site. Because of these numerous options, the San Diego Water Board expects that every development project will be able to implement some form of LID BMPs. Examples of LID BMPs include using permeable pavements, rain gardens, rain barrels, grassy swales, soil amendments, and native plants.

Provision E.3.a also includes requirements for all development projects to, where feasible, landscape with native and/or low water use plants to minimize the discharge of non-storm water discharges associated with excessive irrigation, as well as harvest (i.e., storage) and use precipitation to promote the concept of utilizing storm water as a resource.

While all development projects are subject to the requirements of Provision E.3.a, Provision E.3.b identifies Priority Development Projects that exceed given size thresholds and/or fit under specific use categories. Priority Development Projects are required to incorporate specific performance criteria for structural BMPs into the

[33] California Department of Public Health, 2012. Best Management Practices for Mosquito Control in California. (http://www.cdph.ca.gov/HealthInfo/discond/Documents/BMPforMosquitoControl07-12.pdf)
[34] www.lowimpactdevelopment.org

project plan to reduce the generation of pollutants, and address potential impacts from hydromodification.

The Priority Development Project categories are based on the requirements of the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), and do not differ significantly from the Fourth Term Permit for San Diego County. Furthermore, the Priority Development Project categories are consistent with Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), and Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit).

Because of the impact of relatively small increases in watershed impervious surfaces to receiving waters, Provision E.3.b.(1)(c)(iv) has been updated to include large driveways that are 5,000 square feet or more. The San Diego Water Board finds that large driveways can exacerbate altered flow regimes if not properly controlled.

Provision E.3.b.(3) describes projects that are exempt from Priority Development Project status. These include new or retrofit paved sidewalks, bicycle lanes, or trails that are designed and constructed to direct runoff to vegetated areas or be hydraulically disconnected from paved areas. The exemptions have been provided to encourage these types of projects because they provide multiple environmental benefits, such as promoting walking rather than driving, which will in turn improve air quality. Additionally, retrofitting of existing alleys, streets, or roads are exempt from Priority Development Project status if they are constructed using USEPA Green Streets guidance.[35] By doing so, retrofitting of these types of projects is encouraged. The San Diego Water Board recognizes that there are spatial constraints associated with these projects, and implementation of structural BMPs are not always feasible.

For development projects identified as Priority Development Projects, the requirements of Provision E.3.c are the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment.*" Provisions E.3.c.(1)-(3) describe the performance criteria for the structural BMPs that must be implemented for each Priority Development Project defined by Provision E.3.b.

Provision E.3.c.(1) describes the storm water pollutant control BMP requirements that must be implemented by all Priority Development Projects. The purpose of Provision E.3.c.(1) is to reduce pollutants in storm water runoff to the MEP from Priority Development Projects before it is discharged to the MS4. Of all the available treatment processes available, retention of storm water, and therefore capture of the

[35] "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).

pollutants in the storm water, will achieve 100 percent pollutant removal efficiency for the volume of storm water retained. No other method of treatment can achieve 100 percent pollutant removal efficiency. Thus, retention of as much storm water onsite is the most effective way to reduce pollutants in storm water discharges to, and consequently from the MS4, and controls pollutants in storm water discharges from a site to the MEP.

Under Provision E.3.c.(1)(a), retention of the pollutants in the runoff produced from the 85th percentile storm event ("design capture volume") is the design standard to which Priority Development Projects must comply. Since the 85th percentile storm event has previously been used as the numeric design standard for treatment control BMPs, this same size storm event is used as the numeric design standard for storm water retention. This is the MEP standard recognized by the San Diego Water Board and is consistent with the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), as well as Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit), and Los Angeles Water Board Order No. R4-2012-0175 (Los Angeles County MS4 Permit).

The 85th percentile storm event is the event that has a precipitation total greater than or equal to 85 percent of all storm events over a given period of record in a specific area or location. For example, to determine what the 85th percentile storm event is in a specific location, all 24 hour storms that have recorded values over a 30 year period would be tabulated and a 85th percentile storm would be determined from this record (i.e. 15 percent of the storms would be greater than the number determined to be the 85th percentile storm). Most jurisdictions in the San Diego Region have already developed isopluvial maps that can provide this type of information. The 85th percentile storm might be determined to be a number such as 1.0 inch, and this would be multiplied by the total area of the project footprint producing runoff to calculate the design capture volume. The Priority Development Project designer would then select a system of BMPs that would retain (i.e. intercept, store, infiltrate, evaporate, or evapotranspire) the pollutants contained in the design capture volume onsite.

Retention BMPs are necessary to capture and retain pollutants generated from a Priority Development Project. In a recent study performed by SCCWRP in the Los Angeles Region, they found "*that the magnitude of constituent load associated with storm water runoff depends, at least in part, on the amount of time available for pollutant build-up on land surfaces. The extended dry period that typically occurs in arid climates such as southern California maximizes the time for constituents to build-up on land surfaces, resulting in proportionally higher concentrations and loads during*

initial storms of the season."[36] This implies that the "first flush" of a rainy season and the first storm events after long antecedent dry periods tend to have the highest pollutant loads. Capturing and retaining the pollutant loads of the "first flush" of a rainy season and the first storm events after long antecedent dry periods will reduce a significant portion of the pollutants in storm water discharged to and from the MS4.

The San Diego Water Board, however, acknowledges that in some situations retention of the full design capture volume onsite may not be technically feasible. In this event, the Copermittee may allow the Priority Development Project to use biofiltration BMPs to treat 1.5 times the design capture volume not reliably retained onsite, or biofiltration BMPs with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite.

The 1.5 multiplier is based on the finding in the Ventura County Technical Guidance Manual that biofiltration of 1.5 times the design capture volume not retained onsite will provide approximately the same pollutant removal as retention of the design capture volume on an annual basis.[37] This standard is consistent with the Los Angeles Water Board's Los Angeles County and Ventura County municipal storm water permits (Order Nos. R4-2012-0175 and R4-2010-0108, respectively). The flow-thru design of 0.75 times the portion of the design capture volume not reliably retained onsite is consistent with the San Diego Water Board's Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively). In either case, the biofiltration BMPs must be designed with an appropriate hydraulic loading rate to maximize storm water retention and pollutant removal, as well as to prevent erosion, scour, and channeling within the BMP. Each Copermittee is required to update its BMP Design Manual to provide guidance for hydraulic loading rates and other biofiltration design criteria necessary to maximize storm water retention and pollutant removal.

The San Diego Water Board further recognizes that, in addition to not being technically feasible, retention of the full design capture storm onsite may be cost prohibitive, or may not provide as much water quality benefit to the Watershed Management Area as would implementing BMPs elsewhere in the watershed. Thus, Provision E.3.c.(1)(b) allows for the use of a combination of onsite retention BMPs, and the implementation of an Alternative Compliance Program described in Provision E.3.c.(3). Provision E.3.c.(3) is discussed in more detail below.

If the full design capture volume is not retained onsite either because biofiltration is not technically feasible, or a Copermittee grants a Priority Development Project permission

[36] Stein, E.D., Tiefenthaler, L.L., and Schiff, K.C., 2007. Technical Report 510, Sources, Patterns and Mechanisms of Storm Water Pollutant Loading from Watershed and Land Uses of the Greater Los Angeles Area, California, USA. March 20, 2007.
[37] Ventura Countywide Stormwater Management Program. 2011. Ventura Technical Guidance Manual, Manual Update, 2011.

to utilize the Alternative Compliance Program, then the pollutants in the portion of the design capture volume that are not reliably retained onsite must still be reduced to the MEP. Thus, flow-thru treatment control BMPs are required to be implemented on Priority Development Projects in addition to the retention BMPs. The requirements of Provisions E.3.c.(1)(a)(ii)[a]-[c] include the performance standards for flow-thru treatment control BMPs, consistent with the Fourth Term Permits in the San Diego Region.

Whereas the purpose of the requirements under Provision E.3.c.(1) is to reduce pollutants in storm water runoff to the MEP, the purpose of the requirements under Provision E.3.c.(2) is to maintain or restore more natural hydrologic flow regimes to prevent accelerated, unnatural erosion in downstream receiving waters, also to the MEP standard. Provision E.3.c.(2) describes hydromodification management BMP requirements that must be implemented by all Priority Development Projects.

The performance criteria for the implementation of hydromodification management BMPs on Priority Development Projects are consistent with the requirements in the Fourth Term Permits for Orange and Riverside Counties (Order Nos. R9-2009-0002 and R9-2010-0016, respectively). Modifications to the Orange County and Riverside County Hydromodification Management Plans (HMPs) will likely be minor, or may not be necessary. The HMP for San Diego County will likely require some minor modifications to incorporate the requirements of Provision E.3.c.(2) and become consistent with the Orange County and Riverside County HMPs. The San Diego Water Board does not, however, expect that it will be necessary for the San Diego County Copermittees to develop a new approach or significantly re-write the San Diego County HMP. This is because the premise of the hydromodification management BMP requirements, which are to control storm water runoff conditions (flow rates and durations) for Copermittee-defined range of flows, is unchanged from all Fourth Term Permits in the San Diego Region.

Provision E.3.c.(2)(a) requires that post-project runoff conditions mimic the *pre-development* runoff conditions, and not the *pre-project* runoff conditions. Fundamentally, the San Diego Water Board believes that using a hydrology baseline that approximates that of an undeveloped, natural watershed is the only way to facilitate the return of more natural hydrological conditions to already built-out watersheds, and ultimately improved stream health. On the other hand, using the *pre-project* hydrology as a baseline for redevelopment projects results in propagating the unnatural hydrology of urbanized areas. Propagating the urbanized flow regime does not support conditions for restoring degraded or channelized stream segments, and would forever sentence such streams to the degraded state. Furthermore, reducing the volume of storm water runoff associated with the urbanized flow regime will also result in reducing the discharge of pollutants into receiving waters, since storm water runoff from impervious surfaces contains untreated pollutants.

The San Diego Water Board understands that approximating the pre-development runoff condition associated with a redevelopment site is not necessarily straightforward because factors such as natural grade and native vegetation for the site cannot be precisely known. Therefore, the San Diego Water Board does not expect project designers to estimate historical conditions associated with redevelopment sites. Rather, the San Diego Water Board expects project designers and the Copermittees to approximate pre-development runoff conditions using the parameters of a *pervious* area rather than an *impervious* area. This means that for redevelopment sites, approximating pre-development runoff conditions equates to using existing onsite grade and assuming the infiltration characteristics of the underlying soil. A redevelopment Priority Development Project must not use runoff coefficients of concrete or asphalt to estimate pre-development runoff conditions. Rather, redevelopment projects must use available information pertaining to existing underlying soil type (such as soil maps published by the National Resource Conservation Service), onsite existing grade, and any other readily available pertinent information to estimate pre-development runoff conditions.

The San Diego Water Board understands, indeed asserts, that the pre-development hydrology of an area in question can only be roughly estimated and cannot be precisely known. However, using the hydrology of a natural condition, even if not precisely known, will provide significant benefit to receiving waters over using the hydrology associated with impervious (developed) surfaces. Therefore in order to achieve the goals of the Clean Water Act, which are to "*restore and maintain the chemical, physical, and biological integrity of the nation's waters* [emphasis added]," the most appropriate standard to use for hydromodification management is the standard associated with the pre-development condition.

Provision E.3.c.(2)(b) requires Priority Development Projects to avoid known critical sediment yield areas or implement measures that would allow coarse sediment to be discharged to receiving waters, such that the natural sediment supply is unaffected by the project. This is necessary because the availability of coarse sediment supply is as much an issue for causing erosive conditions to receiving streams as are accelerated flows.

The San Diego Water Board recognizes that in some situations implementing the hydromodification management BMP requirements for flow control fully onsite may not be technically feasible, may be cost prohibitive, or may not provide any overall water quality benefits to the Watershed Management Area. Thus, Provision E.3.c.(2)(c) allows for the use of a combination of onsite hydromodification management BMPs for flow control and alternative compliance options described in Provision E.3.c.(3).

Provision E.3.c.(3) allows for alternative compliance in instances where the Copermittee determines that offsite measures will have a greater overall water quality benefit for the Watershed Management Area than if the Priority Development Project were to implement structural BMPs onsite. Consequently, watershed-specific

structural BMP requirements are present in this Order in the form of allowable compliance offsite. The Alternative Compliance Program to Onsite Structural BMP Implementation Provision is intended to integrate with the Copermittees' planning efforts in the Water Quality Improvement Plans.

The Alternative Compliance Program is an option for Priority Development Projects where the governing Copermittee has participated in the development of a Watershed Management Area Analysis as part of the Water Quality Improvement Plan (described in Provision B.3.b.(4)). Such an approach is consistent with the latest findings in hydromodification management by the scientific community. In a Technical Report entitled *Hydromodification Assessment and Management in California,*[38] the report states:

> *"An effective [hydromodification] management program will likely include combinations of on-site measures (e.g., low-impact development techniques, flow-control basins), in-stream measures (e.g., stream habitat restoration), floodplain and riparian zone actions, and off-site measures. Off-site measures may include compensatory mitigation measures at upstream locations that are designed to help restore and manage flow and sediment yield in the watershed."*

Consistent with the ideas brought forth in the report, in the Watershed Management Area Analysis of Provision B.3.b.(4), which is optional, the Copermittees will develop watershed maps that include as much detail about factors that affect the hydrology of the watershed as is available. Such factors included identification of areas suitable for infiltration, coarse sediment supply areas, and locating stream channel structures and constrictions. Once these factors are mapped and studied, the Copermittees can identify areas in the watershed where candidate projects may be implemented that are expected to improve water quality in the watershed by providing more opportunity for infiltration, slowing down storm water flows, or attenuation of pollutants naturally via healthy stream habitat. These candidate projects may be in the form of retrofitting existing development, rehabilitating degraded stream segments, identifying regional BMPs, purchasing land to preserve valuable floodplain functions, and any other project(s) that the Copermittees identify.

Under the Alternative Compliance Program, Priority Development Projects may be allowed to fund, partially fund, or implement a candidate project, in lieu of implementing structural BMPs onsite, if they enter into a voluntary agreement with the governing Copermittee permitting this arrangement. Project proponents may also propose an alternative project not previously identified by the Copermittees. In either case, whether a project proponent implements a candidate project identified by the Copermittees or a separate alternative compliance project, the governing Copermittee must determine that implementation of the project will have a greater overall water

[38] 2012. ED Stein, F Federico, DB Booth, BP Bledsoe, C Bowles, Z Rubin, GM Kondolf, A Sengupta. Technical Report 667. Southern California Coastal Water Research Project. Costa Mesa, CA.

quality benefit for the Watershed Management Area than fully implementing structural BMPs onsite. Determination of greater overall water quality benefits associated with alternative compliance projects would be accomplished by utilizing Water Quality Equivalency calculations developed pursuant to Provision E.3.c.(3)(a). Water Quality Equivalency calculations are necessary to establish a regional and technical basis for determining water quality benefits associated with alternative compliance projects, which can be consistently used by all Copermittees in the San Diego Region. Finally, if ~~I~~f alternative compliance involves funding or implementing a project that is outside the jurisdiction of the governing Copermittee, then that Copermittee may enter into an inter-agency agreement with the appropriate jurisdiction.

Finally, Provision E.3.c.(2)(d) allows Priority Development Projects to be exempt from the hydromodification management BMP requirements if there is no threat of erosion to downstream receiving waters (i.e. the receiving stream is concrete lined from the point of discharge all the way to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean). If the Copermittees believe that more exemptions are warranted, then they must perform the optional Watershed Management Area Analysis of Provision B.3.b.(4). Additional exemptions other than those specified in this Order may be established on a watershed basis, provided the Copermittees perform the analysis, provide supporting rationale for the exemptions, and complete the Water Quality Improvement Plan approval process pursuant to Provision F.1.

To facilitate the transition to this Order from the Fourth Term Permits for Orange and Riverside County Copermittees, Provision E.3.c.(2)(e) allows two additional temporary exemptions from hydromodification management BMP implementation. The first temporary exemption allows relief from hydromodification management BMP implementation for Priority Development Projects discharging directly to an engineered channel conveyance system with a capacity to convey peak flows generated by the 10-year storm event all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean. Similar to the exemption allowed for concrete-lined channels, this exemption is premised on the concept that there is little threat of erosion to these types of engineered channel systems.

The second temporary exemption allows relief from hydromodification management BMP implementation for Priority Development Projects discharging directly to large river reaches with drainage areas larger than 100 square miles and a 100-year flow capacity in excess of 20,000 cubic feet per second. If this exemption is claimed, then properly sized energy dissipation is required at all discharge points associated with the Priority Development Project. This exemption is premised on the concept that large river reaches can essentially assimilate the accelerated flow rates associated with individual Priority Development Projects because they are inconsequential compared

to the flow rate in the large river reach. Both of these exemptions are included in the Hydromodification Management Plan for San Diego County[39].

These temporary exemptions are allowed as a means to facilitate Orange and Riverside County Copermittees' transition to this Order from the Fourth Term Permits and are not meant to reside as permanent exemptions without additional rigorous technical analyses specific to each County. Therefore, these exemptions will no longer apply once the Copermittees' land development programs are fully updated to reflect the requirements of this Order, i.e., upon implementation of the BMP Design Manual pursuant to Provision F.2.b. If the Copermittees believe that these or other exemptions are warranted in the context of water quality improvement and stream restoration opportunities, then the Copermittees must perform the optional Watershed Management Area Analysis of Provision B.3.b.(4) and provide supporting rationale for the exemptions. The San Diego County Copermittees are also required to perform the optional Watershed Management Area Analysis to provide supporting rationale to justify use of these and other exemptions. Updated BMP Design Manuals including rationale to justify use of exemptions will be reviewed by the San Diego Water Board pursuant to Provision F.2.b.

Provisions E.3.c.(4) and E.3.c.(5) were included under the BMP requirements applicable to all development projects in the Fourth Term Permits for San Diego, Orange, and Riverside Counties (Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016, respectively). In this Order, the long-term BMP maintenance and infiltration and groundwater protection requirements apply to structural BMPs implemented by Priority Development Projects only.

Provision E.3.d requires the Copermittees to update their BMP Design Manual as needed to incorporate the requirements of Provision E.3. The BMP Design Manual is formerly known as the Standard Storm Water Mitigation Plan, or SSMP, and was renamed so that the title has a more accurate description of the document content. The contents of the BMP Design Manual are largely unchanged from the previous Standard Storm Water Mitigation Plans required under the Fourth Term Permits. The BMP Design Manual fulfills the 40 CFR 122.26(d)(2)(iv)(A)(2) requirement that the Copermittee's development planning program includes "*a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment*."

As part of the "*planning procedures,*" 40 CFR 122.26(d)(2)(iv)(A)(2) requires the procedures to "*address controls to reduce pollutants in discharges from municipal separate storm sewers after construction is completed*." The requirements applicable to the implementation and oversight of structural BMPs at Priority Development Projects are provided under Provision E.3.e.

[39] Final Hydromodification Management Plan Prepared for County of San Diego, March 2011

Proper installation of the structural BMPs approved for a Priority Development Project is necessary to ensure that pollutants in storm water discharges will be reduced to the MEP after the project is completed. In addition to the proper installation of structural BMPs, the maintenance of structural BMPs on Priority Development Projects is necessary to ensure that pollutants in storm water discharges will continue to be reduced to the MEP. Provision E.3.e.(1) includes the minimum requirements that each Copermittee must implement to ensure structural BMPs are properly installed and will be properly maintained.

Provisions E.3.e.(1)(a)(i)-(ii) have been included to provide additional clarification regarding when a Copermittee may allow land development requirements from earlier MS4 permits to apply to a Priority Development Project. Since the MS4 permits issued from 2001 to the adoption of Order No. R9-2015-0001 amending Order No. R9-2013-0001 (Regional MS4 Permit), a Copermittee could allow development projects with "prior lawful approval" to be "grandfathered" into implementing BMP requirements from previous MS4 permits. The Copermittees were given the discretion to use their land use authority to determine when it was appropriate to allow a development project with prior lawful approval to implement BMP requirements from the previous MS4 permits, and when the most recent BMP requirements should be required to achieve the reduction of pollutants in storm water runoff from development projects to the MEP. However, the San Diego Water Board has found that the Copermittees and the development community frequently disagree about when a development project has prior lawful approval and what is necessary to reduce pollutants in storm water runoff from development projects to the MEP.

Therefore, Provisions E.3.e.(1)(a)(i)-(ii) were included to provide more clarity and certainty for the Copermittees, the land development community, and the general public about when the structural BMP performance standards of earlier MS4 permits may be allowed to be implemented. A Copermittee may allow a Priority Development Project to implement BMP requirements of the previous MS4 permit only if all requirements of Provisions E.3.e.(1)(a)(i)[a]-[d] have been met. Otherwise, the Copermittees must require all Priority Development Projects to incorporate the BMP requirements of Provision E.3 into the project to reduce pollutants in storm water runoff from development projects to the MEP.

Provisions E.3.e.(1)(a)(i)[a]-[d] are dependent upon the effective date of the BMP Design Manual. Unless otherwise directed by the San Diego Water Board, the effective date of the BMP Design Manual is December 24, 2015 for the San Diego County Copermittees, September 28, 2017 for the Orange County Copermittees, and July 5, 2018 for the Riverside County Copermittees.

Alternatively, if the Copermittee can demonstrate a lack of land use authority or legal authority to require a Priority Development Project to implement the requirements of Provision E.3, the Copermittee may allow land development requirements from the

previous MS4 permits to apply. However, under these circumstances the San Diego Water Board expects the Copermittee to utilize its available land use authority or legal authority to require the implementation of as much of Provision E.3 as possible to reduce the discharge of pollutants in storm water from development and redevelopment projects within its jurisdiction to the MEP.

In cases where BMP requirements from the earlier MS4 permits govern the structural BMP design requirements of a Priority Development Project, the San Diego Water Board expects the Copermittees to be able to demonstrate, in a programmatic audit or other means, that a Priority Development Project met all the requirements listed under Provisions E.3.e.(1)(a)(i)[a]-[d], or have evidence that the Copermittee did not have the land use or legal authority to require the implementation of Provision E.3 for a Priority Development Project.

The requirements under Provision E.3.e.(2)-(3) are necessary to demonstrate each Copermittee is implementing a program that complies with Provisions E.3.b-c and E.3.e.(1), and ensure structural BMPs at Priority Development Project will continue to be able to reduce pollutants in storm water discharges to the MEP.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary for any development projects to compel compliance with the requirements of Provision E.3 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.3.f requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Provision E.4 (Construction Management) requires each Copermittee to implement a construction management program to control and reduce the discharge of pollutants in storm water from construction sites to the MEP. Proper implementation of the construction management program will also contribute toward effectively prohibiting non-storm water discharges from construction sites to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." As part of the management program, 40 CFR 122.26(d)(2)(iv)(D) requires "*a program to implement and maintain structural and non-structural best management practices to reduce pollutants in storm water runoff from construction sites to the municipal storm sewer system.*"

Construction sites can be significant sources of sediment, trash, and other pollutants to receiving waters. Although sediment is naturally occurring in the natural

environment, the discharge of sediment under unnatural conditions is problematic to receiving waters. Fine sediment in creeks causes high turbidity that interferes with the functionality of native flora and fauna in local creeks. For example, turbidity interferes with both photosynthesis of water-philic plants, as well as successful foraging and reproduction of benthic macroinvertebrates. Sediment can also make it difficult for fish to breathe because it clogs fish gills. Other pollutants such as heavy metals or pesticides can adhere to sediment and are transported to receiving waters during storm events, where they dissolve in the water column and become bioavailable to aquatic organisms. Sediment is recognized as a major stressor to surface waters and is responsible for the impairment of several lagoons and creeks in the San Diego Region.

Provision E.4 includes requirements that each Copermittee must implement to minimize the discharge of sediment and other pollutants from construction sites to the MS4 within its jurisdiction. The requirements under Provision E.4 are consistent with the Fourth Term Permits for San Diego, Orange, and Riverside Counties. Therefore, Copermittees are expected to implement the requirements seamlessly, with minimal changes to their existing construction management programs. The Copermittees, however, are given more flexibility to run their programs as needed to maximize efficiency, and also to be consistent with the Water Quality Improvement Plan for the Watershed Management Area.

As part of the construction management program, 40 CFR 122.26(d)(2)(iv)(D)(1) requires "*procedures for site planning which incorporate consideration of potential water quality impacts.*" Provision E.4.a describes the minimum elements each Copermittee is required to include as part of the construction site planning and project approval process. The construction site planning and approval process is based primarily on ensuring each project had an adequate site-specific pollution control, construction BMP, and/or erosion and sediment control plan that will be implemented to minimize the discharge of pollutants in storm water to the MEP, and minimize impacts to receiving waters.

The requirements under Provision E.4.b provide the data and information necessary to identify "*priorities for inspecting sites and enforcing control measures*" required pursuant to 40 CFR 122.26(d)(2)(iv)(D)(3). Under Provision E.4.b, each Copermittee must identify construction sites that are considered a high threat to downstream surface waters. Designation of "high threat to water quality" construction sites will necessitate the Copermittees to develop criteria to identify such sites. Provision E.4.b.(2) describes a list of factors that must be considered when the Copermittee considers threat to water quality. For example, a Copermittee must identify sites as "high threat to water quality" if it is located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions, according to the Water Quality Improvement Plan. This ensures that construction management program implementation is compatible with the Copermittee's identified highest priority water quality conditions.

Pursuant to 40 CFR 122.26(d)(2)(iv)(D)(2) each Copermittee is required describe "*requirements for nonstructural and structural best management practices*" at construction sites. Provision E.4.c includes the types of construction site BMPs that the Copermittees must implement, or require the implementation of, at each construction site to reduce pollutants in storm water discharges to the MEP.

Each Copermittee is expected to require the implementation of appropriate BMPs given specific site conditions, the season and likelihood of rain events, and construction phase (i.e. grading vs. vertical construction). This means that throughout the life of the project construction, the appropriate BMPs will vary, especially if the construction of the project spans multiple wet seasons. As opposed to describing specific minimum BMPs that must be implemented, the Order describes major BMP categories that should be considered for each site.

Each Copermittee is expected to use its 20 years of storm water experience and knowledge to require implementation of appropriate BMPs from the various categories at each construction site within its jurisdiction. For example, the San Diego Water Board expects that each site will be required to implement erosion control and sediment control. The San Diego Water Board also expects each Copermittee to require implementation of active/passive sediment treatment systems at sites where other BMPs have been tried and are known to be inadequate, and discharges of sediment are causing or contributing to water quality impairment downstream. Each Copermittee is granted flexibility in specifying the minimum level of BMP requirements at each site, but the San Diego Water Board expects each site to be capable of controlling pollutants in storm water discharges to the MEP and preventing illicit discharges.

The requirements under Provision E.4.d are necessary to demonstrate that each Copermittee is implementing a program that complies with Provisions E.4.a and E.4.c and ensure BMPs at construction sites will reduce pollutants in storm water discharges to the MEP.

Provision E.4.d does not include minimum required inspection frequencies for construction sites. Each Copermittee must use its experience and knowledge to specify an appropriate inspection frequency for both high priority and lower priority sites in their jurisdictional runoff management program documents, and in accordance with the Water Quality Improvement Plan. Appropriate inspection frequencies may vary by Copermittee, but the San Diego Water Board expects that the stated frequency will be adequate for each Copermittee to properly oversee the construction sites within its jurisdiction, confirm BMPs are implemented to reduce pollutants in storm water discharges from constructions sites to the MEP, and make needed changes to its program on an ongoing basis as necessary.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary for any development projects to compel compliance with the requirements of Provision E.4 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.4.e requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Provision E.5 (Existing Development Management) requires each Copermittee to implement an existing development management program to control and reduce the discharge of pollutants in storm water from areas of existing development to the MEP. Proper implementation of the existing development management program will also contribute toward effectively prohibiting non-storm water discharges from areas of existing development to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." Within 40 CFR 122.26(d)(2)(iv)(A) and (C), the management program is required to reduce impacts on receiving waters and reduce pollutants in storm water discharges to the MEP from commercial and residential areas, industrial facilities, and municipal facilities.

Commercial and residential areas, industrial facilities, and municipal facilities must be addressed by each Copermittee with the existing development management program required under Provision E.5. All other areas within each Copermittee's jurisdiction should be either undeveloped open space, or areas that are being developed or under construction. Areas being developed or under construction will be addressed by the Copermittee under the requirements of Provision E.3 (Development Planning) or Provision E.4 (Construction Management).

Areas of existing development typically include impervious surfaces such as sidewalks, driveways, roads, and rooftops, which generate and concentrate pollutants (such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not found in high concentrations in the natural environment. Pollutants that accumulate on impervious surfaces are not easily biodegraded or not subject to natural treatment processes. When it rains, these pollutants are transported in storm water runoff from these impervious surfaces into receiving waters, resulting in poor water quality and degradation of beneficial uses.

In addition to the generation of pollutants, areas of existing development have generally altered the natural conditions of the land and removed vegetative cover, reduced the perviousness of the surface, and reduced the capacity of storm water that can be intercepted, captured, stored, infiltrated, evaporated, and/or evapotranspired.

The alteration of the natural conditions and the impervious surfaces associated with areas of existing development causes water quality problems due to the alteration of natural flow regimes within the watersheds; resulting in hydromodification of channels, streams, and habitats that exist within or adjacent to the areas of existing development.

Thus, storm water discharges from areas of existing development are responsible for poor water quality, degraded habitats, and hydromodified channels throughout the developed portions of the watersheds in the San Diego Region. To improve the health and functionality of the receiving waters in a Watershed Management Area, land use practices and the amount of impervious surfaces in areas of existing development must change to reduce the various impacts caused by hydromodification and pollutants from storm water runoff generated in developed areas. Each Copermittee must be aggressive to address pollutant sources and runoff from areas of existing development to be able to reduce pollutants in storm water discharges from the MS4 to the MEP.

There is some overlap in the requirements under Provision E.5 with the requirements under Provisions E.2 (Illicit Discharge Detection and Elimination), E.3 (Development Planning), and E.4 (Construction Management). Illicit discharges frequently originate from areas of existing development. New development projects, when completed will become some type of residential, commercial, industrial or municipal existing development. Redevelopment projects are, by definition, redeveloping areas of existing development. And, redevelopment projects become construction sites located in areas of existing development. Much of the data and information collected, inspections performed, and enforcement actions taken for the requirements under Provisions E.2 to E.4 may also be utilized by the existing development management program. The requirements under Provision E.5, however, are focused primarily on reducing pollutants generated in areas of existing development that can be transported in storm water runoff and discharged to and from the MS4.

The requirements under Provision E.5 build upon existing program elements being implemented by the Copermittees. Provision E.5 is generally consistent with the existing development requirements of the Fourth Term Permits for Orange and Riverside Counties (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), but modified to provide more flexibility to implement the programs so resources can be better focused toward addressing the highest priority water quality conditions identified in the Water Quality Improvement Plans.

For a Copermittee to properly manage areas of existing development, having knowledge of what development exists within its jurisdiction is essential. Provision E.5.a requires each Copermittee to maintain a watershed-based inventory of all the existing development within its jurisdiction. This requirement is necessary for each Copermittee to implement the requirements of Provision E.5.b-e.

As opposed to just maintaining separate inventories based on the type of site, each Copermittee must maintain a watershed-based inventory that includes all types of existing development within its jurisdiction. By utilizing a watershed-based inventory, the Copermittees within a Watershed Management Area can combine their inventories and review the inventories by watershed in addition to by jurisdiction. Pollutant sources and strategies for abatement can then be evaluated on a watershed level, as opposed to evaluating sources and strategies strictly by type of site.

Provision E.5.a includes the information that must be included in the inventory. Provision E.5.a.(1) specifies what facilities or areas must be included in the inventory. A commercial type of existing development may be identified in the inventory as a facility (e.g. individual building, individual business) or an area (e.g. shopping center, commercial zone). An industrial type of existing development must be identified in the inventory by facility (e.g. individual industrial entity). A municipal type of existing development must be identified in the inventory by facility, with a list of specific municipal facilities that must be included in the inventory. A residential type of existing development must be identified by areas to be designated by the Copermittee. For each of the facilities and areas identified in the Copermittee's inventory developed pursuant to Provision E.5.a.(1), Provision E.5.a.(2) specifies the information that must be included in the description for the facility or area.

Provision E.5.a.(3) requires each Copermittee to maintain an updated map showing the location of inventoried existing development, watershed boundaries, and water bodies. This requirement was included because this information is expected to help the Copermittees in a Watershed Management Area identify and prioritize sources of pollutants and/or stressors in areas of existing development that contribute toward the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Knowledge of the existing development that are likely to be sources of pollutants contributing to the highest priority water quality conditions is expected to be a key element in the Copermittees' development of the water quality improvement strategies that will be included in the Water Quality Improvement Plans. The strategies described in the Water Quality Improvement Plans will direct efforts within the existing development management programs implemented by each Copermittee.

Pursuant to 40 CFR 122.26(d)(2)(iv)(A) each Copermittee is required describe "*structural and source control measures to reduce pollutants*" in storm water runoff discharged from areas of existing development. Provision E.5.b includes the BMP implementation and maintenance requirements that the each Copermittee must require at areas of existing development to reduce pollutants in storm water discharges to the MEP. The San Diego Water Board, however, recognizes that BMP implementation and maintenance for residential areas will require much more education and encouragement through less authoritative measures than for commercial, industrial and municipal facilities and areas. Thus, the BMP

implementation and maintenance requirements have been separated between requirements under Provision E.5.b.(1) for commercial, industrial and municipal facilities and areas, and Provision E.5.b.(2) for residential areas.

Most of the requirements in Provision E.5.b are consistent with the related requirements in the Fourth Term Permits. The level of specificity, however, has been changed to allow each Copermittee the flexibility to implement its program to achieve maximum efficiency, and to perform functions that will address the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Each Copermittee is expected to require the implementation of appropriate BMPs to address the expected pollutants from each facility or area. The Third and Fourth Term Permits described specific minimum BMPs that must be implemented at various sites. This Order, however, requires each Copermittee to designate minimum BMPs themselves and require implementation. Consistent with the Fourth Term Permits, each Copermittee is required to maintain, or require the maintenance of, all BMPs as needed.

The BMP implementation and maintenance requirements include a schedule of operation and maintenance activities for the MS4 and related structures (such as catch basins, storm drain inlets, and detention basins), as well as public streets and roads. Public streets and roads specifically include public unpaved roads. The San Diego Water Board identified, through investigations and complaints, sediment discharges from unpaved roads as a significant source of water quality problems in the San Diego Region. Inspection activities conducted by the San Diego Water Board since the Third Term Permits have found a lack of source control for many unpaved roads within the jurisdiction of the Copermittees.

Unpaved roads are a source of sediment that can be discharged in runoff to receiving waters, especially during storm events. Erosion of unpaved roadways occurs when soil particles are loosened and carried away from the roadway base, ditch, or road bank by water, wind, traffic, or other transport means. Exposed soils, high runoff velocities and volumes, sandy or silty soil types, and poor compaction increase the potential for erosion.

Road construction, culvert installation, and other maintenance activities can disturb the soil and drainage patterns to streams in undeveloped areas, causing excess runoff and thereby erosion and the release of sediment. Poorly designed unpaved roads can act as preferential drainage pathways that carry runoff and sediment into natural streams, impacting water quality. In addition, other public works activities along unpaved roads have the potential to significantly affect sediment discharge and transport within streams and other waterways, which can degrade the beneficial uses of those waterways.

USEPA also recognizes that discharges from unpaved roads pose a significant potential threat to water quality. USEPA guidance[40] emphasizes the threat of unpaved roads to water quality:

> "*Dirt and gravel roads are a major potential source of these pollutants [sediment] and pollutants that bind to sediment such as oils, nutrients, pesticides, herbicides, and other toxic substances. Many roads have unstable surfaces and bases. Roads act like dams, concentrating flows that accelerate erosion of road materials and roadsides. Both unstable surfaces and accelerated erosion then lead to sediment and dust.*"

There are several guidance documents, developed by the USEPA,[41] the US Forest Service,[42] the University of California,[43] and others, that include design and construction specifications and BMPs that are readily available for implementation by public entities. Implementing design and other source control BMPs for unpaved roads in the region is necessary to reduce and minimize the impacts of sediment discharged during storm events from unpaved roads to the MS4s and receiving waters.

Provision E.5.c describes existing development site inspection frequency, content, and tracking that each Copermittee must incorporate into their existing development management programs. The requirements under Provision E.5.c are necessary to demonstrate each Copermittee is implementing a program that complies with Provision E.5.b and ensure BMPs implemented in areas of existing development will reduce pollutants in storm water discharges to the MEP. Provision E.5.c has been modified to include a minimum of once every 5 years for all inventoried facilities and areas of existing development, utilizing one or more methods of inspection.

In addition to onsite inspections, the methods of inspection have been expanded to include drive-by inspections. Inspections may be performed by the Copermittee's municipal and contract staff, or by volunteer monitoring or patrol programs. Volunteer monitoring or patrol programs are not expected to enforce the Copermittee's ordinances, or to inspect areas or facilities where members of the public are not allowed access. Volunteer monitoring or patrol programs must be trained by the Copermittee, and are only expected to collect visual observations. By utilizing drive-by inspections and volunteer monitoring or patrol programs, the Copermittees will be able to maximize and efficiently use their resources to identify and address sources of pollutants in areas of existing development.

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[40] USEPA, 2006. Environmentally Sensitive Maintenance for Dirt and Gravel Roads. Gesford and Anderson, USEPA-PA-2005.
[41] Ibid
[42] US Forest Service, 1996. Forest Service Specifications for Construction of Roads & Bridges. EM-7720-100. Revised August 1996.
[43] University of California Division of Agriculture and Natural Resources, 2007. Rural Roads: A Construction and Maintenance Guide of California Landowners. Publication 8262.

The municipal and contract staff of each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial, industrial, and municipal facilities and areas in its inventoried existing development pursuant to Provision E.5.c.(1)(a)(iv). An "equivalent" of at least 20 percent means if any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspections may count toward the total annual inspection requirement. Linear municipal facilities (i.e. MS4 linear channels, sanitary sewer collection systems, streets, roads and highways) in the Copermittee's existing development inventory are not subject to the inspection frequency requirement of Provision E.5.c.(1)(a)(iv).

The inspection content specified in Provision E.5.c.(2)(a) includes the information required to be collected during an inspection by any method. The inspection content specified in Provision E.5.c.(2)(b) includes additional information that must be collected when a Copermittee's municipal or contract staff perform an onsite inspection. Provision E.5.c.(3) specifies the information that each Copermittee must maintain in its existing development inspection records.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary to compel compliance with the requirements of Provision E.5 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.5.d requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Provisions E.5.e.(1)-(2) specifically require the Copermittee to identify areas of existing development as candidates for retrofitting, and streams, channels, and/or habitats as candidates for rehabilitation. Provisions E.5.e.(1)-(2) are based on the retrofitting requirements of the Fourth Term Permits for Orange and Riverside Counties, but modified to also include identifying projects to rehabilitate channels within areas of existing development. The requirements have also been modified to be more focused on utilizing these types of projects for addressing the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Interest and opportunity to retrofit areas of existing development and rehabilitate channels located in areas of existing development has been observed in several programs the San Diego Water Board oversees (e.g., CWA Section 401 Water Quality Certification program, supplemental environmental projects, and grant programs). Each jurisdiction has miles and miles of streets that could be retrofitted to become green streets. Reshaping landscaped areas from convex to concave configurations can detain storm water instead of directing runoff as quickly as possible to the MS4. Retrofit projects could also include simply replacing impervious surfaces with permeable surfaces.

Retrofitting projects do not necessarily have to be expensive. Retrofitting projects could be as simple as redirecting downspouts from roofs to pervious or landscaped areas instead of to hardscaped areas discharging directly to the MS4, providing rain barrels to harvest storm water from downspouts for use at a later time, or planting more trees in areas with little vegetation to provide canopy that can intercept storm water. The San Diego Water Board encourages the Copermittees to identify simple, low-cost retrofitting opportunities that can be easily implemented, in addition to other more expensive retrofitting and channel rehabilitation projects.

Rehabilitation of channels, streams, and/or habitat will require more significant planning and resources to implement. There are, however, also abundant opportunities to rehabilitate channels, streams and/or habitats in or adjacent to areas of existing development. Each Watershed Management Area likely has several creeks and stream reaches that have been undergrounded, artificially hardened, or hydromodified that could be rehabilitated to be more sustainably configured, which would slow down storm water flows and potentially have more assimilative capacity for pollutants while still being supportive of designated beneficial uses.

The San Diego Water Board recognizes that it may be infeasible to implement retrofitting or channel rehabilitation projects within certain areas of a Copermittee's jurisdictions. For such areas, the Copermittee must instead identify, develop, and implement regional retrofitting and channel rehabilitation projects (i.e. projects that can retain and/or treat storm water from one or more areas of existing development) adjacent to and/or downstream of the areas of existing development.

Provisions E.5.e.(1)-(2) do not require the implementation of retrofitting and rehabilitation projects, but do require the Copermittee to develop a program with strategies to facilitate the implementation of these types of projects in areas of existing development. The strategies are expected to include allowing and encouraging Priority Development Projects to implement retrofitting types of projects as a means of compliance with the structural BMP performance criteria requirements of Provisions E.3.c.(1) and E.3.c.(2).

Provision E.6 (Enforcement Response Plans) requires each Copermittee to develop an Enforcement Response Plan as part of its jurisdictional runoff management program document. Proper implementation of the Enforcement Response Plans is necessary to effectively prohibit non-storm water discharges to the MS4, and reduce the discharge of pollutants in storm water from the MS4 to the MEP.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system*" and be able to demonstrate that it can "*operate pursuant to legal authority established by statute, ordinance or series of contracts*" to control the discharge of non-storm water and pollutants in storm water to and from its MS4. Pursuant to 40 CFR 122.26(d)(2)(i)(E) each Copermittee is specifically required to

have the legal authority to "*[r]equire compliance with conditions in ordinances, permits, contracts or order*s."

The requirements under Provision E.6 are necessary to demonstrate that each Copermittee can enforce its legal authority to *"effectively prohibit non-stormwater discharges"* and "*reduce the discharge of pollutants to the maximum extent practicable*" as well as "*[r]equire compliance with conditions in ordinances, permits, contracts or order*."

The Enforcement Response Plan required under Provision E.6 will serve as a reference for the Copermittee and the San Diego Water Board to determine if consistent enforcement actions are being implemented to achieve timely and effective compliance from all public and private entities that are not in compliance with the Copermittee's ordinances, permits, or other requirements. The Enforcement Response Plan must contain clear direction for the Copermittee to take immediate enforcement action, when appropriate and necessary, in their illicit discharge detection and elimination, development planning, construction management, and existing development management programs.

If the entities subject to the Copermittee's legal authority do not implement appropriate corrective actions in a timely manner, or if violations repeat, the Copermittee must take progressively stricter responses to enforce its legal authority and achieve compliance with its ordinances, permits, or other requirements to *"effectively prohibit non-stormwater discharges"* and "*reduce the discharge of pollutants to the maximum extent practicable.*"

<u>Provision E.7 (Public Education and Participation)</u> requires each Copermittee to implement a public education and participation program. Proper implementation of the public education and participation program as part of its jurisdictional runoff management program will contribute toward effectively prohibiting non-storm water discharges to the MS4, and toward the reduction of pollutants in storm water from the MS4 to the MEP.

Provision E.7 establishes the minimum requirements that each Copermittee must implement to engage members of the public as part of its jurisdictional runoff management program. In the Fourth Term Permits, the public education program requirements and the public participation requirements were included as separate jurisdictional runoff management program components. In this Order, the public education requirements have been consolidated with the public participation requirements, as both sets of requirements are related to the engagement of the public by each Copermittee. Engagement of the public is critical for the success of each Copermittee's jurisdictional runoff management program.

The Copermittees have been implementing public education programs for the last 20 years, which are now well established. The specificity of expected public education program elements of the Fourth Term Permits has been removed. For the most part,

the public education program requirements in Provision E.7.a have been reduced to a set of requirements that are specifically included in the federal regulations under 40 CFR 122.26(d)(2)(iv)(A)(6), 122.26(d)(2)(B)(6) and 122.26(d)(2)(D)(4), which should already be incorporated into each Copermittee's existing public education program. Each Copermittee is expected to utilize the information and data collected from the monitoring and assessments conducted within the Watershed Management Area, and from its inventories and inspections to best direct its public education program resources toward addressing the highest priority water quality conditions identified within the Water Quality Improvement Plan.

According to 40 CFR 122.26(d)(2)(iv), public participation is required to be included as part of the "*comprehensive planning process*", which includes the development and implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs. The requirements under Provision E.7.b specify the opportunities that the public must be provided to be involved in the "*comprehensive planning process*", as required by to 40 CFR 122.26(d)(2)(iv).

Provision E.8 (Fiscal Analysis) requires each Copermittee to secure the resources and provide an analysis of the resources that will be necessary to implement the requirements of the Order. Adequate fiscal resources are necessary for a jurisdictional runoff management program to effectively prohibit non-storm water discharges to the MS4, and reduce pollutants in storm water from the MS4 to the MEP.

According to 40 CFR 122.26(d)(2)(vi), each Copermittee is responsible for providing "*a fiscal analysis of the necessary capital and operation and maintenance expenditures necessary to accomplish the activities*" required by this Order, including "*a description of the source of funds that are proposed to meet the necessary expenditures, including legal restrictions on the use of such funds.*" The fiscal analysis requirements of Provision E.8 are consistent with 40 CFR 122.26(d)(2)(vi).

The San Diego Water Board has chosen not to require a description of fiscal benefits realized from implementation of the jurisdictional runoff management programs. This is a recommendation from the National Association of Flood and Stormwater Management Agencies.[44] For instance, the fiscal analysis requirements do not address city-wide fiscal benefits of protection (e.g., public health, tourism, property values, economic activity, beneficial uses, etc.), even though many costs currently reported to the San Diego Water Board are for related activities. This type of assessment may help Copermittees improve the allocation of resources and it may help the Copermittees secure adequate funding for the program. Qualitative assessments, however, could be overly subjective and most Copermittees likely lack the ability to provide accurate quantitative assessments. The San Diego Water Board encourages the Copermittees to consider means for conducting assessments of fiscal

[44] National Association of Flood and Stormwater Management Agencies. 2006. *Guidance for Municipal Stormwater Funding.* Prepared under a grant provided by the USEPA.

benefits derived from the programs. Such assessments could be conducted on a regional scale similar to studies of program costs conducted by the State Water Board.[45]

[45] State Water Board, 2005. NPDES Stormwater Cost Survey.

F. Reporting

Purpose: Provision F includes the requirements for the documents and reports that the Copermittees must prepare and provide to the San Diego Water Board. The documents prepared by the Copermittees and provided to the San Diego Water Board and made available to the public will provide the documentation that the Copermittees are complying with the requirements of the Order.

***Discussion*:** Provision F requires the Copermittees to prepare several documents and reports that must be provided to the San Diego Water Board and made available to the public. The reporting requirements have been significantly reduced compared to the Fourth Term Permit reporting requirements. The reduction in reporting requirements was recommended by the San Diego County Copermittees in the Report of Water Discharge submitted in June 2011.

More specific and detailed discussions of the requirements of Provision F are provided below.

Provision F.1 (Water Quality Improvement Plans) requires the Copermittees in each Watershed Management Area to develop and submit a Water Quality Improvement Plan in accordance with the requirements of Provision B.

Of all the requirements of Provision F, the Water Quality Improvement Plans will likely be the documents requiring the most significant effort to develop. The content of the Water Quality Improvement Plans, however, is expected to include content that should already have been developed for the Watershed Plans and several elements that are included in the Monitoring and Reporting Programs required under the Fourth Term Permits.

Because the Water Quality Improvement Plan is part of the "*comprehensive planning process which involves public participation*," Provision F.1 includes requirements to give multiple opportunities to the public to provide input on the content of the plans.

Provision F.1.a.(1) specifies the elements that the Copermittees must include in the public participation process for the development of the Water Quality Improvement Plans. In order for the public to be aware of the opportunities to provide input, Provision F.1.a.(1)(a) requires the Copermittees to develop a publicly available and noticed schedule of the opportunities for the public to participate and provide comments during the development of the Water Quality Improvement Plan. These opportunities are when the public can provide the data, information, and recommendations that the Copermittees can consider during the development of the Water Quality Improvement Plans.

The San Diego Water Board recognizes, however, that the Copermittees cannot be expected to incorporate all the data, information, and recommendations that the public may provide into the Water Quality Improvement Plans. The Copermittees will have to review the data, information, and recommendations received and make some decisions on what to incorporate into the Water Quality Improvement Plans. Before the Copermittees finalize their decisions, members of the public should be allowed to review the Copermittees' decisions. Thus, Provision F.1.a.(1)(b) requires the Copermittees to form a Water Quality Improvement Consultation Panel (Panel).

The Panel will consist of a member from the environmental community and a member from the development community familiar with the Watershed Management Area. A representative from the San Diego Water Board staff will also be part of the Panel. The Copermittees may choose to include additional members, but the Panel is only required to include three panel members.

The Panel will serve as an additional public participation and input mechanism during the development of the Water Quality Improvement Plans. The knowledge and expertise from these Panel members are expected to provide the Copermittees valuable direction during their decision-making process. The Copermittees will review the content of their planned submittals with the Panel members to receive recommendations. If the Panel provides recommendations, the Copermittees must consider revisions to the Water Quality Improvement Plan submittals.

The San Diego Water Board recognizes that the development of multiple Water Quality Improvement Plans concurrently may limit the ability of the public to review and provide comments to the Copermittees. Thus, Provision F.1.a.(1)(c) requires the Copermittees to coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public time and opportunity to participate during the development of the Water Quality Improvement Plans.

Provision F.1.a.(2) requires the Copermittees to develop and submit the first Water Quality Improvement Plan component, in accordance with the requirements of Provision B.2, which includes the identification of the priority water quality conditions and potential water quality improvement strategies. The public must be provided an opportunity to provide data, information and recommendations to be utilized in the development and identification of the priority water quality conditions and potential water quality improvement strategies for the Watershed Management Area. The Copermittees must consult with the Panel and consider making revisions. The Copermittees may submit the requirements of Provision B.2 as early as 6 months and no later than 12 months after the commencement of coverage under this Order. After the requirements of Provision B.2 are submitted to the San Diego Water Board, the public will be provided another opportunity to provide comments.

Provision F.1.a.(3) requires the Copermittees to develop and submit the second Water Quality Improvement Plan component, in accordance with the requirements of Provision B.3, which includes the identification of the numeric goals for the highest

priority water quality conditions identified for the Watershed Management Area, and the strategies that will be implemented to achieve the potential numeric goals. The Copermittees may also develop the Optional Watershed Management Area Analysis, in accordance with the requirements of Provision B.3.b.(4), as part of this submittal. The public must be provided an opportunity to provide data, information and recommendations to be utilized in the development and identification of the numeric goals and water quality improvement strategies for the Watershed Management Area. The Copermittees must consult with the Panel and consider making revisions. The Copermittees may submit the requirements of Provision B.3 as early as 9 months and no later than 18 months after the commencement of coverage under this Order. After the requirements of Provision B.3 are submitted to the San Diego Water Board, the public will be provided another opportunity to provide comments.

Finally, Provision F.1.b describes the process for the submittal and implementation of the Water Quality Improvement Plans. The complete Water Quality Improvement Plans are required to be submitted by the Copermittees within 24 months after the commencement of coverage under this Order. The San Diego Water Board will provide the public an opportunity to provide comments on each complete Water Quality Improvement Plan.

The San Diego Water Board will review each Water Quality Improvement Plan and the public comments received to determine if the Copermittees have submitted a Water Quality Improvement Plan that meets the requirements of Provision B. If a Water Quality Improvement Plan does not meet the requirements of Provision B, the Copermittees will be considered out of compliance and directed in writing by the San Diego Water Board Executive Officer to correct the deficiencies.

When a Water Quality Improvement Plan meets the requirements of Provision B, the San Diego Water Board will determine whether to hold a public hearing or to limit public input to submittal of written comments before accepting the Water Quality Improvement Plan. Implementation of the Water Quality Improvement Plan must begin within 30 days of acceptance.

The San Diego Water Board expects that any deficiencies in the Water Quality Improvement Plan will be identified either in the public comments or during the review by the San Diego Water Board before implementation begins. In the event any deficiencies are identified after the implementation of the Water Quality Improvement Plan, Provision F.1.b.(7) clarifies that the San Diego Water Board maintains the right to require the Copermittees to correct any deficiencies that may be identified.

Provision F.2 (Updates) requires the Copermittees to update specific documents that the Copermittees will utilize to implement the requirements of this Order.

Each Copermittee is required to continue implementing a jurisdictional runoff management program, as required under Provision E. Implementation of each Copermittee's jurisdictional runoff management program is directed by its jurisdictional

runoff management program document. Provision F.2.a requires each Copermittee to update its jurisdictional runoff management program document to be consistent with the requirements of Provision E concurrent with the submittal of the Water Quality Improvement Plan.

Likewise, each Copermittee must continue to require new development and redevelopment projects to implement BMPs to control pollutants in storm water runoff. The control of pollutants in storm water runoff from development and redevelopment projects within each Copermittee's jurisdiction is guided and directed by its BMP Design Manual, formerly known as a Standard Storm Water Mitigation Plan (SSMP). Provision F.2.b requires each Copermittee to update its BMP Design Manual to be consistent with the requirements of Provision E.3 concurrent with the submittal of the Water Quality Improvement Plan.

For situations where the San Diego Water Board may amend the requirements of Provisions E.3.a-d after a Copermittee has updated its BMP Design Manual pursuant to Provision F.2.b.(1), Provision F.2.b.(4) gives the Copermittee up to 90 days to incorporate the amended requirements of Provision E.3.a-d into its BMP Design Manual. The San Diego Water Board Executive Officer has discretion to modify the 90-day time period depending on the complexity of the amendments or other information that warrants a change in the 90-day time period.

In general, the requirements of the Order should not necessitate a complete rewrite of each Copermittee's jurisdictional runoff management program document or BMP Design Manual, as was required by the Third Term Permits. The jurisdictional runoff management program and BMP Design Manual requirements of this Order are not significantly different than the requirements of the Fourth Term Permits. Thus, only sections of the Order which are new or have been significantly changed should warrant revisions to specific sections of the Copermittee's jurisdictional runoff management program document and BMP Design Manual.

Finally, the Water Quality Improvement Plans are expected to require updates as the iterative approach and adaptive management process included in the Water Quality Improvement Plan, as required under Provision B.5, is implemented by the Copermittees. Provision F.2.c.(1) requires the Copermittees to implement a public participation process for the proposed updates, review the proposed updates with the Panel, and submit the updates to the Water Quality Improvement Plan as part of the Annual Reports required under Provision F.3.b.

Also, because TMDLs are likely to be developed, adopted and approved during the term of the Order, Provision F.2.c.(2) has been included to expedite the incorporation of TMDLs into the Copermittees' Water Quality Improvement Plans as part of the update process, potentially before the Order is re-opened to incorporated the requirements of the new TMDLs.

Provision F.3 (Progress Reporting) requires the Copermittees to report on the progress of implementing the Water Quality Improvement Plans.

The requirements of Provision F.3 are to report the progress toward improving water quality that the Copermittees are achieving with the implementation of the Water Quality Improvement Plans and each Copermittee's jurisdictional runoff management program. The Progress Report Presentations required under Provision F.3.a are included to provide the Copermittees an opportunity to communicate directly with the San Diego Water Board and the public. The Progress Report Presentations will also provide the members of the San Diego Water Board and members of the public an opportunity to become more acquainted with the Copermittees and their projects and programs to address non-storm water and storm water discharges into and from their MS4s.

The Annual Report requirements of Provision F.3.b are a consolidation of several reporting requirements from the Fourth Term Permits, including the Jurisdictional Runoff Management Program Annual Reports, the Watershed Annual Reports, and the Monitoring and Reporting Program Annual Reports. Furthermore, the Annual Report requirements are consistent with the requirements under 40 CFR 122.42(c).

Pursuant to 40 CFR 122.42(c), "*[t]he operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the Director…must submit an annual report*", which must include the following:

(1) *The status of implementing the components of the storm water management program that are established as permit conditions* [40 CFR 122.42(c)(1)];

(2) *Proposed changes to the storm water management programs that are established as permit conditions* [40 CFR 122.42(c)(2)];

(3) *Revisions, if necessary, to the assessment of controls and fiscal analysis* [40 CFR 122.42(c)(3)];

(4) *A summary of data, including monitoring data, that is accumulated throughout the reporting year* [40 CFR 122.42(c)(4)];

(5) *Annual expenditures and budget for year following each annual report* [40 CFR 122.42(c)(5)];

(6) *A summary describing the number and nature of enforcement actions, inspections, and public education programs* [40 CFR 122.42(c)(6)];

(7) *Identification of water quality improvements or degradation* [40 CFR 122.42(c)(7)].

Under the Fourth Term Permits, each Copermittee is responsible for submitting a Jurisdictional Runoff Management Program Annual Report; the Copermittees in each

designated watershed are responsible for submitting a Watershed Annual Report; and the Copermittees from each county are responsible for submitting a Monitoring and Reporting Program Annual Report.

There are 39 Copermittees in the San Diego Region, each required to prepare and submit a Jurisdictional Runoff Management Program Annual Report. There are 9 designated watersheds in San Diego County, 6 designated watersheds in Orange County, and 1 designated watershed in Riverside County for a total of 16 designated watersheds, each requiring a Watershed Annual Report. There are 3 sets of Copermittees in 3 counties in the San Diego Region, requiring Copermittees from each county to prepare and submit a Monitoring and Reporting Program Annual Report. Thus each Copermittee is currently required to prepare, or participate in the preparation of at least 3 annual reports. In addition, the San Diego County Copermittees are required to prepare and submit a Regional Urban Runoff Management Plan Annual Report.

In total, there are 59 annual reports that are prepared by the Copermittees and submitted to the San Diego Water Board for the Fourth Term Permits. The preparation of these annual reports requires significant time and resources from each Copermittee, which could otherwise be expended on actions that could improve water quality within its jurisdiction. In turn, significant time and resources are required from the San Diego Water Board staff to review these reports, which could otherwise be expended on working directly with the Copermittees to improve their implementation efforts toward restoring and protecting water quality.

Until the Water Quality Improvement Plans are developed, there will be a transitional period during which the Copermittees will continue to implement their existing jurisdictional runoff management programs. There will also be a transitional period during which the Copermittees will implement the transitional monitoring and assessment requirements of Provision D. During the transitional period, the Copermittees will submit annual reports pursuant to the requirements of Provisions F.3.b.(1) and F.3.b.(2).

Provision F.3.b.(1) includes the transitional annual reporting requirements for each Copermittee's jurisdictional runoff management program. The reporting of the jurisdictional runoff management program implementation efforts have been reduced to a single 2-page form. Each Copermittee is required to complete and submit a Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D or a revised form accepted by the San Diego Water Board) no later than October 31 of each year for each jurisdictional runoff management program reporting period (i.e. July 1 to June 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted. The Jurisdictional Runoff Management Program Annual Report Form will certify that each Copermittee has implemented its jurisdictional runoff management program in accordance with the requirements of Provision E. Each Copermittee may choose to continue to utilize and submit the jurisdictional runoff management program annual reporting format of its

current Order until the first Water Quality Improvement Plan Annual Report is required to be submitted.

Provision F.3.b.(2) includes the transitional annual reporting requirements for the transitional monitoring and assessment program for each Watershed Management Area. The Copermittees in the Watershed Management Area are required to submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted. The Transitional Monitoring and Assessment Program Annual Report is required to include the transitional period monitoring data collected pursuant to Provisions D.1.a and D.2.a, and the findings from the transitional period findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

Provision F.3.b.(3) includes the Water Quality Improvement Plan Annual Report requirements. Only one Water Quality Improvement Plan Annual Report is required for each of the ten (10) Watershed Management Areas designated under Provision B.1, which is a significant reduction in the number of annual reports required to be prepared and submitted by the Copermittees. The Water Quality Improvement Plan Annual Report will document the Copermittees' efforts to implement the Water Quality Improvement Plan. Each Water Quality Improvement Plan Annual Report will be focused primarily on reporting the analysis of the monitoring data collected pursuant to Provisions D.1-D.3 during the reporting period, and the assessments that are required pursuant to Provision D.4 based on the data. The monitoring data analyses and the assessments that are provided in the Water Quality Improvement Plan Annual Report will be the core of the report. The reporting of the jurisdictional runoff management program implementation efforts have been reduced to a single 2-page form, and will no longer be the primary focus of the reporting requirements as in the Third and Fourth Term Permits.

Each Copermittee will continue to prepare and submit a Jurisdictional Runoff Management Program Annual Report Form as part of the Water Quality Improvement Plan Annual Report to certify that each Copermittee has implemented its jurisdictional runoff management program in accordance with the requirements of Provision E. Instead of reviewing a voluminous report from each Copermittee, as was required under the Third and Fourth Term Permits, the San Diego Water Board will conduct audits of each Copermittee's jurisdictional runoff management program to investigate and confirm the information provided by each Copermittee on its Jurisdictional Runoff Management Program Annual Report Form. The audits will allow the San Diego Water Board to become more familiar with the each Copermittee's jurisdictional runoff management program, and each Copermittee will become more informed about the expectations of the San Diego Water Board.

The reduction in the number and content of the Water Quality Improvement Plan Annual Reports should result in significant time, cost and resource savings for the

Copermittees, as well as the San Diego Water Board. Those savings should offset a significant portion of any additional costs that may be incurred to develop the Water Quality Improvement Plans and to implement the monitoring and assessment program requirements of Provision D.

The reporting period for the Water Quality Improvement Plan Annual Reports consists of two periods. Because the jurisdictional runoff management programs are typically budgeted and implemented during a fiscal year, the information provided on the Jurisdictional Runoff Management Program Annual Report Forms will cover the period from July 1 to June 30 of the following year.

The Water Quality Improvement Plan Annual Reports, however, are focused primarily on the monitoring data and the assessments based on the monitoring data. The monitoring data is collected during the monitoring year, which begins October 1 and ends September 30 of the following year. The monitoring year begins after the beginning of the fiscal year and ends after the end of the fiscal year. Therefore, to accommodate and capture the information collected during the fiscal year and the monitoring year, the Annual Report reporting period incorporates both periods.

Finally, Provision F.3.c requires the Copermittees to develop and submit a Regional Monitoring and Assessment Report. The Regional Monitoring and Assessment Report is similar to the Long Term Effectiveness Assessment required under the Fourth Term San Diego County Permit. The Regional Monitoring and Assessment Report is expected to utilize the entire body of data and information collected by the Copermittees during the term of this Order to assess improvements to water quality on a regional scale.

Provision F.4 (Regional Clearinghouse) requires the Copermittees to develop, update, and maintain an internet-based Regional Clearinghouse that can be used to store, disseminate, and share the Copermittees' documents, monitoring data, special studies, and any other data or information.

Most of the documents and data that are generated by the Copermittees can be provided in electronic format, and made available to the San Diego Water Board and the public on the internet. The San Diego Water Board has been gradually transitioning its document submittal requirements to electronic submittals. Provision F.4 has been included to further these efforts.

Provision F.4 has also been included to improve the exchange and availability of information among the Copermittees, as well as between the Copermittees and the San Diego Water Board. Provision F.4 will also make the information generated during the implementation of the Order more accessible to the public.

Provision F.5 (Report of Waste Discharge) requires the Copermittees to submit a Report of Waste Discharge to reapply for renewal of the Order prior to its expiration, in accordance with 40 CFR 122.21(d)(2) and CWC section 13376.

~~Because the Riverside County Copermittees will not be subject to the requirements of this Order until they are notified of coverage, Provision F.5.a describes the process of submitting a Report of Waste Discharge pursuant to the requirements of their current permit to obtain coverage under this Order.~~

~~For the Copermittees subject to the requirements of this Order,~~ Provision F.5~~.b~~ requires the Copermittees to submit a Report of Waste Discharge 180 days in advance of the expiration of this Order. Provision F.5~~.b~~ also describes the minimum information to be included in the Report of Waste Discharge, based on USEPA guidance "Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems," dated May 17, 1996.

~~Provision F.6 (Application for Early Coverage) describes the process that would allow the Orange County and/or Riverside County Copermittees to obtain coverage under this Order earlier than the expiration of their current Orders.~~

~~If the Riverside County Copermittees choose to obtain coverage under this Order earlier than the expiration of their current Orders, the preparation and submittal of a Report of Waste Discharge, as required by the Fourth Term Permits, will not be necessary. The existing Order for the respective county will be rescinded upon the effective coverage date under this Order, except for enforcement purposes.~~

G. Principal Watershed Copermittee Responsibilities

Purpose: Provision G includes the requirements for the Principal Watershed Copermittee designated by the Copermittees in each Watershed Management Area.

***Discussion*:** Unlike previous NPDES requirements, there will no longer be a single Principal Copermittee. Provision G.1 requires the Copermittees to designate a Principal Watershed Copermittee for each Watershed Management Area. There are ten (10) Watershed Management Areas in the San Diego Region, as defined in Table B-1 under Provision B.1 of the Order. An individual Copermittee should not be the Principal Watershed Copermittee for more than two (2) Watershed Management Areas. There could be up to ten (10) Principal Water Copermittees designated for the Watershed Management Areas in the San Diego Region.

Provision G.2 describes the minimum responsibilities of each Principal Watershed Copermittee. The primary responsibility of the Principal Watershed Copermittees is to serve as the liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues. Ideally, the Principal Watershed Copermittee can represent the interests of all the Copermittees within a Watershed Management Area during discussions or meetings to facilitate communication with the San Diego Water Board. The Principal Watershed Copermittees are also responsible for facilitating and coordinating the implementation efforts of the Copermittees and submittals of required documents and reports.

The Principal Watershed Copermittee is responsible for facilitating the efforts of the Copermittees within the Watershed Management Area to develop the Water Quality Improvement Plan required under Provision B, and submit it for approval in accordance with Provision F.1. The Principal Watershed Copermittee is also responsible for coordinating the submittal of the document updates, Progress Report Presentations, and Annual Reports required from the Copermittees within each Watershed Management Area under Provisions F.2, F.3.a, and F.3.b. The Principal Watershed Copermittees are responsible for coordinating with each other to develop and submit the Regional Clearinghouse, Regional Monitoring and Assessment Report, and the Report of Waste Discharge required under Provisions F.3.c, F.4, and F.5.

The designated Principal Watershed Copermittee for each Watershed Management Area does not necessarily have to serve as the Principal Watershed Copermittee for the entire term of the Order. If the Copermittees in a Watershed Management Area choose to designate a new Principal Watershed Copermittee, the change may be submitted as part of the Annual Report required under Provision F.3.b, with an update to the Water Quality Improvement Plan in accordance with Provision F.2.c.

Provision G.3 specifies that the Principal Watershed Copermittee is not responsible for ensuring that the other Copermittees within the Watershed Management Area are in compliance with the requirements of this Order

H. Modification of Order

Purpose: Provision H provides the conditions under which modifications to Order No. R9-2013-0001, as amended, may occur.

***Discussion*:** Provision H allows for modifications to Order No. R9-2013-0001, as amended, for bases in addition to modifications (minor and major) allowed under the federal regulations at 40 CFR 122.62 and 122.63.

Modifications to the Order require re-opening the Order (see Water Code section 13223), subject to the requirements of 40 CFR 122.44, 122.62 to 122.64, and 124.5, but only for the specific provisions subject to the modification. Proposed modifications of the Order will be made available for public review, a public notice and comment period, and a public hearing if requested. Comments on the provisions not subject to the proposed modifications are not required to be considered in the San Diego Water Board's responses to comments or during the public hearing.

Provision H.4 was included to specify that the Order will be re-opened for modifications if ~~the State Water Board determines revisions to Provision A are warranted, an application for early coverage under the Order is received pursuant to Provision F.6,~~ the Basin Plan is amended to modify an existing TMDL or incorporate a new TMDL, or the monitoring and assessment program requirements need to be updated or revised.

~~Provision H.5 was included to specify that the San Diego Water Board will re-open and consider modifications to this Order when the Orange County Copermittees or the Riverside County Copermittees submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders~~

I. Standard Permit Provisions and General Provisions

Purpose: Provision I incorporates the standard permit provisions required to be included in all NPDES permits, as well as several other general provisions.

***Discussion*:** Provision I refers to Attachment B to the Order. Attachment B expressly incorporates the conditions applicable to all NPDES permits as provided under 40 CFR 122.41(a)-(n), as well as the applicable conditions for MS4s and storm water discharges provided under 40 CFR 122.42(c) and 40 CFR 122.42(d), respectively. Attachment B also includes several general provisions that are typically included in or applicable to waste discharge requirements issued by the San Diego Water Board.

IX. ATTACHMENTS

The attachments to the Order are discussed below. The discussions describe the content of the attachments.

Attachment A – Discharge Prohibitions and Special Protections

Section 1 of Attachment A includes the Waste Discharge Prohibitions from the Basin Plan. They have been provided verbatim in their entirety.

Section 2 of Attachment A includes the "*Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges*" applicable to permitted point source discharges of storm water, adopted under State Water Board Resolution No. 2012-0012, as amended by Resolution No. 2012-0031. The terms, prohibitions, and special conditions (collectively referred to as special conditions) are established as limitations on point source storm water discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in ASBS, as required for State Water Quality Protection Areas pursuant to California Public Resources Code sections 36700(f) and 36710(f). These Special Protections were adopted by the State Water Board as part of the Ocean Plan General Exception.

Attachment B – Standard Permit Provisions and General Provisions

Conditions applicable to all NPDES permits, as required under 40 CFR 122.41, and conditions applicable to MS4s and storm water discharges, as required under 40 CFR 122.42(c) and 122.42(d), respectively are provided in Attachment B to the Order. They have been provided expressly in their entirety.

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. These general provisions are typically included in or applicable to waste discharge requirements issued by the San Diego Water Board. Many of the general provisions were developed by the State Water Board. Where a general provision is derived from statute or regulation, a citation of the statute or regulation section is provided. General provisions that do not provide a citation are included under the authority provided CWC 13377.

Attachment C – Acronyms, Abbreviations and Definitions

The acronyms and abbreviations that are used in the Order are provided in Attachment C. Attachment C also includes definitions that may provide an explanation or description of the meaning or intent of specific terms or phrases included in the Order.

Attachment D – Jurisdictional Runoff Management Program Annual Report Form

An example of the Jurisdictional Runoff Management Program Annual Report Form required to be submitted by each Copermittee as part of the Annual Reports required under Provision F.3.b.(1)(e) is provided as Attachment D to the Order. An electronic version of the form will be available from the San Diego Water Board after the adoption of the Order.

The Jurisdictional Runoff Management Program Annual Report Form includes the minimum information necessary to demonstrate that the Copermittee is implementing and in compliance with the requirements of Provision E, and includes much of the information required to be reported pursuant to 40 CFR 122.42(c).

The information that must be provided on the Jurisdictional Runoff Management Program Annual Report Form is limited to the fiscal year, which begins July 1 and ends June 30 of the following year. The information expected to be provided by the Copermittees in each section of the Jurisdictional Runoff Management Program Annual Report Form is discussed below.

I. COPERMITTEE INFORMATION

The name of the Copermittee (e.g. name of city, county, or special district) and the contact information for the storm water program manager are provided under this section.

II. LEGAL AUTHORITY

The Copermittee must confirm whether or not the legal authorities under Provision E.1.a have been established for itself within its jurisdiction.

The Copermittee must also confirm whether or not a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority, as required under Provision E.1.b. The certification statement required by Provision E.1.b is only required to be submitted with the first Annual Report required under Provision F.3.b.

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

The Copermittee must inform the San Diego Water Board whether or not an update to its jurisdictional runoff management program document was required or recommended by the San Diego Water Board during the reporting period. An update to the jurisdictional runoff management program is required under Provision F.2.a. The San Diego Water Board may recommend modifications to the jurisdictional runoff management program as part of the iterative approach and adaptive management process required under Provision B.5, which may result in an update that is necessary for the Copermittee's jurisdictional runoff management document.

If an update was required or recommended, the Copermittee must confirm whether or not the update was completed and made available on the Regional Clearinghouse within the reporting period. If no update was required or recommended, an answer is not required. If the answer is NO, meaning the required or recommended update was not completed and/or made available on the Regional Clearinghouse, the Copermittee must attach a

schedule for the completion of the update and/or posting of the updated document on the Regional Clearinghouse.

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

The Copermittee must confirm whether or not a program was implemented during the fiscal year to actively detect and eliminate illicit discharges and connections in accordance with the requirements under Provision E.2.

In addition to confirming that a program to detect and eliminate illicit discharges was implemented during the reporting period, the Copermittee is also required to report on several items related to the program. The information that must be reported is limited to the fiscal year for the Annual Report.

All non-storm water discharges are considered illicit discharges unless the source is identified as one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5). If a non-storm water discharge is identified as one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5), the discharge is a non-storm water discharge, but not an illicit discharge. If a non-storm water discharge is identified but not in one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5), the discharge is both a non-storm water discharge and an illicit discharge.

V. DEVELOPMENT PLANNING PROGRAM

The Copermittee must confirm whether or not a development planning program was implemented during the fiscal year in accordance with the requirements under Provision E.3.

The Copermittee must also inform the San Diego Water Board whether or not an update to its BMP Design Manual was required or recommended by the San Diego Water Board during the fiscal year. An update to the BMP Design Manual is required under Provision F.2.b. The San Diego Water Board may recommend modifications to the BMP Design Manual, which may result in an update that is necessary for Copermittee's the BMP Design Manual.

If an update was required or recommended, the Copermittee must confirm whether or not the update was completed and made available on the Regional Clearinghouse within the reporting period. If no update was required or recommended, an answer is not required. If the answer is NO, meaning the required or recommended update was not completed and/or made available on the Regional Clearinghouse, the Copermittee must attach a schedule for the completion of the update and/or posting of the updated document on the Regional Clearinghouse.

The Copermittee is also required to report on several items related to the program. For the development and redevelopment projects that are reviewed under the program, the Copermittee must report the total number projects submitted for review during the fiscal year. Of those projects, the Copermittee must report the number that are Priority Development Projects, as defined under Provision E.3.b.(1). The Copermittee must also report the number of Priority Development Projects that were approved and/or granted occupancy during the fiscal year, regardless of when the project was originally submitted for review. Any projects that were approved during the fiscal year and granted any

exemptions from the BMP Design Manual requirements and/or allowed to implement alternative compliance options in accordance with Provision E.3.c.(3) must be reported.

Finally, the Copermittee must also report on several items related to its oversight of permanent BMPs on Priority Development Projects within its jurisdiction, as required under Provision E.3.e. The information that must be reported is limited to the fiscal year for the Annual Report.

VI. CONSTRUCTION MANAGEMENT PROGRAM

The Copermittee must confirm whether or not a construction management program was implemented during the fiscal year in accordance with the requirements under Provision E.4.

The Copermittee is also required to report on several items related to its oversight construction projects within its jurisdiction. The information that must be reported is limited to the fiscal year for the Annual Report.

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

The Copermittee must confirm whether or not an existing development management program was implemented during the fiscal year in accordance with the requirements under Provision E.5.

The Copermittee is also required to report on several items related to its oversight in areas of existing development within its jurisdiction. The information that must be reported is limited to the fiscal year for the Annual Report. The information must also be separated into four categories of existing development: municipal, commercial, industrial, and residential.

VIII. PUBLIC EDUCATION AND PARTICIPATION

The Copermittee must confirm whether or not a public education program component was implemented during the fiscal year in accordance with the requirements under Provision E.7.a.

The Copermittee must also confirm whether or not a public participation program component was implemented during the fiscal year in accordance with the requirements under Provision E.7.b.

IX. FISCAL ANALYSIS

The Copermittee must confirm a summary of its fiscal analysis, conducted in accordance with the requirements under Provision E.8, has been attached to the form.

X. CERTIFICATION

A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative must sign and certify the Jurisdictional Runoff Management Program Annual Report Form. The appropriate box must be checked to indicate the whether a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative is signing the form.

Attachment E – Specific Provisions for Total Maximum Daily Loads

Attachment E provides specific provisions for implementing the load allocations (LAs) and wasteload allocations (WLAs) of Total Maximum Daily Loads (TMDLs) adopted by the San Diego Water Board and approved by USEPA in which the Copermittees are identified as responsible for discharges subject to the requirements of the TMDLs. Federal regulations require that NPDES requirements incorporate water quality based effluent limitations (WQBELs) that must be consistent with the requirements and assumptions of any available WLAs,[46] which may be expressed as numeric effluent limitations, when feasible, and/or as a best management practice (BMP) program of expanded or better-tailored BMPs.[47] Where the TMDL includes WLAs that provide numeric pollutant load or pollutant parameter objectives, the WLA has been, where feasible, translated into numeric WQBELs.[48]

For each TMDL in Attachment E, four sections are included:

a. Applicability: This section provides the resolution under which the TMDL Basin Plan amendment was adopted and approved, with the applicable adoption and approval dates. This section also gives the effective date of the TMDL and where the TMDL is applicable (i.e. Watershed Management Area and water body). The Copermittees that are responsible for implementing the specific provisions are also given in this section.

b. Final TMDL Compliance Requirements: For each TMDL, the final TMDL compliance requirements consist of the final TMDL compliance date(s), the final WQBELs, and the final TMDL compliance determination requirements. The final WQBELs are expressed in terms of receiving water limitations, effluent limitations, and/or best management practices (BMPs). The final WQBELs for the TMDLs are incorporated by reference into Provision A of the Order. The final WQBELs become enforceable when the final TMDL compliance dates have passed. Applicable BMPs within the final WQBELs must be incorporated into the Water Quality Improvement Plans. Compliance with the final WQBELs will be determined in accordance with the options provided under the final TMDL compliance determination requirements.

c. Interim TMDL Compliance Requirements: If the final TMDL compliance date has not passed and there are interim TMDL compliance requirements, they are included in this section. If there are interim WQBELs with interim compliance dates, the interim WQBELs become enforceable when the corresponding interim compliance dates have passed. Compliance with the interim WQBELs will be determined in accordance with the options provided under the interim TMDL compliance determination requirements.

d. Specific Monitoring and Assessment Requirements: If there are specific monitoring and assessment requirements that cannot be met with the monitoring and assessment program

[46] 40 CFR 122.44(d)(1)(vii)(B)
[47] 40 CFR 122.44(k)(2) and 40 CFR 122.44(k)(3)
[48] November 26, 2014 Memorandum from the USEPA, Revisions to the November 22, 2002 Memorandum "Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLA""

requirements under Provision D of the Order, the additional requirements are included in this section.

The requirements of the TMDLs are based on and consistent with the assumptions and requirements of any available adopted and approved TMDLs that have been incorporated into the Basin Plan. Modifications to the requirements for the TMDLs in Attachment E cannot be made unless the TMDLs are modified in the Basin Plan.

A modification to any aspect of a TMDL in the Basin Plan requires a Basin Plan amendment. A Basin Plan amendment to modify a TMDL will require the San Diego Water Board to adopt a resolution to amend the Basin Plan, which includes a separate public process. When the San Diego Water Board adopts a Basin Plan amendment, it subsequently requires approval from the State Water Board, the Office of Administrative Law, and the USEPA before it becomes effective.

If and when the TMDLs are a modified in the Basin Plan, the San Diego Water Board will revise the requirements of the Order in accordance with the Basin Plan amendment. When a Basin Plan amendment to modify a TMDL becomes effective, the San Diego Water Board will modify the requirements of the Order pursuant to the requirements of Provision H.4 of the Order as soon as possible.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

ORDER NO. R9-2013-0001,
AS AMENDED BY ORDER NOS. R9-2015-0001 AND R9-2015-0100
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The San Diego County Copermittees in Table 1a are subject to waste discharge requirements set forth in this Order.

Table 1a. San Diego County Copermittees

City of Carlsbad	City of Oceanside
City of Chula Vista	City of Poway
City of Coronado	City of San Diego
City of Del Mar	City of San Marcos
City of El Cajon	City of Santee
City of Encinitas	City of Solana Beach
City of Escondido	City of Vista
City of Imperial Beach	County of San Diego
City of La Mesa	San Diego County Regional Airport Authority
City of Lemon Grove	San Diego Unified Port District
City of National City	

The Orange County Copermittees in Table 1b are subject to waste discharge requirements set forth in this Order.

Table 1b. Orange County Copermittees[1]

City of Aliso Viejo	City of Rancho Santa Margarita
City of Dana Point	City of San Clemente
City of Laguna Beach	City of San Juan Capistrano
City of Laguna Hills	City of Laguna Woods
City of Laguna Niguel	County of Orange
City of Mission Viejo	Orange County Flood Control District

[1] While not listed in Table 1b., the City of Lake Forest remains a Copermittee under this Order until the later effective date of this Order or the effective date of Santa Ana Water Board Tentative Order No. R8-2015-0001. Thereafter, the City of Lake Forest will no longer be considered a Copermittee under this Order because its Phase I MS4 discharges will be regulated by the Santa Ana Water Board pursuant to Water Code section 13228 designation. The requirements of this Order that apply to the City of Lake Forest for the duration of this Order, however, are described in Finding 29 and Footnote 2 to Table B-1.

The Riverside County Copermittees in Table 1c are subject to waste discharge requirements set forth in this Order.

Table 1c. Riverside County Copermittees

City of Murrieta	County of Riverside
City of Temecula	Riverside County Flood Control and Water Conservation District
City of Wildomar	

The term Copermittee in this Order refers to any San Diego County, Orange County, or Riverside County Copermittee covered under this Order, unless specified otherwise.

This Order provides permit coverage for the Copermittee discharges described in Table 2.

Table 2. Discharge Locations and Receiving Waters

Discharge Points	Locations throughout San Diego Region
Discharge Description	Municipal Separate Storm Sewer System (MS4) Discharges
Receiving Waters	Inland Surface Waters, Enclosed Bays and Estuaries, and Coastal Ocean Waters of the San Diego Region

Table 3. Administrative Information

This Order was adopted by the San Diego Water Board on:	**May 8, 2013**
Order No. R9-2013-0001 became effective on:	**June 27, 2013**
This Order as amended by R9-2015-0001 became effective on:	**April 1, 2015**
This Order as amended by R9-2015-0100 became effective on:	**January 7, 2016**
This Order will expire on:	**June 27, 2018**
The Copermittees must file a Report of Waste Discharge in accordance with Title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than 180 days in advance of the Order expiration date.	

I, David W. Gibson, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on May 8, 2013, as amended by adoption of Order No. R9-2015-0001 on February 11, 2015, and as amended by adoption of Order No. R9-2015-0100 on November 18, 2015.

David W. Gibson
Executive Officer

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ATTACHMENTS

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Attachment B: Standard Permit Provisions and General Provisions B-1
Attachment C: Acronyms, Abbreviations and Definitions C-1
Attachment D: Jurisdictional Runoff Management Program Annual Report Form D-1
Attachment E: Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2013-0001, as amended by Order Nos. R9-2015-0001 and R9-2015-0100 ..... E-1
Attachment F: Fact Sheet / Technical Report for Order No. R9-2013-0001, as amended by Order Nos. R9-2015-0001 and R9-2015-0100 ..... F-1

I. FINDINGS

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), finds that:

JURISDICTION

1. **MS4 Ownership or Operation.** Each of the Copermittees owns or operates an MS4, through which it discharges storm water and non-storm water into waters of the U.S. within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the U.S.

2. **Legal and Regulatory Authority.** This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]) adopted by the United States Environmental Protection Agency (USEPA), and chapter 5.5, division 7 of the California Water Code (CWC) (commencing with section 13370). This Order serves as an NPDES permit for discharges from MS4s to surface waters. This Order also serves as waste discharge requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

   The San Diego Water Board has the legal authority to issue a regional MS4 permit pursuant to its authority under CWA section 402(p)(3)(B) and 40 CFR 122.26(a)(1)(v). The USEPA also made it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide permits (55 Federal Register [FR] 47990, 48039-48042). The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees and San Diego Water Board.

   The federal regulations make it clear that the Copermittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators (40 CFR 122.26(a)(3)(vi)). This Order does not require the Copermittees to manage storm water outside of their jurisdictional boundaries, but rather to work collectively to improve storm water management within watersheds.

3. **CWA NPDES Permit Conditions.** Pursuant to CWA section 402(p)(3)(B), NPDES permits for storm water discharges from MS4s must include requirements to effectively prohibit non-storm water discharges into MS4s, and require controls to reduce the discharge of pollutants in storm water to the maximum extent practicable (MEP), and to require other provisions as the San Diego Water Board determines are appropriate to control such pollutants. This Order prescribes conditions to assure compliance with the CWA requirements for owners and operators of MS4s to effectively prohibit non-storm water discharges into the MS4s, and require controls to reduce the discharge of pollutants in storm water from the MS4s to the MEP.

4. **CWA and CWC Monitoring Requirements.** CWA section 308(a) and 40 CFR 122.41(h),(j)-(l) and 122.48 require that NPDES permits must specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s also specify additional monitoring and reporting requirements in 40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c). CWC section 13383 authorizes the San Diego Water Board to establish monitoring, inspection, entry, reporting and recordkeeping requirements. This Order establishes monitoring and reporting requirements to implement federal and State requirements. This Order also includes requirements for the Orange County Copermittees to participate in, and together with South Orange County Wastewater Authority and Orange County Health Care Agency, share responsibility for implementing the unified approach to beach water quality monitoring and assessment program set forth in the October 2014 report, *Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County*, issued pursuant to CWC section 13383 in the San Diego Water Board December 5, 2014 Letter Directive.

5. **Total Maximum Daily Loads.** CWA section 303(d)(1)(A) requires that "[e]ach state shall identify those waters within its boundaries for which the effluent limitations are not stringent enough to implement any water quality standard applicable to such waters." The CWA also requires states to establish a priority ranking of impaired water bodies known as Water Quality Limited Segments and to establish Total Maximum Daily Loads (TMDLs) for such waters. This priority list of impaired water bodies is called the Clean Water Act Section 303(d) List of Water Quality Limited Segments, commonly referred to as the 303(d) List. The CWA requires the 303(d) List to be updated every two years.

   TMDLs are numerical calculations of the maximum amount of a pollutant that a water body can assimilate and still meet water quality standards. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point sources (waste load allocations or WLAs) and non-point sources (load allocations or LAs), background contribution, plus a margin of safety. Discharges from MS4s are point source discharges. The federal regulations (40 CFR 122.44(d)(1)(vii)(B)) require that NPDES permits incorporate water quality based effluent limitations (WQBELs) developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, consistent with the assumptions and requirements of any available WLA for the discharge. Requirements of this Order implement the TMDLs established by the San Diego Water Board or USEPA as of the date this Order was amended in 2015. This Order establishes WQBELs consistent with the assumptions and requirements of all available TMDL WLAs assigned to discharges from the Copermittees' MS4s.

6. **Non-Storm Water Discharges.** Pursuant to CWA section 402(p)(3)(B)(ii), this Order requires each Copermittee to effectively prohibit discharges of non-storm water into its MS4. Nevertheless, non-storm water discharges into and from the

MS4s continue to be reported to the San Diego Water Board by the Copermittees and other persons. Monitoring conducted by the Copermittees, as well as the 303(d) List, have identified dry weather, non-storm water discharges from the MS4s as a source of pollutants causing or contributing to receiving water quality impairments in the San Diego Region. The federal regulations (40 CFR 122.26(d)(2)(iv)(B)(1)) require the Copermittees to have a program to prevent illicit discharges to the MS4. The federal regulations, however, allow for specific categories of non-storm water discharges or flows to be addressed as illicit discharges only where such discharges are identified as sources of pollutants to waters of the U.S.

7. **In-Stream Treatment Systems.** Pursuant to federal regulations (40 CFR 131.10(a)), in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S. Authorizing the construction of a runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to accepting waste assimilation as an appropriate use for that water body. Runoff treatment must occur prior to the discharge of runoff into receiving waters. Treatment control best management practices (BMPs) must not be constructed in waters of the U.S. Construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body.

DISCHARGE CHARACTERISTICS AND RUNOFF MANAGEMENT

8. **Point Source Discharges of Pollutants.** Discharges from the MS4s contain waste, as defined in the CWC, and pollutants that adversely affect the quality of the waters of the state. A discharge from an MS4 is a “discharge of pollutants from a point source” into waters of the U.S. as defined in the CWA. Storm water and non-storm water discharges from the MS4s contain pollutants that cause or threaten to cause a violation of surface water quality standards, as outlined in the Water Quality Control Plan for the San Diego Basin (Basin Plan). Storm water and non-storm water discharges from the MS4s are subject to the conditions and requirements established in the Basin Plan for point source discharges.

9. **Potential Beneficial Use Impairment.** The discharge of pollutants and/or increased flows from MS4s may cause or threaten to cause the concentration of pollutants to exceed applicable receiving water quality objectives and impair or threaten to impair designated beneficial uses resulting in a condition of pollution, contamination, or nuisance.

10. **Pollutants Generated by Land Development.** Land development has created and continues to create new sources of non-storm water discharges and pollutants in storm water discharges as human population density increases. This brings higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash. Pollutants from these sources are dumped or washed off the surface by non-storm water or storm water flows into

and from the MS4s. When development converts natural vegetated pervious ground cover to impervious surfaces such as paved highways, streets, rooftops, and parking lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving a developed area without BMPs that can maintain pre-development runoff conditions will contain greater pollutant loads and have significantly greater runoff volume, velocity, and peak flow rate than pre-development runoff conditions from the same area.

11. **Runoff Discharges to Receiving Waters.** The MS4s discharge runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within the eleven hydrologic units comprising the San Diego Region. Historic and current development makes use of natural drainage patterns and features as conveyances for runoff. Rivers, streams and creeks in developed areas used in this manner are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and receiving water. Numerous receiving water bodies and water body segments have been designated as impaired by the San Diego Water Board pursuant to CWA section 303(d).

12. **Pollutants in Runoff.** The most common pollutants in runoff discharged from the MS4s include total suspended solids, sediment, pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., cadmium, copper, lead, and zinc), petroleum products and polynuclear aromatic hydrocarbons, synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus), oxygen-demanding substances (e.g., decaying vegetation, animal waste), detergents, and trash. As operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not prohibit or otherwise control. These discharges may cause or contribute to a condition of pollution or a violation of water quality standards.

13. **Human Health and Aquatic Life Impairment.** Pollutants in runoff discharged from the MS4s can threaten and adversely affect human health and aquatic organisms. Adverse responses of organisms to chemicals or physical agents in runoff range from physiological responses such as impaired reproduction or growth anomalies to mortality. Increased volume, velocity, rate, and duration of storm water runoff greatly accelerate the erosion of downstream natural channels. This alters stream channels and habitats and can adversely affect aquatic and terrestrial organisms.

14. **Water Quality Effects.** The Copermittees' water quality monitoring data submitted to date documents persistent exceedances of Basin Plan water quality objectives for runoff-related pollutants at various watershed monitoring stations. Persistent toxicity has also been observed at several watershed monitoring stations. In addition, bioassessment data indicate that the majority of the monitored receiving waters have

Poor to Very Poor Index of Biological Integrity (IBI) ratings. These findings indicate that runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in the San Diego Region. Non-storm water discharges from the MS4s have been shown to contribute significant levels of pollutants and flow in arid, developed Southern California watersheds, and contribute significantly to exceedances of applicable receiving water quality objectives.

15. **Non-Storm Water and Storm Water Discharges.** Non-storm water discharges from the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard of CWA section 402(p)(3)(B)(iii), which is explicitly for "Municipal … *Stormwater Discharges* (emphasis added)" from the MS4s. Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s must be effectively prohibited.

16. **Best Management Practices.** Waste and pollutants which are deposited and accumulate in MS4 drainage structures will be discharged from these structures to waters of the U.S. unless they are removed. These discharges may cause or contribute to, or threaten to cause or contribute to, a condition of pollution in receiving waters. For this reason, pollutants in storm water discharges from the MS4s can be and must be effectively reduced in runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Pollution prevention is the reduction or elimination of pollutant generation at its source and is the best "first line of defense." Source control BMPs (both structural and non-structural) minimize the contact between pollutants and runoff, therefore keeping pollutants onsite and out of receiving waters. Treatment control BMPs remove pollutants that have been mobilized by storm water or non-storm water flows.

17. **BMP Implementation.** Runoff needs to be addressed during the three major phases of development (planning, construction, and use) in order to reduce the discharge of storm water pollutants to the MEP, effectively prohibit non-storm water discharges, and protect receiving waters. Development which is not guided by water quality planning policies and principles can result in increased pollutant load discharges, flow rates, and flow durations which can negatively affect receiving water beneficial uses. Construction sites without adequate BMP implementation result in sediment runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. Existing development can generate substantial pollutant loads which are discharged in runoff to receiving waters. Retrofitting areas of existing development with storm water pollutant control and hydromodification management BMPs is necessary to address storm water discharges from existing development that may cause or contribute to a condition of pollution or a violation of water quality standards.

18. **Water Quality Improvements.** Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges to the MS4s and control pollutants in storm water

discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the CWA.

19. **Long Term Planning and Implementation.** Federal regulations require municipal storm water permits to expire 5 years from adoption, after which the permit must be renewed and reissued. The San Diego Water Board recognizes that the degradation of water quality and impacts to beneficial uses of the waters in the San Diego Region occurred over several decades. The San Diego Water Board further recognizes that a decade or more may be necessary to realize demonstrable improvement to the quality of waters in the San Diego Region. This Order includes a long term planning and implementation approach that will require more than a single permit term to complete.

WATER QUALITY STANDARDS

20. **Basin Plan.** The San Diego Water Board adopted the Water Quality Control Plan for the San Diego Basin (Basin Plan) on September 8, 1994, that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for receiving waters addressed through the plan. The Basin Plan was subsequently approved by the State Water Resources Control Board (State Water Board) on December 13, 1994. Subsequent revisions to the Basin Plan have also been adopted by the San Diego Water Board and approved by the State Water Board. Requirements of this Order implement the Basin Plan.

    The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Process Supply (PROC), Industrial Service Supply (IND), Ground Water Recharge (GWR), Contact Water Recreation (REC1), Non-contact Water Recreation (REC2), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Freshwater Replenishment (FRSH), Hydropower Generation (POW), and Preservation of Biological Habitats of Special Significance (BIOL). The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region: Navigation (NAV), Commercial and Sport Fishing (COMM), Estuarine Habitat (EST), Marine Habitat (MAR), Aquaculture (AQUA), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN), and Shellfish Harvesting (SHELL).

21. **Ocean Plan.** The State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, and 2005. The State Water Board adopted the latest amendment on October 16, 2012 and it became effective on August 19, 2013. The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean. Requirements of this Order implement the Ocean Plan.

    The Ocean Plan identifies the following beneficial uses of ocean waters of the state to be protected: Industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture; preservation and enhancement of designated Areas of Special Biological Significance; rare and endangered species; marine habitat; fish spawning and shellfish harvesting.

22. **Sediment Quality Control Plan**. On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes: 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

23. **National Toxics Rule and California Toxics Rule.** USEPA adopted the National Toxics Rule (NTR) on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the NTR applied in California. On May 18, 2000, USEPA adopted the California Toxics Rule (CTR). The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants.

24. **Antidegradation Policy.** This Order is in conformance with the federal Antidegradation Policy described in 40 CFR 131.12, and State Water Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality Waters in California*. Federal regulations at 40 CFR 131.12 require that the State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. State Water Board Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies. The Fact Sheet of this Order contains additional discussion about antidegradation.

25. **Anti-Backsliding Requirements.** Section 402(o)(2) of the CWA and federal regulations at 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations may be relaxed. All effluent limitations in this Order are at least as stringent as effluent limitations in the previous permits. The Fact Sheet of this Order contains additional discussion about anti-backsliding.

CONSIDERATIONS UNDER FEDERAL AND STATE LAW

26. **Coastal Zone Act Reauthorization Amendments.** Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states with approved coastal zone management programs to address non-point source pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point source pollution: agriculture, silviculture, urban, marinas, and hydromodification. This Order addresses the management measures required for the urban category, with the exception of septic systems. The runoff management programs developed pursuant to this Order fulfills the need for coastal cities to develop a runoff non-point source plan identified in the Non-Point Source Program Strategy and Implementation Plan. The San Diego Water Board addresses septic systems through the administration of other programs.

27. **Endangered Species Act.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 USC sections 1531 to 1544). This Order requires compliance with receiving water limits, and other requirements to protect the beneficial uses of waters of the State. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

28. **Report of Waste Discharge Process.** The waste discharge requirements set forth in this Order are based upon the Report of Waste Discharge submitted by the San Diego County Copermittees prior to the expiration of Order No. R9-2007-0001 (NPDES No. CAS0109266), the Report of Waste Discharge submitted by the Orange County Copermittees prior to the expiration of Order No. R9-2009-0002 (CAS0108740), and the Report of Waste Discharge submitted by the Riverside County Copermittees prior to the expiration of Order No. R9-2010-0016 (CAS0108766).

    The federal regulations (40 CFR 122.21(d)(2)) and CWC section 13376 impose a duty on the Copermittees to reapply for continued coverage through submittal of a Report of Waste Discharge no later than 180 days prior to expiration of a currently effective permit. The expiration date of this Order as shown in Table 3, and requirement to file a Report of Waste Discharge no later than 180 days prior to the

expiration date of the Order, applies jointly to the San Diego County, Orange County, and Riverside County Copermittees.

29. **Regional Water Board Designation.** The Cities of Laguna Hills, Laguna Woods, Lake Forest, Menifee, Murrieta, and Wildomar are located partially within the jurisdictions of the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board) and the San Diego Water Board and their discharges are subject to regulation by both Regional Water Boards. CWC section 13228 provides a way to streamline the regulation of entities whose jurisdictions straddle the border of two or more Regions. CWC section 13228 is implemented in this Order at the request of these six cities and to ease the regulatory burden of municipalities that lie in both the San Diego Water Board's and the adjacent Santa Ana Water Board's jurisdiction. MS4 discharges from these municipalities are regulated by the San Diego Water Board and Santa Ana Water Board as follows:

    a. Pursuant to CWC section 13228, the Cities of Laguna Hills, Laguna Woods, and Lake Forest submitted written requests that one Regional Water Board be designated to regulate Phase I MS4 discharges for each of the Cities. The Santa Ana Water Board and the San Diego Water Board have entered into an agreement dated February 10, 2015, whereby the Cities of Laguna Woods and Laguna Hills are largely regulated by the San Diego Water Board under this Order, including those portions of the Cities of Laguna Woods and Laguna Hills not within the San Diego Water Board's jurisdiction, upon the effective date of this Order or Santa Ana Water Board Order No. R8-2015-0001, whichever is later. Similarly, the City of Lake Forest, including those portions of the City of Lake Forest within the San Diego Water Board's jurisdiction, is largely regulated by the Santa Ana Water Board under Order No. R8-2015-0001 (NPDES No. CAS618030) upon the later effective date of this Order or Order No. R8-2015-0001. The agreement provides that the City of Lake Forest is required to retain, and continue implementation of, its over-irrigation discharge prohibition in Title 15, Chapter 14.030, List (b) of the City Municipal Code for regulating storm water quality throughout its jurisdiction. The agreement also requires the City of Lake Forest to actively participate during development and implementation of the Aliso Creek Watershed Management Area Water Quality Improvement Plan required pursuant to this Order. Each Regional Water Board retains the authority to enforce provisions of its Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee under the terms of the agreement (Water Code section 13228 (b)). Under the terms of the agreement, any TMDL and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Laguna Woods, Laguna Hills or Lake Forest as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement of the applicable TMDL will remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's San

Diego Creek/Newport Bay TMDL and the San Diego Water Board's Indicator Bacteria Project I Beaches and Creeks TMDL. The San Diego Water Board will periodically review the effectiveness of the agreement during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate the agreement with Santa Ana Water Board or otherwise modify the agreement subject to the approval of the Santa Ana Water Board.

b. Pursuant to CWC section 13228, the Cities of Murrieta, Wildomar, and Menifee submitted written requests that one Regional Water Board be designated to regulate Phase I MS4 discharges for each of the Cities. The Santa Ana Water Board and the San Diego Water Board have entered into an agreement dated October 26, 2015, whereby the Cities of Murrieta and Wildomar are largely regulated by the San Diego Water Board under this Order, including those portions of the Cities of Murrieta and Wildomar not within the San Diego Water Board's jurisdiction, upon the effective date of this Order. Similarly, the City of Menifee is largely regulated by the Santa Ana Water Board under Order No. R8-2010-0033 as it may be amended or reissued, including those portions of the City of Menifee within the San Diego Water Board's jurisdiction, upon the effective date of this Order. The agreement also requires the City of Menifee to actively participate during development and implementation of the Santa Margarita River Watershed Management Area Water Quality Improvement Plan required pursuant to this Order. Each Regional Water Board retains the authority to enforce provisions of its Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee under the terms of the agreement (Water Code section 13228 (b)). Under the terms of the agreement, any TMDL and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Menifee, Murrieta, or Wildomar as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement of the applicable TMDL will remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's Lake Elsinore/Canyon Lake Nutrient TMDLs. The San Diego Water Board will periodically review the effectiveness of the agreement during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate the agreement with Santa Ana Water Board or otherwise modify the agreement subject to the approval of the Santa Ana Water Board.

30. Integrated Report and Clean Water Act Section 303(d) List. The San Diego Water Board and State Water Board submit an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. USEPA issued its *Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act* on July 29, 2005, which advocates the use of a five category approach for

classifying the attainment status of water quality standards for water bodies in the Integrated Report. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 in the Integrated Report are placed on the 303(d) List.

Water bodies with available data and/or information that indicate at least one beneficial use is not being supported or is threatened, but a TMDL is not required, are included in Category 4 in the Integrated Report. Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

Implementation of the requirements of this Order may allow the San Diego Water Board to include surface waters impaired by discharges from the Copermittees' MS4s in Category 4 in the Integrated Report for consideration during the next 303(d) List submittal by the State to USEPA.

31. **Economic Considerations.** The California Supreme Court has ruled that although CWC section 13263 requires the State and Regional Water Boards (collectively Water Boards) to consider factors set forth in CWC section 13241 when issuing an NPDES permit, the Water Board may not consider the factors to justify imposing pollutant restrictions that are less stringent than the applicable federal regulations require. (*City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 618, 626-627.) However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

    As noted in the following finding, the San Diego Water Board finds that the requirements in this Order are not more stringent than the minimum federal requirements. Therefore, a CWC section 13241 analysis is not required for permit requirements that implement the effective prohibition on the discharge of non-storm water into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determined appropriate to control such pollutants, as those requirements are mandated by federal law. Notwithstanding the above, the San Diego Water Board has developed an economic analysis of the requirements in this Order. The economic analysis is provided in the Fact Sheet.

32. **Unfunded Mandates.** This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following:

a. This Order implements federally mandated requirements under CWA section 402 (33 USC section 1342(p)(3)(B)).

b. The local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental and new dischargers who are issued NPDES permits for storm water and non-storm water discharges.

c. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order.

d. The Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)) and in lieu of numeric restrictions on their MS4 discharges (i.e. effluent limitations).

e. The local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under State law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

f. The provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state develops a TMDL, federal law requires that permits must contain water quality based effluent limitations consistent with the assumptions and requirements of any applicable wasteload allocation (40 CFR 122.44(d)(1)(vii)(B)).

See the Fact Sheet for further discussion of unfunded mandates.

33. California Environmental Quality Act. The issuance of waste discharge requirements and an NPDES permit for the discharge of runoff from MS4s to waters of the U.S. is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 et seq.) in accordance with CWC section 13389.

STATE WATER BOARD DECISIONS

34. Compliance with Prohibitions and Limitations. The receiving water limitation language specified in this Order is consistent with language recommended by the USEPA and established in State Water Board Order WQ 99-05, *Own Motion Review of the Petition of Environmental Health Coalition to Review Waste Discharge Requirements Order No. 96-03, NPDES Permit No. CAS0108740*, adopted by the State Water Board on June 17, 1999. The receiving water limitation language in this Order requires storm water discharges from MS4s to not cause or contribute to a violation of water quality standards, which is to be achieved through an iterative approach requiring the implementation of improved and better-tailored BMPs over time. Implementation of the iterative approach to comply with receiving water

limitations based on applicable water quality standards is necessary to ensure that storm water discharges from the MS4 will not ultimately cause or contribute to violations of water quality standards and will not create conditions of pollution, contamination, or nuisance.

The San Diego, Orange County, and Riverside County Copermittees have asserted that the prohibitions and limitations may result in many years of noncompliance because years of technical efforts may ultimately be required to achieve compliance with the prohibitions and limitations, especially for wet weather discharges. To address this concern, this Order includes an option that allows a Copermittee to be deemed in compliance with the prohibitions and limitations where more than one permit term may be necessary to achieve full compliance with the prohibitions and limitations. One or more Copermittees within a Watershed Management Area can choose to implement this option.

An alternative compliance pathway option has been included in this Order consistent with the approach described in Order WQ 2015-0075, *In the Matter of Review of Order No. R4-2012-0175, NPDES Permit No. CAS004001, Waste Discharge Requirements for Municipal Separate Storm Sewer System (MS4) Discharges within the Coastal Watersheds of Los Angeles County, Except Those Discharges Originating from the City of Long Beach MS4,* adopted by the State Water Board on June 16, 2015. State Water Board Order WQ 2015-0075 directs the Regional Water Boards to consider a watershed-based planning and implementation approach to compliance with receiving water limitations when issuing Phase I MS4 permits going forward. Order WQ 2015-0075 included seven principles that the Regional Water Boards are expected to follow when incorporating an alternative compliance pathway into an MS4 permit. The Fact Sheet discusses the incorporation of the seven principles stipulated in State Water Board Order WQ 2015-0075 into the alternative compliance pathway option in this Order.

35. **Special Conditions for Areas of Special Biological Significance.** On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving a general exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges (General Exception). On June 19, 2012, the State Water Board adopted Order No. 2012-0031, amending the General Exception to require pollutant reductions to be achieved within six years in accordance with ASBS Compliance Plans and ASBS Pollution Prevention Plans. The General Exception requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject to the terms and conditions of the General Exception as amended. The Special Protections contained in Attachment B to the General Exception as amended are

applicable to these discharges, and are hereby incorporated into Attachment A of this Order.

ADMINISTRATIVE FINDINGS

36. **Executive Officer Delegation of Authority.** The San Diego Water Board by prior resolution has delegated all matters that may legally be delegated to its Executive Officer to act on its behalf pursuant to CWC section 13223. Therefore, the Executive Officer is authorized to act on the San Diego Water Board's behalf on any matter within this Order unless such delegation is unlawful under CWC section 13223 or this Order explicitly states otherwise.

37. **Standard Provisions.** Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR 122.42, are provided in Attachment B to this Order.

38. **Fact Sheet.** The Fact Sheet for this Order contains background information, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of this Order. The Fact Sheet is hereby incorporated into this Order and constitutes part of the Findings of this Order.

39. **Public Notice.** In accordance with State and federal laws and regulations, the San Diego Water Board notified the Copermittees, and interested agencies and persons of its intent to prescribe waste discharge requirements for the control of discharges into and from the MS4s to waters of the U.S. and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet.

40. **Public Hearings.** The San Diego Water Board held a public hearing on April 10 and 11, 2013, that was continued to May 8, 2013 and heard and considered all comments pertaining to the terms and conditions of this Order. The San Diego Water Board also held a public workshop on October 8, 2015, and a public hearing on February 11, 2015, and heard and considered all comments pertaining to the amendment of this Order through Order No. R9-2015-0001. The San Diego Water Board also held a public hearing on November 18, 2015, and heard and considered all comments pertaining to the amendment of this Order through Order No. R9-2015-0100. Details of these public hearings are provided in the Fact Sheet.

41. **Effective Date.** This Order serves as an NPDES permit pursuant to CWA section 402 or amendments thereto, and as to the San Diego County Copermittees listed in Table 1a, became effective fifty (50) days after the date of its adoption, and as to the Orange County Copermittees listed in Table 1b, became effective on April 1, 2015, after Order No. R9-2015-0001 was adopted, and as to the Riverside County Copermittees listed in Table 1c, became effective on January 7, 2016, after Order No. R9-2015-0100 was adopted, provided that the Regional Administrator, USEPA, Region IX, does not object to this Order.

42. **Review by the State Water Board.** Any person aggrieved by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with CWC section 13320 and California Code of Regulations, title 23, sections 2050, and following. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date of this Order, except that if the thirtieth day following the date of this Order falls on a Saturday, Sunday or State holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

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THEREFORE, IT IS HEREBY ORDERED that the Copermittees, in order to meet the provisions contained in division 7 of the CWC (commencing with section 13000) and regulations adopted thereunder, and the provisions of the CWA and regulations adopted thereunder, must each comply with the requirements of this Order. This action in no way prevents the San Diego Water Board from taking enforcement action for past violations of the previous Order applicable to the Copermittees. If any part of this Order is subject to a temporary stay of enforcement, unless otherwise specified, the Copermittees must comply with the analogous portions of the previous Order, which will remain in effect for all purposes during the pendency of the stay.

II. PROVISIONS

A. PROHIBITIONS AND LIMITATIONS

The purpose of this provision is to describe the conditions under which storm water and non-storm water discharges into and from MS4s are prohibited or limited. The goal of the prohibitions and limitations is to protect the water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through the implementation of water quality improvement strategies and runoff management programs that effectively prohibit non-storm water discharges into the Copermittees' MS4s, and reduce pollutants in storm water discharges from the Copermittees' MS4s to the MEP.

1. Discharge Prohibitions

a. Discharges from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the state are prohibited.

b. Non-storm water discharges into MS4s are to be effectively prohibited, through the implementation of Provision E.2, unless such discharges are authorized by a separate NPDES permit.

c. Discharges from MS4s are subject to all waste discharge prohibitions in the Basin Plan, included in Attachment A to this Order.

d. Storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012, as amended by State Water Board Resolution No. 2012-0031, applicable to these discharges, included in Attachment A to this Order. All other discharges from the Copermittees' MS4s to ASBS are prohibited.

2. Receiving Water Limitations

a. Discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters, including but not limited to all applicable provisions contained in:

(1) The San Diego Water Board's Basin Plan, including beneficial uses, water quality objectives, and implementation plans;

(2) State Water Board plans for water quality control including the following:

(a) Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries (Thermal Plan), and

(b) The Ocean Plan, including beneficial uses, water quality objectives, and implementation plans;

(3) State Water Board policies for water and sediment quality control including the following:

(a) Water Quality Control Policy for the Enclosed Bays and Estuaries of California,

(b) Sediment Quality Control Plan which includes the following narrative objectives for bays and estuaries:

(i) Pollutants in sediments shall not be present in quantities that, alone or in combination, are toxic to benthic communities, and

(ii) Pollutants shall not be present in sediments at levels that will bioaccumulate in aquatic life to levels that are harmful to human health,

(c) The Statement of Policy with Respect to Maintaining High Quality of Waters in California;[2]

(4) Priority pollutant criteria promulgated by the USEPA through the following:

(a) National Toxics Rule (NTR)[3] (promulgated on December 22, 1992 and amended on May 4, 1995), and

(b) California Toxics Rule (CTR).[4,5]

b. Discharges from MS4s composed of storm water runoff must not alter natural ocean water quality in an ASBS.

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[2] State Water Board Resolution No. 68-16
[3] 40 CFR 131.36
[4] 65 Federal Register 31682-31719 (May 18, 2000), adding Section 131.38 to 40 CFR
[5] If a water quality objective and a CTR criterion are in effect for the same priority pollutant, the more stringent of the two applies.

3. Effluent Limitations

a. TECHNOLOGY BASED EFFLUENT LIMITATIONS

Pollutants in storm water discharges from MS4s must be reduced to the MEP.[6]

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

Each Copermittee must comply with applicable WQBELs established for the TMDLs in Attachment E to this Order, pursuant to the applicable TMDL compliance schedules.

4. Compliance with Discharge Prohibitions and Receiving Water Limitations

Each Copermittee must achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order through timely implementation of control measures and other actions as specified in Provisions B and E of this Order, including any modifications. The Water Quality Improvement Plans required under Provision B must be designed and adapted to ultimately achieve compliance with Provisions A.1.a, A.1.c and A.2.a.

a. If exceedance(s) of water quality standards persist in receiving waters notwithstanding implementation of this Order, the Copermittees must comply with the following procedures:

(1) For exceedance(s) of a water quality standard in the process of being addressed by the Water Quality Improvement Plan, the Copermittee(s) must implement the Water Quality Improvement Plan as accepted by the San Diego Water Board, and update the Water Quality Improvement Plan, as necessary, pursuant to Provision F.2.c;

(2) Upon a determination by either the Copermittees or the San Diego Water Board that discharges from the MS4 are causing or contributing to a new exceedance of an applicable water quality standard not addressed by the Water Quality Improvement Plan, the Copermittees must submit the following updates to the Water Quality Improvement Plan pursuant to Provision F.2.c or as part of the Water Quality Improvement Plan Annual Report required under Provision F.3.b, unless the San Diego Water Board directs an earlier submittal:

(a) The water quality improvement strategies being implemented that are effective and will continue to be implemented,

[6] This does not apply to MS4 discharges which receive subsequent treatment to reduce pollutants in storm water discharges to the MEP prior to entering receiving waters (e.g., low flow diversions to the sanitary sewer). Runoff treatment must occur prior to the discharge of runoff into receiving waters per Finding 7.

(b) Water quality improvement strategies (i.e. BMPs, retrofitting projects, stream and/or habitat rehabilitation projects, adjustments to jurisdictional runoff management programs, etc.) that will be implemented to reduce or eliminate any pollutants or conditions that are causing or contributing to the exceedance of water quality standards,

(c) Updates to the schedule for implementation of the existing and additional water quality improvement strategies, and

(d) Updates to the monitoring and assessment program to track progress toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a of this Order;

(3) The San Diego Water Board may require the incorporation of additional modifications to the Water Quality Improvement Plan required under Provision B. The applicable Copermittees must submit any modifications to the update to the Water Quality Improvement Plan within 90 days of notification that additional modifications are required by the San Diego Water Board, or as otherwise directed;

(4) Within 90 days of the San Diego Water Board determination that the modifications to the Water Quality Improvement Plan required under Provision A.4.a.(3) meet the requirements of this Order, the applicable Copermittees must revise the jurisdictional runoff management program documents to incorporate the modified water quality improvement strategies that have been and will be implemented, the implementation schedule, and any additional monitoring required; and

(5) Each Copermittee must implement the updated Water Quality Improvement Plan.

b. The procedure set forth above to achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order do not have to be repeated for continuing or recurring exceedances of the same water quality standard(s) following implementation of scheduled actions unless directed to do otherwise by the San Diego Water Board.

c. Nothing in Provisions A.4.a and A.4.b prevents the San Diego Water Board from enforcing any provision of this Order while the applicable Copermittees prepare and implement the above update to the Water Quality Improvement Plan and jurisdictional runoff management programs.

B. WATER QUALITY IMPROVEMENT PLANS

The purpose of this provision is to develop Water Quality Improvement Plans that guide the Copermittees' jurisdictional runoff management programs towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plans is to further the Clean Water Act's objective to protect, preserve, enhance, and restore the water quality and designated beneficial uses of waters of the state. This goal will be accomplished through an adaptive planning and management process that identifies the highest priority water quality conditions within a watershed and implements strategies through the jurisdictional runoff management programs to achieve improvements in the quality of discharges from the MS4s and receiving waters.

1. Watershed Management Areas

The Copermittees must develop a Water Quality Improvement Plan for each of the Watershed Management Areas in Table B-1. A total of ten Water Quality Improvement Plans must be developed for the San Diego Region.

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
San Juan (901.00)	South Orange County	- Aliso Creek - San Juan Creek - San Mateo Creek - Pacific Ocean - Heisler Park ASBS	- City of Aliso Viejo - City of Dana Point - City of Laguna Beach - City of Laguna Hills[1] - City of Laguna Niguel - City of Laguna Woods[1] - City of Lake Forest[2] - City of Mission Viejo - City of Rancho Santa Margarita - City of San Clemente - City of San Juan Capistrano - County of Orange - Orange County Flood Control District
Santa Margarita (902.00)	Santa Margarita River	- Murrieta Creek - Temecula Creek - Santa Margarita River - Santa Margarita Lagoon - Pacific Ocean	- City of Menifee[3] - City of Murrieta[4] - City of Temecula - City of Wildomar[4] - County of Riverside - County of San Diego - Riverside County Flood Control and Water Conservation District
San Luis Rey (903.00)	San Luis Rey River	- San Luis Rey River - San Luis Rey Estuary - Pacific Ocean	- City of Oceanside - City of Vista - County of San Diego

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
Carlsbad (904.00)	Carlsbad	- Loma Alta Slough - Buena Vista Lagoon - Agua Hedionda Lagoon - Batiquitos Lagoon - San Elijo Lagoon - Pacific Ocean	- City of Carlsbad - City of Encinitas - City of Escondido - City of Oceanside - City of San Marcos - City of Solana Beach - City of Vista - County of San Diego
San Dieguito (905.00)	San Dieguito River	- San Dieguito River - San Dieguito Lagoon - Pacific Ocean	- City of Del Mar - City of Escondido - City of Poway - City of San Diego - City of Solana Beach - County of San Diego
Penasquitos (906.00)	Penasquitos	- Los Penasquitos Lagoon - Pacific Ocean	- City of Del Mar - City of Poway - City of San Diego - County of San Diego
	Mission Bay	- Mission Bay - Pacific Ocean - San Diego Marine Life Refuge ASBS	- City of San Diego
San Diego (907.00)	San Diego River	- San Diego River - Pacific Ocean	- City of El Cajon - City of La Mesa - City of San Diego - City of Santee - County of San Diego
Pueblo San Diego (908.00) Sweetwater (909.00) Otay (910.00)	San Diego Bay	- Sweetwater River - Otay River - San Diego Bay - Pacific Ocean	- City of Chula Vista - City of Coronado - City of Imperial Beach - City of La Mesa - City of Lemon Grove - City of National City - City of San Diego - County of San Diego - San Diego County Regional Airport Authority - San Diego Unified Port District
Tijuana (911.00)	Tijuana River	- Tijuana River - Tijuana Estuary - Pacific Ocean	- City of Imperial Beach - City of San Diego - County of San Diego

Notes:

1. By agreement dated February 10, 2015, pursuant to Water Code section 13228, the Phase I MS4 discharges within the jurisdiction of the City of Laguna Hills and the City of Laguna Woods located in the Santa Ana Region are regulated by San Diego Water Board Order No. R9-2013-0001 as amended by Order No. R9-2015-0001, upon the later effective date of Order No. R9-2015-0001 or Santa Ana Water Board Tentative Order No. R8-2015-0001. The City of Laguna Hills and Laguna Woods must also comply with the requirements of the San Diego Creek/Newport Bay TMDL in section XVIII of Santa Ana Water Board Order No. R8-2015-0001.
2. By agreement dated February 10, 2015, pursuant to Water Code section 13228, Phase I MS4 discharges within the City of Lake Forest located within the San Diego Water Board Region are regulated by the Santa Ana Water Board Order No. R8-2015-0001 (NPDES No. CAS618030) upon the later effective date of this Order or Santa Ana Water Board Tentative Order No. R8-2015-0001. In accordance with the terms of the agreement between the San Diego Water Board and the Santa Ana Water Board, the City of Lake Forest must implement the requirements of the Bacteria TMDL in Attachment E of this Order, participate in preparation and implementation of the Water Quality Improvement Plan for the Aliso Creek Watershed Management Area as described in Provision B of this Order and continue implementation of its over-irrigation discharge prohibition in its City Ordinance, Title 15, Chapter 15, section 14.030, List (b).
3. By agreement dated October 26, 2015, pursuant to Water Code section 13228, Phase I MS4 discharges within the City of Menifee located within the San Diego Water Board Region are regulated by the Santa Ana Water Board Order No. R8-2010-0033 as it may be amended or reissued (NPDES No. CAS618033) upon the later effective date of this Order. In accordance with the terms of the agreement between the San Diego Water Board and the Santa Ana Water Board, the City of Menifee must participate in preparation and implementation of the Water Quality Improvement Plan for the Santa Margarita River Watershed Management Area as described in Provision B of this Order.
4. By agreement dated October 26, 2015, pursuant to Water Code section 13228, the Phase I MS4 discharges within the jurisdiction of the City of Murrieta and the City of Wildomar located in the Santa Ana Region are regulated by San Diego Water Board Order No. R9-2013-0001 as amended by Orders No. R9-2015-0001 and R9-2015-0100. The City of Murrieta and City of Wildomar must also comply with the requirements of the Lake Elsinore/Canyon Lake Nutrient TMDLs in section VI.D.2 of Santa Ana Water Board Order No. R8-2010-0033, or corresponding section as it may be amended or reissued.

2. Priority Water Quality Conditions

The Copermittees must identify the water quality priorities within each Watershed Management Area that will be addressed by the Water Quality Improvement Plan. Where appropriate, Watershed Management Areas may be separated into subwatersheds to focus water quality prioritization and jurisdictional runoff management program implementation efforts by receiving water.

a. Assessment of Receiving Water Conditions

The Copermittees must consider the following, at a minimum, to identify water quality priorities based on impacts of MS4 discharges on receiving water beneficial uses:

(1) Receiving waters listed as impaired on the CWA Section 303(d) List of Water Quality Limited Segments (303(d) List);

(2) TMDLs adopted and under development by the San Diego Water Board;

(3) Receiving waters recognized as sensitive or highly valued by the Copermittees, including estuaries designated under the National Estuary Program under CWA section 320, marine protected areas, wetlands defined by the State or U.S. Fish and Wildlife Service's National Wetlands Inventory as wetlands, waters having the Preservation of Biological Habitats of Special Significance (BIOL) beneficial use designation, and receiving waters identified as ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(4) The receiving water limitations of Provision A.2;

(5) Known historical versus current physical, chemical, and biological water quality conditions;

(6) Available, relevant, and appropriately collected and analyzed physical, chemical, and biological receiving water monitoring data, including, but not limited to, data describing:

(a) Chemical constituents,

(b) Water quality parameters (i.e. pH, temperature, conductivity, etc.),

(c) Toxicity Identification Evaluations for both receiving water column and sediment,

(d) Trash impacts,

(e) Bioassessments, and

(f) Physical habitat;

(7) Available evidence of erosional impacts in receiving waters due to accelerated flows (i.e. hydromodification);

(8) Available evidence of adverse impacts to the chemical, physical, and biological integrity of receiving waters; and

(9) The potential improvements in the overall condition of the Watershed Management Area that can be achieved.

b. ASSESSMENT OF IMPACTS FROM MS4 DISCHARGES

The Copermittees must consider the following, at a minimum, to identify the potential impacts to receiving waters that may be caused or contributed to by discharges from the Copermittees' MS4s:

(1) The discharge prohibitions of Provision A.1 and effluent limitations of Provision A.3; and

(2) Available, relevant, and appropriately collected and analyzed storm water and non-storm water monitoring data from the Copermittees' MS4 outfalls;

(3) Locations of each Copermittee's MS4 outfalls that discharge to receiving waters;

(4) Locations of MS4 outfalls that are known to persistently discharge non-storm water to receiving waters likely causing or contributing to impacts on receiving water beneficial uses;

(5) Locations of MS4 outfalls that are known to discharge pollutants in storm water causing or contributing to impacts on receiving water beneficial uses; and

(6) The potential improvements in the quality of discharges from the MS4 that can be achieved.

c. IDENTIFICATION OF PRIORITY WATER QUALITY CONDITIONS

(1) The Copermittees must use the information gathered for Provisions B.2.a and B.2.b to develop a list of priority water quality conditions as pollutants, stressors and/or receiving water conditions that are the highest threat to receiving water quality or that most adversely affect the quality of receiving waters. The list must include the following information for each priority water quality condition:

(a) The beneficial use(s) associated with the priority water quality condition;

(b) The geographic extent of the priority water quality condition within the Watershed Management Area, if known;

(c) The temporal extent of the priority water quality condition (e.g., dry weather and/or wet weather);

(d) The Copermittees with MS4s discharges that may cause or contribute to the priority water quality condition; and

(e) An assessment of the adequacy of and data gaps in the monitoring data to characterize the conditions causing or contributing to the priority water quality condition, including a consideration of spatial and temporal variation.

(2) The Copermittees must identify the highest priority water quality conditions to be addressed by the Water Quality Improvement Plan, and provide a rationale for selecting a subset of the water quality conditions identified pursuant to Provision B.2.c.(1) as the highest priorities.

d. IDENTIFICATION OF MS4 SOURCES OF POLLUTANTS AND/OR STRESSORS

The Copermittees must identify and prioritize known and suspected sources of storm water and non-storm water pollutants and/or other stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c. The identification of known and suspected sources of pollutants and/or stressors that cause or contribute to the highest priority water quality conditions as identified for Provision B.2.c must consider the following:

(1) Pollutant generating facilities, areas, and/or activities within the Watershed Management Area, including:

(a) Each Copermittee's inventory of construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas,

(b) Publicly owned parks and/or recreational areas,

(c) Open space areas,

(d) All currently operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste, and

(e) Areas not within the Copermittees' jurisdictions (e.g., Phase II MS4s, tribal lands, state lands, federal lands) that are known or suspected to be discharging to the Copermittees' MS4s;

(2) Locations of the Copermittees' MS4s, including the following:

(a) All MS4 outfalls that discharge to receiving waters, and

(b) Locations of major structural controls for storm water and non-storm water (e.g., retention basins, detention basins, major infiltration devices, etc.);

(3) Other known and suspected sources of non-storm water or pollutants in storm water discharges to receiving waters within the Watershed Management Area, including the following:

(a) Other MS4 outfalls (e.g., Phase II Municipal and Caltrans),

(b) Other NPDES permitted discharges,

(c) Any other discharges that may be considered point sources (e.g., private outfalls), and

(d) Any other discharges that may be considered non-point sources (e.g., agriculture, wildlife or other natural sources);

(4) Review of available data, including but not limited to:

(a) Findings from the Copermittees' illicit discharge detection and elimination programs,

(b) Findings from the Copermittees' MS4 outfall discharge monitoring,

(c) Findings from the Copermittees' receiving water monitoring,

(d) Findings from the Copermittees' MS4 outfall discharge and receiving water assessments, and

(e) Other available, relevant, and appropriately collected data, information, or studies related to pollutant sources and/or stressors that contribute to the highest priority water quality conditions as identified for Provision B.2.c.

(5) The adequacy of the available data to identify and prioritize sources and/or stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c.

e. IDENTIFICATION OF POTENTIAL WATER QUALITY IMPROVEMENT STRATEGIES

The Copermittees must evaluate the findings identified under Provisions B.2.a-d, and identify potential strategies that can result in improvements to water quality in MS4 discharges and/or receiving waters within the Watershed Management Area. Potential water quality improvement strategies that may be implemented within the Watershed Management Area must include the following:

(1) Structural BMPs, non-structural BMPs, incentives, or programs that can potentially be implemented to address the highest priority water quality conditions identified under Provision B.2.c, or MS4 sources of pollutants or stressors identified under Provision B.2.d,

(2) Retrofitting projects in areas of existing development within the Watershed Management Area that can potentially be implemented to reduce MS4 sources of pollutants or stressors identified under Provision B.2.d causing or contributing to the highest priority water quality conditions identified under Provision B.2.c, and

(3) Stream, channel, and/or habitat rehabilitation projects within the Watershed Management Area that can potentially be implemented to protect and/or improve conditions in receiving waters from MS4 pollutants and/or stressors identified under Provision B.2.d causing or contributing to the highest priority water quality conditions identified under Provision B.2.c.

3. Water Quality Improvement Goals, Strategies and Schedules

The Copermittees must identify and develop specific water quality improvement goals and strategies to address the highest priority water quality conditions identified within a Watershed Management Area. The water quality improvement goals and strategies must address the highest priority water quality conditions by effectively prohibiting non-storm water discharges to the MS4, reducing pollutants in storm water discharges from the MS4 to the MEP, and protecting the water quality standards of receiving waters.

a. WATER QUALITY IMPROVEMENT GOALS AND SCHEDULES

(1) <u>Numeric Goals</u>

The Copermittees must develop and incorporate numeric goals[7] into the Water Quality Improvement Plan. Numeric goals must be used to support

[7] Interim and final numeric goals may take a variety of forms such as TMDL established WQBELs, action levels, pollutant concentration, load reductions, number of impaired water bodies delisted from the List of Water Quality Impaired Segments, Index of Biotic Integrity (IBI) scores, or other appropriate metrics. Interim and final numeric goals are not necessarily limited to one criterion or indicator, but may include multiple criteria and/or indicators. Except for TMDL established WQBELs, interim and final numeric goals and corresponding schedules may be revised through the adaptive management process under Provision B.5.

Water Quality Improvement Plan implementation and measure reasonable progress towards addressing the highest priority water quality conditions identified under Provision B.2.c. The Copermittees must establish and incorporate the following numeric goals in the Water Quality Improvement Plan:

(a) Final numeric goals must be based on measureable criteria or indicators capable of demonstrating one or more of the following:

(i) Discharges from the Copermittees' MS4s will not cause or contribute to exceedances of water quality standards in receiving waters, AND/OR

(ii) The conditions of receiving waters and associated habitat are protected from MS4 discharges, AND/OR

(iii) Beneficial uses of receiving waters are protected from MS4 discharges and will be supported.

(b) Interim numeric goals must be based on measureable criteria or indicators capable of demonstrating reasonable incremental progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges as follows:

(i) One or more interim numeric goals may be established to demonstrate progress toward achieving each final numeric goal,

(ii) For each final numeric goal, at least one interim numeric goal must be expressed as a reasonable increment toward achievement of the final numeric goal,

(iii) For each final numeric goal, reasonable interim numeric goals must be established to be accomplished during each 5 year period between the acceptance of the Water Quality Improvement Plan and the achievement of the final numeric goals.

(2) <u>Schedules for Achieving Numeric Goals</u>

The Copermittees must develop and incorporate schedules for achieving the numeric goals into the Water Quality Improvement Plan. The schedules must demonstrate reasonable progress toward achieving the final numeric goals required for Provision B.3.a.(1). The Copermittees must incorporate the schedules for achieving the numeric goals into the Water Quality Improvement Plan based on the following considerations:

(a) Final dates for achieving all final numeric goals must be established considering the following:

(i) Final compliance dates for any applicable TMDLs in Attachment E to this Order;

(ii) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(iii) Achievement of the final numeric goals for the highest water quality priorities must be as soon as possible;

(iv) Final dates for achieving the final numeric goals must reflect a realistic assessment of the shortest practicable time required based on the temporal and spatial extent and factors associated with the highest priority water quality conditions identified under Provision B.2.c, and taking into account the time reasonably required to implement the water quality improvement strategies required pursuant to Provision B.3.b.

(b) Interim dates for achieving all interim numeric goals must be established considering the following:

(i) Interim compliance dates for any applicable TMDLs in Attachment E to this Order;

(ii) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(iii) Interim dates for achieving the interim numeric goals must reflect a realistic assessment of the shortest practicable time reasonably required, taking into account the time needed to implement new or significantly expanded programs and securing financing, if necessary; and

(iv) For each final numeric goal, at least one interim numeric goal must be established that the Copermittees will work toward achieving within the term of this Order.

b. WATER QUALITY IMPROVEMENT STRATEGIES AND SCHEDULES

Based on the likely effectiveness and efficiency of the potential water quality improvement strategies identified under Provision B.2.e to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a, the Copermittees must identify the strategies that will be implemented in each Watershed Management Area as follows:

(1) Jurisdictional Strategies

(a) Each Copermittee in the Watershed Management Area must identify the strategies that will be implemented within its jurisdiction as part of its jurisdictional runoff management program requirements under Provisions E.2 through E.7, including descriptions of the following:

(i) For each of the inventories developed for its jurisdiction, as required under Provisions D.2.a.(1), E.3.e.(2), E.4.b, and E.5.a, each Copermittee must identify the known and suspected areas or sources causing or contributing to the highest priority water quality conditions in the Watershed Management Area that the Copermittee will focus on in its efforts to effectively prohibit non-storm water discharges to its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, and achieve the interim and final numeric goals identified under Provision B.3.a;

(ii) BMPs that each Copermittee will implement, or require to be implemented, as applicable, for those areas or sources within its jurisdiction;

(iii) Education programs that each Copermittee will implement, as applicable, for those areas or sources within its jurisdiction;

(iv) Frequencies that each Copermittee will conduct inspections on those areas or sources within its jurisdiction;

(v) Incentive and enforcement programs that each Copermittee will implement, as applicable, for those areas or sources within its jurisdiction; and

(vi) Any other BMPs, incentives, or programs that each Copermittee will implement for those areas or sources within its jurisdiction.

(b) Identify the optional jurisdictional strategies that each Copermittee will implement within its jurisdiction, as necessary, to effectively prohibit non-storm water discharges to its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. Descriptions of the optional jurisdictional strategies must include:

(i) BMPs, incentives, or programs that may be implemented by the Copermittee within its jurisdiction in addition to the requirements of Provisions B.3.b.(1)(a);

(ii) Incentives or programs that may be implemented by the Copermittee to encourage or implement projects to retrofit areas of existing development within its jurisdiction;

(iii) Incentives or programs that may be implemented by the Copermittee to encourage or implement projects that will rehabilitate the conditions of channels or habitats within its jurisdiction;

(iv) The funds and/or resources that must be secured by the Copermittee to implement the optional strategies described for Provisions B.3.b.(1)(b)(i)-(iii) within its jurisdiction; and

(v) The circumstances necessary to trigger implementation of the optional jurisdictional strategies, in addition to the requirements of Provision B.3.b.(1)(a), to achieve the interim and final numeric goals within the schedules established under Provision B.3.a.

(c) Identify the strategies that will be implemented by the Copermittee in coordination with or with the cooperation of other agencies (e.g. Caltrans, water districts, school districts) and/or entities (e.g. non-governmental organizations) within its jurisdiction.

(2) Watershed Management Area Strategies

The Copermittees must identify the optional regional or multi-jurisdictional strategies that will be implemented in the Watershed Management Area, as necessary, to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. Descriptions of the optional regional or multi-jurisdictional strategies must include:

(a) Regional or multi-jurisdictional BMPs, incentives, or programs that may be implemented by the Copermittees in the Watershed Management Area;

(b) Incentives or programs that may be implemented by the Copermittees in the Watershed Management Area to encourage or implement regional or multi-jurisdictional projects to retrofit areas of existing development;

(c) Incentives or programs that may be implemented by the Copermittees to encourage or implement regional or multi-jurisdictional projects that will rehabilitate the conditions of channels, streams, or habitats within the Watershed Management Area;

(d) The funds and/or resources that must be secured by the Copermittees to implement the optional strategies described for Provisions B.3.b.(2)(a)-(c) within the Watershed Management Area; and

(e) The circumstances necessary to trigger implementation of the optional regional or multi-jurisdictional strategies to achieve the interim and final numeric goals within the schedules established under Provision B.3.a.

(3) Schedules for Implementing Strategies

The Copermittees must develop reasonable schedules for implementing the water quality improvement strategies identified under Provisions B.3.b.(1) and B.3.b.(2) to achieve the interim and final numeric goals identified and schedules established under Provision B.3.a. The Copermittees must incorporate the schedules to implement the water quality improvement strategies into the Water Quality Improvement Plan as follows:

(a) Each Copermittee must develop schedules for the jurisdictional strategies identified pursuant to Provisions B.3.b.(1)(a)-(b). Each schedule must specify:

(i) If each jurisdictional strategy identified pursuant to Provision B.3.b.(1)(a) will or will not be initiated upon acceptance of the Water Quality Improvement Plan;

(ii) For each jurisdictional strategy identified pursuant to Provision B.3.b.(1)(a) that will not be initiated upon acceptance of the Water Quality Improvement Plan, the shortest practicable time in which each jurisdictional strategy will be initiated after acceptance of the Water Quality Improvement Plan;

(iii) For each optional jurisdictional strategy identified pursuant to Provision B.3.b.(1)(b), a realistic assessment of the shortest practicable time required to:

[a] Secure the resources needed to fund the optional jurisdictional strategy, and
[b] Procure the resources, materials, labor, and applicable permits necessary to initiate implementation of the optional jurisdictional strategy;

(iv) If each jurisdictional strategy identified pursuant to Provisions B.3.b.(1)(a)-(b) is expected to be continuously implemented (e.g. inspections) or completed within a schedule (e.g. construction of structural BMP); and

(v) If a jurisdictional strategy identified pursuant to Provisions B.3.b.(1)(a)-(b) is expected to be completed within a schedule, the anticipated time to complete based on a realistic assessment of the shortest practicable time required.

(b) The Copermittees in the Watershed Management Area must develop schedules for the regional or multi-jurisdictional strategies identified pursuant to Provision B.3.b.(2). Each schedule must specify:

(i) A realistic assessment of the shortest practicable time to:

[a] Secure the resources needed to fund the optional regional or multi-jurisdictional strategy, and
[b] Procure the resources, materials, labor, and permits necessary to initiate the implementation of the optional regional or multi-jurisdictional strategy;

(ii) If each regional or multi-jurisdictional strategy identified pursuant to Provision B.3.b.(2) is expected to be continuously implemented (e.g. inspections) or completed within a schedule (e.g. construction of structural BMP); and

(iii) If a regional or multi-jurisdictional strategy and/or activity identified pursuant to Provisions B.3.b.(2) is expected to be completed within a schedule, the anticipated time to complete based on a realistic assessment of the shortest practicable time required.

(4) <u>Optional Watershed Management Area Analysis</u>

(a) For each Watershed Management Area, the Copermittees have the option to perform a Watershed Management Area Analysis for the purpose of developing watershed-specific requirements for structural BMP implementation, as described in Provision E.3.c.(3). The Watershed Management Area Analysis must include GIS layers (maps) as output. The analysis must include the following information, to the extent it is available, in order to characterize the Watershed Management Areas:

(i) A description of dominant hydrologic processes, such as areas where infiltration or overland flow likely dominates;

(ii) A description of existing streams in the watershed, including bed material and composition, and if they are perennial or ephemeral;

(iii) Current and anticipated future land uses;

(iv) Potential coarse sediment yield areas; and

(v) Locations of existing flood control structures and channel structures, such as stream armoring, constrictions, grade control structures, and hydromodification or flood management basins.

(b) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify and compile a list of candidate projects that could potentially be used as

alternative compliance options for Priority Development Projects, to be implemented in lieu of onsite structural BMP performance requirements described in Provisions E.3.c.(1) and E.3.c.(2)(a). Specifically, the Copermittees must identify opportunities to be included in the list of candidate projects in each Watershed Management Area, such as:

(i) Stream or riparian area rehabilitation;

(ii) Retrofitting existing infrastructure to incorporate storm water retention or treatment;

(iii) Regional BMPs;

(iv) Groundwater recharge projects;

(v) Water supply augmentation projects; and

(vi) Land purchases to preserve floodplain functions.

(c) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify areas within the Watershed Management Area where it is appropriate to allow Priority Development Projects to be exempt from the hydromodification management BMP performance requirements described in Provision E.3.c.(2), including supporting rationale.

c. Prohibitions and Limitations Compliance Option

Each Copermittee has the option to utilize the implementation of the Water Quality Improvement Plan to demonstrate compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b within a Watershed Management Area subject to the following conditions:

(1) A Copermittee is eligible to be deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b within a Watershed Management Area when the Water Quality Improvement Plan for a Watershed Management Area incorporates the following:

(a) Numeric goals, water quality improvement strategies, and schedules developed pursuant to Provisions B.3.a and B.3.b that include the following:

(i) Interim and final WQBELs established by the TMDLs in Attachment E to this Order applicable to the Copermittee's jurisdiction within the Watershed Management Area; AND

(ii) Interim and final numeric goals for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012

(included as Attachment A to this Order) applicable to the Copermittee's jurisdiction within the Watershed Management Area; AND

(iii) Interim and final numeric goals applicable to the Copermittee's MS4 discharges within the Watershed Management Area expressed as numeric concentration-based or load-based goals for all pollutants and conditions listed on the Clean Water Act Section 303(d) List of Water Quality Impaired Segments[8] for the receiving waters in the Watershed Management Area that do not have a TMDL incorporated into Attachment E to this Order; AND/OR

(iv) Interim and final numeric goals for pollutants and conditions identified as receiving water priorities in the Water Quality Improvement Plan that will result in chemical, physical, and biological conditions protective of the beneficial uses of the receiving waters impacted by the Copermittee's MS4 discharges within the Watershed Management Area; AND

(v) The Copermittee has the option to include interim and final numeric goals applicable to the Copermittee's MS4 discharges and/or receiving waters within the Watershed Management Area for any pollutants or conditions in addition to those described in Provisions B.3.c.(1)(a)(i)-(iv); AND

(vi) Schedules for achieving each final numeric goal that reflect a realistic assessment of the shortest practicable time needed for achievement; AND

(vii) For each final numeric goal developed pursuant to Provisions B.3.a and B.3.c.(1)(a)(i)-(v), annual milestones[9] and the dates for their achievement must be included within each of the next five (5) Water Quality Improvement Plan Annual Report reporting periods, or until the final numeric goal is achieved. Annual milestones and the dates for their achievement for the 5 Water Quality Improvement Plan Annual Report reporting periods of the next permit term, or until the final numeric goal is achieved, must be provided as part of the Report of Waste Discharge required pursuant to Provision F.5.

(b) An analysis that meets all of the following conditions:

(i) The analysis, with clearly stated assumptions included in the analysis, must quantitatively demonstrate that the implementation of

[8] 2010 and subsequent 303(d) Lists

[9] Annual milestones for each final numeric goal must be clearly and directly linked to, or demonstrate progress is being made toward the achievement of the final numeric goal. The annual milestones may consist of water quality improvement strategy implementation phases, interim numeric goals, and other acceptable metrics. The annual milestones may address multiple numeric goals and/or multiple water bodies, as applicable and appropriate.

the water quality improvement strategies required under Provision B.3.b will achieve the final numeric goals within the schedules developed pursuant to Provisions B.3.a and B.3.c.(1)(a).

(ii) The development of the analysis must include a public participation process which allows the public to review and provide comments on the analysis methodology utilized and the assumptions included in the analysis. Public comments and responses must be included as part of the analysis documentation included in the Water Quality Improvement Plan.

(iii) The analysis may be performed by an individual Copermittee or jointly by two or more Copermittees choosing to utilize this compliance option for their jurisdictions within the Watershed Management Area.

(iv) The analysis must be updated as part of the iterative approach and adaptive management process required under Provisions B.5.a-b.

(c) Specific monitoring and assessments required pursuant to Provision B.4.a that will be performed by the Copermittee capable of 1) demonstrating whether the implementation of the water quality improvement strategies are making progress toward achieving the numeric goals in accordance with the established schedules developed pursuant to Provisions B.3.a and B.3.c.(1)(a), and 2) determining whether interim and final numeric goals have been achieved. The specific monitoring and assessments must be updated as part of the iterative approach and adaptive management process required under Provision B.5.c.

(d) Documentation showing that the numeric goals, schedules, and annual milestones proposed pursuant to Provision B.3.c.(1)(a), the analysis performed pursuant to Provision B.3.c.(1)(b), and the specific monitoring and assessments proposed pursuant to Provision B.3.c.(1)(c) have been reviewed by the Water Quality Improvement Consultation Panel (see Provision F.1.a.(1)(b)). Updates must be reviewed by the Water Quality Improvement Consultation Panel for any recommendations.

(2) Each Copermittee that voluntarily completes the requirements of Provision B.3.c.(1) is deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b for the pollutants and conditions for which numeric goals are developed when the Water Quality Improvement Plan, incorporating the requirements of Provision B.3.c.(1), is accepted by the San Diego Water Board pursuant to Provision F.1.b or F.2.c. The Copermittee is deemed in compliance during the term of this Order as long as:

(a) The Copermittee is implementing the water quality improvement strategies within its jurisdiction developed pursuant to Provision B.3.b.(1) and in

compliance with the schedules for implementing the strategies established pursuant to Provisions B.3.b.(3)(a) and B.3.c.(1)(a)(vii); AND

(b) The Copermittee is performing the monitoring and assessments developed pursuant to Provision B.3.c.(1)(c); AND

(c) The Copermittee's assessments in the Water Quality Improvement Plan Annual Report submitted pursuant to Provision F.3.b.(3) support a conclusion that: 1) the Copermittee is in compliance with the annual milestones and dates for achievement developed pursuant to Provision B.3.c.(1)(a)(vii), OR 2) the Copermittee has provided acceptable rationale and recommends appropriate modifications to the interim numeric goals, and/or water quality improvement strategies, and/or schedules to improve the rate of progress toward achieving the final numeric goals developed pursuant to Provisions B.3.a and B.3.c.(1)(a)(i)-(vi); AND

(d) Any proposed modifications to the numeric goals, strategies, schedules, and/or annual milestones are accepted by the San Diego Water Board as part of subsequent updates to the Water Quality Improvement Plan pursuant to Provision F.2.c;[10] AND

(e) The Copermittee is implementing the requirements of Provision A.4.a.

4. Water Quality Improvement Monitoring and Assessment Program

a. The Copermittees in each Watershed Management Area must develop and incorporate an integrated monitoring and assessment program into the Water Quality Improvement Plan that assesses: 1) the progress toward achieving the numeric goals and schedules, 2) the progress toward addressing the highest priority water quality conditions for each Watershed Management Area, and 3) each Copermittee's overall efforts to implement the Water Quality Improvement Plan.

b. The monitoring and assessment program must incorporate the monitoring and assessment requirements of Provision D, which may allow the Copermittees to modify the program to be consistent with and focus on the highest priority water quality conditions for each Watershed Management Area.

c. For Watershed Management Areas with applicable TMDLs, the monitoring and assessment program must incorporate the specific monitoring and assessment requirements of Attachment E.

[10] A request for proposed changes to the Water Quality Improvement Plan does not stay any permit condition.

d. For Watershed Management Areas with any ASBS, the water quality monitoring and assessment program must incorporate the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

5. Iterative Approach and Adaptive Management Process

The Copermittees in each Watershed Management Area must implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a, and must include the following:

a. RE-EVALUATION OF PRIORITY WATER QUALITY CONDITIONS

The priority water quality conditions and potential water quality improvement strategies included in the Water Quality Improvement Plan pursuant to Provisions B.2.c and B.2.e may be re-evaluated by the Copermittees as needed during the term of this Order as part of the Water Quality Improvement Plan Annual Report. Re-evaluation and recommendations for modifications to the priority water quality conditions and potential water quality improvement strategies must be provided in the Report of Waste Discharge, and must consider the following:

(1) Achieving the outcome of improved water quality in MS4 discharges and receiving waters through implementation of the water quality improvement strategies identified in the Water Quality Improvement Plan;

(2) New information developed when the requirements of Provisions B.2.a-c have been re-evaluated;

(3) Spatial and temporal accuracy of monitoring data collected to inform prioritization of water quality conditions and implementation strategies to address the highest priority water quality conditions;

(4) Availability of new information and data from sources other than the jurisdictional runoff management programs within the Watershed Management Area that informs the effectiveness of the actions implemented by the Copermittees;

(5) San Diego Water Board recommendations; and

(6) Recommendations for modifications solicited through a public participation process.

b. ADAPTATION OF GOALS, STRATEGIES AND SCHEDULES

The water quality improvement goals, strategies and schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.3, must be re-evaluated and adapted as new information becomes available to result in more effective and efficient measures to address the highest priority water quality conditions identified pursuant to Provision B.2.c. Re-evaluation of and modifications to the water quality improvement goals, strategies and schedules must be provided in the Water Quality Improvement Plan Annual Report, and must consider the following:

(1) Modifications to the priority water quality conditions based on Provision B.5.a;

(2) Progress toward achieving interim and final numeric goals in receiving waters and MS4 discharges for the highest priority water quality conditions in the Watershed Management Area,

(3) Progress toward achieving outcomes according to established schedules;

(4) New policies or regulations that may affect identified numeric goals;

(5) Measurable or demonstrable reductions of non-storm water discharges to and from each Copermittee's MS4;

(6) Measurable or demonstrable reductions of pollutants in storm water discharges from each Copermittee's MS4 to the MEP;

(7) New information developed when the requirements of Provisions B.2.b and B.2.d have been re-evaluated;

(8) Efficiency in implementing the Water Quality Improvement Plan;

(9) San Diego Water Board recommendations; and

(10) Recommendations for modifications solicited through a public participation process.

c. ADAPTATION OF MONITORING AND ASSESSMENT PROGRAM

The water quality improvement monitoring and assessment program, included in the Water Quality Improvement Plan pursuant to Provision B.4, must be re-evaluated and adapted when new information becomes available. Re-evaluation and recommendations for modifications to the monitoring and assessment program, pursuant to the requirements of Provision D, may be provided in the Water Quality Improvement Plan Annual Report, but must be provided in the Report of Waste Discharge.

d. ADAPTATION OF PROHIBITIONS AND LIMITATIONS COMPLIANCE OPTION

If a Copermittee has implemented the Prohibitions and Limitations Compliance Option allowed to be included in the Water Quality Improvement Plan pursuant to Provision B.3.c, the Copermittee must re-evaluate and adapt the numeric goals, water quality improvement strategies, schedules, and annual milestones required under Provision B.3.c.(1) when significant new information becomes available, or with the Report of Waste Discharge required pursuant to Provision F.5. Significant changes in the numeric goals, water quality improvement strategies, schedules, or annual milestones requires an update to the analysis required under Provision B.3.c.(2).

6. Water Quality Improvement Plan Submittal, Updates, and Implementation

a. The Copermittees must submit and commence implementation of the Water Quality Improvement Plans in accordance with the requirements of Provision F.1.

b. The Copermittees must submit proposed updates to the Water Quality Improvement Plan for acceptance by the San Diego Water Board Executive Officer in accordance with the requirements of Provision F.2.c.

C. ACTION LEVELS

The purpose of this provision is for the Copermittees to incorporate numeric action levels in the Water Quality Improvement Plans. The goal of the action levels is to guide Water Quality Improvement Plan implementation efforts and measure progress towards the protection of water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through monitoring and assessing the quality of the MS4 discharges during the implementation of the Water Quality Improvement Plans.

1. Non-Storm Water Action Levels[11]

The Copermittees must develop and incorporate numeric non-storm water action levels (NALs) into the Water Quality Improvement Plan to: 1) support the development and prioritization of water quality improvement strategies for effectively prohibiting non-storm water discharges to the MS4s, 2) assess the effectiveness of the water quality improvement strategies toward addressing MS4 non-storm water discharges, required pursuant to Provision D.4.b.(1), and 3) support the detection and elimination of non-storm water and illicit discharges to the MS4, required pursuant to Provision E.2.[12]

a. The following NALs must be incorporated:

(1) Non-Storm Water Discharges from MS4s to Ocean Surf Zone

Table C-1. Non-Storm Water Action Levels for Discharges from MS4s to Ocean Surf Zone

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Total Coliform	MPN/100 ml	1,000	-	10,000/1,000[1]	OP
Fecal Coliform	MPN/100 ml	200[2]	-	400	OP
Enterococci	MPN/100 ml	35	-	104[3]	OP

Abbreviations/Acronyms
AMAL – average monthly action level
MDAL – maximum daily action level
OP – Ocean Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Total coliform density NAL is 1,000 MPN/100 ml when the fecal/total coliform ratio exceeds 0.1.
2. Fecal coliform density NAL is 200 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas."

[11] NALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, unless the NAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed.
[12] The Copermittees may utilize NALs or other benchmarks currently established by the Copermittees as interim NALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

(2) Non-Storm Water Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Table C-2. Non-Storm Water Action Levels for Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Turbidity	NTU	75	-	225	OP
pH	Units	Within limit of 6.0 to 9.0 at all times			OP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	35	-	104[3]	BP
Priority Pollutants	µg/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
OP – Ocean Plan water quality objective
NTU – Nephelometric Turbidity Units
µg/L – micrograms per liter
MDAL – maximum daily action level
BP – Basin Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas" and is not applicable to water bodies that are not designated with the water contact recreation (REC-1) beneficial use.

Table C-3. Non-Storm Water Action Levels for Priority Pollutants

Parameter	Units	Freshwater (CTR)		Saltwater (CTR)	
		MDAL	AMAL	MDAL	AMAL
Cadmium	µg/L	**	**	16	8
Copper	µg/L	*	*	5.8	2.9
Chromium III	µg/L	**	**	-	-
Chromium VI	µg/L	16	8.1	83	41
Lead	µg/L	*	*	14	2.9
Nickel	µg/L	**	**	14	6.8
Silver	µg/L	*	*	2.2	1.1
Zinc	µg/L	*	*	95	47

Abbreviations/Acronyms:
CTR – California Toxic Rule
AMAL – average monthly action level
µg/L – micrograms per liter
MDAL – maximum daily action level

Notes:
* Action levels developed on a case-by-case basis (see below)
** Action levels developed on a case-by-case basis (see below), but calculated criteria are not to exceed Maximum Contaminant Levels (MCLs) under the California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64431

The Cadmium, Copper, Chromium (III), Lead, Nickel, Silver and Zinc NALs for MS4 discharges to freshwater receiving waters will be developed on a case-by-case basis based on site-specific water quality data (receiving water hardness). For these priority pollutants, refer to 40 CFR 131.38(b)(2).

(3) Non-Storm Water Discharges from MS4s to Inland Surface Waters

Table C-4. Non-Storm Water Action Levels for Discharges from MS4s to Inland Surface Waters

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Dissolved Oxygen	mg/L	Not less than 5.0 in WARM waters and not less than 6.0 in COLD waters			BP
Turbidity	NTU	-	20	See MDAL	BP
pH	Units	Within limit of 6.5 to 8.5 at all times			BP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	33	-	61[3]	BP
Total Nitrogen	mg/L	-	1.0	See MDAL	BP
Total Phosphorus	mg/L	-	0.1	See MDAL	BP
MBAS	mg/L	-	0.5	See MDAL	BP
Iron	mg/L	-	0.3	See MDAL	BP
Manganese	mg/L	-	0.05	See MDAL	BP
Priority Pollutants	µg/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
BP – Basin Plan water quality objective
COLD – cold freshwater habitat beneficial use
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
MDAL – maximum daily action level
WARM – warm freshwater habitat beneficial use
MBAS – Methylene Blue Active Substances
MPN/100 ml – most probable number per 100 milliliters
µg/L – micrograms per liter

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for freshwater "designated beach areas" and is not applicable to water bodies that are not designated with the water contact recreation (REC-1) beneficial use.

b. If not identified in Provision C.1.a, NALs must be identified, developed and incorporated in the Water Quality Improvement Plan for any pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in receiving waters associated with the highest priority water quality conditions related to non-storm water discharges from the MS4s. NALs must be based on:

(1) Applicable water quality standards which may be dependent upon site-specific or receiving water-specific conditions or assumptions to be identified by the Copermittees; or

(2) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the NALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary NALs specific to the Watershed Management Area at levels greater than the NALs required by Provisions C.1.a and C.1.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for effectively prohibiting non-storm water discharges to the MS4s, as well as the detection and

elimination of non-storm water and illicit discharges to and from the MS4. The secondary NALs may be developed using an approach acceptable to the San Diego Water Board.

d. Dry weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.b may be utilized to develop or revise NALs based on watershed-specific data, subject to San Diego Water Board Executive Officer approval.

2. Storm Water Action Levels[13]

The Copermittees must develop and incorporate numeric storm water action levels (SALs) in the Water Quality Improvement Plans to: 1) support the development and prioritization of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s, and 2) assess the effectiveness of the water quality improvement strategies toward reducing pollutants in storm water discharges, required pursuant to Provision D.4.b.(2).[14]

a. The following SALs for discharges of storm water from the MS4 must be incorporated:

Table C-5. Storm Water Action Levels for Discharges from MS4s to Receiving Waters

Parameter	Units	Action Level
Turbidity	NTU	126
Nitrate & Nitrite (Total)	mg/L	2.6
Phosphorus (Total P)	mg/L	1.46
Cadmium (Total Cd)*	µg/L	3.0
Copper (Total Cu)*	µg/L	127
Lead (Total Pb)*	µg/L	250
Zinc (Total Zn)*	µg/L	976

Abbreviations/Acronyms:
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
µg/L – micrograms per liter

Notes:
* The sampling must include a measure of receiving water hardness at each MS4 outfall. If a total metal concentration exceeds the corresponding metals SAL in Table C-5, that concentration must be compared to the California Toxics Rule criteria and the USEPA 1-hour maximum concentration for the detected level of receiving water hardness associated with that sample. If it is determined that the sample's total metal concentration for that specific metal exceeds that SAL, but does not exceed the applicable USEPA 1-hour maximum concentration criterion for the measured level of hardness, then the sample result will not be considered above the SAL for that measurement.

[13] SALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, unless the SAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed.

[14] The Copermittees may utilize SALs or other benchmarks currently established by the Copermittees as interim SALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

b. If not identified in Provision C.2.a, SALs must be identified, developed and incorporated in the Water Quality Improvement Plan for pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in receiving waters associated with the highest priority water quality conditions related to storm water discharges from the MS4s. SALs must be based on:

(1) Federal and State water quality guidance and/or water quality standards; and

(2) Site-specific or receiving water-specific conditions; or

(3) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the SALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary SALs specific to the Watershed Management Area at levels greater than the SALs required by Provisions C.2.a and C.2.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s. The secondary SALs may be developed based on the approaches recommended by the State Water Board's Storm Water Panel[15] or using an approach acceptable to the San Diego Water Board.

d. Wet weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.c may be used to develop or revise SALs based upon watershed-specific data, subject to San Diego Water Board Executive Officer approval.

[15] Storm Water Panel Recommendations to the California State Water Resources Control Board: The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities (June 2006)

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D. MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS

The purpose of this provision is for the Copermittees to monitor and assess the impact on the conditions of receiving waters caused by discharges from the Copermittees' MS4s under wet weather and dry weather conditions. The goal of the monitoring and assessment program is to inform the Copermittees about the nexus between the health of receiving waters and the water quality condition of the discharges from their MS4s. This goal will be accomplished through monitoring and assessing the conditions of the receiving waters, discharges from the MS4s, pollutant sources and/or stressors, and effectiveness of the water quality improvement strategies implemented as part of the Water Quality Improvement Plans.

1. Receiving Water Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the condition of the receiving waters in each Watershed Management Area during dry weather and wet weather. Following San Diego Water Board acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct long-term receiving water monitoring during implementation of the Water Quality Improvement Plan to assess the long term trends and determine if conditions in receiving waters are improving. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following receiving water monitoring procedures:

a. TRANSITIONAL RECEIVING WATER MONITORING

Until the monitoring requirements and schedules of Provisions D.1.b-e are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following receiving water monitoring in the Watershed Management Area:

(1) Continue the receiving water monitoring programs required in Order Nos. R9-2007-0001 (Monitoring and Reporting Program No. R9-2007-0001 Sections II.A.1-A.5), R9-2009-0002, and R9-2010-0016, unless the Executive Officer provides conditional approval for Copermittees to proceed with implementation of the proposed monitoring and assessment program developed in accordance with Provision B.4;

(2) Continue the monitoring in the Hydromodification Management Plans approved by the San Diego Water Board;

(3) Participate in the following regional receiving water monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring,

(b) Southern California Bight Regional Monitoring, and

(c) Sediment Quality Monitoring;

(4) Implement the monitoring programs developed as part of any implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) for the TMDLs in Attachment E to this Order; and

(5) For Watershed Management Areas with ASBS, implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

b. LONG-TERM RECEIVING WATER MONITORING STATIONS

The Copermittees must select at least one long-term receiving water monitoring station from among the existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees to be representative of the receiving water quality in the Watershed Management Area. Additional long-term receiving water monitoring stations must be selected where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

c. DRY WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three dry weather monitoring events at each of the long-term receiving water monitoring stations. At least one monitoring event must be conducted during the dry season (May 1 – September 30) and at least one monitoring event must be conducted during a dry weather period during the wet season (October 1 – April 30), after the first wet weather event of the season, with an antecedent dry period of at least 72 hours following a storm event producing measureable rainfall of greater than 0.1 inch.

(1) <u>Dry Weather Receiving Water Field Observations</u>

For each dry weather monitoring event, the Copermittees must record field observations consistent with Table D-1 at each long-term receiving water monitoring station.

Table D-1. Field Observations for Receiving Water Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) • Station description (i.e. deposits or stains, vegetation condition, structural condition, and observable biology) • Presence and assessment of trash in and around station

(2) Dry Weather Receiving Water Field Monitoring

For each dry weather monitoring event, if conditions allow the collection of the data, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

Table D-2. Field Monitoring Parameters for Receiving Water Monitoring Stations

Parameters
• pH • Temperature • Specific conductivity • Dissolved oxygen • Turbidity

(3) Dry Weather Receiving Water Analytical Monitoring

For each dry weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable NAL constituents, and

(v) Constituents listed in Table D-3.

Table D-3. Analytical Monitoring Constituents for Receiving Water Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Pesticides	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Mercury • Nickel • Selenium • Thallium • Zinc	• Organophosphate Pesticides • Pyrethroid Pesticides	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(4) Dry Weather Receiving Water Toxicity Monitoring

For each dry weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for aquatic toxicity in accordance with Table D-4. When the State Water Board's Policy for Toxicity Assessment and Control (Toxicity Policy) is approved and in effect, the San Diego Water Board Executive Officer may direct the Copermittees to replace current toxicity program elements with standardized procedures in the Toxicity Policy.

Table D-4. Dry Weather Chronic[1] Toxicity Testing for Receiving Water Monitoring Stations

Organism	Units	Test	USEPA Protocol
Freshwater			
Pimephales promelas (Fathead Minnow)	Pass / Fail	Larval Survival and Growth	EPA-821-R-02-013
Ceriodaphnia dubia (*Daphnid*)	Pass / Fail	Survival and Production	EPA-821-R-02-013
Selenastrum capricornutum (Green Algae)	Pass / Fail	Growth	EPA-821-R-02-013
Marine and Estuarine			
Strongylocentrotus purpuratus *(Purple Sea Urchin)*	Pass / Fail	Embryo-Larval Development	EPA-600-R-95-136

Notes:
1. Chronic toxicity testing is not required at receiving water monitoring stations located at mass loading stations if the channel flows are diverted year-round during dry weather conditions to the sanitary sewer for treatment.

(a) Freshwater Test Species and Methods: If samples are collected in receiving waters with salinity less than 1 ppt, the Copermittees must follow the methods for chronic toxicity tests as established in 40 CFR 136.3 using a single-concentration test design for routine monitoring, or a five-concentration test design for additional toxicity testing if the limitation is exceeded. The Copermittees must estimate the critical life stage chronic toxicity on undiluted samples in accordance with species and short term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms (EPA-821-R-02-013; Table IA, 40 CFR 136). Additional test species may be used by the Copermittees if approved by the San Diego Water Board Executive Officer. The Copermittees must conduct:

(i) A static renewal toxicity test with the fathead minnow, *Pimephales promelas* (Larval Survival and Growth Test Method 1000.0);

(ii) A static renewal toxicity test with the daphnid, *Ceriodaphnia dubia* (Survival and Reproduction Test Method 1002.0); and

(iii) A static renewal toxicity test with the green alga, *Selenastrum capricornutum* (also named *Raphidocelis subcapitata*) (Growth Test Method 1003.0).

(b) Marine and Estuarine Test Species and Methods: If samples are collected in receiving waters with salinity greater or equal to 1 ppt, the Copermittees must follow the methods for chronic toxicity tests as established in 40 CFR 136.3 using a single-concentration test design for routine monitoring, or a five-concentration test design for additional toxicity testing if the limitation is exceeded. The Copermittees must conduct the following critical life state chronic toxicity tests on undiluted samples in accordance with species and short term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms (EPA-600-R-95-136; 1995). Artificial sea salts must be used to increase sample salinity. The Copermittees must conduct a static non-renewal toxicity test with the purple sea urchin, *Strongylocentrotus purpuratus* (Embryo-larval Development Test Method). Additional species may be used by the Copermittees if approved by the San Diego Water Board Executive Officer.

(c) Holding Times: All toxicity tests must be conducted as soon as possible following sample collection. The 36-hour sample holding time for test initiation shall be targeted. However, no more than 72 hours shall elapse before the conclusion of sample collection and test initiation.

(d) Test Species Sensitivity Screening: To determine the most sensitive test species for freshwater, the Copermittees must screen 2 wet weather and 2 dry weather toxicity tests with a vertebrate, an invertebrate, and a plant species. After this screening period, subsequent monitoring must be conducted using the most sensitive test species. Alternatively, if a sensitive test species has already been determined, or if there is prior knowledge of potential toxicant(s) and a test species is sensitive to such toxicant(s), then monitoring must be conducted using only that test species. Sensitive test species determinations must also consider the most sensitive test species used for proximal receiving water monitoring. Rescreening must occur once each permit term.

(e) Chronic toxicity test biological endpoint data must be analyzed using the Test of Significant Toxicity t-test approach specified in *National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document* (USEPA, Office of Wastewater Management, Washington, D.C., EPA-833-R-10-003, 2010). For this monitoring program, the critical chronic instream waste concentration (IWC) is set at 100 percent receiving water (i.e. no dilution) for receiving water samples. A 100 percent receiving water and a control must be tested.

(f) Toxicity Identification Evaluation (TIE) / Toxicity Reduction Evaluation (TRE): If chronic toxicity is detected in receiving waters, the Copermittees must discuss the need for conducting a TIE/TRE in the assessments

required under Provision D.4.a.(2), and develop a plan for implementing the TIE/TRE to be incorporated in the Water Quality Improvement Plan.

(5) Dry Weather Receiving Water Bioassessment Monitoring

Bioassessment monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must conduct bioassessment monitoring during at least one dry weather monitoring event at each long-term receiving water monitoring station as follows:

(a) The following bioassessment samples and measurements must be collected:

(i) Macroinvertebrate samples must be collected in accordance with the "Reachwide Benthos (Multihabitat) Procedure" in the most current Surface Water Ambient Monitoring Program (SWAMP) Bioassessment Standard Operating Procedures (SOP), and amendments, as applicable;[16]

(ii) The "Full" suite of physical habitat characterization measurements must be collected in accordance with the most current SWAMP Bioassessment SOP, and as summarized in the SWAMP Stream Habitat Characterization Form – Full Version;[17] and

(iii) Freshwater algae samples must be collected in accordance with the SWAMP Standard Operating Procedures for Collecting Algae Samples.[18] Analysis of samples must include algal taxonomic composition (diatoms and soft algae) and algal biomass.

(b) The bioassessment samples, measurements, and appropriate water chemistry data must be used to calculate the following:

(i) An Index of Biological Integrity (IBI) for macroinvertebrates for each monitoring station where bioassessment monitoring was conducted, based on the most current calculation method;[19] and

[16] Ode, P.R.. 2007. Standard operating procedures for collecting macroinvertebrate samples and associated physical and chemical data for ambient bioassessments in California. California State Water Resources Control Board Surface Water Ambient Monitoring Program (SWAMP) Bioassessment SOP 001. http://www.swrcb.ca.gov/water_issues/programs/swamp/tools.shtml#monitoring
[17] Available at: http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/reports/fieldforms_fullversion052908.pdf
[18] Fetscher et al. 2009. Standard Operating Procedures for Collecting Stream Algae Samples and Associated Physical Habitat and Chemical Data for Ambient Bioassessments in California.
[19] The most current calculation method at the time the Order was adopted is outlined in "A Quantitative Tool for Assessing the Integrity of Southern California Coastal Streams" (Ode, et al. 2005. Environmental Management. Vol. 35, No. 1, pp. 1-13). If an updated or new calculation method is developed, either both

(ii) An IBI for algae for each monitoring station where bioassessment monitoring was conducted, when a calculation method is developed.[20]

(c) In lieu of the requirements of Provision D.1.c.(5)(a), the Copermittees may conduct the bioassessment monitoring in accordance with the "Triad" assessment approach[21] to calculate the IBIs required for Provision D.1.c.(5)(b). The Copermittees must conduct sampling, analysis, and reporting of specified in-stream biological and habitat data according to the protocols specified in the SCCWRP Technical Report No. 539, or subsequent protocols, if developed.

(6) Dry Weather Receiving Water Hydromodification Monitoring

In addition to the hydromodification monitoring conducted as part of the Copermittees' Hydromodification Management Plans, hydromodification monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must collect the following hydromodification monitoring observations and measurements within an appropriate domain of analysis during at least one dry weather monitoring event for each long-term receiving water monitoring station:

(a) Channel conditions, including:

(i) Channel dimensions,

(ii) Hydrologic and geomorphic conditions, and

(iii) Presence and condition of vegetation and habitat;

(b) Location of discharge points;

(c) Habitat integrity;

(d) Photo documentation of existing erosion and habitat impacts, with location (i.e. latitude and longitude coordinates) where photos were taken;

(e) Measurement or estimate of dimensions of any existing channel bed or bank eroded areas, including length, width, and depth of any incisions; and

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(i.e. current and updated/new) methods must be used, or historical IBIs must be recalculated with the updated or new calculation method.

[20] When a calculation method is developed, IBIs must be calculated for all available and appropriate historical data.

[21] Stormwater Monitoring Coalition Model Monitoring Technical Committee, 2004. Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California. Technical Report #419. August 2004.

(f) Known or suspected cause(s) of existing downstream erosion or habitat impact, including flow, soil, slope, and vegetation conditions, as well as upstream land uses and contributing new and existing development.

d. WET WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three wet weather monitoring events at each long-term receiving water monitoring station. At least one wet weather monitoring event must be conducted during the first wet weather event of the wet season (October 1 – April 30), and at least one wet weather monitoring event during a wet weather event that occurs after February 1.

(1) Wet Weather Receiving Water Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each long-term receiving water monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event;

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(d) Presence and assessment of trash in and around station.

(2) Wet Weather Receiving Water Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

(3) Wet Weather Receiving Water Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) Constituents listed in Table D-3.

(4) <u>Wet Weather Receiving Water Toxicity Monitoring</u>

For each wet weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for chronic aquatic toxicity in accordance with Provisions D.1.c.(4)(a)-(f).

e. OTHER RECEIVING WATER MONITORING REQUIREMENTS

(1) Regional Monitoring

The Copermittees must participate in the following regional receiving waters monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring; and

(b) Southern California Bight Regional Monitoring and

(c) Unified Beach Water Quality Monitoring and Assessment Program. The Orange County Copermittees shall participate in and, together with South Orange County Wastewater Authority and Orange County Health Care Agency, shall share responsibility for implementation of a unified regional beach water quality monitoring and assessment program in south Orange County, as set forth in the October 2014 report, *Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County* , issued pursuant to CWC section 13383 and subject to future revision in the San Diego Water Board December 5, 2014 Letter Directive.

(2) Sediment Quality Monitoring

The Copermittees must perform sediment monitoring to assess compliance with sediment quality receiving water limits applicable to MS4 discharges to enclosed bays and estuaries. The monitoring may be performed either by individual or multiple Copermittees to assess compliance with receiving water limits, or through participation in a water body monitoring coalition. A Sediment Monitoring Plan which satisfies the requirements of the State Water Board's Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part 1 Sediment Quality (Sediment Control Plan) must be submitted as part of the monitoring and assessment program in the Water Quality Improvement Plan.

(a) The Sediment Monitoring Plan design must include the following:

(i) The elements required under Section VII.D (Receiving Water Limits Monitoring Frequency) and Section VII.E (Sediment Monitoring) of the Sediment Control Plan;

(ii) A Quality Assurance Project Plan (QAPP) describing the project objectives and organization, functional activities, and quality assurance/quality control protocols for the water and sediment monitoring; and

(iii) A schedule for completion of all sample collection and analysis activities and submission of Sediment Monitoring Reports.

(b) The Copermittees must implement the Sediment Monitoring Plan in accordance with the schedule contained in the Sediment Monitoring Plan, unless otherwise directed in writing by the San Diego Water Board Executive Officer.

(c) The Copermittees must incorporate a Sediment Monitoring Report as part of the Water Quality Improvement Plan Annual Report in accordance with the schedule contained in the Sediment Monitoring Plan, unless otherwise directed in writing by the San Diego Water Board Executive Officer. The Sediment Monitoring Report must contain the following information:

(i) Analysis: An evaluation, interpretation and tabulation of the water and sediment monitoring data, including interpretations and conclusions as to whether applicable Receiving Water Limitations in this Order have been attained at each sample station;

(ii) Sample Location Map: The locations, type, and number of samples must be identified and shown on a site map; and

(iii) California Environmental Data Exchange Network: A statement certifying that the monitoring data and results have been uploaded into the California Environmental Data Exchange Network (CEDEN).

(d) Based on the Sediment Monitoring Report conclusions the San Diego Water Board may require a human health risk assessment to determine if the human health objective contained in Receiving Water Limitations in Provision A.2.a.(3)(b)(ii) has been attained at each sample station. In conducting a risk assessment, the Copermittees must consider any applicable and relevant information, including California Environmental Protection Agency's (Cal/EPA) Office of Environmental Health Hazard Assessment (OEHHA) policies for fish consumption and risk assessment, Cal/EPA's Department of Toxic Substances Control (DTSC) Risk Assessment, and USEPA Human Health Risk Assessment policies.

(3) <u>ASBS Monitoring</u>

For Watershed Management Areas with ASBS, the Copermittees must implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

f. ALTERNATIVE WATERSHED MONITORING REQUIREMENTS

The San Diego Water Board may direct the Copermittees to participate in an effort to develop alternative watershed monitoring with other regulated entities, other interested parties, and the San Diego Water Board to refine, coordinate, and implement regional monitoring and assessment programs to determine the status and trends of water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams.

2. MS4 Outfall Discharge Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the discharges from the MS4 outfalls in each Watershed Management Area during dry weather and wet weather. Following San Diego Water Board acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct MS4 outfall discharge monitoring during implementation of the Water Quality Improvement Plan to assess the effectiveness of their jurisdictional runoff management programs toward effectively prohibiting non-storm water discharges into the MS4 and reducing pollutants in storm water discharges from their MS4s to the MEP. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following MS4 outfall monitoring procedures:

a. TRANSITIONAL MS4 OUTFALL DISCHARGE MONITORING

Until the monitoring requirements and schedules of Provisions D.2.b-c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following MS4 outfall discharge monitoring in the Watershed Management Area:

(1) <u>MS4 Outfall Discharge Monitoring Station Inventory</u>

Each Copermittee must identify all major MS4 outfalls that discharge directly to receiving waters within its jurisdiction and geo-locate those outfalls on a map of the MS4 pursuant to Provision E.2.b.(1). This information must be compiled into a MS4 outfall discharge monitoring station inventory, and must include the following information:

(a) Latitude and longitude of MS4 outfall point of discharge;

(b) Watershed Management Area;

(c) Hydrologic subarea;

(d) Outlet size;

(e) Accessibility (i.e. safety and without disturbance of critical habitat);

(f) Approximate drainage area; and

(g) Classification of whether the MS4 outfall is known to have persistent dry weather flows, transient dry weather flows, no dry weather flows, or unknown dry weather flows.

(2) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Until the monitoring requirements and schedules of Provision D.2.b are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, each Copermittee must perform dry weather MS4 outfall field screening monitoring to identify non-storm water and illicit discharges within its jurisdiction in accordance with Provision E.2.c, to determine which discharges are transient flows and which are persistent flows, and prioritize the dry weather MS4 discharges that will be investigated and eliminated in accordance with Provision E.2.d.

(a) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Frequency

Each Copermittee must field screen the MS4 outfalls in its inventory developed pursuant to Provision D.2.a.(1) as follows:

(i) For Copermittees with less than 125 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 80 percent of the outfalls must be visually inspected two times per year during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv).

(ii) For Copermittees with 125 major MS4 outfalls or more, but less than or equal to 500 that discharge to receiving waters within a Watershed Management Area, all the outfalls must be visually inspected at least annually during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv).

(iii) For Copermittees with more than 500 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 500 outfalls must be visually inspected at least annually during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv). Copermittees with more than 500 major MS4 outfalls within a Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;

[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(iv) For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major MS4 outfalls within its jurisdiction, at least 500 major MS4 outfalls within its inventory must be visually inspected at least annually during dry weather conditions. Copermittees with more than 500 major MS4 outfalls in more than one Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(v) Inspections of major MS4 outfalls conducted in response to public reports and staff or contractor reports and notifications may count toward the required visual inspections of MS4 outfall discharge monitoring stations.

(b) Transitional Dry Weather MS4 Outfall Discharge Field Screening Visual Observations

(i) An antecedent dry period of at least 72 hours following any storm event producing measurable rainfall greater than 0.1 inch is required prior to conducting field screening visual observations during a field screening monitoring event.

(ii) During the field screening monitoring event, each Copermittee must record visual observations consistent with Table D-5 at each MS4 outfall discharge monitoring station inspected.

Table D-5. Field Screening Visual Observations for MS4 Outfall Discharge Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) - Flow source(s) suspected or identified from non-storm water source investigation - Flow source(s) eliminated during non-storm water source identification • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) - Known or suspected source(s) of pooled or ponded water • Station description (i.e. deposits or stains, vegetation condition, structural condition, observable biology) • Presence and assessment of trash in and around station • Evidence or signs of illicit connections or illegal dumping

(iii) Each Copermittee must implement the requirements of Provisions E.2.d.(2)(c)-(e) based on the field observations required pursuant to Provision D.2.a.(2)(b)(ii).

(iv) Each Copermittee must evaluate field observations together with existing information available from prior reports, inspections and monitoring results to determine whether any observed flowing, pooled, or ponded waters are likely to be transient or persistent flow.[22]

(c) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Records

Based upon the results of the transitional dry weather MS4 outfall discharge field screening monitoring conducted pursuant to Provisions D.2.a.(2)(a)-(b), each Copermittee must update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow.

(3) <u>Transitional Wet Weather MS4 Outfall Discharge Monitoring</u>

Until the monitoring requirements and schedules of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the

[22] Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(a) Transitional Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees must select wet weather MS4 outfall discharge monitoring stations from the inventories developed pursuant to Provision D.2.a.(1) for each Watershed Management Area as follows:

(i) At least five wet weather MS4 outfall discharge monitoring stations that are representative of storm water discharges from areas consisting primarily of residential, commercial, industrial, and typical mixed-use land uses present within the Watershed Management Area;

(ii) At least one wet weather MS4 outfall discharge monitoring station for each Copermittee within the Watershed Management Area; and

(iii) The County of San Diego may select at least two (2) wet weather MS4 outfall discharge monitoring stations for the portion of the Santa Margarita River Watershed Management Area within its jurisdiction to be monitored during the transitional period until the Riverside County Copermittees are notified of coverage under this Order. After the Riverside County Copermittees are notified of coverage under this Order, the Copermittees in the Watershed Management Area must select wet weather MS4 outfall discharge monitoring stations consistent with the requirements above.

(b) Transitional Wet Weather MS4 Outfall Discharge Monitoring Frequency

Each wet weather MS4 outfall discharge monitoring station selected pursuant to Provision D.2.a.(3)(a) must be monitored once during the wet season (October 1 – April 30). The wet weather monitoring events must be selected to be representative of the range of hydrological conditions experienced in the region. At least 10 percent of samples must be conducted during the first wet weather event of the wet season, to include at least one such sample in each Watershed Management Area..

(c) Transitional Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(i) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(ii) The flow rates and volumes measured or estimated from the MS4 outfall (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(d) Transitional Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(e) Transitional Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, and indicator bacteria;

(iv) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

[a] Time-weighted composites collected over the length of the storm event or the first 24 hour period whichever is shorter, composed of discrete samples, which may be collected through the use of automated equipment, or

[b] Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

[c] If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during

the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours;

(v) Only one analysis of the composite of aliquots is required;

(vi) The samples must be analyzed for the following constituents:

[a] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

[b] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and

[c] Constituents listed in Table D-6.

Table D-6. Analytical Monitoring Constituents for Wet Weather MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Nickel • Selenium • Thallium • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(f) Other Transitional Wet Weather MS4 Outfall Discharge Monitoring

The San Diego County Copermittees must continue the wet weather MS4 outfall monitoring program developed under Order No. R9-2007-0001, as approved by the San Diego Water Board, through its planned completion.

b. DRY WEATHER MS4 OUTFALL DISCHARGE MONITORING

Each Copermittee must perform dry weather MS4 outfall monitoring to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision

E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. Each Copermittee must conduct the following dry weather MS4 outfall discharge monitoring within its jurisdiction:

(1) Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Each Copermittee must continue to perform the dry weather MS4 outfall discharge field screening monitoring in accordance with the requirements of Provision D.2.a.(2). The Copermittee may adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of persistent flow non-storm water discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of visual inspections performed is equivalent to the number of visual inspections required under Provision D.2.a.(2)(a).

(2) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring

Each Copermittee must perform non-storm water persistent flow MS4 outfall discharge monitoring to determine which persistent non-storm water discharges contain concentrations of pollutants below NALs, and which persistent non-storm water discharges impact receiving water quality during dry weather. Each Copermittee must conduct the following non-storm water persistent flow MS4 outfall discharge monitoring within its jurisdiction:

(a) Prioritization of Non-Storm Water Persistent Flow MS4 Outfalls

Based upon the dry weather MS4 outfall discharge field screening monitoring records developed pursuant to Provision D.2.a.(2)(c), each Copermittee must identify and prioritize the MS4 outfalls with persistent flows based on the highest priority water quality conditions identified in the Water Quality Improvement Plan and any additional criteria developed by the Copermittee, which may include historical data and data from sources other than what the Copermittee collects.

(b) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring Frequency

(i) Based on the prioritization of major MS4 outfalls developed under Provision D.2.b.(2)(a), each Copermittee must identify, at a minimum, the 5 highest priority major MS4 outfalls with non-storm water persistent flows that the Copermittee will monitor within its jurisdiction in each Watershed Management Area. For Responsible Copermittees identified by a TMDL in Attachment E to this Order, if the 5 chosen outfall locations are not sufficient to determine compliance with the TMDL(s), then each Responsible Copermittee

must identify additional MS4 outfall monitoring locations within its jurisdiction sufficient to address compliance with the TMDL(s). If a Copermittee has less than 5 major outfalls within a Watershed Management Area, then the Copermittee must monitor all of its major MS4 outfalls with persistent flows within each Watershed Management Area. The location of the highest priority non-storm water persistent flow MS4 outfall monitoring stations must be identified on the map required pursuant to Provision E.2.b.(1). The map must specify which MS4 outfalls are being monitored for compliance with a TMDL.

(ii) Each of the highest priority non-storm water persistent flow MS4 outfall monitoring stations identified pursuant to Provision D.2.b.(2)(b)(i) must be monitored under dry weather conditions at least semi-annually until one of the following occurs:

[a] The non-storm water discharges have been effectively eliminated (i.e. no flowing, pooled, or ponded water) for three consecutive dry weather monitoring events; or

[b] The source(s) of the persistent flows has been identified as a category of non-storm water discharges that does not require an NPDES permit and does not have to be addressed as an illicit discharge because it was not identified as a source of pollutants (i.e. constituents in non-storm water discharge do not exceed NALs), and the persistent flow can be re-prioritized to a lower priority; or

[c] The constituents in the persistent flow non-storm water discharge do not exceed NALs, and the persistent flow can be re-prioritized to a lower priority; or

[d] The source(s) of the persistent flows has been identified as a non-storm water discharge authorized by a separate NPDES permit.

(iii) Where the criteria under Provision D.2.b.(2)(b)(ii) are not met, but the threat to water quality has been reduced by the Copermittee, the highest priority persistent flow MS4 outfall monitoring stations may be reprioritized accordingly for continued dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1).

(iv) Each Copermittee must document removal or re-prioritization of the highest priority persistent flow MS4 outfall monitoring stations identified under Provision D.2.b.(2)(a) in the Water Quality Improvement Plan Annual Report. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized major MS4 outfall in the Watershed Management Area within its jurisdiction, unless there are no remaining qualifying major MS4 outfalls within the Copermittee's jurisdiction in the Watershed Management Area.

(c) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Observations

During each semi-annual monitoring event, each Copermittee must record field observations consistent with Table D-5 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(d) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Monitoring

During each semi-annual monitoring event, if conditions allow the collection of the data, each Copermittee must monitor and record the parameters in Table D-2 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(e) Non-Storm Water Persistent Flow MS4 Outfall Discharge Analytical Monitoring

During each semi-annual monitoring event in which measurable flow is present, each Copermittee must collect and analyze samples from each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Collect grab or composite samples to be analyzed at a qualified laboratory for the following constituents:

[a] Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,
[b] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,
[c] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,
[d] Applicable NAL constituents, and
[e] Constituents listed in Table D-7. The Copermittees may adjust the list of constituents for the Watershed Management Area if historical data or supporting information can be provided that demonstrates or justifies the analysis of a constituent is not necessary.

Table D-7. Analytical Monitoring Constituents for Persistent Flow MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Total Hardness • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Cadmium • Copper • Lead • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(iv) If the Copermittee identifies and eliminates the source of the persistent flow non-storm water discharge, analysis of the sample is not required.

c. WET WEATHER MS4 OUTFALL DISCHARGE MONITORING

The Copermittees must perform wet weather MS4 outfall monitoring to identify pollutants in storm water discharges from the MS4s, to guide pollutant source identification efforts, and to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order. The Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(1) Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees may adjust the wet weather MS4 outfall discharge monitoring locations in the Watershed Management Area, as needed, to identify pollutants in storm water discharges from MS4s, to guide pollutant source identification efforts, and to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of stations is at least equivalent to the number of stations required under Provision D.2.a.(3)(a). Additional outfall monitoring locations, above the minimum per jurisdiction, may be required to demonstrate compliance with the WQBELs associated with the applicable TMDLs in Attachment E.

(2) Wet Weather MS4 Outfall Discharge Monitoring Frequency

The Copermittees must monitor the wet weather MS4 outfall discharge monitoring stations in the Watershed Management Area at least once (1) per year. The Copermittees may need to increase the frequency of monitoring in order to identify pollutants in storm water discharges from the MS4s causing or contributing to the highest priority water quality conditions, to guide pollutant source identification efforts, or to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order.

(3) Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(4) Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(5) Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites collected over the length of the storm event or the first 24 hour period, whichever is shorter , composed of discrete samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

(iii) If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours.

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) The Copermittees may adjust the analytical monitoring required for the Watershed Management Area, if the Copermittees have historical data or supporting information that can demonstrate or provide justification that the analysis of a constituent is not necessary.

3. Special Studies

a. Within the term of this Order, the Copermittees must initiate the following special studies:

(1) At least two special studies in each Watershed Management Area to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that cause or contribute to highest priority water quality conditions identified in the Water Quality Improvement Plan.

(2) At least one special study for the San Diego Region to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that are impacting receiving waters on a regional basis in the San Diego Region.

(3) One of the two special studies in each Watershed Management Area required pursuant to Provision D.3.a.(1) may be replaced by a special study implemented pursuant to Provision D.3.a.(2).

b. The special studies must, at a minimum, be in conformance with the following criteria:

(1) The special studies must be related to the highest priority water quality conditions identified by the Copermittees in the Watershed Management Area and/or for the entire San Diego Region;

(2) The special studies developed pursuant to Provision D.3.a.(1) must:

(a) Be implemented within the applicable Watershed Management Area, and

(b) Require some form of participation by all the Copermittees within the Watershed Management Area;

(3) The special studies developed pursuant to Provision D.3.a.(2) must:

(a) Be implemented within the San Diego Region, and

(b) Require some form of participation by all Copermittees covered under the requirements of this Order.

(4) The Copermittees are encouraged to partner with environmental groups or third parties knowledgeable of watershed conditions to complete the required special studies.

c. Special studies developed to identify sources of pollutants and/or stressors should be pollutant and/or stressor specific and based on historical monitoring data and monitoring performed pursuant to Provisions D.1 and D.2. Development of source identification special studies should include the following:

(1) A compilation of known information on the specific pollutant and/or stressor, including data on potential sources and movement of the pollutant and/or stressor within the watershed. Data generated by the Copermittees and others, as well as information available from a literature research on the pollutant and/or stressor should be compiled and analyzed as appropriate.

(2) An identification of data gaps, based on the compiled information generated on the specific pollutant and/or stressor identified in Provision D.3.c.(1). Source identification special studies should be developed to fill identified data gaps.

(3) A monitoring plan that will collect and provide data the Copermittees can utilize to do the following:

(a) Quantify the relative loading or impact of a pollutant and/or stressor from a particular source or pollutant generating activity;

(b) Improve understanding of the fate of a pollutant and/or stressor in the environment;

(c) Develop an inventory of known and suspected sources of a pollutant and/or stressor in the Watershed Management Area; and/or

(d) Prioritize known and suspected sources of a pollutant and/or stressor based on relative magnitude in discharges, geographical distribution (i.e., regional or localized), frequency of occurrence in discharges, human health risk, and controllability.

d. Special studies initiated prior to the effective date of this Order that meet the requirements of Provision D.3.b and are implemented during the term of this Order as part of the Water Quality Improvement Plan may be utilized to fulfill the special study requirements of Provision D.3.a. Special studies completed before the effective date of this Order cannot be utilized to fulfill the special study requirements of Provision D.3.a.

e. The Copermittees must submit the monitoring plans for the special studies in the Water Quality Improvement Plans required pursuant to Provision F.1.

f. The Copermittees are encouraged to share the results of the special studies regionally among the Copermittees to provide information useful in improving and adapting the management of non-storm water and storm water runoff through the implementation of the Water Quality Improvement Plans.

4. Assessment Requirements

Each Copermittee must evaluate the data collected pursuant to Provisions D.1, D.2 and D.3, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E, to assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a. Assessments must be performed as described in the following provisions:

a. Receiving Waters Assessments

(1) The Copermittees must assess and report the conditions of the receiving waters in the Watershed Management Area as follows:

(a) Based on data collected pursuant to Provision D.1.a, the assessments under Provision D.4.a.(2) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(b) Based on the data collected pursuant to Provisions D.1.a-e, the assessments required under Provision D.4.a.(2) must be included in the Report of Waste Discharge required pursuant to Provision F.5.b.

(2) The Copermittees must assess the status and trends of receiving water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under dry weather and wet weather conditions. For each of the three types of receiving waters in each Watershed Management Area the Copermittees must:

(a) Determine whether or not the conditions of the receiving waters are meeting the numeric goals established pursuant to Provision B.3.a;

(b) Identify the most critical beneficial uses that must be protected to ensure overall health of the receiving water;

(c) Determine whether or not those critical beneficial uses are being protected;

(d) Identify short-term and/or long-term improvements or degradation of those critical beneficial uses;

(e) Determine whether or not the strategies established in the Water Quality Improvement Plan contribute towards progress in achieving the interim and final numeric goals of the Water Quality Improvement Plan; and

(f) Identify data gaps in the monitoring data necessary to assess Provisions D.4.a.(2)(a)-(e).

b. MS4 OUTFALL DISCHARGES ASSESSMENTS

(1) Non-Storm Water Discharges Reduction Assessments

(a) Each Copermittee must assess and report the progress of its illicit discharge detection and elimination program, required to be implemented pursuant to Provision E.2, toward effectively prohibiting non-storm water and illicit discharges into the MS4 within its jurisdiction as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(2), the assessments under Provision D.4.b.(1)(b) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(ii) Based on the data collected pursuant to Provisions D.2.b, the assessments required under Provision D.4.b.(1)(c) must be included in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

(iii) Based on the data collected pursuant to Provisions D.2.b, the assessment required under Provision D.4.b.(1)(c) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.a.(2), each Copermittee must assess and report the following:

(i) Identify the known and suspected controllable sources (e.g. facilities, areas, land uses, pollutant generating activities) of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area;

(ii) Identify sources of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area that have been reduced or eliminated; and

(iii) Identify modifications to the field screening monitoring locations and frequencies for the MS4 outfalls in its inventory necessary to identify and eliminate sources of persistent flow non-storm water discharges pursuant to Provision D.2.b.

(c) Based on the dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1), each Copermittee must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(1)(b);

(ii) Based on the data collected and applicable NALs in the Water Quality Improvement Plan, rank the MS4 outfalls in the Copermittee's jurisdiction according to potential threat to receiving water quality, and produce a prioritized list of major MS4 outfalls for follow-up action to update the Water Quality Improvement Plan, with the goal of eliminating persistent flow non-storm water discharges and/or pollutant loads in order of the ranked priority list through targeted programmatic actions and source investigations;

(iii) For the highest priority major MS4 outfalls with persistent flows that are in exceedance of NALs, identify the known and suspected sources within the Copermittee's jurisdiction in the Watershed Management Area that may cause or contribute to the NAL exceedances;

(iv) Each Copermittee must analyze the data collected pursuant to Provision D.2.b, and utilize a model or other method, to calculate or estimate the non-storm water volumes and pollutant loads collectively discharged from all the major MS4s outfalls in its jurisdiction identified as having persistent dry weather flows during the monitoring year. These calculations or estimates must be updated annually.

[a] Each Copermittee must calculate or estimate the annual non-storm water volumes and pollutant loads collectively discharged from the Copermittee's major MS4 outfalls to receiving waters within the Copermittee's jurisdiction, with an estimate of the percent contribution from each known source for each MS4 outfall;

[b] Each Copermittee must annually identify and quantify (i.e. volume and pollutant loads) sources of non-storm water not subject to the Copermittee's legal authority that are discharged from the Copermittee's major MS4 outfalls to downstream receiving waters.

(v) Each Copermittee must review the data collected pursuant to Provision D.2.b and findings from the assessments required pursuant to Provision D.4.b.(1)(c)(i)-(iv) at least once during the term of this Order to:

[a] Identify reductions and progress in achieving reductions in non-storm water and illicit discharges to the Copermittee's MS4 in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction, with an estimate, if possible, of the non-storm water volume and/or pollutant load reductions attributable to specific water quality strategies implemented by the Copermittee; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittee in the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction.

(vi) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(1)(c)(i)-(v).

(2) <u>Storm Water Pollutant Discharges Reduction Assessments</u>

(a) The Copermittees must assess and report the progress of the water quality improvement strategies, required to be implemented pursuant to Provisions B and E, toward reducing pollutants in storm water discharges from the MS4s within the Watershed Management Area as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(3), the assessments under Provision D.4.b.(2)(b) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(ii) Based on the data collected pursuant to Provisions D.2.c, the assessments required under Provision D.4.b.(2)(c) must be included in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

(iii) Based on the data collected pursuant to Provisions D.2.c, the assessment required under Provisions D.4.b.(2)(c)-(d) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.a.(3) the Copermittees must assess and report the following:

(i) The Copermittees must analyze the monitoring data collected pursuant to Provision D.2.a.(3), and utilize a watershed model or other method, to calculate or estimate the following for each monitoring year:

[a] The average storm water runoff coefficient for each land use type within the Watershed Management Area;
[b] The volume of storm water and pollutant loads discharged from each of the Copermittee's monitored MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch;
[c] The total flow volume and pollutant loadings discharged from the Copermittee's jurisdiction within the Watershed Management Area over the course of the wet season, extrapolated from the data produced from the monitored MS4 outfalls; and
[d] The percent contribution of storm water volumes and pollutant loads discharged from each land use type within each hydrologic subarea with a major MS4 outfall to receiving waters or within each major MS4 outfall to receiving waters in the Copermittee's jurisdiction within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch.

(ii) Identify modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify pollutants in storm water discharges from the MS4s in the Watershed Management Area pursuant to Provision D.2.c.(1).

(c) Based on the wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.c the Copermittees must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(2)(b);

(ii) Based on the data collected and applicable SALs in the Water Quality Improvement Plan, analyze and compare the monitoring data to the analyses and assumptions used to develop the Water Quality Improvement Plans, including strategies developed pursuant to Provision B.3, and evaluate whether those analyses and assumptions should be updated as a component of the adaptive management efforts pursuant to Provision B.5 for follow-up action to update the Water Quality Improvement Plan;

(iii) The Copermittees must review the data collected pursuant to Provision D.2.c and findings from the assessments required pursuant to Provisions D.4.b.(2)(c)(i)-(ii) at least once during the term of this Order to:

[a] Identify reductions or progress in achieving reductions in pollutant concentrations and/or pollutant loads from different land uses and/or drainage areas discharging from the Copermittees' MS4s in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters within the Watershed Management Area to the MEP, with an estimate, if possible, of the pollutant load reductions attributable to specific water quality strategies implemented by the Copermittees; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittees in the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters in the Watershed Management Area to the MEP.

(iv) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(iii).

(d) The Copermittees must evaluate all the data collected pursuant to Provision D.2.c, and incorporate new outfall monitoring data into time series plots for each long-term monitoring constituent for the Watershed Management Area, and perform statistical trends analysis on the cumulative long-term wet weather MS4 outfall discharge water quality data set.

c. Special Studies Assessments

The Copermittees must annually evaluate the results and findings from the special studies developed and implemented pursuant to Provision D.3, and assess their relevance to the Copermittees' efforts to characterize receiving water conditions, understand sources of pollutants and/or stressors, and control and reduce the discharges of pollutants from the MS4 outfalls to receiving waters in the Watershed Management Area. The Copermittees must report the results of the special studies assessments applicable to the Watershed Management Area, and identify any necessary modifications or updates to the Water Quality Improvement Plan based on the results in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

d. Integrated Assessment of Water Quality Improvement Plan

As part of the iterative approach and adaptive management process required for the Water Quality Improvement Plan pursuant to Provision B.5, the Copermittees in each Watershed Management Area must integrate the data collected pursuant to Provisions D.1-D.3, the findings from the assessments required pursuant to

Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to assess the effectiveness of, and identify necessary modifications to, the Water Quality Improvement Plan as follows:

(1) The Copermittees must re-evaluate the priority water quality conditions and numeric goals for the Watershed Management Area, as needed, during the term of this Order pursuant to Provision B.5.a. The re-evaluation and recommendations for modifications to the priority water quality conditions, and/or numeric goals and corresponding schedules may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The priority water quality conditions and numeric goals for the Watershed Management Area must be re-evaluated as follows:

(a) Re-evaluate the receiving water conditions in the Watershed Management Area in accordance with Provision B.2.a;

(b) Re-evaluate the impacts on receiving waters in the Watershed Management Area from MS4 discharges in accordance with Provision B.2.b;

(c) Re-evaluate the identification of MS4 sources of pollutants and/or stressors in accordance with Provision B.2.d;

(d) Identify beneficial uses of the receiving waters that are protected in accordance with Provision D.4.a;

(e) Evaluate the progress toward achieving the interim and final numeric goals for protecting impacted beneficial uses in the receiving waters.

(2) The Copermittees must re-evaluate the water quality improvement strategies for the Watershed Management Area during the term of this Order pursuant to Provision B.5.b. The re-evaluation and recommendations for modifications to the water quality improvement strategies and schedules may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The water quality improvement strategies for the Watershed Management Area must be re-evaluated as follows:

(a) Identify the non-storm water and storm water pollutant loads from the Copermittees' MS4 outfalls in the Watershed Management Area, calculated or estimated pursuant to Provisions D.4.b;

(b) Identify the non-storm water and storm water pollutant load reductions, or other improvements to receiving water or water quality conditions, that are necessary to attain the interim and final numeric goals identified in the Water Quality Improvement Plan for protecting beneficial uses in the receiving waters;

(c) Identify the non-storm water and storm water pollutant load reductions, or other improvements to the quality of MS4 discharges, that are necessary for the Copermittees to demonstrate that non-storm water and storm water discharges from their MS4s are not causing or contributing to exceedances of receiving water limitations;

(d) Evaluate the progress of the water quality improvement strategies toward achieving the interim and final numeric goals identified in the Water Quality Improvement Plan for protecting beneficial uses in the receiving waters.

(3) The Copermittees must re-evaluate and adapt the water quality monitoring and assessment program for the Watershed Management Area when new information becomes available to improve the monitoring and assessment program pursuant to Provision B.5.c. The re-evaluation and recommendations for modifications to the monitoring and assessment program may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. Modifications to the water quality monitoring and assessment program must be consistent with the requirements of Provision D.1-D.3. The re-evaluation of the water quality monitoring and assessment program for the Watershed Management Area must consider the data gaps identified by the assessments required pursuant to Provisions D.4.a-b, and results of the special studies implemented pursuant to Provision D.4.c.

5. Monitoring Provisions

Each Copermittee must comply with all the monitoring, reporting, and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

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E. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS

The purpose of this provision is for each Copermittee to implement a program to control the contribution of pollutants to and the discharges from the MS4 within its jurisdiction. The goal of the jurisdictional runoff management programs is to implement strategies that effectively prohibit non-storm water discharges to the MS4 and reduce the discharge of pollutants in storm water to the MEP. This goal will be accomplished through implementing the jurisdictional runoff management programs in accordance with the strategies identified in the Water Quality Improvement Plans.

Each Copermittee must update its jurisdictional runoff management program document, in accordance with Provision F.2.a, to incorporate all the requirements of Provision E. Until the Copermittee has updated its jurisdictional runoff management program document with the requirements of Provision E, the Copermittee must continue implementing its current jurisdictional runoff management program.

1. Legal Authority Establishment and Enforcement

a. Each Copermittee must establish, maintain, and enforce adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 through statute, ordinance, permit, contract, order, or similar means. This legal authority must, at a minimum, authorize the Copermittee to:

(1) Prohibit and eliminate all illicit discharges and illicit connections to its MS4;

(2) Control the contribution of pollutants in discharges of runoff associated with industrial and construction activity to its MS4 and control the quality of runoff from industrial and construction sites, including industrial and construction sites which have coverage under the statewide General Permit for Discharges of Storm Water Associated with Industrial Activities (Industrial General Permit) or General Permit for Discharges of Storm Water Associated with Construction Activities (Construction General Permit), as well as to those sites which do not;

(3) Control the discharge of spills, dumping, or disposal of materials other than storm water into its MS4;

(4) Control through interagency agreements among Copermittees the contribution of pollutants from one portion of the MS4 to another portion of the MS4;

(5) Control, by coordinating and cooperating with other owners of the MS4 such as Caltrans, the U.S. federal government, or sovereign Native American Tribes through interagency agreements, where possible, the contribution of pollutants from their portion of the MS4 to the portion of the MS4 within the Copermittee's jurisdiction;

(6) Require compliance with conditions in its statutes, ordinances, permits, contracts, orders, or similar means to hold dischargers to its MS4 accountable for their contributions of pollutants and flows;

(7) Require the use of BMPs to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(8) Require documentation on the effectiveness of BMPs implemented to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(9) Utilize enforcement mechanisms to require compliance with its statutes, ordinances, permits, contracts, orders, or similar means; and

(10) Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with its statutes, ordinances, permits, contracts, orders, or similar means and with the requirements of this Order, including the prohibition of illicit discharges and connections to its MS4; the Copermittee must also have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from industrial facilities, including construction sites, discharging into its MS4.

b. With the first Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3), each Copermittee must submit a statement certified by its Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative that the Copermittee has taken the necessary steps to obtain and maintain full legal authority within its jurisdiction to implement and enforce each of the requirements contained in this Order.

2. Illicit Discharge Detection and Elimination

Each Copermittee must implement a program to actively detect and eliminate illicit discharges and improper disposal into the MS4, or otherwise require the discharger to apply for and obtain a separate NPDES permit. The illicit discharge detection and elimination program must be implemented in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include, at a minimum, the following requirements:

a. Non-Storm Water Discharges

Each Copermittee must address all non-storm water discharges as illicit discharges unless a non-storm water discharge is either identified as a discharge authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to the following requirements:

(1) Discharges of non-storm water to the MS4 from the following categories must be addressed as illicit discharges unless the discharge has coverage or meets the exception criteria under NPDES Permit No. CAG919003(Order No. R9-2015-0013, as it may be amended or reissued) for discharges to surface waters within the San Diego Region:

(1) Uncontaminated pumped ground water;

(2) Discharges from foundation drains;[23]

(3) Water from crawl space pumps; and

(4) Water from footing drains.[20]

(2) Discharges of non-storm water from water line flushing and water main breaks to the MS4 must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG679001 (Order No. R9-2010-0003, as it may be amended or reissued) or NPDES General Permit No. CAG140001 (Order 2014-0194-DWQ, as it may be amended or reissued). This category includes water line flushing and water main break discharges from water purveyors issued a water supply permit by the California Department of Public Health or federal military installations. Discharges from recycled or reclaimed water lines to the MS4 must be addressed as illicit discharges, unless the discharges have coverage under a separate NPDES permit.

(3) Discharges of non-storm water to the MS4 from the following categories must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a source of pollutants to receiving waters:

(a) Diverted stream flows;

(b) Rising ground waters;

(c) Uncontaminated ground water infiltration to MS4s;

(d) Springs;

(e) Flows from riparian habitats and wetlands;

(f) Discharges from potable water sources;

[23] Provision E.2.a.(1) only applies to this category of non-storm water if the system is designed to be located at or below the groundwater table to actively or passively extract groundwater during any part of the year.

(g) Discharges from foundation drains;[24] and

(h) Discharges from footing drains.[21]

(4) Discharges of non-storm water to the MS4 from the following categories must be controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means. Discharges of non-storm water to the MS4 from the following categories not controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means must be addressed by the Copermittee as illicit discharges.

(a) Air conditioning condensation

The discharge of air conditioning condensation should be directed to landscaped areas or other pervious surfaces, or to the sanitary sewer, where feasible.

(b) Individual residential vehicle washing

(i) The discharge of wash water should be directed to landscaped areas or other pervious surfaces where feasible; and

(ii) The minimization of water, washing detergent and other vehicle wash products used for residential vehicle washing, and the implementation of other practices or behaviors that will prevent the discharge of pollutants associated with individual residential vehicle washing from entering the MS4 must be encouraged.

(c) Dechlorinated swimming pool discharges

(i) Residual chlorine, algaecide, filter backwash, or other pollutants from swimming pools must be eliminated prior to discharging to the MS4; and

(ii) The discharge of saline swimming pool water must be directed to the sanitary sewer, landscaped areas, or other pervious surfaces that can accommodate the volume of water, unless the saline swimming pool water can be discharged via a pipe or concrete channel directly to a naturally saline water body (e.g. Pacific Ocean).

(5) Firefighting discharges to the MS4 must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a significant source of pollutants to receiving waters. Firefighting discharges to the MS4 not identified as a significant

[24] Provision E.2.a.(3) only applies to this category of non-storm water discharge if the system is designed to be located above the groundwater table at all times of the year, and the system is only expected to discharge non-storm water under unusual circumstances.

source of pollutants to receiving waters, must be addressed, at a minimum, as follows:

(a) Non-emergency firefighting discharges

(i) Building fire suppression system maintenance discharges (e.g. sprinkler line flushing) to the MS4 must be addressed as illicit discharges unless BMPs are implemented to prevent pollutants associated with such discharges to the MS4.

(ii) Non-emergency firefighting discharges (i.e., discharges from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems) must be addressed by a program, to be developed and implemented by the Copermittee, to reduce or eliminate pollutants in such discharges from entering the MS4.

(b) Emergency firefighting discharges

Each Copermittee should develop and encourage implementation of BMPs to reduce or eliminate pollutants in emergency firefighting discharges to the MS4s and receiving waters within its jurisdiction. During emergency situations, priority of efforts should be directed toward life, property, and the environment (in descending order). BMPs should not interfere with immediate emergency response operations or impact public health and safety.

(6) If the Copermittee or San Diego Water Board identifies any category of non-storm water discharges listed under Provisions E.2.a.(1)-(4) as a source of pollutants to receiving waters, the category must be prohibited through ordinance, order, or similar means and addressed as an illicit discharge. Alternatively, the Copermittee may propose controls to be implemented for the category of non-storm water discharges as part of the Water Quality Improvement Plan instead of prohibiting the category of non-storm water discharges, and implement the controls if accepted by the San Diego Water Board as part of the Water Quality Improvement Plan.

(7) Each Copermittee must, where feasible and priorities and resources allow, reduce or eliminate non-storm water discharges listed under Provisions E.2.a.(1)-(4) into its MS4, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit.

b. PREVENT AND DETECT ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to prevent and detect illicit discharges to the MS4:

(1) Each Copermittee must maintain an updated map of its entire MS4 and the

corresponding drainage areas. The accuracy of the MS4 map must be confirmed during the field screening required pursuant to Provision E.2.c. The MS4 map must be included as part of the jurisdictional runoff management program document. Any geographic information system (GIS) layers or files used by the Copermittee to maintain the MS4 map must be made available to the San Diego Water Board upon request. The MS4 map must identify the following:

(a) All segments of the MS4 owned, operated, and maintained by the Copermittee;

(b) All known locations of inlets that discharge and/or collect runoff into the Copermittee's MS4;

(c) All known locations of connections with other MS4s not owned or operated by the Copermittee (e.g. Caltrans MS4s);

(d) All known locations of MS4 outfalls and private outfalls that discharge runoff collected from areas within the Copermittee's jurisdiction;

(e) All segments of receiving waters within the Copermittee's jurisdiction that receive and convey runoff discharged from the Copermittee's MS4 outfalls;

(f) Locations of the MS4 outfalls, identified pursuant to Provision D.2.a.(1), within its jurisdiction; and

(g) Locations of the non-storm water persistent flow MS4 outfall discharge monitoring stations, identified pursuant to Provision D.2.b.(2), within its jurisdiction.

(2) Each Copermittee must use Copermittee personnel and contractors to assist in identifying and reporting illicit discharges and connections during their daily employment activities.

(3) Each Copermittee must promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges to or from the MS4, including the following methods for public reporting:

(a) Operate a public hotline, which can be Copermittee-specific or shared by the Copermittees, and must be capable of receiving reports in both English and Spanish 24 hours per day and seven days per week; and

(b) Designate an e-mail address for receiving electronic reports from the public, which can be Copermittee-specific or shared by the Copermittees,

and must be prominently displayed on the Copermittee's webpage and the Regional Clearinghouse required pursuant to Provision F.4.

(4) Each Copermittee must implement practices and procedures (including a notification mechanism) to prevent, respond to, contain, and clean up any spills that may discharge into the MS4 within its jurisdiction from any source. The Copermittee must coordinate, to the extent possible, with spill response teams to prevent entry of spills into the MS4, and prevent contamination of surface water, ground water, and soil. The Copermittee must coordinate spill prevention, containment, and response activities throughout all appropriate Copermittee departments, programs, and agencies.

(5) Each Copermittee must implement practices and procedures to prevent and limit infiltration of seepage from sanitary sewers (including private laterals and failing septic systems) to the MS4.

(6) Each Copermittee must coordinate, when necessary, with upstream Copermittees and/or entities to prevent illicit discharges from upstream sources into the MS4 within its jurisdiction.

c. FIELD SCREENING

Each Copermittee must conduct field screening (i.e. visual observations, field testing, and/or analytical testing) of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4 in accordance with the dry weather MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

d. INVESTIGATE AND ELIMINATE ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to investigate and eliminate illicit discharges to the MS4:

(1) Each Copermittee must prioritize and determine when follow-up investigations will be performed in response to visual observations and/or water quality monitoring data collected during an investigation of a detected non-storm water or illicit discharge to or from the MS4. The criteria for prioritizing investigations must consider the following:

(a) Pollutants identified as causing or contributing to the highest water quality priorities identified in the Water Quality Improvement Plan;

(b) Pollutants identified as causing or contributing, or threatening to cause or contribute to impairments in water bodies on the 303(d) List and/or in environmentally sensitive areas (ESAs), located within its jurisdiction;

(c) Pollutants identified from sources or land uses known to exist within the

area, drainage basin, or watershed that discharges to the portion of the MS4 within its jurisdiction included in the investigation;

(d) Pollutants identified as causing or contributing to an exceedance of a NAL in the Water Quality Improvement Plan; and

(e) Pollutants identified as a threat to human health or the environment.

(2) Each Copermittee must implement procedures to investigate and inspect portions of its MS4 that, based on reports or notifications, field screening, or other appropriate information, indicate a reasonable potential of receiving, containing, or discharging pollutants due to illicit discharges, illicit connections, or other sources of non-storm water. The procedures must include the following:

(a) Each Copermittee must develop criteria to:

(i) Assess the validity of each report or notification received; and

(ii) Prioritize the response to each report or notification received.

(b) Each Copermittee must prioritize and respond to each valid report or notification (e.g., public reports, staff or contractor reports and notifications, etc.) of an incident in a timely manner.

(c) In accordance with the requirements of Provision E.2.d.(1), each Copermittee must investigate and seek to identify the source(s) of discharges of non-storm water where flows are observed in and from the MS4 during the field screening required pursuant to Provision D.2.b.(1) as follows:

(i) Obvious illicit discharges must be immediately investigated to identify the source(s) of non-storm water discharges;

(ii) The investigation must include field investigations to identify sources or potential sources for the discharge, unless the source or potential source has already been identified during previous investigations; and

(iii) The investigation may include follow-up field investigations and/or reviewing Copermittee inventories and other land use data to identify potential sources of the discharge.

(d) Each Copermittee must maintain records and a database of the following information:

(i) Location of incident, including hydrologic subarea, portion of MS4

receiving the non-storm water or illicit discharge, and point of discharge or potential discharge from MS4 to receiving water;

(ii) Source of information initiating the investigation (e.g., public reports, staff or contractor reports and notifications, field screening, etc.);

(iii) Date the information used to initiate the investigation was received;

(iv) Date the investigation was initiated;

(v) Dates of follow-up investigations;

(vi) Identified or suspected source of the illicit discharge or connection, if determined;

(vii) Known or suspected related incidents, if any;

(viii) Result of the investigation; and

(ix) If a source cannot be identified and the investigation is not continued, document the response pursuant to the requirements of Provision E.2.d.(4).

(e) Each Copermittee must maintain records and, in accordance with the priorities of the Water Quality Improvement Plan, seek to identify the source(s) of non-storm water discharges from the MS4 where there is evidence of non-storm water having been discharged into or from the MS4 (e.g., pooled water), in accordance with MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

(3) Each Copermittee must initiate the implementation of procedures, in a timely manner, to eliminate all detected and identified illicit discharges and connections within its jurisdiction. The procedures must include the following responses:

(a) Each Copermittee must enforce its legal authority, as required under Provision E.1, to eliminate illicit discharges and connections to the MS4.

(b) If the Copermittee identifies the source as a controllable source of non-storm water or illicit discharge or connection, the Copermittee must implement its Enforcement Response Plan pursuant to Provision E.6 and enforce its legal authority to prohibit and eliminate illicit discharges and connections to its MS4.

(c) If the Copermittee identifies the source of the discharge as a category of non-storm water discharges in Provision E.2.a, and the discharge is in exceedance of NALs in the Water Quality Improvement Plan, then the Copermittee must determine if: (1) this is an isolated incident or set of circumstances that will be addressed through its Enforcement Response Plan pursuant to Provision E.6, or (2) the category of discharge must be

addressed through the prohibition of that category of discharge as an illicit discharge pursuant to Provision E.2.a.(6).

(d) If the Copermittee suspects the source of the non-storm water discharge as natural in origin (i.e. non-anthropogenically influenced) and in conveyance into the MS4, then the Copermittee must document and provide the data and evidence necessary to demonstrate to the San Diego Water Board that it is natural in origin and does not require further investigation.

(e) If the Copermittee is unable to identify and document the source of a recurring non-storm water discharge to or from the MS4, then the Copermittee must address the discharge as an illicit discharge and update its jurisdictional runoff management program to address the common and suspected sources of the non-storm water discharge within its jurisdiction in accordance with the Copermittee's priorities.

(4) Each Copermittee must submit a summary of the non-storm water discharges and illicit discharges and connections investigated and eliminated within its jurisdiction with each Water Quality Improvement Plan Annual Report required under Provision F.3.b.(3) of this Order.

3. Development Planning

Each Copermittee must use their land use and planning authorities to implement a development planning program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. BMP Requirements for All Development Projects

Each Copermittee must prescribe the following BMP requirements during the planning process (i.e. prior to project approval and issuance of local permits) for all development projects (regardless of project type or size), where local permits are issued, including unpaved roads and flood management projects:

(1) <u>General Requirements</u>

(a) Onsite BMPs must be located so as to remove pollutants from runoff prior to its discharge to any receiving waters, and as close to the source as possible;

(b) Structural BMPs must not be constructed within waters of the U.S.

(c) Onsite BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors (e.g.

mosquitos, rodents, or flies).

(2) Source Control BMP Requirements

The following source control BMPs must be implemented at all development projects where applicable and feasible:

(a) Prevention of illicit discharges into the MS4;

(b) Storm drain system stenciling or signage;

(c) Protect outdoor material storage areas from rainfall, run-on, runoff, and wind dispersal;

(d) Protect materials stored in outdoor work areas from rainfall, run-on, runoff, and wind dispersal;

(e) Protect trash storage areas from rainfall, run-on, runoff, and wind dispersal; and

(f) Any additional BMPs determined to be necessary by the Copermittee to minimize pollutant generation at each project.

(3) Low Impact Development (LID) BMP Requirements

The following LID BMPs must be implemented at all development projects where applicable and feasible:

(a) Maintenance or restoration of natural storage reservoirs and drainage corridors (including topographic depressions, areas of permeable soils, natural swales, and ephemeral and intermittent streams);[25]

(b) Buffer zones for natural water bodies (where buffer zones are technically infeasible, require project applicant to include other buffers such as trees, access restrictions, etc.);

(c) Conservation of natural areas within the project footprint including existing trees, other vegetation, and soils;

(d) Construction of streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided public safety is not compromised;

(e) Minimization of the impervious footprint of the project;

[25] Development projects proposing to dredge or fill materials in waters of the U.S. must obtain a CWA Section 401 Water Quality Certification. Projects proposing to dredge or fill waters of the state must obtain waste discharge requirements.

(f) Minimization of soil compaction to landscaped areas;

(g) Disconnection of impervious surfaces through distributed pervious areas;

(h) Landscaped or other pervious areas designed and constructed to effectively receive and infiltrate, retain and/or treat runoff from impervious areas, prior to discharging to the MS4;

(i) Small collection strategies located at, or as close as possible to, the source (i.e. the point where storm water initially meets the ground) to minimize the transport of runoff and pollutants to the MS4 and receiving waters;

(j) Use of permeable materials for projects with low traffic areas and appropriate soil conditions;

(k) Landscaping with native or drought tolerant species; and

(l) Harvesting and using precipitation.

b. PRIORITY DEVELOPMENT PROJECTS

Priority Development Projects are land development projects that fall under the planning and building authority of the Copermittee for which the Copermittee must impose specific requirements, in addition to those described in Provision E.3.a, including the implementation of structural BMPs to meet the performance requirements described in Provision E.3.c.

(1) Definition of Priority Development Project

Priority Development Projects include the following:

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(b) Redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site on an existing site of 10,000 square feet or more of impervious surfaces). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(c) New and redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project

site), and support one or more of the following uses:

(i) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812).

(ii) Hillside development projects. This category includes development on any natural slope that is twenty-five percent or greater.

(iii) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce.

(iv) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

(d) New or redevelopment projects that create and/or replace 2,500 square feet or more of impervious surface (collectively over the entire project site), and discharging directly to an Environmentally Sensitive Area (ESA). "Discharging directly to" includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands).

(e) New development projects, or redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface, that support one or more of the following uses:

(i) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

(ii) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

(f) New or redevelopment projects that result in the disturbance of one or more acres of land and are expected to generate pollutants post construction.

(2) <u>Special Considerations for Redevelopment Projects</u>

The structural BMP performance requirements of Provision E.3.c are applicable to redevelopment Priority Development Projects, as defined in E.3.b.(1), as follows:

(a) Where redevelopment results in the creation or replacement of impervious surface in an amount of less than fifty percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provision E.3.c apply only to the creation or replacement of impervious surface, and not the entire development; or

(b) Where redevelopment results in the creation or replacement of impervious surface in an amount of more than fifty percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provision E.3.c apply to the entire development.

(3) Priority Development Project Exemptions

Each Copermittee has the discretion to exempt the following projects from being defined as Priority Development Projects:

(a) New or retrofit paved sidewalks, bicycle lanes, or trails that meet the following criteria:

(i) Designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas; OR

(ii) Designed and constructed to be hydraulically disconnected from paved streets or roads; OR

(iii) Designed and constructed with permeable pavements or surfaces in accordance with USEPA Green Streets guidance.[26]

(b) Retrofitting or redevelopment of existing paved alleys, streets or roads that are designed and constructed in accordance with the USEPA Green Streets guidance.[27]

c. Priority Development Project Structural BMP Performance Requirements

In addition to the BMP requirements listed for all development projects under Provision E.3.a, Priority Development Projects must also implement structural BMPs that conform to performance requirements described below.

(1) Storm Water Pollutant Control BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite structural BMPs to control pollutants in storm water that may be discharged from a project as follows:

[26] See "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).
[27] Ibid.

(a) Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite the pollutants contained in the volume of storm water runoff produced from a 24-hour 85th percentile storm event (design capture volume);[28]

(i) If a Copermittee determines that implementing BMPs to retain the full design capture volume onsite for a Priority Development Project is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize biofiltration BMPs. Biofiltration BMPs must be designed to have an appropriate hydraulic loading rate to maximize storm water retention and pollutant removal, as well as to prevent erosion, scour, and channeling within the BMP,[29] and must be sized to:

[a] Treat 1.5 times the design capture volume not reliably retained onsite, OR
[b] Treat the design capture volume not reliably retained onsite with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite.

(ii) If a Copermittee determines that biofiltration is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize flow-thru treatment control BMPs to treat runoff leaving the site, AND mitigate for the design capture volume not reliably retained onsite pursuant to Provision E.3.c.(1)(b). Flow thru treatment control BMPs must be sized and designed to:

[a] Remove pollutants from storm water to the MEP;
[b] Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;

[28] This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals.

[29] As part of the Copermittee's update to its BMP Design Manual, pursuant to Provision E.3.d, the Copermittee must provide guidance for hydraulic loading rates and other biofiltration design criteria necessary to maximize storm water retention and pollutant removal.

[c] Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Flow-thru treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of flow-thru treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

(b) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1)(a). The Priority Development Project must mitigate for the portion of the pollutant load in the design capture volume not retained onsite if Provision E.3.c.(3) is utilized. If a Priority Development Project is allowed to utilize alternative compliance, flow-thru treatment control BMPs must be implemented to treat the portion of the design capture volume that is not reliably retained onsite. Flow-thru treatment control BMPs must be sized and designed in accordance with Provisions E.3.c.(1)(a)(ii)[a]-[c].

(2) <u>Hydromodification Management BMP Requirements</u>

Each Copermittee must require each Priority Development Project to implement onsite BMPs to manage hydromodification that may be caused by storm water runoff discharged from a project as follows:

(a) Post-project runoff conditions (flow rates and durations) must not exceed pre-development runoff conditions by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat downstream of Priority Development Projects).

(i) In evaluating the range of flows that results in increased potential for erosion of natural (non-hardened) channels, the lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks.

(ii) The Copermittees may use monitoring results collected pursuant to Provision D.1.a.(2) to re-define the range of flows resulting in increased potential for erosion, or degraded instream habitat conditions, as warranted by the data.

(b) Each Priority Development Project must avoid critical sediment yield areas known to the Copermittee or identified by the optional Watershed Management Area Analysis pursuant to Provision B.3.b.(4), or implement measures that allow critical coarse sediment to be discharged to receiving waters, such that there is no net impact to the receiving water.

(c) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the performance requirements of Provision E.3.c.(2)(a). The Priority Development Project must mitigate for the post-project runoff conditions not fully managed onsite if Provision E.3.c.(3) is utilized.

(d) Exemptions

Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provisions E.3.c.(2) where the project discharges storm water runoff to:

(i) Existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;

(ii) Conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; or

(iii) An area identified by the Copermittees as appropriate for an exemption by the optional Watershed Management Area Analysis incorporated into the Water Quality Improvement Plan pursuant to Provision B.3.b.(4).

(e) Interim Timeframe Exemptions

Until the Copermittees have updated their BMP Design Manual in accordance with Provision F.2.b with the requirements of Provision E, the Copermittees have the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provision E.3.c.(2) where the project discharges storm water runoff directly to:

(i) An engineered channel conveyance system with a capacity to convey peak flows generated by the 10-year storm event all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; and

(ii) Large river reaches with a drainage area larger than 100 square miles and a 100-year flow capacity in excess of 20,000 cubic feet per second, provided that properly sized energy dissipation is included at all Priority Development Project discharge points.

(3) Alternative Compliance Program to Onsite Structural BMP Implementation

At the discretion of each Copermittee, Priority Development Projects may be allowed to participate in an alternative compliance program in lieu of implementing the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a), provided that the Water Quality Improvement Plan includes the optional Watershed Management Area Analysis described in Provision B.3.b.(4), and Water Quality Equivalency calculations have been accepted by the San Diego Water Board's Executive Officer pursuant to Provision E.3.c.(3)(a). The alternative compliance program is available to a Priority Development Project only if the Priority Development Project applicant enters into a voluntary agreement with the Copermittee authorizing this arrangement. In addition to the voluntary agreement, relief from implementing structural BMPs onsite may be authorized by the Copermittee under the following conditions:

(a) Water Quality Equivalency

Copermittees must submit Water Quality Equivalency calculations for acceptance by the San Diego Water Board's Executive Officer prior to administering an alternative compliance program in order to establish a regional and technical basis for determining the water quality benefits associated with alternative compliance projects. Accepted Water Quality Equivalency calculations must be incorporated as part of any Copermittee's alternative compliance program necessary for evaluating Watershed Management Area Analysis candidate projects, project applicant-proposed alternative compliance projects, alternative compliance in lieu fee structures, and alternative compliance water quality credit systems as described in Provisions E.3.c.(3)(b)-(e).

(b) Watershed Management Area Analysis Candidate Projects

The Priority Development Project applicant agrees to fund, contribute funds to, or implement a candidate project identified by the Copermittees in the Watershed Management Area Analysis included in the Water Quality Improvement Plan, pursuant to Provisions B.3.b.(4) subject to the following conditions:

(i) The Copermittee must determine that implementation of the candidate project will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a) onsite;

(ii) If the Priority Development Project applicant chooses to fully or partially fund a candidate project, then the in-lieu fee structure described in Provision E.3.c.(3)(c) must be followed;

(iii) If the Priority Development Project applicant chooses to fully or partially fund a candidate project, then the Copermittee must ensure that the funds to be obtained from the Priority Development Project applicant are sufficient to mitigate for impacts caused by not fully implementing structural BMPs onsite, pursuant to the performance requirements described in Provisions E.3.c.(1) and E.3.c.(2)(a);

(iv) If the Priority Development Project applicant chooses to implement a candidate project, then the Copermittee must ensure that pollutant control and/or hydromodification management within the candidate project are sufficient to mitigate for impacts caused by not implementing structural BMPs fully onsite, pursuant to the performance requirements described in Provisions E.3.c.(1) and E.3.c.(2)(a);

(v) The voluntary agreement to fund, partially fund, or implement a candidate project must include reliable sources of funding for operation and maintenance of the candidate project;

(vi) Design of the candidate project must be conducted under an appropriately qualified engineer, geologist, architect, landscape architect, or other professional, licenses where applicable, and competent and proficient in the fields pertinent to the candidate project design;

(vii) The candidate project must be constructed as soon as possible, but no later than 4 years after the certificate of occupancy is granted for the first Priority Development Project that contributed funds toward the construction of the candidate project, unless a longer period of time is authorized by the San Diego Water Board Executive Officer; and

(viii) If the candidate project is constructed after the Priority Development Project is constructed, the Copermittee must require temporal mitigation for pollutant loads and altered flows that are discharged from the Priority Development Project.

(c) Project Applicant Proposed Alternative Compliance Projects

The Copermittee may allow a Priority Development Project applicant to propose and fund, contribute funds to, or implement an alternative compliance project not identified by the Watershed Management Area Analysis included in the Water Quality Improvement Plan pursuant to Provisions B.3.b.(4). This option is allowed provided the Copermittee determines that implementation of the alternative compliance project will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a) onsite, and is subject to the requirements described in Provisions E.3.c.(3)(a)(ii)-(viii).

(d) Alternative Compliance In-Lieu Fee Structure

If a Copermittee chooses to allow a Priority Development Project applicant to fund, or partially fund a candidate project or an alternative compliance project, then the Copermittee must develop and implement an in-lieu fee structure. This may be developed individually or with other Copermittees and/or entities, as a means for designing, developing, constructing, operating and maintaining offsite alternative compliance projects. The in-lieu fee must be transferred to the Copermittee (for public projects) or an escrow account (for private projects) prior to the construction of the Priority Development Project.

(e) Alternative Compliance Water Quality Credit System Option

The Copermittee may develop and implement an alternative compliance water quality credit system option, individually or with other Copermittees and/or entities, provided that such a credit system clearly exhibits that it will not allow discharges from Priority Development Projects to cause or contribute to a net impact over and above the impact caused by projects meeting the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a). Any credit system that a Copermittee chooses to implement must be submitted to the San Diego Water Board Executive Officer for review and acceptance as part of the Water Quality Improvement Plan.

(4) Long-Term Structural BMP Maintenance

Each Copermittee must require the project applicant to submit proof of the mechanism under which ongoing long-term maintenance of all structural BMPs will be conducted.

(5) Infiltration and Groundwater Protection

(a) Structural BMPs designed to primarily function as large, centralized infiltration devices (such as large infiltration trenches and infiltration basins) must not cause or contribute to an exceedance of an applicable groundwater quality objective. At a minimum, such infiltration BMPs must be in conformance with the design criteria listed below, unless the development project applicant demonstrates to the Copermittee that one or more of the specific design criteria listed below are not necessary to protect groundwater quality. The design criteria listed below do not apply to small infiltration systems dispersed throughout a development project.

(i) Runoff must undergo pretreatment such as sedimentation or filtration prior to infiltration;

(ii) Pollution prevention and source control BMPs must be implemented at a level appropriate to protect groundwater quality at sites where infiltration BMPs are to be used;

(iii) Infiltration BMPs must be adequately maintained to remove pollutants in storm water to the MEP;

(iv) The vertical distance from the base of any infiltration BMP to the seasonal high groundwater mark must be at least 10 feet. Where groundwater basins do not support beneficial uses, this vertical distance criteria may be reduced, provided groundwater quality is maintained;

(v) The soil through which infiltration is to occur must have physical and chemical characteristics (e.g., appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses;

(vi) Infiltration BMPs must not be used for areas of industrial or light industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee, unless source control BMPs to prevent exposure of high threat activities are implemented, or runoff from such activities is first treated or filtered to remove pollutants prior to infiltration; and

(vii) Infiltration BMPs must be located a minimum of 100 feet horizontally from any water supply wells.

(b) The Copermittee may develop, individually or with other Copermittees, alternative mandatory design criteria to that listed above for infiltration BMPs which are designed to primarily function as centralized infiltration devices. Before implementing the alternative design criteria in the development planning process the Copermitee(s) must:

(i) Notify the San Diego Water Board of the intent to implement the alternative design criteria submitted; and

(ii) Comply with any conditions set by the San Diego Water Board.

d. BMP DESIGN MANUAL UPDATE

Each Copermittee must update its BMP Design Manual[30] pursuant to Provision F.2.b. Until the Copermittee has updated its BMP Design Manual pursuant to Provision F.2.b.(1), the Copermittee must continue implementing its current BMP Design Manual. The Copermittee must implement the updated BMP Design Manual within 180 days following completion of the update pursuant to Provision

[30] The BMP Design Manual was formerly known as the Standard Storm Water Mitigation Plan under Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016.

F.2.b.(1), unless directed otherwise by the San Diego Water Board Executive Officer. The date the BMP Design Manual is implemented is the "effective date" of the BMP Design Manual. The update of the BMP Design Manual required pursuant to Provision F.2.b.(1) must include the following:

(1) Updated procedures to determine the nature and extent of storm water requirements applicable to a potential development or redevelopment projects. These procedures must inform project applicants of the storm water management requirements applicable to their project including, but not limited to, general requirements for all development projects, structural BMP design procedures and requirements, hydromodification management requirements, requirements specific to phased projects, and procedures specific to private developments and public improvement projects;

(2) Updated procedures to identify pollutants and conditions of concern for selecting the most appropriate structural BMPs that consider, at a minimum, the following:

(a) Receiving water quality (including pollutants for which receiving waters are listed as impaired under the CWA section 303(d) List);

(b) Pollutants, stressors, and/or receiving water conditions that cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(c) Land use type of the project and pollutants associated with that land use type; and

(d) Pollutants expected to be present onsite.

(3) Updated procedures for designing structural BMPs, including any updated performance requirements to be consistent with the requirements of Provision E.3.c for all structural BMPs listed in the BMP Design Manual;

(4) Long-term maintenance criteria for each structural BMP listed in the BMP Design Manual; and

(5) Alternative compliance criteria, in accordance with the requirements under Provision E.3.c.(3), if the Copermittee elects to allow Priority Development Projects within its jurisdiction to utilize alternative compliance.

e. Priority Development Project BMP Implementation and Oversight

Each Copermittee must implement a program that requires and confirms structural BMPs on all Priority Development Projects are designed, constructed, and maintained to remove pollutants in storm water to the MEP.

(1) Structural BMP Approval and Verification Process

(a) Each Copermittee must require and confirm that all Priority Development Projects implement the requirements of Provision E.3, except that the Copermittee may allow previous land development requirements to apply to a Priority Development Project if the conditions of Provision E.3.e.(1)(a)(i) or Provision E.3.e.(1)(a)(ii) are met:

(i) The Copermittee has, prior to the effective date of the BMP Design Manual required to be developed pursuant to Provision E.3.d:

[a] Approved[31] a design that incorporates the storm water drainage system for the Priority Development Project in its entirety, including all applicable structural pollutant treatment control and hydromodification management BMPs consistent with the previous applicable MS4 permit requirements;[32] AND

[b] Issued a private project permit or approval, or functional equivalent for public projects, that authorizes the Priority Development Project applicant to commence construction activities based on a design that incorporates the storm water drainage system approved in conformance with Provision E.3.e.(1)(a)(i)[a]; AND

[c] Confirmed that there have been construction activities on the Priority Development Project site within the 365 days prior to the effective date of the BMP Design Manual, *OR* the Copermittee confirms that construction activities have commenced on the Priority Development Project site within the 180 days after the effective date of the BMP Design Manual, where construction activities are undertaken in reliance on the permit or approval, or functional equivalent for public projects, issued by the Copermittee in conformance with Provision E.3.e.(1)(a)(i)[b]; AND

[d] Issued all subsequent private project permits or approvals, or functional equivalent for public projects, that are needed to implement the design initially approved in conformance with Provision E.3.e.(1)(a)(i)[a] within 5 years of the effective date of the BMP Design Manual. The storm water drainage system for the Priority Development Project in its entirety, including all applicable structural pollutant treatment control and hydromodification management BMPs must remain in substantial conformity with the design initially approved in conformance with Provision E.3.e.(1)(a)(i)[a].

[31] For public projects, a design stamped by the City or County Engineer, or engineer of record for the project is considered an approved design.
[32] Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016 for San Diego County, Orange County, and Riverside County Copermittees, respectively

(ii) The Copermittee demonstrates it lacks the land use authority or legal authority to require a Priority Development Project to implement the requirements of Provision E.3.

(b) Each Copermittee must identify the roles and responsibilities of its various municipal departments in implementing the structural BMP requirements, including each stage of a project from application review and approval through BMP maintenance and inspections.

(c) Each Copermittee must require and confirm that appropriate easements and ownerships are properly recorded in public records and the information is conveyed to all appropriate parties when there is a change in project or site ownership.

(d) Each Copermittee must require and confirm that prior to occupancy and/or intended use of any portion of the Priority Development Project, each structural BMP is inspected to verify that it has been constructed and is operating in compliance with all of its specifications, plans, permits, ordinances, and the requirements of this Order.

(2) Priority Development Project Inventory and Prioritization

(a) Each Copermittee must develop, maintain, and update at least annually, a watershed-based database to track and inventory all Priority Development Projects and associated structural BMPs within its jurisdiction. Inventories must be accurate and complete beginning from December 2002 for the San Diego County Copermittees, February 2003 for the Orange County Copermittees, and July 2005 for the Riverside County Copermittees. The use of an automated database system, such as GIS, is highly recommended. The database must include, at a minimum, the following information:

(i) Priority Development Project location (address and hydrologic subarea);

(ii) Descriptions of structural BMP type(s);

(iii) Date(s) of construction;

(iv) Party responsible for structural BMP maintenance;

(v) Dates and findings of structural BMP maintenance verifications; and

(vi) Corrective actions and/or resolutions, when applicable.

(b) Each Copermittee must prioritize the Priority Development Projects with structural BMPs within its jurisdiction. The designation of Priority Development Projects as high priority must consider the following:

(i) The highest water quality priorities identified in the Water Quality Improvement Plan;

(ii) Receiving water quality;

(iii) Number and sizes of structural BMPs;

(iv) Recommended maintenance frequency of structural BMPs;

(v) Likelihood of operation and maintenance issues of structural BMPs;

(vi) Land use and expected pollutants generated; and

(vii) Compliance record.

(3) Structural BMP Maintenance Verifications and Inspections

Each Copermittee is required to verify that structural BMPs on each Priority Development Project are adequately maintained, and continue to operate effectively to remove pollutants in storm water to the MEP through inspections, self-certifications, surveys, or other equally effective approaches.

(a) All (100 percent) of the structural BMPs at Priority Development Projects that are designated as high priority must be inspected directly by the Copermittee annually prior to each rainy season;

(b) For verifications performed through a means other than direct Copermittee inspection, adequate documentation must be required by the Copermittee to provide assurance that the required maintenance of structural BMPs at each Priority Development Project has been completed; and

(c) Appropriate follow-up measures (including re-inspections, enforcement, etc.) must be conducted to ensure that structural BMPs at each Priority Development Project continue to reduce pollutants in storm water to the MEP as originally designed.

f. DEVELOPMENT PROJECT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all development projects, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

4. Construction Management

Each Copermittee must implement a construction management program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. Project Approval Process

Prior to issuance of any local permit(s) that allows the commencement of construction projects that involve ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff, each Copermittee must:

(1) Require a pollution control plan, construction BMP plan, and/or an erosion and sediment control plan, to be submitted by the project applicant to the Copermittee;

(2) Confirm the pollution control plan, construction BMP plan, and/or erosion and sediment control plan, complies with the local grading ordinance, other applicable local ordinances, and the requirements of this Order;

(3) Confirm the pollution control, construction BMP, and/or erosion and sediment control plan, includes seasonally appropriate and effective BMPs and management measures described in Provision E.4.c, as applicable to the project; and

(4) Verify that the project applicant has obtained coverage under the statewide Construction General Permit (Order 2009-0009-DWQ or subsequent Order), if applicable.

b. Construction Site Inventory and Tracking

(1) Each Copermittee must maintain and update, at least quarterly, a watershed-based inventory of all construction projects issued a local permit that allows ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff. The use of an automated database system, such as GIS, is highly recommended. The inventory must include:

(a) Relevant contact information for each site (e.g., name, address, phone, and email for the owner and contractor);

(b) The basic site information including location (address and hydrologic subarea), Waste Discharge Identification (WDID) number (if applicable), size of the site, and approximate area of disturbance;

(c) Whether or not the site is considered a high threat to water quality, as defined in Provision E.4.b.(2) below;

(d) The project start and completion dates;

(e) The required inspection frequency, as defined in the Copermittee's jurisdictional runoff management program document;

(f) The date the Copermittee accepted or approved the pollution control plan, construction BMP plan, and/or erosion and sediment control plan; and

(g) Whether or not there are ongoing enforcement actions administered to the site.

(2) Each Copermittee must identify all construction sites within its jurisdiction that represent a high threat to downstream surface water quality. The designation of construction sites as high threat to water quality must consider the following:

(a) Sites located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Sites located within the same hydrologic subarea and tributary to a water body segment listed as impaired for sediment on the CWA section 303(d) List;

(c) Sites located within, directly adjacent to, or discharging directly to a receiving water within an ESA; and

(d) Other sites determined by the Copermittees or the San Diego Water Board as a high threat to water quality.

c. CONSTRUCTION SITE BMP IMPLEMENTATION

Each Copermittee must implement, or require the implementation of effective BMPs to reduce discharges of pollutants in storm water from construction sites to the MEP, and effectively prohibit non-storm water discharges from construction sites into the MS4. These BMPs must be site specific, seasonally appropriate, and construction phase appropriate. BMPs must be implemented at each construction site year round. Dry season BMP implementation must plan for and address unseasonal rain events that may occur during the dry season (May 1 through September 30). Copermittees must implement, or require the implementation of, BMPs in the following categories:

(1) Project Planning;

(2) Good Site Management "Housekeeping", including waste management;

(3) Non-storm Water Management;

(4) Erosion Control;

(5) Sediment Control;

(6) Run-on and Run-off Control; and

(7) Active/Passive Sediment Treatment Systems, where applicable.

d. CONSTRUCTION SITE INSPECTIONS

Each Copermittee must conduct construction site inspections to require and confirm compliance with its local permits and applicable local ordinances, and the requirements of this Order. Priority for site inspections must consider threat to water quality pursuant to Provision E.4.b as well as the nature of the construction activity, topography, and the characteristics of soils and receiving water quality.

(1) Inspection Frequency

(a) Each Copermittee must conduct inspections at all inventoried sites, including high threat to water quality sites, at an appropriate frequency for each phase of construction to confirm the site reduces the discharge of pollutants in storm water from construction sites to the MEP, and effectively prohibits non-storm water discharges from entering the MS4.

(b) Each Copermittee must establish appropriate inspection frequencies for high threat to water quality sites, and all other sites, for each phase of construction. Inspection frequencies appropriate for addressing the highest water quality priorities identified in the Water Quality Improvement Plan, and for complying with the requirements of this Order must be identified in each Copermittee's jurisdictional runoff management program document.

(c) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e., re-inspection, enforcement) necessary to require and confirm site compliance with its local permits and applicable local ordinances, and the requirements of this Order.

(2) Inspection Content

Inspections of construction sites by the Copermittee must include, at a minimum:

(a) Verification of coverage under the Construction General Permit (Notice of Intent (NOI) and/or WDID number) during initial inspections, when applicable;

(b) Assessment of compliance with its local permits and applicable local ordinances related to pollution prevention, including the implementation and maintenance of applicable BMPs;

(c) Assessment of BMP adequacy and effectiveness;

(d) Visual observations of actual non-storm water discharges;

(e) Visual observations of actual or potential discharge of sediment and/or construction related materials from the site;

(f) Visual observations of actual or potential illicit connections; and

(g) If any violations are found and BMP corrections are needed, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried construction sites. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Site name, location (address and hydrologic subarea), and WDID number (if applicable);

(b) Inspection date;

(c) Approximate amount of rainfall since last inspection;

(d) Description of problems observed with BMPs and indication of need for BMP addition/repair/replacement and any scheduled re-inspection, and date of re-inspection;

(e) Descriptions of any other specific inspection comments which must, at a minimum, include rationales for longer compliance time;

(f) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(g) Resolution of problems noted and date problems fixed.

e. CONSTRUCTION SITE ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried construction sites, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

5. Existing Development Management

Each Copermittee must implement an existing development management program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. EXISTING DEVELOPMENT INVENTORY AND TRACKING

Each Copermittee must maintain, and update at least annually, a watershed-based inventory of the existing development within its jurisdiction that may discharge a pollutant load to and from the MS4. The use of an automated database system, such as GIS, is highly recommended. The inventory must, at a minimum, include:

(1) Name, location (hydrological subarea and address, if applicable) of the following types of existing development with its jurisdiction:

(a) Commercial facilities or areas;

(b) Industrial facilities;

(c) Municipal facilities, including:

(i) MS4 and related structures;[33]

(ii) Roads, streets, and highways;

(iii) Parking facilities;

(iv) Municipal airfields;

(v) Parks and recreation facilities;

[33] The inventory may refer to the MS4 map required to be maintained pursuant to Provision E.2.b.(1).

(vi) Flood management facilities, flood control devices and structures;

(vii) Operating or closed municipal landfills;

(viii) Publicly owned treatment works (including water and wastewater treatment plants) and sanitary sewer collection systems;

(ix) Corporate yards, including maintenance and storage yards for materials, waste, equipment, and vehicles;

(x) Hazardous waste collection facilities;

(xi) Other treatment, storage or disposal facilities for municipal waste; and

(xii) Other municipal facilities that the Copermittee determines may contribute a significant pollutant load to the MS4.

(d) Residential areas, which may be designated by one or more of the following:

(i) Residential management area;

(ii) Drainage basin or area;

(iii) Land use (e.g., single family, multi-family, rural);

(iv) Neighborhood;

(v) Common Interest Area;

(vi) Home Owner Association;

(vii) Mobile home park; and/or

(viii) Other designations accepted by the San Diego Water Board Executive Officer.

(2) A description of the facility or area, including the following information:

(a) Classification as commercial, industrial, municipal, or residential;

(b) Status of facility or area as active or inactive;

(c) Identification if a business is a mobile business;

(d) SIC Code or NAICS Code, if applicable;

(e) Industrial General Permit NOI and/or WDID number, if applicable;

(f) Identification if a residential area is or includes a Common Interest Area / Home Owner Association, or mobile home park;

(g) Identification of pollutants generated and potentially generated by the facility or area;

(h) Whether the facility or area is adjacent to an ESA;

(i) Whether the facility or area is tributary to and within the same hydrologic subarea as a water body segment listed as impaired on the CWA section 303(d) List and generates pollutants for which the water body segment is impaired; and

(3) An annually updated map showing the location of inventoried existing development, watershed boundaries, and water bodies.

b. EXISTING DEVELOPMENT BMP IMPLEMENTATION AND MAINTENANCE

Each Copermittee must designate a minimum set of BMPs required for all inventoried existing development, including special event venues. The designated minimum BMPs must be specific to facility or area types and pollutant generating activities, as appropriate.

(1) Commercial, Industrial, and Municipal Facilities and Areas

(a) Pollution Prevention

Each Copermittee must require the use of pollution prevention methods by the commercial, industrial, and municipal facilities and areas in its inventoried existing development to address the priorities and strategies in the Water Quality Improvement Plan.

(b) BMP Implementation

Each Copermittee must require the implementation of designated BMPs at commercial facilities and areas, industrial facilities, and implement designated BMPs at municipal facilities in its inventoried existing development.

(c) BMP Operation and Maintenance

(i) Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development.

(ii) Each Copermittee must implement a schedule of operation and maintenance activities for its MS4 and related structures (including

but not limited to catch basins, storm drain inlets, detention basins, etc.), and verify proper operation of all its municipal structural treatment controls designed to reduce pollutants (including floatables) in storm water discharges to or from its MS4s and related drainage structures. Operation and maintenance activities may include, but is not limited to, the following:

[a] Inspections of the MS4 and related structures;
[b] Cleaning of the MS4 and related structures; and
[c] Proper disposal of materials removed from cleaning of the MS4 and related structures.

(iii) Each Copermittee must implement a schedule of operation and maintenance for public streets, unpaved roads, paved roads, and paved highways within its jurisdiction to minimize pollutants that can be discharged in storm water.

(iv) Each Copermittee must implement controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers. Copermittees that operate both a municipal sanitary sewer system and a MS4 must implement controls and measures to prevent and eliminate seeping sewage from infiltrating the MS4. Copermittees that do not operate both a municipal sanitary sewer system and a MS4 must coordinate with sewering agencies to keep themselves informed of relevant and appropriate maintenance activities and sanitary sewage projects in their jurisdiction that may cause or contribute to seepage of sewage into the MS4.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must require the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from commercial facilities and areas and industrial facilities, and implement BMPs at municipal facilities in its inventoried existing development. Such BMPs must include, as appropriate, educational activities, permits, certifications and other measures for applicators and distributors.

(2) <u>Residential Areas</u>

(a) Pollution Prevention

Each Copermittee must promote and encourage the use of pollution prevention methods, where appropriate, by the residential areas in its inventoried existing development.

(b) BMP Implementation

Each Copermittee must promote and encourage the implementation of designated BMPs at residential areas in its inventoried existing development.

(c) BMP Operation and Maintenance

Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at residential areas in its inventoried existing development.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must promote and encourage the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from residential areas in its inventoried existing development.

c. EXISTING DEVELOPMENT INSPECTIONS

Each Copermittee must conduct inspections of inventoried existing development to ensure compliance with applicable local ordinances and permits, and the requirements of this Order.

(1) Inspection Frequency

(a) Each Copermittee must establish appropriate inspection frequencies for inventoried existing development in accordance with the following requirements:

(i) At a minimum, inventoried existing development must be inspected once every five years utilizing one or more of the following methods:

[a] Drive-by inspections by Copermittee municipal and contract staff;
[b] Onsite inspections by Copermittee municipal and contract staff; and/or
[c] Visual inspections of publicly accessible inventoried facilities or areas by volunteer monitoring or patrol programs that have been trained by the Copermittee;

(ii) The frequency of inspections must be appropriate to confirm that BMPs are being implemented to reduce the discharge of pollutants in storm water from the MS4 to the MEP and effectively prohibit non-storm water discharges to the MS4;

(iii) The frequency of inspections must be based on the potential for a facility or area to discharge non-storm water and pollutants in storm water, and should reflect the priorities set forth in the Water Quality Improvement Plan;

(iv) Each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development;[34] and

(v) Inventoried existing development must be inspected by the Copermittee, as needed, in response to valid public complaints.

(b) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e. education and outreach, re-inspection, enforcement) necessary to require and confirm compliance with its applicable local ordinances and permits and the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

(2) Inspection Content

(a) Inspections of existing development must include, at a minimum:

(i) Visual inspections for the presence of actual non-storm water discharges;

(ii) Visual inspections for the presence of actual or potential discharge of pollutants;

(iii) Visual inspections for the presence of actual or potential illicit connections; and

(iv) Verification that the description of the facility or area in the inventory, required pursuant to Provision E.5.a.(2), has not changed.

(b) Onsite inspections of existing development by the Copermittee must include, at a minimum:

(i) Assessment of compliance with its applicable local ordinances and permits related to non-storm water and storm water discharges and runoff;

(ii) Assessment of the implementation of the designated BMPs;

(iii) Verification of coverage under the Industrial General Permit, when applicable; and

[34] If any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspection may count toward the total annual inspection requirement. This requirement excludes linear municipal facilities (i.e., MS4 linear channels, sanitary sewer collection systems, streets, roads and highways).

(iv) If any problems or violations are found, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried existing development. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Name and location of the facility or area (address and hydrologic subarea) consistent with the inventory name and location, pursuant to Provision E.5.a.(1);

(b) Inspection and re-inspection date(s);

(c) Inspection method(s) (i.e. drive-by, onsite);

(d) Observations and findings from the inspection(s);

(e) For onsite inspections of existing development by Copermittee municipal or contract staff, the records must also include, as applicable:

(i) Description of any problems or violations found during the inspection(s);

(ii) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(iii) The date problems or violations were resolved.

d. EXISTING DEVELOPMENT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried existing development, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

e. RETROFITTING AND REHABILITATING AREAS OF EXISTING DEVELOPMENT

(1) Retrofitting Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to retrofit areas of existing development within its jurisdiction to address identified sources of pollutants and/or stressors that

contribute to the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify areas of existing development as candidates for retrofitting, focusing on areas where retrofitting will address pollutants and/or stressors that contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for retrofitting projects may be utilized to reduce pollutants that may be discharged in storm water from areas of existing development, and/or address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of retrofitting projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting projects; and

(e) Where retrofitting projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional retrofitting projects (i.e. projects that can receive and/or treat storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment) adjacent to and/or downstream of the areas of existing development.

(2) Stream, Channel and/or Habitat Rehabilitation in Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to rehabilitate streams, channels, and/or habitats in areas of existing development within its jurisdiction to address the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify streams, channels, and/or habitats in areas of existing development as candidates for rehabilitation, focusing on areas where stream, channel, and/or habitat rehabilitation projects will address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for stream, channel, and/or habitat rehabilitation projects may be utilized to address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters, rehabilitate channelized or hydromodified streams, restore wetland and riparian habitat, restore watershed functions, and/or restore beneficial uses of receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of stream, channel, and/or habitat rehabilitation projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance stream, channel, and/or habitat rehabilitation projects; and

(e) Where stream, channel, and/or habitat rehabilitation projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional stream, channel, and/or habitat rehabilitation projects (i.e. projects that can receive storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment).

6. Enforcement Response Plans

Each Copermittee must develop and implement an Enforcement Response Plan as part of its jurisdictional runoff management program document. The Enforcement Response Plan must describe the applicable approaches and options to enforce its legal authority established pursuant to Provision E.1, as necessary, to achieve compliance with the requirements of this Order. The Enforcement Response Plan must be in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include the following:

a. Enforcement Response Plan Components

The Enforcement Response Plan must include the following individual components:

(1) Illicit Discharge Detection and Elimination Enforcement Component;

(2) Development Planning Enforcement Component;

(3) Construction Management Enforcement Component; and

(4) Existing Development Enforcement Component.

b. ENFORCEMENT RESPONSE APPROACHES AND OPTIONS

Each component of the Enforcement Response Plan must describe the enforcement response approaches that the Copermittee will implement to compel compliance with its statutes, ordinances, permits, contracts, orders, or similar means, and the requirements of this Order. The description must include the protocols for implementing progressively stricter enforcement responses. The enforcement response approaches must include appropriate sanctions to compel compliance, including, at a minimum, the following tools or their equivalent:

(1) Verbal and written notices of violation;

(2) Cleanup requirements;

(3) Fines;

(4) Bonding requirements;

(5) Administrative and criminal penalties;

(6) Liens;

(7) Stop work orders; and

(8) Permit and occupancy denials.

c. CORRECTION OF VIOLATIONS

(1) Violations must be corrected in a timely manner with the goal of correcting the violations within 30 calendar days after the violations are discovered, or prior to the next predicted rain event, whichever is sooner.

(2) If more than 30 calendar days are required to achieve compliance, then a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

d. ESCALATED ENFORCEMENT

(1) The Enforcement Response Plan must include a definition of “escalated enforcement.” Escalated enforcement must include any enforcement scenario where a violation or other non-compliance is determined to cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan. Escalated enforcement may be defined differently for development planning, construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas.

(2) Where the Copermittee determines escalated enforcement is not required, a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

(3) Escalated enforcement actions must continue to increase in severity, as necessary, to compel compliance as soon as possible.

e. REPORTING OF NON-COMPLIANT SITES

(1) Each Copermittee must notify the San Diego Water Board in writing within five (5) calendar days of issuing escalated enforcement (as defined in the Copermittee's Enforcement Response Plan) to a construction site that poses a significant threat to water quality as a result of violations or other non-compliance with its permits and applicable local ordinances, and the requirements of this Order. Written notification may be provided electronically by email to the appropriate San Diego Water Board staff.

(2) Each Copermittee must notify the San Diego Water Board of any persons required to obtain coverage under the statewide Industrial General Permit and Construction General Permit and failing to do so, within five (5) calendar days from the time the Copermittee become aware of the circumstances. Written notification may be provided electronically by email to RB9_Nonfilers@waterboards.ca.gov.

7. Public Education and Participation

Each Copermittee must implement, individually or with other Copermittees, a public education and participation program in accordance with the strategies identified in the Water Quality Improvement Plan to promote and encourage the development of programs, management practices, and behaviors that reduce the discharge of pollutants in storm water to the MEP, prevent controllable non-storm water discharges from entering the MS4, and protect water quality standards in receiving waters. The public education and participation program must be implemented in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include, at a minimum, the following requirements:

a. PUBLIC EDUCATION

The public education program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) Educational activities, public information activities, and other appropriate outreach activities intended to reduce pollutants associated with the application of pesticides, herbicides and fertilizer and other pollutants of

concern in storm water discharges to and from its MS4 to the MEP, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed to address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(2) Educational activities, public information activities, and other appropriate outreach activities to facilitate the proper management and disposal of used oil and toxic materials; and

(3) Appropriate education and training measures for specific target audiences, such as construction site operators, residents, underserved target audiences and school-aged children, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed, based on high risk behaviors and pollutants of concern.

b. PUBLIC PARTICIPATION

The public participation program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) A process for members of the public to participate in updating the highest priority water quality conditions, numeric goals, and water quality improvement strategies in the Water Quality Improvement Plan;

(2) Opportunities for members of the public to participate in providing the Copermittee recommendations for improving the effectiveness of the water quality improvement strategies implemented within its jurisdiction; and

(3) Opportunities for members of the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or protection of the quality of receiving waters.

8. Fiscal Analysis

a. Each Copermittee must secure the resources necessary to meet all the requirements of this Order.

b. Each Copermittee must conduct an annual fiscal analysis of its jurisdictional runoff management program in its entirety. The fiscal analysis must include the following:

(1) Identification of the various categories of expenditures necessary to implement the requirements of this Order, including a description of the specific capital, operation and maintenance, and other expenditure items to be accounted for in each category of expenditures;

(2) The staff resources needed and allocated to meet the requirements of this Order, including any development, implementation, and enforcement activities required;

(3) The estimated expenditures for Provisions E.8.b.(1) and E.8.b.(2) for the current fiscal year; and

(4) The source(s) of funds that are proposed to meet the necessary expenditures described in Provisions E.8.b.(1) and E.8.b.(2), including legal restrictions on the use of such funds, for the current fiscal year and next fiscal year.

c. Each Copermittee must submit a summary of the annual fiscal analysis with each Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3).

d. Each Copermittee must provide the documentation used to develop the summary of the annual fiscal analysis upon request by the San Diego Water Board.

F. REPORTING

The purpose of this provision is to determine and document compliance with the requirements set forth in this Order. The goal of reporting is to communicate to the San Diego Water Board and the people of the State of California the implementation status of each jurisdictional runoff management program and compliance with the requirements of this Order. This goal is to be accomplished through the submittal of specific deliverables to the San Diego Water Board by the Copermittees.

1. Water Quality Improvement Plans

The Copermittees for each Watershed Management Area must develop and submit the Water Quality Improvement Plan in accordance with the following requirements:

a. WATER QUALITY IMPROVEMENT PLAN DEVELOPMENT

Each Water Quality Improvement Plan must be developed in accordance with the following process:

(1) Public Participation Process

The Copermittees must implement a public participation process to solicit data, information, and recommendations to be utilized in the development of the Water Quality Improvement Plan. The public participation process must include the following:

(a) The Copermittees must develop a publicly available and noticed schedule of the opportunities for the public to participate and provide comments during the development of the Water Quality Improvement Plan. The schedule may be adjusted as necessary by the Copermittees, provided the public is provided timely notification of the changes to the schedule.

(b) The Copermittees must form a Water Quality Improvement Consultation Panel to provide recommendations during the development of the Water Quality Improvement Plan. The Water Quality Improvement Consultation Panel must consist of at least the following members:

(i) A representative of the San Diego Water Board;

(ii) A representative of the environmental community familiar with the water quality conditions of concern of the receiving waters in the Watershed Management Area, preferably from an environmental interest group associated with a water body within the Watershed Management Area; and

(iii) A representative of the development community familiar with the opportunities and constraints for implementing structural BMPs,

retrofitting projects, and stream, channel or habitat rehabilitation projects in the Watershed Management Area, preferably with relevant engineering, hydrology, and/or geomorphology experience in the Watershed Management Area.

(c) The Copermittees must coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public time and opportunity to participate during the development of the Water Quality Improvement Plans.

(2) Priority Water Quality Conditions

(a) The Copermittees must solicit data, information and recommendations from the public to be utilized in the development and identification of the priority water quality conditions and potential water quality improvement strategies for the Watershed Management Area.

(b) The Copermittees must review the priority water quality conditions the Copermittees plan on including in the Water Quality Improvement Plan with the Water Quality Improvement Consultation Panel to receive recommendations or concurrence.

(c) The Copermittees must consider revisions to the priority water quality conditions based on recommendations from the Water Quality Improvement Consultation Panel.

(d) The Copermittees must include all the potential water quality improvement strategies identified by the public and the Water Quality Improvement Consultation Panel with the submittal of the priority water quality conditions to the San Diego Water Board.

(e) The Copermittees must submit the Water Quality Improvement Plan requirements of Provision B.2 to the San Diego Water Board as early as 6 months and no later than 12 months after the commencement of coverage under this Order. Upon receipt, the San Diego Water Board will issue a public notice and release the proposed priority water quality conditions and potential water quality improvement strategies for public review and comment for a minimum of 30 days.

(f) The Copermittees must consider revisions to the priority water quality conditions and potential water quality improvement strategies developed pursuant to Provision B.2 based on public comments received by the close of the comment period.

(3) Water Quality Improvement Goals, Strategies and Schedules

(a) The Copermittees must solicit recommendations from the public on potential numeric goals for the highest priority water quality conditions identified for the Watershed Management Area, and recommendations on the strategies that should be implemented to achieve the potential numeric goals.

(b) The Copermittees must consult with the Water Quality Improvement Consultation Panel and consider revisions to the following items based on the Panel's recommendations:

(i) The numeric goals and schedules the Copermittees propose to include in the Water Quality Improvement Plan;

(ii) The water quality improvement strategies and schedules the Copermittees propose to implement in the Watershed Management Area and include in the Water Quality Improvement Plan; and

(iii) If the Copermittees choose to implement Provision B.3.b.(4), the results of the Watershed Management Area Analysis the Copermittees proposed to incorporate into the Water Quality Improvement Plan.

(c) The Copermittees must submit the Water Quality Improvement Plan requirements of Provision B.3 to the San Diego Water Board as early as 9 months and no later than 18 months after the commencement of coverage under this Order. Upon receipt, the San Diego Water Board will issue a public notice and release the proposed water quality improvement goals, strategies and schedules for public review and comment for a minimum of 30 days.

(d) The Copermittees must consider revisions to the water quality improvement goals, strategies and schedules developed pursuant to Provision B.3 based on public comments received by the close of the comment period.

b. WATER QUALITY IMPROVEMENT PLAN SUBMITTAL AND IMPLEMENTATION

(1) Within 24 months after the commencement of coverage under this Order, the Copermittees for each Watershed Management Area must submit a complete Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order to the San Diego Water Board. The San Diego Water Board will issue a public notice and release the Water Quality Improvement Plan for public review and comment for a minimum of 30 days.

(2) The Copermittees must consider revisions to the Water Quality Improvement Plan based on written comments received by the close of the public comment period.

(3) The Copermittees must promptly submit any revisions to the Water Quality Improvement Plan to the San Diego Water Board no later than 60 days after the close of the public comment period.

(4) If issues concerning the Water Quality Improvement Plan are resolved informally through discussions among the Copermittees, the San Diego Water Board and interested parties, the San Diego Water Board Executive Officer may provide written notification of acceptance to the Copermittees that the Water Quality Improvement Plan meets the requirements of Provision B. However, if the Executive Officer determines that significant issues with the Water Quality Improvement Plan remain, the matter will be scheduled for San Diego Water Board consideration at a public meeting.

(5) The Copermittees must commence with implementation of the Water Quality Improvement Plan, in accordance with the water quality improvement strategies and schedules therein, upon written notification of acceptance with the Water Quality Improvement Plan by the San Diego Water Board Executive Officer.

(6) During implementation of the Water Quality Improvement Plan the Copermittees must correct any deficiencies in the Plan identified by the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report following a request by the Board to do so.

(7) The Water Quality Improvement Plan must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of receiving notification of acceptance with the Water Quality Improvement Plan by the San Diego Water Board Executive Officer.

2. Updates

a. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATES

Each Copermittee must update its jurisdictional runoff management program document in accordance with the following requirements:

(1) Each Copermittee is encouraged to seek public and key stakeholder participation and comments, as early and often as possible during the process of developing updates to its jurisdictional runoff management program document;

(2) Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E concurrent with the submittal of the Water Quality Improvement Plan. Each Copermittee must correct any deficiencies in the jurisdictional runoff management program document based on comments received from the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report;

(3) Each Copermittee must submit updates to its jurisdictional runoff management program, with the supporting rationale for the modifications, either in the Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b;

(4) The Copermittee must revise proposed modifications to its jurisdictional runoff management program as directed by the San Diego Water Board Executive Officer; and

(5) Updated jurisdictional runoff management program documents must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of submitting the Water Quality Improvement Plan Annual Report.

b. BMP DESIGN MANUAL UPDATES

Each Copermittee must update its BMP Design Manual in accordance with the following requirements:

(1) Each Copermittee must update its BMP Design Manual to incorporate the requirements of Provisions E.3.a-d concurrent with the submittal of the Water Quality Improvement Plan. Each Copermittee must correct any deficiencies in the BMP Design Manual based on comments received from the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report;

(2) Any future updates to the BMP Design Manual made after its update pursuant to Provision F.2.b.(1) is completed must be consistent with the requirements of Provisions E.3.a-d and must be submitted as part of the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b; and

(3) BMP Design Manuals must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of completing the update.

(4) If the San Diego Water Board amends Provisions E.3.a-d during the permit term but after the Copermittee has completed the update pursuant to Provision F.2.b.(1), the Copermittee must revise its BMP Design Manual to

incorporate the amended Provision E.3.a-d requirements as soon as possible but not later than 90 days after the date the San Diego Water Board adopts the amendments to Provisions E.3.a-d, unless otherwise directed by the San Diego Water Board Executive Officer. Under these circumstances, the effective date of the BMP Design Manual is no later than 90 days after the date the San Diego Water Board adopts the amendments to Provisions E.3.a-d, unless otherwise directed by the San Diego Water Board Executive Officer.

c. WATER QUALITY IMPROVEMENT PLAN UPDATES

(1) The Water Quality Improvement Plans must be updated in accordance with the following process:

(a) The Copermittees must develop and implement a public participation process to obtain data, information and recommendations for updating the Water Quality Improvement Plan. The public participation process must provide for a publicly available and noticed schedule of opportunities for the public to participate and provide comments during the development of updates to the Water Quality Improvement Plan;

(b) The Copermittees must consult with the Water Quality Improvement Consultation Panel on proposed updates of the Water Quality Improvement Plan, and consider the Water Quality Improvement Consultation Panel's recommendations in finalizing the proposed updates;

(c) The Copermittees for each Watershed Management Area must submit 1) proposed updates to the Water Quality Improvement Plan and supporting rationale, and 2) recommendations received from the public and the Water Quality Improvement Consultation Panel and the rationale for the requested updates, either in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The updates submitted will be deemed accepted for inclusion in the Water Quality Improvement Plan ninety (90) days after submission unless otherwise directed in writing by the San Diego Water Board Executive Officer;

(d) The Copermittees must revise the requested updates as directed by the San Diego Water Board Executive Officer; and

(e) Updated Water Quality Improvement Plans must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance of the requested updates by the San Diego Water Board.

(2) No later than six months following Office of Administrative Law and USEPA approval of any TMDL Basin Plan amendment with wasteload allocations (WLAs) assigned to the Copermittees during the term of this Order, the

Copermittees must initiate an update to the applicable Water Quality Improvement Plans in accordance with Provision F.1 or Provision F.2.c.(1) to incorporate the requirements of the TMDL WLAs.

3. Progress Reporting

a. PROGRESS REPORT PRESENTATIONS

The Copermittees for each Watershed Management Area must periodically appear before the San Diego Water Board, as requested by the Board, to provide progress reports on the implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs.

b. ANNUAL REPORTS

(1) Transitional Jurisdictional Runoff Management Program Annual Reports

(a) Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) no later than October 31 of each year for each jurisdictional runoff management program reporting period (i.e. July 1 to June 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted.

(b) Each Copermittee must submit the information on the Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) specific to the area within its jurisdiction in each Watershed Management Area.

(c) In addition to submitting the Jurisdictional Runoff Management Program Annual Report Form during the transitional reporting period, each Copermittee may continue to utilize and submit the jurisdictional runoff management program annual reporting format of its previous NPDES permit until the first Water Quality Improvement Plan Annual Report is required to be submitted.

(2) Transitional Monitoring and Assessment Program Annual Reports

The Copermittees for each Watershed Management Area must submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted under this Order. The Transitional

Monitoring and Assessment Program Annual Reports must include:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1.a and D.2.a, summarized and presented in tabular and graphical form; and

(b) The findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

(3) Water Quality Improvement Plan Annual Reports

The Copermittees for each Watershed Management Area must submit a Water Quality Improvement Plan Annual Report for each reporting period no later than January 31 of the following year. The annual reporting period consists of two different periods: 1) July 1 to June 30 of the following year for the jurisdictional runoff management programs, 2) October 1 to September 30 of the following year for the monitoring and assessment programs. The Water Quality Improvement Plan Annual Reports must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Each Annual Report must include the following:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, summarized and presented in tabular and graphical form;

(b) The progress of the special studies required pursuant to Provision D.3, and the findings, interpretations and conclusions of a special study, or each phase of a special study, upon its completion;

(c) The findings, interpretations and conclusions from the assessments required pursuant to Provision D.4;

(d) The progress of implementing the Water Quality Improvement Plan, including, but not limited to, the following:

(i) The progress toward achieving the interim and final numeric goals for the highest water quality priorities for the Watershed Management Area;

(ii) The water quality improvement strategies that were implemented and/or no longer implemented by each of the Copermittees during the reporting period and previous reporting periods;

(iii) The water quality improvement strategies planned for implementation during the next reporting period;

(iv) Proposed modifications to the water quality improvement strategies, the public comments received and the supporting rationale for the

proposed modifications;

(v) Previous modifications or updates incorporated into the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document and implemented by the Copermittees in the Watershed Management Area; and

(vi) Proposed modifications or updates to the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document;

(e) A completed Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) for each Copermittee in the Watershed Management Area, certified by a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative; and

(f) Each Copermittee must provide any data or documentation utilized in developing the Water Quality Improvement Plan Annual Report upon request by the San Diego Water Board. Any Copermittee monitoring data utilized in developing the Water Quality Improvement Plan Annual Report must be uploaded to the California Environmental Data Exchange Network (CEDEN).[35] Any Copermittee monitoring and assessment data utilized in developing the Water Quality Improvement Plan Annual Report must be available for access on the Regional Clearinghouse required pursuant to Provision F.4.

c. Regional Monitoring and Assessment Report

(1) The Copermittees must submit a Regional Monitoring and Assessment Report no later than 180 days prior to the expiration date of this Order. The Regional Monitoring and Assessment Report may be submitted as part of the Report of Waste Discharge required pursuant to Provision F.5.b. In preparing the report the Copermittees must consider the receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, and the findings, interpretations, and conclusions from the assessments required pursuant to Provision D.4. Based on these considerations the report must assess the following:

[35] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

(a) The beneficial uses of the receiving waters within the San Diego Region that are supported and not adversely affected by the Copermittees' MS4 discharges;

(b) The beneficial uses of the receiving waters within the San Diego Region that are adversely impacted by the Copermittees' MS4 discharges;

(c) The progress toward protecting the beneficial uses in the receiving waters within the San Diego Region from the Copermittees' discharges; and

(d) Pollutants or conditions of emerging concern that may impact beneficial uses in the receiving waters within the San Diego Region.

(2) The Regional Monitoring and Assessment Report must include recommendations for improving the implementation and assessment of the Water Quality Improvement Plans and jurisdictional runoff management programs.

(3) Each Copermittee must provide any data or documentation utilized in developing the Regional Monitoring and Assessment Report upon request by the San Diego Water Board. Any Copermittee monitoring and assessment data utilized in developing the Regional Monitoring and Assessment Report must be available for access on the Regional Clearinghouse required pursuant to Provision F.4.

4. Regional Clearinghouse

The Copermittees must develop, update, and maintain an internet-based Regional Clearinghouse that is made available to the public no later than 18 months after the effective date of this Order.[36]

a. The Copermittees, through the Regional Clearinghouse, must make the following documents and data available for access, and organized by Watershed Management Area. The documents and data may be linked to other internet-based data portals and databases where the original documents are stored:

(1) Water Quality Improvement Plan for the Watershed Management Area, and all updated versions with date of update;

(2) Annual Reports for the Watershed Management Area;

(3) Jurisdictional Runoff Management Program document for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

[36] The Copermittees may develop, update and maintain the clearinghouse(s) of other Copermittees or agencies.

(4) BMP Design Manual for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(5) Reports from special studies (e.g. source identification, BMP effectiveness assessment) conducted in the Watershed Management Area;

(6) Monitoring data collected pursuant to Provision D for each Watershed Management Area must be uploaded to CEDEN,[37] with links to the uploaded data; and

(7) Available GIS data, layers, and/or shapefiles used to develop the maps generated and maintained by the Copermittees for the Water Quality Improvement Plans, Annual Reports, and jurisdictional runoff management program documents.

b. The Copermittees, through the Regional Clearinghouse, must make the following information and documents available for access:

(1) Contact information (point of contact, phone number, email address, and mailing address) for each Copermittee;

(2) Public hotline number for reporting non-storm water and illicit discharges for each Copermittee;

(3) Email address for reporting non-storm water and illicit discharges for each Copermittee;

(4) Link to each Copermittee's website, if available, where the public may find additional information about the Copermittee's storm water management program and for requesting records for the implementation of its program;

(5) Information about opportunities for the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or protection of the quality of receiving waters; and

(6) Reports from regional monitoring programs in which the Copermittees participate (e.g. Southern California Monitoring Coalition, Southern California Coastal Water Research Project Bight Monitoring);

(7) Regional Monitoring and Assessment Reports; and

(8) Any other information, data, and documents the Copermittees determine as appropriate for making available to the public.

[37] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

5. Report of Waste Discharge

The Copermittees subject to the requirements of this Order must submit to the San Diego Water Board a complete Report of Waste Discharge as an application for the re-issuance of this Order and NPDES permit. The Report of Waste Discharge must be submitted no later than 180 days in advance of the expiration date of this Order. The Report of Waste Discharge must contain the following minimum information:

a. Names and addresses of the Copermittees;

b. Names and titles of the primary contacts of the Copermittees;

c. Proposed changes to the Copermittees' Water Quality Improvement Plans and the supporting justification;

d. Proposed changes to the Copermittees' jurisdictional runoff management programs and the supporting justification;

e. Any other information necessary for the re-issuance of this Order;

f. Any information to be included as part of the Report of Waste Discharge pursuant to the requirements of this Order; and

g. Any other information required by federal regulations for NPDES permit reissuance.

6. Reporting Provisions

Each Copermittee must comply with all the reporting and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

G. PRINCIPAL WATERSHED COPERMITTEE RESPONSIBILITIES

1. The Copermittees within each Watershed Management Area must designate a Principal Watershed Copermittee and notify the San Diego Water Board of the name of the Principal Watershed Copermittee. An individual Copermittee should not be designated a Principal Watershed Copermittee for more than two Watershed Management Areas. The notification may be submitted with the Water Quality Improvement Plan required pursuant to Provision F.1 of this Order.

2. The Principal Watershed Copermittee is responsible for, at a minimum, the following:

a. Serving as liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues, and when necessary and appropriate, representing the Copermittees in the Watershed Management Area before the San Diego Water Board;

b. Facilitating the development of the Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order;

c. Coordinating the submittal of the deliverables required by Provisions F.1, F.2, F.3.a, and F.3.b of this Order; and

d. Coordinating and developing, with the other Principal Watershed Copermittees, the requirements of Provisions F.3.c, F.4, and F.5.b of this Order.

3. The Principal Watershed Copermittee is not responsible for ensuring that the other Copermittees within the Watershed Management Area are in compliance with the requirements of this Order. Each Copermittee within the Watershed Management Area is responsible for complying with the requirements of this Order.

H. MODIFICATION OF ORDER

1. Modifications of the Order may be initiated by the San Diego Water Board or by the Copermittees. Requests by Copermittees must be made to the San Diego Water Board.

2. Minor modifications to the Order may be made by the San Diego Water Board where the proposed modification complies with all the prohibitions and limitations, and other requirements of this Order.

3. This Order may also be re-opened and modified, revoked and, reissued or terminated in accordance with the provisions of 40 CFR 122.44, 122.62 to 122.64, and 124.5. Causes for taking such actions include, but are not limited to, failure to comply with any condition of this Order and permit, and endangerment to human health or the environment resulting from the permitted activity.

4. This Order may be re-opened for modification for cause including but not limited to the following:

a. Any of the TMDLs in Attachment E to this Order are amended in the Basin Plan by San Diego Water Board, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA;

b. The Basin Plan is amended by the San Diego Water Board to incorporate a new TMDL, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA; or

c. Updating or revising the monitoring and reporting requirements is determined to be necessary, at the discretion of the San Diego Water Board. Such modification(s) may include, but is (are) not limited to, revision(s) to: (i) implement recommendations from Southern California Coastal Water Research Project (SCCWRP), (ii) develop, refine, implement, and/or coordinate a regional monitoring program, (iii) develop and implement improved monitoring and assessment programs in keeping with San Diego Water Board Resolution No. R9-2012-0069, Resolution in Support of a Regional Monitoring Framework, and/or (iv) add provisions to require the Copermittees to evaluate and provide information on cost and values of the monitoring and reporting program.

I. STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

Each Copermittee must comply with all the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

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ATTACHMENT A

DISCHARGE PROHIBITIONS AND SPECIAL PROTECTIONS

1. Basin Plan Waste Discharge Prohibitions

California Water Code Section 13243 provides that a Regional Water Board, in a water quality control plan, may specify certain conditions or areas where the discharge of waste or certain types of waste is not permitted. The following waste discharge prohibitions in the Water Quality Control Plan for the San Diego Basin (Basin Plan) are applicable to any person, as defined by Section 13050(c) of the California Water Code, who is a citizen, domiciliary, or political agency or entity of California whose activities in California could affect the quality of waters of the state within the boundaries of the San Diego Region.

1. The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in California Water Code Section 13050, is prohibited.

2. The discharge of waste to land, except as authorized by waste discharge requirements or the terms described in California Water Code Section 13264 is prohibited.

3. The discharge of pollutants or dredged or fill material to waters of the United States except as authorized by a National Pollutant Discharge Elimination System (NPDES) permit or a dredged or fill material permit (subject to the exemption described in California Water Code Section 13376) is prohibited.

4. Discharges of recycled water to lakes or reservoirs used for municipal water supply or to inland surface water tributaries thereto are prohibited, unless this San Diego Water Board issues a NPDES permit authorizing such a discharge; the proposed discharge has been approved by the State Department of Health Services (DHS) and the operating agency of the impacted reservoir; and the discharger has an approved fail-safe long-term disposal alternative.

5. The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the San Diego Water Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

6. The discharge of waste in a manner causing flow, ponding, or surfacing on lands not owned or under the control of the discharger is prohibited, unless the discharge is authorized by the San Diego Water Board.

7. The dumping, deposition, or discharge of waste directly into waters of the state, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the San Diego Water Board.

8. Any discharge to a storm water conveyance system that is not composed entirely of "*storm water*" is prohibited unless authorized by the San Diego Water Board. [The federal regulations, 40 CFR 122.26(b)(13), define storm water as storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from firefighting activities.] [§122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

9. The unauthorized discharge of treated or untreated sewage to waters of the state or to a storm water conveyance system is prohibited.

10. The discharge of industrial wastes to conventional septic tank/subsurface disposal systems, except as authorized by the terms described in California Water Code Section 13264, is prohibited.

11. The discharge of radioactive wastes amenable to alternative methods of disposal into the waters of the state is prohibited.

12. The discharge of any radiological, chemical, or biological warfare agent into waters of the state is prohibited.

13. The discharge of waste into a natural or excavated site below historic water levels is prohibited unless the discharge is authorized by the San Diego Water Board.

14. The discharge of sand, silt, clay, or other earthen materials from any activity, including land grading and construction, in quantities which cause deleterious bottom deposits, turbidity or discoloration in waters of the state or which unreasonably affect, or threaten to affect, beneficial uses of such waters is prohibited.

15. The discharge of treated or untreated sewage from vessels to Mission Bay, Oceanside Harbor, Dana Point Harbor, or other small boat harbors is prohibited.

16. The discharge of untreated sewage from vessels to San Diego Bay is prohibited.

17. The discharge of treated sewage from vessels to portions of San Diego Bay that are less than 30 feet deep at mean lower low water (MLLW) is prohibited.

18. The discharge of treated sewage from vessels, which do not have a properly functioning US Coast Guard certified Type I or Type II marine sanitation device, to portions of San Diego Bay that are greater than 30 feet deep at mean lower low water (MLLW) is prohibited.

2. Attachment B to State Water Board Resolution 2012-0012, as amended by State Water Board Resolution No. 2012-0031.

Special Protections for Areas of Special Biological Significance (ASBS), Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges

I. PROVISIONS FOR POINT SOURCE DISCHARGES OF STORM WATER AND NONPOINT SOURCE WASTE DISCHARGES

The following terms, prohibitions, and special conditions (hereafter collectively referred to as special conditions) are established as limitations on point source storm water and nonpoint source discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in Areas of Special Biological Significance (ASBS), as required for State Water Quality Protection Areas pursuant to California Public Resources Code Sections 36700(f) and 36710(f). These Special Protections are adopted by the State Water Board as part of the California Ocean Plan (Ocean Plan) General Exception.

The special conditions are organized by category of discharge. The State Water Resources Control Board (State Water Board) and Regional Water Quality Control Boards (Regional Water Boards) will determine categories and the means of regulation for those categories [e.g., Point Source Storm Water National Pollutant Discharge Elimination System (NPDES) or Nonpoint Source].

A. PERMITTED POINT SOURCE DISCHARGES OF STORM WATER

1. General Provisions for Permitted Point Source Discharges of Storm Water

   a. Existing storm water discharges into an ASBS are allowed only under the following conditions:

      (1) The discharges are authorized by an NPDES permit issued by the State Water Board or Regional Water Board;

      (2) The discharges comply with all of the applicable terms, prohibitions, and special conditions contained in these Special Protections; and

      (3) The discharges:

         (i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

         (ii) Are designed to prevent soil erosion;

         (iii) Occur only during wet weather;

         (iv) Are composed of only storm water runoff.

   b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

   c. The discharge of trash is prohibited.

d. Only discharges from existing storm water outfalls are allowed. Any proposed or new storm water runoff discharge shall be routed to existing storm water discharge outfalls and shall not result in any new contribution of waste to an ASBS (i.e., no additional pollutant loading). "Existing storm water outfalls" are those that were constructed or under construction prior to January 1, 2005. "New contribution of waste" is defined as any addition of waste beyond what would have occurred as of January 1, 2005. A change to an existing storm water outfall, in terms of re-location or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges are prohibited except as provided below:

(1) The term "non-storm water discharges" means any waste discharges from a municipal separate storm sewer system (MS4) or other NPDES permitted storm drain system to an ASBS that are not composed entirely of storm water.

(2) (i) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability or occur naturally:

(a) Discharges associated with emergency fire fighting operations.

(b) Foundation and footing drains.

(c) Water from crawl space or basement pumps.

(d) Hillside dewatering.

(e) Naturally occurring groundwater seepage via a storm drain.

(f) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(ii) An NPDES permitting authority may authorize non-storm water discharges to an MS4 with a direct discharge to an ASBS only to the extent the NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

2. Compliance Plans for Inclusion in Storm Water Management Plans (SWMP) and Storm Water Pollution Prevention Plans (SWPPP).

The discharger shall specifically address the prohibition of non-storm water runoff and the requirement to maintain natural water quality for storm water discharges to an ASBS in an ASBS Compliance Plan to be included in its SWMP or a SWPPP, as appropriate to permit type. If a statewide permit includes a SWMP, then the discharger shall prepare a stand-alone compliance plan for ASBS discharges. The ASBS Compliance Plan is subject to approval by the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (for permits issued by Regional Water Boards).

a. The Compliance Plan shall include a map of surface drainage of storm water runoff, showing areas of sheet runoff, prioritize discharges, and describe any structural Best Management Practices (BMPs) already employed and/or BMPs to be employed in the future. Priority discharges are those that pose the greatest water quality threat and which are identified to require installation of structural BMPs. The map shall also show the storm water conveyances in relation to other features such as service areas, sewage conveyances and treatment facilities, landslides, areas prone to erosion, and waste and hazardous material storage areas, if applicable. The SWMP or SWPPP shall also include a procedure for updating the map and plan when changes are made to the storm water conveyance facilities.

b. The ASBS Compliance Plan shall describe the measures by which all non-authorized non-storm water runoff (e.g., dry weather flows) has been eliminated, how these measures will be maintained over time, and how these measures are monitored and documented.

c. For Municipal Separate Storm Sewer System (MS4s), the ASBS Compliance Plan shall require minimum inspection frequencies as follows:

(1) The minimum inspection frequency for construction sites shall be weekly during rainy season;

(2) The minimum inspection frequency for industrial facilities shall be monthly during the rainy season;

(3) The minimum inspection frequency for commercial facilities (e.g., restaurants) shall be twice during the rainy season; and

(4) Storm water outfall drains equal to or greater than 18 inches (457 mm) in diameter or width shall be inspected once prior to the beginning of the rainy season and once during the rainy season and maintained to remove trash and other anthropogenic debris.

d. The ASBS Compliance Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff, that are necessary to comply with these special conditions, will be achieved through BMPs. Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that such installation would pose a threat to health or safety. BMPs to control storm water runoff discharges (at the end-of-pipe) during a design storm shall be designed to achieve on average the following target levels:

(1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

(2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges.

The baseline for these determinations is the effective date of the Exception, except for those structural BMPs installed between January 1, 2005 and adoption of these Special Protections, and the reductions must be achieved and documented within six (6) years of the effective date.

e. The ASBS Compliance Plan shall address erosion control and the prevention of anthropogenic sedimentation in ASBS. The natural habitat conditions in the ASBS shall not be altered as a result of anthropogenic sedimentation.

f. The ASBS Compliance Plan shall describe the non-structural BMPs currently employed and planned in the future (including those for construction activities), and include an implementation schedule. The ASBS Compliance Plan shall include non-structural BMPs that address public education and outreach. Education and outreach efforts must adequately inform the public that direct discharges of pollutants from private property not entering an MS4 are prohibited. The ASBS Compliance Plan shall also describe the structural BMPs, including any low impact development (LID) measures, currently employed and planned for higher threat discharges and include an implementation schedule. To control storm water runoff discharges (at the end-of-pipe) during a design storm, permittees must first consider, and use where feasible, LID practices to infiltrate, use, or evapotranspirate storm water runoff on-site, if LID practices would be the most effective at reducing pollutants from entering the ASBS.

g. The BMPs and implementation schedule shall be designed to ensure that natural water quality conditions in the receiving water are achieved and maintained by either reducing flows from impervious surfaces or reducing pollutant loading, or some combination thereof.

h. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents in storm water runoff that alter natural ocean water quality and the sources of these constituents.

(2) The report shall describe BMPs that are currently being implemented, BMPs that are identified in the SWMP or SWPPP for future implementation, and any additional BMPs that may be added to the SWMP or SWPPP to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the BMPs.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits), the discharger shall revise its ASBS Compliance Plan to incorporate any new or modified BMPs that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised SWMP or SWPPP, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural ocean water quality conditions due to the same constituent.

(5) The requirements of this section are in addition to the terms, prohibitions, and conditions contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within eighteen (18) months from the effective date of the Exception, the discharger shall submit a draft written ASBS Compliance Plan to the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that describes its strategy to comply with these special conditions, including the requirement to maintain natural water quality in the affected ASBS. The ASBS Compliance Plan shall include a description of appropriate non-structural controls and a time schedule to implement structural controls (implementation schedule) to comply with these special conditions for inclusion in the discharger's SWMP or SWPPP, as appropriate to permit type. The final ASBS Compliance Plan, including a description and final schedule for structural controls based on the results of runoff and receiving water monitoring, must be submitted within thirty (30) months from the effective date of the Exception.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these special conditions shall be implemented.

d. Within six (6) years of the effective date of the Exception, any structural controls identified in the ASBS Compliance Plan that are necessary to comply with these special conditions shall be operational.

e. Within six (6) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water, pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data, and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by

the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. for municipalities, a demonstration of significant hardship to discharger ratepayers, by showing the relationship of storm water fees to annual household income for residents within the discharger's jurisdictional area, and the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or

2. for other governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

B. NONPOINT SOURCE DISCHARGES

1. General Provisions for Nonpoint Sources

a. Existing nonpoint source waste discharges are allowed into an ASBS only under the following conditions:

(1) The discharges are authorized under waste discharge requirements, a conditional waiver of waste discharge requirements, or a conditional prohibition issued by the State Water Board or a Regional Water Board.

(2) The discharges are in compliance with the applicable terms, prohibitions, and special conditions contained in these Special Protections.

(3) The discharges:

(i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

(ii) Are designed to prevent soil erosion;

(iii) Occur only during wet weather;

(iv) Are composed of only storm water runoff.

b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

c. The discharge of trash is prohibited.

d. Only existing nonpoint source waste discharges are allowed. "Existing nonpoint source waste discharges" are discharges that were ongoing prior to January 1, 2005. "New nonpoint source discharges" are defined as those that commenced on or after January 1,

2005. A change to an existing nonpoint source discharge, in terms of relocation or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges from nonpoint sources (those not subject to an NPDES Permit) are prohibited except as provided below:

(1) The term "non-storm water discharges" means any waste discharges that are not composed entirely of storm water.

(2) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability, or occur naturally:

(i) Discharges associated with emergency fire fighting operations.

(ii) Foundation and footing drains.

(iii) Water from crawl space or basement pumps.

(iv) Hillside dewatering.

(v) Naturally occurring groundwater seepage via a storm drain.

(vi) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

f. At the San Clemente Island ASBS, discharges incidental to military training and research, development, test, and evaluation operations are allowed. Discharges incidental to underwater demolition and other in-water explosions are not allowed in the two military closure areas in the vicinity of Wilson Cove and Castle Rock. Discharges must not result in a violation of the water quality objectives, including the protection of the marine aquatic life beneficial use, anywhere in the ASBS.

g. At the San Nicolas Island and Begg Rock ASBS, discharges incidental to military research, development, testing, and evaluation of, and training with, guided missile and other weapons systems, fleet training exercises, small-scale amphibious warfare training, and special warfare training are allowed. Discharges incidental to underwater demolition and other in-water explosions are not allowed. Discharges must not result in a violation of the water quality objectives, including the protection of the marine aquatic life beneficial use, anywhere in the ASBS.

h. All other nonpoint source discharges not specifically authorized above are prohibited.

2. Planning and Reporting

a. The nonpoint source discharger shall develop an ASBS Pollution Prevention Plan, including an implementation schedule, to address storm water runoff and any other nonpoint source discharges from its facilities. The ASBS Pollution Prevention Plan must be equivalent in contents to an ASBS Compliance Plan as described in I (A)(2) in this document. The ASBS Pollution Prevention Plan is subject to approval by the Executive Director of the State Water Board (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements).

b. The ASBS Pollution Prevention Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff that are necessary to comply with these special conditions, will be achieved through Management Measures and associated Management Practices (Management Measures/Practices). Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director or Regional Water Board Executive Officer that such installation would pose a threat to health or safety. Management Measures to control storm water runoff during a design storm shall achieve on average the following target levels:

(1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

(2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges.

The baseline for these determinations is the effective date of the Exception, except for those structural BMPs installed between January 1, 2005 and adoption of these Special Protections, and the reductions must be achieved and documented within six (6) years of the effective date.

c. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff or other nonpoint source pollution is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and the Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents that alter natural water quality and the sources of these constituents.

(2) The report shall describe Management Measures/Practices that are currently being implemented, Management Measures/Practices that are identified in the ASBS Pollution Prevention Plan for future implementation, and any additional Management Measures/Practices that may be added to the Pollution Prevention Plan to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the Management Measures/Practices.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements), the discharger shall revise its ASBS Pollution Prevention Plan to incorporate any new or modified Management Measures/Practices that have been or

will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised ASBS Pollution Prevention Plan, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural water quality conditions due to the same constituent.

(5) The requirements of this section are in addition to the terms, prohibitions, and conditions contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within eighteen (18) months from the effective date of the Exception, the discharger~~s~~ shall submit a draft written ASBS Pollution Prevention Plan to the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) that describes its strategy to comply with these special conditions, including the requirement to maintain natural ocean water quality in the affected ASBS. The Pollution Prevention Plan shall include a description of appropriate non-structural controls and a time schedule to implement structural controls to comply with these special conditions for inclusion in the discharger's Pollution Prevention Plan. The final ASBS Pollution Prevention Plan, including a description and final schedule for structural controls based on the results of runoff and receiving water monitoring, must be submitted within thirty (30) months from the effective date of the Exception.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these Special Protections shall be implemented.

d. Within six (6) years of the effective date of the Exception, any structural controls identified in the ASBS Pollution Prevention Plan that are necessary to comply with these special conditions shall be operational.

e. Within six (6) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in (d.) or (e.). The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. a demonstration that the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or

2. for governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

II. ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES

In addition to the provisions in Section I (A) or I (B), respectively, a discharger with parks and recreation facilities shall comply with the following:

A. The discharger shall include a section in an ASBS Compliance Plan (for NPDES dischargers) or an ASBS Pollution Prevention Plan (for nonpoint source dischargers) to address storm water runoff from parks and recreation facilities.

1. The plan shall identify all pollutant sources, including sediment sources, which may result in waste entering storm water runoff. Pollutant sources include, but are not limited to, roadside rest areas and vistas, picnic areas, campgrounds, trash receptacles, maintenance facilities, park personnel housing, portable toilets, leach fields, fuel tanks, roads, piers, and boat launch facilities.

2. The plan shall describe BMPs or Management Measures/Practices that will be implemented to control soil erosion (both temporary and permanent erosion controls) and reduce or eliminate pollutants in storm water runoff in order to achieve and maintain natural water quality conditions in the affected ASBS. The plan shall include BMPs or Management Measures/Practices to ensure that trails and culverts are maintained to prevent erosion and minimize waste discharges to ASBS.

3. The plan shall include BMPs or Management Measures/Practices to prevent the discharge of pesticides or other chemicals, including agricultural chemicals, in storm water runoff to the affected ASBS.

4. The plan shall include BMPs or Management Measures/Practices that address public education and outreach. The goal of these BMPs or Management Measures/Practices is to ensure that the public is adequately informed that waste discharges to the affected ASBS are prohibited or limited by special conditions in these Special Protections. The BMPs or Management Measures/Practices shall include signage at camping, picnicking, beach and roadside parking areas, and visitor centers, or other appropriate measures, which notify the public of any applicable requirements of these Special Protections and identify the ASBS boundaries.

5. The plan shall include BMPs or Management Measures/Practices that address the prohibition against the discharge of trash to ASBS. The BMPs or Management Measures/Practices shall include measures to ensure that adequate trash receptacles are available for public use at visitor facilities, including parking areas, and that the receptacles are adequately maintained to prevent trash discharges into the ASBS. Appropriate measures include covering trash receptacles to prevent trash from being wind blown and periodically emptying the receptacles to prevent overflows.

6. The plan shall include BMPs or Management Measures/Practices to address runoff from parking areas and other developed features to ensure that the runoff does not alter natural water quality in the affected ASBS. BMPs or Management Measures/Practices shall include measures to reduce pollutant loading in runoff to the ASBS through installation of natural area buffers (LID), treatment, or other appropriate measures.

B. Maintenance and repair of park and recreation facilities must not result in waste discharges to the ASBS. The practice of road oiling must be minimized or eliminated, and must not result in waste discharges to the ASBS.

III. ADDITIONAL REQUIREMENTS – WATERFRONT AND MARINE OPERATIONS

In addition to the provisions in Section I (A) or I (B), respectively, a discharger with waterfront and marine operations shall comply with the following:

A. For discharges related to waterfront and marine operations, the discharger shall develop a Waterfront and Marine Operations Management Plan (Waterfront Plan). This plan shall contain appropriate Management Measures/Practices to address nonpoint source pollutant discharges to the affected ASBS.

1. The Waterfront Plan shall contain appropriate Management Measures/Practices for any waste discharges associated with the operation and maintenance of vessels, moorings, piers, launch ramps, and cleaning stations in order to ensure that beneficial uses are protected and natural water quality is maintained in the affected ASBS.

2. For discharges from marinas and recreational boating activities, the Waterfront Plan shall include appropriate Management Measures, described in The Plan for California's Nonpoint Source Pollution Control Program, for marinas and recreational boating, or equivalent practices, to ensure that nonpoint source pollutant discharges do not alter natural water quality in the affected ASBS.

3. The Waterfront Plan shall include Management Practices to address public education and outreach to ensure that the public is adequately informed that waste discharges to the affected ASBS are prohibited or limited by special conditions in these Special

Protections. The management practices shall include appropriate signage, or similar measures, to inform the public of the ASBS restrictions and to identify the ASBS boundaries.

4. The Waterfront Plan shall include Management Practices to address the prohibition against trash discharges to ASBS. The Management Practices shall include the provision of adequate trash receptacles for marine recreation areas, including parking areas, launch ramps, and docks. The plan shall also include appropriate Management Practices to ensure that the receptacles are adequately maintained and secured in order to prevent trash discharges into the ASBS. Appropriate Management Practices include covering the trash receptacles to prevent trash from being windblown, staking or securing the trash receptacles so they don't tip over, and periodically emptying the receptacles to prevent overflow.

5. The discharger shall submit its Waterfront Plan to the by the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) within six months of the effective date of these special conditions. The Waterfront Plan is subject to approval by the State Water Board Executive Director or the Regional Water Board Executive Officer, as appropriate. The plan must be fully implemented within 18 months of the effective date of the Exception.

B. The discharge of chlorine, soaps, petroleum, other chemical contaminants, trash, fish offal, or human sewage to ASBS is prohibited. Sinks and fish cleaning stations are point source discharges of wastes and are prohibited from discharging into ASBS. Anthropogenic accumulations of discarded fouling organisms on the sea floor must be minimized.

C. Limited-term activities, such as the repair, renovation, or maintenance of waterfront facilities, including, but not limited to, piers, docks, moorings, and breakwaters, are authorized only in accordance with Chapter III.E.2 of the Ocean Plan.

D. If the discharger anticipates that the discharger will fail to fully implement the approved Waterfront Plan within the 18 month deadline, the discharger shall submit a technical report as soon as practicable to the State Water Board Executive Director or the Regional Water Board Executive Officer, as appropriate. The technical report shall contain reasons for failing to meet the deadline and propose a revised schedule to fully implement the plan.

E. The State Water Board or the Regional Water Board may, for good cause, authorize additional time to comply with the Waterfront Plan. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in Section III.A.5. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the

discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality. The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. a demonstration of significant hardship by showing that the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate.

2. for governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

IV. MONITORING REQUIREMENTS

Monitoring is mandatory for all dischargers to assure compliance with the Ocean Plan. Monitoring requirements include both: (A) core discharge monitoring, and (B) ocean receiving water monitoring. The State and Regional Water Boards must approve sampling site locations and any adjustments to the monitoring programs. All ocean receiving water and reference area monitoring must be comparable with the Water Boards' Surface Water Ambient Monitoring Program (SWAMP).

Safety concerns: Sample locations and sampling periods must be determined considering safety issues. Sampling may be postponed upon notification to the State and Regional Water Boards if hazardous conditions prevail.

Analytical Chemistry Methods: All constituents must be analyzed using the lowest minimum detection limits comparable to the Ocean Plan water quality objectives. For metal analysis, all samples, including storm water effluent, reference samples, and ocean receiving water samples, must be analyzed by the approved analytical method with the lowest minimum detection limits (currently Inductively Coupled Plasma/Mass Spectrometry) described in the Ocean Plan.

A. CORE DISCHARGE MONITORING PROGRAM

1. General sampling requirements for timing and storm size:

   Runoff must be collected during a storm event that is greater than 0.1 inch and generates runoff, and at least 72 hours from the previously measurable storm event. Runoff samples shall be collected during the same storm and at approximately the same time when post-storm receiving water is sampled, and analyzed for the same constituents as receiving water and reference site samples (see section IV B) as described below.

2. Runoff flow measurements

   a. For municipal/industrial storm water outfalls in existence as of December 31, 2007, 18 inches (457mm) or greater in diameter/width (including multiple outfall pipes in combination having a width of 18 inches, runoff flows must be measured or calculated, using a method acceptable to and approved by the State and Regional Water Boards.

b. This will be reported annually for each precipitation season to the State and Regional Water Boards.

3. Runoff samples – storm events

a. For outfalls equal to or greater than 18 inches (0.46m) in diameter or width:

(1) samples of storm water runoff shall be collected during the same storm as receiving water samples and analyzed for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

(2) samples of storm water runoff shall be collected and analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

(3) If an applicant has no outfall greater than 36 inches, then storm water runoff from the applicant's largest outfall shall be further collected during the same storm as receiving water samples and analyzed for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates).

b. For outfalls equal to or greater than 36 inches (0.91m) in diameter or width:

(1) samples of storm water runoff shall be collected during the same storm as receiving water samples and analyzed for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

(2) samples of storm water runoff shall be further collected during the same storm as receiving water samples and analyzed for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates); and

(3) samples of storm water runoff shall be collected and analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

c. For an applicant not participating in a regional monitoring program [see below in Section IV (B)] in addition to (a.) and (b.) above, a minimum of the two largest outfalls or 20 percent of the larger outfalls, whichever is greater, shall be sampled (flow weighted composite samples) at least three times annually during wet weather (storm event) and analyzed for all Ocean Plan Table A constituents, Table B constituents for marine aquatic life protection (except for toxicity, only chronic toxicity for three species shall be required), DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, and Ocean Plan indicator bacteria. For parties discharging to ASBS in

more than one Regional Water Board region, at a minimum, one (the largest) such discharge shall be sampled annually in each Region.

4. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may reduce or suspend core monitoring once the storm runoff is fully characterized. This determination may be made at any point after the discharge is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

B. Ocean Receiving Water and Reference Area Monitoring Program

In addition to performing the Core Discharge Monitoring Program in Section II.A above, all applicants having authorized discharges must perform ocean receiving water monitoring. In order to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS, dischargers may choose either (1) an individual monitoring program, or (2) participation in a regional integrated monitoring program.

1. Individual Monitoring Program: The requirements listed below are for those dischargers who elect to perform an individual monitoring program to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within the affected ASBS. In addition to Core Discharge Monitoring, the following additional monitoring requirements shall be met:

   a. Three times annually, during wet weather (storm events), the receiving water at the point of discharge from the outfalls described in section (IV)(A)(3)(c) above shall be sampled and analyzed for Ocean Plan Table A constituents, Table B constituents for marine aquatic life, DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, salinity, chronic toxicity (three species), and Ocean Plan indicator bacteria.

      The sample location for the ocean receiving water shall be in the surf zone at the point of discharges; this must be at the same location where storm water runoff is sampled. Receiving water shall be sampled prior to (pre-storm) and during (or immediately after) the same storm (post storm). Post storm sampling shall be during the same storm and at approximately the same time as when the runoff is sampled. Reference water quality shall also be sampled three times annually and analyzed for the same constituents pre-storm and post-storm, during the same storm seasons when receiving water is sampled. Reference stations will be determined by the State Water Board's Division of Water Quality and the applicable Regional Water Board(s).

   b. Sediment sampling shall occur at least three times during every five (5) year period. The subtidal sediment (sand or finer, if present) at the discharge shall be sampled and analyzed for Ocean Plan Table B constituents for marine aquatic life, DDT, PCBs, PAHs, pyrethroids, and OP pesticides. For sediment toxicity testing, only an acute toxicity test using the amphipod *Eohaustorius estuarius* must be performed.

   c. A quantitative survey of intertidal benthic marine life shall be performed at the discharge and at a reference site. The survey shall be performed at least once every five (5) year period. The survey design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The results of the survey shall be

completed and submitted to the State Water Board and Regional Water Board at least six months prior to the end of the permit cycle.

d. Once during each five (5) year period, a bioaccumulation study shall be conducted to determine the concentrations of metals and synthetic organic pollutants at representative discharge sites and at representative reference sites. The study design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The bioaccumulation study may include California mussels (*Mytilus californianus*) and/or sand crabs (*Emerita analoga* or *Blepharipoda occidentalis*). Based on the study results, the Regional Water Board and the State Water Board's Division of Water Quality, may adjust the study design in subsequent permits, or add or modify additional test organisms (such as shore crabs or fish), or modify the study design appropriate for the area and best available sensitive measures of contaminant exposure.

e. Marine Debris: Representative quantitative observations for trash by type and source shall be performed along the coast of the ASBS within the influence of the discharger's outfalls. The design, including locations and frequency, of the marine debris observations is subject to approval by the Regional Water Board and State Water Board's Division of Water Quality.

f. The monitoring requirements of the Individual Monitoring Program in this section are minimum requirements. After a minimum of one (1) year of continuous water quality monitoring of the discharges and ocean receiving waters, the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may require additional monitoring, or adjust, reduce or suspend receiving water and reference station monitoring. This determination may be made at any point after the discharge and receiving water is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

2. Regional Integrated Monitoring Program: Dischargers may elect to participate in a regional integrated monitoring program, in lieu of an individual monitoring program, to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS. This regional approach shall characterize natural water quality, pre- and post-storm, in ocean reference areas near the mouths of identified open space watersheds and the effects of the discharges on natural water quality (physical, chemical, and toxicity) in the ASBS receiving waters, and should include benthic marine aquatic life and bioaccumulation components. The design of the ASBS stratum of a regional integrated monitoring program may deviate from the otherwise prescribed individual monitoring approach (in Section IV.B.1) if approved by the State Water Board's Division of Water Quality and the Regional Water Boards.

a. Ocean reference areas shall be located at the drainages of flowing watersheds with minimal development (in no instance more than 10% development), and shall not be located in CWA Section 303(d) listed waterbodies or have tributaries that are 303(d) listed. Reference areas shall be free of wastewater discharges and anthropogenic non- storm water runoff. A minimum of low threat storm runoff discharges (e.g. stream highway overpasses and campgrounds) may be allowed on a case-by-case basis. Reference areas shall be located in the same region as the ASBS receiving water monitoring occurs. The reference areas for each Region are subject to approval by the participants in the regional monitoring program and the State Water

Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean reference water samples must be collected from each station, each from a separate storm during the same storm season that receiving water is sampled. A minimum of one reference location shall be sampled for each ASBS receiving water site sampled per responsible party. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

b. ASBS ocean receiving water must be sampled in the surf zone at the location where the runoff makes contact with ocean water (i.e. at "point zero"). Ocean receiving water stations must be representative of worst-case discharge conditions (i.e. co-located at a large drain greater than 36 inches, or if drains greater than 36 inches are not present in the ASBS then the largest drain greater than18 inches.) Ocean receiving water stations are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean receiving water samples must be collected during each storm season from each station, each from a separate storm. A minimum of one receiving water location shall be sampled in each ASBS per responsible party in that ASBS. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

c. Reference and receiving water sampling shall commence during the first full storm season following the adoption of these special conditions, and post-storm samples shall be collected during the same storm event when storm water runoff is sampled. Sampling shall occur in a minimum of two storm seasons. For those ASBS dischargers that have already participated in the Southern California Bight 2008 ASBS regional monitoring effort, sampling may be limited to only one storm season.

d. Receiving water and reference samples shall be analyzed for the same constituents as storm water runoff samples. At a minimum, constituents to be sampled and analyzed in reference and discharge receiving waters must include oil and grease, total suspended solids, Ocean Plan Table B metals for protection of marine life, Ocean Plan PAHs, pyrethroids, OP pesticides, ammonia, nitrate, phosphates, and critical life stage chronic toxicity for three species. In addition, within the range of the southern sea otter, indicator bacteria or some other measure of fecal contamination shall be analyzed.

3. Waterfront and Marine Operations: In addition to the above requirements for ocean receiving water monitoring, additional monitoring must be performed for marinas and boat launch and pier facilities:

a. For all marina or mooring field operators, in mooring fields with 10 or more occupied moorings, the ocean receiving water must be sampled for Ocean Plan indicator bacteria, residual chlorine, copper, zinc, grease and oil, methylene blue active substances (MBAS), and ammonia nitrogen.

(1) For mooring field operators opting for an individual monitoring program (Section IV.B.1 above), this sampling must occur weekly (on the weekend) from May through October.

(2) For mooring field operators opting to participate in a regional integrated monitoring program (Section IV.B.2 above), this sampling must occur monthly from May through October on a high use weekend in each month. The Water Boards may allow a reduction in the frequency of sampling, through the regional monitoring program, after the first year of monitoring.

b. For all mooring field operators, the subtidal sediment (sand or finer, if present) within mooring fields and below piers shall be sampled and analyzed for Ocean Plan Table B metals (for marine aquatic life beneficial use), acute toxicity, PAHs, and tributyltin. For sediment toxicity testing, only an acute toxicity test using the amphipod *Eohaustorius estuarius* must be performed. This sampling shall occur at least three times during a five (5) year period. For mooring field operators opting to participate in a regional integrated monitoring program, the Water Boards may allow a reduction in the frequency of sampling after the first sampling effort's results are assessed.

Glossary

At the point of discharge(s) – Means in the surf zone immediately where runoff from an outfall meets the ocean water (a.k.a., at point zero).

Areas of Special Biological Significance (ASBS) – Those areas designated by the State Water Board as ocean areas requiring protection of species or biological communities to the extent that alteration of natural water quality is undesirable. All Areas of Special Biological Significance are also classified as a subset of State Water Quality Protection Areas.

Design storm – For purposes of these Special Protections, a design storm is defined as the volume of runoff produced from one inch of precipitation per day or, if this definition is inconsistent with the discharger's applicable storm water permit, then the design storm shall be the definition included in the discharger's applicable storm water permit.

Development – Relevant to reference monitoring sites, means urban, industrial, agricultural, grazing, mining, and timber harvesting land uses.

Higher threat discharges - Permitted storm drains discharging equal to or greater than 18 inches, industrial storm drains, agricultural runoff discharged through an MS4, discharges associated with waterfront and marina operations (e.g., piers, launch ramps, mooring fields, and associated vessel support activities, except for passive discharges defined below), and direct discharges associated with commercial or industrial activities to ASBS.

Low Impact Development (LID) – A sustainable practice that benefits water supply and contributes to water quality protection. Unlike traditional storm water management, which entails collecting and conveying storm water runoff through storm drains, pipes, or other conveyances to a centralized storm water facility, LID focuses on using site design and storm water management to maintain the site's pre-development runoff rates and volumes. The goal of LID is to mimic a site's predevelopment hydrology by using design techniques that infiltrate, filter, store, evaporate, and detain runoff close to the source of rainfall.

Marine Operations – Marinas or mooring fields that contain slips or mooring locations for 10 or more vessels.

Management Measure (MM) - Economically achievable measures for the control of the addition of pollutants from various classes of nonpoint sources of pollution, which reflect the greatest degree of pollutant reduction achievable through the application of the best available nonpoint pollution control practices, technologies, processes, siting criteria, operating methods, or other alternatives. For example, in the "marinas and recreational boating" land- use category specified in the Plan for California's Nonpoint Source Pollution Control Program (NPS Program Plan) (SWRCB, 1999), "boat cleaning and maintenance" is considered a MM or the source of a specific class or type of NPS pollution.

Management Practice (MP) - The practices (e.g., structural, non-structural, operational, or other alternatives) that can be used either individually or in combination to address a specific MM class or classes of NPS pollution. For example, for the "boat cleaning and maintenance" MM, specific MPs can include, but are not limited to, methods for the selection of environmentally sensitive hull paints or methods for cleaning/removal of hull copper anti- fouling paints.

Municipal Separate Storm Sewer System (MS4) – A municipally-owned storm sewer system regulated under the Phase I or Phase II storm water program implemented in compliance with Clean Water Act section 402(p). Note that an MS4 program's boundaries are not necessarily congruent with the permittee's political boundaries.

Natural Ocean Water Quality - The water quality (based on selected physical, chemical and biological characteristics) that is required to sustain marine ecosystems, and which is without apparent human influence, *i.e.*, an absence of significant amounts of: (a) man-made constituents (*e.g.,* DDT); (b) other chemical (*e.g.,* trace metals), physical (temperature/thermal pollution, sediment burial), and biological (*e.g.*, bacteria) constituents at concentrations that have been elevated due to man's activities above those resulting from the naturally occurring processes that affect the area in question; and (c) non-indigenous biota (*e.g.,* invasive algal bloom species) that have been introduced either deliberately or accidentally by man. Discharges "*shall not alter natural ocean water quality*" as determined by a comparison to the range of constituent concentrations in reference areas agreed upon via the regional monitoring program(s). If monitoring information indicates that *natural ocean water quality* is not maintained, but there is sufficient evidence that a discharge is not contributing to the alteration of natural water quality, then the Regional Water Board may make that determination. In this case, sufficient information must include runoff sample data that has equal or lower concentrations for the range of constituents at the applicable reference area(s).

Nonpoint source – Nonpoint pollution sources generally are sources that do not meet the definition of a point source. Nonpoint source pollution typically results from land runoff, precipitation, atmospheric deposition, agricultural drainage, marine/boating operations or hydrologic modification. Nonpoint sources, for purposes of these Special Protections, include discharges that are not required to be regulated under an NPDES permit.

Non-storm water discharge – Any runoff that is not the result of a precipitation event. This is often referred to as "dry weather flow."

Non-structural control – A Best Management Practice that involves operational, maintenance, regulatory (e.g., ordinances) or educational activities designed to reduce or eliminate pollutants in runoff, and that are not structural controls (i.e. there are no physical structures involved).

Physical impossibility - Means any act of God, war, fire, earthquake, windstorm, flood or natural catastrophe; unexpected and unintended accidents not caused by discharger or its employees' negligence; civil disturbance, vandalism, sabotage or terrorism; restrain by court order or public authority or agency; or action or non-action by, or inability to

obtain the necessary authorizations or approvals from any governmental agency other than the permittee.

Representative sites and monitoring procedures – Are to be proposed by the discharger, with appropriate rationale, and subject to approval by Water Board staff.

Sheet-flow – Runoff that flows across land surfaces at a shallow depth relative to the cross- sectional width of the flow. These types of flow may or may not enter a storm drain system before discharge to receiving waters.

Storm Season – Also referred to as rainy season, means the months of the year from the onset of rainfall during autumn until the cessation of rainfall in the spring.

Structural control – A Best Management Practice that involves the installation of engineering solutions to the physical treatment or infiltration of runoff.

Surf Zone - The surf zone is defined as the submerged area between the breaking waves and the shoreline at any one time.

Surface Water Ambient Monitoring Program (SWAMP) comparable – Means that the monitoring program must 1) meet or exceed 2008 SWAMP Quality Assurance Program Management Plan (QAPP) Measurement Quality Objectives, or 2) have a Quality Assurance Project Plan that has been approved by SWAMP; in addition data must be formatted to match the database requirements of the SWAMP Information Management System. Adherence to the measurement quality objectives in the Southern California Bight 2008 ASBS Regional Monitoring Program QAPP and data base management comprises being SWAMP comparable.

Waterfront Operations - Piers, launch ramps, and cleaning stations in the water or on the adjacent shoreline.

Attachment 1
Special Protections Sections I(A)(3)(e) and I(B)(3)(e)
Flowchart to Determine Compliance with natural Water Quality

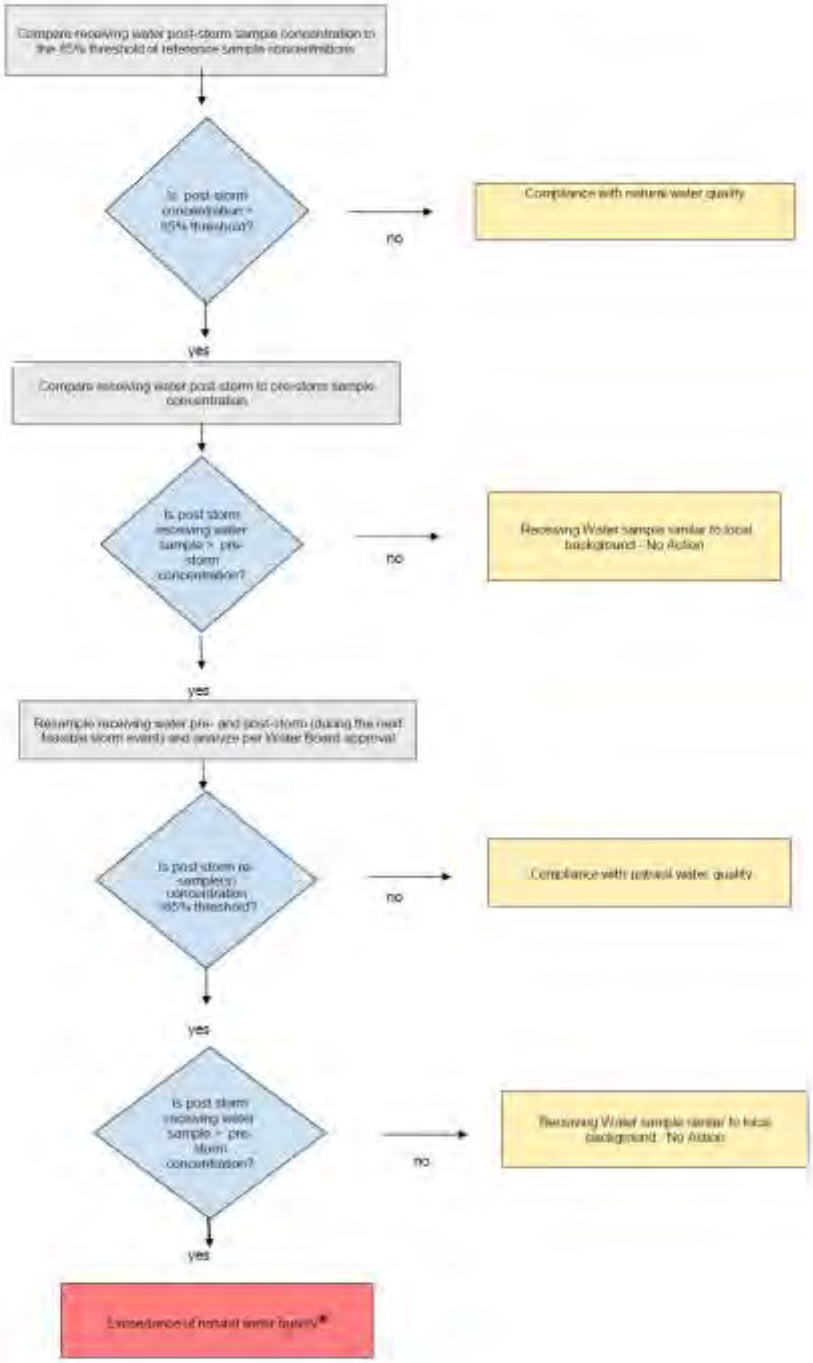

*** When an exceedance of natural water quality occurs, the discharger must comply with section I.A.2.h (for permitted storm water) or section I.B.2.c (for nonpoint sources). Note, when sampling data is available, end-of-pipe effluent concentrations will be considered by the Water Boards in making this determination.**

ATTACHMENT B

STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

1. Standard Permit Provisions

Code of Federal Regulations Title 40 Section 122.41 (40 CFR 122.41) includes conditions, or provisions, that apply to all National Pollutant Discharge Elimination System (NPDES) permits. Additional provisions applicable to NPDES permits are in 40 CFR 122.42. All applicable provisions in 40 CFR 122.41 and 40 CFR 122.42 must be incorporated into this Order and NPDES permit. The applicable 40 CFR 122.41 and 40 CFR 122.42 provisions are as follows:

a. DUTY TO COMPLY [40 CFR 122.41(a)]

The Copermittee must comply with all of the provisions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

(1) The Copermittee must comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement. [40 CFR 122.41(a)(1)]

(2) The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to a civil penalty not to exceed $25,000 per day for each violation. The CWA provides that any person who *negligently* violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than 2 years, or both. Any person who *knowingly* violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both. Any person who knowingly violates Section 301, 302, 303, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, and who knows at that time that he thereby places another person in imminent

danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.
[40 CFR 122.41(a)(2)]

(3) Any person may be assessed an administrative penalty by the San Diego Regional Water Quality Control Board (San Diego Water Board), State Water Resources Control Board (State Water Board), or United States Environmental Protection Agency (USEPA) for violating Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.
[40 CFR 122.41(a)(3)]

b. DUTY TO REAPPLY [40 CFR 122.41(b)]

If a Copermittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Copermittee must apply for and obtain a new permit.

c. NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE [40 CFR 122.41(c)]

It shall not be a defense for a Copermittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

d. DUTY TO MITIGATE [40 CFR 122.41(d)]

The Copermittee must take all reasonable steps to minimize or prevent any discharge or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

e. PROPER OPERATION AND MAINTENANCE [40 CFR 122.41(e)]

The Copermittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Copermittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by a Copermittee only when the operation is necessary to achieve compliance with the conditions of this permit.

f. PERMIT ACTIONS [40 CFR 122.41(f)]

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Copermittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

g. PROPERTY RIGHTS [40 CFR 122.41(g)]

This permit does not convey any property rights of any sort, or any exclusive privilege.

h. DUTY TO PROVIDE INFORMATION [40 CFR 122.41(h)]

The Copermittee must furnish to the San Diego Water Board, State Water Board, or USEPA within a reasonable time, any information which the San Diego Water Board, State Water Board, or USPEA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Copermittee must also furnish to the San Diego Water Board, State Water Board, or USPEA upon request, copies of records required to be kept by this permit.

i. INSPECTION AND ENTRY [40 CFR 122.41(i)]

The Copermittee must allow the San Diego Water Board, State Water Board, USEPA, and/or their authorized representative (including an authorized contractor acting as their representative), upon presentation of credentials and other documents as may be required by law, to:

(1) Enter upon the Copermittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit; [40 CFR 122.41(i)(1)]

(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit; [40 CFR 122.41(i)(2)]

(3) Inspect and photograph at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; [40 CFR 122.41(i)(3)] and

(4) Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location. [40 CFR 122.41(i)(4)]

j. MONITORING AND RECORDS [40 CFR 122.41(j)]

(1) Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity. [40 CFR 122.41(j)(1)]

(2) Except for records of monitoring information required by this permit related to the Copermittee's sewage sludge use and disposal activities, which shall be retained for

a period of at least five (5) years (or longer as required by 40 CFR Part 503), the Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time. [40 CFR 122.41(j)(2)]

(3) Records for monitoring information must include: [40 CFR 122.41(j)(3)]

(a) The date, exact place, and time of sampling or measurements; [40 CFR 122.41(j)(3)(i)]
(b) The individual(s) who performed the sampling or measurements; [40 CFR 122.41(j)(3)(ii)]
(c) The date(s) analyses were performed; [40 CFR 122.41(j)(3)(iii)]
(d) The individual(s) who performed the analyses; [40 CFR 122.41(j)(3)(iv)]
(e) The analytical techniques or methods used; [40 CFR 122.41(j)(3)(v)] and
(f) The results of such analyses. [40 CFR 122.41(j)(3)(vi)]

(4) Monitoring must be conducted according to test procedures under 40 CFR Part 136 unless another method is required under 40 CFR Subchapters N or O. [40 CFR 122.41(j)(4)]

In the case of pollutants for which there are no approved methods under 40 CFR Part 136 or otherwise required under 40 CFR Subchapters N and O, monitoring must be conducted according to a test procedure specified in the permit for such pollutants. [40 CFR 122.44(i)(1)(iv)]

(5) The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. [40 CFR 122.41(j)(5)]

k. SIGNATORY REQUIREMENT [40 CFR 122.41(k)]

(1) All applications, reports, or information submitted to the San Diego Water Board, State Water Board, or USEPA must be signed and certified. (See 40 CFR 122.22) [40 CFR 122.41(k)(1)]

(a) *For a municipality, State, Federal, or other public agency.* [All applications must be signed] by either a principal executive officer or ranking elected official. [40 CFR 122.22(a)(3)]

(b) All reports required by permits, and other information requested by the San Diego Water Board, State Water Board, or USEPA must be signed by a person described in paragraph (a) of this section, or by a duly authorized

representative of that person. A person is a duly authorized representative only if: [40 CFR 122.22(b)]

(i) The authorization is made in writing by a person described in paragraph (a) of this section; [40 CFR 122.22(b)(1)]
(ii) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company, (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) [40 CFR 122.22(b)(2)] and,
(iii) The written authorization is submitted to the San Diego Water Board and State Water Board. [40 CFR 122.22(b)(3)]

(c) *Changes to authorization.* If an authorization under paragraph (b) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (b) of this section must be submitted to the San Diego Water Board prior to or together with any reports, information, or applications to be signed by an authorized representative. [40 CFR 122.22(c)]

(d) *Certification.* Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." [40 CFR 122.22(d)]

(2) The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both. [40 CFR 122.41(k)(2)]

I. REPORTING REQUIREMENTS [40 CFR 122.41(l)]

(1) *Planned changes.* The Copermittee must give notice to the San Diego Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when: [40 CFR 122.41(l)(1)]

(a) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); [40 CFR 122.41(l)(1)(i)] or

(b) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1). [40 CFR 122.41(l)(1)(ii)]

(c) The alteration or addition results in a significant change in the Copermittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. [40 CFR 122.41(l)(1)(iii)]

(2) *Anticipated noncompliance*. The Copermittee must give advance notice to the San Diego Water Board or State Water Board of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements. [40 CFR 122.41(l)(2)]

(3) *Transfers*. This permit is not transferable to any person except after notice to the San Diego Water Board. The San Diego Water Board may require modification or revocation and reissuance of the permit to change the name of the Copermittee and incorporate such other requirements as may be necessary under the CWA. [40 CFR 122.41(l)(3)]

(4) *Monitoring reports.* Monitoring results must be reported at the intervals specified elsewhere in this permit. [40 CFR 122.41(l)(4)]

(a) Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the San Diego Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices. [40 CFR 122.41(l)(4)(i)]

(b) If the Copermittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or another method required for an industry-specific waste stream under 40 CFR Subchapters N or O, the results of this monitoring must be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the San Diego Water Board or State Water Board. [40 CFR 122.41(l)(4)(ii)]

(c) Calculations for all limitations which require averaging of measurements must utilize an arithmetic mean unless otherwise specified in the permit. [40 CFR 122.41(l)(4)(iii)]

(5) *Compliance schedules*. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date. [40 CFR 122.41(l)(5)]

(6) *Twenty-four hour reporting.*

(a) The Copermittee must report any noncompliance that may endanger health or the environment. Any information must be provided orally within 24 hours from the time the Copermittee becomes aware of the circumstances. A written submission must also be provided within five (5) days of the time the Copermittee becomes aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6)(i)]

(b) The following must be included as information which must be reported within 24 hours under this paragraph: [40 CFR 122.41(l)(6)(ii)]

(i) Any unanticipated bypass that exceeds any effluent limitation in the permit (See 40 CFR 122.41(g)). [40 CFR 122.41(l)(6)(ii)(A)]
(ii) Any upset which exceeds any effluent limitation in the permit. [40 CFR 122.41(l)(6)(ii)(B)] and,
(iii) Violation of a maximum daily discharge limitation for any of the pollutants listed by the San Diego Water Board in the permit to be reported within 24 hours. (See 40 CFR 122.44(g)) [40 CFR 122.41(l)(6)(ii)(C)]

(c) The San Diego Water Board may waive the above-required written report on a case-by-case basis if the oral report has been received within 24 hours. [40 CFR 122.41(l)(6)(iii)]

(7) *Other noncompliance.* The Copermittee must report all instances of noncompliance not reported in accordance with the standard provisions required under 40 CFR 122.41(l)(4), (5), and (6), at the time monitoring reports are submitted. The reports must contain the information listed in the standard provisions required under 40 CFR 122.41(l)(6). [40 CFR 122.41(l)(7))]

(8) *Other information.* When the Copermittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the San Diego Water Board, State Water Board, or USEPA, the Copermittee must promptly submit such facts or information. [40 CFR 122.41(l)(8)]

m. BYPASS [40 CFR 122.41(m)]

(1) *Definitions.*

(a) "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. [40 CFR 122.41(m)(1)(i)] or

(b) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or

substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
[40 CFR 122.41(m)(1)(ii)]

(2) *Bypass not exceeding limitations*. The Copermittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the standard provisions required under 40 CFR 122.41(m)(3) and (4).
[40 CFR 122.41(m)(2)]

(3) *Notice.*

(a) *Anticipated bypass*. If the Copermittee knows in advance of the need for a bypass, it must submit a notice, if possible at least ten days before the date of the bypass. [40 CFR 122.41(m)(3)(i)] or

(b) *Unanticipated bypass*. The Copermittee must submit notice of an unanticipated bypass in accordance with the standard provisions required under 40 CFR 122.41(l)(6) (24-hour notice).
[40 CFR 122.41(m)(3)(ii)]

(4) *Prohibition of Bypass.*

(a) Bypass is prohibited, and the San Diego Water Board may take enforcement action against a Copermittee for bypass, unless:
[40 CFR 122.41(m)(4)(i)]

(i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; [40 CFR 122.41(m)(4)(i)(A)]
(ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance;
[40 CFR 122.41(m)(4)(i)(B)] and,
(iii) The Copermittee submitted notice in accordance with the standard provisions required under 40 CFR 122.41(m)(3).
[40 CFR 122.41(m)(4)(i)(C)]

(b) The San Diego Water Board may approve an anticipated bypass, after considering its adverse effects, if the San Diego Water Board determines that it will meet the three conditions listed above.
[40 CFR 122.41(m)(4)(ii)]

n. UPSET [40 CFR 122.41(n)]

(1) *Definition.* "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because

of factors beyond the reasonable control of the Copermittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. [40 CFR 122.41(n)(1)]

(2) *Effect of an upset*. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the standard provisions required under 40 CFR 122.41(n)(3) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. [40 CFR 122.41(n)(2)]

(3) *Conditions necessary for a demonstration of upset*. A Copermittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that: [40 CFR 122.41(n)(3)]

(a) An upset occurred and that the Copermittee can identify the cause(s) of the upset; [40 CFR 122.41(n)(3)(i)]
(b) The permitted facility was at the time being properly operated; [40 CFR 122.41(n)(3)(ii)] and
(c) The Copermittee submitted notice of the upset in accordance with the standard provisions required under 40 CFR 122.41(l)(6)(ii)(B) (24-hour notice). [40 CFR 122.41(n)(3)(iii)]
(d) The Copermittee complied with any remedial measures pursuant to the standard provisions required under 40 CFR 122.41(d). [40 CFR 122.41(n)(3)(iii)]

(4) *Burden of proof*. In any enforcement proceeding, the Copermittee seeking to establish the occurrence of an upset has the burden of proof. [40 CFR 122.41(n)(4)]

o. STANDARD PERMIT PROVISIONS FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS [40 CFR 122.42(c)]

The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the San Diego Water Board or State Water Board under 40 CFR 122.26(a)(1)(v) must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report must include:

(1) The status of implementing the components of the storm water management program that are established as permit conditions; [40 CFR 122.42(c)(1)]

(2) Proposed changes to the storm water management programs that are established as permit conditions. Such proposed changes must be consistent with 40 CFR 122.26(d)(2)(iii); [40 CFR 122.42(c)(2)] and

(3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under 40 CFR 122.26(d)(2)(iv) and (v); [40 CFR 122.42(c)(3)]

(4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; [40 CFR 122.42(c)(4)]

(5) Annual expenditures and budget for year following each annual report; [40 CFR 122.42(c)(5)]

(6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; [40 CFR 122.42(c)(6)]

(7) Identification of water quality improvements or degradation. [40 CFR 122.42(c)(7)]

p. STANDARD PERMIT PROVISIONS FOR STORM WATER DISCHARGES [40 CFR 122.42(d)]

The initial permits for discharges composed entirely of storm water issued pursuant to 40 CFR 122.26(e)(7) must require compliance with the conditions of the permit as expeditiously as practicable, but in no event later than three years after the date of issuance of the permit.

2. General Provisions

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. The general provisions applicable to this Order and NPDES permit are as follows:

a. DISCHARGE OF WASTE IS A PRIVILEGE

No discharge of waste into the waters of the State, whether or not such discharge is made pursuant to waste discharge requirements, shall create a vested right to continue such discharge. All discharges of waste into waters of the State are privileges, not rights. [CWC Section 13263(g)]

b. DURATION OF ORDER AND NPDES PERMIT

(1) *Effective date*. This Order supersedes Order No. R9-2007-0001 for the San Diego County Copermittees listed in Table 1a and became effective on June 27, 2013. This Order as amended by Order R9-2015-0001 supersedes Order No. R9-2009-0002 for the Orange County Copermittees listed in Table 1b and its amendments through Order No. R9-2015-0001 became effective April 1, 2015. This Order as amended by Order Nos. R9-2015-0001 and R9-2015-0100 supersedes Order No. R9-2010-0016 for the Riverside County Copermittees listed in Table 1c and its amendments through Order No. R9-2015-0100 became effective January 7, 2016.

(2) *Expiration*. This Order and NPDES permit expires five years after June 27, 2013, its initial effective date. [40 CFR 122.46(a)]

(3) *Continuation of expired order*. After this Order and NPDES permit expires, the terms and conditions of this Order and NPDES permit are automatically continued pending issuance of a new permit if all requirements of the federal NPDES regulations on the continuation of expired permits (40 CFR 122.6) are complied with.

c. AVAILABILITY

A copy of this Order must be kept at a readily accessible location and must be available to on-site personnel at all times.

d. CONFIDENTIALITY OF INFORMATION

Except as provided for in 40 CFR 122.7, no information or documents submitted in accordance with or in application for this Order will be considered confidential, and all such information and documents shall be available for review by the public at the San Diego Water Board office.

Claims of confidentiality for the following information will be denied: [40 CFR 122.7(b)]

(1) The name and address of any permit applicant or Copermittee; [40 CFR 122.7(b)(1)] and

(2) Permit applications and attachments, permits, and effluent data. [40 CFR 122.7(b)(2)]

e. EFFLUENT LIMITATIONS

(1) *Interim effluent limitations*. The Copermittee must comply with any interim effluent limitations as established by addendum, enforcement action, or revised waste discharge requirements which have been, or may be, adopted by the San Diego Water Board.

(2) *Other effluent limitations and standards*. If any applicable toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant and that standard or prohibition is more stringent than any limitation on the pollutant in the permit, the San Diego Water Board shall institute proceedings under these regulations to modify or revoke and reissue the permit to conform to the toxic effluent standard or prohibition. [40 CFR 122.44(b)(1)]

f. DUTY TO MINIMIZE OR CORRECT ADVERSE IMPACTS

The Copermittee must take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this Order, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the noncompliance.

g. PERMIT ACTIONS

The filing of a request by the Copermittee for modification, revocation and reissuance, or termination of this Order, or a notification of planned change in or anticipated noncompliance with this Order does not stay any condition of this Order. (See 40 CFR 122.41(f)) In addition, the following provisions apply to this Order:

(1) Upon application by any affected person, or on its own motion, the San Diego Water Board may review and revise the requirements in this Order. All requirements must be reviewed periodically. [CWC Section 13263(e)]

(2) This Order may be terminated or modified for cause, including, but not limited to, all of the following: [CWC Section 13381]

(a) Violation of any condition contained in the requirements of this Order. [CWC Section 13381(a)]

(b) Obtaining the requirements in this Order by misrepresentation, or failure to disclose fully all relevant facts. [CWC Section 13381(b)]

(c) A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge. [CWC Section 13381(c)]

(3) When this Order is transferred to a new owner or operator, such requirements as may be necessary under the CWC may be incorporated into this Order.

h. NPDES Permitted Non-Storm Water Discharges

The San Diego Water Board has, in prior years, issued a limited number of individual NPDES permits for non-storm water discharges to MS4s. The San Diego Water Board or State Water Board may in the future, upon prior notice to the Copermittee(s), issue an NPDES permit for any non-storm water discharge (or class of non-storm water discharges) to an MS4.

i. Monitoring

In addition to the standard provisions required under 40 CFR 122.41(j) and (l)(4), the following general monitoring provisions apply to this Order:

(1) Where procedures are not otherwise specified in Order, sampling, analysis and quality assurance/quality control must be conducted in accordance with the Quality Assurance Management Plan (QAMP) for the State of California's Surface Water Ambient Monitoring Program (SWAMP), adopted by the State Water Resources Control Board (State Water Board).

(2) Pursuant to 40 CFR 122.41(j)(2) and CWC Section 13383(a), each Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five (5) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time.

(3) All chemical, bacteriological, and toxicity analyses must be conducted at a laboratory certified for such analyses by the California Department of Public Health or a laboratory approved by the San Diego Water Board.

(4) For priority toxic pollutants that are identified in the California Toxics Rule (CTR) (65 Fed. Reg. 31682), the Copermittees must instruct their laboratories to establish calibration standards that are equivalent to or lower than the Minimum Levels (MLs) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP). If a Copermittee can demonstrate that a particular ML is not attainable, in accordance with procedures set forth in 40 CFR Part 136, the lowest quantifiable concentration of the lowest calibration standard analyzed by a specific analytical procedure (assuming that all the method specified sample weights, volumes, and processing steps have been followed) may be used instead of the ML listed in Appendix 4 of the SIP. The Copermittee must submit documentation from the laboratory to the San Diego Water Board for approval prior to raising the ML for any priority toxic pollutant.

j. ENFORCEMENT

(1) The San Diego Water Board is authorized to enforce the terms of this Order under several provisions of the CWC, including, but not limited to, CWC Sections 13385, 13386, and 13387.

(2) Nothing in this Order shall be construed to protect the Copermittee from its liabilities under federal, state, or local laws.

(3) The CWC provides for civil and criminal penalties comparable to, and in some cases greater than, those provided for under the CWA.

(4) Except as provided in the standard conditions required under 40 CFR 122.41(m) and (n), nothing in this Order shall be construed to relieve the Copermittee from civil or criminal penalties for noncompliance.

(5) Nothing in this Order shall be construed to preclude the institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties to which the Copermittee is or may be subject to under Section 311 of the CWA.

(6) Nothing in this Order shall be construed to preclude institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authoring preserved by Section 510 of the CWA.

k. SEVERABILITY

The provisions of this Order are severable, and if any provision of this Order, or the application of any provisions of this Order to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this Order shall not be affected thereby.

l. APPLICATIONS

Any application submitted by a Copermittee for reissuance or modification of this Order must satisfy all applicable requirements specified in federal regulations as well as any additional requirements for submittal of a Report of Waste Discharge specified in the CWC and the California Code of Regulations.

m. IMPLEMENTATION

All plans, reports and subsequent amendments submitted in compliance with this Order must be implemented immediately (or as otherwise specified). All submittals by Copermittees must be adequate to implement the requirements of this Order.

n. REPORT SUBMITTALS

(1) All report submittals must include an executive summary, introduction, conclusion, recommendations, and signed certified statement.

(2) Each Copermittee must submit a signed certified statement covering its responsibilities for each applicable submittal.

(3) The Principal Watershed Copermittee(s) must submit a signed certified statement covering its responsibilities for each applicable submittal and the sections of the submittals for which it is responsible.

(4) Unless otherwise directed, the Copermittees must submit one electronic copy of each report required under this Order to the San Diego Water Board at SanDiego@waterboards.ca.gov.

(5) When hard copies are requested or required, the Copermittees must submit reports and provide notifications as required by this Order to:

EXECUTIVE OFFICER
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
2375 NORTHSIDE DRIVE, SUITE 100
SAN DIEGO CA 92108
Telephone: (619) 516-1990 Fax: (619) 516-1994

ATTACHMENT C

ACRONYMS AND ABBREVIATIONS

AMAL	Average Monthly Action Level
ASBS	Area(s) of Special Biological Significance
BMP	Best Management Practice
Basin Plan	Water Quality Control Plan for the San Diego Basin
CEQA	California Environmental Quality Act
CCR	California Code of Regulations
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWC	California Water Code
CZARA	Coastal Zone Act Reauthorization Amendments of 1990
ESAs	Environmentally Sensitive Areas
GIS	Geographic Information System
IBI	Index of Biological Integrity
LID	Low Impact Development
MDAL	Maximum Daily Action Level
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
NAL	Non-Storm Water Action Level
NAICS	North American Industry Classification System
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
ROWD	Report of Waste Discharge (application for NPDES reissuance)
SAL	Storm Water Action Level
San Diego Water Board	California Regional Water Quality Control Board, San Diego Region
SIC	Standard Industrial Classification Code
State Water Board	State Water Resources Control Board
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
WDID	Waste Discharge Identification Number
WLA	Waste Load Allocation
WQBEL	Water Quality Based Effluent Limitation

DEFINITIONS

Active/Passive Sediment Treatment - Using mechanical, electrical or chemical means to flocculate or coagulate suspended sediment for removal from runoff from construction sites prior to discharge.

Anthropogenic Litter – Trash generated from human activities, not including sediment.

Average Monthly Action Level – The highest allowable average of daily discharges over a calendar month.

Beneficial Uses - The uses of water necessary for the survival or wellbeing of man, plants, and wildlife. These uses of water serve to promote tangible and intangible economic, social, and environmental goals. "Beneficial Uses" of the waters of the State that may be protected include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. Existing beneficial uses are uses that were attained in the surface or ground water on or after November 28, 1975; and potential beneficial uses are uses that would probably develop in future years through the implementation of various control measures. "Beneficial Uses" are equivalent to "Designated Uses" under federal law. [California Water Code Section 13050(f)].

Best Management Practices (BMPs) - Defined in 40 CFR 122.2 as schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Bioassessment - The use of biological community information to evaluate the biological integrity of a water body and its watershed. With respect to aquatic ecosystems, bioassessment is the collection and analysis of samples of the benthic macroinvertebrate community together with physical/habitat quality measurements associated with the sampling site and the watershed to evaluate the biological condition (i.e. biotic integrity) of a water body.

Biofiltration - Practices that use vegetation and amended soils to detain and treat runoff from impervious areas. Treatment is through filtration, infiltration, adsorption, ion exchange, and biological uptake of pollutants.

Biological Integrity - Defined in Karr J.R. and D.R. Dudley. 1981. Ecological perspective on water quality goals. *Environmental Management* 5:55-68 as: "A balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitat of the region." Also referred to as ecosystem health.

BMP Design Manual – A plan developed to eliminate, reduce, or mitigate the impacts of runoff from development projects, including Priority Development Projects.

Chronic Toxicity – A measurement of sublethal effect (e.g. reduced growth, reproduction) to experimental test organisms exposed to an effluent or receiving waters compared to that of the control organisms.

Clean Water Act Section 303(d) Water Body - An impaired water body in which water quality does not meet applicable water quality standards and/or is not expected to meet water quality standards, even after the application of technology based pollution controls required by the CWA. The discharge of runoff to these water bodies by the Copermittees is significant because these discharges can cause or contribute to violations of applicable water quality standards.

Construction Activities – Actions implemented during construction of development or redevelopment projects during the Preliminary Task (including rough grading and/or disking, clearing and grubbing operations, or any soil disturbance prior to mass grading), Grading or Land Development (including topography and slope reconfiguration, alluvium removals, canyon cleanouts, rock undercuts, keyway excavations, land form grading, and stockpiling of select material for capping operations), Streets and Utility Installation (including excavation and street paving, lot grading, curbs, gutters and sidewalks, public utilities, public water facilities including fire hydrants, public sanitary sewer systems, storm sewer systems and/or other drainage improvements), or Vertical Construction (including the build out of structures from foundations to roofing, including rough landscaping).

Construction Site – Any project, including projects requiring coverage under the Construction General Permit, that involves soil disturbing activities including, but not limited to, clearing, grading, disturbances to ground such as stockpiling, and excavation.

Contamination - As defined in the Porter-Cologne Water Quality Control Act, contamination is "an impairment of the quality of waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste whether or not waters of the State are affected."

Copermittee – A permittee to a NPDES permit that is only responsible for permit conditions relating to the discharge for which it is operator [40 CFR 122.26(b)(1)]. For the purposes of this Order, a Copermittee is one of the individual permittees identified in Tables 1a-1c of this Order.

Copermittees – All of the individual Copermittees, collectively.

Critical Channel Flow (Qc) – The channel flow that produces the critical shear stress that initiates bed movement or that erodes the toe of channel banks. When measuring Qc, it should be based on the weakest boundary material – either bed or bank.

Daily Discharge – Defined as either: (1) the total mass of the constituent discharged over the calendar day or any 24 hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g. concentration.)

The Daily Discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day, or other 24 hour period other than a day), or by the arithmetic mean of analytical results from one or more grab samples taken over the course of a day.

Development Projects - Construction, rehabilitation, redevelopment, or reconstruction of any public or private projects.

Dry Season –May 1 to September 30.

Dry Weather – Weather is considered dry if the preceding 72 hours has been without measurable precipitation (>0.1 inch).

Enclosed Bays – Enclosed bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost bay works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays do not include inland surface waters or ocean waters.

Erosion – When land is diminished or worn away due to wind, water, or glacial ice. Often the eroded debris (silt or sediment) becomes a pollutant via storm water runoff. Erosion occurs naturally but can be intensified by land clearing activities such as farming, development, road building, and timber harvesting.

Environmentally Sensitive Areas (ESAs) - Areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; areas designated as preserves or their equivalent under the Natural Communities Conservation Program within the Cities and County of Orange; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.

Estuaries – Waters, including coastal lagoons, located at the mouth of streams that serve as areas of mixing fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and ocean water. Estuaries do not include inland surface waters or ocean waters.

Existing Development – Any area that has been developed and exists for municipal, commercial, industrial, or residential purposes, uses, or activities. May include areas that are not actively used for its originally developed purpose, but may be re-purposed or redeveloped for another use or activity.

Flow Duration – The long-term period of time that flows occur above a threshold that causes significant sediment transport and may cause excessive erosion damage to creeks and streams (not a single storm event duration). The simplest way to visualize this is to consider a histogram of pre- and post-project flows using long-term records of hourly data. To maintain pre-development flow duration means that the total number of hours (counts) within each range of flows in a flow-duration histogram cannot increase between the pre- and post-development condition. Flow duration within the range of geomorphologically significant flows is important for managing erosion.

Grading - The cutting and/or filling of the land surface to a desired slope or elevation.

Groundwater – Subsurface water that occurs beneath the water table in soils and geologic formations that are fully saturated.

Hazardous Material – Any substance that poses a threat to human health or the environment due to its toxicity, corrosiveness, ignitability, explosive nature or chemical reactivity. These also include materials named by the USEPA in 40 CFR 116 to be reported if a designated quantity of the material is spilled into the waters of the U.S. or emitted into the environment.

Hazardous Waste - Hazardous waste is defined as "any waste which, under Section 600 of Title 22 of this code, is required to be managed according to Chapter 30 of Division 4.5 of Title 22 of this code" [CCR Title 22, Division 4.5, Chapter 11, Article 1].

Household Hazardous Waste – Paints, cleaning products, and other hazardous wastes generated during home improvement or maintenance activities.

Hydromodification – The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

Illicit Connection – Any man-made conveyance or drainage system through which a non-storm water discharge to the storm water drainage system occurs or may occur. Any connection to the MS4 that conveys an illicit discharge.

Illicit Discharge - Any discharge to the MS4 that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from firefighting activities [40 CFR 122.26(b)(2)].

Inactive Areas – Areas of construction activity that are not active and those that have been active and are not scheduled to be re-disturbed for at least 14 days.

Infiltration – In the context of low impact development, infiltration is defined as the percolation of water into the ground. Infiltration is often expressed as a rate (inches per hour), which is determined through an infiltration test. In the context of non-storm water, infiltration is water other than wastewater that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow [40 CFR 35.2005(20)].

Inland Surface Waters – Includes all surface waters of the State that do not include the ocean, enclosed bays, or estuaries.

Jurisdictional Runoff Management Program Document – A written description of the specific jurisdictional runoff management measures and programs that each Copermittee will implement to comply with this Order and ensure that storm water pollutant discharges in runoff are reduced to the MEP and do not cause or contribute to a violation of water quality standards.

Low Impact Development (LID) – A storm water management and land development strategy that emphasizes conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions.

Low Impact Development Best Management Practices (LID BMPs) – LID BMPs include schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States through storm water management and land development strategies that emphasize conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions. LID BMPs include retention practices that do not allow runoff, such as infiltration, rain water harvesting and reuse, and evapotranspiration. LID BMPs also include flow-through practices such as biofiltration that may have some discharge of storm water following pollutant reduction.

Major Outfall – As defined in the Code of Federal Regulations, a major outfall is a MS4 outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (i.e. discharge from a single conveyance other than a circular pipe which is associated with a drainage area of more than 50 acres); or, for MS4s that receive storm water from lands zoned for industrial activity (based on comprehensive zoning plans or equivalent), a MS4 outfall that discharges from a single pipe with an inside diameter of 12 inches or more or from its equivalent (i.e. discharge from other than a circular pipe associated with a drainage area of 2 acres or more).

Maximum Daily Action Level (MDAL) –The highest allowable daily discharge of a pollutant, over a calendar day (or 24 hour period). For pollutants with action levels expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with action levels expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

Maximum Extent Practicable (MEP) – The technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) for storm water that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) in combination with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than BAT. A definition for MEP is not provided either in the statute or in the regulations. Instead the definition of MEP is dynamic and will be defined by the following process over time: municipalities propose their definition of MEP by way of their runoff management programs. Their total collective and individual activities conducted pursuant to the runoff management programs becomes their proposal for MEP as it applies both to their overall effort, as well as to specific activities (e.g., MEP for street sweeping, or MEP for MS4 maintenance). In the absence of a proposal acceptable to the San Diego Water Board, the San Diego Water Board defines MEP.

In a memo dated February 11, 1993, entitled "Definition of Maximum Extent Practicable," Elizabeth Jennings, Senior Staff Counsel, SWRCB addressed the achievement of the MEP standard as follows:

"*To achieve the MEP standard, municipalities must employ whatever Best Management Practices (BMPs) are technically feasible (i.e., are likely to be effective) and are not cost prohibitive. The major emphasis is on technical feasibility. Reducing pollutants to the MEP means choosing effective BMPs, and rejecting applicable BMPs only where other effective BMPs will serve the same purpose, or the BMPs would not be technically feasible, or the cost would be prohibitive. In selecting BMPs to achieve the MEP standard, the following factors may be useful to consider:*

a. *Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?*
b. *Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?*
c. *Public Acceptance: Does the BMP have public support?*
d. *Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?*
e. *Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc.?*

The final determination regarding whether a municipality has reduced pollutants to the maximum extent practicable can only be made by the Regional or State Water Boards, and not by the municipal discharger. If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit derived, it would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs that would address a pollutant source, or to pick a BMP based solely on cost, which would be clearly less effective. In selecting BMPs the municipality must make a serious attempt to comply and practical solutions may not be lightly rejected. In any case, the burden would be on the municipal discharger to show compliance with its permit. After selecting a menu of BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented."

Monitoring Year – October 1 to September 30

Municipal Separate Storm Sewer System (MS4) – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designated or used for collecting or conveying storm water; (iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.26.

National Pollutant Discharge Elimination System (NPDES) - The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the CWA.

Non-Storm Water - All discharges to and from a MS4 that do not originate from precipitation events (i.e., all discharges from a MS4 other than storm water). Non-storm water includes illicit discharges and NPDES permitted discharges.

Nuisance - As defined in the Porter-Cologne Water Quality Control Act, a nuisance is "anything which meets all of the following requirements: 1) Is injurious to health, or is indecent, or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. 2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. 3) Occurs during, or as a result of, the treatment or disposal of wastes."

Ocean Waters – The territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the State Board's California Ocean Plan.

Order – Unless otherwise specified, refers to this Order, Order No. R9-2013-0001 (NPDES No. CAS0109266)

Outfall - Outfall means a point source as defined by 40 CFR 122.2 at the point where a municipal separate storm sewer discharges to waters of the US and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels or other conveyances which connect segments of the same stream or other waters of the US and are used to convey waters of the US.

Persistent Flow - Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

Person - A person is defined as an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof [40 CFR 122.2].

Point Source - Any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, landfill leachate collection systems, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

Pollutant - Any agent that may cause or contribute to the degradation of water quality such that a condition of pollution or contamination is created or aggravated.

Pollution - As defined in the Porter-Cologne Water Quality Control Act, pollution is "the alteration of the quality of the waters of the State by waste, to a degree which unreasonably affects either of the following: 1) The waters for beneficial uses; or 2) Facilities that serve these beneficial uses." Pollution may include contamination.

Pollution Prevention - Pollution prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control BMPs, treatment control BMPs, or disposal.

Pre-Development Runoff Conditions – Approximate flow rates and durations that exist or existed onsite before land development occurs. For new development projects, this equates to runoff conditions immediately before project construction. For redevelopment projects, this equates to runoff conditions from the project footprint assuming infiltration characteristics of the underlying soil, and existing grade. Runoff coefficients of concrete or asphalt must not be used. A redevelopment Priority Development Project must use available information pertaining to existing underlying soil type and onsite existing grade to estimate pre-development runoff conditions.

Priority Development Projects - New development and redevelopment projects defined under Provision E.3.b of Order No. R9-2013-0001, as amended by Order Nos. R9-2015-0001 and R9-2015-0100.

Rainy Season (aka Wet Season) –October 1 to April 30

Receiving Waters – Waters of the United States.

Receiving Water Limitations - Waste discharge requirements issued by the San Diego Water Board typically include both: (1) "Effluent Limitations" (or "Discharge Limitations") that specify the technology-based or water-quality-based effluent limitations; and (2) "Receiving Water Limitations" that specify the water quality objectives in the Basin Plan as well as any other limitations necessary to attain those objectives. In summary, the "Receiving Water Limitations" provision is the provision used to implement the requirements of CWA section 402(p)(3)(B).

Redevelopment - The creation and/or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure. Replacement of impervious surfaces includes any activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include routine maintenance activities, such as trenching and resurfacing associated with utility work; pavement grinding; resurfacing existing roadways, sidewalks, pedestrian ramps, or bike lanes on existing roads; and routine replacement of damaged pavement, such as pothole repair.

Regional Clearinghouse – A central location for the collection and distribution of information developed and maintained by the Copermittees including, but not limited to, plans, reports, manuals, data, contact information, and/or links to such documents and information.

Rehabilitation - Remedial measures or activities for the purpose of improving or restoring the beneficial uses of streams, channels or river systems. Techniques may vary from in-stream restoration techniques to off-line storm water management practices installed in the system corridor or upland areas, or a combination of in-stream and out of stream techniques. Rehabilitation techniques may include, but are not limited to the following: riparian zone restoration, constructed wetlands, channel modifications that improve habitat and stability, and daylighting of drainage systems.

Reporting Period – The period of information that is reported in the Water Quality Improvement Plan Annual Report. The reporting period consists of two components: 1) July 1 to June 30, consistent with the fiscal year, for the implementation of the jurisdictional runoff management programs, and 2) October 1 to September 30, consistent with the monitoring year for the monitoring and assessment programs. Together, these two time periods constitute the reporting year for the Water Quality Improvement Plan Annual Report due January 31 following the end of the monitoring year.

Retain – Keep or hold in a particular place, condition, or position without discharge to surface waters.

Retrofitting – Storm water management practice put into place after development has occurred in watersheds where the practices previously did not exist or are ineffective. Retrofitting of developed areas is intended to improve water quality, protect downstream channels, reduce flooding, or meet other specific objectives. Retrofitting developed areas may include, but is not limited to replacing roofs with green roofs, disconnecting downspouts or impervious surfaces to drain to pervious surfaces, replacing impervious surfaces with pervious surfaces, installing rain barrels, installing rain gardens, and trash area enclosures.

Runoff - All flows in a storm water conveyance system that consists of the following components: (1) storm water (wet weather flows) and (2) non-storm water including dry weather flows.

San Diego Water Board – As used in this document the term "San Diego Water Board" is synonymous with the term "Regional Board" as defined in Water Code section 13050(b) and is intended to refer to the California Regional Water Quality Control Board for the San Diego Region as specified in Water Code Section 13200.

Sediment - Soil, sand, and minerals washed from land into water. Sediment resulting from anthropogenic sources (i.e. human induced land disturbance activities) is considered a pollutant. This Order regulates only the discharges of sediment from anthropogenic sources and does not regulate naturally occurring sources of sediment. Sediment can destroy fish-nesting areas, clog animal habitats, and cloud waters so that sunlight does not reach aquatic plants.

Source Control BMP – Land use or site planning practices, or structural or nonstructural measures that aim to prevent runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between pollutants and runoff.

Storm Water – Per 40 CFR 122.26(b)(13), means storm water runoff, snowmelt runoff and surface runoff and drainage. Surface runoff and drainage pertains to runoff and drainage resulting from precipitation events.

Structural BMPs - A subset of BMPs which detains, retains, filters, removes, or prevents the release of pollutants to surface waters from development projects in perpetuity, after construction of a project is completed.

Test of Significant Toxicity (TST) - A statistical approach used to analyze toxicity test data. The TST incorporates a restated null hypothesis, Welch's t-test, and biological effect thresholds for chronic and acute toxicity.

Total Maximum Daily Load (TMDL) - The maximum amount of a pollutant that can be discharged into a water body from all sources (point and non-point) and still maintain water quality standards. Under CWA section 303(d), TMDLs must be developed for all water bodies that do not meet water quality standards after application of technology-based controls.

Toxicity - Adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies. The water quality objectives for toxicity provided in the Basin Plan, state in part…"All waters shall be

free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life….The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge."

Toxicity Identification Evaluation (TIE) - A set of procedures for identifying the specific chemical(s) responsible for toxicity. These procedures are performed in three phases (characterization, identification, and confirmation) using aquatic organism toxicity tests.

Toxicity Reduction Evaluation (TRE) - A study conducted in a step-wise process designed to identify the causative agents of effluent or ambient toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in toxicity. The first steps of the TRE consist of the collection of data relevant to the toxicity, including additional toxicity testing, and an evaluation of facility operations and maintenance practices, and best management practices. A Toxicity Identification Evaluation (TIE) may be required as part of the TRE, if appropriate.

Treatment Control BMP – Any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media absorption or any other physical, biological, or chemical process.

Unpaved Road – Any long, narrow stretch without pavement used for traveling by motor passenger vehicles between two or more points. Unpaved roads are generally constructed of dirt, gravel, aggregate or macadam and may be improved or unimproved.

Waste - As defined in CWC Section 13050(d), "waste includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal."

Article 2 of CCR Title 23, Chapter 15 (Chapter 15) contains a waste classification system that applies to solid and semi-solid waste, which cannot be discharged directly or indirectly to water of the state and which therefore must be discharged to land for treatment, storage, or disposal in accordance with Chapter 15. There are four classifications of waste (listed in order of highest to lowest threat to water quality): hazardous waste, designated waste, non-hazardous solid waste, and inert waste.

Water Quality Objective - Numerical or narrative limits on constituents or characteristics of water designated to protect designated beneficial uses of the water. [California Water Code Section 13050 (h)]. California's water quality objectives are established by the State and Regional Water Boards in the Water Quality Control Plans. Numeric or narrative limits for pollutants or characteristics of water designed to protect the beneficial uses of the water. In other words, a water quality objective is the maximum concentration of a pollutant that can exist in a receiving water and still generally ensure that the beneficial uses of the receiving water remain protected (i.e., not impaired). Since water quality objectives are designed specifically to protect the beneficial uses, when the objectives are violated the beneficial uses are, by definition, no longer protected and become impaired. This is a fundamental concept under the Porter Cologne Act. Equally fundamental is Porter Cologne's definition of pollution. A condition of pollution exists when the water quality needed to support designated beneficial uses has

become unreasonably affected or impaired; in other words, when the water quality objectives have been violated. These underlying definitions (regarding beneficial use protection) are the reason why all waste discharge requirements implementing the federal NPDES regulations require compliance with water quality objectives. (Water quality objectives are also called water quality criteria in the CWA.)

Water Quality Standards - Water quality standards, as defined in Clean Water Act section 303(c) consist of the beneficial uses (e.g., swimming, fishing, municipal drinking water supply, etc.,) of a water body and criteria (referred to as water quality objectives in the California Water Code) necessary to protect those uses. Under the Water Code, the water boards establish beneficial uses and water quality objectives in water quality control or basin plans. Together with an anti-degradation policy, these beneficial uses and water quality objectives serve as water quality standards under the Clean Water Act. In Clean Water Act parlance, state beneficial uses are called "designated uses" and state water quality objectives are called "criteria." Throughout this Order, the relevant term is used depending on the statutory scheme.

Waters of the State - Any water, surface or underground, including saline waters within the boundaries of the State [CWC section 13050 (e)]. The definition of the Waters of the State is broader than that for the Waters of the United States in that all water in the State is considered to be a Waters of the State regardless of circumstances or condition.

Waters of the United States - As defined in the 40 CFR 122.2, the Waters of the U.S. are defined as: "(a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate "wetlands;" (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters otherwise defined as waters of the United States under this definition: (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial seas; and (g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA."

Watershed - That geographical area which drains to a specified point on a water course, usually a confluence of streams or rivers (also known as drainage area, catchment, or river basin).

Wet Season (aka Rainy Season) – October 1 to April 30

Wet Weather – Weather is considered wet up to 72 hours after a storm event of 0.1 inches and greater, unless otherwise defined by another regulatory mechanism (e.g. a TMDL).

ATTACHMENT D

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

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JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

FY _____

I. COPERMITTEE INFORMATION

Copermittee Name:

Copermittee Primary Contact Name:

Copermittee Primary Contact Information:
Address:
City: County: State: Zip:
Telephone: Fax: Email:

II. LEGAL AUTHORITY

Has the Copermittee established adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐
A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority?	**YES**	☐
	NO	☐

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

Was an update of the jurisdictional runoff management program document required or recommended by the San Diego Water Board?	**YES**	☐
	NO	☐
If YES to the question above, did the Copermittee update its jurisdictional runoff management program document and make it available on the Regional Clearinghouse?	**YES**	☐
	NO	☐

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

Has the Copermittee implemented a program to actively detect and eliminate illicit discharges and connections to its MS4 that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

Number of non-storm water discharges reported by the public	
Number of non-storm water discharges detected by Copermittee staff or contractors	
Number of non-storm water discharges investigated by the Copermittee	
Number of sources of non-storm water discharges identified	
Number of non-storm water discharges eliminated	
Number of sources of illicit discharges or connections identified	
Number of illicit discharges or connections eliminated	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

V. DEVELOPMENT PLANNING PROGRAM

Has the Copermittee implemented a development planning program that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐
Was an update to the BMP Design Manual required or recommended by the San Diego Water Board?	**YES**	☐
	NO	☐
If YES to the question above, did the Copermittee update its BMP Design Manual and make it available on the Regional Clearinghouse?	**YES**	☐
	NO	☐

Number of proposed development projects in review	
Number of Priority Development Projects in review	
Number of Priority Development Projects approved	
Number of approved Priority Development Projects exempt from any BMP requirements	
Number of approved Priority Development Projects allowed alternative compliance	
Number of Priority Development Projects granted occupancy	

Number of completed Priority Development Projects in inventory	
Number of high priority Priority Development Project structural BMP inspections	
Number of Priority Development Project structural BMP violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

FY _____

VI. CONSTRUCTION MANAGEMENT PROGRAM

Has the Copermittee implemented a construction management program that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

Number of construction sites in inventory	
Number of active construction sites in inventory	
Number of inactive construction sites in inventory	
Number of construction sites closed/completed during reporting period	
Number of construction site inspections	
Number of construction site violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

Has the Copermittee implemented an existing development management program that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

	Municipal	Commercial	Industrial	Residential
Number of facilities or areas in inventory				
Number of existing development inspections				
Number of follow-up inspections				
Number of violations				
Number of enforcement actions issued				
Number of escalated enforcement actions issued				

VIII. PUBLIC EDUCATION AND PARTICIPATION

Has the Copermittee implemented a public education program component that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐
Has the Copermittee implemented a public participation program component that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

IX. FISCAL ANALYSIS

Has the Copermittee attached to this form a summary of its fiscal analysis that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

X. CERTIFICATION

I [☐ Principal Executive Officer ☐ Ranking Elected Official ☐ Duly Authorized Representative] certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature	Date
Print Name	Title
Telephone Number	Email

ATTACHMENT E

SPECIFIC PROVISIONS FOR TOTAL MAXIMUM DAILY LOADS APPLICABLE TO ORDER NO. R9-2013-0001, AS AMENDED BY ORDER NOS. R9-2015-0001 AND R9-2015-0100

These provisions implement load allocations (LAs) and wasteload allocations (WLAs) of the Total Maximum Daily Loads (TMDLs) established by the San Diego Water Board or USEPA under Clean Water Act section 303(c), applicable to discharges regulated under this Order. The provisions and schedules for implementation of the TMDLs described below must be incorporated into the Water Quality Improvement Plans, required pursuant to Provision B of this Order, for the specified Watershed Management Areas.

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed
2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin
3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed
4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek
5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay
6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)
7. Total Maximum Daily Load for Sediment in Los Peñasquitos Lagoon

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1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2002-0123

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	August 14, 2002
State Water Board Approval Date:	July 16, 2003
Office of Administrative Law Approval Date:	September 11, 2003
US EPA Approval Date:	November 3, 2003

(3) TMDL Effective Date: September 11, 2003

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final diazinon TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must be in compliance with the final TMDL compliance requirements as of December 31, 2010.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations:

Table 1.1
Final Receiving Water Limitations Expressed as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Diazinon	Acute	0.08 µg/L	1 hour
	Chronic	0.05 µg/L	4 days

(b) Final Effluent Limitations

Discharges from the MS4s containing concentrations that do not exceed the following effluent limitations will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 1.b.(2)(a):

Table 1.2
Final Effluent Limitations Expressed as Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation	Averaging Period
Diazinon	Acute	0.072 µg/L	1 hour
	Chronic	0.045 µg/L	4 days

(c) Best Management Practices

The following BMPs for Chollas Creek must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area and implemented by the Responsible Copermittees:

(i) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 1.b.(2)(a) and/or the effluent limitations under Specific Provision 1.b.(2)(b) for Chollas Creek.

(ii) The Responsible Copermittees must implement the Diazinon Toxicity Control Plan and Diazinon Public Outreach/Education Program as described in the report titled, *Technical Report for Total Maximum Daily Load for Diazinon in Chollas Creek Watershed, San Diego County*, dated August 14, 2002, including subsequent modifications, in order to achieve the receiving water limitations under Specific Provision 1.b.(2)(a) and/or the effluent limitations under Specific Provision 1.b.(2)(b).

(iii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 1.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 1.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 1.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 1.b.(2)(c) achieves compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 1.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 1.d, to demonstrate compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The Responsible Copermittees must be in compliance with the final diazinon TMDL compliance requirements as of December 31, 2010.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls for diazinon within the Chollas Creek watershed, and calculate or estimate the annual diazinon loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment

Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 1.b.(2)(b), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0019

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	September 22, 2005
Office of Administrative Law Approval Date:	December 2, 2005
US EPA Approval Date:	February 8, 2006

(3) TMDL Effective Date: December 2, 2005

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Shelter Island Yacht Basin

(6) Responsible Copermittee: City of San Diego

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final dissolved copper TMDL compliance requirements for Shelter Island Yacht Basin consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittee must be in compliance with the final TMDL compliance requirements as of December 2, 2005.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations:

Table 2.1
Final Receiving Water Limitations Expressed as Concentrations in Shelter Island Yacht Basin

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Dissolved Copper	Acute	4.8 µg/L x WER*	1 hour
	Chronic	3.1 µg/L x WER*	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 2.b.(2)(a):

Table 2.2
Final Effluent Limitations as Expressed as Annual Loads in MS4 Discharges to Shelter Island Yacht Basin

Constituent	Effluent Limitation
Dissolved Copper	30 kg/yr*

* If the water quality objectives for dissolved copper in Shelter Island Yacht Basin are changed in the future, then the margin of safety (MOS), TMDL and allocations will be recalculated using the *Method for Recalculation of the Total Maximum Daily Load for Dissolved Copper in the Shelter Island Yacht Basin, San Diego Bay* in the Basin Plan (p. 7-14).

(c) Best Management Practices

The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 2.b.(2)(a) and/or the effluent limitations under Specific Provision 2.b.(2)(b) for Shelter Island Yacht Basin. The BMPs must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 2.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 2.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittee develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 2.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 2.b.(2)(c) achieves compliance with Specific Provisions 2.b.(3)(a), 2.b.(3)(b) and/or 2.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 2.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 2.d, to demonstrate compliance with Specific Provisions 2.b.(3)(a), 2.b.(3)(b) and/or 2.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The Responsible Copermittees must be in compliance with the final dissolved copper TMDL compliance requirements as of December 2, 2005.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

The Responsible Copermittee must monitor the effluent of its MS4 outfalls for dissolved copper, and calculate or estimate the monthly and annual dissolved copper loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.(b)(2)of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0036

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	November 16, 2005
Office of Administrative Law Approval Date:	February 1, 2006
US EPA Approval Date:	March 22, 2006

(3) TMDL Effective Date: February 1, 2006

(4) Watershed Management Area: Santa Margarita River

(5) Water Body: Rainbow Creek

(6) Responsible Copermittee: County of San Diego

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final total nitrogen and total phosphorus TMDL compliance requirements for Rainbow Creek consist of the following

(1) Final TMDL Compliance Date

The Responsible Copermittee must comply with final TMDL compliance requirements by December 31, 2021.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance date under Specific Provision 3.b.(1):

Table 3.1
Final Receiving Water Limitations Expressed as Concentrations in Rainbow Creek

Constituent	Receiving Water Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing concentrations that do not exceed the following effluent limitations by the compliance date under Specific Provision 3.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 3.b.(2)(a):

Table 3.2
Final Effluent Limitations Expressed as Concentrations in MS4 Discharges to Rainbow Creek

Constituent	Effluent Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(ii) Annual pollutant loads from given land uses discharging to and from the MS4s that do not exceed the following annual loads by the compliance date under Specific Provision 3.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 3.b.(2)(a):

Table 3.3
Final Effluent Limitations Expressed as Annual Loads in MS4 Discharges to Rainbow Creek

Land Use	Total N	Total P
Commercial nurseries	116 kg/yr	3 kg/yr
Park	3 kg/yr	0.1 kg/yr
Residential areas	149 kg/yr	12 kg/yr
Urban areas	27 kg/yr	6 kg/yr

(c) Best Management Practices

(i) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 3.b.(2)(a) and/or the effluent limitations under Specific Provision 3.b.(2)(b) for Rainbow Creek.

(ii) The Responsible Copermittee should coordinate any BMPs implemented to address this TMDL with Caltrans and other sources as possible.

(3) <u>Final TMDL Compliance Determination</u>

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 3.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 3.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the final effluent limitations under Specific Provision 3.b.(2)(b)(ii); OR

(e) The Responsible Copermittee develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 3.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Specific Provision 3.b.(2)(c) achieves compliance with Specific Provisions 3.b.(3)(a), 3.b.(3)(b), 3.b.(3)(c) and/or 3.b.(3)(d),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 3.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 3.d, to demonstrate compliance with Specific Provisions 3.b.(3)(a), 3.b.(3)(b), 3.b.(3)(c) and/or 3.b.(3)(d).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim total nitrogen and total phosphorus TMDL compliance requirements for Rainbow Creek consist of the following:

(1) Interim Compliance Dates and WQBELs

The Responsible Copermittee must comply with the interim WQBELs, expressed as annual loads, by December 31 of the interim compliance year given in Table 3.4.

Table 3.4
Interim Water Quality Based Effluent Limitations Expressed as Annual Loads in MS4 Discharges from Specific Land Uses to Rainbow Creek

	Total N Interim Effluent Limitations (kg/yr)			Total P Interim Effluent Limitations (kg/yr)		
	Interim Compliance Date			Interim Compliance Date		
Land Use	**2009**	**2013**	**2017**	**2009**	**2013**	**2017**
Commercial nurseries	390	299	196	20	16	10
Park	5	3	3	0.15	0.10	0.10
Residential areas	507	390	260	99	74	47
Urban areas	40	27	27	9	6	6

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 3.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 3.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the final effluent limitations under Specific Provision 3.b.(2)(b)(ii); OR

(e) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the interim effluent limitations under Specific Provision 3.c.(1); OR

(f) The Responsible Copermittee has submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

d. Specific Monitoring and Assessment Requirements

(1) The Responsible Copermittee must incorporate into the Water Quality Improvement Plan and implement the Sampling and Analysis Plan for Rainbow Creek Nutrient Reduction TMDL Implementation Water Quality Monitoring, dated January 2010.

(2) The results of any monitoring conducted during the reporting period, and assessment of whether the interim and final TMDL compliance requirements have been achieved must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 3.b.(2)(b)(i), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2007-0043

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2007
State Water Board Approval Date:	July 15, 2008
Office of Administrative Law Approval Date:	October 22, 2008
US EPA Approval Date:	December 18, 2008

(3) TMDL Effective Date: October 22, 2008

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final dissolved copper, lead, and zinc TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must comply with the final TMDL compliance requirements by October 22, 2028.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance date under Specific Provision 4.b.(1):

Table 4.1
Final Receiving Water Limitations Expressed as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$(0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$(0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$(0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$(0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations by the compliance date under Specific Provision 4.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 4.b.(2)(a):

Table 4.2
Final Effluent Limitations as Expressed Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(c) Best Management Practices

(i) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 4.b.(2)(a) and/or the effluent limitations under Specific Provision 4.b.(2)(b) for Chollas Creek.

(ii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans and the U.S. Navy as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 4.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 4.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 4.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 4.b.(2)(c) achieves compliance with Specific Provisions 4.b.(3)(a), 4.b.(3)(b) and/or 4.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 4.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 4.d, to demonstrate compliance with Specific Provisions 4.b.(3)(a), 4.b.(3)(b) and/or 4.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim dissolved copper, lead, and zinc TMDL compliance requirements for Chollas Creek consist of the following:

(1) Interim Compliance Date and WQBELs

The Responsible Copermittee must comply with the interim WQBELs, expressed as concentrations, by the interim compliance date given in Table 4.3:

Table 4.3
Interim Water Quality Based Effluent Limitations Expressed as Concentrations in MS4 Discharges to Chollas Creek

Interim Compliance Date	Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
October 22, 2018	Dissolved Copper	Acute	$1.2 \times 90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
	Dissolved Lead	Acute	$1.2 \times 90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
	Dissolved Zinc	Acute	$1.2 \times 90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 4.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 4.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) There are no exceedances of the interim effluent limitations under Specific Provision 4.c.(1) at the Responsible Copermittee's MS4 outfalls; OR

(e) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance date.

d. Specific Monitoring and Assessment Requirements

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*, when it is amended to include monitoring requirements for the Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls discharging to Chollas Creek for dissolved copper, lead, and zinc, and calculate or estimate the monthly and annual dissolved copper, lead, and zinc loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 4.b.(2)(b) or 4.c.(1), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2008-0027

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 11, 2008
State Water Board Approval Date:	June 16, 2009
Office of Administrative Law Approval Date:	September 15, 2009
US EPA Approval Date:	October 26, 2009

(3) TMDL Effective Date: September 15, 2009

(4) Watershed Management Areas: See Table 5.0

(5) Water Bodies: See Table 5.0

(6) Responsible Copermittees: See Table 5.0

Table 5.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County	Dana Point Harbor	Baby Beach	-City of Dana Point -County of Orange
San Diego Bay	San Diego Bay	Shelter Island Shoreline Park	- San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final indicator bacteria TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Final TMDL Compliance Dates

(a) Baby Beach in Dana Point Harbor

The Responsible Copermittees for MS4 discharges to Baby Beach must be in compliance with the final TMDL compliance requirements according to the following compliance dates:

Table 5.1
Compliance Dates to Achieve Final TMDL Compliance Requirements For Baby Beach in Dana Point Harbor

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform	September 15, 2014	September 15, 2009
Fecal Coliform		September 15, 2009
Enterococcus		September 15, 2019

(b) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park must be in compliance with the final TMDL compliance requirements as of December 31, 2012.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance dates under Specific Provision 5.b.(1):

Table 5.2
Final Receiving Water Limitations Expressed as Bacteria Densities in the Water Body

	Receiving Water Limitations	
Constituent	Single Sample Maximum[1,2]	30-Day Geometric Mean[2]
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing indicator bacteria densities that do not exceed the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.3a
Final Effluent Limitations as Expressed as Bacteria Densities in MS4 Discharges to the Water Body

	Effluent Limitations	
Constituent	**Single Sample Maximum[1,2]**	**30-Day Geometric Mean[2]**
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.

(ii) Discharges from the MS4s containing indicator bacteria loads that do not exceed the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.4a
Final Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to the Baby Beach in Dana Point Harbor

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0.86×10^9 MPN/day	$3{,}254 \times 10^9$ MPN/30days
Fecal Coliform	0.17×10^9 MPN/day	112×10^9 MPN/30days
Enterococcus	0.03×10^9 MPN/day	114×10^9 MPN/30days

Table 5.4b
Final Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to the Shelter Island Shoreline Park in San Diego Bay

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0 MPN/day	198×10^9 MPN/30days
Fecal Coliform	0 MPN/day	8×10^9 MPN/30days
Enterococcus	0 MPN/day	26×10^9 MPN/30days

(iii) Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.5a
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to Baby Beach in Dana Point Harbor*

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	90.4%	0%
Fecal Coliform	82.7%	0%
Enterococcus	96.2%	62.2%

Notes:
* The percent load reductions are relative to data collected between 1996-2002. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittees' MS4s must not exceed the loads in Table 5.4a, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the water body.

Table 5.5b
*Final Effluent Limitations Expressed as Percent Load Reductions** in MS4 Discharges to Shelter Island Shoreline Park in San Diego Bay*

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0%	0%
Fecal Coliform	0%	0%
Enterococcus	0%	0%

Notes:
* The percent load reductions are relative to data collected between 1999-2004. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittee's MS4s must not exceed the loads in Table 5.4b, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the water body.

(c) Best Management Practices

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 5.0 must incorporate the Bacteria Load Reduction Plan (BLRP) required to be developed pursuant to Resolution No. R9-2008-0027.

(ii) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 5.b.(2)(a) and/or the effluent limitations under Specific Provision 5.b.(2)(b) for the segments or areas of the water bodies listed in Table 5.0

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.b.(2)(b)(ii); OR

(e) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 5.b.(2)(b)(iii); OR

(f) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(g) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 5.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 5.b.(2)(c) achieves compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 5.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 5.d, to demonstrate compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim indicator bacteria TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Baby Beach in Dana Point Harbor

(a) Interim TMDL Compliance Dates and WQBELs

The Responsible Copermittees for MS4 discharges to Baby Beach must comply with the following interim WQBELs by the interim compliance dates given in Tables 5.6a and/or 5.6b:

Table 5.6a
Interim Water Quality Based Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to Baby Beach in Dana Point Harbor

Constituent	Interim Compliance Dates	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	4.93×10^9 MPN/day	$3{,}254 \times 10^9$ MPN/30days*
Fecal Coliform	September 15, 2012	0.59×10^9 MPN/day	112×10^9 MPN/30days*
Enterococcus	September 15, 2012	0.42×10^9 MPN/day	301×10^9 MPN/30days
	September 15, 2016	0.03×10^9 MPN/day *	207×10^9 MPN/30days

Notes:
* Same as the final effluent limitations in Table 5.4a.

Table 5.6b
Interim Water Quality Based Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to Baby Beach in Dana Point Harbor*

Constituent	Interim Compliance Dates	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	45.2%	0%**
Fecal Coliform	September 15, 2012	41.4%	0%**
Enterococcus	September 15, 2012	48.1%	0%
	September 15, 2016	96.2%**	31.1%

Notes:
* The percent load reductions are relative to data collected between 1996-2002. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittees' MS4s must not exceed the loads in Table 5.6a, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the waterbody.
** Same as the final effluent limitations in Table 5.5a.

(b) Interim Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(i) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(ii) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(iii) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(iv) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.b(2)(b)(ii); OR

(v) The Responsible Copermittees can demonstrate that exceedances of the applicable receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(vi) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the interim effluent limitations under Table 5.6a of Specific Provision 5.c.(1)(a); OR

(vii) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the interim effluent limitations under Table 5.6b of Specific Provision 5.c.(1)(a); OR

(viii) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

(2) <u>Shelter Island Shoreline Park in San Diego Bay</u>

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park must be in compliance with the final indicator bacteria TMDL requirements as of December 31, 2012.

d. Specific Monitoring and Assessment Requirements

(1) Monitoring Stations

Monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[38] If discharges of bacteria from the MS4 exceed the applicable interim or final WQBELs, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(2) Monitoring Procedures

(a) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) The Responsible Copermittees must collect wet weather monitoring samples within the first 24 hours of a storm event[39] of the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(c) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

[38] Commonly referred to as AB 411 monitoring
[39] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs have been achieved.

(b) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 5.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(c) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to correlate elevated bacteria levels with known or suspected sewage spills from wastewater collection systems and treatment plants or boats.

(d) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2010-0001

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date: February 10, 2010
State Water Board Approval Date: December 14, 2010
Office of Administrative Law Approval Date: April 4, 2011
US EPA Approval Date: June 22, 2011

(3) TMDL Effective Date: April 4, 2011

(4) Watershed Management Areas: See Table 6.0

(5) Water Bodies: See Table 6.0

(6) Responsible Copermittees: See Table 6.0

Table 6.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	-City of Laguna Beach -County of Orange -Orange County Flood Control District
		at Heisler Park - North	
	Pacific Ocean Shoreline	at Main Laguna Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Woods -County of Orange -Orange County Flood Control District
		Laguna Beach at Ocean Avenue	
		Laguna Beach at Cleo Street	
		Arch Cove at Bluebird Canyon Road	
		Laguna Beach at Dumond Drive	
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Hills -City of Laguna Niguel -City of Laguna Woods -City of Lake Forest -City of Mission Viejo -County of Orange -Orange County Flood Control District
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	
	Aliso Creek Mouth	at mouth	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	-City of Dana Point -City of Laguna Beach -City of Laguna Niguel -County of Orange -Orange County Flood Control District
		Aliso Beach at Table Rock Drive	
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)	
		at Salt Creek (large outlet)	
		Salt Creek Beach at Salt Creek service road	
		Salt Creek Beach at Strand Road	
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	-City of Dana Point -City of Laguna Hills -City of Laguna Niguel -City of Mission Viejo -City of Rancho Santa Margarita -City of San Juan Capistrano -County of Orange -Orange County Flood Control District
	San Juan Creek	lower 1 mile	
	San Juan Creek Mouth	at mouth	
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	-City of Dana Point -City of San Clemente -County of Orange -Orange County Flood Control District
		Ole Hanson Beach Club Beach at Pico Drain	
		San Clemente City Beach at El Portal Street Stairs	
		San Clemente City Beach at Mariposa Street	
		San Clemente City Beach at Linda Lane	
		San Clemente City Beach at South Linda Lane	
		San Clemente City Beach at Lifeguard Headquarters	
		under San Clemente Municipal Pier	
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	
		San Clemente State Beach at Riviera Beach	
		Can Clemente State Beach at Cypress Shores	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	-City of Oceanside -City of Vista -County of San Diego
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	-City of Carlsbad -City of Encinitas -City of Escondido -City of San Marcos -County of San Diego
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	-City of Del Mar -City of Escondido -City of Poway -City of San Diego -City of Solana Beach -County of San Diego
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	-City of Del Mar -City of Poway -City of San Diego -County of San Diego
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	-City of San Diego
		La Jolla Shores Beach at Caminito del Oro	
		La Jolla Shores Beach at Vallecitos	
		La Jolla Shores Beach at Avenida de la Playa	
		at Casa Beach, Children's Pool	
		South Casa Beach at Coast Boulevard	
		Whispering Sands Beach at Ravina Street	
		Windansea Beach at Vista de la Playa	
		Windansea Beach at Bonair Street	
		Windansea Beach at Playa del Norte	
		Windansea Beach at Palomar Avenue	
		at Tourmaline Surf Park	
		Pacific Beach at Grand Avenue	
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I- Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	-City of El Cajon -City of Santee -County of San Diego
	San Diego River	lower 6 miles	-City of El Cajon -City of La Mesa -City of San Diego -City of Santee -County of San Diego
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	-City of La Mesa -City of Lemon Grove -City of San Diego -County of San Diego - San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final indicator bacteria TMDL compliance requirements for the water bodies listed in Table 6.0 consist of the following:

(1) Final TMDL Compliance Dates

The Responsible Copermittees for MS4 discharges to the water bodies listed in Table 6.0 must be in compliance with the final TMDL compliance requirements according to the following compliance dates:

Table 6.1
Compliance Dates to Achieve Final TMDL Compliance Requirements

Constituent	Dry Weather TMDL Compliance Date	Wet Weather TMDL Compliance Date*
Total Coliform	April 4, 2021	April 4, 2031 (April 4, 2021)
Fecal Coliform		
Enterococcus		

* The Wet Weather TMDL Compliance Date in parenthesis applies if the applicable Water Quality Improvement Plan does not include load reduction programs for other constituents (e.g. metals, pesticides, trash, nutrients, sediment, etc.) together with bacteria load reduction requirements of these TMDLs.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance dates under Specific Provision 6.b.(1):

Table 6.2a
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Beaches

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform	10,000	22%	1,000	0%
Fecal Coliform	400	22%	200	0%
Enterococcus	104	22%	35	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan.

Table 6.2b
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Creeks

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Fecal Coliform	400	22%	200	0%
Enterococcus	61 (104)	22%	33	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Basin Plan.
d. A single sample maximum of 104 MPN/100ml for *Enterococcus* may be applied as a receiving water limitation for creeks, instead of 61 MPN/100mL, if one or more of the creeks addressed by these TMDLs (San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek, San Diego River, and/or Chollas Creek) is designated with a "moderately to lightly used area" or less frequent usage frequency in the Basin Plan. Otherwise, the single sample maximum of 61 MPN/100mL for *Enterococcus* must be used to assess compliance with the allowable exceedance frequency.

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing indicator bacteria densities that do not exceed the following effluent limitations by the compliance dates under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a):

Table 6.2c
Final Effluent Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies in MS4 Discharges to the Water Body

Constituent	Concentration-Based Effluent Limitations			
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform[d]	10,000	22%	1,000	0%
Fecal Coliform	400	22%	200	0%
Enterococcus	104[e] / 61[f]	22%	35[e] / 33[f]	0%

Notes:
a. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan for discharges to beaches, and the Basin Plan for discharges to creeks and creek mouths.
d. Total coliform effluent limitations only apply to MS4 outfalls that discharge to the Pacific Ocean Shorelines and creek mouths listed in Table 6.0.
e. This *Enterococcus* effluent limitation applies to MS4 discharges to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
f. This *Enterococcus* effluent limitation applies to MS4 discharges to segments or areas of creeks or creek mouths listed in Table 6.0.

(ii) Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the compliance dates under Specific Provision 6.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a):

Table 6.3
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watershed and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
South Orange County	**San Joaquin Hills HSA** (901.11) and **Laguna Hills HSA** (901.12) - Pacific Ocean Shoreline	91.78%	91.72%	98.28%	46.85%	52.07%	51.26%
	Aliso HSA (901.13) - Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	95.47%	95.58%	99.13%	25.29%	26.62%	27.52% (27.37%)**
	Dana Point HSA (901.14) - Pacific Ocean Shoreline	95.04%	95.03%	98.98%	13.15%	14.86%	15.16%
	Lower San Juan HSA (901.27) - Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	72.96%	74.21%	94.94%	19.21%	12.82%	27.12% (26.90%)**
	San Clemente HA (901.30) - Pacific Ocean Shoreline	94.28%	94.23%	98.83%	23.85%	24.58%	25.26%
San Luis Rey River	**San Luis Rey HU** (903.00) - Pacific Ocean Shoreline	38.13%	39.09%	87.38%	5.62%	3.12%	11.69%

Table 6.3 (Cont'd)
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watershed and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
Carlsbad	**San Marcos HA** (904.50) - Pacific Ocean Shoreline	82.82%	82.55%	96.03%	18.47%	18.98%	20.19%
San Dieguito River	**San Dieguito HU** (905.00) - Pacific Ocean Shoreline	14.39%	20.72%	83.48%	4.29%	1.46%	7.72%
Penasquitos	**Miramar Reservoir HA** (906.10) - Pacific Ocean Shoreline	96.50%	96.59%	99.42%	1.61%	1.99%	1.93%
Mission Bay	**Scripps HA** (906.30) - Pacific Ocean Shoreline	96.44%	96.42%	99.25%	16.32%	21.14%	18.82%
	Tecolote HA (906.50) - Tecolote Creek	94.51%	94.59%	98.94%	16.51%	20.47%	18.15% (18.08%)**
San Diego River	**Mission San Diego HSA** (907.11) and **Santee HSA** (907.12) - Pacific Ocean Shoreline - Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles)	74.03%	69.44%	93.96%	38.14%	53.22%	42.74% (42.47%)**
San Diego Bay	**Chollas HSA** (908.22) - Chollas Creek	92.06%	92.15%	98.46%	17.82%	24.84%	21.46% (21.36%)**

Notes:
* The percent load reductions are based on reducing loads compared to pollutant loads from 2001 to 2002.
** The alternative *Enterococcus* percent load reduction was calculated based on a numeric target of 104 MPN/100mL instead of 61 MPN/100mL, protective of the REC-1 "moderately to lightly used area" usage frequency that is protective of freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative pollutant load reductions can be utilized.

(c) Best Management Practices

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 6.0 must incorporate the Bacteria Load Reduction Plans (BLRPs) or Comprehensive Load Reduction Plans (CLRPs) required to be developed pursuant to Resolution No. R9-2010-0001.

(ii) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 6.b.(2)(a) and/or the effluent limitations under Specific Provision 6.b.(2)(b) for the segments or areas of the water bodies listed in Table 6.0.

(iii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans, owners/operators of small MS4s, and agricultural dischargers as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(f) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 6.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 6.b.(2)(c) achieves compliance with Specific Provisions 6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), and/or 6.b.(3)(e),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 6.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 6.d, to demonstrate compliance with Specific Provisions 6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), 6.b.(3)(e) and/or 6.b.(3)(f).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim indicator bacteria TMDL compliance requirements for the water bodies listed in Table 6.0 consist of the following:

(1) Interim TMDL Compliance Dates

The Responsible Copermittees must achieve compliance with the interim TMDL compliance requirements, as determined in accordance with Specific Provision 6.c.(3), by the interim compliance dates given in Table 6.4, unless alternative interim compliance dates are accepted by the San Diego Water Board Executive Officer as part of the Water Quality Improvement Plan.

Table 6.4
Interim Compliance Dates to Achieve Interim TMDL Compliance Requirements

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs*
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	April 4, 2016	April 4, 2021 (April 4, 2016)
		at Heisler Park - North		
	Pacific Ocean Shoreline	at Main Laguna Beach	April 4, 2016	April 4, 2021 (April 4, 2016)
		Laguna Beach at Ocean Avenue		
		Laguna Beach at Cleo Street		
		Arch Cove at Bluebird Canyon Road		
		Laguna Beach at Dumond Drive		
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	April 4, 2016	April 4, 2021 (April 4, 2016)
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	April 4, 2018	April 4, 2021 (April 4, 2018)
	Aliso Creek Mouth	at mouth	April 4, 2018	April 4, 2021 (April 4, 2018)
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	April 4, 2016	April 4, 2021 (April 4, 2016)
		Aliso Beach at Table Rock Drive		
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)		
		at Salt Creek (large outlet)		
		Salt Creek Beach at Salt Creek service road	April 4, 2017	April 4, 2021 (April 4, 2017)
		Salt Creek Beach at Strand Road	April 4, 2017	April 4, 2021 (April 4, 2017)

Table 6.4 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs*
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	April 4, 2016	April 4, 2021 (April 4, 2016)
	San Juan Creek	lower 1 mile	April 4, 2018	April 4, 2021 (April 4, 2018)
	San Juan Creek Mouth	at mouth	April 4, 2016	April 4, 2021 (April 4, 2016)
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	April 4, 2016	April 4, 2021 (April 4, 2016)
		Ole Hanson Beach Club Beach at Pico Drain	April 4, 2016	April 4, 2021 (April 4, 2016)
		San Clemente City Beach at El Portal Street Stairs	April 4, 2017	April 4, 2021 (April 4, 2017)
		San Clemente City Beach at Mariposa Street		
		San Clemente City Beach at Linda Lane	April 4, 2016	April 4, 2021 (April 4, 2016)
		San Clemente City Beach at South Linda Lane	April 4, 2018	April 4, 2021 (April 4, 2018)
		San Clemente City Beach at Lifeguard Headquarters	April 4, 2017	April 4, 2021 (April 4, 2017)
		under San Clemente Municipal Pier		
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	April 4, 2018	April 4, 2021 (April 4, 2018)
		San Clemente State Beach at Riviera Beach	April 4, 2016	April 4, 2021 (April 4, 2016)
		Can Clemente State Beach at Cypress Shores	April 4, 2017	April 4, 2021 (April 4, 2017)
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	April 4, 2017	April 4, 2021 (April 4, 2017)
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	April 4, 2016	April 4, 2021 (April 4, 2016)
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	April 4, 2016	April 4, 2021 (April 4, 2016)

Table 6.4 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates	
			Interim Dry Weather WQBELs	Interim Wet Weather WQBELs*
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	April 4, 2016	April 4, 2021 (April 4, 2016)
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	April 4, 2016	April 4, 2021 (April 4, 2016)
		La Jolla Shores Beach at Caminito del Oro		
		La Jolla Shores Beach at Vallecitos		
		La Jolla Shores Beach at Avenida de la Playa		
		at Casa Beach, Children's Pool		
		South Casa Beach at Coast Boulevard		
		Whispering Sands Beach at Ravina Street		
		Windansea Beach at Vista de la Playa		
		Windansea Beach at Bonair Street		
		Windansea Beach at Playa del Norte		
		Windansea Beach at Palomar Avenue		
		at Tourmaline Surf Park		
		Pacific Beach at Grand Avenue		
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries		
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	April 4, 2018	April 4, 2021 (April 4, 2018)
	San Diego River	lower 6 miles		
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach		
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	April 4, 2018	April 4, 2021 (April 4, 2018)

* The Interim Compliance Dates to achieve the Interim Wet Weather WQBELs in parenthesis apply if the applicable Water Quality Improvement Plan does not include load reduction programs for other constituents (e.g. metals, pesticides, trash, nutrients, sediment, etc.) together with bacteria load reduction requirements of these TMDLs.

(2) Interim Water Quality Based Effluent Limitations

The Responsible Copermittees for discharges to the water bodies in Table 6.0 must comply with the following interim WQBELs by the interim compliance dates given in Specific Provision 6.c.(1):

(a) Interim Receiving Water Limitations

(i) *Interim Dry Weather Receiving Water Limitations*

The Responsible Copermittee must calculate the "existing" exceedance frequencies of the 30-day geometric mean water quality objectives for each of the indicator bacteria by analyzing the available monitoring data collected between January 1, 1996 and December 31, 2002. "Existing" exceedance frequencies may be calculated by water body and/or by Watershed Management Area listed in Table 6.0. Separate "existing" exceedance frequencies must be calculated for beaches and creeks/creek mouths.

The Responsible Copermittees must achieve a 50 percent reduction in the "existing" exceedance frequency of the 30-day geometric mean WQBELs for the water bodies listed in Table 6.0 by the interim compliance dates given in Table 6.4. A 50 percent reduction in the "existing" exceedance frequency is equivalent to half of the "existing" exceedance frequency of the 30-day geometric mean WQBELs.

The "existing" exceedance frequencies and the interim dry weather allowable exceedance frequencies (i.e. interim dry weather receiving water limitations) calculated by the Responsible Copermittees must be included in the Water Quality Improvement Plans for the applicable Watershed Management Areas.

(ii) *Interim Wet Weather Receiving Water Limitations*

The Responsible Copermittees must achieve the interim wet weather receiving water limitations in Table 6.5, expressed as interim wet weather allowable exceedance frequencies, by the interim compliance dates given in Table 6.4.

Table 6.5
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	38%	37%	39%
		at Heisler Park - North			
	Pacific Ocean Shoreline	at Main Laguna Beach			
		Laguna Beach at Ocean Avenue			
		Laguna Beach at Cleo Street			
		Arch Cove at Bluebird Canyon Road			
		Laguna Beach at Dumond Drive			
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	41%	41%	42%
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	41%	41%	42%
	Aliso Creek Mouth	at mouth	41%	41%	42%
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	36%	36%	36%
		Aliso Beach at Table Rock Drive			
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)			
		at Salt Creek (large outlet)			
		Salt Creek Beach at Salt Creek service road			
		Salt Creek Beach at Strand Road			

Table 6.5 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	44%	44%	48%
	San Juan Creek	lower 1 mile	44%	44%	47%
	San Juan Creek Mouth	at mouth	44%	44%	47%
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	35%	35%	36%
		Ole Hanson Beach Club Beach at Pico Drain			
		San Clemente City Beach at El Portal Street Stairs			
		San Clemente City Beach at Mariposa Street			
		San Clemente City Beach at Linda Lane			
		San Clemente City Beach at South Linda Lane			
		San Clemente City Beach at Lifeguard Headquarters			
		under San Clemente Municipal Pier			
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)			
		San Clemente State Beach at Riviera Beach			
		Can Clemente State Beach at Cypress Shores			
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	45%	44%	47%
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	40%	40%	41%
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	33%	33%	36%

Table 6.5 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	26%	26%	26%
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	37%	37%	37%
		La Jolla Shores Beach at Caminito del Oro			
		La Jolla Shores Beach at Vallecitos			
		La Jolla Shores Beach at Avenida de la Playa			
		at Casa Beach, Children's Pool			
		South Casa Beach at Coast Boulevard			
		Whispering Sands Beach at Ravina Street			
		Windansea Beach at Vista de la Playa			
		Windansea Beach at Bonair Street			
		Windansea Beach at Playa del Norte			
		Windansea Beach at Palomar Avenue			
		at Tourmaline Surf Park			
		Pacific Beach at Grand Avenue			
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries	49%	49%	51%
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	46%	43%	49%
	San Diego River	lower 6 miles	46%	43%	49%
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	46%	43%	51%
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	41%	41%	43%

(b) Interim Effluent Limitations

Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the interim compliance dates under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.c.(2)(a):

Table 6.6
Interim Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watersheds and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
South Orange County	**San Joaquin Hills HSA** (901.11) and **Laguna Hills HSA** (901.12) - Pacific Ocean Shoreline	45.89%	45.86%	49.14%	23.43%	26.04%	25.63%
	Aliso HSA (901.13) - Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	47.74%	47.79%	49.57%	12.65%	13.31%	13.76% (13.69%)**
	Dana Point HSA (901.14) - Pacific Ocean Shoreline	47.52%	47.52%	49.49%	6.58%	7.43%	7.58%
	Lower San Juan HSA (901.27) - Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	36.48%	37.11%	47.47%	9.61%	6.41%	13.56% (13.45%)**
	San Clemente HA (901.30) - Pacific Ocean Shoreline	47.14%	47.12%	49.42%	11.93%	12.29%	12.63%
San Luis Rey River	**San Luis Rey HU** (903.00) - Pacific Ocean Shoreline	19.07%	19.55%	43.69%	2.81%	1.56%	5.85%
Carlsbad	**San Marcos HA** (904.50) - Pacific Ocean Shoreline	41.41%	41.28%	48.02%	9.24%	9.49%	10.10%

Table 6.6 (Cont'd)
Interim Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watersheds and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
San Dieguito River	**San Dieguito HU** (905.00) - Pacific Ocean Shoreline	7.20%	10.36%	41.74%	2.15%	0.73%	3.86%
Penasquitos	**Miramar Reservoir HA** (906.10) - Pacific Ocean Shoreline	48.25%	48.30%	49.71%	0.81%	1.00%	0.97%
Mission Bay	**Scripps HA** (906.30) - Pacific Ocean Shoreline	48.22%	48.21%	49.63%	8.16%	10.57%	9.41%
	Tecolote HA (906.50) - Tecolote Creek	47.26%	47.30%	49.47%	8.26%	10.24%	9.08% (9.04%)**
San Diego River	**Mission San Diego HSA** (907.11) and **Santee HSA** (907.12) - Pacific Ocean Shoreline - Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles)	37.02%	34.72%	46.98%	19.07%	26.61%	21.37% (21.24%)**
San Diego Bay	**Chollas HSA** (908.22) - Chollas Creek	46.03%	46.08%	49.23%	8.91%	12.42%	10.73% (10.68%)**

Notes:
* The percent load reductions are based on reducing loads compared to pollutant loads from 2001 to 2002.
** The alternative *Enterococcus* percent load reduction was calculated based on a numeric target of 104 MPN/100mL instead of 61 MPN/100mL, protective of the REC-1 "moderately to lightly used area" usage frequency that is protective of freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative pollutant load reductions can be utilized.

(3) <u>Interim TMDL Compliance Determination</u>

Compliance with the interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(f) There are no exceedances of the interim receiving water limitations under Specific Provision 6.c.(2)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(g) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the interim effluent limitations under Specific Provision 6.c.(2)(b); OR

(h) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

d. Specific Monitoring and Assessment Requirements

(1) <u>Monitoring and Assessment Requirements for Beaches</u>

(a) Monitoring Stations

For beaches addressed by the TMDL, monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[40] If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source

[40] Commonly referred to as AB 411 monitoring

identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations at least once within the first 24 hours of the end of a storm event[41] during the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer in exceedance of the allowable exceedance frequencies in the receiving waters.

(iii) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(iv) For Pacific Ocean Shoreline segments or areas listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

[41] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs for the Pacific Ocean Shoreline segments or areas listed in Table 6.0 have been achieved.

(ii) Dry weather exceedance frequencies must be calculated as follows:

[a] 30-day geometric means must be calculated from the results of any dry weather samples collected from the segments or areas for each water body listed in Table 6.0;
[b] The method and number of samples need for calculating the 30-day geometric means must be consistent with the number of samples required by the Ocean Plan;
[c] Where there are multiple segments or areas associated with a water body listed in Table 6.0, the Copermittees may calculate geometric means for each segment or area, or combine the dry weather monitoring data from all the segments or areas to calculate geometric means for the water body;
[d] The exceedance frequency must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the dry season.

(iii) Wet weather exceedance frequencies must be calculated as follows:

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;
[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;
[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria densities reported from each storm event sampled; and
[d] The single sample maximum exceedance frequency must be calculated by dividing the number of wet weather days that exceed the single sample maximum receiving water limitations in Table 6.2 by the total number of wet weather days during the rainy season.
[e] The data collected for dry weather must be used in addition to the data collected for wet weather to calculate the wet weather 30-

day geometric means. The exceedance frequency of the wet weather 30-day geometric means must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the wet season.

(iv) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(v) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) Monitoring and Assessment Requirements for Creeks and Creek Mouths

(a) Monitoring Stations

For creeks addressed by the TMDL, monitoring locations should consist of, at a minimum, a location at or near the mouth of the creek (e.g. Mass Loading Station or Mass Emission Station) and one or more locations upstream of the mouth (e.g. Watershed Assessment Station). If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations in accordance with the requirements of Provision D.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations within the first 24 hours of the end of a storm event[42] during the rainy season (i.e. October 1 through April 30).

[42] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to

(iii) Samples collected from receiving water monitoring stations must be analyzed for fecal coliform and *Enterococcus* indicator bacteria.

(iv) For creeks or creek mouths listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the receiving water monitoring data to assess whether the interim and final receiving water WQBELs for the creeks and creek mouths listed in Table 6.0 have been achieved.

(ii) Dry weather exceedance frequencies must be calculated as follows:

[a] 30-day geometric means must be calculated from the results of any dry weather samples collected from the segment or area for each water body listed in Table 6.0;
[b] The method and number of samples need for calculating the 30-day geometric means must be consistent with the number of samples required by the Basin Plan;
[c] The exceedance frequency must be calculated by dividing the number of 30-day geometric means that exceed the 30-day geometric mean receiving water limitations in Table 6.2 by the total number of 30-day geometric means calculated from samples collected during the dry season.

(iii) Wet weather exceedance frequencies must be calculated as follows:

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;
[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;

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storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria densities reported from each of the storm events sampled; and

[d] The exceedance frequency must be calculated by dividing the number of wet weather days that exceed the single sample maximum receiving water limitations in Table 6.2 by the total number of wet weather days during the rainy season.

[e] The data collected for dry weather must be used in addition to the data collected for wet weather to calculate the wet weather 30-day geometric means. The exceedance frequency of the wet weather 30-day geometric means must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the wet season.

(iv) The Responsible Copermittee must identify and incorporate additional MS4 outfall and receiving water monitoring stations and/or adjust monitoring frequencies to identify sources causing exceedances of the receiving water WQBELs.

(v) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(vi) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

7. Total Maximum Daily Loads for Sediment in Los Peñasquitos Lagoon

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2012-0033

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2012
State Water Board Approval Date:	January 21, 2014
Office of Administrative Law Approval Date:	July 14, 2014
US EPA Approval Date:	October 30, 2014

(3) TMDL Effective Date: July 14, 2014

(4) Watershed Management Area: Peñasquitos

(5) Water Body: Los Peñasquitos Lagoon

(6) Responsible Copermittees: County of San Diego, City of San Diego, City of Del Mar, and City of Poway

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final sediment TMDL compliance requirements for Los Peñasquitos Lagoon consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must be in compliance with the final TMDL compliance requirements by December 31, 2034.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not prohibit the sustainable restoration of tidal and non-tidal saltmarsh vegetation of at least 346 acres.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations by the compliance date under Provision 7.b(1) will not cause or contribute to a failure of the receiving water condition specified under Specific Provision 7.b.(2)(a):

Table 7.1
*Final Effluent Limitations as Expressed as Wet Season Loads in MS4 Discharges to Los Peñasquitos Lagoon**

Constituent	Effluent Limitation
Sediment	2,580 tons/wet season

* Final effluent limitations are to be achieved by the following Responsible Parties: County of San Diego, City of San Diego, City of Del Mar, City of Poway, Phase II MS4 permittees, Caltrans, general construction storm water NPDES permittees, and general industrial storm water NPDES permittees.

(c) Best Management Practices

(i) The Water Quality Improvement Plan for the Los Peñasquitos Watershed Management Area must incorporate the Sediment Load Reduction Plan required to be developed pursuant to Resolution No. R9-2012-0033.

(ii) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 7.b.(2)(a) and/or the Copermittee's portion of the effluent limitations under Specific Provision 7.b.(2)(b) for Los Peñasquitos Lagoon.

(3) Final TMDL Compliance Determination

Compliance determination with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) Successful restoration of 80 percent of the 1973 acreage of tidal and non-tidal lagoon salt marsh (346 acres) as described in Attachment A of Resolution No. R9-2010-0033; OR

(b) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 7.b.(2)(c)(ii) and/or other implementation actions to achieve compliance with Specific Provision 7.b.(3)(a) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 7.b.(2)(c)(ii) or other implementation actions to achieve compliance with Specific Provision 7.b.(3)(a),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 7.b.(2)(c)(ii) or other implementation actions, AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 7.d to demonstrate compliance with Specific Provision 7.b.(3)(a).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim sediment TMDL compliance requirements for Los Penasquitos Lagoon consist of the following:

(1) Interim Compliance Dates and WQBELs

The Responsible Copermittees must comply with the interim WQBELs, expressed as wet season loads, by December 31 of the interim compliance year set forth in Table 7.2.

Table 7.2
*Interim Water Quality Based Effluent Limitations Expressed as Wet Season Loads in MS4 Discharges**

Interim Compliance Date	Interim Effluent Limitations (tons/wet season)
December 31, 2019	6,691
December 31, 2023	5,663
December 31, 2027	4,636
December 31, 2029	3,608

* Interim effluent limitations are to be achieved by the following Responsible Parties: County of San Diego, City of San Diego, City of Del Mar, City of Poway, Phase II MS4 permittees, Caltrans, general construction storm water NPDES permittees, and general industrial storm water NPDES permittees.

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) The final receiving water limitation under Specific Provision 7.b.(2)(a) is met; OR

(c) There are no exceedances of the Copermittee's portion of interim effluent limitations under Table 7.2 at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the Copermittee's portion of the interim TMDL compliance requirements described in Attachment A of Resolution No. R9-2010-0033 will be achieved by the interim compliance date.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) Watershed Monitoring

The Responsible Copermittees must conduct suspended sediment, bed load, and flow monitoring to calculate total sediment loading to the Los Peñasquitos Lagoon for each wet season (October 1 thru April 30) as set forth below:

(a) The Responsible Copermittees must monitor enough storm events throughout the season to quantify sediment loading over each wet season, and

(b) The Responsible Copermittees must monitor at least 3 stations to quantify cumulative sediment loading into Los Peñasquitos Lagoon. Stations must be located within the Los Peñasquitos, Carroll Canyon, and Carmel Creek tributaries prior to discharging into Los Peñasquitos Lagoon.

(2) Lagoon Monitoring

The Responsible Copermittees must monitor Los Peñasquitos Lagoon each Fall for changes in the extent of the vegetation types as set forth below:

(a) The Responsible Copermittees must acquire aerial photos of Los Peñasquitos Lagoon and digitize them at an approximate scale of 1:2,500,

(b) The Responsible Copermittees must appropriately interpret the vegetation and classify the various types as saltmarsh, non-tidal saltmarsh, freshwater marsh, non-tidal saltmarsh –*Lolium perrene* infested, southern willow scrub/mulefat scrub, herbaceous wetland, or upland land cover.

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the monitoring data collected under Specific Provision 7.d(1) and 7.d(2) to assess whether the interim and final WQBELs have been achieved.

(b) For assessing and determining compliance with the final receiving water limitations under Specific Provision 7.b.(2)(a), the Responsible Copermittees must use the data acquired under Specific Provision 7.d.(2) to estimate the acreage of tidal and non-tidal saltmarsh actually restored.

(c) For assessing and determining compliance with the final effluent limitations under Specific Provision 7.b.(2)(b), the Responsible Copermittees must use the data acquired under Specific Provision 7.d.(1) to estimate sediment loading into Los Peñasquitos Lagoon. Sediment loading must be evaluated using a 3-year, weighted rolling average. The first reported average shall be calculated using data collected in the year, 2015-2016, 2016-2017, and 2017-2018 wet seasons.

(d) The monitoring and assessment results must be submitted as part of the Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

ATTACHMENT F

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

FACT SHEET / TECHNICAL REPORT

FOR

ORDER NO. R9-2013-0001
AS AMENDED BY ORDER NOS. R9-2015-0001 AND R9-2015-0100
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

May 8, 2013
Amended February 11, 2015
and November 18, 2015

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I. FACT SHEET FORMAT

This Fact Sheet briefly sets forth the principal facts and the significant factual, legal, methodological, and policy questions that the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) considered in preparing Order No. R9-2013-0001 (Order), as amended by Order Nos. R9-2015-0001 and R9-2015-0100. In accordance with the Code of Federal Regulations (CFR) Title 40 Parts 124.8 and 124.56 (40 CFR 124.8 and 40 CFR 124.56), this Fact Sheet includes, but is not limited to, the following information:

1. Contact information
2. Public process and notification procedures
3. Background of municipal storm water permits
4. Regional MS4 Permit approach
5. Economic considerations
6. Applicable statutes, regulations, plans and policies
7. Discussion of the provisions in the Order

Tentative Order No. R9-2013-0001 was distributed for public review on October 31, 2012. The San Diego Water Board accepted written comments on Tentative Order No. R9-2013-0001 until January 11, 2013. A public hearing was subsequently held on April 10 and 11, 2013, that was continued to May 8, 2013 to receive oral comments from interested persons. The San Diego Water Board adopted Order No. R9-2013-0001 on May 8, 2013.

Tentative Order No. R9-2015-0001, an Order amending Order No. R9-2013-0001, was distributed for public review on September 19, 2014. The San Diego Water Board accepted written comments on Tentative Order No. R9-2015-0001 until November 19, 2014. A public hearing was held on February 11, 2015, to receive oral comments from Copermittees and interested persons. The San Diego Water Board adopted Order No. R9-2015-0001 amending Order No. R9-2013-0001 on February 11, 2015. Order No. R9-2015-0001 amended the findings and provisions of Order No. R9-2013-0001 to:

a. Enroll the County of Orange, the Orange County Flood Control District and the south Orange County Cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano as Copermittees responsible for compliance with the terms and conditions of Order No. R9-2013-0001, as amended by Order No. R9-2015-0001;

b. Designate the San Diego Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the Cities of Laguna Woods and Laguna Hills and agree to the designation of the Santa Ana Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the City of Lake Forest, subject to the

terms of the February 10, 2015 agreement between San Diego Water Board and the Santa Ana Water Board described in Finding 29 of this Order, upon the later effective date of Order No. R9-2015-0001 or Order No. R8-2015-0001 (superseding Order No. R8-2009-0030);

c. Establish interim exceptions to land development requirements for those priority development projects that discharge to engineered channels and large river reaches as described in Provision E.3.c.(2)(e) of this Order;

d. Incorporate the amended requirements of the State Water Resources Control Board's (State Water Board) General Exception to require that pollutant reductions be achieved within 6 years for storm water and nonpoint source discharges to ASBS within the Region;

e. Incorporate applicable requirements of the Los Peñasquitos Lagoon Sediment TMDL; and

f. Require the Orange County Copermittees to implement the "*Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County*," dated October 2014, made effective in the Monitoring and Reporting Program/Order issued pursuant to California Water Code section 13383 in the December 5, 2014 San Diego Water Board Letter Directive and subject to future revisions by the Executive Officer after appropriate public input.

Tentative Order No. R9-2015-0100, an Order amending Order No. R9-2013-0001 as amended by Order No. R9-2015-0001, was distributed for public review on July 31, 2015. The San Diego Water Board accepted written comments on Tentative Order No. R9-2015-0100 until September 14, 2015. A public hearing was held on November 18, 2015, to receive oral comments from Copermittees and interested persons. The San Diego Water Board adopted Order No. R9-2015-0100 amending Order No. R9-2013-0001 as amended by Order No. R9-2015-0001, on November 18, 2015. Order No. R9-2015-0100 amended the findings and provisions of Order No. R9-2013-0001 as amended by Order No. R9-2015-0001 to:

a. Enroll the County of Riverside, the Cities of Murrieta, Temecula, and Wildomar, and the Riverside County Flood Control and Water Conservation District as Copermittees responsible for compliance with the terms and conditions of Order No. R9-2013-0001, as amended by Order Nos. R9-2015-0001 and R9-2015-0100;

b. Continue designation of the San Diego Water Board to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Murrieta and Wildomar, including areas within the Santa Ana Region; and, agree to continue designation of the Santa Ana Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the City of Menifee, including areas within

the San Diego Region, subject to the terms of the October 26, 2015 agreement between San Diego Water Board and the Santa Ana Water Board described in Finding 29 of this Order;

d. Incorporate Provision B.3.c, which provides an option that allows a Copermittee to utilize the watershed-based Water Quality Improvement Plan to be deemed in compliance with the prohibitions and limitations of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b;

e. Incorporate minor revisions to Provisions E.2.a.(1) and E.2.a.(2) to include San Diego Water Board Order No. R9-2015-0013 and State Water Board Order 2014-0194-DWQ into the requirements for addressing non-storm water discharges to a Copermittee's MS4;

e. Incorporate minor revisions to Provision E.3.b.(1) to correct inconsistencies in the definition of a Priority Development Project as compared to the definitions in Order No. R9-2009-0002 (Fourth Term Orange County MS4 Permit) and Order No. R9-2010-0016 (Fourth Term Riverside County MS4 Permit), and requirements for incorporating the corrected definitions into the BMP Design Manual;

f. Incorporate revisions to Provision E.3.e.(1)(a) to provide additional clarity on when the structural BMP performance requirements of Provision E.3.c are applicable to Priority Development Projects;

e. Incorporate minor revisions to the Revised TMDLs for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region and the TMDLs for Sediment in Los Peñasquitos Lagoon in Attachment E to the Order to make the requirements consistent with the Basin Plan amendments adopted by the San Diego Water Board; and

f. Remove provisions related to allowing the Riverside County Copermittees to apply for early coverage under the Regional MS4 Permit.

The San Diego Water Board files applicable to the issuance of Order No. R9-2013-0001 and amendments thereto are incorporated into the administrative record in support of the findings and requirements of the Order.

II. CONTACT INFORMATION

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The Order and other related documents can be downloaded from the San Diego Water Board website at

http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

The documents referenced in this Fact Sheet and in Order No. R9-2013-0001 and amendments thereto are available for public review at the San Diego Water Board office, located at the address listed above. Public records are available for inspection during regular business hours, from 8:00 am to 5:00 pm Monday through Friday. To schedule an appointment to inspect public records, contact the San Diego Water Board Records Management Officer at 619-516-1990.

COPERMITTEES

Orange County Copermittees

- County of Orange
  - City of Aliso Viejo
  - City of Dana Point
  - City of Laguna Beach
  - City of Laguna Hills
  - City of Laguna Niguel
  - City of Laguna Woods
  - City of Lake Forest *
  - City of Mission Viejo
  - City of Ranch Santa Margarita
  - City of San Clemente
  - City of San Juan Capistrano
  - Orange County Flood Control District

* While not listed in the above table, the City of Lake Forest remains a Copermittee under this Order until the later effective date of this Order or Santa Ana Water Board Tentative Order No. R8-2015-0001. Thereafter, the City of Lake Forest will no longer be considered a Copermittee under this Order because its Phase I MS4 discharges will be regulated by the Santa Ana Water Board pursuant to Water Code section 13328 designation. The requirements of this Order that apply to the City of Lake Forest for the duration of this Order, consistent with the Water Code section 13228 agreement dated February 10, 2015, are described in Finding 29 and Footnote 2 to Table B-1.

Riverside County Copermittees

- County of Riverside
  - City of Menifee**
  - City of Murrieta
  - City of Temecula
  - City of Wildomar
  - Riverside County Flood Control and Water Conservation District

** The City of Menifee is not regulated as a Copermittee under this Order because its Phase I MS4 discharges are regulated by Santa Ana Water Board Order No. R8-2010-0033 as it may be amended or issued pursuant to Water Code section 13228 designation. The requirements of this Order that apply to the City of Menifee for the duration of this Order, consistent with the Water Code section 13228 written agreement dated October 26, 2015, are described in Finding 29 and Footnote 3 to Table B-1.

San Diego County Copermittees

- County of San Diego
  - City of Carlsbad
  - City of Chula Vista
  - City of Coronado
  - City of Del Mar
  - City of El Cajon
  - City of Encinitas
  - City of Escondido
  - City of Imperial Beach
  - City of La Mesa
  - City of Lemon Grove
  - City of National City
  - City of Oceanside
  - City of Poway
  - City of San Diego
  - City of San Marcos
  - City of Santee
  - City of Solana Beach
  - City of Vista
  - San Diego County Regional Airport Authority
  - San Diego Unified Port District

III. PUBLIC PROCESS AND NOTIFICATION PROCEDURES

The San Diego Water Board followed the schedule listed below for the preparation of Order No. R9-2013-0001 and amendments thereto:

San Diego County Copermittee Permit Reissuance Process

1. On February 8, 2011, the San Diego Water Board met with the San Diego County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No. R9-2007-0001.

2. Between February and May 2011, the San Diego Water Board met with select San Diego County, Orange County, and Riverside County Copermittees, as well as representatives of the environmental community to discuss concepts and receive recommendations for elements to be incorporated in a Regional Municipal Separate Storm Sewer System Permit (Regional MS4 Permit).

3. On June 27, 2011 the San Diego Water Board received the Report of Waste Discharge from the San Diego County Copermittees for the renewal of their NPDES permit, Order No. R9-2007-0001.

4. On April 9, 2012, the San Diego Water Board released an administrative draft of Tentative Order No. R9-2013-0001 for preliminary informal comments and feedback.

5. On April 25, 2012, the San Diego Water Board held an informal public workshop to present the administrative draft of Tentative Order No. R9-2013-0001 and receive verbal comments.

6. Between June and August 2012, the San Diego Water Board held four (4) focused meetings with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community, and USEPA) to discuss and receive preliminary comments and feedback about specific elements in the administrative draft of Tentative Order No. R9-2013-0001.

7. On September 5, 2012, the San Diego Water Board held an informal public workshop to present the modifications that were expected to be incorporated into the Tentative Order based on the preliminary comments and feedback received during the focused meetings held between June and August 2012.

8. Informal written comments on the administrative draft of Tentative Order No. R9-2013-0001 were accepted until September 14, 2012.

9. On October 12, 2012, the San Diego Water Board released a revised administrative draft of Tentative Order No. R9-2013-0001.

10. On October 24, 2012, the San Diego Water Board held a focused meeting with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community, and USEPA) to discuss modifications incorporated into the administrative draft of Tentative Order No. R9-2013-0001.

11. On October 31, 2012, the San Diego Water Board released Tentative Order No. R9-2013-0001 for formal public review and comment.

12. On November 13, 2012 and December 12, 2012, the San Diego Water Board held a formal public Board workshop to present the public draft of Tentative Order No. R9-2013-0001 and receive verbal comments.

13. Formal written comments on the public draft of Tentative Order No. R9-2013-0001 were accepted until January 11, 2013.

14. A public hearing of Tentative Order No. R9-2013-0001 was conducted on April 10 and 11, 2013, that was continued to May 8, 2013.

Orange County Copermittee Permit Reissuance Process

15. On May 20, 2014 the San Diego Water Board received the Report of Waste Discharge from the Orange County Copermittees for the renewal of their MS4 NPDES permit, Order No. R9-2009-0002.

16. On June 24, 2014, the San Diego Water Board met with the Orange County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No.R9-2009-0002 and the process for enrollment as Copermittees under Regional MS4 Permit Order No. R9-2013-0001.

17. On July 1, 2014, the San Diego Water Board held a public meeting to discuss the Orange County Report of Waste Discharge and receive comments on potential modifications to Order No. R9-2013-0001. Based on comments received from the Orange County Copermittees and other interested persons at this meeting, the San Diego Water Board determined that additional public meetings were not needed prior to release of Tentative Order No. R9-2015-0001, amending Order No. R9-2013-0001 in redlined – strikeout format for public review and comment.

18. On September 19, 2014, the San Diego Water Board released Tentative Order No. R9-2015-0001 for a 60 day public review and comment period.

19. On October 8, 2014, the San Diego Water Board held a formal public workshop at a regular board meeting to receive information and discuss the proposed amendments to Order No. R9-2013-0001 described in Tentative Order No. R9-2015-0001.

20. In accordance with State and federal laws and regulations, the San Diego Water Board notified San Diego County, Orange County and Riverside County Copermittees, and all known interested agencies and persons of its intent to adopt Tentative Order No. R9-2015-0001 and provided them with an opportunity to submit their written comments and recommendations. Written comments and recommendations on Tentative Order No. R9-2015-0001 were accepted until November 19, 2014.

21. The San Diego Water Board held a public workshop on October 8, 2014, and a public hearing on February 11, 2015, and heard and considered all comments pertaining to the adoption of Tentative Order No. R9-2015-0001 on February 11, 2015.

Riverside County Copermittee Permit Reissuance Process

22. Between April and June 2015, the San Diego Water Board held three (3) public workshops with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community) to discuss and receive comments and feedback about amending Order No. R9-2013-0001 to incorporate a definition of prior lawful approval for Priority Development Projects, and an alternative compliance pathway for prohibitions and limitations in Provision A of the Order. A San Diego Water Board member attended the April and May 2015 public workshops, but no actions or voting took place.

23. On April 15, 2015, the San Diego Water Board met with the Riverside County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No.R9-2010-0016 and the process for enrollment as Copermittees under Order No. R9-2013-0001 (Regional MS4 Permit).

24. On May 8, 2015 the San Diego Water Board received a Report of Waste Discharge from the Riverside County Copermittees for the renewal of their MS4 NPDES permit, Order No. R9-2010-0016.

25. On July 31, 2015, the San Diego Water Board released Tentative Order No. R9-2015-0100 for a formal public review and comment period.

26. Formal written comments on the public draft of Tentative Order No. R9-2015-0100 were accepted until September 14, 2015, a formal public written comment period of 46 days.

27. A public hearing to receive oral comments on Tentative Order No. R9-2015-0100 was conducted on November 18, 2015.

IV. BACKGROUND OF THE SAN DIEGO REGION MUNICIPAL STORM WATER PERMITS

In developed and developing areas, storm water runoff is commonly transported through municipal separate storm sewer systems (MS4s) and discharged into local receiving water bodies. As the storm water runs off and flows over the land or impervious surfaces (e.g., paved streets, parking lots, and building rooftops), it accumulates debris, chemicals, sediment, and other pollutants that can adversely affect receiving water quality if discharged untreated. The United States Environmental Protection Agency (USEPA) recognizes wet weather flows from urban areas as the number one source of estuarine pollution in coastal communities,[1] such as those within the San Diego Region.

The federal Clean Water Act (CWA) was amended in 1987 to address and regulate discharges of storm water associated with industrial activities and from municipal storm sewers. With the amendments, many municipalities throughout the United States were obligated for the first time to obtain National Pollutant Discharge Elimination System (NPDES) permits for discharges of storm water from their MS4s.

In response to the CWA 1987 amendment, as well as the pending federal NPDES regulations which would implement the amendment, the San Diego Water Board issued "early" MS4 permits. The San Diego Water Board adopted and issued Order Nos. 90-38, 90-42, and 90-46 to regulate storm water discharges from the MS4s in Orange County, San Diego County, and Riverside County, respectively, within the San Diego Region on July 16, 1990.

The "early" MS4 permits, or First Term Permits, were issued prior to the November 1990 promulgation of the final federal NPDES storm water regulations. By issuing these First Term Permits before the federal regulations took effect, the San Diego Water Board was able to provide the Copermittees additional flexibility in addressing and managing storm water discharges. The First Term Permits contained the essentials of the 1990 regulations, and required the Copermittees to develop and implement runoff management programs, but provided little specificity about what was required to be included in or actually achieved by those programs.

The flexibility provided in the First Term Permits was generally continued through the Second Term Permits. The combination of the lack of specificity in the First and Second Term Permits, a general lack of meaningful action by the Copermittees and a general lack of corresponding reaction (i.e. enforcement) by the San Diego Water Board during the first ten years of the storm water program, resulted in few substantive steps towards achieving improvements in the quality of receiving waters or storm water discharges from the MS4s.

[1] US EPA. 1999. 40 CFR Parts 9, 122, 123, and 124. National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. 64 FR 68727.

From 2001, the regulatory approach incorporated into Third Term Permits was a significant departure from the regulatory approach of the First and Second Term Permits. The Third Term Permits issued by the San Diego Water Board included more detailed requirements that outlined the minimum level of implementation required for the Copermittees' programs to meet the maximum extent practicable (MEP) standard for storm water. The Third Term Permits included more detail to emphasize and enhance the jurisdictional runoff management programs developed by the Copermittees and introduced requirements for developing and implementing watershed-based programs.

The Third Term Permits also incorporated two precedent setting decisions by the State Water Board. In Order WQ 99-05, the State Water Board established receiving water limitation language to be included in all MS4 permits. The State Water Board's precedential language clarified that municipal storm water permits must include provisions requiring discharges to be controlled to attain water quality standards in receiving waters. Unlike previously adopted versions of the receiving water limitation language in the First and Second Term Permits, the language no longer stated that "*violations of water quality standards are not violations of the municipal storm water permit under certain conditions*." In addition, the receiving water limitation language no longer indicated that the "*implementation of best management practices is the 'functional equivalent' of meeting water quality standards*." State Water Board Order WQ 99-05 specifically requires language in MS4 permits for the Copermittees to comply with water quality standards based discharge prohibitions and receiving water limitations through timely implementation of control measures and other actions to reduce pollutants in discharges. (See State Water Board Order WQ 99-05 (*Environmental Health Coalition*)).

In Order WQ 2000-11, also a precedential decision, the State Water Board addressed design standards for structural post-construction best management practices (BMPs) for new development and significant redevelopment. The State Water Board found that the design standards, which require that runoff generated by 85 percent of storm events from specific development categories be infiltrated or treated, reflect the MEP standard. State Water Board Order WQ 2000-11 also found that the post-construction BMP provisions, or Standard Storm Water Mitigation Plan (SSMP) provisions, constitute MEP for addressing storm water pollutant discharges resulting from specific development categories.

The Third Term San Diego County and Orange County Permits (Order Nos. 2001-01 and R9-2002-0001, respectively) were appealed to the State Water Board. Minor modifications were made by the State Water Board, but the requirements were largely upheld. In State Water Board Order WQ 2001-15, the State Water Board upheld the Third Term San Diego County Permit requirements with certain modifications. The State Water Board removed the prohibition of storm water discharges *into* the MS4 that cause or contribute to exceedances of water quality objectives. The revision allows for treatment of pollutants in storm water runoff after the pollutants have entered the MS4.

State Water Board Order WQ 2001-15 otherwise upheld all the other requirements of the permit.

In addition to the modification to the discharge prohibition in Order WQ 2001-15, the State Water Board refined Order WQ 99-05 by making clear that the Copermittees may use an iterative approach to achieving compliance with water quality standards that involves ongoing assessments and revisions. Thus, the language for the discharge prohibitions and receiving water limitations was revised to explicitly require the Copermittees to implement an iterative process of assessments and revisions to comply with the discharge prohibitions and receiving water limitations. The San Diego Water Board retained the authority to enforce receiving water limitations and discharge prohibitions even if the Copermittee is engaged in the iterative process.

The Third Term San Diego County Permit was subsequently challenged in the Superior Court of the State of California and the Court of Appeal, Fourth Appellate District. The Court of Appeal, Fourth Appellate District, found that the approach of the Third Term San Diego County Permit to regulating discharges into the MS4 was appropriate (*Building Industry Ass'n. v. State Water Resources Control Bd., et al.,* 124 Cal.App.4th 866 (2004)). The State of California Supreme Court denied review sought by the Building Industry Association in March 2005.

The Fourth Term Permits began with the adoption of Order No. R9-2007-0001 issued to the Copermittees of San Diego County in January 2007. Order Nos. R9-2009-0002 and R9-2010-0016 were subsequently issued to the Copermittees of Orange County and Riverside County. The Fourth Term Permits continued to include more detailed requirements to be implemented by each Copermittee's jurisdictional runoff management program. The Fourth Term Permits also included requirements to further emphasize a watershed management approach and for more coordination among jurisdictional runoff management programs. In addition, the Fourth Term Permits included more requirements for assessing the effectiveness of the runoff management programs being implemented by the Copermittees. The intent of the inclusion of additional requirements was to enhance and better define elements of the permit that were expected to be incorporated into the iterative process for managing runoff from each Copermittee's jurisdiction and within the watersheds of the San Diego Region.

The Fourth Term Permits included several new and emerging approaches for managing storm water runoff and discharges. Low impact development (LID) requirements are included for development and significant redevelopment to reduce pollutants in storm water runoff from sites through more natural processes such as infiltration and biofiltration closer to the source, rather than utilizing conventional mechanical end-of-pipe treatment systems. Hydrograph modification (hydromodification) management requirements also are included to mitigate the potential for increased erosion in receiving waters due to increased runoff rates and durations often caused by development and increased impervious surfaces. The Fourth Term Orange County and Riverside County Permits introduced requirements to identify areas of existing

development where retrofitting with LID projects would be feasible and could be implemented to reduce storm water runoff and pollutants in storm water discharges.

The Fourth Term Orange County and Riverside County Permits included a clearer distinction between storm water and non-storm water discharges. The term “urban runoff” was completely removed, and a distinction between storm water (wet weather) runoff and non-storm water (dry weather) runoff was emphasized. This clarification was made to prevent any potential misunderstanding that regulation under the MS4 permits is limited only to urbanized areas, and to prevent non-storm water runoff from being managed in the same manner as storm water runoff. The term “urban runoff” is not defined in the Code of Federal Regulations (CFR) or Federal Register (FR) in the regulation of MS4 discharges. According to the CWA 402(p)(3)(B)(ii), MS4 permits must include a requirement to effectively prohibit non-storm water discharges into the MS4s.

Finally, for the Fourth Term Orange County and Riverside County Permits the San Diego Water Board found that non-storm water discharges to the MS4 from over application of irrigation water are sources of pollutants. The San Diego Water Board found that non-storm water discharges resulting from over-irrigation must be prohibited from entering the MS4 in accordance with the requirements of the CWA and pursuant to 40 CFR 122.26(d)(2)(iv)(B)(1).

The requirements of the Fourth Term Permits issued to the Copermittees in each county within the San Diego Region now have substantively the same core requirements such as discharge prohibitions, receiving water limitations, jurisdictional runoff management program components, and monitoring program requirements. There are, however, several inconsistencies that exist among the three Fourth Term Permits which complicate oversight and implementation of the permits by the San Diego Water Board.

The Fourth Term San Diego County Permit expired in January 2012. The Fourth Term Orange County permit expired in December 2014 and the Fourth Term Riverside County Permit expired in November 2015. Issuing the Fifth Term Permits within five years for three counties under three different permits would have required the San Diego Water Board to expend significant time and resources for the issuance of the permits through three separate public proceedings, thereby greatly reducing the time and resources available to oversee implementation and compliance. Multiple permits also create confusion for determining compliance among regulated entities, especially for the land development community.

The San Diego Water Board acknowledged that issuing a single MS4 permit for all the Copermittees in the San Diego Region can and is expected to result in more consistent implementation, improve communication among agencies within watersheds crossing multiple jurisdictions, and minimize resources spent with each permit renewal process. Within the findings of the Fourth Term Riverside County Permit issued in November 2010, the San Diego Water Board notified the public of its intent to develop and issue a single Regional MS4 Permit.

V. REGIONAL MS4 PERMIT APPROACH

The Fifth Term Permit, or Regional MS4 Permit, shifts the focus of the permit requirements from a minimum level of actions to be implemented by the Copermittees to identifying outcomes to be achieved by those actions. Order No. R9-2013-0001 represents an important paradigm shift in the approach for MS4 permits within the San Diego Region.

Historical Permitting Approach

The First and Second Term Permits were very broad and provided little specificity about what was required to be developed and implemented by the Copermittees. The Third Term Permits began to become more specific about the minimum level of implementation required by the Copermittees. The Fourth Term Permits subsequently increased in specificity. The MS4 permits have progressively become more detailed and focused on specifying the minimum level of actions expected to be implemented by the Copermittees. As detailed and specific as the MS4 permits have become, however, they include very little detail about what the desired outcomes of the required actions are expected to achieve. Compliance with the permit requirements has essentially been tracking numbers of actions and reporting, not tracking progress or actual improvements in the quality of receiving waters or discharges from the MS4s. The result has been an increase in actions being implemented by the Copermittees with little or no ability or expectations to determine whether or not improvements in water quality are being achieved.

The Fourth Term Permits result in significant resource expenditure by the Copermittees to report permit compliance information to the San Diego Water Board in the form of annual jurisdictional runoff management program, watershed program, and monitoring program reports. The San Diego Water Board was required to expend much of its limited resources on reviewing more than 50 voluminous reports submitted annually by the Copermittees. The information reported by the Copermittees was of limited value when trying to measure progress toward achieving improvements in the quality of receiving waters or discharges from the MS4s. Oversight of the MS4 permits was further complicated by the inconsistencies among the requirements issued to the Orange County, San Diego County, and Riverside County Copermittees under three separate MS4 permits.

Under the Fourth Term Permits, the Copermittees were required to expend a significant portion of their limited resources collecting data of limited value, and putting together reports to submit that information to the San Diego Water Board. Likewise, the San Diego Water Board was required to expend most of its limited resources reviewing reports, and developing permits instead of working directly with the Copermittees to identify solutions to problems causing impacts to water quality. This was an unsustainable course that would have continued to demand more resources

from the Copermittees and the San Diego Water Board, and would have continued to result in unknown water quality benefits.

New Permitting Approach

The goal of the Regional MS4 Permit is twofold: 1) bring a consistent set of MS4 permit requirements to all of the Copermittees within the San Diego Region; and, 2) provide an MS4 permit with requirements that will allow the Copermittees to focus their efforts and resources on achieving goals and desired outcomes toward the improvement of water quality rather than completing specific actions.

The overall approach included in the Regional MS4 Permit with respect to the jurisdictional runoff management programs will not differ significantly from the current permits. The general requirements for the jurisdictional runoff management program components and compliance with those requirements will remain and be applied consistently throughout the San Diego Region under the Regional MS4 Permit.

The most significant difference in the new permitting approach is the specific manner of implementation for those jurisdictional runoff management programs. Implementation will be based on decisions made by the Copermittees in accordance with what they have identified as their highest priority water quality conditions. In other words, the Copermittees will have significant control in how to implement the jurisdictional runoff management programs to best utilize their available resources in addressing a specific set of priorities effectively, instead of trying to address all the water quality priorities ineffectively.

The Copermittees are given the responsibility of identifying their highest priority water quality conditions that they intend to address. The Copermittees will develop goals that can be used to measure and demonstrate progress or improvements toward addressing those priorities. In addition to the goals, the Copermittees will provide a schedule for achieving the goals for those highest priorities. The measurement of progress toward achieving the goals for those highest priorities requires a better defined and more focused program of monitoring and assessment than under the Fourth Term Permits.

The monitoring and assessment program must be designed to inform the Copermittees of their progress, and the need for modifications in their jurisdictional runoff management programs and schedules to achieve their goals to improve water quality. The monitoring and assessment program requirements will have a more central role in the Regional MS4 Permit than in earlier permits. The monitoring and assessment requirements must also be designed to enable the Copermittees to focus and direct their efforts in implementing their jurisdictional runoff management programs toward their stated desired outcomes to improve the quality of receiving waters and/or discharges from the MS4s.

By providing an MS4 permit that allows the Copermittees to make more decisions about how to utilize and focus their resources, along with a better defined monitoring and assessment program to inform their water quality management decisions, the Copermittees have the opportunity to:

1) *Plan strategically*. The Copermittees must have the ability to identify their available resources and develop and implement long term plans that can organize, collect, and use those resources in the most strategically advantageous and efficient manner possible. This ability to develop long term plans will allow the Copermittees to focus and utilize their resources in a more concerted way over the short term and long term to address specific water quality priorities through stated desired outcomes.

2) *Manage adaptively*. The Copermittees must be given the ability to modify their plans as additional information and data are collected from the monitoring and assessment programs. The Copermittees' plans may require modifications to the programs, priorities, goals, strategies, and/or schedules in order for the Copermittees to achieve a stated desired outcome.

3) *Identify synergies*. The Copermittees must be given more flexibility to identify efficiencies within and among their jurisdictional runoff management programs as the strategies are developed and implemented to increase the Copermittees' collective effectiveness. The Copermittees must also be able to identify and utilize resources available from other agencies and entities to further augment and enhance their jurisdictional runoff management programs and/or to collectively work with those other agencies and entities toward achieving a stated desired outcome.

The Regional MS4 Permit requirements provide the Copermittees the flexibility and responsibility to decide what actions will be necessary to achieve an outcome that is tailored and designed by the Copermittees to improve specific prioritized water quality conditions. The San Diego Water Board expects the approach of the Regional MS4 Permit to give the Copermittees a greater sense of ownership for restoring the quality of receiving waters in the San Diego Region by becoming an integral part of the decision making process in identifying water quality conditions to be addressed, as well as determining the best use of their resources.

VI. ECONOMIC CONSIDERATIONS

Statutory Considerations

California Water Code (CWC) section 13241 requires the San Diego Water Board to consider certain factors, including economic considerations, in the adoption of water quality objectives. CWC section 13263 requires the San Diego Water Board to take into consideration the provisions of CWC section 13241 in adopting waste discharge requirements.

In *City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, the California Supreme Court considered whether Regional Water Boards must comply with CWC section 13241 when issuing waste discharge requirements under CWC section 13263(a) by taking into account the costs a permittee will incur in complying with the permit requirements. The Court concluded that whether it is necessary to consider such cost information "*depends on whether those restrictions meet or exceed the requirements of the federal Clean Water Act.*" (*Id.* at p. 627.) The Court ruled that Regional Water Boards may not consider the factors in CWC section 13241, including economics, to justify imposing pollutant restrictions that are less stringent than applicable federal law requires. (*Id.* At pp. 618, 626-627 ["*[Water Code section 13377 specifies that [ ] discharge permits issued by California's regional boards must meet the federal standards set by federal law. In effect, section 13377 forbids a regional board's consideration of any economic hardship on the part of the permit holder if doing so would result in the dilution of the requirements set by Congress in the Clean Water Act...Because CWC section 13263 cannot authorize what federal law forbids, it cannot authorize a regional board, when issuing a [ ] discharge permit, to use compliance costs to justify pollutant restrictions that do not comply with federal clean water standards*."]). However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Regional Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

As discussed in Section VII.F, Unfunded State Mandates, the San Diego Water Board finds that the requirements in this Order are not more stringent than the minimum federal requirements. Among other requirements, federal law requires MS4 permits to include requirements to effectively prohibit non-storm water discharges into the MS4s, in addition to requiring controls to reduce the discharge of pollutants in storm water to the MEP, and other provisions as USEPA or the State determines are appropriate for the control of pollutants in MS4 discharges.

The requirements in this Order may be more specific or detailed than those enumerated in federal regulations under 40 CFR 122.26 or in the USEPA guidance. However, the requirements have been designed to be consistent with and within the federal statutory mandates described in CWA section 402(p)(3)(B)(ii) and (iii) and the related federal regulations and guidance. Consistent with federal law, all of the

conditions in this Order could have been included in a permit adopted by USEPA in the absence of the in lieu authority of California to issue NPDES permits.

Moreover, the inclusion of numeric WQBELs in this Order does not cause this Order to be more stringent than federal law. Federal law authorizes both narrative and numeric effluent limitations to meet state water quality standards. The inclusion of WQBELs as discharge specifications in an NPDES permit in order to achieve compliance with water quality standards is not a more stringent requirement than the inclusion of BMP based permit limitations to achieve water quality standards (State Water Board Order No. WQ 2006-0012 (*Boeing*)). Therefore, consideration of the factors set forth in CWC section 13241 is not required for permit requirements to implement the effective prohibition on the discharge of non-storm water discharges into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determine appropriate to control such pollutants, as those requirements are mandated by federal law.

Included in the provisions of the Order are monitoring and reporting requirements that are designed to demonstrate that the Copermittees are implementing programs to comply with the CWA municipal storm water requirements. CWA section 308(a) and 40 CFR 122.41(h), (j)-(l), 122.44(i) and 122.48 require that all NPDES permits specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s (40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c)) also specify additional monitoring and reporting requirements. In addition to the federal requirements of the CWA, the San Diego Water Board also has the authority in CWC 13383 to establish monitoring, reporting, and recordkeeping requirements that implement federal and state laws and regulations through NPDES permits.

The monitoring and assessment information that will be reported to the San Diego Water Board is necessary to determine if the Copermittees are making progress toward achieving compliance with the discharge prohibitions, receiving water limitations, and effluent limitations under Provision A of the Order. The monitoring and assessment information that will be reported is also expected to be key to the iterative approach and adaptive management process that is required to be implemented by the Copermittees if they cannot meet the discharge prohibitions and receiving water limitations under the present conditions, which is also part of the requirements under Provision A of the Order.

Notwithstanding the above, the San Diego Water Board has considered cost information in issuing this Order, as discussed below. The San Diego Water Board has also considered all of the evidence that has been presented to the San Diego Water Board regarding the CWC section 13241 factors in adopting this Order. The San Diego Water Board finds that the requirements in this Order are reasonably necessary to protect beneficial uses identified in the Basin Plan and the economic information related to costs of compliance and other CWC section 13241 factors are not sufficient to justify failing to protect those beneficial uses. Where appropriate, the

San Diego Water Board has provided or will consider providing the Copermittees with additional time to implement control measures to achieve final WQBELs and/or water quality standards.

Cost Information

Discussions of the financial and economic ramifications of municipal storm water management programs tend to focus on the significant costs incurred by municipalities in developing and implementing the programs. When considering the cost of implementing the programs, however, it is also important to consider the alternative costs that are incurred when programs are not fully implemented, as well as the economic benefits which result from effective program implementation.

The recent financial and economic conditions have amplified the concerns about the costs incurred by the municipalities in developing and implementing their programs. The reduction in resources resulting from the recent financial and economic conditions has been cited by many of the Copermittees as a justification for reducing the requirements that must be met by their programs. While the recent conditions are a cause for concern in the short term, these programs also have an opportunity to identify and implement improvements and efficiencies before the next period of growth and development, resulting in more effective and sustainable programs over the long term.

In addition, it is very difficult to ascertain the true cost of implementation of the Copermittees' management programs because of inconsistencies in reporting by the Copermittees. Reported costs of compliance for the same program element can vary widely from city to city, often by a very wide margin that is not easily explained.[2] Despite these problems, efforts have been made to identify management program costs, which can be helpful in understanding the costs of program implementation.

The San Diego Water Board recognizes that the Copermittees will incur costs in implementing this Order, potentially above and beyond the costs from the Copermittees' prior permits. The San Diego Water Board also recognizes that, due to California's current economic condition, many Copermittees currently have limited staff and resources to implement actions to address its MS4 discharges. Based on the economic considerations below, the San Diego Water Board has provided the Copermittees a significant amount of flexibility to choose how to implement the requirements of the Order.

The Order also allows the Copermittees to customize their plans, programs, and monitoring requirements. In the end, it is up to the Copermittees to determine the effective BMPs and measures necessary to comply with this Order. The Copermittees can choose to implement the least expensive measures that are effective in meeting

[2] Los Angeles Water Board, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.

the requirements of this Order. This Order also does not require the Copermittees to fully implement all requirements within a single permit term. Where appropriate, the Board has provided the Copermittees with additional time outside of the permit term to implement control measures to achieve final WQBELs and/or water quality standards.

The San Diego Water Board has considered available cost information associated with compliance with this Order. It is not possible to predict accurately the cost impact of the requirements that involve an unknown level of implementation or that depend on environmental variables that are as yet undefined. Only general conclusions can be drawn from this information.

Estimated Municipal Storm Water Program Implementation Costs

The USEPA, the State Water Board, and the California Regional Water Quality Control Boards (Regional Water Boards) have attempted to evaluate the costs of implementing municipal storm water programs. The assessments have demonstrated that the true costs are difficult to ascertain and reported costs vary widely. In addition, reported fiscal analyses tend to neglect the costs incurred to municipalities when storm water and non-storm water runoff is not effectively managed, which are incurred as a result of pollution, contamination, nuisance, and damage to ecosystems, property, and human health. Nonetheless, they provide a useful context for considering the costs of requirements within Order No. R9-2013-0001.

In 1999, the USEPA reported on multiple studies it conducted to determine the cost of management programs. A study of Phase II municipalities determined that the annual cost of the Phase II program was expected to be $9.16 per household. The USEPA also studied 35 Phase I municipalities, finding costs to be $9.08 per household annually, similar to those anticipated for Phase II municipalities.[3]

The State Water Board commissioned a study by the California State University, Sacramento to assess costs of the Phase I MS4 program. This study includes an assessment of costs incurred by Phase I MS4s throughout the state to implement their programs. Annual cost per household in the study ranged from $18 to $46, with the Fresno-Clovis Metropolitan Area representing the lower end of the range, and the City of Encinitas (in San Diego County) representing the upper end of the range.[4]

A study on Phase I MS4 program costs was also conducted by the California Regional Water Quality Control Board, Los Angeles Region (Los Angeles Water Board), where program costs reported in the municipalities' annual reports were assessed. The Los

[3] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791-68792.
[4] State Water Board, 2005. NPDES Stormwater Cost Survey. P. ii.

Angeles Water Board estimated that average per household cost to implement the MS4 program in Los Angeles County was $12.50. [5]

It is important to note that reported program costs are not all attributable to solely complying with MS4 permits. Many program components, and their associated costs, existed before any MS4 permits were ever issued. For example, street sweeping and trash collection costs cannot be solely or even principally attributable to MS4 permit compliance, since these practices have long been expected from and implemented by municipalities.

Therefore, true program cost resulting from MS4 permit requirements is some fraction of reported costs. The California State University, Sacramento study found that only 38 percent of program costs are new costs fully attributable to MS4 permits. The remainder of the program costs was either pre-existing or resulted from enhancement of pre-existing programs.[6] In 2000, the County of Orange found that even lower amounts of program costs are solely attributable to MS4 permit compliance, reporting that the amount attributable to implement the County or Orange Drainage Area Management Plan (DAMP), was less than 20 percent of the total budget. The remaining 80 percent was attributable to pre-existing programs.[7] More current data from the County of Orange is not used in this discussion because the County of Orange no longer reports such information.

Estimated Value of Healthy Water Quality

Economic considerations of municipal storm water management programs cannot be limited only to program costs. Evaluation of programs must also consider information on the benefits derived from environmental protection and improvement.[8] Attention is often focused on municipal storm water management program costs, but the programs must also be viewed in terms of their value to the public.

Placing a value on healthy receiving waters is very difficult. Often the value of receiving waters with good water quality manifests in other forms, such as tourism, recreational opportunities, and/or increased property values. When surface water bodies are degraded, thereby degrading the habitat within and adjacent to the water bodies, the public loses the value and benefits associated with being able to use the area in and around the water bodies. Surface waters that are able to support the beneficial uses designated in the Basin Plan can sustain plants and wildlife that can attract visitors and residents, providing aesthetic, recreational, as well as monetary value to the public. At this time, however, there have been no studies for the San

[5] Los Angeles Water Board, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.
[6] State Water Board, 2005. NPDES Stormwater Cost Survey. P. 58.
[7] County of Orange, 2000. A NPDES Annual Progress Report. P. 60.
[8] Ribaudo M.O. and D. Heelerstein. 1992, *Estimating Water Quality Benefits: Theoretical and Methodological Issues.* U.S. Department of Agriculture. Technical Bulletin No. 1808.

Diego Region to quantify the added value that surface waters with healthy water quality can provide.

USEPA has estimated that household willingness to pay for improvements in fresh water quality for fishing and boating is approximately $158-$210.[9] This estimate can be considered conservative, since it does not include important considerations such as marine waters benefits, wildlife benefits, or flood control benefits. Another study conducted by California State University, Sacramento reported that the annual household willingness to pay for statewide clean water is approximately $180.[10]

A study conducted by the University of Southern California and University of California, Los Angeles assessed the costs and benefits of implementing various approaches for achieving compliance with the MS4 permits in the Los Angeles region. The study found that non-structural systems would cost $2.8 billion but provide $5.6 billion in benefit. If structural systems were determined to be needed, the study found that total costs would be $5.7 to $7.4 billion, while benefits could reach $18 billion.[11] Costs are anticipated to be borne over many years, probably at least ten years.

As can be seen, the benefits of the municipal storm water management programs are expected to considerably exceed their costs. Such findings are corroborated by USEPA, which found that the benefits of implementation of its Phase II storm water rule would also outweigh the costs.[12]

[9] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68793.
[10] State Water Board, 2005. NPDES Stormwater Cost Survey. P. iv.
[11] Los Angeles Water Board, 2004. Alternative Approaches to Stormwater Control.
[12] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791.

VII. APPLICABLE STATUTES, REGULATIONS, PLANS AND POLICIES

A. Legal Authorities – Federal Clean Water Act and California Water Code

This Order is issued pursuant to section 402 of the CWA and implementing regulations adopted by the USEPA and chapter 5.5, division 7 of the CWC (commencing with section 13370). This Order serves as an NPDES permit for point source discharges to surface waters. This Order also serves as waste discharge requirements pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

The objective of the CWA is "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*." To carry out this objective, the CWA requires the implementation of permit programs to regulate the discharge of pollutants and dredged or fill material to the navigable waters of the U.S. and to regulate the use and disposal of sewage sludge. CWA section 402 provides the legal authority to issue a permit for the discharge of pollutants to waters of the U.S. under the NPDES. The CWA provides that NPDES permits may be issued by states which are authorized to implement the provisions of that act. California became authorized to implement the NPDES permit program on May 14, 1973.

The Porter-Cologne Water Quality Control Act (Division 7, commencing with CWC section 13000) established the State Water Resources Control Board (State Water Board) and nine Regional Water Quality Control Boards (Regional Water Boards) as the principal state agencies with primary responsibility for the coordination and control of water quality. CWC section 13200(f) established the San Diego Water Board, which has the primary responsibility for the coordination and control of water quality in the San Diego Region, which includes all the basins draining into the Pacific Ocean between the southern boundary of the Santa Ana Region and the California-Mexico boundary. The San Diego Water Board implements the CWA through Chapter 5.5 of the CWC, commencing with section 13370. CWC section 13377 provides the San Diego Water Board the legal authority to issue waste discharge requirements to ensure compliance with all applicable provisions of the CWA and acts amendatory thereof or supplementary, thereto, to implement water quality control plans, or for the protection of beneficial uses, or to prevent nuisance.

CWA section 402(p) requires the USEPA or authorized state to issue NPDES permits for storm water discharges from MS4s to waters of the U.S. CWA section 402(p)(3)(B)(ii) requires that NPDES permits for storm water discharges from MS4s "*effectively prohibit non-storm water discharges*" into the MS4s. CWA section 402(p)(3)(B)(iii) requires that NPDES permits for storm water discharges from MS4s to "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable* [MEP], *including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*."

The USEPA published implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]), which prescribe permit application requirements for storm water discharges from MS4s pursuant to CWA 402(p), on November 16, 1990. The USEPA published an Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems, which provided guidance on permit application requirements for regulated MS4s, on May 17, 1996. The federal regulations in 40 CFR 122 and guidance issued by USEPA serve as the foundation for the provisions of Order No. R9-2013-0001. The legal authorities provided by the above statutes and regulations are included as part of the discussions in Section VIII of this Fact Sheet.

B. Legal Authority for the Permit Issued on a Region-wide Basis

CWA section 402(p)(3)(B) provides the San Diego Water Board the legal authority to issue an NPDES permit for the San Diego Region as compared to separate MS4 permits based upon County- and partial County-wide boundaries as they existed within the San Diego Region. CWA section 402(p)(3)(B) states that "*Permits for discharges from municipal storm sewers- (i) may be issued on a system- or jurisdiction-wide basis* ...." The federal regulations in 40 CFR 122.26(a)(1)(v) also state that the San Diego Water Board "*may designate dischargers from municipal separate storm sewers on a system-wide or jurisdiction-wide basis. In making this determination, the [San Diego Water Board] may consider the following factors: (A) the location of the discharge with respect to waters of the United States; (B) the size of the discharge; (C) the quantity and nature of the pollutants discharged to waters of the United States; and (D) other relevant factors*."

More specifically, the federal regulations provide that for large and medium MS4 systems, the San Diego Water Board may issue a regional permit. Specifically, the federal regulation in 40 CFR 122.26(a)(3) provide:

"*(ii) The Director may either issue one system-wide permit covering all discharges from municipal separate storm sewers within a large or medium municipal storm sewer system or issue distinct permits for appropriate categories of discharges within a large or municipal separate storm sewer system including, but not limited to: all discharges owned or operated by the same municipality; located within the same jurisdiction; all discharges within a system that discharge to the same watershed; discharges within a system that are similar in nature; or for individual discharges from municipal separate storm sewers within the system.*

(iii) The operator of a discharge from a municipal separate storm sewer which is part of a large or medium municipal separate storm sewer system must either: (A) Participate in a permit application (to be a permittee or a co-permittee) with one or more other operator of discharges from the large or medium municipal storm sewer system which covers all, or a portion of all, discharges from the municipal separate storm sewer system; (B) Submit a distinct permit application which only covers discharges from the municipal separate storm sewers for

which the operator is responsible; or (C) A regional authority may be responsible for submitting a permit application under the following guidelines....

(iv) One permit application may be submitted for all or a portion of all municipal separate storm sewers within adjacent or interconnected large or medium municipal separate storm sewer systems. The Director may issue one systemwide permit covering all, or a portion of all municipal separate storm sewers in adjacent or interconnected large or medium municipal separate storm sewer systems.

(v) Permits for all or a portion of all discharges from large or medium municipal separate storm sewer systems that are issued on a system-wide, jurisdiction-wide, watershed or other basis may specify different conditions relating to different discharges covered by the permit, including different management programs for different drainage areas which contribute storm water to the system."

Based on these regulations, the San Diego Water Board may issue a region-wide MS4 permit. The regulations also clarify that the permit may include different conditions for separate discharges covered by the permit. This allows the San Diego Water Board to ensure that suitable water quality conditions and provisions are identified for each watershed.

The USEPA's responses to comments in the Final Rule for the above-mentioned regulations also make it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide, permits. In the Final Rule published in the Federal Register and containing the responses to comments, USEPA notes that 40 CFR 122.26(a)(3)(iv) would allow an entire system in a geographical region under the purview of a State agency to be designated under a permit.[13] USEPA also states that many commenters wanted to allow the permitting authority broad discretion to establish system-wide permits, and that EPA believes that paragraphs 40 CFR 122.26 (a)(1)(v) and (a)(3)(ii) allow for such broad discretion.[14]

This Order creates watershed requirements that apply to multiple counties. The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees. Managing storm water on a regional and watershed basis is expected to result in improved water quality, as the Order focuses on monitoring and management practices necessary to improve each watershed rather than political boundaries. A single permit also allows the San Diego Water Board staff to expend fewer resources developing successive multiple permits and allows more resources to be devoted to working cooperatively with all three current groups of Copermittees to ensure implementation of this Order results in improved water quality.

[13] 55 Federal Register 47990-01, 48042.
[14] Ibid.

C. Federal and California Endangered Species Acts

This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2115.5) or the Federal Endangered Species Act (16 United States Code [USC] sections 1531 to 1544). This Order requires compliance with requirements to protect the beneficial uses of waters of the U.S. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

D. California Environmental Quality Act

The action to adopt an NPDES Permit is exempt from the provisions of Chapter 3 of the California Environmental Quality Act (CEQA) (Public Resources Code section 21100, et seq.) pursuant to CWC section 13389. (*County of Los Angeles v. Cal. Water Boards* (2006) 143 Cal.App.4th 985.)

E. State and Federal Regulations, Plans and Policies

The legal authority provided by the following regulations, plans, and policies are also included as part of the discussions in Section VIII of this Fact Sheet.

<u>Water Quality Control Plan for the San Diego Basin</u>

The CWA requires the San Diego Water Board to establish water quality standards for each water body in its region. Water quality standards include beneficial uses, water quality objectives and criteria that are established at levels sufficient to protect beneficial uses, and an antidegradation policy to prevent degrading of waters. On September 8, 1994, the San Diego Water Board adopted the *Water Quality Control Plan for the San Diego Basin* (Basin Plan). The Basin Plan designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters in the San Diego Region. The San Diego Water Board has amended the Basin Plan on multiple occasions since 1994. In addition, the Basin Plan implements State Water Board Resolution No. 88-63, which established state policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply. Beneficial uses applicable to the surface water bodies that receive discharges from the MS4s within the San Diego Region generally include those listed below:

The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region:

- Municipal and Domestic Supply (MUN)
- Agricultural Supply (AGR)
- Industrial Process Supply (PROC)

- Industrial Service Supply (IND)
- Ground Water Recharge (GWR)
- Contact Water Recreation (REC1)
- Non-contact Water Recreation (REC2)
- Warm Freshwater Habitat (WARM)
- Cold Freshwater Habitat (COLD)
- Wildlife Habitat (WILD)
- Rare, Threatened, or Endangered Species (RARE)
- Freshwater Replenishment (FRSH)
- Hydropower Generation (POW)
- Preservation of Biological Habitats of Special Significance (BIOL)

The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region:

- Navigation (NAV)
- Commercial and Sport Fishing (COMM)
- Estuarine Habitat (EST)
- Marine Habitat (MAR)
- Aquaculture (AQUA)
- Migration of Aquatic Organisms (MIGR)
- Spawning, Reproduction, and/or Early Development (SPWN)
- Shellfish Harvesting (SHELL)

Pursuant to Water Code sections 13263 and 13377, the requirements of this Order implement the Basin Plan.

Water Quality Control Plan for Ocean Waters of California, California Ocean Plan

In 1972, the State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan). The State Water Board adopted the most recent amended Ocean Plan on October 16, 2012. The Office of Administrative Law approved it on July 3, 2013. The amended Ocean Plan became effective on August 19, 2013. The Ocean Plan is applicable, in its entirety, to ocean waters of the State. In order to protect beneficial uses, the Ocean Plan establishes water quality objectives and a program of implementation. Pursuant to Water Code sections 13263 and 13377, the requirements of this Order implement the Ocean Plan. The Ocean Plan identifies the beneficial uses of ocean waters of the State to be protected as summarized below:

- Industrial water supply
- Water contact and non-contact recreation, including aesthetic enjoyment; navigation
- Commercial and sport fishing

- Mariculture
- Preservation and enhancement of designated Areas of Special Biological Significance
- Rare and endangered species
- Marine habitat
- Fish spawning and shellfish harvesting

On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving an exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges. On June 19, 2012, the State Water Board adopted Order No. 2012-0031, amending Order No. 2012-0012 to require pollutant load reductions to be achieved within six years for the ASBS Compliance Plans, section A.2.d(2) and ASBS Pollution Prevention Plans, section B.2.b(2). The State Water Board Resolution No. 2012-0012, as amended requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject terms and conditions of State Water Board Resolution No. 2012-0012, as amended. The Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012, as amended, applicable to these discharges, are incorporated in Attachment A of this Order. Requirements of this Order implement the Ocean Plan.

Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality

On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

Antidegradation Policy

Federal regulations (40 CFR 131.12) require that the state water quality standards include an antidegradation policy consistent with the federal antidegradation policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16 ("Statement of Policy with Respect to Maintaining the Quality of the Waters of the State"). State Water Board Resolution No. 68-16 incorporates the

federal antidegradation policy where the federal policy applies under federal law.

The San Diego Water Board's Basin Plan implements and incorporates by reference both the State and federal antidegradation policies. State Water Board Resolution No. 68-16 and 40 CFR 131.12 require the San Diego Water Board to maintain high quality waters of the State unless degradation is justified based on specific findings. First, the Board must ensure that "existing instream uses and the level of water quality necessary to protect the existing uses" are maintained and protected. Second, if the baseline quality of a water body for a given constituent exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water, that quality shall be maintained and protected through the requirements of the Order unless the Board makes findings that (1) any lowering of the water quality is necessary to accommodate important economic or social development in the area in which the waters are located; (2) water quality adequate to protect existing uses fully is assured; and (3) the highest statutory and regulatory requirements for all new and existing point sources and all cost-effective and reasonable best management practices for nonpoint source control are achieved. The San Diego Water Board must also comply with any requirements of State Water Board Resolution No. 68-16 beyond those imposed through incorporation of the federal antidegradation policy. In particular, the Board must find that not only present, but also anticipated future uses of water are protected, and must ensure best practicable treatment or control of the discharges. The baseline quality considered in making the appropriate findings is the best quality of the water since 1968, the year of the adoption of Resolution No. 68-16, or a lower level if that lower level was allowed through a permitting action that was consistent with the federal and state antidegradation policies.

The discharges permitted in this Order are consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Board Resolution No. 68-16 as set forth below:

1. Many of the waters within the area covered by this Order are impaired for multiple pollutants discharged through MS4s and are not high quality waters with regard to these pollutants. In most cases, there is insufficient data to determine whether these water bodies were impaired as early as 1968, but the limited available data shows impairment dating back for more than two decades. Many such water bodies are listed on the State's CWA Section 303(d) List and the San Diego Water Board has established TMDLs to address the impairments. This Order ensures that existing instream (beneficial) water uses and the level of water quality necessary to protect the existing uses is maintained and protected. This Order requires the Copermittees to comply with permit provisions to implement the WLAs set forth in the TMDLs in order to restore the beneficial uses of the impaired water bodies consistent with the assumptions and requirements of the TMDLs. This Order further requires compliance with receiving water limitations to meet water quality standards in the receiving water either by demonstrating compliance pursuant to Provision A and the Copermittees' monitoring and assessment program pursuant to Provision D of this Order, or by implementing Provision B.3.c with a schedule to achieve compliance

with receiving water limitations. This Order includes requirements to develop and implement storm water management programs, achieve WQBELs, and effectively prohibit non-storm water discharges into the MS4. The issuance of this Order does not authorize an increase in the amount of discharge of waste.

2. To the extent that water bodies within the area covered by this Order are high quality waters with regard to some constituents, this Order finds as follows:

   a. Allowing limited degradation of high quality water bodies through MS4 discharges is necessary to accommodate important economic or social development in the area and is consistent with the maximum benefit to the people of the state. The discharge of storm water in certain circumstances is to the maximum benefit to the people of the state because it can assist with maintaining instream flows that support beneficial uses, may spur the development of multiple-benefit projects, and may be necessary for flood control, and public safety as well as to accommodate development in the area. The alternative – capturing all storm water from all storm events – would be an enormous opportunity cost that would preclude MS4 permittees from spending substantial funds on other important social needs. The Order ensures that any limited degradation does not affect existing and anticipated future uses of the water and does not result in water quality less than established standards. The Order requires compliance with receiving water limitations that act as a floor to any limited degradation.

   b. The Order requires the highest statutory and regulatory requirements and requires that the Copermittees meet best practicable treatment or control. The Order prohibits all non-storm water discharges, with a few enumerated exceptions, through the MS4 to the receiving waters. As required by 40 CFR section 122.44(a), the Copermittees must comply with the "maximum extent practicable" technology-based standard set forth in CWA section 402(p), and implement extensive minimum control measures in a storm water management program. Recognizing that best practicable treatment or control may evolve over time, the Order includes new and more specific requirements as compared to the prior Phase I MS4 permits for the San Diego County, Orange County and Riverside County Copermittees. The Order incorporates options to implement Water Quality Improvement Plans that must specify detailed structural and non-structural storm water controls that must be implemented in accordance with an accepted proposed time schedule. The Order contains provisions to encourage, wherever feasible, retention of the storm water from the 85th percentile 24-hour storm event.

<u>Anti-Backsliding Requirements</u>

CWA sections 402(o) and 303(d)(4) and federal regulations at 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations or conditions may be relaxed. While this Order

allows implementation of an alternative compliance pathway option in Provision B.3.c to constitute compliance with receiving water limitations under certain circumstances, the availability of that alternative and the corresponding availability of additional time to come into compliance with receiving water limitations does not violate the anti-backsliding provisions. The receiving water limitations provisions of this Order are imposed under section 402(p)(3)(B) of the Clean Water Act rather than based on best professional judgment, or based on section 301(b)(1)(C) or sections 303(d) or (e), and are accordingly not subject to the anti-backsliding requirements of section 402(o). Although the non-applicability is less clear with respect to the regulatory anti-backsliding provisions in 40 CFR 122.44(l), the regulatory history suggests that USEPA's intent was to establish the anti-backsliding regulations with respect to evolving technology standards for traditional point sources. (See, e.g., 44 Fed.Reg. 32854, 32864 (Jun. 7, 1979)). It is unnecessary, however, to resolve the ultimate applicability of the regulatory anti-backsliding provisions, because the alternative compliance pathway option in Provision B.3.c qualifies for an exception to backsliding as based on new information.

The alternative compliance pathway option in Provision B.3.c of this Order was informed by new information available to the Board from experience and knowledge gained through storm water permitting at the Regional Water Boards in the last ten years. There has been a statewide paradigm shift in storm water management. State Water Board Order WQ 2015-0075 directed all of the Regional Water Boards to consider the Los Angeles Water Board's alternative compliance path to receiving water limitations in all Phase I MS4 permits going forward (State Water Board Order WQ 2015-0075 at page 51), and the Los Angeles Water Board's process of developing over 30 watershed-based TMDLs and implementing several TMDLs since the adoption of the previous permits. In particular, the Los Angeles Water Board recognized the significance of allowing time to plan, design, fund, operate and maintain watershed-based BMPs necessary to attain water quality improvements and additionally recognized the potential for municipal storm water to benefit water supply. Similarly, the San Diego Water Board's experience developing and implementing the Fourth Term MS4 Permits and TMDLs that apply on a region-wide scale (e.g. TMDLs for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region) has resulted in a similar recognition of the need for a watershed-based approach that allows time to plan, design, fund, operate and maintain BMPs to address impaired waters that have been impacted by MS4 discharges. Thus, even if the receiving water limitations are subject to anti-backsliding requirements, they were revised based on new information that would support an exception to the anti-backsliding provisions. (33 U.S.C. § 1342(o)(2)(B)(i); 40 C.F.R. § 122.44(l)(1); 40 C.F.R. §122.44(l)(2)(i)(B)(1)).

<u>Clean Water Act Section 303(d) List</u>

CWA section 303(d)(1) requires each State to identify specific water bodies within its boundaries where water quality standards are not being met or are not expected to be met after implementation of technology-based effluent limitations on point sources. Water bodies that do not meet water quality standards are considered impaired and are placed on the state's "303(d) List." Periodically, USEPA approves the State's 303(d) List.

Most recently, USEPA approved the State's 2010 303(d) List of impaired water bodies on October 11, 2011, which includes certain receiving waters in the San Diego Region. For each listed water body, the state or USEPA is required to establish a TMDL of each pollutant impairing the water quality standards in that water body. A TMDL is a tool for implementing water quality standards and is based on the relationship between pollution sources and in-stream water quality conditions. The TMDL establishes the allowable pollutant loadings for a water body and thereby provides the basis to establish water quality-based controls. These controls should provide the pollution reduction necessary for a water body to meet water quality standards.

A TMDL is the sum of the allowable pollutant loads of a single pollutant from all contributing point sources (the waste load allocations or WLAs) and non-point sources (load allocations of LAs) plus the contribution from background sources and a margin of safety (40 CFR 130.2(i)). MS4 discharges are considered point source discharges. For 303(d)-listed water bodies and pollutants in the San Diego Region, the San Diego Water Board or USEPA develops and adopts TMDLs that specify these requirements.

Since 2002, the San Diego Water Board has established seven (7) TMDLs to remedy water quality impairments in various water bodies within the San Diego Region (see Attachment E to the Order). These TMDLs identify MS4 discharges as a source of pollutants to these water bodies, and, as required, establish WLAs for MS4 discharges to reduce the amount of pollutant discharged to receiving waters. CWA section 402(p)(3)(B)(iii) requires the San Diego Water Board to impose permit conditions, including: "management practices, control techniques and system, design and engineering methods, and *such other provisions as the Administrator or the State determines appropriate for the control of such pollutants."* (Emphasis added.) CWA section 402(a)(1) also requires states to issue permits with conditions necessary to carry out the provisions of the CWA. Federal regulations also require that NDPES permits contain WQBELs consistent with the assumptions and requirements of all available WLAs (40 CFR 122.44(d)(1)(vii)(B)). CWC section 13377 also requires that NPDES permits include limitations necessary to implement water quality control plans. Therefore, this Order includes WQBELs and other provisions to implement the TMDL WLAs assigned to Copermittees regulated by this Order.

<u>Other Regulations, Plans and Policies</u>

This Order implements all other applicable federal regulations and State regulations, plans and policies, including the California Toxics Rule at 40 CFR 131.38 (Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California Rule [California Toxics Rule or CTR]), and State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP).

F. Unfunded State Mandates

Article XIII B, Section 6(a) of the California Constitution provides that whenever "*any state agency mandates a new program or higher level of service on any local government, the state shall provide a subvention of funds to reimburse that local government for the costs of the program or increased level of service*." The requirements of this Order do not constitute state mandates that are subject to a subvention of funds for several reasons, including, but not limited to, the following.

First, the requirements of this Order do not constitute a new program or a higher level of service as compared to the requirements contained in the previous Fourth Term Permits. The overarching requirement to impose controls to reduce the pollutants in discharges from MS4s is dictated by the CWA and is not new to this permit cycle (33 USC section 1342(p)(3)(B)). The inclusion of new and advanced measures as the MS4 programs evolve and mature over time is anticipated under the CWA (55 FR 47990, 48052 (Nov. 16, 1990)), and to the extent requirements in this Order are interpreted as new advanced measures, they do not constitute a new program or higher level of service.

Second, and more broadly, mandates imposed by federal law, rather than by a state agency, are exempt from the requirement that the local agency's expenditures be reimbursed (Cal. Const., art. XIII B, section 9, subd. (b)). This Order implements federally mandated requirements under the CWA and its requirements are therefore not subject to subvention of funds. This includes federal requirements to effectively prohibit non-storm water discharges, to reduce the discharge of pollutants in storm water to the MEP, and to include such other provisions as the Administrator or the State determines appropriate for the control of such pollutants (33 USC section 1342(p)(3)(B)). Federal cases have held these provisions require the development of permits and permit provisions on a case-by-case basis to satisfy federal requirements. (*Natural Resources Defense Council, Inc., v. USEPA* (9th Cir. 1992) 966 F.2d 1292, 1308, fn. 17.)

The authority exercised under this Order is not reserved state authority under the CWA's savings clause (cf. *Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 627-628 [relying on 33 USC section 1370, which allows a state to develop requirements which are not "less stringent" than federal requirements]), but instead is part of a federal mandate to develop pollutant reduction requirements for municipal separate storm sewer systems. To this extent, it is entirely federal authority that forms the legal basis to establish the permit provisions. (See, *City of Rancho Cucamonga v. Regional Water Quality Control Board, Santa Ana Region* (2006) 135 Cal.App.4th 1377, 1389; *Building Industry Ass'n of San Diego Co. v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 882-883.)

The MEP standard is a flexible standard that balances a number of considerations, including technical feasibility, cost, public acceptance, regulatory compliance, and effectiveness. (*Building Ind. Ass'n., supra,* 124 Cal.App.4th at pp. 873-874, 889.) Such considerations change over time with advances in technology and with experience

gained in storm water management (55 FR 47990, 48052 (Nov. 16, 1990)). Accordingly, a determination of whether the conditions contained in this Order exceed the requirements of federal law cannot be based on a point by point comparison of the permit conditions and the minimum control measures that are required "at a minimum" to reduce pollutants to the maximum extent practicable and to protect water quality (40 CFR 122.34). Rather, the appropriate focus is whether the permit conditions, as a whole, exceed the MEP standard.

In recent months, the County of Los Angeles and County of Sacramento Superior Courts have granted writs setting aside decisions of the Commission on State Mandates that held certain requirements in Phase I permits constituted unfunded mandates. In both cases, the courts have found that the correct analysis in determining whether an MS4 permit constituted a state mandate was to evaluate whether the permit as a whole exceeds the MEP standard. (*State of Cal. v. Comm. on State Mandates* (Super. Ct. Sacramento County, 2012, No. 34-2010-80000604), *State of California v. County of Los Angeles* (Super. Ct. Los Angeles County, 2011, No. BS130730.) Both cases are currently pending appeal.

The requirements of the Order, taken as a whole rather than individually, are necessary to reduce the discharge of pollutants to the MEP and to protect water quality. The San Diego Water Board finds that the requirements of the Order are practicable, do not exceed federal law, and thus do not constitute an unfunded mandate. These findings are the expert conclusions of the principal state agency charged with implementing the NPDES program in California (CWC sections 13001, 13370).

It should also be noted that the provisions in this Order to effectively prohibit non-storm water discharges are also mandated by the CWA (33 USC section 1342(p)(3)(B)(ii)). Likewise, the provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state establishes or adopts a TMDL, federal law requires that permits must contain effluent limitations consistent with the assumptions and requirements of any applicable waste load allocation in a TMDL (40 CFR 122.44(d)(1)(vii)(B)).

Third, the local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental dischargers who are issued NPDES permits for storm water discharges. With a few inapplicable exceptions, the CWA regulates the discharge of pollutants from point sources (33 USC section 1342) and the Porter-Cologne Act regulates the discharge of waste (CWC section 13263), both without regard to the source of the pollutant or waste. As a result, the "costs incurred by local agencies" to protect water quality reflect an overarching regulatory scheme that places similar requirements on governmental and non-governmental dischargers. (See *County of Los Angeles v. State of California* (1987) 43 Cal.3d 46, 57-58 [finding comprehensive workers' compensation scheme did not create a cost for local agencies that was subject to state subvention].)

The CWA and the Porter-Cologne Act largely regulate storm water with an even hand, but to the extent there is any relaxation of this even-handed regulation, it is in favor of the local agencies. Generally, the CWA requires point source dischargers, including dischargers of storm water associated with industrial or construction activity, to comply strictly with water quality standards (33 USC section 1311(b)(1)(C); *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159, 1164-1165 [noting that industrial discharges must strictly comply with water quality standards]). As discussed in prior State Water Board decisions, certain provisions of this Order do not require strict compliance with water quality standards (State Water Board Order No. WQ 2001-0015, p. 7). Those provisions of this Order regulate the discharge of waste in municipal storm water under the CWA's MEP standard, not the BAT/BCT standard that applies to other types of discharges. These provisions, therefore, regulate the discharge of waste in municipal storm water more leniently than the discharge of waste from non-governmental sources.

Fourth, the Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)). To the extent that the local agency Copermittees have voluntarily availed themselves of the permit, the program is not a state mandate. (Accord, *County of San Diego v. State of California* (1997) 15 Cal.4th 68, 107-108.)

Fifth, the local agency Copermittees' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under state law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

Finally, even if any of the permit provisions could be considered unfunded mandates, under Government Code section 17556, subdivision (d), a state mandate is not subject to reimbursement if the local agency has the authority to charge a fee. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order, subject to certain voting requirements contained in the California Constitution. (See Cal. Const., Art. XIII D, section 6, subd. (c); see also *Howard Jarvis Taxpayers Ass'n v. City of Salinas* (2002) 98 Cal.App.4th 1351, 1358-1359.) The Fact Sheet demonstrates that numerous activities contribute to the pollutant loading in the MS4. Local agencies can levy service charges, fees, or assessments on these activities, independent of real property ownership. (See, e.g., *Apartment Ass'n of Los Angeles County, Inc., v. City of Los Angeles* (2001(24 Cal.4th 830, 842 [upholding inspection fees associated with renting property].) The authority and ability of a local agency to defray the cost of a program without raising taxes indicates that a program does not entail a cost subject to subvention. (*Clovis Unified School Dist. V. Chiang* (2010) 188 Cal.App.4th 794, 812, citing *Connell v. Sup. Ct.* (1997) 59 Cal.App.4th 382, 401; *County of Fresno v. State of California* (1991) 53 Cal. 3d. 482, 487-488.)

VIII. PROVISIONS

The provisions (i.e. NPDES permit requirements) of the Order are discussed below.

A. Prohibitions and Limitations

Purpose: Provision A includes the prohibitions and limitations requirements that are the foundation of all the subsequent requirements included in the Order. Compliance with the prohibitions and limitations will restore and protect receiving waters from impacts that may be caused by discharges into and from the Copermittees' MS4s and ultimately achieve the objective of the CWA.

In meeting the requirements set forth in the Order, the Copermittees must be cognizant that the prohibitions and limitations exist and will be the standard by which the San Diego Water Board will be measuring the progress and success of their implementation of the NPDES permit requirements.

***Discussion*:** The objective of the CWA is to "*restore and maintain the chemical, physical, and biological integrity of the Nation's waters*." The CWA requires the implementation of NPDES permit programs to regulate discharges of pollutants and dredged or fill material to the navigable waters of the U.S. For discharges into and from MS4s, the CWA requires the NPDES permits to "*effectively prohibit non-stormwater discharges into the storm sewers*" and "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable.*"

Provision A includes limitations, consistent with the requirements of the CWA for discharges from MS4s. Provision A expresses these limitations as discharge prohibitions, receiving water limitations, and effluent limitations. Compliance with the discharge prohibitions and receiving water limitations is also explicitly described, in conformance with precedential State Water Board Orders.

More specific and detailed discussions of the requirements of Provision A are provided below.

Provision A.1 (Discharge Prohibitions) prohibits the discharge of specific types of waste into and/or from the Copermittees' MS4s.

Provision A.1.a restates and reiterates Basin Plan Waste Discharge Prohibition 1, by prohibiting discharges into and from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the

state. The terms pollution,[15] contamination,[16] and nuisance[17] are defined under CWC 13050. Provision A.1.c incorporates all the waste discharge prohibitions of the Basin Plan into the requirements of the Order. The waste discharge prohibitions from the Basin Plan have been reproduced and provided in Attachment A to the Order.

Provision A.1.b requires non-storm water discharges into the MS4s to be effectively prohibited, consistent with the requirements of the CWA for MS4 permits to "*effectively prohibit non-stormwater discharges into the storm sewers*." The effective prohibition is required to be implemented by each Copermittee within its jurisdiction through the illicit discharge detection and elimination requirements under Provision E.2. The prohibition does not apply to NPDES permitted discharges into the Copermittees' MS4s.

The CWA employs the strategy of prohibiting the discharge of any pollutant from a point source into waters of the United States unless the discharger of the pollutant(s) obtains an NPDES permit pursuant to CWA Section 402. The 1987 amendment to the CWA includes provision 402(p) that specifically addresses NPDES permitting requirements for storm water discharges from MS4s. CWA section 402(p) prohibits the discharge of pollutants from specified MS4s to waters of the U.S. except as authorized by an NPDES permit and identifies two substantive standards for MS4 storm water permits. MS4 permits (1) "*shall include a requirement to effectively prohibit non-stormwater discharges into the storm sewers*" and (2) "*shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or State determines appropriate for the control of such pollutants*." (CWA section 402(p)(3)(B)(ii)-(iii).)

In November 1990, the USEPA published regulations addressing storm water discharges from MS4s (55 FR 47990 and following (Nov. 16, 1990) (Phase I Final Rule)). The regulations establish minimum requirements for MS4 permits, and generally focus on the requirement that MS4s implement programs to reduce the amount of pollutants found in storm water discharges to the MEP. The CWA's municipal storm water MEP standard does not require storm water discharges to strictly meet water quality standards, as is required for other NPDES permitted

[15] CWC 13050(l): "(1) 'Pollution' means an alteration of the quality of waters of the state by waste to a degree which unreasonably affects either of the following: (A) The water for beneficial uses. (B) Facilities which serve beneficial uses. (2) 'Pollution' may include 'contamination.'

[16] CWC 13050(k): "Contamination' means an impairment of the quality of waters of the state by waste to a degree which creates a hazard to public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste, whether or not waters of the state are affected."

[17] CWC 13050(m): 'Nuisance' means anything which meets all of the following requirements: (1) Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. (2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. (3) Occurs during, or as a result of, the treatment or disposal of wastes."

discharges. Compliance is achieved through an iterative approach of continuous implementation of improved BMPs. This distinction reflects Congress's recognition that variability in flow and intensity of storm events render difficult strict compliance with water quality standards by MS4 permittees. In describing the controls that permits must include to reduce pollutants in storm water discharges to the MEP, the statute (CWA section 402(p)(3)(B)(iii)) states that the controls shall include: "*management practices, control techniques and system, design and engineering methods, and such other provisions as the [permit writer] determines appropriate for the control of such pollutants*."

In contrast, non-storm water discharges from the MS4 that are not authorized by separate NPDES permits are subject to requirements under the NPDES program, including discharge prohibitions, technology based effluent limitations and water quality-based effluent limitations (40 CFR 122.44). The regulations also require the Copermittee's program to include an element to detect and remove illicit discharges and improper disposal into the storm sewer (40 CFR 122.26(d)(2)(iv)(B)).

While "non-storm water" is not defined in the CWA or federal regulations, the federal regulations (at 40 CFR 122.26(b)(2)) define "*illicit discharge*" as *"any discharge to a municipal separate storm sewer that is not composed entirely of storm water and that is not covered by an NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer and discharges resulting from fire fighting activities)*." This definition is the most closely applicable definition of "non-storm water" contained in federal law. As stated in the Phase I Final Rule, USEPA added the illicit discharge program requirement to begin implementation of the 'effective prohibition' requirement to detect and control non-storm water discharges to their municipal system.

Thus, federal law mandates that permits issued to MS4s must require management practices that will result in reducing storm water pollutants to the MEP yet at the same time requires that non-storm water discharges be effectively prohibited from entering the MS4. "Effectively" prohibit does not mean that non-storm water discharges are authorized to be discharged into and from the Copermittees' MS4s. The Phase I Final Rule clarifies what "effectively prohibit" means (55 FR 47995):

> "*Section 402(p)(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…<u>Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit</u> (other than the permit for the discharge from the municipal separate storm sewer)*" [Emphasis added].

Consistent with federal law, unless non-storm water discharges to the MS4 are authorized by a separate NPDES permit, non-storm water discharges are

appropriately subject to the effective prohibition requirement in the CWA and Regional Water Boards are not limited by the iterative MEP approach to storm water regulation in crafting appropriate regulations for non-storm water discharges.

The federal regulations (40CFR122.26(d)(2)(i)(B)) require the Copermittees to establish the legal authority which authorizes or enables the Copermittees to prohibit illicit discharges to the MS4s. The federal regulations (40 CFR 122.26(d)(2)(vi)(B)(1)) require the Copermittees to "*implement and enforce an ordinance, order or similar means*" to prevent non-storm water discharges to their MS4s. Thus, the Copermittees are required to "*effectively*" prohibit non-storm water discharges to their MS4s through enforcing their legal authority established under "*ordinance, order or similar mean*s" and either remove those discharges to their MS4s, or require those discharges to obtain coverage under a separate NPDES permit. More detail about the program that must be implemented to "*effectively*" prohibit non-storm water discharges to the Copermittees' MS4s is provided under the discussion for Provision E.2.

Provision A.1.d was included to be consistent with Resolution No. 2012-0012, adopted by the State Water Board on March 20, 2012. Provision A.1.d prohibits discharges from MS4s to Areas of Special Biological Significance (ASBS), except for storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach to the Heisler Park ASBS subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012. The pertinent Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 are provided in Attachment A to the Order.

<u>Provision A.2 (Receiving Water Limitations)</u> specifies the condition of the receiving waters that must be achieved when there are discharges from the Copermittees' MS4s. Receiving water limitations are included in all NPDES permits issued pursuant to the CWA section 402. CWA section 402(p)(3)(B)(iii) authorizes the inclusion of "*such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." This requirement gives USEPA or the State permitting authority, in this case the San Diego Water Board, discretion to determine what permit conditions are necessary to control pollutants.

In its Phase I Final Rule (see 55 FR 47990, 47994 (Nov. 16, 1990)), USEPA elaborated on these requirements, stating that, "*permits for discharges from municipal separate storm sewer systems must require controls to reduce the discharge of pollutants to the maximum extent practicable, and where necessary water quality-based controls*." USEPA reiterated in its Phase II Final Rule (64 FR 68722, 68737), that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL*." CWC section 13377 also requires that NPDES permits include limitations necessary to implement water quality control plans. Both the State Water Board and the San Diego Water Board have previously concluded that discharges from the MS4 contain pollutants that have

the reasonable potential to cause or contribute to excursions above water quality standards. As such, inclusion of receiving water limitations is appropriate to control MS4 discharges.

The inclusion of receiving water limitations is also consistent with the Ninth Circuit Court of Appeals' ruling in *Defenders of Wildlife v. Browner* (191 F.3d 1159, 1166 (1999)) that the permitting authority has discretion regarding the nature and timing of requirements that it includes as MS4 permit conditions to attain water quality standards. The Ninth Circuit Court of Appeals recently explained that, "*[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*" (*Natural Resources Defense Council v. County of Los Angeles* (9th Cir. 2011) 673 F.3d 880, 886 (revd. On other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013)))

The receiving water limitations included in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan or in water quality control plans or policies adopted by the State Water Board, including State Water Board Resolution No. 68-16, or in federal regulations, including but not limited to 40 CFR 131.12 and 131.38. The water quality objectives in the Basin Plan and other State Water Board plans and policies have been approved by USEPA and combined with designated beneficial uses constitute the water quality standards required under federal law.

Provision A.2.a requires that discharges from the Copermittees' MS4s must not cause or contribute to the violation of water quality standards in receiving waters. The water quality standards of the receiving waters must be protected from the impacts that may be caused by the Copermittees' MS4 discharges. Water quality standards applicable to the surface waters in the San Diego Region must be achieved through meeting the technology based standard of MEP through an iterative process of improved management actions. Provision A.2.a is also consistent with State Water Board Order WQ 99-05 precedent-setting language requiring discharges from MS4s to attain receiving water quality standards. The water quality control plans and policies with water quality standards applicable to the waters in the San Diego Region are included under Provision A.2.a.

Provisions A.2.b was included to be consistent with the requirements of State Water Board Resolution No. 2012-0012, adopted on March 20, 2012.

<u>Provision A.3 (Effluent Limitations)</u> specifies the condition of the discharges from the Copermittees' MS4s that must be achieved if and when there are discharges.

Consistent with CWA section 301(b)(1)(A) and 40 CFR 122.44(a), Provision A.3.a includes the technology-based effluent limitations that must be included in the Order. The technology-based effluent limits, representing the minimum level of control that must be imposed in a permit under CWA section 402, requires that pollutants in discharges of storm water from the Copermittees' MS4s be reduced to the MEP. This provision applies specifically to storm water discharges. Non-storm water discharges must be effectively prohibited, as required under Provision A.1.b. Non-storm water (dry weather) discharges from the MS4 are not considered storm water (wet weather) discharges and therefore are not subject to the MEP standard.

The technology-based MEP standard is an ever-evolving, flexible, and advancing concept. Neither Congress nor USEPA has specifically defined the term "maximum extent practicable." Congress established this flexible MEP standard so that the administrative bodies would have "*the tools to meet the fundamental goals of the Clean Water Act in the context of storm water pollution*." (*Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 884.) As knowledge about controlling storm water runoff and discharges continues to evolve, so does the knowledge which constitutes MEP. Reducing the discharge of pollutants in storm water from the MS4 to the MEP requires the Copermittees to assess each program component and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP.

The San Diego Water Board or the State Water Board ultimately define MEP, and may include requirements that provide specific guidance on what is expected to demonstrate MEP. It is the responsibility of the Copermittees to propose actions that implement BMPs to reduce storm water pollution to the MEP. In other words, the Copermittees' runoff management programs developed and implemented under the Order are the Copermittees' proposals for achieving MEP. Their total collective and individual activities conducted pursuant to their runoff management programs become their proposal for achieving MEP as it applies both to their overall effort, as well as to specific activities. Provisions B through E of the Order provides a minimum framework to guide the Copermittees in achieving the MEP standard for discharges of pollutants in storm water.

Provision A.3.b incorporates any water quality based effluent limitations (WQBELs) applicable to the MS4s established for TMDLs adopted and approved for the San Diego Region and requires the Copermittees to comply with those WQBELs. This is consistent with 40 CFR 122.44(d)(1)(vii)(B), which requires that NPDES permits to incorporate WQBELs "*developed to protect a narrative water quality criterion, a numeric water quality criterion, or both…consistent with the assumptions and requirements of any available wasteload allocation for the discharge...*"

Pursuant to CWA section 303(d), for surface water bodies identified as impaired by one or more pollutants, the San Diego Water Board is required to establish TMDLs "*at a level necessary to implement the applicable water quality standards with seasonal variations and a margin of safety which takes into account any lack of knowledge*

concerning the relationship between effluent limitations and water quality." The TMDLs identify sources of the pollutants causing the impairments and assign portions of the TMDL as WLAs to point sources, which include MS4s.

WLAs must be expressed in NPDES permits as WQBELs, which may include one or more numeric components such as numeric effluent limits, and/or receiving water limitations, and/or BMP requirements. Because numeric targets for TMDLs typically include a component that will be protective of water quality standards, a TMDL will likely include one or more numeric receiving water limitations and/or effluent limitations as part of the assumptions or requirements of the TMDL. Any numeric receiving water limitations and/or effluent limitations developed as part of the assumptions or requirements of a TMDL must be incorporated and included as part of WQBELs for the MS4s.

Because the development and approval of new TMDLs, or modification of existing TMDLs, may occur during the term of this Order, the specific provisions of those TMDLs, including effluent limitations applicable to MS4s are provided within Attachment E to the Order. Attachment E will be updated with new TMDLs and modifications to existing TMDLs in a timely manner as they occur.

Provision A.4 (Compliance with Discharge Prohibitions and Receiving Water Limitations) describes the process required to be implemented by the Copermittees if compliance with the discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a are not being achieved under current conditions.

In its Phase II Stormwater Regulations, Final Rule, USEPA states that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL.*"[18] In a series of comment letters on MS4 permits issued by various Regional Water Boards, USEPA has also reiterated that MS4 discharges must meet water quality standards.[19] In addition, the Ninth Circuit Court of Appeals explained in a recent ruling that, *"[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*"[20]

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[18] Phase II Stormwater Regulations, Final Rule, 64 Fed. Reg. 68722, 68737.
[19] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.
[20] NRDC v. County of Los Angeles (9th Cir. 2011), 673 F.3d 880, 886 (revd. on other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013))). See also, *Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 884-886, citing *Defenders of Wildlife v. Browning,* (9th Cir. 1999) 191 F.3d 1159.)

Water quality standards for the San Diego Region are established in the Basin Plan. The water quality standards of the Basin Plan are incorporated into this Order as the discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a. The discharge prohibitions and receiving water limitations in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations or prohibitions to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan, water quality control plans or policies adopted by the State Water Board, including Resolution No. 68-16, or federal regulations, including but not limited to, 40 CFR 131.12 and 131.38. The waste discharge prohibitions and water quality objectives in the Basin Plan have been approved by USEPA and combined with the designated beneficial uses constitute the water quality standards required under federal law.

Under federal law (CWA section 402(p)(3)(B)(iii)), an MS4 permit must include "*controls to reduce the discharge of pollutants to the maximum extent practicable...and such other provision as...the State determines appropriate for control of such pollutants*." The State Water Board has previously determined that limitations necessary to meet water quality standards are appropriate for the control of pollutants discharged by MS4s and must be included in MS4 permits. (State Water Board Orders WQ 91-03, 98-01, 99-05, 2001-15; see also *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159.) This Order prohibits discharges that cause or contribute to violations of water quality standards.

The discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a are included in this Order to ensure that discharges from the MS4s do not cause or contribute to exceedances of water quality objectives necessary to protect the beneficial uses of the receiving waters.

Provision A.4 is consistent with the precedent-setting language in State Water Board Order WQ 99-05 required to be included in municipal storm water permits. State Water Board Order WQ 2001-15 refined Order WQ 99-05 by requiring an iterative approach to compliance with water quality standards involving ongoing assessments and revisions, referred to as the "iterative process." The "iterative process" is a fundamental NPDES requirement for municipal storm water permits to achieve the objectives of the CWA.

The State Water Board and Regional Water Boards have stated that the provisions under Provisions A.1.a, A.1.c, A.2.a, and A.4 are independently applicable, meaning that compliance with one provision does not provide a "safe harbor" where there is non-compliance with another provision (i.e., compliance with the Provision A.4 does not shield a Copermittee who may have violated Provision A.1.a, A.1.c, or A.2.a from an enforcement action). The intent of Provision A.4 is to ensure that the Copermittees have the necessary storm water management programs and controls in place, and that they are modified by the Copermittees in a timely fashion when necessary, so that compliance with Provisions A.1.a, A.1.c, and/or A.2.a is achieved as soon as possible. USEPA expressed the importance of this independent applicability in a series of

comment letters on MS4 permits proposed by various Regional Water Boards. At that time, USEPA expressly objected to certain MS4 permits that included language stating, *"permittees will not be in violation of this [receiving water limitation] provision … [if certain steps are taken to evaluate and improve the effectiveness of the jurisdictional runoff management programs],"* concluding that this phrase would not comply with the CWA.[21]

The Ninth Circuit held in *Natural Resources Defense Council v. County of Los Angeles* (2011) 673 F3d. 880, 886 (revd. on other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013))) that engagement in the iterative process does not provide a safe harbor from liability for violations of permit terms prohibiting exceedances of water quality standards. The Ninth Circuit holding is consistent with the position of the State and Regional Water Boards that exceedances of water quality standards in an MS4 permit constitute violations of permit terms subject to enforcement by the Water Boards or through a citizen suit. While the Water Boards have generally directed dischargers to achieve compliance by improving control measures through the iterative process, the San Diego Water Board retains the discretion to take other appropriate enforcement and the iterative process does not shield dischargers from citizen suits under the CWA.

The requirements of Provision A.4, therefore, are required to be implemented until the water quality standards expressed under Provisions A.1.a, A.1.c, and A.2.a are achieved. The CWA requires MS4 permits to "*require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." The requirements of this Order have been deemed or determined to be "appropriate" to achieve water quality standards in receiving waters.

Part of the "*controls*" required by the Order is the process described in Provision A.4. Provision A.4 includes the process that is ultimately expected to achieve compliance with the requirement that discharges from the MS4 do not cause or contribute to violations of water quality standards in the receiving waters. The implementation of Provision A.4 is required when the Copermittees or the San Diego Water Board have determined that discharges from the MS4 are causing or contributing to violations of water quality standards in the receiving waters.

The Copermittees must effectively prohibit non-storm water discharges into the MS4s, reduce the discharge of pollutants in storm water from the MS4s to the MEP, and ensure that their MS4 discharges do not cause or contribute to violations of water quality standards. If the Copermittees have effectively prohibited non-storm water

[21] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.

discharges and reduced storm water pollutant discharges to the MEP, but their discharges are still causing or contributing to violations of water quality standards, Provision A.4 provides a clear "iterative process" for the Copermittees to follow.

Provision A.4 essentially requires the Copermittees to implement additional BMPs until MS4 discharges no longer cause or contribute to a violation of water quality standards.

In assessing compliance and potential enforcement actions, the San Diego Water Board looks at the Copermittees' efforts in total to meet the requirements of Provisions A.1.a, A.1.c, A.2.a and Provision A.4. The Copermittees need to demonstrate that they are making improvements to their programs and making progress toward achieving the discharge prohibitions and receiving water limitations in Provisions A.1.a, A.1.c, and A.2.a by implementing the requirements of Provision A.4. The San Diego Water Board would consider these efforts prior to strictly enforcing the requirements of Provisions A.1.a, A.1.c, and A.2.a. Causes of exceedances of the receiving water limitations can often be more difficult to identify and attribute solely to the Copermittees' MS4s. The intent of the Order is to provide the Copermittees more clarity and flexibility in addressing these exceedances through the iterative approach and adaptive management process until the requirements under Provisions A.1.a, A.1.c, and A.2.a are fully achieved.

An exception to the iterative approach and adaptive management process would be in receiving waters subject to adopted and approved TMDLs. For TMDLs that are incorporated into the Order, there is a specific date for compliance to be achieved, after which the iterative approach and adaptive management process required under Provision A.4 no longer provides the flexibility to achieve compliance. Where compliance dates for a TMDL have passed, compliance with the WQBELs incorporated into the Order established by a TMDL in Attachment E to protect water quality standards is required. Thus, after the interim or final compliance dates for a TMDL have passed, if the discharges from the Copermittees' MS4s are causing or contributing to a violation of WQBELs, exceedances of WQBELs must be strictly enforced by the San Diego Water Board. In the meantime, however, the Copermittees are in compliance with the interim or final TMDL requirements in Attachment E as long as the interim or final WQBELs are being achieved in accordance with the interim or final compliance dates.

In addition, this Order includes an optional pathway that incorporates the requirements of Provision A.4 and would allow a Copermittee to be deemed in compliance with the requirements under Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b during implementation of a Water Quality Improvement Plan that incorporates specific additional requirements. This alternative compliance pathway and the additional specific requirements are described below under the discussion for Provision B.3.c.

B. Water Quality Improvement Plans

Purpose: Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges to the MS4s and control pollutants in storm water discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the Clean Water Act.

Provision B includes requirements for the Copermittees to develop and implement Water Quality Improvement Plans to ultimately comply with the prohibitions and limitations under Provision A. The Water Quality Improvement Plans will provide the Copermittees a comprehensive program that can achieve the requirements and further the objectives of the CWA. Implementation of the Water Quality Improvement Plans will also improve the quality of the receiving waters in the San Diego Region.

The Water Quality Improvement Plan is the backbone of the Regional MS4 Permit requirements. Provision B provides the guidance, criteria, and minimum expectations and requirements for the elements of the Water Quality Improvement Plan to be developed and implemented by the Copermittees. The Water Quality Improvement Plans will be implemented in the Watershed Management Area by the Copermittees within their jurisdictions through their jurisdictional runoff management programs.

The Water Quality Improvement Plan also incorporates a program to monitor and assess the progress of the Copermittees' jurisdictional runoff management programs toward improving the quality of discharges from the MS4s, as well as tracking improvements to the quality of receiving waters. A process to adapt and improve the effectiveness of the Water Quality Improvement Plans has also been incorporated into the requirements of Provision B to be consistent with the "iterative approach" required to achieve compliance with discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a, pursuant to the requirements of Provision A.4.

The Water Quality Improvement Plans have also been structured to incorporate the requirements of any TMDLs that have been adopted for the San Diego Region. Incorporating the requirements of the TMDLs into the requirements of Provision B allows the Copermittees to develop a single plan, instead of separate plans, to coordinate their non-storm water and storm water runoff management programs. The Water Quality Improvement Plans allow the Copermittees to meet the requirements of this Order, as well as fulfill the requirements of the TMDLs.

As an added benefit, if the Copermittees demonstrate that impaired water bodies within the Watershed Management Area listed on the 303(d) List will be addressed with their Water Quality Improvement Plans in a reasonable period of time, the San Diego Water Board may be able to remove the water bodies from the 303(d) List, which would greatly reduce the need for the San Diego Water Board to develop additional TMDLs that would have to be incorporated into the Order and implemented by the Copermittees.

***Discussion*:** The federal NPDES regulations require the Copermittees to develop a proposed management program (40 CFR 122.26(d)(2)(iv)). The proposed management program must include "*a comprehensive planning process*" and "*where necessary intergovernmental coordination*" for the "*duration of the permit.*" The Water Quality Improvement Plan is the Copermittees' "*comprehensive planning process*" document for the proposed management program that will be implemented within a Watershed Management Area. Implementation of the Water Quality Improvement Plan requires "*intergovernmental coordination*" among the Copermittees for at least the "*duration of the permit*," and likely into and beyond the next iteration of the permit.

Developing Water Quality Improvement Plans based upon watersheds is consistent with federal regulations that support the development of permit conditions, as well as implementation of storm water management programs, at a watershed scale (40 CFR 122.26(a)(3)(ii), 122.26(a)(3)(v), and 122.26(d)(2)(iv)). In 2003, USEPA issued a Watershed-Based NPDES Permitting Policy Statement (USEPA, 2003) that defines watershed-based permitting as an approach that produces NPDES permits that are issued to point sources on a geographic or watershed basis. In this policy statement, USEPA explains that "*[t]he utility of this tool relies heavily on a detailed, integrated, and inclusive watershed planning process*." USEPA identifies a number of important benefits of watershed permitting, including more environmentally effective results, the ability to emphasize measuring the effectiveness of targeted actions on improvements in water quality, reduced cost of improving the quality of the nation's waters and more effective implementation of watershed plans, including TMDLs, among others.

An emphasis on watersheds is appropriate at this stage in the San Diego Region's MS4 program to shift the focus to more targeted, water quality driven planning and implementation. Addressing discharges on a watershed scale focuses on water quality results by emphasizing the receiving waters in the watershed. The conditions of the receiving waters drive management actions, which in turn focus measures to address pollutant contributions from MS4 discharges.

The Water Quality Improvement Plan gives the Copermittees the responsibility of developing a comprehensive plan to coordinate the efforts of their jurisdictional runoff management programs for addressing the problems related to MS4 discharges causing impacts to water quality in the Watershed Management Area. The development of the plan provides the Copermittees the opportunity to provide

significant input on how to implement their jurisdictional runoff management programs, and how to best utilize their available resources in addressing a focused set of priorities that they believe will result in measureable improvements to water quality within the Watershed Management Area.

The Copermittees are encouraged to separate the Watershed Management Area into subwatersheds, as appropriate. This allows the Copermittees to identify priorities applicable to a subset of the Copermittees or specific water bodies or areas within the Watershed Management Area.

Included in the requirements for the elements to be included in the Water Quality Improvement Plan are monitoring and assessment requirements that are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order. In addition to the federal requirements of the CWA section 308(a) and 40 CFR 122.26(d), the San Diego Water Board has the authority to establish monitoring, reporting, and recordkeeping requirements for NPDES permits under CWC 13383.

More specific and detailed discussions of the requirements of Provision B are provided below.

Provision B.1 (Watershed Management Areas) requires the Copermittees to develop a Water Quality Improvement Plan for each of the Watershed Management Areas defined by the San Diego Water Board.

Pursuant to 40 CFR 122.26(d)(2)(iv), proposed management programs "*may impose controls on a…watershed basis…*" The Water Quality Improvement Plan is the Copermittees' proposed management program. A Water Quality Improvement Plan must be developed for each Watershed Management Area identified in the Order.

The Watershed Management Areas are identified in Table B-1. Table B-1 establishes ten (10) Watershed Management Areas, and identifies the Copermittees that are responsible for developing and implementing the Water Quality Improvement Plan for each Watershed Management Area.

The Copermittees from each of the three counties within the San Diego Region were phased in as their respective NPDES municipal storm water permits expired. Order No. R9-2007-0001 expired in January 2012, and the San Diego County Copermittees became covered under the Regional MS4 Permit on June 27, 2013, the effective date of the Order. Order No. R9-2009-0002 expired in December 2014, and the Orange County Copermittees became covered under the Regional MS4 Permit on April 1, 2015, the effective date of Order No. R9-2013-0001 as amended by Order No. R9-2015-0001. Order No. R9-2010-0016 expired in November 2015, and the Riverside County Copermittees became covered under the Regional MS4 Permit on January 7, 2016, the effective date of Order No. R9-2013-0001 as amended by Order No. R9-2015-0100.

The Cities of Laguna Woods, Laguna Hills, Murrieta, and Wildomar are located partially within the jurisdictions of both the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board) and the San Diego Water Board. Written requests for designation of a single Regional Water Board to regulate matters pertaining to permitting of Phase I MS4 discharges were submitted to the San Diego Water Board and the Santa Ana Water Board by the City of Laguna Woods by letter dated September 8, 2014, the City of Laguna Hills by letter dated March 12, 2014, the City of Murrieta by letter dated June 22, 2015, and the City of Wildomar by letter dated June 23, 2015. The Cities of Laguna Woods, Laguna Hills, Murrieta, and Wildomar requested designation of the San Diego Water Board pursuant to CWC section 13228.

The Cities of Laguna Woods, Laguna Hills, Murrieta, and Wildomar reported that management and implementation of municipal programs to comply with two different Phase I MS4 permits creates a significant administrative and financial burden and inhibits their ability to contribute to greater overall water quality improvements in either Region. In an effort to address these concerns, the San Diego Water Board and the Santa Ana Water Board have entered into written agreements, whereby the San Diego Water Board is designated to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Laguna Woods, Laguna Hills, Murrieta, and Wildomar including the portions of the jurisdictions within the Santa Ana Region. The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated February 10, 2015 to designate the San Diego Water Board to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Laguna Woods and Laguna Hills, including the portions of the jurisdictions within the Santa Ana Region, upon the later effective date of Order No. R9-2015-0001 or Santa Ana Water Board Tentative Order No. R8-2015-0001. The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated October 26, 2015 to designate the San Diego Water Board to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Murrieta and Wildomar, including the portions of the jurisdictions within the Santa Ana Region upon the effective date of Order R9-2015-0100.

Under the terms of the agreements, each Regional Water Board retains the authority to enforce provisions of the Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee (Water Code section 13228 (b)). Also under the terms of the agreements, any TMDL and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Laguna Woods, Laguna Hills, Murrieta, or Wildomar as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement of the applicable TMDL would remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's San Diego Creek/Newport Bay TMDL and Lake Elsinore/Canyon Lake Nutrient TMDLs, and the San Diego Water Board's Indicator Bacteria Project I Beaches and Creeks TMDL.

In conformance with the agreements, footnotes to Table B-1 are included to specify coverage under Order No. R9-2013-0001 for those Phase I MS4 discharges within the jurisdictional boundaries of the Cities of Laguna Woods, Laguna Hills, Murrieta, and Wildomar within the Santa Ana Region. Footnote 1 to Table B-1 specifies that the Cities of Laguna Woods and Laguna Hills are identified as responsible Copermittees in the San Diego Creek/Newport Bay TMDL in the Santa Ana Region and remain obligated to comply with the San Diego Creek/Newport Bay TMDL pursuant to section XVIII of Tentative Order No. R8-2015-0001 (NPDES No. CAS618030) and any reissuance thereof. Footnote 4 to Table B-1 specifies that the Cities of Murrieta and Wildomar are identified as responsible Copermittees in the Lake Elsinore/Canyon Lake Nutrient TMDLs in the Santa Ana Region and remain obligated to comply with the Lake Elsinore/Canyon Lake Nutrient TMDLs pursuant to section VI.D.2 of Order No. R8-2010-0033 (NPDES No. CAS618030) or corresponding section as it may be amended or reissued.

The Cities of Lake Forest and Menifee are located partially within the jurisdictions of both the Santa Ana Water Board and the San Diego Water Board. Written requests for designation of a single Regional Water Board to regulate matters pertaining to permitting of Phase I MS4 discharges were submitted to the San Diego Water Board and the Santa Ana Water Board by the City of Lake Forest by letters dated January 14, 2013 and April 4, 2014, and the City of Menifee by letter dated June 25, 2015. The Cities of Lake Forest and Menifee requested designation of the San Ana Water Board pursuant to CWC section 13228.

The Cities of Lake Forest and Menifee reported that management and implementation of municipal programs to comply with two different Phase I MS4 permits creates a significant administrative and financial burden and inhibits their ability to contribute to greater overall water quality improvements in either Region. In an effort to address these concerns, the San Diego Water Board and the Santa Ana Water Board have entered into written agreements, whereby the Santa Ana Water Board is designated to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Lake Forest and Menifee including the portions of the jurisdictions within the San Diego Region. The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated February 10, 2015 to designate the San Ana Water Board to regulate Phase I MS4 discharges within the jurisdiction of the City of Lake Forest, including portions of the jurisdiction within the Santa Diego Region, upon the later date of Order No. R9-2015-0001 or Santa Ana Water Board Tentative Order No. R8-2015-0001. The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated October 26, 2015 to designate the San Ana Water Board to regulate Phase I MS4 discharges within the jurisdiction of the City of Menifee, including portions of the jurisdiction within the San Diego Region, under Order No. R8-2010-0033 (NPDES No. CAS618030) as it may be amended or reissued upon the effective date of Order No. R9-2015-0100.

Under the terms of the agreements, each Regional Water Board retains the authority to enforce provisions of the Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee (Water Code section 13228 (b)). Also under the terms of the agreements, any TMDL and associated Phase I MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Lake Forest or Menifee as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement authority for the applicable TMDL would remain with the Regional Water Board which has the jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's San Diego Creek/Newport Bay TMDL and Lake Elsinore/Canyon Lake Nutrient TMDLs, and the San Diego Water Board's Indicator Bacteria Project I Beaches and Creeks TMDL.

In conformance with the agreements, Footnote 2 to Table B-1 has been included to specify that Phase I MS4 discharges within the jurisdictional boundaries of the City of Lake Forest located within the San Diego Region will be regulated under Santa Ana Water Board Order No. R8-2015-0001 (NPDES No. CAS618030) and any reissuance thereof. The footnote specifies that the City of Lake Forest is an identified responsible Copermittee in the Indicator Bacteria Project I Beaches and Creeks TMDL (Bacteria TMDL) in the San Diego Region and remains obligated to comply with the Bacteria TMDL pursuant to Attachment E of Order No. R9-2013-0001 and any reissuance thereto. The City of Lake Forest is also identified as a responsible Copermittee in the San Diego Creek/Newport Bay TMDL established by the Santa Ana Water Board. The City remains obligated to comply with the San Diego Creek/New Port Bay TMDL pursuant to the Santa Ana Water Board's Phase I MS4 Permit (Tentative Order No. R8-2015-0001 (NPDES No. CAS618030), as it may be amended or reissued). Under the terms of the agreement, the City of Lake Forest must retain and continue implementation of the over irrigation prohibition in Title 15, Chapter 15, Section 14.030, List (b) of the City Municipal Code throughout its jurisdiction. Also under the terms of the agreement, the City of Lake Forest must actively participate in the development and implementation of the South Orange County Watershed Management Area Water Quality Improvement Plan required pursuant to Order No. R9-2013-0001, and any reissuance thereof.

Footnote 3 to Table B-1 has been included to specify that Phase I MS4 discharges within the jurisdictional boundaries of the City of Menifee located within the San Diego Region will be regulated under Santa Ana Water Board Order No. R8-2010-0033 (NPDES No. CAS618033) and any reissuance thereof. At this time, the City of Menifee is not identified as a responsible Copermittee for any TMDLs established by the San Diego Water Board. Under the terms of the agreement, the City of Menifee must actively participate in the development and implementation of the Santa Margarita River Watershed Management Area Water Quality Improvement Plan required pursuant to Order No. R9-2013-0001, and any reissuance thereof.

The basis supporting the Cities of Laguna Woods, Laguna Hills, Lake Forest, Menifee, Murrieta, and Wildomar requests to designate a specific Regional Water Board for regulatory oversight of Phase I MS4 discharges may change under future conditions and circumstances, therefore the San Diego Water Board will periodically review the effectiveness of the agreements during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate one or both of the agreements with the Santa Ana Water Board or otherwise modify the agreements subject to the approval of the Santa Ana Water Board.

Provision B.2 (Priority Water Quality Conditions) requires the Copermittees in each Watershed Management Area to identify the highest priority water quality conditions which will be the focus of the Water Quality Improvement Plan implementation.

Provisions B.2.a and B.2.b provide the criteria that must be assessed when characterizing the receiving water quality and potential impacts from MS4 discharges of the receiving waters within the Watershed Management Area. The criteria are based primarily on the requirements in 40 CFR 122.26(d)(1)(iv)(C) and (C)(1)-(9). Characterizing the receiving water quality and identifying the potential impacts caused by MS4 discharges to receiving waters in the Watershed Management Area is necessary to identify the impacts to receiving waters associated with MS4 discharges that are of the most concern to the Copermittees.

Based on the information required to be considered under Provisions B.2.a and B.2.b, Provision B.2.c requires to Copermittees to identify the highest priority water quality conditions related to discharges from the MS4s that will be the primary focus of the Water Quality Improvement Plan in the Watershed Management Area. Addressing and improving these highest priority water quality conditions will become the focus of each Copermittee's jurisdictional runoff management program as the Water Quality Improvement Plan is implemented in the Watershed Management Area. The highest priority water quality conditions are expected to include sources of pollutants and/or stressors, and/or receiving water conditions, that the Copermittees consider the highest threats or most likely to have adverse impacts on the physical, chemical, and biological integrity of receiving waters. Addressing these threats and/or adverse impacts should restore the physical, chemical, and biological integrity of receiving waters, and result in the restoration and protection of the beneficial uses of the receiving waters in the Watershed Management Area.

Provision B.2.d requires the Copermittees to identify known and suspected sources of pollutants and/or stressors contributing to the highest priority water quality conditions. The requirements of Provision B.2.d are based primarily on the requirements in 40 CFR 122.26(d)(1)(iii)(B)(1)-(6). The Copermittees are required to evaluate several factors in the identification of those sources. The Copermittees must consider and evaluate the following: (1) the land uses that may contribute toward impacts to receiving waters, (2) the locations of the Copermittees' MS4s that can convey and discharge runoff and pollutants to receiving waters, (3) other sources that discharge

into the Copermittees' MS4s and receiving waters, and (4) other information and data that can help the Copermittees to evaluate the relative importance of or contribution from those sources toward the highest priority water quality conditions. Identifying the known and suspected sources, and their relative contribution toward the highest priority water quality conditions, will help the Copermittees to focus, direct, and prioritize their resources and implementation efforts within their jurisdictions.

Provision B.2.e requires the Copermittees to identify potential strategies that can result in improvements to water quality in MS4 discharges and/or receiving waters within the Watershed Management Area. Potential water quality improvement strategies will not necessarily be implemented by the Copermittees, but provide a "menu" of options that the Copermittees will consider for implementation. The public participation process that will be implemented during the development of the Water Quality Improvement Plan is where the potential water quality improvement strategies will be identified.

Provision B.3 (Water Quality Improvement Goals, Strategies and Schedules) requires the Copermittees in each Watershed Management Area to identify the goals that the Copermittees' jurisdictional runoff management programs will work toward achieving to address and improve the highest priority water quality conditions identified under Provision B.2.c; the strategies that will be implemented by the Copermittees within their jurisdictions and the Watershed Management Area to achieve the goals; and, the schedules for implementing the strategies and achieving the goals. The element of the Water Quality Improvement Plan required under Provision B.3 is where the "*comprehensive planning*" and "*intergovernmental coordination*" [40 CFR 122.26(d)(2)(iv)] of the Copermittees' actions for the proposed management programs within the Watershed Management Area is required to be described.

Provision B.3.a requires the Copermittees to identify interim and final numeric goals, and schedules to achieve those goals as part of the Water Quality Improvement Plans. Provision B.3.a.(1) requires the Copermittees to identify two types of numeric goals to be achieved:

(1) Final numeric goals in the receiving waters and/or MS4 discharges that will result in the protection of the water quality standards of the receiving waters for the highest priority water quality conditions identified by the Copermittees for Provision B.2.c. These final numeric goals are the ultimate goals for the Water Quality Improvement Plan, and the achievement and maintenance of these final numeric goals will indicate that one or more beneficial uses have been successfully restored and/or protected from MS4 discharges.

(2) Interim numeric goals that can be used by the Copermittees to demonstrate progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges for the highest priority water quality conditions in the Watershed Management Area. Achievement of the interim numeric goals will demonstrate to the San Diego Water Board that the Copermittees' implementation efforts are progressing toward achieving the final numeric goals.

Provision B.3.a.(1) does not specify what the interim and final numeric goals must be based on, but they essentially must be designed to achieve compliance with water quality standards in the receiving waters. To that end, the interim goals must be based on measureable criteria or indicators capable of demonstrating progress toward achieving the numeric goals.

The interim and final numeric goals can be based on the water quality objectives in the Basin Plan. The water quality objectives in the Basin Plan, however, consist of numeric and narrative water quality objectives. Numeric water quality objectives can be directly used as numeric goals. Narrative water quality objectives, on the other hand, will require some interpretation to identify numeric goals. The achievement of multiple numeric goals based on the water quality objectives, used in combination, may be necessary to demonstrate that beneficial uses have been restored and/or protected.

The Copermittees could also propose other numeric goals that are not necessarily water quality objectives from the Basin Plan. For example, the Copermittees could propose a numeric goal that consists of achieving some percent improvement of a measureable indicator, such as acreage of a specific habitat or increase in a specific plant or animal species population. Other examples may include pollutant load reductions, number of impaired waterbodies delisted from the List of Water Quality Impaired Segments, Index of Biological Integrity (IBI) scores, etc.

The Copermittees may choose to develop interim numeric goals based on the final numeric goals they develop, such as incremental steps toward ultimately achieving the final numeric goals. The Copermittees may also choose to develop interim numeric goals that are based on other measureable indicators that can indirectly indicate improvements and progress toward the final numeric goals.

There are no limits to the types of interim numeric goals that could be proposed by the Copermittees, other than the goals must be based on measureable criteria or indicators capable of demonstrating progress toward achieving the numeric goals. Likewise, there are no limits to the types of final numeric goals that could be proposed by the Copermittees, other than the goals must "*restore and protect the water quality standards of the receiving waters.*"

Finally, Provision B.3.a.(2) also requires the Copermittees to develop schedules for measuring progress and achieving the interim and final numeric goals. Several criteria are included for the development of the schedules, but the Copermittees are required to achieve the numeric goals as soon as possible, consistent with federal NPDES regulations (40 CFR 122.47(a)(1)).

The Copermittees are also required to incorporate any compliance schedules for applicable ASBS or TMDL requirements. Applicable ASBS and TMDL compliance schedules are set forth in Attachment A and Attachment E to the Order, respectively.

The information provided by the Copermittees under Provision B.3.a.(2) will be used by the Copermittees and the San Diego Water Board to gauge and track the progress of the Copermittees' efforts in addressing the highest priority water quality conditions identified in the Water Quality Improvement Plan.

Provision B.3.b requires the Copermittees to identify the strategies and schedules to implement those strategies as part of the Water Quality Improvement Plans. Provision B.3.b requires the Copermittees to identify the water quality improvement strategies that will be and may be implemented within the Watershed Management Area to 1) reduce pollutants in storm water discharged from the MS4 to the MEP, 2) effectively prohibit non-storm water discharges from entering the MS4, 3) protect water quality standards in receiving waters by controlling MS4 discharges so that they do not cause or contribute to exceedances of receiving water limitations, and 4) achieve applicable WQBELs that implement TMDLs. The Copermittees will select the strategies to be implemented based on the likely effectiveness and efficiency of the potential water quality improvement strategies identified under Provision B.2.e to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, and/or achieve the interim and final numeric goals identified under Provision B.3.a.

Provision B.3.b.(1) requires each Copermittee to identify the strategies that will be or may be implemented within its jurisdiction. Each Copermittee is required to describe the strategies it is committed to implementing as part of its jurisdictional runoff management requirements under Provisions E.2 through E.7, and the optional jurisdictional strategies that the Copermittee will implement, as necessary, to achieve the numeric goals.

Each Copermittee is expected to implement the optional jurisdictional strategies identified under Provisions B.3.b.(1)(b) when the jurisdictional strategies it has committed to implement under Provision B.3.b.(1)(a) are not making adequate progress toward the interim and final numeric goals in accordance with the schedules established under Provision B.3.a. Provision B.3.b.(1)(b)(v) requires each Copermittee to describe the circumstances necessary to trigger implementation of the optional jurisdictional strategies, in addition to the requirements of Provisions B.3.b.(1)(a).

The San Diego Water Board recognizes that there may be optional jurisdictional strategies that will likely require funding and/or resources for planning, permitting, procurement of labor and materials, and implementation. Thus, Provision B.3.b.(1)(b)(iv) requires each Copermittee to describe the funding and/or resources that are necessary to implement these optional jurisdictional strategies. This information may provide interested groups and members of the public an understanding of the resources that they could provide or assist in obtaining to implement these optional jurisdictional strategies.

Provision B.3.b.(2) requires the Copermittees in the Watershed Management Area to identify the regional or multi-jurisdictional strategies that may be implemented, as necessary, to achieve the numeric goals. Similar to the requirements of Provision B.3.b.(1)(b), these regional or multi-jurisdictional strategies will likely require funding and/or resources for planning, permitting, procurement of labor and materials, and implementation, and San Diego Water Board recognizes that these strategies may be difficult to implement with only Copermittee resources. Thus, Provision B.3.b.(2)(d) requires the Copermittees to describe the funding and/or resources necessary to implement these optional regional or multi-jurisdictional strategies. This information may provide interested groups and members of the public an understanding of the resources that they could provide or assist in obtaining to implement these optional regional or multi-jurisdictional strategies.

Provision B.3.b.(3) requires the Copermittees to develop and include schedules in the Water Quality Improvement Plan for implementing the water quality improvement strategies identified under Provisions B.3.b.(1) and B.3.b.(2). The schedule for implementing the water quality improvement strategies will be used by the Copermittees and San Diego Water Board to measure and demonstrate the progress of the Copermittees' implementation efforts toward reducing pollutants in storm water discharged from the MS4 to the MEP, and eliminating illicit non-storm water discharges from entering the MS4.

Provision B.3.b.(4) provides the Copermittees in each Watershed Management Area the option of implementing watershed-specific structural BMP requirements for Priority Development Projects. Historically, storm water permits have included very specific performance standards for permanent, structural BMPs. These standards describe the expectation for the capture or treatment of pollutants and control of excessive flow before storm water is discharged from a site. The Copermittees were also allowed to develop waiver programs for Priority Development Projects to avoid implementing the structural BMPs; however, the waiver programs were not necessarily tied into any sort of holistic watershed strategy. The result is that implementation of BMP requirements is largely done on a site-by-site basis. This requires proper design on the part of the Priority Development Project and strict oversight on the part of the Copermittee.

Provision B.3.b.(4) promotes the evaluation of multiple strategies for water quality improvement, in addition to the implementation of permanent structural BMPs, on a watershed-scale versus the site-by-site approach. In a report issued by the Southern California Coastal Water Research Project (SCCWRP) and several other research institutions, the report emphasized that a successful hydromodification management program will involve watershed analysis as a first step, and that integrating multiple watershed-based strategies is preferable over a site-by-site approach. Indeed, the report states that the watershed analysis "…*should lead to identification of existing opportunities and constraints that can be used to help prioritize areas of greater concern, areas of restoration potential, infrastructure constraints, and pathways for*

potential cumulative effects."[22] Provision B.3.b.(4) promotes the findings and recommendations of the report by providing a pathway for Copermittees to develop an integrated approach to their land development programs.

Under Provision B.3.b.(4), the Copermittees in a Watershed Management Area must first perform an analysis by gathering as much information pertaining to the physical characteristics of the Watershed Management Area as possible. This includes, for example, identifying potential areas of coarse sediment supply, present and anticipated future land uses, and locations of physical structures within receiving streams and upland areas that affect the watershed hydrology (such as bridges, culverts, and flood management basins). Once this information is collected, the Copermittees must produce GIS layers (maps) that include this information.

From there, the Copermittees must use the results of the Watershed Management Area Analysis to identify and compile a list of candidate projects that could potentially be used as alternative compliance options for Priority Development Projects. Such projects include, for example, opportunities for stream or riparian area rehabilitation, opportunities for retrofitting existing infrastructure to incorporate storm water retention or treatment, and opportunities for regional BMPs, among others. Once these candidate projects are identified, Copermittees may allow Priority Development Projects to fund, partially fund, or completely implement these candidate projects. The Copermittees must first find that implementing such a candidate project would provide greater overall benefit to the watershed than requiring implementation of the structural BMPs onsite, and also enter into a voluntary agreement with the Priority Development Project that authorizes this arrangement. The Copermittees may use Provision B.3.b.(4) as both 1) a mechanism to reach their stated goals of the Water Quality Improvement Plan by using Priority Development Projects to either fund or implement projects that will provide water quality benefit, and 2) an alternative to requiring strict adherence to the structural BMP design standards.

Additionally, Provision B.3.b.(4) allows the Copermittees to use the results of the Watershed Management Area Analysis to identify areas within the Watershed Management Area where it is appropriate to allow Priority Development Projects to be exempt from the hydromodification management BMP performance requirements. Provision E.3.c.(2) already allows exemptions for Priority Development Projects that discharge to a conveyance channel whose bed and bank are concrete lined from the point of discharge to an enclosed embayment or the Pacific Ocean. However, there may be cases where further exemptions are warranted. The Copermittees may identify such cases on a watershed basis and include them in the Watershed Management Area Analysis; however, they must provide the supporting rationale to support all claims for exemptions.

[22] 2012. ED Stein, F Federico, DB Booth, BP Bledsoe, C Bowles, Z Rubin, GM Kondolf, A Sengupta. Technical Report 667. Southern California Coastal Water Research Project. Costa Mesa, CA.

Provision B.3.b.(4) provides an innovative pathway for Copermittees to regulate their land development programs by allowing alternative compliance in lieu of implementing structural BMPs on each and every Priority Development Project. This approach facilitates the integration of watershed-scale solutions for improving overall water quality and assisting Copermittees to achieve their stated goals of the Water Quality Improvement Plan. The San Diego Water Board understands, however, that undertaking this approach, which involves extensive planning, could be resource intensive for the Copermittees. Therefore, the Watershed Management Area Analysis is optional and not a requirement. The Copermittees can choose not to perform the watershed planning and mapping exercise described in Provision B.3.b.(4), and instead choose to require strict implementation of the structural BMPs onsite, pursuant to Provision E.3.c.

Provision B.3.c is included to provide the Copermittees an option that allows the Copermittees to be deemed in compliance with the prohibitions and limitations (receiving water limitations) of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b. One or more Copermittees within a Watershed Management Area can choose to implement this option. This option is only expected to be utilized by a Copermittee that wishes to be deemed in compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b.

The alternative compliance pathway option included in Provision B.3.c is consistent with the approach described in Order WQ 2015-0075, *In the Matter of Review of Order No. R4-2012-0175, NPDES Permit No. CAS004001, Waste Discharge Requirements for Municipal Separate Storm Sewer System (MS4) Discharges within the Coastal Watersheds of Los Angeles County, Except Those Discharges Originating from the City of Long Beach MS4,* adopted by the State Water Board on June 16, 2015. State Water Board Order WQ 2015-0075 directs the Regional Water Boards to consider a watershed-based planning and implementation approach to compliance with receiving water limitations when issuing Phase I MS4 permits going forward. Order WQ 2015-0075 included seven principles that the Regional Water Boards are expected to follow when incorporating an alternative compliance pathway into a MS4 permit. The San Diego Water Board incorporated the seven principles stipulated in State Water Board Order WQ 2015-0075 into the Regional MS4 Permit as follows:

1. Provision A of this Order continues to require compliance with water quality standards in the receiving water and does not deem good faith engagement in the iterative process to constitute compliance with receiving water limitations. Provision A of this Order continues to be consistent with the receiving water limitations provisions from State Water Board Order WQ 99-05.

2. Compliance with Provision B.3.c constitutes compliance with the requirements of the Provision A.3.b, which requires compliance with the WQBELs of the TMDLs in Attachment E to the Order, and is considered compliance with receiving water limitations for those TMDL water body-pollutant combinations.

3. Provision B.3.c is an ambitious, rigorous, and transparent alternative compliance pathway that allows a Copermittee appropriate time to come into compliance with receiving water limitations without being in violation of the receiving water limitations during implementation of the compliance alternative.

4. Provision B.3.c requirements are incorporated into a Water Quality Improvement Plan. Water Quality Improvement Plans are a watershed-based planning and implementation approach, which address multiple contaminants, and incorporate TMDL requirements.

5. The strategies required to be included in the Water Quality Improvement Plans promote and incentivize the use of green infrastructure and requires the implementation of low impact development principles.

6. The strategies required to be included in the Water Quality Improvement Plans encourage multi-benefit regional projects that capture, infiltrate, and reuse storm water and support a local sustainable water supply.

7. The alternative compliance pathway of Provision B.3.c includes rigor and accountability. The Copermittee is required, through a transparent public process, to demonstrate that water quality issues in the watershed have been analyzed and prioritized, and that appropriate solutions are proposed. The Copermittee is also required, through a transparent process, to monitor the results and return to their analysis to verify assumptions and update the solutions. The Copermittee is required to conduct this type of adaptive management on its own initiative without waiting for direction from the San Diego Water Board.

In order for a Copermittee to utilize this option, the Copermittee is required to include three components in the Water Quality Improvement Plan. The first component is a comprehensive set of numeric goals and schedules that will demonstrate the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b will be achieved within a specified period of time. The criteria provided in the Order will require the Copermittee to demonstrate that the discharges from its MS4s will not cause or contribute to exceedances of water quality objectives in the receiving waters, and/or the receiving waters will be adequately protected from adverse impacts attributable to the Copermittee's MS4 discharges. The Copermittee is also required to specify annual milestones to be achieved each year, which adds rigor, accountability, and transparency to the process. The annual milestones may consist of water quality improvement strategy implementation phases, interim numeric goals, and other acceptable metrics, which are expected to build upon previous milestones and lead to the achievement of the final numeric goals.

The second component is an analysis to demonstrate that implementation of the water quality improvement strategies required under Provision B.3.b will achieve the numeric goals within the established schedules required under Provisions B.3.a and B.3.c.(1).

Because the development of the analysis may require significant resources, the Order allows the Copermittees in each Watershed Management Area that choose to implement this option to perform the analysis individually, or pool their resources for the analysis collectively.

The analysis must “reasonably” and “quantitatively” demonstrate that the implementation of the water quality improvement strategies can achieve the numeric goals within the established schedules. However, as more data and information are collected during implementation of the Water Quality Improvement Plan to demonstrate progress toward achieving the numeric goals, the numeric goals, water quality improvement strategies and schedules may need to be modified. If the data and information indicate that modification is needed, the Copermittee must also update the analysis. With the exception of numeric goals and schedules associated with TMDLs from Attachment E to the Order, the modification to the analysis would be allowed as part of the adaptive management process of the Water Quality Improvement Plan. For TMDLs, modification of numeric goals or schedules would likely require an amendment to the Basin Plan and Attachment E to the Order before the analysis and Water Quality Improvement Plan could include such modifications.

Thus, the third component is the key component that allows a Copermittee to demonstrate the implementation of the water quality improvement strategies within its jurisdiction is making progress toward achieving the final numeric goals. Each Copermittee must specify the monitoring and assessments that will be performed to confirm that implementation of the water quality improvement strategies are making progress toward achieving the numeric goals within the established schedules, and whether the interim and final numeric goals have been achieved.

These three components must then be reviewed by the Water Quality Improvement Consultation Panel. The Water Quality Improvement Consultation Panel is required to be formed as part of the public participation process for the development of the Water Quality Improvement Plans. The Water Quality Improvement Consultation Panel is described under Provision F.1.a.(1)(b). Review by the Water Quality Improvement Consultation Panel is included to provide an additional layer of input, support, and accountability for the implementation of this option.

Compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b begins when the Water Quality Improvement Plan, incorporating the requirements of Provision B.3.c.(1), is accepted by the San Diego Water Board. Each Copermittee that chooses to implement and continues to implement this option will be deemed in compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b as long as the Copermittee continues to implement the strategies, monitoring and assessments as incorporated in the Water Quality Improvement Plan in accordance with Provision B.3.c.(1), and the Copermittee reports the achievement of the annual milestones each year, or provides acceptable rationale and recommends appropriate modifications to the interim numeric goals, and/or water quality improvement

strategies, and/or schedules to improve the rate of progress toward achieving the final numeric goals. The Copermittee continues to be deemed in compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b during the time the San Diego Water Board reviews the rationale and recommended modifications to the interim numeric goals, and/or water quality improvement strategies, and/or schedules. If and when the San Diego Water Board determines that it does not accept the rationale or recommendations, the Copermittee will be notified they are no longer deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b.

Provision B.4 (Water Quality Improvement Monitoring and Assessment) requires the Copermittees to develop an integrated monitoring and assessment program to track the progress of the Water Quality Improvement Plan toward meeting the implementation goals and schedules, and improving the water quality of the Watershed Management Area. Provision B.4 is the part of the Water Quality Improvement Plan where the Copermittees describe the monitoring data that will be collected, which is not only necessary to implement the "iterative approach" required by Provision A.4, but inform the adaptive management and "*comprehensive planning process*" that allows the Copermittees to make adjustments and modifications to the Water Quality Improvement Plans and the jurisdictional runoff management programs.

Provision B.4 requires the Copermittees, at a minimum, to include the requirements of Provision D as part of the water quality improvement monitoring and assessment program for the Water Quality Improvement Plan. The Copermittees, however, are not limited to the requirements of Provision D and may include additional monitoring and assessment methods to track progress toward improving water quality in the Watershed Management Area.

In addition to incorporating the requirements of Provision D, the water quality improvement monitoring and assessment program must incorporate any monitoring and assessment requirements specified for any applicable TMDLs included in Attachment E to the Order, and the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 for Watershed Management Areas with ASBS.

The monitoring and assessments required to be incorporated into the Water Quality Improvement Plan are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order.

Provision B.5 (Iterative Approach and Adaptive Management Process) requires the Copermittees to implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a.

Provision B.5 requires the Copermittees in each Watershed Management Area to re-evaluate the highest priority water quality conditions and potential water quality

improvement strategies, the water quality improvement goals, strategies and schedules, and the water quality improvement monitoring and assessment program and provide recommendations for modifying those elements to improve the effectiveness of the Water Quality Improvement Plan. The re-evaluation of the Water Quality Improvement Plan is part of the assessment requirements of Provision D.

Provision B.6 (Water Quality Improvement Plan Submittal, Updates, and Implementation) requires to Copermittees to submit, update, and implement the Water Quality Improvement Plans.

The requirements for the process to develop and submit the Water Quality Improvement Plans is described in more detail under the discussion for Provision F.1. The process will include several opportunities for the public to provide input during the development of the Water Quality Improvement Plans. The process for updating the Water Quality Improvement Plans is described in more detail under the discussion for Provision F.3.c. Upon acceptance of the Water Quality Improvement Plan and updates, the Copermittees are required to immediately begin implementing the Water Quality Improvement Plan and subsequent updates.

The Water Quality Improvement Plan is expected to be a dynamic document that will evolve over time. The Water Quality Improvement Plan is also expected to be a long term plan that focuses the Copermittees' efforts and resources on a limited set of priority water quality conditions, with the ultimate goal of protecting all the beneficial uses of the receiving waters within the Watershed Management Area from impacts that may be caused or contributed to by MS4 discharges. As the Copermittees collect data, implement their jurisdictional runoff management programs, and review the results from their water quality improvement monitoring and assessment program, the Water Quality Improvement Plan is expected to be continually reviewed and updated until compliance with Provisions A.1.a, A.1.b, and A.2.a is achieved.

However, in specific cases supported by robust analytical documentation the implementation of the Water Quality Improvement Plans may demonstrate that TMDLs are not necessary for identified impaired water bodies within the Watershed Management Area if the analytical record demonstrates that technology-based effluent limitations required by the CWA, more stringent effluent limitations required by state, local, or federal authority, and/or other pollution control requirements (e.g., best management practices) required by local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time.[23]

The San Diego Water Board submits an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region.

[23] 40 CFR 130.7(b)(1)

According to USEPA guidance for the Integrated Report,[24] water bodies are placed in one of five categories. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 are placed on the 303(d) List.

Category 4 in the Integrated Report is for water bodies where available data and/or information indicate that at least one beneficial use is not being supported or is threatened, but a TMDL is not needed.[25] Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

Impaired water bodies can be included in Category 4a if a TMDL has been adopted and approved. The TMDLs in Attachment E to the Order implement the requirements of the TMDLs adopted by the San Diego Water Board, and approved by the State Water Board and USEPA. The water bodies in Attachment E will be included in Category 4a in the Integrated Report and removed from the 303(d) List.

Impaired water bodies can be included in Category 4b if there are *acceptable* "pollution control requirements" required by a local, state or federal authority stringent enough to implement applicable water quality standards within a reasonable period of time (e.g., a compliance date is set). When evaluating whether a particular set of pollution controls are "requirements," the USEPA considers a number of factors, including: (1) the authority (local, state, federal) under which the controls are required and will be implemented with respect to sources contributing to the water quality impairment (examples may include: self-executing state or local regulations, permits, and contracts and grant/funding agreements that require implementation of necessary controls), (2) existing commitments made by the sources and completion or soon to be completed implementation of the controls (including an analysis of the amount of actual implementation that has already occurred), (3) the certainty of dedicated funding for the implementation of the controls, and (4) other relevant factors as determined by USEPA depending on case-specific circumstances.[26]

Impaired water bodies can be included in Category 4c if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution. Pollution, as defined by the CWA is "the man-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of water."[27] In

[24] USEPA, 2005. Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act
[25] Ibid
[26] Ibid
[27] CWA section 502(19)

other cases, pollution does not result from a pollutant and a TMDL is not required. Examples of circumstances where an impaired segment may be placed in Category 4c include segments impaired solely due to lack of adequate flow, stream channelization, or hydromodification. In these situations, there may be water quality management actions that can address the cause(s) of the impairment, but a TMDL may not be required to implement the actions.

The Water Quality Improvement Plans will require the implementation of pollution controls and water quality management actions (i.e. water quality improvement strategies) which can result in the attainment of water quality standards in water bodies impaired by discharges from the Copermittees' MS4s. The Water Quality Improvement Plans also include requirements that are expected to attain water quality standards in a reasonable period of time. The San Diego Water Board considers the Water Quality Improvement Plans to be a commitment by the Copermittees to develop, plan, budget for, and implement pollution controls that will attain water quality standards in receiving waters in a reasonable period of time, or as soon as possible. The results of the Copermittees' efforts in implementing the Water Quality Improvement Plans can be used to re-evaluate the condition of the impaired water bodies during the next update to the 303(d) List.

After the Copermittees submit the Water Quality Improvement Plans and demonstrate that water quality standards are being attained or will be attained in a reasonable period of time, the San Diego Water Board may re-evaluate the water bodies on the 303(d) List. These water bodies on the 303(d) List may be re-evaluated and placed into Category 4b or Category 4c in the Integrated Report. The water bodies placed in Category 4b or Category 4c in the Integrated Report must show a record that the water bodies are attaining water quality standards or supporting the identified beneficial uses, or will attain water quality standards or support identified beneficial uses in a reasonable period of time, in order for the water bodies to be appropriately removed from the 303(d) List.

C. Action Levels

Purpose: Provision C includes requirements for the Copermittees to identify and include numeric action levels in the Water Quality Improvement Plan to direct and focus the Copermittees' jurisdictional runoff management program implementation efforts for controlling MS4 discharges to receiving waters.

***Discussion*:** Under Provision C, the numeric action levels required are for non-storm water discharges and storm water discharges. The non-storm water action levels (NALs) are applicable to non-storm water discharges from the Copermittees' MS4s, which can occur year-round. The storm water action levels (SALs) are applicable to storm water discharges from the Copermittees' MS4s, which occur during the rainy season defined as the period between October 1 and April 30.

The action levels required by Provision C are based on the action level requirements that were developed and incorporated into Order Nos. R9-2009-0002 and R9-2010-0016, the Orange County and Riverside County MS4 Permits, respectively. The Fact Sheets for these Orders provide detailed discussions about the development of the numeric NALs and SALs included in this Order.

Order Nos. R9-2009-0002 and R9-2010-0016 required the Copermittees to perform prescribed actions if the NALs or SALs are exceeded. The actions required under Order Nos. R9-2009-0002 and R9-2010-0016 generally included conducting additional monitoring and source investigations when a discharge from the MS4 is observed to exceed one or more NALs and/or SALs.

For this Order, however, the action levels of Provision C are to be used by the Copermittees to prioritize the actions to be implemented as part of the Water Quality Improvement Plan. Monitoring data collected by the Copermittees from MS4 outfalls will be compared with the NALs and SALs. Exceedances of the NALs and SALs will not require the Copermittees to immediately identify sources causing exceedances, but will provide some numeric indicator levels that can give the Copermittees a way to measure the relative severity of a pollutant contributing to receiving water quality impacts.

NALs and SALs must be included in the Water Quality Improvement Plans to be used by the Copermittees in directing and focusing their water quality improvement strategies. The Copermittees are expected to utilize the NALs and SALs to help focus their implementation efforts on addressing pollutants that have the most significant potential or observed impacts to receiving waters. The NALs and SALs will be used as part of the MS4 discharges assessments required under Provision D.4.b. The NALs and SALs may also be used by the Copermittees as the numeric goals to be achieved in MS4 discharges and/or receiving waters as the Water Quality Improvement Plans are implemented.

More specific and detailed discussions of the requirements of Provision C are provided below.

Provision C.1 (Non-storm Water Action Levels) requires the Copermittees to incorporate NALs into the Water Quality Improvement Plan for pollutants and/or constituents that are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions identified in the Water Quality Improvement Plan related to non-storm water discharges from the MS4s. NALs generally must be consistent with the water quality objectives found within the Basin Plan.

The NALs have been included to ensure that the Copermittees are implementing and complying with several requirements of the MS4 permit. The federal CWA requires permits for municipal storm sewer systems to "*effectively prohibit non-storm water discharges into the storm sewers*." The federal NPDES regulations, which were promulgated to implement the CWA requirements for discharges from municipal storm sewers, require a program to address illicit discharges, which are non-storm water discharges. Provision A.1.b prohibits "*[n]on-storm water discharges into MS4s*" unless the non-storm water discharge authorized by a separate NPDES permit. The NALs will be used as part of the illicit discharge detection and elimination program required pursuant to Provision E.2, as well as part of the MS4 discharges assessments required pursuant to Provision D.4.b.

Provision A.1.a prohibits non-storm water discharges from the MS4 from "*causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state.*" In addition, pursuant to Provision A.2.a, non-storm water discharges "*must not cause or contribute to the violation of water quality standards in any receiving waters*."

Ideally, the Copermittees' jurisdictional runoff management programs will eliminate all non-storm water discharges entering the MS4s within their jurisdictions. The complete elimination of non-storm water discharges to the Copermittees' MS4s would be in compliance with the CWA requirements for non-storm water discharges, as well as the prohibitions and limitations of Provisions A.1.a and A.2.a.

The federal regulations, however, also refer to several non-storm water discharge categories that must be addressed as illicit discharges if they are found to be a source of pollutants. The federal regulations thus identify some non-storm water discharges that are not required to be addressed as illicit discharges if they are not a source of pollutants (e.g. non-storm water discharges specified in Provisions E.2.a.(1)-(5)). Thus, these regulations imply that some non-storm water discharges into and from the MS4 may occur even if non-storm water discharges are "effectively" prohibited by the Copermittees.

If the source of a non-storm water discharge is identified as a category of non-storm water specified in Provisions E.2.a.(1)-(5), the NALs can be used to determine if the category of non-storm water discharges is a source of pollutants. For other non-storm water discharges not specified in Provisions E.2.a.(1)-(5), the CWA requires those discharges to be "*effectively"* prohibited by removing the discharge to the MS4 through enforcement of the Copermittees' legal authority established under "*ordinance, order or similar mean*s" to prohibit illicit discharges to the MS4s.

If there are non-storm water discharges that are not required to be addressed as illicit discharges, those discharges must comply, at a minimum, with the discharge prohibitions and receiving water limitations of Provision A. Thus, the non-storm water discharges from the MS4 must be at levels that will not cause or contribute to a condition of pollution, contamination, or nuisance (Provision A.1.a), and must not cause or contribute to a violation of water quality standards in receiving waters (Provision A.2.a) to be consistent with the discharge prohibitions and receiving water limitations of Provisions A.1.a and A.2.a.

Furthermore, the San Diego Region has predominantly intermittent and ephemeral rivers and streams which vary in flow volume and duration at spatial and temporal scales. For most of these river and stream systems, non-storm water discharges from the MS4 are likely to be the most significant or the only source contributing to surface flows present within the receiving water, especially during the dry season.

Therefore, because of the prohibitions and limitations of Provision A.1.a and A.2.a, and the likelihood that non-storm water discharges from the MS4 are the most significant or only source contributing to surface flows present within the receiving water, NALs generally must be consistent with the water quality objectives found within the Basin Plan. Non-storm water discharges that are meeting the NALs would not be expected to cause or contribute to an exceedance of water quality objectives in receiving waters, which would be consistent with the discharge prohibitions and receiving water limitations of Provisions A.1.a and A.2.a.

Exceedances of the NALs would then provide an indication of the relative severity of a pollutant in non-storm water discharges from the MS4 contributing to potential or observed receiving water quality impacts. The relative severity or significance of a pollutant in non-storm water discharges from the MS4 will provide the Copermittees a valuable source of information that can be used to identify priority water quality conditions within a Watershed Management Area and within each Copermittee's jurisdiction.

Tables C-1 through C-4 under Provision C.1.a specify numeric NALs for several parameters or pollutant constituents for non-storm water discharges from the MS4 to several water body types. The NALs for MS4 discharges given under Provision C.1.a are based on the water quality objectives for inland surface waters in the Basin Plan, and the water quality objectives for ocean waters in the Ocean Plan. The NALs for

most of the metals were calculated based on the State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP). The NALs provided in Tables C-1 through C-4 must be included in the Water Quality Improvement Plans required to be developed pursuant to Provision B.

Provision C.1.b requires the Copermittees to identify NALs for pollutants and/or constituents, not specified in Provision C.1.a, which are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions of the Watershed Management Area related to non-storm water discharges from the MS4s. The NALs must be based on the water quality objectives in the Basin Plan. The NALs identified under Provision C.1.b must be included in the Water Quality Improvement Plan.

The San Diego Water Board recognizes that some of the NALs required pursuant to Provisions C.1.a and C.1.b may be exceeded more frequently than not. Thus, Provision C.1.c has been included in the Order to provide the Copermittees the option to develop secondary NALs that are set at levels greater than the levels required pursuant to Provisions C.1.a and C.1.b to further refine the prioritization and assessment of water quality improvement strategies for addressing non-storm water discharges to and from the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and from the MS4.

<u>Provision C.2 (Storm Water Action Levels)</u> requires the Copermittees to incorporate SALs into the Water Quality Improvement Plan for pollutants and/or constituents causing or contributing, or may be causing or contributing, to the highest priority water quality conditions identified in the Water Quality Improvement Plan related to storm water discharges from the MS4s.

The SALs have been included to ensure that the Copermittees are implementing and complying with several requirements of the MS4 permit. Provision A.1.a prohibits storm water discharges from the MS4 from "*causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state.*" In addition, pursuant to Provision A.2.a, storm water discharges "*must not cause or contribute to the violation of water quality standards in any receiving waters*."

Provision A.3.a, however, implicitly acknowledges that compliance with Provisions A.1.a and A.2.a cannot be achieved immediately for discharges of storm water from the MS4 by applying the MEP standard. Thus, Provision A.4 requires the Copermittees to implement an iterative approach to demonstrate that MEP is being achieved. This approach is supported by USEPA.

The federal CWA requires permits for municipal storm sewer systems to "*require controls to reduce the discharge of pollutants [in storm water] to the maximum extent practicable*, *including management practices, control techniques and system, design*

and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants." MEP is an ever-evolving, flexible, and advancing concept. As knowledge about controlling storm water runoff and discharges evolves, so does the knowledge which constitutes MEP. Reducing the discharge of storm water pollutants from the MS4 to the MEP requires the Copermittees to assess their jurisdictional runoff management programs and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP. The SALs provide the Copermittees measureable goals that may be used to demonstrate the achievement of MEP for reducing pollutants in storm water discharges from the MS4. The SALs will be used as part of the MS4 discharges assessments required under Provision D.4.a.

In June of 2006, the State Water Board's Blue Ribbon Storm Water Panel released its report titled "*The Feasibility of Numerical Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities*." In the recommendations, the Blue Ribbon panel proposed storm water effluent limitations which are computed using statistical based population approaches. The SALs specified in Table C-5 under Provision C.2.a were developed from a regional subset of nationwide Phase I MS4 data by using USEPA Rain Zone 6 (arid west) data.[28] Additionally, utilization of regional data is appropriate due to the addition of data into the nationwide Phase I MS4 monitoring dataset in February 2008. This additional data increased the number of USEPA Rain Zone 6 samples to more than 400, and included additional monitoring events within Southern California.

Utilizing data from USEPA Rain Zone 6 resulted in SALs which closely reflect the environmental conditions experienced in the San Diego Region. The localized subset of data includes sampling events from multiple Southern California locations including Orange, San Diego, Riverside, Los Angeles, and San Bernardino Counties. The dataset includes samples taken from highly built-out impervious areas and from storm events representative of Southern California conditions.

The SALs for cadmium, copper, lead and zinc require the measurement of hardness and to provide more specificity in the assessment of samples with SALs for total metal concentrations. While USEPA Rain Zone 6 data include a large sample size for concentrations of total metals, the impact the concentration will have on receiving waters will vary with receiving water hardness. Since it is the goal of the SALs, through the iterative process and MEP standard, to have MS4 storm water discharges meet all applicable water quality objectives, the hardness of the receiving water should be used when assessing the total metal concentration of a sample.

Thus, when there is an exceedance of a SAL for a metal, the Copermittee must determine if that exceedance is above the existing applicable water quality objectives based upon the hardness of the receiving water. The water quality objectives

[28] Data used to develop SAL were obtained from http://rpitt.eng.ua.edu/Research/ms4/mainms4.shtml

Copermittees must use to assess total metal SAL exceedances are the California Toxic Rule (CTR) and USEPA National Recommended Water Quality Criteria for Freshwater Aquatic Life 1 hour maximum concentrations. The 1-hour maximum concentration is to be used for comparison since it is expected to most replicate the impacts to waters of the State from the first flush following a precipitation event.

The statistically calculated SALs given in Table C-5 are at levels greater than the water quality objectives in the Basin Plan or Ocean Plan. Because the objective of the CWA is to "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*", meaning eventually pollutants in storm water discharges must be reduced to a level that cannot cause or contribute to an exceedance of water quality objectives in receiving waters, over time the SALs are expected to be reduced to a level that is based on the water quality objectives rather than statistical calculations. The San Diego Water Board will review the SALs as more data for discharges of storm water from the MS4s are collected, and revise them as conditions improve and the MEP standard advances. For the Water Quality Improvement Plans required under this Order, the SALs identified under Provision C.2.a must be included.

Provision C.2.b requires the Copermittees to identify SALs for pollutants and/or constituents, not specified in Provision C.2.a, which are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions of the Watershed Management Area related to storm water discharges from the MS4s. The SALs identified under Provision C.2.b must be included in the Water Quality Improvement Plan.

The San Diego Water Board recognizes that some of the SALs required pursuant to Provisions C.2.a and C.2.b may be exceeded more frequently than not. Thus, Provision C.2.c has been included in the Order to provide the Copermittees the option to develop secondary SALs that are set at levels greater than the levels required pursuant to Provisions C.2.a and C.2.b to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s.

D. Monitoring and Assessment Program Requirements

Purpose: Provision D includes minimum monitoring and assessment requirements that must be developed and implemented by the Copermittees as part of the Water Quality Improvement Plans. Implementation of the monitoring and assessment requirements of Provision D will allow the Copermittees to demonstrate that the requirements of the CWA to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP are being achieved. Implementation of the monitoring and assessment requirements of Provision D will also allow the Copermittees and the San Diego Water Board to track improvements to the water quality in the San Diego Region. The monitoring and assessment program requirements are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order.

***Discussion*:** The San Diego Water Board recognized that changes to the monitoring and assessment requirements of the Fourth Term Permit were necessary to improve the usefulness and usability of monitoring data collected by the Copermittees to support their jurisdictional storm water programs more efficiently and with increased effectiveness. The data collected are needed to better inform the Copermittees' understanding of the physical, chemical, and biological condition of the receiving waters and the quality of the MS4 discharges. The monitoring program needs to provide opportunities for the Copermittees to integrate regional monitoring efforts into municipal storm water monitoring requirements to provide a cost-effective approach to monitoring and avoid duplication of efforts.

The requirements in Provision D were largely recommended by the Copermittees as an outcome of the San Diego Water Boards Focused Meeting process. The monitoring and assessment program requirements now require collection of more specific information necessary for each Copermittee to adapt its jurisdictional runoff management program in such a way that focuses resources on a watershed's highest priority water quality conditions. The monitoring and assessment program will require the Copermittees to collect data that can be utilized to answer both watershed level management questions (e.g. Are the chemical, physical, and biological conditions of a receiving water protective, or likely protective of beneficial uses?), and specific jurisdictional runoff management program activity questions (e.g. Are the water quality improvement strategies of the jurisdictional program effectively eliminating non-storm water discharges to the MS4?).

The monitoring data collected and assessment information that will be reported to the San Diego Water Board are necessary to determine if the Copermittees are complying with the prohibitions and limitations of Provision A. The required monitoring and assessments that must be reported to the San Diego Water Board will be utilized for three purposes:

(1) Inform the Copermittees, San Diego Water Board, and the public on the progress of the Copermittees' efforts to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP;

(2) Inform the Copermittees, San Diego Water Board, and the public on the condition of water bodies receiving discharges from the Copermittees' MS4, and the progress of the Copermittees' water quality improvement implementation efforts toward improving the receiving water quality; and

(3) Inform the Copermittees, the San Diego Water Board, and the public on the effectiveness of the Water Quality Improvement Plan toward achieving (1) and (2).

The monitoring and assessment information reported pursuant to Provision F is also expected to be key to the iterative approach and adaptive management process required under Provision A.4 and implemented through the Water Quality Improvement Plan required under Provision B. As required by Provision A.4, the iterative approach and adaptive management process is required if the Copermittees cannot meet the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c, and/or A.2.a under the present conditions.

Provision D provides the minimum monitoring and assessment requirements that must be included in each Water Quality Improvement Plan to be developed and implemented by the Copermittees. The Copermittees, however, are not limited to the requirements of Provision D and may include additional methods to track progress toward improving water quality in a Watershed Management Area.

More specific and detailed discussions of the requirements of Provision D are provided below.

<u>Provision D.1 (Receiving Water Monitoring Requirements)</u> specifies the minimum receiving water monitoring that the Copermittees must conduct within the Watershed Management Area and include as part of the Water Quality Improvement Plan.

Provision D.1 establishes minimum monitoring requirements that must be conducted by the Copermittees within each Watershed Management Area. Provision D.1 requires the Copermittees to collect and develop the data and information necessary to determine potential impacts to the beneficial uses in the receiving waters due to discharges from the MS4s. The monitoring required under Provision D.1 will also provide the data that will allow the Copermittees to gauge the effectiveness and progress of its Water Quality Improvement Plan implementation efforts toward improving the quality of receiving waters.

The receiving water monitoring requirements of Provision D.1 are focused primarily on monitoring the conditions and response of the receiving waters to the Copermittees'

collective implementation efforts to reduce receiving water impacts that may be caused by the discharges from the MS4s. The preference of the San Diego Water Board is for the Copermittees to spend their resources achieving tangible and observable improvements in receiving water conditions instead of collecting samples and analyzing data that has consistently indicated that receiving water conditions are degraded and require improvement. In general, the ability to measure potential improvements in receiving water conditions due to any actions implemented by the Copermittees as part of the Water Quality Improvement Plan may require several years before a response can be observed. Thus, the frequency of collecting receiving water monitoring data has been kept to a minimum.

During the transitional period between adoption of this Order and San Diego Water Board acceptance of a Water Quality Improvement Plan, the Copermittees must conduct receiving water monitoring in accordance with Provision D.1.a. This approach to collecting receiving water data is different from what was required in the Fourth Term Permits, but one that truly embraces the concept of an integrated, cost-effective, streamlined receiving water monitoring approach.

Provision D.1.a requires Copermittees to continue performing the receiving water monitoring programs required in Order Nos. R-2007-0001, R9-2009-002, and R9-2010-0016; plus participation in: hydromodification management plan monitoring approved by the San Diego Water Board, monitoring plans as part of load reduction plans (either Bacteria Load Reduction Plans or Comprehensive Load Reduction Plans) for TMDLs in Attachment E of the Order, Storm Water Monitoring Coalition Regional Monitoring, Southern California Bight Regional Monitoring, Sediment Quality Monitoring, and ASBS Monitoring as applicable to a Watershed Management Area.

Provision D.1.a also provides an opportunity for the Copermittees to use third party data to meet receiving water monitoring requirements where feasible. Allowing the Copermittees to use the data currently collected through its participation in existing regional receiving water programs and that of third parties provides an efficiency of resources in obtaining the data necessary to inform the Copermittees and the San Diego Water Board about the physical, chemical, and biological conditions of the receiving waters, which can also help to focus the receiving water monitoring during the implementation of the Water Quality Improvement Plan. Once a Water Quality Improvement Plan is developed for a Watershed Management Area in compliance with Provision B of this Order, the transitional period is over and Copermittees are required to conduct receiving water monitoring according to the requirements of Provisions D.1.b-e.

Provision D.1.b requires each Copermittee to identify at least one long term receiving water monitoring station to be representative of receiving water quality within each Watershed Management Area. Long term receiving water monitoring stations can be located at any existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees. The requirements under Provision D.1.b. are

consistent with 40 CFR 122.26(d)(2)(iii)(D), which specifies that a "*monitoring program for representative data collection for the term of the permit*" may include "*instream locations.*" For each Watershed Management Area, at least one long term watershed monitoring station is required to be established and monitored. The Copermittees may choose to establish additional long term monitoring stations where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

Provision D.1.b. requires the Copermittees to locate the long term receiving water monitoring station at one of these existing receiving water monitoring stations to provide the Copermittees an opportunity to experience monitoring cost savings while continuing to collect the necessary data to assess the status and trends of receiving water quality conditions in 1) coastal water, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under both dry weather and wet weather conditions. Ideally these stations will continue to be monitored as part of the receiving water monitoring for each Watershed Management Area to maintain a consistent set of locations and a period of data that can be built upon with the monitoring required under this Order.

The receiving water monitoring requirements are separated into monitoring required during dry weather conditions pursuant to Provision D.1.c, and wet weather conditions pursuant to Provision D.1.d.

At each long term monitoring station the Copermittees must conduct at least three dry weather monitoring events as required pursuant to Provision D.1.c and at least three wet weather monitoring events as required pursuant to Provision D.1.d per permit term. Provisions D.1.c and D.1.d require the Copermittees to monitor priority water quality conditions identified in the Water Quality Improvement Plan, constituents listed as causing impairment of receiving waters in the Watershed Management Area, applicable NALs, toxicity, constituents listed in Tables D-2 and D-3, and constituents for implementation plans (e.g. Bacteria Load Reduction Plans and Comprehensive Load Reduction Plans). Required toxicity monitoring was changed to reflect an updated understanding of the unique challenges associated with sampling storm water for toxicity. Copermittees are required to sample receiving water for toxicity during each dry weather and each wet weather event pursuant to Provision D.1.c.(4) and D.1.d.(4). Required toxicity monitoring is now consistent with the State Water Resources Control Board Policy for Toxicity Assessment and Control (Draft June 2012) and recently adopted MS4 permits for Caltrans and Los Angeles Water Board. Receiving water monitoring efforts in this Order have been streamlined to redirect resources to monitoring efforts that better support pollutant reduction solutions with an increasing emphasis on MS4 outfall monitoring, source identification, and source abatement activities.

In addition to the receiving water monitoring requirements under Provisions D.1.b-d, Provision D.1.e requires the Copermittees participate in and/or conduct other types of receiving water monitoring. As recommended and requested by the Copermittees, Provision D.1.e.(1) requires the Copermittees to participate in existing regional monitoring, as applicable to each Watershed Management Area. Existing regional

monitoring includes monitoring conducted by the Storm Water Monitoring Coalition and for the Southern California Bight. Participation in and use of monitoring data collected from these existing regional water quality monitoring programs provide the Copermittees a greater opportunity for efficiency in the use of their resources to manage their storm water programs and those controllable discharges under their authority.

Provision D.1.e.(1)(c) requires the south Orange County MS4 Copermittees to participate in "unified regional beach water quality monitoring." This monitoring replaces requirements to conduct "core monitoring" of beach water quality, as provided for in Appendix III of the Ocean Plan.

Several different public agencies currently conduct routine, ongoing beach water quality monitoring in south Orange County in accordance with several different sets of requirements. The monitoring programs implemented to meet those requirements overlap temporally and spatially. These monitoring programs are partially but not fully integrated. In November 2010, the State Water Board adopted Resolution No. 2010-0053, which directed Regional Water Boards to work with dischargers to modify beach water quality monitoring programs required by Regional Water Board-issued permits in order to eliminate redundancies and incorporate beach water quality monitoring required by beach water quality statutes, where appropriate.

In April 2012, the San Diego Water Board requested that its staff review beach water quality monitoring conducted in south Orange County. To assist in responding to that request, staff of the Board convened a workgroup that included representatives of the three public agencies that currently conduct almost all of the routine, ongoing beach water quality monitoring in south Orange County, i.e., South Orange County Wastewater Authority (SOCWA), Orange County Public Works, and Orange County Health Care Agency (OCHCA). The workgroup also included other interested parties, including representatives of the Sierra Club and Surfrider Foundation. In December 2012, the San Diego Water Board adopted Resolution No. R9-2012-0069, which endorsed the San Diego Water Board staff report entitled "A Framework for Monitoring and Assessment in the San Diego Region," dated November 2012.

The unified program is consistent with and will meet or exceed the minimum requirements for beach water quality monitoring and related public notification and reporting established by State law, including the Ocean Plan. The unified program is consistent with State Water Board Resolution No. 2010-0053. The unified program is also consistent with and will help implement, "A Framework for Monitoring and Assessment in the San Diego Region," which emphasizes the need for question-driven, beneficial use-oriented monitoring and assessment. The primary purpose of the unified program will be to answer the question "Does beach water quality meet standards for the beneficial use of water contact recreation?"

The unified program is intended to be protective; it will help protect the health of swimmers, surfers, and others who use south Orange County beach waters for water

contact recreational activities. The unified program is also intended to be reasonable; it will eliminate duplicative monitoring and will include triggers for public notification and additional sampling at all sampling stations year-round. The unified program is intended to be equitable; responsibility for implementation of the unified program will be shared and the responsible agencies will jointly make arrangements to implement the program and will have the flexibility to jointly make short and/or long term changes in those arrangements.

The San Diego Water Board Executive Officer issued a written directive on December 5, 2014, pursuant to California Water Code section 13383, for SOCWA and the south Orange County MS4 Copermittees to implement the unified program in cooperation with OCHCA. The Executive Officer may make revisions to the unified program, provided that the unified program, as revised, continues to be consistent with and meet the requirements of State law, including the Ocean Plan, for beach water quality monitoring and related public notification and reporting. Following a thirty day public comment period, and subject to a request for a hearing before the San Diego Water Board, any such revision shall take effect as specified in a written directive issued by the Executive Officer pursuant to CWC section 13383. The program and any Executive Officer issued revisions to the program are subject to CWC section 13320 right of review from the date of issuance.

The unified program will supersede the existing routine, ongoing, beach water quality monitoring programs in south Orange County that are conducted in accordance with the existing requirements of the NPDES permits for discharges from the SOCWA ocean outfalls and the south Orange County MS4s. The requirement to participate in "regional monitoring" of beach water quality replaces requirements to conduct "core monitoring" of beach water quality, as provided for in Appendix III of the Ocean Plan.

The State Water Resources Control Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part 1 Sediment Quality which became effective August 25, 2009 (Sediment Quality Monitoring Policy). Provision D.1.e.(2) requires any Copermittees with MS4 discharges to an enclosed bay or estuary to monitoring the sediments in the enclosed bay or estuary receiving water in accordance with the sediment quality monitoring procedures as prescribed in the Sediment Quality Monitoring Policy.

The State Water Board adopted Resolution No. 2012-0012 which approved exceptions to the California Ocean Plan for selected discharges into Areas of Special Biological Significance (ASBS), including special protections for beneficial uses. State Board Resolution No. 2012-0012 became effective on March 20, 2012, and Attachment B to the Resolution established limitations on point source storm water discharges to ASBS. Copermittees with MS4s that discharge to an ASBS must monitor its discharge to assure compliance with State Board Resolution No. 2012-0012 as required pursuant to Provision D.1.e.(3).

The San Diego Water Board is developing a regional monitoring strategy to assess the conditions of receiving waters in the San Diego Region. The monitoring requirements of Provision D.1 are expected to be incorporated or serve as a foundation of this regional monitoring strategy, but may require some modifications. When the San Diego Water Board develops an alternative regional monitoring strategy, the Copermittees will be required to participate in the development and implementation of the alternative regional monitoring program pursuant to Provision D.1.f.

Provision D.2 (MS4 Outfall Discharge Monitoring Requirements) specifies the minimum MS4 outfall discharge monitoring requirements that the Copermittees must incorporate and implement as part of the Water Quality Improvement Plan.

The dry weather MS4 outfall discharge monitoring requirements are included under Provisions D.2.a.(2) and D.2.b. The dry weather MS4 outfall discharge monitoring requirements are part of the "*program, including a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer*" required by 40 CFR 122.26(d)(2)(iv)(B), which is expected to achieve compliance with the CWA section 402(p)(3)(B)(ii) statutory requirement for municipal storm water permits to require the Copermittees to "*effectively prohibit non-storm water discharges into the storm sewers*." The dry weather MS4 outfall discharge monitoring data collection requirements are based on requirements under 40 CFR 122.26(d)(1)(iv)(D) and 122.26(d)(2)(iv)(B)(3).

The dry weather MS4 outfall discharge monitoring requirements are designed to provide wide spatial and temporal coverage of each jurisdiction to better understand the extent and magnitude of non-storm water discharges to receiving waters, and make a distinction between persistent and transient non-storm water flows. This information is expected to allow each Copermittee to focus its resources on eliminating and controlling the highest priority threats to receiving water quality, as well as integrating other elements of the storm water programs (e.g. complaint call response) and third party data to efficiently and effectively assist in efforts to eliminate non-storm water discharges.

The dry weather MS4 outfall discharge monitoring requirements of Provision D.2.a.(2) and D.2.b are separated into monitoring required before and after the San Diego Water Board accepts the Copermittees' Water Quality Improvement Plan. Outfall monitoring conducted prior to acceptance of the Water Quality Improvement Plan is referred to in the Order as Transitional MS4 Outfall Discharge Monitoring. Provision D.2.a.(2) includes the transitional dry weather MS4 outfall discharge monitoring requirements.

The requirements under Provision D.2.a.(2) are based on the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B), which include the requirements for a monitoring program to identify, detect, and eliminate illicit connections and illegal discharges to the MS4s. The federal regulations (40 CFR 122.26(d)(1)(iv)(D)) require

the monitoring program to include "*a field screening analysis for illicit connections and illegal dumping [that]…[a]t a minimum, include[s] a narrative description, for either each field screening point or major outfall, of visual observations made during dry weather periods.*" The federal regulations (40 CFR 122.26(d)(1)(v)(B)) require the monitoring program to include "*inspection procedures and methods for detecting and preventing illicit discharges, and describe areas where this program has been implemented.*" Furthermore, the monitoring program is required by federal regulations (40 CFR 122.26(d)(2)(iv)(B)) to include "*a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer.*"

Dry weather transitional MS4 outfall discharge monitoring requires each Copermittee to field screen (inspect) its major MS4 outfalls to classify the MS4 outfall locations as having persistent dry weather flows, transient dry weather flows, or no dry weather flows. To account for the variance in size of the 39 jurisdictions covered under this Order, the Copermittees recommended a tiered approach to the number of major MS4 outfalls that must be inspected. Provision D.2.a.(2)(a) provides a tiered approach to the number of major MS4 outfalls that must be visually inspected per jurisdiction as well as a minimum frequency each Copermittee must inspect each major MS4 outfall per year. This tiered approach is based on the total number of major MS4 outfalls within a Copermittees jurisdiction within each Watershed Management Area.

Based on the field screening, each Copermittee is required to make a determination whether any observed flowing, pooled, or ponded waters are transient or persistent flows. Based on this field screening information, other jurisdictional program information, and third party information, each Copermittee is required to prioritize the MS4 outfalls within its jurisdiction for follow up investigation and elimination of the non-storm water discharge, as part of its illicit discharge detection and elimination program required pursuant to Provision E.2. In accordance with the requirements of Provision E.2, each Copermittee is required to immediately investigate obvious illicit discharges (e.g. outfall discharges with unusual color, unusual odor, or high flows).

This approach allows a Copermittee to use all of its resources, as well as leverage resources and information provided by third parties, to effectively eliminate non-storm water discharges from its MS4 outfalls. If the source of the non-storm water discharge cannot be immediately eliminated, the Copermittee uses the persistent flow or transient flow classification along with other programmatic implementation data to prioritize the MS4 outfalls for future investigation. In accordance with the adaptive management approach deployed throughout this Order, Provision D.2.a.(2)(c) requires each Copermittee to update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow. The requirement of Provision D.2.a.(2)(c) assures that each Copermittee is collecting data that can be used to demonstrate compliance with the CWA requirement that each Copermittee must implement a program to "*effectively*

prohibit non-storm water discharges into the [MS4]" and with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

Provision D.2.b describes the dry weather MS4 outfall discharge monitoring required to be incorporated and implemented as part of the Water Quality Improvement Plan. Dry weather MS4 outfall discharge monitoring must be performed by each Copermittee to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. The emphasis of the dry weather MS4 outfall discharge monitoring required pursuant to Provision D.2.b is consistent with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

Provision D.2.b.(1) requires each Copermittee to continue field screening its major MS4 outfalls and identifying those with persistent flows and transient flows, as conducted during the transitional period (i.e. before the Water Quality Improvement Plan was developed). However, each Copermittee now has the flexibility to adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of non-storm water persistent flow discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan. In order to ensure a minimum number of outfalls are inspected, Provision D.2.b.(1) requires the number of visual inspections be equal to the number of visual inspections required in the tiered inspection program pursuant to Provision D.2.a.(2)(a).

Provision D.2.b.(2)(b) requires each Copermittee to monitor a minimum of 5 major MS4 outfalls with persistent flows identified as the highest priorities within a Copermittee's jurisdiction, within each Watershed Management Area. In other words, Copermittees located in more than one Watershed Management Area must identify at least 5 major MS4 outfalls with persistent flows in its jurisdiction in each Watershed Management Area. If a Copermittee is located in more than one Watershed Management Area, and they have less than 5 major MS4 outfalls with persistent flows per jurisdictional area per Watershed Management Area, all of the major MS4 outfalls must be identified as high priority dry weather persistent flow MS4 outfalls. The Copermittees identified as Responsible Copermittees by a TMDL in Attachment E of the Order may need to monitor more than 5 dry weather major MS4 outfall locations to determine compliance with the requirements of the TMDL(s).

Monitoring must occur at the highest priority outfall locations at least semi-annually until the non-storm water discharges have been eliminated for three consecutive dry weather monitoring events; identified to be authorized by a separate NPDES Permit; or reprioritized to a lower priority. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized MS4 major outfall in the Copermittee's jurisdiction within the Watershed Management Area, unless there are no remaining qualifying major MS4 outfalls within the Copermittees jurisdiction. The Copermittees must continually update their dry weather persistent

flow MS4 outfall discharge monitoring locations with the next highest priority non-storm water flow that have yet to be eliminated until all persistent and transient flows are eliminated or its threat reduced.

Non-storm water persistent flow MS4 outfall discharge monitoring data collected during each semi-annual monitoring event, must be collected and analyzed according to the requirements of Provision D.2.b.(2)(b)-(e). These monitoring requirements are consistent with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

The wet weather MS4 outfall discharge monitoring requirements are included under Provisions D.2.a.(3) and D.2.c. The wet weather MS4 outfall discharge monitoring requirements are necessary for the Copermittees to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable, using management practices, control techniques and system, design and engineering methods, and such other provisions which are appropriate*" required by 40CFR 122.26(d)(2)(iv), which is expected to achieve compliance with the CWA section 402(p)(3)(B)(iii) statutory requirement for municipal storm water permits to require "*controls to reduce the discharge of pollutants [in storm water] to the maximum extent practicable*." The wet weather MS4 outfall discharge monitoring data collection requirements are based on requirements under 40 CFR 122.26(d)(2)(iii), 122.26(d)(2)(iii)(A) and 122.26(d)(2)(iii)(A)(1)-(4), and 40 CFR 122.21(g)(7)(i)-(ii).

The wet weather MS4 outfall discharge monitoring requirements of Provision D.2.a.(3) and D.2.c are separated into monitoring required before and after the San Diego Water Board accepts the Copermittees' Water Quality Improvement Plan. Outfall monitoring conducted prior to acceptance of the Water Quality Improvement Plan is referred to in the Order as Transitional MS4 Outfall Discharge Monitoring. Provision D.2.a.(3) includes the transitional wet weather MS4 outfall discharge monitoring requirements.

Until the wet weather MS4 outfall discharge monitoring requirements of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board, the Copermittees must comply with the requirements of transitional wet weather MS4 outfall monitoring requirements pursuant to Provision D.2.a.(3). Provision D.2.a.(3) requires the Copermittees in each Watershed Management Area to sample, at least five of the major MS4 outfalls inventoried pursuant to Provision D.2.a.(1) once per wet season for the monitoring data required to be collected pursuant to Provision D.2.a.(3)(c)-(e). Provision D.2.a.(3) further requires at least one major MS4 outfall monitoring station be located in each Copermittee's jurisdiction within the Watershed Management Area.

At a minimum, the five sampling locations chosen must be representative of storm water discharges from residential, commercial, industrial, and typical mixed-use land uses present within a Watershed Management Area. The San Diego Water Board expects the Copermittees to extrapolate from these data to similar land uses

throughout the Watershed Management Area to better inform the Water Quality Improvement Plan development process by prioritizing drainages for implementation of storm water control efforts required pursuant to Provision E.

Provision D.2.c describes the wet weather MS4 outfall discharge monitoring required to be included and implemented as part of the Water Quality Improvement Plan. Provision D.2.c provides the Copermittees the flexibility to adjust the wet weather MS4 outfall discharge monitoring locations and frequencies in the Watershed Management Area, as needed, to identify sources of pollutants in storm water discharges from MS4s in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan.

Although Provision D.2.c.(1) allows the Copermittees to adaptively manage the wet weather MS4 outfall discharge monitoring locations and frequencies, the provision requires a minimum of at least five wet weather outfall stations to be monitored. Provision D.2.c.(2) further allows the Copermittees to modify the monitoring frequency at each wet weather MS4 outfall station to meet the goals of the Water Quality Improvement Plan as long as the monitoring frequency occurs at least once per year and is at an appropriate frequency to identify sources of pollutants in storm water discharges, guide pollutant source identification efforts, or determine compliance with the requirements of the applicable TMDLs in Attachment E to the Order.

The wet weather MS4 outfall discharge monitoring requirements of Provisions D.2.c.(3) and D.2.c.(4) are the same as the transitional wet weather MS4 outfall discharge monitoring. In contrast, the requirements of Provision D.2.c.(5) are focused on collecting analytical data specific to the highest priority water quality conditions in the Watershed Management Area identified in the Water Quality Improvement Plan. The wet weather MS4 outfall discharge monitoring data collection requirements are consistent with the requirements under 40 CFR 122.26(d)(2)(iii), 122.26(d)(2)(iii)(A) and 122.26(d)(2)(iii)(A)(1)-(4), and 40 CFR 122.21(g)(7)(i)-(ii).

<u>Provision D.3 (Special Studies)</u> requires the Copermittees to develop special studies that will be conducted for each Watershed Management Area and the entire San Diego Region. Data collected pursuant to Provision D.3 is to be used by the Copermittees to improve the effectiveness of the strategies implemented by the jurisdictional runoff management programs toward achieving the numeric goals identified in the Water Quality Improvement Plans and ultimately achieve compliance with the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c, and A.2.a, which is consistent with the requirements of Provision A.4.

Special studies are often necessary to fill data gaps or provide more refined information that allow the Copermittees to better manage the generation or elimination of pollutants and discharges to and from the MS4. In the Fourth Term Permits, the Copermittees have been required to implement special studies as directed by the San Diego Water Board. The special studies required by this Order provide the Copermittees more flexibility to identify and implement special studies that will be most

useful to improving the effectiveness of their jurisdictional runoff management programs.

Provision D.3.a.(1) requires the Copermittees to develop and conduct at least two special studies per Watershed Management Area, to be determined by the Copermittees. One of the two special studies may be accomplished through participation in a Regional Special Study required under Provision D.3.a.(2). The requirements provide the Copermittees great latitude in identifying and developing the special studies. Watershed Management Area special studies are required, at a minimum, to: (a) relate in some way to the highest water quality priorities identified by the Copermittees in the Water Quality Improvement Plan, (b) be conducted within the Watershed Management Area, and (c) include some form of participation (e.g. contribution of funds, personnel services, project management) by all the responsible Copermittees within the Watershed Management Area.

Examples of Watershed Management Area special studies might include, but are not limited to: (1) focused pollutant source identification studies, (2) BMP effectiveness and/or comparison studies, (3) pilot tests for new or emerging pollutant control methods, (4) receiving water pollutant or stressor source identification and/or mitigation studies, or (5) pollutant fate and transport studies. The Watershed Management Area special studies are expected to provide data that can be utilized by the Copermittees to improve the Water Quality Improvement Plan or implementation of the Copermittees' jurisdictional runoff management programs to address the highest priority water quality conditions.

Provision D.3.a.(2) requires the Copermittees to develop at least one special study that will be conducted for the entire San Diego region. The regional special study is expected to provide data that can be utilized by the Copermittees to improve the Water Quality Improvement Plan or implementation of the Copermittees' jurisdictional runoff management programs to identify or address regional water quality concerns and priorities.

An example of a regional special study would be to develop and establish allowable exceedance frequencies of the bacteria water quality objectives for several types of water bodies, during different wet and dry weather conditions the San Diego region. The special study would be related to bacteria, which is a priority for the San Diego region due to the adoption of "*Bacteria TMDL Project I – Beaches and Creeks in the San Diego Region*." The study results could be used to inform the Copermittees and the San Diego Water Board about the indictor bacteria water quality objective exceedance frequencies that occur in natural or reference watersheds.

<u>Provision D.4 (Assessment Requirements)</u> specifies the assessments that the Copermittees are required to perform, based on the monitoring data collected, and will be reported as part of the Annual Report for the Water Quality Improvement Plan implementation. Provision D.4 requires the Copermittees assess the progress of the

water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c, and A.2.a.

Provision D.4 specifies the assessments that Copermittees must perform for each Watershed Management Area to assess the effectiveness of each Copermittee's jurisdictional runoff management program and the Water Quality Improvement Plan. The effectiveness of each Copermittee's jurisdictional runoff management program and Water Quality Improvement Plan is measured through these types of assessments: (a) Receiving Waters Assessments (b) MS4 Outfall Discharges Assessments, (c) Special Studies Assessments, and (d) Integrated Assessment of Water Quality Improvement Plan.

Provision D.4.a requires the Copermittees to assess the status of receiving water conditions annually during the transitional monitoring period (during development of the Water Quality Improvement Plan) and after acceptance of the Water Quality Improvement Plan. The monitoring data collected pursuant to Provision D.1 will be evaluated, among other information, to assess the condition of a Watershed Management Area's streams, coastal waters, enclosed bays, harbors, estuaries, and lagoons. The focus of the receiving waters assessments is to measure progress toward the objective of the CWA to "*restore and maintain the chemical, physical, and biological integrity of the Nation's waters*" as the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program are implemented within a Watershed Management Area. Provision D.4.a is consistent with 40 CFR 122.42(c)(7) which requires the Copermittees to annually report the *"[i]dentification of water quality improvements or degradation."*

Provision D.4.b includes the MS4 outfall discharges assessment requirements. The focus of MS4 outfall discharges assessments is to determine if the Copermittees' are implementing programs that comply with the requirements of the CWA for MS4 permits to "*effectively prohibit non-stormwater discharges into the storm sewers*" and "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable.*" The monitoring data collected pursuant to Provisions D.2 will be evaluated, among other information, to assess the effectiveness of the transitional MS4 outfall field screening monitoring, the implementation of the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program. The MS4 outfall discharge assessments consist of Non-Storm Water Discharges Reduction Assessments and Storm Water Pollutant Discharges Reduction Assessments.

The Non-Storm Water Discharges Reduction Assessments are how each Copermittee will demonstrate that its jurisdictional runoff management program implementation efforts are achieving the CWA requirement to "*effectively prohibit non-stormwater discharges into the storm sewers.*" Provision D.4.b.(1) requires each Copermittee to assess and report on its illicit discharge detection and elimination program required pursuant to Provision E.2 to reduce and effectively prohibit non-storm water and illicit discharges into the MS4 within its jurisdiction. The Non-Storm Water Discharges

Reduction Assessments include specific assessment requirements applicable to each Copermittee.

As each Copermittee collects and analyzes the data collected pursuant to dry weather MS4 outfall discharges monitoring requirements of Provisions D.2.a.(2) and D.2.b, Provision D.4.b.(1) requires each Copermittee to assess the progress, assess the effectiveness of its current actions, and identify modifications necessary to increase the effectiveness of its actions toward reducing and eliminating non-storm water and illicit discharges to its MS4. The findings from these assessments are expected to be utilized by the Copermittee as part of its procedures to prioritize the non-storm water discharges that will be addressed by its Illicit Discharge Detection and Elimination program required pursuant to Provision E.2.

The assessment requirements of Provision D.4.a.(1) are consistent with 40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(3) which require "*procedures…to investigate portions of the separate storm sewer system that, <u>based on the results of the field screen, or other appropriate information</u> [emphasis added], indicate a reasonable potential of contain illicit discharges or other sources of non-storm water*" as part of a "*program…to detect and remove…illicit discharges and improper disposal into the storm sewer.*" The assessment requirements of Provision D.4.a.(1) are also consistent with 40 CFR122.42(c)(1) requires the Copermittees to annually report the "*status of implementing the components of the storm water management program that are established as permit conditions.*"

The Storm Water Pollutant Discharges Reduction Assessment is how the Copermittees in each Watershed Management Area will demonstrate that their jurisdictional runoff management program implementation efforts are achieving the CWA requirement to "*reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable*." Provision D.4.b.(2) requires the Copermittees in each Watershed Management Area to assess and report the progress of the Copermittees' efforts to reduce pollutants in storm water discharges from the MS4s to the MEP. The Storm Water Pollutant Discharges Reduction Assessments include specific assessment requirements during both the transitional monitoring period and after acceptance of the Water Quality Improvement Plan applicable to the Watershed Management Area and each Copermittee.

As the Copermittees collect and analyze the data collected pursuant to wet weather MS4 outfall discharges monitoring requirements of Provisions D.2.a.(3) and D.2.c, Provision D.4.b.(2) requires the Copermittees to assess runoff conditions during the transitional period, and the progress of the Water Quality Improvement Plan strategies toward reducing pollutants in storm water from the MS4 to the MEP. The findings from these assessments are expected to be utilized by the Copermittees to identify any modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify sources of pollutants in storm water discharges from the MS4s, as well as focus, modify, and improve the water quality improvement

strategies implemented by each Copermittee within its jurisdiction to reduce pollutants in storm water discharges to the MEP.

The assessment requirements of Provision D.4.b.(2) are consistent with 40 CFR 122.26(d)(2)(iii)(B) which requires "*[e]stimates of the annual pollutant load of the cumulative discharges to waters of the United States from all identified municipal outfalls…during a storm event…accompanied by a description of the procedures for estimating constituent loads and concentrations, including any modeling, data analysis, and calculation methods.*" The assessment requirements of Provision D.4.a.(2) are consistent with 40 CFR 122.26(d)(2)(v) which requires that each Copermittee assesses the *"estimated reductions in loadings of pollutants from discharges of municipal storm sewer constituents from municipal storm sewer systems expected as the result of the municipal storm water quality management program."* The assessment requirements of Provision D.4.b.(2) are also consistent with 40 CFR122.42(c)(1) requires the Copermittees to annually report the "*status of implementing the components of the storm water management program that are established as permit conditions.*"

Provision D.4.c includes the special studies assessment requirements. Performing special studies are how the Copermittees will address data gaps identified during the development of and updates to the Water Quality Improvement Plan. The relevant findings from the special studies assessments are expected to be incorporated as part of the applicable receiving water assessments, MS4 outfall discharge assessments, and integrated water quality improvement assessments required in Provision D.4.a, D.4.b, and D.4.d, respectively.

The assessment requirements in Provision D.4.d are part of the iterative approach and adaptive management process required by Provision A.4. The Copermittees are required to integrate the data collected pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to re-evaluate the Water Quality Improvement Plan.

The monitoring data collected pursuant to Provisions D.1 and D.2, and the results of the assessment required pursuant to Provisions D.4.a-c, will be used to determine whether the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program are effective, or require modifications or improvements to become more effective to achieve the requirements of the CWA. The assessments required by Provision D.4.d are consistent with 40 CFR 122.42(c)(1) which requires that the Copermittees to report the *"[t]he status of implementing the components of the storm water management program that are established as permit conditions."*

E. Jurisdictional Runoff Management Programs

Purpose: Provision E includes the requirements for the jurisdictional runoff management programs to be implemented by each of the Copermittees. Compliance with the requirements for the jurisdictional runoff management programs will allow the Copermittees to demonstrate that they are implementing programs to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP. The jurisdictional runoff management program document prepared by each Copermittee will also provide the details for implementing the water quality improvement strategies identified in the Water Quality Improvement Plan specifically within its jurisdiction.

***Discussion*:** Implementation of the jurisdictional runoff management program requirements under Provision E is how the Copermittees "*effectively prohibit non-stormwater discharges into the storm sewer,*" and outlines the "*controls to reduce the discharge of pollutants to the maximum extent practicable"* consistent with the federal regulations under 40 CFR 122.26. The jurisdictional runoff management program is part of the "*comprehensive planning process*" that is required pursuant to 40 CFR 122.26(d)(2)(iv). Where the Water Quality Improvement Plan is the "*comprehensive planning process*" on a Watershed Management Area scale, requiring "*intergovernmental coordination,*" the jurisdictional runoff management program document is the "*comprehensive planning process*" on a jurisdictional scale that should be coordinated with the other Copermittees in the Watershed Management Area to achieve the goals of the Water Quality Improvement Plan.

The jurisdictional runoff management program requirements are included to provide each Copermittee criteria that can be used to demonstrate that its storm water management program is implementing the "*comprehensive planning process*" within its jurisdiction to "*effectively prohibit non-stormwater discharges into the storm sewers,*" and to identify and implement the most effective "*controls to reduce the discharge of pollutants to the maximum extent practicable"* in accordance with the performance standards given in the CWA.

Provision E includes the requirements for each of the components that must be included in the Copermittee's jurisdictional runoff management program document that will be implemented by the Copermittee within its jurisdiction. Implementation of the components of each Copermittee's jurisdictional runoff management program must incorporate the water quality improvement strategies identified by each Copermittee in the Water Quality Improvement Plans, described pursuant to Provision B.3.b.(1)(a).

More specific and detailed discussions of the requirements of Provision E are provided below.

Provision E.1 (Legal Authority Establishment and Enforcement) requires each Copermittee to establish and enforce sufficient legal authority to control discharges to the MS4 within its jurisdiction.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system*" and be able to demonstrate that it can "*operate pursuant to legal authority established by statute, ordinance or series of contracts.*" Provision E.1.a describes the minimum legal authorities each Copermittee must establish for itself within its jurisdiction to control discharges to its MS4. The requirements of Provision E.1.a are consistent with the requirements set forth in 40 CFR 122.26(d)(2)(i)(A)-(F).

The certification statement required from each Copermittee by Provision E.1.b is included to provide the San Diego Water Board additional documentation that each Copermittee has established the legal authorities consistent with Provision E.1.a and 40 CFR 122.26(d)(2)(i)(A)-(F), and the Copermittee can "*operate pursuant to legal authority established by statute, ordinance or series of contracts.*"

Provision E.2 (Illicit Discharge Detection and Elimination) requires each Copermittee to implement an illicit discharge detection and elimination program to effectively prohibit non-storm water discharges to the MS4 by actively detecting and eliminating illicit discharges and disposal into its MS4. If the San Diego Water Board finds that a Copermittee is fully implementing the requirements of Provision E.2, then the Copermittee is deemed in compliance with the effective prohibition of non-storm water discharges to the MS4 required under Provision A.1.b.

Provision E.2 establishes the minimum requirements that each Copermittee must implement within its jurisdiction to effectively prohibit non-storm water discharges from entering its MS4. The federal CWA requires permits for municipal storm sewer systems to "*effectively prohibit non-storm water discharges into the storm sewers*." The federal regulations (40CFR122.26(d)(2)(i)(B)) require each Copermittee to establish the legal authority to prohibit illicit discharges to its MS4s. Under 40 CFR 122.26(d)(2)(iv)(B), each Copermittee must implement a "*program…to detect and remove…illicit discharges and improper disposal into the storm sewer.*" The federal NPDES regulations, under 40 CFR 122.26(b)(2), define illicit discharges as "*any discharge to a municipal separate storm sewer that is not composed entirely of storm water*." Thus, non-storm water discharges are not authorized to enter the MS4 and are considered to be illicit discharges, unless authorized by a separate NPDES permit.

The Phase I Final Rule clarifies that non-storm water discharges through an MS4 are not authorized under the CWA (55 FR 47995):

> "*Today's rule defines the term "illicit discharge" to describe any discharge through a municipal separate storm sewer system that is not composed entirely of storm water and that is not covered by an NPDES permit. Such illicit discharges are not*

> *authorized under the Clean Water Act. Section 402(p)(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit*."

The federal NPDES requirements for the program to address illicit discharges must include "*inspections, to implement and enforce an ordinance, orders, or other similar means to prevent illicit discharges to the MS4*." The federal NPDES regulations also reference several categories of "*non-storm water discharges or flows* [which] *shall be addressed where such discharges are identified…as sources of pollutants to waters of the United States*." The Phase I Final Rule (55 FR 48037) further clarified the requirements of 40 CFR 122.26(d)(2)(iv)(B)(1) as follows:

> "*EPA is clarifying that section 402(p)(3)(B) of the CWA (which requires permits for municipal separate storm sewers to 'effectively' prohibit non-storm water discharges) does not require permits for municipalities to prohibit certain discharges or flows of nonstorm water to waters of the United States through municipal separate storm sewers in all cases*."

In previous iterations of the municipal storm water permits for the San Diego Region, these categories were simply listed and referred to as categories of non-storm water discharges "not prohibited" unless identified as a source of pollutants. The Copermittees have often referred to these categories as "exempt" discharges. In both cases, however, the language is inconsistent with the federal CWA and NPDES regulations. And, the clarification provided in the Phase I Final Rule does not specifically state that such discharges are "not prohibited" or "exempt" or in any way authorized. The federal NPDES regulations do, however, state that specific categories of non-storm water discharges must be "*addressed*" if identified as "*sources of pollutants to waters of the United States*."

The language of Provision E.2.a has been revised to be fully consistent with the language of the CWA and the requirements of the federal regulations under 40 CFR 122.26(d)(2)(iv)(B)(1). Provision E.2.a requires each Copermittee to address <u>all</u> types of non-storm water discharges into its MS4 as illicit discharges, <u>unless</u> the discharge is authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to Provisions E.2.a.(1) through E.2.a.(5). Only non-NPDES-permitted non-storm water discharges identified as a category of non-storm water discharges under Provisions E.2.a.(1) through E.2.a.(5) <u>and</u> *not identified as a source of pollutants* do not have to be addressed as illicit discharges. Categories of non-storm water discharges that meet the requirements of Provisions E.2.a.(1) through E.2.a.(5) do not have to be addressed by the Copermittee as illicit discharges.

Several of the non-storm water categories listed in 40 CFR 122.26(d)(2)(iv)(B)(1) have not been included in Provisions E.2.a.(1) through E.2.a.(5), including: street wash water, landscape irrigation, irrigation water, and lawn watering. Because these are no longer included within the categories listed under Provisions E.2.a.(1) through E.2.a.(5), the Copermittees must prohibit these types of non-storm water discharges from entering the MS4. This is consistent with the clarification of 40 CFR 122.26(d)(2)(iv)(B)(1) in the Phase I Final Rule (55 FR 48037), which states:

> "*[T]he Director may include permit conditions that either require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*."

Street wash water is a category of non-storm water discharges that was removed when the Third Term Permits were issued. Street wash water is a source of several pollutants (e.g., metals, oil and grease, petroleum hydrocarbons, chlorinated solvents, sediment) which are generated during the street washing process. The removal of this category requires the Copermittees to prohibit this type of non-storm water discharge from entering the MS4.

The landscape irrigation, irrigation water, and lawn watering categories, collectively referred to hereafter as "over-irrigation" discharges, were removed from the list of non-storm water discharge categories in the Fourth Term Orange County and Riverside County Permits. Non-storm water discharges resulting from over-irrigation have been found to be a source of several types of pollutants (e.g., nutrients, bacteria, pesticides, sediment) in receiving waters. The San Diego Water Board and the Copermittees have identified categories of non-storm water discharges associated with over-irrigation as a source of pollutants and conveyance of pollutants to the MS4 and waters of the United States in the following documents:

- **SmartTimer/Edgescape Evaluation Program (SEEP) Grant Application**

  The State Water Board allocated grant funding to the SEEP project grant application submitted in 2006, which targeted irrigation runoff by retrofitting areas of existing development and documenting the conservation and runoff improvements. The basis of this grant project is that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 is a source and conveyance of pollutants. In addition, the grant application indicated that this alteration of natural flows is impacting the beneficial uses of waters of the state and U.S. Results from the study indicate that that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 *is* a source and conveyance of pollutants. The results of this study can be applied broadly to any area where over-irrigation takes place. The grant application included the following statements:

  > "*Irrigation runoff contributes flow & pollutant loads to creeks and beaches that are 303(d) listed for bacteria indicators.*"

"*Regional program managers agree that the reduction and/or elimination of irrigation-related urban flows and associated pollutant loads may be key to successful attainment of water quality and beneficial use goals as outlined in the San Diego Basin Plan and Bacteria TMDL over the long term.*"

"*Elevated dry-weather storm drain flows, composed primarily … of landscape irrigation water wasted as runoff, carry pollutants that impair recreational use and aquatic habitats all along Southern California's urbanized coastline. Storm drain systems carry the wasted water, along with landscape derived pollutants such as bacteria, nutrients and pesticides, to local creeks and the ocean. Given the local Mediterranean climate, excessive perennial dry season stream flows are an unnatural hydrologic pattern, causing species shifts in local riparian communities and warm, unseasonal contaminated freshwater plumes in the near-shore marine environment.*"

- **2006-2007 Orange County Watershed Action Plan Annual Reports**

The Watershed Action Plan Annual Reports for the 2006-2007 reporting period were submitted by the County of Orange, Orange County Flood Control District and Copermittees within the San Juan Creek, Laguna Coastal Streams, Aliso Creek, and Dana Point Coastal Streams Watersheds. San Juan Creek, Laguna Coastal Streams, Aliso Creek and Dana Point Coastal Streams are all currently 303(d) listed as impaired for indicator bacteria within their watersheds and/or in the Pacific Ocean at the discharge points of their watersheds. The Orange County Copermittees, within their Watershed Action Strategy Table for fecal indicator bacteria included the following:

"*Support programs to reduce or eliminate the discharge of anthropogenic dry weather nuisance flow throughout the…watershed. Dry weather flow is the transport medium for bacteria and other 303(d) constituents of concern.*"

Additionally, they state that "*conditions in the MS4 contribute to high seasonal bacteria propagation in-pipe during warm weather. Landscape irrigation is a major contributor to dry weather flow, both as surface runoff due to over-irrigation and overspray onto pavements; and as subsurface seepage that finds its way into the MS4.*"

- **Fiscal Year 2008 Carlsbad Watershed Urban Runoff Management Program Annual Report**

The Carlsbad Watershed Urban Runoff Management Program Annual Report for Fiscal Year 2008 was submitted by the Carlsbad Watershed Copermittees (Cities of Carlsbad, Encinitas, Escondido, Oceanside, San Marcos, Solana Beach, and Vista, and the County of San Diego). In the Annual Report, the Carlsbad Watershed Copermittees stated the following:

"The Carlsbad Watershed Management Area (WMA) collective watershed strategy identifies bacteria, sediment, and nutrients as high priority water quality pollutants in the Agua Hedionda (904.3 – bacteria and sediment), Buena Vista (904.2 – bacteria), and San Marcos Creek (904.5 – nutrients) Hydrologic Areas. Bacteria, sediment, and nutrients have been identified as potential discharges from over-irrigation."

- **2007-2008 San Diego Bay Watershed Urban Runoff Management Program Annual Report**

  The San Diego Bay Watershed Urban Runoff Management Program 2007-2008 Annual Report was submitted by the San Diego Bay Watershed Copermittees (Cities of Chula Vista, Coronado, Imperial Beach, La Mesa, Lemon Grove, National City, and San Diego, the County of San Diego, the Port of San Diego, and the San Diego County Airport Authority). In Appendix D of the Annual Report, titled "Likely Sources of Pollutants," the San Diego Bay Watershed Copermittees identified over-irrigation of lawns as a pollutant generating activity from business and/or residential land uses for bacteria, pesticides, and sediment.

- **Copermittee Public Education Materials**

  The Orange County Public Works *Tips for Landscape & Gardening* public education brochure states: "*Fertilizers, pesticides and other chemicals that are left on yards or driveways can be blown or washed into storm drains that flow to the ocean. Overwatering lawns can also send materials into storm drains*."

  The Riverside County Flood Control and Water Conservation District *Landscape and Garden* public education brochure states: *"Soil, yard wastes, over-watering and garden chemicals become part of the urban runoff mix that winds its way through streets, gutters and storm drains before entering lakes, rivers, streams, etc. Urban runoff pollution contaminates water and harms aquatic life!"*

- **Los Peñasquitos Lagoon Sedimentation/Siltation TMDL Technical Report**

  The Los Peñasquitos Lagoon Sedimentation/Siltation TMDL technical report was prepared for the City of San Diego and USEPA in October 2010. The technical report was included as a technical supporting document attached to the Sediment TMDL for Los Peñasquitos Lagoon staff report prepared by the San Diego Water Board, dated June 13, 2012. Under the Source Assessment section, the technical report states the following:

  "*Dry weather loading is dominated by nuisance flows from urban land use activities such as car washing, sidewalk washing, and lawn over-irrigation, which pick up and transport sediment into receiving waters.*"

These documents confirm that non-storm water discharges associated with over-irrigation are a source of pollutants and should be addressed as illicit discharges to the MS4. Prohibiting non-storm water discharges associated with over-irrigation, however, is not a new requirement for the Copermittees because it is also consistent with and required by the Water Conservation in Landscaping Act (AB 1881, Laird).

The Water Conservation in Landscaping Act required the Department of Water Resources (DWR) to prepare a Model Water Efficient Landscape Ordinance for use by local agencies (e.g. the Copermittees). All local agencies were required to adopt a water efficient landscape ordinance by January 1, 2010. Local agencies could adopt the Water Efficient Landscape Ordinance developed by DWR, or an ordinance considered at least as effective as the Model Ordinance. The Water Efficient Landscape Ordinance includes a requirement that local agencies prohibit runoff from irrigation (§ 493.2):

> "*Local agencies shall prevent water waste resulting from inefficient landscape irrigation by <u>prohibiting runoff from leaving the target landscape</u> [emphasis added] due to low head drainage, overspray, or other similar conditions where water flows onto adjacent property, non-irrigated areas, walks, roadways, parking lots, or structures. Penalties for violation of these prohibitions shall be established locally*."

Furthermore, non-storm water discharges from over-irrigation not only transport and discharge pollutants to receiving waters, but are also a likely source of the dry weather flows causing changes to habitat within and along the receiving water bodies. Examples of habitat changes from the dry weather flows include perennialization of ephemeral streams, and conversion of saltwater and brackish water marsh habitats to freshwater marsh habitats (e.g. Los Peñasquitos Lagoon). Both of these examples have resulted in the promotion of invasive species in several areas of the San Diego Region.

The removal of the over-irrigation discharges categories does not require the Copermittees to strictly prohibit lawn and landscape irrigation, but does require the prohibition of excessive irrigation water that results in non-storm water discharges to the MS4. Non-storm water discharges to the MS4 from over-irrigation must be addressed as illicit discharges by the Copermittees pursuant to the requirements of Provision E.2.

The remaining non-storm water categories listed in 40 CFR 122.26(d)(2)(iv)(B)(1) are listed under Provisions E.2.a.(1) through E.2.a.(5) and generally fall into four categories: (1) non-storm water discharges subject to existing San Diego Water Board waste discharge requirements and NPDES permits; (2) non-storm water discharges generally not expected to be a source of pollutants to receiving waters; (3) non-storm water discharges likely to contain pollutants requiring some form of control to address

the pollutants prior to discharging to the MS4; and (4) non-storm water discharges or flows associated with firefighting.

Provisions E.2.a.(1) and E.2.a.(2) include several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) for which the San Diego Water Board already has developed general waste discharge requirements and NPDES permits to address the discharges. The Copermittees are only required to address these types of non-storm water discharges as illicit discharges if the Copermittees or the San Diego Water Board identifies these non-storm water discharges not having coverage under the applicable NPDES permit.

Provision E.2.a.(3) includes several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) which are generally not expected to be a source of pollutants to receiving waters, many of which originate from what are typically natural, uncontrollable sources. The Copermittees are only required to address these types of non-storm water discharges as illicit discharges if the Copermittees or the San Diego Water Board identifies these non-storm water discharges as a source of pollutants to receiving waters. Because many of these sources are generally uncontrollable, enforcing a prohibition may not be a possibility for the Copermittees. The Copermittees would be able to address these non-storm water discharges by preventing these non-storm water discharges from entering the MS4. This could potentially be achieved by sealing their MS4 structures so the discharges cannot enter the MS4.

Provision E.2.a.(4) includes several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) that are likely to contain pollutants requiring some form of control to address the pollutants prior to discharging to the MS4. At this time, an outright prohibition of these types of non-storm water discharges does not yet appear to be warranted. Thus, Provision E.2.a.(4) includes several requirements for the Copermittees to control the pollutants from these types of non-storm water discharges. This is consistent with the clarification of the federal regulations in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board has the authority to require the Copermittees to "*control any of these types of discharges where appropriate*."

Unlike non-storm water discharges from over-irrigation, these types of non-storm water discharges are not expected to occur in close proximity to each other or very frequently. Provided these types of non-storm water discharges are controlled as required in Provision E.2.a.(4), the Copermittees would only be required to address these types of non-storm water discharges as illicit discharges if the Copermittee or the San Diego Water Board identifies these non-storm water discharges as a source of pollutants to receiving waters.

Provision E.2.a.(5) includes specific requirements for fire fighting discharges and flows. The requirements for non-storm water discharges and flows associated with fire

fighting have been separated into requirements for: a) non-emergency fire fighting discharges and flows, and b) emergency fire fighting discharges and flows.

The San Diego Water Board has found that discharges from building fire suppression system maintenance (e.g. fire sprinklers) contain waste and potentially a significant source of pollutants to receiving waters. As such, the San Diego Water Board is requiring these discharges be addressed as illicit discharges by the Copermittees. Thus, the discharges to the MS4 are to be prohibited via ordinance, order or similar means. For other non-emergency firefighting discharges and flows (i.e. flows from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems), the Copermittees are required to develop and implement a program to address pollutants in these non-storm water discharges and flows. This is consistent with the clarification of the federal regulations in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board has the authority to require the Copermittees to "*control any of these types of discharges where appropriate*."

For emergency firefighting discharges and flows, the Phase I Final Rule (55 FR 48037) has clarified the requirements of 40 CFR 122.26(d)(2)(iv)(B)(1) pertaining to emergency firefighting flows and discharges, which states:

> "*In the case of firefighting it is not the intention of these rules to prohibit in any circumstances the protection of life and public or private property through the use of water or other fire retardants that flow into separate storm sewers*."

Thus, the requirements have been made to be consistent with the guidance provided by the Phase I Final Rule. The Order recommends that the Copermittees develop and encourage implementation of BMPs to reduce or eliminate the discharge of pollutants from emergency firefighting flows to the MS4s and receiving waters. The Order does not include any requirements that should be interpreted as requiring the implementation of BMPs for emergency firefighting flows to the MS4s and receiving waters.

The Copermittees are expected to review the dry weather MS4 outfall discharge monitoring data they collect to determine if and when there are non-storm water discharges to or from their MS4s that are a source of pollutants to receiving waters. If the Copermittees identify one of the types of non-storm water discharges listed in Provisions E.2.a.(1) through E.2.a.(4) as a source of pollutants to receiving waters based on the review and evaluation of monitoring data, Provision E.2.a.(6) requires the Copermittees to prohibit those categories of discharges from entering the MS4 through ordinance, order or similar means. In addition, Provision E.2.a.(6) clarifies that the San Diego Water Board may identify categories of non-storm water discharges or flows listed under Provisions E.2.a.(1) through E.2.a.(4) that must be prohibited.

Provision E.2.a.(6) also provides the Copermittees an option to propose controls to be implemented for the category of non-storm water discharges as part of the Water Quality Improvement Plan instead of prohibiting the category of non-storm water discharges. If the Water Quality Improvement Plan is accepted by the San Diego Water Board with the proposed controls, the Copermittees will not be required to prohibit the category of non-storm water discharges to their MS4s as long as the controls are implemented. This is consistent with the clarification of 40 CFR 122.26(d)(2)(iv)(B)(1) in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board may "*require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*."

Finally, Provision E.2.a.(7) has been included in the requirements for non-storm water discharges to clarify that any non-storm water discharges to the Copermittee's MS4, even those identified pursuant to Provisions E.2.a.(1) through E.2.a.(4), must be reduced or eliminated, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit. Provision E.2.a.(7) is consistent with the requirements of CWA section 402(p)(3)(B)(ii) and 40 CFR 122.26(d)(1)(v)(B), as clarified in the Phase I Final Rule (55 FR 47995) that "*[u]ltimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit*." However, the reduction or elimination of those non-storm water discharges are expected to be achieved as feasible, in accordance with the priorities in the Water Quality Improvement Plan and when the resources are available to the Copermittee.

Consistent with 40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(1), each Copermittee must implement a "*program…to prevent illicit discharges to the municipal storm sewer system*" and "*detect…illicit discharges and improper disposal into the storm sewer.*" Provision E.2.b requires each Copermittee to implement measures to prevent and detect illicit discharges and connections to its MS4 as part of its illicit discharge detection and elimination program.

As part of the program to prevent and detect illicit discharges to the MS4, 40 CFR 122.26(d)(2)(iv)(B)(2) requires "*procedures to conduct on-going field screening activities during the life of the permit, including areas or locations that will be evaluated by such field screens*." As part of the procedures, each Copermittee is required to maintain an updated map of its entire MS4 and the corresponding drainage areas within its jurisdiction. Having knowledge about where inlets, access points, connections with other MS4s, and outfalls are located is necessary for each Copermittee to track, identify, and eliminate illicit discharges and connections. Thus, Provision E.2.b.(1) of the Order specifies that the map must include the segments of the storm sewer system owned, operated, and maintained by the Copermittee, and include locations of all known inlets, connections with other MS4s, and outfalls to the Copermittee's MS4. The remaining requirements of Provision E.2.b are consistent with the requirements of 40 CFR 122.26(d)(2)(iv)(B)(3)-(7) related to implementing measures to prevent and detect illicit discharges and connections to the MS4.

Provision E.2.c requires each Copermittee to conduct field screening and monitoring of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4. Field screening is a required element of the program to detect and eliminate illicit discharges and connections to the MS4, pursuant to 40 CFR 122.26(d)(2)(iv)(B)(2). The field screening requirement will be implemented through the dry weather MS4 outfall discharge monitoring required under Provisions D.2.a.(2) and D.2.b.(1).

Provision E.2.d specifies the measures each Copermittee must implement to eliminate illicit discharges and connections to its MS4. Elimination of illicit discharges and connections to the MS4 is consistent with the requirement of 40 CFR 122.26(d)(2)(iv)(B) "*to detect and <u>remove</u> [emphasis added]…illicit discharges and improper disposal into the storm sewer*" and will achieve the CWA requirement for MS4 permits to "*effectively prohibit non-storm water discharges into the storm sewers*."

Generally, each Copermittee is responsible for prioritizing its efforts to eliminate non-storm water and illicit discharges or connections to its MS4 based on field screening and monitoring data, NALs, illicit discharge investigation records, and the known or suspected sources. Sources of non-storm water and illicit discharges or connections must be eliminated by enforcing the legal authority established by each Copermittee pursuant to Provision E.1.

<u>Provision E.3 (Development Planning)</u> requires each Copermittee to use its land use and planning authority to implement a development planning program to control and reduce the discharge of pollutants in storm water from new development and significant redevelopment to the MEP. Proper implementation of the development planning program will also contribute toward effectively prohibiting non-storm water discharges from development projects to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." As part of the management program, 40 CFR 122.26(d)(2)(iv)(A)(2) requires "*planning procedures including a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment*."

Land development generally alters the natural conditions of the land by removing vegetative cover, compacting soil, and/or placement of concrete, asphalt, or other impervious surfaces. These impervious surfaces concentrate urban pollutants (such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not found in high concentrations in the natural environment. Pollutants that

accumulate on impervious surfaces are not easily biodegraded nor subject to natural treatment processes.

Impervious surfaces greatly affect the natural hydrology of the land because they do not allow natural infiltration and treatment of storm water runoff to take place. Instead, storm water runoff from impervious surfaces is typically directed through pipes, curbs, gutters, and other hardscape into receiving waters, with little treatment, at significantly increased volumes and accelerated flow rates over what would occur naturally. The increased pollutant loads, storm water volume, discharge rates and velocities, and discharge durations from the MS4 adversely impact stream habitat by causing accelerated, unnatural erosion and scouring within creek bed and banks. Placement of impervious surfaces also encapsulates "good" sediment (such as sand, gravel, rocks and cobbles) that would normally replenish creek beds and banks to help stabilize them. Collectively, these changes to natural hydrologic processes are termed hydrograph modification, or hydromodification.

Hydromodification, which is caused by both altered storm water flow and altered sediment flow regimes, is largely responsible for degradation of creeks, streams, and associated habitats in the San Diego Region. In an ongoing study by the Stormwater Monitoring Coalition to assess the health of streams throughout Southern California, researchers found that three of the four highest risk stressors to creeks (percent sands and fines present, channel alteration, and riparian disturbance) were related to physical habitat.[29] Researchers studying flood frequencies in Riverside County have found that increases in watershed imperviousness of only 9-22 percent can result in increases in peak flow rates for the two-year storm event of up to 100 percent.[30] Such changes in runoff have significant impacts on channel morphology.

In addition, a technical report issued by the Southern California Coastal Water Research Project (SCCWRP) stated that "*[r]ecent studies indicate that California's intermittent and ephemeral streams are more susceptible to the effects of hydromodification than streams from other parts of the United States. Physical degradation of stream channels in the central and eastern United States can initially be detected when watershed impervious cover approaches 10 percent, although biological effects (which may be more difficult to detect) may occur at lower levels. In contrast, initial response of streams in the semi-arid portions of California appears to occur between 3 and 5 percent impervious cover*."[31] These studies highlight the extent to which impacts originating from impervious surfaces created by land development are responsible for the degradation of creek and stream habitat.

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[29] Assessing the Health of Southern California Streams, Stormwater Monitoring Coalition, Fact Sheet
[30] Schueler and Holland, 2000. Storm Water Strategies for Arid and Semi-Arid Watersheds (Article 66). The Practice of Watershed Protection.
[31] Stein, E. and Zaleski, S., 2005. Technical Report 475, Managing Runoff to Protect Natural Streams: The Latest Development on Investigation and Management of Hydromodification in California. December 30, 2005.

This is consistent with what USEPA has noted, that "*[m]ost stormwater runoff is the result of the man-made hydrologic modifications that normally accompany development. The addition of impervious surfaces, soil compaction, and tree and vegetation removal result in alterations to the movement of water through the environment. As interception, evapotranspiration, and infiltration are reduced and precipitation is converted to overland flow, these modifications affect not only the characteristics of the developed site but also the watershed in which the development is located. Stormwater has been identified as one of the leading sources of pollution for all waterbody types in the United States. Furthermore, the impacts of stormwater pollution are not static; they usually increase with more development and urbanization*."[32]

Reducing the impact from the increased pollutant loads and flows generated by impervious surfaces within a watershed is essential to protecting and restoring the integrity of the receiving waters. Provision E.3 includes the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment*." The requirements of Provision E.3 will 1) minimize the generation and discharge of pollutants in storm water from the MS4, and 2) minimize the potential of storm water discharges from the MS4 from causing altered flow regimes and excessive downstream erosion in receiving waters.

The requirements of Provision E.3.a include the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment*" applicable to all development projects, regardless of size or purpose of development. In general, all development projects must implement onsite BMPs to remove pollutants from runoff prior to its discharge to any receiving waters, as close to the pollutant generating source as possible, and structural BMPs must not be constructed within waters of the U.S.

Furthermore, the onsite BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors (e.g. mosquitos, rodents, and flies). If not properly designed or maintained, certain BMPs implemented or required by municipalities may create a habitat for vectors. Monitoring studies conducted by the California Department of Public Health (CDPH) have documented that mosquitoes opportunistically breed in structural storm water BMPs, particularly those that hold standing water for over 96 hours. Certain site design features that hold standing water may similarly produce mosquitoes.

[32] USEPA, 2007. Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices, December 2007.

Structural BMPs and site design features should incorporate design, construction, and maintenance principles to promote drainage within 96 hours to minimize standing water available to mosquitoes. Nuisances and public health impacts resulting from vector breeding can be prevented with close collaboration and cooperative effort between municipalities and local vector control agencies and the CDPH during the development and implementation of storm water runoff management programs. The CDPH also has issued guidance for BMP implementation that will minimize potential nuisances and public health impacts resulting from vector breeding.[33]

All development projects are required to implement source control BMPs that will minimize the generation of pollutants. Additionally, each development project must implement, where applicable and feasible, low impact development (LID) BMPs to mimic the natural hydrology of the site and retain and/or treat pollutants in storm water runoff prior to discharging to and from the MS4.

The LID Center defines LID as "*a comprehensive land planning and engineering design approach with a goal of maintaining and enhancing the pre-development hydrologic regime of urban and developing watersheds.*"[34] LID designs seek to control storm water at the source, using small-scale integrated site design and management practices to mimic the natural hydrology of a site, retain storm water runoff by minimizing soil compaction and impervious surfaces, and disconnect storm water runoff from conveyances to the storm drain system.

LID BMPs may utilize interception, storage, evaporation, evapotranspiration, infiltration, and filtration processes to retain and/or treat pollutants in storm water before it is discharged from a site. Because of these numerous options, the San Diego Water Board expects that every development project will be able to implement some form of LID BMPs. Examples of LID BMPs include using permeable pavements, rain gardens, rain barrels, grassy swales, soil amendments, and native plants.

Provision E.3.a also includes requirements for all development projects to, where feasible, landscape with native and/or low water use plants to minimize the discharge of non-storm water discharges associated with excessive irrigation, as well as harvest (i.e., storage) and use precipitation to promote the concept of utilizing storm water as a resource.

While all development projects are subject to the requirements of Provision E.3.a, Provision E.3.b identifies Priority Development Projects that exceed given size thresholds and/or fit under specific use categories. Priority Development Projects are required to incorporate specific performance criteria for structural BMPs into the

[33] California Department of Public Health, 2012. Best Management Practices for Mosquito Control in California. (http://www.cdph.ca.gov/HealthInfo/discond/Documents/BMPforMosquitoControl07-12.pdf)
[34] www.lowimpactdevelopment.org

project plan to reduce the generation of pollutants, and address potential impacts from hydromodification.

The Priority Development Project categories are based on the requirements of the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), and do not differ significantly from the Fourth Term Permit for San Diego County. Furthermore, the Priority Development Project categories are consistent with Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), and Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit).

Because of the impact of relatively small increases in watershed impervious surfaces to receiving waters, Provision E.3.b.(1)(c)(iv) has been updated to include large driveways that are 5,000 square feet or more. The San Diego Water Board finds that large driveways can exacerbate altered flow regimes if not properly controlled.

Provision E.3.b.(3) describes projects that are exempt from Priority Development Project status. These include new or retrofit paved sidewalks, bicycle lanes, or trails that are designed and constructed to direct runoff to vegetated areas or be hydraulically disconnected from paved areas. The exemptions have been provided to encourage these types of projects because they provide multiple environmental benefits, such as promoting walking rather than driving, which will in turn improve air quality. Additionally, retrofitting of existing alleys, streets, or roads are exempt from Priority Development Project status if they are constructed using USEPA Green Streets guidance.[35] By doing so, retrofitting of these types of projects is encouraged. The San Diego Water Board recognizes that there are spatial constraints associated with these projects, and implementation of structural BMPs are not always feasible.

For development projects identified as Priority Development Projects, the requirements of Provision E.3.c are the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment.*" Provisions E.3.c.(1)-(3) describe the performance criteria for the structural BMPs that must be implemented for each Priority Development Project defined by Provision E.3.b.

Provision E.3.c.(1) describes the storm water pollutant control BMP requirements that must be implemented by all Priority Development Projects. The purpose of Provision E.3.c.(1) is to reduce pollutants in storm water runoff to the MEP from Priority Development Projects before it is discharged to the MS4. Of all the available treatment processes available, retention of storm water, and therefore capture of the

[35] "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).

pollutants in the storm water, will achieve 100 percent pollutant removal efficiency for the volume of storm water retained. No other method of treatment can achieve 100 percent pollutant removal efficiency. Thus, retention of as much storm water onsite is the most effective way to reduce pollutants in storm water discharges to, and consequently from the MS4, and controls pollutants in storm water discharges from a site to the MEP.

Under Provision E.3.c.(1)(a), retention of the pollutants in the runoff produced from the 85th percentile storm event ("design capture volume") is the design standard to which Priority Development Projects must comply. Since the 85th percentile storm event has previously been used as the numeric design standard for treatment control BMPs, this same size storm event is used as the numeric design standard for storm water retention. This is the MEP standard recognized by the San Diego Water Board and is consistent with the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), as well as Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit), and Los Angeles Water Board Order No. R4-2012-0175 (Los Angeles County MS4 Permit).

The 85th percentile storm event is the event that has a precipitation total greater than or equal to 85 percent of all storm events over a given period of record in a specific area or location. For example, to determine what the 85th percentile storm event is in a specific location, all 24 hour storms that have recorded values over a 30 year period would be tabulated and a 85th percentile storm would be determined from this record (i.e. 15 percent of the storms would be greater than the number determined to be the 85th percentile storm). Most jurisdictions in the San Diego Region have already developed isopluvial maps that can provide this type of information. The 85th percentile storm might be determined to be a number such as 1.0 inch, and this would be multiplied by the total area of the project footprint producing runoff to calculate the design capture volume. The Priority Development Project designer would then select a system of BMPs that would retain (i.e. intercept, store, infiltrate, evaporate, or evapotranspire) the pollutants contained in the design capture volume onsite.

Retention BMPs are necessary to capture and retain pollutants generated from a Priority Development Project. In a recent study performed by SCCWRP in the Los Angeles Region, they found "*that the magnitude of constituent load associated with storm water runoff depends, at least in part, on the amount of time available for pollutant build-up on land surfaces. The extended dry period that typically occurs in arid climates such as southern California maximizes the time for constituents to build-up on land surfaces, resulting in proportionally higher concentrations and loads during*

initial storms of the season."[36] This implies that the "first flush" of a rainy season and the first storm events after long antecedent dry periods tend to have the highest pollutant loads. Capturing and retaining the pollutant loads of the "first flush" of a rainy season and the first storm events after long antecedent dry periods will reduce a significant portion of the pollutants in storm water discharged to and from the MS4.

The San Diego Water Board, however, acknowledges that in some situations retention of the full design capture volume onsite may not be technically feasible. In this event, the Copermittee may allow the Priority Development Project to use biofiltration BMPs to treat 1.5 times the design capture volume not reliably retained onsite, or biofiltration BMPs with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite.

The 1.5 multiplier is based on the finding in the Ventura County Technical Guidance Manual that biofiltration of 1.5 times the design capture volume not retained onsite will provide approximately the same pollutant removal as retention of the design capture volume on an annual basis.[37] This standard is consistent with the Los Angeles Water Board's Los Angeles County and Ventura County municipal storm water permits (Order Nos. R4-2012-0175 and R4-2010-0108, respectively). The flow-thru design of 0.75 times the portion of the design capture volume not reliably retained onsite is consistent with the San Diego Water Board's Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively). In either case, the biofiltration BMPs must be designed with an appropriate hydraulic loading rate to maximize storm water retention and pollutant removal, as well as to prevent erosion, scour, and channeling within the BMP. Each Copermittee is required to update its BMP Design Manual to provide guidance for hydraulic loading rates and other biofiltration design criteria necessary to maximize storm water retention and pollutant removal.

The San Diego Water Board further recognizes that, in addition to not being technically feasible, retention of the full design capture storm onsite may be cost prohibitive, or may not provide as much water quality benefit to the Watershed Management Area as would implementing BMPs elsewhere in the watershed. Thus, Provision E.3.c.(1)(b) allows for the use of a combination of onsite retention BMPs, and the implementation of an Alternative Compliance Program described in Provision E.3.c.(3). Provision E.3.c.(3) is discussed in more detail below.

If the full design capture volume is not retained onsite either because biofiltration is not technically feasible, or a Copermittee grants a Priority Development Project permission

[36] Stein, E.D., Tiefenthaler, L.L., and Schiff, K.C., 2007. Technical Report 510, Sources, Patterns and Mechanisms of Storm Water Pollutant Loading from Watershed and Land Uses of the Greater Los Angeles Area, California, USA. March 20, 2007.
[37] Ventura Countywide Stormwater Management Program. 2011. Ventura Technical Guidance Manual, Manual Update, 2011.

to utilize the Alternative Compliance Program, then the pollutants in the portion of the design capture volume that are not reliably retained onsite must still be reduced to the MEP. Thus, flow-thru treatment control BMPs are required to be implemented on Priority Development Projects in addition to the retention BMPs. The requirements of Provisions E.3.c.(1)(a)(ii)[a]-[c] include the performance standards for flow-thru treatment control BMPs, consistent with the Fourth Term Permits in the San Diego Region.

Whereas the purpose of the requirements under Provision E.3.c.(1) is to reduce pollutants in storm water runoff to the MEP, the purpose of the requirements under Provision E.3.c.(2) is to maintain or restore more natural hydrologic flow regimes to prevent accelerated, unnatural erosion in downstream receiving waters, also to the MEP standard. Provision E.3.c.(2) describes hydromodification management BMP requirements that must be implemented by all Priority Development Projects.

The performance criteria for the implementation of hydromodification management BMPs on Priority Development Projects are consistent with the requirements in the Fourth Term Permits for Orange and Riverside Counties (Order Nos. R9-2009-0002 and R9-2010-0016, respectively). Modifications to the Orange County and Riverside County Hydromodification Management Plans (HMPs) will likely be minor, or may not be necessary. The HMP for San Diego County will likely require some minor modifications to incorporate the requirements of Provision E.3.c.(2) and become consistent with the Orange County and Riverside County HMPs. The San Diego Water Board does not, however, expect that it will be necessary for the San Diego County Copermittees to develop a new approach or significantly re-write the San Diego County HMP. This is because the premise of the hydromodification management BMP requirements, which are to control storm water runoff conditions (flow rates and durations) for Copermittee-defined range of flows, is unchanged from all Fourth Term Permits in the San Diego Region.

Provision E.3.c.(2)(a) requires that post-project runoff conditions mimic the *pre-development* runoff conditions, and not the *pre-project* runoff conditions. Fundamentally, the San Diego Water Board believes that using a hydrology baseline that approximates that of an undeveloped, natural watershed is the only way to facilitate the return of more natural hydrological conditions to already built-out watersheds, and ultimately improved stream health. On the other hand, using the *pre-project* hydrology as a baseline for redevelopment projects results in propagating the unnatural hydrology of urbanized areas. Propagating the urbanized flow regime does not support conditions for restoring degraded or channelized stream segments, and would forever sentence such streams to the degraded state. Furthermore, reducing the volume of storm water runoff associated with the urbanized flow regime will also result in reducing the discharge of pollutants into receiving waters, since storm water runoff from impervious surfaces contains untreated pollutants.

The San Diego Water Board understands that approximating the pre-development runoff condition associated with a redevelopment site is not necessarily straightforward because factors such as natural grade and native vegetation for the site cannot be precisely known. Therefore, the San Diego Water Board does not expect project designers to estimate historical conditions associated with redevelopment sites. Rather, the San Diego Water Board expects project designers and the Copermittees to approximate pre-development runoff conditions using the parameters of a *pervious* area rather than an *impervious* area. This means that for redevelopment sites, approximating pre-development runoff conditions equates to using existing onsite grade and assuming the infiltration characteristics of the underlying soil. A redevelopment Priority Development Project must not use runoff coefficients of concrete or asphalt to estimate pre-development runoff conditions. Rather, redevelopment projects must use available information pertaining to existing underlying soil type (such as soil maps published by the National Resource Conservation Service), onsite existing grade, and any other readily available pertinent information to estimate pre-development runoff conditions.

The San Diego Water Board understands, indeed asserts, that the pre-development hydrology of an area in question can only be roughly estimated and cannot be precisely known. However, using the hydrology of a natural condition, even if not precisely known, will provide significant benefit to receiving waters over using the hydrology associated with impervious (developed) surfaces. Therefore in order to achieve the goals of the Clean Water Act, which are to "*restore and maintain the chemical, physical, and biological integrity of the nation's waters* [emphasis added]," the most appropriate standard to use for hydromodification management is the standard associated with the pre-development condition.

Provision E.3.c.(2)(b) requires Priority Development Projects to avoid known critical sediment yield areas or implement measures that would allow coarse sediment to be discharged to receiving waters, such that the natural sediment supply is unaffected by the project. This is necessary because the availability of coarse sediment supply is as much an issue for causing erosive conditions to receiving streams as are accelerated flows.

The San Diego Water Board recognizes that in some situations implementing the hydromodification management BMP requirements for flow control fully onsite may not be technically feasible, may be cost prohibitive, or may not provide any overall water quality benefits to the Watershed Management Area. Thus, Provision E.3.c.(2)(c) allows for the use of a combination of onsite hydromodification management BMPs for flow control and alternative compliance options described in Provision E.3.c.(3).

Provision E.3.c.(3) allows for alternative compliance in instances where the Copermittee determines that offsite measures will have a greater overall water quality benefit for the Watershed Management Area than if the Priority Development Project were to implement structural BMPs onsite. Consequently, watershed-specific

structural BMP requirements are present in this Order in the form of allowable compliance offsite. The Alternative Compliance Program to Onsite Structural BMP Implementation Provision is intended to integrate with the Copermittees' planning efforts in the Water Quality Improvement Plans.

The Alternative Compliance Program is an option for Priority Development Projects where the governing Copermittee has participated in the development of a Watershed Management Area Analysis as part of the Water Quality Improvement Plan (described in Provision B.3.b.(4)). Such an approach is consistent with the latest findings in hydromodification management by the scientific community. In a Technical Report entitled *Hydromodification Assessment and Management in California,*[38] the report states:

> *"An effective [hydromodification] management program will likely include combinations of on-site measures (e.g., low-impact development techniques, flow-control basins), in-stream measures (e.g., stream habitat restoration), floodplain and riparian zone actions, and off-site measures. Off-site measures may include compensatory mitigation measures at upstream locations that are designed to help restore and manage flow and sediment yield in the watershed."*

Consistent with the ideas brought forth in the report, in the Watershed Management Area Analysis of Provision B.3.b.(4), which is optional, the Copermittees will develop watershed maps that include as much detail about factors that affect the hydrology of the watershed as is available. Such factors included identification of areas suitable for infiltration, coarse sediment supply areas, and locating stream channel structures and constrictions. Once these factors are mapped and studied, the Copermittees can identify areas in the watershed where candidate projects may be implemented that are expected to improve water quality in the watershed by providing more opportunity for infiltration, slowing down storm water flows, or attenuation of pollutants naturally via healthy stream habitat. These candidate projects may be in the form of retrofitting existing development, rehabilitating degraded stream segments, identifying regional BMPs, purchasing land to preserve valuable floodplain functions, and any other project(s) that the Copermittees identify.

Under the Alternative Compliance Program, Priority Development Projects may be allowed to fund, partially fund, or implement a candidate project, in lieu of implementing structural BMPs onsite, if they enter into a voluntary agreement with the governing Copermittee permitting this arrangement. Project proponents may also propose an alternative project not previously identified by the Copermittees. In either case, whether a project proponent implements a candidate project identified by the Copermittees or a separate alternative compliance project, the governing Copermittee must determine that implementation of the project will have a greater overall water

[38] 2012. ED Stein, F Federico, DB Booth, BP Bledsoe, C Bowles, Z Rubin, GM Kondolf, A Sengupta. Technical Report 667. Southern California Coastal Water Research Project. Costa Mesa, CA.

quality benefit for the Watershed Management Area than fully implementing structural BMPs onsite. Determination of greater overall water quality benefits associated with alternative compliance projects would be accomplished by utilizing Water Quality Equivalency calculations developed pursuant to Provision E.3.c.(3)(a). Water Quality Equivalency calculations are necessary to establish a regional and technical basis for determining water quality benefits associated with alternative compliance projects, which can be consistently used by all Copermittees in the San Diego Region. Finally, if ~~I~~f alternative compliance involves funding or implementing a project that is outside the jurisdiction of the governing Copermittee, then that Copermittee may enter into an inter-agency agreement with the appropriate jurisdiction.

Finally, Provision E.3.c.(2)(d) allows Priority Development Projects to be exempt from the hydromodification management BMP requirements if there is no threat of erosion to downstream receiving waters (i.e. the receiving stream is concrete lined from the point of discharge all the way to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean). If the Copermittees believe that more exemptions are warranted, then they must perform the optional Watershed Management Area Analysis of Provision B.3.b.(4). Additional exemptions other than those specified in this Order may be established on a watershed basis, provided the Copermittees perform the analysis, provide supporting rationale for the exemptions, and complete the Water Quality Improvement Plan approval process pursuant to Provision F.1.

To facilitate the transition to this Order from the Fourth Term Permits for Orange and Riverside County Copermittees, Provision E.3.c.(2)(e) allows two additional temporary exemptions from hydromodification management BMP implementation. The first temporary exemption allows relief from hydromodification management BMP implementation for Priority Development Projects discharging directly to an engineered channel conveyance system with a capacity to convey peak flows generated by the 10-year storm event all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean. Similar to the exemption allowed for concrete-lined channels, this exemption is premised on the concept that there is little threat of erosion to these types of engineered channel systems.

The second temporary exemption allows relief from hydromodification management BMP implementation for Priority Development Projects discharging directly to large river reaches with drainage areas larger than 100 square miles and a 100-year flow capacity in excess of 20,000 cubic feet per second. If this exemption is claimed, then properly sized energy dissipation is required at all discharge points associated with the Priority Development Project. This exemption is premised on the concept that large river reaches can essentially assimilate the accelerated flow rates associated with individual Priority Development Projects because they are inconsequential compared

to the flow rate in the large river reach. Both of these exemptions are included in the Hydromodification Management Plan for San Diego County[39].

These temporary exemptions are allowed as a means to facilitate Orange and Riverside County Copermittees' transition to this Order from the Fourth Term Permits and are not meant to reside as permanent exemptions without additional rigorous technical analyses specific to each County. Therefore, these exemptions will no longer apply once the Copermittees' land development programs are fully updated to reflect the requirements of this Order, i.e., upon implementation of the BMP Design Manual pursuant to Provision F.2.b. If the Copermittees believe that these or other exemptions are warranted in the context of water quality improvement and stream restoration opportunities, then the Copermittees must perform the optional Watershed Management Area Analysis of Provision B.3.b.(4) and provide supporting rationale for the exemptions. The San Diego County Copermittees are also required to perform the optional Watershed Management Area Analysis to provide supporting rationale to justify use of these and other exemptions. Updated BMP Design Manuals including rationale to justify use of exemptions will be reviewed by the San Diego Water Board pursuant to Provision F.2.b.

Provisions E.3.c.(4) and E.3.c.(5) were included under the BMP requirements applicable to all development projects in the Fourth Term Permits for San Diego, Orange, and Riverside Counties (Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016, respectively). In this Order, the long-term BMP maintenance and infiltration and groundwater protection requirements apply to structural BMPs implemented by Priority Development Projects only.

Provision E.3.d requires the Copermittees to update their BMP Design Manual as needed to incorporate the requirements of Provision E.3. The BMP Design Manual is formerly known as the Standard Storm Water Mitigation Plan, or SSMP, and was renamed so that the title has a more accurate description of the document content. The contents of the BMP Design Manual are largely unchanged from the previous Standard Storm Water Mitigation Plans required under the Fourth Term Permits. The BMP Design Manual fulfills the 40 CFR 122.26(d)(2)(iv)(A)(2) requirement that the Copermittee's development planning program includes "*a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment*."

As part of the "*planning procedures,*" 40 CFR 122.26(d)(2)(iv)(A)(2) requires the procedures to "*address controls to reduce pollutants in discharges from municipal separate storm sewers after construction is completed*." The requirements applicable to the implementation and oversight of structural BMPs at Priority Development Projects are provided under Provision E.3.e.

[39] Final Hydromodification Management Plan Prepared for County of San Diego, March 2011

Proper installation of the structural BMPs approved for a Priority Development Project is necessary to ensure that pollutants in storm water discharges will be reduced to the MEP after the project is completed. In addition to the proper installation of structural BMPs, the maintenance of structural BMPs on Priority Development Projects is necessary to ensure that pollutants in storm water discharges will continue to be reduced to the MEP. Provision E.3.e.(1) includes the minimum requirements that each Copermittee must implement to ensure structural BMPs are properly installed and will be properly maintained.

Provisions E.3.e.(1)(a)(i)-(ii) have been included to provide additional clarification regarding when a Copermittee may allow land development requirements from earlier MS4 permits to apply to a Priority Development Project. Since the MS4 permits issued from 2001 to the adoption of Order No. R9-2015-0001 amending Order No. R9-2013-0001 (Regional MS4 Permit), a Copermittee could allow development projects with "prior lawful approval" to be "grandfathered" into implementing BMP requirements from previous MS4 permits. The Copermittees were given the discretion to use their land use authority to determine when it was appropriate to allow a development project with prior lawful approval to implement BMP requirements from the previous MS4 permits, and when the most recent BMP requirements should be required to achieve the reduction of pollutants in storm water runoff from development projects to the MEP. However, the San Diego Water Board has found that the Copermittees and the development community frequently disagree about when a development project has prior lawful approval and what is necessary to reduce pollutants in storm water runoff from development projects to the MEP.

Therefore, Provisions E.3.e.(1)(a)(i)-(ii) were included to provide more clarity and certainty for the Copermittees, the land development community, and the general public about when the structural BMP performance standards of earlier MS4 permits may be allowed to be implemented. A Copermittee may allow a Priority Development Project to implement BMP requirements of the previous MS4 permit only if all requirements of Provisions E.3.e.(1)(a)(i)[a]-[d] have been met. Otherwise, the Copermittees must require all Priority Development Projects to incorporate the BMP requirements of Provision E.3 into the project to reduce pollutants in storm water runoff from development projects to the MEP.

Provisions E.3.e.(1)(a)(i)[a]-[d] are dependent upon the effective date of the BMP Design Manual. Unless otherwise directed by the San Diego Water Board, the effective date of the BMP Design Manual is December 24, 2015 for the San Diego County Copermittees, September 28, 2017 for the Orange County Copermittees, and July 5, 2018 for the Riverside County Copermittees.

Alternatively, if the Copermittee can demonstrate a lack of land use authority or legal authority to require a Priority Development Project to implement the requirements of Provision E.3, the Copermittee may allow land development requirements from the previous MS4 permits to apply. However, under these circumstances the San Diego

Water Board expects the Copermittee to utilize its available land use authority or legal authority to require the implementation of as much of Provision E.3 as possible to reduce the discharge of pollutants in storm water from development and redevelopment projects within its jurisdiction to the MEP.

In cases where BMP requirements from the earlier MS4 permits govern the structural BMP design requirements of a Priority Development Project, the San Diego Water Board expects the Copermittees to be able to demonstrate, in a programmatic audit or other means, that a Priority Development Project met all the requirements listed under Provisions E.3.e.(1)(a)(i)[a]-[d], or have evidence that the Copermittee did not have the land use or legal authority to require the implementation of Provision E.3 for a Priority Development Project.

The requirements under Provision E.3.e.(2)-(3) are necessary to demonstrate each Copermittee is implementing a program that complies with Provisions E.3.b-c and E.3.e.(1), and ensure structural BMPs at Priority Development Project will continue to be able to reduce pollutants in storm water discharges to the MEP.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary for any development projects to compel compliance with the requirements of Provision E.3 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.3.f requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

<u>Provision E.4 (Construction Management)</u> requires each Copermittee to implement a construction management program to control and reduce the discharge of pollutants in storm water from construction sites to the MEP. Proper implementation of the construction management program will also contribute toward effectively prohibiting non-storm water discharges from construction sites to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." As part of the management program, 40 CFR 122.26(d)(2)(iv)(D) requires "*a program to implement and maintain structural and non-structural best management practices to reduce pollutants in storm water runoff from construction sites to the municipal storm sewer system.*"

Construction sites can be significant sources of sediment, trash, and other pollutants to receiving waters. Although sediment is naturally occurring in the natural environment, the discharge of sediment under unnatural conditions is problematic to receiving waters. Fine sediment in creeks causes high turbidity that interferes with the

functionality of native flora and fauna in local creeks. For example, turbidity interferes with both photosynthesis of water-philic plants, as well as successful foraging and reproduction of benthic macroinvertebrates. Sediment can also make it difficult for fish to breathe because it clogs fish gills. Other pollutants such as heavy metals or pesticides can adhere to sediment and are transported to receiving waters during storm events, where they dissolve in the water column and become bioavailable to aquatic organisms. Sediment is recognized as a major stressor to surface waters and is responsible for the impairment of several lagoons and creeks in the San Diego Region.

Provision E.4 includes requirements that each Copermittee must implement to minimize the discharge of sediment and other pollutants from construction sites to the MS4 within its jurisdiction. The requirements under Provision E.4 are consistent with the Fourth Term Permits for San Diego, Orange, and Riverside Counties. Therefore, Copermittees are expected to implement the requirements seamlessly, with minimal changes to their existing construction management programs. The Copermittees, however, are given more flexibility to run their programs as needed to maximize efficiency, and also to be consistent with the Water Quality Improvement Plan for the Watershed Management Area.

As part of the construction management program, 40 CFR 122.26(d)(2)(iv)(D)(1) requires "*procedures for site planning which incorporate consideration of potential water quality impacts.*" Provision E.4.a describes the minimum elements each Copermittee is required to include as part of the construction site planning and project approval process. The construction site planning and approval process is based primarily on ensuring each project had an adequate site-specific pollution control, construction BMP, and/or erosion and sediment control plan that will be implemented to minimize the discharge of pollutants in storm water to the MEP, and minimize impacts to receiving waters.

The requirements under Provision E.4.b provide the data and information necessary to identify "*priorities for inspecting sites and enforcing control measures*" required pursuant to 40 CFR 122.26(d)(2)(iv)(D)(3). Under Provision E.4.b, each Copermittee must identify construction sites that are considered a high threat to downstream surface waters. Designation of "high threat to water quality" construction sites will necessitate the Copermittees to develop criteria to identify such sites. Provision E.4.b.(2) describes a list of factors that must be considered when the Copermittee considers threat to water quality. For example, a Copermittee must identify sites as "high threat to water quality" if it is located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions, according to the Water Quality Improvement Plan. This ensures that construction management program implementation is compatible with the Copermittee's identified highest priority water quality conditions.

Pursuant to 40 CFR 122.26(d)(2)(iv)(D)(2) each Copermittee is required describe "*requirements for nonstructural and structural best management practices*" at

construction sites. Provision E.4.c includes the types of construction site BMPs that the Copermittees must implement, or require the implementation of, at each construction site to reduce pollutants in storm water discharges to the MEP.

Each Copermittee is expected to require the implementation of appropriate BMPs given specific site conditions, the season and likelihood of rain events, and construction phase (i.e. grading vs. vertical construction). This means that throughout the life of the project construction, the appropriate BMPs will vary, especially if the construction of the project spans multiple wet seasons. As opposed to describing specific minimum BMPs that must be implemented, the Order describes major BMP categories that should be considered for each site.

Each Copermittee is expected to use its 20 years of storm water experience and knowledge to require implementation of appropriate BMPs from the various categories at each construction site within its jurisdiction. For example, the San Diego Water Board expects that each site will be required to implement erosion control and sediment control. The San Diego Water Board also expects each Copermittee to require implementation of active/passive sediment treatment systems at sites where other BMPs have been tried and are known to be inadequate, and discharges of sediment are causing or contributing to water quality impairment downstream. Each Copermittee is granted flexibility in specifying the minimum level of BMP requirements at each site, but the San Diego Water Board expects each site to be capable of controlling pollutants in storm water discharges to the MEP and preventing illicit discharges.

The requirements under Provision E.4.d are necessary to demonstrate that each Copermittee is implementing a program that complies with Provisions E.4.a and E.4.c and ensure BMPs at construction sites will reduce pollutants in storm water discharges to the MEP.

Provision E.4.d does not include minimum required inspection frequencies for construction sites. Each Copermittee must use its experience and knowledge to specify an appropriate inspection frequency for both high priority and lower priority sites in their jurisdictional runoff management program documents, and in accordance with the Water Quality Improvement Plan. Appropriate inspection frequencies may vary by Copermittee, but the San Diego Water Board expects that the stated frequency will be adequate for each Copermittee to properly oversee the construction sites within its jurisdiction, confirm BMPs are implemented to reduce pollutants in storm water discharges from constructions sites to the MEP, and make needed changes to its program on an ongoing basis as necessary.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary for any development projects to compel compliance with the requirements of Provision E.4 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to

the MEP, Provision E.4.e requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Provision E.5 (Existing Development Management) requires each Copermittee to implement an existing development management program to control and reduce the discharge of pollutants in storm water from areas of existing development to the MEP. Proper implementation of the existing development management program will also contribute toward effectively prohibiting non-storm water discharges from areas of existing development to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." Within 40 CFR 122.26(d)(2)(iv)(A) and (C), the management program is required to reduce impacts on receiving waters and reduce pollutants in storm water discharges to the MEP from commercial and residential areas, industrial facilities, and municipal facilities.

Commercial and residential areas, industrial facilities, and municipal facilities must be addressed by each Copermittee with the existing development management program required under Provision E.5. All other areas within each Copermittee's jurisdiction should be either undeveloped open space, or areas that are being developed or under construction. Areas being developed or under construction will be addressed by the Copermittee under the requirements of Provision E.3 (Development Planning) or Provision E.4 (Construction Management).

Areas of existing development typically include impervious surfaces such as sidewalks, driveways, roads, and rooftops, which generate and concentrate pollutants (such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not found in high concentrations in the natural environment. Pollutants that accumulate on impervious surfaces are not easily biodegraded or not subject to natural treatment processes. When it rains, these pollutants are transported in storm water runoff from these impervious surfaces into receiving waters, resulting in poor water quality and degradation of beneficial uses.

In addition to the generation of pollutants, areas of existing development have generally altered the natural conditions of the land and removed vegetative cover, reduced the perviousness of the surface, and reduced the capacity of storm water that can be intercepted, captured, stored, infiltrated, evaporated, and/or evapotranspired. The alteration of the natural conditions and the impervious surfaces associated with areas of existing development causes water quality problems due to the alteration of natural flow regimes within the watersheds; resulting in hydromodification of channels, streams, and habitats that exist within or adjacent to the areas of existing development.

Thus, storm water discharges from areas of existing development are responsible for poor water quality, degraded habitats, and hydromodified channels throughout the developed portions of the watersheds in the San Diego Region. To improve the health and functionality of the receiving waters in a Watershed Management Area, land use practices and the amount of impervious surfaces in areas of existing development must change to reduce the various impacts caused by hydromodification and pollutants from storm water runoff generated in developed areas. Each Copermittee must be aggressive to address pollutant sources and runoff from areas of existing development to be able to reduce pollutants in storm water discharges from the MS4 to the MEP.

There is some overlap in the requirements under Provision E.5 with the requirements under Provisions E.2 (Illicit Discharge Detection and Elimination), E.3 (Development Planning), and E.4 (Construction Management). Illicit discharges frequently originate from areas of existing development. New development projects, when completed will become some type of residential, commercial, industrial or municipal existing development. Redevelopment projects are, by definition, redeveloping areas of existing development. And, redevelopment projects become construction sites located in areas of existing development. Much of the data and information collected, inspections performed, and enforcement actions taken for the requirements under Provisions E.2 to E.4 may also be utilized by the existing development management program. The requirements under Provision E.5, however, are focused primarily on reducing pollutants generated in areas of existing development that can be transported in storm water runoff and discharged to and from the MS4.

The requirements under Provision E.5 build upon existing program elements being implemented by the Copermittees. Provision E.5 is generally consistent with the existing development requirements of the Fourth Term Permits for Orange and Riverside Counties (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), but modified to provide more flexibility to implement the programs so resources can be better focused toward addressing the highest priority water quality conditions identified in the Water Quality Improvement Plans.

For a Copermittee to properly manage areas of existing development, having knowledge of what development exists within its jurisdiction is essential. Provision E.5.a requires each Copermittee to maintain a watershed-based inventory of all the existing development within its jurisdiction. This requirement is necessary for each Copermittee to implement the requirements of Provision E.5.b-e.

As opposed to just maintaining separate inventories based on the type of site, each Copermittee must maintain a watershed-based inventory that includes all types of existing development within its jurisdiction. By utilizing a watershed-based inventory, the Copermittees within a Watershed Management Area can combine their inventories and review the inventories by watershed in addition to by jurisdiction. Pollutant

sources and strategies for abatement can then be evaluated on a watershed level, as opposed to evaluating sources and strategies strictly by type of site.

Provision E.5.a includes the information that must be included in the inventory. Provision E.5.a.(1) specifies what facilities or areas must be included in the inventory. A commercial type of existing development may be identified in the inventory as a facility (e.g. individual building, individual business) or an area (e.g. shopping center, commercial zone). An industrial type of existing development must be identified in the inventory by facility (e.g. individual industrial entity). A municipal type of existing development must be identified in the inventory by facility, with a list of specific municipal facilities that must be included in the inventory. A residential type of existing development must be identified by areas to be designated by the Copermittee. For each of the facilities and areas identified in the Copermittee's inventory developed pursuant to Provision E.5.a.(1), Provision E.5.a.(2) specifies the information that must be included in the description for the facility or area.

Provision E.5.a.(3) requires each Copermittee to maintain an updated map showing the location of inventoried existing development, watershed boundaries, and water bodies. This requirement was included because this information is expected to help the Copermittees in a Watershed Management Area identify and prioritize sources of pollutants and/or stressors in areas of existing development that contribute toward the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Knowledge of the existing development that are likely to be sources of pollutants contributing to the highest priority water quality conditions is expected to be a key element in the Copermittees' development of the water quality improvement strategies that will be included in the Water Quality Improvement Plans. The strategies described in the Water Quality Improvement Plans will direct efforts within the existing development management programs implemented by each Copermittee.

Pursuant to 40 CFR 122.26(d)(2)(iv)(A) each Copermittee is required describe "*structural and source control measures to reduce pollutants*" in storm water runoff discharged from areas of existing development. Provision E.5.b includes the BMP implementation and maintenance requirements that the each Copermittee must require at areas of existing development to reduce pollutants in storm water discharges to the MEP. The San Diego Water Board, however, recognizes that BMP implementation and maintenance for residential areas will require much more education and encouragement through less authoritative measures than for commercial, industrial and municipal facilities and areas. Thus, the BMP implementation and maintenance requirements have been separated between requirements under Provision E.5.b.(1) for commercial, industrial and municipal facilities and areas, and Provision E.5.b.(2) for residential areas.

Most of the requirements in Provision E.5.b are consistent with the related requirements in the Fourth Term Permits. The level of specificity, however, has been changed to allow each Copermittee the flexibility to implement its program to achieve maximum efficiency, and to perform functions that will address the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Each Copermittee is expected to require the implementation of appropriate BMPs to address the expected pollutants from each facility or area. The Third and Fourth Term Permits described specific minimum BMPs that must be implemented at various sites. This Order, however, requires each Copermittee to designate minimum BMPs themselves and require implementation. Consistent with the Fourth Term Permits, each Copermittee is required to maintain, or require the maintenance of, all BMPs as needed.

The BMP implementation and maintenance requirements include a schedule of operation and maintenance activities for the MS4 and related structures (such as catch basins, storm drain inlets, and detention basins), as well as public streets and roads. Public streets and roads specifically include public unpaved roads. The San Diego Water Board identified, through investigations and complaints, sediment discharges from unpaved roads as a significant source of water quality problems in the San Diego Region. Inspection activities conducted by the San Diego Water Board since the Third Term Permits have found a lack of source control for many unpaved roads within the jurisdiction of the Copermittees.

Unpaved roads are a source of sediment that can be discharged in runoff to receiving waters, especially during storm events. Erosion of unpaved roadways occurs when soil particles are loosened and carried away from the roadway base, ditch, or road bank by water, wind, traffic, or other transport means. Exposed soils, high runoff velocities and volumes, sandy or silty soil types, and poor compaction increase the potential for erosion.

Road construction, culvert installation, and other maintenance activities can disturb the soil and drainage patterns to streams in undeveloped areas, causing excess runoff and thereby erosion and the release of sediment. Poorly designed unpaved roads can act as preferential drainage pathways that carry runoff and sediment into natural streams, impacting water quality. In addition, other public works activities along unpaved roads have the potential to significantly affect sediment discharge and transport within streams and other waterways, which can degrade the beneficial uses of those waterways.

USEPA also recognizes that discharges from unpaved roads pose a significant potential threat to water quality. USEPA guidance[40] emphasizes the threat of unpaved roads to water quality:

[40] USEPA, 2006. Environmentally Sensitive Maintenance for Dirt and Gravel Roads. Gesford and Anderson, USEPA-PA-2005.

> "*Dirt and gravel roads are a major potential source of these pollutants [sediment] and pollutants that bind to sediment such as oils, nutrients, pesticides, herbicides, and other toxic substances. Many roads have unstable surfaces and bases. Roads act like dams, concentrating flows that accelerate erosion of road materials and roadsides. Both unstable surfaces and accelerated erosion then lead to sediment and dust.*"

There are several guidance documents, developed by the USEPA,[41] the US Forest Service,[42] the University of California,[43] and others, that include design and construction specifications and BMPs that are readily available for implementation by public entities. Implementing design and other source control BMPs for unpaved roads in the region is necessary to reduce and minimize the impacts of sediment discharged during storm events from unpaved roads to the MS4s and receiving waters.

Provision E.5.c describes existing development site inspection frequency, content, and tracking that each Copermittee must incorporate into their existing development management programs. The requirements under Provision E.5.c are necessary to demonstrate each Copermittee is implementing a program that complies with Provision E.5.b and ensure BMPs implemented in areas of existing development will reduce pollutants in storm water discharges to the MEP. Provision E.5.c has been modified to include a minimum of once every 5 years for all inventoried facilities and areas of existing development, utilizing one or more methods of inspection.

In addition to onsite inspections, the methods of inspection have been expanded to include drive-by inspections. Inspections may be performed by the Copermittee's municipal and contract staff, or by volunteer monitoring or patrol programs. Volunteer monitoring or patrol programs are not expected to enforce the Copermittee's ordinances, or to inspect areas or facilities where members of the public are not allowed access. Volunteer monitoring or patrol programs must be trained by the Copermittee, and are only expected to collect visual observations. By utilizing drive-by inspections and volunteer monitoring or patrol programs, the Copermittees will be able to maximize and efficiently use their resources to identify and address sources of pollutants in areas of existing development.

The municipal and contract staff of each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial, industrial, and municipal facilities and areas in its inventoried existing development pursuant to Provision E.5.c.(1)(a)(iv). An "equivalent" of at least 20 percent means if any commercial, industrial, or municipal facilities or areas require multiple onsite

[41] Ibid
[42] US Forest Service, 1996. Forest Service Specifications for Construction of Roads & Bridges. EM-7720-100. Revised August 1996.
[43] University of California Division of Agriculture and Natural Resources, 2007. Rural Roads: A Construction and Maintenance Guide of California Landowners. Publication 8262.

inspections during any given year, those additional inspections may count toward the total annual inspection requirement. Linear municipal facilities (i.e. MS4 linear channels, sanitary sewer collection systems, streets, roads and highways) in the Copermittee's existing development inventory are not subject to the inspection frequency requirement of Provision E.5.c.(1)(a)(iv).

The inspection content specified in Provision E.5.c.(2)(a) includes the information required to be collected during an inspection by any method. The inspection content specified in Provision E.5.c.(2)(b) includes additional information that must be collected when a Copermittee's municipal or contract staff perform an onsite inspection. Provision E.5.c.(3) specifies the information that each Copermittee must maintain in its existing development inspection records.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary to compel compliance with the requirements of Provision E.5 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.5.d requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Provisions E.5.e.(1)-(2) specifically require the Copermittee to identify areas of existing development as candidates for retrofitting, and streams, channels, and/or habitats as candidates for rehabilitation. Provisions E.5.e.(1)-(2) are based on the retrofitting requirements of the Fourth Term Permits for Orange and Riverside Counties, but modified to also include identifying projects to rehabilitate channels within areas of existing development. The requirements have also been modified to be more focused on utilizing these types of projects for addressing the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Interest and opportunity to retrofit areas of existing development and rehabilitate channels located in areas of existing development has been observed in several programs the San Diego Water Board oversees (e.g., CWA Section 401 Water Quality Certification program, supplemental environmental projects, and grant programs). Each jurisdiction has miles and miles of streets that could be retrofitted to become green streets. Reshaping landscaped areas from convex to concave configurations can detain storm water instead of directing runoff as quickly as possible to the MS4. Retrofit projects could also include simply replacing impervious surfaces with permeable surfaces.

Retrofitting projects do not necessarily have to be expensive. Retrofitting projects could be as simple as redirecting downspouts from roofs to pervious or landscaped areas instead of to hardscaped areas discharging directly to the MS4, providing rain barrels to harvest storm water from downspouts for use at a later time, or planting more trees in areas with little vegetation to provide canopy that can intercept storm

water. The San Diego Water Board encourages the Copermittees to identify simple, low-cost retrofitting opportunities that can be easily implemented, in addition to other more expensive retrofitting and channel rehabilitation projects.

Rehabilitation of channels, streams, and/or habitat will require more significant planning and resources to implement. There are, however, also abundant opportunities to rehabilitate channels, streams and/or habitats in or adjacent to areas of existing development. Each Watershed Management Area likely has several creeks and stream reaches that have been undergrounded, artificially hardened, or hydromodified that could be rehabilitated to be more sustainably configured, which would slow down storm water flows and potentially have more assimilative capacity for pollutants while still being supportive of designated beneficial uses.

The San Diego Water Board recognizes that it may be infeasible to implement retrofitting or channel rehabilitation projects within certain areas of a Copermittee's jurisdictions. For such areas, the Copermittee must instead identify, develop, and implement regional retrofitting and channel rehabilitation projects (i.e. projects that can retain and/or treat storm water from one or more areas of existing development) adjacent to and/or downstream of the areas of existing development.

Provisions E.5.e.(1)-(2) do not require the implementation of retrofitting and rehabilitation projects, but do require the Copermittee to develop a program with strategies to facilitate the implementation of these types of projects in areas of existing development. The strategies are expected to include allowing and encouraging Priority Development Projects to implement retrofitting types of projects as a means of compliance with the structural BMP performance criteria requirements of Provisions E.3.c.(1) and E.3.c.(2).

<u>Provision E.6 (Enforcement Response Plans)</u> requires each Copermittee to develop an Enforcement Response Plan as part of its jurisdictional runoff management program document. Proper implementation of the Enforcement Response Plans is necessary to effectively prohibit non-storm water discharges to the MS4, and reduce the discharge of pollutants in storm water from the MS4 to the MEP.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system*" and be able to demonstrate that it can "*operate pursuant to legal authority established by statute, ordinance or series of contracts*" to control the discharge of non-storm water and pollutants in storm water to and from its MS4. Pursuant to 40 CFR 122.26(d)(2)(i)(E) each Copermittee is specifically required to have the legal authority to "*[r]equire compliance with conditions in ordinances, permits, contracts or order*s."

The requirements under Provision E.6 are necessary to demonstrate that each Copermittee can enforce its legal authority to *"effectively prohibit non-stormwater discharges"* and "*reduce the discharge of pollutants to the maximum extent*

practicable" as well as "*[r]equire compliance with conditions in ordinances, permits, contracts or order*."

The Enforcement Response Plan required under Provision E.6 will serve as a reference for the Copermittee and the San Diego Water Board to determine if consistent enforcement actions are being implemented to achieve timely and effective compliance from all public and private entities that are not in compliance with the Copermittee's ordinances, permits, or other requirements. The Enforcement Response Plan must contain clear direction for the Copermittee to take immediate enforcement action, when appropriate and necessary, in their illicit discharge detection and elimination, development planning, construction management, and existing development management programs.

If the entities subject to the Copermittee's legal authority do not implement appropriate corrective actions in a timely manner, or if violations repeat, the Copermittee must take progressively stricter responses to enforce its legal authority and achieve compliance with its ordinances, permits, or other requirements to *"effectively prohibit non-stormwater discharges"* and "*reduce the discharge of pollutants to the maximum extent practicable.*"

<u>Provision E.7 (Public Education and Participation)</u> requires each Copermittee to implement a public education and participation program. Proper implementation of the public education and participation program as part of its jurisdictional runoff management program will contribute toward effectively prohibiting non-storm water discharges to the MS4, and toward the reduction of pollutants in storm water from the MS4 to the MEP.

Provision E.7 establishes the minimum requirements that each Copermittee must implement to engage members of the public as part of its jurisdictional runoff management program. In the Fourth Term Permits, the public education program requirements and the public participation requirements were included as separate jurisdictional runoff management program components. In this Order, the public education requirements have been consolidated with the public participation requirements, as both sets of requirements are related to the engagement of the public by each Copermittee. Engagement of the public is critical for the success of each Copermittee's jurisdictional runoff management program.

The Copermittees have been implementing public education programs for the last 20 years, which are now well established. The specificity of expected public education program elements of the Fourth Term Permits has been removed. For the most part, the public education program requirements in Provision E.7.a have been reduced to a set of requirements that are specifically included in the federal regulations under 40 CFR 122.26(d)(2)(iv)(A)(6), 122.26(d)(2)(B)(6) and 122.26(d)(2)(D)(4), which should already be incorporated into each Copermittee's existing public education program. Each Copermittee is expected to utilize the information and data collected from the monitoring and assessments conducted within the Watershed Management Area, and

from its inventories and inspections to best direct its public education program resources toward addressing the highest priority water quality conditions identified within the Water Quality Improvement Plan.

According to 40 CFR 122.26(d)(2)(iv), public participation is required to be included as part of the "*comprehensive planning process*", which includes the development and implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs. The requirements under Provision E.7.b specify the opportunities that the public must be provided to be involved in the "*comprehensive planning process*", as required by to 40 CFR 122.26(d)(2)(iv).

Provision E.8 (Fiscal Analysis) requires each Copermittee to secure the resources and provide an analysis of the resources that will be necessary to implement the requirements of the Order. Adequate fiscal resources are necessary for a jurisdictional runoff management program to effectively prohibit non-storm water discharges to the MS4, and reduce pollutants in storm water from the MS4 to the MEP.

According to 40 CFR 122.26(d)(2)(vi), each Copermittee is responsible for providing "*a fiscal analysis of the necessary capital and operation and maintenance expenditures necessary to accomplish the activities*" required by this Order, including "*a description of the source of funds that are proposed to meet the necessary expenditures, including legal restrictions on the use of such funds.*" The fiscal analysis requirements of Provision E.8 are consistent with 40 CFR 122.26(d)(2)(vi).

The San Diego Water Board has chosen not to require a description of fiscal benefits realized from implementation of the jurisdictional runoff management programs. This is a recommendation from the National Association of Flood and Stormwater Management Agencies.[44] For instance, the fiscal analysis requirements do not address city-wide fiscal benefits of protection (e.g., public health, tourism, property values, economic activity, beneficial uses, etc.), even though many costs currently reported to the San Diego Water Board are for related activities. This type of assessment may help Copermittees improve the allocation of resources and it may help the Copermittees secure adequate funding for the program. Qualitative assessments, however, could be overly subjective and most Copermittees likely lack the ability to provide accurate quantitative assessments. The San Diego Water Board encourages the Copermittees to consider means for conducting assessments of fiscal benefits derived from the programs. Such assessments could be conducted on a regional scale similar to studies of program costs conducted by the State Water Board.[45]

[44] National Association of Flood and Stormwater Management Agencies. 2006. *Guidance for Municipal Stormwater Funding.* Prepared under a grant provided by the USEPA.
[45] State Water Board, 2005. NPDES Stormwater Cost Survey.

F. Reporting

Purpose: Provision F includes the requirements for the documents and reports that the Copermittees must prepare and provide to the San Diego Water Board. The documents prepared by the Copermittees and provided to the San Diego Water Board and made available to the public will provide the documentation that the Copermittees are complying with the requirements of the Order.

***Discussion*:** Provision F requires the Copermittees to prepare several documents and reports that must be provided to the San Diego Water Board and made available to the public. The reporting requirements have been significantly reduced compared to the Fourth Term Permit reporting requirements. The reduction in reporting requirements was recommended by the San Diego County Copermittees in the Report of Water Discharge submitted in June 2011.

More specific and detailed discussions of the requirements of Provision F are provided below.

Provision F.1 (Water Quality Improvement Plans) requires the Copermittees in each Watershed Management Area to develop and submit a Water Quality Improvement Plan in accordance with the requirements of Provision B.

Of all the requirements of Provision F, the Water Quality Improvement Plans will likely be the documents requiring the most significant effort to develop. The content of the Water Quality Improvement Plans, however, is expected to include content that should already have been developed for the Watershed Plans and several elements that are included in the Monitoring and Reporting Programs required under the Fourth Term Permits.

Because the Water Quality Improvement Plan is part of the "*comprehensive planning process which involves public participation*," Provision F.1 includes requirements to give multiple opportunities to the public to provide input on the content of the plans.

Provision F.1.a.(1) specifies the elements that the Copermittees must include in the public participation process for the development of the Water Quality Improvement Plans. In order for the public to be aware of the opportunities to provide input, Provision F.1.a.(1)(a) requires the Copermittees to develop a publicly available and noticed schedule of the opportunities for the public to participate and provide comments during the development of the Water Quality Improvement Plan. These opportunities are when the public can provide the data, information, and recommendations that the Copermittees can consider during the development of the Water Quality Improvement Plans.

The San Diego Water Board recognizes, however, that the Copermittees cannot be expected to incorporate all the data, information, and recommendations that the public may provide into the Water Quality Improvement Plans. The Copermittees will have to

review the data, information, and recommendations received and make some decisions on what to incorporate into the Water Quality Improvement Plans. Before the Copermittees finalize their decisions, members of the public should be allowed to review the Copermittees' decisions. Thus, Provision F.1.a.(1)(b) requires the Copermittees to form a Water Quality Improvement Consultation Panel (Panel).

The Panel will consist of a member from the environmental community and a member from the development community familiar with the Watershed Management Area. A representative from the San Diego Water Board staff will also be part of the Panel. The Copermittees may choose to include additional members, but the Panel is only required to include three panel members.

The Panel will serve as an additional public participation and input mechanism during the development of the Water Quality Improvement Plans. The knowledge and expertise from these Panel members are expected to provide the Copermittees valuable direction during their decision-making process. The Copermittees will review the content of their planned submittals with the Panel members to receive recommendations. If the Panel provides recommendations, the Copermittees must consider revisions to the Water Quality Improvement Plan submittals.

The San Diego Water Board recognizes that the development of multiple Water Quality Improvement Plans concurrently may limit the ability of the public to review and provide comments to the Copermittees. Thus, Provision F.1.a.(1)(c) requires the Copermittees to coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public time and opportunity to participate during the development of the Water Quality Improvement Plans.

Provision F.1.a.(2) requires the Copermittees to develop and submit the first Water Quality Improvement Plan component, in accordance with the requirements of Provision B.2, which includes the identification of the priority water quality conditions and potential water quality improvement strategies. The public must be provided an opportunity to provide data, information and recommendations to be utilized in the development and identification of the priority water quality conditions and potential water quality improvement strategies for the Watershed Management Area. The Copermittees must consult with the Panel and consider making revisions. The Copermittees may submit the requirements of Provision B.2 as early as 6 months and no later than 12 months after the commencement of coverage under this Order. After the requirements of Provision B.2 are submitted to the San Diego Water Board, the public will be provided another opportunity to provide comments.

Provision F.1.a.(3) requires the Copermittees to develop and submit the second Water Quality Improvement Plan component, in accordance with the requirements of Provision B.3, which includes the identification of the numeric goals for the highest priority water quality conditions identified for the Watershed Management Area, and the strategies that will be implemented to achieve the potential numeric goals. The Copermittees may also develop the Optional Watershed Management Area Analysis, in accordance with the requirements of Provision B.3.b.(4), as part of this submittal.

The public must be provided an opportunity to provide data, information and recommendations to be utilized in the development and identification of the numeric goals and water quality improvement strategies for the Watershed Management Area. The Copermittees must consult with the Panel and consider making revisions. The Copermittees may submit the requirements of Provision B.3 as early as 9 months and no later than 18 months after the commencement of coverage under this Order. After the requirements of Provision B.3 are submitted to the San Diego Water Board, the public will be provided another opportunity to provide comments.

Finally, Provision F.1.b describes the process for the submittal and implementation of the Water Quality Improvement Plans. The complete Water Quality Improvement Plans are required to be submitted by the Copermittees within 24 months after the commencement of coverage under this Order. The San Diego Water Board will provide the public an opportunity to provide comments on each complete Water Quality Improvement Plan.

The San Diego Water Board will review each Water Quality Improvement Plan and the public comments received to determine if the Copermittees have submitted a Water Quality Improvement Plan that meets the requirements of Provision B. If a Water Quality Improvement Plan does not meet the requirements of Provision B, the Copermittees will be considered out of compliance and directed in writing by the San Diego Water Board Executive Officer to correct the deficiencies.

When a Water Quality Improvement Plan meets the requirements of Provision B, the San Diego Water Board will determine whether to hold a public hearing or to limit public input to submittal of written comments before accepting the Water Quality Improvement Plan. Implementation of the Water Quality Improvement Plan must begin within 30 days of acceptance.

The San Diego Water Board expects that any deficiencies in the Water Quality Improvement Plan will be identified either in the public comments or during the review by the San Diego Water Board before implementation begins. In the event any deficiencies are identified after the implementation of the Water Quality Improvement Plan, Provision F.1.b.(7) clarifies that the San Diego Water Board maintains the right to require the Copermittees to correct any deficiencies that may be identified.

<u>Provision F.2 (Updates)</u> requires the Copermittees to update specific documents that the Copermittees will utilize to implement the requirements of this Order.

Each Copermittee is required to continue implementing a jurisdictional runoff management program, as required under Provision E. Implementation of each Copermittee's jurisdictional runoff management program is directed by its jurisdictional runoff management program document. Provision F.2.a requires each Copermittee to update its jurisdictional runoff management program document to be consistent with the requirements of Provision E concurrent with the submittal of the Water Quality Improvement Plan.

Likewise, each Copermittee must continue to require new development and redevelopment projects to implement BMPs to control pollutants in storm water runoff. The control of pollutants in storm water runoff from development and redevelopment projects within each Copermittee's jurisdiction is guided and directed by its BMP Design Manual, formerly known as a Standard Storm Water Mitigation Plan (SSMP). Provision F.2.b requires each Copermittee to update its BMP Design Manual to be consistent with the requirements of Provision E.3 concurrent with the submittal of the Water Quality Improvement Plan.

For situations where the San Diego Water Board may amend the requirements of Provisions E.3.a-d after a Copermittee has updated its BMP Design Manual pursuant to Provision F.2.b.(1), Provision F.2.b.(4) gives the Copermittee up to 90 days to incorporate the amended requirements of Provision E.3.a-d into its BMP Design Manual. The San Diego Water Board Executive Officer has discretion to modify the 90-day time period depending on the complexity of the amendments or other information that warrants a change in the 90-day time period.

In general, the requirements of the Order should not necessitate a complete rewrite of each Copermittee's jurisdictional runoff management program document or BMP Design Manual, as was required by the Third Term Permits. The jurisdictional runoff management program and BMP Design Manual requirements of this Order are not significantly different than the requirements of the Fourth Term Permits. Thus, only sections of the Order which are new or have been significantly changed should warrant revisions to specific sections of the Copermittee's jurisdictional runoff management program document and BMP Design Manual.

Finally, the Water Quality Improvement Plans are expected to require updates as the iterative approach and adaptive management process included in the Water Quality Improvement Plan, as required under Provision B.5, is implemented by the Copermittees. Provision F.2.c.(1) requires the Copermittees to implement a public participation process for the proposed updates, review the proposed updates with the Panel, and submit the updates to the Water Quality Improvement Plan as part of the Annual Reports required under Provision F.3.b.

Also, because TMDLs are likely to be developed, adopted and approved during the term of the Order, Provision F.2.c.(2) has been included to expedite the incorporation of TMDLs into the Copermittees' Water Quality Improvement Plans as part of the update process, potentially before the Order is re-opened to incorporated the requirements of the new TMDLs.

<u>Provision F.3 (Progress Reporting)</u> requires the Copermittees to report on the progress of implementing the Water Quality Improvement Plans.

The requirements of Provision F.3 are to report the progress toward improving water quality that the Copermittees are achieving with the implementation of the Water Quality Improvement Plans and each Copermittee's jurisdictional runoff management program. The Progress Report Presentations required under Provision F.3.a are

included to provide the Copermittees an opportunity to communicate directly with the San Diego Water Board and the public. The Progress Report Presentations will also provide the members of the San Diego Water Board and members of the public an opportunity to become more acquainted with the Copermittees and their projects and programs to address non-storm water and storm water discharges into and from their MS4s.

The Annual Report requirements of Provision F.3.b are a consolidation of several reporting requirements from the Fourth Term Permits, including the Jurisdictional Runoff Management Program Annual Reports, the Watershed Annual Reports, and the Monitoring and Reporting Program Annual Reports. Furthermore, the Annual Report requirements are consistent with the requirements under 40 CFR 122.42(c).

Pursuant to 40 CFR 122.42(c), "*[t]he operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the Director…must submit an annual report*", which must include the following:

(1) *The status of implementing the components of the storm water management program that are established as permit conditions* [40 CFR 122.42(c)(1)];

(2) *Proposed changes to the storm water management programs that are established as permit conditions* [40 CFR 122.42(c)(2)];

(3) *Revisions, if necessary, to the assessment of controls and fiscal analysis* [40 CFR 122.42(c)(3)];

(4) *A summary of data, including monitoring data, that is accumulated throughout the reporting year* [40 CFR 122.42(c)(4)];

(5) *Annual expenditures and budget for year following each annual report* [40 CFR 122.42(c)(5)];

(6) *A summary describing the number and nature of enforcement actions, inspections, and public education programs* [40 CFR 122.42(c)(6)];

(7) *Identification of water quality improvements or degradation* [40 CFR 122.42(c)(7)].

Under the Fourth Term Permits, each Copermittee is responsible for submitting a Jurisdictional Runoff Management Program Annual Report; the Copermittees in each designated watershed are responsible for submitting a Watershed Annual Report; and the Copermittees from each county are responsible for submitting a Monitoring and Reporting Program Annual Report.

There are 39 Copermittees in the San Diego Region, each required to prepare and submit a Jurisdictional Runoff Management Program Annual Report. There are 9 designated watersheds in San Diego County, 6 designated watersheds in Orange County, and 1 designated watershed in Riverside County for a total of 16 designated watersheds, each requiring a Watershed Annual Report. There are 3 sets of

Copermittees in 3 counties in the San Diego Region, requiring Copermittees from each county to prepare and submit a Monitoring and Reporting Program Annual Report. Thus each Copermittee is currently required to prepare, or participate in the preparation of at least 3 annual reports. In addition, the San Diego County Copermittees are required to prepare and submit a Regional Urban Runoff Management Plan Annual Report.

In total, there are 59 annual reports that are prepared by the Copermittees and submitted to the San Diego Water Board for the Fourth Term Permits. The preparation of these annual reports requires significant time and resources from each Copermittee, which could otherwise be expended on actions that could improve water quality within its jurisdiction. In turn, significant time and resources are required from the San Diego Water Board staff to review these reports, which could otherwise be expended on working directly with the Copermittees to improve their implementation efforts toward restoring and protecting water quality.

Until the Water Quality Improvement Plans are developed, there will be a transitional period during which the Copermittees will continue to implement their existing jurisdictional runoff management programs. There will also be a transitional period during which the Copermittees will implement the transitional monitoring and assessment requirements of Provision D. During the transitional period, the Copermittees will submit annual reports pursuant to the requirements of Provisions F.3.b.(1) and F.3.b.(2).

Provision F.3.b.(1) includes the transitional annual reporting requirements for each Copermittee's jurisdictional runoff management program. The reporting of the jurisdictional runoff management program implementation efforts have been reduced to a single 2-page form. Each Copermittee is required to complete and submit a Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D or a revised form accepted by the San Diego Water Board) no later than October 31 of each year for each jurisdictional runoff management program reporting period (i.e. July 1 to June 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted. The Jurisdictional Runoff Management Program Annual Report Form will certify that each Copermittee has implemented its jurisdictional runoff management program in accordance with the requirements of Provision E. Each Copermittee may choose to continue to utilize and submit the jurisdictional runoff management program annual reporting format of its current Order until the first Water Quality Improvement Plan Annual Report is required to be submitted.

Provision F.3.b.(2) includes the transitional annual reporting requirements for the transitional monitoring and assessment program for each Watershed Management Area. The Copermittees in the Watershed Management Area are required to submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water

Quality Improvement Plan Annual Reports are required to be submitted. The Transitional Monitoring and Assessment Program Annual Report is required to include the transitional period monitoring data collected pursuant to Provisions D.1.a and D.2.a, and the findings from the transitional period findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

Provision F.3.b.(3) includes the Water Quality Improvement Plan Annual Report requirements. Only one Water Quality Improvement Plan Annual Report is required for each of the ten (10) Watershed Management Areas designated under Provision B.1, which is a significant reduction in the number of annual reports required to be prepared and submitted by the Copermittees. The Water Quality Improvement Plan Annual Report will document the Copermittees' efforts to implement the Water Quality Improvement Plan. Each Water Quality Improvement Plan Annual Report will be focused primarily on reporting the analysis of the monitoring data collected pursuant to Provisions D.1-D.3 during the reporting period, and the assessments that are required pursuant to Provision D.4 based on the data. The monitoring data analyses and the assessments that are provided in the Water Quality Improvement Plan Annual Report will be the core of the report. The reporting of the jurisdictional runoff management program implementation efforts have been reduced to a single 2-page form, and will no longer be the primary focus of the reporting requirements as in the Third and Fourth Term Permits.

Each Copermittee will continue to prepare and submit a Jurisdictional Runoff Management Program Annual Report Form as part of the Water Quality Improvement Plan Annual Report to certify that each Copermittee has implemented its jurisdictional runoff management program in accordance with the requirements of Provision E. Instead of reviewing a voluminous report from each Copermittee, as was required under the Third and Fourth Term Permits, the San Diego Water Board will conduct audits of each Copermittee's jurisdictional runoff management program to investigate and confirm the information provided by each Copermittee on its Jurisdictional Runoff Management Program Annual Report Form. The audits will allow the San Diego Water Board to become more familiar with the each Copermittee's jurisdictional runoff management program, and each Copermittee will become more informed about the expectations of the San Diego Water Board.

The reduction in the number and content of the Water Quality Improvement Plan Annual Reports should result in significant time, cost and resource savings for the Copermittees, as well as the San Diego Water Board. Those savings should offset a significant portion of any additional costs that may be incurred to develop the Water Quality Improvement Plans and to implement the monitoring and assessment program requirements of Provision D.

The reporting period for the Water Quality Improvement Plan Annual Reports consists of two periods. Because the jurisdictional runoff management programs are typically budgeted and implemented during a fiscal year, the information provided on the

Jurisdictional Runoff Management Program Annual Report Forms will cover the period from July 1 to June 30 of the following year.

The Water Quality Improvement Plan Annual Reports, however, are focused primarily on the monitoring data and the assessments based on the monitoring data. The monitoring data is collected during the monitoring year, which begins October 1 and ends September 30 of the following year. The monitoring year begins after the beginning of the fiscal year and ends after the end of the fiscal year. Therefore, to accommodate and capture the information collected during the fiscal year and the monitoring year, the Annual Report reporting period incorporates both periods.

Finally, Provision F.3.c requires the Copermittees to develop and submit a Regional Monitoring and Assessment Report. The Regional Monitoring and Assessment Report is similar to the Long Term Effectiveness Assessment required under the Fourth Term San Diego County Permit. The Regional Monitoring and Assessment Report is expected to utilize the entire body of data and information collected by the Copermittees during the term of this Order to assess improvements to water quality on a regional scale.

Provision F.4 (Regional Clearinghouse) requires the Copermittees to develop, update, and maintain an internet-based Regional Clearinghouse that can be used to store, disseminate, and share the Copermittees' documents, monitoring data, special studies, and any other data or information.

Most of the documents and data that are generated by the Copermittees can be provided in electronic format, and made available to the San Diego Water Board and the public on the internet. The San Diego Water Board has been gradually transitioning its document submittal requirements to electronic submittals. Provision F.4 has been included to further these efforts.

Provision F.4 has also been included to improve the exchange and availability of information among the Copermittees, as well as between the Copermittees and the San Diego Water Board. Provision F.4 will also make the information generated during the implementation of the Order more accessible to the public.

Provision F.5 (Report of Waste Discharge) requires the Copermittees to submit a Report of Waste Discharge to reapply for renewal of the Order prior to its expiration, in accordance with 40 CFR 122.21(d)(2) and CWC section 13376.

Provision F.5 requires the Copermittees to submit a Report of Waste Discharge 180 days in advance of the expiration of this Order. Provision F.5 also describes the minimum information to be included in the Report of Waste Discharge, based on USEPA guidance "Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems," dated May 17, 1996.

G. Principal Watershed Copermittee Responsibilities

Purpose: Provision G includes the requirements for the Principal Watershed Copermittee designated by the Copermittees in each Watershed Management Area.

***Discussion*:** Unlike previous NPDES requirements, there will no longer be a single Principal Copermittee. Provision G.1 requires the Copermittees to designate a Principal Watershed Copermittee for each Watershed Management Area. There are ten (10) Watershed Management Areas in the San Diego Region, as defined in Table B-1 under Provision B.1 of the Order. An individual Copermittee should not be the Principal Watershed Copermittee for more than two (2) Watershed Management Areas. There could be up to ten (10) Principal Water Copermittees designated for the Watershed Management Areas in the San Diego Region.

Provision G.2 describes the minimum responsibilities of each Principal Watershed Copermittee. The primary responsibility of the Principal Watershed Copermittees is to serve as the liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues. Ideally, the Principal Watershed Copermittee can represent the interests of all the Copermittees within a Watershed Management Area during discussions or meetings to facilitate communication with the San Diego Water Board. The Principal Watershed Copermittees are also responsible for facilitating and coordinating the implementation efforts of the Copermittees and submittals of required documents and reports.

The Principal Watershed Copermittee is responsible for facilitating the efforts of the Copermittees within the Watershed Management Area to develop the Water Quality Improvement Plan required under Provision B, and submit it for approval in accordance with Provision F.1. The Principal Watershed Copermittee is also responsible for coordinating the submittal of the document updates, Progress Report Presentations, and Annual Reports required from the Copermittees within each Watershed Management Area under Provisions F.2, F.3.a, and F.3.b. The Principal Watershed Copermittees are responsible for coordinating with each other to develop and submit the Regional Clearinghouse, Regional Monitoring and Assessment Report, and the Report of Waste Discharge required under Provisions F.3.c, F.4, and F.5.

The designated Principal Watershed Copermittee for each Watershed Management Area does not necessarily have to serve as the Principal Watershed Copermittee for the entire term of the Order. If the Copermittees in a Watershed Management Area choose to designate a new Principal Watershed Copermittee, the change may be submitted as part of the Annual Report required under Provision F.3.b, with an update to the Water Quality Improvement Plan in accordance with Provision F.2.c.

Provision G.3 specifies that the Principal Watershed Copermittee is not responsible for ensuring that the other Copermittees within the Watershed Management Area are in compliance with the requirements of this Order

H. Modification of Order

Purpose: Provision H provides the conditions under which modifications to Order No. R9-2013-0001, as amended, may occur.

***Discussion*:** Provision H allows for modifications to Order No. R9-2013-0001, as amended, for bases in addition to modifications (minor and major) allowed under the federal regulations at 40 CFR 122.62 and 122.63.

Modifications to the Order require re-opening the Order (see Water Code section 13223), subject to the requirements of 40 CFR 122.44, 122.62 to 122.64, and 124.5, but only for the specific provisions subject to the modification. Proposed modifications of the Order will be made available for public review, a public notice and comment period, and a public hearing if requested. Comments on the provisions not subject to the proposed modifications are not required to be considered in the San Diego Water Board's responses to comments or during the public hearing.

Provision H.4 was included to specify that the Order will be re-opened for modifications if the Basin Plan is amended to modify an existing TMDL or incorporate a new TMDL, or the monitoring and assessment program requirements need to be updated or revised.

I. Standard Permit Provisions and General Provisions

Purpose: Provision I incorporates the standard permit provisions required to be included in all NPDES permits, as well as several other general provisions.

***Discussion*:** Provision I refers to Attachment B to the Order. Attachment B expressly incorporates the conditions applicable to all NPDES permits as provided under 40 CFR 122.41(a)-(n), as well as the applicable conditions for MS4s and storm water discharges provided under 40 CFR 122.42(c) and 40 CFR 122.42(d), respectively. Attachment B also includes several general provisions that are typically included in or applicable to waste discharge requirements issued by the San Diego Water Board.

IX. ATTACHMENTS

The attachments to the Order are discussed below. The discussions describe the content of the attachments.

Attachment A – Discharge Prohibitions and Special Protections

Section 1 of Attachment A includes the Waste Discharge Prohibitions from the Basin Plan. They have been provided verbatim in their entirety.

Section 2 of Attachment A includes the "*Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges*" applicable to permitted point source discharges of storm water, adopted under State Water Board Resolution No. 2012-0012, as amended by Resolution No. 2012-0031. The terms, prohibitions, and special conditions (collectively referred to as special conditions) are established as limitations on point source storm water discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in ASBS, as required for State Water Quality Protection Areas pursuant to California Public Resources Code sections 36700(f) and 36710(f). These Special Protections were adopted by the State Water Board as part of the Ocean Plan General Exception.

Attachment B – Standard Permit Provisions and General Provisions

Conditions applicable to all NPDES permits, as required under 40 CFR 122.41, and conditions applicable to MS4s and storm water discharges, as required under 40 CFR 122.42(c) and 122.42(d), respectively are provided in Attachment B to the Order. They have been provided expressly in their entirety.

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. These general provisions are typically included in or applicable to waste discharge requirements issued by the San Diego Water Board. Many of the general provisions were developed by the State Water Board. Where a general provision is derived from statute or regulation, a citation of the statute or regulation section is provided. General provisions that do not provide a citation are included under the authority provided CWC 13377.

Attachment C – Acronyms, Abbreviations and Definitions

The acronyms and abbreviations that are used in the Order are provided in Attachment C. Attachment C also includes definitions that may provide an explanation or description of the meaning or intent of specific terms or phrases included in the Order.

Attachment D – Jurisdictional Runoff Management Program Annual Report Form

An example of the Jurisdictional Runoff Management Program Annual Report Form required to be submitted by each Copermittee as part of the Annual Reports required under Provision F.3.b.(1)(e) is provided as Attachment D to the Order. An electronic version of the form will be available from the San Diego Water Board after the adoption of the Order.

The Jurisdictional Runoff Management Program Annual Report Form includes the minimum information necessary to demonstrate that the Copermittee is implementing and in compliance with the requirements of Provision E, and includes much of the information required to be reported pursuant to 40 CFR 122.42(c).

The information that must be provided on the Jurisdictional Runoff Management Program Annual Report Form is limited to the fiscal year, which begins July 1 and ends June 30 of the following year. The information expected to be provided by the Copermittees in each section of the Jurisdictional Runoff Management Program Annual Report Form is discussed below.

I. COPERMITTEE INFORMATION

The name of the Copermittee (e.g. name of city, county, or special district) and the contact information for the storm water program manager are provided under this section.

II. LEGAL AUTHORITY

The Copermittee must confirm whether or not the legal authorities under Provision E.1.a have been established for itself within its jurisdiction.

The Copermittee must also confirm whether or not a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority, as required under Provision E.1.b. The certification statement required by Provision E.1.b is only required to be submitted with the first Annual Report required under Provision F.3.b.

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

The Copermittee must inform the San Diego Water Board whether or not an update to its jurisdictional runoff management program document was required or recommended by the San Diego Water Board during the reporting period. An update to the jurisdictional runoff management program is required under Provision F.2.a. The San Diego Water Board may recommend modifications to the jurisdictional runoff management program as part of the iterative approach and adaptive management process required under Provision B.5, which may result in an update that is necessary for the Copermittee's jurisdictional runoff management document.

If an update was required or recommended, the Copermittee must confirm whether or not the update was completed and made available on the Regional Clearinghouse within the reporting period. If no update was required or recommended, an answer is not required. If the answer is NO, meaning the required or recommended update was not completed and/or made available on the Regional Clearinghouse, the Copermittee must attach a

schedule for the completion of the update and/or posting of the updated document on the Regional Clearinghouse.

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

The Copermittee must confirm whether or not a program was implemented during the fiscal year to actively detect and eliminate illicit discharges and connections in accordance with the requirements under Provision E.2.

In addition to confirming that a program to detect and eliminate illicit discharges was implemented during the reporting period, the Copermittee is also required to report on several items related to the program. The information that must be reported is limited to the fiscal year for the Annual Report.

All non-storm water discharges are considered illicit discharges unless the source is identified as one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5). If a non-storm water discharge is identified as one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5), the discharge is a non-storm water discharge, but not an illicit discharge. If a non-storm water discharge is identified but not in one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5), the discharge is both a non-storm water discharge and an illicit discharge.

V. DEVELOPMENT PLANNING PROGRAM

The Copermittee must confirm whether or not a development planning program was implemented during the fiscal year in accordance with the requirements under Provision E.3.

The Copermittee must also inform the San Diego Water Board whether or not an update to its BMP Design Manual was required or recommended by the San Diego Water Board during the fiscal year. An update to the BMP Design Manual is required under Provision F.2.b. The San Diego Water Board may recommend modifications to the BMP Design Manual, which may result in an update that is necessary for Copermittee's the BMP Design Manual.

If an update was required or recommended, the Copermittee must confirm whether or not the update was completed and made available on the Regional Clearinghouse within the reporting period. If no update was required or recommended, an answer is not required. If the answer is NO, meaning the required or recommended update was not completed and/or made available on the Regional Clearinghouse, the Copermittee must attach a schedule for the completion of the update and/or posting of the updated document on the Regional Clearinghouse.

The Copermittee is also required to report on several items related to the program. For the development and redevelopment projects that are reviewed under the program, the Copermittee must report the total number projects submitted for review during the fiscal year. Of those projects, the Copermittee must report the number that are Priority Development Projects, as defined under Provision E.3.b.(1). The Copermittee must also report the number of Priority Development Projects that were approved and/or granted occupancy during the fiscal year, regardless of when the project was originally submitted for review. Any projects that were approved during the fiscal year and granted any

exemptions from the BMP Design Manual requirements and/or allowed to implement alternative compliance options in accordance with Provision E.3.c.(3) must be reported.

Finally, the Copermittee must also report on several items related to its oversight of permanent BMPs on Priority Development Projects within its jurisdiction, as required under Provision E.3.e. The information that must be reported is limited to the fiscal year for the Annual Report.

VI. CONSTRUCTION MANAGEMENT PROGRAM

The Copermittee must confirm whether or not a construction management program was implemented during the fiscal year in accordance with the requirements under Provision E.4.

The Copermittee is also required to report on several items related to its oversight construction projects within its jurisdiction. The information that must be reported is limited to the fiscal year for the Annual Report.

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

The Copermittee must confirm whether or not an existing development management program was implemented during the fiscal year in accordance with the requirements under Provision E.5.

The Copermittee is also required to report on several items related to its oversight in areas of existing development within its jurisdiction. The information that must be reported is limited to the fiscal year for the Annual Report. The information must also be separated into four categories of existing development: municipal, commercial, industrial, and residential.

VIII. PUBLIC EDUCATION AND PARTICIPATION

The Copermittee must confirm whether or not a public education program component was implemented during the fiscal year in accordance with the requirements under Provision E.7.a.

The Copermittee must also confirm whether or not a public participation program component was implemented during the fiscal year in accordance with the requirements under Provision E.7.b.

IX. FISCAL ANALYSIS

The Copermittee must confirm a summary of its fiscal analysis, conducted in accordance with the requirements under Provision E.8, has been attached to the form.

X. CERTIFICATION

A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative must sign and certify the Jurisdictional Runoff Management Program Annual Report Form. The appropriate box must be checked to indicate the whether a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative is signing the form.

Attachment E – Specific Provisions for Total Maximum Daily Loads

Attachment E provides specific provisions for implementing the load allocations (LAs) and wasteload allocations (WLAs) of Total Maximum Daily Loads (TMDLs) adopted by the San Diego Water Board and approved by USEPA in which the Copermittees are identified as responsible for discharges subject to the requirements of the TMDLs. Federal regulations require that NPDES requirements incorporate water quality based effluent limitations (WQBELs) that must be consistent with the requirements and assumptions of any available WLAs,[46] which may be expressed as numeric effluent limitations, when feasible, and/or as a best management practice (BMP) program of expanded or better-tailored BMPs.[47] Where the TMDL includes WLAs that provide numeric pollutant load or pollutant parameter objectives, the WLA has been, where feasible, translated into numeric WQBELs.[48]

For each TMDL in Attachment E, four sections are included:

a. Applicability: This section provides the resolution under which the TMDL Basin Plan amendment was adopted and approved, with the applicable adoption and approval dates. This section also gives the effective date of the TMDL and where the TMDL is applicable (i.e. Watershed Management Area and water body). The Copermittees that are responsible for implementing the specific provisions are also given in this section.

b. Final TMDL Compliance Requirements: For each TMDL, the final TMDL compliance requirements consist of the final TMDL compliance date(s), the final WQBELs, and the final TMDL compliance determination requirements. The final WQBELs are expressed in terms of receiving water limitations, effluent limitations, and/or best management practices (BMPs). The final WQBELs for the TMDLs are incorporated by reference into Provision A of the Order. The final WQBELs become enforceable when the final TMDL compliance dates have passed. Applicable BMPs within the final WQBELs must be incorporated into the Water Quality Improvement Plans. Compliance with the final WQBELs will be determined in accordance with the options provided under the final TMDL compliance determination requirements.

c. Interim TMDL Compliance Requirements: If the final TMDL compliance date has not passed and there are interim TMDL compliance requirements, they are included in this section. If there are interim WQBELs with interim compliance dates, the interim WQBELs become enforceable when the corresponding interim compliance dates have passed. Compliance with the interim WQBELs will be determined in accordance with the options provided under the interim TMDL compliance determination requirements.

d. Specific Monitoring and Assessment Requirements: If there are specific monitoring and assessment requirements that cannot be met with the monitoring and assessment program

[46] 40 CFR 122.44(d)(1)(vii)(B)
[47] 40 CFR 122.44(k)(2) and 40 CFR 122.44(k)(3)
[48] November 26, 2014 Memorandum from the USEPA, Revisions to the November 22, 2002 Memorandum "Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLA""

requirements under Provision D of the Order, the additional requirements are included in this section.

The requirements of the TMDLs are based on and consistent with the assumptions and requirements of any available adopted and approved TMDLs that have been incorporated into the Basin Plan. Modifications to the requirements for the TMDLs in Attachment E cannot be made unless the TMDLs are modified in the Basin Plan.

A modification to any aspect of a TMDL in the Basin Plan requires a Basin Plan amendment. A Basin Plan amendment to modify a TMDL will require the San Diego Water Board to adopt a resolution to amend the Basin Plan, which includes a separate public process. When the San Diego Water Board adopts a Basin Plan amendment, it subsequently requires approval from the State Water Board, the Office of Administrative Law, and the USEPA before it becomes effective.

If and when the TMDLs are a modified in the Basin Plan, the San Diego Water Board will revise the requirements of the Order in accordance with the Basin Plan amendment. When a Basin Plan amendment to modify a TMDL becomes effective, the San Diego Water Board will modify the requirements of the Order pursuant to the requirements of Provision H.4 of the Order as soon as possible.

Chiu, Wayne@Waterboards

From: Chiu, Wayne@Waterboards
Sent: Wednesday, November 25, 2015 1:03 PM
To: Aldo Licitra (Aldo.Licitra@cityoftemecula.org); Bill Woolsey (wwoolsey@murrieta.org); Bruckner, Scott (sebruckner@rcflood.org); Horn, Steven (Shorn@rceo.org); Matt Bennett (mbennett@cityofwildomar.org); Boon, Richard (Richard.Boon@ocpw.ocgov.com); Chris Crompton (chris.crompton@ocpw.ocgov.com); Christopher Macon (cmacon@lagunawoodscity.org); Greg Yi (greg.yi@rdmd.ocgov.com); 'Hossein Ajideh'; Humza Javed (hjaved@ci.laguna-hills.ca.us); Joe Ames (JAmes@cityofmissionviejo.org); Lisa Zawaski (lzawaski@danapoint.org); Mary Vondrak (vondrakM@san-clemente.org); Moy Yahya (myahya@cityofalisoviejo.com); Nancy Palmer (NPalmer@cityoflagunaniguel.org); Rae Beimer (RBeimer@cityofrsm.org); Slaven, Devin (dslaven@lakeforestca.gov); Tracy Ingebrigtsen (tingebrigtsen@lagunabeachcity.net); 'Boushra Salem' (bsalem@chulavistaca.gov); Brown, Clement (CMBrown@sandiego.gov); Cecilia Padres-Tipton (ctipton@cityofsanteeca.gov); Cheryl Filar (cfilar@cityofvista.com); Chris Helmer; Dan Goldberg; Elaine Lukey (Elaine.Lukey@carlsbadca.gov); Erik Steenblock (esteenblock@encinitasca.gov); Godby, Kim (kgodby@coronado.ca.us); Helen M. Davies (hdavies@ci.escondido.ca.us); Jaime Campos (jcampos@ci.el-cajon.ca.us); 'James Wood'; 'JoAnn Weber'; Joe Kuhn (jkuhn@ci.la-mesa.ca.us); John Quenzer (jquenzer@dmaxinc.com); Karen Holman (kholman@portofsandiego.org); Kolb, Ruth (RKolb@sandiego.gov); Kuma Muthusamy; Malik Tamimi (mtamimi@lemongrove.ca.gov); Mikhail Ogawa (mikhail@mogawaeng.com); Mo Lahsaie (mlahsaie@ci.oceanside.ca.us); Reed Thornberry (rthornberry@san-marcos.net); Richard Gilb (rgilb@san.org); Ron Borromeo; Steven Strapac (SStrapac@poway.org)
Cc: Walsh, Laurie@Waterboards; Barker, David@Waterboards; Arias, Christina@Waterboards; Ryan, Erica@Waterboards; 'Bill Paznokas'; 'Carol Roberts'; 'Cindy Lin'; 'Dave Smith'; 'Deborah Lee'; 'Robert Smith'
Subject: Transmittal of Order No. R9-2015-0100 and Conformed Order No. R9-2013-0001
Attachments: 2015-1125 Transmittal Letter Order No. R9-2015-0100.pdf; 2015-1118 Adopted Order No. R9-2015-0100_withAttachments.pdf; 2015-1118 Conformed Order No. R9-2013-0001 COMPLETE.pdf

San Diego Region Municipal Storm Water Copermittees:

Please find attached the transmittal letter and a copy of Order No. R9-2015-0100 and the attachments adopted by the San Diego Water Board on November 18, 2015. The attachments to Order No. R9-2015-0100 show the amendments to the Regional MS4 Permit in blue underline and red strikeout text. A conformed copy of the Regional MS4 Permit (including attachments) incorporating the amendments adopted pursuant to Order No. R9-2015-0001 is also attached.

These documents are available on the San Diego Water Board website at:
http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/rsd_stormwater.shtml

The San Diego Water Board Storm Water webpage has also been updated with the amended Regional MS4 Permit:
http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

Please contact me with any questions.

Happy holidays,

Wayne Chiu, PE
Water Resource Control Engineer
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California Water Boards

Edmund G. Brown Jr., Governor

Matthew Rodriquez, Secretary for Environmental Protection

California Regional Water Quality Control Board, San Diego Region

November 25, 2015

Sent via E-mail

Riverside County Copermittees
Orange County Copermittees
San Diego County Copermittees

In reply refer to / attn:
Place ID: 786088:WChiu

Subject: Order No. R9-2015-0100, An Order Amending Order No. R9-2013-0001, NPDES No. CAS0109266, as Amended by Order No. R9-2015-0001, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) is pleased to transmit to you the finalized copy of Order No. R9-2015-0100, *An Order Amending Order No. R9-2013-0001, NPDES No. 0109266, as Amended by Order No. R9-2015-0001, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Amending Order), as adopted by the San Diego Water Board November 18, 2015. The Amending Order identifies specific changes made to Order No. R9-2013-0001 and Attachments in blue underline and red strikeout text. Also enclosed is a conformed copy of Order No. R9-2013-0001 and Attachments which incorporates all adopted changes.

An electronic copy of both the Amending Order and a conformed copy of Order R9-2013-0001 and Attachments are available from the San Diego Water Board website at: http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml
If a Copermittee or other interested person would like to receive a hard copy of either the Amending Order or a conformed copy of Order No. R9-2013-0001 with Attachments, please contact Wayne Chiu at (619) 521-3354 or Wayne.Chiu@waterboards.ca.gov or visit the San Diego Water Board's office at 2375 Northside Drive, Suite 100, San Diego, California 92108, weekdays between 8:00 a.m. and 5:00 p.m.

Please submit any written correspondence in response to this letter to SanDiego@waterboards.ca.gov. Electronic documents must be submitted as a single file, in Portable Document Format (PDF) format, and converted to text searchable format using Optical Character Recognition (OCR). All electronic documents must also include scanned copies of all signature pages; electronic signatures will not be accepted. Electronic documents submitted to the San Diego Water Board must include the following identification numbers in the header or subject line: **PIN: CW-786088:WChiu.**

Respectfully,

David T. Barker P.E.
Supervising Water Resource Control Engineer

DTB: law:wc

Enclosures: Order No. R9-2015-0100 with Attachments
Conformed Copy of Order No. R9-2013-0001 with Attachments

cc:

Distribution list via email:
(see attached address list)

San Diego County MS4 Permit E-mail Service List
Orange County MS4 Permit E-mail Service List
Riverside County MS4 Permit E-mail Service List
Natural Resources Agencies

Tech Staff Info & Use	
Order No.	R9-2015-0100
NPDES No.	CAS0109266
Place ID	786088

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CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

2375 Northside Drive, Suite 100, San Diego, CA 92108
Phone (619) 516-1990 Fax (619) 516-1994
http://www.waterboards.ca.gov/sandiego

ORDER NO. R9-2015-0100

AN ORDER AMENDING ORDER NO. R9-2013-0001, NPDES NO. CAS010266, AS AMENDED BY ORDER NO. R9-2015-0001 NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The California Regional Water Quality Control Board, San Diego Region (hereinafter San Diego Water Board), finds that:

ENROLLMENT OF RIVERSIDE COUNTY COPERMITTEES

1. **Enrollment Process.** On May 8, 2013, the San Diego Water Board adopted Order No. R9-2013-0001, NPDES No. CAS019266, *National Pollutant Discharge Elimination System Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Order No. R9-2013-0001, or Regional MS4 Permit). Provision F.5 of that Order (as amended by Order No. R9-2015-0001) outlines a process to designate (enroll) the County of Riverside, the Riverside County Cities of Murrieta, Temecula, and Wildomar, and the Riverside County Flood Control and Water Conservation District as Copermittees under Order No. R9-2013-0001, responsible for compliance with the terms and the conditions of the Regional MS4 Permit. Provision F.5 provides that prior to such enrollment, the San Diego Water Board must first review and consider a Report of Waste Discharge (ROWD) submitted by the Riverside County Copermittees under their current MS4 Permit, Order No. R9-2010-0016, to determine whether the Copermittees should be enrolled under Order No. R9-2013-0001, and what changes to Order No. R9-2013-0001 proposed in the ROWD are appropriate.

2. **Report of Waste Discharge.** By letter dated May 8, 2015, the Riverside County Copermittees jointly submitted a ROWD in application for the reissuance of waste discharge requirements, pursuant to the requirements of section K.2.c of Order No. R9-2010-0016. The San Diego Water Board reviewed the ROWD and determined it is complete.

3. **Riverside County Copermittees Enrollment.** After consideration of the Riverside County Copermitees' ROWD and changes needed to Order No. R9-2013-0001, the San Diego Water Board determined that the County of Riverside, the Cities of Murrieta, Temecula, and Wildomar, and the Riverside County Flood Control and Water Conservation District should be enrolled as Copermittees under Order No. R9-2013-0001 and be responsible for compliance with the terms and the conditions of the Regional MS4 Permit. Enrolling the Riverside County Copermittees into Order No. R9-2013-0001 will provide regulatory consistency in the implementation of MS4 permit requirements throughout the San Diego Region, improve communication and coordination among Copermittees within watersheds crossing multiple jurisdictions, and maximize efficiency and economy of resources for the San Diego Water Board achieved through the redirection of staff permitting resources to better advance the storm water program. Enrollment of the Cities of Murrieta and Wildomar is subject to a California Water Code section 13228 agreement as set forth in the findings of this Order.

DESIGNATION OF A REGIONAL WATER BOARD

4. **Regional Water Board Designation.** The Cities of Menifee, Murrieta, and Wildomar are located partially within the jurisdictions of both the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board) and the San Diego Water Board. California Water Code section 13228 provides a way to streamline the regulation of entities whose jurisdictions straddle the border of two or more Regional Water Boards.

   As allowed by California Water Code section 13228, during the proceedings for Order No. R9-2010-0016, the Fourth Term Riverside County MS4 Permit, written requests for designation of a single Regional Water Board to regulate matters pertaining to Phase I MS4 discharges were submitted to the San Diego Water Board and Santa Ana Water Board by the City of Murrieta by letter dated July 20, 2010, the City of Wildomar by letter dated July 21, 2010, and the City of Menifee by letter dated July 22, 2010. The Cities of Murrieta and Wildomar requested designation of the San Diego Water Board, and the City of Menifee requested designation of the Santa Ana Water Board.

   As authorized by California Water Code section 13228 and pursuant to written agreements dated September 28, 2010 between the San Diego Water Board and the Santa Ana Water Board, the San Diego Water Board is designated under Order No. R9-2010-0016 to regulate Phase I MS4s within the entire jurisdictional area of the Cities of Murrieta and Wildomar, including those areas of each City located within the Santa Ana Water Board's geographic jurisdiction. The Santa Ana Water Board is designated under Order No. R8-2010-0033 to regulate the Phase I MS4s within the entire jurisdictional area of the City of Menifee, including those areas of the City located within the San Diego Water Board's geographic jurisdiction. Written requests to continue these Regional Water Board designations were submitted to the San Diego Water Board and Santa Ana Water Board by the City of Murrieta by

letter dated June 22, 2015, the City of Wildomar by letter dated June 23, 2015, and the City of Menifee by letter dated June 25, 2015.

5. **Factual Considerations.** The Santa Ana Water Board and San Diego Water Board establish generally consistent requirements for MS4 discharges to meet the technology-based standard of reducing pollutants in the discharge to the maximum extent practicable (MEP), a related iterative process to ensure MS4 discharges meet receiving water quality standards, and for non-storm water discharges to be effectively prohibited from entering the MS4. However due to the unique nature of watersheds and water quality issues in the San Diego Region and Santa Ana Region, MS4 permit requirements between the two Regional Water Boards may also vary to address region specific pollutant discharges and watershed conditions. The Cities of Menifee, Murrieta, and Wildomar report that management and implementation of municipal programs to comply with two different MS4 permits creates a significant administrative and financial burden that is not contributing to greater overall water quality improvements in either region.

6. **Regional Water Board Agreement.** The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated October 26, 2015 to:

   a. Continue designation of the San Diego Water Board to regulate Phase I MS4 discharges within the entire jurisdictional area of the Cities of Murrieta and Wildomar, including those areas of each City located within the Santa Ana Region upon the effective date of Order R9-2015-0100, *and*

   b. Continue designation of the San Ana Water Board to regulate Phase I MS4 discharges within the entire jurisdictional area of the City of Menifee, including those areas of the City located within the San Diego Region, under Order No. R8-2010-0033 (NPDES No. CAS618030) as it may be amended or reissued upon the effective date of Order No. R9-2015-0100.

7. **Periodic Review of Regional Water Board Agreement.** The basis supporting the Cities of Menifee, Murrieta, and Wildomar requests to designate a specific Regional Water Board for regulatory oversight of MS4 discharges may change under future conditions and circumstances. Therefore the San Diego Water Board and Santa Ana Water Board will periodically review the effectiveness of the agreement during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate the agreement with the Santa Ana Water Board or otherwise modify the agreement subject to the approval of the Santa Ana Water Board.

AMENDMENTS TO ORDER NO. R9-2013-0001

8. **Effect of this Order.** Order No. R9-2013-0001 is not being reopened for any other purpose than the amendments contained herein. Except as contradicted or superseded by the findings and directives set forth in this Order, all of the previous findings and directives of Order No. R9-2013-0001 (as amended by Order No. R9-2015-0001) shall remain in full force and effect.

9. **Enroll Riverside County Copermittees.** This Order amends Order No. R9-2013-0001 to incorporate the County of Riverside, the Riverside County Cities of Murrieta, Temecula, and Wildomar, and the Riverside County Flood Control and Water Conservation District as Copermittees responsible for compliance with the terms and the conditions of Order No. R9-2013-0001, as amended by Order No. R9-2015-0001 and this Order.

10. **Alternative Compliance Pathway for Prohibitions and Limitations.** The San Diego County, Orange County, and Riverside County Copermittees have asserted that the prohibitions and limitations under Provision A of Order No. R9-2013-0001 may result in many years of noncompliance because years of technical efforts may ultimately be required to achieve compliance with the prohibitions and limitations, especially for wet weather discharges.

    The San Diego Water Board considered the incorporation of an alternative pathway to compliance during the adoption proceedings for Order No. R9-2013-0001 in May 2013, but chose not to include it at that time. During the proceedings for Order No. R9-2015-0001, amending Order No. R9-2013-0001 to extend coverage of the Regional MS4 Permit to the Orange County Copermittees and as reflected in Order No. R9-2015-0001, the San Diego Water Board committed to considering the incorporation of a well-defined, transparent, and finite alternative pathway to compliance in Order No. R9-2013-0001 during the MS4 permit reissuance proceedings for the Riverside County Copermittees.

    On June 16, 2015, the State Water Resources Control Board (State Water Board) adopted Order WQ 2015-0075, *In the Matter of Review of Order No. R4-2012-0175, NPDES Permit No. CAS004001, Waste Discharge Requirements for Municipal Separate Storm Sewer System (MS4) Discharges within the Coastal Watersheds of Los Angeles County, Except Those Discharges Originating from the City of Long Beach MS4,* which directs all Regional Water Boards to consider a watershed-based planning and implementation approach to compliance with receiving water limitations when issuing Phase I MS4 permits going forward. Consistent with the principles set forth in Order WQ 2015-0075, this Order amends Order No. R9-2013-0001 to incorporate an alternative compliance pathway that allows a Copermittee to utilize the watershed-based Water Quality Improvement Plan to be deemed in compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2.a, and A.3.b which are included in the prohibitions and limitations under Provision A of the Regional MS4 Permit.

    This Order amends the Fact Sheet of Order No. R9-2013-0001, Attachment F, section VII.E, Antidegradation Policy, to provide an expanded analysis consistent with the principles set forth in State Water Board Order WQ 2015-0075, demonstrating why the incorporation of an alternative compliance pathway for prohibitions and limitations in Order No. R9-2013-0001 complies with federal and state antidegradation policies. This Order also amends the Fact Sheet of Order No. R9-2013-0001, Attachment F, section VII.E, Anti-Backsliding Requirements, with an expanded analysis consistent with State Water Board Order WQ 2015-0075 demonstrating that the anti-backsliding requirements of the Clean Water Act and the

federal regulations do not foreclose the incorporation of an alternative compliance pathway into Order No. R9-2013-0001.

11. **Update to Non-Storm Water Discharges.** Since Order No. R9-2013-0001 was adopted, the State Water Board adopted Order 2014-0194-DWQ (*Statewide National Pollutant Discharge Elimination System (NPDES) Permit for Drinking Water System Discharges to Waters of the United States*) and the San Diego Water Board adopted Order No. R9-2015-0013 (*General Waste Discharge Requirements for Groundwater Extraction Discharges to Surface Waters within the San Diego Region*). These orders are NPDES permits regulating non-storm water discharges that may be discharged to the Copermittees' MS4s. This Order amends Order No. R9-2013-0001 to incorporate State Water Board Order 2014-0194-DWQ and San Diego Water Board Order No. R9-2015-0013 into the requirements for addressing non-storm water discharges.

12. **Priority Development Project Definition Consistency.** The Fact Sheet of the Regional MS4 Permit as modified by Order No. R9-2015-0001, describes on Page F-98 the San Diego Water Board's intent that the Priority Development Project categories in Provision E.3.b.(1) be consistent with the categories in the Riverside County MS4 Permit (Order No. R9-2010-0016) and the Orange County MS4 Permit (Order No. R9-2009-0002). The San Diego Water Board's intention reflected in the Fact Sheet was not explicitly incorporated in some of the Priority Development Project categories described in Provision E.3.b.(1) and this Order amends the provision with clarifying language to better describe these categories consistent with the Fact Sheet. The Order also has been amended to include the requirements for updating the BMP Design Manual as a result of the corrections to the Priority Development Project categories in Provision E.3.b.(1).

13. **Definition of Prior Lawful Approval.** During the proceedings for Order No. R9-2015-0001, amending Order No. R9-2013-0001 to extend coverage of the Regional MS4 Permit to the Orange County Copermittees, the land development community asserted that the lack of a definition for the term "prior lawful approval" in the Regional MS4 Permit had created significant uncertainty for the San Diego County Copermittees, the land development community, and the general public about when the development planning requirements are applicable. The San Diego Water Board committed to considering the incorporation of additional guidance for prior lawful approval in Order No. R9-2013-0001 during the MS4 permit reissuance proceedings for the Riverside County Copermittees. This Order amends Order No. R9-2013-0001 to incorporate additional clarification describing when the structural BMP performance requirements are applicable to Priority Development Projects.

14. **Los Peñasquitos Lagoon Sediment TMDL.** During the proceedings for Order No. R9-2015-0001, amending Order No. R9-2013-0001 to extend coverage of the Regional MS4 Permit to the Orange County Copermittees, the San Diego County Copermittees responsible for implementing the TMDLs for Sediment in Los Peñasquitos Lagoon requested several minor revisions to make the TMDL requirements consistent with the Basin Plan amendment adopted by the San Diego

Water Board. This Order amends Attachment E to Order No. R9-2013-0001 to incorporate minor revisions to the Los Peñasquitos Lagoon Sediment TMDL to make the requirements consistent with the adopted Basin Plan amendment.

15. **Compliance Dates for TMDLs Beaches and Creeks Indicator Bacteria TMDLs.** A review of the interim and final compliance dates for the Revised TMDLs for Indicator Bacteria, Project I – Beaches and Creeks (Beaches and Creeks Indicator Bacteria TMDLs) in the San Diego Region in Attachment E to the Order revealed an inconsistency with the adopted Basin Plan amendment. This Order amends Attachment E to Order No. R9-2013-0001 to incorporate minor revisions to the Beaches and Creeks Indicator Bacteria TMDLs to make the requirements consistent with the adopted Basin Plan amendment.

16. **Removal of Application for Early Coverage Provisions.** Order No. R9-2013-0001, as amended by Order No. R9-2015-0001 included several provisions that allowed the Riverside County Copermittees to apply for early coverage under the Regional MS4 Permit prior to the expiration of Order No. R9-2010-0016. These provisions are no longer necessary once the Riverside County Copermittees are covered by the requirements of the Regional MS4 Permit with the adoption of this Order. This Order amends Order No. R9-2013-0001 to remove provisions related to applying for early coverage under the Regional MS4 Permit.

ADMINISTRATIVE FINDINGS

17. **California Environmental Quality Act**. This action is exempt from the requirement of preparation of environmental documents under the California Environmental Quality Act [Public Resources Code, Division 13, Chapter 3, Section 21000 et seq.] in accordance with California Water Code section 13389.

18. **Public Notice.** In accordance with State and federal laws and regulations, the San Diego Water Board has notified San Diego County, Orange County and Riverside County Copermittees, and all known interested agencies and persons of its intent to adopt this Order and has provided them with an opportunity to submit their written comments.

19. **Public Hearing.** The San Diego Water Board held a public hearing on November 18, 2015 and heard and considered all comments pertaining to the adoption of this Order.

20. **Notification.** Any person aggrieved by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with California Water Code section 13320 and California Code of Regulations, title 23, sections 2050 et seq. The State Water Board must receive the petition by 5:00 p.m., 30 days after the adoption date of this Order. Copies of the law and regulations applicable to filing petitions may be found on the Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

THEREFORE, IT IS HEREBY ORDERED,

1. This Order amends Order No. R9-2013-0001 and Fact Sheet as amended by Order No. R9-2015-0001 (Regional MS4 Permit and Fact Sheet). The revisions to the Regional MS4 Permit and Fact Sheet are shown Attachments 1 and 2 to this Order. Added text to the Regional MS4 Permit and Fact Sheet is displayed in blue-underline text and deleted text is displayed as red-strikeout text.

2. The amended Regional MS4 Permit and Fact Sheet included as Attachments 1 and 2 to this Order shall become effective on January 7, 2016.

3. The amended Regional MS4 Permit and Fact Sheet included as Attachments 1 and 2 to this Order shall supersede Order No. R9-2010-0016 for the Riverside County Copermittees except for enforcement purposes.

4. San Diego Water Board staff is directed to prepare and post a conformed copy of the Regional MS4 Permit and Fact Sheet, as amended by this Order, incorporating the revisions made by this Order.

I, David W. Gibson, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on November 18, 2015.

David W. Gibson
Executive Officer

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

ORDER NO. R9-2013-0001,
AS AMENDED BY ORDER NOS. R9-2015-0001 AND R9-2015-0100
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The San Diego County Copermittees in Table 1a are subject to waste discharge requirements set forth in this Order.

Table 1a. San Diego County Copermittees

City of Carlsbad	City of Oceanside
City of Chula Vista	City of Poway
City of Coronado	City of San Diego
City of Del Mar	City of San Marcos
City of El Cajon	City of Santee
City of Encinitas	City of Solana Beach
City of Escondido	City of Vista
City of Imperial Beach	County of San Diego
City of La Mesa	San Diego County Regional Airport Authority
City of Lemon Grove	San Diego Unified Port District
City of National City	

The Orange County Copermittees in Table 1b are subject to waste discharge requirements set forth in this Order.

Table 1b. Orange County Copermittees[1]

City of Aliso Viejo	City of Rancho Santa Margarita
City of Dana Point	City of San Clemente
City of Laguna Beach	City of San Juan Capistrano
City of Laguna Hills	City of Laguna Woods
City of Laguna Niguel	County of Orange
City of Mission Viejo	Orange County Flood Control District

~~After the San Diego Water Board receives and considers the Riverside County Copermittees' Report of Waste Discharge and makes any necessary changes to this Order, t~~The Riverside County Copermittees in Table 1c ~~will become~~ are subject to waste

[1] While not listed in Table 1b., the City of Lake Forest remains a Copermittee under this Order until the later effective date of this Order or the effective date of Santa Ana Water Board Tentative Order No. R8-2015-0001. Thereafter, the City of Lake Forest will no longer be considered a Copermittee under this Order because its Phase I MS4 discharges will be regulated by the Santa Ana Water Board pursuant to Water Code section 13228 designation. The requirements of this Order that apply to the City of Lake Forest for the duration of this Order, however, are described in Finding 29 and Footnote 2 to Table B-1.

discharge requirements set forth in this Order ~~after expiration of Order No.R9-2010-0016, NPDES No. CAS0108766 on or after November 10, 2015~~.

Table 1c. Riverside County Copermittees

City of Murrieta	County of Riverside
City of Temecula	Riverside County Flood Control and Water Conservation District
City of Wildomar	

~~The Riverside County Copermittees may become subject to the requirements of this Order at a date earlier than the expiration date of their current Order subject to the conditions described in Provision F.6 of this Order if the Riverside County Copermittees receive notification of coverage from the San Diego Water Board.~~

The term Copermittee in this Order refers to any San Diego County, Orange County, or Riverside County Copermittee covered under this Order, unless specified otherwise.

This Order provides permit coverage for the Copermittee discharges described in Table 2.

Table 2. Discharge Locations and Receiving Waters

Discharge Points	Locations throughout San Diego Region
Discharge Description	Municipal Separate Storm Sewer System (MS4) Discharges
Receiving Waters	Inland Surface Waters, Enclosed Bays and Estuaries, and Coastal Ocean Waters of the San Diego Region

Table 3. Administrative Information

This Order was adopted by the San Diego Water Board on:	**May 8, 2013**
Order No. R9-2013-0001 became effective on:	**June 27, 2013**
This Order as amended by R9-2015-0001 became effective on:	**April 1, 2015**
This Order as amended by R9-2015-0100 became effective on:	**January 7, 2016**
This Order will expire on:	**June 27, 2018**
The Copermittees must file a Report of Waste Discharge in accordance with Title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than 180 days in advance of the Order expiration date.	

I, David W. Gibson, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on May 8, 2013, as amended by adoption of Order No. R9-2015-0001 on February 11, 2015, and as amended by adoption of Order No. R9-2015-0100 on November 18, 2015.

TENTATIVE

David W. Gibson
Executive Officer

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Attachment A: Discharge Prohibitions and Special Protections A-1
Attachment B: Standard Permit Provisions and General Provisions B-1
Attachment C: Acronyms, Abbreviations and Definitions C-1
Attachment D: Jurisdictional Runoff Management Program Annual Report Form D-1
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Attachment F: Fact Sheet / Technical Report for Order No. R9-2013-0001 as amended by Order Nos. R9-2015-0001 and R9-2015-0100 ..... F-1

I. FINDINGS

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), finds that:

JURISDICTION

1. **MS4 Ownership or Operation.** Each of the Copermittees owns or operates an MS4, through which it discharges storm water and non-storm water into waters of the U.S. within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the U.S.

2. **Legal and Regulatory Authority.** This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]) adopted by the United States Environmental Protection Agency (USEPA), and chapter 5.5, division 7 of the California Water Code (CWC) (commencing with section 13370). This Order serves as an NPDES permit for discharges from MS4s to surface waters. This Order also serves as waste discharge requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

   The San Diego Water Board has the legal authority to issue a regional MS4 permit pursuant to its authority under CWA section 402(p)(3)(B) and 40 CFR 122.26(a)(1)(v). The USEPA also made it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide permits (55 Federal Register [FR] 47990, 48039-48042). The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees and San Diego Water Board.

   The federal regulations make it clear that the Copermittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators (40 CFR 122.26(a)(3)(vi)). This Order does not require the Copermittees to manage storm water outside of their jurisdictional boundaries, but rather to work collectively to improve storm water management within watersheds.

3. **CWA NPDES Permit Conditions.** Pursuant to CWA section 402(p)(3)(B), NPDES permits for storm water discharges from MS4s must include requirements to effectively prohibit non-storm water discharges into MS4s, and require controls to reduce the discharge of pollutants in storm water to the maximum extent practicable (MEP), and to require other provisions as the San Diego Water Board determines are appropriate to control such pollutants. This Order prescribes conditions to assure compliance with the CWA requirements for owners and operators of MS4s to effectively prohibit non-storm water discharges into the MS4s, and require controls to reduce the discharge of pollutants in storm water from the MS4s to the MEP.

4. **CWA and CWC Monitoring Requirements.** CWA section 308(a) and 40 CFR 122.41(h),(j)-(l) and 122.48 require that NPDES permits must specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s also specify additional monitoring and reporting requirements in 40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c). CWC section 13383 authorizes the San Diego Water Board to establish monitoring, inspection, entry, reporting and recordkeeping requirements. This Order establishes monitoring and reporting requirements to implement federal and State requirements. This Order also includes requirements for the Orange County Copermittees to participate in, and together with South Orange County Wastewater Authority and Orange County Health Care Agency, share responsibility for implementing the unified approach to beach water quality monitoring and assessment program set forth in the October 2014 report, *Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County*, issued pursuant to CWC section 13383 in the San Diego Water Board December 5, 2014 Letter Directive.

5. **Total Maximum Daily Loads.** CWA section 303(d)(1)(A) requires that "[e]ach state shall identify those waters within its boundaries for which the effluent limitations are not stringent enough to implement any water quality standard applicable to such waters." The CWA also requires states to establish a priority ranking of impaired water bodies known as Water Quality Limited Segments and to establish Total Maximum Daily Loads (TMDLs) for such waters. This priority list of impaired water bodies is called the Clean Water Act Section 303(d) List of Water Quality Limited Segments, commonly referred to as the 303(d) List. The CWA requires the 303(d) List to be updated every two years.

   TMDLs are numerical calculations of the maximum amount of a pollutant that a water body can assimilate and still meet water quality standards. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point sources (waste load allocations or WLAs) and non-point sources (load allocations or LAs), background contribution, plus a margin of safety. Discharges from MS4s are point source discharges. The federal regulations (40 CFR 122.44(d)(1)(vii)(B)) require that NPDES permits incorporate water quality based effluent limitations (WQBELs) developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, consistent with the assumptions and requirements of any available WLA for the discharge. Requirements of this Order implement the TMDLs established by the San Diego Water Board or USEPA as of the date this Order was amended in 2015. This Order establishes WQBELs consistent with the assumptions and requirements of all available TMDL WLAs assigned to discharges from the Copermittees' MS4s.

6. **Non-Storm Water Discharges.** Pursuant to CWA section 402(p)(3)(B)(ii), this Order requires each Copermittee to effectively prohibit discharges of non-storm water into its MS4. Nevertheless, non-storm water discharges into and from the

MS4s continue to be reported to the San Diego Water Board by the Copermittees and other persons. Monitoring conducted by the Copermittees, as well as the 303(d) List, have identified dry weather, non-storm water discharges from the MS4s as a source of pollutants causing or contributing to receiving water quality impairments in the San Diego Region. The federal regulations (40 CFR 122.26(d)(2)(iv)(B)(1)) require the Copermittees to have a program to prevent illicit discharges to the MS4. The federal regulations, however, allow for specific categories of non-storm water discharges or flows to be addressed as illicit discharges only where such discharges are identified as sources of pollutants to waters of the U.S.

7. **In-Stream Treatment Systems.** Pursuant to federal regulations (40 CFR 131.10(a)), in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S. Authorizing the construction of a runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to accepting waste assimilation as an appropriate use for that water body. Runoff treatment must occur prior to the discharge of runoff into receiving waters. Treatment control best management practices (BMPs) must not be constructed in waters of the U.S. Construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body.

DISCHARGE CHARACTERISTICS AND RUNOFF MANAGEMENT

8. **Point Source Discharges of Pollutants.** Discharges from the MS4s contain waste, as defined in the CWC, and pollutants that adversely affect the quality of the waters of the state. A discharge from an MS4 is a “discharge of pollutants from a point source” into waters of the U.S. as defined in the CWA. Storm water and non-storm water discharges from the MS4s contain pollutants that cause or threaten to cause a violation of surface water quality standards, as outlined in the Water Quality Control Plan for the San Diego Basin (Basin Plan). Storm water and non-storm water discharges from the MS4s are subject to the conditions and requirements established in the Basin Plan for point source discharges.

9. **Potential Beneficial Use Impairment.** The discharge of pollutants and/or increased flows from MS4s may cause or threaten to cause the concentration of pollutants to exceed applicable receiving water quality objectives and impair or threaten to impair designated beneficial uses resulting in a condition of pollution, contamination, or nuisance.

10. **Pollutants Generated by Land Development.** Land development has created and continues to create new sources of non-storm water discharges and pollutants in storm water discharges as human population density increases. This brings higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash. Pollutants from these sources are dumped or washed off the surface by non-storm water or storm water flows into

and from the MS4s. When development converts natural vegetated pervious ground cover to impervious surfaces such as paved highways, streets, rooftops, and parking lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving a developed area without BMPs that can maintain pre-development runoff conditions will contain greater pollutant loads and have significantly greater runoff volume, velocity, and peak flow rate than pre-development runoff conditions from the same area.

11. **Runoff Discharges to Receiving Waters.** The MS4s discharge runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within the eleven hydrologic units comprising the San Diego Region. Historic and current development makes use of natural drainage patterns and features as conveyances for runoff. Rivers, streams and creeks in developed areas used in this manner are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and receiving water. Numerous receiving water bodies and water body segments have been designated as impaired by the San Diego Water Board pursuant to CWA section 303(d).

12. **Pollutants in Runoff.** The most common pollutants in runoff discharged from the MS4s include total suspended solids, sediment, pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., cadmium, copper, lead, and zinc), petroleum products and polynuclear aromatic hydrocarbons, synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus), oxygen-demanding substances (e.g., decaying vegetation, animal waste), detergents, and trash. As operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not prohibit or otherwise control. These discharges may cause or contribute to a condition of pollution or a violation of water quality standards.

13. **Human Health and Aquatic Life Impairment.** Pollutants in runoff discharged from the MS4s can threaten and adversely affect human health and aquatic organisms. Adverse responses of organisms to chemicals or physical agents in runoff range from physiological responses such as impaired reproduction or growth anomalies to mortality. Increased volume, velocity, rate, and duration of storm water runoff greatly accelerate the erosion of downstream natural channels. This alters stream channels and habitats and can adversely affect aquatic and terrestrial organisms.

14. **Water Quality Effects.** The Copermittees' water quality monitoring data submitted to date documents persistent exceedances of Basin Plan water quality objectives for runoff-related pollutants at various watershed monitoring stations. Persistent toxicity has also been observed at several watershed monitoring stations. In addition, bioassessment data indicate that the majority of the monitored receiving waters have

Poor to Very Poor Index of Biological Integrity (IBI) ratings. These findings indicate that runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in the San Diego Region. Non-storm water discharges from the MS4s have been shown to contribute significant levels of pollutants and flow in arid, developed Southern California watersheds, and contribute significantly to exceedances of applicable receiving water quality objectives.

15. **Non-Storm Water and Storm Water Discharges.** Non-storm water discharges from the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard of CWA section 402(p)(3)(B)(iii), which is explicitly for "Municipal … *Stormwater Discharges* (emphasis added)" from the MS4s. Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s must be effectively prohibited.

16. **Best Management Practices.** Waste and pollutants which are deposited and accumulate in MS4 drainage structures will be discharged from these structures to waters of the U.S. unless they are removed. These discharges may cause or contribute to, or threaten to cause or contribute to, a condition of pollution in receiving waters. For this reason, pollutants in storm water discharges from the MS4s can be and must be effectively reduced in runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Pollution prevention is the reduction or elimination of pollutant generation at its source and is the best "first line of defense." Source control BMPs (both structural and non-structural) minimize the contact between pollutants and runoff, therefore keeping pollutants onsite and out of receiving waters. Treatment control BMPs remove pollutants that have been mobilized by storm water or non-storm water flows.

17. **BMP Implementation.** Runoff needs to be addressed during the three major phases of development (planning, construction, and use) in order to reduce the discharge of storm water pollutants to the MEP, effectively prohibit non-storm water discharges, and protect receiving waters. Development which is not guided by water quality planning policies and principles can result in increased pollutant load discharges, flow rates, and flow durations which can negatively affect receiving water beneficial uses. Construction sites without adequate BMP implementation result in sediment runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. Existing development can generate substantial pollutant loads which are discharged in runoff to receiving waters. Retrofitting areas of existing development with storm water pollutant control and hydromodification management BMPs is necessary to address storm water discharges from existing development that may cause or contribute to a condition of pollution or a violation of water quality standards.

18. **Water Quality Improvements.** Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit

non-storm water discharges to the MS4s and control pollutants in storm water discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the CWA.

19. **Long Term Planning and Implementation.** Federal regulations require municipal storm water permits to expire 5 years from adoption, after which the permit must be renewed and reissued. The San Diego Water Board recognizes that the degradation of water quality and impacts to beneficial uses of the waters in the San Diego Region occurred over several decades. The San Diego Water Board further recognizes that a decade or more may be necessary to realize demonstrable improvement to the quality of waters in the San Diego Region. This Order includes a long term planning and implementation approach that will require more than a single permit term to complete.

WATER QUALITY STANDARDS

20. **Basin Plan.** The San Diego Water Board adopted the Water Quality Control Plan for the San Diego Basin (Basin Plan) on September 8, 1994, that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for receiving waters addressed through the plan. The Basin Plan was subsequently approved by the State Water Resources Control Board (State Water Board) on December 13, 1994. Subsequent revisions to the Basin Plan have also been adopted by the San Diego Water Board and approved by the State Water Board. Requirements of this Order implement the Basin Plan.

    The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Process Supply (PROC), Industrial Service Supply (IND), Ground Water Recharge (GWR), Contact Water Recreation (REC1), Non-contact Water Recreation (REC2), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Freshwater Replenishment (FRSH), Hydropower Generation (POW), and Preservation of Biological Habitats of Special Significance (BIOL). The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region: Navigation (NAV), Commercial and Sport Fishing (COMM), Estuarine Habitat (EST), Marine Habitat (MAR), Aquaculture (AQUA), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN), and Shellfish Harvesting (SHELL).

21. **Ocean Plan.** The State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, and 2005. The State Water Board adopted the latest amendment on ~~April 21, 2005~~ October 16, 2012 and it became effective on ~~February 14, 2006~~ August 19, 2013. The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean. Requirements of this Order implement the Ocean Plan.

    The Ocean Plan identifies the following beneficial uses of ocean waters of the state to be protected: Industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture; preservation and enhancement of designated Areas of Special Biological Significance; rare and endangered species; marine habitat; fish spawning and shellfish harvesting.

22. **Sediment Quality Control Plan**. On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes: 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

23. **National Toxics Rule and California Toxics Rule.** USEPA adopted the National Toxics Rule (NTR) on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the NTR applied in California. On May 18, 2000, USEPA adopted the California Toxics Rule (CTR). The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants.

24. **Antidegradation Policy.** This Order is in conformance with the federal Antidegradation Policy described in 40 CFR 131.12, and State Water Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality Waters in California*. Federal regulations at 40 CFR 131.12 require that the State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. State Water Board Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies. The Fact Sheet of this Order contains additional discussion about antidegradation.

25. **Anti-Backsliding Requirements.** Section 402(o)(2) of the CWA and federal regulations at 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations may be relaxed. All effluent limitations in this Order are at least as stringent as effluent limitations in the previous permits. The Fact Sheet of this Order contains additional discussion about anti-backsliding.

CONSIDERATIONS UNDER FEDERAL AND STATE LAW

26. **Coastal Zone Act Reauthorization Amendments.** Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states with approved coastal zone management programs to address non-point source pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point source pollution: agriculture, silviculture, urban, marinas, and hydromodification. This Order addresses the management measures required for the urban category, with the exception of septic systems. The runoff management programs developed pursuant to this Order fulfills the need for coastal cities to develop a runoff non-point source plan identified in the Non-Point Source Program Strategy and Implementation Plan. The San Diego Water Board addresses septic systems through the administration of other programs.

27. **Endangered Species Act.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 USC sections 1531 to 1544). This Order requires compliance with receiving water limits, and other requirements to protect the beneficial uses of waters of the State. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

28. **Report of Waste Discharge Process.** The waste discharge requirements set forth in this Order are based upon the Report of Waste Discharge submitted by the San Diego County Copermittees prior to the expiration of Order No. R9-2007-0001 (NPDES No. CAS0109266), ~~and~~ the Report of Waste Discharge submitted by the Orange County Copermittees prior to the expiration of Order No. R9-2009-0002 (CAS0108740), and the Report of Waste Discharge submitted by the Riverside County Copermittees prior to the expiration of Order No. R9-2010-0016 (CAS0108766). ~~The Riverside County Copermittees are not immediately covered by the waste discharge requirements in this Order. The San Diego Water Board understands that each municipality is unique although the Counties share watersheds and/or geographical boundaries. The Order will continue to use the Report of Waste Discharge process prior to initially making Riverside County Copermittees subject to the requirements of this Order.~~

The federal regulations (40 CFR 122.21(d)(2)) and CWC section 13376 impose a duty on the Copermittees to reapply for continued coverage through submittal of a Report of Waste Discharge no later than 180 days prior to expiration of a currently effective permit. The expiration date of this Order as shown in Table 3, and requirement to file a Report of Waste Discharge no later than 180 days prior to the expiration date of the Order, applies jointly to the San Diego County, Orange County, and Riverside County Copermittees. ~~This requirement is set forth in the Riverside County Copermittees' currently effective permit at ProvisionK.2.c. The Riverside County MS4 Permit, Order No. R9-2010-0016 (NPDES No. CAS0108766) expires on November 10, 2015.~~

~~Unless the Riverside County Copermittees apply for and receive early coverage under this Order, the Riverside County Copermittees' permit will be superseded by this Order upon expiration of their permit, subject to any necessary revisions to the requirements of this Order made after the San Diego Water Board considers their Report of Waste Discharge through the public process provided in 40 CFR Part 124.~~

29. Regional Water Board Designation. The Cities of Laguna Hills, Laguna Woods, ~~and~~ Lake Forest, Menifee, Murrieta, and Wildomar are located partially within the jurisdictions of the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board) and the San Diego Water Board and their discharges are subject to regulation by both Regional Water Boards. CWC section 13228 provides a way to streamline the regulation of entities whose jurisdictions straddle the border of two or more Regions. CWC section 13228 is implemented in this Order at the request of these six cities and to ease the regulatory burden of municipalities that lie in both the San Diego Water Board's and the adjacent Santa Ana Water Board's jurisdiction. MS4 discharges from these municipalities are regulated by the San Diego Water Board and Santa Ana Water Board as follows:

a. Pursuant to CWC section 13228, the Cities of Laguna Hills, Laguna Woods, and Lake Forest submitted written requests that one Regional Water Board be designated to regulate Phase I MS4 discharges for each of the Cities. The Santa Ana Water Board and the San Diego Water Board have entered into an agreement dated February 10, 2015, whereby the Cities of Laguna Woods and Laguna Hills are largely regulated by the San Diego Water Board under this Order, including those portions of the Cities of Laguna Woods and Laguna Hills not within the San Diego Water Board's jurisdiction, upon the effective date of this Order or Santa Ana Water Board Order No. R8-2015-0001, whichever is later. Similarly, the City of Lake Forest, including those portions of the City of Lake Forest within the San Diego Water Board's jurisdiction, is largely regulated by the Santa Ana Water Board under Order No. R8-2015-0001 (NPDES No. CAS618030) upon the later effective date of this Order or Order No. R8-2015-0001. The agreement provides that the City of Lake Forest is required to retain, and continue implementation of, its over-irrigation discharge prohibition in Title 15, Chapter 14.030, List (b) of the City Municipal Code for regulating storm water quality throughout its jurisdiction. The agreement also requires the City of Lake Forest to actively participate during development and implementation of the Aliso

Creek Watershed Management Area Water Quality Improvement Plan required pursuant to this Order. Each Regional Water Board retains the authority to enforce provisions of its Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee under the terms of the agreement (Water Code section 13228 (b)). Under the terms of the agreement, any TMDL and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Laguna Woods, Laguna Hills or Lake Forest as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement of the applicable TMDL will remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's San Diego Creek/Newport Bay TMDL and the San Diego Water Board's Indicator Bacteria Project I Beaches and Creeks TMDL. The San Diego Water Board will periodically review the effectiveness of the agreement during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate the agreement with Santa Ana Water Board or otherwise modify the agreement subject to the approval of the Santa Ana Water Board.

b. Pursuant to CWC section 13228, the Cities of Murrieta, Wildomar, and Menifee submitted written requests that one Regional Water Board be designated to regulate Phase I MS4 discharges for each of the Cities. The Santa Ana Water Board and the San Diego Water Board have entered into an agreement dated October 26, 2015, whereby the Cities of Murrieta and Wildomar are largely regulated by the San Diego Water Board under this Order, including those portions of the Cities of Murrieta and Wildomar not within the San Diego Water Board's jurisdiction, upon the effective date of this Order. Similarly, the City of Menifee is largely regulated by the Santa Ana Water Board under Order No. R8-2010-0033 as it may be amended or reissued, including those portions of the City of Menifee within the San Diego Water Board's jurisdiction, upon the effective date of this Order. The agreement also requires the City of Menifee to actively participate during development and implementation of the Santa Margarita River Watershed Management Area Water Quality Improvement Plan required pursuant to this Order. Each Regional Water Board retains the authority to enforce provisions of its Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee under the terms of the agreement (Water Code section 13228 (b)). Under the terms of the agreement, any TMDL and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Menifee, Murrieta, or Wildomar as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement of the applicable TMDL will remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's Lake Elsinore/Canyon Lake Nutrient

TMDLs. The San Diego Water Board will periodically review the effectiveness of the agreement during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate the agreement with Santa Ana Water Board or otherwise modify the agreement subject to the approval of the Santa Ana Water Board.

30. **Integrated Report and Clean Water Act Section 303(d) List.** The San Diego Water Board and State Water Board submit an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. USEPA issued its *Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act* on July 29, 2005, which advocates the use of a five category approach for classifying the attainment status of water quality standards for water bodies in the Integrated Report. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 in the Integrated Report are placed on the 303(d) List.

    Water bodies with available data and/or information that indicate at least one beneficial use is not being supported or is threatened, but a TMDL is not required, are included in Category 4 in the Integrated Report. Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

    Implementation of the requirements of this Order may allow the San Diego Water Board to include surface waters impaired by discharges from the Copermittees' MS4s in Category 4 in the Integrated Report for consideration during the next 303(d) List submittal by the State to USEPA.

31. **Economic Considerations.** The California Supreme Court has ruled that although CWC section 13263 requires the State and Regional Water Boards (collectively Water Boards) to consider factors set forth in CWC section 13241 when issuing an NPDES permit, the Water Board may not consider the factors to justify imposing pollutant restrictions that are less stringent than the applicable federal regulations require. (*City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 618, 626-627.) However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

    As noted in the following finding, the San Diego Water Board finds that the requirements in this Order are not more stringent than the minimum federal

requirements. Therefore, a CWC section 13241 analysis is not required for permit requirements that implement the effective prohibition on the discharge of non-storm water into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determined appropriate to control such pollutants, as those requirements are mandated by federal law. Notwithstanding the above, the San Diego Water Board has developed an economic analysis of the requirements in this Order. The economic analysis is provided in the Fact Sheet.

32. **Unfunded Mandates.** This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following:

    a. This Order implements federally mandated requirements under CWA section 402 (33 USC section 1342(p)(3)(B)).

    b. The local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental and new dischargers who are issued NPDES permits for storm water and non-storm water discharges.

    c. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order.

    d. The Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)) and in lieu of numeric restrictions on their MS4 discharges (i.e. effluent limitations).

    e. The local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under State law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

    f. The provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state develops a TMDL, federal law requires that permits must contain water quality based effluent limitations consistent with the assumptions and requirements of any applicable wasteload allocation (40 CFR 122.44(d)(1)(vii)(B)).

    See the Fact Sheet for further discussion of unfunded mandates.

33. **California Environmental Quality Act.** The issuance of waste discharge requirements and an NPDES permit for the discharge of runoff from MS4s to waters of the U.S. is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 et seq.) in accordance with CWC section 13389.

STATE WATER BOARD DECISIONS

34. **Compliance with Prohibitions and Limitations.** The receiving water limitation language specified in this Order is consistent with language recommended by the USEPA and established in State Water Board Order WQ 99-05, *Own Motion Review of the Petition of Environmental Health Coalition to Review Waste Discharge Requirements Order No. 96-03, NPDES Permit No. CAS0108740*, adopted by the State Water Board on June 17, 1999. The receiving water limitation language in this Order requires storm water discharges from MS4s to not cause or contribute to a violation of water quality standards, which is to be achieved through an iterative approach requiring the implementation of improved and better-tailored BMPs over time. Implementation of the iterative approach to comply with receiving water limitations based on applicable water quality standards is necessary to ensure that storm water discharges from the MS4 will not ultimately cause or contribute to violations of water quality standards and will not create conditions of pollution, contamination, or nuisance.

The San Diego, Orange County, and Riverside County Copermittees have asserted that the prohibitions and limitations may result in many years of noncompliance because years of technical efforts may ultimately be required to achieve compliance with the prohibitions and limitations, especially for wet weather discharges. To address this concern, this Order includes an option that allows a Copermittee to be deemed in compliance with the prohibitions and limitations where more than one permit term may be necessary to achieve full compliance with the prohibitions and limitations. One or more Copermittees within a Watershed Management Area can choose to implement this option.

An alternative compliance pathway option has been included in this Order consistent with the approach described in Order WQ 2015-0075, *In the Matter of Review of Order No. R4-2012-0175, NPDES Permit No. CAS004001, Waste Discharge Requirements for Municipal Separate Storm Sewer System (MS4) Discharges within the Coastal Watersheds of Los Angeles County, Except Those Discharges Originating from the City of Long Beach MS4*, adopted by the State Water Board on June 16, 2015. State Water Board Order WQ 2015-0075 directs the Regional Water Boards to consider a watershed-based planning and implementation approach to compliance with receiving water limitations when issuing Phase I MS4 permits going forward. Order WQ 2015-0075 included seven principles that the Regional Water Boards are expected to follow when incorporating an alternative compliance pathway into an MS4 permit. The Fact Sheet discusses the incorporation of the seven principles stipulated in State Water Board Order WQ 2015-0075 into the alternative compliance pathway option in this Order.

35. **Special Conditions for Areas of Special Biological Significance.** On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving a general exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and

NPDES permitted municipal storm water discharges (General Exception). On June 19, 2012, the State Water Board adopted Order No. 2012-0031, amending the General Exception to require pollutant reductions to be achieved within six years in accordance with ASBS Compliance Plans and ASBS Pollution Prevention Plans. The General Exception requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject to the terms and conditions of the General Exception as amended. The Special Protections contained in Attachment B to the General Exception as amended are applicable to these discharges, and are hereby incorporated into Attachment A of this Order.

ADMINISTRATIVE FINDINGS

36. **Executive Officer Delegation of Authority.** The San Diego Water Board by prior resolution has delegated all matters that may legally be delegated to its Executive Officer to act on its behalf pursuant to CWC section 13223. Therefore, the Executive Officer is authorized to act on the San Diego Water Board's behalf on any matter within this Order unless such delegation is unlawful under CWC section 13223 or this Order explicitly states otherwise.

37. **Standard Provisions.** Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR 122.42, are provided in Attachment B to this Order.

38. **Fact Sheet.** The Fact Sheet for this Order contains background information, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of this Order. The Fact Sheet is hereby incorporated into this Order and constitutes part of the Findings of this Order.

39. **Public Notice.** In accordance with State and federal laws and regulations, the San Diego Water Board notified the Copermittees, and interested agencies and persons of its intent to prescribe waste discharge requirements for the control of discharges into and from the MS4s to waters of the U.S. and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet.

40. **Public Hearings.** The San Diego Water Board held a public hearing on April 10 and 11, 2013, that was continued to May 8, 2013 and heard and considered all comments pertaining to the terms and conditions of this Order. The San Diego Water Board also held a public workshop on October 8, 2015, and a public hearing

on February 11, 2015, and heard and considered all comments pertaining to the amendment of this Order through Order No. R9-2015-0001. The San Diego Water Board also held a public hearing on November 18, 2015, and heard and considered all comments pertaining to the amendment of this Order through Order No. R9-2015-0100. Details of these public hearings are provided in the Fact Sheet.

41. **Effective Date.** This Order serves as an NPDES permit pursuant to CWA section 402 or amendments thereto, and as to the San Diego County Copermittees listed in Table ~~2.~~1a~~.~~, became effective fifty (50) days after the date of its adoption, and as to the Orange County Copermittees listed in Table ~~2.~~1b~~.~~, ~~becomes~~ became effective on April 1, 2015, after Order No. R9-2015-0001 was ~~is~~ adopted, and as to the Riverside County Copermittees listed in Table 1c, became effective on January 7, 2016, after Order No. R9-2015-0100 was adopted, provided that the Regional Administrator, USEPA, Region IX, does not object to this Order.

42. **Review by the State Water Board.** Any person aggrieved by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with CWC section 13320 and California Code of Regulations, title 23, sections 2050, and following. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date of this Order, except that if the thirtieth day following the date of this Order falls on a Saturday, Sunday or State holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

THEREFORE, IT IS HEREBY ORDERED that the Copermittees, in order to meet the provisions contained in division 7 of the CWC (commencing with section 13000) and regulations adopted thereunder, and the provisions of the CWA and regulations adopted thereunder, must each comply with the requirements of this Order. This action in no way prevents the San Diego Water Board from taking enforcement action for past violations of the previous Order applicable to the Copermittees. If any part of this Order is subject to a temporary stay of enforcement, unless otherwise specified, the Copermittees must comply with the analogous portions of the previous Order, which will remain in effect for all purposes during the pendency of the stay.

II. PROVISIONS

A. PROHIBITIONS AND LIMITATIONS

The purpose of this provision is to describe the conditions under which storm water and non-storm water discharges into and from MS4s are prohibited or limited. The goal of the prohibitions and limitations is to protect the water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through the implementation of water quality improvement strategies and runoff management programs that effectively prohibit non-storm water discharges into the Copermittees' MS4s, and reduce pollutants in storm water discharges from the Copermittees' MS4s to the MEP.

1. Discharge Prohibitions

a. Discharges from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the state are prohibited.

b. Non-storm water discharges into MS4s are to be effectively prohibited, through the implementation of Provision E.2, unless such discharges are authorized by a separate NPDES permit.

c. Discharges from MS4s are subject to all waste discharge prohibitions in the Basin Plan, included in Attachment A to this Order.

d. Storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012, as amended by State Water Board Resolution No. 2012-0031, applicable to these discharges, included in Attachment A to this Order. All other discharges from the Copermittees' MS4s to ASBS are prohibited.

2. Receiving Water Limitations

a. Discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters, including but not limited to all applicable provisions contained in:

(1) The San Diego Water Board's Basin Plan, including beneficial uses, water quality objectives, and implementation plans;

(2) State Water Board plans for water quality control including the following:

(a) Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries (Thermal Plan), and

(b) The Ocean Plan, including beneficial uses, water quality objectives, and implementation plans;

(3) State Water Board policies for water and sediment quality control including the following:

(a) Water Quality Control Policy for the Enclosed Bays and Estuaries of California,

(b) Sediment Quality Control Plan which includes the following narrative objectives for bays and estuaries:

(i) Pollutants in sediments shall not be present in quantities that, alone or in combination, are toxic to benthic communities, and

(ii) Pollutants shall not be present in sediments at levels that will bioaccumulate in aquatic life to levels that are harmful to human health,

(c) The Statement of Policy with Respect to Maintaining High Quality of Waters in California;[2]

(4) Priority pollutant criteria promulgated by the USEPA through the following:

(a) National Toxics Rule (NTR)[3] (promulgated on December 22, 1992 and amended on May 4, 1995), and

(b) California Toxics Rule (CTR).[4,5]

b. Discharges from MS4s composed of storm water runoff must not alter natural ocean water quality in an ASBS.

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[2] State Water Board Resolution No. 68-16
[3] 40 CFR 131.36
[4] 65 Federal Register 31682-31719 (May 18, 2000), adding Section 131.38 to 40 CFR
[5] If a water quality objective and a CTR criterion are in effect for the same priority pollutant, the more stringent of the two applies.

3. Effluent Limitations

a. Technology Based Effluent Limitations

Pollutants in storm water discharges from MS4s must be reduced to the MEP.[6]

b. Water Quality Based Effluent Limitations

Each Copermittee must comply with applicable WQBELs established for the TMDLs in Attachment E to this Order, pursuant to the applicable TMDL compliance schedules.

4. Compliance with Discharge Prohibitions and Receiving Water Limitations

Each Copermittee must achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order through timely implementation of control measures and other actions as specified in Provisions B and E of this Order, including any modifications. The Water Quality Improvement Plans required under Provision B must be designed and adapted to ultimately achieve compliance with Provisions A.1.a, A.1.c and A.2.a.

a. If exceedance(s) of water quality standards persist in receiving waters notwithstanding implementation of this Order, the Copermittees must comply with the following procedures:

(1) For exceedance(s) of a water quality standard in the process of being addressed by the Water Quality Improvement Plan, the Copermittee(s) must implement the Water Quality Improvement Plan as accepted by the San Diego Water Board, and update the Water Quality Improvement Plan, as necessary, pursuant to Provision F.2.c;

(2) Upon a determination by either the Copermittees or the San Diego Water Board that discharges from the MS4 are causing or contributing to a new exceedance of an applicable water quality standard not addressed by the Water Quality Improvement Plan, the Copermittees must submit the following updates to the Water Quality Improvement Plan pursuant to Provision F.2.c or as part of the Water Quality Improvement Plan Annual Report required under Provision F.3.b, unless the San Diego Water Board directs an earlier submittal:

(a) The water quality improvement strategies being implemented that are effective and will continue to be implemented,

[6] This does not apply to MS4 discharges which receive subsequent treatment to reduce pollutants in storm water discharges to the MEP prior to entering receiving waters (e.g., low flow diversions to the sanitary sewer). Runoff treatment must occur prior to the discharge of runoff into receiving waters per Finding 7.

(b) Water quality improvement strategies (i.e. BMPs, retrofitting projects, stream and/or habitat rehabilitation projects, adjustments to jurisdictional runoff management programs, etc.) that will be implemented to reduce or eliminate any pollutants or conditions that are causing or contributing to the exceedance of water quality standards,

(c) Updates to the schedule for implementation of the existing and additional water quality improvement strategies, and

(d) Updates to the monitoring and assessment program to track progress toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a of this Order;

(3) The San Diego Water Board may require the incorporation of additional modifications to the Water Quality Improvement Plan required under Provision B. The applicable Copermittees must submit any modifications to the update to the Water Quality Improvement Plan within 90 days of notification that additional modifications are required by the San Diego Water Board, or as otherwise directed;

(4) Within 90 days of the San Diego Water Board determination that the modifications to the Water Quality Improvement Plan required under Provision A.4.a.(3) meet the requirements of this Order, the applicable Copermittees must revise the jurisdictional runoff management program documents to incorporate the modified water quality improvement strategies that have been and will be implemented, the implementation schedule, and any additional monitoring required; and

(5) Each Copermittee must implement the updated Water Quality Improvement Plan.

b. The procedure set forth above to achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order do not have to be repeated for continuing or recurring exceedances of the same water quality standard(s) following implementation of scheduled actions unless directed to do otherwise by the San Diego Water Board.

c. Nothing in Provisions A.4.a and A.4.b prevents the San Diego Water Board from enforcing any provision of this Order while the applicable Copermittees prepare and implement the above update to the Water Quality Improvement Plan and jurisdictional runoff management programs.

B. WATER QUALITY IMPROVEMENT PLANS

The purpose of this provision is to develop Water Quality Improvement Plans that guide the Copermittees' jurisdictional runoff management programs towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plans is to further the Clean Water Act's objective to protect, preserve, enhance, and restore the water quality and designated beneficial uses of waters of the state. This goal will be accomplished through an adaptive planning and management process that identifies the highest priority water quality conditions within a watershed and implements strategies through the jurisdictional runoff management programs to achieve improvements in the quality of discharges from the MS4s and receiving waters.

1. Watershed Management Areas

The Copermittees must develop a Water Quality Improvement Plan for each of the Watershed Management Areas in Table B-1. A total of ten Water Quality Improvement Plans must be developed for the San Diego Region.

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
San Juan (901.00)	South Orange County	- Aliso Creek - San Juan Creek - San Mateo Creek - Pacific Ocean - Heisler Park ASBS	- City of Aliso Viejo - City of Dana Point - City of Laguna Beach - City of Laguna Hills[1] - City of Laguna Niguel - City of Laguna Woods[1] - City of Lake Forest[2] - City of Mission Viejo - City of Rancho Santa Margarita - City of San Clemente - City of San Juan Capistrano - County of Orange - Orange County Flood Control District
Santa Margarita (902.00)	Santa Margarita River	- Murrieta Creek - Temecula Creek - Santa Margarita River - Santa Margarita Lagoon - Pacific Ocean	- City of Menifee[3] - City of Murrieta[~~3~~4] - City of Temecula[~~3~~] - City of Wildomar[~~3~~4] - County of Riverside[~~3~~] - County of San Diego[4] - Riverside County Flood Control and Water Conservation District[~~3~~]
San Luis Rey (903.00)	San Luis Rey River	- San Luis Rey River - San Luis Rey Estuary - Pacific Ocean	- City of Oceanside - City of Vista - County of San Diego

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
Carlsbad (904.00)	Carlsbad	- Loma Alta Slough - Buena Vista Lagoon - Agua Hedionda Lagoon - Batiquitos Lagoon - San Elijo Lagoon - Pacific Ocean	- City of Carlsbad - City of Encinitas - City of Escondido - City of Oceanside - City of San Marcos - City of Solana Beach - City of Vista - County of San Diego
San Dieguito (905.00)	San Dieguito River	- San Dieguito River - San Dieguito Lagoon - Pacific Ocean	- City of Del Mar - City of Escondido - City of Poway - City of San Diego - City of Solana Beach - County of San Diego
Penasquitos (906.00)	Penasquitos	- Los Penasquitos Lagoon - Pacific Ocean	- City of Del Mar - City of Poway - City of San Diego - County of San Diego
	Mission Bay	- Mission Bay - Pacific Ocean - San Diego Marine Life Refuge ASBS	- City of San Diego
San Diego (907.00)	San Diego River	- San Diego River - Pacific Ocean	- City of El Cajon - City of La Mesa - City of San Diego - City of Santee - County of San Diego
Pueblo San Diego (908.00) Sweetwater (909.00) Otay (910.00)	San Diego Bay	- Sweetwater River - Otay River - San Diego Bay - Pacific Ocean	- City of Chula Vista - City of Coronado - City of Imperial Beach - City of La Mesa - City of Lemon Grove - City of National City - City of San Diego - County of San Diego - San Diego County Regional Airport Authority - San Diego Unified Port District
Tijuana (911.00)	Tijuana River	- Tijuana River - Tijuana Estuary - Pacific Ocean	- City of Imperial Beach - City of San Diego - County of San Diego

Notes:

1. By agreement dated February 10, 2015, pursuant to Water Code section 13228, the Phase I MS4 discharges within the jurisdiction of the City of Laguna Hills and the City of Laguna Woods located in the Santa Ana Region are regulated by San Diego Water Board Order No. R9-2013-0001 as amended by Order No. R9-2015-0001, upon the later effective date of Order No. R9-2015-0001 or Santa Ana Water Board Tentative Order No. R8-2015-0001. The City of Laguna Hills and Laguna Woods must also comply with the requirements of the San Diego Creek/Newport Bay TMDL in section XVIII of Santa Ana Water Board Order No. R8-2015-0001.
2. By agreement dated February 10, 2015, pursuant to Water Code section 13228, Phase I MS4 discharges within the City of Lake Forest located within the San Diego Water Board Region are regulated by the Santa Ana Water Board Order No. R8-2015-0001 (NPDES No. CAS618030) upon the later effective date of this Order or Santa Ana Water Board Tentative Order No. R8-2015-0001. In accordance with the terms of the agreement between the San Diego Water Board and the Santa Ana Water Board, the City of Lake Forest must implement the requirements of the Bacteria TMDL in Attachment E of this Order, participate in preparation and implementation of the Water Quality Improvement Plan for the Aliso Creek Watershed Management Area as described in Provision B of this Order and continue implementation of its over-irrigation discharge prohibition in its City Ordinance, Title 15, Chapter 15, section 14.030, List (b).
3. By agreement dated October 26, 2015, pursuant to Water Code section 13228, Phase I MS4 discharges within the City of Menifee located within the San Diego Water Board Region are regulated by the Santa Ana Water Board Order No. R8-2010-0033 as it may be amended or reissued (NPDES No. CAS618033) upon the later effective date of this Order. In accordance with the terms of the agreement between the San Diego Water Board and the Santa Ana Water Board, the City of Menifee must participate in preparation and implementation of the Water Quality Improvement Plan for the Santa Margarita River Watershed Management Area as described in Provision B of this Order.~~The Riverside County Copermittees will be covered under this Order after expiration of Order No. R9-2010-0016 or earlier if the Riverside County Copermittees meet the conditions in Provision F.6, upon further amendment of this Order.~~
4. By agreement dated October 26, 2015, pursuant to Water Code section 13228, the Phase I MS4 discharges within the jurisdiction of the City of Murrieta and the City of Wildomar located in the Santa Ana Region are regulated by San Diego Water Board Order No. R9-2013-0001 as amended by Orders No. R9-2015-0001 and R9-2015-0100. The City of Murrieta and City of Wildomar must also comply with the requirements of the Lake Elsinore/Canyon Lake Nutrient TMDLs in section VI.D.2 of Santa Ana Water Board Order No. R8-2010-0033, or corresponding section as it may be amended or reissued.~~The County of San Diego is not required to implement the requirements of Provision B for its jurisdiction within the Santa Margarita River Watershed Management Area~~

~~until the Riverside County Copermittees have been notified of coverage under this Order. The County of San Diego is required to implement the requirements of Provisions D, F.3.b, and Attachment E until the Riverside County Copermittees have been notified of coverage under this Order.~~

2. Priority Water Quality Conditions

The Copermittees must identify the water quality priorities within each Watershed Management Area that will be addressed by the Water Quality Improvement Plan. Where appropriate, Watershed Management Areas may be separated into subwatersheds to focus water quality prioritization and jurisdictional runoff management program implementation efforts by receiving water.

a. Assessment of Receiving Water Conditions

The Copermittees must consider the following, at a minimum, to identify water quality priorities based on impacts of MS4 discharges on receiving water beneficial uses:

(1) Receiving waters listed as impaired on the CWA Section 303(d) List of Water Quality Limited Segments (303(d) List);

(2) TMDLs adopted and under development by the San Diego Water Board;

(3) Receiving waters recognized as sensitive or highly valued by the Copermittees, including estuaries designated under the National Estuary Program under CWA section 320, marine protected areas, wetlands defined by the State or U.S. Fish and Wildlife Service's National Wetlands Inventory as wetlands, waters having the Preservation of Biological Habitats of Special Significance (BIOL) beneficial use designation, and receiving waters identified as ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(4) The receiving water limitations of Provision A.2;

(5) Known historical versus current physical, chemical, and biological water quality conditions;

(6) Available, relevant, and appropriately collected and analyzed physical, chemical, and biological receiving water monitoring data, including, but not limited to, data describing:

(a) Chemical constituents,

(b) Water quality parameters (i.e. pH, temperature, conductivity, etc.),

(c) Toxicity Identification Evaluations for both receiving water column and sediment,

(d) Trash impacts,

(e) Bioassessments, and

(f) Physical habitat;

(7) Available evidence of erosional impacts in receiving waters due to accelerated flows (i.e. hydromodification);

(8) Available evidence of adverse impacts to the chemical, physical, and biological integrity of receiving waters; and

(9) The potential improvements in the overall condition of the Watershed Management Area that can be achieved.

b. ASSESSMENT OF IMPACTS FROM MS4 DISCHARGES

The Copermittees must consider the following, at a minimum, to identify the potential impacts to receiving waters that may be caused or contributed to by discharges from the Copermittees' MS4s:

(1) The discharge prohibitions of Provision A.1 and effluent limitations of Provision A.3; and

(2) Available, relevant, and appropriately collected and analyzed storm water and non-storm water monitoring data from the Copermittees' MS4 outfalls;

(3) Locations of each Copermittee's MS4 outfalls that discharge to receiving waters;

(4) Locations of MS4 outfalls that are known to persistently discharge non-storm water to receiving waters likely causing or contributing to impacts on receiving water beneficial uses;

(5) Locations of MS4 outfalls that are known to discharge pollutants in storm water causing or contributing to impacts on receiving water beneficial uses; and

(6) The potential improvements in the quality of discharges from the MS4 that can be achieved.

c. IDENTIFICATION OF PRIORITY WATER QUALITY CONDITIONS

(1) The Copermittees must use the information gathered for Provisions B.2.a and B.2.b to develop a list of priority water quality conditions as pollutants, stressors and/or receiving water conditions that are the highest threat to receiving water quality or that most adversely affect the quality of receiving waters. The list must include the following information for each priority water quality condition:

(a) The beneficial use(s) associated with the priority water quality condition;

(b) The geographic extent of the priority water quality condition within the Watershed Management Area, if known;

(c) The temporal extent of the priority water quality condition (e.g., dry weather and/or wet weather);

(d) The Copermittees with MS4s discharges that may cause or contribute to the priority water quality condition; and

(e) An assessment of the adequacy of and data gaps in the monitoring data to characterize the conditions causing or contributing to the priority water quality condition, including a consideration of spatial and temporal variation.

(2) The Copermittees must identify the highest priority water quality conditions to be addressed by the Water Quality Improvement Plan, and provide a rationale for selecting a subset of the water quality conditions identified pursuant to Provision B.2.c.(1) as the highest priorities.

d. IDENTIFICATION OF MS4 SOURCES OF POLLUTANTS AND/OR STRESSORS

The Copermittees must identify and prioritize known and suspected sources of storm water and non-storm water pollutants and/or other stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c. The identification of known and suspected sources of pollutants and/or stressors that cause or contribute to the highest priority water quality conditions as identified for Provision B.2.c must consider the following:

(1) Pollutant generating facilities, areas, and/or activities within the Watershed Management Area, including:

(a) Each Copermittee's inventory of construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas,

(b) Publicly owned parks and/or recreational areas,

(c) Open space areas,

(d) All currently operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste, and

(e) Areas not within the Copermittees' jurisdictions (e.g., Phase II MS4s, tribal lands, state lands, federal lands) that are known or suspected to be discharging to the Copermittees' MS4s;

(2) Locations of the Copermittees' MS4s, including the following:

(a) All MS4 outfalls that discharge to receiving waters, and

(b) Locations of major structural controls for storm water and non-storm water (e.g., retention basins, detention basins, major infiltration devices, etc.);

(3) Other known and suspected sources of non-storm water or pollutants in storm water discharges to receiving waters within the Watershed Management Area, including the following:

(a) Other MS4 outfalls (e.g., Phase II Municipal and Caltrans),

(b) Other NPDES permitted discharges,

(c) Any other discharges that may be considered point sources (e.g., private outfalls), and

(d) Any other discharges that may be considered non-point sources (e.g., agriculture, wildlife or other natural sources);

(4) Review of available data, including but not limited to:

(a) Findings from the Copermittees' illicit discharge detection and elimination programs,

(b) Findings from the Copermittees' MS4 outfall discharge monitoring,

(c) Findings from the Copermittees' receiving water monitoring,

(d) Findings from the Copermittees' MS4 outfall discharge and receiving water assessments, and

(e) Other available, relevant, and appropriately collected data, information, or studies related to pollutant sources and/or stressors that contribute to the highest priority water quality conditions as identified for Provision B.2.c.

(5) The adequacy of the available data to identify and prioritize sources and/or stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c.

e. IDENTIFICATION OF POTENTIAL WATER QUALITY IMPROVEMENT STRATEGIES

The Copermittees must evaluate the findings identified under Provisions B.2.a-d, and identify potential strategies that can result in improvements to water quality in MS4 discharges and/or receiving waters within the Watershed Management Area. Potential water quality improvement strategies that may be implemented within the Watershed Management Area must include the following:

(1) Structural BMPs, non-structural BMPs, incentives, or programs that can potentially be implemented to address the highest priority water quality conditions identified under Provision B.2.c, or MS4 sources of pollutants or stressors identified under Provision B.2.d,

(2) Retrofitting projects in areas of existing development within the Watershed Management Area that can potentially be implemented to reduce MS4 sources of pollutants or stressors identified under Provision B.2.d causing or contributing to the highest priority water quality conditions identified under Provision B.2.c, and

(3) Stream, channel, and/or habitat rehabilitation projects within the Watershed Management Area that can potentially be implemented to protect and/or improve conditions in receiving waters from MS4 pollutants and/or stressors identified under Provision B.2.d causing or contributing to the highest priority water quality conditions identified under Provision B.2.c.

3. Water Quality Improvement Goals, Strategies and Schedules

The Copermittees must identify and develop specific water quality improvement goals and strategies to address the highest priority water quality conditions identified within a Watershed Management Area. The water quality improvement goals and strategies must address the highest priority water quality conditions by effectively prohibiting non-storm water discharges to the MS4, reducing pollutants in storm water discharges from the MS4 to the MEP, and protecting the water quality standards of receiving waters.

a. WATER QUALITY IMPROVEMENT GOALS AND SCHEDULES

(1) Numeric Goals

The Copermittees must develop and incorporate numeric goals[7] into the

[7] Interim and final numeric goals may take a variety of forms such as TMDL established WQBELs, action levels, pollutant concentration, load reductions, number of impaired water bodies delisted from the List of Water Quality Impaired Segments, Index of Biotic Integrity (IBI) scores, or other appropriate metrics. Interim and final numeric goals are not necessarily limited to one criterion or indicator, but may include multiple criteria and/or indicators. Except for TMDL established WQBELs, interim and final numeric goals and corresponding schedules may be revised through the adaptive management process under Provision B.5.

Water Quality Improvement Plan. Numeric goals must be used to support Water Quality Improvement Plan implementation and measure reasonable progress towards addressing the highest priority water quality conditions identified under Provision B.2.c. The Copermittees must establish and incorporate the following numeric goals in the Water Quality Improvement Plan:

(a) Final numeric goals must be based on measureable criteria or indicators capable of demonstrating one or more of the following:

(i) Discharges from the Copermittees' MS4s will not cause or contribute to exceedances of water quality standards in receiving waters, AND/OR

(ii) The conditions of receiving waters and associated habitat are protected from MS4 discharges, AND/OR

(iii) Beneficial uses of receiving waters are protected from MS4 discharges and will be supported.

(b) Interim numeric goals must be based on measureable criteria or indicators capable of demonstrating reasonable incremental progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges as follows:

(i) One or more interim numeric goals may be established to demonstrate progress toward achieving each final numeric goal,

(ii) For each final numeric goal, at least one interim numeric goal must be expressed as a reasonable increment toward achievement of the final numeric goal,

(iii) For each final numeric goal, reasonable interim numeric goals must be established to be accomplished during each 5 year period between the acceptance of the Water Quality Improvement Plan and the achievement of the final numeric goals.

(2) <u>Schedules for Achieving Numeric Goals</u>

The Copermittees must develop and incorporate schedules for achieving the numeric goals into the Water Quality Improvement Plan. The schedules must demonstrate reasonable progress toward achieving the final numeric goals required for Provision B.3.a.(1). The Copermittees must incorporate the schedules for achieving the numeric goals into the Water Quality Improvement Plan based on the following considerations:

(a) Final dates for achieving all final numeric goals must be established considering the following:

(i) Final compliance dates for any applicable TMDLs in Attachment E to this Order;

(ii) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(iii) Achievement of the final numeric goals for the highest water quality priorities must be as soon as possible;

(iv) Final dates for achieving the final numeric goals must reflect a realistic assessment of the shortest practicable time required based on the temporal and spatial extent and factors associated with the highest priority water quality conditions identified under Provision B.2.c, and taking into account the time reasonably required to implement the water quality improvement strategies required pursuant to Provision B.3.b.

(b) Interim dates for achieving all interim numeric goals must be established considering the following:

(i) Interim compliance dates for any applicable TMDLs in Attachment E to this Order;

(ii) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(iii) Interim dates for achieving the interim numeric goals must reflect a realistic assessment of the shortest practicable time reasonably required, taking into account the time needed to implement new or significantly expanded programs and securing financing, if necessary; and

(iv) For each final numeric goal, at least one interim numeric goal must be established that the Copermittees will work toward achieving within the term of this Order.

b. WATER QUALITY IMPROVEMENT STRATEGIES AND SCHEDULES

Based on the likely effectiveness and efficiency of the potential water quality improvement strategies identified under Provision B.2.e to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a, the Copermittees must identify the strategies that will be implemented in each Watershed Management Area as follows:

(1) Jurisdictional Strategies

(a) Each Copermittee in the Watershed Management Area must identify the strategies that will be implemented within its jurisdiction as part of its jurisdictional runoff management program requirements under Provisions E.2 through E.7, including descriptions of the following:

(i) For each of the inventories developed for its jurisdiction, as required under Provisions D.2.a.(1), E.3.e.(2), E.4.b, and E.5.a, each Copermittee must identify the known and suspected areas or sources causing or contributing to the highest priority water quality conditions in the Watershed Management Area that the Copermittee will focus on in its efforts to effectively prohibit non-storm water discharges to its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, and achieve the interim and final numeric goals identified under Provision B.3.a;

(ii) BMPs that each Copermittee will implement, or require to be implemented, as applicable, for those areas or sources within its jurisdiction;

(iii) Education programs that each Copermittee will implement, as applicable, for those areas or sources within its jurisdiction;

(iv) Frequencies that each Copermittee will conduct inspections on those areas or sources within its jurisdiction;

(v) Incentive and enforcement programs that each Copermittee will implement, as applicable, for those areas or sources within its jurisdiction; and

(vi) Any other BMPs, incentives, or programs that each Copermittee will implement for those areas or sources within its jurisdiction.

(b) Identify the optional jurisdictional strategies that each Copermittee will implement within its jurisdiction, as necessary, to effectively prohibit non-storm water discharges to its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. Descriptions of the optional jurisdictional strategies must include:

(i) BMPs, incentives, or programs that may be implemented by the Copermittee within its jurisdiction in addition to the requirements of Provisions B.3.b.(1)(a);

(ii) Incentives or programs that may be implemented by the Copermittee to encourage or implement projects to retrofit areas of existing development within its jurisdiction;

(iii) Incentives or programs that may be implemented by the Copermittee to encourage or implement projects that will rehabilitate the conditions of channels or habitats within its jurisdiction;

(iv) The funds and/or resources that must be secured by the Copermittee to implement the optional strategies described for Provisions B.3.b.(1)(b)(i)-(iii) within its jurisdiction; and

(v) The circumstances necessary to trigger implementation of the optional jurisdictional strategies, in addition to the requirements of Provision B.3.b.(1)(a), to achieve the interim and final numeric goals within the schedules established under Provision B.3.a.

(c) Identify the strategies that will be implemented by the Copermittee in coordination with or with the cooperation of other agencies (e.g. Caltrans, water districts, school districts) and/or entities (e.g. non-governmental organizations) within its jurisdiction.

(2) Watershed Management Area Strategies

The Copermittees must identify the optional regional or multi-jurisdictional strategies that will be implemented in the Watershed Management Area, as necessary, to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. Descriptions of the optional regional or multi-jurisdictional strategies must include:

(a) Regional or multi-jurisdictional BMPs, incentives, or programs that may be implemented by the Copermittees in the Watershed Management Area;

(b) Incentives or programs that may be implemented by the Copermittees in the Watershed Management Area to encourage or implement regional or multi-jurisdictional projects to retrofit areas of existing development;

(c) Incentives or programs that may be implemented by the Copermittees to encourage or implement regional or multi-jurisdictional projects that will rehabilitate the conditions of channels, streams, or habitats within the Watershed Management Area;

(d) The funds and/or resources that must be secured by the Copermittees to implement the optional strategies described for Provisions B.3.b.(2)(a)-(c) within the Watershed Management Area; and

(e) The circumstances necessary to trigger implementation of the optional regional or multi-jurisdictional strategies to achieve the interim and final numeric goals within the schedules established under Provision B.3.a.

(3) Schedules for Implementing Strategies

The Copermittees must develop reasonable schedules for implementing the water quality improvement strategies identified under Provisions B.3.b.(1) and B.3.b.(2) to achieve the interim and final numeric goals identified and schedules established under Provision B.3.a. The Copermittees must incorporate the schedules to implement the water quality improvement strategies into the Water Quality Improvement Plan as follows:

(a) Each Copermittee must develop schedules for the jurisdictional strategies identified pursuant to Provisions B.3.b.(1)(a)-(b). Each schedule must specify:

(i) If each jurisdictional strategy identified pursuant to Provision B.3.b.(1)(a) will or will not be initiated upon acceptance of the Water Quality Improvement Plan;

(ii) For each jurisdictional strategy identified pursuant to Provision B.3.b.(1)(a) that will not be initiated upon acceptance of the Water Quality Improvement Plan, the shortest practicable time in which each jurisdictional strategy will be initiated after acceptance of the Water Quality Improvement Plan;

(iii) For each optional jurisdictional strategy identified pursuant to Provision B.3.b.(1)(b), a realistic assessment of the shortest practicable time required to:

[a] Secure the resources needed to fund the optional jurisdictional strategy, and
[b] Procure the resources, materials, labor, and applicable permits necessary to initiate implementation of the optional jurisdictional strategy;

(iv) If each jurisdictional strategy identified pursuant to Provisions B.3.b.(1)(a)-(b) is expected to be continuously implemented (e.g. inspections) or completed within a schedule (e.g. construction of structural BMP); and

(v) If a jurisdictional strategy identified pursuant to Provisions B.3.b.(1)(a)-(b) is expected to be completed within a schedule, the anticipated time to complete based on a realistic assessment of the shortest practicable time required.

(b) The Copermittees in the Watershed Management Area must develop schedules for the regional or multi-jurisdictional strategies identified pursuant to Provision B.3.b.(2). Each schedule must specify:

(i) A realistic assessment of the shortest practicable time to:

[a] Secure the resources needed to fund the optional regional or multi-jurisdictional strategy, and
[b] Procure the resources, materials, labor, and permits necessary to initiate the implementation of the optional regional or multi-jurisdictional strategy;

(ii) If each regional or multi-jurisdictional strategy identified pursuant to Provision B.3.b.(2) is expected to be continuously implemented (e.g. inspections) or completed within a schedule (e.g. construction of structural BMP); and

(iii) If a regional or multi-jurisdictional strategy and/or activity identified pursuant to Provisions B.3.b.(2) is expected to be completed within a schedule, the anticipated time to complete based on a realistic assessment of the shortest practicable time required.

(4) Optional Watershed Management Area Analysis

(a) For each Watershed Management Area, the Copermittees have the option to perform a Watershed Management Area Analysis for the purpose of developing watershed-specific requirements for structural BMP implementation, as described in Provision E.3.c.(3). The Watershed Management Area Analysis must include GIS layers (maps) as output. The analysis must include the following information, to the extent it is available, in order to characterize the Watershed Management Areas:

(i) A description of dominant hydrologic processes, such as areas where infiltration or overland flow likely dominates;

(ii) A description of existing streams in the watershed, including bed material and composition, and if they are perennial or ephemeral;

(iii) Current and anticipated future land uses;

(iv) Potential coarse sediment yield areas; and

(v) Locations of existing flood control structures and channel structures, such as stream armoring, constrictions, grade control structures, and hydromodification or flood management basins.

(b) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify and compile a list of candidate projects that could potentially be used as

alternative compliance options for Priority Development Projects, to be implemented in lieu of onsite structural BMP performance requirements described in Provisions E.3.c.(1) and E.3.c.(2)(a). Specifically, the Copermittees must identify opportunities to be included in the list of candidate projects in each Watershed Management Area, such as:

(i) Stream or riparian area rehabilitation;

(ii) Retrofitting existing infrastructure to incorporate storm water retention or treatment;

(iii) Regional BMPs;

(iv) Groundwater recharge projects;

(v) Water supply augmentation projects; and

(vi) Land purchases to preserve floodplain functions.

(c) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify areas within the Watershed Management Area where it is appropriate to allow Priority Development Projects to be exempt from the hydromodification management BMP performance requirements described in Provision E.3.c.(2), including supporting rationale.

c. Prohibitions and Limitations Compliance Option

Each Copermittee has the option to utilize the implementation of the Water Quality Improvement Plan to demonstrate compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b within a Watershed Management Area subject to the following conditions:

(1) A Copermittee is eligible to be deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b within a Watershed Management Area when the Water Quality Improvement Plan for a Watershed Management Area incorporates the following:

(a) Numeric goals, water quality improvement strategies, and schedules developed pursuant to Provisions B.3.a and B.3.b that include the following:

(i) Interim and final WQBELs established by the TMDLs in Attachment E to this Order applicable to the Copermittee's jurisdiction within the Watershed Management Area; AND

(ii) Interim and final numeric goals for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012

(included as Attachment A to this Order) applicable to the Copermittee's jurisdiction within the Watershed Management Area; AND

(iii) Interim and final numeric goals applicable to the Copermittee's MS4 discharges within the Watershed Management Area expressed as numeric concentration-based or load-based goals for all pollutants and conditions listed on the Clean Water Act Section 303(d) List of Water Quality Impaired Segments[8] for the receiving waters in the Watershed Management Area that do not have a TMDL incorporated into Attachment E to this Order; AND/OR

(iv) Interim and final numeric goals for pollutants and conditions identified as receiving water priorities in the Water Quality Improvement Plan that will result in chemical, physical, and biological conditions protective of the beneficial uses of the receiving waters impacted by the Copermittee's MS4 discharges within the Watershed Management Area; AND

(v) The Copermittee has the option to include interim and final numeric goals applicable to the Copermittee's MS4 discharges and/or receiving waters within the Watershed Management Area for any pollutants or conditions in addition to those described in Provisions B.3.c.(1)(a)(i)-(iv); AND

(vi) Schedules for achieving each final numeric goal that reflect a realistic assessment of the shortest practicable time needed for achievement; AND

(vii) For each final numeric goal developed pursuant to Provisions B.3.a and B.3.c.(1)(a)(i)-(v), annual milestones[9] and the dates for their achievement must be included within each of the next five (5) Water Quality Improvement Plan Annual Report reporting periods, or until the final numeric goal is achieved. Annual milestones and the dates for their achievement for the 5 Water Quality Improvement Plan Annual Report reporting periods of the next permit term, or until the final numeric goal is achieved, must be provided as part of the Report of Waste Discharge required pursuant to Provision F.5.

(b) An analysis that meets all of the following conditions:

(i) The analysis, with clearly stated assumptions included in the analysis, must quantitatively demonstrate that the implementation of

[8] 2010 and subsequent 303(d) Lists

[9] Annual milestones for each final numeric goal must be clearly and directly linked to, or demonstrate progress is being made toward the achievement of the final numeric goal. The annual milestones may consist of water quality improvement strategy implementation phases, interim numeric goals, and other acceptable metrics. The annual milestones may address multiple numeric goals and/or multiple water bodies, as applicable and appropriate.

the water quality improvement strategies required under Provision B.3.b will achieve the final numeric goals within the schedules developed pursuant to Provisions B.3.a and B.3.c.(1)(a).

(ii) The development of the analysis must include a public participation process which allows the public to review and provide comments on the analysis methodology utilized and the assumptions included in the analysis. Public comments and responses must be included as part of the analysis documentation included in the Water Quality Improvement Plan.

(iii) The analysis may be performed by an individual Copermittee or jointly by two or more Copermittees choosing to utilize this compliance option for their jurisdictions within the Watershed Management Area.

(iv) The analysis must be updated as part of the iterative approach and adaptive management process required under Provisions B.5.a-b.

(c) Specific monitoring and assessments required pursuant to Provision B.4.a that will be performed by the Copermittee capable of 1) demonstrating whether the implementation of the water quality improvement strategies are making progress toward achieving the numeric goals in accordance with the established schedules developed pursuant to Provisions B.3.a and B.3.c.(1)(a), and 2) determining whether interim and final numeric goals have been achieved. The specific monitoring and assessments must be updated as part of the iterative approach and adaptive management process required under Provision B.5.c.

(d) Documentation showing that the numeric goals, schedules, and annual milestones proposed pursuant to Provision B.3.c.(1)(a), the analysis performed pursuant to Provision B.3.c.(1)(b), and the specific monitoring and assessments proposed pursuant to Provision B.3.c.(1)(c) have been reviewed by the Water Quality Improvement Consultation Panel (see Provision F.1.a.(1)(b)). Updates must be reviewed by the Water Quality Improvement Consultation Panel for any recommendations.

(2) Each Copermittee that voluntarily completes the requirements of Provision B.3.c.(1) is deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b for the pollutants and conditions for which numeric goals are developed when the Water Quality Improvement Plan, incorporating the requirements of Provision B.3.c.(1), is accepted by the San Diego Water Board pursuant to Provision F.1.b or F.2.c. The Copermittee is deemed in compliance during the term of this Order as long as:

(a) The Copermittee is implementing the water quality improvement strategies within its jurisdiction developed pursuant to Provision B.3.b.(1) and in

compliance with the schedules for implementing the strategies established pursuant to Provisions B.3.b.(3)(a) and B.3.c.(1)(a)(vii); AND

(b) The Copermittee is performing the monitoring and assessments developed pursuant to Provision B.3.c.(1)(c); AND

(c) The Copermittee's assessments in the Water Quality Improvement Plan Annual Report submitted pursuant to Provision F.3.b.(3) support a conclusion that: 1) the Copermittee is in compliance with the annual milestones and dates for achievement developed pursuant to Provision B.3.c.(1)(a)(vii), OR 2) the Copermittee has provided acceptable rationale and recommends appropriate modifications to the interim numeric goals, and/or water quality improvement strategies, and/or schedules to improve the rate of progress toward achieving the final numeric goals developed pursuant to Provisions B.3.a and B.3.c.(1)(a)(i)-(vi); AND

(d) Any proposed modifications to the numeric goals, strategies, schedules, and/or annual milestones are accepted by the San Diego Water Board as part of subsequent updates to the Water Quality Improvement Plan pursuant to Provision F.2.c;[10] AND

(e) The Copermittee is implementing the requirements of Provision A.4.a.

4. Water Quality Improvement Monitoring and Assessment Program

a. The Copermittees in each Watershed Management Area must develop and incorporate an integrated monitoring and assessment program into the Water Quality Improvement Plan that assesses: 1) the progress toward achieving the numeric goals and schedules, 2) the progress toward addressing the highest priority water quality conditions for each Watershed Management Area, and 3) each Copermittee's overall efforts to implement the Water Quality Improvement Plan.

b. The monitoring and assessment program must incorporate the monitoring and assessment requirements of Provision D, which may allow the Copermittees to modify the program to be consistent with and focus on the highest priority water quality conditions for each Watershed Management Area.

c. For Watershed Management Areas with applicable TMDLs, the monitoring and assessment program must incorporate the specific monitoring and assessment requirements of Attachment E.

[10] A request for proposed changes to the Water Quality Improvement Plan does not stay any permit condition.

d. For Watershed Management Areas with any ASBS, the water quality monitoring and assessment program must incorporate the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

5. Iterative Approach and Adaptive Management Process

The Copermittees in each Watershed Management Area must implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a, and must include the following:

a. RE-EVALUATION OF PRIORITY WATER QUALITY CONDITIONS

The priority water quality conditions and potential water quality improvement strategies included in the Water Quality Improvement Plan pursuant to Provisions B.2.c and B.2.e may be re-evaluated by the Copermittees as needed during the term of this Order as part of the Water Quality Improvement Plan Annual Report. Re-evaluation and recommendations for modifications to the priority water quality conditions and potential water quality improvement strategies must be provided in the Report of Waste Discharge, and must consider the following:

(1) Achieving the outcome of improved water quality in MS4 discharges and receiving waters through implementation of the water quality improvement strategies identified in the Water Quality Improvement Plan;

(2) New information developed when the requirements of Provisions B.2.a-c have been re-evaluated;

(3) Spatial and temporal accuracy of monitoring data collected to inform prioritization of water quality conditions and implementation strategies to address the highest priority water quality conditions;

(4) Availability of new information and data from sources other than the jurisdictional runoff management programs within the Watershed Management Area that informs the effectiveness of the actions implemented by the Copermittees;

(5) San Diego Water Board recommendations; and

(6) Recommendations for modifications solicited through a public participation process.

b. ADAPTATION OF GOALS, STRATEGIES AND SCHEDULES

The water quality improvement goals, strategies and schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.3, must be re-evaluated and adapted as new information becomes available to result in more effective and efficient measures to address the highest priority water quality conditions identified pursuant to Provision B.2.c. Re-evaluation of and modifications to the water quality improvement goals, strategies and schedules must be provided in the Water Quality Improvement Plan Annual Report, and must consider the following:

(1) Modifications to the priority water quality conditions based on Provision B.5.a;

(2) Progress toward achieving interim and final numeric goals in receiving waters and MS4 discharges for the highest priority water quality conditions in the Watershed Management Area,

(3) Progress toward achieving outcomes according to established schedules;

(4) New policies or regulations that may affect identified numeric goals;

(5) Measurable or demonstrable reductions of non-storm water discharges to and from each Copermittee's MS4;

(6) Measurable or demonstrable reductions of pollutants in storm water discharges from each Copermittee's MS4 to the MEP;

(7) New information developed when the requirements of Provisions B.2.b and B.2.d have been re-evaluated;

(8) Efficiency in implementing the Water Quality Improvement Plan;

(9) San Diego Water Board recommendations; and

(10) Recommendations for modifications solicited through a public participation process.

c. ADAPTATION OF MONITORING AND ASSESSMENT PROGRAM

The water quality improvement monitoring and assessment program, included in the Water Quality Improvement Plan pursuant to Provision B.4, must be re-evaluated and adapted when new information becomes available. Re-evaluation and recommendations for modifications to the monitoring and assessment program, pursuant to the requirements of Provision D, may be provided in the Water Quality Improvement Plan Annual Report, but must be provided in the Report of Waste Discharge.

d. ADAPTATION OF PROHIBITIONS AND LIMITATIONS COMPLIANCE OPTION

If a Copermittee has implemented the Prohibitions and Limitations Compliance Option allowed to be included in the Water Quality Improvement Plan pursuant to Provision B.3.c, the Copermittee must re-evaluate and adapt the numeric goals, water quality improvement strategies, schedules, and annual milestones required under Provision B.3.c.(1) when significant new information becomes available, or with the Report of Waste Discharge required pursuant to Provision F.5. Significant changes in the numeric goals, water quality improvement strategies, schedules, or annual milestones requires an update to the analysis required under Provision B.3.c.(2).

6. Water Quality Improvement Plan Submittal, Updates, and Implementation

a. The Copermittees must submit and commence implementation of the Water Quality Improvement Plans in accordance with the requirements of Provision F.1.

b. The Copermittees must submit proposed updates to the Water Quality Improvement Plan for acceptance by the San Diego Water Board Executive Officer in accordance with the requirements of Provision F.2.c.

C. ACTION LEVELS

The purpose of this provision is for the Copermittees to incorporate numeric action levels in the Water Quality Improvement Plans. The goal of the action levels is to guide Water Quality Improvement Plan implementation efforts and measure progress towards the protection of water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through monitoring and assessing the quality of the MS4 discharges during the implementation of the Water Quality Improvement Plans.

1. Non-Storm Water Action Levels[11]

The Copermittees must develop and incorporate numeric non-storm water action levels (NALs) into the Water Quality Improvement Plan to: 1) support the development and prioritization of water quality improvement strategies for effectively prohibiting non-storm water discharges to the MS4s, 2) assess the effectiveness of the water quality improvement strategies toward addressing MS4 non-storm water discharges, required pursuant to Provision D.4.b.(1), and 3) support the detection and elimination of non-storm water and illicit discharges to the MS4, required pursuant to Provision E.2.[12]

a. The following NALs must be incorporated:

(1) Non-Storm Water Discharges from MS4s to Ocean Surf Zone

Table C-1. Non-Storm Water Action Levels for Discharges from MS4s to Ocean Surf Zone

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Total Coliform	MPN/100 ml	1,000	-	10,000/1,000[1]	OP
Fecal Coliform	MPN/100 ml	200[2]	-	400	OP
Enterococci	MPN/100 ml	35	-	104[3]	OP

Abbreviations/Acronyms
AMAL – average monthly action level
MDAL – maximum daily action level
OP – Ocean Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Total coliform density NAL is 1,000 MPN/100 ml when the fecal/total coliform ratio exceeds 0.1.
2. Fecal coliform density NAL is 200 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas."

[11] NALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, unless the NAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed.
[12] The Copermittees may utilize NALs or other benchmarks currently established by the Copermittees as interim NALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

(2) Non-Storm Water Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Table C-2. Non-Storm Water Action Levels for Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Turbidity	NTU	75	-	225	OP
pH	Units	Within limit of 6.0 to 9.0 at all times			OP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	35	-	104[3]	BP
Priority Pollutants	µg/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
OP – Ocean Plan water quality objective
NTU – Nephelometric Turbidity Units
µg/L – micrograms per liter
MDAL – maximum daily action level
BP – Basin Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas" and is not applicable to water bodies that are not designated with the water contact recreation (REC-1) beneficial use.

Table C-3. Non-Storm Water Action Levels for Priority Pollutants

Parameter	Units	Freshwater (CTR)		Saltwater (CTR)	
		MDAL	AMAL	MDAL	AMAL
Cadmium	µg/L	**	**	16	8
Copper	µg/L	*	*	5.8	2.9
Chromium III	µg/L	**	**	-	-
Chromium VI	µg/L	16	8.1	83	41
Lead	µg/L	*	*	14	2.9
Nickel	µg/L	**	**	14	6.8
Silver	µg/L	*	*	2.2	1.1
Zinc	µg/L	*	*	95	47

Abbreviations/Acronyms:
CTR – California Toxic Rule
AMAL – average monthly action level
µg/L – micrograms per liter
MDAL – maximum daily action level

Notes:
* Action levels developed on a case-by-case basis (see below)
** Action levels developed on a case-by-case basis (see below), but calculated criteria are not to exceed Maximum Contaminant Levels (MCLs) under the California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64431

The Cadmium, Copper, Chromium (III), Lead, Nickel, Silver and Zinc NALs for MS4 discharges to freshwater receiving waters will be developed on a case-by-case basis based on site-specific water quality data (receiving water hardness). For these priority pollutants, refer to 40 CFR 131.38(b)(2).

(3) Non-Storm Water Discharges from MS4s to Inland Surface Waters

Table C-4. Non-Storm Water Action Levels for Discharges from MS4s to Inland Surface Waters

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Dissolved Oxygen	mg/L	Not less than 5.0 in WARM waters and not less than 6.0 in COLD waters			BP
Turbidity	NTU	-	20	See MDAL	BP
pH	Units	Within limit of 6.5 to 8.5 at all times			BP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	33	-	61[3]	BP
Total Nitrogen	mg/L	-	1.0	See MDAL	BP
Total Phosphorus	mg/L	-	0.1	See MDAL	BP
MBAS	mg/L	-	0.5	See MDAL	BP
Iron	mg/L	-	0.3	See MDAL	BP
Manganese	mg/L	-	0.05	See MDAL	BP
Priority Pollutants	µg/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
BP – Basin Plan water quality objective
COLD – cold freshwater habitat beneficial use
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
MDAL – maximum daily action level
WARM – warm freshwater habitat beneficial use
MBAS – Methylene Blue Active Substances
MPN/100 ml – most probable number per 100 milliliters
µg/L – micrograms per liter

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for freshwater "designated beach areas" and is not applicable to water bodies that are not designated with the water contact recreation (REC-1) beneficial use.

b. If not identified in Provision C.1.a, NALs must be identified, developed and incorporated in the Water Quality Improvement Plan for any pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in receiving waters associated with the highest priority water quality conditions related to non-storm water discharges from the MS4s. NALs must be based on:

(1) Applicable water quality standards which may be dependent upon site-specific or receiving water-specific conditions or assumptions to be identified by the Copermittees; or

(2) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the NALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary NALs specific to the Watershed Management Area at levels greater than the NALs required by Provisions C.1.a and C.1.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for effectively prohibiting non-storm water discharges to the MS4s, as well as the detection and

elimination of non-storm water and illicit discharges to and from the MS4. The secondary NALs may be developed using an approach acceptable to the San Diego Water Board.

d. Dry weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.b may be utilized to develop or revise NALs based on watershed-specific data, subject to San Diego Water Board Executive Officer approval.

2. Storm Water Action Levels[13]

The Copermittees must develop and incorporate numeric storm water action levels (SALs) in the Water Quality Improvement Plans to: 1) support the development and prioritization of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s, and 2) assess the effectiveness of the water quality improvement strategies toward reducing pollutants in storm water discharges, required pursuant to Provision D.4.b.(2).[14]

a. The following SALs for discharges of storm water from the MS4 must be incorporated:

Table C-5. Storm Water Action Levels for Discharges from MS4s to Receiving Waters

Parameter	Units	Action Level
Turbidity	NTU	126
Nitrate & Nitrite (Total)	mg/L	2.6
Phosphorus (Total P)	mg/L	1.46
Cadmium (Total Cd)*	µg/L	3.0
Copper (Total Cu)*	µg/L	127
Lead (Total Pb)*	µg/L	250
Zinc (Total Zn)*	µg/L	976

Abbreviations/Acronyms:
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
µg/L – micrograms per liter

Notes:
* The sampling must include a measure of receiving water hardness at each MS4 outfall. If a total metal concentration exceeds the corresponding metals SAL in Table C-5, that concentration must be compared to the California Toxics Rule criteria and the USEPA 1-hour maximum concentration for the detected level of receiving water hardness associated with that sample. If it is determined that the sample's total metal concentration for that specific metal exceeds that SAL, but does not exceed the applicable USEPA 1-hour maximum concentration criterion for the measured level of hardness, then the sample result will not be considered above the SAL for that measurement.

[13] SALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, unless the SAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed.

[14] The Copermittees may utilize SALs or other benchmarks currently established by the Copermittees as interim SALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

b. If not identified in Provision C.2.a, SALs must be identified, developed and incorporated in the Water Quality Improvement Plan for pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in receiving waters associated with the highest priority water quality conditions related to storm water discharges from the MS4s. SALs must be based on:

(1) Federal and State water quality guidance and/or water quality standards; and

(2) Site-specific or receiving water-specific conditions; or

(3) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the SALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary SALs specific to the Watershed Management Area at levels greater than the SALs required by Provisions C.2.a and C.2.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s. The secondary SALs may be developed based on the approaches recommended by the State Water Board's Storm Water Panel[15] or using an approach acceptable to the San Diego Water Board.

d. Wet weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.c may be used to develop or revise SALs based upon watershed-specific data, subject to San Diego Water Board Executive Officer approval.

[15] Storm Water Panel Recommendations to the California State Water Resources Control Board: The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities (June 2006)

D. MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS

The purpose of this provision is for the Copermittees to monitor and assess the impact on the conditions of receiving waters caused by discharges from the Copermittees' MS4s under wet weather and dry weather conditions. The goal of the monitoring and assessment program is to inform the Copermittees about the nexus between the health of receiving waters and the water quality condition of the discharges from their MS4s. This goal will be accomplished through monitoring and assessing the conditions of the receiving waters, discharges from the MS4s, pollutant sources and/or stressors, and effectiveness of the water quality improvement strategies implemented as part of the Water Quality Improvement Plans.

1. Receiving Water Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the condition of the receiving waters in each Watershed Management Area during dry weather and wet weather. Following San Diego Water Board acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct long-term receiving water monitoring during implementation of the Water Quality Improvement Plan to assess the long term trends and determine if conditions in receiving waters are improving. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following receiving water monitoring procedures:

a. TRANSITIONAL RECEIVING WATER MONITORING

Until the monitoring requirements and schedules of Provisions D.1.b-e are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following receiving water monitoring in the Watershed Management Area:

(1) Continue the receiving water monitoring programs required in Order Nos. R9-2007-0001 (Monitoring and Reporting Program No. R9-2007-0001 Sections II.A.1-A.5), R9-2009-0002, and R9-2010-0016, unless the Executive Officer provides conditional approval for Copermittees to proceed with implementation of the proposed monitoring and assessment program developed in accordance with Provision B.4;

(2) Continue the monitoring in the Hydromodification Management Plans approved by the San Diego Water Board;

(3) Participate in the following regional receiving water monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring,

(b) Southern California Bight Regional Monitoring, and

(c) Sediment Quality Monitoring;

(4) Implement the monitoring programs developed as part of any implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) for the TMDLs in Attachment E to this Order; and

(5) For Watershed Management Areas with ASBS, implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

b. LONG-TERM RECEIVING WATER MONITORING STATIONS

The Copermittees must select at least one long-term receiving water monitoring station from among the existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees to be representative of the receiving water quality in the Watershed Management Area. Additional long-term receiving water monitoring stations must be selected where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

c. DRY WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three dry weather monitoring events at each of the long-term receiving water monitoring stations. At least one monitoring event must be conducted during the dry season (May 1 – September 30) and at least one monitoring event must be conducted during a dry weather period during the wet season (October 1 – April 30), after the first wet weather event of the season, with an antecedent dry period of at least 72 hours following a storm event producing measureable rainfall of greater than 0.1 inch.

(1) Dry Weather Receiving Water Field Observations

For each dry weather monitoring event, the Copermittees must record field observations consistent with Table D-1 at each long-term receiving water monitoring station.

Table D-1. Field Observations for Receiving Water Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) • Station description (i.e. deposits or stains, vegetation condition, structural condition, and observable biology) • Presence and assessment of trash in and around station

(2) Dry Weather Receiving Water Field Monitoring

For each dry weather monitoring event, if conditions allow the collection of the data, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

Table D-2. Field Monitoring Parameters for Receiving Water Monitoring Stations

Parameters
• pH • Temperature • Specific conductivity • Dissolved oxygen • Turbidity

(3) Dry Weather Receiving Water Analytical Monitoring

For each dry weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable NAL constituents, and

(v) Constituents listed in Table D-3.

Table D-3. Analytical Monitoring Constituents for Receiving Water Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Pesticides	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Mercury • Nickel • Selenium • Thallium • Zinc	• Organophosphate Pesticides • Pyrethroid Pesticides	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(4) Dry Weather Receiving Water Toxicity Monitoring

For each dry weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for aquatic toxicity in accordance with Table D-4. When the State Water Board's Policy for Toxicity Assessment and Control (Toxicity Policy) is approved and in effect, the San Diego Water Board Executive Officer may direct the Copermittees to replace current toxicity program elements with standardized procedures in the Toxicity Policy.

Table D-4. Dry Weather Chronic[1] Toxicity Testing for Receiving Water Monitoring Stations

Organism	Units	Test	USEPA Protocol
Freshwater			
Pimephales promelas (Fathead Minnow)	Pass / Fail	Larval Survival and Growth	EPA-821-R-02-013
Ceriodaphnia dubia (*Daphnid*)	Pass / Fail	Survival and Production	EPA-821-R-02-013
Selenastrum capricornutum (Green Algae)	Pass / Fail	Growth	EPA-821-R-02-013
Marine and Estuarine			
Strongylocentrotus purpuratus *(Purple Sea Urchin)*	Pass / Fail	Embryo-Larval Development	EPA-600-R-95-136

Notes:
1. Chronic toxicity testing is not required at receiving water monitoring stations located at mass loading stations if the channel flows are diverted year-round during dry weather conditions to the sanitary sewer for treatment.

(a) Freshwater Test Species and Methods: If samples are collected in receiving waters with salinity less than 1 ppt, the Copermittees must follow the methods for chronic toxicity tests as established in 40 CFR 136.3 using a single-concentration test design for routine monitoring, or a five-concentration test design for additional toxicity testing if the limitation is exceeded. The Copermittees must estimate the critical life stage chronic toxicity on undiluted samples in accordance with species and short term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms (EPA-821-R-02-013; Table IA, 40 CFR 136). Additional test species may be used by the Copermittees if approved by the San Diego Water Board Executive Officer. The Copermittees must conduct:

(i) A static renewal toxicity test with the fathead minnow, *Pimephales promelas* (Larval Survival and Growth Test Method 1000.0);

(ii) A static renewal toxicity test with the daphnid, *Ceriodaphnia dubia* (Survival and Reproduction Test Method 1002.0); and

(iii) A static renewal toxicity test with the green alga, *Selenastrum capricornutum* (also named *Raphidocelis subcapitata*) (Growth Test Method 1003.0).

(b) Marine and Estuarine Test Species and Methods: If samples are collected in receiving waters with salinity greater or equal to 1 ppt, the Copermittees must follow the methods for chronic toxicity tests as established in 40 CFR 136.3 using a single-concentration test design for routine monitoring, or a five-concentration test design for additional toxicity testing if the limitation is exceeded. The Copermittees must conduct the following critical life state chronic toxicity tests on undiluted samples in accordance with species and short term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms (EPA-600-R-95-136; 1995). Artificial sea salts must be used to increase sample salinity. The Copermittees must conduct a static non-renewal toxicity test with the purple sea urchin, *Strongylocentrotus purpuratus* (Embryo-larval Development Test Method). Additional species may be used by the Copermittees if approved by the San Diego Water Board Executive Officer.

(c) Holding Times: All toxicity tests must be conducted as soon as possible following sample collection. The 36-hour sample holding time for test initiation shall be targeted. However, no more than 72 hours shall elapse before the conclusion of sample collection and test initiation.

(d) Test Species Sensitivity Screening: To determine the most sensitive test species for freshwater, the Copermittees must screen 2 wet weather and 2 dry weather toxicity tests with a vertebrate, an invertebrate, and a plant species. After this screening period, subsequent monitoring must be conducted using the most sensitive test species. Alternatively, if a sensitive test species has already been determined, or if there is prior knowledge of potential toxicant(s) and a test species is sensitive to such toxicant(s), then monitoring must be conducted using only that test species. Sensitive test species determinations must also consider the most sensitive test species used for proximal receiving water monitoring. Rescreening must occur once each permit term.

(e) Chronic toxicity test biological endpoint data must be analyzed using the Test of Significant Toxicity t-test approach specified in *National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document* (USEPA, Office of Wastewater Management, Washington, D.C., EPA-833-R-10-003, 2010). For this monitoring program, the critical chronic instream waste concentration (IWC) is set at 100 percent receiving water (i.e. no dilution) for receiving water samples. A 100 percent receiving water and a control must be tested.

(f) Toxicity Identification Evaluation (TIE) / Toxicity Reduction Evaluation (TRE): If chronic toxicity is detected in receiving waters, the Copermittees must discuss the need for conducting a TIE/TRE in the assessments

required under Provision D.4.a.(2), and develop a plan for implementing the TIE/TRE to be incorporated in the Water Quality Improvement Plan.

(5) Dry Weather Receiving Water Bioassessment Monitoring

Bioassessment monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must conduct bioassessment monitoring during at least one dry weather monitoring event at each long-term receiving water monitoring station as follows:

(a) The following bioassessment samples and measurements must be collected:

(i) Macroinvertebrate samples must be collected in accordance with the "Reachwide Benthos (Multihabitat) Procedure" in the most current Surface Water Ambient Monitoring Program (SWAMP) Bioassessment Standard Operating Procedures (SOP), and amendments, as applicable;[16]

(ii) The "Full" suite of physical habitat characterization measurements must be collected in accordance with the most current SWAMP Bioassessment SOP, and as summarized in the SWAMP Stream Habitat Characterization Form – Full Version;[17] and

(iii) Freshwater algae samples must be collected in accordance with the SWAMP Standard Operating Procedures for Collecting Algae Samples.[18] Analysis of samples must include algal taxonomic composition (diatoms and soft algae) and algal biomass.

(b) The bioassessment samples, measurements, and appropriate water chemistry data must be used to calculate the following:

(i) An Index of Biological Integrity (IBI) for macroinvertebrates for each monitoring station where bioassessment monitoring was conducted, based on the most current calculation method;[19] and

[16] Ode, P.R.. 2007. Standard operating procedures for collecting macroinvertebrate samples and associated physical and chemical data for ambient bioassessments in California. California State Water Resources Control Board Surface Water Ambient Monitoring Program (SWAMP) Bioassessment SOP 001. http://www.swrcb.ca.gov/water_issues/programs/swamp/tools.shtml#monitoring
[17] Available at: http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/reports/fieldforms_fullversion052908.pdf
[18] Fetscher et al. 2009. Standard Operating Procedures for Collecting Stream Algae Samples and Associated Physical Habitat and Chemical Data for Ambient Bioassessments in California.
[19] The most current calculation method at the time the Order was adopted is outlined in "A Quantitative Tool for Assessing the Integrity of Southern California Coastal Streams" (Ode, et al. 2005. Environmental Management. Vol. 35, No. 1, pp. 1-13). If an updated or new calculation method is developed, either both

(ii) An IBI for algae for each monitoring station where bioassessment monitoring was conducted, when a calculation method is developed.[20]

(c) In lieu of the requirements of Provision D.1.c.(5)(a), the Copermittees may conduct the bioassessment monitoring in accordance with the "Triad" assessment approach[21] to calculate the IBIs required for Provision D.1.c.(5)(b). The Copermittees must conduct sampling, analysis, and reporting of specified in-stream biological and habitat data according to the protocols specified in the SCCWRP Technical Report No. 539, or subsequent protocols, if developed.

(6) Dry Weather Receiving Water Hydromodification Monitoring

In addition to the hydromodification monitoring conducted as part of the Copermittees' Hydromodification Management Plans, hydromodification monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must collect the following hydromodification monitoring observations and measurements within an appropriate domain of analysis during at least one dry weather monitoring event for each long-term receiving water monitoring station:

(a) Channel conditions, including:

(i) Channel dimensions,

(ii) Hydrologic and geomorphic conditions, and

(iii) Presence and condition of vegetation and habitat;

(b) Location of discharge points;

(c) Habitat integrity;

(d) Photo documentation of existing erosion and habitat impacts, with location (i.e. latitude and longitude coordinates) where photos were taken;

(e) Measurement or estimate of dimensions of any existing channel bed or bank eroded areas, including length, width, and depth of any incisions; and

(i.e. current and updated/new) methods must be used, or historical IBIs must be recalculated with the updated or new calculation method.

[20] When a calculation method is developed, IBIs must be calculated for all available and appropriate historical data.

[21] Stormwater Monitoring Coalition Model Monitoring Technical Committee, 2004. Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California. Technical Report #419. August 2004.

(f) Known or suspected cause(s) of existing downstream erosion or habitat impact, including flow, soil, slope, and vegetation conditions, as well as upstream land uses and contributing new and existing development.

d. WET WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three wet weather monitoring events at each long-term receiving water monitoring station. At least one wet weather monitoring event must be conducted during the first wet weather event of the wet season (October 1 – April 30), and at least one wet weather monitoring event during a wet weather event that occurs after February 1.

(1) Wet Weather Receiving Water Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each long-term receiving water monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event;

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(d) Presence and assessment of trash in and around station.

(2) Wet Weather Receiving Water Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

(3) Wet Weather Receiving Water Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) Constituents listed in Table D-3.

(4) Wet Weather Receiving Water Toxicity Monitoring

For each wet weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for chronic aquatic toxicity in accordance with Provisions D.1.c.(4)(a)-(f).

e. OTHER RECEIVING WATER MONITORING REQUIREMENTS

(1) Regional Monitoring

The Copermittees must participate in the following regional receiving waters monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring; and

(b) Southern California Bight Regional Monitoring and

(c) Unified Beach Water Quality Monitoring and Assessment Program. The Orange County Copermittees shall participate in and, together with South Orange County Wastewater Authority and Orange County Health Care Agency, shall share responsibility for implementation of a unified regional beach water quality monitoring and assessment program in south Orange County, as set forth in the October 2014 report, *Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County* , issued pursuant to CWC section 13383 and subject to future revision in the San Diego Water Board December 5, 2014 Letter Directive.

(2) Sediment Quality Monitoring

The Copermittees must perform sediment monitoring to assess compliance with sediment quality receiving water limits applicable to MS4 discharges to enclosed bays and estuaries. The monitoring may be performed either by individual or multiple Copermittees to assess compliance with receiving water limits, or through participation in a water body monitoring coalition. A Sediment Monitoring Plan which satisfies the requirements of the State Water Board's Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part 1 Sediment Quality (Sediment Control Plan) must be submitted as part of the monitoring and assessment program in the Water Quality Improvement Plan.

(a) The Sediment Monitoring Plan design must include the following:

(i) The elements required under Section VII.D (Receiving Water Limits Monitoring Frequency) and Section VII.E (Sediment Monitoring) of the Sediment Control Plan;

(ii) A Quality Assurance Project Plan (QAPP) describing the project objectives and organization, functional activities, and quality assurance/quality control protocols for the water and sediment monitoring; and

(iii) A schedule for completion of all sample collection and analysis activities and submission of Sediment Monitoring Reports.

(b) The Copermittees must implement the Sediment Monitoring Plan in accordance with the schedule contained in the Sediment Monitoring Plan, unless otherwise directed in writing by the San Diego Water Board Executive Officer.

(c) The Copermittees must incorporate a Sediment Monitoring Report as part of the Water Quality Improvement Plan Annual Report in accordance with the schedule contained in the Sediment Monitoring Plan, unless otherwise directed in writing by the San Diego Water Board Executive Officer. The Sediment Monitoring Report must contain the following information:

(i) Analysis: An evaluation, interpretation and tabulation of the water and sediment monitoring data, including interpretations and conclusions as to whether applicable Receiving Water Limitations in this Order have been attained at each sample station;

(ii) Sample Location Map: The locations, type, and number of samples must be identified and shown on a site map; and

(iii) California Environmental Data Exchange Network: A statement certifying that the monitoring data and results have been uploaded into the California Environmental Data Exchange Network (CEDEN).

(d) Based on the Sediment Monitoring Report conclusions the San Diego Water Board may require a human health risk assessment to determine if the human health objective contained in Receiving Water Limitations in Provision A.2.a.(3)(b)(ii) has been attained at each sample station. In conducting a risk assessment, the Copermittees must consider any applicable and relevant information, including California Environmental Protection Agency's (Cal/EPA) Office of Environmental Health Hazard Assessment (OEHHA) policies for fish consumption and risk assessment, Cal/EPA's Department of Toxic Substances Control (DTSC) Risk Assessment, and USEPA Human Health Risk Assessment policies.

(3) ASBS Monitoring

For Watershed Management Areas with ASBS, the Copermittees must implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

f. ALTERNATIVE WATERSHED MONITORING REQUIREMENTS

The San Diego Water Board may direct the Copermittees to participate in an effort to develop alternative watershed monitoring with other regulated entities, other interested parties, and the San Diego Water Board to refine, coordinate, and implement regional monitoring and assessment programs to determine the status and trends of water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams.

2. MS4 Outfall Discharge Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the discharges from the MS4 outfalls in each Watershed Management Area during dry weather and wet weather. Following San Diego Water Board acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct MS4 outfall discharge monitoring during implementation of the Water Quality Improvement Plan to assess the effectiveness of their jurisdictional runoff management programs toward effectively prohibiting non-storm water discharges into the MS4 and reducing pollutants in storm water discharges from their MS4s to the MEP. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following MS4 outfall monitoring procedures:

a. TRANSITIONAL MS4 OUTFALL DISCHARGE MONITORING

Until the monitoring requirements and schedules of Provisions D.2.b-c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following MS4 outfall discharge monitoring in the Watershed Management Area:

(1) MS4 Outfall Discharge Monitoring Station Inventory

Each Copermittee must identify all major MS4 outfalls that discharge directly to receiving waters within its jurisdiction and geo-locate those outfalls on a map of the MS4 pursuant to Provision E.2.b.(1). This information must be compiled into a MS4 outfall discharge monitoring station inventory, and must include the following information:

(a) Latitude and longitude of MS4 outfall point of discharge;

(b) Watershed Management Area;

(c) Hydrologic subarea;

(d) Outlet size;

(e) Accessibility (i.e. safety and without disturbance of critical habitat);

(f) Approximate drainage area; and

(g) Classification of whether the MS4 outfall is known to have persistent dry weather flows, transient dry weather flows, no dry weather flows, or unknown dry weather flows.

(2) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Until the monitoring requirements and schedules of Provision D.2.b are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, each Copermittee must perform dry weather MS4 outfall field screening monitoring to identify non-storm water and illicit discharges within its jurisdiction in accordance with Provision E.2.c, to determine which discharges are transient flows and which are persistent flows, and prioritize the dry weather MS4 discharges that will be investigated and eliminated in accordance with Provision E.2.d.

(a) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Frequency

Each Copermittee must field screen the MS4 outfalls in its inventory developed pursuant to Provision D.2.a.(1) as follows:

(i) For Copermittees with less than 125 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 80 percent of the outfalls must be visually inspected two times per year during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv).

(ii) For Copermittees with 125 major MS4 outfalls or more, but less than or equal to 500 that discharge to receiving waters within a Watershed Management Area, all the outfalls must be visually inspected at least annually during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv).

(iii) For Copermittees with more than 500 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 500 outfalls must be visually inspected at least annually during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv). Copermittees with more than 500 major MS4 outfalls within a Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;

[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(iv) For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major MS4 outfalls within its jurisdiction, at least 500 major MS4 outfalls within its inventory must be visually inspected at least annually during dry weather conditions. Copermittees with more than 500 major MS4 outfalls in more than one Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(v) Inspections of major MS4 outfalls conducted in response to public reports and staff or contractor reports and notifications may count toward the required visual inspections of MS4 outfall discharge monitoring stations.

(b) Transitional Dry Weather MS4 Outfall Discharge Field Screening Visual Observations

(i) An antecedent dry period of at least 72 hours following any storm event producing measurable rainfall greater than 0.1 inch is required prior to conducting field screening visual observations during a field screening monitoring event.

(ii) During the field screening monitoring event, each Copermittee must record visual observations consistent with Table D-5 at each MS4 outfall discharge monitoring station inspected.

Table D-5. Field Screening Visual Observations for MS4 Outfall Discharge Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) - Flow source(s) suspected or identified from non-storm water source investigation - Flow source(s) eliminated during non-storm water source identification • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) - Known or suspected source(s) of pooled or ponded water • Station description (i.e. deposits or stains, vegetation condition, structural condition, observable biology) • Presence and assessment of trash in and around station • Evidence or signs of illicit connections or illegal dumping

(iii) Each Copermittee must implement the requirements of Provisions E.2.d.(2)(c)-(e) based on the field observations required pursuant to Provision D.2.a.(2)(b)(ii).

(iv) Each Copermittee must evaluate field observations together with existing information available from prior reports, inspections and monitoring results to determine whether any observed flowing, pooled, or ponded waters are likely to be transient or persistent flow.[22]

(c) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Records

Based upon the results of the transitional dry weather MS4 outfall discharge field screening monitoring conducted pursuant to Provisions D.2.a.(2)(a)-(b), each Copermittee must update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow.

(3) Transitional Wet Weather MS4 Outfall Discharge Monitoring

Until the monitoring requirements and schedules of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the

[22] Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(a) Transitional Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees must select wet weather MS4 outfall discharge monitoring stations from the inventories developed pursuant to Provision D.2.a.(1) for each Watershed Management Area as follows:

(i) At least five wet weather MS4 outfall discharge monitoring stations that are representative of storm water discharges from areas consisting primarily of residential, commercial, industrial, and typical mixed-use land uses present within the Watershed Management Area;

(ii) At least one wet weather MS4 outfall discharge monitoring station for each Copermittee within the Watershed Management Area; and

(iii) The County of San Diego may select at least two (2) wet weather MS4 outfall discharge monitoring stations for the portion of the Santa Margarita River Watershed Management Area within its jurisdiction to be monitored during the transitional period until the Riverside County Copermittees are notified of coverage under this Order. After the Riverside County Copermittees are notified of coverage under this Order, the Copermittees in the Watershed Management Area must select wet weather MS4 outfall discharge monitoring stations consistent with the requirements above.

(b) Transitional Wet Weather MS4 Outfall Discharge Monitoring Frequency

Each wet weather MS4 outfall discharge monitoring station selected pursuant to Provision D.2.a.(3)(a) must be monitored once during the wet season (October 1 – April 30). The wet weather monitoring events must be selected to be representative of the range of hydrological conditions experienced in the region. At least 10 percent of samples must be conducted during the first wet weather event of the wet season, to include at least one such sample in each Watershed Management Area..

(c) Transitional Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(i) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(ii) The flow rates and volumes measured or estimated from the MS4 outfall (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(d) Transitional Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(e) Transitional Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, and indicator bacteria;

(iv) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

[a] Time-weighted composites collected over the length of the storm event or the first 24 hour period whichever is shorter, composed of discrete samples, which may be collected through the use of automated equipment, or

[b] Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

[c] If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during

the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours;

(v) Only one analysis of the composite of aliquots is required;

(vi) The samples must be analyzed for the following constituents:

[a] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

[b] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and

[c] Constituents listed in Table D-6.

Table D-6. Analytical Monitoring Constituents for Wet Weather MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Nickel • Selenium • Thallium • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(f) Other Transitional Wet Weather MS4 Outfall Discharge Monitoring

The San Diego County Copermittees must continue the wet weather MS4 outfall monitoring program developed under Order No. R9-2007-0001, as approved by the San Diego Water Board, through its planned completion.

b. Dry Weather MS4 Outfall Discharge Monitoring

Each Copermittee must perform dry weather MS4 outfall monitoring to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision

E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. Each Copermittee must conduct the following dry weather MS4 outfall discharge monitoring within its jurisdiction:

(1) Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Each Copermittee must continue to perform the dry weather MS4 outfall discharge field screening monitoring in accordance with the requirements of Provision D.2.a.(2). The Copermittee may adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of persistent flow non-storm water discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of visual inspections performed is equivalent to the number of visual inspections required under Provision D.2.a.(2)(a).

(2) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring

Each Copermittee must perform non-storm water persistent flow MS4 outfall discharge monitoring to determine which persistent non-storm water discharges contain concentrations of pollutants below NALs, and which persistent non-storm water discharges impact receiving water quality during dry weather. Each Copermittee must conduct the following non-storm water persistent flow MS4 outfall discharge monitoring within its jurisdiction:

(a) Prioritization of Non-Storm Water Persistent Flow MS4 Outfalls

Based upon the dry weather MS4 outfall discharge field screening monitoring records developed pursuant to Provision D.2.a.(2)(c), each Copermittee must identify and prioritize the MS4 outfalls with persistent flows based on the highest priority water quality conditions identified in the Water Quality Improvement Plan and any additional criteria developed by the Copermittee, which may include historical data and data from sources other than what the Copermittee collects.

(b) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring Frequency

(i) Based on the prioritization of major MS4 outfalls developed under Provision D.2.b.(2)(a), each Copermittee must identify, at a minimum, the 5 highest priority major MS4 outfalls with non-storm water persistent flows that the Copermittee will monitor within its jurisdiction in each Watershed Management Area. For Responsible Copermittees identified by a TMDL in Attachment E to this Order, if the 5 chosen outfall locations are not sufficient to determine compliance with the TMDL(s), then each Responsible Copermittee

must identify additional MS4 outfall monitoring locations within its jurisdiction sufficient to address compliance with the TMDL(s). If a Copermittee has less than 5 major outfalls within a Watershed Management Area, then the Copermittee must monitor all of its major MS4 outfalls with persistent flows within each Watershed Management Area. The location of the highest priority non-storm water persistent flow MS4 outfall monitoring stations must be identified on the map required pursuant to Provision E.2.b.(1). The map must specify which MS4 outfalls are being monitored for compliance with a TMDL.

(ii) Each of the highest priority non-storm water persistent flow MS4 outfall monitoring stations identified pursuant to Provision D.2.b.(2)(b)(i) must be monitored under dry weather conditions at least semi-annually until one of the following occurs:

[a] The non-storm water discharges have been effectively eliminated (i.e. no flowing, pooled, or ponded water) for three consecutive dry weather monitoring events; or

[b] The source(s) of the persistent flows has been identified as a category of non-storm water discharges that does not require an NPDES permit and does not have to be addressed as an illicit discharge because it was not identified as a source of pollutants (i.e. constituents in non-storm water discharge do not exceed NALs), and the persistent flow can be re-prioritized to a lower priority; or

[c] The constituents in the persistent flow non-storm water discharge do not exceed NALs, and the persistent flow can be re-prioritized to a lower priority; or

[d] The source(s) of the persistent flows has been identified as a non-storm water discharge authorized by a separate NPDES permit.

(iii) Where the criteria under Provision D.2.b.(2)(b)(ii) are not met, but the threat to water quality has been reduced by the Copermittee, the highest priority persistent flow MS4 outfall monitoring stations may be reprioritized accordingly for continued dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1).

(iv) Each Copermittee must document removal or re-prioritization of the highest priority persistent flow MS4 outfall monitoring stations identified under Provision D.2.b.(2)(a) in the Water Quality Improvement Plan Annual Report. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized major MS4 outfall in the Watershed Management Area within its jurisdiction, unless there are no remaining qualifying major MS4 outfalls within the Copermittee's jurisdiction in the Watershed Management Area.

(c) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Observations

During each semi-annual monitoring event, each Copermittee must record field observations consistent with Table D-5 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(d) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Monitoring

During each semi-annual monitoring event, if conditions allow the collection of the data, each Copermittee must monitor and record the parameters in Table D-2 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(e) Non-Storm Water Persistent Flow MS4 Outfall Discharge Analytical Monitoring

During each semi-annual monitoring event in which measurable flow is present, each Copermittee must collect and analyze samples from each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Collect grab or composite samples to be analyzed at a qualified laboratory for the following constituents:

[a] Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,
[b] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,
[c] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,
[d] Applicable NAL constituents, and
[e] Constituents listed in Table D-7. The Copermittees may adjust the list of constituents for the Watershed Management Area if historical data or supporting information can be provided that demonstrates or justifies the analysis of a constituent is not necessary.

Table D-7. Analytical Monitoring Constituents for Persistent Flow MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Total Hardness • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Cadmium • Copper • Lead • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(iv) If the Copermittee identifies and eliminates the source of the persistent flow non-storm water discharge, analysis of the sample is not required.

c. WET WEATHER MS4 OUTFALL DISCHARGE MONITORING

The Copermittees must perform wet weather MS4 outfall monitoring to identify pollutants in storm water discharges from the MS4s, to guide pollutant source identification efforts, and to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order. The Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(1) Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees may adjust the wet weather MS4 outfall discharge monitoring locations in the Watershed Management Area, as needed, to identify pollutants in storm water discharges from MS4s, to guide pollutant source identification efforts, and to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of stations is at least equivalent to the number of stations required under Provision D.2.a.(3)(a). Additional outfall monitoring locations, above the minimum per jurisdiction, may be required to demonstrate compliance with the WQBELs associated with the applicable TMDLs in Attachment E.

(2) Wet Weather MS4 Outfall Discharge Monitoring Frequency

The Copermittees must monitor the wet weather MS4 outfall discharge monitoring stations in the Watershed Management Area at least once (1) per year. The Copermittees may need to increase the frequency of monitoring in order to identify pollutants in storm water discharges from the MS4s causing or contributing to the highest priority water quality conditions, to guide pollutant source identification efforts, or to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order.

(3) Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(4) Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(5) Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites collected over the length of the storm event or the first 24 hour period, whichever is shorter , composed of discrete samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

(iii) If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours.

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) The Copermittees may adjust the analytical monitoring required for the Watershed Management Area, if the Copermittees have historical data or supporting information that can demonstrate or provide justification that the analysis of a constituent is not necessary.

3. Special Studies

a. Within the term of this Order, the Copermittees must initiate the following special studies:

(1) At least two special studies in each Watershed Management Area to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that cause or contribute to highest priority water quality conditions identified in the Water Quality Improvement Plan.

(2) At least one special study for the San Diego Region to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that are impacting receiving waters on a regional basis in the San Diego Region.

(3) One of the two special studies in each Watershed Management Area required pursuant to Provision D.3.a.(1) may be replaced by a special study implemented pursuant to Provision D.3.a.(2).

b. The special studies must, at a minimum, be in conformance with the following criteria:

(1) The special studies must be related to the highest priority water quality conditions identified by the Copermittees in the Watershed Management Area and/or for the entire San Diego Region;

(2) The special studies developed pursuant to Provision D.3.a.(1) must:

(a) Be implemented within the applicable Watershed Management Area, and

(b) Require some form of participation by all the Copermittees within the Watershed Management Area;

(3) The special studies developed pursuant to Provision D.3.a.(2) must:

(a) Be implemented within the San Diego Region, and

(b) Require some form of participation by all Copermittees covered under the requirements of this Order.

(4) The Copermittees are encouraged to partner with environmental groups or third parties knowledgeable of watershed conditions to complete the required special studies.

c. Special studies developed to identify sources of pollutants and/or stressors should be pollutant and/or stressor specific and based on historical monitoring data and monitoring performed pursuant to Provisions D.1 and D.2. Development of source identification special studies should include the following:

(1) A compilation of known information on the specific pollutant and/or stressor, including data on potential sources and movement of the pollutant and/or stressor within the watershed. Data generated by the Copermittees and others, as well as information available from a literature research on the pollutant and/or stressor should be compiled and analyzed as appropriate.

(2) An identification of data gaps, based on the compiled information generated on the specific pollutant and/or stressor identified in Provision D.3.c.(1). Source identification special studies should be developed to fill identified data gaps.

(3) A monitoring plan that will collect and provide data the Copermittees can utilize to do the following:

(a) Quantify the relative loading or impact of a pollutant and/or stressor from a particular source or pollutant generating activity;

(b) Improve understanding of the fate of a pollutant and/or stressor in the environment;

(c) Develop an inventory of known and suspected sources of a pollutant and/or stressor in the Watershed Management Area; and/or

(d) Prioritize known and suspected sources of a pollutant and/or stressor based on relative magnitude in discharges, geographical distribution (i.e., regional or localized), frequency of occurrence in discharges, human health risk, and controllability.

d. Special studies initiated prior to the effective date of this Order that meet the requirements of Provision D.3.b and are implemented during the term of this Order as part of the Water Quality Improvement Plan may be utilized to fulfill the special study requirements of Provision D.3.a. Special studies completed before the effective date of this Order cannot be utilized to fulfill the special study requirements of Provision D.3.a.

e. The Copermittees must submit the monitoring plans for the special studies in the Water Quality Improvement Plans required pursuant to Provision F.1.

f. The Copermittees are encouraged to share the results of the special studies regionally among the Copermittees to provide information useful in improving and adapting the management of non-storm water and storm water runoff through the implementation of the Water Quality Improvement Plans.

4. Assessment Requirements

Each Copermittee must evaluate the data collected pursuant to Provisions D.1, D.2 and D.3, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E, to assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a. Assessments must be performed as described in the following provisions:

a. Receiving Waters Assessments

(1) The Copermittees must assess and report the conditions of the receiving waters in the Watershed Management Area as follows:

(a) Based on data collected pursuant to Provision D.1.a, the assessments under Provision D.4.a.(2) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(b) Based on the data collected pursuant to Provisions D.1.a-e, the assessments required under Provision D.4.a.(2) must be included in the Report of Waste Discharge required pursuant to Provision F.5.b.

(2) The Copermittees must assess the status and trends of receiving water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under dry weather and wet weather conditions. For each of the three types of receiving waters in each Watershed Management Area the Copermittees must:

(a) Determine whether or not the conditions of the receiving waters are meeting the numeric goals established pursuant to Provision B.3.a;

(b) Identify the most critical beneficial uses that must be protected to ensure overall health of the receiving water;

(c) Determine whether or not those critical beneficial uses are being protected;

(d) Identify short-term and/or long-term improvements or degradation of those critical beneficial uses;

(e) Determine whether or not the strategies established in the Water Quality Improvement Plan contribute towards progress in achieving the interim and final numeric goals of the Water Quality Improvement Plan; and

(f) Identify data gaps in the monitoring data necessary to assess Provisions D.4.a.(2)(a)-(e).

b. MS4 OUTFALL DISCHARGES ASSESSMENTS

(1) Non-Storm Water Discharges Reduction Assessments

(a) Each Copermittee must assess and report the progress of its illicit discharge detection and elimination program, required to be implemented pursuant to Provision E.2, toward effectively prohibiting non-storm water and illicit discharges into the MS4 within its jurisdiction as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(2), the assessments under Provision D.4.b.(1)(b) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(ii) Based on the data collected pursuant to Provisions D.2.b, the assessments required under Provision D.4.b.(1)(c) must be included in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

(iii) Based on the data collected pursuant to Provisions D.2.b, the assessment required under Provision D.4.b.(1)(c) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.a.(2), each Copermittee must assess and report the following:

(i) Identify the known and suspected controllable sources (e.g. facilities, areas, land uses, pollutant generating activities) of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area;

(ii) Identify sources of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area that have been reduced or eliminated; and

(iii) Identify modifications to the field screening monitoring locations and frequencies for the MS4 outfalls in its inventory necessary to identify and eliminate sources of persistent flow non-storm water discharges pursuant to Provision D.2.b.

(c) Based on the dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1), each Copermittee must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(1)(b);

(ii) Based on the data collected and applicable NALs in the Water Quality Improvement Plan, rank the MS4 outfalls in the Copermittee's jurisdiction according to potential threat to receiving water quality, and produce a prioritized list of major MS4 outfalls for follow-up action to update the Water Quality Improvement Plan, with the goal of eliminating persistent flow non-storm water discharges and/or pollutant loads in order of the ranked priority list through targeted programmatic actions and source investigations;

(iii) For the highest priority major MS4 outfalls with persistent flows that are in exceedance of NALs, identify the known and suspected sources within the Copermittee's jurisdiction in the Watershed Management Area that may cause or contribute to the NAL exceedances;

(iv) Each Copermittee must analyze the data collected pursuant to Provision D.2.b, and utilize a model or other method, to calculate or estimate the non-storm water volumes and pollutant loads collectively discharged from all the major MS4s outfalls in its jurisdiction identified as having persistent dry weather flows during the monitoring year. These calculations or estimates must be updated annually.

[a] Each Copermittee must calculate or estimate the annual non-storm water volumes and pollutant loads collectively discharged from the Copermittee's major MS4 outfalls to receiving waters within the Copermittee's jurisdiction, with an estimate of the percent contribution from each known source for each MS4 outfall;

[b] Each Copermittee must annually identify and quantify (i.e. volume and pollutant loads) sources of non-storm water not subject to the Copermittee's legal authority that are discharged from the Copermittee's major MS4 outfalls to downstream receiving waters.

(v) Each Copermittee must review the data collected pursuant to Provision D.2.b and findings from the assessments required pursuant to Provision D.4.b.(1)(c)(i)-(iv) at least once during the term of this Order to:

[a] Identify reductions and progress in achieving reductions in non-storm water and illicit discharges to the Copermittee's MS4 in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction, with an estimate, if possible, of the non-storm water volume and/or pollutant load reductions attributable to specific water quality strategies implemented by the Copermittee; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittee in the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction.

(vi) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(1)(c)(i)-(v).

(2) Storm Water Pollutant Discharges Reduction Assessments

(a) The Copermittees must assess and report the progress of the water quality improvement strategies, required to be implemented pursuant to Provisions B and E, toward reducing pollutants in storm water discharges from the MS4s within the Watershed Management Area as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(3), the assessments under Provision D.4.b.(2)(b) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(ii) Based on the data collected pursuant to Provisions D.2.c, the assessments required under Provision D.4.b.(2)(c) must be included in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

(iii) Based on the data collected pursuant to Provisions D.2.c, the assessment required under Provisions D.4.b.(2)(c)-(d) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.a.(3) the Copermittees must assess and report the following:

(i) The Copermittees must analyze the monitoring data collected pursuant to Provision D.2.a.(3), and utilize a watershed model or other method, to calculate or estimate the following for each monitoring year:

[a] The average storm water runoff coefficient for each land use type within the Watershed Management Area;
[b] The volume of storm water and pollutant loads discharged from each of the Copermittee's monitored MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch;
[c] The total flow volume and pollutant loadings discharged from the Copermittee's jurisdiction within the Watershed Management Area over the course of the wet season, extrapolated from the data produced from the monitored MS4 outfalls; and
[d] The percent contribution of storm water volumes and pollutant loads discharged from each land use type within each hydrologic subarea with a major MS4 outfall to receiving waters or within each major MS4 outfall to receiving waters in the Copermittee's jurisdiction within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch.

(ii) Identify modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify pollutants in storm water discharges from the MS4s in the Watershed Management Area pursuant to Provision D.2.c.(1).

(c) Based on the wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.c the Copermittees must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(2)(b);

(ii) Based on the data collected and applicable SALs in the Water Quality Improvement Plan, analyze and compare the monitoring data to the analyses and assumptions used to develop the Water Quality Improvement Plans, including strategies developed pursuant to Provision B.3, and evaluate whether those analyses and assumptions should be updated as a component of the adaptive management efforts pursuant to Provision B.5 for follow-up action to update the Water Quality Improvement Plan;

(iii) The Copermittees must review the data collected pursuant to Provision D.2.c and findings from the assessments required pursuant to Provisions D.4.b.(2)(c)(i)-(ii) at least once during the term of this Order to:

[a] Identify reductions or progress in achieving reductions in pollutant concentrations and/or pollutant loads from different land uses and/or drainage areas discharging from the Copermittees' MS4s in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters within the Watershed Management Area to the MEP, with an estimate, if possible, of the pollutant load reductions attributable to specific water quality strategies implemented by the Copermittees; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittees in the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters in the Watershed Management Area to the MEP.

(iv) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(iii).

(d) The Copermittees must evaluate all the data collected pursuant to Provision D.2.c, and incorporate new outfall monitoring data into time series plots for each long-term monitoring constituent for the Watershed Management Area, and perform statistical trends analysis on the cumulative long-term wet weather MS4 outfall discharge water quality data set.

c. Special Studies Assessments

The Copermittees must annually evaluate the results and findings from the special studies developed and implemented pursuant to Provision D.3, and assess their relevance to the Copermittees' efforts to characterize receiving water conditions, understand sources of pollutants and/or stressors, and control and reduce the discharges of pollutants from the MS4 outfalls to receiving waters in the Watershed Management Area. The Copermittees must report the results of the special studies assessments applicable to the Watershed Management Area, and identify any necessary modifications or updates to the Water Quality Improvement Plan based on the results in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

d. Integrated Assessment of Water Quality Improvement Plan

As part of the iterative approach and adaptive management process required for the Water Quality Improvement Plan pursuant to Provision B.5, the Copermittees in each Watershed Management Area must integrate the data collected pursuant to Provisions D.1-D.3, the findings from the assessments required pursuant to

Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to assess the effectiveness of, and identify necessary modifications to, the Water Quality Improvement Plan as follows:

(1) The Copermittees must re-evaluate the priority water quality conditions and numeric goals for the Watershed Management Area, as needed, during the term of this Order pursuant to Provision B.5.a. The re-evaluation and recommendations for modifications to the priority water quality conditions, and/or numeric goals and corresponding schedules may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The priority water quality conditions and numeric goals for the Watershed Management Area must be re-evaluated as follows:

(a) Re-evaluate the receiving water conditions in the Watershed Management Area in accordance with Provision B.2.a;

(b) Re-evaluate the impacts on receiving waters in the Watershed Management Area from MS4 discharges in accordance with Provision B.2.b;

(c) Re-evaluate the identification of MS4 sources of pollutants and/or stressors in accordance with Provision B.2.d;

(d) Identify beneficial uses of the receiving waters that are protected in accordance with Provision D.4.a;

(e) Evaluate the progress toward achieving the interim and final numeric goals for protecting impacted beneficial uses in the receiving waters.

(2) The Copermittees must re-evaluate the water quality improvement strategies for the Watershed Management Area during the term of this Order pursuant to Provision B.5.b. The re-evaluation and recommendations for modifications to the water quality improvement strategies and schedules may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The water quality improvement strategies for the Watershed Management Area must be re-evaluated as follows:

(a) Identify the non-storm water and storm water pollutant loads from the Copermittees' MS4 outfalls in the Watershed Management Area, calculated or estimated pursuant to Provisions D.4.b;

(b) Identify the non-storm water and storm water pollutant load reductions, or other improvements to receiving water or water quality conditions, that are necessary to attain the interim and final numeric goals identified in the Water Quality Improvement Plan for protecting beneficial uses in the receiving waters;

(c) Identify the non-storm water and storm water pollutant load reductions, or other improvements to the quality of MS4 discharges, that are necessary for the Copermittees to demonstrate that non-storm water and storm water discharges from their MS4s are not causing or contributing to exceedances of receiving water limitations;

(d) Evaluate the progress of the water quality improvement strategies toward achieving the interim and final numeric goals identified in the Water Quality Improvement Plan for protecting beneficial uses in the receiving waters.

(3) The Copermittees must re-evaluate and adapt the water quality monitoring and assessment program for the Watershed Management Area when new information becomes available to improve the monitoring and assessment program pursuant to Provision B.5.c. The re-evaluation and recommendations for modifications to the monitoring and assessment program may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. Modifications to the water quality monitoring and assessment program must be consistent with the requirements of Provision D.1-D.3. The re-evaluation of the water quality monitoring and assessment program for the Watershed Management Area must consider the data gaps identified by the assessments required pursuant to Provisions D.4.a-b, and results of the special studies implemented pursuant to Provision D.4.c.

5. Monitoring Provisions

Each Copermittee must comply with all the monitoring, reporting, and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

E. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS

The purpose of this provision is for each Copermittee to implement a program to control the contribution of pollutants to and the discharges from the MS4 within its jurisdiction. The goal of the jurisdictional runoff management programs is to implement strategies that effectively prohibit non-storm water discharges to the MS4 and reduce the discharge of pollutants in storm water to the MEP. This goal will be accomplished through implementing the jurisdictional runoff management programs in accordance with the strategies identified in the Water Quality Improvement Plans.

Each Copermittee must update its jurisdictional runoff management program document, in accordance with Provision F.2.a, to incorporate all the requirements of Provision E. Until the Copermittee has updated its jurisdictional runoff management program document with the requirements of Provision E, the Copermittee must continue implementing its current jurisdictional runoff management program.

1. Legal Authority Establishment and Enforcement

a. Each Copermittee must establish, maintain, and enforce adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 through statute, ordinance, permit, contract, order, or similar means. This legal authority must, at a minimum, authorize the Copermittee to:

(1) Prohibit and eliminate all illicit discharges and illicit connections to its MS4;

(2) Control the contribution of pollutants in discharges of runoff associated with industrial and construction activity to its MS4 and control the quality of runoff from industrial and construction sites, including industrial and construction sites which have coverage under the statewide General Permit for Discharges of Storm Water Associated with Industrial Activities (Industrial General Permit) or General Permit for Discharges of Storm Water Associated with Construction Activities (Construction General Permit), as well as to those sites which do not;

(3) Control the discharge of spills, dumping, or disposal of materials other than storm water into its MS4;

(4) Control through interagency agreements among Copermittees the contribution of pollutants from one portion of the MS4 to another portion of the MS4;

(5) Control, by coordinating and cooperating with other owners of the MS4 such as Caltrans, the U.S. federal government, or sovereign Native American Tribes through interagency agreements, where possible, the contribution of pollutants from their portion of the MS4 to the portion of the MS4 within the Copermittee's jurisdiction;

(6) Require compliance with conditions in its statutes, ordinances, permits, contracts, orders, or similar means to hold dischargers to its MS4 accountable for their contributions of pollutants and flows;

(7) Require the use of BMPs to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(8) Require documentation on the effectiveness of BMPs implemented to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(9) Utilize enforcement mechanisms to require compliance with its statutes, ordinances, permits, contracts, orders, or similar means; and

(10) Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with its statutes, ordinances, permits, contracts, orders, or similar means and with the requirements of this Order, including the prohibition of illicit discharges and connections to its MS4; the Copermittee must also have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from industrial facilities, including construction sites, discharging into its MS4.

b. With the first Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3), each Copermittee must submit a statement certified by its Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative that the Copermittee has taken the necessary steps to obtain and maintain full legal authority within its jurisdiction to implement and enforce each of the requirements contained in this Order.

2. Illicit Discharge Detection and Elimination

Each Copermittee must implement a program to actively detect and eliminate illicit discharges and improper disposal into the MS4, or otherwise require the discharger to apply for and obtain a separate NPDES permit. The illicit discharge detection and elimination program must be implemented in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include, at a minimum, the following requirements:

a. Non-Storm Water Discharges

Each Copermittee must address all non-storm water discharges as illicit discharges unless a non-storm water discharge is either identified as a discharge authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to the following requirements:

(1) Discharges of non-storm water to the MS4 from the following categories must be addressed as illicit discharges unless the discharge has coverage or meets the exception criteria under NPDES Permit No. CAG919003~~1 (Order No. R9-2007-0034, or subsequent order) for discharges to San Diego Bay, or NPDES Permit No. CAG919002~~ (Order No. R9-2015-0013 ~~2008-0002~~, ~~or subsequent order~~ as it may be amended or reissued) for discharges to surface waters within the San Diego Region ~~other than San Diego Bay~~:

(1) Uncontaminated pumped ground water;

(2) Discharges from foundation drains;[23]

(3) Water from crawl space pumps; and

(4) Water from footing drains.[20]

(2) Discharges of non-storm water from water line flushing and water main breaks to the MS4 must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG679001 (Order No. R9-2010-0003, ~~or subsequent order~~ as it may be amended or reissued) or NPDES General Permit No. CAG140001 (Order 2014-0194-DWQ, as it may be amended or reissued). This category includes water line flushing and water main break discharges from water purveyors issued a water supply permit by the California Department of Public Health or federal military installations. Discharges from recycled or reclaimed water lines to the MS4 must be addressed as illicit discharges, unless the discharges have coverage under a separate NPDES permit.

(3) Discharges of non-storm water to the MS4 from the following categories must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a source of pollutants to receiving waters:

(a) Diverted stream flows;

(b) Rising ground waters;

(c) Uncontaminated ground water infiltration to MS4s;

(d) Springs;

(e) Flows from riparian habitats and wetlands;

[23] Provision E.2.a.(1) only applies to this category of non-storm water if the system is designed to be located at or below the groundwater table to actively or passively extract groundwater during any part of the year.

(f) Discharges from potable water sources;

(g) Discharges from foundation drains;[24] and

(h) Discharges from footing drains.[21]

(4) Discharges of non-storm water to the MS4 from the following categories must be controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means. Discharges of non-storm water to the MS4 from the following categories not controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means must be addressed by the Copermittee as illicit discharges.

(a) Air conditioning condensation

The discharge of air conditioning condensation should be directed to landscaped areas or other pervious surfaces, or to the sanitary sewer, where feasible.

(b) Individual residential vehicle washing

(i) The discharge of wash water should be directed to landscaped areas or other pervious surfaces where feasible; and

(ii) The minimization of water, washing detergent and other vehicle wash products used for residential vehicle washing, and the implementation of other practices or behaviors that will prevent the discharge of pollutants associated with individual residential vehicle washing from entering the MS4 must be encouraged.

(c) Dechlorinated swimming pool discharges

(i) Residual chlorine, algaecide, filter backwash, or other pollutants from swimming pools must be eliminated prior to discharging to the MS4; and

(ii) The discharge of saline swimming pool water must be directed to the sanitary sewer, landscaped areas, or other pervious surfaces that can accommodate the volume of water, unless the saline swimming pool water can be discharged via a pipe or concrete channel directly to a naturally saline water body (e.g. Pacific Ocean).

(5) Firefighting discharges to the MS4 must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board

[24] Provision E.2.a.(3) only applies to this category of non-storm water discharge if the system is designed to be located above the groundwater table at all times of the year, and the system is only expected to discharge non-storm water under unusual circumstances.

identifies the discharge as a significant source of pollutants to receiving waters. Firefighting discharges to the MS4 not identified as a significant source of pollutants to receiving waters, must be addressed, at a minimum, as follows:

(a) Non-emergency firefighting discharges

(i) Building fire suppression system maintenance discharges (e.g. sprinkler line flushing) to the MS4 must be addressed as illicit discharges unless BMPs are implemented to prevent pollutants associated with such discharges to the MS4.

(ii) Non-emergency firefighting discharges (i.e., discharges from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems) must be addressed by a program, to be developed and implemented by the Copermittee, to reduce or eliminate pollutants in such discharges from entering the MS4.

(b) Emergency firefighting discharges

Each Copermittee should develop and encourage implementation of BMPs to reduce or eliminate pollutants in emergency firefighting discharges to the MS4s and receiving waters within its jurisdiction. During emergency situations, priority of efforts should be directed toward life, property, and the environment (in descending order). BMPs should not interfere with immediate emergency response operations or impact public health and safety.

(6) If the Copermittee or San Diego Water Board identifies any category of non-storm water discharges listed under Provisions E.2.a.(1)-(4) as a source of pollutants to receiving waters, the category must be prohibited through ordinance, order, or similar means and addressed as an illicit discharge. Alternatively, the Copermittee may propose controls to be implemented for the category of non-storm water discharges as part of the Water Quality Improvement Plan instead of prohibiting the category of non-storm water discharges, and implement the controls if accepted by the San Diego Water Board as part of the Water Quality Improvement Plan.

(7) Each Copermittee must, where feasible and priorities and resources allow, reduce or eliminate non-storm water discharges listed under Provisions E.2.a.(1)-(4) into its MS4, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit.

b. PREVENT AND DETECT ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to prevent and detect illicit discharges to the MS4:

(1) Each Copermittee must maintain an updated map of its entire MS4 and the corresponding drainage areas. The accuracy of the MS4 map must be confirmed during the field screening required pursuant to Provision E.2.c. The MS4 map must be included as part of the jurisdictional runoff management program document. Any geographic information system (GIS) layers or files used by the Copermittee to maintain the MS4 map must be made available to the San Diego Water Board upon request. The MS4 map must identify the following:

(a) All segments of the MS4 owned, operated, and maintained by the Copermittee;

(b) All known locations of inlets that discharge and/or collect runoff into the Copermittee's MS4;

(c) All known locations of connections with other MS4s not owned or operated by the Copermittee (e.g. Caltrans MS4s);

(d) All known locations of MS4 outfalls and private outfalls that discharge runoff collected from areas within the Copermittee's jurisdiction;

(e) All segments of receiving waters within the Copermittee's jurisdiction that receive and convey runoff discharged from the Copermittee's MS4 outfalls;

(f) Locations of the MS4 outfalls, identified pursuant to Provision D.2.a.(1), within its jurisdiction; and

(g) Locations of the non-storm water persistent flow MS4 outfall discharge monitoring stations, identified pursuant to Provision D.2.b.(2), within its jurisdiction.

(2) Each Copermittee must use Copermittee personnel and contractors to assist in identifying and reporting illicit discharges and connections during their daily employment activities.

(3) Each Copermittee must promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges to or from the MS4, including the following methods for public reporting:

(a) Operate a public hotline, which can be Copermittee-specific or shared by the Copermittees, and must be capable of receiving reports in both English and Spanish 24 hours per day and seven days per week; and

(b) Designate an e-mail address for receiving electronic reports from the public, which can be Copermittee-specific or shared by the Copermittees, and must be prominently displayed on the Copermittee's webpage and the Regional Clearinghouse required pursuant to Provision F.4.

(4) Each Copermittee must implement practices and procedures (including a notification mechanism) to prevent, respond to, contain, and clean up any spills that may discharge into the MS4 within its jurisdiction from any source. The Copermittee must coordinate, to the extent possible, with spill response teams to prevent entry of spills into the MS4, and prevent contamination of surface water, ground water, and soil. The Copermittee must coordinate spill prevention, containment, and response activities throughout all appropriate Copermittee departments, programs, and agencies.

(5) Each Copermittee must implement practices and procedures to prevent and limit infiltration of seepage from sanitary sewers (including private laterals and failing septic systems) to the MS4.

(6) Each Copermittee must coordinate, when necessary, with upstream Copermittees and/or entities to prevent illicit discharges from upstream sources into the MS4 within its jurisdiction.

c. Field Screening

Each Copermittee must conduct field screening (i.e. visual observations, field testing, and/or analytical testing) of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4 in accordance with the dry weather MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

d. Investigate and Eliminate Illicit Discharges And Connections

Each Copermittee must include the following measures within its program to investigate and eliminate illicit discharges to the MS4:

(1) Each Copermittee must prioritize and determine when follow-up investigations will be performed in response to visual observations and/or water quality monitoring data collected during an investigation of a detected non-storm water or illicit discharge to or from the MS4. The criteria for prioritizing investigations must consider the following:

(a) Pollutants identified as causing or contributing to the highest water quality priorities identified in the Water Quality Improvement Plan;

(b) Pollutants identified as causing or contributing, or threatening to cause or contribute to impairments in water bodies on the 303(d) List and/or in environmentally sensitive areas (ESAs), located within its jurisdiction;

(c) Pollutants identified from sources or land uses known to exist within the area, drainage basin, or watershed that discharges to the portion of the MS4 within its jurisdiction included in the investigation;

(d) Pollutants identified as causing or contributing to an exceedance of a NAL in the Water Quality Improvement Plan; and

(e) Pollutants identified as a threat to human health or the environment.

(2) Each Copermittee must implement procedures to investigate and inspect portions of its MS4 that, based on reports or notifications, field screening, or other appropriate information, indicate a reasonable potential of receiving, containing, or discharging pollutants due to illicit discharges, illicit connections, or other sources of non-storm water. The procedures must include the following:

(a) Each Copermittee must develop criteria to:

(i) Assess the validity of each report or notification received; and

(ii) Prioritize the response to each report or notification received.

(b) Each Copermittee must prioritize and respond to each valid report or notification (e.g., public reports, staff or contractor reports and notifications, etc.) of an incident in a timely manner.

(c) In accordance with the requirements of Provision E.2.d.(1), each Copermittee must investigate and seek to identify the source(s) of discharges of non-storm water where flows are observed in and from the MS4 during the field screening required pursuant to Provision D.2.b.(1) as follows:

(i) Obvious illicit discharges must be immediately investigated to identify the source(s) of non-storm water discharges;

(ii) The investigation must include field investigations to identify sources or potential sources for the discharge, unless the source or potential source has already been identified during previous investigations; and

(iii) The investigation may include follow-up field investigations and/or reviewing Copermittee inventories and other land use data to identify potential sources of the discharge.

(d) Each Copermittee must maintain records and a database of the following information:

(i) Location of incident, including hydrologic subarea, portion of MS4 receiving the non-storm water or illicit discharge, and point of discharge or potential discharge from MS4 to receiving water;

(ii) Source of information initiating the investigation (e.g., public reports, staff or contractor reports and notifications, field screening, etc.);

(iii) Date the information used to initiate the investigation was received;

(iv) Date the investigation was initiated;

(v) Dates of follow-up investigations;

(vi) Identified or suspected source of the illicit discharge or connection, if determined;

(vii) Known or suspected related incidents, if any;

(viii) Result of the investigation; and

(ix) If a source cannot be identified and the investigation is not continued, document the response pursuant to the requirements of Provision E.2.d.(4).

(e) Each Copermittee must maintain records and, in accordance with the priorities of the Water Quality Improvement Plan, seek to identify the source(s) of non-storm water discharges from the MS4 where there is evidence of non-storm water having been discharged into or from the MS4 (e.g., pooled water), in accordance with MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

(3) Each Copermittee must initiate the implementation of procedures, in a timely manner, to eliminate all detected and identified illicit discharges and connections within its jurisdiction. The procedures must include the following responses:

(a) Each Copermittee must enforce its legal authority, as required under Provision E.1, to eliminate illicit discharges and connections to the MS4.

(b) If the Copermittee identifies the source as a controllable source of non-storm water or illicit discharge or connection, the Copermittee must implement its Enforcement Response Plan pursuant to Provision E.6 and enforce its legal authority to prohibit and eliminate illicit discharges and connections to its MS4.

(c) If the Copermittee identifies the source of the discharge as a category of non-storm water discharges in Provision E.2.a, and the discharge is in exceedance of NALs in the Water Quality Improvement Plan, then the Copermittee must determine if: (1) this is an isolated incident or set of

circumstances that will be addressed through its Enforcement Response Plan pursuant to Provision E.6, or (2) the category of discharge must be addressed through the prohibition of that category of discharge as an illicit discharge pursuant to Provision E.2.a.(6).

(d) If the Copermittee suspects the source of the non-storm water discharge as natural in origin (i.e. non-anthropogenically influenced) and in conveyance into the MS4, then the Copermittee must document and provide the data and evidence necessary to demonstrate to the San Diego Water Board that it is natural in origin and does not require further investigation.

(e) If the Copermittee is unable to identify and document the source of a recurring non-storm water discharge to or from the MS4, then the Copermittee must address the discharge as an illicit discharge and update its jurisdictional runoff management program to address the common and suspected sources of the non-storm water discharge within its jurisdiction in accordance with the Copermittee's priorities.

(4) Each Copermittee must submit a summary of the non-storm water discharges and illicit discharges and connections investigated and eliminated within its jurisdiction with each Water Quality Improvement Plan Annual Report required under Provision F.3.b.(3) of this Order.

3. Development Planning

Each Copermittee must use their land use and planning authorities to implement a development planning program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. BMP Requirements for All Development Projects

Each Copermittee must prescribe the following BMP requirements during the planning process (i.e. prior to project approval and issuance of local permits) for all development projects (regardless of project type or size), where local permits are issued, including unpaved roads and flood management projects:

(1) General Requirements

(a) Onsite BMPs must be located so as to remove pollutants from runoff prior to its discharge to any receiving waters, and as close to the source as possible;

(b) Structural BMPs must not be constructed within waters of the U.S.

(c) Onsite BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors (e.g. mosquitos, rodents, or flies).

(2) Source Control BMP Requirements

The following source control BMPs must be implemented at all development projects where applicable and feasible:

(a) Prevention of illicit discharges into the MS4;

(b) Storm drain system stenciling or signage;

(c) Protect outdoor material storage areas from rainfall, run-on, runoff, and wind dispersal;

(d) Protect materials stored in outdoor work areas from rainfall, run-on, runoff, and wind dispersal;

(e) Protect trash storage areas from rainfall, run-on, runoff, and wind dispersal; and

(f) Any additional BMPs determined to be necessary by the Copermittee to minimize pollutant generation at each project.

(3) Low Impact Development (LID) BMP Requirements

The following LID BMPs must be implemented at all development projects where applicable and feasible:

(a) Maintenance or restoration of natural storage reservoirs and drainage corridors (including topographic depressions, areas of permeable soils, natural swales, and ephemeral and intermittent streams);[25]

(b) Buffer zones for natural water bodies (where buffer zones are technically infeasible, require project applicant to include other buffers such as trees, access restrictions, etc.);

(c) Conservation of natural areas within the project footprint including existing trees, other vegetation, and soils;

(d) Construction of streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided public safety is not compromised;

[25] Development projects proposing to dredge or fill materials in waters of the U.S. must obtain a CWA Section 401 Water Quality Certification. Projects proposing to dredge or fill waters of the state must obtain waste discharge requirements.

(e) Minimization of the impervious footprint of the project;

(f) Minimization of soil compaction to landscaped areas;

(g) Disconnection of impervious surfaces through distributed pervious areas;

(h) Landscaped or other pervious areas designed and constructed to effectively receive and infiltrate, retain and/or treat runoff from impervious areas, prior to discharging to the MS4;

(i) Small collection strategies located at, or as close as possible to, the source (i.e. the point where storm water initially meets the ground) to minimize the transport of runoff and pollutants to the MS4 and receiving waters;

(j) Use of permeable materials for projects with low traffic areas and appropriate soil conditions;

(k) Landscaping with native or drought tolerant species; and

(l) Harvesting and using precipitation.

b. PRIORITY DEVELOPMENT PROJECTS

Priority Development Projects are land development projects that fall under the planning and building authority of the Copermittee for which the Copermittee must impose specific requirements, in addition to those described in Provision E.3.a, including the implementation of structural BMPs to meet the performance requirements described in Provision E.3.c.

(1) Definition of Priority Development Project

Priority Development Projects include the following:

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(b) Redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site on an existing site of 10,000 square feet or more of impervious surfaces). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(c) New and redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site), and support one or more of the following uses:

(i) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812).

(ii) Hillside development projects. This category includes development on any natural slope that is twenty-five percent or greater.

(iii) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce.

(iv) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

(d) New or redevelopment projects that create and/or replace 2,500 square feet or more of impervious surface (collectively over the entire project site), and discharging directly to an Environmentally Sensitive Area (ESA). "Discharging directly to" includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands).

(e) New development projects, or redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface, that support one or more of the following uses:

(i) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

(ii) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

(f) New or redevelopment projects that result in the disturbance of one or more acres of land and are expected to generate pollutants post construction.

(2) Special Considerations for Redevelopment Projects

The structural BMP performance requirements of Provision E.3.c are applicable to redevelopment Priority Development Projects, as defined in E.3.b.(1), as follows:

(a) Where redevelopment results in the creation or replacement of impervious surface in an amount of less than fifty percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provision E.3.c apply only to the creation or replacement of impervious surface, and not the entire development; or

(b) Where redevelopment results in the creation or replacement of impervious surface in an amount of more than fifty percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provision E.3.c apply to the entire development.

(3) Priority Development Project Exemptions

Each Copermittee has the discretion to exempt the following projects from being defined as Priority Development Projects:

(a) New or retrofit paved sidewalks, bicycle lanes, or trails that meet the following criteria:

(i) Designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas; OR

(ii) Designed and constructed to be hydraulically disconnected from paved streets or roads; OR

(iii) Designed and constructed with permeable pavements or surfaces in accordance with USEPA Green Streets guidance.[26]

(b) Retrofitting or redevelopment of existing paved alleys, streets or roads that are designed and constructed in accordance with the USEPA Green Streets guidance.[27]

c. Priority Development Project Structural BMP Performance Requirements

In addition to the BMP requirements listed for all development projects under Provision E.3.a, Priority Development Projects must also implement structural BMPs that conform to performance requirements described below.

[26] See "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).
[27] Ibid.

(1) Storm Water Pollutant Control BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite structural BMPs to control pollutants in storm water that may be discharged from a project as follows:

(a) Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite the pollutants contained in the volume of storm water runoff produced from a 24-hour 85th percentile storm event (design capture volume);[28]

(i) If a Copermittee determines that implementing BMPs to retain the full design capture volume onsite for a Priority Development Project is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize biofiltration BMPs. Biofiltration BMPs must be designed to have an appropriate hydraulic loading rate to maximize storm water retention and pollutant removal, as well as to prevent erosion, scour, and channeling within the BMP,[29] and must be sized to:

[a] Treat 1.5 times the design capture volume not reliably retained onsite, OR

[b] Treat the design capture volume not reliably retained onsite with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite.

(ii) If a Copermittee determines that biofiltration is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize flow-thru treatment control BMPs to treat runoff leaving the site, AND mitigate for the design capture volume not reliably retained onsite pursuant to Provision E.3.c.(1)(b). Flow thru treatment control BMPs must be sized and designed to:

[28] This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals.

[29] As part of the Copermittee's update to its BMP Design Manual, pursuant to Provision E.3.d, the Copermittee must provide guidance for hydraulic loading rates and other biofiltration design criteria necessary to maximize storm water retention and pollutant removal.

[a] Remove pollutants from storm water to the MEP;
[b] Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;
[c] Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Flow-thru treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of flow-thru treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

(b) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1)(a). The Priority Development Project must mitigate for the portion of the pollutant load in the design capture volume not retained onsite if Provision E.3.c.(3) is utilized. If a Priority Development Project is allowed to utilize alternative compliance, flow-thru treatment control BMPs must be implemented to treat the portion of the design capture volume that is not reliably retained onsite. Flow-thru treatment control BMPs must be sized and designed in accordance with Provisions E.3.c.(1)(a)(ii)[a]-[c].

(2) Hydromodification Management BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite BMPs to manage hydromodification that may be caused by storm water runoff discharged from a project as follows:

(a) Post-project runoff conditions (flow rates and durations) must not exceed pre-development runoff conditions by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat downstream of Priority Development Projects).

(i) In evaluating the range of flows that results in increased potential for erosion of natural (non-hardened) channels, the lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks.

(ii) The Copermittees may use monitoring results collected pursuant to Provision D.1.a.(2) to re-define the range of flows resulting in

increased potential for erosion, or degraded instream habitat conditions, as warranted by the data.

(b) Each Priority Development Project must avoid critical sediment yield areas known to the Copermittee or identified by the optional Watershed Management Area Analysis pursuant to Provision B.3.b.(4), or implement measures that allow critical coarse sediment to be discharged to receiving waters, such that there is no net impact to the receiving water.

(c) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the performance requirements of Provision E.3.c.(2)(a). The Priority Development Project must mitigate for the post-project runoff conditions not fully managed onsite if Provision E.3.c.(3) is utilized.

(d) Exemptions

Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provisions E.3.c.(2) where the project discharges storm water runoff to:

(i) Existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;

(ii) Conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; or

(iii) An area identified by the Copermittees as appropriate for an exemption by the optional Watershed Management Area Analysis incorporated into the Water Quality Improvement Plan pursuant to Provision B.3.b.(4).

(e) Interim Timeframe Exemptions

Until the Copermittees have updated their BMP Design Manual in accordance with Provision F.2.b with the requirements of Provision E, the Copermittees have the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provision E.3.c.(2) where the project discharges storm water runoff directly to:

(i) An engineered channel conveyance system with a capacity to convey peak flows generated by the 10-year storm event all the way from the

point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; and

(ii) Large river reaches with a drainage area larger than 100 square miles and a 100-year flow capacity in excess of 20,000 cubic feet per second, provided that properly sized energy dissipation is included at all Priority Development Project discharge points.

(3) Alternative Compliance Program to Onsite Structural BMP Implementation

At the discretion of each Copermittee, Priority Development Projects may be allowed to participate in an alternative compliance program in lieu of implementing the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a), provided that the Water Quality Improvement Plan includes the optional Watershed Management Area Analysis described in Provision B.3.b.(4), and Water Quality Equivalency calculations have been accepted by the San Diego Water Board's Executive Officer pursuant to Provision E.3.c.(3)(a). The alternative compliance program is available to a Priority Development Project only if the Priority Development Project applicant enters into a voluntary agreement with the Copermittee authorizing this arrangement. In addition to the voluntary agreement, relief from implementing structural BMPs onsite may be authorized by the Copermittee under the following conditions:

(a) Water Quality Equivalency

Copermittees must submit Water Quality Equivalency calculations for acceptance by the San Diego Water Board's Executive Officer prior to administering an alternative compliance program in order to establish a regional and technical basis for determining the water quality benefits associated with alternative compliance projects. Accepted Water Quality Equivalency calculations must be incorporated as part of any Copermittee's alternative compliance program necessary for evaluating Watershed Management Area Analysis candidate projects, project applicant-proposed alternative compliance projects, alternative compliance in lieu fee structures, and alternative compliance water quality credit systems as described in Provisions E.3.c.(3)(b)-(e).

(b) Watershed Management Area Analysis Candidate Projects

The Priority Development Project applicant agrees to fund, contribute funds to, or implement a candidate project identified by the Copermittees in the Watershed Management Area Analysis included in the Water Quality Improvement Plan, pursuant to Provisions B.3.b.(4) subject to the following conditions:

(i) The Copermittee must determine that implementation of the candidate project will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a) onsite;

(ii) If the Priority Development Project applicant chooses to fully or partially fund a candidate project, then the in-lieu fee structure described in Provision E.3.c.(3)(c) must be followed;

(iii) If the Priority Development Project applicant chooses to fully or partially fund a candidate project, then the Copermittee must ensure that the funds to be obtained from the Priority Development Project applicant are sufficient to mitigate for impacts caused by not fully implementing structural BMPs onsite, pursuant to the performance requirements described in Provisions E.3.c.(1) and E.3.c.(2)(a);

(iv) If the Priority Development Project applicant chooses to implement a candidate project, then the Copermittee must ensure that pollutant control and/or hydromodification management within the candidate project are sufficient to mitigate for impacts caused by not implementing structural BMPs fully onsite, pursuant to the performance requirements described in Provisions E.3.c.(1) and E.3.c.(2)(a);

(v) The voluntary agreement to fund, partially fund, or implement a candidate project must include reliable sources of funding for operation and maintenance of the candidate project;

(vi) Design of the candidate project must be conducted under an appropriately qualified engineer, geologist, architect, landscape architect, or other professional, licenses where applicable, and competent and proficient in the fields pertinent to the candidate project design;

(vii) The candidate project must be constructed as soon as possible, but no later than 4 years after the certificate of occupancy is granted for the first Priority Development Project that contributed funds toward the construction of the candidate project, unless a longer period of time is authorized by the San Diego Water Board Executive Officer; and

(viii) If the candidate project is constructed after the Priority Development Project is constructed, the Copermittee must require temporal mitigation for pollutant loads and altered flows that are discharged from the Priority Development Project.

(c) Project Applicant Proposed Alternative Compliance Projects

The Copermittee may allow a Priority Development Project applicant to propose and fund, contribute funds to, or implement an alternative compliance project not identified by the Watershed Management Area Analysis included in the Water Quality Improvement Plan pursuant to Provisions B.3.b.(4). This option is allowed provided the Copermittee determines that implementation of the alternative compliance project will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a) onsite, and is subject to the requirements described in Provisions E.3.c.(3)(a)(ii)-(viii).

(d) Alternative Compliance In-Lieu Fee Structure

If a Copermittee chooses to allow a Priority Development Project applicant to fund, or partially fund a candidate project or an alternative compliance project, then the Copermittee must develop and implement an in-lieu fee structure. This may be developed individually or with other Copermittees and/or entities, as a means for designing, developing, constructing, operating and maintaining offsite alternative compliance projects. The in-lieu fee must be transferred to the Copermittee (for public projects) or an escrow account (for private projects) prior to the construction of the Priority Development Project.

(e) Alternative Compliance Water Quality Credit System Option

The Copermittee may develop and implement an alternative compliance water quality credit system option, individually or with other Copermittees and/or entities, provided that such a credit system clearly exhibits that it will not allow discharges from Priority Development Projects to cause or contribute to a net impact over and above the impact caused by projects meeting the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a). Any credit system that a Copermittee chooses to implement must be submitted to the San Diego Water Board Executive Officer for review and acceptance as part of the Water Quality Improvement Plan.

(4) Long-Term Structural BMP Maintenance

Each Copermittee must require the project applicant to submit proof of the mechanism under which ongoing long-term maintenance of all structural BMPs will be conducted.

(5) Infiltration and Groundwater Protection

(a) Structural BMPs designed to primarily function as large, centralized infiltration devices (such as large infiltration trenches and infiltration basins) must not cause or contribute to an exceedance of an applicable groundwater quality objective. At a minimum, such infiltration BMPs must be in conformance with the design criteria listed below, unless the development project applicant demonstrates to the Copermittee that one or more of the specific design criteria listed below are not necessary to protect groundwater quality. The design criteria listed below do not apply to small infiltration systems dispersed throughout a development project.

(i) Runoff must undergo pretreatment such as sedimentation or filtration prior to infiltration;

(ii) Pollution prevention and source control BMPs must be implemented at a level appropriate to protect groundwater quality at sites where infiltration BMPs are to be used;

(iii) Infiltration BMPs must be adequately maintained to remove pollutants in storm water to the MEP;

(iv) The vertical distance from the base of any infiltration BMP to the seasonal high groundwater mark must be at least 10 feet. Where groundwater basins do not support beneficial uses, this vertical distance criteria may be reduced, provided groundwater quality is maintained;

(v) The soil through which infiltration is to occur must have physical and chemical characteristics (e.g., appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses;

(vi) Infiltration BMPs must not be used for areas of industrial or light industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee, unless source control BMPs to prevent exposure of high threat activities are implemented, or runoff from such activities is first treated or filtered to remove pollutants prior to infiltration; and

(vii) Infiltration BMPs must be located a minimum of 100 feet horizontally from any water supply wells.

(b) The Copermittee may develop, individually or with other Copermittees, alternative mandatory design criteria to that listed above for infiltration BMPs which are designed to primarily function as centralized infiltration devices. Before implementing the alternative design criteria in the development planning process the Copermitee(s) must:

(i) Notify the San Diego Water Board of the intent to implement the alternative design criteria submitted; and

(ii) Comply with any conditions set by the San Diego Water Board.

d. BMP DESIGN MANUAL UPDATE

Each Copermittee must update its BMP Design Manual[30] pursuant to Provision F.2.b. Until the Copermittee has updated its BMP Design Manual pursuant to Provision F.2.b.(1) ~~with the requirements of Provisions E.3.a-c~~, the Copermittee must continue implementing its current BMP Design Manual. ~~Unless directed otherwise by the San Diego Water Board, t~~The Copermittee must implement the updated BMP Design Manual within 180 days following completion of ~~completing~~ the update pursuant to Provision F.2.b.(1), unless directed otherwise by the San Diego Water Board Executive Officer. The date the BMP Design Manual is implemented is the "effective date" of the BMP Design Manual. The update of the BMP Design Manual required pursuant to Provision F.2.b.(1) must include the following:

(1) Updated procedures to determine the nature and extent of storm water requirements applicable to a potential development or redevelopment projects. These procedures must inform project applicants of the storm water management requirements applicable to their project including, but not limited to, general requirements for all development projects, structural BMP design procedures and requirements, hydromodification management requirements, requirements specific to phased projects, and procedures specific to private developments and public improvement projects;

(2) Updated procedures to identify pollutants and conditions of concern for selecting the most appropriate structural BMPs that consider, at a minimum, the following:

(a) Receiving water quality (including pollutants for which receiving waters are listed as impaired under the CWA section 303(d) List);

(b) Pollutants, stressors, and/or receiving water conditions that cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(c) Land use type of the project and pollutants associated with that land use type; and

(d) Pollutants expected to be present onsite.

(3) Updated procedures for designing structural BMPs, including any updated

[30] The BMP Design Manual was formerly known as the Standard Storm Water Mitigation Plan under Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016.

performance requirements to be consistent with the requirements of Provision E.3.c for all structural BMPs listed in the BMP Design Manual;

(4) Long-term maintenance criteria for each structural BMP listed in the BMP Design Manual; and

(5) Alternative compliance criteria, in accordance with the requirements under Provision E.3.c.(3), if the Copermittee elects to allow Priority Development Projects within its jurisdiction to utilize alternative compliance.

e. PRIORITY DEVELOPMENT PROJECT BMP IMPLEMENTATION AND OVERSIGHT

Each Copermittee must implement a program that requires and confirms structural BMPs on all Priority Development Projects are designed, constructed, and maintained to remove pollutants in storm water to the MEP.

(1) Structural BMP Approval and Verification Process

(a) Each Copermittee must require and confirm that ~~for~~ all Priority Development Projects ~~applications that have not received prior lawful approval by the Copermittee by the effective date of the BMP Design Manual pursuant to Provision E.3.d,~~ implement the requirements of Provision E.3, ~~must be implemented. For project applications that have received prior lawful approval before the effective date of the BMP Design Manual pursuant to Provision E.3.d, the Copermittee may allow previous land development requirements to apply.~~ except that the Copermittee may allow previous land development requirements to apply to a Priority Development Project if the conditions of Provision E.3.e.(1)(a)(i) or Provision E.3.e.(1)(a)(ii) are met:

(i) The Copermittee has, prior to the effective date of the BMP Design Manual required to be developed pursuant to Provision E.3.d:

[a] Approved[31] a design that incorporates the storm water drainage system for the Priority Development Project in its entirety, including all applicable structural pollutant treatment control and hydromodification management BMPs consistent with the previous applicable MS4 permit requirements;[32] AND

[b] Issued a private project permit or approval, or functional equivalent for public projects, that authorizes the Priority Development Project applicant to commence construction activities based on a design that incorporates the storm water

[31] For public projects, a design stamped by the City or County Engineer, or engineer of record for the project is considered an approved design.

[32] Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016 for San Diego County, Orange County, and Riverside County Copermittees, respectively

drainage system approved in conformance with Provision E.3.e.(1)(a)(i)[a]; AND

[c] Confirmed that there have been construction activities on the Priority Development Project site within the 365 days prior to the effective date of the BMP Design Manual, *OR* the Copermittee confirms that construction activities have commenced on the Priority Development Project site within the 180 days after the effective date of the BMP Design Manual, where construction activities are undertaken in reliance on the permit or approval, or functional equivalent for public projects, issued by the Copermittee in conformance with Provision E.3.e.(1)(a)(i)[b]; AND

[d] Issued all subsequent private project permits or approvals, or functional equivalent for public projects, that are needed to implement the design initially approved in conformance with Provision E.3.e.(1)(a)(i)[a] within 5 years of the effective date of the BMP Design Manual. The storm water drainage system for the Priority Development Project in its entirety, including all applicable structural pollutant treatment control and hydromodification management BMPs must remain in substantial conformity with the design initially approved in conformance with Provision E.3.e.(1)(a)(i)[a].

(ii) The Copermittee demonstrates it lacks the land use authority or legal authority to require a Priority Development Project to implement the requirements of Provision E.3.

(b) Each Copermittee must identify the roles and responsibilities of its various municipal departments in implementing the structural BMP requirements, including each stage of a project from application review and approval through BMP maintenance and inspections.

(c) Each Copermittee must require and confirm that appropriate easements and ownerships are properly recorded in public records and the information is conveyed to all appropriate parties when there is a change in project or site ownership.

(d) Each Copermittee must require and confirm that prior to occupancy and/or intended use of any portion of the Priority Development Project, each structural BMP is inspected to verify that it has been constructed and is operating in compliance with all of its specifications, plans, permits, ordinances, and the requirements of this Order.

(2) Priority Development Project Inventory and Prioritization

(a) Each Copermittee must develop, maintain, and update at least annually, a watershed-based database to track and inventory all Priority Development

Projects and associated structural BMPs within its jurisdiction. Inventories must be accurate and complete beginning from December 2002 for the San Diego County Copermittees, February 2003 for the Orange County Copermittees, and July 2005 for the Riverside County Copermittees. The use of an automated database system, such as GIS, is highly recommended. The database must include, at a minimum, the following information:

(i) Priority Development Project location (address and hydrologic subarea);

(ii) Descriptions of structural BMP type(s);

(iii) Date(s) of construction;

(iv) Party responsible for structural BMP maintenance;

(v) Dates and findings of structural BMP maintenance verifications; and

(vi) Corrective actions and/or resolutions, when applicable.

(b) Each Copermittee must prioritize the Priority Development Projects with structural BMPs within its jurisdiction. The designation of Priority Development Projects as high priority must consider the following:

(i) The highest water quality priorities identified in the Water Quality Improvement Plan;

(ii) Receiving water quality;

(iii) Number and sizes of structural BMPs;

(iv) Recommended maintenance frequency of structural BMPs;

(v) Likelihood of operation and maintenance issues of structural BMPs;

(vi) Land use and expected pollutants generated; and

(vii) Compliance record.

(3) Structural BMP Maintenance Verifications and Inspections

Each Copermittee is required to verify that structural BMPs on each Priority Development Project are adequately maintained, and continue to operate effectively to remove pollutants in storm water to the MEP through inspections, self-certifications, surveys, or other equally effective approaches.

(a) All (100 percent) of the structural BMPs at Priority Development Projects that are designated as high priority must be inspected directly by the Copermittee annually prior to each rainy season;

(b) For verifications performed through a means other than direct Copermittee inspection, adequate documentation must be required by the Copermittee

to provide assurance that the required maintenance of structural BMPs at each Priority Development Project has been completed; and

(c) Appropriate follow-up measures (including re-inspections, enforcement, etc.) must be conducted to ensure that structural BMPs at each Priority Development Project continue to reduce pollutants in storm water to the MEP as originally designed.

f. DEVELOPMENT PROJECT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all development projects, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

4. Construction Management

Each Copermittee must implement a construction management program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. PROJECT APPROVAL PROCESS

Prior to issuance of any local permit(s) that allows the commencement of construction projects that involve ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff, each Copermittee must:

(1) Require a pollution control plan, construction BMP plan, and/or an erosion and sediment control plan, to be submitted by the project applicant to the Copermittee;

(2) Confirm the pollution control plan, construction BMP plan, and/or erosion and sediment control plan, complies with the local grading ordinance, other applicable local ordinances, and the requirements of this Order;

(3) Confirm the pollution control, construction BMP, and/or erosion and sediment control plan, includes seasonally appropriate and effective BMPs and management measures described in Provision E.4.c, as applicable to the project; and

(4) Verify that the project applicant has obtained coverage under the statewide Construction General Permit (Order 2009-0009-DWQ or subsequent Order), if applicable.

b. Construction Site Inventory and Tracking

(1) Each Copermittee must maintain and update, at least quarterly, a watershed-based inventory of all construction projects issued a local permit that allows ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff. The use of an automated database system, such as GIS, is highly recommended. The inventory must include:

(a) Relevant contact information for each site (e.g., name, address, phone, and email for the owner and contractor);

(b) The basic site information including location (address and hydrologic subarea), Waste Discharge Identification (WDID) number (if applicable), size of the site, and approximate area of disturbance;

(c) Whether or not the site is considered a high threat to water quality, as defined in Provision E.4.b.(2) below;

(d) The project start and completion dates;

(e) The required inspection frequency, as defined in the Copermittee's jurisdictional runoff management program document;

(f) The date the Copermittee accepted or approved the pollution control plan, construction BMP plan, and/or erosion and sediment control plan; and

(g) Whether or not there are ongoing enforcement actions administered to the site.

(2) Each Copermittee must identify all construction sites within its jurisdiction that represent a high threat to downstream surface water quality. The designation of construction sites as high threat to water quality must consider the following:

(a) Sites located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Sites located within the same hydrologic subarea and tributary to a water body segment listed as impaired for sediment on the CWA section 303(d) List;

(c) Sites located within, directly adjacent to, or discharging directly to a receiving water within an ESA; and

(d) Other sites determined by the Copermittees or the San Diego Water Board as a high threat to water quality.

c. CONSTRUCTION SITE BMP IMPLEMENTATION

Each Copermittee must implement, or require the implementation of effective BMPs to reduce discharges of pollutants in storm water from construction sites to the MEP, and effectively prohibit non-storm water discharges from construction sites into the MS4. These BMPs must be site specific, seasonally appropriate, and construction phase appropriate. BMPs must be implemented at each construction site year round. Dry season BMP implementation must plan for and address unseasonal rain events that may occur during the dry season (May 1 through September 30). Copermittees must implement, or require the implementation of, BMPs in the following categories:

(1) Project Planning;

(2) Good Site Management "Housekeeping", including waste management;

(3) Non-storm Water Management;

(4) Erosion Control;

(5) Sediment Control;

(6) Run-on and Run-off Control; and

(7) Active/Passive Sediment Treatment Systems, where applicable.

d. CONSTRUCTION SITE INSPECTIONS

Each Copermittee must conduct construction site inspections to require and confirm compliance with its local permits and applicable local ordinances, and the requirements of this Order. Priority for site inspections must consider threat to water quality pursuant to Provision E.4.b as well as the nature of the construction activity, topography, and the characteristics of soils and receiving water quality.

(1) Inspection Frequency

(a) Each Copermittee must conduct inspections at all inventoried sites, including high threat to water quality sites, at an appropriate frequency for each phase of construction to confirm the site reduces the discharge of pollutants in storm water from construction sites to the MEP, and effectively prohibits non-storm water discharges from entering the MS4.

(b) Each Copermittee must establish appropriate inspection frequencies for high threat to water quality sites, and all other sites, for each phase of construction. Inspection frequencies appropriate for addressing the

highest water quality priorities identified in the Water Quality Improvement Plan, and for complying with the requirements of this Order must be identified in each Copermittee's jurisdictional runoff management program document.

(c) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e., re-inspection, enforcement) necessary to require and confirm site compliance with its local permits and applicable local ordinances, and the requirements of this Order.

(2) Inspection Content

Inspections of construction sites by the Copermittee must include, at a minimum:

(a) Verification of coverage under the Construction General Permit (Notice of Intent (NOI) and/or WDID number) during initial inspections, when applicable;

(b) Assessment of compliance with its local permits and applicable local ordinances related to pollution prevention, including the implementation and maintenance of applicable BMPs;

(c) Assessment of BMP adequacy and effectiveness;

(d) Visual observations of actual non-storm water discharges;

(e) Visual observations of actual or potential discharge of sediment and/or construction related materials from the site;

(f) Visual observations of actual or potential illicit connections; and

(g) If any violations are found and BMP corrections are needed, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried construction sites. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Site name, location (address and hydrologic subarea), and WDID number (if applicable);

(b) Inspection date;

(c) Approximate amount of rainfall since last inspection;

(d) Description of problems observed with BMPs and indication of need for BMP addition/repair/replacement and any scheduled re-inspection, and date of re-inspection;

(e) Descriptions of any other specific inspection comments which must, at a minimum, include rationales for longer compliance time;

(f) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(g) Resolution of problems noted and date problems fixed.

e. CONSTRUCTION SITE ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried construction sites, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

5. Existing Development Management

Each Copermittee must implement an existing development management program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. EXISTING DEVELOPMENT INVENTORY AND TRACKING

Each Copermittee must maintain, and update at least annually, a watershed-based inventory of the existing development within its jurisdiction that may discharge a pollutant load to and from the MS4. The use of an automated database system, such as GIS, is highly recommended. The inventory must, at a minimum, include:

(1) Name, location (hydrological subarea and address, if applicable) of the following types of existing development with its jurisdiction:

(a) Commercial facilities or areas;

(b) Industrial facilities;

(c) Municipal facilities, including:

(i) MS4 and related structures;[33]

(ii) Roads, streets, and highways;

(iii) Parking facilities;

(iv) Municipal airfields;

(v) Parks and recreation facilities;

(vi) Flood management facilities, flood control devices and structures;

(vii) Operating or closed municipal landfills;

(viii) Publicly owned treatment works (including water and wastewater treatment plants) and sanitary sewer collection systems;

(ix) Corporate yards, including maintenance and storage yards for materials, waste, equipment, and vehicles;

(x) Hazardous waste collection facilities;

(xi) Other treatment, storage or disposal facilities for municipal waste; and

(xii) Other municipal facilities that the Copermittee determines may contribute a significant pollutant load to the MS4.

(d) Residential areas, which may be designated by one or more of the following:

(i) Residential management area;

(ii) Drainage basin or area;

(iii) Land use (e.g., single family, multi-family, rural);

(iv) Neighborhood;

(v) Common Interest Area;

(vi) Home Owner Association;

(vii) Mobile home park; and/or

(viii) Other designations accepted by the San Diego Water Board Executive Officer.

(2) A description of the facility or area, including the following information:

(a) Classification as commercial, industrial, municipal, or residential;

[33] The inventory may refer to the MS4 map required to be maintained pursuant to Provision E.2.b.(1).

(b) Status of facility or area as active or inactive;

(c) Identification if a business is a mobile business;

(d) SIC Code or NAICS Code, if applicable;

(e) Industrial General Permit NOI and/or WDID number, if applicable;

(f) Identification if a residential area is or includes a Common Interest Area / Home Owner Association, or mobile home park;

(g) Identification of pollutants generated and potentially generated by the facility or area;

(h) Whether the facility or area is adjacent to an ESA;

(i) Whether the facility or area is tributary to and within the same hydrologic subarea as a water body segment listed as impaired on the CWA section 303(d) List and generates pollutants for which the water body segment is impaired; and

(3) An annually updated map showing the location of inventoried existing development, watershed boundaries, and water bodies.

b. EXISTING DEVELOPMENT BMP IMPLEMENTATION AND MAINTENANCE

Each Copermittee must designate a minimum set of BMPs required for all inventoried existing development, including special event venues. The designated minimum BMPs must be specific to facility or area types and pollutant generating activities, as appropriate.

(1) Commercial, Industrial, and Municipal Facilities and Areas

(a) Pollution Prevention

Each Copermittee must require the use of pollution prevention methods by the commercial, industrial, and municipal facilities and areas in its inventoried existing development to address the priorities and strategies in the Water Quality Improvement Plan.

(b) BMP Implementation

Each Copermittee must require the implementation of designated BMPs at commercial facilities and areas, industrial facilities, and implement designated BMPs at municipal facilities in its inventoried existing development.

(c) BMP Operation and Maintenance

(i) Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development.

(ii) Each Copermittee must implement a schedule of operation and maintenance activities for its MS4 and related structures (including but not limited to catch basins, storm drain inlets, detention basins, etc.), and verify proper operation of all its municipal structural treatment controls designed to reduce pollutants (including floatables) in storm water discharges to or from its MS4s and related drainage structures. Operation and maintenance activities may include, but is not limited to, the following:

[a] Inspections of the MS4 and related structures;
[b] Cleaning of the MS4 and related structures; and
[c] Proper disposal of materials removed from cleaning of the MS4 and related structures.

(iii) Each Copermittee must implement a schedule of operation and maintenance for public streets, unpaved roads, paved roads, and paved highways within its jurisdiction to minimize pollutants that can be discharged in storm water.

(iv) Each Copermittee must implement controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers. Copermittees that operate both a municipal sanitary sewer system and a MS4 must implement controls and measures to prevent and eliminate seeping sewage from infiltrating the MS4. Copermittees that do not operate both a municipal sanitary sewer system and a MS4 must coordinate with sewering agencies to keep themselves informed of relevant and appropriate maintenance activities and sanitary sewage projects in their jurisdiction that may cause or contribute to seepage of sewage into the MS4.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must require the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from commercial facilities and areas and industrial facilities, and implement BMPs at municipal facilities in its inventoried existing development. Such BMPs must include, as appropriate, educational activities, permits, certifications and other measures for applicators and distributors.

(2) Residential Areas

(a) Pollution Prevention

Each Copermittee must promote and encourage the use of pollution prevention methods, where appropriate, by the residential areas in its inventoried existing development.

(b) BMP Implementation

Each Copermittee must promote and encourage the implementation of designated BMPs at residential areas in its inventoried existing development.

(c) BMP Operation and Maintenance

Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at residential areas in its inventoried existing development.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must promote and encourage the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from residential areas in its inventoried existing development.

c. EXISTING DEVELOPMENT INSPECTIONS

Each Copermittee must conduct inspections of inventoried existing development to ensure compliance with applicable local ordinances and permits, and the requirements of this Order.

(1) Inspection Frequency

(a) Each Copermittee must establish appropriate inspection frequencies for inventoried existing development in accordance with the following requirements:

(i) At a minimum, inventoried existing development must be inspected once every five years utilizing one or more of the following methods:

[a] Drive-by inspections by Copermittee municipal and contract staff;

[b] Onsite inspections by Copermittee municipal and contract staff; and/or

[c] Visual inspections of publicly accessible inventoried facilities or areas by volunteer monitoring or patrol programs that have been trained by the Copermittee;

(ii) The frequency of inspections must be appropriate to confirm that BMPs are being implemented to reduce the discharge of pollutants in storm water from the MS4 to the MEP and effectively prohibit non-storm water discharges to the MS4;

(iii) The frequency of inspections must be based on the potential for a facility or area to discharge non-storm water and pollutants in storm water, and should reflect the priorities set forth in the Water Quality Improvement Plan;

(iv) Each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development;[34] and

(v) Inventoried existing development must be inspected by the Copermittee, as needed, in response to valid public complaints.

(b) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e. education and outreach, re-inspection, enforcement) necessary to require and confirm compliance with its applicable local ordinances and permits and the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

(2) <u>Inspection Content</u>

(a) Inspections of existing development must include, at a minimum:

(i) Visual inspections for the presence of actual non-storm water discharges;

(ii) Visual inspections for the presence of actual or potential discharge of pollutants;

(iii) Visual inspections for the presence of actual or potential illicit connections; and

(iv) Verification that the description of the facility or area in the inventory, required pursuant to Provision E.5.a.(2), has not changed.

[34] If any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspection may count toward the total annual inspection requirement. This requirement excludes linear municipal facilities (i.e., MS4 linear channels, sanitary sewer collection systems, streets, roads and highways).

(b) Onsite inspections of existing development by the Copermittee must include, at a minimum:

(i) Assessment of compliance with its applicable local ordinances and permits related to non-storm water and storm water discharges and runoff;

(ii) Assessment of the implementation of the designated BMPs;

(iii) Verification of coverage under the Industrial General Permit, when applicable; and

(iv) If any problems or violations are found, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried existing development. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Name and location of the facility or area (address and hydrologic subarea) consistent with the inventory name and location, pursuant to Provision E.5.a.(1);

(b) Inspection and re-inspection date(s);

(c) Inspection method(s) (i.e. drive-by, onsite);

(d) Observations and findings from the inspection(s);

(e) For onsite inspections of existing development by Copermittee municipal or contract staff, the records must also include, as applicable:

(i) Description of any problems or violations found during the inspection(s);

(ii) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(iii) The date problems or violations were resolved.

d. EXISTING DEVELOPMENT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried existing development, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

e. RETROFITTING AND REHABILITATING AREAS OF EXISTING DEVELOPMENT

(1) Retrofitting Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to retrofit areas of existing development within its jurisdiction to address identified sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify areas of existing development as candidates for retrofitting, focusing on areas where retrofitting will address pollutants and/or stressors that contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for retrofitting projects may be utilized to reduce pollutants that may be discharged in storm water from areas of existing development, and/or address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of retrofitting projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting projects; and

(e) Where retrofitting projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional retrofitting projects (i.e. projects that can receive and/or treat storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment) adjacent to and/or downstream of the areas of existing development.

(2) Stream, Channel and/or Habitat Rehabilitation in Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to rehabilitate streams, channels, and/or habitats in areas of existing development within its jurisdiction to address the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify streams, channels, and/or habitats in areas of existing development as candidates for rehabilitation, focusing on areas where stream, channel, and/or habitat rehabilitation projects will address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for stream, channel, and/or habitat rehabilitation projects may be utilized to address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters, rehabilitate channelized or hydromodified streams, restore wetland and riparian habitat, restore watershed functions, and/or restore beneficial uses of receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of stream, channel, and/or habitat rehabilitation projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance stream, channel, and/or habitat rehabilitation projects; and

(e) Where stream, channel, and/or habitat rehabilitation projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional stream, channel, and/or habitat rehabilitation projects (i.e. projects that can receive storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment).

6. Enforcement Response Plans

Each Copermittee must develop and implement an Enforcement Response Plan as part of its jurisdictional runoff management program document. The Enforcement Response Plan must describe the applicable approaches and options to enforce its legal authority established pursuant to Provision E.1, as necessary, to achieve compliance with the requirements of this Order. The Enforcement Response Plan must be in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include the following:

a. Enforcement Response Plan Components

The Enforcement Response Plan must include the following individual components:

(1) Illicit Discharge Detection and Elimination Enforcement Component;

(2) Development Planning Enforcement Component;

(3) Construction Management Enforcement Component; and

(4) Existing Development Enforcement Component.

b. Enforcement Response Approaches and Options

Each component of the Enforcement Response Plan must describe the enforcement response approaches that the Copermittee will implement to compel compliance with its statutes, ordinances, permits, contracts, orders, or similar means, and the requirements of this Order. The description must include the protocols for implementing progressively stricter enforcement responses. The enforcement response approaches must include appropriate sanctions to compel compliance, including, at a minimum, the following tools or their equivalent:

(1) Verbal and written notices of violation;

(2) Cleanup requirements;

(3) Fines;

(4) Bonding requirements;

(5) Administrative and criminal penalties;

(6) Liens;

(7) Stop work orders; and

(8) Permit and occupancy denials.

c. Correction of Violations

(1) Violations must be corrected in a timely manner with the goal of correcting the violations within 30 calendar days after the violations are discovered, or prior to the next predicted rain event, whichever is sooner.

(2) If more than 30 calendar days are required to achieve compliance, then a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

d. Escalated Enforcement

(1) The Enforcement Response Plan must include a definition of "escalated enforcement." Escalated enforcement must include any enforcement scenario where a violation or other non-compliance is determined to cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan. Escalated enforcement may be defined differently for development planning, construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas.

(2) Where the Copermittee determines escalated enforcement is not required, a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

(3) Escalated enforcement actions must continue to increase in severity, as necessary, to compel compliance as soon as possible.

e. Reporting of Non-Compliant Sites

(1) Each Copermittee must notify the San Diego Water Board in writing within five (5) calendar days of issuing escalated enforcement (as defined in the Copermittee's Enforcement Response Plan) to a construction site that poses a significant threat to water quality as a result of violations or other non-compliance with its permits and applicable local ordinances, and the requirements of this Order. Written notification may be provided electronically by email to the appropriate San Diego Water Board staff.

(2) Each Copermittee must notify the San Diego Water Board of any persons required to obtain coverage under the statewide Industrial General Permit and Construction General Permit and failing to do so, within five (5) calendar days from the time the Copermittee become aware of the circumstances. Written notification may be provided electronically by email to RB9_Nonfilers@waterboards.ca.gov.

7. Public Education and Participation

Each Copermittee must implement, individually or with other Copermittees, a public education and participation program in accordance with the strategies identified in the Water Quality Improvement Plan to promote and encourage the development of programs, management practices, and behaviors that reduce the discharge of pollutants in storm water to the MEP, prevent controllable non-storm water discharges from entering the MS4, and protect water quality standards in receiving waters. The public education and participation program must be implemented in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include, at a minimum, the following requirements:

a. PUBLIC EDUCATION

The public education program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) Educational activities, public information activities, and other appropriate outreach activities intended to reduce pollutants associated with the application of pesticides, herbicides and fertilizer and other pollutants of concern in storm water discharges to and from its MS4 to the MEP, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed to address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(2) Educational activities, public information activities, and other appropriate outreach activities to facilitate the proper management and disposal of used oil and toxic materials; and

(3) Appropriate education and training measures for specific target audiences, such as construction site operators, residents, underserved target audiences and school-aged children, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed, based on high risk behaviors and pollutants of concern.

b. PUBLIC PARTICIPATION

The public participation program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) A process for members of the public to participate in updating the highest priority water quality conditions, numeric goals, and water quality improvement strategies in the Water Quality Improvement Plan;

(2) Opportunities for members of the public to participate in providing the Copermittee recommendations for improving the effectiveness of the water quality improvement strategies implemented within its jurisdiction; and

(3) Opportunities for members of the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or protection of the quality of receiving waters.

8. Fiscal Analysis

a. Each Copermittee must secure the resources necessary to meet all the requirements of this Order.

b. Each Copermittee must conduct an annual fiscal analysis of its jurisdictional runoff management program in its entirety. The fiscal analysis must include the following:

(1) Identification of the various categories of expenditures necessary to implement the requirements of this Order, including a description of the specific capital, operation and maintenance, and other expenditure items to be accounted for in each category of expenditures;

(2) The staff resources needed and allocated to meet the requirements of this Order, including any development, implementation, and enforcement activities required;

(3) The estimated expenditures for Provisions E.8.b.(1) and E.8.b.(2) for the current fiscal year; and

(4) The source(s) of funds that are proposed to meet the necessary expenditures described in Provisions E.8.b.(1) and E.8.b.(2), including legal restrictions on the use of such funds, for the current fiscal year and next fiscal year.

c. Each Copermittee must submit a summary of the annual fiscal analysis with each Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3).

d. Each Copermittee must provide the documentation used to develop the summary of the annual fiscal analysis upon request by the San Diego Water Board.

F. REPORTING

The purpose of this provision is to determine and document compliance with the requirements set forth in this Order. The goal of reporting is to communicate to the San Diego Water Board and the people of the State of California the implementation status of each jurisdictional runoff management program and compliance with the requirements of this Order. This goal is to be accomplished through the submittal of specific deliverables to the San Diego Water Board by the Copermittees.

1. Water Quality Improvement Plans

The Copermittees for each Watershed Management Area must develop and submit the Water Quality Improvement Plan in accordance with the following requirements:

a. WATER QUALITY IMPROVEMENT PLAN DEVELOPMENT

Each Water Quality Improvement Plan must be developed in accordance with the following process:

(1) Public Participation Process

The Copermittees must implement a public participation process to solicit data, information, and recommendations to be utilized in the development of the Water Quality Improvement Plan. The public participation process must include the following:

(a) The Copermittees must develop a publicly available and noticed schedule of the opportunities for the public to participate and provide comments during the development of the Water Quality Improvement Plan. The schedule may be adjusted as necessary by the Copermittees, provided the public is provided timely notification of the changes to the schedule.

(b) The Copermittees must form a Water Quality Improvement Consultation Panel to provide recommendations during the development of the Water Quality Improvement Plan. The Water Quality Improvement Consultation Panel must consist of at least the following members:

(i) A representative of the San Diego Water Board;

(ii) A representative of the environmental community familiar with the water quality conditions of concern of the receiving waters in the Watershed Management Area, preferably from an environmental interest group associated with a water body within the Watershed Management Area; and

(iii) A representative of the development community familiar with the opportunities and constraints for implementing structural BMPs,

retrofitting projects, and stream, channel or habitat rehabilitation projects in the Watershed Management Area, preferably with relevant engineering, hydrology, and/or geomorphology experience in the Watershed Management Area.

(c) The Copermittees must coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public time and opportunity to participate during the development of the Water Quality Improvement Plans.

(2) Priority Water Quality Conditions

(a) The Copermittees must solicit data, information and recommendations from the public to be utilized in the development and identification of the priority water quality conditions and potential water quality improvement strategies for the Watershed Management Area.

(b) The Copermittees must review the priority water quality conditions the Copermittees plan on including in the Water Quality Improvement Plan with the Water Quality Improvement Consultation Panel to receive recommendations or concurrence.

(c) The Copermittees must consider revisions to the priority water quality conditions based on recommendations from the Water Quality Improvement Consultation Panel.

(d) The Copermittees must include all the potential water quality improvement strategies identified by the public and the Water Quality Improvement Consultation Panel with the submittal of the priority water quality conditions to the San Diego Water Board.

(e) The Copermittees must submit the Water Quality Improvement Plan requirements of Provision B.2 to the San Diego Water Board as early as 6 months and no later than 12 months after the commencement of coverage under this Order. Upon receipt, the San Diego Water Board will issue a public notice and release the proposed priority water quality conditions and potential water quality improvement strategies for public review and comment for a minimum of 30 days.

(f) The Copermittees must consider revisions to the priority water quality conditions and potential water quality improvement strategies developed pursuant to Provision B.2 based on public comments received by the close of the comment period.

(3) Water Quality Improvement Goals, Strategies and Schedules

(a) The Copermittees must solicit recommendations from the public on potential numeric goals for the highest priority water quality conditions identified for the Watershed Management Area, and recommendations on the strategies that should be implemented to achieve the potential numeric goals.

(b) The Copermittees must consult with the Water Quality Improvement Consultation Panel and consider revisions to the following items based on the Panel's recommendations:

(i) The numeric goals and schedules the Copermittees propose to include in the Water Quality Improvement Plan;

(ii) The water quality improvement strategies and schedules the Copermittees propose to implement in the Watershed Management Area and include in the Water Quality Improvement Plan; and

(iii) If the Copermittees choose to implement Provision B.3.b.(4), the results of the Watershed Management Area Analysis the Copermittees proposed to incorporate into the Water Quality Improvement Plan.

(c) The Copermittees must submit the Water Quality Improvement Plan requirements of Provision B.3 to the San Diego Water Board as early as 9 months and no later than 18 months after the commencement of coverage under this Order. Upon receipt, the San Diego Water Board will issue a public notice and release the proposed water quality improvement goals, strategies and schedules for public review and comment for a minimum of 30 days.

(d) The Copermittees must consider revisions to the water quality improvement goals, strategies and schedules developed pursuant to Provision B.3 based on public comments received by the close of the comment period.

b. WATER QUALITY IMPROVEMENT PLAN SUBMITTAL AND IMPLEMENTATION

(1) Within 24 months after the commencement of coverage under this Order, the Copermittees for each Watershed Management Area must submit a complete Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order to the San Diego Water Board. The San Diego Water Board will issue a public notice and release the Water Quality Improvement Plan for public review and comment for a minimum of 30 days.

(2) The Copermittees must consider revisions to the Water Quality Improvement Plan based on written comments received by the close of the public comment period.

(3) The Copermittees must promptly submit any revisions to the Water Quality Improvement Plan to the San Diego Water Board no later than 60 days after the close of the public comment period.

(4) If issues concerning the Water Quality Improvement Plan are resolved informally through discussions among the Copermittees, the San Diego Water Board and interested parties, the San Diego Water Board Executive Officer may provide written notification of acceptance to the Copermittees that the Water Quality Improvement Plan meets the requirements of Provision B. However, if the Executive Officer determines that significant issues with the Water Quality Improvement Plan remain, the matter will be scheduled for San Diego Water Board consideration at a public meeting.

(5) The Copermittees must commence with implementation of the Water Quality Improvement Plan, in accordance with the water quality improvement strategies and schedules therein, upon written notification of acceptance with the Water Quality Improvement Plan by the San Diego Water Board Executive Officer.

(6) During implementation of the Water Quality Improvement Plan the Copermittees must correct any deficiencies in the Plan identified by the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report following a request by the Board to do so.

(7) The Water Quality Improvement Plan must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of receiving notification of acceptance with the Water Quality Improvement Plan by the San Diego Water Board Executive Officer.

2. Updates

a. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATES

Each Copermittee must update its jurisdictional runoff management program document in accordance with the following requirements:

(1) Each Copermittee is encouraged to seek public and key stakeholder participation and comments, as early and often as possible during the process of developing updates to its jurisdictional runoff management program document;

(2) Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E concurrent with the submittal of the Water Quality Improvement Plan. Each Copermittee must correct any deficiencies in the jurisdictional runoff management program document based on comments received from the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report;

(3) Each Copermittee must submit updates to its jurisdictional runoff management program, with the supporting rationale for the modifications, either in the Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b;

(4) The Copermittee must revise proposed modifications to its jurisdictional runoff management program as directed by the San Diego Water Board Executive Officer; and

(5) Updated jurisdictional runoff management program documents must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of submitting the Water Quality Improvement Plan Annual Report.

b. BMP DESIGN MANUAL UPDATES

Each Copermittee must update its BMP Design Manual in accordance with the following requirements:

(1) Each Copermittee must update its BMP Design Manual to incorporate the requirements of Provisions E.3.a-d concurrent with the submittal of the Water Quality Improvement Plan. Each Copermittee must correct any deficiencies in the BMP Design Manual based on comments received from the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report;

(2) ~~Subsequent~~ Any future updates to the BMP Design Manual made after its update pursuant to Provision F.2.b.(1) is completed must be consistent with the requirements of Provisions E.3.a-d and must be submitted as part of the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b; and

(3) ~~Updated~~ BMP Design Manuals must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of completing the update.

(4) If the San Diego Water Board amends Provisions E.3.a-d during the permit term but after the Copermittee has completed the update pursuant to

Provision F.2.b.(1), the Copermittee must revise its BMP Design Manual to incorporate the amended Provision E.3.a-d requirements as soon as possible but not later than 90 days after the date the San Diego Water Board adopts the amendments to Provisions E.3.a-d, unless otherwise directed by the San Diego Water Board Executive Officer. Under these circumstances, the effective date of the BMP Design Manual is no later than 90 days after the date the San Diego Water Board adopts the amendments to Provisions E.3.a-d, unless otherwise directed by the San Diego Water Board Executive Officer.

c. Water Quality Improvement Plan Updates

(1) The Water Quality Improvement Plans must be updated in accordance with the following process:

(a) The Copermittees must develop and implement a public participation process to obtain data, information and recommendations for updating the Water Quality Improvement Plan. The public participation process must provide for a publicly available and noticed schedule of opportunities for the public to participate and provide comments during the development of updates to the Water Quality Improvement Plan;

(b) The Copermittees must consult with the Water Quality Improvement Consultation Panel on proposed updates of the Water Quality Improvement Plan, and consider the Water Quality Improvement Consultation Panel's recommendations in finalizing the proposed updates;

(c) The Copermittees for each Watershed Management Area must submit 1) proposed updates to the Water Quality Improvement Plan and supporting rationale, and 2) recommendations received from the public and the Water Quality Improvement Consultation Panel and the rationale for the requested updates, either in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The updates submitted will be deemed accepted for inclusion in the Water Quality Improvement Plan ninety (90) days after submission unless otherwise directed in writing by the San Diego Water Board Executive Officer;

(d) The Copermittees must revise the requested updates as directed by the San Diego Water Board Executive Officer; and

(e) Updated Water Quality Improvement Plans must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance of the requested updates by the San Diego Water Board.

(2) No later than six months following Office of Administrative Law and USEPA approval of any TMDL Basin Plan amendment with wasteload allocations (WLAs) assigned to the Copermittees during the term of this Order, the Copermittees must initiate an update to the applicable Water Quality Improvement Plans in accordance with Provision F.1 or Provision F.2.c.(1) to incorporate the requirements of the TMDL WLAs.

3. Progress Reporting

a. Progress Report Presentations

The Copermittees for each Watershed Management Area must periodically appear before the San Diego Water Board, as requested by the Board, to provide progress reports on the implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs.

b. Annual Reports

(1) Transitional Jurisdictional Runoff Management Program Annual Reports

(a) Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) no later than October 31 of each year for each jurisdictional runoff management program reporting period (i.e. July 1 to June 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted.

(b) Each Copermittee must submit the information on the Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) specific to the area within its jurisdiction in each Watershed Management Area.

(c) In addition to submitting the Jurisdictional Runoff Management Program Annual Report Form during the transitional reporting period, each Copermittee may continue to utilize and submit the jurisdictional runoff management program annual reporting format of its previous NPDES permit until the first Water Quality Improvement Plan Annual Report is required to be submitted.

(2) Transitional Monitoring and Assessment Program Annual Reports

The Copermittees for each Watershed Management Area must submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment

program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted under this Order. The Transitional Monitoring and Assessment Program Annual Reports must include:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1.a and D.2.a, summarized and presented in tabular and graphical form; and

(b) The findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

(3) Water Quality Improvement Plan Annual Reports

The Copermittees for each Watershed Management Area must submit a Water Quality Improvement Plan Annual Report for each reporting period no later than January 31 of the following year. The annual reporting period consists of two different periods: 1) July 1 to June 30 of the following year for the jurisdictional runoff management programs, 2) October 1 to September 30 of the following year for the monitoring and assessment programs. The Water Quality Improvement Plan Annual Reports must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Each Annual Report must include the following:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, summarized and presented in tabular and graphical form;

(b) The progress of the special studies required pursuant to Provision D.3, and the findings, interpretations and conclusions of a special study, or each phase of a special study, upon its completion;

(c) The findings, interpretations and conclusions from the assessments required pursuant to Provision D.4;

(d) The progress of implementing the Water Quality Improvement Plan, including, but not limited to, the following:

(i) The progress toward achieving the interim and final numeric goals for the highest water quality priorities for the Watershed Management Area;

(ii) The water quality improvement strategies that were implemented and/or no longer implemented by each of the Copermittees during the reporting period and previous reporting periods;

(iii) The water quality improvement strategies planned for implementation during the next reporting period;

(iv) Proposed modifications to the water quality improvement strategies, the public comments received and the supporting rationale for the proposed modifications;

(v) Previous modifications or updates incorporated into the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document and implemented by the Copermittees in the Watershed Management Area; and

(vi) Proposed modifications or updates to the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document;

(e) A completed Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) for each Copermittee in the Watershed Management Area, certified by a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative; and

(f) Each Copermittee must provide any data or documentation utilized in developing the Water Quality Improvement Plan Annual Report upon request by the San Diego Water Board. Any Copermittee monitoring data utilized in developing the Water Quality Improvement Plan Annual Report must be uploaded to the California Environmental Data Exchange Network (CEDEN).[35] Any Copermittee monitoring and assessment data utilized in developing the Water Quality Improvement Plan Annual Report must be available for access on the Regional Clearinghouse required pursuant to Provision F.4.

c. Regional Monitoring and Assessment Report

(1) The Copermittees must submit a Regional Monitoring and Assessment Report no later than 180 days prior to the expiration date of this Order. The Regional Monitoring and Assessment Report may be submitted as part of the Report of Waste Discharge required pursuant to Provision F.5.b. In preparing the report the Copermittees must consider the receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, and the findings, interpretations, and conclusions from the assessments required pursuant to Provision D.4. Based on these considerations the report must assess the following:

[35] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

(a) The beneficial uses of the receiving waters within the San Diego Region that are supported and not adversely affected by the Copermittees' MS4 discharges;

(b) The beneficial uses of the receiving waters within the San Diego Region that are adversely impacted by the Copermittees' MS4 discharges;

(c) The progress toward protecting the beneficial uses in the receiving waters within the San Diego Region from the Copermittees' discharges; and

(d) Pollutants or conditions of emerging concern that may impact beneficial uses in the receiving waters within the San Diego Region.

(2) The Regional Monitoring and Assessment Report must include recommendations for improving the implementation and assessment of the Water Quality Improvement Plans and jurisdictional runoff management programs.

(3) Each Copermittee must provide any data or documentation utilized in developing the Regional Monitoring and Assessment Report upon request by the San Diego Water Board. Any Copermittee monitoring and assessment data utilized in developing the Regional Monitoring and Assessment Report must be available for access on the Regional Clearinghouse required pursuant to Provision F.4.

4. Regional Clearinghouse

The Copermittees must develop, update, and maintain an internet-based Regional Clearinghouse that is made available to the public no later than 18 months after the effective date of this Order.[36]

a. The Copermittees, through the Regional Clearinghouse, must make the following documents and data available for access, and organized by Watershed Management Area. The documents and data may be linked to other internet-based data portals and databases where the original documents are stored:

(1) Water Quality Improvement Plan for the Watershed Management Area, and all updated versions with date of update;

(2) Annual Reports for the Watershed Management Area;

(3) Jurisdictional Runoff Management Program document for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

[36] The Copermittees may develop, update and maintain the clearinghouse(s) of other Copermittees or agencies.

(4) BMP Design Manual for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(5) Reports from special studies (e.g. source identification, BMP effectiveness assessment) conducted in the Watershed Management Area;

(6) Monitoring data collected pursuant to Provision D for each Watershed Management Area must be uploaded to CEDEN,[37] with links to the uploaded data; and

(7) Available GIS data, layers, and/or shapefiles used to develop the maps generated and maintained by the Copermittees for the Water Quality Improvement Plans, Annual Reports, and jurisdictional runoff management program documents.

b. The Copermittees, through the Regional Clearinghouse, must make the following information and documents available for access:

(1) Contact information (point of contact, phone number, email address, and mailing address) for each Copermittee;

(2) Public hotline number for reporting non-storm water and illicit discharges for each Copermittee;

(3) Email address for reporting non-storm water and illicit discharges for each Copermittee;

(4) Link to each Copermittee's website, if available, where the public may find additional information about the Copermittee's storm water management program and for requesting records for the implementation of its program;

(5) Information about opportunities for the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or protection of the quality of receiving waters; and

(6) Reports from regional monitoring programs in which the Copermittees participate (e.g. Southern California Monitoring Coalition, Southern California Coastal Water Research Project Bight Monitoring);

(7) Regional Monitoring and Assessment Reports; and

(8) Any other information, data, and documents the Copermittees determine as appropriate for making available to the public.

[37] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

5. Report of Waste Discharge

~~a. The Riverside County Copermittees are required to submit a complete Report of Waste Discharge pursuant to the requirements of their current Order. The San Diego Water Board will review and consider the Report of Waste Discharge to determine whether modification to this Order, pursuant to the requirements of Provision H, will be required prior to the Riverside County Copermittees obtaining coverage under this Order. The current Order for Riverside County Copermittees is rescinded upon the date of effective coverage under this Order except for enforcement purposes.~~

~~b.~~
The Copermittees subject to the requirements of this Order must submit to the San Diego Water Board a complete Report of Waste Discharge as an application for the re-issuance of this Order and NPDES permit. The Report of Waste Discharge must be submitted no later than 180 days in advance of the expiration date of this Order. The Report of Waste Discharge must contain the following minimum information:

~~(1)~~
a. Names and addresses of the Copermittees;
~~(2)~~
b. Names and titles of the primary contacts of the Copermittees;
~~(3)~~
c. Proposed changes to the Copermittees' Water Quality Improvement Plans and the supporting justification;
~~(4)~~
d. Proposed changes to the Copermittees' jurisdictional runoff management programs and the supporting justification;
~~(5)~~
e. Any other information necessary for the re-issuance of this Order;
~~(6)~~
f. Any information to be included as part of the Report of Waste Discharge pursuant to the requirements of this Order; and
~~(7)~~
g. Any other information required by federal regulations for NPDES permit reissuance.

~~6. Application for Early Coverage~~

~~a. The Riverside County Copermittees may apply for early coverage under this Order by submitting a Report of Waste Discharge Form 200, with a written request for early coverage under this Order.~~

~~b. The San Diego Water Board will review the application for early coverage. A notification of coverage under this Order will be issued to the Copermittees in the respective county by the San Diego Water Board upon completion of the early coverage application requirements. The effective coverage date will be specified~~

~~in the notification of coverage. The Copermittees in the respective county are authorized to have MS4 discharges pursuant to the requirements of this Order starting on the effective coverage date specified in the notification of coverage. The existing Order for the respective county is rescinded upon the effective coverage date specified in the notification of coverage except for enforcement purposes.~~

~~7.~~

6. Reporting Provisions

Each Copermittee must comply with all the reporting and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

G. PRINCIPAL WATERSHED COPERMITTEE RESPONSIBILITIES

1. The Copermittees within each Watershed Management Area must designate a Principal Watershed Copermittee and notify the San Diego Water Board of the name of the Principal Watershed Copermittee. An individual Copermittee should not be designated a Principal Watershed Copermittee for more than two Watershed Management Areas. The notification may be submitted with the Water Quality Improvement Plan required pursuant to Provision F.1 of this Order.

2. The Principal Watershed Copermittee is responsible for, at a minimum, the following:

a. Serving as liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues, and when necessary and appropriate, representing the Copermittees in the Watershed Management Area before the San Diego Water Board;

b. Facilitating the development of the Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order;

c. Coordinating the submittal of the deliverables required by Provisions F.1, F.2, F.3.a, and F.3.b of this Order; and

d. Coordinating and developing, with the other Principal Watershed Copermittees, the requirements of Provisions F.3.c, F.4, and F.5.b of this Order.

3. The Principal Watershed Copermittee is not responsible for ensuring that the other Copermittees within the Watershed Management Area are in compliance with the requirements of this Order. Each Copermittee within the Watershed Management Area is responsible for complying with the requirements of this Order.

H. MODIFICATION OF ORDER

1. Modifications of the Order may be initiated by the San Diego Water Board or by the Copermittees. Requests by Copermittees must be made to the San Diego Water Board.

2. Minor modifications to the Order may be made by the San Diego Water Board where the proposed modification complies with all the prohibitions and limitations, and other requirements of this Order.

3. This Order may also be re-opened and modified, revoked and, reissued or terminated in accordance with the provisions of 40 CFR 122.44, 122.62 to 122.64, and 124.5. Causes for taking such actions include, but are not limited to, failure to comply with any condition of this Order and permit, and endangerment to human health or the environment resulting from the permitted activity.

4. This Order may be re-opened for modification for cause including but not limited to the following:

   ~~a. The State Water Board determines that revisions are warranted, and the San Diego Water Board concurs that revisions are necessary to those provisions of the Order addressing compliance with water quality standards in the receiving water and/or those provisions of the Order establishing an iterative process for implementation of management practices to assure compliance with water quality standards in the receiving water;~~

   ~~b. An application for early coverage under this Order is received pursuant to Provision F.6;~~

   ~~c.~~

   a. Any of the TMDLs in Attachment E to this Order are amended in the Basin Plan by San Diego Water Board, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA;

   ~~d.~~

   b. The Basin Plan is amended by the San Diego Water Board to incorporate a new TMDL, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA; or

   ~~e.~~

   c. Updating or revising the monitoring and reporting requirements is determined to be necessary, at the discretion of the San Diego Water Board. Such modification(s) may include, but is (are) not limited to, revision(s) to: (i) implement recommendations from Southern California Coastal Water Research Project (SCCWRP), (ii) develop, refine, implement, and/or coordinate a regional monitoring program, (iii) develop and implement improved monitoring and assessment programs in keeping with San Diego Water Board Resolution No. R9-2012-0069, Resolution in Support of a Regional Monitoring Framework, and/or (iv) add provisions to require the Copermittees to evaluate and provide information on cost and values of the monitoring and reporting program.

~~**5.** The San Diego Water Board, after opportunity for public comment and a public hearing, will re-open and consider modifications to this Order when the Riverside County Copermittees submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders.~~

I. STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

Each Copermittee must comply with all the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

ATTACHMENT A

DISCHARGE PROHIBITIONS AND SPECIAL PROTECTIONS

1. Basin Plan Waste Discharge Prohibitions

California Water Code Section 13243 provides that a Regional Water Board, in a water quality control plan, may specify certain conditions or areas where the discharge of waste or certain types of waste is not permitted. The following waste discharge prohibitions in the Water Quality Control Plan for the San Diego Basin (Basin Plan) are applicable to any person, as defined by Section 13050(c) of the California Water Code, who is a citizen, domiciliary, or political agency or entity of California whose activities in California could affect the quality of waters of the state within the boundaries of the San Diego Region.

1. The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in California Water Code Section 13050, is prohibited.

2. The discharge of waste to land, except as authorized by waste discharge requirements or the terms described in California Water Code Section 13264 is prohibited.

3. The discharge of pollutants or dredged or fill material to waters of the United States except as authorized by a National Pollutant Discharge Elimination System (NPDES) permit or a dredged or fill material permit (subject to the exemption described in California Water Code Section 13376) is prohibited.

4. Discharges of recycled water to lakes or reservoirs used for municipal water supply or to inland surface water tributaries thereto are prohibited, unless this San Diego Water Board issues a NPDES permit authorizing such a discharge; the proposed discharge has been approved by the State Department of Health Services (DHS) and the operating agency of the impacted reservoir; and the discharger has an approved fail-safe long-term disposal alternative.

5. The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the San Diego Water Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

6. The discharge of waste in a manner causing flow, ponding, or surfacing on lands not owned or under the control of the discharger is prohibited, unless the discharge is authorized by the San Diego Water Board.

7. The dumping, deposition, or discharge of waste directly into waters of the state, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the San Diego Water Board.

8. Any discharge to a storm water conveyance system that is not composed entirely of "*storm water*" is prohibited unless authorized by the San Diego Water Board. [The federal regulations, 40 CFR 122.26(b)(13), define storm water as storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from firefighting activities.] [§122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

9. The unauthorized discharge of treated or untreated sewage to waters of the state or to a storm water conveyance system is prohibited.

10. The discharge of industrial wastes to conventional septic tank/subsurface disposal systems, except as authorized by the terms described in California Water Code Section 13264, is prohibited.

11. The discharge of radioactive wastes amenable to alternative methods of disposal into the waters of the state is prohibited.

12. The discharge of any radiological, chemical, or biological warfare agent into waters of the state is prohibited.

13. The discharge of waste into a natural or excavated site below historic water levels is prohibited unless the discharge is authorized by the San Diego Water Board.

14. The discharge of sand, silt, clay, or other earthen materials from any activity, including land grading and construction, in quantities which cause deleterious bottom deposits, turbidity or discoloration in waters of the state or which unreasonably affect, or threaten to affect, beneficial uses of such waters is prohibited.

15. The discharge of treated or untreated sewage from vessels to Mission Bay, Oceanside Harbor, Dana Point Harbor, or other small boat harbors is prohibited.

16. The discharge of untreated sewage from vessels to San Diego Bay is prohibited.

17. The discharge of treated sewage from vessels to portions of San Diego Bay that are less than 30 feet deep at mean lower low water (MLLW) is prohibited.

18. The discharge of treated sewage from vessels, which do not have a properly functioning US Coast Guard certified Type I or Type II marine sanitation device, to portions of San Diego Bay that are greater than 30 feet deep at mean lower low water (MLLW) is prohibited.

2. Attachment B to State Water Board Resolution 2012-0012, as amended by State Water Board Resolution No. 2012-0031.

Special Protections for Areas of Special Biological Significance (ASBS), Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges

I. PROVISIONS FOR POINT SOURCE DISCHARGES OF STORM WATER AND NONPOINT SOURCE WASTE DISCHARGES

The following terms, prohibitions, and special conditions (hereafter collectively referred to as special conditions) are established as limitations on point source storm water and nonpoint source discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in Areas of Special Biological Significance (ASBS), as required for State Water Quality Protection Areas pursuant to California Public Resources Code Sections 36700(f) and 36710(f). These Special Protections are adopted by the State Water Board as part of the California Ocean Plan (Ocean Plan) General Exception.

The special conditions are organized by category of discharge. The State Water Resources Control Board (State Water Board) and Regional Water Quality Control Boards (Regional Water Boards) will determine categories and the means of regulation for those categories [e.g., Point Source Storm Water National Pollutant Discharge Elimination System (NPDES) or Nonpoint Source].

A. PERMITTED POINT SOURCE DISCHARGES OF STORM WATER

1. General Provisions for Permitted Point Source Discharges of Storm Water

   a. Existing storm water discharges into an ASBS are allowed only under the following conditions:

      (1) The discharges are authorized by an NPDES permit issued by the State Water Board or Regional Water Board;

      (2) The discharges comply with all of the applicable terms, prohibitions, and special conditions contained in these Special Protections; and

      (3) The discharges:

         (i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

         (ii) Are designed to prevent soil erosion;

         (iii) Occur only during wet weather;

         (iv) Are composed of only storm water runoff.

   b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

c. The discharge of trash is prohibited.

d. Only discharges from existing storm water outfalls are allowed. Any proposed or new storm water runoff discharge shall be routed to existing storm water discharge outfalls and shall not result in any new contribution of waste to an ASBS (i.e., no additional pollutant loading). "Existing storm water outfalls" are those that were constructed or under construction prior to January 1, 2005. "New contribution of waste" is defined as any addition of waste beyond what would have occurred as of January 1, 2005. A change to an existing storm water outfall, in terms of re-location or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges are prohibited except as provided below:

(1) The term "non-storm water discharges" means any waste discharges from a municipal separate storm sewer system (MS4) or other NPDES permitted storm drain system to an ASBS that are not composed entirely of storm water.

(2) (i) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability or occur naturally:

(a) Discharges associated with emergency fire fighting operations.

(b) Foundation and footing drains.

(c) Water from crawl space or basement pumps.

(d) Hillside dewatering.

(e) Naturally occurring groundwater seepage via a storm drain.

(f) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(ii) An NPDES permitting authority may authorize non-storm water discharges to an MS4 with a direct discharge to an ASBS only to the extent the NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

2. Compliance Plans for Inclusion in Storm Water Management Plans (SWMP) and Storm Water Pollution Prevention Plans (SWPPP).

The discharger shall specifically address the prohibition of non-storm water runoff and the requirement to maintain natural water quality for storm water discharges to an ASBS in an ASBS Compliance Plan to be included in its SWMP or a SWPPP, as appropriate to permit type. If a statewide permit includes a SWMP, then the discharger shall prepare a stand-alone compliance plan for ASBS discharges. The ASBS Compliance Plan is subject to approval by

the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (for permits issued by Regional Water Boards).

a. The Compliance Plan shall include a map of surface drainage of storm water runoff, showing areas of sheet runoff, prioritize discharges, and describe any structural Best Management Practices (BMPs) already employed and/or BMPs to be employed in the future. Priority discharges are those that pose the greatest water quality threat and which are identified to require installation of structural BMPs. The map shall also show the storm water conveyances in relation to other features such as service areas, sewage conveyances and treatment facilities, landslides, areas prone to erosion, and waste and hazardous material storage areas, if applicable. The SWMP or SWPPP shall also include a procedure for updating the map and plan when changes are made to the storm water conveyance facilities.

b. The ASBS Compliance Plan shall describe the measures by which all non-authorized non-storm water runoff (e.g., dry weather flows) has been eliminated, how these measures will be maintained over time, and how these measures are monitored and documented.

c. For Municipal Separate Storm Sewer System (MS4s), the ASBS Compliance Plan shall require minimum inspection frequencies as follows:

(1) The minimum inspection frequency for construction sites shall be weekly during rainy season;

(2) The minimum inspection frequency for industrial facilities shall be monthly during the rainy season;

(3) The minimum inspection frequency for commercial facilities (e.g., restaurants) shall be twice during the rainy season; and

(4) Storm water outfall drains equal to or greater than 18 inches (457 mm) in diameter or width shall be inspected once prior to the beginning of the rainy season and once during the rainy season and maintained to remove trash and other anthropogenic debris.

d. The ASBS Compliance Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff, that are necessary to comply with these special conditions, will be achieved through BMPs. Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that such installation would pose a threat to health or safety. BMPs to control storm water runoff discharges (at the end-of-pipe) during a design storm shall be designed to achieve on average the following target levels:

(1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

(2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges.

The baseline for these determinations is the effective date of the Exception, except for those structural BMPs installed between January 1, 2005 and adoption of these Special Protections, and the reductions must be achieved and documented within six (6) years of the effective date.

e. The ASBS Compliance Plan shall address erosion control and the prevention of anthropogenic sedimentation in ASBS. The natural habitat conditions in the ASBS shall not be altered as a result of anthropogenic sedimentation.

f. The ASBS Compliance Plan shall describe the non-structural BMPs currently employed and planned in the future (including those for construction activities), and include an implementation schedule. The ASBS Compliance Plan shall include non-structural BMPs that address public education and outreach. Education and outreach efforts must adequately inform the public that direct discharges of pollutants from private property not entering an MS4 are prohibited. The ASBS Compliance Plan shall also describe the structural BMPs, including any low impact development (LID) measures, currently employed and planned for higher threat discharges and include an implementation schedule. To control storm water runoff discharges (at the end-of-pipe) during a design storm, permittees must first consider, and use where feasible, LID practices to infiltrate, use, or evapotranspirate storm water runoff on-site, if LID practices would be the most effective at reducing pollutants from entering the ASBS.

g. The BMPs and implementation schedule shall be designed to ensure that natural water quality conditions in the receiving water are achieved and maintained by either reducing flows from impervious surfaces or reducing pollutant loading, or some combination thereof.

h. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents in storm water runoff that alter natural ocean water quality and the sources of these constituents.

(2) The report shall describe BMPs that are currently being implemented, BMPs that are identified in the SWMP or SWPPP for future implementation, and any additional BMPs that may be added to the SWMP or SWPPP to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the BMPs.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits), the discharger shall revise its ASBS Compliance Plan to incorporate any new or modified BMPs that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised SWMP or SWPPP, the discharger does not have to repeat

the same procedure for continuing or recurring exceedances of natural ocean water quality conditions due to the same constituent.

(5) The requirements of this section are in addition to the terms, prohibitions, and conditions contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within eighteen (18) months from the effective date of the Exception, the discharger shall submit a draft written ASBS Compliance Plan to the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that describes its strategy to comply with these special conditions, including the requirement to maintain natural water quality in the affected ASBS. The ASBS Compliance Plan shall include a description of appropriate non-structural controls and a time schedule to implement structural controls (implementation schedule) to comply with these special conditions for inclusion in the discharger's SWMP or SWPPP, as appropriate to permit type. The final ASBS Compliance Plan, including a description and final schedule for structural controls based on the results of runoff and receiving water monitoring, must be submitted within thirty (30) months from the effective date of the Exception.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these special conditions shall be implemented.

d. Within six (6) years of the effective date of the Exception, any structural controls identified in the ASBS Compliance Plan that are necessary to comply with these special conditions shall be operational.

e. Within six (6) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water, pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data, and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in

compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. for municipalities, a demonstration of significant hardship to discharger ratepayers, by showing the relationship of storm water fees to annual household income for residents within the discharger's jurisdictional area, and the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or

2. for other governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

B. NONPOINT SOURCE DISCHARGES

1. General Provisions for Nonpoint Sources

a. Existing nonpoint source waste discharges are allowed into an ASBS only under the following conditions:

(1) The discharges are authorized under waste discharge requirements, a conditional waiver of waste discharge requirements, or a conditional prohibition issued by the State Water Board or a Regional Water Board.

(2) The discharges are in compliance with the applicable terms, prohibitions, and special conditions contained in these Special Protections.

(3) The discharges:

(i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

(ii) Are designed to prevent soil erosion;

(iii) Occur only during wet weather;

(iv) Are composed of only storm water runoff.

b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

c. The discharge of trash is prohibited.

d. Only existing nonpoint source waste discharges are allowed. "Existing nonpoint source waste discharges" are discharges that were ongoing prior to January 1, 2005. "New nonpoint source discharges" are defined as those that commenced on or after January 1, 2005. A change to an existing nonpoint source discharge, in terms of relocation or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges from nonpoint sources (those not subject to an NPDES Permit) are prohibited except as provided below:

(1) The term "non-storm water discharges" means any waste discharges that are not composed entirely of storm water.

(2) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability, or occur naturally:

(i) Discharges associated with emergency fire fighting operations.

(ii) Foundation and footing drains.

(iii) Water from crawl space or basement pumps.

(iv) Hillside dewatering.

(v) Naturally occurring groundwater seepage via a storm drain.

(vi) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

f. At the San Clemente Island ASBS, discharges incidental to military training and research, development, test, and evaluation operations are allowed. Discharges incidental to underwater demolition and other in-water explosions are not allowed in the two military closure areas in the vicinity of Wilson Cove and Castle Rock. Discharges must not result in a violation of the water quality objectives, including the protection of the marine aquatic life beneficial use, anywhere in the ASBS.

g. At the San Nicolas Island and Begg Rock ASBS, discharges incidental to military research, development, testing, and evaluation of, and training with, guided missile and other weapons systems, fleet training exercises, small-scale amphibious warfare training, and special warfare training are allowed. Discharges incidental to underwater demolition and other in-water explosions are not allowed. Discharges must not result in a violation of the water quality objectives, including the protection of the marine aquatic life beneficial use, anywhere in the ASBS.

h. All other nonpoint source discharges not specifically authorized above are prohibited.

2. Planning and Reporting

a. The nonpoint source discharger shall develop an ASBS Pollution Prevention Plan, including an implementation schedule, to address storm water runoff and any other nonpoint source discharges from its facilities. The ASBS Pollution Prevention Plan must be equivalent in contents to an ASBS Compliance Plan as described in I (A)(2) in this document. The ASBS Pollution Prevention Plan is subject to approval by the Executive Director of the State Water Board (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements).

b. The ASBS Pollution Prevention Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff that are necessary to comply with these special conditions, will be achieved through Management Measures and associated Management Practices (Management Measures/Practices). Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director or Regional Water Board Executive Officer that such installation would pose a threat to health or safety. Management Measures to control storm water runoff during a design storm shall achieve on average the following target levels:

(1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

(2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges.

The baseline for these determinations is the effective date of the Exception, except for those structural BMPs installed between January 1, 2005 and adoption of these Special Protections, and the reductions must be achieved and documented within six (6) years of the effective date.

c. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff or other nonpoint source pollution is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and the Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents that alter natural water quality and the sources of these constituents.

(2) The report shall describe Management Measures/Practices that are currently being implemented, Management Measures/Practices that are identified in the ASBS Pollution Prevention Plan for future implementation, and any additional Management Measures/Practices that may be added to the Pollution Prevention Plan to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the Management Measures/Practices.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge

requirements), the discharger shall revise its ASBS Pollution Prevention Plan to incorporate any new or modified Management Measures/Practices that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised ASBS Pollution Prevention Plan, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural water quality conditions due to the same constituent.

(5) The requirements of this section are in addition to the terms, prohibitions, and conditions contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within eighteen (18) months from the effective date of the Exception, the discharger~~s~~ shall submit a draft written ASBS Pollution Prevention Plan to the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) that describes its strategy to comply with these special conditions, including the requirement to maintain natural ocean water quality in the affected ASBS. The Pollution Prevention Plan shall include a description of appropriate non-structural controls and a time schedule to implement structural controls to comply with these special conditions for inclusion in the discharger's Pollution Prevention Plan. The final ASBS Pollution Prevention Plan, including a description and final schedule for structural controls based on the results of runoff and receiving water monitoring, must be submitted within thirty (30) months from the effective date of the Exception.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these Special Protections shall be implemented.

d. Within six (6) years of the effective date of the Exception, any structural controls identified in the ASBS Pollution Prevention Plan that are necessary to comply with these special conditions shall be operational.

e. Within six (6) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) may only authorize additional time to comply

with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in (d.) or (e.). The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. a demonstration that the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or

2. for governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

II. ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES

In addition to the provisions in Section I (A) or I (B), respectively, a discharger with parks and recreation facilities shall comply with the following:

A. The discharger shall include a section in an ASBS Compliance Plan (for NPDES dischargers) or an ASBS Pollution Prevention Plan (for nonpoint source dischargers) to address storm water runoff from parks and recreation facilities.

1. The plan shall identify all pollutant sources, including sediment sources, which may result in waste entering storm water runoff. Pollutant sources include, but are not limited to, roadside rest areas and vistas, picnic areas, campgrounds, trash receptacles, maintenance facilities, park personnel housing, portable toilets, leach fields, fuel tanks, roads, piers, and boat launch facilities.

2. The plan shall describe BMPs or Management Measures/Practices that will be implemented to control soil erosion (both temporary and permanent erosion controls) and reduce or eliminate pollutants in storm water runoff in order to achieve and maintain natural water quality conditions in the affected ASBS. The plan shall include BMPs or Management Measures/Practices to ensure that trails and culverts are maintained to prevent erosion and minimize waste discharges to ASBS.

3. The plan shall include BMPs or Management Measures/Practices to prevent the discharge of pesticides or other chemicals, including agricultural chemicals, in storm water runoff to the affected ASBS.

4. The plan shall include BMPs or Management Measures/Practices that address public education and outreach. The goal of these BMPs or Management Measures/Practices is to ensure that the public is adequately informed that waste discharges to the affected ASBS are prohibited or limited by special conditions in these Special Protections. The BMPs or Management Measures/Practices shall include signage at camping, picnicking, beach and roadside parking areas, and visitor centers, or other appropriate measures, which notify the public of any applicable requirements of these Special Protections and identify the ASBS boundaries.

5. The plan shall include BMPs or Management Measures/Practices that address the prohibition against the discharge of trash to ASBS. The BMPs or Management Measures/Practices shall include measures to ensure that adequate trash receptacles are available for public use at visitor facilities, including parking areas, and that the receptacles are adequately maintained to prevent trash discharges into the ASBS. Appropriate measures include covering trash receptacles to prevent trash from being wind blown and periodically emptying the receptacles to prevent overflows.

6. The plan shall include BMPs or Management Measures/Practices to address runoff from parking areas and other developed features to ensure that the runoff does not alter natural water quality in the affected ASBS. BMPs or Management Measures/Practices shall include measures to reduce pollutant loading in runoff to the ASBS through installation of natural area buffers (LID), treatment, or other appropriate measures.

B. Maintenance and repair of park and recreation facilities must not result in waste discharges to the ASBS. The practice of road oiling must be minimized or eliminated, and must not result in waste discharges to the ASBS.

III. ADDITIONAL REQUIREMENTS – WATERFRONT AND MARINE OPERATIONS

In addition to the provisions in Section I (A) or I (B), respectively, a discharger with waterfront and marine operations shall comply with the following:

A. For discharges related to waterfront and marine operations, the discharger shall develop a Waterfront and Marine Operations Management Plan (Waterfront Plan). This plan shall contain appropriate Management Measures/Practices to address nonpoint source pollutant discharges to the affected ASBS.

1. The Waterfront Plan shall contain appropriate Management Measures/Practices for any waste discharges associated with the operation and maintenance of vessels, moorings, piers, launch ramps, and cleaning stations in order to ensure that beneficial uses are protected and natural water quality is maintained in the affected ASBS.

2. For discharges from marinas and recreational boating activities, the Waterfront Plan shall include appropriate Management Measures, described in The Plan for California's Nonpoint Source Pollution Control Program, for marinas and recreational boating, or equivalent practices, to ensure that nonpoint source pollutant discharges do not alter natural water quality in the affected ASBS.

3. The Waterfront Plan shall include Management Practices to address public education and outreach to ensure that the public is adequately informed that waste discharges to the affected ASBS are prohibited or limited by special conditions in these Special Protections. The management practices shall include appropriate signage, or similar measures, to inform the public of the ASBS restrictions and to identify the ASBS boundaries.

4. The Waterfront Plan shall include Management Practices to address the prohibition against trash discharges to ASBS. The Management Practices shall include the provision of adequate trash receptacles for marine recreation areas, including parking areas, launch ramps, and docks. The plan shall also include appropriate Management Practices to ensure that the receptacles are adequately maintained and secured in order to prevent trash discharges into the ASBS. Appropriate Management Practices include covering the trash receptacles to prevent trash from being windblown, staking or securing the trash receptacles so they don't tip over, and periodically emptying the receptacles to prevent overflow.

5. The discharger shall submit its Waterfront Plan to the by the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) within six months of the effective date of these special conditions. The Waterfront Plan is subject to approval by the State Water Board Executive Director or the Regional Water Board Executive Officer, as appropriate. The plan must be fully implemented within 18 months of the effective date of the Exception.

B. The discharge of chlorine, soaps, petroleum, other chemical contaminants, trash, fish offal, or human sewage to ASBS is prohibited. Sinks and fish cleaning stations are point source discharges of wastes and are prohibited from discharging into ASBS. Anthropogenic accumulations of discarded fouling organisms on the sea floor must be minimized.

C. Limited-term activities, such as the repair, renovation, or maintenance of waterfront facilities, including, but not limited to, piers, docks, moorings, and breakwaters, are authorized only in accordance with Chapter III.E.2 of the Ocean Plan.

D. If the discharger anticipates that the discharger will fail to fully implement the approved Waterfront Plan within the 18 month deadline, the discharger shall submit a technical report as soon as practicable to the State Water Board Executive Director or the Regional Water Board Executive Officer, as appropriate. The technical report shall contain reasons for failing to meet the deadline and propose a revised schedule to fully implement the plan.

E. The State Water Board or the Regional Water Board may, for good cause, authorize additional time to comply with the Waterfront Plan. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in Section III.A.5. The notice shall

describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality. The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. a demonstration of significant hardship by showing that the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate.

2. for governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

IV. MONITORING REQUIREMENTS

Monitoring is mandatory for all dischargers to assure compliance with the Ocean Plan. Monitoring requirements include both: (A) core discharge monitoring, and (B) ocean receiving water monitoring. The State and Regional Water Boards must approve sampling site locations and any adjustments to the monitoring programs. All ocean receiving water and reference area monitoring must be comparable with the Water Boards' Surface Water Ambient Monitoring Program (SWAMP).

Safety concerns: Sample locations and sampling periods must be determined considering safety issues. Sampling may be postponed upon notification to the State and Regional Water Boards if hazardous conditions prevail.

Analytical Chemistry Methods: All constituents must be analyzed using the lowest minimum detection limits comparable to the Ocean Plan water quality objectives. For metal analysis, all samples, including storm water effluent, reference samples, and ocean receiving water samples, must be analyzed by the approved analytical method with the lowest minimum detection limits (currently Inductively Coupled Plasma/Mass Spectrometry) described in the Ocean Plan.

A. CORE DISCHARGE MONITORING PROGRAM

1. General sampling requirements for timing and storm size:

   Runoff must be collected during a storm event that is greater than 0.1 inch and generates runoff, and at least 72 hours from the previously measurable storm event. Runoff samples shall be collected during the same storm and at approximately the same time when post-storm receiving water is sampled, and analyzed for the same constituents as receiving water and reference site samples (see section IV B) as described below.

2. Runoff flow measurements

   a. For municipal/industrial storm water outfalls in existence as of December 31, 2007,

18 inches (457mm) or greater in diameter/width (including multiple outfall pipes in combination having a width of 18 inches, runoff flows must be measured or calculated, using a method acceptable to and approved by the State and Regional Water Boards.

b. This will be reported annually for each precipitation season to the State and Regional Water Boards.

3. Runoff samples – storm events

a. For outfalls equal to or greater than 18 inches (0.46m) in diameter or width:

(1) samples of storm water runoff shall be collected during the same storm as receiving water samples and analyzed for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

(2) samples of storm water runoff shall be collected and analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

(3) If an applicant has no outfall greater than 36 inches, then storm water runoff from the applicant's largest outfall shall be further collected during the same storm as receiving water samples and analyzed for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates).

b. For outfalls equal to or greater than 36 inches (0.91m) in diameter or width:

(1) samples of storm water runoff shall be collected during the same storm as receiving water samples and analyzed for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

(2) samples of storm water runoff shall be further collected during the same storm as receiving water samples and analyzed for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates); and

(3) samples of storm water runoff shall be collected and analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

c. For an applicant not participating in a regional monitoring program [see below in Section IV (B)] in addition to (a.) and (b.) above, a minimum of the two largest outfalls or 20 percent of the larger outfalls, whichever is greater, shall be sampled (flow weighted composite samples) at least three times annually during wet weather (storm event) and analyzed for all Ocean Plan Table A constituents, Table B constituents for marine

aquatic life protection (except for toxicity, only chronic toxicity for three species shall be required), DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, and Ocean Plan indicator bacteria. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one (the largest) such discharge shall be sampled annually in each Region.

4. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may reduce or suspend core monitoring once the storm runoff is fully characterized. This determination may be made at any point after the discharge is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

B. Ocean Receiving Water and Reference Area Monitoring Program

In addition to performing the Core Discharge Monitoring Program in Section II.A above, all applicants having authorized discharges must perform ocean receiving water monitoring. In order to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS, dischargers may choose either (1) an individual monitoring program, or (2) participation in a regional integrated monitoring program.

1. Individual Monitoring Program: The requirements listed below are for those dischargers who elect to perform an individual monitoring program to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within the affected ASBS. In addition to Core Discharge Monitoring, the following additional monitoring requirements shall be met:

   a. Three times annually, during wet weather (storm events), the receiving water at the point of discharge from the outfalls described in section (IV)(A)(3)(c) above shall be sampled and analyzed for Ocean Plan Table A constituents, Table B constituents for marine aquatic life, DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, salinity, chronic toxicity (three species), and Ocean Plan indicator bacteria.

      The sample location for the ocean receiving water shall be in the surf zone at the point of discharges; this must be at the same location where storm water runoff is sampled. Receiving water shall be sampled prior to (pre-storm) and during (or immediately after) the same storm (post storm). Post storm sampling shall be during the same storm and at approximately the same time as when the runoff is sampled. Reference water quality shall also be sampled three times annually and analyzed for the same constituents pre-storm and post-storm, during the same storm seasons when receiving water is sampled. Reference stations will be determined by the State Water Board's Division of Water Quality and the applicable Regional Water Board(s).

   b. Sediment sampling shall occur at least three times during every five (5) year period. The subtidal sediment (sand or finer, if present) at the discharge shall be sampled and analyzed for Ocean Plan Table B constituents for marine aquatic life, DDT, PCBs, PAHs, pyrethroids, and OP pesticides. For sediment toxicity testing, only an acute toxicity test using the amphipod *Eohaustorius estuarius* must be performed.

c. A quantitative survey of intertidal benthic marine life shall be performed at the discharge and at a reference site. The survey shall be performed at least once every five (5) year period. The survey design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The results of the survey shall be completed and submitted to the State Water Board and Regional Water Board at least six months prior to the end of the permit cycle.

d. Once during each five (5) year period, a bioaccumulation study shall be conducted to determine the concentrations of metals and synthetic organic pollutants at representative discharge sites and at representative reference sites. The study design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The bioaccumulation study may include California mussels (*Mytilus californianus*) and/or sand crabs (*Emerita analoga* or *Blepharipoda occidentalis*). Based on the study results, the Regional Water Board and the State Water Board's Division of Water Quality, may adjust the study design in subsequent permits, or add or modify additional test organisms (such as shore crabs or fish), or modify the study design appropriate for the area and best available sensitive measures of contaminant exposure.

e. Marine Debris: Representative quantitative observations for trash by type and source shall be performed along the coast of the ASBS within the influence of the discharger's outfalls. The design, including locations and frequency, of the marine debris observations is subject to approval by the Regional Water Board and State Water Board's Division of Water Quality.

f. The monitoring requirements of the Individual Monitoring Program in this section are minimum requirements. After a minimum of one (1) year of continuous water quality monitoring of the discharges and ocean receiving waters, the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may require additional monitoring, or adjust, reduce or suspend receiving water and reference station monitoring. This determination may be made at any point after the discharge and receiving water is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

2. Regional Integrated Monitoring Program: Dischargers may elect to participate in a regional integrated monitoring program, in lieu of an individual monitoring program, to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS. This regional approach shall characterize natural water quality, pre- and post-storm, in ocean reference areas near the mouths of identified open space watersheds and the effects of the discharges on natural water quality (physical, chemical, and toxicity) in the ASBS receiving waters, and should include benthic marine aquatic life and bioaccumulation components. The design of the ASBS stratum of a regional integrated monitoring program may deviate from the otherwise prescribed individual monitoring approach (in Section IV.B.1) if approved by the State Water Board's Division of Water Quality and the Regional Water Boards.

a. Ocean reference areas shall be located at the drainages of flowing watersheds with minimal development (in no instance more than 10% development), and shall not be located in CWA Section 303(d) listed waterbodies or have tributaries that are 303(d) listed. Reference areas shall be free of wastewater discharges and anthropogenic non- storm water runoff. A minimum of low threat storm runoff discharges (e.g.

stream highway overpasses and campgrounds) may be allowed on a case-by-case basis. Reference areas shall be located in the same region as the ASBS receiving water monitoring occurs. The reference areas for each Region are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean reference water samples must be collected from each station, each from a separate storm during the same storm season that receiving water is sampled. A minimum of one reference location shall be sampled for each ASBS receiving water site sampled per responsible party. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

b. ASBS ocean receiving water must be sampled in the surf zone at the location where the runoff makes contact with ocean water (i.e. at "point zero"). Ocean receiving water stations must be representative of worst-case discharge conditions (i.e. co-located at a large drain greater than 36 inches, or if drains greater than 36 inches are not present in the ASBS then the largest drain greater than18 inches.) Ocean receiving water stations are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean receiving water samples must be collected during each storm season from each station, each from a separate storm. A minimum of one receiving water location shall be sampled in each ASBS per responsible party in that ASBS. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

c. Reference and receiving water sampling shall commence during the first full storm season following the adoption of these special conditions, and post-storm samples shall be collected during the same storm event when storm water runoff is sampled. Sampling shall occur in a minimum of two storm seasons. For those ASBS dischargers that have already participated in the Southern California Bight 2008 ASBS regional monitoring effort, sampling may be limited to only one storm season.

d. Receiving water and reference samples shall be analyzed for the same constituents as storm water runoff samples. At a minimum, constituents to be sampled and analyzed in reference and discharge receiving waters must include oil and grease, total suspended solids, Ocean Plan Table B metals for protection of marine life, Ocean Plan PAHs, pyrethroids, OP pesticides, ammonia, nitrate, phosphates, and critical life stage chronic toxicity for three species. In addition, within the range of the southern sea otter, indicator bacteria or some other measure of fecal contamination shall be analyzed.

3. Waterfront and Marine Operations: In addition to the above requirements for ocean receiving water monitoring, additional monitoring must be performed for marinas and boat launch and pier facilities:

a. For all marina or mooring field operators, in mooring fields with 10 or more occupied moorings, the ocean receiving water must be sampled for Ocean Plan indicator bacteria, residual chlorine, copper, zinc, grease and oil, methylene blue active substances (MBAS), and ammonia nitrogen.

(1) For mooring field operators opting for an individual monitoring program (Section IV.B.1 above), this sampling must occur weekly (on the weekend) from May through October.

(2) For mooring field operators opting to participate in a regional integrated monitoring program (Section IV.B.2 above), this sampling must occur monthly from May through October on a high use weekend in each month. The Water Boards may allow a reduction in the frequency of sampling, through the regional monitoring program, after the first year of monitoring.

b. For all mooring field operators, the subtidal sediment (sand or finer, if present) within mooring fields and below piers shall be sampled and analyzed for Ocean Plan Table B metals (for marine aquatic life beneficial use), acute toxicity, PAHs, and tributyltin. For sediment toxicity testing, only an acute toxicity test using the amphipod *Eohaustorius estuarius* must be performed. This sampling shall occur at least three times during a five (5) year period. For mooring field operators opting to participate in a regional integrated monitoring program, the Water Boards may allow a reduction in the frequency of sampling after the first sampling effort's results are assessed.

Glossary

At the point of discharge(s) – Means in the surf zone immediately where runoff from an outfall meets the ocean water (a.k.a., at point zero).

Areas of Special Biological Significance (ASBS) – Those areas designated by the State Water Board as ocean areas requiring protection of species or biological communities to the extent that alteration of natural water quality is undesirable. All Areas of Special Biological Significance are also classified as a subset of State Water Quality Protection Areas.

Design storm – For purposes of these Special Protections, a design storm is defined as the volume of runoff produced from one inch of precipitation per day or, if this definition is inconsistent with the discharger's applicable storm water permit, then the design storm shall be the definition included in the discharger's applicable storm water permit.

Development – Relevant to reference monitoring sites, means urban, industrial, agricultural, grazing, mining, and timber harvesting land uses.

Higher threat discharges - Permitted storm drains discharging equal to or greater than 18 inches, industrial storm drains, agricultural runoff discharged through an MS4, discharges associated with waterfront and marina operations (e.g., piers, launch ramps, mooring fields, and associated vessel support activities, except for passive discharges defined below), and direct discharges associated with commercial or industrial activities to ASBS.

Low Impact Development (LID) – A sustainable practice that benefits water supply and contributes to water quality protection. Unlike traditional storm water management, which entails collecting and conveying storm water runoff through storm drains, pipes, or other conveyances to a centralized storm water facility, LID focuses on using site design and storm water management to maintain the site's pre-development runoff rates and volumes. The goal of LID is to mimic a site's predevelopment hydrology by using design techniques that infiltrate, filter, store, evaporate, and detain runoff close to the source of rainfall.

Marine Operations – Marinas or mooring fields that contain slips or mooring locations for 10 or more vessels.

Management Measure (MM) - Economically achievable measures for the control of the addition of pollutants from various classes of nonpoint sources of pollution, which reflect the greatest degree of pollutant reduction achievable through the application of the best available nonpoint pollution control practices, technologies, processes, siting criteria, operating methods, or other alternatives. For example, in the "marinas and recreational boating" land- use category specified in the Plan for California's Nonpoint Source Pollution Control Program (NPS Program Plan) (SWRCB, 1999), "boat cleaning and maintenance" is considered a MM or the source of a specific class or type of NPS pollution.

Management Practice (MP) - The practices (e.g., structural, non-structural, operational, or other alternatives) that can be used either individually or in combination to address a specific MM class or classes of NPS pollution. For example, for the "boat cleaning and maintenance" MM, specific MPs can include, but are not limited to, methods for the selection of environmentally sensitive hull paints or methods for cleaning/removal of hull copper anti- fouling paints.

Municipal Separate Storm Sewer System (MS4) – A municipally-owned storm sewer system regulated under the Phase I or Phase II storm water program implemented in compliance with Clean Water Act section 402(p). Note that an MS4 program's boundaries are not necessarily congruent with the permittee's political boundaries.

Natural Ocean Water Quality - The water quality (based on selected physical, chemical and biological characteristics) that is required to sustain marine ecosystems, and which is without apparent human influence, *i.e.*, an absence of significant amounts of: (a) man-made constituents (*e.g.,* DDT); (b) other chemical (*e.g.,* trace metals), physical (temperature/thermal pollution, sediment burial), and biological (*e.g.*, bacteria) constituents at concentrations that have been elevated due to man's activities above those resulting from the naturally occurring processes that affect the area in question; and (c) non-indigenous biota (*e.g.,* invasive algal bloom species) that have been introduced either deliberately or accidentally by man. Discharges "*shall not alter natural ocean water quality*" as determined by a comparison to the range of constituent concentrations in reference areas agreed upon via the regional monitoring program(s). If monitoring information indicates that *natural ocean water quality* is not maintained, but there is sufficient evidence that a discharge is not contributing to the alteration of natural water quality, then the Regional Water Board may make that determination. In this case, sufficient information must include runoff sample data that has equal or lower concentrations for the range of constituents at the applicable reference area(s).

Nonpoint source – Nonpoint pollution sources generally are sources that do not meet the definition of a point source. Nonpoint source pollution typically results from land runoff, precipitation, atmospheric deposition, agricultural drainage, marine/boating operations or hydrologic modification. Nonpoint sources, for purposes of these Special Protections, include discharges that are not required to be regulated under an NPDES permit.

Non-storm water discharge – Any runoff that is not the result of a precipitation event. This is often referred to as "dry weather flow."

Non-structural control – A Best Management Practice that involves operational, maintenance, regulatory (e.g., ordinances) or educational activities designed to reduce or eliminate pollutants in runoff, and that are not structural controls (i.e. there are no physical structures involved).

Physical impossibility - Means any act of God, war, fire, earthquake, windstorm, flood or natural catastrophe; unexpected and unintended accidents not caused by discharger or its employees' negligence; civil disturbance, vandalism, sabotage or terrorism; restrain by court order or public authority or agency; or action or non-action by, or inability to

obtain the necessary authorizations or approvals from any governmental agency other than the permittee.

Representative sites and monitoring procedures – Are to be proposed by the discharger, with appropriate rationale, and subject to approval by Water Board staff.

Sheet-flow – Runoff that flows across land surfaces at a shallow depth relative to the cross- sectional width of the flow. These types of flow may or may not enter a storm drain system before discharge to receiving waters.

Storm Season – Also referred to as rainy season, means the months of the year from the onset of rainfall during autumn until the cessation of rainfall in the spring.

Structural control – A Best Management Practice that involves the installation of engineering solutions to the physical treatment or infiltration of runoff.

Surf Zone - The surf zone is defined as the submerged area between the breaking waves and the shoreline at any one time.

Surface Water Ambient Monitoring Program (SWAMP) comparable – Means that the monitoring program must 1) meet or exceed 2008 SWAMP Quality Assurance Program Management Plan (QAPP) Measurement Quality Objectives, or 2) have a Quality Assurance Project Plan that has been approved by SWAMP; in addition data must be formatted to match the database requirements of the SWAMP Information Management System. Adherence to the measurement quality objectives in the Southern California Bight 2008 ASBS Regional Monitoring Program QAPP and data base management comprises being SWAMP comparable.

Waterfront Operations - Piers, launch ramps, and cleaning stations in the water or on the adjacent shoreline.

Attachment 1
Special Protections Sections I(A)(3)(e) and I(B)(3)(e)
Flowchart to Determine Compliance with natural Water Quality

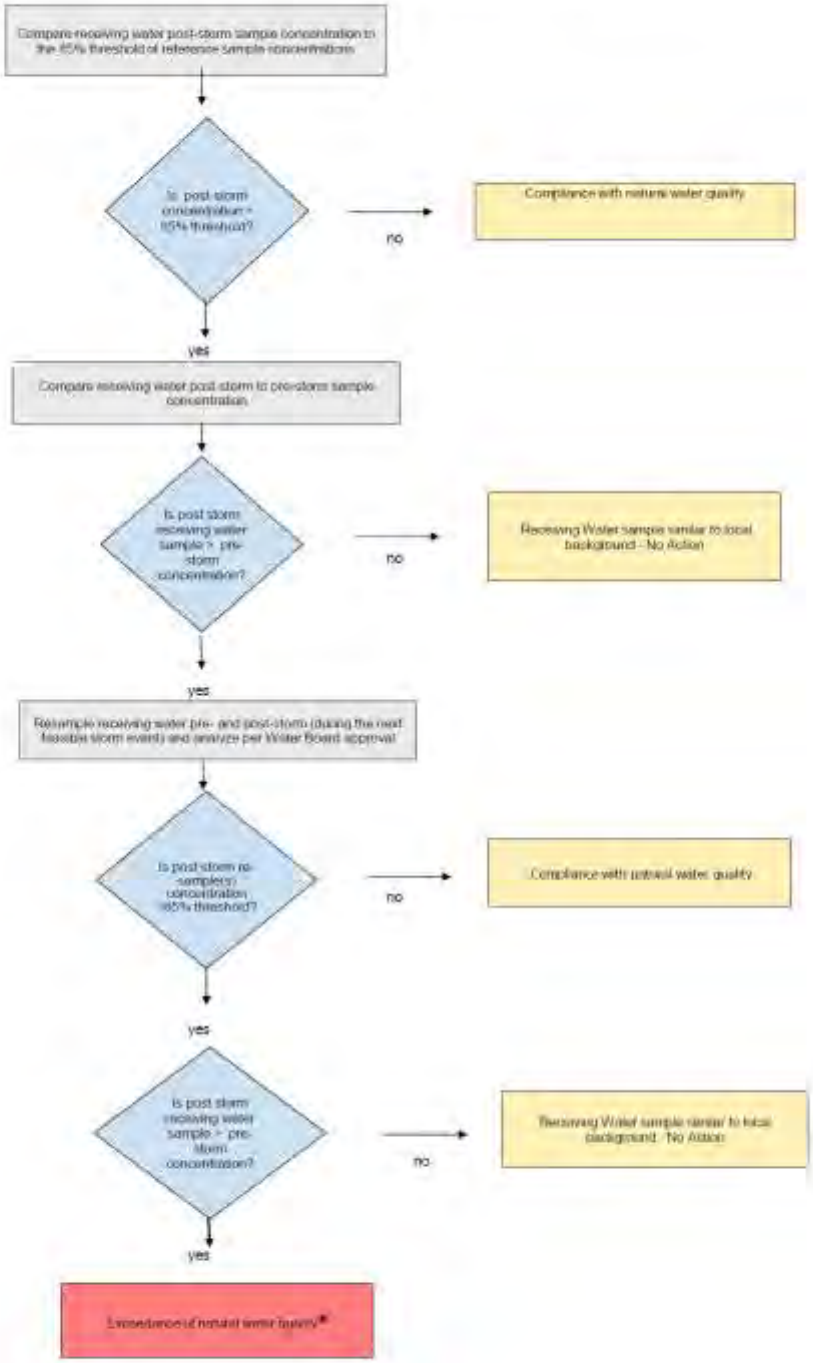

* When an exceedance of natural water quality occurs, the discharger must comply with section I.A.2.h (for permitted storm water) or section I.B.2.c (for nonpoint sources). Note, when sampling data is available, end-of-pipe effluent concentrations will be considered by the Water Boards in making this determination.

ATTACHMENT B

STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

1. Standard Permit Provisions

Code of Federal Regulations Title 40 Section 122.41 (40 CFR 122.41) includes conditions, or provisions, that apply to all National Pollutant Discharge Elimination System (NPDES) permits. Additional provisions applicable to NPDES permits are in 40 CFR 122.42. All applicable provisions in 40 CFR 122.41 and 40 CFR 122.42 must be incorporated into this Order and NPDES permit. The applicable 40 CFR 122.41 and 40 CFR 122.42 provisions are as follows:

a. DUTY TO COMPLY [40 CFR 122.41(a)]

The Copermittee must comply with all of the provisions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

(1) The Copermittee must comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement. [40 CFR 122.41(a)(1)]

(2) The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to a civil penalty not to exceed $25,000 per day for each violation. The CWA provides that any person who *negligently* violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than 2 years, or both. Any person who *knowingly* violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both. Any person who knowingly violates Section 301, 302, 303, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, and who knows at that time that he thereby places another person in imminent

danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.
[40 CFR 122.41(a)(2)]

(3) Any person may be assessed an administrative penalty by the San Diego Regional Water Quality Control Board (San Diego Water Board), State Water Resources Control Board (State Water Board), or United States Environmental Protection Agency (USEPA) for violating Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.
[40 CFR 122.41(a)(3)]

b. DUTY TO REAPPLY [40 CFR 122.41(b)]

If a Copermittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Copermittee must apply for and obtain a new permit.

c. NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE [40 CFR 122.41(c)]

It shall not be a defense for a Copermittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

d. DUTY TO MITIGATE [40 CFR 122.41(d)]

The Copermittee must take all reasonable steps to minimize or prevent any discharge or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

e. PROPER OPERATION AND MAINTENANCE [40 CFR 122.41(e)]

The Copermittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Copermittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by a Copermittee only when the operation is necessary to achieve compliance with the conditions of this permit.

f. PERMIT ACTIONS [40 CFR 122.41(f)]

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Copermittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

g. PROPERTY RIGHTS [40 CFR 122.41(g)]

This permit does not convey any property rights of any sort, or any exclusive privilege.

h. DUTY TO PROVIDE INFORMATION [40 CFR 122.41(h)]

The Copermittee must furnish to the San Diego Water Board, State Water Board, or USEPA within a reasonable time, any information which the San Diego Water Board, State Water Board, or USPEA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Copermittee must also furnish to the San Diego Water Board, State Water Board, or USPEA upon request, copies of records required to be kept by this permit.

i. INSPECTION AND ENTRY [40 CFR 122.41(i)]

The Copermittee must allow the San Diego Water Board, State Water Board, USEPA, and/or their authorized representative (including an authorized contractor acting as their representative), upon presentation of credentials and other documents as may be required by law, to:

(1) Enter upon the Copermittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit; [40 CFR 122.41(i)(1)]

(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit; [40 CFR 122.41(i)(2)]

(3) Inspect and photograph at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; [40 CFR 122.41(i)(3)] and

(4) Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location. [40 CFR 122.41(i)(4)]

j. MONITORING AND RECORDS [40 CFR 122.41(j)]

(1) Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity. [40 CFR 122.41(j)(1)]

(2) Except for records of monitoring information required by this permit related to the Copermittee's sewage sludge use and disposal activities, which shall be retained for

a period of at least five (5) years (or longer as required by 40 CFR Part 503), the Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time. [40 CFR 122.41(j)(2)]

(3) Records for monitoring information must include: [40 CFR 122.41(j)(3)]

(a) The date, exact place, and time of sampling or measurements; [40 CFR 122.41(j)(3)(i)]
(b) The individual(s) who performed the sampling or measurements; [40 CFR 122.41(j)(3)(ii)]
(c) The date(s) analyses were performed; [40 CFR 122.41(j)(3)(iii)]
(d) The individual(s) who performed the analyses; [40 CFR 122.41(j)(3)(iv)]
(e) The analytical techniques or methods used; [40 CFR 122.41(j)(3)(v)] and
(f) The results of such analyses. [40 CFR 122.41(j)(3)(vi)]

(4) Monitoring must be conducted according to test procedures under 40 CFR Part 136 unless another method is required under 40 CFR Subchapters N or O. [40 CFR 122.41(j)(4)]

In the case of pollutants for which there are no approved methods under 40 CFR Part 136 or otherwise required under 40 CFR Subchapters N and O, monitoring must be conducted according to a test procedure specified in the permit for such pollutants. [40 CFR 122.44(i)(1)(iv)]

(5) The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. [40 CFR 122.41(j)(5)]

k. SIGNATORY REQUIREMENT [40 CFR 122.41(k)]

(1) All applications, reports, or information submitted to the San Diego Water Board, State Water Board, or USEPA must be signed and certified. (See 40 CFR 122.22) [40 CFR 122.41(k)(1)]

(a) *For a municipality, State, Federal, or other public agency.* [All applications must be signed] by either a principal executive officer or ranking elected official. [40 CFR 122.22(a)(3)]

(b) All reports required by permits, and other information requested by the San Diego Water Board, State Water Board, or USEPA must be signed by a person described in paragraph (a) of this section, or by a duly authorized

representative of that person. A person is a duly authorized representative only if: [40 CFR 122.22(b)]

(i) The authorization is made in writing by a person described in paragraph (a) of this section; [40 CFR 122.22(b)(1)]
(ii) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company, (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) [40 CFR 122.22(b)(2)] and,
(iii) The written authorization is submitted to the San Diego Water Board and State Water Board. [40 CFR 122.22(b)(3)]

(c) *Changes to authorization.* If an authorization under paragraph (b) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (b) of this section must be submitted to the San Diego Water Board prior to or together with any reports, information, or applications to be signed by an authorized representative. [40 CFR 122.22(c)]

(d) *Certification.* Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." [40 CFR 122.22(d)]

(2) The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both. [40 CFR 122.41(k)(2)]

I. REPORTING REQUIREMENTS [40 CFR 122.41(l)]

(1) *Planned changes.* The Copermittee must give notice to the San Diego Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when: [40 CFR 122.41(l)(1)]

(a) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); [40 CFR 122.41(l)(1)(i)] or

(b) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1). [40 CFR 122.41(l)(1)(ii)]

(c) The alteration or addition results in a significant change in the Copermittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. [40 CFR 122.41(l)(1)(iii)]

(2) *Anticipated noncompliance*. The Copermittee must give advance notice to the San Diego Water Board or State Water Board of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements. [40 CFR 122.41(l)(2)]

(3) *Transfers*. This permit is not transferable to any person except after notice to the San Diego Water Board. The San Diego Water Board may require modification or revocation and reissuance of the permit to change the name of the Copermittee and incorporate such other requirements as may be necessary under the CWA. [40 CFR 122.41(l)(3)]

(4) *Monitoring reports.* Monitoring results must be reported at the intervals specified elsewhere in this permit. [40 CFR 122.41(l)(4)]

(a) Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the San Diego Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices. [40 CFR 122.41(l)(4)(i)]

(b) If the Copermittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or another method required for an industry-specific waste stream under 40 CFR Subchapters N or O, the results of this monitoring must be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the San Diego Water Board or State Water Board. [40 CFR 122.41(l)(4)(ii)]

(c) Calculations for all limitations which require averaging of measurements must utilize an arithmetic mean unless otherwise specified in the permit. [40 CFR 122.41(l)(4)(iii)]

(5) *Compliance schedules*. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date. [40 CFR 122.41(l)(5)]

(6) *Twenty-four hour reporting.*

(a) The Copermittee must report any noncompliance that may endanger health or the environment. Any information must be provided orally within 24 hours from the time the Copermittee becomes aware of the circumstances. A written submission must also be provided within five (5) days of the time the Copermittee becomes aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6)(i)]

(b) The following must be included as information which must be reported within 24 hours under this paragraph: [40 CFR 122.41(l)(6)(ii)]

(i) Any unanticipated bypass that exceeds any effluent limitation in the permit (See 40 CFR 122.41(g)). [40 CFR 122.41(l)(6)(ii)(A)]
(ii) Any upset which exceeds any effluent limitation in the permit. [40 CFR 122.41(l)(6)(ii)(B)] and,
(iii) Violation of a maximum daily discharge limitation for any of the pollutants listed by the San Diego Water Board in the permit to be reported within 24 hours. (See 40 CFR 122.44(g)) [40 CFR 122.41(l)(6)(ii)(C)]

(c) The San Diego Water Board may waive the above-required written report on a case-by-case basis if the oral report has been received within 24 hours. [40 CFR 122.41(l)(6)(iii)]

(7) *Other noncompliance.* The Copermittee must report all instances of noncompliance not reported in accordance with the standard provisions required under 40 CFR 122.41(l)(4), (5), and (6), at the time monitoring reports are submitted. The reports must contain the information listed in the standard provisions required under 40 CFR 122.41(l)(6). [40 CFR 122.41(l)(7))]

(8) *Other information.* When the Copermittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the San Diego Water Board, State Water Board, or USEPA, the Copermittee must promptly submit such facts or information. [40 CFR 122.41(l)(8)]

m. BYPASS [40 CFR 122.41(m)]

(1) *Definitions.*

(a) "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. [40 CFR 122.41(m)(1)(i)] or

(b) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or

substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
[40 CFR 122.41(m)(1)(ii)]

(2) *Bypass not exceeding limitations*. The Copermittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the standard provisions required under 40 CFR 122.41(m)(3) and (4).
[40 CFR 122.41(m)(2)]

(3) *Notice.*

(a) *Anticipated bypass*. If the Copermittee knows in advance of the need for a bypass, it must submit a notice, if possible at least ten days before the date of the bypass. [40 CFR 122.41(m)(3)(i)] or

(b) *Unanticipated bypass*. The Copermittee must submit notice of an unanticipated bypass in accordance with the standard provisions required under 40 CFR 122.41(l)(6) (24-hour notice).
[40 CFR 122.41(m)(3)(ii)]

(4) *Prohibition of Bypass.*

(a) Bypass is prohibited, and the San Diego Water Board may take enforcement action against a Copermittee for bypass, unless:
[40 CFR 122.41(m)(4)(i)]

(i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; [40 CFR 122.41(m)(4)(i)(A)]
(ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance;
[40 CFR 122.41(m)(4)(i)(B)] and,
(iii) The Copermittee submitted notice in accordance with the standard provisions required under 40 CFR 122.41(m)(3).
[40 CFR 122.41(m)(4)(i)(C)]

(b) The San Diego Water Board may approve an anticipated bypass, after considering its adverse effects, if the San Diego Water Board determines that it will meet the three conditions listed above.
[40 CFR 122.41(m)(4)(ii)]

n. UPSET [40 CFR 122.41(n)]

(1) *Definition.* "Upset" means an exceptional incident in which there is unintentional and

temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Copermittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. [40 CFR 122.41(n)(1)]

(2) *Effect of an upset*. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the standard provisions required under 40 CFR 122.41(n)(3) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. [40 CFR 122.41(n)(2)]

(3) *Conditions necessary for a demonstration of upset*. A Copermittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that: [40 CFR 122.41(n)(3)]

(a) An upset occurred and that the Copermittee can identify the cause(s) of the upset; [40 CFR 122.41(n)(3)(i)]
(b) The permitted facility was at the time being properly operated; [40 CFR 122.41(n)(3)(ii)] and
(c) The Copermittee submitted notice of the upset in accordance with the standard provisions required under 40 CFR 122.41(l)(6)(ii)(B) (24-hour notice). [40 CFR 122.41(n)(3)(iii)]
(d) The Copermittee complied with any remedial measures pursuant to the standard provisions required under 40 CFR 122.41(d). [40 CFR 122.41(n)(3)(iii)]

(4) *Burden of proof*. In any enforcement proceeding, the Copermittee seeking to establish the occurrence of an upset has the burden of proof. [40 CFR 122.41(n)(4)]

o. STANDARD PERMIT PROVISIONS FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS [40 CFR 122.42(c)]

The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the San Diego Water Board or State Water Board under 40 CFR 122.26(a)(1)(v) must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report must include:

(1) The status of implementing the components of the storm water management program that are established as permit conditions; [40 CFR 122.42(c)(1)]

(2) Proposed changes to the storm water management programs that are established as permit conditions. Such proposed changes must be consistent with 40 CFR 122.26(d)(2)(iii); [40 CFR 122.42(c)(2)] and

(3) Revisions, if necessary, to the assessment of controls and the fiscal analysis

reported in the permit application under 40 CFR 122.26(d)(2)(iv) and (v); [40 CFR 122.42(c)(3)]

(4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; [40 CFR 122.42(c)(4)]

(5) Annual expenditures and budget for year following each annual report; [40 CFR 122.42(c)(5)]

(6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; [40 CFR 122.42(c)(6)]

(7) Identification of water quality improvements or degradation. [40 CFR 122.42(c)(7)]

p. STANDARD PERMIT PROVISIONS FOR STORM WATER DISCHARGES [40 CFR 122.42(d)]

The initial permits for discharges composed entirely of storm water issued pursuant to 40 CFR 122.26(e)(7) must require compliance with the conditions of the permit as expeditiously as practicable, but in no event later than three years after the date of issuance of the permit.

2. General Provisions

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. The general provisions applicable to this Order and NPDES permit are as follows:

a. DISCHARGE OF WASTE IS A PRIVILEGE

No discharge of waste into the waters of the State, whether or not such discharge is made pursuant to waste discharge requirements, shall create a vested right to continue such discharge. All discharges of waste into waters of the State are privileges, not rights. [CWC Section 13263(g)]

b. DURATION OF ORDER AND NPDES PERMIT

(1) *Effective date*. This Order supersedes Order No. R9-2007-0001 for the San Diego County Copermittees listed in Table ~~2.~~1a and became effective on June 27, 2013~~ for those Copermittees~~. This Order as amended by Order R9-2015-0001 supersedes Order No. R9-2009-0002 for the Orange County Copermittees listed in Table 1b and its amendments through Order No. R9-2015-0001 ~~becomes~~ became effective April 1, 2015~~, following the date Order No. R9-2015-0001 is adopted~~. This Order as amended by Order Nos. R9-2015-0001 and R9-2015-0100 supersedes Order No. R9-2010-0016 for the Riverside County Copermittees listed in Table 1c and its amendments through Order No. R9-2015-0100 became effective January 7, 2016. ~~upon further amendment or earlier notice of coverage.~~

(2) *Expiration*. This Order and NPDES permit expires five years after June 27, 2013, its initial effective date. [40 CFR 122.46(a)]

(3) *Continuation of expired order*. After this Order and NPDES permit expires, the terms and conditions of this Order and NPDES permit are automatically continued pending issuance of a new permit if all requirements of the federal NPDES regulations on the continuation of expired permits (40 CFR 122.6) are complied with.

c. AVAILABILITY

A copy of this Order must be kept at a readily accessible location and must be available to on-site personnel at all times.

d. CONFIDENTIALITY OF INFORMATION

Except as provided for in 40 CFR 122.7, no information or documents submitted in accordance with or in application for this Order will be considered confidential, and all such information and documents shall be available for review by the public at the San Diego Water Board office.

Claims of confidentiality for the following information will be denied:
[40 CFR 122.7(b)]

(1) The name and address of any permit applicant or Copermittee; [40 CFR 122.7(b)(1)] and

(2) Permit applications and attachments, permits, and effluent data. [40 CFR 122.7(b)(2)]

e. EFFLUENT LIMITATIONS

(1) *Interim effluent limitations*. The Copermittee must comply with any interim effluent limitations as established by addendum, enforcement action, or revised waste discharge requirements which have been, or may be, adopted by the San Diego Water Board.

(2) *Other effluent limitations and standards*. If any applicable toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant and that standard or prohibition is more stringent than any limitation on the pollutant in the permit, the San Diego Water Board shall institute proceedings under these regulations to modify or revoke and reissue the permit to conform to the toxic effluent standard or prohibition. [40 CFR 122.44(b)(1)]

f. DUTY TO MINIMIZE OR CORRECT ADVERSE IMPACTS

The Copermittee must take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this Order, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the noncompliance.

g. PERMIT ACTIONS

The filing of a request by the Copermittee for modification, revocation and reissuance, or termination of this Order, or a notification of planned change in or anticipated noncompliance with this Order does not stay any condition of this Order. (See 40 CFR 122.41(f)) In addition, the following provisions apply to this Order:

(1) Upon application by any affected person, or on its own motion, the San Diego Water Board may review and revise the requirements in this Order. All requirements must be reviewed periodically. [CWC Section 13263(e)]

(2) This Order may be terminated or modified for cause, including, but not limited to, all of the following: [CWC Section 13381]

(a) Violation of any condition contained in the requirements of this Order. [CWC Section 13381(a)]

(b) Obtaining the requirements in this Order by misrepresentation, or failure to disclose fully all relevant facts. [CWC Section 13381(b)]

(c) A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge. [CWC Section 13381(c)]

(3) When this Order is transferred to a new owner or operator, such requirements as may be necessary under the CWC may be incorporated into this Order.

h. NPDES PERMITTED NON-STORM WATER DISCHARGES

The San Diego Water Board has, in prior years, issued a limited number of individual NPDES permits for non-storm water discharges to MS4s. The San Diego Water Board or State Water Board may in the future, upon prior notice to the Copermittee(s), issue an NPDES permit for any non-storm water discharge (or class of non-storm water discharges) to an MS4.

i. MONITORING

In addition to the standard provisions required under 40 CFR 122.41(j) and (l)(4), the following general monitoring provisions apply to this Order:

(1) Where procedures are not otherwise specified in Order, sampling, analysis and quality assurance/quality control must be conducted in accordance with the Quality Assurance Management Plan (QAMP) for the State of California's Surface Water Ambient Monitoring Program (SWAMP), adopted by the State Water Resources Control Board (State Water Board).

(2) Pursuant to 40 CFR 122.41(j)(2) and CWC Section 13383(a), each Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring

instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five (5) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time.

(3) All chemical, bacteriological, and toxicity analyses must be conducted at a laboratory certified for such analyses by the California Department of Public Health or a laboratory approved by the San Diego Water Board.

(4) For priority toxic pollutants that are identified in the California Toxics Rule (CTR) (65 Fed. Reg. 31682), the Copermittees must instruct their laboratories to establish calibration standards that are equivalent to or lower than the Minimum Levels (MLs) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP). If a Copermittee can demonstrate that a particular ML is not attainable, in accordance with procedures set forth in 40 CFR Part 136, the lowest quantifiable concentration of the lowest calibration standard analyzed by a specific analytical procedure (assuming that all the method specified sample weights, volumes, and processing steps have been followed) may be used instead of the ML listed in Appendix 4 of the SIP. The Copermittee must submit documentation from the laboratory to the San Diego Water Board for approval prior to raising the ML for any priority toxic pollutant.

j. ENFORCEMENT

(1) The San Diego Water Board is authorized to enforce the terms of this Order under several provisions of the CWC, including, but not limited to, CWC Sections 13385, 13386, and 13387.

(2) Nothing in this Order shall be construed to protect the Copermittee from its liabilities under federal, state, or local laws.

(3) The CWC provides for civil and criminal penalties comparable to, and in some cases greater than, those provided for under the CWA.

(4) Except as provided in the standard conditions required under 40 CFR 122.41(m) and (n), nothing in this Order shall be construed to relieve the Copermittee from civil or criminal penalties for noncompliance.

(5) Nothing in this Order shall be construed to preclude the institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties to which the Copermittee is or may be subject to under Section 311 of the CWA.

(6) Nothing in this Order shall be construed to preclude institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authoring preserved by Section 510 of the CWA.

k. SEVERABILITY

The provisions of this Order are severable, and if any provision of this Order, or the application of any provisions of this Order to any circumstance, is held invalid, the

application of such provision to other circumstances and the remainder of this Order shall not be affected thereby.

l. APPLICATIONS

Any application submitted by a Copermittee for reissuance or modification of this Order must satisfy all applicable requirements specified in federal regulations as well as any additional requirements for submittal of a Report of Waste Discharge specified in the CWC and the California Code of Regulations.

m. IMPLEMENTATION

All plans, reports and subsequent amendments submitted in compliance with this Order must be implemented immediately (or as otherwise specified). All submittals by Copermittees must be adequate to implement the requirements of this Order.

n. REPORT SUBMITTALS

(1) All report submittals must include an executive summary, introduction, conclusion, recommendations, and signed certified statement.

(2) Each Copermittee must submit a signed certified statement covering its responsibilities for each applicable submittal.

(3) The Principal Watershed Copermittee(s) must submit a signed certified statement covering its responsibilities for each applicable submittal and the sections of the submittals for which it is responsible.

(4) Unless otherwise directed, the Copermittees must submit ~~one hard copy and~~ one electronic copy of each report required under this Order to the San Diego Water Board at SanDiego@waterboards.ca.gov~~, and one electronic copy to the USEPA~~.

(5) When hard copies are requested or required, ~~T~~the Copermittees must submit reports and provide notifications as required by this Order to ~~the following~~:

EXECUTIVE OFFICER
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
2375 NORTHSIDE DRIVE, SUITE 100
SAN DIEGO CA 92108
Telephone: (619) 516-1990 Fax: (619) 516-1994

~~EUGENE BROMLEY~~
~~US ENVIRONMENTAL PROTECTION AGENCY~~
~~REGION IX~~
~~PERMITS ISSUANCE SECTION (W-5-1)~~
~~75 HAWTHORNE STREET~~
~~SAN FRANCISCO CA 94105~~

ATTACHMENT C

ACRONYMS AND ABBREVIATIONS

AMAL	Average Monthly Action Level
ASBS	Area(s) of Special Biological Significance
BMP	Best Management Practice
Basin Plan	Water Quality Control Plan for the San Diego Basin
CEQA	California Environmental Quality Act
CCR	California Code of Regulations
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWC	California Water Code
CZARA	Coastal Zone Act Reauthorization Amendments of 1990
ESAs	Environmentally Sensitive Areas
GIS	Geographic Information System
IBI	Index of Biological Integrity
LID	Low Impact Development
MDAL	Maximum Daily Action Level
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
NAL	Non-Storm Water Action Level
NAICS	North American Industry Classification System
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
ROWD	Report of Waste Discharge (application for NPDES reissuance)
SAL	Storm Water Action Level
San Diego Water Board	California Regional Water Quality Control Board, San Diego Region
SIC	Standard Industrial Classification Code
State Water Board	State Water Resources Control Board
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
WDID	Waste Discharge Identification Number
WLA	Waste Load Allocation
WQBEL	Water Quality Based Effluent Limitation

DEFINITIONS

Active/Passive Sediment Treatment - Using mechanical, electrical or chemical means to flocculate or coagulate suspended sediment for removal from runoff from construction sites prior to discharge.

Anthropogenic Litter – Trash generated from human activities, not including sediment.

Average Monthly Action Level – The highest allowable average of daily discharges over a calendar month.

Beneficial Uses - The uses of water necessary for the survival or wellbeing of man, plants, and wildlife. These uses of water serve to promote tangible and intangible economic, social, and environmental goals. "Beneficial Uses" of the waters of the State that may be protected include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. Existing beneficial uses are uses that were attained in the surface or ground water on or after November 28, 1975; and potential beneficial uses are uses that would probably develop in future years through the implementation of various control measures. "Beneficial Uses" are equivalent to "Designated Uses" under federal law. [California Water Code Section 13050(f)].

Best Management Practices (BMPs) - Defined in 40 CFR 122.2 as schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Bioassessment - The use of biological community information to evaluate the biological integrity of a water body and its watershed. With respect to aquatic ecosystems, bioassessment is the collection and analysis of samples of the benthic macroinvertebrate community together with physical/habitat quality measurements associated with the sampling site and the watershed to evaluate the biological condition (i.e. biotic integrity) of a water body.

Biofiltration - Practices that use vegetation and amended soils to detain and treat runoff from impervious areas. Treatment is through filtration, infiltration, adsorption, ion exchange, and biological uptake of pollutants.

Biological Integrity - Defined in Karr J.R. and D.R. Dudley. 1981. Ecological perspective on water quality goals. *Environmental Management* 5:55-68 as: "A balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitat of the region." Also referred to as ecosystem health.

BMP Design Manual – A plan developed to eliminate, reduce, or mitigate the impacts of runoff from development projects, including Priority Development Projects.

Chronic Toxicity – A measurement of sublethal effect (e.g. reduced growth, reproduction) to experimental test organisms exposed to an effluent or receiving waters compared to that of the control organisms.

Clean Water Act Section 303(d) Water Body - An impaired water body in which water quality does not meet applicable water quality standards and/or is not expected to meet water quality standards, even after the application of technology based pollution controls required by the CWA. The discharge of runoff to these water bodies by the Copermittees is significant because these discharges can cause or contribute to violations of applicable water quality standards.

Construction Activities – Actions implemented during construction of development or redevelopment projects during the Preliminary Task (including rough grading and/or disking, clearing and grubbing operations, or any soil disturbance prior to mass grading), Grading or Land Development (including topography and slope reconfiguration, alluvium removals, canyon cleanouts, rock undercuts, keyway excavations, land form grading, and stockpiling of select material for capping operations), Streets and Utility Installation (including excavation and street paving, lot grading, curbs, gutters and sidewalks, public utilities, public water facilities including fire hydrants, public sanitary sewer systems, storm sewer systems and/or other drainage improvements), or Vertical Construction (including the build out of structures from foundations to roofing, including rough landscaping).

Construction Site – Any project, including projects requiring coverage under the Construction General Permit, that involves soil disturbing activities including, but not limited to, clearing, grading, disturbances to ground such as stockpiling, and excavation.

Contamination - As defined in the Porter-Cologne Water Quality Control Act, contamination is "an impairment of the quality of waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste whether or not waters of the State are affected."

Copermittee – A permittee to a NPDES permit that is only responsible for permit conditions relating to the discharge for which it is operator [40 CFR 122.26(b)(1)]. For the purposes of this Order, a Copermittee is one of the individual permittees identified in Tables 1a-1c of this Order.

Copermittees – All of the individual Copermittees, collectively.

Critical Channel Flow (Qc) – The channel flow that produces the critical shear stress that initiates bed movement or that erodes the toe of channel banks. When measuring Qc, it should be based on the weakest boundary material – either bed or bank.

Daily Discharge – Defined as either: (1) the total mass of the constituent discharged over the calendar day or any 24 hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g. concentration.)

The Daily Discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day, or other 24 hour period other than a day), or by the arithmetic mean of analytical results from one or more grab samples taken over the course of a day.

Development Projects - Construction, rehabilitation, redevelopment, or reconstruction of any public or private projects.

Dry Season –May 1 to September 30.

Dry Weather – Weather is considered dry if the preceding 72 hours has been without measurable precipitation (>0.1 inch).

Enclosed Bays – Enclosed bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost bay works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays do not include inland surface waters or ocean waters.

Erosion – When land is diminished or worn away due to wind, water, or glacial ice. Often the eroded debris (silt or sediment) becomes a pollutant via storm water runoff. Erosion occurs naturally but can be intensified by land clearing activities such as farming, development, road building, and timber harvesting.

Environmentally Sensitive Areas (ESAs) - Areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; areas designated as preserves or their equivalent under the Natural Communities Conservation Program within the Cities and County of Orange; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.

Estuaries – Waters, including coastal lagoons, located at the mouth of streams that serve as areas of mixing fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and ocean water. Estuaries do not include inland surface waters or ocean waters.

Existing Development – Any area that has been developed and exists for municipal, commercial, industrial, or residential purposes, uses, or activities. May include areas that are not actively used for its originally developed purpose, but may be re-purposed or redeveloped for another use or activity.

Flow Duration – The long-term period of time that flows occur above a threshold that causes significant sediment transport and may cause excessive erosion damage to creeks and streams (not a single storm event duration). The simplest way to visualize this is to consider a histogram of pre- and post-project flows using long-term records of hourly data. To maintain pre-development flow duration means that the total number of hours (counts) within each range of flows in a flow-duration histogram cannot increase between the pre- and post-development condition. Flow duration within the range of geomorphologically significant flows is important for managing erosion.

Grading - The cutting and/or filling of the land surface to a desired slope or elevation.

Groundwater – Subsurface water that occurs beneath the water table in soils and geologic formations that are fully saturated.

Hazardous Material – Any substance that poses a threat to human health or the environment due to its toxicity, corrosiveness, ignitability, explosive nature or chemical reactivity. These also include materials named by the USEPA in 40 CFR 116 to be reported if a designated quantity of the material is spilled into the waters of the U.S. or emitted into the environment.

Hazardous Waste - Hazardous waste is defined as "any waste which, under Section 600 of Title 22 of this code, is required to be managed according to Chapter 30 of Division 4.5 of Title 22 of this code" [CCR Title 22, Division 4.5, Chapter 11, Article 1].

Household Hazardous Waste – Paints, cleaning products, and other hazardous wastes generated during home improvement or maintenance activities.

Hydromodification – The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

Illicit Connection – Any man-made conveyance or drainage system through which a non-storm water discharge to the storm water drainage system occurs or may occur. Any connection to the MS4 that conveys an illicit discharge.

Illicit Discharge - Any discharge to the MS4 that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from firefighting activities [40 CFR 122.26(b)(2)].

Inactive Areas – Areas of construction activity that are not active and those that have been active and are not scheduled to be re-disturbed for at least 14 days.

Infiltration – In the context of low impact development, infiltration is defined as the percolation of water into the ground. Infiltration is often expressed as a rate (inches per hour), which is determined through an infiltration test. In the context of non-storm water, infiltration is water other than wastewater that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow [40 CFR 35.2005(20)].

Inland Surface Waters – Includes all surface waters of the State that do not include the ocean, enclosed bays, or estuaries.

Jurisdictional Runoff Management Program Document – A written description of the specific jurisdictional runoff management measures and programs that each Copermittee will implement to comply with this Order and ensure that storm water pollutant discharges in runoff are reduced to the MEP and do not cause or contribute to a violation of water quality standards.

Low Impact Development (LID) – A storm water management and land development strategy that emphasizes conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions.

Low Impact Development Best Management Practices (LID BMPs) – LID BMPs include schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States through storm water management and land development strategies that emphasize conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions. LID BMPs include retention practices that do not allow runoff, such as infiltration, rain water harvesting and reuse, and evapotranspiration. LID BMPs also include flow-through practices such as biofiltration that may have some discharge of storm water following pollutant reduction.

Major Outfall – As defined in the Code of Federal Regulations, a major outfall is a MS4 outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (i.e. discharge from a single conveyance other than a circular pipe which is associated with a drainage area of more than 50 acres); or, for MS4s that receive storm water from lands zoned for industrial activity (based on comprehensive zoning plans or equivalent), a MS4 outfall that discharges from a single pipe with an inside diameter of 12 inches or more or from its equivalent (i.e. discharge from other than a circular pipe associated with a drainage area of 2 acres or more).

Maximum Daily Action Level (MDAL) –The highest allowable daily discharge of a pollutant, over a calendar day (or 24 hour period). For pollutants with action levels expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with action levels expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

Maximum Extent Practicable (MEP) – The technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) for storm water that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) in combination with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than BAT. A definition for MEP is not provided either in the statute or in the regulations. Instead the definition of MEP is dynamic and will be defined by the following process over time: municipalities propose their definition of MEP by way of their runoff management programs. Their total collective and individual activities conducted pursuant to the runoff management programs becomes their proposal for MEP as it applies both to their overall effort, as well as to specific activities (e.g., MEP for street sweeping, or MEP for MS4 maintenance). In the absence of a proposal acceptable to the San Diego Water Board, the San Diego Water Board defines MEP.

In a memo dated February 11, 1993, entitled "Definition of Maximum Extent Practicable," Elizabeth Jennings, Senior Staff Counsel, SWRCB addressed the achievement of the MEP standard as follows:

"*To achieve the MEP standard, municipalities must employ whatever Best Management Practices (BMPs) are technically feasible (i.e., are likely to be effective) and are not cost prohibitive. The major emphasis is on technical feasibility. Reducing pollutants to the MEP means choosing effective BMPs, and rejecting applicable BMPs only where other effective BMPs will serve the same purpose, or the BMPs would not be technically feasible, or the cost would be prohibitive. In selecting BMPs to achieve the MEP standard, the following factors may be useful to consider:*

a. Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?
b. Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?
c. Public Acceptance: Does the BMP have public support?
d. Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?
e. Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc.?

The final determination regarding whether a municipality has reduced pollutants to the maximum extent practicable can only be made by the Regional or State Water Boards, and not by the municipal discharger. If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit derived, it would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs that would address a pollutant source, or to pick a BMP based solely on cost, which would be clearly less effective. In selecting BMPs the municipality must make a serious attempt to comply and practical solutions may not be lightly rejected. In any case, the burden would be on the municipal discharger to show compliance with its permit. After selecting a menu of BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented."

Monitoring Year – October 1 to September 30

Municipal Separate Storm Sewer System (MS4) – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designated or used for collecting or conveying storm water; (iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.26.

National Pollutant Discharge Elimination System (NPDES) - The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the CWA.

Non-Storm Water - All discharges to and from a MS4 that do not originate from precipitation events (i.e., all discharges from a MS4 other than storm water). Non-storm water includes illicit discharges and NPDES permitted discharges.

Nuisance - As defined in the Porter-Cologne Water Quality Control Act, a nuisance is "anything which meets all of the following requirements: 1) Is injurious to health, or is indecent, or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. 2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. 3) Occurs during, or as a result of, the treatment or disposal of wastes."

Ocean Waters – The territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the State Board's California Ocean Plan.

Order – Unless otherwise specified, refers to this Order, Order No. R9-2013-0001 (NPDES No. CAS0109266)

Outfall - Outfall means a point source as defined by 40 CFR 122.2 at the point where a municipal separate storm sewer discharges to waters of the US and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels or other conveyances which connect segments of the same stream or other waters of the US and are used to convey waters of the US.

Persistent Flow - Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

Person - A person is defined as an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof [40 CFR 122.2].

Point Source - Any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, landfill leachate collection systems, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

Pollutant - Any agent that may cause or contribute to the degradation of water quality such that a condition of pollution or contamination is created or aggravated.

Pollution - As defined in the Porter-Cologne Water Quality Control Act, pollution is "the alteration of the quality of the waters of the State by waste, to a degree which unreasonably affects either of the following: 1) The waters for beneficial uses; or 2) Facilities that serve these beneficial uses." Pollution may include contamination.

Pollution Prevention - Pollution prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control BMPs, treatment control BMPs, or disposal.

Pre-Development Runoff Conditions – Approximate flow rates and durations that exist or existed onsite before land development occurs. For new development projects, this equates to runoff conditions immediately before project construction. For redevelopment projects, this equates to runoff conditions from the project footprint assuming infiltration characteristics of the underlying soil, and existing grade. Runoff coefficients of concrete or asphalt must not be used. A redevelopment Priority Development Project must use available information pertaining to existing underlying soil type and onsite existing grade to estimate pre-development runoff conditions.

Priority Development Projects - New development and redevelopment projects defined under Provision E.3.b of Order No. R9-2013-0001, as amended by Order Nos. R9-2015-0001 and R9-2015-0100.

Rainy Season (aka Wet Season) –October 1 to April 30

Receiving Waters – Waters of the United States.

Receiving Water Limitations - Waste discharge requirements issued by the San Diego Water Board typically include both: (1) "Effluent Limitations" (or "Discharge Limitations") that specify the technology-based or water-quality-based effluent limitations; and (2) "Receiving Water Limitations" that specify the water quality objectives in the Basin Plan as well as any other limitations necessary to attain those objectives. In summary, the "Receiving Water Limitations" provision is the provision used to implement the requirements of CWA section 402(p)(3)(B).

Redevelopment - The creation and/or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure~~, and creation or addition of impervious surfaces~~. Replacement of impervious surfaces includes any activity ~~that is not part of a routine maintenance activity~~ where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include routine maintenance activities, such as trenching and resurfacing associated with utility work; pavement grinding; resurfacing existing roadways,~~;~~ ~~new~~ sidewalks~~ construction~~, pedestrian ramps, or bike lanes on existing roads; and routine replacement of damaged pavement, such as pothole repair.

Regional Clearinghouse – A central location for the collection and distribution of information developed and maintained by the Copermittees including, but not limited to, plans, reports, manuals, data, contact information, and/or links to such documents and information.

Rehabilitation - Remedial measures or activities for the purpose of improving or restoring the beneficial uses of streams, channels or river systems. Techniques may vary from in-stream restoration techniques to off-line storm water management practices installed in the system corridor or upland areas, or a combination of in-stream and out of stream techniques. Rehabilitation techniques may include, but are not limited to the following: riparian zone restoration, constructed wetlands, channel modifications that improve habitat and stability, and daylighting of drainage systems.

Reporting Period – The period of information that is reported in the Water Quality Improvement Plan Annual Report. The reporting period consists of two components: 1) July 1 to June 30, consistent with the fiscal year, for the implementation of the jurisdictional runoff management programs, and 2) October 1 to September 30, consistent with the monitoring year for the monitoring and assessment programs. Together, these two time periods constitute the reporting year for the Water Quality Improvement Plan Annual Report due January 31 following the end of the monitoring year.

Retain – Keep or hold in a particular place, condition, or position without discharge to surface waters.

Retrofitting – Storm water management practice put into place after development has occurred in watersheds where the practices previously did not exist or are ineffective. Retrofitting of developed areas is intended to improve water quality, protect downstream channels, reduce flooding, or meet other specific objectives. Retrofitting developed areas may include, but is not limited to replacing roofs with green roofs, disconnecting downspouts or impervious surfaces to drain to pervious surfaces, replacing impervious surfaces with pervious surfaces, installing rain barrels, installing rain gardens, and trash area enclosures.

Runoff - All flows in a storm water conveyance system that consists of the following components: (1) storm water (wet weather flows) and (2) non-storm water including dry weather flows.

San Diego Water Board – As used in this document the term "San Diego Water Board" is synonymous with the term "Regional Board" as defined in Water Code section 13050(b) and is intended to refer to the California Regional Water Quality Control Board for the San Diego Region as specified in Water Code Section 13200.

Sediment - Soil, sand, and minerals washed from land into water. Sediment resulting from anthropogenic sources (i.e. human induced land disturbance activities) is considered a pollutant. This Order regulates only the discharges of sediment from anthropogenic sources and does not regulate naturally occurring sources of sediment. Sediment can destroy fish-nesting areas, clog animal habitats, and cloud waters so that sunlight does not reach aquatic plants.

Source Control BMP – Land use or site planning practices, or structural or nonstructural measures that aim to prevent runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between pollutants and runoff.

Storm Water – Per 40 CFR 122.26(b)(13), means storm water runoff, snowmelt runoff and surface runoff and drainage. Surface runoff and drainage pertains to runoff and drainage resulting from precipitation events.

Structural BMPs - A subset of BMPs which detains, retains, filters, removes, or prevents the release of pollutants to surface waters from development projects in perpetuity, after construction of a project is completed.

Test of Significant Toxicity (TST) - A statistical approach used to analyze toxicity test data. The TST incorporates a restated null hypothesis, Welch's t-test, and biological effect thresholds for chronic and acute toxicity.

Total Maximum Daily Load (TMDL) - The maximum amount of a pollutant that can be discharged into a water body from all sources (point and non-point) and still maintain water quality standards. Under CWA section 303(d), TMDLs must be developed for all water bodies that do not meet water quality standards after application of technology-based controls.

Toxicity - Adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies. The water quality objectives for toxicity provided in the Basin Plan, state in part…"All waters shall be

free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life….The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge."

Toxicity Identification Evaluation (TIE) - A set of procedures for identifying the specific chemical(s) responsible for toxicity. These procedures are performed in three phases (characterization, identification, and confirmation) using aquatic organism toxicity tests.

Toxicity Reduction Evaluation (TRE) - A study conducted in a step-wise process designed to identify the causative agents of effluent or ambient toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in toxicity. The first steps of the TRE consist of the collection of data relevant to the toxicity, including additional toxicity testing, and an evaluation of facility operations and maintenance practices, and best management practices. A Toxicity Identification Evaluation (TIE) may be required as part of the TRE, if appropriate.

Treatment Control BMP – Any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media absorption or any other physical, biological, or chemical process.

Unpaved Road – Any long, narrow stretch without pavement used for traveling by motor passenger vehicles between two or more points. Unpaved roads are generally constructed of dirt, gravel, aggregate or macadam and may be improved or unimproved.

Waste - As defined in CWC Section 13050(d), "waste includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal."

Article 2 of CCR Title 23, Chapter 15 (Chapter 15) contains a waste classification system that applies to solid and semi-solid waste, which cannot be discharged directly or indirectly to water of the state and which therefore must be discharged to land for treatment, storage, or disposal in accordance with Chapter 15. There are four classifications of waste (listed in order of highest to lowest threat to water quality): hazardous waste, designated waste, non-hazardous solid waste, and inert waste.

Water Quality Objective - Numerical or narrative limits on constituents or characteristics of water designated to protect designated beneficial uses of the water. [California Water Code Section 13050 (h)]. California's water quality objectives are established by the State and Regional Water Boards in the Water Quality Control Plans. Numeric or narrative limits for pollutants or characteristics of water designed to protect the beneficial uses of the water. In other words, a water quality objective is the maximum concentration of a pollutant that can exist in a receiving water and still generally ensure that the beneficial uses of the receiving water remain protected (i.e., not impaired). Since water quality objectives are designed specifically to protect the beneficial uses, when the objectives are violated the beneficial uses are, by definition, no longer protected and become impaired. This is a fundamental concept under the Porter Cologne Act. Equally fundamental is Porter Cologne's definition of pollution. A condition of pollution exists when the water quality needed to support designated beneficial uses has

become unreasonably affected or impaired; in other words, when the water quality objectives have been violated. These underlying definitions (regarding beneficial use protection) are the reason why all waste discharge requirements implementing the federal NPDES regulations require compliance with water quality objectives. (Water quality objectives are also called water quality criteria in the CWA.)

Water Quality Standards - Water quality standards, as defined in Clean Water Act section 303(c) consist of the beneficial uses (e.g., swimming, fishing, municipal drinking water supply, etc.,) of a water body and criteria (referred to as water quality objectives in the California Water Code) necessary to protect those uses. Under the Water Code, the water boards establish beneficial uses and water quality objectives in water quality control or basin plans. Together with an anti-degradation policy, these beneficial uses and water quality objectives serve as water quality standards under the Clean Water Act. In Clean Water Act parlance, state beneficial uses are called "designated uses" and state water quality objectives are called "criteria." Throughout this Order, the relevant term is used depending on the statutory scheme.

Waters of the State - Any water, surface or underground, including saline waters within the boundaries of the State [CWC section 13050 (e)]. The definition of the Waters of the State is broader than that for the Waters of the United States in that all water in the State is considered to be a Waters of the State regardless of circumstances or condition.

Waters of the United States - As defined in the 40 CFR 122.2, the Waters of the U.S. are defined as: "(a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate "wetlands;" (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters otherwise defined as waters of the United States under this definition: (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial seas; and (g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA."

Watershed - That geographical area which drains to a specified point on a water course, usually a confluence of streams or rivers (also known as drainage area, catchment, or river basin).

Wet Season (aka Rainy Season) – October 1 to April 30

Wet Weather – Weather is considered wet up to 72 hours after a storm event of 0.1 inches and greater, unless otherwise defined by another regulatory mechanism (e.g. a TMDL).

ATTACHMENT D

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

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JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

FY _____

I. COPERMITTEE INFORMATION

Copermittee Name:

Copermittee Primary Contact Name:

Copermittee Primary Contact Information:
Address:
City: County: State: Zip:
Telephone: Fax: Email:

II. LEGAL AUTHORITY

Has the Copermittee established adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐
A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority?	**YES**	☐
	NO	☐

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

Was an update of the jurisdictional runoff management program document required or recommended by the San Diego Water Board?	**YES**	☐
	NO	☐
If YES to the question above, did the Copermittee update its jurisdictional runoff management program document and make it available on the Regional Clearinghouse?	**YES**	☐
	NO	☐

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

Has the Copermittee implemented a program to actively detect and eliminate illicit discharges and connections to its MS4 that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

Number of non-storm water discharges reported by the public	
Number of non-storm water discharges detected by Copermittee staff or contractors	
Number of non-storm water discharges investigated by the Copermittee	
Number of sources of non-storm water discharges identified	
Number of non-storm water discharges eliminated	
Number of sources of illicit discharges or connections identified	
Number of illicit discharges or connections eliminated	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

V. DEVELOPMENT PLANNING PROGRAM

Has the Copermittee implemented a development planning program that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐
Was an update to the BMP Design Manual required or recommended by the San Diego Water Board?	**YES**	☐
	NO	☐
If YES to the question above, did the Copermittee update its BMP Design Manual and make it available on the Regional Clearinghouse?	**YES**	☐
	NO	☐

Number of proposed development projects in review	
Number of Priority Development Projects in review	
Number of Priority Development Projects approved	
Number of approved Priority Development Projects exempt from any BMP requirements	
Number of approved Priority Development Projects allowed alternative compliance	
Number of Priority Development Projects granted occupancy	

Number of completed Priority Development Projects in inventory	
Number of high priority Priority Development Project structural BMP inspections	
Number of Priority Development Project structural BMP violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

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VI. CONSTRUCTION MANAGEMENT PROGRAM

Has the Copermittee implemented a construction management program that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

Number of construction sites in inventory	
Number of active construction sites in inventory	
Number of inactive construction sites in inventory	
Number of construction sites closed/completed during reporting period	
Number of construction site inspections	
Number of construction site violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

Has the Copermittee implemented an existing development management program that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

	Municipal	Commercial	Industrial	Residential
Number of facilities or areas in inventory				
Number of existing development inspections				
Number of follow-up inspections				
Number of violations				
Number of enforcement actions issued				
Number of escalated enforcement actions issued				

VIII. PUBLIC EDUCATION AND PARTICIPATION

Has the Copermittee implemented a public education program component that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐
Has the Copermittee implemented a public participation program component that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

IX. FISCAL ANALYSIS

Has the Copermittee attached to this form a summary of its fiscal analysis that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

X. CERTIFICATION

I [☐ Principal Executive Officer ☐ Ranking Elected Official ☐ Duly Authorized Representative] certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature	Date
Print Name	Title
Telephone Number	Email

ATTACHMENT E

SPECIFIC PROVISIONS FOR TOTAL MAXIMUM DAILY LOADS APPLICABLE TO ORDER NO. R9-2013-0001, AS AMENDED BY ORDER NOS. R9-2015-0001 AND R9-2015-0100

These provisions implement load allocations (LAs) and wasteload allocations (WLAs) of the Total Maximum Daily Loads (TMDLs) established by the San Diego Water Board or USEPA under Clean Water Act section 303(c), applicable to discharges regulated under this Order. The provisions and schedules for implementation of the TMDLs described below must be incorporated into the Water Quality Improvement Plans, required pursuant to Provision B of this Order, for the specified Watershed Management Areas.

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed
2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin
3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed
4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek
5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay
6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)
7. Total Maximum Daily Load for Sediment in Los Peñasquitos Lagoon

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2002-0123

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	August 14, 2002
State Water Board Approval Date:	July 16, 2003
Office of Administrative Law Approval Date:	September 11, 2003
US EPA Approval Date:	November 3, 2003

(3) TMDL Effective Date: September 11, 2003

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final diazinon TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must be in compliance with the final TMDL compliance requirements as of December 31, 2010.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations:

Table 1.1
Final Receiving Water Limitations Expressed as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Diazinon	Acute	0.08 µg/L	1 hour
	Chronic	0.05 µg/L	4 days

(b) Final Effluent Limitations

Discharges from the MS4s containing concentrations that do not exceed the following effluent limitations will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 1.b.(2)(a):

Table 1.2
Final Effluent Limitations Expressed as Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation	Averaging Period
Diazinon	Acute	0.072 µg/L	1 hour
	Chronic	0.045 µg/L	4 days

(c) Best Management Practices

The following BMPs for Chollas Creek must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area and implemented by the Responsible Copermittees:

(i) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 1.b.(2)(a) and/or the effluent limitations under Specific Provision 1.b.(2)(b) for Chollas Creek.

(ii) The Responsible Copermittees must implement the Diazinon Toxicity Control Plan and Diazinon Public Outreach/Education Program as described in the report titled, *Technical Report for Total Maximum Daily Load for Diazinon in Chollas Creek Watershed, San Diego County*, dated August 14, 2002, including subsequent modifications, in order to achieve the receiving water limitations under Specific Provision 1.b.(2)(a) and/or the effluent limitations under Specific Provision 1.b.(2)(b).

(iii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 1.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 1.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 1.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 1.b.(2)(c) achieves compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 1.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 1.d, to demonstrate compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The Responsible Copermittees must be in compliance with the final diazinon TMDL compliance requirements as of December 31, 2010.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls for diazinon within the Chollas Creek watershed, and calculate or estimate the annual diazinon loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment

Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 1.b.(2)(b), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0019

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	September 22, 2005
Office of Administrative Law Approval Date:	December 2, 2005
US EPA Approval Date:	February 8, 2006

(3) TMDL Effective Date: December 2, 2005

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Shelter Island Yacht Basin

(6) Responsible Copermittee: City of San Diego

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final dissolved copper TMDL compliance requirements for Shelter Island Yacht Basin consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittee must be in compliance with the final TMDL compliance requirements as of December 2, 2005.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations:

Table 2.1
Final Receiving Water Limitations Expressed as Concentrations in Shelter Island Yacht Basin

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Dissolved Copper	Acute	4.8 µg/L x WER*	1 hour
	Chronic	3.1 µg/L x WER*	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 2.b.(2)(a):

Table 2.2
Final Effluent Limitations as Expressed as Annual Loads in MS4 Discharges to Shelter Island Yacht Basin

Constituent	Effluent Limitation
Dissolved Copper	30 kg/yr*

* If the water quality objectives for dissolved copper in Shelter Island Yacht Basin are changed in the future, then the margin of safety (MOS), TMDL and allocations will be recalculated using the *Method for Recalculation of the Total Maximum Daily Load for Dissolved Copper in the Shelter Island Yacht Basin, San Diego Bay* in the Basin Plan (p. 7-14).

(c) Best Management Practices

The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 2.b.(2)(a) and/or the effluent limitations under Specific Provision 2.b.(2)(b) for Shelter Island Yacht Basin. The BMPs must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 2.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 2.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittee develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 2.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 2.b.(2)(c) achieves compliance with Specific Provisions 2.b.(3)(a), 2.b.(3)(b) and/or 2.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 2.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 2.d, to demonstrate compliance with Specific Provisions 2.b.(3)(a), 2.b.(3)(b) and/or 2.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The Responsible Copermittees must be in compliance with the final dissolved copper TMDL compliance requirements as of December 2, 2005.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

The Responsible Copermittee must monitor the effluent of its MS4 outfalls for dissolved copper, and calculate or estimate the monthly and annual dissolved copper loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.(b)(2)of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0036

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	November 16, 2005
Office of Administrative Law Approval Date:	February 1, 2006
US EPA Approval Date:	March 22, 2006

(3) TMDL Effective Date: February 1, 2006

(4) Watershed Management Area: Santa Margarita River

(5) Water Body: Rainbow Creek

(6) Responsible Copermittee: County of San Diego

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final total nitrogen and total phosphorus TMDL compliance requirements for Rainbow Creek consist of the following

(1) Final TMDL Compliance Date

The Responsible Copermittee must comply with final TMDL compliance requirements by December 31, 2021.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance date under Specific Provision 3.b.(1):

Table 3.1
Final Receiving Water Limitations Expressed as Concentrations in Rainbow Creek

Constituent	Receiving Water Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing concentrations that do not exceed the following effluent limitations by the compliance date under Specific Provision 3.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 3.b.(2)(a):

Table 3.2
Final Effluent Limitations Expressed as Concentrations in MS4 Discharges to Rainbow Creek

Constituent	Effluent Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(ii) Annual pollutant loads from given land uses discharging to and from the MS4s that do not exceed the following annual loads by the compliance date under Specific Provision 3.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 3.b.(2)(a):

Table 3.3
Final Effluent Limitations Expressed as Annual Loads in MS4 Discharges to Rainbow Creek

Land Use	Total N	Total P
Commercial nurseries	116 kg/yr	3 kg/yr
Park	3 kg/yr	0.1 kg/yr
Residential areas	149 kg/yr	12 kg/yr
Urban areas	27 kg/yr	6 kg/yr

(c) Best Management Practices

(i) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 3.b.(2)(a) and/or the effluent limitations under Specific Provision 3.b.(2)(b) for Rainbow Creek.

(ii) The Responsible Copermittee should coordinate any BMPs implemented to address this TMDL with Caltrans and other sources as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under

Specific Provision 3.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 3.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the final effluent limitations under Specific Provision 3.b.(2)(b)(ii); OR

(e) The Responsible Copermittee develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 3.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Specific Provision 3.b.(2)(c) achieves compliance with Specific Provisions 3.b.(3)(a), 3.b.(3)(b), 3.b.(3)(c) and/or 3.b.(3)(d),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 3.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 3.d, to demonstrate compliance with Specific Provisions 3.b.(3)(a), 3.b.(3)(b), 3.b.(3)(c) and/or 3.b.(3)(d).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim total nitrogen and total phosphorus TMDL compliance requirements for Rainbow Creek consist of the following:

(1) Interim Compliance Dates and WQBELs

The Responsible Copermittee must comply with the interim WQBELs, expressed as annual loads, by December 31 of the interim compliance year given in Table 3.4.

Table 3.4
Interim Water Quality Based Effluent Limitations Expressed as Annual Loads in MS4 Discharges from Specific Land Uses to Rainbow Creek

	Total N Interim Effluent Limitations (kg/yr)			Total P Interim Effluent Limitations (kg/yr)		
	Interim Compliance Date			Interim Compliance Date		
Land Use	**2009**	**2013**	**2017**	**2009**	**2013**	**2017**
Commercial nurseries	390	299	196	20	16	10
Park	5	3	3	0.15	0.10	0.10
Residential areas	507	390	260	99	74	47
Urban areas	40	27	27	9	6	6

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 3.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 3.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the final effluent limitations under Specific Provision 3.b.(2)(b)(ii); OR

(e) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the interim effluent limitations under Specific Provision 3.c.(1); OR

(f) The Responsible Copermittee has submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

d. Specific Monitoring and Assessment Requirements

(1) The Responsible Copermittee must incorporate into the Water Quality Improvement Plan and implement the Sampling and Analysis Plan for Rainbow Creek Nutrient Reduction TMDL Implementation Water Quality Monitoring, dated January 2010.

(2) The results of any monitoring conducted during the reporting period, and assessment of whether the interim and final TMDL compliance requirements have been achieved must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 3.b.(2)(b)(i), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2007-0043

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2007
State Water Board Approval Date:	July 15, 2008
Office of Administrative Law Approval Date:	October 22, 2008
US EPA Approval Date:	December 18, 2008

(3) TMDL Effective Date: October 22, 2008

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final dissolved copper, lead, and zinc TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must comply with the final TMDL compliance requirements by October 22, 2028.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance date under Specific Provision 4.b.(1):

Table 4.1
Final Receiving Water Limitations Expressed as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$(0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$(0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$(0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$(0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations by the compliance date under Specific Provision 4.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 4.b.(2)(a):

Table 4.2
Final Effluent Limitations as Expressed Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(c) Best Management Practices

(i) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 4.b.(2)(a) and/or the effluent limitations under Specific Provision 4.b.(2)(b) for Chollas Creek.

(ii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans and the U.S. Navy as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 4.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 4.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 4.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 4.b.(2)(c) achieves compliance with Specific Provisions 4.b.(3)(a), 4.b.(3)(b) and/or 4.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 4.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 4.d, to demonstrate compliance with Specific Provisions 4.b.(3)(a), 4.b.(3)(b) and/or 4.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim dissolved copper, lead, and zinc TMDL compliance requirements for Chollas Creek consist of the following:

(1) Interim Compliance Date and WQBELs

The Responsible Copermittee must comply with the interim WQBELs, expressed as concentrations, by the interim compliance date given in Table 4.3:

Table 4.3
Interim Water Quality Based Effluent Limitations Expressed as Concentrations in MS4 Discharges to Chollas Creek

Interim Compliance Date	Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
October 22, 2018	Dissolved Copper	Acute	$1.2 \times 90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
	Dissolved Lead	Acute	$1.2 \times 90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
	Dissolved Zinc	Acute	$1.2 \times 90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 4.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 4.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) There are no exceedances of the interim effluent limitations under Specific

Provision 4.c.(1) at the Responsible Copermittee's MS4 outfalls; OR

(e) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance date.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*, when it is amended to include monitoring requirements for the Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls discharging to Chollas Creek for dissolved copper, lead, and zinc, and calculate or estimate the monthly and annual dissolved copper, lead, and zinc loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 4.b.(2)(b) or 4.c.(1), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2008-0027

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 11, 2008
State Water Board Approval Date:	June 16, 2009
Office of Administrative Law Approval Date:	September 15, 2009
US EPA Approval Date:	October 26, 2009

(3) TMDL Effective Date: September 15, 2009

(4) Watershed Management Areas: See Table 5.0

(5) Water Bodies: See Table 5.0

(6) Responsible Copermittees: See Table 5.0

Table 5.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County	Dana Point Harbor	Baby Beach	-City of Dana Point -County of Orange
San Diego Bay	San Diego Bay	Shelter Island Shoreline Park	- San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final indicator bacteria TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Final TMDL Compliance Dates

(a) Baby Beach in Dana Point Harbor

The Responsible Copermittees for MS4 discharges to Baby Beach must be in compliance with the final TMDL compliance requirements according to the following compliance dates:

Table 5.1
Compliance Dates to Achieve Final TMDL Compliance Requirements For Baby Beach in Dana Point Harbor

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform	September 15, 2014	September 15, 2009
Fecal Coliform		September 15, 2009
Enterococcus		September 15, 2019

(b) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park must be in compliance with the final TMDL compliance requirements as of December 31, 2012.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance dates under Specific Provision 5.b.(1):

Table 5.2
Final Receiving Water Limitations Expressed as Bacteria Densities in the Water Body

	Receiving Water Limitations	
Constituent	Single Sample Maximum[1,2]	30-Day Geometric Mean[2]
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing indicator bacteria densities that do not exceed the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.3a
Final Effluent Limitations as Expressed as Bacteria Densities in MS4 Discharges to the Water Body

	Effluent Limitations	
Constituent	**Single Sample Maximum[1,2]**	**30-Day Geometric Mean[2]**
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.

(ii) Discharges from the MS4s containing indicator bacteria loads that do not exceed the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.4a
Final Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to the Baby Beach in Dana Point Harbor

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0.86×10^9 MPN/day	$3{,}254 \times 10^9$ MPN/30days
Fecal Coliform	0.17×10^9 MPN/day	112×10^9 MPN/30days
Enterococcus	0.03×10^9 MPN/day	114×10^9 MPN/30days

Table 5.4b
Final Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to the Shelter Island Shoreline Park in San Diego Bay

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0 MPN/day	198×10^9 MPN/30days
Fecal Coliform	0 MPN/day	8×10^9 MPN/30days
Enterococcus	0 MPN/day	26×10^9 MPN/30days

(iii) Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.5a
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to Baby Beach in Dana Point Harbor*

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	90.4%	0%
Fecal Coliform	82.7%	0%
Enterococcus	96.2%	62.2%

Notes:
* The percent load reductions are relative to data collected between 1996-2002. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittees' MS4s must not exceed the loads in Table 5.4a, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the water body.

Table 5.5b
*Final Effluent Limitations Expressed as Percent Load Reductions** in MS4 Discharges to Shelter Island Shoreline Park in San Diego Bay*

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0%	0%
Fecal Coliform	0%	0%
Enterococcus	0%	0%

Notes:
* The percent load reductions are relative to data collected between 1999-2004. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittee's MS4s must not exceed the loads in Table 5.4b, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the water body.

(c) Best Management Practices

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 5.0 must incorporate the Bacteria Load Reduction Plan (BLRP) required to be developed pursuant to Resolution No. R9-2008-0027.

(ii) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 5.b.(2)(a) and/or the effluent limitations under Specific Provision 5.b.(2)(b) for the segments or areas of the water bodies listed in Table 5.0

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.b.(2)(b)(ii); OR

(e) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 5.b.(2)(b)(iii); OR

(f) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(g) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 5.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 5.b.(2)(c) achieves compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 5.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 5.d, to demonstrate compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim indicator bacteria TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Baby Beach in Dana Point Harbor

(a) Interim TMDL Compliance Dates and WQBELs

The Responsible Copermittees for MS4 discharges to Baby Beach must comply with the following interim WQBELs by the interim compliance dates given in Tables 5.6a and/or 5.6b:

Table 5.6a
Interim Water Quality Based Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to Baby Beach in Dana Point Harbor

Constituent	Interim Compliance Dates	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	4.93×10^9 MPN/day	$3{,}254 \times 10^9$ MPN/30days*
Fecal Coliform	September 15, 2012	0.59×10^9 MPN/day	112×10^9 MPN/30days*
Enterococcus	September 15, 2012	0.42×10^9 MPN/day	301×10^9 MPN/30days
	September 15, 2016	0.03×10^9 MPN/day *	207×10^9 MPN/30days

Notes:
* Same as the final effluent limitations in Table 5.4a.

Table 5.6b
Interim Water Quality Based Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to Baby Beach in Dana Point Harbor*

Constituent	Interim Compliance Dates	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	45.2%	0%**
Fecal Coliform	September 15, 2012	41.4%	0%**
Enterococcus	September 15, 2012	48.1%	0%
	September 15, 2016	96.2%**	31.1%

Notes:
* The percent load reductions are relative to data collected between 1996-2002. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittees' MS4s must not exceed the loads in Table 5.6a, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the waterbody.
** Same as the final effluent limitations in Table 5.5a.

(b) Interim Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(i) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(ii) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(iii) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(iv) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.b(2)(b)(ii); OR

(v) The Responsible Copermittees can demonstrate that exceedances of the applicable receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(vi) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the interim effluent limitations under Table 5.6a of Specific Provision 5.c.(1)(a); OR

(vii) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the interim effluent limitations under Table 5.6b of Specific Provision 5.c.(1)(a); OR

(viii) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

(2) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park must be in compliance with the final indicator bacteria TMDL requirements as of December 31, 2012.

d. Specific Monitoring and Assessment Requirements

(1) Monitoring Stations

Monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[38] If discharges of bacteria from the MS4 exceed the applicable interim or final WQBELs, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(2) Monitoring Procedures

(a) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) The Responsible Copermittees must collect wet weather monitoring samples within the first 24 hours of a storm event[39] of the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(c) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

[38] Commonly referred to as AB 411 monitoring

[39] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs have been achieved.

(b) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 5.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(c) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to correlate elevated bacteria levels with known or suspected sewage spills from wastewater collection systems and treatment plants or boats.

(d) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2010-0001

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 10, 2010
State Water Board Approval Date:	December 14, 2010
Office of Administrative Law Approval Date:	April 4, 2011
US EPA Approval Date:	June 22, 2011

(3) TMDL Effective Date: April 4, 2011

(4) Watershed Management Areas: See Table 6.0

(5) Water Bodies: See Table 6.0

(6) Responsible Copermittees: See Table 6.0

Table 6.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	-City of Laguna Beach -County of Orange -Orange County Flood Control District
		at Heisler Park - North	
	Pacific Ocean Shoreline	at Main Laguna Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Woods -County of Orange -Orange County Flood Control District
		Laguna Beach at Ocean Avenue	
		Laguna Beach at Cleo Street	
		Arch Cove at Bluebird Canyon Road	
		Laguna Beach at Dumond Drive	
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Hills -City of Laguna Niguel -City of Laguna Woods -City of Lake Forest -City of Mission Viejo -County of Orange -Orange County Flood Control District
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	
	Aliso Creek Mouth	at mouth	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	-City of Dana Point -City of Laguna Beach -City of Laguna Niguel -County of Orange -Orange County Flood Control District
		Aliso Beach at Table Rock Drive	
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)	
		at Salt Creek (large outlet)	
		Salt Creek Beach at Salt Creek service road	
		Salt Creek Beach at Strand Road	
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	-City of Dana Point -City of Laguna Hills -City of Laguna Niguel -City of Mission Viejo -City of Rancho Santa Margarita -City of San Juan Capistrano -County of Orange -Orange County Flood Control District
	San Juan Creek	lower 1 mile	
	San Juan Creek Mouth	at mouth	
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	-City of Dana Point -City of San Clemente -County of Orange -Orange County Flood Control District
		Ole Hanson Beach Club Beach at Pico Drain	
		San Clemente City Beach at El Portal Street Stairs	
		San Clemente City Beach at Mariposa Street	
		San Clemente City Beach at Linda Lane	
		San Clemente City Beach at South Linda Lane	
		San Clemente City Beach at Lifeguard Headquarters	
		under San Clemente Municipal Pier	
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	
		San Clemente State Beach at Riviera Beach	
		Can Clemente State Beach at Cypress Shores	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	-City of Oceanside -City of Vista -County of San Diego
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	-City of Carlsbad -City of Encinitas -City of Escondido -City of San Marcos -County of San Diego
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	-City of Del Mar -City of Escondido -City of Poway -City of San Diego -City of Solana Beach -County of San Diego
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	-City of Del Mar -City of Poway -City of San Diego -County of San Diego
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	-City of San Diego
		La Jolla Shores Beach at Caminito del Oro	
		La Jolla Shores Beach at Vallecitos	
		La Jolla Shores Beach at Avenida de la Playa	
		at Casa Beach, Children's Pool	
		South Casa Beach at Coast Boulevard	
		Whispering Sands Beach at Ravina Street	
		Windansea Beach at Vista de la Playa	
		Windansea Beach at Bonair Street	
		Windansea Beach at Playa del Norte	
		Windansea Beach at Palomar Avenue	
		at Tourmaline Surf Park	
		Pacific Beach at Grand Avenue	
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I- Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	-City of El Cajon -City of Santee -County of San Diego
	San Diego River	lower 6 miles	-City of El Cajon -City of La Mesa -City of San Diego -City of Santee -County of San Diego
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	-City of La Mesa -City of Lemon Grove -City of San Diego -County of San Diego - San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final indicator bacteria TMDL compliance requirements for the water bodies listed in Table 6.0 consist of the following:

(1) Final TMDL Compliance Dates

The Responsible Copermittees for MS4 discharges to the water bodies listed in Table 6.0 must be in compliance with the final TMDL compliance requirements according to the following compliance dates:

Table 6.1
Compliance Dates to Achieve Final TMDL Compliance Requirements

Constituent	Dry Weather TMDL Compliance Date	Wet Weather TMDL Compliance Date*
Total Coliform	April 4, 2021	April 4, 2031 (April 4, 2021)
Fecal Coliform		
Enterococcus		

* The Wet Weather TMDL Compliance Date in parenthesis applies if the applicable Water Quality Improvement Plan does not include load reduction programs for other constituents (e.g. metals, pesticides, trash, nutrients, sediment, etc.) together with bacteria load reduction requirements of these TMDLs.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance dates under Specific Provision 6.b.(1):

Table 6.2a
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Beaches

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform	10,000	22%	1,000	0%
Fecal Coliform	400	22%	200	0%
Enterococcus	104	22%	35	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan.

Table 6.2b
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Creeks

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Fecal Coliform	400	22%	200	0%
Enterococcus	61 (104)	22%	33	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Basin Plan.
d. A single sample maximum of 104 MPN/100ml for *Enterococcus* may be applied as a receiving water limitation for creeks, instead of 61 MPN/100mL, if one or more of the creeks addressed by these TMDLs (San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek, San Diego River, and/or Chollas Creek) is designated with a "moderately to lightly used area" or less frequent usage frequency in the Basin Plan. Otherwise, the single sample maximum of 61 MPN/100mL for *Enterococcus* must be used to assess compliance with the allowable exceedance frequency.

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing indicator bacteria densities that do not exceed the following effluent limitations by the compliance dates under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a):

Table 6.2c
Final Effluent Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies in MS4 Discharges to the Water Body

Constituent	Concentration-Based Effluent Limitations			
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform[d]	10,000	22%	1,000	0%
Fecal Coliform	400	22%	200	0%
Enterococcus	104[e] / 61[f]	22%	35[e] / 33[f]	0%

Notes:
a. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan for discharges to beaches, and the Basin Plan for discharges to creeks and creek mouths.
d. Total coliform effluent limitations only apply to MS4 outfalls that discharge to the Pacific Ocean Shorelines and creek mouths listed in Table 6.0.
e. This *Enterococcus* effluent limitation applies to MS4 discharges to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
f. This *Enterococcus* effluent limitation applies to MS4 discharges to segments or areas of creeks or creek mouths listed in Table 6.0.

(ii) Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the compliance dates under Specific Provision 6.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a):

Table 6.3
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watershed and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
South Orange County	**San Joaquin Hills HSA** (901.11) and **Laguna Hills HSA** (901.12) - Pacific Ocean Shoreline	91.78%	91.72%	98.28%	46.85%	52.07%	51.26%
	Aliso HSA (901.13) - Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	95.47%	95.58%	99.13%	25.29%	26.62%	27.52% (27.37%)**
	Dana Point HSA (901.14) - Pacific Ocean Shoreline	95.04%	95.03%	98.98%	13.15%	14.86%	15.16%
	Lower San Juan HSA (901.27) - Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	72.96%	74.21%	94.94%	19.21%	12.82%	27.12% (26.90%)**
	San Clemente HA (901.30) - Pacific Ocean Shoreline	94.28%	94.23%	98.83%	23.85%	24.58%	25.26%
San Luis Rey River	**San Luis Rey HU** (903.00) - Pacific Ocean Shoreline	38.13%	39.09%	87.38%	5.62%	3.12%	11.69%

Table 6.3 (Cont'd)
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watershed and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
Carlsbad	**San Marcos HA** (904.50) - Pacific Ocean Shoreline	82.82%	82.55%	96.03%	18.47%	18.98%	20.19%
San Dieguito River	**San Dieguito HU** (905.00) - Pacific Ocean Shoreline	14.39%	20.72%	83.48%	4.29%	1.46%	7.72%
Penasquitos	**Miramar Reservoir HA** (906.10) - Pacific Ocean Shoreline	96.50%	96.59%	99.42%	1.61%	1.99%	1.93%
Mission Bay	**Scripps HA** (906.30) - Pacific Ocean Shoreline	96.44%	96.42%	99.25%	16.32%	21.14%	18.82%
	Tecolote HA (906.50) - Tecolote Creek	94.51%	94.59%	98.94%	16.51%	20.47%	18.15% (18.08%)**
San Diego River	**Mission San Diego HSA** (907.11) and **Santee HSA** (907.12) - Pacific Ocean Shoreline - Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles)	74.03%	69.44%	93.96%	38.14%	53.22%	42.74% (42.47%)**
San Diego Bay	**Chollas HSA** (908.22) - Chollas Creek	92.06%	92.15%	98.46%	17.82%	24.84%	21.46% (21.36%)**

Notes:
* The percent load reductions are based on reducing loads compared to pollutant loads from 2001 to 2002.
** The alternative *Enterococcus* percent load reduction was calculated based on a numeric target of 104 MPN/100mL instead of 61 MPN/100mL, protective of the REC-1 "moderately to lightly used area" usage frequency that is protective of freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative pollutant load reductions can be utilized.

(c) Best Management Practices

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 6.0 must incorporate the Bacteria Load Reduction Plans (BLRPs) or Comprehensive Load Reduction Plans (CLRPs) required to be developed pursuant to Resolution No. R9-2010-0001.

(ii) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 6.b.(2)(a) and/or the effluent limitations under Specific Provision 6.b.(2)(b) for the segments or areas of the water bodies listed in Table 6.0.

(iii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans, owners/operators of small MS4s, and agricultural dischargers as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(f) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 6.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 6.b.(2)(c) achieves compliance with Specific Provisions 6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), and/or 6.b.(3)(e),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 6.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 6.d, to demonstrate compliance with Specific Provisions 6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), 6.b.(3)(e) and/or 6.b.(3)(f).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim indicator bacteria TMDL compliance requirements for the water bodies listed in Table 6.0 consist of the following:

(1) Interim TMDL Compliance Dates

The Responsible Copermittees must achieve compliance with the interim TMDL compliance requirements, as determined in accordance with Specific Provision 6.c.(3), by the interim compliance dates given in Table 6.4, unless alternative interim compliance dates are accepted by the San Diego Water Board Executive Officer as part of the Water Quality Improvement Plan.

Table 6.4
Interim Compliance Dates to Achieve Interim TMDL Compliance Requirements

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs*
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	April 4, 2016	April 4, 2021 (April 4, 2016)
		at Heisler Park - North		
	Pacific Ocean Shoreline	at Main Laguna Beach	April 4, 2016	April 4, 2021 (April 4, 2016)
		Laguna Beach at Ocean Avenue		
		Laguna Beach at Cleo Street		
		Arch Cove at Bluebird Canyon Road		
		Laguna Beach at Dumond Drive		
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	April 4, 2016	April 4, 2021 (April 4, 2016)
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	April 4, 2018	April 4, 2021 (April 4, 2018)
	Aliso Creek Mouth	at mouth	April 4, 2018	April 4, 2021 (April 4, 2018)
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	April 4, 2016	April 4, 2021 (April 4, 2016)
		Aliso Beach at Table Rock Drive		
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)		
		at Salt Creek (large outlet)		
		Salt Creek Beach at Salt Creek service road	April 4, 2017	April 4, 2021 (April 4, 2017)
		Salt Creek Beach at Strand Road	April 4, 2017	April 4, 2021 (April 4, 2017)

Table 6.4 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs*
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	April 4, 2016	April 4, 2021 (April 4, 2016)
	San Juan Creek	lower 1 mile	April 4, 2018	April 4, 2021 (April 4, 2018)
	San Juan Creek Mouth	at mouth	April 4, 2016	April 4, 2021 (April 4, 2016)
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	April 4, 2016	April 4, 2021 (April 4, 2016)
		Ole Hanson Beach Club Beach at Pico Drain	April 4, 2016	April 4, 2021 (April 4, 2016)
		San Clemente City Beach at El Portal Street Stairs	April 4, 2017	April 4, 2021 (April 4, 2017)
		San Clemente City Beach at Mariposa Street		
		San Clemente City Beach at Linda Lane	April 4, 2016	April 4, 2021 (April 4, 2016)
		San Clemente City Beach at South Linda Lane	April 4, 2018	April 4, 2021 (April 4, 2018)
		San Clemente City Beach at Lifeguard Headquarters	April 4, 2017	April 4, 2021 (April 4, 2017)
		under San Clemente Municipal Pier		
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	April 4, 2018	April 4, 2021 (April 4, 2018)
		San Clemente State Beach at Riviera Beach	April 4, 2016	April 4, 2021 (April 4, 2016)
		Can Clemente State Beach at Cypress Shores	April 4, 2017	April 4, 2021 (April 4, 2017)
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	April 4, 2017	April 4, 2021 (April 4, 2017)
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	April 4, 2016	April 4, 2021 (April 4, 2016)
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	April 4, 2016	April 4, 2021 (April 4, 2016)

Table 6.4 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs*
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	April 4, 2016	April 4, 2021 (April 4, 2016)
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	April 4, 2016	April 4, 2021 (April 4, 2016)
		La Jolla Shores Beach at Caminito del Oro		
		La Jolla Shores Beach at Vallecitos		
		La Jolla Shores Beach at Avenida de la Playa		
		at Casa Beach, Children's Pool		
		South Casa Beach at Coast Boulevard		
		Whispering Sands Beach at Ravina Street		
		Windansea Beach at Vista de la Playa		
		Windansea Beach at Bonair Street		
		Windansea Beach at Playa del Norte		
		Windansea Beach at Palomar Avenue		
		at Tourmaline Surf Park		
		Pacific Beach at Grand Avenue		
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries		
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	April 4, 2018	April 4, 2021 (April 4, 2018)
	San Diego River	lower 6 miles		
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach		
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	April 4, 2018	April 4, 2021 (April 4, 2018)

* The Interim Compliance Dates to achieve the Interim Wet Weather WQBELs in parenthesis apply if the applicable Water Quality Improvement Plan does not include load reduction programs for other constituents (e.g. metals, pesticides, trash, nutrients, sediment, etc.) together with bacteria load reduction requirements of these TMDLs.

(2) Interim Water Quality Based Effluent Limitations

The Responsible Copermittees for discharges to the water bodies in Table 6.0 must comply with the following interim WQBELs by the interim compliance dates given in Specific Provision 6.c.(1):

(a) Interim Receiving Water Limitations

(i) *Interim Dry Weather Receiving Water Limitations*

The Responsible Copermittee must calculate the "existing" exceedance frequencies of the 30-day geometric mean water quality objectives for each of the indicator bacteria by analyzing the available monitoring data collected between January 1, 1996 and December 31, 2002. "Existing" exceedance frequencies may be calculated by water body and/or by Watershed Management Area listed in Table 6.0. Separate "existing" exceedance frequencies must be calculated for beaches and creeks/creek mouths.

The Responsible Copermittees must achieve a 50 percent reduction in the "existing" exceedance frequency of the 30-day geometric mean WQBELs for the water bodies listed in Table 6.0 by the interim compliance dates given in Table 6.4. A 50 percent reduction in the "existing" exceedance frequency is equivalent to half of the "existing" exceedance frequency of the 30-day geometric mean WQBELs.

The "existing" exceedance frequencies and the interim dry weather allowable exceedance frequencies (i.e. interim dry weather receiving water limitations) calculated by the Responsible Copermittees must be included in the Water Quality Improvement Plans for the applicable Watershed Management Areas.

(ii) *Interim Wet Weather Receiving Water Limitations*

The Responsible Copermittees must achieve the interim wet weather receiving water limitations in Table 6.5, expressed as interim wet weather allowable exceedance frequencies, by the interim compliance dates given in Table 6.4.

Table 6.5
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	38%	37%	39%
		at Heisler Park - North			
	Pacific Ocean Shoreline	at Main Laguna Beach			
		Laguna Beach at Ocean Avenue			
		Laguna Beach at Cleo Street			
		Arch Cove at Bluebird Canyon Road			
		Laguna Beach at Dumond Drive			
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	41%	41%	42%
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	41%	41%	42%
	Aliso Creek Mouth	at mouth	41%	41%	42%
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	36%	36%	36%
		Aliso Beach at Table Rock Drive			
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)			
		at Salt Creek (large outlet)			
		Salt Creek Beach at Salt Creek service road			
		Salt Creek Beach at Strand Road			

Table 6.5 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	44%	44%	48%
	San Juan Creek	lower 1 mile	44%	44%	47%
	San Juan Creek Mouth	at mouth	44%	44%	47%
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	35%	35%	36%
		Ole Hanson Beach Club Beach at Pico Drain			
		San Clemente City Beach at El Portal Street Stairs			
		San Clemente City Beach at Mariposa Street			
		San Clemente City Beach at Linda Lane			
		San Clemente City Beach at South Linda Lane			
		San Clemente City Beach at Lifeguard Headquarters			
		under San Clemente Municipal Pier			
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)			
		San Clemente State Beach at Riviera Beach			
		Can Clemente State Beach at Cypress Shores			
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	45%	44%	47%
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	40%	40%	41%
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	33%	33%	36%

Table 6.5 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	26%	26%	26%
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	37%	37%	37%
		La Jolla Shores Beach at Caminito del Oro			
		La Jolla Shores Beach at Vallecitos			
		La Jolla Shores Beach at Avenida de la Playa			
		at Casa Beach, Children's Pool			
		South Casa Beach at Coast Boulevard			
		Whispering Sands Beach at Ravina Street			
		Windansea Beach at Vista de la Playa			
		Windansea Beach at Bonair Street			
		Windansea Beach at Playa del Norte			
		Windansea Beach at Palomar Avenue			
		at Tourmaline Surf Park			
		Pacific Beach at Grand Avenue			
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries	49%	49%	51%
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	46%	43%	49%
	San Diego River	lower 6 miles	46%	43%	49%
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	46%	43%	51%
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	41%	41%	43%

(b) Interim Effluent Limitations

Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the interim compliance dates under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.c.(2)(a):

Table 6.6
Interim Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watersheds and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
South Orange County	**San Joaquin Hills HSA** (901.11) and **Laguna Hills HSA** (901.12) - Pacific Ocean Shoreline	45.89%	45.86%	49.14%	23.43%	26.04%	25.63%
	Aliso HSA (901.13) - Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	47.74%	47.79%	49.57%	12.65%	13.31%	13.76% (13.69%)**
	Dana Point HSA (901.14) - Pacific Ocean Shoreline	47.52%	47.52%	49.49%	6.58%	7.43%	7.58%
	Lower San Juan HSA (901.27) - Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	36.48%	37.11%	47.47%	9.61%	6.41%	13.56% (13.45%)**
	San Clemente HA (901.30) - Pacific Ocean Shoreline	47.14%	47.12%	49.42%	11.93%	12.29%	12.63%
San Luis Rey River	**San Luis Rey HU** (903.00) - Pacific Ocean Shoreline	19.07%	19.55%	43.69%	2.81%	1.56%	5.85%
Carlsbad	**San Marcos HA** (904.50) - Pacific Ocean Shoreline	41.41%	41.28%	48.02%	9.24%	9.49%	10.10%

Table 6.6 (Cont'd)
Interim Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watersheds and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
San Dieguito River	**San Dieguito HU** (905.00) - Pacific Ocean Shoreline	7.20%	10.36%	41.74%	2.15%	0.73%	3.86%
Penasquitos	**Miramar Reservoir HA** (906.10) - Pacific Ocean Shoreline	48.25%	48.30%	49.71%	0.81%	1.00%	0.97%
Mission Bay	**Scripps HA** (906.30) - Pacific Ocean Shoreline	48.22%	48.21%	49.63%	8.16%	10.57%	9.41%
	Tecolote HA (906.50) - Tecolote Creek	47.26%	47.30%	49.47%	8.26%	10.24%	9.08% (9.04%)**
San Diego River	**Mission San Diego HSA** (907.11) and **Santee HSA** (907.12) - Pacific Ocean Shoreline - Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles)	37.02%	34.72%	46.98%	19.07%	26.61%	21.37% (21.24%)**
San Diego Bay	**Chollas HSA** (908.22) - Chollas Creek	46.03%	46.08%	49.23%	8.91%	12.42%	10.73% (10.68%)**

Notes:
* The percent load reductions are based on reducing loads compared to pollutant loads from 2001 to 2002.
** The alternative *Enterococcus* percent load reduction was calculated based on a numeric target of 104 MPN/100mL instead of 61 MPN/100mL, protective of the REC-1 "moderately to lightly used area" usage frequency that is protective of freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative pollutant load reductions can be utilized.

(3) Interim TMDL Compliance Determination

Compliance with the interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(f) There are no exceedances of the interim receiving water limitations under Specific Provision 6.c.(2)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(g) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the interim effluent limitations under Specific Provision 6.c.(2)(b); OR

(h) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

d. Specific Monitoring and Assessment Requirements

(1) Monitoring and Assessment Requirements for Beaches

(a) Monitoring Stations

For beaches addressed by the TMDL, monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[40] If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source

[40] Commonly referred to as AB 411 monitoring

identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations at least once within the first 24 hours of the end of a storm event[41] during the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer in exceedance of the allowable exceedance frequencies in the receiving waters.

(iii) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(iv) For Pacific Ocean Shoreline segments or areas listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the dry weather and

[41] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

wet weather monitoring data to assess whether the interim and final WQBELs for the Pacific Ocean Shoreline segments or areas listed in Table 6.0 have been achieved.

(ii) Dry weather exceedance frequencies must be calculated as follows:

[a] 30-day geometric means must be calculated from the results of any dry weather samples collected from the segments or areas for each water body listed in Table 6.0;
[b] The method and number of samples need for calculating the 30-day geometric means must be consistent with the number of samples required by the Ocean Plan;
[c] Where there are multiple segments or areas associated with a water body listed in Table 6.0, the Copermittees may calculate geometric means for each segment or area, or combine the dry weather monitoring data from all the segments or areas to calculate geometric means for the water body;
[d] The exceedance frequency must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the dry season.

(iii) Wet weather exceedance frequencies must be calculated as follows:

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;
[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;
[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria densities reported from each storm event sampled; and
[d] The single sample maximum exceedance frequency must be calculated by dividing the number of wet weather days that exceed the single sample maximum receiving water limitations in Table 6.2 by the total number of wet weather days during the rainy season.
[e] The data collected for dry weather must be used in addition to the data collected for wet weather to calculate the wet weather 30-day geometric means. The exceedance frequency of the wet weather 30-day geometric means must be calculated by dividing the number of geometric means that exceed the geometric mean

receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the wet season.

(iv) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(v) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) Monitoring and Assessment Requirements for Creeks and Creek Mouths

(a) Monitoring Stations

For creeks addressed by the TMDL, monitoring locations should consist of, at a minimum, a location at or near the mouth of the creek (e.g. Mass Loading Station or Mass Emission Station) and one or more locations upstream of the mouth (e.g. Watershed Assessment Station). If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations in accordance with the requirements of Provision D.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations within the first 24 hours of the end of a storm event[42] during the rainy season (i.e. October 1 through April 30).

[42] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(iii) Samples collected from receiving water monitoring stations must be analyzed for fecal coliform and *Enterococcus* indicator bacteria.

(iv) For creeks or creek mouths listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the receiving water monitoring data to assess whether the interim and final receiving water WQBELs for the creeks and creek mouths listed in Table 6.0 have been achieved.

(ii) Dry weather exceedance frequencies must be calculated as follows:

[a] 30-day geometric means must be calculated from the results of any dry weather samples collected from the segment or area for each water body listed in Table 6.0;
[b] The method and number of samples need for calculating the 30-day geometric means must be consistent with the number of samples required by the Basin Plan;
[c] The exceedance frequency must be calculated by dividing the number of 30-day geometric means that exceed the 30-day geometric mean receiving water limitations in Table 6.2 by the total number of 30-day geometric means calculated from samples collected during the dry season.

(iii) Wet weather exceedance frequencies must be calculated as follows:

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;
[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;
[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria densities reported from each of the storm events sampled; and

[d] The exceedance frequency must be calculated by dividing the number of wet weather days that exceed the single sample maximum receiving water limitations in Table 6.2 by the total number of wet weather days during the rainy season.

[e] The data collected for dry weather must be used in addition to the data collected for wet weather to calculate the wet weather 30-day geometric means. The exceedance frequency of the wet weather 30-day geometric means must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the wet season.

(iv) The Responsible Copermittee must identify and incorporate additional MS4 outfall and receiving water monitoring stations and/or adjust monitoring frequencies to identify sources causing exceedances of the receiving water WQBELs.

(v) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(vi) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

7. Total Maximum Daily Loads for Sediment in Los Peñasquitos Lagoon

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2012-0033

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2012
State Water Board Approval Date:	January 21, 2014
Office of Administrative Law Approval Date:	July 14, 2014
US EPA Approval Date:	October 30, 2014

(3) TMDL Effective Date: July 14, 2014

(4) Watershed Management Area: ~~Los~~ Peñasquitos

(5) Water Body: Los Peñasquitos Lagoon

(6) Responsible Copermittees: County of San Diego, City of San Diego, City of Del Mar, and City of Poway

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final sediment TMDL compliance requirements for Los Peñasquitos Lagoon consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must be in compliance with the final TMDL compliance requirements by December 31, 2034.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not prohibit the sustainable restoration of tidal and non-tidal saltmarsh vegetation of at least 346 acres.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations by the compliance date under Provision 7.b(1) will not cause or contribute to a failure of the receiving water condition specified under Specific Provision 7.b.(2)(a):

Table 7.1
*Final Effluent Limitations as Expressed as Wet Season Loads in MS4 Discharges to Los Peñasquitos Lagoon**

Constituent	Effluent Limitation
Sediment	2,580 tons/wet season

* Final effluent limitations are to be achieved by the following Responsible Parties: County of San Diego, City of San Diego, City of Del Mar, City of Poway, Phase II MS4 permittees, Caltrans, general construction storm water NPDES permittees, and general industrial storm water NPDES permittees.

(c) Best Management Practices

(i) The Water Quality Improvement Plan for the Los Peñasquitos Watershed Management Area must incorporate the Sediment Load Reduction Plan required to be developed pursuant to Resolution No. R9-2012-0033.

(ii) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 7.b.(2)(a) and/or the Copermittee's portion of the effluent limitations under Specific Provision 7.b.(2)(b) for Los Peñasquitos Lagoon.

(3) Final TMDL Compliance Determination

Compliance determination with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) Successful restoration of 80 percent of the 1973 acreage of tidal and non-tidal lagoon salt marsh (346 acres) as described in Attachment A of Resolution No. R9-2010-0033; OR

(b) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 7.b.(2)(c)(ii) and/or other implementation actions to achieve compliance with Specific Provision 7.b.(3)(a) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 7.b.(2)(c)(ii) or other implementation actions to achieve compliance with Specific Provision 7.b.(3)(a),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 7.b.(2)(c)(ii) or other implementation actions, AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 7.d to demonstrate compliance with Specific Provision 7.b.(3)(a).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim sediment TMDL compliance requirements for Los Penasquitos Lagoon consist of the following:

(1) Interim Compliance Dates and WQBELs

The Responsible Copermittees must comply with the interim WQBELs, expressed as wet season loads, by December 31 of the interim compliance year set forth in Table 7.2.

Table 7.2
*Interim Water Quality Based Effluent Limitations Expressed as Wet Season Loads in MS4 Discharges**

Interim Compliance Date	Interim Effluent Limitations (tons/wet season)
December 31, 2019	6,691
December 31, 2023	5,663
December 31, 2027	4,636
December 31, 2029	3,608

* Interim effluent limitations are to be achieved by the following Responsible Parties: County of San Diego, City of San Diego, City of Del Mar, City of Poway, Phase II MS4 permittees, Caltrans, general construction storm water NPDES permittees, and general industrial storm water NPDES permittees.

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) The final receiving water limitation under Specific Provision 7.b.(2)(a) is met; OR

(c) There are no exceedances of the Copermittee's portion of interim effluent limitations under Table 7.2 at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the Copermittee's portion of the interim TMDL compliance requirements described in Attachment A of Resolution No. R9-2010-0033 will be achieved by the interim compliance date.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) Watershed Monitoring

The Responsible Copermittees must conduct suspended sediment, bed load, and flow monitoring to calculate total sediment loading to the Los Peñasquitos Lagoon for each wet season (October 1 thru April 30) as set forth below:

(a) The Responsible Copermittees must monitor enough storm events throughout the season to quantify sediment loading over each wet season, and

(b) The Responsible Copermittees must monitor at least 3 stations to quantify cumulative sediment loading into Los Peñasquitos Lagoon. Stations must be located within the Los Peñasquitos, Carroll Canyon, and Carmel Creek tributaries prior to discharging into Los Peñasquitos Lagoon.

(2) Lagoon Monitoring

The Responsible Copermittees must monitor Los Peñasquitos Lagoon each Fall for changes in the extent of the vegetation types as set forth below:

(a) The Responsible Copermittees must acquire aerial photos of Los Peñasquitos Lagoon and digitize them at an approximate scale of 1:2,500,

(b) The Responsible Copermittees must appropriately interpret the vegetation and classify the various types as saltmarsh, non-tidal saltmarsh, freshwater marsh, non-tidal saltmarsh –*Lolium perrene* infested, southern willow scrub/mulefat scrub, herbaceous wetland, or upland land cover.

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the monitoring data collected under Specific Provision 7.d(1) and 7.d(2) to assess whether the interim and final WQBELs have been achieved.

(b) For assessing and determining compliance with the final receiving water limitations under Specific Provision 7.b.(2)(a), the Responsible

Copermittees must use the data acquired under Specific Provision 7.d.(2) to estimate the acreage of tidal and non-tidal saltmarsh actually restored.

(c) For assessing and determining compliance with the final effluent limitations under Specific Provision 7.b.(2)(b), the Responsible Copermittees must use the data acquired under Specific Provision 7.d.(1) to estimate sediment loading into Los Peñasquitos Lagoon. Sediment loading must be evaluated using a 3-year, weighted rolling average. The first reported average shall be calculated using data collected in the year, 2015-2016, 2016-2017, and 2017-2018 wet seasons.

(d) The monitoring and assessment results must be submitted as part of the Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

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ATTACHMENT F

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

FACT SHEET / TECHNICAL REPORT

FOR

ORDER NO. R9-2013-0001
AS AMENDED BY ORDER NOS. R9-2015-0001 AND R9-2015-0100
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

May 8, 2013
Amended ~~on~~ February 11, 2015
and November 18, 2015

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I. FACT SHEET FORMAT

This Fact Sheet briefly sets forth the principal facts and the significant factual, legal, methodological, and policy questions that the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) considered in preparing Order No. R9-2013-0001 (Order), as amended by Order Nos. R9-2015-0001 and R9-2015-0100. In accordance with the Code of Federal Regulations (CFR) Title 40 Parts 124.8 and 124.56 (40 CFR 124.8 and 40 CFR 124.56), this Fact Sheet includes, but is not limited to, the following information:

1. Contact information
2. Public process and notification procedures
3. Background of municipal storm water permits
4. Regional MS4 Permit approach
5. Economic considerations
6. Applicable statutes, regulations, plans and policies
7. Discussion of the provisions in the Order

Tentative Order No. R9-2013-0001 was distributed for public review on October 31, 2012. The San Diego Water Board accepted written comments on ~~the~~ Tentative Order No. R9-2013-0001 until January 11, 2013. A public hearing was subsequently held on April 10 and 11, 2013, that was continued to May 8, 2013 to receive oral comments from interested persons. The San Diego Water Board adopted Order No. R9-2013-0001 on May 8, 2013.

Tentative Order No. R9-2015-0001, an Order amending Order No. R9-2013-0001, was distributed for public review on September 19, 2014. The San Diego Water Board accepted written comments on Tentative Order No. R9-2015-0001 until November 19, 2014. A public hearing was held on February 11, 2015, to receive oral comments from Copermittees and interested persons. The San Diego Water Board adopted Order No. R9-2015-0001 amending Order No. R9-2013-0001 on February 11, 2015. Order No. R9-2015-0001 amended the findings and provisions of Order No. R9-2013-0001 to:

a. Enroll the County of Orange, the Orange County Flood Control District and the south Orange County Cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano as Copermittees responsible for compliance with the terms and conditions of Order No. R9-2013-0001, as amended by Order No. R9-2015-0001;

b. Designate the San Diego Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the Cities of Laguna Woods and Laguna Hills and agree to the designation of the Santa Ana Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the City of Lake Forest, subject to the

terms of the February 10, 2015 agreement between San Diego Water Board and the Santa Ana Water Board described in Finding 29 of this Order, upon the later effective date of Order No. R9-2015-0001 or Order No. R8-2015-0001 (superseding Order No. R8-2009-0030);

c. Establish interim exceptions to land development requirements for those priority development projects that discharge to engineered channels and large river reaches as described in Provision E.3.c.(2)(e) of this Order;

d. Incorporate the amended requirements of the State Water Resources Control Board's (State Water Board) General Exception to require that pollutant reductions be achieved within 6 years for storm water and nonpoint source discharges to ASBS within the Region;

e. Incorporate applicable requirements of the Los Peñasquitos Lagoon Sediment TMDL; and

f. Require the Orange County Copermittees to implement the "*Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County*," dated October 2014, made effective in the Monitoring and Reporting Program/Order issued pursuant to California Water Code section 13383 in the December 5, 2014 San Diego Water Board Letter Directive and subject to future revisions by the Executive Officer after appropriate public input.

~~A public hearing was held on February 11, 2015, to receive oral comments from Copermittees and interested persons. The San Diego Water Board adopted Order No. R9-2015-0001 amending Order No. R9-2013-0001 on February 11, 2015.~~

Tentative Order No. R9-2015-0100, an Order amending Order No. R9-2013-0001 as amended by Order No. R9-2015-0001, was distributed for public review on July 31, 2015. The San Diego Water Board accepted written comments on Tentative Order No. R9-2015-0100 until September 14, 2015. A public hearing was held on November 18, 2015, to receive oral comments from Copermittees and interested persons. The San Diego Water Board adopted Order No. R9-2015-0100 amending Order No. R9-2013-0001 as amended by Order No. R9-2015-0001, on November 18, 2015. Order No. R9-2015-0100 amended the findings and provisions of Order No. R9-2013-0001 as amended by Order No. R9-2015-0001 to:

a. Enroll the County of Riverside, the Cities of Murrieta, Temecula, and Wildomar, and the Riverside County Flood Control and Water Conservation District as Copermittees responsible for compliance with the terms and conditions of Order No. R9-2013-0001, as amended by Order Nos. R9-2015-0001 and R9-2015-0100;

b. Continue designation of the San Diego Water Board to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Murrieta and Wildomar, including areas within the Santa Ana Region; and, agree to continue designation of the Santa Ana Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the City of Menifee, including areas within the San Diego Region, subject to the terms of the October 26, 2015 agreement between San Diego Water Board and the Santa Ana Water Board described in Finding 29 of this Order;

d. Incorporate Provision B.3.c, which provides an option that allows a Copermittee to utilize the watershed-based Water Quality Improvement Plan to be deemed in compliance with the prohibitions and limitations of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b;

e. Incorporate minor revisions to Provisions E.2.a.(1) and E.2.a.(2) to include San Diego Water Board Order No. R9-2015-0013 and State Water Board Order 2014-0194-DWQ into the requirements for addressing non-storm water discharges to a Copermittee's MS4;

e. Incorporate minor revisions to Provision E.3.b.(1) to correct inconsistencies in the definition of a Priority Development Project as compared to the definitions in Order No. R9-2009-0002 (Fourth Term Orange County MS4 Permit) and Order No. R9-2010-0016 (Fourth Term Riverside County MS4 Permit), and requirements for incorporating the corrected definitions into the BMP Design Manual;

f. Incorporate revisions to Provision E.3.e.(1)(a) to provide additional clarity on when the structural BMP performance requirements of Provision E.3.c are applicable to Priority Development Projects;

e. Incorporate minor revisions to the Revised TMDLs for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region and the TMDLs for Sediment in Los Peñasquitos Lagoon in Attachment E to the Order to make the requirements consistent with the Basin Plan amendments adopted by the San Diego Water Board; and

f. Remove provisions related to allowing the Riverside County Copermittees to apply for early coverage under the Regional MS4 Permit.

The San Diego Water Board files applicable to the issuance of Order No. R9-2013-0001 and amendments thereto are incorporated into the administrative record in support of the findings and requirements of the Order.

II. CONTACT INFORMATION

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The Order and other related documents can be downloaded from the San Diego Water Board website at

http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

The documents referenced in this Fact Sheet and in Order No. R9-2013-0001 and amendments thereto are available for public review at the San Diego Water Board office, located at the address listed above. Public records are available for inspection during regular business hours, from 8:00 am to 5:00 pm Monday through Friday. To schedule an appointment to inspect public records, contact the San Diego Water Board Records Management Officer at 619-516-1990.

COPERMITTEES

Orange County Copermittees

- County of Orange
  - City of Aliso Viejo
  - City of Dana Point
  - City of Laguna Beach
  - City of Laguna Hills
  - City of Laguna Niguel
  - City of Laguna Woods
  - City of Lake Forest *
  - City of Mission Viejo
  - City of Ranch Santa Margarita
  - City of San Clemente
  - City of San Juan Capistrano
  - Orange County Flood Control District

* While not listed in the above table, the City of Lake Forest remains a Copermittee under this Order until the later effective date of this Order or Santa Ana Water Board Tentative Order No. R8-2015-0001. Thereafter, the City of Lake Forest will no longer be considered a Copermittee under this Order because its Phase I MS4 discharges will be regulated by the Santa Ana Water Board pursuant to Water Code section 13328 designation. The requirements of this Order that apply to the City of Lake Forest for the duration of this Order, consistent with the Water Code section 13228 agreement dated February 10, 2015, are described in Finding 29 and Footnote 2 to Table B-1.

Riverside County Copermittees

- County of Riverside
  - City of Menifee**
  - City of Murrieta
  - City of Temecula
  - City of Wildomar
  - Riverside County Flood Control and Water Conservation District

** The City of Menifee is not regulated as a Copermittee under this Order because its Phase I MS4 discharges are regulated by Santa Ana Water Board Order No. R8-2010-0033 as it may be amended or issued pursuant to Water Code section 13228 designation. The requirements of this Order that apply to the City of Menifee for the duration of this Order, consistent with the Water Code section 13228 written agreement dated October 26, 2015, are described in Finding 29 and Footnote 3 to Table B-1.

San Diego County Copermittees

- County of San Diego
  - City of Carlsbad
  - City of Chula Vista
  - City of Coronado
  - City of Del Mar
  - City of El Cajon
  - City of Encinitas
  - City of Escondido
  - City of Imperial Beach
  - City of La Mesa
  - City of Lemon Grove
  - City of National City
  - City of Oceanside
  - City of Poway
  - City of San Diego
  - City of San Marcos
  - City of Santee
  - City of Solana Beach
  - City of Vista
  - San Diego County Regional Airport Authority
  - San Diego Unified Port District

III. PUBLIC PROCESS AND NOTIFICATION PROCEDURES

The San Diego Water Board followed the schedule listed below for the preparation of Order No. R9-2013-0001 and amendments thereto:

San Diego County Copermittee Permit Reissuance Process

1. On February 8, 2011, the San Diego Water Board met with the San Diego County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No. R9-2007-0001.

2. Between February and May 2011, the San Diego Water Board met with select San Diego County, Orange County, and Riverside County Copermittees, as well as representatives of the environmental community to discuss concepts and receive recommendations for elements to be incorporated in a Regional Municipal Separate Storm Sewer System Permit (Regional MS4 Permit).

3. On June 27, 2011 the San Diego Water Board received the Report of Waste Discharge from the San Diego County Copermittees for the renewal of their NPDES permit, Order No. R9-2007-0001.

4. On April 9, 2012, the San Diego Water Board released an administrative draft of Tentative Order No. R9-2013-0001 for preliminary informal comments and feedback.

5. On April 25, 2012, the San Diego Water Board held an informal public workshop to present the administrative draft of Tentative Order No. R9-2013-0001 and receive verbal comments.

6. Between June and August 2012, the San Diego Water Board held four (4) focused meetings with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community, and USEPA) to discuss and receive preliminary comments and feedback about specific elements in the administrative draft of Tentative Order No. R9-2013-0001.

7. On September 5, 2012, the San Diego Water Board held an informal public workshop to present the modifications that were expected to be incorporated into the Tentative Order based on the preliminary comments and feedback received during the focused meetings held between June and August 2012.

8. Informal written comments on the administrative draft of Tentative Order No. R9-2013-0001 were accepted until September 14, 2012.

9. On October 12, 2012, the San Diego Water Board released a revised administrative draft of Tentative Order No. R9-2013-0001.

10. On October 24, 2012, the San Diego Water Board held a focused meeting with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community, and USEPA) to discuss modifications incorporated into the administrative draft of Tentative Order No. R9-2013-0001.

11. On October 31, 2012, the San Diego Water Board released Tentative Order No. R9-2013-0001 for formal public review and comment.

12. On November 13, 2012 and December 12, 2012, the San Diego Water Board held a formal public Board workshop to present the public draft of Tentative Order No. R9-2013-0001 and receive verbal comments.

13. Formal written comments on the public draft of Tentative Order No. R9-2013-0001 were accepted until January 11, 2013.

14. A public hearing of Tentative Order No. R9-2013-0001 was conducted on April 10 and 11, 2013, that was continued to May 8, 2013.

Orange County Copermittee Permit Reissuance Process

15. On May 20, 2014 the San Diego Water Board received the Report of Waste Discharge from the Orange County Copermittees for the renewal of their MS4 NPDES permit, Order No. R9-2009-0002.

16. On June 24, 2014, the San Diego Water Board met with the Orange County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No.R9-2009-0002 and the process for enrollment as Copermittees under Regional MS4 Permit Order No. R9-2013-0001.

17. On July 1, 2014, the San Diego Water Board held a public meeting to discuss the Orange County Report of Waste Discharge and receive comments on potential modifications to Order No. R9-2013-0001. Based on comments received from the Orange County Copermittees and other interested persons at this meeting, the San Diego Water Board determined that additional public meetings were not needed prior to release of Tentative Order No. R9-2015-0001, amending Order No. R9-2013-0001 in redlined – strikeout format for public review and comment.

18. On September 19, 2014, the San Diego Water Board released Tentative Order No. R9-2015-0001 for a 60 day public review and comment period.

19. On October 8, 2014, the San Diego Water Board held a formal public workshop at a regular board meeting to receive information and discuss the proposed amendments to Order No. R9-2013-0001 described in Tentative Order No. R9-2015-0001.

20. In accordance with State and federal laws and regulations, the San Diego Water Board notified San Diego County, Orange County and Riverside County Copermittees, and all known interested agencies and persons of its intent to adopt Tentative Order No. R9-2015-0001 and provided them with an opportunity to submit their written comments and recommendations. Written comments and recommendations on Tentative Order No. R9-2015-0001 were accepted until November 19, 2014.

21. The San Diego Water Board held a public workshop on October 8, 2014, and a public hearing on February 11, 2015, and heard and considered all comments pertaining to the adoption of Tentative Order No. R9-2015-0001 on February 11, 2015.

Riverside County Copermittee Permit Reissuance Process

22. Between April and June 2015, the San Diego Water Board held three (3) public workshops with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community) to discuss and receive comments and feedback about amending Order No. R9-2013-0001 to incorporate a definition of prior lawful approval for Priority Development Projects, and an alternative compliance pathway for prohibitions and limitations in Provision A of the Order. A San Diego Water Board member attended the April and May 2015 public workshops, but no actions or voting took place.

23. On April 15, 2015, the San Diego Water Board met with the Riverside County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No.R9-2010-0016 and the process for enrollment as Copermittees under Order No. R9-2013-0001 (Regional MS4 Permit).

24. On May 8, 2015 the San Diego Water Board received a Report of Waste Discharge from the Riverside County Copermittees for the renewal of their MS4 NPDES permit, Order No. R9-2010-0016.

25. On July 31, 2015, the San Diego Water Board released Tentative Order No. R9-2015-0100 for a formal public review and comment period.

26. Formal written comments on the public draft of Tentative Order No. R9-2015-0100 were accepted until September 14, 2015, a formal public written comment period of 46 days.

27. A public hearing to receive oral comments on Tentative Order No. R9-2015-0100 was conducted on November 18, 2015.

IV. BACKGROUND OF THE SAN DIEGO REGION MUNICIPAL STORM WATER PERMITS

In developed and developing areas, storm water runoff is commonly transported through municipal separate storm sewer systems (MS4s) and discharged into local receiving water bodies. As the storm water runs off and flows over the land or impervious surfaces (e.g., paved streets, parking lots, and building rooftops), it accumulates debris, chemicals, sediment, and other pollutants that can adversely affect receiving water quality if discharged untreated. The United States Environmental Protection Agency (USEPA) recognizes wet weather flows from urban areas as the number one source of estuarine pollution in coastal communities,[1] such as those within the San Diego Region.

The federal Clean Water Act (CWA) was amended in 1987 to address and regulate discharges of storm water associated with industrial activities and from municipal storm sewers. With the amendments, many municipalities throughout the United States were obligated for the first time to obtain National Pollutant Discharge Elimination System (NPDES) permits for discharges of storm water from their MS4s.

In response to the CWA 1987 amendment, as well as the pending federal NPDES regulations which would implement the amendment, the San Diego Water Board issued "early" MS4 permits. The San Diego Water Board adopted and issued Order Nos. 90-38, 90-42, and 90-46 to regulate storm water discharges from the MS4s in Orange County, San Diego County, and Riverside County, respectively, within the San Diego Region on July 16, 1990.

The "early" MS4 permits, or First Term Permits, were issued prior to the November 1990 promulgation of the final federal NPDES storm water regulations. By issuing these First Term Permits before the federal regulations took effect, the San Diego Water Board was able to provide the Copermittees additional flexibility in addressing and managing storm water discharges. The First Term Permits contained the essentials of the 1990 regulations, and required the Copermittees to develop and implement runoff management programs, but provided little specificity about what was required to be included in or actually achieved by those programs.

The flexibility provided in the First Term Permits was generally continued through the Second Term Permits. The combination of the lack of specificity in the First and Second Term Permits, a general lack of meaningful action by the Copermittees and a general lack of corresponding reaction (i.e. enforcement) by the San Diego Water Board during the first ten years of the storm water program, resulted in few substantive steps towards achieving improvements in the quality of receiving waters or storm water discharges from the MS4s.

[1] US EPA. 1999. 40 CFR Parts 9, 122, 123, and 124. National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. 64 FR 68727.

From 2001, the regulatory approach incorporated into Third Term Permits was a significant departure from the regulatory approach of the First and Second Term Permits. The Third Term Permits issued by the San Diego Water Board included more detailed requirements that outlined the minimum level of implementation required for the Copermittees' programs to meet the maximum extent practicable (MEP) standard for storm water. The Third Term Permits included more detail to emphasize and enhance the jurisdictional runoff management programs developed by the Copermittees and introduced requirements for developing and implementing watershed-based programs.

The Third Term Permits also incorporated two precedent setting decisions by the State Water Board. In Order WQ 99-05, the State Water Board established receiving water limitation language to be included in all MS4 permits. The State Water Board's precedential language clarified that municipal storm water permits must include provisions requiring discharges to be controlled to attain water quality standards in receiving waters. Unlike previously adopted versions of the receiving water limitation language in the First and Second Term Permits, the language no longer stated that "*violations of water quality standards are not violations of the municipal storm water permit under certain conditions*." In addition, the receiving water limitation language no longer indicated that the "*implementation of best management practices is the 'functional equivalent' of meeting water quality standards*." State Water Board Order WQ 99-05 specifically requires language in MS4 permits for the Copermittees to comply with water quality standards based discharge prohibitions and receiving water limitations through timely implementation of control measures and other actions to reduce pollutants in discharges. (See State Water Board Order WQ 99-05 (*Environmental Health Coalition*)).

In Order WQ 2000-11, also a precedential decision, the State Water Board addressed design standards for structural post-construction best management practices (BMPs) for new development and significant redevelopment. The State Water Board found that the design standards, which require that runoff generated by 85 percent of storm events from specific development categories be infiltrated or treated, reflect the MEP standard. State Water Board Order WQ 2000-11 also found that the post-construction BMP provisions, or Standard Storm Water Mitigation Plan (SSMP) provisions, constitute MEP for addressing storm water pollutant discharges resulting from specific development categories.

The Third Term San Diego County and Orange County Permits (Order Nos. 2001-01 and R9-2002-0001, respectively) were appealed to the State Water Board. Minor modifications were made by the State Water Board, but the requirements were largely upheld. In State Water Board Order WQ 2001-15, the State Water Board upheld the Third Term San Diego County Permit requirements with certain modifications. The State Water Board removed the prohibition of storm water discharges *into* the MS4 that cause or contribute to exceedances of water quality objectives. The revision allows for treatment of pollutants in storm water runoff after the pollutants have entered the MS4.

State Water Board Order WQ 2001-15 otherwise upheld all the other requirements of the permit.

In addition to the modification to the discharge prohibition in Order WQ 2001-15, the State Water Board refined Order WQ 99-05 by making clear that the Copermittees may use an iterative approach to achieving compliance with water quality standards that involves ongoing assessments and revisions. Thus, the language for the discharge prohibitions and receiving water limitations was revised to explicitly require the Copermittees to implement an iterative process of assessments and revisions to comply with the discharge prohibitions and receiving water limitations. The San Diego Water Board retained the authority to enforce receiving water limitations and discharge prohibitions even if the Copermittee is engaged in the iterative process.

The Third Term San Diego County Permit was subsequently challenged in the Superior Court of the State of California and the Court of Appeal, Fourth Appellate District. The Court of Appeal, Fourth Appellate District, found that the approach of the Third Term San Diego County Permit to regulating discharges into the MS4 was appropriate (*Building Industry Ass'n. v. State Water Resources Control Bd., et al.,* 124 Cal.App.4th 866 (2004)). The State of California Supreme Court denied review sought by the Building Industry Association in March 2005.

The Fourth Term Permits~~, or current MS4 permits,~~ began with the adoption of Order No. R9-2007-0001 issued to the Copermittees of San Diego County in January 2007. Order Nos. R9-2009-0002 and R9-2010-0016 were subsequently issued to the Copermittees of Orange County and Riverside County. The Fourth Term Permits continued to include more detailed requirements to be implemented by each Copermittee's jurisdictional runoff management program. The Fourth Term Permits also included requirements to further emphasize a watershed management approach and for more coordination among jurisdictional runoff management programs. In addition, the Fourth Term Permits included more requirements for assessing the effectiveness of the runoff management programs being implemented by the Copermittees. The intent of the inclusion of additional requirements was to enhance and better define elements of the permit that were expected to be incorporated into the iterative process for managing runoff from each Copermittee's jurisdiction and within the watersheds of the San Diego Region.

The Fourth Term Permits included several new and emerging approaches for managing storm water runoff and discharges. Low impact development (LID) requirements are included for development and significant redevelopment to reduce pollutants in storm water runoff from sites through more natural processes such as infiltration and biofiltration closer to the source, rather than utilizing conventional mechanical end-of-pipe treatment systems. Hydrograph modification (hydromodification) management requirements also are included to mitigate the potential for increased erosion in receiving waters due to increased runoff rates and durations often caused by development and increased impervious surfaces. The Fourth Term Orange County and Riverside County Permits introduced requirements to identify areas of existing

development where retrofitting with LID projects would be feasible and could be implemented to reduce storm water runoff and pollutants in storm water discharges.

The Fourth Term Orange County and Riverside County Permits included a clearer distinction between storm water and non-storm water discharges. The term "urban runoff" was completely removed, and a distinction between storm water (wet weather) runoff and non-storm water (dry weather) runoff was emphasized. This clarification was made to prevent any potential misunderstanding that regulation under the MS4 permits is limited only to urbanized areas, and to prevent non-storm water runoff from being managed in the same manner as storm water runoff. The term "urban runoff" is not defined in the Code of Federal Regulations (CFR) or Federal Register (FR) in the regulation of MS4 discharges. According to the CWA 402(p)(3)(B)(ii), MS4 permits must include a requirement to effectively prohibit non-storm water discharges into the MS4s.

Finally, for the Fourth Term Orange County and Riverside County Permits the San Diego Water Board found that non-storm water discharges to the MS4 from over application of irrigation water are sources of pollutants. The San Diego Water Board found that non-storm water discharges resulting from over-irrigation must be prohibited from entering the MS4 in accordance with the requirements of the CWA and pursuant to 40 CFR 122.26(d)(2)(iv)(B)(1).

The requirements of the Fourth Term Permits issued to the Copermittees in each county within the San Diego Region now have substantively the same core requirements such as discharge prohibitions, receiving water limitations, jurisdictional runoff management program components, and monitoring program requirements. There are, however, several inconsistencies that exist among the three Fourth Term Permits which complicate oversight and implementation of the permits by the San Diego Water Board.

The Fourth Term San Diego County Permit expired in January 2012. The Fourth Term Orange County permit expired in December 2014 and the Fourth Term Riverside County Permit ~~will~~ expired in November 2015. Issuing the Fifth Term Permits within five years for three counties under three different permits would have required the San Diego Water Board to expend significant time and resources for the issuance of the permits through three separate public proceedings, thereby greatly reducing the time and resources available to oversee implementation and compliance. Multiple permits also create confusion for determining compliance among regulated entities, especially for the land development community.

The San Diego Water Board ~~has~~ acknowledged that issuing a single MS4 permit for all the Copermittees in the San Diego Region can and is expected to result in more consistent implementation, improve communication among agencies within watersheds crossing multiple jurisdictions, and minimize resources spent with each permit renewal process. Within the findings of the Fourth Term Riverside County Permit issued in November 2010, the San Diego Water Board notified the public of its intent to develop and issue a single Regional MS4 Permit.

V. REGIONAL MS4 PERMIT APPROACH

The Fifth Term Permit, or Regional MS4 Permit, shifts the focus of the permit requirements from a minimum level of actions to be implemented by the Copermittees to identifying outcomes to be achieved by those actions. Order No. R9-2013-0001 represents an important paradigm shift in the approach for MS4 permits within the San Diego Region.

Historical Permitting Approach

The First and Second Term Permits were very broad and provided little specificity about what was required to be developed and implemented by the Copermittees. The Third Term Permits began to become more specific about the minimum level of implementation required by the Copermittees. The Fourth Term Permits subsequently increased in specificity. The MS4 permits have progressively become more detailed and focused on specifying the minimum level of actions expected to be implemented by the Copermittees. As detailed and specific as the MS4 permits have become, however, they include very little detail about what the desired outcomes of the required actions are expected to achieve. Compliance with the permit requirements has essentially been tracking numbers of actions and reporting, not tracking progress or actual improvements in the quality of receiving waters or discharges from the MS4s. The result has been an increase in actions being implemented by the Copermittees with little or no ability or expectations to determine whether or not improvements in water quality are being achieved.

The Fourth Term Permits result in significant resource expenditure by the Copermittees to report permit compliance information to the San Diego Water Board in the form of annual jurisdictional runoff management program, watershed program, and monitoring program reports. The San Diego Water Board ~~must then~~ was required to expend much of its limited resources on reviewing more than 50 voluminous reports submitted annually by the Copermittees. The information ~~currently~~ reported by the Copermittees ~~is~~ was of limited value when trying to measure progress toward achieving improvements in the quality of receiving waters or discharges from the MS4s. Oversight of the MS4 permits ~~is~~ was further complicated by the inconsistencies among the requirements issued to the Orange County, San Diego County, and Riverside County Copermittees under three separate MS4 permits.

Under the Fourth Term Permits, the Copermittees ~~must~~ were required to expend a significant portion of their limited resources collecting data of limited value, and putting together reports to submit that information to the San Diego Water Board. Likewise, the San Diego Water Board ~~must~~ was required to expend most of its limited resources reviewing reports, and developing permits instead of working directly with the Copermittees to identify solutions to problems causing impacts to water quality. This ~~is~~ was an unsustainable course that ~~will~~ would have continued to demand more

resources from the Copermittees and the San Diego Water Board, and would have continued to result in unknown water quality benefits.

New Permitting Approach

The goal of the Regional MS4 Permit is twofold: 1) bring a consistent set of MS4 permit requirements to all of the Copermittees within the San Diego Region; and, 2) provide an MS4 permit with requirements that will allow the Copermittees to focus their efforts and resources on achieving goals and desired outcomes toward the improvement of water quality rather than completing specific actions.

The overall approach included in the Regional MS4 Permit with respect to the jurisdictional runoff management programs will not differ significantly from the current permits. The general requirements for the jurisdictional runoff management program components and compliance with those requirements will remain and be applied consistently throughout the San Diego Region under the Regional MS4 Permit.

The most significant difference in the new permitting approach is the specific manner of implementation for those jurisdictional runoff management programs. Implementation will be based on decisions made by the Copermittees in accordance with what they have identified as their highest priority water quality conditions. In other words, the Copermittees will have significant control in how to implement the jurisdictional runoff management programs to best utilize their available resources in addressing a specific set of priorities effectively, instead of trying to address all the water quality priorities ineffectively.

The Copermittees are given the responsibility of identifying their highest priority water quality conditions that they intend to address. The Copermittees will develop goals that can be used to measure and demonstrate progress or improvements toward addressing those priorities. In addition to the goals, the Copermittees will provide a schedule for achieving the goals for those highest priorities. The measurement of progress toward achieving the goals for those highest priorities requires a better defined and more focused program of monitoring and assessment than under the Fourth Term Permits.

The monitoring and assessment program must be designed to inform the Copermittees of their progress, and the need for modifications in their jurisdictional runoff management programs and schedules to achieve their goals to improve water quality. The monitoring and assessment program requirements will have a more central role in the Regional MS4 Permit than in earlier permits. The monitoring and assessment requirements must also be designed to enable the Copermittees to focus and direct their efforts in implementing their jurisdictional runoff management programs toward their stated desired outcomes to improve the quality of receiving waters and/or discharges from the MS4s.

By providing an MS4 permit that allows the Copermittees to make more decisions about how to utilize and focus their resources, along with a better defined monitoring and assessment program to inform their water quality management decisions, the Copermittees ~~will~~ have the opportunity to:

1) *Plan strategically*. The Copermittees must have the ability to identify their available resources and develop and implement long term plans that can organize, collect, and use those resources in the most strategically advantageous and efficient manner possible. This ability to develop long term plans will allow the Copermittees to focus and utilize their resources in a more concerted way over the short term and long term to address specific water quality priorities through stated desired outcomes.

2) *Manage adaptively*. The Copermittees must be given the ability to modify their plans as additional information and data are collected from the monitoring and assessment programs. The Copermittees' plans may require modifications to the programs, priorities, goals, strategies, and/or schedules in order for the Copermittees to achieve a stated desired outcome.

3) *Identify synergies*. The Copermittees must be given more flexibility to identify efficiencies within and among their jurisdictional runoff management programs as the strategies are developed and implemented to increase the Copermittees' collective effectiveness. The Copermittees must also be able to identify and utilize resources available from other agencies and entities to further augment and enhance their jurisdictional runoff management programs and/or to collectively work with those other agencies and entities toward achieving a stated desired outcome.

The Regional MS4 Permit requirements ~~will~~ provide the Copermittees the flexibility and responsibility to decide what actions will be necessary to achieve an outcome that is tailored and designed by the Copermittees to improve specific prioritized water quality conditions. The San Diego Water Board expects the approach of the Regional MS4 Permit to give the Copermittees a greater sense of ownership for restoring the quality of receiving waters in the San Diego Region by becoming an integral part of the decision making process in identifying water quality conditions to be addressed, as well as determining the best use of their resources.

VI. ECONOMIC CONSIDERATIONS

Statutory Considerations

California Water Code (CWC) section 13241 requires the San Diego Water Board to consider certain factors, including economic considerations, in the adoption of water quality objectives. CWC section 13263 requires the San Diego Water Board to take into consideration the provisions of CWC section 13241 in adopting waste discharge requirements.

In *City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, the California Supreme Court considered whether Regional Water Boards must comply with CWC section 13241 when issuing waste discharge requirements under CWC section 13263(a) by taking into account the costs a permittee will incur in complying with the permit requirements. The Court concluded that whether it is necessary to consider such cost information "*depends on whether those restrictions meet or exceed the requirements of the federal Clean Water Act.*" (*Id.* at p. 627.) The Court ruled that Regional Water Boards may not consider the factors in CWC section 13241, including economics, to justify imposing pollutant restrictions that are less stringent than applicable federal law requires. (*Id.* At pp. 618, 626-627 ["*[Water Code section 13377 specifies that [ ] discharge permits issued by California's regional boards must meet the federal standards set by federal law. In effect, section 13377 forbids a regional board's consideration of any economic hardship on the part of the permit holder if doing so would result in the dilution of the requirements set by Congress in the Clean Water Act...Because CWC section 13263 cannot authorize what federal law forbids, it cannot authorize a regional board, when issuing a [ ] discharge permit, to use compliance costs to justify pollutant restrictions that do not comply with federal clean water standards*."]). However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Regional Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

As discussed in Section VII.F, Unfunded State Mandates, the San Diego Water Board finds that the requirements in this Order are not more stringent than the minimum federal requirements. Among other requirements, federal law requires MS4 permits to include requirements to effectively prohibit non-storm water discharges into the MS4s, in addition to requiring controls to reduce the discharge of pollutants in storm water to the MEP, and other provisions as USEPA or the State determines are appropriate for the control of pollutants in MS4 discharges.

The requirements in this Order may be more specific or detailed than those enumerated in federal regulations under 40 CFR 122.26 or in the USEPA guidance. However, the requirements have been designed to be consistent with and within the federal statutory mandates described in CWA section 402(p)(3)(B)(ii) and (iii) and the related federal regulations and guidance. Consistent with federal law, all of the

conditions in this Order could have been included in a permit adopted by USEPA in the absence of the in lieu authority of California to issue NPDES permits.

Moreover, the inclusion of numeric WQBELs in this Order does not cause this Order to be more stringent than federal law. Federal law authorizes both narrative and numeric effluent limitations to meet state water quality standards. The inclusion of WQBELs as discharge specifications in an NPDES permit in order to achieve compliance with water quality standards is not a more stringent requirement than the inclusion of BMP based permit limitations to achieve water quality standards (State Water Board Order No. WQ 2006-0012 (*Boeing*)). Therefore, consideration of the factors set forth in CWC section 13241 is not required for permit requirements to implement the effective prohibition on the discharge of non-storm water discharges into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determine appropriate to control such pollutants, as those requirements are mandated by federal law.

Included in the provisions of the Order are monitoring and reporting requirements that are designed to demonstrate that the Copermittees are implementing programs to comply with the CWA municipal storm water requirements. CWA section 308(a) and 40 CFR 122.41(h), (j)-(l), 122.44(i) and 122.48 require that all NPDES permits specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s (40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c)) also specify additional monitoring and reporting requirements. In addition to the federal requirements of the CWA, the San Diego Water Board also has the authority in CWC 13383 to establish monitoring, reporting, and recordkeeping requirements that implement federal and state laws and regulations through NPDES permits.

The monitoring and assessment information that will be reported to the San Diego Water Board is necessary to determine if the Copermittees are making progress toward achieving compliance with the discharge prohibitions, receiving water limitations, and effluent limitations under Provision A of the Order. The monitoring and assessment information that will be reported is also expected to be key to the iterative approach and adaptive management process that is required to be implemented by the Copermittees if they cannot meet the discharge prohibitions and receiving water limitations under the present conditions, which is also part of the requirements under Provision A of the Order.

Notwithstanding the above, the San Diego Water Board has considered cost information in issuing this Order, as discussed below. The San Diego Water Board has also considered all of the evidence that has been presented to the San Diego Water Board regarding the CWC section 13241 factors in adopting this Order. The San Diego Water Board finds that the requirements in this Order are reasonably necessary to protect beneficial uses identified in the Basin Plan and the economic information related to costs of compliance and other CWC section 13241 factors are not sufficient to justify failing to protect those beneficial uses. Where appropriate, the

San Diego Water Board has provided or will consider providing the Copermittees with additional time to implement control measures to achieve final WQBELs and/or water quality standards.

Cost Information

Discussions of the financial and economic ramifications of municipal storm water management programs tend to focus on the significant costs incurred by municipalities in developing and implementing the programs. When considering the cost of implementing the programs, however, it is also important to consider the alternative costs that are incurred when programs are not fully implemented, as well as the economic benefits which result from effective program implementation.

The recent financial and economic conditions have amplified the concerns about the costs incurred by the municipalities in developing and implementing their programs. The reduction in resources resulting from the recent financial and economic conditions has been cited by many of the Copermittees as a justification for reducing the requirements that must be met by their programs. While the recent conditions are a cause for concern in the short term, these programs also have an opportunity to identify and implement improvements and efficiencies before the next period of growth and development, resulting in more effective and sustainable programs over the long term.

In addition, it is very difficult to ascertain the true cost of implementation of the Copermittees' management programs because of inconsistencies in reporting by the Copermittees. Reported costs of compliance for the same program element can vary widely from city to city, often by a very wide margin that is not easily explained.[2] Despite these problems, efforts have been made to identify management program costs, which can be helpful in understanding the costs of program implementation.

The San Diego Water Board recognizes that the Copermittees will incur costs in implementing this Order, potentially above and beyond the costs from the Copermittees' prior permits. The San Diego Water Board also recognizes that, due to California's current economic condition, many Copermittees currently have limited staff and resources to implement actions to address its MS4 discharges. Based on the economic considerations below, the San Diego Water Board has provided the Copermittees a significant amount of flexibility to choose how to implement the requirements of the Order.

The Order also allows the Copermittees to customize their plans, programs, and monitoring requirements. In the end, it is up to the Copermittees to determine the effective BMPs and measures necessary to comply with this Order. The Copermittees can choose to implement the least expensive measures that are effective in meeting

[2] Los Angeles Water Board, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.

the requirements of this Order. This Order also does not require the Copermittees to fully implement all requirements within a single permit term. Where appropriate, the Board has provided the Copermittees with additional time outside of the permit term to implement control measures to achieve final WQBELs and/or water quality standards.

The San Diego Water Board has considered available cost information associated with compliance with this Order. It is not possible to predict accurately the cost impact of the requirements that involve an unknown level of implementation or that depend on environmental variables that are as yet undefined. Only general conclusions can be drawn from this information.

Estimated Municipal Storm Water Program Implementation Costs

The USEPA, the State Water Board, and the California Regional Water Quality Control Boards (Regional Water Boards) have attempted to evaluate the costs of implementing municipal storm water programs. The assessments have demonstrated that the true costs are difficult to ascertain and reported costs vary widely. In addition, reported fiscal analyses tend to neglect the costs incurred to municipalities when storm water and non-storm water runoff is not effectively managed, which are incurred as a result of pollution, contamination, nuisance, and damage to ecosystems, property, and human health. Nonetheless, they provide a useful context for considering the costs of requirements within Order No. R9-2013-0001.

In 1999, the USEPA reported on multiple studies it conducted to determine the cost of management programs. A study of Phase II municipalities determined that the annual cost of the Phase II program was expected to be $9.16 per household. The USEPA also studied 35 Phase I municipalities, finding costs to be $9.08 per household annually, similar to those anticipated for Phase II municipalities.[3]

The State Water Board commissioned a study by the California State University, Sacramento to assess costs of the Phase I MS4 program. This study includes an assessment of costs incurred by Phase I MS4s throughout the state to implement their programs. Annual cost per household in the study ranged from $18 to $46, with the Fresno-Clovis Metropolitan Area representing the lower end of the range, and the City of Encinitas (in San Diego County) representing the upper end of the range.[4]

A study on Phase I MS4 program costs was also conducted by the California Regional Water Quality Control Board, Los Angeles Region (Los Angeles Water Board), where program costs reported in the municipalities' annual reports were assessed. The Los

[3] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791-68792.
[4] State Water Board, 2005. NPDES Stormwater Cost Survey. P. ii.

Angeles Water Board estimated that average per household cost to implement the MS4 program in Los Angeles County was $12.50. [5]

It is important to note that reported program costs are not all attributable to solely complying with MS4 permits. Many program components, and their associated costs, existed before any MS4 permits were ever issued. For example, street sweeping and trash collection costs cannot be solely or even principally attributable to MS4 permit compliance, since these practices have long been expected from and implemented by municipalities.

Therefore, true program cost resulting from MS4 permit requirements is some fraction of reported costs. The California State University, Sacramento study found that only 38 percent of program costs are new costs fully attributable to MS4 permits. The remainder of the program costs was either pre-existing or resulted from enhancement of pre-existing programs.[6] In 2000, the County of Orange found that even lower amounts of program costs are solely attributable to MS4 permit compliance, reporting that the amount attributable to implement the County or Orange Drainage Area Management Plan (DAMP), was less than 20 percent of the total budget. The remaining 80 percent was attributable to pre-existing programs.[7] More current data from the County of Orange is not used in this discussion because the County of Orange no longer reports such information.

Estimated Value of Healthy Water Quality

Economic considerations of municipal storm water management programs cannot be limited only to program costs. Evaluation of programs must also consider information on the benefits derived from environmental protection and improvement.[8] Attention is often focused on municipal storm water management program costs, but the programs must also be viewed in terms of their value to the public.

Placing a value on healthy receiving waters is very difficult. Often the value of receiving waters with good water quality manifests in other forms, such as tourism, recreational opportunities, and/or increased property values. When surface water bodies are degraded, thereby degrading the habitat within and adjacent to the water bodies, the public loses the value and benefits associated with being able to use the area in and around the water bodies. Surface waters that are able to support the beneficial uses designated in the Basin Plan can sustain plants and wildlife that can attract visitors and residents, providing aesthetic, recreational, as well as monetary value to the public. At this time, however, there have been no studies for the San

[5] Los Angeles Water Board, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.
[6] State Water Board, 2005. NPDES Stormwater Cost Survey. P. 58.
[7] County of Orange, 2000. A NPDES Annual Progress Report. P. 60.
[8] Ribaudo M.O. and D. Heelerstein. 1992, *Estimating Water Quality Benefits: Theoretical and Methodological Issues.* U.S. Department of Agriculture. Technical Bulletin No. 1808.

Diego Region to quantify the added value that surface waters with healthy water quality can provide.

USEPA has estimated that household willingness to pay for improvements in fresh water quality for fishing and boating is approximately $158-$210.[9] This estimate can be considered conservative, since it does not include important considerations such as marine waters benefits, wildlife benefits, or flood control benefits. Another study conducted by California State University, Sacramento reported that the annual household willingness to pay for statewide clean water is approximately $180.[10]

A study conducted by the University of Southern California and University of California, Los Angeles assessed the costs and benefits of implementing various approaches for achieving compliance with the MS4 permits in the Los Angeles region. The study found that non-structural systems would cost $2.8 billion but provide $5.6 billion in benefit. If structural systems were determined to be needed, the study found that total costs would be $5.7 to $7.4 billion, while benefits could reach $18 billion.[11] Costs are anticipated to be borne over many years, probably at least ten years.

As can be seen, the benefits of the municipal storm water management programs are expected to considerably exceed their costs. Such findings are corroborated by USEPA, which found that the benefits of implementation of its Phase II storm water rule would also outweigh the costs.[12]

[9] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68793.
[10] State Water Board, 2005. NPDES Stormwater Cost Survey. P. iv.
[11] Los Angeles Water Board, 2004. Alternative Approaches to Stormwater Control.
[12] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791.

VII. APPLICABLE STATUTES, REGULATIONS, PLANS AND POLICIES

A. Legal Authorities – Federal Clean Water Act and California Water Code

This Order is issued pursuant to section 402 of the CWA and implementing regulations adopted by the USEPA and chapter 5.5, division 7 of the CWC (commencing with section 13370). This Order serves as an NPDES permit for point source discharges to surface waters. This Order also serves as waste discharge requirements pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

The objective of the CWA is "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*." To carry out this objective, the CWA requires the implementation of permit programs to regulate the discharge of pollutants and dredged or fill material to the navigable waters of the U.S. and to regulate the use and disposal of sewage sludge. CWA section 402 provides the legal authority to issue a permit for the discharge of pollutants to waters of the U.S. under the NPDES. The CWA provides that NPDES permits may be issued by states which are authorized to implement the provisions of that act. California became authorized to implement the NPDES permit program on May 14, 1973.

The Porter-Cologne Water Quality Control Act (Division 7, commencing with CWC section 13000) established the State Water Resources Control Board (State Water Board) and nine Regional Water Quality Control Boards (Regional Water Boards) as the principal state agencies with primary responsibility for the coordination and control of water quality. CWC section 13200(f) established the San Diego Water Board, which has the primary responsibility for the coordination and control of water quality in the San Diego Region, which includes all the basins draining into the Pacific Ocean between the southern boundary of the Santa Ana Region and the California-Mexico boundary. The San Diego Water Board implements the CWA through Chapter 5.5 of the CWC, commencing with section 13370. CWC section 13377 provides the San Diego Water Board the legal authority to issue waste discharge requirements to ensure compliance with all applicable provisions of the CWA and acts amendatory thereof or supplementary, thereto, to implement water quality control plans, or for the protection of beneficial uses, or to prevent nuisance.

CWA section 402(p) requires the USEPA or authorized state to issue NPDES permits for storm water discharges from MS4s to waters of the U.S. CWA section 402(p)(3)(B)(ii) requires that NPDES permits for storm water discharges from MS4s "*effectively prohibit non-storm water discharges*" into the MS4s. CWA section 402(p)(3)(B)(iii) requires that NPDES permits for storm water discharges from MS4s to "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable* [MEP], *including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*."

The USEPA published implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]), which prescribe permit application requirements for storm water discharges from MS4s pursuant to CWA 402(p), on November 16, 1990. The USEPA published an Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems, which provided guidance on permit application requirements for regulated MS4s, on May 17, 1996. The federal regulations in 40 CFR 122 and guidance issued by USEPA serve as the foundation for the provisions of Order No. R9-2013-0001. The legal authorities provided by the above statutes and regulations are included as part of the discussions in Section VIII of this Fact Sheet.

B. Legal Authority for the Permit Issued on a Region-wide Basis

CWA section 402(p)(3)(B) provides the San Diego Water Board the legal authority to issue an NPDES permit for the San Diego Region as compared to separate MS4 permits based upon County- and partial County-wide boundaries as they existed within the San Diego Region. CWA section 402(p)(3)(B) states that "*Permits for discharges from municipal storm sewers- (i) may be issued on a system- or jurisdiction-wide basis* ...." The federal regulations in 40 CFR 122.26(a)(1)(v) also state that the San Diego Water Board "*may designate dischargers from municipal separate storm sewers on a system-wide or jurisdiction-wide basis. In making this determination, the [San Diego Water Board] may consider the following factors: (A) the location of the discharge with respect to waters of the United States; (B) the size of the discharge; (C) the quantity and nature of the pollutants discharged to waters of the United States; and (D) other relevant factors*."

More specifically, the federal regulations provide that for large and medium MS4 systems, the San Diego Water Board may issue a regional permit. Specifically, the federal regulation in 40 CFR 122.26(a)(3) provide:

"*(ii) The Director may either issue one system-wide permit covering all discharges from municipal separate storm sewers within a large or medium municipal storm sewer system or issue distinct permits for appropriate categories of discharges within a large or municipal separate storm sewer system including, but not limited to: all discharges owned or operated by the same municipality; located within the same jurisdiction; all discharges within a system that discharge to the same watershed; discharges within a system that are similar in nature; or for individual discharges from municipal separate storm sewers within the system.*

(iii) The operator of a discharge from a municipal separate storm sewer which is part of a large or medium municipal separate storm sewer system must either: (A) Participate in a permit application (to be a permittee or a co-permittee) with one or more other operator of discharges from the large or medium municipal storm sewer system which covers all, or a portion of all, discharges from the municipal separate storm sewer system; (B) Submit a distinct permit application which only covers discharges from the municipal separate storm sewers for

which the operator is responsible; or (C) A regional authority may be responsible for submitting a permit application under the following guidelines....

(iv) One permit application may be submitted for all or a portion of all municipal separate storm sewers within adjacent or interconnected large or medium municipal separate storm sewer systems. The Director may issue one systemwide permit covering all, or a portion of all municipal separate storm sewers in adjacent or interconnected large or medium municipal separate storm sewer systems.

(v) Permits for all or a portion of all discharges from large or medium municipal separate storm sewer systems that are issued on a system-wide, jurisdiction-wide, watershed or other basis may specify different conditions relating to different discharges covered by the permit, including different management programs for different drainage areas which contribute storm water to the system."

Based on these regulations, the San Diego Water Board may issue a region-wide MS4 permit. The regulations also clarify that the permit may include different conditions for separate discharges covered by the permit. This allows the San Diego Water Board to ensure that suitable water quality conditions and provisions are identified for each watershed.

The USEPA's responses to comments in the Final Rule for the above-mentioned regulations also make it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide, permits. In the Final Rule published in the Federal Register and containing the responses to comments, USEPA notes that 40 CFR 122.26(a)(3)(iv) would allow an entire system in a geographical region under the purview of a State agency to be designated under a permit.[13] USEPA also states that many commenters wanted to allow the permitting authority broad discretion to establish system-wide permits, and that EPA believes that paragraphs 40 CFR 122.26 (a)(1)(v) and (a)(3)(ii) allow for such broad discretion.[14]

This Order creates watershed requirements that apply to multiple counties. The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees. Managing storm water on a regional and watershed basis is expected to result in improved water quality, as the Order focuses on monitoring and management practices necessary to improve each watershed rather than political boundaries. A single permit also allows the San Diego Water Board staff to expend fewer resources developing successive multiple permits and allows more resources to be devoted to working cooperatively with all three current groups of Copermittees to ensure implementation of this Order results in improved water quality.

[13] 55 Federal Register 47990-01, 48042.
[14] Ibid.

C. Federal and California Endangered Species Acts

This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2115.5) or the Federal Endangered Species Act (16 United States Code [USC] sections 1531 to 1544). This Order requires compliance with requirements to protect the beneficial uses of waters of the U.S. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

D. California Environmental Quality Act

The action to adopt an NPDES Permit is exempt from the provisions of Chapter 3 of the California Environmental Quality Act (CEQA) (Public Resources Code section 21100, et seq.) pursuant to CWC section 13389. (*County of Los Angeles v. Cal. Water Boards* (2006) 143 Cal.App.4th 985.)

E. State and Federal Regulations, Plans and Policies

The legal authority provided by the following regulations, plans, and policies are also included as part of the discussions in Section VIII of this Fact Sheet.

Water Quality Control Plan for the San Diego Basin

The CWA requires the San Diego Water Board to establish water quality standards for each water body in its region. Water quality standards include beneficial uses, water quality objectives and criteria that are established at levels sufficient to protect beneficial uses, and an antidegradation policy to prevent degrading of waters. On September 8, 1994, the San Diego Water Board adopted the *Water Quality Control Plan for the San Diego Basin* (Basin Plan). The Basin Plan designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters in the San Diego Region. The San Diego Water Board has amended the Basin Plan on multiple occasions since 1994. In addition, the Basin Plan implements State Water Board Resolution No. 88-63, which established state policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply. Beneficial uses applicable to the surface water bodies that receive discharges from the MS4s within the San Diego Region generally include those listed below:

The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region:

- Municipal and Domestic Supply (MUN)
- Agricultural Supply (AGR)
- Industrial Process Supply (PROC)

- Industrial Service Supply (IND)
- Ground Water Recharge (GWR)
- Contact Water Recreation (REC1)
- Non-contact Water Recreation (REC2)
- Warm Freshwater Habitat (WARM)
- Cold Freshwater Habitat (COLD)
- Wildlife Habitat (WILD)
- Rare, Threatened, or Endangered Species (RARE)
- Freshwater Replenishment (FRSH)
- Hydropower Generation (POW)
- Preservation of Biological Habitats of Special Significance (BIOL)

The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region:

- Navigation (NAV)
- Commercial and Sport Fishing (COMM)
- Estuarine Habitat (EST)
- Marine Habitat (MAR)
- Aquaculture (AQUA)
- Migration of Aquatic Organisms (MIGR)
- Spawning, Reproduction, and/or Early Development (SPWN)
- Shellfish Harvesting (SHELL)

Pursuant to Water Code sections 13263 and 13377, the requirements of this Order implement the Basin Plan.

Water Quality Control Plan for Ocean Waters of California, California Ocean Plan

In 1972, the State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan). The State Water Board adopted the most recent amended Ocean Plan on October 16, 2012 ~~September 15, 2009~~. The Office of Administrative Law approved it on July 3, 2013 ~~March 10, 2010~~. ~~On October 8, 2010, USEPA approved the 2009 Ocean Plan.~~ The amended Ocean Plan became effective on August 19, 2013. The Ocean Plan is applicable, in its entirety, to ocean waters of the State. In order to protect beneficial uses, the Ocean Plan establishes water quality objectives and a program of implementation. Pursuant to Water Code sections 13263 and 13377, the requirements of this Order implement the Ocean Plan. The Ocean Plan identifies the beneficial uses of ocean waters of the State to be protected as summarized below:

- Industrial water supply
- Water contact and non-contact recreation, including aesthetic enjoyment; navigation

- Commercial and sport fishing
- Mariculture
- Preservation and enhancement of designated Areas of Special Biological Significance
- Rare and endangered species
- Marine habitat
- Fish spawning and shellfish harvesting

On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving an exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges. On June 19, 2012, the State Water Board adopted Order No. 2012-0031, amending Order No. 2012-0012 to require pollutant load reductions to be achieved within six years for the ASBS Compliance Plans, section A.2.d(2) and ASBS Pollution Prevention Plans, section B.2.b(2). The State Water Board Resolution No. 2012-0012, as amended requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject terms and conditions of State Water Board Resolution No. 2012-0012, as amended. The Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012, as amended, applicable to these discharges, are incorporated in Attachment A of this Order. Requirements of this Order implement the Ocean Plan.

Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality

On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

Antidegradation Policy

Federal regulations (40 CFR 131.12) require that the state water quality standards include an antidegradation policy consistent with the federal antidegradation policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16 ("Statement of Policy with Respect to Maintaining the Quality of

the Waters of the State"). State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law.

The San Diego Water Board's Basin Plan implements and incorporates by reference both the State and federal antidegradation policies. State Water Board Resolution No. 68-16 and 40 CFR 131.12 require the San Diego Water Board to maintain high quality waters of the State unless degradation is justified based on specific findings. First, the Board must ensure that "existing instream uses and the level of water quality necessary to protect the existing uses" are maintained and protected. Second, if the baseline quality of a water body for a given constituent exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water, that quality shall be maintained and protected through the requirements of the Order unless the Board makes findings that (1) any lowering of the water quality is necessary to accommodate important economic or social development in the area in which the waters are located; (2) water quality adequate to protect existing uses fully is assured; and (3) the highest statutory and regulatory requirements for all new and existing point sources and all cost-effective and reasonable best management practices for nonpoint source control are achieved. The San Diego Water Board must also comply with any requirements of State Water Board Resolution No. 68-16 beyond those imposed through incorporation of the federal antidegradation policy. In particular, the Board must find that not only present, but also anticipated future uses of water are protected, and must ensure best practicable treatment or control of the discharges. The baseline quality considered in making the appropriate findings is the best quality of the water since 1968, the year of the adoption of Resolution No. 68-16, or a lower level if that lower level was allowed through a permitting action that was consistent with the federal and state antidegradation policies. ~~until it is demonstrated that any change in quality will be consistent with maximum benefit to the people of the State, will not unreasonably affect beneficial uses, and will not result in water quality less than that described in the San Diego Water Boards' policies. State Water Board Resolution No. 68-16 requires that discharges of waste be regulated to meet best practicable treatment or control to assure that pollution or nuisance will not occur and the highest water quality consistent with the maximum benefit to the people of the State be maintained.~~

The discharges permitted in this Order are consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Board Resolution No. 68-16 as set forth below~~.~~: ~~Many of the water bodies within the area covered by this Order are of high quality. The Order requires the Copermittees to meet best practicable treatment or control to meet water quality standards. As required by 40 CFR 122.44(a), the Copermittees must comply with the "maximum extent practicable" technology-based standard set forth in CWA section 402(p) for discharges of pollutants in storm water from the MS4s.~~

1. Many of the waters within the area covered by this Order are impaired for multiple pollutants discharged through MS4s and are not high quality waters with regard to these pollutants. In most cases, there is insufficient data to determine whether these water bodies were impaired as early as 1968, but the limited available data shows

impairment dating back for more than two decades. Many such water bodies are ~~and~~ listed on the State's CWA Section 303(d) List and the San Diego Water Board has established TMDLs to address the impairments. This Order ensures that existing instream (beneficial) water uses and the level of water quality necessary to protect the existing uses is maintained and protected. This Order requires the Copermittees to comply with permit provisions to implement the WLAs set forth in the TMDLs in order to restore the beneficial uses of the impaired water bodies consistent with the assumptions and requirements of the TMDLs. This Order further requires compliance with receiving water limitations to meet water quality standards in the receiving water either by demonstrating compliance pursuant to Provision A and the Copermittees' monitoring and assessment program pursuant to Provision D of this Order, or by implementing Provision B.3.c with a schedule to achieve compliance with receiving water limitations. This Order includes requirements to develop and implement storm water management programs, achieve WQBELs, and effectively prohibit non-storm water discharges into the MS4. The issuance of this Order does not authorize an increase in the amount of discharge of waste.

2. To the extent that water bodies within the area covered by this Order are high quality waters with regard to some constituents, this Order finds as follows:

   a. Allowing limited degradation of high quality water bodies through MS4 discharges is necessary to accommodate important economic or social development in the area and is consistent with the maximum benefit to the people of the state. The discharge of storm water in certain circumstances is to the maximum benefit to the people of the state because it can assist with maintaining instream flows that support beneficial uses, may spur the development of multiple-benefit projects, and may be necessary for flood control, and public safety as well as to accommodate development in the area. The alternative – capturing all storm water from all storm events – would be an enormous opportunity cost that would preclude MS4 permittees from spending substantial funds on other important social needs. The Order ensures that any limited degradation does not affect existing and anticipated future uses of the water and does not result in water quality less than established standards. The Order requires compliance with receiving water limitations that act as a floor to any limited degradation.

   b. The Order requires the highest statutory and regulatory requirements and requires that the Copermittees meet best practicable treatment or control. The Order prohibits all non-storm water discharges, with a few enumerated exceptions, through the MS4 to the receiving waters. As required by 40 CFR section 122.44(a), the Copermittees must comply with the "maximum extent practicable" technology-based standard set forth in CWA section 402(p), and implement extensive minimum control measures in a storm water management program. Recognizing that best practicable treatment or control may evolve over time, the Order includes new and more specific requirements as compared to the prior Phase I MS4 permits for the San Diego County, Orange County and Riverside County Copermittees. The Order incorporates options to implement

Water Quality Improvement Plans that must specify detailed structural and non-structural storm water controls that must be implemented in accordance with an accepted proposed time schedule. The Order contains provisions to encourage, wherever feasible, retention of the storm water from the 85th percentile 24-hour storm event.

Anti-Backsliding Requirements

CWA sections 402(o) and 303(d)(4) and federal regulations at 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations or conditions may be relaxed. ~~All effluent limitations and other conditions in this Order are at least as stringent as the effluent limitations in the previous permits issued to the San Diego County Copermittees, the Orange County Copermittees, and the Riverside County Copermittees.~~ While this Order allows implementation of an alternative compliance pathway option in Provision B.3.c to constitute compliance with receiving water limitations under certain circumstances, the availability of that alternative and the corresponding availability of additional time to come into compliance with receiving water limitations~~,~~ does not violate the anti-backsliding provisions. The receiving water limitations provisions of this Order are imposed under section 402(p)(3)(B) of the Clean Water Act rather than based on best professional judgment, or based on section 301(b)(1)(C) or sections 303(d) or (e), and are accordingly not subject to the anti-backsliding requirements of section 402(o). Although the non-applicability is less clear with respect to the regulatory anti-backsliding provisions in 40 CFR 122.44(l), the regulatory history suggests that USEPA's intent was to establish the anti-backsliding regulations with respect to evolving technology standards for traditional point sources. (See, e.g., 44 Fed.Reg. 32854, 32864 (Jun. 7, 1979)). It is unnecessary, however, to resolve the ultimate applicability of the regulatory anti-backsliding provisions, because the alternative compliance pathway option in Provision B.3.c qualifies for an exception to backsliding as based on new information.

The alternative compliance pathway option in Provision B.3.c of this Order was informed by new information available to the Board from experience and knowledge gained through storm water permitting at the Regional Water Boards in the last ten years. There has been a statewide paradigm shift in storm water management. State Water Board Order WQ 2015-0075 directed all of the Regional Water Boards to consider the Los Angeles Water Board's alternative compliance path to receiving water limitations in all Phase I MS4 permits going forward (State Water Board Order WQ 2015-0075 at page 51), and the Los Angeles Water Board's process of developing over 30 watershed-based TMDLs and implementing several TMDLs since the adoption of the previous permits. In particular, the Los Angeles Water Board recognized the significance of allowing time to plan, design, fund, operate and maintain watershed-based BMPs necessary to attain water quality improvements and additionally recognized the potential for municipal storm water to benefit water supply. Similarly, the San Diego Water Board's experience developing and implementing the Fourth Term MS4 Permits and TMDLs that apply on a region-wide scale (e.g. TMDLs for Indicator

Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region) has resulted in a similar recognition of the need for a watershed-based approach that allows time to plan, design, fund, operate and maintain BMPs to address impaired waters that have been impacted by MS4 discharges. Thus, even if the receiving water limitations are subject to anti-backsliding requirements, they were revised based on new information that would support an exception to the anti-backsliding provisions. (33 U.S.C. § 1342(o)(2)(B)(i); 40 C.F.R. § 122.44(l)(1); 40 C.F.R. §122.44(l)(2)(i)(B)(1)).

Clean Water Act Section 303(d) List

CWA section 303(d)(1) requires each State to identify specific water bodies within its boundaries where water quality standards are not being met or are not expected to be met after implementation of technology-based effluent limitations on point sources. Water bodies that do not meet water quality standards are considered impaired and are placed on the state's "303(d) List." Periodically, USEPA approves the State's 303(d) List.

Most recently, USEPA approved the State's 2010 303(d) List of impaired water bodies on October 11, 2011, which includes certain receiving waters in the San Diego Region. For each listed water body, the state or USEPA is required to establish a TMDL of each pollutant impairing the water quality standards in that water body. A TMDL is a tool for implementing water quality standards and is based on the relationship between pollution sources and in-stream water quality conditions. The TMDL establishes the allowable pollutant loadings for a water body and thereby provides the basis to establish water quality-based controls. These controls should provide the pollution reduction necessary for a water body to meet water quality standards.

A TMDL is the sum of the allowable pollutant loads of a single pollutant from all contributing point sources (the waste load allocations or WLAs) and non-point sources (load allocations of LAs) plus the contribution from background sources and a margin of safety (40 CFR 130.2(i)). MS4 discharges are considered point source discharges. For 303(d)-listed water bodies and pollutants in the San Diego Region, the San Diego Water Board or USEPA develops and adopts TMDLs that specify these requirements.

Since 2002, the San Diego Water Board has established seven (7) TMDLs to remedy water quality impairments in various water bodies within the San Diego Region (see Attachment E to the Order). These TMDLs identify MS4 discharges as a source of pollutants to these water bodies, and, as required, establish WLAs for MS4 discharges to reduce the amount of pollutant discharged to receiving waters. CWA section 402(p)(3)(B)(iii) requires the San Diego Water Board to impose permit conditions, including: "management practices, control techniques and system, design and engineering methods, and *such other provisions as the Administrator or the State determines appropriate for the control of such pollutants."* (Emphasis added.) CWA section 402(a)(1) also requires states to issue permits with conditions necessary to carry out the provisions of the CWA. Federal regulations also require that NDPES permits contain WQBELs consistent with the assumptions and requirements of all available WLAs (40 CFR 122.44(d)(1)(vii)(B)). CWC section 13377 also requires that

NPDES permits include limitations necessary to implement water quality control plans. Therefore, this Order includes WQBELs and other provisions to implement the TMDL WLAs assigned to Copermittees regulated by this Order.

Other Regulations, Plans and Policies

This Order implements all other applicable federal regulations and State regulations, plans and policies, including the California Toxics Rule at 40 CFR 131.38 (Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California Rule [California Toxics Rule or CTR]), and State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP).

F. Unfunded State Mandates

Article XIII B, Section 6(a) of the California Constitution provides that whenever "*any state agency mandates a new program or higher level of service on any local government, the state shall provide a subvention of funds to reimburse that local government for the costs of the program or increased level of service*." The requirements of this Order do not constitute state mandates that are subject to a subvention of funds for several reasons, including, but not limited to, the following.

First, the requirements of this Order do not constitute a new program or a higher level of service as compared to the requirements contained in the previous Fourth Term Permits. The overarching requirement to impose controls to reduce the pollutants in discharges from MS4s is dictated by the CWA and is not new to this permit cycle (33 USC section 1342(p)(3)(B)). The inclusion of new and advanced measures as the MS4 programs evolve and mature over time is anticipated under the CWA (55 FR 47990, 48052 (Nov. 16, 1990)), and to the extent requirements in this Order are interpreted as new advanced measures, they do not constitute a new program or higher level of service.

Second, and more broadly, mandates imposed by federal law, rather than by a state agency, are exempt from the requirement that the local agency's expenditures be reimbursed (Cal. Const., art. XIII B, section 9, subd. (b)). This Order implements federally mandated requirements under the CWA and its requirements are therefore not subject to subvention of funds. This includes federal requirements to effectively prohibit non-storm water discharges, to reduce the discharge of pollutants in storm water to the MEP, and to include such other provisions as the Administrator or the State determines appropriate for the control of such pollutants (33 USC section 1342(p)(3)(B)). Federal cases have held these provisions require the development of permits and permit provisions on a case-by-case basis to satisfy federal requirements. (*Natural Resources Defense Council, Inc., v. USEPA* (9th Cir. 1992) 966 F.2d 1292, 1308, fn. 17.)

The authority exercised under this Order is not reserved state authority under the CWA's savings clause (cf. *Burbank v. State Water Resources Control Bd.* (2005) 35

Cal.4th 613, 627-628 [relying on 33 USC section 1370, which allows a state to develop requirements which are not "less stringent" than federal requirements]), but instead is part of a federal mandate to develop pollutant reduction requirements for municipal separate storm sewer systems. To this extent, it is entirely federal authority that forms the legal basis to establish the permit provisions. (See, *City of Rancho Cucamonga v. Regional Water Quality Control Board, Santa Ana Region* (2006) 135 Cal.App.4th 1377, 1389; *Building Industry Ass'n of San Diego Co. v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 882-883.)

The MEP standard is a flexible standard that balances a number of considerations, including technical feasibility, cost, public acceptance, regulatory compliance, and effectiveness. (*Building Ind. Ass'n., supra,* 124 Cal.App.4th at pp. 873-874, 889.) Such considerations change over time with advances in technology and with experience gained in storm water management (55 FR 47990, 48052 (Nov. 16, 1990)). Accordingly, a determination of whether the conditions contained in this Order exceed the requirements of federal law cannot be based on a point by point comparison of the permit conditions and the minimum control measures that are required "at a minimum" to reduce pollutants to the maximum extent practicable and to protect water quality (40 CFR 122.34). Rather, the appropriate focus is whether the permit conditions, as a whole, exceed the MEP standard.

In recent months, the County of Los Angeles and County of Sacramento Superior Courts have granted writs setting aside decisions of the Commission on State Mandates that held certain requirements in Phase I permits constituted unfunded mandates. In both cases, the courts have found that the correct analysis in determining whether an MS4 permit constituted a state mandate was to evaluate whether the permit as a whole exceeds the MEP standard. (*State of Cal. v. Comm. on State Mandates* (Super. Ct. Sacramento County, 2012, No. 34-2010-80000604), *State of California v. County of Los Angeles* (Super. Ct. Los Angeles County, 2011, No. BS130730.) Both cases are currently pending appeal.

The requirements of the Order, taken as a whole rather than individually, are necessary to reduce the discharge of pollutants to the MEP and to protect water quality. The San Diego Water Board finds that the requirements of the Order are practicable, do not exceed federal law, and thus do not constitute an unfunded mandate. These findings are the expert conclusions of the principal state agency charged with implementing the NPDES program in California (CWC sections 13001, 13370).

It should also be noted that the provisions in this Order to effectively prohibit non-storm water discharges are also mandated by the CWA (33 USC section 1342(p)(3)(B)(ii)). Likewise, the provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state establishes or adopts a TMDL, federal law requires that permits must contain effluent limitations consistent with the assumptions and requirements of any applicable waste load allocation in a TMDL (40 CFR 122.44(d)(1)(vii)(B)).

Third, the local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental dischargers who are issued NPDES permits for storm water discharges. With a few inapplicable exceptions, the CWA regulates the discharge of pollutants from point sources (33 USC section 1342) and the Porter-Cologne Act regulates the discharge of waste (CWC section 13263), both without regard to the source of the pollutant or waste. As a result, the "costs incurred by local agencies" to protect water quality reflect an overarching regulatory scheme that places similar requirements on governmental and non-governmental dischargers. (See *County of Los Angeles v. State of California* (1987) 43 Cal.3d 46, 57-58 [finding comprehensive workers' compensation scheme did not create a cost for local agencies that was subject to state subvention].)

The CWA and the Porter-Cologne Act largely regulate storm water with an even hand, but to the extent there is any relaxation of this even-handed regulation, it is in favor of the local agencies. Generally, the CWA requires point source dischargers, including dischargers of storm water associated with industrial or construction activity, to comply strictly with water quality standards (33 USC section 1311(b)(1)(C); *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159, 1164-1165 [noting that industrial discharges must strictly comply with water quality standards]). As discussed in prior State Water Board decisions, certain provisions of this Order do not require strict compliance with water quality standards (State Water Board Order No. WQ 2001-0015, p. 7). Those provisions of this Order regulate the discharge of waste in municipal storm water under the CWA's MEP standard, not the BAT/BCT standard that applies to other types of discharges. These provisions, therefore, regulate the discharge of waste in municipal storm water more leniently than the discharge of waste from non-governmental sources.

Fourth, the Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)). To the extent that the local agency Copermittees have voluntarily availed themselves of the permit, the program is not a state mandate. (Accord, *County of San Diego v. State of California* (1997) 15 Cal.4th 68, 107-108.)

Fifth, the local agency Copermittees' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under state law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

Finally, even if any of the permit provisions could be considered unfunded mandates, under Government Code section 17556, subdivision (d), a state mandate is not subject to reimbursement if the local agency has the authority to charge a fee. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order, subject to certain voting requirements contained in the California Constitution. (See Cal. Const., Art. XIII D, section 6, subd. (c); see also *Howard Jarvis Taxpayers Ass'n v. City of Salinas* (2002) 98 Cal.App.4th

1351, 1358-1359.) The Fact Sheet demonstrates that numerous activities contribute to the pollutant loading in the MS4. Local agencies can levy service charges, fees, or assessments on these activities, independent of real property ownership. (See, e.g., *Apartment Ass'n of Los Angeles County, Inc., v. City of Los Angeles* (2001(24 Cal.4th 830, 842 [upholding inspection fees associated with renting property].) The authority and ability of a local agency to defray the cost of a program without raising taxes indicates that a program does not entail a cost subject to subvention. (*Clovis Unified School Dist. V. Chiang* (2010) 188 Cal.App.4th 794, 812, citing *Connell v. Sup. Ct.* (1997) 59 Cal.App.4th 382, 401; *County of Fresno v. State of California* (1991) 53 Cal. 3d. 482, 487-488.)

VIII. PROVISIONS

The provisions (i.e. NPDES permit requirements) of the Order are discussed below.

A. Prohibitions and Limitations

Purpose: Provision A includes the prohibitions and limitations requirements that are the foundation of all the subsequent requirements included in the Order. Compliance with the prohibitions and limitations will restore and protect receiving waters from impacts that may be caused by discharges into and from the Copermittees' MS4s and ultimately achieve the objective of the CWA.

In meeting the requirements set forth in the Order, the Copermittees must be cognizant that the prohibitions and limitations exist and will be the standard by which the San Diego Water Board will be measuring the progress and success of their implementation of the NPDES permit requirements.

***Discussion*:** The objective of the CWA is to "*restore and maintain the chemical, physical, and biological integrity of the Nation's waters*." The CWA requires the implementation of NPDES permit programs to regulate discharges of pollutants and dredged or fill material to the navigable waters of the U.S. For discharges into and from MS4s, the CWA requires the NPDES permits to "*effectively prohibit non-stormwater discharges into the storm sewers*" and "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable.*"

Provision A includes limitations, consistent with the requirements of the CWA for discharges from MS4s. Provision A expresses these limitations as discharge prohibitions, receiving water limitations, and effluent limitations. Compliance with the discharge prohibitions and receiving water limitations is also explicitly described, in conformance with precedential State Water Board Orders.

More specific and detailed discussions of the requirements of Provision A are provided below.

Provision A.1 (Discharge Prohibitions) prohibits the discharge of specific types of waste into and/or from the Copermittees' MS4s.

Provision A.1.a restates and reiterates Basin Plan Waste Discharge Prohibition 1, by prohibiting discharges into and from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the

state. The terms pollution,[15] contamination,[16] and nuisance[17] are defined under CWC 13050. Provision A.1.c incorporates all the waste discharge prohibitions of the Basin Plan into the requirements of the Order. The waste discharge prohibitions from the Basin Plan have been reproduced and provided in Attachment A to the Order.

Provision A.1.b requires non-storm water discharges into the MS4s to be effectively prohibited, consistent with the requirements of the CWA for MS4 permits to "*effectively prohibit non-stormwater discharges into the storm sewers*." The effective prohibition is required to be implemented by each Copermittee within its jurisdiction through the illicit discharge detection and elimination requirements under Provision E.2. The prohibition does not apply to NPDES permitted discharges into the Copermittees' MS4s.

The CWA employs the strategy of prohibiting the discharge of any pollutant from a point source into waters of the United States unless the discharger of the pollutant(s) obtains an NPDES permit pursuant to CWA Section 402. The 1987 amendment to the CWA includes provision 402(p) that specifically addresses NPDES permitting requirements for storm water discharges from MS4s. CWA section 402(p) prohibits the discharge of pollutants from specified MS4s to waters of the U.S. except as authorized by an NPDES permit and identifies two substantive standards for MS4 storm water permits. MS4 permits (1) "*shall include a requirement to effectively prohibit non-stormwater discharges into the storm sewers*" and (2) "*shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or State determines appropriate for the control of such pollutants*." (CWA section 402(p)(3)(B)(ii)-(iii).)

In November 1990, the USEPA published regulations addressing storm water discharges from MS4s (55 FR 47990 and following (Nov. 16, 1990) (Phase I Final Rule)). The regulations establish minimum requirements for MS4 permits, and generally focus on the requirement that MS4s implement programs to reduce the amount of pollutants found in storm water discharges to the MEP. The CWA's municipal storm water MEP standard does not require storm water discharges to strictly meet water quality standards, as is required for other NPDES permitted

[15] CWC 13050(l): "(1) 'Pollution' means an alteration of the quality of waters of the state by waste to a degree which unreasonably affects either of the following: (A) The water for beneficial uses. (B) Facilities which serve beneficial uses. (2) 'Pollution' may include 'contamination.'

[16] CWC 13050(k): "Contamination' means an impairment of the quality of waters of the state by waste to a degree which creates a hazard to public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste, whether or not waters of the state are affected."

[17] CWC 13050(m): 'Nuisance' means anything which meets all of the following requirements: (1) Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. (2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. (3) Occurs during, or as a result of, the treatment or disposal of wastes."

discharges. Compliance is achieved through an iterative approach of continuous implementation of improved BMPs. This distinction reflects Congress's recognition that variability in flow and intensity of storm events render difficult strict compliance with water quality standards by MS4 permittees. In describing the controls that permits must include to reduce pollutants in storm water discharges to the MEP, the statute (CWA section 402(p)(3)(B)(iii)) states that the controls shall include: "*management practices, control techniques and system, design and engineering methods, and such other provisions as the [permit writer] determines appropriate for the control of such pollutants*."

In contrast, non-storm water discharges from the MS4 that are not authorized by separate NPDES permits are subject to requirements under the NPDES program, including discharge prohibitions, technology based effluent limitations and water quality-based effluent limitations (40 CFR 122.44). The regulations also require the Copermittee's program to include an element to detect and remove illicit discharges and improper disposal into the storm sewer (40 CFR 122.26(d)(2)(iv)(B)).

While "non-storm water" is not defined in the CWA or federal regulations, the federal regulations (at 40 CFR 122.26(b)(2)) define "*illicit discharge*" as *"any discharge to a municipal separate storm sewer that is not composed entirely of storm water and that is not covered by an NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer and discharges resulting from fire fighting activities)*." This definition is the most closely applicable definition of "non-storm water" contained in federal law. As stated in the Phase I Final Rule, USEPA added the illicit discharge program requirement to begin implementation of the 'effective prohibition' requirement to detect and control non-storm water discharges to their municipal system.

Thus, federal law mandates that permits issued to MS4s must require management practices that will result in reducing storm water pollutants to the MEP yet at the same time requires that non-storm water discharges be effectively prohibited from entering the MS4. "Effectively" prohibit does not mean that non-storm water discharges are authorized to be discharged into and from the Copermittees' MS4s. The Phase I Final Rule clarifies what "effectively prohibit" means (55 FR 47995):

> "*Section 402(p)(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…<u>Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit</u> (other than the permit for the discharge from the municipal separate storm sewer)*" [Emphasis added].

Consistent with federal law, unless non-storm water discharges to the MS4 are authorized by a separate NPDES permit, non-storm water discharges are

appropriately subject to the effective prohibition requirement in the CWA and Regional Water Boards are not limited by the iterative MEP approach to storm water regulation in crafting appropriate regulations for non-storm water discharges.

The federal regulations (40CFR122.26(d)(2)(i)(B)) require the Copermittees to establish the legal authority which authorizes or enables the Copermittees to prohibit illicit discharges to the MS4s. The federal regulations (40 CFR 122.26(d)(2)(vi)(B)(1)) require the Copermittees to "*implement and enforce an ordinance, order or similar means*" to prevent non-storm water discharges to their MS4s. Thus, the Copermittees are required to "*effectively*" prohibit non-storm water discharges to their MS4s through enforcing their legal authority established under "*ordinance, order or similar mean*s" and either remove those discharges to their MS4s, or require those discharges to obtain coverage under a separate NPDES permit. More detail about the program that must be implemented to "*effectively*" prohibit non-storm water discharges to the Copermittees' MS4s is provided under the discussion for Provision E.2.

Provision A.1.d was included to be consistent with Resolution No. 2012-0012, adopted by the State Water Board on March 20, 2012. Provision A.1.d prohibits discharges from MS4s to Areas of Special Biological Significance (ASBS), except for storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach to the Heisler Park ASBS subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012. The pertinent Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 are provided in Attachment A to the Order.

<u>Provision A.2 (Receiving Water Limitations)</u> specifies the condition of the receiving waters that must be achieved when there are discharges from the Copermittees' MS4s. Receiving water limitations are included in all NPDES permits issued pursuant to the CWA section 402. CWA section 402(p)(3)(B)(iii) authorizes the inclusion of "*such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." This requirement gives USEPA or the State permitting authority, in this case the San Diego Water Board, discretion to determine what permit conditions are necessary to control pollutants.

In its Phase I Final Rule (see 55 FR 47990, 47994 (Nov. 16, 1990)), USEPA elaborated on these requirements, stating that, "*permits for discharges from municipal separate storm sewer systems must require controls to reduce the discharge of pollutants to the maximum extent practicable, and where necessary water quality-based controls*." USEPA reiterated in its Phase II Final Rule (64 FR 68722, 68737), that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL*." CWC section 13377 also requires that NPDES permits include limitations necessary to implement water quality control plans. Both the State Water Board and the San Diego Water Board have previously concluded that discharges from the MS4 contain pollutants that have

the reasonable potential to cause or contribute to excursions above water quality standards. As such, inclusion of receiving water limitations is appropriate to control MS4 discharges.

The inclusion of receiving water limitations is also consistent with the Ninth Circuit Court of Appeals' ruling in *Defenders of Wildlife v. Browner* (191 F.3d 1159, 1166 (1999)) that the permitting authority has discretion regarding the nature and timing of requirements that it includes as MS4 permit conditions to attain water quality standards. The Ninth Circuit Court of Appeals recently explained that, "*[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*" (*Natural Resources Defense Council v. County of Los Angeles* (9th Cir. 2011) 673 F.3d 880, 886 (revd. On other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013)))

The receiving water limitations included in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan or in water quality control plans or policies adopted by the State Water Board, including State Water Board Resolution No. 68-16, or in federal regulations, including but not limited to 40 CFR 131.12 and 131.38. The water quality objectives in the Basin Plan and other State Water Board plans and policies have been approved by USEPA and combined with designated beneficial uses constitute the water quality standards required under federal law.

Provision A.2.a requires that discharges from the Copermittees' MS4s must not cause or contribute to the violation of water quality standards in receiving waters. The water quality standards of the receiving waters must be protected from the impacts that may be caused by the Copermittees' MS4 discharges. Water quality standards applicable to the surface waters in the San Diego Region must be achieved through meeting the technology based standard of MEP through an iterative process of improved management actions. Provision A.2.a is also consistent with State Water Board Order WQ 99-05 precedent-setting language requiring discharges from MS4s to attain receiving water quality standards. The water quality control plans and policies with water quality standards applicable to the waters in the San Diego Region are included under Provision A.2.a.

Provisions A.2.b was included to be consistent with the requirements of State Water Board Resolution No. 2012-0012, adopted on March 20, 2012.

Provision A.3 (Effluent Limitations) specifies the condition of the discharges from the Copermittees' MS4s that must be achieved if and when there are discharges.

Consistent with CWA section 301(b)(1)(A) and 40 CFR 122.44(a), Provision A.3.a includes the technology-based effluent limitations that must be included in the Order. The technology-based effluent limits, representing the minimum level of control that must be imposed in a permit under CWA section 402, requires that pollutants in discharges of storm water from the Copermittees' MS4s be reduced to the MEP. This provision applies specifically to storm water discharges. Non-storm water discharges must be effectively prohibited, as required under Provision A.1.b. Non-storm water (dry weather) discharges from the MS4 are not considered storm water (wet weather) discharges and therefore are not subject to the MEP standard.

The technology-based MEP standard is an ever-evolving, flexible, and advancing concept. Neither Congress nor USEPA has specifically defined the term "maximum extent practicable." Congress established this flexible MEP standard so that the administrative bodies would have "*the tools to meet the fundamental goals of the Clean Water Act in the context of storm water pollution*." (*Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 884.) As knowledge about controlling storm water runoff and discharges continues to evolve, so does the knowledge which constitutes MEP. Reducing the discharge of pollutants in storm water from the MS4 to the MEP requires the Copermittees to assess each program component and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP.

The San Diego Water Board or the State Water Board ultimately define MEP, and may include requirements that provide specific guidance on what is expected to demonstrate MEP. It is the responsibility of the Copermittees to propose actions that implement BMPs to reduce storm water pollution to the MEP. In other words, the Copermittees' runoff management programs developed and implemented under the Order are the Copermittees' proposals for achieving MEP. Their total collective and individual activities conducted pursuant to their runoff management programs become their proposal for achieving MEP as it applies both to their overall effort, as well as to specific activities. Provisions B through E of the Order provides a minimum framework to guide the Copermittees in achieving the MEP standard for discharges of pollutants in storm water.

Provision A.3.b incorporates any water quality based effluent limitations (WQBELs) applicable to the MS4s established for TMDLs adopted and approved for the San Diego Region and requires the Copermittees to comply with those WQBELs. This is consistent with 40 CFR 122.44(d)(1)(vii)(B), which requires that NPDES permits to incorporate WQBELs "*developed to protect a narrative water quality criterion, a numeric water quality criterion, or both…consistent with the assumptions and requirements of any available wasteload allocation for the discharge...*"

Pursuant to CWA section 303(d), for surface water bodies identified as impaired by one or more pollutants, the San Diego Water Board is required to establish TMDLs "*at a level necessary to implement the applicable water quality standards with seasonal variations and a margin of safety which takes into account any lack of knowledge*

concerning the relationship between effluent limitations and water quality." The TMDLs identify sources of the pollutants causing the impairments and assign portions of the TMDL as WLAs to point sources, which include MS4s.

WLAs must be expressed in NPDES permits as WQBELs, which may include one or more numeric components such as numeric effluent limits, and/or receiving water limitations, and/or BMP requirements. Because numeric targets for TMDLs typically include a component that will be protective of water quality standards, a TMDL will likely include one or more numeric receiving water limitations and/or effluent limitations as part of the assumptions or requirements of the TMDL. Any numeric receiving water limitations and/or effluent limitations developed as part of the assumptions or requirements of a TMDL must be incorporated and included as part of WQBELs for the MS4s.

Because the development and approval of new TMDLs, or modification of existing TMDLs, may occur during the term of this Order, the specific provisions of those TMDLs, including effluent limitations applicable to MS4s are provided within Attachment E to the Order. Attachment E will be updated with new TMDLs and modifications to existing TMDLs in a timely manner as they occur.

Provision A.4 (Compliance with Discharge Prohibitions and Receiving Water Limitations) describes the process required to be implemented by the Copermittees if compliance with the discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a are not being achieved under current conditions.

In its Phase II Stormwater Regulations, Final Rule, USEPA states that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL.*"[18] In a series of comment letters on MS4 permits issued by various Regional Water Boards, USEPA has also reiterated that MS4 discharges must meet water quality standards.[19] In addition, the Ninth Circuit Court of Appeals explained in a recent ruling that, *"[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*"[20]

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[18] Phase II Stormwater Regulations, Final Rule, 64 Fed. Reg. 68722, 68737.

[19] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.

[20] NRDC v. County of Los Angeles (9th Cir. 2011), 673 F.3d 880, 886 (revd. on other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013))). See also, *Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 884-886, citing *Defenders of Wildlife v. Browning,* (9th Cir. 1999) 191 F.3d 1159.)

Water quality standards for the San Diego Region are established in the Basin Plan. The water quality standards of the Basin Plan are incorporated into this Order as the discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a. The discharge prohibitions and receiving water limitations in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations or prohibitions to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan, water quality control plans or policies adopted by the State Water Board, including Resolution No. 68-16, or federal regulations, including but not limited to, 40 CFR 131.12 and 131.38. The waste discharge prohibitions and water quality objectives in the Basin Plan have been approved by USEPA and combined with the designated beneficial uses constitute the water quality standards required under federal law.

Under federal law (CWA section 402(p)(3)(B)(iii)), an MS4 permit must include "*controls to reduce the discharge of pollutants to the maximum extent practicable...and such other provision as...the State determines appropriate for control of such pollutants*." The State Water Board has previously determined that limitations necessary to meet water quality standards are appropriate for the control of pollutants discharged by MS4s and must be included in MS4 permits. (State Water Board Orders WQ 91-03, 98-01, 99-05, 2001-15; see also *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159.) This Order prohibits discharges that cause or contribute to violations of water quality standards.

The discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a are included in this Order to ensure that discharges from the MS4s do not cause or contribute to exceedances of water quality objectives necessary to protect the beneficial uses of the receiving waters.

Provision A.4 is consistent with the precedent-setting language in State Water Board Order WQ 99-05 required to be included in municipal storm water permits. State Water Board Order WQ 2001-15 refined Order WQ 99-05 by requiring an iterative approach to compliance with water quality standards involving ongoing assessments and revisions, referred to as the "iterative process." The "iterative process" is a fundamental NPDES requirement for municipal storm water permits to achieve the objectives of the CWA.

The State Water Board and Regional Water Boards have stated that the provisions under Provisions A.1.a, A.1.c, A.2.a, and A.4 are independently applicable, meaning that compliance with one provision does not provide a "safe harbor" where there is non-compliance with another provision (i.e., compliance with the Provision A.4 does not shield a Copermittee who may have violated Provision A.1.a, A.1.c, or A.2.a from an enforcement action). The intent of Provision A.4 is to ensure that the Copermittees have the necessary storm water management programs and controls in place, and that they are modified by the Copermittees in a timely fashion when necessary, so that compliance with Provisions A.1.a, A.1.c, and/or A.2.a is achieved as soon as possible. USEPA expressed the importance of this independent applicability in a series of

comment letters on MS4 permits proposed by various Regional Water Boards. At that time, USEPA expressly objected to certain MS4 permits that included language stating, *"permittees will not be in violation of this [receiving water limitation] provision … [if certain steps are taken to evaluate and improve the effectiveness of the jurisdictional runoff management programs],"* concluding that this phrase would not comply with the CWA.[21]

The Ninth Circuit held in *Natural Resources Defense Council v. County of Los Angeles* (2011) 673 F3d. 880, 886 (revd. on other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013))) that engagement in the iterative process does not provide a safe harbor from liability for violations of permit terms prohibiting exceedances of water quality standards. The Ninth Circuit holding is consistent with the position of the State and Regional Water Boards that exceedances of water quality standards in an MS4 permit constitute violations of permit terms subject to enforcement by the Water Boards or through a citizen suit. While the Water Boards have generally directed dischargers to achieve compliance by improving control measures through the iterative process, the San Diego Water Board retains the discretion to take other appropriate enforcement and the iterative process does not shield dischargers from citizen suits under the CWA.

The requirements of Provision A.4, therefore, are required to be implemented until the water quality standards expressed under Provisions A.1.a, A.1.c, and A.2.a are achieved. The CWA requires MS4 permits to "*require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." The requirements of this Order have been deemed or determined to be "appropriate" to achieve water quality standards in receiving waters.

Part of the "*controls*" required by the Order is the process described in Provision A.4. Provision A.4 includes the process that is ultimately expected to achieve compliance with the requirement that discharges from the MS4 do not cause or contribute to violations of water quality standards in the receiving waters. The implementation of Provision A.4 is required when the Copermittees or the San Diego Water Board have determined that discharges from the MS4 are causing or contributing to violations of water quality standards in the receiving waters.

The Copermittees must effectively prohibit non-storm water discharges into the MS4s, reduce the discharge of pollutants in storm water from the MS4s to the MEP, and ensure that their MS4 discharges do not cause or contribute to violations of water quality standards. If the Copermittees have effectively prohibited non-storm water

[21] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.

discharges and reduced storm water pollutant discharges to the MEP, but their discharges are still causing or contributing to violations of water quality standards, Provision A.4 provides a clear "iterative process" for the Copermittees to follow.

Provision A.4 essentially requires the Copermittees to implement additional BMPs until MS4 discharges no longer cause or contribute to a violation of water quality standards.

In assessing compliance and potential enforcement actions, the San Diego Water Board looks at the Copermittees' efforts in total to meet the requirements of Provisions A.1.a, A.1.c, A.2.a and Provision A.4. The Copermittees need to demonstrate that they are making improvements to their programs and making progress toward achieving the discharge prohibitions and receiving water limitations in Provisions A.1.a, A.1.c, and A.2.a by implementing the requirements of Provision A.4. The San Diego Water Board would consider these efforts prior to strictly enforcing the requirements of Provisions A.1.a, A.1.c, and A.2.a. Causes of exceedances of the receiving water limitations can often be more difficult to identify and attribute solely to the Copermittees' MS4s. The intent of the Order is to provide the Copermittees more clarity and flexibility in addressing these exceedances through the iterative approach and adaptive management process until the requirements under Provisions A.1.a, A.1.c, and A.2.a are fully achieved.

An exception to the iterative approach and adaptive management process would be in receiving waters subject to adopted and approved TMDLs. For TMDLs that are incorporated into the Order, there is a specific date for compliance to be achieved, after which the iterative approach and adaptive management process required under Provision A.4 no longer provides the flexibility to achieve compliance. Where compliance dates for a TMDL have passed, compliance with the WQBELs incorporated into the Order established by a TMDL in Attachment E to protect water quality standards is required. Thus, after the interim or final compliance dates for a TMDL have passed, if the discharges from the Copermittees' MS4s are causing or contributing to a violation of WQBELs, exceedances of WQBELs must be strictly enforced by the San Diego Water Board. In the meantime, however, the Copermittees are in compliance with the interim or final TMDL requirements in Attachment E as long as the interim or final WQBELs are being achieved in accordance with the interim or final compliance dates.

In addition, this Order includes an optional pathway that incorporates the requirements of Provision A.4 and would allow a Copermittee to be deemed in compliance with the requirements under Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b during implementation of a Water Quality Improvement Plan that incorporates specific additional requirements. This alternative compliance pathway and the additional specific requirements are described below under the discussion for Provision B.3.c.

B. Water Quality Improvement Plans

Purpose: Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges to the MS4s and control pollutants in storm water discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the Clean Water Act.

Provision B includes requirements for the Copermittees to develop and implement Water Quality Improvement Plans to ultimately comply with the prohibitions and limitations under Provision A. The Water Quality Improvement Plans will provide the Copermittees a comprehensive program that can achieve the requirements and further the objectives of the CWA. Implementation of the Water Quality Improvement Plans will also improve the quality of the receiving waters in the San Diego Region.

The Water Quality Improvement Plan is the backbone of the Regional MS4 Permit requirements. Provision B provides the guidance, criteria, and minimum expectations and requirements for the elements of the Water Quality Improvement Plan to be developed and implemented by the Copermittees. The Water Quality Improvement Plans will be implemented in the Watershed Management Area by the Copermittees within their jurisdictions through their jurisdictional runoff management programs.

The Water Quality Improvement Plan also incorporates a program to monitor and assess the progress of the Copermittees' jurisdictional runoff management programs toward improving the quality of discharges from the MS4s, as well as tracking improvements to the quality of receiving waters. A process to adapt and improve the effectiveness of the Water Quality Improvement Plans has also been incorporated into the requirements of Provision B to be consistent with the "iterative approach" required to achieve compliance with discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a, pursuant to the requirements of Provision A.4.

The Water Quality Improvement Plans have also been structured to incorporate the requirements of any TMDLs that have been adopted for the San Diego Region. Incorporating the requirements of the TMDLs into the requirements of Provision B allows the Copermittees to develop a single plan, instead of separate plans, to coordinate their non-storm water and storm water runoff management programs. The Water Quality Improvement Plans allow the Copermittees to meet the requirements of this Order, as well as fulfill the requirements of the TMDLs.

As an added benefit, if the Copermittees demonstrate that impaired water bodies within the Watershed Management Area listed on the 303(d) List will be addressed with their Water Quality Improvement Plans in a reasonable period of time, the San Diego Water Board may be able to remove the water bodies from the 303(d) List, which would greatly reduce the need for the San Diego Water Board to develop additional TMDLs that would have to be incorporated into the Order and implemented by the Copermittees.

***Discussion*:** The federal NPDES regulations require the Copermittees to develop a proposed management program (40 CFR 122.26(d)(2)(iv)). The proposed management program must include "*a comprehensive planning process*" and "*where necessary intergovernmental coordination*" for the "*duration of the permit.*" The Water Quality Improvement Plan is the Copermittees' "*comprehensive planning process*" document for the proposed management program that will be implemented within a Watershed Management Area. Implementation of the Water Quality Improvement Plan requires "*intergovernmental coordination*" among the Copermittees for at least the "*duration of the permit*," and likely into and beyond the next iteration of the permit.

Developing Water Quality Improvement Plans based upon watersheds is consistent with federal regulations that support the development of permit conditions, as well as implementation of storm water management programs, at a watershed scale (40 CFR 122.26(a)(3)(ii), 122.26(a)(3)(v), and 122.26(d)(2)(iv)). In 2003, USEPA issued a Watershed-Based NPDES Permitting Policy Statement (USEPA, 2003) that defines watershed-based permitting as an approach that produces NPDES permits that are issued to point sources on a geographic or watershed basis. In this policy statement, USEPA explains that "*[t]he utility of this tool relies heavily on a detailed, integrated, and inclusive watershed planning process*." USEPA identifies a number of important benefits of watershed permitting, including more environmentally effective results, the ability to emphasize measuring the effectiveness of targeted actions on improvements in water quality, reduced cost of improving the quality of the nation's waters and more effective implementation of watershed plans, including TMDLs, among others.

An emphasis on watersheds is appropriate at this stage in the San Diego Region's MS4 program to shift the focus to more targeted, water quality driven planning and implementation. Addressing discharges on a watershed scale focuses on water quality results by emphasizing the receiving waters in the watershed. The conditions of the receiving waters drive management actions, which in turn focus measures to address pollutant contributions from MS4 discharges.

The Water Quality Improvement Plan gives the Copermittees the responsibility of developing a comprehensive plan to coordinate the efforts of their jurisdictional runoff management programs for addressing the problems related to MS4 discharges causing impacts to water quality in the Watershed Management Area. The development of the plan provides the Copermittees the opportunity to provide

significant input on how to implement their jurisdictional runoff management programs, and how to best utilize their available resources in addressing a focused set of priorities that they believe will result in measureable improvements to water quality within the Watershed Management Area.

The Copermittees are encouraged to separate the Watershed Management Area into subwatersheds, as appropriate. This allows the Copermittees to identify priorities applicable to a subset of the Copermittees or specific water bodies or areas within the Watershed Management Area.

Included in the requirements for the elements to be included in the Water Quality Improvement Plan are monitoring and assessment requirements that are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order. In addition to the federal requirements of the CWA section 308(a) and 40 CFR 122.26(d), the San Diego Water Board has the authority to establish monitoring, reporting, and recordkeeping requirements for NPDES permits under CWC 13383.

More specific and detailed discussions of the requirements of Provision B are provided below.

Provision B.1 (Watershed Management Areas) requires the Copermittees to develop a Water Quality Improvement Plan for each of the Watershed Management Areas defined by the San Diego Water Board.

Pursuant to 40 CFR 122.26(d)(2)(iv), proposed management programs "*may impose controls on a…watershed basis…*" The Water Quality Improvement Plan is the Copermittees' proposed management program. A Water Quality Improvement Plan must be developed for each Watershed Management Area identified in the Order.

The Watershed Management Areas are identified in Table B-1. Table B-1 establishes ten (10) Watershed Management Areas, and identifies the Copermittees that are responsible for developing and implementing the Water Quality Improvement Plan for each Watershed Management Area.

The Copermittees from each of the three counties within the San Diego Region ~~are~~ were ~~expected to be~~ phased in as their respective NPDES municipal storm water permits expired. ~~Because~~ Order No. R9-2007-0001 expired in January 2012, and the San Diego County Copermittees ~~were~~ became covered under the Regional MS4 Permit on June 27, 2013, the effective date of the Order. ~~Because~~ Order No. R9-2009-0002 expired in December 2014, and the Orange County Copermittees ~~are~~ became covered under the Regional MS4 Permit on April 1, 2015, the effective date of Order No. R9-2013-0001 as amended by Order No. R9-2015-0001. Order No. R9-2010-0016 expired in November 2015, and the Riverside County Copermittees became covered under the Regional MS4 Permit on January 7, 2016, the effective

date of Order No. R9-2013-0001 as amended by Order No. R9-2015-0100.

~~After the San Diego Water Board receives and considers the Report of Waste Discharge required to be submitted by the Riverside County Copermittees pursuant to the requirements of their current permit, and makes any necessary changes to the Order, the Riverside County Copermittees will be covered under the Regional MS4 Permit after Order No. R9-2010-0016 expires in December 2015.~~

~~The Riverside County Copermittees also have the option to obtain coverage under the Regional MS4 Permit earlier than their respective permit expiration dates. The process to apply for early coverage is described Provision F.6.~~

~~Because the Santa Margarita River Watershed Management Area includes Copermittees from both San Diego County and Riverside County, a footnote to Table B-1 has been included to specify that the requirements of Provision B are not required to be implemented by the County of San Diego until the Riverside County Copermittees have received a notice of coverage under the Order. Until the Riverside County Copermittees are notified of coverage under the Order, the County of San Diego is subject to the prohibitions and limitations under Provision A, responsible for continuing to implement its existing jurisdictional runoff management program, and responsible for implementing the transitional monitoring and assessment requirements of Provision D, the transitional annual reporting requirements of Provision F.3.b, and the TMDL requirements of Attachment E to the Order.~~

The Cities~~y~~ of Laguna Woods, ~~and~~ Laguna Hills, Murrieta, and Wildomar are located partially within the jurisdictions of both the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board) and the San Diego Water Board. Written requests for designation of a single Regional Water Board to regulate matters pertaining to permitting of Phase I MS4 discharges were submitted to the San Diego Water Board and the Santa Ana Water Board by the City of Laguna Woods by letter dated September 8, 2014, ~~and~~ the City of Laguna Hills by letter dated March 12, 2014, the City of Murrieta by letter dated June 22, 2015, and the City of Wildomar by letter dated June 23, 2015. The Cities of Laguna Woods, ~~and~~ Laguna Hills, Murrieta, and Wildomar requested designation of the San Diego Water Board pursuant to CWC section 13228.

The Cities of Laguna Woods, ~~and~~ Laguna Hills, Murrieta, and Wildomar reported that management and implementation of municipal programs to comply with two different Phase I MS4 permits creates a significant administrative and financial burden and inhibits their ability to contribute to greater overall water quality improvements in either Region. In an effort to address these concerns, the San Diego Water Board and the Santa Ana Water Board have entered into ~~an~~ written agreements ~~dated February 10, 2015~~, whereby the San Diego Water Board is designated to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Laguna Woods, ~~and~~ Laguna Hills, Murrieta, and Wildomar including ~~areas~~ the portions of the jurisdictions within the

Santa Ana Region. The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated February 10, 2015 to designate the San Diego Water Board to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Laguna Woods and Laguna Hills, including the portions of the jurisdictions within the Santa Ana Region, upon the later effective date of ~~this~~ Order No. R9-2015-0001 or Santa Ana Water Board Tentative Order No. R8-2015-0001. The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated October 26, 2015 to designate the San Diego Water Board to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Murrieta and Wildomar, including the portions of the jurisdictions within the Santa Ana Region upon the effective date of Order R9-2015-0100.

Under the terms of the agreements, each Regional Water Board retains the authority to enforce provisions of the Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee (Water Code section 13228 (b)). Also under the terms of the agreements, any TMDL and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Laguna Woods, ~~or~~ Laguna Hills, Murrieta, or Wildomar as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement of the applicable TMDL would remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's San Diego Creek/Newport Bay TMDL and Lake Elsinore/Canyon Lake Nutrient TMDLs, and the San Diego Water Board's Indicator Bacteria Project I Beaches and Creeks TMDL.

In conformance with the~~is~~ agreements, ~~a~~ footnotes to Table B-1 ~~has been~~ are included to specify coverage under Order No. R9-2013-0001 for those Phase I MS4 discharges within the jurisdictional boundaries of the Cities of Laguna Woods, ~~and~~ Laguna Hills, Murrieta, and Wildomar within the Santa Ana Region. ~~The f~~Footnote 1 to Table B-1 specifies that the Cities~~y~~ of Laguna Woods and Laguna Hills are identified as responsible Copermittees in the San Diego Creek/Newport Bay TMDL in the Santa Ana Region and remain obligated to comply with the San Diego Creek/Newport Bay TMDL pursuant to section XVIII of Tentative Order No. R8-2015-0001 (NPDES No. CAS618030) and any reissuance thereof. Footnote 4 to Table B-1 specifies that the Cities of Murrieta and Wildomar are identified as responsible Copermittees in the Lake Elsinore/Canyon Lake Nutrient TMDLs in the Santa Ana Region and remain obligated to comply with the Lake Elsinore/Canyon Lake Nutrient TMDLs pursuant to section VI.D.2 of Order No. R8-2010-0033 (NPDES No. CAS618030) or corresponding section as it may be amended or reissued.

The Cities~~y~~ of Lake Forest and Menifee ~~is~~ are located partially within the jurisdictions of both the Santa Ana Water Board and the San Diego Water Board. Written requests for designation of a single Regional Water Board to regulate matters pertaining to

permitting of Phase I MS4 discharges were submitted to the San Diego Water Board and the Santa Ana Water Board by the City of Lake Forest by letters dated January 14, 2013 and April 4, 2014, and the City of Menifee by letter dated June 25, 2015. The Cities of Lake Forest and Menifee requested designation of the San Ana Water Board pursuant to CWC section 13228. ~~By letters dated January 14, 2013 and April 4, 2014 the City of Lake Forest submitted a written request, pursuant to CWC section 13228, to the San Diego Water Board and the Santa Ana Water Board requesting the Santa Ana Water Board be designated to regulate matters within the City of Lake Forest pertaining to permitting of their Phase I MS4 discharges.~~

The Cities~~y~~ of Lake Forest and Menifee reported that management and implementation of municipal programs to comply with two different Phase I MS4 permits creates a significant administrative and financial burden and inhibits their ability to contribute to greater overall water quality improvements in either Region. In an effort to address these concerns, the San Diego Water Board and the Santa Ana Water Board have entered into ~~an~~ written agreements ~~dated February 10, 2015~~, whereby the Santa Ana Water Board is designated to regulate Phase I MS4 discharges within the jurisdictions of the Cities~~y~~ of Lake Forest and Menifee including the portions of the jurisdictions within the San Diego Region. The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated February 10, 2015 to designate the San Ana Water Board to regulate Phase I MS4 discharges within the jurisdiction of the City of Lake Forest, including portions of the jurisdiction within the Santa Diego Region, upon the later date of ~~this~~ Order No. R9-2015-0001 or Santa Ana Water Board Tentative Order No. R8-2015-0001. The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated October 26, 2015 to designate the San Ana Water Board to regulate Phase I MS4 discharges within the jurisdiction of the City of Menifee, including portions of the jurisdiction within the San Diego Region, under Order No. R8-2010-0033 (NPDES No. CAS618030) as it may be amended or reissued upon the effective date of Order No. R9-2015-0100.

Under the terms of the agreements, each Regional Water Board retains the authority to enforce provisions of the Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee (Water Code section 13228 (b)). Also under the terms of the agreements, any TMDL and associated Phase I MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities~~y~~ of Lake Forest or Menifee as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement authority for the applicable TMDL would remain with the Regional Water Board which has the jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's San Diego Creek/Newport Bay TMDL and Lake Elsinore/Canyon Lake Nutrient TMDLs, and the San Diego Water Board's Indicator Bacteria Project I Beaches and Creeks TMDL.

In conformance with the~~is~~ agreements, ~~a f~~Footnote 2 to Table B-1 has been included to specify that Phase I MS4 discharges within the jurisdictional boundaries of the City of Lake Forest located within the San Diego Region will be regulated under Santa Ana Water Board Order No. R8-2015-0001 (NPDES No. CAS618030) and any reissuance thereof. The footnote specifies that the City of Lake Forest is an identified responsible Copermittee in the Indicator Bacteria Project I Beaches and Creeks TMDL (Bacteria TMDL) in the San Diego Region and remains obligated to comply with the Bacteria TMDL pursuant to Attachment E of Order No. R9-2013-0001 and any reissuance thereto. The City of Lake Forest is also identified as a responsible Copermittee in the San Diego Creek/Newport Bay TMDL established by the Santa Ana Water Board. The City remains obligated to comply with the San Diego Creek/New Port Bay TMDL pursuant to the Santa Ana Water Board's Phase I MS4 Permit (Tentative Order No. R8-2015-0001 (NPDES No. CAS618030), as it may be amended or reissued). Under the terms of the agreement, the City of Lake Forest must retain and continue implementation of the over irrigation prohibition in Title 15, Chapter 15, Section 14.030, List (b) of the City Municipal Code throughout its jurisdiction. Also under the terms of the agreement, the City of Lake Forest must actively participate in the development and implementation of the ~~Aliso Creek~~ South Orange County Watershed Management Area Water Quality Improvement Plan required pursuant to Order No. R9-2013-0001, and any reissuance thereof.

Footnote 3 to Table B-1 has been included to specify that Phase I MS4 discharges within the jurisdictional boundaries of the City of Menifee located within the San Diego Region will be regulated under Santa Ana Water Board Order No. R8-2010-0033 (NPDES No. CAS618033) and any reissuance thereof. At this time, the City of Menifee is not identified as a responsible Copermittee for any TMDLs established by the San Diego Water Board. Under the terms of the agreement, the City of Menifee must actively participate in the development and implementation of the Santa Margarita River Watershed Management Area Water Quality Improvement Plan required pursuant to Order No. R9-2013-0001, and any reissuance thereof.

The basis supporting the Cities of Laguna Woods, Laguna Hills, ~~and~~ Lake Forest, Menifee, Murrieta, and Wildomar requests to designate a specific Regional Water Board for regulatory oversight of Phase I MS4 discharges may change under future conditions and circumstances, therefore the San Diego Water Board will periodically review the effectiveness of the agreements during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate ~~the~~ one or both of the agreements with the Santa Ana Water Board or otherwise modify the agreements subject to the approval of the Santa Ana Water Board.

Provision B.2 (Priority Water Quality Conditions) requires the Copermittees in each Watershed Management Area to identify the highest priority water quality conditions which will be the focus of the Water Quality Improvement Plan implementation.

Provisions B.2.a and B.2.b provide the criteria that must be assessed when

characterizing the receiving water quality and potential impacts from MS4 discharges of the receiving waters within the Watershed Management Area. The criteria are based primarily on the requirements in 40 CFR 122.26(d)(1)(iv)(C) and (C)(1)-(9). Characterizing the receiving water quality and identifying the potential impacts caused by MS4 discharges to receiving waters in the Watershed Management Area is necessary to identify the impacts to receiving waters associated with MS4 discharges that are of the most concern to the Copermittees.

Based on the information required to be considered under Provisions B.2.a and B.2.b, Provision B.2.c requires to Copermittees to identify the highest priority water quality conditions related to discharges from the MS4s that will be the primary focus of the Water Quality Improvement Plan in the Watershed Management Area. Addressing and improving these highest priority water quality conditions will become the focus of each Copermittee's jurisdictional runoff management program as the Water Quality Improvement Plan is implemented in the Watershed Management Area. The highest priority water quality conditions are expected to include sources of pollutants and/or stressors, and/or receiving water conditions, that the Copermittees consider the highest threats or most likely to have adverse impacts on the physical, chemical, and biological integrity of receiving waters. Addressing these threats and/or adverse impacts should restore the physical, chemical, and biological integrity of receiving waters, and result in the restoration and protection of the beneficial uses of the receiving waters in the Watershed Management Area.

Provision B.2.d requires the Copermittees to identify known and suspected sources of pollutants and/or stressors contributing to the highest priority water quality conditions. The requirements of Provision B.2.d are based primarily on the requirements in 40 CFR 122.26(d)(1)(iii)(B)(1)-(6). The Copermittees are required to evaluate several factors in the identification of those sources. The Copermittees must consider and evaluate the following: (1) the land uses that may contribute toward impacts to receiving waters, (2) the locations of the Copermittees' MS4s that can convey and discharge runoff and pollutants to receiving waters, (3) other sources that discharge into the Copermittees' MS4s and receiving waters, and (4) other information and data that can help the Copermittees to evaluate the relative importance of or contribution from those sources toward the highest priority water quality conditions. Identifying the known and suspected sources, and their relative contribution toward the highest priority water quality conditions, will help the Copermittees to focus, direct, and prioritize their resources and implementation efforts within their jurisdictions.

Provision B.2.e requires the Copermittees to identify potential strategies that can result in improvements to water quality in MS4 discharges and/or receiving waters within the Watershed Management Area. Potential water quality improvement strategies will not necessarily be implemented by the Copermittees, but provide a "menu" of options that the Copermittees will consider for implementation. The public participation process that will be implemented during the development of the Water Quality Improvement Plan is where the potential water quality improvement strategies will be identified.

Provision B.3 (Water Quality Improvement Goals, Strategies and Schedules) requires the Copermittees in each Watershed Management Area to identify the goals that the Copermittees' jurisdictional runoff management programs will work toward achieving to address and improve the highest priority water quality conditions identified under Provision B.2.c; the strategies that will be implemented by the Copermittees within their jurisdictions and the Watershed Management Area to achieve the goals; and, the schedules for implementing the strategies and achieving the goals. The element of the Water Quality Improvement Plan required under Provision B.3 is where the "*comprehensive planning*" and "*intergovernmental coordination*" [40 CFR 122.26(d)(2)(iv)] of the Copermittees' actions for the proposed management programs within the Watershed Management Area is required to be described.

Provision B.3.a requires the Copermittees to identify interim and final numeric goals, and schedules to achieve those goals as part of the Water Quality Improvement Plans. Provision B.3.a.(1) requires the Copermittees to identify two types of numeric goals to be achieved:

(1) Final numeric goals in the receiving waters and/or MS4 discharges that will result in the protection of the water quality standards of the receiving waters for the highest priority water quality conditions identified by the Copermittees for Provision B.2.c. These final numeric goals are the ultimate goals for the Water Quality Improvement Plan, and the achievement and maintenance of these final numeric goals will indicate that one or more beneficial uses have been successfully restored and/or protected from MS4 discharges.

(2) Interim numeric goals that can be used by the Copermittees to demonstrate progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges for the highest priority water quality conditions in the Watershed Management Area. Achievement of the interim numeric goals will demonstrate to the San Diego Water Board that the Copermittees' implementation efforts are progressing toward achieving the final numeric goals.

Provision B.3.a.(1) does not specify what the interim and final numeric goals must be based on, but they essentially must be designed to achieve compliance with water quality standards in the receiving waters. To that end, the interim goals must be based on measureable criteria or indicators capable of demonstrating progress toward achieving the numeric goals.

The interim and final numeric goals can be based on the water quality objectives in the Basin Plan. The water quality objectives in the Basin Plan, however, consist of numeric and narrative water quality objectives. Numeric water quality objectives can be directly used as numeric goals. Narrative water quality objectives, on the other hand, will require some interpretation to identify numeric goals. The achievement of multiple numeric goals based on the water quality objectives, used in combination,

may be necessary to demonstrate that beneficial uses have been restored and/or protected.

The Copermittees could also propose other numeric goals that are not necessarily water quality objectives from the Basin Plan. For example, the Copermittees could propose a numeric goal that consists of achieving some percent improvement of a measureable indicator, such as acreage of a specific habitat or increase in a specific plant or animal species population. Other examples may include pollutant load reductions, number of impaired waterbodies delisted from the List of Water Quality Impaired Segments, Index of Biological Integrity (IBI) scores, etc.

The Copermittees may choose to develop interim numeric goals based on the final numeric goals they develop, such as incremental steps toward ultimately achieving the final numeric goals. The Copermittees may also choose to develop interim numeric goals that are based on other measureable indicators that can indirectly indicate improvements and progress toward the final numeric goals.

There are no limits to the types of interim numeric goals that could be proposed by the Copermittees, other than the goals must be based on measureable criteria or indicators capable of demonstrating progress toward achieving the numeric goals. Likewise, there are no limits to the types of final numeric goals that could be proposed by the Copermittees, other than the goals must "*restore and protect the water quality standards of the receiving waters.*"

Finally, Provision B.3.a.(2) also requires the Copermittees to develop schedules for measuring progress and achieving the interim and final numeric goals. Several criteria are included for the development of the schedules, but the Copermittees are required to achieve the numeric goals as soon as possible, consistent with federal NPDES regulations (40 CFR 122.47(a)(1)).

The Copermittees are also required to incorporate any compliance schedules for applicable ASBS or TMDL requirements. Applicable ASBS and TMDL compliance schedules are set forth in Attachment A and Attachment E to the Order, respectively. The information provided by the Copermittees under Provision B.3.a.(2) will be used by the Copermittees and the San Diego Water Board to gauge and track the progress of the Copermittees' efforts in addressing the highest priority water quality conditions identified in the Water Quality Improvement Plan.

Provision B.3.b requires the Copermittees to identify the strategies and schedules to implement those strategies as part of the Water Quality Improvement Plans. Provision B.3.b requires the Copermittees to identify the water quality improvement strategies that will be and may be implemented within the Watershed Management Area to 1) reduce pollutants in storm water discharged from the MS4 to the MEP, 2) effectively prohibit non-storm water discharges from entering the MS4, 3) protect water quality standards in receiving waters by controlling MS4 discharges so that they do not cause

or contribute to exceedances of receiving water limitations, and 4) achieve applicable WQBELs that implement TMDLs. The Copermittees will select the strategies to be implemented based on the likely effectiveness and efficiency of the potential water quality improvement strategies identified under Provision B.2.e to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, and/or achieve the interim and final numeric goals identified under Provision B.3.a.

Provision B.3.b.(1) requires each Copermittee to identify the strategies that will be or may be implemented within its jurisdiction. Each Copermittee is required to describe the strategies it is committed to implementing as part of its jurisdictional runoff management requirements under Provisions E.2 through E.7, and the optional jurisdictional strategies that the Copermittee will implement, as necessary, to achieve the numeric goals.

Each Copermittee is expected to implement the optional jurisdictional strategies identified under Provisions B.3.b.(1)(b) when the jurisdictional strategies it has committed to implement under Provision B.3.b.(1)(a) are not making adequate progress toward the interim and final numeric goals in accordance with the schedules established under Provision B.3.a. Provision B.3.b.(1)(b)(v) requires each Copermittee to describe the circumstances necessary to trigger implementation of the optional jurisdictional strategies, in addition to the requirements of Provisions B.3.b.(1)(a).

The San Diego Water Board recognizes that there may be optional jurisdictional strategies that will likely require funding and/or resources for planning, permitting, procurement of labor and materials, and implementation. Thus, Provision B.3.b.(1)(b)(iv) requires each Copermittee to describe the funding and/or resources that are necessary to implement these optional jurisdictional strategies. This information may provide interested groups and members of the public an understanding of the resources that they could provide or assist in obtaining to implement these optional jurisdictional strategies.

Provision B.3.b.(2) requires the Copermittees in the Watershed Management Area to identify the regional or multi-jurisdictional strategies that may be implemented, as necessary, to achieve the numeric goals. Similar to the requirements of Provision B.3.b.(1)(b), these regional or multi-jurisdictional strategies will likely require funding and/or resources for planning, permitting, procurement of labor and materials, and implementation, and San Diego Water Board recognizes that these strategies may be difficult to implement with only Copermittee resources. Thus, Provision B.3.b.(2)(d) requires the Copermittees to describe the funding and/or resources necessary to implement these optional regional or multi-jurisdictional strategies. This information may provide interested groups and members of the public an understanding of the resources that they could provide or assist in obtaining to implement these optional regional or multi-jurisdictional strategies.

Provision B.3.b.(3) requires the Copermittees to develop and include schedules in the Water Quality Improvement Plan for implementing the water quality improvement strategies identified under Provisions B.3.b.(1) and B.3.b.(2). The schedule for implementing the water quality improvement strategies will be used by the Copermittees and San Diego Water Board to measure and demonstrate the progress of the Copermittees' implementation efforts toward reducing pollutants in storm water discharged from the MS4 to the MEP, and eliminating illicit non-storm water discharges from entering the MS4.

Provision B.3.b.(4) provides the Copermittees in each Watershed Management Area the option of implementing watershed-specific structural BMP requirements for Priority Development Projects. Historically, storm water permits have included very specific performance standards for permanent, structural BMPs. These standards describe the expectation for the capture or treatment of pollutants and control of excessive flow before storm water is discharged from a site. The Copermittees were also allowed to develop waiver programs for Priority Development Projects to avoid implementing the structural BMPs; however, the waiver programs were not necessarily tied into any sort of holistic watershed strategy. The result is that implementation of BMP requirements is largely done on a site-by-site basis. This requires proper design on the part of the Priority Development Project and strict oversight on the part of the Copermittee.

Provision B.3.b.(4) promotes the evaluation of multiple strategies for water quality improvement, in addition to the implementation of permanent structural BMPs, on a watershed-scale versus the site-by-site approach. In a report issued by the Southern California Coastal Water Research Project (SCCWRP) and several other research institutions, the report emphasized that a successful hydromodification management program will involve watershed analysis as a first step, and that integrating multiple watershed-based strategies is preferable over a site-by-site approach. Indeed, the report states that the watershed analysis "…*should lead to identification of existing opportunities and constraints that can be used to help prioritize areas of greater concern, areas of restoration potential, infrastructure constraints, and pathways for potential cumulative effects*."[22] Provision B.3.b.(4) promotes the findings and recommendations of the report by providing a pathway for Copermittees to develop an integrated approach to their land development programs.

Under Provision B.3.b.(4), the Copermittees in a Watershed Management Area must first perform an analysis by gathering as much information pertaining to the physical characteristics of the Watershed Management Area as possible. This includes, for example, identifying potential areas of coarse sediment supply, present and anticipated future land uses, and locations of physical structures within receiving streams and upland areas that affect the watershed hydrology (such as bridges,

[22] 2012. ED Stein, F Federico, DB Booth, BP Bledsoe, C Bowles, Z Rubin, GM Kondolf, A Sengupta. Technical Report 667. Southern California Coastal Water Research Project. Costa Mesa, CA.

culverts, and flood management basins). Once this information is collected, the Copermittees must produce GIS layers (maps) that include this information.

From there, the Copermittees must use the results of the Watershed Management Area Analysis to identify and compile a list of candidate projects that could potentially be used as alternative compliance options for Priority Development Projects. Such projects include, for example, opportunities for stream or riparian area rehabilitation, opportunities for retrofitting existing infrastructure to incorporate storm water retention or treatment, and opportunities for regional BMPs, among others. Once these candidate projects are identified, Copermittees may allow Priority Development Projects to fund, partially fund, or completely implement these candidate projects. The Copermittees must first find that implementing such a candidate project would provide greater overall benefit to the watershed than requiring implementation of the structural BMPs onsite, and also enter into a voluntary agreement with the Priority Development Project that authorizes this arrangement. The Copermittees may use Provision B.3.b.(4) as both 1) a mechanism to reach their stated goals of the Water Quality Improvement Plan by using Priority Development Projects to either fund or implement projects that will provide water quality benefit, and 2) an alternative to requiring strict adherence to the structural BMP design standards.

Additionally, Provision B.3.b.(4) allows the Copermittees to use the results of the Watershed Management Area Analysis to identify areas within the Watershed Management Area where it is appropriate to allow Priority Development Projects to be exempt from the hydromodification management BMP performance requirements. Provision E.3.c.(2) already allows exemptions for Priority Development Projects that discharge to a conveyance channel whose bed and bank are concrete lined from the point of discharge to an enclosed embayment or the Pacific Ocean. However, there may be cases where further exemptions are warranted. The Copermittees may identify such cases on a watershed basis and include them in the Watershed Management Area Analysis; however, they must provide the supporting rationale to support all claims for exemptions.

Provision B.3.b.(4) provides an innovative pathway for Copermittees to regulate their land development programs by allowing alternative compliance in lieu of implementing structural BMPs on each and every Priority Development Project. This approach facilitates the integration of watershed-scale solutions for improving overall water quality and assisting Copermittees to achieve their stated goals of the Water Quality Improvement Plan. The San Diego Water Board understands, however, that undertaking this approach, which involves extensive planning, could be resource intensive for the Copermittees. Therefore, the Watershed Management Area Analysis is optional and not a requirement. The Copermittees can choose not to perform the watershed planning and mapping exercise described in Provision B.3.b.(4), and instead choose to require strict implementation of the structural BMPs onsite, pursuant to Provision E.3.c.

Provision B.3.c is included to provide the Copermittees an option that allows the Copermittees to be deemed in compliance with the prohibitions and limitations (receiving water limitations) of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b. One or more Copermittees within a Watershed Management Area can choose to implement this option. This option is only expected to be utilized by a Copermittee that wishes to be deemed in compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b.

The alternative compliance pathway option included in Provision B.3.c is consistent with the approach described in Order WQ 2015-0075, *In the Matter of Review of Order No. R4-2012-0175, NPDES Permit No. CAS004001, Waste Discharge Requirements for Municipal Separate Storm Sewer System (MS4) Discharges within the Coastal Watersheds of Los Angeles County, Except Those Discharges Originating from the City of Long Beach MS4,* adopted by the State Water Board on June 16, 2015. State Water Board Order WQ 2015-0075 directs the Regional Water Boards to consider a watershed-based planning and implementation approach to compliance with receiving water limitations when issuing Phase I MS4 permits going forward. Order WQ 2015-0075 included seven principles that the Regional Water Boards are expected to follow when incorporating an alternative compliance pathway into a MS4 permit. The San Diego Water Board incorporated the seven principles stipulated in State Water Board Order WQ 2015-0075 into the Regional MS4 Permit as follows:

1. Provision A of this Order continues to require compliance with water quality standards in the receiving water and does not deem good faith engagement in the iterative process to constitute compliance with receiving water limitations. Provision A of this Order continues to be consistent with the receiving water limitations provisions from State Water Board Order WQ 99-05.

2. Compliance with Provision B.3.c constitutes compliance with the requirements of the Provision A.3.b, which requires compliance with the WQBELs of the TMDLs in Attachment E to the Order, and is considered compliance with receiving water limitations for those TMDL water body-pollutant combinations.

3. Provision B.3.c is an ambitious, rigorous, and transparent alternative compliance pathway that allows a Copermittee appropriate time to come into compliance with receiving water limitations without being in violation of the receiving water limitations during implementation of the compliance alternative.

4. Provision B.3.c requirements are incorporated into a Water Quality Improvement Plan. Water Quality Improvement Plans are a watershed-based planning and implementation approach, which address multiple contaminants, and incorporate TMDL requirements.

5. The strategies required to be included in the Water Quality Improvement Plans promote and incentivize the use of green infrastructure and requires the implementation of low impact development principles.

6. The strategies required to be included in the Water Quality Improvement Plans encourage multi-benefit regional projects that capture, infiltrate, and reuse storm water and support a local sustainable water supply.

7. The alternative compliance pathway of Provision B.3.c includes rigor and accountability. The Copermittee is required, through a transparent public process, to demonstrate that water quality issues in the watershed have been analyzed and prioritized, and that appropriate solutions are proposed. The Copermittee is also required, through a transparent process, to monitor the results and return to their analysis to verify assumptions and update the solutions. The Copermittee is required to conduct this type of adaptive management on its own initiative without waiting for direction from the San Diego Water Board.

In order for a Copermittee to utilize this option, the Copermittee is required to include three components in the Water Quality Improvement Plan. The first component is a comprehensive set of numeric goals and schedules that will demonstrate the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b will be achieved within a specified period of time. The criteria provided in the Order will require the Copermittee to demonstrate that the discharges from its MS4s will not cause or contribute to exceedances of water quality objectives in the receiving waters, and/or the receiving waters will be adequately protected from adverse impacts attributable to the Copermittee's MS4 discharges. The Copermittee is also required to specify annual milestones to be achieved each year, which adds rigor, accountability, and transparency to the process. The annual milestones may consist of water quality improvement strategy implementation phases, interim numeric goals, and other acceptable metrics, which are expected to build upon previous milestones and lead to the achievement of the final numeric goals.

The second component is an analysis to demonstrate that implementation of the water quality improvement strategies required under Provision B.3.b will achieve the numeric goals within the established schedules required under Provisions B.3.a and B.3.c.(1). Because the development of the analysis may require significant resources, the Order allows the Copermittees in each Watershed Management Area that choose to implement this option to perform the analysis individually, or pool their resources for the analysis collectively.

The analysis must "reasonably" and "quantitatively" demonstrate that the implementation of the water quality improvement strategies can achieve the numeric goals within the established schedules. However, as more data and information are collected during implementation of the Water Quality Improvement Plan to demonstrate progress toward achieving the numeric goals, the numeric goals, water quality improvement strategies and schedules may need to be modified. If the data and information indicate that modification is needed, the Copermittee must also update the analysis. With the exception of numeric goals and schedules associated with

TMDLs from Attachment E to the Order, the modification to the analysis would be allowed as part of the adaptive management process of the Water Quality Improvement Plan. For TMDLs, modification of numeric goals or schedules would likely require an amendment to the Basin Plan and Attachment E to the Order before the analysis and Water Quality Improvement Plan could include such modifications.

Thus, the third component is the key component that allows a Copermittee to demonstrate the implementation of the water quality improvement strategies within its jurisdiction is making progress toward achieving the final numeric goals. Each Copermittee must specify the monitoring and assessments that will be performed to confirm that implementation of the water quality improvement strategies are making progress toward achieving the numeric goals within the established schedules, and whether the interim and final numeric goals have been achieved.

These three components must then be reviewed by the Water Quality Improvement Consultation Panel. The Water Quality Improvement Consultation Panel is required to be formed as part of the public participation process for the development of the Water Quality Improvement Plans. The Water Quality Improvement Consultation Panel is described under Provision F.1.a.(1)(b). Review by the Water Quality Improvement Consultation Panel is included to provide an additional layer of input, support, and accountability for the implementation of this option.

Compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b begins when the Water Quality Improvement Plan, incorporating the requirements of Provision B.3.c.(1), is accepted by the San Diego Water Board. Each Copermittee that chooses to implement and continues to implement this option will be deemed in compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b as long as the Copermittee continues to implement the strategies, monitoring and assessments as incorporated in the Water Quality Improvement Plan in accordance with Provision B.3.c.(1), and the Copermittee reports the achievement of the annual milestones each year, or provides acceptable rationale and recommends appropriate modifications to the interim numeric goals, and/or water quality improvement strategies, and/or schedules to improve the rate of progress toward achieving the final numeric goals. The Copermittee continues to be deemed in compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b during the time the San Diego Water Board reviews the rationale and recommended modifications to the interim numeric goals, and/or water quality improvement strategies, and/or schedules. If and when the San Diego Water Board determines that it does not accept the rationale or recommendations, the Copermittee will be notified they are no longer deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b.

Provision B.4 (Water Quality Improvement Monitoring and Assessment) requires the Copermittees to develop an integrated monitoring and assessment program to track the progress of the Water Quality Improvement Plan toward meeting the implementation goals and schedules, and improving the water quality of the

Watershed Management Area. Provision B.4 is the part of the Water Quality Improvement Plan where the Copermittees describe the monitoring data that will be collected, which is not only necessary to implement the "iterative approach" required by Provision A.4, but inform the adaptive management and "*comprehensive planning process*" that allows the Copermittees to make adjustments and modifications to the Water Quality Improvement Plans and the jurisdictional runoff management programs.

Provision B.4 requires the Copermittees, at a minimum, to include the requirements of Provision D as part of the water quality improvement monitoring and assessment program for the Water Quality Improvement Plan. The Copermittees, however, are not limited to the requirements of Provision D and may include additional monitoring and assessment methods to track progress toward improving water quality in the Watershed Management Area.

In addition to incorporating the requirements of Provision D, the water quality improvement monitoring and assessment program must incorporate any monitoring and assessment requirements specified for any applicable TMDLs included in Attachment E to the Order, and the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 for Watershed Management Areas with ASBS.

The monitoring and assessments required to be incorporated into the Water Quality Improvement Plan are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order.

Provision B.5 (Iterative Approach and Adaptive Management Process) requires the Copermittees to implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a.

Provision B.5 requires the Copermittees in each Watershed Management Area to re-evaluate the highest priority water quality conditions and potential water quality improvement strategies, the water quality improvement goals, strategies and schedules, and the water quality improvement monitoring and assessment program and provide recommendations for modifying those elements to improve the effectiveness of the Water Quality Improvement Plan. The re-evaluation of the Water Quality Improvement Plan is part of the assessment requirements of Provision D.

Provision B.6 (Water Quality Improvement Plan Submittal, Updates, and Implementation) requires to Copermittees to submit, update, and implement the Water Quality Improvement Plans.

The requirements for the process to develop and submit the Water Quality Improvement Plans is described in more detail under the discussion for Provision F.1. The process will include several opportunities for the public to provide input during the

development of the Water Quality Improvement Plans. The process for updating the Water Quality Improvement Plans is described in more detail under the discussion for Provision F.3.c. Upon acceptance of the Water Quality Improvement Plan and updates, the Copermittees are required to immediately begin implementing the Water Quality Improvement Plan and subsequent updates.

The Water Quality Improvement Plan is expected to be a dynamic document that will evolve over time. The Water Quality Improvement Plan is also expected to be a long term plan that focuses the Copermittees' efforts and resources on a limited set of priority water quality conditions, with the ultimate goal of protecting all the beneficial uses of the receiving waters within the Watershed Management Area from impacts that may be caused or contributed to by MS4 discharges. As the Copermittees collect data, implement their jurisdictional runoff management programs, and review the results from their water quality improvement monitoring and assessment program, the Water Quality Improvement Plan is expected to be continually reviewed and updated until compliance with Provisions A.1.a, A.1.b, and A.2.a is achieved.

However, in specific cases supported by robust analytical documentation the implementation of the Water Quality Improvement Plans may demonstrate that TMDLs are not necessary for identified impaired water bodies within the Watershed Management Area if the analytical record demonstrates that technology-based effluent limitations required by the CWA, more stringent effluent limitations required by state, local, or federal authority, and/or other pollution control requirements (e.g., best management practices) required by local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time.[23]

The San Diego Water Board submits an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. According to USEPA guidance for the Integrated Report,[24] water bodies are placed in one of five categories. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 are placed on the 303(d) List.

Category 4 in the Integrated Report is for water bodies where available data and/or information indicate that at least one beneficial use is not being supported or is threatened, but a TMDL is not needed.[25] Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality

[23] 40 CFR 130.7(b)(1)
[24] USEPA, 2005. Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act
[25] Ibid

standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

Impaired water bodies can be included in Category 4a if a TMDL has been adopted and approved. The TMDLs in Attachment E to the Order implement the requirements of the TMDLs adopted by the San Diego Water Board, and approved by the State Water Board and USEPA. The water bodies in Attachment E will be included in Category 4a in the Integrated Report and removed from the 303(d) List.

Impaired water bodies can be included in Category 4b if there are *acceptable* "pollution control requirements" required by a local, state or federal authority stringent enough to implement applicable water quality standards within a reasonable period of time (e.g., a compliance date is set). When evaluating whether a particular set of pollution controls are "requirements," the USEPA considers a number of factors, including: (1) the authority (local, state, federal) under which the controls are required and will be implemented with respect to sources contributing to the water quality impairment (examples may include: self-executing state or local regulations, permits, and contracts and grant/funding agreements that require implementation of necessary controls), (2) existing commitments made by the sources and completion or soon to be completed implementation of the controls (including an analysis of the amount of actual implementation that has already occurred), (3) the certainty of dedicated funding for the implementation of the controls, and (4) other relevant factors as determined by USEPA depending on case-specific circumstances.[26]

Impaired water bodies can be included in Category 4c if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution. Pollution, as defined by the CWA is "the man-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of water."[27] In other cases, pollution does not result from a pollutant and a TMDL is not required. Examples of circumstances where an impaired segment may be placed in Category 4c include segments impaired solely due to lack of adequate flow, stream channelization, or hydromodification. In these situations, there may be water quality management actions that can address the cause(s) of the impairment, but a TMDL may not be required to implement the actions.

The Water Quality Improvement Plans will require the implementation of pollution controls and water quality management actions (i.e. water quality improvement strategies) which can result in the attainment of water quality standards in water bodies impaired by discharges from the Copermittees' MS4s. The Water Quality Improvement Plans also include requirements that are expected to attain water quality standards in a reasonable period of time. The San Diego Water Board considers the Water Quality Improvement Plans to be a commitment by the Copermittees to

[26] Ibid
[27] CWA section 502(19)

develop, plan, budget for, and implement pollution controls that will attain water quality standards in receiving waters in a reasonable period of time, or as soon as possible. The results of the Copermittees' efforts in implementing the Water Quality Improvement Plans can be used to re-evaluate the condition of the impaired water bodies during the next update to the 303(d) List.

After the Copermittees submit the Water Quality Improvement Plans and demonstrate that water quality standards are being attained or will be attained in a reasonable period of time, the San Diego Water Board may re-evaluate the water bodies on the 303(d) List. These water bodies on the 303(d) List may be re-evaluated and placed into Category 4b or Category 4c in the Integrated Report. The water bodies placed in Category 4b or Category 4c in the Integrated Report must show a record that the water bodies are attaining water quality standards or supporting the identified beneficial uses, or will attain water quality standards or support identified beneficial uses in a reasonable period of time, in order for the water bodies to be appropriately removed from the 303(d) List.

C. Action Levels

Purpose: Provision C includes requirements for the Copermittees to identify and include numeric action levels in the Water Quality Improvement Plan to direct and focus the Copermittees' jurisdictional runoff management program implementation efforts for controlling MS4 discharges to receiving waters.

***Discussion*:** Under Provision C, the numeric action levels required are for non-storm water discharges and storm water discharges. The non-storm water action levels (NALs) are applicable to non-storm water discharges from the Copermittees' MS4s, which can occur year-round. The storm water action levels (SALs) are applicable to storm water discharges from the Copermittees' MS4s, which occur during the rainy season defined as the period between October 1 and April 30.

The action levels required by Provision C are based on the action level requirements that were developed and incorporated into Order Nos. R9-2009-0002 and R9-2010-0016, the Orange County and Riverside County MS4 Permits, respectively. The Fact Sheets for these Orders provide detailed discussions about the development of the numeric NALs and SALs included in this Order.

Order Nos. R9-2009-0002 and R9-2010-0016 required the Copermittees to perform prescribed actions if the NALs or SALs are exceeded. The actions required under Order Nos. R9-2009-0002 and R9-2010-0016 generally included conducting additional monitoring and source investigations when a discharge from the MS4 is observed to exceed one or more NALs and/or SALs.

For this Order, however, the action levels of Provision C are to be used by the Copermittees to prioritize the actions to be implemented as part of the Water Quality Improvement Plan. Monitoring data collected by the Copermittees from MS4 outfalls will be compared with the NALs and SALs. Exceedances of the NALs and SALs will not require the Copermittees to immediately identify sources causing exceedances, but will provide some numeric indicator levels that can give the Copermittees a way to measure the relative severity of a pollutant contributing to receiving water quality impacts.

NALs and SALs must be included in the Water Quality Improvement Plans to be used by the Copermittees in directing and focusing their water quality improvement strategies. The Copermittees are expected to utilize the NALs and SALs to help focus their implementation efforts on addressing pollutants that have the most significant potential or observed impacts to receiving waters. The NALs and SALs will be used as part of the MS4 discharges assessments required under Provision D.4.b. The NALs and SALs may also be used by the Copermittees as the numeric goals to be achieved in MS4 discharges and/or receiving waters as the Water Quality Improvement Plans are implemented.

More specific and detailed discussions of the requirements of Provision C are provided below.

Provision C.1 (Non-storm Water Action Levels) requires the Copermittees to incorporate NALs into the Water Quality Improvement Plan for pollutants and/or constituents that are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions identified in the Water Quality Improvement Plan related to non-storm water discharges from the MS4s. NALs generally must be consistent with the water quality objectives found within the Basin Plan.

The NALs have been included to ensure that the Copermittees are implementing and complying with several requirements of the MS4 permit. The federal CWA requires permits for municipal storm sewer systems to "*effectively prohibit non-storm water discharges into the storm sewers*." The federal NPDES regulations, which were promulgated to implement the CWA requirements for discharges from municipal storm sewers, require a program to address illicit discharges, which are non-storm water discharges. Provision A.1.b prohibits "*[n]on-storm water discharges into MS4s*" unless the non-storm water discharge authorized by a separate NPDES permit. The NALs will be used as part of the illicit discharge detection and elimination program required pursuant to Provision E.2, as well as part of the MS4 discharges assessments required pursuant to Provision D.4.b.

Provision A.1.a prohibits non-storm water discharges from the MS4 from "*causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state.*" In addition, pursuant to Provision A.2.a, non-storm water discharges "*must not cause or contribute to the violation of water quality standards in any receiving waters*."

Ideally, the Copermittees' jurisdictional runoff management programs will eliminate all non-storm water discharges entering the MS4s within their jurisdictions. The complete elimination of non-storm water discharges to the Copermittees' MS4s would be in compliance with the CWA requirements for non-storm water discharges, as well as the prohibitions and limitations of Provisions A.1.a and A.2.a.

The federal regulations, however, also refer to several non-storm water discharge categories that must be addressed as illicit discharges if they are found to be a source of pollutants. The federal regulations thus identify some non-storm water discharges that are not required to be addressed as illicit discharges if they are not a source of pollutants (e.g. non-storm water discharges specified in Provisions E.2.a.(1)-(5)). Thus, these regulations imply that some non-storm water discharges into and from the MS4 may occur even if non-storm water discharges are "effectively" prohibited by the Copermittees.

If the source of a non-storm water discharge is identified as a category of non-storm water specified in Provisions E.2.a.(1)-(5), the NALs can be used to determine if the category of non-storm water discharges is a source of pollutants. For other non-storm water discharges not specified in Provisions E.2.a.(1)-(5), the CWA requires those discharges to be "*effectively"* prohibited by removing the discharge to the MS4 through enforcement of the Copermittees' legal authority established under "*ordinance, order or similar means*" to prohibit illicit discharges to the MS4s.

If there are non-storm water discharges that are not required to be addressed as illicit discharges, those discharges must comply, at a minimum, with the discharge prohibitions and receiving water limitations of Provision A. Thus, the non-storm water discharges from the MS4 must be at levels that will not cause or contribute to a condition of pollution, contamination, or nuisance (Provision A.1.a), and must not cause or contribute to a violation of water quality standards in receiving waters (Provision A.2.a) to be consistent with the discharge prohibitions and receiving water limitations of Provisions A.1.a and A.2.a.

Furthermore, the San Diego Region has predominantly intermittent and ephemeral rivers and streams which vary in flow volume and duration at spatial and temporal scales. For most of these river and stream systems, non-storm water discharges from the MS4 are likely to be the most significant or the only source contributing to surface flows present within the receiving water, especially during the dry season.

Therefore, because of the prohibitions and limitations of Provision A.1.a and A.2.a, and the likelihood that non-storm water discharges from the MS4 are the most significant or only source contributing to surface flows present within the receiving water, NALs generally must be consistent with the water quality objectives found within the Basin Plan. Non-storm water discharges that are meeting the NALs would not be expected to cause or contribute to an exceedance of water quality objectives in receiving waters, which would be consistent with the discharge prohibitions and receiving water limitations of Provisions A.1.a and A.2.a.

Exceedances of the NALs would then provide an indication of the relative severity of a pollutant in non-storm water discharges from the MS4 contributing to potential or observed receiving water quality impacts. The relative severity or significance of a pollutant in non-storm water discharges from the MS4 will provide the Copermittees a valuable source of information that can be used to identify priority water quality conditions within a Watershed Management Area and within each Copermittee's jurisdiction.

Tables C-1 through C-4 under Provision C.1.a specify numeric NALs for several parameters or pollutant constituents for non-storm water discharges from the MS4 to several water body types. The NALs for MS4 discharges given under Provision C.1.a are based on the water quality objectives for inland surface waters in the Basin Plan, and the water quality objectives for ocean waters in the Ocean Plan. The NALs for

most of the metals were calculated based on the State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP). The NALs provided in Tables C-1 through C-4 must be included in the Water Quality Improvement Plans required to be developed pursuant to Provision B.

Provision C.1.b requires the Copermittees to identify NALs for pollutants and/or constituents, not specified in Provision C.1.a, which are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions of the Watershed Management Area related to non-storm water discharges from the MS4s. The NALs must be based on the water quality objectives in the Basin Plan. The NALs identified under Provision C.1.b must be included in the Water Quality Improvement Plan.

The San Diego Water Board recognizes that some of the NALs required pursuant to Provisions C.1.a and C.1.b may be exceeded more frequently than not. Thus, Provision C.1.c has been included in the Order to provide the Copermittees the option to develop secondary NALs that are set at levels greater than the levels required pursuant to Provisions C.1.a and C.1.b to further refine the prioritization and assessment of water quality improvement strategies for addressing non-storm water discharges to and from the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and from the MS4.

Provision C.2 (Storm Water Action Levels) requires the Copermittees to incorporate SALs into the Water Quality Improvement Plan for pollutants and/or constituents causing or contributing, or may be causing or contributing, to the highest priority water quality conditions identified in the Water Quality Improvement Plan related to storm water discharges from the MS4s.

The SALs have been included to ensure that the Copermittees are implementing and complying with several requirements of the MS4 permit. Provision A.1.a prohibits storm water discharges from the MS4 from "*causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state.*" In addition, pursuant to Provision A.2.a, storm water discharges "*must not cause or contribute to the violation of water quality standards in any receiving waters*."

Provision A.3.a, however, implicitly acknowledges that compliance with Provisions A.1.a and A.2.a cannot be achieved immediately for discharges of storm water from the MS4 by applying the MEP standard. Thus, Provision A.4 requires the Copermittees to implement an iterative approach to demonstrate that MEP is being achieved. This approach is supported by USEPA.

The federal CWA requires permits for municipal storm sewer systems to "*require controls to reduce the discharge of pollutants [in storm water] to the maximum extent*

practicable, *including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants.*" MEP is an ever-evolving, flexible, and advancing concept. As knowledge about controlling storm water runoff and discharges evolves, so does the knowledge which constitutes MEP. Reducing the discharge of storm water pollutants from the MS4 to the MEP requires the Copermittees to assess their jurisdictional runoff management programs and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP. The SALs provide the Copermittees measureable goals that may be used to demonstrate the achievement of MEP for reducing pollutants in storm water discharges from the MS4. The SALs will be used as part of the MS4 discharges assessments required under Provision D.4.a.

In June of 2006, the State Water Board's Blue Ribbon Storm Water Panel released its report titled "*The Feasibility of Numerical Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities*." In the recommendations, the Blue Ribbon panel proposed storm water effluent limitations which are computed using statistical based population approaches. The SALs specified in Table C-5 under Provision C.2.a were developed from a regional subset of nationwide Phase I MS4 data by using USEPA Rain Zone 6 (arid west) data.[28] Additionally, utilization of regional data is appropriate due to the addition of data into the nationwide Phase I MS4 monitoring dataset in February 2008. This additional data increased the number of USEPA Rain Zone 6 samples to more than 400, and included additional monitoring events within Southern California.

Utilizing data from USEPA Rain Zone 6 resulted in SALs which closely reflect the environmental conditions experienced in the San Diego Region. The localized subset of data includes sampling events from multiple Southern California locations including Orange, San Diego, Riverside, Los Angeles, and San Bernardino Counties. The dataset includes samples taken from highly built-out impervious areas and from storm events representative of Southern California conditions.

The SALs for cadmium, copper, lead and zinc require the measurement of hardness and to provide more specificity in the assessment of samples with SALs for total metal concentrations. While USEPA Rain Zone 6 data include a large sample size for concentrations of total metals, the impact the concentration will have on receiving waters will vary with receiving water hardness. Since it is the goal of the SALs, through the iterative process and MEP standard, to have MS4 storm water discharges meet all applicable water quality objectives, the hardness of the receiving water should be used when assessing the total metal concentration of a sample.

Thus, when there is an exceedance of a SAL for a metal, the Copermittee must determine if that exceedance is above the existing applicable water quality objectives

[28] Data used to develop SAL were obtained from http://rpitt.eng.ua.edu/Research/ms4/mainms4.shtml

based upon the hardness of the receiving water. The water quality objectives Copermittees must use to assess total metal SAL exceedances are the California Toxic Rule (CTR) and USEPA National Recommended Water Quality Criteria for Freshwater Aquatic Life 1 hour maximum concentrations. The 1-hour maximum concentration is to be used for comparison since it is expected to most replicate the impacts to waters of the State from the first flush following a precipitation event.

The statistically calculated SALs given in Table C-5 are at levels greater than the water quality objectives in the Basin Plan or Ocean Plan. Because the objective of the CWA is to "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*", meaning eventually pollutants in storm water discharges must be reduced to a level that cannot cause or contribute to an exceedance of water quality objectives in receiving waters, over time the SALs are expected to be reduced to a level that is based on the water quality objectives rather than statistical calculations. The San Diego Water Board will review the SALs as more data for discharges of storm water from the MS4s are collected, and revise them as conditions improve and the MEP standard advances. For the Water Quality Improvement Plans required under this Order, the SALs identified under Provision C.2.a must be included.

Provision C.2.b requires the Copermittees to identify SALs for pollutants and/or constituents, not specified in Provision C.2.a, which are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions of the Watershed Management Area related to storm water discharges from the MS4s. The SALs identified under Provision C.2.b must be included in the Water Quality Improvement Plan.

The San Diego Water Board recognizes that some of the SALs required pursuant to Provisions C.2.a and C.2.b may be exceeded more frequently than not. Thus, Provision C.2.c has been included in the Order to provide the Copermittees the option to develop secondary SALs that are set at levels greater than the levels required pursuant to Provisions C.2.a and C.2.b to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s.

D. Monitoring and Assessment Program Requirements

Purpose: Provision D includes minimum monitoring and assessment requirements that must be developed and implemented by the Copermittees as part of the Water Quality Improvement Plans. Implementation of the monitoring and assessment requirements of Provision D will allow the Copermittees to demonstrate that the requirements of the CWA to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP are being achieved. Implementation of the monitoring and assessment requirements of Provision D will also allow the Copermittees and the San Diego Water Board to track improvements to the water quality in the San Diego Region. The monitoring and assessment program requirements are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order.

***Discussion*:** The San Diego Water Board recognized that changes to the monitoring and assessment requirements of the Fourth Term Permit were necessary to improve the usefulness and usability of monitoring data collected by the Copermittees to support their jurisdictional storm water programs more efficiently and with increased effectiveness. The data collected are needed to better inform the Copermittees' understanding of the physical, chemical, and biological condition of the receiving waters and the quality of the MS4 discharges. The monitoring program needs to provide opportunities for the Copermittees to integrate regional monitoring efforts into municipal storm water monitoring requirements to provide a cost-effective approach to monitoring and avoid duplication of efforts.

The requirements in Provision D were largely recommended by the Copermittees as an outcome of the San Diego Water Boards Focused Meeting process. The monitoring and assessment program requirements now require collection of more specific information necessary for each Copermittee to adapt its jurisdictional runoff management program in such a way that focuses resources on a watershed's highest priority water quality conditions. The monitoring and assessment program will require the Copermittees to collect data that can be utilized to answer both watershed level management questions (e.g. Are the chemical, physical, and biological conditions of a receiving water protective, or likely protective of beneficial uses?), and specific jurisdictional runoff management program activity questions (e.g. Are the water quality improvement strategies of the jurisdictional program effectively eliminating non-storm water discharges to the MS4?).

The monitoring data collected and assessment information that will be reported to the San Diego Water Board are necessary to determine if the Copermittees are complying with the prohibitions and limitations of Provision A. The required monitoring and assessments that must be reported to the San Diego Water Board will be utilized for three purposes:

(1) Inform the Copermittees, San Diego Water Board, and the public on the progress of the Copermittees' efforts to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP;

(2) Inform the Copermittees, San Diego Water Board, and the public on the condition of water bodies receiving discharges from the Copermittees' MS4, and the progress of the Copermittees' water quality improvement implementation efforts toward improving the receiving water quality; and

(3) Inform the Copermittees, the San Diego Water Board, and the public on the effectiveness of the Water Quality Improvement Plan toward achieving (1) and (2).

The monitoring and assessment information reported pursuant to Provision F is also expected to be key to the iterative approach and adaptive management process required under Provision A.4 and implemented through the Water Quality Improvement Plan required under Provision B. As required by Provision A.4, the iterative approach and adaptive management process is required if the Copermittees cannot meet the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c, and/or A.2.a under the present conditions.

Provision D provides the minimum monitoring and assessment requirements that must be included in each Water Quality Improvement Plan to be developed and implemented by the Copermittees. The Copermittees, however, are not limited to the requirements of Provision D and may include additional methods to track progress toward improving water quality in a Watershed Management Area.

More specific and detailed discussions of the requirements of Provision D are provided below.

Provision D.1 (Receiving Water Monitoring Requirements) specifies the minimum receiving water monitoring that the Copermittees must conduct within the Watershed Management Area and include as part of the Water Quality Improvement Plan.

Provision D.1 establishes minimum monitoring requirements that must be conducted by the Copermittees within each Watershed Management Area. Provision D.1 requires the Copermittees to collect and develop the data and information necessary to determine potential impacts to the beneficial uses in the receiving waters due to discharges from the MS4s. The monitoring required under Provision D.1 will also provide the data that will allow the Copermittees to gauge the effectiveness and progress of its Water Quality Improvement Plan implementation efforts toward improving the quality of receiving waters.

The receiving water monitoring requirements of Provision D.1 are focused primarily on monitoring the conditions and response of the receiving waters to the Copermittees'

collective implementation efforts to reduce receiving water impacts that may be caused by the discharges from the MS4s. The preference of the San Diego Water Board is for the Copermittees to spend their resources achieving tangible and observable improvements in receiving water conditions instead of collecting samples and analyzing data that has consistently indicated that receiving water conditions are degraded and require improvement. In general, the ability to measure potential improvements in receiving water conditions due to any actions implemented by the Copermittees as part of the Water Quality Improvement Plan may require several years before a response can be observed. Thus, the frequency of collecting receiving water monitoring data has been kept to a minimum.

During the transitional period between adoption of this Order and San Diego Water Board acceptance of a Water Quality Improvement Plan, the Copermittees must conduct receiving water monitoring in accordance with Provision D.1.a. This approach to collecting receiving water data is different from what was required in the Fourth Term Permits, but one that truly embraces the concept of an integrated, cost-effective, streamlined receiving water monitoring approach.

Provision D.1.a requires Copermittees to continue performing the receiving water monitoring programs required in Order Nos. R-2007-0001, R9-2009-002, and R9-2010-0016; plus participation in: hydromodification management plan monitoring approved by the San Diego Water Board, monitoring plans as part of load reduction plans (either Bacteria Load Reduction Plans or Comprehensive Load Reduction Plans) for TMDLs in Attachment E of the Order, Storm Water Monitoring Coalition Regional Monitoring, Southern California Bight Regional Monitoring, Sediment Quality Monitoring, and ASBS Monitoring as applicable to a Watershed Management Area.

Provision D.1.a also provides an opportunity for the Copermittees to use third party data to meet receiving water monitoring requirements where feasible. Allowing the Copermittees to use the data currently collected through its participation in existing regional receiving water programs and that of third parties provides an efficiency of resources in obtaining the data necessary to inform the Copermittees and the San Diego Water Board about the physical, chemical, and biological conditions of the receiving waters, which can also help to focus the receiving water monitoring during the implementation of the Water Quality Improvement Plan. Once a Water Quality Improvement Plan is developed for a Watershed Management Area in compliance with Provision B of this Order, the transitional period is over and Copermittees are required to conduct receiving water monitoring according to the requirements of Provisions D.1.b-e.

Provision D.1.b requires each Copermittee to identify at least one long term receiving water monitoring station to be representative of receiving water quality within each Watershed Management Area. Long term receiving water monitoring stations can be located at any existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees. The requirements under Provision D.1.b. are

consistent with 40 CFR 122.26(d)(2)(iii)(D), which specifies that a "*monitoring program for representative data collection for the term of the permit*" may include "*instream locations.*" For each Watershed Management Area, at least one long term watershed monitoring station is required to be established and monitored. The Copermittees may choose to establish additional long term monitoring stations where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

Provision D.1.b. requires the Copermittees to locate the long term receiving water monitoring station at one of these existing receiving water monitoring stations to provide the Copermittees an opportunity to experience monitoring cost savings while continuing to collect the necessary data to assess the status and trends of receiving water quality conditions in 1) coastal water, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under both dry weather and wet weather conditions. Ideally these stations will continue to be monitored as part of the receiving water monitoring for each Watershed Management Area to maintain a consistent set of locations and a period of data that can be built upon with the monitoring required under this Order.

The receiving water monitoring requirements are separated into monitoring required during dry weather conditions pursuant to Provision D.1.c, and wet weather conditions pursuant to Provision D.1.d.

At each long term monitoring station the Copermittees must conduct at least three dry weather monitoring events as required pursuant to Provision D.1.c and at least three wet weather monitoring events as required pursuant to Provision D.1.d per permit term. Provisions D.1.c and D.1.d require the Copermittees to monitor priority water quality conditions identified in the Water Quality Improvement Plan, constituents listed as causing impairment of receiving waters in the Watershed Management Area, applicable NALs, toxicity, constituents listed in Tables D-2 and D-3, and constituents for implementation plans (e.g. Bacteria Load Reduction Plans and Comprehensive Load Reduction Plans). Required toxicity monitoring was changed to reflect an updated understanding of the unique challenges associated with sampling storm water for toxicity. Copermittees are required to sample receiving water for toxicity during each dry weather and each wet weather event pursuant to Provision D.1.c.(4) and D.1.d.(4). Required toxicity monitoring is now consistent with the State Water Resources Control Board Policy for Toxicity Assessment and Control (Draft June 2012) and recently adopted MS4 permits for Caltrans and Los Angeles Water Board. Receiving water monitoring efforts in this Order have been streamlined to redirect resources to monitoring efforts that better support pollutant reduction solutions with an increasing emphasis on MS4 outfall monitoring, source identification, and source abatement activities.

In addition to the receiving water monitoring requirements under Provisions D.1.b-d, Provision D.1.e requires the Copermittees participate in and/or conduct other types of receiving water monitoring. As recommended and requested by the Copermittees, Provision D.1.e.(1) requires the Copermittees to participate in existing regional monitoring, as applicable to each Watershed Management Area. Existing regional

monitoring includes monitoring conducted by the Storm Water Monitoring Coalition and for the Southern California Bight. Participation in and use of monitoring data collected from these existing regional water quality monitoring programs provide the Copermittees a greater opportunity for efficiency in the use of their resources to manage their storm water programs and those controllable discharges under their authority.

Provision D.1.e.(1)(c) requires the south Orange County MS4 Copermittees to participate in "unified regional beach water quality monitoring." This monitoring replaces requirements to conduct "core monitoring" of beach water quality, as provided for in Appendix III of the Ocean Plan.

Several different public agencies currently conduct routine, ongoing beach water quality monitoring in south Orange County in accordance with several different sets of requirements. The monitoring programs implemented to meet those requirements overlap temporally and spatially. These monitoring programs are partially but not fully integrated. In November 2010, the State Water Board adopted Resolution No. 2010-0053, which directed Regional Water Boards to work with dischargers to modify beach water quality monitoring programs required by Regional Water Board-issued permits in order to eliminate redundancies and incorporate beach water quality monitoring required by beach water quality statutes, where appropriate.

In April 2012, the San Diego Water Board requested that its staff review beach water quality monitoring conducted in south Orange County. To assist in responding to that request, staff of the Board convened a workgroup that included representatives of the three public agencies that currently conduct almost all of the routine, ongoing beach water quality monitoring in south Orange County, i.e., South Orange County Wastewater Authority (SOCWA), Orange County Public Works, and Orange County Health Care Agency (OCHCA). The workgroup also included other interested parties, including representatives of the Sierra Club and Surfrider Foundation. In December 2012, the San Diego Water Board adopted Resolution No. R9-2012-0069, which endorsed the San Diego Water Board staff report entitled "A Framework for Monitoring and Assessment in the San Diego Region," dated November 2012.

The unified program is consistent with and will meet or exceed the minimum requirements for beach water quality monitoring and related public notification and reporting established by State law, including the Ocean Plan. The unified program is consistent with State Water Board Resolution No. 2010-0053. The unified program is also consistent with and will help implement, "A Framework for Monitoring and Assessment in the San Diego Region," which emphasizes the need for question-driven, beneficial use-oriented monitoring and assessment. The primary purpose of the unified program will be to answer the question "Does beach water quality meet standards for the beneficial use of water contact recreation?"

The unified program is intended to be protective; it will help protect the health of swimmers, surfers, and others who use south Orange County beach waters for water

contact recreational activities. The unified program is also intended to be reasonable; it will eliminate duplicative monitoring and will include triggers for public notification and additional sampling at all sampling stations year-round. The unified program is intended to be equitable; responsibility for implementation of the unified program will be shared and the responsible agencies will jointly make arrangements to implement the program and will have the flexibility to jointly make short and/or long term changes in those arrangements.

The San Diego Water Board Executive Officer issued a written directive on December 5, 2014, pursuant to California Water Code section 13383, for SOCWA and the south Orange County MS4 Copermittees to implement the unified program in cooperation with OCHCA. The Executive Officer may make revisions to the unified program, provided that the unified program, as revised, continues to be consistent with and meet the requirements of State law, including the Ocean Plan, for beach water quality monitoring and related public notification and reporting. Following a thirty day public comment period, and subject to a request for a hearing before the San Diego Water Board, any such revision shall take effect as specified in a written directive issued by the Executive Officer pursuant to CWC section 13383. The program and any Executive Officer issued revisions to the program are subject to CWC section 13320 right of review from the date of issuance.

The unified program will supersede the existing routine, ongoing, beach water quality monitoring programs in south Orange County that are conducted in accordance with the existing requirements of the NPDES permits for discharges from the SOCWA ocean outfalls and the south Orange County MS4s. The requirement to participate in "regional monitoring" of beach water quality replaces requirements to conduct "core monitoring" of beach water quality, as provided for in Appendix III of the Ocean Plan.

The State Water Resources Control Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part 1 Sediment Quality which became effective August 25, 2009 (Sediment Quality Monitoring Policy). Provision D.1.e.(2) requires any Copermittees with MS4 discharges to an enclosed bay or estuary to monitoring the sediments in the enclosed bay or estuary receiving water in accordance with the sediment quality monitoring procedures as prescribed in the Sediment Quality Monitoring Policy.

The State Water Board adopted Resolution No. 2012-0012 which approved exceptions to the California Ocean Plan for selected discharges into Areas of Special Biological Significance (ASBS), including special protections for beneficial uses. State Board Resolution No. 2012-0012 became effective on March 20, 2012, and Attachment B to the Resolution established limitations on point source storm water discharges to ASBS. Copermittees with MS4s that discharge to an ASBS must monitor its discharge to assure compliance with State Board Resolution No. 2012-0012 as required pursuant to Provision D.1.e.(3).

The San Diego Water Board is developing a regional monitoring strategy to assess the conditions of receiving waters in the San Diego Region. The monitoring requirements of Provision D.1 are expected to be incorporated or serve as a foundation of this regional monitoring strategy, but may require some modifications. When the San Diego Water Board develops an alternative regional monitoring strategy, the Copermittees will be required to participate in the development and implementation of the alternative regional monitoring program pursuant to Provision D.1.f.

Provision D.2 (MS4 Outfall Discharge Monitoring Requirements) specifies the minimum MS4 outfall discharge monitoring requirements that the Copermittees must incorporate and implement as part of the Water Quality Improvement Plan.

The dry weather MS4 outfall discharge monitoring requirements are included under Provisions D.2.a.(2) and D.2.b. The dry weather MS4 outfall discharge monitoring requirements are part of the "*program, including a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer*" required by 40 CFR 122.26(d)(2)(iv)(B), which is expected to achieve compliance with the CWA section 402(p)(3)(B)(ii) statutory requirement for municipal storm water permits to require the Copermittees to "*effectively prohibit non-storm water discharges into the storm sewers*." The dry weather MS4 outfall discharge monitoring data collection requirements are based on requirements under 40 CFR 122.26(d)(1)(iv)(D) and 122.26(d)(2)(iv)(B)(3).

The dry weather MS4 outfall discharge monitoring requirements are designed to provide wide spatial and temporal coverage of each jurisdiction to better understand the extent and magnitude of non-storm water discharges to receiving waters, and make a distinction between persistent and transient non-storm water flows. This information is expected to allow each Copermittee to focus its resources on eliminating and controlling the highest priority threats to receiving water quality, as well as integrating other elements of the storm water programs (e.g. complaint call response) and third party data to efficiently and effectively assist in efforts to eliminate non-storm water discharges.

The dry weather MS4 outfall discharge monitoring requirements of Provision D.2.a.(2) and D.2.b are separated into monitoring required before and after the San Diego Water Board accepts the Copermittees' Water Quality Improvement Plan. Outfall monitoring conducted prior to acceptance of the Water Quality Improvement Plan is referred to in the Order as Transitional MS4 Outfall Discharge Monitoring. Provision D.2.a.(2) includes the transitional dry weather MS4 outfall discharge monitoring requirements.

The requirements under Provision D.2.a.(2) are based on the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B), which include the requirements for a monitoring program to identify, detect, and eliminate illicit connections and illegal discharges to the MS4s. The federal regulations (40 CFR 122.26(d)(1)(iv)(D)) require

the monitoring program to include "*a field screening analysis for illicit connections and illegal dumping [that]…[a]t a minimum, include[s] a narrative description, for either each field screening point or major outfall, of visual observations made during dry weather periods.*" The federal regulations (40 CFR 122.26(d)(1)(v)(B)) require the monitoring program to include "*inspection procedures and methods for detecting and preventing illicit discharges, and describe areas where this program has been implemented.*" Furthermore, the monitoring program is required by federal regulations (40 CFR 122.26(d)(2)(iv)(B)) to include "*a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer.*"

Dry weather transitional MS4 outfall discharge monitoring requires each Copermittee to field screen (inspect) its major MS4 outfalls to classify the MS4 outfall locations as having persistent dry weather flows, transient dry weather flows, or no dry weather flows. To account for the variance in size of the 39 jurisdictions covered under this Order, the Copermittees recommended a tiered approach to the number of major MS4 outfalls that must be inspected. Provision D.2.a.(2)(a) provides a tiered approach to the number of major MS4 outfalls that must be visually inspected per jurisdiction as well as a minimum frequency each Copermittee must inspect each major MS4 outfall per year. This tiered approach is based on the total number of major MS4 outfalls within a Copermittees jurisdiction within each Watershed Management Area.

Based on the field screening, each Copermittee is required to make a determination whether any observed flowing, pooled, or ponded waters are transient or persistent flows. Based on this field screening information, other jurisdictional program information, and third party information, each Copermittee is required to prioritize the MS4 outfalls within its jurisdiction for follow up investigation and elimination of the non-storm water discharge, as part of its illicit discharge detection and elimination program required pursuant to Provision E.2. In accordance with the requirements of Provision E.2, each Copermittee is required to immediately investigate obvious illicit discharges (e.g. outfall discharges with unusual color, unusual odor, or high flows).

This approach allows a Copermittee to use all of its resources, as well as leverage resources and information provided by third parties, to effectively eliminate non-storm water discharges from its MS4 outfalls. If the source of the non-storm water discharge cannot be immediately eliminated, the Copermittee uses the persistent flow or transient flow classification along with other programmatic implementation data to prioritize the MS4 outfalls for future investigation. In accordance with the adaptive management approach deployed throughout this Order, Provision D.2.a.(2)(c) requires each Copermittee to update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow. The requirement of Provision D.2.a.(2)(c) assures that each Copermittee is collecting data that can be used to demonstrate compliance with the CWA requirement that each Copermittee must implement a program to "*effectively*

prohibit non-storm water discharges into the [MS4]" and with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

Provision D.2.b describes the dry weather MS4 outfall discharge monitoring required to be incorporated and implemented as part of the Water Quality Improvement Plan. Dry weather MS4 outfall discharge monitoring must be performed by each Copermittee to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. The emphasis of the dry weather MS4 outfall discharge monitoring required pursuant to Provision D.2.b is consistent with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

Provision D.2.b.(1) requires each Copermittee to continue field screening its major MS4 outfalls and identifying those with persistent flows and transient flows, as conducted during the transitional period (i.e. before the Water Quality Improvement Plan was developed). However, each Copermittee now has the flexibility to adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of non-storm water persistent flow discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan. In order to ensure a minimum number of outfalls are inspected, Provision D.2.b.(1) requires the number of visual inspections be equal to the number of visual inspections required in the tiered inspection program pursuant to Provision D.2.a.(2)(a).

Provision D.2.b.(2)(b) requires each Copermittee to monitor a minimum of 5 major MS4 outfalls with persistent flows identified as the highest priorities within a Copermittee's jurisdiction, within each Watershed Management Area. In other words, Copermittees located in more than one Watershed Management Area must identify at least 5 major MS4 outfalls with persistent flows in its jurisdiction in each Watershed Management Area. If a Copermittee is located in more than one Watershed Management Area, and they have less than 5 major MS4 outfalls with persistent flows per jurisdictional area per Watershed Management Area, all of the major MS4 outfalls must be identified as high priority dry weather persistent flow MS4 outfalls. The Copermittees identified as Responsible Copermittees by a TMDL in Attachment E of the Order may need to monitor more than 5 dry weather major MS4 outfall locations to determine compliance with the requirements of the TMDL(s).

Monitoring must occur at the highest priority outfall locations at least semi-annually until the non-storm water discharges have been eliminated for three consecutive dry weather monitoring events; identified to be authorized by a separate NPDES Permit; or reprioritized to a lower priority. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized MS4 major outfall in the Copermittee's jurisdiction within the Watershed Management Area, unless there are no remaining qualifying major MS4 outfalls within the Copermittees jurisdiction. The Copermittees must continually update their dry weather persistent

flow MS4 outfall discharge monitoring locations with the next highest priority non-storm water flow that have yet to be eliminated until all persistent and transient flows are eliminated or its threat reduced.

Non-storm water persistent flow MS4 outfall discharge monitoring data collected during each semi-annual monitoring event, must be collected and analyzed according to the requirements of Provision D.2.b.(2)(b)-(e). These monitoring requirements are consistent with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

The wet weather MS4 outfall discharge monitoring requirements are included under Provisions D.2.a.(3) and D.2.c. The wet weather MS4 outfall discharge monitoring requirements are necessary for the Copermittees to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable, using management practices, control techniques and system, design and engineering methods, and such other provisions which are appropriate*" required by 40CFR 122.26(d)(2)(iv), which is expected to achieve compliance with the CWA section 402(p)(3)(B)(iii) statutory requirement for municipal storm water permits to require "*controls to reduce the discharge of pollutants [in storm water] to the maximum extent practicable*." The wet weather MS4 outfall discharge monitoring data collection requirements are based on requirements under 40 CFR 122.26(d)(2)(iii), 122.26(d)(2)(iii)(A) and 122.26(d)(2)(iii)(A)(1)-(4), and 40 CFR 122.21(g)(7)(i)-(ii).

The wet weather MS4 outfall discharge monitoring requirements of Provision D.2.a.(3) and D.2.c are separated into monitoring required before and after the San Diego Water Board accepts the Copermittees' Water Quality Improvement Plan. Outfall monitoring conducted prior to acceptance of the Water Quality Improvement Plan is referred to in the Order as Transitional MS4 Outfall Discharge Monitoring. Provision D.2.a.(3) includes the transitional wet weather MS4 outfall discharge monitoring requirements.

Until the wet weather MS4 outfall discharge monitoring requirements of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board, the Copermittees must comply with the requirements of transitional wet weather MS4 outfall monitoring requirements pursuant to Provision D.2.a.(3). Provision D.2.a.(3) requires the Copermittees in each Watershed Management Area to sample, at least five of the major MS4 outfalls inventoried pursuant to Provision D.2.a.(1) once per wet season for the monitoring data required to be collected pursuant to Provision D.2.a.(3)(c)-(e). Provision D.2.a.(3) further requires at least one major MS4 outfall monitoring station be located in each Copermittee's jurisdiction within the Watershed Management Area.

At a minimum, the five sampling locations chosen must be representative of storm water discharges from residential, commercial, industrial, and typical mixed-use land uses present within a Watershed Management Area. The San Diego Water Board expects the Copermittees to extrapolate from these data to similar land uses

throughout the Watershed Management Area to better inform the Water Quality Improvement Plan development process by prioritizing drainages for implementation of storm water control efforts required pursuant to Provision E.

Provision D.2.c describes the wet weather MS4 outfall discharge monitoring required to be included and implemented as part of the Water Quality Improvement Plan. Provision D.2.c provides the Copermittees the flexibility to adjust the wet weather MS4 outfall discharge monitoring locations and frequencies in the Watershed Management Area, as needed, to identify sources of pollutants in storm water discharges from MS4s in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan.

Although Provision D.2.c.(1) allows the Copermittees to adaptively manage the wet weather MS4 outfall discharge monitoring locations and frequencies, the provision requires a minimum of at least five wet weather outfall stations to be monitored. Provision D.2.c.(2) further allows the Copermittees to modify the monitoring frequency at each wet weather MS4 outfall station to meet the goals of the Water Quality Improvement Plan as long as the monitoring frequency occurs at least once per year and is at an appropriate frequency to identify sources of pollutants in storm water discharges, guide pollutant source identification efforts, or determine compliance with the requirements of the applicable TMDLs in Attachment E to the Order.

The wet weather MS4 outfall discharge monitoring requirements of Provisions D.2.c.(3) and D.2.c.(4) are the same as the transitional wet weather MS4 outfall discharge monitoring. In contrast, the requirements of Provision D.2.c.(5) are focused on collecting analytical data specific to the highest priority water quality conditions in the Watershed Management Area identified in the Water Quality Improvement Plan. The wet weather MS4 outfall discharge monitoring data collection requirements are consistent with the requirements under 40 CFR 122.26(d)(2)(iii), 122.26(d)(2)(iii)(A) and 122.26(d)(2)(iii)(A)(1)-(4), and 40 CFR 122.21(g)(7)(i)-(ii).

Provision D.3 (Special Studies) requires the Copermittees to develop special studies that will be conducted for each Watershed Management Area and the entire San Diego Region. Data collected pursuant to Provision D.3 is to be used by the Copermittees to improve the effectiveness of the strategies implemented by the jurisdictional runoff management programs toward achieving the numeric goals identified in the Water Quality Improvement Plans and ultimately achieve compliance with the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c, and A.2.a, which is consistent with the requirements of Provision A.4.

Special studies are often necessary to fill data gaps or provide more refined information that allow the Copermittees to better manage the generation or elimination of pollutants and discharges to and from the MS4. In the Fourth Term Permits, the Copermittees have been required to implement special studies as directed by the San Diego Water Board. The special studies required by this Order provide the Copermittees more flexibility to identify and implement special studies that will be most

useful to improving the effectiveness of their jurisdictional runoff management programs.

Provision D.3.a.(1) requires the Copermittees to develop and conduct at least two special studies per Watershed Management Area, to be determined by the Copermittees. One of the two special studies may be accomplished through participation in a Regional Special Study required under Provision D.3.a.(2). The requirements provide the Copermittees great latitude in identifying and developing the special studies. Watershed Management Area special studies are required, at a minimum, to: (a) relate in some way to the highest water quality priorities identified by the Copermittees in the Water Quality Improvement Plan, (b) be conducted within the Watershed Management Area, and (c) include some form of participation (e.g. contribution of funds, personnel services, project management) by all the responsible Copermittees within the Watershed Management Area.

Examples of Watershed Management Area special studies might include, but are not limited to: (1) focused pollutant source identification studies, (2) BMP effectiveness and/or comparison studies, (3) pilot tests for new or emerging pollutant control methods, (4) receiving water pollutant or stressor source identification and/or mitigation studies, or (5) pollutant fate and transport studies. The Watershed Management Area special studies are expected to provide data that can be utilized by the Copermittees to improve the Water Quality Improvement Plan or implementation of the Copermittees' jurisdictional runoff management programs to address the highest priority water quality conditions.

Provision D.3.a.(2) requires the Copermittees to develop at least one special study that will be conducted for the entire San Diego region. The regional special study is expected to provide data that can be utilized by the Copermittees to improve the Water Quality Improvement Plan or implementation of the Copermittees' jurisdictional runoff management programs to identify or address regional water quality concerns and priorities.

An example of a regional special study would be to develop and establish allowable exceedance frequencies of the bacteria water quality objectives for several types of water bodies, during different wet and dry weather conditions the San Diego region. The special study would be related to bacteria, which is a priority for the San Diego region due to the adoption of "*Bacteria TMDL Project I – Beaches and Creeks in the San Diego Region*." The study results could be used to inform the Copermittees and the San Diego Water Board about the indictor bacteria water quality objective exceedance frequencies that occur in natural or reference watersheds.

<u>Provision D.4 (Assessment Requirements)</u> specifies the assessments that the Copermittees are required to perform, based on the monitoring data collected, and will be reported as part of the Annual Report for the Water Quality Improvement Plan implementation. Provision D.4 requires the Copermittees assess the progress of the

water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c, and A.2.a.

Provision D.4 specifies the assessments that Copermittees must perform for each Watershed Management Area to assess the effectiveness of each Copermittee's jurisdictional runoff management program and the Water Quality Improvement Plan. The effectiveness of each Copermittee's jurisdictional runoff management program and Water Quality Improvement Plan is measured through these types of assessments: (a) Receiving Waters Assessments (b) MS4 Outfall Discharges Assessments, (c) Special Studies Assessments, and (d) Integrated Assessment of Water Quality Improvement Plan.

Provision D.4.a requires the Copermittees to assess the status of receiving water conditions annually during the transitional monitoring period (during development of the Water Quality Improvement Plan) and after acceptance of the Water Quality Improvement Plan. The monitoring data collected pursuant to Provision D.1 will be evaluated, among other information, to assess the condition of a Watershed Management Area's streams, coastal waters, enclosed bays, harbors, estuaries, and lagoons. The focus of the receiving waters assessments is to measure progress toward the objective of the CWA to "*restore and maintain the chemical, physical, and biological integrity of the Nation's waters*" as the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program are implemented within a Watershed Management Area. Provision D.4.a is consistent with 40 CFR 122.42(c)(7) which requires the Copermittees to annually report the *"[i]dentification of water quality improvements or degradation."*

Provision D.4.b includes the MS4 outfall discharges assessment requirements. The focus of MS4 outfall discharges assessments is to determine if the Copermittees' are implementing programs that comply with the requirements of the CWA for MS4 permits to "*effectively prohibit non-stormwater discharges into the storm sewers*" and "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable.*" The monitoring data collected pursuant to Provisions D.2 will be evaluated, among other information, to assess the effectiveness of the transitional MS4 outfall field screening monitoring, the implementation of the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program. The MS4 outfall discharge assessments consist of Non-Storm Water Discharges Reduction Assessments and Storm Water Pollutant Discharges Reduction Assessments.

The Non-Storm Water Discharges Reduction Assessments are how each Copermittee will demonstrate that its jurisdictional runoff management program implementation efforts are achieving the CWA requirement to "*effectively prohibit non-stormwater discharges into the storm sewers.*" Provision D.4.b.(1) requires each Copermittee to assess and report on its illicit discharge detection and elimination program required pursuant to Provision E.2 to reduce and effectively prohibit non-storm water and illicit discharges into the MS4 within its jurisdiction. The Non-Storm Water Discharges

Reduction Assessments include specific assessment requirements applicable to each Copermittee.

As each Copermittee collects and analyzes the data collected pursuant to dry weather MS4 outfall discharges monitoring requirements of Provisions D.2.a.(2) and D.2.b, Provision D.4.b.(1) requires each Copermittee to assess the progress, assess the effectiveness of its current actions, and identify modifications necessary to increase the effectiveness of its actions toward reducing and eliminating non-storm water and illicit discharges to its MS4. The findings from these assessments are expected to be utilized by the Copermittee as part of its procedures to prioritize the non-storm water discharges that will be addressed by its Illicit Discharge Detection and Elimination program required pursuant to Provision E.2.

The assessment requirements of Provision D.4.a.(1) are consistent with 40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(3) which require "*procedures…to investigate portions of the separate storm sewer system that, <u>based on the results of the field screen, or other appropriate information</u> [emphasis added], indicate a reasonable potential of contain illicit discharges or other sources of non-storm water*" as part of a "*program…to detect and remove…illicit discharges and improper disposal into the storm sewer.*" The assessment requirements of Provision D.4.a.(1) are also consistent with 40 CFR122.42(c)(1) requires the Copermittees to annually report the "*status of implementing the components of the storm water management program that are established as permit conditions.*"

The Storm Water Pollutant Discharges Reduction Assessment is how the Copermittees in each Watershed Management Area will demonstrate that their jurisdictional runoff management program implementation efforts are achieving the CWA requirement to "*reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable*." Provision D.4.b.(2) requires the Copermittees in each Watershed Management Area to assess and report the progress of the Copermittees' efforts to reduce pollutants in storm water discharges from the MS4s to the MEP. The Storm Water Pollutant Discharges Reduction Assessments include specific assessment requirements during both the transitional monitoring period and after acceptance of the Water Quality Improvement Plan applicable to the Watershed Management Area and each Copermittee.

As the Copermittees collect and analyze the data collected pursuant to wet weather MS4 outfall discharges monitoring requirements of Provisions D.2.a.(3) and D.2.c, Provision D.4.b.(2) requires the Copermittees to assess runoff conditions during the transitional period, and the progress of the Water Quality Improvement Plan strategies toward reducing pollutants in storm water from the MS4 to the MEP. The findings from these assessments are expected to be utilized by the Copermittees to identify any modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify sources of pollutants in storm water discharges from the MS4s, as well as focus, modify, and improve the water quality improvement

strategies implemented by each Copermittee within its jurisdiction to reduce pollutants in storm water discharges to the MEP.

The assessment requirements of Provision D.4.b.(2) are consistent with 40 CFR 122.26(d)(2)(iii)(B) which requires "*[e]stimates of the annual pollutant load of the cumulative discharges to waters of the United States from all identified municipal outfalls…during a storm event…accompanied by a description of the procedures for estimating constituent loads and concentrations, including any modeling, data analysis, and calculation methods.*" The assessment requirements of Provision D.4.a.(2) are consistent with 40 CFR 122.26(d)(2)(v) which requires that each Copermittee assesses the *"estimated reductions in loadings of pollutants from discharges of municipal storm sewer constituents from municipal storm sewer systems expected as the result of the municipal storm water quality management program."* The assessment requirements of Provision D.4.b.(2) are also consistent with 40 CFR122.42(c)(1) requires the Copermittees to annually report the "*status of implementing the components of the storm water management program that are established as permit conditions.*"

Provision D.4.c includes the special studies assessment requirements. Performing special studies are how the Copermittees will address data gaps identified during the development of and updates to the Water Quality Improvement Plan. The relevant findings from the special studies assessments are expected to be incorporated as part of the applicable receiving water assessments, MS4 outfall discharge assessments, and integrated water quality improvement assessments required in Provision D.4.a, D.4.b, and D.4.d, respectively.

The assessment requirements in Provision D.4.d are part of the iterative approach and adaptive management process required by Provision A.4. The Copermittees are required to integrate the data collected pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to re-evaluate the Water Quality Improvement Plan.

The monitoring data collected pursuant to Provisions D.1 and D.2, and the results of the assessment required pursuant to Provisions D.4.a-c, will be used to determine whether the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program are effective, or require modifications or improvements to become more effective to achieve the requirements of the CWA. The assessments required by Provision D.4.d are consistent with 40 CFR 122.42(c)(1) which requires that the Copermittees to report the *"[t]he status of implementing the components of the storm water management program that are established as permit conditions."*

E. Jurisdictional Runoff Management Programs

Purpose: Provision E includes the requirements for the jurisdictional runoff management programs to be implemented by each of the Copermittees. Compliance with the requirements for the jurisdictional runoff management programs will allow the Copermittees to demonstrate that they are implementing programs to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP. The jurisdictional runoff management program document prepared by each Copermittee will also provide the details for implementing the water quality improvement strategies identified in the Water Quality Improvement Plan specifically within its jurisdiction.

***Discussion*:** Implementation of the jurisdictional runoff management program requirements under Provision E is how the Copermittees "*effectively prohibit non-stormwater discharges into the storm sewer,*" and outlines the "*controls to reduce the discharge of pollutants to the maximum extent practicable"* consistent with the federal regulations under 40 CFR 122.26. The jurisdictional runoff management program is part of the "*comprehensive planning process*" that is required pursuant to 40 CFR 122.26(d)(2)(iv). Where the Water Quality Improvement Plan is the "*comprehensive planning process*" on a Watershed Management Area scale, requiring "*intergovernmental coordination,*" the jurisdictional runoff management program document is the "*comprehensive planning process*" on a jurisdictional scale that should be coordinated with the other Copermittees in the Watershed Management Area to achieve the goals of the Water Quality Improvement Plan.

The jurisdictional runoff management program requirements are included to provide each Copermittee criteria that can be used to demonstrate that its storm water management program is implementing the "*comprehensive planning process*" within its jurisdiction to "*effectively prohibit non-stormwater discharges into the storm sewers,*" and to identify and implement the most effective "*controls to reduce the discharge of pollutants to the maximum extent practicable"* in accordance with the performance standards given in the CWA.

Provision E includes the requirements for each of the components that must be included in the Copermittee's jurisdictional runoff management program document that will be implemented by the Copermittee within its jurisdiction. Implementation of the components of each Copermittee's jurisdictional runoff management program must incorporate the water quality improvement strategies identified by each Copermittee in the Water Quality Improvement Plans, described pursuant to Provision B.3.b.(1)(a).

More specific and detailed discussions of the requirements of Provision E are provided below.

Provision E.1 (Legal Authority Establishment and Enforcement) requires each Copermittee to establish and enforce sufficient legal authority to control discharges to the MS4 within its jurisdiction.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system*" and be able to demonstrate that it can "*operate pursuant to legal authority established by statute, ordinance or series of contracts.*" Provision E.1.a describes the minimum legal authorities each Copermittee must establish for itself within its jurisdiction to control discharges to its MS4. The requirements of Provision E.1.a are consistent with the requirements set forth in 40 CFR 122.26(d)(2)(i)(A)-(F).

The certification statement required from each Copermittee by Provision E.1.b is included to provide the San Diego Water Board additional documentation that each Copermittee has established the legal authorities consistent with Provision E.1.a and 40 CFR 122.26(d)(2)(i)(A)-(F), and the Copermittee can "*operate pursuant to legal authority established by statute, ordinance or series of contracts.*"

Provision E.2 (Illicit Discharge Detection and Elimination) requires each Copermittee to implement an illicit discharge detection and elimination program to effectively prohibit non-storm water discharges to the MS4 by actively detecting and eliminating illicit discharges and disposal into its MS4. If the San Diego Water Board finds that a Copermittee is fully implementing the requirements of Provision E.2, then the Copermittee is deemed in compliance with the effective prohibition of non-storm water discharges to the MS4 required under Provision A.1.b.

Provision E.2 establishes the minimum requirements that each Copermittee must implement within its jurisdiction to effectively prohibit non-storm water discharges from entering its MS4. The federal CWA requires permits for municipal storm sewer systems to "*effectively prohibit non-storm water discharges into the storm sewers*." The federal regulations (40CFR122.26(d)(2)(i)(B)) require each Copermittee to establish the legal authority to prohibit illicit discharges to its MS4s. Under 40 CFR 122.26(d)(2)(iv)(B), each Copermittee must implement a "*program…to detect and remove…illicit discharges and improper disposal into the storm sewer.*" The federal NPDES regulations, under 40 CFR 122.26(b)(2), define illicit discharges as "*any discharge to a municipal separate storm sewer that is not composed entirely of storm water*." Thus, non-storm water discharges are not authorized to enter the MS4 and are considered to be illicit discharges, unless authorized by a separate NPDES permit.

The Phase I Final Rule clarifies that non-storm water discharges through an MS4 are not authorized under the CWA (55 FR 47995):

> "*Today's rule defines the term "illicit discharge" to describe any discharge through a municipal separate storm sewer system that is not composed entirely of storm water and that is not covered by an NPDES permit. Such illicit discharges are not*

> *authorized under the Clean Water Act. Section 402(p)(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit*."

The federal NPDES requirements for the program to address illicit discharges must include "*inspections, to implement and enforce an ordinance, orders, or other similar means to prevent illicit discharges to the MS4*." The federal NPDES regulations also reference several categories of "*non-storm water discharges or flows* [which] *shall be addressed where such discharges are identified…as sources of pollutants to waters of the United States*." The Phase I Final Rule (55 FR 48037) further clarified the requirements of 40 CFR 122.26(d)(2)(iv)(B)(1) as follows:

> "*EPA is clarifying that section 402(p)(3)(B) of the CWA (which requires permits for municipal separate storm sewers to 'effectively' prohibit non-storm water discharges) does not require permits for municipalities to prohibit certain discharges or flows of nonstorm water to waters of the United States through municipal separate storm sewers in all cases*."

In previous iterations of the municipal storm water permits for the San Diego Region, these categories were simply listed and referred to as categories of non-storm water discharges "not prohibited" unless identified as a source of pollutants. The Copermittees have often referred to these categories as "exempt" discharges. In both cases, however, the language is inconsistent with the federal CWA and NPDES regulations. And, the clarification provided in the Phase I Final Rule does not specifically state that such discharges are "not prohibited" or "exempt" or in any way authorized. The federal NPDES regulations do, however, state that specific categories of non-storm water discharges must be "*addressed*" if identified as "*sources of pollutants to waters of the United States*."

The language of Provision E.2.a has been revised to be fully consistent with the language of the CWA and the requirements of the federal regulations under 40 CFR 122.26(d)(2)(iv)(B)(1). Provision E.2.a requires each Copermittee to address <u>all</u> types of non-storm water discharges into its MS4 as illicit discharges, <u>unless</u> the discharge is authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to Provisions E.2.a.(1) through E.2.a.(5). Only non-NPDES-permitted non-storm water discharges identified as a category of non-storm water discharges under Provisions E.2.a.(1) through E.2.a.(5) <u>and</u> *not identified as a source of pollutants* do not have to be addressed as illicit discharges. Categories of non-storm water discharges that meet the requirements of Provisions E.2.a.(1) through E.2.a.(5) do not have to be addressed by the Copermittee as illicit discharges.

Several of the non-storm water categories listed in 40 CFR 122.26(d)(2)(iv)(B)(1) have not been included in Provisions E.2.a.(1) through E.2.a.(5), including: street wash water, landscape irrigation, irrigation water, and lawn watering. Because these are no longer included within the categories listed under Provisions E.2.a.(1) through E.2.a.(5), the Copermittees must prohibit these types of non-storm water discharges from entering the MS4. This is consistent with the clarification of 40 CFR 122.26(d)(2)(iv)(B)(1) in the Phase I Final Rule (55 FR 48037), which states:

> "*[T]he Director may include permit conditions that either require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*."

Street wash water is a category of non-storm water discharges that was removed when the Third Term Permits were issued. Street wash water is a source of several pollutants (e.g., metals, oil and grease, petroleum hydrocarbons, chlorinated solvents, sediment) which are generated during the street washing process. The removal of this category requires the Copermittees to prohibit this type of non-storm water discharge from entering the MS4.

The landscape irrigation, irrigation water, and lawn watering categories, collectively referred to hereafter as "over-irrigation" discharges, were removed from the list of non-storm water discharge categories in the Fourth Term Orange County and Riverside County Permits. Non-storm water discharges resulting from over-irrigation have been found to be a source of several types of pollutants (e.g., nutrients, bacteria, pesticides, sediment) in receiving waters. The San Diego Water Board and the Copermittees have identified categories of non-storm water discharges associated with over-irrigation as a source of pollutants and conveyance of pollutants to the MS4 and waters of the United States in the following documents:

- **SmartTimer/Edgescape Evaluation Program (SEEP) Grant Application**

  The State Water Board allocated grant funding to the SEEP project grant application submitted in 2006, which targeted irrigation runoff by retrofitting areas of existing development and documenting the conservation and runoff improvements. The basis of this grant project is that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 is a source and conveyance of pollutants. In addition, the grant application indicated that this alteration of natural flows is impacting the beneficial uses of waters of the state and U.S. Results from the study indicate that that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 *is* a source and conveyance of pollutants. The results of this study can be applied broadly to any area where over-irrigation takes place. The grant application included the following statements:

  > "*Irrigation runoff contributes flow & pollutant loads to creeks and beaches that are 303(d) listed for bacteria indicators.*"

"*Regional program managers agree that the reduction and/or elimination of irrigation-related urban flows and associated pollutant loads may be key to successful attainment of water quality and beneficial use goals as outlined in the San Diego Basin Plan and Bacteria TMDL over the long term.*"

"*Elevated dry-weather storm drain flows, composed primarily … of landscape irrigation water wasted as runoff, carry pollutants that impair recreational use and aquatic habitats all along Southern California's urbanized coastline. Storm drain systems carry the wasted water, along with landscape derived pollutants such as bacteria, nutrients and pesticides, to local creeks and the ocean. Given the local Mediterranean climate, excessive perennial dry season stream flows are an unnatural hydrologic pattern, causing species shifts in local riparian communities and warm, unseasonal contaminated freshwater plumes in the near-shore marine environment.*"

- **2006-2007 Orange County Watershed Action Plan Annual Reports**

The Watershed Action Plan Annual Reports for the 2006-2007 reporting period were submitted by the County of Orange, Orange County Flood Control District and Copermittees within the San Juan Creek, Laguna Coastal Streams, Aliso Creek, and Dana Point Coastal Streams Watersheds. San Juan Creek, Laguna Coastal Streams, Aliso Creek and Dana Point Coastal Streams are all currently 303(d) listed as impaired for indicator bacteria within their watersheds and/or in the Pacific Ocean at the discharge points of their watersheds. The Orange County Copermittees, within their Watershed Action Strategy Table for fecal indicator bacteria included the following:

"*Support programs to reduce or eliminate the discharge of anthropogenic dry weather nuisance flow throughout the…watershed. Dry weather flow is the transport medium for bacteria and other 303(d) constituents of concern.*"

Additionally, they state that "*conditions in the MS4 contribute to high seasonal bacteria propagation in-pipe during warm weather. Landscape irrigation is a major contributor to dry weather flow, both as surface runoff due to over-irrigation and overspray onto pavements; and as subsurface seepage that finds its way into the MS4.*"

- **Fiscal Year 2008 Carlsbad Watershed Urban Runoff Management Program Annual Report**

The Carlsbad Watershed Urban Runoff Management Program Annual Report for Fiscal Year 2008 was submitted by the Carlsbad Watershed Copermittees (Cities of Carlsbad, Encinitas, Escondido, Oceanside, San Marcos, Solana Beach, and Vista, and the County of San Diego). In the Annual Report, the Carlsbad Watershed Copermittees stated the following:

"The Carlsbad Watershed Management Area (WMA) collective watershed strategy identifies bacteria, sediment, and nutrients as high priority water quality pollutants in the Agua Hedionda (904.3 – bacteria and sediment), Buena Vista (904.2 – bacteria), and San Marcos Creek (904.5 – nutrients) Hydrologic Areas. Bacteria, sediment, and nutrients have been identified as potential discharges from over-irrigation."

- **2007-2008 San Diego Bay Watershed Urban Runoff Management Program Annual Report**

  The San Diego Bay Watershed Urban Runoff Management Program 2007-2008 Annual Report was submitted by the San Diego Bay Watershed Copermittees (Cities of Chula Vista, Coronado, Imperial Beach, La Mesa, Lemon Grove, National City, and San Diego, the County of San Diego, the Port of San Diego, and the San Diego County Airport Authority). In Appendix D of the Annual Report, titled "Likely Sources of Pollutants," the San Diego Bay Watershed Copermittees identified over-irrigation of lawns as a pollutant generating activity from business and/or residential land uses for bacteria, pesticides, and sediment.

- **Copermittee Public Education Materials**

  The Orange County Public Works *Tips for Landscape & Gardening* public education brochure states: "*Fertilizers, pesticides and other chemicals that are left on yards or driveways can be blown or washed into storm drains that flow to the ocean. Overwatering lawns can also send materials into storm drains*."

  The Riverside County Flood Control and Water Conservation District *Landscape and Garden* public education brochure states: *"Soil, yard wastes, over-watering and garden chemicals become part of the urban runoff mix that winds its way through streets, gutters and storm drains before entering lakes, rivers, streams, etc. Urban runoff pollution contaminates water and harms aquatic life!"*

- **Los Peñasquitos Lagoon Sedimentation/Siltation TMDL Technical Report**

  The Los Peñasquitos Lagoon Sedimentation/Siltation TMDL technical report was prepared for the City of San Diego and USEPA in October 2010. The technical report was included as a technical supporting document attached to the Sediment TMDL for Los Peñasquitos Lagoon staff report prepared by the San Diego Water Board, dated June 13, 2012. Under the Source Assessment section, the technical report states the following:

  "*Dry weather loading is dominated by nuisance flows from urban land use activities such as car washing, sidewalk washing, and lawn over-irrigation, which pick up and transport sediment into receiving waters.*"

These documents confirm that non-storm water discharges associated with over-irrigation are a source of pollutants and should be addressed as illicit discharges to the MS4. Prohibiting non-storm water discharges associated with over-irrigation, however, is not a new requirement for the Copermittees because it is also consistent with and required by the Water Conservation in Landscaping Act (AB 1881, Laird).

The Water Conservation in Landscaping Act required the Department of Water Resources (DWR) to prepare a Model Water Efficient Landscape Ordinance for use by local agencies (e.g. the Copermittees). All local agencies were required to adopt a water efficient landscape ordinance by January 1, 2010. Local agencies could adopt the Water Efficient Landscape Ordinance developed by DWR, or an ordinance considered at least as effective as the Model Ordinance. The Water Efficient Landscape Ordinance includes a requirement that local agencies prohibit runoff from irrigation (§ 493.2):

> "*Local agencies shall prevent water waste resulting from inefficient landscape irrigation by <u>prohibiting runoff from leaving the target landscape</u> [emphasis added] due to low head drainage, overspray, or other similar conditions where water flows onto adjacent property, non-irrigated areas, walks, roadways, parking lots, or structures. Penalties for violation of these prohibitions shall be established locally*."

Furthermore, non-storm water discharges from over-irrigation not only transport and discharge pollutants to receiving waters, but are also a likely source of the dry weather flows causing changes to habitat within and along the receiving water bodies. Examples of habitat changes from the dry weather flows include perennialization of ephemeral streams, and conversion of saltwater and brackish water marsh habitats to freshwater marsh habitats (e.g. Los Peñasquitos Lagoon). Both of these examples have resulted in the promotion of invasive species in several areas of the San Diego Region.

The removal of the over-irrigation discharges categories does not require the Copermittees to strictly prohibit lawn and landscape irrigation, but does require the prohibition of excessive irrigation water that results in non-storm water discharges to the MS4. Non-storm water discharges to the MS4 from over-irrigation must be addressed as illicit discharges by the Copermittees pursuant to the requirements of Provision E.2.

The remaining non-storm water categories listed in 40 CFR 122.26(d)(2)(iv)(B)(1) are listed under Provisions E.2.a.(1) through E.2.a.(5) and generally fall into four categories: (1) non-storm water discharges subject to existing San Diego Water Board waste discharge requirements and NPDES permits; (2) non-storm water discharges generally not expected to be a source of pollutants to receiving waters; (3) non-storm water discharges likely to contain pollutants requiring some form of control to address

the pollutants prior to discharging to the MS4; and (4) non-storm water discharges or flows associated with firefighting.

Provisions E.2.a.(1) and E.2.a.(2) include several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) for which the San Diego Water Board already has developed general waste discharge requirements and NPDES permits to address the discharges. The Copermittees are only required to address these types of non-storm water discharges as illicit discharges if the Copermittees or the San Diego Water Board identifies these non-storm water discharges not having coverage under the applicable NPDES permit.

Provision E.2.a.(3) includes several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) which are generally not expected to be a source of pollutants to receiving waters, many of which originate from what are typically natural, uncontrollable sources. The Copermittees are only required to address these types of non-storm water discharges as illicit discharges if the Copermittees or the San Diego Water Board identifies these non-storm water discharges as a source of pollutants to receiving waters. Because many of these sources are generally uncontrollable, enforcing a prohibition may not be a possibility for the Copermittees. The Copermittees would be able to address these non-storm water discharges by preventing these non-storm water discharges from entering the MS4. This could potentially be achieved by sealing their MS4 structures so the discharges cannot enter the MS4.

Provision E.2.a.(4) includes several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) that are likely to contain pollutants requiring some form of control to address the pollutants prior to discharging to the MS4. At this time, an outright prohibition of these types of non-storm water discharges does not yet appear to be warranted. Thus, Provision E.2.a.(4) includes several requirements for the Copermittees to control the pollutants from these types of non-storm water discharges. This is consistent with the clarification of the federal regulations in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board has the authority to require the Copermittees to "*control any of these types of discharges where appropriate*."

Unlike non-storm water discharges from over-irrigation, these types of non-storm water discharges are not expected to occur in close proximity to each other or very frequently. Provided these types of non-storm water discharges are controlled as required in Provision E.2.a.(4), the Copermittees would only be required to address these types of non-storm water discharges as illicit discharges if the Copermittee or the San Diego Water Board identifies these non-storm water discharges as a source of pollutants to receiving waters.

Provision E.2.a.(5) includes specific requirements for fire fighting discharges and flows. The requirements for non-storm water discharges and flows associated with fire

fighting have been separated into requirements for: a) non-emergency fire fighting discharges and flows, and b) emergency fire fighting discharges and flows.

The San Diego Water Board has found that discharges from building fire suppression system maintenance (e.g. fire sprinklers) contain waste and potentially a significant source of pollutants to receiving waters. As such, the San Diego Water Board is requiring these discharges be addressed as illicit discharges by the Copermittees. Thus, the discharges to the MS4 are to be prohibited via ordinance, order or similar means. For other non-emergency firefighting discharges and flows (i.e. flows from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems), the Copermittees are required to develop and implement a program to address pollutants in these non-storm water discharges and flows. This is consistent with the clarification of the federal regulations in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board has the authority to require the Copermittees to "*control any of these types of discharges where appropriate*."

For emergency firefighting discharges and flows, the Phase I Final Rule (55 FR 48037) has clarified the requirements of 40 CFR 122.26(d)(2)(iv)(B)(1) pertaining to emergency firefighting flows and discharges, which states:

> "*In the case of firefighting it is not the intention of these rules to prohibit in any circumstances the protection of life and public or private property through the use of water or other fire retardants that flow into separate storm sewers*."

Thus, the requirements have been made to be consistent with the guidance provided by the Phase I Final Rule. The Order recommends that the Copermittees develop and encourage implementation of BMPs to reduce or eliminate the discharge of pollutants from emergency firefighting flows to the MS4s and receiving waters. The Order does not include any requirements that should be interpreted as requiring the implementation of BMPs for emergency firefighting flows to the MS4s and receiving waters.

The Copermittees are expected to review the dry weather MS4 outfall discharge monitoring data they collect to determine if and when there are non-storm water discharges to or from their MS4s that are a source of pollutants to receiving waters. If the Copermittees identify one of the types of non-storm water discharges listed in Provisions E.2.a.(1) through E.2.a.(4) as a source of pollutants to receiving waters based on the review and evaluation of monitoring data, Provision E.2.a.(6) requires the Copermittees to prohibit those categories of discharges from entering the MS4 through ordinance, order or similar means. In addition, Provision E.2.a.(6) clarifies that the San Diego Water Board may identify categories of non-storm water discharges or flows listed under Provisions E.2.a.(1) through E.2.a.(4) that must be prohibited.

Provision E.2.a.(6) also provides the Copermittees an option to propose controls to be implemented for the category of non-storm water discharges as part of the Water Quality Improvement Plan instead of prohibiting the category of non-storm water discharges. If the Water Quality Improvement Plan is accepted by the San Diego Water Board with the proposed controls, the Copermittees will not be required to prohibit the category of non-storm water discharges to their MS4s as long as the controls are implemented. This is consistent with the clarification of 40 CFR 122.26(d)(2)(iv)(B)(1) in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board may "*require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*."

Finally, Provision E.2.a.(7) has been included in the requirements for non-storm water discharges to clarify that any non-storm water discharges to the Copermittee's MS4, even those identified pursuant to Provisions E.2.a.(1) through E.2.a.(4), must be reduced or eliminated, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit. Provision E.2.a.(7) is consistent with the requirements of CWA section 402(p)(3)(B)(ii) and 40 CFR 122.26(d)(1)(v)(B), as clarified in the Phase I Final Rule (55 FR 47995) that "*[u]ltimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit*." However, the reduction or elimination of those non-storm water discharges are expected to be achieved as feasible, in accordance with the priorities in the Water Quality Improvement Plan and when the resources are available to the Copermittee.

Consistent with 40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(1), each Copermittee must implement a "*program…to prevent illicit discharges to the municipal storm sewer system*" and "*detect…illicit discharges and improper disposal into the storm sewer.*" Provision E.2.b requires each Copermittee to implement measures to prevent and detect illicit discharges and connections to its MS4 as part of its illicit discharge detection and elimination program.

As part of the program to prevent and detect illicit discharges to the MS4, 40 CFR 122.26(d)(2)(iv)(B)(2) requires "*procedures to conduct on-going field screening activities during the life of the permit, including areas or locations that will be evaluated by such field screens*." As part of the procedures, each Copermittee is required to maintain an updated map of its entire MS4 and the corresponding drainage areas within its jurisdiction. Having knowledge about where inlets, access points, connections with other MS4s, and outfalls are located is necessary for each Copermittee to track, identify, and eliminate illicit discharges and connections. Thus, Provision E.2.b.(1) of the Order specifies that the map must include the segments of the storm sewer system owned, operated, and maintained by the Copermittee, and include locations of all known inlets, connections with other MS4s, and outfalls to the Copermittee's MS4. The remaining requirements of Provision E.2.b are consistent with the requirements of 40 CFR 122.26(d)(2)(iv)(B)(3)-(7) related to implementing measures to prevent and detect illicit discharges and connections to the MS4.

Provision E.2.c requires each Copermittee to conduct field screening and monitoring of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4. Field screening is a required element of the program to detect and eliminate illicit discharges and connections to the MS4, pursuant to 40 CFR 122.26(d)(2)(iv)(B)(2). The field screening requirement will be implemented through the dry weather MS4 outfall discharge monitoring required under Provisions D.2.a.(2) and D.2.b.(1).

Provision E.2.d specifies the measures each Copermittee must implement to eliminate illicit discharges and connections to its MS4. Elimination of illicit discharges and connections to the MS4 is consistent with the requirement of 40 CFR 122.26(d)(2)(iv)(B) "*to detect and remove [emphasis added]…illicit discharges and improper disposal into the storm sewer*" and will achieve the CWA requirement for MS4 permits to "*effectively prohibit non-storm water discharges into the storm sewers*."

Generally, each Copermittee is responsible for prioritizing its efforts to eliminate non-storm water and illicit discharges or connections to its MS4 based on field screening and monitoring data, NALs, illicit discharge investigation records, and the known or suspected sources. Sources of non-storm water and illicit discharges or connections must be eliminated by enforcing the legal authority established by each Copermittee pursuant to Provision E.1.

Provision E.3 (Development Planning) requires each Copermittee to use its land use and planning authority to implement a development planning program to control and reduce the discharge of pollutants in storm water from new development and significant redevelopment to the MEP. Proper implementation of the development planning program will also contribute toward effectively prohibiting non-storm water discharges from development projects to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." As part of the management program, 40 CFR 122.26(d)(2)(iv)(A)(2) requires "*planning procedures including a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment*."

Land development generally alters the natural conditions of the land by removing vegetative cover, compacting soil, and/or placement of concrete, asphalt, or other impervious surfaces. These impervious surfaces concentrate urban pollutants (such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not found in high concentrations in the natural environment. Pollutants that

accumulate on impervious surfaces are not easily biodegraded nor subject to natural treatment processes.

Impervious surfaces greatly affect the natural hydrology of the land because they do not allow natural infiltration and treatment of storm water runoff to take place. Instead, storm water runoff from impervious surfaces is typically directed through pipes, curbs, gutters, and other hardscape into receiving waters, with little treatment, at significantly increased volumes and accelerated flow rates over what would occur naturally. The increased pollutant loads, storm water volume, discharge rates and velocities, and discharge durations from the MS4 adversely impact stream habitat by causing accelerated, unnatural erosion and scouring within creek bed and banks. Placement of impervious surfaces also encapsulates "good" sediment (such as sand, gravel, rocks and cobbles) that would normally replenish creek beds and banks to help stabilize them. Collectively, these changes to natural hydrologic processes are termed hydrograph modification, or hydromodification.

Hydromodification, which is caused by both altered storm water flow and altered sediment flow regimes, is largely responsible for degradation of creeks, streams, and associated habitats in the San Diego Region. In an ongoing study by the Stormwater Monitoring Coalition to assess the health of streams throughout Southern California, researchers found that three of the four highest risk stressors to creeks (percent sands and fines present, channel alteration, and riparian disturbance) were related to physical habitat.[29] Researchers studying flood frequencies in Riverside County have found that increases in watershed imperviousness of only 9-22 percent can result in increases in peak flow rates for the two-year storm event of up to 100 percent.[30] Such changes in runoff have significant impacts on channel morphology.

In addition, a technical report issued by the Southern California Coastal Water Research Project (SCCWRP) stated that "*[r]ecent studies indicate that California's intermittent and ephemeral streams are more susceptible to the effects of hydromodification than streams from other parts of the United States. Physical degradation of stream channels in the central and eastern United States can initially be detected when watershed impervious cover approaches 10 percent, although biological effects (which may be more difficult to detect) may occur at lower levels. In contrast, initial response of streams in the semi-arid portions of California appears to occur between 3 and 5 percent impervious cover.*"[31] These studies highlight the extent to which impacts originating from impervious surfaces created by land development are responsible for the degradation of creek and stream habitat.

[29] Assessing the Health of Southern California Streams, Stormwater Monitoring Coalition, Fact Sheet
[30] Schueler and Holland, 2000. Storm Water Strategies for Arid and Semi-Arid Watersheds (Article 66). The Practice of Watershed Protection.
[31] Stein, E. and Zaleski, S., 2005. Technical Report 475, Managing Runoff to Protect Natural Streams: The Latest Development on Investigation and Management of Hydromodification in California. December 30, 2005.

This is consistent with what USEPA has noted, that "*[m]ost stormwater runoff is the result of the man-made hydrologic modifications that normally accompany development. The addition of impervious surfaces, soil compaction, and tree and vegetation removal result in alterations to the movement of water through the environment. As interception, evapotranspiration, and infiltration are reduced and precipitation is converted to overland flow, these modifications affect not only the characteristics of the developed site but also the watershed in which the development is located. Stormwater has been identified as one of the leading sources of pollution for all waterbody types in the United States. Furthermore, the impacts of stormwater pollution are not static; they usually increase with more development and urbanization*."[32]

Reducing the impact from the increased pollutant loads and flows generated by impervious surfaces within a watershed is essential to protecting and restoring the integrity of the receiving waters. Provision E.3 includes the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment*." The requirements of Provision E.3 will 1) minimize the generation and discharge of pollutants in storm water from the MS4, and 2) minimize the potential of storm water discharges from the MS4 from causing altered flow regimes and excessive downstream erosion in receiving waters.

The requirements of Provision E.3.a include the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment*" applicable to all development projects, regardless of size or purpose of development. In general, all development projects must implement onsite BMPs to remove pollutants from runoff prior to its discharge to any receiving waters, as close to the pollutant generating source as possible, and structural BMPs must not be constructed within waters of the U.S.

Furthermore, the onsite BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors (e.g. mosquitos, rodents, and flies). If not properly designed or maintained, certain BMPs implemented or required by municipalities may create a habitat for vectors. Monitoring studies conducted by the California Department of Public Health (CDPH) have documented that mosquitoes opportunistically breed in structural storm water BMPs, particularly those that hold standing water for over 96 hours. Certain site design features that hold standing water may similarly produce mosquitoes.

[32] USEPA, 2007. Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices, December 2007.

Structural BMPs and site design features should incorporate design, construction, and maintenance principles to promote drainage within 96 hours to minimize standing water available to mosquitoes. Nuisances and public health impacts resulting from vector breeding can be prevented with close collaboration and cooperative effort between municipalities and local vector control agencies and the CDPH during the development and implementation of storm water runoff management programs. The CDPH also has issued guidance for BMP implementation that will minimize potential nuisances and public health impacts resulting from vector breeding.[33]

All development projects are required to implement source control BMPs that will minimize the generation of pollutants. Additionally, each development project must implement, where applicable and feasible, low impact development (LID) BMPs to mimic the natural hydrology of the site and retain and/or treat pollutants in storm water runoff prior to discharging to and from the MS4.

The LID Center defines LID as "*a comprehensive land planning and engineering design approach with a goal of maintaining and enhancing the pre-development hydrologic regime of urban and developing watersheds.*"[34] LID designs seek to control storm water at the source, using small-scale integrated site design and management practices to mimic the natural hydrology of a site, retain storm water runoff by minimizing soil compaction and impervious surfaces, and disconnect storm water runoff from conveyances to the storm drain system.

LID BMPs may utilize interception, storage, evaporation, evapotranspiration, infiltration, and filtration processes to retain and/or treat pollutants in storm water before it is discharged from a site. Because of these numerous options, the San Diego Water Board expects that every development project will be able to implement some form of LID BMPs. Examples of LID BMPs include using permeable pavements, rain gardens, rain barrels, grassy swales, soil amendments, and native plants.

Provision E.3.a also includes requirements for all development projects to, where feasible, landscape with native and/or low water use plants to minimize the discharge of non-storm water discharges associated with excessive irrigation, as well as harvest (i.e., storage) and use precipitation to promote the concept of utilizing storm water as a resource.

While all development projects are subject to the requirements of Provision E.3.a, Provision E.3.b identifies Priority Development Projects that exceed given size thresholds and/or fit under specific use categories. Priority Development Projects are required to incorporate specific performance criteria for structural BMPs into the

[33] California Department of Public Health, 2012. Best Management Practices for Mosquito Control in California. (http://www.cdph.ca.gov/HealthInfo/discond/Documents/BMPforMosquitoControl07-12.pdf)
[34] www.lowimpactdevelopment.org

project plan to reduce the generation of pollutants, and address potential impacts from hydromodification.

The Priority Development Project categories are based on the requirements of the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), and do not differ significantly from the Fourth Term Permit for San Diego County. Furthermore, the Priority Development Project categories are consistent with Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), and Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit).

Because of the impact of relatively small increases in watershed impervious surfaces to receiving waters, Provision E.3.b.(1)(c)(iv) has been updated to include large driveways that are 5,000 square feet or more. The San Diego Water Board finds that large driveways can exacerbate altered flow regimes if not properly controlled.

Provision E.3.b.(3) describes projects that are exempt from Priority Development Project status. These include new or retrofit paved sidewalks, bicycle lanes, or trails that are designed and constructed to direct runoff to vegetated areas or be hydraulically disconnected from paved areas. The exemptions have been provided to encourage these types of projects because they provide multiple environmental benefits, such as promoting walking rather than driving, which will in turn improve air quality. Additionally, retrofitting of existing alleys, streets, or roads are exempt from Priority Development Project status if they are constructed using USEPA Green Streets guidance.[35] By doing so, retrofitting of these types of projects is encouraged. The San Diego Water Board recognizes that there are spatial constraints associated with these projects, and implementation of structural BMPs are not always feasible.

For development projects identified as Priority Development Projects, the requirements of Provision E.3.c are the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment.*" Provisions E.3.c.(1)-(3) describe the performance criteria for the structural BMPs that must be implemented for each Priority Development Project defined by Provision E.3.b.

Provision E.3.c.(1) describes the storm water pollutant control BMP requirements that must be implemented by all Priority Development Projects. The purpose of Provision E.3.c.(1) is to reduce pollutants in storm water runoff to the MEP from Priority Development Projects before it is discharged to the MS4. Of all the available treatment processes available, retention of storm water, and therefore capture of the

[35] "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).

pollutants in the storm water, will achieve 100 percent pollutant removal efficiency for the volume of storm water retained. No other method of treatment can achieve 100 percent pollutant removal efficiency. Thus, retention of as much storm water onsite is the most effective way to reduce pollutants in storm water discharges to, and consequently from the MS4, and controls pollutants in storm water discharges from a site to the MEP.

Under Provision E.3.c.(1)(a), retention of the pollutants in the runoff produced from the 85th percentile storm event ("design capture volume") is the design standard to which Priority Development Projects must comply. Since the 85th percentile storm event has previously been used as the numeric design standard for treatment control BMPs, this same size storm event is used as the numeric design standard for storm water retention. This is the MEP standard recognized by the San Diego Water Board and is consistent with the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), as well as Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit), and Los Angeles Water Board Order No. R4-2012-0175 (Los Angeles County MS4 Permit).

The 85th percentile storm event is the event that has a precipitation total greater than or equal to 85 percent of all storm events over a given period of record in a specific area or location. For example, to determine what the 85th percentile storm event is in a specific location, all 24 hour storms that have recorded values over a 30 year period would be tabulated and a 85th percentile storm would be determined from this record (i.e. 15 percent of the storms would be greater than the number determined to be the 85th percentile storm). Most jurisdictions in the San Diego Region have already developed isopluvial maps that can provide this type of information. The 85th percentile storm might be determined to be a number such as 1.0 inch, and this would be multiplied by the total area of the project footprint producing runoff to calculate the design capture volume. The Priority Development Project designer would then select a system of BMPs that would retain (i.e. intercept, store, infiltrate, evaporate, or evapotranspire) the pollutants contained in the design capture volume onsite.

Retention BMPs are necessary to capture and retain pollutants generated from a Priority Development Project. In a recent study performed by SCCWRP in the Los Angeles Region, they found "*that the magnitude of constituent load associated with storm water runoff depends, at least in part, on the amount of time available for pollutant build-up on land surfaces. The extended dry period that typically occurs in arid climates such as southern California maximizes the time for constituents to build-up on land surfaces, resulting in proportionally higher concentrations and loads during*

initial storms of the season."[36] This implies that the "first flush" of a rainy season and the first storm events after long antecedent dry periods tend to have the highest pollutant loads. Capturing and retaining the pollutant loads of the "first flush" of a rainy season and the first storm events after long antecedent dry periods will reduce a significant portion of the pollutants in storm water discharged to and from the MS4.

The San Diego Water Board, however, acknowledges that in some situations retention of the full design capture volume onsite may not be technically feasible. In this event, the Copermittee may allow the Priority Development Project to use biofiltration BMPs to treat 1.5 times the design capture volume not reliably retained onsite, or biofiltration BMPs with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite.

The 1.5 multiplier is based on the finding in the Ventura County Technical Guidance Manual that biofiltration of 1.5 times the design capture volume not retained onsite will provide approximately the same pollutant removal as retention of the design capture volume on an annual basis.[37] This standard is consistent with the Los Angeles Water Board's Los Angeles County and Ventura County municipal storm water permits (Order Nos. R4-2012-0175 and R4-2010-0108, respectively). The flow-thru design of 0.75 times the portion of the design capture volume not reliably retained onsite is consistent with the San Diego Water Board's Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively). In either case, the biofiltration BMPs must be designed with an appropriate hydraulic loading rate to maximize storm water retention and pollutant removal, as well as to prevent erosion, scour, and channeling within the BMP. Each Copermittee is required to update its BMP Design Manual to provide guidance for hydraulic loading rates and other biofiltration design criteria necessary to maximize storm water retention and pollutant removal.

The San Diego Water Board further recognizes that, in addition to not being technically feasible, retention of the full design capture storm onsite may be cost prohibitive, or may not provide as much water quality benefit to the Watershed Management Area as would implementing BMPs elsewhere in the watershed. Thus, Provision E.3.c.(1)(b) allows for the use of a combination of onsite retention BMPs, and the implementation of an Alternative Compliance Program described in Provision E.3.c.(3). Provision E.3.c.(3) is discussed in more detail below.

If the full design capture volume is not retained onsite either because biofiltration is not technically feasible, or a Copermittee grants a Priority Development Project permission

[36] Stein, E.D., Tiefenthaler, L.L., and Schiff, K.C., 2007. Technical Report 510, Sources, Patterns and Mechanisms of Storm Water Pollutant Loading from Watershed and Land Uses of the Greater Los Angeles Area, California, USA. March 20, 2007.
[37] Ventura Countywide Stormwater Management Program. 2011. Ventura Technical Guidance Manual, Manual Update, 2011.

to utilize the Alternative Compliance Program, then the pollutants in the portion of the design capture volume that are not reliably retained onsite must still be reduced to the MEP. Thus, flow-thru treatment control BMPs are required to be implemented on Priority Development Projects in addition to the retention BMPs. The requirements of Provisions E.3.c.(1)(a)(ii)[a]-[c] include the performance standards for flow-thru treatment control BMPs, consistent with the Fourth Term Permits in the San Diego Region.

Whereas the purpose of the requirements under Provision E.3.c.(1) is to reduce pollutants in storm water runoff to the MEP, the purpose of the requirements under Provision E.3.c.(2) is to maintain or restore more natural hydrologic flow regimes to prevent accelerated, unnatural erosion in downstream receiving waters, also to the MEP standard. Provision E.3.c.(2) describes hydromodification management BMP requirements that must be implemented by all Priority Development Projects.

The performance criteria for the implementation of hydromodification management BMPs on Priority Development Projects are consistent with the requirements in the Fourth Term Permits for Orange and Riverside Counties (Order Nos. R9-2009-0002 and R9-2010-0016, respectively). Modifications to the Orange County and Riverside County Hydromodification Management Plans (HMPs) will likely be minor, or may not be necessary. The HMP for San Diego County will likely require some minor modifications to incorporate the requirements of Provision E.3.c.(2) and become consistent with the Orange County and Riverside County HMPs. The San Diego Water Board does not, however, expect that it will be necessary for the San Diego County Copermittees to develop a new approach or significantly re-write the San Diego County HMP. This is because the premise of the hydromodification management BMP requirements, which are to control storm water runoff conditions (flow rates and durations) for Copermittee-defined range of flows, is unchanged from all Fourth Term Permits in the San Diego Region.

Provision E.3.c.(2)(a) requires that post-project runoff conditions mimic the *pre-development* runoff conditions, and not the *pre-project* runoff conditions. Fundamentally, the San Diego Water Board believes that using a hydrology baseline that approximates that of an undeveloped, natural watershed is the only way to facilitate the return of more natural hydrological conditions to already built-out watersheds, and ultimately improved stream health. On the other hand, using the *pre-project* hydrology as a baseline for redevelopment projects results in propagating the unnatural hydrology of urbanized areas. Propagating the urbanized flow regime does not support conditions for restoring degraded or channelized stream segments, and would forever sentence such streams to the degraded state. Furthermore, reducing the volume of storm water runoff associated with the urbanized flow regime will also result in reducing the discharge of pollutants into receiving waters, since storm water runoff from impervious surfaces contains untreated pollutants.

The San Diego Water Board understands that approximating the pre-development runoff condition associated with a redevelopment site is not necessarily straightforward because factors such as natural grade and native vegetation for the site cannot be precisely known. Therefore, the San Diego Water Board does not expect project designers to estimate historical conditions associated with redevelopment sites. Rather, the San Diego Water Board expects project designers and the Copermittees to approximate pre-development runoff conditions using the parameters of a *pervious* area rather than an *impervious* area. This means that for redevelopment sites, approximating pre-development runoff conditions equates to using existing onsite grade and assuming the infiltration characteristics of the underlying soil. A redevelopment Priority Development Project must not use runoff coefficients of concrete or asphalt to estimate pre-development runoff conditions. Rather, redevelopment projects must use available information pertaining to existing underlying soil type (such as soil maps published by the National Resource Conservation Service), onsite existing grade, and any other readily available pertinent information to estimate pre-development runoff conditions.

The San Diego Water Board understands, indeed asserts, that the pre-development hydrology of an area in question can only be roughly estimated and cannot be precisely known. However, using the hydrology of a natural condition, even if not precisely known, will provide significant benefit to receiving waters over using the hydrology associated with impervious (developed) surfaces. Therefore in order to achieve the goals of the Clean Water Act, which are to "*restore and maintain the chemical, physical, and biological integrity of the nation's waters* [emphasis added]," the most appropriate standard to use for hydromodification management is the standard associated with the pre-development condition.

Provision E.3.c.(2)(b) requires Priority Development Projects to avoid known critical sediment yield areas or implement measures that would allow coarse sediment to be discharged to receiving waters, such that the natural sediment supply is unaffected by the project. This is necessary because the availability of coarse sediment supply is as much an issue for causing erosive conditions to receiving streams as are accelerated flows.

The San Diego Water Board recognizes that in some situations implementing the hydromodification management BMP requirements for flow control fully onsite may not be technically feasible, may be cost prohibitive, or may not provide any overall water quality benefits to the Watershed Management Area. Thus, Provision E.3.c.(2)(c) allows for the use of a combination of onsite hydromodification management BMPs for flow control and alternative compliance options described in Provision E.3.c.(3).

Provision E.3.c.(3) allows for alternative compliance in instances where the Copermittee determines that offsite measures will have a greater overall water quality benefit for the Watershed Management Area than if the Priority Development Project were to implement structural BMPs onsite. Consequently, watershed-specific

structural BMP requirements are present in this Order in the form of allowable compliance offsite. The Alternative Compliance Program to Onsite Structural BMP Implementation Provision is intended to integrate with the Copermittees' planning efforts in the Water Quality Improvement Plans.

The Alternative Compliance Program is an option for Priority Development Projects where the governing Copermittee has participated in the development of a Watershed Management Area Analysis as part of the Water Quality Improvement Plan (described in Provision B.3.b.(4)). Such an approach is consistent with the latest findings in hydromodification management by the scientific community. In a Technical Report entitled *Hydromodification Assessment and Management in California,*[38] the report states:

> *"An effective [hydromodification] management program will likely include combinations of on-site measures (e.g., low-impact development techniques, flow-control basins), in-stream measures (e.g., stream habitat restoration), floodplain and riparian zone actions, and off-site measures. Off-site measures may include compensatory mitigation measures at upstream locations that are designed to help restore and manage flow and sediment yield in the watershed."*

Consistent with the ideas brought forth in the report, in the Watershed Management Area Analysis of Provision B.3.b.(4), which is optional, the Copermittees will develop watershed maps that include as much detail about factors that affect the hydrology of the watershed as is available. Such factors included identification of areas suitable for infiltration, coarse sediment supply areas, and locating stream channel structures and constrictions. Once these factors are mapped and studied, the Copermittees can identify areas in the watershed where candidate projects may be implemented that are expected to improve water quality in the watershed by providing more opportunity for infiltration, slowing down storm water flows, or attenuation of pollutants naturally via healthy stream habitat. These candidate projects may be in the form of retrofitting existing development, rehabilitating degraded stream segments, identifying regional BMPs, purchasing land to preserve valuable floodplain functions, and any other project(s) that the Copermittees identify.

Under the Alternative Compliance Program, Priority Development Projects may be allowed to fund, partially fund, or implement a candidate project, in lieu of implementing structural BMPs onsite, if they enter into a voluntary agreement with the governing Copermittee permitting this arrangement. Project proponents may also propose an alternative project not previously identified by the Copermittees. In either case, whether a project proponent implements a candidate project identified by the Copermittees or a separate alternative compliance project, the governing Copermittee must determine that implementation of the project will have a greater overall water

[38] 2012. ED Stein, F Federico, DB Booth, BP Bledsoe, C Bowles, Z Rubin, GM Kondolf, A Sengupta. Technical Report 667. Southern California Coastal Water Research Project. Costa Mesa, CA.

quality benefit for the Watershed Management Area than fully implementing structural BMPs onsite. Determination of greater overall water quality benefits associated with alternative compliance projects would be accomplished by utilizing Water Quality Equivalency calculations developed pursuant to Provision E.3.c.(3)(a). Water Quality Equivalency calculations are necessary to establish a regional and technical basis for determining water quality benefits associated with alternative compliance projects, which can be consistently used by all Copermittees in the San Diego Region. Finally, if ~~I~~f alternative compliance involves funding or implementing a project that is outside the jurisdiction of the governing Copermittee, then that Copermittee may enter into an inter-agency agreement with the appropriate jurisdiction.

Finally, Provision E.3.c.(2)(d) allows Priority Development Projects to be exempt from the hydromodification management BMP requirements if there is no threat of erosion to downstream receiving waters (i.e. the receiving stream is concrete lined from the point of discharge all the way to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean). If the Copermittees believe that more exemptions are warranted, then they must perform the optional Watershed Management Area Analysis of Provision B.3.b.(4). Additional exemptions other than those specified in this Order may be established on a watershed basis, provided the Copermittees perform the analysis, provide supporting rationale for the exemptions, and complete the Water Quality Improvement Plan approval process pursuant to Provision F.1.

To facilitate the transition to this Order from the Fourth Term Permits for Orange and Riverside County Copermittees, Provision E.3.c.(2)(e) allows two additional temporary exemptions from hydromodification management BMP implementation. The first temporary exemption allows relief from hydromodification management BMP implementation for Priority Development Projects discharging directly to an engineered channel conveyance system with a capacity to convey peak flows generated by the 10-year storm event all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean. Similar to the exemption allowed for concrete-lined channels, this exemption is premised on the concept that there is little threat of erosion to these types of engineered channel systems.

The second temporary exemption allows relief from hydromodification management BMP implementation for Priority Development Projects discharging directly to large river reaches with drainage areas larger than 100 square miles and a 100-year flow capacity in excess of 20,000 cubic feet per second. If this exemption is claimed, then properly sized energy dissipation is required at all discharge points associated with the Priority Development Project. This exemption is premised on the concept that large river reaches can essentially assimilate the accelerated flow rates associated with individual Priority Development Projects because they are inconsequential compared

to the flow rate in the large river reach. Both of these exemptions are included in the Hydromodification Management Plan for San Diego County[39].

These temporary exemptions are allowed as a means to facilitate Orange and Riverside County Copermittees' transition to this Order from the Fourth Term Permits and are not meant to reside as permanent exemptions without additional rigorous technical analyses specific to each County. Therefore, these exemptions will no longer apply once the Copermittees' land development programs are fully updated to reflect the requirements of this Order, i.e., upon implementation of the BMP Design Manual pursuant to Provision F.2.b. If the Copermittees believe that these or other exemptions are warranted in the context of water quality improvement and stream restoration opportunities, then the Copermittees must perform the optional Watershed Management Area Analysis of Provision B.3.b.(4) and provide supporting rationale for the exemptions. The San Diego County Copermittees are also required to perform the optional Watershed Management Area Analysis to provide supporting rationale to justify use of these and other exemptions. Updated BMP Design Manuals including rationale to justify use of exemptions will be reviewed by the San Diego Water Board pursuant to Provision F.2.b.

Provisions E.3.c.(4) and E.3.c.(5) were included under the BMP requirements applicable to all development projects in the Fourth Term Permits for San Diego, Orange, and Riverside Counties (Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016, respectively). In this Order, the long-term BMP maintenance and infiltration and groundwater protection requirements apply to structural BMPs implemented by Priority Development Projects only.

Provision E.3.d requires the Copermittees to update their BMP Design Manual as needed to incorporate the requirements of Provision E.3. The BMP Design Manual is formerly known as the Standard Storm Water Mitigation Plan, or SSMP, and was renamed so that the title has a more accurate description of the document content. The contents of the BMP Design Manual are largely unchanged from the previous Standard Storm Water Mitigation Plans required under the Fourth Term Permits. The BMP Design Manual fulfills the 40 CFR 122.26(d)(2)(iv)(A)(2) requirement that the Copermittee's development planning program includes "*a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment*."

As part of the "*planning procedures,*" 40 CFR 122.26(d)(2)(iv)(A)(2) requires the procedures to "*address controls to reduce pollutants in discharges from municipal separate storm sewers after construction is completed*." The requirements applicable to the implementation and oversight of structural BMPs at Priority Development Projects are provided under Provision E.3.e.

[39] Final Hydromodification Management Plan Prepared for County of San Diego, March 2011

Proper installation of the structural BMPs approved for a Priority Development Project is necessary to ensure that pollutants in storm water discharges will be reduced to the MEP after the project is completed. In addition to the proper installation of structural BMPs, the maintenance of structural BMPs on Priority Development Projects is necessary to ensure that pollutants in storm water discharges will continue to be reduced to the MEP. Provision E.3.e.(1) includes the minimum requirements that each Copermittee must implement to ensure structural BMPs are properly installed and will be properly maintained.

Provisions E.3.e.(1)(a)(i)-(ii) have been included to provide additional clarification regarding when a Copermittee may allow land development requirements from earlier MS4 permits to apply to a Priority Development Project. Since the MS4 permits issued from 2001 to the adoption of Order No. R9-2015-0001 amending Order No. R9-2013-0001 (Regional MS4 Permit), a Copermittee could allow development projects with "prior lawful approval" to be "grandfathered" into implementing BMP requirements from previous MS4 permits. The Copermittees were given the discretion to use their land use authority to determine when it was appropriate to allow a development project with prior lawful approval to implement BMP requirements from the previous MS4 permits, and when the most recent BMP requirements should be required to achieve the reduction of pollutants in storm water runoff from development projects to the MEP. However, the San Diego Water Board has found that the Copermittees and the development community frequently disagree about when a development project has prior lawful approval and what is necessary to reduce pollutants in storm water runoff from development projects to the MEP.

Therefore, Provisions E.3.e.(1)(a)(i)-(ii) were included to provide more clarity and certainty for the Copermittees, the land development community, and the general public about when the structural BMP performance standards of earlier MS4 permits may be allowed to be implemented. A Copermittee may allow a Priority Development Project to implement BMP requirements of the previous MS4 permit only if all requirements of Provisions E.3.e.(1)(a)(i)[a]-[d] have been met. Otherwise, the Copermittees must require all Priority Development Projects to incorporate the BMP requirements of Provision E.3 into the project to reduce pollutants in storm water runoff from development projects to the MEP.

Provisions E.3.e.(1)(a)(i)[a]-[d] are dependent upon the effective date of the BMP Design Manual. Unless otherwise directed by the San Diego Water Board, the effective date of the BMP Design Manual is December 24, 2015 for the San Diego County Copermittees, September 28, 2017 for the Orange County Copermittees, and July 5, 2018 for the Riverside County Copermittees.

Alternatively, if the Copermittee can demonstrate a lack of land use authority or legal authority to require a Priority Development Project to implement the requirements of Provision E.3, the Copermittee may allow land development requirements from the

previous MS4 permits to apply. However, under these circumstances the San Diego Water Board expects the Copermittee to utilize its available land use authority or legal authority to require the implementation of as much of Provision E.3 as possible to reduce the discharge of pollutants in storm water from development and redevelopment projects within its jurisdiction to the MEP.

In cases where BMP requirements from the earlier MS4 permits govern the structural BMP design requirements of a Priority Development Project, the San Diego Water Board expects the Copermittees to be able to demonstrate, in a programmatic audit or other means, that a Priority Development Project met all the requirements listed under Provisions E.3.e.(1)(a)(i)[a]-[d], or have evidence that the Copermittee did not have the land use or legal authority to require the implementation of Provision E.3 for a Priority Development Project.

The requirements under Provision E.3.e.(2)-(3) are necessary to demonstrate each Copermittee is implementing a program that complies with Provisions E.3.b-c and E.3.e.(1), and ensure structural BMPs at Priority Development Project will continue to be able to reduce pollutants in storm water discharges to the MEP.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary for any development projects to compel compliance with the requirements of Provision E.3 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.3.f requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Provision E.4 (Construction Management) requires each Copermittee to implement a construction management program to control and reduce the discharge of pollutants in storm water from construction sites to the MEP. Proper implementation of the construction management program will also contribute toward effectively prohibiting non-storm water discharges from construction sites to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." As part of the management program, 40 CFR 122.26(d)(2)(iv)(D) requires "*a program to implement and maintain structural and non-structural best management practices to reduce pollutants in storm water runoff from construction sites to the municipal storm sewer system.*"

Construction sites can be significant sources of sediment, trash, and other pollutants to receiving waters. Although sediment is naturally occurring in the natural

environment, the discharge of sediment under unnatural conditions is problematic to receiving waters. Fine sediment in creeks causes high turbidity that interferes with the functionality of native flora and fauna in local creeks. For example, turbidity interferes with both photosynthesis of water-philic plants, as well as successful foraging and reproduction of benthic macroinvertebrates. Sediment can also make it difficult for fish to breathe because it clogs fish gills. Other pollutants such as heavy metals or pesticides can adhere to sediment and are transported to receiving waters during storm events, where they dissolve in the water column and become bioavailable to aquatic organisms. Sediment is recognized as a major stressor to surface waters and is responsible for the impairment of several lagoons and creeks in the San Diego Region.

Provision E.4 includes requirements that each Copermittee must implement to minimize the discharge of sediment and other pollutants from construction sites to the MS4 within its jurisdiction. The requirements under Provision E.4 are consistent with the Fourth Term Permits for San Diego, Orange, and Riverside Counties. Therefore, Copermittees are expected to implement the requirements seamlessly, with minimal changes to their existing construction management programs. The Copermittees, however, are given more flexibility to run their programs as needed to maximize efficiency, and also to be consistent with the Water Quality Improvement Plan for the Watershed Management Area.

As part of the construction management program, 40 CFR 122.26(d)(2)(iv)(D)(1) requires "*procedures for site planning which incorporate consideration of potential water quality impacts.*" Provision E.4.a describes the minimum elements each Copermittee is required to include as part of the construction site planning and project approval process. The construction site planning and approval process is based primarily on ensuring each project had an adequate site-specific pollution control, construction BMP, and/or erosion and sediment control plan that will be implemented to minimize the discharge of pollutants in storm water to the MEP, and minimize impacts to receiving waters.

The requirements under Provision E.4.b provide the data and information necessary to identify "*priorities for inspecting sites and enforcing control measures*" required pursuant to 40 CFR 122.26(d)(2)(iv)(D)(3). Under Provision E.4.b, each Copermittee must identify construction sites that are considered a high threat to downstream surface waters. Designation of "high threat to water quality" construction sites will necessitate the Copermittees to develop criteria to identify such sites. Provision E.4.b.(2) describes a list of factors that must be considered when the Copermittee considers threat to water quality. For example, a Copermittee must identify sites as "high threat to water quality" if it is located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions, according to the Water Quality Improvement Plan. This ensures that construction management program implementation is compatible with the Copermittee's identified highest priority water quality conditions.

Pursuant to 40 CFR 122.26(d)(2)(iv)(D)(2) each Copermittee is required describe "*requirements for nonstructural and structural best management practices*" at construction sites. Provision E.4.c includes the types of construction site BMPs that the Copermittees must implement, or require the implementation of, at each construction site to reduce pollutants in storm water discharges to the MEP.

Each Copermittee is expected to require the implementation of appropriate BMPs given specific site conditions, the season and likelihood of rain events, and construction phase (i.e. grading vs. vertical construction). This means that throughout the life of the project construction, the appropriate BMPs will vary, especially if the construction of the project spans multiple wet seasons. As opposed to describing specific minimum BMPs that must be implemented, the Order describes major BMP categories that should be considered for each site.

Each Copermittee is expected to use its 20 years of storm water experience and knowledge to require implementation of appropriate BMPs from the various categories at each construction site within its jurisdiction. For example, the San Diego Water Board expects that each site will be required to implement erosion control and sediment control. The San Diego Water Board also expects each Copermittee to require implementation of active/passive sediment treatment systems at sites where other BMPs have been tried and are known to be inadequate, and discharges of sediment are causing or contributing to water quality impairment downstream. Each Copermittee is granted flexibility in specifying the minimum level of BMP requirements at each site, but the San Diego Water Board expects each site to be capable of controlling pollutants in storm water discharges to the MEP and preventing illicit discharges.

The requirements under Provision E.4.d are necessary to demonstrate that each Copermittee is implementing a program that complies with Provisions E.4.a and E.4.c and ensure BMPs at construction sites will reduce pollutants in storm water discharges to the MEP.

Provision E.4.d does not include minimum required inspection frequencies for construction sites. Each Copermittee must use its experience and knowledge to specify an appropriate inspection frequency for both high priority and lower priority sites in their jurisdictional runoff management program documents, and in accordance with the Water Quality Improvement Plan. Appropriate inspection frequencies may vary by Copermittee, but the San Diego Water Board expects that the stated frequency will be adequate for each Copermittee to properly oversee the construction sites within its jurisdiction, confirm BMPs are implemented to reduce pollutants in storm water discharges from constructions sites to the MEP, and make needed changes to its program on an ongoing basis as necessary.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary for any development projects to compel compliance with the requirements of Provision E.4 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.4.e requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Provision E.5 (Existing Development Management) requires each Copermittee to implement an existing development management program to control and reduce the discharge of pollutants in storm water from areas of existing development to the MEP. Proper implementation of the existing development management program will also contribute toward effectively prohibiting non-storm water discharges from areas of existing development to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." Within 40 CFR 122.26(d)(2)(iv)(A) and (C), the management program is required to reduce impacts on receiving waters and reduce pollutants in storm water discharges to the MEP from commercial and residential areas, industrial facilities, and municipal facilities.

Commercial and residential areas, industrial facilities, and municipal facilities must be addressed by each Copermittee with the existing development management program required under Provision E.5. All other areas within each Copermittee's jurisdiction should be either undeveloped open space, or areas that are being developed or under construction. Areas being developed or under construction will be addressed by the Copermittee under the requirements of Provision E.3 (Development Planning) or Provision E.4 (Construction Management).

Areas of existing development typically include impervious surfaces such as sidewalks, driveways, roads, and rooftops, which generate and concentrate pollutants (such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not found in high concentrations in the natural environment. Pollutants that accumulate on impervious surfaces are not easily biodegraded or not subject to natural treatment processes. When it rains, these pollutants are transported in storm water runoff from these impervious surfaces into receiving waters, resulting in poor water quality and degradation of beneficial uses.

In addition to the generation of pollutants, areas of existing development have generally altered the natural conditions of the land and removed vegetative cover, reduced the perviousness of the surface, and reduced the capacity of storm water that can be intercepted, captured, stored, infiltrated, evaporated, and/or evapotranspired.

The alteration of the natural conditions and the impervious surfaces associated with areas of existing development causes water quality problems due to the alteration of natural flow regimes within the watersheds; resulting in hydromodification of channels, streams, and habitats that exist within or adjacent to the areas of existing development.

Thus, storm water discharges from areas of existing development are responsible for poor water quality, degraded habitats, and hydromodified channels throughout the developed portions of the watersheds in the San Diego Region. To improve the health and functionality of the receiving waters in a Watershed Management Area, land use practices and the amount of impervious surfaces in areas of existing development must change to reduce the various impacts caused by hydromodification and pollutants from storm water runoff generated in developed areas. Each Copermittee must be aggressive to address pollutant sources and runoff from areas of existing development to be able to reduce pollutants in storm water discharges from the MS4 to the MEP.

There is some overlap in the requirements under Provision E.5 with the requirements under Provisions E.2 (Illicit Discharge Detection and Elimination), E.3 (Development Planning), and E.4 (Construction Management). Illicit discharges frequently originate from areas of existing development. New development projects, when completed will become some type of residential, commercial, industrial or municipal existing development. Redevelopment projects are, by definition, redeveloping areas of existing development. And, redevelopment projects become construction sites located in areas of existing development. Much of the data and information collected, inspections performed, and enforcement actions taken for the requirements under Provisions E.2 to E.4 may also be utilized by the existing development management program. The requirements under Provision E.5, however, are focused primarily on reducing pollutants generated in areas of existing development that can be transported in storm water runoff and discharged to and from the MS4.

The requirements under Provision E.5 build upon existing program elements being implemented by the Copermittees. Provision E.5 is generally consistent with the existing development requirements of the Fourth Term Permits for Orange and Riverside Counties (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), but modified to provide more flexibility to implement the programs so resources can be better focused toward addressing the highest priority water quality conditions identified in the Water Quality Improvement Plans.

For a Copermittee to properly manage areas of existing development, having knowledge of what development exists within its jurisdiction is essential. Provision E.5.a requires each Copermittee to maintain a watershed-based inventory of all the existing development within its jurisdiction. This requirement is necessary for each Copermittee to implement the requirements of Provision E.5.b-e.

As opposed to just maintaining separate inventories based on the type of site, each Copermittee must maintain a watershed-based inventory that includes all types of existing development within its jurisdiction. By utilizing a watershed-based inventory, the Copermittees within a Watershed Management Area can combine their inventories and review the inventories by watershed in addition to by jurisdiction. Pollutant sources and strategies for abatement can then be evaluated on a watershed level, as opposed to evaluating sources and strategies strictly by type of site.

Provision E.5.a includes the information that must be included in the inventory. Provision E.5.a.(1) specifies what facilities or areas must be included in the inventory. A commercial type of existing development may be identified in the inventory as a facility (e.g. individual building, individual business) or an area (e.g. shopping center, commercial zone). An industrial type of existing development must be identified in the inventory by facility (e.g. individual industrial entity). A municipal type of existing development must be identified in the inventory by facility, with a list of specific municipal facilities that must be included in the inventory. A residential type of existing development must be identified by areas to be designated by the Copermittee. For each of the facilities and areas identified in the Copermittee's inventory developed pursuant to Provision E.5.a.(1), Provision E.5.a.(2) specifies the information that must be included in the description for the facility or area.

Provision E.5.a.(3) requires each Copermittee to maintain an updated map showing the location of inventoried existing development, watershed boundaries, and water bodies. This requirement was included because this information is expected to help the Copermittees in a Watershed Management Area identify and prioritize sources of pollutants and/or stressors in areas of existing development that contribute toward the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Knowledge of the existing development that are likely to be sources of pollutants contributing to the highest priority water quality conditions is expected to be a key element in the Copermittees' development of the water quality improvement strategies that will be included in the Water Quality Improvement Plans. The strategies described in the Water Quality Improvement Plans will direct efforts within the existing development management programs implemented by each Copermittee.

Pursuant to 40 CFR 122.26(d)(2)(iv)(A) each Copermittee is required describe "*structural and source control measures to reduce pollutants*" in storm water runoff discharged from areas of existing development. Provision E.5.b includes the BMP implementation and maintenance requirements that the each Copermittee must require at areas of existing development to reduce pollutants in storm water discharges to the MEP. The San Diego Water Board, however, recognizes that BMP implementation and maintenance for residential areas will require much more education and encouragement through less authoritative measures than for commercial, industrial and municipal facilities and areas. Thus, the BMP

implementation and maintenance requirements have been separated between requirements under Provision E.5.b.(1) for commercial, industrial and municipal facilities and areas, and Provision E.5.b.(2) for residential areas.

Most of the requirements in Provision E.5.b are consistent with the related requirements in the Fourth Term Permits. The level of specificity, however, has been changed to allow each Copermittee the flexibility to implement its program to achieve maximum efficiency, and to perform functions that will address the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Each Copermittee is expected to require the implementation of appropriate BMPs to address the expected pollutants from each facility or area. The Third and Fourth Term Permits described specific minimum BMPs that must be implemented at various sites. This Order, however, requires each Copermittee to designate minimum BMPs themselves and require implementation. Consistent with the Fourth Term Permits, each Copermittee is required to maintain, or require the maintenance of, all BMPs as needed.

The BMP implementation and maintenance requirements include a schedule of operation and maintenance activities for the MS4 and related structures (such as catch basins, storm drain inlets, and detention basins), as well as public streets and roads. Public streets and roads specifically include public unpaved roads. The San Diego Water Board identified, through investigations and complaints, sediment discharges from unpaved roads as a significant source of water quality problems in the San Diego Region. Inspection activities conducted by the San Diego Water Board since the Third Term Permits have found a lack of source control for many unpaved roads within the jurisdiction of the Copermittees.

Unpaved roads are a source of sediment that can be discharged in runoff to receiving waters, especially during storm events. Erosion of unpaved roadways occurs when soil particles are loosened and carried away from the roadway base, ditch, or road bank by water, wind, traffic, or other transport means. Exposed soils, high runoff velocities and volumes, sandy or silty soil types, and poor compaction increase the potential for erosion.

Road construction, culvert installation, and other maintenance activities can disturb the soil and drainage patterns to streams in undeveloped areas, causing excess runoff and thereby erosion and the release of sediment. Poorly designed unpaved roads can act as preferential drainage pathways that carry runoff and sediment into natural streams, impacting water quality. In addition, other public works activities along unpaved roads have the potential to significantly affect sediment discharge and transport within streams and other waterways, which can degrade the beneficial uses of those waterways.

USEPA also recognizes that discharges from unpaved roads pose a significant potential threat to water quality. USEPA guidance[40] emphasizes the threat of unpaved roads to water quality:

> "*Dirt and gravel roads are a major potential source of these pollutants [sediment] and pollutants that bind to sediment such as oils, nutrients, pesticides, herbicides, and other toxic substances. Many roads have unstable surfaces and bases. Roads act like dams, concentrating flows that accelerate erosion of road materials and roadsides. Both unstable surfaces and accelerated erosion then lead to sediment and dust.*"

There are several guidance documents, developed by the USEPA,[41] the US Forest Service,[42] the University of California,[43] and others, that include design and construction specifications and BMPs that are readily available for implementation by public entities. Implementing design and other source control BMPs for unpaved roads in the region is necessary to reduce and minimize the impacts of sediment discharged during storm events from unpaved roads to the MS4s and receiving waters.

Provision E.5.c describes existing development site inspection frequency, content, and tracking that each Copermittee must incorporate into their existing development management programs. The requirements under Provision E.5.c are necessary to demonstrate each Copermittee is implementing a program that complies with Provision E.5.b and ensure BMPs implemented in areas of existing development will reduce pollutants in storm water discharges to the MEP. Provision E.5.c has been modified to include a minimum of once every 5 years for all inventoried facilities and areas of existing development, utilizing one or more methods of inspection.

In addition to onsite inspections, the methods of inspection have been expanded to include drive-by inspections. Inspections may be performed by the Copermittee's municipal and contract staff, or by volunteer monitoring or patrol programs. Volunteer monitoring or patrol programs are not expected to enforce the Copermittee's ordinances, or to inspect areas or facilities where members of the public are not allowed access. Volunteer monitoring or patrol programs must be trained by the Copermittee, and are only expected to collect visual observations. By utilizing drive-by inspections and volunteer monitoring or patrol programs, the Copermittees will be able to maximize and efficiently use their resources to identify and address sources of pollutants in areas of existing development.

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[40] USEPA, 2006. Environmentally Sensitive Maintenance for Dirt and Gravel Roads. Gesford and Anderson, USEPA-PA-2005.
[41] Ibid
[42] US Forest Service, 1996. Forest Service Specifications for Construction of Roads & Bridges. EM-7720-100. Revised August 1996.
[43] University of California Division of Agriculture and Natural Resources, 2007. Rural Roads: A Construction and Maintenance Guide of California Landowners. Publication 8262.

The municipal and contract staff of each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial, industrial, and municipal facilities and areas in its inventoried existing development pursuant to Provision E.5.c.(1)(a)(iv). An "equivalent" of at least 20 percent means if any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspections may count toward the total annual inspection requirement. Linear municipal facilities (i.e. MS4 linear channels, sanitary sewer collection systems, streets, roads and highways) in the Copermittee's existing development inventory are not subject to the inspection frequency requirement of Provision E.5.c.(1)(a)(iv).

The inspection content specified in Provision E.5.c.(2)(a) includes the information required to be collected during an inspection by any method. The inspection content specified in Provision E.5.c.(2)(b) includes additional information that must be collected when a Copermittee's municipal or contract staff perform an onsite inspection. Provision E.5.c.(3) specifies the information that each Copermittee must maintain in its existing development inspection records.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary to compel compliance with the requirements of Provision E.5 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.5.d requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Provisions E.5.e.(1)-(2) specifically require the Copermittee to identify areas of existing development as candidates for retrofitting, and streams, channels, and/or habitats as candidates for rehabilitation. Provisions E.5.e.(1)-(2) are based on the retrofitting requirements of the Fourth Term Permits for Orange and Riverside Counties, but modified to also include identifying projects to rehabilitate channels within areas of existing development. The requirements have also been modified to be more focused on utilizing these types of projects for addressing the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Interest and opportunity to retrofit areas of existing development and rehabilitate channels located in areas of existing development has been observed in several programs the San Diego Water Board oversees (e.g., CWA Section 401 Water Quality Certification program, supplemental environmental projects, and grant programs). Each jurisdiction has miles and miles of streets that could be retrofitted to become green streets. Reshaping landscaped areas from convex to concave configurations can detain storm water instead of directing runoff as quickly as possible to the MS4. Retrofit projects could also include simply replacing impervious surfaces with permeable surfaces.

Retrofitting projects do not necessarily have to be expensive. Retrofitting projects could be as simple as redirecting downspouts from roofs to pervious or landscaped areas instead of to hardscaped areas discharging directly to the MS4, providing rain barrels to harvest storm water from downspouts for use at a later time, or planting more trees in areas with little vegetation to provide canopy that can intercept storm water. The San Diego Water Board encourages the Copermittees to identify simple, low-cost retrofitting opportunities that can be easily implemented, in addition to other more expensive retrofitting and channel rehabilitation projects.

Rehabilitation of channels, streams, and/or habitat will require more significant planning and resources to implement. There are, however, also abundant opportunities to rehabilitate channels, streams and/or habitats in or adjacent to areas of existing development. Each Watershed Management Area likely has several creeks and stream reaches that have been undergrounded, artificially hardened, or hydromodified that could be rehabilitated to be more sustainably configured, which would slow down storm water flows and potentially have more assimilative capacity for pollutants while still being supportive of designated beneficial uses.

The San Diego Water Board recognizes that it may be infeasible to implement retrofitting or channel rehabilitation projects within certain areas of a Copermittee's jurisdictions. For such areas, the Copermittee must instead identify, develop, and implement regional retrofitting and channel rehabilitation projects (i.e. projects that can retain and/or treat storm water from one or more areas of existing development) adjacent to and/or downstream of the areas of existing development.

Provisions E.5.e.(1)-(2) do not require the implementation of retrofitting and rehabilitation projects, but do require the Copermittee to develop a program with strategies to facilitate the implementation of these types of projects in areas of existing development. The strategies are expected to include allowing and encouraging Priority Development Projects to implement retrofitting types of projects as a means of compliance with the structural BMP performance criteria requirements of Provisions E.3.c.(1) and E.3.c.(2).

Provision E.6 (Enforcement Response Plans) requires each Copermittee to develop an Enforcement Response Plan as part of its jurisdictional runoff management program document. Proper implementation of the Enforcement Response Plans is necessary to effectively prohibit non-storm water discharges to the MS4, and reduce the discharge of pollutants in storm water from the MS4 to the MEP.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system*" and be able to demonstrate that it can "*operate pursuant to legal authority established by statute, ordinance or series of contracts*" to control the discharge of non-storm water and pollutants in storm water to and from its MS4. Pursuant to 40 CFR 122.26(d)(2)(i)(E) each Copermittee is specifically required to

have the legal authority to "*[r]equire compliance with conditions in ordinances, permits, contracts or order*s."

The requirements under Provision E.6 are necessary to demonstrate that each Copermittee can enforce its legal authority to *"effectively prohibit non-stormwater discharges"* and "*reduce the discharge of pollutants to the maximum extent practicable*" as well as "*[r]equire compliance with conditions in ordinances, permits, contracts or order*."

The Enforcement Response Plan required under Provision E.6 will serve as a reference for the Copermittee and the San Diego Water Board to determine if consistent enforcement actions are being implemented to achieve timely and effective compliance from all public and private entities that are not in compliance with the Copermittee's ordinances, permits, or other requirements. The Enforcement Response Plan must contain clear direction for the Copermittee to take immediate enforcement action, when appropriate and necessary, in their illicit discharge detection and elimination, development planning, construction management, and existing development management programs.

If the entities subject to the Copermittee's legal authority do not implement appropriate corrective actions in a timely manner, or if violations repeat, the Copermittee must take progressively stricter responses to enforce its legal authority and achieve compliance with its ordinances, permits, or other requirements to *"effectively prohibit non-stormwater discharges"* and "*reduce the discharge of pollutants to the maximum extent practicable.*"

Provision E.7 (Public Education and Participation) requires each Copermittee to implement a public education and participation program. Proper implementation of the public education and participation program as part of its jurisdictional runoff management program will contribute toward effectively prohibiting non-storm water discharges to the MS4, and toward the reduction of pollutants in storm water from the MS4 to the MEP.

Provision E.7 establishes the minimum requirements that each Copermittee must implement to engage members of the public as part of its jurisdictional runoff management program. In the Fourth Term Permits, the public education program requirements and the public participation requirements were included as separate jurisdictional runoff management program components. In this Order, the public education requirements have been consolidated with the public participation requirements, as both sets of requirements are related to the engagement of the public by each Copermittee. Engagement of the public is critical for the success of each Copermittee's jurisdictional runoff management program.

The Copermittees have been implementing public education programs for the last 20 years, which are now well established. The specificity of expected public education program elements of the Fourth Term Permits has been removed. For the most part,

the public education program requirements in Provision E.7.a have been reduced to a set of requirements that are specifically included in the federal regulations under 40 CFR 122.26(d)(2)(iv)(A)(6), 122.26(d)(2)(B)(6) and 122.26(d)(2)(D)(4), which should already be incorporated into each Copermittee's existing public education program. Each Copermittee is expected to utilize the information and data collected from the monitoring and assessments conducted within the Watershed Management Area, and from its inventories and inspections to best direct its public education program resources toward addressing the highest priority water quality conditions identified within the Water Quality Improvement Plan.

According to 40 CFR 122.26(d)(2)(iv), public participation is required to be included as part of the "*comprehensive planning process*", which includes the development and implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs. The requirements under Provision E.7.b specify the opportunities that the public must be provided to be involved in the "*comprehensive planning process*", as required by to 40 CFR 122.26(d)(2)(iv).

Provision E.8 (Fiscal Analysis) requires each Copermittee to secure the resources and provide an analysis of the resources that will be necessary to implement the requirements of the Order. Adequate fiscal resources are necessary for a jurisdictional runoff management program to effectively prohibit non-storm water discharges to the MS4, and reduce pollutants in storm water from the MS4 to the MEP.

According to 40 CFR 122.26(d)(2)(vi), each Copermittee is responsible for providing "*a fiscal analysis of the necessary capital and operation and maintenance expenditures necessary to accomplish the activities*" required by this Order, including "*a description of the source of funds that are proposed to meet the necessary expenditures, including legal restrictions on the use of such funds.*" The fiscal analysis requirements of Provision E.8 are consistent with 40 CFR 122.26(d)(2)(vi).

The San Diego Water Board has chosen not to require a description of fiscal benefits realized from implementation of the jurisdictional runoff management programs. This is a recommendation from the National Association of Flood and Stormwater Management Agencies.[44] For instance, the fiscal analysis requirements do not address city-wide fiscal benefits of protection (e.g., public health, tourism, property values, economic activity, beneficial uses, etc.), even though many costs currently reported to the San Diego Water Board are for related activities. This type of assessment may help Copermittees improve the allocation of resources and it may help the Copermittees secure adequate funding for the program. Qualitative assessments, however, could be overly subjective and most Copermittees likely lack the ability to provide accurate quantitative assessments. The San Diego Water Board encourages the Copermittees to consider means for conducting assessments of fiscal

[44] National Association of Flood and Stormwater Management Agencies. 2006. *Guidance for Municipal Stormwater Funding.* Prepared under a grant provided by the USEPA.

benefits derived from the programs. Such assessments could be conducted on a regional scale similar to studies of program costs conducted by the State Water Board.[45]

[45] State Water Board, 2005. NPDES Stormwater Cost Survey.

F. Reporting

Purpose: Provision F includes the requirements for the documents and reports that the Copermittees must prepare and provide to the San Diego Water Board. The documents prepared by the Copermittees and provided to the San Diego Water Board and made available to the public will provide the documentation that the Copermittees are complying with the requirements of the Order.

***Discussion*:** Provision F requires the Copermittees to prepare several documents and reports that must be provided to the San Diego Water Board and made available to the public. The reporting requirements have been significantly reduced compared to the Fourth Term Permit reporting requirements. The reduction in reporting requirements was recommended by the San Diego County Copermittees in the Report of Water Discharge submitted in June 2011.

More specific and detailed discussions of the requirements of Provision F are provided below.

Provision F.1 (Water Quality Improvement Plans) requires the Copermittees in each Watershed Management Area to develop and submit a Water Quality Improvement Plan in accordance with the requirements of Provision B.

Of all the requirements of Provision F, the Water Quality Improvement Plans will likely be the documents requiring the most significant effort to develop. The content of the Water Quality Improvement Plans, however, is expected to include content that should already have been developed for the Watershed Plans and several elements that are included in the Monitoring and Reporting Programs required under the Fourth Term Permits.

Because the Water Quality Improvement Plan is part of the "*comprehensive planning process which involves public participation*," Provision F.1 includes requirements to give multiple opportunities to the public to provide input on the content of the plans.

Provision F.1.a.(1) specifies the elements that the Copermittees must include in the public participation process for the development of the Water Quality Improvement Plans. In order for the public to be aware of the opportunities to provide input, Provision F.1.a.(1)(a) requires the Copermittees to develop a publicly available and noticed schedule of the opportunities for the public to participate and provide comments during the development of the Water Quality Improvement Plan. These opportunities are when the public can provide the data, information, and recommendations that the Copermittees can consider during the development of the Water Quality Improvement Plans.

The San Diego Water Board recognizes, however, that the Copermittees cannot be expected to incorporate all the data, information, and recommendations that the public may provide into the Water Quality Improvement Plans. The Copermittees will have to review the data, information, and recommendations received and make some decisions on what to incorporate into the Water Quality Improvement Plans. Before the Copermittees finalize their decisions, members of the public should be allowed to review the Copermittees' decisions. Thus, Provision F.1.a.(1)(b) requires the Copermittees to form a Water Quality Improvement Consultation Panel (Panel).

The Panel will consist of a member from the environmental community and a member from the development community familiar with the Watershed Management Area. A representative from the San Diego Water Board staff will also be part of the Panel. The Copermittees may choose to include additional members, but the Panel is only required to include three panel members.

The Panel will serve as an additional public participation and input mechanism during the development of the Water Quality Improvement Plans. The knowledge and expertise from these Panel members are expected to provide the Copermittees valuable direction during their decision-making process. The Copermittees will review the content of their planned submittals with the Panel members to receive recommendations. If the Panel provides recommendations, the Copermittees must consider revisions to the Water Quality Improvement Plan submittals.

The San Diego Water Board recognizes that the development of multiple Water Quality Improvement Plans concurrently may limit the ability of the public to review and provide comments to the Copermittees. Thus, Provision F.1.a.(1)(c) requires the Copermittees to coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public time and opportunity to participate during the development of the Water Quality Improvement Plans.

Provision F.1.a.(2) requires the Copermittees to develop and submit the first Water Quality Improvement Plan component, in accordance with the requirements of Provision B.2, which includes the identification of the priority water quality conditions and potential water quality improvement strategies. The public must be provided an opportunity to provide data, information and recommendations to be utilized in the development and identification of the priority water quality conditions and potential water quality improvement strategies for the Watershed Management Area. The Copermittees must consult with the Panel and consider making revisions. The Copermittees may submit the requirements of Provision B.2 as early as 6 months and no later than 12 months after the commencement of coverage under this Order. After the requirements of Provision B.2 are submitted to the San Diego Water Board, the public will be provided another opportunity to provide comments.

Provision F.1.a.(3) requires the Copermittees to develop and submit the second Water Quality Improvement Plan component, in accordance with the requirements of Provision B.3, which includes the identification of the numeric goals for the highest

priority water quality conditions identified for the Watershed Management Area, and the strategies that will be implemented to achieve the potential numeric goals. The Copermittees may also develop the Optional Watershed Management Area Analysis, in accordance with the requirements of Provision B.3.b.(4), as part of this submittal. The public must be provided an opportunity to provide data, information and recommendations to be utilized in the development and identification of the numeric goals and water quality improvement strategies for the Watershed Management Area. The Copermittees must consult with the Panel and consider making revisions. The Copermittees may submit the requirements of Provision B.3 as early as 9 months and no later than 18 months after the commencement of coverage under this Order. After the requirements of Provision B.3 are submitted to the San Diego Water Board, the public will be provided another opportunity to provide comments.

Finally, Provision F.1.b describes the process for the submittal and implementation of the Water Quality Improvement Plans. The complete Water Quality Improvement Plans are required to be submitted by the Copermittees within 24 months after the commencement of coverage under this Order. The San Diego Water Board will provide the public an opportunity to provide comments on each complete Water Quality Improvement Plan.

The San Diego Water Board will review each Water Quality Improvement Plan and the public comments received to determine if the Copermittees have submitted a Water Quality Improvement Plan that meets the requirements of Provision B. If a Water Quality Improvement Plan does not meet the requirements of Provision B, the Copermittees will be considered out of compliance and directed in writing by the San Diego Water Board Executive Officer to correct the deficiencies.

When a Water Quality Improvement Plan meets the requirements of Provision B, the San Diego Water Board will determine whether to hold a public hearing or to limit public input to submittal of written comments before accepting the Water Quality Improvement Plan. Implementation of the Water Quality Improvement Plan must begin within 30 days of acceptance.

The San Diego Water Board expects that any deficiencies in the Water Quality Improvement Plan will be identified either in the public comments or during the review by the San Diego Water Board before implementation begins. In the event any deficiencies are identified after the implementation of the Water Quality Improvement Plan, Provision F.1.b.(7) clarifies that the San Diego Water Board maintains the right to require the Copermittees to correct any deficiencies that may be identified.

Provision F.2 (Updates) requires the Copermittees to update specific documents that the Copermittees will utilize to implement the requirements of this Order.

Each Copermittee is required to continue implementing a jurisdictional runoff management program, as required under Provision E. Implementation of each Copermittee's jurisdictional runoff management program is directed by its jurisdictional

runoff management program document. Provision F.2.a requires each Copermittee to update its jurisdictional runoff management program document to be consistent with the requirements of Provision E concurrent with the submittal of the Water Quality Improvement Plan.

Likewise, each Copermittee must continue to require new development and redevelopment projects to implement BMPs to control pollutants in storm water runoff. The control of pollutants in storm water runoff from development and redevelopment projects within each Copermittee's jurisdiction is guided and directed by its BMP Design Manual, formerly known as a Standard Storm Water Mitigation Plan (SSMP). Provision F.2.b requires each Copermittee to update its BMP Design Manual to be consistent with the requirements of Provision E.3 concurrent with the submittal of the Water Quality Improvement Plan.

For situations where the San Diego Water Board may amend the requirements of Provisions E.3.a-d after a Copermittee has updated its BMP Design Manual pursuant to Provision F.2.b.(1), Provision F.2.b.(4) gives the Copermittee up to 90 days to incorporate the amended requirements of Provision E.3.a-d into its BMP Design Manual. The San Diego Water Board Executive Officer has discretion to modify the 90-day time period depending on the complexity of the amendments or other information that warrants a change in the 90-day time period.

In general, the requirements of the Order should not necessitate a complete rewrite of each Copermittee's jurisdictional runoff management program document or BMP Design Manual, as was required by the Third Term Permits. The jurisdictional runoff management program and BMP Design Manual requirements of this Order are not significantly different than the requirements of the Fourth Term Permits. Thus, only sections of the Order which are new or have been significantly changed should warrant revisions to specific sections of the Copermittee's jurisdictional runoff management program document and BMP Design Manual.

Finally, the Water Quality Improvement Plans are expected to require updates as the iterative approach and adaptive management process included in the Water Quality Improvement Plan, as required under Provision B.5, is implemented by the Copermittees. Provision F.2.c.(1) requires the Copermittees to implement a public participation process for the proposed updates, review the proposed updates with the Panel, and submit the updates to the Water Quality Improvement Plan as part of the Annual Reports required under Provision F.3.b.

Also, because TMDLs are likely to be developed, adopted and approved during the term of the Order, Provision F.2.c.(2) has been included to expedite the incorporation of TMDLs into the Copermittees' Water Quality Improvement Plans as part of the update process, potentially before the Order is re-opened to incorporated the requirements of the new TMDLs.

Provision F.3 (Progress Reporting) requires the Copermittees to report on the progress of implementing the Water Quality Improvement Plans.

The requirements of Provision F.3 are to report the progress toward improving water quality that the Copermittees are achieving with the implementation of the Water Quality Improvement Plans and each Copermittee's jurisdictional runoff management program. The Progress Report Presentations required under Provision F.3.a are included to provide the Copermittees an opportunity to communicate directly with the San Diego Water Board and the public. The Progress Report Presentations will also provide the members of the San Diego Water Board and members of the public an opportunity to become more acquainted with the Copermittees and their projects and programs to address non-storm water and storm water discharges into and from their MS4s.

The Annual Report requirements of Provision F.3.b are a consolidation of several reporting requirements from the Fourth Term Permits, including the Jurisdictional Runoff Management Program Annual Reports, the Watershed Annual Reports, and the Monitoring and Reporting Program Annual Reports. Furthermore, the Annual Report requirements are consistent with the requirements under 40 CFR 122.42(c).

Pursuant to 40 CFR 122.42(c), "*[t]he operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the Director…must submit an annual report*", which must include the following:

(1) *The status of implementing the components of the storm water management program that are established as permit conditions* [40 CFR 122.42(c)(1)];

(2) *Proposed changes to the storm water management programs that are established as permit conditions* [40 CFR 122.42(c)(2)];

(3) *Revisions, if necessary, to the assessment of controls and fiscal analysis* [40 CFR 122.42(c)(3)];

(4) *A summary of data, including monitoring data, that is accumulated throughout the reporting year* [40 CFR 122.42(c)(4)];

(5) *Annual expenditures and budget for year following each annual report* [40 CFR 122.42(c)(5)];

(6) *A summary describing the number and nature of enforcement actions, inspections, and public education programs* [40 CFR 122.42(c)(6)];

(7) *Identification of water quality improvements or degradation* [40 CFR 122.42(c)(7)].

Under the Fourth Term Permits, each Copermittee is responsible for submitting a Jurisdictional Runoff Management Program Annual Report; the Copermittees in each

designated watershed are responsible for submitting a Watershed Annual Report; and the Copermittees from each county are responsible for submitting a Monitoring and Reporting Program Annual Report.

There are 39 Copermittees in the San Diego Region, each required to prepare and submit a Jurisdictional Runoff Management Program Annual Report. There are 9 designated watersheds in San Diego County, 6 designated watersheds in Orange County, and 1 designated watershed in Riverside County for a total of 16 designated watersheds, each requiring a Watershed Annual Report. There are 3 sets of Copermittees in 3 counties in the San Diego Region, requiring Copermittees from each county to prepare and submit a Monitoring and Reporting Program Annual Report. Thus each Copermittee is currently required to prepare, or participate in the preparation of at least 3 annual reports. In addition, the San Diego County Copermittees are required to prepare and submit a Regional Urban Runoff Management Plan Annual Report.

In total, there are 59 annual reports that are prepared by the Copermittees and submitted to the San Diego Water Board for the Fourth Term Permits. The preparation of these annual reports requires significant time and resources from each Copermittee, which could otherwise be expended on actions that could improve water quality within its jurisdiction. In turn, significant time and resources are required from the San Diego Water Board staff to review these reports, which could otherwise be expended on working directly with the Copermittees to improve their implementation efforts toward restoring and protecting water quality.

Until the Water Quality Improvement Plans are developed, there will be a transitional period during which the Copermittees will continue to implement their existing jurisdictional runoff management programs. There will also be a transitional period during which the Copermittees will implement the transitional monitoring and assessment requirements of Provision D. During the transitional period, the Copermittees will submit annual reports pursuant to the requirements of Provisions F.3.b.(1) and F.3.b.(2).

Provision F.3.b.(1) includes the transitional annual reporting requirements for each Copermittee's jurisdictional runoff management program. The reporting of the jurisdictional runoff management program implementation efforts have been reduced to a single 2-page form. Each Copermittee is required to complete and submit a Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D or a revised form accepted by the San Diego Water Board) no later than October 31 of each year for each jurisdictional runoff management program reporting period (i.e. July 1 to June 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted. The Jurisdictional Runoff Management Program Annual Report Form will certify that each Copermittee has implemented its jurisdictional runoff management program in accordance with the requirements of Provision E. Each Copermittee may choose to continue to utilize and submit the jurisdictional runoff management program annual reporting format of its

current Order until the first Water Quality Improvement Plan Annual Report is required to be submitted.

Provision F.3.b.(2) includes the transitional annual reporting requirements for the transitional monitoring and assessment program for each Watershed Management Area. The Copermittees in the Watershed Management Area are required to submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted. The Transitional Monitoring and Assessment Program Annual Report is required to include the transitional period monitoring data collected pursuant to Provisions D.1.a and D.2.a, and the findings from the transitional period findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

Provision F.3.b.(3) includes the Water Quality Improvement Plan Annual Report requirements. Only one Water Quality Improvement Plan Annual Report is required for each of the ten (10) Watershed Management Areas designated under Provision B.1, which is a significant reduction in the number of annual reports required to be prepared and submitted by the Copermittees. The Water Quality Improvement Plan Annual Report will document the Copermittees' efforts to implement the Water Quality Improvement Plan. Each Water Quality Improvement Plan Annual Report will be focused primarily on reporting the analysis of the monitoring data collected pursuant to Provisions D.1-D.3 during the reporting period, and the assessments that are required pursuant to Provision D.4 based on the data. The monitoring data analyses and the assessments that are provided in the Water Quality Improvement Plan Annual Report will be the core of the report. The reporting of the jurisdictional runoff management program implementation efforts have been reduced to a single 2-page form, and will no longer be the primary focus of the reporting requirements as in the Third and Fourth Term Permits.

Each Copermittee will continue to prepare and submit a Jurisdictional Runoff Management Program Annual Report Form as part of the Water Quality Improvement Plan Annual Report to certify that each Copermittee has implemented its jurisdictional runoff management program in accordance with the requirements of Provision E. Instead of reviewing a voluminous report from each Copermittee, as was required under the Third and Fourth Term Permits, the San Diego Water Board will conduct audits of each Copermittee's jurisdictional runoff management program to investigate and confirm the information provided by each Copermittee on its Jurisdictional Runoff Management Program Annual Report Form. The audits will allow the San Diego Water Board to become more familiar with the each Copermittee's jurisdictional runoff management program, and each Copermittee will become more informed about the expectations of the San Diego Water Board.

The reduction in the number and content of the Water Quality Improvement Plan Annual Reports should result in significant time, cost and resource savings for the

Copermittees, as well as the San Diego Water Board. Those savings should offset a significant portion of any additional costs that may be incurred to develop the Water Quality Improvement Plans and to implement the monitoring and assessment program requirements of Provision D.

The reporting period for the Water Quality Improvement Plan Annual Reports consists of two periods. Because the jurisdictional runoff management programs are typically budgeted and implemented during a fiscal year, the information provided on the Jurisdictional Runoff Management Program Annual Report Forms will cover the period from July 1 to June 30 of the following year.

The Water Quality Improvement Plan Annual Reports, however, are focused primarily on the monitoring data and the assessments based on the monitoring data. The monitoring data is collected during the monitoring year, which begins October 1 and ends September 30 of the following year. The monitoring year begins after the beginning of the fiscal year and ends after the end of the fiscal year. Therefore, to accommodate and capture the information collected during the fiscal year and the monitoring year, the Annual Report reporting period incorporates both periods.

Finally, Provision F.3.c requires the Copermittees to develop and submit a Regional Monitoring and Assessment Report. The Regional Monitoring and Assessment Report is similar to the Long Term Effectiveness Assessment required under the Fourth Term San Diego County Permit. The Regional Monitoring and Assessment Report is expected to utilize the entire body of data and information collected by the Copermittees during the term of this Order to assess improvements to water quality on a regional scale.

Provision F.4 (Regional Clearinghouse) requires the Copermittees to develop, update, and maintain an internet-based Regional Clearinghouse that can be used to store, disseminate, and share the Copermittees' documents, monitoring data, special studies, and any other data or information.

Most of the documents and data that are generated by the Copermittees can be provided in electronic format, and made available to the San Diego Water Board and the public on the internet. The San Diego Water Board has been gradually transitioning its document submittal requirements to electronic submittals. Provision F.4 has been included to further these efforts.

Provision F.4 has also been included to improve the exchange and availability of information among the Copermittees, as well as between the Copermittees and the San Diego Water Board. Provision F.4 will also make the information generated during the implementation of the Order more accessible to the public.

Provision F.5 (Report of Waste Discharge) requires the Copermittees to submit a Report of Waste Discharge to reapply for renewal of the Order prior to its expiration, in accordance with 40 CFR 122.21(d)(2) and CWC section 13376.

~~Because the Riverside County Copermittees will not be subject to the requirements of this Order until they are notified of coverage, Provision F.5.a describes the process of submitting a Report of Waste Discharge pursuant to the requirements of their current permit to obtain coverage under this Order.~~

~~For the Copermittees subject to the requirements of this Order,~~ Provision F.5~~.b~~ requires the Copermittees to submit a Report of Waste Discharge 180 days in advance of the expiration of this Order. Provision F.5~~.b~~ also describes the minimum information to be included in the Report of Waste Discharge, based on USEPA guidance "Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems," dated May 17, 1996.

~~Provision F.6 (Application for Early Coverage) describes the process that would allow the Orange County and/or Riverside County Copermittees to obtain coverage under this Order earlier than the expiration of their current Orders.~~

~~If the Riverside County Copermittees choose to obtain coverage under this Order earlier than the expiration of their current Orders, the preparation and submittal of a Report of Waste Discharge, as required by the Fourth Term Permits, will not be necessary. The existing Order for the respective county will be rescinded upon the effective coverage date under this Order, except for enforcement purposes.~~

G. Principal Watershed Copermittee Responsibilities

Purpose: Provision G includes the requirements for the Principal Watershed Copermittee designated by the Copermittees in each Watershed Management Area.

***Discussion*:** Unlike previous NPDES requirements, there will no longer be a single Principal Copermittee. Provision G.1 requires the Copermittees to designate a Principal Watershed Copermittee for each Watershed Management Area. There are ten (10) Watershed Management Areas in the San Diego Region, as defined in Table B-1 under Provision B.1 of the Order. An individual Copermittee should not be the Principal Watershed Copermittee for more than two (2) Watershed Management Areas. There could be up to ten (10) Principal Water Copermittees designated for the Watershed Management Areas in the San Diego Region.

Provision G.2 describes the minimum responsibilities of each Principal Watershed Copermittee. The primary responsibility of the Principal Watershed Copermittees is to serve as the liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues. Ideally, the Principal Watershed Copermittee can represent the interests of all the Copermittees within a Watershed Management Area during discussions or meetings to facilitate communication with the San Diego Water Board. The Principal Watershed Copermittees are also responsible for facilitating and coordinating the implementation efforts of the Copermittees and submittals of required documents and reports.

The Principal Watershed Copermittee is responsible for facilitating the efforts of the Copermittees within the Watershed Management Area to develop the Water Quality Improvement Plan required under Provision B, and submit it for approval in accordance with Provision F.1. The Principal Watershed Copermittee is also responsible for coordinating the submittal of the document updates, Progress Report Presentations, and Annual Reports required from the Copermittees within each Watershed Management Area under Provisions F.2, F.3.a, and F.3.b. The Principal Watershed Copermittees are responsible for coordinating with each other to develop and submit the Regional Clearinghouse, Regional Monitoring and Assessment Report, and the Report of Waste Discharge required under Provisions F.3.c, F.4, and F.5.

The designated Principal Watershed Copermittee for each Watershed Management Area does not necessarily have to serve as the Principal Watershed Copermittee for the entire term of the Order. If the Copermittees in a Watershed Management Area choose to designate a new Principal Watershed Copermittee, the change may be submitted as part of the Annual Report required under Provision F.3.b, with an update to the Water Quality Improvement Plan in accordance with Provision F.2.c.

Provision G.3 specifies that the Principal Watershed Copermittee is not responsible for ensuring that the other Copermittees within the Watershed Management Area are in compliance with the requirements of this Order

H. Modification of Order

Purpose: Provision H provides the conditions under which modifications to Order No. R9-2013-0001, as amended, may occur.

***Discussion*:** Provision H allows for modifications to Order No. R9-2013-0001, as amended, for bases in addition to modifications (minor and major) allowed under the federal regulations at 40 CFR 122.62 and 122.63.

Modifications to the Order require re-opening the Order (see Water Code section 13223), subject to the requirements of 40 CFR 122.44, 122.62 to 122.64, and 124.5, but only for the specific provisions subject to the modification. Proposed modifications of the Order will be made available for public review, a public notice and comment period, and a public hearing if requested. Comments on the provisions not subject to the proposed modifications are not required to be considered in the San Diego Water Board's responses to comments or during the public hearing.

Provision H.4 was included to specify that the Order will be re-opened for modifications if ~~the State Water Board determines revisions to Provision A are warranted, an application for early coverage under the Order is received pursuant to Provision F.6,~~ the Basin Plan is amended to modify an existing TMDL or incorporate a new TMDL, or the monitoring and assessment program requirements need to be updated or revised.

~~Provision H.5 was included to specify that the San Diego Water Board will re-open and consider modifications to this Order when the Orange County Copermittees or the Riverside County Copermittees submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders~~

I. Standard Permit Provisions and General Provisions

Purpose: Provision I incorporates the standard permit provisions required to be included in all NPDES permits, as well as several other general provisions.

***Discussion*:** Provision I refers to Attachment B to the Order. Attachment B expressly incorporates the conditions applicable to all NPDES permits as provided under 40 CFR 122.41(a)-(n), as well as the applicable conditions for MS4s and storm water discharges provided under 40 CFR 122.42(c) and 40 CFR 122.42(d), respectively. Attachment B also includes several general provisions that are typically included in or applicable to waste discharge requirements issued by the San Diego Water Board.

IX. ATTACHMENTS

The attachments to the Order are discussed below. The discussions describe the content of the attachments.

Attachment A – Discharge Prohibitions and Special Protections

Section 1 of Attachment A includes the Waste Discharge Prohibitions from the Basin Plan. They have been provided verbatim in their entirety.

Section 2 of Attachment A includes the "*Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges*" applicable to permitted point source discharges of storm water, adopted under State Water Board Resolution No. 2012-0012, as amended by Resolution No. 2012-0031. The terms, prohibitions, and special conditions (collectively referred to as special conditions) are established as limitations on point source storm water discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in ASBS, as required for State Water Quality Protection Areas pursuant to California Public Resources Code sections 36700(f) and 36710(f). These Special Protections were adopted by the State Water Board as part of the Ocean Plan General Exception.

Attachment B – Standard Permit Provisions and General Provisions

Conditions applicable to all NPDES permits, as required under 40 CFR 122.41, and conditions applicable to MS4s and storm water discharges, as required under 40 CFR 122.42(c) and 122.42(d), respectively are provided in Attachment B to the Order. They have been provided expressly in their entirety.

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. These general provisions are typically included in or applicable to waste discharge requirements issued by the San Diego Water Board. Many of the general provisions were developed by the State Water Board. Where a general provision is derived from statute or regulation, a citation of the statute or regulation section is provided. General provisions that do not provide a citation are included under the authority provided CWC 13377.

Attachment C – Acronyms, Abbreviations and Definitions

The acronyms and abbreviations that are used in the Order are provided in Attachment C. Attachment C also includes definitions that may provide an explanation or description of the meaning or intent of specific terms or phrases included in the Order.

Attachment D – Jurisdictional Runoff Management Program Annual Report Form

An example of the Jurisdictional Runoff Management Program Annual Report Form required to be submitted by each Copermittee as part of the Annual Reports required under Provision F.3.b.(1)(e) is provided as Attachment D to the Order. An electronic version of the form will be available from the San Diego Water Board after the adoption of the Order.

The Jurisdictional Runoff Management Program Annual Report Form includes the minimum information necessary to demonstrate that the Copermittee is implementing and in compliance with the requirements of Provision E, and includes much of the information required to be reported pursuant to 40 CFR 122.42(c).

The information that must be provided on the Jurisdictional Runoff Management Program Annual Report Form is limited to the fiscal year, which begins July 1 and ends June 30 of the following year. The information expected to be provided by the Copermittees in each section of the Jurisdictional Runoff Management Program Annual Report Form is discussed below.

I. COPERMITTEE INFORMATION

The name of the Copermittee (e.g. name of city, county, or special district) and the contact information for the storm water program manager are provided under this section.

II. LEGAL AUTHORITY

The Copermittee must confirm whether or not the legal authorities under Provision E.1.a have been established for itself within its jurisdiction.

The Copermittee must also confirm whether or not a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority, as required under Provision E.1.b. The certification statement required by Provision E.1.b is only required to be submitted with the first Annual Report required under Provision F.3.b.

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

The Copermittee must inform the San Diego Water Board whether or not an update to its jurisdictional runoff management program document was required or recommended by the San Diego Water Board during the reporting period. An update to the jurisdictional runoff management program is required under Provision F.2.a. The San Diego Water Board may recommend modifications to the jurisdictional runoff management program as part of the iterative approach and adaptive management process required under Provision B.5, which may result in an update that is necessary for the Copermittee's jurisdictional runoff management document.

If an update was required or recommended, the Copermittee must confirm whether or not the update was completed and made available on the Regional Clearinghouse within the reporting period. If no update was required or recommended, an answer is not required. If the answer is NO, meaning the required or recommended update was not completed and/or made available on the Regional Clearinghouse, the Copermittee must attach a

schedule for the completion of the update and/or posting of the updated document on the Regional Clearinghouse.

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

The Copermittee must confirm whether or not a program was implemented during the fiscal year to actively detect and eliminate illicit discharges and connections in accordance with the requirements under Provision E.2.

In addition to confirming that a program to detect and eliminate illicit discharges was implemented during the reporting period, the Copermittee is also required to report on several items related to the program. The information that must be reported is limited to the fiscal year for the Annual Report.

All non-storm water discharges are considered illicit discharges unless the source is identified as one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5). If a non-storm water discharge is identified as one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5), the discharge is a non-storm water discharge, but not an illicit discharge. If a non-storm water discharge is identified but not in one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5), the discharge is both a non-storm water discharge and an illicit discharge.

V. DEVELOPMENT PLANNING PROGRAM

The Copermittee must confirm whether or not a development planning program was implemented during the fiscal year in accordance with the requirements under Provision E.3.

The Copermittee must also inform the San Diego Water Board whether or not an update to its BMP Design Manual was required or recommended by the San Diego Water Board during the fiscal year. An update to the BMP Design Manual is required under Provision F.2.b. The San Diego Water Board may recommend modifications to the BMP Design Manual, which may result in an update that is necessary for Copermittee's the BMP Design Manual.

If an update was required or recommended, the Copermittee must confirm whether or not the update was completed and made available on the Regional Clearinghouse within the reporting period. If no update was required or recommended, an answer is not required. If the answer is NO, meaning the required or recommended update was not completed and/or made available on the Regional Clearinghouse, the Copermittee must attach a schedule for the completion of the update and/or posting of the updated document on the Regional Clearinghouse.

The Copermittee is also required to report on several items related to the program. For the development and redevelopment projects that are reviewed under the program, the Copermittee must report the total number projects submitted for review during the fiscal year. Of those projects, the Copermittee must report the number that are Priority Development Projects, as defined under Provision E.3.b.(1). The Copermittee must also report the number of Priority Development Projects that were approved and/or granted occupancy during the fiscal year, regardless of when the project was originally submitted for review. Any projects that were approved during the fiscal year and granted any

exemptions from the BMP Design Manual requirements and/or allowed to implement alternative compliance options in accordance with Provision E.3.c.(3) must be reported.

Finally, the Copermittee must also report on several items related to its oversight of permanent BMPs on Priority Development Projects within its jurisdiction, as required under Provision E.3.e. The information that must be reported is limited to the fiscal year for the Annual Report.

VI. CONSTRUCTION MANAGEMENT PROGRAM

The Copermittee must confirm whether or not a construction management program was implemented during the fiscal year in accordance with the requirements under Provision E.4.

The Copermittee is also required to report on several items related to its oversight construction projects within its jurisdiction. The information that must be reported is limited to the fiscal year for the Annual Report.

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

The Copermittee must confirm whether or not an existing development management program was implemented during the fiscal year in accordance with the requirements under Provision E.5.

The Copermittee is also required to report on several items related to its oversight in areas of existing development within its jurisdiction. The information that must be reported is limited to the fiscal year for the Annual Report. The information must also be separated into four categories of existing development: municipal, commercial, industrial, and residential.

VIII. PUBLIC EDUCATION AND PARTICIPATION

The Copermittee must confirm whether or not a public education program component was implemented during the fiscal year in accordance with the requirements under Provision E.7.a.

The Copermittee must also confirm whether or not a public participation program component was implemented during the fiscal year in accordance with the requirements under Provision E.7.b.

IX. FISCAL ANALYSIS

The Copermittee must confirm a summary of its fiscal analysis, conducted in accordance with the requirements under Provision E.8, has been attached to the form.

X. CERTIFICATION

A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative must sign and certify the Jurisdictional Runoff Management Program Annual Report Form. The appropriate box must be checked to indicate the whether a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative is signing the form.

Attachment E – Specific Provisions for Total Maximum Daily Loads

Attachment E provides specific provisions for implementing the load allocations (LAs) and wasteload allocations (WLAs) of Total Maximum Daily Loads (TMDLs) adopted by the San Diego Water Board and approved by USEPA in which the Copermittees are identified as responsible for discharges subject to the requirements of the TMDLs. Federal regulations require that NPDES requirements incorporate water quality based effluent limitations (WQBELs) that must be consistent with the requirements and assumptions of any available WLAs,[46] which may be expressed as numeric effluent limitations, when feasible, and/or as a best management practice (BMP) program of expanded or better-tailored BMPs.[47] Where the TMDL includes WLAs that provide numeric pollutant load or pollutant parameter objectives, the WLA has been, where feasible, translated into numeric WQBELs.[48]

For each TMDL in Attachment E, four sections are included:

a. Applicability: This section provides the resolution under which the TMDL Basin Plan amendment was adopted and approved, with the applicable adoption and approval dates. This section also gives the effective date of the TMDL and where the TMDL is applicable (i.e. Watershed Management Area and water body). The Copermittees that are responsible for implementing the specific provisions are also given in this section.

b. Final TMDL Compliance Requirements: For each TMDL, the final TMDL compliance requirements consist of the final TMDL compliance date(s), the final WQBELs, and the final TMDL compliance determination requirements. The final WQBELs are expressed in terms of receiving water limitations, effluent limitations, and/or best management practices (BMPs). The final WQBELs for the TMDLs are incorporated by reference into Provision A of the Order. The final WQBELs become enforceable when the final TMDL compliance dates have passed. Applicable BMPs within the final WQBELs must be incorporated into the Water Quality Improvement Plans. Compliance with the final WQBELs will be determined in accordance with the options provided under the final TMDL compliance determination requirements.

c. Interim TMDL Compliance Requirements: If the final TMDL compliance date has not passed and there are interim TMDL compliance requirements, they are included in this section. If there are interim WQBELs with interim compliance dates, the interim WQBELs become enforceable when the corresponding interim compliance dates have passed. Compliance with the interim WQBELs will be determined in accordance with the options provided under the interim TMDL compliance determination requirements.

d. Specific Monitoring and Assessment Requirements: If there are specific monitoring and assessment requirements that cannot be met with the monitoring and assessment program

[46] 40 CFR 122.44(d)(1)(vii)(B)
[47] 40 CFR 122.44(k)(2) and 40 CFR 122.44(k)(3)
[48] November 26, 2014 Memorandum from the USEPA, Revisions to the November 22, 2002 Memorandum "Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLA""

requirements under Provision D of the Order, the additional requirements are included in this section.

The requirements of the TMDLs are based on and consistent with the assumptions and requirements of any available adopted and approved TMDLs that have been incorporated into the Basin Plan. Modifications to the requirements for the TMDLs in Attachment E cannot be made unless the TMDLs are modified in the Basin Plan.

A modification to any aspect of a TMDL in the Basin Plan requires a Basin Plan amendment. A Basin Plan amendment to modify a TMDL will require the San Diego Water Board to adopt a resolution to amend the Basin Plan, which includes a separate public process. When the San Diego Water Board adopts a Basin Plan amendment, it subsequently requires approval from the State Water Board, the Office of Administrative Law, and the USEPA before it becomes effective.

If and when the TMDLs are a modified in the Basin Plan, the San Diego Water Board will revise the requirements of the Order in accordance with the Basin Plan amendment. When a Basin Plan amendment to modify a TMDL becomes effective, the San Diego Water Board will modify the requirements of the Order pursuant to the requirements of Provision H.4 of the Order as soon as possible.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

ORDER NO. R9-2013-0001,
AS AMENDED BY ORDER NOS. R9-2015-0001 AND R9-2015-0100
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The San Diego County Copermittees in Table 1a are subject to waste discharge requirements set forth in this Order.

Table 1a. San Diego County Copermittees

City of Carlsbad	City of Oceanside
City of Chula Vista	City of Poway
City of Coronado	City of San Diego
City of Del Mar	City of San Marcos
City of El Cajon	City of Santee
City of Encinitas	City of Solana Beach
City of Escondido	City of Vista
City of Imperial Beach	County of San Diego
City of La Mesa	San Diego County Regional Airport Authority
City of Lemon Grove	San Diego Unified Port District
City of National City	

The Orange County Copermittees in Table 1b are subject to waste discharge requirements set forth in this Order.

Table 1b. Orange County Copermittees[1]

City of Aliso Viejo	City of Rancho Santa Margarita
City of Dana Point	City of San Clemente
City of Laguna Beach	City of San Juan Capistrano
City of Laguna Hills	City of Laguna Woods
City of Laguna Niguel	County of Orange
City of Mission Viejo	Orange County Flood Control District

[1] While not listed in Table 1b., the City of Lake Forest remains a Copermittee under this Order until the later effective date of this Order or the effective date of Santa Ana Water Board Tentative Order No. R8-2015-0001. Thereafter, the City of Lake Forest will no longer be considered a Copermittee under this Order because its Phase I MS4 discharges will be regulated by the Santa Ana Water Board pursuant to Water Code section 13228 designation. The requirements of this Order that apply to the City of Lake Forest for the duration of this Order, however, are described in Finding 29 and Footnote 2 to Table B-1.

The Riverside County Copermittees in Table 1c are subject to waste discharge requirements set forth in this Order.

Table 1c. Riverside County Copermittees

City of Murrieta	County of Riverside
City of Temecula	Riverside County Flood Control and Water Conservation District
City of Wildomar	

The term Copermittee in this Order refers to any San Diego County, Orange County, or Riverside County Copermittee covered under this Order, unless specified otherwise.

This Order provides permit coverage for the Copermittee discharges described in Table 2.

Table 2. Discharge Locations and Receiving Waters

Discharge Points	Locations throughout San Diego Region
Discharge Description	Municipal Separate Storm Sewer System (MS4) Discharges
Receiving Waters	Inland Surface Waters, Enclosed Bays and Estuaries, and Coastal Ocean Waters of the San Diego Region

Table 3. Administrative Information

This Order was adopted by the San Diego Water Board on:	**May 8, 2013**
Order No. R9-2013-0001 became effective on:	**June 27, 2013**
This Order as amended by R9-2015-0001 became effective on:	**April 1, 2015**
This Order as amended by R9-2015-0100 became effective on:	**January 7, 2016**
This Order will expire on:	**June 27, 2018**
The Copermittees must file a Report of Waste Discharge in accordance with Title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than 180 days in advance of the Order expiration date.	

I, David W. Gibson, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on May 8, 2013, as amended by adoption of Order No. R9-2015-0001 on February 11, 2015, and as amended by adoption of Order No. R9-2015-0100 on November 18, 2015.

David W. Gibson
Executive Officer

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ATTACHMENTS

Attachment A: Discharge Prohibitions and Special Protections A-1
Attachment B: Standard Permit Provisions and General Provisions B-1
Attachment C: Acronyms, Abbreviations and Definitions C-1
Attachment D: Jurisdictional Runoff Management Program Annual Report Form D-1
Attachment E: Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2013-0001, as amended by Order Nos. R9-2015-0001 and R9-2015-0100 ..... E-1
Attachment F: Fact Sheet / Technical Report for Order No. R9-2013-0001, as amended by Order Nos. R9-2015-0001 and R9-2015-0100 ..... F-1

I. FINDINGS

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), finds that:

JURISDICTION

1. **MS4 Ownership or Operation.** Each of the Copermittees owns or operates an MS4, through which it discharges storm water and non-storm water into waters of the U.S. within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the U.S.

2. **Legal and Regulatory Authority.** This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]) adopted by the United States Environmental Protection Agency (USEPA), and chapter 5.5, division 7 of the California Water Code (CWC) (commencing with section 13370). This Order serves as an NPDES permit for discharges from MS4s to surface waters. This Order also serves as waste discharge requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

   The San Diego Water Board has the legal authority to issue a regional MS4 permit pursuant to its authority under CWA section 402(p)(3)(B) and 40 CFR 122.26(a)(1)(v). The USEPA also made it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide permits (55 Federal Register [FR] 47990, 48039-48042). The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees and San Diego Water Board.

   The federal regulations make it clear that the Copermittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators (40 CFR 122.26(a)(3)(vi)). This Order does not require the Copermittees to manage storm water outside of their jurisdictional boundaries, but rather to work collectively to improve storm water management within watersheds.

3. **CWA NPDES Permit Conditions.** Pursuant to CWA section 402(p)(3)(B), NPDES permits for storm water discharges from MS4s must include requirements to effectively prohibit non-storm water discharges into MS4s, and require controls to reduce the discharge of pollutants in storm water to the maximum extent practicable (MEP), and to require other provisions as the San Diego Water Board determines are appropriate to control such pollutants. This Order prescribes conditions to assure compliance with the CWA requirements for owners and operators of MS4s to effectively prohibit non-storm water discharges into the MS4s, and require controls to reduce the discharge of pollutants in storm water from the MS4s to the MEP.

4. **CWA and CWC Monitoring Requirements.** CWA section 308(a) and 40 CFR 122.41(h),(j)-(l) and 122.48 require that NPDES permits must specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s also specify additional monitoring and reporting requirements in 40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c). CWC section 13383 authorizes the San Diego Water Board to establish monitoring, inspection, entry, reporting and recordkeeping requirements. This Order establishes monitoring and reporting requirements to implement federal and State requirements. This Order also includes requirements for the Orange County Copermittees to participate in, and together with South Orange County Wastewater Authority and Orange County Health Care Agency, share responsibility for implementing the unified approach to beach water quality monitoring and assessment program set forth in the October 2014 report, *Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County*, issued pursuant to CWC section 13383 in the San Diego Water Board December 5, 2014 Letter Directive.

5. **Total Maximum Daily Loads.** CWA section 303(d)(1)(A) requires that "[e]ach state shall identify those waters within its boundaries for which the effluent limitations are not stringent enough to implement any water quality standard applicable to such waters." The CWA also requires states to establish a priority ranking of impaired water bodies known as Water Quality Limited Segments and to establish Total Maximum Daily Loads (TMDLs) for such waters. This priority list of impaired water bodies is called the Clean Water Act Section 303(d) List of Water Quality Limited Segments, commonly referred to as the 303(d) List. The CWA requires the 303(d) List to be updated every two years.

   TMDLs are numerical calculations of the maximum amount of a pollutant that a water body can assimilate and still meet water quality standards. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point sources (waste load allocations or WLAs) and non-point sources (load allocations or LAs), background contribution, plus a margin of safety. Discharges from MS4s are point source discharges. The federal regulations (40 CFR 122.44(d)(1)(vii)(B)) require that NPDES permits incorporate water quality based effluent limitations (WQBELs) developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, consistent with the assumptions and requirements of any available WLA for the discharge. Requirements of this Order implement the TMDLs established by the San Diego Water Board or USEPA as of the date this Order was amended in 2015. This Order establishes WQBELs consistent with the assumptions and requirements of all available TMDL WLAs assigned to discharges from the Copermittees' MS4s.

6. **Non-Storm Water Discharges.** Pursuant to CWA section 402(p)(3)(B)(ii), this Order requires each Copermittee to effectively prohibit discharges of non-storm water into its MS4. Nevertheless, non-storm water discharges into and from the

MS4s continue to be reported to the San Diego Water Board by the Copermittees and other persons. Monitoring conducted by the Copermittees, as well as the 303(d) List, have identified dry weather, non-storm water discharges from the MS4s as a source of pollutants causing or contributing to receiving water quality impairments in the San Diego Region. The federal regulations (40 CFR 122.26(d)(2)(iv)(B)(1)) require the Copermittees to have a program to prevent illicit discharges to the MS4. The federal regulations, however, allow for specific categories of non-storm water discharges or flows to be addressed as illicit discharges only where such discharges are identified as sources of pollutants to waters of the U.S.

7. **In-Stream Treatment Systems.** Pursuant to federal regulations (40 CFR 131.10(a)), in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S. Authorizing the construction of a runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to accepting waste assimilation as an appropriate use for that water body. Runoff treatment must occur prior to the discharge of runoff into receiving waters. Treatment control best management practices (BMPs) must not be constructed in waters of the U.S. Construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body.

DISCHARGE CHARACTERISTICS AND RUNOFF MANAGEMENT

8. **Point Source Discharges of Pollutants.** Discharges from the MS4s contain waste, as defined in the CWC, and pollutants that adversely affect the quality of the waters of the state. A discharge from an MS4 is a “discharge of pollutants from a point source” into waters of the U.S. as defined in the CWA. Storm water and non-storm water discharges from the MS4s contain pollutants that cause or threaten to cause a violation of surface water quality standards, as outlined in the Water Quality Control Plan for the San Diego Basin (Basin Plan). Storm water and non-storm water discharges from the MS4s are subject to the conditions and requirements established in the Basin Plan for point source discharges.

9. **Potential Beneficial Use Impairment.** The discharge of pollutants and/or increased flows from MS4s may cause or threaten to cause the concentration of pollutants to exceed applicable receiving water quality objectives and impair or threaten to impair designated beneficial uses resulting in a condition of pollution, contamination, or nuisance.

10. **Pollutants Generated by Land Development.** Land development has created and continues to create new sources of non-storm water discharges and pollutants in storm water discharges as human population density increases. This brings higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash. Pollutants from these sources are dumped or washed off the surface by non-storm water or storm water flows into

and from the MS4s. When development converts natural vegetated pervious ground cover to impervious surfaces such as paved highways, streets, rooftops, and parking lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving a developed area without BMPs that can maintain pre-development runoff conditions will contain greater pollutant loads and have significantly greater runoff volume, velocity, and peak flow rate than pre-development runoff conditions from the same area.

11. **Runoff Discharges to Receiving Waters.** The MS4s discharge runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within the eleven hydrologic units comprising the San Diego Region. Historic and current development makes use of natural drainage patterns and features as conveyances for runoff. Rivers, streams and creeks in developed areas used in this manner are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and receiving water. Numerous receiving water bodies and water body segments have been designated as impaired by the San Diego Water Board pursuant to CWA section 303(d).

12. **Pollutants in Runoff.** The most common pollutants in runoff discharged from the MS4s include total suspended solids, sediment, pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., cadmium, copper, lead, and zinc), petroleum products and polynuclear aromatic hydrocarbons, synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus), oxygen-demanding substances (e.g., decaying vegetation, animal waste), detergents, and trash. As operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not prohibit or otherwise control. These discharges may cause or contribute to a condition of pollution or a violation of water quality standards.

13. **Human Health and Aquatic Life Impairment.** Pollutants in runoff discharged from the MS4s can threaten and adversely affect human health and aquatic organisms. Adverse responses of organisms to chemicals or physical agents in runoff range from physiological responses such as impaired reproduction or growth anomalies to mortality. Increased volume, velocity, rate, and duration of storm water runoff greatly accelerate the erosion of downstream natural channels. This alters stream channels and habitats and can adversely affect aquatic and terrestrial organisms.

14. **Water Quality Effects.** The Copermittees' water quality monitoring data submitted to date documents persistent exceedances of Basin Plan water quality objectives for runoff-related pollutants at various watershed monitoring stations. Persistent toxicity has also been observed at several watershed monitoring stations. In addition, bioassessment data indicate that the majority of the monitored receiving waters have

Poor to Very Poor Index of Biological Integrity (IBI) ratings. These findings indicate that runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in the San Diego Region. Non-storm water discharges from the MS4s have been shown to contribute significant levels of pollutants and flow in arid, developed Southern California watersheds, and contribute significantly to exceedances of applicable receiving water quality objectives.

15. **Non-Storm Water and Storm Water Discharges.** Non-storm water discharges from the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard of CWA section 402(p)(3)(B)(iii), which is explicitly for "Municipal … *Stormwater Discharges* (emphasis added)" from the MS4s. Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s must be effectively prohibited.

16. **Best Management Practices.** Waste and pollutants which are deposited and accumulate in MS4 drainage structures will be discharged from these structures to waters of the U.S. unless they are removed. These discharges may cause or contribute to, or threaten to cause or contribute to, a condition of pollution in receiving waters. For this reason, pollutants in storm water discharges from the MS4s can be and must be effectively reduced in runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Pollution prevention is the reduction or elimination of pollutant generation at its source and is the best "first line of defense." Source control BMPs (both structural and non-structural) minimize the contact between pollutants and runoff, therefore keeping pollutants onsite and out of receiving waters. Treatment control BMPs remove pollutants that have been mobilized by storm water or non-storm water flows.

17. **BMP Implementation.** Runoff needs to be addressed during the three major phases of development (planning, construction, and use) in order to reduce the discharge of storm water pollutants to the MEP, effectively prohibit non-storm water discharges, and protect receiving waters. Development which is not guided by water quality planning policies and principles can result in increased pollutant load discharges, flow rates, and flow durations which can negatively affect receiving water beneficial uses. Construction sites without adequate BMP implementation result in sediment runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. Existing development can generate substantial pollutant loads which are discharged in runoff to receiving waters. Retrofitting areas of existing development with storm water pollutant control and hydromodification management BMPs is necessary to address storm water discharges from existing development that may cause or contribute to a condition of pollution or a violation of water quality standards.

18. **Water Quality Improvements.** Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges to the MS4s and control pollutants in storm water

discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the CWA.

19. **Long Term Planning and Implementation.** Federal regulations require municipal storm water permits to expire 5 years from adoption, after which the permit must be renewed and reissued. The San Diego Water Board recognizes that the degradation of water quality and impacts to beneficial uses of the waters in the San Diego Region occurred over several decades. The San Diego Water Board further recognizes that a decade or more may be necessary to realize demonstrable improvement to the quality of waters in the San Diego Region. This Order includes a long term planning and implementation approach that will require more than a single permit term to complete.

WATER QUALITY STANDARDS

20. **Basin Plan.** The San Diego Water Board adopted the Water Quality Control Plan for the San Diego Basin (Basin Plan) on September 8, 1994, that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for receiving waters addressed through the plan. The Basin Plan was subsequently approved by the State Water Resources Control Board (State Water Board) on December 13, 1994. Subsequent revisions to the Basin Plan have also been adopted by the San Diego Water Board and approved by the State Water Board. Requirements of this Order implement the Basin Plan.

    The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Process Supply (PROC), Industrial Service Supply (IND), Ground Water Recharge (GWR), Contact Water Recreation (REC1), Non-contact Water Recreation (REC2), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Freshwater Replenishment (FRSH), Hydropower Generation (POW), and Preservation of Biological Habitats of Special Significance (BIOL). The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region: Navigation (NAV), Commercial and Sport Fishing (COMM), Estuarine Habitat (EST), Marine Habitat (MAR), Aquaculture (AQUA), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN), and Shellfish Harvesting (SHELL).

21. **Ocean Plan.** The State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, and 2005. The State Water Board adopted the latest amendment on October 16, 2012 and it became effective on August 19, 2013. The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean. Requirements of this Order implement the Ocean Plan.

    The Ocean Plan identifies the following beneficial uses of ocean waters of the state to be protected: Industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture; preservation and enhancement of designated Areas of Special Biological Significance; rare and endangered species; marine habitat; fish spawning and shellfish harvesting.

22. **Sediment Quality Control Plan**. On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes: 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

23. **National Toxics Rule and California Toxics Rule.** USEPA adopted the National Toxics Rule (NTR) on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the NTR applied in California. On May 18, 2000, USEPA adopted the California Toxics Rule (CTR). The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants.

24. **Antidegradation Policy.** This Order is in conformance with the federal Antidegradation Policy described in 40 CFR 131.12, and State Water Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality Waters in California*. Federal regulations at 40 CFR 131.12 require that the State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. State Water Board Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies. The Fact Sheet of this Order contains additional discussion about antidegradation.

25. **Anti-Backsliding Requirements.** Section 402(o)(2) of the CWA and federal regulations at 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations may be relaxed. All effluent limitations in this Order are at least as stringent as effluent limitations in the previous permits. The Fact Sheet of this Order contains additional discussion about anti-backsliding.

CONSIDERATIONS UNDER FEDERAL AND STATE LAW

26. **Coastal Zone Act Reauthorization Amendments.** Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states with approved coastal zone management programs to address non-point source pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point source pollution: agriculture, silviculture, urban, marinas, and hydromodification. This Order addresses the management measures required for the urban category, with the exception of septic systems. The runoff management programs developed pursuant to this Order fulfills the need for coastal cities to develop a runoff non-point source plan identified in the Non-Point Source Program Strategy and Implementation Plan. The San Diego Water Board addresses septic systems through the administration of other programs.

27. **Endangered Species Act.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 USC sections 1531 to 1544). This Order requires compliance with receiving water limits, and other requirements to protect the beneficial uses of waters of the State. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

28. **Report of Waste Discharge Process.** The waste discharge requirements set forth in this Order are based upon the Report of Waste Discharge submitted by the San Diego County Copermittees prior to the expiration of Order No. R9-2007-0001 (NPDES No. CAS0109266), the Report of Waste Discharge submitted by the Orange County Copermittees prior to the expiration of Order No. R9-2009-0002 (CAS0108740), and the Report of Waste Discharge submitted by the Riverside County Copermittees prior to the expiration of Order No. R9-2010-0016 (CAS0108766).

    The federal regulations (40 CFR 122.21(d)(2)) and CWC section 13376 impose a duty on the Copermittees to reapply for continued coverage through submittal of a Report of Waste Discharge no later than 180 days prior to expiration of a currently effective permit. The expiration date of this Order as shown in Table 3, and requirement to file a Report of Waste Discharge no later than 180 days prior to the

expiration date of the Order, applies jointly to the San Diego County, Orange County, and Riverside County Copermittees.

29. **Regional Water Board Designation.** The Cities of Laguna Hills, Laguna Woods, Lake Forest, Menifee, Murrieta, and Wildomar are located partially within the jurisdictions of the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board) and the San Diego Water Board and their discharges are subject to regulation by both Regional Water Boards. CWC section 13228 provides a way to streamline the regulation of entities whose jurisdictions straddle the border of two or more Regions. CWC section 13228 is implemented in this Order at the request of these six cities and to ease the regulatory burden of municipalities that lie in both the San Diego Water Board's and the adjacent Santa Ana Water Board's jurisdiction. MS4 discharges from these municipalities are regulated by the San Diego Water Board and Santa Ana Water Board as follows:

    a. Pursuant to CWC section 13228, the Cities of Laguna Hills, Laguna Woods, and Lake Forest submitted written requests that one Regional Water Board be designated to regulate Phase I MS4 discharges for each of the Cities. The Santa Ana Water Board and the San Diego Water Board have entered into an agreement dated February 10, 2015, whereby the Cities of Laguna Woods and Laguna Hills are largely regulated by the San Diego Water Board under this Order, including those portions of the Cities of Laguna Woods and Laguna Hills not within the San Diego Water Board's jurisdiction, upon the effective date of this Order or Santa Ana Water Board Order No. R8-2015-0001, whichever is later. Similarly, the City of Lake Forest, including those portions of the City of Lake Forest within the San Diego Water Board's jurisdiction, is largely regulated by the Santa Ana Water Board under Order No. R8-2015-0001 (NPDES No. CAS618030) upon the later effective date of this Order or Order No. R8-2015-0001. The agreement provides that the City of Lake Forest is required to retain, and continue implementation of, its over-irrigation discharge prohibition in Title 15, Chapter 14.030, List (b) of the City Municipal Code for regulating storm water quality throughout its jurisdiction. The agreement also requires the City of Lake Forest to actively participate during development and implementation of the Aliso Creek Watershed Management Area Water Quality Improvement Plan required pursuant to this Order. Each Regional Water Board retains the authority to enforce provisions of its Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee under the terms of the agreement (Water Code section 13228 (b)). Under the terms of the agreement, any TMDL and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Laguna Woods, Laguna Hills or Lake Forest as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement of the applicable TMDL will remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's San

Diego Creek/Newport Bay TMDL and the San Diego Water Board's Indicator Bacteria Project I Beaches and Creeks TMDL. The San Diego Water Board will periodically review the effectiveness of the agreement during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate the agreement with Santa Ana Water Board or otherwise modify the agreement subject to the approval of the Santa Ana Water Board.

b. Pursuant to CWC section 13228, the Cities of Murrieta, Wildomar, and Menifee submitted written requests that one Regional Water Board be designated to regulate Phase I MS4 discharges for each of the Cities. The Santa Ana Water Board and the San Diego Water Board have entered into an agreement dated October 26, 2015, whereby the Cities of Murrieta and Wildomar are largely regulated by the San Diego Water Board under this Order, including those portions of the Cities of Murrieta and Wildomar not within the San Diego Water Board's jurisdiction, upon the effective date of this Order. Similarly, the City of Menifee is largely regulated by the Santa Ana Water Board under Order No. R8-2010-0033 as it may be amended or reissued, including those portions of the City of Menifee within the San Diego Water Board's jurisdiction, upon the effective date of this Order. The agreement also requires the City of Menifee to actively participate during development and implementation of the Santa Margarita River Watershed Management Area Water Quality Improvement Plan required pursuant to this Order. Each Regional Water Board retains the authority to enforce provisions of its Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee under the terms of the agreement (Water Code section 13228 (b)). Under the terms of the agreement, any TMDL and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Menifee, Murrieta, or Wildomar as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement of the applicable TMDL will remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's Lake Elsinore/Canyon Lake Nutrient TMDLs. The San Diego Water Board will periodically review the effectiveness of the agreement during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate the agreement with Santa Ana Water Board or otherwise modify the agreement subject to the approval of the Santa Ana Water Board.

30. Integrated Report and Clean Water Act Section 303(d) List. The San Diego Water Board and State Water Board submit an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. USEPA issued its *Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act* on July 29, 2005, which advocates the use of a five category approach for

classifying the attainment status of water quality standards for water bodies in the Integrated Report. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 in the Integrated Report are placed on the 303(d) List.

Water bodies with available data and/or information that indicate at least one beneficial use is not being supported or is threatened, but a TMDL is not required, are included in Category 4 in the Integrated Report. Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

Implementation of the requirements of this Order may allow the San Diego Water Board to include surface waters impaired by discharges from the Copermittees' MS4s in Category 4 in the Integrated Report for consideration during the next 303(d) List submittal by the State to USEPA.

31. **Economic Considerations.** The California Supreme Court has ruled that although CWC section 13263 requires the State and Regional Water Boards (collectively Water Boards) to consider factors set forth in CWC section 13241 when issuing an NPDES permit, the Water Board may not consider the factors to justify imposing pollutant restrictions that are less stringent than the applicable federal regulations require. (*City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 618, 626-627.) However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

    As noted in the following finding, the San Diego Water Board finds that the requirements in this Order are not more stringent than the minimum federal requirements. Therefore, a CWC section 13241 analysis is not required for permit requirements that implement the effective prohibition on the discharge of non-storm water into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determined appropriate to control such pollutants, as those requirements are mandated by federal law. Notwithstanding the above, the San Diego Water Board has developed an economic analysis of the requirements in this Order. The economic analysis is provided in the Fact Sheet.

32. **Unfunded Mandates.** This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following:

a. This Order implements federally mandated requirements under CWA section 402 (33 USC section 1342(p)(3)(B)).

b. The local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental and new dischargers who are issued NPDES permits for storm water and non-storm water discharges.

c. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order.

d. The Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)) and in lieu of numeric restrictions on their MS4 discharges (i.e. effluent limitations).

e. The local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under State law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

f. The provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state develops a TMDL, federal law requires that permits must contain water quality based effluent limitations consistent with the assumptions and requirements of any applicable wasteload allocation (40 CFR 122.44(d)(1)(vii)(B)).

See the Fact Sheet for further discussion of unfunded mandates.

33. California Environmental Quality Act. The issuance of waste discharge requirements and an NPDES permit for the discharge of runoff from MS4s to waters of the U.S. is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 et seq.) in accordance with CWC section 13389.

STATE WATER BOARD DECISIONS

34. Compliance with Prohibitions and Limitations. The receiving water limitation language specified in this Order is consistent with language recommended by the USEPA and established in State Water Board Order WQ 99-05, *Own Motion Review of the Petition of Environmental Health Coalition to Review Waste Discharge Requirements Order No. 96-03, NPDES Permit No. CAS0108740*, adopted by the State Water Board on June 17, 1999. The receiving water limitation language in this Order requires storm water discharges from MS4s to not cause or contribute to a violation of water quality standards, which is to be achieved through an iterative approach requiring the implementation of improved and better-tailored BMPs over time. Implementation of the iterative approach to comply with receiving water

limitations based on applicable water quality standards is necessary to ensure that storm water discharges from the MS4 will not ultimately cause or contribute to violations of water quality standards and will not create conditions of pollution, contamination, or nuisance.

The San Diego, Orange County, and Riverside County Copermittees have asserted that the prohibitions and limitations may result in many years of noncompliance because years of technical efforts may ultimately be required to achieve compliance with the prohibitions and limitations, especially for wet weather discharges. To address this concern, this Order includes an option that allows a Copermittee to be deemed in compliance with the prohibitions and limitations where more than one permit term may be necessary to achieve full compliance with the prohibitions and limitations. One or more Copermittees within a Watershed Management Area can choose to implement this option.

An alternative compliance pathway option has been included in this Order consistent with the approach described in Order WQ 2015-0075, *In the Matter of Review of Order No. R4-2012-0175, NPDES Permit No. CAS004001, Waste Discharge Requirements for Municipal Separate Storm Sewer System (MS4) Discharges within the Coastal Watersheds of Los Angeles County, Except Those Discharges Originating from the City of Long Beach MS4,* adopted by the State Water Board on June 16, 2015. State Water Board Order WQ 2015-0075 directs the Regional Water Boards to consider a watershed-based planning and implementation approach to compliance with receiving water limitations when issuing Phase I MS4 permits going forward. Order WQ 2015-0075 included seven principles that the Regional Water Boards are expected to follow when incorporating an alternative compliance pathway into an MS4 permit. The Fact Sheet discusses the incorporation of the seven principles stipulated in State Water Board Order WQ 2015-0075 into the alternative compliance pathway option in this Order.

35. **Special Conditions for Areas of Special Biological Significance.** On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving a general exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges (General Exception). On June 19, 2012, the State Water Board adopted Order No. 2012-0031, amending the General Exception to require pollutant reductions to be achieved within six years in accordance with ASBS Compliance Plans and ASBS Pollution Prevention Plans. The General Exception requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject to the terms and conditions of the General Exception as amended. The Special Protections contained in Attachment B to the General Exception as amended are

applicable to these discharges, and are hereby incorporated into Attachment A of this Order.

ADMINISTRATIVE FINDINGS

36. **Executive Officer Delegation of Authority.** The San Diego Water Board by prior resolution has delegated all matters that may legally be delegated to its Executive Officer to act on its behalf pursuant to CWC section 13223. Therefore, the Executive Officer is authorized to act on the San Diego Water Board's behalf on any matter within this Order unless such delegation is unlawful under CWC section 13223 or this Order explicitly states otherwise.

37. **Standard Provisions.** Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR 122.42, are provided in Attachment B to this Order.

38. **Fact Sheet.** The Fact Sheet for this Order contains background information, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of this Order. The Fact Sheet is hereby incorporated into this Order and constitutes part of the Findings of this Order.

39. **Public Notice.** In accordance with State and federal laws and regulations, the San Diego Water Board notified the Copermittees, and interested agencies and persons of its intent to prescribe waste discharge requirements for the control of discharges into and from the MS4s to waters of the U.S. and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet.

40. **Public Hearings.** The San Diego Water Board held a public hearing on April 10 and 11, 2013, that was continued to May 8, 2013 and heard and considered all comments pertaining to the terms and conditions of this Order. The San Diego Water Board also held a public workshop on October 8, 2015, and a public hearing on February 11, 2015, and heard and considered all comments pertaining to the amendment of this Order through Order No. R9-2015-0001. The San Diego Water Board also held a public hearing on November 18, 2015, and heard and considered all comments pertaining to the amendment of this Order through Order No. R9-2015-0100. Details of these public hearings are provided in the Fact Sheet.

41. **Effective Date.** This Order serves as an NPDES permit pursuant to CWA section 402 or amendments thereto, and as to the San Diego County Copermittees listed in Table 1a, became effective fifty (50) days after the date of its adoption, and as to the Orange County Copermittees listed in Table 1b, became effective on April 1, 2015, after Order No. R9-2015-0001 was adopted, and as to the Riverside County Copermittees listed in Table 1c, became effective on January 7, 2016, after Order No. R9-2015-0100 was adopted, provided that the Regional Administrator, USEPA, Region IX, does not object to this Order.

42. **Review by the State Water Board.** Any person aggrieved by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with CWC section 13320 and California Code of Regulations, title 23, sections 2050, and following. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date of this Order, except that if the thirtieth day following the date of this Order falls on a Saturday, Sunday or State holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

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THEREFORE, IT IS HEREBY ORDERED that the Copermittees, in order to meet the provisions contained in division 7 of the CWC (commencing with section 13000) and regulations adopted thereunder, and the provisions of the CWA and regulations adopted thereunder, must each comply with the requirements of this Order. This action in no way prevents the San Diego Water Board from taking enforcement action for past violations of the previous Order applicable to the Copermittees. If any part of this Order is subject to a temporary stay of enforcement, unless otherwise specified, the Copermittees must comply with the analogous portions of the previous Order, which will remain in effect for all purposes during the pendency of the stay.

II. PROVISIONS

A. PROHIBITIONS AND LIMITATIONS

The purpose of this provision is to describe the conditions under which storm water and non-storm water discharges into and from MS4s are prohibited or limited. The goal of the prohibitions and limitations is to protect the water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through the implementation of water quality improvement strategies and runoff management programs that effectively prohibit non-storm water discharges into the Copermittees' MS4s, and reduce pollutants in storm water discharges from the Copermittees' MS4s to the MEP.

1. Discharge Prohibitions

a. Discharges from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the state are prohibited.

b. Non-storm water discharges into MS4s are to be effectively prohibited, through the implementation of Provision E.2, unless such discharges are authorized by a separate NPDES permit.

c. Discharges from MS4s are subject to all waste discharge prohibitions in the Basin Plan, included in Attachment A to this Order.

d. Storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012, as amended by State Water Board Resolution No. 2012-0031, applicable to these discharges, included in Attachment A to this Order. All other discharges from the Copermittees' MS4s to ASBS are prohibited.

2. Receiving Water Limitations

a. Discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters, including but not limited to all applicable provisions contained in:

(1) The San Diego Water Board's Basin Plan, including beneficial uses, water quality objectives, and implementation plans;

(2) State Water Board plans for water quality control including the following:

(a) Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries (Thermal Plan), and

(b) The Ocean Plan, including beneficial uses, water quality objectives, and implementation plans;

(3) State Water Board policies for water and sediment quality control including the following:

(a) Water Quality Control Policy for the Enclosed Bays and Estuaries of California,

(b) Sediment Quality Control Plan which includes the following narrative objectives for bays and estuaries:

(i) Pollutants in sediments shall not be present in quantities that, alone or in combination, are toxic to benthic communities, and

(ii) Pollutants shall not be present in sediments at levels that will bioaccumulate in aquatic life to levels that are harmful to human health,

(c) The Statement of Policy with Respect to Maintaining High Quality of Waters in California;[2]

(4) Priority pollutant criteria promulgated by the USEPA through the following:

(a) National Toxics Rule (NTR)[3] (promulgated on December 22, 1992 and amended on May 4, 1995), and

(b) California Toxics Rule (CTR).[4,5]

b. Discharges from MS4s composed of storm water runoff must not alter natural ocean water quality in an ASBS.

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[2] State Water Board Resolution No. 68-16
[3] 40 CFR 131.36
[4] 65 Federal Register 31682-31719 (May 18, 2000), adding Section 131.38 to 40 CFR
[5] If a water quality objective and a CTR criterion are in effect for the same priority pollutant, the more stringent of the two applies.

3. Effluent Limitations

a. TECHNOLOGY BASED EFFLUENT LIMITATIONS

Pollutants in storm water discharges from MS4s must be reduced to the MEP.[6]

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

Each Copermittee must comply with applicable WQBELs established for the TMDLs in Attachment E to this Order, pursuant to the applicable TMDL compliance schedules.

4. Compliance with Discharge Prohibitions and Receiving Water Limitations

Each Copermittee must achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order through timely implementation of control measures and other actions as specified in Provisions B and E of this Order, including any modifications. The Water Quality Improvement Plans required under Provision B must be designed and adapted to ultimately achieve compliance with Provisions A.1.a, A.1.c and A.2.a.

a. If exceedance(s) of water quality standards persist in receiving waters notwithstanding implementation of this Order, the Copermittees must comply with the following procedures:

(1) For exceedance(s) of a water quality standard in the process of being addressed by the Water Quality Improvement Plan, the Copermittee(s) must implement the Water Quality Improvement Plan as accepted by the San Diego Water Board, and update the Water Quality Improvement Plan, as necessary, pursuant to Provision F.2.c;

(2) Upon a determination by either the Copermittees or the San Diego Water Board that discharges from the MS4 are causing or contributing to a new exceedance of an applicable water quality standard not addressed by the Water Quality Improvement Plan, the Copermittees must submit the following updates to the Water Quality Improvement Plan pursuant to Provision F.2.c or as part of the Water Quality Improvement Plan Annual Report required under Provision F.3.b, unless the San Diego Water Board directs an earlier submittal:

(a) The water quality improvement strategies being implemented that are effective and will continue to be implemented,

[6] This does not apply to MS4 discharges which receive subsequent treatment to reduce pollutants in storm water discharges to the MEP prior to entering receiving waters (e.g., low flow diversions to the sanitary sewer). Runoff treatment must occur prior to the discharge of runoff into receiving waters per Finding 7.

(b) Water quality improvement strategies (i.e. BMPs, retrofitting projects, stream and/or habitat rehabilitation projects, adjustments to jurisdictional runoff management programs, etc.) that will be implemented to reduce or eliminate any pollutants or conditions that are causing or contributing to the exceedance of water quality standards,

(c) Updates to the schedule for implementation of the existing and additional water quality improvement strategies, and

(d) Updates to the monitoring and assessment program to track progress toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a of this Order;

(3) The San Diego Water Board may require the incorporation of additional modifications to the Water Quality Improvement Plan required under Provision B. The applicable Copermittees must submit any modifications to the update to the Water Quality Improvement Plan within 90 days of notification that additional modifications are required by the San Diego Water Board, or as otherwise directed;

(4) Within 90 days of the San Diego Water Board determination that the modifications to the Water Quality Improvement Plan required under Provision A.4.a.(3) meet the requirements of this Order, the applicable Copermittees must revise the jurisdictional runoff management program documents to incorporate the modified water quality improvement strategies that have been and will be implemented, the implementation schedule, and any additional monitoring required; and

(5) Each Copermittee must implement the updated Water Quality Improvement Plan.

b. The procedure set forth above to achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order do not have to be repeated for continuing or recurring exceedances of the same water quality standard(s) following implementation of scheduled actions unless directed to do otherwise by the San Diego Water Board.

c. Nothing in Provisions A.4.a and A.4.b prevents the San Diego Water Board from enforcing any provision of this Order while the applicable Copermittees prepare and implement the above update to the Water Quality Improvement Plan and jurisdictional runoff management programs.

B. WATER QUALITY IMPROVEMENT PLANS

The purpose of this provision is to develop Water Quality Improvement Plans that guide the Copermittees' jurisdictional runoff management programs towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plans is to further the Clean Water Act's objective to protect, preserve, enhance, and restore the water quality and designated beneficial uses of waters of the state. This goal will be accomplished through an adaptive planning and management process that identifies the highest priority water quality conditions within a watershed and implements strategies through the jurisdictional runoff management programs to achieve improvements in the quality of discharges from the MS4s and receiving waters.

1. Watershed Management Areas

The Copermittees must develop a Water Quality Improvement Plan for each of the Watershed Management Areas in Table B-1. A total of ten Water Quality Improvement Plans must be developed for the San Diego Region.

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
San Juan (901.00)	South Orange County	- Aliso Creek - San Juan Creek - San Mateo Creek - Pacific Ocean - Heisler Park ASBS	- City of Aliso Viejo - City of Dana Point - City of Laguna Beach - City of Laguna Hills[1] - City of Laguna Niguel - City of Laguna Woods[1] - City of Lake Forest[2] - City of Mission Viejo - City of Rancho Santa Margarita - City of San Clemente - City of San Juan Capistrano - County of Orange - Orange County Flood Control District
Santa Margarita (902.00)	Santa Margarita River	- Murrieta Creek - Temecula Creek - Santa Margarita River - Santa Margarita Lagoon - Pacific Ocean	- City of Menifee[3] - City of Murrieta[4] - City of Temecula - City of Wildomar[4] - County of Riverside - County of San Diego - Riverside County Flood Control and Water Conservation District
San Luis Rey (903.00)	San Luis Rey River	- San Luis Rey River - San Luis Rey Estuary - Pacific Ocean	- City of Oceanside - City of Vista - County of San Diego

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
Carlsbad (904.00)	Carlsbad	- Loma Alta Slough - Buena Vista Lagoon - Agua Hedionda Lagoon - Batiquitos Lagoon - San Elijo Lagoon - Pacific Ocean	- City of Carlsbad - City of Encinitas - City of Escondido - City of Oceanside - City of San Marcos - City of Solana Beach - City of Vista - County of San Diego
San Dieguito (905.00)	San Dieguito River	- San Dieguito River - San Dieguito Lagoon - Pacific Ocean	- City of Del Mar - City of Escondido - City of Poway - City of San Diego - City of Solana Beach - County of San Diego
Penasquitos (906.00)	Penasquitos	- Los Penasquitos Lagoon - Pacific Ocean	- City of Del Mar - City of Poway - City of San Diego - County of San Diego
	Mission Bay	- Mission Bay - Pacific Ocean - San Diego Marine Life Refuge ASBS	- City of San Diego
San Diego (907.00)	San Diego River	- San Diego River - Pacific Ocean	- City of El Cajon - City of La Mesa - City of San Diego - City of Santee - County of San Diego
Pueblo San Diego (908.00) Sweetwater (909.00) Otay (910.00)	San Diego Bay	- Sweetwater River - Otay River - San Diego Bay - Pacific Ocean	- City of Chula Vista - City of Coronado - City of Imperial Beach - City of La Mesa - City of Lemon Grove - City of National City - City of San Diego - County of San Diego - San Diego County Regional Airport Authority - San Diego Unified Port District
Tijuana (911.00)	Tijuana River	- Tijuana River - Tijuana Estuary - Pacific Ocean	- City of Imperial Beach - City of San Diego - County of San Diego

Notes:

1. By agreement dated February 10, 2015, pursuant to Water Code section 13228, the Phase I MS4 discharges within the jurisdiction of the City of Laguna Hills and the City of Laguna Woods located in the Santa Ana Region are regulated by San Diego Water Board Order No. R9-2013-0001 as amended by Order No. R9-2015-0001, upon the later effective date of Order No. R9-2015-0001 or Santa Ana Water Board Tentative Order No. R8-2015-0001. The City of Laguna Hills and Laguna Woods must also comply with the requirements of the San Diego Creek/Newport Bay TMDL in section XVIII of Santa Ana Water Board Order No. R8-2015-0001.
2. By agreement dated February 10, 2015, pursuant to Water Code section 13228, Phase I MS4 discharges within the City of Lake Forest located within the San Diego Water Board Region are regulated by the Santa Ana Water Board Order No. R8-2015-0001 (NPDES No. CAS618030) upon the later effective date of this Order or Santa Ana Water Board Tentative Order No. R8-2015-0001. In accordance with the terms of the agreement between the San Diego Water Board and the Santa Ana Water Board, the City of Lake Forest must implement the requirements of the Bacteria TMDL in Attachment E of this Order, participate in preparation and implementation of the Water Quality Improvement Plan for the Aliso Creek Watershed Management Area as described in Provision B of this Order and continue implementation of its over-irrigation discharge prohibition in its City Ordinance, Title 15, Chapter 15, section 14.030, List (b).
3. By agreement dated October 26, 2015, pursuant to Water Code section 13228, Phase I MS4 discharges within the City of Menifee located within the San Diego Water Board Region are regulated by the Santa Ana Water Board Order No. R8-2010-0033 as it may be amended or reissued (NPDES No. CAS618033) upon the later effective date of this Order. In accordance with the terms of the agreement between the San Diego Water Board and the Santa Ana Water Board, the City of Menifee must participate in preparation and implementation of the Water Quality Improvement Plan for the Santa Margarita River Watershed Management Area as described in Provision B of this Order.
4. By agreement dated October 26, 2015, pursuant to Water Code section 13228, the Phase I MS4 discharges within the jurisdiction of the City of Murrieta and the City of Wildomar located in the Santa Ana Region are regulated by San Diego Water Board Order No. R9-2013-0001 as amended by Orders No. R9-2015-0001 and R9-2015-0100. The City of Murrieta and City of Wildomar must also comply with the requirements of the Lake Elsinore/Canyon Lake Nutrient TMDLs in section VI.D.2 of Santa Ana Water Board Order No. R8-2010-0033, or corresponding section as it may be amended or reissued.

2. Priority Water Quality Conditions

The Copermittees must identify the water quality priorities within each Watershed Management Area that will be addressed by the Water Quality Improvement Plan. Where appropriate, Watershed Management Areas may be separated into subwatersheds to focus water quality prioritization and jurisdictional runoff management program implementation efforts by receiving water.

a. Assessment of Receiving Water Conditions

The Copermittees must consider the following, at a minimum, to identify water quality priorities based on impacts of MS4 discharges on receiving water beneficial uses:

(1) Receiving waters listed as impaired on the CWA Section 303(d) List of Water Quality Limited Segments (303(d) List);

(2) TMDLs adopted and under development by the San Diego Water Board;

(3) Receiving waters recognized as sensitive or highly valued by the Copermittees, including estuaries designated under the National Estuary Program under CWA section 320, marine protected areas, wetlands defined by the State or U.S. Fish and Wildlife Service's National Wetlands Inventory as wetlands, waters having the Preservation of Biological Habitats of Special Significance (BIOL) beneficial use designation, and receiving waters identified as ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(4) The receiving water limitations of Provision A.2;

(5) Known historical versus current physical, chemical, and biological water quality conditions;

(6) Available, relevant, and appropriately collected and analyzed physical, chemical, and biological receiving water monitoring data, including, but not limited to, data describing:

(a) Chemical constituents,

(b) Water quality parameters (i.e. pH, temperature, conductivity, etc.),

(c) Toxicity Identification Evaluations for both receiving water column and sediment,

(d) Trash impacts,

(e) Bioassessments, and

(f) Physical habitat;

(7) Available evidence of erosional impacts in receiving waters due to accelerated flows (i.e. hydromodification);

(8) Available evidence of adverse impacts to the chemical, physical, and biological integrity of receiving waters; and

(9) The potential improvements in the overall condition of the Watershed Management Area that can be achieved.

b. ASSESSMENT OF IMPACTS FROM MS4 DISCHARGES

The Copermittees must consider the following, at a minimum, to identify the potential impacts to receiving waters that may be caused or contributed to by discharges from the Copermittees' MS4s:

(1) The discharge prohibitions of Provision A.1 and effluent limitations of Provision A.3; and

(2) Available, relevant, and appropriately collected and analyzed storm water and non-storm water monitoring data from the Copermittees' MS4 outfalls;

(3) Locations of each Copermittee's MS4 outfalls that discharge to receiving waters;

(4) Locations of MS4 outfalls that are known to persistently discharge non-storm water to receiving waters likely causing or contributing to impacts on receiving water beneficial uses;

(5) Locations of MS4 outfalls that are known to discharge pollutants in storm water causing or contributing to impacts on receiving water beneficial uses; and

(6) The potential improvements in the quality of discharges from the MS4 that can be achieved.

c. IDENTIFICATION OF PRIORITY WATER QUALITY CONDITIONS

(1) The Copermittees must use the information gathered for Provisions B.2.a and B.2.b to develop a list of priority water quality conditions as pollutants, stressors and/or receiving water conditions that are the highest threat to receiving water quality or that most adversely affect the quality of receiving waters. The list must include the following information for each priority water quality condition:

(a) The beneficial use(s) associated with the priority water quality condition;

(b) The geographic extent of the priority water quality condition within the Watershed Management Area, if known;

(c) The temporal extent of the priority water quality condition (e.g., dry weather and/or wet weather);

(d) The Copermittees with MS4s discharges that may cause or contribute to the priority water quality condition; and

(e) An assessment of the adequacy of and data gaps in the monitoring data to characterize the conditions causing or contributing to the priority water quality condition, including a consideration of spatial and temporal variation.

(2) The Copermittees must identify the highest priority water quality conditions to be addressed by the Water Quality Improvement Plan, and provide a rationale for selecting a subset of the water quality conditions identified pursuant to Provision B.2.c.(1) as the highest priorities.

d. IDENTIFICATION OF MS4 SOURCES OF POLLUTANTS AND/OR STRESSORS

The Copermittees must identify and prioritize known and suspected sources of storm water and non-storm water pollutants and/or other stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c. The identification of known and suspected sources of pollutants and/or stressors that cause or contribute to the highest priority water quality conditions as identified for Provision B.2.c must consider the following:

(1) Pollutant generating facilities, areas, and/or activities within the Watershed Management Area, including:

(a) Each Copermittee's inventory of construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas,

(b) Publicly owned parks and/or recreational areas,

(c) Open space areas,

(d) All currently operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste, and

(e) Areas not within the Copermittees' jurisdictions (e.g., Phase II MS4s, tribal lands, state lands, federal lands) that are known or suspected to be discharging to the Copermittees' MS4s;

(2) Locations of the Copermittees' MS4s, including the following:

(a) All MS4 outfalls that discharge to receiving waters, and

(b) Locations of major structural controls for storm water and non-storm water (e.g., retention basins, detention basins, major infiltration devices, etc.);

(3) Other known and suspected sources of non-storm water or pollutants in storm water discharges to receiving waters within the Watershed Management Area, including the following:

(a) Other MS4 outfalls (e.g., Phase II Municipal and Caltrans),

(b) Other NPDES permitted discharges,

(c) Any other discharges that may be considered point sources (e.g., private outfalls), and

(d) Any other discharges that may be considered non-point sources (e.g., agriculture, wildlife or other natural sources);

(4) Review of available data, including but not limited to:

(a) Findings from the Copermittees' illicit discharge detection and elimination programs,

(b) Findings from the Copermittees' MS4 outfall discharge monitoring,

(c) Findings from the Copermittees' receiving water monitoring,

(d) Findings from the Copermittees' MS4 outfall discharge and receiving water assessments, and

(e) Other available, relevant, and appropriately collected data, information, or studies related to pollutant sources and/or stressors that contribute to the highest priority water quality conditions as identified for Provision B.2.c.

(5) The adequacy of the available data to identify and prioritize sources and/or stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c.

e. IDENTIFICATION OF POTENTIAL WATER QUALITY IMPROVEMENT STRATEGIES

The Copermittees must evaluate the findings identified under Provisions B.2.a-d, and identify potential strategies that can result in improvements to water quality in MS4 discharges and/or receiving waters within the Watershed Management Area. Potential water quality improvement strategies that may be implemented within the Watershed Management Area must include the following:

(1) Structural BMPs, non-structural BMPs, incentives, or programs that can potentially be implemented to address the highest priority water quality conditions identified under Provision B.2.c, or MS4 sources of pollutants or stressors identified under Provision B.2.d,

(2) Retrofitting projects in areas of existing development within the Watershed Management Area that can potentially be implemented to reduce MS4 sources of pollutants or stressors identified under Provision B.2.d causing or contributing to the highest priority water quality conditions identified under Provision B.2.c, and

(3) Stream, channel, and/or habitat rehabilitation projects within the Watershed Management Area that can potentially be implemented to protect and/or improve conditions in receiving waters from MS4 pollutants and/or stressors identified under Provision B.2.d causing or contributing to the highest priority water quality conditions identified under Provision B.2.c.

3. Water Quality Improvement Goals, Strategies and Schedules

The Copermittees must identify and develop specific water quality improvement goals and strategies to address the highest priority water quality conditions identified within a Watershed Management Area. The water quality improvement goals and strategies must address the highest priority water quality conditions by effectively prohibiting non-storm water discharges to the MS4, reducing pollutants in storm water discharges from the MS4 to the MEP, and protecting the water quality standards of receiving waters.

a. WATER QUALITY IMPROVEMENT GOALS AND SCHEDULES

(1) <u>Numeric Goals</u>

The Copermittees must develop and incorporate numeric goals[7] into the Water Quality Improvement Plan. Numeric goals must be used to support

[7] Interim and final numeric goals may take a variety of forms such as TMDL established WQBELs, action levels, pollutant concentration, load reductions, number of impaired water bodies delisted from the List of Water Quality Impaired Segments, Index of Biotic Integrity (IBI) scores, or other appropriate metrics. Interim and final numeric goals are not necessarily limited to one criterion or indicator, but may include multiple criteria and/or indicators. Except for TMDL established WQBELs, interim and final numeric goals and corresponding schedules may be revised through the adaptive management process under Provision B.5.

Water Quality Improvement Plan implementation and measure reasonable progress towards addressing the highest priority water quality conditions identified under Provision B.2.c. The Copermittees must establish and incorporate the following numeric goals in the Water Quality Improvement Plan:

(a) Final numeric goals must be based on measureable criteria or indicators capable of demonstrating one or more of the following:

(i) Discharges from the Copermittees' MS4s will not cause or contribute to exceedances of water quality standards in receiving waters, AND/OR

(ii) The conditions of receiving waters and associated habitat are protected from MS4 discharges, AND/OR

(iii) Beneficial uses of receiving waters are protected from MS4 discharges and will be supported.

(b) Interim numeric goals must be based on measureable criteria or indicators capable of demonstrating reasonable incremental progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges as follows:

(i) One or more interim numeric goals may be established to demonstrate progress toward achieving each final numeric goal,

(ii) For each final numeric goal, at least one interim numeric goal must be expressed as a reasonable increment toward achievement of the final numeric goal,

(iii) For each final numeric goal, reasonable interim numeric goals must be established to be accomplished during each 5 year period between the acceptance of the Water Quality Improvement Plan and the achievement of the final numeric goals.

(2) <u>Schedules for Achieving Numeric Goals</u>

The Copermittees must develop and incorporate schedules for achieving the numeric goals into the Water Quality Improvement Plan. The schedules must demonstrate reasonable progress toward achieving the final numeric goals required for Provision B.3.a.(1). The Copermittees must incorporate the schedules for achieving the numeric goals into the Water Quality Improvement Plan based on the following considerations:

(a) Final dates for achieving all final numeric goals must be established considering the following:

(i) Final compliance dates for any applicable TMDLs in Attachment E to this Order;

(ii) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(iii) Achievement of the final numeric goals for the highest water quality priorities must be as soon as possible;

(iv) Final dates for achieving the final numeric goals must reflect a realistic assessment of the shortest practicable time required based on the temporal and spatial extent and factors associated with the highest priority water quality conditions identified under Provision B.2.c, and taking into account the time reasonably required to implement the water quality improvement strategies required pursuant to Provision B.3.b.

(b) Interim dates for achieving all interim numeric goals must be established considering the following:

(i) Interim compliance dates for any applicable TMDLs in Attachment E to this Order;

(ii) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(iii) Interim dates for achieving the interim numeric goals must reflect a realistic assessment of the shortest practicable time reasonably required, taking into account the time needed to implement new or significantly expanded programs and securing financing, if necessary; and

(iv) For each final numeric goal, at least one interim numeric goal must be established that the Copermittees will work toward achieving within the term of this Order.

b. WATER QUALITY IMPROVEMENT STRATEGIES AND SCHEDULES

Based on the likely effectiveness and efficiency of the potential water quality improvement strategies identified under Provision B.2.e to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a, the Copermittees must identify the strategies that will be implemented in each Watershed Management Area as follows:

(1) Jurisdictional Strategies

(a) Each Copermittee in the Watershed Management Area must identify the strategies that will be implemented within its jurisdiction as part of its jurisdictional runoff management program requirements under Provisions E.2 through E.7, including descriptions of the following:

(i) For each of the inventories developed for its jurisdiction, as required under Provisions D.2.a.(1), E.3.e.(2), E.4.b, and E.5.a, each Copermittee must identify the known and suspected areas or sources causing or contributing to the highest priority water quality conditions in the Watershed Management Area that the Copermittee will focus on in its efforts to effectively prohibit non-storm water discharges to its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, and achieve the interim and final numeric goals identified under Provision B.3.a;

(ii) BMPs that each Copermittee will implement, or require to be implemented, as applicable, for those areas or sources within its jurisdiction;

(iii) Education programs that each Copermittee will implement, as applicable, for those areas or sources within its jurisdiction;

(iv) Frequencies that each Copermittee will conduct inspections on those areas or sources within its jurisdiction;

(v) Incentive and enforcement programs that each Copermittee will implement, as applicable, for those areas or sources within its jurisdiction; and

(vi) Any other BMPs, incentives, or programs that each Copermittee will implement for those areas or sources within its jurisdiction.

(b) Identify the optional jurisdictional strategies that each Copermittee will implement within its jurisdiction, as necessary, to effectively prohibit non-storm water discharges to its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. Descriptions of the optional jurisdictional strategies must include:

(i) BMPs, incentives, or programs that may be implemented by the Copermittee within its jurisdiction in addition to the requirements of Provisions B.3.b.(1)(a);

(ii) Incentives or programs that may be implemented by the Copermittee to encourage or implement projects to retrofit areas of existing development within its jurisdiction;

(iii) Incentives or programs that may be implemented by the Copermittee to encourage or implement projects that will rehabilitate the conditions of channels or habitats within its jurisdiction;

(iv) The funds and/or resources that must be secured by the Copermittee to implement the optional strategies described for Provisions B.3.b.(1)(b)(i)-(iii) within its jurisdiction; and

(v) The circumstances necessary to trigger implementation of the optional jurisdictional strategies, in addition to the requirements of Provision B.3.b.(1)(a), to achieve the interim and final numeric goals within the schedules established under Provision B.3.a.

(c) Identify the strategies that will be implemented by the Copermittee in coordination with or with the cooperation of other agencies (e.g. Caltrans, water districts, school districts) and/or entities (e.g. non-governmental organizations) within its jurisdiction.

(2) Watershed Management Area Strategies

The Copermittees must identify the optional regional or multi-jurisdictional strategies that will be implemented in the Watershed Management Area, as necessary, to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. Descriptions of the optional regional or multi-jurisdictional strategies must include:

(a) Regional or multi-jurisdictional BMPs, incentives, or programs that may be implemented by the Copermittees in the Watershed Management Area;

(b) Incentives or programs that may be implemented by the Copermittees in the Watershed Management Area to encourage or implement regional or multi-jurisdictional projects to retrofit areas of existing development;

(c) Incentives or programs that may be implemented by the Copermittees to encourage or implement regional or multi-jurisdictional projects that will rehabilitate the conditions of channels, streams, or habitats within the Watershed Management Area;

(d) The funds and/or resources that must be secured by the Copermittees to implement the optional strategies described for Provisions B.3.b.(2)(a)-(c) within the Watershed Management Area; and

(e) The circumstances necessary to trigger implementation of the optional regional or multi-jurisdictional strategies to achieve the interim and final numeric goals within the schedules established under Provision B.3.a.

(3) Schedules for Implementing Strategies

The Copermittees must develop reasonable schedules for implementing the water quality improvement strategies identified under Provisions B.3.b.(1) and B.3.b.(2) to achieve the interim and final numeric goals identified and schedules established under Provision B.3.a. The Copermittees must incorporate the schedules to implement the water quality improvement strategies into the Water Quality Improvement Plan as follows:

(a) Each Copermittee must develop schedules for the jurisdictional strategies identified pursuant to Provisions B.3.b.(1)(a)-(b). Each schedule must specify:

(i) If each jurisdictional strategy identified pursuant to Provision B.3.b.(1)(a) will or will not be initiated upon acceptance of the Water Quality Improvement Plan;

(ii) For each jurisdictional strategy identified pursuant to Provision B.3.b.(1)(a) that will not be initiated upon acceptance of the Water Quality Improvement Plan, the shortest practicable time in which each jurisdictional strategy will be initiated after acceptance of the Water Quality Improvement Plan;

(iii) For each optional jurisdictional strategy identified pursuant to Provision B.3.b.(1)(b), a realistic assessment of the shortest practicable time required to:

[a] Secure the resources needed to fund the optional jurisdictional strategy, and
[b] Procure the resources, materials, labor, and applicable permits necessary to initiate implementation of the optional jurisdictional strategy;

(iv) If each jurisdictional strategy identified pursuant to Provisions B.3.b.(1)(a)-(b) is expected to be continuously implemented (e.g. inspections) or completed within a schedule (e.g. construction of structural BMP); and

(v) If a jurisdictional strategy identified pursuant to Provisions B.3.b.(1)(a)-(b) is expected to be completed within a schedule, the anticipated time to complete based on a realistic assessment of the shortest practicable time required.

(b) The Copermittees in the Watershed Management Area must develop schedules for the regional or multi-jurisdictional strategies identified pursuant to Provision B.3.b.(2). Each schedule must specify:

(i) A realistic assessment of the shortest practicable time to:

[a] Secure the resources needed to fund the optional regional or multi-jurisdictional strategy, and
[b] Procure the resources, materials, labor, and permits necessary to initiate the implementation of the optional regional or multi-jurisdictional strategy;

(ii) If each regional or multi-jurisdictional strategy identified pursuant to Provision B.3.b.(2) is expected to be continuously implemented (e.g. inspections) or completed within a schedule (e.g. construction of structural BMP); and

(iii) If a regional or multi-jurisdictional strategy and/or activity identified pursuant to Provisions B.3.b.(2) is expected to be completed within a schedule, the anticipated time to complete based on a realistic assessment of the shortest practicable time required.

(4) <u>Optional Watershed Management Area Analysis</u>

(a) For each Watershed Management Area, the Copermittees have the option to perform a Watershed Management Area Analysis for the purpose of developing watershed-specific requirements for structural BMP implementation, as described in Provision E.3.c.(3). The Watershed Management Area Analysis must include GIS layers (maps) as output. The analysis must include the following information, to the extent it is available, in order to characterize the Watershed Management Areas:

(i) A description of dominant hydrologic processes, such as areas where infiltration or overland flow likely dominates;

(ii) A description of existing streams in the watershed, including bed material and composition, and if they are perennial or ephemeral;

(iii) Current and anticipated future land uses;

(iv) Potential coarse sediment yield areas; and

(v) Locations of existing flood control structures and channel structures, such as stream armoring, constrictions, grade control structures, and hydromodification or flood management basins.

(b) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify and compile a list of candidate projects that could potentially be used as

alternative compliance options for Priority Development Projects, to be implemented in lieu of onsite structural BMP performance requirements described in Provisions E.3.c.(1) and E.3.c.(2)(a). Specifically, the Copermittees must identify opportunities to be included in the list of candidate projects in each Watershed Management Area, such as:

(i) Stream or riparian area rehabilitation;

(ii) Retrofitting existing infrastructure to incorporate storm water retention or treatment;

(iii) Regional BMPs;

(iv) Groundwater recharge projects;

(v) Water supply augmentation projects; and

(vi) Land purchases to preserve floodplain functions.

(c) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify areas within the Watershed Management Area where it is appropriate to allow Priority Development Projects to be exempt from the hydromodification management BMP performance requirements described in Provision E.3.c.(2), including supporting rationale.

c. Prohibitions and Limitations Compliance Option

Each Copermittee has the option to utilize the implementation of the Water Quality Improvement Plan to demonstrate compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b within a Watershed Management Area subject to the following conditions:

(1) A Copermittee is eligible to be deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b within a Watershed Management Area when the Water Quality Improvement Plan for a Watershed Management Area incorporates the following:

(a) Numeric goals, water quality improvement strategies, and schedules developed pursuant to Provisions B.3.a and B.3.b that include the following:

(i) Interim and final WQBELs established by the TMDLs in Attachment E to this Order applicable to the Copermittee's jurisdiction within the Watershed Management Area; AND

(ii) Interim and final numeric goals for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012

(included as Attachment A to this Order) applicable to the Copermittee's jurisdiction within the Watershed Management Area; AND

(iii) Interim and final numeric goals applicable to the Copermittee's MS4 discharges within the Watershed Management Area expressed as numeric concentration-based or load-based goals for all pollutants and conditions listed on the Clean Water Act Section 303(d) List of Water Quality Impaired Segments[8] for the receiving waters in the Watershed Management Area that do not have a TMDL incorporated into Attachment E to this Order; AND/OR

(iv) Interim and final numeric goals for pollutants and conditions identified as receiving water priorities in the Water Quality Improvement Plan that will result in chemical, physical, and biological conditions protective of the beneficial uses of the receiving waters impacted by the Copermittee's MS4 discharges within the Watershed Management Area; AND

(v) The Copermittee has the option to include interim and final numeric goals applicable to the Copermittee's MS4 discharges and/or receiving waters within the Watershed Management Area for any pollutants or conditions in addition to those described in Provisions B.3.c.(1)(a)(i)-(iv); AND

(vi) Schedules for achieving each final numeric goal that reflect a realistic assessment of the shortest practicable time needed for achievement; AND

(vii) For each final numeric goal developed pursuant to Provisions B.3.a and B.3.c.(1)(a)(i)-(v), annual milestones[9] and the dates for their achievement must be included within each of the next five (5) Water Quality Improvement Plan Annual Report reporting periods, or until the final numeric goal is achieved. Annual milestones and the dates for their achievement for the 5 Water Quality Improvement Plan Annual Report reporting periods of the next permit term, or until the final numeric goal is achieved, must be provided as part of the Report of Waste Discharge required pursuant to Provision F.5.

(b) An analysis that meets all of the following conditions:

(i) The analysis, with clearly stated assumptions included in the analysis, must quantitatively demonstrate that the implementation of

[8] 2010 and subsequent 303(d) Lists

[9] Annual milestones for each final numeric goal must be clearly and directly linked to, or demonstrate progress is being made toward the achievement of the final numeric goal. The annual milestones may consist of water quality improvement strategy implementation phases, interim numeric goals, and other acceptable metrics. The annual milestones may address multiple numeric goals and/or multiple water bodies, as applicable and appropriate.

the water quality improvement strategies required under Provision B.3.b will achieve the final numeric goals within the schedules developed pursuant to Provisions B.3.a and B.3.c.(1)(a).

(ii) The development of the analysis must include a public participation process which allows the public to review and provide comments on the analysis methodology utilized and the assumptions included in the analysis. Public comments and responses must be included as part of the analysis documentation included in the Water Quality Improvement Plan.

(iii) The analysis may be performed by an individual Copermittee or jointly by two or more Copermittees choosing to utilize this compliance option for their jurisdictions within the Watershed Management Area.

(iv) The analysis must be updated as part of the iterative approach and adaptive management process required under Provisions B.5.a-b.

(c) Specific monitoring and assessments required pursuant to Provision B.4.a that will be performed by the Copermittee capable of 1) demonstrating whether the implementation of the water quality improvement strategies are making progress toward achieving the numeric goals in accordance with the established schedules developed pursuant to Provisions B.3.a and B.3.c.(1)(a), and 2) determining whether interim and final numeric goals have been achieved. The specific monitoring and assessments must be updated as part of the iterative approach and adaptive management process required under Provision B.5.c.

(d) Documentation showing that the numeric goals, schedules, and annual milestones proposed pursuant to Provision B.3.c.(1)(a), the analysis performed pursuant to Provision B.3.c.(1)(b), and the specific monitoring and assessments proposed pursuant to Provision B.3.c.(1)(c) have been reviewed by the Water Quality Improvement Consultation Panel (see Provision F.1.a.(1)(b)). Updates must be reviewed by the Water Quality Improvement Consultation Panel for any recommendations.

(2) Each Copermittee that voluntarily completes the requirements of Provision B.3.c.(1) is deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b for the pollutants and conditions for which numeric goals are developed when the Water Quality Improvement Plan, incorporating the requirements of Provision B.3.c.(1), is accepted by the San Diego Water Board pursuant to Provision F.1.b or F.2.c. The Copermittee is deemed in compliance during the term of this Order as long as:

(a) The Copermittee is implementing the water quality improvement strategies within its jurisdiction developed pursuant to Provision B.3.b.(1) and in

compliance with the schedules for implementing the strategies established pursuant to Provisions B.3.b.(3)(a) and B.3.c.(1)(a)(vii); AND

(b) The Copermittee is performing the monitoring and assessments developed pursuant to Provision B.3.c.(1)(c); AND

(c) The Copermittee's assessments in the Water Quality Improvement Plan Annual Report submitted pursuant to Provision F.3.b.(3) support a conclusion that: 1) the Copermittee is in compliance with the annual milestones and dates for achievement developed pursuant to Provision B.3.c.(1)(a)(vii), OR 2) the Copermittee has provided acceptable rationale and recommends appropriate modifications to the interim numeric goals, and/or water quality improvement strategies, and/or schedules to improve the rate of progress toward achieving the final numeric goals developed pursuant to Provisions B.3.a and B.3.c.(1)(a)(i)-(vi); AND

(d) Any proposed modifications to the numeric goals, strategies, schedules, and/or annual milestones are accepted by the San Diego Water Board as part of subsequent updates to the Water Quality Improvement Plan pursuant to Provision F.2.c;[10] AND

(e) The Copermittee is implementing the requirements of Provision A.4.a.

4. Water Quality Improvement Monitoring and Assessment Program

a. The Copermittees in each Watershed Management Area must develop and incorporate an integrated monitoring and assessment program into the Water Quality Improvement Plan that assesses: 1) the progress toward achieving the numeric goals and schedules, 2) the progress toward addressing the highest priority water quality conditions for each Watershed Management Area, and 3) each Copermittee's overall efforts to implement the Water Quality Improvement Plan.

b. The monitoring and assessment program must incorporate the monitoring and assessment requirements of Provision D, which may allow the Copermittees to modify the program to be consistent with and focus on the highest priority water quality conditions for each Watershed Management Area.

c. For Watershed Management Areas with applicable TMDLs, the monitoring and assessment program must incorporate the specific monitoring and assessment requirements of Attachment E.

[10] A request for proposed changes to the Water Quality Improvement Plan does not stay any permit condition.

d. For Watershed Management Areas with any ASBS, the water quality monitoring and assessment program must incorporate the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

5. Iterative Approach and Adaptive Management Process

The Copermittees in each Watershed Management Area must implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a, and must include the following:

a. RE-EVALUATION OF PRIORITY WATER QUALITY CONDITIONS

The priority water quality conditions and potential water quality improvement strategies included in the Water Quality Improvement Plan pursuant to Provisions B.2.c and B.2.e may be re-evaluated by the Copermittees as needed during the term of this Order as part of the Water Quality Improvement Plan Annual Report. Re-evaluation and recommendations for modifications to the priority water quality conditions and potential water quality improvement strategies must be provided in the Report of Waste Discharge, and must consider the following:

(1) Achieving the outcome of improved water quality in MS4 discharges and receiving waters through implementation of the water quality improvement strategies identified in the Water Quality Improvement Plan;

(2) New information developed when the requirements of Provisions B.2.a-c have been re-evaluated;

(3) Spatial and temporal accuracy of monitoring data collected to inform prioritization of water quality conditions and implementation strategies to address the highest priority water quality conditions;

(4) Availability of new information and data from sources other than the jurisdictional runoff management programs within the Watershed Management Area that informs the effectiveness of the actions implemented by the Copermittees;

(5) San Diego Water Board recommendations; and

(6) Recommendations for modifications solicited through a public participation process.

b. ADAPTATION OF GOALS, STRATEGIES AND SCHEDULES

The water quality improvement goals, strategies and schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.3, must be re-evaluated and adapted as new information becomes available to result in more effective and efficient measures to address the highest priority water quality conditions identified pursuant to Provision B.2.c. Re-evaluation of and modifications to the water quality improvement goals, strategies and schedules must be provided in the Water Quality Improvement Plan Annual Report, and must consider the following:

(1) Modifications to the priority water quality conditions based on Provision B.5.a;

(2) Progress toward achieving interim and final numeric goals in receiving waters and MS4 discharges for the highest priority water quality conditions in the Watershed Management Area,

(3) Progress toward achieving outcomes according to established schedules;

(4) New policies or regulations that may affect identified numeric goals;

(5) Measurable or demonstrable reductions of non-storm water discharges to and from each Copermittee's MS4;

(6) Measurable or demonstrable reductions of pollutants in storm water discharges from each Copermittee's MS4 to the MEP;

(7) New information developed when the requirements of Provisions B.2.b and B.2.d have been re-evaluated;

(8) Efficiency in implementing the Water Quality Improvement Plan;

(9) San Diego Water Board recommendations; and

(10) Recommendations for modifications solicited through a public participation process.

c. ADAPTATION OF MONITORING AND ASSESSMENT PROGRAM

The water quality improvement monitoring and assessment program, included in the Water Quality Improvement Plan pursuant to Provision B.4, must be re-evaluated and adapted when new information becomes available. Re-evaluation and recommendations for modifications to the monitoring and assessment program, pursuant to the requirements of Provision D, may be provided in the Water Quality Improvement Plan Annual Report, but must be provided in the Report of Waste Discharge.

d. ADAPTATION OF PROHIBITIONS AND LIMITATIONS COMPLIANCE OPTION

If a Copermittee has implemented the Prohibitions and Limitations Compliance Option allowed to be included in the Water Quality Improvement Plan pursuant to Provision B.3.c, the Copermittee must re-evaluate and adapt the numeric goals, water quality improvement strategies, schedules, and annual milestones required under Provision B.3.c.(1) when significant new information becomes available, or with the Report of Waste Discharge required pursuant to Provision F.5. Significant changes in the numeric goals, water quality improvement strategies, schedules, or annual milestones requires an update to the analysis required under Provision B.3.c.(2).

6. Water Quality Improvement Plan Submittal, Updates, and Implementation

a. The Copermittees must submit and commence implementation of the Water Quality Improvement Plans in accordance with the requirements of Provision F.1.

b. The Copermittees must submit proposed updates to the Water Quality Improvement Plan for acceptance by the San Diego Water Board Executive Officer in accordance with the requirements of Provision F.2.c.

C. ACTION LEVELS

The purpose of this provision is for the Copermittees to incorporate numeric action levels in the Water Quality Improvement Plans. The goal of the action levels is to guide Water Quality Improvement Plan implementation efforts and measure progress towards the protection of water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through monitoring and assessing the quality of the MS4 discharges during the implementation of the Water Quality Improvement Plans.

1. Non-Storm Water Action Levels[11]

The Copermittees must develop and incorporate numeric non-storm water action levels (NALs) into the Water Quality Improvement Plan to: 1) support the development and prioritization of water quality improvement strategies for effectively prohibiting non-storm water discharges to the MS4s, 2) assess the effectiveness of the water quality improvement strategies toward addressing MS4 non-storm water discharges, required pursuant to Provision D.4.b.(1), and 3) support the detection and elimination of non-storm water and illicit discharges to the MS4, required pursuant to Provision E.2.[12]

a. The following NALs must be incorporated:

(1) Non-Storm Water Discharges from MS4s to Ocean Surf Zone

Table C-1. Non-Storm Water Action Levels for Discharges from MS4s to Ocean Surf Zone

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Total Coliform	MPN/100 ml	1,000	-	10,000/1,000[1]	OP
Fecal Coliform	MPN/100 ml	200[2]	-	400	OP
Enterococci	MPN/100 ml	35	-	104[3]	OP

Abbreviations/Acronyms
AMAL – average monthly action level
MDAL – maximum daily action level
OP – Ocean Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Total coliform density NAL is 1,000 MPN/100 ml when the fecal/total coliform ratio exceeds 0.1.
2. Fecal coliform density NAL is 200 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas."

[11] NALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, unless the NAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed.
[12] The Copermittees may utilize NALs or other benchmarks currently established by the Copermittees as interim NALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

(2) Non-Storm Water Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Table C-2. Non-Storm Water Action Levels for Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Turbidity	NTU	75	-	225	OP
pH	Units	Within limit of 6.0 to 9.0 at all times			OP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	35	-	104[3]	BP
Priority Pollutants	µg/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
OP – Ocean Plan water quality objective
NTU – Nephelometric Turbidity Units
µg/L – micrograms per liter
MDAL – maximum daily action level
BP – Basin Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas" and is not applicable to water bodies that are not designated with the water contact recreation (REC-1) beneficial use.

Table C-3. Non-Storm Water Action Levels for Priority Pollutants

Parameter	Units	Freshwater (CTR)		Saltwater (CTR)	
		MDAL	AMAL	MDAL	AMAL
Cadmium	µg/L	**	**	16	8
Copper	µg/L	*	*	5.8	2.9
Chromium III	µg/L	**	**	-	-
Chromium VI	µg/L	16	8.1	83	41
Lead	µg/L	*	*	14	2.9
Nickel	µg/L	**	**	14	6.8
Silver	µg/L	*	*	2.2	1.1
Zinc	µg/L	*	*	95	47

Abbreviations/Acronyms:
CTR – California Toxic Rule
AMAL – average monthly action level
µg/L – micrograms per liter
MDAL – maximum daily action level

Notes:
* Action levels developed on a case-by-case basis (see below)
** Action levels developed on a case-by-case basis (see below), but calculated criteria are not to exceed Maximum Contaminant Levels (MCLs) under the California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64431

The Cadmium, Copper, Chromium (III), Lead, Nickel, Silver and Zinc NALs for MS4 discharges to freshwater receiving waters will be developed on a case-by-case basis based on site-specific water quality data (receiving water hardness). For these priority pollutants, refer to 40 CFR 131.38(b)(2).

(3) Non-Storm Water Discharges from MS4s to Inland Surface Waters

Table C-4. Non-Storm Water Action Levels for Discharges from MS4s to Inland Surface Waters

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Dissolved Oxygen	mg/L	Not less than 5.0 in WARM waters and not less than 6.0 in COLD waters			BP
Turbidity	NTU	-	20	See MDAL	BP
pH	Units	Within limit of 6.5 to 8.5 at all times			BP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	33	-	61[3]	BP
Total Nitrogen	mg/L	-	1.0	See MDAL	BP
Total Phosphorus	mg/L	-	0.1	See MDAL	BP
MBAS	mg/L	-	0.5	See MDAL	BP
Iron	mg/L	-	0.3	See MDAL	BP
Manganese	mg/L	-	0.05	See MDAL	BP
Priority Pollutants	µg/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
BP – Basin Plan water quality objective
COLD – cold freshwater habitat beneficial use
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
MDAL – maximum daily action level
WARM – warm freshwater habitat beneficial use
MBAS – Methylene Blue Active Substances
MPN/100 ml – most probable number per 100 milliliters
µg/L – micrograms per liter

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for freshwater "designated beach areas" and is not applicable to water bodies that are not designated with the water contact recreation (REC-1) beneficial use.

b. If not identified in Provision C.1.a, NALs must be identified, developed and incorporated in the Water Quality Improvement Plan for any pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in receiving waters associated with the highest priority water quality conditions related to non-storm water discharges from the MS4s. NALs must be based on:

(1) Applicable water quality standards which may be dependent upon site-specific or receiving water-specific conditions or assumptions to be identified by the Copermittees; or

(2) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the NALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary NALs specific to the Watershed Management Area at levels greater than the NALs required by Provisions C.1.a and C.1.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for effectively prohibiting non-storm water discharges to the MS4s, as well as the detection and

elimination of non-storm water and illicit discharges to and from the MS4. The secondary NALs may be developed using an approach acceptable to the San Diego Water Board.

d. Dry weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.b may be utilized to develop or revise NALs based on watershed-specific data, subject to San Diego Water Board Executive Officer approval.

2. Storm Water Action Levels[13]

The Copermittees must develop and incorporate numeric storm water action levels (SALs) in the Water Quality Improvement Plans to: 1) support the development and prioritization of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s, and 2) assess the effectiveness of the water quality improvement strategies toward reducing pollutants in storm water discharges, required pursuant to Provision D.4.b.(2).[14]

a. The following SALs for discharges of storm water from the MS4 must be incorporated:

Table C-5. Storm Water Action Levels for Discharges from MS4s to Receiving Waters

Parameter	Units	Action Level
Turbidity	NTU	126
Nitrate & Nitrite (Total)	mg/L	2.6
Phosphorus (Total P)	mg/L	1.46
Cadmium (Total Cd)*	µg/L	3.0
Copper (Total Cu)*	µg/L	127
Lead (Total Pb)*	µg/L	250
Zinc (Total Zn)*	µg/L	976

Abbreviations/Acronyms:
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
µg/L – micrograms per liter

Notes:
* The sampling must include a measure of receiving water hardness at each MS4 outfall. If a total metal concentration exceeds the corresponding metals SAL in Table C-5, that concentration must be compared to the California Toxics Rule criteria and the USEPA 1-hour maximum concentration for the detected level of receiving water hardness associated with that sample. If it is determined that the sample's total metal concentration for that specific metal exceeds that SAL, but does not exceed the applicable USEPA 1-hour maximum concentration criterion for the measured level of hardness, then the sample result will not be considered above the SAL for that measurement.

[13] SALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, unless the SAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed.

[14] The Copermittees may utilize SALs or other benchmarks currently established by the Copermittees as interim SALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

b. If not identified in Provision C.2.a, SALs must be identified, developed and incorporated in the Water Quality Improvement Plan for pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in receiving waters associated with the highest priority water quality conditions related to storm water discharges from the MS4s. SALs must be based on:

(1) Federal and State water quality guidance and/or water quality standards; and

(2) Site-specific or receiving water-specific conditions; or

(3) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the SALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary SALs specific to the Watershed Management Area at levels greater than the SALs required by Provisions C.2.a and C.2.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s. The secondary SALs may be developed based on the approaches recommended by the State Water Board's Storm Water Panel[15] or using an approach acceptable to the San Diego Water Board.

d. Wet weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.c may be used to develop or revise SALs based upon watershed-specific data, subject to San Diego Water Board Executive Officer approval.

[15] Storm Water Panel Recommendations to the California State Water Resources Control Board: The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities (June 2006)

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D. MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS

The purpose of this provision is for the Copermittees to monitor and assess the impact on the conditions of receiving waters caused by discharges from the Copermittees' MS4s under wet weather and dry weather conditions. The goal of the monitoring and assessment program is to inform the Copermittees about the nexus between the health of receiving waters and the water quality condition of the discharges from their MS4s. This goal will be accomplished through monitoring and assessing the conditions of the receiving waters, discharges from the MS4s, pollutant sources and/or stressors, and effectiveness of the water quality improvement strategies implemented as part of the Water Quality Improvement Plans.

1. Receiving Water Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the condition of the receiving waters in each Watershed Management Area during dry weather and wet weather. Following San Diego Water Board acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct long-term receiving water monitoring during implementation of the Water Quality Improvement Plan to assess the long term trends and determine if conditions in receiving waters are improving. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following receiving water monitoring procedures:

a. TRANSITIONAL RECEIVING WATER MONITORING

Until the monitoring requirements and schedules of Provisions D.1.b-e are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following receiving water monitoring in the Watershed Management Area:

(1) Continue the receiving water monitoring programs required in Order Nos. R9-2007-0001 (Monitoring and Reporting Program No. R9-2007-0001 Sections II.A.1-A.5), R9-2009-0002, and R9-2010-0016, unless the Executive Officer provides conditional approval for Copermittees to proceed with implementation of the proposed monitoring and assessment program developed in accordance with Provision B.4;

(2) Continue the monitoring in the Hydromodification Management Plans approved by the San Diego Water Board;

(3) Participate in the following regional receiving water monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring,

(b) Southern California Bight Regional Monitoring, and

(c) Sediment Quality Monitoring;

(4) Implement the monitoring programs developed as part of any implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) for the TMDLs in Attachment E to this Order; and

(5) For Watershed Management Areas with ASBS, implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

b. LONG-TERM RECEIVING WATER MONITORING STATIONS

The Copermittees must select at least one long-term receiving water monitoring station from among the existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees to be representative of the receiving water quality in the Watershed Management Area. Additional long-term receiving water monitoring stations must be selected where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

c. DRY WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three dry weather monitoring events at each of the long-term receiving water monitoring stations. At least one monitoring event must be conducted during the dry season (May 1 – September 30) and at least one monitoring event must be conducted during a dry weather period during the wet season (October 1 – April 30), after the first wet weather event of the season, with an antecedent dry period of at least 72 hours following a storm event producing measureable rainfall of greater than 0.1 inch.

(1) <u>Dry Weather Receiving Water Field Observations</u>

For each dry weather monitoring event, the Copermittees must record field observations consistent with Table D-1 at each long-term receiving water monitoring station.

Table D-1. Field Observations for Receiving Water Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) • Station description (i.e. deposits or stains, vegetation condition, structural condition, and observable biology) • Presence and assessment of trash in and around station

(2) Dry Weather Receiving Water Field Monitoring

For each dry weather monitoring event, if conditions allow the collection of the data, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

Table D-2. Field Monitoring Parameters for Receiving Water Monitoring Stations

Parameters
• pH • Temperature • Specific conductivity • Dissolved oxygen • Turbidity

(3) Dry Weather Receiving Water Analytical Monitoring

For each dry weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable NAL constituents, and

(v) Constituents listed in Table D-3.

Table D-3. Analytical Monitoring Constituents for Receiving Water Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Pesticides	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Mercury • Nickel • Selenium • Thallium • Zinc	• Organophosphate Pesticides • Pyrethroid Pesticides	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(4) Dry Weather Receiving Water Toxicity Monitoring

For each dry weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for aquatic toxicity in accordance with Table D-4. When the State Water Board's Policy for Toxicity Assessment and Control (Toxicity Policy) is approved and in effect, the San Diego Water Board Executive Officer may direct the Copermittees to replace current toxicity program elements with standardized procedures in the Toxicity Policy.

Table D-4. Dry Weather Chronic[1] Toxicity Testing for Receiving Water Monitoring Stations

Organism	Units	Test	USEPA Protocol
Freshwater			
Pimephales promelas (Fathead Minnow)	Pass / Fail	Larval Survival and Growth	EPA-821-R-02-013
Ceriodaphnia dubia (*Daphnid*)	Pass / Fail	Survival and Production	EPA-821-R-02-013
Selenastrum capricornutum (Green Algae)	Pass / Fail	Growth	EPA-821-R-02-013
Marine and Estuarine			
Strongylocentrotus purpuratus *(Purple Sea Urchin)*	Pass / Fail	Embryo-Larval Development	EPA-600-R-95-136

Notes:
1. Chronic toxicity testing is not required at receiving water monitoring stations located at mass loading stations if the channel flows are diverted year-round during dry weather conditions to the sanitary sewer for treatment.

(a) Freshwater Test Species and Methods: If samples are collected in receiving waters with salinity less than 1 ppt, the Copermittees must follow the methods for chronic toxicity tests as established in 40 CFR 136.3 using a single-concentration test design for routine monitoring, or a five-concentration test design for additional toxicity testing if the limitation is exceeded. The Copermittees must estimate the critical life stage chronic toxicity on undiluted samples in accordance with species and short term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms (EPA-821-R-02-013; Table IA, 40 CFR 136). Additional test species may be used by the Copermittees if approved by the San Diego Water Board Executive Officer. The Copermittees must conduct:

(i) A static renewal toxicity test with the fathead minnow, *Pimephales promelas* (Larval Survival and Growth Test Method 1000.0);

(ii) A static renewal toxicity test with the daphnid, *Ceriodaphnia dubia* (Survival and Reproduction Test Method 1002.0); and

(iii) A static renewal toxicity test with the green alga, *Selenastrum capricornutum* (also named *Raphidocelis subcapitata*) (Growth Test Method 1003.0).

(b) Marine and Estuarine Test Species and Methods: If samples are collected in receiving waters with salinity greater or equal to 1 ppt, the Copermittees must follow the methods for chronic toxicity tests as established in 40 CFR 136.3 using a single-concentration test design for routine monitoring, or a five-concentration test design for additional toxicity testing if the limitation is exceeded. The Copermittees must conduct the following critical life state chronic toxicity tests on undiluted samples in accordance with species and short term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms (EPA-600-R-95-136; 1995). Artificial sea salts must be used to increase sample salinity. The Copermittees must conduct a static non-renewal toxicity test with the purple sea urchin, *Strongylocentrotus purpuratus* (Embryo-larval Development Test Method). Additional species may be used by the Copermittees if approved by the San Diego Water Board Executive Officer.

(c) Holding Times: All toxicity tests must be conducted as soon as possible following sample collection. The 36-hour sample holding time for test initiation shall be targeted. However, no more than 72 hours shall elapse before the conclusion of sample collection and test initiation.

(d) Test Species Sensitivity Screening: To determine the most sensitive test species for freshwater, the Copermittees must screen 2 wet weather and 2 dry weather toxicity tests with a vertebrate, an invertebrate, and a plant species. After this screening period, subsequent monitoring must be conducted using the most sensitive test species. Alternatively, if a sensitive test species has already been determined, or if there is prior knowledge of potential toxicant(s) and a test species is sensitive to such toxicant(s), then monitoring must be conducted using only that test species. Sensitive test species determinations must also consider the most sensitive test species used for proximal receiving water monitoring. Rescreening must occur once each permit term.

(e) Chronic toxicity test biological endpoint data must be analyzed using the Test of Significant Toxicity t-test approach specified in *National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document* (USEPA, Office of Wastewater Management, Washington, D.C., EPA-833-R-10-003, 2010). For this monitoring program, the critical chronic instream waste concentration (IWC) is set at 100 percent receiving water (i.e. no dilution) for receiving water samples. A 100 percent receiving water and a control must be tested.

(f) Toxicity Identification Evaluation (TIE) / Toxicity Reduction Evaluation (TRE): If chronic toxicity is detected in receiving waters, the Copermittees must discuss the need for conducting a TIE/TRE in the assessments

required under Provision D.4.a.(2), and develop a plan for implementing the TIE/TRE to be incorporated in the Water Quality Improvement Plan.

(5) Dry Weather Receiving Water Bioassessment Monitoring

Bioassessment monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must conduct bioassessment monitoring during at least one dry weather monitoring event at each long-term receiving water monitoring station as follows:

(a) The following bioassessment samples and measurements must be collected:

(i) Macroinvertebrate samples must be collected in accordance with the "Reachwide Benthos (Multihabitat) Procedure" in the most current Surface Water Ambient Monitoring Program (SWAMP) Bioassessment Standard Operating Procedures (SOP), and amendments, as applicable;[16]

(ii) The "Full" suite of physical habitat characterization measurements must be collected in accordance with the most current SWAMP Bioassessment SOP, and as summarized in the SWAMP Stream Habitat Characterization Form – Full Version;[17] and

(iii) Freshwater algae samples must be collected in accordance with the SWAMP Standard Operating Procedures for Collecting Algae Samples.[18] Analysis of samples must include algal taxonomic composition (diatoms and soft algae) and algal biomass.

(b) The bioassessment samples, measurements, and appropriate water chemistry data must be used to calculate the following:

(i) An Index of Biological Integrity (IBI) for macroinvertebrates for each monitoring station where bioassessment monitoring was conducted, based on the most current calculation method;[19] and

[16] Ode, P.R.. 2007. Standard operating procedures for collecting macroinvertebrate samples and associated physical and chemical data for ambient bioassessments in California. California State Water Resources Control Board Surface Water Ambient Monitoring Program (SWAMP) Bioassessment SOP 001. http://www.swrcb.ca.gov/water_issues/programs/swamp/tools.shtml#monitoring
[17] Available at: http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/reports/fieldforms_fullversion052908.pdf
[18] Fetscher et al. 2009. Standard Operating Procedures for Collecting Stream Algae Samples and Associated Physical Habitat and Chemical Data for Ambient Bioassessments in California.
[19] The most current calculation method at the time the Order was adopted is outlined in "A Quantitative Tool for Assessing the Integrity of Southern California Coastal Streams" (Ode, et al. 2005. Environmental Management. Vol. 35, No. 1, pp. 1-13). If an updated or new calculation method is developed, either both

(ii) An IBI for algae for each monitoring station where bioassessment monitoring was conducted, when a calculation method is developed.[20]

(c) In lieu of the requirements of Provision D.1.c.(5)(a), the Copermittees may conduct the bioassessment monitoring in accordance with the "Triad" assessment approach[21] to calculate the IBIs required for Provision D.1.c.(5)(b). The Copermittees must conduct sampling, analysis, and reporting of specified in-stream biological and habitat data according to the protocols specified in the SCCWRP Technical Report No. 539, or subsequent protocols, if developed.

(6) Dry Weather Receiving Water Hydromodification Monitoring

In addition to the hydromodification monitoring conducted as part of the Copermittees' Hydromodification Management Plans, hydromodification monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must collect the following hydromodification monitoring observations and measurements within an appropriate domain of analysis during at least one dry weather monitoring event for each long-term receiving water monitoring station:

(a) Channel conditions, including:

(i) Channel dimensions,

(ii) Hydrologic and geomorphic conditions, and

(iii) Presence and condition of vegetation and habitat;

(b) Location of discharge points;

(c) Habitat integrity;

(d) Photo documentation of existing erosion and habitat impacts, with location (i.e. latitude and longitude coordinates) where photos were taken;

(e) Measurement or estimate of dimensions of any existing channel bed or bank eroded areas, including length, width, and depth of any incisions; and

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(i.e. current and updated/new) methods must be used, or historical IBIs must be recalculated with the updated or new calculation method.

[20] When a calculation method is developed, IBIs must be calculated for all available and appropriate historical data.

[21] Stormwater Monitoring Coalition Model Monitoring Technical Committee, 2004. Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California. Technical Report #419. August 2004.

(f) Known or suspected cause(s) of existing downstream erosion or habitat impact, including flow, soil, slope, and vegetation conditions, as well as upstream land uses and contributing new and existing development.

d. WET WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three wet weather monitoring events at each long-term receiving water monitoring station. At least one wet weather monitoring event must be conducted during the first wet weather event of the wet season (October 1 – April 30), and at least one wet weather monitoring event during a wet weather event that occurs after February 1.

(1) Wet Weather Receiving Water Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each long-term receiving water monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event;

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(d) Presence and assessment of trash in and around station.

(2) Wet Weather Receiving Water Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

(3) Wet Weather Receiving Water Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) Constituents listed in Table D-3.

(4) <u>Wet Weather Receiving Water Toxicity Monitoring</u>

For each wet weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for chronic aquatic toxicity in accordance with Provisions D.1.c.(4)(a)-(f).

e. OTHER RECEIVING WATER MONITORING REQUIREMENTS

(1) Regional Monitoring

The Copermittees must participate in the following regional receiving waters monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring; and

(b) Southern California Bight Regional Monitoring and

(c) Unified Beach Water Quality Monitoring and Assessment Program. The Orange County Copermittees shall participate in and, together with South Orange County Wastewater Authority and Orange County Health Care Agency, shall share responsibility for implementation of a unified regional beach water quality monitoring and assessment program in south Orange County, as set forth in the October 2014 report, *Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County* , issued pursuant to CWC section 13383 and subject to future revision in the San Diego Water Board December 5, 2014 Letter Directive.

(2) Sediment Quality Monitoring

The Copermittees must perform sediment monitoring to assess compliance with sediment quality receiving water limits applicable to MS4 discharges to enclosed bays and estuaries. The monitoring may be performed either by individual or multiple Copermittees to assess compliance with receiving water limits, or through participation in a water body monitoring coalition. A Sediment Monitoring Plan which satisfies the requirements of the State Water Board's Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part 1 Sediment Quality (Sediment Control Plan) must be submitted as part of the monitoring and assessment program in the Water Quality Improvement Plan.

(a) The Sediment Monitoring Plan design must include the following:

(i) The elements required under Section VII.D (Receiving Water Limits Monitoring Frequency) and Section VII.E (Sediment Monitoring) of the Sediment Control Plan;

(ii) A Quality Assurance Project Plan (QAPP) describing the project objectives and organization, functional activities, and quality assurance/quality control protocols for the water and sediment monitoring; and

(iii) A schedule for completion of all sample collection and analysis activities and submission of Sediment Monitoring Reports.

(b) The Copermittees must implement the Sediment Monitoring Plan in accordance with the schedule contained in the Sediment Monitoring Plan, unless otherwise directed in writing by the San Diego Water Board Executive Officer.

(c) The Copermittees must incorporate a Sediment Monitoring Report as part of the Water Quality Improvement Plan Annual Report in accordance with the schedule contained in the Sediment Monitoring Plan, unless otherwise directed in writing by the San Diego Water Board Executive Officer. The Sediment Monitoring Report must contain the following information:

(i) Analysis: An evaluation, interpretation and tabulation of the water and sediment monitoring data, including interpretations and conclusions as to whether applicable Receiving Water Limitations in this Order have been attained at each sample station;

(ii) Sample Location Map: The locations, type, and number of samples must be identified and shown on a site map; and

(iii) California Environmental Data Exchange Network: A statement certifying that the monitoring data and results have been uploaded into the California Environmental Data Exchange Network (CEDEN).

(d) Based on the Sediment Monitoring Report conclusions the San Diego Water Board may require a human health risk assessment to determine if the human health objective contained in Receiving Water Limitations in Provision A.2.a.(3)(b)(ii) has been attained at each sample station. In conducting a risk assessment, the Copermittees must consider any applicable and relevant information, including California Environmental Protection Agency's (Cal/EPA) Office of Environmental Health Hazard Assessment (OEHHA) policies for fish consumption and risk assessment, Cal/EPA's Department of Toxic Substances Control (DTSC) Risk Assessment, and USEPA Human Health Risk Assessment policies.

(3) <u>ASBS Monitoring</u>

For Watershed Management Areas with ASBS, the Copermittees must implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

f. ALTERNATIVE WATERSHED MONITORING REQUIREMENTS

The San Diego Water Board may direct the Copermittees to participate in an effort to develop alternative watershed monitoring with other regulated entities, other interested parties, and the San Diego Water Board to refine, coordinate, and implement regional monitoring and assessment programs to determine the status and trends of water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams.

2. MS4 Outfall Discharge Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the discharges from the MS4 outfalls in each Watershed Management Area during dry weather and wet weather. Following San Diego Water Board acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct MS4 outfall discharge monitoring during implementation of the Water Quality Improvement Plan to assess the effectiveness of their jurisdictional runoff management programs toward effectively prohibiting non-storm water discharges into the MS4 and reducing pollutants in storm water discharges from their MS4s to the MEP. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following MS4 outfall monitoring procedures:

a. TRANSITIONAL MS4 OUTFALL DISCHARGE MONITORING

Until the monitoring requirements and schedules of Provisions D.2.b-c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following MS4 outfall discharge monitoring in the Watershed Management Area:

(1) <u>MS4 Outfall Discharge Monitoring Station Inventory</u>

Each Copermittee must identify all major MS4 outfalls that discharge directly to receiving waters within its jurisdiction and geo-locate those outfalls on a map of the MS4 pursuant to Provision E.2.b.(1). This information must be compiled into a MS4 outfall discharge monitoring station inventory, and must include the following information:

(a) Latitude and longitude of MS4 outfall point of discharge;

(b) Watershed Management Area;

(c) Hydrologic subarea;

(d) Outlet size;

(e) Accessibility (i.e. safety and without disturbance of critical habitat);

(f) Approximate drainage area; and

(g) Classification of whether the MS4 outfall is known to have persistent dry weather flows, transient dry weather flows, no dry weather flows, or unknown dry weather flows.

(2) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Until the monitoring requirements and schedules of Provision D.2.b are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, each Copermittee must perform dry weather MS4 outfall field screening monitoring to identify non-storm water and illicit discharges within its jurisdiction in accordance with Provision E.2.c, to determine which discharges are transient flows and which are persistent flows, and prioritize the dry weather MS4 discharges that will be investigated and eliminated in accordance with Provision E.2.d.

(a) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Frequency

Each Copermittee must field screen the MS4 outfalls in its inventory developed pursuant to Provision D.2.a.(1) as follows:

(i) For Copermittees with less than 125 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 80 percent of the outfalls must be visually inspected two times per year during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv).

(ii) For Copermittees with 125 major MS4 outfalls or more, but less than or equal to 500 that discharge to receiving waters within a Watershed Management Area, all the outfalls must be visually inspected at least annually during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv).

(iii) For Copermittees with more than 500 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 500 outfalls must be visually inspected at least annually during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv). Copermittees with more than 500 major MS4 outfalls within a Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;

[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(iv) For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major MS4 outfalls within its jurisdiction, at least 500 major MS4 outfalls within its inventory must be visually inspected at least annually during dry weather conditions. Copermittees with more than 500 major MS4 outfalls in more than one Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(v) Inspections of major MS4 outfalls conducted in response to public reports and staff or contractor reports and notifications may count toward the required visual inspections of MS4 outfall discharge monitoring stations.

(b) Transitional Dry Weather MS4 Outfall Discharge Field Screening Visual Observations

(i) An antecedent dry period of at least 72 hours following any storm event producing measurable rainfall greater than 0.1 inch is required prior to conducting field screening visual observations during a field screening monitoring event.

(ii) During the field screening monitoring event, each Copermittee must record visual observations consistent with Table D-5 at each MS4 outfall discharge monitoring station inspected.

Table D-5. Field Screening Visual Observations for MS4 Outfall Discharge Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) - Flow source(s) suspected or identified from non-storm water source investigation - Flow source(s) eliminated during non-storm water source identification • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) - Known or suspected source(s) of pooled or ponded water • Station description (i.e. deposits or stains, vegetation condition, structural condition, observable biology) • Presence and assessment of trash in and around station • Evidence or signs of illicit connections or illegal dumping

(iii) Each Copermittee must implement the requirements of Provisions E.2.d.(2)(c)-(e) based on the field observations required pursuant to Provision D.2.a.(2)(b)(ii).

(iv) Each Copermittee must evaluate field observations together with existing information available from prior reports, inspections and monitoring results to determine whether any observed flowing, pooled, or ponded waters are likely to be transient or persistent flow.[22]

(c) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Records

Based upon the results of the transitional dry weather MS4 outfall discharge field screening monitoring conducted pursuant to Provisions D.2.a.(2)(a)-(b), each Copermittee must update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow.

(3) <u>Transitional Wet Weather MS4 Outfall Discharge Monitoring</u>

Until the monitoring requirements and schedules of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the

[22] Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(a) Transitional Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees must select wet weather MS4 outfall discharge monitoring stations from the inventories developed pursuant to Provision D.2.a.(1) for each Watershed Management Area as follows:

(i) At least five wet weather MS4 outfall discharge monitoring stations that are representative of storm water discharges from areas consisting primarily of residential, commercial, industrial, and typical mixed-use land uses present within the Watershed Management Area;

(ii) At least one wet weather MS4 outfall discharge monitoring station for each Copermittee within the Watershed Management Area; and

(iii) The County of San Diego may select at least two (2) wet weather MS4 outfall discharge monitoring stations for the portion of the Santa Margarita River Watershed Management Area within its jurisdiction to be monitored during the transitional period until the Riverside County Copermittees are notified of coverage under this Order. After the Riverside County Copermittees are notified of coverage under this Order, the Copermittees in the Watershed Management Area must select wet weather MS4 outfall discharge monitoring stations consistent with the requirements above.

(b) Transitional Wet Weather MS4 Outfall Discharge Monitoring Frequency

Each wet weather MS4 outfall discharge monitoring station selected pursuant to Provision D.2.a.(3)(a) must be monitored once during the wet season (October 1 – April 30). The wet weather monitoring events must be selected to be representative of the range of hydrological conditions experienced in the region. At least 10 percent of samples must be conducted during the first wet weather event of the wet season, to include at least one such sample in each Watershed Management Area..

(c) Transitional Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(i) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(ii) The flow rates and volumes measured or estimated from the MS4 outfall (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(d) Transitional Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(e) Transitional Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, and indicator bacteria;

(iv) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

[a] Time-weighted composites collected over the length of the storm event or the first 24 hour period whichever is shorter, composed of discrete samples, which may be collected through the use of automated equipment, or

[b] Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

[c] If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during

the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours;

(v) Only one analysis of the composite of aliquots is required;

(vi) The samples must be analyzed for the following constituents:

[a] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

[b] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and

[c] Constituents listed in Table D-6.

Table D-6. Analytical Monitoring Constituents for Wet Weather MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Nickel • Selenium • Thallium • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(f) Other Transitional Wet Weather MS4 Outfall Discharge Monitoring

The San Diego County Copermittees must continue the wet weather MS4 outfall monitoring program developed under Order No. R9-2007-0001, as approved by the San Diego Water Board, through its planned completion.

b. DRY WEATHER MS4 OUTFALL DISCHARGE MONITORING

Each Copermittee must perform dry weather MS4 outfall monitoring to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision

E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. Each Copermittee must conduct the following dry weather MS4 outfall discharge monitoring within its jurisdiction:

(1) Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Each Copermittee must continue to perform the dry weather MS4 outfall discharge field screening monitoring in accordance with the requirements of Provision D.2.a.(2). The Copermittee may adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of persistent flow non-storm water discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of visual inspections performed is equivalent to the number of visual inspections required under Provision D.2.a.(2)(a).

(2) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring

Each Copermittee must perform non-storm water persistent flow MS4 outfall discharge monitoring to determine which persistent non-storm water discharges contain concentrations of pollutants below NALs, and which persistent non-storm water discharges impact receiving water quality during dry weather. Each Copermittee must conduct the following non-storm water persistent flow MS4 outfall discharge monitoring within its jurisdiction:

(a) Prioritization of Non-Storm Water Persistent Flow MS4 Outfalls

Based upon the dry weather MS4 outfall discharge field screening monitoring records developed pursuant to Provision D.2.a.(2)(c), each Copermittee must identify and prioritize the MS4 outfalls with persistent flows based on the highest priority water quality conditions identified in the Water Quality Improvement Plan and any additional criteria developed by the Copermittee, which may include historical data and data from sources other than what the Copermittee collects.

(b) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring Frequency

(i) Based on the prioritization of major MS4 outfalls developed under Provision D.2.b.(2)(a), each Copermittee must identify, at a minimum, the 5 highest priority major MS4 outfalls with non-storm water persistent flows that the Copermittee will monitor within its jurisdiction in each Watershed Management Area. For Responsible Copermittees identified by a TMDL in Attachment E to this Order, if the 5 chosen outfall locations are not sufficient to determine compliance with the TMDL(s), then each Responsible Copermittee

must identify additional MS4 outfall monitoring locations within its jurisdiction sufficient to address compliance with the TMDL(s). If a Copermittee has less than 5 major outfalls within a Watershed Management Area, then the Copermittee must monitor all of its major MS4 outfalls with persistent flows within each Watershed Management Area. The location of the highest priority non-storm water persistent flow MS4 outfall monitoring stations must be identified on the map required pursuant to Provision E.2.b.(1). The map must specify which MS4 outfalls are being monitored for compliance with a TMDL.

(ii) Each of the highest priority non-storm water persistent flow MS4 outfall monitoring stations identified pursuant to Provision D.2.b.(2)(b)(i) must be monitored under dry weather conditions at least semi-annually until one of the following occurs:

[a] The non-storm water discharges have been effectively eliminated (i.e. no flowing, pooled, or ponded water) for three consecutive dry weather monitoring events; or

[b] The source(s) of the persistent flows has been identified as a category of non-storm water discharges that does not require an NPDES permit and does not have to be addressed as an illicit discharge because it was not identified as a source of pollutants (i.e. constituents in non-storm water discharge do not exceed NALs), and the persistent flow can be re-prioritized to a lower priority; or

[c] The constituents in the persistent flow non-storm water discharge do not exceed NALs, and the persistent flow can be re-prioritized to a lower priority; or

[d] The source(s) of the persistent flows has been identified as a non-storm water discharge authorized by a separate NPDES permit.

(iii) Where the criteria under Provision D.2.b.(2)(b)(ii) are not met, but the threat to water quality has been reduced by the Copermittee, the highest priority persistent flow MS4 outfall monitoring stations may be reprioritized accordingly for continued dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1).

(iv) Each Copermittee must document removal or re-prioritization of the highest priority persistent flow MS4 outfall monitoring stations identified under Provision D.2.b.(2)(a) in the Water Quality Improvement Plan Annual Report. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized major MS4 outfall in the Watershed Management Area within its jurisdiction, unless there are no remaining qualifying major MS4 outfalls within the Copermittee's jurisdiction in the Watershed Management Area.

(c) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Observations

During each semi-annual monitoring event, each Copermittee must record field observations consistent with Table D-5 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(d) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Monitoring

During each semi-annual monitoring event, if conditions allow the collection of the data, each Copermittee must monitor and record the parameters in Table D-2 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(e) Non-Storm Water Persistent Flow MS4 Outfall Discharge Analytical Monitoring

During each semi-annual monitoring event in which measurable flow is present, each Copermittee must collect and analyze samples from each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Collect grab or composite samples to be analyzed at a qualified laboratory for the following constituents:

[a] Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,
[b] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,
[c] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,
[d] Applicable NAL constituents, and
[e] Constituents listed in Table D-7. The Copermittees may adjust the list of constituents for the Watershed Management Area if historical data or supporting information can be provided that demonstrates or justifies the analysis of a constituent is not necessary.

Table D-7. Analytical Monitoring Constituents for Persistent Flow MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Total Hardness • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Cadmium • Copper • Lead • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(iv) If the Copermittee identifies and eliminates the source of the persistent flow non-storm water discharge, analysis of the sample is not required.

c. WET WEATHER MS4 OUTFALL DISCHARGE MONITORING

The Copermittees must perform wet weather MS4 outfall monitoring to identify pollutants in storm water discharges from the MS4s, to guide pollutant source identification efforts, and to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order. The Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(1) Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees may adjust the wet weather MS4 outfall discharge monitoring locations in the Watershed Management Area, as needed, to identify pollutants in storm water discharges from MS4s, to guide pollutant source identification efforts, and to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of stations is at least equivalent to the number of stations required under Provision D.2.a.(3)(a). Additional outfall monitoring locations, above the minimum per jurisdiction, may be required to demonstrate compliance with the WQBELs associated with the applicable TMDLs in Attachment E.

(2) Wet Weather MS4 Outfall Discharge Monitoring Frequency

The Copermittees must monitor the wet weather MS4 outfall discharge monitoring stations in the Watershed Management Area at least once (1) per year. The Copermittees may need to increase the frequency of monitoring in order to identify pollutants in storm water discharges from the MS4s causing or contributing to the highest priority water quality conditions, to guide pollutant source identification efforts, or to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order.

(3) Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(4) Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(5) Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites collected over the length of the storm event or the first 24 hour period, whichever is shorter , composed of discrete samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

(iii) If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours.

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) The Copermittees may adjust the analytical monitoring required for the Watershed Management Area, if the Copermittees have historical data or supporting information that can demonstrate or provide justification that the analysis of a constituent is not necessary.

3. Special Studies

a. Within the term of this Order, the Copermittees must initiate the following special studies:

(1) At least two special studies in each Watershed Management Area to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that cause or contribute to highest priority water quality conditions identified in the Water Quality Improvement Plan.

(2) At least one special study for the San Diego Region to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that are impacting receiving waters on a regional basis in the San Diego Region.

(3) One of the two special studies in each Watershed Management Area required pursuant to Provision D.3.a.(1) may be replaced by a special study implemented pursuant to Provision D.3.a.(2).

b. The special studies must, at a minimum, be in conformance with the following criteria:

(1) The special studies must be related to the highest priority water quality conditions identified by the Copermittees in the Watershed Management Area and/or for the entire San Diego Region;

(2) The special studies developed pursuant to Provision D.3.a.(1) must:

(a) Be implemented within the applicable Watershed Management Area, and

(b) Require some form of participation by all the Copermittees within the Watershed Management Area;

(3) The special studies developed pursuant to Provision D.3.a.(2) must:

(a) Be implemented within the San Diego Region, and

(b) Require some form of participation by all Copermittees covered under the requirements of this Order.

(4) The Copermittees are encouraged to partner with environmental groups or third parties knowledgeable of watershed conditions to complete the required special studies.

c. Special studies developed to identify sources of pollutants and/or stressors should be pollutant and/or stressor specific and based on historical monitoring data and monitoring performed pursuant to Provisions D.1 and D.2. Development of source identification special studies should include the following:

(1) A compilation of known information on the specific pollutant and/or stressor, including data on potential sources and movement of the pollutant and/or stressor within the watershed. Data generated by the Copermittees and others, as well as information available from a literature research on the pollutant and/or stressor should be compiled and analyzed as appropriate.

(2) An identification of data gaps, based on the compiled information generated on the specific pollutant and/or stressor identified in Provision D.3.c.(1). Source identification special studies should be developed to fill identified data gaps.

(3) A monitoring plan that will collect and provide data the Copermittees can utilize to do the following:

(a) Quantify the relative loading or impact of a pollutant and/or stressor from a particular source or pollutant generating activity;

(b) Improve understanding of the fate of a pollutant and/or stressor in the environment;

(c) Develop an inventory of known and suspected sources of a pollutant and/or stressor in the Watershed Management Area; and/or

(d) Prioritize known and suspected sources of a pollutant and/or stressor based on relative magnitude in discharges, geographical distribution (i.e., regional or localized), frequency of occurrence in discharges, human health risk, and controllability.

d. Special studies initiated prior to the effective date of this Order that meet the requirements of Provision D.3.b and are implemented during the term of this Order as part of the Water Quality Improvement Plan may be utilized to fulfill the special study requirements of Provision D.3.a. Special studies completed before the effective date of this Order cannot be utilized to fulfill the special study requirements of Provision D.3.a.

e. The Copermittees must submit the monitoring plans for the special studies in the Water Quality Improvement Plans required pursuant to Provision F.1.

f. The Copermittees are encouraged to share the results of the special studies regionally among the Copermittees to provide information useful in improving and adapting the management of non-storm water and storm water runoff through the implementation of the Water Quality Improvement Plans.

4. Assessment Requirements

Each Copermittee must evaluate the data collected pursuant to Provisions D.1, D.2 and D.3, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E, to assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a. Assessments must be performed as described in the following provisions:

a. Receiving Waters Assessments

(1) The Copermittees must assess and report the conditions of the receiving waters in the Watershed Management Area as follows:

(a) Based on data collected pursuant to Provision D.1.a, the assessments under Provision D.4.a.(2) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(b) Based on the data collected pursuant to Provisions D.1.a-e, the assessments required under Provision D.4.a.(2) must be included in the Report of Waste Discharge required pursuant to Provision F.5.b.

(2) The Copermittees must assess the status and trends of receiving water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under dry weather and wet weather conditions. For each of the three types of receiving waters in each Watershed Management Area the Copermittees must:

(a) Determine whether or not the conditions of the receiving waters are meeting the numeric goals established pursuant to Provision B.3.a;

(b) Identify the most critical beneficial uses that must be protected to ensure overall health of the receiving water;

(c) Determine whether or not those critical beneficial uses are being protected;

(d) Identify short-term and/or long-term improvements or degradation of those critical beneficial uses;

(e) Determine whether or not the strategies established in the Water Quality Improvement Plan contribute towards progress in achieving the interim and final numeric goals of the Water Quality Improvement Plan; and

(f) Identify data gaps in the monitoring data necessary to assess Provisions D.4.a.(2)(a)-(e).

b. MS4 OUTFALL DISCHARGES ASSESSMENTS

(1) Non-Storm Water Discharges Reduction Assessments

(a) Each Copermittee must assess and report the progress of its illicit discharge detection and elimination program, required to be implemented pursuant to Provision E.2, toward effectively prohibiting non-storm water and illicit discharges into the MS4 within its jurisdiction as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(2), the assessments under Provision D.4.b.(1)(b) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(ii) Based on the data collected pursuant to Provisions D.2.b, the assessments required under Provision D.4.b.(1)(c) must be included in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

(iii) Based on the data collected pursuant to Provisions D.2.b, the assessment required under Provision D.4.b.(1)(c) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.a.(2), each Copermittee must assess and report the following:

(i) Identify the known and suspected controllable sources (e.g. facilities, areas, land uses, pollutant generating activities) of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area;

(ii) Identify sources of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area that have been reduced or eliminated; and

(iii) Identify modifications to the field screening monitoring locations and frequencies for the MS4 outfalls in its inventory necessary to identify and eliminate sources of persistent flow non-storm water discharges pursuant to Provision D.2.b.

(c) Based on the dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1), each Copermittee must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(1)(b);

(ii) Based on the data collected and applicable NALs in the Water Quality Improvement Plan, rank the MS4 outfalls in the Copermittee's jurisdiction according to potential threat to receiving water quality, and produce a prioritized list of major MS4 outfalls for follow-up action to update the Water Quality Improvement Plan, with the goal of eliminating persistent flow non-storm water discharges and/or pollutant loads in order of the ranked priority list through targeted programmatic actions and source investigations;

(iii) For the highest priority major MS4 outfalls with persistent flows that are in exceedance of NALs, identify the known and suspected sources within the Copermittee's jurisdiction in the Watershed Management Area that may cause or contribute to the NAL exceedances;

(iv) Each Copermittee must analyze the data collected pursuant to Provision D.2.b, and utilize a model or other method, to calculate or estimate the non-storm water volumes and pollutant loads collectively discharged from all the major MS4s outfalls in its jurisdiction identified as having persistent dry weather flows during the monitoring year. These calculations or estimates must be updated annually.

[a] Each Copermittee must calculate or estimate the annual non-storm water volumes and pollutant loads collectively discharged from the Copermittee's major MS4 outfalls to receiving waters within the Copermittee's jurisdiction, with an estimate of the percent contribution from each known source for each MS4 outfall;

[b] Each Copermittee must annually identify and quantify (i.e. volume and pollutant loads) sources of non-storm water not subject to the Copermittee's legal authority that are discharged from the Copermittee's major MS4 outfalls to downstream receiving waters.

(v) Each Copermittee must review the data collected pursuant to Provision D.2.b and findings from the assessments required pursuant to Provision D.4.b.(1)(c)(i)-(iv) at least once during the term of this Order to:

[a] Identify reductions and progress in achieving reductions in non-storm water and illicit discharges to the Copermittee's MS4 in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction, with an estimate, if possible, of the non-storm water volume and/or pollutant load reductions attributable to specific water quality strategies implemented by the Copermittee; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittee in the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction.

(vi) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(1)(c)(i)-(v).

(2) <u>Storm Water Pollutant Discharges Reduction Assessments</u>

(a) The Copermittees must assess and report the progress of the water quality improvement strategies, required to be implemented pursuant to Provisions B and E, toward reducing pollutants in storm water discharges from the MS4s within the Watershed Management Area as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(3), the assessments under Provision D.4.b.(2)(b) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(ii) Based on the data collected pursuant to Provisions D.2.c, the assessments required under Provision D.4.b.(2)(c) must be included in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

(iii) Based on the data collected pursuant to Provisions D.2.c, the assessment required under Provisions D.4.b.(2)(c)-(d) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.a.(3) the Copermittees must assess and report the following:

(i) The Copermittees must analyze the monitoring data collected pursuant to Provision D.2.a.(3), and utilize a watershed model or other method, to calculate or estimate the following for each monitoring year:

[a] The average storm water runoff coefficient for each land use type within the Watershed Management Area;
[b] The volume of storm water and pollutant loads discharged from each of the Copermittee's monitored MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch;
[c] The total flow volume and pollutant loadings discharged from the Copermittee's jurisdiction within the Watershed Management Area over the course of the wet season, extrapolated from the data produced from the monitored MS4 outfalls; and
[d] The percent contribution of storm water volumes and pollutant loads discharged from each land use type within each hydrologic subarea with a major MS4 outfall to receiving waters or within each major MS4 outfall to receiving waters in the Copermittee's jurisdiction within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch.

(ii) Identify modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify pollutants in storm water discharges from the MS4s in the Watershed Management Area pursuant to Provision D.2.c.(1).

(c) Based on the wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.c the Copermittees must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(2)(b);

(ii) Based on the data collected and applicable SALs in the Water Quality Improvement Plan, analyze and compare the monitoring data to the analyses and assumptions used to develop the Water Quality Improvement Plans, including strategies developed pursuant to Provision B.3, and evaluate whether those analyses and assumptions should be updated as a component of the adaptive management efforts pursuant to Provision B.5 for follow-up action to update the Water Quality Improvement Plan;

(iii) The Copermittees must review the data collected pursuant to Provision D.2.c and findings from the assessments required pursuant to Provisions D.4.b.(2)(c)(i)-(ii) at least once during the term of this Order to:

[a] Identify reductions or progress in achieving reductions in pollutant concentrations and/or pollutant loads from different land uses and/or drainage areas discharging from the Copermittees' MS4s in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters within the Watershed Management Area to the MEP, with an estimate, if possible, of the pollutant load reductions attributable to specific water quality strategies implemented by the Copermittees; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittees in the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters in the Watershed Management Area to the MEP.

(iv) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(iii).

(d) The Copermittees must evaluate all the data collected pursuant to Provision D.2.c, and incorporate new outfall monitoring data into time series plots for each long-term monitoring constituent for the Watershed Management Area, and perform statistical trends analysis on the cumulative long-term wet weather MS4 outfall discharge water quality data set.

c. Special Studies Assessments

The Copermittees must annually evaluate the results and findings from the special studies developed and implemented pursuant to Provision D.3, and assess their relevance to the Copermittees' efforts to characterize receiving water conditions, understand sources of pollutants and/or stressors, and control and reduce the discharges of pollutants from the MS4 outfalls to receiving waters in the Watershed Management Area. The Copermittees must report the results of the special studies assessments applicable to the Watershed Management Area, and identify any necessary modifications or updates to the Water Quality Improvement Plan based on the results in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

d. Integrated Assessment of Water Quality Improvement Plan

As part of the iterative approach and adaptive management process required for the Water Quality Improvement Plan pursuant to Provision B.5, the Copermittees in each Watershed Management Area must integrate the data collected pursuant to Provisions D.1-D.3, the findings from the assessments required pursuant to

Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to assess the effectiveness of, and identify necessary modifications to, the Water Quality Improvement Plan as follows:

(1) The Copermittees must re-evaluate the priority water quality conditions and numeric goals for the Watershed Management Area, as needed, during the term of this Order pursuant to Provision B.5.a. The re-evaluation and recommendations for modifications to the priority water quality conditions, and/or numeric goals and corresponding schedules may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The priority water quality conditions and numeric goals for the Watershed Management Area must be re-evaluated as follows:

(a) Re-evaluate the receiving water conditions in the Watershed Management Area in accordance with Provision B.2.a;

(b) Re-evaluate the impacts on receiving waters in the Watershed Management Area from MS4 discharges in accordance with Provision B.2.b;

(c) Re-evaluate the identification of MS4 sources of pollutants and/or stressors in accordance with Provision B.2.d;

(d) Identify beneficial uses of the receiving waters that are protected in accordance with Provision D.4.a;

(e) Evaluate the progress toward achieving the interim and final numeric goals for protecting impacted beneficial uses in the receiving waters.

(2) The Copermittees must re-evaluate the water quality improvement strategies for the Watershed Management Area during the term of this Order pursuant to Provision B.5.b. The re-evaluation and recommendations for modifications to the water quality improvement strategies and schedules may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The water quality improvement strategies for the Watershed Management Area must be re-evaluated as follows:

(a) Identify the non-storm water and storm water pollutant loads from the Copermittees' MS4 outfalls in the Watershed Management Area, calculated or estimated pursuant to Provisions D.4.b;

(b) Identify the non-storm water and storm water pollutant load reductions, or other improvements to receiving water or water quality conditions, that are necessary to attain the interim and final numeric goals identified in the Water Quality Improvement Plan for protecting beneficial uses in the receiving waters;

(c) Identify the non-storm water and storm water pollutant load reductions, or other improvements to the quality of MS4 discharges, that are necessary for the Copermittees to demonstrate that non-storm water and storm water discharges from their MS4s are not causing or contributing to exceedances of receiving water limitations;

(d) Evaluate the progress of the water quality improvement strategies toward achieving the interim and final numeric goals identified in the Water Quality Improvement Plan for protecting beneficial uses in the receiving waters.

(3) The Copermittees must re-evaluate and adapt the water quality monitoring and assessment program for the Watershed Management Area when new information becomes available to improve the monitoring and assessment program pursuant to Provision B.5.c. The re-evaluation and recommendations for modifications to the monitoring and assessment program may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. Modifications to the water quality monitoring and assessment program must be consistent with the requirements of Provision D.1-D.3. The re-evaluation of the water quality monitoring and assessment program for the Watershed Management Area must consider the data gaps identified by the assessments required pursuant to Provisions D.4.a-b, and results of the special studies implemented pursuant to Provision D.4.c.

5. Monitoring Provisions

Each Copermittee must comply with all the monitoring, reporting, and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

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E. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS

The purpose of this provision is for each Copermittee to implement a program to control the contribution of pollutants to and the discharges from the MS4 within its jurisdiction. The goal of the jurisdictional runoff management programs is to implement strategies that effectively prohibit non-storm water discharges to the MS4 and reduce the discharge of pollutants in storm water to the MEP. This goal will be accomplished through implementing the jurisdictional runoff management programs in accordance with the strategies identified in the Water Quality Improvement Plans.

Each Copermittee must update its jurisdictional runoff management program document, in accordance with Provision F.2.a, to incorporate all the requirements of Provision E. Until the Copermittee has updated its jurisdictional runoff management program document with the requirements of Provision E, the Copermittee must continue implementing its current jurisdictional runoff management program.

1. Legal Authority Establishment and Enforcement

a. Each Copermittee must establish, maintain, and enforce adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 through statute, ordinance, permit, contract, order, or similar means. This legal authority must, at a minimum, authorize the Copermittee to:

(1) Prohibit and eliminate all illicit discharges and illicit connections to its MS4;

(2) Control the contribution of pollutants in discharges of runoff associated with industrial and construction activity to its MS4 and control the quality of runoff from industrial and construction sites, including industrial and construction sites which have coverage under the statewide General Permit for Discharges of Storm Water Associated with Industrial Activities (Industrial General Permit) or General Permit for Discharges of Storm Water Associated with Construction Activities (Construction General Permit), as well as to those sites which do not;

(3) Control the discharge of spills, dumping, or disposal of materials other than storm water into its MS4;

(4) Control through interagency agreements among Copermittees the contribution of pollutants from one portion of the MS4 to another portion of the MS4;

(5) Control, by coordinating and cooperating with other owners of the MS4 such as Caltrans, the U.S. federal government, or sovereign Native American Tribes through interagency agreements, where possible, the contribution of pollutants from their portion of the MS4 to the portion of the MS4 within the Copermittee's jurisdiction;

(6) Require compliance with conditions in its statutes, ordinances, permits, contracts, orders, or similar means to hold dischargers to its MS4 accountable for their contributions of pollutants and flows;

(7) Require the use of BMPs to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(8) Require documentation on the effectiveness of BMPs implemented to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(9) Utilize enforcement mechanisms to require compliance with its statutes, ordinances, permits, contracts, orders, or similar means; and

(10) Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with its statutes, ordinances, permits, contracts, orders, or similar means and with the requirements of this Order, including the prohibition of illicit discharges and connections to its MS4; the Copermittee must also have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from industrial facilities, including construction sites, discharging into its MS4.

b. With the first Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3), each Copermittee must submit a statement certified by its Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative that the Copermittee has taken the necessary steps to obtain and maintain full legal authority within its jurisdiction to implement and enforce each of the requirements contained in this Order.

2. Illicit Discharge Detection and Elimination

Each Copermittee must implement a program to actively detect and eliminate illicit discharges and improper disposal into the MS4, or otherwise require the discharger to apply for and obtain a separate NPDES permit. The illicit discharge detection and elimination program must be implemented in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include, at a minimum, the following requirements:

a. NON-STORM WATER DISCHARGES

Each Copermittee must address all non-storm water discharges as illicit discharges unless a non-storm water discharge is either identified as a discharge authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to the following requirements:

(1) Discharges of non-storm water to the MS4 from the following categories must be addressed as illicit discharges unless the discharge has coverage or meets the exception criteria under NPDES Permit No. CAG919003(Order No. R9-2015-0013, as it may be amended or reissued) for discharges to surface waters within the San Diego Region:

(1) Uncontaminated pumped ground water;

(2) Discharges from foundation drains;[23]

(3) Water from crawl space pumps; and

(4) Water from footing drains.[20]

(2) Discharges of non-storm water from water line flushing and water main breaks to the MS4 must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG679001 (Order No. R9-2010-0003, as it may be amended or reissued) or NPDES General Permit No. CAG140001 (Order 2014-0194-DWQ, as it may be amended or reissued). This category includes water line flushing and water main break discharges from water purveyors issued a water supply permit by the California Department of Public Health or federal military installations. Discharges from recycled or reclaimed water lines to the MS4 must be addressed as illicit discharges, unless the discharges have coverage under a separate NPDES permit.

(3) Discharges of non-storm water to the MS4 from the following categories must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a source of pollutants to receiving waters:

(a) Diverted stream flows;

(b) Rising ground waters;

(c) Uncontaminated ground water infiltration to MS4s;

(d) Springs;

(e) Flows from riparian habitats and wetlands;

(f) Discharges from potable water sources;

[23] Provision E.2.a.(1) only applies to this category of non-storm water if the system is designed to be located at or below the groundwater table to actively or passively extract groundwater during any part of the year.

(g) Discharges from foundation drains;[24] and

(h) Discharges from footing drains.[21]

(4) Discharges of non-storm water to the MS4 from the following categories must be controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means. Discharges of non-storm water to the MS4 from the following categories not controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means must be addressed by the Copermittee as illicit discharges.

(a) Air conditioning condensation

The discharge of air conditioning condensation should be directed to landscaped areas or other pervious surfaces, or to the sanitary sewer, where feasible.

(b) Individual residential vehicle washing

(i) The discharge of wash water should be directed to landscaped areas or other pervious surfaces where feasible; and

(ii) The minimization of water, washing detergent and other vehicle wash products used for residential vehicle washing, and the implementation of other practices or behaviors that will prevent the discharge of pollutants associated with individual residential vehicle washing from entering the MS4 must be encouraged.

(c) Dechlorinated swimming pool discharges

(i) Residual chlorine, algaecide, filter backwash, or other pollutants from swimming pools must be eliminated prior to discharging to the MS4; and

(ii) The discharge of saline swimming pool water must be directed to the sanitary sewer, landscaped areas, or other pervious surfaces that can accommodate the volume of water, unless the saline swimming pool water can be discharged via a pipe or concrete channel directly to a naturally saline water body (e.g. Pacific Ocean).

(5) Firefighting discharges to the MS4 must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a significant source of pollutants to receiving waters. Firefighting discharges to the MS4 not identified as a significant

[24] Provision E.2.a.(3) only applies to this category of non-storm water discharge if the system is designed to be located above the groundwater table at all times of the year, and the system is only expected to discharge non-storm water under unusual circumstances.

source of pollutants to receiving waters, must be addressed, at a minimum, as follows:

(a) Non-emergency firefighting discharges

(i) Building fire suppression system maintenance discharges (e.g. sprinkler line flushing) to the MS4 must be addressed as illicit discharges unless BMPs are implemented to prevent pollutants associated with such discharges to the MS4.

(ii) Non-emergency firefighting discharges (i.e., discharges from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems) must be addressed by a program, to be developed and implemented by the Copermittee, to reduce or eliminate pollutants in such discharges from entering the MS4.

(b) Emergency firefighting discharges

Each Copermittee should develop and encourage implementation of BMPs to reduce or eliminate pollutants in emergency firefighting discharges to the MS4s and receiving waters within its jurisdiction. During emergency situations, priority of efforts should be directed toward life, property, and the environment (in descending order). BMPs should not interfere with immediate emergency response operations or impact public health and safety.

(6) If the Copermittee or San Diego Water Board identifies any category of non-storm water discharges listed under Provisions E.2.a.(1)-(4) as a source of pollutants to receiving waters, the category must be prohibited through ordinance, order, or similar means and addressed as an illicit discharge. Alternatively, the Copermittee may propose controls to be implemented for the category of non-storm water discharges as part of the Water Quality Improvement Plan instead of prohibiting the category of non-storm water discharges, and implement the controls if accepted by the San Diego Water Board as part of the Water Quality Improvement Plan.

(7) Each Copermittee must, where feasible and priorities and resources allow, reduce or eliminate non-storm water discharges listed under Provisions E.2.a.(1)-(4) into its MS4, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit.

b. PREVENT AND DETECT ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to prevent and detect illicit discharges to the MS4:

(1) Each Copermittee must maintain an updated map of its entire MS4 and the

corresponding drainage areas. The accuracy of the MS4 map must be confirmed during the field screening required pursuant to Provision E.2.c. The MS4 map must be included as part of the jurisdictional runoff management program document. Any geographic information system (GIS) layers or files used by the Copermittee to maintain the MS4 map must be made available to the San Diego Water Board upon request. The MS4 map must identify the following:

(a) All segments of the MS4 owned, operated, and maintained by the Copermittee;

(b) All known locations of inlets that discharge and/or collect runoff into the Copermittee's MS4;

(c) All known locations of connections with other MS4s not owned or operated by the Copermittee (e.g. Caltrans MS4s);

(d) All known locations of MS4 outfalls and private outfalls that discharge runoff collected from areas within the Copermittee's jurisdiction;

(e) All segments of receiving waters within the Copermittee's jurisdiction that receive and convey runoff discharged from the Copermittee's MS4 outfalls;

(f) Locations of the MS4 outfalls, identified pursuant to Provision D.2.a.(1), within its jurisdiction; and

(g) Locations of the non-storm water persistent flow MS4 outfall discharge monitoring stations, identified pursuant to Provision D.2.b.(2), within its jurisdiction.

(2) Each Copermittee must use Copermittee personnel and contractors to assist in identifying and reporting illicit discharges and connections during their daily employment activities.

(3) Each Copermittee must promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges to or from the MS4, including the following methods for public reporting:

(a) Operate a public hotline, which can be Copermittee-specific or shared by the Copermittees, and must be capable of receiving reports in both English and Spanish 24 hours per day and seven days per week; and

(b) Designate an e-mail address for receiving electronic reports from the public, which can be Copermittee-specific or shared by the Copermittees,

and must be prominently displayed on the Copermittee's webpage and the Regional Clearinghouse required pursuant to Provision F.4.

(4) Each Copermittee must implement practices and procedures (including a notification mechanism) to prevent, respond to, contain, and clean up any spills that may discharge into the MS4 within its jurisdiction from any source. The Copermittee must coordinate, to the extent possible, with spill response teams to prevent entry of spills into the MS4, and prevent contamination of surface water, ground water, and soil. The Copermittee must coordinate spill prevention, containment, and response activities throughout all appropriate Copermittee departments, programs, and agencies.

(5) Each Copermittee must implement practices and procedures to prevent and limit infiltration of seepage from sanitary sewers (including private laterals and failing septic systems) to the MS4.

(6) Each Copermittee must coordinate, when necessary, with upstream Copermittees and/or entities to prevent illicit discharges from upstream sources into the MS4 within its jurisdiction.

c. FIELD SCREENING

Each Copermittee must conduct field screening (i.e. visual observations, field testing, and/or analytical testing) of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4 in accordance with the dry weather MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

d. INVESTIGATE AND ELIMINATE ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to investigate and eliminate illicit discharges to the MS4:

(1) Each Copermittee must prioritize and determine when follow-up investigations will be performed in response to visual observations and/or water quality monitoring data collected during an investigation of a detected non-storm water or illicit discharge to or from the MS4. The criteria for prioritizing investigations must consider the following:

(a) Pollutants identified as causing or contributing to the highest water quality priorities identified in the Water Quality Improvement Plan;

(b) Pollutants identified as causing or contributing, or threatening to cause or contribute to impairments in water bodies on the 303(d) List and/or in environmentally sensitive areas (ESAs), located within its jurisdiction;

(c) Pollutants identified from sources or land uses known to exist within the

area, drainage basin, or watershed that discharges to the portion of the MS4 within its jurisdiction included in the investigation;

(d) Pollutants identified as causing or contributing to an exceedance of a NAL in the Water Quality Improvement Plan; and

(e) Pollutants identified as a threat to human health or the environment.

(2) Each Copermittee must implement procedures to investigate and inspect portions of its MS4 that, based on reports or notifications, field screening, or other appropriate information, indicate a reasonable potential of receiving, containing, or discharging pollutants due to illicit discharges, illicit connections, or other sources of non-storm water. The procedures must include the following:

(a) Each Copermittee must develop criteria to:

(i) Assess the validity of each report or notification received; and

(ii) Prioritize the response to each report or notification received.

(b) Each Copermittee must prioritize and respond to each valid report or notification (e.g., public reports, staff or contractor reports and notifications, etc.) of an incident in a timely manner.

(c) In accordance with the requirements of Provision E.2.d.(1), each Copermittee must investigate and seek to identify the source(s) of discharges of non-storm water where flows are observed in and from the MS4 during the field screening required pursuant to Provision D.2.b.(1) as follows:

(i) Obvious illicit discharges must be immediately investigated to identify the source(s) of non-storm water discharges;

(ii) The investigation must include field investigations to identify sources or potential sources for the discharge, unless the source or potential source has already been identified during previous investigations; and

(iii) The investigation may include follow-up field investigations and/or reviewing Copermittee inventories and other land use data to identify potential sources of the discharge.

(d) Each Copermittee must maintain records and a database of the following information:

(i) Location of incident, including hydrologic subarea, portion of MS4

receiving the non-storm water or illicit discharge, and point of discharge or potential discharge from MS4 to receiving water;

(ii) Source of information initiating the investigation (e.g., public reports, staff or contractor reports and notifications, field screening, etc.);

(iii) Date the information used to initiate the investigation was received;

(iv) Date the investigation was initiated;

(v) Dates of follow-up investigations;

(vi) Identified or suspected source of the illicit discharge or connection, if determined;

(vii) Known or suspected related incidents, if any;

(viii) Result of the investigation; and

(ix) If a source cannot be identified and the investigation is not continued, document the response pursuant to the requirements of Provision E.2.d.(4).

(e) Each Copermittee must maintain records and, in accordance with the priorities of the Water Quality Improvement Plan, seek to identify the source(s) of non-storm water discharges from the MS4 where there is evidence of non-storm water having been discharged into or from the MS4 (e.g., pooled water), in accordance with MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

(3) Each Copermittee must initiate the implementation of procedures, in a timely manner, to eliminate all detected and identified illicit discharges and connections within its jurisdiction. The procedures must include the following responses:

(a) Each Copermittee must enforce its legal authority, as required under Provision E.1, to eliminate illicit discharges and connections to the MS4.

(b) If the Copermittee identifies the source as a controllable source of non-storm water or illicit discharge or connection, the Copermittee must implement its Enforcement Response Plan pursuant to Provision E.6 and enforce its legal authority to prohibit and eliminate illicit discharges and connections to its MS4.

(c) If the Copermittee identifies the source of the discharge as a category of non-storm water discharges in Provision E.2.a, and the discharge is in exceedance of NALs in the Water Quality Improvement Plan, then the Copermittee must determine if: (1) this is an isolated incident or set of circumstances that will be addressed through its Enforcement Response Plan pursuant to Provision E.6, or (2) the category of discharge must be

addressed through the prohibition of that category of discharge as an illicit discharge pursuant to Provision E.2.a.(6).

(d) If the Copermittee suspects the source of the non-storm water discharge as natural in origin (i.e. non-anthropogenically influenced) and in conveyance into the MS4, then the Copermittee must document and provide the data and evidence necessary to demonstrate to the San Diego Water Board that it is natural in origin and does not require further investigation.

(e) If the Copermittee is unable to identify and document the source of a recurring non-storm water discharge to or from the MS4, then the Copermittee must address the discharge as an illicit discharge and update its jurisdictional runoff management program to address the common and suspected sources of the non-storm water discharge within its jurisdiction in accordance with the Copermittee's priorities.

(4) Each Copermittee must submit a summary of the non-storm water discharges and illicit discharges and connections investigated and eliminated within its jurisdiction with each Water Quality Improvement Plan Annual Report required under Provision F.3.b.(3) of this Order.

3. Development Planning

Each Copermittee must use their land use and planning authorities to implement a development planning program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. BMP Requirements for All Development Projects

Each Copermittee must prescribe the following BMP requirements during the planning process (i.e. prior to project approval and issuance of local permits) for all development projects (regardless of project type or size), where local permits are issued, including unpaved roads and flood management projects:

(1) <u>General Requirements</u>

(a) Onsite BMPs must be located so as to remove pollutants from runoff prior to its discharge to any receiving waters, and as close to the source as possible;

(b) Structural BMPs must not be constructed within waters of the U.S.

(c) Onsite BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors (e.g.

mosquitos, rodents, or flies).

(2) Source Control BMP Requirements

The following source control BMPs must be implemented at all development projects where applicable and feasible:

(a) Prevention of illicit discharges into the MS4;

(b) Storm drain system stenciling or signage;

(c) Protect outdoor material storage areas from rainfall, run-on, runoff, and wind dispersal;

(d) Protect materials stored in outdoor work areas from rainfall, run-on, runoff, and wind dispersal;

(e) Protect trash storage areas from rainfall, run-on, runoff, and wind dispersal; and

(f) Any additional BMPs determined to be necessary by the Copermittee to minimize pollutant generation at each project.

(3) Low Impact Development (LID) BMP Requirements

The following LID BMPs must be implemented at all development projects where applicable and feasible:

(a) Maintenance or restoration of natural storage reservoirs and drainage corridors (including topographic depressions, areas of permeable soils, natural swales, and ephemeral and intermittent streams);[25]

(b) Buffer zones for natural water bodies (where buffer zones are technically infeasible, require project applicant to include other buffers such as trees, access restrictions, etc.);

(c) Conservation of natural areas within the project footprint including existing trees, other vegetation, and soils;

(d) Construction of streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided public safety is not compromised;

(e) Minimization of the impervious footprint of the project;

[25] Development projects proposing to dredge or fill materials in waters of the U.S. must obtain a CWA Section 401 Water Quality Certification. Projects proposing to dredge or fill waters of the state must obtain waste discharge requirements.

(f) Minimization of soil compaction to landscaped areas;

(g) Disconnection of impervious surfaces through distributed pervious areas;

(h) Landscaped or other pervious areas designed and constructed to effectively receive and infiltrate, retain and/or treat runoff from impervious areas, prior to discharging to the MS4;

(i) Small collection strategies located at, or as close as possible to, the source (i.e. the point where storm water initially meets the ground) to minimize the transport of runoff and pollutants to the MS4 and receiving waters;

(j) Use of permeable materials for projects with low traffic areas and appropriate soil conditions;

(k) Landscaping with native or drought tolerant species; and

(l) Harvesting and using precipitation.

b. PRIORITY DEVELOPMENT PROJECTS

Priority Development Projects are land development projects that fall under the planning and building authority of the Copermittee for which the Copermittee must impose specific requirements, in addition to those described in Provision E.3.a, including the implementation of structural BMPs to meet the performance requirements described in Provision E.3.c.

(1) Definition of Priority Development Project

Priority Development Projects include the following:

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(b) Redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site on an existing site of 10,000 square feet or more of impervious surfaces). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(c) New and redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project

site), and support one or more of the following uses:

(i) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812).

(ii) Hillside development projects. This category includes development on any natural slope that is twenty-five percent or greater.

(iii) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce.

(iv) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

(d) New or redevelopment projects that create and/or replace 2,500 square feet or more of impervious surface (collectively over the entire project site), and discharging directly to an Environmentally Sensitive Area (ESA). "Discharging directly to" includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands).

(e) New development projects, or redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface, that support one or more of the following uses:

(i) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

(ii) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

(f) New or redevelopment projects that result in the disturbance of one or more acres of land and are expected to generate pollutants post construction.

(2) <u>Special Considerations for Redevelopment Projects</u>

The structural BMP performance requirements of Provision E.3.c are applicable to redevelopment Priority Development Projects, as defined in E.3.b.(1), as follows:

(a) Where redevelopment results in the creation or replacement of impervious surface in an amount of less than fifty percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provision E.3.c apply only to the creation or replacement of impervious surface, and not the entire development; or

(b) Where redevelopment results in the creation or replacement of impervious surface in an amount of more than fifty percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provision E.3.c apply to the entire development.

(3) Priority Development Project Exemptions

Each Copermittee has the discretion to exempt the following projects from being defined as Priority Development Projects:

(a) New or retrofit paved sidewalks, bicycle lanes, or trails that meet the following criteria:

(i) Designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas; OR

(ii) Designed and constructed to be hydraulically disconnected from paved streets or roads; OR

(iii) Designed and constructed with permeable pavements or surfaces in accordance with USEPA Green Streets guidance.[26]

(b) Retrofitting or redevelopment of existing paved alleys, streets or roads that are designed and constructed in accordance with the USEPA Green Streets guidance.[27]

c. Priority Development Project Structural BMP Performance Requirements

In addition to the BMP requirements listed for all development projects under Provision E.3.a, Priority Development Projects must also implement structural BMPs that conform to performance requirements described below.

(1) Storm Water Pollutant Control BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite structural BMPs to control pollutants in storm water that may be discharged from a project as follows:

[26] See "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).
[27] Ibid.

(a) Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite the pollutants contained in the volume of storm water runoff produced from a 24-hour 85th percentile storm event (design capture volume);[28]

(i) If a Copermittee determines that implementing BMPs to retain the full design capture volume onsite for a Priority Development Project is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize biofiltration BMPs. Biofiltration BMPs must be designed to have an appropriate hydraulic loading rate to maximize storm water retention and pollutant removal, as well as to prevent erosion, scour, and channeling within the BMP,[29] and must be sized to:

[a] Treat 1.5 times the design capture volume not reliably retained onsite, OR
[b] Treat the design capture volume not reliably retained onsite with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite.

(ii) If a Copermittee determines that biofiltration is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize flow-thru treatment control BMPs to treat runoff leaving the site, AND mitigate for the design capture volume not reliably retained onsite pursuant to Provision E.3.c.(1)(b). Flow thru treatment control BMPs must be sized and designed to:

[a] Remove pollutants from storm water to the MEP;
[b] Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;

[28] This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals.

[29] As part of the Copermittee's update to its BMP Design Manual, pursuant to Provision E.3.d, the Copermittee must provide guidance for hydraulic loading rates and other biofiltration design criteria necessary to maximize storm water retention and pollutant removal.

[c] Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Flow-thru treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of flow-thru treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

(b) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1)(a). The Priority Development Project must mitigate for the portion of the pollutant load in the design capture volume not retained onsite if Provision E.3.c.(3) is utilized. If a Priority Development Project is allowed to utilize alternative compliance, flow-thru treatment control BMPs must be implemented to treat the portion of the design capture volume that is not reliably retained onsite. Flow-thru treatment control BMPs must be sized and designed in accordance with Provisions E.3.c.(1)(a)(ii)[a]-[c].

(2) <u>Hydromodification Management BMP Requirements</u>

Each Copermittee must require each Priority Development Project to implement onsite BMPs to manage hydromodification that may be caused by storm water runoff discharged from a project as follows:

(a) Post-project runoff conditions (flow rates and durations) must not exceed pre-development runoff conditions by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat downstream of Priority Development Projects).

(i) In evaluating the range of flows that results in increased potential for erosion of natural (non-hardened) channels, the lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks.

(ii) The Copermittees may use monitoring results collected pursuant to Provision D.1.a.(2) to re-define the range of flows resulting in increased potential for erosion, or degraded instream habitat conditions, as warranted by the data.

(b) Each Priority Development Project must avoid critical sediment yield areas known to the Copermittee or identified by the optional Watershed Management Area Analysis pursuant to Provision B.3.b.(4), or implement measures that allow critical coarse sediment to be discharged to receiving waters, such that there is no net impact to the receiving water.

(c) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the performance requirements of Provision E.3.c.(2)(a). The Priority Development Project must mitigate for the post-project runoff conditions not fully managed onsite if Provision E.3.c.(3) is utilized.

(d) Exemptions

Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provisions E.3.c.(2) where the project discharges storm water runoff to:

(i) Existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;

(ii) Conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; or

(iii) An area identified by the Copermittees as appropriate for an exemption by the optional Watershed Management Area Analysis incorporated into the Water Quality Improvement Plan pursuant to Provision B.3.b.(4).

(e) Interim Timeframe Exemptions

Until the Copermittees have updated their BMP Design Manual in accordance with Provision F.2.b with the requirements of Provision E, the Copermittees have the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provision E.3.c.(2) where the project discharges storm water runoff directly to:

(i) An engineered channel conveyance system with a capacity to convey peak flows generated by the 10-year storm event all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; and

(ii) Large river reaches with a drainage area larger than 100 square miles and a 100-year flow capacity in excess of 20,000 cubic feet per second, provided that properly sized energy dissipation is included at all Priority Development Project discharge points.

(3) Alternative Compliance Program to Onsite Structural BMP Implementation

At the discretion of each Copermittee, Priority Development Projects may be allowed to participate in an alternative compliance program in lieu of implementing the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a), provided that the Water Quality Improvement Plan includes the optional Watershed Management Area Analysis described in Provision B.3.b.(4), and Water Quality Equivalency calculations have been accepted by the San Diego Water Board's Executive Officer pursuant to Provision E.3.c.(3)(a). The alternative compliance program is available to a Priority Development Project only if the Priority Development Project applicant enters into a voluntary agreement with the Copermittee authorizing this arrangement. In addition to the voluntary agreement, relief from implementing structural BMPs onsite may be authorized by the Copermittee under the following conditions:

(a) Water Quality Equivalency

Copermittees must submit Water Quality Equivalency calculations for acceptance by the San Diego Water Board's Executive Officer prior to administering an alternative compliance program in order to establish a regional and technical basis for determining the water quality benefits associated with alternative compliance projects. Accepted Water Quality Equivalency calculations must be incorporated as part of any Copermittee's alternative compliance program necessary for evaluating Watershed Management Area Analysis candidate projects, project applicant-proposed alternative compliance projects, alternative compliance in lieu fee structures, and alternative compliance water quality credit systems as described in Provisions E.3.c.(3)(b)-(e).

(b) Watershed Management Area Analysis Candidate Projects

The Priority Development Project applicant agrees to fund, contribute funds to, or implement a candidate project identified by the Copermittees in the Watershed Management Area Analysis included in the Water Quality Improvement Plan, pursuant to Provisions B.3.b.(4) subject to the following conditions:

(i) The Copermittee must determine that implementation of the candidate project will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a) onsite;

(ii) If the Priority Development Project applicant chooses to fully or partially fund a candidate project, then the in-lieu fee structure described in Provision E.3.c.(3)(c) must be followed;

(iii) If the Priority Development Project applicant chooses to fully or partially fund a candidate project, then the Copermittee must ensure that the funds to be obtained from the Priority Development Project applicant are sufficient to mitigate for impacts caused by not fully implementing structural BMPs onsite, pursuant to the performance requirements described in Provisions E.3.c.(1) and E.3.c.(2)(a);

(iv) If the Priority Development Project applicant chooses to implement a candidate project, then the Copermittee must ensure that pollutant control and/or hydromodification management within the candidate project are sufficient to mitigate for impacts caused by not implementing structural BMPs fully onsite, pursuant to the performance requirements described in Provisions E.3.c.(1) and E.3.c.(2)(a);

(v) The voluntary agreement to fund, partially fund, or implement a candidate project must include reliable sources of funding for operation and maintenance of the candidate project;

(vi) Design of the candidate project must be conducted under an appropriately qualified engineer, geologist, architect, landscape architect, or other professional, licenses where applicable, and competent and proficient in the fields pertinent to the candidate project design;

(vii) The candidate project must be constructed as soon as possible, but no later than 4 years after the certificate of occupancy is granted for the first Priority Development Project that contributed funds toward the construction of the candidate project, unless a longer period of time is authorized by the San Diego Water Board Executive Officer; and

(viii) If the candidate project is constructed after the Priority Development Project is constructed, the Copermittee must require temporal mitigation for pollutant loads and altered flows that are discharged from the Priority Development Project.

(c) Project Applicant Proposed Alternative Compliance Projects

The Copermittee may allow a Priority Development Project applicant to propose and fund, contribute funds to, or implement an alternative compliance project not identified by the Watershed Management Area Analysis included in the Water Quality Improvement Plan pursuant to Provisions B.3.b.(4). This option is allowed provided the Copermittee determines that implementation of the alternative compliance project will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a) onsite, and is subject to the requirements described in Provisions E.3.c.(3)(a)(ii)-(viii).

(d) Alternative Compliance In-Lieu Fee Structure

If a Copermittee chooses to allow a Priority Development Project applicant to fund, or partially fund a candidate project or an alternative compliance project, then the Copermittee must develop and implement an in-lieu fee structure. This may be developed individually or with other Copermittees and/or entities, as a means for designing, developing, constructing, operating and maintaining offsite alternative compliance projects. The in-lieu fee must be transferred to the Copermittee (for public projects) or an escrow account (for private projects) prior to the construction of the Priority Development Project.

(e) Alternative Compliance Water Quality Credit System Option

The Copermittee may develop and implement an alternative compliance water quality credit system option, individually or with other Copermittees and/or entities, provided that such a credit system clearly exhibits that it will not allow discharges from Priority Development Projects to cause or contribute to a net impact over and above the impact caused by projects meeting the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a). Any credit system that a Copermittee chooses to implement must be submitted to the San Diego Water Board Executive Officer for review and acceptance as part of the Water Quality Improvement Plan.

(4) Long-Term Structural BMP Maintenance

Each Copermittee must require the project applicant to submit proof of the mechanism under which ongoing long-term maintenance of all structural BMPs will be conducted.

(5) Infiltration and Groundwater Protection

(a) Structural BMPs designed to primarily function as large, centralized infiltration devices (such as large infiltration trenches and infiltration basins) must not cause or contribute to an exceedance of an applicable groundwater quality objective. At a minimum, such infiltration BMPs must be in conformance with the design criteria listed below, unless the development project applicant demonstrates to the Copermittee that one or more of the specific design criteria listed below are not necessary to protect groundwater quality. The design criteria listed below do not apply to small infiltration systems dispersed throughout a development project.

(i) Runoff must undergo pretreatment such as sedimentation or filtration prior to infiltration;

(ii) Pollution prevention and source control BMPs must be implemented at a level appropriate to protect groundwater quality at sites where infiltration BMPs are to be used;

(iii) Infiltration BMPs must be adequately maintained to remove pollutants in storm water to the MEP;

(iv) The vertical distance from the base of any infiltration BMP to the seasonal high groundwater mark must be at least 10 feet. Where groundwater basins do not support beneficial uses, this vertical distance criteria may be reduced, provided groundwater quality is maintained;

(v) The soil through which infiltration is to occur must have physical and chemical characteristics (e.g., appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses;

(vi) Infiltration BMPs must not be used for areas of industrial or light industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee, unless source control BMPs to prevent exposure of high threat activities are implemented, or runoff from such activities is first treated or filtered to remove pollutants prior to infiltration; and

(vii) Infiltration BMPs must be located a minimum of 100 feet horizontally from any water supply wells.

(b) The Copermittee may develop, individually or with other Copermittees, alternative mandatory design criteria to that listed above for infiltration BMPs which are designed to primarily function as centralized infiltration devices. Before implementing the alternative design criteria in the development planning process the Copermitee(s) must:

(i) Notify the San Diego Water Board of the intent to implement the alternative design criteria submitted; and

(ii) Comply with any conditions set by the San Diego Water Board.

d. BMP DESIGN MANUAL UPDATE

Each Copermittee must update its BMP Design Manual[30] pursuant to Provision F.2.b. Until the Copermittee has updated its BMP Design Manual pursuant to Provision F.2.b.(1), the Copermittee must continue implementing its current BMP Design Manual. The Copermittee must implement the updated BMP Design Manual within 180 days following completion of the update pursuant to Provision

[30] The BMP Design Manual was formerly known as the Standard Storm Water Mitigation Plan under Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016.

F.2.b.(1), unless directed otherwise by the San Diego Water Board Executive Officer. The date the BMP Design Manual is implemented is the "effective date" of the BMP Design Manual. The update of the BMP Design Manual required pursuant to Provision F.2.b.(1) must include the following:

(1) Updated procedures to determine the nature and extent of storm water requirements applicable to a potential development or redevelopment projects. These procedures must inform project applicants of the storm water management requirements applicable to their project including, but not limited to, general requirements for all development projects, structural BMP design procedures and requirements, hydromodification management requirements, requirements specific to phased projects, and procedures specific to private developments and public improvement projects;

(2) Updated procedures to identify pollutants and conditions of concern for selecting the most appropriate structural BMPs that consider, at a minimum, the following:

(a) Receiving water quality (including pollutants for which receiving waters are listed as impaired under the CWA section 303(d) List);

(b) Pollutants, stressors, and/or receiving water conditions that cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(c) Land use type of the project and pollutants associated with that land use type; and

(d) Pollutants expected to be present onsite.

(3) Updated procedures for designing structural BMPs, including any updated performance requirements to be consistent with the requirements of Provision E.3.c for all structural BMPs listed in the BMP Design Manual;

(4) Long-term maintenance criteria for each structural BMP listed in the BMP Design Manual; and

(5) Alternative compliance criteria, in accordance with the requirements under Provision E.3.c.(3), if the Copermittee elects to allow Priority Development Projects within its jurisdiction to utilize alternative compliance.

e. PRIORITY DEVELOPMENT PROJECT BMP IMPLEMENTATION AND OVERSIGHT

Each Copermittee must implement a program that requires and confirms structural BMPs on all Priority Development Projects are designed, constructed, and maintained to remove pollutants in storm water to the MEP.

(1) Structural BMP Approval and Verification Process

(a) Each Copermittee must require and confirm that all Priority Development Projects implement the requirements of Provision E.3, except that the Copermittee may allow previous land development requirements to apply to a Priority Development Project if the conditions of Provision E.3.e.(1)(a)(i) or Provision E.3.e.(1)(a)(ii) are met:

(i) The Copermittee has, prior to the effective date of the BMP Design Manual required to be developed pursuant to Provision E.3.d:

[a] Approved[31] a design that incorporates the storm water drainage system for the Priority Development Project in its entirety, including all applicable structural pollutant treatment control and hydromodification management BMPs consistent with the previous applicable MS4 permit requirements;[32] AND

[b] Issued a private project permit or approval, or functional equivalent for public projects, that authorizes the Priority Development Project applicant to commence construction activities based on a design that incorporates the storm water drainage system approved in conformance with Provision E.3.e.(1)(a)(i)[a]; AND

[c] Confirmed that there have been construction activities on the Priority Development Project site within the 365 days prior to the effective date of the BMP Design Manual, *OR* the Copermittee confirms that construction activities have commenced on the Priority Development Project site within the 180 days after the effective date of the BMP Design Manual, where construction activities are undertaken in reliance on the permit or approval, or functional equivalent for public projects, issued by the Copermittee in conformance with Provision E.3.e.(1)(a)(i)[b]; AND

[d] Issued all subsequent private project permits or approvals, or functional equivalent for public projects, that are needed to implement the design initially approved in conformance with Provision E.3.e.(1)(a)(i)[a] within 5 years of the effective date of the BMP Design Manual. The storm water drainage system for the Priority Development Project in its entirety, including all applicable structural pollutant treatment control and hydromodification management BMPs must remain in substantial conformity with the design initially approved in conformance with Provision E.3.e.(1)(a)(i)[a].

[31] For public projects, a design stamped by the City or County Engineer, or engineer of record for the project is considered an approved design.
[32] Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016 for San Diego County, Orange County, and Riverside County Copermittees, respectively

(ii) The Copermittee demonstrates it lacks the land use authority or legal authority to require a Priority Development Project to implement the requirements of Provision E.3.

(b) Each Copermittee must identify the roles and responsibilities of its various municipal departments in implementing the structural BMP requirements, including each stage of a project from application review and approval through BMP maintenance and inspections.

(c) Each Copermittee must require and confirm that appropriate easements and ownerships are properly recorded in public records and the information is conveyed to all appropriate parties when there is a change in project or site ownership.

(d) Each Copermittee must require and confirm that prior to occupancy and/or intended use of any portion of the Priority Development Project, each structural BMP is inspected to verify that it has been constructed and is operating in compliance with all of its specifications, plans, permits, ordinances, and the requirements of this Order.

(2) Priority Development Project Inventory and Prioritization

(a) Each Copermittee must develop, maintain, and update at least annually, a watershed-based database to track and inventory all Priority Development Projects and associated structural BMPs within its jurisdiction. Inventories must be accurate and complete beginning from December 2002 for the San Diego County Copermittees, February 2003 for the Orange County Copermittees, and July 2005 for the Riverside County Copermittees. The use of an automated database system, such as GIS, is highly recommended. The database must include, at a minimum, the following information:

(i) Priority Development Project location (address and hydrologic subarea);

(ii) Descriptions of structural BMP type(s);

(iii) Date(s) of construction;

(iv) Party responsible for structural BMP maintenance;

(v) Dates and findings of structural BMP maintenance verifications; and

(vi) Corrective actions and/or resolutions, when applicable.

(b) Each Copermittee must prioritize the Priority Development Projects with structural BMPs within its jurisdiction. The designation of Priority Development Projects as high priority must consider the following:

(i) The highest water quality priorities identified in the Water Quality Improvement Plan;

(ii) Receiving water quality;

(iii) Number and sizes of structural BMPs;

(iv) Recommended maintenance frequency of structural BMPs;

(v) Likelihood of operation and maintenance issues of structural BMPs;

(vi) Land use and expected pollutants generated; and

(vii) Compliance record.

(3) Structural BMP Maintenance Verifications and Inspections

Each Copermittee is required to verify that structural BMPs on each Priority Development Project are adequately maintained, and continue to operate effectively to remove pollutants in storm water to the MEP through inspections, self-certifications, surveys, or other equally effective approaches.

(a) All (100 percent) of the structural BMPs at Priority Development Projects that are designated as high priority must be inspected directly by the Copermittee annually prior to each rainy season;

(b) For verifications performed through a means other than direct Copermittee inspection, adequate documentation must be required by the Copermittee to provide assurance that the required maintenance of structural BMPs at each Priority Development Project has been completed; and

(c) Appropriate follow-up measures (including re-inspections, enforcement, etc.) must be conducted to ensure that structural BMPs at each Priority Development Project continue to reduce pollutants in storm water to the MEP as originally designed.

f. DEVELOPMENT PROJECT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all development projects, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

4. Construction Management

Each Copermittee must implement a construction management program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. Project Approval Process

Prior to issuance of any local permit(s) that allows the commencement of construction projects that involve ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff, each Copermittee must:

(1) Require a pollution control plan, construction BMP plan, and/or an erosion and sediment control plan, to be submitted by the project applicant to the Copermittee;

(2) Confirm the pollution control plan, construction BMP plan, and/or erosion and sediment control plan, complies with the local grading ordinance, other applicable local ordinances, and the requirements of this Order;

(3) Confirm the pollution control, construction BMP, and/or erosion and sediment control plan, includes seasonally appropriate and effective BMPs and management measures described in Provision E.4.c, as applicable to the project; and

(4) Verify that the project applicant has obtained coverage under the statewide Construction General Permit (Order 2009-0009-DWQ or subsequent Order), if applicable.

b. Construction Site Inventory and Tracking

(1) Each Copermittee must maintain and update, at least quarterly, a watershed-based inventory of all construction projects issued a local permit that allows ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff. The use of an automated database system, such as GIS, is highly recommended. The inventory must include:

(a) Relevant contact information for each site (e.g., name, address, phone, and email for the owner and contractor);

(b) The basic site information including location (address and hydrologic subarea), Waste Discharge Identification (WDID) number (if applicable), size of the site, and approximate area of disturbance;

(c) Whether or not the site is considered a high threat to water quality, as defined in Provision E.4.b.(2) below;

(d) The project start and completion dates;

(e) The required inspection frequency, as defined in the Copermittee's jurisdictional runoff management program document;

(f) The date the Copermittee accepted or approved the pollution control plan, construction BMP plan, and/or erosion and sediment control plan; and

(g) Whether or not there are ongoing enforcement actions administered to the site.

(2) Each Copermittee must identify all construction sites within its jurisdiction that represent a high threat to downstream surface water quality. The designation of construction sites as high threat to water quality must consider the following:

(a) Sites located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Sites located within the same hydrologic subarea and tributary to a water body segment listed as impaired for sediment on the CWA section 303(d) List;

(c) Sites located within, directly adjacent to, or discharging directly to a receiving water within an ESA; and

(d) Other sites determined by the Copermittees or the San Diego Water Board as a high threat to water quality.

c. CONSTRUCTION SITE BMP IMPLEMENTATION

Each Copermittee must implement, or require the implementation of effective BMPs to reduce discharges of pollutants in storm water from construction sites to the MEP, and effectively prohibit non-storm water discharges from construction sites into the MS4. These BMPs must be site specific, seasonally appropriate, and construction phase appropriate. BMPs must be implemented at each construction site year round. Dry season BMP implementation must plan for and address unseasonal rain events that may occur during the dry season (May 1 through September 30). Copermittees must implement, or require the implementation of, BMPs in the following categories:

(1) Project Planning;

(2) Good Site Management "Housekeeping", including waste management;

(3) Non-storm Water Management;

(4) Erosion Control;

(5) Sediment Control;

(6) Run-on and Run-off Control; and

(7) Active/Passive Sediment Treatment Systems, where applicable.

d. CONSTRUCTION SITE INSPECTIONS

Each Copermittee must conduct construction site inspections to require and confirm compliance with its local permits and applicable local ordinances, and the requirements of this Order. Priority for site inspections must consider threat to water quality pursuant to Provision E.4.b as well as the nature of the construction activity, topography, and the characteristics of soils and receiving water quality.

(1) Inspection Frequency

(a) Each Copermittee must conduct inspections at all inventoried sites, including high threat to water quality sites, at an appropriate frequency for each phase of construction to confirm the site reduces the discharge of pollutants in storm water from construction sites to the MEP, and effectively prohibits non-storm water discharges from entering the MS4.

(b) Each Copermittee must establish appropriate inspection frequencies for high threat to water quality sites, and all other sites, for each phase of construction. Inspection frequencies appropriate for addressing the highest water quality priorities identified in the Water Quality Improvement Plan, and for complying with the requirements of this Order must be identified in each Copermittee's jurisdictional runoff management program document.

(c) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e., re-inspection, enforcement) necessary to require and confirm site compliance with its local permits and applicable local ordinances, and the requirements of this Order.

(2) Inspection Content

Inspections of construction sites by the Copermittee must include, at a minimum:

(a) Verification of coverage under the Construction General Permit (Notice of Intent (NOI) and/or WDID number) during initial inspections, when applicable;

(b) Assessment of compliance with its local permits and applicable local ordinances related to pollution prevention, including the implementation and maintenance of applicable BMPs;

(c) Assessment of BMP adequacy and effectiveness;

(d) Visual observations of actual non-storm water discharges;

(e) Visual observations of actual or potential discharge of sediment and/or construction related materials from the site;

(f) Visual observations of actual or potential illicit connections; and

(g) If any violations are found and BMP corrections are needed, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried construction sites. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Site name, location (address and hydrologic subarea), and WDID number (if applicable);

(b) Inspection date;

(c) Approximate amount of rainfall since last inspection;

(d) Description of problems observed with BMPs and indication of need for BMP addition/repair/replacement and any scheduled re-inspection, and date of re-inspection;

(e) Descriptions of any other specific inspection comments which must, at a minimum, include rationales for longer compliance time;

(f) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(g) Resolution of problems noted and date problems fixed.

e. CONSTRUCTION SITE ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried construction sites, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

5. Existing Development Management

Each Copermittee must implement an existing development management program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. EXISTING DEVELOPMENT INVENTORY AND TRACKING

Each Copermittee must maintain, and update at least annually, a watershed-based inventory of the existing development within its jurisdiction that may discharge a pollutant load to and from the MS4. The use of an automated database system, such as GIS, is highly recommended. The inventory must, at a minimum, include:

(1) Name, location (hydrological subarea and address, if applicable) of the following types of existing development with its jurisdiction:

(a) Commercial facilities or areas;

(b) Industrial facilities;

(c) Municipal facilities, including:

(i) MS4 and related structures;[33]

(ii) Roads, streets, and highways;

(iii) Parking facilities;

(iv) Municipal airfields;

(v) Parks and recreation facilities;

[33] The inventory may refer to the MS4 map required to be maintained pursuant to Provision E.2.b.(1).

(vi) Flood management facilities, flood control devices and structures;

(vii) Operating or closed municipal landfills;

(viii) Publicly owned treatment works (including water and wastewater treatment plants) and sanitary sewer collection systems;

(ix) Corporate yards, including maintenance and storage yards for materials, waste, equipment, and vehicles;

(x) Hazardous waste collection facilities;

(xi) Other treatment, storage or disposal facilities for municipal waste; and

(xii) Other municipal facilities that the Copermittee determines may contribute a significant pollutant load to the MS4.

(d) Residential areas, which may be designated by one or more of the following:

(i) Residential management area;

(ii) Drainage basin or area;

(iii) Land use (e.g., single family, multi-family, rural);

(iv) Neighborhood;

(v) Common Interest Area;

(vi) Home Owner Association;

(vii) Mobile home park; and/or

(viii) Other designations accepted by the San Diego Water Board Executive Officer.

(2) A description of the facility or area, including the following information:

(a) Classification as commercial, industrial, municipal, or residential;

(b) Status of facility or area as active or inactive;

(c) Identification if a business is a mobile business;

(d) SIC Code or NAICS Code, if applicable;

(e) Industrial General Permit NOI and/or WDID number, if applicable;

(f) Identification if a residential area is or includes a Common Interest Area / Home Owner Association, or mobile home park;

(g) Identification of pollutants generated and potentially generated by the facility or area;

(h) Whether the facility or area is adjacent to an ESA;

(i) Whether the facility or area is tributary to and within the same hydrologic subarea as a water body segment listed as impaired on the CWA section 303(d) List and generates pollutants for which the water body segment is impaired; and

(3) An annually updated map showing the location of inventoried existing development, watershed boundaries, and water bodies.

b. EXISTING DEVELOPMENT BMP IMPLEMENTATION AND MAINTENANCE

Each Copermittee must designate a minimum set of BMPs required for all inventoried existing development, including special event venues. The designated minimum BMPs must be specific to facility or area types and pollutant generating activities, as appropriate.

(1) Commercial, Industrial, and Municipal Facilities and Areas

(a) Pollution Prevention

Each Copermittee must require the use of pollution prevention methods by the commercial, industrial, and municipal facilities and areas in its inventoried existing development to address the priorities and strategies in the Water Quality Improvement Plan.

(b) BMP Implementation

Each Copermittee must require the implementation of designated BMPs at commercial facilities and areas, industrial facilities, and implement designated BMPs at municipal facilities in its inventoried existing development.

(c) BMP Operation and Maintenance

(i) Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development.

(ii) Each Copermittee must implement a schedule of operation and maintenance activities for its MS4 and related structures (including

but not limited to catch basins, storm drain inlets, detention basins, etc.), and verify proper operation of all its municipal structural treatment controls designed to reduce pollutants (including floatables) in storm water discharges to or from its MS4s and related drainage structures. Operation and maintenance activities may include, but is not limited to, the following:

[a] Inspections of the MS4 and related structures;
[b] Cleaning of the MS4 and related structures; and
[c] Proper disposal of materials removed from cleaning of the MS4 and related structures.

(iii) Each Copermittee must implement a schedule of operation and maintenance for public streets, unpaved roads, paved roads, and paved highways within its jurisdiction to minimize pollutants that can be discharged in storm water.

(iv) Each Copermittee must implement controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers. Copermittees that operate both a municipal sanitary sewer system and a MS4 must implement controls and measures to prevent and eliminate seeping sewage from infiltrating the MS4. Copermittees that do not operate both a municipal sanitary sewer system and a MS4 must coordinate with sewering agencies to keep themselves informed of relevant and appropriate maintenance activities and sanitary sewage projects in their jurisdiction that may cause or contribute to seepage of sewage into the MS4.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must require the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from commercial facilities and areas and industrial facilities, and implement BMPs at municipal facilities in its inventoried existing development. Such BMPs must include, as appropriate, educational activities, permits, certifications and other measures for applicators and distributors.

(2) <u>Residential Areas</u>

(a) Pollution Prevention

Each Copermittee must promote and encourage the use of pollution prevention methods, where appropriate, by the residential areas in its inventoried existing development.

(b) BMP Implementation

Each Copermittee must promote and encourage the implementation of designated BMPs at residential areas in its inventoried existing development.

(c) BMP Operation and Maintenance

Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at residential areas in its inventoried existing development.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must promote and encourage the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from residential areas in its inventoried existing development.

c. EXISTING DEVELOPMENT INSPECTIONS

Each Copermittee must conduct inspections of inventoried existing development to ensure compliance with applicable local ordinances and permits, and the requirements of this Order.

(1) Inspection Frequency

(a) Each Copermittee must establish appropriate inspection frequencies for inventoried existing development in accordance with the following requirements:

(i) At a minimum, inventoried existing development must be inspected once every five years utilizing one or more of the following methods:

[a] Drive-by inspections by Copermittee municipal and contract staff;
[b] Onsite inspections by Copermittee municipal and contract staff; and/or
[c] Visual inspections of publicly accessible inventoried facilities or areas by volunteer monitoring or patrol programs that have been trained by the Copermittee;

(ii) The frequency of inspections must be appropriate to confirm that BMPs are being implemented to reduce the discharge of pollutants in storm water from the MS4 to the MEP and effectively prohibit non-storm water discharges to the MS4;

(iii) The frequency of inspections must be based on the potential for a facility or area to discharge non-storm water and pollutants in storm water, and should reflect the priorities set forth in the Water Quality Improvement Plan;

(iv) Each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development;[34] and

(v) Inventoried existing development must be inspected by the Copermittee, as needed, in response to valid public complaints.

(b) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e. education and outreach, re-inspection, enforcement) necessary to require and confirm compliance with its applicable local ordinances and permits and the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

(2) Inspection Content

(a) Inspections of existing development must include, at a minimum:

(i) Visual inspections for the presence of actual non-storm water discharges;

(ii) Visual inspections for the presence of actual or potential discharge of pollutants;

(iii) Visual inspections for the presence of actual or potential illicit connections; and

(iv) Verification that the description of the facility or area in the inventory, required pursuant to Provision E.5.a.(2), has not changed.

(b) Onsite inspections of existing development by the Copermittee must include, at a minimum:

(i) Assessment of compliance with its applicable local ordinances and permits related to non-storm water and storm water discharges and runoff;

(ii) Assessment of the implementation of the designated BMPs;

(iii) Verification of coverage under the Industrial General Permit, when applicable; and

[34] If any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspection may count toward the total annual inspection requirement. This requirement excludes linear municipal facilities (i.e., MS4 linear channels, sanitary sewer collection systems, streets, roads and highways).

(iv) If any problems or violations are found, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried existing development. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Name and location of the facility or area (address and hydrologic subarea) consistent with the inventory name and location, pursuant to Provision E.5.a.(1);

(b) Inspection and re-inspection date(s);

(c) Inspection method(s) (i.e. drive-by, onsite);

(d) Observations and findings from the inspection(s);

(e) For onsite inspections of existing development by Copermittee municipal or contract staff, the records must also include, as applicable:

(i) Description of any problems or violations found during the inspection(s);

(ii) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(iii) The date problems or violations were resolved.

d. EXISTING DEVELOPMENT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried existing development, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

e. RETROFITTING AND REHABILITATING AREAS OF EXISTING DEVELOPMENT

(1) Retrofitting Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to retrofit areas of existing development within its jurisdiction to address identified sources of pollutants and/or stressors that

contribute to the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify areas of existing development as candidates for retrofitting, focusing on areas where retrofitting will address pollutants and/or stressors that contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for retrofitting projects may be utilized to reduce pollutants that may be discharged in storm water from areas of existing development, and/or address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of retrofitting projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting projects; and

(e) Where retrofitting projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional retrofitting projects (i.e. projects that can receive and/or treat storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment) adjacent to and/or downstream of the areas of existing development.

(2) Stream, Channel and/or Habitat Rehabilitation in Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to rehabilitate streams, channels, and/or habitats in areas of existing development within its jurisdiction to address the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify streams, channels, and/or habitats in areas of existing development as candidates for rehabilitation, focusing on areas where stream, channel, and/or habitat rehabilitation projects will address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for stream, channel, and/or habitat rehabilitation projects may be utilized to address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters, rehabilitate channelized or hydromodified streams, restore wetland and riparian habitat, restore watershed functions, and/or restore beneficial uses of receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of stream, channel, and/or habitat rehabilitation projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance stream, channel, and/or habitat rehabilitation projects; and

(e) Where stream, channel, and/or habitat rehabilitation projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional stream, channel, and/or habitat rehabilitation projects (i.e. projects that can receive storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment).

6. Enforcement Response Plans

Each Copermittee must develop and implement an Enforcement Response Plan as part of its jurisdictional runoff management program document. The Enforcement Response Plan must describe the applicable approaches and options to enforce its legal authority established pursuant to Provision E.1, as necessary, to achieve compliance with the requirements of this Order. The Enforcement Response Plan must be in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include the following:

a. Enforcement Response Plan Components

The Enforcement Response Plan must include the following individual components:

(1) Illicit Discharge Detection and Elimination Enforcement Component;

(2) Development Planning Enforcement Component;

(3) Construction Management Enforcement Component; and

(4) Existing Development Enforcement Component.

b. ENFORCEMENT RESPONSE APPROACHES AND OPTIONS

Each component of the Enforcement Response Plan must describe the enforcement response approaches that the Copermittee will implement to compel compliance with its statutes, ordinances, permits, contracts, orders, or similar means, and the requirements of this Order. The description must include the protocols for implementing progressively stricter enforcement responses. The enforcement response approaches must include appropriate sanctions to compel compliance, including, at a minimum, the following tools or their equivalent:

(1) Verbal and written notices of violation;

(2) Cleanup requirements;

(3) Fines;

(4) Bonding requirements;

(5) Administrative and criminal penalties;

(6) Liens;

(7) Stop work orders; and

(8) Permit and occupancy denials.

c. CORRECTION OF VIOLATIONS

(1) Violations must be corrected in a timely manner with the goal of correcting the violations within 30 calendar days after the violations are discovered, or prior to the next predicted rain event, whichever is sooner.

(2) If more than 30 calendar days are required to achieve compliance, then a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

d. ESCALATED ENFORCEMENT

(1) The Enforcement Response Plan must include a definition of “escalated enforcement.” Escalated enforcement must include any enforcement scenario where a violation or other non-compliance is determined to cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan. Escalated enforcement may be defined differently for development planning, construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas.

(2) Where the Copermittee determines escalated enforcement is not required, a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

(3) Escalated enforcement actions must continue to increase in severity, as necessary, to compel compliance as soon as possible.

e. REPORTING OF NON-COMPLIANT SITES

(1) Each Copermittee must notify the San Diego Water Board in writing within five (5) calendar days of issuing escalated enforcement (as defined in the Copermittee's Enforcement Response Plan) to a construction site that poses a significant threat to water quality as a result of violations or other non-compliance with its permits and applicable local ordinances, and the requirements of this Order. Written notification may be provided electronically by email to the appropriate San Diego Water Board staff.

(2) Each Copermittee must notify the San Diego Water Board of any persons required to obtain coverage under the statewide Industrial General Permit and Construction General Permit and failing to do so, within five (5) calendar days from the time the Copermittee become aware of the circumstances. Written notification may be provided electronically by email to RB9_Nonfilers@waterboards.ca.gov.

7. Public Education and Participation

Each Copermittee must implement, individually or with other Copermittees, a public education and participation program in accordance with the strategies identified in the Water Quality Improvement Plan to promote and encourage the development of programs, management practices, and behaviors that reduce the discharge of pollutants in storm water to the MEP, prevent controllable non-storm water discharges from entering the MS4, and protect water quality standards in receiving waters. The public education and participation program must be implemented in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include, at a minimum, the following requirements:

a. PUBLIC EDUCATION

The public education program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) Educational activities, public information activities, and other appropriate outreach activities intended to reduce pollutants associated with the application of pesticides, herbicides and fertilizer and other pollutants of

concern in storm water discharges to and from its MS4 to the MEP, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed to address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(2) Educational activities, public information activities, and other appropriate outreach activities to facilitate the proper management and disposal of used oil and toxic materials; and

(3) Appropriate education and training measures for specific target audiences, such as construction site operators, residents, underserved target audiences and school-aged children, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed, based on high risk behaviors and pollutants of concern.

b. PUBLIC PARTICIPATION

The public participation program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) A process for members of the public to participate in updating the highest priority water quality conditions, numeric goals, and water quality improvement strategies in the Water Quality Improvement Plan;

(2) Opportunities for members of the public to participate in providing the Copermittee recommendations for improving the effectiveness of the water quality improvement strategies implemented within its jurisdiction; and

(3) Opportunities for members of the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or protection of the quality of receiving waters.

8. Fiscal Analysis

a. Each Copermittee must secure the resources necessary to meet all the requirements of this Order.

b. Each Copermittee must conduct an annual fiscal analysis of its jurisdictional runoff management program in its entirety. The fiscal analysis must include the following:

(1) Identification of the various categories of expenditures necessary to implement the requirements of this Order, including a description of the specific capital, operation and maintenance, and other expenditure items to be accounted for in each category of expenditures;

(2) The staff resources needed and allocated to meet the requirements of this Order, including any development, implementation, and enforcement activities required;

(3) The estimated expenditures for Provisions E.8.b.(1) and E.8.b.(2) for the current fiscal year; and

(4) The source(s) of funds that are proposed to meet the necessary expenditures described in Provisions E.8.b.(1) and E.8.b.(2), including legal restrictions on the use of such funds, for the current fiscal year and next fiscal year.

c. Each Copermittee must submit a summary of the annual fiscal analysis with each Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3).

d. Each Copermittee must provide the documentation used to develop the summary of the annual fiscal analysis upon request by the San Diego Water Board.

F. REPORTING

The purpose of this provision is to determine and document compliance with the requirements set forth in this Order. The goal of reporting is to communicate to the San Diego Water Board and the people of the State of California the implementation status of each jurisdictional runoff management program and compliance with the requirements of this Order. This goal is to be accomplished through the submittal of specific deliverables to the San Diego Water Board by the Copermittees.

1. Water Quality Improvement Plans

The Copermittees for each Watershed Management Area must develop and submit the Water Quality Improvement Plan in accordance with the following requirements:

a. WATER QUALITY IMPROVEMENT PLAN DEVELOPMENT

Each Water Quality Improvement Plan must be developed in accordance with the following process:

(1) Public Participation Process

The Copermittees must implement a public participation process to solicit data, information, and recommendations to be utilized in the development of the Water Quality Improvement Plan. The public participation process must include the following:

(a) The Copermittees must develop a publicly available and noticed schedule of the opportunities for the public to participate and provide comments during the development of the Water Quality Improvement Plan. The schedule may be adjusted as necessary by the Copermittees, provided the public is provided timely notification of the changes to the schedule.

(b) The Copermittees must form a Water Quality Improvement Consultation Panel to provide recommendations during the development of the Water Quality Improvement Plan. The Water Quality Improvement Consultation Panel must consist of at least the following members:

(i) A representative of the San Diego Water Board;

(ii) A representative of the environmental community familiar with the water quality conditions of concern of the receiving waters in the Watershed Management Area, preferably from an environmental interest group associated with a water body within the Watershed Management Area; and

(iii) A representative of the development community familiar with the opportunities and constraints for implementing structural BMPs,

retrofitting projects, and stream, channel or habitat rehabilitation projects in the Watershed Management Area, preferably with relevant engineering, hydrology, and/or geomorphology experience in the Watershed Management Area.

(c) The Copermittees must coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public time and opportunity to participate during the development of the Water Quality Improvement Plans.

(2) Priority Water Quality Conditions

(a) The Copermittees must solicit data, information and recommendations from the public to be utilized in the development and identification of the priority water quality conditions and potential water quality improvement strategies for the Watershed Management Area.

(b) The Copermittees must review the priority water quality conditions the Copermittees plan on including in the Water Quality Improvement Plan with the Water Quality Improvement Consultation Panel to receive recommendations or concurrence.

(c) The Copermittees must consider revisions to the priority water quality conditions based on recommendations from the Water Quality Improvement Consultation Panel.

(d) The Copermittees must include all the potential water quality improvement strategies identified by the public and the Water Quality Improvement Consultation Panel with the submittal of the priority water quality conditions to the San Diego Water Board.

(e) The Copermittees must submit the Water Quality Improvement Plan requirements of Provision B.2 to the San Diego Water Board as early as 6 months and no later than 12 months after the commencement of coverage under this Order. Upon receipt, the San Diego Water Board will issue a public notice and release the proposed priority water quality conditions and potential water quality improvement strategies for public review and comment for a minimum of 30 days.

(f) The Copermittees must consider revisions to the priority water quality conditions and potential water quality improvement strategies developed pursuant to Provision B.2 based on public comments received by the close of the comment period.

(3) Water Quality Improvement Goals, Strategies and Schedules

(a) The Copermittees must solicit recommendations from the public on potential numeric goals for the highest priority water quality conditions identified for the Watershed Management Area, and recommendations on the strategies that should be implemented to achieve the potential numeric goals.

(b) The Copermittees must consult with the Water Quality Improvement Consultation Panel and consider revisions to the following items based on the Panel's recommendations:

(i) The numeric goals and schedules the Copermittees propose to include in the Water Quality Improvement Plan;

(ii) The water quality improvement strategies and schedules the Copermittees propose to implement in the Watershed Management Area and include in the Water Quality Improvement Plan; and

(iii) If the Copermittees choose to implement Provision B.3.b.(4), the results of the Watershed Management Area Analysis the Copermittees proposed to incorporate into the Water Quality Improvement Plan.

(c) The Copermittees must submit the Water Quality Improvement Plan requirements of Provision B.3 to the San Diego Water Board as early as 9 months and no later than 18 months after the commencement of coverage under this Order. Upon receipt, the San Diego Water Board will issue a public notice and release the proposed water quality improvement goals, strategies and schedules for public review and comment for a minimum of 30 days.

(d) The Copermittees must consider revisions to the water quality improvement goals, strategies and schedules developed pursuant to Provision B.3 based on public comments received by the close of the comment period.

b. WATER QUALITY IMPROVEMENT PLAN SUBMITTAL AND IMPLEMENTATION

(1) Within 24 months after the commencement of coverage under this Order, the Copermittees for each Watershed Management Area must submit a complete Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order to the San Diego Water Board. The San Diego Water Board will issue a public notice and release the Water Quality Improvement Plan for public review and comment for a minimum of 30 days.

(2) The Copermittees must consider revisions to the Water Quality Improvement Plan based on written comments received by the close of the public comment period.

(3) The Copermittees must promptly submit any revisions to the Water Quality Improvement Plan to the San Diego Water Board no later than 60 days after the close of the public comment period.

(4) If issues concerning the Water Quality Improvement Plan are resolved informally through discussions among the Copermittees, the San Diego Water Board and interested parties, the San Diego Water Board Executive Officer may provide written notification of acceptance to the Copermittees that the Water Quality Improvement Plan meets the requirements of Provision B. However, if the Executive Officer determines that significant issues with the Water Quality Improvement Plan remain, the matter will be scheduled for San Diego Water Board consideration at a public meeting.

(5) The Copermittees must commence with implementation of the Water Quality Improvement Plan, in accordance with the water quality improvement strategies and schedules therein, upon written notification of acceptance with the Water Quality Improvement Plan by the San Diego Water Board Executive Officer.

(6) During implementation of the Water Quality Improvement Plan the Copermittees must correct any deficiencies in the Plan identified by the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report following a request by the Board to do so.

(7) The Water Quality Improvement Plan must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of receiving notification of acceptance with the Water Quality Improvement Plan by the San Diego Water Board Executive Officer.

2. Updates

a. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATES

Each Copermittee must update its jurisdictional runoff management program document in accordance with the following requirements:

(1) Each Copermittee is encouraged to seek public and key stakeholder participation and comments, as early and often as possible during the process of developing updates to its jurisdictional runoff management program document;

(2) Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E concurrent with the submittal of the Water Quality Improvement Plan. Each Copermittee must correct any deficiencies in the jurisdictional runoff management program document based on comments received from the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report;

(3) Each Copermittee must submit updates to its jurisdictional runoff management program, with the supporting rationale for the modifications, either in the Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b;

(4) The Copermittee must revise proposed modifications to its jurisdictional runoff management program as directed by the San Diego Water Board Executive Officer; and

(5) Updated jurisdictional runoff management program documents must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of submitting the Water Quality Improvement Plan Annual Report.

b. BMP DESIGN MANUAL UPDATES

Each Copermittee must update its BMP Design Manual in accordance with the following requirements:

(1) Each Copermittee must update its BMP Design Manual to incorporate the requirements of Provisions E.3.a-d concurrent with the submittal of the Water Quality Improvement Plan. Each Copermittee must correct any deficiencies in the BMP Design Manual based on comments received from the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report;

(2) Any future updates to the BMP Design Manual made after its update pursuant to Provision F.2.b.(1) is completed must be consistent with the requirements of Provisions E.3.a-d and must be submitted as part of the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b; and

(3) BMP Design Manuals must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of completing the update.

(4) If the San Diego Water Board amends Provisions E.3.a-d during the permit term but after the Copermittee has completed the update pursuant to Provision F.2.b.(1), the Copermittee must revise its BMP Design Manual to

incorporate the amended Provision E.3.a-d requirements as soon as possible but not later than 90 days after the date the San Diego Water Board adopts the amendments to Provisions E.3.a-d, unless otherwise directed by the San Diego Water Board Executive Officer. Under these circumstances, the effective date of the BMP Design Manual is no later than 90 days after the date the San Diego Water Board adopts the amendments to Provisions E.3.a-d, unless otherwise directed by the San Diego Water Board Executive Officer.

c. WATER QUALITY IMPROVEMENT PLAN UPDATES

(1) The Water Quality Improvement Plans must be updated in accordance with the following process:

(a) The Copermittees must develop and implement a public participation process to obtain data, information and recommendations for updating the Water Quality Improvement Plan. The public participation process must provide for a publicly available and noticed schedule of opportunities for the public to participate and provide comments during the development of updates to the Water Quality Improvement Plan;

(b) The Copermittees must consult with the Water Quality Improvement Consultation Panel on proposed updates of the Water Quality Improvement Plan, and consider the Water Quality Improvement Consultation Panel's recommendations in finalizing the proposed updates;

(c) The Copermittees for each Watershed Management Area must submit 1) proposed updates to the Water Quality Improvement Plan and supporting rationale, and 2) recommendations received from the public and the Water Quality Improvement Consultation Panel and the rationale for the requested updates, either in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The updates submitted will be deemed accepted for inclusion in the Water Quality Improvement Plan ninety (90) days after submission unless otherwise directed in writing by the San Diego Water Board Executive Officer;

(d) The Copermittees must revise the requested updates as directed by the San Diego Water Board Executive Officer; and

(e) Updated Water Quality Improvement Plans must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance of the requested updates by the San Diego Water Board.

(2) No later than six months following Office of Administrative Law and USEPA approval of any TMDL Basin Plan amendment with wasteload allocations (WLAs) assigned to the Copermittees during the term of this Order, the

Copermittees must initiate an update to the applicable Water Quality Improvement Plans in accordance with Provision F.1 or Provision F.2.c.(1) to incorporate the requirements of the TMDL WLAs.

3. Progress Reporting

a. Progress Report Presentations

The Copermittees for each Watershed Management Area must periodically appear before the San Diego Water Board, as requested by the Board, to provide progress reports on the implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs.

b. Annual Reports

(1) Transitional Jurisdictional Runoff Management Program Annual Reports

(a) Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) no later than October 31 of each year for each jurisdictional runoff management program reporting period (i.e. July 1 to June 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted.

(b) Each Copermittee must submit the information on the Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) specific to the area within its jurisdiction in each Watershed Management Area.

(c) In addition to submitting the Jurisdictional Runoff Management Program Annual Report Form during the transitional reporting period, each Copermittee may continue to utilize and submit the jurisdictional runoff management program annual reporting format of its previous NPDES permit until the first Water Quality Improvement Plan Annual Report is required to be submitted.

(2) Transitional Monitoring and Assessment Program Annual Reports

The Copermittees for each Watershed Management Area must submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted under this Order. The Transitional

Monitoring and Assessment Program Annual Reports must include:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1.a and D.2.a, summarized and presented in tabular and graphical form; and

(b) The findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

(3) Water Quality Improvement Plan Annual Reports

The Copermittees for each Watershed Management Area must submit a Water Quality Improvement Plan Annual Report for each reporting period no later than January 31 of the following year. The annual reporting period consists of two different periods: 1) July 1 to June 30 of the following year for the jurisdictional runoff management programs, 2) October 1 to September 30 of the following year for the monitoring and assessment programs. The Water Quality Improvement Plan Annual Reports must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Each Annual Report must include the following:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, summarized and presented in tabular and graphical form;

(b) The progress of the special studies required pursuant to Provision D.3, and the findings, interpretations and conclusions of a special study, or each phase of a special study, upon its completion;

(c) The findings, interpretations and conclusions from the assessments required pursuant to Provision D.4;

(d) The progress of implementing the Water Quality Improvement Plan, including, but not limited to, the following:

(i) The progress toward achieving the interim and final numeric goals for the highest water quality priorities for the Watershed Management Area;

(ii) The water quality improvement strategies that were implemented and/or no longer implemented by each of the Copermittees during the reporting period and previous reporting periods;

(iii) The water quality improvement strategies planned for implementation during the next reporting period;

(iv) Proposed modifications to the water quality improvement strategies, the public comments received and the supporting rationale for the

proposed modifications;

(v) Previous modifications or updates incorporated into the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document and implemented by the Copermittees in the Watershed Management Area; and

(vi) Proposed modifications or updates to the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document;

(e) A completed Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) for each Copermittee in the Watershed Management Area, certified by a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative; and

(f) Each Copermittee must provide any data or documentation utilized in developing the Water Quality Improvement Plan Annual Report upon request by the San Diego Water Board. Any Copermittee monitoring data utilized in developing the Water Quality Improvement Plan Annual Report must be uploaded to the California Environmental Data Exchange Network (CEDEN).[35] Any Copermittee monitoring and assessment data utilized in developing the Water Quality Improvement Plan Annual Report must be available for access on the Regional Clearinghouse required pursuant to Provision F.4.

c. Regional Monitoring and Assessment Report

(1) The Copermittees must submit a Regional Monitoring and Assessment Report no later than 180 days prior to the expiration date of this Order. The Regional Monitoring and Assessment Report may be submitted as part of the Report of Waste Discharge required pursuant to Provision F.5.b. In preparing the report the Copermittees must consider the receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, and the findings, interpretations, and conclusions from the assessments required pursuant to Provision D.4. Based on these considerations the report must assess the following:

[35] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

(a) The beneficial uses of the receiving waters within the San Diego Region that are supported and not adversely affected by the Copermittees' MS4 discharges;

(b) The beneficial uses of the receiving waters within the San Diego Region that are adversely impacted by the Copermittees' MS4 discharges;

(c) The progress toward protecting the beneficial uses in the receiving waters within the San Diego Region from the Copermittees' discharges; and

(d) Pollutants or conditions of emerging concern that may impact beneficial uses in the receiving waters within the San Diego Region.

(2) The Regional Monitoring and Assessment Report must include recommendations for improving the implementation and assessment of the Water Quality Improvement Plans and jurisdictional runoff management programs.

(3) Each Copermittee must provide any data or documentation utilized in developing the Regional Monitoring and Assessment Report upon request by the San Diego Water Board. Any Copermittee monitoring and assessment data utilized in developing the Regional Monitoring and Assessment Report must be available for access on the Regional Clearinghouse required pursuant to Provision F.4.

4. Regional Clearinghouse

The Copermittees must develop, update, and maintain an internet-based Regional Clearinghouse that is made available to the public no later than 18 months after the effective date of this Order.[36]

a. The Copermittees, through the Regional Clearinghouse, must make the following documents and data available for access, and organized by Watershed Management Area. The documents and data may be linked to other internet-based data portals and databases where the original documents are stored:

(1) Water Quality Improvement Plan for the Watershed Management Area, and all updated versions with date of update;

(2) Annual Reports for the Watershed Management Area;

(3) Jurisdictional Runoff Management Program document for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

[36] The Copermittees may develop, update and maintain the clearinghouse(s) of other Copermittees or agencies.

(4) BMP Design Manual for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(5) Reports from special studies (e.g. source identification, BMP effectiveness assessment) conducted in the Watershed Management Area;

(6) Monitoring data collected pursuant to Provision D for each Watershed Management Area must be uploaded to CEDEN,[37] with links to the uploaded data; and

(7) Available GIS data, layers, and/or shapefiles used to develop the maps generated and maintained by the Copermittees for the Water Quality Improvement Plans, Annual Reports, and jurisdictional runoff management program documents.

b. The Copermittees, through the Regional Clearinghouse, must make the following information and documents available for access:

(1) Contact information (point of contact, phone number, email address, and mailing address) for each Copermittee;

(2) Public hotline number for reporting non-storm water and illicit discharges for each Copermittee;

(3) Email address for reporting non-storm water and illicit discharges for each Copermittee;

(4) Link to each Copermittee's website, if available, where the public may find additional information about the Copermittee's storm water management program and for requesting records for the implementation of its program;

(5) Information about opportunities for the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or protection of the quality of receiving waters; and

(6) Reports from regional monitoring programs in which the Copermittees participate (e.g. Southern California Monitoring Coalition, Southern California Coastal Water Research Project Bight Monitoring);

(7) Regional Monitoring and Assessment Reports; and

(8) Any other information, data, and documents the Copermittees determine as appropriate for making available to the public.

[37] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

5. Report of Waste Discharge

The Copermittees subject to the requirements of this Order must submit to the San Diego Water Board a complete Report of Waste Discharge as an application for the re-issuance of this Order and NPDES permit. The Report of Waste Discharge must be submitted no later than 180 days in advance of the expiration date of this Order. The Report of Waste Discharge must contain the following minimum information:

a. Names and addresses of the Copermittees;

b. Names and titles of the primary contacts of the Copermittees;

c. Proposed changes to the Copermittees' Water Quality Improvement Plans and the supporting justification;

d. Proposed changes to the Copermittees' jurisdictional runoff management programs and the supporting justification;

e. Any other information necessary for the re-issuance of this Order;

f. Any information to be included as part of the Report of Waste Discharge pursuant to the requirements of this Order; and

g. Any other information required by federal regulations for NPDES permit reissuance.

6. Reporting Provisions

Each Copermittee must comply with all the reporting and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

G. PRINCIPAL WATERSHED COPERMITTEE RESPONSIBILITIES

1. The Copermittees within each Watershed Management Area must designate a Principal Watershed Copermittee and notify the San Diego Water Board of the name of the Principal Watershed Copermittee. An individual Copermittee should not be designated a Principal Watershed Copermittee for more than two Watershed Management Areas. The notification may be submitted with the Water Quality Improvement Plan required pursuant to Provision F.1 of this Order.

2. The Principal Watershed Copermittee is responsible for, at a minimum, the following:

a. Serving as liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues, and when necessary and appropriate, representing the Copermittees in the Watershed Management Area before the San Diego Water Board;

b. Facilitating the development of the Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order;

c. Coordinating the submittal of the deliverables required by Provisions F.1, F.2, F.3.a, and F.3.b of this Order; and

d. Coordinating and developing, with the other Principal Watershed Copermittees, the requirements of Provisions F.3.c, F.4, and F.5.b of this Order.

3. The Principal Watershed Copermittee is not responsible for ensuring that the other Copermittees within the Watershed Management Area are in compliance with the requirements of this Order. Each Copermittee within the Watershed Management Area is responsible for complying with the requirements of this Order.

H. MODIFICATION OF ORDER

1. Modifications of the Order may be initiated by the San Diego Water Board or by the Copermittees. Requests by Copermittees must be made to the San Diego Water Board.

2. Minor modifications to the Order may be made by the San Diego Water Board where the proposed modification complies with all the prohibitions and limitations, and other requirements of this Order.

3. This Order may also be re-opened and modified, revoked and, reissued or terminated in accordance with the provisions of 40 CFR 122.44, 122.62 to 122.64, and 124.5. Causes for taking such actions include, but are not limited to, failure to comply with any condition of this Order and permit, and endangerment to human health or the environment resulting from the permitted activity.

4. This Order may be re-opened for modification for cause including but not limited to the following:

a. Any of the TMDLs in Attachment E to this Order are amended in the Basin Plan by San Diego Water Board, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA;

b. The Basin Plan is amended by the San Diego Water Board to incorporate a new TMDL, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA; or

c. Updating or revising the monitoring and reporting requirements is determined to be necessary, at the discretion of the San Diego Water Board. Such modification(s) may include, but is (are) not limited to, revision(s) to: (i) implement recommendations from Southern California Coastal Water Research Project (SCCWRP), (ii) develop, refine, implement, and/or coordinate a regional monitoring program, (iii) develop and implement improved monitoring and assessment programs in keeping with San Diego Water Board Resolution No. R9-2012-0069, Resolution in Support of a Regional Monitoring Framework, and/or (iv) add provisions to require the Copermittees to evaluate and provide information on cost and values of the monitoring and reporting program.

I. STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

Each Copermittee must comply with all the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

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ATTACHMENT A

DISCHARGE PROHIBITIONS AND SPECIAL PROTECTIONS

1. Basin Plan Waste Discharge Prohibitions

California Water Code Section 13243 provides that a Regional Water Board, in a water quality control plan, may specify certain conditions or areas where the discharge of waste or certain types of waste is not permitted. The following waste discharge prohibitions in the Water Quality Control Plan for the San Diego Basin (Basin Plan) are applicable to any person, as defined by Section 13050(c) of the California Water Code, who is a citizen, domiciliary, or political agency or entity of California whose activities in California could affect the quality of waters of the state within the boundaries of the San Diego Region.

1. The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in California Water Code Section 13050, is prohibited.

2. The discharge of waste to land, except as authorized by waste discharge requirements or the terms described in California Water Code Section 13264 is prohibited.

3. The discharge of pollutants or dredged or fill material to waters of the United States except as authorized by a National Pollutant Discharge Elimination System (NPDES) permit or a dredged or fill material permit (subject to the exemption described in California Water Code Section 13376) is prohibited.

4. Discharges of recycled water to lakes or reservoirs used for municipal water supply or to inland surface water tributaries thereto are prohibited, unless this San Diego Water Board issues a NPDES permit authorizing such a discharge; the proposed discharge has been approved by the State Department of Health Services (DHS) and the operating agency of the impacted reservoir; and the discharger has an approved fail-safe long-term disposal alternative.

5. The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the San Diego Water Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

6. The discharge of waste in a manner causing flow, ponding, or surfacing on lands not owned or under the control of the discharger is prohibited, unless the discharge is authorized by the San Diego Water Board.

7. The dumping, deposition, or discharge of waste directly into waters of the state, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the San Diego Water Board.

8. Any discharge to a storm water conveyance system that is not composed entirely of "*storm water*" is prohibited unless authorized by the San Diego Water Board. [The federal regulations, 40 CFR 122.26(b)(13), define storm water as storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from firefighting activities.] [§122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

9. The unauthorized discharge of treated or untreated sewage to waters of the state or to a storm water conveyance system is prohibited.

10. The discharge of industrial wastes to conventional septic tank/subsurface disposal systems, except as authorized by the terms described in California Water Code Section 13264, is prohibited.

11. The discharge of radioactive wastes amenable to alternative methods of disposal into the waters of the state is prohibited.

12. The discharge of any radiological, chemical, or biological warfare agent into waters of the state is prohibited.

13. The discharge of waste into a natural or excavated site below historic water levels is prohibited unless the discharge is authorized by the San Diego Water Board.

14. The discharge of sand, silt, clay, or other earthen materials from any activity, including land grading and construction, in quantities which cause deleterious bottom deposits, turbidity or discoloration in waters of the state or which unreasonably affect, or threaten to affect, beneficial uses of such waters is prohibited.

15. The discharge of treated or untreated sewage from vessels to Mission Bay, Oceanside Harbor, Dana Point Harbor, or other small boat harbors is prohibited.

16. The discharge of untreated sewage from vessels to San Diego Bay is prohibited.

17. The discharge of treated sewage from vessels to portions of San Diego Bay that are less than 30 feet deep at mean lower low water (MLLW) is prohibited.

18. The discharge of treated sewage from vessels, which do not have a properly functioning US Coast Guard certified Type I or Type II marine sanitation device, to portions of San Diego Bay that are greater than 30 feet deep at mean lower low water (MLLW) is prohibited.

2. Attachment B to State Water Board Resolution 2012-0012, as amended by State Water Board Resolution No. 2012-0031.

Special Protections for Areas of Special Biological Significance (ASBS), Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges

I. PROVISIONS FOR POINT SOURCE DISCHARGES OF STORM WATER AND NONPOINT SOURCE WASTE DISCHARGES

The following terms, prohibitions, and special conditions (hereafter collectively referred to as special conditions) are established as limitations on point source storm water and nonpoint source discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in Areas of Special Biological Significance (ASBS), as required for State Water Quality Protection Areas pursuant to California Public Resources Code Sections 36700(f) and 36710(f). These Special Protections are adopted by the State Water Board as part of the California Ocean Plan (Ocean Plan) General Exception.

The special conditions are organized by category of discharge. The State Water Resources Control Board (State Water Board) and Regional Water Quality Control Boards (Regional Water Boards) will determine categories and the means of regulation for those categories [e.g., Point Source Storm Water National Pollutant Discharge Elimination System (NPDES) or Nonpoint Source].

A. PERMITTED POINT SOURCE DISCHARGES OF STORM WATER

1. General Provisions for Permitted Point Source Discharges of Storm Water

   a. Existing storm water discharges into an ASBS are allowed only under the following conditions:

      (1) The discharges are authorized by an NPDES permit issued by the State Water Board or Regional Water Board;

      (2) The discharges comply with all of the applicable terms, prohibitions, and special conditions contained in these Special Protections; and

      (3) The discharges:

         (i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

         (ii) Are designed to prevent soil erosion;

         (iii) Occur only during wet weather;

         (iv) Are composed of only storm water runoff.

   b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

   c. The discharge of trash is prohibited.

d. Only discharges from existing storm water outfalls are allowed. Any proposed or new storm water runoff discharge shall be routed to existing storm water discharge outfalls and shall not result in any new contribution of waste to an ASBS (i.e., no additional pollutant loading). "Existing storm water outfalls" are those that were constructed or under construction prior to January 1, 2005. "New contribution of waste" is defined as any addition of waste beyond what would have occurred as of January 1, 2005. A change to an existing storm water outfall, in terms of re-location or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges are prohibited except as provided below:

(1) The term "non-storm water discharges" means any waste discharges from a municipal separate storm sewer system (MS4) or other NPDES permitted storm drain system to an ASBS that are not composed entirely of storm water.

(2) (i) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability or occur naturally:

(a) Discharges associated with emergency fire fighting operations.

(b) Foundation and footing drains.

(c) Water from crawl space or basement pumps.

(d) Hillside dewatering.

(e) Naturally occurring groundwater seepage via a storm drain.

(f) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(ii) An NPDES permitting authority may authorize non-storm water discharges to an MS4 with a direct discharge to an ASBS only to the extent the NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

2. Compliance Plans for Inclusion in Storm Water Management Plans (SWMP) and Storm Water Pollution Prevention Plans (SWPPP).

The discharger shall specifically address the prohibition of non-storm water runoff and the requirement to maintain natural water quality for storm water discharges to an ASBS in an ASBS Compliance Plan to be included in its SWMP or a SWPPP, as appropriate to permit type. If a statewide permit includes a SWMP, then the discharger shall prepare a stand-alone compliance plan for ASBS discharges. The ASBS Compliance Plan is subject to approval by the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (for permits issued by Regional Water Boards).

a. The Compliance Plan shall include a map of surface drainage of storm water runoff, showing areas of sheet runoff, prioritize discharges, and describe any structural Best Management Practices (BMPs) already employed and/or BMPs to be employed in the future. Priority discharges are those that pose the greatest water quality threat and which are identified to require installation of structural BMPs. The map shall also show the storm water conveyances in relation to other features such as service areas, sewage conveyances and treatment facilities, landslides, areas prone to erosion, and waste and hazardous material storage areas, if applicable. The SWMP or SWPPP shall also include a procedure for updating the map and plan when changes are made to the storm water conveyance facilities.

b. The ASBS Compliance Plan shall describe the measures by which all non-authorized non-storm water runoff (e.g., dry weather flows) has been eliminated, how these measures will be maintained over time, and how these measures are monitored and documented.

c. For Municipal Separate Storm Sewer System (MS4s), the ASBS Compliance Plan shall require minimum inspection frequencies as follows:

(1) The minimum inspection frequency for construction sites shall be weekly during rainy season;

(2) The minimum inspection frequency for industrial facilities shall be monthly during the rainy season;

(3) The minimum inspection frequency for commercial facilities (e.g., restaurants) shall be twice during the rainy season; and

(4) Storm water outfall drains equal to or greater than 18 inches (457 mm) in diameter or width shall be inspected once prior to the beginning of the rainy season and once during the rainy season and maintained to remove trash and other anthropogenic debris.

d. The ASBS Compliance Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff, that are necessary to comply with these special conditions, will be achieved through BMPs. Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that such installation would pose a threat to health or safety. BMPs to control storm water runoff discharges (at the end-of-pipe) during a design storm shall be designed to achieve on average the following target levels:

(1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

(2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges.

The baseline for these determinations is the effective date of the Exception, except for those structural BMPs installed between January 1, 2005 and adoption of these Special Protections, and the reductions must be achieved and documented within six (6) years of the effective date.

e. The ASBS Compliance Plan shall address erosion control and the prevention of anthropogenic sedimentation in ASBS. The natural habitat conditions in the ASBS shall not be altered as a result of anthropogenic sedimentation.

f. The ASBS Compliance Plan shall describe the non-structural BMPs currently employed and planned in the future (including those for construction activities), and include an implementation schedule. The ASBS Compliance Plan shall include non-structural BMPs that address public education and outreach. Education and outreach efforts must adequately inform the public that direct discharges of pollutants from private property not entering an MS4 are prohibited. The ASBS Compliance Plan shall also describe the structural BMPs, including any low impact development (LID) measures, currently employed and planned for higher threat discharges and include an implementation schedule. To control storm water runoff discharges (at the end-of-pipe) during a design storm, permittees must first consider, and use where feasible, LID practices to infiltrate, use, or evapotranspirate storm water runoff on-site, if LID practices would be the most effective at reducing pollutants from entering the ASBS.

g. The BMPs and implementation schedule shall be designed to ensure that natural water quality conditions in the receiving water are achieved and maintained by either reducing flows from impervious surfaces or reducing pollutant loading, or some combination thereof.

h. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents in storm water runoff that alter natural ocean water quality and the sources of these constituents.

(2) The report shall describe BMPs that are currently being implemented, BMPs that are identified in the SWMP or SWPPP for future implementation, and any additional BMPs that may be added to the SWMP or SWPPP to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the BMPs.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits), the discharger shall revise its ASBS Compliance Plan to incorporate any new or modified BMPs that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised SWMP or SWPPP, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural ocean water quality conditions due to the same constituent.

(5) The requirements of this section are in addition to the terms, prohibitions, and conditions contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within eighteen (18) months from the effective date of the Exception, the discharger shall submit a draft written ASBS Compliance Plan to the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that describes its strategy to comply with these special conditions, including the requirement to maintain natural water quality in the affected ASBS. The ASBS Compliance Plan shall include a description of appropriate non-structural controls and a time schedule to implement structural controls (implementation schedule) to comply with these special conditions for inclusion in the discharger's SWMP or SWPPP, as appropriate to permit type. The final ASBS Compliance Plan, including a description and final schedule for structural controls based on the results of runoff and receiving water monitoring, must be submitted within thirty (30) months from the effective date of the Exception.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these special conditions shall be implemented.

d. Within six (6) years of the effective date of the Exception, any structural controls identified in the ASBS Compliance Plan that are necessary to comply with these special conditions shall be operational.

e. Within six (6) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water, pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data, and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by

the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. for municipalities, a demonstration of significant hardship to discharger ratepayers, by showing the relationship of storm water fees to annual household income for residents within the discharger's jurisdictional area, and the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or

2. for other governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

B. NONPOINT SOURCE DISCHARGES

1. General Provisions for Nonpoint Sources

a. Existing nonpoint source waste discharges are allowed into an ASBS only under the following conditions:

(1) The discharges are authorized under waste discharge requirements, a conditional waiver of waste discharge requirements, or a conditional prohibition issued by the State Water Board or a Regional Water Board.

(2) The discharges are in compliance with the applicable terms, prohibitions, and special conditions contained in these Special Protections.

(3) The discharges:

(i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

(ii) Are designed to prevent soil erosion;

(iii) Occur only during wet weather;

(iv) Are composed of only storm water runoff.

b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

c. The discharge of trash is prohibited.

d. Only existing nonpoint source waste discharges are allowed. "Existing nonpoint source waste discharges" are discharges that were ongoing prior to January 1, 2005. "New nonpoint source discharges" are defined as those that commenced on or after January 1,

2005. A change to an existing nonpoint source discharge, in terms of relocation or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges from nonpoint sources (those not subject to an NPDES Permit) are prohibited except as provided below:

(1) The term "non-storm water discharges" means any waste discharges that are not composed entirely of storm water.

(2) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability, or occur naturally:

(i) Discharges associated with emergency fire fighting operations.

(ii) Foundation and footing drains.

(iii) Water from crawl space or basement pumps.

(iv) Hillside dewatering.

(v) Naturally occurring groundwater seepage via a storm drain.

(vi) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

f. At the San Clemente Island ASBS, discharges incidental to military training and research, development, test, and evaluation operations are allowed. Discharges incidental to underwater demolition and other in-water explosions are not allowed in the two military closure areas in the vicinity of Wilson Cove and Castle Rock. Discharges must not result in a violation of the water quality objectives, including the protection of the marine aquatic life beneficial use, anywhere in the ASBS.

g. At the San Nicolas Island and Begg Rock ASBS, discharges incidental to military research, development, testing, and evaluation of, and training with, guided missile and other weapons systems, fleet training exercises, small-scale amphibious warfare training, and special warfare training are allowed. Discharges incidental to underwater demolition and other in-water explosions are not allowed. Discharges must not result in a violation of the water quality objectives, including the protection of the marine aquatic life beneficial use, anywhere in the ASBS.

h. All other nonpoint source discharges not specifically authorized above are prohibited.

2. Planning and Reporting

a. The nonpoint source discharger shall develop an ASBS Pollution Prevention Plan, including an implementation schedule, to address storm water runoff and any other nonpoint source discharges from its facilities. The ASBS Pollution Prevention Plan must be equivalent in contents to an ASBS Compliance Plan as described in I (A)(2) in this document. The ASBS Pollution Prevention Plan is subject to approval by the Executive Director of the State Water Board (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements).

b. The ASBS Pollution Prevention Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff that are necessary to comply with these special conditions, will be achieved through Management Measures and associated Management Practices (Management Measures/Practices). Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director or Regional Water Board Executive Officer that such installation would pose a threat to health or safety. Management Measures to control storm water runoff during a design storm shall achieve on average the following target levels:

(1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

(2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges.

The baseline for these determinations is the effective date of the Exception, except for those structural BMPs installed between January 1, 2005 and adoption of these Special Protections, and the reductions must be achieved and documented within six (6) years of the effective date.

c. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff or other nonpoint source pollution is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and the Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents that alter natural water quality and the sources of these constituents.

(2) The report shall describe Management Measures/Practices that are currently being implemented, Management Measures/Practices that are identified in the ASBS Pollution Prevention Plan for future implementation, and any additional Management Measures/Practices that may be added to the Pollution Prevention Plan to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the Management Measures/Practices.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements), the discharger shall revise its ASBS Pollution Prevention Plan to incorporate any new or modified Management Measures/Practices that have been or

will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised ASBS Pollution Prevention Plan, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural water quality conditions due to the same constituent.

(5) The requirements of this section are in addition to the terms, prohibitions, and conditions contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within eighteen (18) months from the effective date of the Exception, the discharger~~s~~ shall submit a draft written ASBS Pollution Prevention Plan to the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) that describes its strategy to comply with these special conditions, including the requirement to maintain natural ocean water quality in the affected ASBS. The Pollution Prevention Plan shall include a description of appropriate non-structural controls and a time schedule to implement structural controls to comply with these special conditions for inclusion in the discharger's Pollution Prevention Plan. The final ASBS Pollution Prevention Plan, including a description and final schedule for structural controls based on the results of runoff and receiving water monitoring, must be submitted within thirty (30) months from the effective date of the Exception.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these Special Protections shall be implemented.

d. Within six (6) years of the effective date of the Exception, any structural controls identified in the ASBS Pollution Prevention Plan that are necessary to comply with these special conditions shall be operational.

e. Within six (6) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in (d.) or (e.). The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. a demonstration that the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or

2. for governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

II. ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES

In addition to the provisions in Section I (A) or I (B), respectively, a discharger with parks and recreation facilities shall comply with the following:

A. The discharger shall include a section in an ASBS Compliance Plan (for NPDES dischargers) or an ASBS Pollution Prevention Plan (for nonpoint source dischargers) to address storm water runoff from parks and recreation facilities.

1. The plan shall identify all pollutant sources, including sediment sources, which may result in waste entering storm water runoff. Pollutant sources include, but are not limited to, roadside rest areas and vistas, picnic areas, campgrounds, trash receptacles, maintenance facilities, park personnel housing, portable toilets, leach fields, fuel tanks, roads, piers, and boat launch facilities.

2. The plan shall describe BMPs or Management Measures/Practices that will be implemented to control soil erosion (both temporary and permanent erosion controls) and reduce or eliminate pollutants in storm water runoff in order to achieve and maintain natural water quality conditions in the affected ASBS. The plan shall include BMPs or Management Measures/Practices to ensure that trails and culverts are maintained to prevent erosion and minimize waste discharges to ASBS.

3. The plan shall include BMPs or Management Measures/Practices to prevent the discharge of pesticides or other chemicals, including agricultural chemicals, in storm water runoff to the affected ASBS.

4. The plan shall include BMPs or Management Measures/Practices that address public education and outreach. The goal of these BMPs or Management Measures/Practices is to ensure that the public is adequately informed that waste discharges to the affected ASBS are prohibited or limited by special conditions in these Special Protections. The BMPs or Management Measures/Practices shall include signage at camping, picnicking, beach and roadside parking areas, and visitor centers, or other appropriate measures, which notify the public of any applicable requirements of these Special Protections and identify the ASBS boundaries.

5. The plan shall include BMPs or Management Measures/Practices that address the prohibition against the discharge of trash to ASBS. The BMPs or Management Measures/Practices shall include measures to ensure that adequate trash receptacles are available for public use at visitor facilities, including parking areas, and that the receptacles are adequately maintained to prevent trash discharges into the ASBS. Appropriate measures include covering trash receptacles to prevent trash from being wind blown and periodically emptying the receptacles to prevent overflows.

6. The plan shall include BMPs or Management Measures/Practices to address runoff from parking areas and other developed features to ensure that the runoff does not alter natural water quality in the affected ASBS. BMPs or Management Measures/Practices shall include measures to reduce pollutant loading in runoff to the ASBS through installation of natural area buffers (LID), treatment, or other appropriate measures.

B. Maintenance and repair of park and recreation facilities must not result in waste discharges to the ASBS. The practice of road oiling must be minimized or eliminated, and must not result in waste discharges to the ASBS.

III. ADDITIONAL REQUIREMENTS – WATERFRONT AND MARINE OPERATIONS

In addition to the provisions in Section I (A) or I (B), respectively, a discharger with waterfront and marine operations shall comply with the following:

A. For discharges related to waterfront and marine operations, the discharger shall develop a Waterfront and Marine Operations Management Plan (Waterfront Plan). This plan shall contain appropriate Management Measures/Practices to address nonpoint source pollutant discharges to the affected ASBS.

1. The Waterfront Plan shall contain appropriate Management Measures/Practices for any waste discharges associated with the operation and maintenance of vessels, moorings, piers, launch ramps, and cleaning stations in order to ensure that beneficial uses are protected and natural water quality is maintained in the affected ASBS.

2. For discharges from marinas and recreational boating activities, the Waterfront Plan shall include appropriate Management Measures, described in The Plan for California's Nonpoint Source Pollution Control Program, for marinas and recreational boating, or equivalent practices, to ensure that nonpoint source pollutant discharges do not alter natural water quality in the affected ASBS.

3. The Waterfront Plan shall include Management Practices to address public education and outreach to ensure that the public is adequately informed that waste discharges to the affected ASBS are prohibited or limited by special conditions in these Special

Protections. The management practices shall include appropriate signage, or similar measures, to inform the public of the ASBS restrictions and to identify the ASBS boundaries.

4. The Waterfront Plan shall include Management Practices to address the prohibition against trash discharges to ASBS. The Management Practices shall include the provision of adequate trash receptacles for marine recreation areas, including parking areas, launch ramps, and docks. The plan shall also include appropriate Management Practices to ensure that the receptacles are adequately maintained and secured in order to prevent trash discharges into the ASBS. Appropriate Management Practices include covering the trash receptacles to prevent trash from being windblown, staking or securing the trash receptacles so they don't tip over, and periodically emptying the receptacles to prevent overflow.

5. The discharger shall submit its Waterfront Plan to the by the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) within six months of the effective date of these special conditions. The Waterfront Plan is subject to approval by the State Water Board Executive Director or the Regional Water Board Executive Officer, as appropriate. The plan must be fully implemented within 18 months of the effective date of the Exception.

B. The discharge of chlorine, soaps, petroleum, other chemical contaminants, trash, fish offal, or human sewage to ASBS is prohibited. Sinks and fish cleaning stations are point source discharges of wastes and are prohibited from discharging into ASBS. Anthropogenic accumulations of discarded fouling organisms on the sea floor must be minimized.

C. Limited-term activities, such as the repair, renovation, or maintenance of waterfront facilities, including, but not limited to, piers, docks, moorings, and breakwaters, are authorized only in accordance with Chapter III.E.2 of the Ocean Plan.

D. If the discharger anticipates that the discharger will fail to fully implement the approved Waterfront Plan within the 18 month deadline, the discharger shall submit a technical report as soon as practicable to the State Water Board Executive Director or the Regional Water Board Executive Officer, as appropriate. The technical report shall contain reasons for failing to meet the deadline and propose a revised schedule to fully implement the plan.

E. The State Water Board or the Regional Water Board may, for good cause, authorize additional time to comply with the Waterfront Plan. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in Section III.A.5. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the

discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality. The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. a demonstration of significant hardship by showing that the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate.

2. for governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

IV. MONITORING REQUIREMENTS

Monitoring is mandatory for all dischargers to assure compliance with the Ocean Plan. Monitoring requirements include both: (A) core discharge monitoring, and (B) ocean receiving water monitoring. The State and Regional Water Boards must approve sampling site locations and any adjustments to the monitoring programs. All ocean receiving water and reference area monitoring must be comparable with the Water Boards' Surface Water Ambient Monitoring Program (SWAMP).

Safety concerns: Sample locations and sampling periods must be determined considering safety issues. Sampling may be postponed upon notification to the State and Regional Water Boards if hazardous conditions prevail.

Analytical Chemistry Methods: All constituents must be analyzed using the lowest minimum detection limits comparable to the Ocean Plan water quality objectives. For metal analysis, all samples, including storm water effluent, reference samples, and ocean receiving water samples, must be analyzed by the approved analytical method with the lowest minimum detection limits (currently Inductively Coupled Plasma/Mass Spectrometry) described in the Ocean Plan.

A. CORE DISCHARGE MONITORING PROGRAM

1. General sampling requirements for timing and storm size:

   Runoff must be collected during a storm event that is greater than 0.1 inch and generates runoff, and at least 72 hours from the previously measurable storm event. Runoff samples shall be collected during the same storm and at approximately the same time when post-storm receiving water is sampled, and analyzed for the same constituents as receiving water and reference site samples (see section IV B) as described below.

2. Runoff flow measurements

   a. For municipal/industrial storm water outfalls in existence as of December 31, 2007, 18 inches (457mm) or greater in diameter/width (including multiple outfall pipes in combination having a width of 18 inches, runoff flows must be measured or calculated, using a method acceptable to and approved by the State and Regional Water Boards.

b. This will be reported annually for each precipitation season to the State and Regional Water Boards.

3. Runoff samples – storm events

a. For outfalls equal to or greater than 18 inches (0.46m) in diameter or width:

(1) samples of storm water runoff shall be collected during the same storm as receiving water samples and analyzed for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

(2) samples of storm water runoff shall be collected and analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

(3) If an applicant has no outfall greater than 36 inches, then storm water runoff from the applicant's largest outfall shall be further collected during the same storm as receiving water samples and analyzed for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates).

b. For outfalls equal to or greater than 36 inches (0.91m) in diameter or width:

(1) samples of storm water runoff shall be collected during the same storm as receiving water samples and analyzed for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

(2) samples of storm water runoff shall be further collected during the same storm as receiving water samples and analyzed for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates); and

(3) samples of storm water runoff shall be collected and analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

c. For an applicant not participating in a regional monitoring program [see below in Section IV (B)] in addition to (a.) and (b.) above, a minimum of the two largest outfalls or 20 percent of the larger outfalls, whichever is greater, shall be sampled (flow weighted composite samples) at least three times annually during wet weather (storm event) and analyzed for all Ocean Plan Table A constituents, Table B constituents for marine aquatic life protection (except for toxicity, only chronic toxicity for three species shall be required), DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, and Ocean Plan indicator bacteria. For parties discharging to ASBS in

more than one Regional Water Board region, at a minimum, one (the largest) such discharge shall be sampled annually in each Region.

4. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may reduce or suspend core monitoring once the storm runoff is fully characterized. This determination may be made at any point after the discharge is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

B. Ocean Receiving Water and Reference Area Monitoring Program

In addition to performing the Core Discharge Monitoring Program in Section II.A above, all applicants having authorized discharges must perform ocean receiving water monitoring. In order to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS, dischargers may choose either (1) an individual monitoring program, or (2) participation in a regional integrated monitoring program.

1. Individual Monitoring Program: The requirements listed below are for those dischargers who elect to perform an individual monitoring program to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within the affected ASBS. In addition to Core Discharge Monitoring, the following additional monitoring requirements shall be met:

   a. Three times annually, during wet weather (storm events), the receiving water at the point of discharge from the outfalls described in section (IV)(A)(3)(c) above shall be sampled and analyzed for Ocean Plan Table A constituents, Table B constituents for marine aquatic life, DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, salinity, chronic toxicity (three species), and Ocean Plan indicator bacteria.

      The sample location for the ocean receiving water shall be in the surf zone at the point of discharges; this must be at the same location where storm water runoff is sampled. Receiving water shall be sampled prior to (pre-storm) and during (or immediately after) the same storm (post storm). Post storm sampling shall be during the same storm and at approximately the same time as when the runoff is sampled. Reference water quality shall also be sampled three times annually and analyzed for the same constituents pre-storm and post-storm, during the same storm seasons when receiving water is sampled. Reference stations will be determined by the State Water Board's Division of Water Quality and the applicable Regional Water Board(s).

   b. Sediment sampling shall occur at least three times during every five (5) year period. The subtidal sediment (sand or finer, if present) at the discharge shall be sampled and analyzed for Ocean Plan Table B constituents for marine aquatic life, DDT, PCBs, PAHs, pyrethroids, and OP pesticides. For sediment toxicity testing, only an acute toxicity test using the amphipod *Eohaustorius estuarius* must be performed.

   c. A quantitative survey of intertidal benthic marine life shall be performed at the discharge and at a reference site. The survey shall be performed at least once every five (5) year period. The survey design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The results of the survey shall be

completed and submitted to the State Water Board and Regional Water Board at least six months prior to the end of the permit cycle.

d. Once during each five (5) year period, a bioaccumulation study shall be conducted to determine the concentrations of metals and synthetic organic pollutants at representative discharge sites and at representative reference sites. The study design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The bioaccumulation study may include California mussels (*Mytilus californianus*) and/or sand crabs (*Emerita analoga* or *Blepharipoda occidentalis*). Based on the study results, the Regional Water Board and the State Water Board's Division of Water Quality, may adjust the study design in subsequent permits, or add or modify additional test organisms (such as shore crabs or fish), or modify the study design appropriate for the area and best available sensitive measures of contaminant exposure.

e. Marine Debris: Representative quantitative observations for trash by type and source shall be performed along the coast of the ASBS within the influence of the discharger's outfalls. The design, including locations and frequency, of the marine debris observations is subject to approval by the Regional Water Board and State Water Board's Division of Water Quality.

f. The monitoring requirements of the Individual Monitoring Program in this section are minimum requirements. After a minimum of one (1) year of continuous water quality monitoring of the discharges and ocean receiving waters, the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may require additional monitoring, or adjust, reduce or suspend receiving water and reference station monitoring. This determination may be made at any point after the discharge and receiving water is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

2. Regional Integrated Monitoring Program: Dischargers may elect to participate in a regional integrated monitoring program, in lieu of an individual monitoring program, to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS. This regional approach shall characterize natural water quality, pre- and post-storm, in ocean reference areas near the mouths of identified open space watersheds and the effects of the discharges on natural water quality (physical, chemical, and toxicity) in the ASBS receiving waters, and should include benthic marine aquatic life and bioaccumulation components. The design of the ASBS stratum of a regional integrated monitoring program may deviate from the otherwise prescribed individual monitoring approach (in Section IV.B.1) if approved by the State Water Board's Division of Water Quality and the Regional Water Boards.

a. Ocean reference areas shall be located at the drainages of flowing watersheds with minimal development (in no instance more than 10% development), and shall not be located in CWA Section 303(d) listed waterbodies or have tributaries that are 303(d) listed. Reference areas shall be free of wastewater discharges and anthropogenic non- storm water runoff. A minimum of low threat storm runoff discharges (e.g. stream highway overpasses and campgrounds) may be allowed on a case-by-case basis. Reference areas shall be located in the same region as the ASBS receiving water monitoring occurs. The reference areas for each Region are subject to approval by the participants in the regional monitoring program and the State Water

Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean reference water samples must be collected from each station, each from a separate storm during the same storm season that receiving water is sampled. A minimum of one reference location shall be sampled for each ASBS receiving water site sampled per responsible party. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

b. ASBS ocean receiving water must be sampled in the surf zone at the location where the runoff makes contact with ocean water (i.e. at "point zero"). Ocean receiving water stations must be representative of worst-case discharge conditions (i.e. co-located at a large drain greater than 36 inches, or if drains greater than 36 inches are not present in the ASBS then the largest drain greater than18 inches.) Ocean receiving water stations are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean receiving water samples must be collected during each storm season from each station, each from a separate storm. A minimum of one receiving water location shall be sampled in each ASBS per responsible party in that ASBS. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

c. Reference and receiving water sampling shall commence during the first full storm season following the adoption of these special conditions, and post-storm samples shall be collected during the same storm event when storm water runoff is sampled. Sampling shall occur in a minimum of two storm seasons. For those ASBS dischargers that have already participated in the Southern California Bight 2008 ASBS regional monitoring effort, sampling may be limited to only one storm season.

d. Receiving water and reference samples shall be analyzed for the same constituents as storm water runoff samples. At a minimum, constituents to be sampled and analyzed in reference and discharge receiving waters must include oil and grease, total suspended solids, Ocean Plan Table B metals for protection of marine life, Ocean Plan PAHs, pyrethroids, OP pesticides, ammonia, nitrate, phosphates, and critical life stage chronic toxicity for three species. In addition, within the range of the southern sea otter, indicator bacteria or some other measure of fecal contamination shall be analyzed.

3. Waterfront and Marine Operations: In addition to the above requirements for ocean receiving water monitoring, additional monitoring must be performed for marinas and boat launch and pier facilities:

a. For all marina or mooring field operators, in mooring fields with 10 or more occupied moorings, the ocean receiving water must be sampled for Ocean Plan indicator bacteria, residual chlorine, copper, zinc, grease and oil, methylene blue active substances (MBAS), and ammonia nitrogen.

(1) For mooring field operators opting for an individual monitoring program (Section IV.B.1 above), this sampling must occur weekly (on the weekend) from May through October.

(2) For mooring field operators opting to participate in a regional integrated monitoring program (Section IV.B.2 above), this sampling must occur monthly from May through October on a high use weekend in each month. The Water Boards may allow a reduction in the frequency of sampling, through the regional monitoring program, after the first year of monitoring.

b. For all mooring field operators, the subtidal sediment (sand or finer, if present) within mooring fields and below piers shall be sampled and analyzed for Ocean Plan Table B metals (for marine aquatic life beneficial use), acute toxicity, PAHs, and tributyltin. For sediment toxicity testing, only an acute toxicity test using the amphipod *Eohaustorius estuarius* must be performed. This sampling shall occur at least three times during a five (5) year period. For mooring field operators opting to participate in a regional integrated monitoring program, the Water Boards may allow a reduction in the frequency of sampling after the first sampling effort's results are assessed.

Glossary

At the point of discharge(s) – Means in the surf zone immediately where runoff from an outfall meets the ocean water (a.k.a., at point zero).

Areas of Special Biological Significance (ASBS) – Those areas designated by the State Water Board as ocean areas requiring protection of species or biological communities to the extent that alteration of natural water quality is undesirable. All Areas of Special Biological Significance are also classified as a subset of State Water Quality Protection Areas.

Design storm – For purposes of these Special Protections, a design storm is defined as the volume of runoff produced from one inch of precipitation per day or, if this definition is inconsistent with the discharger's applicable storm water permit, then the design storm shall be the definition included in the discharger's applicable storm water permit.

Development – Relevant to reference monitoring sites, means urban, industrial, agricultural, grazing, mining, and timber harvesting land uses.

Higher threat discharges - Permitted storm drains discharging equal to or greater than 18 inches, industrial storm drains, agricultural runoff discharged through an MS4, discharges associated with waterfront and marina operations (e.g., piers, launch ramps, mooring fields, and associated vessel support activities, except for passive discharges defined below), and direct discharges associated with commercial or industrial activities to ASBS.

Low Impact Development (LID) – A sustainable practice that benefits water supply and contributes to water quality protection. Unlike traditional storm water management, which entails collecting and conveying storm water runoff through storm drains, pipes, or other conveyances to a centralized storm water facility, LID focuses on using site design and storm water management to maintain the site's pre-development runoff rates and volumes. The goal of LID is to mimic a site's predevelopment hydrology by using design techniques that infiltrate, filter, store, evaporate, and detain runoff close to the source of rainfall.

Marine Operations – Marinas or mooring fields that contain slips or mooring locations for 10 or more vessels.

Management Measure (MM) - Economically achievable measures for the control of the addition of pollutants from various classes of nonpoint sources of pollution, which reflect the greatest degree of pollutant reduction achievable through the application of the best available nonpoint pollution control practices, technologies, processes, siting criteria, operating methods, or other alternatives. For example, in the "marinas and recreational boating" land- use category specified in the Plan for California's Nonpoint Source Pollution Control Program (NPS Program Plan) (SWRCB, 1999), "boat cleaning and maintenance" is considered a MM or the source of a specific class or type of NPS pollution.

Management Practice (MP) - The practices (e.g., structural, non-structural, operational, or other alternatives) that can be used either individually or in combination to address a specific MM class or classes of NPS pollution. For example, for the "boat cleaning and maintenance" MM, specific MPs can include, but are not limited to, methods for the selection of environmentally sensitive hull paints or methods for cleaning/removal of hull copper anti- fouling paints.

Municipal Separate Storm Sewer System (MS4) – A municipally-owned storm sewer system regulated under the Phase I or Phase II storm water program implemented in compliance with Clean Water Act section 402(p). Note that an MS4 program's boundaries are not necessarily congruent with the permittee's political boundaries.

Natural Ocean Water Quality - The water quality (based on selected physical, chemical and biological characteristics) that is required to sustain marine ecosystems, and which is without apparent human influence, *i.e.*, an absence of significant amounts of: (a) man-made constituents (*e.g.,* DDT); (b) other chemical (*e.g.,* trace metals), physical (temperature/thermal pollution, sediment burial), and biological (*e.g.*, bacteria) constituents at concentrations that have been elevated due to man's activities above those resulting from the naturally occurring processes that affect the area in question; and (c) non-indigenous biota (*e.g.,* invasive algal bloom species) that have been introduced either deliberately or accidentally by man. Discharges "*shall not alter natural ocean water quality*" as determined by a comparison to the range of constituent concentrations in reference areas agreed upon via the regional monitoring program(s). If monitoring information indicates that *natural ocean water quality* is not maintained, but there is sufficient evidence that a discharge is not contributing to the alteration of natural water quality, then the Regional Water Board may make that determination. In this case, sufficient information must include runoff sample data that has equal or lower concentrations for the range of constituents at the applicable reference area(s).

Nonpoint source – Nonpoint pollution sources generally are sources that do not meet the definition of a point source. Nonpoint source pollution typically results from land runoff, precipitation, atmospheric deposition, agricultural drainage, marine/boating operations or hydrologic modification. Nonpoint sources, for purposes of these Special Protections, include discharges that are not required to be regulated under an NPDES permit.

Non-storm water discharge – Any runoff that is not the result of a precipitation event. This is often referred to as "dry weather flow."

Non-structural control – A Best Management Practice that involves operational, maintenance, regulatory (e.g., ordinances) or educational activities designed to reduce or eliminate pollutants in runoff, and that are not structural controls (i.e. there are no physical structures involved).

Physical impossibility - Means any act of God, war, fire, earthquake, windstorm, flood or natural catastrophe; unexpected and unintended accidents not caused by discharger or its employees' negligence; civil disturbance, vandalism, sabotage or terrorism; restrain by court order or public authority or agency; or action or non-action by, or inability to

obtain the necessary authorizations or approvals from any governmental agency other than the permittee.

Representative sites and monitoring procedures – Are to be proposed by the discharger, with appropriate rationale, and subject to approval by Water Board staff.

Sheet-flow – Runoff that flows across land surfaces at a shallow depth relative to the cross- sectional width of the flow. These types of flow may or may not enter a storm drain system before discharge to receiving waters.

Storm Season – Also referred to as rainy season, means the months of the year from the onset of rainfall during autumn until the cessation of rainfall in the spring.

Structural control – A Best Management Practice that involves the installation of engineering solutions to the physical treatment or infiltration of runoff.

Surf Zone - The surf zone is defined as the submerged area between the breaking waves and the shoreline at any one time.

Surface Water Ambient Monitoring Program (SWAMP) comparable – Means that the monitoring program must 1) meet or exceed 2008 SWAMP Quality Assurance Program Management Plan (QAPP) Measurement Quality Objectives, or 2) have a Quality Assurance Project Plan that has been approved by SWAMP; in addition data must be formatted to match the database requirements of the SWAMP Information Management System. Adherence to the measurement quality objectives in the Southern California Bight 2008 ASBS Regional Monitoring Program QAPP and data base management comprises being SWAMP comparable.

Waterfront Operations - Piers, launch ramps, and cleaning stations in the water or on the adjacent shoreline.

Attachment 1
Special Protections Sections I(A)(3)(e) and I(B)(3)(e)
Flowchart to Determine Compliance with natural Water Quality

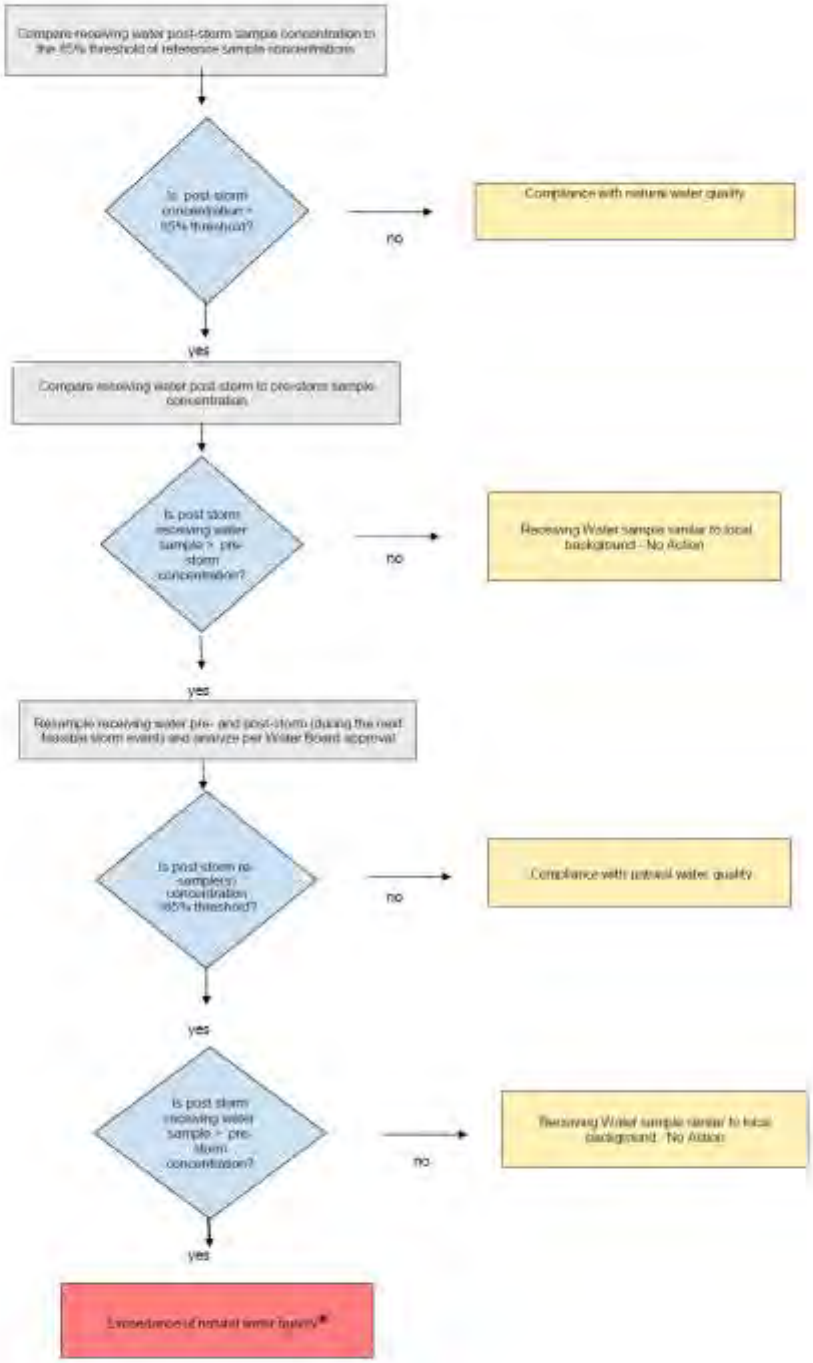

*** When an exceedance of natural water quality occurs, the discharger must comply with section I.A.2.h (for permitted storm water) or section I.B.2.c (for nonpoint sources). Note, when sampling data is available, end-of-pipe effluent concentrations will be considered by the Water Boards in making this determination.**

ATTACHMENT B

STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

1. Standard Permit Provisions

Code of Federal Regulations Title 40 Section 122.41 (40 CFR 122.41) includes conditions, or provisions, that apply to all National Pollutant Discharge Elimination System (NPDES) permits. Additional provisions applicable to NPDES permits are in 40 CFR 122.42. All applicable provisions in 40 CFR 122.41 and 40 CFR 122.42 must be incorporated into this Order and NPDES permit. The applicable 40 CFR 122.41 and 40 CFR 122.42 provisions are as follows:

a. DUTY TO COMPLY [40 CFR 122.41(a)]

The Copermittee must comply with all of the provisions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

(1) The Copermittee must comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement. [40 CFR 122.41(a)(1)]

(2) The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to a civil penalty not to exceed $25,000 per day for each violation. The CWA provides that any person who *negligently* violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than 2 years, or both. Any person who *knowingly* violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both. Any person who knowingly violates Section 301, 302, 303, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, and who knows at that time that he thereby places another person in imminent

danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.
[40 CFR 122.41(a)(2)]

(3) Any person may be assessed an administrative penalty by the San Diego Regional Water Quality Control Board (San Diego Water Board), State Water Resources Control Board (State Water Board), or United States Environmental Protection Agency (USEPA) for violating Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.
[40 CFR 122.41(a)(3)]

b. DUTY TO REAPPLY [40 CFR 122.41(b)]

If a Copermittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Copermittee must apply for and obtain a new permit.

c. NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE [40 CFR 122.41(c)]

It shall not be a defense for a Copermittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

d. DUTY TO MITIGATE [40 CFR 122.41(d)]

The Copermittee must take all reasonable steps to minimize or prevent any discharge or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

e. PROPER OPERATION AND MAINTENANCE [40 CFR 122.41(e)]

The Copermittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Copermittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by a Copermittee only when the operation is necessary to achieve compliance with the conditions of this permit.

f. PERMIT ACTIONS [40 CFR 122.41(f)]

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Copermittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

g. PROPERTY RIGHTS [40 CFR 122.41(g)]

This permit does not convey any property rights of any sort, or any exclusive privilege.

h. DUTY TO PROVIDE INFORMATION [40 CFR 122.41(h)]

The Copermittee must furnish to the San Diego Water Board, State Water Board, or USEPA within a reasonable time, any information which the San Diego Water Board, State Water Board, or USPEA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Copermittee must also furnish to the San Diego Water Board, State Water Board, or USPEA upon request, copies of records required to be kept by this permit.

i. INSPECTION AND ENTRY [40 CFR 122.41(i)]

The Copermittee must allow the San Diego Water Board, State Water Board, USEPA, and/or their authorized representative (including an authorized contractor acting as their representative), upon presentation of credentials and other documents as may be required by law, to:

(1) Enter upon the Copermittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit; [40 CFR 122.41(i)(1)]

(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit; [40 CFR 122.41(i)(2)]

(3) Inspect and photograph at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; [40 CFR 122.41(i)(3)] and

(4) Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location. [40 CFR 122.41(i)(4)]

j. MONITORING AND RECORDS [40 CFR 122.41(j)]

(1) Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity. [40 CFR 122.41(j)(1)]

(2) Except for records of monitoring information required by this permit related to the Copermittee's sewage sludge use and disposal activities, which shall be retained for

a period of at least five (5) years (or longer as required by 40 CFR Part 503), the Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time. [40 CFR 122.41(j)(2)]

(3) Records for monitoring information must include: [40 CFR 122.41(j)(3)]

(a) The date, exact place, and time of sampling or measurements; [40 CFR 122.41(j)(3)(i)]
(b) The individual(s) who performed the sampling or measurements; [40 CFR 122.41(j)(3)(ii)]
(c) The date(s) analyses were performed; [40 CFR 122.41(j)(3)(iii)]
(d) The individual(s) who performed the analyses; [40 CFR 122.41(j)(3)(iv)]
(e) The analytical techniques or methods used; [40 CFR 122.41(j)(3)(v)] and
(f) The results of such analyses. [40 CFR 122.41(j)(3)(vi)]

(4) Monitoring must be conducted according to test procedures under 40 CFR Part 136 unless another method is required under 40 CFR Subchapters N or O. [40 CFR 122.41(j)(4)]

In the case of pollutants for which there are no approved methods under 40 CFR Part 136 or otherwise required under 40 CFR Subchapters N and O, monitoring must be conducted according to a test procedure specified in the permit for such pollutants. [40 CFR 122.44(i)(1)(iv)]

(5) The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. [40 CFR 122.41(j)(5)]

k. SIGNATORY REQUIREMENT [40 CFR 122.41(k)]

(1) All applications, reports, or information submitted to the San Diego Water Board, State Water Board, or USEPA must be signed and certified. (See 40 CFR 122.22) [40 CFR 122.41(k)(1)]

(a) *For a municipality, State, Federal, or other public agency.* [All applications must be signed] by either a principal executive officer or ranking elected official. [40 CFR 122.22(a)(3)]

(b) All reports required by permits, and other information requested by the San Diego Water Board, State Water Board, or USEPA must be signed by a person described in paragraph (a) of this section, or by a duly authorized

representative of that person. A person is a duly authorized representative only if: [40 CFR 122.22(b)]

(i) The authorization is made in writing by a person described in paragraph (a) of this section; [40 CFR 122.22(b)(1)]
(ii) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company, (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) [40 CFR 122.22(b)(2)] and,
(iii) The written authorization is submitted to the San Diego Water Board and State Water Board. [40 CFR 122.22(b)(3)]

(c) *Changes to authorization.* If an authorization under paragraph (b) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (b) of this section must be submitted to the San Diego Water Board prior to or together with any reports, information, or applications to be signed by an authorized representative. [40 CFR 122.22(c)]

(d) *Certification.* Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." [40 CFR 122.22(d)]

(2) The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both. [40 CFR 122.41(k)(2)]

I. REPORTING REQUIREMENTS [40 CFR 122.41(l)]

(1) *Planned changes.* The Copermittee must give notice to the San Diego Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when: [40 CFR 122.41(l)(1)]

(a) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); [40 CFR 122.41(l)(1)(i)] or

(b) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1). [40 CFR 122.41(l)(1)(ii)]

(c) The alteration or addition results in a significant change in the Copermittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. [40 CFR 122.41(l)(1)(iii)]

(2) *Anticipated noncompliance*. The Copermittee must give advance notice to the San Diego Water Board or State Water Board of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements. [40 CFR 122.41(l)(2)]

(3) *Transfers*. This permit is not transferable to any person except after notice to the San Diego Water Board. The San Diego Water Board may require modification or revocation and reissuance of the permit to change the name of the Copermittee and incorporate such other requirements as may be necessary under the CWA. [40 CFR 122.41(l)(3)]

(4) *Monitoring reports.* Monitoring results must be reported at the intervals specified elsewhere in this permit. [40 CFR 122.41(l)(4)]

(a) Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the San Diego Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices. [40 CFR 122.41(l)(4)(i)]

(b) If the Copermittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or another method required for an industry-specific waste stream under 40 CFR Subchapters N or O, the results of this monitoring must be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the San Diego Water Board or State Water Board. [40 CFR 122.41(l)(4)(ii)]

(c) Calculations for all limitations which require averaging of measurements must utilize an arithmetic mean unless otherwise specified in the permit. [40 CFR 122.41(l)(4)(iii)]

(5) *Compliance schedules*. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date. [40 CFR 122.41(l)(5)]

(6) *Twenty-four hour reporting.*

(a) The Copermittee must report any noncompliance that may endanger health or the environment. Any information must be provided orally within 24 hours from the time the Copermittee becomes aware of the circumstances. A written submission must also be provided within five (5) days of the time the Copermittee becomes aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6)(i)]

(b) The following must be included as information which must be reported within 24 hours under this paragraph: [40 CFR 122.41(l)(6)(ii)]

(i) Any unanticipated bypass that exceeds any effluent limitation in the permit (See 40 CFR 122.41(g)). [40 CFR 122.41(l)(6)(ii)(A)]
(ii) Any upset which exceeds any effluent limitation in the permit. [40 CFR 122.41(l)(6)(ii)(B)] and,
(iii) Violation of a maximum daily discharge limitation for any of the pollutants listed by the San Diego Water Board in the permit to be reported within 24 hours. (See 40 CFR 122.44(g)) [40 CFR 122.41(l)(6)(ii)(C)]

(c) The San Diego Water Board may waive the above-required written report on a case-by-case basis if the oral report has been received within 24 hours. [40 CFR 122.41(l)(6)(iii)]

(7) *Other noncompliance.* The Copermittee must report all instances of noncompliance not reported in accordance with the standard provisions required under 40 CFR 122.41(l)(4), (5), and (6), at the time monitoring reports are submitted. The reports must contain the information listed in the standard provisions required under 40 CFR 122.41(l)(6). [40 CFR 122.41(l)(7))]

(8) *Other information.* When the Copermittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the San Diego Water Board, State Water Board, or USEPA, the Copermittee must promptly submit such facts or information. [40 CFR 122.41(l)(8)]

m. BYPASS [40 CFR 122.41(m)]

(1) *Definitions.*

(a) "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. [40 CFR 122.41(m)(1)(i)] or

(b) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or

substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
[40 CFR 122.41(m)(1)(ii)]

(2) *Bypass not exceeding limitations*. The Copermittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the standard provisions required under 40 CFR 122.41(m)(3) and (4).
[40 CFR 122.41(m)(2)]

(3) *Notice.*

(a) *Anticipated bypass*. If the Copermittee knows in advance of the need for a bypass, it must submit a notice, if possible at least ten days before the date of the bypass. [40 CFR 122.41(m)(3)(i)] or

(b) *Unanticipated bypass*. The Copermittee must submit notice of an unanticipated bypass in accordance with the standard provisions required under 40 CFR 122.41(l)(6) (24-hour notice).
[40 CFR 122.41(m)(3)(ii)]

(4) *Prohibition of Bypass.*

(a) Bypass is prohibited, and the San Diego Water Board may take enforcement action against a Copermittee for bypass, unless:
[40 CFR 122.41(m)(4)(i)]

(i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; [40 CFR 122.41(m)(4)(i)(A)]
(ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance;
[40 CFR 122.41(m)(4)(i)(B)] and,
(iii) The Copermittee submitted notice in accordance with the standard provisions required under 40 CFR 122.41(m)(3).
[40 CFR 122.41(m)(4)(i)(C)]

(b) The San Diego Water Board may approve an anticipated bypass, after considering its adverse effects, if the San Diego Water Board determines that it will meet the three conditions listed above.
[40 CFR 122.41(m)(4)(ii)]

n. UPSET [40 CFR 122.41(n)]

(1) *Definition.* "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because

of factors beyond the reasonable control of the Copermittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. [40 CFR 122.41(n)(1)]

(2) *Effect of an upset*. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the standard provisions required under 40 CFR 122.41(n)(3) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. [40 CFR 122.41(n)(2)]

(3) *Conditions necessary for a demonstration of upset*. A Copermittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that: [40 CFR 122.41(n)(3)]

(a) An upset occurred and that the Copermittee can identify the cause(s) of the upset; [40 CFR 122.41(n)(3)(i)]
(b) The permitted facility was at the time being properly operated; [40 CFR 122.41(n)(3)(ii)] and
(c) The Copermittee submitted notice of the upset in accordance with the standard provisions required under 40 CFR 122.41(l)(6)(ii)(B) (24-hour notice). [40 CFR 122.41(n)(3)(iii)]
(d) The Copermittee complied with any remedial measures pursuant to the standard provisions required under 40 CFR 122.41(d). [40 CFR 122.41(n)(3)(iii)]

(4) *Burden of proof*. In any enforcement proceeding, the Copermittee seeking to establish the occurrence of an upset has the burden of proof. [40 CFR 122.41(n)(4)]

o. STANDARD PERMIT PROVISIONS FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS [40 CFR 122.42(c)]

The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the San Diego Water Board or State Water Board under 40 CFR 122.26(a)(1)(v) must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report must include:

(1) The status of implementing the components of the storm water management program that are established as permit conditions; [40 CFR 122.42(c)(1)]

(2) Proposed changes to the storm water management programs that are established as permit conditions. Such proposed changes must be consistent with 40 CFR 122.26(d)(2)(iii); [40 CFR 122.42(c)(2)] and

(3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under 40 CFR 122.26(d)(2)(iv) and (v); [40 CFR 122.42(c)(3)]

(4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; [40 CFR 122.42(c)(4)]

(5) Annual expenditures and budget for year following each annual report; [40 CFR 122.42(c)(5)]

(6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; [40 CFR 122.42(c)(6)]

(7) Identification of water quality improvements or degradation. [40 CFR 122.42(c)(7)]

p. STANDARD PERMIT PROVISIONS FOR STORM WATER DISCHARGES [40 CFR 122.42(d)]

The initial permits for discharges composed entirely of storm water issued pursuant to 40 CFR 122.26(e)(7) must require compliance with the conditions of the permit as expeditiously as practicable, but in no event later than three years after the date of issuance of the permit.

2. General Provisions

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. The general provisions applicable to this Order and NPDES permit are as follows:

a. DISCHARGE OF WASTE IS A PRIVILEGE

No discharge of waste into the waters of the State, whether or not such discharge is made pursuant to waste discharge requirements, shall create a vested right to continue such discharge. All discharges of waste into waters of the State are privileges, not rights. [CWC Section 13263(g)]

b. DURATION OF ORDER AND NPDES PERMIT

(1) *Effective date*. This Order supersedes Order No. R9-2007-0001 for the San Diego County Copermittees listed in Table 1a and became effective on June 27, 2013. This Order as amended by Order R9-2015-0001 supersedes Order No. R9-2009-0002 for the Orange County Copermittees listed in Table 1b and its amendments through Order No. R9-2015-0001 became effective April 1, 2015. This Order as amended by Order Nos. R9-2015-0001 and R9-2015-0100 supersedes Order No. R9-2010-0016 for the Riverside County Copermittees listed in Table 1c and its amendments through Order No. R9-2015-0100 became effective January 7, 2016.

(2) *Expiration*. This Order and NPDES permit expires five years after June 27, 2013, its initial effective date. [40 CFR 122.46(a)]

(3) *Continuation of expired order*. After this Order and NPDES permit expires, the terms and conditions of this Order and NPDES permit are automatically continued pending issuance of a new permit if all requirements of the federal NPDES regulations on the continuation of expired permits (40 CFR 122.6) are complied with.

c. AVAILABILITY

A copy of this Order must be kept at a readily accessible location and must be available to on-site personnel at all times.

d. CONFIDENTIALITY OF INFORMATION

Except as provided for in 40 CFR 122.7, no information or documents submitted in accordance with or in application for this Order will be considered confidential, and all such information and documents shall be available for review by the public at the San Diego Water Board office.

Claims of confidentiality for the following information will be denied: [40 CFR 122.7(b)]

(1) The name and address of any permit applicant or Copermittee; [40 CFR 122.7(b)(1)] and

(2) Permit applications and attachments, permits, and effluent data. [40 CFR 122.7(b)(2)]

e. EFFLUENT LIMITATIONS

(1) *Interim effluent limitations*. The Copermittee must comply with any interim effluent limitations as established by addendum, enforcement action, or revised waste discharge requirements which have been, or may be, adopted by the San Diego Water Board.

(2) *Other effluent limitations and standards*. If any applicable toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant and that standard or prohibition is more stringent than any limitation on the pollutant in the permit, the San Diego Water Board shall institute proceedings under these regulations to modify or revoke and reissue the permit to conform to the toxic effluent standard or prohibition. [40 CFR 122.44(b)(1)]

f. DUTY TO MINIMIZE OR CORRECT ADVERSE IMPACTS

The Copermittee must take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this Order, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the noncompliance.

g. PERMIT ACTIONS

The filing of a request by the Copermittee for modification, revocation and reissuance, or termination of this Order, or a notification of planned change in or anticipated noncompliance with this Order does not stay any condition of this Order. (See 40 CFR 122.41(f)) In addition, the following provisions apply to this Order:

(1) Upon application by any affected person, or on its own motion, the San Diego Water Board may review and revise the requirements in this Order. All requirements must be reviewed periodically. [CWC Section 13263(e)]

(2) This Order may be terminated or modified for cause, including, but not limited to, all of the following: [CWC Section 13381]

(a) Violation of any condition contained in the requirements of this Order. [CWC Section 13381(a)]

(b) Obtaining the requirements in this Order by misrepresentation, or failure to disclose fully all relevant facts. [CWC Section 13381(b)]

(c) A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge. [CWC Section 13381(c)]

(3) When this Order is transferred to a new owner or operator, such requirements as may be necessary under the CWC may be incorporated into this Order.

h. NPDES Permitted Non-Storm Water Discharges

The San Diego Water Board has, in prior years, issued a limited number of individual NPDES permits for non-storm water discharges to MS4s. The San Diego Water Board or State Water Board may in the future, upon prior notice to the Copermittee(s), issue an NPDES permit for any non-storm water discharge (or class of non-storm water discharges) to an MS4.

i. Monitoring

In addition to the standard provisions required under 40 CFR 122.41(j) and (l)(4), the following general monitoring provisions apply to this Order:

(1) Where procedures are not otherwise specified in Order, sampling, analysis and quality assurance/quality control must be conducted in accordance with the Quality Assurance Management Plan (QAMP) for the State of California's Surface Water Ambient Monitoring Program (SWAMP), adopted by the State Water Resources Control Board (State Water Board).

(2) Pursuant to 40 CFR 122.41(j)(2) and CWC Section 13383(a), each Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five (5) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time.

(3) All chemical, bacteriological, and toxicity analyses must be conducted at a laboratory certified for such analyses by the California Department of Public Health or a laboratory approved by the San Diego Water Board.

(4) For priority toxic pollutants that are identified in the California Toxics Rule (CTR) (65 Fed. Reg. 31682), the Copermittees must instruct their laboratories to establish calibration standards that are equivalent to or lower than the Minimum Levels (MLs) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP). If a Copermittee can demonstrate that a particular ML is not attainable, in accordance with procedures set forth in 40 CFR Part 136, the lowest quantifiable concentration of the lowest calibration standard analyzed by a specific analytical procedure (assuming that all the method specified sample weights, volumes, and processing steps have been followed) may be used instead of the ML listed in Appendix 4 of the SIP. The Copermittee must submit documentation from the laboratory to the San Diego Water Board for approval prior to raising the ML for any priority toxic pollutant.

j. ENFORCEMENT

(1) The San Diego Water Board is authorized to enforce the terms of this Order under several provisions of the CWC, including, but not limited to, CWC Sections 13385, 13386, and 13387.

(2) Nothing in this Order shall be construed to protect the Copermittee from its liabilities under federal, state, or local laws.

(3) The CWC provides for civil and criminal penalties comparable to, and in some cases greater than, those provided for under the CWA.

(4) Except as provided in the standard conditions required under 40 CFR 122.41(m) and (n), nothing in this Order shall be construed to relieve the Copermittee from civil or criminal penalties for noncompliance.

(5) Nothing in this Order shall be construed to preclude the institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties to which the Copermittee is or may be subject to under Section 311 of the CWA.

(6) Nothing in this Order shall be construed to preclude institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authoring preserved by Section 510 of the CWA.

k. SEVERABILITY

The provisions of this Order are severable, and if any provision of this Order, or the application of any provisions of this Order to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this Order shall not be affected thereby.

l. APPLICATIONS

Any application submitted by a Copermittee for reissuance or modification of this Order must satisfy all applicable requirements specified in federal regulations as well as any additional requirements for submittal of a Report of Waste Discharge specified in the CWC and the California Code of Regulations.

m. IMPLEMENTATION

All plans, reports and subsequent amendments submitted in compliance with this Order must be implemented immediately (or as otherwise specified). All submittals by Copermittees must be adequate to implement the requirements of this Order.

n. REPORT SUBMITTALS

(1) All report submittals must include an executive summary, introduction, conclusion, recommendations, and signed certified statement.

(2) Each Copermittee must submit a signed certified statement covering its responsibilities for each applicable submittal.

(3) The Principal Watershed Copermittee(s) must submit a signed certified statement covering its responsibilities for each applicable submittal and the sections of the submittals for which it is responsible.

(4) Unless otherwise directed, the Copermittees must submit one electronic copy of each report required under this Order to the San Diego Water Board at SanDiego@waterboards.ca.gov.

(5) When hard copies are requested or required, the Copermittees must submit reports and provide notifications as required by this Order to:

EXECUTIVE OFFICER
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
2375 NORTHSIDE DRIVE, SUITE 100
SAN DIEGO CA 92108
Telephone: (619) 516-1990 Fax: (619) 516-1994

ATTACHMENT C

ACRONYMS AND ABBREVIATIONS

AMAL	Average Monthly Action Level
ASBS	Area(s) of Special Biological Significance
BMP	Best Management Practice
Basin Plan	Water Quality Control Plan for the San Diego Basin
CEQA	California Environmental Quality Act
CCR	California Code of Regulations
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWC	California Water Code
CZARA	Coastal Zone Act Reauthorization Amendments of 1990
ESAs	Environmentally Sensitive Areas
GIS	Geographic Information System
IBI	Index of Biological Integrity
LID	Low Impact Development
MDAL	Maximum Daily Action Level
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
NAL	Non-Storm Water Action Level
NAICS	North American Industry Classification System
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
ROWD	Report of Waste Discharge (application for NPDES reissuance)
SAL	Storm Water Action Level
San Diego Water Board	California Regional Water Quality Control Board, San Diego Region
SIC	Standard Industrial Classification Code
State Water Board	State Water Resources Control Board
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
WDID	Waste Discharge Identification Number
WLA	Waste Load Allocation
WQBEL	Water Quality Based Effluent Limitation

DEFINITIONS

Active/Passive Sediment Treatment - Using mechanical, electrical or chemical means to flocculate or coagulate suspended sediment for removal from runoff from construction sites prior to discharge.

Anthropogenic Litter – Trash generated from human activities, not including sediment.

Average Monthly Action Level – The highest allowable average of daily discharges over a calendar month.

Beneficial Uses - The uses of water necessary for the survival or wellbeing of man, plants, and wildlife. These uses of water serve to promote tangible and intangible economic, social, and environmental goals. "Beneficial Uses" of the waters of the State that may be protected include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. Existing beneficial uses are uses that were attained in the surface or ground water on or after November 28, 1975; and potential beneficial uses are uses that would probably develop in future years through the implementation of various control measures. "Beneficial Uses" are equivalent to "Designated Uses" under federal law. [California Water Code Section 13050(f)].

Best Management Practices (BMPs) - Defined in 40 CFR 122.2 as schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Bioassessment - The use of biological community information to evaluate the biological integrity of a water body and its watershed. With respect to aquatic ecosystems, bioassessment is the collection and analysis of samples of the benthic macroinvertebrate community together with physical/habitat quality measurements associated with the sampling site and the watershed to evaluate the biological condition (i.e. biotic integrity) of a water body.

Biofiltration - Practices that use vegetation and amended soils to detain and treat runoff from impervious areas. Treatment is through filtration, infiltration, adsorption, ion exchange, and biological uptake of pollutants.

Biological Integrity - Defined in Karr J.R. and D.R. Dudley. 1981. Ecological perspective on water quality goals. *Environmental Management* 5:55-68 as: "A balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitat of the region." Also referred to as ecosystem health.

BMP Design Manual – A plan developed to eliminate, reduce, or mitigate the impacts of runoff from development projects, including Priority Development Projects.

Chronic Toxicity – A measurement of sublethal effect (e.g. reduced growth, reproduction) to experimental test organisms exposed to an effluent or receiving waters compared to that of the control organisms.

Clean Water Act Section 303(d) Water Body - An impaired water body in which water quality does not meet applicable water quality standards and/or is not expected to meet water quality standards, even after the application of technology based pollution controls required by the CWA. The discharge of runoff to these water bodies by the Copermittees is significant because these discharges can cause or contribute to violations of applicable water quality standards.

Construction Activities – Actions implemented during construction of development or redevelopment projects during the Preliminary Task (including rough grading and/or disking, clearing and grubbing operations, or any soil disturbance prior to mass grading), Grading or Land Development (including topography and slope reconfiguration, alluvium removals, canyon cleanouts, rock undercuts, keyway excavations, land form grading, and stockpiling of select material for capping operations), Streets and Utility Installation (including excavation and street paving, lot grading, curbs, gutters and sidewalks, public utilities, public water facilities including fire hydrants, public sanitary sewer systems, storm sewer systems and/or other drainage improvements), or Vertical Construction (including the build out of structures from foundations to roofing, including rough landscaping).

Construction Site – Any project, including projects requiring coverage under the Construction General Permit, that involves soil disturbing activities including, but not limited to, clearing, grading, disturbances to ground such as stockpiling, and excavation.

Contamination - As defined in the Porter-Cologne Water Quality Control Act, contamination is "an impairment of the quality of waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste whether or not waters of the State are affected."

Copermittee – A permittee to a NPDES permit that is only responsible for permit conditions relating to the discharge for which it is operator [40 CFR 122.26(b)(1)]. For the purposes of this Order, a Copermittee is one of the individual permittees identified in Tables 1a-1c of this Order.

Copermittees – All of the individual Copermittees, collectively.

Critical Channel Flow (Qc) – The channel flow that produces the critical shear stress that initiates bed movement or that erodes the toe of channel banks. When measuring Qc, it should be based on the weakest boundary material – either bed or bank.

Daily Discharge – Defined as either: (1) the total mass of the constituent discharged over the calendar day or any 24 hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g. concentration.)

The Daily Discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day, or other 24 hour period other than a day), or by the arithmetic mean of analytical results from one or more grab samples taken over the course of a day.

Development Projects - Construction, rehabilitation, redevelopment, or reconstruction of any public or private projects.

Dry Season –May 1 to September 30.

Dry Weather – Weather is considered dry if the preceding 72 hours has been without measurable precipitation (>0.1 inch).

Enclosed Bays – Enclosed bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost bay works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays do not include inland surface waters or ocean waters.

Erosion – When land is diminished or worn away due to wind, water, or glacial ice. Often the eroded debris (silt or sediment) becomes a pollutant via storm water runoff. Erosion occurs naturally but can be intensified by land clearing activities such as farming, development, road building, and timber harvesting.

Environmentally Sensitive Areas (ESAs) - Areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; areas designated as preserves or their equivalent under the Natural Communities Conservation Program within the Cities and County of Orange; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.

Estuaries – Waters, including coastal lagoons, located at the mouth of streams that serve as areas of mixing fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and ocean water. Estuaries do not include inland surface waters or ocean waters.

Existing Development – Any area that has been developed and exists for municipal, commercial, industrial, or residential purposes, uses, or activities. May include areas that are not actively used for its originally developed purpose, but may be re-purposed or redeveloped for another use or activity.

Flow Duration – The long-term period of time that flows occur above a threshold that causes significant sediment transport and may cause excessive erosion damage to creeks and streams (not a single storm event duration). The simplest way to visualize this is to consider a histogram of pre- and post-project flows using long-term records of hourly data. To maintain pre-development flow duration means that the total number of hours (counts) within each range of flows in a flow-duration histogram cannot increase between the pre- and post-development condition. Flow duration within the range of geomorphologically significant flows is important for managing erosion.

Grading - The cutting and/or filling of the land surface to a desired slope or elevation.

Groundwater – Subsurface water that occurs beneath the water table in soils and geologic formations that are fully saturated.

Hazardous Material – Any substance that poses a threat to human health or the environment due to its toxicity, corrosiveness, ignitability, explosive nature or chemical reactivity. These also include materials named by the USEPA in 40 CFR 116 to be reported if a designated quantity of the material is spilled into the waters of the U.S. or emitted into the environment.

Hazardous Waste - Hazardous waste is defined as "any waste which, under Section 600 of Title 22 of this code, is required to be managed according to Chapter 30 of Division 4.5 of Title 22 of this code" [CCR Title 22, Division 4.5, Chapter 11, Article 1].

Household Hazardous Waste – Paints, cleaning products, and other hazardous wastes generated during home improvement or maintenance activities.

Hydromodification – The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

Illicit Connection – Any man-made conveyance or drainage system through which a non-storm water discharge to the storm water drainage system occurs or may occur. Any connection to the MS4 that conveys an illicit discharge.

Illicit Discharge - Any discharge to the MS4 that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from firefighting activities [40 CFR 122.26(b)(2)].

Inactive Areas – Areas of construction activity that are not active and those that have been active and are not scheduled to be re-disturbed for at least 14 days.

Infiltration – In the context of low impact development, infiltration is defined as the percolation of water into the ground. Infiltration is often expressed as a rate (inches per hour), which is determined through an infiltration test. In the context of non-storm water, infiltration is water other than wastewater that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow [40 CFR 35.2005(20)].

Inland Surface Waters – Includes all surface waters of the State that do not include the ocean, enclosed bays, or estuaries.

Jurisdictional Runoff Management Program Document – A written description of the specific jurisdictional runoff management measures and programs that each Copermittee will implement to comply with this Order and ensure that storm water pollutant discharges in runoff are reduced to the MEP and do not cause or contribute to a violation of water quality standards.

Low Impact Development (LID) – A storm water management and land development strategy that emphasizes conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions.

Low Impact Development Best Management Practices (LID BMPs) – LID BMPs include schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States through storm water management and land development strategies that emphasize conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions. LID BMPs include retention practices that do not allow runoff, such as infiltration, rain water harvesting and reuse, and evapotranspiration. LID BMPs also include flow-through practices such as biofiltration that may have some discharge of storm water following pollutant reduction.

Major Outfall – As defined in the Code of Federal Regulations, a major outfall is a MS4 outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (i.e. discharge from a single conveyance other than a circular pipe which is associated with a drainage area of more than 50 acres); or, for MS4s that receive storm water from lands zoned for industrial activity (based on comprehensive zoning plans or equivalent), a MS4 outfall that discharges from a single pipe with an inside diameter of 12 inches or more or from its equivalent (i.e. discharge from other than a circular pipe associated with a drainage area of 2 acres or more).

Maximum Daily Action Level (MDAL) –The highest allowable daily discharge of a pollutant, over a calendar day (or 24 hour period). For pollutants with action levels expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with action levels expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

Maximum Extent Practicable (MEP) – The technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) for storm water that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) in combination with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than BAT. A definition for MEP is not provided either in the statute or in the regulations. Instead the definition of MEP is dynamic and will be defined by the following process over time: municipalities propose their definition of MEP by way of their runoff management programs. Their total collective and individual activities conducted pursuant to the runoff management programs becomes their proposal for MEP as it applies both to their overall effort, as well as to specific activities (e.g., MEP for street sweeping, or MEP for MS4 maintenance). In the absence of a proposal acceptable to the San Diego Water Board, the San Diego Water Board defines MEP.

In a memo dated February 11, 1993, entitled "Definition of Maximum Extent Practicable," Elizabeth Jennings, Senior Staff Counsel, SWRCB addressed the achievement of the MEP standard as follows:

"*To achieve the MEP standard, municipalities must employ whatever Best Management Practices (BMPs) are technically feasible (i.e., are likely to be effective) and are not cost prohibitive. The major emphasis is on technical feasibility. Reducing pollutants to the MEP means choosing effective BMPs, and rejecting applicable BMPs only where other effective BMPs will serve the same purpose, or the BMPs would not be technically feasible, or the cost would be prohibitive. In selecting BMPs to achieve the MEP standard, the following factors may be useful to consider:*

a. *Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?*
b. *Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?*
c. *Public Acceptance: Does the BMP have public support?*
d. *Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?*
e. *Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc.?*

The final determination regarding whether a municipality has reduced pollutants to the maximum extent practicable can only be made by the Regional or State Water Boards, and not by the municipal discharger. If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit derived, it would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs that would address a pollutant source, or to pick a BMP based solely on cost, which would be clearly less effective. In selecting BMPs the municipality must make a serious attempt to comply and practical solutions may not be lightly rejected. In any case, the burden would be on the municipal discharger to show compliance with its permit. After selecting a menu of BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented."

Monitoring Year – October 1 to September 30

Municipal Separate Storm Sewer System (MS4) – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designated or used for collecting or conveying storm water; (iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.26.

National Pollutant Discharge Elimination System (NPDES) - The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the CWA.

Non-Storm Water - All discharges to and from a MS4 that do not originate from precipitation events (i.e., all discharges from a MS4 other than storm water). Non-storm water includes illicit discharges and NPDES permitted discharges.

Nuisance - As defined in the Porter-Cologne Water Quality Control Act, a nuisance is "anything which meets all of the following requirements: 1) Is injurious to health, or is indecent, or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. 2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. 3) Occurs during, or as a result of, the treatment or disposal of wastes."

Ocean Waters – The territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the State Board's California Ocean Plan.

Order – Unless otherwise specified, refers to this Order, Order No. R9-2013-0001 (NPDES No. CAS0109266)

Outfall - Outfall means a point source as defined by 40 CFR 122.2 at the point where a municipal separate storm sewer discharges to waters of the US and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels or other conveyances which connect segments of the same stream or other waters of the US and are used to convey waters of the US.

Persistent Flow - Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

Person - A person is defined as an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof [40 CFR 122.2].

Point Source - Any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, landfill leachate collection systems, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

Pollutant - Any agent that may cause or contribute to the degradation of water quality such that a condition of pollution or contamination is created or aggravated.

Pollution - As defined in the Porter-Cologne Water Quality Control Act, pollution is "the alteration of the quality of the waters of the State by waste, to a degree which unreasonably affects either of the following: 1) The waters for beneficial uses; or 2) Facilities that serve these beneficial uses." Pollution may include contamination.

Pollution Prevention - Pollution prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control BMPs, treatment control BMPs, or disposal.

Pre-Development Runoff Conditions – Approximate flow rates and durations that exist or existed onsite before land development occurs. For new development projects, this equates to runoff conditions immediately before project construction. For redevelopment projects, this equates to runoff conditions from the project footprint assuming infiltration characteristics of the underlying soil, and existing grade. Runoff coefficients of concrete or asphalt must not be used. A redevelopment Priority Development Project must use available information pertaining to existing underlying soil type and onsite existing grade to estimate pre-development runoff conditions.

Priority Development Projects - New development and redevelopment projects defined under Provision E.3.b of Order No. R9-2013-0001, as amended by Order Nos. R9-2015-0001 and R9-2015-0100.

Rainy Season (aka Wet Season) –October 1 to April 30

Receiving Waters – Waters of the United States.

Receiving Water Limitations - Waste discharge requirements issued by the San Diego Water Board typically include both: (1) "Effluent Limitations" (or "Discharge Limitations") that specify the technology-based or water-quality-based effluent limitations; and (2) "Receiving Water Limitations" that specify the water quality objectives in the Basin Plan as well as any other limitations necessary to attain those objectives. In summary, the "Receiving Water Limitations" provision is the provision used to implement the requirements of CWA section 402(p)(3)(B).

Redevelopment - The creation and/or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure. Replacement of impervious surfaces includes any activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include routine maintenance activities, such as trenching and resurfacing associated with utility work; pavement grinding; resurfacing existing roadways, sidewalks, pedestrian ramps, or bike lanes on existing roads; and routine replacement of damaged pavement, such as pothole repair.

Regional Clearinghouse – A central location for the collection and distribution of information developed and maintained by the Copermittees including, but not limited to, plans, reports, manuals, data, contact information, and/or links to such documents and information.

Rehabilitation - Remedial measures or activities for the purpose of improving or restoring the beneficial uses of streams, channels or river systems. Techniques may vary from in-stream restoration techniques to off-line storm water management practices installed in the system corridor or upland areas, or a combination of in-stream and out of stream techniques. Rehabilitation techniques may include, but are not limited to the following: riparian zone restoration, constructed wetlands, channel modifications that improve habitat and stability, and daylighting of drainage systems.

Reporting Period – The period of information that is reported in the Water Quality Improvement Plan Annual Report. The reporting period consists of two components: 1) July 1 to June 30, consistent with the fiscal year, for the implementation of the jurisdictional runoff management programs, and 2) October 1 to September 30, consistent with the monitoring year for the monitoring and assessment programs. Together, these two time periods constitute the reporting year for the Water Quality Improvement Plan Annual Report due January 31 following the end of the monitoring year.

Retain – Keep or hold in a particular place, condition, or position without discharge to surface waters.

Retrofitting – Storm water management practice put into place after development has occurred in watersheds where the practices previously did not exist or are ineffective. Retrofitting of developed areas is intended to improve water quality, protect downstream channels, reduce flooding, or meet other specific objectives. Retrofitting developed areas may include, but is not limited to replacing roofs with green roofs, disconnecting downspouts or impervious surfaces to drain to pervious surfaces, replacing impervious surfaces with pervious surfaces, installing rain barrels, installing rain gardens, and trash area enclosures.

Runoff - All flows in a storm water conveyance system that consists of the following components: (1) storm water (wet weather flows) and (2) non-storm water including dry weather flows.

San Diego Water Board – As used in this document the term "San Diego Water Board" is synonymous with the term "Regional Board" as defined in Water Code section 13050(b) and is intended to refer to the California Regional Water Quality Control Board for the San Diego Region as specified in Water Code Section 13200.

Sediment - Soil, sand, and minerals washed from land into water. Sediment resulting from anthropogenic sources (i.e. human induced land disturbance activities) is considered a pollutant. This Order regulates only the discharges of sediment from anthropogenic sources and does not regulate naturally occurring sources of sediment. Sediment can destroy fish-nesting areas, clog animal habitats, and cloud waters so that sunlight does not reach aquatic plants.

Source Control BMP – Land use or site planning practices, or structural or nonstructural measures that aim to prevent runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between pollutants and runoff.

Storm Water – Per 40 CFR 122.26(b)(13), means storm water runoff, snowmelt runoff and surface runoff and drainage. Surface runoff and drainage pertains to runoff and drainage resulting from precipitation events.

Structural BMPs - A subset of BMPs which detains, retains, filters, removes, or prevents the release of pollutants to surface waters from development projects in perpetuity, after construction of a project is completed.

Test of Significant Toxicity (TST) - A statistical approach used to analyze toxicity test data. The TST incorporates a restated null hypothesis, Welch's t-test, and biological effect thresholds for chronic and acute toxicity.

Total Maximum Daily Load (TMDL) - The maximum amount of a pollutant that can be discharged into a water body from all sources (point and non-point) and still maintain water quality standards. Under CWA section 303(d), TMDLs must be developed for all water bodies that do not meet water quality standards after application of technology-based controls.

Toxicity - Adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies. The water quality objectives for toxicity provided in the Basin Plan, state in part…"All waters shall be

free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life….The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge."

Toxicity Identification Evaluation (TIE) - A set of procedures for identifying the specific chemical(s) responsible for toxicity. These procedures are performed in three phases (characterization, identification, and confirmation) using aquatic organism toxicity tests.

Toxicity Reduction Evaluation (TRE) - A study conducted in a step-wise process designed to identify the causative agents of effluent or ambient toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in toxicity. The first steps of the TRE consist of the collection of data relevant to the toxicity, including additional toxicity testing, and an evaluation of facility operations and maintenance practices, and best management practices. A Toxicity Identification Evaluation (TIE) may be required as part of the TRE, if appropriate.

Treatment Control BMP – Any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media absorption or any other physical, biological, or chemical process.

Unpaved Road – Any long, narrow stretch without pavement used for traveling by motor passenger vehicles between two or more points. Unpaved roads are generally constructed of dirt, gravel, aggregate or macadam and may be improved or unimproved.

Waste - As defined in CWC Section 13050(d), "waste includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal."

Article 2 of CCR Title 23, Chapter 15 (Chapter 15) contains a waste classification system that applies to solid and semi-solid waste, which cannot be discharged directly or indirectly to water of the state and which therefore must be discharged to land for treatment, storage, or disposal in accordance with Chapter 15. There are four classifications of waste (listed in order of highest to lowest threat to water quality): hazardous waste, designated waste, non-hazardous solid waste, and inert waste.

Water Quality Objective - Numerical or narrative limits on constituents or characteristics of water designated to protect designated beneficial uses of the water. [California Water Code Section 13050 (h)]. California's water quality objectives are established by the State and Regional Water Boards in the Water Quality Control Plans. Numeric or narrative limits for pollutants or characteristics of water designed to protect the beneficial uses of the water. In other words, a water quality objective is the maximum concentration of a pollutant that can exist in a receiving water and still generally ensure that the beneficial uses of the receiving water remain protected (i.e., not impaired). Since water quality objectives are designed specifically to protect the beneficial uses, when the objectives are violated the beneficial uses are, by definition, no longer protected and become impaired. This is a fundamental concept under the Porter Cologne Act. Equally fundamental is Porter Cologne's definition of pollution. A condition of pollution exists when the water quality needed to support designated beneficial uses has

become unreasonably affected or impaired; in other words, when the water quality objectives have been violated. These underlying definitions (regarding beneficial use protection) are the reason why all waste discharge requirements implementing the federal NPDES regulations require compliance with water quality objectives. (Water quality objectives are also called water quality criteria in the CWA.)

Water Quality Standards - Water quality standards, as defined in Clean Water Act section 303(c) consist of the beneficial uses (e.g., swimming, fishing, municipal drinking water supply, etc.,) of a water body and criteria (referred to as water quality objectives in the California Water Code) necessary to protect those uses. Under the Water Code, the water boards establish beneficial uses and water quality objectives in water quality control or basin plans. Together with an anti-degradation policy, these beneficial uses and water quality objectives serve as water quality standards under the Clean Water Act. In Clean Water Act parlance, state beneficial uses are called "designated uses" and state water quality objectives are called "criteria." Throughout this Order, the relevant term is used depending on the statutory scheme.

Waters of the State - Any water, surface or underground, including saline waters within the boundaries of the State [CWC section 13050 (e)]. The definition of the Waters of the State is broader than that for the Waters of the United States in that all water in the State is considered to be a Waters of the State regardless of circumstances or condition.

Waters of the United States - As defined in the 40 CFR 122.2, the Waters of the U.S. are defined as: "(a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate "wetlands;" (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters otherwise defined as waters of the United States under this definition: (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial seas; and (g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA."

Watershed - That geographical area which drains to a specified point on a water course, usually a confluence of streams or rivers (also known as drainage area, catchment, or river basin).

Wet Season (aka Rainy Season) – October 1 to April 30

Wet Weather – Weather is considered wet up to 72 hours after a storm event of 0.1 inches and greater, unless otherwise defined by another regulatory mechanism (e.g. a TMDL).

ATTACHMENT D

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

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JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

FY _____

I. COPERMITTEE INFORMATION

Copermittee Name:

Copermittee Primary Contact Name:

Copermittee Primary Contact Information:
Address:
City: County: State: Zip:
Telephone: Fax: Email:

II. LEGAL AUTHORITY

Has the Copermittee established adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐
A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority?	**YES**	☐
	NO	☐

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

Was an update of the jurisdictional runoff management program document required or recommended by the San Diego Water Board?	**YES**	☐
	NO	☐
If YES to the question above, did the Copermittee update its jurisdictional runoff management program document and make it available on the Regional Clearinghouse?	**YES**	☐
	NO	☐

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

Has the Copermittee implemented a program to actively detect and eliminate illicit discharges and connections to its MS4 that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

Number of non-storm water discharges reported by the public	
Number of non-storm water discharges detected by Copermittee staff or contractors	
Number of non-storm water discharges investigated by the Copermittee	
Number of sources of non-storm water discharges identified	
Number of non-storm water discharges eliminated	
Number of sources of illicit discharges or connections identified	
Number of illicit discharges or connections eliminated	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

V. DEVELOPMENT PLANNING PROGRAM

Has the Copermittee implemented a development planning program that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐
Was an update to the BMP Design Manual required or recommended by the San Diego Water Board?	**YES**	☐
	NO	☐
If YES to the question above, did the Copermittee update its BMP Design Manual and make it available on the Regional Clearinghouse?	**YES**	☐
	NO	☐

Number of proposed development projects in review	
Number of Priority Development Projects in review	
Number of Priority Development Projects approved	
Number of approved Priority Development Projects exempt from any BMP requirements	
Number of approved Priority Development Projects allowed alternative compliance	
Number of Priority Development Projects granted occupancy	

Number of completed Priority Development Projects in inventory	
Number of high priority Priority Development Project structural BMP inspections	
Number of Priority Development Project structural BMP violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

FY _____

VI. CONSTRUCTION MANAGEMENT PROGRAM

Has the Copermittee implemented a construction management program that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

Number of construction sites in inventory	
Number of active construction sites in inventory	
Number of inactive construction sites in inventory	
Number of construction sites closed/completed during reporting period	
Number of construction site inspections	
Number of construction site violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

Has the Copermittee implemented an existing development management program that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

	Municipal	Commercial	Industrial	Residential
Number of facilities or areas in inventory				
Number of existing development inspections				
Number of follow-up inspections				
Number of violations				
Number of enforcement actions issued				
Number of escalated enforcement actions issued				

VIII. PUBLIC EDUCATION AND PARTICIPATION

Has the Copermittee implemented a public education program component that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐
Has the Copermittee implemented a public participation program component that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

IX. FISCAL ANALYSIS

Has the Copermittee attached to this form a summary of its fiscal analysis that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

X. CERTIFICATION

I [☐ Principal Executive Officer ☐ Ranking Elected Official ☐ Duly Authorized Representative] certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature	Date
Print Name	Title
Telephone Number	Email

ATTACHMENT E

SPECIFIC PROVISIONS FOR TOTAL MAXIMUM DAILY LOADS APPLICABLE TO ORDER NO. R9-2013-0001, AS AMENDED BY ORDER NOS. R9-2015-0001 AND R9-2015-0100

These provisions implement load allocations (LAs) and wasteload allocations (WLAs) of the Total Maximum Daily Loads (TMDLs) established by the San Diego Water Board or USEPA under Clean Water Act section 303(c), applicable to discharges regulated under this Order. The provisions and schedules for implementation of the TMDLs described below must be incorporated into the Water Quality Improvement Plans, required pursuant to Provision B of this Order, for the specified Watershed Management Areas.

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed
2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin
3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed
4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek
5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay
6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)
7. Total Maximum Daily Load for Sediment in Los Peñasquitos Lagoon

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1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2002-0123

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	August 14, 2002
State Water Board Approval Date:	July 16, 2003
Office of Administrative Law Approval Date:	September 11, 2003
US EPA Approval Date:	November 3, 2003

(3) TMDL Effective Date: September 11, 2003

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final diazinon TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must be in compliance with the final TMDL compliance requirements as of December 31, 2010.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations:

Table 1.1
Final Receiving Water Limitations Expressed as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Diazinon	Acute	0.08 µg/L	1 hour
	Chronic	0.05 µg/L	4 days

(b) Final Effluent Limitations

Discharges from the MS4s containing concentrations that do not exceed the following effluent limitations will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 1.b.(2)(a):

Table 1.2
Final Effluent Limitations Expressed as Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation	Averaging Period
Diazinon	Acute	0.072 µg/L	1 hour
	Chronic	0.045 µg/L	4 days

(c) Best Management Practices

The following BMPs for Chollas Creek must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area and implemented by the Responsible Copermittees:

(i) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 1.b.(2)(a) and/or the effluent limitations under Specific Provision 1.b.(2)(b) for Chollas Creek.

(ii) The Responsible Copermittees must implement the Diazinon Toxicity Control Plan and Diazinon Public Outreach/Education Program as described in the report titled, *Technical Report for Total Maximum Daily Load for Diazinon in Chollas Creek Watershed, San Diego County*, dated August 14, 2002, including subsequent modifications, in order to achieve the receiving water limitations under Specific Provision 1.b.(2)(a) and/or the effluent limitations under Specific Provision 1.b.(2)(b).

(iii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 1.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 1.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 1.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 1.b.(2)(c) achieves compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 1.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 1.d, to demonstrate compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The Responsible Copermittees must be in compliance with the final diazinon TMDL compliance requirements as of December 31, 2010.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls for diazinon within the Chollas Creek watershed, and calculate or estimate the annual diazinon loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment

Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 1.b.(2)(b), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0019

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	September 22, 2005
Office of Administrative Law Approval Date:	December 2, 2005
US EPA Approval Date:	February 8, 2006

(3) TMDL Effective Date: December 2, 2005

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Shelter Island Yacht Basin

(6) Responsible Copermittee: City of San Diego

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final dissolved copper TMDL compliance requirements for Shelter Island Yacht Basin consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittee must be in compliance with the final TMDL compliance requirements as of December 2, 2005.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations:

Table 2.1
Final Receiving Water Limitations Expressed as Concentrations in Shelter Island Yacht Basin

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Dissolved Copper	Acute	4.8 µg/L x WER*	1 hour
	Chronic	3.1 µg/L x WER*	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 2.b.(2)(a):

Table 2.2
Final Effluent Limitations as Expressed as Annual Loads in MS4 Discharges to Shelter Island Yacht Basin

Constituent	Effluent Limitation
Dissolved Copper	30 kg/yr*

* If the water quality objectives for dissolved copper in Shelter Island Yacht Basin are changed in the future, then the margin of safety (MOS), TMDL and allocations will be recalculated using the *Method for Recalculation of the Total Maximum Daily Load for Dissolved Copper in the Shelter Island Yacht Basin, San Diego Bay* in the Basin Plan (p. 7-14).

(c) Best Management Practices

The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 2.b.(2)(a) and/or the effluent limitations under Specific Provision 2.b.(2)(b) for Shelter Island Yacht Basin. The BMPs must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 2.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 2.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittee develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 2.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 2.b.(2)(c) achieves compliance with Specific Provisions 2.b.(3)(a), 2.b.(3)(b) and/or 2.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 2.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 2.d, to demonstrate compliance with Specific Provisions 2.b.(3)(a), 2.b.(3)(b) and/or 2.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The Responsible Copermittees must be in compliance with the final dissolved copper TMDL compliance requirements as of December 2, 2005.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

The Responsible Copermittee must monitor the effluent of its MS4 outfalls for dissolved copper, and calculate or estimate the monthly and annual dissolved copper loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.(b)(2)of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0036

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	November 16, 2005
Office of Administrative Law Approval Date:	February 1, 2006
US EPA Approval Date:	March 22, 2006

(3) TMDL Effective Date: February 1, 2006

(4) Watershed Management Area: Santa Margarita River

(5) Water Body: Rainbow Creek

(6) Responsible Copermittee: County of San Diego

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final total nitrogen and total phosphorus TMDL compliance requirements for Rainbow Creek consist of the following

(1) Final TMDL Compliance Date

The Responsible Copermittee must comply with final TMDL compliance requirements by December 31, 2021.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance date under Specific Provision 3.b.(1):

Table 3.1
Final Receiving Water Limitations Expressed as Concentrations in Rainbow Creek

Constituent	Receiving Water Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing concentrations that do not exceed the following effluent limitations by the compliance date under Specific Provision 3.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 3.b.(2)(a):

Table 3.2
Final Effluent Limitations Expressed as Concentrations in MS4 Discharges to Rainbow Creek

Constituent	Effluent Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(ii) Annual pollutant loads from given land uses discharging to and from the MS4s that do not exceed the following annual loads by the compliance date under Specific Provision 3.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 3.b.(2)(a):

Table 3.3
Final Effluent Limitations Expressed as Annual Loads in MS4 Discharges to Rainbow Creek

Land Use	Total N	Total P
Commercial nurseries	116 kg/yr	3 kg/yr
Park	3 kg/yr	0.1 kg/yr
Residential areas	149 kg/yr	12 kg/yr
Urban areas	27 kg/yr	6 kg/yr

(c) Best Management Practices

(i) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 3.b.(2)(a) and/or the effluent limitations under Specific Provision 3.b.(2)(b) for Rainbow Creek.

(ii) The Responsible Copermittee should coordinate any BMPs implemented to address this TMDL with Caltrans and other sources as possible.

(3) <u>Final TMDL Compliance Determination</u>

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 3.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 3.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the final effluent limitations under Specific Provision 3.b.(2)(b)(ii); OR

(e) The Responsible Copermittee develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 3.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Specific Provision 3.b.(2)(c) achieves compliance with Specific Provisions 3.b.(3)(a), 3.b.(3)(b), 3.b.(3)(c) and/or 3.b.(3)(d),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 3.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 3.d, to demonstrate compliance with Specific Provisions 3.b.(3)(a), 3.b.(3)(b), 3.b.(3)(c) and/or 3.b.(3)(d).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim total nitrogen and total phosphorus TMDL compliance requirements for Rainbow Creek consist of the following:

(1) Interim Compliance Dates and WQBELs

The Responsible Copermittee must comply with the interim WQBELs, expressed as annual loads, by December 31 of the interim compliance year given in Table 3.4.

Table 3.4
Interim Water Quality Based Effluent Limitations Expressed as Annual Loads in MS4 Discharges from Specific Land Uses to Rainbow Creek

	Total N Interim Effluent Limitations (kg/yr)			Total P Interim Effluent Limitations (kg/yr)		
	Interim Compliance Date			Interim Compliance Date		
Land Use	**2009**	**2013**	**2017**	**2009**	**2013**	**2017**
Commercial nurseries	390	299	196	20	16	10
Park	5	3	3	0.15	0.10	0.10
Residential areas	507	390	260	99	74	47
Urban areas	40	27	27	9	6	6

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 3.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 3.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the final effluent limitations under Specific Provision 3.b.(2)(b)(ii); OR

(e) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the interim effluent limitations under Specific Provision 3.c.(1); OR

(f) The Responsible Copermittee has submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

d. Specific Monitoring and Assessment Requirements

(1) The Responsible Copermittee must incorporate into the Water Quality Improvement Plan and implement the Sampling and Analysis Plan for Rainbow Creek Nutrient Reduction TMDL Implementation Water Quality Monitoring, dated January 2010.

(2) The results of any monitoring conducted during the reporting period, and assessment of whether the interim and final TMDL compliance requirements have been achieved must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 3.b.(2)(b)(i), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2007-0043

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2007
State Water Board Approval Date:	July 15, 2008
Office of Administrative Law Approval Date:	October 22, 2008
US EPA Approval Date:	December 18, 2008

(3) TMDL Effective Date: October 22, 2008

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final dissolved copper, lead, and zinc TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must comply with the final TMDL compliance requirements by October 22, 2028.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance date under Specific Provision 4.b.(1):

Table 4.1
Final Receiving Water Limitations Expressed as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$(0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$(0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$(0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$(0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations by the compliance date under Specific Provision 4.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 4.b.(2)(a):

Table 4.2
Final Effluent Limitations as Expressed Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(c) Best Management Practices

(i) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 4.b.(2)(a) and/or the effluent limitations under Specific Provision 4.b.(2)(b) for Chollas Creek.

(ii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans and the U.S. Navy as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 4.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 4.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 4.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 4.b.(2)(c) achieves compliance with Specific Provisions 4.b.(3)(a), 4.b.(3)(b) and/or 4.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 4.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 4.d, to demonstrate compliance with Specific Provisions 4.b.(3)(a), 4.b.(3)(b) and/or 4.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim dissolved copper, lead, and zinc TMDL compliance requirements for Chollas Creek consist of the following:

(1) Interim Compliance Date and WQBELs

The Responsible Copermittee must comply with the interim WQBELs, expressed as concentrations, by the interim compliance date given in Table 4.3:

Table 4.3
Interim Water Quality Based Effluent Limitations Expressed as Concentrations in MS4 Discharges to Chollas Creek

Interim Compliance Date	Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
October 22, 2018	Dissolved Copper	Acute	$1.2 \times 90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
	Dissolved Lead	Acute	$1.2 \times 90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
	Dissolved Zinc	Acute	$1.2 \times 90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 4.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 4.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) There are no exceedances of the interim effluent limitations under Specific Provision 4.c.(1) at the Responsible Copermittee's MS4 outfalls; OR

(e) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance date.

d. Specific Monitoring and Assessment Requirements

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*, when it is amended to include monitoring requirements for the Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls discharging to Chollas Creek for dissolved copper, lead, and zinc, and calculate or estimate the monthly and annual dissolved copper, lead, and zinc loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 4.b.(2)(b) or 4.c.(1), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2008-0027

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 11, 2008
State Water Board Approval Date:	June 16, 2009
Office of Administrative Law Approval Date:	September 15, 2009
US EPA Approval Date:	October 26, 2009

(3) TMDL Effective Date: September 15, 2009

(4) Watershed Management Areas: See Table 5.0

(5) Water Bodies: See Table 5.0

(6) Responsible Copermittees: See Table 5.0

Table 5.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County	Dana Point Harbor	Baby Beach	-City of Dana Point -County of Orange
San Diego Bay	San Diego Bay	Shelter Island Shoreline Park	- San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final indicator bacteria TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Final TMDL Compliance Dates

(a) Baby Beach in Dana Point Harbor

The Responsible Copermittees for MS4 discharges to Baby Beach must be in compliance with the final TMDL compliance requirements according to the following compliance dates:

Table 5.1
Compliance Dates to Achieve Final TMDL Compliance Requirements For Baby Beach in Dana Point Harbor

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform	September 15, 2014	September 15, 2009
Fecal Coliform		September 15, 2009
Enterococcus		September 15, 2019

(b) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park must be in compliance with the final TMDL compliance requirements as of December 31, 2012.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance dates under Specific Provision 5.b.(1):

Table 5.2
Final Receiving Water Limitations Expressed as Bacteria Densities in the Water Body

	Receiving Water Limitations	
Constituent	Single Sample Maximum[1,2]	30-Day Geometric Mean[2]
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing indicator bacteria densities that do not exceed the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.3a
Final Effluent Limitations as Expressed as Bacteria Densities in MS4 Discharges to the Water Body

	Effluent Limitations	
Constituent	**Single Sample Maximum[1,2]**	**30-Day Geometric Mean[2]**
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.

(ii) Discharges from the MS4s containing indicator bacteria loads that do not exceed the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.4a
Final Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to the Baby Beach in Dana Point Harbor

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0.86×10^9 MPN/day	$3{,}254 \times 10^9$ MPN/30days
Fecal Coliform	0.17×10^9 MPN/day	112×10^9 MPN/30days
Enterococcus	0.03×10^9 MPN/day	114×10^9 MPN/30days

Table 5.4b
Final Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to the Shelter Island Shoreline Park in San Diego Bay

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0 MPN/day	198×10^9 MPN/30days
Fecal Coliform	0 MPN/day	8×10^9 MPN/30days
Enterococcus	0 MPN/day	26×10^9 MPN/30days

(iii) Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.5a
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to Baby Beach in Dana Point Harbor*

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	90.4%	0%
Fecal Coliform	82.7%	0%
Enterococcus	96.2%	62.2%

Notes:
* The percent load reductions are relative to data collected between 1996-2002. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittees' MS4s must not exceed the loads in Table 5.4a, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the water body.

Table 5.5b
*Final Effluent Limitations Expressed as Percent Load Reductions** in MS4 Discharges to Shelter Island Shoreline Park in San Diego Bay*

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0%	0%
Fecal Coliform	0%	0%
Enterococcus	0%	0%

Notes:
* The percent load reductions are relative to data collected between 1999-2004. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittee's MS4s must not exceed the loads in Table 5.4b, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the water body.

(c) Best Management Practices

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 5.0 must incorporate the Bacteria Load Reduction Plan (BLRP) required to be developed pursuant to Resolution No. R9-2008-0027.

(ii) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 5.b.(2)(a) and/or the effluent limitations under Specific Provision 5.b.(2)(b) for the segments or areas of the water bodies listed in Table 5.0

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.b.(2)(b)(ii); OR

(e) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 5.b.(2)(b)(iii); OR

(f) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(g) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 5.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 5.b.(2)(c) achieves compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 5.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 5.d, to demonstrate compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim indicator bacteria TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Baby Beach in Dana Point Harbor

(a) Interim TMDL Compliance Dates and WQBELs

The Responsible Copermittees for MS4 discharges to Baby Beach must comply with the following interim WQBELs by the interim compliance dates given in Tables 5.6a and/or 5.6b:

Table 5.6a
Interim Water Quality Based Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to Baby Beach in Dana Point Harbor

Constituent	Interim Compliance Dates	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	4.93×10^9 MPN/day	$3{,}254 \times 10^9$ MPN/30days*
Fecal Coliform	September 15, 2012	0.59×10^9 MPN/day	112×10^9 MPN/30days*
Enterococcus	September 15, 2012	0.42×10^9 MPN/day	301×10^9 MPN/30days
	September 15, 2016	0.03×10^9 MPN/day *	207×10^9 MPN/30days

Notes:
* Same as the final effluent limitations in Table 5.4a.

Table 5.6b
Interim Water Quality Based Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to Baby Beach in Dana Point Harbor*

Constituent	Interim Compliance Dates	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	45.2%	0%**
Fecal Coliform	September 15, 2012	41.4%	0%**
Enterococcus	September 15, 2012	48.1%	0%
	September 15, 2016	96.2%**	31.1%

Notes:
* The percent load reductions are relative to data collected between 1996-2002. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittees' MS4s must not exceed the loads in Table 5.6a, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the waterbody.
** Same as the final effluent limitations in Table 5.5a.

(b) Interim Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(i) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(ii) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(iii) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(iv) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.b(2)(b)(ii); OR

(v) The Responsible Copermittees can demonstrate that exceedances of the applicable receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(vi) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the interim effluent limitations under Table 5.6a of Specific Provision 5.c.(1)(a); OR

(vii) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the interim effluent limitations under Table 5.6b of Specific Provision 5.c.(1)(a); OR

(viii) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

(2) <u>Shelter Island Shoreline Park in San Diego Bay</u>

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park must be in compliance with the final indicator bacteria TMDL requirements as of December 31, 2012.

d. Specific Monitoring and Assessment Requirements

(1) Monitoring Stations

Monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[38] If discharges of bacteria from the MS4 exceed the applicable interim or final WQBELs, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(2) Monitoring Procedures

(a) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) The Responsible Copermittees must collect wet weather monitoring samples within the first 24 hours of a storm event[39] of the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(c) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

[38] Commonly referred to as AB 411 monitoring
[39] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs have been achieved.

(b) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 5.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(c) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to correlate elevated bacteria levels with known or suspected sewage spills from wastewater collection systems and treatment plants or boats.

(d) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2010-0001

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date: February 10, 2010
State Water Board Approval Date: December 14, 2010
Office of Administrative Law Approval Date: April 4, 2011
US EPA Approval Date: June 22, 2011

(3) TMDL Effective Date: April 4, 2011

(4) Watershed Management Areas: See Table 6.0

(5) Water Bodies: See Table 6.0

(6) Responsible Copermittees: See Table 6.0

Table 6.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	-City of Laguna Beach -County of Orange -Orange County Flood Control District
		at Heisler Park - North	
	Pacific Ocean Shoreline	at Main Laguna Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Woods -County of Orange -Orange County Flood Control District
		Laguna Beach at Ocean Avenue	
		Laguna Beach at Cleo Street	
		Arch Cove at Bluebird Canyon Road	
		Laguna Beach at Dumond Drive	
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Hills -City of Laguna Niguel -City of Laguna Woods -City of Lake Forest -City of Mission Viejo -County of Orange -Orange County Flood Control District
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	
	Aliso Creek Mouth	at mouth	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	-City of Dana Point -City of Laguna Beach -City of Laguna Niguel -County of Orange -Orange County Flood Control District
		Aliso Beach at Table Rock Drive	
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)	
		at Salt Creek (large outlet)	
		Salt Creek Beach at Salt Creek service road	
		Salt Creek Beach at Strand Road	
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	-City of Dana Point -City of Laguna Hills -City of Laguna Niguel -City of Mission Viejo -City of Rancho Santa Margarita -City of San Juan Capistrano -County of Orange -Orange County Flood Control District
	San Juan Creek	lower 1 mile	
	San Juan Creek Mouth	at mouth	
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	-City of Dana Point -City of San Clemente -County of Orange -Orange County Flood Control District
		Ole Hanson Beach Club Beach at Pico Drain	
		San Clemente City Beach at El Portal Street Stairs	
		San Clemente City Beach at Mariposa Street	
		San Clemente City Beach at Linda Lane	
		San Clemente City Beach at South Linda Lane	
		San Clemente City Beach at Lifeguard Headquarters	
		under San Clemente Municipal Pier	
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	
		San Clemente State Beach at Riviera Beach	
		Can Clemente State Beach at Cypress Shores	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	-City of Oceanside -City of Vista -County of San Diego
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	-City of Carlsbad -City of Encinitas -City of Escondido -City of San Marcos -County of San Diego
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	-City of Del Mar -City of Escondido -City of Poway -City of San Diego -City of Solana Beach -County of San Diego
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	-City of Del Mar -City of Poway -City of San Diego -County of San Diego
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	-City of San Diego
		La Jolla Shores Beach at Caminito del Oro	
		La Jolla Shores Beach at Vallecitos	
		La Jolla Shores Beach at Avenida de la Playa	
		at Casa Beach, Children's Pool	
		South Casa Beach at Coast Boulevard	
		Whispering Sands Beach at Ravina Street	
		Windansea Beach at Vista de la Playa	
		Windansea Beach at Bonair Street	
		Windansea Beach at Playa del Norte	
		Windansea Beach at Palomar Avenue	
		at Tourmaline Surf Park	
		Pacific Beach at Grand Avenue	
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I- Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	-City of El Cajon -City of Santee -County of San Diego
	San Diego River	lower 6 miles	-City of El Cajon -City of La Mesa -City of San Diego -City of Santee -County of San Diego
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	-City of La Mesa -City of Lemon Grove -City of San Diego -County of San Diego - San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final indicator bacteria TMDL compliance requirements for the water bodies listed in Table 6.0 consist of the following:

(1) Final TMDL Compliance Dates

The Responsible Copermittees for MS4 discharges to the water bodies listed in Table 6.0 must be in compliance with the final TMDL compliance requirements according to the following compliance dates:

Table 6.1
Compliance Dates to Achieve Final TMDL Compliance Requirements

Constituent	Dry Weather TMDL Compliance Date	Wet Weather TMDL Compliance Date*
Total Coliform	April 4, 2021	April 4, 2031 (April 4, 2021)
Fecal Coliform		
Enterococcus		

* The Wet Weather TMDL Compliance Date in parenthesis applies if the applicable Water Quality Improvement Plan does not include load reduction programs for other constituents (e.g. metals, pesticides, trash, nutrients, sediment, etc.) together with bacteria load reduction requirements of these TMDLs.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance dates under Specific Provision 6.b.(1):

Table 6.2a
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Beaches

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform	10,000	22%	1,000	0%
Fecal Coliform	400	22%	200	0%
Enterococcus	104	22%	35	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan.

Table 6.2b
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Creeks

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Fecal Coliform	400	22%	200	0%
Enterococcus	61 (104)	22%	33	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Basin Plan.
d. A single sample maximum of 104 MPN/100ml for *Enterococcus* may be applied as a receiving water limitation for creeks, instead of 61 MPN/100mL, if one or more of the creeks addressed by these TMDLs (San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek, San Diego River, and/or Chollas Creek) is designated with a "moderately to lightly used area" or less frequent usage frequency in the Basin Plan. Otherwise, the single sample maximum of 61 MPN/100mL for *Enterococcus* must be used to assess compliance with the allowable exceedance frequency.

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing indicator bacteria densities that do not exceed the following effluent limitations by the compliance dates under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a):

Table 6.2c
Final Effluent Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies in MS4 Discharges to the Water Body

Constituent	Concentration-Based Effluent Limitations			
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform[d]	10,000	22%	1,000	0%
Fecal Coliform	400	22%	200	0%
Enterococcus	104[e] / 61[f]	22%	35[e] / 33[f]	0%

Notes:
a. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan for discharges to beaches, and the Basin Plan for discharges to creeks and creek mouths.
d. Total coliform effluent limitations only apply to MS4 outfalls that discharge to the Pacific Ocean Shorelines and creek mouths listed in Table 6.0.
e. This *Enterococcus* effluent limitation applies to MS4 discharges to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
f. This *Enterococcus* effluent limitation applies to MS4 discharges to segments or areas of creeks or creek mouths listed in Table 6.0.

(ii) Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the compliance dates under Specific Provision 6.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a):

Table 6.3
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watershed and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
South Orange County	**San Joaquin Hills HSA** (901.11) and **Laguna Hills HSA** (901.12) - Pacific Ocean Shoreline	91.78%	91.72%	98.28%	46.85%	52.07%	51.26%
	Aliso HSA (901.13) - Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	95.47%	95.58%	99.13%	25.29%	26.62%	27.52% (27.37%)**
	Dana Point HSA (901.14) - Pacific Ocean Shoreline	95.04%	95.03%	98.98%	13.15%	14.86%	15.16%
	Lower San Juan HSA (901.27) - Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	72.96%	74.21%	94.94%	19.21%	12.82%	27.12% (26.90%)**
	San Clemente HA (901.30) - Pacific Ocean Shoreline	94.28%	94.23%	98.83%	23.85%	24.58%	25.26%
San Luis Rey River	**San Luis Rey HU** (903.00) - Pacific Ocean Shoreline	38.13%	39.09%	87.38%	5.62%	3.12%	11.69%

Table 6.3 (Cont'd)
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watershed and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
Carlsbad	**San Marcos HA** (904.50) - Pacific Ocean Shoreline	82.82%	82.55%	96.03%	18.47%	18.98%	20.19%
San Dieguito River	**San Dieguito HU** (905.00) - Pacific Ocean Shoreline	14.39%	20.72%	83.48%	4.29%	1.46%	7.72%
Penasquitos	**Miramar Reservoir HA** (906.10) - Pacific Ocean Shoreline	96.50%	96.59%	99.42%	1.61%	1.99%	1.93%
Mission Bay	**Scripps HA** (906.30) - Pacific Ocean Shoreline	96.44%	96.42%	99.25%	16.32%	21.14%	18.82%
	Tecolote HA (906.50) - Tecolote Creek	94.51%	94.59%	98.94%	16.51%	20.47%	18.15% (18.08%)**
San Diego River	**Mission San Diego HSA** (907.11) and **Santee HSA** (907.12) - Pacific Ocean Shoreline - Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles)	74.03%	69.44%	93.96%	38.14%	53.22%	42.74% (42.47%)**
San Diego Bay	**Chollas HSA** (908.22) - Chollas Creek	92.06%	92.15%	98.46%	17.82%	24.84%	21.46% (21.36%)**

Notes:
* The percent load reductions are based on reducing loads compared to pollutant loads from 2001 to 2002.
** The alternative *Enterococcus* percent load reduction was calculated based on a numeric target of 104 MPN/100mL instead of 61 MPN/100mL, protective of the REC-1 "moderately to lightly used area" usage frequency that is protective of freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative pollutant load reductions can be utilized.

(c) Best Management Practices

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 6.0 must incorporate the Bacteria Load Reduction Plans (BLRPs) or Comprehensive Load Reduction Plans (CLRPs) required to be developed pursuant to Resolution No. R9-2010-0001.

(ii) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 6.b.(2)(a) and/or the effluent limitations under Specific Provision 6.b.(2)(b) for the segments or areas of the water bodies listed in Table 6.0.

(iii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans, owners/operators of small MS4s, and agricultural dischargers as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(f) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 6.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 6.b.(2)(c) achieves compliance with Specific Provisions 6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), and/or 6.b.(3)(e),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 6.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 6.d, to demonstrate compliance with Specific Provisions 6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), 6.b.(3)(e) and/or 6.b.(3)(f).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim indicator bacteria TMDL compliance requirements for the water bodies listed in Table 6.0 consist of the following:

(1) Interim TMDL Compliance Dates

The Responsible Copermittees must achieve compliance with the interim TMDL compliance requirements, as determined in accordance with Specific Provision 6.c.(3), by the interim compliance dates given in Table 6.4, unless alternative interim compliance dates are accepted by the San Diego Water Board Executive Officer as part of the Water Quality Improvement Plan.

Table 6.4
Interim Compliance Dates to Achieve Interim TMDL Compliance Requirements

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs*
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	April 4, 2016	April 4, 2021 (April 4, 2016)
		at Heisler Park - North		
	Pacific Ocean Shoreline	at Main Laguna Beach	April 4, 2016	April 4, 2021 (April 4, 2016)
		Laguna Beach at Ocean Avenue		
		Laguna Beach at Cleo Street		
		Arch Cove at Bluebird Canyon Road		
		Laguna Beach at Dumond Drive		
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	April 4, 2016	April 4, 2021 (April 4, 2016)
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	April 4, 2018	April 4, 2021 (April 4, 2018)
	Aliso Creek Mouth	at mouth	April 4, 2018	April 4, 2021 (April 4, 2018)
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	April 4, 2016	April 4, 2021 (April 4, 2016)
		Aliso Beach at Table Rock Drive		
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)		
		at Salt Creek (large outlet)		
		Salt Creek Beach at Salt Creek service road	April 4, 2017	April 4, 2021 (April 4, 2017)
		Salt Creek Beach at Strand Road	April 4, 2017	April 4, 2021 (April 4, 2017)

Table 6.4 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs*
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	April 4, 2016	April 4, 2021 (April 4, 2016)
	San Juan Creek	lower 1 mile	April 4, 2018	April 4, 2021 (April 4, 2018)
	San Juan Creek Mouth	at mouth	April 4, 2016	April 4, 2021 (April 4, 2016)
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	April 4, 2016	April 4, 2021 (April 4, 2016)
		Ole Hanson Beach Club Beach at Pico Drain	April 4, 2016	April 4, 2021 (April 4, 2016)
		San Clemente City Beach at El Portal Street Stairs	April 4, 2017	April 4, 2021 (April 4, 2017)
		San Clemente City Beach at Mariposa Street		
		San Clemente City Beach at Linda Lane	April 4, 2016	April 4, 2021 (April 4, 2016)
		San Clemente City Beach at South Linda Lane	April 4, 2018	April 4, 2021 (April 4, 2018)
		San Clemente City Beach at Lifeguard Headquarters	April 4, 2017	April 4, 2021 (April 4, 2017)
		under San Clemente Municipal Pier		
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	April 4, 2018	April 4, 2021 (April 4, 2018)
		San Clemente State Beach at Riviera Beach	April 4, 2016	April 4, 2021 (April 4, 2016)
		Can Clemente State Beach at Cypress Shores	April 4, 2017	April 4, 2021 (April 4, 2017)
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	April 4, 2017	April 4, 2021 (April 4, 2017)
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	April 4, 2016	April 4, 2021 (April 4, 2016)
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	April 4, 2016	April 4, 2021 (April 4, 2016)

Table 6.4 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates	
			Interim Dry Weather WQBELs	Interim Wet Weather WQBELs*
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	April 4, 2016	April 4, 2021 (April 4, 2016)
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	April 4, 2016	April 4, 2021 (April 4, 2016)
		La Jolla Shores Beach at Caminito del Oro		
		La Jolla Shores Beach at Vallecitos		
		La Jolla Shores Beach at Avenida de la Playa		
		at Casa Beach, Children's Pool		
		South Casa Beach at Coast Boulevard		
		Whispering Sands Beach at Ravina Street		
		Windansea Beach at Vista de la Playa		
		Windansea Beach at Bonair Street		
		Windansea Beach at Playa del Norte		
		Windansea Beach at Palomar Avenue		
		at Tourmaline Surf Park		
		Pacific Beach at Grand Avenue		
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries		
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	April 4, 2018	April 4, 2021 (April 4, 2018)
	San Diego River	lower 6 miles		
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach		
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	April 4, 2018	April 4, 2021 (April 4, 2018)

* The Interim Compliance Dates to achieve the Interim Wet Weather WQBELs in parenthesis apply if the applicable Water Quality Improvement Plan does not include load reduction programs for other constituents (e.g. metals, pesticides, trash, nutrients, sediment, etc.) together with bacteria load reduction requirements of these TMDLs.

(2) Interim Water Quality Based Effluent Limitations

The Responsible Copermittees for discharges to the water bodies in Table 6.0 must comply with the following interim WQBELs by the interim compliance dates given in Specific Provision 6.c.(1):

(a) Interim Receiving Water Limitations

(i) *Interim Dry Weather Receiving Water Limitations*

The Responsible Copermittee must calculate the "existing" exceedance frequencies of the 30-day geometric mean water quality objectives for each of the indicator bacteria by analyzing the available monitoring data collected between January 1, 1996 and December 31, 2002. "Existing" exceedance frequencies may be calculated by water body and/or by Watershed Management Area listed in Table 6.0. Separate "existing" exceedance frequencies must be calculated for beaches and creeks/creek mouths.

The Responsible Copermittees must achieve a 50 percent reduction in the "existing" exceedance frequency of the 30-day geometric mean WQBELs for the water bodies listed in Table 6.0 by the interim compliance dates given in Table 6.4. A 50 percent reduction in the "existing" exceedance frequency is equivalent to half of the "existing" exceedance frequency of the 30-day geometric mean WQBELs.

The "existing" exceedance frequencies and the interim dry weather allowable exceedance frequencies (i.e. interim dry weather receiving water limitations) calculated by the Responsible Copermittees must be included in the Water Quality Improvement Plans for the applicable Watershed Management Areas.

(ii) *Interim Wet Weather Receiving Water Limitations*

The Responsible Copermittees must achieve the interim wet weather receiving water limitations in Table 6.5, expressed as interim wet weather allowable exceedance frequencies, by the interim compliance dates given in Table 6.4.

Table 6.5
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	38%	37%	39%
		at Heisler Park - North			
	Pacific Ocean Shoreline	at Main Laguna Beach			
		Laguna Beach at Ocean Avenue			
		Laguna Beach at Cleo Street			
		Arch Cove at Bluebird Canyon Road			
		Laguna Beach at Dumond Drive			
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	41%	41%	42%
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	41%	41%	42%
	Aliso Creek Mouth	at mouth	41%	41%	42%
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	36%	36%	36%
		Aliso Beach at Table Rock Drive			
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)			
		at Salt Creek (large outlet)			
		Salt Creek Beach at Salt Creek service road			
		Salt Creek Beach at Strand Road			

Table 6.5 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	44%	44%	48%
	San Juan Creek	lower 1 mile	44%	44%	47%
	San Juan Creek Mouth	at mouth	44%	44%	47%
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	35%	35%	36%
		Ole Hanson Beach Club Beach at Pico Drain			
		San Clemente City Beach at El Portal Street Stairs			
		San Clemente City Beach at Mariposa Street			
		San Clemente City Beach at Linda Lane			
		San Clemente City Beach at South Linda Lane			
		San Clemente City Beach at Lifeguard Headquarters			
		under San Clemente Municipal Pier			
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)			
		San Clemente State Beach at Riviera Beach			
		Can Clemente State Beach at Cypress Shores			
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	45%	44%	47%
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	40%	40%	41%
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	33%	33%	36%

Table 6.5 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	26%	26%	26%
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	37%	37%	37%
		La Jolla Shores Beach at Caminito del Oro			
		La Jolla Shores Beach at Vallecitos			
		La Jolla Shores Beach at Avenida de la Playa			
		at Casa Beach, Children's Pool			
		South Casa Beach at Coast Boulevard			
		Whispering Sands Beach at Ravina Street			
		Windansea Beach at Vista de la Playa			
		Windansea Beach at Bonair Street			
		Windansea Beach at Playa del Norte			
		Windansea Beach at Palomar Avenue			
		at Tourmaline Surf Park			
		Pacific Beach at Grand Avenue			
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries	49%	49%	51%
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	46%	43%	49%
	San Diego River	lower 6 miles	46%	43%	49%
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	46%	43%	51%
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	41%	41%	43%

(b) Interim Effluent Limitations

Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the interim compliance dates under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.c.(2)(a):

Table 6.6
Interim Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watersheds and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
South Orange County	**San Joaquin Hills HSA** (901.11) and **Laguna Hills HSA** (901.12) - Pacific Ocean Shoreline	45.89%	45.86%	49.14%	23.43%	26.04%	25.63%
	Aliso HSA (901.13) - Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	47.74%	47.79%	49.57%	12.65%	13.31%	13.76% (13.69%)**
	Dana Point HSA (901.14) - Pacific Ocean Shoreline	47.52%	47.52%	49.49%	6.58%	7.43%	7.58%
	Lower San Juan HSA (901.27) - Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	36.48%	37.11%	47.47%	9.61%	6.41%	13.56% (13.45%)**
	San Clemente HA (901.30) - Pacific Ocean Shoreline	47.14%	47.12%	49.42%	11.93%	12.29%	12.63%
San Luis Rey River	**San Luis Rey HU** (903.00) - Pacific Ocean Shoreline	19.07%	19.55%	43.69%	2.81%	1.56%	5.85%
Carlsbad	**San Marcos HA** (904.50) - Pacific Ocean Shoreline	41.41%	41.28%	48.02%	9.24%	9.49%	10.10%

Table 6.6 (Cont'd)
Interim Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watersheds and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
San Dieguito River	**San Dieguito HU** (905.00) - Pacific Ocean Shoreline	7.20%	10.36%	41.74%	2.15%	0.73%	3.86%
Penasquitos	**Miramar Reservoir HA** (906.10) - Pacific Ocean Shoreline	48.25%	48.30%	49.71%	0.81%	1.00%	0.97%
Mission Bay	**Scripps HA** (906.30) - Pacific Ocean Shoreline	48.22%	48.21%	49.63%	8.16%	10.57%	9.41%
	Tecolote HA (906.50) - Tecolote Creek	47.26%	47.30%	49.47%	8.26%	10.24%	9.08% (9.04%)**
San Diego River	**Mission San Diego HSA** (907.11) and **Santee HSA** (907.12) - Pacific Ocean Shoreline - Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles)	37.02%	34.72%	46.98%	19.07%	26.61%	21.37% (21.24%)**
San Diego Bay	**Chollas HSA** (908.22) - Chollas Creek	46.03%	46.08%	49.23%	8.91%	12.42%	10.73% (10.68%)**

Notes:
* The percent load reductions are based on reducing loads compared to pollutant loads from 2001 to 2002.
** The alternative *Enterococcus* percent load reduction was calculated based on a numeric target of 104 MPN/100mL instead of 61 MPN/100mL, protective of the REC-1 "moderately to lightly used area" usage frequency that is protective of freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative pollutant load reductions can be utilized.

(3) <u>Interim TMDL Compliance Determination</u>

Compliance with the interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(f) There are no exceedances of the interim receiving water limitations under Specific Provision 6.c.(2)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(g) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the interim effluent limitations under Specific Provision 6.c.(2)(b); OR

(h) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

d. Specific Monitoring and Assessment Requirements

(1) Monitoring and Assessment Requirements for Beaches

(a) Monitoring Stations

For beaches addressed by the TMDL, monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[40] If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source

[40] Commonly referred to as AB 411 monitoring

identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations at least once within the first 24 hours of the end of a storm event[41] during the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer in exceedance of the allowable exceedance frequencies in the receiving waters.

(iii) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(iv) For Pacific Ocean Shoreline segments or areas listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

[41] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs for the Pacific Ocean Shoreline segments or areas listed in Table 6.0 have been achieved.

(ii) Dry weather exceedance frequencies must be calculated as follows:

[a] 30-day geometric means must be calculated from the results of any dry weather samples collected from the segments or areas for each water body listed in Table 6.0;
[b] The method and number of samples need for calculating the 30-day geometric means must be consistent with the number of samples required by the Ocean Plan;
[c] Where there are multiple segments or areas associated with a water body listed in Table 6.0, the Copermittees may calculate geometric means for each segment or area, or combine the dry weather monitoring data from all the segments or areas to calculate geometric means for the water body;
[d] The exceedance frequency must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the dry season.

(iii) Wet weather exceedance frequencies must be calculated as follows:

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;
[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;
[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria densities reported from each storm event sampled; and
[d] The single sample maximum exceedance frequency must be calculated by dividing the number of wet weather days that exceed the single sample maximum receiving water limitations in Table 6.2 by the total number of wet weather days during the rainy season.
[e] The data collected for dry weather must be used in addition to the data collected for wet weather to calculate the wet weather 30-

day geometric means. The exceedance frequency of the wet weather 30-day geometric means must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the wet season.

(iv) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(v) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) Monitoring and Assessment Requirements for Creeks and Creek Mouths

(a) Monitoring Stations

For creeks addressed by the TMDL, monitoring locations should consist of, at a minimum, a location at or near the mouth of the creek (e.g. Mass Loading Station or Mass Emission Station) and one or more locations upstream of the mouth (e.g. Watershed Assessment Station). If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations in accordance with the requirements of Provision D.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations within the first 24 hours of the end of a storm event[42] during the rainy season (i.e. October 1 through April 30).

[42] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to

(iii) Samples collected from receiving water monitoring stations must be analyzed for fecal coliform and *Enterococcus* indicator bacteria.

(iv) For creeks or creek mouths listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the receiving water monitoring data to assess whether the interim and final receiving water WQBELs for the creeks and creek mouths listed in Table 6.0 have been achieved.

(ii) Dry weather exceedance frequencies must be calculated as follows:

[a] 30-day geometric means must be calculated from the results of any dry weather samples collected from the segment or area for each water body listed in Table 6.0;
[b] The method and number of samples need for calculating the 30-day geometric means must be consistent with the number of samples required by the Basin Plan;
[c] The exceedance frequency must be calculated by dividing the number of 30-day geometric means that exceed the 30-day geometric mean receiving water limitations in Table 6.2 by the total number of 30-day geometric means calculated from samples collected during the dry season.

(iii) Wet weather exceedance frequencies must be calculated as follows:

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;
[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;

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storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria densities reported from each of the storm events sampled; and

[d] The exceedance frequency must be calculated by dividing the number of wet weather days that exceed the single sample maximum receiving water limitations in Table 6.2 by the total number of wet weather days during the rainy season.

[e] The data collected for dry weather must be used in addition to the data collected for wet weather to calculate the wet weather 30-day geometric means. The exceedance frequency of the wet weather 30-day geometric means must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the wet season.

(iv) The Responsible Copermittee must identify and incorporate additional MS4 outfall and receiving water monitoring stations and/or adjust monitoring frequencies to identify sources causing exceedances of the receiving water WQBELs.

(v) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(vi) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

7. Total Maximum Daily Loads for Sediment in Los Peñasquitos Lagoon

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2012-0033

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2012
State Water Board Approval Date:	January 21, 2014
Office of Administrative Law Approval Date:	July 14, 2014
US EPA Approval Date:	October 30, 2014

(3) TMDL Effective Date: July 14, 2014

(4) Watershed Management Area: Peñasquitos

(5) Water Body: Los Peñasquitos Lagoon

(6) Responsible Copermittees: County of San Diego, City of San Diego, City of Del Mar, and City of Poway

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final sediment TMDL compliance requirements for Los Peñasquitos Lagoon consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must be in compliance with the final TMDL compliance requirements by December 31, 2034.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not prohibit the sustainable restoration of tidal and non-tidal saltmarsh vegetation of at least 346 acres.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations by the compliance date under Provision 7.b(1) will not cause or contribute to a failure of the receiving water condition specified under Specific Provision 7.b.(2)(a):

Table 7.1
*Final Effluent Limitations as Expressed as Wet Season Loads in MS4 Discharges to Los Peñasquitos Lagoon**

Constituent	Effluent Limitation
Sediment	2,580 tons/wet season

* Final effluent limitations are to be achieved by the following Responsible Parties: County of San Diego, City of San Diego, City of Del Mar, City of Poway, Phase II MS4 permittees, Caltrans, general construction storm water NPDES permittees, and general industrial storm water NPDES permittees.

(c) Best Management Practices

(i) The Water Quality Improvement Plan for the Los Peñasquitos Watershed Management Area must incorporate the Sediment Load Reduction Plan required to be developed pursuant to Resolution No. R9-2012-0033.

(ii) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 7.b.(2)(a) and/or the Copermittee's portion of the effluent limitations under Specific Provision 7.b.(2)(b) for Los Peñasquitos Lagoon.

(3) Final TMDL Compliance Determination

Compliance determination with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) Successful restoration of 80 percent of the 1973 acreage of tidal and non-tidal lagoon salt marsh (346 acres) as described in Attachment A of Resolution No. R9-2010-0033; OR

(b) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 7.b.(2)(c)(ii) and/or other implementation actions to achieve compliance with Specific Provision 7.b.(3)(a) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 7.b.(2)(c)(ii) or other implementation actions to achieve compliance with Specific Provision 7.b.(3)(a),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 7.b.(2)(c)(ii) or other implementation actions, AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 7.d to demonstrate compliance with Specific Provision 7.b.(3)(a).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim sediment TMDL compliance requirements for Los Penasquitos Lagoon consist of the following:

(1) Interim Compliance Dates and WQBELs

The Responsible Copermittees must comply with the interim WQBELs, expressed as wet season loads, by December 31 of the interim compliance year set forth in Table 7.2.

Table 7.2
*Interim Water Quality Based Effluent Limitations Expressed as Wet Season Loads in MS4 Discharges**

Interim Compliance Date	Interim Effluent Limitations (tons/wet season)
December 31, 2019	6,691
December 31, 2023	5,663
December 31, 2027	4,636
December 31, 2029	3,608

* Interim effluent limitations are to be achieved by the following Responsible Parties: County of San Diego, City of San Diego, City of Del Mar, City of Poway, Phase II MS4 permittees, Caltrans, general construction storm water NPDES permittees, and general industrial storm water NPDES permittees.

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) The final receiving water limitation under Specific Provision 7.b.(2)(a) is met; OR

(c) There are no exceedances of the Copermittee's portion of interim effluent limitations under Table 7.2 at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the Copermittee's portion of the interim TMDL compliance requirements described in Attachment A of Resolution No. R9-2010-0033 will be achieved by the interim compliance date.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) Watershed Monitoring

The Responsible Copermittees must conduct suspended sediment, bed load, and flow monitoring to calculate total sediment loading to the Los Peñasquitos Lagoon for each wet season (October 1 thru April 30) as set forth below:

(a) The Responsible Copermittees must monitor enough storm events throughout the season to quantify sediment loading over each wet season, and

(b) The Responsible Copermittees must monitor at least 3 stations to quantify cumulative sediment loading into Los Peñasquitos Lagoon. Stations must be located within the Los Peñasquitos, Carroll Canyon, and Carmel Creek tributaries prior to discharging into Los Peñasquitos Lagoon.

(2) Lagoon Monitoring

The Responsible Copermittees must monitor Los Peñasquitos Lagoon each Fall for changes in the extent of the vegetation types as set forth below:

(a) The Responsible Copermittees must acquire aerial photos of Los Peñasquitos Lagoon and digitize them at an approximate scale of 1:2,500,

(b) The Responsible Copermittees must appropriately interpret the vegetation and classify the various types as saltmarsh, non-tidal saltmarsh, freshwater marsh, non-tidal saltmarsh –*Lolium perrene* infested, southern willow scrub/mulefat scrub, herbaceous wetland, or upland land cover.

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the monitoring data collected under Specific Provision 7.d(1) and 7.d(2) to assess whether the interim and final WQBELs have been achieved.

(b) For assessing and determining compliance with the final receiving water limitations under Specific Provision 7.b.(2)(a), the Responsible Copermittees must use the data acquired under Specific Provision 7.d.(2) to estimate the acreage of tidal and non-tidal saltmarsh actually restored.

(c) For assessing and determining compliance with the final effluent limitations under Specific Provision 7.b.(2)(b), the Responsible Copermittees must use the data acquired under Specific Provision 7.d.(1) to estimate sediment loading into Los Peñasquitos Lagoon. Sediment loading must be evaluated using a 3-year, weighted rolling average. The first reported average shall be calculated using data collected in the year, 2015-2016, 2016-2017, and 2017-2018 wet seasons.

(d) The monitoring and assessment results must be submitted as part of the Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

ATTACHMENT F

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

FACT SHEET / TECHNICAL REPORT

FOR

ORDER NO. R9-2013-0001
AS AMENDED BY ORDER NOS. R9-2015-0001 AND R9-2015-0100
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

May 8, 2013
Amended February 11, 2015
and November 18, 2015

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I. FACT SHEET FORMAT

This Fact Sheet briefly sets forth the principal facts and the significant factual, legal, methodological, and policy questions that the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) considered in preparing Order No. R9-2013-0001 (Order), as amended by Order Nos. R9-2015-0001 and R9-2015-0100. In accordance with the Code of Federal Regulations (CFR) Title 40 Parts 124.8 and 124.56 (40 CFR 124.8 and 40 CFR 124.56), this Fact Sheet includes, but is not limited to, the following information:

1. Contact information
2. Public process and notification procedures
3. Background of municipal storm water permits
4. Regional MS4 Permit approach
5. Economic considerations
6. Applicable statutes, regulations, plans and policies
7. Discussion of the provisions in the Order

Tentative Order No. R9-2013-0001 was distributed for public review on October 31, 2012. The San Diego Water Board accepted written comments on Tentative Order No. R9-2013-0001 until January 11, 2013. A public hearing was subsequently held on April 10 and 11, 2013, that was continued to May 8, 2013 to receive oral comments from interested persons. The San Diego Water Board adopted Order No. R9-2013-0001 on May 8, 2013.

Tentative Order No. R9-2015-0001, an Order amending Order No. R9-2013-0001, was distributed for public review on September 19, 2014. The San Diego Water Board accepted written comments on Tentative Order No. R9-2015-0001 until November 19, 2014. A public hearing was held on February 11, 2015, to receive oral comments from Copermittees and interested persons. The San Diego Water Board adopted Order No. R9-2015-0001 amending Order No. R9-2013-0001 on February 11, 2015. Order No. R9-2015-0001 amended the findings and provisions of Order No. R9-2013-0001 to:

a. Enroll the County of Orange, the Orange County Flood Control District and the south Orange County Cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano as Copermittees responsible for compliance with the terms and conditions of Order No. R9-2013-0001, as amended by Order No. R9-2015-0001;

b. Designate the San Diego Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the Cities of Laguna Woods and Laguna Hills and agree to the designation of the Santa Ana Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the City of Lake Forest, subject to the

terms of the February 10, 2015 agreement between San Diego Water Board and the Santa Ana Water Board described in Finding 29 of this Order, upon the later effective date of Order No. R9-2015-0001 or Order No. R8-2015-0001 (superseding Order No. R8-2009-0030);

c. Establish interim exceptions to land development requirements for those priority development projects that discharge to engineered channels and large river reaches as described in Provision E.3.c.(2)(e) of this Order;

d. Incorporate the amended requirements of the State Water Resources Control Board's (State Water Board) General Exception to require that pollutant reductions be achieved within 6 years for storm water and nonpoint source discharges to ASBS within the Region;

e. Incorporate applicable requirements of the Los Peñasquitos Lagoon Sediment TMDL; and

f. Require the Orange County Copermittees to implement the "*Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County*," dated October 2014, made effective in the Monitoring and Reporting Program/Order issued pursuant to California Water Code section 13383 in the December 5, 2014 San Diego Water Board Letter Directive and subject to future revisions by the Executive Officer after appropriate public input.

Tentative Order No. R9-2015-0100, an Order amending Order No. R9-2013-0001 as amended by Order No. R9-2015-0001, was distributed for public review on July 31, 2015. The San Diego Water Board accepted written comments on Tentative Order No. R9-2015-0100 until September 14, 2015. A public hearing was held on November 18, 2015, to receive oral comments from Copermittees and interested persons. The San Diego Water Board adopted Order No. R9-2015-0100 amending Order No. R9-2013-0001 as amended by Order No. R9-2015-0001, on November 18, 2015. Order No. R9-2015-0100 amended the findings and provisions of Order No. R9-2013-0001 as amended by Order No. R9-2015-0001 to:

a. Enroll the County of Riverside, the Cities of Murrieta, Temecula, and Wildomar, and the Riverside County Flood Control and Water Conservation District as Copermittees responsible for compliance with the terms and conditions of Order No. R9-2013-0001, as amended by Order Nos. R9-2015-0001 and R9-2015-0100;

b. Continue designation of the San Diego Water Board to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Murrieta and Wildomar, including areas within the Santa Ana Region; and, agree to continue designation of the Santa Ana Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the City of Menifee, including areas within

the San Diego Region, subject to the terms of the October 26, 2015 agreement between San Diego Water Board and the Santa Ana Water Board described in Finding 29 of this Order;

d. Incorporate Provision B.3.c, which provides an option that allows a Copermittee to utilize the watershed-based Water Quality Improvement Plan to be deemed in compliance with the prohibitions and limitations of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b;

e. Incorporate minor revisions to Provisions E.2.a.(1) and E.2.a.(2) to include San Diego Water Board Order No. R9-2015-0013 and State Water Board Order 2014-0194-DWQ into the requirements for addressing non-storm water discharges to a Copermittee's MS4;

e. Incorporate minor revisions to Provision E.3.b.(1) to correct inconsistencies in the definition of a Priority Development Project as compared to the definitions in Order No. R9-2009-0002 (Fourth Term Orange County MS4 Permit) and Order No. R9-2010-0016 (Fourth Term Riverside County MS4 Permit), and requirements for incorporating the corrected definitions into the BMP Design Manual;

f. Incorporate revisions to Provision E.3.e.(1)(a) to provide additional clarity on when the structural BMP performance requirements of Provision E.3.c are applicable to Priority Development Projects;

e. Incorporate minor revisions to the Revised TMDLs for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region and the TMDLs for Sediment in Los Peñasquitos Lagoon in Attachment E to the Order to make the requirements consistent with the Basin Plan amendments adopted by the San Diego Water Board; and

f. Remove provisions related to allowing the Riverside County Copermittees to apply for early coverage under the Regional MS4 Permit.

The San Diego Water Board files applicable to the issuance of Order No. R9-2013-0001 and amendments thereto are incorporated into the administrative record in support of the findings and requirements of the Order.

II. CONTACT INFORMATION

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The Order and other related documents can be downloaded from the San Diego Water Board website at

http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

The documents referenced in this Fact Sheet and in Order No. R9-2013-0001 and amendments thereto are available for public review at the San Diego Water Board office, located at the address listed above. Public records are available for inspection during regular business hours, from 8:00 am to 5:00 pm Monday through Friday. To schedule an appointment to inspect public records, contact the San Diego Water Board Records Management Officer at 619-516-1990.

COPERMITTEES

Orange County Copermittees

- County of Orange
  - City of Aliso Viejo
  - City of Dana Point
  - City of Laguna Beach
  - City of Laguna Hills
  - City of Laguna Niguel
  - City of Laguna Woods
  - City of Lake Forest *
  - City of Mission Viejo
  - City of Ranch Santa Margarita
  - City of San Clemente
  - City of San Juan Capistrano
  - Orange County Flood Control District

* While not listed in the above table, the City of Lake Forest remains a Copermittee under this Order until the later effective date of this Order or Santa Ana Water Board Tentative Order No. R8-2015-0001. Thereafter, the City of Lake Forest will no longer be considered a Copermittee under this Order because its Phase I MS4 discharges will be regulated by the Santa Ana Water Board pursuant to Water Code section 13328 designation. The requirements of this Order that apply to the City of Lake Forest for the duration of this Order, consistent with the Water Code section 13228 agreement dated February 10, 2015, are described in Finding 29 and Footnote 2 to Table B-1.

Riverside County Copermittees

- County of Riverside
  - City of Menifee**
  - City of Murrieta
  - City of Temecula
  - City of Wildomar
  - Riverside County Flood Control and Water Conservation District

** The City of Menifee is not regulated as a Copermittee under this Order because its Phase I MS4 discharges are regulated by Santa Ana Water Board Order No. R8-2010-0033 as it may be amended or issued pursuant to Water Code section 13228 designation. The requirements of this Order that apply to the City of Menifee for the duration of this Order, consistent with the Water Code section 13228 written agreement dated October 26, 2015, are described in Finding 29 and Footnote 3 to Table B-1.

San Diego County Copermittees

- County of San Diego
  - City of Carlsbad
  - City of Chula Vista
  - City of Coronado
  - City of Del Mar
  - City of El Cajon
  - City of Encinitas
  - City of Escondido
  - City of Imperial Beach
  - City of La Mesa
  - City of Lemon Grove
  - City of National City
  - City of Oceanside
  - City of Poway
  - City of San Diego
  - City of San Marcos
  - City of Santee
  - City of Solana Beach
  - City of Vista
  - San Diego County Regional Airport Authority
  - San Diego Unified Port District

III. PUBLIC PROCESS AND NOTIFICATION PROCEDURES

The San Diego Water Board followed the schedule listed below for the preparation of Order No. R9-2013-0001 and amendments thereto:

San Diego County Copermittee Permit Reissuance Process

1. On February 8, 2011, the San Diego Water Board met with the San Diego County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No. R9-2007-0001.

2. Between February and May 2011, the San Diego Water Board met with select San Diego County, Orange County, and Riverside County Copermittees, as well as representatives of the environmental community to discuss concepts and receive recommendations for elements to be incorporated in a Regional Municipal Separate Storm Sewer System Permit (Regional MS4 Permit).

3. On June 27, 2011 the San Diego Water Board received the Report of Waste Discharge from the San Diego County Copermittees for the renewal of their NPDES permit, Order No. R9-2007-0001.

4. On April 9, 2012, the San Diego Water Board released an administrative draft of Tentative Order No. R9-2013-0001 for preliminary informal comments and feedback.

5. On April 25, 2012, the San Diego Water Board held an informal public workshop to present the administrative draft of Tentative Order No. R9-2013-0001 and receive verbal comments.

6. Between June and August 2012, the San Diego Water Board held four (4) focused meetings with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community, and USEPA) to discuss and receive preliminary comments and feedback about specific elements in the administrative draft of Tentative Order No. R9-2013-0001.

7. On September 5, 2012, the San Diego Water Board held an informal public workshop to present the modifications that were expected to be incorporated into the Tentative Order based on the preliminary comments and feedback received during the focused meetings held between June and August 2012.

8. Informal written comments on the administrative draft of Tentative Order No. R9-2013-0001 were accepted until September 14, 2012.

9. On October 12, 2012, the San Diego Water Board released a revised administrative draft of Tentative Order No. R9-2013-0001.

10. On October 24, 2012, the San Diego Water Board held a focused meeting with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community, and USEPA) to discuss modifications incorporated into the administrative draft of Tentative Order No. R9-2013-0001.

11. On October 31, 2012, the San Diego Water Board released Tentative Order No. R9-2013-0001 for formal public review and comment.

12. On November 13, 2012 and December 12, 2012, the San Diego Water Board held a formal public Board workshop to present the public draft of Tentative Order No. R9-2013-0001 and receive verbal comments.

13. Formal written comments on the public draft of Tentative Order No. R9-2013-0001 were accepted until January 11, 2013.

14. A public hearing of Tentative Order No. R9-2013-0001 was conducted on April 10 and 11, 2013, that was continued to May 8, 2013.

Orange County Copermittee Permit Reissuance Process

15. On May 20, 2014 the San Diego Water Board received the Report of Waste Discharge from the Orange County Copermittees for the renewal of their MS4 NPDES permit, Order No. R9-2009-0002.

16. On June 24, 2014, the San Diego Water Board met with the Orange County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No.R9-2009-0002 and the process for enrollment as Copermittees under Regional MS4 Permit Order No. R9-2013-0001.

17. On July 1, 2014, the San Diego Water Board held a public meeting to discuss the Orange County Report of Waste Discharge and receive comments on potential modifications to Order No. R9-2013-0001. Based on comments received from the Orange County Copermittees and other interested persons at this meeting, the San Diego Water Board determined that additional public meetings were not needed prior to release of Tentative Order No. R9-2015-0001, amending Order No. R9-2013-0001 in redlined – strikeout format for public review and comment.

18. On September 19, 2014, the San Diego Water Board released Tentative Order No. R9-2015-0001 for a 60 day public review and comment period.

19. On October 8, 2014, the San Diego Water Board held a formal public workshop at a regular board meeting to receive information and discuss the proposed amendments to Order No. R9-2013-0001 described in Tentative Order No. R9-2015-0001.

20. In accordance with State and federal laws and regulations, the San Diego Water Board notified San Diego County, Orange County and Riverside County Copermittees, and all known interested agencies and persons of its intent to adopt Tentative Order No. R9-2015-0001 and provided them with an opportunity to submit their written comments and recommendations. Written comments and recommendations on Tentative Order No. R9-2015-0001 were accepted until November 19, 2014.

21. The San Diego Water Board held a public workshop on October 8, 2014, and a public hearing on February 11, 2015, and heard and considered all comments pertaining to the adoption of Tentative Order No. R9-2015-0001 on February 11, 2015.

Riverside County Copermittee Permit Reissuance Process

22. Between April and June 2015, the San Diego Water Board held three (3) public workshops with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community) to discuss and receive comments and feedback about amending Order No. R9-2013-0001 to incorporate a definition of prior lawful approval for Priority Development Projects, and an alternative compliance pathway for prohibitions and limitations in Provision A of the Order. A San Diego Water Board member attended the April and May 2015 public workshops, but no actions or voting took place.

23. On April 15, 2015, the San Diego Water Board met with the Riverside County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No.R9-2010-0016 and the process for enrollment as Copermittees under Order No. R9-2013-0001 (Regional MS4 Permit).

24. On May 8, 2015 the San Diego Water Board received a Report of Waste Discharge from the Riverside County Copermittees for the renewal of their MS4 NPDES permit, Order No. R9-2010-0016.

25. On July 31, 2015, the San Diego Water Board released Tentative Order No. R9-2015-0100 for a formal public review and comment period.

26. Formal written comments on the public draft of Tentative Order No. R9-2015-0100 were accepted until September 14, 2015, a formal public written comment period of 46 days.

27. A public hearing to receive oral comments on Tentative Order No. R9-2015-0100 was conducted on November 18, 2015.

IV. BACKGROUND OF THE SAN DIEGO REGION MUNICIPAL STORM WATER PERMITS

In developed and developing areas, storm water runoff is commonly transported through municipal separate storm sewer systems (MS4s) and discharged into local receiving water bodies. As the storm water runs off and flows over the land or impervious surfaces (e.g., paved streets, parking lots, and building rooftops), it accumulates debris, chemicals, sediment, and other pollutants that can adversely affect receiving water quality if discharged untreated. The United States Environmental Protection Agency (USEPA) recognizes wet weather flows from urban areas as the number one source of estuarine pollution in coastal communities,[1] such as those within the San Diego Region.

The federal Clean Water Act (CWA) was amended in 1987 to address and regulate discharges of storm water associated with industrial activities and from municipal storm sewers. With the amendments, many municipalities throughout the United States were obligated for the first time to obtain National Pollutant Discharge Elimination System (NPDES) permits for discharges of storm water from their MS4s.

In response to the CWA 1987 amendment, as well as the pending federal NPDES regulations which would implement the amendment, the San Diego Water Board issued "early" MS4 permits. The San Diego Water Board adopted and issued Order Nos. 90-38, 90-42, and 90-46 to regulate storm water discharges from the MS4s in Orange County, San Diego County, and Riverside County, respectively, within the San Diego Region on July 16, 1990.

The "early" MS4 permits, or First Term Permits, were issued prior to the November 1990 promulgation of the final federal NPDES storm water regulations. By issuing these First Term Permits before the federal regulations took effect, the San Diego Water Board was able to provide the Copermittees additional flexibility in addressing and managing storm water discharges. The First Term Permits contained the essentials of the 1990 regulations, and required the Copermittees to develop and implement runoff management programs, but provided little specificity about what was required to be included in or actually achieved by those programs.

The flexibility provided in the First Term Permits was generally continued through the Second Term Permits. The combination of the lack of specificity in the First and Second Term Permits, a general lack of meaningful action by the Copermittees and a general lack of corresponding reaction (i.e. enforcement) by the San Diego Water Board during the first ten years of the storm water program, resulted in few substantive steps towards achieving improvements in the quality of receiving waters or storm water discharges from the MS4s.

[1] US EPA. 1999. 40 CFR Parts 9, 122, 123, and 124. National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. 64 FR 68727.

From 2001, the regulatory approach incorporated into Third Term Permits was a significant departure from the regulatory approach of the First and Second Term Permits. The Third Term Permits issued by the San Diego Water Board included more detailed requirements that outlined the minimum level of implementation required for the Copermittees' programs to meet the maximum extent practicable (MEP) standard for storm water. The Third Term Permits included more detail to emphasize and enhance the jurisdictional runoff management programs developed by the Copermittees and introduced requirements for developing and implementing watershed-based programs.

The Third Term Permits also incorporated two precedent setting decisions by the State Water Board. In Order WQ 99-05, the State Water Board established receiving water limitation language to be included in all MS4 permits. The State Water Board's precedential language clarified that municipal storm water permits must include provisions requiring discharges to be controlled to attain water quality standards in receiving waters. Unlike previously adopted versions of the receiving water limitation language in the First and Second Term Permits, the language no longer stated that "*violations of water quality standards are not violations of the municipal storm water permit under certain conditions*." In addition, the receiving water limitation language no longer indicated that the "*implementation of best management practices is the 'functional equivalent' of meeting water quality standards*." State Water Board Order WQ 99-05 specifically requires language in MS4 permits for the Copermittees to comply with water quality standards based discharge prohibitions and receiving water limitations through timely implementation of control measures and other actions to reduce pollutants in discharges. (See State Water Board Order WQ 99-05 (*Environmental Health Coalition*)).

In Order WQ 2000-11, also a precedential decision, the State Water Board addressed design standards for structural post-construction best management practices (BMPs) for new development and significant redevelopment. The State Water Board found that the design standards, which require that runoff generated by 85 percent of storm events from specific development categories be infiltrated or treated, reflect the MEP standard. State Water Board Order WQ 2000-11 also found that the post-construction BMP provisions, or Standard Storm Water Mitigation Plan (SSMP) provisions, constitute MEP for addressing storm water pollutant discharges resulting from specific development categories.

The Third Term San Diego County and Orange County Permits (Order Nos. 2001-01 and R9-2002-0001, respectively) were appealed to the State Water Board. Minor modifications were made by the State Water Board, but the requirements were largely upheld. In State Water Board Order WQ 2001-15, the State Water Board upheld the Third Term San Diego County Permit requirements with certain modifications. The State Water Board removed the prohibition of storm water discharges *into* the MS4 that cause or contribute to exceedances of water quality objectives. The revision allows for treatment of pollutants in storm water runoff after the pollutants have entered the MS4.

State Water Board Order WQ 2001-15 otherwise upheld all the other requirements of the permit.

In addition to the modification to the discharge prohibition in Order WQ 2001-15, the State Water Board refined Order WQ 99-05 by making clear that the Copermittees may use an iterative approach to achieving compliance with water quality standards that involves ongoing assessments and revisions. Thus, the language for the discharge prohibitions and receiving water limitations was revised to explicitly require the Copermittees to implement an iterative process of assessments and revisions to comply with the discharge prohibitions and receiving water limitations. The San Diego Water Board retained the authority to enforce receiving water limitations and discharge prohibitions even if the Copermittee is engaged in the iterative process.

The Third Term San Diego County Permit was subsequently challenged in the Superior Court of the State of California and the Court of Appeal, Fourth Appellate District. The Court of Appeal, Fourth Appellate District, found that the approach of the Third Term San Diego County Permit to regulating discharges into the MS4 was appropriate (*Building Industry Ass'n. v. State Water Resources Control Bd., et al.,* 124 Cal.App.4th 866 (2004)). The State of California Supreme Court denied review sought by the Building Industry Association in March 2005.

The Fourth Term Permits began with the adoption of Order No. R9-2007-0001 issued to the Copermittees of San Diego County in January 2007. Order Nos. R9-2009-0002 and R9-2010-0016 were subsequently issued to the Copermittees of Orange County and Riverside County. The Fourth Term Permits continued to include more detailed requirements to be implemented by each Copermittee's jurisdictional runoff management program. The Fourth Term Permits also included requirements to further emphasize a watershed management approach and for more coordination among jurisdictional runoff management programs. In addition, the Fourth Term Permits included more requirements for assessing the effectiveness of the runoff management programs being implemented by the Copermittees. The intent of the inclusion of additional requirements was to enhance and better define elements of the permit that were expected to be incorporated into the iterative process for managing runoff from each Copermittee's jurisdiction and within the watersheds of the San Diego Region.

The Fourth Term Permits included several new and emerging approaches for managing storm water runoff and discharges. Low impact development (LID) requirements are included for development and significant redevelopment to reduce pollutants in storm water runoff from sites through more natural processes such as infiltration and biofiltration closer to the source, rather than utilizing conventional mechanical end-of-pipe treatment systems. Hydrograph modification (hydromodification) management requirements also are included to mitigate the potential for increased erosion in receiving waters due to increased runoff rates and durations often caused by development and increased impervious surfaces. The Fourth Term Orange County and Riverside County Permits introduced requirements to identify areas of existing

development where retrofitting with LID projects would be feasible and could be implemented to reduce storm water runoff and pollutants in storm water discharges.

The Fourth Term Orange County and Riverside County Permits included a clearer distinction between storm water and non-storm water discharges. The term “urban runoff” was completely removed, and a distinction between storm water (wet weather) runoff and non-storm water (dry weather) runoff was emphasized. This clarification was made to prevent any potential misunderstanding that regulation under the MS4 permits is limited only to urbanized areas, and to prevent non-storm water runoff from being managed in the same manner as storm water runoff. The term “urban runoff” is not defined in the Code of Federal Regulations (CFR) or Federal Register (FR) in the regulation of MS4 discharges. According to the CWA 402(p)(3)(B)(ii), MS4 permits must include a requirement to effectively prohibit non-storm water discharges into the MS4s.

Finally, for the Fourth Term Orange County and Riverside County Permits the San Diego Water Board found that non-storm water discharges to the MS4 from over application of irrigation water are sources of pollutants. The San Diego Water Board found that non-storm water discharges resulting from over-irrigation must be prohibited from entering the MS4 in accordance with the requirements of the CWA and pursuant to 40 CFR 122.26(d)(2)(iv)(B)(1).

The requirements of the Fourth Term Permits issued to the Copermittees in each county within the San Diego Region now have substantively the same core requirements such as discharge prohibitions, receiving water limitations, jurisdictional runoff management program components, and monitoring program requirements. There are, however, several inconsistencies that exist among the three Fourth Term Permits which complicate oversight and implementation of the permits by the San Diego Water Board.

The Fourth Term San Diego County Permit expired in January 2012. The Fourth Term Orange County permit expired in December 2014 and the Fourth Term Riverside County Permit expired in November 2015. Issuing the Fifth Term Permits within five years for three counties under three different permits would have required the San Diego Water Board to expend significant time and resources for the issuance of the permits through three separate public proceedings, thereby greatly reducing the time and resources available to oversee implementation and compliance. Multiple permits also create confusion for determining compliance among regulated entities, especially for the land development community.

The San Diego Water Board acknowledged that issuing a single MS4 permit for all the Copermittees in the San Diego Region can and is expected to result in more consistent implementation, improve communication among agencies within watersheds crossing multiple jurisdictions, and minimize resources spent with each permit renewal process. Within the findings of the Fourth Term Riverside County Permit issued in November 2010, the San Diego Water Board notified the public of its intent to develop and issue a single Regional MS4 Permit.

V. REGIONAL MS4 PERMIT APPROACH

The Fifth Term Permit, or Regional MS4 Permit, shifts the focus of the permit requirements from a minimum level of actions to be implemented by the Copermittees to identifying outcomes to be achieved by those actions. Order No. R9-2013-0001 represents an important paradigm shift in the approach for MS4 permits within the San Diego Region.

Historical Permitting Approach

The First and Second Term Permits were very broad and provided little specificity about what was required to be developed and implemented by the Copermittees. The Third Term Permits began to become more specific about the minimum level of implementation required by the Copermittees. The Fourth Term Permits subsequently increased in specificity. The MS4 permits have progressively become more detailed and focused on specifying the minimum level of actions expected to be implemented by the Copermittees. As detailed and specific as the MS4 permits have become, however, they include very little detail about what the desired outcomes of the required actions are expected to achieve. Compliance with the permit requirements has essentially been tracking numbers of actions and reporting, not tracking progress or actual improvements in the quality of receiving waters or discharges from the MS4s. The result has been an increase in actions being implemented by the Copermittees with little or no ability or expectations to determine whether or not improvements in water quality are being achieved.

The Fourth Term Permits result in significant resource expenditure by the Copermittees to report permit compliance information to the San Diego Water Board in the form of annual jurisdictional runoff management program, watershed program, and monitoring program reports. The San Diego Water Board was required to expend much of its limited resources on reviewing more than 50 voluminous reports submitted annually by the Copermittees. The information reported by the Copermittees was of limited value when trying to measure progress toward achieving improvements in the quality of receiving waters or discharges from the MS4s. Oversight of the MS4 permits was further complicated by the inconsistencies among the requirements issued to the Orange County, San Diego County, and Riverside County Copermittees under three separate MS4 permits.

Under the Fourth Term Permits, the Copermittees were required to expend a significant portion of their limited resources collecting data of limited value, and putting together reports to submit that information to the San Diego Water Board. Likewise, the San Diego Water Board was required to expend most of its limited resources reviewing reports, and developing permits instead of working directly with the Copermittees to identify solutions to problems causing impacts to water quality. This was an unsustainable course that would have continued to demand more resources

from the Copermittees and the San Diego Water Board, and would have continued to result in unknown water quality benefits.

New Permitting Approach

The goal of the Regional MS4 Permit is twofold: 1) bring a consistent set of MS4 permit requirements to all of the Copermittees within the San Diego Region; and, 2) provide an MS4 permit with requirements that will allow the Copermittees to focus their efforts and resources on achieving goals and desired outcomes toward the improvement of water quality rather than completing specific actions.

The overall approach included in the Regional MS4 Permit with respect to the jurisdictional runoff management programs will not differ significantly from the current permits. The general requirements for the jurisdictional runoff management program components and compliance with those requirements will remain and be applied consistently throughout the San Diego Region under the Regional MS4 Permit.

The most significant difference in the new permitting approach is the specific manner of implementation for those jurisdictional runoff management programs. Implementation will be based on decisions made by the Copermittees in accordance with what they have identified as their highest priority water quality conditions. In other words, the Copermittees will have significant control in how to implement the jurisdictional runoff management programs to best utilize their available resources in addressing a specific set of priorities effectively, instead of trying to address all the water quality priorities ineffectively.

The Copermittees are given the responsibility of identifying their highest priority water quality conditions that they intend to address. The Copermittees will develop goals that can be used to measure and demonstrate progress or improvements toward addressing those priorities. In addition to the goals, the Copermittees will provide a schedule for achieving the goals for those highest priorities. The measurement of progress toward achieving the goals for those highest priorities requires a better defined and more focused program of monitoring and assessment than under the Fourth Term Permits.

The monitoring and assessment program must be designed to inform the Copermittees of their progress, and the need for modifications in their jurisdictional runoff management programs and schedules to achieve their goals to improve water quality. The monitoring and assessment program requirements will have a more central role in the Regional MS4 Permit than in earlier permits. The monitoring and assessment requirements must also be designed to enable the Copermittees to focus and direct their efforts in implementing their jurisdictional runoff management programs toward their stated desired outcomes to improve the quality of receiving waters and/or discharges from the MS4s.

By providing an MS4 permit that allows the Copermittees to make more decisions about how to utilize and focus their resources, along with a better defined monitoring and assessment program to inform their water quality management decisions, the Copermittees have the opportunity to:

1) *Plan strategically*. The Copermittees must have the ability to identify their available resources and develop and implement long term plans that can organize, collect, and use those resources in the most strategically advantageous and efficient manner possible. This ability to develop long term plans will allow the Copermittees to focus and utilize their resources in a more concerted way over the short term and long term to address specific water quality priorities through stated desired outcomes.

2) *Manage adaptively*. The Copermittees must be given the ability to modify their plans as additional information and data are collected from the monitoring and assessment programs. The Copermittees' plans may require modifications to the programs, priorities, goals, strategies, and/or schedules in order for the Copermittees to achieve a stated desired outcome.

3) *Identify synergies*. The Copermittees must be given more flexibility to identify efficiencies within and among their jurisdictional runoff management programs as the strategies are developed and implemented to increase the Copermittees' collective effectiveness. The Copermittees must also be able to identify and utilize resources available from other agencies and entities to further augment and enhance their jurisdictional runoff management programs and/or to collectively work with those other agencies and entities toward achieving a stated desired outcome.

The Regional MS4 Permit requirements provide the Copermittees the flexibility and responsibility to decide what actions will be necessary to achieve an outcome that is tailored and designed by the Copermittees to improve specific prioritized water quality conditions. The San Diego Water Board expects the approach of the Regional MS4 Permit to give the Copermittees a greater sense of ownership for restoring the quality of receiving waters in the San Diego Region by becoming an integral part of the decision making process in identifying water quality conditions to be addressed, as well as determining the best use of their resources.

VI. ECONOMIC CONSIDERATIONS

Statutory Considerations

California Water Code (CWC) section 13241 requires the San Diego Water Board to consider certain factors, including economic considerations, in the adoption of water quality objectives. CWC section 13263 requires the San Diego Water Board to take into consideration the provisions of CWC section 13241 in adopting waste discharge requirements.

In *City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, the California Supreme Court considered whether Regional Water Boards must comply with CWC section 13241 when issuing waste discharge requirements under CWC section 13263(a) by taking into account the costs a permittee will incur in complying with the permit requirements. The Court concluded that whether it is necessary to consider such cost information "*depends on whether those restrictions meet or exceed the requirements of the federal Clean Water Act.*" (*Id.* at p. 627.) The Court ruled that Regional Water Boards may not consider the factors in CWC section 13241, including economics, to justify imposing pollutant restrictions that are less stringent than applicable federal law requires. (*Id.* At pp. 618, 626-627 ["*[Water Code section 13377 specifies that [ ] discharge permits issued by California's regional boards must meet the federal standards set by federal law. In effect, section 13377 forbids a regional board's consideration of any economic hardship on the part of the permit holder if doing so would result in the dilution of the requirements set by Congress in the Clean Water Act...Because CWC section 13263 cannot authorize what federal law forbids, it cannot authorize a regional board, when issuing a [ ] discharge permit, to use compliance costs to justify pollutant restrictions that do not comply with federal clean water standards*."]). However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Regional Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

As discussed in Section VII.F, Unfunded State Mandates, the San Diego Water Board finds that the requirements in this Order are not more stringent than the minimum federal requirements. Among other requirements, federal law requires MS4 permits to include requirements to effectively prohibit non-storm water discharges into the MS4s, in addition to requiring controls to reduce the discharge of pollutants in storm water to the MEP, and other provisions as USEPA or the State determines are appropriate for the control of pollutants in MS4 discharges.

The requirements in this Order may be more specific or detailed than those enumerated in federal regulations under 40 CFR 122.26 or in the USEPA guidance. However, the requirements have been designed to be consistent with and within the federal statutory mandates described in CWA section 402(p)(3)(B)(ii) and (iii) and the related federal regulations and guidance. Consistent with federal law, all of the

conditions in this Order could have been included in a permit adopted by USEPA in the absence of the in lieu authority of California to issue NPDES permits.

Moreover, the inclusion of numeric WQBELs in this Order does not cause this Order to be more stringent than federal law. Federal law authorizes both narrative and numeric effluent limitations to meet state water quality standards. The inclusion of WQBELs as discharge specifications in an NPDES permit in order to achieve compliance with water quality standards is not a more stringent requirement than the inclusion of BMP based permit limitations to achieve water quality standards (State Water Board Order No. WQ 2006-0012 (*Boeing*)). Therefore, consideration of the factors set forth in CWC section 13241 is not required for permit requirements to implement the effective prohibition on the discharge of non-storm water discharges into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determine appropriate to control such pollutants, as those requirements are mandated by federal law.

Included in the provisions of the Order are monitoring and reporting requirements that are designed to demonstrate that the Copermittees are implementing programs to comply with the CWA municipal storm water requirements. CWA section 308(a) and 40 CFR 122.41(h), (j)-(l), 122.44(i) and 122.48 require that all NPDES permits specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s (40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c)) also specify additional monitoring and reporting requirements. In addition to the federal requirements of the CWA, the San Diego Water Board also has the authority in CWC 13383 to establish monitoring, reporting, and recordkeeping requirements that implement federal and state laws and regulations through NPDES permits.

The monitoring and assessment information that will be reported to the San Diego Water Board is necessary to determine if the Copermittees are making progress toward achieving compliance with the discharge prohibitions, receiving water limitations, and effluent limitations under Provision A of the Order. The monitoring and assessment information that will be reported is also expected to be key to the iterative approach and adaptive management process that is required to be implemented by the Copermittees if they cannot meet the discharge prohibitions and receiving water limitations under the present conditions, which is also part of the requirements under Provision A of the Order.

Notwithstanding the above, the San Diego Water Board has considered cost information in issuing this Order, as discussed below. The San Diego Water Board has also considered all of the evidence that has been presented to the San Diego Water Board regarding the CWC section 13241 factors in adopting this Order. The San Diego Water Board finds that the requirements in this Order are reasonably necessary to protect beneficial uses identified in the Basin Plan and the economic information related to costs of compliance and other CWC section 13241 factors are not sufficient to justify failing to protect those beneficial uses. Where appropriate, the

San Diego Water Board has provided or will consider providing the Copermittees with additional time to implement control measures to achieve final WQBELs and/or water quality standards.

Cost Information

Discussions of the financial and economic ramifications of municipal storm water management programs tend to focus on the significant costs incurred by municipalities in developing and implementing the programs. When considering the cost of implementing the programs, however, it is also important to consider the alternative costs that are incurred when programs are not fully implemented, as well as the economic benefits which result from effective program implementation.

The recent financial and economic conditions have amplified the concerns about the costs incurred by the municipalities in developing and implementing their programs. The reduction in resources resulting from the recent financial and economic conditions has been cited by many of the Copermittees as a justification for reducing the requirements that must be met by their programs. While the recent conditions are a cause for concern in the short term, these programs also have an opportunity to identify and implement improvements and efficiencies before the next period of growth and development, resulting in more effective and sustainable programs over the long term.

In addition, it is very difficult to ascertain the true cost of implementation of the Copermittees' management programs because of inconsistencies in reporting by the Copermittees. Reported costs of compliance for the same program element can vary widely from city to city, often by a very wide margin that is not easily explained.[2] Despite these problems, efforts have been made to identify management program costs, which can be helpful in understanding the costs of program implementation.

The San Diego Water Board recognizes that the Copermittees will incur costs in implementing this Order, potentially above and beyond the costs from the Copermittees' prior permits. The San Diego Water Board also recognizes that, due to California's current economic condition, many Copermittees currently have limited staff and resources to implement actions to address its MS4 discharges. Based on the economic considerations below, the San Diego Water Board has provided the Copermittees a significant amount of flexibility to choose how to implement the requirements of the Order.

The Order also allows the Copermittees to customize their plans, programs, and monitoring requirements. In the end, it is up to the Copermittees to determine the effective BMPs and measures necessary to comply with this Order. The Copermittees can choose to implement the least expensive measures that are effective in meeting

[2] Los Angeles Water Board, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.

the requirements of this Order. This Order also does not require the Copermittees to fully implement all requirements within a single permit term. Where appropriate, the Board has provided the Copermittees with additional time outside of the permit term to implement control measures to achieve final WQBELs and/or water quality standards.

The San Diego Water Board has considered available cost information associated with compliance with this Order. It is not possible to predict accurately the cost impact of the requirements that involve an unknown level of implementation or that depend on environmental variables that are as yet undefined. Only general conclusions can be drawn from this information.

Estimated Municipal Storm Water Program Implementation Costs

The USEPA, the State Water Board, and the California Regional Water Quality Control Boards (Regional Water Boards) have attempted to evaluate the costs of implementing municipal storm water programs. The assessments have demonstrated that the true costs are difficult to ascertain and reported costs vary widely. In addition, reported fiscal analyses tend to neglect the costs incurred to municipalities when storm water and non-storm water runoff is not effectively managed, which are incurred as a result of pollution, contamination, nuisance, and damage to ecosystems, property, and human health. Nonetheless, they provide a useful context for considering the costs of requirements within Order No. R9-2013-0001.

In 1999, the USEPA reported on multiple studies it conducted to determine the cost of management programs. A study of Phase II municipalities determined that the annual cost of the Phase II program was expected to be $9.16 per household. The USEPA also studied 35 Phase I municipalities, finding costs to be $9.08 per household annually, similar to those anticipated for Phase II municipalities.[3]

The State Water Board commissioned a study by the California State University, Sacramento to assess costs of the Phase I MS4 program. This study includes an assessment of costs incurred by Phase I MS4s throughout the state to implement their programs. Annual cost per household in the study ranged from $18 to $46, with the Fresno-Clovis Metropolitan Area representing the lower end of the range, and the City of Encinitas (in San Diego County) representing the upper end of the range.[4]

A study on Phase I MS4 program costs was also conducted by the California Regional Water Quality Control Board, Los Angeles Region (Los Angeles Water Board), where program costs reported in the municipalities' annual reports were assessed. The Los

[3] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791-68792.
[4] State Water Board, 2005. NPDES Stormwater Cost Survey. P. ii.

Angeles Water Board estimated that average per household cost to implement the MS4 program in Los Angeles County was $12.50. [5]

It is important to note that reported program costs are not all attributable to solely complying with MS4 permits. Many program components, and their associated costs, existed before any MS4 permits were ever issued. For example, street sweeping and trash collection costs cannot be solely or even principally attributable to MS4 permit compliance, since these practices have long been expected from and implemented by municipalities.

Therefore, true program cost resulting from MS4 permit requirements is some fraction of reported costs. The California State University, Sacramento study found that only 38 percent of program costs are new costs fully attributable to MS4 permits. The remainder of the program costs was either pre-existing or resulted from enhancement of pre-existing programs.[6] In 2000, the County of Orange found that even lower amounts of program costs are solely attributable to MS4 permit compliance, reporting that the amount attributable to implement the County or Orange Drainage Area Management Plan (DAMP), was less than 20 percent of the total budget. The remaining 80 percent was attributable to pre-existing programs.[7] More current data from the County of Orange is not used in this discussion because the County of Orange no longer reports such information.

Estimated Value of Healthy Water Quality

Economic considerations of municipal storm water management programs cannot be limited only to program costs. Evaluation of programs must also consider information on the benefits derived from environmental protection and improvement.[8] Attention is often focused on municipal storm water management program costs, but the programs must also be viewed in terms of their value to the public.

Placing a value on healthy receiving waters is very difficult. Often the value of receiving waters with good water quality manifests in other forms, such as tourism, recreational opportunities, and/or increased property values. When surface water bodies are degraded, thereby degrading the habitat within and adjacent to the water bodies, the public loses the value and benefits associated with being able to use the area in and around the water bodies. Surface waters that are able to support the beneficial uses designated in the Basin Plan can sustain plants and wildlife that can attract visitors and residents, providing aesthetic, recreational, as well as monetary value to the public. At this time, however, there have been no studies for the San

[5] Los Angeles Water Board, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.
[6] State Water Board, 2005. NPDES Stormwater Cost Survey. P. 58.
[7] County of Orange, 2000. A NPDES Annual Progress Report. P. 60.
[8] Ribaudo M.O. and D. Heelerstein. 1992, *Estimating Water Quality Benefits: Theoretical and Methodological Issues.* U.S. Department of Agriculture. Technical Bulletin No. 1808.

Diego Region to quantify the added value that surface waters with healthy water quality can provide.

USEPA has estimated that household willingness to pay for improvements in fresh water quality for fishing and boating is approximately $158-$210.[9] This estimate can be considered conservative, since it does not include important considerations such as marine waters benefits, wildlife benefits, or flood control benefits. Another study conducted by California State University, Sacramento reported that the annual household willingness to pay for statewide clean water is approximately $180.[10]

A study conducted by the University of Southern California and University of California, Los Angeles assessed the costs and benefits of implementing various approaches for achieving compliance with the MS4 permits in the Los Angeles region. The study found that non-structural systems would cost $2.8 billion but provide $5.6 billion in benefit. If structural systems were determined to be needed, the study found that total costs would be $5.7 to $7.4 billion, while benefits could reach $18 billion.[11] Costs are anticipated to be borne over many years, probably at least ten years.

As can be seen, the benefits of the municipal storm water management programs are expected to considerably exceed their costs. Such findings are corroborated by USEPA, which found that the benefits of implementation of its Phase II storm water rule would also outweigh the costs.[12]

[9] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68793.
[10] State Water Board, 2005. NPDES Stormwater Cost Survey. P. iv.
[11] Los Angeles Water Board, 2004. Alternative Approaches to Stormwater Control.
[12] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791.

VII. APPLICABLE STATUTES, REGULATIONS, PLANS AND POLICIES

A. Legal Authorities – Federal Clean Water Act and California Water Code

This Order is issued pursuant to section 402 of the CWA and implementing regulations adopted by the USEPA and chapter 5.5, division 7 of the CWC (commencing with section 13370). This Order serves as an NPDES permit for point source discharges to surface waters. This Order also serves as waste discharge requirements pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

The objective of the CWA is "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*." To carry out this objective, the CWA requires the implementation of permit programs to regulate the discharge of pollutants and dredged or fill material to the navigable waters of the U.S. and to regulate the use and disposal of sewage sludge. CWA section 402 provides the legal authority to issue a permit for the discharge of pollutants to waters of the U.S. under the NPDES. The CWA provides that NPDES permits may be issued by states which are authorized to implement the provisions of that act. California became authorized to implement the NPDES permit program on May 14, 1973.

The Porter-Cologne Water Quality Control Act (Division 7, commencing with CWC section 13000) established the State Water Resources Control Board (State Water Board) and nine Regional Water Quality Control Boards (Regional Water Boards) as the principal state agencies with primary responsibility for the coordination and control of water quality. CWC section 13200(f) established the San Diego Water Board, which has the primary responsibility for the coordination and control of water quality in the San Diego Region, which includes all the basins draining into the Pacific Ocean between the southern boundary of the Santa Ana Region and the California-Mexico boundary. The San Diego Water Board implements the CWA through Chapter 5.5 of the CWC, commencing with section 13370. CWC section 13377 provides the San Diego Water Board the legal authority to issue waste discharge requirements to ensure compliance with all applicable provisions of the CWA and acts amendatory thereof or supplementary, thereto, to implement water quality control plans, or for the protection of beneficial uses, or to prevent nuisance.

CWA section 402(p) requires the USEPA or authorized state to issue NPDES permits for storm water discharges from MS4s to waters of the U.S. CWA section 402(p)(3)(B)(ii) requires that NPDES permits for storm water discharges from MS4s "*effectively prohibit non-storm water discharges*" into the MS4s. CWA section 402(p)(3)(B)(iii) requires that NPDES permits for storm water discharges from MS4s to "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable* [MEP], *including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*."

The USEPA published implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]), which prescribe permit application requirements for storm water discharges from MS4s pursuant to CWA 402(p), on November 16, 1990. The USEPA published an Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems, which provided guidance on permit application requirements for regulated MS4s, on May 17, 1996. The federal regulations in 40 CFR 122 and guidance issued by USEPA serve as the foundation for the provisions of Order No. R9-2013-0001. The legal authorities provided by the above statutes and regulations are included as part of the discussions in Section VIII of this Fact Sheet.

B. Legal Authority for the Permit Issued on a Region-wide Basis

CWA section 402(p)(3)(B) provides the San Diego Water Board the legal authority to issue an NPDES permit for the San Diego Region as compared to separate MS4 permits based upon County- and partial County-wide boundaries as they existed within the San Diego Region. CWA section 402(p)(3)(B) states that "*Permits for discharges from municipal storm sewers- (i) may be issued on a system- or jurisdiction-wide basis* ...." The federal regulations in 40 CFR 122.26(a)(1)(v) also state that the San Diego Water Board "*may designate dischargers from municipal separate storm sewers on a system-wide or jurisdiction-wide basis. In making this determination, the [San Diego Water Board] may consider the following factors: (A) the location of the discharge with respect to waters of the United States; (B) the size of the discharge; (C) the quantity and nature of the pollutants discharged to waters of the United States; and (D) other relevant factors*."

More specifically, the federal regulations provide that for large and medium MS4 systems, the San Diego Water Board may issue a regional permit. Specifically, the federal regulation in 40 CFR 122.26(a)(3) provide:

"*(ii) The Director may either issue one system-wide permit covering all discharges from municipal separate storm sewers within a large or medium municipal storm sewer system or issue distinct permits for appropriate categories of discharges within a large or municipal separate storm sewer system including, but not limited to: all discharges owned or operated by the same municipality; located within the same jurisdiction; all discharges within a system that discharge to the same watershed; discharges within a system that are similar in nature; or for individual discharges from municipal separate storm sewers within the system.*

(iii) The operator of a discharge from a municipal separate storm sewer which is part of a large or medium municipal separate storm sewer system must either: (A) Participate in a permit application (to be a permittee or a co-permittee) with one or more other operator of discharges from the large or medium municipal storm sewer system which covers all, or a portion of all, discharges from the municipal separate storm sewer system; (B) Submit a distinct permit application which only covers discharges from the municipal separate storm sewers for

which the operator is responsible; or (C) A regional authority may be responsible for submitting a permit application under the following guidelines....

(iv) One permit application may be submitted for all or a portion of all municipal separate storm sewers within adjacent or interconnected large or medium municipal separate storm sewer systems. The Director may issue one systemwide permit covering all, or a portion of all municipal separate storm sewers in adjacent or interconnected large or medium municipal separate storm sewer systems.

(v) Permits for all or a portion of all discharges from large or medium municipal separate storm sewer systems that are issued on a system-wide, jurisdiction-wide, watershed or other basis may specify different conditions relating to different discharges covered by the permit, including different management programs for different drainage areas which contribute storm water to the system."

Based on these regulations, the San Diego Water Board may issue a region-wide MS4 permit. The regulations also clarify that the permit may include different conditions for separate discharges covered by the permit. This allows the San Diego Water Board to ensure that suitable water quality conditions and provisions are identified for each watershed.

The USEPA's responses to comments in the Final Rule for the above-mentioned regulations also make it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide, permits. In the Final Rule published in the Federal Register and containing the responses to comments, USEPA notes that 40 CFR 122.26(a)(3)(iv) would allow an entire system in a geographical region under the purview of a State agency to be designated under a permit.[13] USEPA also states that many commenters wanted to allow the permitting authority broad discretion to establish system-wide permits, and that EPA believes that paragraphs 40 CFR 122.26 (a)(1)(v) and (a)(3)(ii) allow for such broad discretion.[14]

This Order creates watershed requirements that apply to multiple counties. The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees. Managing storm water on a regional and watershed basis is expected to result in improved water quality, as the Order focuses on monitoring and management practices necessary to improve each watershed rather than political boundaries. A single permit also allows the San Diego Water Board staff to expend fewer resources developing successive multiple permits and allows more resources to be devoted to working cooperatively with all three current groups of Copermittees to ensure implementation of this Order results in improved water quality.

[13] 55 Federal Register 47990-01, 48042.
[14] Ibid.

C. Federal and California Endangered Species Acts

This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2115.5) or the Federal Endangered Species Act (16 United States Code [USC] sections 1531 to 1544). This Order requires compliance with requirements to protect the beneficial uses of waters of the U.S. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

D. California Environmental Quality Act

The action to adopt an NPDES Permit is exempt from the provisions of Chapter 3 of the California Environmental Quality Act (CEQA) (Public Resources Code section 21100, et seq.) pursuant to CWC section 13389. (*County of Los Angeles v. Cal. Water Boards* (2006) 143 Cal.App.4th 985.)

E. State and Federal Regulations, Plans and Policies

The legal authority provided by the following regulations, plans, and policies are also included as part of the discussions in Section VIII of this Fact Sheet.

<u>Water Quality Control Plan for the San Diego Basin</u>

The CWA requires the San Diego Water Board to establish water quality standards for each water body in its region. Water quality standards include beneficial uses, water quality objectives and criteria that are established at levels sufficient to protect beneficial uses, and an antidegradation policy to prevent degrading of waters. On September 8, 1994, the San Diego Water Board adopted the *Water Quality Control Plan for the San Diego Basin* (Basin Plan). The Basin Plan designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters in the San Diego Region. The San Diego Water Board has amended the Basin Plan on multiple occasions since 1994. In addition, the Basin Plan implements State Water Board Resolution No. 88-63, which established state policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply. Beneficial uses applicable to the surface water bodies that receive discharges from the MS4s within the San Diego Region generally include those listed below:

The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region:

- Municipal and Domestic Supply (MUN)
- Agricultural Supply (AGR)
- Industrial Process Supply (PROC)

- Industrial Service Supply (IND)
- Ground Water Recharge (GWR)
- Contact Water Recreation (REC1)
- Non-contact Water Recreation (REC2)
- Warm Freshwater Habitat (WARM)
- Cold Freshwater Habitat (COLD)
- Wildlife Habitat (WILD)
- Rare, Threatened, or Endangered Species (RARE)
- Freshwater Replenishment (FRSH)
- Hydropower Generation (POW)
- Preservation of Biological Habitats of Special Significance (BIOL)

The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region:

- Navigation (NAV)
- Commercial and Sport Fishing (COMM)
- Estuarine Habitat (EST)
- Marine Habitat (MAR)
- Aquaculture (AQUA)
- Migration of Aquatic Organisms (MIGR)
- Spawning, Reproduction, and/or Early Development (SPWN)
- Shellfish Harvesting (SHELL)

Pursuant to Water Code sections 13263 and 13377, the requirements of this Order implement the Basin Plan.

Water Quality Control Plan for Ocean Waters of California, California Ocean Plan

In 1972, the State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan). The State Water Board adopted the most recent amended Ocean Plan on October 16, 2012. The Office of Administrative Law approved it on July 3, 2013. The amended Ocean Plan became effective on August 19, 2013. The Ocean Plan is applicable, in its entirety, to ocean waters of the State. In order to protect beneficial uses, the Ocean Plan establishes water quality objectives and a program of implementation. Pursuant to Water Code sections 13263 and 13377, the requirements of this Order implement the Ocean Plan. The Ocean Plan identifies the beneficial uses of ocean waters of the State to be protected as summarized below:

- Industrial water supply
- Water contact and non-contact recreation, including aesthetic enjoyment; navigation
- Commercial and sport fishing

- Mariculture
- Preservation and enhancement of designated Areas of Special Biological Significance
- Rare and endangered species
- Marine habitat
- Fish spawning and shellfish harvesting

On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving an exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges. On June 19, 2012, the State Water Board adopted Order No. 2012-0031, amending Order No. 2012-0012 to require pollutant load reductions to be achieved within six years for the ASBS Compliance Plans, section A.2.d(2) and ASBS Pollution Prevention Plans, section B.2.b(2). The State Water Board Resolution No. 2012-0012, as amended requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject terms and conditions of State Water Board Resolution No. 2012-0012, as amended. The Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012, as amended, applicable to these discharges, are incorporated in Attachment A of this Order. Requirements of this Order implement the Ocean Plan.

Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality

On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

Antidegradation Policy

Federal regulations (40 CFR 131.12) require that the state water quality standards include an antidegradation policy consistent with the federal antidegradation policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16 ("Statement of Policy with Respect to Maintaining the Quality of the Waters of the State"). State Water Board Resolution No. 68-16 incorporates the

federal antidegradation policy where the federal policy applies under federal law.

The San Diego Water Board's Basin Plan implements and incorporates by reference both the State and federal antidegradation policies. State Water Board Resolution No. 68-16 and 40 CFR 131.12 require the San Diego Water Board to maintain high quality waters of the State unless degradation is justified based on specific findings. First, the Board must ensure that "existing instream uses and the level of water quality necessary to protect the existing uses" are maintained and protected. Second, if the baseline quality of a water body for a given constituent exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water, that quality shall be maintained and protected through the requirements of the Order unless the Board makes findings that (1) any lowering of the water quality is necessary to accommodate important economic or social development in the area in which the waters are located; (2) water quality adequate to protect existing uses fully is assured; and (3) the highest statutory and regulatory requirements for all new and existing point sources and all cost-effective and reasonable best management practices for nonpoint source control are achieved. The San Diego Water Board must also comply with any requirements of State Water Board Resolution No. 68-16 beyond those imposed through incorporation of the federal antidegradation policy. In particular, the Board must find that not only present, but also anticipated future uses of water are protected, and must ensure best practicable treatment or control of the discharges. The baseline quality considered in making the appropriate findings is the best quality of the water since 1968, the year of the adoption of Resolution No. 68-16, or a lower level if that lower level was allowed through a permitting action that was consistent with the federal and state antidegradation policies.

The discharges permitted in this Order are consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Board Resolution No. 68-16 as set forth below:

1. Many of the waters within the area covered by this Order are impaired for multiple pollutants discharged through MS4s and are not high quality waters with regard to these pollutants. In most cases, there is insufficient data to determine whether these water bodies were impaired as early as 1968, but the limited available data shows impairment dating back for more than two decades. Many such water bodies are listed on the State's CWA Section 303(d) List and the San Diego Water Board has established TMDLs to address the impairments. This Order ensures that existing instream (beneficial) water uses and the level of water quality necessary to protect the existing uses is maintained and protected. This Order requires the Copermittees to comply with permit provisions to implement the WLAs set forth in the TMDLs in order to restore the beneficial uses of the impaired water bodies consistent with the assumptions and requirements of the TMDLs. This Order further requires compliance with receiving water limitations to meet water quality standards in the receiving water either by demonstrating compliance pursuant to Provision A and the Copermittees' monitoring and assessment program pursuant to Provision D of this Order, or by implementing Provision B.3.c with a schedule to achieve compliance

with receiving water limitations. This Order includes requirements to develop and implement storm water management programs, achieve WQBELs, and effectively prohibit non-storm water discharges into the MS4. The issuance of this Order does not authorize an increase in the amount of discharge of waste.

2. To the extent that water bodies within the area covered by this Order are high quality waters with regard to some constituents, this Order finds as follows:

   a. Allowing limited degradation of high quality water bodies through MS4 discharges is necessary to accommodate important economic or social development in the area and is consistent with the maximum benefit to the people of the state. The discharge of storm water in certain circumstances is to the maximum benefit to the people of the state because it can assist with maintaining instream flows that support beneficial uses, may spur the development of multiple-benefit projects, and may be necessary for flood control, and public safety as well as to accommodate development in the area. The alternative – capturing all storm water from all storm events – would be an enormous opportunity cost that would preclude MS4 permittees from spending substantial funds on other important social needs. The Order ensures that any limited degradation does not affect existing and anticipated future uses of the water and does not result in water quality less than established standards. The Order requires compliance with receiving water limitations that act as a floor to any limited degradation.

   b. The Order requires the highest statutory and regulatory requirements and requires that the Copermittees meet best practicable treatment or control. The Order prohibits all non-storm water discharges, with a few enumerated exceptions, through the MS4 to the receiving waters. As required by 40 CFR section 122.44(a), the Copermittees must comply with the "maximum extent practicable" technology-based standard set forth in CWA section 402(p), and implement extensive minimum control measures in a storm water management program. Recognizing that best practicable treatment or control may evolve over time, the Order includes new and more specific requirements as compared to the prior Phase I MS4 permits for the San Diego County, Orange County and Riverside County Copermittees. The Order incorporates options to implement Water Quality Improvement Plans that must specify detailed structural and non-structural storm water controls that must be implemented in accordance with an accepted proposed time schedule. The Order contains provisions to encourage, wherever feasible, retention of the storm water from the 85th percentile 24-hour storm event.

<u>Anti-Backsliding Requirements</u>

CWA sections 402(o) and 303(d)(4) and federal regulations at 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations or conditions may be relaxed. While this Order

allows implementation of an alternative compliance pathway option in Provision B.3.c to constitute compliance with receiving water limitations under certain circumstances, the availability of that alternative and the corresponding availability of additional time to come into compliance with receiving water limitations does not violate the anti-backsliding provisions. The receiving water limitations provisions of this Order are imposed under section 402(p)(3)(B) of the Clean Water Act rather than based on best professional judgment, or based on section 301(b)(1)(C) or sections 303(d) or (e), and are accordingly not subject to the anti-backsliding requirements of section 402(o). Although the non-applicability is less clear with respect to the regulatory anti-backsliding provisions in 40 CFR 122.44(l), the regulatory history suggests that USEPA's intent was to establish the anti-backsliding regulations with respect to evolving technology standards for traditional point sources. (See, e.g., 44 Fed.Reg. 32854, 32864 (Jun. 7, 1979)). It is unnecessary, however, to resolve the ultimate applicability of the regulatory anti-backsliding provisions, because the alternative compliance pathway option in Provision B.3.c qualifies for an exception to backsliding as based on new information.

The alternative compliance pathway option in Provision B.3.c of this Order was informed by new information available to the Board from experience and knowledge gained through storm water permitting at the Regional Water Boards in the last ten years. There has been a statewide paradigm shift in storm water management. State Water Board Order WQ 2015-0075 directed all of the Regional Water Boards to consider the Los Angeles Water Board's alternative compliance path to receiving water limitations in all Phase I MS4 permits going forward (State Water Board Order WQ 2015-0075 at page 51), and the Los Angeles Water Board's process of developing over 30 watershed-based TMDLs and implementing several TMDLs since the adoption of the previous permits. In particular, the Los Angeles Water Board recognized the significance of allowing time to plan, design, fund, operate and maintain watershed-based BMPs necessary to attain water quality improvements and additionally recognized the potential for municipal storm water to benefit water supply. Similarly, the San Diego Water Board's experience developing and implementing the Fourth Term MS4 Permits and TMDLs that apply on a region-wide scale (e.g. TMDLs for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region) has resulted in a similar recognition of the need for a watershed-based approach that allows time to plan, design, fund, operate and maintain BMPs to address impaired waters that have been impacted by MS4 discharges. Thus, even if the receiving water limitations are subject to anti-backsliding requirements, they were revised based on new information that would support an exception to the anti-backsliding provisions. (33 U.S.C. § 1342(o)(2)(B)(i); 40 C.F.R. § 122.44(l)(1); 40 C.F.R. §122.44(l)(2)(i)(B)(1)).

<u>Clean Water Act Section 303(d) List</u>

CWA section 303(d)(1) requires each State to identify specific water bodies within its boundaries where water quality standards are not being met or are not expected to be met after implementation of technology-based effluent limitations on point sources. Water bodies that do not meet water quality standards are considered impaired and are placed on the state's "303(d) List." Periodically, USEPA approves the State's 303(d) List.

Most recently, USEPA approved the State's 2010 303(d) List of impaired water bodies on October 11, 2011, which includes certain receiving waters in the San Diego Region. For each listed water body, the state or USEPA is required to establish a TMDL of each pollutant impairing the water quality standards in that water body. A TMDL is a tool for implementing water quality standards and is based on the relationship between pollution sources and in-stream water quality conditions. The TMDL establishes the allowable pollutant loadings for a water body and thereby provides the basis to establish water quality-based controls. These controls should provide the pollution reduction necessary for a water body to meet water quality standards.

A TMDL is the sum of the allowable pollutant loads of a single pollutant from all contributing point sources (the waste load allocations or WLAs) and non-point sources (load allocations of LAs) plus the contribution from background sources and a margin of safety (40 CFR 130.2(i)). MS4 discharges are considered point source discharges. For 303(d)-listed water bodies and pollutants in the San Diego Region, the San Diego Water Board or USEPA develops and adopts TMDLs that specify these requirements.

Since 2002, the San Diego Water Board has established seven (7) TMDLs to remedy water quality impairments in various water bodies within the San Diego Region (see Attachment E to the Order). These TMDLs identify MS4 discharges as a source of pollutants to these water bodies, and, as required, establish WLAs for MS4 discharges to reduce the amount of pollutant discharged to receiving waters. CWA section 402(p)(3)(B)(iii) requires the San Diego Water Board to impose permit conditions, including: "management practices, control techniques and system, design and engineering methods, and *such other provisions as the Administrator or the State determines appropriate for the control of such pollutants."* (Emphasis added.) CWA section 402(a)(1) also requires states to issue permits with conditions necessary to carry out the provisions of the CWA. Federal regulations also require that NDPES permits contain WQBELs consistent with the assumptions and requirements of all available WLAs (40 CFR 122.44(d)(1)(vii)(B)). CWC section 13377 also requires that NPDES permits include limitations necessary to implement water quality control plans. Therefore, this Order includes WQBELs and other provisions to implement the TMDL WLAs assigned to Copermittees regulated by this Order.

<u>Other Regulations, Plans and Policies</u>

This Order implements all other applicable federal regulations and State regulations, plans and policies, including the California Toxics Rule at 40 CFR 131.38 (Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California Rule [California Toxics Rule or CTR]), and State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP).

F. Unfunded State Mandates

Article XIII B, Section 6(a) of the California Constitution provides that whenever "*any state agency mandates a new program or higher level of service on any local government, the state shall provide a subvention of funds to reimburse that local government for the costs of the program or increased level of service*." The requirements of this Order do not constitute state mandates that are subject to a subvention of funds for several reasons, including, but not limited to, the following.

First, the requirements of this Order do not constitute a new program or a higher level of service as compared to the requirements contained in the previous Fourth Term Permits. The overarching requirement to impose controls to reduce the pollutants in discharges from MS4s is dictated by the CWA and is not new to this permit cycle (33 USC section 1342(p)(3)(B)). The inclusion of new and advanced measures as the MS4 programs evolve and mature over time is anticipated under the CWA (55 FR 47990, 48052 (Nov. 16, 1990)), and to the extent requirements in this Order are interpreted as new advanced measures, they do not constitute a new program or higher level of service.

Second, and more broadly, mandates imposed by federal law, rather than by a state agency, are exempt from the requirement that the local agency's expenditures be reimbursed (Cal. Const., art. XIII B, section 9, subd. (b)). This Order implements federally mandated requirements under the CWA and its requirements are therefore not subject to subvention of funds. This includes federal requirements to effectively prohibit non-storm water discharges, to reduce the discharge of pollutants in storm water to the MEP, and to include such other provisions as the Administrator or the State determines appropriate for the control of such pollutants (33 USC section 1342(p)(3)(B)). Federal cases have held these provisions require the development of permits and permit provisions on a case-by-case basis to satisfy federal requirements. (*Natural Resources Defense Council, Inc., v. USEPA* (9th Cir. 1992) 966 F.2d 1292, 1308, fn. 17.)

The authority exercised under this Order is not reserved state authority under the CWA's savings clause (cf. *Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 627-628 [relying on 33 USC section 1370, which allows a state to develop requirements which are not "less stringent" than federal requirements]), but instead is part of a federal mandate to develop pollutant reduction requirements for municipal separate storm sewer systems. To this extent, it is entirely federal authority that forms the legal basis to establish the permit provisions. (See, *City of Rancho Cucamonga v. Regional Water Quality Control Board, Santa Ana Region* (2006) 135 Cal.App.4th 1377, 1389; *Building Industry Ass'n of San Diego Co. v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 882-883.)

The MEP standard is a flexible standard that balances a number of considerations, including technical feasibility, cost, public acceptance, regulatory compliance, and effectiveness. (*Building Ind. Ass'n., supra,* 124 Cal.App.4th at pp. 873-874, 889.) Such considerations change over time with advances in technology and with experience

gained in storm water management (55 FR 47990, 48052 (Nov. 16, 1990)). Accordingly, a determination of whether the conditions contained in this Order exceed the requirements of federal law cannot be based on a point by point comparison of the permit conditions and the minimum control measures that are required "at a minimum" to reduce pollutants to the maximum extent practicable and to protect water quality (40 CFR 122.34). Rather, the appropriate focus is whether the permit conditions, as a whole, exceed the MEP standard.

In recent months, the County of Los Angeles and County of Sacramento Superior Courts have granted writs setting aside decisions of the Commission on State Mandates that held certain requirements in Phase I permits constituted unfunded mandates. In both cases, the courts have found that the correct analysis in determining whether an MS4 permit constituted a state mandate was to evaluate whether the permit as a whole exceeds the MEP standard. (*State of Cal. v. Comm. on State Mandates* (Super. Ct. Sacramento County, 2012, No. 34-2010-80000604), *State of California v. County of Los Angeles* (Super. Ct. Los Angeles County, 2011, No. BS130730.) Both cases are currently pending appeal.

The requirements of the Order, taken as a whole rather than individually, are necessary to reduce the discharge of pollutants to the MEP and to protect water quality. The San Diego Water Board finds that the requirements of the Order are practicable, do not exceed federal law, and thus do not constitute an unfunded mandate. These findings are the expert conclusions of the principal state agency charged with implementing the NPDES program in California (CWC sections 13001, 13370).

It should also be noted that the provisions in this Order to effectively prohibit non-storm water discharges are also mandated by the CWA (33 USC section 1342(p)(3)(B)(ii)). Likewise, the provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state establishes or adopts a TMDL, federal law requires that permits must contain effluent limitations consistent with the assumptions and requirements of any applicable waste load allocation in a TMDL (40 CFR 122.44(d)(1)(vii)(B)).

Third, the local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental dischargers who are issued NPDES permits for storm water discharges. With a few inapplicable exceptions, the CWA regulates the discharge of pollutants from point sources (33 USC section 1342) and the Porter-Cologne Act regulates the discharge of waste (CWC section 13263), both without regard to the source of the pollutant or waste. As a result, the "costs incurred by local agencies" to protect water quality reflect an overarching regulatory scheme that places similar requirements on governmental and non-governmental dischargers. (See *County of Los Angeles v. State of California* (1987) 43 Cal.3d 46, 57-58 [finding comprehensive workers' compensation scheme did not create a cost for local agencies that was subject to state subvention].)

The CWA and the Porter-Cologne Act largely regulate storm water with an even hand, but to the extent there is any relaxation of this even-handed regulation, it is in favor of the local agencies. Generally, the CWA requires point source dischargers, including dischargers of storm water associated with industrial or construction activity, to comply strictly with water quality standards (33 USC section 1311(b)(1)(C); *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159, 1164-1165 [noting that industrial discharges must strictly comply with water quality standards]). As discussed in prior State Water Board decisions, certain provisions of this Order do not require strict compliance with water quality standards (State Water Board Order No. WQ 2001-0015, p. 7). Those provisions of this Order regulate the discharge of waste in municipal storm water under the CWA's MEP standard, not the BAT/BCT standard that applies to other types of discharges. These provisions, therefore, regulate the discharge of waste in municipal storm water more leniently than the discharge of waste from non-governmental sources.

Fourth, the Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)). To the extent that the local agency Copermittees have voluntarily availed themselves of the permit, the program is not a state mandate. (Accord, *County of San Diego v. State of California* (1997) 15 Cal.4th 68, 107-108.)

Fifth, the local agency Copermittees' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under state law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

Finally, even if any of the permit provisions could be considered unfunded mandates, under Government Code section 17556, subdivision (d), a state mandate is not subject to reimbursement if the local agency has the authority to charge a fee. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order, subject to certain voting requirements contained in the California Constitution. (See Cal. Const., Art. XIII D, section 6, subd. (c); see also *Howard Jarvis Taxpayers Ass'n v. City of Salinas* (2002) 98 Cal.App.4th 1351, 1358-1359.) The Fact Sheet demonstrates that numerous activities contribute to the pollutant loading in the MS4. Local agencies can levy service charges, fees, or assessments on these activities, independent of real property ownership. (See, e.g., *Apartment Ass'n of Los Angeles County, Inc., v. City of Los Angeles* (2001(24 Cal.4th 830, 842 [upholding inspection fees associated with renting property].) The authority and ability of a local agency to defray the cost of a program without raising taxes indicates that a program does not entail a cost subject to subvention. (*Clovis Unified School Dist. V. Chiang* (2010) 188 Cal.App.4th 794, 812, citing *Connell v. Sup. Ct.* (1997) 59 Cal.App.4th 382, 401; *County of Fresno v. State of California* (1991) 53 Cal. 3d. 482, 487-488.)

VIII. PROVISIONS

The provisions (i.e. NPDES permit requirements) of the Order are discussed below.

A. Prohibitions and Limitations

Purpose: Provision A includes the prohibitions and limitations requirements that are the foundation of all the subsequent requirements included in the Order. Compliance with the prohibitions and limitations will restore and protect receiving waters from impacts that may be caused by discharges into and from the Copermittees' MS4s and ultimately achieve the objective of the CWA.

In meeting the requirements set forth in the Order, the Copermittees must be cognizant that the prohibitions and limitations exist and will be the standard by which the San Diego Water Board will be measuring the progress and success of their implementation of the NPDES permit requirements.

***Discussion*:** The objective of the CWA is to "*restore and maintain the chemical, physical, and biological integrity of the Nation's waters*." The CWA requires the implementation of NPDES permit programs to regulate discharges of pollutants and dredged or fill material to the navigable waters of the U.S. For discharges into and from MS4s, the CWA requires the NPDES permits to "*effectively prohibit non-stormwater discharges into the storm sewers*" and "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable.*"

Provision A includes limitations, consistent with the requirements of the CWA for discharges from MS4s. Provision A expresses these limitations as discharge prohibitions, receiving water limitations, and effluent limitations. Compliance with the discharge prohibitions and receiving water limitations is also explicitly described, in conformance with precedential State Water Board Orders.

More specific and detailed discussions of the requirements of Provision A are provided below.

Provision A.1 (Discharge Prohibitions) prohibits the discharge of specific types of waste into and/or from the Copermittees' MS4s.

Provision A.1.a restates and reiterates Basin Plan Waste Discharge Prohibition 1, by prohibiting discharges into and from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the

state. The terms pollution,[15] contamination,[16] and nuisance[17] are defined under CWC 13050. Provision A.1.c incorporates all the waste discharge prohibitions of the Basin Plan into the requirements of the Order. The waste discharge prohibitions from the Basin Plan have been reproduced and provided in Attachment A to the Order.

Provision A.1.b requires non-storm water discharges into the MS4s to be effectively prohibited, consistent with the requirements of the CWA for MS4 permits to "*effectively prohibit non-stormwater discharges into the storm sewers*." The effective prohibition is required to be implemented by each Copermittee within its jurisdiction through the illicit discharge detection and elimination requirements under Provision E.2. The prohibition does not apply to NPDES permitted discharges into the Copermittees' MS4s.

The CWA employs the strategy of prohibiting the discharge of any pollutant from a point source into waters of the United States unless the discharger of the pollutant(s) obtains an NPDES permit pursuant to CWA Section 402. The 1987 amendment to the CWA includes provision 402(p) that specifically addresses NPDES permitting requirements for storm water discharges from MS4s. CWA section 402(p) prohibits the discharge of pollutants from specified MS4s to waters of the U.S. except as authorized by an NPDES permit and identifies two substantive standards for MS4 storm water permits. MS4 permits (1) "*shall include a requirement to effectively prohibit non-stormwater discharges into the storm sewers*" and (2) "*shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or State determines appropriate for the control of such pollutants*." (CWA section 402(p)(3)(B)(ii)-(iii).)

In November 1990, the USEPA published regulations addressing storm water discharges from MS4s (55 FR 47990 and following (Nov. 16, 1990) (Phase I Final Rule)). The regulations establish minimum requirements for MS4 permits, and generally focus on the requirement that MS4s implement programs to reduce the amount of pollutants found in storm water discharges to the MEP. The CWA's municipal storm water MEP standard does not require storm water discharges to strictly meet water quality standards, as is required for other NPDES permitted

[15] CWC 13050(l): "(1) 'Pollution' means an alteration of the quality of waters of the state by waste to a degree which unreasonably affects either of the following: (A) The water for beneficial uses. (B) Facilities which serve beneficial uses. (2) 'Pollution' may include 'contamination.'

[16] CWC 13050(k): "Contamination' means an impairment of the quality of waters of the state by waste to a degree which creates a hazard to public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste, whether or not waters of the state are affected."

[17] CWC 13050(m): 'Nuisance' means anything which meets all of the following requirements: (1) Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. (2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. (3) Occurs during, or as a result of, the treatment or disposal of wastes."

discharges. Compliance is achieved through an iterative approach of continuous implementation of improved BMPs. This distinction reflects Congress's recognition that variability in flow and intensity of storm events render difficult strict compliance with water quality standards by MS4 permittees. In describing the controls that permits must include to reduce pollutants in storm water discharges to the MEP, the statute (CWA section 402(p)(3)(B)(iii)) states that the controls shall include: "*management practices, control techniques and system, design and engineering methods, and such other provisions as the [permit writer] determines appropriate for the control of such pollutants*."

In contrast, non-storm water discharges from the MS4 that are not authorized by separate NPDES permits are subject to requirements under the NPDES program, including discharge prohibitions, technology based effluent limitations and water quality-based effluent limitations (40 CFR 122.44). The regulations also require the Copermittee's program to include an element to detect and remove illicit discharges and improper disposal into the storm sewer (40 CFR 122.26(d)(2)(iv)(B)).

While "non-storm water" is not defined in the CWA or federal regulations, the federal regulations (at 40 CFR 122.26(b)(2)) define "*illicit discharge*" as *"any discharge to a municipal separate storm sewer that is not composed entirely of storm water and that is not covered by an NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer and discharges resulting from fire fighting activities)*." This definition is the most closely applicable definition of "non-storm water" contained in federal law. As stated in the Phase I Final Rule, USEPA added the illicit discharge program requirement to begin implementation of the 'effective prohibition' requirement to detect and control non-storm water discharges to their municipal system.

Thus, federal law mandates that permits issued to MS4s must require management practices that will result in reducing storm water pollutants to the MEP yet at the same time requires that non-storm water discharges be effectively prohibited from entering the MS4. "Effectively" prohibit does not mean that non-storm water discharges are authorized to be discharged into and from the Copermittees' MS4s. The Phase I Final Rule clarifies what "effectively prohibit" means (55 FR 47995):

> "*Section 402(p)(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…<u>Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit</u> (other than the permit for the discharge from the municipal separate storm sewer)*" [Emphasis added].

Consistent with federal law, unless non-storm water discharges to the MS4 are authorized by a separate NPDES permit, non-storm water discharges are

appropriately subject to the effective prohibition requirement in the CWA and Regional Water Boards are not limited by the iterative MEP approach to storm water regulation in crafting appropriate regulations for non-storm water discharges.

The federal regulations (40CFR122.26(d)(2)(i)(B)) require the Copermittees to establish the legal authority which authorizes or enables the Copermittees to prohibit illicit discharges to the MS4s. The federal regulations (40 CFR 122.26(d)(2)(vi)(B)(1)) require the Copermittees to "*implement and enforce an ordinance, order or similar means*" to prevent non-storm water discharges to their MS4s. Thus, the Copermittees are required to "*effectively*" prohibit non-storm water discharges to their MS4s through enforcing their legal authority established under "*ordinance, order or similar mean*s" and either remove those discharges to their MS4s, or require those discharges to obtain coverage under a separate NPDES permit. More detail about the program that must be implemented to "*effectively*" prohibit non-storm water discharges to the Copermittees' MS4s is provided under the discussion for Provision E.2.

Provision A.1.d was included to be consistent with Resolution No. 2012-0012, adopted by the State Water Board on March 20, 2012. Provision A.1.d prohibits discharges from MS4s to Areas of Special Biological Significance (ASBS), except for storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach to the Heisler Park ASBS subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012. The pertinent Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 are provided in Attachment A to the Order.

<u>Provision A.2 (Receiving Water Limitations)</u> specifies the condition of the receiving waters that must be achieved when there are discharges from the Copermittees' MS4s. Receiving water limitations are included in all NPDES permits issued pursuant to the CWA section 402. CWA section 402(p)(3)(B)(iii) authorizes the inclusion of "*such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." This requirement gives USEPA or the State permitting authority, in this case the San Diego Water Board, discretion to determine what permit conditions are necessary to control pollutants.

In its Phase I Final Rule (see 55 FR 47990, 47994 (Nov. 16, 1990)), USEPA elaborated on these requirements, stating that, "*permits for discharges from municipal separate storm sewer systems must require controls to reduce the discharge of pollutants to the maximum extent practicable, and where necessary water quality-based controls*." USEPA reiterated in its Phase II Final Rule (64 FR 68722, 68737), that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL*." CWC section 13377 also requires that NPDES permits include limitations necessary to implement water quality control plans. Both the State Water Board and the San Diego Water Board have previously concluded that discharges from the MS4 contain pollutants that have

the reasonable potential to cause or contribute to excursions above water quality standards. As such, inclusion of receiving water limitations is appropriate to control MS4 discharges.

The inclusion of receiving water limitations is also consistent with the Ninth Circuit Court of Appeals' ruling in *Defenders of Wildlife v. Browner* (191 F.3d 1159, 1166 (1999)) that the permitting authority has discretion regarding the nature and timing of requirements that it includes as MS4 permit conditions to attain water quality standards. The Ninth Circuit Court of Appeals recently explained that, "*[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*" (*Natural Resources Defense Council v. County of Los Angeles* (9th Cir. 2011) 673 F.3d 880, 886 (revd. On other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013)))

The receiving water limitations included in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan or in water quality control plans or policies adopted by the State Water Board, including State Water Board Resolution No. 68-16, or in federal regulations, including but not limited to 40 CFR 131.12 and 131.38. The water quality objectives in the Basin Plan and other State Water Board plans and policies have been approved by USEPA and combined with designated beneficial uses constitute the water quality standards required under federal law.

Provision A.2.a requires that discharges from the Copermittees' MS4s must not cause or contribute to the violation of water quality standards in receiving waters. The water quality standards of the receiving waters must be protected from the impacts that may be caused by the Copermittees' MS4 discharges. Water quality standards applicable to the surface waters in the San Diego Region must be achieved through meeting the technology based standard of MEP through an iterative process of improved management actions. Provision A.2.a is also consistent with State Water Board Order WQ 99-05 precedent-setting language requiring discharges from MS4s to attain receiving water quality standards. The water quality control plans and policies with water quality standards applicable to the waters in the San Diego Region are included under Provision A.2.a.

Provisions A.2.b was included to be consistent with the requirements of State Water Board Resolution No. 2012-0012, adopted on March 20, 2012.

<u>Provision A.3 (Effluent Limitations)</u> specifies the condition of the discharges from the Copermittees' MS4s that must be achieved if and when there are discharges.

Consistent with CWA section 301(b)(1)(A) and 40 CFR 122.44(a), Provision A.3.a includes the technology-based effluent limitations that must be included in the Order. The technology-based effluent limits, representing the minimum level of control that must be imposed in a permit under CWA section 402, requires that pollutants in discharges of storm water from the Copermittees' MS4s be reduced to the MEP. This provision applies specifically to storm water discharges. Non-storm water discharges must be effectively prohibited, as required under Provision A.1.b. Non-storm water (dry weather) discharges from the MS4 are not considered storm water (wet weather) discharges and therefore are not subject to the MEP standard.

The technology-based MEP standard is an ever-evolving, flexible, and advancing concept. Neither Congress nor USEPA has specifically defined the term "maximum extent practicable." Congress established this flexible MEP standard so that the administrative bodies would have "*the tools to meet the fundamental goals of the Clean Water Act in the context of storm water pollution*." (*Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 884.) As knowledge about controlling storm water runoff and discharges continues to evolve, so does the knowledge which constitutes MEP. Reducing the discharge of pollutants in storm water from the MS4 to the MEP requires the Copermittees to assess each program component and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP.

The San Diego Water Board or the State Water Board ultimately define MEP, and may include requirements that provide specific guidance on what is expected to demonstrate MEP. It is the responsibility of the Copermittees to propose actions that implement BMPs to reduce storm water pollution to the MEP. In other words, the Copermittees' runoff management programs developed and implemented under the Order are the Copermittees' proposals for achieving MEP. Their total collective and individual activities conducted pursuant to their runoff management programs become their proposal for achieving MEP as it applies both to their overall effort, as well as to specific activities. Provisions B through E of the Order provides a minimum framework to guide the Copermittees in achieving the MEP standard for discharges of pollutants in storm water.

Provision A.3.b incorporates any water quality based effluent limitations (WQBELs) applicable to the MS4s established for TMDLs adopted and approved for the San Diego Region and requires the Copermittees to comply with those WQBELs. This is consistent with 40 CFR 122.44(d)(1)(vii)(B), which requires that NPDES permits to incorporate WQBELs "*developed to protect a narrative water quality criterion, a numeric water quality criterion, or both…consistent with the assumptions and requirements of any available wasteload allocation for the discharge...*"

Pursuant to CWA section 303(d), for surface water bodies identified as impaired by one or more pollutants, the San Diego Water Board is required to establish TMDLs "*at a level necessary to implement the applicable water quality standards with seasonal variations and a margin of safety which takes into account any lack of knowledge*

concerning the relationship between effluent limitations and water quality." The TMDLs identify sources of the pollutants causing the impairments and assign portions of the TMDL as WLAs to point sources, which include MS4s.

WLAs must be expressed in NPDES permits as WQBELs, which may include one or more numeric components such as numeric effluent limits, and/or receiving water limitations, and/or BMP requirements. Because numeric targets for TMDLs typically include a component that will be protective of water quality standards, a TMDL will likely include one or more numeric receiving water limitations and/or effluent limitations as part of the assumptions or requirements of the TMDL. Any numeric receiving water limitations and/or effluent limitations developed as part of the assumptions or requirements of a TMDL must be incorporated and included as part of WQBELs for the MS4s.

Because the development and approval of new TMDLs, or modification of existing TMDLs, may occur during the term of this Order, the specific provisions of those TMDLs, including effluent limitations applicable to MS4s are provided within Attachment E to the Order. Attachment E will be updated with new TMDLs and modifications to existing TMDLs in a timely manner as they occur.

Provision A.4 (Compliance with Discharge Prohibitions and Receiving Water Limitations) describes the process required to be implemented by the Copermittees if compliance with the discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a are not being achieved under current conditions.

In its Phase II Stormwater Regulations, Final Rule, USEPA states that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL.*"[18] In a series of comment letters on MS4 permits issued by various Regional Water Boards, USEPA has also reiterated that MS4 discharges must meet water quality standards.[19] In addition, the Ninth Circuit Court of Appeals explained in a recent ruling that, *"[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*"[20]

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[18] Phase II Stormwater Regulations, Final Rule, 64 Fed. Reg. 68722, 68737.
[19] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.
[20] NRDC v. County of Los Angeles (9th Cir. 2011), 673 F.3d 880, 886 (revd. on other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013))). See also, *Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 884-886, citing *Defenders of Wildlife v. Browning,* (9th Cir. 1999) 191 F.3d 1159.)

Water quality standards for the San Diego Region are established in the Basin Plan. The water quality standards of the Basin Plan are incorporated into this Order as the discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a. The discharge prohibitions and receiving water limitations in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations or prohibitions to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan, water quality control plans or policies adopted by the State Water Board, including Resolution No. 68-16, or federal regulations, including but not limited to, 40 CFR 131.12 and 131.38. The waste discharge prohibitions and water quality objectives in the Basin Plan have been approved by USEPA and combined with the designated beneficial uses constitute the water quality standards required under federal law.

Under federal law (CWA section 402(p)(3)(B)(iii)), an MS4 permit must include "*controls to reduce the discharge of pollutants to the maximum extent practicable...and such other provision as...the State determines appropriate for control of such pollutants*." The State Water Board has previously determined that limitations necessary to meet water quality standards are appropriate for the control of pollutants discharged by MS4s and must be included in MS4 permits. (State Water Board Orders WQ 91-03, 98-01, 99-05, 2001-15; see also *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159.) This Order prohibits discharges that cause or contribute to violations of water quality standards.

The discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a are included in this Order to ensure that discharges from the MS4s do not cause or contribute to exceedances of water quality objectives necessary to protect the beneficial uses of the receiving waters.

Provision A.4 is consistent with the precedent-setting language in State Water Board Order WQ 99-05 required to be included in municipal storm water permits. State Water Board Order WQ 2001-15 refined Order WQ 99-05 by requiring an iterative approach to compliance with water quality standards involving ongoing assessments and revisions, referred to as the "iterative process." The "iterative process" is a fundamental NPDES requirement for municipal storm water permits to achieve the objectives of the CWA.

The State Water Board and Regional Water Boards have stated that the provisions under Provisions A.1.a, A.1.c, A.2.a, and A.4 are independently applicable, meaning that compliance with one provision does not provide a "safe harbor" where there is non-compliance with another provision (i.e., compliance with the Provision A.4 does not shield a Copermittee who may have violated Provision A.1.a, A.1.c, or A.2.a from an enforcement action). The intent of Provision A.4 is to ensure that the Copermittees have the necessary storm water management programs and controls in place, and that they are modified by the Copermittees in a timely fashion when necessary, so that compliance with Provisions A.1.a, A.1.c, and/or A.2.a is achieved as soon as possible. USEPA expressed the importance of this independent applicability in a series of

comment letters on MS4 permits proposed by various Regional Water Boards. At that time, USEPA expressly objected to certain MS4 permits that included language stating, *"permittees will not be in violation of this [receiving water limitation] provision … [if certain steps are taken to evaluate and improve the effectiveness of the jurisdictional runoff management programs],"* concluding that this phrase would not comply with the CWA.[21]

The Ninth Circuit held in *Natural Resources Defense Council v. County of Los Angeles* (2011) 673 F3d. 880, 886 (revd. on other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013))) that engagement in the iterative process does not provide a safe harbor from liability for violations of permit terms prohibiting exceedances of water quality standards. The Ninth Circuit holding is consistent with the position of the State and Regional Water Boards that exceedances of water quality standards in an MS4 permit constitute violations of permit terms subject to enforcement by the Water Boards or through a citizen suit. While the Water Boards have generally directed dischargers to achieve compliance by improving control measures through the iterative process, the San Diego Water Board retains the discretion to take other appropriate enforcement and the iterative process does not shield dischargers from citizen suits under the CWA.

The requirements of Provision A.4, therefore, are required to be implemented until the water quality standards expressed under Provisions A.1.a, A.1.c, and A.2.a are achieved. The CWA requires MS4 permits to "*require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." The requirements of this Order have been deemed or determined to be "appropriate" to achieve water quality standards in receiving waters.

Part of the "*controls*" required by the Order is the process described in Provision A.4. Provision A.4 includes the process that is ultimately expected to achieve compliance with the requirement that discharges from the MS4 do not cause or contribute to violations of water quality standards in the receiving waters. The implementation of Provision A.4 is required when the Copermittees or the San Diego Water Board have determined that discharges from the MS4 are causing or contributing to violations of water quality standards in the receiving waters.

The Copermittees must effectively prohibit non-storm water discharges into the MS4s, reduce the discharge of pollutants in storm water from the MS4s to the MEP, and ensure that their MS4 discharges do not cause or contribute to violations of water quality standards. If the Copermittees have effectively prohibited non-storm water

[21] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.

discharges and reduced storm water pollutant discharges to the MEP, but their discharges are still causing or contributing to violations of water quality standards, Provision A.4 provides a clear "iterative process" for the Copermittees to follow.

Provision A.4 essentially requires the Copermittees to implement additional BMPs until MS4 discharges no longer cause or contribute to a violation of water quality standards.

In assessing compliance and potential enforcement actions, the San Diego Water Board looks at the Copermittees' efforts in total to meet the requirements of Provisions A.1.a, A.1.c, A.2.a and Provision A.4. The Copermittees need to demonstrate that they are making improvements to their programs and making progress toward achieving the discharge prohibitions and receiving water limitations in Provisions A.1.a, A.1.c, and A.2.a by implementing the requirements of Provision A.4. The San Diego Water Board would consider these efforts prior to strictly enforcing the requirements of Provisions A.1.a, A.1.c, and A.2.a. Causes of exceedances of the receiving water limitations can often be more difficult to identify and attribute solely to the Copermittees' MS4s. The intent of the Order is to provide the Copermittees more clarity and flexibility in addressing these exceedances through the iterative approach and adaptive management process until the requirements under Provisions A.1.a, A.1.c, and A.2.a are fully achieved.

An exception to the iterative approach and adaptive management process would be in receiving waters subject to adopted and approved TMDLs. For TMDLs that are incorporated into the Order, there is a specific date for compliance to be achieved, after which the iterative approach and adaptive management process required under Provision A.4 no longer provides the flexibility to achieve compliance. Where compliance dates for a TMDL have passed, compliance with the WQBELs incorporated into the Order established by a TMDL in Attachment E to protect water quality standards is required. Thus, after the interim or final compliance dates for a TMDL have passed, if the discharges from the Copermittees' MS4s are causing or contributing to a violation of WQBELs, exceedances of WQBELs must be strictly enforced by the San Diego Water Board. In the meantime, however, the Copermittees are in compliance with the interim or final TMDL requirements in Attachment E as long as the interim or final WQBELs are being achieved in accordance with the interim or final compliance dates.

In addition, this Order includes an optional pathway that incorporates the requirements of Provision A.4 and would allow a Copermittee to be deemed in compliance with the requirements under Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b during implementation of a Water Quality Improvement Plan that incorporates specific additional requirements. This alternative compliance pathway and the additional specific requirements are described below under the discussion for Provision B.3.c.

B. Water Quality Improvement Plans

Purpose: Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges to the MS4s and control pollutants in storm water discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the Clean Water Act.

Provision B includes requirements for the Copermittees to develop and implement Water Quality Improvement Plans to ultimately comply with the prohibitions and limitations under Provision A. The Water Quality Improvement Plans will provide the Copermittees a comprehensive program that can achieve the requirements and further the objectives of the CWA. Implementation of the Water Quality Improvement Plans will also improve the quality of the receiving waters in the San Diego Region.

The Water Quality Improvement Plan is the backbone of the Regional MS4 Permit requirements. Provision B provides the guidance, criteria, and minimum expectations and requirements for the elements of the Water Quality Improvement Plan to be developed and implemented by the Copermittees. The Water Quality Improvement Plans will be implemented in the Watershed Management Area by the Copermittees within their jurisdictions through their jurisdictional runoff management programs.

The Water Quality Improvement Plan also incorporates a program to monitor and assess the progress of the Copermittees' jurisdictional runoff management programs toward improving the quality of discharges from the MS4s, as well as tracking improvements to the quality of receiving waters. A process to adapt and improve the effectiveness of the Water Quality Improvement Plans has also been incorporated into the requirements of Provision B to be consistent with the "iterative approach" required to achieve compliance with discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a, pursuant to the requirements of Provision A.4.

The Water Quality Improvement Plans have also been structured to incorporate the requirements of any TMDLs that have been adopted for the San Diego Region. Incorporating the requirements of the TMDLs into the requirements of Provision B allows the Copermittees to develop a single plan, instead of separate plans, to coordinate their non-storm water and storm water runoff management programs. The Water Quality Improvement Plans allow the Copermittees to meet the requirements of this Order, as well as fulfill the requirements of the TMDLs.

As an added benefit, if the Copermittees demonstrate that impaired water bodies within the Watershed Management Area listed on the 303(d) List will be addressed with their Water Quality Improvement Plans in a reasonable period of time, the San Diego Water Board may be able to remove the water bodies from the 303(d) List, which would greatly reduce the need for the San Diego Water Board to develop additional TMDLs that would have to be incorporated into the Order and implemented by the Copermittees.

***Discussion*:** The federal NPDES regulations require the Copermittees to develop a proposed management program (40 CFR 122.26(d)(2)(iv)). The proposed management program must include "*a comprehensive planning process*" and "*where necessary intergovernmental coordination*" for the "*duration of the permit.*" The Water Quality Improvement Plan is the Copermittees' "*comprehensive planning process*" document for the proposed management program that will be implemented within a Watershed Management Area. Implementation of the Water Quality Improvement Plan requires "*intergovernmental coordination*" among the Copermittees for at least the "*duration of the permit*," and likely into and beyond the next iteration of the permit.

Developing Water Quality Improvement Plans based upon watersheds is consistent with federal regulations that support the development of permit conditions, as well as implementation of storm water management programs, at a watershed scale (40 CFR 122.26(a)(3)(ii), 122.26(a)(3)(v), and 122.26(d)(2)(iv)). In 2003, USEPA issued a Watershed-Based NPDES Permitting Policy Statement (USEPA, 2003) that defines watershed-based permitting as an approach that produces NPDES permits that are issued to point sources on a geographic or watershed basis. In this policy statement, USEPA explains that "*[t]he utility of this tool relies heavily on a detailed, integrated, and inclusive watershed planning process*." USEPA identifies a number of important benefits of watershed permitting, including more environmentally effective results, the ability to emphasize measuring the effectiveness of targeted actions on improvements in water quality, reduced cost of improving the quality of the nation's waters and more effective implementation of watershed plans, including TMDLs, among others.

An emphasis on watersheds is appropriate at this stage in the San Diego Region's MS4 program to shift the focus to more targeted, water quality driven planning and implementation. Addressing discharges on a watershed scale focuses on water quality results by emphasizing the receiving waters in the watershed. The conditions of the receiving waters drive management actions, which in turn focus measures to address pollutant contributions from MS4 discharges.

The Water Quality Improvement Plan gives the Copermittees the responsibility of developing a comprehensive plan to coordinate the efforts of their jurisdictional runoff management programs for addressing the problems related to MS4 discharges causing impacts to water quality in the Watershed Management Area. The development of the plan provides the Copermittees the opportunity to provide

significant input on how to implement their jurisdictional runoff management programs, and how to best utilize their available resources in addressing a focused set of priorities that they believe will result in measureable improvements to water quality within the Watershed Management Area.

The Copermittees are encouraged to separate the Watershed Management Area into subwatersheds, as appropriate. This allows the Copermittees to identify priorities applicable to a subset of the Copermittees or specific water bodies or areas within the Watershed Management Area.

Included in the requirements for the elements to be included in the Water Quality Improvement Plan are monitoring and assessment requirements that are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order. In addition to the federal requirements of the CWA section 308(a) and 40 CFR 122.26(d), the San Diego Water Board has the authority to establish monitoring, reporting, and recordkeeping requirements for NPDES permits under CWC 13383.

More specific and detailed discussions of the requirements of Provision B are provided below.

<u>Provision B.1 (Watershed Management Areas)</u> requires the Copermittees to develop a Water Quality Improvement Plan for each of the Watershed Management Areas defined by the San Diego Water Board.

Pursuant to 40 CFR 122.26(d)(2)(iv), proposed management programs "*may impose controls on a…watershed basis…*" The Water Quality Improvement Plan is the Copermittees' proposed management program. A Water Quality Improvement Plan must be developed for each Watershed Management Area identified in the Order.

The Watershed Management Areas are identified in Table B-1. Table B-1 establishes ten (10) Watershed Management Areas, and identifies the Copermittees that are responsible for developing and implementing the Water Quality Improvement Plan for each Watershed Management Area.

The Copermittees from each of the three counties within the San Diego Region were phased in as their respective NPDES municipal storm water permits expired. Order No. R9-2007-0001 expired in January 2012, and the San Diego County Copermittees became covered under the Regional MS4 Permit on June 27, 2013, the effective date of the Order. Order No. R9-2009-0002 expired in December 2014, and the Orange County Copermittees became covered under the Regional MS4 Permit on April 1, 2015, the effective date of Order No. R9-2013-0001 as amended by Order No. R9-2015-0001. Order No. R9-2010-0016 expired in November 2015, and the Riverside County Copermittees became covered under the Regional MS4 Permit on January 7, 2016, the effective date of Order No. R9-2013-0001 as amended by Order No. R9-2015-0100.

The Cities of Laguna Woods, Laguna Hills, Murrieta, and Wildomar are located partially within the jurisdictions of both the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board) and the San Diego Water Board. Written requests for designation of a single Regional Water Board to regulate matters pertaining to permitting of Phase I MS4 discharges were submitted to the San Diego Water Board and the Santa Ana Water Board by the City of Laguna Woods by letter dated September 8, 2014, the City of Laguna Hills by letter dated March 12, 2014, the City of Murrieta by letter dated June 22, 2015, and the City of Wildomar by letter dated June 23, 2015. The Cities of Laguna Woods, Laguna Hills, Murrieta, and Wildomar requested designation of the San Diego Water Board pursuant to CWC section 13228.

The Cities of Laguna Woods, Laguna Hills, Murrieta, and Wildomar reported that management and implementation of municipal programs to comply with two different Phase I MS4 permits creates a significant administrative and financial burden and inhibits their ability to contribute to greater overall water quality improvements in either Region. In an effort to address these concerns, the San Diego Water Board and the Santa Ana Water Board have entered into written agreements, whereby the San Diego Water Board is designated to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Laguna Woods, Laguna Hills, Murrieta, and Wildomar including the portions of the jurisdictions within the Santa Ana Region. The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated February 10, 2015 to designate the San Diego Water Board to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Laguna Woods and Laguna Hills, including the portions of the jurisdictions within the Santa Ana Region, upon the later effective date of Order No. R9-2015-0001 or Santa Ana Water Board Tentative Order No. R8-2015-0001. The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated October 26, 2015 to designate the San Diego Water Board to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Murrieta and Wildomar, including the portions of the jurisdictions within the Santa Ana Region upon the effective date of Order R9-2015-0100.

Under the terms of the agreements, each Regional Water Board retains the authority to enforce provisions of the Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee (Water Code section 13228 (b)). Also under the terms of the agreements, any TMDL and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Laguna Woods, Laguna Hills, Murrieta, or Wildomar as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement of the applicable TMDL would remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's San Diego Creek/Newport Bay TMDL and Lake Elsinore/Canyon Lake Nutrient TMDLs, and the San Diego Water Board's Indicator Bacteria Project I Beaches and Creeks TMDL.

In conformance with the agreements, footnotes to Table B-1 are included to specify coverage under Order No. R9-2013-0001 for those Phase I MS4 discharges within the jurisdictional boundaries of the Cities of Laguna Woods, Laguna Hills, Murrieta, and Wildomar within the Santa Ana Region. Footnote 1 to Table B-1 specifies that the Cities of Laguna Woods and Laguna Hills are identified as responsible Copermittees in the San Diego Creek/Newport Bay TMDL in the Santa Ana Region and remain obligated to comply with the San Diego Creek/Newport Bay TMDL pursuant to section XVIII of Tentative Order No. R8-2015-0001 (NPDES No. CAS618030) and any reissuance thereof. Footnote 4 to Table B-1 specifies that the Cities of Murrieta and Wildomar are identified as responsible Copermittees in the Lake Elsinore/Canyon Lake Nutrient TMDLs in the Santa Ana Region and remain obligated to comply with the Lake Elsinore/Canyon Lake Nutrient TMDLs pursuant to section VI.D.2 of Order No. R8-2010-0033 (NPDES No. CAS618030) or corresponding section as it may be amended or reissued.

The Cities of Lake Forest and Menifee are located partially within the jurisdictions of both the Santa Ana Water Board and the San Diego Water Board. Written requests for designation of a single Regional Water Board to regulate matters pertaining to permitting of Phase I MS4 discharges were submitted to the San Diego Water Board and the Santa Ana Water Board by the City of Lake Forest by letters dated January 14, 2013 and April 4, 2014, and the City of Menifee by letter dated June 25, 2015. The Cities of Lake Forest and Menifee requested designation of the San Ana Water Board pursuant to CWC section 13228.

The Cities of Lake Forest and Menifee reported that management and implementation of municipal programs to comply with two different Phase I MS4 permits creates a significant administrative and financial burden and inhibits their ability to contribute to greater overall water quality improvements in either Region. In an effort to address these concerns, the San Diego Water Board and the Santa Ana Water Board have entered into written agreements, whereby the Santa Ana Water Board is designated to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Lake Forest and Menifee including the portions of the jurisdictions within the San Diego Region. The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated February 10, 2015 to designate the San Ana Water Board to regulate Phase I MS4 discharges within the jurisdiction of the City of Lake Forest, including portions of the jurisdiction within the Santa Diego Region, upon the later date of Order No. R9-2015-0001 or Santa Ana Water Board Tentative Order No. R8-2015-0001. The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated October 26, 2015 to designate the San Ana Water Board to regulate Phase I MS4 discharges within the jurisdiction of the City of Menifee, including portions of the jurisdiction within the San Diego Region, under Order No. R8-2010-0033 (NPDES No. CAS618030) as it may be amended or reissued upon the effective date of Order No. R9-2015-0100.

Under the terms of the agreements, each Regional Water Board retains the authority to enforce provisions of the Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee (Water Code section 13228 (b)). Also under the terms of the agreements, any TMDL and associated Phase I MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Lake Forest or Menifee as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement authority for the applicable TMDL would remain with the Regional Water Board which has the jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's San Diego Creek/Newport Bay TMDL and Lake Elsinore/Canyon Lake Nutrient TMDLs, and the San Diego Water Board's Indicator Bacteria Project I Beaches and Creeks TMDL.

In conformance with the agreements, Footnote 2 to Table B-1 has been included to specify that Phase I MS4 discharges within the jurisdictional boundaries of the City of Lake Forest located within the San Diego Region will be regulated under Santa Ana Water Board Order No. R8-2015-0001 (NPDES No. CAS618030) and any reissuance thereof. The footnote specifies that the City of Lake Forest is an identified responsible Copermittee in the Indicator Bacteria Project I Beaches and Creeks TMDL (Bacteria TMDL) in the San Diego Region and remains obligated to comply with the Bacteria TMDL pursuant to Attachment E of Order No. R9-2013-0001 and any reissuance thereto. The City of Lake Forest is also identified as a responsible Copermittee in the San Diego Creek/Newport Bay TMDL established by the Santa Ana Water Board. The City remains obligated to comply with the San Diego Creek/New Port Bay TMDL pursuant to the Santa Ana Water Board's Phase I MS4 Permit (Tentative Order No. R8-2015-0001 (NPDES No. CAS618030), as it may be amended or reissued). Under the terms of the agreement, the City of Lake Forest must retain and continue implementation of the over irrigation prohibition in Title 15, Chapter 15, Section 14.030, List (b) of the City Municipal Code throughout its jurisdiction. Also under the terms of the agreement, the City of Lake Forest must actively participate in the development and implementation of the South Orange County Watershed Management Area Water Quality Improvement Plan required pursuant to Order No. R9-2013-0001, and any reissuance thereof.

Footnote 3 to Table B-1 has been included to specify that Phase I MS4 discharges within the jurisdictional boundaries of the City of Menifee located within the San Diego Region will be regulated under Santa Ana Water Board Order No. R8-2010-0033 (NPDES No. CAS618033) and any reissuance thereof. At this time, the City of Menifee is not identified as a responsible Copermittee for any TMDLs established by the San Diego Water Board. Under the terms of the agreement, the City of Menifee must actively participate in the development and implementation of the Santa Margarita River Watershed Management Area Water Quality Improvement Plan required pursuant to Order No. R9-2013-0001, and any reissuance thereof.

The basis supporting the Cities of Laguna Woods, Laguna Hills, Lake Forest, Menifee, Murrieta, and Wildomar requests to designate a specific Regional Water Board for regulatory oversight of Phase I MS4 discharges may change under future conditions and circumstances, therefore the San Diego Water Board will periodically review the effectiveness of the agreements during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate one or both of the agreements with the Santa Ana Water Board or otherwise modify the agreements subject to the approval of the Santa Ana Water Board.

Provision B.2 (Priority Water Quality Conditions) requires the Copermittees in each Watershed Management Area to identify the highest priority water quality conditions which will be the focus of the Water Quality Improvement Plan implementation.

Provisions B.2.a and B.2.b provide the criteria that must be assessed when characterizing the receiving water quality and potential impacts from MS4 discharges of the receiving waters within the Watershed Management Area. The criteria are based primarily on the requirements in 40 CFR 122.26(d)(1)(iv)(C) and (C)(1)-(9). Characterizing the receiving water quality and identifying the potential impacts caused by MS4 discharges to receiving waters in the Watershed Management Area is necessary to identify the impacts to receiving waters associated with MS4 discharges that are of the most concern to the Copermittees.

Based on the information required to be considered under Provisions B.2.a and B.2.b, Provision B.2.c requires to Copermittees to identify the highest priority water quality conditions related to discharges from the MS4s that will be the primary focus of the Water Quality Improvement Plan in the Watershed Management Area. Addressing and improving these highest priority water quality conditions will become the focus of each Copermittee's jurisdictional runoff management program as the Water Quality Improvement Plan is implemented in the Watershed Management Area. The highest priority water quality conditions are expected to include sources of pollutants and/or stressors, and/or receiving water conditions, that the Copermittees consider the highest threats or most likely to have adverse impacts on the physical, chemical, and biological integrity of receiving waters. Addressing these threats and/or adverse impacts should restore the physical, chemical, and biological integrity of receiving waters, and result in the restoration and protection of the beneficial uses of the receiving waters in the Watershed Management Area.

Provision B.2.d requires the Copermittees to identify known and suspected sources of pollutants and/or stressors contributing to the highest priority water quality conditions. The requirements of Provision B.2.d are based primarily on the requirements in 40 CFR 122.26(d)(1)(iii)(B)(1)-(6). The Copermittees are required to evaluate several factors in the identification of those sources. The Copermittees must consider and evaluate the following: (1) the land uses that may contribute toward impacts to receiving waters, (2) the locations of the Copermittees' MS4s that can convey and discharge runoff and pollutants to receiving waters, (3) other sources that discharge

into the Copermittees' MS4s and receiving waters, and (4) other information and data that can help the Copermittees to evaluate the relative importance of or contribution from those sources toward the highest priority water quality conditions. Identifying the known and suspected sources, and their relative contribution toward the highest priority water quality conditions, will help the Copermittees to focus, direct, and prioritize their resources and implementation efforts within their jurisdictions.

Provision B.2.e requires the Copermittees to identify potential strategies that can result in improvements to water quality in MS4 discharges and/or receiving waters within the Watershed Management Area. Potential water quality improvement strategies will not necessarily be implemented by the Copermittees, but provide a "menu" of options that the Copermittees will consider for implementation. The public participation process that will be implemented during the development of the Water Quality Improvement Plan is where the potential water quality improvement strategies will be identified.

Provision B.3 (Water Quality Improvement Goals, Strategies and Schedules) requires the Copermittees in each Watershed Management Area to identify the goals that the Copermittees' jurisdictional runoff management programs will work toward achieving to address and improve the highest priority water quality conditions identified under Provision B.2.c; the strategies that will be implemented by the Copermittees within their jurisdictions and the Watershed Management Area to achieve the goals; and, the schedules for implementing the strategies and achieving the goals. The element of the Water Quality Improvement Plan required under Provision B.3 is where the "*comprehensive planning*" and "*intergovernmental coordination*" [40 CFR 122.26(d)(2)(iv)] of the Copermittees' actions for the proposed management programs within the Watershed Management Area is required to be described.

Provision B.3.a requires the Copermittees to identify interim and final numeric goals, and schedules to achieve those goals as part of the Water Quality Improvement Plans. Provision B.3.a.(1) requires the Copermittees to identify two types of numeric goals to be achieved:

(1) Final numeric goals in the receiving waters and/or MS4 discharges that will result in the protection of the water quality standards of the receiving waters for the highest priority water quality conditions identified by the Copermittees for Provision B.2.c. These final numeric goals are the ultimate goals for the Water Quality Improvement Plan, and the achievement and maintenance of these final numeric goals will indicate that one or more beneficial uses have been successfully restored and/or protected from MS4 discharges.

(2) Interim numeric goals that can be used by the Copermittees to demonstrate progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges for the highest priority water quality conditions in the Watershed Management Area. Achievement of the interim numeric goals will demonstrate to the San Diego Water Board that the Copermittees' implementation efforts are progressing toward achieving the final numeric goals.

Provision B.3.a.(1) does not specify what the interim and final numeric goals must be based on, but they essentially must be designed to achieve compliance with water quality standards in the receiving waters. To that end, the interim goals must be based on measureable criteria or indicators capable of demonstrating progress toward achieving the numeric goals.

The interim and final numeric goals can be based on the water quality objectives in the Basin Plan. The water quality objectives in the Basin Plan, however, consist of numeric and narrative water quality objectives. Numeric water quality objectives can be directly used as numeric goals. Narrative water quality objectives, on the other hand, will require some interpretation to identify numeric goals. The achievement of multiple numeric goals based on the water quality objectives, used in combination, may be necessary to demonstrate that beneficial uses have been restored and/or protected.

The Copermittees could also propose other numeric goals that are not necessarily water quality objectives from the Basin Plan. For example, the Copermittees could propose a numeric goal that consists of achieving some percent improvement of a measureable indicator, such as acreage of a specific habitat or increase in a specific plant or animal species population. Other examples may include pollutant load reductions, number of impaired waterbodies delisted from the List of Water Quality Impaired Segments, Index of Biological Integrity (IBI) scores, etc.

The Copermittees may choose to develop interim numeric goals based on the final numeric goals they develop, such as incremental steps toward ultimately achieving the final numeric goals. The Copermittees may also choose to develop interim numeric goals that are based on other measureable indicators that can indirectly indicate improvements and progress toward the final numeric goals.

There are no limits to the types of interim numeric goals that could be proposed by the Copermittees, other than the goals must be based on measureable criteria or indicators capable of demonstrating progress toward achieving the numeric goals. Likewise, there are no limits to the types of final numeric goals that could be proposed by the Copermittees, other than the goals must "*restore and protect the water quality standards of the receiving waters.*"

Finally, Provision B.3.a.(2) also requires the Copermittees to develop schedules for measuring progress and achieving the interim and final numeric goals. Several criteria are included for the development of the schedules, but the Copermittees are required to achieve the numeric goals as soon as possible, consistent with federal NPDES regulations (40 CFR 122.47(a)(1)).

The Copermittees are also required to incorporate any compliance schedules for applicable ASBS or TMDL requirements. Applicable ASBS and TMDL compliance schedules are set forth in Attachment A and Attachment E to the Order, respectively.

The information provided by the Copermittees under Provision B.3.a.(2) will be used by the Copermittees and the San Diego Water Board to gauge and track the progress of the Copermittees' efforts in addressing the highest priority water quality conditions identified in the Water Quality Improvement Plan.

Provision B.3.b requires the Copermittees to identify the strategies and schedules to implement those strategies as part of the Water Quality Improvement Plans. Provision B.3.b requires the Copermittees to identify the water quality improvement strategies that will be and may be implemented within the Watershed Management Area to 1) reduce pollutants in storm water discharged from the MS4 to the MEP, 2) effectively prohibit non-storm water discharges from entering the MS4, 3) protect water quality standards in receiving waters by controlling MS4 discharges so that they do not cause or contribute to exceedances of receiving water limitations, and 4) achieve applicable WQBELs that implement TMDLs. The Copermittees will select the strategies to be implemented based on the likely effectiveness and efficiency of the potential water quality improvement strategies identified under Provision B.2.e to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, and/or achieve the interim and final numeric goals identified under Provision B.3.a.

Provision B.3.b.(1) requires each Copermittee to identify the strategies that will be or may be implemented within its jurisdiction. Each Copermittee is required to describe the strategies it is committed to implementing as part of its jurisdictional runoff management requirements under Provisions E.2 through E.7, and the optional jurisdictional strategies that the Copermittee will implement, as necessary, to achieve the numeric goals.

Each Copermittee is expected to implement the optional jurisdictional strategies identified under Provisions B.3.b.(1)(b) when the jurisdictional strategies it has committed to implement under Provision B.3.b.(1)(a) are not making adequate progress toward the interim and final numeric goals in accordance with the schedules established under Provision B.3.a. Provision B.3.b.(1)(b)(v) requires each Copermittee to describe the circumstances necessary to trigger implementation of the optional jurisdictional strategies, in addition to the requirements of Provisions B.3.b.(1)(a).

The San Diego Water Board recognizes that there may be optional jurisdictional strategies that will likely require funding and/or resources for planning, permitting, procurement of labor and materials, and implementation. Thus, Provision B.3.b.(1)(b)(iv) requires each Copermittee to describe the funding and/or resources that are necessary to implement these optional jurisdictional strategies. This information may provide interested groups and members of the public an understanding of the resources that they could provide or assist in obtaining to implement these optional jurisdictional strategies.

Provision B.3.b.(2) requires the Copermittees in the Watershed Management Area to identify the regional or multi-jurisdictional strategies that may be implemented, as necessary, to achieve the numeric goals. Similar to the requirements of Provision B.3.b.(1)(b), these regional or multi-jurisdictional strategies will likely require funding and/or resources for planning, permitting, procurement of labor and materials, and implementation, and San Diego Water Board recognizes that these strategies may be difficult to implement with only Copermittee resources. Thus, Provision B.3.b.(2)(d) requires the Copermittees to describe the funding and/or resources necessary to implement these optional regional or multi-jurisdictional strategies. This information may provide interested groups and members of the public an understanding of the resources that they could provide or assist in obtaining to implement these optional regional or multi-jurisdictional strategies.

Provision B.3.b.(3) requires the Copermittees to develop and include schedules in the Water Quality Improvement Plan for implementing the water quality improvement strategies identified under Provisions B.3.b.(1) and B.3.b.(2). The schedule for implementing the water quality improvement strategies will be used by the Copermittees and San Diego Water Board to measure and demonstrate the progress of the Copermittees' implementation efforts toward reducing pollutants in storm water discharged from the MS4 to the MEP, and eliminating illicit non-storm water discharges from entering the MS4.

Provision B.3.b.(4) provides the Copermittees in each Watershed Management Area the option of implementing watershed-specific structural BMP requirements for Priority Development Projects. Historically, storm water permits have included very specific performance standards for permanent, structural BMPs. These standards describe the expectation for the capture or treatment of pollutants and control of excessive flow before storm water is discharged from a site. The Copermittees were also allowed to develop waiver programs for Priority Development Projects to avoid implementing the structural BMPs; however, the waiver programs were not necessarily tied into any sort of holistic watershed strategy. The result is that implementation of BMP requirements is largely done on a site-by-site basis. This requires proper design on the part of the Priority Development Project and strict oversight on the part of the Copermittee.

Provision B.3.b.(4) promotes the evaluation of multiple strategies for water quality improvement, in addition to the implementation of permanent structural BMPs, on a watershed-scale versus the site-by-site approach. In a report issued by the Southern California Coastal Water Research Project (SCCWRP) and several other research institutions, the report emphasized that a successful hydromodification management program will involve watershed analysis as a first step, and that integrating multiple watershed-based strategies is preferable over a site-by-site approach. Indeed, the report states that the watershed analysis "…*should lead to identification of existing opportunities and constraints that can be used to help prioritize areas of greater concern, areas of restoration potential, infrastructure constraints, and pathways for*

potential cumulative effects."[22] Provision B.3.b.(4) promotes the findings and recommendations of the report by providing a pathway for Copermittees to develop an integrated approach to their land development programs.

Under Provision B.3.b.(4), the Copermittees in a Watershed Management Area must first perform an analysis by gathering as much information pertaining to the physical characteristics of the Watershed Management Area as possible. This includes, for example, identifying potential areas of coarse sediment supply, present and anticipated future land uses, and locations of physical structures within receiving streams and upland areas that affect the watershed hydrology (such as bridges, culverts, and flood management basins). Once this information is collected, the Copermittees must produce GIS layers (maps) that include this information.

From there, the Copermittees must use the results of the Watershed Management Area Analysis to identify and compile a list of candidate projects that could potentially be used as alternative compliance options for Priority Development Projects. Such projects include, for example, opportunities for stream or riparian area rehabilitation, opportunities for retrofitting existing infrastructure to incorporate storm water retention or treatment, and opportunities for regional BMPs, among others. Once these candidate projects are identified, Copermittees may allow Priority Development Projects to fund, partially fund, or completely implement these candidate projects. The Copermittees must first find that implementing such a candidate project would provide greater overall benefit to the watershed than requiring implementation of the structural BMPs onsite, and also enter into a voluntary agreement with the Priority Development Project that authorizes this arrangement. The Copermittees may use Provision B.3.b.(4) as both 1) a mechanism to reach their stated goals of the Water Quality Improvement Plan by using Priority Development Projects to either fund or implement projects that will provide water quality benefit, and 2) an alternative to requiring strict adherence to the structural BMP design standards.

Additionally, Provision B.3.b.(4) allows the Copermittees to use the results of the Watershed Management Area Analysis to identify areas within the Watershed Management Area where it is appropriate to allow Priority Development Projects to be exempt from the hydromodification management BMP performance requirements. Provision E.3.c.(2) already allows exemptions for Priority Development Projects that discharge to a conveyance channel whose bed and bank are concrete lined from the point of discharge to an enclosed embayment or the Pacific Ocean. However, there may be cases where further exemptions are warranted. The Copermittees may identify such cases on a watershed basis and include them in the Watershed Management Area Analysis; however, they must provide the supporting rationale to support all claims for exemptions.

[22] 2012. ED Stein, F Federico, DB Booth, BP Bledsoe, C Bowles, Z Rubin, GM Kondolf, A Sengupta. Technical Report 667. Southern California Coastal Water Research Project. Costa Mesa, CA.

Provision B.3.b.(4) provides an innovative pathway for Copermittees to regulate their land development programs by allowing alternative compliance in lieu of implementing structural BMPs on each and every Priority Development Project. This approach facilitates the integration of watershed-scale solutions for improving overall water quality and assisting Copermittees to achieve their stated goals of the Water Quality Improvement Plan. The San Diego Water Board understands, however, that undertaking this approach, which involves extensive planning, could be resource intensive for the Copermittees. Therefore, the Watershed Management Area Analysis is optional and not a requirement. The Copermittees can choose not to perform the watershed planning and mapping exercise described in Provision B.3.b.(4), and instead choose to require strict implementation of the structural BMPs onsite, pursuant to Provision E.3.c.

Provision B.3.c is included to provide the Copermittees an option that allows the Copermittees to be deemed in compliance with the prohibitions and limitations (receiving water limitations) of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b. One or more Copermittees within a Watershed Management Area can choose to implement this option. This option is only expected to be utilized by a Copermittee that wishes to be deemed in compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b.

The alternative compliance pathway option included in Provision B.3.c is consistent with the approach described in Order WQ 2015-0075, *In the Matter of Review of Order No. R4-2012-0175, NPDES Permit No. CAS004001, Waste Discharge Requirements for Municipal Separate Storm Sewer System (MS4) Discharges within the Coastal Watersheds of Los Angeles County, Except Those Discharges Originating from the City of Long Beach MS4,* adopted by the State Water Board on June 16, 2015. State Water Board Order WQ 2015-0075 directs the Regional Water Boards to consider a watershed-based planning and implementation approach to compliance with receiving water limitations when issuing Phase I MS4 permits going forward. Order WQ 2015-0075 included seven principles that the Regional Water Boards are expected to follow when incorporating an alternative compliance pathway into a MS4 permit. The San Diego Water Board incorporated the seven principles stipulated in State Water Board Order WQ 2015-0075 into the Regional MS4 Permit as follows:

1. Provision A of this Order continues to require compliance with water quality standards in the receiving water and does not deem good faith engagement in the iterative process to constitute compliance with receiving water limitations. Provision A of this Order continues to be consistent with the receiving water limitations provisions from State Water Board Order WQ 99-05.

2. Compliance with Provision B.3.c constitutes compliance with the requirements of the Provision A.3.b, which requires compliance with the WQBELs of the TMDLs in Attachment E to the Order, and is considered compliance with receiving water limitations for those TMDL water body-pollutant combinations.

3. Provision B.3.c is an ambitious, rigorous, and transparent alternative compliance pathway that allows a Copermittee appropriate time to come into compliance with receiving water limitations without being in violation of the receiving water limitations during implementation of the compliance alternative.

4. Provision B.3.c requirements are incorporated into a Water Quality Improvement Plan. Water Quality Improvement Plans are a watershed-based planning and implementation approach, which address multiple contaminants, and incorporate TMDL requirements.

5. The strategies required to be included in the Water Quality Improvement Plans promote and incentivize the use of green infrastructure and requires the implementation of low impact development principles.

6. The strategies required to be included in the Water Quality Improvement Plans encourage multi-benefit regional projects that capture, infiltrate, and reuse storm water and support a local sustainable water supply.

7. The alternative compliance pathway of Provision B.3.c includes rigor and accountability. The Copermittee is required, through a transparent public process, to demonstrate that water quality issues in the watershed have been analyzed and prioritized, and that appropriate solutions are proposed. The Copermittee is also required, through a transparent process, to monitor the results and return to their analysis to verify assumptions and update the solutions. The Copermittee is required to conduct this type of adaptive management on its own initiative without waiting for direction from the San Diego Water Board.

In order for a Copermittee to utilize this option, the Copermittee is required to include three components in the Water Quality Improvement Plan. The first component is a comprehensive set of numeric goals and schedules that will demonstrate the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b will be achieved within a specified period of time. The criteria provided in the Order will require the Copermittee to demonstrate that the discharges from its MS4s will not cause or contribute to exceedances of water quality objectives in the receiving waters, and/or the receiving waters will be adequately protected from adverse impacts attributable to the Copermittee's MS4 discharges. The Copermittee is also required to specify annual milestones to be achieved each year, which adds rigor, accountability, and transparency to the process. The annual milestones may consist of water quality improvement strategy implementation phases, interim numeric goals, and other acceptable metrics, which are expected to build upon previous milestones and lead to the achievement of the final numeric goals.

The second component is an analysis to demonstrate that implementation of the water quality improvement strategies required under Provision B.3.b will achieve the numeric goals within the established schedules required under Provisions B.3.a and B.3.c.(1).

Because the development of the analysis may require significant resources, the Order allows the Copermittees in each Watershed Management Area that choose to implement this option to perform the analysis individually, or pool their resources for the analysis collectively.

The analysis must “reasonably” and “quantitatively” demonstrate that the implementation of the water quality improvement strategies can achieve the numeric goals within the established schedules. However, as more data and information are collected during implementation of the Water Quality Improvement Plan to demonstrate progress toward achieving the numeric goals, the numeric goals, water quality improvement strategies and schedules may need to be modified. If the data and information indicate that modification is needed, the Copermittee must also update the analysis. With the exception of numeric goals and schedules associated with TMDLs from Attachment E to the Order, the modification to the analysis would be allowed as part of the adaptive management process of the Water Quality Improvement Plan. For TMDLs, modification of numeric goals or schedules would likely require an amendment to the Basin Plan and Attachment E to the Order before the analysis and Water Quality Improvement Plan could include such modifications.

Thus, the third component is the key component that allows a Copermittee to demonstrate the implementation of the water quality improvement strategies within its jurisdiction is making progress toward achieving the final numeric goals. Each Copermittee must specify the monitoring and assessments that will be performed to confirm that implementation of the water quality improvement strategies are making progress toward achieving the numeric goals within the established schedules, and whether the interim and final numeric goals have been achieved.

These three components must then be reviewed by the Water Quality Improvement Consultation Panel. The Water Quality Improvement Consultation Panel is required to be formed as part of the public participation process for the development of the Water Quality Improvement Plans. The Water Quality Improvement Consultation Panel is described under Provision F.1.a.(1)(b). Review by the Water Quality Improvement Consultation Panel is included to provide an additional layer of input, support, and accountability for the implementation of this option.

Compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b begins when the Water Quality Improvement Plan, incorporating the requirements of Provision B.3.c.(1), is accepted by the San Diego Water Board. Each Copermittee that chooses to implement and continues to implement this option will be deemed in compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b as long as the Copermittee continues to implement the strategies, monitoring and assessments as incorporated in the Water Quality Improvement Plan in accordance with Provision B.3.c.(1), and the Copermittee reports the achievement of the annual milestones each year, or provides acceptable rationale and recommends appropriate modifications to the interim numeric goals, and/or water quality improvement

strategies, and/or schedules to improve the rate of progress toward achieving the final numeric goals. The Copermittee continues to be deemed in compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b during the time the San Diego Water Board reviews the rationale and recommended modifications to the interim numeric goals, and/or water quality improvement strategies, and/or schedules. If and when the San Diego Water Board determines that it does not accept the rationale or recommendations, the Copermittee will be notified they are no longer deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b.

Provision B.4 (Water Quality Improvement Monitoring and Assessment) requires the Copermittees to develop an integrated monitoring and assessment program to track the progress of the Water Quality Improvement Plan toward meeting the implementation goals and schedules, and improving the water quality of the Watershed Management Area. Provision B.4 is the part of the Water Quality Improvement Plan where the Copermittees describe the monitoring data that will be collected, which is not only necessary to implement the "iterative approach" required by Provision A.4, but inform the adaptive management and "*comprehensive planning process*" that allows the Copermittees to make adjustments and modifications to the Water Quality Improvement Plans and the jurisdictional runoff management programs.

Provision B.4 requires the Copermittees, at a minimum, to include the requirements of Provision D as part of the water quality improvement monitoring and assessment program for the Water Quality Improvement Plan. The Copermittees, however, are not limited to the requirements of Provision D and may include additional monitoring and assessment methods to track progress toward improving water quality in the Watershed Management Area.

In addition to incorporating the requirements of Provision D, the water quality improvement monitoring and assessment program must incorporate any monitoring and assessment requirements specified for any applicable TMDLs included in Attachment E to the Order, and the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 for Watershed Management Areas with ASBS.

The monitoring and assessments required to be incorporated into the Water Quality Improvement Plan are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order.

Provision B.5 (Iterative Approach and Adaptive Management Process) requires the Copermittees to implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a.

Provision B.5 requires the Copermittees in each Watershed Management Area to re-evaluate the highest priority water quality conditions and potential water quality

improvement strategies, the water quality improvement goals, strategies and schedules, and the water quality improvement monitoring and assessment program and provide recommendations for modifying those elements to improve the effectiveness of the Water Quality Improvement Plan. The re-evaluation of the Water Quality Improvement Plan is part of the assessment requirements of Provision D.

Provision B.6 (Water Quality Improvement Plan Submittal, Updates, and Implementation) requires to Copermittees to submit, update, and implement the Water Quality Improvement Plans.

The requirements for the process to develop and submit the Water Quality Improvement Plans is described in more detail under the discussion for Provision F.1. The process will include several opportunities for the public to provide input during the development of the Water Quality Improvement Plans. The process for updating the Water Quality Improvement Plans is described in more detail under the discussion for Provision F.3.c. Upon acceptance of the Water Quality Improvement Plan and updates, the Copermittees are required to immediately begin implementing the Water Quality Improvement Plan and subsequent updates.

The Water Quality Improvement Plan is expected to be a dynamic document that will evolve over time. The Water Quality Improvement Plan is also expected to be a long term plan that focuses the Copermittees' efforts and resources on a limited set of priority water quality conditions, with the ultimate goal of protecting all the beneficial uses of the receiving waters within the Watershed Management Area from impacts that may be caused or contributed to by MS4 discharges. As the Copermittees collect data, implement their jurisdictional runoff management programs, and review the results from their water quality improvement monitoring and assessment program, the Water Quality Improvement Plan is expected to be continually reviewed and updated until compliance with Provisions A.1.a, A.1.b, and A.2.a is achieved.

However, in specific cases supported by robust analytical documentation the implementation of the Water Quality Improvement Plans may demonstrate that TMDLs are not necessary for identified impaired water bodies within the Watershed Management Area if the analytical record demonstrates that technology-based effluent limitations required by the CWA, more stringent effluent limitations required by state, local, or federal authority, and/or other pollution control requirements (e.g., best management practices) required by local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time.[23]

The San Diego Water Board submits an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region.

[23] 40 CFR 130.7(b)(1)

According to USEPA guidance for the Integrated Report,[24] water bodies are placed in one of five categories. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 are placed on the 303(d) List.

Category 4 in the Integrated Report is for water bodies where available data and/or information indicate that at least one beneficial use is not being supported or is threatened, but a TMDL is not needed.[25] Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

Impaired water bodies can be included in Category 4a if a TMDL has been adopted and approved. The TMDLs in Attachment E to the Order implement the requirements of the TMDLs adopted by the San Diego Water Board, and approved by the State Water Board and USEPA. The water bodies in Attachment E will be included in Category 4a in the Integrated Report and removed from the 303(d) List.

Impaired water bodies can be included in Category 4b if there are *acceptable* "pollution control requirements" required by a local, state or federal authority stringent enough to implement applicable water quality standards within a reasonable period of time (e.g., a compliance date is set). When evaluating whether a particular set of pollution controls are "requirements," the USEPA considers a number of factors, including: (1) the authority (local, state, federal) under which the controls are required and will be implemented with respect to sources contributing to the water quality impairment (examples may include: self-executing state or local regulations, permits, and contracts and grant/funding agreements that require implementation of necessary controls), (2) existing commitments made by the sources and completion or soon to be completed implementation of the controls (including an analysis of the amount of actual implementation that has already occurred), (3) the certainty of dedicated funding for the implementation of the controls, and (4) other relevant factors as determined by USEPA depending on case-specific circumstances.[26]

Impaired water bodies can be included in Category 4c if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution. Pollution, as defined by the CWA is "the man-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of water."[27] In

[24] USEPA, 2005. Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act
[25] Ibid
[26] Ibid
[27] CWA section 502(19)

other cases, pollution does not result from a pollutant and a TMDL is not required. Examples of circumstances where an impaired segment may be placed in Category 4c include segments impaired solely due to lack of adequate flow, stream channelization, or hydromodification. In these situations, there may be water quality management actions that can address the cause(s) of the impairment, but a TMDL may not be required to implement the actions.

The Water Quality Improvement Plans will require the implementation of pollution controls and water quality management actions (i.e. water quality improvement strategies) which can result in the attainment of water quality standards in water bodies impaired by discharges from the Copermittees' MS4s. The Water Quality Improvement Plans also include requirements that are expected to attain water quality standards in a reasonable period of time. The San Diego Water Board considers the Water Quality Improvement Plans to be a commitment by the Copermittees to develop, plan, budget for, and implement pollution controls that will attain water quality standards in receiving waters in a reasonable period of time, or as soon as possible. The results of the Copermittees' efforts in implementing the Water Quality Improvement Plans can be used to re-evaluate the condition of the impaired water bodies during the next update to the 303(d) List.

After the Copermittees submit the Water Quality Improvement Plans and demonstrate that water quality standards are being attained or will be attained in a reasonable period of time, the San Diego Water Board may re-evaluate the water bodies on the 303(d) List. These water bodies on the 303(d) List may be re-evaluated and placed into Category 4b or Category 4c in the Integrated Report. The water bodies placed in Category 4b or Category 4c in the Integrated Report must show a record that the water bodies are attaining water quality standards or supporting the identified beneficial uses, or will attain water quality standards or support identified beneficial uses in a reasonable period of time, in order for the water bodies to be appropriately removed from the 303(d) List.

C. Action Levels

Purpose: Provision C includes requirements for the Copermittees to identify and include numeric action levels in the Water Quality Improvement Plan to direct and focus the Copermittees' jurisdictional runoff management program implementation efforts for controlling MS4 discharges to receiving waters.

***Discussion*:** Under Provision C, the numeric action levels required are for non-storm water discharges and storm water discharges. The non-storm water action levels (NALs) are applicable to non-storm water discharges from the Copermittees' MS4s, which can occur year-round. The storm water action levels (SALs) are applicable to storm water discharges from the Copermittees' MS4s, which occur during the rainy season defined as the period between October 1 and April 30.

The action levels required by Provision C are based on the action level requirements that were developed and incorporated into Order Nos. R9-2009-0002 and R9-2010-0016, the Orange County and Riverside County MS4 Permits, respectively. The Fact Sheets for these Orders provide detailed discussions about the development of the numeric NALs and SALs included in this Order.

Order Nos. R9-2009-0002 and R9-2010-0016 required the Copermittees to perform prescribed actions if the NALs or SALs are exceeded. The actions required under Order Nos. R9-2009-0002 and R9-2010-0016 generally included conducting additional monitoring and source investigations when a discharge from the MS4 is observed to exceed one or more NALs and/or SALs.

For this Order, however, the action levels of Provision C are to be used by the Copermittees to prioritize the actions to be implemented as part of the Water Quality Improvement Plan. Monitoring data collected by the Copermittees from MS4 outfalls will be compared with the NALs and SALs. Exceedances of the NALs and SALs will not require the Copermittees to immediately identify sources causing exceedances, but will provide some numeric indicator levels that can give the Copermittees a way to measure the relative severity of a pollutant contributing to receiving water quality impacts.

NALs and SALs must be included in the Water Quality Improvement Plans to be used by the Copermittees in directing and focusing their water quality improvement strategies. The Copermittees are expected to utilize the NALs and SALs to help focus their implementation efforts on addressing pollutants that have the most significant potential or observed impacts to receiving waters. The NALs and SALs will be used as part of the MS4 discharges assessments required under Provision D.4.b. The NALs and SALs may also be used by the Copermittees as the numeric goals to be achieved in MS4 discharges and/or receiving waters as the Water Quality Improvement Plans are implemented.

More specific and detailed discussions of the requirements of Provision C are provided below.

Provision C.1 (Non-storm Water Action Levels) requires the Copermittees to incorporate NALs into the Water Quality Improvement Plan for pollutants and/or constituents that are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions identified in the Water Quality Improvement Plan related to non-storm water discharges from the MS4s. NALs generally must be consistent with the water quality objectives found within the Basin Plan.

The NALs have been included to ensure that the Copermittees are implementing and complying with several requirements of the MS4 permit. The federal CWA requires permits for municipal storm sewer systems to "*effectively prohibit non-storm water discharges into the storm sewers*." The federal NPDES regulations, which were promulgated to implement the CWA requirements for discharges from municipal storm sewers, require a program to address illicit discharges, which are non-storm water discharges. Provision A.1.b prohibits "*[n]on-storm water discharges into MS4s*" unless the non-storm water discharge authorized by a separate NPDES permit. The NALs will be used as part of the illicit discharge detection and elimination program required pursuant to Provision E.2, as well as part of the MS4 discharges assessments required pursuant to Provision D.4.b.

Provision A.1.a prohibits non-storm water discharges from the MS4 from "*causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state.*" In addition, pursuant to Provision A.2.a, non-storm water discharges "*must not cause or contribute to the violation of water quality standards in any receiving waters*."

Ideally, the Copermittees' jurisdictional runoff management programs will eliminate all non-storm water discharges entering the MS4s within their jurisdictions. The complete elimination of non-storm water discharges to the Copermittees' MS4s would be in compliance with the CWA requirements for non-storm water discharges, as well as the prohibitions and limitations of Provisions A.1.a and A.2.a.

The federal regulations, however, also refer to several non-storm water discharge categories that must be addressed as illicit discharges if they are found to be a source of pollutants. The federal regulations thus identify some non-storm water discharges that are not required to be addressed as illicit discharges if they are not a source of pollutants (e.g. non-storm water discharges specified in Provisions E.2.a.(1)-(5)). Thus, these regulations imply that some non-storm water discharges into and from the MS4 may occur even if non-storm water discharges are "effectively" prohibited by the Copermittees.

If the source of a non-storm water discharge is identified as a category of non-storm water specified in Provisions E.2.a.(1)-(5), the NALs can be used to determine if the category of non-storm water discharges is a source of pollutants. For other non-storm water discharges not specified in Provisions E.2.a.(1)-(5), the CWA requires those discharges to be "*effectively"* prohibited by removing the discharge to the MS4 through enforcement of the Copermittees' legal authority established under "*ordinance, order or similar mean*s" to prohibit illicit discharges to the MS4s.

If there are non-storm water discharges that are not required to be addressed as illicit discharges, those discharges must comply, at a minimum, with the discharge prohibitions and receiving water limitations of Provision A. Thus, the non-storm water discharges from the MS4 must be at levels that will not cause or contribute to a condition of pollution, contamination, or nuisance (Provision A.1.a), and must not cause or contribute to a violation of water quality standards in receiving waters (Provision A.2.a) to be consistent with the discharge prohibitions and receiving water limitations of Provisions A.1.a and A.2.a.

Furthermore, the San Diego Region has predominantly intermittent and ephemeral rivers and streams which vary in flow volume and duration at spatial and temporal scales. For most of these river and stream systems, non-storm water discharges from the MS4 are likely to be the most significant or the only source contributing to surface flows present within the receiving water, especially during the dry season.

Therefore, because of the prohibitions and limitations of Provision A.1.a and A.2.a, and the likelihood that non-storm water discharges from the MS4 are the most significant or only source contributing to surface flows present within the receiving water, NALs generally must be consistent with the water quality objectives found within the Basin Plan. Non-storm water discharges that are meeting the NALs would not be expected to cause or contribute to an exceedance of water quality objectives in receiving waters, which would be consistent with the discharge prohibitions and receiving water limitations of Provisions A.1.a and A.2.a.

Exceedances of the NALs would then provide an indication of the relative severity of a pollutant in non-storm water discharges from the MS4 contributing to potential or observed receiving water quality impacts. The relative severity or significance of a pollutant in non-storm water discharges from the MS4 will provide the Copermittees a valuable source of information that can be used to identify priority water quality conditions within a Watershed Management Area and within each Copermittee's jurisdiction.

Tables C-1 through C-4 under Provision C.1.a specify numeric NALs for several parameters or pollutant constituents for non-storm water discharges from the MS4 to several water body types. The NALs for MS4 discharges given under Provision C.1.a are based on the water quality objectives for inland surface waters in the Basin Plan, and the water quality objectives for ocean waters in the Ocean Plan. The NALs for

most of the metals were calculated based on the State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP). The NALs provided in Tables C-1 through C-4 must be included in the Water Quality Improvement Plans required to be developed pursuant to Provision B.

Provision C.1.b requires the Copermittees to identify NALs for pollutants and/or constituents, not specified in Provision C.1.a, which are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions of the Watershed Management Area related to non-storm water discharges from the MS4s. The NALs must be based on the water quality objectives in the Basin Plan. The NALs identified under Provision C.1.b must be included in the Water Quality Improvement Plan.

The San Diego Water Board recognizes that some of the NALs required pursuant to Provisions C.1.a and C.1.b may be exceeded more frequently than not. Thus, Provision C.1.c has been included in the Order to provide the Copermittees the option to develop secondary NALs that are set at levels greater than the levels required pursuant to Provisions C.1.a and C.1.b to further refine the prioritization and assessment of water quality improvement strategies for addressing non-storm water discharges to and from the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and from the MS4.

<u>Provision C.2 (Storm Water Action Levels)</u> requires the Copermittees to incorporate SALs into the Water Quality Improvement Plan for pollutants and/or constituents causing or contributing, or may be causing or contributing, to the highest priority water quality conditions identified in the Water Quality Improvement Plan related to storm water discharges from the MS4s.

The SALs have been included to ensure that the Copermittees are implementing and complying with several requirements of the MS4 permit. Provision A.1.a prohibits storm water discharges from the MS4 from "*causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state.*" In addition, pursuant to Provision A.2.a, storm water discharges "*must not cause or contribute to the violation of water quality standards in any receiving waters*."

Provision A.3.a, however, implicitly acknowledges that compliance with Provisions A.1.a and A.2.a cannot be achieved immediately for discharges of storm water from the MS4 by applying the MEP standard. Thus, Provision A.4 requires the Copermittees to implement an iterative approach to demonstrate that MEP is being achieved. This approach is supported by USEPA.

The federal CWA requires permits for municipal storm sewer systems to "*require controls to reduce the discharge of pollutants [in storm water] to the maximum extent practicable*, *including management practices, control techniques and system, design*

and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants." MEP is an ever-evolving, flexible, and advancing concept. As knowledge about controlling storm water runoff and discharges evolves, so does the knowledge which constitutes MEP. Reducing the discharge of storm water pollutants from the MS4 to the MEP requires the Copermittees to assess their jurisdictional runoff management programs and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP. The SALs provide the Copermittees measureable goals that may be used to demonstrate the achievement of MEP for reducing pollutants in storm water discharges from the MS4. The SALs will be used as part of the MS4 discharges assessments required under Provision D.4.a.

In June of 2006, the State Water Board's Blue Ribbon Storm Water Panel released its report titled "*The Feasibility of Numerical Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities*." In the recommendations, the Blue Ribbon panel proposed storm water effluent limitations which are computed using statistical based population approaches. The SALs specified in Table C-5 under Provision C.2.a were developed from a regional subset of nationwide Phase I MS4 data by using USEPA Rain Zone 6 (arid west) data.[28] Additionally, utilization of regional data is appropriate due to the addition of data into the nationwide Phase I MS4 monitoring dataset in February 2008. This additional data increased the number of USEPA Rain Zone 6 samples to more than 400, and included additional monitoring events within Southern California.

Utilizing data from USEPA Rain Zone 6 resulted in SALs which closely reflect the environmental conditions experienced in the San Diego Region. The localized subset of data includes sampling events from multiple Southern California locations including Orange, San Diego, Riverside, Los Angeles, and San Bernardino Counties. The dataset includes samples taken from highly built-out impervious areas and from storm events representative of Southern California conditions.

The SALs for cadmium, copper, lead and zinc require the measurement of hardness and to provide more specificity in the assessment of samples with SALs for total metal concentrations. While USEPA Rain Zone 6 data include a large sample size for concentrations of total metals, the impact the concentration will have on receiving waters will vary with receiving water hardness. Since it is the goal of the SALs, through the iterative process and MEP standard, to have MS4 storm water discharges meet all applicable water quality objectives, the hardness of the receiving water should be used when assessing the total metal concentration of a sample.

Thus, when there is an exceedance of a SAL for a metal, the Copermittee must determine if that exceedance is above the existing applicable water quality objectives based upon the hardness of the receiving water. The water quality objectives

[28] Data used to develop SAL were obtained from http://rpitt.eng.ua.edu/Research/ms4/mainms4.shtml

Copermittees must use to assess total metal SAL exceedances are the California Toxic Rule (CTR) and USEPA National Recommended Water Quality Criteria for Freshwater Aquatic Life 1 hour maximum concentrations. The 1-hour maximum concentration is to be used for comparison since it is expected to most replicate the impacts to waters of the State from the first flush following a precipitation event.

The statistically calculated SALs given in Table C-5 are at levels greater than the water quality objectives in the Basin Plan or Ocean Plan. Because the objective of the CWA is to "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*", meaning eventually pollutants in storm water discharges must be reduced to a level that cannot cause or contribute to an exceedance of water quality objectives in receiving waters, over time the SALs are expected to be reduced to a level that is based on the water quality objectives rather than statistical calculations. The San Diego Water Board will review the SALs as more data for discharges of storm water from the MS4s are collected, and revise them as conditions improve and the MEP standard advances. For the Water Quality Improvement Plans required under this Order, the SALs identified under Provision C.2.a must be included.

Provision C.2.b requires the Copermittees to identify SALs for pollutants and/or constituents, not specified in Provision C.2.a, which are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions of the Watershed Management Area related to storm water discharges from the MS4s. The SALs identified under Provision C.2.b must be included in the Water Quality Improvement Plan.

The San Diego Water Board recognizes that some of the SALs required pursuant to Provisions C.2.a and C.2.b may be exceeded more frequently than not. Thus, Provision C.2.c has been included in the Order to provide the Copermittees the option to develop secondary SALs that are set at levels greater than the levels required pursuant to Provisions C.2.a and C.2.b to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s.

D. Monitoring and Assessment Program Requirements

Purpose: Provision D includes minimum monitoring and assessment requirements that must be developed and implemented by the Copermittees as part of the Water Quality Improvement Plans. Implementation of the monitoring and assessment requirements of Provision D will allow the Copermittees to demonstrate that the requirements of the CWA to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP are being achieved. Implementation of the monitoring and assessment requirements of Provision D will also allow the Copermittees and the San Diego Water Board to track improvements to the water quality in the San Diego Region. The monitoring and assessment program requirements are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order.

***Discussion*:** The San Diego Water Board recognized that changes to the monitoring and assessment requirements of the Fourth Term Permit were necessary to improve the usefulness and usability of monitoring data collected by the Copermittees to support their jurisdictional storm water programs more efficiently and with increased effectiveness. The data collected are needed to better inform the Copermittees' understanding of the physical, chemical, and biological condition of the receiving waters and the quality of the MS4 discharges. The monitoring program needs to provide opportunities for the Copermittees to integrate regional monitoring efforts into municipal storm water monitoring requirements to provide a cost-effective approach to monitoring and avoid duplication of efforts.

The requirements in Provision D were largely recommended by the Copermittees as an outcome of the San Diego Water Boards Focused Meeting process. The monitoring and assessment program requirements now require collection of more specific information necessary for each Copermittee to adapt its jurisdictional runoff management program in such a way that focuses resources on a watershed's highest priority water quality conditions. The monitoring and assessment program will require the Copermittees to collect data that can be utilized to answer both watershed level management questions (e.g. Are the chemical, physical, and biological conditions of a receiving water protective, or likely protective of beneficial uses?), and specific jurisdictional runoff management program activity questions (e.g. Are the water quality improvement strategies of the jurisdictional program effectively eliminating non-storm water discharges to the MS4?).

The monitoring data collected and assessment information that will be reported to the San Diego Water Board are necessary to determine if the Copermittees are complying with the prohibitions and limitations of Provision A. The required monitoring and assessments that must be reported to the San Diego Water Board will be utilized for three purposes:

(1) Inform the Copermittees, San Diego Water Board, and the public on the progress of the Copermittees' efforts to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP;

(2) Inform the Copermittees, San Diego Water Board, and the public on the condition of water bodies receiving discharges from the Copermittees' MS4, and the progress of the Copermittees' water quality improvement implementation efforts toward improving the receiving water quality; and

(3) Inform the Copermittees, the San Diego Water Board, and the public on the effectiveness of the Water Quality Improvement Plan toward achieving (1) and (2).

The monitoring and assessment information reported pursuant to Provision F is also expected to be key to the iterative approach and adaptive management process required under Provision A.4 and implemented through the Water Quality Improvement Plan required under Provision B. As required by Provision A.4, the iterative approach and adaptive management process is required if the Copermittees cannot meet the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c, and/or A.2.a under the present conditions.

Provision D provides the minimum monitoring and assessment requirements that must be included in each Water Quality Improvement Plan to be developed and implemented by the Copermittees. The Copermittees, however, are not limited to the requirements of Provision D and may include additional methods to track progress toward improving water quality in a Watershed Management Area.

More specific and detailed discussions of the requirements of Provision D are provided below.

<u>Provision D.1 (Receiving Water Monitoring Requirements)</u> specifies the minimum receiving water monitoring that the Copermittees must conduct within the Watershed Management Area and include as part of the Water Quality Improvement Plan.

Provision D.1 establishes minimum monitoring requirements that must be conducted by the Copermittees within each Watershed Management Area. Provision D.1 requires the Copermittees to collect and develop the data and information necessary to determine potential impacts to the beneficial uses in the receiving waters due to discharges from the MS4s. The monitoring required under Provision D.1 will also provide the data that will allow the Copermittees to gauge the effectiveness and progress of its Water Quality Improvement Plan implementation efforts toward improving the quality of receiving waters.

The receiving water monitoring requirements of Provision D.1 are focused primarily on monitoring the conditions and response of the receiving waters to the Copermittees'

collective implementation efforts to reduce receiving water impacts that may be caused by the discharges from the MS4s. The preference of the San Diego Water Board is for the Copermittees to spend their resources achieving tangible and observable improvements in receiving water conditions instead of collecting samples and analyzing data that has consistently indicated that receiving water conditions are degraded and require improvement. In general, the ability to measure potential improvements in receiving water conditions due to any actions implemented by the Copermittees as part of the Water Quality Improvement Plan may require several years before a response can be observed. Thus, the frequency of collecting receiving water monitoring data has been kept to a minimum.

During the transitional period between adoption of this Order and San Diego Water Board acceptance of a Water Quality Improvement Plan, the Copermittees must conduct receiving water monitoring in accordance with Provision D.1.a. This approach to collecting receiving water data is different from what was required in the Fourth Term Permits, but one that truly embraces the concept of an integrated, cost-effective, streamlined receiving water monitoring approach.

Provision D.1.a requires Copermittees to continue performing the receiving water monitoring programs required in Order Nos. R-2007-0001, R9-2009-002, and R9-2010-0016; plus participation in: hydromodification management plan monitoring approved by the San Diego Water Board, monitoring plans as part of load reduction plans (either Bacteria Load Reduction Plans or Comprehensive Load Reduction Plans) for TMDLs in Attachment E of the Order, Storm Water Monitoring Coalition Regional Monitoring, Southern California Bight Regional Monitoring, Sediment Quality Monitoring, and ASBS Monitoring as applicable to a Watershed Management Area.

Provision D.1.a also provides an opportunity for the Copermittees to use third party data to meet receiving water monitoring requirements where feasible. Allowing the Copermittees to use the data currently collected through its participation in existing regional receiving water programs and that of third parties provides an efficiency of resources in obtaining the data necessary to inform the Copermittees and the San Diego Water Board about the physical, chemical, and biological conditions of the receiving waters, which can also help to focus the receiving water monitoring during the implementation of the Water Quality Improvement Plan. Once a Water Quality Improvement Plan is developed for a Watershed Management Area in compliance with Provision B of this Order, the transitional period is over and Copermittees are required to conduct receiving water monitoring according to the requirements of Provisions D.1.b-e.

Provision D.1.b requires each Copermittee to identify at least one long term receiving water monitoring station to be representative of receiving water quality within each Watershed Management Area. Long term receiving water monitoring stations can be located at any existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees. The requirements under Provision D.1.b. are

consistent with 40 CFR 122.26(d)(2)(iii)(D), which specifies that a "*monitoring program for representative data collection for the term of the permit*" may include "*instream locations.*" For each Watershed Management Area, at least one long term watershed monitoring station is required to be established and monitored. The Copermittees may choose to establish additional long term monitoring stations where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

Provision D.1.b. requires the Copermittees to locate the long term receiving water monitoring station at one of these existing receiving water monitoring stations to provide the Copermittees an opportunity to experience monitoring cost savings while continuing to collect the necessary data to assess the status and trends of receiving water quality conditions in 1) coastal water, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under both dry weather and wet weather conditions. Ideally these stations will continue to be monitored as part of the receiving water monitoring for each Watershed Management Area to maintain a consistent set of locations and a period of data that can be built upon with the monitoring required under this Order.

The receiving water monitoring requirements are separated into monitoring required during dry weather conditions pursuant to Provision D.1.c, and wet weather conditions pursuant to Provision D.1.d.

At each long term monitoring station the Copermittees must conduct at least three dry weather monitoring events as required pursuant to Provision D.1.c and at least three wet weather monitoring events as required pursuant to Provision D.1.d per permit term. Provisions D.1.c and D.1.d require the Copermittees to monitor priority water quality conditions identified in the Water Quality Improvement Plan, constituents listed as causing impairment of receiving waters in the Watershed Management Area, applicable NALs, toxicity, constituents listed in Tables D-2 and D-3, and constituents for implementation plans (e.g. Bacteria Load Reduction Plans and Comprehensive Load Reduction Plans). Required toxicity monitoring was changed to reflect an updated understanding of the unique challenges associated with sampling storm water for toxicity. Copermittees are required to sample receiving water for toxicity during each dry weather and each wet weather event pursuant to Provision D.1.c.(4) and D.1.d.(4). Required toxicity monitoring is now consistent with the State Water Resources Control Board Policy for Toxicity Assessment and Control (Draft June 2012) and recently adopted MS4 permits for Caltrans and Los Angeles Water Board. Receiving water monitoring efforts in this Order have been streamlined to redirect resources to monitoring efforts that better support pollutant reduction solutions with an increasing emphasis on MS4 outfall monitoring, source identification, and source abatement activities.

In addition to the receiving water monitoring requirements under Provisions D.1.b-d, Provision D.1.e requires the Copermittees participate in and/or conduct other types of receiving water monitoring. As recommended and requested by the Copermittees, Provision D.1.e.(1) requires the Copermittees to participate in existing regional monitoring, as applicable to each Watershed Management Area. Existing regional

monitoring includes monitoring conducted by the Storm Water Monitoring Coalition and for the Southern California Bight. Participation in and use of monitoring data collected from these existing regional water quality monitoring programs provide the Copermittees a greater opportunity for efficiency in the use of their resources to manage their storm water programs and those controllable discharges under their authority.

Provision D.1.e.(1)(c) requires the south Orange County MS4 Copermittees to participate in "unified regional beach water quality monitoring." This monitoring replaces requirements to conduct "core monitoring" of beach water quality, as provided for in Appendix III of the Ocean Plan.

Several different public agencies currently conduct routine, ongoing beach water quality monitoring in south Orange County in accordance with several different sets of requirements. The monitoring programs implemented to meet those requirements overlap temporally and spatially. These monitoring programs are partially but not fully integrated. In November 2010, the State Water Board adopted Resolution No. 2010-0053, which directed Regional Water Boards to work with dischargers to modify beach water quality monitoring programs required by Regional Water Board-issued permits in order to eliminate redundancies and incorporate beach water quality monitoring required by beach water quality statutes, where appropriate.

In April 2012, the San Diego Water Board requested that its staff review beach water quality monitoring conducted in south Orange County. To assist in responding to that request, staff of the Board convened a workgroup that included representatives of the three public agencies that currently conduct almost all of the routine, ongoing beach water quality monitoring in south Orange County, i.e., South Orange County Wastewater Authority (SOCWA), Orange County Public Works, and Orange County Health Care Agency (OCHCA). The workgroup also included other interested parties, including representatives of the Sierra Club and Surfrider Foundation. In December 2012, the San Diego Water Board adopted Resolution No. R9-2012-0069, which endorsed the San Diego Water Board staff report entitled "A Framework for Monitoring and Assessment in the San Diego Region," dated November 2012.

The unified program is consistent with and will meet or exceed the minimum requirements for beach water quality monitoring and related public notification and reporting established by State law, including the Ocean Plan. The unified program is consistent with State Water Board Resolution No. 2010-0053. The unified program is also consistent with and will help implement, "A Framework for Monitoring and Assessment in the San Diego Region," which emphasizes the need for question-driven, beneficial use-oriented monitoring and assessment. The primary purpose of the unified program will be to answer the question "Does beach water quality meet standards for the beneficial use of water contact recreation?"

The unified program is intended to be protective; it will help protect the health of swimmers, surfers, and others who use south Orange County beach waters for water

contact recreational activities. The unified program is also intended to be reasonable; it will eliminate duplicative monitoring and will include triggers for public notification and additional sampling at all sampling stations year-round. The unified program is intended to be equitable; responsibility for implementation of the unified program will be shared and the responsible agencies will jointly make arrangements to implement the program and will have the flexibility to jointly make short and/or long term changes in those arrangements.

The San Diego Water Board Executive Officer issued a written directive on December 5, 2014, pursuant to California Water Code section 13383, for SOCWA and the south Orange County MS4 Copermittees to implement the unified program in cooperation with OCHCA. The Executive Officer may make revisions to the unified program, provided that the unified program, as revised, continues to be consistent with and meet the requirements of State law, including the Ocean Plan, for beach water quality monitoring and related public notification and reporting. Following a thirty day public comment period, and subject to a request for a hearing before the San Diego Water Board, any such revision shall take effect as specified in a written directive issued by the Executive Officer pursuant to CWC section 13383. The program and any Executive Officer issued revisions to the program are subject to CWC section 13320 right of review from the date of issuance.

The unified program will supersede the existing routine, ongoing, beach water quality monitoring programs in south Orange County that are conducted in accordance with the existing requirements of the NPDES permits for discharges from the SOCWA ocean outfalls and the south Orange County MS4s. The requirement to participate in "regional monitoring" of beach water quality replaces requirements to conduct "core monitoring" of beach water quality, as provided for in Appendix III of the Ocean Plan.

The State Water Resources Control Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part 1 Sediment Quality which became effective August 25, 2009 (Sediment Quality Monitoring Policy). Provision D.1.e.(2) requires any Copermittees with MS4 discharges to an enclosed bay or estuary to monitoring the sediments in the enclosed bay or estuary receiving water in accordance with the sediment quality monitoring procedures as prescribed in the Sediment Quality Monitoring Policy.

The State Water Board adopted Resolution No. 2012-0012 which approved exceptions to the California Ocean Plan for selected discharges into Areas of Special Biological Significance (ASBS), including special protections for beneficial uses. State Board Resolution No. 2012-0012 became effective on March 20, 2012, and Attachment B to the Resolution established limitations on point source storm water discharges to ASBS. Copermittees with MS4s that discharge to an ASBS must monitor its discharge to assure compliance with State Board Resolution No. 2012-0012 as required pursuant to Provision D.1.e.(3).

The San Diego Water Board is developing a regional monitoring strategy to assess the conditions of receiving waters in the San Diego Region. The monitoring requirements of Provision D.1 are expected to be incorporated or serve as a foundation of this regional monitoring strategy, but may require some modifications. When the San Diego Water Board develops an alternative regional monitoring strategy, the Copermittees will be required to participate in the development and implementation of the alternative regional monitoring program pursuant to Provision D.1.f.

Provision D.2 (MS4 Outfall Discharge Monitoring Requirements) specifies the minimum MS4 outfall discharge monitoring requirements that the Copermittees must incorporate and implement as part of the Water Quality Improvement Plan.

The dry weather MS4 outfall discharge monitoring requirements are included under Provisions D.2.a.(2) and D.2.b. The dry weather MS4 outfall discharge monitoring requirements are part of the "*program, including a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer*" required by 40 CFR 122.26(d)(2)(iv)(B), which is expected to achieve compliance with the CWA section 402(p)(3)(B)(ii) statutory requirement for municipal storm water permits to require the Copermittees to "*effectively prohibit non-storm water discharges into the storm sewers*." The dry weather MS4 outfall discharge monitoring data collection requirements are based on requirements under 40 CFR 122.26(d)(1)(iv)(D) and 122.26(d)(2)(iv)(B)(3).

The dry weather MS4 outfall discharge monitoring requirements are designed to provide wide spatial and temporal coverage of each jurisdiction to better understand the extent and magnitude of non-storm water discharges to receiving waters, and make a distinction between persistent and transient non-storm water flows. This information is expected to allow each Copermittee to focus its resources on eliminating and controlling the highest priority threats to receiving water quality, as well as integrating other elements of the storm water programs (e.g. complaint call response) and third party data to efficiently and effectively assist in efforts to eliminate non-storm water discharges.

The dry weather MS4 outfall discharge monitoring requirements of Provision D.2.a.(2) and D.2.b are separated into monitoring required before and after the San Diego Water Board accepts the Copermittees' Water Quality Improvement Plan. Outfall monitoring conducted prior to acceptance of the Water Quality Improvement Plan is referred to in the Order as Transitional MS4 Outfall Discharge Monitoring. Provision D.2.a.(2) includes the transitional dry weather MS4 outfall discharge monitoring requirements.

The requirements under Provision D.2.a.(2) are based on the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B), which include the requirements for a monitoring program to identify, detect, and eliminate illicit connections and illegal discharges to the MS4s. The federal regulations (40 CFR 122.26(d)(1)(iv)(D)) require

the monitoring program to include "*a field screening analysis for illicit connections and illegal dumping [that]…[a]t a minimum, include[s] a narrative description, for either each field screening point or major outfall, of visual observations made during dry weather periods.*" The federal regulations (40 CFR 122.26(d)(1)(v)(B)) require the monitoring program to include "*inspection procedures and methods for detecting and preventing illicit discharges, and describe areas where this program has been implemented.*" Furthermore, the monitoring program is required by federal regulations (40 CFR 122.26(d)(2)(iv)(B)) to include "*a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer.*"

Dry weather transitional MS4 outfall discharge monitoring requires each Copermittee to field screen (inspect) its major MS4 outfalls to classify the MS4 outfall locations as having persistent dry weather flows, transient dry weather flows, or no dry weather flows. To account for the variance in size of the 39 jurisdictions covered under this Order, the Copermittees recommended a tiered approach to the number of major MS4 outfalls that must be inspected. Provision D.2.a.(2)(a) provides a tiered approach to the number of major MS4 outfalls that must be visually inspected per jurisdiction as well as a minimum frequency each Copermittee must inspect each major MS4 outfall per year. This tiered approach is based on the total number of major MS4 outfalls within a Copermittees jurisdiction within each Watershed Management Area.

Based on the field screening, each Copermittee is required to make a determination whether any observed flowing, pooled, or ponded waters are transient or persistent flows. Based on this field screening information, other jurisdictional program information, and third party information, each Copermittee is required to prioritize the MS4 outfalls within its jurisdiction for follow up investigation and elimination of the non-storm water discharge, as part of its illicit discharge detection and elimination program required pursuant to Provision E.2. In accordance with the requirements of Provision E.2, each Copermittee is required to immediately investigate obvious illicit discharges (e.g. outfall discharges with unusual color, unusual odor, or high flows).

This approach allows a Copermittee to use all of its resources, as well as leverage resources and information provided by third parties, to effectively eliminate non-storm water discharges from its MS4 outfalls. If the source of the non-storm water discharge cannot be immediately eliminated, the Copermittee uses the persistent flow or transient flow classification along with other programmatic implementation data to prioritize the MS4 outfalls for future investigation. In accordance with the adaptive management approach deployed throughout this Order, Provision D.2.a.(2)(c) requires each Copermittee to update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow. The requirement of Provision D.2.a.(2)(c) assures that each Copermittee is collecting data that can be used to demonstrate compliance with the CWA requirement that each Copermittee must implement a program to "*effectively*

prohibit non-storm water discharges into the [MS4]" and with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

Provision D.2.b describes the dry weather MS4 outfall discharge monitoring required to be incorporated and implemented as part of the Water Quality Improvement Plan. Dry weather MS4 outfall discharge monitoring must be performed by each Copermittee to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. The emphasis of the dry weather MS4 outfall discharge monitoring required pursuant to Provision D.2.b is consistent with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

Provision D.2.b.(1) requires each Copermittee to continue field screening its major MS4 outfalls and identifying those with persistent flows and transient flows, as conducted during the transitional period (i.e. before the Water Quality Improvement Plan was developed). However, each Copermittee now has the flexibility to adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of non-storm water persistent flow discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan. In order to ensure a minimum number of outfalls are inspected, Provision D.2.b.(1) requires the number of visual inspections be equal to the number of visual inspections required in the tiered inspection program pursuant to Provision D.2.a.(2)(a).

Provision D.2.b.(2)(b) requires each Copermittee to monitor a minimum of 5 major MS4 outfalls with persistent flows identified as the highest priorities within a Copermittee's jurisdiction, within each Watershed Management Area. In other words, Copermittees located in more than one Watershed Management Area must identify at least 5 major MS4 outfalls with persistent flows in its jurisdiction in each Watershed Management Area. If a Copermittee is located in more than one Watershed Management Area, and they have less than 5 major MS4 outfalls with persistent flows per jurisdictional area per Watershed Management Area, all of the major MS4 outfalls must be identified as high priority dry weather persistent flow MS4 outfalls. The Copermittees identified as Responsible Copermittees by a TMDL in Attachment E of the Order may need to monitor more than 5 dry weather major MS4 outfall locations to determine compliance with the requirements of the TMDL(s).

Monitoring must occur at the highest priority outfall locations at least semi-annually until the non-storm water discharges have been eliminated for three consecutive dry weather monitoring events; identified to be authorized by a separate NPDES Permit; or reprioritized to a lower priority. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized MS4 major outfall in the Copermittee's jurisdiction within the Watershed Management Area, unless there are no remaining qualifying major MS4 outfalls within the Copermittees jurisdiction. The Copermittees must continually update their dry weather persistent

flow MS4 outfall discharge monitoring locations with the next highest priority non-storm water flow that have yet to be eliminated until all persistent and transient flows are eliminated or its threat reduced.

Non-storm water persistent flow MS4 outfall discharge monitoring data collected during each semi-annual monitoring event, must be collected and analyzed according to the requirements of Provision D.2.b.(2)(b)-(e). These monitoring requirements are consistent with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

The wet weather MS4 outfall discharge monitoring requirements are included under Provisions D.2.a.(3) and D.2.c. The wet weather MS4 outfall discharge monitoring requirements are necessary for the Copermittees to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable, using management practices, control techniques and system, design and engineering methods, and such other provisions which are appropriate*" required by 40CFR 122.26(d)(2)(iv), which is expected to achieve compliance with the CWA section 402(p)(3)(B)(iii) statutory requirement for municipal storm water permits to require "*controls to reduce the discharge of pollutants [in storm water] to the maximum extent practicable*." The wet weather MS4 outfall discharge monitoring data collection requirements are based on requirements under 40 CFR 122.26(d)(2)(iii), 122.26(d)(2)(iii)(A) and 122.26(d)(2)(iii)(A)(1)-(4), and 40 CFR 122.21(g)(7)(i)-(ii).

The wet weather MS4 outfall discharge monitoring requirements of Provision D.2.a.(3) and D.2.c are separated into monitoring required before and after the San Diego Water Board accepts the Copermittees' Water Quality Improvement Plan. Outfall monitoring conducted prior to acceptance of the Water Quality Improvement Plan is referred to in the Order as Transitional MS4 Outfall Discharge Monitoring. Provision D.2.a.(3) includes the transitional wet weather MS4 outfall discharge monitoring requirements.

Until the wet weather MS4 outfall discharge monitoring requirements of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board, the Copermittees must comply with the requirements of transitional wet weather MS4 outfall monitoring requirements pursuant to Provision D.2.a.(3). Provision D.2.a.(3) requires the Copermittees in each Watershed Management Area to sample, at least five of the major MS4 outfalls inventoried pursuant to Provision D.2.a.(1) once per wet season for the monitoring data required to be collected pursuant to Provision D.2.a.(3)(c)-(e). Provision D.2.a.(3) further requires at least one major MS4 outfall monitoring station be located in each Copermittee's jurisdiction within the Watershed Management Area.

At a minimum, the five sampling locations chosen must be representative of storm water discharges from residential, commercial, industrial, and typical mixed-use land uses present within a Watershed Management Area. The San Diego Water Board expects the Copermittees to extrapolate from these data to similar land uses

throughout the Watershed Management Area to better inform the Water Quality Improvement Plan development process by prioritizing drainages for implementation of storm water control efforts required pursuant to Provision E.

Provision D.2.c describes the wet weather MS4 outfall discharge monitoring required to be included and implemented as part of the Water Quality Improvement Plan. Provision D.2.c provides the Copermittees the flexibility to adjust the wet weather MS4 outfall discharge monitoring locations and frequencies in the Watershed Management Area, as needed, to identify sources of pollutants in storm water discharges from MS4s in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan.

Although Provision D.2.c.(1) allows the Copermittees to adaptively manage the wet weather MS4 outfall discharge monitoring locations and frequencies, the provision requires a minimum of at least five wet weather outfall stations to be monitored. Provision D.2.c.(2) further allows the Copermittees to modify the monitoring frequency at each wet weather MS4 outfall station to meet the goals of the Water Quality Improvement Plan as long as the monitoring frequency occurs at least once per year and is at an appropriate frequency to identify sources of pollutants in storm water discharges, guide pollutant source identification efforts, or determine compliance with the requirements of the applicable TMDLs in Attachment E to the Order.

The wet weather MS4 outfall discharge monitoring requirements of Provisions D.2.c.(3) and D.2.c.(4) are the same as the transitional wet weather MS4 outfall discharge monitoring. In contrast, the requirements of Provision D.2.c.(5) are focused on collecting analytical data specific to the highest priority water quality conditions in the Watershed Management Area identified in the Water Quality Improvement Plan. The wet weather MS4 outfall discharge monitoring data collection requirements are consistent with the requirements under 40 CFR 122.26(d)(2)(iii), 122.26(d)(2)(iii)(A) and 122.26(d)(2)(iii)(A)(1)-(4), and 40 CFR 122.21(g)(7)(i)-(ii).

<u>Provision D.3 (Special Studies)</u> requires the Copermittees to develop special studies that will be conducted for each Watershed Management Area and the entire San Diego Region. Data collected pursuant to Provision D.3 is to be used by the Copermittees to improve the effectiveness of the strategies implemented by the jurisdictional runoff management programs toward achieving the numeric goals identified in the Water Quality Improvement Plans and ultimately achieve compliance with the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c, and A.2.a, which is consistent with the requirements of Provision A.4.

Special studies are often necessary to fill data gaps or provide more refined information that allow the Copermittees to better manage the generation or elimination of pollutants and discharges to and from the MS4. In the Fourth Term Permits, the Copermittees have been required to implement special studies as directed by the San Diego Water Board. The special studies required by this Order provide the Copermittees more flexibility to identify and implement special studies that will be most

useful to improving the effectiveness of their jurisdictional runoff management programs.

Provision D.3.a.(1) requires the Copermittees to develop and conduct at least two special studies per Watershed Management Area, to be determined by the Copermittees. One of the two special studies may be accomplished through participation in a Regional Special Study required under Provision D.3.a.(2). The requirements provide the Copermittees great latitude in identifying and developing the special studies. Watershed Management Area special studies are required, at a minimum, to: (a) relate in some way to the highest water quality priorities identified by the Copermittees in the Water Quality Improvement Plan, (b) be conducted within the Watershed Management Area, and (c) include some form of participation (e.g. contribution of funds, personnel services, project management) by all the responsible Copermittees within the Watershed Management Area.

Examples of Watershed Management Area special studies might include, but are not limited to: (1) focused pollutant source identification studies, (2) BMP effectiveness and/or comparison studies, (3) pilot tests for new or emerging pollutant control methods, (4) receiving water pollutant or stressor source identification and/or mitigation studies, or (5) pollutant fate and transport studies. The Watershed Management Area special studies are expected to provide data that can be utilized by the Copermittees to improve the Water Quality Improvement Plan or implementation of the Copermittees' jurisdictional runoff management programs to address the highest priority water quality conditions.

Provision D.3.a.(2) requires the Copermittees to develop at least one special study that will be conducted for the entire San Diego region. The regional special study is expected to provide data that can be utilized by the Copermittees to improve the Water Quality Improvement Plan or implementation of the Copermittees' jurisdictional runoff management programs to identify or address regional water quality concerns and priorities.

An example of a regional special study would be to develop and establish allowable exceedance frequencies of the bacteria water quality objectives for several types of water bodies, during different wet and dry weather conditions the San Diego region. The special study would be related to bacteria, which is a priority for the San Diego region due to the adoption of "*Bacteria TMDL Project I – Beaches and Creeks in the San Diego Region*." The study results could be used to inform the Copermittees and the San Diego Water Board about the indictor bacteria water quality objective exceedance frequencies that occur in natural or reference watersheds.

<u>Provision D.4 (Assessment Requirements)</u> specifies the assessments that the Copermittees are required to perform, based on the monitoring data collected, and will be reported as part of the Annual Report for the Water Quality Improvement Plan implementation. Provision D.4 requires the Copermittees assess the progress of the

water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c, and A.2.a.

Provision D.4 specifies the assessments that Copermittees must perform for each Watershed Management Area to assess the effectiveness of each Copermittee's jurisdictional runoff management program and the Water Quality Improvement Plan. The effectiveness of each Copermittee's jurisdictional runoff management program and Water Quality Improvement Plan is measured through these types of assessments: (a) Receiving Waters Assessments (b) MS4 Outfall Discharges Assessments, (c) Special Studies Assessments, and (d) Integrated Assessment of Water Quality Improvement Plan.

Provision D.4.a requires the Copermittees to assess the status of receiving water conditions annually during the transitional monitoring period (during development of the Water Quality Improvement Plan) and after acceptance of the Water Quality Improvement Plan. The monitoring data collected pursuant to Provision D.1 will be evaluated, among other information, to assess the condition of a Watershed Management Area's streams, coastal waters, enclosed bays, harbors, estuaries, and lagoons. The focus of the receiving waters assessments is to measure progress toward the objective of the CWA to "*restore and maintain the chemical, physical, and biological integrity of the Nation's waters*" as the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program are implemented within a Watershed Management Area. Provision D.4.a is consistent with 40 CFR 122.42(c)(7) which requires the Copermittees to annually report the *"[i]dentification of water quality improvements or degradation."*

Provision D.4.b includes the MS4 outfall discharges assessment requirements. The focus of MS4 outfall discharges assessments is to determine if the Copermittees' are implementing programs that comply with the requirements of the CWA for MS4 permits to "*effectively prohibit non-stormwater discharges into the storm sewers*" and "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable.*" The monitoring data collected pursuant to Provisions D.2 will be evaluated, among other information, to assess the effectiveness of the transitional MS4 outfall field screening monitoring, the implementation of the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program. The MS4 outfall discharge assessments consist of Non-Storm Water Discharges Reduction Assessments and Storm Water Pollutant Discharges Reduction Assessments.

The Non-Storm Water Discharges Reduction Assessments are how each Copermittee will demonstrate that its jurisdictional runoff management program implementation efforts are achieving the CWA requirement to "*effectively prohibit non-stormwater discharges into the storm sewers.*" Provision D.4.b.(1) requires each Copermittee to assess and report on its illicit discharge detection and elimination program required pursuant to Provision E.2 to reduce and effectively prohibit non-storm water and illicit discharges into the MS4 within its jurisdiction. The Non-Storm Water Discharges

Reduction Assessments include specific assessment requirements applicable to each Copermittee.

As each Copermittee collects and analyzes the data collected pursuant to dry weather MS4 outfall discharges monitoring requirements of Provisions D.2.a.(2) and D.2.b, Provision D.4.b.(1) requires each Copermittee to assess the progress, assess the effectiveness of its current actions, and identify modifications necessary to increase the effectiveness of its actions toward reducing and eliminating non-storm water and illicit discharges to its MS4. The findings from these assessments are expected to be utilized by the Copermittee as part of its procedures to prioritize the non-storm water discharges that will be addressed by its Illicit Discharge Detection and Elimination program required pursuant to Provision E.2.

The assessment requirements of Provision D.4.a.(1) are consistent with 40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(3) which require "*procedures…to investigate portions of the separate storm sewer system that, <u>based on the results of the field screen, or other appropriate information</u> [emphasis added], indicate a reasonable potential of contain illicit discharges or other sources of non-storm water*" as part of a "*program…to detect and remove…illicit discharges and improper disposal into the storm sewer.*" The assessment requirements of Provision D.4.a.(1) are also consistent with 40 CFR122.42(c)(1) requires the Copermittees to annually report the "*status of implementing the components of the storm water management program that are established as permit conditions.*"

The Storm Water Pollutant Discharges Reduction Assessment is how the Copermittees in each Watershed Management Area will demonstrate that their jurisdictional runoff management program implementation efforts are achieving the CWA requirement to "*reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable*." Provision D.4.b.(2) requires the Copermittees in each Watershed Management Area to assess and report the progress of the Copermittees' efforts to reduce pollutants in storm water discharges from the MS4s to the MEP. The Storm Water Pollutant Discharges Reduction Assessments include specific assessment requirements during both the transitional monitoring period and after acceptance of the Water Quality Improvement Plan applicable to the Watershed Management Area and each Copermittee.

As the Copermittees collect and analyze the data collected pursuant to wet weather MS4 outfall discharges monitoring requirements of Provisions D.2.a.(3) and D.2.c, Provision D.4.b.(2) requires the Copermittees to assess runoff conditions during the transitional period, and the progress of the Water Quality Improvement Plan strategies toward reducing pollutants in storm water from the MS4 to the MEP. The findings from these assessments are expected to be utilized by the Copermittees to identify any modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify sources of pollutants in storm water discharges from the MS4s, as well as focus, modify, and improve the water quality improvement

strategies implemented by each Copermittee within its jurisdiction to reduce pollutants in storm water discharges to the MEP.

The assessment requirements of Provision D.4.b.(2) are consistent with 40 CFR 122.26(d)(2)(iii)(B) which requires "*[e]stimates of the annual pollutant load of the cumulative discharges to waters of the United States from all identified municipal outfalls…during a storm event…accompanied by a description of the procedures for estimating constituent loads and concentrations, including any modeling, data analysis, and calculation methods.*" The assessment requirements of Provision D.4.a.(2) are consistent with 40 CFR 122.26(d)(2)(v) which requires that each Copermittee assesses the *"estimated reductions in loadings of pollutants from discharges of municipal storm sewer constituents from municipal storm sewer systems expected as the result of the municipal storm water quality management program."* The assessment requirements of Provision D.4.b.(2) are also consistent with 40 CFR122.42(c)(1) requires the Copermittees to annually report the "*status of implementing the components of the storm water management program that are established as permit conditions.*"

Provision D.4.c includes the special studies assessment requirements. Performing special studies are how the Copermittees will address data gaps identified during the development of and updates to the Water Quality Improvement Plan. The relevant findings from the special studies assessments are expected to be incorporated as part of the applicable receiving water assessments, MS4 outfall discharge assessments, and integrated water quality improvement assessments required in Provision D.4.a, D.4.b, and D.4.d, respectively.

The assessment requirements in Provision D.4.d are part of the iterative approach and adaptive management process required by Provision A.4. The Copermittees are required to integrate the data collected pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to re-evaluate the Water Quality Improvement Plan.

The monitoring data collected pursuant to Provisions D.1 and D.2, and the results of the assessment required pursuant to Provisions D.4.a-c, will be used to determine whether the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program are effective, or require modifications or improvements to become more effective to achieve the requirements of the CWA. The assessments required by Provision D.4.d are consistent with 40 CFR 122.42(c)(1) which requires that the Copermittees to report the *"[t]he status of implementing the components of the storm water management program that are established as permit conditions."*

E. Jurisdictional Runoff Management Programs

Purpose: Provision E includes the requirements for the jurisdictional runoff management programs to be implemented by each of the Copermittees. Compliance with the requirements for the jurisdictional runoff management programs will allow the Copermittees to demonstrate that they are implementing programs to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP. The jurisdictional runoff management program document prepared by each Copermittee will also provide the details for implementing the water quality improvement strategies identified in the Water Quality Improvement Plan specifically within its jurisdiction.

***Discussion*:** Implementation of the jurisdictional runoff management program requirements under Provision E is how the Copermittees "*effectively prohibit non-stormwater discharges into the storm sewer,*" and outlines the "*controls to reduce the discharge of pollutants to the maximum extent practicable"* consistent with the federal regulations under 40 CFR 122.26. The jurisdictional runoff management program is part of the "*comprehensive planning process*" that is required pursuant to 40 CFR 122.26(d)(2)(iv). Where the Water Quality Improvement Plan is the "*comprehensive planning process*" on a Watershed Management Area scale, requiring "*intergovernmental coordination,*" the jurisdictional runoff management program document is the "*comprehensive planning process*" on a jurisdictional scale that should be coordinated with the other Copermittees in the Watershed Management Area to achieve the goals of the Water Quality Improvement Plan.

The jurisdictional runoff management program requirements are included to provide each Copermittee criteria that can be used to demonstrate that its storm water management program is implementing the "*comprehensive planning process*" within its jurisdiction to "*effectively prohibit non-stormwater discharges into the storm sewers,*" and to identify and implement the most effective "*controls to reduce the discharge of pollutants to the maximum extent practicable"* in accordance with the performance standards given in the CWA.

Provision E includes the requirements for each of the components that must be included in the Copermittee's jurisdictional runoff management program document that will be implemented by the Copermittee within its jurisdiction. Implementation of the components of each Copermittee's jurisdictional runoff management program must incorporate the water quality improvement strategies identified by each Copermittee in the Water Quality Improvement Plans, described pursuant to Provision B.3.b.(1)(a).

More specific and detailed discussions of the requirements of Provision E are provided below.

Provision E.1 (Legal Authority Establishment and Enforcement) requires each Copermittee to establish and enforce sufficient legal authority to control discharges to the MS4 within its jurisdiction.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system*" and be able to demonstrate that it can "*operate pursuant to legal authority established by statute, ordinance or series of contracts.*" Provision E.1.a describes the minimum legal authorities each Copermittee must establish for itself within its jurisdiction to control discharges to its MS4. The requirements of Provision E.1.a are consistent with the requirements set forth in 40 CFR 122.26(d)(2)(i)(A)-(F).

The certification statement required from each Copermittee by Provision E.1.b is included to provide the San Diego Water Board additional documentation that each Copermittee has established the legal authorities consistent with Provision E.1.a and 40 CFR 122.26(d)(2)(i)(A)-(F), and the Copermittee can "*operate pursuant to legal authority established by statute, ordinance or series of contracts.*"

Provision E.2 (Illicit Discharge Detection and Elimination) requires each Copermittee to implement an illicit discharge detection and elimination program to effectively prohibit non-storm water discharges to the MS4 by actively detecting and eliminating illicit discharges and disposal into its MS4. If the San Diego Water Board finds that a Copermittee is fully implementing the requirements of Provision E.2, then the Copermittee is deemed in compliance with the effective prohibition of non-storm water discharges to the MS4 required under Provision A.1.b.

Provision E.2 establishes the minimum requirements that each Copermittee must implement within its jurisdiction to effectively prohibit non-storm water discharges from entering its MS4. The federal CWA requires permits for municipal storm sewer systems to "*effectively prohibit non-storm water discharges into the storm sewers*." The federal regulations (40CFR122.26(d)(2)(i)(B)) require each Copermittee to establish the legal authority to prohibit illicit discharges to its MS4s. Under 40 CFR 122.26(d)(2)(iv)(B), each Copermittee must implement a "*program…to detect and remove…illicit discharges and improper disposal into the storm sewer.*" The federal NPDES regulations, under 40 CFR 122.26(b)(2), define illicit discharges as "*any discharge to a municipal separate storm sewer that is not composed entirely of storm water*." Thus, non-storm water discharges are not authorized to enter the MS4 and are considered to be illicit discharges, unless authorized by a separate NPDES permit.

The Phase I Final Rule clarifies that non-storm water discharges through an MS4 are not authorized under the CWA (55 FR 47995):

> "*Today's rule defines the term "illicit discharge" to describe any discharge through a municipal separate storm sewer system that is not composed entirely of storm water and that is not covered by an NPDES permit. Such illicit discharges are not*

> *authorized under the Clean Water Act. Section 402(p)(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit*."

The federal NPDES requirements for the program to address illicit discharges must include "*inspections, to implement and enforce an ordinance, orders, or other similar means to prevent illicit discharges to the MS4*." The federal NPDES regulations also reference several categories of "*non-storm water discharges or flows* [which] *shall be addressed where such discharges are identified…as sources of pollutants to waters of the United States*." The Phase I Final Rule (55 FR 48037) further clarified the requirements of 40 CFR 122.26(d)(2)(iv)(B)(1) as follows:

> "*EPA is clarifying that section 402(p)(3)(B) of the CWA (which requires permits for municipal separate storm sewers to 'effectively' prohibit non-storm water discharges) does not require permits for municipalities to prohibit certain discharges or flows of nonstorm water to waters of the United States through municipal separate storm sewers in all cases*."

In previous iterations of the municipal storm water permits for the San Diego Region, these categories were simply listed and referred to as categories of non-storm water discharges "not prohibited" unless identified as a source of pollutants. The Copermittees have often referred to these categories as "exempt" discharges. In both cases, however, the language is inconsistent with the federal CWA and NPDES regulations. And, the clarification provided in the Phase I Final Rule does not specifically state that such discharges are "not prohibited" or "exempt" or in any way authorized. The federal NPDES regulations do, however, state that specific categories of non-storm water discharges must be "*addressed*" if identified as "*sources of pollutants to waters of the United States*."

The language of Provision E.2.a has been revised to be fully consistent with the language of the CWA and the requirements of the federal regulations under 40 CFR 122.26(d)(2)(iv)(B)(1). Provision E.2.a requires each Copermittee to address <u>all</u> types of non-storm water discharges into its MS4 as illicit discharges, <u>unless</u> the discharge is authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to Provisions E.2.a.(1) through E.2.a.(5). Only non-NPDES-permitted non-storm water discharges identified as a category of non-storm water discharges under Provisions E.2.a.(1) through E.2.a.(5) <u>and</u> *not identified as a source of pollutants* do not have to be addressed as illicit discharges. Categories of non-storm water discharges that meet the requirements of Provisions E.2.a.(1) through E.2.a.(5) do not have to be addressed by the Copermittee as illicit discharges.

Several of the non-storm water categories listed in 40 CFR 122.26(d)(2)(iv)(B)(1) have not been included in Provisions E.2.a.(1) through E.2.a.(5), including: street wash water, landscape irrigation, irrigation water, and lawn watering. Because these are no longer included within the categories listed under Provisions E.2.a.(1) through E.2.a.(5), the Copermittees must prohibit these types of non-storm water discharges from entering the MS4. This is consistent with the clarification of 40 CFR 122.26(d)(2)(iv)(B)(1) in the Phase I Final Rule (55 FR 48037), which states:

> "*[T]he Director may include permit conditions that either require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*."

Street wash water is a category of non-storm water discharges that was removed when the Third Term Permits were issued. Street wash water is a source of several pollutants (e.g., metals, oil and grease, petroleum hydrocarbons, chlorinated solvents, sediment) which are generated during the street washing process. The removal of this category requires the Copermittees to prohibit this type of non-storm water discharge from entering the MS4.

The landscape irrigation, irrigation water, and lawn watering categories, collectively referred to hereafter as "over-irrigation" discharges, were removed from the list of non-storm water discharge categories in the Fourth Term Orange County and Riverside County Permits. Non-storm water discharges resulting from over-irrigation have been found to be a source of several types of pollutants (e.g., nutrients, bacteria, pesticides, sediment) in receiving waters. The San Diego Water Board and the Copermittees have identified categories of non-storm water discharges associated with over-irrigation as a source of pollutants and conveyance of pollutants to the MS4 and waters of the United States in the following documents:

- **SmartTimer/Edgescape Evaluation Program (SEEP) Grant Application**

  The State Water Board allocated grant funding to the SEEP project grant application submitted in 2006, which targeted irrigation runoff by retrofitting areas of existing development and documenting the conservation and runoff improvements. The basis of this grant project is that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 is a source and conveyance of pollutants. In addition, the grant application indicated that this alteration of natural flows is impacting the beneficial uses of waters of the state and U.S. Results from the study indicate that that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 *is* a source and conveyance of pollutants. The results of this study can be applied broadly to any area where over-irrigation takes place. The grant application included the following statements:

  > "*Irrigation runoff contributes flow & pollutant loads to creeks and beaches that are 303(d) listed for bacteria indicators.*"

"*Regional program managers agree that the reduction and/or elimination of irrigation-related urban flows and associated pollutant loads may be key to successful attainment of water quality and beneficial use goals as outlined in the San Diego Basin Plan and Bacteria TMDL over the long term.*"

"*Elevated dry-weather storm drain flows, composed primarily … of landscape irrigation water wasted as runoff, carry pollutants that impair recreational use and aquatic habitats all along Southern California's urbanized coastline. Storm drain systems carry the wasted water, along with landscape derived pollutants such as bacteria, nutrients and pesticides, to local creeks and the ocean. Given the local Mediterranean climate, excessive perennial dry season stream flows are an unnatural hydrologic pattern, causing species shifts in local riparian communities and warm, unseasonal contaminated freshwater plumes in the near-shore marine environment.*"

- **2006-2007 Orange County Watershed Action Plan Annual Reports**

The Watershed Action Plan Annual Reports for the 2006-2007 reporting period were submitted by the County of Orange, Orange County Flood Control District and Copermittees within the San Juan Creek, Laguna Coastal Streams, Aliso Creek, and Dana Point Coastal Streams Watersheds. San Juan Creek, Laguna Coastal Streams, Aliso Creek and Dana Point Coastal Streams are all currently 303(d) listed as impaired for indicator bacteria within their watersheds and/or in the Pacific Ocean at the discharge points of their watersheds. The Orange County Copermittees, within their Watershed Action Strategy Table for fecal indicator bacteria included the following:

"*Support programs to reduce or eliminate the discharge of anthropogenic dry weather nuisance flow throughout the…watershed. Dry weather flow is the transport medium for bacteria and other 303(d) constituents of concern.*"

Additionally, they state that "*conditions in the MS4 contribute to high seasonal bacteria propagation in-pipe during warm weather. Landscape irrigation is a major contributor to dry weather flow, both as surface runoff due to over-irrigation and overspray onto pavements; and as subsurface seepage that finds its way into the MS4.*"

- **Fiscal Year 2008 Carlsbad Watershed Urban Runoff Management Program Annual Report**

The Carlsbad Watershed Urban Runoff Management Program Annual Report for Fiscal Year 2008 was submitted by the Carlsbad Watershed Copermittees (Cities of Carlsbad, Encinitas, Escondido, Oceanside, San Marcos, Solana Beach, and Vista, and the County of San Diego). In the Annual Report, the Carlsbad Watershed Copermittees stated the following:

"The Carlsbad Watershed Management Area (WMA) collective watershed strategy identifies bacteria, sediment, and nutrients as high priority water quality pollutants in the Agua Hedionda (904.3 – bacteria and sediment), Buena Vista (904.2 – bacteria), and San Marcos Creek (904.5 – nutrients) Hydrologic Areas. Bacteria, sediment, and nutrients have been identified as potential discharges from over-irrigation."

- **2007-2008 San Diego Bay Watershed Urban Runoff Management Program Annual Report**

  The San Diego Bay Watershed Urban Runoff Management Program 2007-2008 Annual Report was submitted by the San Diego Bay Watershed Copermittees (Cities of Chula Vista, Coronado, Imperial Beach, La Mesa, Lemon Grove, National City, and San Diego, the County of San Diego, the Port of San Diego, and the San Diego County Airport Authority). In Appendix D of the Annual Report, titled "Likely Sources of Pollutants," the San Diego Bay Watershed Copermittees identified over-irrigation of lawns as a pollutant generating activity from business and/or residential land uses for bacteria, pesticides, and sediment.

- **Copermittee Public Education Materials**

  The Orange County Public Works *Tips for Landscape & Gardening* public education brochure states: "*Fertilizers, pesticides and other chemicals that are left on yards or driveways can be blown or washed into storm drains that flow to the ocean. Overwatering lawns can also send materials into storm drains*."

  The Riverside County Flood Control and Water Conservation District *Landscape and Garden* public education brochure states: *"Soil, yard wastes, over-watering and garden chemicals become part of the urban runoff mix that winds its way through streets, gutters and storm drains before entering lakes, rivers, streams, etc. Urban runoff pollution contaminates water and harms aquatic life!"*

- **Los Peñasquitos Lagoon Sedimentation/Siltation TMDL Technical Report**

  The Los Peñasquitos Lagoon Sedimentation/Siltation TMDL technical report was prepared for the City of San Diego and USEPA in October 2010. The technical report was included as a technical supporting document attached to the Sediment TMDL for Los Peñasquitos Lagoon staff report prepared by the San Diego Water Board, dated June 13, 2012. Under the Source Assessment section, the technical report states the following:

  "*Dry weather loading is dominated by nuisance flows from urban land use activities such as car washing, sidewalk washing, and lawn over-irrigation, which pick up and transport sediment into receiving waters.*"

These documents confirm that non-storm water discharges associated with over-irrigation are a source of pollutants and should be addressed as illicit discharges to the MS4. Prohibiting non-storm water discharges associated with over-irrigation, however, is not a new requirement for the Copermittees because it is also consistent with and required by the Water Conservation in Landscaping Act (AB 1881, Laird).

The Water Conservation in Landscaping Act required the Department of Water Resources (DWR) to prepare a Model Water Efficient Landscape Ordinance for use by local agencies (e.g. the Copermittees). All local agencies were required to adopt a water efficient landscape ordinance by January 1, 2010. Local agencies could adopt the Water Efficient Landscape Ordinance developed by DWR, or an ordinance considered at least as effective as the Model Ordinance. The Water Efficient Landscape Ordinance includes a requirement that local agencies prohibit runoff from irrigation (§ 493.2):

> "*Local agencies shall prevent water waste resulting from inefficient landscape irrigation by <u>prohibiting runoff from leaving the target landscape</u> [emphasis added] due to low head drainage, overspray, or other similar conditions where water flows onto adjacent property, non-irrigated areas, walks, roadways, parking lots, or structures. Penalties for violation of these prohibitions shall be established locally*."

Furthermore, non-storm water discharges from over-irrigation not only transport and discharge pollutants to receiving waters, but are also a likely source of the dry weather flows causing changes to habitat within and along the receiving water bodies. Examples of habitat changes from the dry weather flows include perennialization of ephemeral streams, and conversion of saltwater and brackish water marsh habitats to freshwater marsh habitats (e.g. Los Peñasquitos Lagoon). Both of these examples have resulted in the promotion of invasive species in several areas of the San Diego Region.

The removal of the over-irrigation discharges categories does not require the Copermittees to strictly prohibit lawn and landscape irrigation, but does require the prohibition of excessive irrigation water that results in non-storm water discharges to the MS4. Non-storm water discharges to the MS4 from over-irrigation must be addressed as illicit discharges by the Copermittees pursuant to the requirements of Provision E.2.

The remaining non-storm water categories listed in 40 CFR 122.26(d)(2)(iv)(B)(1) are listed under Provisions E.2.a.(1) through E.2.a.(5) and generally fall into four categories: (1) non-storm water discharges subject to existing San Diego Water Board waste discharge requirements and NPDES permits; (2) non-storm water discharges generally not expected to be a source of pollutants to receiving waters; (3) non-storm water discharges likely to contain pollutants requiring some form of control to address

the pollutants prior to discharging to the MS4; and (4) non-storm water discharges or flows associated with firefighting.

Provisions E.2.a.(1) and E.2.a.(2) include several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) for which the San Diego Water Board already has developed general waste discharge requirements and NPDES permits to address the discharges. The Copermittees are only required to address these types of non-storm water discharges as illicit discharges if the Copermittees or the San Diego Water Board identifies these non-storm water discharges not having coverage under the applicable NPDES permit.

Provision E.2.a.(3) includes several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) which are generally not expected to be a source of pollutants to receiving waters, many of which originate from what are typically natural, uncontrollable sources. The Copermittees are only required to address these types of non-storm water discharges as illicit discharges if the Copermittees or the San Diego Water Board identifies these non-storm water discharges as a source of pollutants to receiving waters. Because many of these sources are generally uncontrollable, enforcing a prohibition may not be a possibility for the Copermittees. The Copermittees would be able to address these non-storm water discharges by preventing these non-storm water discharges from entering the MS4. This could potentially be achieved by sealing their MS4 structures so the discharges cannot enter the MS4.

Provision E.2.a.(4) includes several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) that are likely to contain pollutants requiring some form of control to address the pollutants prior to discharging to the MS4. At this time, an outright prohibition of these types of non-storm water discharges does not yet appear to be warranted. Thus, Provision E.2.a.(4) includes several requirements for the Copermittees to control the pollutants from these types of non-storm water discharges. This is consistent with the clarification of the federal regulations in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board has the authority to require the Copermittees to "*control any of these types of discharges where appropriate*."

Unlike non-storm water discharges from over-irrigation, these types of non-storm water discharges are not expected to occur in close proximity to each other or very frequently. Provided these types of non-storm water discharges are controlled as required in Provision E.2.a.(4), the Copermittees would only be required to address these types of non-storm water discharges as illicit discharges if the Copermittee or the San Diego Water Board identifies these non-storm water discharges as a source of pollutants to receiving waters.

Provision E.2.a.(5) includes specific requirements for fire fighting discharges and flows. The requirements for non-storm water discharges and flows associated with fire

fighting have been separated into requirements for: a) non-emergency fire fighting discharges and flows, and b) emergency fire fighting discharges and flows.

The San Diego Water Board has found that discharges from building fire suppression system maintenance (e.g. fire sprinklers) contain waste and potentially a significant source of pollutants to receiving waters. As such, the San Diego Water Board is requiring these discharges be addressed as illicit discharges by the Copermittees. Thus, the discharges to the MS4 are to be prohibited via ordinance, order or similar means. For other non-emergency firefighting discharges and flows (i.e. flows from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems), the Copermittees are required to develop and implement a program to address pollutants in these non-storm water discharges and flows. This is consistent with the clarification of the federal regulations in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board has the authority to require the Copermittees to "*control any of these types of discharges where appropriate*."

For emergency firefighting discharges and flows, the Phase I Final Rule (55 FR 48037) has clarified the requirements of 40 CFR 122.26(d)(2)(iv)(B)(1) pertaining to emergency firefighting flows and discharges, which states:

> "*In the case of firefighting it is not the intention of these rules to prohibit in any circumstances the protection of life and public or private property through the use of water or other fire retardants that flow into separate storm sewers*."

Thus, the requirements have been made to be consistent with the guidance provided by the Phase I Final Rule. The Order recommends that the Copermittees develop and encourage implementation of BMPs to reduce or eliminate the discharge of pollutants from emergency firefighting flows to the MS4s and receiving waters. The Order does not include any requirements that should be interpreted as requiring the implementation of BMPs for emergency firefighting flows to the MS4s and receiving waters.

The Copermittees are expected to review the dry weather MS4 outfall discharge monitoring data they collect to determine if and when there are non-storm water discharges to or from their MS4s that are a source of pollutants to receiving waters. If the Copermittees identify one of the types of non-storm water discharges listed in Provisions E.2.a.(1) through E.2.a.(4) as a source of pollutants to receiving waters based on the review and evaluation of monitoring data, Provision E.2.a.(6) requires the Copermittees to prohibit those categories of discharges from entering the MS4 through ordinance, order or similar means. In addition, Provision E.2.a.(6) clarifies that the San Diego Water Board may identify categories of non-storm water discharges or flows listed under Provisions E.2.a.(1) through E.2.a.(4) that must be prohibited.

Provision E.2.a.(6) also provides the Copermittees an option to propose controls to be implemented for the category of non-storm water discharges as part of the Water Quality Improvement Plan instead of prohibiting the category of non-storm water discharges. If the Water Quality Improvement Plan is accepted by the San Diego Water Board with the proposed controls, the Copermittees will not be required to prohibit the category of non-storm water discharges to their MS4s as long as the controls are implemented. This is consistent with the clarification of 40 CFR 122.26(d)(2)(iv)(B)(1) in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board may "*require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*."

Finally, Provision E.2.a.(7) has been included in the requirements for non-storm water discharges to clarify that any non-storm water discharges to the Copermittee's MS4, even those identified pursuant to Provisions E.2.a.(1) through E.2.a.(4), must be reduced or eliminated, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit. Provision E.2.a.(7) is consistent with the requirements of CWA section 402(p)(3)(B)(ii) and 40 CFR 122.26(d)(1)(v)(B), as clarified in the Phase I Final Rule (55 FR 47995) that "*[u]ltimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit*." However, the reduction or elimination of those non-storm water discharges are expected to be achieved as feasible, in accordance with the priorities in the Water Quality Improvement Plan and when the resources are available to the Copermittee.

Consistent with 40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(1), each Copermittee must implement a "*program…to prevent illicit discharges to the municipal storm sewer system*" and "*detect…illicit discharges and improper disposal into the storm sewer.*" Provision E.2.b requires each Copermittee to implement measures to prevent and detect illicit discharges and connections to its MS4 as part of its illicit discharge detection and elimination program.

As part of the program to prevent and detect illicit discharges to the MS4, 40 CFR 122.26(d)(2)(iv)(B)(2) requires "*procedures to conduct on-going field screening activities during the life of the permit, including areas or locations that will be evaluated by such field screens*." As part of the procedures, each Copermittee is required to maintain an updated map of its entire MS4 and the corresponding drainage areas within its jurisdiction. Having knowledge about where inlets, access points, connections with other MS4s, and outfalls are located is necessary for each Copermittee to track, identify, and eliminate illicit discharges and connections. Thus, Provision E.2.b.(1) of the Order specifies that the map must include the segments of the storm sewer system owned, operated, and maintained by the Copermittee, and include locations of all known inlets, connections with other MS4s, and outfalls to the Copermittee's MS4. The remaining requirements of Provision E.2.b are consistent with the requirements of 40 CFR 122.26(d)(2)(iv)(B)(3)-(7) related to implementing measures to prevent and detect illicit discharges and connections to the MS4.

Provision E.2.c requires each Copermittee to conduct field screening and monitoring of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4. Field screening is a required element of the program to detect and eliminate illicit discharges and connections to the MS4, pursuant to 40 CFR 122.26(d)(2)(iv)(B)(2). The field screening requirement will be implemented through the dry weather MS4 outfall discharge monitoring required under Provisions D.2.a.(2) and D.2.b.(1).

Provision E.2.d specifies the measures each Copermittee must implement to eliminate illicit discharges and connections to its MS4. Elimination of illicit discharges and connections to the MS4 is consistent with the requirement of 40 CFR 122.26(d)(2)(iv)(B) "*to detect and remove [emphasis added]…illicit discharges and improper disposal into the storm sewer*" and will achieve the CWA requirement for MS4 permits to "*effectively prohibit non-storm water discharges into the storm sewers*."

Generally, each Copermittee is responsible for prioritizing its efforts to eliminate non-storm water and illicit discharges or connections to its MS4 based on field screening and monitoring data, NALs, illicit discharge investigation records, and the known or suspected sources. Sources of non-storm water and illicit discharges or connections must be eliminated by enforcing the legal authority established by each Copermittee pursuant to Provision E.1.

Provision E.3 (Development Planning) requires each Copermittee to use its land use and planning authority to implement a development planning program to control and reduce the discharge of pollutants in storm water from new development and significant redevelopment to the MEP. Proper implementation of the development planning program will also contribute toward effectively prohibiting non-storm water discharges from development projects to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." As part of the management program, 40 CFR 122.26(d)(2)(iv)(A)(2) requires "*planning procedures including a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment*."

Land development generally alters the natural conditions of the land by removing vegetative cover, compacting soil, and/or placement of concrete, asphalt, or other impervious surfaces. These impervious surfaces concentrate urban pollutants (such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not found in high concentrations in the natural environment. Pollutants that

accumulate on impervious surfaces are not easily biodegraded nor subject to natural treatment processes.

Impervious surfaces greatly affect the natural hydrology of the land because they do not allow natural infiltration and treatment of storm water runoff to take place. Instead, storm water runoff from impervious surfaces is typically directed through pipes, curbs, gutters, and other hardscape into receiving waters, with little treatment, at significantly increased volumes and accelerated flow rates over what would occur naturally. The increased pollutant loads, storm water volume, discharge rates and velocities, and discharge durations from the MS4 adversely impact stream habitat by causing accelerated, unnatural erosion and scouring within creek bed and banks. Placement of impervious surfaces also encapsulates "good" sediment (such as sand, gravel, rocks and cobbles) that would normally replenish creek beds and banks to help stabilize them. Collectively, these changes to natural hydrologic processes are termed hydrograph modification, or hydromodification.

Hydromodification, which is caused by both altered storm water flow and altered sediment flow regimes, is largely responsible for degradation of creeks, streams, and associated habitats in the San Diego Region. In an ongoing study by the Stormwater Monitoring Coalition to assess the health of streams throughout Southern California, researchers found that three of the four highest risk stressors to creeks (percent sands and fines present, channel alteration, and riparian disturbance) were related to physical habitat.[29] Researchers studying flood frequencies in Riverside County have found that increases in watershed imperviousness of only 9-22 percent can result in increases in peak flow rates for the two-year storm event of up to 100 percent.[30] Such changes in runoff have significant impacts on channel morphology.

In addition, a technical report issued by the Southern California Coastal Water Research Project (SCCWRP) stated that "*[r]ecent studies indicate that California's intermittent and ephemeral streams are more susceptible to the effects of hydromodification than streams from other parts of the United States. Physical degradation of stream channels in the central and eastern United States can initially be detected when watershed impervious cover approaches 10 percent, although biological effects (which may be more difficult to detect) may occur at lower levels. In contrast, initial response of streams in the semi-arid portions of California appears to occur between 3 and 5 percent impervious cover*."[31] These studies highlight the extent to which impacts originating from impervious surfaces created by land development are responsible for the degradation of creek and stream habitat.

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[29] Assessing the Health of Southern California Streams, Stormwater Monitoring Coalition, Fact Sheet
[30] Schueler and Holland, 2000. Storm Water Strategies for Arid and Semi-Arid Watersheds (Article 66). The Practice of Watershed Protection.
[31] Stein, E. and Zaleski, S., 2005. Technical Report 475, Managing Runoff to Protect Natural Streams: The Latest Development on Investigation and Management of Hydromodification in California. December 30, 2005.

This is consistent with what USEPA has noted, that "*[m]ost stormwater runoff is the result of the man-made hydrologic modifications that normally accompany development. The addition of impervious surfaces, soil compaction, and tree and vegetation removal result in alterations to the movement of water through the environment. As interception, evapotranspiration, and infiltration are reduced and precipitation is converted to overland flow, these modifications affect not only the characteristics of the developed site but also the watershed in which the development is located. Stormwater has been identified as one of the leading sources of pollution for all waterbody types in the United States. Furthermore, the impacts of stormwater pollution are not static; they usually increase with more development and urbanization*."[32]

Reducing the impact from the increased pollutant loads and flows generated by impervious surfaces within a watershed is essential to protecting and restoring the integrity of the receiving waters. Provision E.3 includes the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment*." The requirements of Provision E.3 will 1) minimize the generation and discharge of pollutants in storm water from the MS4, and 2) minimize the potential of storm water discharges from the MS4 from causing altered flow regimes and excessive downstream erosion in receiving waters.

The requirements of Provision E.3.a include the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment*" applicable to all development projects, regardless of size or purpose of development. In general, all development projects must implement onsite BMPs to remove pollutants from runoff prior to its discharge to any receiving waters, as close to the pollutant generating source as possible, and structural BMPs must not be constructed within waters of the U.S.

Furthermore, the onsite BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors (e.g. mosquitos, rodents, and flies). If not properly designed or maintained, certain BMPs implemented or required by municipalities may create a habitat for vectors. Monitoring studies conducted by the California Department of Public Health (CDPH) have documented that mosquitoes opportunistically breed in structural storm water BMPs, particularly those that hold standing water for over 96 hours. Certain site design features that hold standing water may similarly produce mosquitoes.

[32] USEPA, 2007. Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices, December 2007.

Structural BMPs and site design features should incorporate design, construction, and maintenance principles to promote drainage within 96 hours to minimize standing water available to mosquitoes. Nuisances and public health impacts resulting from vector breeding can be prevented with close collaboration and cooperative effort between municipalities and local vector control agencies and the CDPH during the development and implementation of storm water runoff management programs. The CDPH also has issued guidance for BMP implementation that will minimize potential nuisances and public health impacts resulting from vector breeding.[33]

All development projects are required to implement source control BMPs that will minimize the generation of pollutants. Additionally, each development project must implement, where applicable and feasible, low impact development (LID) BMPs to mimic the natural hydrology of the site and retain and/or treat pollutants in storm water runoff prior to discharging to and from the MS4.

The LID Center defines LID as "*a comprehensive land planning and engineering design approach with a goal of maintaining and enhancing the pre-development hydrologic regime of urban and developing watersheds.*"[34] LID designs seek to control storm water at the source, using small-scale integrated site design and management practices to mimic the natural hydrology of a site, retain storm water runoff by minimizing soil compaction and impervious surfaces, and disconnect storm water runoff from conveyances to the storm drain system.

LID BMPs may utilize interception, storage, evaporation, evapotranspiration, infiltration, and filtration processes to retain and/or treat pollutants in storm water before it is discharged from a site. Because of these numerous options, the San Diego Water Board expects that every development project will be able to implement some form of LID BMPs. Examples of LID BMPs include using permeable pavements, rain gardens, rain barrels, grassy swales, soil amendments, and native plants.

Provision E.3.a also includes requirements for all development projects to, where feasible, landscape with native and/or low water use plants to minimize the discharge of non-storm water discharges associated with excessive irrigation, as well as harvest (i.e., storage) and use precipitation to promote the concept of utilizing storm water as a resource.

While all development projects are subject to the requirements of Provision E.3.a, Provision E.3.b identifies Priority Development Projects that exceed given size thresholds and/or fit under specific use categories. Priority Development Projects are required to incorporate specific performance criteria for structural BMPs into the

[33] California Department of Public Health, 2012. Best Management Practices for Mosquito Control in California. (http://www.cdph.ca.gov/HealthInfo/discond/Documents/BMPforMosquitoControl07-12.pdf)
[34] www.lowimpactdevelopment.org

project plan to reduce the generation of pollutants, and address potential impacts from hydromodification.

The Priority Development Project categories are based on the requirements of the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), and do not differ significantly from the Fourth Term Permit for San Diego County. Furthermore, the Priority Development Project categories are consistent with Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), and Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit).

Because of the impact of relatively small increases in watershed impervious surfaces to receiving waters, Provision E.3.b.(1)(c)(iv) has been updated to include large driveways that are 5,000 square feet or more. The San Diego Water Board finds that large driveways can exacerbate altered flow regimes if not properly controlled.

Provision E.3.b.(3) describes projects that are exempt from Priority Development Project status. These include new or retrofit paved sidewalks, bicycle lanes, or trails that are designed and constructed to direct runoff to vegetated areas or be hydraulically disconnected from paved areas. The exemptions have been provided to encourage these types of projects because they provide multiple environmental benefits, such as promoting walking rather than driving, which will in turn improve air quality. Additionally, retrofitting of existing alleys, streets, or roads are exempt from Priority Development Project status if they are constructed using USEPA Green Streets guidance.[35] By doing so, retrofitting of these types of projects is encouraged. The San Diego Water Board recognizes that there are spatial constraints associated with these projects, and implementation of structural BMPs are not always feasible.

For development projects identified as Priority Development Projects, the requirements of Provision E.3.c are the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment.*" Provisions E.3.c.(1)-(3) describe the performance criteria for the structural BMPs that must be implemented for each Priority Development Project defined by Provision E.3.b.

Provision E.3.c.(1) describes the storm water pollutant control BMP requirements that must be implemented by all Priority Development Projects. The purpose of Provision E.3.c.(1) is to reduce pollutants in storm water runoff to the MEP from Priority Development Projects before it is discharged to the MS4. Of all the available treatment processes available, retention of storm water, and therefore capture of the

[35] "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).

pollutants in the storm water, will achieve 100 percent pollutant removal efficiency for the volume of storm water retained. No other method of treatment can achieve 100 percent pollutant removal efficiency. Thus, retention of as much storm water onsite is the most effective way to reduce pollutants in storm water discharges to, and consequently from the MS4, and controls pollutants in storm water discharges from a site to the MEP.

Under Provision E.3.c.(1)(a), retention of the pollutants in the runoff produced from the 85th percentile storm event ("design capture volume") is the design standard to which Priority Development Projects must comply. Since the 85th percentile storm event has previously been used as the numeric design standard for treatment control BMPs, this same size storm event is used as the numeric design standard for storm water retention. This is the MEP standard recognized by the San Diego Water Board and is consistent with the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), as well as Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit), and Los Angeles Water Board Order No. R4-2012-0175 (Los Angeles County MS4 Permit).

The 85th percentile storm event is the event that has a precipitation total greater than or equal to 85 percent of all storm events over a given period of record in a specific area or location. For example, to determine what the 85th percentile storm event is in a specific location, all 24 hour storms that have recorded values over a 30 year period would be tabulated and a 85th percentile storm would be determined from this record (i.e. 15 percent of the storms would be greater than the number determined to be the 85th percentile storm). Most jurisdictions in the San Diego Region have already developed isopluvial maps that can provide this type of information. The 85th percentile storm might be determined to be a number such as 1.0 inch, and this would be multiplied by the total area of the project footprint producing runoff to calculate the design capture volume. The Priority Development Project designer would then select a system of BMPs that would retain (i.e. intercept, store, infiltrate, evaporate, or evapotranspire) the pollutants contained in the design capture volume onsite.

Retention BMPs are necessary to capture and retain pollutants generated from a Priority Development Project. In a recent study performed by SCCWRP in the Los Angeles Region, they found "*that the magnitude of constituent load associated with storm water runoff depends, at least in part, on the amount of time available for pollutant build-up on land surfaces. The extended dry period that typically occurs in arid climates such as southern California maximizes the time for constituents to build-up on land surfaces, resulting in proportionally higher concentrations and loads during*

initial storms of the season."[36] This implies that the "first flush" of a rainy season and the first storm events after long antecedent dry periods tend to have the highest pollutant loads. Capturing and retaining the pollutant loads of the "first flush" of a rainy season and the first storm events after long antecedent dry periods will reduce a significant portion of the pollutants in storm water discharged to and from the MS4.

The San Diego Water Board, however, acknowledges that in some situations retention of the full design capture volume onsite may not be technically feasible. In this event, the Copermittee may allow the Priority Development Project to use biofiltration BMPs to treat 1.5 times the design capture volume not reliably retained onsite, or biofiltration BMPs with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite.

The 1.5 multiplier is based on the finding in the Ventura County Technical Guidance Manual that biofiltration of 1.5 times the design capture volume not retained onsite will provide approximately the same pollutant removal as retention of the design capture volume on an annual basis.[37] This standard is consistent with the Los Angeles Water Board's Los Angeles County and Ventura County municipal storm water permits (Order Nos. R4-2012-0175 and R4-2010-0108, respectively). The flow-thru design of 0.75 times the portion of the design capture volume not reliably retained onsite is consistent with the San Diego Water Board's Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively). In either case, the biofiltration BMPs must be designed with an appropriate hydraulic loading rate to maximize storm water retention and pollutant removal, as well as to prevent erosion, scour, and channeling within the BMP. Each Copermittee is required to update its BMP Design Manual to provide guidance for hydraulic loading rates and other biofiltration design criteria necessary to maximize storm water retention and pollutant removal.

The San Diego Water Board further recognizes that, in addition to not being technically feasible, retention of the full design capture storm onsite may be cost prohibitive, or may not provide as much water quality benefit to the Watershed Management Area as would implementing BMPs elsewhere in the watershed. Thus, Provision E.3.c.(1)(b) allows for the use of a combination of onsite retention BMPs, and the implementation of an Alternative Compliance Program described in Provision E.3.c.(3). Provision E.3.c.(3) is discussed in more detail below.

If the full design capture volume is not retained onsite either because biofiltration is not technically feasible, or a Copermittee grants a Priority Development Project permission

[36] Stein, E.D., Tiefenthaler, L.L., and Schiff, K.C., 2007. Technical Report 510, Sources, Patterns and Mechanisms of Storm Water Pollutant Loading from Watershed and Land Uses of the Greater Los Angeles Area, California, USA. March 20, 2007.
[37] Ventura Countywide Stormwater Management Program. 2011. Ventura Technical Guidance Manual, Manual Update, 2011.

to utilize the Alternative Compliance Program, then the pollutants in the portion of the design capture volume that are not reliably retained onsite must still be reduced to the MEP. Thus, flow-thru treatment control BMPs are required to be implemented on Priority Development Projects in addition to the retention BMPs. The requirements of Provisions E.3.c.(1)(a)(ii)[a]-[c] include the performance standards for flow-thru treatment control BMPs, consistent with the Fourth Term Permits in the San Diego Region.

Whereas the purpose of the requirements under Provision E.3.c.(1) is to reduce pollutants in storm water runoff to the MEP, the purpose of the requirements under Provision E.3.c.(2) is to maintain or restore more natural hydrologic flow regimes to prevent accelerated, unnatural erosion in downstream receiving waters, also to the MEP standard. Provision E.3.c.(2) describes hydromodification management BMP requirements that must be implemented by all Priority Development Projects.

The performance criteria for the implementation of hydromodification management BMPs on Priority Development Projects are consistent with the requirements in the Fourth Term Permits for Orange and Riverside Counties (Order Nos. R9-2009-0002 and R9-2010-0016, respectively). Modifications to the Orange County and Riverside County Hydromodification Management Plans (HMPs) will likely be minor, or may not be necessary. The HMP for San Diego County will likely require some minor modifications to incorporate the requirements of Provision E.3.c.(2) and become consistent with the Orange County and Riverside County HMPs. The San Diego Water Board does not, however, expect that it will be necessary for the San Diego County Copermittees to develop a new approach or significantly re-write the San Diego County HMP. This is because the premise of the hydromodification management BMP requirements, which are to control storm water runoff conditions (flow rates and durations) for Copermittee-defined range of flows, is unchanged from all Fourth Term Permits in the San Diego Region.

Provision E.3.c.(2)(a) requires that post-project runoff conditions mimic the *pre-development* runoff conditions, and not the *pre-project* runoff conditions. Fundamentally, the San Diego Water Board believes that using a hydrology baseline that approximates that of an undeveloped, natural watershed is the only way to facilitate the return of more natural hydrological conditions to already built-out watersheds, and ultimately improved stream health. On the other hand, using the *pre-project* hydrology as a baseline for redevelopment projects results in propagating the unnatural hydrology of urbanized areas. Propagating the urbanized flow regime does not support conditions for restoring degraded or channelized stream segments, and would forever sentence such streams to the degraded state. Furthermore, reducing the volume of storm water runoff associated with the urbanized flow regime will also result in reducing the discharge of pollutants into receiving waters, since storm water runoff from impervious surfaces contains untreated pollutants.

The San Diego Water Board understands that approximating the pre-development runoff condition associated with a redevelopment site is not necessarily straightforward because factors such as natural grade and native vegetation for the site cannot be precisely known. Therefore, the San Diego Water Board does not expect project designers to estimate historical conditions associated with redevelopment sites. Rather, the San Diego Water Board expects project designers and the Copermittees to approximate pre-development runoff conditions using the parameters of a *pervious* area rather than an *impervious* area. This means that for redevelopment sites, approximating pre-development runoff conditions equates to using existing onsite grade and assuming the infiltration characteristics of the underlying soil. A redevelopment Priority Development Project must not use runoff coefficients of concrete or asphalt to estimate pre-development runoff conditions. Rather, redevelopment projects must use available information pertaining to existing underlying soil type (such as soil maps published by the National Resource Conservation Service), onsite existing grade, and any other readily available pertinent information to estimate pre-development runoff conditions.

The San Diego Water Board understands, indeed asserts, that the pre-development hydrology of an area in question can only be roughly estimated and cannot be precisely known. However, using the hydrology of a natural condition, even if not precisely known, will provide significant benefit to receiving waters over using the hydrology associated with impervious (developed) surfaces. Therefore in order to achieve the goals of the Clean Water Act, which are to "*restore and maintain the chemical, physical, and biological integrity of the nation's waters* [emphasis added]," the most appropriate standard to use for hydromodification management is the standard associated with the pre-development condition.

Provision E.3.c.(2)(b) requires Priority Development Projects to avoid known critical sediment yield areas or implement measures that would allow coarse sediment to be discharged to receiving waters, such that the natural sediment supply is unaffected by the project. This is necessary because the availability of coarse sediment supply is as much an issue for causing erosive conditions to receiving streams as are accelerated flows.

The San Diego Water Board recognizes that in some situations implementing the hydromodification management BMP requirements for flow control fully onsite may not be technically feasible, may be cost prohibitive, or may not provide any overall water quality benefits to the Watershed Management Area. Thus, Provision E.3.c.(2)(c) allows for the use of a combination of onsite hydromodification management BMPs for flow control and alternative compliance options described in Provision E.3.c.(3).

Provision E.3.c.(3) allows for alternative compliance in instances where the Copermittee determines that offsite measures will have a greater overall water quality benefit for the Watershed Management Area than if the Priority Development Project were to implement structural BMPs onsite. Consequently, watershed-specific

structural BMP requirements are present in this Order in the form of allowable compliance offsite. The Alternative Compliance Program to Onsite Structural BMP Implementation Provision is intended to integrate with the Copermittees' planning efforts in the Water Quality Improvement Plans.

The Alternative Compliance Program is an option for Priority Development Projects where the governing Copermittee has participated in the development of a Watershed Management Area Analysis as part of the Water Quality Improvement Plan (described in Provision B.3.b.(4)). Such an approach is consistent with the latest findings in hydromodification management by the scientific community. In a Technical Report entitled *Hydromodification Assessment and Management in California,*[38] the report states:

> *"An effective [hydromodification] management program will likely include combinations of on-site measures (e.g., low-impact development techniques, flow-control basins), in-stream measures (e.g., stream habitat restoration), floodplain and riparian zone actions, and off-site measures. Off-site measures may include compensatory mitigation measures at upstream locations that are designed to help restore and manage flow and sediment yield in the watershed."*

Consistent with the ideas brought forth in the report, in the Watershed Management Area Analysis of Provision B.3.b.(4), which is optional, the Copermittees will develop watershed maps that include as much detail about factors that affect the hydrology of the watershed as is available. Such factors included identification of areas suitable for infiltration, coarse sediment supply areas, and locating stream channel structures and constrictions. Once these factors are mapped and studied, the Copermittees can identify areas in the watershed where candidate projects may be implemented that are expected to improve water quality in the watershed by providing more opportunity for infiltration, slowing down storm water flows, or attenuation of pollutants naturally via healthy stream habitat. These candidate projects may be in the form of retrofitting existing development, rehabilitating degraded stream segments, identifying regional BMPs, purchasing land to preserve valuable floodplain functions, and any other project(s) that the Copermittees identify.

Under the Alternative Compliance Program, Priority Development Projects may be allowed to fund, partially fund, or implement a candidate project, in lieu of implementing structural BMPs onsite, if they enter into a voluntary agreement with the governing Copermittee permitting this arrangement. Project proponents may also propose an alternative project not previously identified by the Copermittees. In either case, whether a project proponent implements a candidate project identified by the Copermittees or a separate alternative compliance project, the governing Copermittee must determine that implementation of the project will have a greater overall water

[38] 2012. ED Stein, F Federico, DB Booth, BP Bledsoe, C Bowles, Z Rubin, GM Kondolf, A Sengupta. Technical Report 667. Southern California Coastal Water Research Project. Costa Mesa, CA.

quality benefit for the Watershed Management Area than fully implementing structural BMPs onsite. Determination of greater overall water quality benefits associated with alternative compliance projects would be accomplished by utilizing Water Quality Equivalency calculations developed pursuant to Provision E.3.c.(3)(a). Water Quality Equivalency calculations are necessary to establish a regional and technical basis for determining water quality benefits associated with alternative compliance projects, which can be consistently used by all Copermittees in the San Diego Region. Finally, if ~~I~~f alternative compliance involves funding or implementing a project that is outside the jurisdiction of the governing Copermittee, then that Copermittee may enter into an inter-agency agreement with the appropriate jurisdiction.

Finally, Provision E.3.c.(2)(d) allows Priority Development Projects to be exempt from the hydromodification management BMP requirements if there is no threat of erosion to downstream receiving waters (i.e. the receiving stream is concrete lined from the point of discharge all the way to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean). If the Copermittees believe that more exemptions are warranted, then they must perform the optional Watershed Management Area Analysis of Provision B.3.b.(4). Additional exemptions other than those specified in this Order may be established on a watershed basis, provided the Copermittees perform the analysis, provide supporting rationale for the exemptions, and complete the Water Quality Improvement Plan approval process pursuant to Provision F.1.

To facilitate the transition to this Order from the Fourth Term Permits for Orange and Riverside County Copermittees, Provision E.3.c.(2)(e) allows two additional temporary exemptions from hydromodification management BMP implementation. The first temporary exemption allows relief from hydromodification management BMP implementation for Priority Development Projects discharging directly to an engineered channel conveyance system with a capacity to convey peak flows generated by the 10-year storm event all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean. Similar to the exemption allowed for concrete-lined channels, this exemption is premised on the concept that there is little threat of erosion to these types of engineered channel systems.

The second temporary exemption allows relief from hydromodification management BMP implementation for Priority Development Projects discharging directly to large river reaches with drainage areas larger than 100 square miles and a 100-year flow capacity in excess of 20,000 cubic feet per second. If this exemption is claimed, then properly sized energy dissipation is required at all discharge points associated with the Priority Development Project. This exemption is premised on the concept that large river reaches can essentially assimilate the accelerated flow rates associated with individual Priority Development Projects because they are inconsequential compared

to the flow rate in the large river reach. Both of these exemptions are included in the Hydromodification Management Plan for San Diego County[39].

These temporary exemptions are allowed as a means to facilitate Orange and Riverside County Copermittees' transition to this Order from the Fourth Term Permits and are not meant to reside as permanent exemptions without additional rigorous technical analyses specific to each County. Therefore, these exemptions will no longer apply once the Copermittees' land development programs are fully updated to reflect the requirements of this Order, i.e., upon implementation of the BMP Design Manual pursuant to Provision F.2.b. If the Copermittees believe that these or other exemptions are warranted in the context of water quality improvement and stream restoration opportunities, then the Copermittees must perform the optional Watershed Management Area Analysis of Provision B.3.b.(4) and provide supporting rationale for the exemptions. The San Diego County Copermittees are also required to perform the optional Watershed Management Area Analysis to provide supporting rationale to justify use of these and other exemptions. Updated BMP Design Manuals including rationale to justify use of exemptions will be reviewed by the San Diego Water Board pursuant to Provision F.2.b.

Provisions E.3.c.(4) and E.3.c.(5) were included under the BMP requirements applicable to all development projects in the Fourth Term Permits for San Diego, Orange, and Riverside Counties (Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016, respectively). In this Order, the long-term BMP maintenance and infiltration and groundwater protection requirements apply to structural BMPs implemented by Priority Development Projects only.

Provision E.3.d requires the Copermittees to update their BMP Design Manual as needed to incorporate the requirements of Provision E.3. The BMP Design Manual is formerly known as the Standard Storm Water Mitigation Plan, or SSMP, and was renamed so that the title has a more accurate description of the document content. The contents of the BMP Design Manual are largely unchanged from the previous Standard Storm Water Mitigation Plans required under the Fourth Term Permits. The BMP Design Manual fulfills the 40 CFR 122.26(d)(2)(iv)(A)(2) requirement that the Copermittee's development planning program includes "*a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment*."

As part of the "*planning procedures,*" 40 CFR 122.26(d)(2)(iv)(A)(2) requires the procedures to "*address controls to reduce pollutants in discharges from municipal separate storm sewers after construction is completed*." The requirements applicable to the implementation and oversight of structural BMPs at Priority Development Projects are provided under Provision E.3.e.

[39] Final Hydromodification Management Plan Prepared for County of San Diego, March 2011

Proper installation of the structural BMPs approved for a Priority Development Project is necessary to ensure that pollutants in storm water discharges will be reduced to the MEP after the project is completed. In addition to the proper installation of structural BMPs, the maintenance of structural BMPs on Priority Development Projects is necessary to ensure that pollutants in storm water discharges will continue to be reduced to the MEP. Provision E.3.e.(1) includes the minimum requirements that each Copermittee must implement to ensure structural BMPs are properly installed and will be properly maintained.

Provisions E.3.e.(1)(a)(i)-(ii) have been included to provide additional clarification regarding when a Copermittee may allow land development requirements from earlier MS4 permits to apply to a Priority Development Project. Since the MS4 permits issued from 2001 to the adoption of Order No. R9-2015-0001 amending Order No. R9-2013-0001 (Regional MS4 Permit), a Copermittee could allow development projects with "prior lawful approval" to be "grandfathered" into implementing BMP requirements from previous MS4 permits. The Copermittees were given the discretion to use their land use authority to determine when it was appropriate to allow a development project with prior lawful approval to implement BMP requirements from the previous MS4 permits, and when the most recent BMP requirements should be required to achieve the reduction of pollutants in storm water runoff from development projects to the MEP. However, the San Diego Water Board has found that the Copermittees and the development community frequently disagree about when a development project has prior lawful approval and what is necessary to reduce pollutants in storm water runoff from development projects to the MEP.

Therefore, Provisions E.3.e.(1)(a)(i)-(ii) were included to provide more clarity and certainty for the Copermittees, the land development community, and the general public about when the structural BMP performance standards of earlier MS4 permits may be allowed to be implemented. A Copermittee may allow a Priority Development Project to implement BMP requirements of the previous MS4 permit only if all requirements of Provisions E.3.e.(1)(a)(i)[a]-[d] have been met. Otherwise, the Copermittees must require all Priority Development Projects to incorporate the BMP requirements of Provision E.3 into the project to reduce pollutants in storm water runoff from development projects to the MEP.

Provisions E.3.e.(1)(a)(i)[a]-[d] are dependent upon the effective date of the BMP Design Manual. Unless otherwise directed by the San Diego Water Board, the effective date of the BMP Design Manual is December 24, 2015 for the San Diego County Copermittees, September 28, 2017 for the Orange County Copermittees, and July 5, 2018 for the Riverside County Copermittees.

Alternatively, if the Copermittee can demonstrate a lack of land use authority or legal authority to require a Priority Development Project to implement the requirements of Provision E.3, the Copermittee may allow land development requirements from the previous MS4 permits to apply. However, under these circumstances the San Diego

Water Board expects the Copermittee to utilize its available land use authority or legal authority to require the implementation of as much of Provision E.3 as possible to reduce the discharge of pollutants in storm water from development and redevelopment projects within its jurisdiction to the MEP.

In cases where BMP requirements from the earlier MS4 permits govern the structural BMP design requirements of a Priority Development Project, the San Diego Water Board expects the Copermittees to be able to demonstrate, in a programmatic audit or other means, that a Priority Development Project met all the requirements listed under Provisions E.3.e.(1)(a)(i)[a]-[d], or have evidence that the Copermittee did not have the land use or legal authority to require the implementation of Provision E.3 for a Priority Development Project.

The requirements under Provision E.3.e.(2)-(3) are necessary to demonstrate each Copermittee is implementing a program that complies with Provisions E.3.b-c and E.3.e.(1), and ensure structural BMPs at Priority Development Project will continue to be able to reduce pollutants in storm water discharges to the MEP.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary for any development projects to compel compliance with the requirements of Provision E.3 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.3.f requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

<u>Provision E.4 (Construction Management)</u> requires each Copermittee to implement a construction management program to control and reduce the discharge of pollutants in storm water from construction sites to the MEP. Proper implementation of the construction management program will also contribute toward effectively prohibiting non-storm water discharges from construction sites to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." As part of the management program, 40 CFR 122.26(d)(2)(iv)(D) requires "*a program to implement and maintain structural and non-structural best management practices to reduce pollutants in storm water runoff from construction sites to the municipal storm sewer system.*"

Construction sites can be significant sources of sediment, trash, and other pollutants to receiving waters. Although sediment is naturally occurring in the natural environment, the discharge of sediment under unnatural conditions is problematic to receiving waters. Fine sediment in creeks causes high turbidity that interferes with the

functionality of native flora and fauna in local creeks. For example, turbidity interferes with both photosynthesis of water-philic plants, as well as successful foraging and reproduction of benthic macroinvertebrates. Sediment can also make it difficult for fish to breathe because it clogs fish gills. Other pollutants such as heavy metals or pesticides can adhere to sediment and are transported to receiving waters during storm events, where they dissolve in the water column and become bioavailable to aquatic organisms. Sediment is recognized as a major stressor to surface waters and is responsible for the impairment of several lagoons and creeks in the San Diego Region.

Provision E.4 includes requirements that each Copermittee must implement to minimize the discharge of sediment and other pollutants from construction sites to the MS4 within its jurisdiction. The requirements under Provision E.4 are consistent with the Fourth Term Permits for San Diego, Orange, and Riverside Counties. Therefore, Copermittees are expected to implement the requirements seamlessly, with minimal changes to their existing construction management programs. The Copermittees, however, are given more flexibility to run their programs as needed to maximize efficiency, and also to be consistent with the Water Quality Improvement Plan for the Watershed Management Area.

As part of the construction management program, 40 CFR 122.26(d)(2)(iv)(D)(1) requires "*procedures for site planning which incorporate consideration of potential water quality impacts.*" Provision E.4.a describes the minimum elements each Copermittee is required to include as part of the construction site planning and project approval process. The construction site planning and approval process is based primarily on ensuring each project had an adequate site-specific pollution control, construction BMP, and/or erosion and sediment control plan that will be implemented to minimize the discharge of pollutants in storm water to the MEP, and minimize impacts to receiving waters.

The requirements under Provision E.4.b provide the data and information necessary to identify "*priorities for inspecting sites and enforcing control measures*" required pursuant to 40 CFR 122.26(d)(2)(iv)(D)(3). Under Provision E.4.b, each Copermittee must identify construction sites that are considered a high threat to downstream surface waters. Designation of "high threat to water quality" construction sites will necessitate the Copermittees to develop criteria to identify such sites. Provision E.4.b.(2) describes a list of factors that must be considered when the Copermittee considers threat to water quality. For example, a Copermittee must identify sites as "high threat to water quality" if it is located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions, according to the Water Quality Improvement Plan. This ensures that construction management program implementation is compatible with the Copermittee's identified highest priority water quality conditions.

Pursuant to 40 CFR 122.26(d)(2)(iv)(D)(2) each Copermittee is required describe "*requirements for nonstructural and structural best management practices*" at

construction sites. Provision E.4.c includes the types of construction site BMPs that the Copermittees must implement, or require the implementation of, at each construction site to reduce pollutants in storm water discharges to the MEP.

Each Copermittee is expected to require the implementation of appropriate BMPs given specific site conditions, the season and likelihood of rain events, and construction phase (i.e. grading vs. vertical construction). This means that throughout the life of the project construction, the appropriate BMPs will vary, especially if the construction of the project spans multiple wet seasons. As opposed to describing specific minimum BMPs that must be implemented, the Order describes major BMP categories that should be considered for each site.

Each Copermittee is expected to use its 20 years of storm water experience and knowledge to require implementation of appropriate BMPs from the various categories at each construction site within its jurisdiction. For example, the San Diego Water Board expects that each site will be required to implement erosion control and sediment control. The San Diego Water Board also expects each Copermittee to require implementation of active/passive sediment treatment systems at sites where other BMPs have been tried and are known to be inadequate, and discharges of sediment are causing or contributing to water quality impairment downstream. Each Copermittee is granted flexibility in specifying the minimum level of BMP requirements at each site, but the San Diego Water Board expects each site to be capable of controlling pollutants in storm water discharges to the MEP and preventing illicit discharges.

The requirements under Provision E.4.d are necessary to demonstrate that each Copermittee is implementing a program that complies with Provisions E.4.a and E.4.c and ensure BMPs at construction sites will reduce pollutants in storm water discharges to the MEP.

Provision E.4.d does not include minimum required inspection frequencies for construction sites. Each Copermittee must use its experience and knowledge to specify an appropriate inspection frequency for both high priority and lower priority sites in their jurisdictional runoff management program documents, and in accordance with the Water Quality Improvement Plan. Appropriate inspection frequencies may vary by Copermittee, but the San Diego Water Board expects that the stated frequency will be adequate for each Copermittee to properly oversee the construction sites within its jurisdiction, confirm BMPs are implemented to reduce pollutants in storm water discharges from constructions sites to the MEP, and make needed changes to its program on an ongoing basis as necessary.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary for any development projects to compel compliance with the requirements of Provision E.4 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to

the MEP, Provision E.4.e requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Provision E.5 (Existing Development Management) requires each Copermittee to implement an existing development management program to control and reduce the discharge of pollutants in storm water from areas of existing development to the MEP. Proper implementation of the existing development management program will also contribute toward effectively prohibiting non-storm water discharges from areas of existing development to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." Within 40 CFR 122.26(d)(2)(iv)(A) and (C), the management program is required to reduce impacts on receiving waters and reduce pollutants in storm water discharges to the MEP from commercial and residential areas, industrial facilities, and municipal facilities.

Commercial and residential areas, industrial facilities, and municipal facilities must be addressed by each Copermittee with the existing development management program required under Provision E.5. All other areas within each Copermittee's jurisdiction should be either undeveloped open space, or areas that are being developed or under construction. Areas being developed or under construction will be addressed by the Copermittee under the requirements of Provision E.3 (Development Planning) or Provision E.4 (Construction Management).

Areas of existing development typically include impervious surfaces such as sidewalks, driveways, roads, and rooftops, which generate and concentrate pollutants (such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not found in high concentrations in the natural environment. Pollutants that accumulate on impervious surfaces are not easily biodegraded or not subject to natural treatment processes. When it rains, these pollutants are transported in storm water runoff from these impervious surfaces into receiving waters, resulting in poor water quality and degradation of beneficial uses.

In addition to the generation of pollutants, areas of existing development have generally altered the natural conditions of the land and removed vegetative cover, reduced the perviousness of the surface, and reduced the capacity of storm water that can be intercepted, captured, stored, infiltrated, evaporated, and/or evapotranspired. The alteration of the natural conditions and the impervious surfaces associated with areas of existing development causes water quality problems due to the alteration of natural flow regimes within the watersheds; resulting in hydromodification of channels, streams, and habitats that exist within or adjacent to the areas of existing development.

Thus, storm water discharges from areas of existing development are responsible for poor water quality, degraded habitats, and hydromodified channels throughout the developed portions of the watersheds in the San Diego Region. To improve the health and functionality of the receiving waters in a Watershed Management Area, land use practices and the amount of impervious surfaces in areas of existing development must change to reduce the various impacts caused by hydromodification and pollutants from storm water runoff generated in developed areas. Each Copermittee must be aggressive to address pollutant sources and runoff from areas of existing development to be able to reduce pollutants in storm water discharges from the MS4 to the MEP.

There is some overlap in the requirements under Provision E.5 with the requirements under Provisions E.2 (Illicit Discharge Detection and Elimination), E.3 (Development Planning), and E.4 (Construction Management). Illicit discharges frequently originate from areas of existing development. New development projects, when completed will become some type of residential, commercial, industrial or municipal existing development. Redevelopment projects are, by definition, redeveloping areas of existing development. And, redevelopment projects become construction sites located in areas of existing development. Much of the data and information collected, inspections performed, and enforcement actions taken for the requirements under Provisions E.2 to E.4 may also be utilized by the existing development management program. The requirements under Provision E.5, however, are focused primarily on reducing pollutants generated in areas of existing development that can be transported in storm water runoff and discharged to and from the MS4.

The requirements under Provision E.5 build upon existing program elements being implemented by the Copermittees. Provision E.5 is generally consistent with the existing development requirements of the Fourth Term Permits for Orange and Riverside Counties (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), but modified to provide more flexibility to implement the programs so resources can be better focused toward addressing the highest priority water quality conditions identified in the Water Quality Improvement Plans.

For a Copermittee to properly manage areas of existing development, having knowledge of what development exists within its jurisdiction is essential. Provision E.5.a requires each Copermittee to maintain a watershed-based inventory of all the existing development within its jurisdiction. This requirement is necessary for each Copermittee to implement the requirements of Provision E.5.b-e.

As opposed to just maintaining separate inventories based on the type of site, each Copermittee must maintain a watershed-based inventory that includes all types of existing development within its jurisdiction. By utilizing a watershed-based inventory, the Copermittees within a Watershed Management Area can combine their inventories and review the inventories by watershed in addition to by jurisdiction. Pollutant

sources and strategies for abatement can then be evaluated on a watershed level, as opposed to evaluating sources and strategies strictly by type of site.

Provision E.5.a includes the information that must be included in the inventory. Provision E.5.a.(1) specifies what facilities or areas must be included in the inventory. A commercial type of existing development may be identified in the inventory as a facility (e.g. individual building, individual business) or an area (e.g. shopping center, commercial zone). An industrial type of existing development must be identified in the inventory by facility (e.g. individual industrial entity). A municipal type of existing development must be identified in the inventory by facility, with a list of specific municipal facilities that must be included in the inventory. A residential type of existing development must be identified by areas to be designated by the Copermittee. For each of the facilities and areas identified in the Copermittee's inventory developed pursuant to Provision E.5.a.(1), Provision E.5.a.(2) specifies the information that must be included in the description for the facility or area.

Provision E.5.a.(3) requires each Copermittee to maintain an updated map showing the location of inventoried existing development, watershed boundaries, and water bodies. This requirement was included because this information is expected to help the Copermittees in a Watershed Management Area identify and prioritize sources of pollutants and/or stressors in areas of existing development that contribute toward the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Knowledge of the existing development that are likely to be sources of pollutants contributing to the highest priority water quality conditions is expected to be a key element in the Copermittees' development of the water quality improvement strategies that will be included in the Water Quality Improvement Plans. The strategies described in the Water Quality Improvement Plans will direct efforts within the existing development management programs implemented by each Copermittee.

Pursuant to 40 CFR 122.26(d)(2)(iv)(A) each Copermittee is required describe "*structural and source control measures to reduce pollutants*" in storm water runoff discharged from areas of existing development. Provision E.5.b includes the BMP implementation and maintenance requirements that the each Copermittee must require at areas of existing development to reduce pollutants in storm water discharges to the MEP. The San Diego Water Board, however, recognizes that BMP implementation and maintenance for residential areas will require much more education and encouragement through less authoritative measures than for commercial, industrial and municipal facilities and areas. Thus, the BMP implementation and maintenance requirements have been separated between requirements under Provision E.5.b.(1) for commercial, industrial and municipal facilities and areas, and Provision E.5.b.(2) for residential areas.

Most of the requirements in Provision E.5.b are consistent with the related requirements in the Fourth Term Permits. The level of specificity, however, has been changed to allow each Copermittee the flexibility to implement its program to achieve maximum efficiency, and to perform functions that will address the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Each Copermittee is expected to require the implementation of appropriate BMPs to address the expected pollutants from each facility or area. The Third and Fourth Term Permits described specific minimum BMPs that must be implemented at various sites. This Order, however, requires each Copermittee to designate minimum BMPs themselves and require implementation. Consistent with the Fourth Term Permits, each Copermittee is required to maintain, or require the maintenance of, all BMPs as needed.

The BMP implementation and maintenance requirements include a schedule of operation and maintenance activities for the MS4 and related structures (such as catch basins, storm drain inlets, and detention basins), as well as public streets and roads. Public streets and roads specifically include public unpaved roads. The San Diego Water Board identified, through investigations and complaints, sediment discharges from unpaved roads as a significant source of water quality problems in the San Diego Region. Inspection activities conducted by the San Diego Water Board since the Third Term Permits have found a lack of source control for many unpaved roads within the jurisdiction of the Copermittees.

Unpaved roads are a source of sediment that can be discharged in runoff to receiving waters, especially during storm events. Erosion of unpaved roadways occurs when soil particles are loosened and carried away from the roadway base, ditch, or road bank by water, wind, traffic, or other transport means. Exposed soils, high runoff velocities and volumes, sandy or silty soil types, and poor compaction increase the potential for erosion.

Road construction, culvert installation, and other maintenance activities can disturb the soil and drainage patterns to streams in undeveloped areas, causing excess runoff and thereby erosion and the release of sediment. Poorly designed unpaved roads can act as preferential drainage pathways that carry runoff and sediment into natural streams, impacting water quality. In addition, other public works activities along unpaved roads have the potential to significantly affect sediment discharge and transport within streams and other waterways, which can degrade the beneficial uses of those waterways.

USEPA also recognizes that discharges from unpaved roads pose a significant potential threat to water quality. USEPA guidance[40] emphasizes the threat of unpaved roads to water quality:

[40] USEPA, 2006. Environmentally Sensitive Maintenance for Dirt and Gravel Roads. Gesford and Anderson, USEPA-PA-2005.

> "*Dirt and gravel roads are a major potential source of these pollutants [sediment] and pollutants that bind to sediment such as oils, nutrients, pesticides, herbicides, and other toxic substances. Many roads have unstable surfaces and bases. Roads act like dams, concentrating flows that accelerate erosion of road materials and roadsides. Both unstable surfaces and accelerated erosion then lead to sediment and dust.*"

There are several guidance documents, developed by the USEPA,[41] the US Forest Service,[42] the University of California,[43] and others, that include design and construction specifications and BMPs that are readily available for implementation by public entities. Implementing design and other source control BMPs for unpaved roads in the region is necessary to reduce and minimize the impacts of sediment discharged during storm events from unpaved roads to the MS4s and receiving waters.

Provision E.5.c describes existing development site inspection frequency, content, and tracking that each Copermittee must incorporate into their existing development management programs. The requirements under Provision E.5.c are necessary to demonstrate each Copermittee is implementing a program that complies with Provision E.5.b and ensure BMPs implemented in areas of existing development will reduce pollutants in storm water discharges to the MEP. Provision E.5.c has been modified to include a minimum of once every 5 years for all inventoried facilities and areas of existing development, utilizing one or more methods of inspection.

In addition to onsite inspections, the methods of inspection have been expanded to include drive-by inspections. Inspections may be performed by the Copermittee's municipal and contract staff, or by volunteer monitoring or patrol programs. Volunteer monitoring or patrol programs are not expected to enforce the Copermittee's ordinances, or to inspect areas or facilities where members of the public are not allowed access. Volunteer monitoring or patrol programs must be trained by the Copermittee, and are only expected to collect visual observations. By utilizing drive-by inspections and volunteer monitoring or patrol programs, the Copermittees will be able to maximize and efficiently use their resources to identify and address sources of pollutants in areas of existing development.

The municipal and contract staff of each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial, industrial, and municipal facilities and areas in its inventoried existing development pursuant to Provision E.5.c.(1)(a)(iv). An "equivalent" of at least 20 percent means if any commercial, industrial, or municipal facilities or areas require multiple onsite

[41] Ibid
[42] US Forest Service, 1996. Forest Service Specifications for Construction of Roads & Bridges. EM-7720-100. Revised August 1996.
[43] University of California Division of Agriculture and Natural Resources, 2007. Rural Roads: A Construction and Maintenance Guide of California Landowners. Publication 8262.

inspections during any given year, those additional inspections may count toward the total annual inspection requirement. Linear municipal facilities (i.e. MS4 linear channels, sanitary sewer collection systems, streets, roads and highways) in the Copermittee's existing development inventory are not subject to the inspection frequency requirement of Provision E.5.c.(1)(a)(iv).

The inspection content specified in Provision E.5.c.(2)(a) includes the information required to be collected during an inspection by any method. The inspection content specified in Provision E.5.c.(2)(b) includes additional information that must be collected when a Copermittee's municipal or contract staff perform an onsite inspection. Provision E.5.c.(3) specifies the information that each Copermittee must maintain in its existing development inspection records.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary to compel compliance with the requirements of Provision E.5 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.5.d requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Provisions E.5.e.(1)-(2) specifically require the Copermittee to identify areas of existing development as candidates for retrofitting, and streams, channels, and/or habitats as candidates for rehabilitation. Provisions E.5.e.(1)-(2) are based on the retrofitting requirements of the Fourth Term Permits for Orange and Riverside Counties, but modified to also include identifying projects to rehabilitate channels within areas of existing development. The requirements have also been modified to be more focused on utilizing these types of projects for addressing the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Interest and opportunity to retrofit areas of existing development and rehabilitate channels located in areas of existing development has been observed in several programs the San Diego Water Board oversees (e.g., CWA Section 401 Water Quality Certification program, supplemental environmental projects, and grant programs). Each jurisdiction has miles and miles of streets that could be retrofitted to become green streets. Reshaping landscaped areas from convex to concave configurations can detain storm water instead of directing runoff as quickly as possible to the MS4. Retrofit projects could also include simply replacing impervious surfaces with permeable surfaces.

Retrofitting projects do not necessarily have to be expensive. Retrofitting projects could be as simple as redirecting downspouts from roofs to pervious or landscaped areas instead of to hardscaped areas discharging directly to the MS4, providing rain barrels to harvest storm water from downspouts for use at a later time, or planting more trees in areas with little vegetation to provide canopy that can intercept storm

water. The San Diego Water Board encourages the Copermittees to identify simple, low-cost retrofitting opportunities that can be easily implemented, in addition to other more expensive retrofitting and channel rehabilitation projects.

Rehabilitation of channels, streams, and/or habitat will require more significant planning and resources to implement. There are, however, also abundant opportunities to rehabilitate channels, streams and/or habitats in or adjacent to areas of existing development. Each Watershed Management Area likely has several creeks and stream reaches that have been undergrounded, artificially hardened, or hydromodified that could be rehabilitated to be more sustainably configured, which would slow down storm water flows and potentially have more assimilative capacity for pollutants while still being supportive of designated beneficial uses.

The San Diego Water Board recognizes that it may be infeasible to implement retrofitting or channel rehabilitation projects within certain areas of a Copermittee's jurisdictions. For such areas, the Copermittee must instead identify, develop, and implement regional retrofitting and channel rehabilitation projects (i.e. projects that can retain and/or treat storm water from one or more areas of existing development) adjacent to and/or downstream of the areas of existing development.

Provisions E.5.e.(1)-(2) do not require the implementation of retrofitting and rehabilitation projects, but do require the Copermittee to develop a program with strategies to facilitate the implementation of these types of projects in areas of existing development. The strategies are expected to include allowing and encouraging Priority Development Projects to implement retrofitting types of projects as a means of compliance with the structural BMP performance criteria requirements of Provisions E.3.c.(1) and E.3.c.(2).

<u>Provision E.6 (Enforcement Response Plans)</u> requires each Copermittee to develop an Enforcement Response Plan as part of its jurisdictional runoff management program document. Proper implementation of the Enforcement Response Plans is necessary to effectively prohibit non-storm water discharges to the MS4, and reduce the discharge of pollutants in storm water from the MS4 to the MEP.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system*" and be able to demonstrate that it can "*operate pursuant to legal authority established by statute, ordinance or series of contracts*" to control the discharge of non-storm water and pollutants in storm water to and from its MS4. Pursuant to 40 CFR 122.26(d)(2)(i)(E) each Copermittee is specifically required to have the legal authority to "*[r]equire compliance with conditions in ordinances, permits, contracts or order*s."

The requirements under Provision E.6 are necessary to demonstrate that each Copermittee can enforce its legal authority to *"effectively prohibit non-stormwater discharges"* and "*reduce the discharge of pollutants to the maximum extent*

practicable" as well as "*[r]equire compliance with conditions in ordinances, permits, contracts or order*."

The Enforcement Response Plan required under Provision E.6 will serve as a reference for the Copermittee and the San Diego Water Board to determine if consistent enforcement actions are being implemented to achieve timely and effective compliance from all public and private entities that are not in compliance with the Copermittee's ordinances, permits, or other requirements. The Enforcement Response Plan must contain clear direction for the Copermittee to take immediate enforcement action, when appropriate and necessary, in their illicit discharge detection and elimination, development planning, construction management, and existing development management programs.

If the entities subject to the Copermittee's legal authority do not implement appropriate corrective actions in a timely manner, or if violations repeat, the Copermittee must take progressively stricter responses to enforce its legal authority and achieve compliance with its ordinances, permits, or other requirements to *"effectively prohibit non-stormwater discharges"* and "*reduce the discharge of pollutants to the maximum extent practicable.*"

<u>Provision E.7 (Public Education and Participation)</u> requires each Copermittee to implement a public education and participation program. Proper implementation of the public education and participation program as part of its jurisdictional runoff management program will contribute toward effectively prohibiting non-storm water discharges to the MS4, and toward the reduction of pollutants in storm water from the MS4 to the MEP.

Provision E.7 establishes the minimum requirements that each Copermittee must implement to engage members of the public as part of its jurisdictional runoff management program. In the Fourth Term Permits, the public education program requirements and the public participation requirements were included as separate jurisdictional runoff management program components. In this Order, the public education requirements have been consolidated with the public participation requirements, as both sets of requirements are related to the engagement of the public by each Copermittee. Engagement of the public is critical for the success of each Copermittee's jurisdictional runoff management program.

The Copermittees have been implementing public education programs for the last 20 years, which are now well established. The specificity of expected public education program elements of the Fourth Term Permits has been removed. For the most part, the public education program requirements in Provision E.7.a have been reduced to a set of requirements that are specifically included in the federal regulations under 40 CFR 122.26(d)(2)(iv)(A)(6), 122.26(d)(2)(B)(6) and 122.26(d)(2)(D)(4), which should already be incorporated into each Copermittee's existing public education program. Each Copermittee is expected to utilize the information and data collected from the monitoring and assessments conducted within the Watershed Management Area, and

from its inventories and inspections to best direct its public education program resources toward addressing the highest priority water quality conditions identified within the Water Quality Improvement Plan.

According to 40 CFR 122.26(d)(2)(iv), public participation is required to be included as part of the "*comprehensive planning process*", which includes the development and implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs. The requirements under Provision E.7.b specify the opportunities that the public must be provided to be involved in the "*comprehensive planning process*", as required by to 40 CFR 122.26(d)(2)(iv).

Provision E.8 (Fiscal Analysis) requires each Copermittee to secure the resources and provide an analysis of the resources that will be necessary to implement the requirements of the Order. Adequate fiscal resources are necessary for a jurisdictional runoff management program to effectively prohibit non-storm water discharges to the MS4, and reduce pollutants in storm water from the MS4 to the MEP.

According to 40 CFR 122.26(d)(2)(vi), each Copermittee is responsible for providing "*a fiscal analysis of the necessary capital and operation and maintenance expenditures necessary to accomplish the activities*" required by this Order, including "*a description of the source of funds that are proposed to meet the necessary expenditures, including legal restrictions on the use of such funds.*" The fiscal analysis requirements of Provision E.8 are consistent with 40 CFR 122.26(d)(2)(vi).

The San Diego Water Board has chosen not to require a description of fiscal benefits realized from implementation of the jurisdictional runoff management programs. This is a recommendation from the National Association of Flood and Stormwater Management Agencies.[44] For instance, the fiscal analysis requirements do not address city-wide fiscal benefits of protection (e.g., public health, tourism, property values, economic activity, beneficial uses, etc.), even though many costs currently reported to the San Diego Water Board are for related activities. This type of assessment may help Copermittees improve the allocation of resources and it may help the Copermittees secure adequate funding for the program. Qualitative assessments, however, could be overly subjective and most Copermittees likely lack the ability to provide accurate quantitative assessments. The San Diego Water Board encourages the Copermittees to consider means for conducting assessments of fiscal benefits derived from the programs. Such assessments could be conducted on a regional scale similar to studies of program costs conducted by the State Water Board.[45]

[44] National Association of Flood and Stormwater Management Agencies. 2006. *Guidance for Municipal Stormwater Funding.* Prepared under a grant provided by the USEPA.
[45] State Water Board, 2005. NPDES Stormwater Cost Survey.

F. Reporting

Purpose: Provision F includes the requirements for the documents and reports that the Copermittees must prepare and provide to the San Diego Water Board. The documents prepared by the Copermittees and provided to the San Diego Water Board and made available to the public will provide the documentation that the Copermittees are complying with the requirements of the Order.

***Discussion*:** Provision F requires the Copermittees to prepare several documents and reports that must be provided to the San Diego Water Board and made available to the public. The reporting requirements have been significantly reduced compared to the Fourth Term Permit reporting requirements. The reduction in reporting requirements was recommended by the San Diego County Copermittees in the Report of Water Discharge submitted in June 2011.

More specific and detailed discussions of the requirements of Provision F are provided below.

Provision F.1 (Water Quality Improvement Plans) requires the Copermittees in each Watershed Management Area to develop and submit a Water Quality Improvement Plan in accordance with the requirements of Provision B.

Of all the requirements of Provision F, the Water Quality Improvement Plans will likely be the documents requiring the most significant effort to develop. The content of the Water Quality Improvement Plans, however, is expected to include content that should already have been developed for the Watershed Plans and several elements that are included in the Monitoring and Reporting Programs required under the Fourth Term Permits.

Because the Water Quality Improvement Plan is part of the "*comprehensive planning process which involves public participation*," Provision F.1 includes requirements to give multiple opportunities to the public to provide input on the content of the plans.

Provision F.1.a.(1) specifies the elements that the Copermittees must include in the public participation process for the development of the Water Quality Improvement Plans. In order for the public to be aware of the opportunities to provide input, Provision F.1.a.(1)(a) requires the Copermittees to develop a publicly available and noticed schedule of the opportunities for the public to participate and provide comments during the development of the Water Quality Improvement Plan. These opportunities are when the public can provide the data, information, and recommendations that the Copermittees can consider during the development of the Water Quality Improvement Plans.

The San Diego Water Board recognizes, however, that the Copermittees cannot be expected to incorporate all the data, information, and recommendations that the public may provide into the Water Quality Improvement Plans. The Copermittees will have to

review the data, information, and recommendations received and make some decisions on what to incorporate into the Water Quality Improvement Plans. Before the Copermittees finalize their decisions, members of the public should be allowed to review the Copermittees' decisions. Thus, Provision F.1.a.(1)(b) requires the Copermittees to form a Water Quality Improvement Consultation Panel (Panel).

The Panel will consist of a member from the environmental community and a member from the development community familiar with the Watershed Management Area. A representative from the San Diego Water Board staff will also be part of the Panel. The Copermittees may choose to include additional members, but the Panel is only required to include three panel members.

The Panel will serve as an additional public participation and input mechanism during the development of the Water Quality Improvement Plans. The knowledge and expertise from these Panel members are expected to provide the Copermittees valuable direction during their decision-making process. The Copermittees will review the content of their planned submittals with the Panel members to receive recommendations. If the Panel provides recommendations, the Copermittees must consider revisions to the Water Quality Improvement Plan submittals.

The San Diego Water Board recognizes that the development of multiple Water Quality Improvement Plans concurrently may limit the ability of the public to review and provide comments to the Copermittees. Thus, Provision F.1.a.(1)(c) requires the Copermittees to coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public time and opportunity to participate during the development of the Water Quality Improvement Plans.

Provision F.1.a.(2) requires the Copermittees to develop and submit the first Water Quality Improvement Plan component, in accordance with the requirements of Provision B.2, which includes the identification of the priority water quality conditions and potential water quality improvement strategies. The public must be provided an opportunity to provide data, information and recommendations to be utilized in the development and identification of the priority water quality conditions and potential water quality improvement strategies for the Watershed Management Area. The Copermittees must consult with the Panel and consider making revisions. The Copermittees may submit the requirements of Provision B.2 as early as 6 months and no later than 12 months after the commencement of coverage under this Order. After the requirements of Provision B.2 are submitted to the San Diego Water Board, the public will be provided another opportunity to provide comments.

Provision F.1.a.(3) requires the Copermittees to develop and submit the second Water Quality Improvement Plan component, in accordance with the requirements of Provision B.3, which includes the identification of the numeric goals for the highest priority water quality conditions identified for the Watershed Management Area, and the strategies that will be implemented to achieve the potential numeric goals. The Copermittees may also develop the Optional Watershed Management Area Analysis, in accordance with the requirements of Provision B.3.b.(4), as part of this submittal.

The public must be provided an opportunity to provide data, information and recommendations to be utilized in the development and identification of the numeric goals and water quality improvement strategies for the Watershed Management Area. The Copermittees must consult with the Panel and consider making revisions. The Copermittees may submit the requirements of Provision B.3 as early as 9 months and no later than 18 months after the commencement of coverage under this Order. After the requirements of Provision B.3 are submitted to the San Diego Water Board, the public will be provided another opportunity to provide comments.

Finally, Provision F.1.b describes the process for the submittal and implementation of the Water Quality Improvement Plans. The complete Water Quality Improvement Plans are required to be submitted by the Copermittees within 24 months after the commencement of coverage under this Order. The San Diego Water Board will provide the public an opportunity to provide comments on each complete Water Quality Improvement Plan.

The San Diego Water Board will review each Water Quality Improvement Plan and the public comments received to determine if the Copermittees have submitted a Water Quality Improvement Plan that meets the requirements of Provision B. If a Water Quality Improvement Plan does not meet the requirements of Provision B, the Copermittees will be considered out of compliance and directed in writing by the San Diego Water Board Executive Officer to correct the deficiencies.

When a Water Quality Improvement Plan meets the requirements of Provision B, the San Diego Water Board will determine whether to hold a public hearing or to limit public input to submittal of written comments before accepting the Water Quality Improvement Plan. Implementation of the Water Quality Improvement Plan must begin within 30 days of acceptance.

The San Diego Water Board expects that any deficiencies in the Water Quality Improvement Plan will be identified either in the public comments or during the review by the San Diego Water Board before implementation begins. In the event any deficiencies are identified after the implementation of the Water Quality Improvement Plan, Provision F.1.b.(7) clarifies that the San Diego Water Board maintains the right to require the Copermittees to correct any deficiencies that may be identified.

<u>Provision F.2 (Updates)</u> requires the Copermittees to update specific documents that the Copermittees will utilize to implement the requirements of this Order.

Each Copermittee is required to continue implementing a jurisdictional runoff management program, as required under Provision E. Implementation of each Copermittee's jurisdictional runoff management program is directed by its jurisdictional runoff management program document. Provision F.2.a requires each Copermittee to update its jurisdictional runoff management program document to be consistent with the requirements of Provision E concurrent with the submittal of the Water Quality Improvement Plan.

Likewise, each Copermittee must continue to require new development and redevelopment projects to implement BMPs to control pollutants in storm water runoff. The control of pollutants in storm water runoff from development and redevelopment projects within each Copermittee's jurisdiction is guided and directed by its BMP Design Manual, formerly known as a Standard Storm Water Mitigation Plan (SSMP). Provision F.2.b requires each Copermittee to update its BMP Design Manual to be consistent with the requirements of Provision E.3 concurrent with the submittal of the Water Quality Improvement Plan.

For situations where the San Diego Water Board may amend the requirements of Provisions E.3.a-d after a Copermittee has updated its BMP Design Manual pursuant to Provision F.2.b.(1), Provision F.2.b.(4) gives the Copermittee up to 90 days to incorporate the amended requirements of Provision E.3.a-d into its BMP Design Manual. The San Diego Water Board Executive Officer has discretion to modify the 90-day time period depending on the complexity of the amendments or other information that warrants a change in the 90-day time period.

In general, the requirements of the Order should not necessitate a complete rewrite of each Copermittee's jurisdictional runoff management program document or BMP Design Manual, as was required by the Third Term Permits. The jurisdictional runoff management program and BMP Design Manual requirements of this Order are not significantly different than the requirements of the Fourth Term Permits. Thus, only sections of the Order which are new or have been significantly changed should warrant revisions to specific sections of the Copermittee's jurisdictional runoff management program document and BMP Design Manual.

Finally, the Water Quality Improvement Plans are expected to require updates as the iterative approach and adaptive management process included in the Water Quality Improvement Plan, as required under Provision B.5, is implemented by the Copermittees. Provision F.2.c.(1) requires the Copermittees to implement a public participation process for the proposed updates, review the proposed updates with the Panel, and submit the updates to the Water Quality Improvement Plan as part of the Annual Reports required under Provision F.3.b.

Also, because TMDLs are likely to be developed, adopted and approved during the term of the Order, Provision F.2.c.(2) has been included to expedite the incorporation of TMDLs into the Copermittees' Water Quality Improvement Plans as part of the update process, potentially before the Order is re-opened to incorporated the requirements of the new TMDLs.

<u>Provision F.3 (Progress Reporting)</u> requires the Copermittees to report on the progress of implementing the Water Quality Improvement Plans.

The requirements of Provision F.3 are to report the progress toward improving water quality that the Copermittees are achieving with the implementation of the Water Quality Improvement Plans and each Copermittee's jurisdictional runoff management program. The Progress Report Presentations required under Provision F.3.a are

included to provide the Copermittees an opportunity to communicate directly with the San Diego Water Board and the public. The Progress Report Presentations will also provide the members of the San Diego Water Board and members of the public an opportunity to become more acquainted with the Copermittees and their projects and programs to address non-storm water and storm water discharges into and from their MS4s.

The Annual Report requirements of Provision F.3.b are a consolidation of several reporting requirements from the Fourth Term Permits, including the Jurisdictional Runoff Management Program Annual Reports, the Watershed Annual Reports, and the Monitoring and Reporting Program Annual Reports. Furthermore, the Annual Report requirements are consistent with the requirements under 40 CFR 122.42(c).

Pursuant to 40 CFR 122.42(c), "*[t]he operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the Director…must submit an annual report*", which must include the following:

(1) *The status of implementing the components of the storm water management program that are established as permit conditions* [40 CFR 122.42(c)(1)];

(2) *Proposed changes to the storm water management programs that are established as permit conditions* [40 CFR 122.42(c)(2)];

(3) *Revisions, if necessary, to the assessment of controls and fiscal analysis* [40 CFR 122.42(c)(3)];

(4) *A summary of data, including monitoring data, that is accumulated throughout the reporting year* [40 CFR 122.42(c)(4)];

(5) *Annual expenditures and budget for year following each annual report* [40 CFR 122.42(c)(5)];

(6) *A summary describing the number and nature of enforcement actions, inspections, and public education programs* [40 CFR 122.42(c)(6)];

(7) *Identification of water quality improvements or degradation* [40 CFR 122.42(c)(7)].

Under the Fourth Term Permits, each Copermittee is responsible for submitting a Jurisdictional Runoff Management Program Annual Report; the Copermittees in each designated watershed are responsible for submitting a Watershed Annual Report; and the Copermittees from each county are responsible for submitting a Monitoring and Reporting Program Annual Report.

There are 39 Copermittees in the San Diego Region, each required to prepare and submit a Jurisdictional Runoff Management Program Annual Report. There are 9 designated watersheds in San Diego County, 6 designated watersheds in Orange County, and 1 designated watershed in Riverside County for a total of 16 designated watersheds, each requiring a Watershed Annual Report. There are 3 sets of

Copermittees in 3 counties in the San Diego Region, requiring Copermittees from each county to prepare and submit a Monitoring and Reporting Program Annual Report. Thus each Copermittee is currently required to prepare, or participate in the preparation of at least 3 annual reports. In addition, the San Diego County Copermittees are required to prepare and submit a Regional Urban Runoff Management Plan Annual Report.

In total, there are 59 annual reports that are prepared by the Copermittees and submitted to the San Diego Water Board for the Fourth Term Permits. The preparation of these annual reports requires significant time and resources from each Copermittee, which could otherwise be expended on actions that could improve water quality within its jurisdiction. In turn, significant time and resources are required from the San Diego Water Board staff to review these reports, which could otherwise be expended on working directly with the Copermittees to improve their implementation efforts toward restoring and protecting water quality.

Until the Water Quality Improvement Plans are developed, there will be a transitional period during which the Copermittees will continue to implement their existing jurisdictional runoff management programs. There will also be a transitional period during which the Copermittees will implement the transitional monitoring and assessment requirements of Provision D. During the transitional period, the Copermittees will submit annual reports pursuant to the requirements of Provisions F.3.b.(1) and F.3.b.(2).

Provision F.3.b.(1) includes the transitional annual reporting requirements for each Copermittee's jurisdictional runoff management program. The reporting of the jurisdictional runoff management program implementation efforts have been reduced to a single 2-page form. Each Copermittee is required to complete and submit a Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D or a revised form accepted by the San Diego Water Board) no later than October 31 of each year for each jurisdictional runoff management program reporting period (i.e. July 1 to June 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted. The Jurisdictional Runoff Management Program Annual Report Form will certify that each Copermittee has implemented its jurisdictional runoff management program in accordance with the requirements of Provision E. Each Copermittee may choose to continue to utilize and submit the jurisdictional runoff management program annual reporting format of its current Order until the first Water Quality Improvement Plan Annual Report is required to be submitted.

Provision F.3.b.(2) includes the transitional annual reporting requirements for the transitional monitoring and assessment program for each Watershed Management Area. The Copermittees in the Watershed Management Area are required to submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water

Quality Improvement Plan Annual Reports are required to be submitted. The Transitional Monitoring and Assessment Program Annual Report is required to include the transitional period monitoring data collected pursuant to Provisions D.1.a and D.2.a, and the findings from the transitional period findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

Provision F.3.b.(3) includes the Water Quality Improvement Plan Annual Report requirements. Only one Water Quality Improvement Plan Annual Report is required for each of the ten (10) Watershed Management Areas designated under Provision B.1, which is a significant reduction in the number of annual reports required to be prepared and submitted by the Copermittees. The Water Quality Improvement Plan Annual Report will document the Copermittees' efforts to implement the Water Quality Improvement Plan. Each Water Quality Improvement Plan Annual Report will be focused primarily on reporting the analysis of the monitoring data collected pursuant to Provisions D.1-D.3 during the reporting period, and the assessments that are required pursuant to Provision D.4 based on the data. The monitoring data analyses and the assessments that are provided in the Water Quality Improvement Plan Annual Report will be the core of the report. The reporting of the jurisdictional runoff management program implementation efforts have been reduced to a single 2-page form, and will no longer be the primary focus of the reporting requirements as in the Third and Fourth Term Permits.

Each Copermittee will continue to prepare and submit a Jurisdictional Runoff Management Program Annual Report Form as part of the Water Quality Improvement Plan Annual Report to certify that each Copermittee has implemented its jurisdictional runoff management program in accordance with the requirements of Provision E. Instead of reviewing a voluminous report from each Copermittee, as was required under the Third and Fourth Term Permits, the San Diego Water Board will conduct audits of each Copermittee's jurisdictional runoff management program to investigate and confirm the information provided by each Copermittee on its Jurisdictional Runoff Management Program Annual Report Form. The audits will allow the San Diego Water Board to become more familiar with the each Copermittee's jurisdictional runoff management program, and each Copermittee will become more informed about the expectations of the San Diego Water Board.

The reduction in the number and content of the Water Quality Improvement Plan Annual Reports should result in significant time, cost and resource savings for the Copermittees, as well as the San Diego Water Board. Those savings should offset a significant portion of any additional costs that may be incurred to develop the Water Quality Improvement Plans and to implement the monitoring and assessment program requirements of Provision D.

The reporting period for the Water Quality Improvement Plan Annual Reports consists of two periods. Because the jurisdictional runoff management programs are typically budgeted and implemented during a fiscal year, the information provided on the

Jurisdictional Runoff Management Program Annual Report Forms will cover the period from July 1 to June 30 of the following year.

The Water Quality Improvement Plan Annual Reports, however, are focused primarily on the monitoring data and the assessments based on the monitoring data. The monitoring data is collected during the monitoring year, which begins October 1 and ends September 30 of the following year. The monitoring year begins after the beginning of the fiscal year and ends after the end of the fiscal year. Therefore, to accommodate and capture the information collected during the fiscal year and the monitoring year, the Annual Report reporting period incorporates both periods.

Finally, Provision F.3.c requires the Copermittees to develop and submit a Regional Monitoring and Assessment Report. The Regional Monitoring and Assessment Report is similar to the Long Term Effectiveness Assessment required under the Fourth Term San Diego County Permit. The Regional Monitoring and Assessment Report is expected to utilize the entire body of data and information collected by the Copermittees during the term of this Order to assess improvements to water quality on a regional scale.

Provision F.4 (Regional Clearinghouse) requires the Copermittees to develop, update, and maintain an internet-based Regional Clearinghouse that can be used to store, disseminate, and share the Copermittees' documents, monitoring data, special studies, and any other data or information.

Most of the documents and data that are generated by the Copermittees can be provided in electronic format, and made available to the San Diego Water Board and the public on the internet. The San Diego Water Board has been gradually transitioning its document submittal requirements to electronic submittals. Provision F.4 has been included to further these efforts.

Provision F.4 has also been included to improve the exchange and availability of information among the Copermittees, as well as between the Copermittees and the San Diego Water Board. Provision F.4 will also make the information generated during the implementation of the Order more accessible to the public.

Provision F.5 (Report of Waste Discharge) requires the Copermittees to submit a Report of Waste Discharge to reapply for renewal of the Order prior to its expiration, in accordance with 40 CFR 122.21(d)(2) and CWC section 13376.

Provision F.5 requires the Copermittees to submit a Report of Waste Discharge 180 days in advance of the expiration of this Order. Provision F.5 also describes the minimum information to be included in the Report of Waste Discharge, based on USEPA guidance "Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems," dated May 17, 1996.

G. Principal Watershed Copermittee Responsibilities

Purpose: Provision G includes the requirements for the Principal Watershed Copermittee designated by the Copermittees in each Watershed Management Area.

***Discussion*:** Unlike previous NPDES requirements, there will no longer be a single Principal Copermittee. Provision G.1 requires the Copermittees to designate a Principal Watershed Copermittee for each Watershed Management Area. There are ten (10) Watershed Management Areas in the San Diego Region, as defined in Table B-1 under Provision B.1 of the Order. An individual Copermittee should not be the Principal Watershed Copermittee for more than two (2) Watershed Management Areas. There could be up to ten (10) Principal Water Copermittees designated for the Watershed Management Areas in the San Diego Region.

Provision G.2 describes the minimum responsibilities of each Principal Watershed Copermittee. The primary responsibility of the Principal Watershed Copermittees is to serve as the liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues. Ideally, the Principal Watershed Copermittee can represent the interests of all the Copermittees within a Watershed Management Area during discussions or meetings to facilitate communication with the San Diego Water Board. The Principal Watershed Copermittees are also responsible for facilitating and coordinating the implementation efforts of the Copermittees and submittals of required documents and reports.

The Principal Watershed Copermittee is responsible for facilitating the efforts of the Copermittees within the Watershed Management Area to develop the Water Quality Improvement Plan required under Provision B, and submit it for approval in accordance with Provision F.1. The Principal Watershed Copermittee is also responsible for coordinating the submittal of the document updates, Progress Report Presentations, and Annual Reports required from the Copermittees within each Watershed Management Area under Provisions F.2, F.3.a, and F.3.b. The Principal Watershed Copermittees are responsible for coordinating with each other to develop and submit the Regional Clearinghouse, Regional Monitoring and Assessment Report, and the Report of Waste Discharge required under Provisions F.3.c, F.4, and F.5.

The designated Principal Watershed Copermittee for each Watershed Management Area does not necessarily have to serve as the Principal Watershed Copermittee for the entire term of the Order. If the Copermittees in a Watershed Management Area choose to designate a new Principal Watershed Copermittee, the change may be submitted as part of the Annual Report required under Provision F.3.b, with an update to the Water Quality Improvement Plan in accordance with Provision F.2.c.

Provision G.3 specifies that the Principal Watershed Copermittee is not responsible for ensuring that the other Copermittees within the Watershed Management Area are in compliance with the requirements of this Order

H. Modification of Order

Purpose: Provision H provides the conditions under which modifications to Order No. R9-2013-0001, as amended, may occur.

***Discussion*:** Provision H allows for modifications to Order No. R9-2013-0001, as amended, for bases in addition to modifications (minor and major) allowed under the federal regulations at 40 CFR 122.62 and 122.63.

Modifications to the Order require re-opening the Order (see Water Code section 13223), subject to the requirements of 40 CFR 122.44, 122.62 to 122.64, and 124.5, but only for the specific provisions subject to the modification. Proposed modifications of the Order will be made available for public review, a public notice and comment period, and a public hearing if requested. Comments on the provisions not subject to the proposed modifications are not required to be considered in the San Diego Water Board's responses to comments or during the public hearing.

Provision H.4 was included to specify that the Order will be re-opened for modifications if the Basin Plan is amended to modify an existing TMDL or incorporate a new TMDL, or the monitoring and assessment program requirements need to be updated or revised.

I. Standard Permit Provisions and General Provisions

Purpose: Provision I incorporates the standard permit provisions required to be included in all NPDES permits, as well as several other general provisions.

***Discussion*:** Provision I refers to Attachment B to the Order. Attachment B expressly incorporates the conditions applicable to all NPDES permits as provided under 40 CFR 122.41(a)-(n), as well as the applicable conditions for MS4s and storm water discharges provided under 40 CFR 122.42(c) and 40 CFR 122.42(d), respectively. Attachment B also includes several general provisions that are typically included in or applicable to waste discharge requirements issued by the San Diego Water Board.

IX. ATTACHMENTS

The attachments to the Order are discussed below. The discussions describe the content of the attachments.

Attachment A – Discharge Prohibitions and Special Protections

Section 1 of Attachment A includes the Waste Discharge Prohibitions from the Basin Plan. They have been provided verbatim in their entirety.

Section 2 of Attachment A includes the "*Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges*" applicable to permitted point source discharges of storm water, adopted under State Water Board Resolution No. 2012-0012, as amended by Resolution No. 2012-0031. The terms, prohibitions, and special conditions (collectively referred to as special conditions) are established as limitations on point source storm water discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in ASBS, as required for State Water Quality Protection Areas pursuant to California Public Resources Code sections 36700(f) and 36710(f). These Special Protections were adopted by the State Water Board as part of the Ocean Plan General Exception.

Attachment B – Standard Permit Provisions and General Provisions

Conditions applicable to all NPDES permits, as required under 40 CFR 122.41, and conditions applicable to MS4s and storm water discharges, as required under 40 CFR 122.42(c) and 122.42(d), respectively are provided in Attachment B to the Order. They have been provided expressly in their entirety.

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. These general provisions are typically included in or applicable to waste discharge requirements issued by the San Diego Water Board. Many of the general provisions were developed by the State Water Board. Where a general provision is derived from statute or regulation, a citation of the statute or regulation section is provided. General provisions that do not provide a citation are included under the authority provided CWC 13377.

Attachment C – Acronyms, Abbreviations and Definitions

The acronyms and abbreviations that are used in the Order are provided in Attachment C. Attachment C also includes definitions that may provide an explanation or description of the meaning or intent of specific terms or phrases included in the Order.

Attachment D – Jurisdictional Runoff Management Program Annual Report Form

An example of the Jurisdictional Runoff Management Program Annual Report Form required to be submitted by each Copermittee as part of the Annual Reports required under Provision F.3.b.(1)(e) is provided as Attachment D to the Order. An electronic version of the form will be available from the San Diego Water Board after the adoption of the Order.

The Jurisdictional Runoff Management Program Annual Report Form includes the minimum information necessary to demonstrate that the Copermittee is implementing and in compliance with the requirements of Provision E, and includes much of the information required to be reported pursuant to 40 CFR 122.42(c).

The information that must be provided on the Jurisdictional Runoff Management Program Annual Report Form is limited to the fiscal year, which begins July 1 and ends June 30 of the following year. The information expected to be provided by the Copermittees in each section of the Jurisdictional Runoff Management Program Annual Report Form is discussed below.

I. COPERMITTEE INFORMATION

The name of the Copermittee (e.g. name of city, county, or special district) and the contact information for the storm water program manager are provided under this section.

II. LEGAL AUTHORITY

The Copermittee must confirm whether or not the legal authorities under Provision E.1.a have been established for itself within its jurisdiction.

The Copermittee must also confirm whether or not a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority, as required under Provision E.1.b. The certification statement required by Provision E.1.b is only required to be submitted with the first Annual Report required under Provision F.3.b.

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

The Copermittee must inform the San Diego Water Board whether or not an update to its jurisdictional runoff management program document was required or recommended by the San Diego Water Board during the reporting period. An update to the jurisdictional runoff management program is required under Provision F.2.a. The San Diego Water Board may recommend modifications to the jurisdictional runoff management program as part of the iterative approach and adaptive management process required under Provision B.5, which may result in an update that is necessary for the Copermittee's jurisdictional runoff management document.

If an update was required or recommended, the Copermittee must confirm whether or not the update was completed and made available on the Regional Clearinghouse within the reporting period. If no update was required or recommended, an answer is not required. If the answer is NO, meaning the required or recommended update was not completed and/or made available on the Regional Clearinghouse, the Copermittee must attach a

schedule for the completion of the update and/or posting of the updated document on the Regional Clearinghouse.

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

The Copermittee must confirm whether or not a program was implemented during the fiscal year to actively detect and eliminate illicit discharges and connections in accordance with the requirements under Provision E.2.

In addition to confirming that a program to detect and eliminate illicit discharges was implemented during the reporting period, the Copermittee is also required to report on several items related to the program. The information that must be reported is limited to the fiscal year for the Annual Report.

All non-storm water discharges are considered illicit discharges unless the source is identified as one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5). If a non-storm water discharge is identified as one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5), the discharge is a non-storm water discharge, but not an illicit discharge. If a non-storm water discharge is identified but not in one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5), the discharge is both a non-storm water discharge and an illicit discharge.

V. DEVELOPMENT PLANNING PROGRAM

The Copermittee must confirm whether or not a development planning program was implemented during the fiscal year in accordance with the requirements under Provision E.3.

The Copermittee must also inform the San Diego Water Board whether or not an update to its BMP Design Manual was required or recommended by the San Diego Water Board during the fiscal year. An update to the BMP Design Manual is required under Provision F.2.b. The San Diego Water Board may recommend modifications to the BMP Design Manual, which may result in an update that is necessary for Copermittee's the BMP Design Manual.

If an update was required or recommended, the Copermittee must confirm whether or not the update was completed and made available on the Regional Clearinghouse within the reporting period. If no update was required or recommended, an answer is not required. If the answer is NO, meaning the required or recommended update was not completed and/or made available on the Regional Clearinghouse, the Copermittee must attach a schedule for the completion of the update and/or posting of the updated document on the Regional Clearinghouse.

The Copermittee is also required to report on several items related to the program. For the development and redevelopment projects that are reviewed under the program, the Copermittee must report the total number projects submitted for review during the fiscal year. Of those projects, the Copermittee must report the number that are Priority Development Projects, as defined under Provision E.3.b.(1). The Copermittee must also report the number of Priority Development Projects that were approved and/or granted occupancy during the fiscal year, regardless of when the project was originally submitted for review. Any projects that were approved during the fiscal year and granted any

exemptions from the BMP Design Manual requirements and/or allowed to implement alternative compliance options in accordance with Provision E.3.c.(3) must be reported.

Finally, the Copermittee must also report on several items related to its oversight of permanent BMPs on Priority Development Projects within its jurisdiction, as required under Provision E.3.e. The information that must be reported is limited to the fiscal year for the Annual Report.

VI. CONSTRUCTION MANAGEMENT PROGRAM

The Copermittee must confirm whether or not a construction management program was implemented during the fiscal year in accordance with the requirements under Provision E.4.

The Copermittee is also required to report on several items related to its oversight construction projects within its jurisdiction. The information that must be reported is limited to the fiscal year for the Annual Report.

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

The Copermittee must confirm whether or not an existing development management program was implemented during the fiscal year in accordance with the requirements under Provision E.5.

The Copermittee is also required to report on several items related to its oversight in areas of existing development within its jurisdiction. The information that must be reported is limited to the fiscal year for the Annual Report. The information must also be separated into four categories of existing development: municipal, commercial, industrial, and residential.

VIII. PUBLIC EDUCATION AND PARTICIPATION

The Copermittee must confirm whether or not a public education program component was implemented during the fiscal year in accordance with the requirements under Provision E.7.a.

The Copermittee must also confirm whether or not a public participation program component was implemented during the fiscal year in accordance with the requirements under Provision E.7.b.

IX. FISCAL ANALYSIS

The Copermittee must confirm a summary of its fiscal analysis, conducted in accordance with the requirements under Provision E.8, has been attached to the form.

X. CERTIFICATION

A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative must sign and certify the Jurisdictional Runoff Management Program Annual Report Form. The appropriate box must be checked to indicate the whether a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative is signing the form.

Attachment E – Specific Provisions for Total Maximum Daily Loads

Attachment E provides specific provisions for implementing the load allocations (LAs) and wasteload allocations (WLAs) of Total Maximum Daily Loads (TMDLs) adopted by the San Diego Water Board and approved by USEPA in which the Copermittees are identified as responsible for discharges subject to the requirements of the TMDLs. Federal regulations require that NPDES requirements incorporate water quality based effluent limitations (WQBELs) that must be consistent with the requirements and assumptions of any available WLAs,[46] which may be expressed as numeric effluent limitations, when feasible, and/or as a best management practice (BMP) program of expanded or better-tailored BMPs.[47] Where the TMDL includes WLAs that provide numeric pollutant load or pollutant parameter objectives, the WLA has been, where feasible, translated into numeric WQBELs.[48]

For each TMDL in Attachment E, four sections are included:

a. Applicability: This section provides the resolution under which the TMDL Basin Plan amendment was adopted and approved, with the applicable adoption and approval dates. This section also gives the effective date of the TMDL and where the TMDL is applicable (i.e. Watershed Management Area and water body). The Copermittees that are responsible for implementing the specific provisions are also given in this section.

b. Final TMDL Compliance Requirements: For each TMDL, the final TMDL compliance requirements consist of the final TMDL compliance date(s), the final WQBELs, and the final TMDL compliance determination requirements. The final WQBELs are expressed in terms of receiving water limitations, effluent limitations, and/or best management practices (BMPs). The final WQBELs for the TMDLs are incorporated by reference into Provision A of the Order. The final WQBELs become enforceable when the final TMDL compliance dates have passed. Applicable BMPs within the final WQBELs must be incorporated into the Water Quality Improvement Plans. Compliance with the final WQBELs will be determined in accordance with the options provided under the final TMDL compliance determination requirements.

c. Interim TMDL Compliance Requirements: If the final TMDL compliance date has not passed and there are interim TMDL compliance requirements, they are included in this section. If there are interim WQBELs with interim compliance dates, the interim WQBELs become enforceable when the corresponding interim compliance dates have passed. Compliance with the interim WQBELs will be determined in accordance with the options provided under the interim TMDL compliance determination requirements.

d. Specific Monitoring and Assessment Requirements: If there are specific monitoring and assessment requirements that cannot be met with the monitoring and assessment program

[46] 40 CFR 122.44(d)(1)(vii)(B)
[47] 40 CFR 122.44(k)(2) and 40 CFR 122.44(k)(3)
[48] November 26, 2014 Memorandum from the USEPA, Revisions to the November 22, 2002 Memorandum "Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLA""

requirements under Provision D of the Order, the additional requirements are included in this section.

The requirements of the TMDLs are based on and consistent with the assumptions and requirements of any available adopted and approved TMDLs that have been incorporated into the Basin Plan. Modifications to the requirements for the TMDLs in Attachment E cannot be made unless the TMDLs are modified in the Basin Plan.

A modification to any aspect of a TMDL in the Basin Plan requires a Basin Plan amendment. A Basin Plan amendment to modify a TMDL will require the San Diego Water Board to adopt a resolution to amend the Basin Plan, which includes a separate public process. When the San Diego Water Board adopts a Basin Plan amendment, it subsequently requires approval from the State Water Board, the Office of Administrative Law, and the USEPA before it becomes effective.

If and when the TMDLs are a modified in the Basin Plan, the San Diego Water Board will revise the requirements of the Order in accordance with the Basin Plan amendment. When a Basin Plan amendment to modify a TMDL becomes effective, the San Diego Water Board will modify the requirements of the Order pursuant to the requirements of Provision H.4 of the Order as soon as possible.

Chiu, Wayne@Waterboards

From: lyris@swrcb18.waterboards.ca.gov
Sent: Wednesday, November 25, 2015 2:42 PM
To: Chiu, Wayne@Waterboards
Subject: Order No. R9-2015-0100 and Conformed Order No. R9-2013-0001
Attachments: 2015-1118 Adopted Order No. R9-2015-0100_withAttachments.pdf; 2015-1118 Conformed Order No. R9-2013-0001 COMPLETE.pdf

Water Boards This is a message from the California Regional Water Quality Control Board, San Diego Region (9).

Municipal Storm Water Interested Persons:

Please find attached a copy of Order No. R9-2015-0100 and the attachments adopted by the San Diego Water Board on November 18, 2015. The attachments to Order No. R9-2015-0100 show the amendments to the Regional MS4 Permit in blue underline and red strikeout text. A conformed copy of the Regional MS4 Permit (including attachments) incorporating the amendments adopted pursuant to Order No. R9-2015-0001 is also attached.

These documents are available on the San Diego Water Board website at:
http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/rsd_stormwater.shtml

The San Diego Water Board Storm Water webpage has also been updated with the amended Regional MS4 Permit:
http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

Please contact me with any questions.
Happy holidays,

Wayne Chiu, PE
Water Resource Control Engineer
Storm Water Management Unit
California Regional Water Quality Control Board
San Diego Region
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CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

2375 Northside Drive, Suite 100, San Diego, CA 92108
Phone (619) 516-1990 Fax (619) 516-1994
http://www.waterboards.ca.gov/sandiego

ORDER NO. R9-2015-0100

AN ORDER AMENDING ORDER NO. R9-2013-0001, NPDES NO. CAS010266, AS AMENDED BY ORDER NO. R9-2015-0001 NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The California Regional Water Quality Control Board, San Diego Region (hereinafter San Diego Water Board), finds that:

ENROLLMENT OF RIVERSIDE COUNTY COPERMITTEES

1. **Enrollment Process.** On May 8, 2013, the San Diego Water Board adopted Order No. R9-2013-0001, NPDES No. CAS019266, *National Pollutant Discharge Elimination System Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Order No. R9-2013-0001, or Regional MS4 Permit). Provision F.5 of that Order (as amended by Order No. R9-2015-0001) outlines a process to designate (enroll) the County of Riverside, the Riverside County Cities of Murrieta, Temecula, and Wildomar, and the Riverside County Flood Control and Water Conservation District as Copermittees under Order No. R9-2013-0001, responsible for compliance with the terms and the conditions of the Regional MS4 Permit. Provision F.5 provides that prior to such enrollment, the San Diego Water Board must first review and consider a Report of Waste Discharge (ROWD) submitted by the Riverside County Copermittees under their current MS4 Permit, Order No. R9-2010-0016, to determine whether the Copermittees should be enrolled under Order No. R9-2013-0001, and what changes to Order No. R9-2013-0001 proposed in the ROWD are appropriate.

2. **Report of Waste Discharge.** By letter dated May 8, 2015, the Riverside County Copermittees jointly submitted a ROWD in application for the reissuance of waste discharge requirements, pursuant to the requirements of section K.2.c of Order No. R9-2010-0016. The San Diego Water Board reviewed the ROWD and determined it is complete.

3. **Riverside County Copermittees Enrollment.** After consideration of the Riverside County Copermitees' ROWD and changes needed to Order No. R9-2013-0001, the San Diego Water Board determined that the County of Riverside, the Cities of Murrieta, Temecula, and Wildomar, and the Riverside County Flood Control and Water Conservation District should be enrolled as Copermittees under Order No. R9-2013-0001 and be responsible for compliance with the terms and the conditions of the Regional MS4 Permit. Enrolling the Riverside County Copermittees into Order No. R9-2013-0001 will provide regulatory consistency in the implementation of MS4 permit requirements throughout the San Diego Region, improve communication and coordination among Copermittees within watersheds crossing multiple jurisdictions, and maximize efficiency and economy of resources for the San Diego Water Board achieved through the redirection of staff permitting resources to better advance the storm water program. Enrollment of the Cities of Murrieta and Wildomar is subject to a California Water Code section 13228 agreement as set forth in the findings of this Order.

DESIGNATION OF A REGIONAL WATER BOARD

4. **Regional Water Board Designation.** The Cities of Menifee, Murrieta, and Wildomar are located partially within the jurisdictions of both the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board) and the San Diego Water Board. California Water Code section 13228 provides a way to streamline the regulation of entities whose jurisdictions straddle the border of two or more Regional Water Boards.

   As allowed by California Water Code section 13228, during the proceedings for Order No. R9-2010-0016, the Fourth Term Riverside County MS4 Permit, written requests for designation of a single Regional Water Board to regulate matters pertaining to Phase I MS4 discharges were submitted to the San Diego Water Board and Santa Ana Water Board by the City of Murrieta by letter dated July 20, 2010, the City of Wildomar by letter dated July 21, 2010, and the City of Menifee by letter dated July 22, 2010. The Cities of Murrieta and Wildomar requested designation of the San Diego Water Board, and the City of Menifee requested designation of the Santa Ana Water Board.

   As authorized by California Water Code section 13228 and pursuant to written agreements dated September 28, 2010 between the San Diego Water Board and the Santa Ana Water Board, the San Diego Water Board is designated under Order No. R9-2010-0016 to regulate Phase I MS4s within the entire jurisdictional area of the Cities of Murrieta and Wildomar, including those areas of each City located within the Santa Ana Water Board's geographic jurisdiction. The Santa Ana Water Board is designated under Order No. R8-2010-0033 to regulate the Phase I MS4s within the entire jurisdictional area of the City of Menifee, including those areas of the City located within the San Diego Water Board's geographic jurisdiction. Written requests to continue these Regional Water Board designations were submitted to the San Diego Water Board and Santa Ana Water Board by the City of Murrieta by

letter dated June 22, 2015, the City of Wildomar by letter dated June 23, 2015, and the City of Menifee by letter dated June 25, 2015.

5. **Factual Considerations.** The Santa Ana Water Board and San Diego Water Board establish generally consistent requirements for MS4 discharges to meet the technology-based standard of reducing pollutants in the discharge to the maximum extent practicable (MEP), a related iterative process to ensure MS4 discharges meet receiving water quality standards, and for non-storm water discharges to be effectively prohibited from entering the MS4. However due to the unique nature of watersheds and water quality issues in the San Diego Region and Santa Ana Region, MS4 permit requirements between the two Regional Water Boards may also vary to address region specific pollutant discharges and watershed conditions. The Cities of Menifee, Murrieta, and Wildomar report that management and implementation of municipal programs to comply with two different MS4 permits creates a significant administrative and financial burden that is not contributing to greater overall water quality improvements in either region.

6. **Regional Water Board Agreement.** The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated October 26, 2015 to:

   a. Continue designation of the San Diego Water Board to regulate Phase I MS4 discharges within the entire jurisdictional area of the Cities of Murrieta and Wildomar, including those areas of each City located within the Santa Ana Region upon the effective date of Order R9-2015-0100, *and*

   b. Continue designation of the San Ana Water Board to regulate Phase I MS4 discharges within the entire jurisdictional area of the City of Menifee, including those areas of the City located within the San Diego Region, under Order No. R8-2010-0033 (NPDES No. CAS618030) as it may be amended or reissued upon the effective date of Order No. R9-2015-0100.

7. **Periodic Review of Regional Water Board Agreement.** The basis supporting the Cities of Menifee, Murrieta, and Wildomar requests to designate a specific Regional Water Board for regulatory oversight of MS4 discharges may change under future conditions and circumstances. Therefore the San Diego Water Board and Santa Ana Water Board will periodically review the effectiveness of the agreement during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate the agreement with the Santa Ana Water Board or otherwise modify the agreement subject to the approval of the Santa Ana Water Board.

AMENDMENTS TO ORDER NO. R9-2013-0001

8. **Effect of this Order.** Order No. R9-2013-0001 is not being reopened for any other purpose than the amendments contained herein. Except as contradicted or superseded by the findings and directives set forth in this Order, all of the previous findings and directives of Order No. R9-2013-0001 (as amended by Order No. R9-2015-0001) shall remain in full force and effect.

9. **Enroll Riverside County Copermittees.** This Order amends Order No. R9-2013-0001 to incorporate the County of Riverside, the Riverside County Cities of Murrieta, Temecula, and Wildomar, and the Riverside County Flood Control and Water Conservation District as Copermittees responsible for compliance with the terms and the conditions of Order No. R9-2013-0001, as amended by Order No. R9-2015-0001 and this Order.

10. **Alternative Compliance Pathway for Prohibitions and Limitations.** The San Diego County, Orange County, and Riverside County Copermittees have asserted that the prohibitions and limitations under Provision A of Order No. R9-2013-0001 may result in many years of noncompliance because years of technical efforts may ultimately be required to achieve compliance with the prohibitions and limitations, especially for wet weather discharges.

    The San Diego Water Board considered the incorporation of an alternative pathway to compliance during the adoption proceedings for Order No. R9-2013-0001 in May 2013, but chose not to include it at that time. During the proceedings for Order No. R9-2015-0001, amending Order No. R9-2013-0001 to extend coverage of the Regional MS4 Permit to the Orange County Copermittees and as reflected in Order No. R9-2015-0001, the San Diego Water Board committed to considering the incorporation of a well-defined, transparent, and finite alternative pathway to compliance in Order No. R9-2013-0001 during the MS4 permit reissuance proceedings for the Riverside County Copermittees.

    On June 16, 2015, the State Water Resources Control Board (State Water Board) adopted Order WQ 2015-0075, *In the Matter of Review of Order No. R4-2012-0175, NPDES Permit No. CAS004001, Waste Discharge Requirements for Municipal Separate Storm Sewer System (MS4) Discharges within the Coastal Watersheds of Los Angeles County, Except Those Discharges Originating from the City of Long Beach MS4,* which directs all Regional Water Boards to consider a watershed-based planning and implementation approach to compliance with receiving water limitations when issuing Phase I MS4 permits going forward. Consistent with the principles set forth in Order WQ 2015-0075, this Order amends Order No. R9-2013-0001 to incorporate an alternative compliance pathway that allows a Copermittee to utilize the watershed-based Water Quality Improvement Plan to be deemed in compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2.a, and A.3.b which are included in the prohibitions and limitations under Provision A of the Regional MS4 Permit.

    This Order amends the Fact Sheet of Order No. R9-2013-0001, Attachment F, section VII.E, Antidegradation Policy, to provide an expanded analysis consistent with the principles set forth in State Water Board Order WQ 2015-0075, demonstrating why the incorporation of an alternative compliance pathway for prohibitions and limitations in Order No. R9-2013-0001 complies with federal and state antidegradation policies. This Order also amends the Fact Sheet of Order No. R9-2013-0001, Attachment F, section VII.E, Anti-Backsliding Requirements, with an expanded analysis consistent with State Water Board Order WQ 2015-0075 demonstrating that the anti-backsliding requirements of the Clean Water Act and the

federal regulations do not foreclose the incorporation of an alternative compliance pathway into Order No. R9-2013-0001.

11. **Update to Non-Storm Water Discharges.** Since Order No. R9-2013-0001 was adopted, the State Water Board adopted Order 2014-0194-DWQ (*Statewide National Pollutant Discharge Elimination System (NPDES) Permit for Drinking Water System Discharges to Waters of the United States*) and the San Diego Water Board adopted Order No. R9-2015-0013 (*General Waste Discharge Requirements for Groundwater Extraction Discharges to Surface Waters within the San Diego Region*). These orders are NPDES permits regulating non-storm water discharges that may be discharged to the Copermittees' MS4s. This Order amends Order No. R9-2013-0001 to incorporate State Water Board Order 2014-0194-DWQ and San Diego Water Board Order No. R9-2015-0013 into the requirements for addressing non-storm water discharges.

12. **Priority Development Project Definition Consistency.** The Fact Sheet of the Regional MS4 Permit as modified by Order No. R9-2015-0001, describes on Page F-98 the San Diego Water Board's intent that the Priority Development Project categories in Provision E.3.b.(1) be consistent with the categories in the Riverside County MS4 Permit (Order No. R9-2010-0016) and the Orange County MS4 Permit (Order No. R9-2009-0002). The San Diego Water Board's intention reflected in the Fact Sheet was not explicitly incorporated in some of the Priority Development Project categories described in Provision E.3.b.(1) and this Order amends the provision with clarifying language to better describe these categories consistent with the Fact Sheet. The Order also has been amended to include the requirements for updating the BMP Design Manual as a result of the corrections to the Priority Development Project categories in Provision E.3.b.(1).

13. **Definition of Prior Lawful Approval.** During the proceedings for Order No. R9-2015-0001, amending Order No. R9-2013-0001 to extend coverage of the Regional MS4 Permit to the Orange County Copermittees, the land development community asserted that the lack of a definition for the term "prior lawful approval" in the Regional MS4 Permit had created significant uncertainty for the San Diego County Copermittees, the land development community, and the general public about when the development planning requirements are applicable. The San Diego Water Board committed to considering the incorporation of additional guidance for prior lawful approval in Order No. R9-2013-0001 during the MS4 permit reissuance proceedings for the Riverside County Copermittees. This Order amends Order No. R9-2013-0001 to incorporate additional clarification describing when the structural BMP performance requirements are applicable to Priority Development Projects.

14. **Los Peñasquitos Lagoon Sediment TMDL.** During the proceedings for Order No. R9-2015-0001, amending Order No. R9-2013-0001 to extend coverage of the Regional MS4 Permit to the Orange County Copermittees, the San Diego County Copermittees responsible for implementing the TMDLs for Sediment in Los Peñasquitos Lagoon requested several minor revisions to make the TMDL requirements consistent with the Basin Plan amendment adopted by the San Diego

Water Board. This Order amends Attachment E to Order No. R9-2013-0001 to incorporate minor revisions to the Los Peñasquitos Lagoon Sediment TMDL to make the requirements consistent with the adopted Basin Plan amendment.

15. **Compliance Dates for TMDLs Beaches and Creeks Indicator Bacteria TMDLs.** A review of the interim and final compliance dates for the Revised TMDLs for Indicator Bacteria, Project I – Beaches and Creeks (Beaches and Creeks Indicator Bacteria TMDLs) in the San Diego Region in Attachment E to the Order revealed an inconsistency with the adopted Basin Plan amendment. This Order amends Attachment E to Order No. R9-2013-0001 to incorporate minor revisions to the Beaches and Creeks Indicator Bacteria TMDLs to make the requirements consistent with the adopted Basin Plan amendment.

16. **Removal of Application for Early Coverage Provisions.** Order No. R9-2013-0001, as amended by Order No. R9-2015-0001 included several provisions that allowed the Riverside County Copermittees to apply for early coverage under the Regional MS4 Permit prior to the expiration of Order No. R9-2010-0016. These provisions are no longer necessary once the Riverside County Copermittees are covered by the requirements of the Regional MS4 Permit with the adoption of this Order. This Order amends Order No. R9-2013-0001 to remove provisions related to applying for early coverage under the Regional MS4 Permit.

ADMINISTRATIVE FINDINGS

17. **California Environmental Quality Act**. This action is exempt from the requirement of preparation of environmental documents under the California Environmental Quality Act [Public Resources Code, Division 13, Chapter 3, Section 21000 et seq.] in accordance with California Water Code section 13389.

18. **Public Notice.** In accordance with State and federal laws and regulations, the San Diego Water Board has notified San Diego County, Orange County and Riverside County Copermittees, and all known interested agencies and persons of its intent to adopt this Order and has provided them with an opportunity to submit their written comments.

19. **Public Hearing.** The San Diego Water Board held a public hearing on November 18, 2015 and heard and considered all comments pertaining to the adoption of this Order.

20. **Notification.** Any person aggrieved by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with California Water Code section 13320 and California Code of Regulations, title 23, sections 2050 et seq. The State Water Board must receive the petition by 5:00 p.m., 30 days after the adoption date of this Order. Copies of the law and regulations applicable to filing petitions may be found on the Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

THEREFORE, IT IS HEREBY ORDERED,

1. This Order amends Order No. R9-2013-0001 and Fact Sheet as amended by Order No. R9-2015-0001 (Regional MS4 Permit and Fact Sheet). The revisions to the Regional MS4 Permit and Fact Sheet are shown Attachments 1 and 2 to this Order. Added text to the Regional MS4 Permit and Fact Sheet is displayed in blue-underline text and deleted text is displayed as red-strikeout text.

2. The amended Regional MS4 Permit and Fact Sheet included as Attachments 1 and 2 to this Order shall become effective on January 7, 2016.

3. The amended Regional MS4 Permit and Fact Sheet included as Attachments 1 and 2 to this Order shall supersede Order No. R9-2010-0016 for the Riverside County Copermittees except for enforcement purposes.

4. San Diego Water Board staff is directed to prepare and post a conformed copy of the Regional MS4 Permit and Fact Sheet, as amended by this Order, incorporating the revisions made by this Order.

I, David W. Gibson, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on November 18, 2015.

David W. Gibson
Executive Officer

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

ORDER NO. R9-2013-0001,
AS AMENDED BY ORDER NOS. R9-2015-0001 AND R9-2015-0100
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The San Diego County Copermittees in Table 1a are subject to waste discharge requirements set forth in this Order.

Table 1a. San Diego County Copermittees

City of Carlsbad	City of Oceanside
City of Chula Vista	City of Poway
City of Coronado	City of San Diego
City of Del Mar	City of San Marcos
City of El Cajon	City of Santee
City of Encinitas	City of Solana Beach
City of Escondido	City of Vista
City of Imperial Beach	County of San Diego
City of La Mesa	San Diego County Regional Airport Authority
City of Lemon Grove	San Diego Unified Port District
City of National City	

The Orange County Copermittees in Table 1b are subject to waste discharge requirements set forth in this Order.

Table 1b. Orange County Copermittees[1]

City of Aliso Viejo	City of Rancho Santa Margarita
City of Dana Point	City of San Clemente
City of Laguna Beach	City of San Juan Capistrano
City of Laguna Hills	City of Laguna Woods
City of Laguna Niguel	County of Orange
City of Mission Viejo	Orange County Flood Control District

~~After the San Diego Water Board receives and considers the Riverside County Copermittees' Report of Waste Discharge and makes any necessary changes to this Order, t~~The Riverside County Copermittees in Table 1c ~~will become~~ are subject to waste

[1] While not listed in Table 1b., the City of Lake Forest remains a Copermittee under this Order until the later effective date of this Order or the effective date of Santa Ana Water Board Tentative Order No. R8-2015-0001. Thereafter, the City of Lake Forest will no longer be considered a Copermittee under this Order because its Phase I MS4 discharges will be regulated by the Santa Ana Water Board pursuant to Water Code section 13228 designation. The requirements of this Order that apply to the City of Lake Forest for the duration of this Order, however, are described in Finding 29 and Footnote 2 to Table B-1.

discharge requirements set forth in this Order ~~after expiration of Order No.R9-2010-0016, NPDES No. CAS0108766 on or after November 10, 2015~~.

Table 1c. Riverside County Copermittees

City of Murrieta	County of Riverside
City of Temecula	Riverside County Flood Control and Water Conservation District
City of Wildomar	

~~The Riverside County Copermittees may become subject to the requirements of this Order at a date earlier than the expiration date of their current Order subject to the conditions described in Provision F.6 of this Order if the Riverside County Copermittees receive notification of coverage from the San Diego Water Board.~~

The term Copermittee in this Order refers to any San Diego County, Orange County, or Riverside County Copermittee covered under this Order, unless specified otherwise.

This Order provides permit coverage for the Copermittee discharges described in Table 2.

Table 2. Discharge Locations and Receiving Waters

Discharge Points	Locations throughout San Diego Region
Discharge Description	Municipal Separate Storm Sewer System (MS4) Discharges
Receiving Waters	Inland Surface Waters, Enclosed Bays and Estuaries, and Coastal Ocean Waters of the San Diego Region

Table 3. Administrative Information

This Order was adopted by the San Diego Water Board on:	**May 8, 2013**
Order No. R9-2013-0001 became effective on:	**June 27, 2013**
This Order as amended by R9-2015-0001 became effective on:	**April 1, 2015**
This Order as amended by R9-2015-0100 became effective on:	**January 7, 2016**
This Order will expire on:	**June 27, 2018**
The Copermittees must file a Report of Waste Discharge in accordance with Title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than 180 days in advance of the Order expiration date.	

I, David W. Gibson, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on May 8, 2013, as amended by adoption of Order No. R9-2015-0001 on February 11, 2015, and as amended by adoption of Order No. R9-2015-0100 on November 18, 2015.

TENTATIVE

David W. Gibson
Executive Officer

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ATTACHMENTS
Attachment A: Discharge Prohibitions and Special Protections A-1
Attachment B: Standard Permit Provisions and General Provisions B-1
Attachment C: Acronyms, Abbreviations and Definitions C-1
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I. FINDINGS

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), finds that:

JURISDICTION

1. **MS4 Ownership or Operation.** Each of the Copermittees owns or operates an MS4, through which it discharges storm water and non-storm water into waters of the U.S. within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the U.S.

2. **Legal and Regulatory Authority.** This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]) adopted by the United States Environmental Protection Agency (USEPA), and chapter 5.5, division 7 of the California Water Code (CWC) (commencing with section 13370). This Order serves as an NPDES permit for discharges from MS4s to surface waters. This Order also serves as waste discharge requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

   The San Diego Water Board has the legal authority to issue a regional MS4 permit pursuant to its authority under CWA section 402(p)(3)(B) and 40 CFR 122.26(a)(1)(v). The USEPA also made it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide permits (55 Federal Register [FR] 47990, 48039-48042). The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees and San Diego Water Board.

   The federal regulations make it clear that the Copermittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators (40 CFR 122.26(a)(3)(vi)). This Order does not require the Copermittees to manage storm water outside of their jurisdictional boundaries, but rather to work collectively to improve storm water management within watersheds.

3. **CWA NPDES Permit Conditions.** Pursuant to CWA section 402(p)(3)(B), NPDES permits for storm water discharges from MS4s must include requirements to effectively prohibit non-storm water discharges into MS4s, and require controls to reduce the discharge of pollutants in storm water to the maximum extent practicable (MEP), and to require other provisions as the San Diego Water Board determines are appropriate to control such pollutants. This Order prescribes conditions to assure compliance with the CWA requirements for owners and operators of MS4s to effectively prohibit non-storm water discharges into the MS4s, and require controls to reduce the discharge of pollutants in storm water from the MS4s to the MEP.

4. **CWA and CWC Monitoring Requirements.** CWA section 308(a) and 40 CFR 122.41(h),(j)-(l) and 122.48 require that NPDES permits must specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s also specify additional monitoring and reporting requirements in 40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c). CWC section 13383 authorizes the San Diego Water Board to establish monitoring, inspection, entry, reporting and recordkeeping requirements. This Order establishes monitoring and reporting requirements to implement federal and State requirements. This Order also includes requirements for the Orange County Copermittees to participate in, and together with South Orange County Wastewater Authority and Orange County Health Care Agency, share responsibility for implementing the unified approach to beach water quality monitoring and assessment program set forth in the October 2014 report, *Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County*, issued pursuant to CWC section 13383 in the San Diego Water Board December 5, 2014 Letter Directive.

5. **Total Maximum Daily Loads.** CWA section 303(d)(1)(A) requires that "[e]ach state shall identify those waters within its boundaries for which the effluent limitations are not stringent enough to implement any water quality standard applicable to such waters." The CWA also requires states to establish a priority ranking of impaired water bodies known as Water Quality Limited Segments and to establish Total Maximum Daily Loads (TMDLs) for such waters. This priority list of impaired water bodies is called the Clean Water Act Section 303(d) List of Water Quality Limited Segments, commonly referred to as the 303(d) List. The CWA requires the 303(d) List to be updated every two years.

   TMDLs are numerical calculations of the maximum amount of a pollutant that a water body can assimilate and still meet water quality standards. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point sources (waste load allocations or WLAs) and non-point sources (load allocations or LAs), background contribution, plus a margin of safety. Discharges from MS4s are point source discharges. The federal regulations (40 CFR 122.44(d)(1)(vii)(B)) require that NPDES permits incorporate water quality based effluent limitations (WQBELs) developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, consistent with the assumptions and requirements of any available WLA for the discharge. Requirements of this Order implement the TMDLs established by the San Diego Water Board or USEPA as of the date this Order was amended in 2015. This Order establishes WQBELs consistent with the assumptions and requirements of all available TMDL WLAs assigned to discharges from the Copermittees' MS4s.

6. **Non-Storm Water Discharges.** Pursuant to CWA section 402(p)(3)(B)(ii), this Order requires each Copermittee to effectively prohibit discharges of non-storm water into its MS4. Nevertheless, non-storm water discharges into and from the

MS4s continue to be reported to the San Diego Water Board by the Copermittees and other persons. Monitoring conducted by the Copermittees, as well as the 303(d) List, have identified dry weather, non-storm water discharges from the MS4s as a source of pollutants causing or contributing to receiving water quality impairments in the San Diego Region. The federal regulations (40 CFR 122.26(d)(2)(iv)(B)(1)) require the Copermittees to have a program to prevent illicit discharges to the MS4. The federal regulations, however, allow for specific categories of non-storm water discharges or flows to be addressed as illicit discharges only where such discharges are identified as sources of pollutants to waters of the U.S.

7. **In-Stream Treatment Systems.** Pursuant to federal regulations (40 CFR 131.10(a)), in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S. Authorizing the construction of a runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to accepting waste assimilation as an appropriate use for that water body. Runoff treatment must occur prior to the discharge of runoff into receiving waters. Treatment control best management practices (BMPs) must not be constructed in waters of the U.S. Construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body.

DISCHARGE CHARACTERISTICS AND RUNOFF MANAGEMENT

8. **Point Source Discharges of Pollutants.** Discharges from the MS4s contain waste, as defined in the CWC, and pollutants that adversely affect the quality of the waters of the state. A discharge from an MS4 is a “discharge of pollutants from a point source” into waters of the U.S. as defined in the CWA. Storm water and non-storm water discharges from the MS4s contain pollutants that cause or threaten to cause a violation of surface water quality standards, as outlined in the Water Quality Control Plan for the San Diego Basin (Basin Plan). Storm water and non-storm water discharges from the MS4s are subject to the conditions and requirements established in the Basin Plan for point source discharges.

9. **Potential Beneficial Use Impairment.** The discharge of pollutants and/or increased flows from MS4s may cause or threaten to cause the concentration of pollutants to exceed applicable receiving water quality objectives and impair or threaten to impair designated beneficial uses resulting in a condition of pollution, contamination, or nuisance.

10. **Pollutants Generated by Land Development.** Land development has created and continues to create new sources of non-storm water discharges and pollutants in storm water discharges as human population density increases. This brings higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash. Pollutants from these sources are dumped or washed off the surface by non-storm water or storm water flows into

and from the MS4s. When development converts natural vegetated pervious ground cover to impervious surfaces such as paved highways, streets, rooftops, and parking lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving a developed area without BMPs that can maintain pre-development runoff conditions will contain greater pollutant loads and have significantly greater runoff volume, velocity, and peak flow rate than pre-development runoff conditions from the same area.

11. **Runoff Discharges to Receiving Waters.** The MS4s discharge runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within the eleven hydrologic units comprising the San Diego Region. Historic and current development makes use of natural drainage patterns and features as conveyances for runoff. Rivers, streams and creeks in developed areas used in this manner are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and receiving water. Numerous receiving water bodies and water body segments have been designated as impaired by the San Diego Water Board pursuant to CWA section 303(d).

12. **Pollutants in Runoff.** The most common pollutants in runoff discharged from the MS4s include total suspended solids, sediment, pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., cadmium, copper, lead, and zinc), petroleum products and polynuclear aromatic hydrocarbons, synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus), oxygen-demanding substances (e.g., decaying vegetation, animal waste), detergents, and trash. As operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not prohibit or otherwise control. These discharges may cause or contribute to a condition of pollution or a violation of water quality standards.

13. **Human Health and Aquatic Life Impairment.** Pollutants in runoff discharged from the MS4s can threaten and adversely affect human health and aquatic organisms. Adverse responses of organisms to chemicals or physical agents in runoff range from physiological responses such as impaired reproduction or growth anomalies to mortality. Increased volume, velocity, rate, and duration of storm water runoff greatly accelerate the erosion of downstream natural channels. This alters stream channels and habitats and can adversely affect aquatic and terrestrial organisms.

14. **Water Quality Effects.** The Copermittees' water quality monitoring data submitted to date documents persistent exceedances of Basin Plan water quality objectives for runoff-related pollutants at various watershed monitoring stations. Persistent toxicity has also been observed at several watershed monitoring stations. In addition, bioassessment data indicate that the majority of the monitored receiving waters have

Poor to Very Poor Index of Biological Integrity (IBI) ratings. These findings indicate that runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in the San Diego Region. Non-storm water discharges from the MS4s have been shown to contribute significant levels of pollutants and flow in arid, developed Southern California watersheds, and contribute significantly to exceedances of applicable receiving water quality objectives.

15. **Non-Storm Water and Storm Water Discharges.** Non-storm water discharges from the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard of CWA section 402(p)(3)(B)(iii), which is explicitly for "Municipal … *Stormwater Discharges* (emphasis added)" from the MS4s. Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s must be effectively prohibited.

16. **Best Management Practices.** Waste and pollutants which are deposited and accumulate in MS4 drainage structures will be discharged from these structures to waters of the U.S. unless they are removed. These discharges may cause or contribute to, or threaten to cause or contribute to, a condition of pollution in receiving waters. For this reason, pollutants in storm water discharges from the MS4s can be and must be effectively reduced in runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Pollution prevention is the reduction or elimination of pollutant generation at its source and is the best "first line of defense." Source control BMPs (both structural and non-structural) minimize the contact between pollutants and runoff, therefore keeping pollutants onsite and out of receiving waters. Treatment control BMPs remove pollutants that have been mobilized by storm water or non-storm water flows.

17. **BMP Implementation.** Runoff needs to be addressed during the three major phases of development (planning, construction, and use) in order to reduce the discharge of storm water pollutants to the MEP, effectively prohibit non-storm water discharges, and protect receiving waters. Development which is not guided by water quality planning policies and principles can result in increased pollutant load discharges, flow rates, and flow durations which can negatively affect receiving water beneficial uses. Construction sites without adequate BMP implementation result in sediment runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. Existing development can generate substantial pollutant loads which are discharged in runoff to receiving waters. Retrofitting areas of existing development with storm water pollutant control and hydromodification management BMPs is necessary to address storm water discharges from existing development that may cause or contribute to a condition of pollution or a violation of water quality standards.

18. **Water Quality Improvements.** Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit

non-storm water discharges to the MS4s and control pollutants in storm water discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the CWA.

19. **Long Term Planning and Implementation.** Federal regulations require municipal storm water permits to expire 5 years from adoption, after which the permit must be renewed and reissued. The San Diego Water Board recognizes that the degradation of water quality and impacts to beneficial uses of the waters in the San Diego Region occurred over several decades. The San Diego Water Board further recognizes that a decade or more may be necessary to realize demonstrable improvement to the quality of waters in the San Diego Region. This Order includes a long term planning and implementation approach that will require more than a single permit term to complete.

WATER QUALITY STANDARDS

20. **Basin Plan.** The San Diego Water Board adopted the Water Quality Control Plan for the San Diego Basin (Basin Plan) on September 8, 1994, that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for receiving waters addressed through the plan. The Basin Plan was subsequently approved by the State Water Resources Control Board (State Water Board) on December 13, 1994. Subsequent revisions to the Basin Plan have also been adopted by the San Diego Water Board and approved by the State Water Board. Requirements of this Order implement the Basin Plan.

    The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Process Supply (PROC), Industrial Service Supply (IND), Ground Water Recharge (GWR), Contact Water Recreation (REC1), Non-contact Water Recreation (REC2), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Freshwater Replenishment (FRSH), Hydropower Generation (POW), and Preservation of Biological Habitats of Special Significance (BIOL). The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region: Navigation (NAV), Commercial and Sport Fishing (COMM), Estuarine Habitat (EST), Marine Habitat (MAR), Aquaculture (AQUA), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN), and Shellfish Harvesting (SHELL).

21. **Ocean Plan.** The State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, and 2005. The State Water Board adopted the latest amendment on ~~April 21, 2005~~ October 16, 2012 and it became effective on ~~February 14, 2006~~ August 19, 2013. The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean. Requirements of this Order implement the Ocean Plan.

    The Ocean Plan identifies the following beneficial uses of ocean waters of the state to be protected: Industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture; preservation and enhancement of designated Areas of Special Biological Significance; rare and endangered species; marine habitat; fish spawning and shellfish harvesting.

22. **Sediment Quality Control Plan**. On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes: 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

23. **National Toxics Rule and California Toxics Rule.** USEPA adopted the National Toxics Rule (NTR) on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the NTR applied in California. On May 18, 2000, USEPA adopted the California Toxics Rule (CTR). The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants.

24. **Antidegradation Policy.** This Order is in conformance with the federal Antidegradation Policy described in 40 CFR 131.12, and State Water Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality Waters in California*. Federal regulations at 40 CFR 131.12 require that the State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. State Water Board Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies. The Fact Sheet of this Order contains additional discussion about antidegradation.

25. **Anti-Backsliding Requirements.** Section 402(o)(2) of the CWA and federal regulations at 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations may be relaxed. All effluent limitations in this Order are at least as stringent as effluent limitations in the previous permits. The Fact Sheet of this Order contains additional discussion about anti-backsliding.

CONSIDERATIONS UNDER FEDERAL AND STATE LAW

26. **Coastal Zone Act Reauthorization Amendments.** Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states with approved coastal zone management programs to address non-point source pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point source pollution: agriculture, silviculture, urban, marinas, and hydromodification. This Order addresses the management measures required for the urban category, with the exception of septic systems. The runoff management programs developed pursuant to this Order fulfills the need for coastal cities to develop a runoff non-point source plan identified in the Non-Point Source Program Strategy and Implementation Plan. The San Diego Water Board addresses septic systems through the administration of other programs.

27. **Endangered Species Act.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 USC sections 1531 to 1544). This Order requires compliance with receiving water limits, and other requirements to protect the beneficial uses of waters of the State. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

28. **Report of Waste Discharge Process.** The waste discharge requirements set forth in this Order are based upon the Report of Waste Discharge submitted by the San Diego County Copermittees prior to the expiration of Order No. R9-2007-0001 (NPDES No. CAS0109266), ~~and~~ the Report of Waste Discharge submitted by the Orange County Copermittees prior to the expiration of Order No. R9-2009-0002 (CAS0108740), and the Report of Waste Discharge submitted by the Riverside County Copermittees prior to the expiration of Order No. R9-2010-0016 (CAS0108766). ~~The Riverside County Copermittees are not immediately covered by the waste discharge requirements in this Order. The San Diego Water Board understands that each municipality is unique although the Counties share watersheds and/or geographical boundaries. The Order will continue to use the Report of Waste Discharge process prior to initially making Riverside County Copermittees subject to the requirements of this Order.~~

The federal regulations (40 CFR 122.21(d)(2)) and CWC section 13376 impose a duty on the Copermittees to reapply for continued coverage through submittal of a Report of Waste Discharge no later than 180 days prior to expiration of a currently effective permit. The expiration date of this Order as shown in Table 3, and requirement to file a Report of Waste Discharge no later than 180 days prior to the expiration date of the Order, applies jointly to the San Diego County, Orange County, and Riverside County Copermittees. ~~This requirement is set forth in the Riverside County Copermittees' currently effective permit at ProvisionK.2.c. The Riverside County MS4 Permit, Order No. R9-2010-0016 (NPDES No. CAS0108766) expires on November 10, 2015.~~

~~Unless the Riverside County Copermittees apply for and receive early coverage under this Order, the Riverside County Copermittees' permit will be superseded by this Order upon expiration of their permit, subject to any necessary revisions to the requirements of this Order made after the San Diego Water Board considers their Report of Waste Discharge through the public process provided in 40 CFR Part 124.~~

29. Regional Water Board Designation. The Cities of Laguna Hills, Laguna Woods, ~~and~~ Lake Forest, Menifee, Murrieta, and Wildomar are located partially within the jurisdictions of the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board) and the San Diego Water Board and their discharges are subject to regulation by both Regional Water Boards. CWC section 13228 provides a way to streamline the regulation of entities whose jurisdictions straddle the border of two or more Regions. CWC section 13228 is implemented in this Order at the request of these six cities and to ease the regulatory burden of municipalities that lie in both the San Diego Water Board's and the adjacent Santa Ana Water Board's jurisdiction. MS4 discharges from these municipalities are regulated by the San Diego Water Board and Santa Ana Water Board as follows:

a. Pursuant to CWC section 13228, the Cities of Laguna Hills, Laguna Woods, and Lake Forest submitted written requests that one Regional Water Board be designated to regulate Phase I MS4 discharges for each of the Cities. The Santa Ana Water Board and the San Diego Water Board have entered into an agreement dated February 10, 2015, whereby the Cities of Laguna Woods and Laguna Hills are largely regulated by the San Diego Water Board under this Order, including those portions of the Cities of Laguna Woods and Laguna Hills not within the San Diego Water Board's jurisdiction, upon the effective date of this Order or Santa Ana Water Board Order No. R8-2015-0001, whichever is later. Similarly, the City of Lake Forest, including those portions of the City of Lake Forest within the San Diego Water Board's jurisdiction, is largely regulated by the Santa Ana Water Board under Order No. R8-2015-0001 (NPDES No. CAS618030) upon the later effective date of this Order or Order No. R8-2015-0001. The agreement provides that the City of Lake Forest is required to retain, and continue implementation of, its over-irrigation discharge prohibition in Title 15, Chapter 14.030, List (b) of the City Municipal Code for regulating storm water quality throughout its jurisdiction. The agreement also requires the City of Lake Forest to actively participate during development and implementation of the Aliso

Creek Watershed Management Area Water Quality Improvement Plan required pursuant to this Order. Each Regional Water Board retains the authority to enforce provisions of its Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee under the terms of the agreement (Water Code section 13228 (b)). Under the terms of the agreement, any TMDL and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Laguna Woods, Laguna Hills or Lake Forest as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement of the applicable TMDL will remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's San Diego Creek/Newport Bay TMDL and the San Diego Water Board's Indicator Bacteria Project I Beaches and Creeks TMDL. The San Diego Water Board will periodically review the effectiveness of the agreement during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate the agreement with Santa Ana Water Board or otherwise modify the agreement subject to the approval of the Santa Ana Water Board.

b. Pursuant to CWC section 13228, the Cities of Murrieta, Wildomar, and Menifee submitted written requests that one Regional Water Board be designated to regulate Phase I MS4 discharges for each of the Cities. The Santa Ana Water Board and the San Diego Water Board have entered into an agreement dated October 26, 2015, whereby the Cities of Murrieta and Wildomar are largely regulated by the San Diego Water Board under this Order, including those portions of the Cities of Murrieta and Wildomar not within the San Diego Water Board's jurisdiction, upon the effective date of this Order. Similarly, the City of Menifee is largely regulated by the Santa Ana Water Board under Order No. R8-2010-0033 as it may be amended or reissued, including those portions of the City of Menifee within the San Diego Water Board's jurisdiction, upon the effective date of this Order. The agreement also requires the City of Menifee to actively participate during development and implementation of the Santa Margarita River Watershed Management Area Water Quality Improvement Plan required pursuant to this Order. Each Regional Water Board retains the authority to enforce provisions of its Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee under the terms of the agreement (Water Code section 13228 (b)). Under the terms of the agreement, any TMDL and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Menifee, Murrieta, or Wildomar as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement of the applicable TMDL will remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's Lake Elsinore/Canyon Lake Nutrient

TMDLs. The San Diego Water Board will periodically review the effectiveness of the agreement during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate the agreement with Santa Ana Water Board or otherwise modify the agreement subject to the approval of the Santa Ana Water Board.

30. **Integrated Report and Clean Water Act Section 303(d) List.** The San Diego Water Board and State Water Board submit an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. USEPA issued its *Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act* on July 29, 2005, which advocates the use of a five category approach for classifying the attainment status of water quality standards for water bodies in the Integrated Report. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 in the Integrated Report are placed on the 303(d) List.

    Water bodies with available data and/or information that indicate at least one beneficial use is not being supported or is threatened, but a TMDL is not required, are included in Category 4 in the Integrated Report. Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

    Implementation of the requirements of this Order may allow the San Diego Water Board to include surface waters impaired by discharges from the Copermittees' MS4s in Category 4 in the Integrated Report for consideration during the next 303(d) List submittal by the State to USEPA.

31. **Economic Considerations.** The California Supreme Court has ruled that although CWC section 13263 requires the State and Regional Water Boards (collectively Water Boards) to consider factors set forth in CWC section 13241 when issuing an NPDES permit, the Water Board may not consider the factors to justify imposing pollutant restrictions that are less stringent than the applicable federal regulations require. (*City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 618, 626-627.) However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

    As noted in the following finding, the San Diego Water Board finds that the requirements in this Order are not more stringent than the minimum federal

requirements. Therefore, a CWC section 13241 analysis is not required for permit requirements that implement the effective prohibition on the discharge of non-storm water into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determined appropriate to control such pollutants, as those requirements are mandated by federal law. Notwithstanding the above, the San Diego Water Board has developed an economic analysis of the requirements in this Order. The economic analysis is provided in the Fact Sheet.

32. **Unfunded Mandates.** This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following:

    a. This Order implements federally mandated requirements under CWA section 402 (33 USC section 1342(p)(3)(B)).

    b. The local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental and new dischargers who are issued NPDES permits for storm water and non-storm water discharges.

    c. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order.

    d. The Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)) and in lieu of numeric restrictions on their MS4 discharges (i.e. effluent limitations).

    e. The local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under State law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

    f. The provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state develops a TMDL, federal law requires that permits must contain water quality based effluent limitations consistent with the assumptions and requirements of any applicable wasteload allocation (40 CFR 122.44(d)(1)(vii)(B)).

    See the Fact Sheet for further discussion of unfunded mandates.

33. **California Environmental Quality Act.** The issuance of waste discharge requirements and an NPDES permit for the discharge of runoff from MS4s to waters of the U.S. is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 et seq.) in accordance with CWC section 13389.

STATE WATER BOARD DECISIONS

34. **Compliance with Prohibitions and Limitations.** The receiving water limitation language specified in this Order is consistent with language recommended by the USEPA and established in State Water Board Order WQ 99-05, *Own Motion Review of the Petition of Environmental Health Coalition to Review Waste Discharge Requirements Order No. 96-03, NPDES Permit No. CAS0108740*, adopted by the State Water Board on June 17, 1999. The receiving water limitation language in this Order requires storm water discharges from MS4s to not cause or contribute to a violation of water quality standards, which is to be achieved through an iterative approach requiring the implementation of improved and better-tailored BMPs over time. Implementation of the iterative approach to comply with receiving water limitations based on applicable water quality standards is necessary to ensure that storm water discharges from the MS4 will not ultimately cause or contribute to violations of water quality standards and will not create conditions of pollution, contamination, or nuisance.

The San Diego, Orange County, and Riverside County Copermittees have asserted that the prohibitions and limitations may result in many years of noncompliance because years of technical efforts may ultimately be required to achieve compliance with the prohibitions and limitations, especially for wet weather discharges. To address this concern, this Order includes an option that allows a Copermittee to be deemed in compliance with the prohibitions and limitations where more than one permit term may be necessary to achieve full compliance with the prohibitions and limitations. One or more Copermittees within a Watershed Management Area can choose to implement this option.

An alternative compliance pathway option has been included in this Order consistent with the approach described in Order WQ 2015-0075, *In the Matter of Review of Order No. R4-2012-0175, NPDES Permit No. CAS004001, Waste Discharge Requirements for Municipal Separate Storm Sewer System (MS4) Discharges within the Coastal Watersheds of Los Angeles County, Except Those Discharges Originating from the City of Long Beach MS4*, adopted by the State Water Board on June 16, 2015. State Water Board Order WQ 2015-0075 directs the Regional Water Boards to consider a watershed-based planning and implementation approach to compliance with receiving water limitations when issuing Phase I MS4 permits going forward. Order WQ 2015-0075 included seven principles that the Regional Water Boards are expected to follow when incorporating an alternative compliance pathway into an MS4 permit. The Fact Sheet discusses the incorporation of the seven principles stipulated in State Water Board Order WQ 2015-0075 into the alternative compliance pathway option in this Order.

35. **Special Conditions for Areas of Special Biological Significance.** On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving a general exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and

NPDES permitted municipal storm water discharges (General Exception). On June 19, 2012, the State Water Board adopted Order No. 2012-0031, amending the General Exception to require pollutant reductions to be achieved within six years in accordance with ASBS Compliance Plans and ASBS Pollution Prevention Plans. The General Exception requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject to the terms and conditions of the General Exception as amended. The Special Protections contained in Attachment B to the General Exception as amended are applicable to these discharges, and are hereby incorporated into Attachment A of this Order.

ADMINISTRATIVE FINDINGS

36. **Executive Officer Delegation of Authority.** The San Diego Water Board by prior resolution has delegated all matters that may legally be delegated to its Executive Officer to act on its behalf pursuant to CWC section 13223. Therefore, the Executive Officer is authorized to act on the San Diego Water Board's behalf on any matter within this Order unless such delegation is unlawful under CWC section 13223 or this Order explicitly states otherwise.

37. **Standard Provisions.** Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR 122.42, are provided in Attachment B to this Order.

38. **Fact Sheet.** The Fact Sheet for this Order contains background information, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of this Order. The Fact Sheet is hereby incorporated into this Order and constitutes part of the Findings of this Order.

39. **Public Notice.** In accordance with State and federal laws and regulations, the San Diego Water Board notified the Copermittees, and interested agencies and persons of its intent to prescribe waste discharge requirements for the control of discharges into and from the MS4s to waters of the U.S. and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet.

40. **Public Hearings.** The San Diego Water Board held a public hearing on April 10 and 11, 2013, that was continued to May 8, 2013 and heard and considered all comments pertaining to the terms and conditions of this Order. The San Diego Water Board also held a public workshop on October 8, 2015, and a public hearing

on February 11, 2015, and heard and considered all comments pertaining to the amendment of this Order through Order No. R9-2015-0001. The San Diego Water Board also held a public hearing on November 18, 2015, and heard and considered all comments pertaining to the amendment of this Order through Order No. R9-2015-0100. Details of these public hearings are provided in the Fact Sheet.

41. **Effective Date.** This Order serves as an NPDES permit pursuant to CWA section 402 or amendments thereto, and as to the San Diego County Copermittees listed in Table ~~2.~~1a~~.~~, became effective fifty (50) days after the date of its adoption, and as to the Orange County Copermittees listed in Table ~~2.~~1b~~.~~, ~~becomes~~ became effective on April 1, 2015, after Order No. R9-2015-0001 was ~~is~~ adopted, and as to the Riverside County Copermittees listed in Table 1c, became effective on January 7, 2016, after Order No. R9-2015-0100 was adopted, provided that the Regional Administrator, USEPA, Region IX, does not object to this Order.

42. **Review by the State Water Board.** Any person aggrieved by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with CWC section 13320 and California Code of Regulations, title 23, sections 2050, and following. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date of this Order, except that if the thirtieth day following the date of this Order falls on a Saturday, Sunday or State holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

THEREFORE, IT IS HEREBY ORDERED that the Copermittees, in order to meet the provisions contained in division 7 of the CWC (commencing with section 13000) and regulations adopted thereunder, and the provisions of the CWA and regulations adopted thereunder, must each comply with the requirements of this Order. This action in no way prevents the San Diego Water Board from taking enforcement action for past violations of the previous Order applicable to the Copermittees. If any part of this Order is subject to a temporary stay of enforcement, unless otherwise specified, the Copermittees must comply with the analogous portions of the previous Order, which will remain in effect for all purposes during the pendency of the stay.

II. PROVISIONS

A. PROHIBITIONS AND LIMITATIONS

The purpose of this provision is to describe the conditions under which storm water and non-storm water discharges into and from MS4s are prohibited or limited. The goal of the prohibitions and limitations is to protect the water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through the implementation of water quality improvement strategies and runoff management programs that effectively prohibit non-storm water discharges into the Copermittees' MS4s, and reduce pollutants in storm water discharges from the Copermittees' MS4s to the MEP.

1. Discharge Prohibitions

a. Discharges from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the state are prohibited.

b. Non-storm water discharges into MS4s are to be effectively prohibited, through the implementation of Provision E.2, unless such discharges are authorized by a separate NPDES permit.

c. Discharges from MS4s are subject to all waste discharge prohibitions in the Basin Plan, included in Attachment A to this Order.

d. Storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012, as amended by State Water Board Resolution No. 2012-0031, applicable to these discharges, included in Attachment A to this Order. All other discharges from the Copermittees' MS4s to ASBS are prohibited.

2. Receiving Water Limitations

a. Discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters, including but not limited to all applicable provisions contained in:

(1) The San Diego Water Board's Basin Plan, including beneficial uses, water quality objectives, and implementation plans;

(2) State Water Board plans for water quality control including the following:

(a) Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries (Thermal Plan), and

(b) The Ocean Plan, including beneficial uses, water quality objectives, and implementation plans;

(3) State Water Board policies for water and sediment quality control including the following:

(a) Water Quality Control Policy for the Enclosed Bays and Estuaries of California,

(b) Sediment Quality Control Plan which includes the following narrative objectives for bays and estuaries:

(i) Pollutants in sediments shall not be present in quantities that, alone or in combination, are toxic to benthic communities, and

(ii) Pollutants shall not be present in sediments at levels that will bioaccumulate in aquatic life to levels that are harmful to human health,

(c) The Statement of Policy with Respect to Maintaining High Quality of Waters in California;[2]

(4) Priority pollutant criteria promulgated by the USEPA through the following:

(a) National Toxics Rule (NTR)[3] (promulgated on December 22, 1992 and amended on May 4, 1995), and

(b) California Toxics Rule (CTR).[4,5]

b. Discharges from MS4s composed of storm water runoff must not alter natural ocean water quality in an ASBS.

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[2] State Water Board Resolution No. 68-16
[3] 40 CFR 131.36
[4] 65 Federal Register 31682-31719 (May 18, 2000), adding Section 131.38 to 40 CFR
[5] If a water quality objective and a CTR criterion are in effect for the same priority pollutant, the more stringent of the two applies.

3. Effluent Limitations

a. Technology Based Effluent Limitations

Pollutants in storm water discharges from MS4s must be reduced to the MEP.[6]

b. Water Quality Based Effluent Limitations

Each Copermittee must comply with applicable WQBELs established for the TMDLs in Attachment E to this Order, pursuant to the applicable TMDL compliance schedules.

4. Compliance with Discharge Prohibitions and Receiving Water Limitations

Each Copermittee must achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order through timely implementation of control measures and other actions as specified in Provisions B and E of this Order, including any modifications. The Water Quality Improvement Plans required under Provision B must be designed and adapted to ultimately achieve compliance with Provisions A.1.a, A.1.c and A.2.a.

a. If exceedance(s) of water quality standards persist in receiving waters notwithstanding implementation of this Order, the Copermittees must comply with the following procedures:

(1) For exceedance(s) of a water quality standard in the process of being addressed by the Water Quality Improvement Plan, the Copermittee(s) must implement the Water Quality Improvement Plan as accepted by the San Diego Water Board, and update the Water Quality Improvement Plan, as necessary, pursuant to Provision F.2.c;

(2) Upon a determination by either the Copermittees or the San Diego Water Board that discharges from the MS4 are causing or contributing to a new exceedance of an applicable water quality standard not addressed by the Water Quality Improvement Plan, the Copermittees must submit the following updates to the Water Quality Improvement Plan pursuant to Provision F.2.c or as part of the Water Quality Improvement Plan Annual Report required under Provision F.3.b, unless the San Diego Water Board directs an earlier submittal:

(a) The water quality improvement strategies being implemented that are effective and will continue to be implemented,

[6] This does not apply to MS4 discharges which receive subsequent treatment to reduce pollutants in storm water discharges to the MEP prior to entering receiving waters (e.g., low flow diversions to the sanitary sewer). Runoff treatment must occur prior to the discharge of runoff into receiving waters per Finding 7.

(b) Water quality improvement strategies (i.e. BMPs, retrofitting projects, stream and/or habitat rehabilitation projects, adjustments to jurisdictional runoff management programs, etc.) that will be implemented to reduce or eliminate any pollutants or conditions that are causing or contributing to the exceedance of water quality standards,

(c) Updates to the schedule for implementation of the existing and additional water quality improvement strategies, and

(d) Updates to the monitoring and assessment program to track progress toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a of this Order;

(3) The San Diego Water Board may require the incorporation of additional modifications to the Water Quality Improvement Plan required under Provision B. The applicable Copermittees must submit any modifications to the update to the Water Quality Improvement Plan within 90 days of notification that additional modifications are required by the San Diego Water Board, or as otherwise directed;

(4) Within 90 days of the San Diego Water Board determination that the modifications to the Water Quality Improvement Plan required under Provision A.4.a.(3) meet the requirements of this Order, the applicable Copermittees must revise the jurisdictional runoff management program documents to incorporate the modified water quality improvement strategies that have been and will be implemented, the implementation schedule, and any additional monitoring required; and

(5) Each Copermittee must implement the updated Water Quality Improvement Plan.

b. The procedure set forth above to achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order do not have to be repeated for continuing or recurring exceedances of the same water quality standard(s) following implementation of scheduled actions unless directed to do otherwise by the San Diego Water Board.

c. Nothing in Provisions A.4.a and A.4.b prevents the San Diego Water Board from enforcing any provision of this Order while the applicable Copermittees prepare and implement the above update to the Water Quality Improvement Plan and jurisdictional runoff management programs.

B. WATER QUALITY IMPROVEMENT PLANS

The purpose of this provision is to develop Water Quality Improvement Plans that guide the Copermittees' jurisdictional runoff management programs towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plans is to further the Clean Water Act's objective to protect, preserve, enhance, and restore the water quality and designated beneficial uses of waters of the state. This goal will be accomplished through an adaptive planning and management process that identifies the highest priority water quality conditions within a watershed and implements strategies through the jurisdictional runoff management programs to achieve improvements in the quality of discharges from the MS4s and receiving waters.

1. Watershed Management Areas

The Copermittees must develop a Water Quality Improvement Plan for each of the Watershed Management Areas in Table B-1. A total of ten Water Quality Improvement Plans must be developed for the San Diego Region.

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
San Juan (901.00)	South Orange County	- Aliso Creek - San Juan Creek - San Mateo Creek - Pacific Ocean - Heisler Park ASBS	- City of Aliso Viejo - City of Dana Point - City of Laguna Beach - City of Laguna Hills[1] - City of Laguna Niguel - City of Laguna Woods[1] - City of Lake Forest[2] - City of Mission Viejo - City of Rancho Santa Margarita - City of San Clemente - City of San Juan Capistrano - County of Orange - Orange County Flood Control District
Santa Margarita (902.00)	Santa Margarita River	- Murrieta Creek - Temecula Creek - Santa Margarita River - Santa Margarita Lagoon - Pacific Ocean	- City of Menifee[3] - City of Murrieta[~~3~~4] - City of Temecula[~~3~~] - City of Wildomar[~~3~~4] - County of Riverside[~~3~~] - County of San Diego[4] - Riverside County Flood Control and Water Conservation District[~~3~~]
San Luis Rey (903.00)	San Luis Rey River	- San Luis Rey River - San Luis Rey Estuary - Pacific Ocean	- City of Oceanside - City of Vista - County of San Diego

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
Carlsbad (904.00)	Carlsbad	- Loma Alta Slough - Buena Vista Lagoon - Agua Hedionda Lagoon - Batiquitos Lagoon - San Elijo Lagoon - Pacific Ocean	- City of Carlsbad - City of Encinitas - City of Escondido - City of Oceanside - City of San Marcos - City of Solana Beach - City of Vista - County of San Diego
San Dieguito (905.00)	San Dieguito River	- San Dieguito River - San Dieguito Lagoon - Pacific Ocean	- City of Del Mar - City of Escondido - City of Poway - City of San Diego - City of Solana Beach - County of San Diego
Penasquitos (906.00)	Penasquitos	- Los Penasquitos Lagoon - Pacific Ocean	- City of Del Mar - City of Poway - City of San Diego - County of San Diego
	Mission Bay	- Mission Bay - Pacific Ocean - San Diego Marine Life Refuge ASBS	- City of San Diego
San Diego (907.00)	San Diego River	- San Diego River - Pacific Ocean	- City of El Cajon - City of La Mesa - City of San Diego - City of Santee - County of San Diego
Pueblo San Diego (908.00) Sweetwater (909.00) Otay (910.00)	San Diego Bay	- Sweetwater River - Otay River - San Diego Bay - Pacific Ocean	- City of Chula Vista - City of Coronado - City of Imperial Beach - City of La Mesa - City of Lemon Grove - City of National City - City of San Diego - County of San Diego - San Diego County Regional Airport Authority - San Diego Unified Port District
Tijuana (911.00)	Tijuana River	- Tijuana River - Tijuana Estuary - Pacific Ocean	- City of Imperial Beach - City of San Diego - County of San Diego

Notes:

1. By agreement dated February 10, 2015, pursuant to Water Code section 13228, the Phase I MS4 discharges within the jurisdiction of the City of Laguna Hills and the City of Laguna Woods located in the Santa Ana Region are regulated by San Diego Water Board Order No. R9-2013-0001 as amended by Order No. R9-2015-0001, upon the later effective date of Order No. R9-2015-0001 or Santa Ana Water Board Tentative Order No. R8-2015-0001. The City of Laguna Hills and Laguna Woods must also comply with the requirements of the San Diego Creek/Newport Bay TMDL in section XVIII of Santa Ana Water Board Order No. R8-2015-0001.
2. By agreement dated February 10, 2015, pursuant to Water Code section 13228, Phase I MS4 discharges within the City of Lake Forest located within the San Diego Water Board Region are regulated by the Santa Ana Water Board Order No. R8-2015-0001 (NPDES No. CAS618030) upon the later effective date of this Order or Santa Ana Water Board Tentative Order No. R8-2015-0001. In accordance with the terms of the agreement between the San Diego Water Board and the Santa Ana Water Board, the City of Lake Forest must implement the requirements of the Bacteria TMDL in Attachment E of this Order, participate in preparation and implementation of the Water Quality Improvement Plan for the Aliso Creek Watershed Management Area as described in Provision B of this Order and continue implementation of its over-irrigation discharge prohibition in its City Ordinance, Title 15, Chapter 15, section 14.030, List (b).
3. By agreement dated October 26, 2015, pursuant to Water Code section 13228, Phase I MS4 discharges within the City of Menifee located within the San Diego Water Board Region are regulated by the Santa Ana Water Board Order No. R8-2010-0033 as it may be amended or reissued (NPDES No. CAS618033) upon the later effective date of this Order. In accordance with the terms of the agreement between the San Diego Water Board and the Santa Ana Water Board, the City of Menifee must participate in preparation and implementation of the Water Quality Improvement Plan for the Santa Margarita River Watershed Management Area as described in Provision B of this Order.~~The Riverside County Copermittees will be covered under this Order after expiration of Order No. R9-2010-0016 or earlier if the Riverside County Copermittees meet the conditions in Provision F.6, upon further amendment of this Order.~~
4. By agreement dated October 26, 2015, pursuant to Water Code section 13228, the Phase I MS4 discharges within the jurisdiction of the City of Murrieta and the City of Wildomar located in the Santa Ana Region are regulated by San Diego Water Board Order No. R9-2013-0001 as amended by Orders No. R9-2015-0001 and R9-2015-0100. The City of Murrieta and City of Wildomar must also comply with the requirements of the Lake Elsinore/Canyon Lake Nutrient TMDLs in section VI.D.2 of Santa Ana Water Board Order No. R8-2010-0033, or corresponding section as it may be amended or reissued.~~The County of San Diego is not required to implement the requirements of Provision B for its jurisdiction within the Santa Margarita River Watershed Management Area~~

~~until the Riverside County Copermittees have been notified of coverage under this Order. The County of San Diego is required to implement the requirements of Provisions D, F.3.b, and Attachment E until the Riverside County Copermittees have been notified of coverage under this Order.~~

2. Priority Water Quality Conditions

The Copermittees must identify the water quality priorities within each Watershed Management Area that will be addressed by the Water Quality Improvement Plan. Where appropriate, Watershed Management Areas may be separated into subwatersheds to focus water quality prioritization and jurisdictional runoff management program implementation efforts by receiving water.

a. Assessment of Receiving Water Conditions

The Copermittees must consider the following, at a minimum, to identify water quality priorities based on impacts of MS4 discharges on receiving water beneficial uses:

(1) Receiving waters listed as impaired on the CWA Section 303(d) List of Water Quality Limited Segments (303(d) List);

(2) TMDLs adopted and under development by the San Diego Water Board;

(3) Receiving waters recognized as sensitive or highly valued by the Copermittees, including estuaries designated under the National Estuary Program under CWA section 320, marine protected areas, wetlands defined by the State or U.S. Fish and Wildlife Service's National Wetlands Inventory as wetlands, waters having the Preservation of Biological Habitats of Special Significance (BIOL) beneficial use designation, and receiving waters identified as ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(4) The receiving water limitations of Provision A.2;

(5) Known historical versus current physical, chemical, and biological water quality conditions;

(6) Available, relevant, and appropriately collected and analyzed physical, chemical, and biological receiving water monitoring data, including, but not limited to, data describing:

(a) Chemical constituents,

(b) Water quality parameters (i.e. pH, temperature, conductivity, etc.),

(c) Toxicity Identification Evaluations for both receiving water column and sediment,

(d) Trash impacts,

(e) Bioassessments, and

(f) Physical habitat;

(7) Available evidence of erosional impacts in receiving waters due to accelerated flows (i.e. hydromodification);

(8) Available evidence of adverse impacts to the chemical, physical, and biological integrity of receiving waters; and

(9) The potential improvements in the overall condition of the Watershed Management Area that can be achieved.

b. ASSESSMENT OF IMPACTS FROM MS4 DISCHARGES

The Copermittees must consider the following, at a minimum, to identify the potential impacts to receiving waters that may be caused or contributed to by discharges from the Copermittees' MS4s:

(1) The discharge prohibitions of Provision A.1 and effluent limitations of Provision A.3; and

(2) Available, relevant, and appropriately collected and analyzed storm water and non-storm water monitoring data from the Copermittees' MS4 outfalls;

(3) Locations of each Copermittee's MS4 outfalls that discharge to receiving waters;

(4) Locations of MS4 outfalls that are known to persistently discharge non-storm water to receiving waters likely causing or contributing to impacts on receiving water beneficial uses;

(5) Locations of MS4 outfalls that are known to discharge pollutants in storm water causing or contributing to impacts on receiving water beneficial uses; and

(6) The potential improvements in the quality of discharges from the MS4 that can be achieved.

c. IDENTIFICATION OF PRIORITY WATER QUALITY CONDITIONS

(1) The Copermittees must use the information gathered for Provisions B.2.a and B.2.b to develop a list of priority water quality conditions as pollutants, stressors and/or receiving water conditions that are the highest threat to receiving water quality or that most adversely affect the quality of receiving waters. The list must include the following information for each priority water quality condition:

(a) The beneficial use(s) associated with the priority water quality condition;

(b) The geographic extent of the priority water quality condition within the Watershed Management Area, if known;

(c) The temporal extent of the priority water quality condition (e.g., dry weather and/or wet weather);

(d) The Copermittees with MS4s discharges that may cause or contribute to the priority water quality condition; and

(e) An assessment of the adequacy of and data gaps in the monitoring data to characterize the conditions causing or contributing to the priority water quality condition, including a consideration of spatial and temporal variation.

(2) The Copermittees must identify the highest priority water quality conditions to be addressed by the Water Quality Improvement Plan, and provide a rationale for selecting a subset of the water quality conditions identified pursuant to Provision B.2.c.(1) as the highest priorities.

d. IDENTIFICATION OF MS4 SOURCES OF POLLUTANTS AND/OR STRESSORS

The Copermittees must identify and prioritize known and suspected sources of storm water and non-storm water pollutants and/or other stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c. The identification of known and suspected sources of pollutants and/or stressors that cause or contribute to the highest priority water quality conditions as identified for Provision B.2.c must consider the following:

(1) Pollutant generating facilities, areas, and/or activities within the Watershed Management Area, including:

(a) Each Copermittee's inventory of construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas,

(b) Publicly owned parks and/or recreational areas,

(c) Open space areas,

(d) All currently operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste, and

(e) Areas not within the Copermittees' jurisdictions (e.g., Phase II MS4s, tribal lands, state lands, federal lands) that are known or suspected to be discharging to the Copermittees' MS4s;

(2) Locations of the Copermittees' MS4s, including the following:

(a) All MS4 outfalls that discharge to receiving waters, and

(b) Locations of major structural controls for storm water and non-storm water (e.g., retention basins, detention basins, major infiltration devices, etc.);

(3) Other known and suspected sources of non-storm water or pollutants in storm water discharges to receiving waters within the Watershed Management Area, including the following:

(a) Other MS4 outfalls (e.g., Phase II Municipal and Caltrans),

(b) Other NPDES permitted discharges,

(c) Any other discharges that may be considered point sources (e.g., private outfalls), and

(d) Any other discharges that may be considered non-point sources (e.g., agriculture, wildlife or other natural sources);

(4) Review of available data, including but not limited to:

(a) Findings from the Copermittees' illicit discharge detection and elimination programs,

(b) Findings from the Copermittees' MS4 outfall discharge monitoring,

(c) Findings from the Copermittees' receiving water monitoring,

(d) Findings from the Copermittees' MS4 outfall discharge and receiving water assessments, and

(e) Other available, relevant, and appropriately collected data, information, or studies related to pollutant sources and/or stressors that contribute to the highest priority water quality conditions as identified for Provision B.2.c.

(5) The adequacy of the available data to identify and prioritize sources and/or stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c.

e. IDENTIFICATION OF POTENTIAL WATER QUALITY IMPROVEMENT STRATEGIES

The Copermittees must evaluate the findings identified under Provisions B.2.a-d, and identify potential strategies that can result in improvements to water quality in MS4 discharges and/or receiving waters within the Watershed Management Area. Potential water quality improvement strategies that may be implemented within the Watershed Management Area must include the following:

(1) Structural BMPs, non-structural BMPs, incentives, or programs that can potentially be implemented to address the highest priority water quality conditions identified under Provision B.2.c, or MS4 sources of pollutants or stressors identified under Provision B.2.d,

(2) Retrofitting projects in areas of existing development within the Watershed Management Area that can potentially be implemented to reduce MS4 sources of pollutants or stressors identified under Provision B.2.d causing or contributing to the highest priority water quality conditions identified under Provision B.2.c, and

(3) Stream, channel, and/or habitat rehabilitation projects within the Watershed Management Area that can potentially be implemented to protect and/or improve conditions in receiving waters from MS4 pollutants and/or stressors identified under Provision B.2.d causing or contributing to the highest priority water quality conditions identified under Provision B.2.c.

3. Water Quality Improvement Goals, Strategies and Schedules

The Copermittees must identify and develop specific water quality improvement goals and strategies to address the highest priority water quality conditions identified within a Watershed Management Area. The water quality improvement goals and strategies must address the highest priority water quality conditions by effectively prohibiting non-storm water discharges to the MS4, reducing pollutants in storm water discharges from the MS4 to the MEP, and protecting the water quality standards of receiving waters.

a. WATER QUALITY IMPROVEMENT GOALS AND SCHEDULES

(1) Numeric Goals

The Copermittees must develop and incorporate numeric goals[7] into the

[7] Interim and final numeric goals may take a variety of forms such as TMDL established WQBELs, action levels, pollutant concentration, load reductions, number of impaired water bodies delisted from the List of Water Quality Impaired Segments, Index of Biotic Integrity (IBI) scores, or other appropriate metrics. Interim and final numeric goals are not necessarily limited to one criterion or indicator, but may include multiple criteria and/or indicators. Except for TMDL established WQBELs, interim and final numeric goals and corresponding schedules may be revised through the adaptive management process under Provision B.5.

Water Quality Improvement Plan. Numeric goals must be used to support Water Quality Improvement Plan implementation and measure reasonable progress towards addressing the highest priority water quality conditions identified under Provision B.2.c. The Copermittees must establish and incorporate the following numeric goals in the Water Quality Improvement Plan:

(a) Final numeric goals must be based on measureable criteria or indicators capable of demonstrating one or more of the following:

(i) Discharges from the Copermittees' MS4s will not cause or contribute to exceedances of water quality standards in receiving waters, AND/OR

(ii) The conditions of receiving waters and associated habitat are protected from MS4 discharges, AND/OR

(iii) Beneficial uses of receiving waters are protected from MS4 discharges and will be supported.

(b) Interim numeric goals must be based on measureable criteria or indicators capable of demonstrating reasonable incremental progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges as follows:

(i) One or more interim numeric goals may be established to demonstrate progress toward achieving each final numeric goal,

(ii) For each final numeric goal, at least one interim numeric goal must be expressed as a reasonable increment toward achievement of the final numeric goal,

(iii) For each final numeric goal, reasonable interim numeric goals must be established to be accomplished during each 5 year period between the acceptance of the Water Quality Improvement Plan and the achievement of the final numeric goals.

(2) <u>Schedules for Achieving Numeric Goals</u>

The Copermittees must develop and incorporate schedules for achieving the numeric goals into the Water Quality Improvement Plan. The schedules must demonstrate reasonable progress toward achieving the final numeric goals required for Provision B.3.a.(1). The Copermittees must incorporate the schedules for achieving the numeric goals into the Water Quality Improvement Plan based on the following considerations:

(a) Final dates for achieving all final numeric goals must be established considering the following:

(i) Final compliance dates for any applicable TMDLs in Attachment E to this Order;

(ii) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(iii) Achievement of the final numeric goals for the highest water quality priorities must be as soon as possible;

(iv) Final dates for achieving the final numeric goals must reflect a realistic assessment of the shortest practicable time required based on the temporal and spatial extent and factors associated with the highest priority water quality conditions identified under Provision B.2.c, and taking into account the time reasonably required to implement the water quality improvement strategies required pursuant to Provision B.3.b.

(b) Interim dates for achieving all interim numeric goals must be established considering the following:

(i) Interim compliance dates for any applicable TMDLs in Attachment E to this Order;

(ii) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(iii) Interim dates for achieving the interim numeric goals must reflect a realistic assessment of the shortest practicable time reasonably required, taking into account the time needed to implement new or significantly expanded programs and securing financing, if necessary; and

(iv) For each final numeric goal, at least one interim numeric goal must be established that the Copermittees will work toward achieving within the term of this Order.

b. WATER QUALITY IMPROVEMENT STRATEGIES AND SCHEDULES

Based on the likely effectiveness and efficiency of the potential water quality improvement strategies identified under Provision B.2.e to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a, the Copermittees must identify the strategies that will be implemented in each Watershed Management Area as follows:

(1) Jurisdictional Strategies

(a) Each Copermittee in the Watershed Management Area must identify the strategies that will be implemented within its jurisdiction as part of its jurisdictional runoff management program requirements under Provisions E.2 through E.7, including descriptions of the following:

(i) For each of the inventories developed for its jurisdiction, as required under Provisions D.2.a.(1), E.3.e.(2), E.4.b, and E.5.a, each Copermittee must identify the known and suspected areas or sources causing or contributing to the highest priority water quality conditions in the Watershed Management Area that the Copermittee will focus on in its efforts to effectively prohibit non-storm water discharges to its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, and achieve the interim and final numeric goals identified under Provision B.3.a;

(ii) BMPs that each Copermittee will implement, or require to be implemented, as applicable, for those areas or sources within its jurisdiction;

(iii) Education programs that each Copermittee will implement, as applicable, for those areas or sources within its jurisdiction;

(iv) Frequencies that each Copermittee will conduct inspections on those areas or sources within its jurisdiction;

(v) Incentive and enforcement programs that each Copermittee will implement, as applicable, for those areas or sources within its jurisdiction; and

(vi) Any other BMPs, incentives, or programs that each Copermittee will implement for those areas or sources within its jurisdiction.

(b) Identify the optional jurisdictional strategies that each Copermittee will implement within its jurisdiction, as necessary, to effectively prohibit non-storm water discharges to its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. Descriptions of the optional jurisdictional strategies must include:

(i) BMPs, incentives, or programs that may be implemented by the Copermittee within its jurisdiction in addition to the requirements of Provisions B.3.b.(1)(a);

(ii) Incentives or programs that may be implemented by the Copermittee to encourage or implement projects to retrofit areas of existing development within its jurisdiction;

(iii) Incentives or programs that may be implemented by the Copermittee to encourage or implement projects that will rehabilitate the conditions of channels or habitats within its jurisdiction;

(iv) The funds and/or resources that must be secured by the Copermittee to implement the optional strategies described for Provisions B.3.b.(1)(b)(i)-(iii) within its jurisdiction; and

(v) The circumstances necessary to trigger implementation of the optional jurisdictional strategies, in addition to the requirements of Provision B.3.b.(1)(a), to achieve the interim and final numeric goals within the schedules established under Provision B.3.a.

(c) Identify the strategies that will be implemented by the Copermittee in coordination with or with the cooperation of other agencies (e.g. Caltrans, water districts, school districts) and/or entities (e.g. non-governmental organizations) within its jurisdiction.

(2) Watershed Management Area Strategies

The Copermittees must identify the optional regional or multi-jurisdictional strategies that will be implemented in the Watershed Management Area, as necessary, to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. Descriptions of the optional regional or multi-jurisdictional strategies must include:

(a) Regional or multi-jurisdictional BMPs, incentives, or programs that may be implemented by the Copermittees in the Watershed Management Area;

(b) Incentives or programs that may be implemented by the Copermittees in the Watershed Management Area to encourage or implement regional or multi-jurisdictional projects to retrofit areas of existing development;

(c) Incentives or programs that may be implemented by the Copermittees to encourage or implement regional or multi-jurisdictional projects that will rehabilitate the conditions of channels, streams, or habitats within the Watershed Management Area;

(d) The funds and/or resources that must be secured by the Copermittees to implement the optional strategies described for Provisions B.3.b.(2)(a)-(c) within the Watershed Management Area; and

(e) The circumstances necessary to trigger implementation of the optional regional or multi-jurisdictional strategies to achieve the interim and final numeric goals within the schedules established under Provision B.3.a.

(3) Schedules for Implementing Strategies

The Copermittees must develop reasonable schedules for implementing the water quality improvement strategies identified under Provisions B.3.b.(1) and B.3.b.(2) to achieve the interim and final numeric goals identified and schedules established under Provision B.3.a. The Copermittees must incorporate the schedules to implement the water quality improvement strategies into the Water Quality Improvement Plan as follows:

(a) Each Copermittee must develop schedules for the jurisdictional strategies identified pursuant to Provisions B.3.b.(1)(a)-(b). Each schedule must specify:

(i) If each jurisdictional strategy identified pursuant to Provision B.3.b.(1)(a) will or will not be initiated upon acceptance of the Water Quality Improvement Plan;

(ii) For each jurisdictional strategy identified pursuant to Provision B.3.b.(1)(a) that will not be initiated upon acceptance of the Water Quality Improvement Plan, the shortest practicable time in which each jurisdictional strategy will be initiated after acceptance of the Water Quality Improvement Plan;

(iii) For each optional jurisdictional strategy identified pursuant to Provision B.3.b.(1)(b), a realistic assessment of the shortest practicable time required to:

[a] Secure the resources needed to fund the optional jurisdictional strategy, and
[b] Procure the resources, materials, labor, and applicable permits necessary to initiate implementation of the optional jurisdictional strategy;

(iv) If each jurisdictional strategy identified pursuant to Provisions B.3.b.(1)(a)-(b) is expected to be continuously implemented (e.g. inspections) or completed within a schedule (e.g. construction of structural BMP); and

(v) If a jurisdictional strategy identified pursuant to Provisions B.3.b.(1)(a)-(b) is expected to be completed within a schedule, the anticipated time to complete based on a realistic assessment of the shortest practicable time required.

(b) The Copermittees in the Watershed Management Area must develop schedules for the regional or multi-jurisdictional strategies identified pursuant to Provision B.3.b.(2). Each schedule must specify:

(i) A realistic assessment of the shortest practicable time to:

[a] Secure the resources needed to fund the optional regional or multi-jurisdictional strategy, and
[b] Procure the resources, materials, labor, and permits necessary to initiate the implementation of the optional regional or multi-jurisdictional strategy;

(ii) If each regional or multi-jurisdictional strategy identified pursuant to Provision B.3.b.(2) is expected to be continuously implemented (e.g. inspections) or completed within a schedule (e.g. construction of structural BMP); and

(iii) If a regional or multi-jurisdictional strategy and/or activity identified pursuant to Provisions B.3.b.(2) is expected to be completed within a schedule, the anticipated time to complete based on a realistic assessment of the shortest practicable time required.

(4) Optional Watershed Management Area Analysis

(a) For each Watershed Management Area, the Copermittees have the option to perform a Watershed Management Area Analysis for the purpose of developing watershed-specific requirements for structural BMP implementation, as described in Provision E.3.c.(3). The Watershed Management Area Analysis must include GIS layers (maps) as output. The analysis must include the following information, to the extent it is available, in order to characterize the Watershed Management Areas:

(i) A description of dominant hydrologic processes, such as areas where infiltration or overland flow likely dominates;

(ii) A description of existing streams in the watershed, including bed material and composition, and if they are perennial or ephemeral;

(iii) Current and anticipated future land uses;

(iv) Potential coarse sediment yield areas; and

(v) Locations of existing flood control structures and channel structures, such as stream armoring, constrictions, grade control structures, and hydromodification or flood management basins.

(b) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify and compile a list of candidate projects that could potentially be used as

alternative compliance options for Priority Development Projects, to be implemented in lieu of onsite structural BMP performance requirements described in Provisions E.3.c.(1) and E.3.c.(2)(a). Specifically, the Copermittees must identify opportunities to be included in the list of candidate projects in each Watershed Management Area, such as:

(i) Stream or riparian area rehabilitation;

(ii) Retrofitting existing infrastructure to incorporate storm water retention or treatment;

(iii) Regional BMPs;

(iv) Groundwater recharge projects;

(v) Water supply augmentation projects; and

(vi) Land purchases to preserve floodplain functions.

(c) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify areas within the Watershed Management Area where it is appropriate to allow Priority Development Projects to be exempt from the hydromodification management BMP performance requirements described in Provision E.3.c.(2), including supporting rationale.

c. Prohibitions and Limitations Compliance Option

Each Copermittee has the option to utilize the implementation of the Water Quality Improvement Plan to demonstrate compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b within a Watershed Management Area subject to the following conditions:

(1) A Copermittee is eligible to be deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b within a Watershed Management Area when the Water Quality Improvement Plan for a Watershed Management Area incorporates the following:

(a) Numeric goals, water quality improvement strategies, and schedules developed pursuant to Provisions B.3.a and B.3.b that include the following:

(i) Interim and final WQBELs established by the TMDLs in Attachment E to this Order applicable to the Copermittee's jurisdiction within the Watershed Management Area; AND

(ii) Interim and final numeric goals for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012

(included as Attachment A to this Order) applicable to the Copermittee's jurisdiction within the Watershed Management Area; AND

(iii) Interim and final numeric goals applicable to the Copermittee's MS4 discharges within the Watershed Management Area expressed as numeric concentration-based or load-based goals for all pollutants and conditions listed on the Clean Water Act Section 303(d) List of Water Quality Impaired Segments[8] for the receiving waters in the Watershed Management Area that do not have a TMDL incorporated into Attachment E to this Order; AND/OR

(iv) Interim and final numeric goals for pollutants and conditions identified as receiving water priorities in the Water Quality Improvement Plan that will result in chemical, physical, and biological conditions protective of the beneficial uses of the receiving waters impacted by the Copermittee's MS4 discharges within the Watershed Management Area; AND

(v) The Copermittee has the option to include interim and final numeric goals applicable to the Copermittee's MS4 discharges and/or receiving waters within the Watershed Management Area for any pollutants or conditions in addition to those described in Provisions B.3.c.(1)(a)(i)-(iv); AND

(vi) Schedules for achieving each final numeric goal that reflect a realistic assessment of the shortest practicable time needed for achievement; AND

(vii) For each final numeric goal developed pursuant to Provisions B.3.a and B.3.c.(1)(a)(i)-(v), annual milestones[9] and the dates for their achievement must be included within each of the next five (5) Water Quality Improvement Plan Annual Report reporting periods, or until the final numeric goal is achieved. Annual milestones and the dates for their achievement for the 5 Water Quality Improvement Plan Annual Report reporting periods of the next permit term, or until the final numeric goal is achieved, must be provided as part of the Report of Waste Discharge required pursuant to Provision F.5.

(b) An analysis that meets all of the following conditions:

(i) The analysis, with clearly stated assumptions included in the analysis, must quantitatively demonstrate that the implementation of

[8] 2010 and subsequent 303(d) Lists

[9] Annual milestones for each final numeric goal must be clearly and directly linked to, or demonstrate progress is being made toward the achievement of the final numeric goal. The annual milestones may consist of water quality improvement strategy implementation phases, interim numeric goals, and other acceptable metrics. The annual milestones may address multiple numeric goals and/or multiple water bodies, as applicable and appropriate.

the water quality improvement strategies required under Provision B.3.b will achieve the final numeric goals within the schedules developed pursuant to Provisions B.3.a and B.3.c.(1)(a).

(ii) The development of the analysis must include a public participation process which allows the public to review and provide comments on the analysis methodology utilized and the assumptions included in the analysis. Public comments and responses must be included as part of the analysis documentation included in the Water Quality Improvement Plan.

(iii) The analysis may be performed by an individual Copermittee or jointly by two or more Copermittees choosing to utilize this compliance option for their jurisdictions within the Watershed Management Area.

(iv) The analysis must be updated as part of the iterative approach and adaptive management process required under Provisions B.5.a-b.

(c) Specific monitoring and assessments required pursuant to Provision B.4.a that will be performed by the Copermittee capable of 1) demonstrating whether the implementation of the water quality improvement strategies are making progress toward achieving the numeric goals in accordance with the established schedules developed pursuant to Provisions B.3.a and B.3.c.(1)(a), and 2) determining whether interim and final numeric goals have been achieved. The specific monitoring and assessments must be updated as part of the iterative approach and adaptive management process required under Provision B.5.c.

(d) Documentation showing that the numeric goals, schedules, and annual milestones proposed pursuant to Provision B.3.c.(1)(a), the analysis performed pursuant to Provision B.3.c.(1)(b), and the specific monitoring and assessments proposed pursuant to Provision B.3.c.(1)(c) have been reviewed by the Water Quality Improvement Consultation Panel (see Provision F.1.a.(1)(b)). Updates must be reviewed by the Water Quality Improvement Consultation Panel for any recommendations.

(2) Each Copermittee that voluntarily completes the requirements of Provision B.3.c.(1) is deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b for the pollutants and conditions for which numeric goals are developed when the Water Quality Improvement Plan, incorporating the requirements of Provision B.3.c.(1), is accepted by the San Diego Water Board pursuant to Provision F.1.b or F.2.c. The Copermittee is deemed in compliance during the term of this Order as long as:

(a) The Copermittee is implementing the water quality improvement strategies within its jurisdiction developed pursuant to Provision B.3.b.(1) and in

compliance with the schedules for implementing the strategies established pursuant to Provisions B.3.b.(3)(a) and B.3.c.(1)(a)(vii); AND

(b) The Copermittee is performing the monitoring and assessments developed pursuant to Provision B.3.c.(1)(c); AND

(c) The Copermittee's assessments in the Water Quality Improvement Plan Annual Report submitted pursuant to Provision F.3.b.(3) support a conclusion that: 1) the Copermittee is in compliance with the annual milestones and dates for achievement developed pursuant to Provision B.3.c.(1)(a)(vii), OR 2) the Copermittee has provided acceptable rationale and recommends appropriate modifications to the interim numeric goals, and/or water quality improvement strategies, and/or schedules to improve the rate of progress toward achieving the final numeric goals developed pursuant to Provisions B.3.a and B.3.c.(1)(a)(i)-(vi); AND

(d) Any proposed modifications to the numeric goals, strategies, schedules, and/or annual milestones are accepted by the San Diego Water Board as part of subsequent updates to the Water Quality Improvement Plan pursuant to Provision F.2.c;[10] AND

(e) The Copermittee is implementing the requirements of Provision A.4.a.

4. Water Quality Improvement Monitoring and Assessment Program

a. The Copermittees in each Watershed Management Area must develop and incorporate an integrated monitoring and assessment program into the Water Quality Improvement Plan that assesses: 1) the progress toward achieving the numeric goals and schedules, 2) the progress toward addressing the highest priority water quality conditions for each Watershed Management Area, and 3) each Copermittee's overall efforts to implement the Water Quality Improvement Plan.

b. The monitoring and assessment program must incorporate the monitoring and assessment requirements of Provision D, which may allow the Copermittees to modify the program to be consistent with and focus on the highest priority water quality conditions for each Watershed Management Area.

c. For Watershed Management Areas with applicable TMDLs, the monitoring and assessment program must incorporate the specific monitoring and assessment requirements of Attachment E.

[10] A request for proposed changes to the Water Quality Improvement Plan does not stay any permit condition.

d. For Watershed Management Areas with any ASBS, the water quality monitoring and assessment program must incorporate the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

5. Iterative Approach and Adaptive Management Process

The Copermittees in each Watershed Management Area must implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a, and must include the following:

a. RE-EVALUATION OF PRIORITY WATER QUALITY CONDITIONS

The priority water quality conditions and potential water quality improvement strategies included in the Water Quality Improvement Plan pursuant to Provisions B.2.c and B.2.e may be re-evaluated by the Copermittees as needed during the term of this Order as part of the Water Quality Improvement Plan Annual Report. Re-evaluation and recommendations for modifications to the priority water quality conditions and potential water quality improvement strategies must be provided in the Report of Waste Discharge, and must consider the following:

(1) Achieving the outcome of improved water quality in MS4 discharges and receiving waters through implementation of the water quality improvement strategies identified in the Water Quality Improvement Plan;

(2) New information developed when the requirements of Provisions B.2.a-c have been re-evaluated;

(3) Spatial and temporal accuracy of monitoring data collected to inform prioritization of water quality conditions and implementation strategies to address the highest priority water quality conditions;

(4) Availability of new information and data from sources other than the jurisdictional runoff management programs within the Watershed Management Area that informs the effectiveness of the actions implemented by the Copermittees;

(5) San Diego Water Board recommendations; and

(6) Recommendations for modifications solicited through a public participation process.

b. ADAPTATION OF GOALS, STRATEGIES AND SCHEDULES

The water quality improvement goals, strategies and schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.3, must be re-evaluated and adapted as new information becomes available to result in more effective and efficient measures to address the highest priority water quality conditions identified pursuant to Provision B.2.c. Re-evaluation of and modifications to the water quality improvement goals, strategies and schedules must be provided in the Water Quality Improvement Plan Annual Report, and must consider the following:

(1) Modifications to the priority water quality conditions based on Provision B.5.a;

(2) Progress toward achieving interim and final numeric goals in receiving waters and MS4 discharges for the highest priority water quality conditions in the Watershed Management Area,

(3) Progress toward achieving outcomes according to established schedules;

(4) New policies or regulations that may affect identified numeric goals;

(5) Measurable or demonstrable reductions of non-storm water discharges to and from each Copermittee's MS4;

(6) Measurable or demonstrable reductions of pollutants in storm water discharges from each Copermittee's MS4 to the MEP;

(7) New information developed when the requirements of Provisions B.2.b and B.2.d have been re-evaluated;

(8) Efficiency in implementing the Water Quality Improvement Plan;

(9) San Diego Water Board recommendations; and

(10) Recommendations for modifications solicited through a public participation process.

c. ADAPTATION OF MONITORING AND ASSESSMENT PROGRAM

The water quality improvement monitoring and assessment program, included in the Water Quality Improvement Plan pursuant to Provision B.4, must be re-evaluated and adapted when new information becomes available. Re-evaluation and recommendations for modifications to the monitoring and assessment program, pursuant to the requirements of Provision D, may be provided in the Water Quality Improvement Plan Annual Report, but must be provided in the Report of Waste Discharge.

d. ADAPTATION OF PROHIBITIONS AND LIMITATIONS COMPLIANCE OPTION

If a Copermittee has implemented the Prohibitions and Limitations Compliance Option allowed to be included in the Water Quality Improvement Plan pursuant to Provision B.3.c, the Copermittee must re-evaluate and adapt the numeric goals, water quality improvement strategies, schedules, and annual milestones required under Provision B.3.c.(1) when significant new information becomes available, or with the Report of Waste Discharge required pursuant to Provision F.5. Significant changes in the numeric goals, water quality improvement strategies, schedules, or annual milestones requires an update to the analysis required under Provision B.3.c.(2).

6. Water Quality Improvement Plan Submittal, Updates, and Implementation

a. The Copermittees must submit and commence implementation of the Water Quality Improvement Plans in accordance with the requirements of Provision F.1.

b. The Copermittees must submit proposed updates to the Water Quality Improvement Plan for acceptance by the San Diego Water Board Executive Officer in accordance with the requirements of Provision F.2.c.

C. ACTION LEVELS

The purpose of this provision is for the Copermittees to incorporate numeric action levels in the Water Quality Improvement Plans. The goal of the action levels is to guide Water Quality Improvement Plan implementation efforts and measure progress towards the protection of water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through monitoring and assessing the quality of the MS4 discharges during the implementation of the Water Quality Improvement Plans.

1. Non-Storm Water Action Levels[11]

The Copermittees must develop and incorporate numeric non-storm water action levels (NALs) into the Water Quality Improvement Plan to: 1) support the development and prioritization of water quality improvement strategies for effectively prohibiting non-storm water discharges to the MS4s, 2) assess the effectiveness of the water quality improvement strategies toward addressing MS4 non-storm water discharges, required pursuant to Provision D.4.b.(1), and 3) support the detection and elimination of non-storm water and illicit discharges to the MS4, required pursuant to Provision E.2.[12]

a. The following NALs must be incorporated:

(1) Non-Storm Water Discharges from MS4s to Ocean Surf Zone

Table C-1. Non-Storm Water Action Levels for Discharges from MS4s to Ocean Surf Zone

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Total Coliform	MPN/100 ml	1,000	-	10,000/1,000[1]	OP
Fecal Coliform	MPN/100 ml	200[2]	-	400	OP
Enterococci	MPN/100 ml	35	-	104[3]	OP

Abbreviations/Acronyms
AMAL – average monthly action level
MDAL – maximum daily action level
OP – Ocean Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Total coliform density NAL is 1,000 MPN/100 ml when the fecal/total coliform ratio exceeds 0.1.
2. Fecal coliform density NAL is 200 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas."

[11] NALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, unless the NAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed.
[12] The Copermittees may utilize NALs or other benchmarks currently established by the Copermittees as interim NALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

(2) Non-Storm Water Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Table C-2. Non-Storm Water Action Levels for Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Turbidity	NTU	75	-	225	OP
pH	Units	Within limit of 6.0 to 9.0 at all times			OP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	35	-	104[3]	BP
Priority Pollutants	µg/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
OP – Ocean Plan water quality objective
NTU – Nephelometric Turbidity Units
µg/L – micrograms per liter
MDAL – maximum daily action level
BP – Basin Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas" and is not applicable to water bodies that are not designated with the water contact recreation (REC-1) beneficial use.

Table C-3. Non-Storm Water Action Levels for Priority Pollutants

Parameter	Units	Freshwater (CTR)		Saltwater (CTR)	
		MDAL	AMAL	MDAL	AMAL
Cadmium	µg/L	**	**	16	8
Copper	µg/L	*	*	5.8	2.9
Chromium III	µg/L	**	**	-	-
Chromium VI	µg/L	16	8.1	83	41
Lead	µg/L	*	*	14	2.9
Nickel	µg/L	**	**	14	6.8
Silver	µg/L	*	*	2.2	1.1
Zinc	µg/L	*	*	95	47

Abbreviations/Acronyms:
CTR – California Toxic Rule
AMAL – average monthly action level
µg/L – micrograms per liter
MDAL – maximum daily action level

Notes:
* Action levels developed on a case-by-case basis (see below)
** Action levels developed on a case-by-case basis (see below), but calculated criteria are not to exceed Maximum Contaminant Levels (MCLs) under the California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64431

The Cadmium, Copper, Chromium (III), Lead, Nickel, Silver and Zinc NALs for MS4 discharges to freshwater receiving waters will be developed on a case-by-case basis based on site-specific water quality data (receiving water hardness). For these priority pollutants, refer to 40 CFR 131.38(b)(2).

(3) Non-Storm Water Discharges from MS4s to Inland Surface Waters

Table C-4. Non-Storm Water Action Levels for Discharges from MS4s to Inland Surface Waters

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Dissolved Oxygen	mg/L	Not less than 5.0 in WARM waters and not less than 6.0 in COLD waters			BP
Turbidity	NTU	-	20	See MDAL	BP
pH	Units	Within limit of 6.5 to 8.5 at all times			BP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	33	-	61[3]	BP
Total Nitrogen	mg/L	-	1.0	See MDAL	BP
Total Phosphorus	mg/L	-	0.1	See MDAL	BP
MBAS	mg/L	-	0.5	See MDAL	BP
Iron	mg/L	-	0.3	See MDAL	BP
Manganese	mg/L	-	0.05	See MDAL	BP
Priority Pollutants	µg/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
BP – Basin Plan water quality objective
COLD – cold freshwater habitat beneficial use
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
MDAL – maximum daily action level
WARM – warm freshwater habitat beneficial use
MBAS – Methylene Blue Active Substances
MPN/100 ml – most probable number per 100 milliliters
µg/L – micrograms per liter

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for freshwater "designated beach areas" and is not applicable to water bodies that are not designated with the water contact recreation (REC-1) beneficial use.

b. If not identified in Provision C.1.a, NALs must be identified, developed and incorporated in the Water Quality Improvement Plan for any pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in receiving waters associated with the highest priority water quality conditions related to non-storm water discharges from the MS4s. NALs must be based on:

(1) Applicable water quality standards which may be dependent upon site-specific or receiving water-specific conditions or assumptions to be identified by the Copermittees; or

(2) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the NALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary NALs specific to the Watershed Management Area at levels greater than the NALs required by Provisions C.1.a and C.1.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for effectively prohibiting non-storm water discharges to the MS4s, as well as the detection and

elimination of non-storm water and illicit discharges to and from the MS4. The secondary NALs may be developed using an approach acceptable to the San Diego Water Board.

d. Dry weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.b may be utilized to develop or revise NALs based on watershed-specific data, subject to San Diego Water Board Executive Officer approval.

2. Storm Water Action Levels[13]

The Copermittees must develop and incorporate numeric storm water action levels (SALs) in the Water Quality Improvement Plans to: 1) support the development and prioritization of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s, and 2) assess the effectiveness of the water quality improvement strategies toward reducing pollutants in storm water discharges, required pursuant to Provision D.4.b.(2).[14]

a. The following SALs for discharges of storm water from the MS4 must be incorporated:

Table C-5. Storm Water Action Levels for Discharges from MS4s to Receiving Waters

Parameter	Units	Action Level
Turbidity	NTU	126
Nitrate & Nitrite (Total)	mg/L	2.6
Phosphorus (Total P)	mg/L	1.46
Cadmium (Total Cd)*	µg/L	3.0
Copper (Total Cu)*	µg/L	127
Lead (Total Pb)*	µg/L	250
Zinc (Total Zn)*	µg/L	976

Abbreviations/Acronyms:
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
µg/L – micrograms per liter

Notes:
* The sampling must include a measure of receiving water hardness at each MS4 outfall. If a total metal concentration exceeds the corresponding metals SAL in Table C-5, that concentration must be compared to the California Toxics Rule criteria and the USEPA 1-hour maximum concentration for the detected level of receiving water hardness associated with that sample. If it is determined that the sample's total metal concentration for that specific metal exceeds that SAL, but does not exceed the applicable USEPA 1-hour maximum concentration criterion for the measured level of hardness, then the sample result will not be considered above the SAL for that measurement.

[13] SALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, unless the SAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed.

[14] The Copermittees may utilize SALs or other benchmarks currently established by the Copermittees as interim SALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

b. If not identified in Provision C.2.a, SALs must be identified, developed and incorporated in the Water Quality Improvement Plan for pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in receiving waters associated with the highest priority water quality conditions related to storm water discharges from the MS4s. SALs must be based on:

(1) Federal and State water quality guidance and/or water quality standards; and

(2) Site-specific or receiving water-specific conditions; or

(3) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the SALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary SALs specific to the Watershed Management Area at levels greater than the SALs required by Provisions C.2.a and C.2.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s. The secondary SALs may be developed based on the approaches recommended by the State Water Board's Storm Water Panel[15] or using an approach acceptable to the San Diego Water Board.

d. Wet weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.c may be used to develop or revise SALs based upon watershed-specific data, subject to San Diego Water Board Executive Officer approval.

[15] Storm Water Panel Recommendations to the California State Water Resources Control Board: The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities (June 2006)

D. MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS

The purpose of this provision is for the Copermittees to monitor and assess the impact on the conditions of receiving waters caused by discharges from the Copermittees' MS4s under wet weather and dry weather conditions. The goal of the monitoring and assessment program is to inform the Copermittees about the nexus between the health of receiving waters and the water quality condition of the discharges from their MS4s. This goal will be accomplished through monitoring and assessing the conditions of the receiving waters, discharges from the MS4s, pollutant sources and/or stressors, and effectiveness of the water quality improvement strategies implemented as part of the Water Quality Improvement Plans.

1. Receiving Water Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the condition of the receiving waters in each Watershed Management Area during dry weather and wet weather. Following San Diego Water Board acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct long-term receiving water monitoring during implementation of the Water Quality Improvement Plan to assess the long term trends and determine if conditions in receiving waters are improving. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following receiving water monitoring procedures:

a. TRANSITIONAL RECEIVING WATER MONITORING

Until the monitoring requirements and schedules of Provisions D.1.b-e are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following receiving water monitoring in the Watershed Management Area:

(1) Continue the receiving water monitoring programs required in Order Nos. R9-2007-0001 (Monitoring and Reporting Program No. R9-2007-0001 Sections II.A.1-A.5), R9-2009-0002, and R9-2010-0016, unless the Executive Officer provides conditional approval for Copermittees to proceed with implementation of the proposed monitoring and assessment program developed in accordance with Provision B.4;

(2) Continue the monitoring in the Hydromodification Management Plans approved by the San Diego Water Board;

(3) Participate in the following regional receiving water monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring,

(b) Southern California Bight Regional Monitoring, and

(c) Sediment Quality Monitoring;

(4) Implement the monitoring programs developed as part of any implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) for the TMDLs in Attachment E to this Order; and

(5) For Watershed Management Areas with ASBS, implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

b. LONG-TERM RECEIVING WATER MONITORING STATIONS

The Copermittees must select at least one long-term receiving water monitoring station from among the existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees to be representative of the receiving water quality in the Watershed Management Area. Additional long-term receiving water monitoring stations must be selected where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

c. DRY WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three dry weather monitoring events at each of the long-term receiving water monitoring stations. At least one monitoring event must be conducted during the dry season (May 1 – September 30) and at least one monitoring event must be conducted during a dry weather period during the wet season (October 1 – April 30), after the first wet weather event of the season, with an antecedent dry period of at least 72 hours following a storm event producing measureable rainfall of greater than 0.1 inch.

(1) Dry Weather Receiving Water Field Observations

For each dry weather monitoring event, the Copermittees must record field observations consistent with Table D-1 at each long-term receiving water monitoring station.

Table D-1. Field Observations for Receiving Water Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) • Station description (i.e. deposits or stains, vegetation condition, structural condition, and observable biology) • Presence and assessment of trash in and around station

(2) Dry Weather Receiving Water Field Monitoring

For each dry weather monitoring event, if conditions allow the collection of the data, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

Table D-2. Field Monitoring Parameters for Receiving Water Monitoring Stations

Parameters
• pH • Temperature • Specific conductivity • Dissolved oxygen • Turbidity

(3) Dry Weather Receiving Water Analytical Monitoring

For each dry weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable NAL constituents, and

(v) Constituents listed in Table D-3.

Table D-3. Analytical Monitoring Constituents for Receiving Water Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Pesticides	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Mercury • Nickel • Selenium • Thallium • Zinc	• Organophosphate Pesticides • Pyrethroid Pesticides	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(4) Dry Weather Receiving Water Toxicity Monitoring

For each dry weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for aquatic toxicity in accordance with Table D-4. When the State Water Board's Policy for Toxicity Assessment and Control (Toxicity Policy) is approved and in effect, the San Diego Water Board Executive Officer may direct the Copermittees to replace current toxicity program elements with standardized procedures in the Toxicity Policy.

Table D-4. Dry Weather Chronic[1] Toxicity Testing for Receiving Water Monitoring Stations

Organism	Units	Test	USEPA Protocol
Freshwater			
Pimephales promelas (Fathead Minnow)	Pass / Fail	Larval Survival and Growth	EPA-821-R-02-013
Ceriodaphnia dubia (*Daphnid*)	Pass / Fail	Survival and Production	EPA-821-R-02-013
Selenastrum capricornutum (Green Algae)	Pass / Fail	Growth	EPA-821-R-02-013
Marine and Estuarine			
Strongylocentrotus purpuratus *(Purple Sea Urchin)*	Pass / Fail	Embryo-Larval Development	EPA-600-R-95-136

Notes:
1. Chronic toxicity testing is not required at receiving water monitoring stations located at mass loading stations if the channel flows are diverted year-round during dry weather conditions to the sanitary sewer for treatment.

(a) Freshwater Test Species and Methods: If samples are collected in receiving waters with salinity less than 1 ppt, the Copermittees must follow the methods for chronic toxicity tests as established in 40 CFR 136.3 using a single-concentration test design for routine monitoring, or a five-concentration test design for additional toxicity testing if the limitation is exceeded. The Copermittees must estimate the critical life stage chronic toxicity on undiluted samples in accordance with species and short term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms (EPA-821-R-02-013; Table IA, 40 CFR 136). Additional test species may be used by the Copermittees if approved by the San Diego Water Board Executive Officer. The Copermittees must conduct:

(i) A static renewal toxicity test with the fathead minnow, *Pimephales promelas* (Larval Survival and Growth Test Method 1000.0);

(ii) A static renewal toxicity test with the daphnid, *Ceriodaphnia dubia* (Survival and Reproduction Test Method 1002.0); and

(iii) A static renewal toxicity test with the green alga, *Selenastrum capricornutum* (also named *Raphidocelis subcapitata*) (Growth Test Method 1003.0).

(b) Marine and Estuarine Test Species and Methods: If samples are collected in receiving waters with salinity greater or equal to 1 ppt, the Copermittees must follow the methods for chronic toxicity tests as established in 40 CFR 136.3 using a single-concentration test design for routine monitoring, or a five-concentration test design for additional toxicity testing if the limitation is exceeded. The Copermittees must conduct the following critical life state chronic toxicity tests on undiluted samples in accordance with species and short term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms (EPA-600-R-95-136; 1995). Artificial sea salts must be used to increase sample salinity. The Copermittees must conduct a static non-renewal toxicity test with the purple sea urchin, *Strongylocentrotus purpuratus* (Embryo-larval Development Test Method). Additional species may be used by the Copermittees if approved by the San Diego Water Board Executive Officer.

(c) Holding Times: All toxicity tests must be conducted as soon as possible following sample collection. The 36-hour sample holding time for test initiation shall be targeted. However, no more than 72 hours shall elapse before the conclusion of sample collection and test initiation.

(d) Test Species Sensitivity Screening: To determine the most sensitive test species for freshwater, the Copermittees must screen 2 wet weather and 2 dry weather toxicity tests with a vertebrate, an invertebrate, and a plant species. After this screening period, subsequent monitoring must be conducted using the most sensitive test species. Alternatively, if a sensitive test species has already been determined, or if there is prior knowledge of potential toxicant(s) and a test species is sensitive to such toxicant(s), then monitoring must be conducted using only that test species. Sensitive test species determinations must also consider the most sensitive test species used for proximal receiving water monitoring. Rescreening must occur once each permit term.

(e) Chronic toxicity test biological endpoint data must be analyzed using the Test of Significant Toxicity t-test approach specified in *National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document* (USEPA, Office of Wastewater Management, Washington, D.C., EPA-833-R-10-003, 2010). For this monitoring program, the critical chronic instream waste concentration (IWC) is set at 100 percent receiving water (i.e. no dilution) for receiving water samples. A 100 percent receiving water and a control must be tested.

(f) Toxicity Identification Evaluation (TIE) / Toxicity Reduction Evaluation (TRE): If chronic toxicity is detected in receiving waters, the Copermittees must discuss the need for conducting a TIE/TRE in the assessments

required under Provision D.4.a.(2), and develop a plan for implementing the TIE/TRE to be incorporated in the Water Quality Improvement Plan.

(5) Dry Weather Receiving Water Bioassessment Monitoring

Bioassessment monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must conduct bioassessment monitoring during at least one dry weather monitoring event at each long-term receiving water monitoring station as follows:

(a) The following bioassessment samples and measurements must be collected:

(i) Macroinvertebrate samples must be collected in accordance with the "Reachwide Benthos (Multihabitat) Procedure" in the most current Surface Water Ambient Monitoring Program (SWAMP) Bioassessment Standard Operating Procedures (SOP), and amendments, as applicable;[16]

(ii) The "Full" suite of physical habitat characterization measurements must be collected in accordance with the most current SWAMP Bioassessment SOP, and as summarized in the SWAMP Stream Habitat Characterization Form – Full Version;[17] and

(iii) Freshwater algae samples must be collected in accordance with the SWAMP Standard Operating Procedures for Collecting Algae Samples.[18] Analysis of samples must include algal taxonomic composition (diatoms and soft algae) and algal biomass.

(b) The bioassessment samples, measurements, and appropriate water chemistry data must be used to calculate the following:

(i) An Index of Biological Integrity (IBI) for macroinvertebrates for each monitoring station where bioassessment monitoring was conducted, based on the most current calculation method;[19] and

[16] Ode, P.R.. 2007. Standard operating procedures for collecting macroinvertebrate samples and associated physical and chemical data for ambient bioassessments in California. California State Water Resources Control Board Surface Water Ambient Monitoring Program (SWAMP) Bioassessment SOP 001. http://www.swrcb.ca.gov/water_issues/programs/swamp/tools.shtml#monitoring

[17] Available at: http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/reports/fieldforms_fullversion052908.pdf

[18] Fetscher et al. 2009. Standard Operating Procedures for Collecting Stream Algae Samples and Associated Physical Habitat and Chemical Data for Ambient Bioassessments in California.

[19] The most current calculation method at the time the Order was adopted is outlined in "A Quantitative Tool for Assessing the Integrity of Southern California Coastal Streams" (Ode, et al. 2005. Environmental Management. Vol. 35, No. 1, pp. 1-13). If an updated or new calculation method is developed, either both

(ii) An IBI for algae for each monitoring station where bioassessment monitoring was conducted, when a calculation method is developed.[20]

(c) In lieu of the requirements of Provision D.1.c.(5)(a), the Copermittees may conduct the bioassessment monitoring in accordance with the "Triad" assessment approach[21] to calculate the IBIs required for Provision D.1.c.(5)(b). The Copermittees must conduct sampling, analysis, and reporting of specified in-stream biological and habitat data according to the protocols specified in the SCCWRP Technical Report No. 539, or subsequent protocols, if developed.

(6) Dry Weather Receiving Water Hydromodification Monitoring

In addition to the hydromodification monitoring conducted as part of the Copermittees' Hydromodification Management Plans, hydromodification monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must collect the following hydromodification monitoring observations and measurements within an appropriate domain of analysis during at least one dry weather monitoring event for each long-term receiving water monitoring station:

(a) Channel conditions, including:

(i) Channel dimensions,

(ii) Hydrologic and geomorphic conditions, and

(iii) Presence and condition of vegetation and habitat;

(b) Location of discharge points;

(c) Habitat integrity;

(d) Photo documentation of existing erosion and habitat impacts, with location (i.e. latitude and longitude coordinates) where photos were taken;

(e) Measurement or estimate of dimensions of any existing channel bed or bank eroded areas, including length, width, and depth of any incisions; and

(i.e. current and updated/new) methods must be used, or historical IBIs must be recalculated with the updated or new calculation method.

[20] When a calculation method is developed, IBIs must be calculated for all available and appropriate historical data.

[21] Stormwater Monitoring Coalition Model Monitoring Technical Committee, 2004. Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California. Technical Report #419. August 2004.

(f) Known or suspected cause(s) of existing downstream erosion or habitat impact, including flow, soil, slope, and vegetation conditions, as well as upstream land uses and contributing new and existing development.

d. WET WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three wet weather monitoring events at each long-term receiving water monitoring station. At least one wet weather monitoring event must be conducted during the first wet weather event of the wet season (October 1 – April 30), and at least one wet weather monitoring event during a wet weather event that occurs after February 1.

(1) Wet Weather Receiving Water Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each long-term receiving water monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event;

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(d) Presence and assessment of trash in and around station.

(2) Wet Weather Receiving Water Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

(3) Wet Weather Receiving Water Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) Constituents listed in Table D-3.

(4) <u>Wet Weather Receiving Water Toxicity Monitoring</u>

For each wet weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for chronic aquatic toxicity in accordance with Provisions D.1.c.(4)(a)-(f).

e. OTHER RECEIVING WATER MONITORING REQUIREMENTS

(1) Regional Monitoring

The Copermittees must participate in the following regional receiving waters monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring; and

(b) Southern California Bight Regional Monitoring and

(c) Unified Beach Water Quality Monitoring and Assessment Program. The Orange County Copermittees shall participate in and, together with South Orange County Wastewater Authority and Orange County Health Care Agency, shall share responsibility for implementation of a unified regional beach water quality monitoring and assessment program in south Orange County, as set forth in the October 2014 report, *Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County* , issued pursuant to CWC section 13383 and subject to future revision in the San Diego Water Board December 5, 2014 Letter Directive.

(2) Sediment Quality Monitoring

The Copermittees must perform sediment monitoring to assess compliance with sediment quality receiving water limits applicable to MS4 discharges to enclosed bays and estuaries. The monitoring may be performed either by individual or multiple Copermittees to assess compliance with receiving water limits, or through participation in a water body monitoring coalition. A Sediment Monitoring Plan which satisfies the requirements of the State Water Board's Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part 1 Sediment Quality (Sediment Control Plan) must be submitted as part of the monitoring and assessment program in the Water Quality Improvement Plan.

(a) The Sediment Monitoring Plan design must include the following:

(i) The elements required under Section VII.D (Receiving Water Limits Monitoring Frequency) and Section VII.E (Sediment Monitoring) of the Sediment Control Plan;

(ii) A Quality Assurance Project Plan (QAPP) describing the project objectives and organization, functional activities, and quality assurance/quality control protocols for the water and sediment monitoring; and

(iii) A schedule for completion of all sample collection and analysis activities and submission of Sediment Monitoring Reports.

(b) The Copermittees must implement the Sediment Monitoring Plan in accordance with the schedule contained in the Sediment Monitoring Plan, unless otherwise directed in writing by the San Diego Water Board Executive Officer.

(c) The Copermittees must incorporate a Sediment Monitoring Report as part of the Water Quality Improvement Plan Annual Report in accordance with the schedule contained in the Sediment Monitoring Plan, unless otherwise directed in writing by the San Diego Water Board Executive Officer. The Sediment Monitoring Report must contain the following information:

(i) Analysis: An evaluation, interpretation and tabulation of the water and sediment monitoring data, including interpretations and conclusions as to whether applicable Receiving Water Limitations in this Order have been attained at each sample station;

(ii) Sample Location Map: The locations, type, and number of samples must be identified and shown on a site map; and

(iii) California Environmental Data Exchange Network: A statement certifying that the monitoring data and results have been uploaded into the California Environmental Data Exchange Network (CEDEN).

(d) Based on the Sediment Monitoring Report conclusions the San Diego Water Board may require a human health risk assessment to determine if the human health objective contained in Receiving Water Limitations in Provision A.2.a.(3)(b)(ii) has been attained at each sample station. In conducting a risk assessment, the Copermittees must consider any applicable and relevant information, including California Environmental Protection Agency's (Cal/EPA) Office of Environmental Health Hazard Assessment (OEHHA) policies for fish consumption and risk assessment, Cal/EPA's Department of Toxic Substances Control (DTSC) Risk Assessment, and USEPA Human Health Risk Assessment policies.

(3) ASBS Monitoring

For Watershed Management Areas with ASBS, the Copermittees must implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

f. ALTERNATIVE WATERSHED MONITORING REQUIREMENTS

The San Diego Water Board may direct the Copermittees to participate in an effort to develop alternative watershed monitoring with other regulated entities, other interested parties, and the San Diego Water Board to refine, coordinate, and implement regional monitoring and assessment programs to determine the status and trends of water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams.

2. MS4 Outfall Discharge Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the discharges from the MS4 outfalls in each Watershed Management Area during dry weather and wet weather. Following San Diego Water Board acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct MS4 outfall discharge monitoring during implementation of the Water Quality Improvement Plan to assess the effectiveness of their jurisdictional runoff management programs toward effectively prohibiting non-storm water discharges into the MS4 and reducing pollutants in storm water discharges from their MS4s to the MEP. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following MS4 outfall monitoring procedures:

a. TRANSITIONAL MS4 OUTFALL DISCHARGE MONITORING

Until the monitoring requirements and schedules of Provisions D.2.b-c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following MS4 outfall discharge monitoring in the Watershed Management Area:

(1) MS4 Outfall Discharge Monitoring Station Inventory

Each Copermittee must identify all major MS4 outfalls that discharge directly to receiving waters within its jurisdiction and geo-locate those outfalls on a map of the MS4 pursuant to Provision E.2.b.(1). This information must be compiled into a MS4 outfall discharge monitoring station inventory, and must include the following information:

(a) Latitude and longitude of MS4 outfall point of discharge;

(b) Watershed Management Area;

(c) Hydrologic subarea;

(d) Outlet size;

(e) Accessibility (i.e. safety and without disturbance of critical habitat);

(f) Approximate drainage area; and

(g) Classification of whether the MS4 outfall is known to have persistent dry weather flows, transient dry weather flows, no dry weather flows, or unknown dry weather flows.

(2) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Until the monitoring requirements and schedules of Provision D.2.b are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, each Copermittee must perform dry weather MS4 outfall field screening monitoring to identify non-storm water and illicit discharges within its jurisdiction in accordance with Provision E.2.c, to determine which discharges are transient flows and which are persistent flows, and prioritize the dry weather MS4 discharges that will be investigated and eliminated in accordance with Provision E.2.d.

(a) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Frequency

Each Copermittee must field screen the MS4 outfalls in its inventory developed pursuant to Provision D.2.a.(1) as follows:

(i) For Copermittees with less than 125 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 80 percent of the outfalls must be visually inspected two times per year during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv).

(ii) For Copermittees with 125 major MS4 outfalls or more, but less than or equal to 500 that discharge to receiving waters within a Watershed Management Area, all the outfalls must be visually inspected at least annually during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv).

(iii) For Copermittees with more than 500 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 500 outfalls must be visually inspected at least annually during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv). Copermittees with more than 500 major MS4 outfalls within a Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;

[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(iv) For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major MS4 outfalls within its jurisdiction, at least 500 major MS4 outfalls within its inventory must be visually inspected at least annually during dry weather conditions. Copermittees with more than 500 major MS4 outfalls in more than one Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(v) Inspections of major MS4 outfalls conducted in response to public reports and staff or contractor reports and notifications may count toward the required visual inspections of MS4 outfall discharge monitoring stations.

(b) Transitional Dry Weather MS4 Outfall Discharge Field Screening Visual Observations

(i) An antecedent dry period of at least 72 hours following any storm event producing measurable rainfall greater than 0.1 inch is required prior to conducting field screening visual observations during a field screening monitoring event.

(ii) During the field screening monitoring event, each Copermittee must record visual observations consistent with Table D-5 at each MS4 outfall discharge monitoring station inspected.

Table D-5. Field Screening Visual Observations for MS4 Outfall Discharge Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) - Flow source(s) suspected or identified from non-storm water source investigation - Flow source(s) eliminated during non-storm water source identification • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) - Known or suspected source(s) of pooled or ponded water • Station description (i.e. deposits or stains, vegetation condition, structural condition, observable biology) • Presence and assessment of trash in and around station • Evidence or signs of illicit connections or illegal dumping

(iii) Each Copermittee must implement the requirements of Provisions E.2.d.(2)(c)-(e) based on the field observations required pursuant to Provision D.2.a.(2)(b)(ii).

(iv) Each Copermittee must evaluate field observations together with existing information available from prior reports, inspections and monitoring results to determine whether any observed flowing, pooled, or ponded waters are likely to be transient or persistent flow.[22]

(c) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Records

Based upon the results of the transitional dry weather MS4 outfall discharge field screening monitoring conducted pursuant to Provisions D.2.a.(2)(a)-(b), each Copermittee must update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow.

(3) Transitional Wet Weather MS4 Outfall Discharge Monitoring

Until the monitoring requirements and schedules of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the

[22] Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(a) Transitional Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees must select wet weather MS4 outfall discharge monitoring stations from the inventories developed pursuant to Provision D.2.a.(1) for each Watershed Management Area as follows:

(i) At least five wet weather MS4 outfall discharge monitoring stations that are representative of storm water discharges from areas consisting primarily of residential, commercial, industrial, and typical mixed-use land uses present within the Watershed Management Area;

(ii) At least one wet weather MS4 outfall discharge monitoring station for each Copermittee within the Watershed Management Area; and

(iii) The County of San Diego may select at least two (2) wet weather MS4 outfall discharge monitoring stations for the portion of the Santa Margarita River Watershed Management Area within its jurisdiction to be monitored during the transitional period until the Riverside County Copermittees are notified of coverage under this Order. After the Riverside County Copermittees are notified of coverage under this Order, the Copermittees in the Watershed Management Area must select wet weather MS4 outfall discharge monitoring stations consistent with the requirements above.

(b) Transitional Wet Weather MS4 Outfall Discharge Monitoring Frequency

Each wet weather MS4 outfall discharge monitoring station selected pursuant to Provision D.2.a.(3)(a) must be monitored once during the wet season (October 1 – April 30). The wet weather monitoring events must be selected to be representative of the range of hydrological conditions experienced in the region. At least 10 percent of samples must be conducted during the first wet weather event of the wet season, to include at least one such sample in each Watershed Management Area..

(c) Transitional Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(i) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(ii) The flow rates and volumes measured or estimated from the MS4 outfall (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(d) Transitional Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(e) Transitional Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, and indicator bacteria;

(iv) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

[a] Time-weighted composites collected over the length of the storm event or the first 24 hour period whichever is shorter, composed of discrete samples, which may be collected through the use of automated equipment, or

[b] Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

[c] If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during

the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours;

(v) Only one analysis of the composite of aliquots is required;

(vi) The samples must be analyzed for the following constituents:

[a] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

[b] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and

[c] Constituents listed in Table D-6.

Table D-6. Analytical Monitoring Constituents for Wet Weather MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Nickel • Selenium • Thallium • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(f) Other Transitional Wet Weather MS4 Outfall Discharge Monitoring

The San Diego County Copermittees must continue the wet weather MS4 outfall monitoring program developed under Order No. R9-2007-0001, as approved by the San Diego Water Board, through its planned completion.

b. Dry Weather MS4 Outfall Discharge Monitoring

Each Copermittee must perform dry weather MS4 outfall monitoring to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision

E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. Each Copermittee must conduct the following dry weather MS4 outfall discharge monitoring within its jurisdiction:

(1) Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Each Copermittee must continue to perform the dry weather MS4 outfall discharge field screening monitoring in accordance with the requirements of Provision D.2.a.(2). The Copermittee may adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of persistent flow non-storm water discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of visual inspections performed is equivalent to the number of visual inspections required under Provision D.2.a.(2)(a).

(2) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring

Each Copermittee must perform non-storm water persistent flow MS4 outfall discharge monitoring to determine which persistent non-storm water discharges contain concentrations of pollutants below NALs, and which persistent non-storm water discharges impact receiving water quality during dry weather. Each Copermittee must conduct the following non-storm water persistent flow MS4 outfall discharge monitoring within its jurisdiction:

(a) Prioritization of Non-Storm Water Persistent Flow MS4 Outfalls

Based upon the dry weather MS4 outfall discharge field screening monitoring records developed pursuant to Provision D.2.a.(2)(c), each Copermittee must identify and prioritize the MS4 outfalls with persistent flows based on the highest priority water quality conditions identified in the Water Quality Improvement Plan and any additional criteria developed by the Copermittee, which may include historical data and data from sources other than what the Copermittee collects.

(b) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring Frequency

(i) Based on the prioritization of major MS4 outfalls developed under Provision D.2.b.(2)(a), each Copermittee must identify, at a minimum, the 5 highest priority major MS4 outfalls with non-storm water persistent flows that the Copermittee will monitor within its jurisdiction in each Watershed Management Area. For Responsible Copermittees identified by a TMDL in Attachment E to this Order, if the 5 chosen outfall locations are not sufficient to determine compliance with the TMDL(s), then each Responsible Copermittee

must identify additional MS4 outfall monitoring locations within its jurisdiction sufficient to address compliance with the TMDL(s). If a Copermittee has less than 5 major outfalls within a Watershed Management Area, then the Copermittee must monitor all of its major MS4 outfalls with persistent flows within each Watershed Management Area. The location of the highest priority non-storm water persistent flow MS4 outfall monitoring stations must be identified on the map required pursuant to Provision E.2.b.(1). The map must specify which MS4 outfalls are being monitored for compliance with a TMDL.

(ii) Each of the highest priority non-storm water persistent flow MS4 outfall monitoring stations identified pursuant to Provision D.2.b.(2)(b)(i) must be monitored under dry weather conditions at least semi-annually until one of the following occurs:

[a] The non-storm water discharges have been effectively eliminated (i.e. no flowing, pooled, or ponded water) for three consecutive dry weather monitoring events; or

[b] The source(s) of the persistent flows has been identified as a category of non-storm water discharges that does not require an NPDES permit and does not have to be addressed as an illicit discharge because it was not identified as a source of pollutants (i.e. constituents in non-storm water discharge do not exceed NALs), and the persistent flow can be re-prioritized to a lower priority; or

[c] The constituents in the persistent flow non-storm water discharge do not exceed NALs, and the persistent flow can be re-prioritized to a lower priority; or

[d] The source(s) of the persistent flows has been identified as a non-storm water discharge authorized by a separate NPDES permit.

(iii) Where the criteria under Provision D.2.b.(2)(b)(ii) are not met, but the threat to water quality has been reduced by the Copermittee, the highest priority persistent flow MS4 outfall monitoring stations may be reprioritized accordingly for continued dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1).

(iv) Each Copermittee must document removal or re-prioritization of the highest priority persistent flow MS4 outfall monitoring stations identified under Provision D.2.b.(2)(a) in the Water Quality Improvement Plan Annual Report. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized major MS4 outfall in the Watershed Management Area within its jurisdiction, unless there are no remaining qualifying major MS4 outfalls within the Copermittee's jurisdiction in the Watershed Management Area.

(c) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Observations

During each semi-annual monitoring event, each Copermittee must record field observations consistent with Table D-5 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(d) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Monitoring

During each semi-annual monitoring event, if conditions allow the collection of the data, each Copermittee must monitor and record the parameters in Table D-2 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(e) Non-Storm Water Persistent Flow MS4 Outfall Discharge Analytical Monitoring

During each semi-annual monitoring event in which measurable flow is present, each Copermittee must collect and analyze samples from each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Collect grab or composite samples to be analyzed at a qualified laboratory for the following constituents:

[a] Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,
[b] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,
[c] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,
[d] Applicable NAL constituents, and
[e] Constituents listed in Table D-7. The Copermittees may adjust the list of constituents for the Watershed Management Area if historical data or supporting information can be provided that demonstrates or justifies the analysis of a constituent is not necessary.

Table D-7. Analytical Monitoring Constituents for Persistent Flow MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Total Hardness • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Cadmium • Copper • Lead • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(iv) If the Copermittee identifies and eliminates the source of the persistent flow non-storm water discharge, analysis of the sample is not required.

c. WET WEATHER MS4 OUTFALL DISCHARGE MONITORING

The Copermittees must perform wet weather MS4 outfall monitoring to identify pollutants in storm water discharges from the MS4s, to guide pollutant source identification efforts, and to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order. The Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(1) Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees may adjust the wet weather MS4 outfall discharge monitoring locations in the Watershed Management Area, as needed, to identify pollutants in storm water discharges from MS4s, to guide pollutant source identification efforts, and to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of stations is at least equivalent to the number of stations required under Provision D.2.a.(3)(a). Additional outfall monitoring locations, above the minimum per jurisdiction, may be required to demonstrate compliance with the WQBELs associated with the applicable TMDLs in Attachment E.

(2) Wet Weather MS4 Outfall Discharge Monitoring Frequency

The Copermittees must monitor the wet weather MS4 outfall discharge monitoring stations in the Watershed Management Area at least once (1) per year. The Copermittees may need to increase the frequency of monitoring in order to identify pollutants in storm water discharges from the MS4s causing or contributing to the highest priority water quality conditions, to guide pollutant source identification efforts, or to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order.

(3) Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(4) Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(5) Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites collected over the length of the storm event or the first 24 hour period, whichever is shorter , composed of discrete samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

(iii) If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours.

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) The Copermittees may adjust the analytical monitoring required for the Watershed Management Area, if the Copermittees have historical data or supporting information that can demonstrate or provide justification that the analysis of a constituent is not necessary.

3. Special Studies

a. Within the term of this Order, the Copermittees must initiate the following special studies:

(1) At least two special studies in each Watershed Management Area to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that cause or contribute to highest priority water quality conditions identified in the Water Quality Improvement Plan.

(2) At least one special study for the San Diego Region to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that are impacting receiving waters on a regional basis in the San Diego Region.

(3) One of the two special studies in each Watershed Management Area required pursuant to Provision D.3.a.(1) may be replaced by a special study implemented pursuant to Provision D.3.a.(2).

b. The special studies must, at a minimum, be in conformance with the following criteria:

(1) The special studies must be related to the highest priority water quality conditions identified by the Copermittees in the Watershed Management Area and/or for the entire San Diego Region;

(2) The special studies developed pursuant to Provision D.3.a.(1) must:

(a) Be implemented within the applicable Watershed Management Area, and

(b) Require some form of participation by all the Copermittees within the Watershed Management Area;

(3) The special studies developed pursuant to Provision D.3.a.(2) must:

(a) Be implemented within the San Diego Region, and

(b) Require some form of participation by all Copermittees covered under the requirements of this Order.

(4) The Copermittees are encouraged to partner with environmental groups or third parties knowledgeable of watershed conditions to complete the required special studies.

c. Special studies developed to identify sources of pollutants and/or stressors should be pollutant and/or stressor specific and based on historical monitoring data and monitoring performed pursuant to Provisions D.1 and D.2. Development of source identification special studies should include the following:

(1) A compilation of known information on the specific pollutant and/or stressor, including data on potential sources and movement of the pollutant and/or stressor within the watershed. Data generated by the Copermittees and others, as well as information available from a literature research on the pollutant and/or stressor should be compiled and analyzed as appropriate.

(2) An identification of data gaps, based on the compiled information generated on the specific pollutant and/or stressor identified in Provision D.3.c.(1). Source identification special studies should be developed to fill identified data gaps.

(3) A monitoring plan that will collect and provide data the Copermittees can utilize to do the following:

(a) Quantify the relative loading or impact of a pollutant and/or stressor from a particular source or pollutant generating activity;

(b) Improve understanding of the fate of a pollutant and/or stressor in the environment;

(c) Develop an inventory of known and suspected sources of a pollutant and/or stressor in the Watershed Management Area; and/or

(d) Prioritize known and suspected sources of a pollutant and/or stressor based on relative magnitude in discharges, geographical distribution (i.e., regional or localized), frequency of occurrence in discharges, human health risk, and controllability.

d. Special studies initiated prior to the effective date of this Order that meet the requirements of Provision D.3.b and are implemented during the term of this Order as part of the Water Quality Improvement Plan may be utilized to fulfill the special study requirements of Provision D.3.a. Special studies completed before the effective date of this Order cannot be utilized to fulfill the special study requirements of Provision D.3.a.

e. The Copermittees must submit the monitoring plans for the special studies in the Water Quality Improvement Plans required pursuant to Provision F.1.

f. The Copermittees are encouraged to share the results of the special studies regionally among the Copermittees to provide information useful in improving and adapting the management of non-storm water and storm water runoff through the implementation of the Water Quality Improvement Plans.

4. Assessment Requirements

Each Copermittee must evaluate the data collected pursuant to Provisions D.1, D.2 and D.3, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E, to assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a. Assessments must be performed as described in the following provisions:

a. Receiving Waters Assessments

(1) The Copermittees must assess and report the conditions of the receiving waters in the Watershed Management Area as follows:

(a) Based on data collected pursuant to Provision D.1.a, the assessments under Provision D.4.a.(2) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(b) Based on the data collected pursuant to Provisions D.1.a-e, the assessments required under Provision D.4.a.(2) must be included in the Report of Waste Discharge required pursuant to Provision F.5.b.

(2) The Copermittees must assess the status and trends of receiving water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under dry weather and wet weather conditions. For each of the three types of receiving waters in each Watershed Management Area the Copermittees must:

(a) Determine whether or not the conditions of the receiving waters are meeting the numeric goals established pursuant to Provision B.3.a;

(b) Identify the most critical beneficial uses that must be protected to ensure overall health of the receiving water;

(c) Determine whether or not those critical beneficial uses are being protected;

(d) Identify short-term and/or long-term improvements or degradation of those critical beneficial uses;

(e) Determine whether or not the strategies established in the Water Quality Improvement Plan contribute towards progress in achieving the interim and final numeric goals of the Water Quality Improvement Plan; and

(f) Identify data gaps in the monitoring data necessary to assess Provisions D.4.a.(2)(a)-(e).

b. MS4 OUTFALL DISCHARGES ASSESSMENTS

(1) Non-Storm Water Discharges Reduction Assessments

(a) Each Copermittee must assess and report the progress of its illicit discharge detection and elimination program, required to be implemented pursuant to Provision E.2, toward effectively prohibiting non-storm water and illicit discharges into the MS4 within its jurisdiction as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(2), the assessments under Provision D.4.b.(1)(b) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(ii) Based on the data collected pursuant to Provisions D.2.b, the assessments required under Provision D.4.b.(1)(c) must be included in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

(iii) Based on the data collected pursuant to Provisions D.2.b, the assessment required under Provision D.4.b.(1)(c) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.a.(2), each Copermittee must assess and report the following:

(i) Identify the known and suspected controllable sources (e.g. facilities, areas, land uses, pollutant generating activities) of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area;

(ii) Identify sources of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area that have been reduced or eliminated; and

(iii) Identify modifications to the field screening monitoring locations and frequencies for the MS4 outfalls in its inventory necessary to identify and eliminate sources of persistent flow non-storm water discharges pursuant to Provision D.2.b.

(c) Based on the dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1), each Copermittee must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(1)(b);

(ii) Based on the data collected and applicable NALs in the Water Quality Improvement Plan, rank the MS4 outfalls in the Copermittee's jurisdiction according to potential threat to receiving water quality, and produce a prioritized list of major MS4 outfalls for follow-up action to update the Water Quality Improvement Plan, with the goal of eliminating persistent flow non-storm water discharges and/or pollutant loads in order of the ranked priority list through targeted programmatic actions and source investigations;

(iii) For the highest priority major MS4 outfalls with persistent flows that are in exceedance of NALs, identify the known and suspected sources within the Copermittee's jurisdiction in the Watershed Management Area that may cause or contribute to the NAL exceedances;

(iv) Each Copermittee must analyze the data collected pursuant to Provision D.2.b, and utilize a model or other method, to calculate or estimate the non-storm water volumes and pollutant loads collectively discharged from all the major MS4s outfalls in its jurisdiction identified as having persistent dry weather flows during the monitoring year. These calculations or estimates must be updated annually.

[a] Each Copermittee must calculate or estimate the annual non-storm water volumes and pollutant loads collectively discharged from the Copermittee's major MS4 outfalls to receiving waters within the Copermittee's jurisdiction, with an estimate of the percent contribution from each known source for each MS4 outfall;

[b] Each Copermittee must annually identify and quantify (i.e. volume and pollutant loads) sources of non-storm water not subject to the Copermittee's legal authority that are discharged from the Copermittee's major MS4 outfalls to downstream receiving waters.

(v) Each Copermittee must review the data collected pursuant to Provision D.2.b and findings from the assessments required pursuant to Provision D.4.b.(1)(c)(i)-(iv) at least once during the term of this Order to:

[a] Identify reductions and progress in achieving reductions in non-storm water and illicit discharges to the Copermittee's MS4 in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction, with an estimate, if possible, of the non-storm water volume and/or pollutant load reductions attributable to specific water quality strategies implemented by the Copermittee; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittee in the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction.

(vi) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(1)(c)(i)-(v).

(2) Storm Water Pollutant Discharges Reduction Assessments

(a) The Copermittees must assess and report the progress of the water quality improvement strategies, required to be implemented pursuant to Provisions B and E, toward reducing pollutants in storm water discharges from the MS4s within the Watershed Management Area as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(3), the assessments under Provision D.4.b.(2)(b) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(ii) Based on the data collected pursuant to Provisions D.2.c, the assessments required under Provision D.4.b.(2)(c) must be included in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

(iii) Based on the data collected pursuant to Provisions D.2.c, the assessment required under Provisions D.4.b.(2)(c)-(d) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.a.(3) the Copermittees must assess and report the following:

(i) The Copermittees must analyze the monitoring data collected pursuant to Provision D.2.a.(3), and utilize a watershed model or other method, to calculate or estimate the following for each monitoring year:

[a] The average storm water runoff coefficient for each land use type within the Watershed Management Area;
[b] The volume of storm water and pollutant loads discharged from each of the Copermittee's monitored MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch;
[c] The total flow volume and pollutant loadings discharged from the Copermittee's jurisdiction within the Watershed Management Area over the course of the wet season, extrapolated from the data produced from the monitored MS4 outfalls; and
[d] The percent contribution of storm water volumes and pollutant loads discharged from each land use type within each hydrologic subarea with a major MS4 outfall to receiving waters or within each major MS4 outfall to receiving waters in the Copermittee's jurisdiction within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch.

(ii) Identify modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify pollutants in storm water discharges from the MS4s in the Watershed Management Area pursuant to Provision D.2.c.(1).

(c) Based on the wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.c the Copermittees must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(2)(b);

(ii) Based on the data collected and applicable SALs in the Water Quality Improvement Plan, analyze and compare the monitoring data to the analyses and assumptions used to develop the Water Quality Improvement Plans, including strategies developed pursuant to Provision B.3, and evaluate whether those analyses and assumptions should be updated as a component of the adaptive management efforts pursuant to Provision B.5 for follow-up action to update the Water Quality Improvement Plan;

(iii) The Copermittees must review the data collected pursuant to Provision D.2.c and findings from the assessments required pursuant to Provisions D.4.b.(2)(c)(i)-(ii) at least once during the term of this Order to:

[a] Identify reductions or progress in achieving reductions in pollutant concentrations and/or pollutant loads from different land uses and/or drainage areas discharging from the Copermittees' MS4s in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters within the Watershed Management Area to the MEP, with an estimate, if possible, of the pollutant load reductions attributable to specific water quality strategies implemented by the Copermittees; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittees in the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters in the Watershed Management Area to the MEP.

(iv) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(iii).

(d) The Copermittees must evaluate all the data collected pursuant to Provision D.2.c, and incorporate new outfall monitoring data into time series plots for each long-term monitoring constituent for the Watershed Management Area, and perform statistical trends analysis on the cumulative long-term wet weather MS4 outfall discharge water quality data set.

c. Special Studies Assessments

The Copermittees must annually evaluate the results and findings from the special studies developed and implemented pursuant to Provision D.3, and assess their relevance to the Copermittees' efforts to characterize receiving water conditions, understand sources of pollutants and/or stressors, and control and reduce the discharges of pollutants from the MS4 outfalls to receiving waters in the Watershed Management Area. The Copermittees must report the results of the special studies assessments applicable to the Watershed Management Area, and identify any necessary modifications or updates to the Water Quality Improvement Plan based on the results in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

d. Integrated Assessment of Water Quality Improvement Plan

As part of the iterative approach and adaptive management process required for the Water Quality Improvement Plan pursuant to Provision B.5, the Copermittees in each Watershed Management Area must integrate the data collected pursuant to Provisions D.1-D.3, the findings from the assessments required pursuant to

Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to assess the effectiveness of, and identify necessary modifications to, the Water Quality Improvement Plan as follows:

(1) The Copermittees must re-evaluate the priority water quality conditions and numeric goals for the Watershed Management Area, as needed, during the term of this Order pursuant to Provision B.5.a. The re-evaluation and recommendations for modifications to the priority water quality conditions, and/or numeric goals and corresponding schedules may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The priority water quality conditions and numeric goals for the Watershed Management Area must be re-evaluated as follows:

(a) Re-evaluate the receiving water conditions in the Watershed Management Area in accordance with Provision B.2.a;

(b) Re-evaluate the impacts on receiving waters in the Watershed Management Area from MS4 discharges in accordance with Provision B.2.b;

(c) Re-evaluate the identification of MS4 sources of pollutants and/or stressors in accordance with Provision B.2.d;

(d) Identify beneficial uses of the receiving waters that are protected in accordance with Provision D.4.a;

(e) Evaluate the progress toward achieving the interim and final numeric goals for protecting impacted beneficial uses in the receiving waters.

(2) The Copermittees must re-evaluate the water quality improvement strategies for the Watershed Management Area during the term of this Order pursuant to Provision B.5.b. The re-evaluation and recommendations for modifications to the water quality improvement strategies and schedules may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The water quality improvement strategies for the Watershed Management Area must be re-evaluated as follows:

(a) Identify the non-storm water and storm water pollutant loads from the Copermittees' MS4 outfalls in the Watershed Management Area, calculated or estimated pursuant to Provisions D.4.b;

(b) Identify the non-storm water and storm water pollutant load reductions, or other improvements to receiving water or water quality conditions, that are necessary to attain the interim and final numeric goals identified in the Water Quality Improvement Plan for protecting beneficial uses in the receiving waters;

(c) Identify the non-storm water and storm water pollutant load reductions, or other improvements to the quality of MS4 discharges, that are necessary for the Copermittees to demonstrate that non-storm water and storm water discharges from their MS4s are not causing or contributing to exceedances of receiving water limitations;

(d) Evaluate the progress of the water quality improvement strategies toward achieving the interim and final numeric goals identified in the Water Quality Improvement Plan for protecting beneficial uses in the receiving waters.

(3) The Copermittees must re-evaluate and adapt the water quality monitoring and assessment program for the Watershed Management Area when new information becomes available to improve the monitoring and assessment program pursuant to Provision B.5.c. The re-evaluation and recommendations for modifications to the monitoring and assessment program may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. Modifications to the water quality monitoring and assessment program must be consistent with the requirements of Provision D.1-D.3. The re-evaluation of the water quality monitoring and assessment program for the Watershed Management Area must consider the data gaps identified by the assessments required pursuant to Provisions D.4.a-b, and results of the special studies implemented pursuant to Provision D.4.c.

5. Monitoring Provisions

Each Copermittee must comply with all the monitoring, reporting, and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

E. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS

The purpose of this provision is for each Copermittee to implement a program to control the contribution of pollutants to and the discharges from the MS4 within its jurisdiction. The goal of the jurisdictional runoff management programs is to implement strategies that effectively prohibit non-storm water discharges to the MS4 and reduce the discharge of pollutants in storm water to the MEP. This goal will be accomplished through implementing the jurisdictional runoff management programs in accordance with the strategies identified in the Water Quality Improvement Plans.

Each Copermittee must update its jurisdictional runoff management program document, in accordance with Provision F.2.a, to incorporate all the requirements of Provision E. Until the Copermittee has updated its jurisdictional runoff management program document with the requirements of Provision E, the Copermittee must continue implementing its current jurisdictional runoff management program.

1. Legal Authority Establishment and Enforcement

a. Each Copermittee must establish, maintain, and enforce adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 through statute, ordinance, permit, contract, order, or similar means. This legal authority must, at a minimum, authorize the Copermittee to:

(1) Prohibit and eliminate all illicit discharges and illicit connections to its MS4;

(2) Control the contribution of pollutants in discharges of runoff associated with industrial and construction activity to its MS4 and control the quality of runoff from industrial and construction sites, including industrial and construction sites which have coverage under the statewide General Permit for Discharges of Storm Water Associated with Industrial Activities (Industrial General Permit) or General Permit for Discharges of Storm Water Associated with Construction Activities (Construction General Permit), as well as to those sites which do not;

(3) Control the discharge of spills, dumping, or disposal of materials other than storm water into its MS4;

(4) Control through interagency agreements among Copermittees the contribution of pollutants from one portion of the MS4 to another portion of the MS4;

(5) Control, by coordinating and cooperating with other owners of the MS4 such as Caltrans, the U.S. federal government, or sovereign Native American Tribes through interagency agreements, where possible, the contribution of pollutants from their portion of the MS4 to the portion of the MS4 within the Copermittee's jurisdiction;

(6) Require compliance with conditions in its statutes, ordinances, permits, contracts, orders, or similar means to hold dischargers to its MS4 accountable for their contributions of pollutants and flows;

(7) Require the use of BMPs to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(8) Require documentation on the effectiveness of BMPs implemented to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(9) Utilize enforcement mechanisms to require compliance with its statutes, ordinances, permits, contracts, orders, or similar means; and

(10) Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with its statutes, ordinances, permits, contracts, orders, or similar means and with the requirements of this Order, including the prohibition of illicit discharges and connections to its MS4; the Copermittee must also have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from industrial facilities, including construction sites, discharging into its MS4.

b. With the first Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3), each Copermittee must submit a statement certified by its Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative that the Copermittee has taken the necessary steps to obtain and maintain full legal authority within its jurisdiction to implement and enforce each of the requirements contained in this Order.

2. Illicit Discharge Detection and Elimination

Each Copermittee must implement a program to actively detect and eliminate illicit discharges and improper disposal into the MS4, or otherwise require the discharger to apply for and obtain a separate NPDES permit. The illicit discharge detection and elimination program must be implemented in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include, at a minimum, the following requirements:

a. Non-Storm Water Discharges

Each Copermittee must address all non-storm water discharges as illicit discharges unless a non-storm water discharge is either identified as a discharge authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to the following requirements:

(1) Discharges of non-storm water to the MS4 from the following categories must be addressed as illicit discharges unless the discharge has coverage or meets the exception criteria under NPDES Permit No. CAG919003~~1 (Order No. R9-2007-0034, or subsequent order) for discharges to San Diego Bay, or NPDES Permit No. CAG919002~~ (Order No. R9-2015-0013 ~~2008-0002~~, ~~or subsequent order~~ as it may be amended or reissued) for discharges to surface waters within the San Diego Region ~~other than San Diego Bay~~:

(1) Uncontaminated pumped ground water;

(2) Discharges from foundation drains;[23]

(3) Water from crawl space pumps; and

(4) Water from footing drains.[20]

(2) Discharges of non-storm water from water line flushing and water main breaks to the MS4 must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG679001 (Order No. R9-2010-0003, ~~or subsequent order~~ as it may be amended or reissued) or NPDES General Permit No. CAG140001 (Order 2014-0194-DWQ, as it may be amended or reissued). This category includes water line flushing and water main break discharges from water purveyors issued a water supply permit by the California Department of Public Health or federal military installations. Discharges from recycled or reclaimed water lines to the MS4 must be addressed as illicit discharges, unless the discharges have coverage under a separate NPDES permit.

(3) Discharges of non-storm water to the MS4 from the following categories must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a source of pollutants to receiving waters:

(a) Diverted stream flows;

(b) Rising ground waters;

(c) Uncontaminated ground water infiltration to MS4s;

(d) Springs;

(e) Flows from riparian habitats and wetlands;

[23] Provision E.2.a.(1) only applies to this category of non-storm water if the system is designed to be located at or below the groundwater table to actively or passively extract groundwater during any part of the year.

(f) Discharges from potable water sources;

(g) Discharges from foundation drains;[24] and

(h) Discharges from footing drains.[21]

(4) Discharges of non-storm water to the MS4 from the following categories must be controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means. Discharges of non-storm water to the MS4 from the following categories not controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means must be addressed by the Copermittee as illicit discharges.

(a) Air conditioning condensation

The discharge of air conditioning condensation should be directed to landscaped areas or other pervious surfaces, or to the sanitary sewer, where feasible.

(b) Individual residential vehicle washing

(i) The discharge of wash water should be directed to landscaped areas or other pervious surfaces where feasible; and

(ii) The minimization of water, washing detergent and other vehicle wash products used for residential vehicle washing, and the implementation of other practices or behaviors that will prevent the discharge of pollutants associated with individual residential vehicle washing from entering the MS4 must be encouraged.

(c) Dechlorinated swimming pool discharges

(i) Residual chlorine, algaecide, filter backwash, or other pollutants from swimming pools must be eliminated prior to discharging to the MS4; and

(ii) The discharge of saline swimming pool water must be directed to the sanitary sewer, landscaped areas, or other pervious surfaces that can accommodate the volume of water, unless the saline swimming pool water can be discharged via a pipe or concrete channel directly to a naturally saline water body (e.g. Pacific Ocean).

(5) Firefighting discharges to the MS4 must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board

[24] Provision E.2.a.(3) only applies to this category of non-storm water discharge if the system is designed to be located above the groundwater table at all times of the year, and the system is only expected to discharge non-storm water under unusual circumstances.

identifies the discharge as a significant source of pollutants to receiving waters. Firefighting discharges to the MS4 not identified as a significant source of pollutants to receiving waters, must be addressed, at a minimum, as follows:

(a) Non-emergency firefighting discharges

(i) Building fire suppression system maintenance discharges (e.g. sprinkler line flushing) to the MS4 must be addressed as illicit discharges unless BMPs are implemented to prevent pollutants associated with such discharges to the MS4.

(ii) Non-emergency firefighting discharges (i.e., discharges from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems) must be addressed by a program, to be developed and implemented by the Copermittee, to reduce or eliminate pollutants in such discharges from entering the MS4.

(b) Emergency firefighting discharges

Each Copermittee should develop and encourage implementation of BMPs to reduce or eliminate pollutants in emergency firefighting discharges to the MS4s and receiving waters within its jurisdiction. During emergency situations, priority of efforts should be directed toward life, property, and the environment (in descending order). BMPs should not interfere with immediate emergency response operations or impact public health and safety.

(6) If the Copermittee or San Diego Water Board identifies any category of non-storm water discharges listed under Provisions E.2.a.(1)-(4) as a source of pollutants to receiving waters, the category must be prohibited through ordinance, order, or similar means and addressed as an illicit discharge. Alternatively, the Copermittee may propose controls to be implemented for the category of non-storm water discharges as part of the Water Quality Improvement Plan instead of prohibiting the category of non-storm water discharges, and implement the controls if accepted by the San Diego Water Board as part of the Water Quality Improvement Plan.

(7) Each Copermittee must, where feasible and priorities and resources allow, reduce or eliminate non-storm water discharges listed under Provisions E.2.a.(1)-(4) into its MS4, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit.

b. PREVENT AND DETECT ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to prevent and detect illicit discharges to the MS4:

(1) Each Copermittee must maintain an updated map of its entire MS4 and the corresponding drainage areas. The accuracy of the MS4 map must be confirmed during the field screening required pursuant to Provision E.2.c. The MS4 map must be included as part of the jurisdictional runoff management program document. Any geographic information system (GIS) layers or files used by the Copermittee to maintain the MS4 map must be made available to the San Diego Water Board upon request. The MS4 map must identify the following:

(a) All segments of the MS4 owned, operated, and maintained by the Copermittee;

(b) All known locations of inlets that discharge and/or collect runoff into the Copermittee's MS4;

(c) All known locations of connections with other MS4s not owned or operated by the Copermittee (e.g. Caltrans MS4s);

(d) All known locations of MS4 outfalls and private outfalls that discharge runoff collected from areas within the Copermittee's jurisdiction;

(e) All segments of receiving waters within the Copermittee's jurisdiction that receive and convey runoff discharged from the Copermittee's MS4 outfalls;

(f) Locations of the MS4 outfalls, identified pursuant to Provision D.2.a.(1), within its jurisdiction; and

(g) Locations of the non-storm water persistent flow MS4 outfall discharge monitoring stations, identified pursuant to Provision D.2.b.(2), within its jurisdiction.

(2) Each Copermittee must use Copermittee personnel and contractors to assist in identifying and reporting illicit discharges and connections during their daily employment activities.

(3) Each Copermittee must promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges to or from the MS4, including the following methods for public reporting:

(a) Operate a public hotline, which can be Copermittee-specific or shared by the Copermittees, and must be capable of receiving reports in both English and Spanish 24 hours per day and seven days per week; and

(b) Designate an e-mail address for receiving electronic reports from the public, which can be Copermittee-specific or shared by the Copermittees, and must be prominently displayed on the Copermittee's webpage and the Regional Clearinghouse required pursuant to Provision F.4.

(4) Each Copermittee must implement practices and procedures (including a notification mechanism) to prevent, respond to, contain, and clean up any spills that may discharge into the MS4 within its jurisdiction from any source. The Copermittee must coordinate, to the extent possible, with spill response teams to prevent entry of spills into the MS4, and prevent contamination of surface water, ground water, and soil. The Copermittee must coordinate spill prevention, containment, and response activities throughout all appropriate Copermittee departments, programs, and agencies.

(5) Each Copermittee must implement practices and procedures to prevent and limit infiltration of seepage from sanitary sewers (including private laterals and failing septic systems) to the MS4.

(6) Each Copermittee must coordinate, when necessary, with upstream Copermittees and/or entities to prevent illicit discharges from upstream sources into the MS4 within its jurisdiction.

c. Field Screening

Each Copermittee must conduct field screening (i.e. visual observations, field testing, and/or analytical testing) of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4 in accordance with the dry weather MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

d. Investigate and Eliminate Illicit Discharges And Connections

Each Copermittee must include the following measures within its program to investigate and eliminate illicit discharges to the MS4:

(1) Each Copermittee must prioritize and determine when follow-up investigations will be performed in response to visual observations and/or water quality monitoring data collected during an investigation of a detected non-storm water or illicit discharge to or from the MS4. The criteria for prioritizing investigations must consider the following:

(a) Pollutants identified as causing or contributing to the highest water quality priorities identified in the Water Quality Improvement Plan;

(b) Pollutants identified as causing or contributing, or threatening to cause or contribute to impairments in water bodies on the 303(d) List and/or in environmentally sensitive areas (ESAs), located within its jurisdiction;

(c) Pollutants identified from sources or land uses known to exist within the area, drainage basin, or watershed that discharges to the portion of the MS4 within its jurisdiction included in the investigation;

(d) Pollutants identified as causing or contributing to an exceedance of a NAL in the Water Quality Improvement Plan; and

(e) Pollutants identified as a threat to human health or the environment.

(2) Each Copermittee must implement procedures to investigate and inspect portions of its MS4 that, based on reports or notifications, field screening, or other appropriate information, indicate a reasonable potential of receiving, containing, or discharging pollutants due to illicit discharges, illicit connections, or other sources of non-storm water. The procedures must include the following:

(a) Each Copermittee must develop criteria to:

(i) Assess the validity of each report or notification received; and

(ii) Prioritize the response to each report or notification received.

(b) Each Copermittee must prioritize and respond to each valid report or notification (e.g., public reports, staff or contractor reports and notifications, etc.) of an incident in a timely manner.

(c) In accordance with the requirements of Provision E.2.d.(1), each Copermittee must investigate and seek to identify the source(s) of discharges of non-storm water where flows are observed in and from the MS4 during the field screening required pursuant to Provision D.2.b.(1) as follows:

(i) Obvious illicit discharges must be immediately investigated to identify the source(s) of non-storm water discharges;

(ii) The investigation must include field investigations to identify sources or potential sources for the discharge, unless the source or potential source has already been identified during previous investigations; and

(iii) The investigation may include follow-up field investigations and/or reviewing Copermittee inventories and other land use data to identify potential sources of the discharge.

(d) Each Copermittee must maintain records and a database of the following information:

(i) Location of incident, including hydrologic subarea, portion of MS4 receiving the non-storm water or illicit discharge, and point of discharge or potential discharge from MS4 to receiving water;

(ii) Source of information initiating the investigation (e.g., public reports, staff or contractor reports and notifications, field screening, etc.);

(iii) Date the information used to initiate the investigation was received;

(iv) Date the investigation was initiated;

(v) Dates of follow-up investigations;

(vi) Identified or suspected source of the illicit discharge or connection, if determined;

(vii) Known or suspected related incidents, if any;

(viii) Result of the investigation; and

(ix) If a source cannot be identified and the investigation is not continued, document the response pursuant to the requirements of Provision E.2.d.(4).

(e) Each Copermittee must maintain records and, in accordance with the priorities of the Water Quality Improvement Plan, seek to identify the source(s) of non-storm water discharges from the MS4 where there is evidence of non-storm water having been discharged into or from the MS4 (e.g., pooled water), in accordance with MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

(3) Each Copermittee must initiate the implementation of procedures, in a timely manner, to eliminate all detected and identified illicit discharges and connections within its jurisdiction. The procedures must include the following responses:

(a) Each Copermittee must enforce its legal authority, as required under Provision E.1, to eliminate illicit discharges and connections to the MS4.

(b) If the Copermittee identifies the source as a controllable source of non-storm water or illicit discharge or connection, the Copermittee must implement its Enforcement Response Plan pursuant to Provision E.6 and enforce its legal authority to prohibit and eliminate illicit discharges and connections to its MS4.

(c) If the Copermittee identifies the source of the discharge as a category of non-storm water discharges in Provision E.2.a, and the discharge is in exceedance of NALs in the Water Quality Improvement Plan, then the Copermittee must determine if: (1) this is an isolated incident or set of

circumstances that will be addressed through its Enforcement Response Plan pursuant to Provision E.6, or (2) the category of discharge must be addressed through the prohibition of that category of discharge as an illicit discharge pursuant to Provision E.2.a.(6).

(d) If the Copermittee suspects the source of the non-storm water discharge as natural in origin (i.e. non-anthropogenically influenced) and in conveyance into the MS4, then the Copermittee must document and provide the data and evidence necessary to demonstrate to the San Diego Water Board that it is natural in origin and does not require further investigation.

(e) If the Copermittee is unable to identify and document the source of a recurring non-storm water discharge to or from the MS4, then the Copermittee must address the discharge as an illicit discharge and update its jurisdictional runoff management program to address the common and suspected sources of the non-storm water discharge within its jurisdiction in accordance with the Copermittee's priorities.

(4) Each Copermittee must submit a summary of the non-storm water discharges and illicit discharges and connections investigated and eliminated within its jurisdiction with each Water Quality Improvement Plan Annual Report required under Provision F.3.b.(3) of this Order.

3. Development Planning

Each Copermittee must use their land use and planning authorities to implement a development planning program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. BMP Requirements for All Development Projects

Each Copermittee must prescribe the following BMP requirements during the planning process (i.e. prior to project approval and issuance of local permits) for all development projects (regardless of project type or size), where local permits are issued, including unpaved roads and flood management projects:

(1) General Requirements

(a) Onsite BMPs must be located so as to remove pollutants from runoff prior to its discharge to any receiving waters, and as close to the source as possible;

(b) Structural BMPs must not be constructed within waters of the U.S.

(c) Onsite BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors (e.g. mosquitos, rodents, or flies).

(2) Source Control BMP Requirements

The following source control BMPs must be implemented at all development projects where applicable and feasible:

(a) Prevention of illicit discharges into the MS4;

(b) Storm drain system stenciling or signage;

(c) Protect outdoor material storage areas from rainfall, run-on, runoff, and wind dispersal;

(d) Protect materials stored in outdoor work areas from rainfall, run-on, runoff, and wind dispersal;

(e) Protect trash storage areas from rainfall, run-on, runoff, and wind dispersal; and

(f) Any additional BMPs determined to be necessary by the Copermittee to minimize pollutant generation at each project.

(3) Low Impact Development (LID) BMP Requirements

The following LID BMPs must be implemented at all development projects where applicable and feasible:

(a) Maintenance or restoration of natural storage reservoirs and drainage corridors (including topographic depressions, areas of permeable soils, natural swales, and ephemeral and intermittent streams);[25]

(b) Buffer zones for natural water bodies (where buffer zones are technically infeasible, require project applicant to include other buffers such as trees, access restrictions, etc.);

(c) Conservation of natural areas within the project footprint including existing trees, other vegetation, and soils;

(d) Construction of streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided public safety is not compromised;

[25] Development projects proposing to dredge or fill materials in waters of the U.S. must obtain a CWA Section 401 Water Quality Certification. Projects proposing to dredge or fill waters of the state must obtain waste discharge requirements.

(e) Minimization of the impervious footprint of the project;

(f) Minimization of soil compaction to landscaped areas;

(g) Disconnection of impervious surfaces through distributed pervious areas;

(h) Landscaped or other pervious areas designed and constructed to effectively receive and infiltrate, retain and/or treat runoff from impervious areas, prior to discharging to the MS4;

(i) Small collection strategies located at, or as close as possible to, the source (i.e. the point where storm water initially meets the ground) to minimize the transport of runoff and pollutants to the MS4 and receiving waters;

(j) Use of permeable materials for projects with low traffic areas and appropriate soil conditions;

(k) Landscaping with native or drought tolerant species; and

(l) Harvesting and using precipitation.

b. PRIORITY DEVELOPMENT PROJECTS

Priority Development Projects are land development projects that fall under the planning and building authority of the Copermittee for which the Copermittee must impose specific requirements, in addition to those described in Provision E.3.a, including the implementation of structural BMPs to meet the performance requirements described in Provision E.3.c.

(1) Definition of Priority Development Project

Priority Development Projects include the following:

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(b) Redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site on an existing site of 10,000 square feet or more of impervious surfaces). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(c) New and redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site), and support one or more of the following uses:

(i) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812).

(ii) Hillside development projects. This category includes development on any natural slope that is twenty-five percent or greater.

(iii) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce.

(iv) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

(d) New or redevelopment projects that create and/or replace 2,500 square feet or more of impervious surface (collectively over the entire project site), and discharging directly to an Environmentally Sensitive Area (ESA). "Discharging directly to" includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands).

(e) New development projects, or redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface, that support one or more of the following uses:

(i) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

(ii) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

(f) New or redevelopment projects that result in the disturbance of one or more acres of land and are expected to generate pollutants post construction.

(2) Special Considerations for Redevelopment Projects

The structural BMP performance requirements of Provision E.3.c are applicable to redevelopment Priority Development Projects, as defined in E.3.b.(1), as follows:

(a) Where redevelopment results in the creation or replacement of impervious surface in an amount of less than fifty percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provision E.3.c apply only to the creation or replacement of impervious surface, and not the entire development; or

(b) Where redevelopment results in the creation or replacement of impervious surface in an amount of more than fifty percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provision E.3.c apply to the entire development.

(3) Priority Development Project Exemptions

Each Copermittee has the discretion to exempt the following projects from being defined as Priority Development Projects:

(a) New or retrofit paved sidewalks, bicycle lanes, or trails that meet the following criteria:

(i) Designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas; OR

(ii) Designed and constructed to be hydraulically disconnected from paved streets or roads; OR

(iii) Designed and constructed with permeable pavements or surfaces in accordance with USEPA Green Streets guidance.[26]

(b) Retrofitting or redevelopment of existing paved alleys, streets or roads that are designed and constructed in accordance with the USEPA Green Streets guidance.[27]

c. Priority Development Project Structural BMP Performance Requirements

In addition to the BMP requirements listed for all development projects under Provision E.3.a, Priority Development Projects must also implement structural BMPs that conform to performance requirements described below.

[26] See "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).
[27] Ibid.

(1) Storm Water Pollutant Control BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite structural BMPs to control pollutants in storm water that may be discharged from a project as follows:

(a) Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite the pollutants contained in the volume of storm water runoff produced from a 24-hour 85th percentile storm event (design capture volume);[28]

(i) If a Copermittee determines that implementing BMPs to retain the full design capture volume onsite for a Priority Development Project is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize biofiltration BMPs. Biofiltration BMPs must be designed to have an appropriate hydraulic loading rate to maximize storm water retention and pollutant removal, as well as to prevent erosion, scour, and channeling within the BMP,[29] and must be sized to:

[a] Treat 1.5 times the design capture volume not reliably retained onsite, OR

[b] Treat the design capture volume not reliably retained onsite with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite.

(ii) If a Copermittee determines that biofiltration is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize flow-thru treatment control BMPs to treat runoff leaving the site, AND mitigate for the design capture volume not reliably retained onsite pursuant to Provision E.3.c.(1)(b). Flow thru treatment control BMPs must be sized and designed to:

[28] This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals.

[29] As part of the Copermittee's update to its BMP Design Manual, pursuant to Provision E.3.d, the Copermittee must provide guidance for hydraulic loading rates and other biofiltration design criteria necessary to maximize storm water retention and pollutant removal.

[a] Remove pollutants from storm water to the MEP;
[b] Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;
[c] Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Flow-thru treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of flow-thru treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

(b) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1)(a). The Priority Development Project must mitigate for the portion of the pollutant load in the design capture volume not retained onsite if Provision E.3.c.(3) is utilized. If a Priority Development Project is allowed to utilize alternative compliance, flow-thru treatment control BMPs must be implemented to treat the portion of the design capture volume that is not reliably retained onsite. Flow-thru treatment control BMPs must be sized and designed in accordance with Provisions E.3.c.(1)(a)(ii)[a]-[c].

(2) Hydromodification Management BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite BMPs to manage hydromodification that may be caused by storm water runoff discharged from a project as follows:

(a) Post-project runoff conditions (flow rates and durations) must not exceed pre-development runoff conditions by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat downstream of Priority Development Projects).

(i) In evaluating the range of flows that results in increased potential for erosion of natural (non-hardened) channels, the lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks.

(ii) The Copermittees may use monitoring results collected pursuant to Provision D.1.a.(2) to re-define the range of flows resulting in

increased potential for erosion, or degraded instream habitat conditions, as warranted by the data.

(b) Each Priority Development Project must avoid critical sediment yield areas known to the Copermittee or identified by the optional Watershed Management Area Analysis pursuant to Provision B.3.b.(4), or implement measures that allow critical coarse sediment to be discharged to receiving waters, such that there is no net impact to the receiving water.

(c) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the performance requirements of Provision E.3.c.(2)(a). The Priority Development Project must mitigate for the post-project runoff conditions not fully managed onsite if Provision E.3.c.(3) is utilized.

(d) Exemptions

Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provisions E.3.c.(2) where the project discharges storm water runoff to:

(i) Existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;

(ii) Conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; or

(iii) An area identified by the Copermittees as appropriate for an exemption by the optional Watershed Management Area Analysis incorporated into the Water Quality Improvement Plan pursuant to Provision B.3.b.(4).

(e) Interim Timeframe Exemptions

Until the Copermittees have updated their BMP Design Manual in accordance with Provision F.2.b with the requirements of Provision E, the Copermittees have the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provision E.3.c.(2) where the project discharges storm water runoff directly to:

(i) An engineered channel conveyance system with a capacity to convey peak flows generated by the 10-year storm event all the way from the

point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; and

(ii) Large river reaches with a drainage area larger than 100 square miles and a 100-year flow capacity in excess of 20,000 cubic feet per second, provided that properly sized energy dissipation is included at all Priority Development Project discharge points.

(3) Alternative Compliance Program to Onsite Structural BMP Implementation

At the discretion of each Copermittee, Priority Development Projects may be allowed to participate in an alternative compliance program in lieu of implementing the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a), provided that the Water Quality Improvement Plan includes the optional Watershed Management Area Analysis described in Provision B.3.b.(4), and Water Quality Equivalency calculations have been accepted by the San Diego Water Board's Executive Officer pursuant to Provision E.3.c.(3)(a). The alternative compliance program is available to a Priority Development Project only if the Priority Development Project applicant enters into a voluntary agreement with the Copermittee authorizing this arrangement. In addition to the voluntary agreement, relief from implementing structural BMPs onsite may be authorized by the Copermittee under the following conditions:

(a) Water Quality Equivalency

Copermittees must submit Water Quality Equivalency calculations for acceptance by the San Diego Water Board's Executive Officer prior to administering an alternative compliance program in order to establish a regional and technical basis for determining the water quality benefits associated with alternative compliance projects. Accepted Water Quality Equivalency calculations must be incorporated as part of any Copermittee's alternative compliance program necessary for evaluating Watershed Management Area Analysis candidate projects, project applicant-proposed alternative compliance projects, alternative compliance in lieu fee structures, and alternative compliance water quality credit systems as described in Provisions E.3.c.(3)(b)-(e).

(b) Watershed Management Area Analysis Candidate Projects

The Priority Development Project applicant agrees to fund, contribute funds to, or implement a candidate project identified by the Copermittees in the Watershed Management Area Analysis included in the Water Quality Improvement Plan, pursuant to Provisions B.3.b.(4) subject to the following conditions:

(i) The Copermittee must determine that implementation of the candidate project will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a) onsite;

(ii) If the Priority Development Project applicant chooses to fully or partially fund a candidate project, then the in-lieu fee structure described in Provision E.3.c.(3)(c) must be followed;

(iii) If the Priority Development Project applicant chooses to fully or partially fund a candidate project, then the Copermittee must ensure that the funds to be obtained from the Priority Development Project applicant are sufficient to mitigate for impacts caused by not fully implementing structural BMPs onsite, pursuant to the performance requirements described in Provisions E.3.c.(1) and E.3.c.(2)(a);

(iv) If the Priority Development Project applicant chooses to implement a candidate project, then the Copermittee must ensure that pollutant control and/or hydromodification management within the candidate project are sufficient to mitigate for impacts caused by not implementing structural BMPs fully onsite, pursuant to the performance requirements described in Provisions E.3.c.(1) and E.3.c.(2)(a);

(v) The voluntary agreement to fund, partially fund, or implement a candidate project must include reliable sources of funding for operation and maintenance of the candidate project;

(vi) Design of the candidate project must be conducted under an appropriately qualified engineer, geologist, architect, landscape architect, or other professional, licenses where applicable, and competent and proficient in the fields pertinent to the candidate project design;

(vii) The candidate project must be constructed as soon as possible, but no later than 4 years after the certificate of occupancy is granted for the first Priority Development Project that contributed funds toward the construction of the candidate project, unless a longer period of time is authorized by the San Diego Water Board Executive Officer; and

(viii) If the candidate project is constructed after the Priority Development Project is constructed, the Copermittee must require temporal mitigation for pollutant loads and altered flows that are discharged from the Priority Development Project.

(c) Project Applicant Proposed Alternative Compliance Projects

The Copermittee may allow a Priority Development Project applicant to propose and fund, contribute funds to, or implement an alternative compliance project not identified by the Watershed Management Area Analysis included in the Water Quality Improvement Plan pursuant to Provisions B.3.b.(4). This option is allowed provided the Copermittee determines that implementation of the alternative compliance project will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a) onsite, and is subject to the requirements described in Provisions E.3.c.(3)(a)(ii)-(viii).

(d) Alternative Compliance In-Lieu Fee Structure

If a Copermittee chooses to allow a Priority Development Project applicant to fund, or partially fund a candidate project or an alternative compliance project, then the Copermittee must develop and implement an in-lieu fee structure. This may be developed individually or with other Copermittees and/or entities, as a means for designing, developing, constructing, operating and maintaining offsite alternative compliance projects. The in-lieu fee must be transferred to the Copermittee (for public projects) or an escrow account (for private projects) prior to the construction of the Priority Development Project.

(e) Alternative Compliance Water Quality Credit System Option

The Copermittee may develop and implement an alternative compliance water quality credit system option, individually or with other Copermittees and/or entities, provided that such a credit system clearly exhibits that it will not allow discharges from Priority Development Projects to cause or contribute to a net impact over and above the impact caused by projects meeting the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a). Any credit system that a Copermittee chooses to implement must be submitted to the San Diego Water Board Executive Officer for review and acceptance as part of the Water Quality Improvement Plan.

(4) Long-Term Structural BMP Maintenance

Each Copermittee must require the project applicant to submit proof of the mechanism under which ongoing long-term maintenance of all structural BMPs will be conducted.

(5) Infiltration and Groundwater Protection

(a) Structural BMPs designed to primarily function as large, centralized infiltration devices (such as large infiltration trenches and infiltration basins) must not cause or contribute to an exceedance of an applicable groundwater quality objective. At a minimum, such infiltration BMPs must be in conformance with the design criteria listed below, unless the development project applicant demonstrates to the Copermittee that one or more of the specific design criteria listed below are not necessary to protect groundwater quality. The design criteria listed below do not apply to small infiltration systems dispersed throughout a development project.

(i) Runoff must undergo pretreatment such as sedimentation or filtration prior to infiltration;

(ii) Pollution prevention and source control BMPs must be implemented at a level appropriate to protect groundwater quality at sites where infiltration BMPs are to be used;

(iii) Infiltration BMPs must be adequately maintained to remove pollutants in storm water to the MEP;

(iv) The vertical distance from the base of any infiltration BMP to the seasonal high groundwater mark must be at least 10 feet. Where groundwater basins do not support beneficial uses, this vertical distance criteria may be reduced, provided groundwater quality is maintained;

(v) The soil through which infiltration is to occur must have physical and chemical characteristics (e.g., appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses;

(vi) Infiltration BMPs must not be used for areas of industrial or light industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee, unless source control BMPs to prevent exposure of high threat activities are implemented, or runoff from such activities is first treated or filtered to remove pollutants prior to infiltration; and

(vii) Infiltration BMPs must be located a minimum of 100 feet horizontally from any water supply wells.

(b) The Copermittee may develop, individually or with other Copermittees, alternative mandatory design criteria to that listed above for infiltration BMPs which are designed to primarily function as centralized infiltration devices. Before implementing the alternative design criteria in the development planning process the Copermitee(s) must:

(i) Notify the San Diego Water Board of the intent to implement the alternative design criteria submitted; and

(ii) Comply with any conditions set by the San Diego Water Board.

d. BMP DESIGN MANUAL UPDATE

Each Copermittee must update its BMP Design Manual[30] pursuant to Provision F.2.b. Until the Copermittee has updated its BMP Design Manual pursuant to Provision F.2.b.(1) ~~with the requirements of Provisions E.3.a-c~~, the Copermittee must continue implementing its current BMP Design Manual. ~~Unless directed otherwise by the San Diego Water Board, t~~The Copermittee must implement the updated BMP Design Manual within 180 days following completion of ~~completing~~ the update pursuant to Provision F.2.b.(1), unless directed otherwise by the San Diego Water Board Executive Officer. The date the BMP Design Manual is implemented is the "effective date" of the BMP Design Manual. The update of the BMP Design Manual required pursuant to Provision F.2.b.(1) must include the following:

(1) Updated procedures to determine the nature and extent of storm water requirements applicable to a potential development or redevelopment projects. These procedures must inform project applicants of the storm water management requirements applicable to their project including, but not limited to, general requirements for all development projects, structural BMP design procedures and requirements, hydromodification management requirements, requirements specific to phased projects, and procedures specific to private developments and public improvement projects;

(2) Updated procedures to identify pollutants and conditions of concern for selecting the most appropriate structural BMPs that consider, at a minimum, the following:

(a) Receiving water quality (including pollutants for which receiving waters are listed as impaired under the CWA section 303(d) List);

(b) Pollutants, stressors, and/or receiving water conditions that cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(c) Land use type of the project and pollutants associated with that land use type; and

(d) Pollutants expected to be present onsite.

(3) Updated procedures for designing structural BMPs, including any updated

[30] The BMP Design Manual was formerly known as the Standard Storm Water Mitigation Plan under Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016.

performance requirements to be consistent with the requirements of Provision E.3.c for all structural BMPs listed in the BMP Design Manual;

(4) Long-term maintenance criteria for each structural BMP listed in the BMP Design Manual; and

(5) Alternative compliance criteria, in accordance with the requirements under Provision E.3.c.(3), if the Copermittee elects to allow Priority Development Projects within its jurisdiction to utilize alternative compliance.

e. PRIORITY DEVELOPMENT PROJECT BMP IMPLEMENTATION AND OVERSIGHT

Each Copermittee must implement a program that requires and confirms structural BMPs on all Priority Development Projects are designed, constructed, and maintained to remove pollutants in storm water to the MEP.

(1) Structural BMP Approval and Verification Process

(a) Each Copermittee must require and confirm that ~~for~~ all Priority Development Projects ~~applications that have not received prior lawful approval by the Copermittee by the effective date of the BMP Design Manual pursuant to Provision E.3.d,~~ implement the requirements of Provision E.3, ~~must be implemented. For project applications that have received prior lawful approval before the effective date of the BMP Design Manual pursuant to Provision E.3.d, the Copermittee may allow previous land development requirements to apply.~~ except that the Copermittee may allow previous land development requirements to apply to a Priority Development Project if the conditions of Provision E.3.e.(1)(a)(i) or Provision E.3.e.(1)(a)(ii) are met:

(i) The Copermittee has, prior to the effective date of the BMP Design Manual required to be developed pursuant to Provision E.3.d:

[a] Approved[31] a design that incorporates the storm water drainage system for the Priority Development Project in its entirety, including all applicable structural pollutant treatment control and hydromodification management BMPs consistent with the previous applicable MS4 permit requirements;[32] AND

[b] Issued a private project permit or approval, or functional equivalent for public projects, that authorizes the Priority Development Project applicant to commence construction activities based on a design that incorporates the storm water

[31] For public projects, a design stamped by the City or County Engineer, or engineer of record for the project is considered an approved design.

[32] Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016 for San Diego County, Orange County, and Riverside County Copermittees, respectively

drainage system approved in conformance with Provision E.3.e.(1)(a)(i)[a]; AND

[c] Confirmed that there have been construction activities on the Priority Development Project site within the 365 days prior to the effective date of the BMP Design Manual, *OR* the Copermittee confirms that construction activities have commenced on the Priority Development Project site within the 180 days after the effective date of the BMP Design Manual, where construction activities are undertaken in reliance on the permit or approval, or functional equivalent for public projects, issued by the Copermittee in conformance with Provision E.3.e.(1)(a)(i)[b]; AND

[d] Issued all subsequent private project permits or approvals, or functional equivalent for public projects, that are needed to implement the design initially approved in conformance with Provision E.3.e.(1)(a)(i)[a] within 5 years of the effective date of the BMP Design Manual. The storm water drainage system for the Priority Development Project in its entirety, including all applicable structural pollutant treatment control and hydromodification management BMPs must remain in substantial conformity with the design initially approved in conformance with Provision E.3.e.(1)(a)(i)[a].

(ii) The Copermittee demonstrates it lacks the land use authority or legal authority to require a Priority Development Project to implement the requirements of Provision E.3.

(b) Each Copermittee must identify the roles and responsibilities of its various municipal departments in implementing the structural BMP requirements, including each stage of a project from application review and approval through BMP maintenance and inspections.

(c) Each Copermittee must require and confirm that appropriate easements and ownerships are properly recorded in public records and the information is conveyed to all appropriate parties when there is a change in project or site ownership.

(d) Each Copermittee must require and confirm that prior to occupancy and/or intended use of any portion of the Priority Development Project, each structural BMP is inspected to verify that it has been constructed and is operating in compliance with all of its specifications, plans, permits, ordinances, and the requirements of this Order.

(2) Priority Development Project Inventory and Prioritization

(a) Each Copermittee must develop, maintain, and update at least annually, a watershed-based database to track and inventory all Priority Development

Projects and associated structural BMPs within its jurisdiction. Inventories must be accurate and complete beginning from December 2002 for the San Diego County Copermittees, February 2003 for the Orange County Copermittees, and July 2005 for the Riverside County Copermittees. The use of an automated database system, such as GIS, is highly recommended. The database must include, at a minimum, the following information:

(i) Priority Development Project location (address and hydrologic subarea);

(ii) Descriptions of structural BMP type(s);

(iii) Date(s) of construction;

(iv) Party responsible for structural BMP maintenance;

(v) Dates and findings of structural BMP maintenance verifications; and

(vi) Corrective actions and/or resolutions, when applicable.

(b) Each Copermittee must prioritize the Priority Development Projects with structural BMPs within its jurisdiction. The designation of Priority Development Projects as high priority must consider the following:

(i) The highest water quality priorities identified in the Water Quality Improvement Plan;

(ii) Receiving water quality;

(iii) Number and sizes of structural BMPs;

(iv) Recommended maintenance frequency of structural BMPs;

(v) Likelihood of operation and maintenance issues of structural BMPs;

(vi) Land use and expected pollutants generated; and

(vii) Compliance record.

(3) Structural BMP Maintenance Verifications and Inspections

Each Copermittee is required to verify that structural BMPs on each Priority Development Project are adequately maintained, and continue to operate effectively to remove pollutants in storm water to the MEP through inspections, self-certifications, surveys, or other equally effective approaches.

(a) All (100 percent) of the structural BMPs at Priority Development Projects that are designated as high priority must be inspected directly by the Copermittee annually prior to each rainy season;

(b) For verifications performed through a means other than direct Copermittee inspection, adequate documentation must be required by the Copermittee

to provide assurance that the required maintenance of structural BMPs at each Priority Development Project has been completed; and

(c) Appropriate follow-up measures (including re-inspections, enforcement, etc.) must be conducted to ensure that structural BMPs at each Priority Development Project continue to reduce pollutants in storm water to the MEP as originally designed.

f. DEVELOPMENT PROJECT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all development projects, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

4. Construction Management

Each Copermittee must implement a construction management program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. PROJECT APPROVAL PROCESS

Prior to issuance of any local permit(s) that allows the commencement of construction projects that involve ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff, each Copermittee must:

(1) Require a pollution control plan, construction BMP plan, and/or an erosion and sediment control plan, to be submitted by the project applicant to the Copermittee;

(2) Confirm the pollution control plan, construction BMP plan, and/or erosion and sediment control plan, complies with the local grading ordinance, other applicable local ordinances, and the requirements of this Order;

(3) Confirm the pollution control, construction BMP, and/or erosion and sediment control plan, includes seasonally appropriate and effective BMPs and management measures described in Provision E.4.c, as applicable to the project; and

(4) Verify that the project applicant has obtained coverage under the statewide Construction General Permit (Order 2009-0009-DWQ or subsequent Order), if applicable.

b. Construction Site Inventory and Tracking

(1) Each Copermittee must maintain and update, at least quarterly, a watershed-based inventory of all construction projects issued a local permit that allows ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff. The use of an automated database system, such as GIS, is highly recommended. The inventory must include:

(a) Relevant contact information for each site (e.g., name, address, phone, and email for the owner and contractor);

(b) The basic site information including location (address and hydrologic subarea), Waste Discharge Identification (WDID) number (if applicable), size of the site, and approximate area of disturbance;

(c) Whether or not the site is considered a high threat to water quality, as defined in Provision E.4.b.(2) below;

(d) The project start and completion dates;

(e) The required inspection frequency, as defined in the Copermittee's jurisdictional runoff management program document;

(f) The date the Copermittee accepted or approved the pollution control plan, construction BMP plan, and/or erosion and sediment control plan; and

(g) Whether or not there are ongoing enforcement actions administered to the site.

(2) Each Copermittee must identify all construction sites within its jurisdiction that represent a high threat to downstream surface water quality. The designation of construction sites as high threat to water quality must consider the following:

(a) Sites located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Sites located within the same hydrologic subarea and tributary to a water body segment listed as impaired for sediment on the CWA section 303(d) List;

(c) Sites located within, directly adjacent to, or discharging directly to a receiving water within an ESA; and

(d) Other sites determined by the Copermittees or the San Diego Water Board as a high threat to water quality.

c. CONSTRUCTION SITE BMP IMPLEMENTATION

Each Copermittee must implement, or require the implementation of effective BMPs to reduce discharges of pollutants in storm water from construction sites to the MEP, and effectively prohibit non-storm water discharges from construction sites into the MS4. These BMPs must be site specific, seasonally appropriate, and construction phase appropriate. BMPs must be implemented at each construction site year round. Dry season BMP implementation must plan for and address unseasonal rain events that may occur during the dry season (May 1 through September 30). Copermittees must implement, or require the implementation of, BMPs in the following categories:

(1) Project Planning;

(2) Good Site Management "Housekeeping", including waste management;

(3) Non-storm Water Management;

(4) Erosion Control;

(5) Sediment Control;

(6) Run-on and Run-off Control; and

(7) Active/Passive Sediment Treatment Systems, where applicable.

d. CONSTRUCTION SITE INSPECTIONS

Each Copermittee must conduct construction site inspections to require and confirm compliance with its local permits and applicable local ordinances, and the requirements of this Order. Priority for site inspections must consider threat to water quality pursuant to Provision E.4.b as well as the nature of the construction activity, topography, and the characteristics of soils and receiving water quality.

(1) <u>Inspection Frequency</u>

(a) Each Copermittee must conduct inspections at all inventoried sites, including high threat to water quality sites, at an appropriate frequency for each phase of construction to confirm the site reduces the discharge of pollutants in storm water from construction sites to the MEP, and effectively prohibits non-storm water discharges from entering the MS4.

(b) Each Copermittee must establish appropriate inspection frequencies for high threat to water quality sites, and all other sites, for each phase of construction. Inspection frequencies appropriate for addressing the

highest water quality priorities identified in the Water Quality Improvement Plan, and for complying with the requirements of this Order must be identified in each Copermittee's jurisdictional runoff management program document.

(c) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e., re-inspection, enforcement) necessary to require and confirm site compliance with its local permits and applicable local ordinances, and the requirements of this Order.

(2) Inspection Content

Inspections of construction sites by the Copermittee must include, at a minimum:

(a) Verification of coverage under the Construction General Permit (Notice of Intent (NOI) and/or WDID number) during initial inspections, when applicable;

(b) Assessment of compliance with its local permits and applicable local ordinances related to pollution prevention, including the implementation and maintenance of applicable BMPs;

(c) Assessment of BMP adequacy and effectiveness;

(d) Visual observations of actual non-storm water discharges;

(e) Visual observations of actual or potential discharge of sediment and/or construction related materials from the site;

(f) Visual observations of actual or potential illicit connections; and

(g) If any violations are found and BMP corrections are needed, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried construction sites. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Site name, location (address and hydrologic subarea), and WDID number (if applicable);

(b) Inspection date;

(c) Approximate amount of rainfall since last inspection;

(d) Description of problems observed with BMPs and indication of need for BMP addition/repair/replacement and any scheduled re-inspection, and date of re-inspection;

(e) Descriptions of any other specific inspection comments which must, at a minimum, include rationales for longer compliance time;

(f) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(g) Resolution of problems noted and date problems fixed.

e. CONSTRUCTION SITE ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried construction sites, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

5. Existing Development Management

Each Copermittee must implement an existing development management program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. EXISTING DEVELOPMENT INVENTORY AND TRACKING

Each Copermittee must maintain, and update at least annually, a watershed-based inventory of the existing development within its jurisdiction that may discharge a pollutant load to and from the MS4. The use of an automated database system, such as GIS, is highly recommended. The inventory must, at a minimum, include:

(1) Name, location (hydrological subarea and address, if applicable) of the following types of existing development with its jurisdiction:

(a) Commercial facilities or areas;

(b) Industrial facilities;

(c) Municipal facilities, including:

(i) MS4 and related structures;[33]

(ii) Roads, streets, and highways;

(iii) Parking facilities;

(iv) Municipal airfields;

(v) Parks and recreation facilities;

(vi) Flood management facilities, flood control devices and structures;

(vii) Operating or closed municipal landfills;

(viii) Publicly owned treatment works (including water and wastewater treatment plants) and sanitary sewer collection systems;

(ix) Corporate yards, including maintenance and storage yards for materials, waste, equipment, and vehicles;

(x) Hazardous waste collection facilities;

(xi) Other treatment, storage or disposal facilities for municipal waste; and

(xii) Other municipal facilities that the Copermittee determines may contribute a significant pollutant load to the MS4.

(d) Residential areas, which may be designated by one or more of the following:

(i) Residential management area;

(ii) Drainage basin or area;

(iii) Land use (e.g., single family, multi-family, rural);

(iv) Neighborhood;

(v) Common Interest Area;

(vi) Home Owner Association;

(vii) Mobile home park; and/or

(viii) Other designations accepted by the San Diego Water Board Executive Officer.

(2) A description of the facility or area, including the following information:

(a) Classification as commercial, industrial, municipal, or residential;

[33] The inventory may refer to the MS4 map required to be maintained pursuant to Provision E.2.b.(1).

(b) Status of facility or area as active or inactive;

(c) Identification if a business is a mobile business;

(d) SIC Code or NAICS Code, if applicable;

(e) Industrial General Permit NOI and/or WDID number, if applicable;

(f) Identification if a residential area is or includes a Common Interest Area / Home Owner Association, or mobile home park;

(g) Identification of pollutants generated and potentially generated by the facility or area;

(h) Whether the facility or area is adjacent to an ESA;

(i) Whether the facility or area is tributary to and within the same hydrologic subarea as a water body segment listed as impaired on the CWA section 303(d) List and generates pollutants for which the water body segment is impaired; and

(3) An annually updated map showing the location of inventoried existing development, watershed boundaries, and water bodies.

b. EXISTING DEVELOPMENT BMP IMPLEMENTATION AND MAINTENANCE

Each Copermittee must designate a minimum set of BMPs required for all inventoried existing development, including special event venues. The designated minimum BMPs must be specific to facility or area types and pollutant generating activities, as appropriate.

(1) Commercial, Industrial, and Municipal Facilities and Areas

(a) Pollution Prevention

Each Copermittee must require the use of pollution prevention methods by the commercial, industrial, and municipal facilities and areas in its inventoried existing development to address the priorities and strategies in the Water Quality Improvement Plan.

(b) BMP Implementation

Each Copermittee must require the implementation of designated BMPs at commercial facilities and areas, industrial facilities, and implement designated BMPs at municipal facilities in its inventoried existing development.

(c) BMP Operation and Maintenance

(i) Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development.

(ii) Each Copermittee must implement a schedule of operation and maintenance activities for its MS4 and related structures (including but not limited to catch basins, storm drain inlets, detention basins, etc.), and verify proper operation of all its municipal structural treatment controls designed to reduce pollutants (including floatables) in storm water discharges to or from its MS4s and related drainage structures. Operation and maintenance activities may include, but is not limited to, the following:

[a] Inspections of the MS4 and related structures;
[b] Cleaning of the MS4 and related structures; and
[c] Proper disposal of materials removed from cleaning of the MS4 and related structures.

(iii) Each Copermittee must implement a schedule of operation and maintenance for public streets, unpaved roads, paved roads, and paved highways within its jurisdiction to minimize pollutants that can be discharged in storm water.

(iv) Each Copermittee must implement controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers. Copermittees that operate both a municipal sanitary sewer system and a MS4 must implement controls and measures to prevent and eliminate seeping sewage from infiltrating the MS4. Copermittees that do not operate both a municipal sanitary sewer system and a MS4 must coordinate with sewering agencies to keep themselves informed of relevant and appropriate maintenance activities and sanitary sewage projects in their jurisdiction that may cause or contribute to seepage of sewage into the MS4.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must require the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from commercial facilities and areas and industrial facilities, and implement BMPs at municipal facilities in its inventoried existing development. Such BMPs must include, as appropriate, educational activities, permits, certifications and other measures for applicators and distributors.

(2) Residential Areas

(a) Pollution Prevention

Each Copermittee must promote and encourage the use of pollution prevention methods, where appropriate, by the residential areas in its inventoried existing development.

(b) BMP Implementation

Each Copermittee must promote and encourage the implementation of designated BMPs at residential areas in its inventoried existing development.

(c) BMP Operation and Maintenance

Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at residential areas in its inventoried existing development.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must promote and encourage the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from residential areas in its inventoried existing development.

c. EXISTING DEVELOPMENT INSPECTIONS

Each Copermittee must conduct inspections of inventoried existing development to ensure compliance with applicable local ordinances and permits, and the requirements of this Order.

(1) Inspection Frequency

(a) Each Copermittee must establish appropriate inspection frequencies for inventoried existing development in accordance with the following requirements:

(i) At a minimum, inventoried existing development must be inspected once every five years utilizing one or more of the following methods:

[a] Drive-by inspections by Copermittee municipal and contract staff;

[b] Onsite inspections by Copermittee municipal and contract staff; and/or

[c] Visual inspections of publicly accessible inventoried facilities or areas by volunteer monitoring or patrol programs that have been trained by the Copermittee;

(ii) The frequency of inspections must be appropriate to confirm that BMPs are being implemented to reduce the discharge of pollutants in storm water from the MS4 to the MEP and effectively prohibit non-storm water discharges to the MS4;

(iii) The frequency of inspections must be based on the potential for a facility or area to discharge non-storm water and pollutants in storm water, and should reflect the priorities set forth in the Water Quality Improvement Plan;

(iv) Each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development;[34] and

(v) Inventoried existing development must be inspected by the Copermittee, as needed, in response to valid public complaints.

(b) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e. education and outreach, re-inspection, enforcement) necessary to require and confirm compliance with its applicable local ordinances and permits and the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

(2) <u>Inspection Content</u>

(a) Inspections of existing development must include, at a minimum:

(i) Visual inspections for the presence of actual non-storm water discharges;

(ii) Visual inspections for the presence of actual or potential discharge of pollutants;

(iii) Visual inspections for the presence of actual or potential illicit connections; and

(iv) Verification that the description of the facility or area in the inventory, required pursuant to Provision E.5.a.(2), has not changed.

[34] If any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspection may count toward the total annual inspection requirement. This requirement excludes linear municipal facilities (i.e., MS4 linear channels, sanitary sewer collection systems, streets, roads and highways).

(b) Onsite inspections of existing development by the Copermittee must include, at a minimum:

(i) Assessment of compliance with its applicable local ordinances and permits related to non-storm water and storm water discharges and runoff;

(ii) Assessment of the implementation of the designated BMPs;

(iii) Verification of coverage under the Industrial General Permit, when applicable; and

(iv) If any problems or violations are found, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried existing development. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Name and location of the facility or area (address and hydrologic subarea) consistent with the inventory name and location, pursuant to Provision E.5.a.(1);

(b) Inspection and re-inspection date(s);

(c) Inspection method(s) (i.e. drive-by, onsite);

(d) Observations and findings from the inspection(s);

(e) For onsite inspections of existing development by Copermittee municipal or contract staff, the records must also include, as applicable:

(i) Description of any problems or violations found during the inspection(s);

(ii) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(iii) The date problems or violations were resolved.

d. EXISTING DEVELOPMENT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried existing development, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

e. RETROFITTING AND REHABILITATING AREAS OF EXISTING DEVELOPMENT

(1) Retrofitting Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to retrofit areas of existing development within its jurisdiction to address identified sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify areas of existing development as candidates for retrofitting, focusing on areas where retrofitting will address pollutants and/or stressors that contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for retrofitting projects may be utilized to reduce pollutants that may be discharged in storm water from areas of existing development, and/or address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of retrofitting projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting projects; and

(e) Where retrofitting projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional retrofitting projects (i.e. projects that can receive and/or treat storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment) adjacent to and/or downstream of the areas of existing development.

(2) Stream, Channel and/or Habitat Rehabilitation in Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to rehabilitate streams, channels, and/or habitats in areas of existing development within its jurisdiction to address the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify streams, channels, and/or habitats in areas of existing development as candidates for rehabilitation, focusing on areas where stream, channel, and/or habitat rehabilitation projects will address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for stream, channel, and/or habitat rehabilitation projects may be utilized to address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters, rehabilitate channelized or hydromodified streams, restore wetland and riparian habitat, restore watershed functions, and/or restore beneficial uses of receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of stream, channel, and/or habitat rehabilitation projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance stream, channel, and/or habitat rehabilitation projects; and

(e) Where stream, channel, and/or habitat rehabilitation projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional stream, channel, and/or habitat rehabilitation projects (i.e. projects that can receive storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment).

6. Enforcement Response Plans

Each Copermittee must develop and implement an Enforcement Response Plan as part of its jurisdictional runoff management program document. The Enforcement Response Plan must describe the applicable approaches and options to enforce its legal authority established pursuant to Provision E.1, as necessary, to achieve compliance with the requirements of this Order. The Enforcement Response Plan must be in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include the following:

a. Enforcement Response Plan Components

The Enforcement Response Plan must include the following individual components:

(1) Illicit Discharge Detection and Elimination Enforcement Component;

(2) Development Planning Enforcement Component;

(3) Construction Management Enforcement Component; and

(4) Existing Development Enforcement Component.

b. Enforcement Response Approaches and Options

Each component of the Enforcement Response Plan must describe the enforcement response approaches that the Copermittee will implement to compel compliance with its statutes, ordinances, permits, contracts, orders, or similar means, and the requirements of this Order. The description must include the protocols for implementing progressively stricter enforcement responses. The enforcement response approaches must include appropriate sanctions to compel compliance, including, at a minimum, the following tools or their equivalent:

(1) Verbal and written notices of violation;

(2) Cleanup requirements;

(3) Fines;

(4) Bonding requirements;

(5) Administrative and criminal penalties;

(6) Liens;

(7) Stop work orders; and

(8) Permit and occupancy denials.

c. Correction of Violations

(1) Violations must be corrected in a timely manner with the goal of correcting the violations within 30 calendar days after the violations are discovered, or prior to the next predicted rain event, whichever is sooner.

(2) If more than 30 calendar days are required to achieve compliance, then a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

d. Escalated Enforcement

(1) The Enforcement Response Plan must include a definition of "escalated enforcement." Escalated enforcement must include any enforcement scenario where a violation or other non-compliance is determined to cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan. Escalated enforcement may be defined differently for development planning, construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas.

(2) Where the Copermittee determines escalated enforcement is not required, a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

(3) Escalated enforcement actions must continue to increase in severity, as necessary, to compel compliance as soon as possible.

e. Reporting of Non-Compliant Sites

(1) Each Copermittee must notify the San Diego Water Board in writing within five (5) calendar days of issuing escalated enforcement (as defined in the Copermittee's Enforcement Response Plan) to a construction site that poses a significant threat to water quality as a result of violations or other non-compliance with its permits and applicable local ordinances, and the requirements of this Order. Written notification may be provided electronically by email to the appropriate San Diego Water Board staff.

(2) Each Copermittee must notify the San Diego Water Board of any persons required to obtain coverage under the statewide Industrial General Permit and Construction General Permit and failing to do so, within five (5) calendar days from the time the Copermittee become aware of the circumstances. Written notification may be provided electronically by email to RB9_Nonfilers@waterboards.ca.gov.

7. Public Education and Participation

Each Copermittee must implement, individually or with other Copermittees, a public education and participation program in accordance with the strategies identified in the Water Quality Improvement Plan to promote and encourage the development of programs, management practices, and behaviors that reduce the discharge of pollutants in storm water to the MEP, prevent controllable non-storm water discharges from entering the MS4, and protect water quality standards in receiving waters. The public education and participation program must be implemented in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include, at a minimum, the following requirements:

a. PUBLIC EDUCATION

The public education program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) Educational activities, public information activities, and other appropriate outreach activities intended to reduce pollutants associated with the application of pesticides, herbicides and fertilizer and other pollutants of concern in storm water discharges to and from its MS4 to the MEP, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed to address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(2) Educational activities, public information activities, and other appropriate outreach activities to facilitate the proper management and disposal of used oil and toxic materials; and

(3) Appropriate education and training measures for specific target audiences, such as construction site operators, residents, underserved target audiences and school-aged children, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed, based on high risk behaviors and pollutants of concern.

b. PUBLIC PARTICIPATION

The public participation program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) A process for members of the public to participate in updating the highest priority water quality conditions, numeric goals, and water quality improvement strategies in the Water Quality Improvement Plan;

(2) Opportunities for members of the public to participate in providing the Copermittee recommendations for improving the effectiveness of the water quality improvement strategies implemented within its jurisdiction; and

(3) Opportunities for members of the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or protection of the quality of receiving waters.

8. Fiscal Analysis

a. Each Copermittee must secure the resources necessary to meet all the requirements of this Order.

b. Each Copermittee must conduct an annual fiscal analysis of its jurisdictional runoff management program in its entirety. The fiscal analysis must include the following:

(1) Identification of the various categories of expenditures necessary to implement the requirements of this Order, including a description of the specific capital, operation and maintenance, and other expenditure items to be accounted for in each category of expenditures;

(2) The staff resources needed and allocated to meet the requirements of this Order, including any development, implementation, and enforcement activities required;

(3) The estimated expenditures for Provisions E.8.b.(1) and E.8.b.(2) for the current fiscal year; and

(4) The source(s) of funds that are proposed to meet the necessary expenditures described in Provisions E.8.b.(1) and E.8.b.(2), including legal restrictions on the use of such funds, for the current fiscal year and next fiscal year.

c. Each Copermittee must submit a summary of the annual fiscal analysis with each Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3).

d. Each Copermittee must provide the documentation used to develop the summary of the annual fiscal analysis upon request by the San Diego Water Board.

F. REPORTING

The purpose of this provision is to determine and document compliance with the requirements set forth in this Order. The goal of reporting is to communicate to the San Diego Water Board and the people of the State of California the implementation status of each jurisdictional runoff management program and compliance with the requirements of this Order. This goal is to be accomplished through the submittal of specific deliverables to the San Diego Water Board by the Copermittees.

1. Water Quality Improvement Plans

The Copermittees for each Watershed Management Area must develop and submit the Water Quality Improvement Plan in accordance with the following requirements:

a. WATER QUALITY IMPROVEMENT PLAN DEVELOPMENT

Each Water Quality Improvement Plan must be developed in accordance with the following process:

(1) Public Participation Process

The Copermittees must implement a public participation process to solicit data, information, and recommendations to be utilized in the development of the Water Quality Improvement Plan. The public participation process must include the following:

(a) The Copermittees must develop a publicly available and noticed schedule of the opportunities for the public to participate and provide comments during the development of the Water Quality Improvement Plan. The schedule may be adjusted as necessary by the Copermittees, provided the public is provided timely notification of the changes to the schedule.

(b) The Copermittees must form a Water Quality Improvement Consultation Panel to provide recommendations during the development of the Water Quality Improvement Plan. The Water Quality Improvement Consultation Panel must consist of at least the following members:

(i) A representative of the San Diego Water Board;

(ii) A representative of the environmental community familiar with the water quality conditions of concern of the receiving waters in the Watershed Management Area, preferably from an environmental interest group associated with a water body within the Watershed Management Area; and

(iii) A representative of the development community familiar with the opportunities and constraints for implementing structural BMPs,

retrofitting projects, and stream, channel or habitat rehabilitation projects in the Watershed Management Area, preferably with relevant engineering, hydrology, and/or geomorphology experience in the Watershed Management Area.

(c) The Copermittees must coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public time and opportunity to participate during the development of the Water Quality Improvement Plans.

(2) Priority Water Quality Conditions

(a) The Copermittees must solicit data, information and recommendations from the public to be utilized in the development and identification of the priority water quality conditions and potential water quality improvement strategies for the Watershed Management Area.

(b) The Copermittees must review the priority water quality conditions the Copermittees plan on including in the Water Quality Improvement Plan with the Water Quality Improvement Consultation Panel to receive recommendations or concurrence.

(c) The Copermittees must consider revisions to the priority water quality conditions based on recommendations from the Water Quality Improvement Consultation Panel.

(d) The Copermittees must include all the potential water quality improvement strategies identified by the public and the Water Quality Improvement Consultation Panel with the submittal of the priority water quality conditions to the San Diego Water Board.

(e) The Copermittees must submit the Water Quality Improvement Plan requirements of Provision B.2 to the San Diego Water Board as early as 6 months and no later than 12 months after the commencement of coverage under this Order. Upon receipt, the San Diego Water Board will issue a public notice and release the proposed priority water quality conditions and potential water quality improvement strategies for public review and comment for a minimum of 30 days.

(f) The Copermittees must consider revisions to the priority water quality conditions and potential water quality improvement strategies developed pursuant to Provision B.2 based on public comments received by the close of the comment period.

(3) Water Quality Improvement Goals, Strategies and Schedules

(a) The Copermittees must solicit recommendations from the public on potential numeric goals for the highest priority water quality conditions identified for the Watershed Management Area, and recommendations on the strategies that should be implemented to achieve the potential numeric goals.

(b) The Copermittees must consult with the Water Quality Improvement Consultation Panel and consider revisions to the following items based on the Panel's recommendations:

(i) The numeric goals and schedules the Copermittees propose to include in the Water Quality Improvement Plan;

(ii) The water quality improvement strategies and schedules the Copermittees propose to implement in the Watershed Management Area and include in the Water Quality Improvement Plan; and

(iii) If the Copermittees choose to implement Provision B.3.b.(4), the results of the Watershed Management Area Analysis the Copermittees proposed to incorporate into the Water Quality Improvement Plan.

(c) The Copermittees must submit the Water Quality Improvement Plan requirements of Provision B.3 to the San Diego Water Board as early as 9 months and no later than 18 months after the commencement of coverage under this Order. Upon receipt, the San Diego Water Board will issue a public notice and release the proposed water quality improvement goals, strategies and schedules for public review and comment for a minimum of 30 days.

(d) The Copermittees must consider revisions to the water quality improvement goals, strategies and schedules developed pursuant to Provision B.3 based on public comments received by the close of the comment period.

b. WATER QUALITY IMPROVEMENT PLAN SUBMITTAL AND IMPLEMENTATION

(1) Within 24 months after the commencement of coverage under this Order, the Copermittees for each Watershed Management Area must submit a complete Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order to the San Diego Water Board. The San Diego Water Board will issue a public notice and release the Water Quality Improvement Plan for public review and comment for a minimum of 30 days.

(2) The Copermittees must consider revisions to the Water Quality Improvement Plan based on written comments received by the close of the public comment period.

(3) The Copermittees must promptly submit any revisions to the Water Quality Improvement Plan to the San Diego Water Board no later than 60 days after the close of the public comment period.

(4) If issues concerning the Water Quality Improvement Plan are resolved informally through discussions among the Copermittees, the San Diego Water Board and interested parties, the San Diego Water Board Executive Officer may provide written notification of acceptance to the Copermittees that the Water Quality Improvement Plan meets the requirements of Provision B. However, if the Executive Officer determines that significant issues with the Water Quality Improvement Plan remain, the matter will be scheduled for San Diego Water Board consideration at a public meeting.

(5) The Copermittees must commence with implementation of the Water Quality Improvement Plan, in accordance with the water quality improvement strategies and schedules therein, upon written notification of acceptance with the Water Quality Improvement Plan by the San Diego Water Board Executive Officer.

(6) During implementation of the Water Quality Improvement Plan the Copermittees must correct any deficiencies in the Plan identified by the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report following a request by the Board to do so.

(7) The Water Quality Improvement Plan must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of receiving notification of acceptance with the Water Quality Improvement Plan by the San Diego Water Board Executive Officer.

2. Updates

a. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATES

Each Copermittee must update its jurisdictional runoff management program document in accordance with the following requirements:

(1) Each Copermittee is encouraged to seek public and key stakeholder participation and comments, as early and often as possible during the process of developing updates to its jurisdictional runoff management program document;

(2) Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E concurrent with the submittal of the Water Quality Improvement Plan. Each Copermittee must correct any deficiencies in the jurisdictional runoff management program document based on comments received from the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report;

(3) Each Copermittee must submit updates to its jurisdictional runoff management program, with the supporting rationale for the modifications, either in the Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b;

(4) The Copermittee must revise proposed modifications to its jurisdictional runoff management program as directed by the San Diego Water Board Executive Officer; and

(5) Updated jurisdictional runoff management program documents must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of submitting the Water Quality Improvement Plan Annual Report.

b. BMP DESIGN MANUAL UPDATES

Each Copermittee must update its BMP Design Manual in accordance with the following requirements:

(1) Each Copermittee must update its BMP Design Manual to incorporate the requirements of Provisions E.3.a-d concurrent with the submittal of the Water Quality Improvement Plan. Each Copermittee must correct any deficiencies in the BMP Design Manual based on comments received from the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report;

(2) ~~Subsequent~~ Any future updates to the BMP Design Manual made after its update pursuant to Provision F.2.b.(1) is completed must be consistent with the requirements of Provisions E.3.a-d and must be submitted as part of the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b; and

(3) ~~Updated~~ BMP Design Manuals must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of completing the update.

(4) If the San Diego Water Board amends Provisions E.3.a-d during the permit term but after the Copermittee has completed the update pursuant to

Provision F.2.b.(1), the Copermittee must revise its BMP Design Manual to incorporate the amended Provision E.3.a-d requirements as soon as possible but not later than 90 days after the date the San Diego Water Board adopts the amendments to Provisions E.3.a-d, unless otherwise directed by the San Diego Water Board Executive Officer. Under these circumstances, the effective date of the BMP Design Manual is no later than 90 days after the date the San Diego Water Board adopts the amendments to Provisions E.3.a-d, unless otherwise directed by the San Diego Water Board Executive Officer.

c. Water Quality Improvement Plan Updates

(1) The Water Quality Improvement Plans must be updated in accordance with the following process:

(a) The Copermittees must develop and implement a public participation process to obtain data, information and recommendations for updating the Water Quality Improvement Plan. The public participation process must provide for a publicly available and noticed schedule of opportunities for the public to participate and provide comments during the development of updates to the Water Quality Improvement Plan;

(b) The Copermittees must consult with the Water Quality Improvement Consultation Panel on proposed updates of the Water Quality Improvement Plan, and consider the Water Quality Improvement Consultation Panel's recommendations in finalizing the proposed updates;

(c) The Copermittees for each Watershed Management Area must submit 1) proposed updates to the Water Quality Improvement Plan and supporting rationale, and 2) recommendations received from the public and the Water Quality Improvement Consultation Panel and the rationale for the requested updates, either in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The updates submitted will be deemed accepted for inclusion in the Water Quality Improvement Plan ninety (90) days after submission unless otherwise directed in writing by the San Diego Water Board Executive Officer;

(d) The Copermittees must revise the requested updates as directed by the San Diego Water Board Executive Officer; and

(e) Updated Water Quality Improvement Plans must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance of the requested updates by the San Diego Water Board.

(2) No later than six months following Office of Administrative Law and USEPA approval of any TMDL Basin Plan amendment with wasteload allocations (WLAs) assigned to the Copermittees during the term of this Order, the Copermittees must initiate an update to the applicable Water Quality Improvement Plans in accordance with Provision F.1 or Provision F.2.c.(1) to incorporate the requirements of the TMDL WLAs.

3. Progress Reporting

a. Progress Report Presentations

The Copermittees for each Watershed Management Area must periodically appear before the San Diego Water Board, as requested by the Board, to provide progress reports on the implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs.

b. Annual Reports

(1) Transitional Jurisdictional Runoff Management Program Annual Reports

(a) Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) no later than October 31 of each year for each jurisdictional runoff management program reporting period (i.e. July 1 to June 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted.

(b) Each Copermittee must submit the information on the Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) specific to the area within its jurisdiction in each Watershed Management Area.

(c) In addition to submitting the Jurisdictional Runoff Management Program Annual Report Form during the transitional reporting period, each Copermittee may continue to utilize and submit the jurisdictional runoff management program annual reporting format of its previous NPDES permit until the first Water Quality Improvement Plan Annual Report is required to be submitted.

(2) Transitional Monitoring and Assessment Program Annual Reports

The Copermittees for each Watershed Management Area must submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment

program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted under this Order. The Transitional Monitoring and Assessment Program Annual Reports must include:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1.a and D.2.a, summarized and presented in tabular and graphical form; and

(b) The findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

(3) Water Quality Improvement Plan Annual Reports

The Copermittees for each Watershed Management Area must submit a Water Quality Improvement Plan Annual Report for each reporting period no later than January 31 of the following year. The annual reporting period consists of two different periods: 1) July 1 to June 30 of the following year for the jurisdictional runoff management programs, 2) October 1 to September 30 of the following year for the monitoring and assessment programs. The Water Quality Improvement Plan Annual Reports must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Each Annual Report must include the following:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, summarized and presented in tabular and graphical form;

(b) The progress of the special studies required pursuant to Provision D.3, and the findings, interpretations and conclusions of a special study, or each phase of a special study, upon its completion;

(c) The findings, interpretations and conclusions from the assessments required pursuant to Provision D.4;

(d) The progress of implementing the Water Quality Improvement Plan, including, but not limited to, the following:

(i) The progress toward achieving the interim and final numeric goals for the highest water quality priorities for the Watershed Management Area;

(ii) The water quality improvement strategies that were implemented and/or no longer implemented by each of the Copermittees during the reporting period and previous reporting periods;

(iii) The water quality improvement strategies planned for implementation during the next reporting period;

(iv) Proposed modifications to the water quality improvement strategies, the public comments received and the supporting rationale for the proposed modifications;

(v) Previous modifications or updates incorporated into the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document and implemented by the Copermittees in the Watershed Management Area; and

(vi) Proposed modifications or updates to the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document;

(e) A completed Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) for each Copermittee in the Watershed Management Area, certified by a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative; and

(f) Each Copermittee must provide any data or documentation utilized in developing the Water Quality Improvement Plan Annual Report upon request by the San Diego Water Board. Any Copermittee monitoring data utilized in developing the Water Quality Improvement Plan Annual Report must be uploaded to the California Environmental Data Exchange Network (CEDEN).[35] Any Copermittee monitoring and assessment data utilized in developing the Water Quality Improvement Plan Annual Report must be available for access on the Regional Clearinghouse required pursuant to Provision F.4.

c. Regional Monitoring and Assessment Report

(1) The Copermittees must submit a Regional Monitoring and Assessment Report no later than 180 days prior to the expiration date of this Order. The Regional Monitoring and Assessment Report may be submitted as part of the Report of Waste Discharge required pursuant to Provision F.5.b. In preparing the report the Copermittees must consider the receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, and the findings, interpretations, and conclusions from the assessments required pursuant to Provision D.4. Based on these considerations the report must assess the following:

[35] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

(a) The beneficial uses of the receiving waters within the San Diego Region that are supported and not adversely affected by the Copermittees' MS4 discharges;

(b) The beneficial uses of the receiving waters within the San Diego Region that are adversely impacted by the Copermittees' MS4 discharges;

(c) The progress toward protecting the beneficial uses in the receiving waters within the San Diego Region from the Copermittees' discharges; and

(d) Pollutants or conditions of emerging concern that may impact beneficial uses in the receiving waters within the San Diego Region.

(2) The Regional Monitoring and Assessment Report must include recommendations for improving the implementation and assessment of the Water Quality Improvement Plans and jurisdictional runoff management programs.

(3) Each Copermittee must provide any data or documentation utilized in developing the Regional Monitoring and Assessment Report upon request by the San Diego Water Board. Any Copermittee monitoring and assessment data utilized in developing the Regional Monitoring and Assessment Report must be available for access on the Regional Clearinghouse required pursuant to Provision F.4.

4. Regional Clearinghouse

The Copermittees must develop, update, and maintain an internet-based Regional Clearinghouse that is made available to the public no later than 18 months after the effective date of this Order.[36]

a. The Copermittees, through the Regional Clearinghouse, must make the following documents and data available for access, and organized by Watershed Management Area. The documents and data may be linked to other internet-based data portals and databases where the original documents are stored:

(1) Water Quality Improvement Plan for the Watershed Management Area, and all updated versions with date of update;

(2) Annual Reports for the Watershed Management Area;

(3) Jurisdictional Runoff Management Program document for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

[36] The Copermittees may develop, update and maintain the clearinghouse(s) of other Copermittees or agencies.

(4) BMP Design Manual for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(5) Reports from special studies (e.g. source identification, BMP effectiveness assessment) conducted in the Watershed Management Area;

(6) Monitoring data collected pursuant to Provision D for each Watershed Management Area must be uploaded to CEDEN,[37] with links to the uploaded data; and

(7) Available GIS data, layers, and/or shapefiles used to develop the maps generated and maintained by the Copermittees for the Water Quality Improvement Plans, Annual Reports, and jurisdictional runoff management program documents.

b. The Copermittees, through the Regional Clearinghouse, must make the following information and documents available for access:

(1) Contact information (point of contact, phone number, email address, and mailing address) for each Copermittee;

(2) Public hotline number for reporting non-storm water and illicit discharges for each Copermittee;

(3) Email address for reporting non-storm water and illicit discharges for each Copermittee;

(4) Link to each Copermittee's website, if available, where the public may find additional information about the Copermittee's storm water management program and for requesting records for the implementation of its program;

(5) Information about opportunities for the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or protection of the quality of receiving waters; and

(6) Reports from regional monitoring programs in which the Copermittees participate (e.g. Southern California Monitoring Coalition, Southern California Coastal Water Research Project Bight Monitoring);

(7) Regional Monitoring and Assessment Reports; and

(8) Any other information, data, and documents the Copermittees determine as appropriate for making available to the public.

[37] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

5. Report of Waste Discharge

~~a. The Riverside County Copermittees are required to submit a complete Report of Waste Discharge pursuant to the requirements of their current Order. The San Diego Water Board will review and consider the Report of Waste Discharge to determine whether modification to this Order, pursuant to the requirements of Provision H, will be required prior to the Riverside County Copermittees obtaining coverage under this Order. The current Order for Riverside County Copermittees is rescinded upon the date of effective coverage under this Order except for enforcement purposes.~~

~~b.~~
The Copermittees subject to the requirements of this Order must submit to the San Diego Water Board a complete Report of Waste Discharge as an application for the re-issuance of this Order and NPDES permit. The Report of Waste Discharge must be submitted no later than 180 days in advance of the expiration date of this Order. The Report of Waste Discharge must contain the following minimum information:

~~(1)~~
a. Names and addresses of the Copermittees;
~~(2)~~
b. Names and titles of the primary contacts of the Copermittees;
~~(3)~~
c. Proposed changes to the Copermittees' Water Quality Improvement Plans and the supporting justification;
~~(4)~~
d. Proposed changes to the Copermittees' jurisdictional runoff management programs and the supporting justification;
~~(5)~~
e. Any other information necessary for the re-issuance of this Order;
~~(6)~~
f. Any information to be included as part of the Report of Waste Discharge pursuant to the requirements of this Order; and
~~(7)~~
g. Any other information required by federal regulations for NPDES permit reissuance.

~~6. Application for Early Coverage~~

~~a. The Riverside County Copermittees may apply for early coverage under this Order by submitting a Report of Waste Discharge Form 200, with a written request for early coverage under this Order.~~

~~b. The San Diego Water Board will review the application for early coverage. A notification of coverage under this Order will be issued to the Copermittees in the respective county by the San Diego Water Board upon completion of the early coverage application requirements. The effective coverage date will be specified~~

~~in the notification of coverage. The Copermittees in the respective county are authorized to have MS4 discharges pursuant to the requirements of this Order starting on the effective coverage date specified in the notification of coverage. The existing Order for the respective county is rescinded upon the effective coverage date specified in the notification of coverage except for enforcement purposes.~~

~~7.~~

6. Reporting Provisions

Each Copermittee must comply with all the reporting and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

G. PRINCIPAL WATERSHED COPERMITTEE RESPONSIBILITIES

1. The Copermittees within each Watershed Management Area must designate a Principal Watershed Copermittee and notify the San Diego Water Board of the name of the Principal Watershed Copermittee. An individual Copermittee should not be designated a Principal Watershed Copermittee for more than two Watershed Management Areas. The notification may be submitted with the Water Quality Improvement Plan required pursuant to Provision F.1 of this Order.

2. The Principal Watershed Copermittee is responsible for, at a minimum, the following:

a. Serving as liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues, and when necessary and appropriate, representing the Copermittees in the Watershed Management Area before the San Diego Water Board;

b. Facilitating the development of the Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order;

c. Coordinating the submittal of the deliverables required by Provisions F.1, F.2, F.3.a, and F.3.b of this Order; and

d. Coordinating and developing, with the other Principal Watershed Copermittees, the requirements of Provisions F.3.c, F.4, and F.5.b of this Order.

3. The Principal Watershed Copermittee is not responsible for ensuring that the other Copermittees within the Watershed Management Area are in compliance with the requirements of this Order. Each Copermittee within the Watershed Management Area is responsible for complying with the requirements of this Order.

H. MODIFICATION OF ORDER

1. Modifications of the Order may be initiated by the San Diego Water Board or by the Copermittees. Requests by Copermittees must be made to the San Diego Water Board.

2. Minor modifications to the Order may be made by the San Diego Water Board where the proposed modification complies with all the prohibitions and limitations, and other requirements of this Order.

3. This Order may also be re-opened and modified, revoked and, reissued or terminated in accordance with the provisions of 40 CFR 122.44, 122.62 to 122.64, and 124.5. Causes for taking such actions include, but are not limited to, failure to comply with any condition of this Order and permit, and endangerment to human health or the environment resulting from the permitted activity.

4. This Order may be re-opened for modification for cause including but not limited to the following:

   ~~a. The State Water Board determines that revisions are warranted, and the San Diego Water Board concurs that revisions are necessary to those provisions of the Order addressing compliance with water quality standards in the receiving water and/or those provisions of the Order establishing an iterative process for implementation of management practices to assure compliance with water quality standards in the receiving water;~~

   ~~b. An application for early coverage under this Order is received pursuant to Provision F.6;~~

   ~~c.~~

   a. Any of the TMDLs in Attachment E to this Order are amended in the Basin Plan by San Diego Water Board, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA;

   ~~d.~~

   b. The Basin Plan is amended by the San Diego Water Board to incorporate a new TMDL, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA; or

   ~~e.~~

   c. Updating or revising the monitoring and reporting requirements is determined to be necessary, at the discretion of the San Diego Water Board. Such modification(s) may include, but is (are) not limited to, revision(s) to: (i) implement recommendations from Southern California Coastal Water Research Project (SCCWRP), (ii) develop, refine, implement, and/or coordinate a regional monitoring program, (iii) develop and implement improved monitoring and assessment programs in keeping with San Diego Water Board Resolution No. R9-2012-0069, Resolution in Support of a Regional Monitoring Framework, and/or (iv) add provisions to require the Copermittees to evaluate and provide information on cost and values of the monitoring and reporting program.

~~**5.** The San Diego Water Board, after opportunity for public comment and a public hearing, will re-open and consider modifications to this Order when the Riverside County Copermittees submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders.~~

I. STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

Each Copermittee must comply with all the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

ATTACHMENT A

DISCHARGE PROHIBITIONS AND SPECIAL PROTECTIONS

1. Basin Plan Waste Discharge Prohibitions

California Water Code Section 13243 provides that a Regional Water Board, in a water quality control plan, may specify certain conditions or areas where the discharge of waste or certain types of waste is not permitted. The following waste discharge prohibitions in the Water Quality Control Plan for the San Diego Basin (Basin Plan) are applicable to any person, as defined by Section 13050(c) of the California Water Code, who is a citizen, domiciliary, or political agency or entity of California whose activities in California could affect the quality of waters of the state within the boundaries of the San Diego Region.

1. The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in California Water Code Section 13050, is prohibited.

2. The discharge of waste to land, except as authorized by waste discharge requirements or the terms described in California Water Code Section 13264 is prohibited.

3. The discharge of pollutants or dredged or fill material to waters of the United States except as authorized by a National Pollutant Discharge Elimination System (NPDES) permit or a dredged or fill material permit (subject to the exemption described in California Water Code Section 13376) is prohibited.

4. Discharges of recycled water to lakes or reservoirs used for municipal water supply or to inland surface water tributaries thereto are prohibited, unless this San Diego Water Board issues a NPDES permit authorizing such a discharge; the proposed discharge has been approved by the State Department of Health Services (DHS) and the operating agency of the impacted reservoir; and the discharger has an approved fail-safe long-term disposal alternative.

5. The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the San Diego Water Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

6. The discharge of waste in a manner causing flow, ponding, or surfacing on lands not owned or under the control of the discharger is prohibited, unless the discharge is authorized by the San Diego Water Board.

7. The dumping, deposition, or discharge of waste directly into waters of the state, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the San Diego Water Board.

8. Any discharge to a storm water conveyance system that is not composed entirely of "*storm water*" is prohibited unless authorized by the San Diego Water Board. [The federal regulations, 40 CFR 122.26(b)(13), define storm water as storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from firefighting activities.] [§122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

9. The unauthorized discharge of treated or untreated sewage to waters of the state or to a storm water conveyance system is prohibited.

10. The discharge of industrial wastes to conventional septic tank/subsurface disposal systems, except as authorized by the terms described in California Water Code Section 13264, is prohibited.

11. The discharge of radioactive wastes amenable to alternative methods of disposal into the waters of the state is prohibited.

12. The discharge of any radiological, chemical, or biological warfare agent into waters of the state is prohibited.

13. The discharge of waste into a natural or excavated site below historic water levels is prohibited unless the discharge is authorized by the San Diego Water Board.

14. The discharge of sand, silt, clay, or other earthen materials from any activity, including land grading and construction, in quantities which cause deleterious bottom deposits, turbidity or discoloration in waters of the state or which unreasonably affect, or threaten to affect, beneficial uses of such waters is prohibited.

15. The discharge of treated or untreated sewage from vessels to Mission Bay, Oceanside Harbor, Dana Point Harbor, or other small boat harbors is prohibited.

16. The discharge of untreated sewage from vessels to San Diego Bay is prohibited.

17. The discharge of treated sewage from vessels to portions of San Diego Bay that are less than 30 feet deep at mean lower low water (MLLW) is prohibited.

18. The discharge of treated sewage from vessels, which do not have a properly functioning US Coast Guard certified Type I or Type II marine sanitation device, to portions of San Diego Bay that are greater than 30 feet deep at mean lower low water (MLLW) is prohibited.

2. Attachment B to State Water Board Resolution 2012-0012, as amended by State Water Board Resolution No. 2012-0031.

Special Protections for Areas of Special Biological Significance (ASBS), Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges

I. PROVISIONS FOR POINT SOURCE DISCHARGES OF STORM WATER AND NONPOINT SOURCE WASTE DISCHARGES

The following terms, prohibitions, and special conditions (hereafter collectively referred to as special conditions) are established as limitations on point source storm water and nonpoint source discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in Areas of Special Biological Significance (ASBS), as required for State Water Quality Protection Areas pursuant to California Public Resources Code Sections 36700(f) and 36710(f). These Special Protections are adopted by the State Water Board as part of the California Ocean Plan (Ocean Plan) General Exception.

The special conditions are organized by category of discharge. The State Water Resources Control Board (State Water Board) and Regional Water Quality Control Boards (Regional Water Boards) will determine categories and the means of regulation for those categories [e.g., Point Source Storm Water National Pollutant Discharge Elimination System (NPDES) or Nonpoint Source].

A. PERMITTED POINT SOURCE DISCHARGES OF STORM WATER

1. General Provisions for Permitted Point Source Discharges of Storm Water

   a. Existing storm water discharges into an ASBS are allowed only under the following conditions:

      (1) The discharges are authorized by an NPDES permit issued by the State Water Board or Regional Water Board;

      (2) The discharges comply with all of the applicable terms, prohibitions, and special conditions contained in these Special Protections; and

      (3) The discharges:

         (i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

         (ii) Are designed to prevent soil erosion;

         (iii) Occur only during wet weather;

         (iv) Are composed of only storm water runoff.

   b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

c. The discharge of trash is prohibited.

d. Only discharges from existing storm water outfalls are allowed. Any proposed or new storm water runoff discharge shall be routed to existing storm water discharge outfalls and shall not result in any new contribution of waste to an ASBS (i.e., no additional pollutant loading). "Existing storm water outfalls" are those that were constructed or under construction prior to January 1, 2005. "New contribution of waste" is defined as any addition of waste beyond what would have occurred as of January 1, 2005. A change to an existing storm water outfall, in terms of re-location or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges are prohibited except as provided below:

(1) The term "non-storm water discharges" means any waste discharges from a municipal separate storm sewer system (MS4) or other NPDES permitted storm drain system to an ASBS that are not composed entirely of storm water.

(2) (i) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability or occur naturally:

(a) Discharges associated with emergency fire fighting operations.

(b) Foundation and footing drains.

(c) Water from crawl space or basement pumps.

(d) Hillside dewatering.

(e) Naturally occurring groundwater seepage via a storm drain.

(f) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(ii) An NPDES permitting authority may authorize non-storm water discharges to an MS4 with a direct discharge to an ASBS only to the extent the NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

2. Compliance Plans for Inclusion in Storm Water Management Plans (SWMP) and Storm Water Pollution Prevention Plans (SWPPP).

The discharger shall specifically address the prohibition of non-storm water runoff and the requirement to maintain natural water quality for storm water discharges to an ASBS in an ASBS Compliance Plan to be included in its SWMP or a SWPPP, as appropriate to permit type. If a statewide permit includes a SWMP, then the discharger shall prepare a stand-alone compliance plan for ASBS discharges. The ASBS Compliance Plan is subject to approval by

the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (for permits issued by Regional Water Boards).

a. The Compliance Plan shall include a map of surface drainage of storm water runoff, showing areas of sheet runoff, prioritize discharges, and describe any structural Best Management Practices (BMPs) already employed and/or BMPs to be employed in the future. Priority discharges are those that pose the greatest water quality threat and which are identified to require installation of structural BMPs. The map shall also show the storm water conveyances in relation to other features such as service areas, sewage conveyances and treatment facilities, landslides, areas prone to erosion, and waste and hazardous material storage areas, if applicable. The SWMP or SWPPP shall also include a procedure for updating the map and plan when changes are made to the storm water conveyance facilities.

b. The ASBS Compliance Plan shall describe the measures by which all non-authorized non-storm water runoff (e.g., dry weather flows) has been eliminated, how these measures will be maintained over time, and how these measures are monitored and documented.

c. For Municipal Separate Storm Sewer System (MS4s), the ASBS Compliance Plan shall require minimum inspection frequencies as follows:

(1) The minimum inspection frequency for construction sites shall be weekly during rainy season;

(2) The minimum inspection frequency for industrial facilities shall be monthly during the rainy season;

(3) The minimum inspection frequency for commercial facilities (e.g., restaurants) shall be twice during the rainy season; and

(4) Storm water outfall drains equal to or greater than 18 inches (457 mm) in diameter or width shall be inspected once prior to the beginning of the rainy season and once during the rainy season and maintained to remove trash and other anthropogenic debris.

d. The ASBS Compliance Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff, that are necessary to comply with these special conditions, will be achieved through BMPs. Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that such installation would pose a threat to health or safety. BMPs to control storm water runoff discharges (at the end-of-pipe) during a design storm shall be designed to achieve on average the following target levels:

(1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

(2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges.

The baseline for these determinations is the effective date of the Exception, except for those structural BMPs installed between January 1, 2005 and adoption of these Special Protections, and the reductions must be achieved and documented within six (6) years of the effective date.

e. The ASBS Compliance Plan shall address erosion control and the prevention of anthropogenic sedimentation in ASBS. The natural habitat conditions in the ASBS shall not be altered as a result of anthropogenic sedimentation.

f. The ASBS Compliance Plan shall describe the non-structural BMPs currently employed and planned in the future (including those for construction activities), and include an implementation schedule. The ASBS Compliance Plan shall include non-structural BMPs that address public education and outreach. Education and outreach efforts must adequately inform the public that direct discharges of pollutants from private property not entering an MS4 are prohibited. The ASBS Compliance Plan shall also describe the structural BMPs, including any low impact development (LID) measures, currently employed and planned for higher threat discharges and include an implementation schedule. To control storm water runoff discharges (at the end-of-pipe) during a design storm, permittees must first consider, and use where feasible, LID practices to infiltrate, use, or evapotranspirate storm water runoff on-site, if LID practices would be the most effective at reducing pollutants from entering the ASBS.

g. The BMPs and implementation schedule shall be designed to ensure that natural water quality conditions in the receiving water are achieved and maintained by either reducing flows from impervious surfaces or reducing pollutant loading, or some combination thereof.

h. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents in storm water runoff that alter natural ocean water quality and the sources of these constituents.

(2) The report shall describe BMPs that are currently being implemented, BMPs that are identified in the SWMP or SWPPP for future implementation, and any additional BMPs that may be added to the SWMP or SWPPP to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the BMPs.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits), the discharger shall revise its ASBS Compliance Plan to incorporate any new or modified BMPs that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised SWMP or SWPPP, the discharger does not have to repeat

the same procedure for continuing or recurring exceedances of natural ocean water quality conditions due to the same constituent.

(5) The requirements of this section are in addition to the terms, prohibitions, and conditions contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within eighteen (18) months from the effective date of the Exception, the discharger shall submit a draft written ASBS Compliance Plan to the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that describes its strategy to comply with these special conditions, including the requirement to maintain natural water quality in the affected ASBS. The ASBS Compliance Plan shall include a description of appropriate non-structural controls and a time schedule to implement structural controls (implementation schedule) to comply with these special conditions for inclusion in the discharger's SWMP or SWPPP, as appropriate to permit type. The final ASBS Compliance Plan, including a description and final schedule for structural controls based on the results of runoff and receiving water monitoring, must be submitted within thirty (30) months from the effective date of the Exception.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these special conditions shall be implemented.

d. Within six (6) years of the effective date of the Exception, any structural controls identified in the ASBS Compliance Plan that are necessary to comply with these special conditions shall be operational.

e. Within six (6) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water, pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data, and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in

compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. for municipalities, a demonstration of significant hardship to discharger ratepayers, by showing the relationship of storm water fees to annual household income for residents within the discharger's jurisdictional area, and the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or

2. for other governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

B. NONPOINT SOURCE DISCHARGES

1. General Provisions for Nonpoint Sources

a. Existing nonpoint source waste discharges are allowed into an ASBS only under the following conditions:

(1) The discharges are authorized under waste discharge requirements, a conditional waiver of waste discharge requirements, or a conditional prohibition issued by the State Water Board or a Regional Water Board.

(2) The discharges are in compliance with the applicable terms, prohibitions, and special conditions contained in these Special Protections.

(3) The discharges:

(i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

(ii) Are designed to prevent soil erosion;

(iii) Occur only during wet weather;

(iv) Are composed of only storm water runoff.

b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

c. The discharge of trash is prohibited.

d. Only existing nonpoint source waste discharges are allowed. "Existing nonpoint source waste discharges" are discharges that were ongoing prior to January 1, 2005. "New nonpoint source discharges" are defined as those that commenced on or after January 1, 2005. A change to an existing nonpoint source discharge, in terms of relocation or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges from nonpoint sources (those not subject to an NPDES Permit) are prohibited except as provided below:

(1) The term "non-storm water discharges" means any waste discharges that are not composed entirely of storm water.

(2) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability, or occur naturally:

(i) Discharges associated with emergency fire fighting operations.

(ii) Foundation and footing drains.

(iii) Water from crawl space or basement pumps.

(iv) Hillside dewatering.

(v) Naturally occurring groundwater seepage via a storm drain.

(vi) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

f. At the San Clemente Island ASBS, discharges incidental to military training and research, development, test, and evaluation operations are allowed. Discharges incidental to underwater demolition and other in-water explosions are not allowed in the two military closure areas in the vicinity of Wilson Cove and Castle Rock. Discharges must not result in a violation of the water quality objectives, including the protection of the marine aquatic life beneficial use, anywhere in the ASBS.

g. At the San Nicolas Island and Begg Rock ASBS, discharges incidental to military research, development, testing, and evaluation of, and training with, guided missile and other weapons systems, fleet training exercises, small-scale amphibious warfare training, and special warfare training are allowed. Discharges incidental to underwater demolition and other in-water explosions are not allowed. Discharges must not result in a violation of the water quality objectives, including the protection of the marine aquatic life beneficial use, anywhere in the ASBS.

h. All other nonpoint source discharges not specifically authorized above are prohibited.

2. Planning and Reporting

a. The nonpoint source discharger shall develop an ASBS Pollution Prevention Plan, including an implementation schedule, to address storm water runoff and any other nonpoint source discharges from its facilities. The ASBS Pollution Prevention Plan must be equivalent in contents to an ASBS Compliance Plan as described in I (A)(2) in this document. The ASBS Pollution Prevention Plan is subject to approval by the Executive Director of the State Water Board (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements).

b. The ASBS Pollution Prevention Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff that are necessary to comply with these special conditions, will be achieved through Management Measures and associated Management Practices (Management Measures/Practices). Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director or Regional Water Board Executive Officer that such installation would pose a threat to health or safety. Management Measures to control storm water runoff during a design storm shall achieve on average the following target levels:

(1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

(2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges.

The baseline for these determinations is the effective date of the Exception, except for those structural BMPs installed between January 1, 2005 and adoption of these Special Protections, and the reductions must be achieved and documented within six (6) years of the effective date.

c. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff or other nonpoint source pollution is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and the Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents that alter natural water quality and the sources of these constituents.

(2) The report shall describe Management Measures/Practices that are currently being implemented, Management Measures/Practices that are identified in the ASBS Pollution Prevention Plan for future implementation, and any additional Management Measures/Practices that may be added to the Pollution Prevention Plan to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the Management Measures/Practices.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge

requirements), the discharger shall revise its ASBS Pollution Prevention Plan to incorporate any new or modified Management Measures/Practices that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised ASBS Pollution Prevention Plan, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural water quality conditions due to the same constituent.

(5) The requirements of this section are in addition to the terms, prohibitions, and conditions contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within eighteen (18) months from the effective date of the Exception, the discharger~~s~~ shall submit a draft written ASBS Pollution Prevention Plan to the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) that describes its strategy to comply with these special conditions, including the requirement to maintain natural ocean water quality in the affected ASBS. The Pollution Prevention Plan shall include a description of appropriate non-structural controls and a time schedule to implement structural controls to comply with these special conditions for inclusion in the discharger's Pollution Prevention Plan. The final ASBS Pollution Prevention Plan, including a description and final schedule for structural controls based on the results of runoff and receiving water monitoring, must be submitted within thirty (30) months from the effective date of the Exception.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these Special Protections shall be implemented.

d. Within six (6) years of the effective date of the Exception, any structural controls identified in the ASBS Pollution Prevention Plan that are necessary to comply with these special conditions shall be operational.

e. Within six (6) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) may only authorize additional time to comply

with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in (d.) or (e.). The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. a demonstration that the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or

2. for governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

II. ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES

In addition to the provisions in Section I (A) or I (B), respectively, a discharger with parks and recreation facilities shall comply with the following:

A. The discharger shall include a section in an ASBS Compliance Plan (for NPDES dischargers) or an ASBS Pollution Prevention Plan (for nonpoint source dischargers) to address storm water runoff from parks and recreation facilities.

1. The plan shall identify all pollutant sources, including sediment sources, which may result in waste entering storm water runoff. Pollutant sources include, but are not limited to, roadside rest areas and vistas, picnic areas, campgrounds, trash receptacles, maintenance facilities, park personnel housing, portable toilets, leach fields, fuel tanks, roads, piers, and boat launch facilities.

2. The plan shall describe BMPs or Management Measures/Practices that will be implemented to control soil erosion (both temporary and permanent erosion controls) and reduce or eliminate pollutants in storm water runoff in order to achieve and maintain natural water quality conditions in the affected ASBS. The plan shall include BMPs or Management Measures/Practices to ensure that trails and culverts are maintained to prevent erosion and minimize waste discharges to ASBS.

3. The plan shall include BMPs or Management Measures/Practices to prevent the discharge of pesticides or other chemicals, including agricultural chemicals, in storm water runoff to the affected ASBS.

4. The plan shall include BMPs or Management Measures/Practices that address public education and outreach. The goal of these BMPs or Management Measures/Practices is to ensure that the public is adequately informed that waste discharges to the affected ASBS are prohibited or limited by special conditions in these Special Protections. The BMPs or Management Measures/Practices shall include signage at camping, picnicking, beach and roadside parking areas, and visitor centers, or other appropriate measures, which notify the public of any applicable requirements of these Special Protections and identify the ASBS boundaries.

5. The plan shall include BMPs or Management Measures/Practices that address the prohibition against the discharge of trash to ASBS. The BMPs or Management Measures/Practices shall include measures to ensure that adequate trash receptacles are available for public use at visitor facilities, including parking areas, and that the receptacles are adequately maintained to prevent trash discharges into the ASBS. Appropriate measures include covering trash receptacles to prevent trash from being wind blown and periodically emptying the receptacles to prevent overflows.

6. The plan shall include BMPs or Management Measures/Practices to address runoff from parking areas and other developed features to ensure that the runoff does not alter natural water quality in the affected ASBS. BMPs or Management Measures/Practices shall include measures to reduce pollutant loading in runoff to the ASBS through installation of natural area buffers (LID), treatment, or other appropriate measures.

B. Maintenance and repair of park and recreation facilities must not result in waste discharges to the ASBS. The practice of road oiling must be minimized or eliminated, and must not result in waste discharges to the ASBS.

III. ADDITIONAL REQUIREMENTS – WATERFRONT AND MARINE OPERATIONS

In addition to the provisions in Section I (A) or I (B), respectively, a discharger with waterfront and marine operations shall comply with the following:

A. For discharges related to waterfront and marine operations, the discharger shall develop a Waterfront and Marine Operations Management Plan (Waterfront Plan). This plan shall contain appropriate Management Measures/Practices to address nonpoint source pollutant discharges to the affected ASBS.

1. The Waterfront Plan shall contain appropriate Management Measures/Practices for any waste discharges associated with the operation and maintenance of vessels, moorings, piers, launch ramps, and cleaning stations in order to ensure that beneficial uses are protected and natural water quality is maintained in the affected ASBS.

2. For discharges from marinas and recreational boating activities, the Waterfront Plan shall include appropriate Management Measures, described in The Plan for California's Nonpoint Source Pollution Control Program, for marinas and recreational boating, or equivalent practices, to ensure that nonpoint source pollutant discharges do not alter natural water quality in the affected ASBS.

3. The Waterfront Plan shall include Management Practices to address public education and outreach to ensure that the public is adequately informed that waste discharges to the affected ASBS are prohibited or limited by special conditions in these Special Protections. The management practices shall include appropriate signage, or similar measures, to inform the public of the ASBS restrictions and to identify the ASBS boundaries.

4. The Waterfront Plan shall include Management Practices to address the prohibition against trash discharges to ASBS. The Management Practices shall include the provision of adequate trash receptacles for marine recreation areas, including parking areas, launch ramps, and docks. The plan shall also include appropriate Management Practices to ensure that the receptacles are adequately maintained and secured in order to prevent trash discharges into the ASBS. Appropriate Management Practices include covering the trash receptacles to prevent trash from being windblown, staking or securing the trash receptacles so they don't tip over, and periodically emptying the receptacles to prevent overflow.

5. The discharger shall submit its Waterfront Plan to the by the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) within six months of the effective date of these special conditions. The Waterfront Plan is subject to approval by the State Water Board Executive Director or the Regional Water Board Executive Officer, as appropriate. The plan must be fully implemented within 18 months of the effective date of the Exception.

B. The discharge of chlorine, soaps, petroleum, other chemical contaminants, trash, fish offal, or human sewage to ASBS is prohibited. Sinks and fish cleaning stations are point source discharges of wastes and are prohibited from discharging into ASBS. Anthropogenic accumulations of discarded fouling organisms on the sea floor must be minimized.

C. Limited-term activities, such as the repair, renovation, or maintenance of waterfront facilities, including, but not limited to, piers, docks, moorings, and breakwaters, are authorized only in accordance with Chapter III.E.2 of the Ocean Plan.

D. If the discharger anticipates that the discharger will fail to fully implement the approved Waterfront Plan within the 18 month deadline, the discharger shall submit a technical report as soon as practicable to the State Water Board Executive Director or the Regional Water Board Executive Officer, as appropriate. The technical report shall contain reasons for failing to meet the deadline and propose a revised schedule to fully implement the plan.

E. The State Water Board or the Regional Water Board may, for good cause, authorize additional time to comply with the Waterfront Plan. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in Section III.A.5. The notice shall

describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality. The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. a demonstration of significant hardship by showing that the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate.

2. for governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

IV. MONITORING REQUIREMENTS

Monitoring is mandatory for all dischargers to assure compliance with the Ocean Plan. Monitoring requirements include both: (A) core discharge monitoring, and (B) ocean receiving water monitoring. The State and Regional Water Boards must approve sampling site locations and any adjustments to the monitoring programs. All ocean receiving water and reference area monitoring must be comparable with the Water Boards' Surface Water Ambient Monitoring Program (SWAMP).

Safety concerns: Sample locations and sampling periods must be determined considering safety issues. Sampling may be postponed upon notification to the State and Regional Water Boards if hazardous conditions prevail.

Analytical Chemistry Methods: All constituents must be analyzed using the lowest minimum detection limits comparable to the Ocean Plan water quality objectives. For metal analysis, all samples, including storm water effluent, reference samples, and ocean receiving water samples, must be analyzed by the approved analytical method with the lowest minimum detection limits (currently Inductively Coupled Plasma/Mass Spectrometry) described in the Ocean Plan.

A. CORE DISCHARGE MONITORING PROGRAM

1. General sampling requirements for timing and storm size:

   Runoff must be collected during a storm event that is greater than 0.1 inch and generates runoff, and at least 72 hours from the previously measurable storm event. Runoff samples shall be collected during the same storm and at approximately the same time when post-storm receiving water is sampled, and analyzed for the same constituents as receiving water and reference site samples (see section IV B) as described below.

2. Runoff flow measurements

   a. For municipal/industrial storm water outfalls in existence as of December 31, 2007,

18 inches (457mm) or greater in diameter/width (including multiple outfall pipes in combination having a width of 18 inches, runoff flows must be measured or calculated, using a method acceptable to and approved by the State and Regional Water Boards.

b. This will be reported annually for each precipitation season to the State and Regional Water Boards.

3. Runoff samples – storm events

a. For outfalls equal to or greater than 18 inches (0.46m) in diameter or width:

(1) samples of storm water runoff shall be collected during the same storm as receiving water samples and analyzed for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

(2) samples of storm water runoff shall be collected and analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

(3) If an applicant has no outfall greater than 36 inches, then storm water runoff from the applicant's largest outfall shall be further collected during the same storm as receiving water samples and analyzed for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates).

b. For outfalls equal to or greater than 36 inches (0.91m) in diameter or width:

(1) samples of storm water runoff shall be collected during the same storm as receiving water samples and analyzed for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

(2) samples of storm water runoff shall be further collected during the same storm as receiving water samples and analyzed for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates); and

(3) samples of storm water runoff shall be collected and analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

c. For an applicant not participating in a regional monitoring program [see below in Section IV (B)] in addition to (a.) and (b.) above, a minimum of the two largest outfalls or 20 percent of the larger outfalls, whichever is greater, shall be sampled (flow weighted composite samples) at least three times annually during wet weather (storm event) and analyzed for all Ocean Plan Table A constituents, Table B constituents for marine

aquatic life protection (except for toxicity, only chronic toxicity for three species shall be required), DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, and Ocean Plan indicator bacteria. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one (the largest) such discharge shall be sampled annually in each Region.

4. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may reduce or suspend core monitoring once the storm runoff is fully characterized. This determination may be made at any point after the discharge is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

B. Ocean Receiving Water and Reference Area Monitoring Program

In addition to performing the Core Discharge Monitoring Program in Section II.A above, all applicants having authorized discharges must perform ocean receiving water monitoring. In order to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS, dischargers may choose either (1) an individual monitoring program, or (2) participation in a regional integrated monitoring program.

1. Individual Monitoring Program: The requirements listed below are for those dischargers who elect to perform an individual monitoring program to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within the affected ASBS. In addition to Core Discharge Monitoring, the following additional monitoring requirements shall be met:

   a. Three times annually, during wet weather (storm events), the receiving water at the point of discharge from the outfalls described in section (IV)(A)(3)(c) above shall be sampled and analyzed for Ocean Plan Table A constituents, Table B constituents for marine aquatic life, DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, salinity, chronic toxicity (three species), and Ocean Plan indicator bacteria.

      The sample location for the ocean receiving water shall be in the surf zone at the point of discharges; this must be at the same location where storm water runoff is sampled. Receiving water shall be sampled prior to (pre-storm) and during (or immediately after) the same storm (post storm). Post storm sampling shall be during the same storm and at approximately the same time as when the runoff is sampled. Reference water quality shall also be sampled three times annually and analyzed for the same constituents pre-storm and post-storm, during the same storm seasons when receiving water is sampled. Reference stations will be determined by the State Water Board's Division of Water Quality and the applicable Regional Water Board(s).

   b. Sediment sampling shall occur at least three times during every five (5) year period. The subtidal sediment (sand or finer, if present) at the discharge shall be sampled and analyzed for Ocean Plan Table B constituents for marine aquatic life, DDT, PCBs, PAHs, pyrethroids, and OP pesticides. For sediment toxicity testing, only an acute toxicity test using the amphipod *Eohaustorius estuarius* must be performed.

c. A quantitative survey of intertidal benthic marine life shall be performed at the discharge and at a reference site. The survey shall be performed at least once every five (5) year period. The survey design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The results of the survey shall be completed and submitted to the State Water Board and Regional Water Board at least six months prior to the end of the permit cycle.

d. Once during each five (5) year period, a bioaccumulation study shall be conducted to determine the concentrations of metals and synthetic organic pollutants at representative discharge sites and at representative reference sites. The study design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The bioaccumulation study may include California mussels (*Mytilus californianus*) and/or sand crabs (*Emerita analoga* or *Blepharipoda occidentalis*). Based on the study results, the Regional Water Board and the State Water Board's Division of Water Quality, may adjust the study design in subsequent permits, or add or modify additional test organisms (such as shore crabs or fish), or modify the study design appropriate for the area and best available sensitive measures of contaminant exposure.

e. Marine Debris: Representative quantitative observations for trash by type and source shall be performed along the coast of the ASBS within the influence of the discharger's outfalls. The design, including locations and frequency, of the marine debris observations is subject to approval by the Regional Water Board and State Water Board's Division of Water Quality.

f. The monitoring requirements of the Individual Monitoring Program in this section are minimum requirements. After a minimum of one (1) year of continuous water quality monitoring of the discharges and ocean receiving waters, the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may require additional monitoring, or adjust, reduce or suspend receiving water and reference station monitoring. This determination may be made at any point after the discharge and receiving water is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

2. Regional Integrated Monitoring Program: Dischargers may elect to participate in a regional integrated monitoring program, in lieu of an individual monitoring program, to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS. This regional approach shall characterize natural water quality, pre- and post-storm, in ocean reference areas near the mouths of identified open space watersheds and the effects of the discharges on natural water quality (physical, chemical, and toxicity) in the ASBS receiving waters, and should include benthic marine aquatic life and bioaccumulation components. The design of the ASBS stratum of a regional integrated monitoring program may deviate from the otherwise prescribed individual monitoring approach (in Section IV.B.1) if approved by the State Water Board's Division of Water Quality and the Regional Water Boards.

a. Ocean reference areas shall be located at the drainages of flowing watersheds with minimal development (in no instance more than 10% development), and shall not be located in CWA Section 303(d) listed waterbodies or have tributaries that are 303(d) listed. Reference areas shall be free of wastewater discharges and anthropogenic non- storm water runoff. A minimum of low threat storm runoff discharges (e.g.

stream highway overpasses and campgrounds) may be allowed on a case-by-case basis. Reference areas shall be located in the same region as the ASBS receiving water monitoring occurs. The reference areas for each Region are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean reference water samples must be collected from each station, each from a separate storm during the same storm season that receiving water is sampled. A minimum of one reference location shall be sampled for each ASBS receiving water site sampled per responsible party. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

b. ASBS ocean receiving water must be sampled in the surf zone at the location where the runoff makes contact with ocean water (i.e. at "point zero"). Ocean receiving water stations must be representative of worst-case discharge conditions (i.e. co-located at a large drain greater than 36 inches, or if drains greater than 36 inches are not present in the ASBS then the largest drain greater than18 inches.) Ocean receiving water stations are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean receiving water samples must be collected during each storm season from each station, each from a separate storm. A minimum of one receiving water location shall be sampled in each ASBS per responsible party in that ASBS. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

c. Reference and receiving water sampling shall commence during the first full storm season following the adoption of these special conditions, and post-storm samples shall be collected during the same storm event when storm water runoff is sampled. Sampling shall occur in a minimum of two storm seasons. For those ASBS dischargers that have already participated in the Southern California Bight 2008 ASBS regional monitoring effort, sampling may be limited to only one storm season.

d. Receiving water and reference samples shall be analyzed for the same constituents as storm water runoff samples. At a minimum, constituents to be sampled and analyzed in reference and discharge receiving waters must include oil and grease, total suspended solids, Ocean Plan Table B metals for protection of marine life, Ocean Plan PAHs, pyrethroids, OP pesticides, ammonia, nitrate, phosphates, and critical life stage chronic toxicity for three species. In addition, within the range of the southern sea otter, indicator bacteria or some other measure of fecal contamination shall be analyzed.

3. Waterfront and Marine Operations: In addition to the above requirements for ocean receiving water monitoring, additional monitoring must be performed for marinas and boat launch and pier facilities:

a. For all marina or mooring field operators, in mooring fields with 10 or more occupied moorings, the ocean receiving water must be sampled for Ocean Plan indicator bacteria, residual chlorine, copper, zinc, grease and oil, methylene blue active substances (MBAS), and ammonia nitrogen.

(1) For mooring field operators opting for an individual monitoring program (Section IV.B.1 above), this sampling must occur weekly (on the weekend) from May through October.

(2) For mooring field operators opting to participate in a regional integrated monitoring program (Section IV.B.2 above), this sampling must occur monthly from May through October on a high use weekend in each month. The Water Boards may allow a reduction in the frequency of sampling, through the regional monitoring program, after the first year of monitoring.

b. For all mooring field operators, the subtidal sediment (sand or finer, if present) within mooring fields and below piers shall be sampled and analyzed for Ocean Plan Table B metals (for marine aquatic life beneficial use), acute toxicity, PAHs, and tributyltin. For sediment toxicity testing, only an acute toxicity test using the amphipod *Eohaustorius estuarius* must be performed. This sampling shall occur at least three times during a five (5) year period. For mooring field operators opting to participate in a regional integrated monitoring program, the Water Boards may allow a reduction in the frequency of sampling after the first sampling effort's results are assessed.

Glossary

At the point of discharge(s) – Means in the surf zone immediately where runoff from an outfall meets the ocean water (a.k.a., at point zero).

Areas of Special Biological Significance (ASBS) – Those areas designated by the State Water Board as ocean areas requiring protection of species or biological communities to the extent that alteration of natural water quality is undesirable. All Areas of Special Biological Significance are also classified as a subset of State Water Quality Protection Areas.

Design storm – For purposes of these Special Protections, a design storm is defined as the volume of runoff produced from one inch of precipitation per day or, if this definition is inconsistent with the discharger's applicable storm water permit, then the design storm shall be the definition included in the discharger's applicable storm water permit.

Development – Relevant to reference monitoring sites, means urban, industrial, agricultural, grazing, mining, and timber harvesting land uses.

Higher threat discharges - Permitted storm drains discharging equal to or greater than 18 inches, industrial storm drains, agricultural runoff discharged through an MS4, discharges associated with waterfront and marina operations (e.g., piers, launch ramps, mooring fields, and associated vessel support activities, except for passive discharges defined below), and direct discharges associated with commercial or industrial activities to ASBS.

Low Impact Development (LID) – A sustainable practice that benefits water supply and contributes to water quality protection. Unlike traditional storm water management, which entails collecting and conveying storm water runoff through storm drains, pipes, or other conveyances to a centralized storm water facility, LID focuses on using site design and storm water management to maintain the site's pre-development runoff rates and volumes. The goal of LID is to mimic a site's predevelopment hydrology by using design techniques that infiltrate, filter, store, evaporate, and detain runoff close to the source of rainfall.

Marine Operations – Marinas or mooring fields that contain slips or mooring locations for 10 or more vessels.

Management Measure (MM) - Economically achievable measures for the control of the addition of pollutants from various classes of nonpoint sources of pollution, which reflect the greatest degree of pollutant reduction achievable through the application of the best available nonpoint pollution control practices, technologies, processes, siting criteria, operating methods, or other alternatives. For example, in the "marinas and recreational boating" land- use category specified in the Plan for California's Nonpoint Source Pollution Control Program (NPS Program Plan) (SWRCB, 1999), "boat cleaning and maintenance" is considered a MM or the source of a specific class or type of NPS pollution.

Management Practice (MP) - The practices (e.g., structural, non-structural, operational, or other alternatives) that can be used either individually or in combination to address a specific MM class or classes of NPS pollution. For example, for the "boat cleaning and maintenance" MM, specific MPs can include, but are not limited to, methods for the selection of environmentally sensitive hull paints or methods for cleaning/removal of hull copper anti- fouling paints.

Municipal Separate Storm Sewer System (MS4) – A municipally-owned storm sewer system regulated under the Phase I or Phase II storm water program implemented in compliance with Clean Water Act section 402(p). Note that an MS4 program's boundaries are not necessarily congruent with the permittee's political boundaries.

Natural Ocean Water Quality - The water quality (based on selected physical, chemical and biological characteristics) that is required to sustain marine ecosystems, and which is without apparent human influence, *i.e.*, an absence of significant amounts of: (a) man-made constituents (*e.g.,* DDT); (b) other chemical (*e.g.,* trace metals), physical (temperature/thermal pollution, sediment burial), and biological (*e.g.*, bacteria) constituents at concentrations that have been elevated due to man's activities above those resulting from the naturally occurring processes that affect the area in question; and (c) non-indigenous biota (*e.g.,* invasive algal bloom species) that have been introduced either deliberately or accidentally by man. Discharges "*shall not alter natural ocean water quality*" as determined by a comparison to the range of constituent concentrations in reference areas agreed upon via the regional monitoring program(s). If monitoring information indicates that *natural ocean water quality* is not maintained, but there is sufficient evidence that a discharge is not contributing to the alteration of natural water quality, then the Regional Water Board may make that determination. In this case, sufficient information must include runoff sample data that has equal or lower concentrations for the range of constituents at the applicable reference area(s).

Nonpoint source – Nonpoint pollution sources generally are sources that do not meet the definition of a point source. Nonpoint source pollution typically results from land runoff, precipitation, atmospheric deposition, agricultural drainage, marine/boating operations or hydrologic modification. Nonpoint sources, for purposes of these Special Protections, include discharges that are not required to be regulated under an NPDES permit.

Non-storm water discharge – Any runoff that is not the result of a precipitation event. This is often referred to as "dry weather flow."

Non-structural control – A Best Management Practice that involves operational, maintenance, regulatory (e.g., ordinances) or educational activities designed to reduce or eliminate pollutants in runoff, and that are not structural controls (i.e. there are no physical structures involved).

Physical impossibility - Means any act of God, war, fire, earthquake, windstorm, flood or natural catastrophe; unexpected and unintended accidents not caused by discharger or its employees' negligence; civil disturbance, vandalism, sabotage or terrorism; restrain by court order or public authority or agency; or action or non-action by, or inability to

obtain the necessary authorizations or approvals from any governmental agency other than the permittee.

Representative sites and monitoring procedures – Are to be proposed by the discharger, with appropriate rationale, and subject to approval by Water Board staff.

Sheet-flow – Runoff that flows across land surfaces at a shallow depth relative to the cross- sectional width of the flow. These types of flow may or may not enter a storm drain system before discharge to receiving waters.

Storm Season – Also referred to as rainy season, means the months of the year from the onset of rainfall during autumn until the cessation of rainfall in the spring.

Structural control – A Best Management Practice that involves the installation of engineering solutions to the physical treatment or infiltration of runoff.

Surf Zone - The surf zone is defined as the submerged area between the breaking waves and the shoreline at any one time.

Surface Water Ambient Monitoring Program (SWAMP) comparable – Means that the monitoring program must 1) meet or exceed 2008 SWAMP Quality Assurance Program Management Plan (QAPP) Measurement Quality Objectives, or 2) have a Quality Assurance Project Plan that has been approved by SWAMP; in addition data must be formatted to match the database requirements of the SWAMP Information Management System. Adherence to the measurement quality objectives in the Southern California Bight 2008 ASBS Regional Monitoring Program QAPP and data base management comprises being SWAMP comparable.

Waterfront Operations - Piers, launch ramps, and cleaning stations in the water or on the adjacent shoreline.

Attachment 1
Special Protections Sections I(A)(3)(e) and I(B)(3)(e)
Flowchart to Determine Compliance with natural Water Quality

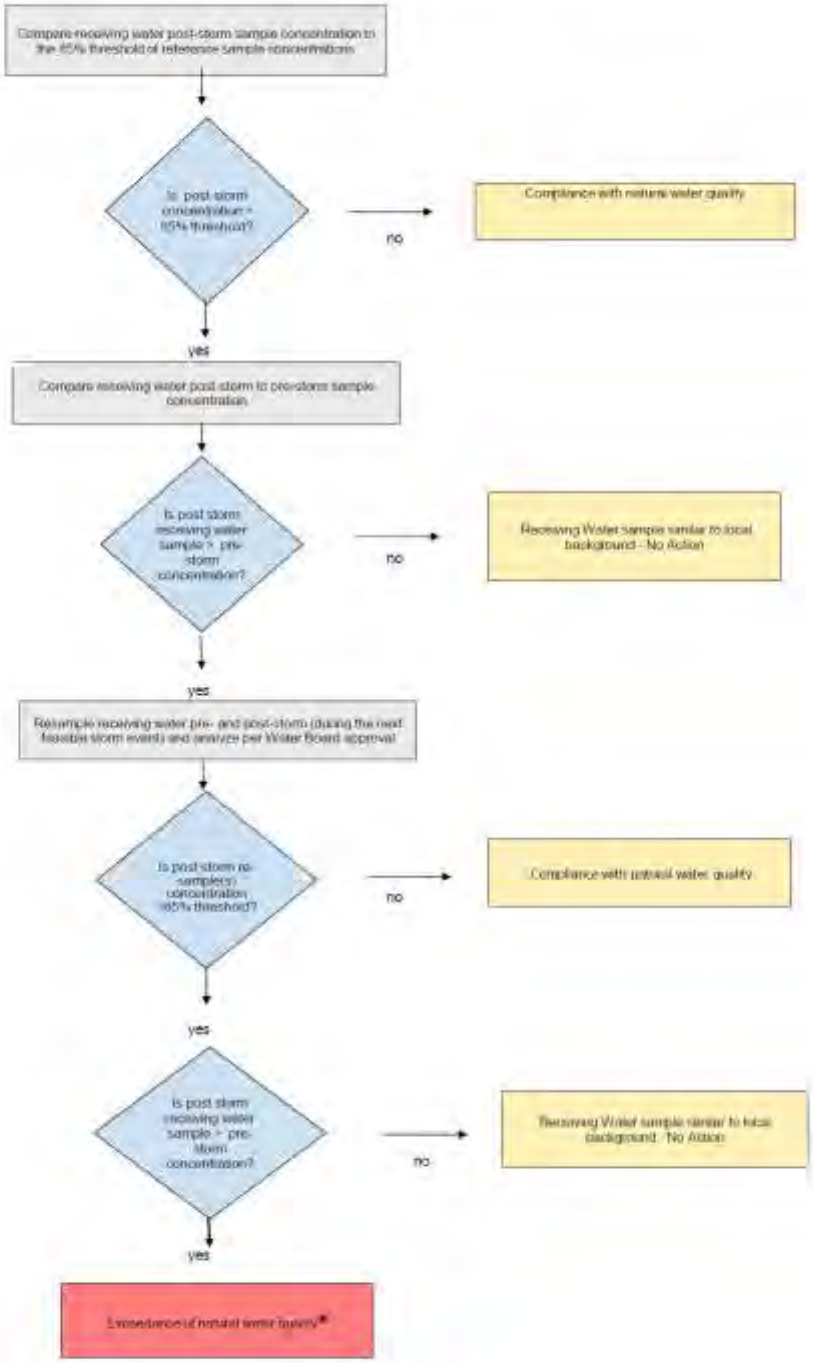

* When an exceedance of natural water quality occurs, the discharger must comply with section I.A.2.h (for permitted storm water) or section I.B.2.c (for nonpoint sources). Note, when sampling data is available, end-of-pipe effluent concentrations will be considered by the Water Boards in making this determination.

ATTACHMENT B

STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

1. Standard Permit Provisions

Code of Federal Regulations Title 40 Section 122.41 (40 CFR 122.41) includes conditions, or provisions, that apply to all National Pollutant Discharge Elimination System (NPDES) permits. Additional provisions applicable to NPDES permits are in 40 CFR 122.42. All applicable provisions in 40 CFR 122.41 and 40 CFR 122.42 must be incorporated into this Order and NPDES permit. The applicable 40 CFR 122.41 and 40 CFR 122.42 provisions are as follows:

a. DUTY TO COMPLY [40 CFR 122.41(a)]

The Copermittee must comply with all of the provisions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

(1) The Copermittee must comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement. [40 CFR 122.41(a)(1)]

(2) The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to a civil penalty not to exceed $25,000 per day for each violation. The CWA provides that any person who *negligently* violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than 2 years, or both. Any person who *knowingly* violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both. Any person who knowingly violates Section 301, 302, 303, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, and who knows at that time that he thereby places another person in imminent

danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.
[40 CFR 122.41(a)(2)]

(3) Any person may be assessed an administrative penalty by the San Diego Regional Water Quality Control Board (San Diego Water Board), State Water Resources Control Board (State Water Board), or United States Environmental Protection Agency (USEPA) for violating Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.
[40 CFR 122.41(a)(3)]

b. DUTY TO REAPPLY [40 CFR 122.41(b)]

If a Copermittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Copermittee must apply for and obtain a new permit.

c. NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE [40 CFR 122.41(c)]

It shall not be a defense for a Copermittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

d. DUTY TO MITIGATE [40 CFR 122.41(d)]

The Copermittee must take all reasonable steps to minimize or prevent any discharge or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

e. PROPER OPERATION AND MAINTENANCE [40 CFR 122.41(e)]

The Copermittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Copermittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by a Copermittee only when the operation is necessary to achieve compliance with the conditions of this permit.

f. PERMIT ACTIONS [40 CFR 122.41(f)]

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Copermittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

g. PROPERTY RIGHTS [40 CFR 122.41(g)]

This permit does not convey any property rights of any sort, or any exclusive privilege.

h. DUTY TO PROVIDE INFORMATION [40 CFR 122.41(h)]

The Copermittee must furnish to the San Diego Water Board, State Water Board, or USEPA within a reasonable time, any information which the San Diego Water Board, State Water Board, or USPEA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Copermittee must also furnish to the San Diego Water Board, State Water Board, or USPEA upon request, copies of records required to be kept by this permit.

i. INSPECTION AND ENTRY [40 CFR 122.41(i)]

The Copermittee must allow the San Diego Water Board, State Water Board, USEPA, and/or their authorized representative (including an authorized contractor acting as their representative), upon presentation of credentials and other documents as may be required by law, to:

(1) Enter upon the Copermittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit; [40 CFR 122.41(i)(1)]

(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit; [40 CFR 122.41(i)(2)]

(3) Inspect and photograph at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; [40 CFR 122.41(i)(3)] and

(4) Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location. [40 CFR 122.41(i)(4)]

j. MONITORING AND RECORDS [40 CFR 122.41(j)]

(1) Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity. [40 CFR 122.41(j)(1)]

(2) Except for records of monitoring information required by this permit related to the Copermittee's sewage sludge use and disposal activities, which shall be retained for

a period of at least five (5) years (or longer as required by 40 CFR Part 503), the Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time. [40 CFR 122.41(j)(2)]

(3) Records for monitoring information must include: [40 CFR 122.41(j)(3)]

(a) The date, exact place, and time of sampling or measurements; [40 CFR 122.41(j)(3)(i)]
(b) The individual(s) who performed the sampling or measurements; [40 CFR 122.41(j)(3)(ii)]
(c) The date(s) analyses were performed; [40 CFR 122.41(j)(3)(iii)]
(d) The individual(s) who performed the analyses; [40 CFR 122.41(j)(3)(iv)]
(e) The analytical techniques or methods used; [40 CFR 122.41(j)(3)(v)] and
(f) The results of such analyses. [40 CFR 122.41(j)(3)(vi)]

(4) Monitoring must be conducted according to test procedures under 40 CFR Part 136 unless another method is required under 40 CFR Subchapters N or O. [40 CFR 122.41(j)(4)]

In the case of pollutants for which there are no approved methods under 40 CFR Part 136 or otherwise required under 40 CFR Subchapters N and O, monitoring must be conducted according to a test procedure specified in the permit for such pollutants. [40 CFR 122.44(i)(1)(iv)]

(5) The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. [40 CFR 122.41(j)(5)]

k. SIGNATORY REQUIREMENT [40 CFR 122.41(k)]

(1) All applications, reports, or information submitted to the San Diego Water Board, State Water Board, or USEPA must be signed and certified. (See 40 CFR 122.22) [40 CFR 122.41(k)(1)]

(a) *For a municipality, State, Federal, or other public agency.* [All applications must be signed] by either a principal executive officer or ranking elected official. [40 CFR 122.22(a)(3)]

(b) All reports required by permits, and other information requested by the San Diego Water Board, State Water Board, or USEPA must be signed by a person described in paragraph (a) of this section, or by a duly authorized

representative of that person. A person is a duly authorized representative only if: [40 CFR 122.22(b)]

(i) The authorization is made in writing by a person described in paragraph (a) of this section; [40 CFR 122.22(b)(1)]
(ii) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company, (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) [40 CFR 122.22(b)(2)] and,
(iii) The written authorization is submitted to the San Diego Water Board and State Water Board. [40 CFR 122.22(b)(3)]

(c) *Changes to authorization.* If an authorization under paragraph (b) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (b) of this section must be submitted to the San Diego Water Board prior to or together with any reports, information, or applications to be signed by an authorized representative. [40 CFR 122.22(c)]

(d) *Certification.* Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." [40 CFR 122.22(d)]

(2) The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both. [40 CFR 122.41(k)(2)]

I. REPORTING REQUIREMENTS [40 CFR 122.41(l)]

(1) *Planned changes.* The Copermittee must give notice to the San Diego Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when: [40 CFR 122.41(l)(1)]

(a) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); [40 CFR 122.41(l)(1)(i)] or

(b) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1). [40 CFR 122.41(l)(1)(ii)]

(c) The alteration or addition results in a significant change in the Copermittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. [40 CFR 122.41(l)(1)(iii)]

(2) *Anticipated noncompliance*. The Copermittee must give advance notice to the San Diego Water Board or State Water Board of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements. [40 CFR 122.41(l)(2)]

(3) *Transfers*. This permit is not transferable to any person except after notice to the San Diego Water Board. The San Diego Water Board may require modification or revocation and reissuance of the permit to change the name of the Copermittee and incorporate such other requirements as may be necessary under the CWA. [40 CFR 122.41(l)(3)]

(4) *Monitoring reports.* Monitoring results must be reported at the intervals specified elsewhere in this permit. [40 CFR 122.41(l)(4)]

(a) Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the San Diego Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices. [40 CFR 122.41(l)(4)(i)]

(b) If the Copermittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or another method required for an industry-specific waste stream under 40 CFR Subchapters N or O, the results of this monitoring must be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the San Diego Water Board or State Water Board. [40 CFR 122.41(l)(4)(ii)]

(c) Calculations for all limitations which require averaging of measurements must utilize an arithmetic mean unless otherwise specified in the permit. [40 CFR 122.41(l)(4)(iii)]

(5) *Compliance schedules*. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date. [40 CFR 122.41(l)(5)]

(6) *Twenty-four hour reporting.*

(a) The Copermittee must report any noncompliance that may endanger health or the environment. Any information must be provided orally within 24 hours from the time the Copermittee becomes aware of the circumstances. A written submission must also be provided within five (5) days of the time the Copermittee becomes aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6)(i)]

(b) The following must be included as information which must be reported within 24 hours under this paragraph: [40 CFR 122.41(l)(6)(ii)]

(i) Any unanticipated bypass that exceeds any effluent limitation in the permit (See 40 CFR 122.41(g)). [40 CFR 122.41(l)(6)(ii)(A)]
(ii) Any upset which exceeds any effluent limitation in the permit. [40 CFR 122.41(l)(6)(ii)(B)] and,
(iii) Violation of a maximum daily discharge limitation for any of the pollutants listed by the San Diego Water Board in the permit to be reported within 24 hours. (See 40 CFR 122.44(g)) [40 CFR 122.41(l)(6)(ii)(C)]

(c) The San Diego Water Board may waive the above-required written report on a case-by-case basis if the oral report has been received within 24 hours. [40 CFR 122.41(l)(6)(iii)]

(7) *Other noncompliance.* The Copermittee must report all instances of noncompliance not reported in accordance with the standard provisions required under 40 CFR 122.41(l)(4), (5), and (6), at the time monitoring reports are submitted. The reports must contain the information listed in the standard provisions required under 40 CFR 122.41(l)(6). [40 CFR 122.41(l)(7))]

(8) *Other information.* When the Copermittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the San Diego Water Board, State Water Board, or USEPA, the Copermittee must promptly submit such facts or information. [40 CFR 122.41(l)(8)]

m. BYPASS [40 CFR 122.41(m)]

(1) *Definitions.*

(a) "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. [40 CFR 122.41(m)(1)(i)] or

(b) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or

substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
[40 CFR 122.41(m)(1)(ii)]

(2) *Bypass not exceeding limitations*. The Copermittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the standard provisions required under 40 CFR 122.41(m)(3) and (4).
[40 CFR 122.41(m)(2)]

(3) *Notice.*

(a) *Anticipated bypass*. If the Copermittee knows in advance of the need for a bypass, it must submit a notice, if possible at least ten days before the date of the bypass. [40 CFR 122.41(m)(3)(i)] or

(b) *Unanticipated bypass*. The Copermittee must submit notice of an unanticipated bypass in accordance with the standard provisions required under 40 CFR 122.41(l)(6) (24-hour notice).
[40 CFR 122.41(m)(3)(ii)]

(4) *Prohibition of Bypass.*

(a) Bypass is prohibited, and the San Diego Water Board may take enforcement action against a Copermittee for bypass, unless:
[40 CFR 122.41(m)(4)(i)]

(i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; [40 CFR 122.41(m)(4)(i)(A)]
(ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance;
[40 CFR 122.41(m)(4)(i)(B)] and,
(iii) The Copermittee submitted notice in accordance with the standard provisions required under 40 CFR 122.41(m)(3).
[40 CFR 122.41(m)(4)(i)(C)]

(b) The San Diego Water Board may approve an anticipated bypass, after considering its adverse effects, if the San Diego Water Board determines that it will meet the three conditions listed above.
[40 CFR 122.41(m)(4)(ii)]

n. UPSET [40 CFR 122.41(n)]

(1) *Definition.* "Upset" means an exceptional incident in which there is unintentional and

temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Copermittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. [40 CFR 122.41(n)(1)]

(2) *Effect of an upset*. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the standard provisions required under 40 CFR 122.41(n)(3) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. [40 CFR 122.41(n)(2)]

(3) *Conditions necessary for a demonstration of upset*. A Copermittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that: [40 CFR 122.41(n)(3)]

(a) An upset occurred and that the Copermittee can identify the cause(s) of the upset; [40 CFR 122.41(n)(3)(i)]
(b) The permitted facility was at the time being properly operated; [40 CFR 122.41(n)(3)(ii)] and
(c) The Copermittee submitted notice of the upset in accordance with the standard provisions required under 40 CFR 122.41(l)(6)(ii)(B) (24-hour notice). [40 CFR 122.41(n)(3)(iii)]
(d) The Copermittee complied with any remedial measures pursuant to the standard provisions required under 40 CFR 122.41(d). [40 CFR 122.41(n)(3)(iii)]

(4) *Burden of proof*. In any enforcement proceeding, the Copermittee seeking to establish the occurrence of an upset has the burden of proof. [40 CFR 122.41(n)(4)]

o. STANDARD PERMIT PROVISIONS FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS [40 CFR 122.42(c)]

The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the San Diego Water Board or State Water Board under 40 CFR 122.26(a)(1)(v) must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report must include:

(1) The status of implementing the components of the storm water management program that are established as permit conditions; [40 CFR 122.42(c)(1)]

(2) Proposed changes to the storm water management programs that are established as permit conditions. Such proposed changes must be consistent with 40 CFR 122.26(d)(2)(iii); [40 CFR 122.42(c)(2)] and

(3) Revisions, if necessary, to the assessment of controls and the fiscal analysis

reported in the permit application under 40 CFR 122.26(d)(2)(iv) and (v); [40 CFR 122.42(c)(3)]

(4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; [40 CFR 122.42(c)(4)]

(5) Annual expenditures and budget for year following each annual report; [40 CFR 122.42(c)(5)]

(6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; [40 CFR 122.42(c)(6)]

(7) Identification of water quality improvements or degradation. [40 CFR 122.42(c)(7)]

p. STANDARD PERMIT PROVISIONS FOR STORM WATER DISCHARGES [40 CFR 122.42(d)]

The initial permits for discharges composed entirely of storm water issued pursuant to 40 CFR 122.26(e)(7) must require compliance with the conditions of the permit as expeditiously as practicable, but in no event later than three years after the date of issuance of the permit.

2. General Provisions

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. The general provisions applicable to this Order and NPDES permit are as follows:

a. DISCHARGE OF WASTE IS A PRIVILEGE

No discharge of waste into the waters of the State, whether or not such discharge is made pursuant to waste discharge requirements, shall create a vested right to continue such discharge. All discharges of waste into waters of the State are privileges, not rights. [CWC Section 13263(g)]

b. DURATION OF ORDER AND NPDES PERMIT

(1) *Effective date*. This Order supersedes Order No. R9-2007-0001 for the San Diego County Copermittees listed in Table ~~2.~~1a and became effective on June 27, 2013~~ for those Copermittees~~. This Order as amended by Order R9-2015-0001 supersedes Order No. R9-2009-0002 for the Orange County Copermittees listed in Table 1b and its amendments through Order No. R9-2015-0001 ~~becomes~~ became effective April 1, 2015~~, following the date Order No. R9-2015-0001 is adopted~~. This Order as amended by Order Nos. R9-2015-0001 and R9-2015-0100 supersedes Order No. R9-2010-0016 for the Riverside County Copermittees listed in Table 1c and its amendments through Order No. R9-2015-0100 became effective January 7, 2016. ~~upon further amendment or earlier notice of coverage.~~

(2) *Expiration*. This Order and NPDES permit expires five years after June 27, 2013, its initial effective date. [40 CFR 122.46(a)]

(3) *Continuation of expired order*. After this Order and NPDES permit expires, the terms and conditions of this Order and NPDES permit are automatically continued pending issuance of a new permit if all requirements of the federal NPDES regulations on the continuation of expired permits (40 CFR 122.6) are complied with.

c. AVAILABILITY

A copy of this Order must be kept at a readily accessible location and must be available to on-site personnel at all times.

d. CONFIDENTIALITY OF INFORMATION

Except as provided for in 40 CFR 122.7, no information or documents submitted in accordance with or in application for this Order will be considered confidential, and all such information and documents shall be available for review by the public at the San Diego Water Board office.

Claims of confidentiality for the following information will be denied:
[40 CFR 122.7(b)]

(1) The name and address of any permit applicant or Copermittee; [40 CFR 122.7(b)(1)] and

(2) Permit applications and attachments, permits, and effluent data. [40 CFR 122.7(b)(2)]

e. EFFLUENT LIMITATIONS

(1) *Interim effluent limitations*. The Copermittee must comply with any interim effluent limitations as established by addendum, enforcement action, or revised waste discharge requirements which have been, or may be, adopted by the San Diego Water Board.

(2) *Other effluent limitations and standards*. If any applicable toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant and that standard or prohibition is more stringent than any limitation on the pollutant in the permit, the San Diego Water Board shall institute proceedings under these regulations to modify or revoke and reissue the permit to conform to the toxic effluent standard or prohibition. [40 CFR 122.44(b)(1)]

f. DUTY TO MINIMIZE OR CORRECT ADVERSE IMPACTS

The Copermittee must take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this Order, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the noncompliance.

g. PERMIT ACTIONS

The filing of a request by the Copermittee for modification, revocation and reissuance, or termination of this Order, or a notification of planned change in or anticipated noncompliance with this Order does not stay any condition of this Order. (See 40 CFR 122.41(f)) In addition, the following provisions apply to this Order:

(1) Upon application by any affected person, or on its own motion, the San Diego Water Board may review and revise the requirements in this Order. All requirements must be reviewed periodically. [CWC Section 13263(e)]

(2) This Order may be terminated or modified for cause, including, but not limited to, all of the following: [CWC Section 13381]

(a) Violation of any condition contained in the requirements of this Order. [CWC Section 13381(a)]

(b) Obtaining the requirements in this Order by misrepresentation, or failure to disclose fully all relevant facts. [CWC Section 13381(b)]

(c) A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge. [CWC Section 13381(c)]

(3) When this Order is transferred to a new owner or operator, such requirements as may be necessary under the CWC may be incorporated into this Order.

h. NPDES PERMITTED NON-STORM WATER DISCHARGES

The San Diego Water Board has, in prior years, issued a limited number of individual NPDES permits for non-storm water discharges to MS4s. The San Diego Water Board or State Water Board may in the future, upon prior notice to the Copermittee(s), issue an NPDES permit for any non-storm water discharge (or class of non-storm water discharges) to an MS4.

i. MONITORING

In addition to the standard provisions required under 40 CFR 122.41(j) and (l)(4), the following general monitoring provisions apply to this Order:

(1) Where procedures are not otherwise specified in Order, sampling, analysis and quality assurance/quality control must be conducted in accordance with the Quality Assurance Management Plan (QAMP) for the State of California's Surface Water Ambient Monitoring Program (SWAMP), adopted by the State Water Resources Control Board (State Water Board).

(2) Pursuant to 40 CFR 122.41(j)(2) and CWC Section 13383(a), each Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring

instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five (5) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time.

(3) All chemical, bacteriological, and toxicity analyses must be conducted at a laboratory certified for such analyses by the California Department of Public Health or a laboratory approved by the San Diego Water Board.

(4) For priority toxic pollutants that are identified in the California Toxics Rule (CTR) (65 Fed. Reg. 31682), the Copermittees must instruct their laboratories to establish calibration standards that are equivalent to or lower than the Minimum Levels (MLs) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP). If a Copermittee can demonstrate that a particular ML is not attainable, in accordance with procedures set forth in 40 CFR Part 136, the lowest quantifiable concentration of the lowest calibration standard analyzed by a specific analytical procedure (assuming that all the method specified sample weights, volumes, and processing steps have been followed) may be used instead of the ML listed in Appendix 4 of the SIP. The Copermittee must submit documentation from the laboratory to the San Diego Water Board for approval prior to raising the ML for any priority toxic pollutant.

j. ENFORCEMENT

(1) The San Diego Water Board is authorized to enforce the terms of this Order under several provisions of the CWC, including, but not limited to, CWC Sections 13385, 13386, and 13387.

(2) Nothing in this Order shall be construed to protect the Copermittee from its liabilities under federal, state, or local laws.

(3) The CWC provides for civil and criminal penalties comparable to, and in some cases greater than, those provided for under the CWA.

(4) Except as provided in the standard conditions required under 40 CFR 122.41(m) and (n), nothing in this Order shall be construed to relieve the Copermittee from civil or criminal penalties for noncompliance.

(5) Nothing in this Order shall be construed to preclude the institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties to which the Copermittee is or may be subject to under Section 311 of the CWA.

(6) Nothing in this Order shall be construed to preclude institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authoring preserved by Section 510 of the CWA.

k. SEVERABILITY

The provisions of this Order are severable, and if any provision of this Order, or the application of any provisions of this Order to any circumstance, is held invalid, the

application of such provision to other circumstances and the remainder of this Order shall not be affected thereby.

l. APPLICATIONS

Any application submitted by a Copermittee for reissuance or modification of this Order must satisfy all applicable requirements specified in federal regulations as well as any additional requirements for submittal of a Report of Waste Discharge specified in the CWC and the California Code of Regulations.

m. IMPLEMENTATION

All plans, reports and subsequent amendments submitted in compliance with this Order must be implemented immediately (or as otherwise specified). All submittals by Copermittees must be adequate to implement the requirements of this Order.

n. REPORT SUBMITTALS

(1) All report submittals must include an executive summary, introduction, conclusion, recommendations, and signed certified statement.

(2) Each Copermittee must submit a signed certified statement covering its responsibilities for each applicable submittal.

(3) The Principal Watershed Copermittee(s) must submit a signed certified statement covering its responsibilities for each applicable submittal and the sections of the submittals for which it is responsible.

(4) Unless otherwise directed, the Copermittees must submit ~~one hard copy and~~ one electronic copy of each report required under this Order to the San Diego Water Board at SanDiego@waterboards.ca.gov~~, and one electronic copy to the USEPA~~.

(5) When hard copies are requested or required, ~~T~~the Copermittees must submit reports and provide notifications as required by this Order to ~~the following~~:

EXECUTIVE OFFICER
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
2375 NORTHSIDE DRIVE, SUITE 100
SAN DIEGO CA 92108
Telephone: (619) 516-1990 Fax: (619) 516-1994

~~EUGENE BROMLEY~~
~~US ENVIRONMENTAL PROTECTION AGENCY~~
~~REGION IX~~
~~PERMITS ISSUANCE SECTION (W-5-1)~~
~~75 HAWTHORNE STREET~~
~~SAN FRANCISCO CA 94105~~

ATTACHMENT C

ACRONYMS AND ABBREVIATIONS

AMAL	Average Monthly Action Level
ASBS	Area(s) of Special Biological Significance
BMP	Best Management Practice
Basin Plan	Water Quality Control Plan for the San Diego Basin
CEQA	California Environmental Quality Act
CCR	California Code of Regulations
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWC	California Water Code
CZARA	Coastal Zone Act Reauthorization Amendments of 1990
ESAs	Environmentally Sensitive Areas
GIS	Geographic Information System
IBI	Index of Biological Integrity
LID	Low Impact Development
MDAL	Maximum Daily Action Level
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
NAL	Non-Storm Water Action Level
NAICS	North American Industry Classification System
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
ROWD	Report of Waste Discharge (application for NPDES reissuance)
SAL	Storm Water Action Level
San Diego Water Board	California Regional Water Quality Control Board, San Diego Region
SIC	Standard Industrial Classification Code
State Water Board	State Water Resources Control Board
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
WDID	Waste Discharge Identification Number
WLA	Waste Load Allocation
WQBEL	Water Quality Based Effluent Limitation

DEFINITIONS

Active/Passive Sediment Treatment - Using mechanical, electrical or chemical means to flocculate or coagulate suspended sediment for removal from runoff from construction sites prior to discharge.

Anthropogenic Litter – Trash generated from human activities, not including sediment.

Average Monthly Action Level – The highest allowable average of daily discharges over a calendar month.

Beneficial Uses - The uses of water necessary for the survival or wellbeing of man, plants, and wildlife. These uses of water serve to promote tangible and intangible economic, social, and environmental goals. "Beneficial Uses" of the waters of the State that may be protected include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. Existing beneficial uses are uses that were attained in the surface or ground water on or after November 28, 1975; and potential beneficial uses are uses that would probably develop in future years through the implementation of various control measures. "Beneficial Uses" are equivalent to "Designated Uses" under federal law. [California Water Code Section 13050(f)].

Best Management Practices (BMPs) - Defined in 40 CFR 122.2 as schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Bioassessment - The use of biological community information to evaluate the biological integrity of a water body and its watershed. With respect to aquatic ecosystems, bioassessment is the collection and analysis of samples of the benthic macroinvertebrate community together with physical/habitat quality measurements associated with the sampling site and the watershed to evaluate the biological condition (i.e. biotic integrity) of a water body.

Biofiltration - Practices that use vegetation and amended soils to detain and treat runoff from impervious areas. Treatment is through filtration, infiltration, adsorption, ion exchange, and biological uptake of pollutants.

Biological Integrity - Defined in Karr J.R. and D.R. Dudley. 1981. Ecological perspective on water quality goals. *Environmental Management* 5:55-68 as: "A balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitat of the region." Also referred to as ecosystem health.

BMP Design Manual – A plan developed to eliminate, reduce, or mitigate the impacts of runoff from development projects, including Priority Development Projects.

Chronic Toxicity – A measurement of sublethal effect (e.g. reduced growth, reproduction) to experimental test organisms exposed to an effluent or receiving waters compared to that of the control organisms.

Clean Water Act Section 303(d) Water Body - An impaired water body in which water quality does not meet applicable water quality standards and/or is not expected to meet water quality standards, even after the application of technology based pollution controls required by the CWA. The discharge of runoff to these water bodies by the Copermittees is significant because these discharges can cause or contribute to violations of applicable water quality standards.

Construction Activities – Actions implemented during construction of development or redevelopment projects during the Preliminary Task (including rough grading and/or disking, clearing and grubbing operations, or any soil disturbance prior to mass grading), Grading or Land Development (including topography and slope reconfiguration, alluvium removals, canyon cleanouts, rock undercuts, keyway excavations, land form grading, and stockpiling of select material for capping operations), Streets and Utility Installation (including excavation and street paving, lot grading, curbs, gutters and sidewalks, public utilities, public water facilities including fire hydrants, public sanitary sewer systems, storm sewer systems and/or other drainage improvements), or Vertical Construction (including the build out of structures from foundations to roofing, including rough landscaping).

Construction Site – Any project, including projects requiring coverage under the Construction General Permit, that involves soil disturbing activities including, but not limited to, clearing, grading, disturbances to ground such as stockpiling, and excavation.

Contamination - As defined in the Porter-Cologne Water Quality Control Act, contamination is "an impairment of the quality of waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste whether or not waters of the State are affected."

Copermittee – A permittee to a NPDES permit that is only responsible for permit conditions relating to the discharge for which it is operator [40 CFR 122.26(b)(1)]. For the purposes of this Order, a Copermittee is one of the individual permittees identified in Tables 1a-1c of this Order.

Copermittees – All of the individual Copermittees, collectively.

Critical Channel Flow (Qc) – The channel flow that produces the critical shear stress that initiates bed movement or that erodes the toe of channel banks. When measuring Qc, it should be based on the weakest boundary material – either bed or bank.

Daily Discharge – Defined as either: (1) the total mass of the constituent discharged over the calendar day or any 24 hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g. concentration.)

The Daily Discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day, or other 24 hour period other than a day), or by the arithmetic mean of analytical results from one or more grab samples taken over the course of a day.

Development Projects - Construction, rehabilitation, redevelopment, or reconstruction of any public or private projects.

Dry Season –May 1 to September 30.

Dry Weather – Weather is considered dry if the preceding 72 hours has been without measurable precipitation (>0.1 inch).

Enclosed Bays – Enclosed bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost bay works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays do not include inland surface waters or ocean waters.

Erosion – When land is diminished or worn away due to wind, water, or glacial ice. Often the eroded debris (silt or sediment) becomes a pollutant via storm water runoff. Erosion occurs naturally but can be intensified by land clearing activities such as farming, development, road building, and timber harvesting.

Environmentally Sensitive Areas (ESAs) - Areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; areas designated as preserves or their equivalent under the Natural Communities Conservation Program within the Cities and County of Orange; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.

Estuaries – Waters, including coastal lagoons, located at the mouth of streams that serve as areas of mixing fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and ocean water. Estuaries do not include inland surface waters or ocean waters.

Existing Development – Any area that has been developed and exists for municipal, commercial, industrial, or residential purposes, uses, or activities. May include areas that are not actively used for its originally developed purpose, but may be re-purposed or redeveloped for another use or activity.

Flow Duration – The long-term period of time that flows occur above a threshold that causes significant sediment transport and may cause excessive erosion damage to creeks and streams (not a single storm event duration). The simplest way to visualize this is to consider a histogram of pre- and post-project flows using long-term records of hourly data. To maintain pre-development flow duration means that the total number of hours (counts) within each range of flows in a flow-duration histogram cannot increase between the pre- and post-development condition. Flow duration within the range of geomorphologically significant flows is important for managing erosion.

Grading - The cutting and/or filling of the land surface to a desired slope or elevation.

Groundwater – Subsurface water that occurs beneath the water table in soils and geologic formations that are fully saturated.

Hazardous Material – Any substance that poses a threat to human health or the environment due to its toxicity, corrosiveness, ignitability, explosive nature or chemical reactivity. These also include materials named by the USEPA in 40 CFR 116 to be reported if a designated quantity of the material is spilled into the waters of the U.S. or emitted into the environment.

Hazardous Waste - Hazardous waste is defined as "any waste which, under Section 600 of Title 22 of this code, is required to be managed according to Chapter 30 of Division 4.5 of Title 22 of this code" [CCR Title 22, Division 4.5, Chapter 11, Article 1].

Household Hazardous Waste – Paints, cleaning products, and other hazardous wastes generated during home improvement or maintenance activities.

Hydromodification – The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

Illicit Connection – Any man-made conveyance or drainage system through which a non-storm water discharge to the storm water drainage system occurs or may occur. Any connection to the MS4 that conveys an illicit discharge.

Illicit Discharge - Any discharge to the MS4 that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from firefighting activities [40 CFR 122.26(b)(2)].

Inactive Areas – Areas of construction activity that are not active and those that have been active and are not scheduled to be re-disturbed for at least 14 days.

Infiltration – In the context of low impact development, infiltration is defined as the percolation of water into the ground. Infiltration is often expressed as a rate (inches per hour), which is determined through an infiltration test. In the context of non-storm water, infiltration is water other than wastewater that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow [40 CFR 35.2005(20)].

Inland Surface Waters – Includes all surface waters of the State that do not include the ocean, enclosed bays, or estuaries.

Jurisdictional Runoff Management Program Document – A written description of the specific jurisdictional runoff management measures and programs that each Copermittee will implement to comply with this Order and ensure that storm water pollutant discharges in runoff are reduced to the MEP and do not cause or contribute to a violation of water quality standards.

Low Impact Development (LID) – A storm water management and land development strategy that emphasizes conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions.

Low Impact Development Best Management Practices (LID BMPs) – LID BMPs include schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States through storm water management and land development strategies that emphasize conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions. LID BMPs include retention practices that do not allow runoff, such as infiltration, rain water harvesting and reuse, and evapotranspiration. LID BMPs also include flow-through practices such as biofiltration that may have some discharge of storm water following pollutant reduction.

Major Outfall – As defined in the Code of Federal Regulations, a major outfall is a MS4 outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (i.e. discharge from a single conveyance other than a circular pipe which is associated with a drainage area of more than 50 acres); or, for MS4s that receive storm water from lands zoned for industrial activity (based on comprehensive zoning plans or equivalent), a MS4 outfall that discharges from a single pipe with an inside diameter of 12 inches or more or from its equivalent (i.e. discharge from other than a circular pipe associated with a drainage area of 2 acres or more).

Maximum Daily Action Level (MDAL) –The highest allowable daily discharge of a pollutant, over a calendar day (or 24 hour period). For pollutants with action levels expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with action levels expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

Maximum Extent Practicable (MEP) – The technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) for storm water that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) in combination with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than BAT. A definition for MEP is not provided either in the statute or in the regulations. Instead the definition of MEP is dynamic and will be defined by the following process over time: municipalities propose their definition of MEP by way of their runoff management programs. Their total collective and individual activities conducted pursuant to the runoff management programs becomes their proposal for MEP as it applies both to their overall effort, as well as to specific activities (e.g., MEP for street sweeping, or MEP for MS4 maintenance). In the absence of a proposal acceptable to the San Diego Water Board, the San Diego Water Board defines MEP.

In a memo dated February 11, 1993, entitled "Definition of Maximum Extent Practicable," Elizabeth Jennings, Senior Staff Counsel, SWRCB addressed the achievement of the MEP standard as follows:

"*To achieve the MEP standard, municipalities must employ whatever Best Management Practices (BMPs) are technically feasible (i.e., are likely to be effective) and are not cost prohibitive. The major emphasis is on technical feasibility. Reducing pollutants to the MEP means choosing effective BMPs, and rejecting applicable BMPs only where other effective BMPs will serve the same purpose, or the BMPs would not be technically feasible, or the cost would be prohibitive. In selecting BMPs to achieve the MEP standard, the following factors may be useful to consider:*

a. Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?
b. Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?
c. Public Acceptance: Does the BMP have public support?
d. Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?
e. Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc.?

The final determination regarding whether a municipality has reduced pollutants to the maximum extent practicable can only be made by the Regional or State Water Boards, and not by the municipal discharger. If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit derived, it would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs that would address a pollutant source, or to pick a BMP based solely on cost, which would be clearly less effective. In selecting BMPs the municipality must make a serious attempt to comply and practical solutions may not be lightly rejected. In any case, the burden would be on the municipal discharger to show compliance with its permit. After selecting a menu of BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented."

Monitoring Year – October 1 to September 30

Municipal Separate Storm Sewer System (MS4) – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designated or used for collecting or conveying storm water; (iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.26.

National Pollutant Discharge Elimination System (NPDES) - The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the CWA.

Non-Storm Water - All discharges to and from a MS4 that do not originate from precipitation events (i.e., all discharges from a MS4 other than storm water). Non-storm water includes illicit discharges and NPDES permitted discharges.

Nuisance - As defined in the Porter-Cologne Water Quality Control Act, a nuisance is "anything which meets all of the following requirements: 1) Is injurious to health, or is indecent, or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. 2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. 3) Occurs during, or as a result of, the treatment or disposal of wastes."

Ocean Waters – The territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the State Board's California Ocean Plan.

Order – Unless otherwise specified, refers to this Order, Order No. R9-2013-0001 (NPDES No. CAS0109266)

Outfall - Outfall means a point source as defined by 40 CFR 122.2 at the point where a municipal separate storm sewer discharges to waters of the US and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels or other conveyances which connect segments of the same stream or other waters of the US and are used to convey waters of the US.

Persistent Flow - Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

Person - A person is defined as an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof [40 CFR 122.2].

Point Source - Any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, landfill leachate collection systems, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

Pollutant - Any agent that may cause or contribute to the degradation of water quality such that a condition of pollution or contamination is created or aggravated.

Pollution - As defined in the Porter-Cologne Water Quality Control Act, pollution is "the alteration of the quality of the waters of the State by waste, to a degree which unreasonably affects either of the following: 1) The waters for beneficial uses; or 2) Facilities that serve these beneficial uses." Pollution may include contamination.

Pollution Prevention - Pollution prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control BMPs, treatment control BMPs, or disposal.

Pre-Development Runoff Conditions – Approximate flow rates and durations that exist or existed onsite before land development occurs. For new development projects, this equates to runoff conditions immediately before project construction. For redevelopment projects, this equates to runoff conditions from the project footprint assuming infiltration characteristics of the underlying soil, and existing grade. Runoff coefficients of concrete or asphalt must not be used. A redevelopment Priority Development Project must use available information pertaining to existing underlying soil type and onsite existing grade to estimate pre-development runoff conditions.

Priority Development Projects - New development and redevelopment projects defined under Provision E.3.b of Order No. R9-2013-0001, as amended by Order Nos. R9-2015-0001 and R9-2015-0100.

Rainy Season (aka Wet Season) –October 1 to April 30

Receiving Waters – Waters of the United States.

Receiving Water Limitations - Waste discharge requirements issued by the San Diego Water Board typically include both: (1) "Effluent Limitations" (or "Discharge Limitations") that specify the technology-based or water-quality-based effluent limitations; and (2) "Receiving Water Limitations" that specify the water quality objectives in the Basin Plan as well as any other limitations necessary to attain those objectives. In summary, the "Receiving Water Limitations" provision is the provision used to implement the requirements of CWA section 402(p)(3)(B).

Redevelopment - The creation and/or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure~~, and creation or addition of impervious surfaces~~. Replacement of impervious surfaces includes any activity ~~that is not part of a routine maintenance activity~~ where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include routine maintenance activities, such as trenching and resurfacing associated with utility work; pavement grinding; resurfacing existing roadways,~~;~~ ~~new~~ sidewalks ~~construction~~, pedestrian ramps, or bike lanes on existing roads; and routine replacement of damaged pavement, such as pothole repair.

Regional Clearinghouse – A central location for the collection and distribution of information developed and maintained by the Copermittees including, but not limited to, plans, reports, manuals, data, contact information, and/or links to such documents and information.

Rehabilitation - Remedial measures or activities for the purpose of improving or restoring the beneficial uses of streams, channels or river systems. Techniques may vary from in-stream restoration techniques to off-line storm water management practices installed in the system corridor or upland areas, or a combination of in-stream and out of stream techniques. Rehabilitation techniques may include, but are not limited to the following: riparian zone restoration, constructed wetlands, channel modifications that improve habitat and stability, and daylighting of drainage systems.

Reporting Period – The period of information that is reported in the Water Quality Improvement Plan Annual Report. The reporting period consists of two components: 1) July 1 to June 30, consistent with the fiscal year, for the implementation of the jurisdictional runoff management programs, and 2) October 1 to September 30, consistent with the monitoring year for the monitoring and assessment programs. Together, these two time periods constitute the reporting year for the Water Quality Improvement Plan Annual Report due January 31 following the end of the monitoring year.

Retain – Keep or hold in a particular place, condition, or position without discharge to surface waters.

Retrofitting – Storm water management practice put into place after development has occurred in watersheds where the practices previously did not exist or are ineffective. Retrofitting of developed areas is intended to improve water quality, protect downstream channels, reduce flooding, or meet other specific objectives. Retrofitting developed areas may include, but is not limited to replacing roofs with green roofs, disconnecting downspouts or impervious surfaces to drain to pervious surfaces, replacing impervious surfaces with pervious surfaces, installing rain barrels, installing rain gardens, and trash area enclosures.

Runoff - All flows in a storm water conveyance system that consists of the following components: (1) storm water (wet weather flows) and (2) non-storm water including dry weather flows.

San Diego Water Board – As used in this document the term "San Diego Water Board" is synonymous with the term "Regional Board" as defined in Water Code section 13050(b) and is intended to refer to the California Regional Water Quality Control Board for the San Diego Region as specified in Water Code Section 13200.

Sediment - Soil, sand, and minerals washed from land into water. Sediment resulting from anthropogenic sources (i.e. human induced land disturbance activities) is considered a pollutant. This Order regulates only the discharges of sediment from anthropogenic sources and does not regulate naturally occurring sources of sediment. Sediment can destroy fish-nesting areas, clog animal habitats, and cloud waters so that sunlight does not reach aquatic plants.

Source Control BMP – Land use or site planning practices, or structural or nonstructural measures that aim to prevent runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between pollutants and runoff.

Storm Water – Per 40 CFR 122.26(b)(13), means storm water runoff, snowmelt runoff and surface runoff and drainage. Surface runoff and drainage pertains to runoff and drainage resulting from precipitation events.

Structural BMPs - A subset of BMPs which detains, retains, filters, removes, or prevents the release of pollutants to surface waters from development projects in perpetuity, after construction of a project is completed.

Test of Significant Toxicity (TST) - A statistical approach used to analyze toxicity test data. The TST incorporates a restated null hypothesis, Welch's t-test, and biological effect thresholds for chronic and acute toxicity.

Total Maximum Daily Load (TMDL) - The maximum amount of a pollutant that can be discharged into a water body from all sources (point and non-point) and still maintain water quality standards. Under CWA section 303(d), TMDLs must be developed for all water bodies that do not meet water quality standards after application of technology-based controls.

Toxicity - Adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies. The water quality objectives for toxicity provided in the Basin Plan, state in part…"All waters shall be

free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life….The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge."

Toxicity Identification Evaluation (TIE) - A set of procedures for identifying the specific chemical(s) responsible for toxicity. These procedures are performed in three phases (characterization, identification, and confirmation) using aquatic organism toxicity tests.

Toxicity Reduction Evaluation (TRE) - A study conducted in a step-wise process designed to identify the causative agents of effluent or ambient toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in toxicity. The first steps of the TRE consist of the collection of data relevant to the toxicity, including additional toxicity testing, and an evaluation of facility operations and maintenance practices, and best management practices. A Toxicity Identification Evaluation (TIE) may be required as part of the TRE, if appropriate.

Treatment Control BMP – Any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media absorption or any other physical, biological, or chemical process.

Unpaved Road – Any long, narrow stretch without pavement used for traveling by motor passenger vehicles between two or more points. Unpaved roads are generally constructed of dirt, gravel, aggregate or macadam and may be improved or unimproved.

Waste - As defined in CWC Section 13050(d), "waste includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal."

Article 2 of CCR Title 23, Chapter 15 (Chapter 15) contains a waste classification system that applies to solid and semi-solid waste, which cannot be discharged directly or indirectly to water of the state and which therefore must be discharged to land for treatment, storage, or disposal in accordance with Chapter 15. There are four classifications of waste (listed in order of highest to lowest threat to water quality): hazardous waste, designated waste, non-hazardous solid waste, and inert waste.

Water Quality Objective - Numerical or narrative limits on constituents or characteristics of water designated to protect designated beneficial uses of the water. [California Water Code Section 13050 (h)]. California's water quality objectives are established by the State and Regional Water Boards in the Water Quality Control Plans. Numeric or narrative limits for pollutants or characteristics of water designed to protect the beneficial uses of the water. In other words, a water quality objective is the maximum concentration of a pollutant that can exist in a receiving water and still generally ensure that the beneficial uses of the receiving water remain protected (i.e., not impaired). Since water quality objectives are designed specifically to protect the beneficial uses, when the objectives are violated the beneficial uses are, by definition, no longer protected and become impaired. This is a fundamental concept under the Porter Cologne Act. Equally fundamental is Porter Cologne's definition of pollution. A condition of pollution exists when the water quality needed to support designated beneficial uses has

become unreasonably affected or impaired; in other words, when the water quality objectives have been violated. These underlying definitions (regarding beneficial use protection) are the reason why all waste discharge requirements implementing the federal NPDES regulations require compliance with water quality objectives. (Water quality objectives are also called water quality criteria in the CWA.)

Water Quality Standards - Water quality standards, as defined in Clean Water Act section 303(c) consist of the beneficial uses (e.g., swimming, fishing, municipal drinking water supply, etc.,) of a water body and criteria (referred to as water quality objectives in the California Water Code) necessary to protect those uses. Under the Water Code, the water boards establish beneficial uses and water quality objectives in water quality control or basin plans. Together with an anti-degradation policy, these beneficial uses and water quality objectives serve as water quality standards under the Clean Water Act. In Clean Water Act parlance, state beneficial uses are called "designated uses" and state water quality objectives are called "criteria." Throughout this Order, the relevant term is used depending on the statutory scheme.

Waters of the State - Any water, surface or underground, including saline waters within the boundaries of the State [CWC section 13050 (e)]. The definition of the Waters of the State is broader than that for the Waters of the United States in that all water in the State is considered to be a Waters of the State regardless of circumstances or condition.

Waters of the United States - As defined in the 40 CFR 122.2, the Waters of the U.S. are defined as: "(a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate "wetlands;" (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters otherwise defined as waters of the United States under this definition: (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial seas; and (g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA."

Watershed - That geographical area which drains to a specified point on a water course, usually a confluence of streams or rivers (also known as drainage area, catchment, or river basin).

Wet Season (aka Rainy Season) – October 1 to April 30

Wet Weather – Weather is considered wet up to 72 hours after a storm event of 0.1 inches and greater, unless otherwise defined by another regulatory mechanism (e.g. a TMDL).

ATTACHMENT D

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

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JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

FY _____

I. COPERMITTEE INFORMATION

Copermittee Name:

Copermittee Primary Contact Name:

Copermittee Primary Contact Information:
Address:
City: County: State: Zip:
Telephone: Fax: Email:

II. LEGAL AUTHORITY

Has the Copermittee established adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐
A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority?	**YES**	☐
	NO	☐

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

Was an update of the jurisdictional runoff management program document required or recommended by the San Diego Water Board?	**YES**	☐
	NO	☐
If YES to the question above, did the Copermittee update its jurisdictional runoff management program document and make it available on the Regional Clearinghouse?	**YES**	☐
	NO	☐

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

Has the Copermittee implemented a program to actively detect and eliminate illicit discharges and connections to its MS4 that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

Number of non-storm water discharges reported by the public	
Number of non-storm water discharges detected by Copermittee staff or contractors	
Number of non-storm water discharges investigated by the Copermittee	
Number of sources of non-storm water discharges identified	
Number of non-storm water discharges eliminated	
Number of sources of illicit discharges or connections identified	
Number of illicit discharges or connections eliminated	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

V. DEVELOPMENT PLANNING PROGRAM

Has the Copermittee implemented a development planning program that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐
Was an update to the BMP Design Manual required or recommended by the San Diego Water Board?	**YES**	☐
	NO	☐
If YES to the question above, did the Copermittee update its BMP Design Manual and make it available on the Regional Clearinghouse?	**YES**	☐
	NO	☐

Number of proposed development projects in review	
Number of Priority Development Projects in review	
Number of Priority Development Projects approved	
Number of approved Priority Development Projects exempt from any BMP requirements	
Number of approved Priority Development Projects allowed alternative compliance	
Number of Priority Development Projects granted occupancy	

Number of completed Priority Development Projects in inventory	
Number of high priority Priority Development Project structural BMP inspections	
Number of Priority Development Project structural BMP violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

FY _____

VI. CONSTRUCTION MANAGEMENT PROGRAM

Has the Copermittee implemented a construction management program that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

Number of construction sites in inventory	
Number of active construction sites in inventory	
Number of inactive construction sites in inventory	
Number of construction sites closed/completed during reporting period	
Number of construction site inspections	
Number of construction site violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

Has the Copermittee implemented an existing development management program that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

	Municipal	Commercial	Industrial	Residential
Number of facilities or areas in inventory				
Number of existing development inspections				
Number of follow-up inspections				
Number of violations				
Number of enforcement actions issued				
Number of escalated enforcement actions issued				

VIII. PUBLIC EDUCATION AND PARTICIPATION

Has the Copermittee implemented a public education program component that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐
Has the Copermittee implemented a public participation program component that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

IX. FISCAL ANALYSIS

Has the Copermittee attached to this form a summary of its fiscal analysis that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

X. CERTIFICATION

I [☐ Principal Executive Officer ☐ Ranking Elected Official ☐ Duly Authorized Representative] certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature	Date
Print Name	Title
Telephone Number	Email

ATTACHMENT E

SPECIFIC PROVISIONS FOR TOTAL MAXIMUM DAILY LOADS APPLICABLE TO ORDER NO. R9-2013-0001, AS AMENDED BY ORDER NOS. R9-2015-0001 AND R9-2015-0100

These provisions implement load allocations (LAs) and wasteload allocations (WLAs) of the Total Maximum Daily Loads (TMDLs) established by the San Diego Water Board or USEPA under Clean Water Act section 303(c), applicable to discharges regulated under this Order. The provisions and schedules for implementation of the TMDLs described below must be incorporated into the Water Quality Improvement Plans, required pursuant to Provision B of this Order, for the specified Watershed Management Areas.

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed
2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin
3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed
4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek
5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay
6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)
7. Total Maximum Daily Load for Sediment in Los Peñasquitos Lagoon

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2002-0123

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	August 14, 2002
State Water Board Approval Date:	July 16, 2003
Office of Administrative Law Approval Date:	September 11, 2003
US EPA Approval Date:	November 3, 2003

(3) TMDL Effective Date: September 11, 2003

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final diazinon TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must be in compliance with the final TMDL compliance requirements as of December 31, 2010.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations:

Table 1.1
Final Receiving Water Limitations Expressed as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Diazinon	Acute	0.08 µg/L	1 hour
	Chronic	0.05 µg/L	4 days

(b) Final Effluent Limitations

Discharges from the MS4s containing concentrations that do not exceed the following effluent limitations will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 1.b.(2)(a):

Table 1.2
Final Effluent Limitations Expressed as Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation	Averaging Period
Diazinon	Acute	0.072 µg/L	1 hour
	Chronic	0.045 µg/L	4 days

(c) Best Management Practices

The following BMPs for Chollas Creek must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area and implemented by the Responsible Copermittees:

(i) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 1.b.(2)(a) and/or the effluent limitations under Specific Provision 1.b.(2)(b) for Chollas Creek.

(ii) The Responsible Copermittees must implement the Diazinon Toxicity Control Plan and Diazinon Public Outreach/Education Program as described in the report titled, *Technical Report for Total Maximum Daily Load for Diazinon in Chollas Creek Watershed, San Diego County*, dated August 14, 2002, including subsequent modifications, in order to achieve the receiving water limitations under Specific Provision 1.b.(2)(a) and/or the effluent limitations under Specific Provision 1.b.(2)(b).

(iii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 1.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 1.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 1.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 1.b.(2)(c) achieves compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 1.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 1.d, to demonstrate compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The Responsible Copermittees must be in compliance with the final diazinon TMDL compliance requirements as of December 31, 2010.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls for diazinon within the Chollas Creek watershed, and calculate or estimate the annual diazinon loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment

Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 1.b.(2)(b), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0019

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	September 22, 2005
Office of Administrative Law Approval Date:	December 2, 2005
US EPA Approval Date:	February 8, 2006

(3) TMDL Effective Date: December 2, 2005

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Shelter Island Yacht Basin

(6) Responsible Copermittee: City of San Diego

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final dissolved copper TMDL compliance requirements for Shelter Island Yacht Basin consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittee must be in compliance with the final TMDL compliance requirements as of December 2, 2005.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations:

Table 2.1
Final Receiving Water Limitations Expressed as Concentrations in Shelter Island Yacht Basin

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Dissolved Copper	Acute	4.8 µg/L x WER*	1 hour
	Chronic	3.1 µg/L x WER*	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 2.b.(2)(a):

Table 2.2
Final Effluent Limitations as Expressed as Annual Loads in MS4 Discharges to Shelter Island Yacht Basin

Constituent	Effluent Limitation
Dissolved Copper	30 kg/yr*

* If the water quality objectives for dissolved copper in Shelter Island Yacht Basin are changed in the future, then the margin of safety (MOS), TMDL and allocations will be recalculated using the *Method for Recalculation of the Total Maximum Daily Load for Dissolved Copper in the Shelter Island Yacht Basin, San Diego Bay* in the Basin Plan (p. 7-14).

(c) Best Management Practices

The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 2.b.(2)(a) and/or the effluent limitations under Specific Provision 2.b.(2)(b) for Shelter Island Yacht Basin. The BMPs must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 2.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 2.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittee develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 2.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 2.b.(2)(c) achieves compliance with Specific Provisions 2.b.(3)(a), 2.b.(3)(b) and/or 2.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 2.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 2.d, to demonstrate compliance with Specific Provisions 2.b.(3)(a), 2.b.(3)(b) and/or 2.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The Responsible Copermittees must be in compliance with the final dissolved copper TMDL compliance requirements as of December 2, 2005.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

The Responsible Copermittee must monitor the effluent of its MS4 outfalls for dissolved copper, and calculate or estimate the monthly and annual dissolved copper loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.(b)(2)of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0036

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	November 16, 2005
Office of Administrative Law Approval Date:	February 1, 2006
US EPA Approval Date:	March 22, 2006

(3) TMDL Effective Date: February 1, 2006

(4) Watershed Management Area: Santa Margarita River

(5) Water Body: Rainbow Creek

(6) Responsible Copermittee: County of San Diego

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final total nitrogen and total phosphorus TMDL compliance requirements for Rainbow Creek consist of the following

(1) Final TMDL Compliance Date

The Responsible Copermittee must comply with final TMDL compliance requirements by December 31, 2021.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance date under Specific Provision 3.b.(1):

Table 3.1
Final Receiving Water Limitations Expressed as Concentrations in Rainbow Creek

Constituent	Receiving Water Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing concentrations that do not exceed the following effluent limitations by the compliance date under Specific Provision 3.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 3.b.(2)(a):

Table 3.2
Final Effluent Limitations Expressed as Concentrations in MS4 Discharges to Rainbow Creek

Constituent	Effluent Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(ii) Annual pollutant loads from given land uses discharging to and from the MS4s that do not exceed the following annual loads by the compliance date under Specific Provision 3.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 3.b.(2)(a):

Table 3.3
Final Effluent Limitations Expressed as Annual Loads in MS4 Discharges to Rainbow Creek

Land Use	Total N	Total P
Commercial nurseries	116 kg/yr	3 kg/yr
Park	3 kg/yr	0.1 kg/yr
Residential areas	149 kg/yr	12 kg/yr
Urban areas	27 kg/yr	6 kg/yr

(c) Best Management Practices

(i) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 3.b.(2)(a) and/or the effluent limitations under Specific Provision 3.b.(2)(b) for Rainbow Creek.

(ii) The Responsible Copermittee should coordinate any BMPs implemented to address this TMDL with Caltrans and other sources as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under

Specific Provision 3.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 3.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the final effluent limitations under Specific Provision 3.b.(2)(b)(ii); OR

(e) The Responsible Copermittee develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 3.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Specific Provision 3.b.(2)(c) achieves compliance with Specific Provisions 3.b.(3)(a), 3.b.(3)(b), 3.b.(3)(c) and/or 3.b.(3)(d),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 3.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 3.d, to demonstrate compliance with Specific Provisions 3.b.(3)(a), 3.b.(3)(b), 3.b.(3)(c) and/or 3.b.(3)(d).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim total nitrogen and total phosphorus TMDL compliance requirements for Rainbow Creek consist of the following:

(1) Interim Compliance Dates and WQBELs

The Responsible Copermittee must comply with the interim WQBELs, expressed as annual loads, by December 31 of the interim compliance year given in Table 3.4.

Table 3.4
Interim Water Quality Based Effluent Limitations Expressed as Annual Loads in MS4 Discharges from Specific Land Uses to Rainbow Creek

	Total N Interim Effluent Limitations (kg/yr)			Total P Interim Effluent Limitations (kg/yr)		
	Interim Compliance Date			Interim Compliance Date		
Land Use	**2009**	**2013**	**2017**	**2009**	**2013**	**2017**
Commercial nurseries	390	299	196	20	16	10
Park	5	3	3	0.15	0.10	0.10
Residential areas	507	390	260	99	74	47
Urban areas	40	27	27	9	6	6

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 3.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 3.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the final effluent limitations under Specific Provision 3.b.(2)(b)(ii); OR

(e) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the interim effluent limitations under Specific Provision 3.c.(1); OR

(f) The Responsible Copermittee has submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

d. Specific Monitoring and Assessment Requirements

(1) The Responsible Copermittee must incorporate into the Water Quality Improvement Plan and implement the Sampling and Analysis Plan for Rainbow Creek Nutrient Reduction TMDL Implementation Water Quality Monitoring, dated January 2010.

(2) The results of any monitoring conducted during the reporting period, and assessment of whether the interim and final TMDL compliance requirements have been achieved must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 3.b.(2)(b)(i), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2007-0043

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2007
State Water Board Approval Date:	July 15, 2008
Office of Administrative Law Approval Date:	October 22, 2008
US EPA Approval Date:	December 18, 2008

(3) TMDL Effective Date: October 22, 2008

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final dissolved copper, lead, and zinc TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must comply with the final TMDL compliance requirements by October 22, 2028.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance date under Specific Provision 4.b.(1):

Table 4.1
Final Receiving Water Limitations Expressed as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$(0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$(0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$(0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$(0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations by the compliance date under Specific Provision 4.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 4.b.(2)(a):

Table 4.2
Final Effluent Limitations as Expressed Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(c) Best Management Practices

(i) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 4.b.(2)(a) and/or the effluent limitations under Specific Provision 4.b.(2)(b) for Chollas Creek.

(ii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans and the U.S. Navy as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 4.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 4.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 4.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 4.b.(2)(c) achieves compliance with Specific Provisions 4.b.(3)(a), 4.b.(3)(b) and/or 4.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 4.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 4.d, to demonstrate compliance with Specific Provisions 4.b.(3)(a), 4.b.(3)(b) and/or 4.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim dissolved copper, lead, and zinc TMDL compliance requirements for Chollas Creek consist of the following:

(1) Interim Compliance Date and WQBELs

The Responsible Copermittee must comply with the interim WQBELs, expressed as concentrations, by the interim compliance date given in Table 4.3:

Table 4.3
Interim Water Quality Based Effluent Limitations Expressed as Concentrations in MS4 Discharges to Chollas Creek

Interim Compliance Date	Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
October 22, 2018	Dissolved Copper	Acute	$1.2 \times 90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
	Dissolved Lead	Acute	$1.2 \times 90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
	Dissolved Zinc	Acute	$1.2 \times 90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 4.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 4.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) There are no exceedances of the interim effluent limitations under Specific

Provision 4.c.(1) at the Responsible Copermittee's MS4 outfalls; OR

(e) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance date.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*, when it is amended to include monitoring requirements for the Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls discharging to Chollas Creek for dissolved copper, lead, and zinc, and calculate or estimate the monthly and annual dissolved copper, lead, and zinc loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 4.b.(2)(b) or 4.c.(1), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2008-0027

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 11, 2008
State Water Board Approval Date:	June 16, 2009
Office of Administrative Law Approval Date:	September 15, 2009
US EPA Approval Date:	October 26, 2009

(3) TMDL Effective Date: September 15, 2009

(4) Watershed Management Areas: See Table 5.0

(5) Water Bodies: See Table 5.0

(6) Responsible Copermittees: See Table 5.0

Table 5.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County	Dana Point Harbor	Baby Beach	-City of Dana Point -County of Orange
San Diego Bay	San Diego Bay	Shelter Island Shoreline Park	- San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final indicator bacteria TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Final TMDL Compliance Dates

(a) Baby Beach in Dana Point Harbor

The Responsible Copermittees for MS4 discharges to Baby Beach must be in compliance with the final TMDL compliance requirements according to the following compliance dates:

Table 5.1
Compliance Dates to Achieve Final TMDL Compliance Requirements For Baby Beach in Dana Point Harbor

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform	September 15, 2014	September 15, 2009
Fecal Coliform		September 15, 2009
Enterococcus		September 15, 2019

(b) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park must be in compliance with the final TMDL compliance requirements as of December 31, 2012.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance dates under Specific Provision 5.b.(1):

Table 5.2
Final Receiving Water Limitations Expressed as Bacteria Densities in the Water Body

	Receiving Water Limitations	
Constituent	Single Sample Maximum[1,2]	30-Day Geometric Mean[2]
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing indicator bacteria densities that do not exceed the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.3a
Final Effluent Limitations as Expressed as Bacteria Densities in MS4 Discharges to the Water Body

	Effluent Limitations	
Constituent	**Single Sample Maximum[1,2]**	**30-Day Geometric Mean[2]**
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.

(ii) Discharges from the MS4s containing indicator bacteria loads that do not exceed the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.4a
Final Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to the Baby Beach in Dana Point Harbor

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0.86×10^9 MPN/day	$3{,}254 \times 10^9$ MPN/30days
Fecal Coliform	0.17×10^9 MPN/day	112×10^9 MPN/30days
Enterococcus	0.03×10^9 MPN/day	114×10^9 MPN/30days

Table 5.4b
Final Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to the Shelter Island Shoreline Park in San Diego Bay

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0 MPN/day	198×10^9 MPN/30days
Fecal Coliform	0 MPN/day	8×10^9 MPN/30days
Enterococcus	0 MPN/day	26×10^9 MPN/30days

(iii) Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.5a
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to Baby Beach in Dana Point Harbor*

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	90.4%	0%
Fecal Coliform	82.7%	0%
Enterococcus	96.2%	62.2%

Notes:
* The percent load reductions are relative to data collected between 1996-2002. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittees' MS4s must not exceed the loads in Table 5.4a, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the water body.

Table 5.5b
*Final Effluent Limitations Expressed as Percent Load Reductions** in MS4 Discharges to Shelter Island Shoreline Park in San Diego Bay*

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0%	0%
Fecal Coliform	0%	0%
Enterococcus	0%	0%

Notes:
* The percent load reductions are relative to data collected between 1999-2004. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittee's MS4s must not exceed the loads in Table 5.4b, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the water body.

(c) Best Management Practices

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 5.0 must incorporate the Bacteria Load Reduction Plan (BLRP) required to be developed pursuant to Resolution No. R9-2008-0027.

(ii) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 5.b.(2)(a) and/or the effluent limitations under Specific Provision 5.b.(2)(b) for the segments or areas of the water bodies listed in Table 5.0

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.b.(2)(b)(ii); OR

(e) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 5.b.(2)(b)(iii); OR

(f) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(g) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 5.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 5.b.(2)(c) achieves compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 5.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 5.d, to demonstrate compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim indicator bacteria TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Baby Beach in Dana Point Harbor

(a) Interim TMDL Compliance Dates and WQBELs

The Responsible Copermittees for MS4 discharges to Baby Beach must comply with the following interim WQBELs by the interim compliance dates given in Tables 5.6a and/or 5.6b:

Table 5.6a
Interim Water Quality Based Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to Baby Beach in Dana Point Harbor

Constituent	Interim Compliance Dates	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	4.93×10^9 MPN/day	$3{,}254 \times 10^9$ MPN/30days*
Fecal Coliform	September 15, 2012	0.59×10^9 MPN/day	112×10^9 MPN/30days*
Enterococcus	September 15, 2012	0.42×10^9 MPN/day	301×10^9 MPN/30days
	September 15, 2016	0.03×10^9 MPN/day *	207×10^9 MPN/30days

Notes:
* Same as the final effluent limitations in Table 5.4a.

Table 5.6b
Interim Water Quality Based Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to Baby Beach in Dana Point Harbor*

Constituent	Interim Compliance Dates	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	45.2%	0%**
Fecal Coliform	September 15, 2012	41.4%	0%**
Enterococcus	September 15, 2012	48.1%	0%
	September 15, 2016	96.2%**	31.1%

Notes:
* The percent load reductions are relative to data collected between 1996-2002. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittees' MS4s must not exceed the loads in Table 5.6a, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the waterbody.
** Same as the final effluent limitations in Table 5.5a.

(b) Interim Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(i) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(ii) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(iii) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(iv) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.b(2)(b)(ii); OR

(v) The Responsible Copermittees can demonstrate that exceedances of the applicable receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(vi) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the interim effluent limitations under Table 5.6a of Specific Provision 5.c.(1)(a); OR

(vii) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the interim effluent limitations under Table 5.6b of Specific Provision 5.c.(1)(a); OR

(viii) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

(2) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park must be in compliance with the final indicator bacteria TMDL requirements as of December 31, 2012.

d. Specific Monitoring and Assessment Requirements

(1) Monitoring Stations

Monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[38] If discharges of bacteria from the MS4 exceed the applicable interim or final WQBELs, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(2) Monitoring Procedures

(a) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) The Responsible Copermittees must collect wet weather monitoring samples within the first 24 hours of a storm event[39] of the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(c) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

[38] Commonly referred to as AB 411 monitoring

[39] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs have been achieved.

(b) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 5.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(c) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to correlate elevated bacteria levels with known or suspected sewage spills from wastewater collection systems and treatment plants or boats.

(d) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2010-0001

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 10, 2010
State Water Board Approval Date:	December 14, 2010
Office of Administrative Law Approval Date:	April 4, 2011
US EPA Approval Date:	June 22, 2011

(3) TMDL Effective Date: April 4, 2011

(4) Watershed Management Areas: See Table 6.0

(5) Water Bodies: See Table 6.0

(6) Responsible Copermittees: See Table 6.0

Table 6.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	-City of Laguna Beach -County of Orange -Orange County Flood Control District
		at Heisler Park - North	
	Pacific Ocean Shoreline	at Main Laguna Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Woods -County of Orange -Orange County Flood Control District
		Laguna Beach at Ocean Avenue	
		Laguna Beach at Cleo Street	
		Arch Cove at Bluebird Canyon Road	
		Laguna Beach at Dumond Drive	
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Hills -City of Laguna Niguel -City of Laguna Woods -City of Lake Forest -City of Mission Viejo -County of Orange -Orange County Flood Control District
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	
	Aliso Creek Mouth	at mouth	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	-City of Dana Point -City of Laguna Beach -City of Laguna Niguel -County of Orange -Orange County Flood Control District
		Aliso Beach at Table Rock Drive	
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)	
		at Salt Creek (large outlet)	
		Salt Creek Beach at Salt Creek service road	
		Salt Creek Beach at Strand Road	
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	-City of Dana Point -City of Laguna Hills -City of Laguna Niguel -City of Mission Viejo -City of Rancho Santa Margarita -City of San Juan Capistrano -County of Orange -Orange County Flood Control District
	San Juan Creek	lower 1 mile	
	San Juan Creek Mouth	at mouth	
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	-City of Dana Point -City of San Clemente -County of Orange -Orange County Flood Control District
		Ole Hanson Beach Club Beach at Pico Drain	
		San Clemente City Beach at El Portal Street Stairs	
		San Clemente City Beach at Mariposa Street	
		San Clemente City Beach at Linda Lane	
		San Clemente City Beach at South Linda Lane	
		San Clemente City Beach at Lifeguard Headquarters	
		under San Clemente Municipal Pier	
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	
		San Clemente State Beach at Riviera Beach	
		Can Clemente State Beach at Cypress Shores	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	-City of Oceanside -City of Vista -County of San Diego
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	-City of Carlsbad -City of Encinitas -City of Escondido -City of San Marcos -County of San Diego
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	-City of Del Mar -City of Escondido -City of Poway -City of San Diego -City of Solana Beach -County of San Diego
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	-City of Del Mar -City of Poway -City of San Diego -County of San Diego
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	-City of San Diego
		La Jolla Shores Beach at Caminito del Oro	
		La Jolla Shores Beach at Vallecitos	
		La Jolla Shores Beach at Avenida de la Playa	
		at Casa Beach, Children's Pool	
		South Casa Beach at Coast Boulevard	
		Whispering Sands Beach at Ravina Street	
		Windansea Beach at Vista de la Playa	
		Windansea Beach at Bonair Street	
		Windansea Beach at Playa del Norte	
		Windansea Beach at Palomar Avenue	
		at Tourmaline Surf Park	
		Pacific Beach at Grand Avenue	
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I- Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	-City of El Cajon -City of Santee -County of San Diego
	San Diego River	lower 6 miles	-City of El Cajon -City of La Mesa -City of San Diego -City of Santee -County of San Diego
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	-City of La Mesa -City of Lemon Grove -City of San Diego -County of San Diego - San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final indicator bacteria TMDL compliance requirements for the water bodies listed in Table 6.0 consist of the following:

(1) Final TMDL Compliance Dates

The Responsible Copermittees for MS4 discharges to the water bodies listed in Table 6.0 must be in compliance with the final TMDL compliance requirements according to the following compliance dates:

Table 6.1
Compliance Dates to Achieve Final TMDL Compliance Requirements

Constituent	Dry Weather TMDL Compliance Date	Wet Weather TMDL Compliance Date*
Total Coliform	April 4, 2021	April 4, 2031 (April 4, 2021)
Fecal Coliform		
Enterococcus		

* The Wet Weather TMDL Compliance Date in parenthesis applies if the applicable Water Quality Improvement Plan does not include load reduction programs for other constituents (e.g. metals, pesticides, trash, nutrients, sediment, etc.) together with bacteria load reduction requirements of these TMDLs.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance dates under Specific Provision 6.b.(1):

Table 6.2a
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Beaches

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform	10,000	22%	1,000	0%
Fecal Coliform	400	22%	200	0%
Enterococcus	104	22%	35	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan.

Table 6.2b
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Creeks

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Fecal Coliform	400	22%	200	0%
Enterococcus	61 (104)	22%	33	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Basin Plan.
d. A single sample maximum of 104 MPN/100ml for *Enterococcus* may be applied as a receiving water limitation for creeks, instead of 61 MPN/100mL, if one or more of the creeks addressed by these TMDLs (San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek, San Diego River, and/or Chollas Creek) is designated with a "moderately to lightly used area" or less frequent usage frequency in the Basin Plan. Otherwise, the single sample maximum of 61 MPN/100mL for *Enterococcus* must be used to assess compliance with the allowable exceedance frequency.

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing indicator bacteria densities that do not exceed the following effluent limitations by the compliance dates under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a):

Table 6.2c
Final Effluent Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies in MS4 Discharges to the Water Body

Constituent	Concentration-Based Effluent Limitations			
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform[d]	10,000	22%	1,000	0%
Fecal Coliform	400	22%	200	0%
Enterococcus	104[e] / 61[f]	22%	35[e] / 33[f]	0%

Notes:
a. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan for discharges to beaches, and the Basin Plan for discharges to creeks and creek mouths.
d. Total coliform effluent limitations only apply to MS4 outfalls that discharge to the Pacific Ocean Shorelines and creek mouths listed in Table 6.0.
e. This *Enterococcus* effluent limitation applies to MS4 discharges to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
f. This *Enterococcus* effluent limitation applies to MS4 discharges to segments or areas of creeks or creek mouths listed in Table 6.0.

(ii) Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the compliance dates under Specific Provision 6.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a):

Table 6.3
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watershed and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
South Orange County	**San Joaquin Hills HSA** (901.11) and **Laguna Hills HSA** (901.12) - Pacific Ocean Shoreline	91.78%	91.72%	98.28%	46.85%	52.07%	51.26%
	Aliso HSA (901.13) - Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	95.47%	95.58%	99.13%	25.29%	26.62%	27.52% (27.37%)**
	Dana Point HSA (901.14) - Pacific Ocean Shoreline	95.04%	95.03%	98.98%	13.15%	14.86%	15.16%
	Lower San Juan HSA (901.27) - Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	72.96%	74.21%	94.94%	19.21%	12.82%	27.12% (26.90%)**
	San Clemente HA (901.30) - Pacific Ocean Shoreline	94.28%	94.23%	98.83%	23.85%	24.58%	25.26%
San Luis Rey River	**San Luis Rey HU** (903.00) - Pacific Ocean Shoreline	38.13%	39.09%	87.38%	5.62%	3.12%	11.69%

Table 6.3 (Cont'd)
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watershed and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
Carlsbad	**San Marcos HA** (904.50) - Pacific Ocean Shoreline	82.82%	82.55%	96.03%	18.47%	18.98%	20.19%
San Dieguito River	**San Dieguito HU** (905.00) - Pacific Ocean Shoreline	14.39%	20.72%	83.48%	4.29%	1.46%	7.72%
Penasquitos	**Miramar Reservoir HA** (906.10) - Pacific Ocean Shoreline	96.50%	96.59%	99.42%	1.61%	1.99%	1.93%
Mission Bay	**Scripps HA** (906.30) - Pacific Ocean Shoreline	96.44%	96.42%	99.25%	16.32%	21.14%	18.82%
	Tecolote HA (906.50) - Tecolote Creek	94.51%	94.59%	98.94%	16.51%	20.47%	18.15% (18.08%)**
San Diego River	**Mission San Diego HSA** (907.11) and **Santee HSA** (907.12) - Pacific Ocean Shoreline - Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles)	74.03%	69.44%	93.96%	38.14%	53.22%	42.74% (42.47%)**
San Diego Bay	**Chollas HSA** (908.22) - Chollas Creek	92.06%	92.15%	98.46%	17.82%	24.84%	21.46% (21.36%)**

Notes:
* The percent load reductions are based on reducing loads compared to pollutant loads from 2001 to 2002.
** The alternative *Enterococcus* percent load reduction was calculated based on a numeric target of 104 MPN/100mL instead of 61 MPN/100mL, protective of the REC-1 "moderately to lightly used area" usage frequency that is protective of freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative pollutant load reductions can be utilized.

(c) Best Management Practices

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 6.0 must incorporate the Bacteria Load Reduction Plans (BLRPs) or Comprehensive Load Reduction Plans (CLRPs) required to be developed pursuant to Resolution No. R9-2010-0001.

(ii) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 6.b.(2)(a) and/or the effluent limitations under Specific Provision 6.b.(2)(b) for the segments or areas of the water bodies listed in Table 6.0.

(iii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans, owners/operators of small MS4s, and agricultural dischargers as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(f) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 6.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 6.b.(2)(c) achieves compliance with Specific Provisions 6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), and/or 6.b.(3)(e),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 6.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 6.d, to demonstrate compliance with Specific Provisions 6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), 6.b.(3)(e) and/or 6.b.(3)(f).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim indicator bacteria TMDL compliance requirements for the water bodies listed in Table 6.0 consist of the following:

(1) Interim TMDL Compliance Dates

The Responsible Copermittees must achieve compliance with the interim TMDL compliance requirements, as determined in accordance with Specific Provision 6.c.(3), by the interim compliance dates given in Table 6.4, unless alternative interim compliance dates are accepted by the San Diego Water Board Executive Officer as part of the Water Quality Improvement Plan.

Table 6.4
Interim Compliance Dates to Achieve Interim TMDL Compliance Requirements

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs*
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	April 4, 2016	April 4, 2021 (April 4, 2016)
		at Heisler Park - North		
	Pacific Ocean Shoreline	at Main Laguna Beach	April 4, 2016	April 4, 2021 (April 4, 2016)
		Laguna Beach at Ocean Avenue		
		Laguna Beach at Cleo Street		
		Arch Cove at Bluebird Canyon Road		
		Laguna Beach at Dumond Drive		
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	April 4, 2016	April 4, 2021 (April 4, 2016)
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	April 4, 2018	April 4, 2021 (April 4, 2018)
	Aliso Creek Mouth	at mouth	April 4, 2018	April 4, 2021 (April 4, 2018)
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	April 4, 2016	April 4, 2021 (April 4, 2016)
		Aliso Beach at Table Rock Drive		
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)		
		at Salt Creek (large outlet)		
		Salt Creek Beach at Salt Creek service road	April 4, 2017	April 4, 2021 (April 4, 2017)
		Salt Creek Beach at Strand Road	April 4, 2017	April 4, 2021 (April 4, 2017)

Table 6.4 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs*
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	April 4, 2016	April 4, 2021 (April 4, 2016)
	San Juan Creek	lower 1 mile	April 4, 2018	April 4, 2021 (April 4, 2018)
	San Juan Creek Mouth	at mouth	April 4, 2016	April 4, 2021 (April 4, 2016)
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	April 4, 2016	April 4, 2021 (April 4, 2016)
		Ole Hanson Beach Club Beach at Pico Drain	April 4, 2016	April 4, 2021 (April 4, 2016)
		San Clemente City Beach at El Portal Street Stairs	April 4, 2017	April 4, 2021 (April 4, 2017)
		San Clemente City Beach at Mariposa Street		
		San Clemente City Beach at Linda Lane	April 4, 2016	April 4, 2021 (April 4, 2016)
		San Clemente City Beach at South Linda Lane	April 4, 2018	April 4, 2021 (April 4, 2018)
		San Clemente City Beach at Lifeguard Headquarters	April 4, 2017	April 4, 2021 (April 4, 2017)
		under San Clemente Municipal Pier		
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	April 4, 2018	April 4, 2021 (April 4, 2018)
		San Clemente State Beach at Riviera Beach	April 4, 2016	April 4, 2021 (April 4, 2016)
		Can Clemente State Beach at Cypress Shores	April 4, 2017	April 4, 2021 (April 4, 2017)
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	April 4, 2017	April 4, 2021 (April 4, 2017)
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	April 4, 2016	April 4, 2021 (April 4, 2016)
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	April 4, 2016	April 4, 2021 (April 4, 2016)

Table 6.4 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs*
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	April 4, 2016	April 4, 2021 (April 4, 2016)
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	April 4, 2016	April 4, 2021 (April 4, 2016)
		La Jolla Shores Beach at Caminito del Oro		
		La Jolla Shores Beach at Vallecitos		
		La Jolla Shores Beach at Avenida de la Playa		
		at Casa Beach, Children's Pool		
		South Casa Beach at Coast Boulevard		
		Whispering Sands Beach at Ravina Street		
		Windansea Beach at Vista de la Playa		
		Windansea Beach at Bonair Street		
		Windansea Beach at Playa del Norte		
		Windansea Beach at Palomar Avenue		
		at Tourmaline Surf Park		
		Pacific Beach at Grand Avenue		
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries		
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	April 4, 2018	April 4, 2021 (April 4, 2018)
	San Diego River	lower 6 miles		
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach		
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	April 4, 2018	April 4, 2021 (April 4, 2018)

* The Interim Compliance Dates to achieve the Interim Wet Weather WQBELs in parenthesis apply if the applicable Water Quality Improvement Plan does not include load reduction programs for other constituents (e.g. metals, pesticides, trash, nutrients, sediment, etc.) together with bacteria load reduction requirements of these TMDLs.

(2) Interim Water Quality Based Effluent Limitations

The Responsible Copermittees for discharges to the water bodies in Table 6.0 must comply with the following interim WQBELs by the interim compliance dates given in Specific Provision 6.c.(1):

(a) Interim Receiving Water Limitations

(i) *Interim Dry Weather Receiving Water Limitations*

The Responsible Copermittee must calculate the "existing" exceedance frequencies of the 30-day geometric mean water quality objectives for each of the indicator bacteria by analyzing the available monitoring data collected between January 1, 1996 and December 31, 2002. "Existing" exceedance frequencies may be calculated by water body and/or by Watershed Management Area listed in Table 6.0. Separate "existing" exceedance frequencies must be calculated for beaches and creeks/creek mouths.

The Responsible Copermittees must achieve a 50 percent reduction in the "existing" exceedance frequency of the 30-day geometric mean WQBELs for the water bodies listed in Table 6.0 by the interim compliance dates given in Table 6.4. A 50 percent reduction in the "existing" exceedance frequency is equivalent to half of the "existing" exceedance frequency of the 30-day geometric mean WQBELs.

The "existing" exceedance frequencies and the interim dry weather allowable exceedance frequencies (i.e. interim dry weather receiving water limitations) calculated by the Responsible Copermittees must be included in the Water Quality Improvement Plans for the applicable Watershed Management Areas.

(ii) *Interim Wet Weather Receiving Water Limitations*

The Responsible Copermittees must achieve the interim wet weather receiving water limitations in Table 6.5, expressed as interim wet weather allowable exceedance frequencies, by the interim compliance dates given in Table 6.4.

Table 6.5
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	38%	37%	39%
		at Heisler Park - North			
	Pacific Ocean Shoreline	at Main Laguna Beach			
		Laguna Beach at Ocean Avenue			
		Laguna Beach at Cleo Street			
		Arch Cove at Bluebird Canyon Road			
		Laguna Beach at Dumond Drive			
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	41%	41%	42%
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	41%	41%	42%
	Aliso Creek Mouth	at mouth	41%	41%	42%
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	36%	36%	36%
		Aliso Beach at Table Rock Drive			
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)			
		at Salt Creek (large outlet)			
		Salt Creek Beach at Salt Creek service road			
		Salt Creek Beach at Strand Road			

Table 6.5 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	44%	44%	48%
	San Juan Creek	lower 1 mile	44%	44%	47%
	San Juan Creek Mouth	at mouth	44%	44%	47%
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	35%	35%	36%
		Ole Hanson Beach Club Beach at Pico Drain			
		San Clemente City Beach at El Portal Street Stairs			
		San Clemente City Beach at Mariposa Street			
		San Clemente City Beach at Linda Lane			
		San Clemente City Beach at South Linda Lane			
		San Clemente City Beach at Lifeguard Headquarters			
		under San Clemente Municipal Pier			
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)			
		San Clemente State Beach at Riviera Beach			
		Can Clemente State Beach at Cypress Shores			
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	45%	44%	47%
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	40%	40%	41%
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	33%	33%	36%

Table 6.5 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	26%	26%	26%
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	37%	37%	37%
		La Jolla Shores Beach at Caminito del Oro			
		La Jolla Shores Beach at Vallecitos			
		La Jolla Shores Beach at Avenida de la Playa			
		at Casa Beach, Children's Pool			
		South Casa Beach at Coast Boulevard			
		Whispering Sands Beach at Ravina Street			
		Windansea Beach at Vista de la Playa			
		Windansea Beach at Bonair Street			
		Windansea Beach at Playa del Norte			
		Windansea Beach at Palomar Avenue			
		at Tourmaline Surf Park			
		Pacific Beach at Grand Avenue			
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries	49%	49%	51%
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	46%	43%	49%
	San Diego River	lower 6 miles	46%	43%	49%
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	46%	43%	51%
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	41%	41%	43%

(b) Interim Effluent Limitations

Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the interim compliance dates under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.c.(2)(a):

Table 6.6
Interim Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watersheds and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
South Orange County	**San Joaquin Hills HSA** (901.11) and **Laguna Hills HSA** (901.12) - Pacific Ocean Shoreline	45.89%	45.86%	49.14%	23.43%	26.04%	25.63%
	Aliso HSA (901.13) - Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	47.74%	47.79%	49.57%	12.65%	13.31%	13.76% (13.69%)**
	Dana Point HSA (901.14) - Pacific Ocean Shoreline	47.52%	47.52%	49.49%	6.58%	7.43%	7.58%
	Lower San Juan HSA (901.27) - Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	36.48%	37.11%	47.47%	9.61%	6.41%	13.56% (13.45%)**
	San Clemente HA (901.30) - Pacific Ocean Shoreline	47.14%	47.12%	49.42%	11.93%	12.29%	12.63%
San Luis Rey River	**San Luis Rey HU** (903.00) - Pacific Ocean Shoreline	19.07%	19.55%	43.69%	2.81%	1.56%	5.85%
Carlsbad	**San Marcos HA** (904.50) - Pacific Ocean Shoreline	41.41%	41.28%	48.02%	9.24%	9.49%	10.10%

Table 6.6 (Cont'd)
Interim Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watersheds and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
San Dieguito River	**San Dieguito HU** (905.00) - Pacific Ocean Shoreline	7.20%	10.36%	41.74%	2.15%	0.73%	3.86%
Penasquitos	**Miramar Reservoir HA** (906.10) - Pacific Ocean Shoreline	48.25%	48.30%	49.71%	0.81%	1.00%	0.97%
Mission Bay	**Scripps HA** (906.30) - Pacific Ocean Shoreline	48.22%	48.21%	49.63%	8.16%	10.57%	9.41%
	Tecolote HA (906.50) - Tecolote Creek	47.26%	47.30%	49.47%	8.26%	10.24%	9.08% (9.04%)**
San Diego River	**Mission San Diego HSA** (907.11) and **Santee HSA** (907.12) - Pacific Ocean Shoreline - Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles)	37.02%	34.72%	46.98%	19.07%	26.61%	21.37% (21.24%)**
San Diego Bay	**Chollas HSA** (908.22) - Chollas Creek	46.03%	46.08%	49.23%	8.91%	12.42%	10.73% (10.68%)**

Notes:
* The percent load reductions are based on reducing loads compared to pollutant loads from 2001 to 2002.
** The alternative *Enterococcus* percent load reduction was calculated based on a numeric target of 104 MPN/100mL instead of 61 MPN/100mL, protective of the REC-1 "moderately to lightly used area" usage frequency that is protective of freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative pollutant load reductions can be utilized.

(3) Interim TMDL Compliance Determination

Compliance with the interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(f) There are no exceedances of the interim receiving water limitations under Specific Provision 6.c.(2)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(g) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the interim effluent limitations under Specific Provision 6.c.(2)(b); OR

(h) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

d. Specific Monitoring and Assessment Requirements

(1) Monitoring and Assessment Requirements for Beaches

(a) Monitoring Stations

For beaches addressed by the TMDL, monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[40] If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source

[40] Commonly referred to as AB 411 monitoring

identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations at least once within the first 24 hours of the end of a storm event[41] during the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer in exceedance of the allowable exceedance frequencies in the receiving waters.

(iii) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(iv) For Pacific Ocean Shoreline segments or areas listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the dry weather and

[41] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

wet weather monitoring data to assess whether the interim and final WQBELs for the Pacific Ocean Shoreline segments or areas listed in Table 6.0 have been achieved.

(ii) Dry weather exceedance frequencies must be calculated as follows:

[a] 30-day geometric means must be calculated from the results of any dry weather samples collected from the segments or areas for each water body listed in Table 6.0;
[b] The method and number of samples need for calculating the 30-day geometric means must be consistent with the number of samples required by the Ocean Plan;
[c] Where there are multiple segments or areas associated with a water body listed in Table 6.0, the Copermittees may calculate geometric means for each segment or area, or combine the dry weather monitoring data from all the segments or areas to calculate geometric means for the water body;
[d] The exceedance frequency must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the dry season.

(iii) Wet weather exceedance frequencies must be calculated as follows:

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;
[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;
[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria densities reported from each storm event sampled; and
[d] The single sample maximum exceedance frequency must be calculated by dividing the number of wet weather days that exceed the single sample maximum receiving water limitations in Table 6.2 by the total number of wet weather days during the rainy season.
[e] The data collected for dry weather must be used in addition to the data collected for wet weather to calculate the wet weather 30-day geometric means. The exceedance frequency of the wet weather 30-day geometric means must be calculated by dividing the number of geometric means that exceed the geometric mean

receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the wet season.

(iv) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(v) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) Monitoring and Assessment Requirements for Creeks and Creek Mouths

(a) Monitoring Stations

For creeks addressed by the TMDL, monitoring locations should consist of, at a minimum, a location at or near the mouth of the creek (e.g. Mass Loading Station or Mass Emission Station) and one or more locations upstream of the mouth (e.g. Watershed Assessment Station). If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations in accordance with the requirements of Provision D.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations within the first 24 hours of the end of a storm event[42] during the rainy season (i.e. October 1 through April 30).

[42] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(iii) Samples collected from receiving water monitoring stations must be analyzed for fecal coliform and *Enterococcus* indicator bacteria.

(iv) For creeks or creek mouths listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the receiving water monitoring data to assess whether the interim and final receiving water WQBELs for the creeks and creek mouths listed in Table 6.0 have been achieved.

(ii) Dry weather exceedance frequencies must be calculated as follows:

[a] 30-day geometric means must be calculated from the results of any dry weather samples collected from the segment or area for each water body listed in Table 6.0;
[b] The method and number of samples need for calculating the 30-day geometric means must be consistent with the number of samples required by the Basin Plan;
[c] The exceedance frequency must be calculated by dividing the number of 30-day geometric means that exceed the 30-day geometric mean receiving water limitations in Table 6.2 by the total number of 30-day geometric means calculated from samples collected during the dry season.

(iii) Wet weather exceedance frequencies must be calculated as follows:

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;
[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;
[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria densities reported from each of the storm events sampled; and

[d] The exceedance frequency must be calculated by dividing the number of wet weather days that exceed the single sample maximum receiving water limitations in Table 6.2 by the total number of wet weather days during the rainy season.

[e] The data collected for dry weather must be used in addition to the data collected for wet weather to calculate the wet weather 30-day geometric means. The exceedance frequency of the wet weather 30-day geometric means must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the wet season.

(iv) The Responsible Copermittee must identify and incorporate additional MS4 outfall and receiving water monitoring stations and/or adjust monitoring frequencies to identify sources causing exceedances of the receiving water WQBELs.

(v) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(vi) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

7. Total Maximum Daily Loads for Sediment in Los Peñasquitos Lagoon

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2012-0033

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2012
State Water Board Approval Date:	January 21, 2014
Office of Administrative Law Approval Date:	July 14, 2014
US EPA Approval Date:	October 30, 2014

(3) TMDL Effective Date: July 14, 2014

(4) Watershed Management Area: ~~Los~~ Peñasquitos

(5) Water Body: Los Peñasquitos Lagoon

(6) Responsible Copermittees: County of San Diego, City of San Diego, City of Del Mar, and City of Poway

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final sediment TMDL compliance requirements for Los Peñasquitos Lagoon consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must be in compliance with the final TMDL compliance requirements by December 31, 2034.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not prohibit the sustainable restoration of tidal and non-tidal saltmarsh vegetation of at least 346 acres.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations by the compliance date under Provision 7.b(1) will not cause or contribute to a failure of the receiving water condition specified under Specific Provision 7.b.(2)(a):

Table 7.1
*Final Effluent Limitations as Expressed as Wet Season Loads in MS4 Discharges to Los Peñasquitos Lagoon**

Constituent	Effluent Limitation
Sediment	2,580 tons/wet season

* Final effluent limitations are to be achieved by the following Responsible Parties: County of San Diego, City of San Diego, City of Del Mar, City of Poway, Phase II MS4 permittees, Caltrans, general construction storm water NPDES permittees, and general industrial storm water NPDES permittees.

(c) Best Management Practices

(i) The Water Quality Improvement Plan for the Los Peñasquitos Watershed Management Area must incorporate the Sediment Load Reduction Plan required to be developed pursuant to Resolution No. R9-2012-0033.

(ii) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 7.b.(2)(a) and/or the Copermittee's portion of the effluent limitations under Specific Provision 7.b.(2)(b) for Los Peñasquitos Lagoon.

(3) Final TMDL Compliance Determination

Compliance determination with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) Successful restoration of 80 percent of the 1973 acreage of tidal and non-tidal lagoon salt marsh (346 acres) as described in Attachment A of Resolution No. R9-2010-0033; OR

(b) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 7.b.(2)(c)(ii) and/or other implementation actions to achieve compliance with Specific Provision 7.b.(3)(a) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 7.b.(2)(c)(ii) or other implementation actions to achieve compliance with Specific Provision 7.b.(3)(a),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 7.b.(2)(c)(ii) or other implementation actions, AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 7.d to demonstrate compliance with Specific Provision 7.b.(3)(a).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim sediment TMDL compliance requirements for Los Penasquitos Lagoon consist of the following:

(1) Interim Compliance Dates and WQBELs

The Responsible Copermittees must comply with the interim WQBELs, expressed as wet season loads, by December 31 of the interim compliance year set forth in Table 7.2.

Table 7.2
*Interim Water Quality Based Effluent Limitations Expressed as Wet Season Loads in MS4 Discharges**

Interim Compliance Date	Interim Effluent Limitations (tons/wet season)
December 31, 2019	6,691
December 31, 2023	5,663
December 31, 2027	4,636
December 31, 2029	3,608

* Interim effluent limitations are to be achieved by the following Responsible Parties: County of San Diego, City of San Diego, City of Del Mar, City of Poway, Phase II MS4 permittees, Caltrans, general construction storm water NPDES permittees, and general industrial storm water NPDES permittees.

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) The final receiving water limitation under Specific Provision 7.b.(2)(a) is met; OR

(c) There are no exceedances of the Copermittee's portion of interim effluent limitations under Table 7.2 at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the Copermittee's portion of the interim TMDL compliance requirements described in Attachment A of Resolution No. R9-2010-0033 will be achieved by the interim compliance date.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) Watershed Monitoring

The Responsible Copermittees must conduct suspended sediment, bed load, and flow monitoring to calculate total sediment loading to the Los Peñasquitos Lagoon for each wet season (October 1 thru April 30) as set forth below:

(a) The Responsible Copermittees must monitor enough storm events throughout the season to quantify sediment loading over each wet season, and

(b) The Responsible Copermittees must monitor at least 3 stations to quantify cumulative sediment loading into Los Peñasquitos Lagoon. Stations must be located within the Los Peñasquitos, Carroll Canyon, and Carmel Creek tributaries prior to discharging into Los Peñasquitos Lagoon.

(2) Lagoon Monitoring

The Responsible Copermittees must monitor Los Peñasquitos Lagoon each Fall for changes in the extent of the vegetation types as set forth below:

(a) The Responsible Copermittees must acquire aerial photos of Los Peñasquitos Lagoon and digitize them at an approximate scale of 1:2,500,

(b) The Responsible Copermittees must appropriately interpret the vegetation and classify the various types as saltmarsh, non-tidal saltmarsh, freshwater marsh, non-tidal saltmarsh –*Lolium perrene* infested, southern willow scrub/mulefat scrub, herbaceous wetland, or upland land cover.

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the monitoring data collected under Specific Provision 7.d(1) and 7.d(2) to assess whether the interim and final WQBELs have been achieved.

(b) For assessing and determining compliance with the final receiving water limitations under Specific Provision 7.b.(2)(a), the Responsible

Copermittees must use the data acquired under Specific Provision 7.d.(2) to estimate the acreage of tidal and non-tidal saltmarsh actually restored.

(c) For assessing and determining compliance with the final effluent limitations under Specific Provision 7.b.(2)(b), the Responsible Copermittees must use the data acquired under Specific Provision 7.d.(1) to estimate sediment loading into Los Peñasquitos Lagoon. Sediment loading must be evaluated using a 3-year, weighted rolling average. The first reported average shall be calculated using data collected in the year, 2015-2016, 2016-2017, and 2017-2018 wet seasons.

(d) The monitoring and assessment results must be submitted as part of the Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

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ATTACHMENT F

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

FACT SHEET / TECHNICAL REPORT

FOR

ORDER NO. R9-2013-0001
AS AMENDED BY ORDER NOS. R9-2015-0001 AND R9-2015-0100
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

May 8, 2013
Amended ~~on~~ February 11, 2015
and November 18, 2015

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I. FACT SHEET FORMAT

This Fact Sheet briefly sets forth the principal facts and the significant factual, legal, methodological, and policy questions that the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) considered in preparing Order No. R9-2013-0001 (Order), as amended by Order Nos. R9-2015-0001 and R9-2015-0100. In accordance with the Code of Federal Regulations (CFR) Title 40 Parts 124.8 and 124.56 (40 CFR 124.8 and 40 CFR 124.56), this Fact Sheet includes, but is not limited to, the following information:

1. Contact information
2. Public process and notification procedures
3. Background of municipal storm water permits
4. Regional MS4 Permit approach
5. Economic considerations
6. Applicable statutes, regulations, plans and policies
7. Discussion of the provisions in the Order

Tentative Order No. R9-2013-0001 was distributed for public review on October 31, 2012. The San Diego Water Board accepted written comments on ~~the~~ Tentative Order No. R9-2013-0001 until January 11, 2013. A public hearing was subsequently held on April 10 and 11, 2013, that was continued to May 8, 2013 to receive oral comments from interested persons. The San Diego Water Board adopted Order No. R9-2013-0001 on May 8, 2013.

Tentative Order No. R9-2015-0001, an Order amending Order No. R9-2013-0001, was distributed for public review on September 19, 2014. The San Diego Water Board accepted written comments on Tentative Order No. R9-2015-0001 until November 19, 2014. A public hearing was held on February 11, 2015, to receive oral comments from Copermittees and interested persons. The San Diego Water Board adopted Order No. R9-2015-0001 amending Order No. R9-2013-0001 on February 11, 2015. Order No. R9-2015-0001 amended the findings and provisions of Order No. R9-2013-0001 to:

a. Enroll the County of Orange, the Orange County Flood Control District and the south Orange County Cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano as Copermittees responsible for compliance with the terms and conditions of Order No. R9-2013-0001, as amended by Order No. R9-2015-0001;

b. Designate the San Diego Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the Cities of Laguna Woods and Laguna Hills and agree to the designation of the Santa Ana Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the City of Lake Forest, subject to the

terms of the February 10, 2015 agreement between San Diego Water Board and the Santa Ana Water Board described in Finding 29 of this Order, upon the later effective date of Order No. R9-2015-0001 or Order No. R8-2015-0001 (superseding Order No. R8-2009-0030);

c. Establish interim exceptions to land development requirements for those priority development projects that discharge to engineered channels and large river reaches as described in Provision E.3.c.(2)(e) of this Order;

d. Incorporate the amended requirements of the State Water Resources Control Board's (State Water Board) General Exception to require that pollutant reductions be achieved within 6 years for storm water and nonpoint source discharges to ASBS within the Region;

e. Incorporate applicable requirements of the Los Peñasquitos Lagoon Sediment TMDL; and

f. Require the Orange County Copermittees to implement the "*Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County*," dated October 2014, made effective in the Monitoring and Reporting Program/Order issued pursuant to California Water Code section 13383 in the December 5, 2014 San Diego Water Board Letter Directive and subject to future revisions by the Executive Officer after appropriate public input.

~~A public hearing was held on February 11, 2015, to receive oral comments from Copermittees and interested persons. The San Diego Water Board adopted Order No. R9-2015-0001 amending Order No. R9-2013-0001 on February 11, 2015.~~

Tentative Order No. R9-2015-0100, an Order amending Order No. R9-2013-0001 as amended by Order No. R9-2015-0001, was distributed for public review on July 31, 2015. The San Diego Water Board accepted written comments on Tentative Order No. R9-2015-0100 until September 14, 2015. A public hearing was held on November 18, 2015, to receive oral comments from Copermittees and interested persons. The San Diego Water Board adopted Order No. R9-2015-0100 amending Order No. R9-2013-0001 as amended by Order No. R9-2015-0001, on November 18, 2015. Order No. R9-2015-0100 amended the findings and provisions of Order No. R9-2013-0001 as amended by Order No. R9-2015-0001 to:

a. Enroll the County of Riverside, the Cities of Murrieta, Temecula, and Wildomar, and the Riverside County Flood Control and Water Conservation District as Copermittees responsible for compliance with the terms and conditions of Order No. R9-2013-0001, as amended by Order Nos. R9-2015-0001 and R9-2015-0100;

b. Continue designation of the San Diego Water Board to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Murrieta and Wildomar, including areas within the Santa Ana Region; and, agree to continue designation of the Santa Ana Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the City of Menifee, including areas within the San Diego Region, subject to the terms of the October 26, 2015 agreement between San Diego Water Board and the Santa Ana Water Board described in Finding 29 of this Order;

d. Incorporate Provision B.3.c, which provides an option that allows a Copermittee to utilize the watershed-based Water Quality Improvement Plan to be deemed in compliance with the prohibitions and limitations of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b;

e. Incorporate minor revisions to Provisions E.2.a.(1) and E.2.a.(2) to include San Diego Water Board Order No. R9-2015-0013 and State Water Board Order 2014-0194-DWQ into the requirements for addressing non-storm water discharges to a Copermittee's MS4;

e. Incorporate minor revisions to Provision E.3.b.(1) to correct inconsistencies in the definition of a Priority Development Project as compared to the definitions in Order No. R9-2009-0002 (Fourth Term Orange County MS4 Permit) and Order No. R9-2010-0016 (Fourth Term Riverside County MS4 Permit), and requirements for incorporating the corrected definitions into the BMP Design Manual;

f. Incorporate revisions to Provision E.3.e.(1)(a) to provide additional clarity on when the structural BMP performance requirements of Provision E.3.c are applicable to Priority Development Projects;

e. Incorporate minor revisions to the Revised TMDLs for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region and the TMDLs for Sediment in Los Peñasquitos Lagoon in Attachment E to the Order to make the requirements consistent with the Basin Plan amendments adopted by the San Diego Water Board; and

f. Remove provisions related to allowing the Riverside County Copermittees to apply for early coverage under the Regional MS4 Permit.

The San Diego Water Board files applicable to the issuance of Order No. R9-2013-0001 and amendments thereto are incorporated into the administrative record in support of the findings and requirements of the Order.

II. CONTACT INFORMATION

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The Order and other related documents can be downloaded from the San Diego Water Board website at

http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

The documents referenced in this Fact Sheet and in Order No. R9-2013-0001 and amendments thereto are available for public review at the San Diego Water Board office, located at the address listed above. Public records are available for inspection during regular business hours, from 8:00 am to 5:00 pm Monday through Friday. To schedule an appointment to inspect public records, contact the San Diego Water Board Records Management Officer at 619-516-1990.

COPERMITTEES

Orange County Copermittees

- County of Orange
  - City of Aliso Viejo
  - City of Dana Point
  - City of Laguna Beach
  - City of Laguna Hills
  - City of Laguna Niguel
  - City of Laguna Woods
  - City of Lake Forest *
  - City of Mission Viejo
  - City of Ranch Santa Margarita
  - City of San Clemente
  - City of San Juan Capistrano
  - Orange County Flood Control District

* While not listed in the above table, the City of Lake Forest remains a Copermittee under this Order until the later effective date of this Order or Santa Ana Water Board Tentative Order No. R8-2015-0001. Thereafter, the City of Lake Forest will no longer be considered a Copermittee under this Order because its Phase I MS4 discharges will be regulated by the Santa Ana Water Board pursuant to Water Code section 13328 designation. The requirements of this Order that apply to the City of Lake Forest for the duration of this Order, consistent with the Water Code section 13228 agreement dated February 10, 2015, are described in Finding 29 and Footnote 2 to Table B-1.

Riverside County Copermittees

- County of Riverside
  - City of Menifee**
  - City of Murrieta
  - City of Temecula
  - City of Wildomar
  - Riverside County Flood Control and Water Conservation District

** The City of Menifee is not regulated as a Copermittee under this Order because its Phase I MS4 discharges are regulated by Santa Ana Water Board Order No. R8-2010-0033 as it may be amended or issued pursuant to Water Code section 13228 designation. The requirements of this Order that apply to the City of Menifee for the duration of this Order, consistent with the Water Code section 13228 written agreement dated October 26, 2015, are described in Finding 29 and Footnote 3 to Table B-1.

San Diego County Copermittees

- County of San Diego
  - City of Carlsbad
  - City of Chula Vista
  - City of Coronado
  - City of Del Mar
  - City of El Cajon
  - City of Encinitas
  - City of Escondido
  - City of Imperial Beach
  - City of La Mesa
  - City of Lemon Grove
  - City of National City
  - City of Oceanside
  - City of Poway
  - City of San Diego
  - City of San Marcos
  - City of Santee
  - City of Solana Beach
  - City of Vista
  - San Diego County Regional Airport Authority
  - San Diego Unified Port District

III. PUBLIC PROCESS AND NOTIFICATION PROCEDURES

The San Diego Water Board followed the schedule listed below for the preparation of Order No. R9-2013-0001 and amendments thereto:

San Diego County Copermittee Permit Reissuance Process

1. On February 8, 2011, the San Diego Water Board met with the San Diego County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No. R9-2007-0001.

2. Between February and May 2011, the San Diego Water Board met with select San Diego County, Orange County, and Riverside County Copermittees, as well as representatives of the environmental community to discuss concepts and receive recommendations for elements to be incorporated in a Regional Municipal Separate Storm Sewer System Permit (Regional MS4 Permit).

3. On June 27, 2011 the San Diego Water Board received the Report of Waste Discharge from the San Diego County Copermittees for the renewal of their NPDES permit, Order No. R9-2007-0001.

4. On April 9, 2012, the San Diego Water Board released an administrative draft of Tentative Order No. R9-2013-0001 for preliminary informal comments and feedback.

5. On April 25, 2012, the San Diego Water Board held an informal public workshop to present the administrative draft of Tentative Order No. R9-2013-0001 and receive verbal comments.

6. Between June and August 2012, the San Diego Water Board held four (4) focused meetings with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community, and USEPA) to discuss and receive preliminary comments and feedback about specific elements in the administrative draft of Tentative Order No. R9-2013-0001.

7. On September 5, 2012, the San Diego Water Board held an informal public workshop to present the modifications that were expected to be incorporated into the Tentative Order based on the preliminary comments and feedback received during the focused meetings held between June and August 2012.

8. Informal written comments on the administrative draft of Tentative Order No. R9-2013-0001 were accepted until September 14, 2012.

9. On October 12, 2012, the San Diego Water Board released a revised administrative draft of Tentative Order No. R9-2013-0001.

10. On October 24, 2012, the San Diego Water Board held a focused meeting with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community, and USEPA) to discuss modifications incorporated into the administrative draft of Tentative Order No. R9-2013-0001.

11. On October 31, 2012, the San Diego Water Board released Tentative Order No. R9-2013-0001 for formal public review and comment.

12. On November 13, 2012 and December 12, 2012, the San Diego Water Board held a formal public Board workshop to present the public draft of Tentative Order No. R9-2013-0001 and receive verbal comments.

13. Formal written comments on the public draft of Tentative Order No. R9-2013-0001 were accepted until January 11, 2013.

14. A public hearing of Tentative Order No. R9-2013-0001 was conducted on April 10 and 11, 2013, that was continued to May 8, 2013.

Orange County Copermittee Permit Reissuance Process

15. On May 20, 2014 the San Diego Water Board received the Report of Waste Discharge from the Orange County Copermittees for the renewal of their MS4 NPDES permit, Order No. R9-2009-0002.

16. On June 24, 2014, the San Diego Water Board met with the Orange County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No.R9-2009-0002 and the process for enrollment as Copermittees under Regional MS4 Permit Order No. R9-2013-0001.

17. On July 1, 2014, the San Diego Water Board held a public meeting to discuss the Orange County Report of Waste Discharge and receive comments on potential modifications to Order No. R9-2013-0001. Based on comments received from the Orange County Copermittees and other interested persons at this meeting, the San Diego Water Board determined that additional public meetings were not needed prior to release of Tentative Order No. R9-2015-0001, amending Order No. R9-2013-0001 in redlined – strikeout format for public review and comment.

18. On September 19, 2014, the San Diego Water Board released Tentative Order No. R9-2015-0001 for a 60 day public review and comment period.

19. On October 8, 2014, the San Diego Water Board held a formal public workshop at a regular board meeting to receive information and discuss the proposed amendments to Order No. R9-2013-0001 described in Tentative Order No. R9-2015-0001.

20. In accordance with State and federal laws and regulations, the San Diego Water Board notified San Diego County, Orange County and Riverside County Copermittees, and all known interested agencies and persons of its intent to adopt Tentative Order No. R9-2015-0001 and provided them with an opportunity to submit their written comments and recommendations. Written comments and recommendations on Tentative Order No. R9-2015-0001 were accepted until November 19, 2014.

21. The San Diego Water Board held a public workshop on October 8, 2014, and a public hearing on February 11, 2015, and heard and considered all comments pertaining to the adoption of Tentative Order No. R9-2015-0001 on February 11, 2015.

Riverside County Copermittee Permit Reissuance Process

22. Between April and June 2015, the San Diego Water Board held three (3) public workshops with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community) to discuss and receive comments and feedback about amending Order No. R9-2013-0001 to incorporate a definition of prior lawful approval for Priority Development Projects, and an alternative compliance pathway for prohibitions and limitations in Provision A of the Order. A San Diego Water Board member attended the April and May 2015 public workshops, but no actions or voting took place.

23. On April 15, 2015, the San Diego Water Board met with the Riverside County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No.R9-2010-0016 and the process for enrollment as Copermittees under Order No. R9-2013-0001 (Regional MS4 Permit).

24. On May 8, 2015 the San Diego Water Board received a Report of Waste Discharge from the Riverside County Copermittees for the renewal of their MS4 NPDES permit, Order No. R9-2010-0016.

25. On July 31, 2015, the San Diego Water Board released Tentative Order No. R9-2015-0100 for a formal public review and comment period.

26. Formal written comments on the public draft of Tentative Order No. R9-2015-0100 were accepted until September 14, 2015, a formal public written comment period of 46 days.

27. A public hearing to receive oral comments on Tentative Order No. R9-2015-0100 was conducted on November 18, 2015.

IV. BACKGROUND OF THE SAN DIEGO REGION MUNICIPAL STORM WATER PERMITS

In developed and developing areas, storm water runoff is commonly transported through municipal separate storm sewer systems (MS4s) and discharged into local receiving water bodies. As the storm water runs off and flows over the land or impervious surfaces (e.g., paved streets, parking lots, and building rooftops), it accumulates debris, chemicals, sediment, and other pollutants that can adversely affect receiving water quality if discharged untreated. The United States Environmental Protection Agency (USEPA) recognizes wet weather flows from urban areas as the number one source of estuarine pollution in coastal communities,[1] such as those within the San Diego Region.

The federal Clean Water Act (CWA) was amended in 1987 to address and regulate discharges of storm water associated with industrial activities and from municipal storm sewers. With the amendments, many municipalities throughout the United States were obligated for the first time to obtain National Pollutant Discharge Elimination System (NPDES) permits for discharges of storm water from their MS4s.

In response to the CWA 1987 amendment, as well as the pending federal NPDES regulations which would implement the amendment, the San Diego Water Board issued "early" MS4 permits. The San Diego Water Board adopted and issued Order Nos. 90-38, 90-42, and 90-46 to regulate storm water discharges from the MS4s in Orange County, San Diego County, and Riverside County, respectively, within the San Diego Region on July 16, 1990.

The "early" MS4 permits, or First Term Permits, were issued prior to the November 1990 promulgation of the final federal NPDES storm water regulations. By issuing these First Term Permits before the federal regulations took effect, the San Diego Water Board was able to provide the Copermittees additional flexibility in addressing and managing storm water discharges. The First Term Permits contained the essentials of the 1990 regulations, and required the Copermittees to develop and implement runoff management programs, but provided little specificity about what was required to be included in or actually achieved by those programs.

The flexibility provided in the First Term Permits was generally continued through the Second Term Permits. The combination of the lack of specificity in the First and Second Term Permits, a general lack of meaningful action by the Copermittees and a general lack of corresponding reaction (i.e. enforcement) by the San Diego Water Board during the first ten years of the storm water program, resulted in few substantive steps towards achieving improvements in the quality of receiving waters or storm water discharges from the MS4s.

[1] US EPA. 1999. 40 CFR Parts 9, 122, 123, and 124. National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. 64 FR 68727.

From 2001, the regulatory approach incorporated into Third Term Permits was a significant departure from the regulatory approach of the First and Second Term Permits. The Third Term Permits issued by the San Diego Water Board included more detailed requirements that outlined the minimum level of implementation required for the Copermittees' programs to meet the maximum extent practicable (MEP) standard for storm water. The Third Term Permits included more detail to emphasize and enhance the jurisdictional runoff management programs developed by the Copermittees and introduced requirements for developing and implementing watershed-based programs.

The Third Term Permits also incorporated two precedent setting decisions by the State Water Board. In Order WQ 99-05, the State Water Board established receiving water limitation language to be included in all MS4 permits. The State Water Board's precedential language clarified that municipal storm water permits must include provisions requiring discharges to be controlled to attain water quality standards in receiving waters. Unlike previously adopted versions of the receiving water limitation language in the First and Second Term Permits, the language no longer stated that "*violations of water quality standards are not violations of the municipal storm water permit under certain conditions*." In addition, the receiving water limitation language no longer indicated that the "*implementation of best management practices is the 'functional equivalent' of meeting water quality standards*." State Water Board Order WQ 99-05 specifically requires language in MS4 permits for the Copermittees to comply with water quality standards based discharge prohibitions and receiving water limitations through timely implementation of control measures and other actions to reduce pollutants in discharges. (See State Water Board Order WQ 99-05 (*Environmental Health Coalition*)).

In Order WQ 2000-11, also a precedential decision, the State Water Board addressed design standards for structural post-construction best management practices (BMPs) for new development and significant redevelopment. The State Water Board found that the design standards, which require that runoff generated by 85 percent of storm events from specific development categories be infiltrated or treated, reflect the MEP standard. State Water Board Order WQ 2000-11 also found that the post-construction BMP provisions, or Standard Storm Water Mitigation Plan (SSMP) provisions, constitute MEP for addressing storm water pollutant discharges resulting from specific development categories.

The Third Term San Diego County and Orange County Permits (Order Nos. 2001-01 and R9-2002-0001, respectively) were appealed to the State Water Board. Minor modifications were made by the State Water Board, but the requirements were largely upheld. In State Water Board Order WQ 2001-15, the State Water Board upheld the Third Term San Diego County Permit requirements with certain modifications. The State Water Board removed the prohibition of storm water discharges *into* the MS4 that cause or contribute to exceedances of water quality objectives. The revision allows for treatment of pollutants in storm water runoff after the pollutants have entered the MS4.

State Water Board Order WQ 2001-15 otherwise upheld all the other requirements of the permit.

In addition to the modification to the discharge prohibition in Order WQ 2001-15, the State Water Board refined Order WQ 99-05 by making clear that the Copermittees may use an iterative approach to achieving compliance with water quality standards that involves ongoing assessments and revisions. Thus, the language for the discharge prohibitions and receiving water limitations was revised to explicitly require the Copermittees to implement an iterative process of assessments and revisions to comply with the discharge prohibitions and receiving water limitations. The San Diego Water Board retained the authority to enforce receiving water limitations and discharge prohibitions even if the Copermittee is engaged in the iterative process.

The Third Term San Diego County Permit was subsequently challenged in the Superior Court of the State of California and the Court of Appeal, Fourth Appellate District. The Court of Appeal, Fourth Appellate District, found that the approach of the Third Term San Diego County Permit to regulating discharges into the MS4 was appropriate (*Building Industry Ass'n. v. State Water Resources Control Bd., et al.,* 124 Cal.App.4th 866 (2004)). The State of California Supreme Court denied review sought by the Building Industry Association in March 2005.

The Fourth Term Permits~~, or current MS4 permits,~~ began with the adoption of Order No. R9-2007-0001 issued to the Copermittees of San Diego County in January 2007. Order Nos. R9-2009-0002 and R9-2010-0016 were subsequently issued to the Copermittees of Orange County and Riverside County. The Fourth Term Permits continued to include more detailed requirements to be implemented by each Copermittee's jurisdictional runoff management program. The Fourth Term Permits also included requirements to further emphasize a watershed management approach and for more coordination among jurisdictional runoff management programs. In addition, the Fourth Term Permits included more requirements for assessing the effectiveness of the runoff management programs being implemented by the Copermittees. The intent of the inclusion of additional requirements was to enhance and better define elements of the permit that were expected to be incorporated into the iterative process for managing runoff from each Copermittee's jurisdiction and within the watersheds of the San Diego Region.

The Fourth Term Permits included several new and emerging approaches for managing storm water runoff and discharges. Low impact development (LID) requirements are included for development and significant redevelopment to reduce pollutants in storm water runoff from sites through more natural processes such as infiltration and biofiltration closer to the source, rather than utilizing conventional mechanical end-of-pipe treatment systems. Hydrograph modification (hydromodification) management requirements also are included to mitigate the potential for increased erosion in receiving waters due to increased runoff rates and durations often caused by development and increased impervious surfaces. The Fourth Term Orange County and Riverside County Permits introduced requirements to identify areas of existing

development where retrofitting with LID projects would be feasible and could be implemented to reduce storm water runoff and pollutants in storm water discharges.

The Fourth Term Orange County and Riverside County Permits included a clearer distinction between storm water and non-storm water discharges. The term "urban runoff" was completely removed, and a distinction between storm water (wet weather) runoff and non-storm water (dry weather) runoff was emphasized. This clarification was made to prevent any potential misunderstanding that regulation under the MS4 permits is limited only to urbanized areas, and to prevent non-storm water runoff from being managed in the same manner as storm water runoff. The term "urban runoff" is not defined in the Code of Federal Regulations (CFR) or Federal Register (FR) in the regulation of MS4 discharges. According to the CWA 402(p)(3)(B)(ii), MS4 permits must include a requirement to effectively prohibit non-storm water discharges into the MS4s.

Finally, for the Fourth Term Orange County and Riverside County Permits the San Diego Water Board found that non-storm water discharges to the MS4 from over application of irrigation water are sources of pollutants. The San Diego Water Board found that non-storm water discharges resulting from over-irrigation must be prohibited from entering the MS4 in accordance with the requirements of the CWA and pursuant to 40 CFR 122.26(d)(2)(iv)(B)(1).

The requirements of the Fourth Term Permits issued to the Copermittees in each county within the San Diego Region now have substantively the same core requirements such as discharge prohibitions, receiving water limitations, jurisdictional runoff management program components, and monitoring program requirements. There are, however, several inconsistencies that exist among the three Fourth Term Permits which complicate oversight and implementation of the permits by the San Diego Water Board.

The Fourth Term San Diego County Permit expired in January 2012. The Fourth Term Orange County permit expired in December 2014 and the Fourth Term Riverside County Permit ~~will~~ expired in November 2015. Issuing the Fifth Term Permits within five years for three counties under three different permits would have required the San Diego Water Board to expend significant time and resources for the issuance of the permits through three separate public proceedings, thereby greatly reducing the time and resources available to oversee implementation and compliance. Multiple permits also create confusion for determining compliance among regulated entities, especially for the land development community.

The San Diego Water Board ~~has~~ acknowledged that issuing a single MS4 permit for all the Copermittees in the San Diego Region can and is expected to result in more consistent implementation, improve communication among agencies within watersheds crossing multiple jurisdictions, and minimize resources spent with each permit renewal process. Within the findings of the Fourth Term Riverside County Permit issued in November 2010, the San Diego Water Board notified the public of its intent to develop and issue a single Regional MS4 Permit.

V. REGIONAL MS4 PERMIT APPROACH

The Fifth Term Permit, or Regional MS4 Permit, shifts the focus of the permit requirements from a minimum level of actions to be implemented by the Copermittees to identifying outcomes to be achieved by those actions. Order No. R9-2013-0001 represents an important paradigm shift in the approach for MS4 permits within the San Diego Region.

Historical Permitting Approach

The First and Second Term Permits were very broad and provided little specificity about what was required to be developed and implemented by the Copermittees. The Third Term Permits began to become more specific about the minimum level of implementation required by the Copermittees. The Fourth Term Permits subsequently increased in specificity. The MS4 permits have progressively become more detailed and focused on specifying the minimum level of actions expected to be implemented by the Copermittees. As detailed and specific as the MS4 permits have become, however, they include very little detail about what the desired outcomes of the required actions are expected to achieve. Compliance with the permit requirements has essentially been tracking numbers of actions and reporting, not tracking progress or actual improvements in the quality of receiving waters or discharges from the MS4s. The result has been an increase in actions being implemented by the Copermittees with little or no ability or expectations to determine whether or not improvements in water quality are being achieved.

The Fourth Term Permits result in significant resource expenditure by the Copermittees to report permit compliance information to the San Diego Water Board in the form of annual jurisdictional runoff management program, watershed program, and monitoring program reports. The San Diego Water Board ~~must then~~ was required to expend much of its limited resources on reviewing more than 50 voluminous reports submitted annually by the Copermittees. The information ~~currently~~ reported by the Copermittees ~~is~~ was of limited value when trying to measure progress toward achieving improvements in the quality of receiving waters or discharges from the MS4s. Oversight of the MS4 permits ~~is~~ was further complicated by the inconsistencies among the requirements issued to the Orange County, San Diego County, and Riverside County Copermittees under three separate MS4 permits.

Under the Fourth Term Permits, the Copermittees ~~must~~ were required to expend a significant portion of their limited resources collecting data of limited value, and putting together reports to submit that information to the San Diego Water Board. Likewise, the San Diego Water Board ~~must~~ was required to expend most of its limited resources reviewing reports, and developing permits instead of working directly with the Copermittees to identify solutions to problems causing impacts to water quality. This ~~is~~ was an unsustainable course that ~~will~~ would have continued to demand more

resources from the Copermittees and the San Diego Water Board, and would have continued to result in unknown water quality benefits.

New Permitting Approach

The goal of the Regional MS4 Permit is twofold: 1) bring a consistent set of MS4 permit requirements to all of the Copermittees within the San Diego Region; and, 2) provide an MS4 permit with requirements that will allow the Copermittees to focus their efforts and resources on achieving goals and desired outcomes toward the improvement of water quality rather than completing specific actions.

The overall approach included in the Regional MS4 Permit with respect to the jurisdictional runoff management programs will not differ significantly from the current permits. The general requirements for the jurisdictional runoff management program components and compliance with those requirements will remain and be applied consistently throughout the San Diego Region under the Regional MS4 Permit.

The most significant difference in the new permitting approach is the specific manner of implementation for those jurisdictional runoff management programs. Implementation will be based on decisions made by the Copermittees in accordance with what they have identified as their highest priority water quality conditions. In other words, the Copermittees will have significant control in how to implement the jurisdictional runoff management programs to best utilize their available resources in addressing a specific set of priorities effectively, instead of trying to address all the water quality priorities ineffectively.

The Copermittees are given the responsibility of identifying their highest priority water quality conditions that they intend to address. The Copermittees will develop goals that can be used to measure and demonstrate progress or improvements toward addressing those priorities. In addition to the goals, the Copermittees will provide a schedule for achieving the goals for those highest priorities. The measurement of progress toward achieving the goals for those highest priorities requires a better defined and more focused program of monitoring and assessment than under the Fourth Term Permits.

The monitoring and assessment program must be designed to inform the Copermittees of their progress, and the need for modifications in their jurisdictional runoff management programs and schedules to achieve their goals to improve water quality. The monitoring and assessment program requirements will have a more central role in the Regional MS4 Permit than in earlier permits. The monitoring and assessment requirements must also be designed to enable the Copermittees to focus and direct their efforts in implementing their jurisdictional runoff management programs toward their stated desired outcomes to improve the quality of receiving waters and/or discharges from the MS4s.

By providing an MS4 permit that allows the Copermittees to make more decisions about how to utilize and focus their resources, along with a better defined monitoring and assessment program to inform their water quality management decisions, the Copermittees ~~will~~ have the opportunity to:

1) *Plan strategically*. The Copermittees must have the ability to identify their available resources and develop and implement long term plans that can organize, collect, and use those resources in the most strategically advantageous and efficient manner possible. This ability to develop long term plans will allow the Copermittees to focus and utilize their resources in a more concerted way over the short term and long term to address specific water quality priorities through stated desired outcomes.

2) *Manage adaptively*. The Copermittees must be given the ability to modify their plans as additional information and data are collected from the monitoring and assessment programs. The Copermittees' plans may require modifications to the programs, priorities, goals, strategies, and/or schedules in order for the Copermittees to achieve a stated desired outcome.

3) *Identify synergies*. The Copermittees must be given more flexibility to identify efficiencies within and among their jurisdictional runoff management programs as the strategies are developed and implemented to increase the Copermittees' collective effectiveness. The Copermittees must also be able to identify and utilize resources available from other agencies and entities to further augment and enhance their jurisdictional runoff management programs and/or to collectively work with those other agencies and entities toward achieving a stated desired outcome.

The Regional MS4 Permit requirements ~~will~~ provide the Copermittees the flexibility and responsibility to decide what actions will be necessary to achieve an outcome that is tailored and designed by the Copermittees to improve specific prioritized water quality conditions. The San Diego Water Board expects the approach of the Regional MS4 Permit to give the Copermittees a greater sense of ownership for restoring the quality of receiving waters in the San Diego Region by becoming an integral part of the decision making process in identifying water quality conditions to be addressed, as well as determining the best use of their resources.

VI. ECONOMIC CONSIDERATIONS

Statutory Considerations

California Water Code (CWC) section 13241 requires the San Diego Water Board to consider certain factors, including economic considerations, in the adoption of water quality objectives. CWC section 13263 requires the San Diego Water Board to take into consideration the provisions of CWC section 13241 in adopting waste discharge requirements.

In *City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, the California Supreme Court considered whether Regional Water Boards must comply with CWC section 13241 when issuing waste discharge requirements under CWC section 13263(a) by taking into account the costs a permittee will incur in complying with the permit requirements. The Court concluded that whether it is necessary to consider such cost information "*depends on whether those restrictions meet or exceed the requirements of the federal Clean Water Act.*" (*Id.* at p. 627.) The Court ruled that Regional Water Boards may not consider the factors in CWC section 13241, including economics, to justify imposing pollutant restrictions that are less stringent than applicable federal law requires. (*Id.* At pp. 618, 626-627 ["*[Water Code section 13377 specifies that [ ] discharge permits issued by California's regional boards must meet the federal standards set by federal law. In effect, section 13377 forbids a regional board's consideration of any economic hardship on the part of the permit holder if doing so would result in the dilution of the requirements set by Congress in the Clean Water Act...Because CWC section 13263 cannot authorize what federal law forbids, it cannot authorize a regional board, when issuing a [ ] discharge permit, to use compliance costs to justify pollutant restrictions that do not comply with federal clean water standards*."]). However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Regional Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

As discussed in Section VII.F, Unfunded State Mandates, the San Diego Water Board finds that the requirements in this Order are not more stringent than the minimum federal requirements. Among other requirements, federal law requires MS4 permits to include requirements to effectively prohibit non-storm water discharges into the MS4s, in addition to requiring controls to reduce the discharge of pollutants in storm water to the MEP, and other provisions as USEPA or the State determines are appropriate for the control of pollutants in MS4 discharges.

The requirements in this Order may be more specific or detailed than those enumerated in federal regulations under 40 CFR 122.26 or in the USEPA guidance. However, the requirements have been designed to be consistent with and within the federal statutory mandates described in CWA section 402(p)(3)(B)(ii) and (iii) and the related federal regulations and guidance. Consistent with federal law, all of the

conditions in this Order could have been included in a permit adopted by USEPA in the absence of the in lieu authority of California to issue NPDES permits.

Moreover, the inclusion of numeric WQBELs in this Order does not cause this Order to be more stringent than federal law. Federal law authorizes both narrative and numeric effluent limitations to meet state water quality standards. The inclusion of WQBELs as discharge specifications in an NPDES permit in order to achieve compliance with water quality standards is not a more stringent requirement than the inclusion of BMP based permit limitations to achieve water quality standards (State Water Board Order No. WQ 2006-0012 (*Boeing*)). Therefore, consideration of the factors set forth in CWC section 13241 is not required for permit requirements to implement the effective prohibition on the discharge of non-storm water discharges into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determine appropriate to control such pollutants, as those requirements are mandated by federal law.

Included in the provisions of the Order are monitoring and reporting requirements that are designed to demonstrate that the Copermittees are implementing programs to comply with the CWA municipal storm water requirements. CWA section 308(a) and 40 CFR 122.41(h), (j)-(l), 122.44(i) and 122.48 require that all NPDES permits specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s (40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c)) also specify additional monitoring and reporting requirements. In addition to the federal requirements of the CWA, the San Diego Water Board also has the authority in CWC 13383 to establish monitoring, reporting, and recordkeeping requirements that implement federal and state laws and regulations through NPDES permits.

The monitoring and assessment information that will be reported to the San Diego Water Board is necessary to determine if the Copermittees are making progress toward achieving compliance with the discharge prohibitions, receiving water limitations, and effluent limitations under Provision A of the Order. The monitoring and assessment information that will be reported is also expected to be key to the iterative approach and adaptive management process that is required to be implemented by the Copermittees if they cannot meet the discharge prohibitions and receiving water limitations under the present conditions, which is also part of the requirements under Provision A of the Order.

Notwithstanding the above, the San Diego Water Board has considered cost information in issuing this Order, as discussed below. The San Diego Water Board has also considered all of the evidence that has been presented to the San Diego Water Board regarding the CWC section 13241 factors in adopting this Order. The San Diego Water Board finds that the requirements in this Order are reasonably necessary to protect beneficial uses identified in the Basin Plan and the economic information related to costs of compliance and other CWC section 13241 factors are not sufficient to justify failing to protect those beneficial uses. Where appropriate, the

San Diego Water Board has provided or will consider providing the Copermittees with additional time to implement control measures to achieve final WQBELs and/or water quality standards.

Cost Information

Discussions of the financial and economic ramifications of municipal storm water management programs tend to focus on the significant costs incurred by municipalities in developing and implementing the programs. When considering the cost of implementing the programs, however, it is also important to consider the alternative costs that are incurred when programs are not fully implemented, as well as the economic benefits which result from effective program implementation.

The recent financial and economic conditions have amplified the concerns about the costs incurred by the municipalities in developing and implementing their programs. The reduction in resources resulting from the recent financial and economic conditions has been cited by many of the Copermittees as a justification for reducing the requirements that must be met by their programs. While the recent conditions are a cause for concern in the short term, these programs also have an opportunity to identify and implement improvements and efficiencies before the next period of growth and development, resulting in more effective and sustainable programs over the long term.

In addition, it is very difficult to ascertain the true cost of implementation of the Copermittees' management programs because of inconsistencies in reporting by the Copermittees. Reported costs of compliance for the same program element can vary widely from city to city, often by a very wide margin that is not easily explained.[2] Despite these problems, efforts have been made to identify management program costs, which can be helpful in understanding the costs of program implementation.

The San Diego Water Board recognizes that the Copermittees will incur costs in implementing this Order, potentially above and beyond the costs from the Copermittees' prior permits. The San Diego Water Board also recognizes that, due to California's current economic condition, many Copermittees currently have limited staff and resources to implement actions to address its MS4 discharges. Based on the economic considerations below, the San Diego Water Board has provided the Copermittees a significant amount of flexibility to choose how to implement the requirements of the Order.

The Order also allows the Copermittees to customize their plans, programs, and monitoring requirements. In the end, it is up to the Copermittees to determine the effective BMPs and measures necessary to comply with this Order. The Copermittees can choose to implement the least expensive measures that are effective in meeting

[2] Los Angeles Water Board, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.

the requirements of this Order. This Order also does not require the Copermittees to fully implement all requirements within a single permit term. Where appropriate, the Board has provided the Copermittees with additional time outside of the permit term to implement control measures to achieve final WQBELs and/or water quality standards.

The San Diego Water Board has considered available cost information associated with compliance with this Order. It is not possible to predict accurately the cost impact of the requirements that involve an unknown level of implementation or that depend on environmental variables that are as yet undefined. Only general conclusions can be drawn from this information.

Estimated Municipal Storm Water Program Implementation Costs

The USEPA, the State Water Board, and the California Regional Water Quality Control Boards (Regional Water Boards) have attempted to evaluate the costs of implementing municipal storm water programs. The assessments have demonstrated that the true costs are difficult to ascertain and reported costs vary widely. In addition, reported fiscal analyses tend to neglect the costs incurred to municipalities when storm water and non-storm water runoff is not effectively managed, which are incurred as a result of pollution, contamination, nuisance, and damage to ecosystems, property, and human health. Nonetheless, they provide a useful context for considering the costs of requirements within Order No. R9-2013-0001.

In 1999, the USEPA reported on multiple studies it conducted to determine the cost of management programs. A study of Phase II municipalities determined that the annual cost of the Phase II program was expected to be $9.16 per household. The USEPA also studied 35 Phase I municipalities, finding costs to be $9.08 per household annually, similar to those anticipated for Phase II municipalities.[3]

The State Water Board commissioned a study by the California State University, Sacramento to assess costs of the Phase I MS4 program. This study includes an assessment of costs incurred by Phase I MS4s throughout the state to implement their programs. Annual cost per household in the study ranged from $18 to $46, with the Fresno-Clovis Metropolitan Area representing the lower end of the range, and the City of Encinitas (in San Diego County) representing the upper end of the range.[4]

A study on Phase I MS4 program costs was also conducted by the California Regional Water Quality Control Board, Los Angeles Region (Los Angeles Water Board), where program costs reported in the municipalities' annual reports were assessed. The Los

[3] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791-68792.
[4] State Water Board, 2005. NPDES Stormwater Cost Survey. P. ii.

Angeles Water Board estimated that average per household cost to implement the MS4 program in Los Angeles County was $12.50. [5]

It is important to note that reported program costs are not all attributable to solely complying with MS4 permits. Many program components, and their associated costs, existed before any MS4 permits were ever issued. For example, street sweeping and trash collection costs cannot be solely or even principally attributable to MS4 permit compliance, since these practices have long been expected from and implemented by municipalities.

Therefore, true program cost resulting from MS4 permit requirements is some fraction of reported costs. The California State University, Sacramento study found that only 38 percent of program costs are new costs fully attributable to MS4 permits. The remainder of the program costs was either pre-existing or resulted from enhancement of pre-existing programs.[6] In 2000, the County of Orange found that even lower amounts of program costs are solely attributable to MS4 permit compliance, reporting that the amount attributable to implement the County or Orange Drainage Area Management Plan (DAMP), was less than 20 percent of the total budget. The remaining 80 percent was attributable to pre-existing programs.[7] More current data from the County of Orange is not used in this discussion because the County of Orange no longer reports such information.

Estimated Value of Healthy Water Quality

Economic considerations of municipal storm water management programs cannot be limited only to program costs. Evaluation of programs must also consider information on the benefits derived from environmental protection and improvement.[8] Attention is often focused on municipal storm water management program costs, but the programs must also be viewed in terms of their value to the public.

Placing a value on healthy receiving waters is very difficult. Often the value of receiving waters with good water quality manifests in other forms, such as tourism, recreational opportunities, and/or increased property values. When surface water bodies are degraded, thereby degrading the habitat within and adjacent to the water bodies, the public loses the value and benefits associated with being able to use the area in and around the water bodies. Surface waters that are able to support the beneficial uses designated in the Basin Plan can sustain plants and wildlife that can attract visitors and residents, providing aesthetic, recreational, as well as monetary value to the public. At this time, however, there have been no studies for the San

[5] Los Angeles Water Board, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.
[6] State Water Board, 2005. NPDES Stormwater Cost Survey. P. 58.
[7] County of Orange, 2000. A NPDES Annual Progress Report. P. 60.
[8] Ribaudo M.O. and D. Heelerstein. 1992, *Estimating Water Quality Benefits: Theoretical and Methodological Issues.* U.S. Department of Agriculture. Technical Bulletin No. 1808.

Diego Region to quantify the added value that surface waters with healthy water quality can provide.

USEPA has estimated that household willingness to pay for improvements in fresh water quality for fishing and boating is approximately $158-$210.[9] This estimate can be considered conservative, since it does not include important considerations such as marine waters benefits, wildlife benefits, or flood control benefits. Another study conducted by California State University, Sacramento reported that the annual household willingness to pay for statewide clean water is approximately $180.[10]

A study conducted by the University of Southern California and University of California, Los Angeles assessed the costs and benefits of implementing various approaches for achieving compliance with the MS4 permits in the Los Angeles region. The study found that non-structural systems would cost $2.8 billion but provide $5.6 billion in benefit. If structural systems were determined to be needed, the study found that total costs would be $5.7 to $7.4 billion, while benefits could reach $18 billion.[11] Costs are anticipated to be borne over many years, probably at least ten years.

As can be seen, the benefits of the municipal storm water management programs are expected to considerably exceed their costs. Such findings are corroborated by USEPA, which found that the benefits of implementation of its Phase II storm water rule would also outweigh the costs.[12]

[9] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68793.
[10] State Water Board, 2005. NPDES Stormwater Cost Survey. P. iv.
[11] Los Angeles Water Board, 2004. Alternative Approaches to Stormwater Control.
[12] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791.

VII. APPLICABLE STATUTES, REGULATIONS, PLANS AND POLICIES

A. Legal Authorities – Federal Clean Water Act and California Water Code

This Order is issued pursuant to section 402 of the CWA and implementing regulations adopted by the USEPA and chapter 5.5, division 7 of the CWC (commencing with section 13370). This Order serves as an NPDES permit for point source discharges to surface waters. This Order also serves as waste discharge requirements pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

The objective of the CWA is "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*." To carry out this objective, the CWA requires the implementation of permit programs to regulate the discharge of pollutants and dredged or fill material to the navigable waters of the U.S. and to regulate the use and disposal of sewage sludge. CWA section 402 provides the legal authority to issue a permit for the discharge of pollutants to waters of the U.S. under the NPDES. The CWA provides that NPDES permits may be issued by states which are authorized to implement the provisions of that act. California became authorized to implement the NPDES permit program on May 14, 1973.

The Porter-Cologne Water Quality Control Act (Division 7, commencing with CWC section 13000) established the State Water Resources Control Board (State Water Board) and nine Regional Water Quality Control Boards (Regional Water Boards) as the principal state agencies with primary responsibility for the coordination and control of water quality. CWC section 13200(f) established the San Diego Water Board, which has the primary responsibility for the coordination and control of water quality in the San Diego Region, which includes all the basins draining into the Pacific Ocean between the southern boundary of the Santa Ana Region and the California-Mexico boundary. The San Diego Water Board implements the CWA through Chapter 5.5 of the CWC, commencing with section 13370. CWC section 13377 provides the San Diego Water Board the legal authority to issue waste discharge requirements to ensure compliance with all applicable provisions of the CWA and acts amendatory thereof or supplementary, thereto, to implement water quality control plans, or for the protection of beneficial uses, or to prevent nuisance.

CWA section 402(p) requires the USEPA or authorized state to issue NPDES permits for storm water discharges from MS4s to waters of the U.S. CWA section 402(p)(3)(B)(ii) requires that NPDES permits for storm water discharges from MS4s "*effectively prohibit non-storm water discharges*" into the MS4s. CWA section 402(p)(3)(B)(iii) requires that NPDES permits for storm water discharges from MS4s to "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable* [MEP], *including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*."

The USEPA published implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]), which prescribe permit application requirements for storm water discharges from MS4s pursuant to CWA 402(p), on November 16, 1990. The USEPA published an Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems, which provided guidance on permit application requirements for regulated MS4s, on May 17, 1996. The federal regulations in 40 CFR 122 and guidance issued by USEPA serve as the foundation for the provisions of Order No. R9-2013-0001. The legal authorities provided by the above statutes and regulations are included as part of the discussions in Section VIII of this Fact Sheet.

B. Legal Authority for the Permit Issued on a Region-wide Basis

CWA section 402(p)(3)(B) provides the San Diego Water Board the legal authority to issue an NPDES permit for the San Diego Region as compared to separate MS4 permits based upon County- and partial County-wide boundaries as they existed within the San Diego Region. CWA section 402(p)(3)(B) states that "*Permits for discharges from municipal storm sewers- (i) may be issued on a system- or jurisdiction-wide basis* ...." The federal regulations in 40 CFR 122.26(a)(1)(v) also state that the San Diego Water Board "*may designate dischargers from municipal separate storm sewers on a system-wide or jurisdiction-wide basis. In making this determination, the [San Diego Water Board] may consider the following factors: (A) the location of the discharge with respect to waters of the United States; (B) the size of the discharge; (C) the quantity and nature of the pollutants discharged to waters of the United States; and (D) other relevant factors*."

More specifically, the federal regulations provide that for large and medium MS4 systems, the San Diego Water Board may issue a regional permit. Specifically, the federal regulation in 40 CFR 122.26(a)(3) provide:

"*(ii) The Director may either issue one system-wide permit covering all discharges from municipal separate storm sewers within a large or medium municipal storm sewer system or issue distinct permits for appropriate categories of discharges within a large or municipal separate storm sewer system including, but not limited to: all discharges owned or operated by the same municipality; located within the same jurisdiction; all discharges within a system that discharge to the same watershed; discharges within a system that are similar in nature; or for individual discharges from municipal separate storm sewers within the system.*

(iii) The operator of a discharge from a municipal separate storm sewer which is part of a large or medium municipal separate storm sewer system must either: (A) Participate in a permit application (to be a permittee or a co-permittee) with one or more other operator of discharges from the large or medium municipal storm sewer system which covers all, or a portion of all, discharges from the municipal separate storm sewer system; (B) Submit a distinct permit application which only covers discharges from the municipal separate storm sewers for

which the operator is responsible; or (C) A regional authority may be responsible for submitting a permit application under the following guidelines....

(iv) One permit application may be submitted for all or a portion of all municipal separate storm sewers within adjacent or interconnected large or medium municipal separate storm sewer systems. The Director may issue one systemwide permit covering all, or a portion of all municipal separate storm sewers in adjacent or interconnected large or medium municipal separate storm sewer systems.

(v) Permits for all or a portion of all discharges from large or medium municipal separate storm sewer systems that are issued on a system-wide, jurisdiction-wide, watershed or other basis may specify different conditions relating to different discharges covered by the permit, including different management programs for different drainage areas which contribute storm water to the system."

Based on these regulations, the San Diego Water Board may issue a region-wide MS4 permit. The regulations also clarify that the permit may include different conditions for separate discharges covered by the permit. This allows the San Diego Water Board to ensure that suitable water quality conditions and provisions are identified for each watershed.

The USEPA's responses to comments in the Final Rule for the above-mentioned regulations also make it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide, permits. In the Final Rule published in the Federal Register and containing the responses to comments, USEPA notes that 40 CFR 122.26(a)(3)(iv) would allow an entire system in a geographical region under the purview of a State agency to be designated under a permit.[13] USEPA also states that many commenters wanted to allow the permitting authority broad discretion to establish system-wide permits, and that EPA believes that paragraphs 40 CFR 122.26 (a)(1)(v) and (a)(3)(ii) allow for such broad discretion.[14]

This Order creates watershed requirements that apply to multiple counties. The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees. Managing storm water on a regional and watershed basis is expected to result in improved water quality, as the Order focuses on monitoring and management practices necessary to improve each watershed rather than political boundaries. A single permit also allows the San Diego Water Board staff to expend fewer resources developing successive multiple permits and allows more resources to be devoted to working cooperatively with all three current groups of Copermittees to ensure implementation of this Order results in improved water quality.

[13] 55 Federal Register 47990-01, 48042.
[14] Ibid.

C. Federal and California Endangered Species Acts

This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2115.5) or the Federal Endangered Species Act (16 United States Code [USC] sections 1531 to 1544). This Order requires compliance with requirements to protect the beneficial uses of waters of the U.S. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

D. California Environmental Quality Act

The action to adopt an NPDES Permit is exempt from the provisions of Chapter 3 of the California Environmental Quality Act (CEQA) (Public Resources Code section 21100, et seq.) pursuant to CWC section 13389. (*County of Los Angeles v. Cal. Water Boards* (2006) 143 Cal.App.4th 985.)

E. State and Federal Regulations, Plans and Policies

The legal authority provided by the following regulations, plans, and policies are also included as part of the discussions in Section VIII of this Fact Sheet.

Water Quality Control Plan for the San Diego Basin

The CWA requires the San Diego Water Board to establish water quality standards for each water body in its region. Water quality standards include beneficial uses, water quality objectives and criteria that are established at levels sufficient to protect beneficial uses, and an antidegradation policy to prevent degrading of waters. On September 8, 1994, the San Diego Water Board adopted the *Water Quality Control Plan for the San Diego Basin* (Basin Plan). The Basin Plan designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters in the San Diego Region. The San Diego Water Board has amended the Basin Plan on multiple occasions since 1994. In addition, the Basin Plan implements State Water Board Resolution No. 88-63, which established state policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply. Beneficial uses applicable to the surface water bodies that receive discharges from the MS4s within the San Diego Region generally include those listed below:

The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region:

- Municipal and Domestic Supply (MUN)
- Agricultural Supply (AGR)
- Industrial Process Supply (PROC)

- Industrial Service Supply (IND)
- Ground Water Recharge (GWR)
- Contact Water Recreation (REC1)
- Non-contact Water Recreation (REC2)
- Warm Freshwater Habitat (WARM)
- Cold Freshwater Habitat (COLD)
- Wildlife Habitat (WILD)
- Rare, Threatened, or Endangered Species (RARE)
- Freshwater Replenishment (FRSH)
- Hydropower Generation (POW)
- Preservation of Biological Habitats of Special Significance (BIOL)

The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region:

- Navigation (NAV)
- Commercial and Sport Fishing (COMM)
- Estuarine Habitat (EST)
- Marine Habitat (MAR)
- Aquaculture (AQUA)
- Migration of Aquatic Organisms (MIGR)
- Spawning, Reproduction, and/or Early Development (SPWN)
- Shellfish Harvesting (SHELL)

Pursuant to Water Code sections 13263 and 13377, the requirements of this Order implement the Basin Plan.

Water Quality Control Plan for Ocean Waters of California, California Ocean Plan

In 1972, the State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan). The State Water Board adopted the most recent amended Ocean Plan on October 16, 2012 ~~September 15, 2009~~. The Office of Administrative Law approved it on July 3, 2013 ~~March 10, 2010~~. ~~On October 8, 2010, USEPA approved the 2009 Ocean Plan.~~ The amended Ocean Plan became effective on August 19, 2013. The Ocean Plan is applicable, in its entirety, to ocean waters of the State. In order to protect beneficial uses, the Ocean Plan establishes water quality objectives and a program of implementation. Pursuant to Water Code sections 13263 and 13377, the requirements of this Order implement the Ocean Plan. The Ocean Plan identifies the beneficial uses of ocean waters of the State to be protected as summarized below:

- Industrial water supply
- Water contact and non-contact recreation, including aesthetic enjoyment; navigation

- Commercial and sport fishing
- Mariculture
- Preservation and enhancement of designated Areas of Special Biological Significance
- Rare and endangered species
- Marine habitat
- Fish spawning and shellfish harvesting

On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving an exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges. On June 19, 2012, the State Water Board adopted Order No. 2012-0031, amending Order No. 2012-0012 to require pollutant load reductions to be achieved within six years for the ASBS Compliance Plans, section A.2.d(2) and ASBS Pollution Prevention Plans, section B.2.b(2). The State Water Board Resolution No. 2012-0012, as amended requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject terms and conditions of State Water Board Resolution No. 2012-0012, as amended. The Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012, as amended, applicable to these discharges, are incorporated in Attachment A of this Order. Requirements of this Order implement the Ocean Plan.

Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality

On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

Antidegradation Policy

Federal regulations (40 CFR 131.12) require that the state water quality standards include an antidegradation policy consistent with the federal antidegradation policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16 ("Statement of Policy with Respect to Maintaining the Quality of

the Waters of the State"). State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law.

The San Diego Water Board's Basin Plan implements and incorporates by reference both the State and federal antidegradation policies. State Water Board Resolution No. 68-16 and 40 CFR 131.12 require the San Diego Water Board to maintain high quality waters of the State unless degradation is justified based on specific findings. First, the Board must ensure that "existing instream uses and the level of water quality necessary to protect the existing uses" are maintained and protected. Second, if the baseline quality of a water body for a given constituent exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water, that quality shall be maintained and protected through the requirements of the Order unless the Board makes findings that (1) any lowering of the water quality is necessary to accommodate important economic or social development in the area in which the waters are located; (2) water quality adequate to protect existing uses fully is assured; and (3) the highest statutory and regulatory requirements for all new and existing point sources and all cost-effective and reasonable best management practices for nonpoint source control are achieved. The San Diego Water Board must also comply with any requirements of State Water Board Resolution No. 68-16 beyond those imposed through incorporation of the federal antidegradation policy. In particular, the Board must find that not only present, but also anticipated future uses of water are protected, and must ensure best practicable treatment or control of the discharges. The baseline quality considered in making the appropriate findings is the best quality of the water since 1968, the year of the adoption of Resolution No. 68-16, or a lower level if that lower level was allowed through a permitting action that was consistent with the federal and state antidegradation policies. ~~until it is demonstrated that any change in quality will be consistent with maximum benefit to the people of the State, will not unreasonably affect beneficial uses, and will not result in water quality less than that described in the San Diego Water Boards' policies. State Water Board Resolution No. 68-16 requires that discharges of waste be regulated to meet best practicable treatment or control to assure that pollution or nuisance will not occur and the highest water quality consistent with the maximum benefit to the people of the State be maintained.~~

The discharges permitted in this Order are consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Board Resolution No. 68-16 as set forth below~~.~~: ~~Many of the water bodies within the area covered by this Order are of high quality. The Order requires the Copermittees to meet best practicable treatment or control to meet water quality standards. As required by 40 CFR 122.44(a), the Copermittees must comply with the "maximum extent practicable" technology-based standard set forth in CWA section 402(p) for discharges of pollutants in storm water from the MS4s.~~

1. Many of the waters within the area covered by this Order are impaired for multiple pollutants discharged through MS4s and are not high quality waters with regard to these pollutants. In most cases, there is insufficient data to determine whether these water bodies were impaired as early as 1968, but the limited available data shows

impairment dating back for more than two decades. Many such water bodies are ~~and~~ listed on the State's CWA Section 303(d) List and the San Diego Water Board has established TMDLs to address the impairments. This Order ensures that existing instream (beneficial) water uses and the level of water quality necessary to protect the existing uses is maintained and protected. This Order requires the Copermittees to comply with permit provisions to implement the WLAs set forth in the TMDLs in order to restore the beneficial uses of the impaired water bodies consistent with the assumptions and requirements of the TMDLs. This Order further requires compliance with receiving water limitations to meet water quality standards in the receiving water either by demonstrating compliance pursuant to Provision A and the Copermittees' monitoring and assessment program pursuant to Provision D of this Order, or by implementing Provision B.3.c with a schedule to achieve compliance with receiving water limitations. This Order includes requirements to develop and implement storm water management programs, achieve WQBELs, and effectively prohibit non-storm water discharges into the MS4. The issuance of this Order does not authorize an increase in the amount of discharge of waste.

2. To the extent that water bodies within the area covered by this Order are high quality waters with regard to some constituents, this Order finds as follows:

   a. Allowing limited degradation of high quality water bodies through MS4 discharges is necessary to accommodate important economic or social development in the area and is consistent with the maximum benefit to the people of the state. The discharge of storm water in certain circumstances is to the maximum benefit to the people of the state because it can assist with maintaining instream flows that support beneficial uses, may spur the development of multiple-benefit projects, and may be necessary for flood control, and public safety as well as to accommodate development in the area. The alternative – capturing all storm water from all storm events – would be an enormous opportunity cost that would preclude MS4 permittees from spending substantial funds on other important social needs. The Order ensures that any limited degradation does not affect existing and anticipated future uses of the water and does not result in water quality less than established standards. The Order requires compliance with receiving water limitations that act as a floor to any limited degradation.

   b. The Order requires the highest statutory and regulatory requirements and requires that the Copermittees meet best practicable treatment or control. The Order prohibits all non-storm water discharges, with a few enumerated exceptions, through the MS4 to the receiving waters. As required by 40 CFR section 122.44(a), the Copermittees must comply with the "maximum extent practicable" technology-based standard set forth in CWA section 402(p), and implement extensive minimum control measures in a storm water management program. Recognizing that best practicable treatment or control may evolve over time, the Order includes new and more specific requirements as compared to the prior Phase I MS4 permits for the San Diego County, Orange County and Riverside County Copermittees. The Order incorporates options to implement

Water Quality Improvement Plans that must specify detailed structural and non-structural storm water controls that must be implemented in accordance with an accepted proposed time schedule. The Order contains provisions to encourage, wherever feasible, retention of the storm water from the 85th percentile 24-hour storm event.

Anti-Backsliding Requirements

CWA sections 402(o) and 303(d)(4) and federal regulations at 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations or conditions may be relaxed. ~~All effluent limitations and other conditions in this Order are at least as stringent as the effluent limitations in the previous permits issued to the San Diego County Copermittees, the Orange County Copermittees, and the Riverside County Copermittees.~~ While this Order allows implementation of an alternative compliance pathway option in Provision B.3.c to constitute compliance with receiving water limitations under certain circumstances, the availability of that alternative and the corresponding availability of additional time to come into compliance with receiving water limitations~~,~~ does not violate the anti-backsliding provisions. The receiving water limitations provisions of this Order are imposed under section 402(p)(3)(B) of the Clean Water Act rather than based on best professional judgment, or based on section 301(b)(1)(C) or sections 303(d) or (e), and are accordingly not subject to the anti-backsliding requirements of section 402(o). Although the non-applicability is less clear with respect to the regulatory anti-backsliding provisions in 40 CFR 122.44(l), the regulatory history suggests that USEPA's intent was to establish the anti-backsliding regulations with respect to evolving technology standards for traditional point sources. (See, e.g., 44 Fed.Reg. 32854, 32864 (Jun. 7, 1979)). It is unnecessary, however, to resolve the ultimate applicability of the regulatory anti-backsliding provisions, because the alternative compliance pathway option in Provision B.3.c qualifies for an exception to backsliding as based on new information.

The alternative compliance pathway option in Provision B.3.c of this Order was informed by new information available to the Board from experience and knowledge gained through storm water permitting at the Regional Water Boards in the last ten years. There has been a statewide paradigm shift in storm water management. State Water Board Order WQ 2015-0075 directed all of the Regional Water Boards to consider the Los Angeles Water Board's alternative compliance path to receiving water limitations in all Phase I MS4 permits going forward (State Water Board Order WQ 2015-0075 at page 51), and the Los Angeles Water Board's process of developing over 30 watershed-based TMDLs and implementing several TMDLs since the adoption of the previous permits. In particular, the Los Angeles Water Board recognized the significance of allowing time to plan, design, fund, operate and maintain watershed-based BMPs necessary to attain water quality improvements and additionally recognized the potential for municipal storm water to benefit water supply. Similarly, the San Diego Water Board's experience developing and implementing the Fourth Term MS4 Permits and TMDLs that apply on a region-wide scale (e.g. TMDLs for Indicator

Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region) has resulted in a similar recognition of the need for a watershed-based approach that allows time to plan, design, fund, operate and maintain BMPs to address impaired waters that have been impacted by MS4 discharges. Thus, even if the receiving water limitations are subject to anti-backsliding requirements, they were revised based on new information that would support an exception to the anti-backsliding provisions. (33 U.S.C. § 1342(o)(2)(B)(i); 40 C.F.R. § 122.44(l)(1); 40 C.F.R. §122.44(l)(2)(i)(B)(1)).

Clean Water Act Section 303(d) List

CWA section 303(d)(1) requires each State to identify specific water bodies within its boundaries where water quality standards are not being met or are not expected to be met after implementation of technology-based effluent limitations on point sources. Water bodies that do not meet water quality standards are considered impaired and are placed on the state's "303(d) List." Periodically, USEPA approves the State's 303(d) List.

Most recently, USEPA approved the State's 2010 303(d) List of impaired water bodies on October 11, 2011, which includes certain receiving waters in the San Diego Region. For each listed water body, the state or USEPA is required to establish a TMDL of each pollutant impairing the water quality standards in that water body. A TMDL is a tool for implementing water quality standards and is based on the relationship between pollution sources and in-stream water quality conditions. The TMDL establishes the allowable pollutant loadings for a water body and thereby provides the basis to establish water quality-based controls. These controls should provide the pollution reduction necessary for a water body to meet water quality standards.

A TMDL is the sum of the allowable pollutant loads of a single pollutant from all contributing point sources (the waste load allocations or WLAs) and non-point sources (load allocations of LAs) plus the contribution from background sources and a margin of safety (40 CFR 130.2(i)). MS4 discharges are considered point source discharges. For 303(d)-listed water bodies and pollutants in the San Diego Region, the San Diego Water Board or USEPA develops and adopts TMDLs that specify these requirements.

Since 2002, the San Diego Water Board has established seven (7) TMDLs to remedy water quality impairments in various water bodies within the San Diego Region (see Attachment E to the Order). These TMDLs identify MS4 discharges as a source of pollutants to these water bodies, and, as required, establish WLAs for MS4 discharges to reduce the amount of pollutant discharged to receiving waters. CWA section 402(p)(3)(B)(iii) requires the San Diego Water Board to impose permit conditions, including: "management practices, control techniques and system, design and engineering methods, and *such other provisions as the Administrator or the State determines appropriate for the control of such pollutants."* (Emphasis added.) CWA section 402(a)(1) also requires states to issue permits with conditions necessary to carry out the provisions of the CWA. Federal regulations also require that NDPES permits contain WQBELs consistent with the assumptions and requirements of all available WLAs (40 CFR 122.44(d)(1)(vii)(B)). CWC section 13377 also requires that

NPDES permits include limitations necessary to implement water quality control plans. Therefore, this Order includes WQBELs and other provisions to implement the TMDL WLAs assigned to Copermittees regulated by this Order.

Other Regulations, Plans and Policies

This Order implements all other applicable federal regulations and State regulations, plans and policies, including the California Toxics Rule at 40 CFR 131.38 (Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California Rule [California Toxics Rule or CTR]), and State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP).

F. Unfunded State Mandates

Article XIII B, Section 6(a) of the California Constitution provides that whenever "*any state agency mandates a new program or higher level of service on any local government, the state shall provide a subvention of funds to reimburse that local government for the costs of the program or increased level of service*." The requirements of this Order do not constitute state mandates that are subject to a subvention of funds for several reasons, including, but not limited to, the following.

First, the requirements of this Order do not constitute a new program or a higher level of service as compared to the requirements contained in the previous Fourth Term Permits. The overarching requirement to impose controls to reduce the pollutants in discharges from MS4s is dictated by the CWA and is not new to this permit cycle (33 USC section 1342(p)(3)(B)). The inclusion of new and advanced measures as the MS4 programs evolve and mature over time is anticipated under the CWA (55 FR 47990, 48052 (Nov. 16, 1990)), and to the extent requirements in this Order are interpreted as new advanced measures, they do not constitute a new program or higher level of service.

Second, and more broadly, mandates imposed by federal law, rather than by a state agency, are exempt from the requirement that the local agency's expenditures be reimbursed (Cal. Const., art. XIII B, section 9, subd. (b)). This Order implements federally mandated requirements under the CWA and its requirements are therefore not subject to subvention of funds. This includes federal requirements to effectively prohibit non-storm water discharges, to reduce the discharge of pollutants in storm water to the MEP, and to include such other provisions as the Administrator or the State determines appropriate for the control of such pollutants (33 USC section 1342(p)(3)(B)). Federal cases have held these provisions require the development of permits and permit provisions on a case-by-case basis to satisfy federal requirements. (*Natural Resources Defense Council, Inc., v. USEPA* (9th Cir. 1992) 966 F.2d 1292, 1308, fn. 17.)

The authority exercised under this Order is not reserved state authority under the CWA's savings clause (cf. *Burbank v. State Water Resources Control Bd.* (2005) 35

Cal.4th 613, 627-628 [relying on 33 USC section 1370, which allows a state to develop requirements which are not "less stringent" than federal requirements]), but instead is part of a federal mandate to develop pollutant reduction requirements for municipal separate storm sewer systems. To this extent, it is entirely federal authority that forms the legal basis to establish the permit provisions. (See, *City of Rancho Cucamonga v. Regional Water Quality Control Board, Santa Ana Region* (2006) 135 Cal.App.4th 1377, 1389; *Building Industry Ass'n of San Diego Co. v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 882-883.)

The MEP standard is a flexible standard that balances a number of considerations, including technical feasibility, cost, public acceptance, regulatory compliance, and effectiveness. (*Building Ind. Ass'n., supra,* 124 Cal.App.4th at pp. 873-874, 889.) Such considerations change over time with advances in technology and with experience gained in storm water management (55 FR 47990, 48052 (Nov. 16, 1990)). Accordingly, a determination of whether the conditions contained in this Order exceed the requirements of federal law cannot be based on a point by point comparison of the permit conditions and the minimum control measures that are required "at a minimum" to reduce pollutants to the maximum extent practicable and to protect water quality (40 CFR 122.34). Rather, the appropriate focus is whether the permit conditions, as a whole, exceed the MEP standard.

In recent months, the County of Los Angeles and County of Sacramento Superior Courts have granted writs setting aside decisions of the Commission on State Mandates that held certain requirements in Phase I permits constituted unfunded mandates. In both cases, the courts have found that the correct analysis in determining whether an MS4 permit constituted a state mandate was to evaluate whether the permit as a whole exceeds the MEP standard. (*State of Cal. v. Comm. on State Mandates* (Super. Ct. Sacramento County, 2012, No. 34-2010-80000604), *State of California v. County of Los Angeles* (Super. Ct. Los Angeles County, 2011, No. BS130730.) Both cases are currently pending appeal.

The requirements of the Order, taken as a whole rather than individually, are necessary to reduce the discharge of pollutants to the MEP and to protect water quality. The San Diego Water Board finds that the requirements of the Order are practicable, do not exceed federal law, and thus do not constitute an unfunded mandate. These findings are the expert conclusions of the principal state agency charged with implementing the NPDES program in California (CWC sections 13001, 13370).

It should also be noted that the provisions in this Order to effectively prohibit non-storm water discharges are also mandated by the CWA (33 USC section 1342(p)(3)(B)(ii)). Likewise, the provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state establishes or adopts a TMDL, federal law requires that permits must contain effluent limitations consistent with the assumptions and requirements of any applicable waste load allocation in a TMDL (40 CFR 122.44(d)(1)(vii)(B)).

Third, the local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental dischargers who are issued NPDES permits for storm water discharges. With a few inapplicable exceptions, the CWA regulates the discharge of pollutants from point sources (33 USC section 1342) and the Porter-Cologne Act regulates the discharge of waste (CWC section 13263), both without regard to the source of the pollutant or waste. As a result, the "costs incurred by local agencies" to protect water quality reflect an overarching regulatory scheme that places similar requirements on governmental and non-governmental dischargers. (See *County of Los Angeles v. State of California* (1987) 43 Cal.3d 46, 57-58 [finding comprehensive workers' compensation scheme did not create a cost for local agencies that was subject to state subvention].)

The CWA and the Porter-Cologne Act largely regulate storm water with an even hand, but to the extent there is any relaxation of this even-handed regulation, it is in favor of the local agencies. Generally, the CWA requires point source dischargers, including dischargers of storm water associated with industrial or construction activity, to comply strictly with water quality standards (33 USC section 1311(b)(1)(C); *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159, 1164-1165 [noting that industrial discharges must strictly comply with water quality standards]). As discussed in prior State Water Board decisions, certain provisions of this Order do not require strict compliance with water quality standards (State Water Board Order No. WQ 2001-0015, p. 7). Those provisions of this Order regulate the discharge of waste in municipal storm water under the CWA's MEP standard, not the BAT/BCT standard that applies to other types of discharges. These provisions, therefore, regulate the discharge of waste in municipal storm water more leniently than the discharge of waste from non-governmental sources.

Fourth, the Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)). To the extent that the local agency Copermittees have voluntarily availed themselves of the permit, the program is not a state mandate. (Accord, *County of San Diego v. State of California* (1997) 15 Cal.4th 68, 107-108.)

Fifth, the local agency Copermittees' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under state law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

Finally, even if any of the permit provisions could be considered unfunded mandates, under Government Code section 17556, subdivision (d), a state mandate is not subject to reimbursement if the local agency has the authority to charge a fee. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order, subject to certain voting requirements contained in the California Constitution. (See Cal. Const., Art. XIII D, section 6, subd. (c); see also *Howard Jarvis Taxpayers Ass'n v. City of Salinas* (2002) 98 Cal.App.4th

1351, 1358-1359.) The Fact Sheet demonstrates that numerous activities contribute to the pollutant loading in the MS4. Local agencies can levy service charges, fees, or assessments on these activities, independent of real property ownership. (See, e.g., *Apartment Ass'n of Los Angeles County, Inc., v. City of Los Angeles* (2001(24 Cal.4th 830, 842 [upholding inspection fees associated with renting property].) The authority and ability of a local agency to defray the cost of a program without raising taxes indicates that a program does not entail a cost subject to subvention. (*Clovis Unified School Dist. V. Chiang* (2010) 188 Cal.App.4th 794, 812, citing *Connell v. Sup. Ct.* (1997) 59 Cal.App.4th 382, 401; *County of Fresno v. State of California* (1991) 53 Cal. 3d. 482, 487-488.)

VIII. PROVISIONS

The provisions (i.e. NPDES permit requirements) of the Order are discussed below.

A. Prohibitions and Limitations

Purpose: Provision A includes the prohibitions and limitations requirements that are the foundation of all the subsequent requirements included in the Order. Compliance with the prohibitions and limitations will restore and protect receiving waters from impacts that may be caused by discharges into and from the Copermittees' MS4s and ultimately achieve the objective of the CWA.

In meeting the requirements set forth in the Order, the Copermittees must be cognizant that the prohibitions and limitations exist and will be the standard by which the San Diego Water Board will be measuring the progress and success of their implementation of the NPDES permit requirements.

***Discussion*:** The objective of the CWA is to "*restore and maintain the chemical, physical, and biological integrity of the Nation's waters*." The CWA requires the implementation of NPDES permit programs to regulate discharges of pollutants and dredged or fill material to the navigable waters of the U.S. For discharges into and from MS4s, the CWA requires the NPDES permits to "*effectively prohibit non-stormwater discharges into the storm sewers*" and "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable.*"

Provision A includes limitations, consistent with the requirements of the CWA for discharges from MS4s. Provision A expresses these limitations as discharge prohibitions, receiving water limitations, and effluent limitations. Compliance with the discharge prohibitions and receiving water limitations is also explicitly described, in conformance with precedential State Water Board Orders.

More specific and detailed discussions of the requirements of Provision A are provided below.

Provision A.1 (Discharge Prohibitions) prohibits the discharge of specific types of waste into and/or from the Copermittees' MS4s.

Provision A.1.a restates and reiterates Basin Plan Waste Discharge Prohibition 1, by prohibiting discharges into and from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the

state. The terms pollution,[15] contamination,[16] and nuisance[17] are defined under CWC 13050. Provision A.1.c incorporates all the waste discharge prohibitions of the Basin Plan into the requirements of the Order. The waste discharge prohibitions from the Basin Plan have been reproduced and provided in Attachment A to the Order.

Provision A.1.b requires non-storm water discharges into the MS4s to be effectively prohibited, consistent with the requirements of the CWA for MS4 permits to "*effectively prohibit non-stormwater discharges into the storm sewers*." The effective prohibition is required to be implemented by each Copermittee within its jurisdiction through the illicit discharge detection and elimination requirements under Provision E.2. The prohibition does not apply to NPDES permitted discharges into the Copermittees' MS4s.

The CWA employs the strategy of prohibiting the discharge of any pollutant from a point source into waters of the United States unless the discharger of the pollutant(s) obtains an NPDES permit pursuant to CWA Section 402. The 1987 amendment to the CWA includes provision 402(p) that specifically addresses NPDES permitting requirements for storm water discharges from MS4s. CWA section 402(p) prohibits the discharge of pollutants from specified MS4s to waters of the U.S. except as authorized by an NPDES permit and identifies two substantive standards for MS4 storm water permits. MS4 permits (1) "*shall include a requirement to effectively prohibit non-stormwater discharges into the storm sewers*" and (2) "*shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or State determines appropriate for the control of such pollutants*." (CWA section 402(p)(3)(B)(ii)-(iii).)

In November 1990, the USEPA published regulations addressing storm water discharges from MS4s (55 FR 47990 and following (Nov. 16, 1990) (Phase I Final Rule)). The regulations establish minimum requirements for MS4 permits, and generally focus on the requirement that MS4s implement programs to reduce the amount of pollutants found in storm water discharges to the MEP. The CWA's municipal storm water MEP standard does not require storm water discharges to strictly meet water quality standards, as is required for other NPDES permitted

[15] CWC 13050(l): "(1) 'Pollution' means an alteration of the quality of waters of the state by waste to a degree which unreasonably affects either of the following: (A) The water for beneficial uses. (B) Facilities which serve beneficial uses. (2) 'Pollution' may include 'contamination.'
[16] CWC 13050(k): "Contamination' means an impairment of the quality of waters of the state by waste to a degree which creates a hazard to public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste, whether or not waters of the state are affected."
[17] CWC 13050(m): 'Nuisance' means anything which meets all of the following requirements: (1) Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. (2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. (3) Occurs during, or as a result of, the treatment or disposal of wastes."

discharges. Compliance is achieved through an iterative approach of continuous implementation of improved BMPs. This distinction reflects Congress's recognition that variability in flow and intensity of storm events render difficult strict compliance with water quality standards by MS4 permittees. In describing the controls that permits must include to reduce pollutants in storm water discharges to the MEP, the statute (CWA section 402(p)(3)(B)(iii)) states that the controls shall include: "*management practices, control techniques and system, design and engineering methods, and such other provisions as the [permit writer] determines appropriate for the control of such pollutants*."

In contrast, non-storm water discharges from the MS4 that are not authorized by separate NPDES permits are subject to requirements under the NPDES program, including discharge prohibitions, technology based effluent limitations and water quality-based effluent limitations (40 CFR 122.44). The regulations also require the Copermittee's program to include an element to detect and remove illicit discharges and improper disposal into the storm sewer (40 CFR 122.26(d)(2)(iv)(B)).

While "non-storm water" is not defined in the CWA or federal regulations, the federal regulations (at 40 CFR 122.26(b)(2)) define "*illicit discharge*" as *"any discharge to a municipal separate storm sewer that is not composed entirely of storm water and that is not covered by an NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer and discharges resulting from fire fighting activities)*." This definition is the most closely applicable definition of "non-storm water" contained in federal law. As stated in the Phase I Final Rule, USEPA added the illicit discharge program requirement to begin implementation of the 'effective prohibition' requirement to detect and control non-storm water discharges to their municipal system.

Thus, federal law mandates that permits issued to MS4s must require management practices that will result in reducing storm water pollutants to the MEP yet at the same time requires that non-storm water discharges be effectively prohibited from entering the MS4. "Effectively" prohibit does not mean that non-storm water discharges are authorized to be discharged into and from the Copermittees' MS4s. The Phase I Final Rule clarifies what "effectively prohibit" means (55 FR 47995):

> "*Section 402(p)(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…<u>Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit</u> (other than the permit for the discharge from the municipal separate storm sewer)*" [Emphasis added].

Consistent with federal law, unless non-storm water discharges to the MS4 are authorized by a separate NPDES permit, non-storm water discharges are

appropriately subject to the effective prohibition requirement in the CWA and Regional Water Boards are not limited by the iterative MEP approach to storm water regulation in crafting appropriate regulations for non-storm water discharges.

The federal regulations (40CFR122.26(d)(2)(i)(B)) require the Copermittees to establish the legal authority which authorizes or enables the Copermittees to prohibit illicit discharges to the MS4s. The federal regulations (40 CFR 122.26(d)(2)(vi)(B)(1)) require the Copermittees to "*implement and enforce an ordinance, order or similar means*" to prevent non-storm water discharges to their MS4s. Thus, the Copermittees are required to "*effectively*" prohibit non-storm water discharges to their MS4s through enforcing their legal authority established under "*ordinance, order or similar mean*s" and either remove those discharges to their MS4s, or require those discharges to obtain coverage under a separate NPDES permit. More detail about the program that must be implemented to "*effectively*" prohibit non-storm water discharges to the Copermittees' MS4s is provided under the discussion for Provision E.2.

Provision A.1.d was included to be consistent with Resolution No. 2012-0012, adopted by the State Water Board on March 20, 2012. Provision A.1.d prohibits discharges from MS4s to Areas of Special Biological Significance (ASBS), except for storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach to the Heisler Park ASBS subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012. The pertinent Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 are provided in Attachment A to the Order.

<u>Provision A.2 (Receiving Water Limitations)</u> specifies the condition of the receiving waters that must be achieved when there are discharges from the Copermittees' MS4s. Receiving water limitations are included in all NPDES permits issued pursuant to the CWA section 402. CWA section 402(p)(3)(B)(iii) authorizes the inclusion of "*such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." This requirement gives USEPA or the State permitting authority, in this case the San Diego Water Board, discretion to determine what permit conditions are necessary to control pollutants.

In its Phase I Final Rule (see 55 FR 47990, 47994 (Nov. 16, 1990)), USEPA elaborated on these requirements, stating that, "*permits for discharges from municipal separate storm sewer systems must require controls to reduce the discharge of pollutants to the maximum extent practicable, and where necessary water quality-based controls*." USEPA reiterated in its Phase II Final Rule (64 FR 68722, 68737), that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL*." CWC section 13377 also requires that NPDES permits include limitations necessary to implement water quality control plans. Both the State Water Board and the San Diego Water Board have previously concluded that discharges from the MS4 contain pollutants that have

the reasonable potential to cause or contribute to excursions above water quality standards. As such, inclusion of receiving water limitations is appropriate to control MS4 discharges.

The inclusion of receiving water limitations is also consistent with the Ninth Circuit Court of Appeals' ruling in *Defenders of Wildlife v. Browner* (191 F.3d 1159, 1166 (1999)) that the permitting authority has discretion regarding the nature and timing of requirements that it includes as MS4 permit conditions to attain water quality standards. The Ninth Circuit Court of Appeals recently explained that, "*[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*" (*Natural Resources Defense Council v. County of Los Angeles* (9th Cir. 2011) 673 F.3d 880, 886 (revd. On other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013)))

The receiving water limitations included in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan or in water quality control plans or policies adopted by the State Water Board, including State Water Board Resolution No. 68-16, or in federal regulations, including but not limited to 40 CFR 131.12 and 131.38. The water quality objectives in the Basin Plan and other State Water Board plans and policies have been approved by USEPA and combined with designated beneficial uses constitute the water quality standards required under federal law.

Provision A.2.a requires that discharges from the Copermittees' MS4s must not cause or contribute to the violation of water quality standards in receiving waters. The water quality standards of the receiving waters must be protected from the impacts that may be caused by the Copermittees' MS4 discharges. Water quality standards applicable to the surface waters in the San Diego Region must be achieved through meeting the technology based standard of MEP through an iterative process of improved management actions. Provision A.2.a is also consistent with State Water Board Order WQ 99-05 precedent-setting language requiring discharges from MS4s to attain receiving water quality standards. The water quality control plans and policies with water quality standards applicable to the waters in the San Diego Region are included under Provision A.2.a.

Provisions A.2.b was included to be consistent with the requirements of State Water Board Resolution No. 2012-0012, adopted on March 20, 2012.

<u>Provision A.3 (Effluent Limitations)</u> specifies the condition of the discharges from the Copermittees' MS4s that must be achieved if and when there are discharges.

Consistent with CWA section 301(b)(1)(A) and 40 CFR 122.44(a), Provision A.3.a includes the technology-based effluent limitations that must be included in the Order. The technology-based effluent limits, representing the minimum level of control that must be imposed in a permit under CWA section 402, requires that pollutants in discharges of storm water from the Copermittees' MS4s be reduced to the MEP. This provision applies specifically to storm water discharges. Non-storm water discharges must be effectively prohibited, as required under Provision A.1.b. Non-storm water (dry weather) discharges from the MS4 are not considered storm water (wet weather) discharges and therefore are not subject to the MEP standard.

The technology-based MEP standard is an ever-evolving, flexible, and advancing concept. Neither Congress nor USEPA has specifically defined the term "maximum extent practicable." Congress established this flexible MEP standard so that the administrative bodies would have "*the tools to meet the fundamental goals of the Clean Water Act in the context of storm water pollution*." (*Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 884.) As knowledge about controlling storm water runoff and discharges continues to evolve, so does the knowledge which constitutes MEP. Reducing the discharge of pollutants in storm water from the MS4 to the MEP requires the Copermittees to assess each program component and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP.

The San Diego Water Board or the State Water Board ultimately define MEP, and may include requirements that provide specific guidance on what is expected to demonstrate MEP. It is the responsibility of the Copermittees to propose actions that implement BMPs to reduce storm water pollution to the MEP. In other words, the Copermittees' runoff management programs developed and implemented under the Order are the Copermittees' proposals for achieving MEP. Their total collective and individual activities conducted pursuant to their runoff management programs become their proposal for achieving MEP as it applies both to their overall effort, as well as to specific activities. Provisions B through E of the Order provides a minimum framework to guide the Copermittees in achieving the MEP standard for discharges of pollutants in storm water.

Provision A.3.b incorporates any water quality based effluent limitations (WQBELs) applicable to the MS4s established for TMDLs adopted and approved for the San Diego Region and requires the Copermittees to comply with those WQBELs. This is consistent with 40 CFR 122.44(d)(1)(vii)(B), which requires that NPDES permits to incorporate WQBELs "*developed to protect a narrative water quality criterion, a numeric water quality criterion, or both…consistent with the assumptions and requirements of any available wasteload allocation for the discharge...*"

Pursuant to CWA section 303(d), for surface water bodies identified as impaired by one or more pollutants, the San Diego Water Board is required to establish TMDLs "*at a level necessary to implement the applicable water quality standards with seasonal variations and a margin of safety which takes into account any lack of knowledge*

concerning the relationship between effluent limitations and water quality." The TMDLs identify sources of the pollutants causing the impairments and assign portions of the TMDL as WLAs to point sources, which include MS4s.

WLAs must be expressed in NPDES permits as WQBELs, which may include one or more numeric components such as numeric effluent limits, and/or receiving water limitations, and/or BMP requirements. Because numeric targets for TMDLs typically include a component that will be protective of water quality standards, a TMDL will likely include one or more numeric receiving water limitations and/or effluent limitations as part of the assumptions or requirements of the TMDL. Any numeric receiving water limitations and/or effluent limitations developed as part of the assumptions or requirements of a TMDL must be incorporated and included as part of WQBELs for the MS4s.

Because the development and approval of new TMDLs, or modification of existing TMDLs, may occur during the term of this Order, the specific provisions of those TMDLs, including effluent limitations applicable to MS4s are provided within Attachment E to the Order. Attachment E will be updated with new TMDLs and modifications to existing TMDLs in a timely manner as they occur.

Provision A.4 (Compliance with Discharge Prohibitions and Receiving Water Limitations) describes the process required to be implemented by the Copermittees if compliance with the discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a are not being achieved under current conditions.

In its Phase II Stormwater Regulations, Final Rule, USEPA states that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL.*"[18] In a series of comment letters on MS4 permits issued by various Regional Water Boards, USEPA has also reiterated that MS4 discharges must meet water quality standards.[19] In addition, the Ninth Circuit Court of Appeals explained in a recent ruling that, *"[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*"[20]

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[18] Phase II Stormwater Regulations, Final Rule, 64 Fed. Reg. 68722, 68737.

[19] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.

[20] NRDC v. County of Los Angeles (9th Cir. 2011), 673 F.3d 880, 886 (revd. on other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013))). See also, *Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 884-886, citing *Defenders of Wildlife v. Browning,* (9th Cir. 1999) 191 F.3d 1159.)

Water quality standards for the San Diego Region are established in the Basin Plan. The water quality standards of the Basin Plan are incorporated into this Order as the discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a. The discharge prohibitions and receiving water limitations in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations or prohibitions to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan, water quality control plans or policies adopted by the State Water Board, including Resolution No. 68-16, or federal regulations, including but not limited to, 40 CFR 131.12 and 131.38. The waste discharge prohibitions and water quality objectives in the Basin Plan have been approved by USEPA and combined with the designated beneficial uses constitute the water quality standards required under federal law.

Under federal law (CWA section 402(p)(3)(B)(iii)), an MS4 permit must include "*controls to reduce the discharge of pollutants to the maximum extent practicable...and such other provision as...the State determines appropriate for control of such pollutants*." The State Water Board has previously determined that limitations necessary to meet water quality standards are appropriate for the control of pollutants discharged by MS4s and must be included in MS4 permits. (State Water Board Orders WQ 91-03, 98-01, 99-05, 2001-15; see also *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159.) This Order prohibits discharges that cause or contribute to violations of water quality standards.

The discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a are included in this Order to ensure that discharges from the MS4s do not cause or contribute to exceedances of water quality objectives necessary to protect the beneficial uses of the receiving waters.

Provision A.4 is consistent with the precedent-setting language in State Water Board Order WQ 99-05 required to be included in municipal storm water permits. State Water Board Order WQ 2001-15 refined Order WQ 99-05 by requiring an iterative approach to compliance with water quality standards involving ongoing assessments and revisions, referred to as the "iterative process." The "iterative process" is a fundamental NPDES requirement for municipal storm water permits to achieve the objectives of the CWA.

The State Water Board and Regional Water Boards have stated that the provisions under Provisions A.1.a, A.1.c, A.2.a, and A.4 are independently applicable, meaning that compliance with one provision does not provide a "safe harbor" where there is non-compliance with another provision (i.e., compliance with the Provision A.4 does not shield a Copermittee who may have violated Provision A.1.a, A.1.c, or A.2.a from an enforcement action). The intent of Provision A.4 is to ensure that the Copermittees have the necessary storm water management programs and controls in place, and that they are modified by the Copermittees in a timely fashion when necessary, so that compliance with Provisions A.1.a, A.1.c, and/or A.2.a is achieved as soon as possible. USEPA expressed the importance of this independent applicability in a series of

comment letters on MS4 permits proposed by various Regional Water Boards. At that time, USEPA expressly objected to certain MS4 permits that included language stating, *"permittees will not be in violation of this [receiving water limitation] provision … [if certain steps are taken to evaluate and improve the effectiveness of the jurisdictional runoff management programs],"* concluding that this phrase would not comply with the CWA.[21]

The Ninth Circuit held in *Natural Resources Defense Council v. County of Los Angeles* (2011) 673 F3d. 880, 886 (revd. on other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013))) that engagement in the iterative process does not provide a safe harbor from liability for violations of permit terms prohibiting exceedances of water quality standards. The Ninth Circuit holding is consistent with the position of the State and Regional Water Boards that exceedances of water quality standards in an MS4 permit constitute violations of permit terms subject to enforcement by the Water Boards or through a citizen suit. While the Water Boards have generally directed dischargers to achieve compliance by improving control measures through the iterative process, the San Diego Water Board retains the discretion to take other appropriate enforcement and the iterative process does not shield dischargers from citizen suits under the CWA.

The requirements of Provision A.4, therefore, are required to be implemented until the water quality standards expressed under Provisions A.1.a, A.1.c, and A.2.a are achieved. The CWA requires MS4 permits to "*require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." The requirements of this Order have been deemed or determined to be "appropriate" to achieve water quality standards in receiving waters.

Part of the "*controls*" required by the Order is the process described in Provision A.4. Provision A.4 includes the process that is ultimately expected to achieve compliance with the requirement that discharges from the MS4 do not cause or contribute to violations of water quality standards in the receiving waters. The implementation of Provision A.4 is required when the Copermittees or the San Diego Water Board have determined that discharges from the MS4 are causing or contributing to violations of water quality standards in the receiving waters.

The Copermittees must effectively prohibit non-storm water discharges into the MS4s, reduce the discharge of pollutants in storm water from the MS4s to the MEP, and ensure that their MS4 discharges do not cause or contribute to violations of water quality standards. If the Copermittees have effectively prohibited non-storm water

[21] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.

discharges and reduced storm water pollutant discharges to the MEP, but their discharges are still causing or contributing to violations of water quality standards, Provision A.4 provides a clear "iterative process" for the Copermittees to follow.

Provision A.4 essentially requires the Copermittees to implement additional BMPs until MS4 discharges no longer cause or contribute to a violation of water quality standards.

In assessing compliance and potential enforcement actions, the San Diego Water Board looks at the Copermittees' efforts in total to meet the requirements of Provisions A.1.a, A.1.c, A.2.a and Provision A.4. The Copermittees need to demonstrate that they are making improvements to their programs and making progress toward achieving the discharge prohibitions and receiving water limitations in Provisions A.1.a, A.1.c, and A.2.a by implementing the requirements of Provision A.4. The San Diego Water Board would consider these efforts prior to strictly enforcing the requirements of Provisions A.1.a, A.1.c, and A.2.a. Causes of exceedances of the receiving water limitations can often be more difficult to identify and attribute solely to the Copermittees' MS4s. The intent of the Order is to provide the Copermittees more clarity and flexibility in addressing these exceedances through the iterative approach and adaptive management process until the requirements under Provisions A.1.a, A.1.c, and A.2.a are fully achieved.

An exception to the iterative approach and adaptive management process would be in receiving waters subject to adopted and approved TMDLs. For TMDLs that are incorporated into the Order, there is a specific date for compliance to be achieved, after which the iterative approach and adaptive management process required under Provision A.4 no longer provides the flexibility to achieve compliance. Where compliance dates for a TMDL have passed, compliance with the WQBELs incorporated into the Order established by a TMDL in Attachment E to protect water quality standards is required. Thus, after the interim or final compliance dates for a TMDL have passed, if the discharges from the Copermittees' MS4s are causing or contributing to a violation of WQBELs, exceedances of WQBELs must be strictly enforced by the San Diego Water Board. In the meantime, however, the Copermittees are in compliance with the interim or final TMDL requirements in Attachment E as long as the interim or final WQBELs are being achieved in accordance with the interim or final compliance dates.

In addition, this Order includes an optional pathway that incorporates the requirements of Provision A.4 and would allow a Copermittee to be deemed in compliance with the requirements under Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b during implementation of a Water Quality Improvement Plan that incorporates specific additional requirements. This alternative compliance pathway and the additional specific requirements are described below under the discussion for Provision B.3.c.

B. Water Quality Improvement Plans

Purpose: Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges to the MS4s and control pollutants in storm water discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the Clean Water Act.

Provision B includes requirements for the Copermittees to develop and implement Water Quality Improvement Plans to ultimately comply with the prohibitions and limitations under Provision A. The Water Quality Improvement Plans will provide the Copermittees a comprehensive program that can achieve the requirements and further the objectives of the CWA. Implementation of the Water Quality Improvement Plans will also improve the quality of the receiving waters in the San Diego Region.

The Water Quality Improvement Plan is the backbone of the Regional MS4 Permit requirements. Provision B provides the guidance, criteria, and minimum expectations and requirements for the elements of the Water Quality Improvement Plan to be developed and implemented by the Copermittees. The Water Quality Improvement Plans will be implemented in the Watershed Management Area by the Copermittees within their jurisdictions through their jurisdictional runoff management programs.

The Water Quality Improvement Plan also incorporates a program to monitor and assess the progress of the Copermittees' jurisdictional runoff management programs toward improving the quality of discharges from the MS4s, as well as tracking improvements to the quality of receiving waters. A process to adapt and improve the effectiveness of the Water Quality Improvement Plans has also been incorporated into the requirements of Provision B to be consistent with the "iterative approach" required to achieve compliance with discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a, pursuant to the requirements of Provision A.4.

The Water Quality Improvement Plans have also been structured to incorporate the requirements of any TMDLs that have been adopted for the San Diego Region. Incorporating the requirements of the TMDLs into the requirements of Provision B allows the Copermittees to develop a single plan, instead of separate plans, to coordinate their non-storm water and storm water runoff management programs. The Water Quality Improvement Plans allow the Copermittees to meet the requirements of this Order, as well as fulfill the requirements of the TMDLs.

As an added benefit, if the Copermittees demonstrate that impaired water bodies within the Watershed Management Area listed on the 303(d) List will be addressed with their Water Quality Improvement Plans in a reasonable period of time, the San Diego Water Board may be able to remove the water bodies from the 303(d) List, which would greatly reduce the need for the San Diego Water Board to develop additional TMDLs that would have to be incorporated into the Order and implemented by the Copermittees.

***Discussion*:** The federal NPDES regulations require the Copermittees to develop a proposed management program (40 CFR 122.26(d)(2)(iv)). The proposed management program must include "*a comprehensive planning process*" and "*where necessary intergovernmental coordination*" for the "*duration of the permit.*" The Water Quality Improvement Plan is the Copermittees' "*comprehensive planning process*" document for the proposed management program that will be implemented within a Watershed Management Area. Implementation of the Water Quality Improvement Plan requires "*intergovernmental coordination*" among the Copermittees for at least the "*duration of the permit*," and likely into and beyond the next iteration of the permit.

Developing Water Quality Improvement Plans based upon watersheds is consistent with federal regulations that support the development of permit conditions, as well as implementation of storm water management programs, at a watershed scale (40 CFR 122.26(a)(3)(ii), 122.26(a)(3)(v), and 122.26(d)(2)(iv)). In 2003, USEPA issued a Watershed-Based NPDES Permitting Policy Statement (USEPA, 2003) that defines watershed-based permitting as an approach that produces NPDES permits that are issued to point sources on a geographic or watershed basis. In this policy statement, USEPA explains that "*[t]he utility of this tool relies heavily on a detailed, integrated, and inclusive watershed planning process*." USEPA identifies a number of important benefits of watershed permitting, including more environmentally effective results, the ability to emphasize measuring the effectiveness of targeted actions on improvements in water quality, reduced cost of improving the quality of the nation's waters and more effective implementation of watershed plans, including TMDLs, among others.

An emphasis on watersheds is appropriate at this stage in the San Diego Region's MS4 program to shift the focus to more targeted, water quality driven planning and implementation. Addressing discharges on a watershed scale focuses on water quality results by emphasizing the receiving waters in the watershed. The conditions of the receiving waters drive management actions, which in turn focus measures to address pollutant contributions from MS4 discharges.

The Water Quality Improvement Plan gives the Copermittees the responsibility of developing a comprehensive plan to coordinate the efforts of their jurisdictional runoff management programs for addressing the problems related to MS4 discharges causing impacts to water quality in the Watershed Management Area. The development of the plan provides the Copermittees the opportunity to provide

significant input on how to implement their jurisdictional runoff management programs, and how to best utilize their available resources in addressing a focused set of priorities that they believe will result in measureable improvements to water quality within the Watershed Management Area.

The Copermittees are encouraged to separate the Watershed Management Area into subwatersheds, as appropriate. This allows the Copermittees to identify priorities applicable to a subset of the Copermittees or specific water bodies or areas within the Watershed Management Area.

Included in the requirements for the elements to be included in the Water Quality Improvement Plan are monitoring and assessment requirements that are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order. In addition to the federal requirements of the CWA section 308(a) and 40 CFR 122.26(d), the San Diego Water Board has the authority to establish monitoring, reporting, and recordkeeping requirements for NPDES permits under CWC 13383.

More specific and detailed discussions of the requirements of Provision B are provided below.

Provision B.1 (Watershed Management Areas) requires the Copermittees to develop a Water Quality Improvement Plan for each of the Watershed Management Areas defined by the San Diego Water Board.

Pursuant to 40 CFR 122.26(d)(2)(iv), proposed management programs "*may impose controls on a…watershed basis…*" The Water Quality Improvement Plan is the Copermittees' proposed management program. A Water Quality Improvement Plan must be developed for each Watershed Management Area identified in the Order.

The Watershed Management Areas are identified in Table B-1. Table B-1 establishes ten (10) Watershed Management Areas, and identifies the Copermittees that are responsible for developing and implementing the Water Quality Improvement Plan for each Watershed Management Area.

The Copermittees from each of the three counties within the San Diego Region ~~are~~ were ~~expected to be~~ phased in as their respective NPDES municipal storm water permits expired. ~~Because~~ Order No. R9-2007-0001 expired in January 2012, and the San Diego County Copermittees ~~were~~ became covered under the Regional MS4 Permit on June 27, 2013, the effective date of the Order. ~~Because~~ Order No. R9-2009-0002 expired in December 2014, and the Orange County Copermittees ~~are~~ became covered under the Regional MS4 Permit on April 1, 2015, the effective date of Order No. R9-2013-0001 as amended by Order No. R9-2015-0001. Order No. R9-2010-0016 expired in November 2015, and the Riverside County Copermittees became covered under the Regional MS4 Permit on January 7, 2016, the effective

date of Order No. R9-2013-0001 as amended by Order No. R9-2015-0100.

~~After the San Diego Water Board receives and considers the Report of Waste Discharge required to be submitted by the Riverside County Copermittees pursuant to the requirements of their current permit, and makes any necessary changes to the Order, the Riverside County Copermittees will be covered under the Regional MS4 Permit after Order No. R9-2010-0016 expires in December 2015.~~

~~The Riverside County Copermittees also have the option to obtain coverage under the Regional MS4 Permit earlier than their respective permit expiration dates. The process to apply for early coverage is described Provision F.6.~~

~~Because the Santa Margarita River Watershed Management Area includes Copermittees from both San Diego County and Riverside County, a footnote to Table B-1 has been included to specify that the requirements of Provision B are not required to be implemented by the County of San Diego until the Riverside County Copermittees have received a notice of coverage under the Order. Until the Riverside County Copermittees are notified of coverage under the Order, the County of San Diego is subject to the prohibitions and limitations under Provision A, responsible for continuing to implement its existing jurisdictional runoff management program, and responsible for implementing the transitional monitoring and assessment requirements of Provision D, the transitional annual reporting requirements of Provision F.3.b, and the TMDL requirements of Attachment E to the Order.~~

The Cities~~y~~ of Laguna Woods, ~~and~~ Laguna Hills, Murrieta, and Wildomar are located partially within the jurisdictions of both the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board) and the San Diego Water Board. Written requests for designation of a single Regional Water Board to regulate matters pertaining to permitting of Phase I MS4 discharges were submitted to the San Diego Water Board and the Santa Ana Water Board by the City of Laguna Woods by letter dated September 8, 2014, ~~and~~ the City of Laguna Hills by letter dated March 12, 2014, the City of Murrieta by letter dated June 22, 2015, and the City of Wildomar by letter dated June 23, 2015. The Cities of Laguna Woods, ~~and~~ Laguna Hills, Murrieta, and Wildomar requested designation of the San Diego Water Board pursuant to CWC section 13228.

The Cities of Laguna Woods, ~~and~~ Laguna Hills, Murrieta, and Wildomar reported that management and implementation of municipal programs to comply with two different Phase I MS4 permits creates a significant administrative and financial burden and inhibits their ability to contribute to greater overall water quality improvements in either Region. In an effort to address these concerns, the San Diego Water Board and the Santa Ana Water Board have entered into ~~an~~ written agreements ~~dated February 10, 2015~~, whereby the San Diego Water Board is designated to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Laguna Woods, ~~and~~ Laguna Hills, Murrieta, and Wildomar including ~~areas~~ the portions of the jurisdictions within the

Santa Ana Region. The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated February 10, 2015 to designate the San Diego Water Board to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Laguna Woods and Laguna Hills, including the portions of the jurisdictions within the Santa Ana Region, upon the later effective date of ~~this~~ Order No. R9-2015-0001 or Santa Ana Water Board Tentative Order No. R8-2015-0001. The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated October 26, 2015 to designate the San Diego Water Board to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Murrieta and Wildomar, including the portions of the jurisdictions within the Santa Ana Region upon the effective date of Order R9-2015-0100.

Under the terms of the agreements, each Regional Water Board retains the authority to enforce provisions of the Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee (Water Code section 13228 (b)). Also under the terms of the agreements, any TMDL and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Laguna Woods, ~~or~~ Laguna Hills, Murrieta, or Wildomar as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement of the applicable TMDL would remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's San Diego Creek/Newport Bay TMDL and Lake Elsinore/Canyon Lake Nutrient TMDLs, and the San Diego Water Board's Indicator Bacteria Project I Beaches and Creeks TMDL.

In conformance with the~~is~~ agreements, ~~a~~ footnotes to Table B-1 ~~has been~~ are included to specify coverage under Order No. R9-2013-0001 for those Phase I MS4 discharges within the jurisdictional boundaries of the Cities of Laguna Woods, ~~and~~ Laguna Hills, Murrieta, and Wildomar within the Santa Ana Region. ~~The f~~Footnote 1 to Table B-1 specifies that the Cities~~y~~ of Laguna Woods and Laguna Hills are identified as responsible Copermittees in the San Diego Creek/Newport Bay TMDL in the Santa Ana Region and remain obligated to comply with the San Diego Creek/Newport Bay TMDL pursuant to section XVIII of Tentative Order No. R8-2015-0001 (NPDES No. CAS618030) and any reissuance thereof. Footnote 4 to Table B-1 specifies that the Cities of Murrieta and Wildomar are identified as responsible Copermittees in the Lake Elsinore/Canyon Lake Nutrient TMDLs in the Santa Ana Region and remain obligated to comply with the Lake Elsinore/Canyon Lake Nutrient TMDLs pursuant to section VI.D.2 of Order No. R8-2010-0033 (NPDES No. CAS618030) or corresponding section as it may be amended or reissued.

The Cities~~y~~ of Lake Forest and Menifee ~~is~~ are located partially within the jurisdictions of both the Santa Ana Water Board and the San Diego Water Board. Written requests for designation of a single Regional Water Board to regulate matters pertaining to

permitting of Phase I MS4 discharges were submitted to the San Diego Water Board and the Santa Ana Water Board by the City of Lake Forest by letters dated January 14, 2013 and April 4, 2014, and the City of Menifee by letter dated June 25, 2015. The Cities of Lake Forest and Menifee requested designation of the San Ana Water Board pursuant to CWC section 13228. ~~By letters dated January 14, 2013 and April 4, 2014 the City of Lake Forest submitted a written request, pursuant to CWC section 13228, to the San Diego Water Board and the Santa Ana Water Board requesting the Santa Ana Water Board be designated to regulate matters within the City of Lake Forest pertaining to permitting of their Phase I MS4 discharges.~~

The Cities~~y~~ of Lake Forest and Menifee reported that management and implementation of municipal programs to comply with two different Phase I MS4 permits creates a significant administrative and financial burden and inhibits their ability to contribute to greater overall water quality improvements in either Region. In an effort to address these concerns, the San Diego Water Board and the Santa Ana Water Board have entered into ~~an~~ written agreements ~~dated February 10, 2015~~, whereby the Santa Ana Water Board is designated to regulate Phase I MS4 discharges within the jurisdictions of the Cities~~y~~ of Lake Forest and Menifee including the portions of the jurisdictions within the San Diego Region. The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated February 10, 2015 to designate the San Ana Water Board to regulate Phase I MS4 discharges within the jurisdiction of the City of Lake Forest, including portions of the jurisdiction within the Santa Diego Region, upon the later date of ~~this~~ Order No. R9-2015-0001 or Santa Ana Water Board Tentative Order No. R8-2015-0001. The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated October 26, 2015 to designate the San Ana Water Board to regulate Phase I MS4 discharges within the jurisdiction of the City of Menifee, including portions of the jurisdiction within the San Diego Region, under Order No. R8-2010-0033 (NPDES No. CAS618030) as it may be amended or reissued upon the effective date of Order No. R9-2015-0100.

Under the terms of the agreements, each Regional Water Board retains the authority to enforce provisions of the Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee (Water Code section 13228 (b)). Also under the terms of the agreements, any TMDL and associated Phase I MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities~~y~~ of Lake Forest or Menifee as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement authority for the applicable TMDL would remain with the Regional Water Board which has the jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's San Diego Creek/Newport Bay TMDL and Lake Elsinore/Canyon Lake Nutrient TMDLs, and the San Diego Water Board's Indicator Bacteria Project I Beaches and Creeks TMDL.

In conformance with the~~is~~ agreements, ~~a f~~Footnote 2 to Table B-1 has been included to specify that Phase I MS4 discharges within the jurisdictional boundaries of the City of Lake Forest located within the San Diego Region will be regulated under Santa Ana Water Board Order No. R8-2015-0001 (NPDES No. CAS618030) and any reissuance thereof. The footnote specifies that the City of Lake Forest is an identified responsible Copermittee in the Indicator Bacteria Project I Beaches and Creeks TMDL (Bacteria TMDL) in the San Diego Region and remains obligated to comply with the Bacteria TMDL pursuant to Attachment E of Order No. R9-2013-0001 and any reissuance thereto. The City of Lake Forest is also identified as a responsible Copermittee in the San Diego Creek/Newport Bay TMDL established by the Santa Ana Water Board. The City remains obligated to comply with the San Diego Creek/New Port Bay TMDL pursuant to the Santa Ana Water Board's Phase I MS4 Permit (Tentative Order No. R8-2015-0001 (NPDES No. CAS618030), as it may be amended or reissued). Under the terms of the agreement, the City of Lake Forest must retain and continue implementation of the over irrigation prohibition in Title 15, Chapter 15, Section 14.030, List (b) of the City Municipal Code throughout its jurisdiction. Also under the terms of the agreement, the City of Lake Forest must actively participate in the development and implementation of the ~~Aliso Creek~~ South Orange County Watershed Management Area Water Quality Improvement Plan required pursuant to Order No. R9-2013-0001, and any reissuance thereof.

Footnote 3 to Table B-1 has been included to specify that Phase I MS4 discharges within the jurisdictional boundaries of the City of Menifee located within the San Diego Region will be regulated under Santa Ana Water Board Order No. R8-2010-0033 (NPDES No. CAS618033) and any reissuance thereof. At this time, the City of Menifee is not identified as a responsible Copermittee for any TMDLs established by the San Diego Water Board. Under the terms of the agreement, the City of Menifee must actively participate in the development and implementation of the Santa Margarita River Watershed Management Area Water Quality Improvement Plan required pursuant to Order No. R9-2013-0001, and any reissuance thereof.

The basis supporting the Cities of Laguna Woods, Laguna Hills, ~~and~~ Lake Forest, Menifee, Murrieta, and Wildomar requests to designate a specific Regional Water Board for regulatory oversight of Phase I MS4 discharges may change under future conditions and circumstances, therefore the San Diego Water Board will periodically review the effectiveness of the agreements during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate ~~the~~ one or both of the agreements with the Santa Ana Water Board or otherwise modify the agreements subject to the approval of the Santa Ana Water Board.

Provision B.2 (Priority Water Quality Conditions) requires the Copermittees in each Watershed Management Area to identify the highest priority water quality conditions which will be the focus of the Water Quality Improvement Plan implementation.

Provisions B.2.a and B.2.b provide the criteria that must be assessed when

characterizing the receiving water quality and potential impacts from MS4 discharges of the receiving waters within the Watershed Management Area. The criteria are based primarily on the requirements in 40 CFR 122.26(d)(1)(iv)(C) and (C)(1)-(9). Characterizing the receiving water quality and identifying the potential impacts caused by MS4 discharges to receiving waters in the Watershed Management Area is necessary to identify the impacts to receiving waters associated with MS4 discharges that are of the most concern to the Copermittees.

Based on the information required to be considered under Provisions B.2.a and B.2.b, Provision B.2.c requires to Copermittees to identify the highest priority water quality conditions related to discharges from the MS4s that will be the primary focus of the Water Quality Improvement Plan in the Watershed Management Area. Addressing and improving these highest priority water quality conditions will become the focus of each Copermittee's jurisdictional runoff management program as the Water Quality Improvement Plan is implemented in the Watershed Management Area. The highest priority water quality conditions are expected to include sources of pollutants and/or stressors, and/or receiving water conditions, that the Copermittees consider the highest threats or most likely to have adverse impacts on the physical, chemical, and biological integrity of receiving waters. Addressing these threats and/or adverse impacts should restore the physical, chemical, and biological integrity of receiving waters, and result in the restoration and protection of the beneficial uses of the receiving waters in the Watershed Management Area.

Provision B.2.d requires the Copermittees to identify known and suspected sources of pollutants and/or stressors contributing to the highest priority water quality conditions. The requirements of Provision B.2.d are based primarily on the requirements in 40 CFR 122.26(d)(1)(iii)(B)(1)-(6). The Copermittees are required to evaluate several factors in the identification of those sources. The Copermittees must consider and evaluate the following: (1) the land uses that may contribute toward impacts to receiving waters, (2) the locations of the Copermittees' MS4s that can convey and discharge runoff and pollutants to receiving waters, (3) other sources that discharge into the Copermittees' MS4s and receiving waters, and (4) other information and data that can help the Copermittees to evaluate the relative importance of or contribution from those sources toward the highest priority water quality conditions. Identifying the known and suspected sources, and their relative contribution toward the highest priority water quality conditions, will help the Copermittees to focus, direct, and prioritize their resources and implementation efforts within their jurisdictions.

Provision B.2.e requires the Copermittees to identify potential strategies that can result in improvements to water quality in MS4 discharges and/or receiving waters within the Watershed Management Area. Potential water quality improvement strategies will not necessarily be implemented by the Copermittees, but provide a "menu" of options that the Copermittees will consider for implementation. The public participation process that will be implemented during the development of the Water Quality Improvement Plan is where the potential water quality improvement strategies will be identified.

Provision B.3 (Water Quality Improvement Goals, Strategies and Schedules) requires the Copermittees in each Watershed Management Area to identify the goals that the Copermittees' jurisdictional runoff management programs will work toward achieving to address and improve the highest priority water quality conditions identified under Provision B.2.c; the strategies that will be implemented by the Copermittees within their jurisdictions and the Watershed Management Area to achieve the goals; and, the schedules for implementing the strategies and achieving the goals. The element of the Water Quality Improvement Plan required under Provision B.3 is where the "*comprehensive planning*" and "*intergovernmental coordination*" [40 CFR 122.26(d)(2)(iv)] of the Copermittees' actions for the proposed management programs within the Watershed Management Area is required to be described.

Provision B.3.a requires the Copermittees to identify interim and final numeric goals, and schedules to achieve those goals as part of the Water Quality Improvement Plans. Provision B.3.a.(1) requires the Copermittees to identify two types of numeric goals to be achieved:

(1) Final numeric goals in the receiving waters and/or MS4 discharges that will result in the protection of the water quality standards of the receiving waters for the highest priority water quality conditions identified by the Copermittees for Provision B.2.c. These final numeric goals are the ultimate goals for the Water Quality Improvement Plan, and the achievement and maintenance of these final numeric goals will indicate that one or more beneficial uses have been successfully restored and/or protected from MS4 discharges.

(2) Interim numeric goals that can be used by the Copermittees to demonstrate progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges for the highest priority water quality conditions in the Watershed Management Area. Achievement of the interim numeric goals will demonstrate to the San Diego Water Board that the Copermittees' implementation efforts are progressing toward achieving the final numeric goals.

Provision B.3.a.(1) does not specify what the interim and final numeric goals must be based on, but they essentially must be designed to achieve compliance with water quality standards in the receiving waters. To that end, the interim goals must be based on measureable criteria or indicators capable of demonstrating progress toward achieving the numeric goals.

The interim and final numeric goals can be based on the water quality objectives in the Basin Plan. The water quality objectives in the Basin Plan, however, consist of numeric and narrative water quality objectives. Numeric water quality objectives can be directly used as numeric goals. Narrative water quality objectives, on the other hand, will require some interpretation to identify numeric goals. The achievement of multiple numeric goals based on the water quality objectives, used in combination,

may be necessary to demonstrate that beneficial uses have been restored and/or protected.

The Copermittees could also propose other numeric goals that are not necessarily water quality objectives from the Basin Plan. For example, the Copermittees could propose a numeric goal that consists of achieving some percent improvement of a measureable indicator, such as acreage of a specific habitat or increase in a specific plant or animal species population. Other examples may include pollutant load reductions, number of impaired waterbodies delisted from the List of Water Quality Impaired Segments, Index of Biological Integrity (IBI) scores, etc.

The Copermittees may choose to develop interim numeric goals based on the final numeric goals they develop, such as incremental steps toward ultimately achieving the final numeric goals. The Copermittees may also choose to develop interim numeric goals that are based on other measureable indicators that can indirectly indicate improvements and progress toward the final numeric goals.

There are no limits to the types of interim numeric goals that could be proposed by the Copermittees, other than the goals must be based on measureable criteria or indicators capable of demonstrating progress toward achieving the numeric goals. Likewise, there are no limits to the types of final numeric goals that could be proposed by the Copermittees, other than the goals must "*restore and protect the water quality standards of the receiving waters.*"

Finally, Provision B.3.a.(2) also requires the Copermittees to develop schedules for measuring progress and achieving the interim and final numeric goals. Several criteria are included for the development of the schedules, but the Copermittees are required to achieve the numeric goals as soon as possible, consistent with federal NPDES regulations (40 CFR 122.47(a)(1)).

The Copermittees are also required to incorporate any compliance schedules for applicable ASBS or TMDL requirements. Applicable ASBS and TMDL compliance schedules are set forth in Attachment A and Attachment E to the Order, respectively. The information provided by the Copermittees under Provision B.3.a.(2) will be used by the Copermittees and the San Diego Water Board to gauge and track the progress of the Copermittees' efforts in addressing the highest priority water quality conditions identified in the Water Quality Improvement Plan.

Provision B.3.b requires the Copermittees to identify the strategies and schedules to implement those strategies as part of the Water Quality Improvement Plans. Provision B.3.b requires the Copermittees to identify the water quality improvement strategies that will be and may be implemented within the Watershed Management Area to 1) reduce pollutants in storm water discharged from the MS4 to the MEP, 2) effectively prohibit non-storm water discharges from entering the MS4, 3) protect water quality standards in receiving waters by controlling MS4 discharges so that they do not cause

or contribute to exceedances of receiving water limitations, and 4) achieve applicable WQBELs that implement TMDLs. The Copermittees will select the strategies to be implemented based on the likely effectiveness and efficiency of the potential water quality improvement strategies identified under Provision B.2.e to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, and/or achieve the interim and final numeric goals identified under Provision B.3.a.

Provision B.3.b.(1) requires each Copermittee to identify the strategies that will be or may be implemented within its jurisdiction. Each Copermittee is required to describe the strategies it is committed to implementing as part of its jurisdictional runoff management requirements under Provisions E.2 through E.7, and the optional jurisdictional strategies that the Copermittee will implement, as necessary, to achieve the numeric goals.

Each Copermittee is expected to implement the optional jurisdictional strategies identified under Provisions B.3.b.(1)(b) when the jurisdictional strategies it has committed to implement under Provision B.3.b.(1)(a) are not making adequate progress toward the interim and final numeric goals in accordance with the schedules established under Provision B.3.a. Provision B.3.b.(1)(b)(v) requires each Copermittee to describe the circumstances necessary to trigger implementation of the optional jurisdictional strategies, in addition to the requirements of Provisions B.3.b.(1)(a).

The San Diego Water Board recognizes that there may be optional jurisdictional strategies that will likely require funding and/or resources for planning, permitting, procurement of labor and materials, and implementation. Thus, Provision B.3.b.(1)(b)(iv) requires each Copermittee to describe the funding and/or resources that are necessary to implement these optional jurisdictional strategies. This information may provide interested groups and members of the public an understanding of the resources that they could provide or assist in obtaining to implement these optional jurisdictional strategies.

Provision B.3.b.(2) requires the Copermittees in the Watershed Management Area to identify the regional or multi-jurisdictional strategies that may be implemented, as necessary, to achieve the numeric goals. Similar to the requirements of Provision B.3.b.(1)(b), these regional or multi-jurisdictional strategies will likely require funding and/or resources for planning, permitting, procurement of labor and materials, and implementation, and San Diego Water Board recognizes that these strategies may be difficult to implement with only Copermittee resources. Thus, Provision B.3.b.(2)(d) requires the Copermittees to describe the funding and/or resources necessary to implement these optional regional or multi-jurisdictional strategies. This information may provide interested groups and members of the public an understanding of the resources that they could provide or assist in obtaining to implement these optional regional or multi-jurisdictional strategies.

Provision B.3.b.(3) requires the Copermittees to develop and include schedules in the Water Quality Improvement Plan for implementing the water quality improvement strategies identified under Provisions B.3.b.(1) and B.3.b.(2). The schedule for implementing the water quality improvement strategies will be used by the Copermittees and San Diego Water Board to measure and demonstrate the progress of the Copermittees' implementation efforts toward reducing pollutants in storm water discharged from the MS4 to the MEP, and eliminating illicit non-storm water discharges from entering the MS4.

Provision B.3.b.(4) provides the Copermittees in each Watershed Management Area the option of implementing watershed-specific structural BMP requirements for Priority Development Projects. Historically, storm water permits have included very specific performance standards for permanent, structural BMPs. These standards describe the expectation for the capture or treatment of pollutants and control of excessive flow before storm water is discharged from a site. The Copermittees were also allowed to develop waiver programs for Priority Development Projects to avoid implementing the structural BMPs; however, the waiver programs were not necessarily tied into any sort of holistic watershed strategy. The result is that implementation of BMP requirements is largely done on a site-by-site basis. This requires proper design on the part of the Priority Development Project and strict oversight on the part of the Copermittee.

Provision B.3.b.(4) promotes the evaluation of multiple strategies for water quality improvement, in addition to the implementation of permanent structural BMPs, on a watershed-scale versus the site-by-site approach. In a report issued by the Southern California Coastal Water Research Project (SCCWRP) and several other research institutions, the report emphasized that a successful hydromodification management program will involve watershed analysis as a first step, and that integrating multiple watershed-based strategies is preferable over a site-by-site approach. Indeed, the report states that the watershed analysis "…*should lead to identification of existing opportunities and constraints that can be used to help prioritize areas of greater concern, areas of restoration potential, infrastructure constraints, and pathways for potential cumulative effects*."[22] Provision B.3.b.(4) promotes the findings and recommendations of the report by providing a pathway for Copermittees to develop an integrated approach to their land development programs.

Under Provision B.3.b.(4), the Copermittees in a Watershed Management Area must first perform an analysis by gathering as much information pertaining to the physical characteristics of the Watershed Management Area as possible. This includes, for example, identifying potential areas of coarse sediment supply, present and anticipated future land uses, and locations of physical structures within receiving streams and upland areas that affect the watershed hydrology (such as bridges,

[22] 2012. ED Stein, F Federico, DB Booth, BP Bledsoe, C Bowles, Z Rubin, GM Kondolf, A Sengupta. Technical Report 667. Southern California Coastal Water Research Project. Costa Mesa, CA.

culverts, and flood management basins). Once this information is collected, the Copermittees must produce GIS layers (maps) that include this information.

From there, the Copermittees must use the results of the Watershed Management Area Analysis to identify and compile a list of candidate projects that could potentially be used as alternative compliance options for Priority Development Projects. Such projects include, for example, opportunities for stream or riparian area rehabilitation, opportunities for retrofitting existing infrastructure to incorporate storm water retention or treatment, and opportunities for regional BMPs, among others. Once these candidate projects are identified, Copermittees may allow Priority Development Projects to fund, partially fund, or completely implement these candidate projects. The Copermittees must first find that implementing such a candidate project would provide greater overall benefit to the watershed than requiring implementation of the structural BMPs onsite, and also enter into a voluntary agreement with the Priority Development Project that authorizes this arrangement. The Copermittees may use Provision B.3.b.(4) as both 1) a mechanism to reach their stated goals of the Water Quality Improvement Plan by using Priority Development Projects to either fund or implement projects that will provide water quality benefit, and 2) an alternative to requiring strict adherence to the structural BMP design standards.

Additionally, Provision B.3.b.(4) allows the Copermittees to use the results of the Watershed Management Area Analysis to identify areas within the Watershed Management Area where it is appropriate to allow Priority Development Projects to be exempt from the hydromodification management BMP performance requirements. Provision E.3.c.(2) already allows exemptions for Priority Development Projects that discharge to a conveyance channel whose bed and bank are concrete lined from the point of discharge to an enclosed embayment or the Pacific Ocean. However, there may be cases where further exemptions are warranted. The Copermittees may identify such cases on a watershed basis and include them in the Watershed Management Area Analysis; however, they must provide the supporting rationale to support all claims for exemptions.

Provision B.3.b.(4) provides an innovative pathway for Copermittees to regulate their land development programs by allowing alternative compliance in lieu of implementing structural BMPs on each and every Priority Development Project. This approach facilitates the integration of watershed-scale solutions for improving overall water quality and assisting Copermittees to achieve their stated goals of the Water Quality Improvement Plan. The San Diego Water Board understands, however, that undertaking this approach, which involves extensive planning, could be resource intensive for the Copermittees. Therefore, the Watershed Management Area Analysis is optional and not a requirement. The Copermittees can choose not to perform the watershed planning and mapping exercise described in Provision B.3.b.(4), and instead choose to require strict implementation of the structural BMPs onsite, pursuant to Provision E.3.c.

Provision B.3.c is included to provide the Copermittees an option that allows the Copermittees to be deemed in compliance with the prohibitions and limitations (receiving water limitations) of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b. One or more Copermittees within a Watershed Management Area can choose to implement this option. This option is only expected to be utilized by a Copermittee that wishes to be deemed in compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b.

The alternative compliance pathway option included in Provision B.3.c is consistent with the approach described in Order WQ 2015-0075, *In the Matter of Review of Order No. R4-2012-0175, NPDES Permit No. CAS004001, Waste Discharge Requirements for Municipal Separate Storm Sewer System (MS4) Discharges within the Coastal Watersheds of Los Angeles County, Except Those Discharges Originating from the City of Long Beach MS4,* adopted by the State Water Board on June 16, 2015. State Water Board Order WQ 2015-0075 directs the Regional Water Boards to consider a watershed-based planning and implementation approach to compliance with receiving water limitations when issuing Phase I MS4 permits going forward. Order WQ 2015-0075 included seven principles that the Regional Water Boards are expected to follow when incorporating an alternative compliance pathway into a MS4 permit. The San Diego Water Board incorporated the seven principles stipulated in State Water Board Order WQ 2015-0075 into the Regional MS4 Permit as follows:

1. Provision A of this Order continues to require compliance with water quality standards in the receiving water and does not deem good faith engagement in the iterative process to constitute compliance with receiving water limitations. Provision A of this Order continues to be consistent with the receiving water limitations provisions from State Water Board Order WQ 99-05.

2. Compliance with Provision B.3.c constitutes compliance with the requirements of the Provision A.3.b, which requires compliance with the WQBELs of the TMDLs in Attachment E to the Order, and is considered compliance with receiving water limitations for those TMDL water body-pollutant combinations.

3. Provision B.3.c is an ambitious, rigorous, and transparent alternative compliance pathway that allows a Copermittee appropriate time to come into compliance with receiving water limitations without being in violation of the receiving water limitations during implementation of the compliance alternative.

4. Provision B.3.c requirements are incorporated into a Water Quality Improvement Plan. Water Quality Improvement Plans are a watershed-based planning and implementation approach, which address multiple contaminants, and incorporate TMDL requirements.

5. The strategies required to be included in the Water Quality Improvement Plans promote and incentivize the use of green infrastructure and requires the implementation of low impact development principles.

6. The strategies required to be included in the Water Quality Improvement Plans encourage multi-benefit regional projects that capture, infiltrate, and reuse storm water and support a local sustainable water supply.

7. The alternative compliance pathway of Provision B.3.c includes rigor and accountability. The Copermittee is required, through a transparent public process, to demonstrate that water quality issues in the watershed have been analyzed and prioritized, and that appropriate solutions are proposed. The Copermittee is also required, through a transparent process, to monitor the results and return to their analysis to verify assumptions and update the solutions. The Copermittee is required to conduct this type of adaptive management on its own initiative without waiting for direction from the San Diego Water Board.

In order for a Copermittee to utilize this option, the Copermittee is required to include three components in the Water Quality Improvement Plan. The first component is a comprehensive set of numeric goals and schedules that will demonstrate the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b will be achieved within a specified period of time. The criteria provided in the Order will require the Copermittee to demonstrate that the discharges from its MS4s will not cause or contribute to exceedances of water quality objectives in the receiving waters, and/or the receiving waters will be adequately protected from adverse impacts attributable to the Copermittee's MS4 discharges. The Copermittee is also required to specify annual milestones to be achieved each year, which adds rigor, accountability, and transparency to the process. The annual milestones may consist of water quality improvement strategy implementation phases, interim numeric goals, and other acceptable metrics, which are expected to build upon previous milestones and lead to the achievement of the final numeric goals.

The second component is an analysis to demonstrate that implementation of the water quality improvement strategies required under Provision B.3.b will achieve the numeric goals within the established schedules required under Provisions B.3.a and B.3.c.(1). Because the development of the analysis may require significant resources, the Order allows the Copermittees in each Watershed Management Area that choose to implement this option to perform the analysis individually, or pool their resources for the analysis collectively.

The analysis must "reasonably" and "quantitatively" demonstrate that the implementation of the water quality improvement strategies can achieve the numeric goals within the established schedules. However, as more data and information are collected during implementation of the Water Quality Improvement Plan to demonstrate progress toward achieving the numeric goals, the numeric goals, water quality improvement strategies and schedules may need to be modified. If the data and information indicate that modification is needed, the Copermittee must also update the analysis. With the exception of numeric goals and schedules associated with

TMDLs from Attachment E to the Order, the modification to the analysis would be allowed as part of the adaptive management process of the Water Quality Improvement Plan. For TMDLs, modification of numeric goals or schedules would likely require an amendment to the Basin Plan and Attachment E to the Order before the analysis and Water Quality Improvement Plan could include such modifications.

Thus, the third component is the key component that allows a Copermittee to demonstrate the implementation of the water quality improvement strategies within its jurisdiction is making progress toward achieving the final numeric goals. Each Copermittee must specify the monitoring and assessments that will be performed to confirm that implementation of the water quality improvement strategies are making progress toward achieving the numeric goals within the established schedules, and whether the interim and final numeric goals have been achieved.

These three components must then be reviewed by the Water Quality Improvement Consultation Panel. The Water Quality Improvement Consultation Panel is required to be formed as part of the public participation process for the development of the Water Quality Improvement Plans. The Water Quality Improvement Consultation Panel is described under Provision F.1.a.(1)(b). Review by the Water Quality Improvement Consultation Panel is included to provide an additional layer of input, support, and accountability for the implementation of this option.

Compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b begins when the Water Quality Improvement Plan, incorporating the requirements of Provision B.3.c.(1), is accepted by the San Diego Water Board. Each Copermittee that chooses to implement and continues to implement this option will be deemed in compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b as long as the Copermittee continues to implement the strategies, monitoring and assessments as incorporated in the Water Quality Improvement Plan in accordance with Provision B.3.c.(1), and the Copermittee reports the achievement of the annual milestones each year, or provides acceptable rationale and recommends appropriate modifications to the interim numeric goals, and/or water quality improvement strategies, and/or schedules to improve the rate of progress toward achieving the final numeric goals. The Copermittee continues to be deemed in compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b during the time the San Diego Water Board reviews the rationale and recommended modifications to the interim numeric goals, and/or water quality improvement strategies, and/or schedules. If and when the San Diego Water Board determines that it does not accept the rationale or recommendations, the Copermittee will be notified they are no longer deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b.

Provision B.4 (Water Quality Improvement Monitoring and Assessment) requires the Copermittees to develop an integrated monitoring and assessment program to track the progress of the Water Quality Improvement Plan toward meeting the implementation goals and schedules, and improving the water quality of the

Watershed Management Area. Provision B.4 is the part of the Water Quality Improvement Plan where the Copermittees describe the monitoring data that will be collected, which is not only necessary to implement the "iterative approach" required by Provision A.4, but inform the adaptive management and "*comprehensive planning process*" that allows the Copermittees to make adjustments and modifications to the Water Quality Improvement Plans and the jurisdictional runoff management programs.

Provision B.4 requires the Copermittees, at a minimum, to include the requirements of Provision D as part of the water quality improvement monitoring and assessment program for the Water Quality Improvement Plan. The Copermittees, however, are not limited to the requirements of Provision D and may include additional monitoring and assessment methods to track progress toward improving water quality in the Watershed Management Area.

In addition to incorporating the requirements of Provision D, the water quality improvement monitoring and assessment program must incorporate any monitoring and assessment requirements specified for any applicable TMDLs included in Attachment E to the Order, and the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 for Watershed Management Areas with ASBS.

The monitoring and assessments required to be incorporated into the Water Quality Improvement Plan are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order.

Provision B.5 (Iterative Approach and Adaptive Management Process) requires the Copermittees to implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a.

Provision B.5 requires the Copermittees in each Watershed Management Area to re-evaluate the highest priority water quality conditions and potential water quality improvement strategies, the water quality improvement goals, strategies and schedules, and the water quality improvement monitoring and assessment program and provide recommendations for modifying those elements to improve the effectiveness of the Water Quality Improvement Plan. The re-evaluation of the Water Quality Improvement Plan is part of the assessment requirements of Provision D.

Provision B.6 (Water Quality Improvement Plan Submittal, Updates, and Implementation) requires to Copermittees to submit, update, and implement the Water Quality Improvement Plans.

The requirements for the process to develop and submit the Water Quality Improvement Plans is described in more detail under the discussion for Provision F.1. The process will include several opportunities for the public to provide input during the

development of the Water Quality Improvement Plans. The process for updating the Water Quality Improvement Plans is described in more detail under the discussion for Provision F.3.c. Upon acceptance of the Water Quality Improvement Plan and updates, the Copermittees are required to immediately begin implementing the Water Quality Improvement Plan and subsequent updates.

The Water Quality Improvement Plan is expected to be a dynamic document that will evolve over time. The Water Quality Improvement Plan is also expected to be a long term plan that focuses the Copermittees' efforts and resources on a limited set of priority water quality conditions, with the ultimate goal of protecting all the beneficial uses of the receiving waters within the Watershed Management Area from impacts that may be caused or contributed to by MS4 discharges. As the Copermittees collect data, implement their jurisdictional runoff management programs, and review the results from their water quality improvement monitoring and assessment program, the Water Quality Improvement Plan is expected to be continually reviewed and updated until compliance with Provisions A.1.a, A.1.b, and A.2.a is achieved.

However, in specific cases supported by robust analytical documentation the implementation of the Water Quality Improvement Plans may demonstrate that TMDLs are not necessary for identified impaired water bodies within the Watershed Management Area if the analytical record demonstrates that technology-based effluent limitations required by the CWA, more stringent effluent limitations required by state, local, or federal authority, and/or other pollution control requirements (e.g., best management practices) required by local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time.[23]

The San Diego Water Board submits an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. According to USEPA guidance for the Integrated Report,[24] water bodies are placed in one of five categories. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 are placed on the 303(d) List.

Category 4 in the Integrated Report is for water bodies where available data and/or information indicate that at least one beneficial use is not being supported or is threatened, but a TMDL is not needed.[25] Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality

[23] 40 CFR 130.7(b)(1)
[24] USEPA, 2005. Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act
[25] Ibid

standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

Impaired water bodies can be included in Category 4a if a TMDL has been adopted and approved. The TMDLs in Attachment E to the Order implement the requirements of the TMDLs adopted by the San Diego Water Board, and approved by the State Water Board and USEPA. The water bodies in Attachment E will be included in Category 4a in the Integrated Report and removed from the 303(d) List.

Impaired water bodies can be included in Category 4b if there are *acceptable* "pollution control requirements" required by a local, state or federal authority stringent enough to implement applicable water quality standards within a reasonable period of time (e.g., a compliance date is set). When evaluating whether a particular set of pollution controls are "requirements," the USEPA considers a number of factors, including: (1) the authority (local, state, federal) under which the controls are required and will be implemented with respect to sources contributing to the water quality impairment (examples may include: self-executing state or local regulations, permits, and contracts and grant/funding agreements that require implementation of necessary controls), (2) existing commitments made by the sources and completion or soon to be completed implementation of the controls (including an analysis of the amount of actual implementation that has already occurred), (3) the certainty of dedicated funding for the implementation of the controls, and (4) other relevant factors as determined by USEPA depending on case-specific circumstances.[26]

Impaired water bodies can be included in Category 4c if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution. Pollution, as defined by the CWA is "the man-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of water."[27] In other cases, pollution does not result from a pollutant and a TMDL is not required. Examples of circumstances where an impaired segment may be placed in Category 4c include segments impaired solely due to lack of adequate flow, stream channelization, or hydromodification. In these situations, there may be water quality management actions that can address the cause(s) of the impairment, but a TMDL may not be required to implement the actions.

The Water Quality Improvement Plans will require the implementation of pollution controls and water quality management actions (i.e. water quality improvement strategies) which can result in the attainment of water quality standards in water bodies impaired by discharges from the Copermittees' MS4s. The Water Quality Improvement Plans also include requirements that are expected to attain water quality standards in a reasonable period of time. The San Diego Water Board considers the Water Quality Improvement Plans to be a commitment by the Copermittees to

[26] Ibid
[27] CWA section 502(19)

develop, plan, budget for, and implement pollution controls that will attain water quality standards in receiving waters in a reasonable period of time, or as soon as possible. The results of the Copermittees' efforts in implementing the Water Quality Improvement Plans can be used to re-evaluate the condition of the impaired water bodies during the next update to the 303(d) List.

After the Copermittees submit the Water Quality Improvement Plans and demonstrate that water quality standards are being attained or will be attained in a reasonable period of time, the San Diego Water Board may re-evaluate the water bodies on the 303(d) List. These water bodies on the 303(d) List may be re-evaluated and placed into Category 4b or Category 4c in the Integrated Report. The water bodies placed in Category 4b or Category 4c in the Integrated Report must show a record that the water bodies are attaining water quality standards or supporting the identified beneficial uses, or will attain water quality standards or support identified beneficial uses in a reasonable period of time, in order for the water bodies to be appropriately removed from the 303(d) List.

C. Action Levels

Purpose: Provision C includes requirements for the Copermittees to identify and include numeric action levels in the Water Quality Improvement Plan to direct and focus the Copermittees' jurisdictional runoff management program implementation efforts for controlling MS4 discharges to receiving waters.

***Discussion*:** Under Provision C, the numeric action levels required are for non-storm water discharges and storm water discharges. The non-storm water action levels (NALs) are applicable to non-storm water discharges from the Copermittees' MS4s, which can occur year-round. The storm water action levels (SALs) are applicable to storm water discharges from the Copermittees' MS4s, which occur during the rainy season defined as the period between October 1 and April 30.

The action levels required by Provision C are based on the action level requirements that were developed and incorporated into Order Nos. R9-2009-0002 and R9-2010-0016, the Orange County and Riverside County MS4 Permits, respectively. The Fact Sheets for these Orders provide detailed discussions about the development of the numeric NALs and SALs included in this Order.

Order Nos. R9-2009-0002 and R9-2010-0016 required the Copermittees to perform prescribed actions if the NALs or SALs are exceeded. The actions required under Order Nos. R9-2009-0002 and R9-2010-0016 generally included conducting additional monitoring and source investigations when a discharge from the MS4 is observed to exceed one or more NALs and/or SALs.

For this Order, however, the action levels of Provision C are to be used by the Copermittees to prioritize the actions to be implemented as part of the Water Quality Improvement Plan. Monitoring data collected by the Copermittees from MS4 outfalls will be compared with the NALs and SALs. Exceedances of the NALs and SALs will not require the Copermittees to immediately identify sources causing exceedances, but will provide some numeric indicator levels that can give the Copermittees a way to measure the relative severity of a pollutant contributing to receiving water quality impacts.

NALs and SALs must be included in the Water Quality Improvement Plans to be used by the Copermittees in directing and focusing their water quality improvement strategies. The Copermittees are expected to utilize the NALs and SALs to help focus their implementation efforts on addressing pollutants that have the most significant potential or observed impacts to receiving waters. The NALs and SALs will be used as part of the MS4 discharges assessments required under Provision D.4.b. The NALs and SALs may also be used by the Copermittees as the numeric goals to be achieved in MS4 discharges and/or receiving waters as the Water Quality Improvement Plans are implemented.

More specific and detailed discussions of the requirements of Provision C are provided below.

Provision C.1 (Non-storm Water Action Levels) requires the Copermittees to incorporate NALs into the Water Quality Improvement Plan for pollutants and/or constituents that are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions identified in the Water Quality Improvement Plan related to non-storm water discharges from the MS4s. NALs generally must be consistent with the water quality objectives found within the Basin Plan.

The NALs have been included to ensure that the Copermittees are implementing and complying with several requirements of the MS4 permit. The federal CWA requires permits for municipal storm sewer systems to "*effectively prohibit non-storm water discharges into the storm sewers*." The federal NPDES regulations, which were promulgated to implement the CWA requirements for discharges from municipal storm sewers, require a program to address illicit discharges, which are non-storm water discharges. Provision A.1.b prohibits "*[n]on-storm water discharges into MS4s*" unless the non-storm water discharge authorized by a separate NPDES permit. The NALs will be used as part of the illicit discharge detection and elimination program required pursuant to Provision E.2, as well as part of the MS4 discharges assessments required pursuant to Provision D.4.b.

Provision A.1.a prohibits non-storm water discharges from the MS4 from "*causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state.*" In addition, pursuant to Provision A.2.a, non-storm water discharges "*must not cause or contribute to the violation of water quality standards in any receiving waters*."

Ideally, the Copermittees' jurisdictional runoff management programs will eliminate all non-storm water discharges entering the MS4s within their jurisdictions. The complete elimination of non-storm water discharges to the Copermittees' MS4s would be in compliance with the CWA requirements for non-storm water discharges, as well as the prohibitions and limitations of Provisions A.1.a and A.2.a.

The federal regulations, however, also refer to several non-storm water discharge categories that must be addressed as illicit discharges if they are found to be a source of pollutants. The federal regulations thus identify some non-storm water discharges that are not required to be addressed as illicit discharges if they are not a source of pollutants (e.g. non-storm water discharges specified in Provisions E.2.a.(1)-(5)). Thus, these regulations imply that some non-storm water discharges into and from the MS4 may occur even if non-storm water discharges are "effectively" prohibited by the Copermittees.

If the source of a non-storm water discharge is identified as a category of non-storm water specified in Provisions E.2.a.(1)-(5), the NALs can be used to determine if the category of non-storm water discharges is a source of pollutants. For other non-storm water discharges not specified in Provisions E.2.a.(1)-(5), the CWA requires those discharges to be "*effectively"* prohibited by removing the discharge to the MS4 through enforcement of the Copermittees' legal authority established under "*ordinance, order or similar means*" to prohibit illicit discharges to the MS4s.

If there are non-storm water discharges that are not required to be addressed as illicit discharges, those discharges must comply, at a minimum, with the discharge prohibitions and receiving water limitations of Provision A. Thus, the non-storm water discharges from the MS4 must be at levels that will not cause or contribute to a condition of pollution, contamination, or nuisance (Provision A.1.a), and must not cause or contribute to a violation of water quality standards in receiving waters (Provision A.2.a) to be consistent with the discharge prohibitions and receiving water limitations of Provisions A.1.a and A.2.a.

Furthermore, the San Diego Region has predominantly intermittent and ephemeral rivers and streams which vary in flow volume and duration at spatial and temporal scales. For most of these river and stream systems, non-storm water discharges from the MS4 are likely to be the most significant or the only source contributing to surface flows present within the receiving water, especially during the dry season.

Therefore, because of the prohibitions and limitations of Provision A.1.a and A.2.a, and the likelihood that non-storm water discharges from the MS4 are the most significant or only source contributing to surface flows present within the receiving water, NALs generally must be consistent with the water quality objectives found within the Basin Plan. Non-storm water discharges that are meeting the NALs would not be expected to cause or contribute to an exceedance of water quality objectives in receiving waters, which would be consistent with the discharge prohibitions and receiving water limitations of Provisions A.1.a and A.2.a.

Exceedances of the NALs would then provide an indication of the relative severity of a pollutant in non-storm water discharges from the MS4 contributing to potential or observed receiving water quality impacts. The relative severity or significance of a pollutant in non-storm water discharges from the MS4 will provide the Copermittees a valuable source of information that can be used to identify priority water quality conditions within a Watershed Management Area and within each Copermittee's jurisdiction.

Tables C-1 through C-4 under Provision C.1.a specify numeric NALs for several parameters or pollutant constituents for non-storm water discharges from the MS4 to several water body types. The NALs for MS4 discharges given under Provision C.1.a are based on the water quality objectives for inland surface waters in the Basin Plan, and the water quality objectives for ocean waters in the Ocean Plan. The NALs for

most of the metals were calculated based on the State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP). The NALs provided in Tables C-1 through C-4 must be included in the Water Quality Improvement Plans required to be developed pursuant to Provision B.

Provision C.1.b requires the Copermittees to identify NALs for pollutants and/or constituents, not specified in Provision C.1.a, which are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions of the Watershed Management Area related to non-storm water discharges from the MS4s. The NALs must be based on the water quality objectives in the Basin Plan. The NALs identified under Provision C.1.b must be included in the Water Quality Improvement Plan.

The San Diego Water Board recognizes that some of the NALs required pursuant to Provisions C.1.a and C.1.b may be exceeded more frequently than not. Thus, Provision C.1.c has been included in the Order to provide the Copermittees the option to develop secondary NALs that are set at levels greater than the levels required pursuant to Provisions C.1.a and C.1.b to further refine the prioritization and assessment of water quality improvement strategies for addressing non-storm water discharges to and from the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and from the MS4.

Provision C.2 (Storm Water Action Levels) requires the Copermittees to incorporate SALs into the Water Quality Improvement Plan for pollutants and/or constituents causing or contributing, or may be causing or contributing, to the highest priority water quality conditions identified in the Water Quality Improvement Plan related to storm water discharges from the MS4s.

The SALs have been included to ensure that the Copermittees are implementing and complying with several requirements of the MS4 permit. Provision A.1.a prohibits storm water discharges from the MS4 from "*causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state.*" In addition, pursuant to Provision A.2.a, storm water discharges "*must not cause or contribute to the violation of water quality standards in any receiving waters*."

Provision A.3.a, however, implicitly acknowledges that compliance with Provisions A.1.a and A.2.a cannot be achieved immediately for discharges of storm water from the MS4 by applying the MEP standard. Thus, Provision A.4 requires the Copermittees to implement an iterative approach to demonstrate that MEP is being achieved. This approach is supported by USEPA.

The federal CWA requires permits for municipal storm sewer systems to "*require controls to reduce the discharge of pollutants [in storm water] to the maximum extent*

practicable, *including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants.*" MEP is an ever-evolving, flexible, and advancing concept. As knowledge about controlling storm water runoff and discharges evolves, so does the knowledge which constitutes MEP. Reducing the discharge of storm water pollutants from the MS4 to the MEP requires the Copermittees to assess their jurisdictional runoff management programs and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP. The SALs provide the Copermittees measureable goals that may be used to demonstrate the achievement of MEP for reducing pollutants in storm water discharges from the MS4. The SALs will be used as part of the MS4 discharges assessments required under Provision D.4.a.

In June of 2006, the State Water Board's Blue Ribbon Storm Water Panel released its report titled "*The Feasibility of Numerical Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities*." In the recommendations, the Blue Ribbon panel proposed storm water effluent limitations which are computed using statistical based population approaches. The SALs specified in Table C-5 under Provision C.2.a were developed from a regional subset of nationwide Phase I MS4 data by using USEPA Rain Zone 6 (arid west) data.[28] Additionally, utilization of regional data is appropriate due to the addition of data into the nationwide Phase I MS4 monitoring dataset in February 2008. This additional data increased the number of USEPA Rain Zone 6 samples to more than 400, and included additional monitoring events within Southern California.

Utilizing data from USEPA Rain Zone 6 resulted in SALs which closely reflect the environmental conditions experienced in the San Diego Region. The localized subset of data includes sampling events from multiple Southern California locations including Orange, San Diego, Riverside, Los Angeles, and San Bernardino Counties. The dataset includes samples taken from highly built-out impervious areas and from storm events representative of Southern California conditions.

The SALs for cadmium, copper, lead and zinc require the measurement of hardness and to provide more specificity in the assessment of samples with SALs for total metal concentrations. While USEPA Rain Zone 6 data include a large sample size for concentrations of total metals, the impact the concentration will have on receiving waters will vary with receiving water hardness. Since it is the goal of the SALs, through the iterative process and MEP standard, to have MS4 storm water discharges meet all applicable water quality objectives, the hardness of the receiving water should be used when assessing the total metal concentration of a sample.

Thus, when there is an exceedance of a SAL for a metal, the Copermittee must determine if that exceedance is above the existing applicable water quality objectives

[28] Data used to develop SAL were obtained from http://rpitt.eng.ua.edu/Research/ms4/mainms4.shtml

based upon the hardness of the receiving water. The water quality objectives Copermittees must use to assess total metal SAL exceedances are the California Toxic Rule (CTR) and USEPA National Recommended Water Quality Criteria for Freshwater Aquatic Life 1 hour maximum concentrations. The 1-hour maximum concentration is to be used for comparison since it is expected to most replicate the impacts to waters of the State from the first flush following a precipitation event.

The statistically calculated SALs given in Table C-5 are at levels greater than the water quality objectives in the Basin Plan or Ocean Plan. Because the objective of the CWA is to "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*", meaning eventually pollutants in storm water discharges must be reduced to a level that cannot cause or contribute to an exceedance of water quality objectives in receiving waters, over time the SALs are expected to be reduced to a level that is based on the water quality objectives rather than statistical calculations. The San Diego Water Board will review the SALs as more data for discharges of storm water from the MS4s are collected, and revise them as conditions improve and the MEP standard advances. For the Water Quality Improvement Plans required under this Order, the SALs identified under Provision C.2.a must be included.

Provision C.2.b requires the Copermittees to identify SALs for pollutants and/or constituents, not specified in Provision C.2.a, which are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions of the Watershed Management Area related to storm water discharges from the MS4s. The SALs identified under Provision C.2.b must be included in the Water Quality Improvement Plan.

The San Diego Water Board recognizes that some of the SALs required pursuant to Provisions C.2.a and C.2.b may be exceeded more frequently than not. Thus, Provision C.2.c has been included in the Order to provide the Copermittees the option to develop secondary SALs that are set at levels greater than the levels required pursuant to Provisions C.2.a and C.2.b to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s.

D. Monitoring and Assessment Program Requirements

Purpose: Provision D includes minimum monitoring and assessment requirements that must be developed and implemented by the Copermittees as part of the Water Quality Improvement Plans. Implementation of the monitoring and assessment requirements of Provision D will allow the Copermittees to demonstrate that the requirements of the CWA to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP are being achieved. Implementation of the monitoring and assessment requirements of Provision D will also allow the Copermittees and the San Diego Water Board to track improvements to the water quality in the San Diego Region. The monitoring and assessment program requirements are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order.

***Discussion*:** The San Diego Water Board recognized that changes to the monitoring and assessment requirements of the Fourth Term Permit were necessary to improve the usefulness and usability of monitoring data collected by the Copermittees to support their jurisdictional storm water programs more efficiently and with increased effectiveness. The data collected are needed to better inform the Copermittees' understanding of the physical, chemical, and biological condition of the receiving waters and the quality of the MS4 discharges. The monitoring program needs to provide opportunities for the Copermittees to integrate regional monitoring efforts into municipal storm water monitoring requirements to provide a cost-effective approach to monitoring and avoid duplication of efforts.

The requirements in Provision D were largely recommended by the Copermittees as an outcome of the San Diego Water Boards Focused Meeting process. The monitoring and assessment program requirements now require collection of more specific information necessary for each Copermittee to adapt its jurisdictional runoff management program in such a way that focuses resources on a watershed's highest priority water quality conditions. The monitoring and assessment program will require the Copermittees to collect data that can be utilized to answer both watershed level management questions (e.g. Are the chemical, physical, and biological conditions of a receiving water protective, or likely protective of beneficial uses?), and specific jurisdictional runoff management program activity questions (e.g. Are the water quality improvement strategies of the jurisdictional program effectively eliminating non-storm water discharges to the MS4?).

The monitoring data collected and assessment information that will be reported to the San Diego Water Board are necessary to determine if the Copermittees are complying with the prohibitions and limitations of Provision A. The required monitoring and assessments that must be reported to the San Diego Water Board will be utilized for three purposes:

(1) Inform the Copermittees, San Diego Water Board, and the public on the progress of the Copermittees' efforts to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP;

(2) Inform the Copermittees, San Diego Water Board, and the public on the condition of water bodies receiving discharges from the Copermittees' MS4, and the progress of the Copermittees' water quality improvement implementation efforts toward improving the receiving water quality; and

(3) Inform the Copermittees, the San Diego Water Board, and the public on the effectiveness of the Water Quality Improvement Plan toward achieving (1) and (2).

The monitoring and assessment information reported pursuant to Provision F is also expected to be key to the iterative approach and adaptive management process required under Provision A.4 and implemented through the Water Quality Improvement Plan required under Provision B. As required by Provision A.4, the iterative approach and adaptive management process is required if the Copermittees cannot meet the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c, and/or A.2.a under the present conditions.

Provision D provides the minimum monitoring and assessment requirements that must be included in each Water Quality Improvement Plan to be developed and implemented by the Copermittees. The Copermittees, however, are not limited to the requirements of Provision D and may include additional methods to track progress toward improving water quality in a Watershed Management Area.

More specific and detailed discussions of the requirements of Provision D are provided below.

Provision D.1 (Receiving Water Monitoring Requirements) specifies the minimum receiving water monitoring that the Copermittees must conduct within the Watershed Management Area and include as part of the Water Quality Improvement Plan.

Provision D.1 establishes minimum monitoring requirements that must be conducted by the Copermittees within each Watershed Management Area. Provision D.1 requires the Copermittees to collect and develop the data and information necessary to determine potential impacts to the beneficial uses in the receiving waters due to discharges from the MS4s. The monitoring required under Provision D.1 will also provide the data that will allow the Copermittees to gauge the effectiveness and progress of its Water Quality Improvement Plan implementation efforts toward improving the quality of receiving waters.

The receiving water monitoring requirements of Provision D.1 are focused primarily on monitoring the conditions and response of the receiving waters to the Copermittees'

collective implementation efforts to reduce receiving water impacts that may be caused by the discharges from the MS4s. The preference of the San Diego Water Board is for the Copermittees to spend their resources achieving tangible and observable improvements in receiving water conditions instead of collecting samples and analyzing data that has consistently indicated that receiving water conditions are degraded and require improvement. In general, the ability to measure potential improvements in receiving water conditions due to any actions implemented by the Copermittees as part of the Water Quality Improvement Plan may require several years before a response can be observed. Thus, the frequency of collecting receiving water monitoring data has been kept to a minimum.

During the transitional period between adoption of this Order and San Diego Water Board acceptance of a Water Quality Improvement Plan, the Copermittees must conduct receiving water monitoring in accordance with Provision D.1.a. This approach to collecting receiving water data is different from what was required in the Fourth Term Permits, but one that truly embraces the concept of an integrated, cost-effective, streamlined receiving water monitoring approach.

Provision D.1.a requires Copermittees to continue performing the receiving water monitoring programs required in Order Nos. R-2007-0001, R9-2009-002, and R9-2010-0016; plus participation in: hydromodification management plan monitoring approved by the San Diego Water Board, monitoring plans as part of load reduction plans (either Bacteria Load Reduction Plans or Comprehensive Load Reduction Plans) for TMDLs in Attachment E of the Order, Storm Water Monitoring Coalition Regional Monitoring, Southern California Bight Regional Monitoring, Sediment Quality Monitoring, and ASBS Monitoring as applicable to a Watershed Management Area.

Provision D.1.a also provides an opportunity for the Copermittees to use third party data to meet receiving water monitoring requirements where feasible. Allowing the Copermittees to use the data currently collected through its participation in existing regional receiving water programs and that of third parties provides an efficiency of resources in obtaining the data necessary to inform the Copermittees and the San Diego Water Board about the physical, chemical, and biological conditions of the receiving waters, which can also help to focus the receiving water monitoring during the implementation of the Water Quality Improvement Plan. Once a Water Quality Improvement Plan is developed for a Watershed Management Area in compliance with Provision B of this Order, the transitional period is over and Copermittees are required to conduct receiving water monitoring according to the requirements of Provisions D.1.b-e.

Provision D.1.b requires each Copermittee to identify at least one long term receiving water monitoring station to be representative of receiving water quality within each Watershed Management Area. Long term receiving water monitoring stations can be located at any existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees. The requirements under Provision D.1.b. are

consistent with 40 CFR 122.26(d)(2)(iii)(D), which specifies that a "*monitoring program for representative data collection for the term of the permit*" may include "*instream locations.*" For each Watershed Management Area, at least one long term watershed monitoring station is required to be established and monitored. The Copermittees may choose to establish additional long term monitoring stations where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

Provision D.1.b. requires the Copermittees to locate the long term receiving water monitoring station at one of these existing receiving water monitoring stations to provide the Copermittees an opportunity to experience monitoring cost savings while continuing to collect the necessary data to assess the status and trends of receiving water quality conditions in 1) coastal water, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under both dry weather and wet weather conditions. Ideally these stations will continue to be monitored as part of the receiving water monitoring for each Watershed Management Area to maintain a consistent set of locations and a period of data that can be built upon with the monitoring required under this Order.

The receiving water monitoring requirements are separated into monitoring required during dry weather conditions pursuant to Provision D.1.c, and wet weather conditions pursuant to Provision D.1.d.

At each long term monitoring station the Copermittees must conduct at least three dry weather monitoring events as required pursuant to Provision D.1.c and at least three wet weather monitoring events as required pursuant to Provision D.1.d per permit term. Provisions D.1.c and D.1.d require the Copermittees to monitor priority water quality conditions identified in the Water Quality Improvement Plan, constituents listed as causing impairment of receiving waters in the Watershed Management Area, applicable NALs, toxicity, constituents listed in Tables D-2 and D-3, and constituents for implementation plans (e.g. Bacteria Load Reduction Plans and Comprehensive Load Reduction Plans). Required toxicity monitoring was changed to reflect an updated understanding of the unique challenges associated with sampling storm water for toxicity. Copermittees are required to sample receiving water for toxicity during each dry weather and each wet weather event pursuant to Provision D.1.c.(4) and D.1.d.(4). Required toxicity monitoring is now consistent with the State Water Resources Control Board Policy for Toxicity Assessment and Control (Draft June 2012) and recently adopted MS4 permits for Caltrans and Los Angeles Water Board. Receiving water monitoring efforts in this Order have been streamlined to redirect resources to monitoring efforts that better support pollutant reduction solutions with an increasing emphasis on MS4 outfall monitoring, source identification, and source abatement activities.

In addition to the receiving water monitoring requirements under Provisions D.1.b-d, Provision D.1.e requires the Copermittees participate in and/or conduct other types of receiving water monitoring. As recommended and requested by the Copermittees, Provision D.1.e.(1) requires the Copermittees to participate in existing regional monitoring, as applicable to each Watershed Management Area. Existing regional

monitoring includes monitoring conducted by the Storm Water Monitoring Coalition and for the Southern California Bight. Participation in and use of monitoring data collected from these existing regional water quality monitoring programs provide the Copermittees a greater opportunity for efficiency in the use of their resources to manage their storm water programs and those controllable discharges under their authority.

Provision D.1.e.(1)(c) requires the south Orange County MS4 Copermittees to participate in "unified regional beach water quality monitoring." This monitoring replaces requirements to conduct "core monitoring" of beach water quality, as provided for in Appendix III of the Ocean Plan.

Several different public agencies currently conduct routine, ongoing beach water quality monitoring in south Orange County in accordance with several different sets of requirements. The monitoring programs implemented to meet those requirements overlap temporally and spatially. These monitoring programs are partially but not fully integrated. In November 2010, the State Water Board adopted Resolution No. 2010-0053, which directed Regional Water Boards to work with dischargers to modify beach water quality monitoring programs required by Regional Water Board-issued permits in order to eliminate redundancies and incorporate beach water quality monitoring required by beach water quality statutes, where appropriate.

In April 2012, the San Diego Water Board requested that its staff review beach water quality monitoring conducted in south Orange County. To assist in responding to that request, staff of the Board convened a workgroup that included representatives of the three public agencies that currently conduct almost all of the routine, ongoing beach water quality monitoring in south Orange County, i.e., South Orange County Wastewater Authority (SOCWA), Orange County Public Works, and Orange County Health Care Agency (OCHCA). The workgroup also included other interested parties, including representatives of the Sierra Club and Surfrider Foundation. In December 2012, the San Diego Water Board adopted Resolution No. R9-2012-0069, which endorsed the San Diego Water Board staff report entitled "A Framework for Monitoring and Assessment in the San Diego Region," dated November 2012.

The unified program is consistent with and will meet or exceed the minimum requirements for beach water quality monitoring and related public notification and reporting established by State law, including the Ocean Plan. The unified program is consistent with State Water Board Resolution No. 2010-0053. The unified program is also consistent with and will help implement, "A Framework for Monitoring and Assessment in the San Diego Region," which emphasizes the need for question-driven, beneficial use-oriented monitoring and assessment. The primary purpose of the unified program will be to answer the question "Does beach water quality meet standards for the beneficial use of water contact recreation?"

The unified program is intended to be protective; it will help protect the health of swimmers, surfers, and others who use south Orange County beach waters for water

contact recreational activities. The unified program is also intended to be reasonable; it will eliminate duplicative monitoring and will include triggers for public notification and additional sampling at all sampling stations year-round. The unified program is intended to be equitable; responsibility for implementation of the unified program will be shared and the responsible agencies will jointly make arrangements to implement the program and will have the flexibility to jointly make short and/or long term changes in those arrangements.

The San Diego Water Board Executive Officer issued a written directive on December 5, 2014, pursuant to California Water Code section 13383, for SOCWA and the south Orange County MS4 Copermittees to implement the unified program in cooperation with OCHCA. The Executive Officer may make revisions to the unified program, provided that the unified program, as revised, continues to be consistent with and meet the requirements of State law, including the Ocean Plan, for beach water quality monitoring and related public notification and reporting. Following a thirty day public comment period, and subject to a request for a hearing before the San Diego Water Board, any such revision shall take effect as specified in a written directive issued by the Executive Officer pursuant to CWC section 13383. The program and any Executive Officer issued revisions to the program are subject to CWC section 13320 right of review from the date of issuance.

The unified program will supersede the existing routine, ongoing, beach water quality monitoring programs in south Orange County that are conducted in accordance with the existing requirements of the NPDES permits for discharges from the SOCWA ocean outfalls and the south Orange County MS4s. The requirement to participate in "regional monitoring" of beach water quality replaces requirements to conduct "core monitoring" of beach water quality, as provided for in Appendix III of the Ocean Plan.

The State Water Resources Control Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part 1 Sediment Quality which became effective August 25, 2009 (Sediment Quality Monitoring Policy). Provision D.1.e.(2) requires any Copermittees with MS4 discharges to an enclosed bay or estuary to monitoring the sediments in the enclosed bay or estuary receiving water in accordance with the sediment quality monitoring procedures as prescribed in the Sediment Quality Monitoring Policy.

The State Water Board adopted Resolution No. 2012-0012 which approved exceptions to the California Ocean Plan for selected discharges into Areas of Special Biological Significance (ASBS), including special protections for beneficial uses. State Board Resolution No. 2012-0012 became effective on March 20, 2012, and Attachment B to the Resolution established limitations on point source storm water discharges to ASBS. Copermittees with MS4s that discharge to an ASBS must monitor its discharge to assure compliance with State Board Resolution No. 2012-0012 as required pursuant to Provision D.1.e.(3).

The San Diego Water Board is developing a regional monitoring strategy to assess the conditions of receiving waters in the San Diego Region. The monitoring requirements of Provision D.1 are expected to be incorporated or serve as a foundation of this regional monitoring strategy, but may require some modifications. When the San Diego Water Board develops an alternative regional monitoring strategy, the Copermittees will be required to participate in the development and implementation of the alternative regional monitoring program pursuant to Provision D.1.f.

Provision D.2 (MS4 Outfall Discharge Monitoring Requirements) specifies the minimum MS4 outfall discharge monitoring requirements that the Copermittees must incorporate and implement as part of the Water Quality Improvement Plan.

The dry weather MS4 outfall discharge monitoring requirements are included under Provisions D.2.a.(2) and D.2.b. The dry weather MS4 outfall discharge monitoring requirements are part of the "*program, including a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer*" required by 40 CFR 122.26(d)(2)(iv)(B), which is expected to achieve compliance with the CWA section 402(p)(3)(B)(ii) statutory requirement for municipal storm water permits to require the Copermittees to "*effectively prohibit non-storm water discharges into the storm sewers*." The dry weather MS4 outfall discharge monitoring data collection requirements are based on requirements under 40 CFR 122.26(d)(1)(iv)(D) and 122.26(d)(2)(iv)(B)(3).

The dry weather MS4 outfall discharge monitoring requirements are designed to provide wide spatial and temporal coverage of each jurisdiction to better understand the extent and magnitude of non-storm water discharges to receiving waters, and make a distinction between persistent and transient non-storm water flows. This information is expected to allow each Copermittee to focus its resources on eliminating and controlling the highest priority threats to receiving water quality, as well as integrating other elements of the storm water programs (e.g. complaint call response) and third party data to efficiently and effectively assist in efforts to eliminate non-storm water discharges.

The dry weather MS4 outfall discharge monitoring requirements of Provision D.2.a.(2) and D.2.b are separated into monitoring required before and after the San Diego Water Board accepts the Copermittees' Water Quality Improvement Plan. Outfall monitoring conducted prior to acceptance of the Water Quality Improvement Plan is referred to in the Order as Transitional MS4 Outfall Discharge Monitoring. Provision D.2.a.(2) includes the transitional dry weather MS4 outfall discharge monitoring requirements.

The requirements under Provision D.2.a.(2) are based on the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B), which include the requirements for a monitoring program to identify, detect, and eliminate illicit connections and illegal discharges to the MS4s. The federal regulations (40 CFR 122.26(d)(1)(iv)(D)) require

the monitoring program to include "*a field screening analysis for illicit connections and illegal dumping [that]…[a]t a minimum, include[s] a narrative description, for either each field screening point or major outfall, of visual observations made during dry weather periods.*" The federal regulations (40 CFR 122.26(d)(1)(v)(B)) require the monitoring program to include "*inspection procedures and methods for detecting and preventing illicit discharges, and describe areas where this program has been implemented.*" Furthermore, the monitoring program is required by federal regulations (40 CFR 122.26(d)(2)(iv)(B)) to include "*a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer.*"

Dry weather transitional MS4 outfall discharge monitoring requires each Copermittee to field screen (inspect) its major MS4 outfalls to classify the MS4 outfall locations as having persistent dry weather flows, transient dry weather flows, or no dry weather flows. To account for the variance in size of the 39 jurisdictions covered under this Order, the Copermittees recommended a tiered approach to the number of major MS4 outfalls that must be inspected. Provision D.2.a.(2)(a) provides a tiered approach to the number of major MS4 outfalls that must be visually inspected per jurisdiction as well as a minimum frequency each Copermittee must inspect each major MS4 outfall per year. This tiered approach is based on the total number of major MS4 outfalls within a Copermittees jurisdiction within each Watershed Management Area.

Based on the field screening, each Copermittee is required to make a determination whether any observed flowing, pooled, or ponded waters are transient or persistent flows. Based on this field screening information, other jurisdictional program information, and third party information, each Copermittee is required to prioritize the MS4 outfalls within its jurisdiction for follow up investigation and elimination of the non-storm water discharge, as part of its illicit discharge detection and elimination program required pursuant to Provision E.2. In accordance with the requirements of Provision E.2, each Copermittee is required to immediately investigate obvious illicit discharges (e.g. outfall discharges with unusual color, unusual odor, or high flows).

This approach allows a Copermittee to use all of its resources, as well as leverage resources and information provided by third parties, to effectively eliminate non-storm water discharges from its MS4 outfalls. If the source of the non-storm water discharge cannot be immediately eliminated, the Copermittee uses the persistent flow or transient flow classification along with other programmatic implementation data to prioritize the MS4 outfalls for future investigation. In accordance with the adaptive management approach deployed throughout this Order, Provision D.2.a.(2)(c) requires each Copermittee to update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow. The requirement of Provision D.2.a.(2)(c) assures that each Copermittee is collecting data that can be used to demonstrate compliance with the CWA requirement that each Copermittee must implement a program to "*effectively*

prohibit non-storm water discharges into the [MS4]" and with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

Provision D.2.b describes the dry weather MS4 outfall discharge monitoring required to be incorporated and implemented as part of the Water Quality Improvement Plan. Dry weather MS4 outfall discharge monitoring must be performed by each Copermittee to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. The emphasis of the dry weather MS4 outfall discharge monitoring required pursuant to Provision D.2.b is consistent with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

Provision D.2.b.(1) requires each Copermittee to continue field screening its major MS4 outfalls and identifying those with persistent flows and transient flows, as conducted during the transitional period (i.e. before the Water Quality Improvement Plan was developed). However, each Copermittee now has the flexibility to adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of non-storm water persistent flow discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan. In order to ensure a minimum number of outfalls are inspected, Provision D.2.b.(1) requires the number of visual inspections be equal to the number of visual inspections required in the tiered inspection program pursuant to Provision D.2.a.(2)(a).

Provision D.2.b.(2)(b) requires each Copermittee to monitor a minimum of 5 major MS4 outfalls with persistent flows identified as the highest priorities within a Copermittee's jurisdiction, within each Watershed Management Area. In other words, Copermittees located in more than one Watershed Management Area must identify at least 5 major MS4 outfalls with persistent flows in its jurisdiction in each Watershed Management Area. If a Copermittee is located in more than one Watershed Management Area, and they have less than 5 major MS4 outfalls with persistent flows per jurisdictional area per Watershed Management Area, all of the major MS4 outfalls must be identified as high priority dry weather persistent flow MS4 outfalls. The Copermittees identified as Responsible Copermittees by a TMDL in Attachment E of the Order may need to monitor more than 5 dry weather major MS4 outfall locations to determine compliance with the requirements of the TMDL(s).

Monitoring must occur at the highest priority outfall locations at least semi-annually until the non-storm water discharges have been eliminated for three consecutive dry weather monitoring events; identified to be authorized by a separate NPDES Permit; or reprioritized to a lower priority. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized MS4 major outfall in the Copermittee's jurisdiction within the Watershed Management Area, unless there are no remaining qualifying major MS4 outfalls within the Copermittees jurisdiction. The Copermittees must continually update their dry weather persistent

flow MS4 outfall discharge monitoring locations with the next highest priority non-storm water flow that have yet to be eliminated until all persistent and transient flows are eliminated or its threat reduced.

Non-storm water persistent flow MS4 outfall discharge monitoring data collected during each semi-annual monitoring event, must be collected and analyzed according to the requirements of Provision D.2.b.(2)(b)-(e). These monitoring requirements are consistent with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

The wet weather MS4 outfall discharge monitoring requirements are included under Provisions D.2.a.(3) and D.2.c. The wet weather MS4 outfall discharge monitoring requirements are necessary for the Copermittees to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable, using management practices, control techniques and system, design and engineering methods, and such other provisions which are appropriate*" required by 40CFR 122.26(d)(2)(iv), which is expected to achieve compliance with the CWA section 402(p)(3)(B)(iii) statutory requirement for municipal storm water permits to require "*controls to reduce the discharge of pollutants [in storm water] to the maximum extent practicable*." The wet weather MS4 outfall discharge monitoring data collection requirements are based on requirements under 40 CFR 122.26(d)(2)(iii), 122.26(d)(2)(iii)(A) and 122.26(d)(2)(iii)(A)(1)-(4), and 40 CFR 122.21(g)(7)(i)-(ii).

The wet weather MS4 outfall discharge monitoring requirements of Provision D.2.a.(3) and D.2.c are separated into monitoring required before and after the San Diego Water Board accepts the Copermittees' Water Quality Improvement Plan. Outfall monitoring conducted prior to acceptance of the Water Quality Improvement Plan is referred to in the Order as Transitional MS4 Outfall Discharge Monitoring. Provision D.2.a.(3) includes the transitional wet weather MS4 outfall discharge monitoring requirements.

Until the wet weather MS4 outfall discharge monitoring requirements of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board, the Copermittees must comply with the requirements of transitional wet weather MS4 outfall monitoring requirements pursuant to Provision D.2.a.(3). Provision D.2.a.(3) requires the Copermittees in each Watershed Management Area to sample, at least five of the major MS4 outfalls inventoried pursuant to Provision D.2.a.(1) once per wet season for the monitoring data required to be collected pursuant to Provision D.2.a.(3)(c)-(e). Provision D.2.a.(3) further requires at least one major MS4 outfall monitoring station be located in each Copermittee's jurisdiction within the Watershed Management Area.

At a minimum, the five sampling locations chosen must be representative of storm water discharges from residential, commercial, industrial, and typical mixed-use land uses present within a Watershed Management Area. The San Diego Water Board expects the Copermittees to extrapolate from these data to similar land uses

throughout the Watershed Management Area to better inform the Water Quality Improvement Plan development process by prioritizing drainages for implementation of storm water control efforts required pursuant to Provision E.

Provision D.2.c describes the wet weather MS4 outfall discharge monitoring required to be included and implemented as part of the Water Quality Improvement Plan. Provision D.2.c provides the Copermittees the flexibility to adjust the wet weather MS4 outfall discharge monitoring locations and frequencies in the Watershed Management Area, as needed, to identify sources of pollutants in storm water discharges from MS4s in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan.

Although Provision D.2.c.(1) allows the Copermittees to adaptively manage the wet weather MS4 outfall discharge monitoring locations and frequencies, the provision requires a minimum of at least five wet weather outfall stations to be monitored. Provision D.2.c.(2) further allows the Copermittees to modify the monitoring frequency at each wet weather MS4 outfall station to meet the goals of the Water Quality Improvement Plan as long as the monitoring frequency occurs at least once per year and is at an appropriate frequency to identify sources of pollutants in storm water discharges, guide pollutant source identification efforts, or determine compliance with the requirements of the applicable TMDLs in Attachment E to the Order.

The wet weather MS4 outfall discharge monitoring requirements of Provisions D.2.c.(3) and D.2.c.(4) are the same as the transitional wet weather MS4 outfall discharge monitoring. In contrast, the requirements of Provision D.2.c.(5) are focused on collecting analytical data specific to the highest priority water quality conditions in the Watershed Management Area identified in the Water Quality Improvement Plan. The wet weather MS4 outfall discharge monitoring data collection requirements are consistent with the requirements under 40 CFR 122.26(d)(2)(iii), 122.26(d)(2)(iii)(A) and 122.26(d)(2)(iii)(A)(1)-(4), and 40 CFR 122.21(g)(7)(i)-(ii).

Provision D.3 (Special Studies) requires the Copermittees to develop special studies that will be conducted for each Watershed Management Area and the entire San Diego Region. Data collected pursuant to Provision D.3 is to be used by the Copermittees to improve the effectiveness of the strategies implemented by the jurisdictional runoff management programs toward achieving the numeric goals identified in the Water Quality Improvement Plans and ultimately achieve compliance with the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c, and A.2.a, which is consistent with the requirements of Provision A.4.

Special studies are often necessary to fill data gaps or provide more refined information that allow the Copermittees to better manage the generation or elimination of pollutants and discharges to and from the MS4. In the Fourth Term Permits, the Copermittees have been required to implement special studies as directed by the San Diego Water Board. The special studies required by this Order provide the Copermittees more flexibility to identify and implement special studies that will be most

useful to improving the effectiveness of their jurisdictional runoff management programs.

Provision D.3.a.(1) requires the Copermittees to develop and conduct at least two special studies per Watershed Management Area, to be determined by the Copermittees. One of the two special studies may be accomplished through participation in a Regional Special Study required under Provision D.3.a.(2). The requirements provide the Copermittees great latitude in identifying and developing the special studies. Watershed Management Area special studies are required, at a minimum, to: (a) relate in some way to the highest water quality priorities identified by the Copermittees in the Water Quality Improvement Plan, (b) be conducted within the Watershed Management Area, and (c) include some form of participation (e.g. contribution of funds, personnel services, project management) by all the responsible Copermittees within the Watershed Management Area.

Examples of Watershed Management Area special studies might include, but are not limited to: (1) focused pollutant source identification studies, (2) BMP effectiveness and/or comparison studies, (3) pilot tests for new or emerging pollutant control methods, (4) receiving water pollutant or stressor source identification and/or mitigation studies, or (5) pollutant fate and transport studies. The Watershed Management Area special studies are expected to provide data that can be utilized by the Copermittees to improve the Water Quality Improvement Plan or implementation of the Copermittees' jurisdictional runoff management programs to address the highest priority water quality conditions.

Provision D.3.a.(2) requires the Copermittees to develop at least one special study that will be conducted for the entire San Diego region. The regional special study is expected to provide data that can be utilized by the Copermittees to improve the Water Quality Improvement Plan or implementation of the Copermittees' jurisdictional runoff management programs to identify or address regional water quality concerns and priorities.

An example of a regional special study would be to develop and establish allowable exceedance frequencies of the bacteria water quality objectives for several types of water bodies, during different wet and dry weather conditions the San Diego region. The special study would be related to bacteria, which is a priority for the San Diego region due to the adoption of "*Bacteria TMDL Project I – Beaches and Creeks in the San Diego Region*." The study results could be used to inform the Copermittees and the San Diego Water Board about the indictor bacteria water quality objective exceedance frequencies that occur in natural or reference watersheds.

<u>Provision D.4 (Assessment Requirements)</u> specifies the assessments that the Copermittees are required to perform, based on the monitoring data collected, and will be reported as part of the Annual Report for the Water Quality Improvement Plan implementation. Provision D.4 requires the Copermittees assess the progress of the

water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c, and A.2.a.

Provision D.4 specifies the assessments that Copermittees must perform for each Watershed Management Area to assess the effectiveness of each Copermittee's jurisdictional runoff management program and the Water Quality Improvement Plan. The effectiveness of each Copermittee's jurisdictional runoff management program and Water Quality Improvement Plan is measured through these types of assessments: (a) Receiving Waters Assessments (b) MS4 Outfall Discharges Assessments, (c) Special Studies Assessments, and (d) Integrated Assessment of Water Quality Improvement Plan.

Provision D.4.a requires the Copermittees to assess the status of receiving water conditions annually during the transitional monitoring period (during development of the Water Quality Improvement Plan) and after acceptance of the Water Quality Improvement Plan. The monitoring data collected pursuant to Provision D.1 will be evaluated, among other information, to assess the condition of a Watershed Management Area's streams, coastal waters, enclosed bays, harbors, estuaries, and lagoons. The focus of the receiving waters assessments is to measure progress toward the objective of the CWA to "*restore and maintain the chemical, physical, and biological integrity of the Nation's waters*" as the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program are implemented within a Watershed Management Area. Provision D.4.a is consistent with 40 CFR 122.42(c)(7) which requires the Copermittees to annually report the *"[i]dentification of water quality improvements or degradation."*

Provision D.4.b includes the MS4 outfall discharges assessment requirements. The focus of MS4 outfall discharges assessments is to determine if the Copermittees' are implementing programs that comply with the requirements of the CWA for MS4 permits to "*effectively prohibit non-stormwater discharges into the storm sewers*" and "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable.*" The monitoring data collected pursuant to Provisions D.2 will be evaluated, among other information, to assess the effectiveness of the transitional MS4 outfall field screening monitoring, the implementation of the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program. The MS4 outfall discharge assessments consist of Non-Storm Water Discharges Reduction Assessments and Storm Water Pollutant Discharges Reduction Assessments.

The Non-Storm Water Discharges Reduction Assessments are how each Copermittee will demonstrate that its jurisdictional runoff management program implementation efforts are achieving the CWA requirement to "*effectively prohibit non-stormwater discharges into the storm sewers.*" Provision D.4.b.(1) requires each Copermittee to assess and report on its illicit discharge detection and elimination program required pursuant to Provision E.2 to reduce and effectively prohibit non-storm water and illicit discharges into the MS4 within its jurisdiction. The Non-Storm Water Discharges

Reduction Assessments include specific assessment requirements applicable to each Copermittee.

As each Copermittee collects and analyzes the data collected pursuant to dry weather MS4 outfall discharges monitoring requirements of Provisions D.2.a.(2) and D.2.b, Provision D.4.b.(1) requires each Copermittee to assess the progress, assess the effectiveness of its current actions, and identify modifications necessary to increase the effectiveness of its actions toward reducing and eliminating non-storm water and illicit discharges to its MS4. The findings from these assessments are expected to be utilized by the Copermittee as part of its procedures to prioritize the non-storm water discharges that will be addressed by its Illicit Discharge Detection and Elimination program required pursuant to Provision E.2.

The assessment requirements of Provision D.4.a.(1) are consistent with 40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(3) which require "*procedures…to investigate portions of the separate storm sewer system that, <u>based on the results of the field screen, or other appropriate information</u> [emphasis added], indicate a reasonable potential of contain illicit discharges or other sources of non-storm water*" as part of a "*program…to detect and remove…illicit discharges and improper disposal into the storm sewer.*" The assessment requirements of Provision D.4.a.(1) are also consistent with 40 CFR122.42(c)(1) requires the Copermittees to annually report the "*status of implementing the components of the storm water management program that are established as permit conditions.*"

The Storm Water Pollutant Discharges Reduction Assessment is how the Copermittees in each Watershed Management Area will demonstrate that their jurisdictional runoff management program implementation efforts are achieving the CWA requirement to "*reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable*." Provision D.4.b.(2) requires the Copermittees in each Watershed Management Area to assess and report the progress of the Copermittees' efforts to reduce pollutants in storm water discharges from the MS4s to the MEP. The Storm Water Pollutant Discharges Reduction Assessments include specific assessment requirements during both the transitional monitoring period and after acceptance of the Water Quality Improvement Plan applicable to the Watershed Management Area and each Copermittee.

As the Copermittees collect and analyze the data collected pursuant to wet weather MS4 outfall discharges monitoring requirements of Provisions D.2.a.(3) and D.2.c, Provision D.4.b.(2) requires the Copermittees to assess runoff conditions during the transitional period, and the progress of the Water Quality Improvement Plan strategies toward reducing pollutants in storm water from the MS4 to the MEP. The findings from these assessments are expected to be utilized by the Copermittees to identify any modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify sources of pollutants in storm water discharges from the MS4s, as well as focus, modify, and improve the water quality improvement

strategies implemented by each Copermittee within its jurisdiction to reduce pollutants in storm water discharges to the MEP.

The assessment requirements of Provision D.4.b.(2) are consistent with 40 CFR 122.26(d)(2)(iii)(B) which requires "*[e]stimates of the annual pollutant load of the cumulative discharges to waters of the United States from all identified municipal outfalls…during a storm event…accompanied by a description of the procedures for estimating constituent loads and concentrations, including any modeling, data analysis, and calculation methods.*" The assessment requirements of Provision D.4.a.(2) are consistent with 40 CFR 122.26(d)(2)(v) which requires that each Copermittee assesses the *"estimated reductions in loadings of pollutants from discharges of municipal storm sewer constituents from municipal storm sewer systems expected as the result of the municipal storm water quality management program."* The assessment requirements of Provision D.4.b.(2) are also consistent with 40 CFR122.42(c)(1) requires the Copermittees to annually report the "*status of implementing the components of the storm water management program that are established as permit conditions.*"

Provision D.4.c includes the special studies assessment requirements. Performing special studies are how the Copermittees will address data gaps identified during the development of and updates to the Water Quality Improvement Plan. The relevant findings from the special studies assessments are expected to be incorporated as part of the applicable receiving water assessments, MS4 outfall discharge assessments, and integrated water quality improvement assessments required in Provision D.4.a, D.4.b, and D.4.d, respectively.

The assessment requirements in Provision D.4.d are part of the iterative approach and adaptive management process required by Provision A.4. The Copermittees are required to integrate the data collected pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to re-evaluate the Water Quality Improvement Plan.

The monitoring data collected pursuant to Provisions D.1 and D.2, and the results of the assessment required pursuant to Provisions D.4.a-c, will be used to determine whether the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program are effective, or require modifications or improvements to become more effective to achieve the requirements of the CWA. The assessments required by Provision D.4.d are consistent with 40 CFR 122.42(c)(1) which requires that the Copermittees to report the *"[t]he status of implementing the components of the storm water management program that are established as permit conditions."*

E. Jurisdictional Runoff Management Programs

Purpose: Provision E includes the requirements for the jurisdictional runoff management programs to be implemented by each of the Copermittees. Compliance with the requirements for the jurisdictional runoff management programs will allow the Copermittees to demonstrate that they are implementing programs to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP. The jurisdictional runoff management program document prepared by each Copermittee will also provide the details for implementing the water quality improvement strategies identified in the Water Quality Improvement Plan specifically within its jurisdiction.

***Discussion*:** Implementation of the jurisdictional runoff management program requirements under Provision E is how the Copermittees "*effectively prohibit non-stormwater discharges into the storm sewer,*" and outlines the "*controls to reduce the discharge of pollutants to the maximum extent practicable"* consistent with the federal regulations under 40 CFR 122.26. The jurisdictional runoff management program is part of the "*comprehensive planning process*" that is required pursuant to 40 CFR 122.26(d)(2)(iv). Where the Water Quality Improvement Plan is the "*comprehensive planning process*" on a Watershed Management Area scale, requiring "*intergovernmental coordination,*" the jurisdictional runoff management program document is the "*comprehensive planning process*" on a jurisdictional scale that should be coordinated with the other Copermittees in the Watershed Management Area to achieve the goals of the Water Quality Improvement Plan.

The jurisdictional runoff management program requirements are included to provide each Copermittee criteria that can be used to demonstrate that its storm water management program is implementing the "*comprehensive planning process*" within its jurisdiction to "*effectively prohibit non-stormwater discharges into the storm sewers,*" and to identify and implement the most effective "*controls to reduce the discharge of pollutants to the maximum extent practicable"* in accordance with the performance standards given in the CWA.

Provision E includes the requirements for each of the components that must be included in the Copermittee's jurisdictional runoff management program document that will be implemented by the Copermittee within its jurisdiction. Implementation of the components of each Copermittee's jurisdictional runoff management program must incorporate the water quality improvement strategies identified by each Copermittee in the Water Quality Improvement Plans, described pursuant to Provision B.3.b.(1)(a).

More specific and detailed discussions of the requirements of Provision E are provided below.

Provision E.1 (Legal Authority Establishment and Enforcement) requires each Copermittee to establish and enforce sufficient legal authority to control discharges to the MS4 within its jurisdiction.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system*" and be able to demonstrate that it can "*operate pursuant to legal authority established by statute, ordinance or series of contracts.*" Provision E.1.a describes the minimum legal authorities each Copermittee must establish for itself within its jurisdiction to control discharges to its MS4. The requirements of Provision E.1.a are consistent with the requirements set forth in 40 CFR 122.26(d)(2)(i)(A)-(F).

The certification statement required from each Copermittee by Provision E.1.b is included to provide the San Diego Water Board additional documentation that each Copermittee has established the legal authorities consistent with Provision E.1.a and 40 CFR 122.26(d)(2)(i)(A)-(F), and the Copermittee can "*operate pursuant to legal authority established by statute, ordinance or series of contracts.*"

Provision E.2 (Illicit Discharge Detection and Elimination) requires each Copermittee to implement an illicit discharge detection and elimination program to effectively prohibit non-storm water discharges to the MS4 by actively detecting and eliminating illicit discharges and disposal into its MS4. If the San Diego Water Board finds that a Copermittee is fully implementing the requirements of Provision E.2, then the Copermittee is deemed in compliance with the effective prohibition of non-storm water discharges to the MS4 required under Provision A.1.b.

Provision E.2 establishes the minimum requirements that each Copermittee must implement within its jurisdiction to effectively prohibit non-storm water discharges from entering its MS4. The federal CWA requires permits for municipal storm sewer systems to "*effectively prohibit non-storm water discharges into the storm sewers*." The federal regulations (40CFR122.26(d)(2)(i)(B)) require each Copermittee to establish the legal authority to prohibit illicit discharges to its MS4s. Under 40 CFR 122.26(d)(2)(iv)(B), each Copermittee must implement a "*program…to detect and remove…illicit discharges and improper disposal into the storm sewer.*" The federal NPDES regulations, under 40 CFR 122.26(b)(2), define illicit discharges as "*any discharge to a municipal separate storm sewer that is not composed entirely of storm water*." Thus, non-storm water discharges are not authorized to enter the MS4 and are considered to be illicit discharges, unless authorized by a separate NPDES permit.

The Phase I Final Rule clarifies that non-storm water discharges through an MS4 are not authorized under the CWA (55 FR 47995):

> "*Today's rule defines the term "illicit discharge" to describe any discharge through a municipal separate storm sewer system that is not composed entirely of storm water and that is not covered by an NPDES permit. Such illicit discharges are not*

> *authorized under the Clean Water Act. Section 402(p)(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit*."

The federal NPDES requirements for the program to address illicit discharges must include "*inspections, to implement and enforce an ordinance, orders, or other similar means to prevent illicit discharges to the MS4*." The federal NPDES regulations also reference several categories of "*non-storm water discharges or flows* [which] *shall be addressed where such discharges are identified…as sources of pollutants to waters of the United States*." The Phase I Final Rule (55 FR 48037) further clarified the requirements of 40 CFR 122.26(d)(2)(iv)(B)(1) as follows:

> "*EPA is clarifying that section 402(p)(3)(B) of the CWA (which requires permits for municipal separate storm sewers to 'effectively' prohibit non-storm water discharges) does not require permits for municipalities to prohibit certain discharges or flows of nonstorm water to waters of the United States through municipal separate storm sewers in all cases*."

In previous iterations of the municipal storm water permits for the San Diego Region, these categories were simply listed and referred to as categories of non-storm water discharges "not prohibited" unless identified as a source of pollutants. The Copermittees have often referred to these categories as "exempt" discharges. In both cases, however, the language is inconsistent with the federal CWA and NPDES regulations. And, the clarification provided in the Phase I Final Rule does not specifically state that such discharges are "not prohibited" or "exempt" or in any way authorized. The federal NPDES regulations do, however, state that specific categories of non-storm water discharges must be "*addressed*" if identified as "*sources of pollutants to waters of the United States*."

The language of Provision E.2.a has been revised to be fully consistent with the language of the CWA and the requirements of the federal regulations under 40 CFR 122.26(d)(2)(iv)(B)(1). Provision E.2.a requires each Copermittee to address <u>all</u> types of non-storm water discharges into its MS4 as illicit discharges, <u>unless</u> the discharge is authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to Provisions E.2.a.(1) through E.2.a.(5). Only non-NPDES-permitted non-storm water discharges identified as a category of non-storm water discharges under Provisions E.2.a.(1) through E.2.a.(5) <u>and</u> *not identified as a source of pollutants* do not have to be addressed as illicit discharges. Categories of non-storm water discharges that meet the requirements of Provisions E.2.a.(1) through E.2.a.(5) do not have to be addressed by the Copermittee as illicit discharges.

Several of the non-storm water categories listed in 40 CFR 122.26(d)(2)(iv)(B)(1) have not been included in Provisions E.2.a.(1) through E.2.a.(5), including: street wash water, landscape irrigation, irrigation water, and lawn watering. Because these are no longer included within the categories listed under Provisions E.2.a.(1) through E.2.a.(5), the Copermittees must prohibit these types of non-storm water discharges from entering the MS4. This is consistent with the clarification of 40 CFR 122.26(d)(2)(iv)(B)(1) in the Phase I Final Rule (55 FR 48037), which states:

> "*[T]he Director may include permit conditions that either require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*."

Street wash water is a category of non-storm water discharges that was removed when the Third Term Permits were issued. Street wash water is a source of several pollutants (e.g., metals, oil and grease, petroleum hydrocarbons, chlorinated solvents, sediment) which are generated during the street washing process. The removal of this category requires the Copermittees to prohibit this type of non-storm water discharge from entering the MS4.

The landscape irrigation, irrigation water, and lawn watering categories, collectively referred to hereafter as "over-irrigation" discharges, were removed from the list of non-storm water discharge categories in the Fourth Term Orange County and Riverside County Permits. Non-storm water discharges resulting from over-irrigation have been found to be a source of several types of pollutants (e.g., nutrients, bacteria, pesticides, sediment) in receiving waters. The San Diego Water Board and the Copermittees have identified categories of non-storm water discharges associated with over-irrigation as a source of pollutants and conveyance of pollutants to the MS4 and waters of the United States in the following documents:

- **SmartTimer/Edgescape Evaluation Program (SEEP) Grant Application**

  The State Water Board allocated grant funding to the SEEP project grant application submitted in 2006, which targeted irrigation runoff by retrofitting areas of existing development and documenting the conservation and runoff improvements. The basis of this grant project is that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 is a source and conveyance of pollutants. In addition, the grant application indicated that this alteration of natural flows is impacting the beneficial uses of waters of the state and U.S. Results from the study indicate that that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 *is* a source and conveyance of pollutants. The results of this study can be applied broadly to any area where over-irrigation takes place. The grant application included the following statements:

  > "*Irrigation runoff contributes flow & pollutant loads to creeks and beaches that are 303(d) listed for bacteria indicators.*"

"*Regional program managers agree that the reduction and/or elimination of irrigation-related urban flows and associated pollutant loads may be key to successful attainment of water quality and beneficial use goals as outlined in the San Diego Basin Plan and Bacteria TMDL over the long term.*"

"*Elevated dry-weather storm drain flows, composed primarily … of landscape irrigation water wasted as runoff, carry pollutants that impair recreational use and aquatic habitats all along Southern California's urbanized coastline. Storm drain systems carry the wasted water, along with landscape derived pollutants such as bacteria, nutrients and pesticides, to local creeks and the ocean. Given the local Mediterranean climate, excessive perennial dry season stream flows are an unnatural hydrologic pattern, causing species shifts in local riparian communities and warm, unseasonal contaminated freshwater plumes in the near-shore marine environment.*"

- **2006-2007 Orange County Watershed Action Plan Annual Reports**

The Watershed Action Plan Annual Reports for the 2006-2007 reporting period were submitted by the County of Orange, Orange County Flood Control District and Copermittees within the San Juan Creek, Laguna Coastal Streams, Aliso Creek, and Dana Point Coastal Streams Watersheds. San Juan Creek, Laguna Coastal Streams, Aliso Creek and Dana Point Coastal Streams are all currently 303(d) listed as impaired for indicator bacteria within their watersheds and/or in the Pacific Ocean at the discharge points of their watersheds. The Orange County Copermittees, within their Watershed Action Strategy Table for fecal indicator bacteria included the following:

"*Support programs to reduce or eliminate the discharge of anthropogenic dry weather nuisance flow throughout the…watershed. Dry weather flow is the transport medium for bacteria and other 303(d) constituents of concern.*"

Additionally, they state that "*conditions in the MS4 contribute to high seasonal bacteria propagation in-pipe during warm weather. Landscape irrigation is a major contributor to dry weather flow, both as surface runoff due to over-irrigation and overspray onto pavements; and as subsurface seepage that finds its way into the MS4.*"

- **Fiscal Year 2008 Carlsbad Watershed Urban Runoff Management Program Annual Report**

The Carlsbad Watershed Urban Runoff Management Program Annual Report for Fiscal Year 2008 was submitted by the Carlsbad Watershed Copermittees (Cities of Carlsbad, Encinitas, Escondido, Oceanside, San Marcos, Solana Beach, and Vista, and the County of San Diego). In the Annual Report, the Carlsbad Watershed Copermittees stated the following:

"The Carlsbad Watershed Management Area (WMA) collective watershed strategy identifies bacteria, sediment, and nutrients as high priority water quality pollutants in the Agua Hedionda (904.3 – bacteria and sediment), Buena Vista (904.2 – bacteria), and San Marcos Creek (904.5 – nutrients) Hydrologic Areas. Bacteria, sediment, and nutrients have been identified as potential discharges from over-irrigation."

- **2007-2008 San Diego Bay Watershed Urban Runoff Management Program Annual Report**

  The San Diego Bay Watershed Urban Runoff Management Program 2007-2008 Annual Report was submitted by the San Diego Bay Watershed Copermittees (Cities of Chula Vista, Coronado, Imperial Beach, La Mesa, Lemon Grove, National City, and San Diego, the County of San Diego, the Port of San Diego, and the San Diego County Airport Authority). In Appendix D of the Annual Report, titled "Likely Sources of Pollutants," the San Diego Bay Watershed Copermittees identified over-irrigation of lawns as a pollutant generating activity from business and/or residential land uses for bacteria, pesticides, and sediment.

- **Copermittee Public Education Materials**

  The Orange County Public Works *Tips for Landscape & Gardening* public education brochure states: "*Fertilizers, pesticides and other chemicals that are left on yards or driveways can be blown or washed into storm drains that flow to the ocean. Overwatering lawns can also send materials into storm drains*."

  The Riverside County Flood Control and Water Conservation District *Landscape and Garden* public education brochure states: *"Soil, yard wastes, over-watering and garden chemicals become part of the urban runoff mix that winds its way through streets, gutters and storm drains before entering lakes, rivers, streams, etc. Urban runoff pollution contaminates water and harms aquatic life!"*

- **Los Peñasquitos Lagoon Sedimentation/Siltation TMDL Technical Report**

  The Los Peñasquitos Lagoon Sedimentation/Siltation TMDL technical report was prepared for the City of San Diego and USEPA in October 2010. The technical report was included as a technical supporting document attached to the Sediment TMDL for Los Peñasquitos Lagoon staff report prepared by the San Diego Water Board, dated June 13, 2012. Under the Source Assessment section, the technical report states the following:

  "*Dry weather loading is dominated by nuisance flows from urban land use activities such as car washing, sidewalk washing, and lawn over-irrigation, which pick up and transport sediment into receiving waters.*"

These documents confirm that non-storm water discharges associated with over-irrigation are a source of pollutants and should be addressed as illicit discharges to the MS4. Prohibiting non-storm water discharges associated with over-irrigation, however, is not a new requirement for the Copermittees because it is also consistent with and required by the Water Conservation in Landscaping Act (AB 1881, Laird).

The Water Conservation in Landscaping Act required the Department of Water Resources (DWR) to prepare a Model Water Efficient Landscape Ordinance for use by local agencies (e.g. the Copermittees). All local agencies were required to adopt a water efficient landscape ordinance by January 1, 2010. Local agencies could adopt the Water Efficient Landscape Ordinance developed by DWR, or an ordinance considered at least as effective as the Model Ordinance. The Water Efficient Landscape Ordinance includes a requirement that local agencies prohibit runoff from irrigation (§ 493.2):

> "*Local agencies shall prevent water waste resulting from inefficient landscape irrigation by <u>prohibiting runoff from leaving the target landscape</u> [emphasis added] due to low head drainage, overspray, or other similar conditions where water flows onto adjacent property, non-irrigated areas, walks, roadways, parking lots, or structures. Penalties for violation of these prohibitions shall be established locally*."

Furthermore, non-storm water discharges from over-irrigation not only transport and discharge pollutants to receiving waters, but are also a likely source of the dry weather flows causing changes to habitat within and along the receiving water bodies. Examples of habitat changes from the dry weather flows include perennialization of ephemeral streams, and conversion of saltwater and brackish water marsh habitats to freshwater marsh habitats (e.g. Los Peñasquitos Lagoon). Both of these examples have resulted in the promotion of invasive species in several areas of the San Diego Region.

The removal of the over-irrigation discharges categories does not require the Copermittees to strictly prohibit lawn and landscape irrigation, but does require the prohibition of excessive irrigation water that results in non-storm water discharges to the MS4. Non-storm water discharges to the MS4 from over-irrigation must be addressed as illicit discharges by the Copermittees pursuant to the requirements of Provision E.2.

The remaining non-storm water categories listed in 40 CFR 122.26(d)(2)(iv)(B)(1) are listed under Provisions E.2.a.(1) through E.2.a.(5) and generally fall into four categories: (1) non-storm water discharges subject to existing San Diego Water Board waste discharge requirements and NPDES permits; (2) non-storm water discharges generally not expected to be a source of pollutants to receiving waters; (3) non-storm water discharges likely to contain pollutants requiring some form of control to address

the pollutants prior to discharging to the MS4; and (4) non-storm water discharges or flows associated with firefighting.

Provisions E.2.a.(1) and E.2.a.(2) include several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) for which the San Diego Water Board already has developed general waste discharge requirements and NPDES permits to address the discharges. The Copermittees are only required to address these types of non-storm water discharges as illicit discharges if the Copermittees or the San Diego Water Board identifies these non-storm water discharges not having coverage under the applicable NPDES permit.

Provision E.2.a.(3) includes several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) which are generally not expected to be a source of pollutants to receiving waters, many of which originate from what are typically natural, uncontrollable sources. The Copermittees are only required to address these types of non-storm water discharges as illicit discharges if the Copermittees or the San Diego Water Board identifies these non-storm water discharges as a source of pollutants to receiving waters. Because many of these sources are generally uncontrollable, enforcing a prohibition may not be a possibility for the Copermittees. The Copermittees would be able to address these non-storm water discharges by preventing these non-storm water discharges from entering the MS4. This could potentially be achieved by sealing their MS4 structures so the discharges cannot enter the MS4.

Provision E.2.a.(4) includes several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) that are likely to contain pollutants requiring some form of control to address the pollutants prior to discharging to the MS4. At this time, an outright prohibition of these types of non-storm water discharges does not yet appear to be warranted. Thus, Provision E.2.a.(4) includes several requirements for the Copermittees to control the pollutants from these types of non-storm water discharges. This is consistent with the clarification of the federal regulations in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board has the authority to require the Copermittees to "*control any of these types of discharges where appropriate*."

Unlike non-storm water discharges from over-irrigation, these types of non-storm water discharges are not expected to occur in close proximity to each other or very frequently. Provided these types of non-storm water discharges are controlled as required in Provision E.2.a.(4), the Copermittees would only be required to address these types of non-storm water discharges as illicit discharges if the Copermittee or the San Diego Water Board identifies these non-storm water discharges as a source of pollutants to receiving waters.

Provision E.2.a.(5) includes specific requirements for fire fighting discharges and flows. The requirements for non-storm water discharges and flows associated with fire

fighting have been separated into requirements for: a) non-emergency fire fighting discharges and flows, and b) emergency fire fighting discharges and flows.

The San Diego Water Board has found that discharges from building fire suppression system maintenance (e.g. fire sprinklers) contain waste and potentially a significant source of pollutants to receiving waters. As such, the San Diego Water Board is requiring these discharges be addressed as illicit discharges by the Copermittees. Thus, the discharges to the MS4 are to be prohibited via ordinance, order or similar means. For other non-emergency firefighting discharges and flows (i.e. flows from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems), the Copermittees are required to develop and implement a program to address pollutants in these non-storm water discharges and flows. This is consistent with the clarification of the federal regulations in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board has the authority to require the Copermittees to "*control any of these types of discharges where appropriate*."

For emergency firefighting discharges and flows, the Phase I Final Rule (55 FR 48037) has clarified the requirements of 40 CFR 122.26(d)(2)(iv)(B)(1) pertaining to emergency firefighting flows and discharges, which states:

> "*In the case of firefighting it is not the intention of these rules to prohibit in any circumstances the protection of life and public or private property through the use of water or other fire retardants that flow into separate storm sewers*."

Thus, the requirements have been made to be consistent with the guidance provided by the Phase I Final Rule. The Order recommends that the Copermittees develop and encourage implementation of BMPs to reduce or eliminate the discharge of pollutants from emergency firefighting flows to the MS4s and receiving waters. The Order does not include any requirements that should be interpreted as requiring the implementation of BMPs for emergency firefighting flows to the MS4s and receiving waters.

The Copermittees are expected to review the dry weather MS4 outfall discharge monitoring data they collect to determine if and when there are non-storm water discharges to or from their MS4s that are a source of pollutants to receiving waters. If the Copermittees identify one of the types of non-storm water discharges listed in Provisions E.2.a.(1) through E.2.a.(4) as a source of pollutants to receiving waters based on the review and evaluation of monitoring data, Provision E.2.a.(6) requires the Copermittees to prohibit those categories of discharges from entering the MS4 through ordinance, order or similar means. In addition, Provision E.2.a.(6) clarifies that the San Diego Water Board may identify categories of non-storm water discharges or flows listed under Provisions E.2.a.(1) through E.2.a.(4) that must be prohibited.

Provision E.2.a.(6) also provides the Copermittees an option to propose controls to be implemented for the category of non-storm water discharges as part of the Water Quality Improvement Plan instead of prohibiting the category of non-storm water discharges. If the Water Quality Improvement Plan is accepted by the San Diego Water Board with the proposed controls, the Copermittees will not be required to prohibit the category of non-storm water discharges to their MS4s as long as the controls are implemented. This is consistent with the clarification of 40 CFR 122.26(d)(2)(iv)(B)(1) in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board may "*require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*."

Finally, Provision E.2.a.(7) has been included in the requirements for non-storm water discharges to clarify that any non-storm water discharges to the Copermittee's MS4, even those identified pursuant to Provisions E.2.a.(1) through E.2.a.(4), must be reduced or eliminated, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit. Provision E.2.a.(7) is consistent with the requirements of CWA section 402(p)(3)(B)(ii) and 40 CFR 122.26(d)(1)(v)(B), as clarified in the Phase I Final Rule (55 FR 47995) that "*[u]ltimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit*." However, the reduction or elimination of those non-storm water discharges are expected to be achieved as feasible, in accordance with the priorities in the Water Quality Improvement Plan and when the resources are available to the Copermittee.

Consistent with 40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(1), each Copermittee must implement a "*program…to prevent illicit discharges to the municipal storm sewer system*" and "*detect…illicit discharges and improper disposal into the storm sewer.*" Provision E.2.b requires each Copermittee to implement measures to prevent and detect illicit discharges and connections to its MS4 as part of its illicit discharge detection and elimination program.

As part of the program to prevent and detect illicit discharges to the MS4, 40 CFR 122.26(d)(2)(iv)(B)(2) requires "*procedures to conduct on-going field screening activities during the life of the permit, including areas or locations that will be evaluated by such field screens*." As part of the procedures, each Copermittee is required to maintain an updated map of its entire MS4 and the corresponding drainage areas within its jurisdiction. Having knowledge about where inlets, access points, connections with other MS4s, and outfalls are located is necessary for each Copermittee to track, identify, and eliminate illicit discharges and connections. Thus, Provision E.2.b.(1) of the Order specifies that the map must include the segments of the storm sewer system owned, operated, and maintained by the Copermittee, and include locations of all known inlets, connections with other MS4s, and outfalls to the Copermittee's MS4. The remaining requirements of Provision E.2.b are consistent with the requirements of 40 CFR 122.26(d)(2)(iv)(B)(3)-(7) related to implementing measures to prevent and detect illicit discharges and connections to the MS4.

Provision E.2.c requires each Copermittee to conduct field screening and monitoring of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4. Field screening is a required element of the program to detect and eliminate illicit discharges and connections to the MS4, pursuant to 40 CFR 122.26(d)(2)(iv)(B)(2). The field screening requirement will be implemented through the dry weather MS4 outfall discharge monitoring required under Provisions D.2.a.(2) and D.2.b.(1).

Provision E.2.d specifies the measures each Copermittee must implement to eliminate illicit discharges and connections to its MS4. Elimination of illicit discharges and connections to the MS4 is consistent with the requirement of 40 CFR 122.26(d)(2)(iv)(B) "*to detect and remove [emphasis added]…illicit discharges and improper disposal into the storm sewer*" and will achieve the CWA requirement for MS4 permits to "*effectively prohibit non-storm water discharges into the storm sewers*."

Generally, each Copermittee is responsible for prioritizing its efforts to eliminate non-storm water and illicit discharges or connections to its MS4 based on field screening and monitoring data, NALs, illicit discharge investigation records, and the known or suspected sources. Sources of non-storm water and illicit discharges or connections must be eliminated by enforcing the legal authority established by each Copermittee pursuant to Provision E.1.

Provision E.3 (Development Planning) requires each Copermittee to use its land use and planning authority to implement a development planning program to control and reduce the discharge of pollutants in storm water from new development and significant redevelopment to the MEP. Proper implementation of the development planning program will also contribute toward effectively prohibiting non-storm water discharges from development projects to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." As part of the management program, 40 CFR 122.26(d)(2)(iv)(A)(2) requires "*planning procedures including a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment*."

Land development generally alters the natural conditions of the land by removing vegetative cover, compacting soil, and/or placement of concrete, asphalt, or other impervious surfaces. These impervious surfaces concentrate urban pollutants (such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not found in high concentrations in the natural environment. Pollutants that

accumulate on impervious surfaces are not easily biodegraded nor subject to natural treatment processes.

Impervious surfaces greatly affect the natural hydrology of the land because they do not allow natural infiltration and treatment of storm water runoff to take place. Instead, storm water runoff from impervious surfaces is typically directed through pipes, curbs, gutters, and other hardscape into receiving waters, with little treatment, at significantly increased volumes and accelerated flow rates over what would occur naturally. The increased pollutant loads, storm water volume, discharge rates and velocities, and discharge durations from the MS4 adversely impact stream habitat by causing accelerated, unnatural erosion and scouring within creek bed and banks. Placement of impervious surfaces also encapsulates "good" sediment (such as sand, gravel, rocks and cobbles) that would normally replenish creek beds and banks to help stabilize them. Collectively, these changes to natural hydrologic processes are termed hydrograph modification, or hydromodification.

Hydromodification, which is caused by both altered storm water flow and altered sediment flow regimes, is largely responsible for degradation of creeks, streams, and associated habitats in the San Diego Region. In an ongoing study by the Stormwater Monitoring Coalition to assess the health of streams throughout Southern California, researchers found that three of the four highest risk stressors to creeks (percent sands and fines present, channel alteration, and riparian disturbance) were related to physical habitat.[29] Researchers studying flood frequencies in Riverside County have found that increases in watershed imperviousness of only 9-22 percent can result in increases in peak flow rates for the two-year storm event of up to 100 percent.[30] Such changes in runoff have significant impacts on channel morphology.

In addition, a technical report issued by the Southern California Coastal Water Research Project (SCCWRP) stated that "*[r]ecent studies indicate that California's intermittent and ephemeral streams are more susceptible to the effects of hydromodification than streams from other parts of the United States. Physical degradation of stream channels in the central and eastern United States can initially be detected when watershed impervious cover approaches 10 percent, although biological effects (which may be more difficult to detect) may occur at lower levels. In contrast, initial response of streams in the semi-arid portions of California appears to occur between 3 and 5 percent impervious cover*."[31] These studies highlight the extent to which impacts originating from impervious surfaces created by land development are responsible for the degradation of creek and stream habitat.

[29] Assessing the Health of Southern California Streams, Stormwater Monitoring Coalition, Fact Sheet
[30] Schueler and Holland, 2000. Storm Water Strategies for Arid and Semi-Arid Watersheds (Article 66). The Practice of Watershed Protection.
[31] Stein, E. and Zaleski, S., 2005. Technical Report 475, Managing Runoff to Protect Natural Streams: The Latest Development on Investigation and Management of Hydromodification in California. December 30, 2005.

This is consistent with what USEPA has noted, that "*[m]ost stormwater runoff is the result of the man-made hydrologic modifications that normally accompany development. The addition of impervious surfaces, soil compaction, and tree and vegetation removal result in alterations to the movement of water through the environment. As interception, evapotranspiration, and infiltration are reduced and precipitation is converted to overland flow, these modifications affect not only the characteristics of the developed site but also the watershed in which the development is located. Stormwater has been identified as one of the leading sources of pollution for all waterbody types in the United States. Furthermore, the impacts of stormwater pollution are not static; they usually increase with more development and urbanization*."[32]

Reducing the impact from the increased pollutant loads and flows generated by impervious surfaces within a watershed is essential to protecting and restoring the integrity of the receiving waters. Provision E.3 includes the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment*." The requirements of Provision E.3 will 1) minimize the generation and discharge of pollutants in storm water from the MS4, and 2) minimize the potential of storm water discharges from the MS4 from causing altered flow regimes and excessive downstream erosion in receiving waters.

The requirements of Provision E.3.a include the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment*" applicable to all development projects, regardless of size or purpose of development. In general, all development projects must implement onsite BMPs to remove pollutants from runoff prior to its discharge to any receiving waters, as close to the pollutant generating source as possible, and structural BMPs must not be constructed within waters of the U.S.

Furthermore, the onsite BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors (e.g. mosquitos, rodents, and flies). If not properly designed or maintained, certain BMPs implemented or required by municipalities may create a habitat for vectors. Monitoring studies conducted by the California Department of Public Health (CDPH) have documented that mosquitoes opportunistically breed in structural storm water BMPs, particularly those that hold standing water for over 96 hours. Certain site design features that hold standing water may similarly produce mosquitoes.

[32] USEPA, 2007. Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices, December 2007.

Structural BMPs and site design features should incorporate design, construction, and maintenance principles to promote drainage within 96 hours to minimize standing water available to mosquitoes. Nuisances and public health impacts resulting from vector breeding can be prevented with close collaboration and cooperative effort between municipalities and local vector control agencies and the CDPH during the development and implementation of storm water runoff management programs. The CDPH also has issued guidance for BMP implementation that will minimize potential nuisances and public health impacts resulting from vector breeding.[33]

All development projects are required to implement source control BMPs that will minimize the generation of pollutants. Additionally, each development project must implement, where applicable and feasible, low impact development (LID) BMPs to mimic the natural hydrology of the site and retain and/or treat pollutants in storm water runoff prior to discharging to and from the MS4.

The LID Center defines LID as "*a comprehensive land planning and engineering design approach with a goal of maintaining and enhancing the pre-development hydrologic regime of urban and developing watersheds.*"[34] LID designs seek to control storm water at the source, using small-scale integrated site design and management practices to mimic the natural hydrology of a site, retain storm water runoff by minimizing soil compaction and impervious surfaces, and disconnect storm water runoff from conveyances to the storm drain system.

LID BMPs may utilize interception, storage, evaporation, evapotranspiration, infiltration, and filtration processes to retain and/or treat pollutants in storm water before it is discharged from a site. Because of these numerous options, the San Diego Water Board expects that every development project will be able to implement some form of LID BMPs. Examples of LID BMPs include using permeable pavements, rain gardens, rain barrels, grassy swales, soil amendments, and native plants.

Provision E.3.a also includes requirements for all development projects to, where feasible, landscape with native and/or low water use plants to minimize the discharge of non-storm water discharges associated with excessive irrigation, as well as harvest (i.e., storage) and use precipitation to promote the concept of utilizing storm water as a resource.

While all development projects are subject to the requirements of Provision E.3.a, Provision E.3.b identifies Priority Development Projects that exceed given size thresholds and/or fit under specific use categories. Priority Development Projects are required to incorporate specific performance criteria for structural BMPs into the

[33] California Department of Public Health, 2012. Best Management Practices for Mosquito Control in California. (http://www.cdph.ca.gov/HealthInfo/discond/Documents/BMPforMosquitoControl07-12.pdf)
[34] www.lowimpactdevelopment.org

project plan to reduce the generation of pollutants, and address potential impacts from hydromodification.

The Priority Development Project categories are based on the requirements of the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), and do not differ significantly from the Fourth Term Permit for San Diego County. Furthermore, the Priority Development Project categories are consistent with Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), and Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit).

Because of the impact of relatively small increases in watershed impervious surfaces to receiving waters, Provision E.3.b.(1)(c)(iv) has been updated to include large driveways that are 5,000 square feet or more. The San Diego Water Board finds that large driveways can exacerbate altered flow regimes if not properly controlled.

Provision E.3.b.(3) describes projects that are exempt from Priority Development Project status. These include new or retrofit paved sidewalks, bicycle lanes, or trails that are designed and constructed to direct runoff to vegetated areas or be hydraulically disconnected from paved areas. The exemptions have been provided to encourage these types of projects because they provide multiple environmental benefits, such as promoting walking rather than driving, which will in turn improve air quality. Additionally, retrofitting of existing alleys, streets, or roads are exempt from Priority Development Project status if they are constructed using USEPA Green Streets guidance.[35] By doing so, retrofitting of these types of projects is encouraged. The San Diego Water Board recognizes that there are spatial constraints associated with these projects, and implementation of structural BMPs are not always feasible.

For development projects identified as Priority Development Projects, the requirements of Provision E.3.c are the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment.*" Provisions E.3.c.(1)-(3) describe the performance criteria for the structural BMPs that must be implemented for each Priority Development Project defined by Provision E.3.b.

Provision E.3.c.(1) describes the storm water pollutant control BMP requirements that must be implemented by all Priority Development Projects. The purpose of Provision E.3.c.(1) is to reduce pollutants in storm water runoff to the MEP from Priority Development Projects before it is discharged to the MS4. Of all the available treatment processes available, retention of storm water, and therefore capture of the

[35] "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).

pollutants in the storm water, will achieve 100 percent pollutant removal efficiency for the volume of storm water retained. No other method of treatment can achieve 100 percent pollutant removal efficiency. Thus, retention of as much storm water onsite is the most effective way to reduce pollutants in storm water discharges to, and consequently from the MS4, and controls pollutants in storm water discharges from a site to the MEP.

Under Provision E.3.c.(1)(a), retention of the pollutants in the runoff produced from the 85th percentile storm event ("design capture volume") is the design standard to which Priority Development Projects must comply. Since the 85th percentile storm event has previously been used as the numeric design standard for treatment control BMPs, this same size storm event is used as the numeric design standard for storm water retention. This is the MEP standard recognized by the San Diego Water Board and is consistent with the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), as well as Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit), and Los Angeles Water Board Order No. R4-2012-0175 (Los Angeles County MS4 Permit).

The 85th percentile storm event is the event that has a precipitation total greater than or equal to 85 percent of all storm events over a given period of record in a specific area or location. For example, to determine what the 85th percentile storm event is in a specific location, all 24 hour storms that have recorded values over a 30 year period would be tabulated and a 85th percentile storm would be determined from this record (i.e. 15 percent of the storms would be greater than the number determined to be the 85th percentile storm). Most jurisdictions in the San Diego Region have already developed isopluvial maps that can provide this type of information. The 85th percentile storm might be determined to be a number such as 1.0 inch, and this would be multiplied by the total area of the project footprint producing runoff to calculate the design capture volume. The Priority Development Project designer would then select a system of BMPs that would retain (i.e. intercept, store, infiltrate, evaporate, or evapotranspire) the pollutants contained in the design capture volume onsite.

Retention BMPs are necessary to capture and retain pollutants generated from a Priority Development Project. In a recent study performed by SCCWRP in the Los Angeles Region, they found "*that the magnitude of constituent load associated with storm water runoff depends, at least in part, on the amount of time available for pollutant build-up on land surfaces. The extended dry period that typically occurs in arid climates such as southern California maximizes the time for constituents to build-up on land surfaces, resulting in proportionally higher concentrations and loads during*

initial storms of the season."[36] This implies that the "first flush" of a rainy season and the first storm events after long antecedent dry periods tend to have the highest pollutant loads. Capturing and retaining the pollutant loads of the "first flush" of a rainy season and the first storm events after long antecedent dry periods will reduce a significant portion of the pollutants in storm water discharged to and from the MS4.

The San Diego Water Board, however, acknowledges that in some situations retention of the full design capture volume onsite may not be technically feasible. In this event, the Copermittee may allow the Priority Development Project to use biofiltration BMPs to treat 1.5 times the design capture volume not reliably retained onsite, or biofiltration BMPs with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite.

The 1.5 multiplier is based on the finding in the Ventura County Technical Guidance Manual that biofiltration of 1.5 times the design capture volume not retained onsite will provide approximately the same pollutant removal as retention of the design capture volume on an annual basis.[37] This standard is consistent with the Los Angeles Water Board's Los Angeles County and Ventura County municipal storm water permits (Order Nos. R4-2012-0175 and R4-2010-0108, respectively). The flow-thru design of 0.75 times the portion of the design capture volume not reliably retained onsite is consistent with the San Diego Water Board's Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively). In either case, the biofiltration BMPs must be designed with an appropriate hydraulic loading rate to maximize storm water retention and pollutant removal, as well as to prevent erosion, scour, and channeling within the BMP. Each Copermittee is required to update its BMP Design Manual to provide guidance for hydraulic loading rates and other biofiltration design criteria necessary to maximize storm water retention and pollutant removal.

The San Diego Water Board further recognizes that, in addition to not being technically feasible, retention of the full design capture storm onsite may be cost prohibitive, or may not provide as much water quality benefit to the Watershed Management Area as would implementing BMPs elsewhere in the watershed. Thus, Provision E.3.c.(1)(b) allows for the use of a combination of onsite retention BMPs, and the implementation of an Alternative Compliance Program described in Provision E.3.c.(3). Provision E.3.c.(3) is discussed in more detail below.

If the full design capture volume is not retained onsite either because biofiltration is not technically feasible, or a Copermittee grants a Priority Development Project permission

[36] Stein, E.D., Tiefenthaler, L.L., and Schiff, K.C., 2007. Technical Report 510, Sources, Patterns and Mechanisms of Storm Water Pollutant Loading from Watershed and Land Uses of the Greater Los Angeles Area, California, USA. March 20, 2007.
[37] Ventura Countywide Stormwater Management Program. 2011. Ventura Technical Guidance Manual, Manual Update, 2011.

to utilize the Alternative Compliance Program, then the pollutants in the portion of the design capture volume that are not reliably retained onsite must still be reduced to the MEP. Thus, flow-thru treatment control BMPs are required to be implemented on Priority Development Projects in addition to the retention BMPs. The requirements of Provisions E.3.c.(1)(a)(ii)[a]-[c] include the performance standards for flow-thru treatment control BMPs, consistent with the Fourth Term Permits in the San Diego Region.

Whereas the purpose of the requirements under Provision E.3.c.(1) is to reduce pollutants in storm water runoff to the MEP, the purpose of the requirements under Provision E.3.c.(2) is to maintain or restore more natural hydrologic flow regimes to prevent accelerated, unnatural erosion in downstream receiving waters, also to the MEP standard. Provision E.3.c.(2) describes hydromodification management BMP requirements that must be implemented by all Priority Development Projects.

The performance criteria for the implementation of hydromodification management BMPs on Priority Development Projects are consistent with the requirements in the Fourth Term Permits for Orange and Riverside Counties (Order Nos. R9-2009-0002 and R9-2010-0016, respectively). Modifications to the Orange County and Riverside County Hydromodification Management Plans (HMPs) will likely be minor, or may not be necessary. The HMP for San Diego County will likely require some minor modifications to incorporate the requirements of Provision E.3.c.(2) and become consistent with the Orange County and Riverside County HMPs. The San Diego Water Board does not, however, expect that it will be necessary for the San Diego County Copermittees to develop a new approach or significantly re-write the San Diego County HMP. This is because the premise of the hydromodification management BMP requirements, which are to control storm water runoff conditions (flow rates and durations) for Copermittee-defined range of flows, is unchanged from all Fourth Term Permits in the San Diego Region.

Provision E.3.c.(2)(a) requires that post-project runoff conditions mimic the *pre-development* runoff conditions, and not the *pre-project* runoff conditions. Fundamentally, the San Diego Water Board believes that using a hydrology baseline that approximates that of an undeveloped, natural watershed is the only way to facilitate the return of more natural hydrological conditions to already built-out watersheds, and ultimately improved stream health. On the other hand, using the *pre-project* hydrology as a baseline for redevelopment projects results in propagating the unnatural hydrology of urbanized areas. Propagating the urbanized flow regime does not support conditions for restoring degraded or channelized stream segments, and would forever sentence such streams to the degraded state. Furthermore, reducing the volume of storm water runoff associated with the urbanized flow regime will also result in reducing the discharge of pollutants into receiving waters, since storm water runoff from impervious surfaces contains untreated pollutants.

The San Diego Water Board understands that approximating the pre-development runoff condition associated with a redevelopment site is not necessarily straightforward because factors such as natural grade and native vegetation for the site cannot be precisely known. Therefore, the San Diego Water Board does not expect project designers to estimate historical conditions associated with redevelopment sites. Rather, the San Diego Water Board expects project designers and the Copermittees to approximate pre-development runoff conditions using the parameters of a *pervious* area rather than an *impervious* area. This means that for redevelopment sites, approximating pre-development runoff conditions equates to using existing onsite grade and assuming the infiltration characteristics of the underlying soil. A redevelopment Priority Development Project must not use runoff coefficients of concrete or asphalt to estimate pre-development runoff conditions. Rather, redevelopment projects must use available information pertaining to existing underlying soil type (such as soil maps published by the National Resource Conservation Service), onsite existing grade, and any other readily available pertinent information to estimate pre-development runoff conditions.

The San Diego Water Board understands, indeed asserts, that the pre-development hydrology of an area in question can only be roughly estimated and cannot be precisely known. However, using the hydrology of a natural condition, even if not precisely known, will provide significant benefit to receiving waters over using the hydrology associated with impervious (developed) surfaces. Therefore in order to achieve the goals of the Clean Water Act, which are to "*restore and maintain the chemical, physical, and biological integrity of the nation's waters* [emphasis added]," the most appropriate standard to use for hydromodification management is the standard associated with the pre-development condition.

Provision E.3.c.(2)(b) requires Priority Development Projects to avoid known critical sediment yield areas or implement measures that would allow coarse sediment to be discharged to receiving waters, such that the natural sediment supply is unaffected by the project. This is necessary because the availability of coarse sediment supply is as much an issue for causing erosive conditions to receiving streams as are accelerated flows.

The San Diego Water Board recognizes that in some situations implementing the hydromodification management BMP requirements for flow control fully onsite may not be technically feasible, may be cost prohibitive, or may not provide any overall water quality benefits to the Watershed Management Area. Thus, Provision E.3.c.(2)(c) allows for the use of a combination of onsite hydromodification management BMPs for flow control and alternative compliance options described in Provision E.3.c.(3).

Provision E.3.c.(3) allows for alternative compliance in instances where the Copermittee determines that offsite measures will have a greater overall water quality benefit for the Watershed Management Area than if the Priority Development Project were to implement structural BMPs onsite. Consequently, watershed-specific

structural BMP requirements are present in this Order in the form of allowable compliance offsite. The Alternative Compliance Program to Onsite Structural BMP Implementation Provision is intended to integrate with the Copermittees' planning efforts in the Water Quality Improvement Plans.

The Alternative Compliance Program is an option for Priority Development Projects where the governing Copermittee has participated in the development of a Watershed Management Area Analysis as part of the Water Quality Improvement Plan (described in Provision B.3.b.(4)). Such an approach is consistent with the latest findings in hydromodification management by the scientific community. In a Technical Report entitled *Hydromodification Assessment and Management in California,*[38] the report states:

> *"An effective [hydromodification] management program will likely include combinations of on-site measures (e.g., low-impact development techniques, flow-control basins), in-stream measures (e.g., stream habitat restoration), floodplain and riparian zone actions, and off-site measures. Off-site measures may include compensatory mitigation measures at upstream locations that are designed to help restore and manage flow and sediment yield in the watershed."*

Consistent with the ideas brought forth in the report, in the Watershed Management Area Analysis of Provision B.3.b.(4), which is optional, the Copermittees will develop watershed maps that include as much detail about factors that affect the hydrology of the watershed as is available. Such factors included identification of areas suitable for infiltration, coarse sediment supply areas, and locating stream channel structures and constrictions. Once these factors are mapped and studied, the Copermittees can identify areas in the watershed where candidate projects may be implemented that are expected to improve water quality in the watershed by providing more opportunity for infiltration, slowing down storm water flows, or attenuation of pollutants naturally via healthy stream habitat. These candidate projects may be in the form of retrofitting existing development, rehabilitating degraded stream segments, identifying regional BMPs, purchasing land to preserve valuable floodplain functions, and any other project(s) that the Copermittees identify.

Under the Alternative Compliance Program, Priority Development Projects may be allowed to fund, partially fund, or implement a candidate project, in lieu of implementing structural BMPs onsite, if they enter into a voluntary agreement with the governing Copermittee permitting this arrangement. Project proponents may also propose an alternative project not previously identified by the Copermittees. In either case, whether a project proponent implements a candidate project identified by the Copermittees or a separate alternative compliance project, the governing Copermittee must determine that implementation of the project will have a greater overall water

[38] 2012. ED Stein, F Federico, DB Booth, BP Bledsoe, C Bowles, Z Rubin, GM Kondolf, A Sengupta. Technical Report 667. Southern California Coastal Water Research Project. Costa Mesa, CA.

quality benefit for the Watershed Management Area than fully implementing structural BMPs onsite. Determination of greater overall water quality benefits associated with alternative compliance projects would be accomplished by utilizing Water Quality Equivalency calculations developed pursuant to Provision E.3.c.(3)(a). Water Quality Equivalency calculations are necessary to establish a regional and technical basis for determining water quality benefits associated with alternative compliance projects, which can be consistently used by all Copermittees in the San Diego Region. Finally, if ~~I~~f alternative compliance involves funding or implementing a project that is outside the jurisdiction of the governing Copermittee, then that Copermittee may enter into an inter-agency agreement with the appropriate jurisdiction.

Finally, Provision E.3.c.(2)(d) allows Priority Development Projects to be exempt from the hydromodification management BMP requirements if there is no threat of erosion to downstream receiving waters (i.e. the receiving stream is concrete lined from the point of discharge all the way to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean). If the Copermittees believe that more exemptions are warranted, then they must perform the optional Watershed Management Area Analysis of Provision B.3.b.(4). Additional exemptions other than those specified in this Order may be established on a watershed basis, provided the Copermittees perform the analysis, provide supporting rationale for the exemptions, and complete the Water Quality Improvement Plan approval process pursuant to Provision F.1.

To facilitate the transition to this Order from the Fourth Term Permits for Orange and Riverside County Copermittees, Provision E.3.c.(2)(e) allows two additional temporary exemptions from hydromodification management BMP implementation. The first temporary exemption allows relief from hydromodification management BMP implementation for Priority Development Projects discharging directly to an engineered channel conveyance system with a capacity to convey peak flows generated by the 10-year storm event all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean. Similar to the exemption allowed for concrete-lined channels, this exemption is premised on the concept that there is little threat of erosion to these types of engineered channel systems.

The second temporary exemption allows relief from hydromodification management BMP implementation for Priority Development Projects discharging directly to large river reaches with drainage areas larger than 100 square miles and a 100-year flow capacity in excess of 20,000 cubic feet per second. If this exemption is claimed, then properly sized energy dissipation is required at all discharge points associated with the Priority Development Project. This exemption is premised on the concept that large river reaches can essentially assimilate the accelerated flow rates associated with individual Priority Development Projects because they are inconsequential compared

to the flow rate in the large river reach. Both of these exemptions are included in the Hydromodification Management Plan for San Diego County[39].

These temporary exemptions are allowed as a means to facilitate Orange and Riverside County Copermittees' transition to this Order from the Fourth Term Permits and are not meant to reside as permanent exemptions without additional rigorous technical analyses specific to each County. Therefore, these exemptions will no longer apply once the Copermittees' land development programs are fully updated to reflect the requirements of this Order, i.e., upon implementation of the BMP Design Manual pursuant to Provision F.2.b. If the Copermittees believe that these or other exemptions are warranted in the context of water quality improvement and stream restoration opportunities, then the Copermittees must perform the optional Watershed Management Area Analysis of Provision B.3.b.(4) and provide supporting rationale for the exemptions. The San Diego County Copermittees are also required to perform the optional Watershed Management Area Analysis to provide supporting rationale to justify use of these and other exemptions. Updated BMP Design Manuals including rationale to justify use of exemptions will be reviewed by the San Diego Water Board pursuant to Provision F.2.b.

Provisions E.3.c.(4) and E.3.c.(5) were included under the BMP requirements applicable to all development projects in the Fourth Term Permits for San Diego, Orange, and Riverside Counties (Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016, respectively). In this Order, the long-term BMP maintenance and infiltration and groundwater protection requirements apply to structural BMPs implemented by Priority Development Projects only.

Provision E.3.d requires the Copermittees to update their BMP Design Manual as needed to incorporate the requirements of Provision E.3. The BMP Design Manual is formerly known as the Standard Storm Water Mitigation Plan, or SSMP, and was renamed so that the title has a more accurate description of the document content. The contents of the BMP Design Manual are largely unchanged from the previous Standard Storm Water Mitigation Plans required under the Fourth Term Permits. The BMP Design Manual fulfills the 40 CFR 122.26(d)(2)(iv)(A)(2) requirement that the Copermittee's development planning program includes "*a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment*."

As part of the "*planning procedures,*" 40 CFR 122.26(d)(2)(iv)(A)(2) requires the procedures to "*address controls to reduce pollutants in discharges from municipal separate storm sewers after construction is completed*." The requirements applicable to the implementation and oversight of structural BMPs at Priority Development Projects are provided under Provision E.3.e.

[39] Final Hydromodification Management Plan Prepared for County of San Diego, March 2011

Proper installation of the structural BMPs approved for a Priority Development Project is necessary to ensure that pollutants in storm water discharges will be reduced to the MEP after the project is completed. In addition to the proper installation of structural BMPs, the maintenance of structural BMPs on Priority Development Projects is necessary to ensure that pollutants in storm water discharges will continue to be reduced to the MEP. Provision E.3.e.(1) includes the minimum requirements that each Copermittee must implement to ensure structural BMPs are properly installed and will be properly maintained.

Provisions E.3.e.(1)(a)(i)-(ii) have been included to provide additional clarification regarding when a Copermittee may allow land development requirements from earlier MS4 permits to apply to a Priority Development Project. Since the MS4 permits issued from 2001 to the adoption of Order No. R9-2015-0001 amending Order No. R9-2013-0001 (Regional MS4 Permit), a Copermittee could allow development projects with "prior lawful approval" to be "grandfathered" into implementing BMP requirements from previous MS4 permits. The Copermittees were given the discretion to use their land use authority to determine when it was appropriate to allow a development project with prior lawful approval to implement BMP requirements from the previous MS4 permits, and when the most recent BMP requirements should be required to achieve the reduction of pollutants in storm water runoff from development projects to the MEP. However, the San Diego Water Board has found that the Copermittees and the development community frequently disagree about when a development project has prior lawful approval and what is necessary to reduce pollutants in storm water runoff from development projects to the MEP.

Therefore, Provisions E.3.e.(1)(a)(i)-(ii) were included to provide more clarity and certainty for the Copermittees, the land development community, and the general public about when the structural BMP performance standards of earlier MS4 permits may be allowed to be implemented. A Copermittee may allow a Priority Development Project to implement BMP requirements of the previous MS4 permit only if all requirements of Provisions E.3.e.(1)(a)(i)[a]-[d] have been met. Otherwise, the Copermittees must require all Priority Development Projects to incorporate the BMP requirements of Provision E.3 into the project to reduce pollutants in storm water runoff from development projects to the MEP.

Provisions E.3.e.(1)(a)(i)[a]-[d] are dependent upon the effective date of the BMP Design Manual. Unless otherwise directed by the San Diego Water Board, the effective date of the BMP Design Manual is December 24, 2015 for the San Diego County Copermittees, September 28, 2017 for the Orange County Copermittees, and July 5, 2018 for the Riverside County Copermittees.

Alternatively, if the Copermittee can demonstrate a lack of land use authority or legal authority to require a Priority Development Project to implement the requirements of Provision E.3, the Copermittee may allow land development requirements from the

previous MS4 permits to apply. However, under these circumstances the San Diego Water Board expects the Copermittee to utilize its available land use authority or legal authority to require the implementation of as much of Provision E.3 as possible to reduce the discharge of pollutants in storm water from development and redevelopment projects within its jurisdiction to the MEP.

In cases where BMP requirements from the earlier MS4 permits govern the structural BMP design requirements of a Priority Development Project, the San Diego Water Board expects the Copermittees to be able to demonstrate, in a programmatic audit or other means, that a Priority Development Project met all the requirements listed under Provisions E.3.e.(1)(a)(i)[a]-[d], or have evidence that the Copermittee did not have the land use or legal authority to require the implementation of Provision E.3 for a Priority Development Project.

The requirements under Provision E.3.e.(2)-(3) are necessary to demonstrate each Copermittee is implementing a program that complies with Provisions E.3.b-c and E.3.e.(1), and ensure structural BMPs at Priority Development Project will continue to be able to reduce pollutants in storm water discharges to the MEP.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary for any development projects to compel compliance with the requirements of Provision E.3 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.3.f requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Provision E.4 (Construction Management) requires each Copermittee to implement a construction management program to control and reduce the discharge of pollutants in storm water from construction sites to the MEP. Proper implementation of the construction management program will also contribute toward effectively prohibiting non-storm water discharges from construction sites to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." As part of the management program, 40 CFR 122.26(d)(2)(iv)(D) requires "*a program to implement and maintain structural and non-structural best management practices to reduce pollutants in storm water runoff from construction sites to the municipal storm sewer system.*"

Construction sites can be significant sources of sediment, trash, and other pollutants to receiving waters. Although sediment is naturally occurring in the natural

environment, the discharge of sediment under unnatural conditions is problematic to receiving waters. Fine sediment in creeks causes high turbidity that interferes with the functionality of native flora and fauna in local creeks. For example, turbidity interferes with both photosynthesis of water-philic plants, as well as successful foraging and reproduction of benthic macroinvertebrates. Sediment can also make it difficult for fish to breathe because it clogs fish gills. Other pollutants such as heavy metals or pesticides can adhere to sediment and are transported to receiving waters during storm events, where they dissolve in the water column and become bioavailable to aquatic organisms. Sediment is recognized as a major stressor to surface waters and is responsible for the impairment of several lagoons and creeks in the San Diego Region.

Provision E.4 includes requirements that each Copermittee must implement to minimize the discharge of sediment and other pollutants from construction sites to the MS4 within its jurisdiction. The requirements under Provision E.4 are consistent with the Fourth Term Permits for San Diego, Orange, and Riverside Counties. Therefore, Copermittees are expected to implement the requirements seamlessly, with minimal changes to their existing construction management programs. The Copermittees, however, are given more flexibility to run their programs as needed to maximize efficiency, and also to be consistent with the Water Quality Improvement Plan for the Watershed Management Area.

As part of the construction management program, 40 CFR 122.26(d)(2)(iv)(D)(1) requires "*procedures for site planning which incorporate consideration of potential water quality impacts.*" Provision E.4.a describes the minimum elements each Copermittee is required to include as part of the construction site planning and project approval process. The construction site planning and approval process is based primarily on ensuring each project had an adequate site-specific pollution control, construction BMP, and/or erosion and sediment control plan that will be implemented to minimize the discharge of pollutants in storm water to the MEP, and minimize impacts to receiving waters.

The requirements under Provision E.4.b provide the data and information necessary to identify "*priorities for inspecting sites and enforcing control measures*" required pursuant to 40 CFR 122.26(d)(2)(iv)(D)(3). Under Provision E.4.b, each Copermittee must identify construction sites that are considered a high threat to downstream surface waters. Designation of "high threat to water quality" construction sites will necessitate the Copermittees to develop criteria to identify such sites. Provision E.4.b.(2) describes a list of factors that must be considered when the Copermittee considers threat to water quality. For example, a Copermittee must identify sites as "high threat to water quality" if it is located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions, according to the Water Quality Improvement Plan. This ensures that construction management program implementation is compatible with the Copermittee's identified highest priority water quality conditions.

Pursuant to 40 CFR 122.26(d)(2)(iv)(D)(2) each Copermittee is required describe "*requirements for nonstructural and structural best management practices*" at construction sites. Provision E.4.c includes the types of construction site BMPs that the Copermittees must implement, or require the implementation of, at each construction site to reduce pollutants in storm water discharges to the MEP.

Each Copermittee is expected to require the implementation of appropriate BMPs given specific site conditions, the season and likelihood of rain events, and construction phase (i.e. grading vs. vertical construction). This means that throughout the life of the project construction, the appropriate BMPs will vary, especially if the construction of the project spans multiple wet seasons. As opposed to describing specific minimum BMPs that must be implemented, the Order describes major BMP categories that should be considered for each site.

Each Copermittee is expected to use its 20 years of storm water experience and knowledge to require implementation of appropriate BMPs from the various categories at each construction site within its jurisdiction. For example, the San Diego Water Board expects that each site will be required to implement erosion control and sediment control. The San Diego Water Board also expects each Copermittee to require implementation of active/passive sediment treatment systems at sites where other BMPs have been tried and are known to be inadequate, and discharges of sediment are causing or contributing to water quality impairment downstream. Each Copermittee is granted flexibility in specifying the minimum level of BMP requirements at each site, but the San Diego Water Board expects each site to be capable of controlling pollutants in storm water discharges to the MEP and preventing illicit discharges.

The requirements under Provision E.4.d are necessary to demonstrate that each Copermittee is implementing a program that complies with Provisions E.4.a and E.4.c and ensure BMPs at construction sites will reduce pollutants in storm water discharges to the MEP.

Provision E.4.d does not include minimum required inspection frequencies for construction sites. Each Copermittee must use its experience and knowledge to specify an appropriate inspection frequency for both high priority and lower priority sites in their jurisdictional runoff management program documents, and in accordance with the Water Quality Improvement Plan. Appropriate inspection frequencies may vary by Copermittee, but the San Diego Water Board expects that the stated frequency will be adequate for each Copermittee to properly oversee the construction sites within its jurisdiction, confirm BMPs are implemented to reduce pollutants in storm water discharges from constructions sites to the MEP, and make needed changes to its program on an ongoing basis as necessary.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary for any development projects to compel compliance with the requirements of Provision E.4 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.4.e requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Provision E.5 (Existing Development Management) requires each Copermittee to implement an existing development management program to control and reduce the discharge of pollutants in storm water from areas of existing development to the MEP. Proper implementation of the existing development management program will also contribute toward effectively prohibiting non-storm water discharges from areas of existing development to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." Within 40 CFR 122.26(d)(2)(iv)(A) and (C), the management program is required to reduce impacts on receiving waters and reduce pollutants in storm water discharges to the MEP from commercial and residential areas, industrial facilities, and municipal facilities.

Commercial and residential areas, industrial facilities, and municipal facilities must be addressed by each Copermittee with the existing development management program required under Provision E.5. All other areas within each Copermittee's jurisdiction should be either undeveloped open space, or areas that are being developed or under construction. Areas being developed or under construction will be addressed by the Copermittee under the requirements of Provision E.3 (Development Planning) or Provision E.4 (Construction Management).

Areas of existing development typically include impervious surfaces such as sidewalks, driveways, roads, and rooftops, which generate and concentrate pollutants (such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not found in high concentrations in the natural environment. Pollutants that accumulate on impervious surfaces are not easily biodegraded or not subject to natural treatment processes. When it rains, these pollutants are transported in storm water runoff from these impervious surfaces into receiving waters, resulting in poor water quality and degradation of beneficial uses.

In addition to the generation of pollutants, areas of existing development have generally altered the natural conditions of the land and removed vegetative cover, reduced the perviousness of the surface, and reduced the capacity of storm water that can be intercepted, captured, stored, infiltrated, evaporated, and/or evapotranspired.

The alteration of the natural conditions and the impervious surfaces associated with areas of existing development causes water quality problems due to the alteration of natural flow regimes within the watersheds; resulting in hydromodification of channels, streams, and habitats that exist within or adjacent to the areas of existing development.

Thus, storm water discharges from areas of existing development are responsible for poor water quality, degraded habitats, and hydromodified channels throughout the developed portions of the watersheds in the San Diego Region. To improve the health and functionality of the receiving waters in a Watershed Management Area, land use practices and the amount of impervious surfaces in areas of existing development must change to reduce the various impacts caused by hydromodification and pollutants from storm water runoff generated in developed areas. Each Copermittee must be aggressive to address pollutant sources and runoff from areas of existing development to be able to reduce pollutants in storm water discharges from the MS4 to the MEP.

There is some overlap in the requirements under Provision E.5 with the requirements under Provisions E.2 (Illicit Discharge Detection and Elimination), E.3 (Development Planning), and E.4 (Construction Management). Illicit discharges frequently originate from areas of existing development. New development projects, when completed will become some type of residential, commercial, industrial or municipal existing development. Redevelopment projects are, by definition, redeveloping areas of existing development. And, redevelopment projects become construction sites located in areas of existing development. Much of the data and information collected, inspections performed, and enforcement actions taken for the requirements under Provisions E.2 to E.4 may also be utilized by the existing development management program. The requirements under Provision E.5, however, are focused primarily on reducing pollutants generated in areas of existing development that can be transported in storm water runoff and discharged to and from the MS4.

The requirements under Provision E.5 build upon existing program elements being implemented by the Copermittees. Provision E.5 is generally consistent with the existing development requirements of the Fourth Term Permits for Orange and Riverside Counties (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), but modified to provide more flexibility to implement the programs so resources can be better focused toward addressing the highest priority water quality conditions identified in the Water Quality Improvement Plans.

For a Copermittee to properly manage areas of existing development, having knowledge of what development exists within its jurisdiction is essential. Provision E.5.a requires each Copermittee to maintain a watershed-based inventory of all the existing development within its jurisdiction. This requirement is necessary for each Copermittee to implement the requirements of Provision E.5.b-e.

As opposed to just maintaining separate inventories based on the type of site, each Copermittee must maintain a watershed-based inventory that includes all types of existing development within its jurisdiction. By utilizing a watershed-based inventory, the Copermittees within a Watershed Management Area can combine their inventories and review the inventories by watershed in addition to by jurisdiction. Pollutant sources and strategies for abatement can then be evaluated on a watershed level, as opposed to evaluating sources and strategies strictly by type of site.

Provision E.5.a includes the information that must be included in the inventory. Provision E.5.a.(1) specifies what facilities or areas must be included in the inventory. A commercial type of existing development may be identified in the inventory as a facility (e.g. individual building, individual business) or an area (e.g. shopping center, commercial zone). An industrial type of existing development must be identified in the inventory by facility (e.g. individual industrial entity). A municipal type of existing development must be identified in the inventory by facility, with a list of specific municipal facilities that must be included in the inventory. A residential type of existing development must be identified by areas to be designated by the Copermittee. For each of the facilities and areas identified in the Copermittee's inventory developed pursuant to Provision E.5.a.(1), Provision E.5.a.(2) specifies the information that must be included in the description for the facility or area.

Provision E.5.a.(3) requires each Copermittee to maintain an updated map showing the location of inventoried existing development, watershed boundaries, and water bodies. This requirement was included because this information is expected to help the Copermittees in a Watershed Management Area identify and prioritize sources of pollutants and/or stressors in areas of existing development that contribute toward the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Knowledge of the existing development that are likely to be sources of pollutants contributing to the highest priority water quality conditions is expected to be a key element in the Copermittees' development of the water quality improvement strategies that will be included in the Water Quality Improvement Plans. The strategies described in the Water Quality Improvement Plans will direct efforts within the existing development management programs implemented by each Copermittee.

Pursuant to 40 CFR 122.26(d)(2)(iv)(A) each Copermittee is required describe "*structural and source control measures to reduce pollutants*" in storm water runoff discharged from areas of existing development. Provision E.5.b includes the BMP implementation and maintenance requirements that the each Copermittee must require at areas of existing development to reduce pollutants in storm water discharges to the MEP. The San Diego Water Board, however, recognizes that BMP implementation and maintenance for residential areas will require much more education and encouragement through less authoritative measures than for commercial, industrial and municipal facilities and areas. Thus, the BMP

implementation and maintenance requirements have been separated between requirements under Provision E.5.b.(1) for commercial, industrial and municipal facilities and areas, and Provision E.5.b.(2) for residential areas.

Most of the requirements in Provision E.5.b are consistent with the related requirements in the Fourth Term Permits. The level of specificity, however, has been changed to allow each Copermittee the flexibility to implement its program to achieve maximum efficiency, and to perform functions that will address the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Each Copermittee is expected to require the implementation of appropriate BMPs to address the expected pollutants from each facility or area. The Third and Fourth Term Permits described specific minimum BMPs that must be implemented at various sites. This Order, however, requires each Copermittee to designate minimum BMPs themselves and require implementation. Consistent with the Fourth Term Permits, each Copermittee is required to maintain, or require the maintenance of, all BMPs as needed.

The BMP implementation and maintenance requirements include a schedule of operation and maintenance activities for the MS4 and related structures (such as catch basins, storm drain inlets, and detention basins), as well as public streets and roads. Public streets and roads specifically include public unpaved roads. The San Diego Water Board identified, through investigations and complaints, sediment discharges from unpaved roads as a significant source of water quality problems in the San Diego Region. Inspection activities conducted by the San Diego Water Board since the Third Term Permits have found a lack of source control for many unpaved roads within the jurisdiction of the Copermittees.

Unpaved roads are a source of sediment that can be discharged in runoff to receiving waters, especially during storm events. Erosion of unpaved roadways occurs when soil particles are loosened and carried away from the roadway base, ditch, or road bank by water, wind, traffic, or other transport means. Exposed soils, high runoff velocities and volumes, sandy or silty soil types, and poor compaction increase the potential for erosion.

Road construction, culvert installation, and other maintenance activities can disturb the soil and drainage patterns to streams in undeveloped areas, causing excess runoff and thereby erosion and the release of sediment. Poorly designed unpaved roads can act as preferential drainage pathways that carry runoff and sediment into natural streams, impacting water quality. In addition, other public works activities along unpaved roads have the potential to significantly affect sediment discharge and transport within streams and other waterways, which can degrade the beneficial uses of those waterways.

USEPA also recognizes that discharges from unpaved roads pose a significant potential threat to water quality. USEPA guidance[40] emphasizes the threat of unpaved roads to water quality:

> "*Dirt and gravel roads are a major potential source of these pollutants [sediment] and pollutants that bind to sediment such as oils, nutrients, pesticides, herbicides, and other toxic substances. Many roads have unstable surfaces and bases. Roads act like dams, concentrating flows that accelerate erosion of road materials and roadsides. Both unstable surfaces and accelerated erosion then lead to sediment and dust.*"

There are several guidance documents, developed by the USEPA,[41] the US Forest Service,[42] the University of California,[43] and others, that include design and construction specifications and BMPs that are readily available for implementation by public entities. Implementing design and other source control BMPs for unpaved roads in the region is necessary to reduce and minimize the impacts of sediment discharged during storm events from unpaved roads to the MS4s and receiving waters.

Provision E.5.c describes existing development site inspection frequency, content, and tracking that each Copermittee must incorporate into their existing development management programs. The requirements under Provision E.5.c are necessary to demonstrate each Copermittee is implementing a program that complies with Provision E.5.b and ensure BMPs implemented in areas of existing development will reduce pollutants in storm water discharges to the MEP. Provision E.5.c has been modified to include a minimum of once every 5 years for all inventoried facilities and areas of existing development, utilizing one or more methods of inspection.

In addition to onsite inspections, the methods of inspection have been expanded to include drive-by inspections. Inspections may be performed by the Copermittee's municipal and contract staff, or by volunteer monitoring or patrol programs. Volunteer monitoring or patrol programs are not expected to enforce the Copermittee's ordinances, or to inspect areas or facilities where members of the public are not allowed access. Volunteer monitoring or patrol programs must be trained by the Copermittee, and are only expected to collect visual observations. By utilizing drive-by inspections and volunteer monitoring or patrol programs, the Copermittees will be able to maximize and efficiently use their resources to identify and address sources of pollutants in areas of existing development.

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[40] USEPA, 2006. Environmentally Sensitive Maintenance for Dirt and Gravel Roads. Gesford and Anderson, USEPA-PA-2005.
[41] Ibid
[42] US Forest Service, 1996. Forest Service Specifications for Construction of Roads & Bridges. EM-7720-100. Revised August 1996.
[43] University of California Division of Agriculture and Natural Resources, 2007. Rural Roads: A Construction and Maintenance Guide of California Landowners. Publication 8262.

The municipal and contract staff of each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial, industrial, and municipal facilities and areas in its inventoried existing development pursuant to Provision E.5.c.(1)(a)(iv). An "equivalent" of at least 20 percent means if any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspections may count toward the total annual inspection requirement. Linear municipal facilities (i.e. MS4 linear channels, sanitary sewer collection systems, streets, roads and highways) in the Copermittee's existing development inventory are not subject to the inspection frequency requirement of Provision E.5.c.(1)(a)(iv).

The inspection content specified in Provision E.5.c.(2)(a) includes the information required to be collected during an inspection by any method. The inspection content specified in Provision E.5.c.(2)(b) includes additional information that must be collected when a Copermittee's municipal or contract staff perform an onsite inspection. Provision E.5.c.(3) specifies the information that each Copermittee must maintain in its existing development inspection records.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary to compel compliance with the requirements of Provision E.5 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.5.d requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Provisions E.5.e.(1)-(2) specifically require the Copermittee to identify areas of existing development as candidates for retrofitting, and streams, channels, and/or habitats as candidates for rehabilitation. Provisions E.5.e.(1)-(2) are based on the retrofitting requirements of the Fourth Term Permits for Orange and Riverside Counties, but modified to also include identifying projects to rehabilitate channels within areas of existing development. The requirements have also been modified to be more focused on utilizing these types of projects for addressing the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Interest and opportunity to retrofit areas of existing development and rehabilitate channels located in areas of existing development has been observed in several programs the San Diego Water Board oversees (e.g., CWA Section 401 Water Quality Certification program, supplemental environmental projects, and grant programs). Each jurisdiction has miles and miles of streets that could be retrofitted to become green streets. Reshaping landscaped areas from convex to concave configurations can detain storm water instead of directing runoff as quickly as possible to the MS4. Retrofit projects could also include simply replacing impervious surfaces with permeable surfaces.

Retrofitting projects do not necessarily have to be expensive. Retrofitting projects could be as simple as redirecting downspouts from roofs to pervious or landscaped areas instead of to hardscaped areas discharging directly to the MS4, providing rain barrels to harvest storm water from downspouts for use at a later time, or planting more trees in areas with little vegetation to provide canopy that can intercept storm water. The San Diego Water Board encourages the Copermittees to identify simple, low-cost retrofitting opportunities that can be easily implemented, in addition to other more expensive retrofitting and channel rehabilitation projects.

Rehabilitation of channels, streams, and/or habitat will require more significant planning and resources to implement. There are, however, also abundant opportunities to rehabilitate channels, streams and/or habitats in or adjacent to areas of existing development. Each Watershed Management Area likely has several creeks and stream reaches that have been undergrounded, artificially hardened, or hydromodified that could be rehabilitated to be more sustainably configured, which would slow down storm water flows and potentially have more assimilative capacity for pollutants while still being supportive of designated beneficial uses.

The San Diego Water Board recognizes that it may be infeasible to implement retrofitting or channel rehabilitation projects within certain areas of a Copermittee's jurisdictions. For such areas, the Copermittee must instead identify, develop, and implement regional retrofitting and channel rehabilitation projects (i.e. projects that can retain and/or treat storm water from one or more areas of existing development) adjacent to and/or downstream of the areas of existing development.

Provisions E.5.e.(1)-(2) do not require the implementation of retrofitting and rehabilitation projects, but do require the Copermittee to develop a program with strategies to facilitate the implementation of these types of projects in areas of existing development. The strategies are expected to include allowing and encouraging Priority Development Projects to implement retrofitting types of projects as a means of compliance with the structural BMP performance criteria requirements of Provisions E.3.c.(1) and E.3.c.(2).

Provision E.6 (Enforcement Response Plans) requires each Copermittee to develop an Enforcement Response Plan as part of its jurisdictional runoff management program document. Proper implementation of the Enforcement Response Plans is necessary to effectively prohibit non-storm water discharges to the MS4, and reduce the discharge of pollutants in storm water from the MS4 to the MEP.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system*" and be able to demonstrate that it can "*operate pursuant to legal authority established by statute, ordinance or series of contracts*" to control the discharge of non-storm water and pollutants in storm water to and from its MS4. Pursuant to 40 CFR 122.26(d)(2)(i)(E) each Copermittee is specifically required to

have the legal authority to "*[r]equire compliance with conditions in ordinances, permits, contracts or order*s."

The requirements under Provision E.6 are necessary to demonstrate that each Copermittee can enforce its legal authority to *"effectively prohibit non-stormwater discharges"* and "*reduce the discharge of pollutants to the maximum extent practicable*" as well as "*[r]equire compliance with conditions in ordinances, permits, contracts or order*."

The Enforcement Response Plan required under Provision E.6 will serve as a reference for the Copermittee and the San Diego Water Board to determine if consistent enforcement actions are being implemented to achieve timely and effective compliance from all public and private entities that are not in compliance with the Copermittee's ordinances, permits, or other requirements. The Enforcement Response Plan must contain clear direction for the Copermittee to take immediate enforcement action, when appropriate and necessary, in their illicit discharge detection and elimination, development planning, construction management, and existing development management programs.

If the entities subject to the Copermittee's legal authority do not implement appropriate corrective actions in a timely manner, or if violations repeat, the Copermittee must take progressively stricter responses to enforce its legal authority and achieve compliance with its ordinances, permits, or other requirements to *"effectively prohibit non-stormwater discharges"* and "*reduce the discharge of pollutants to the maximum extent practicable.*"

Provision E.7 (Public Education and Participation) requires each Copermittee to implement a public education and participation program. Proper implementation of the public education and participation program as part of its jurisdictional runoff management program will contribute toward effectively prohibiting non-storm water discharges to the MS4, and toward the reduction of pollutants in storm water from the MS4 to the MEP.

Provision E.7 establishes the minimum requirements that each Copermittee must implement to engage members of the public as part of its jurisdictional runoff management program. In the Fourth Term Permits, the public education program requirements and the public participation requirements were included as separate jurisdictional runoff management program components. In this Order, the public education requirements have been consolidated with the public participation requirements, as both sets of requirements are related to the engagement of the public by each Copermittee. Engagement of the public is critical for the success of each Copermittee's jurisdictional runoff management program.

The Copermittees have been implementing public education programs for the last 20 years, which are now well established. The specificity of expected public education program elements of the Fourth Term Permits has been removed. For the most part,

the public education program requirements in Provision E.7.a have been reduced to a set of requirements that are specifically included in the federal regulations under 40 CFR 122.26(d)(2)(iv)(A)(6), 122.26(d)(2)(B)(6) and 122.26(d)(2)(D)(4), which should already be incorporated into each Copermittee's existing public education program. Each Copermittee is expected to utilize the information and data collected from the monitoring and assessments conducted within the Watershed Management Area, and from its inventories and inspections to best direct its public education program resources toward addressing the highest priority water quality conditions identified within the Water Quality Improvement Plan.

According to 40 CFR 122.26(d)(2)(iv), public participation is required to be included as part of the "*comprehensive planning process*", which includes the development and implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs. The requirements under Provision E.7.b specify the opportunities that the public must be provided to be involved in the "*comprehensive planning process*", as required by to 40 CFR 122.26(d)(2)(iv).

Provision E.8 (Fiscal Analysis) requires each Copermittee to secure the resources and provide an analysis of the resources that will be necessary to implement the requirements of the Order. Adequate fiscal resources are necessary for a jurisdictional runoff management program to effectively prohibit non-storm water discharges to the MS4, and reduce pollutants in storm water from the MS4 to the MEP.

According to 40 CFR 122.26(d)(2)(vi), each Copermittee is responsible for providing "*a fiscal analysis of the necessary capital and operation and maintenance expenditures necessary to accomplish the activities*" required by this Order, including "*a description of the source of funds that are proposed to meet the necessary expenditures, including legal restrictions on the use of such funds.*" The fiscal analysis requirements of Provision E.8 are consistent with 40 CFR 122.26(d)(2)(vi).

The San Diego Water Board has chosen not to require a description of fiscal benefits realized from implementation of the jurisdictional runoff management programs. This is a recommendation from the National Association of Flood and Stormwater Management Agencies.[44] For instance, the fiscal analysis requirements do not address city-wide fiscal benefits of protection (e.g., public health, tourism, property values, economic activity, beneficial uses, etc.), even though many costs currently reported to the San Diego Water Board are for related activities. This type of assessment may help Copermittees improve the allocation of resources and it may help the Copermittees secure adequate funding for the program. Qualitative assessments, however, could be overly subjective and most Copermittees likely lack the ability to provide accurate quantitative assessments. The San Diego Water Board encourages the Copermittees to consider means for conducting assessments of fiscal

[44] National Association of Flood and Stormwater Management Agencies. 2006. *Guidance for Municipal Stormwater Funding.* Prepared under a grant provided by the USEPA.

benefits derived from the programs. Such assessments could be conducted on a regional scale similar to studies of program costs conducted by the State Water Board.[45]

[45] State Water Board, 2005. NPDES Stormwater Cost Survey.

F. Reporting

Purpose: Provision F includes the requirements for the documents and reports that the Copermittees must prepare and provide to the San Diego Water Board. The documents prepared by the Copermittees and provided to the San Diego Water Board and made available to the public will provide the documentation that the Copermittees are complying with the requirements of the Order.

***Discussion*:** Provision F requires the Copermittees to prepare several documents and reports that must be provided to the San Diego Water Board and made available to the public. The reporting requirements have been significantly reduced compared to the Fourth Term Permit reporting requirements. The reduction in reporting requirements was recommended by the San Diego County Copermittees in the Report of Water Discharge submitted in June 2011.

More specific and detailed discussions of the requirements of Provision F are provided below.

Provision F.1 (Water Quality Improvement Plans) requires the Copermittees in each Watershed Management Area to develop and submit a Water Quality Improvement Plan in accordance with the requirements of Provision B.

Of all the requirements of Provision F, the Water Quality Improvement Plans will likely be the documents requiring the most significant effort to develop. The content of the Water Quality Improvement Plans, however, is expected to include content that should already have been developed for the Watershed Plans and several elements that are included in the Monitoring and Reporting Programs required under the Fourth Term Permits.

Because the Water Quality Improvement Plan is part of the "*comprehensive planning process which involves public participation*," Provision F.1 includes requirements to give multiple opportunities to the public to provide input on the content of the plans.

Provision F.1.a.(1) specifies the elements that the Copermittees must include in the public participation process for the development of the Water Quality Improvement Plans. In order for the public to be aware of the opportunities to provide input, Provision F.1.a.(1)(a) requires the Copermittees to develop a publicly available and noticed schedule of the opportunities for the public to participate and provide comments during the development of the Water Quality Improvement Plan. These opportunities are when the public can provide the data, information, and recommendations that the Copermittees can consider during the development of the Water Quality Improvement Plans.

The San Diego Water Board recognizes, however, that the Copermittees cannot be expected to incorporate all the data, information, and recommendations that the public may provide into the Water Quality Improvement Plans. The Copermittees will have to review the data, information, and recommendations received and make some decisions on what to incorporate into the Water Quality Improvement Plans. Before the Copermittees finalize their decisions, members of the public should be allowed to review the Copermittees' decisions. Thus, Provision F.1.a.(1)(b) requires the Copermittees to form a Water Quality Improvement Consultation Panel (Panel).

The Panel will consist of a member from the environmental community and a member from the development community familiar with the Watershed Management Area. A representative from the San Diego Water Board staff will also be part of the Panel. The Copermittees may choose to include additional members, but the Panel is only required to include three panel members.

The Panel will serve as an additional public participation and input mechanism during the development of the Water Quality Improvement Plans. The knowledge and expertise from these Panel members are expected to provide the Copermittees valuable direction during their decision-making process. The Copermittees will review the content of their planned submittals with the Panel members to receive recommendations. If the Panel provides recommendations, the Copermittees must consider revisions to the Water Quality Improvement Plan submittals.

The San Diego Water Board recognizes that the development of multiple Water Quality Improvement Plans concurrently may limit the ability of the public to review and provide comments to the Copermittees. Thus, Provision F.1.a.(1)(c) requires the Copermittees to coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public time and opportunity to participate during the development of the Water Quality Improvement Plans.

Provision F.1.a.(2) requires the Copermittees to develop and submit the first Water Quality Improvement Plan component, in accordance with the requirements of Provision B.2, which includes the identification of the priority water quality conditions and potential water quality improvement strategies. The public must be provided an opportunity to provide data, information and recommendations to be utilized in the development and identification of the priority water quality conditions and potential water quality improvement strategies for the Watershed Management Area. The Copermittees must consult with the Panel and consider making revisions. The Copermittees may submit the requirements of Provision B.2 as early as 6 months and no later than 12 months after the commencement of coverage under this Order. After the requirements of Provision B.2 are submitted to the San Diego Water Board, the public will be provided another opportunity to provide comments.

Provision F.1.a.(3) requires the Copermittees to develop and submit the second Water Quality Improvement Plan component, in accordance with the requirements of Provision B.3, which includes the identification of the numeric goals for the highest

priority water quality conditions identified for the Watershed Management Area, and the strategies that will be implemented to achieve the potential numeric goals. The Copermittees may also develop the Optional Watershed Management Area Analysis, in accordance with the requirements of Provision B.3.b.(4), as part of this submittal. The public must be provided an opportunity to provide data, information and recommendations to be utilized in the development and identification of the numeric goals and water quality improvement strategies for the Watershed Management Area. The Copermittees must consult with the Panel and consider making revisions. The Copermittees may submit the requirements of Provision B.3 as early as 9 months and no later than 18 months after the commencement of coverage under this Order. After the requirements of Provision B.3 are submitted to the San Diego Water Board, the public will be provided another opportunity to provide comments.

Finally, Provision F.1.b describes the process for the submittal and implementation of the Water Quality Improvement Plans. The complete Water Quality Improvement Plans are required to be submitted by the Copermittees within 24 months after the commencement of coverage under this Order. The San Diego Water Board will provide the public an opportunity to provide comments on each complete Water Quality Improvement Plan.

The San Diego Water Board will review each Water Quality Improvement Plan and the public comments received to determine if the Copermittees have submitted a Water Quality Improvement Plan that meets the requirements of Provision B. If a Water Quality Improvement Plan does not meet the requirements of Provision B, the Copermittees will be considered out of compliance and directed in writing by the San Diego Water Board Executive Officer to correct the deficiencies.

When a Water Quality Improvement Plan meets the requirements of Provision B, the San Diego Water Board will determine whether to hold a public hearing or to limit public input to submittal of written comments before accepting the Water Quality Improvement Plan. Implementation of the Water Quality Improvement Plan must begin within 30 days of acceptance.

The San Diego Water Board expects that any deficiencies in the Water Quality Improvement Plan will be identified either in the public comments or during the review by the San Diego Water Board before implementation begins. In the event any deficiencies are identified after the implementation of the Water Quality Improvement Plan, Provision F.1.b.(7) clarifies that the San Diego Water Board maintains the right to require the Copermittees to correct any deficiencies that may be identified.

Provision F.2 (Updates) requires the Copermittees to update specific documents that the Copermittees will utilize to implement the requirements of this Order.

Each Copermittee is required to continue implementing a jurisdictional runoff management program, as required under Provision E. Implementation of each Copermittee's jurisdictional runoff management program is directed by its jurisdictional

runoff management program document. Provision F.2.a requires each Copermittee to update its jurisdictional runoff management program document to be consistent with the requirements of Provision E concurrent with the submittal of the Water Quality Improvement Plan.

Likewise, each Copermittee must continue to require new development and redevelopment projects to implement BMPs to control pollutants in storm water runoff. The control of pollutants in storm water runoff from development and redevelopment projects within each Copermittee's jurisdiction is guided and directed by its BMP Design Manual, formerly known as a Standard Storm Water Mitigation Plan (SSMP). Provision F.2.b requires each Copermittee to update its BMP Design Manual to be consistent with the requirements of Provision E.3 concurrent with the submittal of the Water Quality Improvement Plan.

For situations where the San Diego Water Board may amend the requirements of Provisions E.3.a-d after a Copermittee has updated its BMP Design Manual pursuant to Provision F.2.b.(1), Provision F.2.b.(4) gives the Copermittee up to 90 days to incorporate the amended requirements of Provision E.3.a-d into its BMP Design Manual. The San Diego Water Board Executive Officer has discretion to modify the 90-day time period depending on the complexity of the amendments or other information that warrants a change in the 90-day time period.

In general, the requirements of the Order should not necessitate a complete rewrite of each Copermittee's jurisdictional runoff management program document or BMP Design Manual, as was required by the Third Term Permits. The jurisdictional runoff management program and BMP Design Manual requirements of this Order are not significantly different than the requirements of the Fourth Term Permits. Thus, only sections of the Order which are new or have been significantly changed should warrant revisions to specific sections of the Copermittee's jurisdictional runoff management program document and BMP Design Manual.

Finally, the Water Quality Improvement Plans are expected to require updates as the iterative approach and adaptive management process included in the Water Quality Improvement Plan, as required under Provision B.5, is implemented by the Copermittees. Provision F.2.c.(1) requires the Copermittees to implement a public participation process for the proposed updates, review the proposed updates with the Panel, and submit the updates to the Water Quality Improvement Plan as part of the Annual Reports required under Provision F.3.b.

Also, because TMDLs are likely to be developed, adopted and approved during the term of the Order, Provision F.2.c.(2) has been included to expedite the incorporation of TMDLs into the Copermittees' Water Quality Improvement Plans as part of the update process, potentially before the Order is re-opened to incorporated the requirements of the new TMDLs.

Provision F.3 (Progress Reporting) requires the Copermittees to report on the progress of implementing the Water Quality Improvement Plans.

The requirements of Provision F.3 are to report the progress toward improving water quality that the Copermittees are achieving with the implementation of the Water Quality Improvement Plans and each Copermittee's jurisdictional runoff management program. The Progress Report Presentations required under Provision F.3.a are included to provide the Copermittees an opportunity to communicate directly with the San Diego Water Board and the public. The Progress Report Presentations will also provide the members of the San Diego Water Board and members of the public an opportunity to become more acquainted with the Copermittees and their projects and programs to address non-storm water and storm water discharges into and from their MS4s.

The Annual Report requirements of Provision F.3.b are a consolidation of several reporting requirements from the Fourth Term Permits, including the Jurisdictional Runoff Management Program Annual Reports, the Watershed Annual Reports, and the Monitoring and Reporting Program Annual Reports. Furthermore, the Annual Report requirements are consistent with the requirements under 40 CFR 122.42(c).

Pursuant to 40 CFR 122.42(c), "*[t]he operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the Director…must submit an annual report*", which must include the following:

(1) *The status of implementing the components of the storm water management program that are established as permit conditions* [40 CFR 122.42(c)(1)];

(2) *Proposed changes to the storm water management programs that are established as permit conditions* [40 CFR 122.42(c)(2)];

(3) *Revisions, if necessary, to the assessment of controls and fiscal analysis* [40 CFR 122.42(c)(3)];

(4) *A summary of data, including monitoring data, that is accumulated throughout the reporting year* [40 CFR 122.42(c)(4)];

(5) *Annual expenditures and budget for year following each annual report* [40 CFR 122.42(c)(5)];

(6) *A summary describing the number and nature of enforcement actions, inspections, and public education programs* [40 CFR 122.42(c)(6)];

(7) *Identification of water quality improvements or degradation* [40 CFR 122.42(c)(7)].

Under the Fourth Term Permits, each Copermittee is responsible for submitting a Jurisdictional Runoff Management Program Annual Report; the Copermittees in each

designated watershed are responsible for submitting a Watershed Annual Report; and the Copermittees from each county are responsible for submitting a Monitoring and Reporting Program Annual Report.

There are 39 Copermittees in the San Diego Region, each required to prepare and submit a Jurisdictional Runoff Management Program Annual Report. There are 9 designated watersheds in San Diego County, 6 designated watersheds in Orange County, and 1 designated watershed in Riverside County for a total of 16 designated watersheds, each requiring a Watershed Annual Report. There are 3 sets of Copermittees in 3 counties in the San Diego Region, requiring Copermittees from each county to prepare and submit a Monitoring and Reporting Program Annual Report. Thus each Copermittee is currently required to prepare, or participate in the preparation of at least 3 annual reports. In addition, the San Diego County Copermittees are required to prepare and submit a Regional Urban Runoff Management Plan Annual Report.

In total, there are 59 annual reports that are prepared by the Copermittees and submitted to the San Diego Water Board for the Fourth Term Permits. The preparation of these annual reports requires significant time and resources from each Copermittee, which could otherwise be expended on actions that could improve water quality within its jurisdiction. In turn, significant time and resources are required from the San Diego Water Board staff to review these reports, which could otherwise be expended on working directly with the Copermittees to improve their implementation efforts toward restoring and protecting water quality.

Until the Water Quality Improvement Plans are developed, there will be a transitional period during which the Copermittees will continue to implement their existing jurisdictional runoff management programs. There will also be a transitional period during which the Copermittees will implement the transitional monitoring and assessment requirements of Provision D. During the transitional period, the Copermittees will submit annual reports pursuant to the requirements of Provisions F.3.b.(1) and F.3.b.(2).

Provision F.3.b.(1) includes the transitional annual reporting requirements for each Copermittee's jurisdictional runoff management program. The reporting of the jurisdictional runoff management program implementation efforts have been reduced to a single 2-page form. Each Copermittee is required to complete and submit a Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D or a revised form accepted by the San Diego Water Board) no later than October 31 of each year for each jurisdictional runoff management program reporting period (i.e. July 1 to June 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted. The Jurisdictional Runoff Management Program Annual Report Form will certify that each Copermittee has implemented its jurisdictional runoff management program in accordance with the requirements of Provision E. Each Copermittee may choose to continue to utilize and submit the jurisdictional runoff management program annual reporting format of its

current Order until the first Water Quality Improvement Plan Annual Report is required to be submitted.

Provision F.3.b.(2) includes the transitional annual reporting requirements for the transitional monitoring and assessment program for each Watershed Management Area. The Copermittees in the Watershed Management Area are required to submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted. The Transitional Monitoring and Assessment Program Annual Report is required to include the transitional period monitoring data collected pursuant to Provisions D.1.a and D.2.a, and the findings from the transitional period findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

Provision F.3.b.(3) includes the Water Quality Improvement Plan Annual Report requirements. Only one Water Quality Improvement Plan Annual Report is required for each of the ten (10) Watershed Management Areas designated under Provision B.1, which is a significant reduction in the number of annual reports required to be prepared and submitted by the Copermittees. The Water Quality Improvement Plan Annual Report will document the Copermittees' efforts to implement the Water Quality Improvement Plan. Each Water Quality Improvement Plan Annual Report will be focused primarily on reporting the analysis of the monitoring data collected pursuant to Provisions D.1-D.3 during the reporting period, and the assessments that are required pursuant to Provision D.4 based on the data. The monitoring data analyses and the assessments that are provided in the Water Quality Improvement Plan Annual Report will be the core of the report. The reporting of the jurisdictional runoff management program implementation efforts have been reduced to a single 2-page form, and will no longer be the primary focus of the reporting requirements as in the Third and Fourth Term Permits.

Each Copermittee will continue to prepare and submit a Jurisdictional Runoff Management Program Annual Report Form as part of the Water Quality Improvement Plan Annual Report to certify that each Copermittee has implemented its jurisdictional runoff management program in accordance with the requirements of Provision E. Instead of reviewing a voluminous report from each Copermittee, as was required under the Third and Fourth Term Permits, the San Diego Water Board will conduct audits of each Copermittee's jurisdictional runoff management program to investigate and confirm the information provided by each Copermittee on its Jurisdictional Runoff Management Program Annual Report Form. The audits will allow the San Diego Water Board to become more familiar with the each Copermittee's jurisdictional runoff management program, and each Copermittee will become more informed about the expectations of the San Diego Water Board.

The reduction in the number and content of the Water Quality Improvement Plan Annual Reports should result in significant time, cost and resource savings for the

Copermittees, as well as the San Diego Water Board. Those savings should offset a significant portion of any additional costs that may be incurred to develop the Water Quality Improvement Plans and to implement the monitoring and assessment program requirements of Provision D.

The reporting period for the Water Quality Improvement Plan Annual Reports consists of two periods. Because the jurisdictional runoff management programs are typically budgeted and implemented during a fiscal year, the information provided on the Jurisdictional Runoff Management Program Annual Report Forms will cover the period from July 1 to June 30 of the following year.

The Water Quality Improvement Plan Annual Reports, however, are focused primarily on the monitoring data and the assessments based on the monitoring data. The monitoring data is collected during the monitoring year, which begins October 1 and ends September 30 of the following year. The monitoring year begins after the beginning of the fiscal year and ends after the end of the fiscal year. Therefore, to accommodate and capture the information collected during the fiscal year and the monitoring year, the Annual Report reporting period incorporates both periods.

Finally, Provision F.3.c requires the Copermittees to develop and submit a Regional Monitoring and Assessment Report. The Regional Monitoring and Assessment Report is similar to the Long Term Effectiveness Assessment required under the Fourth Term San Diego County Permit. The Regional Monitoring and Assessment Report is expected to utilize the entire body of data and information collected by the Copermittees during the term of this Order to assess improvements to water quality on a regional scale.

Provision F.4 (Regional Clearinghouse) requires the Copermittees to develop, update, and maintain an internet-based Regional Clearinghouse that can be used to store, disseminate, and share the Copermittees' documents, monitoring data, special studies, and any other data or information.

Most of the documents and data that are generated by the Copermittees can be provided in electronic format, and made available to the San Diego Water Board and the public on the internet. The San Diego Water Board has been gradually transitioning its document submittal requirements to electronic submittals. Provision F.4 has been included to further these efforts.

Provision F.4 has also been included to improve the exchange and availability of information among the Copermittees, as well as between the Copermittees and the San Diego Water Board. Provision F.4 will also make the information generated during the implementation of the Order more accessible to the public.

Provision F.5 (Report of Waste Discharge) requires the Copermittees to submit a Report of Waste Discharge to reapply for renewal of the Order prior to its expiration, in accordance with 40 CFR 122.21(d)(2) and CWC section 13376.

~~Because the Riverside County Copermittees will not be subject to the requirements of this Order until they are notified of coverage, Provision F.5.a describes the process of submitting a Report of Waste Discharge pursuant to the requirements of their current permit to obtain coverage under this Order.~~

~~For the Copermittees subject to the requirements of this Order,~~ Provision F.5~~.b~~ requires the Copermittees to submit a Report of Waste Discharge 180 days in advance of the expiration of this Order. Provision F.5~~.b~~ also describes the minimum information to be included in the Report of Waste Discharge, based on USEPA guidance "Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems," dated May 17, 1996.

~~Provision F.6 (Application for Early Coverage) describes the process that would allow the Orange County and/or Riverside County Copermittees to obtain coverage under this Order earlier than the expiration of their current Orders.~~

~~If the Riverside County Copermittees choose to obtain coverage under this Order earlier than the expiration of their current Orders, the preparation and submittal of a Report of Waste Discharge, as required by the Fourth Term Permits, will not be necessary. The existing Order for the respective county will be rescinded upon the effective coverage date under this Order, except for enforcement purposes.~~

G. Principal Watershed Copermittee Responsibilities

Purpose: Provision G includes the requirements for the Principal Watershed Copermittee designated by the Copermittees in each Watershed Management Area.

***Discussion*:** Unlike previous NPDES requirements, there will no longer be a single Principal Copermittee. Provision G.1 requires the Copermittees to designate a Principal Watershed Copermittee for each Watershed Management Area. There are ten (10) Watershed Management Areas in the San Diego Region, as defined in Table B-1 under Provision B.1 of the Order. An individual Copermittee should not be the Principal Watershed Copermittee for more than two (2) Watershed Management Areas. There could be up to ten (10) Principal Water Copermittees designated for the Watershed Management Areas in the San Diego Region.

Provision G.2 describes the minimum responsibilities of each Principal Watershed Copermittee. The primary responsibility of the Principal Watershed Copermittees is to serve as the liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues. Ideally, the Principal Watershed Copermittee can represent the interests of all the Copermittees within a Watershed Management Area during discussions or meetings to facilitate communication with the San Diego Water Board. The Principal Watershed Copermittees are also responsible for facilitating and coordinating the implementation efforts of the Copermittees and submittals of required documents and reports.

The Principal Watershed Copermittee is responsible for facilitating the efforts of the Copermittees within the Watershed Management Area to develop the Water Quality Improvement Plan required under Provision B, and submit it for approval in accordance with Provision F.1. The Principal Watershed Copermittee is also responsible for coordinating the submittal of the document updates, Progress Report Presentations, and Annual Reports required from the Copermittees within each Watershed Management Area under Provisions F.2, F.3.a, and F.3.b. The Principal Watershed Copermittees are responsible for coordinating with each other to develop and submit the Regional Clearinghouse, Regional Monitoring and Assessment Report, and the Report of Waste Discharge required under Provisions F.3.c, F.4, and F.5.

The designated Principal Watershed Copermittee for each Watershed Management Area does not necessarily have to serve as the Principal Watershed Copermittee for the entire term of the Order. If the Copermittees in a Watershed Management Area choose to designate a new Principal Watershed Copermittee, the change may be submitted as part of the Annual Report required under Provision F.3.b, with an update to the Water Quality Improvement Plan in accordance with Provision F.2.c.

Provision G.3 specifies that the Principal Watershed Copermittee is not responsible for ensuring that the other Copermittees within the Watershed Management Area are in compliance with the requirements of this Order

H. Modification of Order

Purpose: Provision H provides the conditions under which modifications to Order No. R9-2013-0001, as amended, may occur.

***Discussion*:** Provision H allows for modifications to Order No. R9-2013-0001, as amended, for bases in addition to modifications (minor and major) allowed under the federal regulations at 40 CFR 122.62 and 122.63.

Modifications to the Order require re-opening the Order (see Water Code section 13223), subject to the requirements of 40 CFR 122.44, 122.62 to 122.64, and 124.5, but only for the specific provisions subject to the modification. Proposed modifications of the Order will be made available for public review, a public notice and comment period, and a public hearing if requested. Comments on the provisions not subject to the proposed modifications are not required to be considered in the San Diego Water Board's responses to comments or during the public hearing.

Provision H.4 was included to specify that the Order will be re-opened for modifications if ~~the State Water Board determines revisions to Provision A are warranted, an application for early coverage under the Order is received pursuant to Provision F.6,~~ the Basin Plan is amended to modify an existing TMDL or incorporate a new TMDL, or the monitoring and assessment program requirements need to be updated or revised.

~~Provision H.5 was included to specify that the San Diego Water Board will re-open and consider modifications to this Order when the Orange County Copermittees or the Riverside County Copermittees submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders~~

I. Standard Permit Provisions and General Provisions

Purpose: Provision I incorporates the standard permit provisions required to be included in all NPDES permits, as well as several other general provisions.

***Discussion*:** Provision I refers to Attachment B to the Order. Attachment B expressly incorporates the conditions applicable to all NPDES permits as provided under 40 CFR 122.41(a)-(n), as well as the applicable conditions for MS4s and storm water discharges provided under 40 CFR 122.42(c) and 40 CFR 122.42(d), respectively. Attachment B also includes several general provisions that are typically included in or applicable to waste discharge requirements issued by the San Diego Water Board.

IX. ATTACHMENTS

The attachments to the Order are discussed below. The discussions describe the content of the attachments.

Attachment A – Discharge Prohibitions and Special Protections

Section 1 of Attachment A includes the Waste Discharge Prohibitions from the Basin Plan. They have been provided verbatim in their entirety.

Section 2 of Attachment A includes the "*Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges*" applicable to permitted point source discharges of storm water, adopted under State Water Board Resolution No. 2012-0012, as amended by Resolution No. 2012-0031. The terms, prohibitions, and special conditions (collectively referred to as special conditions) are established as limitations on point source storm water discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in ASBS, as required for State Water Quality Protection Areas pursuant to California Public Resources Code sections 36700(f) and 36710(f). These Special Protections were adopted by the State Water Board as part of the Ocean Plan General Exception.

Attachment B – Standard Permit Provisions and General Provisions

Conditions applicable to all NPDES permits, as required under 40 CFR 122.41, and conditions applicable to MS4s and storm water discharges, as required under 40 CFR 122.42(c) and 122.42(d), respectively are provided in Attachment B to the Order. They have been provided expressly in their entirety.

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. These general provisions are typically included in or applicable to waste discharge requirements issued by the San Diego Water Board. Many of the general provisions were developed by the State Water Board. Where a general provision is derived from statute or regulation, a citation of the statute or regulation section is provided. General provisions that do not provide a citation are included under the authority provided CWC 13377.

Attachment C – Acronyms, Abbreviations and Definitions

The acronyms and abbreviations that are used in the Order are provided in Attachment C. Attachment C also includes definitions that may provide an explanation or description of the meaning or intent of specific terms or phrases included in the Order.

Attachment D – Jurisdictional Runoff Management Program Annual Report Form

An example of the Jurisdictional Runoff Management Program Annual Report Form required to be submitted by each Copermittee as part of the Annual Reports required under Provision F.3.b.(1)(e) is provided as Attachment D to the Order. An electronic version of the form will be available from the San Diego Water Board after the adoption of the Order.

The Jurisdictional Runoff Management Program Annual Report Form includes the minimum information necessary to demonstrate that the Copermittee is implementing and in compliance with the requirements of Provision E, and includes much of the information required to be reported pursuant to 40 CFR 122.42(c).

The information that must be provided on the Jurisdictional Runoff Management Program Annual Report Form is limited to the fiscal year, which begins July 1 and ends June 30 of the following year. The information expected to be provided by the Copermittees in each section of the Jurisdictional Runoff Management Program Annual Report Form is discussed below.

I. COPERMITTEE INFORMATION

The name of the Copermittee (e.g. name of city, county, or special district) and the contact information for the storm water program manager are provided under this section.

II. LEGAL AUTHORITY

The Copermittee must confirm whether or not the legal authorities under Provision E.1.a have been established for itself within its jurisdiction.

The Copermittee must also confirm whether or not a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority, as required under Provision E.1.b. The certification statement required by Provision E.1.b is only required to be submitted with the first Annual Report required under Provision F.3.b.

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

The Copermittee must inform the San Diego Water Board whether or not an update to its jurisdictional runoff management program document was required or recommended by the San Diego Water Board during the reporting period. An update to the jurisdictional runoff management program is required under Provision F.2.a. The San Diego Water Board may recommend modifications to the jurisdictional runoff management program as part of the iterative approach and adaptive management process required under Provision B.5, which may result in an update that is necessary for the Copermittee's jurisdictional runoff management document.

If an update was required or recommended, the Copermittee must confirm whether or not the update was completed and made available on the Regional Clearinghouse within the reporting period. If no update was required or recommended, an answer is not required. If the answer is NO, meaning the required or recommended update was not completed and/or made available on the Regional Clearinghouse, the Copermittee must attach a

schedule for the completion of the update and/or posting of the updated document on the Regional Clearinghouse.

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

The Copermittee must confirm whether or not a program was implemented during the fiscal year to actively detect and eliminate illicit discharges and connections in accordance with the requirements under Provision E.2.

In addition to confirming that a program to detect and eliminate illicit discharges was implemented during the reporting period, the Copermittee is also required to report on several items related to the program. The information that must be reported is limited to the fiscal year for the Annual Report.

All non-storm water discharges are considered illicit discharges unless the source is identified as one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5). If a non-storm water discharge is identified as one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5), the discharge is a non-storm water discharge, but not an illicit discharge. If a non-storm water discharge is identified but not in one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5), the discharge is both a non-storm water discharge and an illicit discharge.

V. DEVELOPMENT PLANNING PROGRAM

The Copermittee must confirm whether or not a development planning program was implemented during the fiscal year in accordance with the requirements under Provision E.3.

The Copermittee must also inform the San Diego Water Board whether or not an update to its BMP Design Manual was required or recommended by the San Diego Water Board during the fiscal year. An update to the BMP Design Manual is required under Provision F.2.b. The San Diego Water Board may recommend modifications to the BMP Design Manual, which may result in an update that is necessary for Copermittee's the BMP Design Manual.

If an update was required or recommended, the Copermittee must confirm whether or not the update was completed and made available on the Regional Clearinghouse within the reporting period. If no update was required or recommended, an answer is not required. If the answer is NO, meaning the required or recommended update was not completed and/or made available on the Regional Clearinghouse, the Copermittee must attach a schedule for the completion of the update and/or posting of the updated document on the Regional Clearinghouse.

The Copermittee is also required to report on several items related to the program. For the development and redevelopment projects that are reviewed under the program, the Copermittee must report the total number projects submitted for review during the fiscal year. Of those projects, the Copermittee must report the number that are Priority Development Projects, as defined under Provision E.3.b.(1). The Copermittee must also report the number of Priority Development Projects that were approved and/or granted occupancy during the fiscal year, regardless of when the project was originally submitted for review. Any projects that were approved during the fiscal year and granted any

exemptions from the BMP Design Manual requirements and/or allowed to implement alternative compliance options in accordance with Provision E.3.c.(3) must be reported.

Finally, the Copermittee must also report on several items related to its oversight of permanent BMPs on Priority Development Projects within its jurisdiction, as required under Provision E.3.e. The information that must be reported is limited to the fiscal year for the Annual Report.

VI. CONSTRUCTION MANAGEMENT PROGRAM

The Copermittee must confirm whether or not a construction management program was implemented during the fiscal year in accordance with the requirements under Provision E.4.

The Copermittee is also required to report on several items related to its oversight construction projects within its jurisdiction. The information that must be reported is limited to the fiscal year for the Annual Report.

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

The Copermittee must confirm whether or not an existing development management program was implemented during the fiscal year in accordance with the requirements under Provision E.5.

The Copermittee is also required to report on several items related to its oversight in areas of existing development within its jurisdiction. The information that must be reported is limited to the fiscal year for the Annual Report. The information must also be separated into four categories of existing development: municipal, commercial, industrial, and residential.

VIII. PUBLIC EDUCATION AND PARTICIPATION

The Copermittee must confirm whether or not a public education program component was implemented during the fiscal year in accordance with the requirements under Provision E.7.a.

The Copermittee must also confirm whether or not a public participation program component was implemented during the fiscal year in accordance with the requirements under Provision E.7.b.

IX. FISCAL ANALYSIS

The Copermittee must confirm a summary of its fiscal analysis, conducted in accordance with the requirements under Provision E.8, has been attached to the form.

X. CERTIFICATION

A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative must sign and certify the Jurisdictional Runoff Management Program Annual Report Form. The appropriate box must be checked to indicate the whether a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative is signing the form.

Attachment E – Specific Provisions for Total Maximum Daily Loads

Attachment E provides specific provisions for implementing the load allocations (LAs) and wasteload allocations (WLAs) of Total Maximum Daily Loads (TMDLs) adopted by the San Diego Water Board and approved by USEPA in which the Copermittees are identified as responsible for discharges subject to the requirements of the TMDLs. Federal regulations require that NPDES requirements incorporate water quality based effluent limitations (WQBELs) that must be consistent with the requirements and assumptions of any available WLAs,[46] which may be expressed as numeric effluent limitations, when feasible, and/or as a best management practice (BMP) program of expanded or better-tailored BMPs.[47] Where the TMDL includes WLAs that provide numeric pollutant load or pollutant parameter objectives, the WLA has been, where feasible, translated into numeric WQBELs.[48]

For each TMDL in Attachment E, four sections are included:

a. Applicability: This section provides the resolution under which the TMDL Basin Plan amendment was adopted and approved, with the applicable adoption and approval dates. This section also gives the effective date of the TMDL and where the TMDL is applicable (i.e. Watershed Management Area and water body). The Copermittees that are responsible for implementing the specific provisions are also given in this section.

b. Final TMDL Compliance Requirements: For each TMDL, the final TMDL compliance requirements consist of the final TMDL compliance date(s), the final WQBELs, and the final TMDL compliance determination requirements. The final WQBELs are expressed in terms of receiving water limitations, effluent limitations, and/or best management practices (BMPs). The final WQBELs for the TMDLs are incorporated by reference into Provision A of the Order. The final WQBELs become enforceable when the final TMDL compliance dates have passed. Applicable BMPs within the final WQBELs must be incorporated into the Water Quality Improvement Plans. Compliance with the final WQBELs will be determined in accordance with the options provided under the final TMDL compliance determination requirements.

c. Interim TMDL Compliance Requirements: If the final TMDL compliance date has not passed and there are interim TMDL compliance requirements, they are included in this section. If there are interim WQBELs with interim compliance dates, the interim WQBELs become enforceable when the corresponding interim compliance dates have passed. Compliance with the interim WQBELs will be determined in accordance with the options provided under the interim TMDL compliance determination requirements.

d. Specific Monitoring and Assessment Requirements: If there are specific monitoring and assessment requirements that cannot be met with the monitoring and assessment program

[46] 40 CFR 122.44(d)(1)(vii)(B)
[47] 40 CFR 122.44(k)(2) and 40 CFR 122.44(k)(3)
[48] November 26, 2014 Memorandum from the USEPA, Revisions to the November 22, 2002 Memorandum "Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLA""

requirements under Provision D of the Order, the additional requirements are included in this section.

The requirements of the TMDLs are based on and consistent with the assumptions and requirements of any available adopted and approved TMDLs that have been incorporated into the Basin Plan. Modifications to the requirements for the TMDLs in Attachment E cannot be made unless the TMDLs are modified in the Basin Plan.

A modification to any aspect of a TMDL in the Basin Plan requires a Basin Plan amendment. A Basin Plan amendment to modify a TMDL will require the San Diego Water Board to adopt a resolution to amend the Basin Plan, which includes a separate public process. When the San Diego Water Board adopts a Basin Plan amendment, it subsequently requires approval from the State Water Board, the Office of Administrative Law, and the USEPA before it becomes effective.

If and when the TMDLs are a modified in the Basin Plan, the San Diego Water Board will revise the requirements of the Order in accordance with the Basin Plan amendment. When a Basin Plan amendment to modify a TMDL becomes effective, the San Diego Water Board will modify the requirements of the Order pursuant to the requirements of Provision H.4 of the Order as soon as possible.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

ORDER NO. R9-2013-0001,
AS AMENDED BY ORDER NOS. R9-2015-0001 AND R9-2015-0100
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The San Diego County Copermittees in Table 1a are subject to waste discharge requirements set forth in this Order.

Table 1a. San Diego County Copermittees

City of Carlsbad	City of Oceanside
City of Chula Vista	City of Poway
City of Coronado	City of San Diego
City of Del Mar	City of San Marcos
City of El Cajon	City of Santee
City of Encinitas	City of Solana Beach
City of Escondido	City of Vista
City of Imperial Beach	County of San Diego
City of La Mesa	San Diego County Regional Airport Authority
City of Lemon Grove	San Diego Unified Port District
City of National City	

The Orange County Copermittees in Table 1b are subject to waste discharge requirements set forth in this Order.

Table 1b. Orange County Copermittees[1]

City of Aliso Viejo	City of Rancho Santa Margarita
City of Dana Point	City of San Clemente
City of Laguna Beach	City of San Juan Capistrano
City of Laguna Hills	City of Laguna Woods
City of Laguna Niguel	County of Orange
City of Mission Viejo	Orange County Flood Control District

[1] While not listed in Table 1b., the City of Lake Forest remains a Copermittee under this Order until the later effective date of this Order or the effective date of Santa Ana Water Board Tentative Order No. R8-2015-0001. Thereafter, the City of Lake Forest will no longer be considered a Copermittee under this Order because its Phase I MS4 discharges will be regulated by the Santa Ana Water Board pursuant to Water Code section 13228 designation. The requirements of this Order that apply to the City of Lake Forest for the duration of this Order, however, are described in Finding 29 and Footnote 2 to Table B-1.

The Riverside County Copermittees in Table 1c are subject to waste discharge requirements set forth in this Order.

Table 1c. Riverside County Copermittees

City of Murrieta	County of Riverside
City of Temecula	Riverside County Flood Control and Water Conservation District
City of Wildomar	

The term Copermittee in this Order refers to any San Diego County, Orange County, or Riverside County Copermittee covered under this Order, unless specified otherwise.

This Order provides permit coverage for the Copermittee discharges described in Table 2.

Table 2. Discharge Locations and Receiving Waters

Discharge Points	Locations throughout San Diego Region
Discharge Description	Municipal Separate Storm Sewer System (MS4) Discharges
Receiving Waters	Inland Surface Waters, Enclosed Bays and Estuaries, and Coastal Ocean Waters of the San Diego Region

Table 3. Administrative Information

This Order was adopted by the San Diego Water Board on:	**May 8, 2013**
Order No. R9-2013-0001 became effective on:	**June 27, 2013**
This Order as amended by R9-2015-0001 became effective on:	**April 1, 2015**
This Order as amended by R9-2015-0100 became effective on:	**January 7, 2016**
This Order will expire on:	**June 27, 2018**
The Copermittees must file a Report of Waste Discharge in accordance with Title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than 180 days in advance of the Order expiration date.	

I, David W. Gibson, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on May 8, 2013, as amended by adoption of Order No. R9-2015-0001 on February 11, 2015, and as amended by adoption of Order No. R9-2015-0100 on November 18, 2015.

David W. Gibson
Executive Officer

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I. FINDINGS

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), finds that:

JURISDICTION

1. **MS4 Ownership or Operation.** Each of the Copermittees owns or operates an MS4, through which it discharges storm water and non-storm water into waters of the U.S. within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the U.S.

2. **Legal and Regulatory Authority.** This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]) adopted by the United States Environmental Protection Agency (USEPA), and chapter 5.5, division 7 of the California Water Code (CWC) (commencing with section 13370). This Order serves as an NPDES permit for discharges from MS4s to surface waters. This Order also serves as waste discharge requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

   The San Diego Water Board has the legal authority to issue a regional MS4 permit pursuant to its authority under CWA section 402(p)(3)(B) and 40 CFR 122.26(a)(1)(v). The USEPA also made it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide permits (55 Federal Register [FR] 47990, 48039-48042). The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees and San Diego Water Board.

   The federal regulations make it clear that the Copermittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators (40 CFR 122.26(a)(3)(vi)). This Order does not require the Copermittees to manage storm water outside of their jurisdictional boundaries, but rather to work collectively to improve storm water management within watersheds.

3. **CWA NPDES Permit Conditions.** Pursuant to CWA section 402(p)(3)(B), NPDES permits for storm water discharges from MS4s must include requirements to effectively prohibit non-storm water discharges into MS4s, and require controls to reduce the discharge of pollutants in storm water to the maximum extent practicable (MEP), and to require other provisions as the San Diego Water Board determines are appropriate to control such pollutants. This Order prescribes conditions to assure compliance with the CWA requirements for owners and operators of MS4s to effectively prohibit non-storm water discharges into the MS4s, and require controls to reduce the discharge of pollutants in storm water from the MS4s to the MEP.

4. **CWA and CWC Monitoring Requirements.** CWA section 308(a) and 40 CFR 122.41(h),(j)-(l) and 122.48 require that NPDES permits must specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s also specify additional monitoring and reporting requirements in 40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c). CWC section 13383 authorizes the San Diego Water Board to establish monitoring, inspection, entry, reporting and recordkeeping requirements. This Order establishes monitoring and reporting requirements to implement federal and State requirements. This Order also includes requirements for the Orange County Copermittees to participate in, and together with South Orange County Wastewater Authority and Orange County Health Care Agency, share responsibility for implementing the unified approach to beach water quality monitoring and assessment program set forth in the October 2014 report, *Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County*, issued pursuant to CWC section 13383 in the San Diego Water Board December 5, 2014 Letter Directive.

5. **Total Maximum Daily Loads.** CWA section 303(d)(1)(A) requires that "[e]ach state shall identify those waters within its boundaries for which the effluent limitations are not stringent enough to implement any water quality standard applicable to such waters." The CWA also requires states to establish a priority ranking of impaired water bodies known as Water Quality Limited Segments and to establish Total Maximum Daily Loads (TMDLs) for such waters. This priority list of impaired water bodies is called the Clean Water Act Section 303(d) List of Water Quality Limited Segments, commonly referred to as the 303(d) List. The CWA requires the 303(d) List to be updated every two years.

   TMDLs are numerical calculations of the maximum amount of a pollutant that a water body can assimilate and still meet water quality standards. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point sources (waste load allocations or WLAs) and non-point sources (load allocations or LAs), background contribution, plus a margin of safety. Discharges from MS4s are point source discharges. The federal regulations (40 CFR 122.44(d)(1)(vii)(B)) require that NPDES permits incorporate water quality based effluent limitations (WQBELs) developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, consistent with the assumptions and requirements of any available WLA for the discharge. Requirements of this Order implement the TMDLs established by the San Diego Water Board or USEPA as of the date this Order was amended in 2015. This Order establishes WQBELs consistent with the assumptions and requirements of all available TMDL WLAs assigned to discharges from the Copermittees' MS4s.

6. **Non-Storm Water Discharges.** Pursuant to CWA section 402(p)(3)(B)(ii), this Order requires each Copermittee to effectively prohibit discharges of non-storm water into its MS4. Nevertheless, non-storm water discharges into and from the

MS4s continue to be reported to the San Diego Water Board by the Copermittees and other persons. Monitoring conducted by the Copermittees, as well as the 303(d) List, have identified dry weather, non-storm water discharges from the MS4s as a source of pollutants causing or contributing to receiving water quality impairments in the San Diego Region. The federal regulations (40 CFR 122.26(d)(2)(iv)(B)(1)) require the Copermittees to have a program to prevent illicit discharges to the MS4. The federal regulations, however, allow for specific categories of non-storm water discharges or flows to be addressed as illicit discharges only where such discharges are identified as sources of pollutants to waters of the U.S.

7. **In-Stream Treatment Systems.** Pursuant to federal regulations (40 CFR 131.10(a)), in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S. Authorizing the construction of a runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to accepting waste assimilation as an appropriate use for that water body. Runoff treatment must occur prior to the discharge of runoff into receiving waters. Treatment control best management practices (BMPs) must not be constructed in waters of the U.S. Construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body.

DISCHARGE CHARACTERISTICS AND RUNOFF MANAGEMENT

8. **Point Source Discharges of Pollutants.** Discharges from the MS4s contain waste, as defined in the CWC, and pollutants that adversely affect the quality of the waters of the state. A discharge from an MS4 is a “discharge of pollutants from a point source” into waters of the U.S. as defined in the CWA. Storm water and non-storm water discharges from the MS4s contain pollutants that cause or threaten to cause a violation of surface water quality standards, as outlined in the Water Quality Control Plan for the San Diego Basin (Basin Plan). Storm water and non-storm water discharges from the MS4s are subject to the conditions and requirements established in the Basin Plan for point source discharges.

9. **Potential Beneficial Use Impairment.** The discharge of pollutants and/or increased flows from MS4s may cause or threaten to cause the concentration of pollutants to exceed applicable receiving water quality objectives and impair or threaten to impair designated beneficial uses resulting in a condition of pollution, contamination, or nuisance.

10. **Pollutants Generated by Land Development.** Land development has created and continues to create new sources of non-storm water discharges and pollutants in storm water discharges as human population density increases. This brings higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash. Pollutants from these sources are dumped or washed off the surface by non-storm water or storm water flows into

and from the MS4s. When development converts natural vegetated pervious ground cover to impervious surfaces such as paved highways, streets, rooftops, and parking lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving a developed area without BMPs that can maintain pre-development runoff conditions will contain greater pollutant loads and have significantly greater runoff volume, velocity, and peak flow rate than pre-development runoff conditions from the same area.

11. **Runoff Discharges to Receiving Waters.** The MS4s discharge runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within the eleven hydrologic units comprising the San Diego Region. Historic and current development makes use of natural drainage patterns and features as conveyances for runoff. Rivers, streams and creeks in developed areas used in this manner are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and receiving water. Numerous receiving water bodies and water body segments have been designated as impaired by the San Diego Water Board pursuant to CWA section 303(d).

12. **Pollutants in Runoff.** The most common pollutants in runoff discharged from the MS4s include total suspended solids, sediment, pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., cadmium, copper, lead, and zinc), petroleum products and polynuclear aromatic hydrocarbons, synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus), oxygen-demanding substances (e.g., decaying vegetation, animal waste), detergents, and trash. As operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not prohibit or otherwise control. These discharges may cause or contribute to a condition of pollution or a violation of water quality standards.

13. **Human Health and Aquatic Life Impairment.** Pollutants in runoff discharged from the MS4s can threaten and adversely affect human health and aquatic organisms. Adverse responses of organisms to chemicals or physical agents in runoff range from physiological responses such as impaired reproduction or growth anomalies to mortality. Increased volume, velocity, rate, and duration of storm water runoff greatly accelerate the erosion of downstream natural channels. This alters stream channels and habitats and can adversely affect aquatic and terrestrial organisms.

14. **Water Quality Effects.** The Copermittees' water quality monitoring data submitted to date documents persistent exceedances of Basin Plan water quality objectives for runoff-related pollutants at various watershed monitoring stations. Persistent toxicity has also been observed at several watershed monitoring stations. In addition, bioassessment data indicate that the majority of the monitored receiving waters have

Poor to Very Poor Index of Biological Integrity (IBI) ratings. These findings indicate that runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in the San Diego Region. Non-storm water discharges from the MS4s have been shown to contribute significant levels of pollutants and flow in arid, developed Southern California watersheds, and contribute significantly to exceedances of applicable receiving water quality objectives.

15. **Non-Storm Water and Storm Water Discharges.** Non-storm water discharges from the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard of CWA section 402(p)(3)(B)(iii), which is explicitly for "Municipal … *Stormwater Discharges* (emphasis added)" from the MS4s. Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s must be effectively prohibited.

16. **Best Management Practices.** Waste and pollutants which are deposited and accumulate in MS4 drainage structures will be discharged from these structures to waters of the U.S. unless they are removed. These discharges may cause or contribute to, or threaten to cause or contribute to, a condition of pollution in receiving waters. For this reason, pollutants in storm water discharges from the MS4s can be and must be effectively reduced in runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Pollution prevention is the reduction or elimination of pollutant generation at its source and is the best "first line of defense." Source control BMPs (both structural and non-structural) minimize the contact between pollutants and runoff, therefore keeping pollutants onsite and out of receiving waters. Treatment control BMPs remove pollutants that have been mobilized by storm water or non-storm water flows.

17. **BMP Implementation.** Runoff needs to be addressed during the three major phases of development (planning, construction, and use) in order to reduce the discharge of storm water pollutants to the MEP, effectively prohibit non-storm water discharges, and protect receiving waters. Development which is not guided by water quality planning policies and principles can result in increased pollutant load discharges, flow rates, and flow durations which can negatively affect receiving water beneficial uses. Construction sites without adequate BMP implementation result in sediment runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. Existing development can generate substantial pollutant loads which are discharged in runoff to receiving waters. Retrofitting areas of existing development with storm water pollutant control and hydromodification management BMPs is necessary to address storm water discharges from existing development that may cause or contribute to a condition of pollution or a violation of water quality standards.

18. **Water Quality Improvements.** Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges to the MS4s and control pollutants in storm water

discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the CWA.

19. **Long Term Planning and Implementation.** Federal regulations require municipal storm water permits to expire 5 years from adoption, after which the permit must be renewed and reissued. The San Diego Water Board recognizes that the degradation of water quality and impacts to beneficial uses of the waters in the San Diego Region occurred over several decades. The San Diego Water Board further recognizes that a decade or more may be necessary to realize demonstrable improvement to the quality of waters in the San Diego Region. This Order includes a long term planning and implementation approach that will require more than a single permit term to complete.

WATER QUALITY STANDARDS

20. **Basin Plan.** The San Diego Water Board adopted the Water Quality Control Plan for the San Diego Basin (Basin Plan) on September 8, 1994, that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for receiving waters addressed through the plan. The Basin Plan was subsequently approved by the State Water Resources Control Board (State Water Board) on December 13, 1994. Subsequent revisions to the Basin Plan have also been adopted by the San Diego Water Board and approved by the State Water Board. Requirements of this Order implement the Basin Plan.

    The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Process Supply (PROC), Industrial Service Supply (IND), Ground Water Recharge (GWR), Contact Water Recreation (REC1), Non-contact Water Recreation (REC2), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Freshwater Replenishment (FRSH), Hydropower Generation (POW), and Preservation of Biological Habitats of Special Significance (BIOL). The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region: Navigation (NAV), Commercial and Sport Fishing (COMM), Estuarine Habitat (EST), Marine Habitat (MAR), Aquaculture (AQUA), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN), and Shellfish Harvesting (SHELL).

21. **Ocean Plan.** The State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, and 2005. The State Water Board adopted the latest amendment on October 16, 2012 and it became effective on August 19, 2013. The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean. Requirements of this Order implement the Ocean Plan.

    The Ocean Plan identifies the following beneficial uses of ocean waters of the state to be protected: Industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture; preservation and enhancement of designated Areas of Special Biological Significance; rare and endangered species; marine habitat; fish spawning and shellfish harvesting.

22. **Sediment Quality Control Plan**. On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes: 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

23. **National Toxics Rule and California Toxics Rule.** USEPA adopted the National Toxics Rule (NTR) on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the NTR applied in California. On May 18, 2000, USEPA adopted the California Toxics Rule (CTR). The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants.

24. **Antidegradation Policy.** This Order is in conformance with the federal Antidegradation Policy described in 40 CFR 131.12, and State Water Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality Waters in California*. Federal regulations at 40 CFR 131.12 require that the State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. State Water Board Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies. The Fact Sheet of this Order contains additional discussion about antidegradation.

25. **Anti-Backsliding Requirements.** Section 402(o)(2) of the CWA and federal regulations at 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations may be relaxed. All effluent limitations in this Order are at least as stringent as effluent limitations in the previous permits. The Fact Sheet of this Order contains additional discussion about anti-backsliding.

CONSIDERATIONS UNDER FEDERAL AND STATE LAW

26. **Coastal Zone Act Reauthorization Amendments.** Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states with approved coastal zone management programs to address non-point source pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point source pollution: agriculture, silviculture, urban, marinas, and hydromodification. This Order addresses the management measures required for the urban category, with the exception of septic systems. The runoff management programs developed pursuant to this Order fulfills the need for coastal cities to develop a runoff non-point source plan identified in the Non-Point Source Program Strategy and Implementation Plan. The San Diego Water Board addresses septic systems through the administration of other programs.

27. **Endangered Species Act.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 USC sections 1531 to 1544). This Order requires compliance with receiving water limits, and other requirements to protect the beneficial uses of waters of the State. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

28. **Report of Waste Discharge Process.** The waste discharge requirements set forth in this Order are based upon the Report of Waste Discharge submitted by the San Diego County Copermittees prior to the expiration of Order No. R9-2007-0001 (NPDES No. CAS0109266), the Report of Waste Discharge submitted by the Orange County Copermittees prior to the expiration of Order No. R9-2009-0002 (CAS0108740), and the Report of Waste Discharge submitted by the Riverside County Copermittees prior to the expiration of Order No. R9-2010-0016 (CAS0108766).

    The federal regulations (40 CFR 122.21(d)(2)) and CWC section 13376 impose a duty on the Copermittees to reapply for continued coverage through submittal of a Report of Waste Discharge no later than 180 days prior to expiration of a currently effective permit. The expiration date of this Order as shown in Table 3, and requirement to file a Report of Waste Discharge no later than 180 days prior to the

expiration date of the Order, applies jointly to the San Diego County, Orange County, and Riverside County Copermittees.

29. **Regional Water Board Designation.** The Cities of Laguna Hills, Laguna Woods, Lake Forest, Menifee, Murrieta, and Wildomar are located partially within the jurisdictions of the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board) and the San Diego Water Board and their discharges are subject to regulation by both Regional Water Boards. CWC section 13228 provides a way to streamline the regulation of entities whose jurisdictions straddle the border of two or more Regions. CWC section 13228 is implemented in this Order at the request of these six cities and to ease the regulatory burden of municipalities that lie in both the San Diego Water Board's and the adjacent Santa Ana Water Board's jurisdiction. MS4 discharges from these municipalities are regulated by the San Diego Water Board and Santa Ana Water Board as follows:

    a. Pursuant to CWC section 13228, the Cities of Laguna Hills, Laguna Woods, and Lake Forest submitted written requests that one Regional Water Board be designated to regulate Phase I MS4 discharges for each of the Cities. The Santa Ana Water Board and the San Diego Water Board have entered into an agreement dated February 10, 2015, whereby the Cities of Laguna Woods and Laguna Hills are largely regulated by the San Diego Water Board under this Order, including those portions of the Cities of Laguna Woods and Laguna Hills not within the San Diego Water Board's jurisdiction, upon the effective date of this Order or Santa Ana Water Board Order No. R8-2015-0001, whichever is later. Similarly, the City of Lake Forest, including those portions of the City of Lake Forest within the San Diego Water Board's jurisdiction, is largely regulated by the Santa Ana Water Board under Order No. R8-2015-0001 (NPDES No. CAS618030) upon the later effective date of this Order or Order No. R8-2015-0001. The agreement provides that the City of Lake Forest is required to retain, and continue implementation of, its over-irrigation discharge prohibition in Title 15, Chapter 14.030, List (b) of the City Municipal Code for regulating storm water quality throughout its jurisdiction. The agreement also requires the City of Lake Forest to actively participate during development and implementation of the Aliso Creek Watershed Management Area Water Quality Improvement Plan required pursuant to this Order. Each Regional Water Board retains the authority to enforce provisions of its Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee under the terms of the agreement (Water Code section 13228 (b)). Under the terms of the agreement, any TMDL and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Laguna Woods, Laguna Hills or Lake Forest as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement of the applicable TMDL will remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's San

Diego Creek/Newport Bay TMDL and the San Diego Water Board's Indicator Bacteria Project I Beaches and Creeks TMDL. The San Diego Water Board will periodically review the effectiveness of the agreement during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate the agreement with Santa Ana Water Board or otherwise modify the agreement subject to the approval of the Santa Ana Water Board.

b. Pursuant to CWC section 13228, the Cities of Murrieta, Wildomar, and Menifee submitted written requests that one Regional Water Board be designated to regulate Phase I MS4 discharges for each of the Cities. The Santa Ana Water Board and the San Diego Water Board have entered into an agreement dated October 26, 2015, whereby the Cities of Murrieta and Wildomar are largely regulated by the San Diego Water Board under this Order, including those portions of the Cities of Murrieta and Wildomar not within the San Diego Water Board's jurisdiction, upon the effective date of this Order. Similarly, the City of Menifee is largely regulated by the Santa Ana Water Board under Order No. R8-2010-0033 as it may be amended or reissued, including those portions of the City of Menifee within the San Diego Water Board's jurisdiction, upon the effective date of this Order. The agreement also requires the City of Menifee to actively participate during development and implementation of the Santa Margarita River Watershed Management Area Water Quality Improvement Plan required pursuant to this Order. Each Regional Water Board retains the authority to enforce provisions of its Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee under the terms of the agreement (Water Code section 13228 (b)). Under the terms of the agreement, any TMDL and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Menifee, Murrieta, or Wildomar as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement of the applicable TMDL will remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's Lake Elsinore/Canyon Lake Nutrient TMDLs. The San Diego Water Board will periodically review the effectiveness of the agreement during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate the agreement with Santa Ana Water Board or otherwise modify the agreement subject to the approval of the Santa Ana Water Board.

30. Integrated Report and Clean Water Act Section 303(d) List. The San Diego Water Board and State Water Board submit an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. USEPA issued its *Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act* on July 29, 2005, which advocates the use of a five category approach for

classifying the attainment status of water quality standards for water bodies in the Integrated Report. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 in the Integrated Report are placed on the 303(d) List.

Water bodies with available data and/or information that indicate at least one beneficial use is not being supported or is threatened, but a TMDL is not required, are included in Category 4 in the Integrated Report. Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

Implementation of the requirements of this Order may allow the San Diego Water Board to include surface waters impaired by discharges from the Copermittees' MS4s in Category 4 in the Integrated Report for consideration during the next 303(d) List submittal by the State to USEPA.

31. **Economic Considerations.** The California Supreme Court has ruled that although CWC section 13263 requires the State and Regional Water Boards (collectively Water Boards) to consider factors set forth in CWC section 13241 when issuing an NPDES permit, the Water Board may not consider the factors to justify imposing pollutant restrictions that are less stringent than the applicable federal regulations require. (*City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 618, 626-627.) However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

    As noted in the following finding, the San Diego Water Board finds that the requirements in this Order are not more stringent than the minimum federal requirements. Therefore, a CWC section 13241 analysis is not required for permit requirements that implement the effective prohibition on the discharge of non-storm water into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determined appropriate to control such pollutants, as those requirements are mandated by federal law. Notwithstanding the above, the San Diego Water Board has developed an economic analysis of the requirements in this Order. The economic analysis is provided in the Fact Sheet.

32. **Unfunded Mandates.** This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following:

a. This Order implements federally mandated requirements under CWA section 402 (33 USC section 1342(p)(3)(B)).

b. The local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental and new dischargers who are issued NPDES permits for storm water and non-storm water discharges.

c. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order.

d. The Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)) and in lieu of numeric restrictions on their MS4 discharges (i.e. effluent limitations).

e. The local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under State law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

f. The provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state develops a TMDL, federal law requires that permits must contain water quality based effluent limitations consistent with the assumptions and requirements of any applicable wasteload allocation (40 CFR 122.44(d)(1)(vii)(B)).

See the Fact Sheet for further discussion of unfunded mandates.

33. California Environmental Quality Act. The issuance of waste discharge requirements and an NPDES permit for the discharge of runoff from MS4s to waters of the U.S. is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 et seq.) in accordance with CWC section 13389.

STATE WATER BOARD DECISIONS

34. Compliance with Prohibitions and Limitations. The receiving water limitation language specified in this Order is consistent with language recommended by the USEPA and established in State Water Board Order WQ 99-05, *Own Motion Review of the Petition of Environmental Health Coalition to Review Waste Discharge Requirements Order No. 96-03, NPDES Permit No. CAS0108740*, adopted by the State Water Board on June 17, 1999. The receiving water limitation language in this Order requires storm water discharges from MS4s to not cause or contribute to a violation of water quality standards, which is to be achieved through an iterative approach requiring the implementation of improved and better-tailored BMPs over time. Implementation of the iterative approach to comply with receiving water

limitations based on applicable water quality standards is necessary to ensure that storm water discharges from the MS4 will not ultimately cause or contribute to violations of water quality standards and will not create conditions of pollution, contamination, or nuisance.

The San Diego, Orange County, and Riverside County Copermittees have asserted that the prohibitions and limitations may result in many years of noncompliance because years of technical efforts may ultimately be required to achieve compliance with the prohibitions and limitations, especially for wet weather discharges. To address this concern, this Order includes an option that allows a Copermittee to be deemed in compliance with the prohibitions and limitations where more than one permit term may be necessary to achieve full compliance with the prohibitions and limitations. One or more Copermittees within a Watershed Management Area can choose to implement this option.

An alternative compliance pathway option has been included in this Order consistent with the approach described in Order WQ 2015-0075, *In the Matter of Review of Order No. R4-2012-0175, NPDES Permit No. CAS004001, Waste Discharge Requirements for Municipal Separate Storm Sewer System (MS4) Discharges within the Coastal Watersheds of Los Angeles County, Except Those Discharges Originating from the City of Long Beach MS4,* adopted by the State Water Board on June 16, 2015. State Water Board Order WQ 2015-0075 directs the Regional Water Boards to consider a watershed-based planning and implementation approach to compliance with receiving water limitations when issuing Phase I MS4 permits going forward. Order WQ 2015-0075 included seven principles that the Regional Water Boards are expected to follow when incorporating an alternative compliance pathway into an MS4 permit. The Fact Sheet discusses the incorporation of the seven principles stipulated in State Water Board Order WQ 2015-0075 into the alternative compliance pathway option in this Order.

35. **Special Conditions for Areas of Special Biological Significance.** On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving a general exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges (General Exception). On June 19, 2012, the State Water Board adopted Order No. 2012-0031, amending the General Exception to require pollutant reductions to be achieved within six years in accordance with ASBS Compliance Plans and ASBS Pollution Prevention Plans. The General Exception requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject to the terms and conditions of the General Exception as amended. The Special Protections contained in Attachment B to the General Exception as amended are

applicable to these discharges, and are hereby incorporated into Attachment A of this Order.

ADMINISTRATIVE FINDINGS

36. **Executive Officer Delegation of Authority.** The San Diego Water Board by prior resolution has delegated all matters that may legally be delegated to its Executive Officer to act on its behalf pursuant to CWC section 13223. Therefore, the Executive Officer is authorized to act on the San Diego Water Board's behalf on any matter within this Order unless such delegation is unlawful under CWC section 13223 or this Order explicitly states otherwise.

37. **Standard Provisions.** Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR 122.42, are provided in Attachment B to this Order.

38. **Fact Sheet.** The Fact Sheet for this Order contains background information, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of this Order. The Fact Sheet is hereby incorporated into this Order and constitutes part of the Findings of this Order.

39. **Public Notice.** In accordance with State and federal laws and regulations, the San Diego Water Board notified the Copermittees, and interested agencies and persons of its intent to prescribe waste discharge requirements for the control of discharges into and from the MS4s to waters of the U.S. and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet.

40. **Public Hearings.** The San Diego Water Board held a public hearing on April 10 and 11, 2013, that was continued to May 8, 2013 and heard and considered all comments pertaining to the terms and conditions of this Order. The San Diego Water Board also held a public workshop on October 8, 2015, and a public hearing on February 11, 2015, and heard and considered all comments pertaining to the amendment of this Order through Order No. R9-2015-0001. The San Diego Water Board also held a public hearing on November 18, 2015, and heard and considered all comments pertaining to the amendment of this Order through Order No. R9-2015-0100. Details of these public hearings are provided in the Fact Sheet.

41. **Effective Date.** This Order serves as an NPDES permit pursuant to CWA section 402 or amendments thereto, and as to the San Diego County Copermittees listed in Table 1a, became effective fifty (50) days after the date of its adoption, and as to the Orange County Copermittees listed in Table 1b, became effective on April 1, 2015, after Order No. R9-2015-0001 was adopted, and as to the Riverside County Copermittees listed in Table 1c, became effective on January 7, 2016, after Order No. R9-2015-0100 was adopted, provided that the Regional Administrator, USEPA, Region IX, does not object to this Order.

42. **Review by the State Water Board.** Any person aggrieved by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with CWC section 13320 and California Code of Regulations, title 23, sections 2050, and following. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date of this Order, except that if the thirtieth day following the date of this Order falls on a Saturday, Sunday or State holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

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THEREFORE, IT IS HEREBY ORDERED that the Copermittees, in order to meet the provisions contained in division 7 of the CWC (commencing with section 13000) and regulations adopted thereunder, and the provisions of the CWA and regulations adopted thereunder, must each comply with the requirements of this Order. This action in no way prevents the San Diego Water Board from taking enforcement action for past violations of the previous Order applicable to the Copermittees. If any part of this Order is subject to a temporary stay of enforcement, unless otherwise specified, the Copermittees must comply with the analogous portions of the previous Order, which will remain in effect for all purposes during the pendency of the stay.

II. PROVISIONS

A. PROHIBITIONS AND LIMITATIONS

The purpose of this provision is to describe the conditions under which storm water and non-storm water discharges into and from MS4s are prohibited or limited. The goal of the prohibitions and limitations is to protect the water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through the implementation of water quality improvement strategies and runoff management programs that effectively prohibit non-storm water discharges into the Copermittees' MS4s, and reduce pollutants in storm water discharges from the Copermittees' MS4s to the MEP.

1. Discharge Prohibitions

a. Discharges from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the state are prohibited.

b. Non-storm water discharges into MS4s are to be effectively prohibited, through the implementation of Provision E.2, unless such discharges are authorized by a separate NPDES permit.

c. Discharges from MS4s are subject to all waste discharge prohibitions in the Basin Plan, included in Attachment A to this Order.

d. Storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012, as amended by State Water Board Resolution No. 2012-0031, applicable to these discharges, included in Attachment A to this Order. All other discharges from the Copermittees' MS4s to ASBS are prohibited.

2. Receiving Water Limitations

a. Discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters, including but not limited to all applicable provisions contained in:

(1) The San Diego Water Board's Basin Plan, including beneficial uses, water quality objectives, and implementation plans;

(2) State Water Board plans for water quality control including the following:

(a) Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries (Thermal Plan), and

(b) The Ocean Plan, including beneficial uses, water quality objectives, and implementation plans;

(3) State Water Board policies for water and sediment quality control including the following:

(a) Water Quality Control Policy for the Enclosed Bays and Estuaries of California,

(b) Sediment Quality Control Plan which includes the following narrative objectives for bays and estuaries:

(i) Pollutants in sediments shall not be present in quantities that, alone or in combination, are toxic to benthic communities, and

(ii) Pollutants shall not be present in sediments at levels that will bioaccumulate in aquatic life to levels that are harmful to human health,

(c) The Statement of Policy with Respect to Maintaining High Quality of Waters in California;[2]

(4) Priority pollutant criteria promulgated by the USEPA through the following:

(a) National Toxics Rule (NTR)[3] (promulgated on December 22, 1992 and amended on May 4, 1995), and

(b) California Toxics Rule (CTR).[4,5]

b. Discharges from MS4s composed of storm water runoff must not alter natural ocean water quality in an ASBS.

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[2] State Water Board Resolution No. 68-16
[3] 40 CFR 131.36
[4] 65 Federal Register 31682-31719 (May 18, 2000), adding Section 131.38 to 40 CFR
[5] If a water quality objective and a CTR criterion are in effect for the same priority pollutant, the more stringent of the two applies.

3. Effluent Limitations

a. TECHNOLOGY BASED EFFLUENT LIMITATIONS

Pollutants in storm water discharges from MS4s must be reduced to the MEP.[6]

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

Each Copermittee must comply with applicable WQBELs established for the TMDLs in Attachment E to this Order, pursuant to the applicable TMDL compliance schedules.

4. Compliance with Discharge Prohibitions and Receiving Water Limitations

Each Copermittee must achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order through timely implementation of control measures and other actions as specified in Provisions B and E of this Order, including any modifications. The Water Quality Improvement Plans required under Provision B must be designed and adapted to ultimately achieve compliance with Provisions A.1.a, A.1.c and A.2.a.

a. If exceedance(s) of water quality standards persist in receiving waters notwithstanding implementation of this Order, the Copermittees must comply with the following procedures:

(1) For exceedance(s) of a water quality standard in the process of being addressed by the Water Quality Improvement Plan, the Copermittee(s) must implement the Water Quality Improvement Plan as accepted by the San Diego Water Board, and update the Water Quality Improvement Plan, as necessary, pursuant to Provision F.2.c;

(2) Upon a determination by either the Copermittees or the San Diego Water Board that discharges from the MS4 are causing or contributing to a new exceedance of an applicable water quality standard not addressed by the Water Quality Improvement Plan, the Copermittees must submit the following updates to the Water Quality Improvement Plan pursuant to Provision F.2.c or as part of the Water Quality Improvement Plan Annual Report required under Provision F.3.b, unless the San Diego Water Board directs an earlier submittal:

(a) The water quality improvement strategies being implemented that are effective and will continue to be implemented,

[6] This does not apply to MS4 discharges which receive subsequent treatment to reduce pollutants in storm water discharges to the MEP prior to entering receiving waters (e.g., low flow diversions to the sanitary sewer). Runoff treatment must occur prior to the discharge of runoff into receiving waters per Finding 7.

(b) Water quality improvement strategies (i.e. BMPs, retrofitting projects, stream and/or habitat rehabilitation projects, adjustments to jurisdictional runoff management programs, etc.) that will be implemented to reduce or eliminate any pollutants or conditions that are causing or contributing to the exceedance of water quality standards,

(c) Updates to the schedule for implementation of the existing and additional water quality improvement strategies, and

(d) Updates to the monitoring and assessment program to track progress toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a of this Order;

(3) The San Diego Water Board may require the incorporation of additional modifications to the Water Quality Improvement Plan required under Provision B. The applicable Copermittees must submit any modifications to the update to the Water Quality Improvement Plan within 90 days of notification that additional modifications are required by the San Diego Water Board, or as otherwise directed;

(4) Within 90 days of the San Diego Water Board determination that the modifications to the Water Quality Improvement Plan required under Provision A.4.a.(3) meet the requirements of this Order, the applicable Copermittees must revise the jurisdictional runoff management program documents to incorporate the modified water quality improvement strategies that have been and will be implemented, the implementation schedule, and any additional monitoring required; and

(5) Each Copermittee must implement the updated Water Quality Improvement Plan.

b. The procedure set forth above to achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order do not have to be repeated for continuing or recurring exceedances of the same water quality standard(s) following implementation of scheduled actions unless directed to do otherwise by the San Diego Water Board.

c. Nothing in Provisions A.4.a and A.4.b prevents the San Diego Water Board from enforcing any provision of this Order while the applicable Copermittees prepare and implement the above update to the Water Quality Improvement Plan and jurisdictional runoff management programs.

B. WATER QUALITY IMPROVEMENT PLANS

The purpose of this provision is to develop Water Quality Improvement Plans that guide the Copermittees' jurisdictional runoff management programs towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plans is to further the Clean Water Act's objective to protect, preserve, enhance, and restore the water quality and designated beneficial uses of waters of the state. This goal will be accomplished through an adaptive planning and management process that identifies the highest priority water quality conditions within a watershed and implements strategies through the jurisdictional runoff management programs to achieve improvements in the quality of discharges from the MS4s and receiving waters.

1. Watershed Management Areas

The Copermittees must develop a Water Quality Improvement Plan for each of the Watershed Management Areas in Table B-1. A total of ten Water Quality Improvement Plans must be developed for the San Diego Region.

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
San Juan (901.00)	South Orange County	- Aliso Creek - San Juan Creek - San Mateo Creek - Pacific Ocean - Heisler Park ASBS	- City of Aliso Viejo - City of Dana Point - City of Laguna Beach - City of Laguna Hills[1] - City of Laguna Niguel - City of Laguna Woods[1] - City of Lake Forest[2] - City of Mission Viejo - City of Rancho Santa Margarita - City of San Clemente - City of San Juan Capistrano - County of Orange - Orange County Flood Control District
Santa Margarita (902.00)	Santa Margarita River	- Murrieta Creek - Temecula Creek - Santa Margarita River - Santa Margarita Lagoon - Pacific Ocean	- City of Menifee[3] - City of Murrieta[4] - City of Temecula - City of Wildomar[4] - County of Riverside - County of San Diego - Riverside County Flood Control and Water Conservation District
San Luis Rey (903.00)	San Luis Rey River	- San Luis Rey River - San Luis Rey Estuary - Pacific Ocean	- City of Oceanside - City of Vista - County of San Diego

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
Carlsbad (904.00)	Carlsbad	- Loma Alta Slough - Buena Vista Lagoon - Agua Hedionda Lagoon - Batiquitos Lagoon - San Elijo Lagoon - Pacific Ocean	- City of Carlsbad - City of Encinitas - City of Escondido - City of Oceanside - City of San Marcos - City of Solana Beach - City of Vista - County of San Diego
San Dieguito (905.00)	San Dieguito River	- San Dieguito River - San Dieguito Lagoon - Pacific Ocean	- City of Del Mar - City of Escondido - City of Poway - City of San Diego - City of Solana Beach - County of San Diego
Penasquitos (906.00)	Penasquitos	- Los Penasquitos Lagoon - Pacific Ocean	- City of Del Mar - City of Poway - City of San Diego - County of San Diego
	Mission Bay	- Mission Bay - Pacific Ocean - San Diego Marine Life Refuge ASBS	- City of San Diego
San Diego (907.00)	San Diego River	- San Diego River - Pacific Ocean	- City of El Cajon - City of La Mesa - City of San Diego - City of Santee - County of San Diego
Pueblo San Diego (908.00) Sweetwater (909.00) Otay (910.00)	San Diego Bay	- Sweetwater River - Otay River - San Diego Bay - Pacific Ocean	- City of Chula Vista - City of Coronado - City of Imperial Beach - City of La Mesa - City of Lemon Grove - City of National City - City of San Diego - County of San Diego - San Diego County Regional Airport Authority - San Diego Unified Port District
Tijuana (911.00)	Tijuana River	- Tijuana River - Tijuana Estuary - Pacific Ocean	- City of Imperial Beach - City of San Diego - County of San Diego

Notes:

1. By agreement dated February 10, 2015, pursuant to Water Code section 13228, the Phase I MS4 discharges within the jurisdiction of the City of Laguna Hills and the City of Laguna Woods located in the Santa Ana Region are regulated by San Diego Water Board Order No. R9-2013-0001 as amended by Order No. R9-2015-0001, upon the later effective date of Order No. R9-2015-0001 or Santa Ana Water Board Tentative Order No. R8-2015-0001. The City of Laguna Hills and Laguna Woods must also comply with the requirements of the San Diego Creek/Newport Bay TMDL in section XVIII of Santa Ana Water Board Order No. R8-2015-0001.
2. By agreement dated February 10, 2015, pursuant to Water Code section 13228, Phase I MS4 discharges within the City of Lake Forest located within the San Diego Water Board Region are regulated by the Santa Ana Water Board Order No. R8-2015-0001 (NPDES No. CAS618030) upon the later effective date of this Order or Santa Ana Water Board Tentative Order No. R8-2015-0001. In accordance with the terms of the agreement between the San Diego Water Board and the Santa Ana Water Board, the City of Lake Forest must implement the requirements of the Bacteria TMDL in Attachment E of this Order, participate in preparation and implementation of the Water Quality Improvement Plan for the Aliso Creek Watershed Management Area as described in Provision B of this Order and continue implementation of its over-irrigation discharge prohibition in its City Ordinance, Title 15, Chapter 15, section 14.030, List (b).
3. By agreement dated October 26, 2015, pursuant to Water Code section 13228, Phase I MS4 discharges within the City of Menifee located within the San Diego Water Board Region are regulated by the Santa Ana Water Board Order No. R8-2010-0033 as it may be amended or reissued (NPDES No. CAS618033) upon the later effective date of this Order. In accordance with the terms of the agreement between the San Diego Water Board and the Santa Ana Water Board, the City of Menifee must participate in preparation and implementation of the Water Quality Improvement Plan for the Santa Margarita River Watershed Management Area as described in Provision B of this Order.
4. By agreement dated October 26, 2015, pursuant to Water Code section 13228, the Phase I MS4 discharges within the jurisdiction of the City of Murrieta and the City of Wildomar located in the Santa Ana Region are regulated by San Diego Water Board Order No. R9-2013-0001 as amended by Orders No. R9-2015-0001 and R9-2015-0100. The City of Murrieta and City of Wildomar must also comply with the requirements of the Lake Elsinore/Canyon Lake Nutrient TMDLs in section VI.D.2 of Santa Ana Water Board Order No. R8-2010-0033, or corresponding section as it may be amended or reissued.

2. Priority Water Quality Conditions

The Copermittees must identify the water quality priorities within each Watershed Management Area that will be addressed by the Water Quality Improvement Plan. Where appropriate, Watershed Management Areas may be separated into subwatersheds to focus water quality prioritization and jurisdictional runoff management program implementation efforts by receiving water.

a. Assessment of Receiving Water Conditions

The Copermittees must consider the following, at a minimum, to identify water quality priorities based on impacts of MS4 discharges on receiving water beneficial uses:

(1) Receiving waters listed as impaired on the CWA Section 303(d) List of Water Quality Limited Segments (303(d) List);

(2) TMDLs adopted and under development by the San Diego Water Board;

(3) Receiving waters recognized as sensitive or highly valued by the Copermittees, including estuaries designated under the National Estuary Program under CWA section 320, marine protected areas, wetlands defined by the State or U.S. Fish and Wildlife Service's National Wetlands Inventory as wetlands, waters having the Preservation of Biological Habitats of Special Significance (BIOL) beneficial use designation, and receiving waters identified as ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(4) The receiving water limitations of Provision A.2;

(5) Known historical versus current physical, chemical, and biological water quality conditions;

(6) Available, relevant, and appropriately collected and analyzed physical, chemical, and biological receiving water monitoring data, including, but not limited to, data describing:

(a) Chemical constituents,

(b) Water quality parameters (i.e. pH, temperature, conductivity, etc.),

(c) Toxicity Identification Evaluations for both receiving water column and sediment,

(d) Trash impacts,

(e) Bioassessments, and

(f) Physical habitat;

(7) Available evidence of erosional impacts in receiving waters due to accelerated flows (i.e. hydromodification);

(8) Available evidence of adverse impacts to the chemical, physical, and biological integrity of receiving waters; and

(9) The potential improvements in the overall condition of the Watershed Management Area that can be achieved.

b. ASSESSMENT OF IMPACTS FROM MS4 DISCHARGES

The Copermittees must consider the following, at a minimum, to identify the potential impacts to receiving waters that may be caused or contributed to by discharges from the Copermittees' MS4s:

(1) The discharge prohibitions of Provision A.1 and effluent limitations of Provision A.3; and

(2) Available, relevant, and appropriately collected and analyzed storm water and non-storm water monitoring data from the Copermittees' MS4 outfalls;

(3) Locations of each Copermittee's MS4 outfalls that discharge to receiving waters;

(4) Locations of MS4 outfalls that are known to persistently discharge non-storm water to receiving waters likely causing or contributing to impacts on receiving water beneficial uses;

(5) Locations of MS4 outfalls that are known to discharge pollutants in storm water causing or contributing to impacts on receiving water beneficial uses; and

(6) The potential improvements in the quality of discharges from the MS4 that can be achieved.

c. IDENTIFICATION OF PRIORITY WATER QUALITY CONDITIONS

(1) The Copermittees must use the information gathered for Provisions B.2.a and B.2.b to develop a list of priority water quality conditions as pollutants, stressors and/or receiving water conditions that are the highest threat to receiving water quality or that most adversely affect the quality of receiving waters. The list must include the following information for each priority water quality condition:

(a) The beneficial use(s) associated with the priority water quality condition;

(b) The geographic extent of the priority water quality condition within the Watershed Management Area, if known;

(c) The temporal extent of the priority water quality condition (e.g., dry weather and/or wet weather);

(d) The Copermittees with MS4s discharges that may cause or contribute to the priority water quality condition; and

(e) An assessment of the adequacy of and data gaps in the monitoring data to characterize the conditions causing or contributing to the priority water quality condition, including a consideration of spatial and temporal variation.

(2) The Copermittees must identify the highest priority water quality conditions to be addressed by the Water Quality Improvement Plan, and provide a rationale for selecting a subset of the water quality conditions identified pursuant to Provision B.2.c.(1) as the highest priorities.

d. IDENTIFICATION OF MS4 SOURCES OF POLLUTANTS AND/OR STRESSORS

The Copermittees must identify and prioritize known and suspected sources of storm water and non-storm water pollutants and/or other stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c. The identification of known and suspected sources of pollutants and/or stressors that cause or contribute to the highest priority water quality conditions as identified for Provision B.2.c must consider the following:

(1) Pollutant generating facilities, areas, and/or activities within the Watershed Management Area, including:

(a) Each Copermittee's inventory of construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas,

(b) Publicly owned parks and/or recreational areas,

(c) Open space areas,

(d) All currently operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste, and

(e) Areas not within the Copermittees' jurisdictions (e.g., Phase II MS4s, tribal lands, state lands, federal lands) that are known or suspected to be discharging to the Copermittees' MS4s;

(2) Locations of the Copermittees' MS4s, including the following:

(a) All MS4 outfalls that discharge to receiving waters, and

(b) Locations of major structural controls for storm water and non-storm water (e.g., retention basins, detention basins, major infiltration devices, etc.);

(3) Other known and suspected sources of non-storm water or pollutants in storm water discharges to receiving waters within the Watershed Management Area, including the following:

(a) Other MS4 outfalls (e.g., Phase II Municipal and Caltrans),

(b) Other NPDES permitted discharges,

(c) Any other discharges that may be considered point sources (e.g., private outfalls), and

(d) Any other discharges that may be considered non-point sources (e.g., agriculture, wildlife or other natural sources);

(4) Review of available data, including but not limited to:

(a) Findings from the Copermittees' illicit discharge detection and elimination programs,

(b) Findings from the Copermittees' MS4 outfall discharge monitoring,

(c) Findings from the Copermittees' receiving water monitoring,

(d) Findings from the Copermittees' MS4 outfall discharge and receiving water assessments, and

(e) Other available, relevant, and appropriately collected data, information, or studies related to pollutant sources and/or stressors that contribute to the highest priority water quality conditions as identified for Provision B.2.c.

(5) The adequacy of the available data to identify and prioritize sources and/or stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c.

e. IDENTIFICATION OF POTENTIAL WATER QUALITY IMPROVEMENT STRATEGIES

The Copermittees must evaluate the findings identified under Provisions B.2.a-d, and identify potential strategies that can result in improvements to water quality in MS4 discharges and/or receiving waters within the Watershed Management Area. Potential water quality improvement strategies that may be implemented within the Watershed Management Area must include the following:

(1) Structural BMPs, non-structural BMPs, incentives, or programs that can potentially be implemented to address the highest priority water quality conditions identified under Provision B.2.c, or MS4 sources of pollutants or stressors identified under Provision B.2.d,

(2) Retrofitting projects in areas of existing development within the Watershed Management Area that can potentially be implemented to reduce MS4 sources of pollutants or stressors identified under Provision B.2.d causing or contributing to the highest priority water quality conditions identified under Provision B.2.c, and

(3) Stream, channel, and/or habitat rehabilitation projects within the Watershed Management Area that can potentially be implemented to protect and/or improve conditions in receiving waters from MS4 pollutants and/or stressors identified under Provision B.2.d causing or contributing to the highest priority water quality conditions identified under Provision B.2.c.

3. Water Quality Improvement Goals, Strategies and Schedules

The Copermittees must identify and develop specific water quality improvement goals and strategies to address the highest priority water quality conditions identified within a Watershed Management Area. The water quality improvement goals and strategies must address the highest priority water quality conditions by effectively prohibiting non-storm water discharges to the MS4, reducing pollutants in storm water discharges from the MS4 to the MEP, and protecting the water quality standards of receiving waters.

a. WATER QUALITY IMPROVEMENT GOALS AND SCHEDULES

(1) <u>Numeric Goals</u>

The Copermittees must develop and incorporate numeric goals[7] into the Water Quality Improvement Plan. Numeric goals must be used to support

[7] Interim and final numeric goals may take a variety of forms such as TMDL established WQBELs, action levels, pollutant concentration, load reductions, number of impaired water bodies delisted from the List of Water Quality Impaired Segments, Index of Biotic Integrity (IBI) scores, or other appropriate metrics. Interim and final numeric goals are not necessarily limited to one criterion or indicator, but may include multiple criteria and/or indicators. Except for TMDL established WQBELs, interim and final numeric goals and corresponding schedules may be revised through the adaptive management process under Provision B.5.

Water Quality Improvement Plan implementation and measure reasonable progress towards addressing the highest priority water quality conditions identified under Provision B.2.c. The Copermittees must establish and incorporate the following numeric goals in the Water Quality Improvement Plan:

(a) Final numeric goals must be based on measureable criteria or indicators capable of demonstrating one or more of the following:

(i) Discharges from the Copermittees' MS4s will not cause or contribute to exceedances of water quality standards in receiving waters, AND/OR

(ii) The conditions of receiving waters and associated habitat are protected from MS4 discharges, AND/OR

(iii) Beneficial uses of receiving waters are protected from MS4 discharges and will be supported.

(b) Interim numeric goals must be based on measureable criteria or indicators capable of demonstrating reasonable incremental progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges as follows:

(i) One or more interim numeric goals may be established to demonstrate progress toward achieving each final numeric goal,

(ii) For each final numeric goal, at least one interim numeric goal must be expressed as a reasonable increment toward achievement of the final numeric goal,

(iii) For each final numeric goal, reasonable interim numeric goals must be established to be accomplished during each 5 year period between the acceptance of the Water Quality Improvement Plan and the achievement of the final numeric goals.

(2) <u>Schedules for Achieving Numeric Goals</u>

The Copermittees must develop and incorporate schedules for achieving the numeric goals into the Water Quality Improvement Plan. The schedules must demonstrate reasonable progress toward achieving the final numeric goals required for Provision B.3.a.(1). The Copermittees must incorporate the schedules for achieving the numeric goals into the Water Quality Improvement Plan based on the following considerations:

(a) Final dates for achieving all final numeric goals must be established considering the following:

(i) Final compliance dates for any applicable TMDLs in Attachment E to this Order;

(ii) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(iii) Achievement of the final numeric goals for the highest water quality priorities must be as soon as possible;

(iv) Final dates for achieving the final numeric goals must reflect a realistic assessment of the shortest practicable time required based on the temporal and spatial extent and factors associated with the highest priority water quality conditions identified under Provision B.2.c, and taking into account the time reasonably required to implement the water quality improvement strategies required pursuant to Provision B.3.b.

(b) Interim dates for achieving all interim numeric goals must be established considering the following:

(i) Interim compliance dates for any applicable TMDLs in Attachment E to this Order;

(ii) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(iii) Interim dates for achieving the interim numeric goals must reflect a realistic assessment of the shortest practicable time reasonably required, taking into account the time needed to implement new or significantly expanded programs and securing financing, if necessary; and

(iv) For each final numeric goal, at least one interim numeric goal must be established that the Copermittees will work toward achieving within the term of this Order.

b. WATER QUALITY IMPROVEMENT STRATEGIES AND SCHEDULES

Based on the likely effectiveness and efficiency of the potential water quality improvement strategies identified under Provision B.2.e to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a, the Copermittees must identify the strategies that will be implemented in each Watershed Management Area as follows:

(1) Jurisdictional Strategies

(a) Each Copermittee in the Watershed Management Area must identify the strategies that will be implemented within its jurisdiction as part of its jurisdictional runoff management program requirements under Provisions E.2 through E.7, including descriptions of the following:

(i) For each of the inventories developed for its jurisdiction, as required under Provisions D.2.a.(1), E.3.e.(2), E.4.b, and E.5.a, each Copermittee must identify the known and suspected areas or sources causing or contributing to the highest priority water quality conditions in the Watershed Management Area that the Copermittee will focus on in its efforts to effectively prohibit non-storm water discharges to its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, and achieve the interim and final numeric goals identified under Provision B.3.a;

(ii) BMPs that each Copermittee will implement, or require to be implemented, as applicable, for those areas or sources within its jurisdiction;

(iii) Education programs that each Copermittee will implement, as applicable, for those areas or sources within its jurisdiction;

(iv) Frequencies that each Copermittee will conduct inspections on those areas or sources within its jurisdiction;

(v) Incentive and enforcement programs that each Copermittee will implement, as applicable, for those areas or sources within its jurisdiction; and

(vi) Any other BMPs, incentives, or programs that each Copermittee will implement for those areas or sources within its jurisdiction.

(b) Identify the optional jurisdictional strategies that each Copermittee will implement within its jurisdiction, as necessary, to effectively prohibit non-storm water discharges to its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. Descriptions of the optional jurisdictional strategies must include:

(i) BMPs, incentives, or programs that may be implemented by the Copermittee within its jurisdiction in addition to the requirements of Provisions B.3.b.(1)(a);

(ii) Incentives or programs that may be implemented by the Copermittee to encourage or implement projects to retrofit areas of existing development within its jurisdiction;

(iii) Incentives or programs that may be implemented by the Copermittee to encourage or implement projects that will rehabilitate the conditions of channels or habitats within its jurisdiction;

(iv) The funds and/or resources that must be secured by the Copermittee to implement the optional strategies described for Provisions B.3.b.(1)(b)(i)-(iii) within its jurisdiction; and

(v) The circumstances necessary to trigger implementation of the optional jurisdictional strategies, in addition to the requirements of Provision B.3.b.(1)(a), to achieve the interim and final numeric goals within the schedules established under Provision B.3.a.

(c) Identify the strategies that will be implemented by the Copermittee in coordination with or with the cooperation of other agencies (e.g. Caltrans, water districts, school districts) and/or entities (e.g. non-governmental organizations) within its jurisdiction.

(2) Watershed Management Area Strategies

The Copermittees must identify the optional regional or multi-jurisdictional strategies that will be implemented in the Watershed Management Area, as necessary, to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. Descriptions of the optional regional or multi-jurisdictional strategies must include:

(a) Regional or multi-jurisdictional BMPs, incentives, or programs that may be implemented by the Copermittees in the Watershed Management Area;

(b) Incentives or programs that may be implemented by the Copermittees in the Watershed Management Area to encourage or implement regional or multi-jurisdictional projects to retrofit areas of existing development;

(c) Incentives or programs that may be implemented by the Copermittees to encourage or implement regional or multi-jurisdictional projects that will rehabilitate the conditions of channels, streams, or habitats within the Watershed Management Area;

(d) The funds and/or resources that must be secured by the Copermittees to implement the optional strategies described for Provisions B.3.b.(2)(a)-(c) within the Watershed Management Area; and

(e) The circumstances necessary to trigger implementation of the optional regional or multi-jurisdictional strategies to achieve the interim and final numeric goals within the schedules established under Provision B.3.a.

(3) Schedules for Implementing Strategies

The Copermittees must develop reasonable schedules for implementing the water quality improvement strategies identified under Provisions B.3.b.(1) and B.3.b.(2) to achieve the interim and final numeric goals identified and schedules established under Provision B.3.a. The Copermittees must incorporate the schedules to implement the water quality improvement strategies into the Water Quality Improvement Plan as follows:

(a) Each Copermittee must develop schedules for the jurisdictional strategies identified pursuant to Provisions B.3.b.(1)(a)-(b). Each schedule must specify:

(i) If each jurisdictional strategy identified pursuant to Provision B.3.b.(1)(a) will or will not be initiated upon acceptance of the Water Quality Improvement Plan;

(ii) For each jurisdictional strategy identified pursuant to Provision B.3.b.(1)(a) that will not be initiated upon acceptance of the Water Quality Improvement Plan, the shortest practicable time in which each jurisdictional strategy will be initiated after acceptance of the Water Quality Improvement Plan;

(iii) For each optional jurisdictional strategy identified pursuant to Provision B.3.b.(1)(b), a realistic assessment of the shortest practicable time required to:

[a] Secure the resources needed to fund the optional jurisdictional strategy, and
[b] Procure the resources, materials, labor, and applicable permits necessary to initiate implementation of the optional jurisdictional strategy;

(iv) If each jurisdictional strategy identified pursuant to Provisions B.3.b.(1)(a)-(b) is expected to be continuously implemented (e.g. inspections) or completed within a schedule (e.g. construction of structural BMP); and

(v) If a jurisdictional strategy identified pursuant to Provisions B.3.b.(1)(a)-(b) is expected to be completed within a schedule, the anticipated time to complete based on a realistic assessment of the shortest practicable time required.

(b) The Copermittees in the Watershed Management Area must develop schedules for the regional or multi-jurisdictional strategies identified pursuant to Provision B.3.b.(2). Each schedule must specify:

(i) A realistic assessment of the shortest practicable time to:

[a] Secure the resources needed to fund the optional regional or multi-jurisdictional strategy, and
[b] Procure the resources, materials, labor, and permits necessary to initiate the implementation of the optional regional or multi-jurisdictional strategy;

(ii) If each regional or multi-jurisdictional strategy identified pursuant to Provision B.3.b.(2) is expected to be continuously implemented (e.g. inspections) or completed within a schedule (e.g. construction of structural BMP); and

(iii) If a regional or multi-jurisdictional strategy and/or activity identified pursuant to Provisions B.3.b.(2) is expected to be completed within a schedule, the anticipated time to complete based on a realistic assessment of the shortest practicable time required.

(4) <u>Optional Watershed Management Area Analysis</u>

(a) For each Watershed Management Area, the Copermittees have the option to perform a Watershed Management Area Analysis for the purpose of developing watershed-specific requirements for structural BMP implementation, as described in Provision E.3.c.(3). The Watershed Management Area Analysis must include GIS layers (maps) as output. The analysis must include the following information, to the extent it is available, in order to characterize the Watershed Management Areas:

(i) A description of dominant hydrologic processes, such as areas where infiltration or overland flow likely dominates;

(ii) A description of existing streams in the watershed, including bed material and composition, and if they are perennial or ephemeral;

(iii) Current and anticipated future land uses;

(iv) Potential coarse sediment yield areas; and

(v) Locations of existing flood control structures and channel structures, such as stream armoring, constrictions, grade control structures, and hydromodification or flood management basins.

(b) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify and compile a list of candidate projects that could potentially be used as

alternative compliance options for Priority Development Projects, to be implemented in lieu of onsite structural BMP performance requirements described in Provisions E.3.c.(1) and E.3.c.(2)(a). Specifically, the Copermittees must identify opportunities to be included in the list of candidate projects in each Watershed Management Area, such as:

(i) Stream or riparian area rehabilitation;

(ii) Retrofitting existing infrastructure to incorporate storm water retention or treatment;

(iii) Regional BMPs;

(iv) Groundwater recharge projects;

(v) Water supply augmentation projects; and

(vi) Land purchases to preserve floodplain functions.

(c) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify areas within the Watershed Management Area where it is appropriate to allow Priority Development Projects to be exempt from the hydromodification management BMP performance requirements described in Provision E.3.c.(2), including supporting rationale.

c. Prohibitions and Limitations Compliance Option

Each Copermittee has the option to utilize the implementation of the Water Quality Improvement Plan to demonstrate compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b within a Watershed Management Area subject to the following conditions:

(1) A Copermittee is eligible to be deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b within a Watershed Management Area when the Water Quality Improvement Plan for a Watershed Management Area incorporates the following:

(a) Numeric goals, water quality improvement strategies, and schedules developed pursuant to Provisions B.3.a and B.3.b that include the following:

(i) Interim and final WQBELs established by the TMDLs in Attachment E to this Order applicable to the Copermittee's jurisdiction within the Watershed Management Area; AND

(ii) Interim and final numeric goals for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012

(included as Attachment A to this Order) applicable to the Copermittee's jurisdiction within the Watershed Management Area; AND

(iii) Interim and final numeric goals applicable to the Copermittee's MS4 discharges within the Watershed Management Area expressed as numeric concentration-based or load-based goals for all pollutants and conditions listed on the Clean Water Act Section 303(d) List of Water Quality Impaired Segments[8] for the receiving waters in the Watershed Management Area that do not have a TMDL incorporated into Attachment E to this Order; AND/OR

(iv) Interim and final numeric goals for pollutants and conditions identified as receiving water priorities in the Water Quality Improvement Plan that will result in chemical, physical, and biological conditions protective of the beneficial uses of the receiving waters impacted by the Copermittee's MS4 discharges within the Watershed Management Area; AND

(v) The Copermittee has the option to include interim and final numeric goals applicable to the Copermittee's MS4 discharges and/or receiving waters within the Watershed Management Area for any pollutants or conditions in addition to those described in Provisions B.3.c.(1)(a)(i)-(iv); AND

(vi) Schedules for achieving each final numeric goal that reflect a realistic assessment of the shortest practicable time needed for achievement; AND

(vii) For each final numeric goal developed pursuant to Provisions B.3.a and B.3.c.(1)(a)(i)-(v), annual milestones[9] and the dates for their achievement must be included within each of the next five (5) Water Quality Improvement Plan Annual Report reporting periods, or until the final numeric goal is achieved. Annual milestones and the dates for their achievement for the 5 Water Quality Improvement Plan Annual Report reporting periods of the next permit term, or until the final numeric goal is achieved, must be provided as part of the Report of Waste Discharge required pursuant to Provision F.5.

(b) An analysis that meets all of the following conditions:

(i) The analysis, with clearly stated assumptions included in the analysis, must quantitatively demonstrate that the implementation of

[8] 2010 and subsequent 303(d) Lists

[9] Annual milestones for each final numeric goal must be clearly and directly linked to, or demonstrate progress is being made toward the achievement of the final numeric goal. The annual milestones may consist of water quality improvement strategy implementation phases, interim numeric goals, and other acceptable metrics. The annual milestones may address multiple numeric goals and/or multiple water bodies, as applicable and appropriate.

the water quality improvement strategies required under Provision B.3.b will achieve the final numeric goals within the schedules developed pursuant to Provisions B.3.a and B.3.c.(1)(a).

(ii) The development of the analysis must include a public participation process which allows the public to review and provide comments on the analysis methodology utilized and the assumptions included in the analysis. Public comments and responses must be included as part of the analysis documentation included in the Water Quality Improvement Plan.

(iii) The analysis may be performed by an individual Copermittee or jointly by two or more Copermittees choosing to utilize this compliance option for their jurisdictions within the Watershed Management Area.

(iv) The analysis must be updated as part of the iterative approach and adaptive management process required under Provisions B.5.a-b.

(c) Specific monitoring and assessments required pursuant to Provision B.4.a that will be performed by the Copermittee capable of 1) demonstrating whether the implementation of the water quality improvement strategies are making progress toward achieving the numeric goals in accordance with the established schedules developed pursuant to Provisions B.3.a and B.3.c.(1)(a), and 2) determining whether interim and final numeric goals have been achieved. The specific monitoring and assessments must be updated as part of the iterative approach and adaptive management process required under Provision B.5.c.

(d) Documentation showing that the numeric goals, schedules, and annual milestones proposed pursuant to Provision B.3.c.(1)(a), the analysis performed pursuant to Provision B.3.c.(1)(b), and the specific monitoring and assessments proposed pursuant to Provision B.3.c.(1)(c) have been reviewed by the Water Quality Improvement Consultation Panel (see Provision F.1.a.(1)(b)). Updates must be reviewed by the Water Quality Improvement Consultation Panel for any recommendations.

(2) Each Copermittee that voluntarily completes the requirements of Provision B.3.c.(1) is deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b for the pollutants and conditions for which numeric goals are developed when the Water Quality Improvement Plan, incorporating the requirements of Provision B.3.c.(1), is accepted by the San Diego Water Board pursuant to Provision F.1.b or F.2.c. The Copermittee is deemed in compliance during the term of this Order as long as:

(a) The Copermittee is implementing the water quality improvement strategies within its jurisdiction developed pursuant to Provision B.3.b.(1) and in

compliance with the schedules for implementing the strategies established pursuant to Provisions B.3.b.(3)(a) and B.3.c.(1)(a)(vii); AND

(b) The Copermittee is performing the monitoring and assessments developed pursuant to Provision B.3.c.(1)(c); AND

(c) The Copermittee's assessments in the Water Quality Improvement Plan Annual Report submitted pursuant to Provision F.3.b.(3) support a conclusion that: 1) the Copermittee is in compliance with the annual milestones and dates for achievement developed pursuant to Provision B.3.c.(1)(a)(vii), OR 2) the Copermittee has provided acceptable rationale and recommends appropriate modifications to the interim numeric goals, and/or water quality improvement strategies, and/or schedules to improve the rate of progress toward achieving the final numeric goals developed pursuant to Provisions B.3.a and B.3.c.(1)(a)(i)-(vi); AND

(d) Any proposed modifications to the numeric goals, strategies, schedules, and/or annual milestones are accepted by the San Diego Water Board as part of subsequent updates to the Water Quality Improvement Plan pursuant to Provision F.2.c;[10] AND

(e) The Copermittee is implementing the requirements of Provision A.4.a.

4. Water Quality Improvement Monitoring and Assessment Program

a. The Copermittees in each Watershed Management Area must develop and incorporate an integrated monitoring and assessment program into the Water Quality Improvement Plan that assesses: 1) the progress toward achieving the numeric goals and schedules, 2) the progress toward addressing the highest priority water quality conditions for each Watershed Management Area, and 3) each Copermittee's overall efforts to implement the Water Quality Improvement Plan.

b. The monitoring and assessment program must incorporate the monitoring and assessment requirements of Provision D, which may allow the Copermittees to modify the program to be consistent with and focus on the highest priority water quality conditions for each Watershed Management Area.

c. For Watershed Management Areas with applicable TMDLs, the monitoring and assessment program must incorporate the specific monitoring and assessment requirements of Attachment E.

[10] A request for proposed changes to the Water Quality Improvement Plan does not stay any permit condition.

d. For Watershed Management Areas with any ASBS, the water quality monitoring and assessment program must incorporate the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

5. Iterative Approach and Adaptive Management Process

The Copermittees in each Watershed Management Area must implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a, and must include the following:

a. RE-EVALUATION OF PRIORITY WATER QUALITY CONDITIONS

The priority water quality conditions and potential water quality improvement strategies included in the Water Quality Improvement Plan pursuant to Provisions B.2.c and B.2.e may be re-evaluated by the Copermittees as needed during the term of this Order as part of the Water Quality Improvement Plan Annual Report. Re-evaluation and recommendations for modifications to the priority water quality conditions and potential water quality improvement strategies must be provided in the Report of Waste Discharge, and must consider the following:

(1) Achieving the outcome of improved water quality in MS4 discharges and receiving waters through implementation of the water quality improvement strategies identified in the Water Quality Improvement Plan;

(2) New information developed when the requirements of Provisions B.2.a-c have been re-evaluated;

(3) Spatial and temporal accuracy of monitoring data collected to inform prioritization of water quality conditions and implementation strategies to address the highest priority water quality conditions;

(4) Availability of new information and data from sources other than the jurisdictional runoff management programs within the Watershed Management Area that informs the effectiveness of the actions implemented by the Copermittees;

(5) San Diego Water Board recommendations; and

(6) Recommendations for modifications solicited through a public participation process.

b. ADAPTATION OF GOALS, STRATEGIES AND SCHEDULES

The water quality improvement goals, strategies and schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.3, must be re-evaluated and adapted as new information becomes available to result in more effective and efficient measures to address the highest priority water quality conditions identified pursuant to Provision B.2.c. Re-evaluation of and modifications to the water quality improvement goals, strategies and schedules must be provided in the Water Quality Improvement Plan Annual Report, and must consider the following:

(1) Modifications to the priority water quality conditions based on Provision B.5.a;

(2) Progress toward achieving interim and final numeric goals in receiving waters and MS4 discharges for the highest priority water quality conditions in the Watershed Management Area,

(3) Progress toward achieving outcomes according to established schedules;

(4) New policies or regulations that may affect identified numeric goals;

(5) Measurable or demonstrable reductions of non-storm water discharges to and from each Copermittee's MS4;

(6) Measurable or demonstrable reductions of pollutants in storm water discharges from each Copermittee's MS4 to the MEP;

(7) New information developed when the requirements of Provisions B.2.b and B.2.d have been re-evaluated;

(8) Efficiency in implementing the Water Quality Improvement Plan;

(9) San Diego Water Board recommendations; and

(10) Recommendations for modifications solicited through a public participation process.

c. ADAPTATION OF MONITORING AND ASSESSMENT PROGRAM

The water quality improvement monitoring and assessment program, included in the Water Quality Improvement Plan pursuant to Provision B.4, must be re-evaluated and adapted when new information becomes available. Re-evaluation and recommendations for modifications to the monitoring and assessment program, pursuant to the requirements of Provision D, may be provided in the Water Quality Improvement Plan Annual Report, but must be provided in the Report of Waste Discharge.

d. ADAPTATION OF PROHIBITIONS AND LIMITATIONS COMPLIANCE OPTION

If a Copermittee has implemented the Prohibitions and Limitations Compliance Option allowed to be included in the Water Quality Improvement Plan pursuant to Provision B.3.c, the Copermittee must re-evaluate and adapt the numeric goals, water quality improvement strategies, schedules, and annual milestones required under Provision B.3.c.(1) when significant new information becomes available, or with the Report of Waste Discharge required pursuant to Provision F.5. Significant changes in the numeric goals, water quality improvement strategies, schedules, or annual milestones requires an update to the analysis required under Provision B.3.c.(2).

6. Water Quality Improvement Plan Submittal, Updates, and Implementation

a. The Copermittees must submit and commence implementation of the Water Quality Improvement Plans in accordance with the requirements of Provision F.1.

b. The Copermittees must submit proposed updates to the Water Quality Improvement Plan for acceptance by the San Diego Water Board Executive Officer in accordance with the requirements of Provision F.2.c.

C. ACTION LEVELS

The purpose of this provision is for the Copermittees to incorporate numeric action levels in the Water Quality Improvement Plans. The goal of the action levels is to guide Water Quality Improvement Plan implementation efforts and measure progress towards the protection of water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through monitoring and assessing the quality of the MS4 discharges during the implementation of the Water Quality Improvement Plans.

1. Non-Storm Water Action Levels[11]

The Copermittees must develop and incorporate numeric non-storm water action levels (NALs) into the Water Quality Improvement Plan to: 1) support the development and prioritization of water quality improvement strategies for effectively prohibiting non-storm water discharges to the MS4s, 2) assess the effectiveness of the water quality improvement strategies toward addressing MS4 non-storm water discharges, required pursuant to Provision D.4.b.(1), and 3) support the detection and elimination of non-storm water and illicit discharges to the MS4, required pursuant to Provision E.2.[12]

a. The following NALs must be incorporated:

(1) Non-Storm Water Discharges from MS4s to Ocean Surf Zone

Table C-1. Non-Storm Water Action Levels for Discharges from MS4s to Ocean Surf Zone

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Total Coliform	MPN/100 ml	1,000	-	10,000/1,000[1]	OP
Fecal Coliform	MPN/100 ml	200[2]	-	400	OP
Enterococci	MPN/100 ml	35	-	104[3]	OP

Abbreviations/Acronyms
AMAL – average monthly action level
MDAL – maximum daily action level
OP – Ocean Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Total coliform density NAL is 1,000 MPN/100 ml when the fecal/total coliform ratio exceeds 0.1.
2. Fecal coliform density NAL is 200 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas."

[11] NALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, unless the NAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed.
[12] The Copermittees may utilize NALs or other benchmarks currently established by the Copermittees as interim NALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

(2) Non-Storm Water Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Table C-2. Non-Storm Water Action Levels for Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Turbidity	NTU	75	-	225	OP
pH	Units	Within limit of 6.0 to 9.0 at all times			OP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	35	-	104[3]	BP
Priority Pollutants	µg/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
OP – Ocean Plan water quality objective
NTU – Nephelometric Turbidity Units
µg/L – micrograms per liter
MDAL – maximum daily action level
BP – Basin Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas" and is not applicable to water bodies that are not designated with the water contact recreation (REC-1) beneficial use.

Table C-3. Non-Storm Water Action Levels for Priority Pollutants

Parameter	Units	Freshwater (CTR)		Saltwater (CTR)	
		MDAL	AMAL	MDAL	AMAL
Cadmium	µg/L	**	**	16	8
Copper	µg/L	*	*	5.8	2.9
Chromium III	µg/L	**	**	-	-
Chromium VI	µg/L	16	8.1	83	41
Lead	µg/L	*	*	14	2.9
Nickel	µg/L	**	**	14	6.8
Silver	µg/L	*	*	2.2	1.1
Zinc	µg/L	*	*	95	47

Abbreviations/Acronyms:
CTR – California Toxic Rule
AMAL – average monthly action level
µg/L – micrograms per liter
MDAL – maximum daily action level

Notes:
* Action levels developed on a case-by-case basis (see below)
** Action levels developed on a case-by-case basis (see below), but calculated criteria are not to exceed Maximum Contaminant Levels (MCLs) under the California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64431

The Cadmium, Copper, Chromium (III), Lead, Nickel, Silver and Zinc NALs for MS4 discharges to freshwater receiving waters will be developed on a case-by-case basis based on site-specific water quality data (receiving water hardness). For these priority pollutants, refer to 40 CFR 131.38(b)(2).

(3) Non-Storm Water Discharges from MS4s to Inland Surface Waters

Table C-4. Non-Storm Water Action Levels for Discharges from MS4s to Inland Surface Waters

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Dissolved Oxygen	mg/L	Not less than 5.0 in WARM waters and not less than 6.0 in COLD waters			BP
Turbidity	NTU	-	20	See MDAL	BP
pH	Units	Within limit of 6.5 to 8.5 at all times			BP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	33	-	61[3]	BP
Total Nitrogen	mg/L	-	1.0	See MDAL	BP
Total Phosphorus	mg/L	-	0.1	See MDAL	BP
MBAS	mg/L	-	0.5	See MDAL	BP
Iron	mg/L	-	0.3	See MDAL	BP
Manganese	mg/L	-	0.05	See MDAL	BP
Priority Pollutants	µg/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
BP – Basin Plan water quality objective
COLD – cold freshwater habitat beneficial use
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
MDAL – maximum daily action level
WARM – warm freshwater habitat beneficial use
MBAS – Methylene Blue Active Substances
MPN/100 ml – most probable number per 100 milliliters
µg/L – micrograms per liter

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for freshwater "designated beach areas" and is not applicable to water bodies that are not designated with the water contact recreation (REC-1) beneficial use.

b. If not identified in Provision C.1.a, NALs must be identified, developed and incorporated in the Water Quality Improvement Plan for any pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in receiving waters associated with the highest priority water quality conditions related to non-storm water discharges from the MS4s. NALs must be based on:

(1) Applicable water quality standards which may be dependent upon site-specific or receiving water-specific conditions or assumptions to be identified by the Copermittees; or

(2) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the NALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary NALs specific to the Watershed Management Area at levels greater than the NALs required by Provisions C.1.a and C.1.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for effectively prohibiting non-storm water discharges to the MS4s, as well as the detection and

elimination of non-storm water and illicit discharges to and from the MS4. The secondary NALs may be developed using an approach acceptable to the San Diego Water Board.

d. Dry weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.b may be utilized to develop or revise NALs based on watershed-specific data, subject to San Diego Water Board Executive Officer approval.

2. Storm Water Action Levels[13]

The Copermittees must develop and incorporate numeric storm water action levels (SALs) in the Water Quality Improvement Plans to: 1) support the development and prioritization of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s, and 2) assess the effectiveness of the water quality improvement strategies toward reducing pollutants in storm water discharges, required pursuant to Provision D.4.b.(2).[14]

a. The following SALs for discharges of storm water from the MS4 must be incorporated:

Table C-5. Storm Water Action Levels for Discharges from MS4s to Receiving Waters

Parameter	Units	Action Level
Turbidity	NTU	126
Nitrate & Nitrite (Total)	mg/L	2.6
Phosphorus (Total P)	mg/L	1.46
Cadmium (Total Cd)*	µg/L	3.0
Copper (Total Cu)*	µg/L	127
Lead (Total Pb)*	µg/L	250
Zinc (Total Zn)*	µg/L	976

Abbreviations/Acronyms:
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
µg/L – micrograms per liter

Notes:
* The sampling must include a measure of receiving water hardness at each MS4 outfall. If a total metal concentration exceeds the corresponding metals SAL in Table C-5, that concentration must be compared to the California Toxics Rule criteria and the USEPA 1-hour maximum concentration for the detected level of receiving water hardness associated with that sample. If it is determined that the sample's total metal concentration for that specific metal exceeds that SAL, but does not exceed the applicable USEPA 1-hour maximum concentration criterion for the measured level of hardness, then the sample result will not be considered above the SAL for that measurement.

[13] SALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, unless the SAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed.

[14] The Copermittees may utilize SALs or other benchmarks currently established by the Copermittees as interim SALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

b. If not identified in Provision C.2.a, SALs must be identified, developed and incorporated in the Water Quality Improvement Plan for pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in receiving waters associated with the highest priority water quality conditions related to storm water discharges from the MS4s. SALs must be based on:

(1) Federal and State water quality guidance and/or water quality standards; and

(2) Site-specific or receiving water-specific conditions; or

(3) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the SALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary SALs specific to the Watershed Management Area at levels greater than the SALs required by Provisions C.2.a and C.2.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s. The secondary SALs may be developed based on the approaches recommended by the State Water Board's Storm Water Panel[15] or using an approach acceptable to the San Diego Water Board.

d. Wet weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.c may be used to develop or revise SALs based upon watershed-specific data, subject to San Diego Water Board Executive Officer approval.

[15] Storm Water Panel Recommendations to the California State Water Resources Control Board: The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities (June 2006)

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D. MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS

The purpose of this provision is for the Copermittees to monitor and assess the impact on the conditions of receiving waters caused by discharges from the Copermittees' MS4s under wet weather and dry weather conditions. The goal of the monitoring and assessment program is to inform the Copermittees about the nexus between the health of receiving waters and the water quality condition of the discharges from their MS4s. This goal will be accomplished through monitoring and assessing the conditions of the receiving waters, discharges from the MS4s, pollutant sources and/or stressors, and effectiveness of the water quality improvement strategies implemented as part of the Water Quality Improvement Plans.

1. Receiving Water Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the condition of the receiving waters in each Watershed Management Area during dry weather and wet weather. Following San Diego Water Board acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct long-term receiving water monitoring during implementation of the Water Quality Improvement Plan to assess the long term trends and determine if conditions in receiving waters are improving. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following receiving water monitoring procedures:

a. TRANSITIONAL RECEIVING WATER MONITORING

Until the monitoring requirements and schedules of Provisions D.1.b-e are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following receiving water monitoring in the Watershed Management Area:

(1) Continue the receiving water monitoring programs required in Order Nos. R9-2007-0001 (Monitoring and Reporting Program No. R9-2007-0001 Sections II.A.1-A.5), R9-2009-0002, and R9-2010-0016, unless the Executive Officer provides conditional approval for Copermittees to proceed with implementation of the proposed monitoring and assessment program developed in accordance with Provision B.4;

(2) Continue the monitoring in the Hydromodification Management Plans approved by the San Diego Water Board;

(3) Participate in the following regional receiving water monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring,

(b) Southern California Bight Regional Monitoring, and

(c) Sediment Quality Monitoring;

(4) Implement the monitoring programs developed as part of any implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) for the TMDLs in Attachment E to this Order; and

(5) For Watershed Management Areas with ASBS, implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

b. LONG-TERM RECEIVING WATER MONITORING STATIONS

The Copermittees must select at least one long-term receiving water monitoring station from among the existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees to be representative of the receiving water quality in the Watershed Management Area. Additional long-term receiving water monitoring stations must be selected where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

c. DRY WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three dry weather monitoring events at each of the long-term receiving water monitoring stations. At least one monitoring event must be conducted during the dry season (May 1 – September 30) and at least one monitoring event must be conducted during a dry weather period during the wet season (October 1 – April 30), after the first wet weather event of the season, with an antecedent dry period of at least 72 hours following a storm event producing measureable rainfall of greater than 0.1 inch.

(1) <u>Dry Weather Receiving Water Field Observations</u>

For each dry weather monitoring event, the Copermittees must record field observations consistent with Table D-1 at each long-term receiving water monitoring station.

Table D-1. Field Observations for Receiving Water Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) • Station description (i.e. deposits or stains, vegetation condition, structural condition, and observable biology) • Presence and assessment of trash in and around station

(2) Dry Weather Receiving Water Field Monitoring

For each dry weather monitoring event, if conditions allow the collection of the data, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

Table D-2. Field Monitoring Parameters for Receiving Water Monitoring Stations

Parameters
• pH • Temperature • Specific conductivity • Dissolved oxygen • Turbidity

(3) Dry Weather Receiving Water Analytical Monitoring

For each dry weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable NAL constituents, and

(v) Constituents listed in Table D-3.

Table D-3. Analytical Monitoring Constituents for Receiving Water Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Pesticides	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Mercury • Nickel • Selenium • Thallium • Zinc	• Organophosphate Pesticides • Pyrethroid Pesticides	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(4) Dry Weather Receiving Water Toxicity Monitoring

For each dry weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for aquatic toxicity in accordance with Table D-4. When the State Water Board's Policy for Toxicity Assessment and Control (Toxicity Policy) is approved and in effect, the San Diego Water Board Executive Officer may direct the Copermittees to replace current toxicity program elements with standardized procedures in the Toxicity Policy.

Table D-4. Dry Weather Chronic[1] Toxicity Testing for Receiving Water Monitoring Stations

Organism	Units	Test	USEPA Protocol
Freshwater			
Pimephales promelas (Fathead Minnow)	Pass / Fail	Larval Survival and Growth	EPA-821-R-02-013
Ceriodaphnia dubia (*Daphnid*)	Pass / Fail	Survival and Production	EPA-821-R-02-013
Selenastrum capricornutum (Green Algae)	Pass / Fail	Growth	EPA-821-R-02-013
Marine and Estuarine			
Strongylocentrotus purpuratus *(Purple Sea Urchin)*	Pass / Fail	Embryo-Larval Development	EPA-600-R-95-136

Notes:
1. Chronic toxicity testing is not required at receiving water monitoring stations located at mass loading stations if the channel flows are diverted year-round during dry weather conditions to the sanitary sewer for treatment.

(a) Freshwater Test Species and Methods: If samples are collected in receiving waters with salinity less than 1 ppt, the Copermittees must follow the methods for chronic toxicity tests as established in 40 CFR 136.3 using a single-concentration test design for routine monitoring, or a five-concentration test design for additional toxicity testing if the limitation is exceeded. The Copermittees must estimate the critical life stage chronic toxicity on undiluted samples in accordance with species and short term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms (EPA-821-R-02-013; Table IA, 40 CFR 136). Additional test species may be used by the Copermittees if approved by the San Diego Water Board Executive Officer. The Copermittees must conduct:

(i) A static renewal toxicity test with the fathead minnow, *Pimephales promelas* (Larval Survival and Growth Test Method 1000.0);

(ii) A static renewal toxicity test with the daphnid, *Ceriodaphnia dubia* (Survival and Reproduction Test Method 1002.0); and

(iii) A static renewal toxicity test with the green alga, *Selenastrum capricornutum* (also named *Raphidocelis subcapitata*) (Growth Test Method 1003.0).

(b) Marine and Estuarine Test Species and Methods: If samples are collected in receiving waters with salinity greater or equal to 1 ppt, the Copermittees must follow the methods for chronic toxicity tests as established in 40 CFR 136.3 using a single-concentration test design for routine monitoring, or a five-concentration test design for additional toxicity testing if the limitation is exceeded. The Copermittees must conduct the following critical life state chronic toxicity tests on undiluted samples in accordance with species and short term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms (EPA-600-R-95-136; 1995). Artificial sea salts must be used to increase sample salinity. The Copermittees must conduct a static non-renewal toxicity test with the purple sea urchin, *Strongylocentrotus purpuratus* (Embryo-larval Development Test Method). Additional species may be used by the Copermittees if approved by the San Diego Water Board Executive Officer.

(c) Holding Times: All toxicity tests must be conducted as soon as possible following sample collection. The 36-hour sample holding time for test initiation shall be targeted. However, no more than 72 hours shall elapse before the conclusion of sample collection and test initiation.

(d) Test Species Sensitivity Screening: To determine the most sensitive test species for freshwater, the Copermittees must screen 2 wet weather and 2 dry weather toxicity tests with a vertebrate, an invertebrate, and a plant species. After this screening period, subsequent monitoring must be conducted using the most sensitive test species. Alternatively, if a sensitive test species has already been determined, or if there is prior knowledge of potential toxicant(s) and a test species is sensitive to such toxicant(s), then monitoring must be conducted using only that test species. Sensitive test species determinations must also consider the most sensitive test species used for proximal receiving water monitoring. Rescreening must occur once each permit term.

(e) Chronic toxicity test biological endpoint data must be analyzed using the Test of Significant Toxicity t-test approach specified in *National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document* (USEPA, Office of Wastewater Management, Washington, D.C., EPA-833-R-10-003, 2010). For this monitoring program, the critical chronic instream waste concentration (IWC) is set at 100 percent receiving water (i.e. no dilution) for receiving water samples. A 100 percent receiving water and a control must be tested.

(f) Toxicity Identification Evaluation (TIE) / Toxicity Reduction Evaluation (TRE): If chronic toxicity is detected in receiving waters, the Copermittees must discuss the need for conducting a TIE/TRE in the assessments

required under Provision D.4.a.(2), and develop a plan for implementing the TIE/TRE to be incorporated in the Water Quality Improvement Plan.

(5) Dry Weather Receiving Water Bioassessment Monitoring

Bioassessment monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must conduct bioassessment monitoring during at least one dry weather monitoring event at each long-term receiving water monitoring station as follows:

(a) The following bioassessment samples and measurements must be collected:

(i) Macroinvertebrate samples must be collected in accordance with the "Reachwide Benthos (Multihabitat) Procedure" in the most current Surface Water Ambient Monitoring Program (SWAMP) Bioassessment Standard Operating Procedures (SOP), and amendments, as applicable;[16]

(ii) The "Full" suite of physical habitat characterization measurements must be collected in accordance with the most current SWAMP Bioassessment SOP, and as summarized in the SWAMP Stream Habitat Characterization Form – Full Version;[17] and

(iii) Freshwater algae samples must be collected in accordance with the SWAMP Standard Operating Procedures for Collecting Algae Samples.[18] Analysis of samples must include algal taxonomic composition (diatoms and soft algae) and algal biomass.

(b) The bioassessment samples, measurements, and appropriate water chemistry data must be used to calculate the following:

(i) An Index of Biological Integrity (IBI) for macroinvertebrates for each monitoring station where bioassessment monitoring was conducted, based on the most current calculation method;[19] and

[16] Ode, P.R.. 2007. Standard operating procedures for collecting macroinvertebrate samples and associated physical and chemical data for ambient bioassessments in California. California State Water Resources Control Board Surface Water Ambient Monitoring Program (SWAMP) Bioassessment SOP 001. http://www.swrcb.ca.gov/water_issues/programs/swamp/tools.shtml#monitoring
[17] Available at: http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/reports/fieldforms_fullversion052908.pdf
[18] Fetscher et al. 2009. Standard Operating Procedures for Collecting Stream Algae Samples and Associated Physical Habitat and Chemical Data for Ambient Bioassessments in California.
[19] The most current calculation method at the time the Order was adopted is outlined in "A Quantitative Tool for Assessing the Integrity of Southern California Coastal Streams" (Ode, et al. 2005. Environmental Management. Vol. 35, No. 1, pp. 1-13). If an updated or new calculation method is developed, either both

(ii) An IBI for algae for each monitoring station where bioassessment monitoring was conducted, when a calculation method is developed.[20]

(c) In lieu of the requirements of Provision D.1.c.(5)(a), the Copermittees may conduct the bioassessment monitoring in accordance with the "Triad" assessment approach[21] to calculate the IBIs required for Provision D.1.c.(5)(b). The Copermittees must conduct sampling, analysis, and reporting of specified in-stream biological and habitat data according to the protocols specified in the SCCWRP Technical Report No. 539, or subsequent protocols, if developed.

(6) Dry Weather Receiving Water Hydromodification Monitoring

In addition to the hydromodification monitoring conducted as part of the Copermittees' Hydromodification Management Plans, hydromodification monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must collect the following hydromodification monitoring observations and measurements within an appropriate domain of analysis during at least one dry weather monitoring event for each long-term receiving water monitoring station:

(a) Channel conditions, including:

(i) Channel dimensions,

(ii) Hydrologic and geomorphic conditions, and

(iii) Presence and condition of vegetation and habitat;

(b) Location of discharge points;

(c) Habitat integrity;

(d) Photo documentation of existing erosion and habitat impacts, with location (i.e. latitude and longitude coordinates) where photos were taken;

(e) Measurement or estimate of dimensions of any existing channel bed or bank eroded areas, including length, width, and depth of any incisions; and

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(i.e. current and updated/new) methods must be used, or historical IBIs must be recalculated with the updated or new calculation method.

[20] When a calculation method is developed, IBIs must be calculated for all available and appropriate historical data.

[21] Stormwater Monitoring Coalition Model Monitoring Technical Committee, 2004. Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California. Technical Report #419. August 2004.

(f) Known or suspected cause(s) of existing downstream erosion or habitat impact, including flow, soil, slope, and vegetation conditions, as well as upstream land uses and contributing new and existing development.

d. WET WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three wet weather monitoring events at each long-term receiving water monitoring station. At least one wet weather monitoring event must be conducted during the first wet weather event of the wet season (October 1 – April 30), and at least one wet weather monitoring event during a wet weather event that occurs after February 1.

(1) Wet Weather Receiving Water Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each long-term receiving water monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event;

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(d) Presence and assessment of trash in and around station.

(2) Wet Weather Receiving Water Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

(3) Wet Weather Receiving Water Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) Constituents listed in Table D-3.

(4) <u>Wet Weather Receiving Water Toxicity Monitoring</u>

For each wet weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for chronic aquatic toxicity in accordance with Provisions D.1.c.(4)(a)-(f).

e. OTHER RECEIVING WATER MONITORING REQUIREMENTS

(1) Regional Monitoring

The Copermittees must participate in the following regional receiving waters monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring; and

(b) Southern California Bight Regional Monitoring and

(c) Unified Beach Water Quality Monitoring and Assessment Program. The Orange County Copermittees shall participate in and, together with South Orange County Wastewater Authority and Orange County Health Care Agency, shall share responsibility for implementation of a unified regional beach water quality monitoring and assessment program in south Orange County, as set forth in the October 2014 report, *Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County* , issued pursuant to CWC section 13383 and subject to future revision in the San Diego Water Board December 5, 2014 Letter Directive.

(2) Sediment Quality Monitoring

The Copermittees must perform sediment monitoring to assess compliance with sediment quality receiving water limits applicable to MS4 discharges to enclosed bays and estuaries. The monitoring may be performed either by individual or multiple Copermittees to assess compliance with receiving water limits, or through participation in a water body monitoring coalition. A Sediment Monitoring Plan which satisfies the requirements of the State Water Board's Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part 1 Sediment Quality (Sediment Control Plan) must be submitted as part of the monitoring and assessment program in the Water Quality Improvement Plan.

(a) The Sediment Monitoring Plan design must include the following:

(i) The elements required under Section VII.D (Receiving Water Limits Monitoring Frequency) and Section VII.E (Sediment Monitoring) of the Sediment Control Plan;

(ii) A Quality Assurance Project Plan (QAPP) describing the project objectives and organization, functional activities, and quality assurance/quality control protocols for the water and sediment monitoring; and

(iii) A schedule for completion of all sample collection and analysis activities and submission of Sediment Monitoring Reports.

(b) The Copermittees must implement the Sediment Monitoring Plan in accordance with the schedule contained in the Sediment Monitoring Plan, unless otherwise directed in writing by the San Diego Water Board Executive Officer.

(c) The Copermittees must incorporate a Sediment Monitoring Report as part of the Water Quality Improvement Plan Annual Report in accordance with the schedule contained in the Sediment Monitoring Plan, unless otherwise directed in writing by the San Diego Water Board Executive Officer. The Sediment Monitoring Report must contain the following information:

(i) Analysis: An evaluation, interpretation and tabulation of the water and sediment monitoring data, including interpretations and conclusions as to whether applicable Receiving Water Limitations in this Order have been attained at each sample station;

(ii) Sample Location Map: The locations, type, and number of samples must be identified and shown on a site map; and

(iii) California Environmental Data Exchange Network: A statement certifying that the monitoring data and results have been uploaded into the California Environmental Data Exchange Network (CEDEN).

(d) Based on the Sediment Monitoring Report conclusions the San Diego Water Board may require a human health risk assessment to determine if the human health objective contained in Receiving Water Limitations in Provision A.2.a.(3)(b)(ii) has been attained at each sample station. In conducting a risk assessment, the Copermittees must consider any applicable and relevant information, including California Environmental Protection Agency's (Cal/EPA) Office of Environmental Health Hazard Assessment (OEHHA) policies for fish consumption and risk assessment, Cal/EPA's Department of Toxic Substances Control (DTSC) Risk Assessment, and USEPA Human Health Risk Assessment policies.

(3) <u>ASBS Monitoring</u>

For Watershed Management Areas with ASBS, the Copermittees must implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

f. ALTERNATIVE WATERSHED MONITORING REQUIREMENTS

The San Diego Water Board may direct the Copermittees to participate in an effort to develop alternative watershed monitoring with other regulated entities, other interested parties, and the San Diego Water Board to refine, coordinate, and implement regional monitoring and assessment programs to determine the status and trends of water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams.

2. MS4 Outfall Discharge Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the discharges from the MS4 outfalls in each Watershed Management Area during dry weather and wet weather. Following San Diego Water Board acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct MS4 outfall discharge monitoring during implementation of the Water Quality Improvement Plan to assess the effectiveness of their jurisdictional runoff management programs toward effectively prohibiting non-storm water discharges into the MS4 and reducing pollutants in storm water discharges from their MS4s to the MEP. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following MS4 outfall monitoring procedures:

a. TRANSITIONAL MS4 OUTFALL DISCHARGE MONITORING

Until the monitoring requirements and schedules of Provisions D.2.b-c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following MS4 outfall discharge monitoring in the Watershed Management Area:

(1) <u>MS4 Outfall Discharge Monitoring Station Inventory</u>

Each Copermittee must identify all major MS4 outfalls that discharge directly to receiving waters within its jurisdiction and geo-locate those outfalls on a map of the MS4 pursuant to Provision E.2.b.(1). This information must be compiled into a MS4 outfall discharge monitoring station inventory, and must include the following information:

(a) Latitude and longitude of MS4 outfall point of discharge;

(b) Watershed Management Area;

(c) Hydrologic subarea;

(d) Outlet size;

(e) Accessibility (i.e. safety and without disturbance of critical habitat);

(f) Approximate drainage area; and

(g) Classification of whether the MS4 outfall is known to have persistent dry weather flows, transient dry weather flows, no dry weather flows, or unknown dry weather flows.

(2) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Until the monitoring requirements and schedules of Provision D.2.b are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, each Copermittee must perform dry weather MS4 outfall field screening monitoring to identify non-storm water and illicit discharges within its jurisdiction in accordance with Provision E.2.c, to determine which discharges are transient flows and which are persistent flows, and prioritize the dry weather MS4 discharges that will be investigated and eliminated in accordance with Provision E.2.d.

(a) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Frequency

Each Copermittee must field screen the MS4 outfalls in its inventory developed pursuant to Provision D.2.a.(1) as follows:

(i) For Copermittees with less than 125 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 80 percent of the outfalls must be visually inspected two times per year during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv).

(ii) For Copermittees with 125 major MS4 outfalls or more, but less than or equal to 500 that discharge to receiving waters within a Watershed Management Area, all the outfalls must be visually inspected at least annually during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv).

(iii) For Copermittees with more than 500 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 500 outfalls must be visually inspected at least annually during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv). Copermittees with more than 500 major MS4 outfalls within a Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;

[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(iv) For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major MS4 outfalls within its jurisdiction, at least 500 major MS4 outfalls within its inventory must be visually inspected at least annually during dry weather conditions. Copermittees with more than 500 major MS4 outfalls in more than one Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(v) Inspections of major MS4 outfalls conducted in response to public reports and staff or contractor reports and notifications may count toward the required visual inspections of MS4 outfall discharge monitoring stations.

(b) Transitional Dry Weather MS4 Outfall Discharge Field Screening Visual Observations

(i) An antecedent dry period of at least 72 hours following any storm event producing measurable rainfall greater than 0.1 inch is required prior to conducting field screening visual observations during a field screening monitoring event.

(ii) During the field screening monitoring event, each Copermittee must record visual observations consistent with Table D-5 at each MS4 outfall discharge monitoring station inspected.

Table D-5. Field Screening Visual Observations for MS4 Outfall Discharge Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) - Flow source(s) suspected or identified from non-storm water source investigation - Flow source(s) eliminated during non-storm water source identification • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) - Known or suspected source(s) of pooled or ponded water • Station description (i.e. deposits or stains, vegetation condition, structural condition, observable biology) • Presence and assessment of trash in and around station • Evidence or signs of illicit connections or illegal dumping

(iii) Each Copermittee must implement the requirements of Provisions E.2.d.(2)(c)-(e) based on the field observations required pursuant to Provision D.2.a.(2)(b)(ii).

(iv) Each Copermittee must evaluate field observations together with existing information available from prior reports, inspections and monitoring results to determine whether any observed flowing, pooled, or ponded waters are likely to be transient or persistent flow.[22]

(c) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Records

Based upon the results of the transitional dry weather MS4 outfall discharge field screening monitoring conducted pursuant to Provisions D.2.a.(2)(a)-(b), each Copermittee must update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow.

(3) <u>Transitional Wet Weather MS4 Outfall Discharge Monitoring</u>

Until the monitoring requirements and schedules of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the

[22] Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(a) Transitional Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees must select wet weather MS4 outfall discharge monitoring stations from the inventories developed pursuant to Provision D.2.a.(1) for each Watershed Management Area as follows:

(i) At least five wet weather MS4 outfall discharge monitoring stations that are representative of storm water discharges from areas consisting primarily of residential, commercial, industrial, and typical mixed-use land uses present within the Watershed Management Area;

(ii) At least one wet weather MS4 outfall discharge monitoring station for each Copermittee within the Watershed Management Area; and

(iii) The County of San Diego may select at least two (2) wet weather MS4 outfall discharge monitoring stations for the portion of the Santa Margarita River Watershed Management Area within its jurisdiction to be monitored during the transitional period until the Riverside County Copermittees are notified of coverage under this Order. After the Riverside County Copermittees are notified of coverage under this Order, the Copermittees in the Watershed Management Area must select wet weather MS4 outfall discharge monitoring stations consistent with the requirements above.

(b) Transitional Wet Weather MS4 Outfall Discharge Monitoring Frequency

Each wet weather MS4 outfall discharge monitoring station selected pursuant to Provision D.2.a.(3)(a) must be monitored once during the wet season (October 1 – April 30). The wet weather monitoring events must be selected to be representative of the range of hydrological conditions experienced in the region. At least 10 percent of samples must be conducted during the first wet weather event of the wet season, to include at least one such sample in each Watershed Management Area..

(c) Transitional Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(i) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(ii) The flow rates and volumes measured or estimated from the MS4 outfall (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(d) Transitional Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(e) Transitional Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, and indicator bacteria;

(iv) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

[a] Time-weighted composites collected over the length of the storm event or the first 24 hour period whichever is shorter, composed of discrete samples, which may be collected through the use of automated equipment, or

[b] Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

[c] If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during

the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours;

(v) Only one analysis of the composite of aliquots is required;

(vi) The samples must be analyzed for the following constituents:

[a] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

[b] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and

[c] Constituents listed in Table D-6.

Table D-6. Analytical Monitoring Constituents for Wet Weather MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Nickel • Selenium • Thallium • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(f) Other Transitional Wet Weather MS4 Outfall Discharge Monitoring

The San Diego County Copermittees must continue the wet weather MS4 outfall monitoring program developed under Order No. R9-2007-0001, as approved by the San Diego Water Board, through its planned completion.

b. DRY WEATHER MS4 OUTFALL DISCHARGE MONITORING

Each Copermittee must perform dry weather MS4 outfall monitoring to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision

E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. Each Copermittee must conduct the following dry weather MS4 outfall discharge monitoring within its jurisdiction:

(1) Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Each Copermittee must continue to perform the dry weather MS4 outfall discharge field screening monitoring in accordance with the requirements of Provision D.2.a.(2). The Copermittee may adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of persistent flow non-storm water discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of visual inspections performed is equivalent to the number of visual inspections required under Provision D.2.a.(2)(a).

(2) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring

Each Copermittee must perform non-storm water persistent flow MS4 outfall discharge monitoring to determine which persistent non-storm water discharges contain concentrations of pollutants below NALs, and which persistent non-storm water discharges impact receiving water quality during dry weather. Each Copermittee must conduct the following non-storm water persistent flow MS4 outfall discharge monitoring within its jurisdiction:

(a) Prioritization of Non-Storm Water Persistent Flow MS4 Outfalls

Based upon the dry weather MS4 outfall discharge field screening monitoring records developed pursuant to Provision D.2.a.(2)(c), each Copermittee must identify and prioritize the MS4 outfalls with persistent flows based on the highest priority water quality conditions identified in the Water Quality Improvement Plan and any additional criteria developed by the Copermittee, which may include historical data and data from sources other than what the Copermittee collects.

(b) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring Frequency

(i) Based on the prioritization of major MS4 outfalls developed under Provision D.2.b.(2)(a), each Copermittee must identify, at a minimum, the 5 highest priority major MS4 outfalls with non-storm water persistent flows that the Copermittee will monitor within its jurisdiction in each Watershed Management Area. For Responsible Copermittees identified by a TMDL in Attachment E to this Order, if the 5 chosen outfall locations are not sufficient to determine compliance with the TMDL(s), then each Responsible Copermittee

must identify additional MS4 outfall monitoring locations within its jurisdiction sufficient to address compliance with the TMDL(s). If a Copermittee has less than 5 major outfalls within a Watershed Management Area, then the Copermittee must monitor all of its major MS4 outfalls with persistent flows within each Watershed Management Area. The location of the highest priority non-storm water persistent flow MS4 outfall monitoring stations must be identified on the map required pursuant to Provision E.2.b.(1). The map must specify which MS4 outfalls are being monitored for compliance with a TMDL.

(ii) Each of the highest priority non-storm water persistent flow MS4 outfall monitoring stations identified pursuant to Provision D.2.b.(2)(b)(i) must be monitored under dry weather conditions at least semi-annually until one of the following occurs:

[a] The non-storm water discharges have been effectively eliminated (i.e. no flowing, pooled, or ponded water) for three consecutive dry weather monitoring events; or

[b] The source(s) of the persistent flows has been identified as a category of non-storm water discharges that does not require an NPDES permit and does not have to be addressed as an illicit discharge because it was not identified as a source of pollutants (i.e. constituents in non-storm water discharge do not exceed NALs), and the persistent flow can be re-prioritized to a lower priority; or

[c] The constituents in the persistent flow non-storm water discharge do not exceed NALs, and the persistent flow can be re-prioritized to a lower priority; or

[d] The source(s) of the persistent flows has been identified as a non-storm water discharge authorized by a separate NPDES permit.

(iii) Where the criteria under Provision D.2.b.(2)(b)(ii) are not met, but the threat to water quality has been reduced by the Copermittee, the highest priority persistent flow MS4 outfall monitoring stations may be reprioritized accordingly for continued dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1).

(iv) Each Copermittee must document removal or re-prioritization of the highest priority persistent flow MS4 outfall monitoring stations identified under Provision D.2.b.(2)(a) in the Water Quality Improvement Plan Annual Report. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized major MS4 outfall in the Watershed Management Area within its jurisdiction, unless there are no remaining qualifying major MS4 outfalls within the Copermittee's jurisdiction in the Watershed Management Area.

(c) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Observations

During each semi-annual monitoring event, each Copermittee must record field observations consistent with Table D-5 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(d) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Monitoring

During each semi-annual monitoring event, if conditions allow the collection of the data, each Copermittee must monitor and record the parameters in Table D-2 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(e) Non-Storm Water Persistent Flow MS4 Outfall Discharge Analytical Monitoring

During each semi-annual monitoring event in which measurable flow is present, each Copermittee must collect and analyze samples from each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Collect grab or composite samples to be analyzed at a qualified laboratory for the following constituents:

[a] Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,
[b] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,
[c] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,
[d] Applicable NAL constituents, and
[e] Constituents listed in Table D-7. The Copermittees may adjust the list of constituents for the Watershed Management Area if historical data or supporting information can be provided that demonstrates or justifies the analysis of a constituent is not necessary.

Table D-7. Analytical Monitoring Constituents for Persistent Flow MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Total Hardness • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Cadmium • Copper • Lead • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(iv) If the Copermittee identifies and eliminates the source of the persistent flow non-storm water discharge, analysis of the sample is not required.

c. WET WEATHER MS4 OUTFALL DISCHARGE MONITORING

The Copermittees must perform wet weather MS4 outfall monitoring to identify pollutants in storm water discharges from the MS4s, to guide pollutant source identification efforts, and to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order. The Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(1) Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees may adjust the wet weather MS4 outfall discharge monitoring locations in the Watershed Management Area, as needed, to identify pollutants in storm water discharges from MS4s, to guide pollutant source identification efforts, and to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of stations is at least equivalent to the number of stations required under Provision D.2.a.(3)(a). Additional outfall monitoring locations, above the minimum per jurisdiction, may be required to demonstrate compliance with the WQBELs associated with the applicable TMDLs in Attachment E.

(2) Wet Weather MS4 Outfall Discharge Monitoring Frequency

The Copermittees must monitor the wet weather MS4 outfall discharge monitoring stations in the Watershed Management Area at least once (1) per year. The Copermittees may need to increase the frequency of monitoring in order to identify pollutants in storm water discharges from the MS4s causing or contributing to the highest priority water quality conditions, to guide pollutant source identification efforts, or to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order.

(3) Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(4) Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(5) Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites collected over the length of the storm event or the first 24 hour period, whichever is shorter , composed of discrete samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

(iii) If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours.

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) The Copermittees may adjust the analytical monitoring required for the Watershed Management Area, if the Copermittees have historical data or supporting information that can demonstrate or provide justification that the analysis of a constituent is not necessary.

3. Special Studies

a. Within the term of this Order, the Copermittees must initiate the following special studies:

(1) At least two special studies in each Watershed Management Area to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that cause or contribute to highest priority water quality conditions identified in the Water Quality Improvement Plan.

(2) At least one special study for the San Diego Region to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that are impacting receiving waters on a regional basis in the San Diego Region.

(3) One of the two special studies in each Watershed Management Area required pursuant to Provision D.3.a.(1) may be replaced by a special study implemented pursuant to Provision D.3.a.(2).

b. The special studies must, at a minimum, be in conformance with the following criteria:

(1) The special studies must be related to the highest priority water quality conditions identified by the Copermittees in the Watershed Management Area and/or for the entire San Diego Region;

(2) The special studies developed pursuant to Provision D.3.a.(1) must:

(a) Be implemented within the applicable Watershed Management Area, and

(b) Require some form of participation by all the Copermittees within the Watershed Management Area;

(3) The special studies developed pursuant to Provision D.3.a.(2) must:

(a) Be implemented within the San Diego Region, and

(b) Require some form of participation by all Copermittees covered under the requirements of this Order.

(4) The Copermittees are encouraged to partner with environmental groups or third parties knowledgeable of watershed conditions to complete the required special studies.

c. Special studies developed to identify sources of pollutants and/or stressors should be pollutant and/or stressor specific and based on historical monitoring data and monitoring performed pursuant to Provisions D.1 and D.2. Development of source identification special studies should include the following:

(1) A compilation of known information on the specific pollutant and/or stressor, including data on potential sources and movement of the pollutant and/or stressor within the watershed. Data generated by the Copermittees and others, as well as information available from a literature research on the pollutant and/or stressor should be compiled and analyzed as appropriate.

(2) An identification of data gaps, based on the compiled information generated on the specific pollutant and/or stressor identified in Provision D.3.c.(1). Source identification special studies should be developed to fill identified data gaps.

(3) A monitoring plan that will collect and provide data the Copermittees can utilize to do the following:

(a) Quantify the relative loading or impact of a pollutant and/or stressor from a particular source or pollutant generating activity;

(b) Improve understanding of the fate of a pollutant and/or stressor in the environment;

(c) Develop an inventory of known and suspected sources of a pollutant and/or stressor in the Watershed Management Area; and/or

(d) Prioritize known and suspected sources of a pollutant and/or stressor based on relative magnitude in discharges, geographical distribution (i.e., regional or localized), frequency of occurrence in discharges, human health risk, and controllability.

d. Special studies initiated prior to the effective date of this Order that meet the requirements of Provision D.3.b and are implemented during the term of this Order as part of the Water Quality Improvement Plan may be utilized to fulfill the special study requirements of Provision D.3.a. Special studies completed before the effective date of this Order cannot be utilized to fulfill the special study requirements of Provision D.3.a.

e. The Copermittees must submit the monitoring plans for the special studies in the Water Quality Improvement Plans required pursuant to Provision F.1.

f. The Copermittees are encouraged to share the results of the special studies regionally among the Copermittees to provide information useful in improving and adapting the management of non-storm water and storm water runoff through the implementation of the Water Quality Improvement Plans.

4. Assessment Requirements

Each Copermittee must evaluate the data collected pursuant to Provisions D.1, D.2 and D.3, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E, to assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a. Assessments must be performed as described in the following provisions:

a. Receiving Waters Assessments

(1) The Copermittees must assess and report the conditions of the receiving waters in the Watershed Management Area as follows:

(a) Based on data collected pursuant to Provision D.1.a, the assessments under Provision D.4.a.(2) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(b) Based on the data collected pursuant to Provisions D.1.a-e, the assessments required under Provision D.4.a.(2) must be included in the Report of Waste Discharge required pursuant to Provision F.5.b.

(2) The Copermittees must assess the status and trends of receiving water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under dry weather and wet weather conditions. For each of the three types of receiving waters in each Watershed Management Area the Copermittees must:

(a) Determine whether or not the conditions of the receiving waters are meeting the numeric goals established pursuant to Provision B.3.a;

(b) Identify the most critical beneficial uses that must be protected to ensure overall health of the receiving water;

(c) Determine whether or not those critical beneficial uses are being protected;

(d) Identify short-term and/or long-term improvements or degradation of those critical beneficial uses;

(e) Determine whether or not the strategies established in the Water Quality Improvement Plan contribute towards progress in achieving the interim and final numeric goals of the Water Quality Improvement Plan; and

(f) Identify data gaps in the monitoring data necessary to assess Provisions D.4.a.(2)(a)-(e).

b. MS4 OUTFALL DISCHARGES ASSESSMENTS

(1) Non-Storm Water Discharges Reduction Assessments

(a) Each Copermittee must assess and report the progress of its illicit discharge detection and elimination program, required to be implemented pursuant to Provision E.2, toward effectively prohibiting non-storm water and illicit discharges into the MS4 within its jurisdiction as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(2), the assessments under Provision D.4.b.(1)(b) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(ii) Based on the data collected pursuant to Provisions D.2.b, the assessments required under Provision D.4.b.(1)(c) must be included in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

(iii) Based on the data collected pursuant to Provisions D.2.b, the assessment required under Provision D.4.b.(1)(c) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.a.(2), each Copermittee must assess and report the following:

(i) Identify the known and suspected controllable sources (e.g. facilities, areas, land uses, pollutant generating activities) of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area;

(ii) Identify sources of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area that have been reduced or eliminated; and

(iii) Identify modifications to the field screening monitoring locations and frequencies for the MS4 outfalls in its inventory necessary to identify and eliminate sources of persistent flow non-storm water discharges pursuant to Provision D.2.b.

(c) Based on the dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1), each Copermittee must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(1)(b);

(ii) Based on the data collected and applicable NALs in the Water Quality Improvement Plan, rank the MS4 outfalls in the Copermittee's jurisdiction according to potential threat to receiving water quality, and produce a prioritized list of major MS4 outfalls for follow-up action to update the Water Quality Improvement Plan, with the goal of eliminating persistent flow non-storm water discharges and/or pollutant loads in order of the ranked priority list through targeted programmatic actions and source investigations;

(iii) For the highest priority major MS4 outfalls with persistent flows that are in exceedance of NALs, identify the known and suspected sources within the Copermittee's jurisdiction in the Watershed Management Area that may cause or contribute to the NAL exceedances;

(iv) Each Copermittee must analyze the data collected pursuant to Provision D.2.b, and utilize a model or other method, to calculate or estimate the non-storm water volumes and pollutant loads collectively discharged from all the major MS4s outfalls in its jurisdiction identified as having persistent dry weather flows during the monitoring year. These calculations or estimates must be updated annually.

[a] Each Copermittee must calculate or estimate the annual non-storm water volumes and pollutant loads collectively discharged from the Copermittee's major MS4 outfalls to receiving waters within the Copermittee's jurisdiction, with an estimate of the percent contribution from each known source for each MS4 outfall;

[b] Each Copermittee must annually identify and quantify (i.e. volume and pollutant loads) sources of non-storm water not subject to the Copermittee's legal authority that are discharged from the Copermittee's major MS4 outfalls to downstream receiving waters.

(v) Each Copermittee must review the data collected pursuant to Provision D.2.b and findings from the assessments required pursuant to Provision D.4.b.(1)(c)(i)-(iv) at least once during the term of this Order to:

[a] Identify reductions and progress in achieving reductions in non-storm water and illicit discharges to the Copermittee's MS4 in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction, with an estimate, if possible, of the non-storm water volume and/or pollutant load reductions attributable to specific water quality strategies implemented by the Copermittee; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittee in the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction.

(vi) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(1)(c)(i)-(v).

(2) <u>Storm Water Pollutant Discharges Reduction Assessments</u>

(a) The Copermittees must assess and report the progress of the water quality improvement strategies, required to be implemented pursuant to Provisions B and E, toward reducing pollutants in storm water discharges from the MS4s within the Watershed Management Area as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(3), the assessments under Provision D.4.b.(2)(b) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(ii) Based on the data collected pursuant to Provisions D.2.c, the assessments required under Provision D.4.b.(2)(c) must be included in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

(iii) Based on the data collected pursuant to Provisions D.2.c, the assessment required under Provisions D.4.b.(2)(c)-(d) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.a.(3) the Copermittees must assess and report the following:

(i) The Copermittees must analyze the monitoring data collected pursuant to Provision D.2.a.(3), and utilize a watershed model or other method, to calculate or estimate the following for each monitoring year:

[a] The average storm water runoff coefficient for each land use type within the Watershed Management Area;
[b] The volume of storm water and pollutant loads discharged from each of the Copermittee's monitored MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch;
[c] The total flow volume and pollutant loadings discharged from the Copermittee's jurisdiction within the Watershed Management Area over the course of the wet season, extrapolated from the data produced from the monitored MS4 outfalls; and
[d] The percent contribution of storm water volumes and pollutant loads discharged from each land use type within each hydrologic subarea with a major MS4 outfall to receiving waters or within each major MS4 outfall to receiving waters in the Copermittee's jurisdiction within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch.

(ii) Identify modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify pollutants in storm water discharges from the MS4s in the Watershed Management Area pursuant to Provision D.2.c.(1).

(c) Based on the wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.c the Copermittees must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(2)(b);

(ii) Based on the data collected and applicable SALs in the Water Quality Improvement Plan, analyze and compare the monitoring data to the analyses and assumptions used to develop the Water Quality Improvement Plans, including strategies developed pursuant to Provision B.3, and evaluate whether those analyses and assumptions should be updated as a component of the adaptive management efforts pursuant to Provision B.5 for follow-up action to update the Water Quality Improvement Plan;

(iii) The Copermittees must review the data collected pursuant to Provision D.2.c and findings from the assessments required pursuant to Provisions D.4.b.(2)(c)(i)-(ii) at least once during the term of this Order to:

[a] Identify reductions or progress in achieving reductions in pollutant concentrations and/or pollutant loads from different land uses and/or drainage areas discharging from the Copermittees' MS4s in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters within the Watershed Management Area to the MEP, with an estimate, if possible, of the pollutant load reductions attributable to specific water quality strategies implemented by the Copermittees; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittees in the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters in the Watershed Management Area to the MEP.

(iv) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(iii).

(d) The Copermittees must evaluate all the data collected pursuant to Provision D.2.c, and incorporate new outfall monitoring data into time series plots for each long-term monitoring constituent for the Watershed Management Area, and perform statistical trends analysis on the cumulative long-term wet weather MS4 outfall discharge water quality data set.

c. Special Studies Assessments

The Copermittees must annually evaluate the results and findings from the special studies developed and implemented pursuant to Provision D.3, and assess their relevance to the Copermittees' efforts to characterize receiving water conditions, understand sources of pollutants and/or stressors, and control and reduce the discharges of pollutants from the MS4 outfalls to receiving waters in the Watershed Management Area. The Copermittees must report the results of the special studies assessments applicable to the Watershed Management Area, and identify any necessary modifications or updates to the Water Quality Improvement Plan based on the results in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

d. Integrated Assessment of Water Quality Improvement Plan

As part of the iterative approach and adaptive management process required for the Water Quality Improvement Plan pursuant to Provision B.5, the Copermittees in each Watershed Management Area must integrate the data collected pursuant to Provisions D.1-D.3, the findings from the assessments required pursuant to

Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to assess the effectiveness of, and identify necessary modifications to, the Water Quality Improvement Plan as follows:

(1) The Copermittees must re-evaluate the priority water quality conditions and numeric goals for the Watershed Management Area, as needed, during the term of this Order pursuant to Provision B.5.a. The re-evaluation and recommendations for modifications to the priority water quality conditions, and/or numeric goals and corresponding schedules may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The priority water quality conditions and numeric goals for the Watershed Management Area must be re-evaluated as follows:

(a) Re-evaluate the receiving water conditions in the Watershed Management Area in accordance with Provision B.2.a;

(b) Re-evaluate the impacts on receiving waters in the Watershed Management Area from MS4 discharges in accordance with Provision B.2.b;

(c) Re-evaluate the identification of MS4 sources of pollutants and/or stressors in accordance with Provision B.2.d;

(d) Identify beneficial uses of the receiving waters that are protected in accordance with Provision D.4.a;

(e) Evaluate the progress toward achieving the interim and final numeric goals for protecting impacted beneficial uses in the receiving waters.

(2) The Copermittees must re-evaluate the water quality improvement strategies for the Watershed Management Area during the term of this Order pursuant to Provision B.5.b. The re-evaluation and recommendations for modifications to the water quality improvement strategies and schedules may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The water quality improvement strategies for the Watershed Management Area must be re-evaluated as follows:

(a) Identify the non-storm water and storm water pollutant loads from the Copermittees' MS4 outfalls in the Watershed Management Area, calculated or estimated pursuant to Provisions D.4.b;

(b) Identify the non-storm water and storm water pollutant load reductions, or other improvements to receiving water or water quality conditions, that are necessary to attain the interim and final numeric goals identified in the Water Quality Improvement Plan for protecting beneficial uses in the receiving waters;

(c) Identify the non-storm water and storm water pollutant load reductions, or other improvements to the quality of MS4 discharges, that are necessary for the Copermittees to demonstrate that non-storm water and storm water discharges from their MS4s are not causing or contributing to exceedances of receiving water limitations;

(d) Evaluate the progress of the water quality improvement strategies toward achieving the interim and final numeric goals identified in the Water Quality Improvement Plan for protecting beneficial uses in the receiving waters.

(3) The Copermittees must re-evaluate and adapt the water quality monitoring and assessment program for the Watershed Management Area when new information becomes available to improve the monitoring and assessment program pursuant to Provision B.5.c. The re-evaluation and recommendations for modifications to the monitoring and assessment program may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. Modifications to the water quality monitoring and assessment program must be consistent with the requirements of Provision D.1-D.3. The re-evaluation of the water quality monitoring and assessment program for the Watershed Management Area must consider the data gaps identified by the assessments required pursuant to Provisions D.4.a-b, and results of the special studies implemented pursuant to Provision D.4.c.

5. Monitoring Provisions

Each Copermittee must comply with all the monitoring, reporting, and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

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E. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS

The purpose of this provision is for each Copermittee to implement a program to control the contribution of pollutants to and the discharges from the MS4 within its jurisdiction. The goal of the jurisdictional runoff management programs is to implement strategies that effectively prohibit non-storm water discharges to the MS4 and reduce the discharge of pollutants in storm water to the MEP. This goal will be accomplished through implementing the jurisdictional runoff management programs in accordance with the strategies identified in the Water Quality Improvement Plans.

Each Copermittee must update its jurisdictional runoff management program document, in accordance with Provision F.2.a, to incorporate all the requirements of Provision E. Until the Copermittee has updated its jurisdictional runoff management program document with the requirements of Provision E, the Copermittee must continue implementing its current jurisdictional runoff management program.

1. Legal Authority Establishment and Enforcement

a. Each Copermittee must establish, maintain, and enforce adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 through statute, ordinance, permit, contract, order, or similar means. This legal authority must, at a minimum, authorize the Copermittee to:

(1) Prohibit and eliminate all illicit discharges and illicit connections to its MS4;

(2) Control the contribution of pollutants in discharges of runoff associated with industrial and construction activity to its MS4 and control the quality of runoff from industrial and construction sites, including industrial and construction sites which have coverage under the statewide General Permit for Discharges of Storm Water Associated with Industrial Activities (Industrial General Permit) or General Permit for Discharges of Storm Water Associated with Construction Activities (Construction General Permit), as well as to those sites which do not;

(3) Control the discharge of spills, dumping, or disposal of materials other than storm water into its MS4;

(4) Control through interagency agreements among Copermittees the contribution of pollutants from one portion of the MS4 to another portion of the MS4;

(5) Control, by coordinating and cooperating with other owners of the MS4 such as Caltrans, the U.S. federal government, or sovereign Native American Tribes through interagency agreements, where possible, the contribution of pollutants from their portion of the MS4 to the portion of the MS4 within the Copermittee's jurisdiction;

(6) Require compliance with conditions in its statutes, ordinances, permits, contracts, orders, or similar means to hold dischargers to its MS4 accountable for their contributions of pollutants and flows;

(7) Require the use of BMPs to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(8) Require documentation on the effectiveness of BMPs implemented to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(9) Utilize enforcement mechanisms to require compliance with its statutes, ordinances, permits, contracts, orders, or similar means; and

(10) Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with its statutes, ordinances, permits, contracts, orders, or similar means and with the requirements of this Order, including the prohibition of illicit discharges and connections to its MS4; the Copermittee must also have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from industrial facilities, including construction sites, discharging into its MS4.

b. With the first Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3), each Copermittee must submit a statement certified by its Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative that the Copermittee has taken the necessary steps to obtain and maintain full legal authority within its jurisdiction to implement and enforce each of the requirements contained in this Order.

2. Illicit Discharge Detection and Elimination

Each Copermittee must implement a program to actively detect and eliminate illicit discharges and improper disposal into the MS4, or otherwise require the discharger to apply for and obtain a separate NPDES permit. The illicit discharge detection and elimination program must be implemented in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include, at a minimum, the following requirements:

a. NON-STORM WATER DISCHARGES

Each Copermittee must address all non-storm water discharges as illicit discharges unless a non-storm water discharge is either identified as a discharge authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to the following requirements:

(1) Discharges of non-storm water to the MS4 from the following categories must be addressed as illicit discharges unless the discharge has coverage or meets the exception criteria under NPDES Permit No. CAG919003(Order No. R9-2015-0013, as it may be amended or reissued) for discharges to surface waters within the San Diego Region:

(1) Uncontaminated pumped ground water;

(2) Discharges from foundation drains;[23]

(3) Water from crawl space pumps; and

(4) Water from footing drains.[20]

(2) Discharges of non-storm water from water line flushing and water main breaks to the MS4 must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG679001 (Order No. R9-2010-0003, as it may be amended or reissued) or NPDES General Permit No. CAG140001 (Order 2014-0194-DWQ, as it may be amended or reissued). This category includes water line flushing and water main break discharges from water purveyors issued a water supply permit by the California Department of Public Health or federal military installations. Discharges from recycled or reclaimed water lines to the MS4 must be addressed as illicit discharges, unless the discharges have coverage under a separate NPDES permit.

(3) Discharges of non-storm water to the MS4 from the following categories must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a source of pollutants to receiving waters:

(a) Diverted stream flows;

(b) Rising ground waters;

(c) Uncontaminated ground water infiltration to MS4s;

(d) Springs;

(e) Flows from riparian habitats and wetlands;

(f) Discharges from potable water sources;

[23] Provision E.2.a.(1) only applies to this category of non-storm water if the system is designed to be located at or below the groundwater table to actively or passively extract groundwater during any part of the year.

(g) Discharges from foundation drains;[24] and

(h) Discharges from footing drains.[21]

(4) Discharges of non-storm water to the MS4 from the following categories must be controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means. Discharges of non-storm water to the MS4 from the following categories not controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means must be addressed by the Copermittee as illicit discharges.

(a) Air conditioning condensation

The discharge of air conditioning condensation should be directed to landscaped areas or other pervious surfaces, or to the sanitary sewer, where feasible.

(b) Individual residential vehicle washing

(i) The discharge of wash water should be directed to landscaped areas or other pervious surfaces where feasible; and

(ii) The minimization of water, washing detergent and other vehicle wash products used for residential vehicle washing, and the implementation of other practices or behaviors that will prevent the discharge of pollutants associated with individual residential vehicle washing from entering the MS4 must be encouraged.

(c) Dechlorinated swimming pool discharges

(i) Residual chlorine, algaecide, filter backwash, or other pollutants from swimming pools must be eliminated prior to discharging to the MS4; and

(ii) The discharge of saline swimming pool water must be directed to the sanitary sewer, landscaped areas, or other pervious surfaces that can accommodate the volume of water, unless the saline swimming pool water can be discharged via a pipe or concrete channel directly to a naturally saline water body (e.g. Pacific Ocean).

(5) Firefighting discharges to the MS4 must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a significant source of pollutants to receiving waters. Firefighting discharges to the MS4 not identified as a significant

[24] Provision E.2.a.(3) only applies to this category of non-storm water discharge if the system is designed to be located above the groundwater table at all times of the year, and the system is only expected to discharge non-storm water under unusual circumstances.

source of pollutants to receiving waters, must be addressed, at a minimum, as follows:

(a) Non-emergency firefighting discharges

(i) Building fire suppression system maintenance discharges (e.g. sprinkler line flushing) to the MS4 must be addressed as illicit discharges unless BMPs are implemented to prevent pollutants associated with such discharges to the MS4.

(ii) Non-emergency firefighting discharges (i.e., discharges from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems) must be addressed by a program, to be developed and implemented by the Copermittee, to reduce or eliminate pollutants in such discharges from entering the MS4.

(b) Emergency firefighting discharges

Each Copermittee should develop and encourage implementation of BMPs to reduce or eliminate pollutants in emergency firefighting discharges to the MS4s and receiving waters within its jurisdiction. During emergency situations, priority of efforts should be directed toward life, property, and the environment (in descending order). BMPs should not interfere with immediate emergency response operations or impact public health and safety.

(6) If the Copermittee or San Diego Water Board identifies any category of non-storm water discharges listed under Provisions E.2.a.(1)-(4) as a source of pollutants to receiving waters, the category must be prohibited through ordinance, order, or similar means and addressed as an illicit discharge. Alternatively, the Copermittee may propose controls to be implemented for the category of non-storm water discharges as part of the Water Quality Improvement Plan instead of prohibiting the category of non-storm water discharges, and implement the controls if accepted by the San Diego Water Board as part of the Water Quality Improvement Plan.

(7) Each Copermittee must, where feasible and priorities and resources allow, reduce or eliminate non-storm water discharges listed under Provisions E.2.a.(1)-(4) into its MS4, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit.

b. PREVENT AND DETECT ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to prevent and detect illicit discharges to the MS4:

(1) Each Copermittee must maintain an updated map of its entire MS4 and the

corresponding drainage areas. The accuracy of the MS4 map must be confirmed during the field screening required pursuant to Provision E.2.c. The MS4 map must be included as part of the jurisdictional runoff management program document. Any geographic information system (GIS) layers or files used by the Copermittee to maintain the MS4 map must be made available to the San Diego Water Board upon request. The MS4 map must identify the following:

(a) All segments of the MS4 owned, operated, and maintained by the Copermittee;

(b) All known locations of inlets that discharge and/or collect runoff into the Copermittee's MS4;

(c) All known locations of connections with other MS4s not owned or operated by the Copermittee (e.g. Caltrans MS4s);

(d) All known locations of MS4 outfalls and private outfalls that discharge runoff collected from areas within the Copermittee's jurisdiction;

(e) All segments of receiving waters within the Copermittee's jurisdiction that receive and convey runoff discharged from the Copermittee's MS4 outfalls;

(f) Locations of the MS4 outfalls, identified pursuant to Provision D.2.a.(1), within its jurisdiction; and

(g) Locations of the non-storm water persistent flow MS4 outfall discharge monitoring stations, identified pursuant to Provision D.2.b.(2), within its jurisdiction.

(2) Each Copermittee must use Copermittee personnel and contractors to assist in identifying and reporting illicit discharges and connections during their daily employment activities.

(3) Each Copermittee must promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges to or from the MS4, including the following methods for public reporting:

(a) Operate a public hotline, which can be Copermittee-specific or shared by the Copermittees, and must be capable of receiving reports in both English and Spanish 24 hours per day and seven days per week; and

(b) Designate an e-mail address for receiving electronic reports from the public, which can be Copermittee-specific or shared by the Copermittees,

and must be prominently displayed on the Copermittee's webpage and the Regional Clearinghouse required pursuant to Provision F.4.

(4) Each Copermittee must implement practices and procedures (including a notification mechanism) to prevent, respond to, contain, and clean up any spills that may discharge into the MS4 within its jurisdiction from any source. The Copermittee must coordinate, to the extent possible, with spill response teams to prevent entry of spills into the MS4, and prevent contamination of surface water, ground water, and soil. The Copermittee must coordinate spill prevention, containment, and response activities throughout all appropriate Copermittee departments, programs, and agencies.

(5) Each Copermittee must implement practices and procedures to prevent and limit infiltration of seepage from sanitary sewers (including private laterals and failing septic systems) to the MS4.

(6) Each Copermittee must coordinate, when necessary, with upstream Copermittees and/or entities to prevent illicit discharges from upstream sources into the MS4 within its jurisdiction.

c. FIELD SCREENING

Each Copermittee must conduct field screening (i.e. visual observations, field testing, and/or analytical testing) of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4 in accordance with the dry weather MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

d. INVESTIGATE AND ELIMINATE ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to investigate and eliminate illicit discharges to the MS4:

(1) Each Copermittee must prioritize and determine when follow-up investigations will be performed in response to visual observations and/or water quality monitoring data collected during an investigation of a detected non-storm water or illicit discharge to or from the MS4. The criteria for prioritizing investigations must consider the following:

(a) Pollutants identified as causing or contributing to the highest water quality priorities identified in the Water Quality Improvement Plan;

(b) Pollutants identified as causing or contributing, or threatening to cause or contribute to impairments in water bodies on the 303(d) List and/or in environmentally sensitive areas (ESAs), located within its jurisdiction;

(c) Pollutants identified from sources or land uses known to exist within the

area, drainage basin, or watershed that discharges to the portion of the MS4 within its jurisdiction included in the investigation;

(d) Pollutants identified as causing or contributing to an exceedance of a NAL in the Water Quality Improvement Plan; and

(e) Pollutants identified as a threat to human health or the environment.

(2) Each Copermittee must implement procedures to investigate and inspect portions of its MS4 that, based on reports or notifications, field screening, or other appropriate information, indicate a reasonable potential of receiving, containing, or discharging pollutants due to illicit discharges, illicit connections, or other sources of non-storm water. The procedures must include the following:

(a) Each Copermittee must develop criteria to:

(i) Assess the validity of each report or notification received; and

(ii) Prioritize the response to each report or notification received.

(b) Each Copermittee must prioritize and respond to each valid report or notification (e.g., public reports, staff or contractor reports and notifications, etc.) of an incident in a timely manner.

(c) In accordance with the requirements of Provision E.2.d.(1), each Copermittee must investigate and seek to identify the source(s) of discharges of non-storm water where flows are observed in and from the MS4 during the field screening required pursuant to Provision D.2.b.(1) as follows:

(i) Obvious illicit discharges must be immediately investigated to identify the source(s) of non-storm water discharges;

(ii) The investigation must include field investigations to identify sources or potential sources for the discharge, unless the source or potential source has already been identified during previous investigations; and

(iii) The investigation may include follow-up field investigations and/or reviewing Copermittee inventories and other land use data to identify potential sources of the discharge.

(d) Each Copermittee must maintain records and a database of the following information:

(i) Location of incident, including hydrologic subarea, portion of MS4

receiving the non-storm water or illicit discharge, and point of discharge or potential discharge from MS4 to receiving water;

(ii) Source of information initiating the investigation (e.g., public reports, staff or contractor reports and notifications, field screening, etc.);

(iii) Date the information used to initiate the investigation was received;

(iv) Date the investigation was initiated;

(v) Dates of follow-up investigations;

(vi) Identified or suspected source of the illicit discharge or connection, if determined;

(vii) Known or suspected related incidents, if any;

(viii) Result of the investigation; and

(ix) If a source cannot be identified and the investigation is not continued, document the response pursuant to the requirements of Provision E.2.d.(4).

(e) Each Copermittee must maintain records and, in accordance with the priorities of the Water Quality Improvement Plan, seek to identify the source(s) of non-storm water discharges from the MS4 where there is evidence of non-storm water having been discharged into or from the MS4 (e.g., pooled water), in accordance with MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

(3) Each Copermittee must initiate the implementation of procedures, in a timely manner, to eliminate all detected and identified illicit discharges and connections within its jurisdiction. The procedures must include the following responses:

(a) Each Copermittee must enforce its legal authority, as required under Provision E.1, to eliminate illicit discharges and connections to the MS4.

(b) If the Copermittee identifies the source as a controllable source of non-storm water or illicit discharge or connection, the Copermittee must implement its Enforcement Response Plan pursuant to Provision E.6 and enforce its legal authority to prohibit and eliminate illicit discharges and connections to its MS4.

(c) If the Copermittee identifies the source of the discharge as a category of non-storm water discharges in Provision E.2.a, and the discharge is in exceedance of NALs in the Water Quality Improvement Plan, then the Copermittee must determine if: (1) this is an isolated incident or set of circumstances that will be addressed through its Enforcement Response Plan pursuant to Provision E.6, or (2) the category of discharge must be

addressed through the prohibition of that category of discharge as an illicit discharge pursuant to Provision E.2.a.(6).

(d) If the Copermittee suspects the source of the non-storm water discharge as natural in origin (i.e. non-anthropogenically influenced) and in conveyance into the MS4, then the Copermittee must document and provide the data and evidence necessary to demonstrate to the San Diego Water Board that it is natural in origin and does not require further investigation.

(e) If the Copermittee is unable to identify and document the source of a recurring non-storm water discharge to or from the MS4, then the Copermittee must address the discharge as an illicit discharge and update its jurisdictional runoff management program to address the common and suspected sources of the non-storm water discharge within its jurisdiction in accordance with the Copermittee's priorities.

(4) Each Copermittee must submit a summary of the non-storm water discharges and illicit discharges and connections investigated and eliminated within its jurisdiction with each Water Quality Improvement Plan Annual Report required under Provision F.3.b.(3) of this Order.

3. Development Planning

Each Copermittee must use their land use and planning authorities to implement a development planning program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. BMP Requirements for All Development Projects

Each Copermittee must prescribe the following BMP requirements during the planning process (i.e. prior to project approval and issuance of local permits) for all development projects (regardless of project type or size), where local permits are issued, including unpaved roads and flood management projects:

(1) <u>General Requirements</u>

(a) Onsite BMPs must be located so as to remove pollutants from runoff prior to its discharge to any receiving waters, and as close to the source as possible;

(b) Structural BMPs must not be constructed within waters of the U.S.

(c) Onsite BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors (e.g.

mosquitos, rodents, or flies).

(2) Source Control BMP Requirements

The following source control BMPs must be implemented at all development projects where applicable and feasible:

(a) Prevention of illicit discharges into the MS4;

(b) Storm drain system stenciling or signage;

(c) Protect outdoor material storage areas from rainfall, run-on, runoff, and wind dispersal;

(d) Protect materials stored in outdoor work areas from rainfall, run-on, runoff, and wind dispersal;

(e) Protect trash storage areas from rainfall, run-on, runoff, and wind dispersal; and

(f) Any additional BMPs determined to be necessary by the Copermittee to minimize pollutant generation at each project.

(3) Low Impact Development (LID) BMP Requirements

The following LID BMPs must be implemented at all development projects where applicable and feasible:

(a) Maintenance or restoration of natural storage reservoirs and drainage corridors (including topographic depressions, areas of permeable soils, natural swales, and ephemeral and intermittent streams);[25]

(b) Buffer zones for natural water bodies (where buffer zones are technically infeasible, require project applicant to include other buffers such as trees, access restrictions, etc.);

(c) Conservation of natural areas within the project footprint including existing trees, other vegetation, and soils;

(d) Construction of streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided public safety is not compromised;

(e) Minimization of the impervious footprint of the project;

[25] Development projects proposing to dredge or fill materials in waters of the U.S. must obtain a CWA Section 401 Water Quality Certification. Projects proposing to dredge or fill waters of the state must obtain waste discharge requirements.

(f) Minimization of soil compaction to landscaped areas;

(g) Disconnection of impervious surfaces through distributed pervious areas;

(h) Landscaped or other pervious areas designed and constructed to effectively receive and infiltrate, retain and/or treat runoff from impervious areas, prior to discharging to the MS4;

(i) Small collection strategies located at, or as close as possible to, the source (i.e. the point where storm water initially meets the ground) to minimize the transport of runoff and pollutants to the MS4 and receiving waters;

(j) Use of permeable materials for projects with low traffic areas and appropriate soil conditions;

(k) Landscaping with native or drought tolerant species; and

(l) Harvesting and using precipitation.

b. PRIORITY DEVELOPMENT PROJECTS

Priority Development Projects are land development projects that fall under the planning and building authority of the Copermittee for which the Copermittee must impose specific requirements, in addition to those described in Provision E.3.a, including the implementation of structural BMPs to meet the performance requirements described in Provision E.3.c.

(1) Definition of Priority Development Project

Priority Development Projects include the following:

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(b) Redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site on an existing site of 10,000 square feet or more of impervious surfaces). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(c) New and redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project

site), and support one or more of the following uses:

(i) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812).

(ii) Hillside development projects. This category includes development on any natural slope that is twenty-five percent or greater.

(iii) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce.

(iv) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

(d) New or redevelopment projects that create and/or replace 2,500 square feet or more of impervious surface (collectively over the entire project site), and discharging directly to an Environmentally Sensitive Area (ESA). "Discharging directly to" includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands).

(e) New development projects, or redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface, that support one or more of the following uses:

(i) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

(ii) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

(f) New or redevelopment projects that result in the disturbance of one or more acres of land and are expected to generate pollutants post construction.

(2) <u>Special Considerations for Redevelopment Projects</u>

The structural BMP performance requirements of Provision E.3.c are applicable to redevelopment Priority Development Projects, as defined in E.3.b.(1), as follows:

(a) Where redevelopment results in the creation or replacement of impervious surface in an amount of less than fifty percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provision E.3.c apply only to the creation or replacement of impervious surface, and not the entire development; or

(b) Where redevelopment results in the creation or replacement of impervious surface in an amount of more than fifty percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provision E.3.c apply to the entire development.

(3) Priority Development Project Exemptions

Each Copermittee has the discretion to exempt the following projects from being defined as Priority Development Projects:

(a) New or retrofit paved sidewalks, bicycle lanes, or trails that meet the following criteria:

(i) Designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas; OR

(ii) Designed and constructed to be hydraulically disconnected from paved streets or roads; OR

(iii) Designed and constructed with permeable pavements or surfaces in accordance with USEPA Green Streets guidance.[26]

(b) Retrofitting or redevelopment of existing paved alleys, streets or roads that are designed and constructed in accordance with the USEPA Green Streets guidance.[27]

c. Priority Development Project Structural BMP Performance Requirements

In addition to the BMP requirements listed for all development projects under Provision E.3.a, Priority Development Projects must also implement structural BMPs that conform to performance requirements described below.

(1) Storm Water Pollutant Control BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite structural BMPs to control pollutants in storm water that may be discharged from a project as follows:

[26] See "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).
[27] Ibid.

(a) Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite the pollutants contained in the volume of storm water runoff produced from a 24-hour 85th percentile storm event (design capture volume);[28]

(i) If a Copermittee determines that implementing BMPs to retain the full design capture volume onsite for a Priority Development Project is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize biofiltration BMPs. Biofiltration BMPs must be designed to have an appropriate hydraulic loading rate to maximize storm water retention and pollutant removal, as well as to prevent erosion, scour, and channeling within the BMP,[29] and must be sized to:

[a] Treat 1.5 times the design capture volume not reliably retained onsite, OR
[b] Treat the design capture volume not reliably retained onsite with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite.

(ii) If a Copermittee determines that biofiltration is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize flow-thru treatment control BMPs to treat runoff leaving the site, AND mitigate for the design capture volume not reliably retained onsite pursuant to Provision E.3.c.(1)(b). Flow thru treatment control BMPs must be sized and designed to:

[a] Remove pollutants from storm water to the MEP;
[b] Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;

[28] This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals.

[29] As part of the Copermittee's update to its BMP Design Manual, pursuant to Provision E.3.d, the Copermittee must provide guidance for hydraulic loading rates and other biofiltration design criteria necessary to maximize storm water retention and pollutant removal.

[c] Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Flow-thru treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of flow-thru treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

(b) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1)(a). The Priority Development Project must mitigate for the portion of the pollutant load in the design capture volume not retained onsite if Provision E.3.c.(3) is utilized. If a Priority Development Project is allowed to utilize alternative compliance, flow-thru treatment control BMPs must be implemented to treat the portion of the design capture volume that is not reliably retained onsite. Flow-thru treatment control BMPs must be sized and designed in accordance with Provisions E.3.c.(1)(a)(ii)[a]-[c].

(2) <u>Hydromodification Management BMP Requirements</u>

Each Copermittee must require each Priority Development Project to implement onsite BMPs to manage hydromodification that may be caused by storm water runoff discharged from a project as follows:

(a) Post-project runoff conditions (flow rates and durations) must not exceed pre-development runoff conditions by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat downstream of Priority Development Projects).

(i) In evaluating the range of flows that results in increased potential for erosion of natural (non-hardened) channels, the lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks.

(ii) The Copermittees may use monitoring results collected pursuant to Provision D.1.a.(2) to re-define the range of flows resulting in increased potential for erosion, or degraded instream habitat conditions, as warranted by the data.

(b) Each Priority Development Project must avoid critical sediment yield areas known to the Copermittee or identified by the optional Watershed Management Area Analysis pursuant to Provision B.3.b.(4), or implement measures that allow critical coarse sediment to be discharged to receiving waters, such that there is no net impact to the receiving water.

(c) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the performance requirements of Provision E.3.c.(2)(a). The Priority Development Project must mitigate for the post-project runoff conditions not fully managed onsite if Provision E.3.c.(3) is utilized.

(d) Exemptions

Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provisions E.3.c.(2) where the project discharges storm water runoff to:

(i) Existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;

(ii) Conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; or

(iii) An area identified by the Copermittees as appropriate for an exemption by the optional Watershed Management Area Analysis incorporated into the Water Quality Improvement Plan pursuant to Provision B.3.b.(4).

(e) Interim Timeframe Exemptions

Until the Copermittees have updated their BMP Design Manual in accordance with Provision F.2.b with the requirements of Provision E, the Copermittees have the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provision E.3.c.(2) where the project discharges storm water runoff directly to:

(i) An engineered channel conveyance system with a capacity to convey peak flows generated by the 10-year storm event all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; and

(ii) Large river reaches with a drainage area larger than 100 square miles and a 100-year flow capacity in excess of 20,000 cubic feet per second, provided that properly sized energy dissipation is included at all Priority Development Project discharge points.

(3) Alternative Compliance Program to Onsite Structural BMP Implementation

At the discretion of each Copermittee, Priority Development Projects may be allowed to participate in an alternative compliance program in lieu of implementing the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a), provided that the Water Quality Improvement Plan includes the optional Watershed Management Area Analysis described in Provision B.3.b.(4), and Water Quality Equivalency calculations have been accepted by the San Diego Water Board's Executive Officer pursuant to Provision E.3.c.(3)(a). The alternative compliance program is available to a Priority Development Project only if the Priority Development Project applicant enters into a voluntary agreement with the Copermittee authorizing this arrangement. In addition to the voluntary agreement, relief from implementing structural BMPs onsite may be authorized by the Copermittee under the following conditions:

(a) Water Quality Equivalency

Copermittees must submit Water Quality Equivalency calculations for acceptance by the San Diego Water Board's Executive Officer prior to administering an alternative compliance program in order to establish a regional and technical basis for determining the water quality benefits associated with alternative compliance projects. Accepted Water Quality Equivalency calculations must be incorporated as part of any Copermittee's alternative compliance program necessary for evaluating Watershed Management Area Analysis candidate projects, project applicant-proposed alternative compliance projects, alternative compliance in lieu fee structures, and alternative compliance water quality credit systems as described in Provisions E.3.c.(3)(b)-(e).

(b) Watershed Management Area Analysis Candidate Projects

The Priority Development Project applicant agrees to fund, contribute funds to, or implement a candidate project identified by the Copermittees in the Watershed Management Area Analysis included in the Water Quality Improvement Plan, pursuant to Provisions B.3.b.(4) subject to the following conditions:

(i) The Copermittee must determine that implementation of the candidate project will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a) onsite;

(ii) If the Priority Development Project applicant chooses to fully or partially fund a candidate project, then the in-lieu fee structure described in Provision E.3.c.(3)(c) must be followed;

(iii) If the Priority Development Project applicant chooses to fully or partially fund a candidate project, then the Copermittee must ensure that the funds to be obtained from the Priority Development Project applicant are sufficient to mitigate for impacts caused by not fully implementing structural BMPs onsite, pursuant to the performance requirements described in Provisions E.3.c.(1) and E.3.c.(2)(a);

(iv) If the Priority Development Project applicant chooses to implement a candidate project, then the Copermittee must ensure that pollutant control and/or hydromodification management within the candidate project are sufficient to mitigate for impacts caused by not implementing structural BMPs fully onsite, pursuant to the performance requirements described in Provisions E.3.c.(1) and E.3.c.(2)(a);

(v) The voluntary agreement to fund, partially fund, or implement a candidate project must include reliable sources of funding for operation and maintenance of the candidate project;

(vi) Design of the candidate project must be conducted under an appropriately qualified engineer, geologist, architect, landscape architect, or other professional, licenses where applicable, and competent and proficient in the fields pertinent to the candidate project design;

(vii) The candidate project must be constructed as soon as possible, but no later than 4 years after the certificate of occupancy is granted for the first Priority Development Project that contributed funds toward the construction of the candidate project, unless a longer period of time is authorized by the San Diego Water Board Executive Officer; and

(viii) If the candidate project is constructed after the Priority Development Project is constructed, the Copermittee must require temporal mitigation for pollutant loads and altered flows that are discharged from the Priority Development Project.

(c) Project Applicant Proposed Alternative Compliance Projects

The Copermittee may allow a Priority Development Project applicant to propose and fund, contribute funds to, or implement an alternative compliance project not identified by the Watershed Management Area Analysis included in the Water Quality Improvement Plan pursuant to Provisions B.3.b.(4). This option is allowed provided the Copermittee determines that implementation of the alternative compliance project will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a) onsite, and is subject to the requirements described in Provisions E.3.c.(3)(a)(ii)-(viii).

(d) Alternative Compliance In-Lieu Fee Structure

If a Copermittee chooses to allow a Priority Development Project applicant to fund, or partially fund a candidate project or an alternative compliance project, then the Copermittee must develop and implement an in-lieu fee structure. This may be developed individually or with other Copermittees and/or entities, as a means for designing, developing, constructing, operating and maintaining offsite alternative compliance projects. The in-lieu fee must be transferred to the Copermittee (for public projects) or an escrow account (for private projects) prior to the construction of the Priority Development Project.

(e) Alternative Compliance Water Quality Credit System Option

The Copermittee may develop and implement an alternative compliance water quality credit system option, individually or with other Copermittees and/or entities, provided that such a credit system clearly exhibits that it will not allow discharges from Priority Development Projects to cause or contribute to a net impact over and above the impact caused by projects meeting the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a). Any credit system that a Copermittee chooses to implement must be submitted to the San Diego Water Board Executive Officer for review and acceptance as part of the Water Quality Improvement Plan.

(4) Long-Term Structural BMP Maintenance

Each Copermittee must require the project applicant to submit proof of the mechanism under which ongoing long-term maintenance of all structural BMPs will be conducted.

(5) Infiltration and Groundwater Protection

(a) Structural BMPs designed to primarily function as large, centralized infiltration devices (such as large infiltration trenches and infiltration basins) must not cause or contribute to an exceedance of an applicable groundwater quality objective. At a minimum, such infiltration BMPs must be in conformance with the design criteria listed below, unless the development project applicant demonstrates to the Copermittee that one or more of the specific design criteria listed below are not necessary to protect groundwater quality. The design criteria listed below do not apply to small infiltration systems dispersed throughout a development project.

(i) Runoff must undergo pretreatment such as sedimentation or filtration prior to infiltration;

(ii) Pollution prevention and source control BMPs must be implemented at a level appropriate to protect groundwater quality at sites where infiltration BMPs are to be used;

(iii) Infiltration BMPs must be adequately maintained to remove pollutants in storm water to the MEP;

(iv) The vertical distance from the base of any infiltration BMP to the seasonal high groundwater mark must be at least 10 feet. Where groundwater basins do not support beneficial uses, this vertical distance criteria may be reduced, provided groundwater quality is maintained;

(v) The soil through which infiltration is to occur must have physical and chemical characteristics (e.g., appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses;

(vi) Infiltration BMPs must not be used for areas of industrial or light industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee, unless source control BMPs to prevent exposure of high threat activities are implemented, or runoff from such activities is first treated or filtered to remove pollutants prior to infiltration; and

(vii) Infiltration BMPs must be located a minimum of 100 feet horizontally from any water supply wells.

(b) The Copermittee may develop, individually or with other Copermittees, alternative mandatory design criteria to that listed above for infiltration BMPs which are designed to primarily function as centralized infiltration devices. Before implementing the alternative design criteria in the development planning process the Copermitee(s) must:

(i) Notify the San Diego Water Board of the intent to implement the alternative design criteria submitted; and

(ii) Comply with any conditions set by the San Diego Water Board.

d. BMP DESIGN MANUAL UPDATE

Each Copermittee must update its BMP Design Manual[30] pursuant to Provision F.2.b. Until the Copermittee has updated its BMP Design Manual pursuant to Provision F.2.b.(1), the Copermittee must continue implementing its current BMP Design Manual. The Copermittee must implement the updated BMP Design Manual within 180 days following completion of the update pursuant to Provision

[30] The BMP Design Manual was formerly known as the Standard Storm Water Mitigation Plan under Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016.

F.2.b.(1), unless directed otherwise by the San Diego Water Board Executive Officer. The date the BMP Design Manual is implemented is the "effective date" of the BMP Design Manual. The update of the BMP Design Manual required pursuant to Provision F.2.b.(1) must include the following:

(1) Updated procedures to determine the nature and extent of storm water requirements applicable to a potential development or redevelopment projects. These procedures must inform project applicants of the storm water management requirements applicable to their project including, but not limited to, general requirements for all development projects, structural BMP design procedures and requirements, hydromodification management requirements, requirements specific to phased projects, and procedures specific to private developments and public improvement projects;

(2) Updated procedures to identify pollutants and conditions of concern for selecting the most appropriate structural BMPs that consider, at a minimum, the following:

(a) Receiving water quality (including pollutants for which receiving waters are listed as impaired under the CWA section 303(d) List);

(b) Pollutants, stressors, and/or receiving water conditions that cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(c) Land use type of the project and pollutants associated with that land use type; and

(d) Pollutants expected to be present onsite.

(3) Updated procedures for designing structural BMPs, including any updated performance requirements to be consistent with the requirements of Provision E.3.c for all structural BMPs listed in the BMP Design Manual;

(4) Long-term maintenance criteria for each structural BMP listed in the BMP Design Manual; and

(5) Alternative compliance criteria, in accordance with the requirements under Provision E.3.c.(3), if the Copermittee elects to allow Priority Development Projects within its jurisdiction to utilize alternative compliance.

e. PRIORITY DEVELOPMENT PROJECT BMP IMPLEMENTATION AND OVERSIGHT

Each Copermittee must implement a program that requires and confirms structural BMPs on all Priority Development Projects are designed, constructed, and maintained to remove pollutants in storm water to the MEP.

(1) Structural BMP Approval and Verification Process

(a) Each Copermittee must require and confirm that all Priority Development Projects implement the requirements of Provision E.3, except that the Copermittee may allow previous land development requirements to apply to a Priority Development Project if the conditions of Provision E.3.e.(1)(a)(i) or Provision E.3.e.(1)(a)(ii) are met:

(i) The Copermittee has, prior to the effective date of the BMP Design Manual required to be developed pursuant to Provision E.3.d:

[a] Approved[31] a design that incorporates the storm water drainage system for the Priority Development Project in its entirety, including all applicable structural pollutant treatment control and hydromodification management BMPs consistent with the previous applicable MS4 permit requirements;[32] AND

[b] Issued a private project permit or approval, or functional equivalent for public projects, that authorizes the Priority Development Project applicant to commence construction activities based on a design that incorporates the storm water drainage system approved in conformance with Provision E.3.e.(1)(a)(i)[a]; AND

[c] Confirmed that there have been construction activities on the Priority Development Project site within the 365 days prior to the effective date of the BMP Design Manual, *OR* the Copermittee confirms that construction activities have commenced on the Priority Development Project site within the 180 days after the effective date of the BMP Design Manual, where construction activities are undertaken in reliance on the permit or approval, or functional equivalent for public projects, issued by the Copermittee in conformance with Provision E.3.e.(1)(a)(i)[b]; AND

[d] Issued all subsequent private project permits or approvals, or functional equivalent for public projects, that are needed to implement the design initially approved in conformance with Provision E.3.e.(1)(a)(i)[a] within 5 years of the effective date of the BMP Design Manual. The storm water drainage system for the Priority Development Project in its entirety, including all applicable structural pollutant treatment control and hydromodification management BMPs must remain in substantial conformity with the design initially approved in conformance with Provision E.3.e.(1)(a)(i)[a].

[31] For public projects, a design stamped by the City or County Engineer, or engineer of record for the project is considered an approved design.
[32] Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016 for San Diego County, Orange County, and Riverside County Copermittees, respectively

(ii) The Copermittee demonstrates it lacks the land use authority or legal authority to require a Priority Development Project to implement the requirements of Provision E.3.

(b) Each Copermittee must identify the roles and responsibilities of its various municipal departments in implementing the structural BMP requirements, including each stage of a project from application review and approval through BMP maintenance and inspections.

(c) Each Copermittee must require and confirm that appropriate easements and ownerships are properly recorded in public records and the information is conveyed to all appropriate parties when there is a change in project or site ownership.

(d) Each Copermittee must require and confirm that prior to occupancy and/or intended use of any portion of the Priority Development Project, each structural BMP is inspected to verify that it has been constructed and is operating in compliance with all of its specifications, plans, permits, ordinances, and the requirements of this Order.

(2) Priority Development Project Inventory and Prioritization

(a) Each Copermittee must develop, maintain, and update at least annually, a watershed-based database to track and inventory all Priority Development Projects and associated structural BMPs within its jurisdiction. Inventories must be accurate and complete beginning from December 2002 for the San Diego County Copermittees, February 2003 for the Orange County Copermittees, and July 2005 for the Riverside County Copermittees. The use of an automated database system, such as GIS, is highly recommended. The database must include, at a minimum, the following information:

(i) Priority Development Project location (address and hydrologic subarea);

(ii) Descriptions of structural BMP type(s);

(iii) Date(s) of construction;

(iv) Party responsible for structural BMP maintenance;

(v) Dates and findings of structural BMP maintenance verifications; and

(vi) Corrective actions and/or resolutions, when applicable.

(b) Each Copermittee must prioritize the Priority Development Projects with structural BMPs within its jurisdiction. The designation of Priority Development Projects as high priority must consider the following:

(i) The highest water quality priorities identified in the Water Quality Improvement Plan;

(ii) Receiving water quality;

(iii) Number and sizes of structural BMPs;

(iv) Recommended maintenance frequency of structural BMPs;

(v) Likelihood of operation and maintenance issues of structural BMPs;

(vi) Land use and expected pollutants generated; and

(vii) Compliance record.

(3) Structural BMP Maintenance Verifications and Inspections

Each Copermittee is required to verify that structural BMPs on each Priority Development Project are adequately maintained, and continue to operate effectively to remove pollutants in storm water to the MEP through inspections, self-certifications, surveys, or other equally effective approaches.

(a) All (100 percent) of the structural BMPs at Priority Development Projects that are designated as high priority must be inspected directly by the Copermittee annually prior to each rainy season;

(b) For verifications performed through a means other than direct Copermittee inspection, adequate documentation must be required by the Copermittee to provide assurance that the required maintenance of structural BMPs at each Priority Development Project has been completed; and

(c) Appropriate follow-up measures (including re-inspections, enforcement, etc.) must be conducted to ensure that structural BMPs at each Priority Development Project continue to reduce pollutants in storm water to the MEP as originally designed.

f. DEVELOPMENT PROJECT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all development projects, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

4. Construction Management

Each Copermittee must implement a construction management program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. Project Approval Process

Prior to issuance of any local permit(s) that allows the commencement of construction projects that involve ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff, each Copermittee must:

(1) Require a pollution control plan, construction BMP plan, and/or an erosion and sediment control plan, to be submitted by the project applicant to the Copermittee;

(2) Confirm the pollution control plan, construction BMP plan, and/or erosion and sediment control plan, complies with the local grading ordinance, other applicable local ordinances, and the requirements of this Order;

(3) Confirm the pollution control, construction BMP, and/or erosion and sediment control plan, includes seasonally appropriate and effective BMPs and management measures described in Provision E.4.c, as applicable to the project; and

(4) Verify that the project applicant has obtained coverage under the statewide Construction General Permit (Order 2009-0009-DWQ or subsequent Order), if applicable.

b. Construction Site Inventory and Tracking

(1) Each Copermittee must maintain and update, at least quarterly, a watershed-based inventory of all construction projects issued a local permit that allows ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff. The use of an automated database system, such as GIS, is highly recommended. The inventory must include:

(a) Relevant contact information for each site (e.g., name, address, phone, and email for the owner and contractor);

(b) The basic site information including location (address and hydrologic subarea), Waste Discharge Identification (WDID) number (if applicable), size of the site, and approximate area of disturbance;

(c) Whether or not the site is considered a high threat to water quality, as defined in Provision E.4.b.(2) below;

(d) The project start and completion dates;

(e) The required inspection frequency, as defined in the Copermittee's jurisdictional runoff management program document;

(f) The date the Copermittee accepted or approved the pollution control plan, construction BMP plan, and/or erosion and sediment control plan; and

(g) Whether or not there are ongoing enforcement actions administered to the site.

(2) Each Copermittee must identify all construction sites within its jurisdiction that represent a high threat to downstream surface water quality. The designation of construction sites as high threat to water quality must consider the following:

(a) Sites located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Sites located within the same hydrologic subarea and tributary to a water body segment listed as impaired for sediment on the CWA section 303(d) List;

(c) Sites located within, directly adjacent to, or discharging directly to a receiving water within an ESA; and

(d) Other sites determined by the Copermittees or the San Diego Water Board as a high threat to water quality.

c. CONSTRUCTION SITE BMP IMPLEMENTATION

Each Copermittee must implement, or require the implementation of effective BMPs to reduce discharges of pollutants in storm water from construction sites to the MEP, and effectively prohibit non-storm water discharges from construction sites into the MS4. These BMPs must be site specific, seasonally appropriate, and construction phase appropriate. BMPs must be implemented at each construction site year round. Dry season BMP implementation must plan for and address unseasonal rain events that may occur during the dry season (May 1 through September 30). Copermittees must implement, or require the implementation of, BMPs in the following categories:

(1) Project Planning;

(2) Good Site Management "Housekeeping", including waste management;

(3) Non-storm Water Management;

(4) Erosion Control;

(5) Sediment Control;

(6) Run-on and Run-off Control; and

(7) Active/Passive Sediment Treatment Systems, where applicable.

d. CONSTRUCTION SITE INSPECTIONS

Each Copermittee must conduct construction site inspections to require and confirm compliance with its local permits and applicable local ordinances, and the requirements of this Order. Priority for site inspections must consider threat to water quality pursuant to Provision E.4.b as well as the nature of the construction activity, topography, and the characteristics of soils and receiving water quality.

(1) Inspection Frequency

(a) Each Copermittee must conduct inspections at all inventoried sites, including high threat to water quality sites, at an appropriate frequency for each phase of construction to confirm the site reduces the discharge of pollutants in storm water from construction sites to the MEP, and effectively prohibits non-storm water discharges from entering the MS4.

(b) Each Copermittee must establish appropriate inspection frequencies for high threat to water quality sites, and all other sites, for each phase of construction. Inspection frequencies appropriate for addressing the highest water quality priorities identified in the Water Quality Improvement Plan, and for complying with the requirements of this Order must be identified in each Copermittee's jurisdictional runoff management program document.

(c) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e., re-inspection, enforcement) necessary to require and confirm site compliance with its local permits and applicable local ordinances, and the requirements of this Order.

(2) Inspection Content

Inspections of construction sites by the Copermittee must include, at a minimum:

(a) Verification of coverage under the Construction General Permit (Notice of Intent (NOI) and/or WDID number) during initial inspections, when applicable;

(b) Assessment of compliance with its local permits and applicable local ordinances related to pollution prevention, including the implementation and maintenance of applicable BMPs;

(c) Assessment of BMP adequacy and effectiveness;

(d) Visual observations of actual non-storm water discharges;

(e) Visual observations of actual or potential discharge of sediment and/or construction related materials from the site;

(f) Visual observations of actual or potential illicit connections; and

(g) If any violations are found and BMP corrections are needed, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried construction sites. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Site name, location (address and hydrologic subarea), and WDID number (if applicable);

(b) Inspection date;

(c) Approximate amount of rainfall since last inspection;

(d) Description of problems observed with BMPs and indication of need for BMP addition/repair/replacement and any scheduled re-inspection, and date of re-inspection;

(e) Descriptions of any other specific inspection comments which must, at a minimum, include rationales for longer compliance time;

(f) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(g) Resolution of problems noted and date problems fixed.

e. CONSTRUCTION SITE ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried construction sites, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

5. Existing Development Management

Each Copermittee must implement an existing development management program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. EXISTING DEVELOPMENT INVENTORY AND TRACKING

Each Copermittee must maintain, and update at least annually, a watershed-based inventory of the existing development within its jurisdiction that may discharge a pollutant load to and from the MS4. The use of an automated database system, such as GIS, is highly recommended. The inventory must, at a minimum, include:

(1) Name, location (hydrological subarea and address, if applicable) of the following types of existing development with its jurisdiction:

(a) Commercial facilities or areas;

(b) Industrial facilities;

(c) Municipal facilities, including:

(i) MS4 and related structures;[33]

(ii) Roads, streets, and highways;

(iii) Parking facilities;

(iv) Municipal airfields;

(v) Parks and recreation facilities;

[33] The inventory may refer to the MS4 map required to be maintained pursuant to Provision E.2.b.(1).

(vi) Flood management facilities, flood control devices and structures;

(vii) Operating or closed municipal landfills;

(viii) Publicly owned treatment works (including water and wastewater treatment plants) and sanitary sewer collection systems;

(ix) Corporate yards, including maintenance and storage yards for materials, waste, equipment, and vehicles;

(x) Hazardous waste collection facilities;

(xi) Other treatment, storage or disposal facilities for municipal waste; and

(xii) Other municipal facilities that the Copermittee determines may contribute a significant pollutant load to the MS4.

(d) Residential areas, which may be designated by one or more of the following:

(i) Residential management area;

(ii) Drainage basin or area;

(iii) Land use (e.g., single family, multi-family, rural);

(iv) Neighborhood;

(v) Common Interest Area;

(vi) Home Owner Association;

(vii) Mobile home park; and/or

(viii) Other designations accepted by the San Diego Water Board Executive Officer.

(2) A description of the facility or area, including the following information:

(a) Classification as commercial, industrial, municipal, or residential;

(b) Status of facility or area as active or inactive;

(c) Identification if a business is a mobile business;

(d) SIC Code or NAICS Code, if applicable;

(e) Industrial General Permit NOI and/or WDID number, if applicable;

(f) Identification if a residential area is or includes a Common Interest Area / Home Owner Association, or mobile home park;

(g) Identification of pollutants generated and potentially generated by the facility or area;

(h) Whether the facility or area is adjacent to an ESA;

(i) Whether the facility or area is tributary to and within the same hydrologic subarea as a water body segment listed as impaired on the CWA section 303(d) List and generates pollutants for which the water body segment is impaired; and

(3) An annually updated map showing the location of inventoried existing development, watershed boundaries, and water bodies.

b. EXISTING DEVELOPMENT BMP IMPLEMENTATION AND MAINTENANCE

Each Copermittee must designate a minimum set of BMPs required for all inventoried existing development, including special event venues. The designated minimum BMPs must be specific to facility or area types and pollutant generating activities, as appropriate.

(1) Commercial, Industrial, and Municipal Facilities and Areas

(a) Pollution Prevention

Each Copermittee must require the use of pollution prevention methods by the commercial, industrial, and municipal facilities and areas in its inventoried existing development to address the priorities and strategies in the Water Quality Improvement Plan.

(b) BMP Implementation

Each Copermittee must require the implementation of designated BMPs at commercial facilities and areas, industrial facilities, and implement designated BMPs at municipal facilities in its inventoried existing development.

(c) BMP Operation and Maintenance

(i) Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development.

(ii) Each Copermittee must implement a schedule of operation and maintenance activities for its MS4 and related structures (including

but not limited to catch basins, storm drain inlets, detention basins, etc.), and verify proper operation of all its municipal structural treatment controls designed to reduce pollutants (including floatables) in storm water discharges to or from its MS4s and related drainage structures. Operation and maintenance activities may include, but is not limited to, the following:

[a] Inspections of the MS4 and related structures;
[b] Cleaning of the MS4 and related structures; and
[c] Proper disposal of materials removed from cleaning of the MS4 and related structures.

(iii) Each Copermittee must implement a schedule of operation and maintenance for public streets, unpaved roads, paved roads, and paved highways within its jurisdiction to minimize pollutants that can be discharged in storm water.

(iv) Each Copermittee must implement controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers. Copermittees that operate both a municipal sanitary sewer system and a MS4 must implement controls and measures to prevent and eliminate seeping sewage from infiltrating the MS4. Copermittees that do not operate both a municipal sanitary sewer system and a MS4 must coordinate with sewering agencies to keep themselves informed of relevant and appropriate maintenance activities and sanitary sewage projects in their jurisdiction that may cause or contribute to seepage of sewage into the MS4.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must require the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from commercial facilities and areas and industrial facilities, and implement BMPs at municipal facilities in its inventoried existing development. Such BMPs must include, as appropriate, educational activities, permits, certifications and other measures for applicators and distributors.

(2) <u>Residential Areas</u>

(a) Pollution Prevention

Each Copermittee must promote and encourage the use of pollution prevention methods, where appropriate, by the residential areas in its inventoried existing development.

(b) BMP Implementation

Each Copermittee must promote and encourage the implementation of designated BMPs at residential areas in its inventoried existing development.

(c) BMP Operation and Maintenance

Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at residential areas in its inventoried existing development.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must promote and encourage the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from residential areas in its inventoried existing development.

c. EXISTING DEVELOPMENT INSPECTIONS

Each Copermittee must conduct inspections of inventoried existing development to ensure compliance with applicable local ordinances and permits, and the requirements of this Order.

(1) Inspection Frequency

(a) Each Copermittee must establish appropriate inspection frequencies for inventoried existing development in accordance with the following requirements:

(i) At a minimum, inventoried existing development must be inspected once every five years utilizing one or more of the following methods:

[a] Drive-by inspections by Copermittee municipal and contract staff;
[b] Onsite inspections by Copermittee municipal and contract staff; and/or
[c] Visual inspections of publicly accessible inventoried facilities or areas by volunteer monitoring or patrol programs that have been trained by the Copermittee;

(ii) The frequency of inspections must be appropriate to confirm that BMPs are being implemented to reduce the discharge of pollutants in storm water from the MS4 to the MEP and effectively prohibit non-storm water discharges to the MS4;

(iii) The frequency of inspections must be based on the potential for a facility or area to discharge non-storm water and pollutants in storm water, and should reflect the priorities set forth in the Water Quality Improvement Plan;

(iv) Each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development;[34] and

(v) Inventoried existing development must be inspected by the Copermittee, as needed, in response to valid public complaints.

(b) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e. education and outreach, re-inspection, enforcement) necessary to require and confirm compliance with its applicable local ordinances and permits and the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

(2) Inspection Content

(a) Inspections of existing development must include, at a minimum:

(i) Visual inspections for the presence of actual non-storm water discharges;

(ii) Visual inspections for the presence of actual or potential discharge of pollutants;

(iii) Visual inspections for the presence of actual or potential illicit connections; and

(iv) Verification that the description of the facility or area in the inventory, required pursuant to Provision E.5.a.(2), has not changed.

(b) Onsite inspections of existing development by the Copermittee must include, at a minimum:

(i) Assessment of compliance with its applicable local ordinances and permits related to non-storm water and storm water discharges and runoff;

(ii) Assessment of the implementation of the designated BMPs;

(iii) Verification of coverage under the Industrial General Permit, when applicable; and

[34] If any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspection may count toward the total annual inspection requirement. This requirement excludes linear municipal facilities (i.e., MS4 linear channels, sanitary sewer collection systems, streets, roads and highways).

(iv) If any problems or violations are found, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried existing development. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Name and location of the facility or area (address and hydrologic subarea) consistent with the inventory name and location, pursuant to Provision E.5.a.(1);

(b) Inspection and re-inspection date(s);

(c) Inspection method(s) (i.e. drive-by, onsite);

(d) Observations and findings from the inspection(s);

(e) For onsite inspections of existing development by Copermittee municipal or contract staff, the records must also include, as applicable:

(i) Description of any problems or violations found during the inspection(s);

(ii) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(iii) The date problems or violations were resolved.

d. EXISTING DEVELOPMENT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried existing development, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

e. RETROFITTING AND REHABILITATING AREAS OF EXISTING DEVELOPMENT

(1) Retrofitting Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to retrofit areas of existing development within its jurisdiction to address identified sources of pollutants and/or stressors that

contribute to the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify areas of existing development as candidates for retrofitting, focusing on areas where retrofitting will address pollutants and/or stressors that contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for retrofitting projects may be utilized to reduce pollutants that may be discharged in storm water from areas of existing development, and/or address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of retrofitting projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting projects; and

(e) Where retrofitting projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional retrofitting projects (i.e. projects that can receive and/or treat storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment) adjacent to and/or downstream of the areas of existing development.

(2) Stream, Channel and/or Habitat Rehabilitation in Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to rehabilitate streams, channels, and/or habitats in areas of existing development within its jurisdiction to address the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify streams, channels, and/or habitats in areas of existing development as candidates for rehabilitation, focusing on areas where stream, channel, and/or habitat rehabilitation projects will address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for stream, channel, and/or habitat rehabilitation projects may be utilized to address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters, rehabilitate channelized or hydromodified streams, restore wetland and riparian habitat, restore watershed functions, and/or restore beneficial uses of receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of stream, channel, and/or habitat rehabilitation projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance stream, channel, and/or habitat rehabilitation projects; and

(e) Where stream, channel, and/or habitat rehabilitation projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional stream, channel, and/or habitat rehabilitation projects (i.e. projects that can receive storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment).

6. Enforcement Response Plans

Each Copermittee must develop and implement an Enforcement Response Plan as part of its jurisdictional runoff management program document. The Enforcement Response Plan must describe the applicable approaches and options to enforce its legal authority established pursuant to Provision E.1, as necessary, to achieve compliance with the requirements of this Order. The Enforcement Response Plan must be in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include the following:

a. Enforcement Response Plan Components

The Enforcement Response Plan must include the following individual components:

(1) Illicit Discharge Detection and Elimination Enforcement Component;

(2) Development Planning Enforcement Component;

(3) Construction Management Enforcement Component; and

(4) Existing Development Enforcement Component.

b. ENFORCEMENT RESPONSE APPROACHES AND OPTIONS

Each component of the Enforcement Response Plan must describe the enforcement response approaches that the Copermittee will implement to compel compliance with its statutes, ordinances, permits, contracts, orders, or similar means, and the requirements of this Order. The description must include the protocols for implementing progressively stricter enforcement responses. The enforcement response approaches must include appropriate sanctions to compel compliance, including, at a minimum, the following tools or their equivalent:

(1) Verbal and written notices of violation;

(2) Cleanup requirements;

(3) Fines;

(4) Bonding requirements;

(5) Administrative and criminal penalties;

(6) Liens;

(7) Stop work orders; and

(8) Permit and occupancy denials.

c. CORRECTION OF VIOLATIONS

(1) Violations must be corrected in a timely manner with the goal of correcting the violations within 30 calendar days after the violations are discovered, or prior to the next predicted rain event, whichever is sooner.

(2) If more than 30 calendar days are required to achieve compliance, then a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

d. ESCALATED ENFORCEMENT

(1) The Enforcement Response Plan must include a definition of “escalated enforcement.” Escalated enforcement must include any enforcement scenario where a violation or other non-compliance is determined to cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan. Escalated enforcement may be defined differently for development planning, construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas.

(2) Where the Copermittee determines escalated enforcement is not required, a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

(3) Escalated enforcement actions must continue to increase in severity, as necessary, to compel compliance as soon as possible.

e. REPORTING OF NON-COMPLIANT SITES

(1) Each Copermittee must notify the San Diego Water Board in writing within five (5) calendar days of issuing escalated enforcement (as defined in the Copermittee's Enforcement Response Plan) to a construction site that poses a significant threat to water quality as a result of violations or other non-compliance with its permits and applicable local ordinances, and the requirements of this Order. Written notification may be provided electronically by email to the appropriate San Diego Water Board staff.

(2) Each Copermittee must notify the San Diego Water Board of any persons required to obtain coverage under the statewide Industrial General Permit and Construction General Permit and failing to do so, within five (5) calendar days from the time the Copermittee become aware of the circumstances. Written notification may be provided electronically by email to RB9_Nonfilers@waterboards.ca.gov.

7. Public Education and Participation

Each Copermittee must implement, individually or with other Copermittees, a public education and participation program in accordance with the strategies identified in the Water Quality Improvement Plan to promote and encourage the development of programs, management practices, and behaviors that reduce the discharge of pollutants in storm water to the MEP, prevent controllable non-storm water discharges from entering the MS4, and protect water quality standards in receiving waters. The public education and participation program must be implemented in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include, at a minimum, the following requirements:

a. PUBLIC EDUCATION

The public education program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) Educational activities, public information activities, and other appropriate outreach activities intended to reduce pollutants associated with the application of pesticides, herbicides and fertilizer and other pollutants of

concern in storm water discharges to and from its MS4 to the MEP, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed to address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(2) Educational activities, public information activities, and other appropriate outreach activities to facilitate the proper management and disposal of used oil and toxic materials; and

(3) Appropriate education and training measures for specific target audiences, such as construction site operators, residents, underserved target audiences and school-aged children, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed, based on high risk behaviors and pollutants of concern.

b. PUBLIC PARTICIPATION

The public participation program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) A process for members of the public to participate in updating the highest priority water quality conditions, numeric goals, and water quality improvement strategies in the Water Quality Improvement Plan;

(2) Opportunities for members of the public to participate in providing the Copermittee recommendations for improving the effectiveness of the water quality improvement strategies implemented within its jurisdiction; and

(3) Opportunities for members of the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or protection of the quality of receiving waters.

8. Fiscal Analysis

a. Each Copermittee must secure the resources necessary to meet all the requirements of this Order.

b. Each Copermittee must conduct an annual fiscal analysis of its jurisdictional runoff management program in its entirety. The fiscal analysis must include the following:

(1) Identification of the various categories of expenditures necessary to implement the requirements of this Order, including a description of the specific capital, operation and maintenance, and other expenditure items to be accounted for in each category of expenditures;

(2) The staff resources needed and allocated to meet the requirements of this Order, including any development, implementation, and enforcement activities required;

(3) The estimated expenditures for Provisions E.8.b.(1) and E.8.b.(2) for the current fiscal year; and

(4) The source(s) of funds that are proposed to meet the necessary expenditures described in Provisions E.8.b.(1) and E.8.b.(2), including legal restrictions on the use of such funds, for the current fiscal year and next fiscal year.

c. Each Copermittee must submit a summary of the annual fiscal analysis with each Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3).

d. Each Copermittee must provide the documentation used to develop the summary of the annual fiscal analysis upon request by the San Diego Water Board.

F. REPORTING

The purpose of this provision is to determine and document compliance with the requirements set forth in this Order. The goal of reporting is to communicate to the San Diego Water Board and the people of the State of California the implementation status of each jurisdictional runoff management program and compliance with the requirements of this Order. This goal is to be accomplished through the submittal of specific deliverables to the San Diego Water Board by the Copermittees.

1. Water Quality Improvement Plans

The Copermittees for each Watershed Management Area must develop and submit the Water Quality Improvement Plan in accordance with the following requirements:

a. WATER QUALITY IMPROVEMENT PLAN DEVELOPMENT

Each Water Quality Improvement Plan must be developed in accordance with the following process:

(1) Public Participation Process

The Copermittees must implement a public participation process to solicit data, information, and recommendations to be utilized in the development of the Water Quality Improvement Plan. The public participation process must include the following:

(a) The Copermittees must develop a publicly available and noticed schedule of the opportunities for the public to participate and provide comments during the development of the Water Quality Improvement Plan. The schedule may be adjusted as necessary by the Copermittees, provided the public is provided timely notification of the changes to the schedule.

(b) The Copermittees must form a Water Quality Improvement Consultation Panel to provide recommendations during the development of the Water Quality Improvement Plan. The Water Quality Improvement Consultation Panel must consist of at least the following members:

(i) A representative of the San Diego Water Board;

(ii) A representative of the environmental community familiar with the water quality conditions of concern of the receiving waters in the Watershed Management Area, preferably from an environmental interest group associated with a water body within the Watershed Management Area; and

(iii) A representative of the development community familiar with the opportunities and constraints for implementing structural BMPs,

retrofitting projects, and stream, channel or habitat rehabilitation projects in the Watershed Management Area, preferably with relevant engineering, hydrology, and/or geomorphology experience in the Watershed Management Area.

(c) The Copermittees must coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public time and opportunity to participate during the development of the Water Quality Improvement Plans.

(2) Priority Water Quality Conditions

(a) The Copermittees must solicit data, information and recommendations from the public to be utilized in the development and identification of the priority water quality conditions and potential water quality improvement strategies for the Watershed Management Area.

(b) The Copermittees must review the priority water quality conditions the Copermittees plan on including in the Water Quality Improvement Plan with the Water Quality Improvement Consultation Panel to receive recommendations or concurrence.

(c) The Copermittees must consider revisions to the priority water quality conditions based on recommendations from the Water Quality Improvement Consultation Panel.

(d) The Copermittees must include all the potential water quality improvement strategies identified by the public and the Water Quality Improvement Consultation Panel with the submittal of the priority water quality conditions to the San Diego Water Board.

(e) The Copermittees must submit the Water Quality Improvement Plan requirements of Provision B.2 to the San Diego Water Board as early as 6 months and no later than 12 months after the commencement of coverage under this Order. Upon receipt, the San Diego Water Board will issue a public notice and release the proposed priority water quality conditions and potential water quality improvement strategies for public review and comment for a minimum of 30 days.

(f) The Copermittees must consider revisions to the priority water quality conditions and potential water quality improvement strategies developed pursuant to Provision B.2 based on public comments received by the close of the comment period.

(3) Water Quality Improvement Goals, Strategies and Schedules

(a) The Copermittees must solicit recommendations from the public on potential numeric goals for the highest priority water quality conditions identified for the Watershed Management Area, and recommendations on the strategies that should be implemented to achieve the potential numeric goals.

(b) The Copermittees must consult with the Water Quality Improvement Consultation Panel and consider revisions to the following items based on the Panel's recommendations:

(i) The numeric goals and schedules the Copermittees propose to include in the Water Quality Improvement Plan;

(ii) The water quality improvement strategies and schedules the Copermittees propose to implement in the Watershed Management Area and include in the Water Quality Improvement Plan; and

(iii) If the Copermittees choose to implement Provision B.3.b.(4), the results of the Watershed Management Area Analysis the Copermittees proposed to incorporate into the Water Quality Improvement Plan.

(c) The Copermittees must submit the Water Quality Improvement Plan requirements of Provision B.3 to the San Diego Water Board as early as 9 months and no later than 18 months after the commencement of coverage under this Order. Upon receipt, the San Diego Water Board will issue a public notice and release the proposed water quality improvement goals, strategies and schedules for public review and comment for a minimum of 30 days.

(d) The Copermittees must consider revisions to the water quality improvement goals, strategies and schedules developed pursuant to Provision B.3 based on public comments received by the close of the comment period.

b. WATER QUALITY IMPROVEMENT PLAN SUBMITTAL AND IMPLEMENTATION

(1) Within 24 months after the commencement of coverage under this Order, the Copermittees for each Watershed Management Area must submit a complete Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order to the San Diego Water Board. The San Diego Water Board will issue a public notice and release the Water Quality Improvement Plan for public review and comment for a minimum of 30 days.

(2) The Copermittees must consider revisions to the Water Quality Improvement Plan based on written comments received by the close of the public comment period.

(3) The Copermittees must promptly submit any revisions to the Water Quality Improvement Plan to the San Diego Water Board no later than 60 days after the close of the public comment period.

(4) If issues concerning the Water Quality Improvement Plan are resolved informally through discussions among the Copermittees, the San Diego Water Board and interested parties, the San Diego Water Board Executive Officer may provide written notification of acceptance to the Copermittees that the Water Quality Improvement Plan meets the requirements of Provision B. However, if the Executive Officer determines that significant issues with the Water Quality Improvement Plan remain, the matter will be scheduled for San Diego Water Board consideration at a public meeting.

(5) The Copermittees must commence with implementation of the Water Quality Improvement Plan, in accordance with the water quality improvement strategies and schedules therein, upon written notification of acceptance with the Water Quality Improvement Plan by the San Diego Water Board Executive Officer.

(6) During implementation of the Water Quality Improvement Plan the Copermittees must correct any deficiencies in the Plan identified by the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report following a request by the Board to do so.

(7) The Water Quality Improvement Plan must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of receiving notification of acceptance with the Water Quality Improvement Plan by the San Diego Water Board Executive Officer.

2. Updates

a. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATES

Each Copermittee must update its jurisdictional runoff management program document in accordance with the following requirements:

(1) Each Copermittee is encouraged to seek public and key stakeholder participation and comments, as early and often as possible during the process of developing updates to its jurisdictional runoff management program document;

(2) Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E concurrent with the submittal of the Water Quality Improvement Plan. Each Copermittee must correct any deficiencies in the jurisdictional runoff management program document based on comments received from the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report;

(3) Each Copermittee must submit updates to its jurisdictional runoff management program, with the supporting rationale for the modifications, either in the Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b;

(4) The Copermittee must revise proposed modifications to its jurisdictional runoff management program as directed by the San Diego Water Board Executive Officer; and

(5) Updated jurisdictional runoff management program documents must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of submitting the Water Quality Improvement Plan Annual Report.

b. BMP DESIGN MANUAL UPDATES

Each Copermittee must update its BMP Design Manual in accordance with the following requirements:

(1) Each Copermittee must update its BMP Design Manual to incorporate the requirements of Provisions E.3.a-d concurrent with the submittal of the Water Quality Improvement Plan. Each Copermittee must correct any deficiencies in the BMP Design Manual based on comments received from the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report;

(2) Any future updates to the BMP Design Manual made after its update pursuant to Provision F.2.b.(1) is completed must be consistent with the requirements of Provisions E.3.a-d and must be submitted as part of the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b; and

(3) BMP Design Manuals must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of completing the update.

(4) If the San Diego Water Board amends Provisions E.3.a-d during the permit term but after the Copermittee has completed the update pursuant to Provision F.2.b.(1), the Copermittee must revise its BMP Design Manual to

incorporate the amended Provision E.3.a-d requirements as soon as possible but not later than 90 days after the date the San Diego Water Board adopts the amendments to Provisions E.3.a-d, unless otherwise directed by the San Diego Water Board Executive Officer. Under these circumstances, the effective date of the BMP Design Manual is no later than 90 days after the date the San Diego Water Board adopts the amendments to Provisions E.3.a-d, unless otherwise directed by the San Diego Water Board Executive Officer.

c. WATER QUALITY IMPROVEMENT PLAN UPDATES

(1) The Water Quality Improvement Plans must be updated in accordance with the following process:

(a) The Copermittees must develop and implement a public participation process to obtain data, information and recommendations for updating the Water Quality Improvement Plan. The public participation process must provide for a publicly available and noticed schedule of opportunities for the public to participate and provide comments during the development of updates to the Water Quality Improvement Plan;

(b) The Copermittees must consult with the Water Quality Improvement Consultation Panel on proposed updates of the Water Quality Improvement Plan, and consider the Water Quality Improvement Consultation Panel's recommendations in finalizing the proposed updates;

(c) The Copermittees for each Watershed Management Area must submit 1) proposed updates to the Water Quality Improvement Plan and supporting rationale, and 2) recommendations received from the public and the Water Quality Improvement Consultation Panel and the rationale for the requested updates, either in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The updates submitted will be deemed accepted for inclusion in the Water Quality Improvement Plan ninety (90) days after submission unless otherwise directed in writing by the San Diego Water Board Executive Officer;

(d) The Copermittees must revise the requested updates as directed by the San Diego Water Board Executive Officer; and

(e) Updated Water Quality Improvement Plans must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance of the requested updates by the San Diego Water Board.

(2) No later than six months following Office of Administrative Law and USEPA approval of any TMDL Basin Plan amendment with wasteload allocations (WLAs) assigned to the Copermittees during the term of this Order, the

Copermittees must initiate an update to the applicable Water Quality Improvement Plans in accordance with Provision F.1 or Provision F.2.c.(1) to incorporate the requirements of the TMDL WLAs.

3. Progress Reporting

a. Progress Report Presentations

The Copermittees for each Watershed Management Area must periodically appear before the San Diego Water Board, as requested by the Board, to provide progress reports on the implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs.

b. Annual Reports

(1) Transitional Jurisdictional Runoff Management Program Annual Reports

(a) Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) no later than October 31 of each year for each jurisdictional runoff management program reporting period (i.e. July 1 to June 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted.

(b) Each Copermittee must submit the information on the Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) specific to the area within its jurisdiction in each Watershed Management Area.

(c) In addition to submitting the Jurisdictional Runoff Management Program Annual Report Form during the transitional reporting period, each Copermittee may continue to utilize and submit the jurisdictional runoff management program annual reporting format of its previous NPDES permit until the first Water Quality Improvement Plan Annual Report is required to be submitted.

(2) Transitional Monitoring and Assessment Program Annual Reports

The Copermittees for each Watershed Management Area must submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted under this Order. The Transitional

Monitoring and Assessment Program Annual Reports must include:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1.a and D.2.a, summarized and presented in tabular and graphical form; and

(b) The findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

(3) Water Quality Improvement Plan Annual Reports

The Copermittees for each Watershed Management Area must submit a Water Quality Improvement Plan Annual Report for each reporting period no later than January 31 of the following year. The annual reporting period consists of two different periods: 1) July 1 to June 30 of the following year for the jurisdictional runoff management programs, 2) October 1 to September 30 of the following year for the monitoring and assessment programs. The Water Quality Improvement Plan Annual Reports must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Each Annual Report must include the following:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, summarized and presented in tabular and graphical form;

(b) The progress of the special studies required pursuant to Provision D.3, and the findings, interpretations and conclusions of a special study, or each phase of a special study, upon its completion;

(c) The findings, interpretations and conclusions from the assessments required pursuant to Provision D.4;

(d) The progress of implementing the Water Quality Improvement Plan, including, but not limited to, the following:

(i) The progress toward achieving the interim and final numeric goals for the highest water quality priorities for the Watershed Management Area;

(ii) The water quality improvement strategies that were implemented and/or no longer implemented by each of the Copermittees during the reporting period and previous reporting periods;

(iii) The water quality improvement strategies planned for implementation during the next reporting period;

(iv) Proposed modifications to the water quality improvement strategies, the public comments received and the supporting rationale for the

proposed modifications;

(v) Previous modifications or updates incorporated into the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document and implemented by the Copermittees in the Watershed Management Area; and

(vi) Proposed modifications or updates to the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document;

(e) A completed Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) for each Copermittee in the Watershed Management Area, certified by a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative; and

(f) Each Copermittee must provide any data or documentation utilized in developing the Water Quality Improvement Plan Annual Report upon request by the San Diego Water Board. Any Copermittee monitoring data utilized in developing the Water Quality Improvement Plan Annual Report must be uploaded to the California Environmental Data Exchange Network (CEDEN).[35] Any Copermittee monitoring and assessment data utilized in developing the Water Quality Improvement Plan Annual Report must be available for access on the Regional Clearinghouse required pursuant to Provision F.4.

c. Regional Monitoring and Assessment Report

(1) The Copermittees must submit a Regional Monitoring and Assessment Report no later than 180 days prior to the expiration date of this Order. The Regional Monitoring and Assessment Report may be submitted as part of the Report of Waste Discharge required pursuant to Provision F.5.b. In preparing the report the Copermittees must consider the receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, and the findings, interpretations, and conclusions from the assessments required pursuant to Provision D.4. Based on these considerations the report must assess the following:

[35] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

(a) The beneficial uses of the receiving waters within the San Diego Region that are supported and not adversely affected by the Copermittees' MS4 discharges;

(b) The beneficial uses of the receiving waters within the San Diego Region that are adversely impacted by the Copermittees' MS4 discharges;

(c) The progress toward protecting the beneficial uses in the receiving waters within the San Diego Region from the Copermittees' discharges; and

(d) Pollutants or conditions of emerging concern that may impact beneficial uses in the receiving waters within the San Diego Region.

(2) The Regional Monitoring and Assessment Report must include recommendations for improving the implementation and assessment of the Water Quality Improvement Plans and jurisdictional runoff management programs.

(3) Each Copermittee must provide any data or documentation utilized in developing the Regional Monitoring and Assessment Report upon request by the San Diego Water Board. Any Copermittee monitoring and assessment data utilized in developing the Regional Monitoring and Assessment Report must be available for access on the Regional Clearinghouse required pursuant to Provision F.4.

4. Regional Clearinghouse

The Copermittees must develop, update, and maintain an internet-based Regional Clearinghouse that is made available to the public no later than 18 months after the effective date of this Order.[36]

a. The Copermittees, through the Regional Clearinghouse, must make the following documents and data available for access, and organized by Watershed Management Area. The documents and data may be linked to other internet-based data portals and databases where the original documents are stored:

(1) Water Quality Improvement Plan for the Watershed Management Area, and all updated versions with date of update;

(2) Annual Reports for the Watershed Management Area;

(3) Jurisdictional Runoff Management Program document for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

[36] The Copermittees may develop, update and maintain the clearinghouse(s) of other Copermittees or agencies.

(4) BMP Design Manual for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(5) Reports from special studies (e.g. source identification, BMP effectiveness assessment) conducted in the Watershed Management Area;

(6) Monitoring data collected pursuant to Provision D for each Watershed Management Area must be uploaded to CEDEN,[37] with links to the uploaded data; and

(7) Available GIS data, layers, and/or shapefiles used to develop the maps generated and maintained by the Copermittees for the Water Quality Improvement Plans, Annual Reports, and jurisdictional runoff management program documents.

b. The Copermittees, through the Regional Clearinghouse, must make the following information and documents available for access:

(1) Contact information (point of contact, phone number, email address, and mailing address) for each Copermittee;

(2) Public hotline number for reporting non-storm water and illicit discharges for each Copermittee;

(3) Email address for reporting non-storm water and illicit discharges for each Copermittee;

(4) Link to each Copermittee's website, if available, where the public may find additional information about the Copermittee's storm water management program and for requesting records for the implementation of its program;

(5) Information about opportunities for the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or protection of the quality of receiving waters; and

(6) Reports from regional monitoring programs in which the Copermittees participate (e.g. Southern California Monitoring Coalition, Southern California Coastal Water Research Project Bight Monitoring);

(7) Regional Monitoring and Assessment Reports; and

(8) Any other information, data, and documents the Copermittees determine as appropriate for making available to the public.

[37] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

5. Report of Waste Discharge

The Copermittees subject to the requirements of this Order must submit to the San Diego Water Board a complete Report of Waste Discharge as an application for the re-issuance of this Order and NPDES permit. The Report of Waste Discharge must be submitted no later than 180 days in advance of the expiration date of this Order. The Report of Waste Discharge must contain the following minimum information:

a. Names and addresses of the Copermittees;

b. Names and titles of the primary contacts of the Copermittees;

c. Proposed changes to the Copermittees' Water Quality Improvement Plans and the supporting justification;

d. Proposed changes to the Copermittees' jurisdictional runoff management programs and the supporting justification;

e. Any other information necessary for the re-issuance of this Order;

f. Any information to be included as part of the Report of Waste Discharge pursuant to the requirements of this Order; and

g. Any other information required by federal regulations for NPDES permit reissuance.

6. Reporting Provisions

Each Copermittee must comply with all the reporting and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

G. PRINCIPAL WATERSHED COPERMITTEE RESPONSIBILITIES

1. The Copermittees within each Watershed Management Area must designate a Principal Watershed Copermittee and notify the San Diego Water Board of the name of the Principal Watershed Copermittee. An individual Copermittee should not be designated a Principal Watershed Copermittee for more than two Watershed Management Areas. The notification may be submitted with the Water Quality Improvement Plan required pursuant to Provision F.1 of this Order.

2. The Principal Watershed Copermittee is responsible for, at a minimum, the following:

a. Serving as liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues, and when necessary and appropriate, representing the Copermittees in the Watershed Management Area before the San Diego Water Board;

b. Facilitating the development of the Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order;

c. Coordinating the submittal of the deliverables required by Provisions F.1, F.2, F.3.a, and F.3.b of this Order; and

d. Coordinating and developing, with the other Principal Watershed Copermittees, the requirements of Provisions F.3.c, F.4, and F.5.b of this Order.

3. The Principal Watershed Copermittee is not responsible for ensuring that the other Copermittees within the Watershed Management Area are in compliance with the requirements of this Order. Each Copermittee within the Watershed Management Area is responsible for complying with the requirements of this Order.

H. MODIFICATION OF ORDER

1. Modifications of the Order may be initiated by the San Diego Water Board or by the Copermittees. Requests by Copermittees must be made to the San Diego Water Board.

2. Minor modifications to the Order may be made by the San Diego Water Board where the proposed modification complies with all the prohibitions and limitations, and other requirements of this Order.

3. This Order may also be re-opened and modified, revoked and, reissued or terminated in accordance with the provisions of 40 CFR 122.44, 122.62 to 122.64, and 124.5. Causes for taking such actions include, but are not limited to, failure to comply with any condition of this Order and permit, and endangerment to human health or the environment resulting from the permitted activity.

4. This Order may be re-opened for modification for cause including but not limited to the following:

a. Any of the TMDLs in Attachment E to this Order are amended in the Basin Plan by San Diego Water Board, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA;

b. The Basin Plan is amended by the San Diego Water Board to incorporate a new TMDL, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA; or

c. Updating or revising the monitoring and reporting requirements is determined to be necessary, at the discretion of the San Diego Water Board. Such modification(s) may include, but is (are) not limited to, revision(s) to: (i) implement recommendations from Southern California Coastal Water Research Project (SCCWRP), (ii) develop, refine, implement, and/or coordinate a regional monitoring program, (iii) develop and implement improved monitoring and assessment programs in keeping with San Diego Water Board Resolution No. R9-2012-0069, Resolution in Support of a Regional Monitoring Framework, and/or (iv) add provisions to require the Copermittees to evaluate and provide information on cost and values of the monitoring and reporting program.

I. STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

Each Copermittee must comply with all the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

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ATTACHMENT A

DISCHARGE PROHIBITIONS AND SPECIAL PROTECTIONS

1. Basin Plan Waste Discharge Prohibitions

California Water Code Section 13243 provides that a Regional Water Board, in a water quality control plan, may specify certain conditions or areas where the discharge of waste or certain types of waste is not permitted. The following waste discharge prohibitions in the Water Quality Control Plan for the San Diego Basin (Basin Plan) are applicable to any person, as defined by Section 13050(c) of the California Water Code, who is a citizen, domiciliary, or political agency or entity of California whose activities in California could affect the quality of waters of the state within the boundaries of the San Diego Region.

1. The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in California Water Code Section 13050, is prohibited.

2. The discharge of waste to land, except as authorized by waste discharge requirements or the terms described in California Water Code Section 13264 is prohibited.

3. The discharge of pollutants or dredged or fill material to waters of the United States except as authorized by a National Pollutant Discharge Elimination System (NPDES) permit or a dredged or fill material permit (subject to the exemption described in California Water Code Section 13376) is prohibited.

4. Discharges of recycled water to lakes or reservoirs used for municipal water supply or to inland surface water tributaries thereto are prohibited, unless this San Diego Water Board issues a NPDES permit authorizing such a discharge; the proposed discharge has been approved by the State Department of Health Services (DHS) and the operating agency of the impacted reservoir; and the discharger has an approved fail-safe long-term disposal alternative.

5. The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the San Diego Water Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

6. The discharge of waste in a manner causing flow, ponding, or surfacing on lands not owned or under the control of the discharger is prohibited, unless the discharge is authorized by the San Diego Water Board.

7. The dumping, deposition, or discharge of waste directly into waters of the state, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the San Diego Water Board.

8. Any discharge to a storm water conveyance system that is not composed entirely of "*storm water*" is prohibited unless authorized by the San Diego Water Board. [The federal regulations, 40 CFR 122.26(b)(13), define storm water as storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from firefighting activities.] [§122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

9. The unauthorized discharge of treated or untreated sewage to waters of the state or to a storm water conveyance system is prohibited.

10. The discharge of industrial wastes to conventional septic tank/subsurface disposal systems, except as authorized by the terms described in California Water Code Section 13264, is prohibited.

11. The discharge of radioactive wastes amenable to alternative methods of disposal into the waters of the state is prohibited.

12. The discharge of any radiological, chemical, or biological warfare agent into waters of the state is prohibited.

13. The discharge of waste into a natural or excavated site below historic water levels is prohibited unless the discharge is authorized by the San Diego Water Board.

14. The discharge of sand, silt, clay, or other earthen materials from any activity, including land grading and construction, in quantities which cause deleterious bottom deposits, turbidity or discoloration in waters of the state or which unreasonably affect, or threaten to affect, beneficial uses of such waters is prohibited.

15. The discharge of treated or untreated sewage from vessels to Mission Bay, Oceanside Harbor, Dana Point Harbor, or other small boat harbors is prohibited.

16. The discharge of untreated sewage from vessels to San Diego Bay is prohibited.

17. The discharge of treated sewage from vessels to portions of San Diego Bay that are less than 30 feet deep at mean lower low water (MLLW) is prohibited.

18. The discharge of treated sewage from vessels, which do not have a properly functioning US Coast Guard certified Type I or Type II marine sanitation device, to portions of San Diego Bay that are greater than 30 feet deep at mean lower low water (MLLW) is prohibited.

2. Attachment B to State Water Board Resolution 2012-0012, as amended by State Water Board Resolution No. 2012-0031.

Special Protections for Areas of Special Biological Significance (ASBS), Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges

I. PROVISIONS FOR POINT SOURCE DISCHARGES OF STORM WATER AND NONPOINT SOURCE WASTE DISCHARGES

The following terms, prohibitions, and special conditions (hereafter collectively referred to as special conditions) are established as limitations on point source storm water and nonpoint source discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in Areas of Special Biological Significance (ASBS), as required for State Water Quality Protection Areas pursuant to California Public Resources Code Sections 36700(f) and 36710(f). These Special Protections are adopted by the State Water Board as part of the California Ocean Plan (Ocean Plan) General Exception.

The special conditions are organized by category of discharge. The State Water Resources Control Board (State Water Board) and Regional Water Quality Control Boards (Regional Water Boards) will determine categories and the means of regulation for those categories [e.g., Point Source Storm Water National Pollutant Discharge Elimination System (NPDES) or Nonpoint Source].

A. PERMITTED POINT SOURCE DISCHARGES OF STORM WATER

1. General Provisions for Permitted Point Source Discharges of Storm Water

   a. Existing storm water discharges into an ASBS are allowed only under the following conditions:

      (1) The discharges are authorized by an NPDES permit issued by the State Water Board or Regional Water Board;

      (2) The discharges comply with all of the applicable terms, prohibitions, and special conditions contained in these Special Protections; and

      (3) The discharges:

         (i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

         (ii) Are designed to prevent soil erosion;

         (iii) Occur only during wet weather;

         (iv) Are composed of only storm water runoff.

   b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

   c. The discharge of trash is prohibited.

d. Only discharges from existing storm water outfalls are allowed. Any proposed or new storm water runoff discharge shall be routed to existing storm water discharge outfalls and shall not result in any new contribution of waste to an ASBS (i.e., no additional pollutant loading). "Existing storm water outfalls" are those that were constructed or under construction prior to January 1, 2005. "New contribution of waste" is defined as any addition of waste beyond what would have occurred as of January 1, 2005. A change to an existing storm water outfall, in terms of re-location or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges are prohibited except as provided below:

(1) The term "non-storm water discharges" means any waste discharges from a municipal separate storm sewer system (MS4) or other NPDES permitted storm drain system to an ASBS that are not composed entirely of storm water.

(2) (i) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability or occur naturally:

(a) Discharges associated with emergency fire fighting operations.

(b) Foundation and footing drains.

(c) Water from crawl space or basement pumps.

(d) Hillside dewatering.

(e) Naturally occurring groundwater seepage via a storm drain.

(f) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(ii) An NPDES permitting authority may authorize non-storm water discharges to an MS4 with a direct discharge to an ASBS only to the extent the NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

2. Compliance Plans for Inclusion in Storm Water Management Plans (SWMP) and Storm Water Pollution Prevention Plans (SWPPP).

The discharger shall specifically address the prohibition of non-storm water runoff and the requirement to maintain natural water quality for storm water discharges to an ASBS in an ASBS Compliance Plan to be included in its SWMP or a SWPPP, as appropriate to permit type. If a statewide permit includes a SWMP, then the discharger shall prepare a stand-alone compliance plan for ASBS discharges. The ASBS Compliance Plan is subject to approval by the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (for permits issued by Regional Water Boards).

a. The Compliance Plan shall include a map of surface drainage of storm water runoff, showing areas of sheet runoff, prioritize discharges, and describe any structural Best Management Practices (BMPs) already employed and/or BMPs to be employed in the future. Priority discharges are those that pose the greatest water quality threat and which are identified to require installation of structural BMPs. The map shall also show the storm water conveyances in relation to other features such as service areas, sewage conveyances and treatment facilities, landslides, areas prone to erosion, and waste and hazardous material storage areas, if applicable. The SWMP or SWPPP shall also include a procedure for updating the map and plan when changes are made to the storm water conveyance facilities.

b. The ASBS Compliance Plan shall describe the measures by which all non-authorized non-storm water runoff (e.g., dry weather flows) has been eliminated, how these measures will be maintained over time, and how these measures are monitored and documented.

c. For Municipal Separate Storm Sewer System (MS4s), the ASBS Compliance Plan shall require minimum inspection frequencies as follows:

(1) The minimum inspection frequency for construction sites shall be weekly during rainy season;

(2) The minimum inspection frequency for industrial facilities shall be monthly during the rainy season;

(3) The minimum inspection frequency for commercial facilities (e.g., restaurants) shall be twice during the rainy season; and

(4) Storm water outfall drains equal to or greater than 18 inches (457 mm) in diameter or width shall be inspected once prior to the beginning of the rainy season and once during the rainy season and maintained to remove trash and other anthropogenic debris.

d. The ASBS Compliance Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff, that are necessary to comply with these special conditions, will be achieved through BMPs. Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that such installation would pose a threat to health or safety. BMPs to control storm water runoff discharges (at the end-of-pipe) during a design storm shall be designed to achieve on average the following target levels:

(1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

(2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges.

The baseline for these determinations is the effective date of the Exception, except for those structural BMPs installed between January 1, 2005 and adoption of these Special Protections, and the reductions must be achieved and documented within six (6) years of the effective date.

e. The ASBS Compliance Plan shall address erosion control and the prevention of anthropogenic sedimentation in ASBS. The natural habitat conditions in the ASBS shall not be altered as a result of anthropogenic sedimentation.

f. The ASBS Compliance Plan shall describe the non-structural BMPs currently employed and planned in the future (including those for construction activities), and include an implementation schedule. The ASBS Compliance Plan shall include non-structural BMPs that address public education and outreach. Education and outreach efforts must adequately inform the public that direct discharges of pollutants from private property not entering an MS4 are prohibited. The ASBS Compliance Plan shall also describe the structural BMPs, including any low impact development (LID) measures, currently employed and planned for higher threat discharges and include an implementation schedule. To control storm water runoff discharges (at the end-of-pipe) during a design storm, permittees must first consider, and use where feasible, LID practices to infiltrate, use, or evapotranspirate storm water runoff on-site, if LID practices would be the most effective at reducing pollutants from entering the ASBS.

g. The BMPs and implementation schedule shall be designed to ensure that natural water quality conditions in the receiving water are achieved and maintained by either reducing flows from impervious surfaces or reducing pollutant loading, or some combination thereof.

h. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents in storm water runoff that alter natural ocean water quality and the sources of these constituents.

(2) The report shall describe BMPs that are currently being implemented, BMPs that are identified in the SWMP or SWPPP for future implementation, and any additional BMPs that may be added to the SWMP or SWPPP to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the BMPs.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits), the discharger shall revise its ASBS Compliance Plan to incorporate any new or modified BMPs that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised SWMP or SWPPP, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural ocean water quality conditions due to the same constituent.

(5) The requirements of this section are in addition to the terms, prohibitions, and conditions contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within eighteen (18) months from the effective date of the Exception, the discharger shall submit a draft written ASBS Compliance Plan to the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that describes its strategy to comply with these special conditions, including the requirement to maintain natural water quality in the affected ASBS. The ASBS Compliance Plan shall include a description of appropriate non-structural controls and a time schedule to implement structural controls (implementation schedule) to comply with these special conditions for inclusion in the discharger's SWMP or SWPPP, as appropriate to permit type. The final ASBS Compliance Plan, including a description and final schedule for structural controls based on the results of runoff and receiving water monitoring, must be submitted within thirty (30) months from the effective date of the Exception.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these special conditions shall be implemented.

d. Within six (6) years of the effective date of the Exception, any structural controls identified in the ASBS Compliance Plan that are necessary to comply with these special conditions shall be operational.

e. Within six (6) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water, pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data, and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by

the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. for municipalities, a demonstration of significant hardship to discharger ratepayers, by showing the relationship of storm water fees to annual household income for residents within the discharger's jurisdictional area, and the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or

2. for other governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

B. NONPOINT SOURCE DISCHARGES

1. General Provisions for Nonpoint Sources

a. Existing nonpoint source waste discharges are allowed into an ASBS only under the following conditions:

(1) The discharges are authorized under waste discharge requirements, a conditional waiver of waste discharge requirements, or a conditional prohibition issued by the State Water Board or a Regional Water Board.

(2) The discharges are in compliance with the applicable terms, prohibitions, and special conditions contained in these Special Protections.

(3) The discharges:

(i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

(ii) Are designed to prevent soil erosion;

(iii) Occur only during wet weather;

(iv) Are composed of only storm water runoff.

b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

c. The discharge of trash is prohibited.

d. Only existing nonpoint source waste discharges are allowed. "Existing nonpoint source waste discharges" are discharges that were ongoing prior to January 1, 2005. "New nonpoint source discharges" are defined as those that commenced on or after January 1,

2005. A change to an existing nonpoint source discharge, in terms of relocation or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges from nonpoint sources (those not subject to an NPDES Permit) are prohibited except as provided below:

(1) The term "non-storm water discharges" means any waste discharges that are not composed entirely of storm water.

(2) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability, or occur naturally:

(i) Discharges associated with emergency fire fighting operations.

(ii) Foundation and footing drains.

(iii) Water from crawl space or basement pumps.

(iv) Hillside dewatering.

(v) Naturally occurring groundwater seepage via a storm drain.

(vi) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

f. At the San Clemente Island ASBS, discharges incidental to military training and research, development, test, and evaluation operations are allowed. Discharges incidental to underwater demolition and other in-water explosions are not allowed in the two military closure areas in the vicinity of Wilson Cove and Castle Rock. Discharges must not result in a violation of the water quality objectives, including the protection of the marine aquatic life beneficial use, anywhere in the ASBS.

g. At the San Nicolas Island and Begg Rock ASBS, discharges incidental to military research, development, testing, and evaluation of, and training with, guided missile and other weapons systems, fleet training exercises, small-scale amphibious warfare training, and special warfare training are allowed. Discharges incidental to underwater demolition and other in-water explosions are not allowed. Discharges must not result in a violation of the water quality objectives, including the protection of the marine aquatic life beneficial use, anywhere in the ASBS.

h. All other nonpoint source discharges not specifically authorized above are prohibited.

2. Planning and Reporting

a. The nonpoint source discharger shall develop an ASBS Pollution Prevention Plan, including an implementation schedule, to address storm water runoff and any other nonpoint source discharges from its facilities. The ASBS Pollution Prevention Plan must be equivalent in contents to an ASBS Compliance Plan as described in I (A)(2) in this document. The ASBS Pollution Prevention Plan is subject to approval by the Executive Director of the State Water Board (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements).

b. The ASBS Pollution Prevention Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff that are necessary to comply with these special conditions, will be achieved through Management Measures and associated Management Practices (Management Measures/Practices). Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director or Regional Water Board Executive Officer that such installation would pose a threat to health or safety. Management Measures to control storm water runoff during a design storm shall achieve on average the following target levels:

(1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

(2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges.

The baseline for these determinations is the effective date of the Exception, except for those structural BMPs installed between January 1, 2005 and adoption of these Special Protections, and the reductions must be achieved and documented within six (6) years of the effective date.

c. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff or other nonpoint source pollution is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and the Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents that alter natural water quality and the sources of these constituents.

(2) The report shall describe Management Measures/Practices that are currently being implemented, Management Measures/Practices that are identified in the ASBS Pollution Prevention Plan for future implementation, and any additional Management Measures/Practices that may be added to the Pollution Prevention Plan to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the Management Measures/Practices.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements), the discharger shall revise its ASBS Pollution Prevention Plan to incorporate any new or modified Management Measures/Practices that have been or

will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised ASBS Pollution Prevention Plan, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural water quality conditions due to the same constituent.

(5) The requirements of this section are in addition to the terms, prohibitions, and conditions contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within eighteen (18) months from the effective date of the Exception, the discharger~~s~~ shall submit a draft written ASBS Pollution Prevention Plan to the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) that describes its strategy to comply with these special conditions, including the requirement to maintain natural ocean water quality in the affected ASBS. The Pollution Prevention Plan shall include a description of appropriate non-structural controls and a time schedule to implement structural controls to comply with these special conditions for inclusion in the discharger's Pollution Prevention Plan. The final ASBS Pollution Prevention Plan, including a description and final schedule for structural controls based on the results of runoff and receiving water monitoring, must be submitted within thirty (30) months from the effective date of the Exception.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these Special Protections shall be implemented.

d. Within six (6) years of the effective date of the Exception, any structural controls identified in the ASBS Pollution Prevention Plan that are necessary to comply with these special conditions shall be operational.

e. Within six (6) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in (d.) or (e.). The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. a demonstration that the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or

2. for governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

II. ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES

In addition to the provisions in Section I (A) or I (B), respectively, a discharger with parks and recreation facilities shall comply with the following:

A. The discharger shall include a section in an ASBS Compliance Plan (for NPDES dischargers) or an ASBS Pollution Prevention Plan (for nonpoint source dischargers) to address storm water runoff from parks and recreation facilities.

1. The plan shall identify all pollutant sources, including sediment sources, which may result in waste entering storm water runoff. Pollutant sources include, but are not limited to, roadside rest areas and vistas, picnic areas, campgrounds, trash receptacles, maintenance facilities, park personnel housing, portable toilets, leach fields, fuel tanks, roads, piers, and boat launch facilities.

2. The plan shall describe BMPs or Management Measures/Practices that will be implemented to control soil erosion (both temporary and permanent erosion controls) and reduce or eliminate pollutants in storm water runoff in order to achieve and maintain natural water quality conditions in the affected ASBS. The plan shall include BMPs or Management Measures/Practices to ensure that trails and culverts are maintained to prevent erosion and minimize waste discharges to ASBS.

3. The plan shall include BMPs or Management Measures/Practices to prevent the discharge of pesticides or other chemicals, including agricultural chemicals, in storm water runoff to the affected ASBS.

4. The plan shall include BMPs or Management Measures/Practices that address public education and outreach. The goal of these BMPs or Management Measures/Practices is to ensure that the public is adequately informed that waste discharges to the affected ASBS are prohibited or limited by special conditions in these Special Protections. The BMPs or Management Measures/Practices shall include signage at camping, picnicking, beach and roadside parking areas, and visitor centers, or other appropriate measures, which notify the public of any applicable requirements of these Special Protections and identify the ASBS boundaries.

5. The plan shall include BMPs or Management Measures/Practices that address the prohibition against the discharge of trash to ASBS. The BMPs or Management Measures/Practices shall include measures to ensure that adequate trash receptacles are available for public use at visitor facilities, including parking areas, and that the receptacles are adequately maintained to prevent trash discharges into the ASBS. Appropriate measures include covering trash receptacles to prevent trash from being wind blown and periodically emptying the receptacles to prevent overflows.

6. The plan shall include BMPs or Management Measures/Practices to address runoff from parking areas and other developed features to ensure that the runoff does not alter natural water quality in the affected ASBS. BMPs or Management Measures/Practices shall include measures to reduce pollutant loading in runoff to the ASBS through installation of natural area buffers (LID), treatment, or other appropriate measures.

B. Maintenance and repair of park and recreation facilities must not result in waste discharges to the ASBS. The practice of road oiling must be minimized or eliminated, and must not result in waste discharges to the ASBS.

III. ADDITIONAL REQUIREMENTS – WATERFRONT AND MARINE OPERATIONS

In addition to the provisions in Section I (A) or I (B), respectively, a discharger with waterfront and marine operations shall comply with the following:

A. For discharges related to waterfront and marine operations, the discharger shall develop a Waterfront and Marine Operations Management Plan (Waterfront Plan). This plan shall contain appropriate Management Measures/Practices to address nonpoint source pollutant discharges to the affected ASBS.

1. The Waterfront Plan shall contain appropriate Management Measures/Practices for any waste discharges associated with the operation and maintenance of vessels, moorings, piers, launch ramps, and cleaning stations in order to ensure that beneficial uses are protected and natural water quality is maintained in the affected ASBS.

2. For discharges from marinas and recreational boating activities, the Waterfront Plan shall include appropriate Management Measures, described in The Plan for California's Nonpoint Source Pollution Control Program, for marinas and recreational boating, or equivalent practices, to ensure that nonpoint source pollutant discharges do not alter natural water quality in the affected ASBS.

3. The Waterfront Plan shall include Management Practices to address public education and outreach to ensure that the public is adequately informed that waste discharges to the affected ASBS are prohibited or limited by special conditions in these Special

Protections. The management practices shall include appropriate signage, or similar measures, to inform the public of the ASBS restrictions and to identify the ASBS boundaries.

4. The Waterfront Plan shall include Management Practices to address the prohibition against trash discharges to ASBS. The Management Practices shall include the provision of adequate trash receptacles for marine recreation areas, including parking areas, launch ramps, and docks. The plan shall also include appropriate Management Practices to ensure that the receptacles are adequately maintained and secured in order to prevent trash discharges into the ASBS. Appropriate Management Practices include covering the trash receptacles to prevent trash from being windblown, staking or securing the trash receptacles so they don't tip over, and periodically emptying the receptacles to prevent overflow.

5. The discharger shall submit its Waterfront Plan to the by the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) within six months of the effective date of these special conditions. The Waterfront Plan is subject to approval by the State Water Board Executive Director or the Regional Water Board Executive Officer, as appropriate. The plan must be fully implemented within 18 months of the effective date of the Exception.

B. The discharge of chlorine, soaps, petroleum, other chemical contaminants, trash, fish offal, or human sewage to ASBS is prohibited. Sinks and fish cleaning stations are point source discharges of wastes and are prohibited from discharging into ASBS. Anthropogenic accumulations of discarded fouling organisms on the sea floor must be minimized.

C. Limited-term activities, such as the repair, renovation, or maintenance of waterfront facilities, including, but not limited to, piers, docks, moorings, and breakwaters, are authorized only in accordance with Chapter III.E.2 of the Ocean Plan.

D. If the discharger anticipates that the discharger will fail to fully implement the approved Waterfront Plan within the 18 month deadline, the discharger shall submit a technical report as soon as practicable to the State Water Board Executive Director or the Regional Water Board Executive Officer, as appropriate. The technical report shall contain reasons for failing to meet the deadline and propose a revised schedule to fully implement the plan.

E. The State Water Board or the Regional Water Board may, for good cause, authorize additional time to comply with the Waterfront Plan. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in Section III.A.5. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the

discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality. The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. a demonstration of significant hardship by showing that the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate.

2. for governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

IV. MONITORING REQUIREMENTS

Monitoring is mandatory for all dischargers to assure compliance with the Ocean Plan. Monitoring requirements include both: (A) core discharge monitoring, and (B) ocean receiving water monitoring. The State and Regional Water Boards must approve sampling site locations and any adjustments to the monitoring programs. All ocean receiving water and reference area monitoring must be comparable with the Water Boards' Surface Water Ambient Monitoring Program (SWAMP).

Safety concerns: Sample locations and sampling periods must be determined considering safety issues. Sampling may be postponed upon notification to the State and Regional Water Boards if hazardous conditions prevail.

Analytical Chemistry Methods: All constituents must be analyzed using the lowest minimum detection limits comparable to the Ocean Plan water quality objectives. For metal analysis, all samples, including storm water effluent, reference samples, and ocean receiving water samples, must be analyzed by the approved analytical method with the lowest minimum detection limits (currently Inductively Coupled Plasma/Mass Spectrometry) described in the Ocean Plan.

A. CORE DISCHARGE MONITORING PROGRAM

1. General sampling requirements for timing and storm size:

   Runoff must be collected during a storm event that is greater than 0.1 inch and generates runoff, and at least 72 hours from the previously measurable storm event. Runoff samples shall be collected during the same storm and at approximately the same time when post-storm receiving water is sampled, and analyzed for the same constituents as receiving water and reference site samples (see section IV B) as described below.

2. Runoff flow measurements

   a. For municipal/industrial storm water outfalls in existence as of December 31, 2007, 18 inches (457mm) or greater in diameter/width (including multiple outfall pipes in combination having a width of 18 inches, runoff flows must be measured or calculated, using a method acceptable to and approved by the State and Regional Water Boards.

b. This will be reported annually for each precipitation season to the State and Regional Water Boards.

3. Runoff samples – storm events

a. For outfalls equal to or greater than 18 inches (0.46m) in diameter or width:

(1) samples of storm water runoff shall be collected during the same storm as receiving water samples and analyzed for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

(2) samples of storm water runoff shall be collected and analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

(3) If an applicant has no outfall greater than 36 inches, then storm water runoff from the applicant's largest outfall shall be further collected during the same storm as receiving water samples and analyzed for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates).

b. For outfalls equal to or greater than 36 inches (0.91m) in diameter or width:

(1) samples of storm water runoff shall be collected during the same storm as receiving water samples and analyzed for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

(2) samples of storm water runoff shall be further collected during the same storm as receiving water samples and analyzed for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates); and

(3) samples of storm water runoff shall be collected and analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

c. For an applicant not participating in a regional monitoring program [see below in Section IV (B)] in addition to (a.) and (b.) above, a minimum of the two largest outfalls or 20 percent of the larger outfalls, whichever is greater, shall be sampled (flow weighted composite samples) at least three times annually during wet weather (storm event) and analyzed for all Ocean Plan Table A constituents, Table B constituents for marine aquatic life protection (except for toxicity, only chronic toxicity for three species shall be required), DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, and Ocean Plan indicator bacteria. For parties discharging to ASBS in

more than one Regional Water Board region, at a minimum, one (the largest) such discharge shall be sampled annually in each Region.

4. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may reduce or suspend core monitoring once the storm runoff is fully characterized. This determination may be made at any point after the discharge is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

B. Ocean Receiving Water and Reference Area Monitoring Program

In addition to performing the Core Discharge Monitoring Program in Section II.A above, all applicants having authorized discharges must perform ocean receiving water monitoring. In order to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS, dischargers may choose either (1) an individual monitoring program, or (2) participation in a regional integrated monitoring program.

1. Individual Monitoring Program: The requirements listed below are for those dischargers who elect to perform an individual monitoring program to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within the affected ASBS. In addition to Core Discharge Monitoring, the following additional monitoring requirements shall be met:

   a. Three times annually, during wet weather (storm events), the receiving water at the point of discharge from the outfalls described in section (IV)(A)(3)(c) above shall be sampled and analyzed for Ocean Plan Table A constituents, Table B constituents for marine aquatic life, DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, salinity, chronic toxicity (three species), and Ocean Plan indicator bacteria.

      The sample location for the ocean receiving water shall be in the surf zone at the point of discharges; this must be at the same location where storm water runoff is sampled. Receiving water shall be sampled prior to (pre-storm) and during (or immediately after) the same storm (post storm). Post storm sampling shall be during the same storm and at approximately the same time as when the runoff is sampled. Reference water quality shall also be sampled three times annually and analyzed for the same constituents pre-storm and post-storm, during the same storm seasons when receiving water is sampled. Reference stations will be determined by the State Water Board's Division of Water Quality and the applicable Regional Water Board(s).

   b. Sediment sampling shall occur at least three times during every five (5) year period. The subtidal sediment (sand or finer, if present) at the discharge shall be sampled and analyzed for Ocean Plan Table B constituents for marine aquatic life, DDT, PCBs, PAHs, pyrethroids, and OP pesticides. For sediment toxicity testing, only an acute toxicity test using the amphipod *Eohaustorius estuarius* must be performed.

   c. A quantitative survey of intertidal benthic marine life shall be performed at the discharge and at a reference site. The survey shall be performed at least once every five (5) year period. The survey design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The results of the survey shall be

completed and submitted to the State Water Board and Regional Water Board at least six months prior to the end of the permit cycle.

d. Once during each five (5) year period, a bioaccumulation study shall be conducted to determine the concentrations of metals and synthetic organic pollutants at representative discharge sites and at representative reference sites. The study design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The bioaccumulation study may include California mussels (*Mytilus californianus*) and/or sand crabs (*Emerita analoga* or *Blepharipoda occidentalis*). Based on the study results, the Regional Water Board and the State Water Board's Division of Water Quality, may adjust the study design in subsequent permits, or add or modify additional test organisms (such as shore crabs or fish), or modify the study design appropriate for the area and best available sensitive measures of contaminant exposure.

e. Marine Debris: Representative quantitative observations for trash by type and source shall be performed along the coast of the ASBS within the influence of the discharger's outfalls. The design, including locations and frequency, of the marine debris observations is subject to approval by the Regional Water Board and State Water Board's Division of Water Quality.

f. The monitoring requirements of the Individual Monitoring Program in this section are minimum requirements. After a minimum of one (1) year of continuous water quality monitoring of the discharges and ocean receiving waters, the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may require additional monitoring, or adjust, reduce or suspend receiving water and reference station monitoring. This determination may be made at any point after the discharge and receiving water is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

2. Regional Integrated Monitoring Program: Dischargers may elect to participate in a regional integrated monitoring program, in lieu of an individual monitoring program, to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS. This regional approach shall characterize natural water quality, pre- and post-storm, in ocean reference areas near the mouths of identified open space watersheds and the effects of the discharges on natural water quality (physical, chemical, and toxicity) in the ASBS receiving waters, and should include benthic marine aquatic life and bioaccumulation components. The design of the ASBS stratum of a regional integrated monitoring program may deviate from the otherwise prescribed individual monitoring approach (in Section IV.B.1) if approved by the State Water Board's Division of Water Quality and the Regional Water Boards.

a. Ocean reference areas shall be located at the drainages of flowing watersheds with minimal development (in no instance more than 10% development), and shall not be located in CWA Section 303(d) listed waterbodies or have tributaries that are 303(d) listed. Reference areas shall be free of wastewater discharges and anthropogenic non- storm water runoff. A minimum of low threat storm runoff discharges (e.g. stream highway overpasses and campgrounds) may be allowed on a case-by-case basis. Reference areas shall be located in the same region as the ASBS receiving water monitoring occurs. The reference areas for each Region are subject to approval by the participants in the regional monitoring program and the State Water

Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean reference water samples must be collected from each station, each from a separate storm during the same storm season that receiving water is sampled. A minimum of one reference location shall be sampled for each ASBS receiving water site sampled per responsible party. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

b. ASBS ocean receiving water must be sampled in the surf zone at the location where the runoff makes contact with ocean water (i.e. at "point zero"). Ocean receiving water stations must be representative of worst-case discharge conditions (i.e. co-located at a large drain greater than 36 inches, or if drains greater than 36 inches are not present in the ASBS then the largest drain greater than18 inches.) Ocean receiving water stations are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean receiving water samples must be collected during each storm season from each station, each from a separate storm. A minimum of one receiving water location shall be sampled in each ASBS per responsible party in that ASBS. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

c. Reference and receiving water sampling shall commence during the first full storm season following the adoption of these special conditions, and post-storm samples shall be collected during the same storm event when storm water runoff is sampled. Sampling shall occur in a minimum of two storm seasons. For those ASBS dischargers that have already participated in the Southern California Bight 2008 ASBS regional monitoring effort, sampling may be limited to only one storm season.

d. Receiving water and reference samples shall be analyzed for the same constituents as storm water runoff samples. At a minimum, constituents to be sampled and analyzed in reference and discharge receiving waters must include oil and grease, total suspended solids, Ocean Plan Table B metals for protection of marine life, Ocean Plan PAHs, pyrethroids, OP pesticides, ammonia, nitrate, phosphates, and critical life stage chronic toxicity for three species. In addition, within the range of the southern sea otter, indicator bacteria or some other measure of fecal contamination shall be analyzed.

3. Waterfront and Marine Operations: In addition to the above requirements for ocean receiving water monitoring, additional monitoring must be performed for marinas and boat launch and pier facilities:

a. For all marina or mooring field operators, in mooring fields with 10 or more occupied moorings, the ocean receiving water must be sampled for Ocean Plan indicator bacteria, residual chlorine, copper, zinc, grease and oil, methylene blue active substances (MBAS), and ammonia nitrogen.

(1) For mooring field operators opting for an individual monitoring program (Section IV.B.1 above), this sampling must occur weekly (on the weekend) from May through October.

(2) For mooring field operators opting to participate in a regional integrated monitoring program (Section IV.B.2 above), this sampling must occur monthly from May through October on a high use weekend in each month. The Water Boards may allow a reduction in the frequency of sampling, through the regional monitoring program, after the first year of monitoring.

b. For all mooring field operators, the subtidal sediment (sand or finer, if present) within mooring fields and below piers shall be sampled and analyzed for Ocean Plan Table B metals (for marine aquatic life beneficial use), acute toxicity, PAHs, and tributyltin. For sediment toxicity testing, only an acute toxicity test using the amphipod *Eohaustorius estuarius* must be performed. This sampling shall occur at least three times during a five (5) year period. For mooring field operators opting to participate in a regional integrated monitoring program, the Water Boards may allow a reduction in the frequency of sampling after the first sampling effort's results are assessed.

Glossary

At the point of discharge(s) – Means in the surf zone immediately where runoff from an outfall meets the ocean water (a.k.a., at point zero).

Areas of Special Biological Significance (ASBS) – Those areas designated by the State Water Board as ocean areas requiring protection of species or biological communities to the extent that alteration of natural water quality is undesirable. All Areas of Special Biological Significance are also classified as a subset of State Water Quality Protection Areas.

Design storm – For purposes of these Special Protections, a design storm is defined as the volume of runoff produced from one inch of precipitation per day or, if this definition is inconsistent with the discharger's applicable storm water permit, then the design storm shall be the definition included in the discharger's applicable storm water permit.

Development – Relevant to reference monitoring sites, means urban, industrial, agricultural, grazing, mining, and timber harvesting land uses.

Higher threat discharges - Permitted storm drains discharging equal to or greater than 18 inches, industrial storm drains, agricultural runoff discharged through an MS4, discharges associated with waterfront and marina operations (e.g., piers, launch ramps, mooring fields, and associated vessel support activities, except for passive discharges defined below), and direct discharges associated with commercial or industrial activities to ASBS.

Low Impact Development (LID) – A sustainable practice that benefits water supply and contributes to water quality protection. Unlike traditional storm water management, which entails collecting and conveying storm water runoff through storm drains, pipes, or other conveyances to a centralized storm water facility, LID focuses on using site design and storm water management to maintain the site's pre-development runoff rates and volumes. The goal of LID is to mimic a site's predevelopment hydrology by using design techniques that infiltrate, filter, store, evaporate, and detain runoff close to the source of rainfall.

Marine Operations – Marinas or mooring fields that contain slips or mooring locations for 10 or more vessels.

Management Measure (MM) - Economically achievable measures for the control of the addition of pollutants from various classes of nonpoint sources of pollution, which reflect the greatest degree of pollutant reduction achievable through the application of the best available nonpoint pollution control practices, technologies, processes, siting criteria, operating methods, or other alternatives. For example, in the "marinas and recreational boating" land- use category specified in the Plan for California's Nonpoint Source Pollution Control Program (NPS Program Plan) (SWRCB, 1999), "boat cleaning and maintenance" is considered a MM or the source of a specific class or type of NPS pollution.

Management Practice (MP) - The practices (e.g., structural, non-structural, operational, or other alternatives) that can be used either individually or in combination to address a specific MM class or classes of NPS pollution. For example, for the "boat cleaning and maintenance" MM, specific MPs can include, but are not limited to, methods for the selection of environmentally sensitive hull paints or methods for cleaning/removal of hull copper anti- fouling paints.

Municipal Separate Storm Sewer System (MS4) – A municipally-owned storm sewer system regulated under the Phase I or Phase II storm water program implemented in compliance with Clean Water Act section 402(p). Note that an MS4 program's boundaries are not necessarily congruent with the permittee's political boundaries.

Natural Ocean Water Quality - The water quality (based on selected physical, chemical and biological characteristics) that is required to sustain marine ecosystems, and which is without apparent human influence, *i.e.*, an absence of significant amounts of: (a) man-made constituents (*e.g.,* DDT); (b) other chemical (*e.g.,* trace metals), physical (temperature/thermal pollution, sediment burial), and biological (*e.g.*, bacteria) constituents at concentrations that have been elevated due to man's activities above those resulting from the naturally occurring processes that affect the area in question; and (c) non-indigenous biota (*e.g.,* invasive algal bloom species) that have been introduced either deliberately or accidentally by man. Discharges "*shall not alter natural ocean water quality*" as determined by a comparison to the range of constituent concentrations in reference areas agreed upon via the regional monitoring program(s). If monitoring information indicates that *natural ocean water quality* is not maintained, but there is sufficient evidence that a discharge is not contributing to the alteration of natural water quality, then the Regional Water Board may make that determination. In this case, sufficient information must include runoff sample data that has equal or lower concentrations for the range of constituents at the applicable reference area(s).

Nonpoint source – Nonpoint pollution sources generally are sources that do not meet the definition of a point source. Nonpoint source pollution typically results from land runoff, precipitation, atmospheric deposition, agricultural drainage, marine/boating operations or hydrologic modification. Nonpoint sources, for purposes of these Special Protections, include discharges that are not required to be regulated under an NPDES permit.

Non-storm water discharge – Any runoff that is not the result of a precipitation event. This is often referred to as "dry weather flow."

Non-structural control – A Best Management Practice that involves operational, maintenance, regulatory (e.g., ordinances) or educational activities designed to reduce or eliminate pollutants in runoff, and that are not structural controls (i.e. there are no physical structures involved).

Physical impossibility - Means any act of God, war, fire, earthquake, windstorm, flood or natural catastrophe; unexpected and unintended accidents not caused by discharger or its employees' negligence; civil disturbance, vandalism, sabotage or terrorism; restrain by court order or public authority or agency; or action or non-action by, or inability to

obtain the necessary authorizations or approvals from any governmental agency other than the permittee.

Representative sites and monitoring procedures – Are to be proposed by the discharger, with appropriate rationale, and subject to approval by Water Board staff.

Sheet-flow – Runoff that flows across land surfaces at a shallow depth relative to the cross- sectional width of the flow. These types of flow may or may not enter a storm drain system before discharge to receiving waters.

Storm Season – Also referred to as rainy season, means the months of the year from the onset of rainfall during autumn until the cessation of rainfall in the spring.

Structural control – A Best Management Practice that involves the installation of engineering solutions to the physical treatment or infiltration of runoff.

Surf Zone - The surf zone is defined as the submerged area between the breaking waves and the shoreline at any one time.

Surface Water Ambient Monitoring Program (SWAMP) comparable – Means that the monitoring program must 1) meet or exceed 2008 SWAMP Quality Assurance Program Management Plan (QAPP) Measurement Quality Objectives, or 2) have a Quality Assurance Project Plan that has been approved by SWAMP; in addition data must be formatted to match the database requirements of the SWAMP Information Management System. Adherence to the measurement quality objectives in the Southern California Bight 2008 ASBS Regional Monitoring Program QAPP and data base management comprises being SWAMP comparable.

Waterfront Operations - Piers, launch ramps, and cleaning stations in the water or on the adjacent shoreline.

Attachment 1
Special Protections Sections I(A)(3)(e) and I(B)(3)(e)
Flowchart to Determine Compliance with natural Water Quality

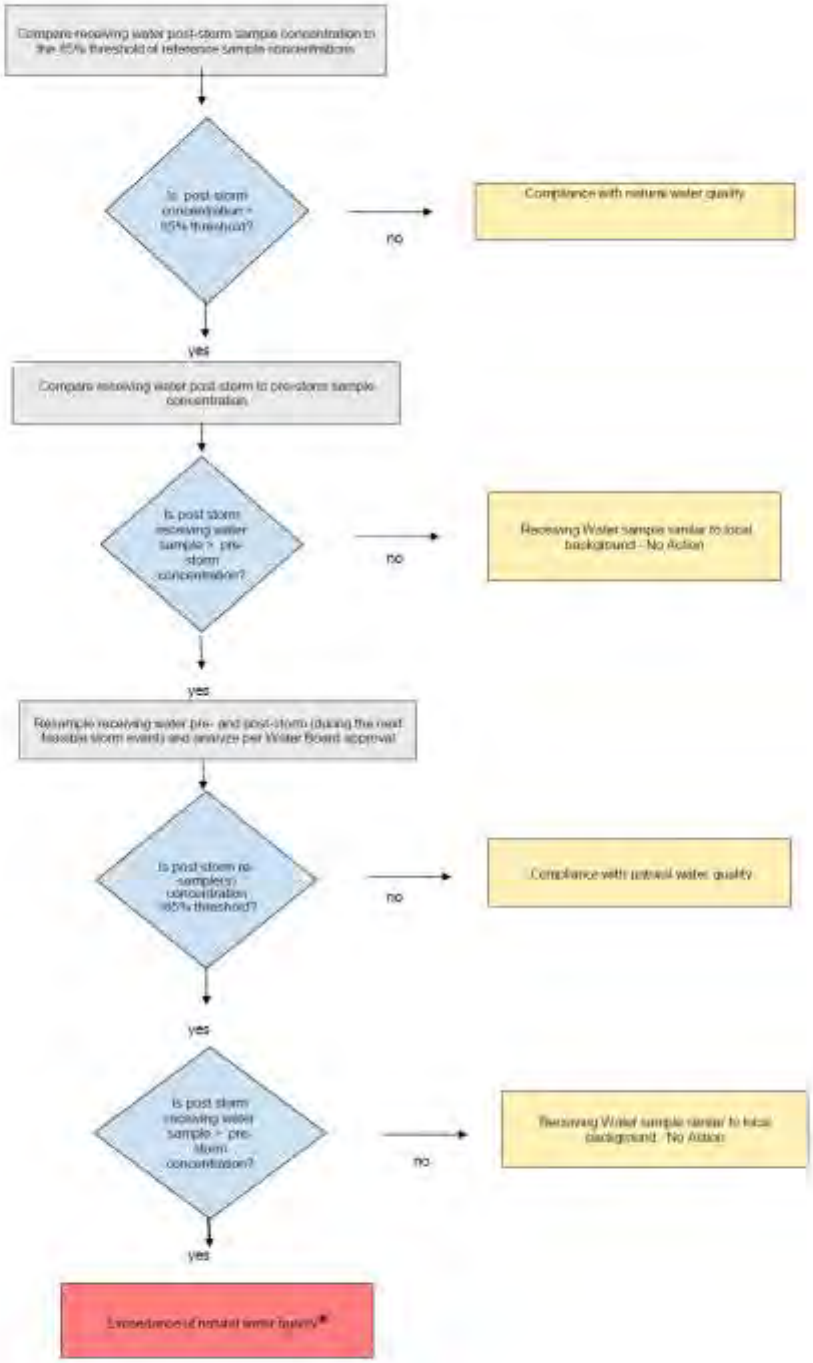

*** When an exceedance of natural water quality occurs, the discharger must comply with section I.A.2.h (for permitted storm water) or section I.B.2.c (for nonpoint sources). Note, when sampling data is available, end-of-pipe effluent concentrations will be considered by the Water Boards in making this determination.**

ATTACHMENT B

STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

1. Standard Permit Provisions

Code of Federal Regulations Title 40 Section 122.41 (40 CFR 122.41) includes conditions, or provisions, that apply to all National Pollutant Discharge Elimination System (NPDES) permits. Additional provisions applicable to NPDES permits are in 40 CFR 122.42. All applicable provisions in 40 CFR 122.41 and 40 CFR 122.42 must be incorporated into this Order and NPDES permit. The applicable 40 CFR 122.41 and 40 CFR 122.42 provisions are as follows:

a. DUTY TO COMPLY [40 CFR 122.41(a)]

The Copermittee must comply with all of the provisions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

(1) The Copermittee must comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement. [40 CFR 122.41(a)(1)]

(2) The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to a civil penalty not to exceed $25,000 per day for each violation. The CWA provides that any person who *negligently* violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than 2 years, or both. Any person who *knowingly* violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both. Any person who knowingly violates Section 301, 302, 303, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, and who knows at that time that he thereby places another person in imminent

danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.
[40 CFR 122.41(a)(2)]

(3) Any person may be assessed an administrative penalty by the San Diego Regional Water Quality Control Board (San Diego Water Board), State Water Resources Control Board (State Water Board), or United States Environmental Protection Agency (USEPA) for violating Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.
[40 CFR 122.41(a)(3)]

b. DUTY TO REAPPLY [40 CFR 122.41(b)]

If a Copermittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Copermittee must apply for and obtain a new permit.

c. NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE [40 CFR 122.41(c)]

It shall not be a defense for a Copermittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

d. DUTY TO MITIGATE [40 CFR 122.41(d)]

The Copermittee must take all reasonable steps to minimize or prevent any discharge or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

e. PROPER OPERATION AND MAINTENANCE [40 CFR 122.41(e)]

The Copermittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Copermittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by a Copermittee only when the operation is necessary to achieve compliance with the conditions of this permit.

f. PERMIT ACTIONS [40 CFR 122.41(f)]

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Copermittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

g. PROPERTY RIGHTS [40 CFR 122.41(g)]

This permit does not convey any property rights of any sort, or any exclusive privilege.

h. DUTY TO PROVIDE INFORMATION [40 CFR 122.41(h)]

The Copermittee must furnish to the San Diego Water Board, State Water Board, or USEPA within a reasonable time, any information which the San Diego Water Board, State Water Board, or USPEA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Copermittee must also furnish to the San Diego Water Board, State Water Board, or USPEA upon request, copies of records required to be kept by this permit.

i. INSPECTION AND ENTRY [40 CFR 122.41(i)]

The Copermittee must allow the San Diego Water Board, State Water Board, USEPA, and/or their authorized representative (including an authorized contractor acting as their representative), upon presentation of credentials and other documents as may be required by law, to:

(1) Enter upon the Copermittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit; [40 CFR 122.41(i)(1)]

(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit; [40 CFR 122.41(i)(2)]

(3) Inspect and photograph at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; [40 CFR 122.41(i)(3)] and

(4) Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location. [40 CFR 122.41(i)(4)]

j. MONITORING AND RECORDS [40 CFR 122.41(j)]

(1) Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity. [40 CFR 122.41(j)(1)]

(2) Except for records of monitoring information required by this permit related to the Copermittee's sewage sludge use and disposal activities, which shall be retained for

a period of at least five (5) years (or longer as required by 40 CFR Part 503), the Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time. [40 CFR 122.41(j)(2)]

(3) Records for monitoring information must include: [40 CFR 122.41(j)(3)]

(a) The date, exact place, and time of sampling or measurements; [40 CFR 122.41(j)(3)(i)]
(b) The individual(s) who performed the sampling or measurements; [40 CFR 122.41(j)(3)(ii)]
(c) The date(s) analyses were performed; [40 CFR 122.41(j)(3)(iii)]
(d) The individual(s) who performed the analyses; [40 CFR 122.41(j)(3)(iv)]
(e) The analytical techniques or methods used; [40 CFR 122.41(j)(3)(v)] and
(f) The results of such analyses. [40 CFR 122.41(j)(3)(vi)]

(4) Monitoring must be conducted according to test procedures under 40 CFR Part 136 unless another method is required under 40 CFR Subchapters N or O. [40 CFR 122.41(j)(4)]

In the case of pollutants for which there are no approved methods under 40 CFR Part 136 or otherwise required under 40 CFR Subchapters N and O, monitoring must be conducted according to a test procedure specified in the permit for such pollutants. [40 CFR 122.44(i)(1)(iv)]

(5) The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. [40 CFR 122.41(j)(5)]

k. SIGNATORY REQUIREMENT [40 CFR 122.41(k)]

(1) All applications, reports, or information submitted to the San Diego Water Board, State Water Board, or USEPA must be signed and certified. (See 40 CFR 122.22) [40 CFR 122.41(k)(1)]

(a) *For a municipality, State, Federal, or other public agency.* [All applications must be signed] by either a principal executive officer or ranking elected official. [40 CFR 122.22(a)(3)]

(b) All reports required by permits, and other information requested by the San Diego Water Board, State Water Board, or USEPA must be signed by a person described in paragraph (a) of this section, or by a duly authorized

representative of that person. A person is a duly authorized representative only if: [40 CFR 122.22(b)]

(i) The authorization is made in writing by a person described in paragraph (a) of this section; [40 CFR 122.22(b)(1)]
(ii) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company, (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) [40 CFR 122.22(b)(2)] and,
(iii) The written authorization is submitted to the San Diego Water Board and State Water Board. [40 CFR 122.22(b)(3)]

(c) *Changes to authorization.* If an authorization under paragraph (b) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (b) of this section must be submitted to the San Diego Water Board prior to or together with any reports, information, or applications to be signed by an authorized representative. [40 CFR 122.22(c)]

(d) *Certification.* Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." [40 CFR 122.22(d)]

(2) The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both. [40 CFR 122.41(k)(2)]

I. REPORTING REQUIREMENTS [40 CFR 122.41(l)]

(1) *Planned changes.* The Copermittee must give notice to the San Diego Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when: [40 CFR 122.41(l)(1)]

(a) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); [40 CFR 122.41(l)(1)(i)] or

(b) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1). [40 CFR 122.41(l)(1)(ii)]

(c) The alteration or addition results in a significant change in the Copermittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. [40 CFR 122.41(l)(1)(iii)]

(2) *Anticipated noncompliance*. The Copermittee must give advance notice to the San Diego Water Board or State Water Board of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements. [40 CFR 122.41(l)(2)]

(3) *Transfers*. This permit is not transferable to any person except after notice to the San Diego Water Board. The San Diego Water Board may require modification or revocation and reissuance of the permit to change the name of the Copermittee and incorporate such other requirements as may be necessary under the CWA. [40 CFR 122.41(l)(3)]

(4) *Monitoring reports.* Monitoring results must be reported at the intervals specified elsewhere in this permit. [40 CFR 122.41(l)(4)]

(a) Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the San Diego Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices. [40 CFR 122.41(l)(4)(i)]

(b) If the Copermittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or another method required for an industry-specific waste stream under 40 CFR Subchapters N or O, the results of this monitoring must be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the San Diego Water Board or State Water Board. [40 CFR 122.41(l)(4)(ii)]

(c) Calculations for all limitations which require averaging of measurements must utilize an arithmetic mean unless otherwise specified in the permit. [40 CFR 122.41(l)(4)(iii)]

(5) *Compliance schedules*. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date. [40 CFR 122.41(l)(5)]

(6) *Twenty-four hour reporting.*

(a) The Copermittee must report any noncompliance that may endanger health or the environment. Any information must be provided orally within 24 hours from the time the Copermittee becomes aware of the circumstances. A written submission must also be provided within five (5) days of the time the Copermittee becomes aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6)(i)]

(b) The following must be included as information which must be reported within 24 hours under this paragraph: [40 CFR 122.41(l)(6)(ii)]

(i) Any unanticipated bypass that exceeds any effluent limitation in the permit (See 40 CFR 122.41(g)). [40 CFR 122.41(l)(6)(ii)(A)]
(ii) Any upset which exceeds any effluent limitation in the permit. [40 CFR 122.41(l)(6)(ii)(B)] and,
(iii) Violation of a maximum daily discharge limitation for any of the pollutants listed by the San Diego Water Board in the permit to be reported within 24 hours. (See 40 CFR 122.44(g)) [40 CFR 122.41(l)(6)(ii)(C)]

(c) The San Diego Water Board may waive the above-required written report on a case-by-case basis if the oral report has been received within 24 hours. [40 CFR 122.41(l)(6)(iii)]

(7) *Other noncompliance.* The Copermittee must report all instances of noncompliance not reported in accordance with the standard provisions required under 40 CFR 122.41(l)(4), (5), and (6), at the time monitoring reports are submitted. The reports must contain the information listed in the standard provisions required under 40 CFR 122.41(l)(6). [40 CFR 122.41(l)(7))]

(8) *Other information.* When the Copermittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the San Diego Water Board, State Water Board, or USEPA, the Copermittee must promptly submit such facts or information. [40 CFR 122.41(l)(8)]

m. BYPASS [40 CFR 122.41(m)]

(1) *Definitions.*

(a) "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. [40 CFR 122.41(m)(1)(i)] or

(b) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or

substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
[40 CFR 122.41(m)(1)(ii)]

(2) *Bypass not exceeding limitations*. The Copermittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the standard provisions required under 40 CFR 122.41(m)(3) and (4).
[40 CFR 122.41(m)(2)]

(3) *Notice.*

(a) *Anticipated bypass*. If the Copermittee knows in advance of the need for a bypass, it must submit a notice, if possible at least ten days before the date of the bypass. [40 CFR 122.41(m)(3)(i)] or

(b) *Unanticipated bypass*. The Copermittee must submit notice of an unanticipated bypass in accordance with the standard provisions required under 40 CFR 122.41(l)(6) (24-hour notice).
[40 CFR 122.41(m)(3)(ii)]

(4) *Prohibition of Bypass.*

(a) Bypass is prohibited, and the San Diego Water Board may take enforcement action against a Copermittee for bypass, unless:
[40 CFR 122.41(m)(4)(i)]

(i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; [40 CFR 122.41(m)(4)(i)(A)]
(ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance;
[40 CFR 122.41(m)(4)(i)(B)] and,
(iii) The Copermittee submitted notice in accordance with the standard provisions required under 40 CFR 122.41(m)(3).
[40 CFR 122.41(m)(4)(i)(C)]

(b) The San Diego Water Board may approve an anticipated bypass, after considering its adverse effects, if the San Diego Water Board determines that it will meet the three conditions listed above.
[40 CFR 122.41(m)(4)(ii)]

n. UPSET [40 CFR 122.41(n)]

(1) *Definition.* "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because

of factors beyond the reasonable control of the Copermittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. [40 CFR 122.41(n)(1)]

(2) *Effect of an upset*. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the standard provisions required under 40 CFR 122.41(n)(3) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. [40 CFR 122.41(n)(2)]

(3) *Conditions necessary for a demonstration of upset*. A Copermittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that: [40 CFR 122.41(n)(3)]

(a) An upset occurred and that the Copermittee can identify the cause(s) of the upset; [40 CFR 122.41(n)(3)(i)]
(b) The permitted facility was at the time being properly operated; [40 CFR 122.41(n)(3)(ii)] and
(c) The Copermittee submitted notice of the upset in accordance with the standard provisions required under 40 CFR 122.41(l)(6)(ii)(B) (24-hour notice). [40 CFR 122.41(n)(3)(iii)]
(d) The Copermittee complied with any remedial measures pursuant to the standard provisions required under 40 CFR 122.41(d). [40 CFR 122.41(n)(3)(iii)]

(4) *Burden of proof*. In any enforcement proceeding, the Copermittee seeking to establish the occurrence of an upset has the burden of proof. [40 CFR 122.41(n)(4)]

o. STANDARD PERMIT PROVISIONS FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS [40 CFR 122.42(c)]

The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the San Diego Water Board or State Water Board under 40 CFR 122.26(a)(1)(v) must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report must include:

(1) The status of implementing the components of the storm water management program that are established as permit conditions; [40 CFR 122.42(c)(1)]

(2) Proposed changes to the storm water management programs that are established as permit conditions. Such proposed changes must be consistent with 40 CFR 122.26(d)(2)(iii); [40 CFR 122.42(c)(2)] and

(3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under 40 CFR 122.26(d)(2)(iv) and (v); [40 CFR 122.42(c)(3)]

(4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; [40 CFR 122.42(c)(4)]

(5) Annual expenditures and budget for year following each annual report; [40 CFR 122.42(c)(5)]

(6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; [40 CFR 122.42(c)(6)]

(7) Identification of water quality improvements or degradation. [40 CFR 122.42(c)(7)]

p. STANDARD PERMIT PROVISIONS FOR STORM WATER DISCHARGES [40 CFR 122.42(d)]

The initial permits for discharges composed entirely of storm water issued pursuant to 40 CFR 122.26(e)(7) must require compliance with the conditions of the permit as expeditiously as practicable, but in no event later than three years after the date of issuance of the permit.

2. General Provisions

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. The general provisions applicable to this Order and NPDES permit are as follows:

a. DISCHARGE OF WASTE IS A PRIVILEGE

No discharge of waste into the waters of the State, whether or not such discharge is made pursuant to waste discharge requirements, shall create a vested right to continue such discharge. All discharges of waste into waters of the State are privileges, not rights. [CWC Section 13263(g)]

b. DURATION OF ORDER AND NPDES PERMIT

(1) *Effective date*. This Order supersedes Order No. R9-2007-0001 for the San Diego County Copermittees listed in Table 1a and became effective on June 27, 2013. This Order as amended by Order R9-2015-0001 supersedes Order No. R9-2009-0002 for the Orange County Copermittees listed in Table 1b and its amendments through Order No. R9-2015-0001 became effective April 1, 2015. This Order as amended by Order Nos. R9-2015-0001 and R9-2015-0100 supersedes Order No. R9-2010-0016 for the Riverside County Copermittees listed in Table 1c and its amendments through Order No. R9-2015-0100 became effective January 7, 2016.

(2) *Expiration*. This Order and NPDES permit expires five years after June 27, 2013, its initial effective date. [40 CFR 122.46(a)]

(3) *Continuation of expired order*. After this Order and NPDES permit expires, the terms and conditions of this Order and NPDES permit are automatically continued pending issuance of a new permit if all requirements of the federal NPDES regulations on the continuation of expired permits (40 CFR 122.6) are complied with.

c. AVAILABILITY

A copy of this Order must be kept at a readily accessible location and must be available to on-site personnel at all times.

d. CONFIDENTIALITY OF INFORMATION

Except as provided for in 40 CFR 122.7, no information or documents submitted in accordance with or in application for this Order will be considered confidential, and all such information and documents shall be available for review by the public at the San Diego Water Board office.

Claims of confidentiality for the following information will be denied: [40 CFR 122.7(b)]

(1) The name and address of any permit applicant or Copermittee; [40 CFR 122.7(b)(1)] and

(2) Permit applications and attachments, permits, and effluent data. [40 CFR 122.7(b)(2)]

e. EFFLUENT LIMITATIONS

(1) *Interim effluent limitations*. The Copermittee must comply with any interim effluent limitations as established by addendum, enforcement action, or revised waste discharge requirements which have been, or may be, adopted by the San Diego Water Board.

(2) *Other effluent limitations and standards*. If any applicable toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant and that standard or prohibition is more stringent than any limitation on the pollutant in the permit, the San Diego Water Board shall institute proceedings under these regulations to modify or revoke and reissue the permit to conform to the toxic effluent standard or prohibition. [40 CFR 122.44(b)(1)]

f. DUTY TO MINIMIZE OR CORRECT ADVERSE IMPACTS

The Copermittee must take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this Order, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the noncompliance.

g. PERMIT ACTIONS

The filing of a request by the Copermittee for modification, revocation and reissuance, or termination of this Order, or a notification of planned change in or anticipated noncompliance with this Order does not stay any condition of this Order. (See 40 CFR 122.41(f)) In addition, the following provisions apply to this Order:

(1) Upon application by any affected person, or on its own motion, the San Diego Water Board may review and revise the requirements in this Order. All requirements must be reviewed periodically. [CWC Section 13263(e)]

(2) This Order may be terminated or modified for cause, including, but not limited to, all of the following: [CWC Section 13381]

(a) Violation of any condition contained in the requirements of this Order. [CWC Section 13381(a)]

(b) Obtaining the requirements in this Order by misrepresentation, or failure to disclose fully all relevant facts. [CWC Section 13381(b)]

(c) A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge. [CWC Section 13381(c)]

(3) When this Order is transferred to a new owner or operator, such requirements as may be necessary under the CWC may be incorporated into this Order.

h. NPDES Permitted Non-Storm Water Discharges

The San Diego Water Board has, in prior years, issued a limited number of individual NPDES permits for non-storm water discharges to MS4s. The San Diego Water Board or State Water Board may in the future, upon prior notice to the Copermittee(s), issue an NPDES permit for any non-storm water discharge (or class of non-storm water discharges) to an MS4.

i. Monitoring

In addition to the standard provisions required under 40 CFR 122.41(j) and (l)(4), the following general monitoring provisions apply to this Order:

(1) Where procedures are not otherwise specified in Order, sampling, analysis and quality assurance/quality control must be conducted in accordance with the Quality Assurance Management Plan (QAMP) for the State of California's Surface Water Ambient Monitoring Program (SWAMP), adopted by the State Water Resources Control Board (State Water Board).

(2) Pursuant to 40 CFR 122.41(j)(2) and CWC Section 13383(a), each Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five (5) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time.

(3) All chemical, bacteriological, and toxicity analyses must be conducted at a laboratory certified for such analyses by the California Department of Public Health or a laboratory approved by the San Diego Water Board.

(4) For priority toxic pollutants that are identified in the California Toxics Rule (CTR) (65 Fed. Reg. 31682), the Copermittees must instruct their laboratories to establish calibration standards that are equivalent to or lower than the Minimum Levels (MLs) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP). If a Copermittee can demonstrate that a particular ML is not attainable, in accordance with procedures set forth in 40 CFR Part 136, the lowest quantifiable concentration of the lowest calibration standard analyzed by a specific analytical procedure (assuming that all the method specified sample weights, volumes, and processing steps have been followed) may be used instead of the ML listed in Appendix 4 of the SIP. The Copermittee must submit documentation from the laboratory to the San Diego Water Board for approval prior to raising the ML for any priority toxic pollutant.

j. ENFORCEMENT

(1) The San Diego Water Board is authorized to enforce the terms of this Order under several provisions of the CWC, including, but not limited to, CWC Sections 13385, 13386, and 13387.

(2) Nothing in this Order shall be construed to protect the Copermittee from its liabilities under federal, state, or local laws.

(3) The CWC provides for civil and criminal penalties comparable to, and in some cases greater than, those provided for under the CWA.

(4) Except as provided in the standard conditions required under 40 CFR 122.41(m) and (n), nothing in this Order shall be construed to relieve the Copermittee from civil or criminal penalties for noncompliance.

(5) Nothing in this Order shall be construed to preclude the institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties to which the Copermittee is or may be subject to under Section 311 of the CWA.

(6) Nothing in this Order shall be construed to preclude institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authoring preserved by Section 510 of the CWA.

k. SEVERABILITY

The provisions of this Order are severable, and if any provision of this Order, or the application of any provisions of this Order to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this Order shall not be affected thereby.

l. APPLICATIONS

Any application submitted by a Copermittee for reissuance or modification of this Order must satisfy all applicable requirements specified in federal regulations as well as any additional requirements for submittal of a Report of Waste Discharge specified in the CWC and the California Code of Regulations.

m. IMPLEMENTATION

All plans, reports and subsequent amendments submitted in compliance with this Order must be implemented immediately (or as otherwise specified). All submittals by Copermittees must be adequate to implement the requirements of this Order.

n. REPORT SUBMITTALS

(1) All report submittals must include an executive summary, introduction, conclusion, recommendations, and signed certified statement.

(2) Each Copermittee must submit a signed certified statement covering its responsibilities for each applicable submittal.

(3) The Principal Watershed Copermittee(s) must submit a signed certified statement covering its responsibilities for each applicable submittal and the sections of the submittals for which it is responsible.

(4) Unless otherwise directed, the Copermittees must submit one electronic copy of each report required under this Order to the San Diego Water Board at SanDiego@waterboards.ca.gov.

(5) When hard copies are requested or required, the Copermittees must submit reports and provide notifications as required by this Order to:

EXECUTIVE OFFICER
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
2375 NORTHSIDE DRIVE, SUITE 100
SAN DIEGO CA 92108
Telephone: (619) 516-1990 Fax: (619) 516-1994

ATTACHMENT C

ACRONYMS AND ABBREVIATIONS

AMAL	Average Monthly Action Level
ASBS	Area(s) of Special Biological Significance
BMP	Best Management Practice
Basin Plan	Water Quality Control Plan for the San Diego Basin
CEQA	California Environmental Quality Act
CCR	California Code of Regulations
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWC	California Water Code
CZARA	Coastal Zone Act Reauthorization Amendments of 1990
ESAs	Environmentally Sensitive Areas
GIS	Geographic Information System
IBI	Index of Biological Integrity
LID	Low Impact Development
MDAL	Maximum Daily Action Level
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
NAL	Non-Storm Water Action Level
NAICS	North American Industry Classification System
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
ROWD	Report of Waste Discharge (application for NPDES reissuance)
SAL	Storm Water Action Level
San Diego Water Board	California Regional Water Quality Control Board, San Diego Region
SIC	Standard Industrial Classification Code
State Water Board	State Water Resources Control Board
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
WDID	Waste Discharge Identification Number
WLA	Waste Load Allocation
WQBEL	Water Quality Based Effluent Limitation

DEFINITIONS

Active/Passive Sediment Treatment - Using mechanical, electrical or chemical means to flocculate or coagulate suspended sediment for removal from runoff from construction sites prior to discharge.

Anthropogenic Litter – Trash generated from human activities, not including sediment.

Average Monthly Action Level – The highest allowable average of daily discharges over a calendar month.

Beneficial Uses - The uses of water necessary for the survival or wellbeing of man, plants, and wildlife. These uses of water serve to promote tangible and intangible economic, social, and environmental goals. "Beneficial Uses" of the waters of the State that may be protected include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. Existing beneficial uses are uses that were attained in the surface or ground water on or after November 28, 1975; and potential beneficial uses are uses that would probably develop in future years through the implementation of various control measures. "Beneficial Uses" are equivalent to "Designated Uses" under federal law. [California Water Code Section 13050(f)].

Best Management Practices (BMPs) - Defined in 40 CFR 122.2 as schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Bioassessment - The use of biological community information to evaluate the biological integrity of a water body and its watershed. With respect to aquatic ecosystems, bioassessment is the collection and analysis of samples of the benthic macroinvertebrate community together with physical/habitat quality measurements associated with the sampling site and the watershed to evaluate the biological condition (i.e. biotic integrity) of a water body.

Biofiltration - Practices that use vegetation and amended soils to detain and treat runoff from impervious areas. Treatment is through filtration, infiltration, adsorption, ion exchange, and biological uptake of pollutants.

Biological Integrity - Defined in Karr J.R. and D.R. Dudley. 1981. Ecological perspective on water quality goals. *Environmental Management* 5:55-68 as: "A balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitat of the region." Also referred to as ecosystem health.

BMP Design Manual – A plan developed to eliminate, reduce, or mitigate the impacts of runoff from development projects, including Priority Development Projects.

Chronic Toxicity – A measurement of sublethal effect (e.g. reduced growth, reproduction) to experimental test organisms exposed to an effluent or receiving waters compared to that of the control organisms.

Clean Water Act Section 303(d) Water Body - An impaired water body in which water quality does not meet applicable water quality standards and/or is not expected to meet water quality standards, even after the application of technology based pollution controls required by the CWA. The discharge of runoff to these water bodies by the Copermittees is significant because these discharges can cause or contribute to violations of applicable water quality standards.

Construction Activities – Actions implemented during construction of development or redevelopment projects during the Preliminary Task (including rough grading and/or disking, clearing and grubbing operations, or any soil disturbance prior to mass grading), Grading or Land Development (including topography and slope reconfiguration, alluvium removals, canyon cleanouts, rock undercuts, keyway excavations, land form grading, and stockpiling of select material for capping operations), Streets and Utility Installation (including excavation and street paving, lot grading, curbs, gutters and sidewalks, public utilities, public water facilities including fire hydrants, public sanitary sewer systems, storm sewer systems and/or other drainage improvements), or Vertical Construction (including the build out of structures from foundations to roofing, including rough landscaping).

Construction Site – Any project, including projects requiring coverage under the Construction General Permit, that involves soil disturbing activities including, but not limited to, clearing, grading, disturbances to ground such as stockpiling, and excavation.

Contamination - As defined in the Porter-Cologne Water Quality Control Act, contamination is "an impairment of the quality of waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste whether or not waters of the State are affected."

Copermittee – A permittee to a NPDES permit that is only responsible for permit conditions relating to the discharge for which it is operator [40 CFR 122.26(b)(1)]. For the purposes of this Order, a Copermittee is one of the individual permittees identified in Tables 1a-1c of this Order.

Copermittees – All of the individual Copermittees, collectively.

Critical Channel Flow (Qc) – The channel flow that produces the critical shear stress that initiates bed movement or that erodes the toe of channel banks. When measuring Qc, it should be based on the weakest boundary material – either bed or bank.

Daily Discharge – Defined as either: (1) the total mass of the constituent discharged over the calendar day or any 24 hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g. concentration.)

The Daily Discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day, or other 24 hour period other than a day), or by the arithmetic mean of analytical results from one or more grab samples taken over the course of a day.

Development Projects - Construction, rehabilitation, redevelopment, or reconstruction of any public or private projects.

Dry Season –May 1 to September 30.

Dry Weather – Weather is considered dry if the preceding 72 hours has been without measurable precipitation (>0.1 inch).

Enclosed Bays – Enclosed bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost bay works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays do not include inland surface waters or ocean waters.

Erosion – When land is diminished or worn away due to wind, water, or glacial ice. Often the eroded debris (silt or sediment) becomes a pollutant via storm water runoff. Erosion occurs naturally but can be intensified by land clearing activities such as farming, development, road building, and timber harvesting.

Environmentally Sensitive Areas (ESAs) - Areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; areas designated as preserves or their equivalent under the Natural Communities Conservation Program within the Cities and County of Orange; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.

Estuaries – Waters, including coastal lagoons, located at the mouth of streams that serve as areas of mixing fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and ocean water. Estuaries do not include inland surface waters or ocean waters.

Existing Development – Any area that has been developed and exists for municipal, commercial, industrial, or residential purposes, uses, or activities. May include areas that are not actively used for its originally developed purpose, but may be re-purposed or redeveloped for another use or activity.

Flow Duration – The long-term period of time that flows occur above a threshold that causes significant sediment transport and may cause excessive erosion damage to creeks and streams (not a single storm event duration). The simplest way to visualize this is to consider a histogram of pre- and post-project flows using long-term records of hourly data. To maintain pre-development flow duration means that the total number of hours (counts) within each range of flows in a flow-duration histogram cannot increase between the pre- and post-development condition. Flow duration within the range of geomorphologically significant flows is important for managing erosion.

Grading - The cutting and/or filling of the land surface to a desired slope or elevation.

Groundwater – Subsurface water that occurs beneath the water table in soils and geologic formations that are fully saturated.

Hazardous Material – Any substance that poses a threat to human health or the environment due to its toxicity, corrosiveness, ignitability, explosive nature or chemical reactivity. These also include materials named by the USEPA in 40 CFR 116 to be reported if a designated quantity of the material is spilled into the waters of the U.S. or emitted into the environment.

Hazardous Waste - Hazardous waste is defined as "any waste which, under Section 600 of Title 22 of this code, is required to be managed according to Chapter 30 of Division 4.5 of Title 22 of this code" [CCR Title 22, Division 4.5, Chapter 11, Article 1].

Household Hazardous Waste – Paints, cleaning products, and other hazardous wastes generated during home improvement or maintenance activities.

Hydromodification – The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

Illicit Connection – Any man-made conveyance or drainage system through which a non-storm water discharge to the storm water drainage system occurs or may occur. Any connection to the MS4 that conveys an illicit discharge.

Illicit Discharge - Any discharge to the MS4 that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from firefighting activities [40 CFR 122.26(b)(2)].

Inactive Areas – Areas of construction activity that are not active and those that have been active and are not scheduled to be re-disturbed for at least 14 days.

Infiltration – In the context of low impact development, infiltration is defined as the percolation of water into the ground. Infiltration is often expressed as a rate (inches per hour), which is determined through an infiltration test. In the context of non-storm water, infiltration is water other than wastewater that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow [40 CFR 35.2005(20)].

Inland Surface Waters – Includes all surface waters of the State that do not include the ocean, enclosed bays, or estuaries.

Jurisdictional Runoff Management Program Document – A written description of the specific jurisdictional runoff management measures and programs that each Copermittee will implement to comply with this Order and ensure that storm water pollutant discharges in runoff are reduced to the MEP and do not cause or contribute to a violation of water quality standards.

Low Impact Development (LID) – A storm water management and land development strategy that emphasizes conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions.

Low Impact Development Best Management Practices (LID BMPs) – LID BMPs include schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States through storm water management and land development strategies that emphasize conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions. LID BMPs include retention practices that do not allow runoff, such as infiltration, rain water harvesting and reuse, and evapotranspiration. LID BMPs also include flow-through practices such as biofiltration that may have some discharge of storm water following pollutant reduction.

Major Outfall – As defined in the Code of Federal Regulations, a major outfall is a MS4 outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (i.e. discharge from a single conveyance other than a circular pipe which is associated with a drainage area of more than 50 acres); or, for MS4s that receive storm water from lands zoned for industrial activity (based on comprehensive zoning plans or equivalent), a MS4 outfall that discharges from a single pipe with an inside diameter of 12 inches or more or from its equivalent (i.e. discharge from other than a circular pipe associated with a drainage area of 2 acres or more).

Maximum Daily Action Level (MDAL) –The highest allowable daily discharge of a pollutant, over a calendar day (or 24 hour period). For pollutants with action levels expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with action levels expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

Maximum Extent Practicable (MEP) – The technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) for storm water that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) in combination with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than BAT. A definition for MEP is not provided either in the statute or in the regulations. Instead the definition of MEP is dynamic and will be defined by the following process over time: municipalities propose their definition of MEP by way of their runoff management programs. Their total collective and individual activities conducted pursuant to the runoff management programs becomes their proposal for MEP as it applies both to their overall effort, as well as to specific activities (e.g., MEP for street sweeping, or MEP for MS4 maintenance). In the absence of a proposal acceptable to the San Diego Water Board, the San Diego Water Board defines MEP.

In a memo dated February 11, 1993, entitled "Definition of Maximum Extent Practicable," Elizabeth Jennings, Senior Staff Counsel, SWRCB addressed the achievement of the MEP standard as follows:

"*To achieve the MEP standard, municipalities must employ whatever Best Management Practices (BMPs) are technically feasible (i.e., are likely to be effective) and are not cost prohibitive. The major emphasis is on technical feasibility. Reducing pollutants to the MEP means choosing effective BMPs, and rejecting applicable BMPs only where other effective BMPs will serve the same purpose, or the BMPs would not be technically feasible, or the cost would be prohibitive. In selecting BMPs to achieve the MEP standard, the following factors may be useful to consider:*

a. *Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?*
b. *Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?*
c. *Public Acceptance: Does the BMP have public support?*
d. *Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?*
e. *Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc.?*

The final determination regarding whether a municipality has reduced pollutants to the maximum extent practicable can only be made by the Regional or State Water Boards, and not by the municipal discharger. If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit derived, it would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs that would address a pollutant source, or to pick a BMP based solely on cost, which would be clearly less effective. In selecting BMPs the municipality must make a serious attempt to comply and practical solutions may not be lightly rejected. In any case, the burden would be on the municipal discharger to show compliance with its permit. After selecting a menu of BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented."

Monitoring Year – October 1 to September 30

Municipal Separate Storm Sewer System (MS4) – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designated or used for collecting or conveying storm water; (iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.26.

National Pollutant Discharge Elimination System (NPDES) - The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the CWA.

Non-Storm Water - All discharges to and from a MS4 that do not originate from precipitation events (i.e., all discharges from a MS4 other than storm water). Non-storm water includes illicit discharges and NPDES permitted discharges.

Nuisance - As defined in the Porter-Cologne Water Quality Control Act, a nuisance is "anything which meets all of the following requirements: 1) Is injurious to health, or is indecent, or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. 2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. 3) Occurs during, or as a result of, the treatment or disposal of wastes."

Ocean Waters – The territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the State Board's California Ocean Plan.

Order – Unless otherwise specified, refers to this Order, Order No. R9-2013-0001 (NPDES No. CAS0109266)

Outfall - Outfall means a point source as defined by 40 CFR 122.2 at the point where a municipal separate storm sewer discharges to waters of the US and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels or other conveyances which connect segments of the same stream or other waters of the US and are used to convey waters of the US.

Persistent Flow - Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

Person - A person is defined as an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof [40 CFR 122.2].

Point Source - Any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, landfill leachate collection systems, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

Pollutant - Any agent that may cause or contribute to the degradation of water quality such that a condition of pollution or contamination is created or aggravated.

Pollution - As defined in the Porter-Cologne Water Quality Control Act, pollution is "the alteration of the quality of the waters of the State by waste, to a degree which unreasonably affects either of the following: 1) The waters for beneficial uses; or 2) Facilities that serve these beneficial uses." Pollution may include contamination.

Pollution Prevention - Pollution prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control BMPs, treatment control BMPs, or disposal.

Pre-Development Runoff Conditions – Approximate flow rates and durations that exist or existed onsite before land development occurs. For new development projects, this equates to runoff conditions immediately before project construction. For redevelopment projects, this equates to runoff conditions from the project footprint assuming infiltration characteristics of the underlying soil, and existing grade. Runoff coefficients of concrete or asphalt must not be used. A redevelopment Priority Development Project must use available information pertaining to existing underlying soil type and onsite existing grade to estimate pre-development runoff conditions.

Priority Development Projects - New development and redevelopment projects defined under Provision E.3.b of Order No. R9-2013-0001, as amended by Order Nos. R9-2015-0001 and R9-2015-0100.

Rainy Season (aka Wet Season) –October 1 to April 30

Receiving Waters – Waters of the United States.

Receiving Water Limitations - Waste discharge requirements issued by the San Diego Water Board typically include both: (1) "Effluent Limitations" (or "Discharge Limitations") that specify the technology-based or water-quality-based effluent limitations; and (2) "Receiving Water Limitations" that specify the water quality objectives in the Basin Plan as well as any other limitations necessary to attain those objectives. In summary, the "Receiving Water Limitations" provision is the provision used to implement the requirements of CWA section 402(p)(3)(B).

Redevelopment - The creation and/or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure. Replacement of impervious surfaces includes any activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include routine maintenance activities, such as trenching and resurfacing associated with utility work; pavement grinding; resurfacing existing roadways, sidewalks, pedestrian ramps, or bike lanes on existing roads; and routine replacement of damaged pavement, such as pothole repair.

Regional Clearinghouse – A central location for the collection and distribution of information developed and maintained by the Copermittees including, but not limited to, plans, reports, manuals, data, contact information, and/or links to such documents and information.

Rehabilitation - Remedial measures or activities for the purpose of improving or restoring the beneficial uses of streams, channels or river systems. Techniques may vary from in-stream restoration techniques to off-line storm water management practices installed in the system corridor or upland areas, or a combination of in-stream and out of stream techniques. Rehabilitation techniques may include, but are not limited to the following: riparian zone restoration, constructed wetlands, channel modifications that improve habitat and stability, and daylighting of drainage systems.

Reporting Period – The period of information that is reported in the Water Quality Improvement Plan Annual Report. The reporting period consists of two components: 1) July 1 to June 30, consistent with the fiscal year, for the implementation of the jurisdictional runoff management programs, and 2) October 1 to September 30, consistent with the monitoring year for the monitoring and assessment programs. Together, these two time periods constitute the reporting year for the Water Quality Improvement Plan Annual Report due January 31 following the end of the monitoring year.

Retain – Keep or hold in a particular place, condition, or position without discharge to surface waters.

Retrofitting – Storm water management practice put into place after development has occurred in watersheds where the practices previously did not exist or are ineffective. Retrofitting of developed areas is intended to improve water quality, protect downstream channels, reduce flooding, or meet other specific objectives. Retrofitting developed areas may include, but is not limited to replacing roofs with green roofs, disconnecting downspouts or impervious surfaces to drain to pervious surfaces, replacing impervious surfaces with pervious surfaces, installing rain barrels, installing rain gardens, and trash area enclosures.

Runoff - All flows in a storm water conveyance system that consists of the following components: (1) storm water (wet weather flows) and (2) non-storm water including dry weather flows.

San Diego Water Board – As used in this document the term "San Diego Water Board" is synonymous with the term "Regional Board" as defined in Water Code section 13050(b) and is intended to refer to the California Regional Water Quality Control Board for the San Diego Region as specified in Water Code Section 13200.

Sediment - Soil, sand, and minerals washed from land into water. Sediment resulting from anthropogenic sources (i.e. human induced land disturbance activities) is considered a pollutant. This Order regulates only the discharges of sediment from anthropogenic sources and does not regulate naturally occurring sources of sediment. Sediment can destroy fish-nesting areas, clog animal habitats, and cloud waters so that sunlight does not reach aquatic plants.

Source Control BMP – Land use or site planning practices, or structural or nonstructural measures that aim to prevent runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between pollutants and runoff.

Storm Water – Per 40 CFR 122.26(b)(13), means storm water runoff, snowmelt runoff and surface runoff and drainage. Surface runoff and drainage pertains to runoff and drainage resulting from precipitation events.

Structural BMPs - A subset of BMPs which detains, retains, filters, removes, or prevents the release of pollutants to surface waters from development projects in perpetuity, after construction of a project is completed.

Test of Significant Toxicity (TST) - A statistical approach used to analyze toxicity test data. The TST incorporates a restated null hypothesis, Welch's t-test, and biological effect thresholds for chronic and acute toxicity.

Total Maximum Daily Load (TMDL) - The maximum amount of a pollutant that can be discharged into a water body from all sources (point and non-point) and still maintain water quality standards. Under CWA section 303(d), TMDLs must be developed for all water bodies that do not meet water quality standards after application of technology-based controls.

Toxicity - Adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies. The water quality objectives for toxicity provided in the Basin Plan, state in part…"All waters shall be

free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life….The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge."

Toxicity Identification Evaluation (TIE) - A set of procedures for identifying the specific chemical(s) responsible for toxicity. These procedures are performed in three phases (characterization, identification, and confirmation) using aquatic organism toxicity tests.

Toxicity Reduction Evaluation (TRE) - A study conducted in a step-wise process designed to identify the causative agents of effluent or ambient toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in toxicity. The first steps of the TRE consist of the collection of data relevant to the toxicity, including additional toxicity testing, and an evaluation of facility operations and maintenance practices, and best management practices. A Toxicity Identification Evaluation (TIE) may be required as part of the TRE, if appropriate.

Treatment Control BMP – Any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media absorption or any other physical, biological, or chemical process.

Unpaved Road – Any long, narrow stretch without pavement used for traveling by motor passenger vehicles between two or more points. Unpaved roads are generally constructed of dirt, gravel, aggregate or macadam and may be improved or unimproved.

Waste - As defined in CWC Section 13050(d), "waste includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal."

Article 2 of CCR Title 23, Chapter 15 (Chapter 15) contains a waste classification system that applies to solid and semi-solid waste, which cannot be discharged directly or indirectly to water of the state and which therefore must be discharged to land for treatment, storage, or disposal in accordance with Chapter 15. There are four classifications of waste (listed in order of highest to lowest threat to water quality): hazardous waste, designated waste, non-hazardous solid waste, and inert waste.

Water Quality Objective - Numerical or narrative limits on constituents or characteristics of water designated to protect designated beneficial uses of the water. [California Water Code Section 13050 (h)]. California's water quality objectives are established by the State and Regional Water Boards in the Water Quality Control Plans. Numeric or narrative limits for pollutants or characteristics of water designed to protect the beneficial uses of the water. In other words, a water quality objective is the maximum concentration of a pollutant that can exist in a receiving water and still generally ensure that the beneficial uses of the receiving water remain protected (i.e., not impaired). Since water quality objectives are designed specifically to protect the beneficial uses, when the objectives are violated the beneficial uses are, by definition, no longer protected and become impaired. This is a fundamental concept under the Porter Cologne Act. Equally fundamental is Porter Cologne's definition of pollution. A condition of pollution exists when the water quality needed to support designated beneficial uses has

become unreasonably affected or impaired; in other words, when the water quality objectives have been violated. These underlying definitions (regarding beneficial use protection) are the reason why all waste discharge requirements implementing the federal NPDES regulations require compliance with water quality objectives. (Water quality objectives are also called water quality criteria in the CWA.)

Water Quality Standards - Water quality standards, as defined in Clean Water Act section 303(c) consist of the beneficial uses (e.g., swimming, fishing, municipal drinking water supply, etc.,) of a water body and criteria (referred to as water quality objectives in the California Water Code) necessary to protect those uses. Under the Water Code, the water boards establish beneficial uses and water quality objectives in water quality control or basin plans. Together with an anti-degradation policy, these beneficial uses and water quality objectives serve as water quality standards under the Clean Water Act. In Clean Water Act parlance, state beneficial uses are called "designated uses" and state water quality objectives are called "criteria." Throughout this Order, the relevant term is used depending on the statutory scheme.

Waters of the State - Any water, surface or underground, including saline waters within the boundaries of the State [CWC section 13050 (e)]. The definition of the Waters of the State is broader than that for the Waters of the United States in that all water in the State is considered to be a Waters of the State regardless of circumstances or condition.

Waters of the United States - As defined in the 40 CFR 122.2, the Waters of the U.S. are defined as: "(a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate "wetlands;" (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters otherwise defined as waters of the United States under this definition: (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial seas; and (g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA."

Watershed - That geographical area which drains to a specified point on a water course, usually a confluence of streams or rivers (also known as drainage area, catchment, or river basin).

Wet Season (aka Rainy Season) – October 1 to April 30

Wet Weather – Weather is considered wet up to 72 hours after a storm event of 0.1 inches and greater, unless otherwise defined by another regulatory mechanism (e.g. a TMDL).

ATTACHMENT D

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

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JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

FY _____

I. COPERMITTEE INFORMATION

Copermittee Name:

Copermittee Primary Contact Name:

Copermittee Primary Contact Information:
Address:
City: County: State: Zip:
Telephone: Fax: Email:

II. LEGAL AUTHORITY

Has the Copermittee established adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐
A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority?	**YES**	☐
	NO	☐

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

Was an update of the jurisdictional runoff management program document required or recommended by the San Diego Water Board?	**YES**	☐
	NO	☐
If YES to the question above, did the Copermittee update its jurisdictional runoff management program document and make it available on the Regional Clearinghouse?	**YES**	☐
	NO	☐

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

Has the Copermittee implemented a program to actively detect and eliminate illicit discharges and connections to its MS4 that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

Number of non-storm water discharges reported by the public	
Number of non-storm water discharges detected by Copermittee staff or contractors	
Number of non-storm water discharges investigated by the Copermittee	
Number of sources of non-storm water discharges identified	
Number of non-storm water discharges eliminated	
Number of sources of illicit discharges or connections identified	
Number of illicit discharges or connections eliminated	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

V. DEVELOPMENT PLANNING PROGRAM

Has the Copermittee implemented a development planning program that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐
Was an update to the BMP Design Manual required or recommended by the San Diego Water Board?	**YES**	☐
	NO	☐
If YES to the question above, did the Copermittee update its BMP Design Manual and make it available on the Regional Clearinghouse?	**YES**	☐
	NO	☐

Number of proposed development projects in review	
Number of Priority Development Projects in review	
Number of Priority Development Projects approved	
Number of approved Priority Development Projects exempt from any BMP requirements	
Number of approved Priority Development Projects allowed alternative compliance	
Number of Priority Development Projects granted occupancy	

Number of completed Priority Development Projects in inventory	
Number of high priority Priority Development Project structural BMP inspections	
Number of Priority Development Project structural BMP violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

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VI. CONSTRUCTION MANAGEMENT PROGRAM

Has the Copermittee implemented a construction management program that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

Number of construction sites in inventory	
Number of active construction sites in inventory	
Number of inactive construction sites in inventory	
Number of construction sites closed/completed during reporting period	
Number of construction site inspections	
Number of construction site violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

Has the Copermittee implemented an existing development management program that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

	Municipal	Commercial	Industrial	Residential
Number of facilities or areas in inventory				
Number of existing development inspections				
Number of follow-up inspections				
Number of violations				
Number of enforcement actions issued				
Number of escalated enforcement actions issued				

VIII. PUBLIC EDUCATION AND PARTICIPATION

Has the Copermittee implemented a public education program component that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐
Has the Copermittee implemented a public participation program component that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

IX. FISCAL ANALYSIS

Has the Copermittee attached to this form a summary of its fiscal analysis that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

X. CERTIFICATION

I [☐ Principal Executive Officer ☐ Ranking Elected Official ☐ Duly Authorized Representative] certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature	Date
Print Name	Title
Telephone Number	Email

ATTACHMENT E

SPECIFIC PROVISIONS FOR TOTAL MAXIMUM DAILY LOADS APPLICABLE TO ORDER NO. R9-2013-0001, AS AMENDED BY ORDER NOS. R9-2015-0001 AND R9-2015-0100

These provisions implement load allocations (LAs) and wasteload allocations (WLAs) of the Total Maximum Daily Loads (TMDLs) established by the San Diego Water Board or USEPA under Clean Water Act section 303(c), applicable to discharges regulated under this Order. The provisions and schedules for implementation of the TMDLs described below must be incorporated into the Water Quality Improvement Plans, required pursuant to Provision B of this Order, for the specified Watershed Management Areas.

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed
2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin
3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed
4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek
5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay
6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)
7. Total Maximum Daily Load for Sediment in Los Peñasquitos Lagoon

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1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2002-0123

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	August 14, 2002
State Water Board Approval Date:	July 16, 2003
Office of Administrative Law Approval Date:	September 11, 2003
US EPA Approval Date:	November 3, 2003

(3) TMDL Effective Date: September 11, 2003

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final diazinon TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must be in compliance with the final TMDL compliance requirements as of December 31, 2010.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations:

Table 1.1
Final Receiving Water Limitations Expressed as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Diazinon	Acute	0.08 µg/L	1 hour
	Chronic	0.05 µg/L	4 days

(b) Final Effluent Limitations

Discharges from the MS4s containing concentrations that do not exceed the following effluent limitations will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 1.b.(2)(a):

Table 1.2
Final Effluent Limitations Expressed as Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation	Averaging Period
Diazinon	Acute	0.072 µg/L	1 hour
	Chronic	0.045 µg/L	4 days

(c) Best Management Practices

The following BMPs for Chollas Creek must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area and implemented by the Responsible Copermittees:

(i) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 1.b.(2)(a) and/or the effluent limitations under Specific Provision 1.b.(2)(b) for Chollas Creek.

(ii) The Responsible Copermittees must implement the Diazinon Toxicity Control Plan and Diazinon Public Outreach/Education Program as described in the report titled, *Technical Report for Total Maximum Daily Load for Diazinon in Chollas Creek Watershed, San Diego County*, dated August 14, 2002, including subsequent modifications, in order to achieve the receiving water limitations under Specific Provision 1.b.(2)(a) and/or the effluent limitations under Specific Provision 1.b.(2)(b).

(iii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 1.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 1.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 1.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 1.b.(2)(c) achieves compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 1.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 1.d, to demonstrate compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The Responsible Copermittees must be in compliance with the final diazinon TMDL compliance requirements as of December 31, 2010.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls for diazinon within the Chollas Creek watershed, and calculate or estimate the annual diazinon loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment

Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 1.b.(2)(b), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0019

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	September 22, 2005
Office of Administrative Law Approval Date:	December 2, 2005
US EPA Approval Date:	February 8, 2006

(3) TMDL Effective Date: December 2, 2005

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Shelter Island Yacht Basin

(6) Responsible Copermittee: City of San Diego

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final dissolved copper TMDL compliance requirements for Shelter Island Yacht Basin consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittee must be in compliance with the final TMDL compliance requirements as of December 2, 2005.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations:

Table 2.1
Final Receiving Water Limitations Expressed as Concentrations in Shelter Island Yacht Basin

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Dissolved Copper	Acute	4.8 µg/L x WER*	1 hour
	Chronic	3.1 µg/L x WER*	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 2.b.(2)(a):

Table 2.2
Final Effluent Limitations as Expressed as Annual Loads in MS4 Discharges to Shelter Island Yacht Basin

Constituent	Effluent Limitation
Dissolved Copper	30 kg/yr*

* If the water quality objectives for dissolved copper in Shelter Island Yacht Basin are changed in the future, then the margin of safety (MOS), TMDL and allocations will be recalculated using the *Method for Recalculation of the Total Maximum Daily Load for Dissolved Copper in the Shelter Island Yacht Basin, San Diego Bay* in the Basin Plan (p. 7-14).

(c) Best Management Practices

The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 2.b.(2)(a) and/or the effluent limitations under Specific Provision 2.b.(2)(b) for Shelter Island Yacht Basin. The BMPs must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 2.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 2.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittee develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 2.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 2.b.(2)(c) achieves compliance with Specific Provisions 2.b.(3)(a), 2.b.(3)(b) and/or 2.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 2.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 2.d, to demonstrate compliance with Specific Provisions 2.b.(3)(a), 2.b.(3)(b) and/or 2.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The Responsible Copermittees must be in compliance with the final dissolved copper TMDL compliance requirements as of December 2, 2005.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

The Responsible Copermittee must monitor the effluent of its MS4 outfalls for dissolved copper, and calculate or estimate the monthly and annual dissolved copper loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.(b)(2)of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0036

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	November 16, 2005
Office of Administrative Law Approval Date:	February 1, 2006
US EPA Approval Date:	March 22, 2006

(3) TMDL Effective Date: February 1, 2006

(4) Watershed Management Area: Santa Margarita River

(5) Water Body: Rainbow Creek

(6) Responsible Copermittee: County of San Diego

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final total nitrogen and total phosphorus TMDL compliance requirements for Rainbow Creek consist of the following

(1) Final TMDL Compliance Date

The Responsible Copermittee must comply with final TMDL compliance requirements by December 31, 2021.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance date under Specific Provision 3.b.(1):

Table 3.1
Final Receiving Water Limitations Expressed as Concentrations in Rainbow Creek

Constituent	Receiving Water Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing concentrations that do not exceed the following effluent limitations by the compliance date under Specific Provision 3.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 3.b.(2)(a):

Table 3.2
Final Effluent Limitations Expressed as Concentrations in MS4 Discharges to Rainbow Creek

Constituent	Effluent Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(ii) Annual pollutant loads from given land uses discharging to and from the MS4s that do not exceed the following annual loads by the compliance date under Specific Provision 3.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 3.b.(2)(a):

Table 3.3
Final Effluent Limitations Expressed as Annual Loads in MS4 Discharges to Rainbow Creek

Land Use	Total N	Total P
Commercial nurseries	116 kg/yr	3 kg/yr
Park	3 kg/yr	0.1 kg/yr
Residential areas	149 kg/yr	12 kg/yr
Urban areas	27 kg/yr	6 kg/yr

(c) Best Management Practices

(i) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 3.b.(2)(a) and/or the effluent limitations under Specific Provision 3.b.(2)(b) for Rainbow Creek.

(ii) The Responsible Copermittee should coordinate any BMPs implemented to address this TMDL with Caltrans and other sources as possible.

(3) <u>Final TMDL Compliance Determination</u>

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 3.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 3.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the final effluent limitations under Specific Provision 3.b.(2)(b)(ii); OR

(e) The Responsible Copermittee develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 3.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Specific Provision 3.b.(2)(c) achieves compliance with Specific Provisions 3.b.(3)(a), 3.b.(3)(b), 3.b.(3)(c) and/or 3.b.(3)(d),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 3.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 3.d, to demonstrate compliance with Specific Provisions 3.b.(3)(a), 3.b.(3)(b), 3.b.(3)(c) and/or 3.b.(3)(d).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim total nitrogen and total phosphorus TMDL compliance requirements for Rainbow Creek consist of the following:

(1) Interim Compliance Dates and WQBELs

The Responsible Copermittee must comply with the interim WQBELs, expressed as annual loads, by December 31 of the interim compliance year given in Table 3.4.

Table 3.4
Interim Water Quality Based Effluent Limitations Expressed as Annual Loads in MS4 Discharges from Specific Land Uses to Rainbow Creek

	Total N Interim Effluent Limitations (kg/yr)			Total P Interim Effluent Limitations (kg/yr)		
	Interim Compliance Date			Interim Compliance Date		
Land Use	**2009**	**2013**	**2017**	**2009**	**2013**	**2017**
Commercial nurseries	390	299	196	20	16	10
Park	5	3	3	0.15	0.10	0.10
Residential areas	507	390	260	99	74	47
Urban areas	40	27	27	9	6	6

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 3.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 3.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the final effluent limitations under Specific Provision 3.b.(2)(b)(ii); OR

(e) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the interim effluent limitations under Specific Provision 3.c.(1); OR

(f) The Responsible Copermittee has submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

d. Specific Monitoring and Assessment Requirements

(1) The Responsible Copermittee must incorporate into the Water Quality Improvement Plan and implement the Sampling and Analysis Plan for Rainbow Creek Nutrient Reduction TMDL Implementation Water Quality Monitoring, dated January 2010.

(2) The results of any monitoring conducted during the reporting period, and assessment of whether the interim and final TMDL compliance requirements have been achieved must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 3.b.(2)(b)(i), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2007-0043

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2007
State Water Board Approval Date:	July 15, 2008
Office of Administrative Law Approval Date:	October 22, 2008
US EPA Approval Date:	December 18, 2008

(3) TMDL Effective Date: October 22, 2008

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final dissolved copper, lead, and zinc TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must comply with the final TMDL compliance requirements by October 22, 2028.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance date under Specific Provision 4.b.(1):

Table 4.1
Final Receiving Water Limitations Expressed as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$(0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$(0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$(0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$(0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations by the compliance date under Specific Provision 4.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 4.b.(2)(a):

Table 4.2
Final Effluent Limitations as Expressed Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(c) Best Management Practices

(i) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 4.b.(2)(a) and/or the effluent limitations under Specific Provision 4.b.(2)(b) for Chollas Creek.

(ii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans and the U.S. Navy as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 4.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 4.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 4.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 4.b.(2)(c) achieves compliance with Specific Provisions 4.b.(3)(a), 4.b.(3)(b) and/or 4.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 4.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 4.d, to demonstrate compliance with Specific Provisions 4.b.(3)(a), 4.b.(3)(b) and/or 4.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim dissolved copper, lead, and zinc TMDL compliance requirements for Chollas Creek consist of the following:

(1) Interim Compliance Date and WQBELs

The Responsible Copermittee must comply with the interim WQBELs, expressed as concentrations, by the interim compliance date given in Table 4.3:

Table 4.3
Interim Water Quality Based Effluent Limitations Expressed as Concentrations in MS4 Discharges to Chollas Creek

Interim Compliance Date	Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
October 22, 2018	Dissolved Copper	Acute	$1.2 \times 90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
	Dissolved Lead	Acute	$1.2 \times 90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
	Dissolved Zinc	Acute	$1.2 \times 90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 4.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 4.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) There are no exceedances of the interim effluent limitations under Specific Provision 4.c.(1) at the Responsible Copermittee's MS4 outfalls; OR

(e) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance date.

d. Specific Monitoring and Assessment Requirements

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*, when it is amended to include monitoring requirements for the Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls discharging to Chollas Creek for dissolved copper, lead, and zinc, and calculate or estimate the monthly and annual dissolved copper, lead, and zinc loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 4.b.(2)(b) or 4.c.(1), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2008-0027

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 11, 2008
State Water Board Approval Date:	June 16, 2009
Office of Administrative Law Approval Date:	September 15, 2009
US EPA Approval Date:	October 26, 2009

(3) TMDL Effective Date: September 15, 2009

(4) Watershed Management Areas: See Table 5.0

(5) Water Bodies: See Table 5.0

(6) Responsible Copermittees: See Table 5.0

Table 5.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County	Dana Point Harbor	Baby Beach	-City of Dana Point -County of Orange
San Diego Bay	San Diego Bay	Shelter Island Shoreline Park	- San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final indicator bacteria TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Final TMDL Compliance Dates

(a) Baby Beach in Dana Point Harbor

The Responsible Copermittees for MS4 discharges to Baby Beach must be in compliance with the final TMDL compliance requirements according to the following compliance dates:

Table 5.1
Compliance Dates to Achieve Final TMDL Compliance Requirements For Baby Beach in Dana Point Harbor

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform	September 15, 2014	September 15, 2009
Fecal Coliform		September 15, 2009
Enterococcus		September 15, 2019

(b) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park must be in compliance with the final TMDL compliance requirements as of December 31, 2012.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance dates under Specific Provision 5.b.(1):

Table 5.2
Final Receiving Water Limitations Expressed as Bacteria Densities in the Water Body

	Receiving Water Limitations	
Constituent	Single Sample Maximum[1,2]	30-Day Geometric Mean[2]
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing indicator bacteria densities that do not exceed the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.3a
Final Effluent Limitations as Expressed as Bacteria Densities in MS4 Discharges to the Water Body

	Effluent Limitations	
Constituent	**Single Sample Maximum[1,2]**	**30-Day Geometric Mean[2]**
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.

(ii) Discharges from the MS4s containing indicator bacteria loads that do not exceed the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.4a
Final Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to the Baby Beach in Dana Point Harbor

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0.86×10^9 MPN/day	$3{,}254 \times 10^9$ MPN/30days
Fecal Coliform	0.17×10^9 MPN/day	112×10^9 MPN/30days
Enterococcus	0.03×10^9 MPN/day	114×10^9 MPN/30days

Table 5.4b
Final Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to the Shelter Island Shoreline Park in San Diego Bay

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0 MPN/day	198×10^9 MPN/30days
Fecal Coliform	0 MPN/day	8×10^9 MPN/30days
Enterococcus	0 MPN/day	26×10^9 MPN/30days

(iii) Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.5a
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to Baby Beach in Dana Point Harbor*

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	90.4%	0%
Fecal Coliform	82.7%	0%
Enterococcus	96.2%	62.2%

Notes:
* The percent load reductions are relative to data collected between 1996-2002. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittees' MS4s must not exceed the loads in Table 5.4a, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the water body.

Table 5.5b
*Final Effluent Limitations Expressed as Percent Load Reductions** in MS4 Discharges to Shelter Island Shoreline Park in San Diego Bay*

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0%	0%
Fecal Coliform	0%	0%
Enterococcus	0%	0%

Notes:
* The percent load reductions are relative to data collected between 1999-2004. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittee's MS4s must not exceed the loads in Table 5.4b, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the water body.

(c) Best Management Practices

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 5.0 must incorporate the Bacteria Load Reduction Plan (BLRP) required to be developed pursuant to Resolution No. R9-2008-0027.

(ii) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 5.b.(2)(a) and/or the effluent limitations under Specific Provision 5.b.(2)(b) for the segments or areas of the water bodies listed in Table 5.0

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.b.(2)(b)(ii); OR

(e) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 5.b.(2)(b)(iii); OR

(f) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(g) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 5.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 5.b.(2)(c) achieves compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 5.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 5.d, to demonstrate compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim indicator bacteria TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Baby Beach in Dana Point Harbor

(a) Interim TMDL Compliance Dates and WQBELs

The Responsible Copermittees for MS4 discharges to Baby Beach must comply with the following interim WQBELs by the interim compliance dates given in Tables 5.6a and/or 5.6b:

Table 5.6a
Interim Water Quality Based Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to Baby Beach in Dana Point Harbor

Constituent	Interim Compliance Dates	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	4.93×10^9 MPN/day	$3{,}254 \times 10^9$ MPN/30days*
Fecal Coliform	September 15, 2012	0.59×10^9 MPN/day	112×10^9 MPN/30days*
Enterococcus	September 15, 2012	0.42×10^9 MPN/day	301×10^9 MPN/30days
	September 15, 2016	0.03×10^9 MPN/day *	207×10^9 MPN/30days

Notes:
* Same as the final effluent limitations in Table 5.4a.

Table 5.6b
Interim Water Quality Based Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to Baby Beach in Dana Point Harbor*

Constituent	Interim Compliance Dates	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	45.2%	0%**
Fecal Coliform	September 15, 2012	41.4%	0%**
Enterococcus	September 15, 2012	48.1%	0%
	September 15, 2016	96.2%**	31.1%

Notes:
* The percent load reductions are relative to data collected between 1996-2002. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittees' MS4s must not exceed the loads in Table 5.6a, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the waterbody.
** Same as the final effluent limitations in Table 5.5a.

(b) Interim Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(i) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(ii) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(iii) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(iv) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.b(2)(b)(ii); OR

(v) The Responsible Copermittees can demonstrate that exceedances of the applicable receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(vi) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the interim effluent limitations under Table 5.6a of Specific Provision 5.c.(1)(a); OR

(vii) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the interim effluent limitations under Table 5.6b of Specific Provision 5.c.(1)(a); OR

(viii) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

(2) <u>Shelter Island Shoreline Park in San Diego Bay</u>

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park must be in compliance with the final indicator bacteria TMDL requirements as of December 31, 2012.

d. Specific Monitoring and Assessment Requirements

(1) Monitoring Stations

Monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[38] If discharges of bacteria from the MS4 exceed the applicable interim or final WQBELs, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(2) Monitoring Procedures

(a) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) The Responsible Copermittees must collect wet weather monitoring samples within the first 24 hours of a storm event[39] of the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(c) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

[38] Commonly referred to as AB 411 monitoring
[39] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs have been achieved.

(b) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 5.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(c) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to correlate elevated bacteria levels with known or suspected sewage spills from wastewater collection systems and treatment plants or boats.

(d) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2010-0001

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date: February 10, 2010
State Water Board Approval Date: December 14, 2010
Office of Administrative Law Approval Date: April 4, 2011
US EPA Approval Date: June 22, 2011

(3) TMDL Effective Date: April 4, 2011

(4) Watershed Management Areas: See Table 6.0

(5) Water Bodies: See Table 6.0

(6) Responsible Copermittees: See Table 6.0

Table 6.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	-City of Laguna Beach -County of Orange -Orange County Flood Control District
		at Heisler Park - North	
	Pacific Ocean Shoreline	at Main Laguna Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Woods -County of Orange -Orange County Flood Control District
		Laguna Beach at Ocean Avenue	
		Laguna Beach at Cleo Street	
		Arch Cove at Bluebird Canyon Road	
		Laguna Beach at Dumond Drive	
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Hills -City of Laguna Niguel -City of Laguna Woods -City of Lake Forest -City of Mission Viejo -County of Orange -Orange County Flood Control District
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	
	Aliso Creek Mouth	at mouth	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	-City of Dana Point -City of Laguna Beach -City of Laguna Niguel -County of Orange -Orange County Flood Control District
		Aliso Beach at Table Rock Drive	
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)	
		at Salt Creek (large outlet)	
		Salt Creek Beach at Salt Creek service road	
		Salt Creek Beach at Strand Road	
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	-City of Dana Point -City of Laguna Hills -City of Laguna Niguel -City of Mission Viejo -City of Rancho Santa Margarita -City of San Juan Capistrano -County of Orange -Orange County Flood Control District
	San Juan Creek	lower 1 mile	
	San Juan Creek Mouth	at mouth	
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	-City of Dana Point -City of San Clemente -County of Orange -Orange County Flood Control District
		Ole Hanson Beach Club Beach at Pico Drain	
		San Clemente City Beach at El Portal Street Stairs	
		San Clemente City Beach at Mariposa Street	
		San Clemente City Beach at Linda Lane	
		San Clemente City Beach at South Linda Lane	
		San Clemente City Beach at Lifeguard Headquarters	
		under San Clemente Municipal Pier	
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	
		San Clemente State Beach at Riviera Beach	
		Can Clemente State Beach at Cypress Shores	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	-City of Oceanside -City of Vista -County of San Diego
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	-City of Carlsbad -City of Encinitas -City of Escondido -City of San Marcos -County of San Diego
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	-City of Del Mar -City of Escondido -City of Poway -City of San Diego -City of Solana Beach -County of San Diego
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	-City of Del Mar -City of Poway -City of San Diego -County of San Diego
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	-City of San Diego
		La Jolla Shores Beach at Caminito del Oro	
		La Jolla Shores Beach at Vallecitos	
		La Jolla Shores Beach at Avenida de la Playa	
		at Casa Beach, Children's Pool	
		South Casa Beach at Coast Boulevard	
		Whispering Sands Beach at Ravina Street	
		Windansea Beach at Vista de la Playa	
		Windansea Beach at Bonair Street	
		Windansea Beach at Playa del Norte	
		Windansea Beach at Palomar Avenue	
		at Tourmaline Surf Park	
		Pacific Beach at Grand Avenue	
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I- Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	-City of El Cajon -City of Santee -County of San Diego
	San Diego River	lower 6 miles	-City of El Cajon -City of La Mesa -City of San Diego -City of Santee -County of San Diego
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	-City of La Mesa -City of Lemon Grove -City of San Diego -County of San Diego - San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final indicator bacteria TMDL compliance requirements for the water bodies listed in Table 6.0 consist of the following:

(1) Final TMDL Compliance Dates

The Responsible Copermittees for MS4 discharges to the water bodies listed in Table 6.0 must be in compliance with the final TMDL compliance requirements according to the following compliance dates:

Table 6.1
Compliance Dates to Achieve Final TMDL Compliance Requirements

Constituent	Dry Weather TMDL Compliance Date	Wet Weather TMDL Compliance Date*
Total Coliform	April 4, 2021	April 4, 2031 (April 4, 2021)
Fecal Coliform		
Enterococcus		

* The Wet Weather TMDL Compliance Date in parenthesis applies if the applicable Water Quality Improvement Plan does not include load reduction programs for other constituents (e.g. metals, pesticides, trash, nutrients, sediment, etc.) together with bacteria load reduction requirements of these TMDLs.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance dates under Specific Provision 6.b.(1):

Table 6.2a
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Beaches

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform	10,000	22%	1,000	0%
Fecal Coliform	400	22%	200	0%
Enterococcus	104	22%	35	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan.

Table 6.2b
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Creeks

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Fecal Coliform	400	22%	200	0%
Enterococcus	61 (104)	22%	33	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Basin Plan.
d. A single sample maximum of 104 MPN/100ml for *Enterococcus* may be applied as a receiving water limitation for creeks, instead of 61 MPN/100mL, if one or more of the creeks addressed by these TMDLs (San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek, San Diego River, and/or Chollas Creek) is designated with a "moderately to lightly used area" or less frequent usage frequency in the Basin Plan. Otherwise, the single sample maximum of 61 MPN/100mL for *Enterococcus* must be used to assess compliance with the allowable exceedance frequency.

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing indicator bacteria densities that do not exceed the following effluent limitations by the compliance dates under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a):

Table 6.2c
Final Effluent Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies in MS4 Discharges to the Water Body

Constituent	Concentration-Based Effluent Limitations			
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform[d]	10,000	22%	1,000	0%
Fecal Coliform	400	22%	200	0%
Enterococcus	104[e] / 61[f]	22%	35[e] / 33[f]	0%

Notes:
a. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan for discharges to beaches, and the Basin Plan for discharges to creeks and creek mouths.
d. Total coliform effluent limitations only apply to MS4 outfalls that discharge to the Pacific Ocean Shorelines and creek mouths listed in Table 6.0.
e. This *Enterococcus* effluent limitation applies to MS4 discharges to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
f. This *Enterococcus* effluent limitation applies to MS4 discharges to segments or areas of creeks or creek mouths listed in Table 6.0.

(ii) Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the compliance dates under Specific Provision 6.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a):

Table 6.3
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watershed and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
South Orange County	**San Joaquin Hills HSA** (901.11) and **Laguna Hills HSA** (901.12) - Pacific Ocean Shoreline	91.78%	91.72%	98.28%	46.85%	52.07%	51.26%
	Aliso HSA (901.13) - Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	95.47%	95.58%	99.13%	25.29%	26.62%	27.52% (27.37%)**
	Dana Point HSA (901.14) - Pacific Ocean Shoreline	95.04%	95.03%	98.98%	13.15%	14.86%	15.16%
	Lower San Juan HSA (901.27) - Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	72.96%	74.21%	94.94%	19.21%	12.82%	27.12% (26.90%)**
	San Clemente HA (901.30) - Pacific Ocean Shoreline	94.28%	94.23%	98.83%	23.85%	24.58%	25.26%
San Luis Rey River	**San Luis Rey HU** (903.00) - Pacific Ocean Shoreline	38.13%	39.09%	87.38%	5.62%	3.12%	11.69%

Table 6.3 (Cont'd)
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watershed and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
Carlsbad	**San Marcos HA** (904.50) - Pacific Ocean Shoreline	82.82%	82.55%	96.03%	18.47%	18.98%	20.19%
San Dieguito River	**San Dieguito HU** (905.00) - Pacific Ocean Shoreline	14.39%	20.72%	83.48%	4.29%	1.46%	7.72%
Penasquitos	**Miramar Reservoir HA** (906.10) - Pacific Ocean Shoreline	96.50%	96.59%	99.42%	1.61%	1.99%	1.93%
Mission Bay	**Scripps HA** (906.30) - Pacific Ocean Shoreline	96.44%	96.42%	99.25%	16.32%	21.14%	18.82%
	Tecolote HA (906.50) - Tecolote Creek	94.51%	94.59%	98.94%	16.51%	20.47%	18.15% (18.08%)**
San Diego River	**Mission San Diego HSA** (907.11) and **Santee HSA** (907.12) - Pacific Ocean Shoreline - Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles)	74.03%	69.44%	93.96%	38.14%	53.22%	42.74% (42.47%)**
San Diego Bay	**Chollas HSA** (908.22) - Chollas Creek	92.06%	92.15%	98.46%	17.82%	24.84%	21.46% (21.36%)**

Notes:
* The percent load reductions are based on reducing loads compared to pollutant loads from 2001 to 2002.
** The alternative *Enterococcus* percent load reduction was calculated based on a numeric target of 104 MPN/100mL instead of 61 MPN/100mL, protective of the REC-1 "moderately to lightly used area" usage frequency that is protective of freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative pollutant load reductions can be utilized.

(c) Best Management Practices

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 6.0 must incorporate the Bacteria Load Reduction Plans (BLRPs) or Comprehensive Load Reduction Plans (CLRPs) required to be developed pursuant to Resolution No. R9-2010-0001.

(ii) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 6.b.(2)(a) and/or the effluent limitations under Specific Provision 6.b.(2)(b) for the segments or areas of the water bodies listed in Table 6.0.

(iii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans, owners/operators of small MS4s, and agricultural dischargers as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(f) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 6.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 6.b.(2)(c) achieves compliance with Specific Provisions 6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), and/or 6.b.(3)(e),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 6.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 6.d, to demonstrate compliance with Specific Provisions 6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), 6.b.(3)(e) and/or 6.b.(3)(f).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim indicator bacteria TMDL compliance requirements for the water bodies listed in Table 6.0 consist of the following:

(1) Interim TMDL Compliance Dates

The Responsible Copermittees must achieve compliance with the interim TMDL compliance requirements, as determined in accordance with Specific Provision 6.c.(3), by the interim compliance dates given in Table 6.4, unless alternative interim compliance dates are accepted by the San Diego Water Board Executive Officer as part of the Water Quality Improvement Plan.

Table 6.4
Interim Compliance Dates to Achieve Interim TMDL Compliance Requirements

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs*
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	April 4, 2016	April 4, 2021 (April 4, 2016)
		at Heisler Park - North		
	Pacific Ocean Shoreline	at Main Laguna Beach	April 4, 2016	April 4, 2021 (April 4, 2016)
		Laguna Beach at Ocean Avenue		
		Laguna Beach at Cleo Street		
		Arch Cove at Bluebird Canyon Road		
		Laguna Beach at Dumond Drive		
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	April 4, 2016	April 4, 2021 (April 4, 2016)
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	April 4, 2018	April 4, 2021 (April 4, 2018)
	Aliso Creek Mouth	at mouth	April 4, 2018	April 4, 2021 (April 4, 2018)
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	April 4, 2016	April 4, 2021 (April 4, 2016)
		Aliso Beach at Table Rock Drive		
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)		
		at Salt Creek (large outlet)		
		Salt Creek Beach at Salt Creek service road	April 4, 2017	April 4, 2021 (April 4, 2017)
		Salt Creek Beach at Strand Road	April 4, 2017	April 4, 2021 (April 4, 2017)

Table 6.4 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs*
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	April 4, 2016	April 4, 2021 (April 4, 2016)
	San Juan Creek	lower 1 mile	April 4, 2018	April 4, 2021 (April 4, 2018)
	San Juan Creek Mouth	at mouth	April 4, 2016	April 4, 2021 (April 4, 2016)
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	April 4, 2016	April 4, 2021 (April 4, 2016)
		Ole Hanson Beach Club Beach at Pico Drain	April 4, 2016	April 4, 2021 (April 4, 2016)
		San Clemente City Beach at El Portal Street Stairs	April 4, 2017	April 4, 2021 (April 4, 2017)
		San Clemente City Beach at Mariposa Street		
		San Clemente City Beach at Linda Lane	April 4, 2016	April 4, 2021 (April 4, 2016)
		San Clemente City Beach at South Linda Lane	April 4, 2018	April 4, 2021 (April 4, 2018)
		San Clemente City Beach at Lifeguard Headquarters	April 4, 2017	April 4, 2021 (April 4, 2017)
		under San Clemente Municipal Pier		
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	April 4, 2018	April 4, 2021 (April 4, 2018)
		San Clemente State Beach at Riviera Beach	April 4, 2016	April 4, 2021 (April 4, 2016)
		Can Clemente State Beach at Cypress Shores	April 4, 2017	April 4, 2021 (April 4, 2017)
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	April 4, 2017	April 4, 2021 (April 4, 2017)
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	April 4, 2016	April 4, 2021 (April 4, 2016)
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	April 4, 2016	April 4, 2021 (April 4, 2016)

Table 6.4 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates	
			Interim Dry Weather WQBELs	Interim Wet Weather WQBELs*
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	April 4, 2016	April 4, 2021 (April 4, 2016)
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	April 4, 2016	April 4, 2021 (April 4, 2016)
		La Jolla Shores Beach at Caminito del Oro		
		La Jolla Shores Beach at Vallecitos		
		La Jolla Shores Beach at Avenida de la Playa		
		at Casa Beach, Children's Pool		
		South Casa Beach at Coast Boulevard		
		Whispering Sands Beach at Ravina Street		
		Windansea Beach at Vista de la Playa		
		Windansea Beach at Bonair Street		
		Windansea Beach at Playa del Norte		
		Windansea Beach at Palomar Avenue		
		at Tourmaline Surf Park		
		Pacific Beach at Grand Avenue		
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries		
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	April 4, 2018	April 4, 2021 (April 4, 2018)
	San Diego River	lower 6 miles		
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach		
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	April 4, 2018	April 4, 2021 (April 4, 2018)

* The Interim Compliance Dates to achieve the Interim Wet Weather WQBELs in parenthesis apply if the applicable Water Quality Improvement Plan does not include load reduction programs for other constituents (e.g. metals, pesticides, trash, nutrients, sediment, etc.) together with bacteria load reduction requirements of these TMDLs.

(2) Interim Water Quality Based Effluent Limitations

The Responsible Copermittees for discharges to the water bodies in Table 6.0 must comply with the following interim WQBELs by the interim compliance dates given in Specific Provision 6.c.(1):

(a) Interim Receiving Water Limitations

(i) *Interim Dry Weather Receiving Water Limitations*

The Responsible Copermittee must calculate the "existing" exceedance frequencies of the 30-day geometric mean water quality objectives for each of the indicator bacteria by analyzing the available monitoring data collected between January 1, 1996 and December 31, 2002. "Existing" exceedance frequencies may be calculated by water body and/or by Watershed Management Area listed in Table 6.0. Separate "existing" exceedance frequencies must be calculated for beaches and creeks/creek mouths.

The Responsible Copermittees must achieve a 50 percent reduction in the "existing" exceedance frequency of the 30-day geometric mean WQBELs for the water bodies listed in Table 6.0 by the interim compliance dates given in Table 6.4. A 50 percent reduction in the "existing" exceedance frequency is equivalent to half of the "existing" exceedance frequency of the 30-day geometric mean WQBELs.

The "existing" exceedance frequencies and the interim dry weather allowable exceedance frequencies (i.e. interim dry weather receiving water limitations) calculated by the Responsible Copermittees must be included in the Water Quality Improvement Plans for the applicable Watershed Management Areas.

(ii) *Interim Wet Weather Receiving Water Limitations*

The Responsible Copermittees must achieve the interim wet weather receiving water limitations in Table 6.5, expressed as interim wet weather allowable exceedance frequencies, by the interim compliance dates given in Table 6.4.

Table 6.5
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	38%	37%	39%
		at Heisler Park - North			
	Pacific Ocean Shoreline	at Main Laguna Beach			
		Laguna Beach at Ocean Avenue			
		Laguna Beach at Cleo Street			
		Arch Cove at Bluebird Canyon Road			
		Laguna Beach at Dumond Drive			
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	41%	41%	42%
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	41%	41%	42%
	Aliso Creek Mouth	at mouth	41%	41%	42%
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	36%	36%	36%
		Aliso Beach at Table Rock Drive			
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)			
		at Salt Creek (large outlet)			
		Salt Creek Beach at Salt Creek service road			
		Salt Creek Beach at Strand Road			

Table 6.5 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	44%	44%	48%
	San Juan Creek	lower 1 mile	44%	44%	47%
	San Juan Creek Mouth	at mouth	44%	44%	47%
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	35%	35%	36%
		Ole Hanson Beach Club Beach at Pico Drain			
		San Clemente City Beach at El Portal Street Stairs			
		San Clemente City Beach at Mariposa Street			
		San Clemente City Beach at Linda Lane			
		San Clemente City Beach at South Linda Lane			
		San Clemente City Beach at Lifeguard Headquarters			
		under San Clemente Municipal Pier			
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)			
		San Clemente State Beach at Riviera Beach			
		Can Clemente State Beach at Cypress Shores			
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	45%	44%	47%
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	40%	40%	41%
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	33%	33%	36%

Table 6.5 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	26%	26%	26%
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	37%	37%	37%
		La Jolla Shores Beach at Caminito del Oro			
		La Jolla Shores Beach at Vallecitos			
		La Jolla Shores Beach at Avenida de la Playa			
		at Casa Beach, Children's Pool			
		South Casa Beach at Coast Boulevard			
		Whispering Sands Beach at Ravina Street			
		Windansea Beach at Vista de la Playa			
		Windansea Beach at Bonair Street			
		Windansea Beach at Playa del Norte			
		Windansea Beach at Palomar Avenue			
		at Tourmaline Surf Park			
		Pacific Beach at Grand Avenue			
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries	49%	49%	51%
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	46%	43%	49%
	San Diego River	lower 6 miles	46%	43%	49%
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	46%	43%	51%
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	41%	41%	43%

(b) Interim Effluent Limitations

Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the interim compliance dates under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.c.(2)(a):

Table 6.6
Interim Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watersheds and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
South Orange County	**San Joaquin Hills HSA** (901.11) and **Laguna Hills HSA** (901.12) - Pacific Ocean Shoreline	45.89%	45.86%	49.14%	23.43%	26.04%	25.63%
	Aliso HSA (901.13) - Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	47.74%	47.79%	49.57%	12.65%	13.31%	13.76% (13.69%)**
	Dana Point HSA (901.14) - Pacific Ocean Shoreline	47.52%	47.52%	49.49%	6.58%	7.43%	7.58%
	Lower San Juan HSA (901.27) - Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	36.48%	37.11%	47.47%	9.61%	6.41%	13.56% (13.45%)**
	San Clemente HA (901.30) - Pacific Ocean Shoreline	47.14%	47.12%	49.42%	11.93%	12.29%	12.63%
San Luis Rey River	**San Luis Rey HU** (903.00) - Pacific Ocean Shoreline	19.07%	19.55%	43.69%	2.81%	1.56%	5.85%
Carlsbad	**San Marcos HA** (904.50) - Pacific Ocean Shoreline	41.41%	41.28%	48.02%	9.24%	9.49%	10.10%

Table 6.6 (Cont'd)
Interim Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watersheds and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
San Dieguito River	**San Dieguito HU** (905.00) - Pacific Ocean Shoreline	7.20%	10.36%	41.74%	2.15%	0.73%	3.86%
Penasquitos	**Miramar Reservoir HA** (906.10) - Pacific Ocean Shoreline	48.25%	48.30%	49.71%	0.81%	1.00%	0.97%
Mission Bay	**Scripps HA** (906.30) - Pacific Ocean Shoreline	48.22%	48.21%	49.63%	8.16%	10.57%	9.41%
	Tecolote HA (906.50) - Tecolote Creek	47.26%	47.30%	49.47%	8.26%	10.24%	9.08% (9.04%)**
San Diego River	**Mission San Diego HSA** (907.11) and **Santee HSA** (907.12) - Pacific Ocean Shoreline - Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles)	37.02%	34.72%	46.98%	19.07%	26.61%	21.37% (21.24%)**
San Diego Bay	**Chollas HSA** (908.22) - Chollas Creek	46.03%	46.08%	49.23%	8.91%	12.42%	10.73% (10.68%)**

Notes:
* The percent load reductions are based on reducing loads compared to pollutant loads from 2001 to 2002.
** The alternative *Enterococcus* percent load reduction was calculated based on a numeric target of 104 MPN/100mL instead of 61 MPN/100mL, protective of the REC-1 "moderately to lightly used area" usage frequency that is protective of freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative pollutant load reductions can be utilized.

(3) Interim TMDL Compliance Determination

Compliance with the interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(f) There are no exceedances of the interim receiving water limitations under Specific Provision 6.c.(2)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(g) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the interim effluent limitations under Specific Provision 6.c.(2)(b); OR

(h) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

d. Specific Monitoring and Assessment Requirements

(1) Monitoring and Assessment Requirements for Beaches

(a) Monitoring Stations

For beaches addressed by the TMDL, monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[40] If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source

[40] Commonly referred to as AB 411 monitoring

identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations at least once within the first 24 hours of the end of a storm event[41] during the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer in exceedance of the allowable exceedance frequencies in the receiving waters.

(iii) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(iv) For Pacific Ocean Shoreline segments or areas listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

[41] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs for the Pacific Ocean Shoreline segments or areas listed in Table 6.0 have been achieved.

(ii) Dry weather exceedance frequencies must be calculated as follows:

[a] 30-day geometric means must be calculated from the results of any dry weather samples collected from the segments or areas for each water body listed in Table 6.0;
[b] The method and number of samples need for calculating the 30-day geometric means must be consistent with the number of samples required by the Ocean Plan;
[c] Where there are multiple segments or areas associated with a water body listed in Table 6.0, the Copermittees may calculate geometric means for each segment or area, or combine the dry weather monitoring data from all the segments or areas to calculate geometric means for the water body;
[d] The exceedance frequency must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the dry season.

(iii) Wet weather exceedance frequencies must be calculated as follows:

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;
[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;
[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria densities reported from each storm event sampled; and
[d] The single sample maximum exceedance frequency must be calculated by dividing the number of wet weather days that exceed the single sample maximum receiving water limitations in Table 6.2 by the total number of wet weather days during the rainy season.
[e] The data collected for dry weather must be used in addition to the data collected for wet weather to calculate the wet weather 30-

day geometric means. The exceedance frequency of the wet weather 30-day geometric means must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the wet season.

(iv) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(v) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) Monitoring and Assessment Requirements for Creeks and Creek Mouths

(a) Monitoring Stations

For creeks addressed by the TMDL, monitoring locations should consist of, at a minimum, a location at or near the mouth of the creek (e.g. Mass Loading Station or Mass Emission Station) and one or more locations upstream of the mouth (e.g. Watershed Assessment Station). If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations in accordance with the requirements of Provision D.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations within the first 24 hours of the end of a storm event[42] during the rainy season (i.e. October 1 through April 30).

[42] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to

(iii) Samples collected from receiving water monitoring stations must be analyzed for fecal coliform and *Enterococcus* indicator bacteria.

(iv) For creeks or creek mouths listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the receiving water monitoring data to assess whether the interim and final receiving water WQBELs for the creeks and creek mouths listed in Table 6.0 have been achieved.

(ii) Dry weather exceedance frequencies must be calculated as follows:

[a] 30-day geometric means must be calculated from the results of any dry weather samples collected from the segment or area for each water body listed in Table 6.0;
[b] The method and number of samples need for calculating the 30-day geometric means must be consistent with the number of samples required by the Basin Plan;
[c] The exceedance frequency must be calculated by dividing the number of 30-day geometric means that exceed the 30-day geometric mean receiving water limitations in Table 6.2 by the total number of 30-day geometric means calculated from samples collected during the dry season.

(iii) Wet weather exceedance frequencies must be calculated as follows:

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;
[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;

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storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria densities reported from each of the storm events sampled; and

[d] The exceedance frequency must be calculated by dividing the number of wet weather days that exceed the single sample maximum receiving water limitations in Table 6.2 by the total number of wet weather days during the rainy season.

[e] The data collected for dry weather must be used in addition to the data collected for wet weather to calculate the wet weather 30-day geometric means. The exceedance frequency of the wet weather 30-day geometric means must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the wet season.

(iv) The Responsible Copermittee must identify and incorporate additional MS4 outfall and receiving water monitoring stations and/or adjust monitoring frequencies to identify sources causing exceedances of the receiving water WQBELs.

(v) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(vi) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

7. Total Maximum Daily Loads for Sediment in Los Peñasquitos Lagoon

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2012-0033

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2012
State Water Board Approval Date:	January 21, 2014
Office of Administrative Law Approval Date:	July 14, 2014
US EPA Approval Date:	October 30, 2014

(3) TMDL Effective Date: July 14, 2014

(4) Watershed Management Area: Peñasquitos

(5) Water Body: Los Peñasquitos Lagoon

(6) Responsible Copermittees: County of San Diego, City of San Diego, City of Del Mar, and City of Poway

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final sediment TMDL compliance requirements for Los Peñasquitos Lagoon consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must be in compliance with the final TMDL compliance requirements by December 31, 2034.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not prohibit the sustainable restoration of tidal and non-tidal saltmarsh vegetation of at least 346 acres.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations by the compliance date under Provision 7.b(1) will not cause or contribute to a failure of the receiving water condition specified under Specific Provision 7.b.(2)(a):

Table 7.1
*Final Effluent Limitations as Expressed as Wet Season Loads in MS4 Discharges to Los Peñasquitos Lagoon**

Constituent	Effluent Limitation
Sediment	2,580 tons/wet season

* Final effluent limitations are to be achieved by the following Responsible Parties: County of San Diego, City of San Diego, City of Del Mar, City of Poway, Phase II MS4 permittees, Caltrans, general construction storm water NPDES permittees, and general industrial storm water NPDES permittees.

(c) Best Management Practices

(i) The Water Quality Improvement Plan for the Los Peñasquitos Watershed Management Area must incorporate the Sediment Load Reduction Plan required to be developed pursuant to Resolution No. R9-2012-0033.

(ii) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 7.b.(2)(a) and/or the Copermittee's portion of the effluent limitations under Specific Provision 7.b.(2)(b) for Los Peñasquitos Lagoon.

(3) Final TMDL Compliance Determination

Compliance determination with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) Successful restoration of 80 percent of the 1973 acreage of tidal and non-tidal lagoon salt marsh (346 acres) as described in Attachment A of Resolution No. R9-2010-0033; OR

(b) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 7.b.(2)(c)(ii) and/or other implementation actions to achieve compliance with Specific Provision 7.b.(3)(a) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 7.b.(2)(c)(ii) or other implementation actions to achieve compliance with Specific Provision 7.b.(3)(a),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 7.b.(2)(c)(ii) or other implementation actions, AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 7.d to demonstrate compliance with Specific Provision 7.b.(3)(a).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim sediment TMDL compliance requirements for Los Penasquitos Lagoon consist of the following:

(1) Interim Compliance Dates and WQBELs

The Responsible Copermittees must comply with the interim WQBELs, expressed as wet season loads, by December 31 of the interim compliance year set forth in Table 7.2.

Table 7.2
*Interim Water Quality Based Effluent Limitations Expressed as Wet Season Loads in MS4 Discharges**

Interim Compliance Date	Interim Effluent Limitations (tons/wet season)
December 31, 2019	6,691
December 31, 2023	5,663
December 31, 2027	4,636
December 31, 2029	3,608

* Interim effluent limitations are to be achieved by the following Responsible Parties: County of San Diego, City of San Diego, City of Del Mar, City of Poway, Phase II MS4 permittees, Caltrans, general construction storm water NPDES permittees, and general industrial storm water NPDES permittees.

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) The final receiving water limitation under Specific Provision 7.b.(2)(a) is met; OR

(c) There are no exceedances of the Copermittee's portion of interim effluent limitations under Table 7.2 at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the Copermittee's portion of the interim TMDL compliance requirements described in Attachment A of Resolution No. R9-2010-0033 will be achieved by the interim compliance date.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) Watershed Monitoring

The Responsible Copermittees must conduct suspended sediment, bed load, and flow monitoring to calculate total sediment loading to the Los Peñasquitos Lagoon for each wet season (October 1 thru April 30) as set forth below:

(a) The Responsible Copermittees must monitor enough storm events throughout the season to quantify sediment loading over each wet season, and

(b) The Responsible Copermittees must monitor at least 3 stations to quantify cumulative sediment loading into Los Peñasquitos Lagoon. Stations must be located within the Los Peñasquitos, Carroll Canyon, and Carmel Creek tributaries prior to discharging into Los Peñasquitos Lagoon.

(2) Lagoon Monitoring

The Responsible Copermittees must monitor Los Peñasquitos Lagoon each Fall for changes in the extent of the vegetation types as set forth below:

(a) The Responsible Copermittees must acquire aerial photos of Los Peñasquitos Lagoon and digitize them at an approximate scale of 1:2,500,

(b) The Responsible Copermittees must appropriately interpret the vegetation and classify the various types as saltmarsh, non-tidal saltmarsh, freshwater marsh, non-tidal saltmarsh –*Lolium perrene* infested, southern willow scrub/mulefat scrub, herbaceous wetland, or upland land cover.

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the monitoring data collected under Specific Provision 7.d(1) and 7.d(2) to assess whether the interim and final WQBELs have been achieved.

(b) For assessing and determining compliance with the final receiving water limitations under Specific Provision 7.b.(2)(a), the Responsible Copermittees must use the data acquired under Specific Provision 7.d.(2) to estimate the acreage of tidal and non-tidal saltmarsh actually restored.

(c) For assessing and determining compliance with the final effluent limitations under Specific Provision 7.b.(2)(b), the Responsible Copermittees must use the data acquired under Specific Provision 7.d.(1) to estimate sediment loading into Los Peñasquitos Lagoon. Sediment loading must be evaluated using a 3-year, weighted rolling average. The first reported average shall be calculated using data collected in the year, 2015-2016, 2016-2017, and 2017-2018 wet seasons.

(d) The monitoring and assessment results must be submitted as part of the Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

ATTACHMENT F

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

FACT SHEET / TECHNICAL REPORT

FOR

ORDER NO. R9-2013-0001
AS AMENDED BY ORDER NOS. R9-2015-0001 AND R9-2015-0100
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

May 8, 2013
Amended February 11, 2015
and November 18, 2015

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I. FACT SHEET FORMAT

This Fact Sheet briefly sets forth the principal facts and the significant factual, legal, methodological, and policy questions that the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) considered in preparing Order No. R9-2013-0001 (Order), as amended by Order Nos. R9-2015-0001 and R9-2015-0100. In accordance with the Code of Federal Regulations (CFR) Title 40 Parts 124.8 and 124.56 (40 CFR 124.8 and 40 CFR 124.56), this Fact Sheet includes, but is not limited to, the following information:

1. Contact information
2. Public process and notification procedures
3. Background of municipal storm water permits
4. Regional MS4 Permit approach
5. Economic considerations
6. Applicable statutes, regulations, plans and policies
7. Discussion of the provisions in the Order

Tentative Order No. R9-2013-0001 was distributed for public review on October 31, 2012. The San Diego Water Board accepted written comments on Tentative Order No. R9-2013-0001 until January 11, 2013. A public hearing was subsequently held on April 10 and 11, 2013, that was continued to May 8, 2013 to receive oral comments from interested persons. The San Diego Water Board adopted Order No. R9-2013-0001 on May 8, 2013.

Tentative Order No. R9-2015-0001, an Order amending Order No. R9-2013-0001, was distributed for public review on September 19, 2014. The San Diego Water Board accepted written comments on Tentative Order No. R9-2015-0001 until November 19, 2014. A public hearing was held on February 11, 2015, to receive oral comments from Copermittees and interested persons. The San Diego Water Board adopted Order No. R9-2015-0001 amending Order No. R9-2013-0001 on February 11, 2015. Order No. R9-2015-0001 amended the findings and provisions of Order No. R9-2013-0001 to:

a. Enroll the County of Orange, the Orange County Flood Control District and the south Orange County Cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano as Copermittees responsible for compliance with the terms and conditions of Order No. R9-2013-0001, as amended by Order No. R9-2015-0001;

b. Designate the San Diego Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the Cities of Laguna Woods and Laguna Hills and agree to the designation of the Santa Ana Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the City of Lake Forest, subject to the

terms of the February 10, 2015 agreement between San Diego Water Board and the Santa Ana Water Board described in Finding 29 of this Order, upon the later effective date of Order No. R9-2015-0001 or Order No. R8-2015-0001 (superseding Order No. R8-2009-0030);

c. Establish interim exceptions to land development requirements for those priority development projects that discharge to engineered channels and large river reaches as described in Provision E.3.c.(2)(e) of this Order;

d. Incorporate the amended requirements of the State Water Resources Control Board's (State Water Board) General Exception to require that pollutant reductions be achieved within 6 years for storm water and nonpoint source discharges to ASBS within the Region;

e. Incorporate applicable requirements of the Los Peñasquitos Lagoon Sediment TMDL; and

f. Require the Orange County Copermittees to implement the "*Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County*," dated October 2014, made effective in the Monitoring and Reporting Program/Order issued pursuant to California Water Code section 13383 in the December 5, 2014 San Diego Water Board Letter Directive and subject to future revisions by the Executive Officer after appropriate public input.

Tentative Order No. R9-2015-0100, an Order amending Order No. R9-2013-0001 as amended by Order No. R9-2015-0001, was distributed for public review on July 31, 2015. The San Diego Water Board accepted written comments on Tentative Order No. R9-2015-0100 until September 14, 2015. A public hearing was held on November 18, 2015, to receive oral comments from Copermittees and interested persons. The San Diego Water Board adopted Order No. R9-2015-0100 amending Order No. R9-2013-0001 as amended by Order No. R9-2015-0001, on November 18, 2015. Order No. R9-2015-0100 amended the findings and provisions of Order No. R9-2013-0001 as amended by Order No. R9-2015-0001 to:

a. Enroll the County of Riverside, the Cities of Murrieta, Temecula, and Wildomar, and the Riverside County Flood Control and Water Conservation District as Copermittees responsible for compliance with the terms and conditions of Order No. R9-2013-0001, as amended by Order Nos. R9-2015-0001 and R9-2015-0100;

b. Continue designation of the San Diego Water Board to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Murrieta and Wildomar, including areas within the Santa Ana Region; and, agree to continue designation of the Santa Ana Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the City of Menifee, including areas within

the San Diego Region, subject to the terms of the October 26, 2015 agreement between San Diego Water Board and the Santa Ana Water Board described in Finding 29 of this Order;

d. Incorporate Provision B.3.c, which provides an option that allows a Copermittee to utilize the watershed-based Water Quality Improvement Plan to be deemed in compliance with the prohibitions and limitations of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b;

e. Incorporate minor revisions to Provisions E.2.a.(1) and E.2.a.(2) to include San Diego Water Board Order No. R9-2015-0013 and State Water Board Order 2014-0194-DWQ into the requirements for addressing non-storm water discharges to a Copermittee's MS4;

e. Incorporate minor revisions to Provision E.3.b.(1) to correct inconsistencies in the definition of a Priority Development Project as compared to the definitions in Order No. R9-2009-0002 (Fourth Term Orange County MS4 Permit) and Order No. R9-2010-0016 (Fourth Term Riverside County MS4 Permit), and requirements for incorporating the corrected definitions into the BMP Design Manual;

f. Incorporate revisions to Provision E.3.e.(1)(a) to provide additional clarity on when the structural BMP performance requirements of Provision E.3.c are applicable to Priority Development Projects;

e. Incorporate minor revisions to the Revised TMDLs for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region and the TMDLs for Sediment in Los Peñasquitos Lagoon in Attachment E to the Order to make the requirements consistent with the Basin Plan amendments adopted by the San Diego Water Board; and

f. Remove provisions related to allowing the Riverside County Copermittees to apply for early coverage under the Regional MS4 Permit.

The San Diego Water Board files applicable to the issuance of Order No. R9-2013-0001 and amendments thereto are incorporated into the administrative record in support of the findings and requirements of the Order.

II. CONTACT INFORMATION

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The Order and other related documents can be downloaded from the San Diego Water Board website at

http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

The documents referenced in this Fact Sheet and in Order No. R9-2013-0001 and amendments thereto are available for public review at the San Diego Water Board office, located at the address listed above. Public records are available for inspection during regular business hours, from 8:00 am to 5:00 pm Monday through Friday. To schedule an appointment to inspect public records, contact the San Diego Water Board Records Management Officer at 619-516-1990.

COPERMITTEES

Orange County Copermittees

- County of Orange
  - City of Aliso Viejo
  - City of Dana Point
  - City of Laguna Beach
  - City of Laguna Hills
  - City of Laguna Niguel
  - City of Laguna Woods
  - City of Lake Forest *
  - City of Mission Viejo
  - City of Ranch Santa Margarita
  - City of San Clemente
  - City of San Juan Capistrano
  - Orange County Flood Control District

* While not listed in the above table, the City of Lake Forest remains a Copermittee under this Order until the later effective date of this Order or Santa Ana Water Board Tentative Order No. R8-2015-0001. Thereafter, the City of Lake Forest will no longer be considered a Copermittee under this Order because its Phase I MS4 discharges will be regulated by the Santa Ana Water Board pursuant to Water Code section 13328 designation. The requirements of this Order that apply to the City of Lake Forest for the duration of this Order, consistent with the Water Code section 13228 agreement dated February 10, 2015, are described in Finding 29 and Footnote 2 to Table B-1.

Riverside County Copermittees

- County of Riverside
  - City of Menifee**
  - City of Murrieta
  - City of Temecula
  - City of Wildomar
  - Riverside County Flood Control and Water Conservation District

** The City of Menifee is not regulated as a Copermittee under this Order because its Phase I MS4 discharges are regulated by Santa Ana Water Board Order No. R8-2010-0033 as it may be amended or issued pursuant to Water Code section 13228 designation. The requirements of this Order that apply to the City of Menifee for the duration of this Order, consistent with the Water Code section 13228 written agreement dated October 26, 2015, are described in Finding 29 and Footnote 3 to Table B-1.

San Diego County Copermittees

- County of San Diego
  - City of Carlsbad
  - City of Chula Vista
  - City of Coronado
  - City of Del Mar
  - City of El Cajon
  - City of Encinitas
  - City of Escondido
  - City of Imperial Beach
  - City of La Mesa
  - City of Lemon Grove
  - City of National City
  - City of Oceanside
  - City of Poway
  - City of San Diego
  - City of San Marcos
  - City of Santee
  - City of Solana Beach
  - City of Vista
  - San Diego County Regional Airport Authority
  - San Diego Unified Port District

III. PUBLIC PROCESS AND NOTIFICATION PROCEDURES

The San Diego Water Board followed the schedule listed below for the preparation of Order No. R9-2013-0001 and amendments thereto:

San Diego County Copermittee Permit Reissuance Process

1. On February 8, 2011, the San Diego Water Board met with the San Diego County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No. R9-2007-0001.

2. Between February and May 2011, the San Diego Water Board met with select San Diego County, Orange County, and Riverside County Copermittees, as well as representatives of the environmental community to discuss concepts and receive recommendations for elements to be incorporated in a Regional Municipal Separate Storm Sewer System Permit (Regional MS4 Permit).

3. On June 27, 2011 the San Diego Water Board received the Report of Waste Discharge from the San Diego County Copermittees for the renewal of their NPDES permit, Order No. R9-2007-0001.

4. On April 9, 2012, the San Diego Water Board released an administrative draft of Tentative Order No. R9-2013-0001 for preliminary informal comments and feedback.

5. On April 25, 2012, the San Diego Water Board held an informal public workshop to present the administrative draft of Tentative Order No. R9-2013-0001 and receive verbal comments.

6. Between June and August 2012, the San Diego Water Board held four (4) focused meetings with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community, and USEPA) to discuss and receive preliminary comments and feedback about specific elements in the administrative draft of Tentative Order No. R9-2013-0001.

7. On September 5, 2012, the San Diego Water Board held an informal public workshop to present the modifications that were expected to be incorporated into the Tentative Order based on the preliminary comments and feedback received during the focused meetings held between June and August 2012.

8. Informal written comments on the administrative draft of Tentative Order No. R9-2013-0001 were accepted until September 14, 2012.

9. On October 12, 2012, the San Diego Water Board released a revised administrative draft of Tentative Order No. R9-2013-0001.

10. On October 24, 2012, the San Diego Water Board held a focused meeting with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community, and USEPA) to discuss modifications incorporated into the administrative draft of Tentative Order No. R9-2013-0001.

11. On October 31, 2012, the San Diego Water Board released Tentative Order No. R9-2013-0001 for formal public review and comment.

12. On November 13, 2012 and December 12, 2012, the San Diego Water Board held a formal public Board workshop to present the public draft of Tentative Order No. R9-2013-0001 and receive verbal comments.

13. Formal written comments on the public draft of Tentative Order No. R9-2013-0001 were accepted until January 11, 2013.

14. A public hearing of Tentative Order No. R9-2013-0001 was conducted on April 10 and 11, 2013, that was continued to May 8, 2013.

Orange County Copermittee Permit Reissuance Process

15. On May 20, 2014 the San Diego Water Board received the Report of Waste Discharge from the Orange County Copermittees for the renewal of their MS4 NPDES permit, Order No. R9-2009-0002.

16. On June 24, 2014, the San Diego Water Board met with the Orange County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No.R9-2009-0002 and the process for enrollment as Copermittees under Regional MS4 Permit Order No. R9-2013-0001.

17. On July 1, 2014, the San Diego Water Board held a public meeting to discuss the Orange County Report of Waste Discharge and receive comments on potential modifications to Order No. R9-2013-0001. Based on comments received from the Orange County Copermittees and other interested persons at this meeting, the San Diego Water Board determined that additional public meetings were not needed prior to release of Tentative Order No. R9-2015-0001, amending Order No. R9-2013-0001 in redlined – strikeout format for public review and comment.

18. On September 19, 2014, the San Diego Water Board released Tentative Order No. R9-2015-0001 for a 60 day public review and comment period.

19. On October 8, 2014, the San Diego Water Board held a formal public workshop at a regular board meeting to receive information and discuss the proposed amendments to Order No. R9-2013-0001 described in Tentative Order No. R9-2015-0001.

20. In accordance with State and federal laws and regulations, the San Diego Water Board notified San Diego County, Orange County and Riverside County Copermittees, and all known interested agencies and persons of its intent to adopt Tentative Order No. R9-2015-0001 and provided them with an opportunity to submit their written comments and recommendations. Written comments and recommendations on Tentative Order No. R9-2015-0001 were accepted until November 19, 2014.

21. The San Diego Water Board held a public workshop on October 8, 2014, and a public hearing on February 11, 2015, and heard and considered all comments pertaining to the adoption of Tentative Order No. R9-2015-0001 on February 11, 2015.

Riverside County Copermittee Permit Reissuance Process

22. Between April and June 2015, the San Diego Water Board held three (3) public workshops with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community) to discuss and receive comments and feedback about amending Order No. R9-2013-0001 to incorporate a definition of prior lawful approval for Priority Development Projects, and an alternative compliance pathway for prohibitions and limitations in Provision A of the Order. A San Diego Water Board member attended the April and May 2015 public workshops, but no actions or voting took place.

23. On April 15, 2015, the San Diego Water Board met with the Riverside County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No.R9-2010-0016 and the process for enrollment as Copermittees under Order No. R9-2013-0001 (Regional MS4 Permit).

24. On May 8, 2015 the San Diego Water Board received a Report of Waste Discharge from the Riverside County Copermittees for the renewal of their MS4 NPDES permit, Order No. R9-2010-0016.

25. On July 31, 2015, the San Diego Water Board released Tentative Order No. R9-2015-0100 for a formal public review and comment period.

26. Formal written comments on the public draft of Tentative Order No. R9-2015-0100 were accepted until September 14, 2015, a formal public written comment period of 46 days.

27. A public hearing to receive oral comments on Tentative Order No. R9-2015-0100 was conducted on November 18, 2015.

IV. BACKGROUND OF THE SAN DIEGO REGION MUNICIPAL STORM WATER PERMITS

In developed and developing areas, storm water runoff is commonly transported through municipal separate storm sewer systems (MS4s) and discharged into local receiving water bodies. As the storm water runs off and flows over the land or impervious surfaces (e.g., paved streets, parking lots, and building rooftops), it accumulates debris, chemicals, sediment, and other pollutants that can adversely affect receiving water quality if discharged untreated. The United States Environmental Protection Agency (USEPA) recognizes wet weather flows from urban areas as the number one source of estuarine pollution in coastal communities,[1] such as those within the San Diego Region.

The federal Clean Water Act (CWA) was amended in 1987 to address and regulate discharges of storm water associated with industrial activities and from municipal storm sewers. With the amendments, many municipalities throughout the United States were obligated for the first time to obtain National Pollutant Discharge Elimination System (NPDES) permits for discharges of storm water from their MS4s.

In response to the CWA 1987 amendment, as well as the pending federal NPDES regulations which would implement the amendment, the San Diego Water Board issued "early" MS4 permits. The San Diego Water Board adopted and issued Order Nos. 90-38, 90-42, and 90-46 to regulate storm water discharges from the MS4s in Orange County, San Diego County, and Riverside County, respectively, within the San Diego Region on July 16, 1990.

The "early" MS4 permits, or First Term Permits, were issued prior to the November 1990 promulgation of the final federal NPDES storm water regulations. By issuing these First Term Permits before the federal regulations took effect, the San Diego Water Board was able to provide the Copermittees additional flexibility in addressing and managing storm water discharges. The First Term Permits contained the essentials of the 1990 regulations, and required the Copermittees to develop and implement runoff management programs, but provided little specificity about what was required to be included in or actually achieved by those programs.

The flexibility provided in the First Term Permits was generally continued through the Second Term Permits. The combination of the lack of specificity in the First and Second Term Permits, a general lack of meaningful action by the Copermittees and a general lack of corresponding reaction (i.e. enforcement) by the San Diego Water Board during the first ten years of the storm water program, resulted in few substantive steps towards achieving improvements in the quality of receiving waters or storm water discharges from the MS4s.

[1] US EPA. 1999. 40 CFR Parts 9, 122, 123, and 124. National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. 64 FR 68727.

From 2001, the regulatory approach incorporated into Third Term Permits was a significant departure from the regulatory approach of the First and Second Term Permits. The Third Term Permits issued by the San Diego Water Board included more detailed requirements that outlined the minimum level of implementation required for the Copermittees' programs to meet the maximum extent practicable (MEP) standard for storm water. The Third Term Permits included more detail to emphasize and enhance the jurisdictional runoff management programs developed by the Copermittees and introduced requirements for developing and implementing watershed-based programs.

The Third Term Permits also incorporated two precedent setting decisions by the State Water Board. In Order WQ 99-05, the State Water Board established receiving water limitation language to be included in all MS4 permits. The State Water Board's precedential language clarified that municipal storm water permits must include provisions requiring discharges to be controlled to attain water quality standards in receiving waters. Unlike previously adopted versions of the receiving water limitation language in the First and Second Term Permits, the language no longer stated that "*violations of water quality standards are not violations of the municipal storm water permit under certain conditions*." In addition, the receiving water limitation language no longer indicated that the "*implementation of best management practices is the 'functional equivalent' of meeting water quality standards*." State Water Board Order WQ 99-05 specifically requires language in MS4 permits for the Copermittees to comply with water quality standards based discharge prohibitions and receiving water limitations through timely implementation of control measures and other actions to reduce pollutants in discharges. (See State Water Board Order WQ 99-05 (*Environmental Health Coalition*)).

In Order WQ 2000-11, also a precedential decision, the State Water Board addressed design standards for structural post-construction best management practices (BMPs) for new development and significant redevelopment. The State Water Board found that the design standards, which require that runoff generated by 85 percent of storm events from specific development categories be infiltrated or treated, reflect the MEP standard. State Water Board Order WQ 2000-11 also found that the post-construction BMP provisions, or Standard Storm Water Mitigation Plan (SSMP) provisions, constitute MEP for addressing storm water pollutant discharges resulting from specific development categories.

The Third Term San Diego County and Orange County Permits (Order Nos. 2001-01 and R9-2002-0001, respectively) were appealed to the State Water Board. Minor modifications were made by the State Water Board, but the requirements were largely upheld. In State Water Board Order WQ 2001-15, the State Water Board upheld the Third Term San Diego County Permit requirements with certain modifications. The State Water Board removed the prohibition of storm water discharges *into* the MS4 that cause or contribute to exceedances of water quality objectives. The revision allows for treatment of pollutants in storm water runoff after the pollutants have entered the MS4.

State Water Board Order WQ 2001-15 otherwise upheld all the other requirements of the permit.

In addition to the modification to the discharge prohibition in Order WQ 2001-15, the State Water Board refined Order WQ 99-05 by making clear that the Copermittees may use an iterative approach to achieving compliance with water quality standards that involves ongoing assessments and revisions. Thus, the language for the discharge prohibitions and receiving water limitations was revised to explicitly require the Copermittees to implement an iterative process of assessments and revisions to comply with the discharge prohibitions and receiving water limitations. The San Diego Water Board retained the authority to enforce receiving water limitations and discharge prohibitions even if the Copermittee is engaged in the iterative process.

The Third Term San Diego County Permit was subsequently challenged in the Superior Court of the State of California and the Court of Appeal, Fourth Appellate District. The Court of Appeal, Fourth Appellate District, found that the approach of the Third Term San Diego County Permit to regulating discharges into the MS4 was appropriate (*Building Industry Ass'n. v. State Water Resources Control Bd., et al.,* 124 Cal.App.4th 866 (2004)). The State of California Supreme Court denied review sought by the Building Industry Association in March 2005.

The Fourth Term Permits began with the adoption of Order No. R9-2007-0001 issued to the Copermittees of San Diego County in January 2007. Order Nos. R9-2009-0002 and R9-2010-0016 were subsequently issued to the Copermittees of Orange County and Riverside County. The Fourth Term Permits continued to include more detailed requirements to be implemented by each Copermittee's jurisdictional runoff management program. The Fourth Term Permits also included requirements to further emphasize a watershed management approach and for more coordination among jurisdictional runoff management programs. In addition, the Fourth Term Permits included more requirements for assessing the effectiveness of the runoff management programs being implemented by the Copermittees. The intent of the inclusion of additional requirements was to enhance and better define elements of the permit that were expected to be incorporated into the iterative process for managing runoff from each Copermittee's jurisdiction and within the watersheds of the San Diego Region.

The Fourth Term Permits included several new and emerging approaches for managing storm water runoff and discharges. Low impact development (LID) requirements are included for development and significant redevelopment to reduce pollutants in storm water runoff from sites through more natural processes such as infiltration and biofiltration closer to the source, rather than utilizing conventional mechanical end-of-pipe treatment systems. Hydrograph modification (hydromodification) management requirements also are included to mitigate the potential for increased erosion in receiving waters due to increased runoff rates and durations often caused by development and increased impervious surfaces. The Fourth Term Orange County and Riverside County Permits introduced requirements to identify areas of existing

development where retrofitting with LID projects would be feasible and could be implemented to reduce storm water runoff and pollutants in storm water discharges.

The Fourth Term Orange County and Riverside County Permits included a clearer distinction between storm water and non-storm water discharges. The term “urban runoff” was completely removed, and a distinction between storm water (wet weather) runoff and non-storm water (dry weather) runoff was emphasized. This clarification was made to prevent any potential misunderstanding that regulation under the MS4 permits is limited only to urbanized areas, and to prevent non-storm water runoff from being managed in the same manner as storm water runoff. The term “urban runoff” is not defined in the Code of Federal Regulations (CFR) or Federal Register (FR) in the regulation of MS4 discharges. According to the CWA 402(p)(3)(B)(ii), MS4 permits must include a requirement to effectively prohibit non-storm water discharges into the MS4s.

Finally, for the Fourth Term Orange County and Riverside County Permits the San Diego Water Board found that non-storm water discharges to the MS4 from over application of irrigation water are sources of pollutants. The San Diego Water Board found that non-storm water discharges resulting from over-irrigation must be prohibited from entering the MS4 in accordance with the requirements of the CWA and pursuant to 40 CFR 122.26(d)(2)(iv)(B)(1).

The requirements of the Fourth Term Permits issued to the Copermittees in each county within the San Diego Region now have substantively the same core requirements such as discharge prohibitions, receiving water limitations, jurisdictional runoff management program components, and monitoring program requirements. There are, however, several inconsistencies that exist among the three Fourth Term Permits which complicate oversight and implementation of the permits by the San Diego Water Board.

The Fourth Term San Diego County Permit expired in January 2012. The Fourth Term Orange County permit expired in December 2014 and the Fourth Term Riverside County Permit expired in November 2015. Issuing the Fifth Term Permits within five years for three counties under three different permits would have required the San Diego Water Board to expend significant time and resources for the issuance of the permits through three separate public proceedings, thereby greatly reducing the time and resources available to oversee implementation and compliance. Multiple permits also create confusion for determining compliance among regulated entities, especially for the land development community.

The San Diego Water Board acknowledged that issuing a single MS4 permit for all the Copermittees in the San Diego Region can and is expected to result in more consistent implementation, improve communication among agencies within watersheds crossing multiple jurisdictions, and minimize resources spent with each permit renewal process. Within the findings of the Fourth Term Riverside County Permit issued in November 2010, the San Diego Water Board notified the public of its intent to develop and issue a single Regional MS4 Permit.

V. REGIONAL MS4 PERMIT APPROACH

The Fifth Term Permit, or Regional MS4 Permit, shifts the focus of the permit requirements from a minimum level of actions to be implemented by the Copermittees to identifying outcomes to be achieved by those actions. Order No. R9-2013-0001 represents an important paradigm shift in the approach for MS4 permits within the San Diego Region.

Historical Permitting Approach

The First and Second Term Permits were very broad and provided little specificity about what was required to be developed and implemented by the Copermittees. The Third Term Permits began to become more specific about the minimum level of implementation required by the Copermittees. The Fourth Term Permits subsequently increased in specificity. The MS4 permits have progressively become more detailed and focused on specifying the minimum level of actions expected to be implemented by the Copermittees. As detailed and specific as the MS4 permits have become, however, they include very little detail about what the desired outcomes of the required actions are expected to achieve. Compliance with the permit requirements has essentially been tracking numbers of actions and reporting, not tracking progress or actual improvements in the quality of receiving waters or discharges from the MS4s. The result has been an increase in actions being implemented by the Copermittees with little or no ability or expectations to determine whether or not improvements in water quality are being achieved.

The Fourth Term Permits result in significant resource expenditure by the Copermittees to report permit compliance information to the San Diego Water Board in the form of annual jurisdictional runoff management program, watershed program, and monitoring program reports. The San Diego Water Board was required to expend much of its limited resources on reviewing more than 50 voluminous reports submitted annually by the Copermittees. The information reported by the Copermittees was of limited value when trying to measure progress toward achieving improvements in the quality of receiving waters or discharges from the MS4s. Oversight of the MS4 permits was further complicated by the inconsistencies among the requirements issued to the Orange County, San Diego County, and Riverside County Copermittees under three separate MS4 permits.

Under the Fourth Term Permits, the Copermittees were required to expend a significant portion of their limited resources collecting data of limited value, and putting together reports to submit that information to the San Diego Water Board. Likewise, the San Diego Water Board was required to expend most of its limited resources reviewing reports, and developing permits instead of working directly with the Copermittees to identify solutions to problems causing impacts to water quality. This was an unsustainable course that would have continued to demand more resources

from the Copermittees and the San Diego Water Board, and would have continued to result in unknown water quality benefits.

New Permitting Approach

The goal of the Regional MS4 Permit is twofold: 1) bring a consistent set of MS4 permit requirements to all of the Copermittees within the San Diego Region; and, 2) provide an MS4 permit with requirements that will allow the Copermittees to focus their efforts and resources on achieving goals and desired outcomes toward the improvement of water quality rather than completing specific actions.

The overall approach included in the Regional MS4 Permit with respect to the jurisdictional runoff management programs will not differ significantly from the current permits. The general requirements for the jurisdictional runoff management program components and compliance with those requirements will remain and be applied consistently throughout the San Diego Region under the Regional MS4 Permit.

The most significant difference in the new permitting approach is the specific manner of implementation for those jurisdictional runoff management programs. Implementation will be based on decisions made by the Copermittees in accordance with what they have identified as their highest priority water quality conditions. In other words, the Copermittees will have significant control in how to implement the jurisdictional runoff management programs to best utilize their available resources in addressing a specific set of priorities effectively, instead of trying to address all the water quality priorities ineffectively.

The Copermittees are given the responsibility of identifying their highest priority water quality conditions that they intend to address. The Copermittees will develop goals that can be used to measure and demonstrate progress or improvements toward addressing those priorities. In addition to the goals, the Copermittees will provide a schedule for achieving the goals for those highest priorities. The measurement of progress toward achieving the goals for those highest priorities requires a better defined and more focused program of monitoring and assessment than under the Fourth Term Permits.

The monitoring and assessment program must be designed to inform the Copermittees of their progress, and the need for modifications in their jurisdictional runoff management programs and schedules to achieve their goals to improve water quality. The monitoring and assessment program requirements will have a more central role in the Regional MS4 Permit than in earlier permits. The monitoring and assessment requirements must also be designed to enable the Copermittees to focus and direct their efforts in implementing their jurisdictional runoff management programs toward their stated desired outcomes to improve the quality of receiving waters and/or discharges from the MS4s.

By providing an MS4 permit that allows the Copermittees to make more decisions about how to utilize and focus their resources, along with a better defined monitoring and assessment program to inform their water quality management decisions, the Copermittees have the opportunity to:

1) *Plan strategically*. The Copermittees must have the ability to identify their available resources and develop and implement long term plans that can organize, collect, and use those resources in the most strategically advantageous and efficient manner possible. This ability to develop long term plans will allow the Copermittees to focus and utilize their resources in a more concerted way over the short term and long term to address specific water quality priorities through stated desired outcomes.

2) *Manage adaptively*. The Copermittees must be given the ability to modify their plans as additional information and data are collected from the monitoring and assessment programs. The Copermittees' plans may require modifications to the programs, priorities, goals, strategies, and/or schedules in order for the Copermittees to achieve a stated desired outcome.

3) *Identify synergies*. The Copermittees must be given more flexibility to identify efficiencies within and among their jurisdictional runoff management programs as the strategies are developed and implemented to increase the Copermittees' collective effectiveness. The Copermittees must also be able to identify and utilize resources available from other agencies and entities to further augment and enhance their jurisdictional runoff management programs and/or to collectively work with those other agencies and entities toward achieving a stated desired outcome.

The Regional MS4 Permit requirements provide the Copermittees the flexibility and responsibility to decide what actions will be necessary to achieve an outcome that is tailored and designed by the Copermittees to improve specific prioritized water quality conditions. The San Diego Water Board expects the approach of the Regional MS4 Permit to give the Copermittees a greater sense of ownership for restoring the quality of receiving waters in the San Diego Region by becoming an integral part of the decision making process in identifying water quality conditions to be addressed, as well as determining the best use of their resources.

VI. ECONOMIC CONSIDERATIONS

Statutory Considerations

California Water Code (CWC) section 13241 requires the San Diego Water Board to consider certain factors, including economic considerations, in the adoption of water quality objectives. CWC section 13263 requires the San Diego Water Board to take into consideration the provisions of CWC section 13241 in adopting waste discharge requirements.

In *City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, the California Supreme Court considered whether Regional Water Boards must comply with CWC section 13241 when issuing waste discharge requirements under CWC section 13263(a) by taking into account the costs a permittee will incur in complying with the permit requirements. The Court concluded that whether it is necessary to consider such cost information "*depends on whether those restrictions meet or exceed the requirements of the federal Clean Water Act.*" (*Id.* at p. 627.) The Court ruled that Regional Water Boards may not consider the factors in CWC section 13241, including economics, to justify imposing pollutant restrictions that are less stringent than applicable federal law requires. (*Id.* At pp. 618, 626-627 ["*[Water Code section 13377 specifies that [ ] discharge permits issued by California's regional boards must meet the federal standards set by federal law. In effect, section 13377 forbids a regional board's consideration of any economic hardship on the part of the permit holder if doing so would result in the dilution of the requirements set by Congress in the Clean Water Act...Because CWC section 13263 cannot authorize what federal law forbids, it cannot authorize a regional board, when issuing a [ ] discharge permit, to use compliance costs to justify pollutant restrictions that do not comply with federal clean water standards*."]). However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Regional Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

As discussed in Section VII.F, Unfunded State Mandates, the San Diego Water Board finds that the requirements in this Order are not more stringent than the minimum federal requirements. Among other requirements, federal law requires MS4 permits to include requirements to effectively prohibit non-storm water discharges into the MS4s, in addition to requiring controls to reduce the discharge of pollutants in storm water to the MEP, and other provisions as USEPA or the State determines are appropriate for the control of pollutants in MS4 discharges.

The requirements in this Order may be more specific or detailed than those enumerated in federal regulations under 40 CFR 122.26 or in the USEPA guidance. However, the requirements have been designed to be consistent with and within the federal statutory mandates described in CWA section 402(p)(3)(B)(ii) and (iii) and the related federal regulations and guidance. Consistent with federal law, all of the

conditions in this Order could have been included in a permit adopted by USEPA in the absence of the in lieu authority of California to issue NPDES permits.

Moreover, the inclusion of numeric WQBELs in this Order does not cause this Order to be more stringent than federal law. Federal law authorizes both narrative and numeric effluent limitations to meet state water quality standards. The inclusion of WQBELs as discharge specifications in an NPDES permit in order to achieve compliance with water quality standards is not a more stringent requirement than the inclusion of BMP based permit limitations to achieve water quality standards (State Water Board Order No. WQ 2006-0012 (*Boeing*)). Therefore, consideration of the factors set forth in CWC section 13241 is not required for permit requirements to implement the effective prohibition on the discharge of non-storm water discharges into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determine appropriate to control such pollutants, as those requirements are mandated by federal law.

Included in the provisions of the Order are monitoring and reporting requirements that are designed to demonstrate that the Copermittees are implementing programs to comply with the CWA municipal storm water requirements. CWA section 308(a) and 40 CFR 122.41(h), (j)-(l), 122.44(i) and 122.48 require that all NPDES permits specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s (40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c)) also specify additional monitoring and reporting requirements. In addition to the federal requirements of the CWA, the San Diego Water Board also has the authority in CWC 13383 to establish monitoring, reporting, and recordkeeping requirements that implement federal and state laws and regulations through NPDES permits.

The monitoring and assessment information that will be reported to the San Diego Water Board is necessary to determine if the Copermittees are making progress toward achieving compliance with the discharge prohibitions, receiving water limitations, and effluent limitations under Provision A of the Order. The monitoring and assessment information that will be reported is also expected to be key to the iterative approach and adaptive management process that is required to be implemented by the Copermittees if they cannot meet the discharge prohibitions and receiving water limitations under the present conditions, which is also part of the requirements under Provision A of the Order.

Notwithstanding the above, the San Diego Water Board has considered cost information in issuing this Order, as discussed below. The San Diego Water Board has also considered all of the evidence that has been presented to the San Diego Water Board regarding the CWC section 13241 factors in adopting this Order. The San Diego Water Board finds that the requirements in this Order are reasonably necessary to protect beneficial uses identified in the Basin Plan and the economic information related to costs of compliance and other CWC section 13241 factors are not sufficient to justify failing to protect those beneficial uses. Where appropriate, the

San Diego Water Board has provided or will consider providing the Copermittees with additional time to implement control measures to achieve final WQBELs and/or water quality standards.

Cost Information

Discussions of the financial and economic ramifications of municipal storm water management programs tend to focus on the significant costs incurred by municipalities in developing and implementing the programs. When considering the cost of implementing the programs, however, it is also important to consider the alternative costs that are incurred when programs are not fully implemented, as well as the economic benefits which result from effective program implementation.

The recent financial and economic conditions have amplified the concerns about the costs incurred by the municipalities in developing and implementing their programs. The reduction in resources resulting from the recent financial and economic conditions has been cited by many of the Copermittees as a justification for reducing the requirements that must be met by their programs. While the recent conditions are a cause for concern in the short term, these programs also have an opportunity to identify and implement improvements and efficiencies before the next period of growth and development, resulting in more effective and sustainable programs over the long term.

In addition, it is very difficult to ascertain the true cost of implementation of the Copermittees' management programs because of inconsistencies in reporting by the Copermittees. Reported costs of compliance for the same program element can vary widely from city to city, often by a very wide margin that is not easily explained.[2] Despite these problems, efforts have been made to identify management program costs, which can be helpful in understanding the costs of program implementation.

The San Diego Water Board recognizes that the Copermittees will incur costs in implementing this Order, potentially above and beyond the costs from the Copermittees' prior permits. The San Diego Water Board also recognizes that, due to California's current economic condition, many Copermittees currently have limited staff and resources to implement actions to address its MS4 discharges. Based on the economic considerations below, the San Diego Water Board has provided the Copermittees a significant amount of flexibility to choose how to implement the requirements of the Order.

The Order also allows the Copermittees to customize their plans, programs, and monitoring requirements. In the end, it is up to the Copermittees to determine the effective BMPs and measures necessary to comply with this Order. The Copermittees can choose to implement the least expensive measures that are effective in meeting

[2] Los Angeles Water Board, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.

the requirements of this Order. This Order also does not require the Copermittees to fully implement all requirements within a single permit term. Where appropriate, the Board has provided the Copermittees with additional time outside of the permit term to implement control measures to achieve final WQBELs and/or water quality standards.

The San Diego Water Board has considered available cost information associated with compliance with this Order. It is not possible to predict accurately the cost impact of the requirements that involve an unknown level of implementation or that depend on environmental variables that are as yet undefined. Only general conclusions can be drawn from this information.

Estimated Municipal Storm Water Program Implementation Costs

The USEPA, the State Water Board, and the California Regional Water Quality Control Boards (Regional Water Boards) have attempted to evaluate the costs of implementing municipal storm water programs. The assessments have demonstrated that the true costs are difficult to ascertain and reported costs vary widely. In addition, reported fiscal analyses tend to neglect the costs incurred to municipalities when storm water and non-storm water runoff is not effectively managed, which are incurred as a result of pollution, contamination, nuisance, and damage to ecosystems, property, and human health. Nonetheless, they provide a useful context for considering the costs of requirements within Order No. R9-2013-0001.

In 1999, the USEPA reported on multiple studies it conducted to determine the cost of management programs. A study of Phase II municipalities determined that the annual cost of the Phase II program was expected to be $9.16 per household. The USEPA also studied 35 Phase I municipalities, finding costs to be $9.08 per household annually, similar to those anticipated for Phase II municipalities.[3]

The State Water Board commissioned a study by the California State University, Sacramento to assess costs of the Phase I MS4 program. This study includes an assessment of costs incurred by Phase I MS4s throughout the state to implement their programs. Annual cost per household in the study ranged from $18 to $46, with the Fresno-Clovis Metropolitan Area representing the lower end of the range, and the City of Encinitas (in San Diego County) representing the upper end of the range.[4]

A study on Phase I MS4 program costs was also conducted by the California Regional Water Quality Control Board, Los Angeles Region (Los Angeles Water Board), where program costs reported in the municipalities' annual reports were assessed. The Los

[3] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791-68792.
[4] State Water Board, 2005. NPDES Stormwater Cost Survey. P. ii.

Angeles Water Board estimated that average per household cost to implement the MS4 program in Los Angeles County was $12.50. [5]

It is important to note that reported program costs are not all attributable to solely complying with MS4 permits. Many program components, and their associated costs, existed before any MS4 permits were ever issued. For example, street sweeping and trash collection costs cannot be solely or even principally attributable to MS4 permit compliance, since these practices have long been expected from and implemented by municipalities.

Therefore, true program cost resulting from MS4 permit requirements is some fraction of reported costs. The California State University, Sacramento study found that only 38 percent of program costs are new costs fully attributable to MS4 permits. The remainder of the program costs was either pre-existing or resulted from enhancement of pre-existing programs.[6] In 2000, the County of Orange found that even lower amounts of program costs are solely attributable to MS4 permit compliance, reporting that the amount attributable to implement the County or Orange Drainage Area Management Plan (DAMP), was less than 20 percent of the total budget. The remaining 80 percent was attributable to pre-existing programs.[7] More current data from the County of Orange is not used in this discussion because the County of Orange no longer reports such information.

Estimated Value of Healthy Water Quality

Economic considerations of municipal storm water management programs cannot be limited only to program costs. Evaluation of programs must also consider information on the benefits derived from environmental protection and improvement.[8] Attention is often focused on municipal storm water management program costs, but the programs must also be viewed in terms of their value to the public.

Placing a value on healthy receiving waters is very difficult. Often the value of receiving waters with good water quality manifests in other forms, such as tourism, recreational opportunities, and/or increased property values. When surface water bodies are degraded, thereby degrading the habitat within and adjacent to the water bodies, the public loses the value and benefits associated with being able to use the area in and around the water bodies. Surface waters that are able to support the beneficial uses designated in the Basin Plan can sustain plants and wildlife that can attract visitors and residents, providing aesthetic, recreational, as well as monetary value to the public. At this time, however, there have been no studies for the San

[5] Los Angeles Water Board, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.
[6] State Water Board, 2005. NPDES Stormwater Cost Survey. P. 58.
[7] County of Orange, 2000. A NPDES Annual Progress Report. P. 60.
[8] Ribaudo M.O. and D. Heelerstein. 1992, *Estimating Water Quality Benefits: Theoretical and Methodological Issues.* U.S. Department of Agriculture. Technical Bulletin No. 1808.

Diego Region to quantify the added value that surface waters with healthy water quality can provide.

USEPA has estimated that household willingness to pay for improvements in fresh water quality for fishing and boating is approximately $158-$210.[9] This estimate can be considered conservative, since it does not include important considerations such as marine waters benefits, wildlife benefits, or flood control benefits. Another study conducted by California State University, Sacramento reported that the annual household willingness to pay for statewide clean water is approximately $180.[10]

A study conducted by the University of Southern California and University of California, Los Angeles assessed the costs and benefits of implementing various approaches for achieving compliance with the MS4 permits in the Los Angeles region. The study found that non-structural systems would cost $2.8 billion but provide $5.6 billion in benefit. If structural systems were determined to be needed, the study found that total costs would be $5.7 to $7.4 billion, while benefits could reach $18 billion.[11] Costs are anticipated to be borne over many years, probably at least ten years.

As can be seen, the benefits of the municipal storm water management programs are expected to considerably exceed their costs. Such findings are corroborated by USEPA, which found that the benefits of implementation of its Phase II storm water rule would also outweigh the costs.[12]

[9] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68793.
[10] State Water Board, 2005. NPDES Stormwater Cost Survey. P. iv.
[11] Los Angeles Water Board, 2004. Alternative Approaches to Stormwater Control.
[12] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791.

VII. APPLICABLE STATUTES, REGULATIONS, PLANS AND POLICIES

A. Legal Authorities – Federal Clean Water Act and California Water Code

This Order is issued pursuant to section 402 of the CWA and implementing regulations adopted by the USEPA and chapter 5.5, division 7 of the CWC (commencing with section 13370). This Order serves as an NPDES permit for point source discharges to surface waters. This Order also serves as waste discharge requirements pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

The objective of the CWA is "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*." To carry out this objective, the CWA requires the implementation of permit programs to regulate the discharge of pollutants and dredged or fill material to the navigable waters of the U.S. and to regulate the use and disposal of sewage sludge. CWA section 402 provides the legal authority to issue a permit for the discharge of pollutants to waters of the U.S. under the NPDES. The CWA provides that NPDES permits may be issued by states which are authorized to implement the provisions of that act. California became authorized to implement the NPDES permit program on May 14, 1973.

The Porter-Cologne Water Quality Control Act (Division 7, commencing with CWC section 13000) established the State Water Resources Control Board (State Water Board) and nine Regional Water Quality Control Boards (Regional Water Boards) as the principal state agencies with primary responsibility for the coordination and control of water quality. CWC section 13200(f) established the San Diego Water Board, which has the primary responsibility for the coordination and control of water quality in the San Diego Region, which includes all the basins draining into the Pacific Ocean between the southern boundary of the Santa Ana Region and the California-Mexico boundary. The San Diego Water Board implements the CWA through Chapter 5.5 of the CWC, commencing with section 13370. CWC section 13377 provides the San Diego Water Board the legal authority to issue waste discharge requirements to ensure compliance with all applicable provisions of the CWA and acts amendatory thereof or supplementary, thereto, to implement water quality control plans, or for the protection of beneficial uses, or to prevent nuisance.

CWA section 402(p) requires the USEPA or authorized state to issue NPDES permits for storm water discharges from MS4s to waters of the U.S. CWA section 402(p)(3)(B)(ii) requires that NPDES permits for storm water discharges from MS4s "*effectively prohibit non-storm water discharges*" into the MS4s. CWA section 402(p)(3)(B)(iii) requires that NPDES permits for storm water discharges from MS4s to "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable* [MEP], *including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*."

The USEPA published implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]), which prescribe permit application requirements for storm water discharges from MS4s pursuant to CWA 402(p), on November 16, 1990. The USEPA published an Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems, which provided guidance on permit application requirements for regulated MS4s, on May 17, 1996. The federal regulations in 40 CFR 122 and guidance issued by USEPA serve as the foundation for the provisions of Order No. R9-2013-0001. The legal authorities provided by the above statutes and regulations are included as part of the discussions in Section VIII of this Fact Sheet.

B. Legal Authority for the Permit Issued on a Region-wide Basis

CWA section 402(p)(3)(B) provides the San Diego Water Board the legal authority to issue an NPDES permit for the San Diego Region as compared to separate MS4 permits based upon County- and partial County-wide boundaries as they existed within the San Diego Region. CWA section 402(p)(3)(B) states that "*Permits for discharges from municipal storm sewers- (i) may be issued on a system- or jurisdiction-wide basis* ...." The federal regulations in 40 CFR 122.26(a)(1)(v) also state that the San Diego Water Board "*may designate dischargers from municipal separate storm sewers on a system-wide or jurisdiction-wide basis. In making this determination, the [San Diego Water Board] may consider the following factors: (A) the location of the discharge with respect to waters of the United States; (B) the size of the discharge; (C) the quantity and nature of the pollutants discharged to waters of the United States; and (D) other relevant factors*."

More specifically, the federal regulations provide that for large and medium MS4 systems, the San Diego Water Board may issue a regional permit. Specifically, the federal regulation in 40 CFR 122.26(a)(3) provide:

"*(ii) The Director may either issue one system-wide permit covering all discharges from municipal separate storm sewers within a large or medium municipal storm sewer system or issue distinct permits for appropriate categories of discharges within a large or municipal separate storm sewer system including, but not limited to: all discharges owned or operated by the same municipality; located within the same jurisdiction; all discharges within a system that discharge to the same watershed; discharges within a system that are similar in nature; or for individual discharges from municipal separate storm sewers within the system.*

(iii) The operator of a discharge from a municipal separate storm sewer which is part of a large or medium municipal separate storm sewer system must either: (A) Participate in a permit application (to be a permittee or a co-permittee) with one or more other operator of discharges from the large or medium municipal storm sewer system which covers all, or a portion of all, discharges from the municipal separate storm sewer system; (B) Submit a distinct permit application which only covers discharges from the municipal separate storm sewers for

which the operator is responsible; or (C) A regional authority may be responsible for submitting a permit application under the following guidelines....

(iv) One permit application may be submitted for all or a portion of all municipal separate storm sewers within adjacent or interconnected large or medium municipal separate storm sewer systems. The Director may issue one systemwide permit covering all, or a portion of all municipal separate storm sewers in adjacent or interconnected large or medium municipal separate storm sewer systems.

(v) Permits for all or a portion of all discharges from large or medium municipal separate storm sewer systems that are issued on a system-wide, jurisdiction-wide, watershed or other basis may specify different conditions relating to different discharges covered by the permit, including different management programs for different drainage areas which contribute storm water to the system."

Based on these regulations, the San Diego Water Board may issue a region-wide MS4 permit. The regulations also clarify that the permit may include different conditions for separate discharges covered by the permit. This allows the San Diego Water Board to ensure that suitable water quality conditions and provisions are identified for each watershed.

The USEPA's responses to comments in the Final Rule for the above-mentioned regulations also make it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide, permits. In the Final Rule published in the Federal Register and containing the responses to comments, USEPA notes that 40 CFR 122.26(a)(3)(iv) would allow an entire system in a geographical region under the purview of a State agency to be designated under a permit.[13] USEPA also states that many commenters wanted to allow the permitting authority broad discretion to establish system-wide permits, and that EPA believes that paragraphs 40 CFR 122.26 (a)(1)(v) and (a)(3)(ii) allow for such broad discretion.[14]

This Order creates watershed requirements that apply to multiple counties. The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees. Managing storm water on a regional and watershed basis is expected to result in improved water quality, as the Order focuses on monitoring and management practices necessary to improve each watershed rather than political boundaries. A single permit also allows the San Diego Water Board staff to expend fewer resources developing successive multiple permits and allows more resources to be devoted to working cooperatively with all three current groups of Copermittees to ensure implementation of this Order results in improved water quality.

[13] 55 Federal Register 47990-01, 48042.
[14] Ibid.

C. Federal and California Endangered Species Acts

This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2115.5) or the Federal Endangered Species Act (16 United States Code [USC] sections 1531 to 1544). This Order requires compliance with requirements to protect the beneficial uses of waters of the U.S. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

D. California Environmental Quality Act

The action to adopt an NPDES Permit is exempt from the provisions of Chapter 3 of the California Environmental Quality Act (CEQA) (Public Resources Code section 21100, et seq.) pursuant to CWC section 13389. (*County of Los Angeles v. Cal. Water Boards* (2006) 143 Cal.App.4th 985.)

E. State and Federal Regulations, Plans and Policies

The legal authority provided by the following regulations, plans, and policies are also included as part of the discussions in Section VIII of this Fact Sheet.

<u>Water Quality Control Plan for the San Diego Basin</u>

The CWA requires the San Diego Water Board to establish water quality standards for each water body in its region. Water quality standards include beneficial uses, water quality objectives and criteria that are established at levels sufficient to protect beneficial uses, and an antidegradation policy to prevent degrading of waters. On September 8, 1994, the San Diego Water Board adopted the *Water Quality Control Plan for the San Diego Basin* (Basin Plan). The Basin Plan designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters in the San Diego Region. The San Diego Water Board has amended the Basin Plan on multiple occasions since 1994. In addition, the Basin Plan implements State Water Board Resolution No. 88-63, which established state policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply. Beneficial uses applicable to the surface water bodies that receive discharges from the MS4s within the San Diego Region generally include those listed below:

The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region:

- Municipal and Domestic Supply (MUN)
- Agricultural Supply (AGR)
- Industrial Process Supply (PROC)

- Industrial Service Supply (IND)
- Ground Water Recharge (GWR)
- Contact Water Recreation (REC1)
- Non-contact Water Recreation (REC2)
- Warm Freshwater Habitat (WARM)
- Cold Freshwater Habitat (COLD)
- Wildlife Habitat (WILD)
- Rare, Threatened, or Endangered Species (RARE)
- Freshwater Replenishment (FRSH)
- Hydropower Generation (POW)
- Preservation of Biological Habitats of Special Significance (BIOL)

The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region:

- Navigation (NAV)
- Commercial and Sport Fishing (COMM)
- Estuarine Habitat (EST)
- Marine Habitat (MAR)
- Aquaculture (AQUA)
- Migration of Aquatic Organisms (MIGR)
- Spawning, Reproduction, and/or Early Development (SPWN)
- Shellfish Harvesting (SHELL)

Pursuant to Water Code sections 13263 and 13377, the requirements of this Order implement the Basin Plan.

Water Quality Control Plan for Ocean Waters of California, California Ocean Plan

In 1972, the State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan). The State Water Board adopted the most recent amended Ocean Plan on October 16, 2012. The Office of Administrative Law approved it on July 3, 2013. The amended Ocean Plan became effective on August 19, 2013. The Ocean Plan is applicable, in its entirety, to ocean waters of the State. In order to protect beneficial uses, the Ocean Plan establishes water quality objectives and a program of implementation. Pursuant to Water Code sections 13263 and 13377, the requirements of this Order implement the Ocean Plan. The Ocean Plan identifies the beneficial uses of ocean waters of the State to be protected as summarized below:

- Industrial water supply
- Water contact and non-contact recreation, including aesthetic enjoyment; navigation
- Commercial and sport fishing

- Mariculture
- Preservation and enhancement of designated Areas of Special Biological Significance
- Rare and endangered species
- Marine habitat
- Fish spawning and shellfish harvesting

On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving an exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges. On June 19, 2012, the State Water Board adopted Order No. 2012-0031, amending Order No. 2012-0012 to require pollutant load reductions to be achieved within six years for the ASBS Compliance Plans, section A.2.d(2) and ASBS Pollution Prevention Plans, section B.2.b(2). The State Water Board Resolution No. 2012-0012, as amended requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject terms and conditions of State Water Board Resolution No. 2012-0012, as amended. The Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012, as amended, applicable to these discharges, are incorporated in Attachment A of this Order. Requirements of this Order implement the Ocean Plan.

Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality

On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

Antidegradation Policy

Federal regulations (40 CFR 131.12) require that the state water quality standards include an antidegradation policy consistent with the federal antidegradation policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16 ("Statement of Policy with Respect to Maintaining the Quality of the Waters of the State"). State Water Board Resolution No. 68-16 incorporates the

federal antidegradation policy where the federal policy applies under federal law.

The San Diego Water Board's Basin Plan implements and incorporates by reference both the State and federal antidegradation policies. State Water Board Resolution No. 68-16 and 40 CFR 131.12 require the San Diego Water Board to maintain high quality waters of the State unless degradation is justified based on specific findings. First, the Board must ensure that "existing instream uses and the level of water quality necessary to protect the existing uses" are maintained and protected. Second, if the baseline quality of a water body for a given constituent exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water, that quality shall be maintained and protected through the requirements of the Order unless the Board makes findings that (1) any lowering of the water quality is necessary to accommodate important economic or social development in the area in which the waters are located; (2) water quality adequate to protect existing uses fully is assured; and (3) the highest statutory and regulatory requirements for all new and existing point sources and all cost-effective and reasonable best management practices for nonpoint source control are achieved. The San Diego Water Board must also comply with any requirements of State Water Board Resolution No. 68-16 beyond those imposed through incorporation of the federal antidegradation policy. In particular, the Board must find that not only present, but also anticipated future uses of water are protected, and must ensure best practicable treatment or control of the discharges. The baseline quality considered in making the appropriate findings is the best quality of the water since 1968, the year of the adoption of Resolution No. 68-16, or a lower level if that lower level was allowed through a permitting action that was consistent with the federal and state antidegradation policies.

The discharges permitted in this Order are consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Board Resolution No. 68-16 as set forth below:

1. Many of the waters within the area covered by this Order are impaired for multiple pollutants discharged through MS4s and are not high quality waters with regard to these pollutants. In most cases, there is insufficient data to determine whether these water bodies were impaired as early as 1968, but the limited available data shows impairment dating back for more than two decades. Many such water bodies are listed on the State's CWA Section 303(d) List and the San Diego Water Board has established TMDLs to address the impairments. This Order ensures that existing instream (beneficial) water uses and the level of water quality necessary to protect the existing uses is maintained and protected. This Order requires the Copermittees to comply with permit provisions to implement the WLAs set forth in the TMDLs in order to restore the beneficial uses of the impaired water bodies consistent with the assumptions and requirements of the TMDLs. This Order further requires compliance with receiving water limitations to meet water quality standards in the receiving water either by demonstrating compliance pursuant to Provision A and the Copermittees' monitoring and assessment program pursuant to Provision D of this Order, or by implementing Provision B.3.c with a schedule to achieve compliance

with receiving water limitations. This Order includes requirements to develop and implement storm water management programs, achieve WQBELs, and effectively prohibit non-storm water discharges into the MS4. The issuance of this Order does not authorize an increase in the amount of discharge of waste.

2. To the extent that water bodies within the area covered by this Order are high quality waters with regard to some constituents, this Order finds as follows:

   a. Allowing limited degradation of high quality water bodies through MS4 discharges is necessary to accommodate important economic or social development in the area and is consistent with the maximum benefit to the people of the state. The discharge of storm water in certain circumstances is to the maximum benefit to the people of the state because it can assist with maintaining instream flows that support beneficial uses, may spur the development of multiple-benefit projects, and may be necessary for flood control, and public safety as well as to accommodate development in the area. The alternative – capturing all storm water from all storm events – would be an enormous opportunity cost that would preclude MS4 permittees from spending substantial funds on other important social needs. The Order ensures that any limited degradation does not affect existing and anticipated future uses of the water and does not result in water quality less than established standards. The Order requires compliance with receiving water limitations that act as a floor to any limited degradation.

   b. The Order requires the highest statutory and regulatory requirements and requires that the Copermittees meet best practicable treatment or control. The Order prohibits all non-storm water discharges, with a few enumerated exceptions, through the MS4 to the receiving waters. As required by 40 CFR section 122.44(a), the Copermittees must comply with the "maximum extent practicable" technology-based standard set forth in CWA section 402(p), and implement extensive minimum control measures in a storm water management program. Recognizing that best practicable treatment or control may evolve over time, the Order includes new and more specific requirements as compared to the prior Phase I MS4 permits for the San Diego County, Orange County and Riverside County Copermittees. The Order incorporates options to implement Water Quality Improvement Plans that must specify detailed structural and non-structural storm water controls that must be implemented in accordance with an accepted proposed time schedule. The Order contains provisions to encourage, wherever feasible, retention of the storm water from the 85th percentile 24-hour storm event.

<u>Anti-Backsliding Requirements</u>

CWA sections 402(o) and 303(d)(4) and federal regulations at 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations or conditions may be relaxed. While this Order

allows implementation of an alternative compliance pathway option in Provision B.3.c to constitute compliance with receiving water limitations under certain circumstances, the availability of that alternative and the corresponding availability of additional time to come into compliance with receiving water limitations does not violate the anti-backsliding provisions. The receiving water limitations provisions of this Order are imposed under section 402(p)(3)(B) of the Clean Water Act rather than based on best professional judgment, or based on section 301(b)(1)(C) or sections 303(d) or (e), and are accordingly not subject to the anti-backsliding requirements of section 402(o). Although the non-applicability is less clear with respect to the regulatory anti-backsliding provisions in 40 CFR 122.44(l), the regulatory history suggests that USEPA's intent was to establish the anti-backsliding regulations with respect to evolving technology standards for traditional point sources. (See, e.g., 44 Fed.Reg. 32854, 32864 (Jun. 7, 1979)). It is unnecessary, however, to resolve the ultimate applicability of the regulatory anti-backsliding provisions, because the alternative compliance pathway option in Provision B.3.c qualifies for an exception to backsliding as based on new information.

The alternative compliance pathway option in Provision B.3.c of this Order was informed by new information available to the Board from experience and knowledge gained through storm water permitting at the Regional Water Boards in the last ten years. There has been a statewide paradigm shift in storm water management. State Water Board Order WQ 2015-0075 directed all of the Regional Water Boards to consider the Los Angeles Water Board's alternative compliance path to receiving water limitations in all Phase I MS4 permits going forward (State Water Board Order WQ 2015-0075 at page 51), and the Los Angeles Water Board's process of developing over 30 watershed-based TMDLs and implementing several TMDLs since the adoption of the previous permits. In particular, the Los Angeles Water Board recognized the significance of allowing time to plan, design, fund, operate and maintain watershed-based BMPs necessary to attain water quality improvements and additionally recognized the potential for municipal storm water to benefit water supply. Similarly, the San Diego Water Board's experience developing and implementing the Fourth Term MS4 Permits and TMDLs that apply on a region-wide scale (e.g. TMDLs for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region) has resulted in a similar recognition of the need for a watershed-based approach that allows time to plan, design, fund, operate and maintain BMPs to address impaired waters that have been impacted by MS4 discharges. Thus, even if the receiving water limitations are subject to anti-backsliding requirements, they were revised based on new information that would support an exception to the anti-backsliding provisions. (33 U.S.C. § 1342(o)(2)(B)(i); 40 C.F.R. § 122.44(l)(1); 40 C.F.R. §122.44(l)(2)(i)(B)(1)).

<u>Clean Water Act Section 303(d) List</u>

CWA section 303(d)(1) requires each State to identify specific water bodies within its boundaries where water quality standards are not being met or are not expected to be met after implementation of technology-based effluent limitations on point sources. Water bodies that do not meet water quality standards are considered impaired and are placed on the state's "303(d) List." Periodically, USEPA approves the State's 303(d) List.

Most recently, USEPA approved the State's 2010 303(d) List of impaired water bodies on October 11, 2011, which includes certain receiving waters in the San Diego Region. For each listed water body, the state or USEPA is required to establish a TMDL of each pollutant impairing the water quality standards in that water body. A TMDL is a tool for implementing water quality standards and is based on the relationship between pollution sources and in-stream water quality conditions. The TMDL establishes the allowable pollutant loadings for a water body and thereby provides the basis to establish water quality-based controls. These controls should provide the pollution reduction necessary for a water body to meet water quality standards.

A TMDL is the sum of the allowable pollutant loads of a single pollutant from all contributing point sources (the waste load allocations or WLAs) and non-point sources (load allocations of LAs) plus the contribution from background sources and a margin of safety (40 CFR 130.2(i)). MS4 discharges are considered point source discharges. For 303(d)-listed water bodies and pollutants in the San Diego Region, the San Diego Water Board or USEPA develops and adopts TMDLs that specify these requirements.

Since 2002, the San Diego Water Board has established seven (7) TMDLs to remedy water quality impairments in various water bodies within the San Diego Region (see Attachment E to the Order). These TMDLs identify MS4 discharges as a source of pollutants to these water bodies, and, as required, establish WLAs for MS4 discharges to reduce the amount of pollutant discharged to receiving waters. CWA section 402(p)(3)(B)(iii) requires the San Diego Water Board to impose permit conditions, including: "management practices, control techniques and system, design and engineering methods, and *such other provisions as the Administrator or the State determines appropriate for the control of such pollutants."* (Emphasis added.) CWA section 402(a)(1) also requires states to issue permits with conditions necessary to carry out the provisions of the CWA. Federal regulations also require that NDPES permits contain WQBELs consistent with the assumptions and requirements of all available WLAs (40 CFR 122.44(d)(1)(vii)(B)). CWC section 13377 also requires that NPDES permits include limitations necessary to implement water quality control plans. Therefore, this Order includes WQBELs and other provisions to implement the TMDL WLAs assigned to Copermittees regulated by this Order.

<u>Other Regulations, Plans and Policies</u>

This Order implements all other applicable federal regulations and State regulations, plans and policies, including the California Toxics Rule at 40 CFR 131.38 (Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California Rule [California Toxics Rule or CTR]), and State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP).

F. Unfunded State Mandates

Article XIII B, Section 6(a) of the California Constitution provides that whenever "*any state agency mandates a new program or higher level of service on any local government, the state shall provide a subvention of funds to reimburse that local government for the costs of the program or increased level of service*." The requirements of this Order do not constitute state mandates that are subject to a subvention of funds for several reasons, including, but not limited to, the following.

First, the requirements of this Order do not constitute a new program or a higher level of service as compared to the requirements contained in the previous Fourth Term Permits. The overarching requirement to impose controls to reduce the pollutants in discharges from MS4s is dictated by the CWA and is not new to this permit cycle (33 USC section 1342(p)(3)(B)). The inclusion of new and advanced measures as the MS4 programs evolve and mature over time is anticipated under the CWA (55 FR 47990, 48052 (Nov. 16, 1990)), and to the extent requirements in this Order are interpreted as new advanced measures, they do not constitute a new program or higher level of service.

Second, and more broadly, mandates imposed by federal law, rather than by a state agency, are exempt from the requirement that the local agency's expenditures be reimbursed (Cal. Const., art. XIII B, section 9, subd. (b)). This Order implements federally mandated requirements under the CWA and its requirements are therefore not subject to subvention of funds. This includes federal requirements to effectively prohibit non-storm water discharges, to reduce the discharge of pollutants in storm water to the MEP, and to include such other provisions as the Administrator or the State determines appropriate for the control of such pollutants (33 USC section 1342(p)(3)(B)). Federal cases have held these provisions require the development of permits and permit provisions on a case-by-case basis to satisfy federal requirements. (*Natural Resources Defense Council, Inc., v. USEPA* (9th Cir. 1992) 966 F.2d 1292, 1308, fn. 17.)

The authority exercised under this Order is not reserved state authority under the CWA's savings clause (cf. *Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 627-628 [relying on 33 USC section 1370, which allows a state to develop requirements which are not "less stringent" than federal requirements]), but instead is part of a federal mandate to develop pollutant reduction requirements for municipal separate storm sewer systems. To this extent, it is entirely federal authority that forms the legal basis to establish the permit provisions. (See, *City of Rancho Cucamonga v. Regional Water Quality Control Board, Santa Ana Region* (2006) 135 Cal.App.4th 1377, 1389; *Building Industry Ass'n of San Diego Co. v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 882-883.)

The MEP standard is a flexible standard that balances a number of considerations, including technical feasibility, cost, public acceptance, regulatory compliance, and effectiveness. (*Building Ind. Ass'n., supra,* 124 Cal.App.4th at pp. 873-874, 889.) Such considerations change over time with advances in technology and with experience

gained in storm water management (55 FR 47990, 48052 (Nov. 16, 1990)). Accordingly, a determination of whether the conditions contained in this Order exceed the requirements of federal law cannot be based on a point by point comparison of the permit conditions and the minimum control measures that are required "at a minimum" to reduce pollutants to the maximum extent practicable and to protect water quality (40 CFR 122.34). Rather, the appropriate focus is whether the permit conditions, as a whole, exceed the MEP standard.

In recent months, the County of Los Angeles and County of Sacramento Superior Courts have granted writs setting aside decisions of the Commission on State Mandates that held certain requirements in Phase I permits constituted unfunded mandates. In both cases, the courts have found that the correct analysis in determining whether an MS4 permit constituted a state mandate was to evaluate whether the permit as a whole exceeds the MEP standard. (*State of Cal. v. Comm. on State Mandates* (Super. Ct. Sacramento County, 2012, No. 34-2010-80000604), *State of California v. County of Los Angeles* (Super. Ct. Los Angeles County, 2011, No. BS130730.) Both cases are currently pending appeal.

The requirements of the Order, taken as a whole rather than individually, are necessary to reduce the discharge of pollutants to the MEP and to protect water quality. The San Diego Water Board finds that the requirements of the Order are practicable, do not exceed federal law, and thus do not constitute an unfunded mandate. These findings are the expert conclusions of the principal state agency charged with implementing the NPDES program in California (CWC sections 13001, 13370).

It should also be noted that the provisions in this Order to effectively prohibit non-storm water discharges are also mandated by the CWA (33 USC section 1342(p)(3)(B)(ii)). Likewise, the provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state establishes or adopts a TMDL, federal law requires that permits must contain effluent limitations consistent with the assumptions and requirements of any applicable waste load allocation in a TMDL (40 CFR 122.44(d)(1)(vii)(B)).

Third, the local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental dischargers who are issued NPDES permits for storm water discharges. With a few inapplicable exceptions, the CWA regulates the discharge of pollutants from point sources (33 USC section 1342) and the Porter-Cologne Act regulates the discharge of waste (CWC section 13263), both without regard to the source of the pollutant or waste. As a result, the "costs incurred by local agencies" to protect water quality reflect an overarching regulatory scheme that places similar requirements on governmental and non-governmental dischargers. (See *County of Los Angeles v. State of California* (1987) 43 Cal.3d 46, 57-58 [finding comprehensive workers' compensation scheme did not create a cost for local agencies that was subject to state subvention].)

The CWA and the Porter-Cologne Act largely regulate storm water with an even hand, but to the extent there is any relaxation of this even-handed regulation, it is in favor of the local agencies. Generally, the CWA requires point source dischargers, including dischargers of storm water associated with industrial or construction activity, to comply strictly with water quality standards (33 USC section 1311(b)(1)(C); *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159, 1164-1165 [noting that industrial discharges must strictly comply with water quality standards]). As discussed in prior State Water Board decisions, certain provisions of this Order do not require strict compliance with water quality standards (State Water Board Order No. WQ 2001-0015, p. 7). Those provisions of this Order regulate the discharge of waste in municipal storm water under the CWA's MEP standard, not the BAT/BCT standard that applies to other types of discharges. These provisions, therefore, regulate the discharge of waste in municipal storm water more leniently than the discharge of waste from non-governmental sources.

Fourth, the Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)). To the extent that the local agency Copermittees have voluntarily availed themselves of the permit, the program is not a state mandate. (Accord, *County of San Diego v. State of California* (1997) 15 Cal.4th 68, 107-108.)

Fifth, the local agency Copermittees' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under state law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

Finally, even if any of the permit provisions could be considered unfunded mandates, under Government Code section 17556, subdivision (d), a state mandate is not subject to reimbursement if the local agency has the authority to charge a fee. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order, subject to certain voting requirements contained in the California Constitution. (See Cal. Const., Art. XIII D, section 6, subd. (c); see also *Howard Jarvis Taxpayers Ass'n v. City of Salinas* (2002) 98 Cal.App.4th 1351, 1358-1359.) The Fact Sheet demonstrates that numerous activities contribute to the pollutant loading in the MS4. Local agencies can levy service charges, fees, or assessments on these activities, independent of real property ownership. (See, e.g., *Apartment Ass'n of Los Angeles County, Inc., v. City of Los Angeles* (2001(24 Cal.4th 830, 842 [upholding inspection fees associated with renting property].) The authority and ability of a local agency to defray the cost of a program without raising taxes indicates that a program does not entail a cost subject to subvention. (*Clovis Unified School Dist. V. Chiang* (2010) 188 Cal.App.4th 794, 812, citing *Connell v. Sup. Ct.* (1997) 59 Cal.App.4th 382, 401; *County of Fresno v. State of California* (1991) 53 Cal. 3d. 482, 487-488.)

VIII. PROVISIONS

The provisions (i.e. NPDES permit requirements) of the Order are discussed below.

A. Prohibitions and Limitations

Purpose: Provision A includes the prohibitions and limitations requirements that are the foundation of all the subsequent requirements included in the Order. Compliance with the prohibitions and limitations will restore and protect receiving waters from impacts that may be caused by discharges into and from the Copermittees' MS4s and ultimately achieve the objective of the CWA.

In meeting the requirements set forth in the Order, the Copermittees must be cognizant that the prohibitions and limitations exist and will be the standard by which the San Diego Water Board will be measuring the progress and success of their implementation of the NPDES permit requirements.

***Discussion*:** The objective of the CWA is to "*restore and maintain the chemical, physical, and biological integrity of the Nation's waters*." The CWA requires the implementation of NPDES permit programs to regulate discharges of pollutants and dredged or fill material to the navigable waters of the U.S. For discharges into and from MS4s, the CWA requires the NPDES permits to "*effectively prohibit non-stormwater discharges into the storm sewers*" and "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable.*"

Provision A includes limitations, consistent with the requirements of the CWA for discharges from MS4s. Provision A expresses these limitations as discharge prohibitions, receiving water limitations, and effluent limitations. Compliance with the discharge prohibitions and receiving water limitations is also explicitly described, in conformance with precedential State Water Board Orders.

More specific and detailed discussions of the requirements of Provision A are provided below.

Provision A.1 (Discharge Prohibitions) prohibits the discharge of specific types of waste into and/or from the Copermittees' MS4s.

Provision A.1.a restates and reiterates Basin Plan Waste Discharge Prohibition 1, by prohibiting discharges into and from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the

state. The terms pollution,[15] contamination,[16] and nuisance[17] are defined under CWC 13050. Provision A.1.c incorporates all the waste discharge prohibitions of the Basin Plan into the requirements of the Order. The waste discharge prohibitions from the Basin Plan have been reproduced and provided in Attachment A to the Order.

Provision A.1.b requires non-storm water discharges into the MS4s to be effectively prohibited, consistent with the requirements of the CWA for MS4 permits to "*effectively prohibit non-stormwater discharges into the storm sewers*." The effective prohibition is required to be implemented by each Copermittee within its jurisdiction through the illicit discharge detection and elimination requirements under Provision E.2. The prohibition does not apply to NPDES permitted discharges into the Copermittees' MS4s.

The CWA employs the strategy of prohibiting the discharge of any pollutant from a point source into waters of the United States unless the discharger of the pollutant(s) obtains an NPDES permit pursuant to CWA Section 402. The 1987 amendment to the CWA includes provision 402(p) that specifically addresses NPDES permitting requirements for storm water discharges from MS4s. CWA section 402(p) prohibits the discharge of pollutants from specified MS4s to waters of the U.S. except as authorized by an NPDES permit and identifies two substantive standards for MS4 storm water permits. MS4 permits (1) "*shall include a requirement to effectively prohibit non-stormwater discharges into the storm sewers*" and (2) "*shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or State determines appropriate for the control of such pollutants*." (CWA section 402(p)(3)(B)(ii)-(iii).)

In November 1990, the USEPA published regulations addressing storm water discharges from MS4s (55 FR 47990 and following (Nov. 16, 1990) (Phase I Final Rule)). The regulations establish minimum requirements for MS4 permits, and generally focus on the requirement that MS4s implement programs to reduce the amount of pollutants found in storm water discharges to the MEP. The CWA's municipal storm water MEP standard does not require storm water discharges to strictly meet water quality standards, as is required for other NPDES permitted

[15] CWC 13050(l): "(1) 'Pollution' means an alteration of the quality of waters of the state by waste to a degree which unreasonably affects either of the following: (A) The water for beneficial uses. (B) Facilities which serve beneficial uses. (2) 'Pollution' may include 'contamination.'

[16] CWC 13050(k): "Contamination' means an impairment of the quality of waters of the state by waste to a degree which creates a hazard to public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste, whether or not waters of the state are affected."

[17] CWC 13050(m): 'Nuisance' means anything which meets all of the following requirements: (1) Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. (2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. (3) Occurs during, or as a result of, the treatment or disposal of wastes."

discharges. Compliance is achieved through an iterative approach of continuous implementation of improved BMPs. This distinction reflects Congress's recognition that variability in flow and intensity of storm events render difficult strict compliance with water quality standards by MS4 permittees. In describing the controls that permits must include to reduce pollutants in storm water discharges to the MEP, the statute (CWA section 402(p)(3)(B)(iii)) states that the controls shall include: "*management practices, control techniques and system, design and engineering methods, and such other provisions as the [permit writer] determines appropriate for the control of such pollutants*."

In contrast, non-storm water discharges from the MS4 that are not authorized by separate NPDES permits are subject to requirements under the NPDES program, including discharge prohibitions, technology based effluent limitations and water quality-based effluent limitations (40 CFR 122.44). The regulations also require the Copermittee's program to include an element to detect and remove illicit discharges and improper disposal into the storm sewer (40 CFR 122.26(d)(2)(iv)(B)).

While "non-storm water" is not defined in the CWA or federal regulations, the federal regulations (at 40 CFR 122.26(b)(2)) define "*illicit discharge*" as *"any discharge to a municipal separate storm sewer that is not composed entirely of storm water and that is not covered by an NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer and discharges resulting from fire fighting activities)*." This definition is the most closely applicable definition of "non-storm water" contained in federal law. As stated in the Phase I Final Rule, USEPA added the illicit discharge program requirement to begin implementation of the 'effective prohibition' requirement to detect and control non-storm water discharges to their municipal system.

Thus, federal law mandates that permits issued to MS4s must require management practices that will result in reducing storm water pollutants to the MEP yet at the same time requires that non-storm water discharges be effectively prohibited from entering the MS4. "Effectively" prohibit does not mean that non-storm water discharges are authorized to be discharged into and from the Copermittees' MS4s. The Phase I Final Rule clarifies what "effectively prohibit" means (55 FR 47995):

> "*Section 402(p)(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…<u>Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit</u> (other than the permit for the discharge from the municipal separate storm sewer)*" [Emphasis added].

Consistent with federal law, unless non-storm water discharges to the MS4 are authorized by a separate NPDES permit, non-storm water discharges are

appropriately subject to the effective prohibition requirement in the CWA and Regional Water Boards are not limited by the iterative MEP approach to storm water regulation in crafting appropriate regulations for non-storm water discharges.

The federal regulations (40CFR122.26(d)(2)(i)(B)) require the Copermittees to establish the legal authority which authorizes or enables the Copermittees to prohibit illicit discharges to the MS4s. The federal regulations (40 CFR 122.26(d)(2)(vi)(B)(1)) require the Copermittees to "*implement and enforce an ordinance, order or similar means*" to prevent non-storm water discharges to their MS4s. Thus, the Copermittees are required to "*effectively*" prohibit non-storm water discharges to their MS4s through enforcing their legal authority established under "*ordinance, order or similar mean*s" and either remove those discharges to their MS4s, or require those discharges to obtain coverage under a separate NPDES permit. More detail about the program that must be implemented to "*effectively*" prohibit non-storm water discharges to the Copermittees' MS4s is provided under the discussion for Provision E.2.

Provision A.1.d was included to be consistent with Resolution No. 2012-0012, adopted by the State Water Board on March 20, 2012. Provision A.1.d prohibits discharges from MS4s to Areas of Special Biological Significance (ASBS), except for storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach to the Heisler Park ASBS subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012. The pertinent Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 are provided in Attachment A to the Order.

<u>Provision A.2 (Receiving Water Limitations)</u> specifies the condition of the receiving waters that must be achieved when there are discharges from the Copermittees' MS4s. Receiving water limitations are included in all NPDES permits issued pursuant to the CWA section 402. CWA section 402(p)(3)(B)(iii) authorizes the inclusion of "*such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." This requirement gives USEPA or the State permitting authority, in this case the San Diego Water Board, discretion to determine what permit conditions are necessary to control pollutants.

In its Phase I Final Rule (see 55 FR 47990, 47994 (Nov. 16, 1990)), USEPA elaborated on these requirements, stating that, "*permits for discharges from municipal separate storm sewer systems must require controls to reduce the discharge of pollutants to the maximum extent practicable, and where necessary water quality-based controls*." USEPA reiterated in its Phase II Final Rule (64 FR 68722, 68737), that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL*." CWC section 13377 also requires that NPDES permits include limitations necessary to implement water quality control plans. Both the State Water Board and the San Diego Water Board have previously concluded that discharges from the MS4 contain pollutants that have

the reasonable potential to cause or contribute to excursions above water quality standards. As such, inclusion of receiving water limitations is appropriate to control MS4 discharges.

The inclusion of receiving water limitations is also consistent with the Ninth Circuit Court of Appeals' ruling in *Defenders of Wildlife v. Browner* (191 F.3d 1159, 1166 (1999)) that the permitting authority has discretion regarding the nature and timing of requirements that it includes as MS4 permit conditions to attain water quality standards. The Ninth Circuit Court of Appeals recently explained that, "*[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*" (*Natural Resources Defense Council v. County of Los Angeles* (9th Cir. 2011) 673 F.3d 880, 886 (revd. On other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013)))

The receiving water limitations included in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan or in water quality control plans or policies adopted by the State Water Board, including State Water Board Resolution No. 68-16, or in federal regulations, including but not limited to 40 CFR 131.12 and 131.38. The water quality objectives in the Basin Plan and other State Water Board plans and policies have been approved by USEPA and combined with designated beneficial uses constitute the water quality standards required under federal law.

Provision A.2.a requires that discharges from the Copermittees' MS4s must not cause or contribute to the violation of water quality standards in receiving waters. The water quality standards of the receiving waters must be protected from the impacts that may be caused by the Copermittees' MS4 discharges. Water quality standards applicable to the surface waters in the San Diego Region must be achieved through meeting the technology based standard of MEP through an iterative process of improved management actions. Provision A.2.a is also consistent with State Water Board Order WQ 99-05 precedent-setting language requiring discharges from MS4s to attain receiving water quality standards. The water quality control plans and policies with water quality standards applicable to the waters in the San Diego Region are included under Provision A.2.a.

Provisions A.2.b was included to be consistent with the requirements of State Water Board Resolution No. 2012-0012, adopted on March 20, 2012.

<u>Provision A.3 (Effluent Limitations)</u> specifies the condition of the discharges from the Copermittees' MS4s that must be achieved if and when there are discharges.

Consistent with CWA section 301(b)(1)(A) and 40 CFR 122.44(a), Provision A.3.a includes the technology-based effluent limitations that must be included in the Order. The technology-based effluent limits, representing the minimum level of control that must be imposed in a permit under CWA section 402, requires that pollutants in discharges of storm water from the Copermittees' MS4s be reduced to the MEP. This provision applies specifically to storm water discharges. Non-storm water discharges must be effectively prohibited, as required under Provision A.1.b. Non-storm water (dry weather) discharges from the MS4 are not considered storm water (wet weather) discharges and therefore are not subject to the MEP standard.

The technology-based MEP standard is an ever-evolving, flexible, and advancing concept. Neither Congress nor USEPA has specifically defined the term "maximum extent practicable." Congress established this flexible MEP standard so that the administrative bodies would have "*the tools to meet the fundamental goals of the Clean Water Act in the context of storm water pollution*." (*Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 884.) As knowledge about controlling storm water runoff and discharges continues to evolve, so does the knowledge which constitutes MEP. Reducing the discharge of pollutants in storm water from the MS4 to the MEP requires the Copermittees to assess each program component and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP.

The San Diego Water Board or the State Water Board ultimately define MEP, and may include requirements that provide specific guidance on what is expected to demonstrate MEP. It is the responsibility of the Copermittees to propose actions that implement BMPs to reduce storm water pollution to the MEP. In other words, the Copermittees' runoff management programs developed and implemented under the Order are the Copermittees' proposals for achieving MEP. Their total collective and individual activities conducted pursuant to their runoff management programs become their proposal for achieving MEP as it applies both to their overall effort, as well as to specific activities. Provisions B through E of the Order provides a minimum framework to guide the Copermittees in achieving the MEP standard for discharges of pollutants in storm water.

Provision A.3.b incorporates any water quality based effluent limitations (WQBELs) applicable to the MS4s established for TMDLs adopted and approved for the San Diego Region and requires the Copermittees to comply with those WQBELs. This is consistent with 40 CFR 122.44(d)(1)(vii)(B), which requires that NPDES permits to incorporate WQBELs "*developed to protect a narrative water quality criterion, a numeric water quality criterion, or both…consistent with the assumptions and requirements of any available wasteload allocation for the discharge...*"

Pursuant to CWA section 303(d), for surface water bodies identified as impaired by one or more pollutants, the San Diego Water Board is required to establish TMDLs "*at a level necessary to implement the applicable water quality standards with seasonal variations and a margin of safety which takes into account any lack of knowledge*

concerning the relationship between effluent limitations and water quality." The TMDLs identify sources of the pollutants causing the impairments and assign portions of the TMDL as WLAs to point sources, which include MS4s.

WLAs must be expressed in NPDES permits as WQBELs, which may include one or more numeric components such as numeric effluent limits, and/or receiving water limitations, and/or BMP requirements. Because numeric targets for TMDLs typically include a component that will be protective of water quality standards, a TMDL will likely include one or more numeric receiving water limitations and/or effluent limitations as part of the assumptions or requirements of the TMDL. Any numeric receiving water limitations and/or effluent limitations developed as part of the assumptions or requirements of a TMDL must be incorporated and included as part of WQBELs for the MS4s.

Because the development and approval of new TMDLs, or modification of existing TMDLs, may occur during the term of this Order, the specific provisions of those TMDLs, including effluent limitations applicable to MS4s are provided within Attachment E to the Order. Attachment E will be updated with new TMDLs and modifications to existing TMDLs in a timely manner as they occur.

Provision A.4 (Compliance with Discharge Prohibitions and Receiving Water Limitations) describes the process required to be implemented by the Copermittees if compliance with the discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a are not being achieved under current conditions.

In its Phase II Stormwater Regulations, Final Rule, USEPA states that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL.*"[18] In a series of comment letters on MS4 permits issued by various Regional Water Boards, USEPA has also reiterated that MS4 discharges must meet water quality standards.[19] In addition, the Ninth Circuit Court of Appeals explained in a recent ruling that, *"[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*"[20]

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[18] Phase II Stormwater Regulations, Final Rule, 64 Fed. Reg. 68722, 68737.
[19] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.
[20] NRDC v. County of Los Angeles (9th Cir. 2011), 673 F.3d 880, 886 (revd. on other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013))). See also, *Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 884-886, citing *Defenders of Wildlife v. Browning,* (9th Cir. 1999) 191 F.3d 1159.)

Water quality standards for the San Diego Region are established in the Basin Plan. The water quality standards of the Basin Plan are incorporated into this Order as the discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a. The discharge prohibitions and receiving water limitations in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations or prohibitions to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan, water quality control plans or policies adopted by the State Water Board, including Resolution No. 68-16, or federal regulations, including but not limited to, 40 CFR 131.12 and 131.38. The waste discharge prohibitions and water quality objectives in the Basin Plan have been approved by USEPA and combined with the designated beneficial uses constitute the water quality standards required under federal law.

Under federal law (CWA section 402(p)(3)(B)(iii)), an MS4 permit must include "*controls to reduce the discharge of pollutants to the maximum extent practicable...and such other provision as...the State determines appropriate for control of such pollutants*." The State Water Board has previously determined that limitations necessary to meet water quality standards are appropriate for the control of pollutants discharged by MS4s and must be included in MS4 permits. (State Water Board Orders WQ 91-03, 98-01, 99-05, 2001-15; see also *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159.) This Order prohibits discharges that cause or contribute to violations of water quality standards.

The discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a are included in this Order to ensure that discharges from the MS4s do not cause or contribute to exceedances of water quality objectives necessary to protect the beneficial uses of the receiving waters.

Provision A.4 is consistent with the precedent-setting language in State Water Board Order WQ 99-05 required to be included in municipal storm water permits. State Water Board Order WQ 2001-15 refined Order WQ 99-05 by requiring an iterative approach to compliance with water quality standards involving ongoing assessments and revisions, referred to as the "iterative process." The "iterative process" is a fundamental NPDES requirement for municipal storm water permits to achieve the objectives of the CWA.

The State Water Board and Regional Water Boards have stated that the provisions under Provisions A.1.a, A.1.c, A.2.a, and A.4 are independently applicable, meaning that compliance with one provision does not provide a "safe harbor" where there is non-compliance with another provision (i.e., compliance with the Provision A.4 does not shield a Copermittee who may have violated Provision A.1.a, A.1.c, or A.2.a from an enforcement action). The intent of Provision A.4 is to ensure that the Copermittees have the necessary storm water management programs and controls in place, and that they are modified by the Copermittees in a timely fashion when necessary, so that compliance with Provisions A.1.a, A.1.c, and/or A.2.a is achieved as soon as possible. USEPA expressed the importance of this independent applicability in a series of

comment letters on MS4 permits proposed by various Regional Water Boards. At that time, USEPA expressly objected to certain MS4 permits that included language stating, *"permittees will not be in violation of this [receiving water limitation] provision … [if certain steps are taken to evaluate and improve the effectiveness of the jurisdictional runoff management programs],"* concluding that this phrase would not comply with the CWA.[21]

The Ninth Circuit held in *Natural Resources Defense Council v. County of Los Angeles* (2011) 673 F3d. 880, 886 (revd. on other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013))) that engagement in the iterative process does not provide a safe harbor from liability for violations of permit terms prohibiting exceedances of water quality standards. The Ninth Circuit holding is consistent with the position of the State and Regional Water Boards that exceedances of water quality standards in an MS4 permit constitute violations of permit terms subject to enforcement by the Water Boards or through a citizen suit. While the Water Boards have generally directed dischargers to achieve compliance by improving control measures through the iterative process, the San Diego Water Board retains the discretion to take other appropriate enforcement and the iterative process does not shield dischargers from citizen suits under the CWA.

The requirements of Provision A.4, therefore, are required to be implemented until the water quality standards expressed under Provisions A.1.a, A.1.c, and A.2.a are achieved. The CWA requires MS4 permits to "*require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." The requirements of this Order have been deemed or determined to be "appropriate" to achieve water quality standards in receiving waters.

Part of the "*controls*" required by the Order is the process described in Provision A.4. Provision A.4 includes the process that is ultimately expected to achieve compliance with the requirement that discharges from the MS4 do not cause or contribute to violations of water quality standards in the receiving waters. The implementation of Provision A.4 is required when the Copermittees or the San Diego Water Board have determined that discharges from the MS4 are causing or contributing to violations of water quality standards in the receiving waters.

The Copermittees must effectively prohibit non-storm water discharges into the MS4s, reduce the discharge of pollutants in storm water from the MS4s to the MEP, and ensure that their MS4 discharges do not cause or contribute to violations of water quality standards. If the Copermittees have effectively prohibited non-storm water

[21] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.

discharges and reduced storm water pollutant discharges to the MEP, but their discharges are still causing or contributing to violations of water quality standards, Provision A.4 provides a clear "iterative process" for the Copermittees to follow.

Provision A.4 essentially requires the Copermittees to implement additional BMPs until MS4 discharges no longer cause or contribute to a violation of water quality standards.

In assessing compliance and potential enforcement actions, the San Diego Water Board looks at the Copermittees' efforts in total to meet the requirements of Provisions A.1.a, A.1.c, A.2.a and Provision A.4. The Copermittees need to demonstrate that they are making improvements to their programs and making progress toward achieving the discharge prohibitions and receiving water limitations in Provisions A.1.a, A.1.c, and A.2.a by implementing the requirements of Provision A.4. The San Diego Water Board would consider these efforts prior to strictly enforcing the requirements of Provisions A.1.a, A.1.c, and A.2.a. Causes of exceedances of the receiving water limitations can often be more difficult to identify and attribute solely to the Copermittees' MS4s. The intent of the Order is to provide the Copermittees more clarity and flexibility in addressing these exceedances through the iterative approach and adaptive management process until the requirements under Provisions A.1.a, A.1.c, and A.2.a are fully achieved.

An exception to the iterative approach and adaptive management process would be in receiving waters subject to adopted and approved TMDLs. For TMDLs that are incorporated into the Order, there is a specific date for compliance to be achieved, after which the iterative approach and adaptive management process required under Provision A.4 no longer provides the flexibility to achieve compliance. Where compliance dates for a TMDL have passed, compliance with the WQBELs incorporated into the Order established by a TMDL in Attachment E to protect water quality standards is required. Thus, after the interim or final compliance dates for a TMDL have passed, if the discharges from the Copermittees' MS4s are causing or contributing to a violation of WQBELs, exceedances of WQBELs must be strictly enforced by the San Diego Water Board. In the meantime, however, the Copermittees are in compliance with the interim or final TMDL requirements in Attachment E as long as the interim or final WQBELs are being achieved in accordance with the interim or final compliance dates.

In addition, this Order includes an optional pathway that incorporates the requirements of Provision A.4 and would allow a Copermittee to be deemed in compliance with the requirements under Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b during implementation of a Water Quality Improvement Plan that incorporates specific additional requirements. This alternative compliance pathway and the additional specific requirements are described below under the discussion for Provision B.3.c.

B. Water Quality Improvement Plans

Purpose: Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges to the MS4s and control pollutants in storm water discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the Clean Water Act.

Provision B includes requirements for the Copermittees to develop and implement Water Quality Improvement Plans to ultimately comply with the prohibitions and limitations under Provision A. The Water Quality Improvement Plans will provide the Copermittees a comprehensive program that can achieve the requirements and further the objectives of the CWA. Implementation of the Water Quality Improvement Plans will also improve the quality of the receiving waters in the San Diego Region.

The Water Quality Improvement Plan is the backbone of the Regional MS4 Permit requirements. Provision B provides the guidance, criteria, and minimum expectations and requirements for the elements of the Water Quality Improvement Plan to be developed and implemented by the Copermittees. The Water Quality Improvement Plans will be implemented in the Watershed Management Area by the Copermittees within their jurisdictions through their jurisdictional runoff management programs.

The Water Quality Improvement Plan also incorporates a program to monitor and assess the progress of the Copermittees' jurisdictional runoff management programs toward improving the quality of discharges from the MS4s, as well as tracking improvements to the quality of receiving waters. A process to adapt and improve the effectiveness of the Water Quality Improvement Plans has also been incorporated into the requirements of Provision B to be consistent with the "iterative approach" required to achieve compliance with discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a, pursuant to the requirements of Provision A.4.

The Water Quality Improvement Plans have also been structured to incorporate the requirements of any TMDLs that have been adopted for the San Diego Region. Incorporating the requirements of the TMDLs into the requirements of Provision B allows the Copermittees to develop a single plan, instead of separate plans, to coordinate their non-storm water and storm water runoff management programs. The Water Quality Improvement Plans allow the Copermittees to meet the requirements of this Order, as well as fulfill the requirements of the TMDLs.

As an added benefit, if the Copermittees demonstrate that impaired water bodies within the Watershed Management Area listed on the 303(d) List will be addressed with their Water Quality Improvement Plans in a reasonable period of time, the San Diego Water Board may be able to remove the water bodies from the 303(d) List, which would greatly reduce the need for the San Diego Water Board to develop additional TMDLs that would have to be incorporated into the Order and implemented by the Copermittees.

***Discussion*:** The federal NPDES regulations require the Copermittees to develop a proposed management program (40 CFR 122.26(d)(2)(iv)). The proposed management program must include "*a comprehensive planning process*" and "*where necessary intergovernmental coordination*" for the "*duration of the permit.*" The Water Quality Improvement Plan is the Copermittees' "*comprehensive planning process*" document for the proposed management program that will be implemented within a Watershed Management Area. Implementation of the Water Quality Improvement Plan requires "*intergovernmental coordination*" among the Copermittees for at least the "*duration of the permit*," and likely into and beyond the next iteration of the permit.

Developing Water Quality Improvement Plans based upon watersheds is consistent with federal regulations that support the development of permit conditions, as well as implementation of storm water management programs, at a watershed scale (40 CFR 122.26(a)(3)(ii), 122.26(a)(3)(v), and 122.26(d)(2)(iv)). In 2003, USEPA issued a Watershed-Based NPDES Permitting Policy Statement (USEPA, 2003) that defines watershed-based permitting as an approach that produces NPDES permits that are issued to point sources on a geographic or watershed basis. In this policy statement, USEPA explains that "*[t]he utility of this tool relies heavily on a detailed, integrated, and inclusive watershed planning process*." USEPA identifies a number of important benefits of watershed permitting, including more environmentally effective results, the ability to emphasize measuring the effectiveness of targeted actions on improvements in water quality, reduced cost of improving the quality of the nation's waters and more effective implementation of watershed plans, including TMDLs, among others.

An emphasis on watersheds is appropriate at this stage in the San Diego Region's MS4 program to shift the focus to more targeted, water quality driven planning and implementation. Addressing discharges on a watershed scale focuses on water quality results by emphasizing the receiving waters in the watershed. The conditions of the receiving waters drive management actions, which in turn focus measures to address pollutant contributions from MS4 discharges.

The Water Quality Improvement Plan gives the Copermittees the responsibility of developing a comprehensive plan to coordinate the efforts of their jurisdictional runoff management programs for addressing the problems related to MS4 discharges causing impacts to water quality in the Watershed Management Area. The development of the plan provides the Copermittees the opportunity to provide

significant input on how to implement their jurisdictional runoff management programs, and how to best utilize their available resources in addressing a focused set of priorities that they believe will result in measureable improvements to water quality within the Watershed Management Area.

The Copermittees are encouraged to separate the Watershed Management Area into subwatersheds, as appropriate. This allows the Copermittees to identify priorities applicable to a subset of the Copermittees or specific water bodies or areas within the Watershed Management Area.

Included in the requirements for the elements to be included in the Water Quality Improvement Plan are monitoring and assessment requirements that are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order. In addition to the federal requirements of the CWA section 308(a) and 40 CFR 122.26(d), the San Diego Water Board has the authority to establish monitoring, reporting, and recordkeeping requirements for NPDES permits under CWC 13383.

More specific and detailed discussions of the requirements of Provision B are provided below.

Provision B.1 (Watershed Management Areas) requires the Copermittees to develop a Water Quality Improvement Plan for each of the Watershed Management Areas defined by the San Diego Water Board.

Pursuant to 40 CFR 122.26(d)(2)(iv), proposed management programs "*may impose controls on a…watershed basis…*" The Water Quality Improvement Plan is the Copermittees' proposed management program. A Water Quality Improvement Plan must be developed for each Watershed Management Area identified in the Order.

The Watershed Management Areas are identified in Table B-1. Table B-1 establishes ten (10) Watershed Management Areas, and identifies the Copermittees that are responsible for developing and implementing the Water Quality Improvement Plan for each Watershed Management Area.

The Copermittees from each of the three counties within the San Diego Region were phased in as their respective NPDES municipal storm water permits expired. Order No. R9-2007-0001 expired in January 2012, and the San Diego County Copermittees became covered under the Regional MS4 Permit on June 27, 2013, the effective date of the Order. Order No. R9-2009-0002 expired in December 2014, and the Orange County Copermittees became covered under the Regional MS4 Permit on April 1, 2015, the effective date of Order No. R9-2013-0001 as amended by Order No. R9-2015-0001. Order No. R9-2010-0016 expired in November 2015, and the Riverside County Copermittees became covered under the Regional MS4 Permit on January 7, 2016, the effective date of Order No. R9-2013-0001 as amended by Order No. R9-2015-0100.

The Cities of Laguna Woods, Laguna Hills, Murrieta, and Wildomar are located partially within the jurisdictions of both the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board) and the San Diego Water Board. Written requests for designation of a single Regional Water Board to regulate matters pertaining to permitting of Phase I MS4 discharges were submitted to the San Diego Water Board and the Santa Ana Water Board by the City of Laguna Woods by letter dated September 8, 2014, the City of Laguna Hills by letter dated March 12, 2014, the City of Murrieta by letter dated June 22, 2015, and the City of Wildomar by letter dated June 23, 2015. The Cities of Laguna Woods, Laguna Hills, Murrieta, and Wildomar requested designation of the San Diego Water Board pursuant to CWC section 13228.

The Cities of Laguna Woods, Laguna Hills, Murrieta, and Wildomar reported that management and implementation of municipal programs to comply with two different Phase I MS4 permits creates a significant administrative and financial burden and inhibits their ability to contribute to greater overall water quality improvements in either Region. In an effort to address these concerns, the San Diego Water Board and the Santa Ana Water Board have entered into written agreements, whereby the San Diego Water Board is designated to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Laguna Woods, Laguna Hills, Murrieta, and Wildomar including the portions of the jurisdictions within the Santa Ana Region. The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated February 10, 2015 to designate the San Diego Water Board to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Laguna Woods and Laguna Hills, including the portions of the jurisdictions within the Santa Ana Region, upon the later effective date of Order No. R9-2015-0001 or Santa Ana Water Board Tentative Order No. R8-2015-0001. The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated October 26, 2015 to designate the San Diego Water Board to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Murrieta and Wildomar, including the portions of the jurisdictions within the Santa Ana Region upon the effective date of Order R9-2015-0100.

Under the terms of the agreements, each Regional Water Board retains the authority to enforce provisions of the Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee (Water Code section 13228 (b)). Also under the terms of the agreements, any TMDL and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Laguna Woods, Laguna Hills, Murrieta, or Wildomar as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement of the applicable TMDL would remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's San Diego Creek/Newport Bay TMDL and Lake Elsinore/Canyon Lake Nutrient TMDLs, and the San Diego Water Board's Indicator Bacteria Project I Beaches and Creeks TMDL.

In conformance with the agreements, footnotes to Table B-1 are included to specify coverage under Order No. R9-2013-0001 for those Phase I MS4 discharges within the jurisdictional boundaries of the Cities of Laguna Woods, Laguna Hills, Murrieta, and Wildomar within the Santa Ana Region. Footnote 1 to Table B-1 specifies that the Cities of Laguna Woods and Laguna Hills are identified as responsible Copermittees in the San Diego Creek/Newport Bay TMDL in the Santa Ana Region and remain obligated to comply with the San Diego Creek/Newport Bay TMDL pursuant to section XVIII of Tentative Order No. R8-2015-0001 (NPDES No. CAS618030) and any reissuance thereof. Footnote 4 to Table B-1 specifies that the Cities of Murrieta and Wildomar are identified as responsible Copermittees in the Lake Elsinore/Canyon Lake Nutrient TMDLs in the Santa Ana Region and remain obligated to comply with the Lake Elsinore/Canyon Lake Nutrient TMDLs pursuant to section VI.D.2 of Order No. R8-2010-0033 (NPDES No. CAS618030) or corresponding section as it may be amended or reissued.

The Cities of Lake Forest and Menifee are located partially within the jurisdictions of both the Santa Ana Water Board and the San Diego Water Board. Written requests for designation of a single Regional Water Board to regulate matters pertaining to permitting of Phase I MS4 discharges were submitted to the San Diego Water Board and the Santa Ana Water Board by the City of Lake Forest by letters dated January 14, 2013 and April 4, 2014, and the City of Menifee by letter dated June 25, 2015. The Cities of Lake Forest and Menifee requested designation of the San Ana Water Board pursuant to CWC section 13228.

The Cities of Lake Forest and Menifee reported that management and implementation of municipal programs to comply with two different Phase I MS4 permits creates a significant administrative and financial burden and inhibits their ability to contribute to greater overall water quality improvements in either Region. In an effort to address these concerns, the San Diego Water Board and the Santa Ana Water Board have entered into written agreements, whereby the Santa Ana Water Board is designated to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Lake Forest and Menifee including the portions of the jurisdictions within the San Diego Region. The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated February 10, 2015 to designate the San Ana Water Board to regulate Phase I MS4 discharges within the jurisdiction of the City of Lake Forest, including portions of the jurisdiction within the Santa Diego Region, upon the later date of Order No. R9-2015-0001 or Santa Ana Water Board Tentative Order No. R8-2015-0001. The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated October 26, 2015 to designate the San Ana Water Board to regulate Phase I MS4 discharges within the jurisdiction of the City of Menifee, including portions of the jurisdiction within the San Diego Region, under Order No. R8-2010-0033 (NPDES No. CAS618030) as it may be amended or reissued upon the effective date of Order No. R9-2015-0100.

Under the terms of the agreements, each Regional Water Board retains the authority to enforce provisions of the Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee (Water Code section 13228 (b)). Also under the terms of the agreements, any TMDL and associated Phase I MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Lake Forest or Menifee as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement authority for the applicable TMDL would remain with the Regional Water Board which has the jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's San Diego Creek/Newport Bay TMDL and Lake Elsinore/Canyon Lake Nutrient TMDLs, and the San Diego Water Board's Indicator Bacteria Project I Beaches and Creeks TMDL.

In conformance with the agreements, Footnote 2 to Table B-1 has been included to specify that Phase I MS4 discharges within the jurisdictional boundaries of the City of Lake Forest located within the San Diego Region will be regulated under Santa Ana Water Board Order No. R8-2015-0001 (NPDES No. CAS618030) and any reissuance thereof. The footnote specifies that the City of Lake Forest is an identified responsible Copermittee in the Indicator Bacteria Project I Beaches and Creeks TMDL (Bacteria TMDL) in the San Diego Region and remains obligated to comply with the Bacteria TMDL pursuant to Attachment E of Order No. R9-2013-0001 and any reissuance thereto. The City of Lake Forest is also identified as a responsible Copermittee in the San Diego Creek/Newport Bay TMDL established by the Santa Ana Water Board. The City remains obligated to comply with the San Diego Creek/New Port Bay TMDL pursuant to the Santa Ana Water Board's Phase I MS4 Permit (Tentative Order No. R8-2015-0001 (NPDES No. CAS618030), as it may be amended or reissued). Under the terms of the agreement, the City of Lake Forest must retain and continue implementation of the over irrigation prohibition in Title 15, Chapter 15, Section 14.030, List (b) of the City Municipal Code throughout its jurisdiction. Also under the terms of the agreement, the City of Lake Forest must actively participate in the development and implementation of the South Orange County Watershed Management Area Water Quality Improvement Plan required pursuant to Order No. R9-2013-0001, and any reissuance thereof.

Footnote 3 to Table B-1 has been included to specify that Phase I MS4 discharges within the jurisdictional boundaries of the City of Menifee located within the San Diego Region will be regulated under Santa Ana Water Board Order No. R8-2010-0033 (NPDES No. CAS618033) and any reissuance thereof. At this time, the City of Menifee is not identified as a responsible Copermittee for any TMDLs established by the San Diego Water Board. Under the terms of the agreement, the City of Menifee must actively participate in the development and implementation of the Santa Margarita River Watershed Management Area Water Quality Improvement Plan required pursuant to Order No. R9-2013-0001, and any reissuance thereof.

The basis supporting the Cities of Laguna Woods, Laguna Hills, Lake Forest, Menifee, Murrieta, and Wildomar requests to designate a specific Regional Water Board for regulatory oversight of Phase I MS4 discharges may change under future conditions and circumstances, therefore the San Diego Water Board will periodically review the effectiveness of the agreements during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate one or both of the agreements with the Santa Ana Water Board or otherwise modify the agreements subject to the approval of the Santa Ana Water Board.

Provision B.2 (Priority Water Quality Conditions) requires the Copermittees in each Watershed Management Area to identify the highest priority water quality conditions which will be the focus of the Water Quality Improvement Plan implementation.

Provisions B.2.a and B.2.b provide the criteria that must be assessed when characterizing the receiving water quality and potential impacts from MS4 discharges of the receiving waters within the Watershed Management Area. The criteria are based primarily on the requirements in 40 CFR 122.26(d)(1)(iv)(C) and (C)(1)-(9). Characterizing the receiving water quality and identifying the potential impacts caused by MS4 discharges to receiving waters in the Watershed Management Area is necessary to identify the impacts to receiving waters associated with MS4 discharges that are of the most concern to the Copermittees.

Based on the information required to be considered under Provisions B.2.a and B.2.b, Provision B.2.c requires to Copermittees to identify the highest priority water quality conditions related to discharges from the MS4s that will be the primary focus of the Water Quality Improvement Plan in the Watershed Management Area. Addressing and improving these highest priority water quality conditions will become the focus of each Copermittee's jurisdictional runoff management program as the Water Quality Improvement Plan is implemented in the Watershed Management Area. The highest priority water quality conditions are expected to include sources of pollutants and/or stressors, and/or receiving water conditions, that the Copermittees consider the highest threats or most likely to have adverse impacts on the physical, chemical, and biological integrity of receiving waters. Addressing these threats and/or adverse impacts should restore the physical, chemical, and biological integrity of receiving waters, and result in the restoration and protection of the beneficial uses of the receiving waters in the Watershed Management Area.

Provision B.2.d requires the Copermittees to identify known and suspected sources of pollutants and/or stressors contributing to the highest priority water quality conditions. The requirements of Provision B.2.d are based primarily on the requirements in 40 CFR 122.26(d)(1)(iii)(B)(1)-(6). The Copermittees are required to evaluate several factors in the identification of those sources. The Copermittees must consider and evaluate the following: (1) the land uses that may contribute toward impacts to receiving waters, (2) the locations of the Copermittees' MS4s that can convey and discharge runoff and pollutants to receiving waters, (3) other sources that discharge

into the Copermittees' MS4s and receiving waters, and (4) other information and data that can help the Copermittees to evaluate the relative importance of or contribution from those sources toward the highest priority water quality conditions. Identifying the known and suspected sources, and their relative contribution toward the highest priority water quality conditions, will help the Copermittees to focus, direct, and prioritize their resources and implementation efforts within their jurisdictions.

Provision B.2.e requires the Copermittees to identify potential strategies that can result in improvements to water quality in MS4 discharges and/or receiving waters within the Watershed Management Area. Potential water quality improvement strategies will not necessarily be implemented by the Copermittees, but provide a "menu" of options that the Copermittees will consider for implementation. The public participation process that will be implemented during the development of the Water Quality Improvement Plan is where the potential water quality improvement strategies will be identified.

Provision B.3 (Water Quality Improvement Goals, Strategies and Schedules) requires the Copermittees in each Watershed Management Area to identify the goals that the Copermittees' jurisdictional runoff management programs will work toward achieving to address and improve the highest priority water quality conditions identified under Provision B.2.c; the strategies that will be implemented by the Copermittees within their jurisdictions and the Watershed Management Area to achieve the goals; and, the schedules for implementing the strategies and achieving the goals. The element of the Water Quality Improvement Plan required under Provision B.3 is where the "*comprehensive planning*" and "*intergovernmental coordination*" [40 CFR 122.26(d)(2)(iv)] of the Copermittees' actions for the proposed management programs within the Watershed Management Area is required to be described.

Provision B.3.a requires the Copermittees to identify interim and final numeric goals, and schedules to achieve those goals as part of the Water Quality Improvement Plans. Provision B.3.a.(1) requires the Copermittees to identify two types of numeric goals to be achieved:

(1) Final numeric goals in the receiving waters and/or MS4 discharges that will result in the protection of the water quality standards of the receiving waters for the highest priority water quality conditions identified by the Copermittees for Provision B.2.c. These final numeric goals are the ultimate goals for the Water Quality Improvement Plan, and the achievement and maintenance of these final numeric goals will indicate that one or more beneficial uses have been successfully restored and/or protected from MS4 discharges.

(2) Interim numeric goals that can be used by the Copermittees to demonstrate progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges for the highest priority water quality conditions in the Watershed Management Area. Achievement of the interim numeric goals will demonstrate to the San Diego Water Board that the Copermittees' implementation efforts are progressing toward achieving the final numeric goals.

Provision B.3.a.(1) does not specify what the interim and final numeric goals must be based on, but they essentially must be designed to achieve compliance with water quality standards in the receiving waters. To that end, the interim goals must be based on measureable criteria or indicators capable of demonstrating progress toward achieving the numeric goals.

The interim and final numeric goals can be based on the water quality objectives in the Basin Plan. The water quality objectives in the Basin Plan, however, consist of numeric and narrative water quality objectives. Numeric water quality objectives can be directly used as numeric goals. Narrative water quality objectives, on the other hand, will require some interpretation to identify numeric goals. The achievement of multiple numeric goals based on the water quality objectives, used in combination, may be necessary to demonstrate that beneficial uses have been restored and/or protected.

The Copermittees could also propose other numeric goals that are not necessarily water quality objectives from the Basin Plan. For example, the Copermittees could propose a numeric goal that consists of achieving some percent improvement of a measureable indicator, such as acreage of a specific habitat or increase in a specific plant or animal species population. Other examples may include pollutant load reductions, number of impaired waterbodies delisted from the List of Water Quality Impaired Segments, Index of Biological Integrity (IBI) scores, etc.

The Copermittees may choose to develop interim numeric goals based on the final numeric goals they develop, such as incremental steps toward ultimately achieving the final numeric goals. The Copermittees may also choose to develop interim numeric goals that are based on other measureable indicators that can indirectly indicate improvements and progress toward the final numeric goals.

There are no limits to the types of interim numeric goals that could be proposed by the Copermittees, other than the goals must be based on measureable criteria or indicators capable of demonstrating progress toward achieving the numeric goals. Likewise, there are no limits to the types of final numeric goals that could be proposed by the Copermittees, other than the goals must "*restore and protect the water quality standards of the receiving waters.*"

Finally, Provision B.3.a.(2) also requires the Copermittees to develop schedules for measuring progress and achieving the interim and final numeric goals. Several criteria are included for the development of the schedules, but the Copermittees are required to achieve the numeric goals as soon as possible, consistent with federal NPDES regulations (40 CFR 122.47(a)(1)).

The Copermittees are also required to incorporate any compliance schedules for applicable ASBS or TMDL requirements. Applicable ASBS and TMDL compliance schedules are set forth in Attachment A and Attachment E to the Order, respectively.

The information provided by the Copermittees under Provision B.3.a.(2) will be used by the Copermittees and the San Diego Water Board to gauge and track the progress of the Copermittees' efforts in addressing the highest priority water quality conditions identified in the Water Quality Improvement Plan.

Provision B.3.b requires the Copermittees to identify the strategies and schedules to implement those strategies as part of the Water Quality Improvement Plans. Provision B.3.b requires the Copermittees to identify the water quality improvement strategies that will be and may be implemented within the Watershed Management Area to 1) reduce pollutants in storm water discharged from the MS4 to the MEP, 2) effectively prohibit non-storm water discharges from entering the MS4, 3) protect water quality standards in receiving waters by controlling MS4 discharges so that they do not cause or contribute to exceedances of receiving water limitations, and 4) achieve applicable WQBELs that implement TMDLs. The Copermittees will select the strategies to be implemented based on the likely effectiveness and efficiency of the potential water quality improvement strategies identified under Provision B.2.e to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, and/or achieve the interim and final numeric goals identified under Provision B.3.a.

Provision B.3.b.(1) requires each Copermittee to identify the strategies that will be or may be implemented within its jurisdiction. Each Copermittee is required to describe the strategies it is committed to implementing as part of its jurisdictional runoff management requirements under Provisions E.2 through E.7, and the optional jurisdictional strategies that the Copermittee will implement, as necessary, to achieve the numeric goals.

Each Copermittee is expected to implement the optional jurisdictional strategies identified under Provisions B.3.b.(1)(b) when the jurisdictional strategies it has committed to implement under Provision B.3.b.(1)(a) are not making adequate progress toward the interim and final numeric goals in accordance with the schedules established under Provision B.3.a. Provision B.3.b.(1)(b)(v) requires each Copermittee to describe the circumstances necessary to trigger implementation of the optional jurisdictional strategies, in addition to the requirements of Provisions B.3.b.(1)(a).

The San Diego Water Board recognizes that there may be optional jurisdictional strategies that will likely require funding and/or resources for planning, permitting, procurement of labor and materials, and implementation. Thus, Provision B.3.b.(1)(b)(iv) requires each Copermittee to describe the funding and/or resources that are necessary to implement these optional jurisdictional strategies. This information may provide interested groups and members of the public an understanding of the resources that they could provide or assist in obtaining to implement these optional jurisdictional strategies.

Provision B.3.b.(2) requires the Copermittees in the Watershed Management Area to identify the regional or multi-jurisdictional strategies that may be implemented, as necessary, to achieve the numeric goals. Similar to the requirements of Provision B.3.b.(1)(b), these regional or multi-jurisdictional strategies will likely require funding and/or resources for planning, permitting, procurement of labor and materials, and implementation, and San Diego Water Board recognizes that these strategies may be difficult to implement with only Copermittee resources. Thus, Provision B.3.b.(2)(d) requires the Copermittees to describe the funding and/or resources necessary to implement these optional regional or multi-jurisdictional strategies. This information may provide interested groups and members of the public an understanding of the resources that they could provide or assist in obtaining to implement these optional regional or multi-jurisdictional strategies.

Provision B.3.b.(3) requires the Copermittees to develop and include schedules in the Water Quality Improvement Plan for implementing the water quality improvement strategies identified under Provisions B.3.b.(1) and B.3.b.(2). The schedule for implementing the water quality improvement strategies will be used by the Copermittees and San Diego Water Board to measure and demonstrate the progress of the Copermittees' implementation efforts toward reducing pollutants in storm water discharged from the MS4 to the MEP, and eliminating illicit non-storm water discharges from entering the MS4.

Provision B.3.b.(4) provides the Copermittees in each Watershed Management Area the option of implementing watershed-specific structural BMP requirements for Priority Development Projects. Historically, storm water permits have included very specific performance standards for permanent, structural BMPs. These standards describe the expectation for the capture or treatment of pollutants and control of excessive flow before storm water is discharged from a site. The Copermittees were also allowed to develop waiver programs for Priority Development Projects to avoid implementing the structural BMPs; however, the waiver programs were not necessarily tied into any sort of holistic watershed strategy. The result is that implementation of BMP requirements is largely done on a site-by-site basis. This requires proper design on the part of the Priority Development Project and strict oversight on the part of the Copermittee.

Provision B.3.b.(4) promotes the evaluation of multiple strategies for water quality improvement, in addition to the implementation of permanent structural BMPs, on a watershed-scale versus the site-by-site approach. In a report issued by the Southern California Coastal Water Research Project (SCCWRP) and several other research institutions, the report emphasized that a successful hydromodification management program will involve watershed analysis as a first step, and that integrating multiple watershed-based strategies is preferable over a site-by-site approach. Indeed, the report states that the watershed analysis "…*should lead to identification of existing opportunities and constraints that can be used to help prioritize areas of greater concern, areas of restoration potential, infrastructure constraints, and pathways for*

potential cumulative effects."[22] Provision B.3.b.(4) promotes the findings and recommendations of the report by providing a pathway for Copermittees to develop an integrated approach to their land development programs.

Under Provision B.3.b.(4), the Copermittees in a Watershed Management Area must first perform an analysis by gathering as much information pertaining to the physical characteristics of the Watershed Management Area as possible. This includes, for example, identifying potential areas of coarse sediment supply, present and anticipated future land uses, and locations of physical structures within receiving streams and upland areas that affect the watershed hydrology (such as bridges, culverts, and flood management basins). Once this information is collected, the Copermittees must produce GIS layers (maps) that include this information.

From there, the Copermittees must use the results of the Watershed Management Area Analysis to identify and compile a list of candidate projects that could potentially be used as alternative compliance options for Priority Development Projects. Such projects include, for example, opportunities for stream or riparian area rehabilitation, opportunities for retrofitting existing infrastructure to incorporate storm water retention or treatment, and opportunities for regional BMPs, among others. Once these candidate projects are identified, Copermittees may allow Priority Development Projects to fund, partially fund, or completely implement these candidate projects. The Copermittees must first find that implementing such a candidate project would provide greater overall benefit to the watershed than requiring implementation of the structural BMPs onsite, and also enter into a voluntary agreement with the Priority Development Project that authorizes this arrangement. The Copermittees may use Provision B.3.b.(4) as both 1) a mechanism to reach their stated goals of the Water Quality Improvement Plan by using Priority Development Projects to either fund or implement projects that will provide water quality benefit, and 2) an alternative to requiring strict adherence to the structural BMP design standards.

Additionally, Provision B.3.b.(4) allows the Copermittees to use the results of the Watershed Management Area Analysis to identify areas within the Watershed Management Area where it is appropriate to allow Priority Development Projects to be exempt from the hydromodification management BMP performance requirements. Provision E.3.c.(2) already allows exemptions for Priority Development Projects that discharge to a conveyance channel whose bed and bank are concrete lined from the point of discharge to an enclosed embayment or the Pacific Ocean. However, there may be cases where further exemptions are warranted. The Copermittees may identify such cases on a watershed basis and include them in the Watershed Management Area Analysis; however, they must provide the supporting rationale to support all claims for exemptions.

[22] 2012. ED Stein, F Federico, DB Booth, BP Bledsoe, C Bowles, Z Rubin, GM Kondolf, A Sengupta. Technical Report 667. Southern California Coastal Water Research Project. Costa Mesa, CA.

Provision B.3.b.(4) provides an innovative pathway for Copermittees to regulate their land development programs by allowing alternative compliance in lieu of implementing structural BMPs on each and every Priority Development Project. This approach facilitates the integration of watershed-scale solutions for improving overall water quality and assisting Copermittees to achieve their stated goals of the Water Quality Improvement Plan. The San Diego Water Board understands, however, that undertaking this approach, which involves extensive planning, could be resource intensive for the Copermittees. Therefore, the Watershed Management Area Analysis is optional and not a requirement. The Copermittees can choose not to perform the watershed planning and mapping exercise described in Provision B.3.b.(4), and instead choose to require strict implementation of the structural BMPs onsite, pursuant to Provision E.3.c.

Provision B.3.c is included to provide the Copermittees an option that allows the Copermittees to be deemed in compliance with the prohibitions and limitations (receiving water limitations) of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b. One or more Copermittees within a Watershed Management Area can choose to implement this option. This option is only expected to be utilized by a Copermittee that wishes to be deemed in compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b.

The alternative compliance pathway option included in Provision B.3.c is consistent with the approach described in Order WQ 2015-0075, *In the Matter of Review of Order No. R4-2012-0175, NPDES Permit No. CAS004001, Waste Discharge Requirements for Municipal Separate Storm Sewer System (MS4) Discharges within the Coastal Watersheds of Los Angeles County, Except Those Discharges Originating from the City of Long Beach MS4,* adopted by the State Water Board on June 16, 2015. State Water Board Order WQ 2015-0075 directs the Regional Water Boards to consider a watershed-based planning and implementation approach to compliance with receiving water limitations when issuing Phase I MS4 permits going forward. Order WQ 2015-0075 included seven principles that the Regional Water Boards are expected to follow when incorporating an alternative compliance pathway into a MS4 permit. The San Diego Water Board incorporated the seven principles stipulated in State Water Board Order WQ 2015-0075 into the Regional MS4 Permit as follows:

1. Provision A of this Order continues to require compliance with water quality standards in the receiving water and does not deem good faith engagement in the iterative process to constitute compliance with receiving water limitations. Provision A of this Order continues to be consistent with the receiving water limitations provisions from State Water Board Order WQ 99-05.

2. Compliance with Provision B.3.c constitutes compliance with the requirements of the Provision A.3.b, which requires compliance with the WQBELs of the TMDLs in Attachment E to the Order, and is considered compliance with receiving water limitations for those TMDL water body-pollutant combinations.

3. Provision B.3.c is an ambitious, rigorous, and transparent alternative compliance pathway that allows a Copermittee appropriate time to come into compliance with receiving water limitations without being in violation of the receiving water limitations during implementation of the compliance alternative.

4. Provision B.3.c requirements are incorporated into a Water Quality Improvement Plan. Water Quality Improvement Plans are a watershed-based planning and implementation approach, which address multiple contaminants, and incorporate TMDL requirements.

5. The strategies required to be included in the Water Quality Improvement Plans promote and incentivize the use of green infrastructure and requires the implementation of low impact development principles.

6. The strategies required to be included in the Water Quality Improvement Plans encourage multi-benefit regional projects that capture, infiltrate, and reuse storm water and support a local sustainable water supply.

7. The alternative compliance pathway of Provision B.3.c includes rigor and accountability. The Copermittee is required, through a transparent public process, to demonstrate that water quality issues in the watershed have been analyzed and prioritized, and that appropriate solutions are proposed. The Copermittee is also required, through a transparent process, to monitor the results and return to their analysis to verify assumptions and update the solutions. The Copermittee is required to conduct this type of adaptive management on its own initiative without waiting for direction from the San Diego Water Board.

In order for a Copermittee to utilize this option, the Copermittee is required to include three components in the Water Quality Improvement Plan. The first component is a comprehensive set of numeric goals and schedules that will demonstrate the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b will be achieved within a specified period of time. The criteria provided in the Order will require the Copermittee to demonstrate that the discharges from its MS4s will not cause or contribute to exceedances of water quality objectives in the receiving waters, and/or the receiving waters will be adequately protected from adverse impacts attributable to the Copermittee's MS4 discharges. The Copermittee is also required to specify annual milestones to be achieved each year, which adds rigor, accountability, and transparency to the process. The annual milestones may consist of water quality improvement strategy implementation phases, interim numeric goals, and other acceptable metrics, which are expected to build upon previous milestones and lead to the achievement of the final numeric goals.

The second component is an analysis to demonstrate that implementation of the water quality improvement strategies required under Provision B.3.b will achieve the numeric goals within the established schedules required under Provisions B.3.a and B.3.c.(1).

Because the development of the analysis may require significant resources, the Order allows the Copermittees in each Watershed Management Area that choose to implement this option to perform the analysis individually, or pool their resources for the analysis collectively.

The analysis must “reasonably” and “quantitatively” demonstrate that the implementation of the water quality improvement strategies can achieve the numeric goals within the established schedules. However, as more data and information are collected during implementation of the Water Quality Improvement Plan to demonstrate progress toward achieving the numeric goals, the numeric goals, water quality improvement strategies and schedules may need to be modified. If the data and information indicate that modification is needed, the Copermittee must also update the analysis. With the exception of numeric goals and schedules associated with TMDLs from Attachment E to the Order, the modification to the analysis would be allowed as part of the adaptive management process of the Water Quality Improvement Plan. For TMDLs, modification of numeric goals or schedules would likely require an amendment to the Basin Plan and Attachment E to the Order before the analysis and Water Quality Improvement Plan could include such modifications.

Thus, the third component is the key component that allows a Copermittee to demonstrate the implementation of the water quality improvement strategies within its jurisdiction is making progress toward achieving the final numeric goals. Each Copermittee must specify the monitoring and assessments that will be performed to confirm that implementation of the water quality improvement strategies are making progress toward achieving the numeric goals within the established schedules, and whether the interim and final numeric goals have been achieved.

These three components must then be reviewed by the Water Quality Improvement Consultation Panel. The Water Quality Improvement Consultation Panel is required to be formed as part of the public participation process for the development of the Water Quality Improvement Plans. The Water Quality Improvement Consultation Panel is described under Provision F.1.a.(1)(b). Review by the Water Quality Improvement Consultation Panel is included to provide an additional layer of input, support, and accountability for the implementation of this option.

Compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b begins when the Water Quality Improvement Plan, incorporating the requirements of Provision B.3.c.(1), is accepted by the San Diego Water Board. Each Copermittee that chooses to implement and continues to implement this option will be deemed in compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b as long as the Copermittee continues to implement the strategies, monitoring and assessments as incorporated in the Water Quality Improvement Plan in accordance with Provision B.3.c.(1), and the Copermittee reports the achievement of the annual milestones each year, or provides acceptable rationale and recommends appropriate modifications to the interim numeric goals, and/or water quality improvement

strategies, and/or schedules to improve the rate of progress toward achieving the final numeric goals. The Copermittee continues to be deemed in compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b during the time the San Diego Water Board reviews the rationale and recommended modifications to the interim numeric goals, and/or water quality improvement strategies, and/or schedules. If and when the San Diego Water Board determines that it does not accept the rationale or recommendations, the Copermittee will be notified they are no longer deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b.

Provision B.4 (Water Quality Improvement Monitoring and Assessment) requires the Copermittees to develop an integrated monitoring and assessment program to track the progress of the Water Quality Improvement Plan toward meeting the implementation goals and schedules, and improving the water quality of the Watershed Management Area. Provision B.4 is the part of the Water Quality Improvement Plan where the Copermittees describe the monitoring data that will be collected, which is not only necessary to implement the "iterative approach" required by Provision A.4, but inform the adaptive management and "*comprehensive planning process*" that allows the Copermittees to make adjustments and modifications to the Water Quality Improvement Plans and the jurisdictional runoff management programs.

Provision B.4 requires the Copermittees, at a minimum, to include the requirements of Provision D as part of the water quality improvement monitoring and assessment program for the Water Quality Improvement Plan. The Copermittees, however, are not limited to the requirements of Provision D and may include additional monitoring and assessment methods to track progress toward improving water quality in the Watershed Management Area.

In addition to incorporating the requirements of Provision D, the water quality improvement monitoring and assessment program must incorporate any monitoring and assessment requirements specified for any applicable TMDLs included in Attachment E to the Order, and the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 for Watershed Management Areas with ASBS.

The monitoring and assessments required to be incorporated into the Water Quality Improvement Plan are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order.

Provision B.5 (Iterative Approach and Adaptive Management Process) requires the Copermittees to implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a.

Provision B.5 requires the Copermittees in each Watershed Management Area to re-evaluate the highest priority water quality conditions and potential water quality

improvement strategies, the water quality improvement goals, strategies and schedules, and the water quality improvement monitoring and assessment program and provide recommendations for modifying those elements to improve the effectiveness of the Water Quality Improvement Plan. The re-evaluation of the Water Quality Improvement Plan is part of the assessment requirements of Provision D.

Provision B.6 (Water Quality Improvement Plan Submittal, Updates, and Implementation) requires to Copermittees to submit, update, and implement the Water Quality Improvement Plans.

The requirements for the process to develop and submit the Water Quality Improvement Plans is described in more detail under the discussion for Provision F.1. The process will include several opportunities for the public to provide input during the development of the Water Quality Improvement Plans. The process for updating the Water Quality Improvement Plans is described in more detail under the discussion for Provision F.3.c. Upon acceptance of the Water Quality Improvement Plan and updates, the Copermittees are required to immediately begin implementing the Water Quality Improvement Plan and subsequent updates.

The Water Quality Improvement Plan is expected to be a dynamic document that will evolve over time. The Water Quality Improvement Plan is also expected to be a long term plan that focuses the Copermittees' efforts and resources on a limited set of priority water quality conditions, with the ultimate goal of protecting all the beneficial uses of the receiving waters within the Watershed Management Area from impacts that may be caused or contributed to by MS4 discharges. As the Copermittees collect data, implement their jurisdictional runoff management programs, and review the results from their water quality improvement monitoring and assessment program, the Water Quality Improvement Plan is expected to be continually reviewed and updated until compliance with Provisions A.1.a, A.1.b, and A.2.a is achieved.

However, in specific cases supported by robust analytical documentation the implementation of the Water Quality Improvement Plans may demonstrate that TMDLs are not necessary for identified impaired water bodies within the Watershed Management Area if the analytical record demonstrates that technology-based effluent limitations required by the CWA, more stringent effluent limitations required by state, local, or federal authority, and/or other pollution control requirements (e.g., best management practices) required by local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time.[23]

The San Diego Water Board submits an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region.

[23] 40 CFR 130.7(b)(1)

According to USEPA guidance for the Integrated Report,[24] water bodies are placed in one of five categories. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 are placed on the 303(d) List.

Category 4 in the Integrated Report is for water bodies where available data and/or information indicate that at least one beneficial use is not being supported or is threatened, but a TMDL is not needed.[25] Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

Impaired water bodies can be included in Category 4a if a TMDL has been adopted and approved. The TMDLs in Attachment E to the Order implement the requirements of the TMDLs adopted by the San Diego Water Board, and approved by the State Water Board and USEPA. The water bodies in Attachment E will be included in Category 4a in the Integrated Report and removed from the 303(d) List.

Impaired water bodies can be included in Category 4b if there are *acceptable* "pollution control requirements" required by a local, state or federal authority stringent enough to implement applicable water quality standards within a reasonable period of time (e.g., a compliance date is set). When evaluating whether a particular set of pollution controls are "requirements," the USEPA considers a number of factors, including: (1) the authority (local, state, federal) under which the controls are required and will be implemented with respect to sources contributing to the water quality impairment (examples may include: self-executing state or local regulations, permits, and contracts and grant/funding agreements that require implementation of necessary controls), (2) existing commitments made by the sources and completion or soon to be completed implementation of the controls (including an analysis of the amount of actual implementation that has already occurred), (3) the certainty of dedicated funding for the implementation of the controls, and (4) other relevant factors as determined by USEPA depending on case-specific circumstances.[26]

Impaired water bodies can be included in Category 4c if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution. Pollution, as defined by the CWA is "the man-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of water."[27] In

[24] USEPA, 2005. Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act
[25] Ibid
[26] Ibid
[27] CWA section 502(19)

other cases, pollution does not result from a pollutant and a TMDL is not required. Examples of circumstances where an impaired segment may be placed in Category 4c include segments impaired solely due to lack of adequate flow, stream channelization, or hydromodification. In these situations, there may be water quality management actions that can address the cause(s) of the impairment, but a TMDL may not be required to implement the actions.

The Water Quality Improvement Plans will require the implementation of pollution controls and water quality management actions (i.e. water quality improvement strategies) which can result in the attainment of water quality standards in water bodies impaired by discharges from the Copermittees' MS4s. The Water Quality Improvement Plans also include requirements that are expected to attain water quality standards in a reasonable period of time. The San Diego Water Board considers the Water Quality Improvement Plans to be a commitment by the Copermittees to develop, plan, budget for, and implement pollution controls that will attain water quality standards in receiving waters in a reasonable period of time, or as soon as possible. The results of the Copermittees' efforts in implementing the Water Quality Improvement Plans can be used to re-evaluate the condition of the impaired water bodies during the next update to the 303(d) List.

After the Copermittees submit the Water Quality Improvement Plans and demonstrate that water quality standards are being attained or will be attained in a reasonable period of time, the San Diego Water Board may re-evaluate the water bodies on the 303(d) List. These water bodies on the 303(d) List may be re-evaluated and placed into Category 4b or Category 4c in the Integrated Report. The water bodies placed in Category 4b or Category 4c in the Integrated Report must show a record that the water bodies are attaining water quality standards or supporting the identified beneficial uses, or will attain water quality standards or support identified beneficial uses in a reasonable period of time, in order for the water bodies to be appropriately removed from the 303(d) List.

C. Action Levels

Purpose: Provision C includes requirements for the Copermittees to identify and include numeric action levels in the Water Quality Improvement Plan to direct and focus the Copermittees' jurisdictional runoff management program implementation efforts for controlling MS4 discharges to receiving waters.

***Discussion*:** Under Provision C, the numeric action levels required are for non-storm water discharges and storm water discharges. The non-storm water action levels (NALs) are applicable to non-storm water discharges from the Copermittees' MS4s, which can occur year-round. The storm water action levels (SALs) are applicable to storm water discharges from the Copermittees' MS4s, which occur during the rainy season defined as the period between October 1 and April 30.

The action levels required by Provision C are based on the action level requirements that were developed and incorporated into Order Nos. R9-2009-0002 and R9-2010-0016, the Orange County and Riverside County MS4 Permits, respectively. The Fact Sheets for these Orders provide detailed discussions about the development of the numeric NALs and SALs included in this Order.

Order Nos. R9-2009-0002 and R9-2010-0016 required the Copermittees to perform prescribed actions if the NALs or SALs are exceeded. The actions required under Order Nos. R9-2009-0002 and R9-2010-0016 generally included conducting additional monitoring and source investigations when a discharge from the MS4 is observed to exceed one or more NALs and/or SALs.

For this Order, however, the action levels of Provision C are to be used by the Copermittees to prioritize the actions to be implemented as part of the Water Quality Improvement Plan. Monitoring data collected by the Copermittees from MS4 outfalls will be compared with the NALs and SALs. Exceedances of the NALs and SALs will not require the Copermittees to immediately identify sources causing exceedances, but will provide some numeric indicator levels that can give the Copermittees a way to measure the relative severity of a pollutant contributing to receiving water quality impacts.

NALs and SALs must be included in the Water Quality Improvement Plans to be used by the Copermittees in directing and focusing their water quality improvement strategies. The Copermittees are expected to utilize the NALs and SALs to help focus their implementation efforts on addressing pollutants that have the most significant potential or observed impacts to receiving waters. The NALs and SALs will be used as part of the MS4 discharges assessments required under Provision D.4.b. The NALs and SALs may also be used by the Copermittees as the numeric goals to be achieved in MS4 discharges and/or receiving waters as the Water Quality Improvement Plans are implemented.

More specific and detailed discussions of the requirements of Provision C are provided below.

Provision C.1 (Non-storm Water Action Levels) requires the Copermittees to incorporate NALs into the Water Quality Improvement Plan for pollutants and/or constituents that are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions identified in the Water Quality Improvement Plan related to non-storm water discharges from the MS4s. NALs generally must be consistent with the water quality objectives found within the Basin Plan.

The NALs have been included to ensure that the Copermittees are implementing and complying with several requirements of the MS4 permit. The federal CWA requires permits for municipal storm sewer systems to "*effectively prohibit non-storm water discharges into the storm sewers*." The federal NPDES regulations, which were promulgated to implement the CWA requirements for discharges from municipal storm sewers, require a program to address illicit discharges, which are non-storm water discharges. Provision A.1.b prohibits "*[n]on-storm water discharges into MS4s*" unless the non-storm water discharge authorized by a separate NPDES permit. The NALs will be used as part of the illicit discharge detection and elimination program required pursuant to Provision E.2, as well as part of the MS4 discharges assessments required pursuant to Provision D.4.b.

Provision A.1.a prohibits non-storm water discharges from the MS4 from "*causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state.*" In addition, pursuant to Provision A.2.a, non-storm water discharges "*must not cause or contribute to the violation of water quality standards in any receiving waters*."

Ideally, the Copermittees' jurisdictional runoff management programs will eliminate all non-storm water discharges entering the MS4s within their jurisdictions. The complete elimination of non-storm water discharges to the Copermittees' MS4s would be in compliance with the CWA requirements for non-storm water discharges, as well as the prohibitions and limitations of Provisions A.1.a and A.2.a.

The federal regulations, however, also refer to several non-storm water discharge categories that must be addressed as illicit discharges if they are found to be a source of pollutants. The federal regulations thus identify some non-storm water discharges that are not required to be addressed as illicit discharges if they are not a source of pollutants (e.g. non-storm water discharges specified in Provisions E.2.a.(1)-(5)). Thus, these regulations imply that some non-storm water discharges into and from the MS4 may occur even if non-storm water discharges are "effectively" prohibited by the Copermittees.

If the source of a non-storm water discharge is identified as a category of non-storm water specified in Provisions E.2.a.(1)-(5), the NALs can be used to determine if the category of non-storm water discharges is a source of pollutants. For other non-storm water discharges not specified in Provisions E.2.a.(1)-(5), the CWA requires those discharges to be "*effectively"* prohibited by removing the discharge to the MS4 through enforcement of the Copermittees' legal authority established under "*ordinance, order or similar mean*s" to prohibit illicit discharges to the MS4s.

If there are non-storm water discharges that are not required to be addressed as illicit discharges, those discharges must comply, at a minimum, with the discharge prohibitions and receiving water limitations of Provision A. Thus, the non-storm water discharges from the MS4 must be at levels that will not cause or contribute to a condition of pollution, contamination, or nuisance (Provision A.1.a), and must not cause or contribute to a violation of water quality standards in receiving waters (Provision A.2.a) to be consistent with the discharge prohibitions and receiving water limitations of Provisions A.1.a and A.2.a.

Furthermore, the San Diego Region has predominantly intermittent and ephemeral rivers and streams which vary in flow volume and duration at spatial and temporal scales. For most of these river and stream systems, non-storm water discharges from the MS4 are likely to be the most significant or the only source contributing to surface flows present within the receiving water, especially during the dry season.

Therefore, because of the prohibitions and limitations of Provision A.1.a and A.2.a, and the likelihood that non-storm water discharges from the MS4 are the most significant or only source contributing to surface flows present within the receiving water, NALs generally must be consistent with the water quality objectives found within the Basin Plan. Non-storm water discharges that are meeting the NALs would not be expected to cause or contribute to an exceedance of water quality objectives in receiving waters, which would be consistent with the discharge prohibitions and receiving water limitations of Provisions A.1.a and A.2.a.

Exceedances of the NALs would then provide an indication of the relative severity of a pollutant in non-storm water discharges from the MS4 contributing to potential or observed receiving water quality impacts. The relative severity or significance of a pollutant in non-storm water discharges from the MS4 will provide the Copermittees a valuable source of information that can be used to identify priority water quality conditions within a Watershed Management Area and within each Copermittee's jurisdiction.

Tables C-1 through C-4 under Provision C.1.a specify numeric NALs for several parameters or pollutant constituents for non-storm water discharges from the MS4 to several water body types. The NALs for MS4 discharges given under Provision C.1.a are based on the water quality objectives for inland surface waters in the Basin Plan, and the water quality objectives for ocean waters in the Ocean Plan. The NALs for

most of the metals were calculated based on the State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP). The NALs provided in Tables C-1 through C-4 must be included in the Water Quality Improvement Plans required to be developed pursuant to Provision B.

Provision C.1.b requires the Copermittees to identify NALs for pollutants and/or constituents, not specified in Provision C.1.a, which are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions of the Watershed Management Area related to non-storm water discharges from the MS4s. The NALs must be based on the water quality objectives in the Basin Plan. The NALs identified under Provision C.1.b must be included in the Water Quality Improvement Plan.

The San Diego Water Board recognizes that some of the NALs required pursuant to Provisions C.1.a and C.1.b may be exceeded more frequently than not. Thus, Provision C.1.c has been included in the Order to provide the Copermittees the option to develop secondary NALs that are set at levels greater than the levels required pursuant to Provisions C.1.a and C.1.b to further refine the prioritization and assessment of water quality improvement strategies for addressing non-storm water discharges to and from the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and from the MS4.

<u>Provision C.2 (Storm Water Action Levels)</u> requires the Copermittees to incorporate SALs into the Water Quality Improvement Plan for pollutants and/or constituents causing or contributing, or may be causing or contributing, to the highest priority water quality conditions identified in the Water Quality Improvement Plan related to storm water discharges from the MS4s.

The SALs have been included to ensure that the Copermittees are implementing and complying with several requirements of the MS4 permit. Provision A.1.a prohibits storm water discharges from the MS4 from "*causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state.*" In addition, pursuant to Provision A.2.a, storm water discharges "*must not cause or contribute to the violation of water quality standards in any receiving waters*."

Provision A.3.a, however, implicitly acknowledges that compliance with Provisions A.1.a and A.2.a cannot be achieved immediately for discharges of storm water from the MS4 by applying the MEP standard. Thus, Provision A.4 requires the Copermittees to implement an iterative approach to demonstrate that MEP is being achieved. This approach is supported by USEPA.

The federal CWA requires permits for municipal storm sewer systems to "*require controls to reduce the discharge of pollutants [in storm water] to the maximum extent practicable*, *including management practices, control techniques and system, design*

and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants." MEP is an ever-evolving, flexible, and advancing concept. As knowledge about controlling storm water runoff and discharges evolves, so does the knowledge which constitutes MEP. Reducing the discharge of storm water pollutants from the MS4 to the MEP requires the Copermittees to assess their jurisdictional runoff management programs and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP. The SALs provide the Copermittees measureable goals that may be used to demonstrate the achievement of MEP for reducing pollutants in storm water discharges from the MS4. The SALs will be used as part of the MS4 discharges assessments required under Provision D.4.a.

In June of 2006, the State Water Board's Blue Ribbon Storm Water Panel released its report titled "*The Feasibility of Numerical Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities*." In the recommendations, the Blue Ribbon panel proposed storm water effluent limitations which are computed using statistical based population approaches. The SALs specified in Table C-5 under Provision C.2.a were developed from a regional subset of nationwide Phase I MS4 data by using USEPA Rain Zone 6 (arid west) data.[28] Additionally, utilization of regional data is appropriate due to the addition of data into the nationwide Phase I MS4 monitoring dataset in February 2008. This additional data increased the number of USEPA Rain Zone 6 samples to more than 400, and included additional monitoring events within Southern California.

Utilizing data from USEPA Rain Zone 6 resulted in SALs which closely reflect the environmental conditions experienced in the San Diego Region. The localized subset of data includes sampling events from multiple Southern California locations including Orange, San Diego, Riverside, Los Angeles, and San Bernardino Counties. The dataset includes samples taken from highly built-out impervious areas and from storm events representative of Southern California conditions.

The SALs for cadmium, copper, lead and zinc require the measurement of hardness and to provide more specificity in the assessment of samples with SALs for total metal concentrations. While USEPA Rain Zone 6 data include a large sample size for concentrations of total metals, the impact the concentration will have on receiving waters will vary with receiving water hardness. Since it is the goal of the SALs, through the iterative process and MEP standard, to have MS4 storm water discharges meet all applicable water quality objectives, the hardness of the receiving water should be used when assessing the total metal concentration of a sample.

Thus, when there is an exceedance of a SAL for a metal, the Copermittee must determine if that exceedance is above the existing applicable water quality objectives based upon the hardness of the receiving water. The water quality objectives

[28] Data used to develop SAL were obtained from http://rpitt.eng.ua.edu/Research/ms4/mainms4.shtml

Copermittees must use to assess total metal SAL exceedances are the California Toxic Rule (CTR) and USEPA National Recommended Water Quality Criteria for Freshwater Aquatic Life 1 hour maximum concentrations. The 1-hour maximum concentration is to be used for comparison since it is expected to most replicate the impacts to waters of the State from the first flush following a precipitation event.

The statistically calculated SALs given in Table C-5 are at levels greater than the water quality objectives in the Basin Plan or Ocean Plan. Because the objective of the CWA is to "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*", meaning eventually pollutants in storm water discharges must be reduced to a level that cannot cause or contribute to an exceedance of water quality objectives in receiving waters, over time the SALs are expected to be reduced to a level that is based on the water quality objectives rather than statistical calculations. The San Diego Water Board will review the SALs as more data for discharges of storm water from the MS4s are collected, and revise them as conditions improve and the MEP standard advances. For the Water Quality Improvement Plans required under this Order, the SALs identified under Provision C.2.a must be included.

Provision C.2.b requires the Copermittees to identify SALs for pollutants and/or constituents, not specified in Provision C.2.a, which are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions of the Watershed Management Area related to storm water discharges from the MS4s. The SALs identified under Provision C.2.b must be included in the Water Quality Improvement Plan.

The San Diego Water Board recognizes that some of the SALs required pursuant to Provisions C.2.a and C.2.b may be exceeded more frequently than not. Thus, Provision C.2.c has been included in the Order to provide the Copermittees the option to develop secondary SALs that are set at levels greater than the levels required pursuant to Provisions C.2.a and C.2.b to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s.

D. Monitoring and Assessment Program Requirements

Purpose: Provision D includes minimum monitoring and assessment requirements that must be developed and implemented by the Copermittees as part of the Water Quality Improvement Plans. Implementation of the monitoring and assessment requirements of Provision D will allow the Copermittees to demonstrate that the requirements of the CWA to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP are being achieved. Implementation of the monitoring and assessment requirements of Provision D will also allow the Copermittees and the San Diego Water Board to track improvements to the water quality in the San Diego Region. The monitoring and assessment program requirements are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order.

***Discussion*:** The San Diego Water Board recognized that changes to the monitoring and assessment requirements of the Fourth Term Permit were necessary to improve the usefulness and usability of monitoring data collected by the Copermittees to support their jurisdictional storm water programs more efficiently and with increased effectiveness. The data collected are needed to better inform the Copermittees' understanding of the physical, chemical, and biological condition of the receiving waters and the quality of the MS4 discharges. The monitoring program needs to provide opportunities for the Copermittees to integrate regional monitoring efforts into municipal storm water monitoring requirements to provide a cost-effective approach to monitoring and avoid duplication of efforts.

The requirements in Provision D were largely recommended by the Copermittees as an outcome of the San Diego Water Boards Focused Meeting process. The monitoring and assessment program requirements now require collection of more specific information necessary for each Copermittee to adapt its jurisdictional runoff management program in such a way that focuses resources on a watershed's highest priority water quality conditions. The monitoring and assessment program will require the Copermittees to collect data that can be utilized to answer both watershed level management questions (e.g. Are the chemical, physical, and biological conditions of a receiving water protective, or likely protective of beneficial uses?), and specific jurisdictional runoff management program activity questions (e.g. Are the water quality improvement strategies of the jurisdictional program effectively eliminating non-storm water discharges to the MS4?).

The monitoring data collected and assessment information that will be reported to the San Diego Water Board are necessary to determine if the Copermittees are complying with the prohibitions and limitations of Provision A. The required monitoring and assessments that must be reported to the San Diego Water Board will be utilized for three purposes:

(1) Inform the Copermittees, San Diego Water Board, and the public on the progress of the Copermittees' efforts to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP;

(2) Inform the Copermittees, San Diego Water Board, and the public on the condition of water bodies receiving discharges from the Copermittees' MS4, and the progress of the Copermittees' water quality improvement implementation efforts toward improving the receiving water quality; and

(3) Inform the Copermittees, the San Diego Water Board, and the public on the effectiveness of the Water Quality Improvement Plan toward achieving (1) and (2).

The monitoring and assessment information reported pursuant to Provision F is also expected to be key to the iterative approach and adaptive management process required under Provision A.4 and implemented through the Water Quality Improvement Plan required under Provision B. As required by Provision A.4, the iterative approach and adaptive management process is required if the Copermittees cannot meet the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c, and/or A.2.a under the present conditions.

Provision D provides the minimum monitoring and assessment requirements that must be included in each Water Quality Improvement Plan to be developed and implemented by the Copermittees. The Copermittees, however, are not limited to the requirements of Provision D and may include additional methods to track progress toward improving water quality in a Watershed Management Area.

More specific and detailed discussions of the requirements of Provision D are provided below.

<u>Provision D.1 (Receiving Water Monitoring Requirements)</u> specifies the minimum receiving water monitoring that the Copermittees must conduct within the Watershed Management Area and include as part of the Water Quality Improvement Plan.

Provision D.1 establishes minimum monitoring requirements that must be conducted by the Copermittees within each Watershed Management Area. Provision D.1 requires the Copermittees to collect and develop the data and information necessary to determine potential impacts to the beneficial uses in the receiving waters due to discharges from the MS4s. The monitoring required under Provision D.1 will also provide the data that will allow the Copermittees to gauge the effectiveness and progress of its Water Quality Improvement Plan implementation efforts toward improving the quality of receiving waters.

The receiving water monitoring requirements of Provision D.1 are focused primarily on monitoring the conditions and response of the receiving waters to the Copermittees'

collective implementation efforts to reduce receiving water impacts that may be caused by the discharges from the MS4s. The preference of the San Diego Water Board is for the Copermittees to spend their resources achieving tangible and observable improvements in receiving water conditions instead of collecting samples and analyzing data that has consistently indicated that receiving water conditions are degraded and require improvement. In general, the ability to measure potential improvements in receiving water conditions due to any actions implemented by the Copermittees as part of the Water Quality Improvement Plan may require several years before a response can be observed. Thus, the frequency of collecting receiving water monitoring data has been kept to a minimum.

During the transitional period between adoption of this Order and San Diego Water Board acceptance of a Water Quality Improvement Plan, the Copermittees must conduct receiving water monitoring in accordance with Provision D.1.a. This approach to collecting receiving water data is different from what was required in the Fourth Term Permits, but one that truly embraces the concept of an integrated, cost-effective, streamlined receiving water monitoring approach.

Provision D.1.a requires Copermittees to continue performing the receiving water monitoring programs required in Order Nos. R-2007-0001, R9-2009-002, and R9-2010-0016; plus participation in: hydromodification management plan monitoring approved by the San Diego Water Board, monitoring plans as part of load reduction plans (either Bacteria Load Reduction Plans or Comprehensive Load Reduction Plans) for TMDLs in Attachment E of the Order, Storm Water Monitoring Coalition Regional Monitoring, Southern California Bight Regional Monitoring, Sediment Quality Monitoring, and ASBS Monitoring as applicable to a Watershed Management Area.

Provision D.1.a also provides an opportunity for the Copermittees to use third party data to meet receiving water monitoring requirements where feasible. Allowing the Copermittees to use the data currently collected through its participation in existing regional receiving water programs and that of third parties provides an efficiency of resources in obtaining the data necessary to inform the Copermittees and the San Diego Water Board about the physical, chemical, and biological conditions of the receiving waters, which can also help to focus the receiving water monitoring during the implementation of the Water Quality Improvement Plan. Once a Water Quality Improvement Plan is developed for a Watershed Management Area in compliance with Provision B of this Order, the transitional period is over and Copermittees are required to conduct receiving water monitoring according to the requirements of Provisions D.1.b-e.

Provision D.1.b requires each Copermittee to identify at least one long term receiving water monitoring station to be representative of receiving water quality within each Watershed Management Area. Long term receiving water monitoring stations can be located at any existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees. The requirements under Provision D.1.b. are

consistent with 40 CFR 122.26(d)(2)(iii)(D), which specifies that a "*monitoring program for representative data collection for the term of the permit*" may include "*instream locations.*" For each Watershed Management Area, at least one long term watershed monitoring station is required to be established and monitored. The Copermittees may choose to establish additional long term monitoring stations where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

Provision D.1.b. requires the Copermittees to locate the long term receiving water monitoring station at one of these existing receiving water monitoring stations to provide the Copermittees an opportunity to experience monitoring cost savings while continuing to collect the necessary data to assess the status and trends of receiving water quality conditions in 1) coastal water, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under both dry weather and wet weather conditions. Ideally these stations will continue to be monitored as part of the receiving water monitoring for each Watershed Management Area to maintain a consistent set of locations and a period of data that can be built upon with the monitoring required under this Order.

The receiving water monitoring requirements are separated into monitoring required during dry weather conditions pursuant to Provision D.1.c, and wet weather conditions pursuant to Provision D.1.d.

At each long term monitoring station the Copermittees must conduct at least three dry weather monitoring events as required pursuant to Provision D.1.c and at least three wet weather monitoring events as required pursuant to Provision D.1.d per permit term. Provisions D.1.c and D.1.d require the Copermittees to monitor priority water quality conditions identified in the Water Quality Improvement Plan, constituents listed as causing impairment of receiving waters in the Watershed Management Area, applicable NALs, toxicity, constituents listed in Tables D-2 and D-3, and constituents for implementation plans (e.g. Bacteria Load Reduction Plans and Comprehensive Load Reduction Plans). Required toxicity monitoring was changed to reflect an updated understanding of the unique challenges associated with sampling storm water for toxicity. Copermittees are required to sample receiving water for toxicity during each dry weather and each wet weather event pursuant to Provision D.1.c.(4) and D.1.d.(4). Required toxicity monitoring is now consistent with the State Water Resources Control Board Policy for Toxicity Assessment and Control (Draft June 2012) and recently adopted MS4 permits for Caltrans and Los Angeles Water Board. Receiving water monitoring efforts in this Order have been streamlined to redirect resources to monitoring efforts that better support pollutant reduction solutions with an increasing emphasis on MS4 outfall monitoring, source identification, and source abatement activities.

In addition to the receiving water monitoring requirements under Provisions D.1.b-d, Provision D.1.e requires the Copermittees participate in and/or conduct other types of receiving water monitoring. As recommended and requested by the Copermittees, Provision D.1.e.(1) requires the Copermittees to participate in existing regional monitoring, as applicable to each Watershed Management Area. Existing regional

monitoring includes monitoring conducted by the Storm Water Monitoring Coalition and for the Southern California Bight. Participation in and use of monitoring data collected from these existing regional water quality monitoring programs provide the Copermittees a greater opportunity for efficiency in the use of their resources to manage their storm water programs and those controllable discharges under their authority.

Provision D.1.e.(1)(c) requires the south Orange County MS4 Copermittees to participate in "unified regional beach water quality monitoring." This monitoring replaces requirements to conduct "core monitoring" of beach water quality, as provided for in Appendix III of the Ocean Plan.

Several different public agencies currently conduct routine, ongoing beach water quality monitoring in south Orange County in accordance with several different sets of requirements. The monitoring programs implemented to meet those requirements overlap temporally and spatially. These monitoring programs are partially but not fully integrated. In November 2010, the State Water Board adopted Resolution No. 2010-0053, which directed Regional Water Boards to work with dischargers to modify beach water quality monitoring programs required by Regional Water Board-issued permits in order to eliminate redundancies and incorporate beach water quality monitoring required by beach water quality statutes, where appropriate.

In April 2012, the San Diego Water Board requested that its staff review beach water quality monitoring conducted in south Orange County. To assist in responding to that request, staff of the Board convened a workgroup that included representatives of the three public agencies that currently conduct almost all of the routine, ongoing beach water quality monitoring in south Orange County, i.e., South Orange County Wastewater Authority (SOCWA), Orange County Public Works, and Orange County Health Care Agency (OCHCA). The workgroup also included other interested parties, including representatives of the Sierra Club and Surfrider Foundation. In December 2012, the San Diego Water Board adopted Resolution No. R9-2012-0069, which endorsed the San Diego Water Board staff report entitled "A Framework for Monitoring and Assessment in the San Diego Region," dated November 2012.

The unified program is consistent with and will meet or exceed the minimum requirements for beach water quality monitoring and related public notification and reporting established by State law, including the Ocean Plan. The unified program is consistent with State Water Board Resolution No. 2010-0053. The unified program is also consistent with and will help implement, "A Framework for Monitoring and Assessment in the San Diego Region," which emphasizes the need for question-driven, beneficial use-oriented monitoring and assessment. The primary purpose of the unified program will be to answer the question "Does beach water quality meet standards for the beneficial use of water contact recreation?"

The unified program is intended to be protective; it will help protect the health of swimmers, surfers, and others who use south Orange County beach waters for water

contact recreational activities. The unified program is also intended to be reasonable; it will eliminate duplicative monitoring and will include triggers for public notification and additional sampling at all sampling stations year-round. The unified program is intended to be equitable; responsibility for implementation of the unified program will be shared and the responsible agencies will jointly make arrangements to implement the program and will have the flexibility to jointly make short and/or long term changes in those arrangements.

The San Diego Water Board Executive Officer issued a written directive on December 5, 2014, pursuant to California Water Code section 13383, for SOCWA and the south Orange County MS4 Copermittees to implement the unified program in cooperation with OCHCA. The Executive Officer may make revisions to the unified program, provided that the unified program, as revised, continues to be consistent with and meet the requirements of State law, including the Ocean Plan, for beach water quality monitoring and related public notification and reporting. Following a thirty day public comment period, and subject to a request for a hearing before the San Diego Water Board, any such revision shall take effect as specified in a written directive issued by the Executive Officer pursuant to CWC section 13383. The program and any Executive Officer issued revisions to the program are subject to CWC section 13320 right of review from the date of issuance.

The unified program will supersede the existing routine, ongoing, beach water quality monitoring programs in south Orange County that are conducted in accordance with the existing requirements of the NPDES permits for discharges from the SOCWA ocean outfalls and the south Orange County MS4s. The requirement to participate in “regional monitoring” of beach water quality replaces requirements to conduct “core monitoring” of beach water quality, as provided for in Appendix III of the Ocean Plan.

The State Water Resources Control Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part 1 Sediment Quality which became effective August 25, 2009 (Sediment Quality Monitoring Policy). Provision D.1.e.(2) requires any Copermittees with MS4 discharges to an enclosed bay or estuary to monitoring the sediments in the enclosed bay or estuary receiving water in accordance with the sediment quality monitoring procedures as prescribed in the Sediment Quality Monitoring Policy.

The State Water Board adopted Resolution No. 2012-0012 which approved exceptions to the California Ocean Plan for selected discharges into Areas of Special Biological Significance (ASBS), including special protections for beneficial uses. State Board Resolution No. 2012-0012 became effective on March 20, 2012, and Attachment B to the Resolution established limitations on point source storm water discharges to ASBS. Copermittees with MS4s that discharge to an ASBS must monitor its discharge to assure compliance with State Board Resolution No. 2012-0012 as required pursuant to Provision D.1.e.(3).

The San Diego Water Board is developing a regional monitoring strategy to assess the conditions of receiving waters in the San Diego Region. The monitoring requirements of Provision D.1 are expected to be incorporated or serve as a foundation of this regional monitoring strategy, but may require some modifications. When the San Diego Water Board develops an alternative regional monitoring strategy, the Copermittees will be required to participate in the development and implementation of the alternative regional monitoring program pursuant to Provision D.1.f.

Provision D.2 (MS4 Outfall Discharge Monitoring Requirements) specifies the minimum MS4 outfall discharge monitoring requirements that the Copermittees must incorporate and implement as part of the Water Quality Improvement Plan.

The dry weather MS4 outfall discharge monitoring requirements are included under Provisions D.2.a.(2) and D.2.b. The dry weather MS4 outfall discharge monitoring requirements are part of the "*program, including a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer*" required by 40 CFR 122.26(d)(2)(iv)(B), which is expected to achieve compliance with the CWA section 402(p)(3)(B)(ii) statutory requirement for municipal storm water permits to require the Copermittees to "*effectively prohibit non-storm water discharges into the storm sewers*." The dry weather MS4 outfall discharge monitoring data collection requirements are based on requirements under 40 CFR 122.26(d)(1)(iv)(D) and 122.26(d)(2)(iv)(B)(3).

The dry weather MS4 outfall discharge monitoring requirements are designed to provide wide spatial and temporal coverage of each jurisdiction to better understand the extent and magnitude of non-storm water discharges to receiving waters, and make a distinction between persistent and transient non-storm water flows. This information is expected to allow each Copermittee to focus its resources on eliminating and controlling the highest priority threats to receiving water quality, as well as integrating other elements of the storm water programs (e.g. complaint call response) and third party data to efficiently and effectively assist in efforts to eliminate non-storm water discharges.

The dry weather MS4 outfall discharge monitoring requirements of Provision D.2.a.(2) and D.2.b are separated into monitoring required before and after the San Diego Water Board accepts the Copermittees' Water Quality Improvement Plan. Outfall monitoring conducted prior to acceptance of the Water Quality Improvement Plan is referred to in the Order as Transitional MS4 Outfall Discharge Monitoring. Provision D.2.a.(2) includes the transitional dry weather MS4 outfall discharge monitoring requirements.

The requirements under Provision D.2.a.(2) are based on the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B), which include the requirements for a monitoring program to identify, detect, and eliminate illicit connections and illegal discharges to the MS4s. The federal regulations (40 CFR 122.26(d)(1)(iv)(D)) require

the monitoring program to include "*a field screening analysis for illicit connections and illegal dumping [that]…[a]t a minimum, include[s] a narrative description, for either each field screening point or major outfall, of visual observations made during dry weather periods.*" The federal regulations (40 CFR 122.26(d)(1)(v)(B)) require the monitoring program to include "*inspection procedures and methods for detecting and preventing illicit discharges, and describe areas where this program has been implemented.*" Furthermore, the monitoring program is required by federal regulations (40 CFR 122.26(d)(2)(iv)(B)) to include "*a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer.*"

Dry weather transitional MS4 outfall discharge monitoring requires each Copermittee to field screen (inspect) its major MS4 outfalls to classify the MS4 outfall locations as having persistent dry weather flows, transient dry weather flows, or no dry weather flows. To account for the variance in size of the 39 jurisdictions covered under this Order, the Copermittees recommended a tiered approach to the number of major MS4 outfalls that must be inspected. Provision D.2.a.(2)(a) provides a tiered approach to the number of major MS4 outfalls that must be visually inspected per jurisdiction as well as a minimum frequency each Copermittee must inspect each major MS4 outfall per year. This tiered approach is based on the total number of major MS4 outfalls within a Copermittees jurisdiction within each Watershed Management Area.

Based on the field screening, each Copermittee is required to make a determination whether any observed flowing, pooled, or ponded waters are transient or persistent flows. Based on this field screening information, other jurisdictional program information, and third party information, each Copermittee is required to prioritize the MS4 outfalls within its jurisdiction for follow up investigation and elimination of the non-storm water discharge, as part of its illicit discharge detection and elimination program required pursuant to Provision E.2. In accordance with the requirements of Provision E.2, each Copermittee is required to immediately investigate obvious illicit discharges (e.g. outfall discharges with unusual color, unusual odor, or high flows).

This approach allows a Copermittee to use all of its resources, as well as leverage resources and information provided by third parties, to effectively eliminate non-storm water discharges from its MS4 outfalls. If the source of the non-storm water discharge cannot be immediately eliminated, the Copermittee uses the persistent flow or transient flow classification along with other programmatic implementation data to prioritize the MS4 outfalls for future investigation. In accordance with the adaptive management approach deployed throughout this Order, Provision D.2.a.(2)(c) requires each Copermittee to update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow. The requirement of Provision D.2.a.(2)(c) assures that each Copermittee is collecting data that can be used to demonstrate compliance with the CWA requirement that each Copermittee must implement a program to "*effectively*

prohibit non-storm water discharges into the [MS4]" and with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

Provision D.2.b describes the dry weather MS4 outfall discharge monitoring required to be incorporated and implemented as part of the Water Quality Improvement Plan. Dry weather MS4 outfall discharge monitoring must be performed by each Copermittee to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. The emphasis of the dry weather MS4 outfall discharge monitoring required pursuant to Provision D.2.b is consistent with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

Provision D.2.b.(1) requires each Copermittee to continue field screening its major MS4 outfalls and identifying those with persistent flows and transient flows, as conducted during the transitional period (i.e. before the Water Quality Improvement Plan was developed). However, each Copermittee now has the flexibility to adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of non-storm water persistent flow discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan. In order to ensure a minimum number of outfalls are inspected, Provision D.2.b.(1) requires the number of visual inspections be equal to the number of visual inspections required in the tiered inspection program pursuant to Provision D.2.a.(2)(a).

Provision D.2.b.(2)(b) requires each Copermittee to monitor a minimum of 5 major MS4 outfalls with persistent flows identified as the highest priorities within a Copermittee's jurisdiction, within each Watershed Management Area. In other words, Copermittees located in more than one Watershed Management Area must identify at least 5 major MS4 outfalls with persistent flows in its jurisdiction in each Watershed Management Area. If a Copermittee is located in more than one Watershed Management Area, and they have less than 5 major MS4 outfalls with persistent flows per jurisdictional area per Watershed Management Area, all of the major MS4 outfalls must be identified as high priority dry weather persistent flow MS4 outfalls. The Copermittees identified as Responsible Copermittees by a TMDL in Attachment E of the Order may need to monitor more than 5 dry weather major MS4 outfall locations to determine compliance with the requirements of the TMDL(s).

Monitoring must occur at the highest priority outfall locations at least semi-annually until the non-storm water discharges have been eliminated for three consecutive dry weather monitoring events; identified to be authorized by a separate NPDES Permit; or reprioritized to a lower priority. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized MS4 major outfall in the Copermittee's jurisdiction within the Watershed Management Area, unless there are no remaining qualifying major MS4 outfalls within the Copermittees jurisdiction. The Copermittees must continually update their dry weather persistent

flow MS4 outfall discharge monitoring locations with the next highest priority non-storm water flow that have yet to be eliminated until all persistent and transient flows are eliminated or its threat reduced.

Non-storm water persistent flow MS4 outfall discharge monitoring data collected during each semi-annual monitoring event, must be collected and analyzed according to the requirements of Provision D.2.b.(2)(b)-(e). These monitoring requirements are consistent with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

The wet weather MS4 outfall discharge monitoring requirements are included under Provisions D.2.a.(3) and D.2.c. The wet weather MS4 outfall discharge monitoring requirements are necessary for the Copermittees to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable, using management practices, control techniques and system, design and engineering methods, and such other provisions which are appropriate*" required by 40CFR 122.26(d)(2)(iv), which is expected to achieve compliance with the CWA section 402(p)(3)(B)(iii) statutory requirement for municipal storm water permits to require "*controls to reduce the discharge of pollutants [in storm water] to the maximum extent practicable*." The wet weather MS4 outfall discharge monitoring data collection requirements are based on requirements under 40 CFR 122.26(d)(2)(iii), 122.26(d)(2)(iii)(A) and 122.26(d)(2)(iii)(A)(1)-(4), and 40 CFR 122.21(g)(7)(i)-(ii).

The wet weather MS4 outfall discharge monitoring requirements of Provision D.2.a.(3) and D.2.c are separated into monitoring required before and after the San Diego Water Board accepts the Copermittees' Water Quality Improvement Plan. Outfall monitoring conducted prior to acceptance of the Water Quality Improvement Plan is referred to in the Order as Transitional MS4 Outfall Discharge Monitoring. Provision D.2.a.(3) includes the transitional wet weather MS4 outfall discharge monitoring requirements.

Until the wet weather MS4 outfall discharge monitoring requirements of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board, the Copermittees must comply with the requirements of transitional wet weather MS4 outfall monitoring requirements pursuant to Provision D.2.a.(3). Provision D.2.a.(3) requires the Copermittees in each Watershed Management Area to sample, at least five of the major MS4 outfalls inventoried pursuant to Provision D.2.a.(1) once per wet season for the monitoring data required to be collected pursuant to Provision D.2.a.(3)(c)-(e). Provision D.2.a.(3) further requires at least one major MS4 outfall monitoring station be located in each Copermittee's jurisdiction within the Watershed Management Area.

At a minimum, the five sampling locations chosen must be representative of storm water discharges from residential, commercial, industrial, and typical mixed-use land uses present within a Watershed Management Area. The San Diego Water Board expects the Copermittees to extrapolate from these data to similar land uses

throughout the Watershed Management Area to better inform the Water Quality Improvement Plan development process by prioritizing drainages for implementation of storm water control efforts required pursuant to Provision E.

Provision D.2.c describes the wet weather MS4 outfall discharge monitoring required to be included and implemented as part of the Water Quality Improvement Plan. Provision D.2.c provides the Copermittees the flexibility to adjust the wet weather MS4 outfall discharge monitoring locations and frequencies in the Watershed Management Area, as needed, to identify sources of pollutants in storm water discharges from MS4s in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan.

Although Provision D.2.c.(1) allows the Copermittees to adaptively manage the wet weather MS4 outfall discharge monitoring locations and frequencies, the provision requires a minimum of at least five wet weather outfall stations to be monitored. Provision D.2.c.(2) further allows the Copermittees to modify the monitoring frequency at each wet weather MS4 outfall station to meet the goals of the Water Quality Improvement Plan as long as the monitoring frequency occurs at least once per year and is at an appropriate frequency to identify sources of pollutants in storm water discharges, guide pollutant source identification efforts, or determine compliance with the requirements of the applicable TMDLs in Attachment E to the Order.

The wet weather MS4 outfall discharge monitoring requirements of Provisions D.2.c.(3) and D.2.c.(4) are the same as the transitional wet weather MS4 outfall discharge monitoring. In contrast, the requirements of Provision D.2.c.(5) are focused on collecting analytical data specific to the highest priority water quality conditions in the Watershed Management Area identified in the Water Quality Improvement Plan. The wet weather MS4 outfall discharge monitoring data collection requirements are consistent with the requirements under 40 CFR 122.26(d)(2)(iii), 122.26(d)(2)(iii)(A) and 122.26(d)(2)(iii)(A)(1)-(4), and 40 CFR 122.21(g)(7)(i)-(ii).

<u>Provision D.3 (Special Studies)</u> requires the Copermittees to develop special studies that will be conducted for each Watershed Management Area and the entire San Diego Region. Data collected pursuant to Provision D.3 is to be used by the Copermittees to improve the effectiveness of the strategies implemented by the jurisdictional runoff management programs toward achieving the numeric goals identified in the Water Quality Improvement Plans and ultimately achieve compliance with the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c, and A.2.a, which is consistent with the requirements of Provision A.4.

Special studies are often necessary to fill data gaps or provide more refined information that allow the Copermittees to better manage the generation or elimination of pollutants and discharges to and from the MS4. In the Fourth Term Permits, the Copermittees have been required to implement special studies as directed by the San Diego Water Board. The special studies required by this Order provide the Copermittees more flexibility to identify and implement special studies that will be most

useful to improving the effectiveness of their jurisdictional runoff management programs.

Provision D.3.a.(1) requires the Copermittees to develop and conduct at least two special studies per Watershed Management Area, to be determined by the Copermittees. One of the two special studies may be accomplished through participation in a Regional Special Study required under Provision D.3.a.(2). The requirements provide the Copermittees great latitude in identifying and developing the special studies. Watershed Management Area special studies are required, at a minimum, to: (a) relate in some way to the highest water quality priorities identified by the Copermittees in the Water Quality Improvement Plan, (b) be conducted within the Watershed Management Area, and (c) include some form of participation (e.g. contribution of funds, personnel services, project management) by all the responsible Copermittees within the Watershed Management Area.

Examples of Watershed Management Area special studies might include, but are not limited to: (1) focused pollutant source identification studies, (2) BMP effectiveness and/or comparison studies, (3) pilot tests for new or emerging pollutant control methods, (4) receiving water pollutant or stressor source identification and/or mitigation studies, or (5) pollutant fate and transport studies. The Watershed Management Area special studies are expected to provide data that can be utilized by the Copermittees to improve the Water Quality Improvement Plan or implementation of the Copermittees' jurisdictional runoff management programs to address the highest priority water quality conditions.

Provision D.3.a.(2) requires the Copermittees to develop at least one special study that will be conducted for the entire San Diego region. The regional special study is expected to provide data that can be utilized by the Copermittees to improve the Water Quality Improvement Plan or implementation of the Copermittees' jurisdictional runoff management programs to identify or address regional water quality concerns and priorities.

An example of a regional special study would be to develop and establish allowable exceedance frequencies of the bacteria water quality objectives for several types of water bodies, during different wet and dry weather conditions the San Diego region. The special study would be related to bacteria, which is a priority for the San Diego region due to the adoption of "*Bacteria TMDL Project I – Beaches and Creeks in the San Diego Region*." The study results could be used to inform the Copermittees and the San Diego Water Board about the indictor bacteria water quality objective exceedance frequencies that occur in natural or reference watersheds.

<u>Provision D.4 (Assessment Requirements)</u> specifies the assessments that the Copermittees are required to perform, based on the monitoring data collected, and will be reported as part of the Annual Report for the Water Quality Improvement Plan implementation. Provision D.4 requires the Copermittees assess the progress of the

water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c, and A.2.a.

Provision D.4 specifies the assessments that Copermittees must perform for each Watershed Management Area to assess the effectiveness of each Copermittee's jurisdictional runoff management program and the Water Quality Improvement Plan. The effectiveness of each Copermittee's jurisdictional runoff management program and Water Quality Improvement Plan is measured through these types of assessments: (a) Receiving Waters Assessments (b) MS4 Outfall Discharges Assessments, (c) Special Studies Assessments, and (d) Integrated Assessment of Water Quality Improvement Plan.

Provision D.4.a requires the Copermittees to assess the status of receiving water conditions annually during the transitional monitoring period (during development of the Water Quality Improvement Plan) and after acceptance of the Water Quality Improvement Plan. The monitoring data collected pursuant to Provision D.1 will be evaluated, among other information, to assess the condition of a Watershed Management Area's streams, coastal waters, enclosed bays, harbors, estuaries, and lagoons. The focus of the receiving waters assessments is to measure progress toward the objective of the CWA to "*restore and maintain the chemical, physical, and biological integrity of the Nation's waters*" as the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program are implemented within a Watershed Management Area. Provision D.4.a is consistent with 40 CFR 122.42(c)(7) which requires the Copermittees to annually report the *"[i]dentification of water quality improvements or degradation."*

Provision D.4.b includes the MS4 outfall discharges assessment requirements. The focus of MS4 outfall discharges assessments is to determine if the Copermittees' are implementing programs that comply with the requirements of the CWA for MS4 permits to "*effectively prohibit non-stormwater discharges into the storm sewers*" and "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable.*" The monitoring data collected pursuant to Provisions D.2 will be evaluated, among other information, to assess the effectiveness of the transitional MS4 outfall field screening monitoring, the implementation of the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program. The MS4 outfall discharge assessments consist of Non-Storm Water Discharges Reduction Assessments and Storm Water Pollutant Discharges Reduction Assessments.

The Non-Storm Water Discharges Reduction Assessments are how each Copermittee will demonstrate that its jurisdictional runoff management program implementation efforts are achieving the CWA requirement to "*effectively prohibit non-stormwater discharges into the storm sewers.*" Provision D.4.b.(1) requires each Copermittee to assess and report on its illicit discharge detection and elimination program required pursuant to Provision E.2 to reduce and effectively prohibit non-storm water and illicit discharges into the MS4 within its jurisdiction. The Non-Storm Water Discharges

Reduction Assessments include specific assessment requirements applicable to each Copermittee.

As each Copermittee collects and analyzes the data collected pursuant to dry weather MS4 outfall discharges monitoring requirements of Provisions D.2.a.(2) and D.2.b, Provision D.4.b.(1) requires each Copermittee to assess the progress, assess the effectiveness of its current actions, and identify modifications necessary to increase the effectiveness of its actions toward reducing and eliminating non-storm water and illicit discharges to its MS4. The findings from these assessments are expected to be utilized by the Copermittee as part of its procedures to prioritize the non-storm water discharges that will be addressed by its Illicit Discharge Detection and Elimination program required pursuant to Provision E.2.

The assessment requirements of Provision D.4.a.(1) are consistent with 40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(3) which require "*procedures…to investigate portions of the separate storm sewer system that, <u>based on the results of the field screen, or other appropriate information</u> [emphasis added], indicate a reasonable potential of contain illicit discharges or other sources of non-storm water*" as part of a "*program…to detect and remove…illicit discharges and improper disposal into the storm sewer.*" The assessment requirements of Provision D.4.a.(1) are also consistent with 40 CFR122.42(c)(1) requires the Copermittees to annually report the "*status of implementing the components of the storm water management program that are established as permit conditions.*"

The Storm Water Pollutant Discharges Reduction Assessment is how the Copermittees in each Watershed Management Area will demonstrate that their jurisdictional runoff management program implementation efforts are achieving the CWA requirement to "*reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable*." Provision D.4.b.(2) requires the Copermittees in each Watershed Management Area to assess and report the progress of the Copermittees' efforts to reduce pollutants in storm water discharges from the MS4s to the MEP. The Storm Water Pollutant Discharges Reduction Assessments include specific assessment requirements during both the transitional monitoring period and after acceptance of the Water Quality Improvement Plan applicable to the Watershed Management Area and each Copermittee.

As the Copermittees collect and analyze the data collected pursuant to wet weather MS4 outfall discharges monitoring requirements of Provisions D.2.a.(3) and D.2.c, Provision D.4.b.(2) requires the Copermittees to assess runoff conditions during the transitional period, and the progress of the Water Quality Improvement Plan strategies toward reducing pollutants in storm water from the MS4 to the MEP. The findings from these assessments are expected to be utilized by the Copermittees to identify any modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify sources of pollutants in storm water discharges from the MS4s, as well as focus, modify, and improve the water quality improvement

strategies implemented by each Copermittee within its jurisdiction to reduce pollutants in storm water discharges to the MEP.

The assessment requirements of Provision D.4.b.(2) are consistent with 40 CFR 122.26(d)(2)(iii)(B) which requires "*[e]stimates of the annual pollutant load of the cumulative discharges to waters of the United States from all identified municipal outfalls…during a storm event…accompanied by a description of the procedures for estimating constituent loads and concentrations, including any modeling, data analysis, and calculation methods.*" The assessment requirements of Provision D.4.a.(2) are consistent with 40 CFR 122.26(d)(2)(v) which requires that each Copermittee assesses the *"estimated reductions in loadings of pollutants from discharges of municipal storm sewer constituents from municipal storm sewer systems expected as the result of the municipal storm water quality management program."* The assessment requirements of Provision D.4.b.(2) are also consistent with 40 CFR122.42(c)(1) requires the Copermittees to annually report the "*status of implementing the components of the storm water management program that are established as permit conditions.*"

Provision D.4.c includes the special studies assessment requirements. Performing special studies are how the Copermittees will address data gaps identified during the development of and updates to the Water Quality Improvement Plan. The relevant findings from the special studies assessments are expected to be incorporated as part of the applicable receiving water assessments, MS4 outfall discharge assessments, and integrated water quality improvement assessments required in Provision D.4.a, D.4.b, and D.4.d, respectively.

The assessment requirements in Provision D.4.d are part of the iterative approach and adaptive management process required by Provision A.4. The Copermittees are required to integrate the data collected pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to re-evaluate the Water Quality Improvement Plan.

The monitoring data collected pursuant to Provisions D.1 and D.2, and the results of the assessment required pursuant to Provisions D.4.a-c, will be used to determine whether the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program are effective, or require modifications or improvements to become more effective to achieve the requirements of the CWA. The assessments required by Provision D.4.d are consistent with 40 CFR 122.42(c)(1) which requires that the Copermittees to report the *"[t]he status of implementing the components of the storm water management program that are established as permit conditions."*

E. Jurisdictional Runoff Management Programs

Purpose: Provision E includes the requirements for the jurisdictional runoff management programs to be implemented by each of the Copermittees. Compliance with the requirements for the jurisdictional runoff management programs will allow the Copermittees to demonstrate that they are implementing programs to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP. The jurisdictional runoff management program document prepared by each Copermittee will also provide the details for implementing the water quality improvement strategies identified in the Water Quality Improvement Plan specifically within its jurisdiction.

***Discussion*:** Implementation of the jurisdictional runoff management program requirements under Provision E is how the Copermittees "*effectively prohibit non-stormwater discharges into the storm sewer,*" and outlines the "*controls to reduce the discharge of pollutants to the maximum extent practicable"* consistent with the federal regulations under 40 CFR 122.26. The jurisdictional runoff management program is part of the "*comprehensive planning process*" that is required pursuant to 40 CFR 122.26(d)(2)(iv). Where the Water Quality Improvement Plan is the "*comprehensive planning process*" on a Watershed Management Area scale, requiring "*intergovernmental coordination,*" the jurisdictional runoff management program document is the "*comprehensive planning process*" on a jurisdictional scale that should be coordinated with the other Copermittees in the Watershed Management Area to achieve the goals of the Water Quality Improvement Plan.

The jurisdictional runoff management program requirements are included to provide each Copermittee criteria that can be used to demonstrate that its storm water management program is implementing the "*comprehensive planning process*" within its jurisdiction to "*effectively prohibit non-stormwater discharges into the storm sewers,*" and to identify and implement the most effective "*controls to reduce the discharge of pollutants to the maximum extent practicable"* in accordance with the performance standards given in the CWA.

Provision E includes the requirements for each of the components that must be included in the Copermittee's jurisdictional runoff management program document that will be implemented by the Copermittee within its jurisdiction. Implementation of the components of each Copermittee's jurisdictional runoff management program must incorporate the water quality improvement strategies identified by each Copermittee in the Water Quality Improvement Plans, described pursuant to Provision B.3.b.(1)(a).

More specific and detailed discussions of the requirements of Provision E are provided below.

Provision E.1 (Legal Authority Establishment and Enforcement) requires each Copermittee to establish and enforce sufficient legal authority to control discharges to the MS4 within its jurisdiction.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system*" and be able to demonstrate that it can "*operate pursuant to legal authority established by statute, ordinance or series of contracts.*" Provision E.1.a describes the minimum legal authorities each Copermittee must establish for itself within its jurisdiction to control discharges to its MS4. The requirements of Provision E.1.a are consistent with the requirements set forth in 40 CFR 122.26(d)(2)(i)(A)-(F).

The certification statement required from each Copermittee by Provision E.1.b is included to provide the San Diego Water Board additional documentation that each Copermittee has established the legal authorities consistent with Provision E.1.a and 40 CFR 122.26(d)(2)(i)(A)-(F), and the Copermittee can "*operate pursuant to legal authority established by statute, ordinance or series of contracts.*"

Provision E.2 (Illicit Discharge Detection and Elimination) requires each Copermittee to implement an illicit discharge detection and elimination program to effectively prohibit non-storm water discharges to the MS4 by actively detecting and eliminating illicit discharges and disposal into its MS4. If the San Diego Water Board finds that a Copermittee is fully implementing the requirements of Provision E.2, then the Copermittee is deemed in compliance with the effective prohibition of non-storm water discharges to the MS4 required under Provision A.1.b.

Provision E.2 establishes the minimum requirements that each Copermittee must implement within its jurisdiction to effectively prohibit non-storm water discharges from entering its MS4. The federal CWA requires permits for municipal storm sewer systems to "*effectively prohibit non-storm water discharges into the storm sewers*." The federal regulations (40CFR122.26(d)(2)(i)(B)) require each Copermittee to establish the legal authority to prohibit illicit discharges to its MS4s. Under 40 CFR 122.26(d)(2)(iv)(B), each Copermittee must implement a "*program…to detect and remove…illicit discharges and improper disposal into the storm sewer.*" The federal NPDES regulations, under 40 CFR 122.26(b)(2), define illicit discharges as "*any discharge to a municipal separate storm sewer that is not composed entirely of storm water*." Thus, non-storm water discharges are not authorized to enter the MS4 and are considered to be illicit discharges, unless authorized by a separate NPDES permit.

The Phase I Final Rule clarifies that non-storm water discharges through an MS4 are not authorized under the CWA (55 FR 47995):

> "*Today's rule defines the term "illicit discharge" to describe any discharge through a municipal separate storm sewer system that is not composed entirely of storm water and that is not covered by an NPDES permit. Such illicit discharges are not*

authorized under the Clean Water Act. Section 402(p)(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit."

The federal NPDES requirements for the program to address illicit discharges must include "*inspections, to implement and enforce an ordinance, orders, or other similar means to prevent illicit discharges to the MS4*." The federal NPDES regulations also reference several categories of "*non-storm water discharges or flows* [which] *shall be addressed where such discharges are identified…as sources of pollutants to waters of the United States*." The Phase I Final Rule (55 FR 48037) further clarified the requirements of 40 CFR 122.26(d)(2)(iv)(B)(1) as follows:

"*EPA is clarifying that section 402(p)(3)(B) of the CWA (which requires permits for municipal separate storm sewers to 'effectively' prohibit non-storm water discharges) does not require permits for municipalities to prohibit certain discharges or flows of nonstorm water to waters of the United States through municipal separate storm sewers in all cases*."

In previous iterations of the municipal storm water permits for the San Diego Region, these categories were simply listed and referred to as categories of non-storm water discharges "not prohibited" unless identified as a source of pollutants. The Copermittees have often referred to these categories as "exempt" discharges. In both cases, however, the language is inconsistent with the federal CWA and NPDES regulations. And, the clarification provided in the Phase I Final Rule does not specifically state that such discharges are "not prohibited" or "exempt" or in any way authorized. The federal NPDES regulations do, however, state that specific categories of non-storm water discharges must be "*addressed*" if identified as "*sources of pollutants to waters of the United States*."

The language of Provision E.2.a has been revised to be fully consistent with the language of the CWA and the requirements of the federal regulations under 40 CFR 122.26(d)(2)(iv)(B)(1). Provision E.2.a requires each Copermittee to address <u>all</u> types of non-storm water discharges into its MS4 as illicit discharges, <u>unless</u> the discharge is authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to Provisions E.2.a.(1) through E.2.a.(5). Only non-NPDES-permitted non-storm water discharges identified as a category of non-storm water discharges under Provisions E.2.a.(1) through E.2.a.(5) <u>and</u> *not identified as a source of pollutants* do not have to be addressed as illicit discharges. Categories of non-storm water discharges that meet the requirements of Provisions E.2.a.(1) through E.2.a.(5) do not have to be addressed by the Copermittee as illicit discharges.

Several of the non-storm water categories listed in 40 CFR 122.26(d)(2)(iv)(B)(1) have not been included in Provisions E.2.a.(1) through E.2.a.(5), including: street wash water, landscape irrigation, irrigation water, and lawn watering. Because these are no longer included within the categories listed under Provisions E.2.a.(1) through E.2.a.(5), the Copermittees must prohibit these types of non-storm water discharges from entering the MS4. This is consistent with the clarification of 40 CFR 122.26(d)(2)(iv)(B)(1) in the Phase I Final Rule (55 FR 48037), which states:

> "*[T]he Director may include permit conditions that either require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*."

Street wash water is a category of non-storm water discharges that was removed when the Third Term Permits were issued. Street wash water is a source of several pollutants (e.g., metals, oil and grease, petroleum hydrocarbons, chlorinated solvents, sediment) which are generated during the street washing process. The removal of this category requires the Copermittees to prohibit this type of non-storm water discharge from entering the MS4.

The landscape irrigation, irrigation water, and lawn watering categories, collectively referred to hereafter as "over-irrigation" discharges, were removed from the list of non-storm water discharge categories in the Fourth Term Orange County and Riverside County Permits. Non-storm water discharges resulting from over-irrigation have been found to be a source of several types of pollutants (e.g., nutrients, bacteria, pesticides, sediment) in receiving waters. The San Diego Water Board and the Copermittees have identified categories of non-storm water discharges associated with over-irrigation as a source of pollutants and conveyance of pollutants to the MS4 and waters of the United States in the following documents:

- **SmartTimer/Edgescape Evaluation Program (SEEP) Grant Application**

  The State Water Board allocated grant funding to the SEEP project grant application submitted in 2006, which targeted irrigation runoff by retrofitting areas of existing development and documenting the conservation and runoff improvements. The basis of this grant project is that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 is a source and conveyance of pollutants. In addition, the grant application indicated that this alteration of natural flows is impacting the beneficial uses of waters of the state and U.S. Results from the study indicate that that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 *is* a source and conveyance of pollutants. The results of this study can be applied broadly to any area where over-irrigation takes place. The grant application included the following statements:

  > "*Irrigation runoff contributes flow & pollutant loads to creeks and beaches that are 303(d) listed for bacteria indicators.*"

"*Regional program managers agree that the reduction and/or elimination of irrigation-related urban flows and associated pollutant loads may be key to successful attainment of water quality and beneficial use goals as outlined in the San Diego Basin Plan and Bacteria TMDL over the long term.*"

"*Elevated dry-weather storm drain flows, composed primarily … of landscape irrigation water wasted as runoff, carry pollutants that impair recreational use and aquatic habitats all along Southern California's urbanized coastline. Storm drain systems carry the wasted water, along with landscape derived pollutants such as bacteria, nutrients and pesticides, to local creeks and the ocean. Given the local Mediterranean climate, excessive perennial dry season stream flows are an unnatural hydrologic pattern, causing species shifts in local riparian communities and warm, unseasonal contaminated freshwater plumes in the near-shore marine environment.*"

- **2006-2007 Orange County Watershed Action Plan Annual Reports**

The Watershed Action Plan Annual Reports for the 2006-2007 reporting period were submitted by the County of Orange, Orange County Flood Control District and Copermittees within the San Juan Creek, Laguna Coastal Streams, Aliso Creek, and Dana Point Coastal Streams Watersheds. San Juan Creek, Laguna Coastal Streams, Aliso Creek and Dana Point Coastal Streams are all currently 303(d) listed as impaired for indicator bacteria within their watersheds and/or in the Pacific Ocean at the discharge points of their watersheds. The Orange County Copermittees, within their Watershed Action Strategy Table for fecal indicator bacteria included the following:

"*Support programs to reduce or eliminate the discharge of anthropogenic dry weather nuisance flow throughout the…watershed. Dry weather flow is the transport medium for bacteria and other 303(d) constituents of concern.*"

Additionally, they state that "*conditions in the MS4 contribute to high seasonal bacteria propagation in-pipe during warm weather. Landscape irrigation is a major contributor to dry weather flow, both as surface runoff due to over-irrigation and overspray onto pavements; and as subsurface seepage that finds its way into the MS4.*"

- **Fiscal Year 2008 Carlsbad Watershed Urban Runoff Management Program Annual Report**

The Carlsbad Watershed Urban Runoff Management Program Annual Report for Fiscal Year 2008 was submitted by the Carlsbad Watershed Copermittees (Cities of Carlsbad, Encinitas, Escondido, Oceanside, San Marcos, Solana Beach, and Vista, and the County of San Diego). In the Annual Report, the Carlsbad Watershed Copermittees stated the following:

"The Carlsbad Watershed Management Area (WMA) collective watershed strategy identifies bacteria, sediment, and nutrients as high priority water quality pollutants in the Agua Hedionda (904.3 – bacteria and sediment), Buena Vista (904.2 – bacteria), and San Marcos Creek (904.5 – nutrients) Hydrologic Areas. Bacteria, sediment, and nutrients have been identified as potential discharges from over-irrigation."

- **2007-2008 San Diego Bay Watershed Urban Runoff Management Program Annual Report**

  The San Diego Bay Watershed Urban Runoff Management Program 2007-2008 Annual Report was submitted by the San Diego Bay Watershed Copermittees (Cities of Chula Vista, Coronado, Imperial Beach, La Mesa, Lemon Grove, National City, and San Diego, the County of San Diego, the Port of San Diego, and the San Diego County Airport Authority). In Appendix D of the Annual Report, titled "Likely Sources of Pollutants," the San Diego Bay Watershed Copermittees identified over-irrigation of lawns as a pollutant generating activity from business and/or residential land uses for bacteria, pesticides, and sediment.

- **Copermittee Public Education Materials**

  The Orange County Public Works *Tips for Landscape & Gardening* public education brochure states: "*Fertilizers, pesticides and other chemicals that are left on yards or driveways can be blown or washed into storm drains that flow to the ocean. Overwatering lawns can also send materials into storm drains*."

  The Riverside County Flood Control and Water Conservation District *Landscape and Garden* public education brochure states: *"Soil, yard wastes, over-watering and garden chemicals become part of the urban runoff mix that winds its way through streets, gutters and storm drains before entering lakes, rivers, streams, etc. Urban runoff pollution contaminates water and harms aquatic life!"*

- **Los Peñasquitos Lagoon Sedimentation/Siltation TMDL Technical Report**

  The Los Peñasquitos Lagoon Sedimentation/Siltation TMDL technical report was prepared for the City of San Diego and USEPA in October 2010. The technical report was included as a technical supporting document attached to the Sediment TMDL for Los Peñasquitos Lagoon staff report prepared by the San Diego Water Board, dated June 13, 2012. Under the Source Assessment section, the technical report states the following:

  "*Dry weather loading is dominated by nuisance flows from urban land use activities such as car washing, sidewalk washing, and lawn over-irrigation, which pick up and transport sediment into receiving waters.*"

These documents confirm that non-storm water discharges associated with over-irrigation are a source of pollutants and should be addressed as illicit discharges to the MS4. Prohibiting non-storm water discharges associated with over-irrigation, however, is not a new requirement for the Copermittees because it is also consistent with and required by the Water Conservation in Landscaping Act (AB 1881, Laird).

The Water Conservation in Landscaping Act required the Department of Water Resources (DWR) to prepare a Model Water Efficient Landscape Ordinance for use by local agencies (e.g. the Copermittees). All local agencies were required to adopt a water efficient landscape ordinance by January 1, 2010. Local agencies could adopt the Water Efficient Landscape Ordinance developed by DWR, or an ordinance considered at least as effective as the Model Ordinance. The Water Efficient Landscape Ordinance includes a requirement that local agencies prohibit runoff from irrigation (§ 493.2):

> "*Local agencies shall prevent water waste resulting from inefficient landscape irrigation by <u>prohibiting runoff from leaving the target landscape</u> [emphasis added] due to low head drainage, overspray, or other similar conditions where water flows onto adjacent property, non-irrigated areas, walks, roadways, parking lots, or structures. Penalties for violation of these prohibitions shall be established locally*."

Furthermore, non-storm water discharges from over-irrigation not only transport and discharge pollutants to receiving waters, but are also a likely source of the dry weather flows causing changes to habitat within and along the receiving water bodies. Examples of habitat changes from the dry weather flows include perennialization of ephemeral streams, and conversion of saltwater and brackish water marsh habitats to freshwater marsh habitats (e.g. Los Peñasquitos Lagoon). Both of these examples have resulted in the promotion of invasive species in several areas of the San Diego Region.

The removal of the over-irrigation discharges categories does not require the Copermittees to strictly prohibit lawn and landscape irrigation, but does require the prohibition of excessive irrigation water that results in non-storm water discharges to the MS4. Non-storm water discharges to the MS4 from over-irrigation must be addressed as illicit discharges by the Copermittees pursuant to the requirements of Provision E.2.

The remaining non-storm water categories listed in 40 CFR 122.26(d)(2)(iv)(B)(1) are listed under Provisions E.2.a.(1) through E.2.a.(5) and generally fall into four categories: (1) non-storm water discharges subject to existing San Diego Water Board waste discharge requirements and NPDES permits; (2) non-storm water discharges generally not expected to be a source of pollutants to receiving waters; (3) non-storm water discharges likely to contain pollutants requiring some form of control to address

the pollutants prior to discharging to the MS4; and (4) non-storm water discharges or flows associated with firefighting.

Provisions E.2.a.(1) and E.2.a.(2) include several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) for which the San Diego Water Board already has developed general waste discharge requirements and NPDES permits to address the discharges. The Copermittees are only required to address these types of non-storm water discharges as illicit discharges if the Copermittees or the San Diego Water Board identifies these non-storm water discharges not having coverage under the applicable NPDES permit.

Provision E.2.a.(3) includes several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) which are generally not expected to be a source of pollutants to receiving waters, many of which originate from what are typically natural, uncontrollable sources. The Copermittees are only required to address these types of non-storm water discharges as illicit discharges if the Copermittees or the San Diego Water Board identifies these non-storm water discharges as a source of pollutants to receiving waters. Because many of these sources are generally uncontrollable, enforcing a prohibition may not be a possibility for the Copermittees. The Copermittees would be able to address these non-storm water discharges by preventing these non-storm water discharges from entering the MS4. This could potentially be achieved by sealing their MS4 structures so the discharges cannot enter the MS4.

Provision E.2.a.(4) includes several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) that are likely to contain pollutants requiring some form of control to address the pollutants prior to discharging to the MS4. At this time, an outright prohibition of these types of non-storm water discharges does not yet appear to be warranted. Thus, Provision E.2.a.(4) includes several requirements for the Copermittees to control the pollutants from these types of non-storm water discharges. This is consistent with the clarification of the federal regulations in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board has the authority to require the Copermittees to "*control any of these types of discharges where appropriate*."

Unlike non-storm water discharges from over-irrigation, these types of non-storm water discharges are not expected to occur in close proximity to each other or very frequently. Provided these types of non-storm water discharges are controlled as required in Provision E.2.a.(4), the Copermittees would only be required to address these types of non-storm water discharges as illicit discharges if the Copermittee or the San Diego Water Board identifies these non-storm water discharges as a source of pollutants to receiving waters.

Provision E.2.a.(5) includes specific requirements for fire fighting discharges and flows. The requirements for non-storm water discharges and flows associated with fire

fighting have been separated into requirements for: a) non-emergency fire fighting discharges and flows, and b) emergency fire fighting discharges and flows.

The San Diego Water Board has found that discharges from building fire suppression system maintenance (e.g. fire sprinklers) contain waste and potentially a significant source of pollutants to receiving waters. As such, the San Diego Water Board is requiring these discharges be addressed as illicit discharges by the Copermittees. Thus, the discharges to the MS4 are to be prohibited via ordinance, order or similar means. For other non-emergency firefighting discharges and flows (i.e. flows from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems), the Copermittees are required to develop and implement a program to address pollutants in these non-storm water discharges and flows. This is consistent with the clarification of the federal regulations in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board has the authority to require the Copermittees to "*control any of these types of discharges where appropriate*."

For emergency firefighting discharges and flows, the Phase I Final Rule (55 FR 48037) has clarified the requirements of 40 CFR 122.26(d)(2)(iv)(B)(1) pertaining to emergency firefighting flows and discharges, which states:

> "*In the case of firefighting it is not the intention of these rules to prohibit in any circumstances the protection of life and public or private property through the use of water or other fire retardants that flow into separate storm sewers*."

Thus, the requirements have been made to be consistent with the guidance provided by the Phase I Final Rule. The Order recommends that the Copermittees develop and encourage implementation of BMPs to reduce or eliminate the discharge of pollutants from emergency firefighting flows to the MS4s and receiving waters. The Order does not include any requirements that should be interpreted as requiring the implementation of BMPs for emergency firefighting flows to the MS4s and receiving waters.

The Copermittees are expected to review the dry weather MS4 outfall discharge monitoring data they collect to determine if and when there are non-storm water discharges to or from their MS4s that are a source of pollutants to receiving waters. If the Copermittees identify one of the types of non-storm water discharges listed in Provisions E.2.a.(1) through E.2.a.(4) as a source of pollutants to receiving waters based on the review and evaluation of monitoring data, Provision E.2.a.(6) requires the Copermittees to prohibit those categories of discharges from entering the MS4 through ordinance, order or similar means. In addition, Provision E.2.a.(6) clarifies that the San Diego Water Board may identify categories of non-storm water discharges or flows listed under Provisions E.2.a.(1) through E.2.a.(4) that must be prohibited.

Provision E.2.a.(6) also provides the Copermittees an option to propose controls to be implemented for the category of non-storm water discharges as part of the Water Quality Improvement Plan instead of prohibiting the category of non-storm water discharges. If the Water Quality Improvement Plan is accepted by the San Diego Water Board with the proposed controls, the Copermittees will not be required to prohibit the category of non-storm water discharges to their MS4s as long as the controls are implemented. This is consistent with the clarification of 40 CFR 122.26(d)(2)(iv)(B)(1) in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board may "*require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*."

Finally, Provision E.2.a.(7) has been included in the requirements for non-storm water discharges to clarify that any non-storm water discharges to the Copermittee's MS4, even those identified pursuant to Provisions E.2.a.(1) through E.2.a.(4), must be reduced or eliminated, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit. Provision E.2.a.(7) is consistent with the requirements of CWA section 402(p)(3)(B)(ii) and 40 CFR 122.26(d)(1)(v)(B), as clarified in the Phase I Final Rule (55 FR 47995) that "*[u]ltimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit*." However, the reduction or elimination of those non-storm water discharges are expected to be achieved as feasible, in accordance with the priorities in the Water Quality Improvement Plan and when the resources are available to the Copermittee.

Consistent with 40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(1), each Copermittee must implement a "*program…to prevent illicit discharges to the municipal storm sewer system*" and "*detect…illicit discharges and improper disposal into the storm sewer.*" Provision E.2.b requires each Copermittee to implement measures to prevent and detect illicit discharges and connections to its MS4 as part of its illicit discharge detection and elimination program.

As part of the program to prevent and detect illicit discharges to the MS4, 40 CFR 122.26(d)(2)(iv)(B)(2) requires "*procedures to conduct on-going field screening activities during the life of the permit, including areas or locations that will be evaluated by such field screens*." As part of the procedures, each Copermittee is required to maintain an updated map of its entire MS4 and the corresponding drainage areas within its jurisdiction. Having knowledge about where inlets, access points, connections with other MS4s, and outfalls are located is necessary for each Copermittee to track, identify, and eliminate illicit discharges and connections. Thus, Provision E.2.b.(1) of the Order specifies that the map must include the segments of the storm sewer system owned, operated, and maintained by the Copermittee, and include locations of all known inlets, connections with other MS4s, and outfalls to the Copermittee's MS4. The remaining requirements of Provision E.2.b are consistent with the requirements of 40 CFR 122.26(d)(2)(iv)(B)(3)-(7) related to implementing measures to prevent and detect illicit discharges and connections to the MS4.

Provision E.2.c requires each Copermittee to conduct field screening and monitoring of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4. Field screening is a required element of the program to detect and eliminate illicit discharges and connections to the MS4, pursuant to 40 CFR 122.26(d)(2)(iv)(B)(2). The field screening requirement will be implemented through the dry weather MS4 outfall discharge monitoring required under Provisions D.2.a.(2) and D.2.b.(1).

Provision E.2.d specifies the measures each Copermittee must implement to eliminate illicit discharges and connections to its MS4. Elimination of illicit discharges and connections to the MS4 is consistent with the requirement of 40 CFR 122.26(d)(2)(iv)(B) "*to detect and <u>remove</u> [emphasis added]…illicit discharges and improper disposal into the storm sewer*" and will achieve the CWA requirement for MS4 permits to "*effectively prohibit non-storm water discharges into the storm sewers*."

Generally, each Copermittee is responsible for prioritizing its efforts to eliminate non-storm water and illicit discharges or connections to its MS4 based on field screening and monitoring data, NALs, illicit discharge investigation records, and the known or suspected sources. Sources of non-storm water and illicit discharges or connections must be eliminated by enforcing the legal authority established by each Copermittee pursuant to Provision E.1.

<u>Provision E.3 (Development Planning)</u> requires each Copermittee to use its land use and planning authority to implement a development planning program to control and reduce the discharge of pollutants in storm water from new development and significant redevelopment to the MEP. Proper implementation of the development planning program will also contribute toward effectively prohibiting non-storm water discharges from development projects to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." As part of the management program, 40 CFR 122.26(d)(2)(iv)(A)(2) requires "*planning procedures including a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment*."

Land development generally alters the natural conditions of the land by removing vegetative cover, compacting soil, and/or placement of concrete, asphalt, or other impervious surfaces. These impervious surfaces concentrate urban pollutants (such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not found in high concentrations in the natural environment. Pollutants that

accumulate on impervious surfaces are not easily biodegraded nor subject to natural treatment processes.

Impervious surfaces greatly affect the natural hydrology of the land because they do not allow natural infiltration and treatment of storm water runoff to take place. Instead, storm water runoff from impervious surfaces is typically directed through pipes, curbs, gutters, and other hardscape into receiving waters, with little treatment, at significantly increased volumes and accelerated flow rates over what would occur naturally. The increased pollutant loads, storm water volume, discharge rates and velocities, and discharge durations from the MS4 adversely impact stream habitat by causing accelerated, unnatural erosion and scouring within creek bed and banks. Placement of impervious surfaces also encapsulates "good" sediment (such as sand, gravel, rocks and cobbles) that would normally replenish creek beds and banks to help stabilize them. Collectively, these changes to natural hydrologic processes are termed hydrograph modification, or hydromodification.

Hydromodification, which is caused by both altered storm water flow and altered sediment flow regimes, is largely responsible for degradation of creeks, streams, and associated habitats in the San Diego Region. In an ongoing study by the Stormwater Monitoring Coalition to assess the health of streams throughout Southern California, researchers found that three of the four highest risk stressors to creeks (percent sands and fines present, channel alteration, and riparian disturbance) were related to physical habitat.[29] Researchers studying flood frequencies in Riverside County have found that increases in watershed imperviousness of only 9-22 percent can result in increases in peak flow rates for the two-year storm event of up to 100 percent.[30] Such changes in runoff have significant impacts on channel morphology.

In addition, a technical report issued by the Southern California Coastal Water Research Project (SCCWRP) stated that "*[r]ecent studies indicate that California's intermittent and ephemeral streams are more susceptible to the effects of hydromodification than streams from other parts of the United States. Physical degradation of stream channels in the central and eastern United States can initially be detected when watershed impervious cover approaches 10 percent, although biological effects (which may be more difficult to detect) may occur at lower levels. In contrast, initial response of streams in the semi-arid portions of California appears to occur between 3 and 5 percent impervious cover*."[31] These studies highlight the extent to which impacts originating from impervious surfaces created by land development are responsible for the degradation of creek and stream habitat.

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[29] Assessing the Health of Southern California Streams, Stormwater Monitoring Coalition, Fact Sheet
[30] Schueler and Holland, 2000. Storm Water Strategies for Arid and Semi-Arid Watersheds (Article 66). The Practice of Watershed Protection.
[31] Stein, E. and Zaleski, S., 2005. Technical Report 475, Managing Runoff to Protect Natural Streams: The Latest Development on Investigation and Management of Hydromodification in California. December 30, 2005.

This is consistent with what USEPA has noted, that "*[m]ost stormwater runoff is the result of the man-made hydrologic modifications that normally accompany development. The addition of impervious surfaces, soil compaction, and tree and vegetation removal result in alterations to the movement of water through the environment. As interception, evapotranspiration, and infiltration are reduced and precipitation is converted to overland flow, these modifications affect not only the characteristics of the developed site but also the watershed in which the development is located. Stormwater has been identified as one of the leading sources of pollution for all waterbody types in the United States. Furthermore, the impacts of stormwater pollution are not static; they usually increase with more development and urbanization*."[32]

Reducing the impact from the increased pollutant loads and flows generated by impervious surfaces within a watershed is essential to protecting and restoring the integrity of the receiving waters. Provision E.3 includes the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment*." The requirements of Provision E.3 will 1) minimize the generation and discharge of pollutants in storm water from the MS4, and 2) minimize the potential of storm water discharges from the MS4 from causing altered flow regimes and excessive downstream erosion in receiving waters.

The requirements of Provision E.3.a include the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment*" applicable to all development projects, regardless of size or purpose of development. In general, all development projects must implement onsite BMPs to remove pollutants from runoff prior to its discharge to any receiving waters, as close to the pollutant generating source as possible, and structural BMPs must not be constructed within waters of the U.S.

Furthermore, the onsite BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors (e.g. mosquitos, rodents, and flies). If not properly designed or maintained, certain BMPs implemented or required by municipalities may create a habitat for vectors. Monitoring studies conducted by the California Department of Public Health (CDPH) have documented that mosquitoes opportunistically breed in structural storm water BMPs, particularly those that hold standing water for over 96 hours. Certain site design features that hold standing water may similarly produce mosquitoes.

[32] USEPA, 2007. Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices, December 2007.

Structural BMPs and site design features should incorporate design, construction, and maintenance principles to promote drainage within 96 hours to minimize standing water available to mosquitoes. Nuisances and public health impacts resulting from vector breeding can be prevented with close collaboration and cooperative effort between municipalities and local vector control agencies and the CDPH during the development and implementation of storm water runoff management programs. The CDPH also has issued guidance for BMP implementation that will minimize potential nuisances and public health impacts resulting from vector breeding.[33]

All development projects are required to implement source control BMPs that will minimize the generation of pollutants. Additionally, each development project must implement, where applicable and feasible, low impact development (LID) BMPs to mimic the natural hydrology of the site and retain and/or treat pollutants in storm water runoff prior to discharging to and from the MS4.

The LID Center defines LID as "*a comprehensive land planning and engineering design approach with a goal of maintaining and enhancing the pre-development hydrologic regime of urban and developing watersheds.*"[34] LID designs seek to control storm water at the source, using small-scale integrated site design and management practices to mimic the natural hydrology of a site, retain storm water runoff by minimizing soil compaction and impervious surfaces, and disconnect storm water runoff from conveyances to the storm drain system.

LID BMPs may utilize interception, storage, evaporation, evapotranspiration, infiltration, and filtration processes to retain and/or treat pollutants in storm water before it is discharged from a site. Because of these numerous options, the San Diego Water Board expects that every development project will be able to implement some form of LID BMPs. Examples of LID BMPs include using permeable pavements, rain gardens, rain barrels, grassy swales, soil amendments, and native plants.

Provision E.3.a also includes requirements for all development projects to, where feasible, landscape with native and/or low water use plants to minimize the discharge of non-storm water discharges associated with excessive irrigation, as well as harvest (i.e., storage) and use precipitation to promote the concept of utilizing storm water as a resource.

While all development projects are subject to the requirements of Provision E.3.a, Provision E.3.b identifies Priority Development Projects that exceed given size thresholds and/or fit under specific use categories. Priority Development Projects are required to incorporate specific performance criteria for structural BMPs into the

[33] California Department of Public Health, 2012. Best Management Practices for Mosquito Control in California. (http://www.cdph.ca.gov/HealthInfo/discond/Documents/BMPforMosquitoControl07-12.pdf)
[34] www.lowimpactdevelopment.org

project plan to reduce the generation of pollutants, and address potential impacts from hydromodification.

The Priority Development Project categories are based on the requirements of the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), and do not differ significantly from the Fourth Term Permit for San Diego County. Furthermore, the Priority Development Project categories are consistent with Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), and Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit).

Because of the impact of relatively small increases in watershed impervious surfaces to receiving waters, Provision E.3.b.(1)(c)(iv) has been updated to include large driveways that are 5,000 square feet or more. The San Diego Water Board finds that large driveways can exacerbate altered flow regimes if not properly controlled.

Provision E.3.b.(3) describes projects that are exempt from Priority Development Project status. These include new or retrofit paved sidewalks, bicycle lanes, or trails that are designed and constructed to direct runoff to vegetated areas or be hydraulically disconnected from paved areas. The exemptions have been provided to encourage these types of projects because they provide multiple environmental benefits, such as promoting walking rather than driving, which will in turn improve air quality. Additionally, retrofitting of existing alleys, streets, or roads are exempt from Priority Development Project status if they are constructed using USEPA Green Streets guidance.[35] By doing so, retrofitting of these types of projects is encouraged. The San Diego Water Board recognizes that there are spatial constraints associated with these projects, and implementation of structural BMPs are not always feasible.

For development projects identified as Priority Development Projects, the requirements of Provision E.3.c are the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment.*" Provisions E.3.c.(1)-(3) describe the performance criteria for the structural BMPs that must be implemented for each Priority Development Project defined by Provision E.3.b.

Provision E.3.c.(1) describes the storm water pollutant control BMP requirements that must be implemented by all Priority Development Projects. The purpose of Provision E.3.c.(1) is to reduce pollutants in storm water runoff to the MEP from Priority Development Projects before it is discharged to the MS4. Of all the available treatment processes available, retention of storm water, and therefore capture of the

[35] "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).

pollutants in the storm water, will achieve 100 percent pollutant removal efficiency for the volume of storm water retained. No other method of treatment can achieve 100 percent pollutant removal efficiency. Thus, retention of as much storm water onsite is the most effective way to reduce pollutants in storm water discharges to, and consequently from the MS4, and controls pollutants in storm water discharges from a site to the MEP.

Under Provision E.3.c.(1)(a), retention of the pollutants in the runoff produced from the 85th percentile storm event ("design capture volume") is the design standard to which Priority Development Projects must comply. Since the 85th percentile storm event has previously been used as the numeric design standard for treatment control BMPs, this same size storm event is used as the numeric design standard for storm water retention. This is the MEP standard recognized by the San Diego Water Board and is consistent with the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), as well as Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit), and Los Angeles Water Board Order No. R4-2012-0175 (Los Angeles County MS4 Permit).

The 85th percentile storm event is the event that has a precipitation total greater than or equal to 85 percent of all storm events over a given period of record in a specific area or location. For example, to determine what the 85th percentile storm event is in a specific location, all 24 hour storms that have recorded values over a 30 year period would be tabulated and a 85th percentile storm would be determined from this record (i.e. 15 percent of the storms would be greater than the number determined to be the 85th percentile storm). Most jurisdictions in the San Diego Region have already developed isopluvial maps that can provide this type of information. The 85th percentile storm might be determined to be a number such as 1.0 inch, and this would be multiplied by the total area of the project footprint producing runoff to calculate the design capture volume. The Priority Development Project designer would then select a system of BMPs that would retain (i.e. intercept, store, infiltrate, evaporate, or evapotranspire) the pollutants contained in the design capture volume onsite.

Retention BMPs are necessary to capture and retain pollutants generated from a Priority Development Project. In a recent study performed by SCCWRP in the Los Angeles Region, they found "*that the magnitude of constituent load associated with storm water runoff depends, at least in part, on the amount of time available for pollutant build-up on land surfaces. The extended dry period that typically occurs in arid climates such as southern California maximizes the time for constituents to build-up on land surfaces, resulting in proportionally higher concentrations and loads during*

initial storms of the season."[36] This implies that the "first flush" of a rainy season and the first storm events after long antecedent dry periods tend to have the highest pollutant loads. Capturing and retaining the pollutant loads of the "first flush" of a rainy season and the first storm events after long antecedent dry periods will reduce a significant portion of the pollutants in storm water discharged to and from the MS4.

The San Diego Water Board, however, acknowledges that in some situations retention of the full design capture volume onsite may not be technically feasible. In this event, the Copermittee may allow the Priority Development Project to use biofiltration BMPs to treat 1.5 times the design capture volume not reliably retained onsite, or biofiltration BMPs with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite.

The 1.5 multiplier is based on the finding in the Ventura County Technical Guidance Manual that biofiltration of 1.5 times the design capture volume not retained onsite will provide approximately the same pollutant removal as retention of the design capture volume on an annual basis.[37] This standard is consistent with the Los Angeles Water Board's Los Angeles County and Ventura County municipal storm water permits (Order Nos. R4-2012-0175 and R4-2010-0108, respectively). The flow-thru design of 0.75 times the portion of the design capture volume not reliably retained onsite is consistent with the San Diego Water Board's Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively). In either case, the biofiltration BMPs must be designed with an appropriate hydraulic loading rate to maximize storm water retention and pollutant removal, as well as to prevent erosion, scour, and channeling within the BMP. Each Copermittee is required to update its BMP Design Manual to provide guidance for hydraulic loading rates and other biofiltration design criteria necessary to maximize storm water retention and pollutant removal.

The San Diego Water Board further recognizes that, in addition to not being technically feasible, retention of the full design capture storm onsite may be cost prohibitive, or may not provide as much water quality benefit to the Watershed Management Area as would implementing BMPs elsewhere in the watershed. Thus, Provision E.3.c.(1)(b) allows for the use of a combination of onsite retention BMPs, and the implementation of an Alternative Compliance Program described in Provision E.3.c.(3). Provision E.3.c.(3) is discussed in more detail below.

If the full design capture volume is not retained onsite either because biofiltration is not technically feasible, or a Copermittee grants a Priority Development Project permission

[36] Stein, E.D., Tiefenthaler, L.L., and Schiff, K.C., 2007. Technical Report 510, Sources, Patterns and Mechanisms of Storm Water Pollutant Loading from Watershed and Land Uses of the Greater Los Angeles Area, California, USA. March 20, 2007.
[37] Ventura Countywide Stormwater Management Program. 2011. Ventura Technical Guidance Manual, Manual Update, 2011.

to utilize the Alternative Compliance Program, then the pollutants in the portion of the design capture volume that are not reliably retained onsite must still be reduced to the MEP. Thus, flow-thru treatment control BMPs are required to be implemented on Priority Development Projects in addition to the retention BMPs. The requirements of Provisions E.3.c.(1)(a)(ii)[a]-[c] include the performance standards for flow-thru treatment control BMPs, consistent with the Fourth Term Permits in the San Diego Region.

Whereas the purpose of the requirements under Provision E.3.c.(1) is to reduce pollutants in storm water runoff to the MEP, the purpose of the requirements under Provision E.3.c.(2) is to maintain or restore more natural hydrologic flow regimes to prevent accelerated, unnatural erosion in downstream receiving waters, also to the MEP standard. Provision E.3.c.(2) describes hydromodification management BMP requirements that must be implemented by all Priority Development Projects.

The performance criteria for the implementation of hydromodification management BMPs on Priority Development Projects are consistent with the requirements in the Fourth Term Permits for Orange and Riverside Counties (Order Nos. R9-2009-0002 and R9-2010-0016, respectively). Modifications to the Orange County and Riverside County Hydromodification Management Plans (HMPs) will likely be minor, or may not be necessary. The HMP for San Diego County will likely require some minor modifications to incorporate the requirements of Provision E.3.c.(2) and become consistent with the Orange County and Riverside County HMPs. The San Diego Water Board does not, however, expect that it will be necessary for the San Diego County Copermittees to develop a new approach or significantly re-write the San Diego County HMP. This is because the premise of the hydromodification management BMP requirements, which are to control storm water runoff conditions (flow rates and durations) for Copermittee-defined range of flows, is unchanged from all Fourth Term Permits in the San Diego Region.

Provision E.3.c.(2)(a) requires that post-project runoff conditions mimic the *pre-development* runoff conditions, and not the *pre-project* runoff conditions. Fundamentally, the San Diego Water Board believes that using a hydrology baseline that approximates that of an undeveloped, natural watershed is the only way to facilitate the return of more natural hydrological conditions to already built-out watersheds, and ultimately improved stream health. On the other hand, using the *pre-project* hydrology as a baseline for redevelopment projects results in propagating the unnatural hydrology of urbanized areas. Propagating the urbanized flow regime does not support conditions for restoring degraded or channelized stream segments, and would forever sentence such streams to the degraded state. Furthermore, reducing the volume of storm water runoff associated with the urbanized flow regime will also result in reducing the discharge of pollutants into receiving waters, since storm water runoff from impervious surfaces contains untreated pollutants.

The San Diego Water Board understands that approximating the pre-development runoff condition associated with a redevelopment site is not necessarily straightforward because factors such as natural grade and native vegetation for the site cannot be precisely known. Therefore, the San Diego Water Board does not expect project designers to estimate historical conditions associated with redevelopment sites. Rather, the San Diego Water Board expects project designers and the Copermittees to approximate pre-development runoff conditions using the parameters of a *pervious* area rather than an *impervious* area. This means that for redevelopment sites, approximating pre-development runoff conditions equates to using existing onsite grade and assuming the infiltration characteristics of the underlying soil. A redevelopment Priority Development Project must not use runoff coefficients of concrete or asphalt to estimate pre-development runoff conditions. Rather, redevelopment projects must use available information pertaining to existing underlying soil type (such as soil maps published by the National Resource Conservation Service), onsite existing grade, and any other readily available pertinent information to estimate pre-development runoff conditions.

The San Diego Water Board understands, indeed asserts, that the pre-development hydrology of an area in question can only be roughly estimated and cannot be precisely known. However, using the hydrology of a natural condition, even if not precisely known, will provide significant benefit to receiving waters over using the hydrology associated with impervious (developed) surfaces. Therefore in order to achieve the goals of the Clean Water Act, which are to "*restore and maintain the chemical, physical, and biological integrity of the nation's waters* [emphasis added]," the most appropriate standard to use for hydromodification management is the standard associated with the pre-development condition.

Provision E.3.c.(2)(b) requires Priority Development Projects to avoid known critical sediment yield areas or implement measures that would allow coarse sediment to be discharged to receiving waters, such that the natural sediment supply is unaffected by the project. This is necessary because the availability of coarse sediment supply is as much an issue for causing erosive conditions to receiving streams as are accelerated flows.

The San Diego Water Board recognizes that in some situations implementing the hydromodification management BMP requirements for flow control fully onsite may not be technically feasible, may be cost prohibitive, or may not provide any overall water quality benefits to the Watershed Management Area. Thus, Provision E.3.c.(2)(c) allows for the use of a combination of onsite hydromodification management BMPs for flow control and alternative compliance options described in Provision E.3.c.(3).

Provision E.3.c.(3) allows for alternative compliance in instances where the Copermittee determines that offsite measures will have a greater overall water quality benefit for the Watershed Management Area than if the Priority Development Project were to implement structural BMPs onsite. Consequently, watershed-specific

structural BMP requirements are present in this Order in the form of allowable compliance offsite. The Alternative Compliance Program to Onsite Structural BMP Implementation Provision is intended to integrate with the Copermittees' planning efforts in the Water Quality Improvement Plans.

The Alternative Compliance Program is an option for Priority Development Projects where the governing Copermittee has participated in the development of a Watershed Management Area Analysis as part of the Water Quality Improvement Plan (described in Provision B.3.b.(4)). Such an approach is consistent with the latest findings in hydromodification management by the scientific community. In a Technical Report entitled *Hydromodification Assessment and Management in California,*[38] the report states:

> *"An effective [hydromodification] management program will likely include combinations of on-site measures (e.g., low-impact development techniques, flow-control basins), in-stream measures (e.g., stream habitat restoration), floodplain and riparian zone actions, and off-site measures. Off-site measures may include compensatory mitigation measures at upstream locations that are designed to help restore and manage flow and sediment yield in the watershed."*

Consistent with the ideas brought forth in the report, in the Watershed Management Area Analysis of Provision B.3.b.(4), which is optional, the Copermittees will develop watershed maps that include as much detail about factors that affect the hydrology of the watershed as is available. Such factors included identification of areas suitable for infiltration, coarse sediment supply areas, and locating stream channel structures and constrictions. Once these factors are mapped and studied, the Copermittees can identify areas in the watershed where candidate projects may be implemented that are expected to improve water quality in the watershed by providing more opportunity for infiltration, slowing down storm water flows, or attenuation of pollutants naturally via healthy stream habitat. These candidate projects may be in the form of retrofitting existing development, rehabilitating degraded stream segments, identifying regional BMPs, purchasing land to preserve valuable floodplain functions, and any other project(s) that the Copermittees identify.

Under the Alternative Compliance Program, Priority Development Projects may be allowed to fund, partially fund, or implement a candidate project, in lieu of implementing structural BMPs onsite, if they enter into a voluntary agreement with the governing Copermittee permitting this arrangement. Project proponents may also propose an alternative project not previously identified by the Copermittees. In either case, whether a project proponent implements a candidate project identified by the Copermittees or a separate alternative compliance project, the governing Copermittee must determine that implementation of the project will have a greater overall water

[38] 2012. ED Stein, F Federico, DB Booth, BP Bledsoe, C Bowles, Z Rubin, GM Kondolf, A Sengupta. Technical Report 667. Southern California Coastal Water Research Project. Costa Mesa, CA.

quality benefit for the Watershed Management Area than fully implementing structural BMPs onsite. Determination of greater overall water quality benefits associated with alternative compliance projects would be accomplished by utilizing Water Quality Equivalency calculations developed pursuant to Provision E.3.c.(3)(a). Water Quality Equivalency calculations are necessary to establish a regional and technical basis for determining water quality benefits associated with alternative compliance projects, which can be consistently used by all Copermittees in the San Diego Region. Finally, if ~~I~~f alternative compliance involves funding or implementing a project that is outside the jurisdiction of the governing Copermittee, then that Copermittee may enter into an inter-agency agreement with the appropriate jurisdiction.

Finally, Provision E.3.c.(2)(d) allows Priority Development Projects to be exempt from the hydromodification management BMP requirements if there is no threat of erosion to downstream receiving waters (i.e. the receiving stream is concrete lined from the point of discharge all the way to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean). If the Copermittees believe that more exemptions are warranted, then they must perform the optional Watershed Management Area Analysis of Provision B.3.b.(4). Additional exemptions other than those specified in this Order may be established on a watershed basis, provided the Copermittees perform the analysis, provide supporting rationale for the exemptions, and complete the Water Quality Improvement Plan approval process pursuant to Provision F.1.

To facilitate the transition to this Order from the Fourth Term Permits for Orange and Riverside County Copermittees, Provision E.3.c.(2)(e) allows two additional temporary exemptions from hydromodification management BMP implementation. The first temporary exemption allows relief from hydromodification management BMP implementation for Priority Development Projects discharging directly to an engineered channel conveyance system with a capacity to convey peak flows generated by the 10-year storm event all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean. Similar to the exemption allowed for concrete-lined channels, this exemption is premised on the concept that there is little threat of erosion to these types of engineered channel systems.

The second temporary exemption allows relief from hydromodification management BMP implementation for Priority Development Projects discharging directly to large river reaches with drainage areas larger than 100 square miles and a 100-year flow capacity in excess of 20,000 cubic feet per second. If this exemption is claimed, then properly sized energy dissipation is required at all discharge points associated with the Priority Development Project. This exemption is premised on the concept that large river reaches can essentially assimilate the accelerated flow rates associated with individual Priority Development Projects because they are inconsequential compared

to the flow rate in the large river reach. Both of these exemptions are included in the Hydromodification Management Plan for San Diego County[39].

These temporary exemptions are allowed as a means to facilitate Orange and Riverside County Copermittees' transition to this Order from the Fourth Term Permits and are not meant to reside as permanent exemptions without additional rigorous technical analyses specific to each County. Therefore, these exemptions will no longer apply once the Copermittees' land development programs are fully updated to reflect the requirements of this Order, i.e., upon implementation of the BMP Design Manual pursuant to Provision F.2.b. If the Copermittees believe that these or other exemptions are warranted in the context of water quality improvement and stream restoration opportunities, then the Copermittees must perform the optional Watershed Management Area Analysis of Provision B.3.b.(4) and provide supporting rationale for the exemptions. The San Diego County Copermittees are also required to perform the optional Watershed Management Area Analysis to provide supporting rationale to justify use of these and other exemptions. Updated BMP Design Manuals including rationale to justify use of exemptions will be reviewed by the San Diego Water Board pursuant to Provision F.2.b.

Provisions E.3.c.(4) and E.3.c.(5) were included under the BMP requirements applicable to all development projects in the Fourth Term Permits for San Diego, Orange, and Riverside Counties (Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016, respectively). In this Order, the long-term BMP maintenance and infiltration and groundwater protection requirements apply to structural BMPs implemented by Priority Development Projects only.

Provision E.3.d requires the Copermittees to update their BMP Design Manual as needed to incorporate the requirements of Provision E.3. The BMP Design Manual is formerly known as the Standard Storm Water Mitigation Plan, or SSMP, and was renamed so that the title has a more accurate description of the document content. The contents of the BMP Design Manual are largely unchanged from the previous Standard Storm Water Mitigation Plans required under the Fourth Term Permits. The BMP Design Manual fulfills the 40 CFR 122.26(d)(2)(iv)(A)(2) requirement that the Copermittee's development planning program includes "*a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment*."

As part of the "*planning procedures,*" 40 CFR 122.26(d)(2)(iv)(A)(2) requires the procedures to "*address controls to reduce pollutants in discharges from municipal separate storm sewers after construction is completed*." The requirements applicable to the implementation and oversight of structural BMPs at Priority Development Projects are provided under Provision E.3.e.

[39] Final Hydromodification Management Plan Prepared for County of San Diego, March 2011

Proper installation of the structural BMPs approved for a Priority Development Project is necessary to ensure that pollutants in storm water discharges will be reduced to the MEP after the project is completed. In addition to the proper installation of structural BMPs, the maintenance of structural BMPs on Priority Development Projects is necessary to ensure that pollutants in storm water discharges will continue to be reduced to the MEP. Provision E.3.e.(1) includes the minimum requirements that each Copermittee must implement to ensure structural BMPs are properly installed and will be properly maintained.

Provisions E.3.e.(1)(a)(i)-(ii) have been included to provide additional clarification regarding when a Copermittee may allow land development requirements from earlier MS4 permits to apply to a Priority Development Project. Since the MS4 permits issued from 2001 to the adoption of Order No. R9-2015-0001 amending Order No. R9-2013-0001 (Regional MS4 Permit), a Copermittee could allow development projects with "prior lawful approval" to be "grandfathered" into implementing BMP requirements from previous MS4 permits. The Copermittees were given the discretion to use their land use authority to determine when it was appropriate to allow a development project with prior lawful approval to implement BMP requirements from the previous MS4 permits, and when the most recent BMP requirements should be required to achieve the reduction of pollutants in storm water runoff from development projects to the MEP. However, the San Diego Water Board has found that the Copermittees and the development community frequently disagree about when a development project has prior lawful approval and what is necessary to reduce pollutants in storm water runoff from development projects to the MEP.

Therefore, Provisions E.3.e.(1)(a)(i)-(ii) were included to provide more clarity and certainty for the Copermittees, the land development community, and the general public about when the structural BMP performance standards of earlier MS4 permits may be allowed to be implemented. A Copermittee may allow a Priority Development Project to implement BMP requirements of the previous MS4 permit only if all requirements of Provisions E.3.e.(1)(a)(i)[a]-[d] have been met. Otherwise, the Copermittees must require all Priority Development Projects to incorporate the BMP requirements of Provision E.3 into the project to reduce pollutants in storm water runoff from development projects to the MEP.

Provisions E.3.e.(1)(a)(i)[a]-[d] are dependent upon the effective date of the BMP Design Manual. Unless otherwise directed by the San Diego Water Board, the effective date of the BMP Design Manual is December 24, 2015 for the San Diego County Copermittees, September 28, 2017 for the Orange County Copermittees, and July 5, 2018 for the Riverside County Copermittees.

Alternatively, if the Copermittee can demonstrate a lack of land use authority or legal authority to require a Priority Development Project to implement the requirements of Provision E.3, the Copermittee may allow land development requirements from the previous MS4 permits to apply. However, under these circumstances the San Diego

Water Board expects the Copermittee to utilize its available land use authority or legal authority to require the implementation of as much of Provision E.3 as possible to reduce the discharge of pollutants in storm water from development and redevelopment projects within its jurisdiction to the MEP.

In cases where BMP requirements from the earlier MS4 permits govern the structural BMP design requirements of a Priority Development Project, the San Diego Water Board expects the Copermittees to be able to demonstrate, in a programmatic audit or other means, that a Priority Development Project met all the requirements listed under Provisions E.3.e.(1)(a)(i)[a]-[d], or have evidence that the Copermittee did not have the land use or legal authority to require the implementation of Provision E.3 for a Priority Development Project.

The requirements under Provision E.3.e.(2)-(3) are necessary to demonstrate each Copermittee is implementing a program that complies with Provisions E.3.b-c and E.3.e.(1), and ensure structural BMPs at Priority Development Project will continue to be able to reduce pollutants in storm water discharges to the MEP.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary for any development projects to compel compliance with the requirements of Provision E.3 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.3.f requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

<u>Provision E.4 (Construction Management)</u> requires each Copermittee to implement a construction management program to control and reduce the discharge of pollutants in storm water from construction sites to the MEP. Proper implementation of the construction management program will also contribute toward effectively prohibiting non-storm water discharges from construction sites to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." As part of the management program, 40 CFR 122.26(d)(2)(iv)(D) requires "*a program to implement and maintain structural and non-structural best management practices to reduce pollutants in storm water runoff from construction sites to the municipal storm sewer system.*"

Construction sites can be significant sources of sediment, trash, and other pollutants to receiving waters. Although sediment is naturally occurring in the natural environment, the discharge of sediment under unnatural conditions is problematic to receiving waters. Fine sediment in creeks causes high turbidity that interferes with the

functionality of native flora and fauna in local creeks. For example, turbidity interferes with both photosynthesis of water-philic plants, as well as successful foraging and reproduction of benthic macroinvertebrates. Sediment can also make it difficult for fish to breathe because it clogs fish gills. Other pollutants such as heavy metals or pesticides can adhere to sediment and are transported to receiving waters during storm events, where they dissolve in the water column and become bioavailable to aquatic organisms. Sediment is recognized as a major stressor to surface waters and is responsible for the impairment of several lagoons and creeks in the San Diego Region.

Provision E.4 includes requirements that each Copermittee must implement to minimize the discharge of sediment and other pollutants from construction sites to the MS4 within its jurisdiction. The requirements under Provision E.4 are consistent with the Fourth Term Permits for San Diego, Orange, and Riverside Counties. Therefore, Copermittees are expected to implement the requirements seamlessly, with minimal changes to their existing construction management programs. The Copermittees, however, are given more flexibility to run their programs as needed to maximize efficiency, and also to be consistent with the Water Quality Improvement Plan for the Watershed Management Area.

As part of the construction management program, 40 CFR 122.26(d)(2)(iv)(D)(1) requires "*procedures for site planning which incorporate consideration of potential water quality impacts.*" Provision E.4.a describes the minimum elements each Copermittee is required to include as part of the construction site planning and project approval process. The construction site planning and approval process is based primarily on ensuring each project had an adequate site-specific pollution control, construction BMP, and/or erosion and sediment control plan that will be implemented to minimize the discharge of pollutants in storm water to the MEP, and minimize impacts to receiving waters.

The requirements under Provision E.4.b provide the data and information necessary to identify "*priorities for inspecting sites and enforcing control measures*" required pursuant to 40 CFR 122.26(d)(2)(iv)(D)(3). Under Provision E.4.b, each Copermittee must identify construction sites that are considered a high threat to downstream surface waters. Designation of "high threat to water quality" construction sites will necessitate the Copermittees to develop criteria to identify such sites. Provision E.4.b.(2) describes a list of factors that must be considered when the Copermittee considers threat to water quality. For example, a Copermittee must identify sites as "high threat to water quality" if it is located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions, according to the Water Quality Improvement Plan. This ensures that construction management program implementation is compatible with the Copermittee's identified highest priority water quality conditions.

Pursuant to 40 CFR 122.26(d)(2)(iv)(D)(2) each Copermittee is required describe "*requirements for nonstructural and structural best management practices*" at

construction sites. Provision E.4.c includes the types of construction site BMPs that the Copermittees must implement, or require the implementation of, at each construction site to reduce pollutants in storm water discharges to the MEP.

Each Copermittee is expected to require the implementation of appropriate BMPs given specific site conditions, the season and likelihood of rain events, and construction phase (i.e. grading vs. vertical construction). This means that throughout the life of the project construction, the appropriate BMPs will vary, especially if the construction of the project spans multiple wet seasons. As opposed to describing specific minimum BMPs that must be implemented, the Order describes major BMP categories that should be considered for each site.

Each Copermittee is expected to use its 20 years of storm water experience and knowledge to require implementation of appropriate BMPs from the various categories at each construction site within its jurisdiction. For example, the San Diego Water Board expects that each site will be required to implement erosion control and sediment control. The San Diego Water Board also expects each Copermittee to require implementation of active/passive sediment treatment systems at sites where other BMPs have been tried and are known to be inadequate, and discharges of sediment are causing or contributing to water quality impairment downstream. Each Copermittee is granted flexibility in specifying the minimum level of BMP requirements at each site, but the San Diego Water Board expects each site to be capable of controlling pollutants in storm water discharges to the MEP and preventing illicit discharges.

The requirements under Provision E.4.d are necessary to demonstrate that each Copermittee is implementing a program that complies with Provisions E.4.a and E.4.c and ensure BMPs at construction sites will reduce pollutants in storm water discharges to the MEP.

Provision E.4.d does not include minimum required inspection frequencies for construction sites. Each Copermittee must use its experience and knowledge to specify an appropriate inspection frequency for both high priority and lower priority sites in their jurisdictional runoff management program documents, and in accordance with the Water Quality Improvement Plan. Appropriate inspection frequencies may vary by Copermittee, but the San Diego Water Board expects that the stated frequency will be adequate for each Copermittee to properly oversee the construction sites within its jurisdiction, confirm BMPs are implemented to reduce pollutants in storm water discharges from constructions sites to the MEP, and make needed changes to its program on an ongoing basis as necessary.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary for any development projects to compel compliance with the requirements of Provision E.4 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to

the MEP, Provision E.4.e requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Provision E.5 (Existing Development Management) requires each Copermittee to implement an existing development management program to control and reduce the discharge of pollutants in storm water from areas of existing development to the MEP. Proper implementation of the existing development management program will also contribute toward effectively prohibiting non-storm water discharges from areas of existing development to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." Within 40 CFR 122.26(d)(2)(iv)(A) and (C), the management program is required to reduce impacts on receiving waters and reduce pollutants in storm water discharges to the MEP from commercial and residential areas, industrial facilities, and municipal facilities.

Commercial and residential areas, industrial facilities, and municipal facilities must be addressed by each Copermittee with the existing development management program required under Provision E.5. All other areas within each Copermittee's jurisdiction should be either undeveloped open space, or areas that are being developed or under construction. Areas being developed or under construction will be addressed by the Copermittee under the requirements of Provision E.3 (Development Planning) or Provision E.4 (Construction Management).

Areas of existing development typically include impervious surfaces such as sidewalks, driveways, roads, and rooftops, which generate and concentrate pollutants (such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not found in high concentrations in the natural environment. Pollutants that accumulate on impervious surfaces are not easily biodegraded or not subject to natural treatment processes. When it rains, these pollutants are transported in storm water runoff from these impervious surfaces into receiving waters, resulting in poor water quality and degradation of beneficial uses.

In addition to the generation of pollutants, areas of existing development have generally altered the natural conditions of the land and removed vegetative cover, reduced the perviousness of the surface, and reduced the capacity of storm water that can be intercepted, captured, stored, infiltrated, evaporated, and/or evapotranspired. The alteration of the natural conditions and the impervious surfaces associated with areas of existing development causes water quality problems due to the alteration of natural flow regimes within the watersheds; resulting in hydromodification of channels, streams, and habitats that exist within or adjacent to the areas of existing development.

Thus, storm water discharges from areas of existing development are responsible for poor water quality, degraded habitats, and hydromodified channels throughout the developed portions of the watersheds in the San Diego Region. To improve the health and functionality of the receiving waters in a Watershed Management Area, land use practices and the amount of impervious surfaces in areas of existing development must change to reduce the various impacts caused by hydromodification and pollutants from storm water runoff generated in developed areas. Each Copermittee must be aggressive to address pollutant sources and runoff from areas of existing development to be able to reduce pollutants in storm water discharges from the MS4 to the MEP.

There is some overlap in the requirements under Provision E.5 with the requirements under Provisions E.2 (Illicit Discharge Detection and Elimination), E.3 (Development Planning), and E.4 (Construction Management). Illicit discharges frequently originate from areas of existing development. New development projects, when completed will become some type of residential, commercial, industrial or municipal existing development. Redevelopment projects are, by definition, redeveloping areas of existing development. And, redevelopment projects become construction sites located in areas of existing development. Much of the data and information collected, inspections performed, and enforcement actions taken for the requirements under Provisions E.2 to E.4 may also be utilized by the existing development management program. The requirements under Provision E.5, however, are focused primarily on reducing pollutants generated in areas of existing development that can be transported in storm water runoff and discharged to and from the MS4.

The requirements under Provision E.5 build upon existing program elements being implemented by the Copermittees. Provision E.5 is generally consistent with the existing development requirements of the Fourth Term Permits for Orange and Riverside Counties (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), but modified to provide more flexibility to implement the programs so resources can be better focused toward addressing the highest priority water quality conditions identified in the Water Quality Improvement Plans.

For a Copermittee to properly manage areas of existing development, having knowledge of what development exists within its jurisdiction is essential. Provision E.5.a requires each Copermittee to maintain a watershed-based inventory of all the existing development within its jurisdiction. This requirement is necessary for each Copermittee to implement the requirements of Provision E.5.b-e.

As opposed to just maintaining separate inventories based on the type of site, each Copermittee must maintain a watershed-based inventory that includes all types of existing development within its jurisdiction. By utilizing a watershed-based inventory, the Copermittees within a Watershed Management Area can combine their inventories and review the inventories by watershed in addition to by jurisdiction. Pollutant

sources and strategies for abatement can then be evaluated on a watershed level, as opposed to evaluating sources and strategies strictly by type of site.

Provision E.5.a includes the information that must be included in the inventory. Provision E.5.a.(1) specifies what facilities or areas must be included in the inventory. A commercial type of existing development may be identified in the inventory as a facility (e.g. individual building, individual business) or an area (e.g. shopping center, commercial zone). An industrial type of existing development must be identified in the inventory by facility (e.g. individual industrial entity). A municipal type of existing development must be identified in the inventory by facility, with a list of specific municipal facilities that must be included in the inventory. A residential type of existing development must be identified by areas to be designated by the Copermittee. For each of the facilities and areas identified in the Copermittee's inventory developed pursuant to Provision E.5.a.(1), Provision E.5.a.(2) specifies the information that must be included in the description for the facility or area.

Provision E.5.a.(3) requires each Copermittee to maintain an updated map showing the location of inventoried existing development, watershed boundaries, and water bodies. This requirement was included because this information is expected to help the Copermittees in a Watershed Management Area identify and prioritize sources of pollutants and/or stressors in areas of existing development that contribute toward the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Knowledge of the existing development that are likely to be sources of pollutants contributing to the highest priority water quality conditions is expected to be a key element in the Copermittees' development of the water quality improvement strategies that will be included in the Water Quality Improvement Plans. The strategies described in the Water Quality Improvement Plans will direct efforts within the existing development management programs implemented by each Copermittee.

Pursuant to 40 CFR 122.26(d)(2)(iv)(A) each Copermittee is required describe "*structural and source control measures to reduce pollutants*" in storm water runoff discharged from areas of existing development. Provision E.5.b includes the BMP implementation and maintenance requirements that the each Copermittee must require at areas of existing development to reduce pollutants in storm water discharges to the MEP. The San Diego Water Board, however, recognizes that BMP implementation and maintenance for residential areas will require much more education and encouragement through less authoritative measures than for commercial, industrial and municipal facilities and areas. Thus, the BMP implementation and maintenance requirements have been separated between requirements under Provision E.5.b.(1) for commercial, industrial and municipal facilities and areas, and Provision E.5.b.(2) for residential areas.

Most of the requirements in Provision E.5.b are consistent with the related requirements in the Fourth Term Permits. The level of specificity, however, has been changed to allow each Copermittee the flexibility to implement its program to achieve maximum efficiency, and to perform functions that will address the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Each Copermittee is expected to require the implementation of appropriate BMPs to address the expected pollutants from each facility or area. The Third and Fourth Term Permits described specific minimum BMPs that must be implemented at various sites. This Order, however, requires each Copermittee to designate minimum BMPs themselves and require implementation. Consistent with the Fourth Term Permits, each Copermittee is required to maintain, or require the maintenance of, all BMPs as needed.

The BMP implementation and maintenance requirements include a schedule of operation and maintenance activities for the MS4 and related structures (such as catch basins, storm drain inlets, and detention basins), as well as public streets and roads. Public streets and roads specifically include public unpaved roads. The San Diego Water Board identified, through investigations and complaints, sediment discharges from unpaved roads as a significant source of water quality problems in the San Diego Region. Inspection activities conducted by the San Diego Water Board since the Third Term Permits have found a lack of source control for many unpaved roads within the jurisdiction of the Copermittees.

Unpaved roads are a source of sediment that can be discharged in runoff to receiving waters, especially during storm events. Erosion of unpaved roadways occurs when soil particles are loosened and carried away from the roadway base, ditch, or road bank by water, wind, traffic, or other transport means. Exposed soils, high runoff velocities and volumes, sandy or silty soil types, and poor compaction increase the potential for erosion.

Road construction, culvert installation, and other maintenance activities can disturb the soil and drainage patterns to streams in undeveloped areas, causing excess runoff and thereby erosion and the release of sediment. Poorly designed unpaved roads can act as preferential drainage pathways that carry runoff and sediment into natural streams, impacting water quality. In addition, other public works activities along unpaved roads have the potential to significantly affect sediment discharge and transport within streams and other waterways, which can degrade the beneficial uses of those waterways.

USEPA also recognizes that discharges from unpaved roads pose a significant potential threat to water quality. USEPA guidance[40] emphasizes the threat of unpaved roads to water quality:

[40] USEPA, 2006. Environmentally Sensitive Maintenance for Dirt and Gravel Roads. Gesford and Anderson, USEPA-PA-2005.

> "*Dirt and gravel roads are a major potential source of these pollutants [sediment] and pollutants that bind to sediment such as oils, nutrients, pesticides, herbicides, and other toxic substances. Many roads have unstable surfaces and bases. Roads act like dams, concentrating flows that accelerate erosion of road materials and roadsides. Both unstable surfaces and accelerated erosion then lead to sediment and dust.*"

There are several guidance documents, developed by the USEPA,[41] the US Forest Service,[42] the University of California,[43] and others, that include design and construction specifications and BMPs that are readily available for implementation by public entities. Implementing design and other source control BMPs for unpaved roads in the region is necessary to reduce and minimize the impacts of sediment discharged during storm events from unpaved roads to the MS4s and receiving waters.

Provision E.5.c describes existing development site inspection frequency, content, and tracking that each Copermittee must incorporate into their existing development management programs. The requirements under Provision E.5.c are necessary to demonstrate each Copermittee is implementing a program that complies with Provision E.5.b and ensure BMPs implemented in areas of existing development will reduce pollutants in storm water discharges to the MEP. Provision E.5.c has been modified to include a minimum of once every 5 years for all inventoried facilities and areas of existing development, utilizing one or more methods of inspection.

In addition to onsite inspections, the methods of inspection have been expanded to include drive-by inspections. Inspections may be performed by the Copermittee's municipal and contract staff, or by volunteer monitoring or patrol programs. Volunteer monitoring or patrol programs are not expected to enforce the Copermittee's ordinances, or to inspect areas or facilities where members of the public are not allowed access. Volunteer monitoring or patrol programs must be trained by the Copermittee, and are only expected to collect visual observations. By utilizing drive-by inspections and volunteer monitoring or patrol programs, the Copermittees will be able to maximize and efficiently use their resources to identify and address sources of pollutants in areas of existing development.

The municipal and contract staff of each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial, industrial, and municipal facilities and areas in its inventoried existing development pursuant to Provision E.5.c.(1)(a)(iv). An "equivalent" of at least 20 percent means if any commercial, industrial, or municipal facilities or areas require multiple onsite

[41] Ibid
[42] US Forest Service, 1996. Forest Service Specifications for Construction of Roads & Bridges. EM-7720-100. Revised August 1996.
[43] University of California Division of Agriculture and Natural Resources, 2007. Rural Roads: A Construction and Maintenance Guide of California Landowners. Publication 8262.

inspections during any given year, those additional inspections may count toward the total annual inspection requirement. Linear municipal facilities (i.e. MS4 linear channels, sanitary sewer collection systems, streets, roads and highways) in the Copermittee's existing development inventory are not subject to the inspection frequency requirement of Provision E.5.c.(1)(a)(iv).

The inspection content specified in Provision E.5.c.(2)(a) includes the information required to be collected during an inspection by any method. The inspection content specified in Provision E.5.c.(2)(b) includes additional information that must be collected when a Copermittee's municipal or contract staff perform an onsite inspection. Provision E.5.c.(3) specifies the information that each Copermittee must maintain in its existing development inspection records.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary to compel compliance with the requirements of Provision E.5 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.5.d requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Provisions E.5.e.(1)-(2) specifically require the Copermittee to identify areas of existing development as candidates for retrofitting, and streams, channels, and/or habitats as candidates for rehabilitation. Provisions E.5.e.(1)-(2) are based on the retrofitting requirements of the Fourth Term Permits for Orange and Riverside Counties, but modified to also include identifying projects to rehabilitate channels within areas of existing development. The requirements have also been modified to be more focused on utilizing these types of projects for addressing the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Interest and opportunity to retrofit areas of existing development and rehabilitate channels located in areas of existing development has been observed in several programs the San Diego Water Board oversees (e.g., CWA Section 401 Water Quality Certification program, supplemental environmental projects, and grant programs). Each jurisdiction has miles and miles of streets that could be retrofitted to become green streets. Reshaping landscaped areas from convex to concave configurations can detain storm water instead of directing runoff as quickly as possible to the MS4. Retrofit projects could also include simply replacing impervious surfaces with permeable surfaces.

Retrofitting projects do not necessarily have to be expensive. Retrofitting projects could be as simple as redirecting downspouts from roofs to pervious or landscaped areas instead of to hardscaped areas discharging directly to the MS4, providing rain barrels to harvest storm water from downspouts for use at a later time, or planting more trees in areas with little vegetation to provide canopy that can intercept storm

water. The San Diego Water Board encourages the Copermittees to identify simple, low-cost retrofitting opportunities that can be easily implemented, in addition to other more expensive retrofitting and channel rehabilitation projects.

Rehabilitation of channels, streams, and/or habitat will require more significant planning and resources to implement. There are, however, also abundant opportunities to rehabilitate channels, streams and/or habitats in or adjacent to areas of existing development. Each Watershed Management Area likely has several creeks and stream reaches that have been undergrounded, artificially hardened, or hydromodified that could be rehabilitated to be more sustainably configured, which would slow down storm water flows and potentially have more assimilative capacity for pollutants while still being supportive of designated beneficial uses.

The San Diego Water Board recognizes that it may be infeasible to implement retrofitting or channel rehabilitation projects within certain areas of a Copermittee's jurisdictions. For such areas, the Copermittee must instead identify, develop, and implement regional retrofitting and channel rehabilitation projects (i.e. projects that can retain and/or treat storm water from one or more areas of existing development) adjacent to and/or downstream of the areas of existing development.

Provisions E.5.e.(1)-(2) do not require the implementation of retrofitting and rehabilitation projects, but do require the Copermittee to develop a program with strategies to facilitate the implementation of these types of projects in areas of existing development. The strategies are expected to include allowing and encouraging Priority Development Projects to implement retrofitting types of projects as a means of compliance with the structural BMP performance criteria requirements of Provisions E.3.c.(1) and E.3.c.(2).

<u>Provision E.6 (Enforcement Response Plans)</u> requires each Copermittee to develop an Enforcement Response Plan as part of its jurisdictional runoff management program document. Proper implementation of the Enforcement Response Plans is necessary to effectively prohibit non-storm water discharges to the MS4, and reduce the discharge of pollutants in storm water from the MS4 to the MEP.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system*" and be able to demonstrate that it can "*operate pursuant to legal authority established by statute, ordinance or series of contracts*" to control the discharge of non-storm water and pollutants in storm water to and from its MS4. Pursuant to 40 CFR 122.26(d)(2)(i)(E) each Copermittee is specifically required to have the legal authority to "*[r]equire compliance with conditions in ordinances, permits, contracts or order*s."

The requirements under Provision E.6 are necessary to demonstrate that each Copermittee can enforce its legal authority to *"effectively prohibit non-stormwater discharges"* and "*reduce the discharge of pollutants to the maximum extent*

practicable" as well as "*[r]equire compliance with conditions in ordinances, permits, contracts or order*."

The Enforcement Response Plan required under Provision E.6 will serve as a reference for the Copermittee and the San Diego Water Board to determine if consistent enforcement actions are being implemented to achieve timely and effective compliance from all public and private entities that are not in compliance with the Copermittee's ordinances, permits, or other requirements. The Enforcement Response Plan must contain clear direction for the Copermittee to take immediate enforcement action, when appropriate and necessary, in their illicit discharge detection and elimination, development planning, construction management, and existing development management programs.

If the entities subject to the Copermittee's legal authority do not implement appropriate corrective actions in a timely manner, or if violations repeat, the Copermittee must take progressively stricter responses to enforce its legal authority and achieve compliance with its ordinances, permits, or other requirements to *"effectively prohibit non-stormwater discharges"* and "*reduce the discharge of pollutants to the maximum extent practicable.*"

<u>Provision E.7 (Public Education and Participation)</u> requires each Copermittee to implement a public education and participation program. Proper implementation of the public education and participation program as part of its jurisdictional runoff management program will contribute toward effectively prohibiting non-storm water discharges to the MS4, and toward the reduction of pollutants in storm water from the MS4 to the MEP.

Provision E.7 establishes the minimum requirements that each Copermittee must implement to engage members of the public as part of its jurisdictional runoff management program. In the Fourth Term Permits, the public education program requirements and the public participation requirements were included as separate jurisdictional runoff management program components. In this Order, the public education requirements have been consolidated with the public participation requirements, as both sets of requirements are related to the engagement of the public by each Copermittee. Engagement of the public is critical for the success of each Copermittee's jurisdictional runoff management program.

The Copermittees have been implementing public education programs for the last 20 years, which are now well established. The specificity of expected public education program elements of the Fourth Term Permits has been removed. For the most part, the public education program requirements in Provision E.7.a have been reduced to a set of requirements that are specifically included in the federal regulations under 40 CFR 122.26(d)(2)(iv)(A)(6), 122.26(d)(2)(B)(6) and 122.26(d)(2)(D)(4), which should already be incorporated into each Copermittee's existing public education program. Each Copermittee is expected to utilize the information and data collected from the monitoring and assessments conducted within the Watershed Management Area, and

from its inventories and inspections to best direct its public education program resources toward addressing the highest priority water quality conditions identified within the Water Quality Improvement Plan.

According to 40 CFR 122.26(d)(2)(iv), public participation is required to be included as part of the "*comprehensive planning process*", which includes the development and implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs. The requirements under Provision E.7.b specify the opportunities that the public must be provided to be involved in the "*comprehensive planning process*", as required by to 40 CFR 122.26(d)(2)(iv).

Provision E.8 (Fiscal Analysis) requires each Copermittee to secure the resources and provide an analysis of the resources that will be necessary to implement the requirements of the Order. Adequate fiscal resources are necessary for a jurisdictional runoff management program to effectively prohibit non-storm water discharges to the MS4, and reduce pollutants in storm water from the MS4 to the MEP.

According to 40 CFR 122.26(d)(2)(vi), each Copermittee is responsible for providing "*a fiscal analysis of the necessary capital and operation and maintenance expenditures necessary to accomplish the activities*" required by this Order, including "*a description of the source of funds that are proposed to meet the necessary expenditures, including legal restrictions on the use of such funds.*" The fiscal analysis requirements of Provision E.8 are consistent with 40 CFR 122.26(d)(2)(vi).

The San Diego Water Board has chosen not to require a description of fiscal benefits realized from implementation of the jurisdictional runoff management programs. This is a recommendation from the National Association of Flood and Stormwater Management Agencies.[44] For instance, the fiscal analysis requirements do not address city-wide fiscal benefits of protection (e.g., public health, tourism, property values, economic activity, beneficial uses, etc.), even though many costs currently reported to the San Diego Water Board are for related activities. This type of assessment may help Copermittees improve the allocation of resources and it may help the Copermittees secure adequate funding for the program. Qualitative assessments, however, could be overly subjective and most Copermittees likely lack the ability to provide accurate quantitative assessments. The San Diego Water Board encourages the Copermittees to consider means for conducting assessments of fiscal benefits derived from the programs. Such assessments could be conducted on a regional scale similar to studies of program costs conducted by the State Water Board.[45]

[44] National Association of Flood and Stormwater Management Agencies. 2006. *Guidance for Municipal Stormwater Funding.* Prepared under a grant provided by the USEPA.
[45] State Water Board, 2005. NPDES Stormwater Cost Survey.

F. Reporting

Purpose: Provision F includes the requirements for the documents and reports that the Copermittees must prepare and provide to the San Diego Water Board. The documents prepared by the Copermittees and provided to the San Diego Water Board and made available to the public will provide the documentation that the Copermittees are complying with the requirements of the Order.

***Discussion*:** Provision F requires the Copermittees to prepare several documents and reports that must be provided to the San Diego Water Board and made available to the public. The reporting requirements have been significantly reduced compared to the Fourth Term Permit reporting requirements. The reduction in reporting requirements was recommended by the San Diego County Copermittees in the Report of Water Discharge submitted in June 2011.

More specific and detailed discussions of the requirements of Provision F are provided below.

Provision F.1 (Water Quality Improvement Plans) requires the Copermittees in each Watershed Management Area to develop and submit a Water Quality Improvement Plan in accordance with the requirements of Provision B.

Of all the requirements of Provision F, the Water Quality Improvement Plans will likely be the documents requiring the most significant effort to develop. The content of the Water Quality Improvement Plans, however, is expected to include content that should already have been developed for the Watershed Plans and several elements that are included in the Monitoring and Reporting Programs required under the Fourth Term Permits.

Because the Water Quality Improvement Plan is part of the "*comprehensive planning process which involves public participation*," Provision F.1 includes requirements to give multiple opportunities to the public to provide input on the content of the plans.

Provision F.1.a.(1) specifies the elements that the Copermittees must include in the public participation process for the development of the Water Quality Improvement Plans. In order for the public to be aware of the opportunities to provide input, Provision F.1.a.(1)(a) requires the Copermittees to develop a publicly available and noticed schedule of the opportunities for the public to participate and provide comments during the development of the Water Quality Improvement Plan. These opportunities are when the public can provide the data, information, and recommendations that the Copermittees can consider during the development of the Water Quality Improvement Plans.

The San Diego Water Board recognizes, however, that the Copermittees cannot be expected to incorporate all the data, information, and recommendations that the public may provide into the Water Quality Improvement Plans. The Copermittees will have to

review the data, information, and recommendations received and make some decisions on what to incorporate into the Water Quality Improvement Plans. Before the Copermittees finalize their decisions, members of the public should be allowed to review the Copermittees' decisions. Thus, Provision F.1.a.(1)(b) requires the Copermittees to form a Water Quality Improvement Consultation Panel (Panel).

The Panel will consist of a member from the environmental community and a member from the development community familiar with the Watershed Management Area. A representative from the San Diego Water Board staff will also be part of the Panel. The Copermittees may choose to include additional members, but the Panel is only required to include three panel members.

The Panel will serve as an additional public participation and input mechanism during the development of the Water Quality Improvement Plans. The knowledge and expertise from these Panel members are expected to provide the Copermittees valuable direction during their decision-making process. The Copermittees will review the content of their planned submittals with the Panel members to receive recommendations. If the Panel provides recommendations, the Copermittees must consider revisions to the Water Quality Improvement Plan submittals.

The San Diego Water Board recognizes that the development of multiple Water Quality Improvement Plans concurrently may limit the ability of the public to review and provide comments to the Copermittees. Thus, Provision F.1.a.(1)(c) requires the Copermittees to coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public time and opportunity to participate during the development of the Water Quality Improvement Plans.

Provision F.1.a.(2) requires the Copermittees to develop and submit the first Water Quality Improvement Plan component, in accordance with the requirements of Provision B.2, which includes the identification of the priority water quality conditions and potential water quality improvement strategies. The public must be provided an opportunity to provide data, information and recommendations to be utilized in the development and identification of the priority water quality conditions and potential water quality improvement strategies for the Watershed Management Area. The Copermittees must consult with the Panel and consider making revisions. The Copermittees may submit the requirements of Provision B.2 as early as 6 months and no later than 12 months after the commencement of coverage under this Order. After the requirements of Provision B.2 are submitted to the San Diego Water Board, the public will be provided another opportunity to provide comments.

Provision F.1.a.(3) requires the Copermittees to develop and submit the second Water Quality Improvement Plan component, in accordance with the requirements of Provision B.3, which includes the identification of the numeric goals for the highest priority water quality conditions identified for the Watershed Management Area, and the strategies that will be implemented to achieve the potential numeric goals. The Copermittees may also develop the Optional Watershed Management Area Analysis, in accordance with the requirements of Provision B.3.b.(4), as part of this submittal.

The public must be provided an opportunity to provide data, information and recommendations to be utilized in the development and identification of the numeric goals and water quality improvement strategies for the Watershed Management Area. The Copermittees must consult with the Panel and consider making revisions. The Copermittees may submit the requirements of Provision B.3 as early as 9 months and no later than 18 months after the commencement of coverage under this Order. After the requirements of Provision B.3 are submitted to the San Diego Water Board, the public will be provided another opportunity to provide comments.

Finally, Provision F.1.b describes the process for the submittal and implementation of the Water Quality Improvement Plans. The complete Water Quality Improvement Plans are required to be submitted by the Copermittees within 24 months after the commencement of coverage under this Order. The San Diego Water Board will provide the public an opportunity to provide comments on each complete Water Quality Improvement Plan.

The San Diego Water Board will review each Water Quality Improvement Plan and the public comments received to determine if the Copermittees have submitted a Water Quality Improvement Plan that meets the requirements of Provision B. If a Water Quality Improvement Plan does not meet the requirements of Provision B, the Copermittees will be considered out of compliance and directed in writing by the San Diego Water Board Executive Officer to correct the deficiencies.

When a Water Quality Improvement Plan meets the requirements of Provision B, the San Diego Water Board will determine whether to hold a public hearing or to limit public input to submittal of written comments before accepting the Water Quality Improvement Plan. Implementation of the Water Quality Improvement Plan must begin within 30 days of acceptance.

The San Diego Water Board expects that any deficiencies in the Water Quality Improvement Plan will be identified either in the public comments or during the review by the San Diego Water Board before implementation begins. In the event any deficiencies are identified after the implementation of the Water Quality Improvement Plan, Provision F.1.b.(7) clarifies that the San Diego Water Board maintains the right to require the Copermittees to correct any deficiencies that may be identified.

<u>Provision F.2 (Updates)</u> requires the Copermittees to update specific documents that the Copermittees will utilize to implement the requirements of this Order.

Each Copermittee is required to continue implementing a jurisdictional runoff management program, as required under Provision E. Implementation of each Copermittee's jurisdictional runoff management program is directed by its jurisdictional runoff management program document. Provision F.2.a requires each Copermittee to update its jurisdictional runoff management program document to be consistent with the requirements of Provision E concurrent with the submittal of the Water Quality Improvement Plan.

Likewise, each Copermittee must continue to require new development and redevelopment projects to implement BMPs to control pollutants in storm water runoff. The control of pollutants in storm water runoff from development and redevelopment projects within each Copermittee's jurisdiction is guided and directed by its BMP Design Manual, formerly known as a Standard Storm Water Mitigation Plan (SSMP). Provision F.2.b requires each Copermittee to update its BMP Design Manual to be consistent with the requirements of Provision E.3 concurrent with the submittal of the Water Quality Improvement Plan.

For situations where the San Diego Water Board may amend the requirements of Provisions E.3.a-d after a Copermittee has updated its BMP Design Manual pursuant to Provision F.2.b.(1), Provision F.2.b.(4) gives the Copermittee up to 90 days to incorporate the amended requirements of Provision E.3.a-d into its BMP Design Manual. The San Diego Water Board Executive Officer has discretion to modify the 90-day time period depending on the complexity of the amendments or other information that warrants a change in the 90-day time period.

In general, the requirements of the Order should not necessitate a complete rewrite of each Copermittee's jurisdictional runoff management program document or BMP Design Manual, as was required by the Third Term Permits. The jurisdictional runoff management program and BMP Design Manual requirements of this Order are not significantly different than the requirements of the Fourth Term Permits. Thus, only sections of the Order which are new or have been significantly changed should warrant revisions to specific sections of the Copermittee's jurisdictional runoff management program document and BMP Design Manual.

Finally, the Water Quality Improvement Plans are expected to require updates as the iterative approach and adaptive management process included in the Water Quality Improvement Plan, as required under Provision B.5, is implemented by the Copermittees. Provision F.2.c.(1) requires the Copermittees to implement a public participation process for the proposed updates, review the proposed updates with the Panel, and submit the updates to the Water Quality Improvement Plan as part of the Annual Reports required under Provision F.3.b.

Also, because TMDLs are likely to be developed, adopted and approved during the term of the Order, Provision F.2.c.(2) has been included to expedite the incorporation of TMDLs into the Copermittees' Water Quality Improvement Plans as part of the update process, potentially before the Order is re-opened to incorporated the requirements of the new TMDLs.

<u>Provision F.3 (Progress Reporting)</u> requires the Copermittees to report on the progress of implementing the Water Quality Improvement Plans.

The requirements of Provision F.3 are to report the progress toward improving water quality that the Copermittees are achieving with the implementation of the Water Quality Improvement Plans and each Copermittee's jurisdictional runoff management program. The Progress Report Presentations required under Provision F.3.a are

included to provide the Copermittees an opportunity to communicate directly with the San Diego Water Board and the public. The Progress Report Presentations will also provide the members of the San Diego Water Board and members of the public an opportunity to become more acquainted with the Copermittees and their projects and programs to address non-storm water and storm water discharges into and from their MS4s.

The Annual Report requirements of Provision F.3.b are a consolidation of several reporting requirements from the Fourth Term Permits, including the Jurisdictional Runoff Management Program Annual Reports, the Watershed Annual Reports, and the Monitoring and Reporting Program Annual Reports. Furthermore, the Annual Report requirements are consistent with the requirements under 40 CFR 122.42(c).

Pursuant to 40 CFR 122.42(c), "*[t]he operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the Director…must submit an annual report*", which must include the following:

(1) *The status of implementing the components of the storm water management program that are established as permit conditions* [40 CFR 122.42(c)(1)];

(2) *Proposed changes to the storm water management programs that are established as permit conditions* [40 CFR 122.42(c)(2)];

(3) *Revisions, if necessary, to the assessment of controls and fiscal analysis* [40 CFR 122.42(c)(3)];

(4) *A summary of data, including monitoring data, that is accumulated throughout the reporting year* [40 CFR 122.42(c)(4)];

(5) *Annual expenditures and budget for year following each annual report* [40 CFR 122.42(c)(5)];

(6) *A summary describing the number and nature of enforcement actions, inspections, and public education programs* [40 CFR 122.42(c)(6)];

(7) *Identification of water quality improvements or degradation* [40 CFR 122.42(c)(7)].

Under the Fourth Term Permits, each Copermittee is responsible for submitting a Jurisdictional Runoff Management Program Annual Report; the Copermittees in each designated watershed are responsible for submitting a Watershed Annual Report; and the Copermittees from each county are responsible for submitting a Monitoring and Reporting Program Annual Report.

There are 39 Copermittees in the San Diego Region, each required to prepare and submit a Jurisdictional Runoff Management Program Annual Report. There are 9 designated watersheds in San Diego County, 6 designated watersheds in Orange County, and 1 designated watershed in Riverside County for a total of 16 designated watersheds, each requiring a Watershed Annual Report. There are 3 sets of

Copermittees in 3 counties in the San Diego Region, requiring Copermittees from each county to prepare and submit a Monitoring and Reporting Program Annual Report. Thus each Copermittee is currently required to prepare, or participate in the preparation of at least 3 annual reports. In addition, the San Diego County Copermittees are required to prepare and submit a Regional Urban Runoff Management Plan Annual Report.

In total, there are 59 annual reports that are prepared by the Copermittees and submitted to the San Diego Water Board for the Fourth Term Permits. The preparation of these annual reports requires significant time and resources from each Copermittee, which could otherwise be expended on actions that could improve water quality within its jurisdiction. In turn, significant time and resources are required from the San Diego Water Board staff to review these reports, which could otherwise be expended on working directly with the Copermittees to improve their implementation efforts toward restoring and protecting water quality.

Until the Water Quality Improvement Plans are developed, there will be a transitional period during which the Copermittees will continue to implement their existing jurisdictional runoff management programs. There will also be a transitional period during which the Copermittees will implement the transitional monitoring and assessment requirements of Provision D. During the transitional period, the Copermittees will submit annual reports pursuant to the requirements of Provisions F.3.b.(1) and F.3.b.(2).

Provision F.3.b.(1) includes the transitional annual reporting requirements for each Copermittee's jurisdictional runoff management program. The reporting of the jurisdictional runoff management program implementation efforts have been reduced to a single 2-page form. Each Copermittee is required to complete and submit a Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D or a revised form accepted by the San Diego Water Board) no later than October 31 of each year for each jurisdictional runoff management program reporting period (i.e. July 1 to June 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted. The Jurisdictional Runoff Management Program Annual Report Form will certify that each Copermittee has implemented its jurisdictional runoff management program in accordance with the requirements of Provision E. Each Copermittee may choose to continue to utilize and submit the jurisdictional runoff management program annual reporting format of its current Order until the first Water Quality Improvement Plan Annual Report is required to be submitted.

Provision F.3.b.(2) includes the transitional annual reporting requirements for the transitional monitoring and assessment program for each Watershed Management Area. The Copermittees in the Watershed Management Area are required to submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water

Quality Improvement Plan Annual Reports are required to be submitted. The Transitional Monitoring and Assessment Program Annual Report is required to include the transitional period monitoring data collected pursuant to Provisions D.1.a and D.2.a, and the findings from the transitional period findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

Provision F.3.b.(3) includes the Water Quality Improvement Plan Annual Report requirements. Only one Water Quality Improvement Plan Annual Report is required for each of the ten (10) Watershed Management Areas designated under Provision B.1, which is a significant reduction in the number of annual reports required to be prepared and submitted by the Copermittees. The Water Quality Improvement Plan Annual Report will document the Copermittees' efforts to implement the Water Quality Improvement Plan. Each Water Quality Improvement Plan Annual Report will be focused primarily on reporting the analysis of the monitoring data collected pursuant to Provisions D.1-D.3 during the reporting period, and the assessments that are required pursuant to Provision D.4 based on the data. The monitoring data analyses and the assessments that are provided in the Water Quality Improvement Plan Annual Report will be the core of the report. The reporting of the jurisdictional runoff management program implementation efforts have been reduced to a single 2-page form, and will no longer be the primary focus of the reporting requirements as in the Third and Fourth Term Permits.

Each Copermittee will continue to prepare and submit a Jurisdictional Runoff Management Program Annual Report Form as part of the Water Quality Improvement Plan Annual Report to certify that each Copermittee has implemented its jurisdictional runoff management program in accordance with the requirements of Provision E. Instead of reviewing a voluminous report from each Copermittee, as was required under the Third and Fourth Term Permits, the San Diego Water Board will conduct audits of each Copermittee's jurisdictional runoff management program to investigate and confirm the information provided by each Copermittee on its Jurisdictional Runoff Management Program Annual Report Form. The audits will allow the San Diego Water Board to become more familiar with the each Copermittee's jurisdictional runoff management program, and each Copermittee will become more informed about the expectations of the San Diego Water Board.

The reduction in the number and content of the Water Quality Improvement Plan Annual Reports should result in significant time, cost and resource savings for the Copermittees, as well as the San Diego Water Board. Those savings should offset a significant portion of any additional costs that may be incurred to develop the Water Quality Improvement Plans and to implement the monitoring and assessment program requirements of Provision D.

The reporting period for the Water Quality Improvement Plan Annual Reports consists of two periods. Because the jurisdictional runoff management programs are typically budgeted and implemented during a fiscal year, the information provided on the

Jurisdictional Runoff Management Program Annual Report Forms will cover the period from July 1 to June 30 of the following year.

The Water Quality Improvement Plan Annual Reports, however, are focused primarily on the monitoring data and the assessments based on the monitoring data. The monitoring data is collected during the monitoring year, which begins October 1 and ends September 30 of the following year. The monitoring year begins after the beginning of the fiscal year and ends after the end of the fiscal year. Therefore, to accommodate and capture the information collected during the fiscal year and the monitoring year, the Annual Report reporting period incorporates both periods.

Finally, Provision F.3.c requires the Copermittees to develop and submit a Regional Monitoring and Assessment Report. The Regional Monitoring and Assessment Report is similar to the Long Term Effectiveness Assessment required under the Fourth Term San Diego County Permit. The Regional Monitoring and Assessment Report is expected to utilize the entire body of data and information collected by the Copermittees during the term of this Order to assess improvements to water quality on a regional scale.

Provision F.4 (Regional Clearinghouse) requires the Copermittees to develop, update, and maintain an internet-based Regional Clearinghouse that can be used to store, disseminate, and share the Copermittees' documents, monitoring data, special studies, and any other data or information.

Most of the documents and data that are generated by the Copermittees can be provided in electronic format, and made available to the San Diego Water Board and the public on the internet. The San Diego Water Board has been gradually transitioning its document submittal requirements to electronic submittals. Provision F.4 has been included to further these efforts.

Provision F.4 has also been included to improve the exchange and availability of information among the Copermittees, as well as between the Copermittees and the San Diego Water Board. Provision F.4 will also make the information generated during the implementation of the Order more accessible to the public.

Provision F.5 (Report of Waste Discharge) requires the Copermittees to submit a Report of Waste Discharge to reapply for renewal of the Order prior to its expiration, in accordance with 40 CFR 122.21(d)(2) and CWC section 13376.

Provision F.5 requires the Copermittees to submit a Report of Waste Discharge 180 days in advance of the expiration of this Order. Provision F.5 also describes the minimum information to be included in the Report of Waste Discharge, based on USEPA guidance "Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems," dated May 17, 1996.

G. Principal Watershed Copermittee Responsibilities

Purpose: Provision G includes the requirements for the Principal Watershed Copermittee designated by the Copermittees in each Watershed Management Area.

***Discussion*:** Unlike previous NPDES requirements, there will no longer be a single Principal Copermittee. Provision G.1 requires the Copermittees to designate a Principal Watershed Copermittee for each Watershed Management Area. There are ten (10) Watershed Management Areas in the San Diego Region, as defined in Table B-1 under Provision B.1 of the Order. An individual Copermittee should not be the Principal Watershed Copermittee for more than two (2) Watershed Management Areas. There could be up to ten (10) Principal Water Copermittees designated for the Watershed Management Areas in the San Diego Region.

Provision G.2 describes the minimum responsibilities of each Principal Watershed Copermittee. The primary responsibility of the Principal Watershed Copermittees is to serve as the liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues. Ideally, the Principal Watershed Copermittee can represent the interests of all the Copermittees within a Watershed Management Area during discussions or meetings to facilitate communication with the San Diego Water Board. The Principal Watershed Copermittees are also responsible for facilitating and coordinating the implementation efforts of the Copermittees and submittals of required documents and reports.

The Principal Watershed Copermittee is responsible for facilitating the efforts of the Copermittees within the Watershed Management Area to develop the Water Quality Improvement Plan required under Provision B, and submit it for approval in accordance with Provision F.1. The Principal Watershed Copermittee is also responsible for coordinating the submittal of the document updates, Progress Report Presentations, and Annual Reports required from the Copermittees within each Watershed Management Area under Provisions F.2, F.3.a, and F.3.b. The Principal Watershed Copermittees are responsible for coordinating with each other to develop and submit the Regional Clearinghouse, Regional Monitoring and Assessment Report, and the Report of Waste Discharge required under Provisions F.3.c, F.4, and F.5.

The designated Principal Watershed Copermittee for each Watershed Management Area does not necessarily have to serve as the Principal Watershed Copermittee for the entire term of the Order. If the Copermittees in a Watershed Management Area choose to designate a new Principal Watershed Copermittee, the change may be submitted as part of the Annual Report required under Provision F.3.b, with an update to the Water Quality Improvement Plan in accordance with Provision F.2.c.

Provision G.3 specifies that the Principal Watershed Copermittee is not responsible for ensuring that the other Copermittees within the Watershed Management Area are in compliance with the requirements of this Order

H. Modification of Order

Purpose: Provision H provides the conditions under which modifications to Order No. R9-2013-0001, as amended, may occur.

***Discussion*:** Provision H allows for modifications to Order No. R9-2013-0001, as amended, for bases in addition to modifications (minor and major) allowed under the federal regulations at 40 CFR 122.62 and 122.63.

Modifications to the Order require re-opening the Order (see Water Code section 13223), subject to the requirements of 40 CFR 122.44, 122.62 to 122.64, and 124.5, but only for the specific provisions subject to the modification. Proposed modifications of the Order will be made available for public review, a public notice and comment period, and a public hearing if requested. Comments on the provisions not subject to the proposed modifications are not required to be considered in the San Diego Water Board's responses to comments or during the public hearing.

Provision H.4 was included to specify that the Order will be re-opened for modifications if the Basin Plan is amended to modify an existing TMDL or incorporate a new TMDL, or the monitoring and assessment program requirements need to be updated or revised.

I. Standard Permit Provisions and General Provisions

Purpose: Provision I incorporates the standard permit provisions required to be included in all NPDES permits, as well as several other general provisions.

***Discussion*:** Provision I refers to Attachment B to the Order. Attachment B expressly incorporates the conditions applicable to all NPDES permits as provided under 40 CFR 122.41(a)-(n), as well as the applicable conditions for MS4s and storm water discharges provided under 40 CFR 122.42(c) and 40 CFR 122.42(d), respectively. Attachment B also includes several general provisions that are typically included in or applicable to waste discharge requirements issued by the San Diego Water Board.

IX. ATTACHMENTS

The attachments to the Order are discussed below. The discussions describe the content of the attachments.

Attachment A – Discharge Prohibitions and Special Protections

Section 1 of Attachment A includes the Waste Discharge Prohibitions from the Basin Plan. They have been provided verbatim in their entirety.

Section 2 of Attachment A includes the "*Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges*" applicable to permitted point source discharges of storm water, adopted under State Water Board Resolution No. 2012-0012, as amended by Resolution No. 2012-0031. The terms, prohibitions, and special conditions (collectively referred to as special conditions) are established as limitations on point source storm water discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in ASBS, as required for State Water Quality Protection Areas pursuant to California Public Resources Code sections 36700(f) and 36710(f). These Special Protections were adopted by the State Water Board as part of the Ocean Plan General Exception.

Attachment B – Standard Permit Provisions and General Provisions

Conditions applicable to all NPDES permits, as required under 40 CFR 122.41, and conditions applicable to MS4s and storm water discharges, as required under 40 CFR 122.42(c) and 122.42(d), respectively are provided in Attachment B to the Order. They have been provided expressly in their entirety.

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. These general provisions are typically included in or applicable to waste discharge requirements issued by the San Diego Water Board. Many of the general provisions were developed by the State Water Board. Where a general provision is derived from statute or regulation, a citation of the statute or regulation section is provided. General provisions that do not provide a citation are included under the authority provided CWC 13377.

Attachment C – Acronyms, Abbreviations and Definitions

The acronyms and abbreviations that are used in the Order are provided in Attachment C. Attachment C also includes definitions that may provide an explanation or description of the meaning or intent of specific terms or phrases included in the Order.

Attachment D – Jurisdictional Runoff Management Program Annual Report Form

An example of the Jurisdictional Runoff Management Program Annual Report Form required to be submitted by each Copermittee as part of the Annual Reports required under Provision F.3.b.(1)(e) is provided as Attachment D to the Order. An electronic version of the form will be available from the San Diego Water Board after the adoption of the Order.

The Jurisdictional Runoff Management Program Annual Report Form includes the minimum information necessary to demonstrate that the Copermittee is implementing and in compliance with the requirements of Provision E, and includes much of the information required to be reported pursuant to 40 CFR 122.42(c).

The information that must be provided on the Jurisdictional Runoff Management Program Annual Report Form is limited to the fiscal year, which begins July 1 and ends June 30 of the following year. The information expected to be provided by the Copermittees in each section of the Jurisdictional Runoff Management Program Annual Report Form is discussed below.

I. COPERMITTEE INFORMATION

The name of the Copermittee (e.g. name of city, county, or special district) and the contact information for the storm water program manager are provided under this section.

II. LEGAL AUTHORITY

The Copermittee must confirm whether or not the legal authorities under Provision E.1.a have been established for itself within its jurisdiction.

The Copermittee must also confirm whether or not a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority, as required under Provision E.1.b. The certification statement required by Provision E.1.b is only required to be submitted with the first Annual Report required under Provision F.3.b.

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

The Copermittee must inform the San Diego Water Board whether or not an update to its jurisdictional runoff management program document was required or recommended by the San Diego Water Board during the reporting period. An update to the jurisdictional runoff management program is required under Provision F.2.a. The San Diego Water Board may recommend modifications to the jurisdictional runoff management program as part of the iterative approach and adaptive management process required under Provision B.5, which may result in an update that is necessary for the Copermittee's jurisdictional runoff management document.

If an update was required or recommended, the Copermittee must confirm whether or not the update was completed and made available on the Regional Clearinghouse within the reporting period. If no update was required or recommended, an answer is not required. If the answer is NO, meaning the required or recommended update was not completed and/or made available on the Regional Clearinghouse, the Copermittee must attach a

schedule for the completion of the update and/or posting of the updated document on the Regional Clearinghouse.

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

The Copermittee must confirm whether or not a program was implemented during the fiscal year to actively detect and eliminate illicit discharges and connections in accordance with the requirements under Provision E.2.

In addition to confirming that a program to detect and eliminate illicit discharges was implemented during the reporting period, the Copermittee is also required to report on several items related to the program. The information that must be reported is limited to the fiscal year for the Annual Report.

All non-storm water discharges are considered illicit discharges unless the source is identified as one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5). If a non-storm water discharge is identified as one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5), the discharge is a non-storm water discharge, but not an illicit discharge. If a non-storm water discharge is identified but not in one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5), the discharge is both a non-storm water discharge and an illicit discharge.

V. DEVELOPMENT PLANNING PROGRAM

The Copermittee must confirm whether or not a development planning program was implemented during the fiscal year in accordance with the requirements under Provision E.3.

The Copermittee must also inform the San Diego Water Board whether or not an update to its BMP Design Manual was required or recommended by the San Diego Water Board during the fiscal year. An update to the BMP Design Manual is required under Provision F.2.b. The San Diego Water Board may recommend modifications to the BMP Design Manual, which may result in an update that is necessary for Copermittee's the BMP Design Manual.

If an update was required or recommended, the Copermittee must confirm whether or not the update was completed and made available on the Regional Clearinghouse within the reporting period. If no update was required or recommended, an answer is not required. If the answer is NO, meaning the required or recommended update was not completed and/or made available on the Regional Clearinghouse, the Copermittee must attach a schedule for the completion of the update and/or posting of the updated document on the Regional Clearinghouse.

The Copermittee is also required to report on several items related to the program. For the development and redevelopment projects that are reviewed under the program, the Copermittee must report the total number projects submitted for review during the fiscal year. Of those projects, the Copermittee must report the number that are Priority Development Projects, as defined under Provision E.3.b.(1). The Copermittee must also report the number of Priority Development Projects that were approved and/or granted occupancy during the fiscal year, regardless of when the project was originally submitted for review. Any projects that were approved during the fiscal year and granted any

exemptions from the BMP Design Manual requirements and/or allowed to implement alternative compliance options in accordance with Provision E.3.c.(3) must be reported.

Finally, the Copermittee must also report on several items related to its oversight of permanent BMPs on Priority Development Projects within its jurisdiction, as required under Provision E.3.e. The information that must be reported is limited to the fiscal year for the Annual Report.

VI. CONSTRUCTION MANAGEMENT PROGRAM

The Copermittee must confirm whether or not a construction management program was implemented during the fiscal year in accordance with the requirements under Provision E.4.

The Copermittee is also required to report on several items related to its oversight construction projects within its jurisdiction. The information that must be reported is limited to the fiscal year for the Annual Report.

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

The Copermittee must confirm whether or not an existing development management program was implemented during the fiscal year in accordance with the requirements under Provision E.5.

The Copermittee is also required to report on several items related to its oversight in areas of existing development within its jurisdiction. The information that must be reported is limited to the fiscal year for the Annual Report. The information must also be separated into four categories of existing development: municipal, commercial, industrial, and residential.

VIII. PUBLIC EDUCATION AND PARTICIPATION

The Copermittee must confirm whether or not a public education program component was implemented during the fiscal year in accordance with the requirements under Provision E.7.a.

The Copermittee must also confirm whether or not a public participation program component was implemented during the fiscal year in accordance with the requirements under Provision E.7.b.

IX. FISCAL ANALYSIS

The Copermittee must confirm a summary of its fiscal analysis, conducted in accordance with the requirements under Provision E.8, has been attached to the form.

X. CERTIFICATION

A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative must sign and certify the Jurisdictional Runoff Management Program Annual Report Form. The appropriate box must be checked to indicate the whether a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative is signing the form.

Attachment E – Specific Provisions for Total Maximum Daily Loads

Attachment E provides specific provisions for implementing the load allocations (LAs) and wasteload allocations (WLAs) of Total Maximum Daily Loads (TMDLs) adopted by the San Diego Water Board and approved by USEPA in which the Copermittees are identified as responsible for discharges subject to the requirements of the TMDLs. Federal regulations require that NPDES requirements incorporate water quality based effluent limitations (WQBELs) that must be consistent with the requirements and assumptions of any available WLAs,[46] which may be expressed as numeric effluent limitations, when feasible, and/or as a best management practice (BMP) program of expanded or better-tailored BMPs.[47] Where the TMDL includes WLAs that provide numeric pollutant load or pollutant parameter objectives, the WLA has been, where feasible, translated into numeric WQBELs.[48]

For each TMDL in Attachment E, four sections are included:

a. Applicability: This section provides the resolution under which the TMDL Basin Plan amendment was adopted and approved, with the applicable adoption and approval dates. This section also gives the effective date of the TMDL and where the TMDL is applicable (i.e. Watershed Management Area and water body). The Copermittees that are responsible for implementing the specific provisions are also given in this section.

b. Final TMDL Compliance Requirements: For each TMDL, the final TMDL compliance requirements consist of the final TMDL compliance date(s), the final WQBELs, and the final TMDL compliance determination requirements. The final WQBELs are expressed in terms of receiving water limitations, effluent limitations, and/or best management practices (BMPs). The final WQBELs for the TMDLs are incorporated by reference into Provision A of the Order. The final WQBELs become enforceable when the final TMDL compliance dates have passed. Applicable BMPs within the final WQBELs must be incorporated into the Water Quality Improvement Plans. Compliance with the final WQBELs will be determined in accordance with the options provided under the final TMDL compliance determination requirements.

c. Interim TMDL Compliance Requirements: If the final TMDL compliance date has not passed and there are interim TMDL compliance requirements, they are included in this section. If there are interim WQBELs with interim compliance dates, the interim WQBELs become enforceable when the corresponding interim compliance dates have passed. Compliance with the interim WQBELs will be determined in accordance with the options provided under the interim TMDL compliance determination requirements.

d. Specific Monitoring and Assessment Requirements: If there are specific monitoring and assessment requirements that cannot be met with the monitoring and assessment program

[46] 40 CFR 122.44(d)(1)(vii)(B)
[47] 40 CFR 122.44(k)(2) and 40 CFR 122.44(k)(3)
[48] November 26, 2014 Memorandum from the USEPA, Revisions to the November 22, 2002 Memorandum "Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLA""

requirements under Provision D of the Order, the additional requirements are included in this section.

The requirements of the TMDLs are based on and consistent with the assumptions and requirements of any available adopted and approved TMDLs that have been incorporated into the Basin Plan. Modifications to the requirements for the TMDLs in Attachment E cannot be made unless the TMDLs are modified in the Basin Plan.

A modification to any aspect of a TMDL in the Basin Plan requires a Basin Plan amendment. A Basin Plan amendment to modify a TMDL will require the San Diego Water Board to adopt a resolution to amend the Basin Plan, which includes a separate public process. When the San Diego Water Board adopts a Basin Plan amendment, it subsequently requires approval from the State Water Board, the Office of Administrative Law, and the USEPA before it becomes effective.

If and when the TMDLs are a modified in the Basin Plan, the San Diego Water Board will revise the requirements of the Order in accordance with the Basin Plan amendment. When a Basin Plan amendment to modify a TMDL becomes effective, the San Diego Water Board will modify the requirements of the Order pursuant to the requirements of Provision H.4 of the Order as soon as possible.

MEETING AGENDA

California Regional Water Quality Control Board
San Diego Region

REPORT OF WASTE DISCHARGE AND
REGIONAL MUNICIPAL STORM WATER PERMIT

Tuesday, February 8, 2011
2:00-4:00 p.m.

I. Introductions (All)

II. ROWD and Regional Permit Issues/Concerns (San Diego County Copermittees)

III. Questions/Discussion (All)

San Diego County MS4s ROWD and Regional Permit Meeting
Sign in Sheet February 8, 2011

Name	Agency/Company Affiliation	Telephone	E-mail Address
Jon Van Rhyn	County	853-495-5133	Jon.vanrhyn@sdcounty.ca.gov
Kris McFadden	City of SD	8/541 4320	Kmcfadden@sandiego.gov.
Drew Kleis	"	8/541-4329	akleis@sandiego.gov
Paul Hartman	CITY OF VISTA	760 726-1340 x1373	phartman@cityofvista.com
JAIME CAMPOS	CITY OF EL CAJON	619-441-5554	JCampos@ci.el-cajon.ca.us
Roger Morrison	City of Poway	858-668-4636	rmorrison@poway.org
Cora Long	City of Lemon Grove	619 825 3827	clong@ci.lemon-grove.ca.us
Stephanie Bauer	Port of SD	619-400-4719	sbauer@portofsandiego.org
Cynthia Mallett	Oceanside	760.435.5807	cmallett@ci.oceanside.ca.us
Elaine Lukey	Carlsbad	760.602-7582	elaine.lukey@carlsbadca.gov
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Chiara Clemente	SDRWQCB	858 467.2359	cclemente@waterboards.ca.gov
WAYNE CHIU	"	858 637 5558	wchiu@waterboards.ca.gov
Cheryl FILAR	city of Escondido	760-839-6315	cfilar@escondido.org
Dave Gibson	SDRWQCB	858 467 4387	dgibson@waterboards.ca.gov
Mac Walker	Walker & Assoc		
Eric Becker	SDRWQCB	858 492-1785	ebecker@water-board.ca.gov

List of Potential Topics and Discussion Points for Agenda Item II
(ROWD and Regional Permit Issues/Concerns -- San Diego County Copermittees)

a. Discussion of Copermittee Priorities:

1. Support for regional Permit concept

   Preliminary Tasks for Copermittee Report of Waste Discharge (ROWD)

   - Comparison of three Region IX permits (San Diego, South Orange, Riverside)
   - Review of existing "regional" permits (Bay Area, South Orange, Portland)

2. Continued dialogue (ongoing meetings with RWQCB staff throughout re-issuance process, development and coordination of Copermittee input)

3. Results of recently completed Copermittee visioning process:

   - Simplified reporting
   - Streamlined / more meaningful assessment
   - Better coordinated water quality monitoring
   - Enhanced TMDL focus
   - Increased emphasis on strategic planning

b. Questions for of RWQCB Staff Consideration:

1. Vision: What is staff's vision for a regional Permit? Other than administrative streamlining, what does staff hope to accomplish through regionalization?

2. Schedule: What is staff's anticipated re-issuance schedule for releasing a draft Permit? What are the major milestones in that process?

3. Administrative / logistical considerations:

   - How will the Permit be administered amongst the three regions?
   - How will outstanding and future unfunded mandates decisions be addressed?
   - How will existing differences between the three Permits be reconciled?
   - Will some future requirements be different between the regions?
   - How will anti-backsliding provisions apply?

4. Changes to Permit Requirements:

   - What specific changes to Permit requirements are being contemplated?
   - Will everything in the Orange and Riverside Permits be included in San Diego?
   - What additional requirements are being considered?

RWQCB Staff Meeting with City of Santee Representatives – 2/17/11
Focus – Discuss Current and Future Municipal Requirements

Overview
Our goal is to continue programs that have a direct benefit on water quality and to eliminate programs that do not. We need flexibility on where efforts are focused, so that we can use our time and budget to make real improvements in water quality. This can be largely accomplished through:

- Reduced reporting;
- Focused inspection efforts based on jurisdictional experience with facilities;
- Using monitoring that focuses on watershed priority pollutants and compliance with relevant TMDLs.
- Eliminate minutia so that we can focus on TMDL-driven projects.

Current Permit Recommendations:
Analysis, Assessment and Reporting

1. Fiscal analysis should be eliminated or greatly reduced. It does not improve water quality. Substantial time is spent preparing this analysis that has limited value.

2. Effectiveness assessment – needs to be focused on a few key indicators and proportional to what is being measured. May be beneficial to measure and report on specific BMPs at a watershed level. **See attached copy of comment letter on draft State policy for effectiveness assessment.**

3. JURMP – the JURMP annual report should be eliminated. It takes 3-months to prepare and has very little value. We envision generating summary tables (a couple of pages) documenting critical numbers which would be incorporated into watershed-based reports. Summaries of projects and JURMP amendments could be incorporated into watershed report.

4. Watershed report – should be a repository for JURMP data and updates and TMDL compliance information. Eliminate "watershed activities" and "watershed education activities." This will be superseded by TMDL-related efforts.

Development and Construction

1. SUSMP requirements were flexible enough to allow us to develop a very good SUSMP. Criticism is that too many updates in the document lead to confusion and lack of understanding. This document should be kept intact and remain unchanged in the next permit cycle. (Note: LID BMP list is now superfluous).

2. HMP requirements were too prescriptive (continuous simulation and shear stress). Left issue of sediment transport out of equation and boxed us into

just meeting the requirements. Permit needs to give flexibility for Board or Board staff to approve alternative methods. We now need time to monitor these facilities to test our HMP.

3. Treatment control BMP inspection program requires flexibility in ensuring maintenance. Should require either maintenance verification or inspection. Maximum and minimums helpful – but clarify.

4. Construction program requirement for inspection of high priority sites every 2 weeks is restrictive. Many sites have been dormant or have little work occurring for periods of time. Would like to avoid conducting inspections to "make the numbers" in the annual report (overprescribing inspections and reporting). Suggest qualifying requirements with "during work."

Industrial and Commercial
The industrial/commercial inspection requirement of 25 percent was understandable when the program was initially established; we have now inspected all of our facilities and we know where we have problems. A major focus of our stormwater program now is to complete over 200 inspections, whether or not there is value in the effort. A reasonable goal would be 10 percent , with a focus on quality inspections at new and problem businesses.

Water Quality Monitoring
Water quality monitoring should be implemented and managed at a regional level and consistent with TMDL. Dry weather program has been valuable, but we have moved beyond that (few illicit connections/illicit discharges discovered). It should be adapted to meet the needs of our current program, which will be TMDL-driven. Some outfall monitoring may be useful (especially if it incorporates any TMDL requirements), but outfall analysis should focus on watershed priority pollutants in receiving waters.

Thoughts on New Permit
Consistency among permits and avoiding duplication of effort. How does the watershed monitoring program for the San Diego River fit in with the current permit? With a Regional Permit? With TMDL monitoring? We need one program that comprehensively addresses our monitoring to ensure efficiency.

Retrofit: requirements should be driven by TMDL requirements. City is unable to use taxpayer money for improvements on private property and there needs to be a trigger to require improvements by property owner (such as a permit application). SUSMP already requires retrofitting redevelopment.

Multiple Regions: How do the three regions fit together? Costs for collaboration (i.e., meeting attendance) and complexity in achieving consensus will be increased. Working relationship within region is good. If the goal is to minimize permit issuance costs, consider allowing each region to operate separately.

CITY OF SANTEE

MAYOR
Randy Voepel

CITY COUNCIL
Jack E. Dale
Brian W. Jones
John W. Minto
Hal Ryan

CITY MANAGER
Keith Till

November 29, 2010

Jeanine Townsend
State Water Resources Control Board
1001 I Street
24th Floor
Sacramento, CA 95814.

Re: Comment Letter – Effectiveness Assessment Document.

Thank you for the opportunity to comment on the draft effectiveness assessment document. The City of Santee, a copermittee under a Phase I municipal permit has several years of experience conducting effectiveness assessment. Ambient monitoring data for our City indicates that water quality generally improves as it traverses our City. As an organization we feel that we have proven ourselves to be good stewards. We hope that our insight from preparing effectiveness assessments and working to protect water quality will assist you.

We are a City with a population of approximately 58,000 people with a stormwater program funded solely through Flood Control funds and the general fund. Despite the limited options for funding available, we have successfully restored two creeks within our jurisdiction, including the CASQA-award winning Forester Creek Restoration Project. Restoration of Forester Creek has resulted in significant improvements in water quality, including an 84% reduction in fecal colliform and 50% reduction in nitrogen. While we understand the need for assessing the effectiveness of a program, we feel that the main focus of any storm water program should be implementing projects that will directly improve water quality.

We provide the following recommendations:

Recommendation 1: The cost of monitoring and assessment should be limited to up to one dollar per capita and no more than 30% of the annual storm water budget. This limitation would ensure that the funds available are spent primarily on implementing BMPs and making direct improvements to water quality. A cost benefit analysis should be incorporated into the effectiveness assessment guidelines so that the costs of the assessment method selected do not outweigh the benefits provided.

The City of Santee currently spends approximately $60,000 or 38% of its annual storm water budget on MS4 outfall monitoring. While the program has been effective at eliminating some illicit connection and illegal discharges, the City has gained an understanding of the potential sources and feels that these funds would

now be better spent implementing projects or programs to directly improve water quality.

The proposed requirements are extensive and comprehensive and could add up to a significant cost potentially exceeding the cost of inspections, education and enforcement. This level of data collection would have limited benefit to the City, and direct scarce dollars away from program implementation to program assessment. Limiting the monitoring and effectiveness assessment costs would ensure that public dollars are directed toward implementation.

In addition, the guidelines should be revised to ensure that selection of assessment methods be performed based on a cost-benefit analysis. For instance, the guidelines should direct program managers to consider what adjustment could be made to respond to data collected from a certain assessment method? What would be the cost (savings or increase) of this adjustment? Would the adjustment be proportional to the costs of the assessment? If the benefits of an assessment method do not outweigh the costs, then another method should be selected.

Recommendation 2: Receiving water assessments should be conducted at a watershed or regional level. In addition where feasible, program effectiveness assessments should be developed and implemented at a regional level (even if they are assessed by watershed) where cost savings can be leveraged.

At present the City participates in regional programs which measure many of the outcomes listed in the draft effectiveness document (resident's knowledge, mass loading, toxicity, bioassessments etc). The cost of this regional monitoring program is very high, in San Diego County it is over $2.2 million annually. However, this regional monitoring is significantly less expensive than if each individual City prepared its' own monitoring plan, performed monitoring and prepared reports. In addition, the regional monitoring program allows assessment of water quality throughout the region and provides the advantage of understanding issues that affect an entire region due to geology, hydrology and climate.

Recommendation 3: MS4 outfall monitoring should be limited to dry weather, as this is the most effective time to directly measure effects of urban run off. MS4 outfall monitoring should <u>not</u> include toxicity tests, as the costs of toxicity monitoring are prohibitive and there is limited benefit from measuring a few locations in the MS4.

The proposed outfall monitoring guidelines significantly increase the requirements, and in turn the cost, of monitoring. Given the evolution of storm water science, more emphasis should be placed on implementation and less on monitoring than in the past.

There is limited benefit to monitoring MS4 outfalls during wet weather. Without an appropriate reference study, it is impossible to determine what pollutants originate

[1] San Diego River Source Tracking Investigation, Weston Solutions Inc., December 2009

from anthropogenic sources. There are many natural areas that drain into our storm drain systems. A recent source ID study conducted in the San Diego River found that run off from open spaces contained approximately 78 percent of the total dissolved solids (TDS) loading.[1] Sampling MS4 outfalls during wet weather would be a waste of public funds, as tracking the source of the pollutants would be impossible. MS4 monitoring should occur during dry weather when groundwater is at its lowest point and the source of pollutants can be traced upstream.

Further, the cost of toxicity monitoring is very high. If the City performed toxicity monitoring at two outfalls twice per year, this would result in a 33 percent increase in the cost of the City's monitoring program. Monitoring only two of hundreds of outfalls at an annual cost of $20,000 is a waste of public funds. It is clear that the cost of performing toxicity monitoring far outweighs the benefit. Toxicity monitoring is more appropriately performed on a receiving water basis. Where toxicity is found in the receiving water, investigations could be conducted immediately upstream to determine the source.

Recommendation 4: BMP performance studies are more appropriately performed by storm water organizations such as CASQA and SCWRPP to determine the relative effectiveness of BMPs. Field testing on the performance of individual BMPs should not be included in the effectiveness assessment as it is unlikely to result in an improvement to water quality.

The guidelines recommend assessments include field testing of BMP performance and comparison to specified performance data. Many credible studies of BMP performance have been performed by universities, certified laboratories and other storm water organizations. These studies are expensive and time consuming. There are dozens of BMPs installed in our small City and this number grows each year. The cost to complete field testing of the performance of each of these BMPs would be enormous.

There are limited benefits to field testing BMP performance on a project by project basis. In San Diego County, low impact development BMPs, such as bioretention, are required to be implemented, where feasible. If LID BMPs cannot be implemented, BMPs are selected based on their relative performance for the pollutants of concern. It is unlikely that even if a particular BMP performed poorly in a program effectiveness assessment study that the selection of BMPs would be altered, since the most relatively effective BMPs are being used. BMP performance studies are more appropriately conducted by universities, CASQA, SCWRPP, and other certified laboratories to allow selection of the most effective BMPs based on relative performance data. The information from this academic research can be used to refine municipal program requirements.

Recommendation 5: The effectiveness assessment guidance should eliminate any discussion regarding region or Statewide comparison of programs, but rather focus

[1] San Diego River Source Tracking Investigation, Weston Solutions Inc., December 2009

on a watershed-based approach to ensure that watershed-specific issues are addressed where the issues arise.

Different watersheds and regions have different issues and different levels of development. For instance, the groundwater in the San Diego region has been found to contain high levels of nitrogen. It would be inappropriate to compare this region's success with another region where the causes of nitrogen pollution are from urban sources. The goal of the effectiveness assessment is to assess an individual program not compare programs. If the State or other entities find such comparisons helpful, then they should fund these assessments. It is not appropriate for the City to direct its taxpayer dollars to this endeavor when they could be directed to program implementation, directly benefiting the funding community.

We appreciate the opportunity to comment on this draft effectiveness assessment document that could impose a significant cost burden to our stormwater programs.

Pedro Orso Delgado, P.E.
Deputy City Manager/Director of Development Services

[1] San Diego River Source Tracking Investigation, Weston Solutions Inc., December 2009

025348

Permit Reissuance Concepts & Ideas

Meeting with Regional Board Staff
February 17, 2011

think BLUE
SAN DIEGO

025349

Agenda

1. Key Issues
   - Vision Process
   - City's experience
2. Potential concepts & ideas
   - Strategic planning
   - Assessment

Themes From Vision Process

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Lack of strategic planning:

1. Increased emphasis on strategic planning
2. Enhanced TMDL focus
3. Better coordinated monitoring

Duplicative program requirements:

4. Streamlined/more meaningful assessment
5. Simplified reporting

025351

Current Program Structure

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Geographic Level	Management Process		
	Planning	Implementation	Assessment
Regional	✓	✓	✓
Jurisdictional	✓	✓	✓
Watershed	✓	✓	✓
TMDL No. 1 (watershed)	✓	✓	✓
TMDL No. 2… etc. (watershed)	✓	✓	✓

Potential Program Structure

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Coordination Level	Adaptive Management Cycle		
	Planning	Implementation	Assessment
All Copermittees			✓ Efficiency Studies* ▪ BMP Effectiveness ▪ PGA Identification
Individual Copermittee	✓ Baseline ✓ Watershed-specific ✓ Partnered BMPs	✓ Baseline ✓ Watershed-specific ✓ Partnered BMPs	✓ Permit Compliance
Watershed Copermittees/ TMDL Dischargers			✓ TMDL Compliance

*Study findings must feed back into planning.

Potential Assessment Structure

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Assessment Type	Efficiency Assessment	Compliance Determination	
Assessment Question	How can the program improve efficiency?	Is the program in compliance?	Is the program doing enough (Y/N)?
Description	• BMP Effectiveness • PGA Identification	Tabular compliance data	Water quality monitoring data
Use	Adaptive Management	Identify corrective actions	Periodic review and adjustment of overall program level of effort
How Reported	Consolidated update in one annual report	Annual Report(s)	LTEA (5 Year)

025354

Potential Strategic Plan

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Strategic Plan	Strategic Intent		Vision			
			Goal A	Goal B	Goal C	Goal D
			Objective	Objective	Objective	Objective
	Workplan	Year 1 Actions	PGA Identification Study			
			BMP Effectiveness Study			
		Etc…				
	Long Term Actions	Years (6-20)	Potential Future Actions			

Memorandum

LARRY WALKER ASSOCIATES

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DATE: February 18, 2011

TO: Jon Van Rhyn, County of San Diego
Todd Snyder, County of San Diego

SUBJECT: Review of Existing Stormwater Permitting Strategies

Cc: Malcolm Walker
Karen Ashby

I. PURPOSE

The County of San Diego (County), the incorporated cities of San Diego County, the San Diego Unified Port District, and the San Diego County Regional Airport Authority (collectively Copermittees) are subject to the National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Permit (Order No. R9-2007-0001, NPDES No. CAS0108758) (Permit). This Permit expires January 24, 2012, and a Report of Waste Discharge (ROWD) is due to the San Diego Regional Water Quality Control Board (Regional Board) 210 days prior to the expiration date (June 2011). As part of the ROWD process, the Copermittees are evaluating different strategies and/or approaches that may be used for the renewed permit.

The purpose of this memorandum is to summarize different strategies/approaches used in a select number of stormwater NPDES permits that the Copermittees may consider for the ROWD process. These strategies are characterized as countywide (e.g., County of Orange), regional (e.g., San Francisco Bay Region), and watershed (e.g., Tualatin River Watershed).

This memorandum reviews and summarizes the key aspects of each of these strategies, including an overview of the permitting approach and program management structure. The memo is organized as follows:

I. Purpose
II. Review of Stormwater Permitting Strategies
   a. Countywide Permit: County of Orange, San Diego Region
   b. Regional Permit: San Francisco Bay Region
   c. Watershed Permit: Clean Water Services (Oregon)
III. Summary and Assessment

II. REVIEW OF STORMWATER PERMITTING STRATEGIES

NPDES municipal stormwater permits are typically issued at the individual, countywide, regional, or watershed level. As a result, these permits and the resulting management programs vary in terms of the permitting approach and organization, as well as the program management structure and implementation. However, in every case, each local jurisdiction is ultimately responsible for the development and implementation of the stormwater management program within its jurisdiction. Three examples of permitting strategies and programs are discussed below.

a. Countywide Permit: County of Orange, San Diego Region

i. Overview

The County of Orange, the incorporated cities of Orange County, and the Orange County Flood Control District are subject to the Phase I NPDES MS4 permits for the Santa Ana and San Diego Regions.[1] The County of Orange is the Principal Permittee, and the cities and the Orange County Flood Control District are Copermittees on the permits (all parties are herein collectively referred to as Copermittees). There are 28 Copermittees in the Santa Ana Region and 13 Copermittees in the San Diego Region. The Orange County Stormwater Program Copermittees are listed in **Table 1**.

For the purpose of this memo, the subsequent review and sections focus on the San Diego Region Permit and the overall implementation of the Orange County Stormwater Program.

Table 1. Orange County Stormwater Program Copermittees

San Diego Region Permit	Santa Ana Region Permit	
• County of Orange	• County of Orange	• City of La Habra
• Orange County Flood Control District	• Orange County Flood Control District	• City of La Palma
• City of Aliso Viejo	• City of Anaheim	• City of Lake Forest
• City of Dana Point	• City of Brea	• City of Los Alamitos
• City of Laguna Beach	• City of Buena Park	• City of Newport Beach
• City of Laguna Hills	• City of Costa Mesa	• City of Orange
• City of Laguna Niguel	• City of Cypress	• City of Placentia
• City of Laguna Woods	• City of Fountain Valley	• City of Santa Ana
• City of Lake Forest	• City of Fullerton	• City of Seal Beach
• City of Mission Viejo	• City of Garden Grove	• City of Stanton
• City of Rancho Santa Margarita	• City of Huntington Beach	• City of Tustin
• City of San Clemente	• City of Irvine	• City of Villa Park
• City of San Juan Capistrano	• City of Laguna Hills	• City of Westminster
	• City of Laguna Woods	• City of Yorba Linda

[1] Order No. R8-2009-0030, NPDES No. CAS618030 (Santa Ana Region Permit) and Order No. R9-2009-0002, NPDES No. CAS0108740 (San Diego Region Permit)

ii. Permitting Approach

Countywide[2] permits typically address stormwater discharges from all municipalities within a single county boundary including the local county, the incorporated cities within the county (Phase I and/or Phase II), and the Flood Control District.

The San Diego Region Permit is a countywide permit because it was issued to all of the municipal stormwater dischargers within the San Diego Region of Orange County. This particular permit includes requirements for certain program elements to be developed, implemented, and reported on at jurisdictional, countywide, and/or watershed levels (**Figure 1**).

Jurisdictional Level

The San Diego Region Permit requires each Copermittee to develop and implement a Jurisdictional Runoff Management Program (JRMP) within its respective jurisdiction that includes the typical stormwater management program elements:

- Development Planning Component
- Construction Component
- Existing Development Component
    - Municipal (Includes training/education of personnel/contractors)
    - Commercial/Industrial (Includes training/education of owners/operators)
    - Residential (Includes residential education)
    - Retrofitting Existing Development
- Illicit Discharge Detection and Elimination
- Public Participation Component

Countywide Level

The San Diego Region Permit encourages, but does not require, the Copermittees to address some program elements on a countywide basis so that they may be efficiently and cost-effectively developed and implemented (e.g., Regional Residential Education Program, Monitoring). Countywide approaches to residential education and other stormwater-related efforts allow for the leveraging of resources and may promote the distribution of consistent stormwater messages.

Watershed Level

The San Diego Region Permit requires the Permittees to identify the "Lead Watershed Copermittee" for each Watershed Management Area and to develop and implement a Watershed Water Quality Workplan (Watershed Workplan). The intent of the Watershed Workplan is to assess and prioritize water quality problems within a particular watershed. This is accomplished by the stakeholders in each watershed collaboratively developing the Watershed Workplan—a watershed-based management strategy—and implementing it on a watershed and/or jurisdictional basis, as appropriate.

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[2] These may also be referred to as "Area-wide" permits.

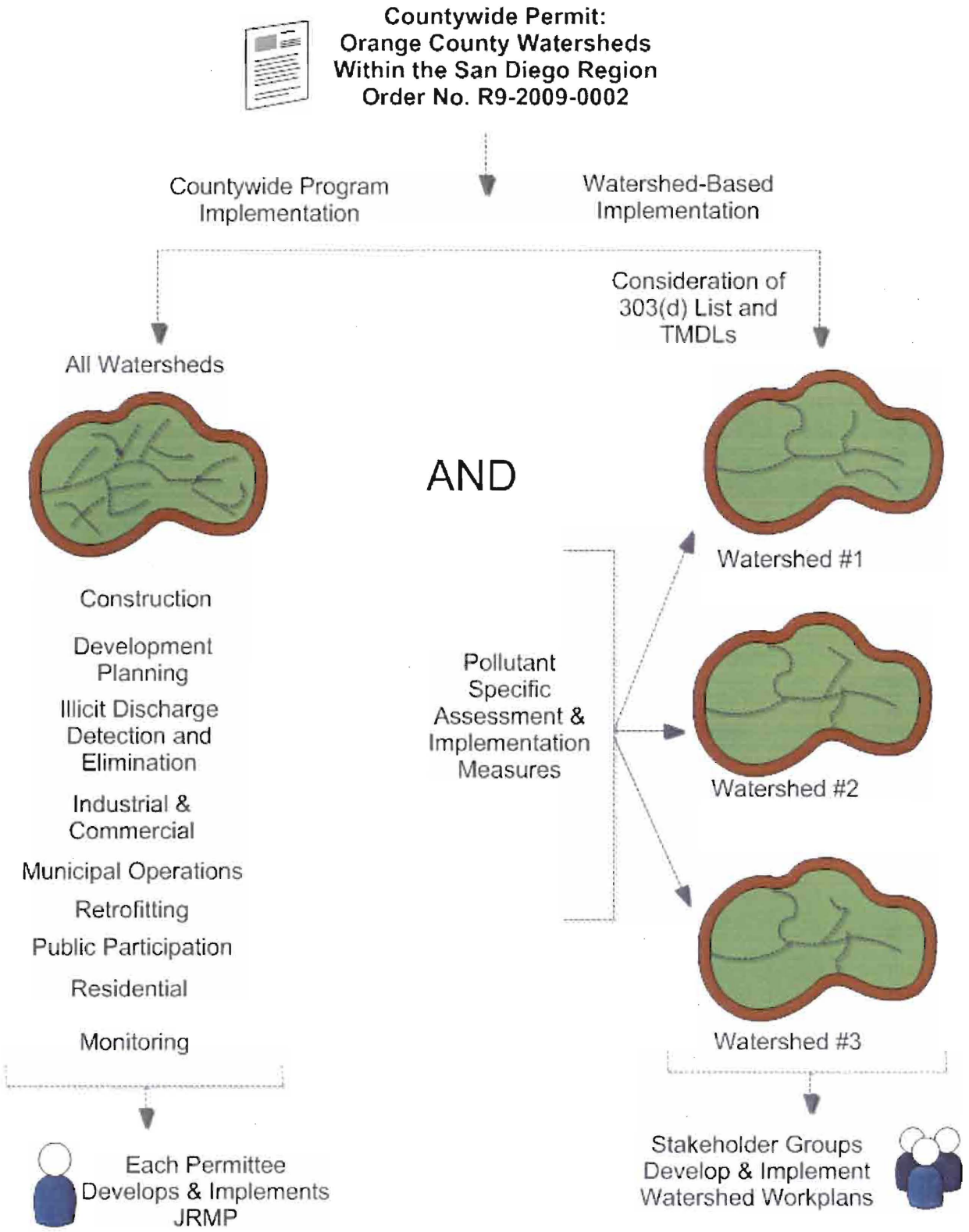

Figure 1. Orange County, San Diego Region Countywide Permitting Approach

iii. Program Management Structure and Implementation

A program management framework and Implementation Agreement for the Copermittees has been in place for the Orange County Stormwater Program since the early 1990s. The framework provides a process and structure for the development and implementation of the coordinated Program at the jurisdictional, countywide, and watershed levels (**Figure 2**). The Copermittees entered into an updated NPDES Stormwater Permit Implementation Agreement in 2002 that designates program implementation responsibilities, among other things (**Attachment A**).

The Principal Permittee and Copermittee responsibilities are specified in both permits and reiterated in the Implementation Agreement. The role of the Principal Permittee (the County of Orange) is the same as that for the other Copermittees, with the addition of certain overall countywide program coordination & management responsibilities.

As Principal Permittee, the County of Orange acts as a liaison between the Regional Board and the Copermittees and provides overarching program support, guidance, and tools for the Copermittees to assist them with the development, implementation, and reporting of the program. This allows for a leveraging of resources among the Copermittees and promotes countywide consistency. The Principal Permittee reports to and receives guidance from a Technical Advisory Committee as well as several sub-committees and task forces that have been created to address various permit requirements (e.g., legal authority, monitoring, inspections).

However, the Principal Permittee has no regulatory authority over the Permittees. Each Permittee is responsible for ensuring permit compliance within its jurisdiction. In addition to the countywide and watershed management framework for program development, the Permittees formally identify the departments with responsibility for implementation of each program element within their jurisdictions.

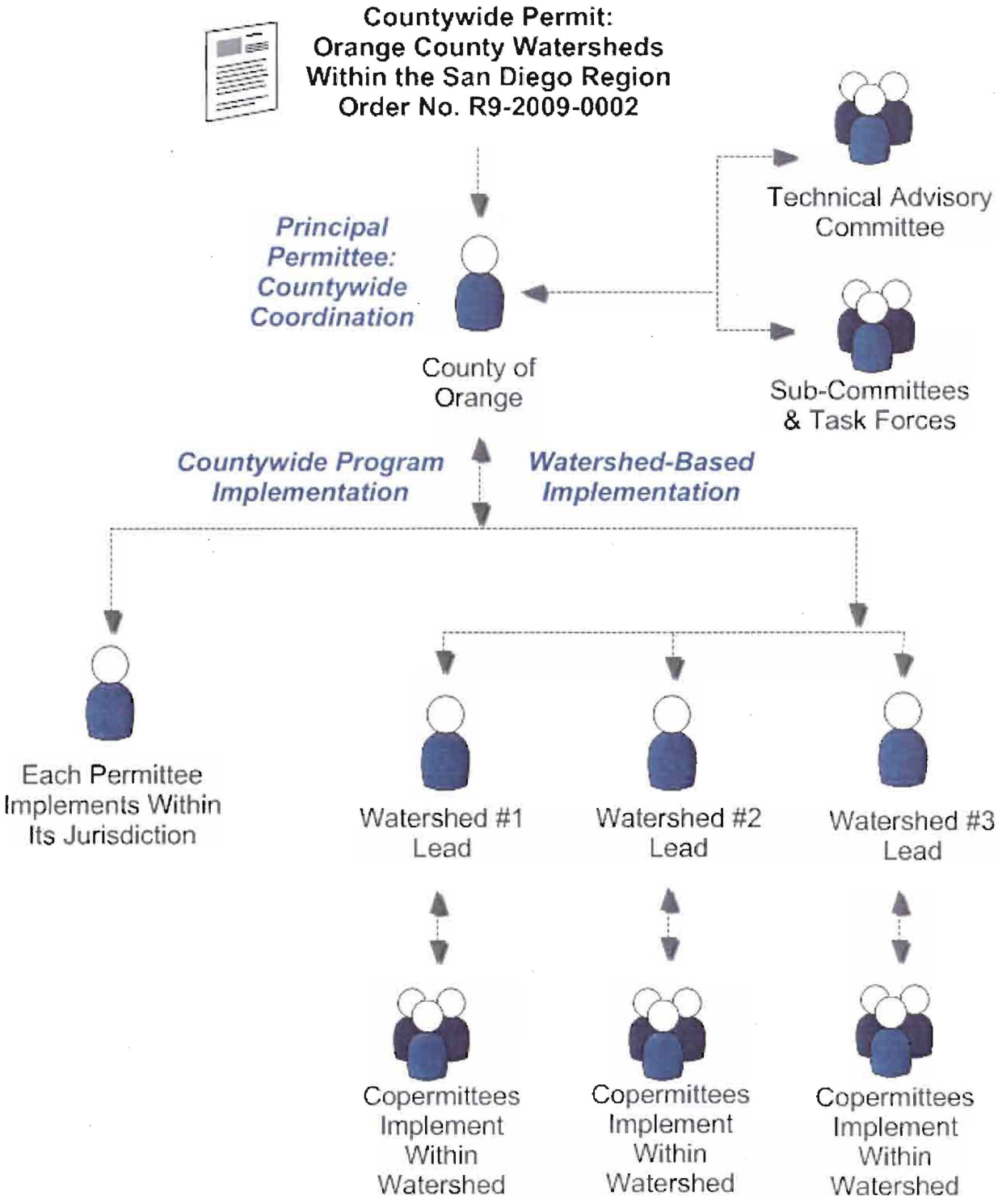

Figure 2. Orange County, San Diego Region Countywide Permit: Program Management Structure

b. Regional Permit: San Francisco Bay Region

i. Overview

The following Programs are subject to the Phase I NPDES Municipal Regional Stormwater Permit (Order No. R2-2009-0074, NPDES No. CAS612008) (Bay Area MRP) for the San Francisco Bay Region:

- Alameda Countywide Clean Water Program
- Contra Costa Clean Water Program
- Fairfield-Suisun Urban Runoff Management Program
- San Mateo Countywide Water Pollution Prevention Program
- Santa Clara Valley Urban Runoff Pollution Prevention Program
- Vallejo Sanitation and Flood Control District

The individual permittees operating under these Programs are listed in **Table 2**. The permittees coordinate regionally, through the Bay Area Stormwater Management Agencies Association (BASMAA), and Program-wide (i.e., depending on Program, may be countywide). Each permittee is also responsible for implementing the permit requirements locally within its jurisdiction.

BASMAA also includes agencies other than those covered by the Bay Area MRP, specifically:

- The Marin County Stormwater Pollution Prevention Program, subject to Order No. 2003-0005-DWQ (Phase II Permit)
- The Sonoma County Water Agency, a co-permittee with the City of Santa Rosa and the County of Sonoma under the North Coast Regional Board issued Phase I Permit (Order No. R1-2003-0062). Areas of Sonoma County are also subject to the Phase II Permit.
- The California Department of Transportation (Caltrans)
- The City and County of San Francisco (combined sewer system)

Together, BASMAA participants represent more than 90 agencies, including 79 cities and 6 counties, which geographically comprise the majority of the watershed adjacent to San Francisco Bay.

Table 2. San Francisco Bay Region Municipal Regional Stormwater NPDES Programs and Permittees

Alameda Countywide Clean Water Program (Alameda Permittees)	Contra Costa Clean Water Program (Contra Costa Permittees)	Santa Clara Valley Urban Runoff Pollution Prevention Program (Santa Clara Permittees)	San Mateo Countywide Water Pollution Prevention Program (San Mateo Permittees)	Fairfield-Suisun Urban Runoff Management Program (Fairfield-Suisun Permittees)	Vallejo Permittees
• City of Alameda • City of Albany • City of Berkeley • City of Dublin • City of Emeryville • City of Fremont • City of Hayward • City of Livermore • City of Newark • City of Oakland • City of Piedmont • City of Pleasanton • City of San Leandro • City of Union City • Alameda County • Alameda County Flood Control and Water Conservation District • Zone 7 of the Alameda County Flood Control and Water Conservation District	• City of Clayton • City of Concord • City of El Cerrito • City of Hercules • City of Lafayette • City of Martinez • City of Orinda • City of Pinole • City of Pittsburg • City of Pleasant Hill • City of Richmond • City of San Pablo • City of San Ramon • City of Walnut Creek • Town of Danville • Town of Moraga • Contra Costa County • Contra Costa County Flood Control and Water Conservation District	• City of Campbell • City of Cupertino • City of Los Altos • City of Milpitas • City of Monte Sereno • City of Mountain View • City of Palo Alto • City of San Jose • City of Santa Clara • City of Saratoga • City of Sunnyvale • Town of Los Altos Hills • Town of Los Gatos • Santa Clara Valley Water District • Santa Clara County	• City of Belmont • Brisbane • Burlingame • Daly City • East Palo Alto • Foster City • Half Moon Bay • Menlo Park • Millbrae • Pacifica • Redwood City • San Bruno • San Carlos • San Mateo • South San Francisco • Town of Atherton • Town of Colma • Town of Hillsborough • Town of Portola Valley • Town of Woodside • San Mateo County Flood Control District • San Mateo County	• City of Fairfield • City of Suisun City	• City of Vallejo • Vallejo Sanitation and Flood Control District

ii. Permitting Approach

Regional permits address municipal stormwater discharges from multiple counties and the local jurisdictions within those counties. Regional permits often bundle several municipal stormwater permits to allow for more regional consistency, as well as for administrative relief for the regulatory agency overseeing the permits. Such permits may include jurisdictional, countywide, regional, and/or watershed elements.

The Bay Area MRP is a regional permit that was issued to six stormwater Programs (including a total of 76 individual permittees) within the San Francisco Bay Region. This particular permit includes requirements for certain program elements to be developed and implemented at a jurisdictional, Program-wide (i.e., depending on Program, may be countywide), and regional levels (**Figure 3**). These program elements, including pollutant-specific programs, are implemented for all watersheds within the permitted area. Many of the regional efforts are conducted as cooperative efforts through BASMAA.

Jurisdictional Level

At the jurisdictional level, the Bay Area MRP requires implementation of traditional stormwater management program elements. These program elements are generally the same for most permittees, with a few differences specified for particular permittees or Programs. The general program elements are as follows:

- Municipal Operations
- New Development and Redevelopment
- Industrial and Commercial Site Controls
- Illicit Discharge Detection and Elimination
- Construction Site Control
- Public Information and Outreach

The Bay Area MRP notes that some of these jurisdictional requirements may be developed and/or implemented collaboratively at either a Program-wide or regional level so that the permittees can leverage their resources and promote consistency within the Bay Area. They include the following:

- New Development and Redevelopment (i.e., training)
- Industrial and Commercial Site Controls
- Construction
- Public Information and Outreach (i.e., advertising campaigns, surveys, and media relations)

In addition, the Bay Area MRP requires pollutant-specific and water quality monitoring programs that may be developed or coordinated at the Program-wide or regional level. The local jurisdictions, though, are responsible for the implementation of the program within their respective jurisdictions. These pollutant-specific and water quality monitoring requirements are as follows:

- Water Quality Monitoring
- Pollutant-Specific Programs
    - Pesticides Toxicity Control

- Trash Load Reduction
- Mercury Controls
- Polychlorinated Biphenyl (PCBs) Controls
- Copper Controls
- Polybrominated Diphenyl Ethers (PBDE), Legacy Pesticides, and Selenium

Countywide or Program-Wide Level

Although the stormwater Programs (including some Countywide Programs) were consolidated with the issuance of the Bay Area MRP, these Programs still meet and maintain their sub-committees to assist with the development, implementation, and coordination of the stormwater program within their respective jurisdictions. Program-wide coordination also provides a mechanism to review guidance and tools developed at the regional level through BASMAA and provide and/or tailor these materials to the local jurisdictions.

Regional Level

BASMAA was started in response to the issuance of the municipal NPDES permits to provide a way for the Bay Area municipalities to coordinate regionally, promote consistency within the region, and to leverage their resources in the development and implementation of their stormwater programs. Some of the permit requirements, such as the C.10 requirements for Trash and C.3 requirements for New Development, are coordinated through BASMAA at the regional level so that a consistent program can be developed and implemented.

BASMAA consists of a Board representing the seven municipal programs and several committees that report to the Board, including, but not limited to, the following:

- Monitoring Committee
- New Development Committee
- Public Information/Participation Committee
- Operational Permits Committee

BASMAA also allows the Bay Area municipalities to work collaboratively to address other regional stormwater-related issues, such as:

- Working with the regional air quality district in linking air quality to water quality;
- Working to strengthen the integration of storm water and wastewater;
- Working with trade associations to develop practical industrial/commercial water quality programs; and
- Working with rural-focused agencies and programs in the upper watersheds.

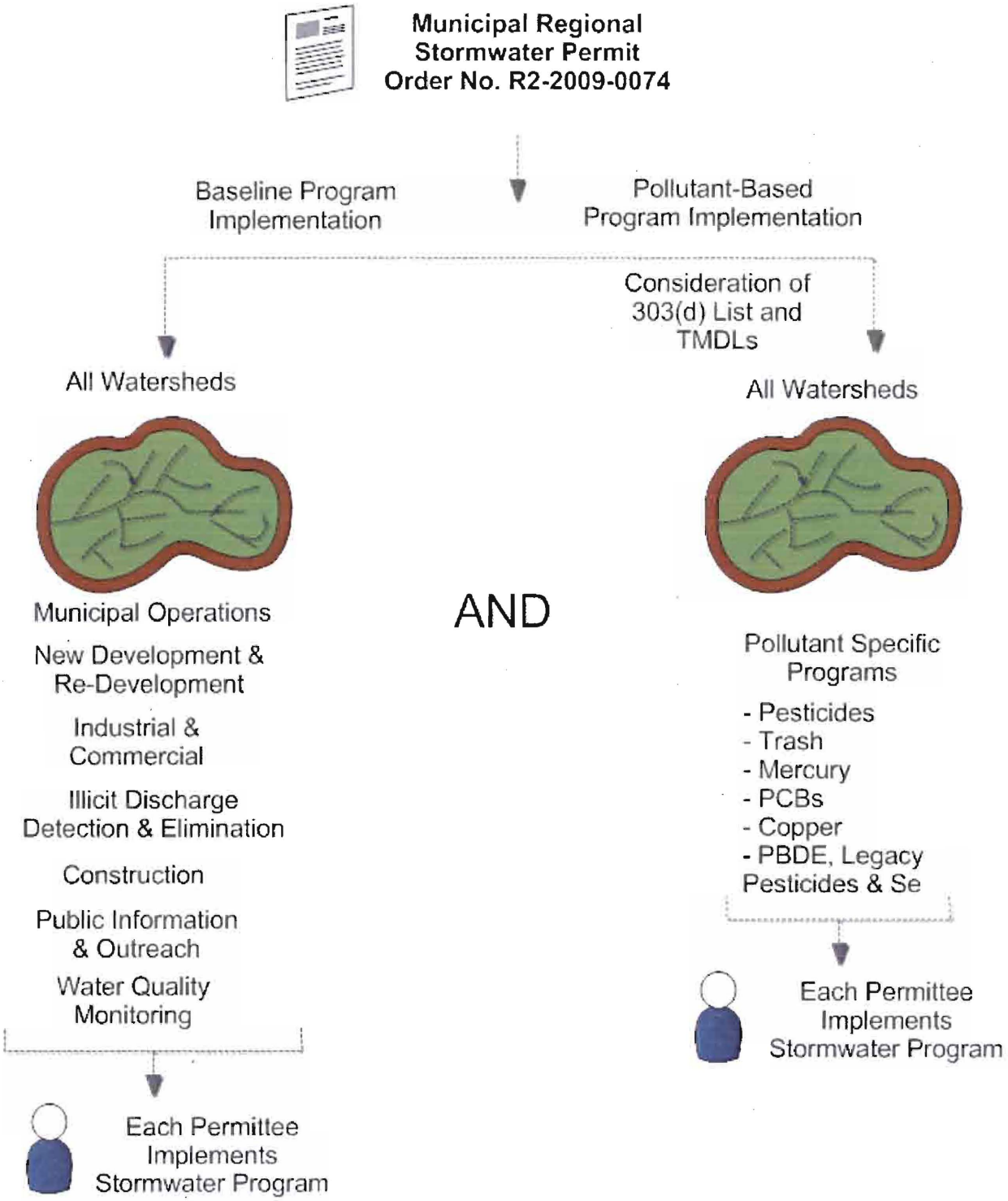

Figure 3. Bay Area Regional Permitting Approach

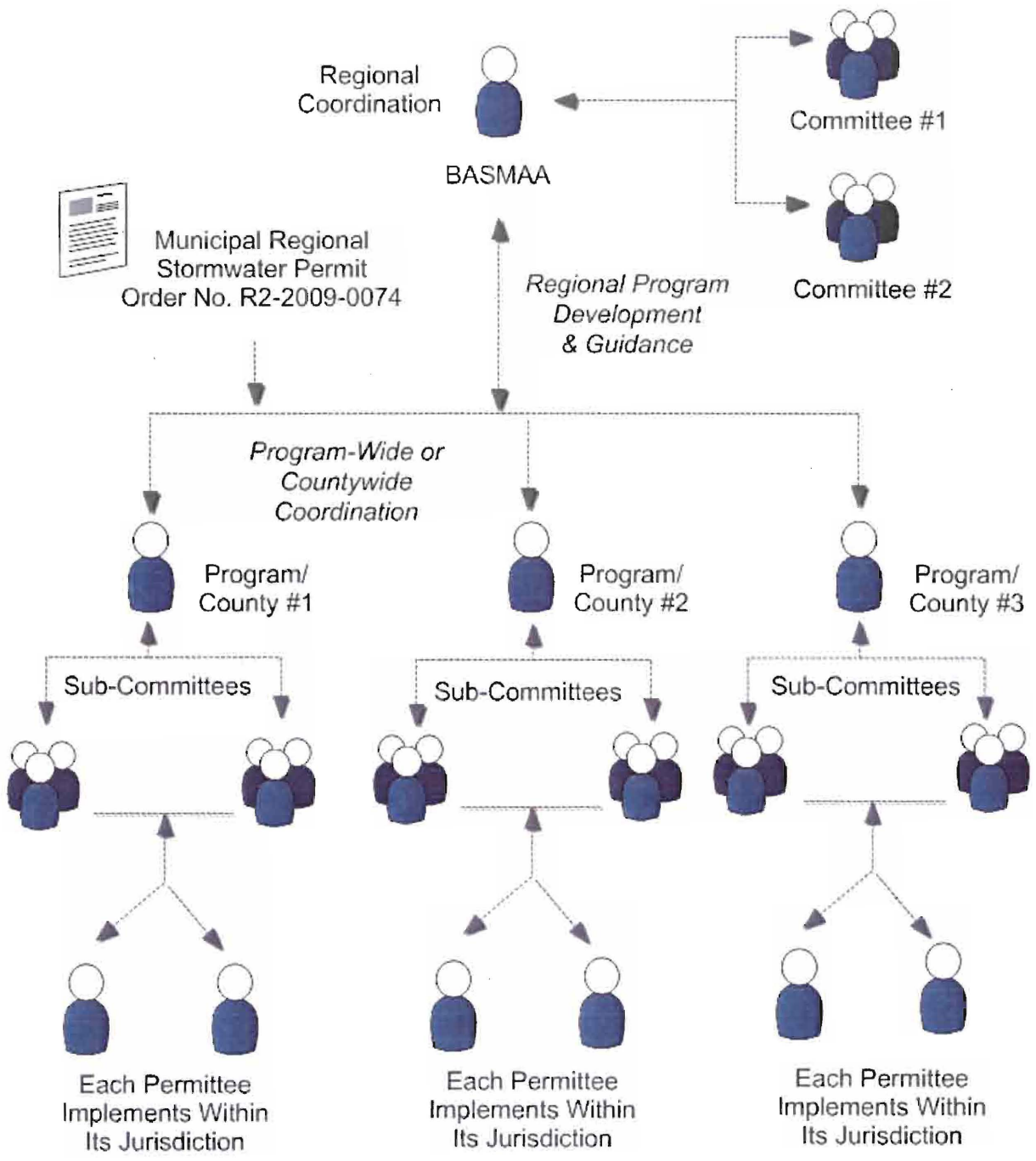

Figure 4. Bay Area Regional Permit: Program Management Structure

c. Watershed Permit: Clean Water Services (Oregon)

i. Overview

The third permit strategy evaluated is for the Tualatin River Watershed in Oregon. Clean Water Services (CWS) is a water resources management public utility for the Tualatin River watershed that is responsible for, among other things, wastewater and stormwater services, flood management projects, and water quality and stream enhancement projects. CWS is the sole permittee of the NPDES permit[3] (CWS Permit) for this watershed that was re-issued by the Oregon Department of Environmental Quality (Oregon DEQ) on July 27, 2005.[4] The implementers of the Stormwater Management Plan (SWMP) associated with this permit are CWS (referred to as "District" in the SWMP), Washington County, and the cities of Banks, Beaverton, Cornelius, Durham, Forest Grove, Hillsboro, King City, North Plains, Sherwood, Tigard, and Tualatin (together referred to as "Co-Implementers").

The Tualatin River watershed lies within the Willamette Basin in the northwest portion of Oregon, west of Portland. This watershed drains 712 square miles and ranges from densely populated areas to agricultural areas to the forests of Oregon's Coast Range Mountains.[5] The watershed is primarily located within Washington County (**Attachment C**). The close correlation that exists between the watershed and political boundaries is a unique feature of the Tualatin River watershed.

ii. Permitting Approach

Over the past two decades, EPA has promoted watershed permitting approaches and developed technical guidance for such approaches.[6] Watershed permitting approaches prioritize watershed protection and enhancement. Watershed-specific issues are identified and assessed prior to determining how to best address stormwater discharges from multiple point and non-point sources within a watershed. Watershed permits may include watershed, regional, and/or jurisdictional elements. EPA has identified three primary types of watershed permitting approaches:

1. Coordination of individual permits – Within a defined watershed or geographic area, individual permits are preserved, but they may contain essentially the same requirements.
2. Municipal permit that integrates multiple programmatic requirements – Within a defined watershed or geographic area, multiple programs (e.g., stormwater, wastewater) are addressed.
3. Multisource watershed-based permit – Within a defined watershed or geographic area, point source dischargers of concern are addressed; may also be used to address non-point sources.

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[3] Oregon Department of Environmental Quality, NPDES Watershed-Based Waste Discharge Permit, Permit Nos. 101141, 101142, 101143, 101144 & MS4, July 27, 2005.

[4] This permit is currently being renegotiated and will be reissued within the next year or so.

[5] http://www.trwc.org/tualatin_info.html

[6] http://cfpub.epa.gov/npdes/wqbasedpermitting/wspermitting.cfm

The CWS Permit is an example of the second type of watershed permit because it addresses stormwater discharges from all MS4s as well as other point and non-point sources within the Tualatin River watershed. The regulated discharges are from the Co-Implementers' collective service area, including the stormwater service area of CWS and the urban growth boundary of Washington County.[7]

This watershed permit consolidated the permitted point sources within the watershed, naming one responsible entity (CWS). The CWS Permit includes requirements for baseline stormwater program elements to be developed and implemented throughout the watershed by CWS on behalf of the Co-Implementers (**Figure 5**). These baseline stormwater program elements, although implemented on a watershed basis, mirror those outlined in the San Diego Region Permit and the Bay Area MRP. Thus, the primary difference between the California permits discussed herein and the CWS Permit is that the California permits define a specific baseline program, whereas the Oregon DEQ allows the CWS to define, develop, and implement a baseline program based on a watershed assessment.

Watershed and Jurisdictional Levels

The stormwater program includes the following program elements that are implemented by CWS on behalf of the other Co-Implementers or by the Co-Implementers themselves, depending on the intergovernmental agreement in place (see "Program Management Structure and Implementation"):

- Best Management Practices (BMPs)
  - Construction Site Stormwater
  - Operation and Maintenance Activities
  - Structural and Source Control Measures
  - Illicit & Non-Stormwater Discharges
  - Landfills, Hazardous Waste Sites, and Industrial Facilities
  - Public Education and Outreach
- Monitoring Program
  - In-Stream Water Quality Monitoring
  - Biological and Physical Monitoring
  - MS4 Stormwater Runoff Monitoring

The stormwater program also includes elements addressing Stormwater Pollutant Loads, TMDLs, and Pollutant Load Reduction Benchmarks for TMDL pollutants, as well as an evaluation and adaptive management strategy.

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[7] As stated in the Clean Water Services permit, "Four individual permits for the operation of publicly owned sewage treatment works (POTWs), one municipal separate storm sewage system (MS4) permit and individual storm water permits for the Durham and Rock Creek Advanced Wastewater Treatment Facilities in the Tualatin River watershed have been integrated and consolidated into this document."

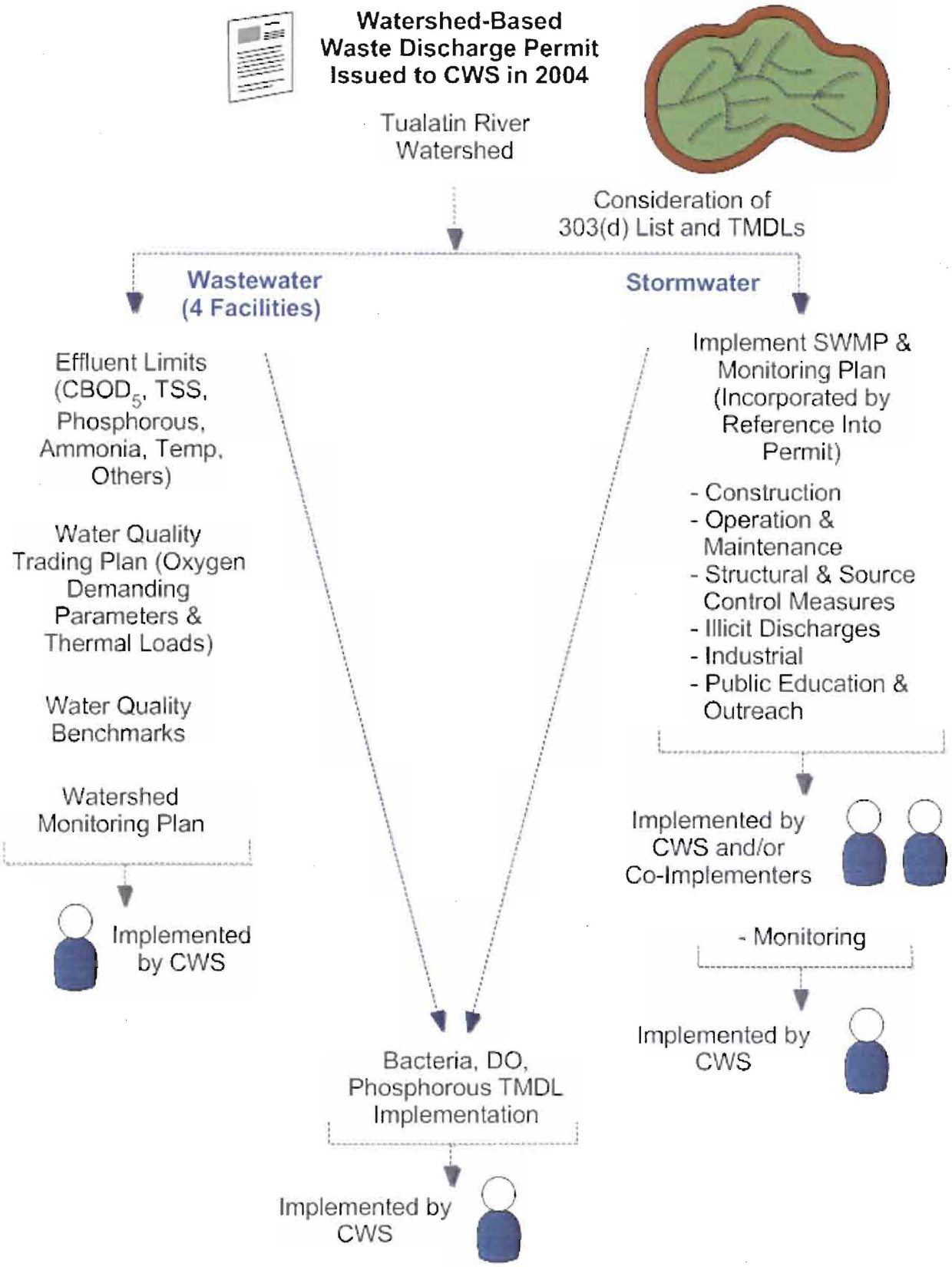

Figure 5. Tualatin River Watershed Permitting Approach

III. SUMMARY AND ASSESSMENT

A summary of the stormwater permit strategies reviewed in this memorandum, along with an assessment of their respective advantages and disadvantages, is provided in **Table 3**.

Table 3. Summary and Assessment of Stormwater Permit Strategies

Permitting Strategy	Countywide Permit	Regional Permit	Watershed-Based Permit
Permitted Region	County of Orange, San Diego Region, California	San Francisco Bay Region, California	Tualatin River Watershed, Oregon
Permit No.	Order No. R9-2009-0002, NPDES Permit No. CAS0108740	Order No. R2-2009-0074, NPDES Permit No. CAS612008	101141, 101142, 101143, 101144 & MS4 (Oregon DEQ)
Number of Permittees or Participants	13 in San Diego Permit (41 total in Program)	76 in Bay Area MRP (~90 total in BASMAA)	One (1) Permittee 13 Co-Implementers
Summary of Permit Strategy	• Establishes comprehensive baseline program implementation requirements for jurisdictions within one county • Requires additional modifications/ enhancements for watersheds based on pollutants of concern	• Establishes detailed baseline program implementation requirements for jurisdictions within multiple counties and/or programs • Requires pollutant-specific programs to be implemented in each jurisdiction	• Consolidates all point source discharges within a watershed into one permit • Requires development of jurisdictional program based on watershed priorities
Permit & SWMP	• Permittees required to develop JRMP, Watershed Workplans	• Permit is prescriptive; Permittees are not required to develop a SWMP	• Permit allows Permittee to develop program within the SWMP based on the watershed assessment
Advantages	• Principal Permittee provides for strong countywide consistency and leveraging of resources in baseline program implementation	• Clear delineation of jurisdictional responsibilities • Establishes comprehensive approach to stormwater management across the region	• Allows jurisdictions to prioritize resources based on local watershed issues • One central agency (utility) responsible for implementation for multiple dischargers • Provides for water quality trading opportunities
Disadvantages	• Compliance primarily assessed at the jurisdictional level; therefore, jurisdictions focus more on jurisdictional implementation, less on watershed implementation. • Overlapping reporting requirements for program elements	• Requires extensive, time-consuming coordination for regional efforts • Oriented to regional, Bay Area issues, not local, watershed-specific issues	• Small geographical area is addressed relative to other strategy types • Requires a central agency (utility) with broad responsibilities to implement

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EXHIBIT 2.II

PROGRAM IMPLEMENTATION AGREEMENT

AMENDMENT AND RESTATEMENT OF NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM STORMWATER PERMIT IMPLEMENTATION AGREEMENT

This AGREEMENT, for purposes of identification numbered D02-048, entered into this 25th day of June, 2002, by the County of Orange, (herein called the COUNTY), the Orange County Flood Control District (herein called DISTRICT) and the cities of Aliso Viejo, Anaheim, Brea, Buena Park, Costa Mesa, Cypress, Dana Point, Fountain Valley, Fullerton, Garden Grove, Huntington Beach, Irvine, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods Lake Forest, La Habra, La Palma, Los Alamitos, Mission Viejo, Newport Beach, Orange, Placentia, Rancho Santa Margarita, San Clemente, San Juan Capistrano Santa Ana, Seal Beach, Stanton, Tustin, Villa Park, Westminster, and Yorba Linda (herein called CITIES) restates the agreement provisions made previously by the COUNTY, DISTRICT and CITIES with respect to compliance with the National Pollutant Discharge Elimination System (NPDES) municipal stormwater permits issued for Orange County and amends specified provisions to add three additional cities, revises participant share calculations and allows participant share calculations on a countywide and regional basis The COUNTY, DISTRICT and CITIES may be referred to collectively as PERMITTEES or individually as a PERMITTEE in this AGREEMENT

RECITALS

WHEREAS, Congress in 1987 through the Water Quality Act (herein called WQA) amended Section 402 of the Federal Clean Water Act (33 U.S.C.A 1342(p) to require the federal Environmental Protection Agency to promulgate regulations for applications for permits for stormwater discharges; and

WHEREAS, these permit regulations will require the control of pollutants from stormwater discharges by requiring a National Pollutant Discharge Elimination System permit which would allow the lawful discharge of stormwaters into waters of the United States; and

WHEREAS, these EPA regulations require NPDES permits for discharges from municipal storm sewers on a system-wide or jurisdiction-wide basis; and

WHEREAS, the Legislature, in enacting the Orange County Flood Control Act, created the Orange County Flood Control District to provide for the control of flood and storm waters; and

WHEREAS, the powers granted to the DISTRICT include carrying on technical and other investigations, examinations, or tests of all kinds, making measurements, collecting data, and making analyses, studies, and inspections pertaining to water supply, control of floods, use of water, water quality, nuisance, pollution, waste, and contamination of water, both within and without the DISTRICT; and

WHEREAS, the COUNTY, the DISTRICT and the CITIES desire to develop an integrated stormwater discharge management program with the objective of improving water quality in the County of Orange; and

WHEREAS, the California State Water Resources Control Board (CSWRCB) as designee of the EPA has delegated authority to the Regional Water Quality Control Boards-Santa Ana Region (RWQCB-SAR) and San Diego Region (RWQCB-SDR)(collectively, the RWQCBs) for administration of the NPDES stormwater permit application process within the boundaries of their Regions; and

WHEREAS, the COUNTY, DISTRICT and CITIES have been designated as PERMITTEES by the RWQCBs; and

WHEREAS, the COUNTY has been designated as the Principal PERMITTEE on the permits; and

WHEREAS, cooperation between the CITIES, the COUNTY and the DISTRICT to jointly file applications for NPDES Stormwater permits and implement common programs to the extent feasible, is in the best interests of the CITIES, the COUNTY and the District; and

WHEREAS, the COUNTY is willing to share the expertise of its staff with the CITIES so that they can join in seeking and implementing certain requirements of the NPDES Stormwater permits; and

WHEREAS, the PERMITTEES approved a Stormwater Permit Implementation Agreement to memorialize program cooperation based on the above recitals on December 18, 1990 which was subsequently amended on October 26, 1993 by Amendment No 1 (the December 18 1990 Agreement as Amended by Amendment No 1 will be referred to collectively hereinafter as the ORIGINAL AGREEMENT); and

WHEREAS Section X of the ORIGINAL AGREEMENT provided that the ORIGINAL AGREEMENT may be amended by consent of a majority of the PERMITTEES which represent a majority of the percentage contributions as described in Section IV of the ORIGINAL AGREEMENT and

WHEREAS, Section VI of the ORIGINAL AGREEMENT states that any city which becomes signatory to this ORIGINAL AGREEMENT after the applications for the initial NPDES stormwater permits have been approved shall comply with all of the provisions of the ORIGINAL AGREEMENT; and,

WHEREAS pursuant to Sections VI and X of the ORIGINAL AGREEMENT, the PERMITTEES approved Amendment No 1 to the ORIGINAL AGREEMENT (herein called AMENDMENT NO 1) on October 26 1993 to add two newly incorporated cities, provide participant share calculations based on thirty-three PERMITTEES and establish a Technical Advisory Committee; and

WHEREAS, the PERMITTEES now desire to restate those provisions in the ORIGINAL AGREEMENT that remain unchanged and amend specified provisions to add three additional

cities, revise participant share calculations and allow participant share calculations on a countywide and regional basis

NOW THEREFORE: The PERMITTEES hereto do mutually agree to add the cities of Aliso Viejo, Laguna Woods and Rancho Santa Margarita as PERMITTEES under this AGREEMENT, to restate those provisions in the ORIGINAL AGREEMENT that remain unchanged and amend Sections II, III.A., III.B., III.C., IV, VIII, IX, XI and XV in their entirety as follows:

I. FILING STATUS

The COUNTY, DISTRICT and CITIES will file the applications for stormwater permits as PERMITTEES The COUNTY, the DISTRICT and each individual City will be a PERMITTEE.

II. INCORPORATION OF FEDERAL GUIDELINES

The terms of all applicable Federal and State water quality regulations and guidelines under the Clean Water Act and Water Quality Act, as presently written or as changed during the life of this agreement are hereby incorporated by reference and made a part of this AGREEMENT and take precedence over any inconsistent terms of this AGREEEMENT.

III. DELEGATION OF RESPONSIBILITIES

The responsibilities of each of the parties shall be as follows:

A. The COUNTY, on a cost-shared basis, shall administer system compliance by:

1 Preparing implementation and annual operating budgets. The budget year shall coincide with the fiscal year of the COUNTY, July 1 - June 30.

a. The participants shall be permitted to review and approve the annual operating budget and work plan for the forthcoming year. Criteria for approval shall be

affirmative responses from a majority of the PERMITTEES which represent a majority of the percentage contribution as described in Section IV. The COUNTY and the DISTRICT will represent one voting PERMITTEE with their percentage contribution equal to the total of the COUNTY and the DISTRICT as described in Section IV The review period shall be from January 1 to January 31 of each year with approval of the final budget to be completed by February 15.

b. The annual operating budget shall not be exceeded without prior consent of the majority of the PERMITTEES which represent a majority of the percentage contribution.

2 Consulting with the city managers and any committees established by the city managers when preparing budgets and major program elements.

3 Preparing compliance reports to the Regional Board and providing copies to the PERMITTEES

4 Preparing a model system-wide Best Management Practices (BMP) Program report

5 Monitoring the implementation and ensuring the effectiveness of system-wide BMPs. This will include field reconnaissance to evaluate structural and procedural BMPs. An annual report to the RWQCBs will be prepared presenting the results of these evaluations.

6. The COUNTY as Principal PERMITTEE may retain the services of professional consultants and may fund, or contribute to

funding technical and/or economic studies conducted by professional organizations such as the American Public Works Association

B The DISTRICT shall to the maximum extent practicable, and on a cost-shared basis except as set forth in subparagraph 4 below:

1. Perform the water quality and hydrographic monitoring for permit compliance

2 Administer the water pollution control program by enforcing the Orange County Water Quality Ordinance

3 Develop uniform criteria for annual inspection of drainage facilities

4 Perform inspections, at no cost to the CITIES or the COUNTY, on those facilities owned by the DISTRICT and on municipal separate storm sewers in unincorporated County. Contracts for such inspections within CITIES may be undertaken at the sole expense of the requesting city.

C The CITIES shall, to the maximum extent practicable, and at no cost to COUNTY or DISTRICT:

1 Implement a facility inspection program in accordance with the uniform criteria developed by the DISTRICT, for all municipal separate storm sewers as defined by the stormwater permit and within the jurisdictional boundaries of that city

2. Submit to the COUNTY stormwater drain maps with periodic revisions which reflect the modifications that were made to the storm drain system

3 Prepare watershed characterizations, including

a. Zoning designations, and

b Identification of areas where hazardous materials presently are or are suspected to have been stored, manufactured, or disposed. This shall include sites at which a hazardous material spill has occurred.

4. Review, approve, and implement system-wide BMPs

5. Eliminate, or have eliminated, illegal/illicit connections to the storm drain system.

6 Identify the legal authority for control of discharges to the storm drain system.

7. Provide to the COUNTY annual reports (on forms provided by the COUNTY) and any other information needed to satisfy annual reporting requirements of the RWQCBs.

8. Adopt and enforce, or name DISTRICT as enforcer of a water pollution control ordinance, which prohibits non-NPDES permitted discharges to the municipal separate storm sewer system.

D The COUNTY shall, to the maximum extent practicable and at no cost to the CITIES or the DISTRICT, undertake in the unincorporated areas of the COUNTY all activities required above of the CITIES that are not responsibilities of the DISTRICT as outlined in Section III B.

E. The PERMITTEES hereby establish a Technical Advisory Committee (herein called COMMITTEE) consisting of five members chosen by the Orange County City Engineers Association, and one member representing the COUNTY The COMMITTEE shall prepare by-laws for the Technical Advisory Committee and submit same to PERMITTEES for approval The COMMITTEE will act in an advisory role to the

PERMITTEES and implement policy previously established by the PERMITTEES.

IV. PROGRAM COSTS

The responsibilities for payment of all shared costs of equipment, services, contracted analytical services, and the cost of the Regional Board permits, shall be distributed among the COUNTY, DISTRICT, and CITIES as follows:

Participants	Percentage Contribution
DISTRICT	10
CITIES + COUNTY	90

The individual percentage contributions from each city and the COUNTY shall be functions of their respective areas and population relative to those of the entire County Each area shall be calculated as one half of the sum of the area and population fractions, multiplied by 90%. Excluded are national forests, state parks, airports, landfills, oceans, harbors, tidal bays and military installations (Exhibit A-1). The contribution of the COUNTY shall be calculated from unincorporated areas and their respective populations.

Share in percent for City #1 = $\{(X_1/X_{tot}) + (Y_1/Y_{tot})\}/2 \times (90)$

X = area

Y = population

tot = total population or area

90 = total percentage excluding Flood Control District contribution

The percentage share shall be calculated by the COUNTY Public Facilities and Resources Department Environmental Resources Section from population and area data. These calculations shall be completed by January 1 of each year and shall be included in the annual budget proposal The annual budget proposal shall be recomputed for the thirty-six PERMITTEES based on the following percentage share computation methods:

A Countywide costs as provided in Exhibit B-1.

B. Regional costs specific to only one RWQCB permit as provided in Exhibits B-2A and B-2B.

C In the event of a regulatory directive issued to PERMITTEES, the COUNTY shall provide immediate notice to the affected PERMITTEES and meet and confer with them with respect to responding to the directive and funding the immediate response

Amended calculations and computation method for fiscal year 2002-03 are provided in Exhibits B-1, B-2A and B-2B, which are made a part hereof

If at any time during a given fiscal year the program costs exceed the sum of the deposits, the COUNTY shall submit invoices to the CITIES to recover the deficit, following the approval process described in Section III.A.1.b above The share for each city shall be prorated according to the formula above Each city shall pay the invoice within 45 days of the billing date

The COUNTY shall prepare a fiscal year end accounting within 60 days of the end of the fiscal year. If the fiscal year end accounting results in costs (net of interest earnings) exceeding the sum of the deposits, the

COUNTY shall invoice each city for its prorated share of the excess cost Each city shall pay the billing within 45 days of the date of the invoice. If the fiscal year end accounting results in the sum of the deposits exceeding costs (net of interest earnings), the excess deposits will carry forward to reduce the billings for the following year.

The COUNTY shall invoice each city for its annual deposit at the beginning (July 1 of each fiscal year. Each city shall pay the deposit within 45 days of the date of the invoice. Each city's deposit shall be based on their prorated share of the approved annual budget, reduced for any surplus identified in the prior fiscal year end accounting

Interest earned on the CITIES' deposits will not be paid to the CITIES, but will be credited against the CITIES' share of the program costs.

Upon termination of the program a final accounting shall be performed by the COUNTY If costs (net of interest earnings) exceed the sum of the deposits, the COUNTY shall invoice each city for its prorated share of the excess Each city shall pay the invoice within 45 days of the date of the invoice. If the sum of the deposits exceeds the costs, the COUNTY shall reimburse to each city its prorated share of the excess, within 45 days of the final accounting. Interest earnings are used to offset the CITIES' share of program costs and will not be refunded to the CITIES.

Each city and the COUNTY shall bear the financial responsibility for implementing the Program, within its jurisdictional boundaries, as outlined in Section III. C. and D.

V. LIFE OF THE AGREEMENT

The life of the AGREEMENT shall be indefinite or as long as the WQA mandates compliance

VI. ADDITIONAL PARTIES

Any city which becomes signatory to this AGREEMENT after the applications for the initial NPDES stormwater permits have been approved and any city which becomes incorporated shall become a PERMITTEE on the NPDES stormwater permit issued by its respective RWQCB and shall comply with all of the provisions of this AGREEMENT. The date of initiation, for determining participant costs for newly incorporated CITIES shall be the date of incorporation, and for a city signing after NPDES stormwater permit approval it shall be the date of the initial application for the NPDES Stormwater permit. The costs for adding the additional parties to the program, including additional permit and processing fees, shall be paid by the added party. Monies to be reimbursed to the existing PERMITTEES shall be credited to their respective annual program operating fees for the following budget year.

VII WITHDRAWAL FROM THE AGREEMENT

A participant may withdraw from the AGREEMENT 60 days subsequent to written notice to the COUNTY. The COUNTY will notify the remaining PERMITTEES within 10 business days of receipt of the withdrawal notice The withdrawing participant shall agree to file for a separate permit and to comply with all of the requirements established by the RWQCB(s). In addition, withdrawal shall constitute forfeiture of the withdrawing participant's deposit for the budget year of withdrawal. The withdrawing participant shall be responsible for all lawfully assessed penalties as a

consequence of withdrawal. The cost allocations to the remaining members will be recalculated in the following budget year.

VIII NON-COMPLIANCE WITH PERMIT REQUIREMENTS

Any PERMITTEE found in non-compliance with the conditions of the permit within their jurisdictional responsibilities shall be solely liable for any lawfully assessed penalties, pursuant to Section 13385 of the Water Code and the Federal Clean Water Act Common penalties shall be calculated according to the formula outlined in Section IV.

IX. LEGAL ACTION/ COSTS/ ATTORNEY FEES

Where any legal action is necessary to enforce any provision hereof for damages by reason of an alleged breach of any provisions of this AGREEMENT, the prevailing party shall be entitled to receive from the losing party all litigation and collection expenses, administrative costs, witness fees and court costs including reasonable attorneys fees

X AMENDMENTS TO THE AGREEMENT

This AGREEMENT may be amended by consent of a majority of the PERMITTEES which represent a majority of the percentage contributions as described in Section IV. The COUNTY and the DISTRICT will represent one voting PERMITTEE with a percentage contribution equal to the sum of the individual contributions of the COUNTY and DISTRICT as described in Section IV No amendment to this AGREEMENT shall be effective unless it is in writing and signed by the duly authorized representatives of the majority of PERMITTEES

XI AUTHORIZED SIGNATORIES

The County Director of the Public Facilities and Resources Department and the respective City Managers, shall be authorized to execute the application(s) for NPDES municipal stormwater permit(s) and take all other

procedural steps necessary to file the application(s) for NPDES municipal stormwater permit(s).

XII. NOTICES

All notices shall be deemed duly given if delivered by hand; or three (3) days after deposit in the U.S Mail, postage prepaid

XIII. GOVERNING LAW

This AGREEMENT will be governed and construed in accordance with laws of the State of California If any provision or provisions of this AGREEMENT shall be held to be invalid illegal or unenforceable the validity, legality and enforceability of the remaining provisions shall not any way be affected or impaired hereby

XIV CONSENT TO BREACH NOT WAIVER

No term or provision hereof shall be deemed waived and no breach excused, unless such waiver or consent shall be in writing and signed by the PERMITTEE to have waived or consented. Any consent by any PERMITTEE to, or waiver of, a breach by the other, whether express or implied, shall not constitute a consent to, waiver of or excuse for any other different or subsequent breach.

XV APPLICABILITY OF PRIOR AGREEMENTS

This document restates and amends the provisions in prior agreements and constitutes the entire AGREEMENT between the PERMITTEES with respect to the subject matter; all prior agreements, representations, statements, negotiations and undertakings are superseded hereby

XVI EXECUTION OF THE AGREEMENT

This AGREEMENT may be executed in counterparts and the signed counterparts shall constitute a single instrument.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement on the dates opposite their respective signatures:

ORANGE COUNTY FLOOD CONTROL DISTRICT
A body corporate and politic

By Cynthia P. Coad
Chairman of the Board of Supervisors

COUNTY OF ORANGE
A body corporate and politic

Date 06-25-02

By Cynthia P. Coad
Chairman of the Board of Supervisors

SIGNED AND CERTIFIED THAT A COPY OF THIS AGREEMENT HAS BEEN DELIVERED TO THE CHAIRMAN OF THE BOARD

Date: 06-25-02

By Robin Stieler for
DARLENE J. BLOOM 6/25/02
Clerk of the Board of Supervisors of
Orange County, California

APPROVED AS TO FORM
COUNTY COUNSEL
ORANGE COUNTY, CALIFORNIA

By
Geoffrey K. Hunt, Deputy

Date: 6/12/

///

///

///

Agreement D02-048

CITY OF ANAHEIM

Date: 6-18-02, 2002

By: Tom Daly
Mayor

ATTEST:

Sherry Schroeder
City Clerk

APPROVED AS TO FORM:
JACK L. WHITE, CITY ATTORNEY

A Kott

By: ALISON M. KOTT, DEPUTY CITY ATTORNEY

CITY OF BREA

Date: 6/19, 2002

By: _____
Mayor

ATTEST

Elaine Capps
City Clerk

APPROVED AS TO FORM:

_____
City

CITY OF BUENA PARK

Date: June 25, 2002

By: _____
Mayor

ATTEST:

_____
City Clerk

APPROVED AS TO FORM

_____
City Attorney

CITY OF COSTA MESA

Date: June 18, 2002

By: Hale W. Dixon
Mayor

ATTEST:

Deputy Lette Delaney, Acting for
City Clerk

APPROVED AS TO FORM:

Linda Nguyen, DCA
City Attorney

CITY OF CYPRESS

Date: July 10, 2002

By: Lydia Smith
Mayor

ATTEST:

Jill R. Ingram-Thurston
City Clerk

APPROVED AS TO FORM:

W. Wise
City Attorney

CITY OF DANA POINT

Date: June 25, 2002

By: Joe Snyder
Mayor

ATTEST:

Cathy Cattlett
City Clerk

APPROVED AS TO FORM:

City Attorney

CITY OF FOUNTAIN VALLEY

Date: June 4, 2002

By: Lauann Cook
Mayor

ATTEST:

Jane Irwin
City Clerk - Deputy

APPROVED AS TO FORM:

Alan Burns
City Attorney

CITY OF FULLERTON

Date: June 19, 2002

By: _____
Mayor

ATTEST:

_____
City Clerk

APPROVED AS TO FORM:

_____
City Attorney

APPROVED AS TO CONTENT:

_____
Director of Engineering

CITY OF GARDEN GROVE

Date: June 24, 2002

By: _____
Mayor

ATTEST

_____
City Clerk

APPROVED AS TO FORM:

_____
City Attorney

CITY OF HUNTINGTON BEACH

Date: June 21, 2002

By: Debbie Cook
Mayor

ATTEST:

Connie Brockway
City Clerk 6/24/02

APPROVED AS TO FORM

Pat Dixon 6-7-02
for City Attorney
6-6-02

CITY OF IRVINE

Date: June 27, 2002, 2002

By: _____
Mayor

ATTEST:

_____
City Clerk

APPROVED AS TO FORM:

_____
City Attorney

CITY OF LA HABRA

Date: 6-17, **2002**

By: _____
Mayor Pro Tem

ATTEST:

_____
City Clerk

APPROVED AS TO FORM:

_____
City Attorney

CITY OF LA PALMA

Date: 7/8, 2002

By: Paul Walker

ATTEST:

Lynn Zakarian
~~City Clerk~~
Deputy City Clerk

APPROVED AS TO FORM:

City Attorney

CITY OF LAGUNA BEACH

Date: 7/16 2002

By: Kenneth Farr
City Manager

ATTEST:

City Clerk

APPROVED AS TO FORM:

City Attorney

CITY OF LAGUNA BEACH
INCORPORATED
JUNE 29, 1927
ORANGE COUNTY, CALIFORNIA

CITY OF LAGUNA HILLS

Date: June 11, 2002

By: _____
Mayor R. Craig Scott

ATTEST:

_____
City Clerk Mary A. Carlson

APPROVED AS TO FORM:

_____
City Attorney Lois E. Jeffrey

Agreement D02-048

CITY OF LAGUNA NIGUEL

Date: June 24, 2002

By: _____
Mayor

ATTEST:

_____
City Clerk

APPROVED AS TO FORM:

_____
City Attorney 6/20/02

CITY OF LAGUNA WOODS

Date: 6-20-02, 2002

By: Jan M. C. Langhlin
Mayor

ATTEST:

Clerk

APPROVED AS TO FORM:

City Attorney

Agreement D02-048

CITY OF LAKE FOREST

Date: _____, 2002

By: _____
Richard T. Dixon, Mayor

ATTEST:

_____
Sherry A.F. Wentz, City Clerk

APPROVED AS TO FORM:

_____
Thomas W. Allen, City Attorney

CITY OF LOS ALAMITOS

Date: June 24, 2002

By: _____
Mayor Ronald Bates

ATTEST:

_____
City Clerk C. D. Cordova

APPROVED AS TO FORM:

_____
City Attorney Fred Galante

CITY OF MISSION VIEJO

Date: 7-2-02, 2002

By: _____
Mayor

ATTEST:

_____
City Clerk

APPROVED AS TO FORM:

_____
City Attorney

CITY OF NEWPORT BEACH

Date: June 25, 2002

By: Tod W. Ridgeway
Mayor

ATTEST:

LaVonne M. Harkless
City Clerk

APPROVED AS TO FORM:

City Attorney

CITY OF RANCHO SANTA MARGARITA

Date: June 20, 2002

By: _____
Mayor James M. Thor

ATTEST:

_____
City Clerk Debbie Zaun

APPROVED AS TO FORM:

_____
City Attorney John E. Cavanaugh

CITY OF SAN CLEMENTE

Date: JUNE 19, 2002

By: _____
Mayor

ATTEST:

_____
City Clerk

APPROVED AS TO FORM:

/s/ Jeff Oderman
City Attorney

Agreement D02-048

CITY OF SAN JUAN CAPISTRANO

Date: _____, 2002

By: Diane Bathgate
Mayor

ATTEST:

City Clerk

APPROVED AS TO FORM:

City Attorney

CITY OF SANTA ANA

Date: July 1, 2002

By: _____
Mayor

ATTEST:

_____
City Clerk

APPROVED AS TO FORM:

_____
City Attorney

CITY OF SEAL BEACH

Date: JUNE 24, 2002

By: JOHN H. LARSON
Mayor

ATTEST:

City Clerk

APPROVED AS TO FORM:

City Attorney

CITY OF STANTON

Date: June 25, 2002

By: _____
Mayor

ATTEST:

_____
City Clerk

APPROVED AS TO FORM:

_____
City Attorney

Agreement D02-048

CITY OF TUSTIN

Date: 7-1-02, 2002

By: _____
Mayor

ATTEST

_____
City Clerk

APPROVED AS TO FORM:

_____
City Attorney

CITY OF VILLA PARK

Date: June 27, 2002 2002

By: _____
Mayor

ATTEST:

_____
City Clerk

APPROVED AS TO FORM:

_____
City Attorney

CITY OF WESTMINSTER

Date: JUNE 24, 2002

By: Margaret L. Rice
Mayor

ATTEST:

Marian Contreras
City Clerk

APPROVED AS TO FORM:

City Attorney

CITY OF YORBA LINDA

By: _____
Mayor Allen Castellano

Date: June 18, 2002

APPROVED AS TO FORM:

ATTEST:

_____
City Clerk

_____
City Attorney
Best, Best & Krieger, LLP

EXHIBIT

LAND AREA DEDUCTED FROM JURISDICTIONS

Landfills	Area sq miles	Jurisdiction
Olinda	0.89	County
Santiago	0.25	County
Prima Descheca	2.34	County
Bee Canyon	1.13	County
Coyote Canyon	1.09	County
State Parks		
Alamitos State Beach	0.002	Seal Beach
Bolsa Chica State Beach	0.27	Huntington Beach
Chino Hills State Park	4.09	County
Corona Del Mar State Beach	0.05	Newport Beach
Crystal Cove State Park	6.30	County
Doheney State Beach	0.40	Dana Point
Huntington State Beach	0.20	Huntington Beach
San Clemente State Beach	0.18	San Clemente
Airports		
Fullerton	0.11	Fullerton
John Wayne	0.78	County
Military facilities		
MCAS Tustin	2.40	Tustin
MCAS El Toro	6.25	County
Los Alamitos Armed Svs. Center	2.07	Los Alamitos
Seal Beach Weapons Station	2.17	Seal Beach
National Forests		
Cleveland National Forest	86.75	County

EXHIBIT B - 1
Cost Sharing For Region Specific Elements
NPDES Permittee Shares of Revenue
Fiscal Year 2002/2003

Permittee	Population *	Area (sq. mi.) **	Weighted Average Share of Revenue (%)	Budget Share FY 2002-2003
Aliso Viejo***	40,166	7.15	1.168548686	$70,114
Anaheim	336,300	49.761	9.005630974	$540,344
Brea	36,100	10.954	1.399038534	$83,943
Buena Park	80,100	10.064	2.007224432	$120,435
Costa Mesa	110,900	15.480	2.898146677	$173,891
Cypress	47,150	6.925	1.258634332	$75,519
Dana Point	35,800	6.440	1.046705013	$62,803
Fountain Valley	55,900	9.553	1.595652357	$95,740
Fullerton	129,200	22.536	3.723143526	$223,391
Garden Grove	169,200	17.900	3.981247954	$238,877
Huntington Beach	193,700	27.283	5.080856025	$304,855
Irvine	150,100	46.148	5.863460245	$351,811
La Habra	60,800	7.313	1.498466857	$89,909
La Palma	15,700	2.014	0.396615551	$23,797
Laguna Beach	24,150	7.820	0.973824935	$58,430
Laguna Hills	33,900	8.626	1.031809811	$61,909
Laguna Niguel	63,200	15.003	2.127750971	$127,666
Laguna Woods***	16,750	3.050	0.492569562	$29,554
Lake Forest	76,700	16.795	2.473428382	$148,407
Los Alamitos	11,750	4.256	0.508566627	$30,514
Mission Viejo	96,600	17.427	2.828184924	$169,693
Newport Beach	72,000	27.740	3.244247595	$194,657
Orange	132,800	23.329	3.839599305	$230,378
Placentia	47,600	6.606	1.240982586	$74,460
Rancho Santa Margarita***	48,350	13.060	1.751218729	$105,074
San Clemente	52,500	17.697	2.170701556	$130,243
San Juan Capistrano	34,600	14.054	1.614764803	$96,887
Santa Ana	348,100	27.349	7.460695499	$447,646
Seal Beach	24,500	10.680	1.197977061	$71,879
Stanton	38,300	3.131	0.830259739	$49,816
Tustin	69,200	10.992	1.911061605	$114,665
Villa Park	6,125	2.088	0.255047196	$15,303
Westminster	89,900	10.190	2.167659672	$130,061
Yorba Linda	60,000	19.918	2.45714216	$147,430
County of Orange	117,634	86.846	8.499136117	$509,953
OCFCD	0	0.000	10	$600,006
TOTALS	**2,925,775**	**584.178**	**100.00000**	**$6,000,063**

* Source: State of California, Department of Finance, *E-1 City/County Population Estimates with Annual Percent Change January 1, 2000 and 2001*, Sacramento, California, May 2001.

** Source: Public Facilities and Resources Department - Geomatics. Area was calculated in miles using the dry land area figures and subtracting areas in each jurisdiction for national forests, state parks, airports, landfills and military installations as determined in the NPDES Implementation Agreement.

*** Source: County of Orange will cover the program costs until the cities are added onto the Implementation Agreement.

025423

BYLAWS

of

BAY AREA STORMWATER MANAGEMENT AGENCIES ASSOCIATION

January 1, 2009

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BYLAWS
OF
BAY AREA STORMWATER MANAGEMENT AGENCIES ASSOCIATION,
a California Nonprofit Public Benefit Corporation

ARTICLE I
ORGANIZATION

Section 1.01 **Name**. The name of the Corporation is BAY AREA STORMWATER MANAGEMENT AGENCIES ASSOCIATION (the ACorporation@).

Section 1.02 **Purposes and Limitations**. The Corporation is a nonprofit public benefit corporation organized under the Nonprofit Public Benefit Corporation Law. The Corporation is organized and operated exclusively for charitable, educational and/or scientific purposes within the meaning of Section 501(c)(3) of the Internal Revenue Code of 1986, as amended (or the corresponding provision of any future United States Internal Revenue law). The primary purpose of the Corporation is to engage in any lawful act or activity for which a corporation may be organized under such law relating to stormwater management.

The specific purposes for which the Corporation is formed are:

(a) To promote the social welfare by facilitating information sharing, cooperation and education concerning stormwater management issues;

(b) To promote the social welfare by facilitating the development of more efficient and effective stormwater products, programs and procedures.

(c) To establish such committees, bureaus and offices as are necessary and incidental to the activities of the Corporation;

(d) To conduct and carry on such other related activities as may be necessary, desirable or incidental to the attainment of its tax-exempt purposes;

(e) To solicit and collect money for any of the exempt purposes of the Corporation, to expend, contribute and disburse any funds and otherwise to handle and deal with or dispose of any funds collected or monies received, for any or all of the purposes of the Corporation, and

(f) To exercise all powers that are or may hereafter be conferred upon a corporation by the laws of the State of California, and to do any and all such other acts and things, including the making and performing of any contracts necessary, desirable or appropriate to carry out or accomplish any of the tax exempt objectives or purposes of the Corporation, except as prohibited by the Articles of Incorporation and the Bylaws of the Corporation.

Notwithstanding any of the above statements of purposes and powers, the Corporation shall not, except to an insubstantial degree, engage in any activities, or exercise

any powers that are not in furtherance of the primary and specific purposes of the Corporation and the Corporation shall not carry on any other activities prohibited by a corporation exempt from Federal income tax under Section 501(c)(3) of the Internal Revenue Code of 1986, as amended (or the corresponding provision of any future United States Internal Revenue Law).

Section 1.03 **Inurement of Net Earnings**. No part of the net earnings of the Corporation shall inure to the benefit of any director, officer or other private person, as defined for purposes of Section 501(c)(3) of the Internal Revenue Code of 1986, as amended (or the corresponding provision of any future United States Internal Revenue Law).

Section 1.04 **Distribution of Assets**. Upon the dissolution or winding up of the Corporation, the Corporation's assets remaining after payment, or provision for payment, of all debts and liabilities of the Corporation shall be distributed for one or more exempt purposes within the meaning of Section 501(c)(3) of the Internal Revenue Code of 1986, as amended (or the corresponding provision of any future United States Internal Revenue Law), or shall be distributed to the federal government or to a state or local government, for a public purpose.

ARTICLE II
OFFICES

Section 2.01 **Principal Office**. The principal office for the transaction of the activities and affairs of the Corporation ("principal executive office") is fixed and located at 437 Encina Avenue, Menlo Park, California 94025. The Board of Directors may change the principal executive office from one location to another. Any change of this location shall be noted by the Secretary of the Corporation on these Bylaws opposite this section, or this section may be amended to state the new location.

Section 2.02 **Other Offices**. The Board of Directors may at any time establish branch or subordinate offices at any place or places, within or without the State of California, where the Corporation is qualified to conduct its activities.

ARTICLE III
MEMBERSHIP

Section 3.01 **Members**. This Corporation shall have no members within the meaning of Section 5056 of the California Corporations Code. Any action which would otherwise require approval by a majority of all members or approval by the members shall require only approval of the Board. All rights which would otherwise vest in the members shall vest in the Board of Directors.

Section 3.02 **Affiliated Persons**. Nothing in this Article III shall limit the right of the Corporation to refer to contributors, advisors, or other persons or entities associated with the Corporation as "members" even though those contributors, advisors, or other persons or entities are not members, and no reference shall constitute that anyone is a

member, within the meaning of Section 5056 of the California Corporations Code. The Corporation may confer by amendment of its Articles of Incorporation or of these Bylaws some or all of the rights of a member, as set forth in the California Nonprofit Corporation Law, upon any person or persons who do not have the right to vote for the election of directors or on a disposition of substantially all of the assets of the Corporation or on a merger or on a dissolution or on changes to the Corporation's Articles of Incorporation or Bylaws, but no such person shall be a member within the meaning of Section 5056 of the California Corporations Code.

ARTICLE IV
DIRECTORS

Section 4.01 **Powers and Responsibilities**. Subject to the provisions and limitations of the California Nonprofit Public Benefit Corporation Law and any other applicable laws, and subject to any limitations in the Articles of Incorporation or these Bylaws, the activities and affairs of the Corporation shall be managed and all corporate powers shall be exercised by, or under the direction of, the Board of Directors. The Board of Directors shall be responsible for, among other things, adopting an annual budget, and adopting policies and positions concerning the affairs of the Corporation. The Board of Directors may delegate the management of the activities of the Corporation to an executive director, a management company, or management committees however composed, provided that the activities and affairs of the Corporation shall be managed, and all corporate powers shall be exercised, by, or under the ultimate direction of, the Board of Directors.

Without prejudice to these general powers and subject to the same limitations, the Board of Directors, in addition to the other powers enumerated in these Bylaws, shall have the power to:

(a) Appoint and remove, subject to any employment agreement and, at the pleasure of the Board of Directors, all officers, agents, and employees of the Corporation; and prescribe powers and duties for them that are consistent with law, with the Articles of Incorporation, and with these Bylaws.

(b) Change the principal executive office in the State of California from one location to another; cause the Corporation to conduct its activities within or without the State of California; and designate any place within or without the State of California for holding any meeting of Directors.

(c) Adopt and use a corporate seal and to alter the form of such seal from time to time, as in their judgment they may deem best, provided such seal shall at all times comply with the provisions of law.

(d) To approve an annual operating budget and capital expenditure budget, to borrow money and incur indebtedness on behalf of the Corporation and cause to be executed and delivered for the Corporation's purposes, in the corporate

name, promissory notes, bonds, debentures, deeds of trust, mortgages, pledges, hypothecations, and other evidences of debt and securities.

(e) To conduct, mange and control the affairs and activities of the Corporation and to make such rules and regulations therefore not inconsistent with applicable federal and California law, the Articles of Incorporation or the Bylaws as they may deem best.

(f) Pursuant to authority hereinafter granted, to appoint committees and to delegate to such committees powers and authority of the Board of Directors in the management of the activities and affairs of the Corporation, except the power to adopt, amend or repeal Bylaws or Articles, and except as otherwise set forth herein.

Section 4.02 **Number and Qualification of Directors**. The authorized number of Directors shall be no less than seven (7) and no more than eleven (11) until changed by amendment to this Bylaw made pursuant to the provisions of Article X of these Bylaws. Directors need not be residents of the State of California.

Section 4.03 **Restriction on Interested Persons as Directors**. No more than forty-nine percent (49%) of the persons serving on the Board of Directors may be interested persons. An "interested person" is (a) any person compensated by the Corporation for services rendered to it within the previous twelve (12) months, whether as a full-time or part-time employee, independent contractor, or otherwise, excluding any reasonable compensation paid to a Director as Director; and (b) any brother, sister, ancestor, descendant, spouse, brother-in-law, sister-in-law, son-in-law, daughter-in-law, mother-in-law, or father-in-law of such person. However, any violation of the provisions of this Bylaw shall not affect the validity or enforceability of any transaction entered into by the Corporation.

Section 4.04 **Election, Designation, and Term of Office of Director(s)**. The Director(s) for the Corporation shall be elected at an annual meeting of the Director(s) by the majority vote of the member(s) of the Board then in office. Each such successor Director shall hold office for one (1) year or until the next annual meeting of Director(s); however, if any such successor Director(s) is/are not elected at an annual meeting, they may be elected at any special meeting of the Board held for that purpose or by unanimous written consent of the Board. Each such Director, including a Director appointed to fill a vacancy or elected at a special Board meeting or by unanimous written consent of the Board, shall hold office until expiration of the term for which appointed or elected and until a successor Director has been elected and qualified. No person shall serve as a Director for more than ten (10) consecutive one (1) year terms.

Section 4.05 **Vacancies; Removal; Resignation of Directors**. A vacancy or vacancies on the Board of Directors shall be deemed to exist on the occurrence of any of the following: (a) the death or resignation of any Director; (b) the declaration by resolution of the Board of Directors of a vacancy in the office of a Director who has been declared of unsound mind by an order of court, convicted of a felony, or found by final order or judgment of any

court to have breached a duty under Article 3 of Chapter 2 of the California Nonprofit Public Benefit Corporation Law; (c) the increase of the authorized number of Directors; or (d) the removal of a Director in accordance with these Bylaws.

A Director may be removed, either with or without cause, by a three-fourths (3/4) vote of all other Directors at the time in office at any regular meeting or special meeting of the Board of Directors. The Board of Directors may set specific attendance guidelines that may cause a Director to be removed for failure to attend Board of Directors' meetings.

Except as provided below, any Director may resign by giving written notice to the Chair of the Board of Directors, the Vice-Chair or the Secretary all defined in Article V below, or the Board of Directors of the Corporation. The resignation shall be effective when the notice is given unless it specifies a later time for the resignation to become effective. If a Director's resignation is effective at a future time, the Board of Directors may elect a successor to take office as of the date when the resignation becomes effective. Except on notice to the Attorney General of State of California, no Director may resign if the Corporation would be left without a duly elected Director or Directors.

Vacancies on the Board of Directors may be filled by a majority of the Directors then in office, whether or not less than a quorum, or by a sole remaining Director.

No reduction of the authorized number of Directors shall have the effect of removing any Director from office before that Director's term of office has expired.

Section 4.06 **Place of Directors' Meetings.** Meetings of the Board shall be held at any place, within or without the State of California, that has been designated by resolution of the Board of Directors or in the notice of the meeting or, if not so designated, at the principal executive office of the Corporation. Any meeting may be held by conference telephone, or similar communication equipment, as long as all Directors participating in the meeting can hear one another. All such Directors shall be deemed to be present in person at such a meeting.

Section 4.07 **Annual Meeting of Directors**. The Board of Directors shall hold an annual meeting on the third Thursday of the month of January of each year. Each such annual meeting shall be held for purposes of organization, the election of officers, and the transaction of other business. Notice of the time and place of this meeting shall be required.

Section 4.08 **Other Regular Meetings**. Other regular meetings of the Board of Directors shall be held monthly at such time and place as the Board of Directors may fix from time to time. The time and place of such meetings will be stated in the minutes of the previous meeting of the Board of Directors.

Section 4.09 **Special Meetings**. Special meetings of the Board of Directors for any purpose may be called at any time by the Chair of the Board of Directors, the Vice-Chair or any two (2) Directors.

Notice of the time and place of special meetings shall be given to each Director by one of the following methods: (a) by personal delivery of written notice; (b) by first-class mail postage prepaid, (c) by telephone, either directly to the Director or to a person at such Director's office who would reasonably be expected to communicate that notice promptly to such Director; (d) by electronic mail (e-mail), either directly to the Director or to a person at such Director's office who would reasonably be expected to communicate that notice promptly to such Director; or (e) by fax, either directly to the Director or to a person at such Director's office who would reasonably be expected to communicate that notice promptly to such Director. All such notices shall be given or sent to the Director's address or telephone number as shown on the records of the Corporation.

Notice sent by first-class mail shall be deposited in the United States mail at least four (4) days before the time set for the meeting. Notices given by personal delivery, telephone, e-mail or fax shall be delivered, telephoned, e-mailed or faxed at least forty-eight (48) hours before the time set for the meeting.

The notice shall state the time of the meeting, and the place if the place is other than the principal executive office of the Corporation. The notice need not specify the purpose of the meeting.

Section 4.10 **Waiver of Notice**. Notice of a meeting need not be given to any Director who, either before or after the meeting, signs a waiver of notice, a written consent to the holding of the meeting, or an approval of the minutes of the meeting. The waiver of notice or consent need not specify the purpose of the meeting. All such waivers, consents, and approvals shall be filed with the corporate records or made a part of the minutes of the meetings. Notice of a meeting need not be given to any Director who attends the meeting and does not protest, before or at the commencement of the meeting, the lack of notice to that Director.

Section 4.11 **Quorum**. A majority of the authorized number of Directors shall constitute a quorum for the transaction of any business, except to adjourn. Every action taken or decision made by a majority of the Directors present at a duly held meeting at which a quorum is present shall be the act of the Board of Directors, subject to the provisions of the California Nonprofit Public Benefit Corporation Law, including, without limitation, those provisions relating to (a) approval of contracts or transactions in which a Director has a direct or indirect material financial interest; (b) approval of certain transactions between corporations having common directorships; (c) creation of, and appointments to, committees of the Board of Directors, and (d) indemnification of Directors. A meeting at which a quorum is initially present may continue to transact business, despite the withdrawal of Directors, if any action taken or decision made is approved by at least a majority of the required quorum for that meeting.

Section 4.12 **Adjournment**. A majority of the Directors present, whether or not a quorum is present, may adjourn any meeting to another time and place.

Section 4.13 **Notice of Adjourned Meeting**. Notice of the time and place of holding an adjourned meeting need not be given unless the original meeting is adjourned for more than twenty-four (24) hours. If the original meeting is adjourned for more than twenty (24) hours, notice of any adjournment to another time and place shall be given, before the time of the adjourned meeting, to the Directors who were not present at the time of the adjournment.

Section 4.14 **Action Without a Meeting**. Pursuant to Section 5211(b) of the California Corporations Code, any action required or permitted to be taken by the Board of Directors may be taken without a meeting if each and every member of the Board of Directors consents in writing to the action; provided, however, that the consent of any Director who has a material financial interest in a transaction to which the Corporation is a party and who is an "interested director," as defined in Section 5233 of the California Corporations Code or any provision herein, shall not be required for approval of that transaction. Such action by written consent shall have the same force and effect as any other validly approved action of the Board of Directors. All such consents shall be filed with the minutes of the proceedings of the Board of Directors.

Section 4.15 **Reimbursement of Directors**. Directors and members of committees may receive such reimbursement of expenses, as may be fixed or determined by resolution of the Board of Directors to be just and reasonable as to the Corporation at the time that such resolution is adopted.

ARTICLE V
OFFICERS

Section 5.01 **Officers of the Corporation**. The officers of the Corporation shall consist of a Chair, a Vice-Chair, a Secretary, and a Chief Financial Officer. The Corporation may also have, at the discretion of the Board of Directors, such other officers as may be appointed in accordance with Section 5.03 of these Bylaws. Any number of offices may be held by the same person, except that neither the Secretary nor the Chief Financial Officer may serve concurrently as the Chair or Vice-Chair of the Board of Directors.

Section 5.02 **Election of Officers**. The officers of the Corporation, except such officers as may be appointed under Section 5.03 of these Bylaws, shall be chosen annually by the Board of Directors from among the Board members. Officers shall serve one (1) year terms. Officers may serve no more than three (3) consecutive one (1) year terms and may be elected to serve again after a one (1) year break in service.

Section 5.03 **Additional Officers**. The Board of Directors may appoint and may authorize the Chair of the Board of Directors, or other officer, to appoint any other

officers that the Corporation may require. Each officer so appointed shall have the title, hold office for the period, have the authority, and perform the duties specified in the Bylaws or determined by the Board of Directors.

Section 5.04 **Removal and Resignation of Officers**. Without prejudice to any rights of an officer under any contract of employment, any officer may be removed with or without cause by the Board of Directors and also, if the officer was not chosen by the Board of Directors, by any officer on whom the Board may confer that power of removal.

Any officer may resign at any time by giving written notice to the Corporation. The resignation shall take effect as of the date the notice is received or at any later time specified in the notice and, unless otherwise specified in the notice, the resignation need not be accepted to be effective. Any resignation shall be without prejudice to the rights, if any, of the Corporation under any contract to which the officer is a party.

Section 5.05 **Vacancies in Office**. A vacancy in any office because of death, resignation, removal, disqualification, or any other cause shall be filled in the manner prescribed in these Bylaws for regular appointments to that office, provided, however, that vacancies need not be filled on an annual basis.

Section 5.06 **Chair of the Board**. Subject to the control of the Board of Directors, the Chair of the Board of Directors shall direct, and control the activities and affairs of the Board and its officers. The Chair of the Board of Directors shall have such other powers and duties as the Board of Directors or these Bylaws may prescribe. In the absence of an executive director, retained either as an employee of the Corporation or as an administrative services contractor of the Corporation, the Chair shall serve as the chief executive officer and direct and control the Corporation's activities and affairs. The Chair shall be given the necessary authority and held responsible for the administration of the Corporation in all its activities and subject only to such policies as may be adopted and such orders as may be issued by the Board of Directors or by any of its committees to which it has delegated power for such action. The Chair shall act as the "duly authorized representative" of the Board of Directors in all matters in which the Board of Directors has not formally designated some other person for that specific purpose. Without prejudice to such general powers as above described, but subject to the limitations, authority and duties of the Chair are hereby expressly declared to be:

(1) To carry out all policies established by the Board of Directors, and to advise on the formation of those policies;

(2) To attend meetings of the Board of Directors and its committees;

(3) To prepare plans for the achievement of the Corporation's long-range objectives and goals as adopted by the Board of Directors;

(4) To promote effective and economical working relationships with other organizations;

(5) To represent the Corporation to the public; and

(6) To perform any other duty that may be necessary in the best interest of the Corporation.

Section 5.07 **Vice-Chair**. If the Chair is absent or disabled, the Vice-Chair shall perform all duties of the Chair. When so acting, the Vice-Chair shall have all powers of, and be subject to, all restrictions on the Chair. The Vice-Chair shall have such other powers and perform such other duties as the Board of Directors or these Bylaws may prescribe.

Section 5.08 **Secretary**. The Secretary shall keep or cause to be kept, at the Corporation's principal executive office or such other place as the Board of Directors may direct, a book of minutes of all meetings, proceedings, and actions of the Board of Directors. The minutes of meetings shall include the time and place that the meeting was held, whether the meeting was annual, regular, or special, and, if special, how authorized, the notice given, and the names of those present at Board and committee meetings. The Secretary shall keep or cause to be kept, at the principal executive office in the State of California, a copy of the Articles of Incorporation and Bylaws, as amended to date.

The Secretary shall give, or cause to be given, notice of all meetings of the Board of Directors and of committees of the Board of Directors required by these Bylaws to be given. The Secretary shall keep the corporate seal in safe custody and shall have such other powers and perform such other duties as the Board of Directors of these Bylaws may prescribe.

Section 5.09 **Chief Financial Officer/Treasurer**. The Chief Financial Officer ("CFO") shall cause to be kept and maintained, adequate and correct books and accounts of the Corporation's properties and transactions. As part of this responsibility, the CFO may appoint a Treasurer who shall keep and maintain adequate and correct books and accounts of the Corporation's properties and transactions. If the CFO does not appoint a Treasurer, then the CFO shall have the responsibilities enumerated herein for the Treasurer. The Treasurer shall send or cause to be given to the Directors such financial statements and reports as are required to be given by law, by these Bylaws, or by the Board of Directors. The books of account shall be open to inspection by any Director at all reasonable times.

The Treasurer shall deposit, or cause to be deposited, all money and other valuables in the name of, and to the credit of, the Corporation with such depositories as the Board of Directors may designate; shall disburse the Corporation's funds as the Board of Directors may order; shall render to the Chair of the Board of Directors, and the Board of Directors, when requested, an account of all transactions as Treasurer and of the financial condition of the Corporation; and shall have such other powers and perform such other duties as the Board of Directors, the CFO or these Bylaws may prescribe.

The Board of Directors may elect to secure in the name of the Corporation and the CFO and the Treasurer a bond in the amount and with the surety or sureties specified by the Board of Directors for faithful performance of the duties of the office and for restoration to the Corporation of all of its books, papers, vouchers, money, and other property of every kind in the possession or under the control of the CFO and Treasurer upon their death, resignation, retirement, or removal from office.

ARTICLE VI
COMMITTEES

Section 6.01 **Committees of the Board**. The Board of Directors, by motion adopted by a majority of the Directors then in office, provided a quorum is present, may create one or more committees, each consisting of two (2) or more Directors, and other persons that the Directors may appoint to serve at the pleasure of the Board of Directors. Appointments to committees of the Board shall be by majority vote of the Directors then in office. The Board of Directors may appoint one or more Directors as alternate members of any such committee, who may replace any absent member at any meeting. Any such committee, to the extent provided in the Board motion, shall only have the authority delegated by the Board of Directors, except that no committee, regardless of Board motion, may:

(1) Fill vacancies on the Board of Directors or on any committee that has the authority of the Board of Directors;

(2) Fix compensation of the Directors for serving on the Board of Directors or on any committee;

(3) Amend or repeal Bylaws or adopt new Bylaws;

(4) Amend or repeal any resolution of the Board of Directors that by its express terms is not so amendable or repealable;

(5) Create any other committees of the Board of Directors or appoint the members of committees of the Board of Directors;

(6) Expend corporate funds to support a nominee for Director after more people have been nominated for Director than can be elected; or

(7) Approve any contract or transaction to which the Corporation is a party and in which one or more of its Directors has a material financial interest, except as special approval is provided for in Section 5233(d)(3) of the California Corporations Code; or

(8) Take any final action in violation of the California Nonprofit Public Benefit Corporation Law.

Section 6.02 **Meetings and Actions of Committees**. Meetings and actions of committees of the Board of Directors shall be governed by, held, and taken in accordance with, the provisions of these Bylaws concerning meetings and other Board actions, except that the time for regular meetings of such committees and the calling of special meetings of such committees may be determined either by Board motion or, if there is none, by motion of the committee of the Board of Directors. Minutes of each meeting of any committee of the Board of Directors shall be kept and shall be filed with the corporate records. The Board of Directors may adopt rules for the government of any committee, provided they are consistent with these Bylaws or, in the absence of rules adopted by the Board of Directors, the committee may adopt such rules.

ARTICLE VII
INDEMNIFICATION OF DIRECTORS, OFFICERS, EMPLOYEES AND OTHER AGENTS

Section 7.01 **Agents, Proceedings, and Expenses**. For the purposes of this Article, "agent" means any person who is or was a Director, officer, employee, or other agent of the Corporation; "proceeding" means any threatened, pending or completed action or proceeding, whether civil, criminal, administrative, or investigative; and "expense" includes, without limitation, attorneys' fees and any expenses of establishing a right to indemnification under Sections 7.04 or 7.05(b) of this Article VII.

Section 7.02 **Actions Other Than By the Corporation**. The Corporation shall have the power to indemnify any person who was or is a party, or is threatened to be made a party, to any proceeding (other than an action by, or in the right of, the Corporation to procure a judgment in its favor, an action brought under Section 5233 of the California Corporations Code, or an action brought by the Attorney General or a person granted relator status by the Attorney General for any breach of duty relating to assets held in charitable trust) by reason of the fact that such person is or was an agent of the Corporation, against expenses, judgments, fines, settlements and other amounts actually and reasonably incurred in connection with such proceeding if that person acted in good faith and in a manner that person reasonably believed to be in the best interests of the Corporation and, in the case of a criminal proceeding, had no reasonable cause to believe the conduct of that person was unlawful. The termination of any proceeding by judgment, order, settlement, conviction, or upon a plea of nolo contendere or its equivalent shall not, of itself, create a presumption that the person did not act in good faith and in a manner which the person reasonably believed to be in the best interests of the Corporation or that the person had reasonable cause to believe that the person's conduct was unlawful.

Section 7.03 **Actions By the Corporation**. The Corporation shall have the power to indemnify any person who was or is a party, or is threatened to be made a party, to any threatened, pending or completed action by, or in the right of, the Corporation, or brought under Section 5233 of the California Corporations Code, or brought by the Attorney General or a person granted relator status by the Attorney General for breach of duty relating to assets

held in charitable trust, to procure a judgment in its favor by reason of the fact that person is or was an agent of the Corporation, against expenses actually and reasonably incurred by that person in connection with the defense or settlement of that action if that person acted in good faith, in a manner that person believed to be in the best interests of the Corporation, and with such care, including reasonable inquiry, as an ordinarily prudent person in a like position would use under similar circumstances. No indemnification shall be made under this Section 7.03 for any of the following reasons:

(a) In respect of any claim, issue or matter as to which that person shall have been adjudged to be liable to the Corporation in the performance of that person's duty to the Corporation, unless, and only to the extent that, the court in which such proceeding is or was pending shall determine upon application that, in view of all the circumstances of the case, that person is fairly and reasonably entitled to indemnity for the expenses and then only to the extent that the court shall determine;

(b) Of amounts paid in settling or otherwise disposing of a threatened or pending action, with or without court approval; or

(c) Of expenses incurred in defending a threatened or pending action which is settled or otherwise disposed of without court approval unless it is settled with the approval of the Attorney General.

Section 7.04 **Successful Defense By Agent**. To the extent that an agent of the Corporation has been successful on the merits in defense of any proceeding referred to in Sections 7.02 or 7.03 of this Article VII, or in defense of any claim, issue, or matter therein, the agent shall be indemnified against expenses actually and reasonably incurred by the agent in connection therewith.

Section 7.05 **Required Approval**. Except as provided in Section 7.04 of this Article VII, any indemnification under this Article VII shall be made by the Corporation only if authorized in the specific case upon a determination that indemnification of the agent is proper in the circumstances because the agent has met the applicable standard of conduct set forth in Section 7.02 or 7.03 of this Article VII, by any of the following:

(a) A majority vote of a quorum consisting of Directors who are not parties to the proceeding; or

(b) The court in which the proceeding is or was pending, upon application made by the Corporation or the agent or the attorney or other person rendering services in connection with the defense, whether or not such application by the agent, attorney, or other person is opposed by the Corporation.

Section 7.06 **Advance of Expenses**. Expenses incurred in defending any proceeding may be advanced by the Corporation before the final disposition of the proceeding upon receipt of an undertaking by, or on behalf of, the agent to repay the amount of the

advance unless it shall be determined ultimately that the agent is entitled to be indemnified as authorized in this Article VII.

Section 7.07 **Other Contractual Rights**. No provision made by a corporation to indemnify its Directors or officers for the defense of any proceeding, whether contained in the Corporation's Articles of Incorporation or Bylaws, a resolution of the Board of Directors, an agreement or otherwise, shall be valid unless consistent with this Article VII. Nothing contained in this Article VII shall affect any right to indemnification to which persons other than Directors and officers of the Corporation may be entitled by contract or otherwise.

Section 7.08 **Limitations.** No indemnification or advance shall be made under this Article VII, except as provided in Sections 7.04 or 7.05(b), in any circumstances where it appears:

(a) That it would be inconsistent with a provision of the Articles of Incorporation, Bylaws, or an agreement in effect at the time of the accrual of the alleged cause of action asserted in the proceeding in which the expenses were incurred or other amounts were paid, which prohibits or otherwise limits indemnification; or

(b) That it would be inconsistent with any condition expressly imposed by a court in approving a settlement.

Section 7.09 **Insurance**. The Corporation shall have the right to purchase and maintain insurance to the full extent permitted by law on behalf of its officers, Directors, employees, and other agents, against any liability asserted against or incurred by any officer, Director, employee, or agent in such capacity or arising out of the officer's, Director's, employee's, or agent's status as such. The Corporation may also purchase and maintain insurance on behalf of any agent of the Corporation against any liability asserted against, or incurred by, the agent in such capacity or arising out of the agent's status as such whether or not the Corporation would have the power to indemnify the agent against the liability under the provisions of this Article VII; provided, however, that the Corporation shall have no power to purchase and maintain such insurance to indemnify any agent of the Corporation for a violation of Section 5233 of the California Corporations Code.

ARTICLE VIII
EXECUTIVE DIRECTOR

Section 8.01 **Employment**. The Board may employ an Executive Director who shall be the administrative head of the Corporation.

Section 8.02 **Duties**. The Executive Director shall be responsible to the Board of Directors. The Executive Director shall be given the authority to carry out the policies established by the Board of Directors. The Executive Director shall have, but not be limited to, the following duties:

(a) Serve as the administrator of all aspects of the day-to-day operations of the Corporation, including operating policies and procedures;

(b) Make recommendations to the Board for its consideration regarding broad policies of the Corporation;

(c) Develop the overall program and services to be provided by the Corporation and its clients;

(d) Be present either personally or through an appointed representative at all Board meetings and be an ex-officio member of all committees; and

(e) Designate, appoint, or remove employees in accordance with established policies and procedures of the Corporation.

ARTICLE IX
RECORDS AND REPORTS

Section 9.01 **Records and Reports**. The Corporation shall keep:

(1) Adequate and correct books and records of account;

(2) Written minutes of the proceedings of its Board of Directors, and committees of the Board of Directors; and

(3) A record of its members giving their names and addresses and the class of membership held by each.

Section 9.02 **Maintenance and Inspection of Articles and Bylaws**. The Corporation shall keep at its principal executive office the original or a copy of the Articles of Incorporation and Bylaws, as amended to date, which shall be open to inspection by the members of the Board of Directors at all reasonable times during office hours.

Section 9.03 **Inspection by Directors**. Every Director shall have the absolute right at any reasonable time to inspect the Corporation's books, records, documents of every kind and physical properties. The inspection may be made in person or by the Director's agent or attorney. The right of inspection includes the right to copy and make extracts of documents.

Section 9.04 **Annual Report**. The Board of Directors shall cause to be prepared and distributed to the membership an annual report, to be sent within one hundred twenty (120) days after the end of the Corporation's fiscal year. That report shall contain the following information, in appropriate detail, for the fiscal year:

(1) The assets and liabilities of the Corporation as of the end of the fiscal year.

(2) The principal changes in assets and liabilities.

(3) The revenue or receipts of the Corporation, both unrestricted and restricted to particular purposes.

(4) The expenses or disbursements of the Corporation for both general and restricted purposes.

(5) A statement of the place where the names and addresses of the current members, if any, are located.

(6) Any information required by Section 9.05 of Article IX of these Bylaws.

The annual report shall be accompanied by any report on it of independent accountants or, if there is no such report, by the certificate of an authorized officer of the Corporation that such statements were prepared without audit from the Corporation's books and records.

This requirement of an annual report shall not apply if the Corporation receives less than Twenty-Five Thousand and No/100 Dollars ($25,000.00) in gross receipts during the fiscal year, provided, however, that the information specified above for inclusion in an annual report must be furnished annually to all Directors who request it in writing.

Section 9.05 **Annual Statement of Certain Transactions and Indemnifications**. As part of the annual report to the Board of Directors of the Corporation, or as a separate document if no annual report is issued, the Corporation shall annually furnish to each member a statement of any transaction or indemnification of the following kind within one hundred twenty (120) days after the end of the Corporation's fiscal year:

(1) Any transaction (i) which the Corporation, its parent, or its subsidiary was a party; (ii) in which an "interested person" had a direct or indirect material financial interest; and (iii) which involved more than Fifty Thousand and No/100 Dollars ($50,000.00), or was one of a number of transactions with the same interested person involving, in the aggregate, more than Fifty Thousand and No/100 Dollars ($50,000.00). For this purpose, an "interested person" is either of the following:

(a) Any Director or officer of the Corporation, its parent, or subsidiary (but mere common directorship shall not be considered such an interest); or

(b) Any holder of more than ten percent (10%) of the voting power of the Corporation, its parent, or its subsidiary. The statement shall include a brief description of the transaction, the names of interested persons involved, their relationship to the Corporation, the nature of their interest in the transaction and, if practicable, the amount of that interest, provided that if the transaction was with a partnership in which the interested person is a partner, only the interest of the partnership need be stated.

(2) Any indemnifications or advances aggregating more than Ten Thousand and No/100 Dollars ($10,000.00) paid during the fiscal year to any officer or Director of the Corporation under Sections 7.01 through 7.03 of these Bylaws, unless that indemnification has already been approved by the Directors under Section 5238(e)(2) of the California Corporations Code.

ARTICLE X
CONFLICTS OF INTERESTS

Section 10.01 **Disqualifying Financial Interest**. Any member of the Board of Directors must obtain the Board of Directors' approval pursuant to Section 10.02 or Section 10.03 and disqualify himself or herself from making, participating in the making of, or attempting to influence any decisions of the Board of Directors or a committee of the Board of Directors if it is reasonably foreseeable that the decision is one in which the Director has a material financial interest.

Section 10.02 **Prior Board of Directors Approval**. The Board of Directors may approve a proposed transaction in which a Director or Directors may have a material financial interest if after reasonable investigation and prior to consummating the transaction or any part thereof, with knowledge of the material facts concerning the transaction and the Director or Directors' interest in transaction, the Board of Directors determines in good faith by vote of a majority of Directors then in office without counting the vote of the interested Director or Directors, that:

(a) The proposed transaction is for the Corporation's own benefit;

(b) The proposed transaction is fair and reasonable as to the Corporation; and

(c) The Corporation cannot obtain a more advantageous arrangement with reasonable efforts under the circumstances.

Section 10.03 **Board of Directors Ratification**. The Board or Directors may ratify a transaction entered into between the Corporation and a Director or Directors in which the Director or Directors had a material financial interest if at the next meeting of the Board of

Directors, the Board of Directors determines in good faith by vote of a majority of Directors then in office without counting the vote of the interested Director or Directors, that:

(a) A committee or person authorized by the Board of Directors approved the transaction;

(b) The Corporation entered into the transaction for its own benefit;

(c) The transaction was fair and reasonable as to the Corporation at the time the Corporation entered into the transaction; and

(d) It was not reasonably practicable to obtain approval of the Board of Directors prior to entering into the transaction.

Section 10.04 **Disqualifying Non-Financial Interest**. Any member of the Board of Directors must likewise disqualify himself or herself when there exists a personal non-financial interest which will prevent the member for applying disinterested skill and undivided loyalty to the Corporation in making or participating in the making of decisions.

Section 10.05 **Procedure of Disqualification**. A Director required to disqualify himself or herself pursuant to Sections 10.01 or 10.04, above, shall (1) immediately disclose the interest, (2) withdraw from any participation in the matter, (3) refrain from attempting to influence any other Director, and (4) refrain from voting. The Director may be counted in determining whether a quorum is present.

Section 10.06 **No Invalidation of Action**. No action or decision of the Board of Directors or committee of the Board of Directors shall be invalid because of the participation therein by a Director or Directors in violation of this policy.

ARTICLE XI
GENERAL CORPORATE MATTERS

Section 11.01 **Construction and Definitions**. Unless the context requires otherwise, the general provisions, rules of construction, and definitions in the California Nonprofit Corporation Law shall govern the construction of these Bylaws. Without limiting the generality of the preceding sentence, the masculine gender includes the feminine and neuter, the singular includes the plural, the plural includes the singular, and the term "person" includes both a legal entity and a natural person.

Section 11.02 **Amendment of Bylaws**. New bylaws may be adopted, or these Bylaws may be amended or repealed, in any manner authorized under Section 5150 of the California Corporations Code, or in any other manner permitted by applicable law. Notwithstanding the foregoing, no amendment may extend the term of a Director beyond that for which such Director was elected.

Section 11.03 **Authority to Bind Corporation**. The Board of Directors, except as in these Bylaws otherwise provided, may authorize any officer or officers, agent or agents, to enter into any contract or execute any instrument in the name of and on behalf of the Corporation, and such authority may be general or confined to specific instances; and unless so authorized by the Board of Directors no officer, agent or employee shall have any power or authority to bind the Corporation by any contract or engagement, or to pledge its credit, or to render it liable for any purpose in any amount.

Section 11.04 **Amendments of Articles**. The Articles of Incorporation of the Corporation may be amended, repealed or new Articles adopted in any manner authorized under Sections 5810 *et seq.* of the California Corporations Code, or in any manner permitted by applicable law.

CERTIFICATE OF ADOPTION

I certify that I am the duly elected and acting Secretary of BAY AREA STORMWATER MANAGEMENT AGENCIES ASSOCIATION, a California non-profit public benefit corporation, that the above Bylaws, consisting of nineteen (19) pages, are the Bylaws of the Corporation as adopted by the Board of Directors of the Corporation on February 26, 2009, and that said Bylaws have not been amended or modified since the date thereof.

Executed on February 26, 2009, at Oakland, California.

Matt Fabry, Secretary

025449

Tualatin River Watershed

Base Map

Tualatin River Watershed Council Atlas Project

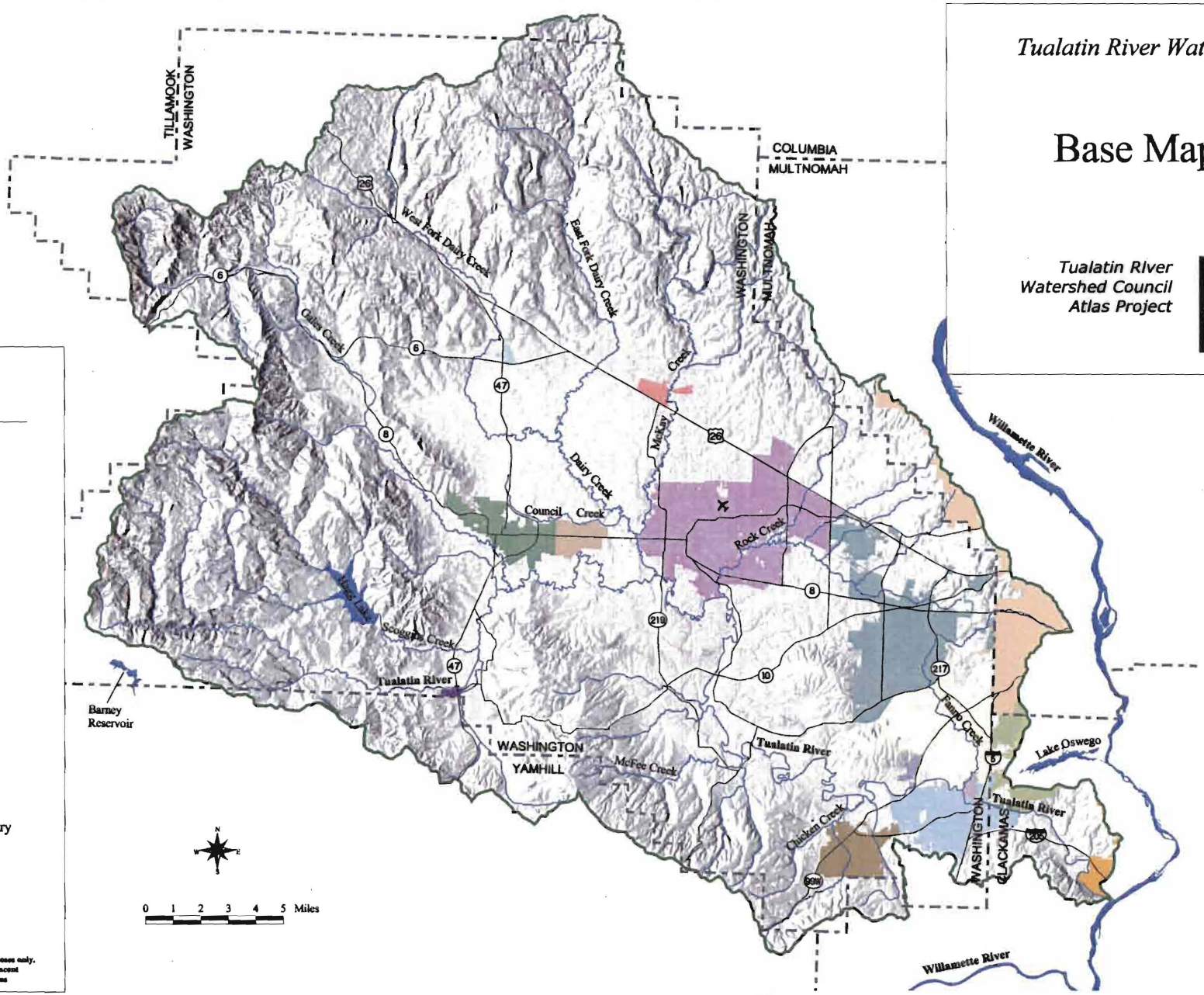

LEGEND

City Limits
- Banks
- Beaverton
- Cornelius
- Durham
- Forest Grove
- Gaston
- Hillsboro
- King City
- Lake Oswego
- North Plains
- Portland
- Rivergrove
- Sherwood
- Tigard
- Tualatin
- West Linn

- Hillsboro Airport
- County Line
- Major Roads
- Tualatin Watershed Boundary
- Streams
- Major Rivers and Lakes

Data Source: Tualatin River Watershed Information System (1996) and Metro (RLIS Lite 2000)

Note: This information is for general and planning purposes only. It is intended to be used together with the text on the adjacent corresponding page in the Tualatin River Watershed Atlas

Meeting with Regional Board Staff regarding Coastkeeper Monitoring

April 21, 2011

1. WQMP details – who, what, where, when, why
2. Effective monitoring data – what does the board view as missing information? What would be most useful information?
3. Permit monitoring – work with City and Horner
4. Sharing of coastkeeper data
    a. tried emailing relevant co-perm when exceedances were noted but seemed ineffective.
        i. Upload to CEDEN
        ii. Quarterly report with summary of exceedances sent to all co-permittees plus regional board

SAN DIEGO REGIONAL WATER QUALITY ASSESSMENT AND OUTREACH PROJECT

MONITORING PLAN

PREPARED FOR THE SAN DIEGO COUNTY WATER AUTHORITY
BY SAN DIEGO COASTKEEPER, LOCAL PROJECT SPONSOR.

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1 Background

1.1 Introduction

The San Diego Coastkeeper is a not-for-profit organization that employs trained citizens and students from the region to conduct chemical, nutrient and microbial monitoring in creeks and rivers in the county's watersheds.

This project is located in San Diego County, California. The land area of the county is approximately 4,200 miles. The county has eleven watersheds, which extend from the San Juan watershed at the Orange County border in the north to the bi-national Tijuana River watershed in the south. Logistical considerations (spatial extent of locations, travel time to and from lab, and sample holding times) generally limit monitoring efforts by Coastkeeper and its volunteers to eight or nine of the 11 watersheds in the county. Most watersheds contain a brackish water element west of Interstate Five (I-5) due to tidal influence. Weather in San Diego County is characterized by a Mediterranean style climate (semi-arid with temperate, wet winters [median annual rainfall of 11"] and dry, warm summers). The county has an approximate population of 3 million, most of which is located within 5 miles of the coast. This equates to more intensive urban land use (commercial, residential) along the coast and more rural and agricultural uses inland.

1.2 Problem Statement

While recent regulatory programs (i.e., MS 4 Stormwater permit R9-2007-0001) and the Surface Water Ambient Monitoring Program (SWAMP) have increased the monitoring efforts and the availability of surface water quality data in the county's watersheds, there is still insufficient information to adequately assess the status of many of the rivers and streams. Additional ambient water quality data is needed to establish a baseline of water quality conditions in San Diego County watersheds, identify impaired water bodies, and provide focus for non-point source pollution prevention efforts. This data can also be used for Clean Water Act 305(b) assessment purposes, or possibly 303(d) impaired water body listings.

The following audiences will be interested in the results of this monitoring: general public, stakeholder groups of the San Diego watersheds, the Southern California Water Research Project, and the SWAMP program of the State Water Resources Control Board.

The constraints to this project may include inclement weather conditions, fire, or other issues that may make sample collection unsafe or unfeasible, and volunteer delinquency or unavailability at planned

1.3 Monitoring Questions

The study questions that this projects seeks to answer are:

i. What are the baseline water quality conditions in San Diego County watersheds as impacted by all pollution sources (point, non-point sources, and other)?

ii. How is water quality in the watersheds characterized, or do ambient levels of chemical, nutrient, bacterial, dissolved metals, and toxicity exceed associated water quality standards or thresholds for these parameters?

1.4 Objectives

To answer the study question, San Diego Coastkeeper (Coastkeeper) will conduct citizen monitoring to augment other monitoring efforts conducted under state programs or permits.

This monitoring will:

i. Continue existing efforts by San Diego Coastkeeper to educate and engage community members on how to monitor water quality in local watersheds. Conduct monitoring at regular intervals (12 times a year conditions permitting) at locations that meet the site selection criteria.

ii. Provide data to fill in the spatial and temporal data gaps (increasing the number of samples in a water body or hydrological unit for better representation). The data may also be useful in increasing the amount of surface water data for a particular constituent in order to help determine an appropriate water quality standard where none currently exists. Coastkeeper and its partners will collect samples for physical, chemical, nutrient, microbial, bio-assessment, dissolved metal, and toxicity analyses. The results from these water quality indicators will compared to water quality

standards or thresholds in the San Diego Basin Plan or other state or federal standards to identify pollution impacted water bodies. Ultimately, the aim is to provide data that complies with all state quality assurance protocols to assist water quality regulators and decision makers.

iii. Share water quality data from with the public with the goal of increasing public knowledge of water quality issues and problems in county watersheds.

2 Study Methods

2.1 Monitoring Design

On the San Diego County coastline, almost 90 locations are sampled weekly by wastewater agencies and the County Department of Environmental Health. However, these locations are only sampled for bacterial indicators.

In addition to this coastal data, many inland creeks and rivers are sampled by the municipal and County of San Diego Stormwater Programs. While these locations are tested for more types of pollutants, the testing frequency is very low (once a year for many), which limits the representativeness of the data.

The focus of Coastkeeper's Water Quality Monitoring efforts in this Monitoring Plan is the county's watersheds. The inland creek and river samples collected each month by Coastkeeper and its volunteers across the County increase the temporal resolution, or frequency, of the data available to assess the water quality in the county's watersheds.

These sites are chosen to be representative of the watershed or hydrologic area that drains to the coast. By focusing on inland water bodies, Coastkeeper monitoring efforts can gauge the health of the creeks and rivers themselves, while building a better understanding of the flow of pollution to our beaches and bays. Inland water bodies are also smaller so the pollutants in them are easier to measure (less susceptible to dilution and dispersion than coastal samples) and usually provide more informative results.

2.1.1 Site Selection Criteria

The Coastkeeper sample location selection criteria for the IRWMP Prop 50 project (San Diego Regional Water Quality Assessment and Outreach Project) are as follows:

- location is a tributary or the principal water course in the hydrologic area and receives flow from the watershed headwaters;
- location is fresh water and has minimal or no tidal influence;
- location is representative of the overall or general ecological health of the stream and hydrologic area;
- any reference sites are chosen upstream of any potential impact or discharge;
- a site chosen to reflect the impact of a particular discharge, tributary or land use is located downstream of the impact where the impact is completely integrated with the water, but upstream of any secondary discharge or disturbance;
- location has safe access;
- permission to cross private property and public land is granted;
- location complements or supplements historical data
- location can be accessed from the bank of a water body using a sampling pole that obtains a sample without collecting surface residue or benthic sediments
- sample can be taken in the main river current or where homogeneous mixing of water occurs;
- location represents an area that possesses value for fish, wildlife or recreational use.

Sampling sites may be changed if, based upon a review of data, it is determined that sufficient data has been collected to assess the water quality for that site, or the site is not providing useful data. Coastkeeper will confer with its partner organizations and Technical Advisory Committee to ensure sampling sites meet the project goals. Prior to final site selection, permission to access the stream will be obtained from all property owners. Coastkeeper will provide training for all

staff and volunteers for sample collection and field analysis per its standard operating procedures.

This Monitoring Plan will exclude sites that do not meet the site selection criteria, and therefore, do not answer the study questions. Coastkeeper will create new Monitoring Plans and associated site selection criteria to answer the study questions of future water quality monitoring projects.

EXCEPTION: Some existing Coastkeeper monitoring sites do not meet this project's selection criteria but are monitored concurrently to this project to satisfy prior contractual obligations (i.e, Golden State Flycasters in San Luis Rey watershed and Southwest Wetlands Interpretive Association / US EPA Initiative for the Tijuana Estuary).

2.1.2 Trash cleanup sites

For trash cleanup sites, I Love A Clean San Diego (ILACSD) will coordinate these events and collection of trash data cards.

ILACSD and San Diego Coastkeeper will focus on five locations and conduct at least two data assessments at each location. Data will be collected in ten categories: Plastic, Biohazard, Construction Debris, Metal, Large Items, Toxic, Biodegradable, Glass, Fabric/Cloth, and Miscellaneous.

Sites will be identified by ILACSD and Coastkeeper staff prior to beginning the subcontractor agreement, and certain qualifications will be taken into account when looking at potential sampling locations. Locations must have water flowing through them at least a portion of the year, provide safe access for volunteers, and show some problems with trash.

Sites may become inaccessible during the winter months if creek beds flood or prove dangerous for volunteers. ILACSD will plan data collection events for times during the year when heavy rainfall is not a factor. All sampling sites are city-owned therefore accessibility will not be affected by landowners.

2.1.3 Bio-assessment Sites

San Diego Stream Team generally follows the non-point pollution probability based sampling design, as described in the manual, "Measuring the Health of California Streams and Rivers: A

methods manual for resource professionals, citizen monitors and natural resources students" second edition (Harrington and Born, 2000).

2.2 Field location of sample collection sites

Table 1 is a list of water quality sampling sites in San Diego County that may be monitored as part of this work. Meta data showing the GPS coordinates (decimal degree), jurisdiction, etc. are available from San Diego Coastkeeper.

The field crew will collect samples at sites where the latitude and longitude (GPS coordinates) were previously recorded during reconnaissance of these stations. If a new station is being sampled, GPS coordinates and cross-referenced photographs will be provided for future reference. Any confusion about site location or prioritization of alternate sites will be resolved in consultation with our internal team

Table 1: List of Monitoring Locations

	Watershed	Water Body	Site ID	Latitude	Longitude	Sampling Frequency
1	San Luis Ray	San Luis Ray River	SLR-010	33.206270	-117.386500	6 times /yr
2	San Luis Ray	San Luis Ray River	SLR-030	33.239767	-117.322433	6 times /yr
3	San Luis Ray	San Luis Ray River	SLR-040	33.261367	-117.235117	6 times /yr
4	San Luis Ray	San Luis Ray River	SLR-050	33.324167	-117.159983	6 times /yr
5	San Luis Ray	Gomez Creek	SLR-070	33.382450	-117.108117	6 times /yr
6	San Luis Ray	Pauma Creek	SLR-080	33.339017	-116.897850	6 times /yr
7	Carlsbad	Buena Vista Creek	BVC-015	33.181417	-117.321417	6 times /yr
8	Carlsbad	Buena Vista Creek	BVC-020	33.177861	-117.341167	6 times /yr
9	Carlsbad	Buena Vista Creek	BVC-035	33.181139	-117.288472	6 times /yr
10	Carlsbad	Encinitas Creek	BTQ-010	33.073194	-117.263917	6 times /yr
11	Carlsbad	San Marcos Creek	BTQ-020	33.088500	-117.244750	6 times /yr
12	Carlsbad	Escondido Creek	EDC-010	33.033889	-117.235556	6 times /yr
13	Carlsbad	Escondido Creek	EDC-020	33.048250	-117.226750	6 times /yr
14	Carlsbad	Escondido Creek	EDC-030	33.071806	-117.164083	6 times /yr
15	Carlsbad	San Elijo Lagoon	SEL-030	33.012833	-117.259861	12 times/yr
16	San Dieguito	San Dieguito River	SGT-028	33.040361	-117.157639	12 times/yr
17	San Dieguito	Lusardi Creek	SGT-025	33.012167	-117.173611	12 times/yr
18	San Dieguito	San Dieguito River	SGT-020	33.003639	-117.199389	12 times/yr
19	Los Peñasquitos	Soledad Creek	LPQ-020	32.929694	-117.241194	12 times/yr
20	Los Peñasquitos	Los Peñasquitos Canyon Creek	LPQ-030	32.906889	-117.230361	12 times/yr
21	Los Peñasquitos	Los Peñasquitos Canyon Creek	LPQ-040	33.904556	-117.222889	12 times/yr
22	Los Peñasquitos	Rose Creek	RSC-010	32.847167	-117.233917	12 times/yr
23	Los Peñasquitos	Rose Creek	RSC-020	32.856139	-117.220861	12 times/yr
24	Los Peñasquitos	Rose Creek	RSC-030	32.860583	-117.209417	12 times/yr
25	Los Peñasquitos	Rose Creek	RSC-040	32.863805	-117.190611	12 times/yr
26	San Diego	San Diego River	SDG-010	32.764333	-117.170083	12 times/yr
27	San Diego	San Diego River	SDG-020	32.838861	-117.045222	12 times/yr
28	Pueblo	Chollas Creek, N. fork	PBL-016	32.712028	-117.120250	6 times /yr
29	Pueblo	Chollas Creek, S. fork	PBL-020	32.727150	-117.069950	12 times/yr
30	Pueblo	Chollas Creek, S. fork	PBL-040	32.691917	-117.112639	12 times/yr
31	Sweetwater	Sweetwater River	SWT-010	32.650500	-117.063528	12 times/yr
32	Sweetwater	Sweetwater River	SWT-020	32.674917	-117.016556	12 times/yr
33	Sweetwater	Sweetwater River	SWT-030	32.733417	-116.940722	12 times/yr
34	Otay	Otay River	OTY-025	32.588750	-116.971444	12 times/yr
35	Otay	Otay River	OTY-020	32.587528	-117.046194	12 times/yr
36	Tijuana	Tijuana River	TJN-040	32.559317	-117.092839	6 times /yr
37	Tijuana	Tijuana River	TJN-050	32.551028	-117.084047	6 times /yr
38	Tijuana	Tijuana River	TJN-060	32.547639	-117.065550	6 times /yr

Figure 1 Map of Monitoring Locations

2.3 Work statement and general overview of monitoring performed

Water samples will be collected during 12 events a year from up to 38 sites (conditions permitting) located in nine of the eleven watersheds in the county to answer the Project study questions. Site is selection is based on a non-judgmental sampling design to represent overall water quality in the watersheds. Samples will be collected with conditions (weather, safety, and stream flow) permitting. Sampling events will be scheduled without respect to rainfall and weather, i.e., sampling events are scheduled before weather forecasts are available. Sampling/ monitoring locations are listed in Table 1. Locations that tend to have ephemeral flow characteristics are shown with a frequency of 6 times/ year.

2.4 Selected parameters

2.4.1 Water chemistry, nutrients, bacteria, and toxicity

The role of San Diego Coastkeeper in this project is to train and equip citizen volunteers to collect water samples and perform field and laboratory analyses of multiple water quality parameters. The work to be performed is described below in Table 2.

2.4.2 Bio-assessment

Employing a non-point source sampling design, SDST will perform bio-assessment by collecting benthic macro-invertebrates (BMI's) once annually (in spring) for the duration of the project. Benthic macro-invertebrate monitoring will be performed according to the SWAMP S.O.P. for "Collecting Benthic Macro invertebrate Samples and Associated Physical and Chemical Data for Ambient Bio-assessments in California" 2007.

2.4.3 Dissolved trace metals

The SDSU School of Public Health, Environmental Chemistry Laboratory will measure dissolved trace metal levels in surface waters samples collected for this event. Dissolved metal analyses will include copper, zinc, lead, cadmium, chromium, and nickel. These samples will be collected by Coastkeeper trained volunteers in accordance with sample collection standard operating procedures and transferred to SDSU using chain of custody procedures and paperwork.

2.4.4 Trash Cleanup

I Love A Clean San Diego will conduct inland cleanup events with volunteers at five watershed locations. Volunteers will remove trash and recyclables and weigh the bags before disposing of

them. ILACSD will track the total number of volunteers, number of cleanups, as well as pounds of debris collected for each event.

2.5 Sampling and Lab Analyses

Table 2 summarizes the sample analyses by method, and type (ambient field analysis or transported for later analysis to Coastkeeper Laboratory or a professional laboratory). The Type column also includes what agency will perform the parameter analysis.

Table 2: Water quality constituents/ parameters to be monitored and measurement techniques

Parameter	Type	Method
Temperature	F (Coastkeeper)	Hach HQ40d electrometric probe
Dissolved Oxygen	F (Coastkeeper)	Hach HQ40d Lumineescent Dissolved Oxygen
pH	F (Coastkeeper)	Oakton Double Junction Electrode
Conductivity (fresh water) or Salinity (marine)	F (Coastkeeper)	Hach HQ40d Conductivity probe
Nitrate	L (Coastkeeper)	Hach 8192 and Hach 10206 (TNT 835) **
Total Orthophosphate	L (Coastkeeper)	Hach 8048 and Hach 10210 (TNT 843)
Ammonia	L (Coastkeeper)	Hach 10205 (TNT 830)
Total Coliform bacteria	L (Coastkeeper)	IDEXX Colisure or Colilert 18
E. Coli bacteria	L (Coastkeeper)	IDEXX Colisure or Colilert 18
Enterococci bacteria	L (Coastkeeper)	IDEXX Enterolert

Toxicity	L (Coastkeeper)	QwikLite 200 Bio-Sensor System using ASTM E1924
Bio-assessment (Benthic macro-invertebrates)	L and P (SDST)	SWAMP Bio-assessment procedures
Bio-assessment (Temperature)	F (SDST)	Thermometric
Bio-assessment (Dissolved oxygen)	F (SDST)	Colorimetric indigo carmine Vacuum ampoules, Color Comparator
Bio-assessment (Alkalinity)	F (SDST)	Titration: Phenolphthlalein and Bromocresol Green/Methyl Red
Bio-assessment (pH)	F (SDST)	Electrometric
Bio-assessment (Nutrients)	F (SDST)	Cadmium Reduction or Zinc Reduction using comparators
Bio-assessment (Conductivity)	F (SDST)	Electrometric
Dissolved Metals (Cadmium, Chromium, Nickel, Lead, Copper, and Zinc)	P (SDSU)	Inductively Coupled Plasma Mass Spectrometer ICP-MS. EPA method 200.8

Codes for Table 2: Type: F: field analysis, L: in-house lab analysis, P: sample only, send to outside professional lab

3 Data

3.1 Data Quality Evaluation and Data Reporting

Data quality evaluation and data reporting will be as specified in the QAPP for this project. Quality control will include a 5% field duplicate level for all parameters. We do not anticipate needing additional special data quality evaluation or data reporting procedures.

3.2 Intended Usage of Data

The data can be used by regulators and municipal storm water agencies to better assess water quality in San Diego County watersheds. This data will be useful in providing information for watershed management and pollution prevention. The data will be made available to the public for purposes of watershed education. It will also be made available to the regulatory and resource management agencies through CEDEN to supplement their existing data collection efforts. One potential application of the data will be to provide information to the Regional and State Boards for use under Clean Water Act section 305(b) or 303(d) reporting. Data will also be available through posting on the World Wide Web for public use.

The data in this program is not designed to identify compliance issues. However, it can be used to document poor water quality when results for a particular analyte exceed or violate an associated water quality standard.

3.3 Data Management

Analytic results for these constituents will be entered into an MS 2007 Excel spread sheet or Access database with separate fields for parameter, method, site ID, site name, hydrological unit, analysis, qualifier, result, and laboratory. The data format will be SWAMP compatible. All of the data collected and analyzed for this project will be sent to, or compiled within, and maintained at the San Diego Coastkeeper. This includes Coastkeeper water quality for chemistry, nutrient, bacteria and toxicity, SDST bio-assessment including field measurements for water chemistry, SDSU dissolved metals, and ILACSD trash data. Data will be posted on the San Diego Stream Team and San Diego Coastkeeper websites (http://sdwatersheds.org or http://www.sdcoastkeeper.org/content/waterWatch/monitorData.htm) for sharing with interested parties. Data will also be collated and shared with the State Water Resources Control Board, the San Diego Regional Water Quality Control Board, in a SWAMP compatible format and upon

request to other state, federal, and local agencies and organizations. The main database will be maintained at San Diego Coastkeeper offices.

4 Collaborations

As part of its effort to engage local communities in promoting understanding of water pollution issues that face our county, San Diego Coastkeeper works with its citizen volunteers and partner organizations to collect surface water quality samples from the county's watersheds. These persons bring various talents, dedication and their time to build the capacity and value of the San Diego Coastkeeper Water Quality Monitoring Program.

This project links with a number of other projects that are already operational throughout the county:

- Tijuana Estuary Research Reserve Project
- Los Peñasquitos Research Reserve Project
- Escondido Creek Conservancy Work
- Friends of Famosa Slough
- San Elijo Lagoon Conservancy
- THINK BLUE's Chollas Creek Water Quality Protection & Habitat Enhancement Project
- San Diego River Conservancy and/or The San Diego River Park Foundation and/or San Diego River Watershed Workgroup
- Friends of the River (http://www.friendsoftheriver.org)
- Batiquitos Lagoon Foundation
- Aqua Hedionda Lagoon Foundation
- Golden State Flycasters

Other local or regional plans in which the project is included:

- San Diego River Watershed Management Plan: http://www.projectcleanwater.org/html/ws_san_diego_river_plan.html
- Project Clean Water: http://www.projectcleanwater.org

5 Project Schedule Timeline

Table 3: Project schedule timeline

Task or Activity	Date (DD/Month/YYYY)		Deliverable	Deliverable Due Date
	Anticipated Date of Initiation	Anticipated Date of Completion		
Start project	31 Dec 2009	31 Dec 2012	None	
Task 1. Project Administration and Quarterly Reports				
1.1 Project administration (prepare project monitoring, quality assurance, and assurance and evaluation plans and subcontract MOUs, etc.)	1 Jan 2010	1 May 2010	MP, QAPP, and PAEP, Subcontractor documentation	1 May 2010
1.2 Submit Quarterly Reports detailing progress on each of the tasks and deliverables met	January 2010	July 2012	Quarterly progress reports	By the 15th day of the month (January, April, July, October) following the quarter

1.3 Attend meetings and TACs for data management, citizen monitoring and TMDL programs in the region.	1 March 2010	Life of project	Lists of meetings Attended in Quarterly progress reports	By the 15th day of the month (January, April, July, October) following the quarter
Task 2. Establish Regional Water Monitoring Training and Resource Center.				
Task or Activity	*Anticipated Date of Initiation*	*Anticipated Date of Completion*	*Deliverable*	*Deliverable Due Date*
2.1 Conduct outreach and education campaign and recruit project participants.	1January 2010	Life of project	Quarterly Progress Reports with Outreach and Education Materials <u>Outcome</u> Increase public awareness and recruit and train citizens to collect water quality data in accordance to U.S. EPA/SWRCB guidelines to help support the Citizen Monitoring.	By the 15th day of the month following the quarter
2.2 Develop training materials	1 March 2010	1 May 2010	Quarterly progress reports with training materials	By the 15th day of the month following the quarter

2.3 Conduct monthly training workshops at Coastkeeper office/lab.	10 March 2010	6 x year over life of project, ending on 30 March 2012	Quarterly Progress Reports with bi-monthly sign-in sheets <u>Outcome</u> After 2 years, more than 500 trained individuals on watershed management, water quality monitoring, data access, analysis and implementation	By the 15th day of the month following the quarter
2.4 Conduct monthly citizen monitoring events at nine watersheds throughout San Diego County	13 March 2010	12 x year over life of project, ending on 30 May 2012	Quarterly Progress Reports with signed liability forms	By the 15th day of the month following the quarter
2.5 Conduct invertebrate bio-assessment sample collection	May 2010	1 x year over life of project, ending on 30 May 2012	Quarterly progress reports	By the 15th day of the month following the quarter
2.6 Integrate monitoring data into the Coastkeeper on-line database (ArcIMS interactive mapping)	14 March 2010	12 x year over life of project, 12 x year over life of project, ending on 30 May 2012	Citizen Monitoring Results posted on Coastkeeper website <u>Outcome</u> Posting of data on the existing Common Ground on-line data repository so that it is publicly accessible; inclusion of information on the WISE data management system to enhance management decisions	By the 15th day of the month following the quarter

2.7 Identify and implement measures to evaluate the effectiveness of Coastkeeper citizen training center	September 2010	2 x year over life of project	Measures to evaluate effectiveness of center will be included in the Project Monitoring and Reporting Plan (Submitted under Task 3).	July 2012
Task 3. Develop and Implement Public Outreach and Education Campaign				
Task or Activity	*Anticipated Date of Initiation*	*Anticipated Date of Completion*	*Deliverable*	*Deliverable Due Date*
3.1 Conduct Data Management Summits for water quality professionals and practitioners over the course of the project	3rd QTR each year of project starting October 2010	1 per year in 3rd QTR. Ending after October 2011	Quarterly Progress Reports with Summit agenda/ program & sign-in sheets, minutes from summit / other write up <u>Outcome</u> Collect feedback on how to make these tools even more effective, facilitate progress in regional data management	By the 15th day of the month following the quarter
3.2 Inland water body trash removal events at 5 sites coordinated by ILACSD	June 2010	Twice a year ending by June 2012	Quarterly Progress Reports with assessment and analysis of trash data <u>Outcome</u> Engage community members and volunteers to participate in trash removal in watersheds to reduce impacts to surface waters	By the 15th day of the month following the quarter

3.2 Develop and distribute outreach materials at various meetings and events	July 2010	Life of project, ending after May 2012	Quarterly Progress Reports with copy of outreach materials; list of meetings & events attended <u>Outcome</u> Inform the public about water quality in San Diego County and involve interested parties by providing opportunities for involvement. The events will include World Water Monitoring Day and Coastal Snapshot Day.	By the 15th day of the month following the quarter
Task 4: Develop San Diego Region Watersheds Water Quality 'Watersheds Report'				
Task or Activity	*Anticipated Date of Initiation*	*Anticipated Date of Completion*	*Deliverable*	*Deliverable Due Date*
4.1 Conduct 10 workshops to identify pollution trends in the San Diego Watersheds.	May 2010	Bi-monthly until November 2011 (immediately preceding monitoring events)	Quarterly Progress Reports with workshop agendas/minutes & sign-in sheets	By the 15th day of the month following the quarter

4.2 Develop 'Watersheds Report' using the data collected and identify locations with poor water quality, and recommendations for community involvement to improve the health of their local waterways	March 2010	April 2012	'Watersheds Report'	April 2012
4.3 Publish, print and distribute 'Watersheds Report' through print newsletters, e-mail alert, on the website and at various meetings, fairs, events and through Coastkeeper's hands-on education programs.	March 2010	July 2012	List of how and when 'Watersheds Report' has been distributed (through the media, by hard copy and electronically) <u>Outcome</u> Information made available about the state of water quality on a watershed basis.	July 2012
Task 5. Final Report				
5.1 Submit Final Report detailing progress on each of the tasks and deliverables met	September 2014	31 Dec 2012	Final Report that tracks activities, challenges and progress through the course of the project.	31 Dec 2012

6 References

1. Ode, P.R. 2007: "Collecting macro-invertebrate samples and associated physical and chemical data for ambient bio-assessment in California". California State Water Resources Control Board Surface Water Ambient Monitoring Program (SWAMP) Bio-assessment SOP 001.

2. San Diego Coastkeeper field sample collection S.O.P. 2010.

San Diego Regional Stormwater Copermittees
Regional Management Committee

County of San Diego
County Operations Center
5500 Overland Ave, Room 120
San Diego, 92123

*** UPDATED April 19, 2011 ***

Thursday, April 21, 2011
10:00 a.m. - 12:30 p.m.
Agenda

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1. Introductions and Announcements (10 minutes)

Copermittee representatives will introduce themselves and provide updates on significant recent or upcoming activities. Other participants may introduce themselves, make general announcements, or raise issues not otherwise identified on the agenda. No action or vote will be taken on any issues raised.

2. Administrative Issues (5 minutes)

Updates and Presentations

3. Regional Water Quality Control Board Update (5 minutes)

4. Update on Permit Re-issuance (15 minutes)

Jon Van Rhyn will present a status update on issues relating to the upcoming re-issuance of the Municipal Stormwater Permit.

5. Status Update on Hydromodification Plan Implementation (20 minutes)

Sara Agahi will present a status update on the hydromodification management planning efforts, including the sizing tools available and the monitoring plan.

Copermittee Business

6. Review, Discuss and Approve the Changes to Copermittee Management Approach for FY 2011-12 (40 minutes) ** VOTE **

- Combine the Industrial and Commercial Sources Workgroup with the Municipal Activities Workgroup; *(Requirement: unanimous approval of 21 Copermittees)*
- Combine the Program Planning Subcommittee with the Fiscal, Reporting, and Assessment Workgroup and the Regional WURMP Workgroup; *(Requirement: unanimous approval of 21 Copermittees)*

- Reduce the minimum meeting frequency for regional working Bodies to twice per year; *(Requirement: unanimous approval of 21 Copermittees)*
- Allow the County to serve all Chair and Secretary Assignments for FY 2011-12; *(Requirements: Consent of individual Copermittees and majority approval of Management Committee)*

7. Review and Approve the FY 2011-12 Regional Consolidated Work Plan and Budgets (45 minutes) ** VOTE **

The Copermittees will be asked to approve a FY 2011-12 Regional Consolidated Work Plan and Budget as recommended by the Program Planning Subcommittee. This recommended workplan and budget reflects the changes to the Copermittee Management Approach discussed in Agenda Item 6.

8. Unfunded Mandates Claim Data Quality meetings (10 minutes)

Copermittees have completed surveys to provide data and information on key aspects of the ongoing stormwater unfunded mandates claim. We now need to clarify some existing responses, and to gather additional data. To assist in completing this process, meetings are now being scheduled with jurisdictional "subject leads" for the week of May 9, 2011. Background information will be provided to assist Copermittees in preparing for the meetings.

9. Future Meetings

The next Management Committee meeting is tentatively scheduled for June 16, 2011.

Directions to meeting location:

County Operations Center
5500 Overland Ave, Room 120, San Diego, 92123

- **From I-15** take Clairemont Mesa Boulevard West exit
- Right on Overland Avenue
- Right on Farnham Street to Parking Structure
- All guests are to park in the parking structure lower floors. The visitor entrance is on Franham Street. The facility is Room 120 (training room) in 5500 Overland Avenue. After parking, guests will need to walk out to the sidewalk on Farnham Street and follow the signs west to the 5500 building (this routes you around current construction). The entrance to 5500 is on the east facing side of the building.

- **From State Route 163** take Clairemont Mesa Boulevard East exit
- Left on Overland Avenue
- Right on Farnham Street to Parking Structure
- All guests are to park in the parking structure lower floors. The visitor entrance is on Franham Street. The facility is Room 120 (training room) in 5500 Overland Avenue. After parking, guests will need to walk out to the sidewalk on Farnham Street and follow the signs west to the 5500 building (this routes you around current construction). The entrance to 5500 is on the east facing side of the building.

ORANGE COUNTY
OC PublicWorks
Our Community. Our Commitment.

San Diego Regional Water Quality Control Board
Regional MS4 Permit – Discussion on Monitoring Requirements

AGENDA
Wednesday, April 27th, 2011
10 a.m. – 12 p.m.

Location: 2301 N. Glassell St., Orange
Room: Laboratory Conference Room

I. **Welcome/Introductions**	Group	10:00-10:05
II. **Regional Permit Overview**	Regional Board Staff	10:05-10:15
III. **4th Term R9 MS4 Permit Monitoring**	County Staff	10:15-11:00
IV. **Regional Permit Monitoring Discussion**	Group	11:00-12:00

DRAFT

www.ocwatersheds.com
OC Watersheds Program
County of Orange

Orange County's Monitoring and Reporting Program

Presentation to San Diego Regional Board Staff

April 27, 2011

"Monitoring is most useful when it results in more effective management decisions, specifically management decisions that protect or rehabilitate the environment"

National Academy of Sciences, 1991

Monitoring and Reporting Program Goals from R9-2009-0002

1. Assess compliance with Order R9-2009-0002;
2. Measure and improve the effectiveness of the Copermittees' runoff management programs;
3. Assess the chemical, physical and biological impacts to receiving waters resulting from MS4 discharges;
4. Characterize storm water discharges;
5. Identify sources of pollutants;
6. Prioritize drainage and sub-drainage areas that need management actions;
7. Detect and eliminate illicit discharges and illicit connections to the MS4; and
8. Assess the overall health of receiving waters.
9. Provide information to implement required BMP improvements

Designed to Answer Core Questions from R9-2009-002

1. Are conditions in receiving waters protective, or likely to be protective of beneficial uses?
2. What is the extent and magnitude of the current or potential receiving water problems?
3. What is the relative MS4 discharge contribution to the receiving water problem(s)?
4. What are the sources of MS4 discharge that contribute to receiving water problem(s)?
5. Are conditions in receiving waters getting better or worse?

4th Term Monitoring and Reporting Program Elements

- Mass Loading Stations (MLS)
- Urban Stream Bioassessment (BA)
  - Stormwater Monitoring Coalition (SMC) Southern California IBI Development
  - FW Sediment Chemistry / Toxicity Special Study
- Ambient Coastal Receiving Waters (ACRW)
  - Regional Harbor Monitoring Program (RHMP - Dana Point Harbor)
- Wet Weather MS4 Stormwater Action Levels (SALs)
- Other Regional Monitoring
  - Shoreline Microbiology (Coastal Stormdrain Outfall Program)
  - Southern California Bight Regional Monitoring

4th Term MRP Elements (cont)

- Non-stormwater MS4 Numeric Action Levels (NALs)
- Other Special Studies
  - Aliso Creek Bacti Investigation
  - Trash / Litter Impairment

Mass Load Monitoring

- Primary Purpose
  - To detect long term trends in pollutant loads
  - To determine event mean concentrations (EMCs) for estimating annual loads or total watershed loads
  - Are conditions in receiving waters getting better or worse?
- Conducted in 6 regional channels
- Streamgauges for volume measurement
- Frequency
  - 2 stormwater events – 1st storm of season meeting EPA criteria + 1 storm after February 1
    - Series of time-weighted composite samples spanning the entire runoff event
  - 2 dry-weather events at least 3 months apart between May and October
    - 24-hr time-weighted composite samples
- Analyses
  - Water chemistry and aqueous toxicity

Mass Load Monitoring Stations

Aqueous Chemistry Monitoring for the MLS, BA, ACRW, and NALs Programs

Conventional	Pesticides	Metals (tot & diss)	Bacteria
TDS	Diazinon*	Arsenic	Total Coliform
TSS	Chlorpyrifos*	Cadmium	Fecal Coliform
Turbidity	Malathion*	Chromium	*Enterococci*
Hardness	Carbamates@	Copper	
pH, SC, T, DO	Pyrethroids@	Lead	
Tot & Diss P		Nickel	
Nitrate + Nitrite		Selenium	
Ammonia / TKN		Zinc	
BOD5^ / COD^			
TOC / DOC			
MBAS / O&G			

*Analysis will also include other OP pesticides

@Initially only in Prima and Segunda Deschecha Watersheds

^The usefulness of these data will be evaluated in the 2010-11 reporting year

Toxicity Testing Specifics - MLS

	Freq	Required Tests	3rd Term Permit	4th Term Permit
Dry	2	2 chronic FW	NA	CS, SG, FHMS@
		2 acute FW	NA	CS, HS, FHMS@
		2 chronic SW*	NA	MS, SUF
Storm	2	2 chronic SW	MS, MG, SUD, SUF	MS, SUF
		1 acute SW	MS	MS
		2 acute FW	NA	CS, HS

ACRW

	Freq	Required Tests	3rd Term Permit	4th Term Permit
Dry	2	2 chronic SW	MS, MG, SUF, SUD	MS, SUF
		1 acute SW	MS	MS
Storm	2	2 chronic SW	MS, MG, SUF,SUD	MS, SUF
		1 acute SW	MS	MS

*Surfzone near outlet of Prima Deshecha only; @Aliso Creek only

CS – *Ceriodaphnia* Survival; SG – *Selenastrum* Growth; FHMS –Fathead Minnow Survival; SUD – Sea Urchin Development; SUF – Sea Urchin Fertilization; HS – *Hyalella azteca* Survival; MS – Mysid Survival; MG – Mysid Growth

Stormwater Action Level Monitoring

- Primary Purposes and Question Addressed
  - Prioritize drainage and sub-drainage areas that need management actions
  - To detect and eliminate ID/ICs to the MS4
  - What is the relative MS4 stormwater discharge contribution to the receiving water problem(s)?
- 1 randomly selected stormdrain (major outfall) from each hydrologic subarea (HSA). Other sites will be added once evaluations are completed at initial sites.
- Selection Criteria
  - Stormwater conveyance structure must be composed of reinforced concrete or corrugated metal pipe with no upstream earthen component
  - Dimensions must meet EPA sizing criteria for major outfalls
  - The major outfall must discharge to waters of the United States
- Frequency – 2 representative storms/year

SALs Locations

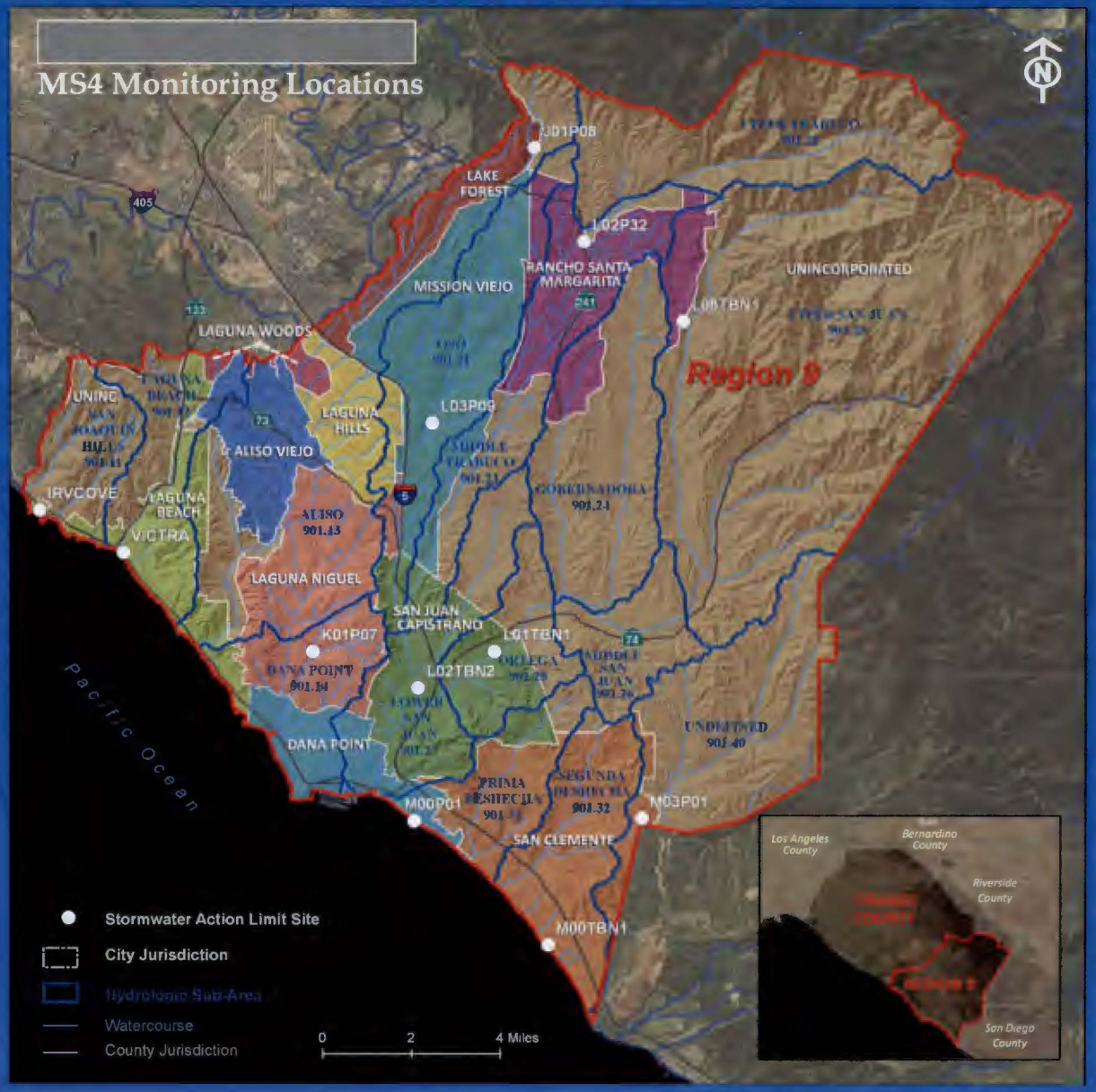

Aqueous Chemistry for SALs Program

Constituents	Type	Location
Turbidity	≤24 hr composite	Stormdrain discharge
Nitrate + nitrite, total phosphorus	≤24 hr composite	Stormdrain discharge
Total Metals (Cd, Cu, Pb, Ni, Zn)	≤24 hr composite	Stormdrain discharge
Water Hardness	grab	Receiving water if FW

Bioassessment Monitoring

- Primary Purpose and Question Addressed
  - Assess the overall health of freshwater urban streams and channels using a multiple lines of evidence (MLE) approach
  - Are conditions in these water bodies protective or likely to be protective of beneficial uses?
- At least 1 site in each Watershed Management Area, 3 reference sites, and new sites each year for the SMC's Southern California Regional IBI development
- Benthic macroinvertebrate (BMI) collection using SWAMP protocols + SWAMP algae assessment (taxonomy and biomass)
- Samples for water chemistry and aqueous toxicity (48-hr/7-day *Ceriodaphnia* survival, 96-hr *Hyalella* survival, 96-hr *Selenastrum* growth)
- Sediment chemistry / toxicity for 2-year special study at 4 sites including 1 ref site

Bioassessment Locations

Ambient Coastal Receiving Waters Monitoring

- Primary Purpose and Question Addressed
  - Assess the chemical, physical, and biological impacts to coastal receiving waters resulting from dry weather and stormwater discharges from the MS4
  - Are conditions in coastal receiving waters protective or likely to be protective of beneficial uses?
- Conducted in ecologically sensitive receiving waters of coastal stormdrains
- Dana Point Harbor monitored as part of Regional Harbor Monitoring Program (RHMP)
- 2 stormwater and 2 dry-weather samplings per year
- Aqueous chemistry and toxicity

ACRW Locations

Regional Shoreline Bacteria Monitoring

- Primary Purposes and Question Addressed
  - Assess potential impacts to public health from water contact recreation in receiving waters of coastal stormdrains during dry weather.
  - Prioritize drainage and sub-drainage areas that need management actions.
  - Are conditions in receiving waters protective, or likely to be protective of beneficial uses?
- Shoreline microbiological monitoring conducted in collaboration with SOCWA and OCHCA
- Weekly dry-weather sampling of stormdrain discharge (no sample if diverted) and surfzone receiving waters (upcoast and downcoast)
- Fecal indicator bacteria: total coliform, fecal coliform, and *Enterococci*
- Temperature (stormdrain and surfzone), flow estimate

Regional Shoreline FIB Locations

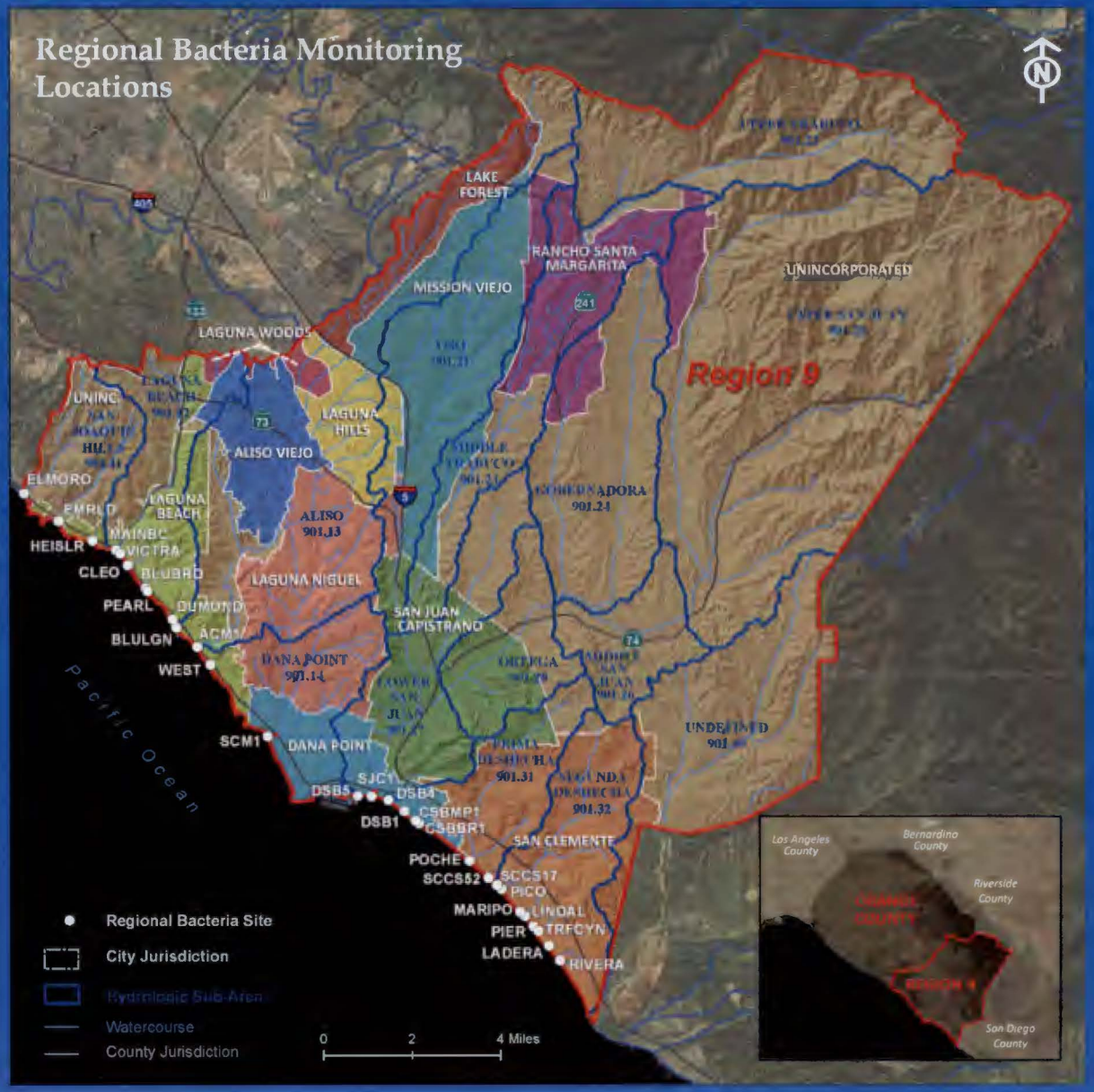

Non-stormwater Action Level Monitoring

- Primary Purpose and Question Addressed
  - Detect and eliminate ID/ICs to the MS4
  - Prioritize drainage and sub-drainage areas that need management actions
  - What are the sources of MS4 discharge that contribute to receiving water problem(s)?
- Targeted drains from 3rd Term Permit DW Reconnaissance Program + randomly selected drains in unrepresented HSAs
- Drain must discharge to receiving water
- One sampling during dry-season (May – Sept) and one sampling during wet season (Oct – April)
- NALs Constituents
  - Fecal Coliform, *Enterococci*, Turbidity, pH, DO, TN, TP, MBAS, total recoverable metals (Cd, Cr, Cu, Ni, Ag, Zn)
  - Hardness in receiving waters
- MLS Chemical Constituents (see prior table)
- Additional Analyses
  - Human specific bacteriodes for microbial source tracking
  - DWRP field measurements (NO_3, NH_3, total Cl_2, ortho-PO_4)
  - Receiving water monitoring (u/s and d/s of discharge) for NALs constituents

NALs Locations

Region 8 vs Region 9 MRP for OC

Region 8	Region 9
Area - 481.6 mi^2; Population – 2.6 million 2010/11 Monitoring Costs - $1.217 million Monitoring year: Jul 1 – Jun 30 Annual report due date: Nov 15	Area – 202.2 mi^2; Population – 0.553 million 2010/11 Monitoring Costs - $1.024 million* Monitoring year: Oct 1 – Sep 30 Annual report due date: Oct 1
Mass Emissions: 11 sites – 3 ST, 3 DW; 1st storm of season includes priority pollutants	Mass Loading: 6 sites – 2 ST, 2 DW
Bioassessment: 12 sites + SMC IBI sites	Bioassessment: 10 sites + SMC IBI sites
Pathogen Monitoring: 9 coastal sites, 6 regional channels, weekly	Coastal Stormdrain Outfall Program: 26 coastal sites, weekly when safely accessible
Estuary, Wetlands: 20 sites – aqueous chemistry, toxicity; sediment toxicity/benthic infaunal assemblage	Ambient Coastal Receiving Waters: 14 sites – aqueous chemistry, toxicity
None	Wet Weather MS4 Monitoring (SALs)* (not included in 2010/11 costs)
Dry Weather MS4 Reconnaissance: 50+ sites, 3-5 times May – Oct, source ID triggered by exceedance of upper bound of regional tolerance interval statistic	Non-Stormwater MS4 Numeric Action Levels (NALs)* – 26 sites, 1 sample May-Sep, 1 sample Oct-Apr, source ID triggered by NAL exceedance (not included in 2010/11 costs)
Newport Bay Trash Management Plan	Trash and Litter Impairment Assessment***(not included in 2010/11 costs)**

Summary

- The current monitoring levels in south Orange County are excessive relative to differences in land areas and populations between regions.
- The County is seeking uniformity of monitoring across the County, in both permit regions.
- Monitoring should be conducted to achieve specific goals and to answer specific questions
- Once the goals are achieved and those questions are answered resources should be directed to new areas.

Storm Water Permit Reissuance

Presented to the Quality of Life Water Quality Working Group

Todd Snyder, County of San Diego
June 28, 2011

Storm Water Permit Reissuance

Today's Presentation:

- Permit reissuance process
- Copermittee Vision for storm water management
- Overview of Report of Waste Discharge (ROWD)

Permit Reissuance Process

- Order R9-2007-0001 set to expire January 2012
- ROWD required 180 days prior to expiration
- RWQCB staff: new Permit will be "regional"
- Unknown when draft Permit will be released

Why do Copermittees need a Vision?

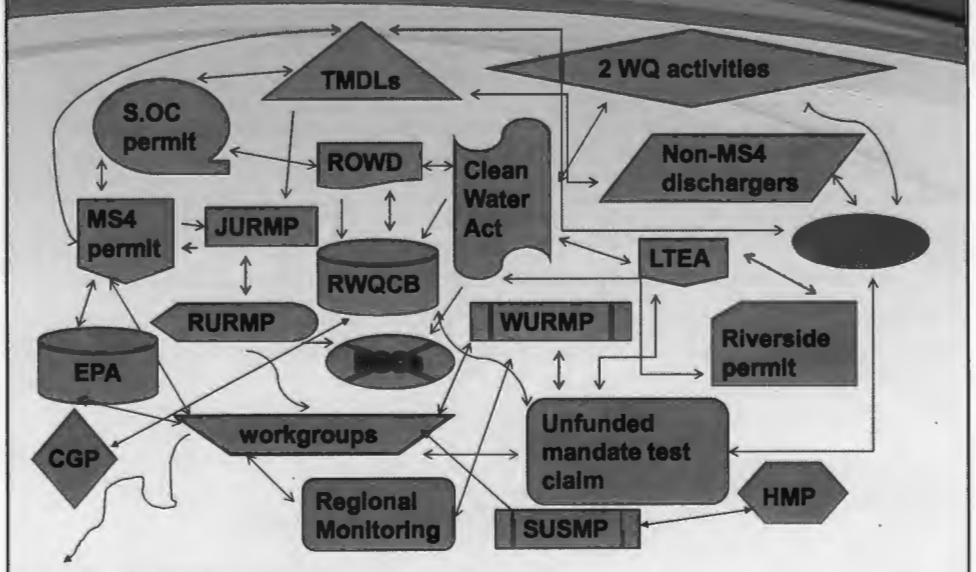

Diagram Courtesy of City of Carlsbad Environmental Programs

No … really, why do we need a vision?

Regulatory Drivers

- ROWD due June 2011
- Riverside/South Orange County MS4 Permits recently reissued
- More TMDLs have been adopted since last Permit

Other Factors

- Unfunded Mandate Test Claim results
- RWQCB/public need for enforceability and accountability
- Copermittee/public need for best use of limited resources: prioritization, elimination of redundancies, increased efficiencies

Visioning Process & Scope

- 5 facilitated workshops with all 21 Copermittees to develop consensus vision, goals, and objectives
- 20-year time horizon
- Focus on urban runoff and surface water protection
- Put aside funding issues for now

Vision

Our vision is for the protection of water quality in our streams, bays, ocean, and other water bodies that benefits wildlife, recreation, the environment, and other community needs as supported by sustainable storm water management.

Goal #1 *Achieve sustainable storm water management that balances social, economic, & environmental needs*

Objectives

a. Promote public policy that supports sustainable storm water management

b. Obtain public support for long-term and reliable funding for storm water programs

c. Involve the public in understanding and defining sustainable storm water management

Goal #2 *Protect and restore appropriate beneficial uses for prioritized water bodies impacted by storm water*

Objectives

a. Establish source, constituent, and water body priorities for each watershed

b. Promote beneficial use designations and water quality objectives that are scientifically valid

c. Reduce flows and pollutant loads from storm water that adversely impact receiving water integrity

d. Promote watershed stewardship as a social standard

e. Support the identification and development of sustainable projects that provide diverse habitats and water quality benefits

Goal #3 *Focus storm water management on sources and practices jurisdictions have the ability to control*

Objectives

a. Identify the pollutant of concern loads that are attributable to storm water

b. Work with regulatory agencies and other parties to ensure that pollutant sources are re-assigned to the appropriate regulatory process (air, water, and waste)

c. Promote public policy that reduces pollutants of concern through source product replacement / substitution / application

Goal #4

Support development of a regulatory framework & organizational structure that facilitate implementation of the most effective & efficient storm water program

Objectives

a. Focus assessment on information needed to implement the most effective control strategies and adaptive management

b. Establish an organizational and workload structure that focuses storm water program implementation at the watershed or other appropriate scale

c. Streamline program implementation, reporting, and assessment

d. Develop TMDL implementation plans that integrate sustainable storm water management

How did the Vision inform the ROWD?

Key Concepts

- Simplified reporting
- Streamlined and more meaningful assessment
- Better coordinated and more useful monitoring
- Enhanced TMDL/watershed focus
- More strategic planning as a region

Report of Waste Discharge

Required Elements

- Updated Copermittee contact info
- Description of the nature of the discharge
- Proposed changes to urban runoff management and monitoring programs, including justification

Report of Waste Discharge

Organization

- Section 1 – Introduction/General Issues
- Section 2 – Recommended Modifications to Order R9-2007-0001
  - 2.A. – Management Programs
  - 2.B. – Monitoring Programs
- Section 3 – Watershed Adaptive Management Strategy
- Section 4 – Conclusions

Current Structure

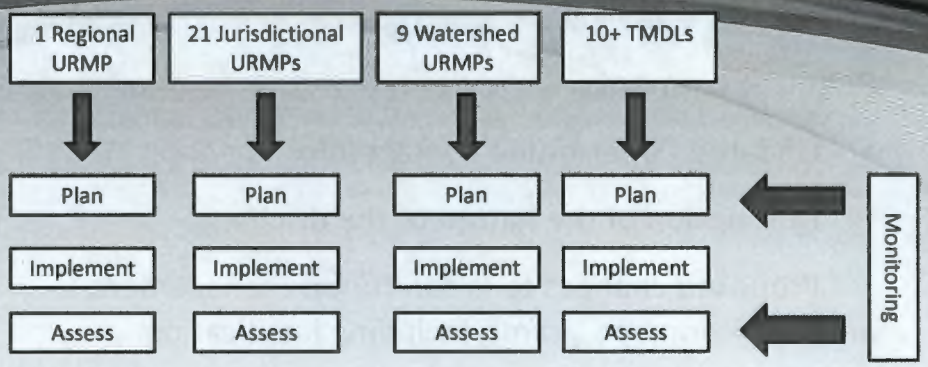

CHALLENGES ...

- Redundant / duplicative planning, implementation & assessment
- Limited flexibility to shift resources away from "core" requirements
- Duplicative watershed programs (TMDLs and WURMPs)
- Monitoring mostly focused on characterization of water quality; data not easily used to inform management decisions

Proposed Structure

Watershed Adaptive Management Strategy

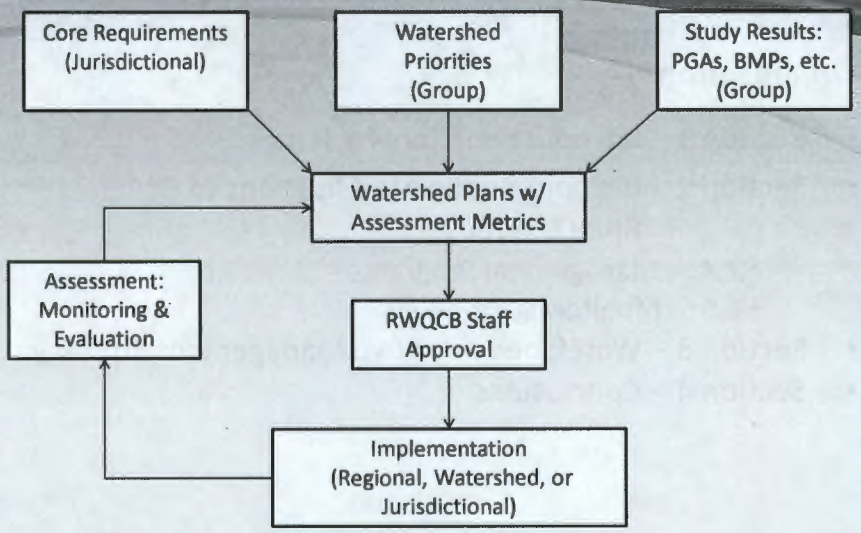

Watershed Adaptive Management Strategy

Considerations

- Criteria need to be established so that modifications to "core" requirements are based on sound and impartial information

- Jurisdictional autonomy needs to be maintained with regard to decision-making

- Watershed-based assessment metrics are needed to gauge progress, but accountability for compliance should remain with the jurisdiction

025512

Wayne Chiu - Notice of Public Workshop

From: Laurie Walsh
To: reg9_sandiegoco_ms4permit@swrcb18.waterboards.ca.gov; reg9_riversideco_m...
Date: 4/2/2012 2:26 PM
Subject: Notice of Public Workshop
Attachments: Final Regional MS4 Storm Water Permit-Workshop Notice San .pdf

Interested Parties:

The San Diego Water Board is considering the development and adoption of a Regional Municipal Separate Storm Sewer System (MS4) Storm Water NPDES Permit that will be issued to municipal Copermittees in San Diego County, Southern Orange County and Riverside County. Currently, each of these counties within the San Diego Region has its own MS4 Storm Water Permit. In order to better achieve regulatory consistency as well as maximum efficiency and economy of resources, the San Diego Water Board has initiated work to develop a single Regional MS4 Storm Water Permit based on the boundaries of the San Diego Region instead of county political boundaries. Under this approach, the permit being developed will uniformly regulate all three counties within the San Diego Region.

The San Diego Water Board will accept comments regarding the administrative draft of the Regional MS4 Storm Water Permit at an upcoming workshop. Attached is the Notice of Public Workshop which includes all pertinent information. **The administrative draft of the Tentative Order will be available at the San Diego Water Boards website on or before April 9, 2012.**

Regards,
San Diego Water Board
Regional MS4 Storm Water Permit Team

California Regional Water Quality Control Board

San Diego Region

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Secretary for Environmental Protection

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(858) 467-2952 • Fax (858) 571-6972
http:// www.waterboards.ca.gov/sandiego

NOTICE OF PUBLIC WORKSHOP

A workshop will be held
to receive comments regarding an administrative draft of
Tentative Order No. R9-2012-0011, NPDES No. CAS01092662
Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region

Wednesday, April 25, 2012
from 9:30 a.m. - 12:00 p.m.
California Regional Water Quality Control Board, San Diego Region
Regional Water Board Room
San Diego Water Board Office Building
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

SUBJECT OF WORKSHOP

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) will accept comments regarding the administrative draft of a Regional NPDES Permit for Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region (Regional MS4 Storm Water Permit) (Tentative Order No. R9-2012-0011). A quorum of San Diego Water Board members may be present. The administrative draft of the Tentative Order will be available **on or before April 9th, 2012** and can be viewed at:

http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

BACKGROUND

The San Diego Water Board is considering the development and adoption of a Regional Municipal Separate Storm Sewer System (MS4) Storm Water NPDES Permit that will be issued to municipal Copermittees in San Diego County, Southern Orange County and Riverside County. Currently, each of these counties within the San Diego Region has its own MS4 Storm Water Permit. In order to better achieve regulatory consistency as well as maximum efficiency and economy of resources, the San Diego Water Board has initiated work to develop a single Regional MS4 Storm Water Permit based on the boundaries of the San Diego Region instead of county political boundaries. Under this approach, the permit being developed will uniformly regulate all three counties within the San Diego Region. The Regional MS4 Storm Water Permit will also provide opportunities for a comprehensive monitoring framework, incentive for a regional collaborative approach, and opportunities for regional cost efficiencies amongst the Copermittees. Upon adoption by the San Diego Water Board, this Regional MS4 Storm Water

Permit will be issued to all 39 Copermittees in a phased manner according to the expiration dates of their current MS4 Storm Water permit.

PROCEDURAL MATTERS

The April 25, 2012, Workshop will be informal and conducted to facilitate discussion on the Regional MS4 Storm Water Permit concept. There will be no sworn testimony or cross-examination of participants. San Diego Water Board staff will summarize significant elements of the Regional MS4 Storm Water Permit and explain the process for stakeholder representatives to participate in a series of focused meetings with the San Diego Water Board. The tentative focused meeting schedule and associated Regional MS4 Storm Water Permit sections selected for discussion are:

May 16, 2012 – Water Quality Improvement Plans

May 23, 2012 – Monitoring and Assessment Requirements

June 6, 2012 – Jurisdictional Programs

June 13, 2012 – Reporting Requirements

Workshop participants may present comments and ask clarifying questions regarding the Regional MS4 Storm Water Permit. Written comments may also be submitted in advance to help frame discussion during the Workshop. The San Diego Water Board may respond to, but will not necessarily provide oral or written responses to, the comments received prior to or at the Workshop. The San Diego Water Board will, however, consider these comments in the development of a Tentative Order. The San Diego Water Board will issue a separate public hearing notice announcing the release of a Tentative Order for public review and comment, the deadline for submission of comments, and the date of the public hearing for the San Diego Water Board to consider the comments received, public testimony, and adoption of a Tentative Order. Once released, the Tentative Order will serve as the public comment draft permit for purposes of applicable public notice requirements under the Code of Federal Regulations (40 C.F.R. § 124.10) and Water Code section 13167.5, subdivision (b). Therefore, interested persons submitting comments in advance of the Workshop must resubmit any comments they wish the San Diego Water Board to respond to during the public comment period that will be established for the future Tentative Order.

To ensure a productive and efficient Workshop, and to ensure that all attending have an opportunity to participate, oral presentations from any interested persons may be **limited to three (3) minutes** or otherwise limited at the discretion of the San Diego Water staff conducting the Workshop. Participants with similar comments are requested to make joint presentations.

ELECTRONIC MAIL LIST SUBSCRIPTION

The San Diego Water Board has established an electronic mail list specifically for information and notices on the development of a Regional MS4 Storm Water Permit. The San Diego Water Board will use the email list to notify interested persons of upcoming important events and the availability of on-line documents. Persons interested in receiving future notices and information on this specific project can subscribe to one (1) of the electronic mail lists titled "Orange County MS4 Permit, " Riverside County MS4 Permit, or "San Diego MS4 Permit ", located on the San Diego Water Board website at:

http://www.waterboards.ca.gov/resources/email_subscriptions/reg9_subscribe.shtml

Persons who wish to receive hard copy notices of future notices or meetings on the Regional MS4 Storm Water Permit in lieu of electronic notices should submit a request to Mr. Wayne Chiu, Water Resource Control Engineer, 9174 Sky Park Court, Suite 100, San Diego, CA 92123.

Please bring this matter to the attention of any person known to you who may be affected by the administrative draft of the Regional MS4 Storm Water Permit.

INFORMATION REGARDING WORKSHOP

If you have any questions or wish to receive a hard copy of the Tentative Order, please contact Wayne Chiu (858) 637-5558 or via e-mail at wchiu@waterboards.ca.gov.

025516

Laurie Walsh - Administrative Draft of Regional MS4 Permit

From: <lyris@swrcb18.waterboards.ca.gov>
To: LWalsh@waterboards.ca.gov
Date: 4/9/2012 11:04 AM
Subject: Administrative Draft of Regional MS4 Permit

Stakeholders:

The San Diego Water Board is considering the development and adoption of a Regional Municipal Separate Storm Sewer System Storm Water NPDES Permit (Regional MS4 Permit) that will be issued to municipal Copermittees in San Diego County, Southern Orange County and Riverside County. Currently, each of these counties within the San Diego Region has its own municipal storm water permit. In order to better achieve regulatory consistency as well as maximum efficiency and economy of resources, the San Diego Water Board developed a single Regional MS4 Permit based on the boundaries of the San Diego Region instead of county political boundaries. Under this approach, the permit will uniformly regulate all three counties within the San Diego Region.

An administrative draft of the Regional MS4 Permit is posted on the San Diego Water Boards website at http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml. At the upcoming April 25, 2012 workshop, the San Diego Water Board will inform stakeholders about the administrative draft review process, focused work group meetings, and the formal public review and permit adoption schedule. Workshop participants may present comments and ask clarifying questions regarding the Regional MS4 Administrative Draft Permit. Written comments may also be submitted in advance to help frame discussion during the Workshop. The San Diego Water Board may respond to, but will not necessarily provide oral or written responses to, the comments received prior to or at the Workshop. **Written comments received by the San Diego Water Board on or before June 15, 2012 will be considered in development of the Tentative Order.**

A copy of the Notice of Public Workshop, which includes all pertinent workshop information, is also posted on the San Diego Water Board's website at the link provided above.

Regards,
San Diego Water Board
Regional MS4 Permit Team

You are currently subscribed to reg9_riversideco_ms4permit as: lwalsh@waterboards.ca.gov.

To unsubscribe click here: http://swrcb18.waterboards.ca.gov/u?id=500886.85d32d801af47be2dd00c692f1c0dfcd&n=T&l=reg9_riversideco_ms4permit&o=327319

(It may be necessary to cut and paste the above URL if the line is broken)

or send a blank email to leave-327319-500886.85d32d801af47be2dd00c692f1c0dfcd@swrcb18.waterboards.ca.gov

025517

Wayne Chiu - Pre-Workshop Administrative Draft Permit Comments

From: "Kleis, Andrew" <AKleis@sandiego.gov>
To: "Wayne Chiu (wchiu@waterboards.ca.gov)" <wchiu@waterboards.ca.gov>
Date: 4/23/2012 9:07 AM
Subject: Pre-Workshop Administrative Draft Permit Comments
CC: "McFadden, Kris" <KMcFadden@sandiego.gov>, "Harris, Bill" <BillHarris@sa...

Hi Wayne-

In advance of the 4/25 workshop, we wanted to provide several process and technical comments to guide the discussion on the 25th and/or in the subsequent focused meetings.

Process Comments

- We request that Board staff provide detail regarding the intent of key sections of the Permit both during an introductory presentation on 4/25 as well as during each of the subsequent focused meetings. Discussion regarding Permit language may be facilitated where consensus can first be reached regarding purpose/intent.
- We request that the Regional Board allow the Copermittees to provide input on the workshop process and topics at the 4/25 workshop, such as:
    - Based on initial discussion with Board staff, we understand that municipal, environmental, building industry and EPA representatives will be invited to participate in the focused meetings. We request that Board staff allow for broader participation in the meetings, such as, representation from the business community at large.
    - We request that Board staff include Section II.A and II.C in at least one of the focused meetings, such as the first meeting regarding the Water Quality Improvement Plans.

Technical Comments

1. ***Some of the Permit conditions increase the scope of Copermittee responsibility beyond MS4 discharges. The Permit should be revised to limit Copermittee responsibilities to their MS4 discharges***. Here are some examples:
    - Water Quality Improvement Plans. Not only are the Copermittees required to develop WQIPs to identify water quality issues resulting from discharges from our MS4s, but also to identify all other sources of pollution in each watershed, define numeric targets that apply to the receiving waters, develop strategies to meet these numeric targets, and conduct monitoring. (Permit p. 13) Our WQIP duties go well beyond controlling and monitoring our own discharges, instead making the Copermittees ultimately responsible for the restoration of impaired beneficial uses in receiving waters.
    - Monitoring and Assessment Requirements. We are not only required to monitor MS4 discharges and their effect on water quality, but to monitor sources outside of our jurisdiction and control. This is and should be the State's responsibility. For example: "(v) In addition to the non-storm water MS4 monitoring stations identified in accordance with Provisions D.1.a.(1)(a)(i)-(iv) above, *each Copermittee must identify stations that will be screened and monitored during dry weather days to identify non-storm water discharges from sources not directly under the jurisdiction of the Copermittee*." (p. 27)

2. ***The Permit should allow for the Copermittees to use an iterative, adaptive management process to more efficiently achieve water quality goals.*** As discussed in the process comments above, this topic warrants further discussion to understand how Board staff attempted to incorporate adaptive management into key

sections of the Permit, such as Section II.A. In the context of a Permit built around numeric targets, adaptive management and the allowance for an iterative process should be reflected in the Prohibitions and Limitations, and in reduced prescriptiveness in programs. For example, the Permit should not specify that Copermittees must inventory, track and inspect every residential property every five years (II.E.5.d.1.). Instead, Copermittees should be able to identify a more efficient combination of education, enforcement, incentives and other strategies.

3. ***Monitoring should be strategic to ensure that the most important questions are being addressed in a prioritized, cost-effective manner***. In the context of a Permit based on numeric targets, where compliance is results-driven, the Copermittees (as with the implementation sections of the Permit), should have the ability and responsibility for strategically planning their monitoring efforts to help support our program planning and adaptive management efforts. Time should be set aside at the monitoring and assessment focused meeting to discuss how best to accomplish this objective.

4. ***HMP/development regulations are unclear or more background is needed:***
   a. In Section E.3.c.(3), it is unclear how the proposed hydromodification management BMP requirements relate to the current HMP that was developed by the San Diego copermittees under the current permit; there is no mention of the current HMP. Provide clarification at the workshop on April 25th or address in more details at the Jurisdictional Program focused meeting.
   b. In Section E.3.b.(2), the PDP categories size limit is proposed to go down to 10,000 sf for commercial, industrial, residential and public development projects. it is unreasonable to impose the BMP sizing criteria and HMP requirements on developments as small as 10,000sf. It is likely to be infeasible to meet HMP requirement on a 10,000 sf development. Provide analysis/justification to demonstrate impact of different development sizes on water quality to justify choosing this threshold.

Please call if you would like to discuss. Thanks, -Drew

DREW KLEIS
Program Manager
City of San Diego
Transportation & Storm Water Department
9370 Chesapeake Drive, Suite 100, MS 1900
San Diego, CA 92123
858.541.4329 | direct
619.990.5515 | mobile

025519

Wayne Chiu - Re: Today's Workshop--Suggestion for Public Review Process

From: Laurie Walsh
To: Filar, Cheryl
Date: 4/26/2012 8:00 AM
Subject: Re: Today's Workshop--Suggestion for Public Review Process
CC: Chiu, Wayne; Christina Arias; David Barker; Eric Becker

Cheryl,

This is a good suggestion and in direct line with our request to provide suggestions rather than just say what we proposed won't work. I will definitely bring it up to the team during our debrief meeting this afternoon.

Thanks for coming yesterday, it was good to see you.
Laurie

Laurie A. Walsh, P.E.
Water Resource Control Engineer
Central Watershed Protection Unit
San Diego Regional Water Quality Control Board
9174 Sky Park Court Suite 100
San Diego Ca 92123
LWalsh@waterboards.ca.gov
Phone: 858-467-2970
Customer Service Survey at http://www.calepa.ca.gov/Customer/

>>> Cheryl Filar <Cfilar@ci.escondido.ca.us> 4/25/2012 5:19 PM >>>
Laurie,

First of all, many thanks to you and the other Board staff for providing today's permit workshop. It is valuable and is a good opportunity for Copermittees and other stakeholders to better understand the rationale behind the permit and to also ask questions and make comments. I know we all look forward to more discussion.

Concerning future opportunities to provide input, I understand the Board staff's concern about including too many stakeholders in the planned focused workshops. However, in listening to comments today, I thought a middle ground might be inviting one representative from each watershed versus only two representatives for each county. I think, at least in the case of San Diego County, this would mirror the proposed permit's structure and provide an opportunity for more stakeholders from different jurisdictions and watersheds to engage in direct dialogue with the Board. I recall that sometime ago Board staff said that with this permit cycle they wanted to decentralize regional stormwater Copermittee management by disbursing it through watershed leads instead of concentrating it in one lead Copermittee. I think it would be appropriate then for the public review process to reflect this intent.

Thank you for considering my suggestion. I'm sure there will be many others!

Cheryl Filar
Environmental Programs Manager
City of Escondido

025520

Utilities Department
201 N Broadway
Escondido, CA 92025

760-839-6315
760-291-7254 (cell)

760-839-4668 (Stormwater Hotline)

SIGN-IN

PPS WORKGROUP MEETING 5/2/12

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Eric Becker	SDRWQCB	ebecker@ " "

025523

Laurie Walsh - San Diego Regional MS4 Permit-Change to Focused Meeting Schedule

From: Eric Becker
To: kemmerer.john@epa.gov; lin.cindy@epamail.epa.gov
Date: 5/3/2012 10:06 AM
Subject: San Diego Regional MS4 Permit-Change to Focused Meeting Schedule
CC: Barker, David; Chiu, Wayne; Laurie Walsh

John & Cindy-

Based on comments from our public workshop last week, nobody liked our proposed meeting process and schedule. We are working to make the process more "inclusive" and include a facilitator. Therefore, the focused meeting dates will have to change. We will let you know as soon as possible of the updated schedule and process.

Thanks again for coming to the workshop.

ESB

Eric Becker, P.E.
Senior Water Resources Control Engineer
Southern Watershed Unit
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9174 Sky Park Court, Suite 100
San Diego, CA 92123
(858) 492-1785
(858) 571-6972
EBecker@waterboards.ca.gov

025524

Wayne Chiu - Re: Proposed Content and Schedule for Admin Draft Permit Workshops

From: Laurie Walsh
To: VanRhyn, Jon
Date: 5/8/2012 2:16 PM
Subject: Re: Proposed Content and Schedule for Admin Draft Permit Workshops
CC: 'Kleis, Andrew'; 'Richard.Boon@ocpw.ocgov.com'; Chiu, Wayne; David Ba...

Jon,

Thank you providing us with an organized proposal from the San Diego County Copermittees for modification to the Administrative Draft Permit focus meeting schedule. We are still in the process of securing a facilitator and are looking to finalize a meeting schedule and nomination process as soon as possible. We are also in the process of meeting with both the Orange County and Riverside County Copermittees to collect any proposed modifications they may suggest to the focus meeting process.

We appreciate your timely response to our request for suggestions to the process and your offer to schedule meeting locations. We will be updating all stakeholders on any changes to the process as soon as possible.

Laurie A. Walsh, P.E.
Water Resource Control Engineer
Central Watershed Protection Unit
San Diego Regional Water Quality Control Board
9174 Sky Park Court Suite 100
San Diego Ca 92123
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>>> "VanRhyn, Jon" <Jon.VanRhyn@sdcounty.ca.gov> 5/7/2012 1:46 PM >>>
Eric and Laurie -- Thank you again for sitting down with the Copermittees to discuss potential changes to the administrative draft permit workshop process. For your consideration, the attached file contains a proposed timeline and workshop content that we believe accords with the San Diego Copermittees' priorities for discussion. As we discussed at the meeting, we believe that at least 2-3 weeks are needed between the workshops to allow the Copermittees to develop and coordinate content.

This is a County proposal, but we've incorporated input received from the cities of San Diego and Carlsbad.

025525

Also note that we do not represent either of the other two counties. As you know, they have additional concerns that may not be addressed by our proposed changes. We would also support additional modifications as necessary to address these concerns.

We're happy to arrange the meeting locations once we reach agreement on dates. Please let Todd or me know if you have questions or would like to discuss. Jon

Jon Van Rhyn
WATER QUALITY PROGRAM MANAGER
COUNTY OF SAN DIEGO WATERSHED PROTECTION PROGRAM
5201 RUFFIN ROAD, STE. P, SAN DIEGO CA 92123
858-495-5133

025526

Wayne Chiu - Riverside Copermittee Meeting Attendees

From: Wayne Chiu
To: Padres, Claudio
Date: 5/10/2012 8:47 AM
Subject: Riverside Copermittee Meeting Attendees
CC: Becker, Eric; Walsh, Laurie

Hi Claudio,

Thanks for making the time to meet with us yesterday. We heard a lot of information that has provided some food for thought. Hopefully, you all learned something about what we are trying to achieve with the regional permit, providing some food for thought on how we might be able to improve the permit requirements.

We forgot to make a sign in sheet and I just wanted to make sure that I have the correct names of the people who attended the meeting. Other than Laurie, Eric and myself from the San Diego Water Board, those in attendance included:

David Garcia, Riverside County Flood Control
Claudio Padres, Riverside County Flood Control
Bob Callecot, Consultant to Riverside County Flood Control
Mike Shetler, County of Riverside
Bill Woolsey, City of Murrieta
Aldo Licitra, City of Temecula
Steve Palmer, City of Wildomar (attended via phone)

Please let me know if the list above is correct, and if I misspelled anyone's name.

Thanks again,
Wayne

Wayne Chiu, PE
Water Resource Control Engineer
Southern Watershed Unit
California Regional Water Quality Control Board
San Diego Region
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E.02552 Becker

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SAN DIEGO REGIONAL
WATER QUALITY
CONTROL BOARD
2012 MAY 15 P 2:21

Ryan M. F. Baron
Senior Deputy
(714) 834-5206

File No. W-410(a)

May 10, 2012

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Catherine George Hagan
Senior Staff Counsel
Office of Chief Counsel
State Water Resources Control Board
P.O. Box 100
Sacramento, CA 95812-0100

Re: Administrative Draft/Regional MS4 Permit (San Diego Region)

Dear Ms. Hagan:

I am writing you on behalf of the County of Orange and the Orange County Flood Control District (collectively, the "County") regarding the Administrative Draft of the new Regional MS4 Permit (posted April 9, 2012). The County is currently evaluating the Administrative Draft and is involved in discussions with Regional Board staff on the various technical aspects of the proposed permit. Although the County has not formulated a position on the concept of a regional permit, the proposed document raises several questions.

An initial issue is the authority of the Regional Board to impose a region-wide permit. The Administrative Draft does not analyze why the regional permit is now the preferred approach or what the procedural authority of the Regional Board is to adopt it. I am generally aware that federal regulations specify that MS4 permits can be adopted system-wide, jurisdiction-wide or by watershed. The Administrative Draft would regulate three large metropolitan counties that do not share an interconnected municipal storm sewer system, are not under common jurisdiction, and contain separate and distinct watersheds. Other than the regional MS4 permit that was adopted with the consensus of the co-permittees in the Bay Area, the County is unaware of any prior precedent to impose a regional MS4 permit. As a point of procedure, it is also unclear how the regional permit application process is consistent with federal law. The County is not yet required to file its Report of Waste Discharge under its current permit, so the individual permit application requirements may not be met through the regional permit process.

Regional Board staff has indicated that the Administrative Draft was released for fact finding purposes to provide for broader comment and discussion. The County also desires to use this time period as a fact finding tool to clarify certain issues so that the County and all permittees can properly evaluate the Administrative Draft and provide the Regional Board with appropriate input. As part of the current fact finding

process, I respectfully request an opinion from your office regarding the authority for the Regional Board to adopt a regional MS4 permit.

Please do not hesitate to contact me with any questions or comments. Thank you for your consideration of this request.

Very truly yours,

NICHOLAS S. CHRISOS
COUNTY COUNSEL

By _____
Ryan M. F. Baron, Senior Deputy

RMFB

cc: Michael A. M. Lauffer, Chief Counsel
David Gibson, Executive Officer

025529

Laurie Walsh - RE: NPDES - San Diego Regional MS4 Permit - 5/14 Workshop Follow Up

From: "Shook, Jennifer" <Jennifer.Shook@ocpw.ocgov.com>
To: "Shook, Jennifer" <Jennifer.Shook@ocpw.ocgov.com>, "Ruano, Betty" <Betty...
Date: 5/14/2012 4:41 PM
Subject: RE: NPDES - San Diego Regional MS4 Permit - 5/14 Workshop Follow Up
Attachments: 5-14-12 Permit Renewal Workshop sign in sheet.pdf

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Good afternoon,

As a follow up to this afternoon's Permit Renewal Workshop, please find attached a copy of the sign in sheet.

Thank you,

Jennifer

From: Shook, Jennifer
Sent: Friday, May 11, 2012 2:02 PM
Subject: RE: NPDES - San Diego Regional MS4 Permit

Good afternoon,

In preparation for Monday's (5/14) meeting with Regional Board staff, please find below a list of discussion topics that will be covered during the meeting. Please let me know if there is anything else that is not on this list that you would like to discuss.

DISCUSSION ITEMS:

- Proposed alternate timeline
  - Relevance of ROWD
- Proposed stakeholder process
  - Permittee representation
  - Status of structure and schedule
- Options for Permittees straddling Regional Board Boundaries
- Legal Areas
  - Receiving Water Limitations Language
- Technical Areas
  - Discharge prohibitions
    - Interim and final numeric targets in Water Quality Improvement Plans
    - Development Planning – Priority Development Requirements
    - Hydromodification requirements
  - Retrofitting
  - TMDLs
  - Reporting

Thank you,

025530

Jennifer Shook
OC Watersheds Program – Stormwater External
County of Orange – OC Public Works Department
2301 N. Glassell Street, Orange, CA 92865
(714) 955-0671 tel / (714) 955-0639 fax
jennifer.shook@ocpw.ocgov.com
www.ocwatersheds.com

Please note my working hours are 7:30 AM - 5:00 PM, Monday - Thursday, and 7:30 AM - 4:00 PM every other Friday.
For the month of May I will be in the office on the following Fridays: 5/11 and 5/25

025531

SAN DIEGO REGION PERMIT RENEWAL WORKSHOP

MAY 14, 2012 • 1:00 PM - 3:00 PM

SIGN-IN SHEET

Name	Organization
MOY Yahya	City of Aliso Viejo / City of Rancho Santa Margarita
David Barker	San Diego Water Quality Control Board
Laurie Walsh	" " " "
Eric Becker	" " "
Nancy Palmer	City of Laguna Niguel
Jonathan Orduña	" "
Chris Macon	City of Laguna Woods
ANDRE MONETTE	BEST BEST & KRIEGER FOR LAKE FOREST & ALISO VIEJO
Jennifer Shook	OC Public Works / OC Watersheds
Grant Sharp	" "
Joe Ames	City of Mission Viejo
Lisa Zanavski	City of Dana Point
MIKE PHILLIPS	City of Laguna Beach
DEVIN SLAVEN	CITY OF LAKE FOREST
Kenneth H Rosenfield	CITY OF LAGUNA HILLS
Rich Schlesinger	City of Mission Viejo
Chris Crompton	County of Orange
Daniel Apt	RBF
RICHARD BOON	COUNTY OF ORANGE
MARY ANNE SKORPANICH	" " "
Mary Vondrak	City of San Clemente
GEOFFREY HUNT	County of Orange

025532

Laurie Walsh - Using a Facilitator for Focused Meeting Process

From: Eric Becker
To: Boon, Richard; JUHLEY@rcflood.org
Date: 5/15/2012 3:52 PM
Subject: Using a Facilitator for Focused Meeting Process
CC: Barker, David; Chiu, Wayne; Kleis, Andrew; Todd.Snyder@sdcounty.ca.go...

Hi Richard & Jason-

Based on our meetings, we have agreement that a facilitator would be helpful during the focused meeting process. Unless you have a major objection, we are going to use Lewis Michaelson from Katz & Associates suggested by the San Diego County Copermittees. San Diego County is developing a contract for his services and hope to meet with him next week. After this meeting, we can finalize the process and schedule.

Thanks.

Eric Becker, P.E.
Senior Water Resources Control Engineer
Southern Watershed Unit
SDRWQCB
9174 Sky Park Court, Suite 100
San Diego, CA 92123
(858) 492-1785
(858) 571-6972
EBecker@waterboards.ca.gov

025533

Wayne Chiu - RE: Focused Meetings Schedule

From: "Kleis, Andrew" <AKleis@sandiego.gov>
To: Eric Becker <EBecker@waterboards.ca.gov>
Date: 5/17/2012 8:14 AM
Subject: RE: Focused Meetings Schedule

Hi Eric-

Thanks for considering this. We have a consultant team working on a group effort to present a strategic monitoring and assessment approach that builds on the framework in the ROWD, but we will not have a draft until 6/15. We see this as being an important aid to a productive discussion for the first workshop topics. I know the schedule is subject to Lewis' availability and other factors, but basically any time in late June for the first workshop would be great.

Also, we thought this may be reasonable b/c by dropping the last placeholder workshop, it wouldn't push the ultimate deadline for comments that the County proposed.

Let me know if you want to discuss.

Thanks, -Drew

DREW KLEIS
Program Manager
City of San Diego
Transportation & Storm Water Department
9370 Chesapeake Drive, Suite 100, MS 1900
San Diego, CA 92123
858.541.4329 | direct
619.990.5515 | mobile

From: Mikhail Ogawa [mailto:mikhail@mogawaeng.com]
Sent: Wednesday, May 16, 2012 4:04 PM
To: Eric Becker
Cc: Kleis, Andrew; Snyder, Todd; Jon Van Rhyn; Kelly Barker
Subject: Focused Meetings Schedule

Hi Eric,

Thanks for your time this afternoon. As a follow-up to our call, Drew and I were calling (at least attempted to conference call) to discuss proposing a slight alternative to the meeting schedule that the County proposed. Many of the Copermittees met today and some were concerned with a June 6th start date.

We are proposing to maintain the overall proposed schedule by having only one wrap-up workshop on September 5th and starting the first of two Planning, Prioritization, Reporting and Assessment meetings on June 27th.

I understand that Board staff still needs to secure meeting space and confirm availability of the meeting

facilitator so none of the proposed dates are set in stone at this time.

Thanks for your consideration. Please contact me or Drew know if you have any questions.

Any updates from the Riverside or Orange folks?

Mikhail

Clean Water Manager
City of Del Mar

F. Osibodu
025535

ORANGE COUNTY
PublicWorks
Our Community. Our Commitment.

Jess A. Carbajal, Director
300 N. Flower Street
Santa Ana, CA

P.O. Box 4048
Santa Ana, CA 92702-4048

Telephone: (714) 834-2300
Fax: (714) 967-0896

SAN DIEGO REGIONAL
WATER QUALITY
CONTROL BOARD

2012 MAY 21 A 8:19

Doc Scanned On: 5/22/12
R. Antonio Time: 8:10

May 17, 2012

David Gibson
Executive Officer
California Regional Water Quality Control Board, San Diego region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4353

Subject: Administrative Draft of Tentative Order No. R9-2012-0011

Dear Mr. Gibson:

The County of Orange, Orange County Flood Control District and cities of South Orange County (the Permittees) are currently evaluating the subject Administrative Draft and have engaged in discussions with your staff on various technical aspects of the proposed permit and the consultation process. While the Permittees have not, pending legal clarification, formulated a position on the concept, appropriateness, or timing of a regional permit, the following observations are made.

The Administrative Draft does not analyze why the regional permit is the preferred approach at this time. The Permittees are concerned in particular that requirements for land development are being changed even before the programs developed to meet the low impact development and hydromodification management requirements of the current permit have been approved. Allowing all of the fourth term permits to expire prior to proposing a regional permit would enable the practice of stormwater management to evolve in a credible manner that is informed by practical experience. This approach may also engender the consensus support for a regional approach that was a key characteristic of the San Francisco Regional Board's Municipal Regional Stormwater Permit. Indeed, the Permittees believe that there is considerable merit in a 2017 regional permit timeline and commend this alternate schedule to you for consideration (see Attachment).

The opportunity to participate in a series of workshops and meetings that will enable all of the Permittees to properly evaluate the Administrative Draft and provide your staff with appropriate input is very welcome. We understand that the structure, scope and schedule of the workshops is now being reconsidered. Notwithstanding our prior comment regarding the timing of permit issuance, the final conception of this consultative process should:

- Provide for meaningful individual participation by all of the municipal entities that are intended to be enrolled in a regional permit;

- Include appropriate proportionate representation by stakeholders and interested parties recognizing that the permit is intended to be issued to the Permittees, not others, and

- Be supported by professional facilitation for which the Permittees are prepared to provide fiscal support.

Please direct any questions regarding this letter to Richard Boon at (714)955-0670.

Very truly yours

Mary Anne Skorpanich, Manager
OC Watersheds

CC: Permittees
Technical Advisory Committee
County of San Diego
Riverside County Flood Control and Water Conservation District
City of San Diego

Attachment: Regional Permit Alternate Timeline

Regional Permit Alternate Timeline

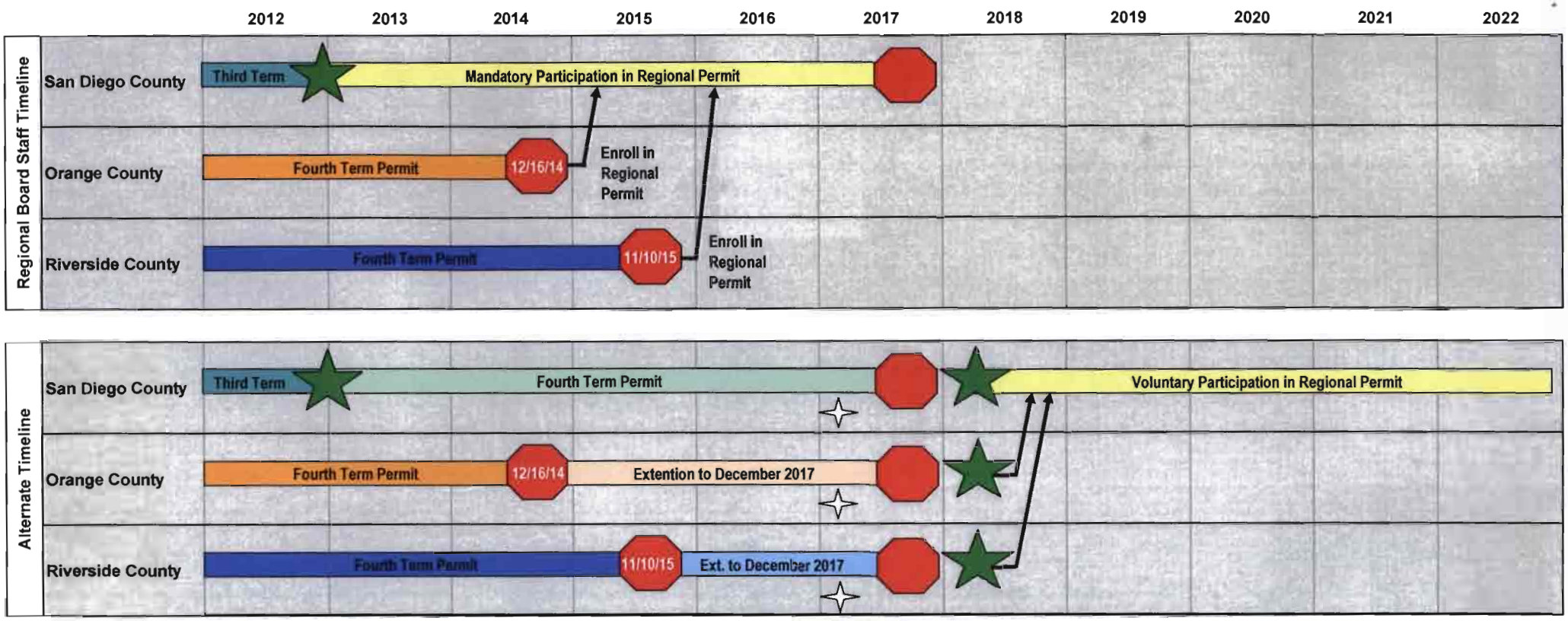

Legend:

- Permit Adoption
- Permit Expiration
- Report of Waste Discharge Submittal

OC Watersheds 5/1/12

025538

Wayne Chiu - Dates for MS4 workshops

From: Jill Witkowski <jill@sdcoastkeeper.org>
To: Wayne Chiu <wchiu@waterboards.ca.gov>, <lwalsh@waterboards.ca.gov>
Date: 5/18/2012 9:08 AM
Subject: Dates for MS4 workshops

Hi Wayne and Laurie,
I met with the folks from San Diego County yesterday and they let me know that the Copermittees had suggested alternate dates for the stakeholder meetings. They also mentioned that they may start on June 27th. I very much would like to be involved in the stakeholder meetings—especially the first one—but I will be out of town from June 27th-July 2. I would appreciate you taking into consideration my availability if you plan to change the dates from the one originally announced.
Also, I just wanted to share a concern that if the stakeholder group is expanded, there is the potential for additional environmental voices (perhaps NRDC) on the panel and also that it does not get too big. Colin from Orange County Coastkeeper relayed to me that the stakeholder process for the Orange County permit was too large to be effective. I would like to avoid that situation here.
Thanks!
Jill

Jill Witkowski
Legal Clinic Director
San Diego Coastkeeper®

www.sdcoastkeeper.org
2825 Dewey Rd, Suite 200
San Diego, CA 92106
619.758.7743 x119

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025539

From: "Lyris ListManager" <lyris-noreply@swrcb18.waterboards.ca.gov>
To: <lwalsh@waterboards.ca.gov>
Date: 5/18/2012 1:41 PM
Subject: CONFIRMED: Update - Regional MS4 Permit Process for Stakeholder Comments and Recommendations

Your message was successfully distributed to list 'reg9_sandiegoco_ms4permit'.

You are receiving this email message because your personal settings
for reg9_sandiegoco_ms4permit are set to "Acknowledge: YES". You can change this setting so
that you will not receive these confirmation messages in the future by
sending an email message to lyris-noreply@swrcb18.waterboards.ca.gov
with the words "set reg9_sandiegoco_ms4permit noack" in the body of the message.

For your records, here is a copy of your message:

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> Content-Type: text/plain; charset="US-ASCII"
> Content-Transfer-Encoding: quoted-printable
>
> Regional MS4 Interested Parties,
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> The San Diego Water Board Permit Team wanted to update all interested =
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> s and receive comments on the Administrative Draft of the Regional MS4 =
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To: <lwalsh@waterboards.ca.gov>
Date: 5/18/2012 1:41 PM
Subject: CONFIRMED: Update - Regional MS4 Permit Process for Stakeholder Comments and Recommendations

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025543

From: "Lyris ListManager" <lyris-noreply@swrcb18.waterboards.ca.gov>
To: <lwalsh@waterboards.ca.gov>
Date: 5/18/2012 1:41 PM
Subject: CONFIRMED: Update - Regional MS4 Permit Process for Stakeholder Comments and Recommendations

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PAMELA J. WALLS
County Counsel

KATHERINE A. LIND
Assistant County Counsel

OFFICE OF COUNTY COUNSEL
COUNTY OF RIVERSIDE

3960 ORANGE STREET, SUITE 500
RIVERSIDE, CA 92501-3674
TELEPHONE: 951/955-6300
FAX: 951/955-6322 & 951/955-6363

May 21, 2012

Sent Via E-mail and First Class Mail

Catherine George Hagan, Esq.
Senior Staff Counsel
Office of Chief Counsel
State Water Resources Control Board
P.O. Box 100
Sacramento, CA 95812-0100

Subject: Proposed Regional MS4 Permit for San Diego RWQCB

Dear Ms. Hagan:

I am writing on behalf of the County of Riverside ("County") and the Riverside County Flood Control & Water Conservation District ("District") concerning the proposed three-county MS4 permit which was released as an Administrative Draft last month by the San Diego Regional Water Quality Control Board ("Regional Board"). Regional Board staff has stated that the proposed regional permit would apply to the copermittees currently regulated by separate MS4 permits issued to San Diego County, South Orange County and the Santa Margarita region of Riverside County ("SMR").

The County and the District are open to discussion of the concept of improving the MS4 Permitting approach as described in the staff workshop on April 25th, 2012. However, both agencies have concerns regarding the administrative process and legal rationale for issuance of a regional MS4 permit. The County and the District also would like to address certain issues relating to the planned focused meetings.

First, with regard to the administrative process and legal rationale, the SMR copermittees are actively engaged in modifying existing compliance programs as well as preparing and submitting the required documentation of these programs under the existing terms of the 2010 MS4 permit adopted only 18 months ago. In addition, the SMR copermittees are fully engaged in working to implement the modifications to these programs. The copermittees do not have the financial or staff resources to simultaneously work on the detailed and comprehensive requirements of the current SMR MS4 permit and effectively participate in the focused meetings and eventual development of the proposed regional permit. Moreover, the SMR copermittees have not budgeted for specialized legal and technical support for these negotiations which would otherwise not have occurred until sometime in 2015.

In light of the County's and the District's concerns, and to hopefully better understand the legal framework for the proposed regional permit, this letter respectfully requests that your office provide its legal position as to whether a regional permit may be issued to copermittees that have not yet filed a ROWD (which for is not due, in the case of the SMR copermittees, until May 2015). Additionally, we request that the Office of Chief Counsel address the Regional Board's legal authority to issue a single regional permit to municipalities located in three counties, which have separate, non-interconnected MS4s as well as different climatic and hydrologic conditions and distinctly different receiving waters and water quality concerns.

I understand that Ryan Baron of the Orange County Counsel's office has sent a letter to you requesting similar advice. For your convenience, your response to Mr. Baron can be co-addressed to my attention and need not be set forth in a separate letter.

Second, with regard to focused meeting issues, the County and District remain concerned that the proposed focused meetings may not allow full participation by all entities that would potentially be covered by a regional permit. While staff has indicated that the workshop process is informal, we believe that it is essential for all potentially regulated parties to have the opportunity to participate. Moreover, since the matters discussed in the focused meetings could lead ultimately to permit language, and the issues discussed in these focused meetings will undoubtedly be referenced as justification for staff's proposed permit language, full participation of all copermittees at this juncture is essential. We would appreciate your conveying this concern to Regional Board staff.

Additionally, we understand that there has been a request from San Diego County copermittees for a separate "legal track" to occur contemporaneously with the focused meetings, since the focused meetings will focus on technical issues. I would like to add the County's and the District's support for a legal track to address the proposed regional permit. We believe that a discussion of legal issues will provide needed direction to staff as it assesses and develops permit language.

Thank you in advance for providing a description of the requested legal authority and for your consideration of the focused meeting issues addressed in this letter. If you have any questions concerning the matters discussed in this letter, or any matters relating to the proposed regional permit, please do not hesitate to contact me at the phone and e-mail address noted below.

Sincerely,

PAMELA J. WALLS
County Counsel

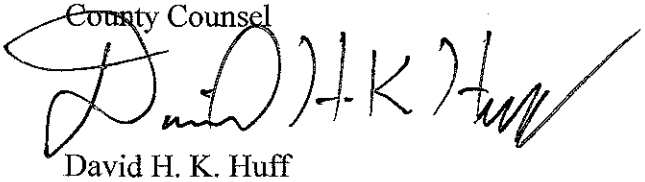

David H. K. Huff
Deputy County Counsel

dhuff@co.riverside.ca.us
951.955.6300
FAX 951.955.6363

cc: (all via E-mail)
Michael Lauffer, Esq., Chief Counsel, Office of Chief Counsel
Jessica Newman, Esq., Office of Chief Counsel
Mr. David Gibson, Executive Officer, SDRWQCB
David Barker, P.E., SDRWQCB
Eric Becker, P.E., SDRWQCB
Laurie Walsh, P.E., SDRWQCB
Wayne Chiu, P.E., SDRWQCB

H:\Letter to Catherine Hagen 05-21-12.doc

WARREN D. WILLIAMS
General Manager-Chief Engineer

025548

1995 MARKET STREET
RIVERSIDE, CA 92501
951.955.1200
FAX 951.788.9965
www.rcflood.org

RIVERSIDE COUNTY FLOOD CONTROL
AND WATER CONSERVATION DISTRICT

May 22, 2012

Mr. Eric Becker, P.E.
Senior WRCE Engineer
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Sent Via E-Mail to ebecker@waterboards.ca.gov

Dear Mr. Becker:

Re: Schedule for Focused Meetings on the Proposed Joint Permit for San Diego, Orange and Riverside County Copermittees

I am writing on behalf of the Santa Margarita Region ("SMR") Copermittees regarding the proposed schedule for focused meetings on the Administrative Draft proposed joint MS4 permit for the San Diego, Orange and Riverside County Copermittees.

As we discussed in our May 10, 2012 meeting with you, Laurie Walsh and Wayne Chiu, the SMR Copermittees are fully occupied through the end of June in modifying existing compliance programs as well as preparing and submitting the required documentation of these programs under the terms of the 2010 MS4 Permit. As a result, the Copermittees lack staff and financial resources to participate in the focused meetings during June, especially given that Regional Board staff has indicated that Copermittees should come to those meetings prepared to comment on the Administrative Draft as well as propose alternative language.

Because the SMR Copermittees cannot attend any focused meetings during June, and need time to study the Administrative Draft and prepare comments, alternative language and questions, the Copermittees request that the first focused meeting occur no earlier than the week of July 23, 2012 which will give the Copermittees time to prepare and help ensure that the focused meetings are productive for all participants.

Please note that by agreeing to participate in the focused meetings, the SMR Copermittees are not waiving their already-stated concerns with the joint permit process nor their previous comments on the format for the focused meetings.

Please contact me at 951.955.8602 or by e-mail at cmpadres@rcflood.org if you have any questions concerning the matters discussed in this letter.

Very truly yours,

CLAUDIO PADRES
Senior Civil Engineer

ec: David Barker, P.E.
Laurie Walsh, P.E.
Wayne Chiu, P.E.
SMR Copermittees

CP:cw
P8/146836

WARREN D. WILLIAMS
General Manager-Chief Engineer

025549

1995 MARKET STREET
RIVERSIDE, CA 92501
951.955.1200
FAX 951.788.9965
www.rcflood.org
147080

RIVERSIDE COUNTY FLOOD CONTROL
AND WATER CONSERVATION DISTRICT

June 1, 2012

Mr. David Gibson
Executive Officer
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Sent Via E-Mail to dgibson@waterboards.ca.gov

Dear Mr. Gibson:

Re: Schedule for Focused Meetings on the Proposed Joint Permit for San Diego, Orange and Riverside County Copermittees

I am writing on behalf of the Santa Margarita Region ("SMR") Copermittees regarding the Administrative Draft of Tentative Order No. R9-2012-0011 for the San Diego, Orange and Riverside County Copermittees (Administrative Draft). Fundamentally, we believe that consideration of the Administrative Draft is premature. However, if the Regional Board insists on proceeding with development of a regional MS4 permit, each of the Copermittee programs must have an opportunity to meaningfully and effectively participate in the focused meeting process.

Development of a Joint MS4 Permit is Premature

The SMR Copermittees support the South Orange County Copermittees' position (set forth in their May 17, 2012 letter) that a regional MS4 permit is not the preferred approach at this point. In discussions leading up to the development of the SMR fourth-term MS4 permit, a regional permitting option was discussed. The SMR Copermittees requested that the Regional Board defer adoption of the fourth-term SMR permit pending coordinated discussions with the other Counties regarding the viability of a regional permit. That request was denied. We are now faced with potentially having to negotiate, develop and implement portions of two MS4 permits for the SMR within two years. This represents a potentially significant waste of limited public resources during a severe and prolonged recessionary period that is impacting State, local and taxpayer budgets. In light of these facts, Board staff should not impose a second permit renewal process upon the SMR Copermittees a mere 18 months after the Board adopted our individual SMR MS4 Permit in 2010.

The SMR Copermittees believe that a more reasonable alternative would include issuance of a fourth-term MS4 permit to the San Diego County Copermittees and development of a regional MS4 permit in 2017, by which time all three fourth-term MS4 permits issued by the San Diego Regional Board will have expired. This would enable the SMR, San Diego and South Orange County Copermittees to schedule for and properly allocate the substantial resources needed to properly undertake such a complex and resource intensive process.

Joint MS4 Permit Development

Without waiving their above-stated objections, the SMR Copermittees are not opposed to participating in the series of focused meetings to discuss a regional permitting approach. Such meetings, if appropriately conducted, may enable the SMR Copermittees to properly evaluate the potential benefits of a regional permit. We would also note that additional meetings beyond those originally proposed by the Regional Board staff may be required if a meaningful dialogue regarding development of a regional permit is expected. Both the existing fourth-term MS4 Permits and the Administrative Draft pose many difficult issues that must be addressed.

The participation of the SMR Copermittees in the focused meetings, however, is predicated on the following scheduling requirements:

July Commencement of Focused Meetings

As previously communicated to Board staff, the SMR Copermittees are fully occupied through the end of June in developing and modifying existing compliance programs as previously directed by the Board in the 2010 MS4 Permit. Therefore, the SMR Copermittees cannot attend any focused meetings during June and still meet our compliance deadlines. Further, once those required documents are completed and submitted, the Copermittees will still need time to study the Administrative Draft and prepare comments, alternative language and questions before being able to effectively participate in the focused meetings as requested by staff. Therefore, the Copermittees reiterate our previous request that the first focused meeting occur no earlier than the week of July 23, 2012. This will provide SMR Copermittee representatives an opportunity to prepare for the focused meetings so that they may effectively represent the interests of the SMR Copermittees. If staff moves forward with focused meetings in June, this will preclude the SMR Copermittees from effective participation in the initial focused meetings.

Mid-October/Mid November Blackout

Riverside County is under the jurisdiction of three Regional Boards and three MS4 permits. As a result, between mid-September and mid-November, the Riverside County MS4 program is fully engaged in preparing the three Annual Reports required by these permits. In addition, the Riverside County MS4 Program will also be finalizing a Report of Waste Discharge for submittal to the Colorado Regional Board. As a result, the key members of SMR MS4 Program management will not have adequate time to prepare or participate in the focused meetings during the mid-September to mid-November time period. We, therefore, require that no focused meetings occur during that period. We understand that this scheduling concern is shared by the South Orange County Copermittees.

Support for Comments by South Orange County Copermittees

In addition to accommodation of the above-noted scheduling requirements, we support the position of the South Orange County Copermittees (set forth in their May 17th letter) that the focused meetings must:

- Provide for meaningful individual participation by all of the municipal entities that are intended to be enrolled in a regional permit, and
- Include appropriate proportionate representation by stakeholders and interested parties, recognizing that the regional permit is intended to be issued to the permittees and not others.

The SMR Copermittees reserve their right to comment on the format for the focused meetings.

Please contact me at 951.955.1273 or by e-mail at juhley@rcflood.org if you have any questions concerning the matters discussed in this letter.

Very truly yours,

JASON UHLEY, P.E.
Principal Engineer

ec: David Barker, P.E.
Eric Becker, P.E.
Laurie Walsh, P.E.
Wayne Chiu, P.E.
SMR Copermittees
Chris Crompton
John Van Rhyne
David Burhenn

RC:JU:bjp

025552

Wayne Chiu - Notice of Revised Procedures and Schedule for Focused Meetings on Regional MS4 Permit

From: <lyris@swrcb18.waterboards.ca.gov>
To: Wayne Chiu <wchiu@waterboards.ca.gov>
Date: 6/21/2012 11:40 AM
Subject: Notice of Revised Procedures and Schedule for Focused Meetings on Regional MS4 Permit
Attachments: 062012 Final Focused Meeting Notice - Regional MS4 Permit.pdf

Please see attached notice of revised administrative draft Regional Municipal Separate Storm Sewer System (MS4) Permit focused meeting procedures and schedule.

Please note the stakeholder participation has been expanded by including an audience and allowing representative stakeholder groups to rotate members at the meeting table.

If you have questions, please contact me at:

Eric Becker, P.E.
Senior Water Resources Control Engineer
Southern Watershed Unit
SDRWQCB
9174 Sky Park Court, Suite 100
San Diego, CA 92123
(858) 492-1785
(858) 571-6972
EBecker@waterboards.ca.gov

You are currently subscribed to reg9_orangeco_ms4permit as: wchiu@waterboards.ca.gov.

To unsubscribe click here: http://swrcb18.waterboards.ca.gov/u?id=508206.5e12452d2cea9a5676faf89bcbc2cb99&n=T&l=reg9_orangeco_ms4permit&o=354834

(It may be necessary to cut and paste the above URL if the line is broken)

or send a blank email to leave-354834-508206.5e12452d2cea9a5676faf89bcbc2cb99@swrcb18.waterboards.ca.gov

California Water Boards

Edmund G. Brown Jr.
Governor

Matthew Rodriquez
Secretary for
Environmental Protection

California Regional Water Quality Control Board, San Diego Region

June 20, 2012

NOTICE OF REVISED ADMINISTRATIVE DRAFT REGIONAL MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) PERMIT FOCUSED MEETING PROCEDURES AND SCHEDULE

The San Diego Water Board is developing a Regional Municipal Separate Storm Sewer System (MS4) Storm Water NPDES Permit that will cover municipal Copermittees in San Diego County, Southern Orange County and Riverside County (Tentative Order No. R9-2012-0011). The San Diego Water Board has released for public review and comment, an administrative draft version of the Tentative Order, also referred to as the Regional MS4 Permit. A follow-up public staff level workshop was held on April 25, 2012 to introduce the Regional MS4 Permit to a large diverse group of stakeholders. The administrative draft of the Regional MS4 Permit is available on the following webpage:

http://www.swrcb.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

The focused meeting procedures and schedule, set forth below, incorporate revisions made by the San Diego Water Board Regional MS4 Permit Team (Regional Permit Team) in response to stakeholder comments and concerns received during the April 25, 2012 workshop and subsequent letters from and meetings with the Orange County, Riverside County, and San Diego County Copermittees (collectively referred to as Copermittees). The Regional Permit Team has also selected a professional facilitator, as requested by the Copermittees, to assist in conducting the focused meetings. Facilitator-suggested revisions to the focused meeting procedures and schedule are included herein. As evidenced by the attendance of approximately 130 people at the April 25, 2012 workshop, the number of Copermittees and interested stakeholders in this matter is quite large. The San Diego Water Board is establishing these procedures and schedule to ensure an orderly, efficient, and impartial focused meeting process to review and discuss the administrative draft permit and to provide a fair opportunity for representatives of Copermittee, environmental non-governmental organization, and development community groups to participate in the meetings. The procedures and schedule set forth below will remain in effect unless modified by the Regional Permit Team.

Focused Meetings Objective

The Regional Permit Team seeks to improve the administrative draft permit prior to its release for formal review and comment through a series of focused technical meetings. The objective of the focused meetings is for the Regional Permit Team to gain a greater understanding of the constraints or limitations the administrative draft permit provisions present to Copermittee storm water program managers, non-government environmental organizations, and the development/business community. The focused meetings will be limited to technical issue discussions about the specific terms and conditions of the administrative draft permit.

Stakeholder Participation

Participation at the focused meetings is structured to provide for an appropriate level of participation by key stakeholder groups, while preserving the ability for the meeting facilitator to ensure a collaborative technical discussion on the administrative draft permit. Meeting

participants are divided into two groups: a limited group to be seated at the meeting table and an audience group. The total number of participants at the meeting table will be limited to twenty-five (25) subdivided into representative stakeholder groups as described in the table below.

Groups of stakeholders can share their seats at the table and rotate particular topic experts from the audience to the table depending on the topic being discussed. To maximize the diversity of perspectives on the proposed permit provisions, the Regional Permit Team encourages each Copermittee group to consider designating table participants within the group from different jurisdictions.

Stakeholder Group	Participants at the Table
San Diego County Copermittees	5
Orange County Copermittees	5
Riverside County Copermittees	3
Environmental Community	3
Development/Business Community	3
USEPA	1
San Diego Water Board Permit Team	5

Ample audience seating will be provided so that interested persons can attend the focused meetings. Audience members will be allowed to ask questions and make comments at the end of each meeting.

Focused Meeting Agenda Topics

Administrative draft permit topics and associated key questions summarized below will be discussed at the following specified meeting dates.

Meeting Date	Topic Discussion Questions
June 27, 2012 and July 11, 2012	**ASSESSMENT and PLANNING** 1. In what ways can the proposed provisions of the administrative draft permit be modified to better assess if the Copermittees' jurisdictional runoff management programs are effectively prohibiting non-storm water discharges to their MS4s? 2. In what ways can the proposed provisions of the administrative draft permit be modified to better assess if the Copermittees' jurisdictional runoff management programs are reducing pollutants in storm water to the maximum extent practicable (MEP)? 3. In what ways can the proposed provisions of the administrative draft permit be modified to better assess that improvements are being achieved in the physical chemical, and biological conditions of receiving waters as a result of implementing the Copermittees' Water Quality Improvement Plans? 4. How can adaptive management or the "iterative process" be incorporated into the proposed provisions of the administrative draft permit better? 5. How can the proposed provisions of the administrative draft permit be modified to support a Copermittee's ability to plan and/or procure resources for its jurisdictional runoff management program?

Meeting Date	Topic Discussion Questions
	6. How can the proposed provisions of the administrative draft permit be modified to reduce or eliminate any conflicts with other requirements (e.g. TMDLs, ASBS) or programs (e.g. flood management, vector control, water supply, recycled water, groundwater recharge)?
July 25, 2012	**ASSESSMENT and MONITORING** 1. In what ways can the proposed provisions of the administrative draft permit be changed to improve how the Copermittees collect data to assess whether their jurisdictional runoff management programs are effectively prohibiting non-storm water discharges to their MS4s? 2. In what ways can the proposed provisions of the administrative draft permit be changed to improve how the Copermittees collect data to assess whether their jurisdictional runoff management programs are reducing pollutants in storm water to the MEP? 3. In what ways can the proposed provisions in the administrative draft permit be changed to improve how the Copermittees collect data to assess whether improvements to the physical, chemical, and biological conditions of receiving waters are being achieved as a result of implementing their Water Quality Improvement Plans?
August 22, 2012	**PLANNING and IMPLEMENTATION** 1. How can adaptive management or the "iterative process" be incorporated into the proposed provisions of the administrative draft permit better? 2. How can the proposed provisions of the administrative draft permit be modified to support a Copermittee's ability to plan and/or procure resources for its jurisdictional runoff management program? 3. How can the proposed provisions of the administrative draft permit be modified to reduce or eliminate any conflicts with other requirements (e.g. TMDLs, ASBS) or programs (e.g. flood management, vector control, water supply, recycled water, groundwater recharge)? 4. How can the proposed provisions of the administrative draft permit be modified to support a Copermittee's ability to implement and enforce its jurisdictional runoff management program to effectively prohibit non-storm water discharges to and from its MS4, and reduce pollutants in storm water discharges from its MS4 to the MEP? 5. How can the proposed provisions of the administrative draft permit be modified to promote retrofitting of existing development and/or implementing projects that can restore or rehabilitate receiving waters as good tools to use as pollution control strategies? 6. How can the proposed provisions of the administrative draft permit be modified to allow the Copermittees to better focus their resources on improving water quality?

Focused Meeting Minutes

CoPermittee stakeholder groups will prepare meeting minutes and provide them to the Regional Permit Team for review and dissemination to all stakeholder groups one week prior to the next focused meeting via the San Diego County, Orange County, and Riverside County MS4 Permit Lyris email lists. Signup for a subscription to any one of these lists at http://www.waterboards.ca.gov/resources/email_subscriptions/reg9_subscribe.shtml

Focused Meeting Schedule and Locations

The focused meetings will begin on June 27, 2012 and conclude on September 5, 2012 as described in the table below. The focused meetings are scheduled to begin at 9:30 a.m. and end at 3:30 p.m. Meeting locations will be at the following different locations in the central portion of the San Diego Region 9 boundaries in an effort to equalize travel time among the meeting participants. The Regional Permit Team will summarize the results of the focused meeting process at its September 5, 2012 workshop.

Meeting Dates	Topic	Location
June 27, 2012	Assessment and Planning	City of Oceanside San Luis Rey Wastewater Treatment Plant 3950 North River Road Oceanside, CA 92057 **Jim Turner Conference Room**
July 11, 2012	Assessment and Planning	City of Escondido 201 North Broadway Escondido, CA 92025 **Mitchell Conference Room**
July 25, 2012	Assessment and Monitoring	City of Carlsbad Faraday Center 1635 Faraday Avenue Carlsbad, CA 92008 **Faraday Center Room 173**
August 22, 2012	Planning and Implementation	City of Vista 200 Civic Center Drive Vista, CA 92084 **Community Room**
September 5, 2012	Focused Meetings Wrap-up San Diego Water Board Workshop	San Diego Water Board 9174 Sky Park Court, Suite 100 San Diego, CA 92123-4340 **Board Meeting Room**

By letter dated June 4, 2012, Riverside County Flood Control and Water Conservation District (District) reported that the Santa Margarita Copermittees could not prepare for and attend the focused meetings scheduled for June 27 and July 11, 2012 or any subsequent meetings scheduled between mid-September and mid–November, 2012 due to work on other storm water program compliance priorities.

The District requested that the meetings be rescheduled to begin no earlier than the week of July 23, 2012. By letter dated June 7, 2012, San Diego County, Department of Public Works made a similar request on behalf of the Orange County and Riverside County (Santa Margarita) Copermittees. The San Diego Water Board carefully considered these requests in finalizing the schedule for the focused meetings and determined that the meetings should proceed as described in the above table in order to maintain momentum towards finalizing a final Draft Permit for public review and comment later this year.

The Regional Permit Team will endeavor to keep stakeholder groups that may miss a scheduled focused meeting informed through the prompt circulation of meeting minutes and additional opportunities to speak with the Regional Permit Team between the scheduled meeting dates.

Other Procedural Matters

Focused meeting participants and other interested persons may submit written comments to the address below on the administrative draft permit until Friday, September 14, 2012 at 5:00 p.m. The San Diego Water Board will not provide written responses to written comments submitted on the administrative draft permit. All written comments, as well as comments received during the focused meetings, will be reviewed and considered in the Regional Permit Team's development of a final Draft Permit that will be released for public comment. The San Diego Water Board will issue a separate public hearing notice announcing the release of a final Draft Permit for public review and comment, the deadline for submission of final comments, and the date of the public hearing for the Board to consider the comments received, public testimony, and adoption of a final Regional MS4 Permit. Submit written comments on the administrative draft permit to Laurie Walsh via e-mail at lwalsh@waterboards.ca.gov and/or by US mail at 9174 Sky Park Court, Suite 100, San Diego, CA 92123-4340.

Meeting Directions and Parking

Meeting Dates	Location	Directions	Parking
June 27, 2012	City of Oceanside San Luis Rey Wastewater Treatment Plant 3950 North River Road Oceanside, CA 92057 **Jim Turner Conference Room**	Take Interstate 15 to I-76 west OR take Interstate 5 to I-76 east to Douglas. Make a left on to Douglas and a left on North River Road. The gate of the facility is at the end of the road.	Free Parking at the Plant.
July 11, 2012	City of Escondido 201 North Broadway Escondido, CA 92025 **Mitchell Conference Room**	See Attached Map.	Free Parking in designated areas. See Attached Map for areas where Free Parking is unlimited. Pay close attention of restricted duration parking lots if you choose to park somewhere other than the unrestricted lot.
July 25, 2012	City of Carlsbad Faraday Center 1635 Faraday Avenue Carlsbad, CA 92008 **Faraday Center Room 173**	See Attached Map.	Free Parking in the lot at the Faraday Center.

Meeting Dates	Location	Directions	Parking
August 22, 2012	City of Vista 200 Civic Center Drive Vista, CA 92084 **Community Room**	Take Interstate 15 to I-78 west OR take Interstate 5 to I- 78 east to Civic Center Drive exit, go north on Civic Center approximately 1.1 miles to stoplight at Alta Vista, turn right on Alta Vista and right into parking lot, follow signs within Civic Center Complex to the Community Room.	Free Parking, After turning right on Alta Vista, turn right into the Civic Center parking lot. Follow signs within Civic Center Complex to Community Room.
September 5, 2012	San Diego Water Board 9174 Sky Park Court, Suite 100 San Diego, CA 92123-4340 **Board Meeting Room**	Interstate 15 - take the Balboa Ave. exit - turn right (west). Proceed to the 2nd stoplight, which is Ruffin Road – turn left. Turn right on Sky Park Court. Our building is located at the end of the court – veer to the right into the parking lot.	Free Parking

CONTACTS FOR ADDITIONAL INFORMATION
The San Diego Water Board Regional MS4 Permit Team includes the following staff:

David Barker – Supervising Water Resource Control Engineer
Eric Becker – Senior Water Resource Control Engineer
Wayne Chiu – Water Resource Control Engineer
Laurie Walsh - Water Resource Control Engineer
Christina Arias - Water Resource Control Engineer

Questions or requests for additional information regarding this notice should be directed to Laurie Walsh at (858) 467-2970 or via e-mail at lwalsh@waterboards.ca.gov.

Escondido City Hall
201 North Broadway

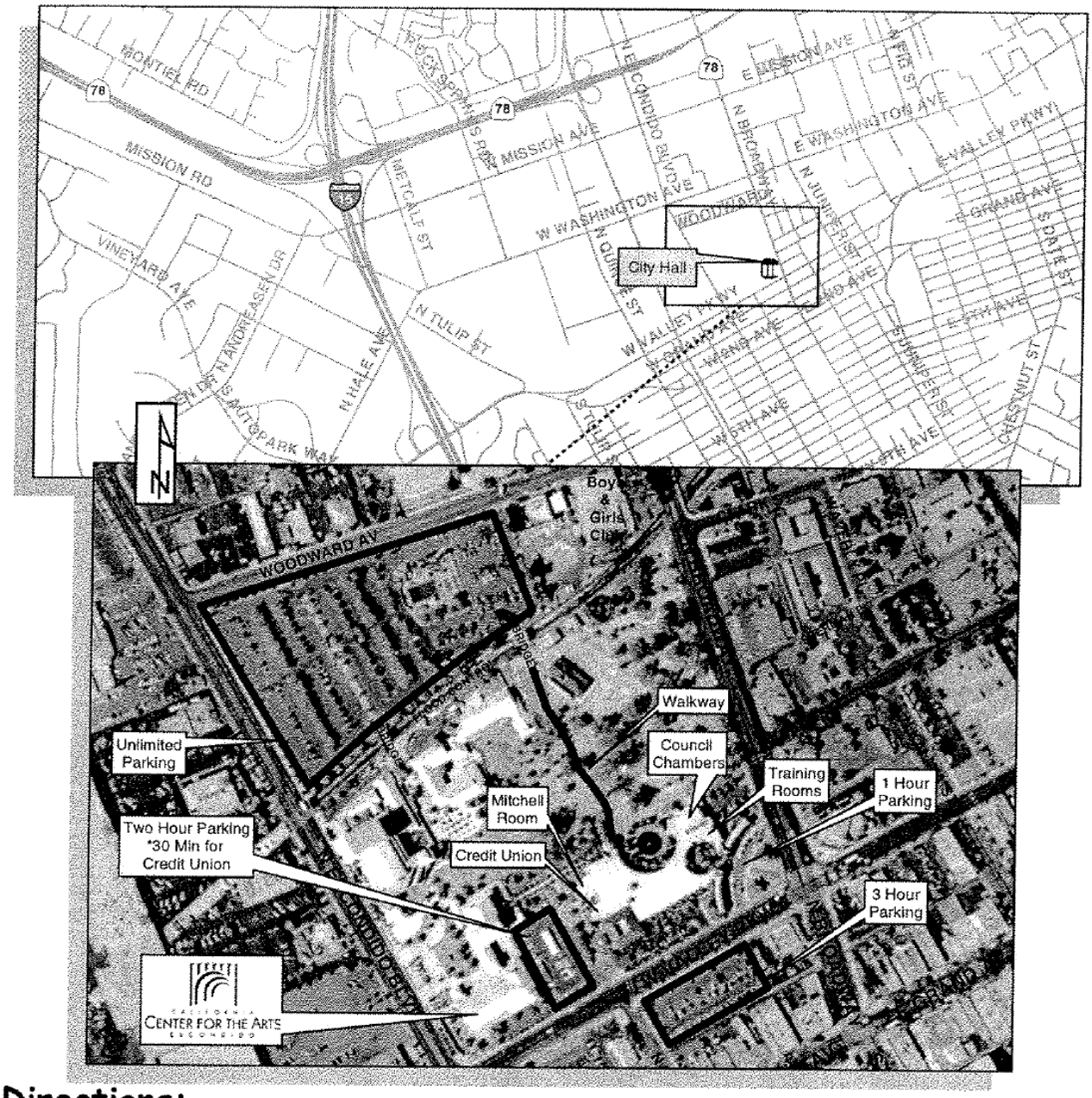

Directions:

From Interstate 15:

Take Valley Parkway (Downtown) exit and head east. When Valley Parkway crosses over Centre City Parkway it becomes Second Avenue. Turn left onto Escondido Blvd. Cross over Valley Parkway, turn right into the parking lot just after the CA Center for the Arts.

From Highway 78:

Continue east on Highway 78 into Escondido. When 78 ends at the light, turn right on Broadway. Just past Washington Ave, turn right on Woodward Ave. The parking lot is on the left, just on the other side of the Boys & Girls Club.

Source: 2005 Color Infra-Red San Diego Imagery Partnership

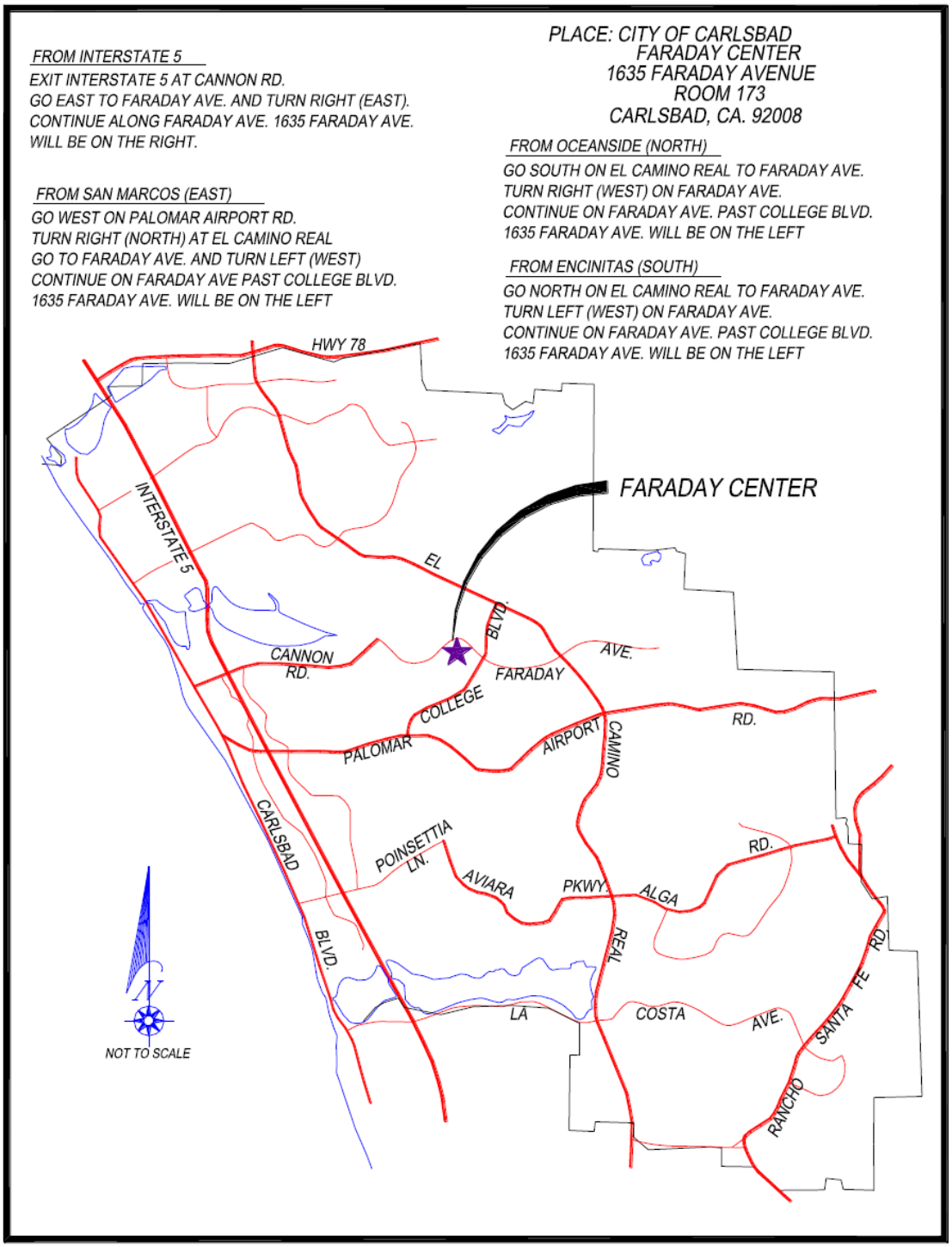
PLACE: CITY OF CARLSBAD
FARADAY CENTER
1635 FARADAY AVENUE
ROOM 173
CARLSBAD, CA. 92008
FROM INTERSTATE 5
EXIT INTERSTATE 5 AT CANNON RD.
GO EAST TO FARADAY AVE. AND TURN RIGHT (EAST).
CONTINUE ALONG FARADAY AVE. 1635 FARADAY AVE.
WILL BE ON THE RIGHT.
FROM SAN MARCOS (EAST)
GO WEST ON PALOMAR AIRPORT RD.
TURN RIGHT (NORTH) AT EL CAMINO REAL
GO TO FARADAY AVE. AND TURN LEFT (WEST)
CONTINUE ON FARADAY AVE PAST COLLEGE BLVD.
1635 FARADAY AVE. WILL BE ON THE LEFT
FROM OCEANSIDE (NORTH)
GO SOUTH ON EL CAMINO REAL TO FARADAY AVE.
TURN RIGHT (WEST) ON FARADAY AVE.
CONTINUE ON FARADAY AVE. PAST COLLEGE BLVD.
1635 FARADAY AVE. WILL BE ON THE LEFT
FROM ENCINITAS (SOUTH)
GO NORTH ON EL CAMINO REAL TO FARADAY AVE.
TURN LEFT (WEST) ON FARADAY AVE.
CONTINUE ON FARADAY AVE. PAST COLLEGE BLVD.
1635 FARADAY AVE. WILL BE ON THE LEFT
HWY 78
FARADAY CENTER
INTERSTATE 5
EL
BLVD.
CANNON
RD.
FARADAY
AVE.
COLLEGE
PALOMAR
AIRPORT
CAMINO
RD.
CARLSBAD
POINSETTIA
LN.
AVIARA
PKWY.
ALGA
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BLVD.
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COSTA
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NOT TO SCALE

County of San Diego

RICHARD E. CROMPTON
DIRECTOR

DEPARTMENT OF PUBLIC WORKS

5500 OVERLAND AVE, SUITE 310
SAN DIEGO, CALIFORNIA 92123-1295

(858) 694-2212 FAX: (858) 268-0461
Web Site: www.sdcounty.ca.gov/dpw/

June 7, 2012

David Gibson
Executive Officer
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-47340

Dear Mr. Gibson:

COPERMITTEE INPUT ON ADMINISTRATIVE DRAFT PERMIT WORKSHOPS

The Regional Water Quality Control Board staff has proposed that a series of stakeholder focused meetings be held to explore and consider the content of *Administrative Draft National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region (Tentative Order No. R9-2012-0011, NPDES No. CAS0109266).* To this end, the Copermittees of San Diego County, South Orange County, and the Santa Margarita Region of Riverside County offer the following input on their expectations and preferences for the organization and conduct of the meetings.

I. Parties at the Table ("Table Parties") for Focused Meetings

Regional Board staff initially proposed that a total of eleven participants be included in the focused meetings. Since that time, Regional Board staff, after consulting with a professional facilitator, has indicated a willingness to allow up to 15-20 participants (excluding Regional Board and USEPA staff) to participate in each meeting. It is the Copermittees' position that increases in participation should be limited to Copermittees of the three regions only, i.e., NGO and industry / public representation should remain as originally proposed. Specifically, we propose that representation for each meeting be distributed as follows:

- San Diego County Copermittees: 5 people.
- Riverside County Copermittees: 4 people.
- Orange County Copermittees: 5 people.
- Industry / Public Representatives: 2 entities.
- Non-governmental Organizations (NGOs): 2 entities.
- U.S. EPA: 1 person.

Given that the Copermittees are the only parties to be directly regulated under this proposed Order, they should have the greatest possible opportunities for productive input. While we agree that NGO and industry representation are also critical, we believe that the formal permit adoption process will allow sufficient opportunity for expanded input from these other parties. It is therefore appropriate to restrict their upfront involvement until many of the specifics of the draft Order are solidified.

Moreover, given the limited availability of total meeting seats, we believe that industry and/or public representation should vary as appropriate to the specific content of each meeting. We are interested in providing additional input on this representation once the meeting content is established, but will defer to Regional Board staff in deciding how best to fill each seat for the non-regulated parties.

II. Makeup of Table Parties

All participants should be free to designate any individual or individuals to serve in their table party for any focused meeting. Where the subject matter of a particular meeting warrants, Copermittees should be able to change representatives during the meeting.

III. Copermittee Attendance (Audience)

Contingent on seating availability, each Copermittee should have the right to send as many attendees as they deem appropriate to each meeting.

Sufficient breaks should be allowed during the sessions to allow Copermittees in the Audience to caucus with the table parties.

As time permits, each focused meeting should end with a time for Copermittees or other attendees who are not at the table to provide brief comments or to ask brief questions.

The focused meetings are not intended to be public workshops, and audience membership beyond the Copermittees should be appropriately limited. Regional Board staff, in consultation with the meeting facilitator, should determine how best to ensure appropriate attendance at each meeting.

IV. Meeting Schedule

Due to existing obligations, USEPA regulatory audits, and deliverables related to recently issued MS4 permits, the Orange and Riverside County Copermittees are constrained in their availability to participate in the proposed focused meetings with Regional Board staff and other stakeholders starting in June 2012. Although the San Diego County Copermittees are not subject to the same constraints in June and July, they support structuring the focused meeting process in a way that allows for full participation by the Orange and Riverside County Copermittees. This is key to ensuring a robust dialogue that involves all of the stakeholders and dischargers who will be significantly affected by the new requirements.

In particular, the San Diego County Copermittees concur that in order to accommodate the Riverside County Copermittees' ability both to fulfill their existing obligations, and to prepare for the meetings, no meeting should occur before the week of July 23, 2012. Moreover, as is stated in the Riverside County

Flood Control and Conservation District's June 1, 2012 letter, meetings should not occur between September and mid-November 2012. This will allow representatives of all three permit regions to fulfill their annual reporting obligations.

V. Time between Meetings

The focused meetings should be scheduled such that there are 3 to 4 weeks between meetings. This will allow sufficient time for participants to adequately prepare for the next meeting topic.

VI. Record Keeping/Report Out

Notes or minutes should be taken at the meetings, and draft notes or minutes circulated within one week to the table parties for edits/concurrence. When concurrence on the notes/minutes is reached, they should be promptly distributed to the Copermittees and other participants to ensure continuity between and adequate preparation for each of the meetings. The Copermittees are able provide these services if desired.

VII. Meetings to be Focused on Technical, Not Legal, Issues

Ground rules should be established to ensure that the focus of the meetings will be on technical, not legal, issues. To the extent that table party members are lawyers, they must abide by these rules.

Issues relating to the legality/illegality of provisions in the Administrative Draft or proposals raised during the focused meetings should be referred to legal counsel for separate discussion and, as appropriate, reporting back to the table participants. Additionally, while Copermittees do not propose to have lawyers in their table parties, they should be allowed limited access to legal counsel for consultation during the meetings. Given that the technical and legal aspects of many issues under consideration are not wholly separable, some issues may arise where immediate input or clarification is needed.

In all cases, counsel should only participate in discussions in accordance with the ground rules established.

Please contact Todd Snyder at (858) 694-3482 if you have questions or would like to further discuss this letter. We look forward to meeting with Regional Board staff to finish preparing for the focused meetings, and are hopeful that they will provide the dialogue needed to craft a permitting approach that meets all of our expectations.

Sincerely,

CID TESORO, Manager
Department of Public Works

CT:js

cc: Eric Becker, San Diego Regional Water Quality Control Board
David Barker, San Diego Regional Water Quality Control Board
Copermittees of Santa Margarita Region of Riverside County
South Orange County Copermittees
San Diego County Copermittees

INDUSTRIAL
ENVIRONMENTAL
ASSOCIATION

June 15, 2012

Mr. Wayne Chiu
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego, California, 92123-4340

Re: Stakeholder Participation - Tentative Order No. R9-2012-0011, NPDES No. CAS01092662, Municipal Separate Storm Sewer Systems Draining the Watersheds within the San Diego Region

Dear Mr. Chiu:

The Industrial Environmental Association (IEA) was formed in 1983 to promote environmental responsibility through effective communication and interaction with our members, government, regulatory agencies, business and the community-at-large. Our 60-plus members include San Diego's largest manufacturers who are striving to achieve a balanced relationship between environmental protection, public health, and economically sustainable growth.

IEA received notice that the San Diego Regional Water Quality Control Board (RWQCB) is considering the development and adoption of a Regional Municipal Separate Storm Sewer System (MS4) Storm Water NPDES Permit that will be issued to municipal Copermittees in San Diego County, Southern Orange County and Riverside County. It is our understanding that the RWQCB will be holding focused meetings with limited stakeholder involvement. As an important organization in the San Diego community, we request that IEA be invited as a stakeholder to participate in the focused meetings. We will identify a representative who will work closely with IEA members to effectively collaborate, consolidate, and communicate IEA's views.

Please let me know what the next steps are to engage in the permit procedural matters. We look forward to working with the RWQCB and its staff on this important permit. Thank you for your consideration.

Sincerely,

Jack Monger
Tel: 619 544-9684

ORANGE COUNTY
PublicWorks
Our Community. Our Commitment.

025566
Jess A. Carbajal, Director
300 N. Flower Street
Santa Ana, CA

P.O. Box 4048
Santa Ana, CA 92702-4048

Telephone: (714) 834-2300
Fax: (714) 967-0896

July 3, 2012

David Gibson
Executive Officer
California Regional Water Quality Control Board, San Diego region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4353

Subject: Focused Meetings on Administrative Draft of Tentative Order No. R9-2012-0011

Dear Mr. Gibson:

The County of Orange, Orange County Flood Control District and cities of South Orange County (the Permittees) participated in the first Focused Meeting on June 27, 2012. The following suggestions are made in response to your staff's request for input on the content of the next meeting scheduled for July 11, 2012.

- The meeting on July 11 should be prefaced with a clarification as to the scope of the discussion. Your staff stated that the requirements of the Draft Tentative Order are fixed and the discussion is now simply limited to how compliance with the requirements is to be achieved. This stated position represents a significant departure form the June 20 notice of the meetings which indicates that the meetings are intended to be used to discuss the "...specific terms and conditions of the administrative draft permit."

- The June 20 notice also references the intention of your staff to use the meetings "....to gain a greater understanding of the constraints or limitations the administrative draft permit provisions present...." If this outcome is going to be realized, the meetings now need to start to focus on the details of the draft permit and specifically the provisions that are of paramount concern to the regulated community, notably the land development provisions, TMDL provisions, adaptive management requirements, performance standards and monitoring. If this shift does not occur, very little will be gleaned by any of the participants which will be of considerable detriment to the credibility of the focused meeting process.

- At the meeting on June 27, your staff explained that the anti-backsliding provisions of the Clean Water Act necessarily require the Regional Permit to contain all of the provisions of the Riverside MS4 permit irrespective of their merit. While the Permittees understand that this provision is one of the Clean Water Act's most challenging, its

relevance and interpretation in this instance needs to be fully discussed and its applicability understood in the context of staff's assertions. Indeed, a separate meeting of legal counsel may be necessary to get the needed clarification in this key area.

- The discussion at the June 27 meeting was dominated by the staff that had prepared significant portions of the permit. Lacking was significant input from senior staff who are best able to balance the broader issues of water quality regulation. We would like to see greater involvement from them and, perhaps, yourself.

As corresponded previously, our participation in these focused meetings is set against a significant concern regarding the legal authority for the San Diego Regional Board to issue a Regional Permit that includes the Orange County Permittees. The letter, dated May 10, 2012, in which this concern was first raised, has not been responded to in almost 2 months and we would encourage a response from the Office of Chief Counsel at the earliest time.

Please direct any questions regarding this letter to Richard Boon at (714)955-0670.

Very truly yours

Mary Anne Skorpanich, Manager
OC Watersheds

CC: South Orange County Permittees
Technical Advisory Committee
County of San Diego
Riverside County Flood Control and Water Conservation District
City of San Diego
Regional Board: David Barker, Eric Becker, Wayne Chiu, Laurie Walsh, Christine Arias
Office of Chief Counsel: Catherine Hagan
Lewis Michaelson, Katz & Associates

Attachment: Regional Permit Alternate Timeline

025568

Wayne Chiu - Second MS4 Stakeholder Meeting

From: Jill Witkowski <jill@sdcoastkeeper.org>
To: <lwalsh@waterboards.ca.gov>, Wayne Chiu <wchiu@waterboards.ca.gov>
Date: 7/3/2012 4:54 PM
Subject: Second MS4 Stakeholder Meeting
CC: <tspanos@sdcoastkeeper.org>, Colin Kelly <colin@coastkeeper.org>

Hi Laurie and Wayne,
I m sorry to have missed the first stakeholder meeting, but my student attorney Thomas Spanos was quite pleased with how the meeting went. Together we have come up with a few ideas of suggestions for the topic of the next focus meeting:

1. The identification of the highest water quality priorities in the Water Quality Improvement Plans.
   - ? We are concerned about exactly how the Copermittees determine the Highest Water Quality Priorities. If a pollutant is 303(d) listed, must it count as a priority, or are Copermittees free to ignore it?
   - ? Can watershed groups decide how many pollutants they want to identify? What if one watershed picks 1 pollutant and one picks 6? Is there a desire to have consistency?
2. Assessment of Water Quality Improvement Plans prior to approval.
   - ? These plans are the bedrock of the permit and are critical. It also seems that they will be quite involved. Is it possible to phase their review and release (i.e. review assessment, priority pollutant identification, and source identification, then review numeric targets and schedules, then review improvement strategies and schedules?) I m guessing that the Copermittees will develop these plans over time, and the whole plan hinges on what pollutants are priorities. If the priorities are wrong/misguided, there will be problems with the whole plan. I think it would be in everyone s interest to do a phased review, but I would like to hear from Copermittees and the board staff.
   - ? Public review periods must allow sufficient time to review all plans. It will be a challenge for the board and the public to simultaneously review and comment on 9 individual plans in 30 days. Phasing the review for each plan could alleviate the problem, but so could staggering the plans or giving a longer comment period. I d like to discuss this with Copermittees and board staff.
3. Discussion of how the requirements of Water Quality Improvement Plans interact with those of the
   Jurisdictional Runoff Management Plans.
   - ? Who decides if the jurisdictional programs are consistent with the water quality improvement plans? What happens if they are not consistent?
   - ? How do the jurisdictional plans have to reflect the goals of the water quality improvement plans?
   - ? Who is accountable for meeting with water quality improvement plan goals? All the jurisdictions? What if the source contributing to a priority problem is only in one jurisdiction?
4. Discussion of Water Quality Improvement Plans and JURMP Implementation/Updating
   - ? We have questions about the 3 year iterative process for the plans and the annual review process for the JURMPs. What if all the interim goals are set for 4 or more years out? Will the Copermittees really have sufficient information to implement the iterative process on the plan or on the JURMPs? Is there a way to insure they have adequate information and are not going through the motions?
   - ? Given the requirements in B.5.b(1) and B.5.b(3) (JURMP adaptive management), does it mean that Copermittees have to adjust annually <u>and</u> potentially more frequently if B.2.d and B.3.b require it?

? Is there any collaboration required between Copermittees as JURMP iterative process happens? Can a watershed partner force a copermittee to take action to help achieve the watershed goal (i.e. if one partner is not carrying their weight in reducing pollution)?

We would be happy to talk with you about any of these points ahead of time so we can explain or identify key discussion areas. I look forward to seeing you July 11th.

Cheers,
Jill

Jill Witkowski
Waterkeeper
San Diego Coastkeeper

www.sdcoastkeeper.org
2825 Dewey Rd, Suite 200
San Diego, CA 92106
619.758.7743 x119

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025570

Wayne Chiu - Input on Focused Meeting 2 Agenda

From: "VanRhyn, Jon" <Jon.VanRhyn@sdcounty.ca.gov>
To: Eric Becker <EBecker@waterboards.ca.gov>, 'Laurie Walsh' <LWalsh@waterbo...
Date: 7/3/2012 5:04 PM
Subject: Input on Focused Meeting 2 Agenda
CC: "Kleis, Andrew" <AKleis@sandiego.gov>, 'Elaine Lukey' <Elaine.Lukey@carl...

Hi Eric, Laurie, Wayne, below are some suggested agenda topics for the next focused meeting on July 11. We may need to revise once we see the meeting notes from the June 27 meeting but here are our initial thoughts. Please note that under item 1, we were hoping to further explore what's potentially on or off the table for future meetings. We realize this is a very sensitive topic, and would also be open to discussing offline if that's more acceptable.

1. Recap of main points from the previous meeting; content, organization, and conduct of remaining meetings
2. Adaptive management issues (What portions of the permit are eligible for adaptation? What are the objectives of an adaptive management framework? How can strategic planning establish a basis for adaptive management efforts? How do monitoring and assessment support adaptive management?)
3. Clarify compliance areas in permit (including multiple lines of evidence, prohibitions and limitations, action levels, expression of water quality based effluent limitations)
4. Approval of WQIP and JRMP updates (approval of the annual JRMP updates in 90 days, and clarifying that if areas of the WQIP are unapproved that they be limited to the jurisdictions involved)

Please let us know if you want to discuss. Jon

Jon Van Rhyn
WATER QUALITY PROGRAM MANAGER
COUNTY OF SAN DIEGO WATERSHED PROTECTION PROGRAM
5201 RUFFIN ROAD, STE. P, SAN DIEGO CA 92123
858-495-5133

025571

Wayne Chiu - Regional MS4 Permit July 11, 2012 Focused Meeting Agenda + June 27th Mtg Notes

From: <lyris@swrcb18.waterboards.ca.gov>
To: Wayne Chiu <wchiu@waterboards.ca.gov>
Date: 7/6/2012 5:24 PM
Subject: Regional MS4 Permit July 11, 2012 Focused Meeting Agenda + June 27th Mtg Notes
Attachments: 20120627MeetingNotes_Final_.pdf; FOCUSED MEETING JULY 11 AGENDA.pdf

Stakeholders,

Attached are the July 11, 2012 Focused Meeting Agenda and the June 27, 2012 Focused Meeting Notes.

The July 11, 2012 Focused Meeting will be held in the City of Escondido Mitchell Conference Room located at the City's Civic Center, 201 North Broadway, Escondido, CA 92025. Please note a map showing locations of free parking is attached to the Focused Meeting Notice found at http://www.waterboards.ca.gov/sandiego/docs/Final_Focused_Meeting_Notice_Regional_MS4_Permit.pdf

Regional Board MS4 Permit Team

You are currently subscribed to reg9_sandiegoco_ms4permit as: wchiu@waterboards.ca.gov.

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(It may be necessary to cut and paste the above URL if the line is broken)

or send a blank email to leave-360935-508208.cee2a373662e566393e62f0af18d11cf@swrcb18.waterboards.ca.gov

California Regional Water Quality Control Board, San Diego Region
Regional MS4 Permit Focused Meeting

Meeting Notes

Date	Location	Agenda Topics
6/27/2012 Start time: 9:30 AM End time: 3:40 PM	City of Oceanside San Luis Rey WWTP 3950 North River Road Oceanside, CA 92057 Jim Turner Conf Room	• Meeting Procedures and Objectives • Background and Intent • Assessment and Iterative Process • Assessment and Action Levels • Assessment and Planning • Next Focused Meeting • Audience Comments

I. Introductions

Table participants introduced themselves. Lewis Michaelson (Facilitator) ensured the appropriate representatives were at the table, per the June 20, 2012, San Diego Regional Water Quality Control Board (SD RWQCB) Notice.

San Diego County Copermittees (5): Drew Kleis (City of San Diego), Jon Van Rhyn (County of San Diego), Mikhail Ogawa (City of Del Mar), Todd Snyder (County of San Diego), Elaine Lukey (City of Carlsbad)

Orange County Copermittees (5): Ziad Mazboudi (City of San Juan Capistrano), Lisa Zawaski (City of Dana Point), Grant Sharp (Orange County Flood Control District), Ryan Baron (County of Orange), Richard Boon (County of Orange)

Environmental Community (3): Thom Spanos (San Diego Coastkeeper), Rick Wilson (Surfrider), Michael Hazzard (Clean Water Now! Carlsbad)

Development/Business Community (3): Thom Fuller (San Diego Business Industry Association), Dennis Bowling (American Public Works Association), Tory Walker (San Diego Business Industry Association), Mike McSweeney* (BIA), Wayne Rosenbaum* (BIA), Mark Grey* (BIA) **Indicates representatives rotated during the meeting.*

U.S. Environmental Protection Agency (US EPA) (1): John Kemmerer

San Diego Water Board Permit Team: David Barker, Wayne Chiu, Laurie Walsh, Eric Becker

Riverside County MS4 Copermittees were invited to the focused meeting but were unable to attend due to prior commitments to other compliance issues.

South Orange County has a request in to look at the legal basis for issuing a regional permit. Pending clarification of that request, the County of Orange will participate in the focused meetings.

SD RWQCB Executive Management is represented at these meetings by David Barker, Division Chief.

II. Meeting Procedures and Objectives

Lewis Michaelson (Facilitator) provided a brief presentation on Collaborative Dialogue Principles, including the theory of collaborative dialogue and the ground rules for collaborative dialogue. In theory, collaborative dialogue is interest-based dialogue, not position-based dialogue, and uses objective criteria to attain a "win-win" solution. The ground rules for collaborative dialogue are: 1) everyone's perspective is valued; 2) listen to understand, not to debate; 3) be hard on the issues – soft on the people; 4) avoid right-wrong paradigms; 5) everyone has an equal opportunity to participate; 6) what's past is past – focus on the future.

III. Background and Intent

The SD RWQCB (Wayne Chiu) provided background on how the administrative draft permit was developed, how the focused meetings were envisioned to run, and what is hoped to be accomplished from this point forward. From February to May of 2011, SD RWQCB staff met with several Riverside, Orange County, and San Diego Copermittees and members of the San Diego environmental community to solicit feedback on what they found useful or not useful about existing stormwater management programs, what could be improved, what could work better, and what they would want to see work differently in a regional permit. The SD RWQCB then received the Report of Waste Discharge (ROWD) from the San Diego Copermittees. From the meetings and ROWD, there were similar, overlapping concerns and ideas, which boiled down to five basic principles:

- Simplified and more useful reporting;
- Better coordinated and more useful monitoring;
- More meaningful assessment;
- Integration of Total Maximum Daily Load (TMDL) requirements into the MS4 permits; and,
- More emphasis on strategic planning, with more flexibility in implementing the programs (adaptive management).

Using that feedback, the SD RWQCB developed the administrative draft permit. The focused meetings are the next step in this collaborative process. The purpose of the focused

meetings is to get feedback on the administrative draft permit, keeping in mind that all elements in the administrative draft permit will remain in the permit. The form in which the elements are included is still open to change so long as the changes will be more cost effective, more efficient, more useful for Copermittees, and/or ultimately achieve improvements in water quality. The focused meetings are a unique opportunity for stakeholders to better understand what the SD RWQCB is trying to accomplish with this permit and for the SD RWQCB to better understand what stakeholders see as potential constraints or limitations in the proposed permit requirements. After these focused meetings, there will still be the same public process with any tentative order, including a public comment period, and a public permit adoption hearing.

Requirements included in the administrative draft permit were based on the current Riverside MS4 permit. The structure of the permit, however, was changed to focus the permit on goals and how to best achieve those goals, not simply plan development and implementation. The ultimate goal is to improve water quality, but there is a holistic approach in the administrative draft permit that encourages consideration of issues on a watershed scale as well as issues like water resources, climate change, and flood control management, in addition to water quality.

The SD RWQCB has a long-term vision for this permit. Although required to have 5-year permit terms, the SD RWQCB does not expect all water quality problems to be fixed in 5 years. The idea is that this permit will, at the five year mark, be renewed almost as-is. This will allow the SD RWQCB to become more familiar with the Copermittees' programs and to work as a supportive agency helping the Copermittees rather than an enforcement agency focused on each and every incident.

IV. Assessment and Iterative Process

The SD RWQCB (Wayne Chiu) explained how the iterative process is the main focus of the permit. The iterative process is embedded in the prohibitions and limitations section of the permit. The prohibitions and limitations are the end goal and are an expression of the requirements set forth in the Clean Water Act (CWA). Per the CWA, for municipal permits, there are two basic requirements/objectives: (1) effectively prohibit non-stormwater discharges, and (2) require controls to reduce pollutants in stormwater discharges from MS4s to the maximum extent practicable (MEP). In addition, the overall objective of the CWA is to restore and maintain the physical, chemical, and biological integrity of receiving waters. Understanding that these objectives cannot be achieved in one permit cycle, the iterative process is necessary. The Monitoring and Assessment Section (Section D) spells out how to assess the effectiveness of the municipal storm water programs in achieving those three objectives of the CWA.

Stakeholders (Ziad Mazboudi, City of San Juan Capistrano, County of Orange Copermittees; Drew Kleis, City of San Diego, County of San Diego Copermittees) agreed with

the basic goals of the permit and acknowledged that the iterative process is key to being successful in implementing and achieving those goals.

County of Orange Copermittees (Ziad Mazboudi, City of San Juan Capistrano) added he would like to see some common sense combined with the common goals, including recognition of financial constraints in implementation of the permit.

County of Orange Copermittees (Richard Boon, County of Orange and Lisa Zawaski, City of Dana Point) would like to see "effectively prohibit non-stormwater discharges" instead of "prohibit" in the permit language. This is directly from the CWA language and would provide latitude in the implementation of the permit and protect copermittees from unwarranted exposure to non-compliance. For example, with "prohibit" language, the test of compliance is if there is an illegal discharge / illicit connection (ID/IC) present within the jurisdiction; however, with the "effectively prohibit" language, other considerations come into play (economic, technical, social, etc.) and the presence of an ID/IC does not immediately result in non-compliance.

County of San Diego Copermittees (Drew Kleis, City of San Diego) believe that program planning is essential to achieving an iterative process and that a broader approach should be taken in terms of assessment activities and goals. The assessment should not be limited to assessing whether or not those three specific goals are reached, it should also include what information the programs need for adaptive management. County of San Diego Copermittees (Jon Van Rhyn, County of San Diego) discussed the need for a thorough discussion of the plans and plan process before fully addressing assessment. Assessment is set up when a plan is designed. In designing plans, the objectives are going to make specific commitments. In implementation, strategies to achieve those objectives are implemented. Some will work; some will not work. New knowledge may become available. The adaptive management process should be a learning lab of sorts. The SD RWQCB (Wayne Chiu) agreed there should be some assessment of the actual strategies implemented; however, that may not need to be included in the permit. The permit is looking for progress toward the three CWA objectives (improvements in discharge quality, improvements in receiving water quality, and reduction of non-stormwater discharges in the MS4).

County of San Diego Copermittees (Todd Snyder, County of San Diego) asked for clarification between assessment and compliance, specifically requesting language in the permit that would state if a Water Quality Improvement Plan is approved by the SD RWQCB, then implementation of that plan would constitute compliance with the permit. The Environmental Community (Thom Spanos, SD Coastkeeper) requested clarification on what compliance would be with reduction of pollutants. The SD RWQCB (Wayne Chiu) lined out the points of compliance: (1) Water Quality Improvement Plan submitted; (2) All required elements are included in the Plan; (3) Implementation of the Plan; (4) Assessment of the Plan. In terms of assessment, the point of compliance is that the assessment is completed and that information is used to improve programs and plans; nothing within the plan itself

(targets, schedules, etc.) is a point of compliance. Compliance is a track record of implementation and forward progress. The San Diego Copermittees (Todd Snyder, County of San Diego and Mikhail Ogawa, City of Del Mar) and County of Orange Copermittees (Ziad Mazboudi, City of San Juan Capistrano) would like that interpretation of compliance put explicitly into the permit. The SD RWQCB (Wayne Chiu) reminded the stakeholders that everything in the permit is written as requirement language, not explanation; explanations can go in the Fact Sheet for the permit. Stakeholders are encouraged to submit language for consideration that captures the aforementioned intent but is still stated as a requirement.

San Diego Copermittees (Mikhail Ogawa, City of Del Mar; Drew Kleis, City of San Diego; and, Elaine Lukey, City of Carlsbad) requested that permit language clearly include the ability to tailor assessment programs. Monitoring of receiving water and outfall data, from experience, cannot be tied directly to specific program implementation. County of Orange Copermittees (Grant Sharp, Orange County Flood Control District) agreed that while 50% of their annual budget is allocated to permit-required monitoring, it is a great challenge to correlate monitoring data to program actions. Additional assessment tools, such as observations or reports from non-governmental organizations (NGOs), such as Heal the Bay or the Natural Resources Defense Council (NRDC), are helpful to adequately assess program implementation. The Environmental Community (Thom Spanos, SD Coastkeeper) volunteered that SD Coastkeeper does have a lot of monitoring data; the permit should allow consideration of those data. The SD RWQCB (Wayne Chiu) acknowledged that the ability to tailor assessment programs could be expanded upon in the permit; however, collection of water quality monitoring data is still necessary to determine if conditions are improving. Furthermore, the permit does try to encourage Copermittees to work with other agencies or groups that are collecting monitoring data, and monitoring data are not limited to water quality monitoring data; monitoring data include anything being done to monitor progress.

The Development Community (Thom Fuller, BIA) requested clarification on the monitoring program being a tool to improve water quality. The SD RWQCB (Wayne Chiu) clarified that monitoring is a tool but it is also the feedback loop that indicates whether or not other tools are working and if changes are necessary. The monitoring requirements also have incorporated a set of special studies that Copermittees may use as tools.

San Diego Copermittees (Todd Snyder, County of San Diego) questioned how the permit achieves the goal of streamlined reporting; with the adaptive management context, a significant amount of changes are expected and the RWQCB may have significantly more pieces of unique programs to review which would also be subject to public review. The SD RWQCB (Wayne Chiu) explained that under current permit regulations, the SD RWQCB receives on the order of 60 reports each year with 60 plans to be familiar with. Under the administrative draft permit, that is reduced to 9 reports and 9 plans.

V. Assessment and Action Levels

The SD RWQCB (Wayne Chiu) explained that as the Riverside and Orange County permits were developed, Action Levels were incorporated, creating a whole new program. The original intent of Action Levels was to force Copermittees to actively address, in response to the data collected, non-stormwater discharges. In this regional permit, the approach is different. Rather than being a reactive set of requirements, in the new permit approach, the Action Levels are part of the assessment tools, part of the way to prioritize issues. However, the Action Levels used for the Riverside and Orange County permits are being used in the regional permit due to the RWQCB's approach of utilizing the requirements from the most recently adopted permit (the Riverside Permit in this case) as the foundation of the next permit, and consideration of the anti-backsliding requirements of the Clean Water Act..

The Development Community (Wayne Rosenbaum, BIA) expressed concern that due to the RWQCB staff's interpretation of anti-backsliding policy, stakeholders will have to live with the language and content of the permit in perpetuity. In addition, the permit is highly complex when it comes to assessment. The Development Community would prefer the approach taken with the Hydromodification Plan (HMP) be taken with this permit; allow the stakeholders to develop a program that makes sense, using all intellectual property and expert knowledge available, then come back to the SD RWQCB with the best program possible. With the assessment requirements in the permit, it does not seem to allow for this type of approach.

The County of Orange Copermittees (Richard Boon, County of Orange) shared that having dry weather numeric action levels set by the Basin Plan has resulted in the misdirection of resources; the numeric action levels have not led to addressing real ID/IC issues. The SD RWQCB (Wayne Chiu) responded that the values will not change but how the numeric action levels are applied is different in this regional permit. In this regional permit, the NALs and SALs are tools to better assess and prioritize resources. The Action Levels section lays out the Action Levels that have to be incorporated into the Water Quality Improvement Plan. How those Action Levels are used in the Water Quality Improvement Plan is in the Assessment Section. Within those assessments, there is a section where the monitoring data are compared to NALs and SALs. Then, that information is used to assess the Water Quality Improvement Plan and prioritize strategies. The intent is for Action Levels to become a measure of progress, not an alarm for immediate action. The SD RWQCB (Laurie Walsh) clarified that the Water Quality Improvement Plans are used to establish pollutant priorities. The Action Levels are to be used to measure progress, not to determine compliance. The San Diego Copermittees (Drew Kleis, City of San Diego) would like that language included in the permit to make the prioritization commitment clearer.

The Environmental Community (Thom Spanos, SD Coastkeeper) asked how Copermittees can change their Water Quality Improvement Plans outside the required

three-year adaptive management process. The SD RWQCB (Laurie Walsh) explained that Copermittees can always modify their Water Quality Improvement Plans more frequently; the permit just sets the minimum timeframe.

The Development Community (Wayne Rosenbaum, BIA) brought up the issue of distinguishing between stormwater and non-stormwater. With the hydromodification systems, the drain out is longer than the 3-day stormwater definition. Perhaps there is a better way to define stormwater that would not catch the hydromodification systems under the non-stormwater definition. There is a concern that much time and resources will be spent tracking non-stormwater discharges to hydromodification systems.

VI. Assessment and Planning

The SD RWQCB (Wayne Chiu) explained how the Water Quality Improvement Plan is intended to be the backbone of the permit. In earlier permits, the permits dictated what needed to be in the plans specifically, such that the plans were simply regurgitations of the permits. With this permit, it is up to the Copermittees to take the knowledge they have collected over the last 20 years and use that to develop a Water Quality Improvement Plan that is still based on the three main objectives of the CWA. This will result in MEP becoming an ever-increasing and ever-improving standard. Assessment of the plans will look at the effectiveness of the plans toward achieving the three main objectives of the CWA.

The SD RWQCB recognizes that priorities within the Water Quality Improvement Plans can change over time; the plans need to be set up such that data are collected that allow assessments of the plan elements so that the priorities can be periodically reevaluated. The SD RWQCB (Laurie Walsh) clarified that watersheds with TMDLs should have the TMDLs as the highest priorities; however, multiple benefits across priority levels may be attained (e.g., removing sediment may also reduce metals). The intent was that these Water Quality Improvement Plans could serve as Comprehensive Load Reduction Plans (CLRPs) as well.

The U.S. EPA (John Kemmerer) has been working with the RWQCB since January. The Water Quality Improvement Plans are a good approach for allowing flexibility. The bottom line is that with TMDLs, those waste load allocations need to be incorporated into the permit. The ultimate bottom line is water quality improvement on a watershed basis.

The Environmental Community (Thom Spanos, SD Coastkeeper) agreed with the same goals: seeing marked improvement in highest priorities. The Environmental Community (Rick Wilson, Surfrider) shared the most valuable part of this meeting so far has been clarification of what constitutes compliance, identification of areas of flexibility, and descriptions of ways priorities can be rearranged.

The County of Orange Copermittees (Ryan Baron, County of Orange) referenced the cause/contribute language on page 9 of the administrative draft permit. As this is strict liability language, it makes it difficult to involve NGOs as there is a legal threat. The SD

RWQCB (Wayne Chiu) referenced A.4 on page 13 of the administrative draft permit which tries to make a clearer distinction that compliance with the requirements of A.4 will lead to and will be considered by the San Diego Water Board to be in compliance with the discharge prohibitions and receiving water limitations.

The County of Orange Copermittees (Richard Boon, County of Orange) raised the issue of the recent Ninth Circuit Court Decision in NRDC vs. Los Angeles County where the court decided that the iterative adaptive response is entirely separate and enforceable to the "shall not cause or contribute" clause of the Los Angeles County Permit. The lawyers will need to take a closer look at that language. The SD RWQCB (Wayne Chiu) reiterated that the RWQCB is open to suggestions on language from all stakeholders and encouraged involvement of the NGOs in developing language.

The San Diego Copermittees (Todd Snyder, County of San Diego) pointed out that one element of the Water Quality Improvement Plans is the numeric targets. In side conversations with the SD RWQCB (Wayne Chiu), it is understood that those numeric targets are goals but are not enforceable. The San Diego Copermittees requested that be specified with permit language.

The SD RWQCB (Wayne Chiu) explained the review and approval process for the Water Quality Improvement Plans. The Water Quality Improvement Plans are to be submitted to the SD RWQCB (within 12 months of permit adoption for the San Diego Copermittees). There is then a 30-day public review period, then the Executive Officer of the SD RWQCB would determine if the plan meets the requirements of the permit and, if it does, approve the plan. In order to have this process in which the Executive Officer can approve the plans and plan updates, the permit must include very specific requirements for that plan. The SD RWQCB mentioned that the public participation component might not be fully fleshed out in this administrative draft.

The San Diego Copermittees (Drew Kleis, City of San Diego) questioned in regard to the plan update process, when compliance is determined. The permit should include clear language on compliance woven into the provisions discussed in Provision A. The SD RWQCB (Wayne Chiu) is open to recommendations or suggestions for language.

The SD RWQCB (Laurie Walsh) described the structure of the leading paragraphs for each section of the permit. The first sentence is the purpose of the provision. The next sentence is how the purpose would be accomplished. Third, is the goal of the provision.

The SD RWQCB (Wayne Chiu) mentioned there is a section talking about adaptive management on both the Jurisdictional Management Plan and Water Quality Improvement Plan scale that could be incorporated or explained better. The SD RWQCB (Wayne Chiu) asked for recommendations or suggestions.

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The next focused meeting is set to address similar topics as this focused meeting. Based on the progress and direction of the discussions at the first meeting, stakeholders may have some recommendations on different or additional topics that are germane and timely to discuss at the second meeting, and thus were asked to propose topics for discussion to the SD RWQCB (Laurie Walsh) no later than Tuesday, July 3. The agenda for the meeting will be distributed Friday, July 6.

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IX. Meeting Adjourned

FOCUSED MEETING AGENDA

Administrative Draft of
Tentative Order No. R9-2012-0011, NPDES No. CAS0109266
Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region

Wednesday, July 11, 2012
9:30 a.m. - 3:30 p.m.

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3:00 p.m. - 3:30 p.m.	Comments & Questions (All)

ELECTRONIC MAIL LIST SUBSCRIPTION
The San Diego Water Board has established an electronic mail list specifically for information and notices on the development of a Regional MS4 Storm Water Permit. The San Diego Water Board will use the email list to notify interested persons of upcoming important events and the availability of on-line documents. Persons interested in receiving future notices and information on this specific project can subscribe to one (1) of the electronic mail lists titled “Orange County MS4 Permit, “ Riverside County MS4 Permit, or “San Diego MS4 Permit ”, located on the San Diego Water Board website at:

http://www.waterboards.ca.gov/resources/email_subscriptions/reg9_subscribe.shtml

California Regional Water Quality Control Board, San Diego Region
Regional MS4 Permit Focused Meeting

Meeting Notes

Date	Location	Agenda Topics
6/27/2012 Start time: 9:30 AM End time: 3:40 PM	City of Oceanside San Luis Rey WWTP 3950 North River Road Oceanside, CA 92057 Jim Turner Conf Room	• Meeting Procedures and Objectives • Background and Intent • Assessment and Iterative Process • Assessment and Action Levels • Assessment and Planning • Next Focused Meeting • Audience Comments

I. Introductions

Table participants introduced themselves. Lewis Michaelson (Facilitator) ensured the appropriate representatives were at the table, per the June 20, 2012, San Diego Regional Water Quality Control Board (SD RWQCB) Notice.

San Diego County Copermittees (5): Drew Kleis (City of San Diego), Jon Van Rhyn (County of San Diego), Mikhail Ogawa (City of Del Mar), Todd Snyder (County of San Diego), Elaine Lukey (City of Carlsbad)

Orange County Copermittees (5): Ziad Mazboudi (City of San Juan Capistrano), Lisa Zawaski (City of Dana Point), Grant Sharp (Orange County Flood Control District), Ryan Baron (County of Orange), Richard Boon (County of Orange)

Environmental Community (3): Thom Spanos (San Diego Coastkeeper), Rick Wilson (Surfrider), Michael Hazzard (Clean Water Now! Carlsbad)

Development/Business Community (3): Thom Fuller (San Diego Business Industry Association), Dennis Bowling (American Public Works Association), Tory Walker (San Diego Business Industry Association), Mike McSweeney* (BIA), Wayne Rosenbaum* (BIA), Mark Grey* (BIA) **Indicates representatives rotated during the meeting.*

U.S. Environmental Protection Agency (US EPA) (1): John Kemmerer

San Diego Water Board Permit Team: David Barker, Wayne Chiu, Laurie Walsh, Eric Becker

Riverside County MS4 Copermittees were invited to the focused meeting but were unable to attend due to prior commitments to other compliance issues.

South Orange County has a request in to look at the legal basis for issuing a regional permit. Pending clarification of that request, the County of Orange will participate in the focused meetings.

SD RWQCB Executive Management is represented at these meetings by David Barker, Division Chief.

II. Meeting Procedures and Objectives

Lewis Michaelson (Facilitator) provided a brief presentation on Collaborative Dialogue Principles, including the theory of collaborative dialogue and the ground rules for collaborative dialogue. In theory, collaborative dialogue is interest-based dialogue, not position-based dialogue, and uses objective criteria to attain a "win-win" solution. The ground rules for collaborative dialogue are: 1) everyone's perspective is valued; 2) listen to understand, not to debate; 3) be hard on the issues – soft on the people; 4) avoid right-wrong paradigms; 5) everyone has an equal opportunity to participate; 6) what's past is past – focus on the future.

III. Background and Intent

The SD RWQCB (Wayne Chiu) provided background on how the administrative draft permit was developed, how the focused meetings were envisioned to run, and what is hoped to be accomplished from this point forward. From February to May of 2011, SD RWQCB staff met with several Riverside, Orange County, and San Diego Copermittees and members of the San Diego environmental community to solicit feedback on what they found useful or not useful about existing stormwater management programs, what could be improved, what could work better, and what they would want to see work differently in a regional permit. The SD RWQCB then received the Report of Waste Discharge (ROWD) from the San Diego Copermittees. From the meetings and ROWD, there were similar, overlapping concerns and ideas, which boiled down to five basic principles:

- Simplified and more useful reporting;
- Better coordinated and more useful monitoring;
- More meaningful assessment;
- Integration of Total Maximum Daily Load (TMDL) requirements into the MS4 permits; and,
- More emphasis on strategic planning, with more flexibility in implementing the programs (adaptive management).

Using that feedback, the SD RWQCB developed the administrative draft permit. The focused meetings are the next step in this collaborative process. The purpose of the focused

meetings is to get feedback on the administrative draft permit, keeping in mind that all elements in the administrative draft permit will remain in the permit. The form in which the elements are included is still open to change so long as the changes will be more cost effective, more efficient, more useful for Copermittees, and/or ultimately achieve improvements in water quality. The focused meetings are a unique opportunity for stakeholders to better understand what the SD RWQCB is trying to accomplish with this permit and for the SD RWQCB to better understand what stakeholders see as potential constraints or limitations in the proposed permit requirements. After these focused meetings, there will still be the same public process with any tentative order, including a public comment period, and a public permit adoption hearing.

Requirements included in the administrative draft permit were based on the current Riverside MS4 permit. The structure of the permit, however, was changed to focus the permit on goals and how to best achieve those goals, not simply plan development and implementation. The ultimate goal is to improve water quality, but there is a holistic approach in the administrative draft permit that encourages consideration of issues on a watershed scale as well as issues like water resources, climate change, and flood control management, in addition to water quality.

The SD RWQCB has a long-term vision for this permit. Although required to have 5-year permit terms, the SD RWQCB does not expect all water quality problems to be fixed in 5 years. The idea is that this permit will, at the five year mark, be renewed almost as-is. This will allow the SD RWQCB to become more familiar with the Copermittees' programs and to work as a supportive agency helping the Copermittees rather than an enforcement agency focused on each and every incident.

IV. Assessment and Iterative Process

The SD RWQCB (Wayne Chiu) explained how the iterative process is the main focus of the permit. The iterative process is embedded in the prohibitions and limitations section of the permit. The prohibitions and limitations are the end goal and are an expression of the requirements set forth in the Clean Water Act (CWA). Per the CWA, for municipal permits, there are two basic requirements/objectives: (1) effectively prohibit non-stormwater discharges, and (2) require controls to reduce pollutants in stormwater discharges from MS4s to the maximum extent practicable (MEP). In addition, the overall objective of the CWA is to restore and maintain the physical, chemical, and biological integrity of receiving waters. Understanding that these objectives cannot be achieved in one permit cycle, the iterative process is necessary. The Monitoring and Assessment Section (Section D) spells out how to assess the effectiveness of the municipal storm water programs in achieving those three objectives of the CWA.

Stakeholders (Ziad Mazboudi, City of San Juan Capistrano, County of Orange Copermittees; Drew Kleis, City of San Diego, County of San Diego Copermittees) agreed with

the basic goals of the permit and acknowledged that the iterative process is key to being successful in implementing and achieving those goals.

County of Orange Copermittees (Ziad Mazboudi, City of San Juan Capistrano) added he would like to see some common sense combined with the common goals, including recognition of financial constraints in implementation of the permit.

County of Orange Copermittees (Richard Boon, County of Orange and Lisa Zawaski, City of Dana Point) would like to see "effectively prohibit non-stormwater discharges" instead of "prohibit" in the permit language. This is directly from the CWA language and would provide latitude in the implementation of the permit and protect copermittees from unwarranted exposure to non-compliance. For example, with "prohibit" language, the test of compliance is if there is an illegal discharge / illicit connection (ID/IC) present within the jurisdiction; however, with the "effectively prohibit" language, other considerations come into play (economic, technical, social, etc.) and the presence of an ID/IC does not immediately result in non-compliance.

County of San Diego Copermittees (Drew Kleis, City of San Diego) believe that program planning is essential to achieving an iterative process and that a broader approach should be taken in terms of assessment activities and goals. The assessment should not be limited to assessing whether or not those three specific goals are reached, it should also include what information the programs need for adaptive management. County of San Diego Copermittees (Jon Van Rhyn, County of San Diego) discussed the need for a thorough discussion of the plans and plan process before fully addressing assessment. Assessment is set up when a plan is designed. In designing plans, the objectives are going to make specific commitments. In implementation, strategies to achieve those objectives are implemented. Some will work; some will not work. New knowledge may become available. The adaptive management process should be a learning lab of sorts. The SD RWQCB (Wayne Chiu) agreed there should be some assessment of the actual strategies implemented; however, that may not need to be included in the permit. The permit is looking for progress toward the three CWA objectives (improvements in discharge quality, improvements in receiving water quality, and reduction of non-stormwater discharges in the MS4).

County of San Diego Copermittees (Todd Snyder, County of San Diego) asked for clarification between assessment and compliance, specifically requesting language in the permit that would state if a Water Quality Improvement Plan is approved by the SD RWQCB, then implementation of that plan would constitute compliance with the permit. The Environmental Community (Thom Spanos, SD Coastkeeper) requested clarification on what compliance would be with reduction of pollutants. The SD RWQCB (Wayne Chiu) lined out the points of compliance: (1) Water Quality Improvement Plan submitted; (2) All required elements are included in the Plan; (3) Implementation of the Plan; (4) Assessment of the Plan. In terms of assessment, the point of compliance is that the assessment is completed and that information is used to improve programs and plans; nothing within the plan itself

(targets, schedules, etc.) is a point of compliance. Compliance is a track record of implementation and forward progress. The San Diego Copermittees (Todd Snyder, County of San Diego and Mikhail Ogawa, City of Del Mar) and County of Orange Copermittees (Ziad Mazboudi, City of San Juan Capistrano) would like that interpretation of compliance put explicitly into the permit. The SD RWQCB (Wayne Chiu) reminded the stakeholders that everything in the permit is written as requirement language, not explanation; explanations can go in the Fact Sheet for the permit. Stakeholders are encouraged to submit language for consideration that captures the aforementioned intent but is still stated as a requirement.

San Diego Copermittees (Mikhail Ogawa, City of Del Mar; Drew Kleis, City of San Diego; and, Elaine Lukey, City of Carlsbad) requested that permit language clearly include the ability to tailor assessment programs. Monitoring of receiving water and outfall data, from experience, cannot be tied directly to specific program implementation. County of Orange Copermittees (Grant Sharp, Orange County Flood Control District) agreed that while 50% of their annual budget is allocated to permit-required monitoring, it is a great challenge to correlate monitoring data to program actions. Additional assessment tools, such as observations or reports from non-governmental organizations (NGOs), such as Heal the Bay or the Natural Resources Defense Council (NRDC), are helpful to adequately assess program implementation. The Environmental Community (Thom Spanos, SD Coastkeeper) volunteered that SD Coastkeeper does have a lot of monitoring data; the permit should allow consideration of those data. The SD RWQCB (Wayne Chiu) acknowledged that the ability to tailor assessment programs could be expanded upon in the permit; however, collection of water quality monitoring data is still necessary to determine if conditions are improving. Furthermore, the permit does try to encourage Copermittees to work with other agencies or groups that are collecting monitoring data, and monitoring data are not limited to water quality monitoring data; monitoring data include anything being done to monitor progress.

The Development Community (Thom Fuller, BIA) requested clarification on the monitoring program being a tool to improve water quality. The SD RWQCB (Wayne Chiu) clarified that monitoring is a tool but it is also the feedback loop that indicates whether or not other tools are working and if changes are necessary. The monitoring requirements also have incorporated a set of special studies that Copermittees may use as tools.

San Diego Copermittees (Todd Snyder, County of San Diego) questioned how the permit achieves the goal of streamlined reporting; with the adaptive management context, a significant amount of changes are expected and the RWQCB may have significantly more pieces of unique programs to review which would also be subject to public review. The SD RWQCB (Wayne Chiu) explained that under current permit regulations, the SD RWQCB receives on the order of 60 reports each year with 60 plans to be familiar with. Under the administrative draft permit, that is reduced to 9 reports and 9 plans.

V. Assessment and Action Levels

The SD RWQCB (Wayne Chiu) explained that as the Riverside and Orange County permits were developed, Action Levels were incorporated, creating a whole new program. The original intent of Action Levels was to force Copermittees to actively address, in response to the data collected, non-stormwater discharges. In this regional permit, the approach is different. Rather than being a reactive set of requirements, in the new permit approach, the Action Levels are part of the assessment tools, part of the way to prioritize issues. However, the Action Levels used for the Riverside and Orange County permits are being used in the regional permit due to the RWQCB's approach of utilizing the requirements from the most recently adopted permit (the Riverside Permit in this case) as the foundation of the next permit, and consideration of the anti-backsliding requirements of the Clean Water Act..

The Development Community (Wayne Rosenbaum, BIA) expressed concern that due to the RWQCB staff's interpretation of anti-backsliding policy, stakeholders will have to live with the language and content of the permit in perpetuity. In addition, the permit is highly complex when it comes to assessment. The Development Community would prefer the approach taken with the Hydromodification Plan (HMP) be taken with this permit; allow the stakeholders to develop a program that makes sense, using all intellectual property and expert knowledge available, then come back to the SD RWQCB with the best program possible. With the assessment requirements in the permit, it does not seem to allow for this type of approach.

The County of Orange Copermittees (Richard Boon, County of Orange) shared that having dry weather numeric action levels set by the Basin Plan has resulted in the misdirection of resources; the numeric action levels have not led to addressing real ID/IC issues. The SD RWQCB (Wayne Chiu) responded that the values will not change but how the numeric action levels are applied is different in this regional permit. In this regional permit, the NALs and SALs are tools to better assess and prioritize resources. The Action Levels section lays out the Action Levels that have to be incorporated into the Water Quality Improvement Plan. How those Action Levels are used in the Water Quality Improvement Plan is in the Assessment Section. Within those assessments, there is a section where the monitoring data are compared to NALs and SALs. Then, that information is used to assess the Water Quality Improvement Plan and prioritize strategies. The intent is for Action Levels to become a measure of progress, not an alarm for immediate action. The SD RWQCB (Laurie Walsh) clarified that the Water Quality Improvement Plans are used to establish pollutant priorities. The Action Levels are to be used to measure progress, not to determine compliance. The San Diego Copermittees (Drew Kleis, City of San Diego) would like that language included in the permit to make the prioritization commitment clearer.

The Environmental Community (Thom Spanos, SD Coastkeeper) asked how Copermittees can change their Water Quality Improvement Plans outside the required

three-year adaptive management process. The SD RWQCB (Laurie Walsh) explained that Copermittees can always modify their Water Quality Improvement Plans more frequently; the permit just sets the minimum timeframe.

The Development Community (Wayne Rosenbaum, BIA) brought up the issue of distinguishing between stormwater and non-stormwater. With the hydromodification systems, the drain out is longer than the 3-day stormwater definition. Perhaps there is a better way to define stormwater that would not catch the hydromodification systems under the non-stormwater definition. There is a concern that much time and resources will be spent tracking non-stormwater discharges to hydromodification systems.

VI. Assessment and Planning

The SD RWQCB (Wayne Chiu) explained how the Water Quality Improvement Plan is intended to be the backbone of the permit. In earlier permits, the permits dictated what needed to be in the plans specifically, such that the plans were simply regurgitations of the permits. With this permit, it is up to the Copermittees to take the knowledge they have collected over the last 20 years and use that to develop a Water Quality Improvement Plan that is still based on the three main objectives of the CWA. This will result in MEP becoming an ever-increasing and ever-improving standard. Assessment of the plans will look at the effectiveness of the plans toward achieving the three main objectives of the CWA.

The SD RWQCB recognizes that priorities within the Water Quality Improvement Plans can change over time; the plans need to be set up such that data are collected that allow assessments of the plan elements so that the priorities can be periodically reevaluated. The SD RWQCB (Laurie Walsh) clarified that watersheds with TMDLs should have the TMDLs as the highest priorities; however, multiple benefits across priority levels may be attained (e.g., removing sediment may also reduce metals). The intent was that these Water Quality Improvement Plans could serve as Comprehensive Load Reduction Plans (CLRPs) as well.

The U.S. EPA (John Kemmerer) has been working with the RWQCB since January. The Water Quality Improvement Plans are a good approach for allowing flexibility. The bottom line is that with TMDLs, those waste load allocations need to be incorporated into the permit. The ultimate bottom line is water quality improvement on a watershed basis.

The Environmental Community (Thom Spanos, SD Coastkeeper) agreed with the same goals: seeing marked improvement in highest priorities. The Environmental Community (Rick Wilson, Surfrider) shared the most valuable part of this meeting so far has been clarification of what constitutes compliance, identification of areas of flexibility, and descriptions of ways priorities can be rearranged.

The County of Orange Copermittees (Ryan Baron, County of Orange) referenced the cause/contribute language on page 9 of the administrative draft permit. As this is strict liability language, it makes it difficult to involve NGOs as there is a legal threat. The SD

RWQCB (Wayne Chiu) referenced A.4 on page 13 of the administrative draft permit which tries to make a clearer distinction that compliance with the requirements of A.4 will lead to and will be considered by the San Diego Water Board to be in compliance with the discharge prohibitions and receiving water limitations.

The County of Orange Copermittees (Richard Boon, County of Orange) raised the issue of the recent Ninth Circuit Court Decision in NRDC vs. Los Angeles County where the court decided that the iterative adaptive response is entirely separate and enforceable to the "shall not cause or contribute" clause of the Los Angeles County Permit. The lawyers will need to take a closer look at that language. The SD RWQCB (Wayne Chiu) reiterated that the RWQCB is open to suggestions on language from all stakeholders and encouraged involvement of the NGOs in developing language.

The San Diego Copermittees (Todd Snyder, County of San Diego) pointed out that one element of the Water Quality Improvement Plans is the numeric targets. In side conversations with the SD RWQCB (Wayne Chiu), it is understood that those numeric targets are goals but are not enforceable. The San Diego Copermittees requested that be specified with permit language.

The SD RWQCB (Wayne Chiu) explained the review and approval process for the Water Quality Improvement Plans. The Water Quality Improvement Plans are to be submitted to the SD RWQCB (within 12 months of permit adoption for the San Diego Copermittees). There is then a 30-day public review period, then the Executive Officer of the SD RWQCB would determine if the plan meets the requirements of the permit and, if it does, approve the plan. In order to have this process in which the Executive Officer can approve the plans and plan updates, the permit must include very specific requirements for that plan. The SD RWQCB mentioned that the public participation component might not be fully fleshed out in this administrative draft.

The San Diego Copermittees (Drew Kleis, City of San Diego) questioned in regard to the plan update process, when compliance is determined. The permit should include clear language on compliance woven into the provisions discussed in Provision A. The SD RWQCB (Wayne Chiu) is open to recommendations or suggestions for language.

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3:00 p.m. - 3:30 p.m.	Comments & Questions (All)

ELECTRONIC MAIL LIST SUBSCRIPTION
The San Diego Water Board has established an electronic mail list specifically for information and notices on the development of a Regional MS4 Storm Water Permit. The San Diego Water Board will use the email list to notify interested persons of upcoming important events and the availability of on-line documents. Persons interested in receiving future notices and information on this specific project can subscribe to one (1) of the electronic mail lists titled “Orange County MS4 Permit, “ Riverside County MS4 Permit, or “San Diego MS4 Permit ”, located on the San Diego Water Board website at:

http://www.waterboards.ca.gov/resources/email_subscriptions/reg9_subscribe.shtml

025594

Wayne Chiu - RE: Offer for Focused Meeting Follow Up With Riverside County MS4 Copermittees

From: "Padres, Claudio" <CMPadres@rcflood.org>
To: Eric Becker <EBecker@waterboards.ca.gov>
Date: 7/9/2012 11:59 AM
Subject: RE: Offer for Focused Meeting Follow Up With Riverside County MS4 Copermittees
CC: "Wildomar (Steve Palmer)" <spalmer@cityofwildomar.org>, "'Temecula (Aldo...

Eric,

Your e-mail was forwarded to the City of Wildomar as requested. For future reference, Steve Palmer's e-mail address is: spalmer@cityofwildomar.org. Also please include me on your future e-mails as well.

Thank you for your offer to meet to summarize the June 27 Focus Meeting. However, given our workloads and priorities as we have previously discussed, a meeting to summarize the topics discussed is not warranted. I expect that your meeting notes will adequately provide that summary.

Regards,

Claudio M. Padres, PE
Senior Civil Engineer – Water Quality Planning
Watershed Protection Division

Riverside County Flood Control and Water Conservation District
1995 Market Street, Riverside, CA 92501

Begin forwarded message:

> **From:** Eric Becker <EBecker@waterboards.ca.gov>
> **Date:** June 28, 2012 10:12:49 AM PDT
> **To:** <Aldo.Licitra@cityoftemecula.org>, <Mayra.DeLaTorre@cityoftemecula.org>, <wwoolsey@murrieta.org>, <mshetler@rceo.org>, <dhgarcia@rcflood.org>, <JUHLEY@rcflood.org>
> **Cc:** David Barker <DBarker@waterboards.ca.gov>, Laurie Walsh <LWalsh@waterboards.ca.gov>, Wayne Chiu <WChiu@waterboards.ca.gov>
> **Subject: Offer for Focused Meeting Follow Up With Riverside County MS4 Copermittees**
>
> Hi All-
>
> It was unfortunate that you could not attend our first Focused Meeting on the Regional MS4

025595

Permit yesterday. We had a very productive meeting and will provide the meeting notes next week. In addition, we are offering to meet with you in Riverside County to provide a summary of topics discussed at the focused meeting. Please let us know if you would like to meet.

Hopefully, someone from the Riverside County Copermittees can be at our next July 11th Focused Meeting.

Could you also forward this email to Steve Palmer with the City of Wildomar. Thanks.

Eric Becker, P.E.
Senior Water Resources Control Engineer
Southern Watershed Unit
SDRWQCB
9174 Sky Park Court, Suite 100
San Diego, CA 92123
(858) 492-1785
(858) 571-6972
EBecker@waterboards.ca.gov

WARREN D. WILLIAMS
General Manager-Chief Engineer

025596

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www.rcflood.org

RIVERSIDE COUNTY FLOOD CONTROL
AND WATER CONSERVATION DISTRICT

July 9, 2012

Mr. Grant Destache, Chairman
California Regional Water Quality Control Board
San Diego Region
9174 Sky Park Court, Suite 100
San Diego, California 92123

Dear Chairman Destache:

Re: Exclusion of Riverside County Copermittees from Focused Meetings on Proposed Regional MS4 Permit

The Riverside County Flood Control and Water Conservation District is the Principal Copermittee on Order R9-2010-0016, the MS4 permit which the San Diego Regional Board issued in November 2010 to the District, the County of Riverside, and the Cities of Murrieta, Temecula and Wildomar (collectively the Riverside Copermittees). The District is sending this letter on behalf of each of these Copermittees.

The purpose of this letter is to request an explanation as to why it was considered appropriate to move forward with "Focused Meetings" on a new proposed Regional MS4 Permit in a manner which knowingly precluded the Riverside Copermittees from participation.

On April 4, 2012, less than 17 months after the adoption of Order R9-2010-0016, Regional Board staff announced that they were actively developing a new proposed Regional MS4 Permit, which would cover San Diego County and the portions of Orange and Riverside Counties within the jurisdiction of the Regional Board. A public workshop was held on April 25th, during which Board staff presented their rationale for the proposed Regional MS4 Permit and announced a series of four subsequent "Focused Meetings", each covering various aspects of the proposed permit. Staff stressed at this workshop that it was important to bring the Copermittee groups of the three Counties together with other stakeholders in these Focused Meetings, to collaboratively and constructively discuss options for a strategic, adaptive, and synergistic permitting approach focused on achieving desired water quality outcomes.

At the April 25th public workshop, another meeting on May 9, 2012, and in three letters dated May 22, June 1, and June 7 (enclosed), the Riverside Copermittees reminded Board staff that the existing MS4 permit, Order R9-2010-0016, required the Riverside Copermittees to develop and submit seven major compliance documents by June 30, 2012. In addition, the District and the County of Riverside were faced with additional major requirements due that same date to the Santa Ana Regional Board.

Accordingly, the Riverside Copermittees informed staff that they simply could not participate in any Focused Meetings before the week of July 23rd due to these other regulatory obligations from the Regional Boards. The Riverside Copermittees explained that beginning the meetings the week of July 23rd would provide the Riverside Copermittees with the minimum amount of time needed to complete their submissions in compliance with Order R9-2010-0016, and leave enough time for them to then review and analyze the administrative draft of the Regional MS4 Permit in preparation for the Focused Meetings. This scheduling concern was discussed with Regional Board staff at an in-person meeting on June 14, 2012. During that meeting, Regional Board staff indicated that a delay of the first Focused Meeting to the week of July 23rd was acceptable, pending approval by Regional Board management.

Despite all of these above referenced communications, and the statements of staff at the June 14th meeting, Regional Board staff issued a notice on June 20th stating that they would nevertheless move forward with the first two (of four) Focused Meetings on June 27th and July 11th. These two Focused Meetings were scheduled to cover many of the fundamental and core elements of the proposed Regional MS4 Permit.

We must conclude that Board staff's actions reflect a conscious decision to move forward with the Focused Meetings without representation and participation from the Riverside Copermittees. Subsequent communications with Board staff unfortunately reinforce a conclusion that staff is not genuinely interested in involving the Riverside Copermittees and considering their input. For example, after the June 27th Focused Meeting, Board staff indicated that they would be willing to meet with the Riverside Copermittees only to "summarize" the meeting. Providing a summary does not address the fact that the Riverside Copermittees were effectively precluded from participating together with the other stakeholders in the actual Focused Meeting discussions. This action appears contrary to the collaborative public participation processes that have been advocated by Executive Officer David Gibson at various public forums, as well as by Regional Board staff at the April 25th public workshop.

The Riverside Copermittees are further concerned that this decision may be indicative of an underlying indifference among some Regional Board staff toward the types of collaboration that they have discussed in their public forums, as well as their commitment to collaboration on other ongoing watershed protection efforts, such as for the Santa Margarita Lagoon and Estuary and the Santa Margarita River TMDL Project.

As public stewards for the citizens of Riverside County, we must be able to provide an explanation to our local elected officials and citizens as to why it was considered appropriate to move forward with the Focused Meetings in a manner which knowingly precluded the Riverside Copermittees from participation. We look forward to receiving your thoughts on this important matter and appreciate the Board's response.

If you have any questions regarding this letter, please contact Jason Uhley or me at 951.955.1200.

Very truly yours,

WARREN D. WILLIAMS
General Manager-Chief Engineer

Enclosures:

- Letter to Eric Becker from Claudio Padres (District), May 22, 2012
- Letter to David Gibson from Jason Uhley (District), June 1, 2012
- Letter to David Gibson from Cid Tesoro (County of San Diego), on behalf of the MS4 Copermittees in the three Counties of San Diego, Orange and Riverside, June 7, 2012

cc: David Gibson
George Johnson, Assistant County Executive Officer
Office of Riverside County Supervisor Jeff Stone (attn. Verne Lauritzen)
David Barker
Eric Becker
Riverside Copermittees

CMP:seb

P8\147760

WARREN D. WILLIAMS
General Manager-Chief Engineer

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RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

May 22, 2012

Mr. Eric Becker, P.E.
Senior WRCE Engineer
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Sent Via E-Mail to ebecker@waterboards.ca.gov

Dear Mr. Becker:

Re: Schedule for Focused Meetings on the Proposed Joint Permit for San Diego, Orange and Riverside County Copermittees

I am writing on behalf of the Santa Margarita Region ("SMR") Copermittees regarding the proposed schedule for focused meetings on the Administrative Draft proposed joint MS4 permit for the San Diego, Orange and Riverside County Copermittees.

As we discussed in our May 10, 2012 meeting with you, Laurie Walsh and Wayne Chiu, the SMR Copermittees are fully occupied through the end of June in modifying existing compliance programs as well as preparing and submitting the required documentation of these programs under the terms of the 2010 MS4 Permit. As a result, the Copermittees lack staff and financial resources to participate in the focused meetings during June, especially given that Regional Board staff has indicated that Copermittees should come to those meetings prepared to comment on the Administrative Draft as well as propose alternative language.

Because the SMR Copermittees cannot attend any focused meetings during June, and need time to study the Administrative Draft and prepare comments, alternative language and questions, the Copermittees request that the first focused meeting occur no earlier than the week of July 23, 2012 which will give the Copermittees time to prepare and help ensure that the focused meetings are productive for all participants.

Please note that by agreeing to participate in the focused meetings, the SMR Copermittees are not waiving their already-stated concerns with the joint permit process nor their previous comments on the format for the focused meetings.

Please contact me at 951.955.8602 or by e-mail at cmpadres@rcflood.org if you have any questions concerning the matters discussed in this letter.

Very truly yours,

CLAUDIO PADRES
Senior Civil Engineer

ec: David Barker, P.E.
Laurie Walsh, P.E.
Wayne Chiu, P.E.
SMR Copermittees

CP:cw
P8/146836

WARREN D. WILLIAMS
General Manager-Chief Engineer

025600

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RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

June 1, 2012

Mr. David Gibson
Executive Officer
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Sent Via E-Mail to dgibson@waterboards.ca.gov

Dear Mr. Gibson:

Re: Schedule for Focused Meetings on the Proposed Joint Permit for San Diego, Orange and Riverside County Copermittees

I am writing on behalf of the Santa Margarita Region ("SMR") Copermittees regarding the Administrative Draft of Tentative Order No. R9-2012-0011 for the San Diego, Orange and Riverside County Copermittees (Administrative Draft). Fundamentally, we believe that consideration of the Administrative Draft is premature. However, if the Regional Board insists on proceeding with development of a regional MS4 permit, each of the Copermittee programs must have an opportunity to meaningfully and effectively participate in the focused meeting process.

Development of a Joint MS4 Permit is Premature

The SMR Copermittees support the South Orange County Copermittees' position (set forth in their May 17, 2012 letter) that a regional MS4 permit is not the preferred approach at this point. In discussions leading up to the development of the SMR fourth-term MS4 permit, a regional permitting option was discussed. The SMR Copermittees requested that the Regional Board defer adoption of the fourth-term SMR permit pending coordinated discussions with the other Counties regarding the viability of a regional permit. That request was denied. We are now faced with potentially having to negotiate, develop and implement portions of two MS4 permits for the SMR within two years. This represents a potentially significant waste of limited public resources during a severe and prolonged recessionary period that is impacting State, local and taxpayer budgets. In light of these facts, Board staff should not impose a second permit renewal process upon the SMR Copermittees a mere 18 months after the Board adopted our individual SMR MS4 Permit in 2010.

The SMR Copermittees believe that a more reasonable alternative would include issuance of a fourth-term MS4 permit to the San Diego County Copermittees and development of a regional MS4 permit in 2017, by which time all three fourth-term MS4 permits issued by the San Diego Regional Board will have expired. This would enable the SMR, San Diego and South Orange County Copermittees to schedule for and properly allocate the substantial resources needed to properly undertake such a complex and resource intensive process.

Joint MS4 Permit Development

Without waiving their above-stated objections, the SMR Copermittees are not opposed to participating in the series of focused meetings to discuss a regional permitting approach. Such meetings, if appropriately conducted, may enable the SMR Copermittees to properly evaluate the potential benefits of a regional permit. We would also note that additional meetings beyond those originally proposed by the Regional Board staff may be required if a meaningful dialogue regarding development of a regional permit is expected. Both the existing fourth-term MS4 Permits and the Administrative Draft pose many difficult issues that must be addressed.

The participation of the SMR Copermittees in the focused meetings, however, is predicated on the following scheduling requirements:

July Commencement of Focused Meetings

As previously communicated to Board staff, the SMR Copermittees are fully occupied through the end of June in developing and modifying existing compliance programs as previously directed by the Board in the 2010 MS4 Permit. Therefore, the SMR Copermittees cannot attend any focused meetings during June and still meet our compliance deadlines. Further, once those required documents are completed and submitted, the Copermittees will still need time to study the Administrative Draft and prepare comments, alternative language and questions before being able to effectively participate in the focused meetings as requested by staff. Therefore, the Copermittees reiterate our previous request that the first focused meeting occur no earlier than the week of July 23, 2012. This will provide SMR Copermittee representatives an opportunity to prepare for the focused meetings so that they may effectively represent the interests of the SMR Copermittees. If staff moves forward with focused meetings in June, this will preclude the SMR Copermittees from effective participation in the initial focused meetings.

Mid-October/Mid November Blackout

Riverside County is under the jurisdiction of three Regional Boards and three MS4 permits. As a result, between mid-September and mid-November, the Riverside County MS4 program is fully engaged in preparing the three Annual Reports required by these permits. In addition, the Riverside County MS4 Program will also be finalizing a Report of Waste Discharge for submittal to the Colorado Regional Board. As a result, the key members of SMR MS4 Program management will not have adequate time to prepare or participate in the focused meetings during the mid-September to mid-November time period. We, therefore, require that no focused meetings occur during that period. We understand that this scheduling concern is shared by the South Orange County Copermittees.

Re: Schedule for Focused Meetings on the Proposed Joint Permit for San Diego, Orange and Riverside County Copermittees

Support for Comments by South Orange County Copermittees

In addition to accommodation of the above-noted scheduling requirements, we support the position of the South Orange County Copermittees (set forth in their May 17th letter) that the focused meetings must:

- Provide for meaningful individual participation by all of the municipal entities that are intended to be enrolled in a regional permit, and
- Include appropriate proportionate representation by stakeholders and interested parties, recognizing that the regional permit is intended to be issued to the permittees and not others.

The SMR Copermittees reserve their right to comment on the format for the focused meetings.

Please contact me at 951.955.1273 or by e-mail at juhley@rcflood.org if you have any questions concerning the matters discussed in this letter.

Very truly yours,

JASON UHLEY, P.E.
Principal Engineer

ec: David Barker, P.E.
Eric Becker, P.E.
Laurie Walsh, P.E.
Wayne Chiu, P.E.
SMR Copermittees
Chris Crompton
John Van Rhyne
David Burhenn

RC:JU:bjp

County of San Diego

RICHARD E. CROMPTON
DIRECTOR

DEPARTMENT OF PUBLIC WORKS

5500 OVERLAND AVE, SUITE 310
SAN DIEGO, CALIFORNIA 92123-1295

(858) 694-2212 FAX: (858) 268-0461
Web Site: www.sdcounty.ca.gov/dpw/

June 7, 2012

David Gibson
Executive Officer
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-47340

Dear Mr. Gibson:

COPERMITTEE INPUT ON ADMINISTRATIVE DRAFT PERMIT WORKSHOPS

The Regional Water Quality Control Board staff has proposed that a series of stakeholder focused meetings be held to explore and consider the content of *Administrative Draft National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region (Tentative Order No. R9-2012-0011, NPDES No. CAS0109266).* To this end, the Copermittees of San Diego County, South Orange County, and the Santa Margarita Region of Riverside County offer the following input on their expectations and preferences for the organization and conduct of the meetings.

I. Parties at the Table ("Table Parties") for Focused Meetings

Regional Board staff initially proposed that a total of eleven participants be included in the focused meetings. Since that time, Regional Board staff, after consulting with a professional facilitator, has indicated a willingness to allow up to 15-20 participants (excluding Regional Board and USEPA staff) to participate in each meeting. It is the Copermittees' position that increases in participation should be limited to Copermittees of the three regions only, i.e., NGO and industry / public representation should remain as originally proposed. Specifically, we propose that representation for each meeting be distributed as follows:

- San Diego County Copermittees: 5 people.
- Riverside County Copermittees: 4 people.
- Orange County Copermittees: 5 people.
- Industry / Public Representatives: 2 entities.
- Non-governmental Organizations (NGOs): 2 entities.
- U.S. EPA: 1 person.

Given that the Copermittees are the only parties to be directly regulated under this proposed Order, they should have the greatest possible opportunities for productive input. While we agree that NGO and industry representation are also critical, we believe that the formal permit adoption process will allow sufficient opportunity for expanded input from these other parties. It is therefore appropriate to restrict their upfront involvement until many of the specifics of the draft Order are solidified.

Moreover, given the limited availability of total meeting seats, we believe that industry and/or public representation should vary as appropriate to the specific content of each meeting. We are interested in providing additional input on this representation once the meeting content is established, but will defer to Regional Board staff in deciding how best to fill each seat for the non-regulated parties.

II. Makeup of Table Parties

All participants should be free to designate any individual or individuals to serve in their table party for any focused meeting. Where the subject matter of a particular meeting warrants, Copermittees should be able to change representatives during the meeting.

III. Copermittee Attendance (Audience)

Contingent on seating availability, each Copermittee should have the right to send as many attendees as they deem appropriate to each meeting.

Sufficient breaks should be allowed during the sessions to allow Copermittees in the Audience to caucus with the table parties.

As time permits, each focused meeting should end with a time for Copermittees or other attendees who are not at the table to provide brief comments or to ask brief questions.

The focused meetings are not intended to be public workshops, and audience membership beyond the Copermittees should be appropriately limited. Regional Board staff, in consultation with the meeting facilitator, should determine how best to ensure appropriate attendance at each meeting.

IV. Meeting Schedule

Due to existing obligations, USEPA regulatory audits, and deliverables related to recently issued MS4 permits, the Orange and Riverside County Copermittees are constrained in their availability to participate in the proposed focused meetings with Regional Board staff and other stakeholders starting in June 2012. Although the San Diego County Copermittees are not subject to the same constraints in June and July, they support structuring the focused meeting process in a way that allows for full participation by the Orange and Riverside County Copermittees. This is key to ensuring a robust dialogue that involves all of the stakeholders and dischargers who will be significantly affected by the new requirements.

In particular, the San Diego County Copermittees concur that in order to accommodate the Riverside County Copermittees' ability both to fulfill their existing obligations, and to prepare for the meetings, no meeting should occur before the week of July 23, 2012. Moreover, as is stated in the Riverside County

Flood Control and Conservation District's June 1, 2012 letter, meetings should not occur between September and mid-November 2012. This will allow representatives of all three permit regions to fulfill their annual reporting obligations.

V. Time between Meetings

The focused meetings should be scheduled such that there are 3 to 4 weeks between meetings. This will allow sufficient time for participants to adequately prepare for the next meeting topic.

VI. Record Keeping/Report Out

Notes or minutes should be taken at the meetings, and draft notes or minutes circulated within one week to the table parties for edits/concurrence. When concurrence on the notes/minutes is reached, they should be promptly distributed to the Copermittees and other participants to ensure continuity between and adequate preparation for each of the meetings. The Copermittees are able provide these services if desired.

VII. Meetings to be Focused on Technical, Not Legal, Issues

Ground rules should be established to ensure that the focus of the meetings will be on technical, not legal, issues. To the extent that table party members are lawyers, they must abide by these rules.

Issues relating to the legality/illegality of provisions in the Administrative Draft or proposals raised during the focused meetings should be referred to legal counsel for separate discussion and, as appropriate, reporting back to the table participants. Additionally, while Copermittees do not propose to have lawyers in their table parties, they should be allowed limited access to legal counsel for consultation during the meetings. Given that the technical and legal aspects of many issues under consideration are not wholly separable, some issues may arise where immediate input or clarification is needed.

In all cases, counsel should only participate in discussions in accordance with the ground rules established.

Please contact Todd Snyder at (858) 694-3482 if you have questions or would like to further discuss this letter. We look forward to meeting with Regional Board staff to finish preparing for the focused meetings, and are hopeful that they will provide the dialogue needed to craft a permitting approach that meets all of our expectations.

Sincerely,

CID TESORO, Manager
Department of Public Works

CT:js

cc: Eric Becker, San Diego Regional Water Quality Control Board
David Barker, San Diego Regional Water Quality Control Board
Copermittees of Santa Margarita Region of Riverside County
South Orange County Copermittees
San Diego County Copermittees

From:	Richard Boon
To:	Chris Crompton; Jason Uhley; rewKleis; kmcfadden@sandiego.gov; todd.snyder@sdcounty.ca.gov; Becker, Eric@Waterboards
Cc:	Chiu, Wayne@Waterboards; Barker, David@Waterboards; Walsh, Laurie@Waterboards
Subject:	RE: Request for Workshop on Development/Hydromod
Date:	Thursday, July 12, 2012 3:59:59 PM

Eric

We have concurrence from the County of San Diego with Orange County taking the lead in putting this workshop on.

We'll have a provisional draft proposal to you next week

Thanks

Richard Boon, Chief
Orange County Stormwater Program
(714)955-0670

From: Becker, Eric@Waterboards [mailto:EBecker@waterboards.ca.gov]
Sent: Thursday, July 12, 2012 2:09 PM
To: 'kmcfadden@sandiego.gov'; , DrewKleis; Boon, Richard; Uhley, Jason; Crompton, Chris; Todd.Snyder@sdcounty.ca.gov
Cc: Chiu, Wayne@Waterboards; Walsh, Laurie@Waterboards; Barker, David@Waterboards
Subject: Request for Workshop on Development/Hydromod

Hi All-

As discussed in yesterday's focused meeting, the San Diego Water Board agreed to participate in a workshop to hear presentations on the development and hydromodification requirements of the Regional MS4 Permit. We would request that the Copermittees develop the agenda, set the presentations, and invite interested stakeholders. We would be available to present an overview of the proposed permit requirements during the workshop. There is an opportunity for this type of workshop during the a month break between the 3rd and 4th focused meeting (July 25 to August 22).

Please let us know if you would like to discuss potential dates. Thanks.

Eric Becker, P.E.
Senior Water Resources Control Engineer
Southern Watershed Unit
SDRWQCB
9174 Sky Park Court, Suite 100
San Diego, CA 92123
(858) 492-1785
(858) 571-6972
EBecker@waterboards.ca.gov

From: Ziad Mazboudi
To: Chiu, Wayne@Waterboards
Cc: Richard.Boon@ocpw.ocgov.com
Subject: Meeting
Date: Tuesday, July 17, 2012 10:46:41 AM

Hi Wayne
It was good chatting with you on Thursday, and to hear some of your thoughts about the Regional permit issues.
I discussed our suggestion to hold an informal off focus meetings meeting with some of the South County cities and the County to clear some of the misunderstandings and try to resolve some of the sticky points between us, and help us work towards a partnership that would hopefully result in less tension and more joint common goals. The South County group representatives would be happy to meet with you and anyone else you'd like to bring to the meeting. As we discussed, this meeting would not include any attorneys.
Please let me know what are some potential dates and times that you could attend, so that I could find a room and pull together some of the representatives from the neighboring cities.
I look forward to working closely with you toward a Success story for all of us.
Ziad

Ziad Mazboudi, PE, F. ASCE
LEED AP, CPSWQ, CPESC, QSD/QSP Trainer of Record
Senior Civil Engineer, Environmental Division Manager
City of San Juan Capistrano
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Cel: 949-678-3404
Fax: 949-493-9814
www.sanjuancapistrano.org

Stormwater Hotline: to report any stormwater violation, or a problem with a catch basin or for information: 949-234-4575

Is sprinkler runoff flowing off your yard? Adjust sprinkler heads and shorten watering times.

Consider the environment. Please don't print this e-mail unless you really need to.

From: Erik Steenblock
To: Becker, Eric@Waterboards
Cc: Chiu, Wayne@Waterboards
Subject: Administrative Draft Permit Provision E.5 - Existing Development
Date: Thursday, July 19, 2012 5:20:37 PM

Eric,

As part of our Regional efforts to review and prepare for the Administrative Draft Permit Focused Meetings, a small workgroup has been reviewing Provision E.5 – Existing Development in preparation for the August 22 meeting. At the request of this group, I wanted to request a meeting with a few (no more than 3) of us and appropriate SDRWQCB staff to help get some clarity on a few areas and inform our interpretation of this section of the Permit. It is our hope that a better mutual understanding of intent early on will aid in the development of constructive dialogue and feedback at the Focused Meeting on August 22.

Thank you for your consideration of this request, and I look forward to your reply. We are open to coming to the SDRWQCB offices if it is more convenient, otherwise I would be happy to accommodate a meeting venue here in Encinitas.

Erik Steenblock ♦ Clean Water Program Manager ♦ (760) 943-2108
City of Encinitas ♦ 505 S. Vulcan Avenue, Encinitas, CA 92024-3633

Correspondents should be aware that all communications to or from this address are subject to public disclosure and may be reviewed by third parties.

From: Jill Witkowski
To: Chiu, Wayne@Waterboards; Walsh, Laurie@Waterboards
Cc: Colin Kelly; tspanos@sdcoastkeeper.org
Subject: Discussion items for next MS4 Meeting
Date: Thursday, July 19, 2012 5:59:57 PM

Hi Laurie and Wayne,
As we prepare for the next focus meeting, I had a few points for discussion/clarification to guide discussion.

1. Will there be a time for the Copermittees to "present" their proposed alternative? If there is, I would really appreciate hearing from staff as to the justification for the expanded dry weather monitoring so that San Diego Coastkeeper, and others in the room, can understand the purpose of the provisions and fairly evaluate the Copermittees' proposal. I asked to meet with the Copermittees to learn more about their specific concerns and their proposal, but they were "unauthorized" to discuss the issue with me prior to the focus meeting (although we did meet to discuss other opportunities for monitoring collaboration).

2. Displaying monitoring data: I would like to discuss at the next meeting exactly how we can best collect and display the extensive monitoring data to facilitate data-sharing and to inform the public about the water quality data their tax dollars pay to collect. San Diego Coastkeeper has developed a multi-level water quality data display system that displays data at a high level and then "drills down" to specifics at the user's discretion. While Coastkeeper does not have a monitoring alternative we would like to present, we would like to present this monitoring display portal to the group if Copermittees are permitted a "presentation time." (We shared this with representatives of the San Diego monitoring workgroup).

3. Collaboration: There is currently a San Diego monitoring work group (and other topic-based workgroups to encourage collaboration among copermittees). I don't see a similar concept in this upcoming permit. Has that approach been scrapped? Is that a good idea? Is there another, better way to encourage collaboration?

4. Regional Clearinghouse: I would like to discuss what this could like, the pros/cons of the prior website, www.projectcleanwater.org, and the possibility of integrating the clearinghouse into the Regional Board's website.

5. CEDEN: (this point dovetails with #2 above) I'd like a discussing about whether CEDEN is the appropriate method for gathering the data. I've heard the site is difficult to use (especially for the public). I've been unable to play around with it because it is "unavailable due to repair."

6. Progress Reporting: I'd like to discuss in more detail with copermittees ways to reduce the funds spent on annual reporting consultants while maximizing the meaningful data and information reported to the Regional Board and the public. I'd like to see a "progress dashboard" featured in each report that is an easy-to-understand graphic summary of progress made to date.

Thanks!

Jill

Jill Witkowski
Waterkeeper
San Diego Coastkeeper®

www.sdcoastkeeper.org
2825 Dewey Rd, Suite 200
San Diego, CA 92106
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From: Becker, Eric@Waterboards
To: Jo Ann Weber; Todd Snyder
Cc: Barker, David@Waterboards; Chiu, Wayne@Waterboards
Subject: RE: San Diego County Copermittee Monitoring Presentation at July 25 Focused Meeting
Date: Friday, July 20, 2012 11:04:28 AM

Hi Jo Ann-

45 minutes should be fine unless we get many additional presentation requests.

Eric Becker, P.E.
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SDRWQCB
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EBecker@waterboards.ca.gov

From: Jo Ann Weber [mailto:JoAnn.Weber@sdcounty.ca.gov]
Sent: Friday, July 20, 2012 8:36 AM
To: Becker, Eric@Waterboards; Todd Snyder
Cc: Barker, David@Waterboards; Chiu, Wayne@Waterboards
Subject: RE: San Diego County Copermittee Monitoring Presentation at July 25 Focused Meeting

Eric, If possible please allocate a 45 min block of time for our presentation. Thank you for your consideration. Best regards, Jo Ann

Jo Ann Weber
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From: Becker, Eric@Waterboards [mailto:EBecker@waterboards.ca.gov]
Sent: Thursday, July 19, 2012 2:59 PM
To: Weber, Jo Ann; Snyder, Todd
Cc: Chiu, Wayne@Waterboards; Barker, David@Waterboards
Subject: San Diego County Copermittee Monitoring Presentation at July 25 Focused Meeting

Hi Jo Ann-

We discussed the San Diego County Copermittees' request to give a presentation to the group broken up by topic. We feel the meeting would be better served if the San Diego Copermittees give a comprehensive monitoring presentation at the beginning of the meeting. We have also scheduled time for other stakeholders to give presentations (if requested). The afternoon would

be dedicated to discussing these monitoring proposals and permit requirements.

Please let us know if you need over 30 minutes for your presentation. Thanks.

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From: lyris@swrcb18.waterboards.ca.gov
To: Chiu, Wayne@Waterboards
Subject: July 25, 2012 Focused Meeting Regional MS4 Permit
Date: Friday, July 20, 2012 5:10:57 PM
Attachments: Final FOCUSED MEETING JULY 25 AGENDA.pdf
20120711MeetingNotes.pdf

The San Diego Water Board is scheduled to conduct its third Focused Meeting on July 25, 2012 at the City of Carlsbad Faraday Center. During this Focused Meeting discussions will cover Monitoring and Assessment provisions of the Administrative Draft Regional MS4 Permit with an intent to receive Stakeholder input on the Topic Discussion Questions attached to the Focused Meeting Agenda (See Email Attachment).

Topic specific presentations will be made by stakeholders during the morning portion of this meeting. Those who wish to make a presentation should contact a member of the MS4 Permit Team with a request and an idea of how much time their presentation will take.

Meeting minutes from the July 11, 2012 Focused Meeting on Assessment and Planning are also attached to this email.

Laurie Walsh P.E.
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California Regional Water Quality Control Board, San Diego Region
Regional MS4 Permit Focused Meeting

Meeting Notes

Date	Location	Agenda Topics
7/11/2012 Start time: 9:30 AM End time: 3:10 PM	City of Escondido 201 North Broadway Escondido, CA 92025 Mitchell Conference Room	• Meeting Recap & Feedback • Focused Meeting Intent • Water Quality Improvement Plan Priority Setting & Approval Process • JRMP Relationship with Water Quality Improvement Plan • Adaptive Management Areas of Permit • Other Topics • Audience Comments

I. Introductions

Table participants introduced themselves. Lewis Michaelson (Facilitator) ensured the appropriate representatives were at the table, per the June 20, 2012, San Diego Regional Water Quality Control Board (SD RWQCB) Notice.

San Diego County Copermittees (5): Drew Kleis (City of San Diego), Jon Van Rhyn (County of San Diego), Mikhail Ogawa (City of Del Mar), Todd Snyder (County of San Diego), Elaine Lukey (City of Carlsbad)

Orange County Copermittees (5): Ziad Mazboudi (City of San Juan Capistrano), Joe Ames (City of Mission Viejo), Grant Sharp (Orange County Flood Control District), Ryan Baron (County of Orange), Chris Crompton (County of Orange), Nancy Palmer* (City of Laguna Niguel) **Indicates representatives rotated during the meeting.*

Environmental Community (3): Colin Kelly (Orange County Coastkeeper), Jill Witkowski (San Diego Coastkeeper), Roger Butow (Clean Water Now! Coalition), Thom Spanos* (San Diego Coastkeeper) **Indicates representatives rotated during the meeting.*

Development/Business Community (3): Thom Fuller (San Diego Business Industry Association), Dennis Bowling (American Public Works Association), Bryn Evans (Industrial Environmental Association), Wayne Rosenbaum* (BIA), Mike McSweeney* (BIA) **Indicates representatives rotated during the meeting.*

U.S. Environmental Protection Agency (US EPA) (1): Cindy Lin

San Diego Water Board Permit Team: David Barker, Wayne Chiu, Laurie Walsh, Eric Becker

It was noted that Riverside County MS4 Copermittees were invited to the focused meeting but were unable to attend.

II. Meeting Recap & Feedback

Lewis Michaelson (Facilitator) reflected on the effectiveness of the June 27 Focused Meeting. It seemed that much of the meeting consisted of stakeholders asking questions of the Regional Water Quality Control Board (RWQCB). Today's meeting should consist more of the opposite; questions from the RWQCB and input from the stakeholders.

As requested at the June 27 meeting, a number of stakeholders provided suggestions on topics for today's meeting. Those suggestions were incorporated into the agenda. Lewis reviewed the agenda for today's meeting.

III. Focused Meeting Intent

David Barker (RWQCB) provided information on the intent of the focused meetings. He is the San Diego Water Board Chief of the Surface Water Basins Branch, which encompasses the NPDES wastewater and stormwater programs, including municipal, construction, and industrial stormwater programs. The team that developed the MS4 administrative draft permit is within his Branch. David is here to observe the meetings and assist staff in framing issues for discussion. He is also here as a representative of executive management, including Executive Officer David Gibson, and will do his best to respond to broad policy issues and the Board's process of bringing the permit to adoption.

Although the specific causes of water quality impairments within the San Diego Region are not all known, it is known that most water quality impairments occur downstream of, or within, urbanized settings, and are therefore directly affected by dry weather flows and urban runoff. Thus, there is a continuing need for comprehensive, innovative, and effective stormwater regulation. Creative and non-traditional approaches are needed to address these challenges.

With these challenges in mind, the RWQCB has put considerable thought and effort into proposing the administrative draft permit, which provides an adaptive management pathway for Copermittees to address water quality issues in an iterative process. Under this process, water quality improvement objectives will be regularly prioritized and assessed.

Unlike current prescriptive permits, this administrative draft permit puts the Copermittees in the driver's seat, allowing deployment of resources to achieve goals that will have the greatest water quality improvements.

The RWQCB would really like to hear thoughts from the stakeholders about what should be in the draft permit. The administrative draft permit was released April 9, 2012. By the time written comments are due in September, it will have been available for public review and comment for more than five months. To communicate detailed ideas on specific permit language, the RWQCB would appreciate that detailed language be submitted as written comments. The RWQCB values the stakeholders' thoughts and insights on permit language and will closely consider all submissions.

During this extended review and comment period on the administrative draft permit, the RWQCB has allocated four days for focused meetings to meet with interested stakeholders and listen to ideas on how to improve the administrative draft permit. The schedule for the focused meetings was selected in order to maintain momentum for finalizing the final draft of the permit later this fall. The RWQCB does not anticipate scheduling additional focused meetings prior to release of the final draft permit, other than perhaps a special session on the hydromodification requirements as suggested at the June 27 focused meeting. With recognition that four focused meetings is not enough time for exhaustive, detailed review of the full administrative draft permit, the focused meetings are structured to discuss key issues at a conceptual level. Stakeholders can be most influential on shaping the next iteration of this permit by providing quality input and feedback on the key issues at the conceptual level. The focused meetings are a golden opportunity to have productive discussions in a fair and impartial setting.

David reminded the stakeholders that while these focused meetings may not allow for detailed discussions on all issues of concern, all stakeholders will have an opportunity to review and provide detailed comments on any aspect of the draft permit again later this fall.

Several stakeholders (Roger Butow, Clean Water Now! Coalition; Todd Snyder, San Diego Copermittees; Ziad Mazboudi, City of San Juan Capistrano) strongly support a stand alone hydromodification meeting prior to the written comment deadline. Ziad Mazboudi (City of San Juan Capistrano) is working with Tory Walker and others to hold a symposium with field experts and would want the hydromodification meeting to be held after the symposium. The RWQCB will have a game plan for a hydromodification meeting ready to roll out by the next focused meeting.

Roger Butow (Clean Water Now! Coalition) asked if the legal issues over the legitimacy of the consolidated permit have been addressed by RWQCB counsel. David Barker (RWQCB) stated the RWQCB's official position is that they do have the legal authority to issue this regional general permit; RWQCB counsel is expected to confirm that authority. David mentioned there is a parallel legal track of meetings underway where RWQCB counsel is working with attorneys of the Copermittees. Any legal opinion issued will be open for public review and scrutiny.

IV. Water Quality Improvement Plan Priority Setting & Approval Process

Laurie Walsh (RWQCB) explained that in pre-drafts of the permit the Water Quality Improvement Plan was originally called a Water Quality Management Plan. The title of the plan was changed to "Improvement" instead of "Management" because the goal of the plan is water quality improvement.

The Water Quality Improvement Plan is in the beginning of the permit because of its high importance to the permit. The Water Quality Improvement Plan sets the road map through which the Copermittees will achieve improved water quality. It gives the Copermittees complete control to set priorities with rationale, set schedules, set targets, etc. From meeting with stakeholders, the RWQCB understands that there are not enough

resources to do everything all at once; the Water Quality Improvement Plans are the Copermittees' opportunity to set priorities.

The approval process for the Water Quality Improvement Plans is outlined in the administrative draft permit. The RWQCB is looking for input on any impediments to developing and implementing the Water Quality Improvement Plans, specifically within the timeframe identified in the administrative draft permit.

San Diego Coastkeeper would be open to a staggered submittal of Water Quality Improvement Plans for the nine watersheds so that public review is not all within the same 30-day period.

Jill Witkowski (San Diego Coastkeeper) suggested a phased review period for the Water Quality Improvement Plans where the first phase is review of the priorities and the second phase is review of the full Water Quality Improvement Plan. This may assist in keeping prioritization consistent across watershed management areas. Ziad Mazboudi (City of San Juan Capistrano) expressed concern that a separate review of the priorities is leaning toward micro-managing. Jon Van Rhyn (County of San Diego) said it is an interesting concept; however, the more the process is extended, the more the Copermittees would have to confront the realities of the time needed to budget, which could affect how fast programs move forward. Jon admitted there may need to be a multi-year planning process upfront where the priorities are laid out at the highest level and made open to feedback before proceeding with details of the Water Quality Improvement Plan. Drew Kleis (City of San Diego) agreed with the concept of getting iterative feedback in the process of developing the Water Quality Improvement Plans to ensure development of the plan stays on track.

Jill Witkowski (San Diego Coastkeeper) pointed out there is good direction in the permit on how to assess receiving water conditions, but there is not good guidance on where the bar should be set; it is not clear if the Copermittees will be aiming low or aiming high in their plans. Ziad Mazboudi (City of San Juan Capistrano) explained that the bar could be set high, but the reality of reaching that level may be driven by available resources. Drew Kleis (City of San Diego) acknowledged that Total Maximum Daily Loads (TMDLs) and other regulations will be major factors in determining priorities. There also may not be high priorities in every watershed; there may be tradeoffs that a certain watershed is not as high as another because of TMDLs or other regulations. By allowing that prioritization, the net benefit of a jurisdiction's efforts can be maximized. The frank reality is that prioritization will be driven by regulations and there will be issues that are medium or low priorities. Eric Becker (RWQCB) explained that the permit was purposefully set up so there could be differences across watersheds. Todd Snyder (County of San Diego) concurred that the intent is there will be different prioritizations across different watersheds.

Jill Witkowski (SD Coastkeeper) raised the concern that in watersheds with TMDLs, the only priority might be the TMDL although there are other issues within the watershed. Eric Becker (RWQCB) clarified that the TMDL might be the top priority and efforts to satisfy the TMDL may not allow for other priorities at that time. Other priorities are still on the list, but resources may not be allocated to them until the TMDL is satisfied. Jill Witkowski (SD

Coastkeeper) is concerned that areas on the cusp of becoming TMDLs and ASBSs may not receive attention needed to prevent them from becoming TMDLs and ASBSs.

Mikhail Ogawa (City of Del Mar) explained that aiming high and capturing as many pollutants as possible is an iterative process within the plan development. For example, bacteria may be the highest priority pollutant because of a bacteria TMDL in the watershed; however, as the plan is developed it may be found that additional pollutants can be targeted at the same time using the same methods as those for bacteria. At that point, the priorities may be adjusted to reflect those findings. Therefore, having a phased approach to approving the priorities and then the Water Quality Improvement Plans may not be efficient. Jill Witkowski (SD Coastkeeper) conceded Mikhail's point about priorities changing during plan development and reiterated that it is still important to the environmental community to have sufficient information about how and why priorities are set.

Elaine Lukey (City of Carlsbad) explained that the Copermittees are not starting from scratch in creating watershed priorities. The Copermittees have many years of experience looking at 303(d) listings, impairments, etc., and already have good programs in place to address watershed priorities. The San Diego Copermittees have had Watershed Urban Runoff Management Plans (WURMPs) for 10 years, and there are priorities in those existing WURMPs. The priorities may change based on a TMDL or other regulations; however, looking at the WURMPs is a good place to start to understand the current watershed priorities.

Wayne Chiu (RWQCB) asked stakeholders to provide suggestions as to how to put priority setting guidelines in the permit without limiting the Copermittees' ability to have flexibility in setting priorities and prevent Copermittees from setting the bar too low. Jill Witkowski (SD Coastkeeper) suggested having a tiered approach to priority setting: the baseline tier would be TMDLs, the next tier might be mid-range priorities, and the next tier might be long-range priorities. Jon Van Rhyn (County of San Diego) responded that there are two program elements defined in the permit that are implemented concurrently: the Water Quality Improvement Plans and the Jurisdictional Urban Runoff Management Plans (JRMPs). The Water Quality Improvement Plans are about establishing priorities and following an adaptive management strategy. The JRMPs have baseline requirements and are about establishing an extensive set of activities. The Water Quality Improvement Plans are not entirely independent of the rest of the permit, including the JRMPs.

Drew Kleis (City of San Diego) referred the group to slide 2 of a handout the San Diego Copermittees prepared for this meeting. The San Diego Copermittees would like to have a reference to permit section A.4 in sections A.1, A.2, and A.3 so that compliance with discharge prohibitions, receiving water limitations, and effluent limitations is clearly defined as implementation of the iterative process. They believe explicit language is needed in light of the 9th Circuit Court's finding of the separate enforceability of these provisions. Drew asked Cindy Lin (US EPA) if there is a possibility of revising Provision A to define compliance through the iterative process. Cindy replied that this is still an NPDES permit and there needs to be clarity regarding compliance points. There is, however, a lot of creative

language in other permits within California, so it is not out of the toolbox to have creative language in this permit.

Drew Kleis (City of San Diego) explained that the Copermittees are not looking to walk away from responsibility, but it is easier to budget for a plan if the plan is the compliance pathway. Jill Witkowski (SD Coastkeeper) asked how linking section A.4 to sections A.1-A.3 accomplishes that. Drew explained that at some point a City Manager or politician will question why certain actions or plans are being done. By linking the iterative process clearly to compliance, Copermittees' staff will be able to defend those questions.

Elaine Lukey (City of Carlsbad) referred the group to slide 3 of the San Diego Copermittees' handout. This slide contains suggestions of what would work for the Copermittees regarding permit language for determining compliance:

1. Insert language clarifying identification of individual jurisdictional commitments in the Water Quality Improvement Plans, and insert language clarifying RWQCB approval of individual jurisdictional commitments.
2. Add language to include RWQCB approval timeline for JRMP updates in year 1.
3. Add language in II.F. stating there is a specific (e.g., 90-day) RWQCB approval timeline for annual updates in years 2, 3, 4, 5.
4. Add language to permit, not fact sheet, about non-enforceability of Numeric Targets.

Todd Snyder (County of San Diego) followed that this ties back into the issue of Section A and why it is important that the permit clearly outline the points of compliance for the Water Quality Improvement Plans that Wayne Chiu (RWQCB) lined out at the June 27 MS4 Focused Meeting (1. Submit Water Quality Improvement Plan; 2. Include all required elements in the plan; 3. Implement the plan; and, 4. Assess the plan). Implementation of the Board-approved Water Quality Improvement Plan should constitute compliance. The approval process is critical to that.

Wayne Chiu (RWQCB) responded that the permit writing team does understand the over-arching concern and tried as much as possible to incorporate that concept into the permit language. The RWQCB will consider any recommendation put forth for revised permit language.

Joe Ames (City of Mission Viejo) asked for clarification about whether a goal under a certain priority could be a research project. Laurie Walsh (RWQCB) clarified that the goals are the water quality standards; numeric targets are interim goals to reach the water quality standards; a research project can be a strategy to reach the numeric targets and water quality goals. Cindy Lin (US EPA) concurred that under the Water Quality Improvement Plans there are priorities, under those priorities there are goals (i.e., water quality standards, waste allocations, etc.), under those goals are monitoring plans or targets to use to achieve the water quality objectives or criteria, and then there are the actions or controls implemented to reach those targets. Mikhail Ogawa (City of Del Mar) followed up that as adaptive management is a learning process, there is inherently an expectation that some of

the actions or controls implemented may not work as effectively or efficiently as planned. However, a failed strategy, action, or control does not imply that the Copermittees are not attempting to reach their priorities; it is part of the adaptive management process.

Chris Crompton (County of Orange) is uncomfortable with the idea of this permit trying to replace TMDLs, as the RWQCB has stated before that CLRPs could be modified slightly and become the Water Quality Improvement Plans. This permit is a municipal stormwater permit. It does not incorporate all the stakeholders that a TMDL process does. In addition to bringing in parties besides municipalities, the TMDL process also allows for longer timeframes than under this permit. This MS4 permit aims to fix issues that can be controlled by the jurisdictions; there are significant issues and sources that the jurisdictions cannot control. Eric Becker (RWQCB) asked for suggestions on changing language in the permit to cover TMDLs. Todd Snyder (County of San Diego) referenced slide 4 of the San Diego Copermittees' handout. The concept is that the WQBELs used to interpret TMDLs in the draft permit are expressed as either (a) achievement of receiving water limitations or (b) achievement of a receiving water limitation applied at the MS4 outfall and applied as a concentration instead of a load. The San Diego Copermittees would like to add other means of demonstrating compliance with WQBELs. For example, load-based compliance with Waste Load Allocations, implementation of EO-approved TMDL compliance plan, compliance with exceedance limitations expressed as "days" or "frequency," and/or other means of compliance identified in future TMDL language. These other means of demonstrating compliance with WQBELs acknowledge that MS4s are part of the TMDL solution but not the entire picture.

Cindy Lin (US EPA) provided an example from a Los Angeles TMDL (Dominguez Channel Greater Los Angeles Long Beach Harbor TMDL) where they are trying to reduce the distance between TMDLs and permit language. The TMDL offers four different ways of demonstrating compliance, thereby providing clarity in the expectations. Sometimes it does not make sense to try to meet the water quality standard level.

Wayne Chiu (RWQCB) asked Cindy Lin (US EPA) if that meant that language can be placed within this permit that states the Copermittees would be in compliance with discharge limits and receiving water limits if they have a numeric set of criteria that are met as part of the iterative process. Cindy responded that the compliance point must always be defined. It is the details of how the water quality standard is met. Different numeric metrics can be provided as long as they show that the water quality standard is met.

Wayne Chiu (RWQCB) acknowledged that everyone is highly concerned about the 9th Circuit Court Decision and the RWQCB has been struggling with how to make the language provide some level of assurance that there would be no requirement of enforcement or threat of third party lawsuits if the first two requirements are not met as long as they are implementing a Water Quality Improvement Plan with the full intent of meeting those requirements in the future. The 9th Circuit Court Decision, however, says those provisions are separate and enforceable. Wayne asked for the EPA's position on this. Is the EPA saying that there is some alternative language that could be placed in the permit that the EPA

would accept as being in compliance with discharge prohibitions and receiving water limitations but not necessarily through actual receiving water quality data?

Cindy Lin (US EPA) responded that the 9th Circuit Court Decision is a legal issue on which she has been directed not to comment. Regarding alternative language, Cindy explained that EPA Region IX has been strong and consistent that Copermittees either meet compliance through WQBELs or through quantitative measures. "Quantitative measures" are purposely not defined to provide some interpretation in how to meet compliance.

Wayne Rosenbaum (SD BIA) recommended looking at other, recent permits regarding compliance language and, also, building into Provision A some enforcement structure.

The Environmental and Development Communities (Colin, Wayne R) believe the solution will not be a safe harbor solution, nor will it be something where Copermittees should put up walls to protect themselves from potential litigation. They would prefer not to spend money on litigation unless critically important; they would prefer to help Copermittees implement or assess effective programs and be more involved in the creation of those programs. The permit will not provide complete security from litigation; however, dealing responsibly with the Environmental and Development Communities will reduce liability.

Ryan Baron (County of Orange) acknowledged the RWQCB's multiple requests for stakeholders to submit language, but questioned if there is a statewide effort going on to suggest model language to the State Water Resources Control Board (SWRCB) and asked how difficult it is to change language provided by the EPA for the permit. Wayne Chiu (RWQCB) explained that the EPA has the final say on the permit language. Cindy Lin (US EPA) concurred, explaining that when the permit is presented to the EPA, they can approve it, reject it with recommendations for re-submittal, or decide to issue their own NPDES permit.

Chris Crompton (County of Orange) suggested that the CASQA conversations with the SWRCB may be the solution to this effort as they are working on language for section A and alternate ways of dealing with the 9th Circuit Court Decision.

V. JRMP Relationship with Water Quality Improvement Plan

Laurie Walsh (RWQCB) explained that one objective of the RWQCB is to work closer with the Copermittees, as they have tried to do with this permit process. The permit team met with various stakeholders to talk about things to improve in the stormwater program and to get feedback on key issues. The permit team then went back and wrote the administrative draft permit, trying to address all the key issues the stakeholders had identified, including flexibility to put resources where best suited. The RWQCB is now looking for action items similar to the handout provided by the San Diego Copermittees. Laurie led off with topic discussion question #5 from the June 20, 2012, San Diego Regional Water Quality Control Board (SD RWQCB) Notice: "How can the proposed provisions of the administrative draft permit be modified to support a Copermittee's ability to plan and/or procure resources for its jurisdictional runoff management program?"

Jill Witkowski (SD Coastkeeper) said one of the things unclear with how Water Quality Improvement Plans work together with JRMPs is how the priority setting at the watershed level, with numeric targets and strategies, gets implemented at each jurisdiction to achieve the targets. It is unclear who is responsible for making sure goals in the Water Quality Improvement Plans actually happen and everyone participates in the improvement together.

Jon Van Rhyn (County of San Diego) responded that the big issue has been to maintain separation of group versus individual responsibilities. The general understanding is there may be some things committed to in a group setting, but in the end there will still be multiple Copermittees in a watershed that will have their own stand alone plans to follow through and implement.

Ziad Mazboudi (City of San Juan Capistrano) said that every Copermittee will make sure they are working under the umbrella of the Water Quality Improvement Plans; however, there may be a jurisdiction where a particular pollutant is not an issue. In that case, the jurisdiction would document it, present it, and move to the next prioritized pollutant in the plan. The ultimate enforcement will have to be from the RWQCB.

Elaine Lukey (City of Carlsbad) directed everyone to slide 7 of the San Diego Copermittees' handout.. For illustrative purposes, the graphic is provided below.

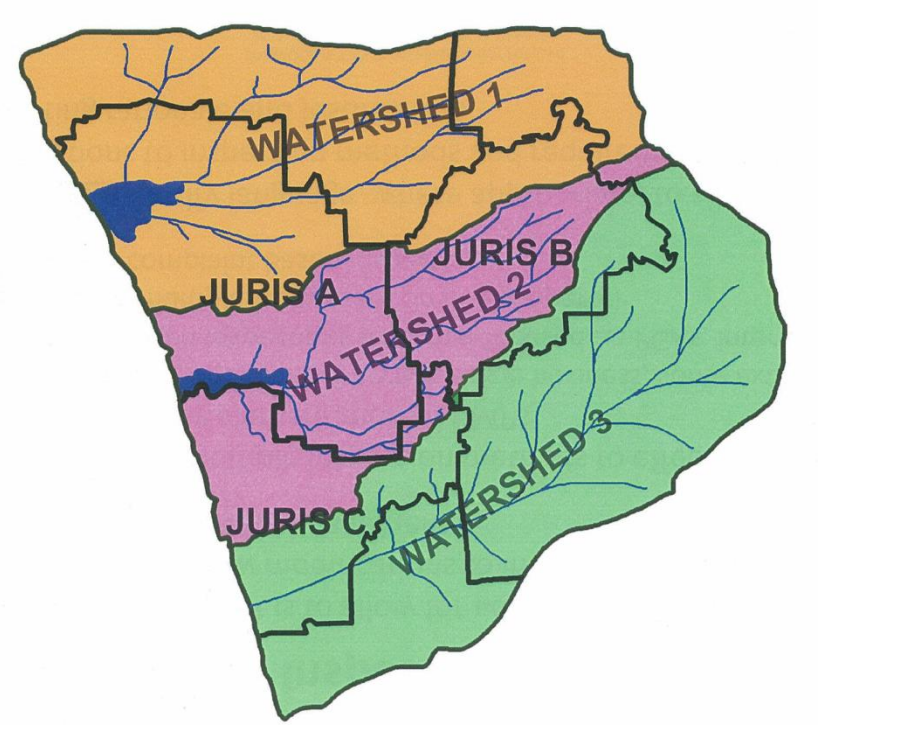

The colored areas are the watersheds; the black lines are the jurisdictional boundaries. The blue lines are receiving waters.

Elaine Lukey (City of Carlsbad) provided an example where Watershed 2 (pink) has bacteria as the top priority but the portion of Jurisdiction C that is in Watershed 2 doesn't have any identified sources of bacteria at the watershed scale. In that case, Jurisdiction C

could address their priority in Watershed 3 (green), doing more intense work in Watershed 3 (green) than in Watershed 2 (pink).

Mikhail Ogawa (City of Del Mar) provided another example where Watershed 2 may have bacteria as a group priority, but Jurisdiction C may decide with rationale and justification that they will focus on nutrients because receiving water in Watershed 2 in Jurisdiction C is impaired for nutrients. The San Diego Copermittees are hoping the RWQCB will look at these not only as individual watersheds, but also look across watersheds and across jurisdictions to get the entire picture.

Wayne Chiu (RWQCB) acknowledged that a very important aspect of this permit is RWQCB oversight. The RWQCB is ultimately responsible for making sure Copermittees are implementing the plans, but they also have to take into consideration that priorities may force them to focus on one watershed over another one as each Copermittee has different circumstances and different priorities because of watershed areas. This permit requires a lot of involvement by RWQCB staff to understand those intricate details. The streamlined reporting in this permit means the RWQCB staff is looking at fewer plans but with more details.

Nancy Palmer (City of Laguna Niguel) shared that South Orange County has been using some of its Integrated Regional Water Management (IRWM) money to develop regional action projects. To do so, they had to find contracting entities under the IRWM that crossed the boundaries; e.g., the Municipal Water District of Orange County is administering a grant for smart landscaping improvements. All the cities in South Orange County have a piece of that pie, but it is administered through a different agency by a grant opportunity. This is an example of an inter-jurisdictional project that is being managed by an identified entity. There are, however, certain projects that become orphans because they are inter-jurisdictional, highly complex, difficult to move forward, or extremely expensive. In the current administrative draft of the permit, there are requirements that regional BMPs are acceptable so long as the BMP is built during the first phase of the project. That does not typically work. It is, however, common in the community development field that for community parks a certain amount of park in lieu fees are collected during the development process and when a certain percentage of buildout is reached, the park is then built using those fees. Nancy suggests those clauses in the administrative draft permit be re-thought.

Colin Kelly (OC Coastkeeper) countered Nancy's argument stating that there have been severe deficiencies with programs that allow BMPs to be developed toward the end of large projects. Especially with the bad economy, some developments have ended up with no BMPs or orphaned BMPs. Colin acknowledged, however, that there are development differences across the jurisdictions and watersheds; some jurisdictions still have high demand for new development so those developments are completed, while other jurisdictions have several developments that have been halted due to low demand and the economy.

Laurie Walsh (RWQCB) informed the group that this topic will be discussed at a future focused meeting and again encouraged stakeholders to submit permit language suggestions.

Jill Witkowski (SD Coastkeeper) asked for more information on how to review the Water Quality Improvement Plans together with the JRMPs. The public needs adequate time to review the reports altogether to check for orphan priorities. Then there needs to be time and a process to resolve conflicts between jurisdictions. Laurie Walsh (RWQCB) said they are interested in hearing more ideas on timing for the public vetting process. Wayne Chiu (RWQCB) explained that orphaned priorities, conflicts between jurisdictions, and other issues would come to light with the audits of the jurisdictions' programs.

Wayne Chiu (RWQCB) explained that they tried to incorporate into the permit a concept of individual jurisdictional accountability as much as possible. There is the Water Quality Improvement Plan that ties jurisdictions together; however, each jurisdiction will be reviewed based on its own merits and own implementation of its portion of achieving the objectives of the Water Quality Improvement Plan. This will require RWQCB staff to look at programs on an individual and watershed scale.

Drew Kleis (City of San Diego) said the Copermittees are very focused on having individual measurability and responsibility. The numeric targets may be set for each Copermittee and that becomes their piece of the pie in addressing implementation of the Water Quality Improvement Plans. Subchapters in and attachments to the Water Quality Improvement Plans will clearly state what each jurisdiction's commitments are. It will be critical to look across watersheds to understand jurisdictional commitments.

Grant Sharp (County of Orange), as someone who helps put together a JRMP for a Copermittee subject to multiple MS4 permits, is highly interested in how the JRMP relates to the Water Quality Improvement Plan. Grant shared that the County of Orange is subject to two separate Phase I MS4 Permits, but the County does not prepare a separate JRMP for each permit. The County prepares one JRMP that covers both permits. The JRMP should document everything being done within the jurisdictional boundaries; it should be a clearinghouse for data; it should be a document that states who, what, and how things are going to be done from the priorities within the Water Quality Improvement Plans. The priorities of the Water Quality Improvement Plans do not need to be reiterated in the JRMPs, just referenced so that the JRMP does not have to be revised every time the WQIP is revised.

Wayne Chiu (RWQCB) explained that the JRMPs establish the programs and lay out who is responsible for doing what within the jurisdiction or each component within the permit. This administrative draft permit has removed some specifics of how often, what frequency of inspections are required to allow discretion by the Copermittee in terms of inspections and enforcement. All actions must still work towards meeting the three basic requirements/objectives of the permit. The RWQCB wants to see outcomes from the Copermittees' actions, whether they are successes or failures. If they are failure, then Copermittees are expected to figure out why their actions failed and revise their plans.

Todd Snyder (County of San Diego) agreed that it is important to see the JRMP to understand how things are being prioritized for jurisdictions in multiple watersheds. This is especially significant to the discussion of phasing plan submittal. To understand commitments in Water Quality Improvement Plans, one needs to understand commitments

at jurisdictional levels (JRMPs). It is unclear how a phased plan submittal process for public review would accommodate this issue.

Chris Crompton (County of Orange) questioned why Section B and Section F are separated in the administrative draft permit. The draft permit seems to have conflicting language about whether the plans are expected to be revised annually or only once every three years. He recommended aligning the JRMP and Water Quality Improvement Plan sections, keeping Sections B, F, and E (TMDLs) closer together either as sequential sections or a combined section.

Jon Van Rhyn (County of San Diego) believes that structurally one of the hardest issues to address in this permit is the annual reporting. Copermittees have to document watershed and jurisdictional commitments, then generate annual reports. Jon does not believe the administrative draft permit fully anticipates all the issues implied in getting through these multiple plans and reports. The San Diego Copermittees, Orange County Copermittees, and SD Coastkeeper volunteered to develop suggested language to address these issues.

Jon Van Rhyn (County of San Diego) appreciated that the RWQCB has taken steps toward streamlined reporting; however, when reporting is too streamlined, it makes it difficult to maintain transparency. In addition, in the administrative draft permit, it appears that JRMP annual reports continue until watershed reports start (Attachment D), but it is unclear as to what happens with JRMP reports after that.

Wayne Chiu (RWQCB) acknowledged Jon's comments and said perhaps having reporting components in one section would be more helpful. With regard to streamlined reporting, the administrative draft permit does focus more on reports on the watershed level than the jurisdictional level. The RWQCB plans to review the jurisdictional level more through audits and working closer with Copermittees. The RWQCB understands that the transparency allowed through streamlined reporting is not fully fleshed out. Wayne continued that the concept behind the regional clearinghouse was to provide documentation and thus transparency to the public. The regional clearinghouse at this time is primarily focused on monitoring data, not inspection or activity data, but that is an area where the RWQCB is open to suggestions. Jon Van Rhyn (County of San Diego) suggested working with the environmental and development communities to develop ways to include things in the clearinghouse that show transparency and robust programs.

Jill Witkowski (SD Coastkeeper) admitted the two-page jurisdictional annual report is a bit terrifying because very little information is provide compared to previous reports. The two-page format does not reflect the work being done. Jill would prefer to see a dashboard-type setup that shows progress bars toward achieving goals; something that is a meaningful summary that still touts the work being done.

Chris Crompton (County of Orange) is also concerned with such a short report as Copermittees ultimately have to defend their programs through audits. Having a thicker report with more information greatly assists with collecting adequate data for such audits.

Wayne Chiu (RWQCB) and Eric Becker (RWQCB) acknowledged the stakeholders' concerns. They explained the Copermittees would still need to maintain the data to support their reports. The RWQCB is open to making the jurisdictional reports a two-page minimum,

allowing the Copermittees to provide additional pages for sufficient information to annually describe their programs and efforts.

VI. Adaptive Management Areas of Permit

Laurie Walsh (RWQCB) stated the administrative draft permit includes some areas for adaptive management. The RWQCB would like to see if those sections are well-received by the stakeholders or if there are other areas to add adaptive management within the permit.

Thom Spanos (SD Coastkeeper) voiced Coastkeeper's support for adaptive management. He specifically highlighted the adaptive management in the JRMP Section of the administrative draft permit where it states that Copermittees are to look at all available data. Thom asked of the Copermittees what SD Coastkeeper and other NGOs could do to make their data useful to the Copermittees.

Drew Kleis (City of San Diego) replied that the Water Quality Improvement Plans and JRMPs first need to be developed so that the Copermittees understand the questions or issues they are to address with the monitoring data. For the data to be useful, they will need to answer a question or issue identified in the Water Quality improvement Plans or JRMPs. Jon Van Rhyn (County of San Diego) noted that the San Diego Copermittees have used SD Coastkeeper's and other NGO's monitoring data in the past. Elaine Lukey (City of Carlsbad) noted that the data need to be strategic, fit into the Water Quality Improvement Plan, be collected in a manner that follows standard protocol, and analyzed in a certified laboratory. Elaine also noted that the Copermittees' stormwater hotlines are always open to receiving notice from NGOs and the public of any observed pollutant generating activities (PGAs).

Regarding the adaptive management areas of the permit, Mikhail Ogawa (City of Del Mar) referred to slide 5 of the San Diego Copermittees' handout. For the San Diego Copermittees, it is unclear in the administrative draft permit what is or is not up for adaptive management. The San Diego Copermittees provided examples of adaptive management based on their understanding of the administrative draft permit, including geographic adjustments, level of effort adjustments within a permit component, method adjustments within a permit component, and level of effort adjustments across permit components. San Diego Copermittees suggested inserting language in Section II.B.5 to clarify what sections of the permit "shall be considered, as appropriate," by each Copermittee for adaptation.

Wayne Chiu (RWQCB) clarified that everything within the Water Quality Improvement Plans is up for adaptation. How the jurisdictional programs are implemented can be adapted through what is discovered in implementing the Water Quality Improvement Plans. For example, the numeric action levels for non-stormwater are based on the water quality objectives. While there is a set of numeric action levels that must be included, that does not mean that all those numeric action levels must be used during implementation of the plan; resources, including monitoring data analysis, can be prioritized on specific pollutants with numeric action levels. Other examples include the LID and hydromodification requirements. The requirements must be in the permit even though meeting those requirements onsite may be a challenge. The performance standards should be used to drive the way the

programs are implemented; such that the programs achieve the goals of those standards through alternate methods (e.g., offsite projects, regional BMP projects, etc.).

Bryn Evans (Industrial Environmental Association) supports the described level of adaptation for the Copermittees. The required monitoring and inspections for industrial sites through other NPDES permits may come into play with adaptive management.

Mike McSweeney (BIA) expressed frustration with the time constraints of the focused meetings and written comment period. The BIA is feeling time-pressured to digest what has been proposed, talk it through with other stakeholders, and provide quality feedback.

David Barker (RWQCB) explained that the focused meetings are a vetting process for the administrative draft permit. There have been four day-long meetings scheduled and dedicated to discussing key issues, along with a five-month schedule for receiving written comments on the administrative draft. After the administrative draft process, there will be another review period for the draft permit, including public hearings and the opportunity for submitting more written comments.

Colin Kelly (OC Coastkeeper) feels there is ample time provided in this permit development process. Jill Witkowski (SD Coastkeeper) concurred with Colin. Elaine Lukey (City of Carlsbad) shared appreciation for the process and the time given in development of this permit.

Jill Witkowski (SD Coastkeeper) referenced Section B.5.a.1.(h) (page 20) of the administrative draft permit where it says public comment will be solicited for the Water Quality Improvement Plans and asked how that will look and at what point public participation will be invited. She also asked how that will dove-tail with the annual reports, as the permit language is vague on the issue. Jill encouraged early, informed public participation for the best results.

Jon Van Rhyn (County of San Diego) admitted it is unknown at this point how the public participation process will work; however, it will be set up during the planning process; therefore, it is critical that the public is part of the development of the plan. Jill Witkowski (SD Coastkeeper) agreed and would appreciate public involvement early in the process.

Elaine Lukey (City of Carlsbad) stated that some areas of the permit dictate that Copermittees must do X, Y, and Z. She suggested adding the language “for the priorities that fit with the watershed” to those required activities.

Chris Crompton (County of Orange) shared in his experience that changes and adaptation are inherently a slow-moving process. Wayne Chiu (RWQCB) explained that the RWQCB is not expecting adaptation every six months or every year. Some issues may not yield significant results even on the 5-year basis. Chris Crompton (County of Orange) agreed that there should be minor course corrections on an annual basis. Todd Snyder (County of San Diego) referred to the San Diego Copermittees’ handout (see graphic below), explaining the mid-course corrections will be the smaller loop and will be minor changes; the overall or big-picture questions and adaptations will be the outer loop on a 5-year or longer term.

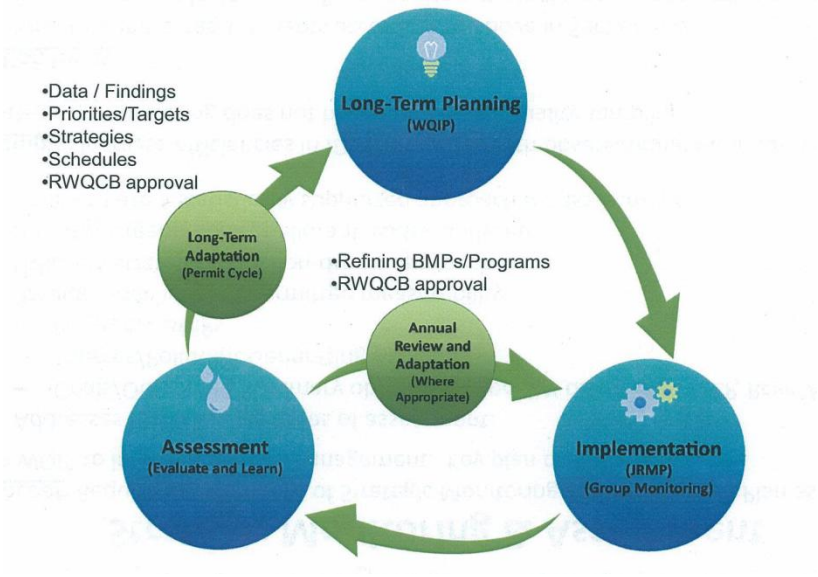

Jon Van Rhyn (County of San Diego) described the differences between program modification and adaptive management. Program modification happens every now and then and is unpredictable. Adaptive management is more defined; it is question-driven. Adaptive management uses questions to direct program modifications; therefore, the questions being asked need to be understood at the beginning of the adaptive management process.

Wayne Chiu (RWQCB) asked the stakeholders how they learn best, where they learn best, and how does the RWQCB put that into the permit. Jon Van Rhyn (County of San Diego) explained that looking back to learn works well only if the plan is well thought out in the beginning. Jon emphasized beginning with a truly robust and comprehensive planning process is important.

Todd Snyder (County of San Diego) referenced slide 10 of the San Diego Copermittees' handout, suggesting development of a Strategic Monitoring and Assessment Plan as part of the Water Quality Improvement Plan to inform adaptive management. This is expected to be discussed in more detail at the next focused meeting; however, Todd recommended the RWQCB provide an opportunity for the San Diego Copermittees to walk through the Strategic Monitoring and Assessment Plan to provide an adequate description before opening up the discussion to questions and answers.

Ziad Mazboudi (City of San Juan Capistrano) provided an example of how the City learned to adjust its program with regard to over irrigation. The City worked with water districts, educated the public, and provided rebates for smart timers instead of attempting to write enforcement tickets for each violation of over irrigation. This was a change in tactic that resulted in the same goal being achieved.

VII. Other Topics

There were some topics raised during the focused meeting that were not within the scope of the meeting but should be discussed at more appropriate times. These included:

- CalGreen / Hydromodification Dedicated Meeting
- Legal Issues
- Aliso Creek / specific areas of geography
- Ninth Circuit Court Decision
- BET and Other Technologies
- Regional BMP Funding and Implementation
- Review time for permit
- Monitoring Presentation by San Diego County Copermittees

VIII. Audience Comments

Comment: Cid Tesoro (County of San Diego), in reference to the proposed meeting, workshop, or symposium focused on hydromodification, recommended also including the full Land Development portion of the permit.

Question: Khosro Aminpour (City of Chula Vista) asked how anti-backsliding works in the realm of adaptive management; will the anti-backsliding policy prevent Copermittees from eliminating inefficient program elements?

Response: David Barker (RWQCB) explained that the anti-backsliding provisions are addressed in the NPDES permit regulations and are usually used in the context of preventing backsliding (relaxation) of numeric effluent limitations. David indicated that RWQCB staff are not prepared to conclude during these focused meetings whether any specific permit requirement is, or is not, subject to the anti-backsliding policy. Therefore, all issues should be open for discussion and we should not let anti-backsliding considerations take issues off the table at this point. Legal determinations will be made at a later date. It is a complicated regulation, but it would not prevent programmatic changes. Cindy Lin (US EPA) concurred.

IX. Meeting Adjourned

San Diego RWQCB
Permit Reissuance Focused Meeting

July 11, 2012

WQIP and JRMP Approval Process

Discharge Prohibitions

- Change "prohibit non-storm water discharges from MS4" to "effectively prohibit …"

Iterative Process

- Include reference to A.4. in sections A.1, A.2, and A.3 to define compliance through the iterative process. Explicit language is needed in light of 9th Circuit Court's finding of the separate enforceability of these provisions.

WQIP and JRMP Approval Process

Concept: The intent of the Permit is for dischargers to submit WQIP and JRMP updates for approval. Compliance is achieved through the submittal, implementation, and update of approved plans. Jurisdictional accountability comes from review and approval of jurisdictional commitments.

Examples:

- If there are 6 dischargers in one WMA, and 5 dischargers' commitments are approved when the WQIP is submitted, any re-submittals need to focus on individual dischargers, not the entire watershed.
- There appears to be no approval process for the JRMP update in year 1 of the permit.
- There is no timeline for approval of annual updates in years 2, 3, 4, 5.
- From previous workshops, "Numeric Targets" are not enforceable.

Action Items:

1. Insert language clarifying identification of individual jurisdictional commitments in WQIP, and insert language clarifying RWQCB approval of individual jurisdictional commitments.
2. Add language to include RWQCB approval timeline for JRMP updates in year 1.
3. Add language in II.F. stating there is a specific (e.g., 90-day) RWQCB approval timeline for annual updates in years 2, 3, 4, 5.
4. Add language to permit, not fact sheet, about non-enforceability of Numeric Targets

WQIP and JRMP Approval Process

Concept: WQBELs in TMDLs are currently expressed as either:

a) Achievement of receiving water limitations, or

b) Achievement of a receiving water limitation applied at the MS4 outfall, and applied as a concentration instead of a load.

Action Item: Add other means of demonstrating compliance with WQBELs, for example:

- Load-based compliance with Waste Load Allocations
- Implementation of EO-approved TMDL compliance plan
- Compliance with exceedance limitations expressed as 'days' or 'frequency' (Bacteria TMDL for Beaches & Creeks)
- Other means of compliance identified in future TMDL language

Adaptive Management Areas of Permit

Concept: The intent of the Permit is to allow for adaptation of Permit programs, strategies, and procedures to enable Copermittees to more effectively and efficiently achieve their goals. Modifications need not be additive. Modifications must be reasonably expected to result in equal or greater overall effectiveness. Modifications can include adjustments to level of effort or methods either geographically, across permit components, or within permit components.

Examples:

- Geographic / Level of Effort Adjustment: Refer to Slides #6 and #7
- Within Permit Component / Level of Effort Adjustment: Modifying IDDE procedures in Section II.E.2.d. (less water quality sampling, more observations)
- Within Permit Component / Method Adjustment: Modifying inspection procedures in Section II.E.5.: Refer to Slide #8
- Across Permit Component / Level of Effort Adjustment: Reducing inspection frequencies in Section II.E.5., and increasing education activities in Section II.E.7.

Action Item: To make clear what is eligible for adaptation, insert language in Section II.B.5. (Adaptive Management Process) clarifying what sections of the Permit "shall be considered, as appropriate," by each Copermittee for adaptation.

Adaptive Management Areas of Permit: Residential Example

Concept: Permit intent is to allow for adaptation of:

- Residential inventory content
- Tools used to address Residential land use as source: O+E, IC/ID complaint response, inspections, street sweeping, MS4 cleaning
- Any other tools needed, providing that residential land use is a source of a WQIP priority

Example: If a Copermittee is in Watersheds 1 and 2 in the figure (slide 7), and residential land use is only a priority in Watershed 1, the Copermittee could conduct IC/ID complaint response in Watershed 2, and conduct any combination of other tools in Watershed 1 to address the priority.

Action Item: Clarify language, where appropriate, to allow modifications to inventories and control strategies with supporting rationale and justification.

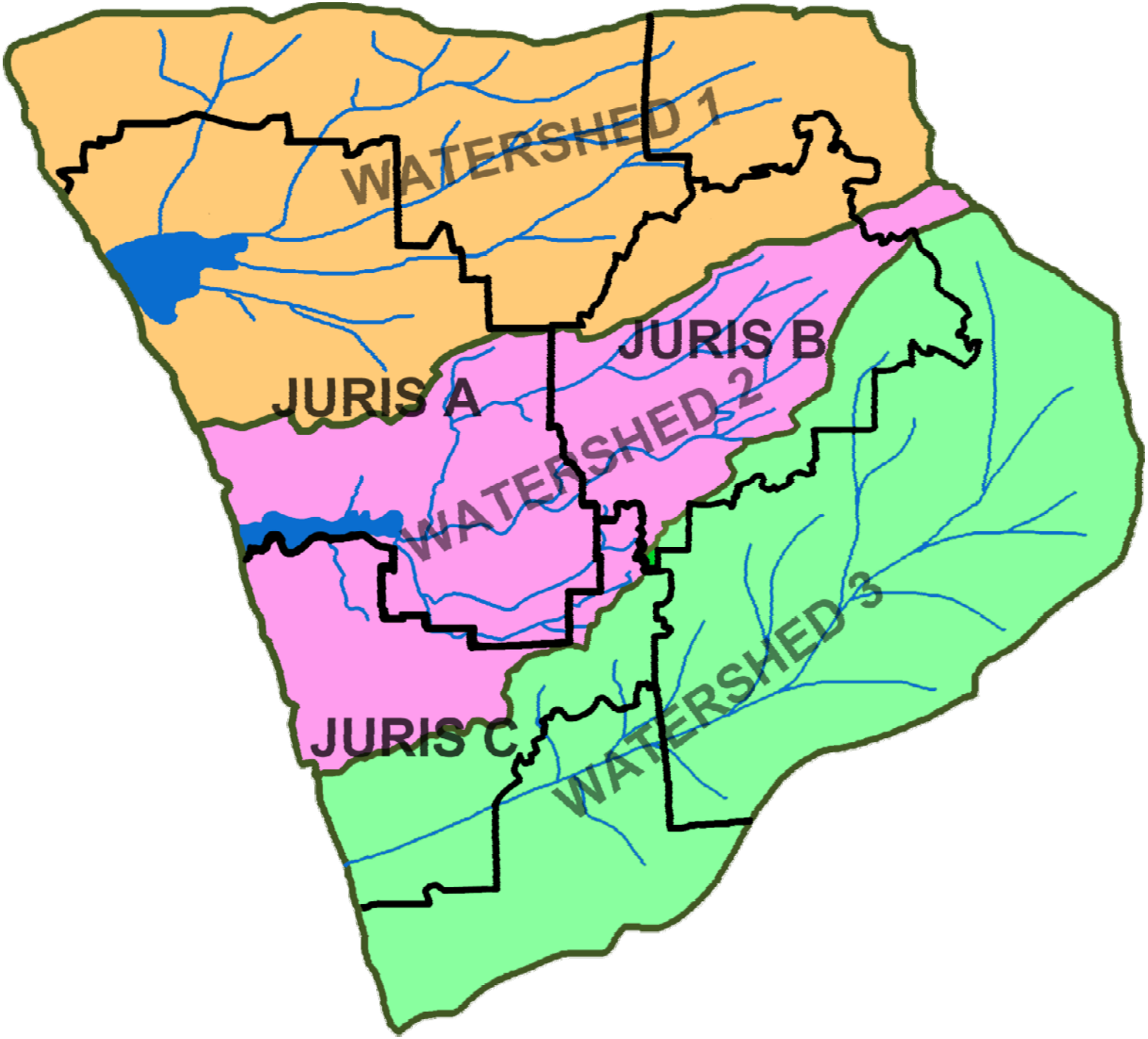
WATERSHED 1
JURIS A
JURIS B
WATERSHED 2
WATERSHED 3
JURIS C

Adaptive Management Areas of Permit: Inspections

Concept: Permit intent is to allow for adaptation of Provision E requirements to allow modifications to inspection methodology as a result of adaptive management

Example: Use of multiple inspection methods to effectively and efficiently verify implementation of BMPs

- "Traditional" Inspections (internal, single business, some external)
- Property-Based Inspections (external-focused on PGAs, internal if necessary, multiple-businesses on one property)
- Patrols or complaint based inspections

Action Item: Clarify language, where appropriate, to allow modifications to inspection methods and requirements with supporting rationale and justification

Adaptive Management Areas of Permit: Long-Term vs. Annual Processes

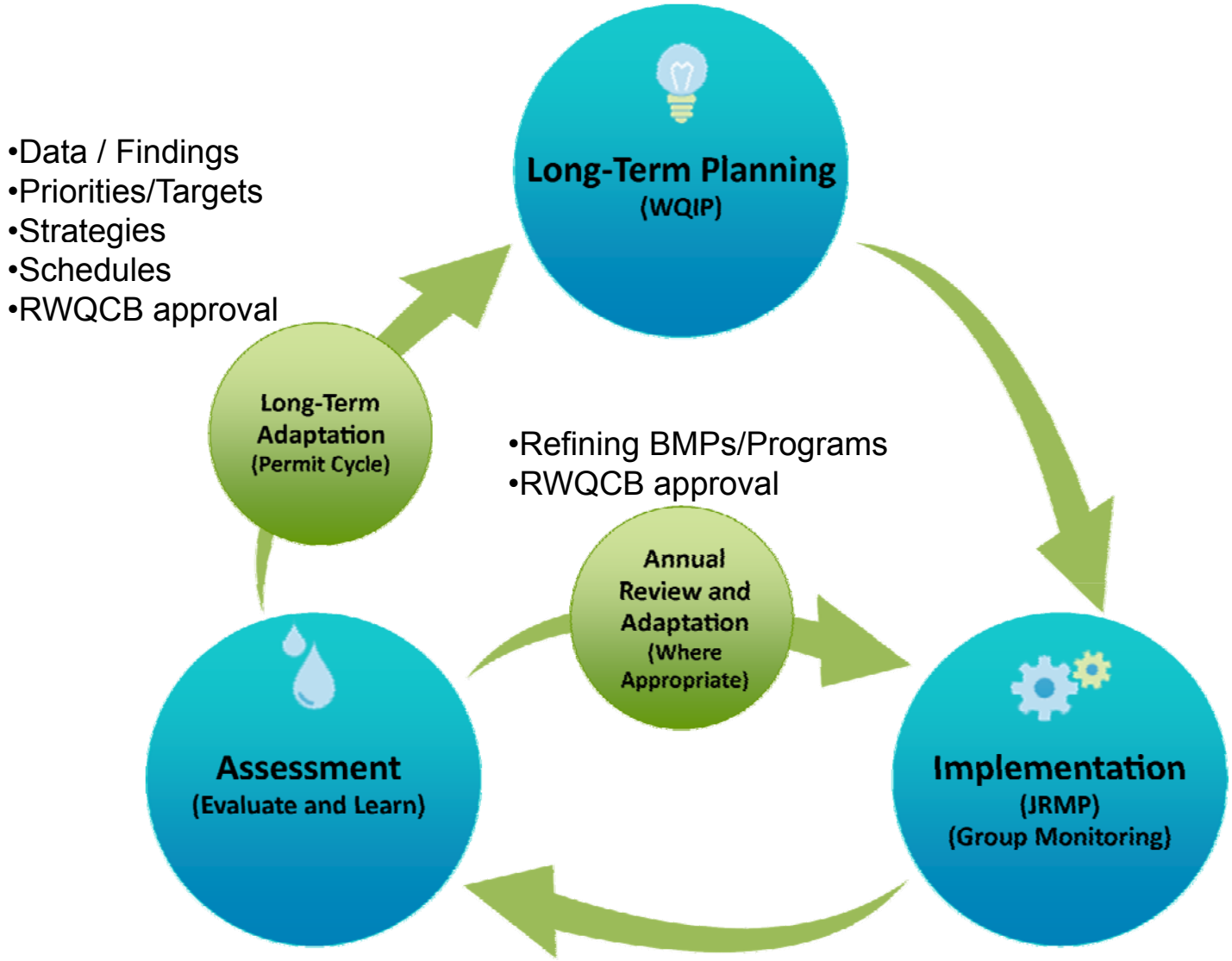

Adaptive Management Areas of Permit: Strategic Monitoring & Assessment

Concept: Require development of Strategic Monitoring and Assessment Plan as part of the WQIP to inform adaptive management. Key plan characteristics:

- Addresses the following areas of assessment:
  - Goals/Outcomes/3 primary objectives (Non-SW discharges, MEP, Rcvg Wtrs)
  - Sources/Pollutant Generating Activities
  - Programs/BMPs
- Provides individual Copermittee measurability
- Utilizes a strategic, question-driven approach
- Prioritizes (geographic, pollutant, water body, etc.)
- Ability to use a statistically supported approach for assessment

Example: Increase efficiencies in IDDE Programs with observational methods (or other strategies); monitoring does not have to be water quality sampling

Action Items:

- Structure initial requirements according to above in Section II.D.
- Adjust language in Section II.B. to require a strategic monitoring and assessment plan as a part of the WQIPs.

FOCUSED MEETING AGENDA

Administrative Draft of
Tentative Order No. R9-2012-0011, NPDES No. CAS0109266
Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region

Wednesday, July 25, 2012
9:30 a.m. - 3:30 p.m.

9:30 a.m. - 9:40 a.m.	Introductions, Table Participants
9:40 a.m. - 9:50 a.m.	Meeting Recap & Feedback, Lewis Michaelson, Katz & Associates
9:50 a.m. - 10:00 a.m.	Focused Meeting Highlights, David Barker, San Diego Water Board
10:00 a.m. - 10:10 a.m.	Monitoring Requirements Intro, Eric Becker, San Diego Water Board
10:10 a.m. - 11:30 a.m.	Stakeholder Monitoring Presentations, Table Participants
11:30 a.m. - 12:30 p.m.	Lunch
12:30 p.m. - 1:30 p.m.	Discussion on Monitoring Proposals Related to Permit Requirements, Table Participants
1:30 p.m. - 1:45 p.m.	Break
1:45 p.m. - 3:00 p.m.	Discussion on Monitoring Proposals Related to Permit Requirements, Table Participants
3:00 p.m. - 3:30 p.m.	Parking Lot Discussion Comments & Questions All

ELECTRONIC MAIL LIST SUBSCRIPTION

The San Diego Water Board has established an electronic mail list specifically for information and notices on the development of a Regional MS4 Storm Water Permit. The San Diego Water Board will use the email list to notify interested persons of upcoming important events and the availability of on-line documents. Persons interested in receiving future notices and information on this specific project can subscribe to one (1) of the electronic mail lists titled "Orange County MS4 Permit, " Riverside County MS4 Permit, or "San Diego MS4 Permit ", located on the San Diego Water Board website at:

http://www.waterboards.ca.gov/resources/email_subscriptions/reg9_subscribe.shtml

Meeting Date	Topic Discussion Questions	Draft Permit Provisions
June 27, 2012 July 11, 2012	**ASSESSMENT/PLANNING** 1. In what ways can the proposed provisions of the administrative draft permit be modified to better assess if the Copermittees' jurisdictional runoff management programs are effectively prohibiting non-storm water discharges to their MS4s? 2. In what ways can the proposed provisions of the administrative draft permit be modified to better assess if the Copermittees' jurisdictional runoff management programs are reducing pollutants in storm water to the maximum extent practicable (MEP)? 3. In what ways can the proposed provisions of the administrative draft permit be modified to better assess that improvements are being achieved in the physical chemical, and biological conditions of receiving waters as a result of implementing the Copermittees' Water Quality Improvement Plans? 4. How can adaptive management or the "iterative process" be incorporated into the proposed provisions of the administrative draft permit better? 5. How can the proposed provisions of the administrative draft permit be modified to support a Copermittee's ability to plan and/or procure resources for its jurisdictional runoff management program? 6. How can the proposed provisions of the administrative draft permit be modified to reduce or eliminate any conflicts with other requirements (e.g. TMDLs, ASBS) or programs (e.g. flood management, vector control, water supply, recycled water, groundwater recharge)?	II.A. Prohibitions and Limitations (includes WQBELs for TMDLs in Attachment E) II.B. Water Quality Improvement Plans II.C. Action Levels II.D.4.a. MS4 Discharges Assessments II.D.4.b. Receiving Waters Assessments II.D.4.c. Water Quality Improvement Assessments II.F.1. Water Quality Improvement Plans II.F.2.c. Water Quality Improvement Plan Updates II.F.3. Progress Reporting II.F.4. Regional Clearinghouse
July 25, 2012	**ASSESSMENT/MONITORING** 1. In what ways can the proposed provisions of the administrative draft permit be changed to improve how the Copermittees collect data to assess whether their jurisdictional runoff management programs are effectively prohibiting non-storm water discharges to their MS4s? 2. In what ways can the proposed provisions of the administrative draft permit be changed to improve how the Copermittees collect data to assess whether their jurisdictional runoff management programs are reducing pollutants in storm water to the MEP? 3. In what ways can the proposed provisions in the administrative draft permit be changed to improve how the Copermittees collect data to assess whether improvements to the physical, chemical, and biological conditions of receiving waters are being achieved as a result of implementing their Water Quality Improvement Plans?	II.D.1. Jurisdictional Monitoring Requirements II.D.2. Watershed Monitoring Requirements II.D.3. Regional Special Studies II.D.4.a. MS4 Discharges Assessments II.D.4.b. Receiving Waters Assessments II.D.4.c. Water Quality Improvement Assessments II.F.3. Progress Reporting II.F.4. Regional Clearinghouse

Meeting Date	Topic Discussion Questions	Draft Permit Provisions
August 22, 2012	**PLANNING/IMPLEMENTATION** 1. How can adaptive management or the "iterative process" be incorporated into the proposed provisions of the administrative draft permit better? 2. How can the proposed provisions of the administrative draft permit be modified to support a Copermittee's ability to plan and/or procure resources for its jurisdictional runoff management program? 3. How can the proposed provisions of the administrative draft permit be modified to reduce or eliminate any conflicts with other requirements (e.g. TMDLs, ASBS) or programs (e.g. flood management, vector control, water supply, recycled water, groundwater recharge)? 4. How can the proposed provisions of the administrative draft permit be modified to support a Copermittee's ability to implement and enforce its jurisdictional runoff management program to effectively prohibit non-storm water discharges to and from its MS4, and reduce pollutants in storm water discharges from its MS4 to the MEP? 5. How can the proposed provisions of the administrative draft permit be modified to promote retrofitting of existing development and/or implementing projects that can restore or rehabilitate receiving waters as good tools to use as pollution control strategies? 6. How can the proposed provisions of the administrative draft permit be modified to allow the Copermittees to better focus their resources on improving water quality?	II.B. Water Quality Improvement Plans II.E. Jurisdictional Runoff Management Programs II.F.1. Water Quality Improvement Plans II.F.2.a. JRMP Document Updates II.F.2.b. BMP Design Manual Updates II.F.2.c. Water Quality Improvement Plan Updates II.F.3.b. Annual Reports II.F.4. Regional Clearinghouse

From: Christine Sloan
To: Chiu, Wayne@Waterboards; Becker, Eric@Waterboards; Walsh, Laurie@Waterboards
Cc: syhasenin@sandiego.gov; Jon VanRhyn
Subject: Land Development Workgroup meeting
Date: Tuesday, July 24, 2012 4:44:37 PM

Laurie/Eric/Wayne,

Thank you very much for a productive discussion today. I think everyone went away with a better understanding for how the new permit might function.

To follow-up with the additional meeting suggestion, we would like to know if you would be able to meet with us again on August 9th. We'd likely use the same format, but this time we'd like your feedback on potential language that we'll draft up. Would an hour or so on August 9th work for you?

Thanks,
Christine

Christine A. Sloan

Program Coordinator
Watershed Protection Program
County of San Diego
www.sdcdpw.org
(858) 495-5257

From: Walsh, Laurie@Waterboards [mailto:LWalsh@waterboards.ca.gov]
Sent: Thursday, July 19, 2012 11:04 AM
To: Sloan, Christine; Becker, Eric@Waterboards
Cc: syhasenin@sandiego.gov; VanRhyn, Jon
Subject: RE: ***LOCATION CHANGE***RE: Land Development Workgroup meeting on Tuesday July 24 1pm - 4pm

Thanks Christine

Laurie Walsh P.E.
San Diego Water Board
858-467-2970
lwalsh@waterboards.ca.gov

From: Christine Sloan [Christine.Sloan@sdcounty.ca.gov]
Sent: Thursday, July 19, 2012 10:21 AM
To: Walsh, Laurie@Waterboards; Becker, Eric@Waterboards
Cc: syhasenin@sandiego.gov; Jon VanRhyn
Subject: FW: ***LOCATION CHANGE***RE: Land Development Workgroup meeting on Tuesday July 24 1pm - 4pm

Eric/Laurie,

Thanks for attending on the 24th. We are looking forward to meeting with you. We've changed the

location to the City's conference room for the added space and comfort. The address is below.

See you then,
Christine

From: Sloan, Christine
Sent: Thursday, July 19, 2012 10:17 AM
To:
Subject: ***LOCATION CHANGE***RE: Land Development Workgroup meeting on Tuesday July 24 1pm - 4pm

The meeting on the 24th will be at:

City of San Diego,
Storm Water Division
9370 Chesapeake Drive, Suite 100
San Diego, CA 92123

Thanks,
Christine

From: Mosley, Deborah
Sent: Tuesday, July 17, 2012 1:03 PM
To: Subject: Land Development Workgroup meeting on Tuesday July 24 1pm - 4pm
Importance: High

Good Afternoon Copermittee Land Development Workgroup,

The Land Development Workgroup will be having a meeting to discuss workshop strategy and specific language proposals for sections E.3 and E.4 of the new administrative draft of the MS4 permit on **Tuesday July 24, 2012 from 1:00pm – 4:00pm** at the ~~County of San Diego Watershed Protection Program offices located at 5201 Ruffin Road, Suite P, San Diego, 92123.~~

The Regional Board will be attending the first part of this meeting from 1:00pm – 2:00pm. During this time the Copermittees will have an opportunity to ask the Regional Board clarifying questions on the administrative draft permit. If you have specific questions or suggestions for language please forward to Christine Sloan.

We would appreciate your attendance and participation in the discussion. An agenda will be sent out prior to the meeting. If you have any questions feel free to contact myself or Christine Sloan, the Land Development Workgroup Chair, at 858-495-5257 or christine.sloan@sdcounty.ca.gov.

Thank you,

Deborah Mosley
Development and Construction Group
DPW - Watershed Protection Program
County of San Diego
(619) 204-5831 Direct
(858) 495-5263 fax

From: Ziad Mazboudi
To: Chiu, Wayne@Waterboards
Cc: Becker, Eric@Waterboards; Walsh, Laurie@Waterboards
Subject: Meeting with South Orange County co-permittees
Date: Tuesday, July 24, 2012 7:38:21 AM

Hi Wayne and all
We are scheduled to meet on August 7, at 1:30 at the San Juan Capistrano Community Center, located at 25925 Camino Del Avion. A group representing the South Orange County cities will be joining the meeting.
We look forward to it.

Ziad

Ziad Mazboudi, PE, F. ASCE
LEED AP, CPSWQ, CPESC, QSD/QSP Trainer of Record
Senior Civil Engineer, Environmental Division Manager
City of San Juan Capistrano
Utilities Department
32450 Paseo Adelanto
San Juan Capistrano, CA 92675
Tel: 949-234-4413
Cel: 949-678-3404
Fax: 949-493-9814
www.sanjuancapistrano.org

Stormwater Hotline: to report any stormwater violation, or a problem with a catch basin or for information: 949-234-4575

Is sprinkler runoff flowing off your yard? Adjust sprinkler heads and shorten watering times.

Consider the environment. Please don't print this e-mail unless you really need to.

CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

July 24, 2012

Mr. Warren D. Williams
General Manager-Chief Engineer
Riverside County Flood Control and Water Conservation District
1995 Market Street
Riverside, California 92501

Subject: Participation of Riverside County Copermittees in Focused Meetings for Administrative Draft Tentative Order No. R9-2012-0011, Regional Municipal Separate Storm Sewer System (MS4) Storm Water NPDES Permit

Mr. Williams:

This is in response to your letter dated July 9, 2012 to Grant Destache, Chair of the California Regional Water Quality Control Board ("San Diego Water Board"), asking why it was necessary to move forward with "Focused Meetings" on the administrative draft version of Tentative Order No. R9-2012-0011 ("Regional MS4 Permit") on a schedule that purportedly precluded the attendance and participation of the Riverside County Copermittees. Chair Destache requested that I respond to your letter on his behalf.

In your letter, you referenced prior communications to the San Diego Water Board from the Riverside County Flood Control and Water Conservation District ("District") and others requesting that the San Diego Water Board delay the start of the Focused Meetings until the week of July 23, 2012 and that no meetings be held between September and mid November 2012. These communications indicated that the requested delays were necessary to accommodate other regulatory obligations of the Riverside County Copermittees to develop and submit various storm water compliance documents to the San Diego and Santa Ana Water Boards. I appreciate the District's and the other Riverside County Copermittees desire to make complete and timely submittals of these compliance documents and to participate fully in the Focused Meetings. However, the requested changes to the San Diego Water Board's schedule for the Focused Meetings would have delayed the completion of the Focused Meeting process by over five months. The San Diego Water Board carefully considered the District's requests in finalizing the schedule for the Focused Meetings and determined that the meetings should proceed as described in the San Diego Water Board's June 20, 2012 notice in order to maintain momentum towards finalizing a Tentative Regional MS4 Permit for public review and comment later this year.

Chair Destache has directed me to move forward expeditiously on the development of a Regional MS4 Permit as one of the San Diego Water Board's top priorities for a variety of

reasons. The continued regulation of San Diego, Riverside, and southern Orange Counties under three separate municipal storm water permits places a significant and unsustainable burden on the San Diego Water Board during a time of increasingly severe resource constraints. Staff resources are primarily focused on the periodic reissuance of the three permits, while the present need is to advance the storm water program through comprehensive, creative, and effective storm water regulation. Most importantly, the dimensions of the urban runoff problem clearly highlight the need for a shift at this time to innovative and more adaptive regulatory approaches.

With these challenges in mind the San Diego Water Board has put considerable effort into developing an administrative draft Regional MS4 permit that that will jointly cover municipal Copermittees in San Diego, Riverside and southern Orange Counties. The administrative draft Regional MS4 permit significantly modifies the prescriptive action-based regulatory approach of the current municipal storm water permits to an outcome-based approach, with a focus on measuring and achieving improvements in MS4 discharges and receiving water quality. A key feature of the administrative draft Regional MS4 permit is that it provides an adaptive management pathway for the Copermittees to select and address the highest priority water quality issues through a non-punitive iterative process. The San Diego Water Board believes the proposed adaptive management permit provisions have great promise and will allow the Copermittees to more flexibly deploy resources to achieve goals that will yield the greatest water quality improvements. The regional approach offers the opportunity to better achieve regulatory consistency as well as maximum efficiency and economy of resources for both the San Diego Water Board and the Copermittees.

It is unfortunate that the District and other Riverside County Copermitees did not attend the June 27 and July 11, 2012 Focused Meetings. These meetings were extremely productive and well attended by the various stakeholder groups including the San Diego and Orange County Copermittees representing 34 of the 39 municipal storm water entities in the San Diego Region. I understand that the District and other Riverside County Copermittees are being provided detailed meeting minutes for all of the Focused Meetings. I would like to reiterate my staff's previous offer to meet with the District and other Riverside County Copermittees to both fully brief them on the June 27 and July 11, 2012 meetings and to hear any comments on the topics discussed or any other aspects of the administrative draft Regional MS4 Permit. I understand that the District and other Riverside County Copermittees may be able to attend all of the remaining focused meetings scheduled for July 27, August 22 and September 5, 2012 and look forward to their participation in those meetings.

The San Diego Water Board released the administrative draft Regional MS4 permit on April 9, 2012 for an extended period of public review and comment. In addition to participating in the remaining Focused Meetings, I also encourage the District and other Riverside County Copermittees to take the opportunity provided in the public notice to submit written comments, suggestions, or recommendations on any aspect of the administrative draft Regional MS4 Permit by September 14, 2012.

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I strongly disagree with your inference that the decision to move forward with the Focused Meetings may be indicative of an indifference among San Diego Water Board staff towards public participation and collaboration in Water Board projects. The San Diego Water Board has a long history of effectively protecting water quality while balancing competing needs of dischargers and other stakeholders and providing an accessible and transparent regulatory process. I can assure you the San Diego Water Board staff are committed to incorporating meaningful public participation into their work and to keeping the public fully informed and involved in the San Diego Water Board's decision-making process. The San Diego Water Board is conducting its proceedings on the development of a Regional MS4 Permit in an open and transparent process that is fully consistent with these principles.

I hope this letter is responsive to your concerns and I would be pleased to discuss these matters with you further at any time. Please contact me at (858) 467- 4387 or via e-mail at DGibson@waterboards.ca.gov.

Respectfully,

David W. Gibson
Executive Officer

DG:js:dtb:eb:wc

cc: Riverside County Copermittees

From: Chiu, Wayne@Waterboards
To: "Christine Sloan"
Cc: "JoeKuhn"; "bwalker@ci.oceanside.ca.us"; Julie Procopio; syhasenin@sandiego.gov; Jon VanRhyn; Becker, Eric@Waterboards; Walsh, Laurie@Waterboards
Subject: RE: Land Development Workgroup meeting
Date: Thursday, July 26, 2012 12:57:00 PM

Sounds good. Got it marked on our calendars.
See y'all then.
Thanks,
Wayne

From: Christine Sloan [mailto:Christine.Sloan@sdcounty.ca.gov]
Sent: Thursday, July 26, 2012 12:50 PM
To: Chiu, Wayne@Waterboards
Cc: 'JoeKuhn'; 'bwalker@ci.oceanside.ca.us'; Julie Procopio; syhasenin@sandiego.gov; Jon VanRhyn; Becker, Eric@Waterboards; Walsh, Laurie@Waterboards
Subject: RE: Land Development Workgroup meeting

Hi Wayne,

We agree with your suggestions. How about 9-11am on August 9th at the City of San Diego, Chesapeake office?

As for attendees, we'll likely have the same 5 LDW representatives attending and maybe a couple other key people that participate often. Does that sound ok with you?

Thanks again,
Christine

From: Chiu, Wayne@Waterboards [mailto:WChiu@waterboards.ca.gov]
Sent: Thursday, July 26, 2012 9:29 AM
To: Sloan, Christine
Cc: syhasenin@sandiego.gov; VanRhyn, Jon; Becker, Eric@Waterboards; Walsh, Laurie@Waterboards
Subject: RE: Land Development Workgroup meeting

Hi Christine,

I'm glad your workgroup was able to get a better understanding for how the new permit might function, and hopefully a clearer understanding about what we are trying to achieve with the new permit.

As for the next meeting, August 9 looks like it should be okay, though it would be better in the morning than in the afternoon.

At this next meeting we would prefer not to review and comment on any specific proposed language. Instead, we'd rather have you walk us through alternative concepts or ideas that you think would be equally or more effective than what we currently have proposed in the

administrative draft. We can then provide you some feedback on whether those alternative concepts or ideas would meet our needs and expectations, and maybe help you identify any shortcomings or gaps that you can try to fill in. Or, we could participate in a brainstorming session if you would like to throw around some ideas.

Also, I'm not sure it is necessary to have the entire workgroup there. We have found that a smaller group of meeting participants tends to produce much more candid and free-flowing discussions. As with most meetings of the size we had, there were about 5 of 20+ people doing most of the talking and the rest did not really participate in the discussion We prefer to have everyone in the room participate in the discussion.

If you would still like to have the meeting on August 9, please let us know a time and place so we can mark it on our calendars.
Thanks,
Wayne

From: Christine Sloan [mailto:Christine.Sloan@sdcounty.ca.gov]
Sent: Tuesday, July 24, 2012 4:44 PM
To: Chiu, Wayne@Waterboards; Becker, Eric@Waterboards; Walsh, Laurie@Waterboards
Cc: syhasenin@sandiego.gov; Jon VanRhyn
Subject: Land Development Workgroup meeting

Laurie/Eric/Wayne,

Thank you very much for a productive discussion today. I think everyone went away with a better understanding for how the new permit might function.

To follow-up with the additional meeting suggestion, we would like to know if you would be able to meet with us again on August 9th. We'd likely use the same format, but this time we'd like your feedback on potential language that we'll draft up. Would an hour or so on August 9th work for you?

Thanks,
Christine

Christine A. Sloan

Program Coordinator
Watershed Protection Program
County of San Diego
www.sdcdpw.org
(858) 495-5257

From: Walsh, Laurie@Waterboards [mailto:LWalsh@waterboards.ca.gov]
Sent: Thursday, July 19, 2012 11:04 AM
To: Sloan, Christine; Becker, Eric@Waterboards
Cc: syhasenin@sandiego.gov; VanRhyn, Jon
Subject: RE: ***LOCATION CHANGE***RE: Land Development Workgroup meeting on Tuesday July

24 1pm - 4pm

Thanks Christine

Laurie Walsh P.E.
San Diego Water Board
858-467-2970
lwalsh@waterboards.ca.gov

From: Christine Sloan [Christine.Sloan@sdcounty.ca.gov]
Sent: Thursday, July 19, 2012 10:21 AM
To: Walsh, Laurie@Waterboards; Becker, Eric@Waterboards
Cc: syhasenin@sandiego.gov; Jon VanRhyn
Subject: FW: ***LOCATION CHANGE***RE: Land Development Workgroup meeting on Tuesday July 24 1pm - 4pm

Eric/Laurie,

Thanks for attending on the 24th. We are looking forward to meeting with you. We've changed the location to the City's conference room for the added space and comfort. The address is below.

See you then,
Christine

From: Sloan, Christine
Sent: Thursday, July 19, 2012 10:17 AM
To:
Subject: ***LOCATION CHANGE***RE: Land Development Workgroup meeting on Tuesday July 24 1pm - 4pm

The meeting on the 24th will be at:

City of San Diego,
Storm Water Division
9370 Chesapeake Drive, Suite 100
San Diego, CA 92123

Thanks,
Christine

From: Mosley, Deborah
Sent: Tuesday, July 17, 2012 1:03 PM
To: Subject: Land Development Workgroup meeting on Tuesday July 24 1pm - 4pm
Importance: High

Good Afternoon Copermittee Land Development Workgroup,

The Land Development Workgroup will be having a meeting to discuss workshop strategy and specific language proposals for sections E.3 and E.4 of the new administrative draft of the MS4 permit on **Tuesday July 24,**

2012 from 1:00pm – 4:00pm at the County of San Diego Watershed ~~Protection Program offices located at 5201 Ruffin Road, Suite P, San Diego, 92123.~~

The Regional Board will be attending the first part of this meeting from 1:00pm – 2:00pm. During this time the Copermittees will have an opportunity to ask the Regional Board clarifying questions on the administrative draft permit. If you have specific questions or suggestions for language please forward to Christine Sloan.

We would appreciate your attendance and participation in the discussion. An agenda will be sent out prior to the meeting. If you have any questions feel free to contact myself or Christine Sloan, the Land Development Workgroup Chair, at 858-495-5257 or christine.sloan@sdcounty.ca.gov.

Thank you,

Deborah Mosley
Development and Construction Group
DPW - Watershed Protection Program
County of San Diego
(619) 204-5831 Direct
(858) 495-5263 fax

From: Chiu, Wayne@Waterboards
To: "Jo Ann Weber"
Cc: Walsh, Laurie@Waterboards; Becker, Eric@Waterboards
Subject: RE: Follow up Meeting on Monitoring
Date: Thursday, July 26, 2012 11:01:00 AM

Sounds good. See y'all 10am on August 2.

From: Jo Ann Weber [mailto:JoAnn.Weber@sdcounty.ca.gov]
Sent: Thursday, July 26, 2012 10:55 AM
To: Chiu, Wayne@Waterboards; Becker, Eric@Waterboards
Cc: Walsh, Laurie@Waterboards
Subject: RE: Follow up Meeting on Monitoring

Dear Wayne and Eric, We are very comfortable meeting with you and Laurie while Eric is out. We will meet at the City of San Diego Stormwater offices on Chesapeake in conference rm 2. Thanks for the opportunity! We look forward to meeting with you both. Best regards, Jo Ann

Jo Ann Weber
Water Quality Program Coordinator
County of San Diego/DPW/Watershed Protection
5201 Ruffin Road, Suite P
San Diego, CA 92123, MS 0326
Tel: 858-495-5317
Fax: 858-495-5263
joann.weber@sdcounty.ca.gov

From: Chiu, Wayne@Waterboards [mailto:WChiu@waterboards.ca.gov]
Sent: Thursday, July 26, 2012 10:39 AM
To: Weber, Jo Ann; Becker, Eric@Waterboards
Cc: Walsh, Laurie@Waterboards
Subject: RE: Follow up Meeting on Monitoring

Hi Jo Ann,

Eric is out and will not return until August 6. If you want Eric at the meeting, it will have to be sometime after he returns. Otherwise, it looks like Laurie and I have time to meet with your team on August 2 if you are comfortable without Eric being at the meeting.

Let me know where and when you would like to meet so I can mark some time on our calendars.
Thanks,
Wayne

From: Jo Ann Weber [mailto:JoAnn.Weber@sdcounty.ca.gov]
Sent: Thursday, July 26, 2012 10:33 AM
To: Becker, Eric@Waterboards
Cc: Chiu, Wayne@Waterboards; Walsh, Laurie@Waterboards
Subject: Follow up Meeting on Monitoring

Dear Eric, We thank you for your attention at the Focused Meeting yesterday and wish to pursue the opportunity to meet with you to further discuss Copermittees' Alternate Provision D. Would you be available to meet with the Copermittees' team on Thursday, August 2nd from 10 am to noon? Thank you, Jo Ann

Jo Ann Weber
Water Quality Program Coordinator
County of San Diego/DPW/Watershed Protection
5201 Ruffin Road, Suite P
San Diego, CA 92123, MS 0326
Tel: 858-495-5317
Fax: 858-495-5263
joann.weber@sdcounty.ca.gov

From: Erik Steenblock
To: Chiu, Wayne@Waterboards; Walsh, Laurie@Waterboards
Cc: Helen Davies; Ruth Kolb
Subject: Existing Development - Topics For Discussion
Date: Tuesday, July 31, 2012 3:50:36 PM

Hi Wayne & Laurie,

Looking forward to our discussion tomorrow on Existing Development here in Encinitas. There will a total of three representatives from our Existing Development sub-workgroup including myself, Helen Davies from the City of Santee, and Ruth Kolb from the City of San Diego. To give you a general idea of some of the areas we would like to get some clarity on, I offer the following list of topic areas. While broad as listed below, there are some more refined points that we want to get your take on to better inform our approach to evaluating them. I apologize that this is coming in late, but we have been working to refine these areas as a working body over the past few weeks. If you have any up front questions please let me know. In advance, thanks for taking the time to work with us on these very important issues.

- Existing Development Inventories
- Existing Development Inspections
- Residential
- BMP Implementation and Maintenance
- Retrofit & Channel Rehab
- WQIP / JRMP Relationship

See you tomorrow.

Erik Steenblock ♦ Clean Water Program Manager ♦ (760) 943-2108
City of Encinitas ♦ 505 S. Vulcan Avenue, Encinitas, CA 92024-3633

Correspondents should be aware that all communications to or from this address are subject to public disclosure and may be reviewed by third parties.

From: Walsh, Laurie@Waterboards
To: Mike McSweeney; Becker, Eric@Waterboards; Chiu, Wayne@Waterboards
Cc: Borre Winckel; Matt Adams
Subject: RE: BIA request for meeting
Date: Monday, August 13, 2012 10:46:00 AM

Mike,

Eric and Wayne will be able to meet with you and the others this Friday 8/17 at 8:30 am at the BIA office.

Laurie Walsh P.E.
San Diego Water Board
858-467-2970
lwalsh@waterboards.ca.gov

From: Mike McSweeney [MMcSweeney@biasandiego.org]
Sent: Monday, August 06, 2012 9:30 AM
To: Walsh, Laurie@Waterboards
Cc: Borre Winckel; Matt Adams
Subject: RE: BIA request for meeting

Laurie:

I wanted to schedule the follow up meeting with BIA members. You had mentioned Friday morning the 17th. Could we still meet at that time? Would 8:30 at BIA work for you and Wayne?

Let me know.

Michael McSweeney
Sr. Public Policy Advisor
Building Industry Association
9201 Spectrum Center Blvd. #110
San Diego, CA 92123
858-450-1221 x 104
858-514-7004 Direct
858-552-1445 Fax
mmcsweeney@biasandiego.org
www.biasandiego.org

From: Walsh, Laurie@Waterboards [mailto:Laurie.Walsh@waterboards.ca.gov]
Sent: Monday, July 30, 2012 4:50 PM
To: Mike McSweeney
Cc: Borre Winckel; Becker, Eric@Waterboards; Chiu, Wayne@Waterboards; Barker, David@Waterboards
Subject: BIA request for meeting

Mike,

The San Diego Water Board MS4 team would be happy to meet with the BIA, however early next week is booked on most all of our calendars. I do see the afternoon of Aug 16th (first preference) and the morning of Aug 17th available and we can certainly come to you if that makes it more convenient.

Please let me know asap, so I can secure the time and date on each team members calendar.

Laurie Walsh P.E.
San Diego Water Board
858-467-2970
lwalsh@waterboards.ca.gov

From: Mike McSweeney [MMcSweeney@biasandiego.org]
Sent: Monday, July 30, 2012 4:00 PM
To: Walsh, Laurie@Waterboards
Cc: Borre Winckel
Subject: request for meeting

Laurie:

I've been asked by members of the BIA to schedule a meeting with you and your staff to discuss the Administrative Draft Permit. The BIA has some questions, seeks some clarification and wishes for an open dialogue with your staff.

We'd like to meet early next week. BIA would be sending our engineering members who are best suited to interact with you and your staff and are our experts on these issues.

Could you please reply to this e-mail with some dates and time availabilities?

It would be most appreciated.

Thank you,

Michael McSweeney
Sr. Public Policy Advisor
Building Industry Association
9201 Spectrum Center Blvd. #110
San Diego, CA 92123
858-450-1221 x 104
858-514-7004 Direct
858-552-1445 Fax
mmcsweeney@biasandiego.org
www.biasandiego.org

From: Helen Davies
To: Chiu, Wayne@Waterboards; Becker, Eric@Waterboards; Walsh, Laurie@Waterboards
Cc: RKolb@sandiego.gov
Subject: Draft Municipal Permit - Existing development section
Date: Tuesday, August 07, 2012 7:53:02 AM

Hi Eric, Wayne and Laurie,

Thanks for meeting with us last week Laurie and Wayne. We found it very helpful to get your insights on this part of the permit and are working with the rest of our group to prepare for the focused meeting. We are working intensively this week to get the majority of the work done, as we have to report out to the rest of the copermittees. We would like to schedule a follow-up discussion with you, if you are available, for Friday (preferably early afternoon) to cover any loose ends. It would be Ruth Kolb and myself (Erik is out of the office) and we would be happy to meet at your office if more convenient for you.

Are you available to meet? If not at this time, when? Please cc Ruth in your reply so she can advise of her availability.

Thanks again for your help.

Helen

Helen M. Davies M.S., CPSWQ
Stormwater Program Manager
City of Santee
HDavies@ci.santee.ca.us
Telephone: (619) 258-4100 (x177)
Fax: (619) 562-9376

From: Richard Boon
To: Chiu, Wayne@Waterboards; Becker, Eric@Waterboards; Walsh, Laurie@Waterboards
Cc: Mark Grey; Julie Procopio; Chris Crompton; Christy Suppes; Grant Sharp; Jennifer Shook; Claudio Padres; Sumer Hasenin; "ZiadMazboudi"; Christine" "Sloan; Jon Van Rhyn (jon.vanrhyn@sdcounty.ca.gov); Todd Snyder; Tory Walker; robert_collacott@urscorp.com
Subject: Focused Meetings - HMP Workshop
Date: Tuesday, August 07, 2012 8:07:43 AM

All

The planning for the HMP Workshop is moving ahead under the direction of Matt Yeager.

The date has been confirmed as August 30, 10am to 3:30pm

The venue has been booked by Sumer Hasenin and will be: 202 C Street, San Diego (about 10 minutes from the airport)

The following panelists/presenters have confirmed their intention to participate:

Derek Bowles, CBEC (http://www.cbecoeng.com/index.php)
Eric Stein, SCCWRP
Derek Booth, Stillwater Sciences (http://wwwstillwatersci.com/staff_directory_bio.php?cat=a-c&id=10)
Eric Berntsen, SWRCB

The agenda will be finalized by early next week.

Arising from yesterday's planning committee call:

There is a presumption that the Regional Board staff that has been attending the Focused Meetings will also attend the HMP Workshop/Focused Meeting? Please confirm.

Finally, if I prepare a page of information regarding the workshop, can we get it out as a Lyris notice this week

Thanks

Richard Boon, Chief
Orange County Stormwater Program
(714)955-0670

From: lyris@swrcb18.waterboards.ca.gov
To: Chiu, Wayne@Waterboards
Subject: Regional MS4 Permit Focused Meeting - July 25 Meeting Notes
Date: Monday, August 13, 2012 8:49:10 AM
Attachments: 2012-0725_MeetingNotes.pdf

Regional MS4 Permit Stakeholders,

Attached are the Regional MS4 Permit Meeting Minutes from the July 25, 2012 Focused Meeting. The San Diego Regional Permit Team will be forwarding the agenda for the next Focused Meeting scheduled on August 22, 2012 by Friday.

Laurie Walsh P.E.
San Diego Water Board
858-467-2970
lwalsh@waterboards.ca.gov

You are currently subscribed to reg9_sandiegoco_ms4permit as: wchiu@waterboards.ca.gov.
To unsubscribe click here: http://swrcb18.waterboards.ca.gov/u?id=508208.cee2a373662e566393e62f0af18d11cf&n=T&l=reg9_sandiegoco_ms4permit&o=374116
(It may be necessary to cut and paste the above URL if the line is broken)
or send a blank email to leave-374116-508208.cee2a373662e566393e62f0af18d11cf@swrcb18.waterboards.ca.gov

California Regional Water Quality Control Board, San Diego Region
Regional MS4 Permit Focused Meeting

Meeting Notes

Date	Location	Agenda Topics
7/25/2012 Start time: 9:30 AM End time: 2:50 PM	City of Carlsbad Faraday Center 1635 Faraday Ave, Rm 173 Carlsbad, CA 92008	• Focused Meeting Highlights • Monitoring Requirements Introduction • Stakeholder Monitoring Presentation • Discussion on Monitoring Proposals Related to Permit Requirements • Parking Lot Discussion • Other Topics / Audience Comments

I. Introductions

Table participants introduced themselves. Lewis Michaelson (Facilitator) ensured the appropriate representatives were at the table, per the June 20, 2012, San Diego Regional Water Quality Control Board (SD RWQCB) Notice.

San Diego County Copermittees (5): Jo Ann Weber (County of San Diego), Andre Sonksen (City of San Diego), Paul Hartman (City of Vista), Karen Holman (Unified Port of San Diego), Alison Witheridge (City of Oceanside), Mikhail Ogawa* (City of Del Mar), Drew Kleis* (City of San Diego) **Indicates representatives rotated during the meeting.*

Orange County Copermittees (5): Grant Sharp (Orange County Flood Control District), Mary Anne Skorpanich (County of Orange), Ted Von Bitner (County of Orange), Richard Boon (County of Orange), Devin Slaven (City of Lake Forest, Lisa Zawaski* (City of Dana Point) **Indicates representatives rotated during the meeting.*

Riverside County Copermittees (3): Claudio Padres (Riverside County Flood Control District), Bob Collacott (Riverside County Flood Control District), Mike Shetler (County of Riverside)

Environmental Community (3): Colin Kelly (Orange County Coastkeeper), Jill Witkowski (San Diego Coastkeeper), Roger Butow (Clean Water Now! Coalition), Thom Spanos* (San Diego Coastkeeper) **Indicates representatives rotated during the meeting.*

Development/Business Community (3): Bryn Evans (Industrial Environmental Association), Wayne Rosenbaum (BIA), Mike McSweeney (BIA), Mark Grey* (BIA) **Indicates representatives rotated during the meeting.*

U.S. Environmental Protection Agency (US EPA) (1): John Kemmerer

San Diego Water Board Permit Team: David Barker, Wayne Chiu, Laurie Walsh, Eric Becker

II. Focused Meeting Highlights

David Barker (RWQCB) announced that there will be an additional meeting on the topic of hydromodification. The County of Orange has taken the lead on organizing the event, which will run in the same manner as the other focused meetings. Details will be sent out once they are available. A tentative decision has been made to have the meeting the last week of August.

David Barker (RWQCB) provided brief remarks on some of the points raised in the past focused meetings that are resonating with the RWQCB staff.

1. Monitoring doesn't have to be water quality sampling. Water quality data are not the only assessment tool that can be used. There were requests that monitoring programs should include field observations as monitoring data, especially for non-stormwater discharges.
2. Adding language to the permit, not just the fact sheet, about the non-enforceability of action levels.
3. Adaptive management in the permit should be flexible enough for the Copermittees to learn without fear of being out of compliance with the permit.
4. Including more specific public participation requirements for development of Water Quality Improvement Plans, and for development of priorities for the Water Quality Improvement Plans.
5. Clarifying Board approval process for all plan submittals, reports, and updates.
6. Making it clearer in the permit what is eligible for adaptive management practices and clarifying the points of compliance in the permit.
7. Consideration of other means of demonstrating compliance with TMDL requirements that are consistent with the assumptions and requirements of the TMDL. The Board does see some flexibility in how waste load allocations are incorporated into the permit.
8. Examining the proposal to change the permit language from "prohibit" to "effectively prohibit" non-stormwater discharges.

David Barker (RWQCB) did caveat that this is not a complete list, and the omission of any points does not mean the Board is ignoring the issue or has made a final decision on the issue.

III. Monitoring Requirements Introduction

Eric Becker (RWQCB) explained how RWQCB staff developed the monitoring provision in the administrative draft permit, almost starting from scratch. The Board looked at what is truly required in federal regulations of the monitoring program and included that in the

monitoring provisions. The Board also listened to feedback from the Copermittees from meetings, as well as recommendations from the Report of Waste Discharge (ROWD). It was a conscious change to include monitoring as a provision within the permit instead of as an attachment. The main goals of the monitoring program are to ensure non-stormwater discharges are eliminated, pollutants in storm water discharges are reduced to the maximum extent practicable (MEP), and that water quality limits are met in the receiving waters. The Board also wants to increase jurisdictional accountability, make sure that monitoring is used as a feedback loop to adapt programs, and identify illicit discharge sources within the MS4, including those outside of the control of the Copermittees. RWQCB staff expects significant changes to this Provision.

IV. Stakeholder Monitoring Presentation

All stakeholders were provided the opportunity in advance to formally present materials at the focused meeting. The San Diego County Copermittees took advantage of the opportunity.

Jo Ann Weber (County of San Diego) stated that we all share a common goal of protecting beneficial uses in waterways. The purpose today is to build on the considerable level of effort already done and provide insights as to what works and what doesn't work. The program as written in Provision D does not support adaptive management. The San Diego County Copermittees have developed a new approach using specific questions provided by RWQCB staff.

The approach proposed by the San Diego County Copermittees is to require development of a Monitoring and Assessment Program (MAP) as part of each Water Quality Improvement Plan to provide information needed to answer management questions and support effective adaptive management. To do so, the San Diego County Copermittees propose to coordinate Provision II.D requirements with Provision II.B language. The goal is to answer the three big assessment questions as efficiently as possible.

Adaptive management has three phases: long-term planning, implementation, and assessment. To provide useful feedback, the MAP is proposed to be developed during the long-term planning process during the first twelve months after permit adoption. Monitoring needs to be coordinated with the other programmatic elements to provide the most useful information.

The San Diego County Copermittees see monitoring fitting in with overall program management. It fits in with the other implementation elements; it is not an element outside the program. To illustrate this, see the following figure.

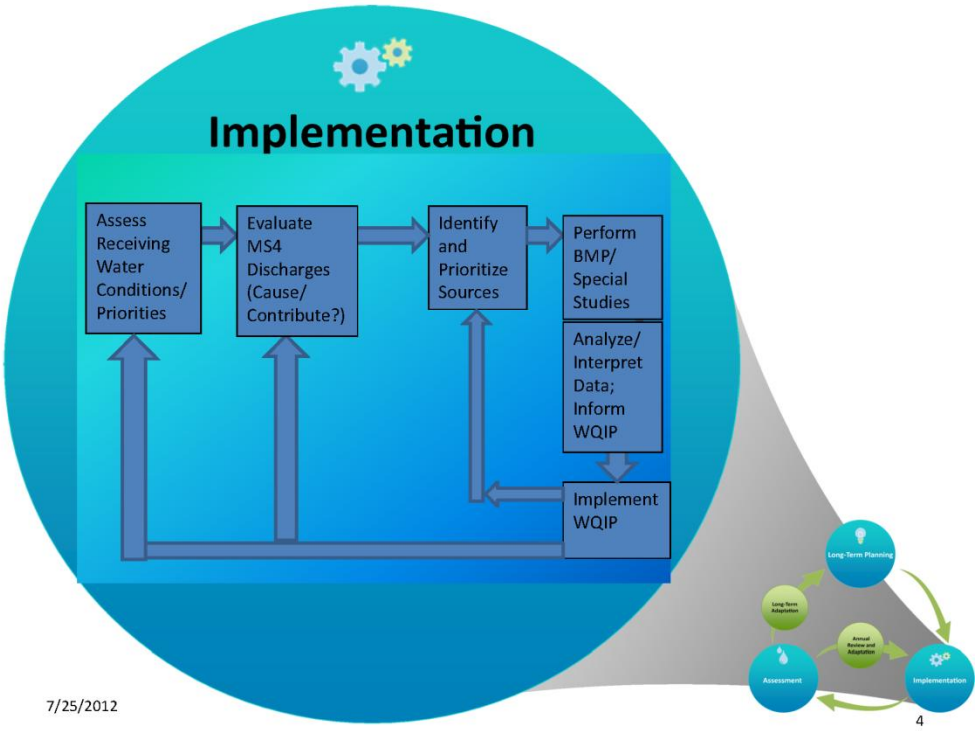

The four overall components of the monitoring program (assess receiving water conditions/priorities; evaluate MS4 discharges; identify and prioritize sources; perform BMP/Special Studies) are shown across the top of the above diagram. The loop across the bottom of the diagram is the adaptive management, or feedback, process.

The San Diego County Copermittees have been monitoring receiving waters for close to 20 years now and have a high level of understanding of the problems in many of the receiving waters. In the 2007 San Diego Permit, the San Diego County Copermittees began to incorporate MS4 stormwater conveyance monitoring to determine how MS4s were impacting the receiving waters. The San Diego County Copermittees are now looking to move this information forward by placing more focus on identifying and prioritizing sources. In earlier permits, a lot of time has been spent in the first box on the left. The focus now should be taking resources and moving forward in the process.

The San Diego County Copermittees believe that this is the nexus to effective implementation because it fits into adaptive management and can guide and utilize other programmatic implementation efforts to improve water quality. For example, if nutrients and bacteria are priority problems, then sources of each must be considered separately. Different strategies for implementation will be necessary to target each audience. Pilot BMPs and other special studies will provide specific information to improve and target implementation activities. These studies may involve more than just water sampling. The loop at the bottom of the diagram represents the adaptive management process.

The San Diego County Copermittees recognize that watersheds are at different levels of understanding with respect to each of the four components. Those with TMDLs have a more mature program. The goal of the MAPs will be to strategically tailor the balance of

monitoring to the prioritized needs of the specific watershed management area. The result will be efficient, coordinated monitoring with an enhanced watershed and TMDL focus.

Provision D in the administrative draft permit has a lot of focus on the first two boxes, but does not allow Copermittees to shift effort to the third and fourth boxes. The San Diego County Copermittees would like that flexibility. The Copermittees want to coordinate the monitoring in Provision D with the assessment plan required in Provision B. To do so, the San Diego County Copermittees propose an Alternate Provision II.D to maximize the benefits of the programs overall. The concept is to use an informed design strategy that tailors a question-driven approach, starting with general questions that lead to more specific questions. The Copermittees would not be starting from scratch; rather, they would be building on the last 20 years of monitoring strategies. Also, as monitoring is not just water sampling, the Copermittees want to incorporate alternate monitoring methods better than has been done in the past. Ultimately, this will support watershed priorities and allow Copermittees to focus water resources on high priorities within each watershed.

The San Diego County Copermittees are proposing alternate language for Provision D that will better provide program managers with needed information to support effective adaptive management. The proposal includes having monitoring within the overall planning process of the Water Quality Improvement Plan. To accomplish this, the San Diego County Copermittees propose a phased approach with pre- and post- Water Quality Improvement Plan phases. The MAP would be developed as part of the Water Quality Improvement Plan. With this approach, the first and second year monitoring requirements would be set forth in the permit as part of a transitional monitoring program. The monitoring requirements would be re-assessed and adjusted as necessary to support the highest priorities in each watershed.

If the permit is adopted in spring 2013, then the current Order No. R9- 2007-0001 monitoring would continue until September 30, 2013 to accommodate the resource commitments for the current fiscal year. The transitional (pre-WQIP) monitoring program would run from October 1, 2013 to September 30, 2015 to accommodate the public review, RWQCB review, and lead time necessary for budgeting. The MAP as part of the Water Quality Improvement Plan (post-WQIP phase) would be implemented from October 1, 2015 forward.

The scientific basis of the San Diego Copermittees' proposed Alternate Provision II.D is an informed, question-driven approach. This approach is strongly endorsed at local, regional, state, and federal levels. At the June 2012 RWQCB meeting, RWQCB staff presented a similar approach that was well-received by the Board. The process proposed by the San Diego County Copermittees aligns well with the condition assessment process proposed by RWQCB Staff with an emphasis on setting priorities. All of these documents (A Framework for Monitoring & Assessment in the San Diego Region (SDRWQCB, 2012), Southern California Stormwater Monitoring Coalition's Model Monitoring Program (SMC, 2004), SWAMP Assessment Framework (SWMP, 2010), Elements of a State Water Monitoring and Assessment Program (EPA, 2003)) stress the importance of basing monitoring on clear questions that support explicit decisions ensuring that data are

gathered only when there is a validated framework in place. These documents follow an earlier National Research Council report on monitoring, which emphasized the importance of building on clear conceptual models and questions that are linked to management needs.

Jo Ann Weber (County of San Diego) stated that today she will summarize key technical issues that support Alternate Provision II.D. Detailed explanation will be provided in a separate memorandum to the RWQCB, including specific permit language revisions.

One key proposed change includes jurisdictional non-stormwater monitoring in Section II.D.1.a. Instead of extensive MS4 outfall testing, the San Diego County Copermittees propose to conduct a targeted program to reduce persistent flows that impact receiving water quality, thus allowing resources to focus on actions to ultimately improve water quality. The San Diego County Copermittees also propose a broad program to eliminate transient illicit discharges/illicit connections (ID/IC) getting the spatial coverage by using visual surveys and appropriate follow up criteria.

In addition, for the jurisdictional stormwater monitoring, instead of extensive MS4 outfall monitoring, the Copermittees propose monitoring homogeneous land uses as input to a model. This wet weather runoff modeling would better inform the planning process by prioritizing drainages for implementation efforts. Representative typical mixed-use sites could be used as a cross-check for model results. Selection of representative outfalls with homogeneous land use types may be coordinated and shared among Copermittees to provide the most efficient representation and characterization of major land use categories. Modeling currently being done as part of the bacteria TMDL implementation plan efforts may be built upon.

The San Diego County Copermittees recognize that the RWQCB wants to see jurisdictional accountability. Jurisdictional accountability should focus on completion of the iterative process and would be supported by data collected at prioritized targeted MS4 outfalls. The San Diego County Copermittees feel that the administrative draft permit's jurisdictional boundary monitoring does not support their goals. In the past, data have shown that jurisdictional boundary monitoring has little value, due to a combination of typically high variability of the concentrations of constituents in receiving waters and discharges, and a relatively small percentage of discharge flows and pollutant loading in the receiving waters. This combination of high variability and relatively small impacts or differences requires extremely high numbers of samples to detect significant differences and would be unlikely to result in any programmatic changes or improvements to water quality.

In addition, instead of the extensive compliance monitoring proposed to comply with the Bacteria TMDL in Attachment E, Copermittees have already developed monitoring programs to comply with Bacteria TMDL requirements that are due October 2012. The current language in Attachment E would replace the monitoring planning effort just completed.

Andre Sonksen (City of San Diego) continued that the workgroup has spent significant time and effort developing their proposed approach. One key point is that this is an ordered process that leads to solving specific water quality problems. This process can be applied at

any level – watershed, jurisdictional, or pollutant level. There are three different components to this: management questions (on the left), monitoring components (in the center), and assessment components (on the right). All three components are essential for this to work.

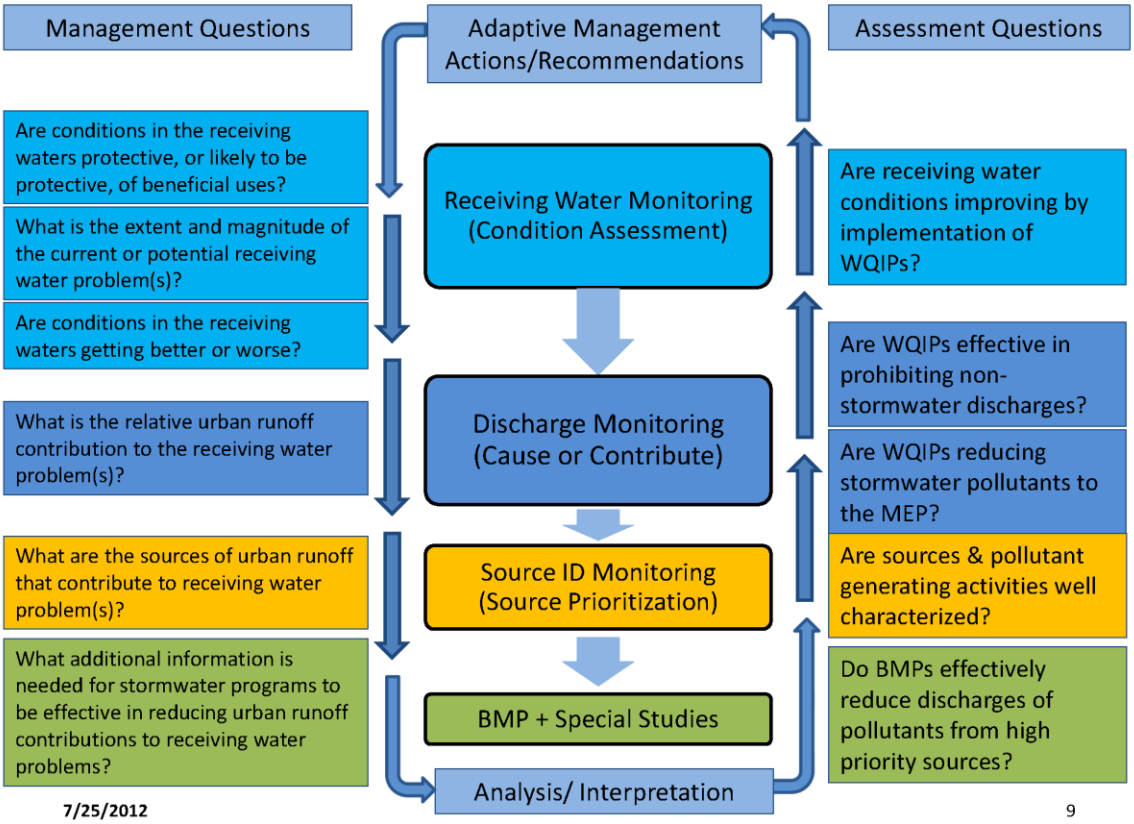

The administrative draft permit focuses on the top four management questions, the receiving water and discharge monitoring, and assessment. There are two more levels needed: source identification and special studies/BMPs. The top three (blue) deal with receiving waters. The next one (darker blue) is discharge monitoring. Yellow is source identification and pollutant-generating activity (PGA) monitoring and identification. The bottom (green) is special studies.

The process starts at the top and moves down. When starting at the top in receiving waters, information is collected that feeds down into discharge monitoring, which feeds into source identification, which then feeds into BMPs. These have to work together. Collecting information at a lower level without collecting information at higher levels will not work. The top question needs to be answered first, or else significant time and effort might be spent looking at something that is not a problem.

The assessment train works in reverse, going back up the process: start with data collected through special studies/BMPs, analyze if the BMPs were effective or if the special

study gives information for feedback into source identification or prioritization, and so on, up the ladder.

The Copermittees have spent a significant amount of time developing how each of these different components are outlined, how they work from top to bottom, left to right, and this is a very well thought out, organized, and methodical process to collect information with direct impacts on how to implement programs.

Andre provided Chollas Creek as an example. In Chollas Creek, the Copermittees have been doing a significant effort for the past 20 years that has culminated into TMDLs for bacteria and metals. Extensive receiving water information has already been collected, the Copermittees already have information at the MS4 discharge level, and there have been special studies completed in Chollas Creek. Looking at the proposed flowchart, some of the questions have already been answered in Chollas Creek. Special studies and BMPs are the next phase for Chollas Creek. Other watersheds don't have the plethora of data that Chollas Creek does, so they would start towards the top of the flowchart.

Claudio Padres (Riverside County Flood Control District) asked if the intent is that this process would be integrally part of the Water Quality Improvement Plan and if the types of monitoring being described would be focused on the high priority issues identified in the Water Quality Improvement Plan or if it would be discharge monitoring everywhere. Andre replied that the MAP would be integrally part of the Water Quality Improvement Plan. This is a methodology for implementing monitoring and how monitoring should be used to inform program planning, program implementation, and adaptive management. For watersheds that have developed high priorities already, the process would be used to tailor the monitoring to get at the issues that are further down in the monitoring tree.

Paul Hartman (City of Vista) stated that the point of the monitoring programs is to allow Copermittees to focus resources on strategic areas identified in the Water Quality Improvement Plan. The way monitoring is laid out in the current administrative draft permit is too prescriptive. Ultimately, the focus needs to be further down in the above diagram, focusing on source identification and special studies.

Claudio Padres (Riverside County Flood Control District) stated that if the intent of the permit is to allow the Copermittees to focus their resources on those high priority issues, then one way to do that is to allow them to focus their monitoring resources, and staffing and time and money, and not spread resources too thin trying to assess everything everywhere.

Colin Kelly (OC Coastkeeper) asked how far the San Diego County Copermittees reached out to Riverside and Orange County about these general ideas. Claudio Padres (Riverside County Flood Control District) responded that the San Diego County Copermittees have been reaching out to Riverside. Unfortunately, due to deliverables under the current Riverside MS4 permit, the County of Riverside has not been able to be involved; however, he has heard a lot of good points and is so far in support of the San Diego County Copermittees presentation today. Richard Boon (County of Orange) stated that Jo Ann Weber has been studiously involving Orange County in conference calls with the group that

developed this approach. Orange County certainly endorses and supports the question-driven approach.

Colin Kelly (OC Coastkeeper) asked if the RWQCB anticipates each program doing every step in this process or if findings can be shared across the jurisdictions, such that if the City of San Diego has done an air deposition study, can those results be taken and used by Orange County so they aren't all doing the same special studies.

David Barker (RWQCB) replied that one reason they are pushing the regional permit is to allow collaborative use of studies.

Mary Anne Skorpanich (County of Orange) shared that she sees this approach very much fitting in with some of their own thoughts that these Water Quality Improvement Plans should take a much more central role in the permit overall. She is completely in concurrence with the overall monitoring required by the permit being linked to the Water Quality Improvement Plan.

Jo Ann Weber (County of San Diego) stepped through the pre-Water Quality Improvement Plan (transitional) monitoring and examples of post-Water Quality Improvement Plan monitoring proposed in Alternate Provision II.D, beginning with receiving waters. The San Diego County Copermittees recognize their responsibilities and commitment to maintaining a level of effort of monitoring during the pre-Water Quality Improvement Plan or transitional phase similar to the current 2007 permit, but adapted to provide more useful information to support Program Managers' needs.

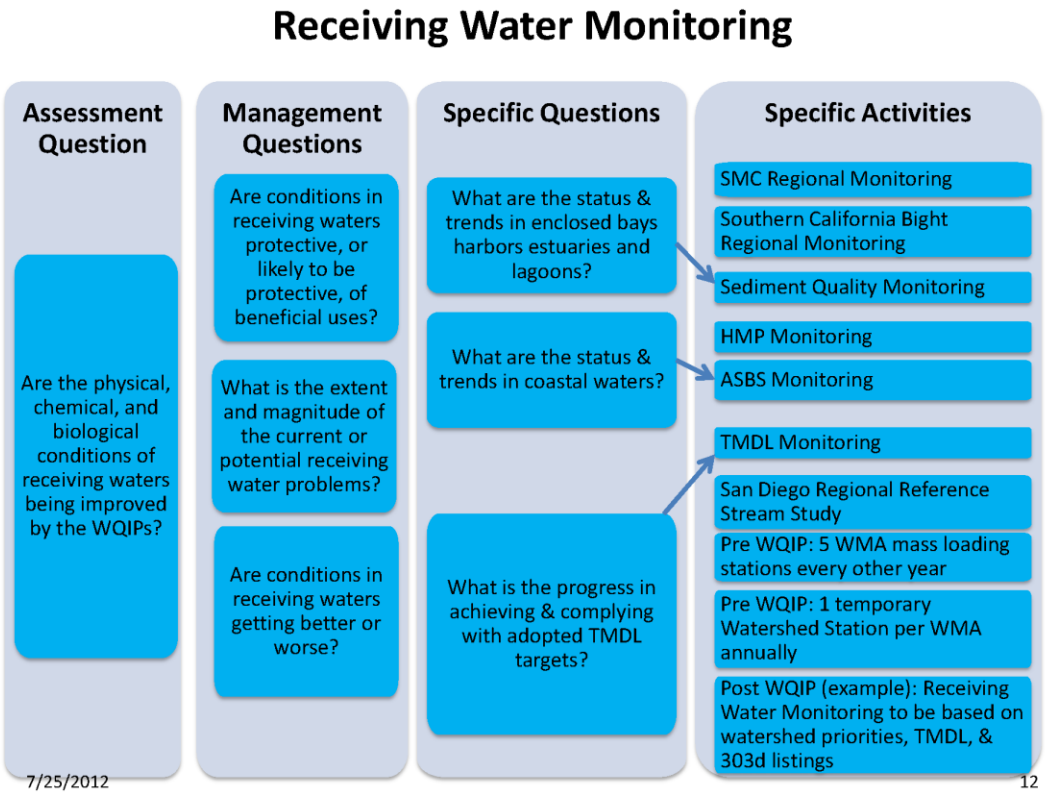

The above diagram illustrates the use of the question-driven approach in designing activities for receiving water monitoring. The process goes from left to right. The Assessment Questions (left side) are from the current Provision II.D ("Are there improvements in the receiving waters conditions?"). The second column lists the appropriate broad Stormwater Monitoring Coalition (SMC) questions that can be summarized as a status question, an extent and magnitude question, and a long-term trend question. These management questions provide context for the more specific, technical questions (third column) and associated monitoring activities (fourth column). Monitoring results from any given activity may only partially contribute to answers for the "big picture" management questions. The specific questions (third column) are examples of detailed study questions that could be used to design the monitoring program. When study questions are answered by specific activities, then the next prioritized study question can begin as part of the adaptive process.

The purpose of the monitoring is to assess trends of receiving waters and magnitude, highlighting rationale and benefits of specific activities. Copermittees are committed to continuing many of the receiving water monitoring programs and balancing sampling needs so that long-term receiving water trends will continue to be addressed. This process supports the question-driven adaptive management approach.

Paul Hartman (City of Vista) presented the Jurisdictional Non-stormwater Discharge Component of the Alternate Provision II.D.

Non-Stormwater Discharge Monitoring

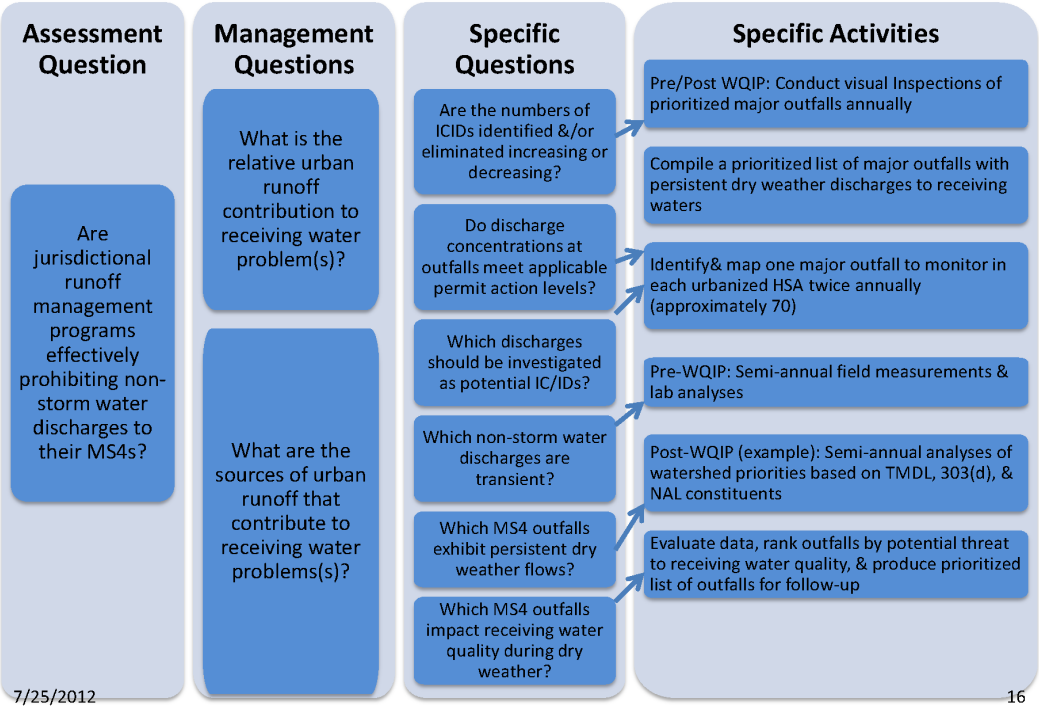

The primary assessment question on the left side is: Are jurisdictional runoff management programs effectively prohibiting non-stormwater discharges to their MS4s? To answer this overall question, the focus is on answering the management questions (second column). From these two management questions, specific monitoring questions have been developed to drive the design of the program. Examples of specific monitoring questions are provided above in the third column. These questions have led to the development of two distinct programs to address non-stormwater discharges during dry weather: one program targeting transient discharges focusing on IDDE; another program targeting persistent flows, designed to strategically prioritize and address outfalls with continuous non-stormwater discharges.

The transient flow program is rooted in a three-pronged approach designed to provide broad spatial and increase temporal coverage. The focus is on sources, the MS4 itself, and the MS4 outfalls discharging to receiving waters. This program would be implemented during both the pre-Water Quality Improvement Plan (transitional) and post-Water Quality Improvement Plan phases. The idea is that the main sources of non-stormwater discharges are addressed via programs such as Industrial, Commercial, and Municipal inspections. Based on analysis of recent data, this program appears effective in preventing discharge impacts. The second part of the transient flow program is to provide coverage of the MS4 system throughout the year, via jurisdictional programs such as complaint response, MS4 cleaning, and staff/citizen reporting of illicit discharges. The third part of the transient flow program consists of visual monitoring at major MS4 outfalls. This would require the updating of inventories and periodic surveys of major outfalls, looking for flow indicative of illicit discharges.

The persistent flow program is based on historical data gathered via existing dry weather programs, MS4 outfall programs, GIS information, and data from the visual observations program discussed previously to identify and prioritize major outfalls that exhibit persistent flows. The current MS4 outfall program will continue to its completion. Once identified and prioritized, one major outfall per hydrologic sub area would be selected for monitoring two times per year. This means approximately 70 outfalls would be under investigation throughout San Diego County at any time. As pollutants are reduced and non-stormwater flows are eliminated, the operation would continue through the prioritized list of outfalls. Comparison to numeric action limits would be used to prioritize outfalls within the Water Quality Improvement Plans.

By implementing the non-stormwater discharge program in two parts (transient and persistent), the Copermittees will be able to best utilize resources to eliminate and control the highest priority threats to receiving water quality.

Jo Ann Weber (County of San Diego) spoke to the stormwater discharge monitoring program.

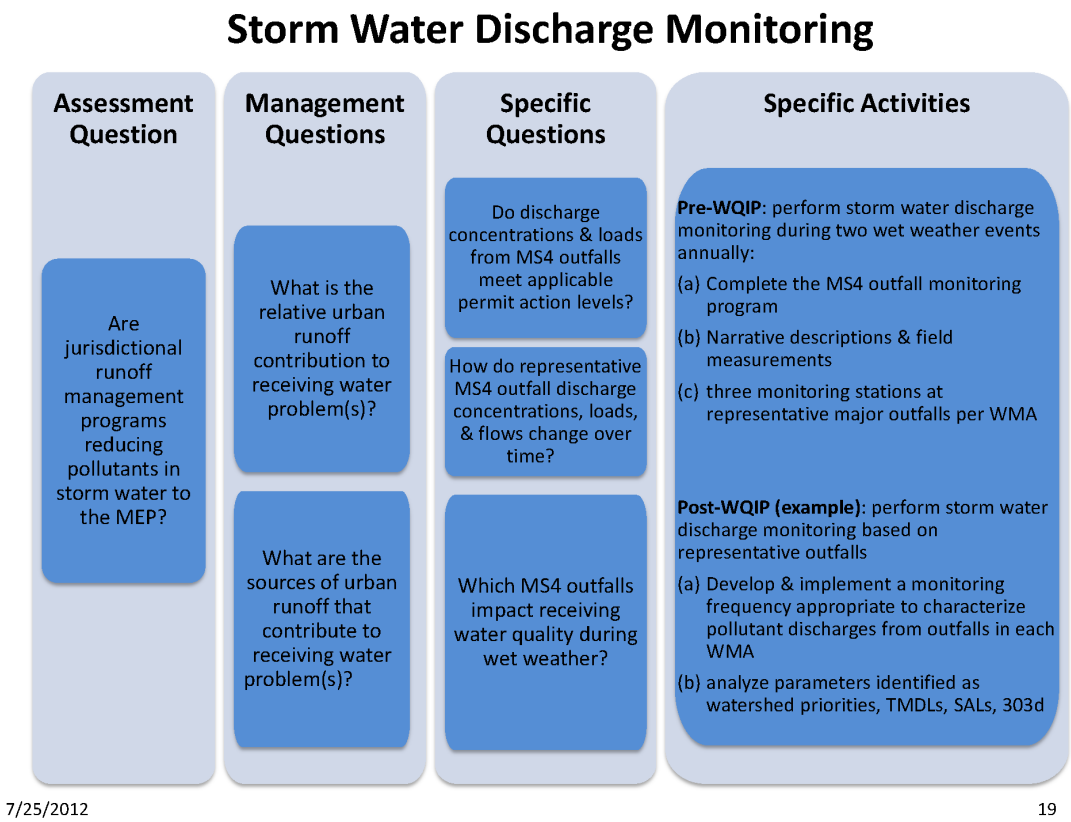

The overall assessment question from the administrative draft permit is if runoff management programs are reducing pollutants to the MEP (first column). The same two over-arching questions are: what is the relative contribution and, if significant, then what are the sources (second column)?

Using the specific questions to guide design, the pre-Water Quality Improvement Plan (transitional) monitoring program commits to completing the current outfall monitoring program (fourth column). In addition, the outfall monitoring in the pre-Water Quality Improvement Plan (transitional) phase would consist of at least three monitoring stations at representative major outfalls per watershed management area. Selection of representative outfalls may be coordinated and shared among Copermittees to provide the most efficient representation and characterization of major land uses. This will allow for more efficient and informed characterization of the MS4 discharges. This effort builds on the rainfall runoff models that use land use coefficients to estimate runoff loads. Sophisticated models developed as part of the implementation plans for the regional bacteria TMDL can be used to inform where additional data for local homogeneous land uses is needed. This proposed MS4 program will be more resource-intensive than the current MS4 program and demonstrates the Copermittees' commitment to gather useful data to target implementation activities.

The post-Water Quality Improvement Plan phase program continues a commitment to perform monitoring of outfalls to characterize pollutants from the MS4s; however, the

design of the program will evolve depending on the specific questions and needs of the watershed management area.

Benefits of this approach are multifold, including broad spatial and temporal coverage; support for assessment-driven, adaptive management approach; and, flexibility in site selection allowing jurisdictions to focus resources on the highest watershed priorities.

JoAnn Weber (County of San Diego) spoke to source/stressor identification (yellow layer). To provide the necessary feedback to improve program implementation, Copermittees have increased emphasis on the Source Identification and BMP/Special Studies, adding the assessment question: "Are sources and pollutants well characterized?" The Copermittees recognize that an increased understanding of sources allows implementation efforts to be focused.

Source/Stressor Identification Monitoring

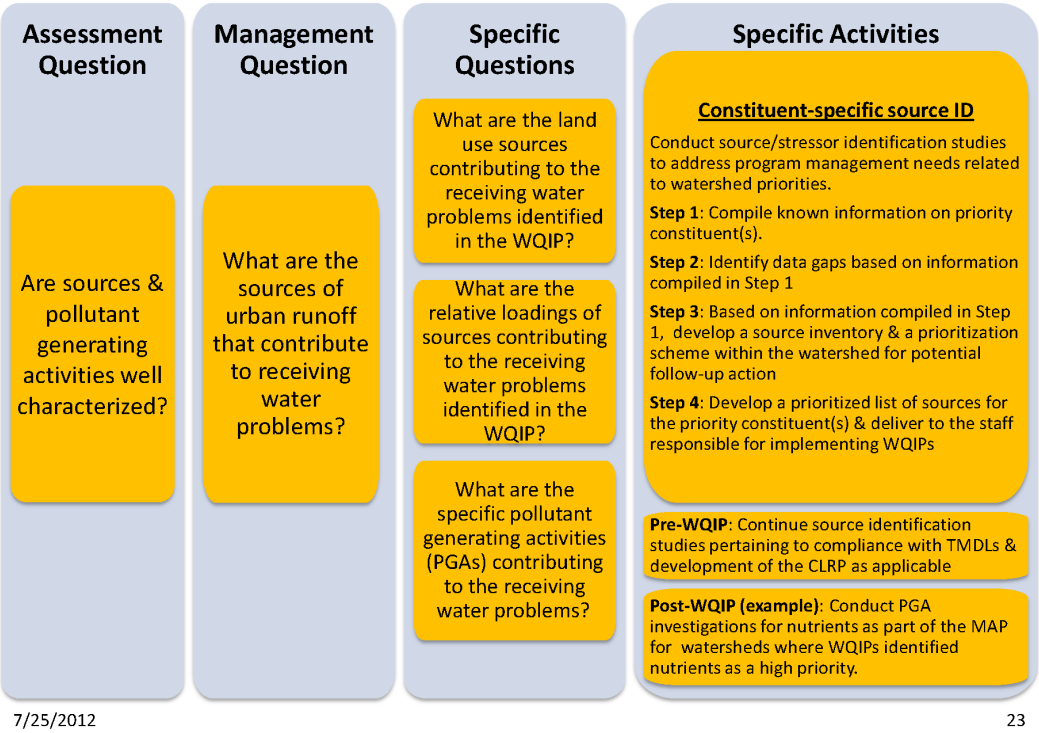

The principle role of identification is to identify and prioritize pollutant generating activities (PGAs) and source categories. PGAs can result in release of pollutants. Once PGAs are identified and prioritized, then behavioral changes and education can take place. Identification of high priority sources is an important step in support of the Water Quality Implementation Plan process, to help inform the development of effective pollutant control strategies for particular priority constituents on a watershed-specific basis.

The key benefits of the source/stressor identification studies are to provide program management with information to verify, quantify, and prioritize sources and provide links between sources, activities, and effects of runoff.

Andre Sonksen (City of San Diego) spoke to Special Studies/BMPs (green layer).

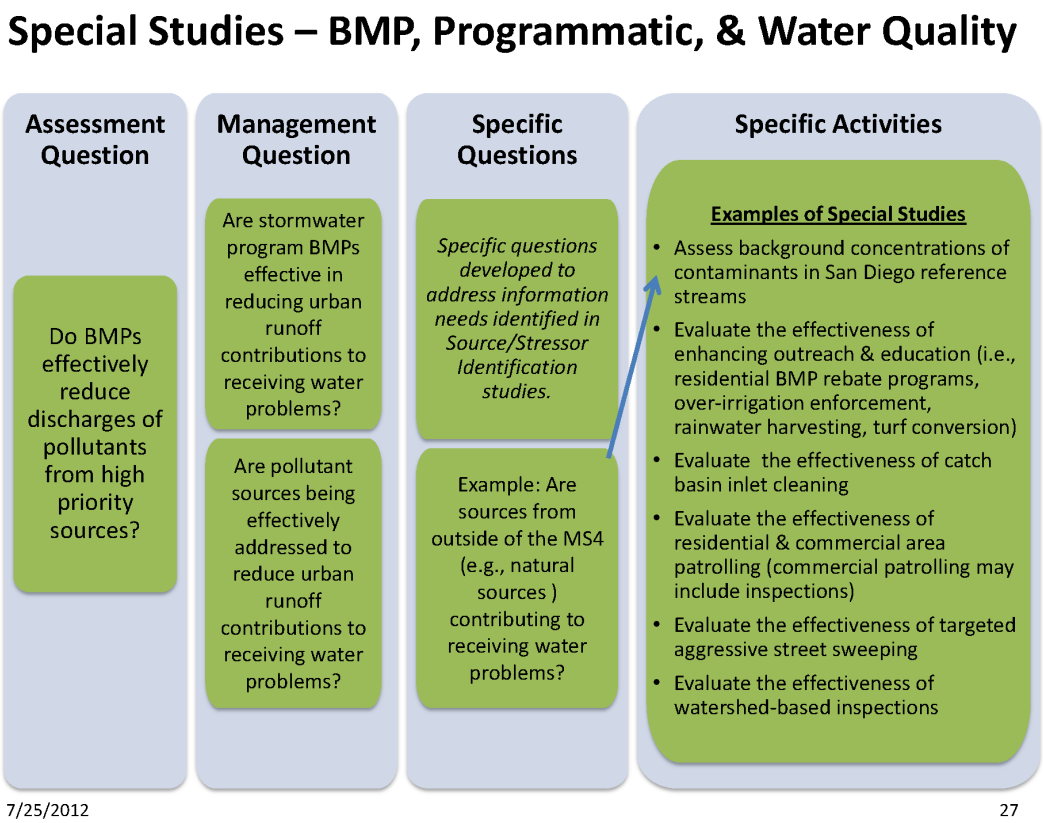

The BMP special studies program follows the same general format seen for receiving waters, etc. Assessment questions are from the administrative draft permit, management questions were developed similar to scope and language as that in the SMC, then specific questions are developed based on specific information needed or desired (third column).

The City of San Diego has used this process to evaluate one of the BMPs in the current permit: street sweeping. As an example, the management question was “Can street sweeping effectiveness be improved?” The City then conducted a pilot study in four phases; each phase had its own specific question. The question for the first phase was “Is there an optimum sweeping frequency? How often do you need to sweep streets to get the maximum benefit?” The question for phase two was “Is there a sweeper type that is better than the others? (vacuum vs. mechanical sweepers).” Phase three asked “How much pollutant removal does sweeping the median in streets add?” Finally, phase four asked “Is there an optimum sweeper speed?” Each phase of the study built upon the results of the previous phases. As a result of the study, the City implemented changes to their street sweeping program.

The purpose of special studies/BMPs is to support effective adaptive management, assess BMP effectiveness, and perform scientific investigations to address data gaps. The methods are very focused (pilot BMP studies, source identification special studies, water quality studies). The benefits are that this all feeds into adaptive management and how to improve programs to improve water quality.

Roger Butow (Clean Water Now! Coalition) asked who creates the questions for this question-driven approach and how much input or influence do watchdog NGOs have over the questions, as the questions are the beginning of the entire flow chart.

Karen Holman (Unified Port of San Diego) responded that the Copermittees started with RWQCB assessment questions from the original permit and SMC questions, especially in the blue areas of the below diagram.

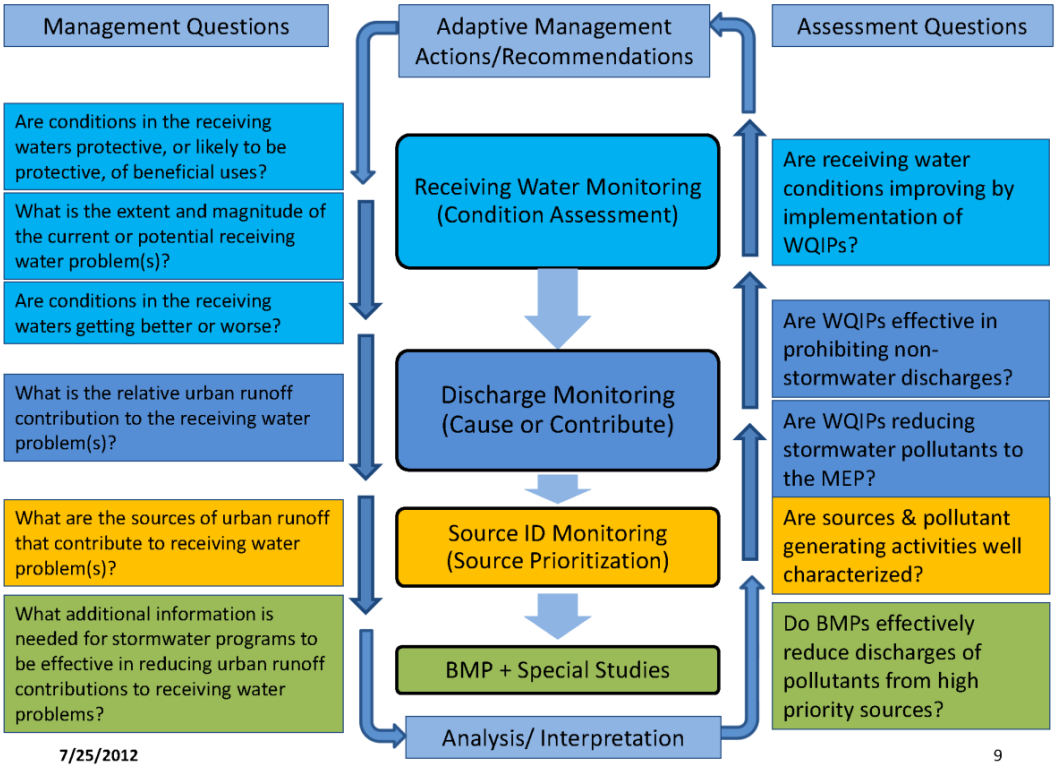

Karen continued that the next two levels (yellow and green) are where adaptive management starts, and that is where the Copermittees are focusing on making the nexus between monitoring and the rest of the permit programs. For these areas, the questions are being developed by the Copermittees based on needs. Questions could be driven by priorities in the Water Quality Improvement Plans; other focused questions could be on whether BMPs are working as expected. Karen hypothesized that NGO involvement could begin there, with the more focused questions that are aligning with Water Quality Improvement Plan priorities.

Jill Wittkowski (SD Coastkeeper) shared that the questions look to be along the right lines. If this is done hand-in-hand with the Water Quality Improvement Plan process, it

makes sense that the public participation process for the Water Quality Improvement Plan would result in a collaborative public process for developing some of the monitoring questions.

Jo Ann Weber (County of San Diego) provided an example of how a MAP might be developed in an example watershed. The slide below lists the steps for the strategic monitoring approach.

Developing Monitoring & Assessment Programs (MAPs) for Each WQIP

STRATEGIC MONITORING APPROACH:

1. Establish stormwater management priorities specific for each WMA ("Watershed Priorities") as part of WQIP development.
2. Compile existing monitoring data & assess available information for receiving waters, MS4 discharges, & sources or stressors within the watershed.
3. Identify regulatory & non-regulatory drivers that apply to water quality monitoring within the watershed, & list all associated monitoring responsibilities assigned to the Copermittees.
4. Evaluate the watershed priorities in context of available monitoring data & existing monitoring responsibilities, & develop specific management questions for each priority issue.
5. Establish metrics & identify assessments that should be performed to supply information needed to address the management questions.
6. Identify elements of a watershed-based monitoring program needed to address the watershed management questions & perform the necessary assessments.
7. Develop detailed monitoring plan to address the identified monitoring needs, coordinated with other ongoing monitoring in the watershed.

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For a sample watershed, assume priorities are TMDL for bacteria and 303(d) listing for copper and nutrients. A likely assessment question would be "Are jurisdictional runoff management programs reducing pollutants in storm water to the maximum extent practicable?" A likely management question would be "What are the sources of urban runoff that contribute to receiving water problems?" Following the previously presented flowchart, the next step would be to develop specific questions using available information. For bacteria and copper, MS4s are known sources; however, MS4s are less well known sources of nutrients. In this watershed example, loadings from land uses are not well quantified to support planning of wet weather management actions or evaluate their effectiveness. A specific question in this case would be "What are the representative MS4 outfall discharge concentrations, loads and flows?" The approach to answering the specific question is to support model development, calibration, and validation. Stormwater discharges should then be monitored at a determined number of sites based on appropriate land use characterization for modeling, at a determined frequency (e.g., 2 storms per year), for specific constituents (e.g., bacteria, copper, nutrients, and any other special study

needs), and for a specific duration (e.g., at least one adaptive management planning cycle to allow for data usability).

To include the San Diego County Copermittees' proposal in the draft permit, the next steps are to provide the RWQCB with Alternate Provision II.D and a technical memorandum with support and rationale for the alternate provision.

In closing, Jo Ann Weber (County of San Diego) stated that the purpose of monitoring is to provide information to program managers to inform implementation of the stormwater programs. A thorough and thoughtful planning process using a question-driven approach provides the roadmap for success. The San Diego County Copermittees have metaphorically traveled the freeways and will now venture onto the roads less traveled, including conducting source identification studies, BMP studies, and targeted special studies. The Copermittees admit they may meet dead ends along the way and through the adaptive planning process will be adjusting the strategic route. The Copermittees look forward to partnering with all stakeholders in the challenging journey ahead.

Roger Butow (Clean Water Now! Coalition) asked how and under what circumstances would the monitoring look at contaminants of emerging concern and take into account any recalibration of trigger levels or metrics. Claudio Padres (Riverside County Flood Control District) responded that there would still be a component of receiving water monitoring to detect emerging issues. The idea would be to assess each issue as it arises, annually go back and review data and review priorities. For example, if perchlorate became an issue, that would get on the priority list and would be set in order as far as doing specific programs to target that particular constituent. It would be addressed in the context of the Water Quality Improvement Plan and its priorities.

Paul Hartman (City of Vista) agreed that it is a matter of striking a balance in the monitoring program: some parts will be monitoring for a broad suite of constituents over the long term; other parts will drill down to activities and BMPs effective at preventing pollutants of concern. The monitoring program will keep a broad approach but will not be monitoring everything everywhere.

Mike Shetler (County of Riverside) shared that Riverside County actually developed a demonstration on flood control district property where they are evaluating different BMPs that could be used in the field. He encouraged Roger Butow to visit the demonstration project.

Jill Wittkowski (SD Coastkeeper) stated that having this presentation in so much detail shows the benefit of the workgroups that the San Diego County Copermittees have. It does not look like these workgroups will be going forward with the new permit. Jill believes it would be valuable to the overall process to continue these workgroups with the next permit.

Jill Wittkowski (SD Coastkeeper) mentioned that the purpose of monitoring that has been repeated a few times is to make the programs better. Another purpose is to keep the pulse of the waterways; to know if the waterways are healthy or not.

Jill Wittkowski (SD Coastkeeper) asked what parts of the administrative draft permit are prohibiting the San Diego County Copermittees' proposed process.

Paul Hartman (City of Vista) replied that there are certain portions of the permit that are focused prescriptively on receiving water and MS4 monitoring. A specific example is the current dry weather program which appears to look for more broad spatial coverage, increasing sampling sites to a ¼-mile grid system (from 40 sites to more than 380 sites for Vista) while also going from quarterly to monthly monitoring. The San Diego County Copermittees are looking for flexibility to dial back those requirements and focus resources through adaptive management monitoring to get valuable feedback.

Claudio Padres (Riverside County Flood Control District) stated that he sees the difference from a high level of what is currently in the administrative draft permit versus the adaptive management strategies presented by the San Diego County Copermittees is the difference between monitoring for monitoring's sake versus strategic monitoring. The current administrative draft permit is a broad brush to do everything everywhere, not the focused approach presented by the San Diego County Copermittees.

Mike McSweeney (BIA) appreciated the approach presented by the San Diego County Copermittees and appreciated that he could understand the thought process from looking at the flowchart. Mike agreed that sampling should not be done so infrequently that if something bad happens it is not caught. He complimented the Copermittees on developing a smart way to address what the RWQCB is looking for. He agrees with Paul Hartman (City of Vista) that the grid pattern seems to be sampling for the sake of sampling, not smart or strategic sampling.

Roger Butow (Clean Water Now! Coalition) asked RWQCB staff if the language "economic feasibility" and "technological possibility" will no longer be used as metrics in the permit.

Wayne Chiu (RWQCB) replied that those terms are not used in this permit. Everything in the permit is a technical possibility and is feasible. The question of whether it is cost effective is part of the equation as well. What the RWQCB has proposed here are the minimum federal requirements, but those are put in as a starting point to basically provide the Copermittees an understanding of what can be in a permit. Those terms are not being used anymore.

Richard Boon (County of Orange) spoke on the definition of MEP as it is a crux issue for this process. The State of California did define MEP in 1993 and used the language "public acceptance," "cost," and "technical feasibility." Until State Board Counsel withdraws that memorandum, Orange County would very much expect to see those discussions in this permit. With respect to monitoring, it would mean that the resources available for monitoring are finite; therefore, Copermittees must be careful with how they allocate resources to monitoring because every dollar spent on monitoring is a dollar not spent on implementation of BMPs.

David Barker (RWQCB) replied that in the administrative draft permit, the State's definition of MEP is listed as part of the definition of MEP; therefore, what Richard has stated is fully consistent with how the administrative draft permit is defining MEP.

Bryn Evans (IEA) stated that the IEA has comments on the permit with regard to permitted non-stormwater discharges, such as groundwater dewatering, that have their

own permits. These activities can be mapped and utilized in the other elements of stormwater programs, including third party data. This would allow Copermittees to cost efficiently understand where those permitted non-stormwater discharges are currently and then focus on non-stormwater discharges that do not have authorization.

Grant Sharp (Orange County Flood Control District) mentioned that Monday was the Phase II Small MS4 permit comment deadline. That permit will target small communities and non-traditional Copermittees, such as school districts, state beaches, state parks, etc. One of the interesting things is the requirement for these non-traditional Copermittees to begin to do water quality monitoring to develop IDDE programs. In addition, the draft Phase II permit also has action levels in it for non-stormwater discharges and when compared to the Phase I MS4 permit, they are very different. With the action levels in the Phase II permit, one of the conceivable situations is one of the new non-traditional Copermittees will be doing their own IDDE monitoring and determine they don't have a problem because findings are below their discharge action levels, but the findings could be above the Phase I MS4 non-stormwater discharge action levels. This results in double investigations with different standards. Grant suggested partnering with the Phase II Copermittees to reduce the chance of double investigations.

Jill Wittkowski (SD Coastkeeper) stated that the modeling makes her nervous. The value of any model is based on the validity of the data being used to create the model. If a bad model is used, then bad decisions may be made based on the bad model. She would like to see the modeling concept developed further so that modeling will be robust and give good information to make good decisions.

Andre Sonksen (City of San Diego) explained that the problem with the current models for the San Diego region is that most of the data for the models are not from the San Diego region. Moving forward, the Copermittees would collect region-specific information that would go into current models or refine models to make them applicable to the appropriate region.

V. Discussion on Monitoring Proposals Related to Permit Requirements

Jill Wittkowski (SD Coastkeeper) stated that Coastkeeper is not the only environmental group involved and interested in this permit. Coastkeeper understands that Copermittees are concerned about the cost and breadth of dry weather monitoring; however, some of the environmental groups do not think that cost should be an issue. It should not be the case that Copermittees are required to comply unless it is too expensive. Dry weather monitoring should be kept in the permit. Jill recognized that Copermittees seem worried about the ¼-mile grid system. An alternative view is that this is a dry weather blitz for the first year and maybe it does make sense for the first year to do a blitz and acquire a broad view of the health of our waters throughout the watersheds. Another possibility may be a tradeoff of dry weather monitoring in exchange for the Copermittees agreeing to the inclusion of numeric effluent limitations in the permit.

Jill Wittkowski (SD Coastkeeper) raised the issue of third party data; the permit allows use of third party data but it is not clear how and when that happens. Coastkeeper would like to see in the permit specific requirements for being able to use the third party data, such as requiring use of that data so long as Quality Control training is done. There is a perception that Copermittees only use the data that looks good for them. The permit should require all data to be used. Coastkeeper would also like to see a useful database where all of the data from the region comes together, including Copermittee data and third party data. The database should be accessible by the public and perhaps show green, yellow, and red as an overview of water health. If people knew better that there are serious problems in waterways, then they may support water quality improvement efforts more and there might not be huge budget struggles.

Jill Wittkoswki (SD Coastkeeper) stated that she heard earlier today there are some places for which the Copermittees do not have a lot of data. If they don't have data, Jill questioned how they are setting priorities.

Jill Wittkowski (SD Coastkeeper) acknowledged that commercial, industrial, and municipal inspections are doing a good job looking at non-stormwater discharges. The big question now is residential sources and what should be done about them. Jill would like to see a commitment from Copermittees to crack down on this issue; to really have a plan for residential sources and be willing to take a stand on it. Jill has seen in watershed reports that there is a problem. She also questioned that if non-stormwater discharges are supposed to be prohibited, then why are there numeric limits for the discharges and why should money be spent on analyzing the discharges rather than locating the sources.

Jill Wittkowski (SD Coastkeeper) recognized the discussion earlier about pollutant-generating activities (PGAs) and using studies to determine which PGAs need to be cracked down on. This information should already be known. Coastkeeper did an audit in the Agua Hedionda Watershed, identified a nutrients problem, and determined it was probably coming from nurseries. They did not see any big problems when doing inspections, but also have not seen any follow up or alternate plans. Coastkeeper would like to see work continued and followed up on.

Jill Wittkowski (SD Coastkeeper) had a general question about having one monitoring station per HSA. She would like to understand how that was chosen, as some areas it may be that more than one would be appropriate.

Colin Kelly (OC Coastkeeper) stated that some issues that Coastkeeper is concerned about were first discussed about an hour ago with the Clean Water Now! Coalition. Colin would like to know what the County believes that this modification might do to impact the prioritization of different waterbodies as constituents of emerging concern (CECs).

Colin wants to make sure that waterbodies not on the priority list are not ignored. Minimum monitoring should be required on the non-priority waterbodies to get a baseline. Colin clarified that he is not specifically asking for Copermittees to test for CECs, but he would like to know the minimum requirements.

Colin Kelly (OC Coastkeeper), regarding the use of historical data, would like to know what is considered to be historical data. There has been a significant adjustment in

technology and lower detection limits between now and the 1970s and 1980s. If there is a ten year term, Colin would like to know at what point will historical data not be useful, or what data can be used by third parties. Colin does not think money should be wasted in duplicative efforts between citizen water monitoring and Copermittee water monitoring. Third parties should be able to provide data to the Copermittees. Colin continued that with the use of historical data, there has been significant land development in Southern California. If there is a certain area that has data from the 1990s but has been developed since then with changed hydrology, then that may be a higher priority.

Thom Spanos (SD Coastkeeper) recognized that there are much more stringent requirements for monitoring during the first year of this permit, but after that it seems to allow much flexibility and the prioritization that the Copermittees desire. Thom asked Copermittees to take a step back and look from the broader perspective; it is not too much to ask that once in every five years Copermittees go back and make sure they are not missing anything. Thom continued that Coastkeeper does understand that costs can be significant, but the Clean Water Act is supposed to be a technology-forcing statute. If they are not made a requirement, then there will be no development in these fields. Copermittees should find ways to make this a more efficient process, into which adaptive management does feed. Coastkeeper does not want Copermittees held responsible for something that is not their fault. If action levels in Phase II permits are higher than Phase I permits, then this is the perfect opportunity for the RWQCB to implement more stringent requirements within their region. Thom hopes that everyone is keeping in mind not just the short term costs, but also the other factors involved.

Roger Butow (Clean Water Now! Coalition) thanked Coastkeeper for their comments on contaminants of emerging concern and that increased science does give a better ability to detect lower limits.

Roger Butow (Clean Water Now! Coalition) mentioned Aliso Creek as an example of sampling where sampling was done week 1 on Monday at 9 am, week 2 on a different day of the week at noon, etc., which resulted in a better window of sampling. He would like to see that type of sampling written into the permit itself, as well as integrating sampling by non-governmental organizations (NGOs). Roger agreed that sampling must take place in a manner that maximizes funds and maximizes the database being developed. Sampling the same time, the same day of the week at one site does not give a general concept of fluctuations and the ability to lead to source tracking.

Ted Von Bitner (County of Orange) stated that the RWQCB's goal is to answer basic questions: what is the condition of the watershed, are beneficial uses being protected, and how are those conditions changing over time? Each permit cycle, the Copermittees have changed their monitoring program. Losing that continuity causes the data set to become less valuable.

Ted von Bitner (County of Orange) continued that one of the primary principles of the NPDES Program in general has been that while you can judge the quality of your discharge by sampling at a specific point, you cannot judge the health of the watershed, which is the mission objective of the RWQCB. Orange County has started on that effort by coming up

with new programs, new monitoring designs that are designed to answer that question. Orange County has the Stormwater Monitoring Coalition's Regional Watershed Monitoring Program which gives a holistic view of the watersheds in general. That approach has also been used by the San Diego RWQCB for the San Diego River Integrated Regional Program, and they are now starting on a coastal program. There seems to be a common approach there that should be adapted for this permit. Following what Coastkeeper said and in context of the approach that San Diego provided, there are some basic questions that need to be answered first about the MS4: What is the condition of the MS4? What needs to be worried about? The Copermittees also need to answer basic questions like: What are the frequency and magnitude of PGAs? Who are the priority pollutant dischargers? The Copermittees cannot answer those questions at this point because they have tried in the past with programs, but each time the permit changes, the Copermittees lose their ability to answer those key questions. The Copermittees would hope to follow what has been proposed and bring back to their previous program. Thinking about the MS4 program, it should be an overall design, recognizing how much of the MS4 creates an impact on receiving waters. It should also be a comprehensive program where everyone comes together, including Phase II dischargers and the Industrial General Permit dischargers. With identical submittal dates, it is difficult to incorporate their program findings with the Copermittees' reports. There is no mechanism to incorporate that data. At same time, Ted does not get a sense from the administrative draft permit of when the RWQCB and Copermittees stop and meet; when does the adaptive management process kick in.

Karen Holman (Unified Port of San Diego) acknowledged that attendees are asking a lot of questions, and that is encouraging because that is why the San Diego County Copermittees developed this question-driven strategy. There are two types of questions: management questions and assessment questions. Looking at the diagram, it is structured in a way that makes sense, asking bigger general questions first, then moving down toward source identification and BMPs.

This approach envisions more time and effort spent on the yellow and green areas, then moving up to answer the larger questions. Going up the ladder focuses more on the assessment questions. At the end of this long phase, the Copermittees should be able to answer the receiving water questions. Adaptive management kicks in throughout the entire process, but especially in the yellow and green areas.

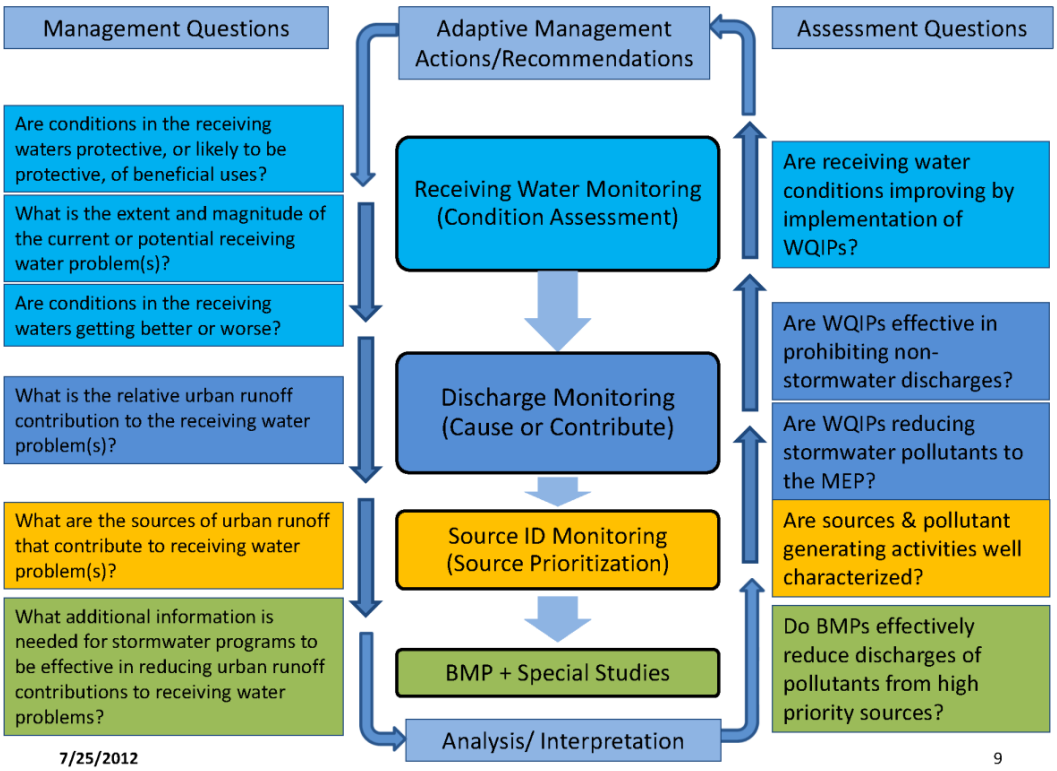

Alison Witheridge (City of Oceanside) shared that as a monitoring person for the last 5-10 years, she wants to believe that monitoring is the answer; that monitoring will indicate if water quality gets better or worse each year; however, she is disappointed each year when the data are analyzed that the variability in water quality data does not allow for indicating changes year after year or even in decades; the amount of data does not seem to help identify or eliminate sources. More data does not always mean more knowledge. That is why the San Diego County Copermittees are proposing a heavier visual observation program instead of straight water quality data collection. As a public employee, Alison needs to spend public funds in a responsible, efficient, and effective manner. For the City of Oceanside alone, it would cost 2 million dollars the first year to implement dry weather monitoring per the current administrative draft permit.

Jo Ann Weber (County of San Diego) continued that for Copermittees in San Diego it is a ten-fold increase in costs the first year with 94 percent for MS4 dry and wet weather monitoring, but at least 70 to 80 percent of that just for dry weather monitoring. In subsequent years, although it does decrease, it is still three to four times what is spent now. The Copermittees want to use their money where they get the greatest value for it. The quarter-mile grid was in the early programs in the mid-1990s and was a guidance document, somewhere to begin. Looking at the current permit writer's guide, it is perfectly reasonable to build on historical record instead of using such a prescriptive grid.

Jo Ann Weber (County of San Diego) is open to discussion on what threshold of monitoring is sufficient, considering visual observations as a key factor to get there. It is

hard to go through an entire MS4 system on an annual or biannual basis for larger jurisdictions, but the County would be okay with prioritizing efforts.

Claudio Padres (Riverside County Flood Control District) stated that regarding cost, his perspective is that everyone can toss around numbers all day, and really what it is not about is not spending money on monitoring; the Copermittees are not trying to avoid monitoring. The Copermittees have to answer to their constituents that they are using their money in an effective way; it needs to be effective monitoring.

Regarding the issue of "cherry-picking" of data, Claudio called attention to the fact that all MS4 permits require the MS4 Copermittees to report all collected data under penalty of perjury.

Claudio Padres (Riverside County Flood Control District) stated that monitoring does not solve problems by itself. Entire city budgets could be spent analyzing the situation without having solved a single problem. The Copermittees need to focus on the type of monitoring needed to take action on high priority issues. Monitoring is an easy way to steal large portions of budgets. The monitoring needs to be taken with an appropriate baseline to assess emerging conditions, taken into the Water Quality Improvement Plan process, and then engaged at the right level to locate sources and measure effectiveness.

Mike McSweeney (BIA) stated that it needs to be realized where our State is financially. It needs to be how smart work is done; not how much money is spent but how the money is spent. Copermittees are trying to figure out the best way to spend money. We all want the same outcome; therefore, there needs to be a sort of triage for priorities. The system should be focused on the outcome and what the best, most efficient way to reach that outcome is.

Andre Sonksen (City of San Diego) explained that when coming up with the proposed monitoring plan and proposing how to implement the program, the workgroup looked at dry weather monitoring program data for the last two years and found it was less than two percent effective in eliminating illicit discharges. The Copermittees do not anticipate that a shotgun approach during the initial year of the new permit would be any more effective than past programs. In developing the proposed process presented today by the San Diego County Copermittees, the workgroup looked at almost twenty years of data from their programs and other related water quality programs not only in San Diego but throughout the country and how to have real, effective changes in water quality.

Colin Kelly (OC Coastkeeper) acknowledged that everyone seems to be broke, and he is not hearing that prioritization is the wrong way to go. He does not, however, want this to be a program where the pause button is hit, causing the Copermittees to not know what is going on with non-priority issues for the next five years. Colin would like to know if there is a floor, and what it is. Focusing all jurisdictional resources on a small portion of a watershed and ignoring everything else is a concern.

Karen Holman (Unified Port of San Diego) agreed with Colin; the intent is not to look at one area in a Water Quality Improvement Plan and ignore the rest. She volunteered the best way to explain the proposed program in more detail may be to meet with Coastkeeper and explain the intent and potential details of the program.

Paul Hartman (City of Vista) stated that one way the Copermittees are looking to address that is through long-term monitoring at existing mass loading stations for a large suite of constituents, including monitoring for contaminants of emerging concern. Also proposed are temporary watershed assessment stations to cover water bodies where information is needed on those outfalls.

Karen Holman (Unified Port of San Diego) responded to Jill Wittkowski's earlier comment about why characterize non-stormwater discharges if they are prohibited. The San Diego County Copermittees are now proposing to look at the transient flows and eliminate transient flows by using observations or other monitoring efforts instead of analytical characterization of the flows. In areas with perpetual flow with sources that cannot be identified easily, those flows would be put into the prioritization program and steps would be taken in the yellow and green areas.

Paul Hartman (City of Vista) responded to Jill Wittkowski's earlier comment about one monitoring station per hydrologic subarea for persistent flows. That provides a broad look at the region, amounting to approximately 70 sites throughout San Diego. The idea came up when working through the Lagoon Investigative Order with SCWRRP, where it was noted that generally one to two outfalls contribute 80 to 90% of the pollutants found in a watershed. As the Copermittees can't monitor everywhere all time, they are trying to use resources effectively and this approach is practical from a staff perspective.

Wayne Chiu (RWQCB) expressed gratitude to the San Diego County Copermittees for providing their proposal as an alternative to what is currently in the administrative draft permit. Throughout this process the RWQCB has asked for recommendations, ideas, etc., and the San Diego County Copermittees have stepped up to the plate. Wayne continued that there are a lot of elements in what he heard today on which all can agree and buy into. The devil will be in the details, and there are a couple aspects where the Board may have its own thoughts. Generally, the approach is sound. In terms of considerations of cost and working smarter, the Board is in favor of that. What is currently in the administrative draft permit is quite onerous, and the Board was not expecting it to make it through to the final draft. The Board hoped to stimulate thinking among Copermittees and send the message that they want to see things done differently, with an increased effort toward eliminating non-stormwater discharges. This permit focuses on elimination first, analysis second for non-stormwater discharges. Stormwater discharges will be a much longer effort.

In terms of historical data, all data collected at any time can be useful. Whether or not it is comparable at all times is a different question. All data can provide historical context and show changes; therefore, any data collected can be used to inform the programs. Wayne agrees that monitoring does not solve problems, but it does indicate if a problem is being solved. Monitoring is needed to identify problems and then to indicate if progress is being made toward solving those problems.

This process is part of the iterative and adaptive management process the RWQCB is trying to incorporate into the permit. Monitoring is an integral part of this; that is why it is the central portion of the permit.

Wayne Chiu (RWQCB) continued that there are two major aspects of the monitoring that the RWQCB would like to make sure are still in the monitoring program: (1) the concept of individual jurisdictional accountability and responsibility and (2) identification of non-Phase I MS4 sources. Wayne is not sure that there is anything with what has been proposed that would inform RWQCB Staff as to what improvements are being shown or demonstrated within a receiving water within a Copermittee's jurisdiction. Wayne would also like to see non-Phase I MS4 sources identified through data. If the monitoring data being collected by non-Phase I MS4 sources are not enough to inform, then the RWQCB has the ability to compel additional information from those dischargers. With a common goal and common understanding through this permit, Wayne believes resources can be jointly used to address the problem.

Karen Holman (Unified Port of San Diego) stated that jurisdictional accountability needs to be in the programs because that is how budget is allocated by City managers. As the Copermittees have been presenting their proposal and talking in depth, it is understood that jurisdictional accountability is a key point for the RWQCB. One of the things the Copermittees are looking at is to see jurisdictional accountability in the green and yellow areas (BMP/Special Studies and Source ID Monitoring). Jurisdictional accountability may not be evident in receiving waters because problems may originate elsewhere.

Paul Hartman (City of Vista) stated that he heard several times in the first focused meetings that the RWQCB is looking for accountability via the iterative process and implementation but that assessment and adaptation of the Copermittees' programs would be more focused on improving the programs. The yellow and green processes are one of the ways to do that. Accountability of items in the blue areas is going to take years to see change unless the RWQCB is only looking at the elimination of non-stormwater flows.

Wayne Chiu (RWQCB) recognized that it will take a long time to see changes in stormwater. The Board expects to see changes in non-stormwater quicker if efforts are placed in the correct places. The Board also still expects monitoring to be done to establish the long-term stormwater trend.

Paul Hartman (City of Vista) stated that one of the places where the Copermittees experience discomfort is where the assessment question is what are the monthly flows and pollutant loads from all outfalls in a jurisdiction.

Wayne Chiu (RWQCB) responded that a lot of the requirements in the monitoring and assessment sections stem from 40 CFR stormwater regulations. There is one assessment requirement in the 40 CFR regulations concerning pollutant loads. That is where the pollutant loading assessment requirement came from. The RWQCB believes that is valuable information, whether it is obtained through modeling, statistics, or empirical data. The RWQCB wants a record of flows and pollutant loads coming out of each Copermittee's MS4; that record can be used to track how improvements are being achieved over time. The RWQCB does not expect everything to happen within a year or 10 years; however, they still need those records to see the trend.

Wayne Chiu (RWQCB) continued, speaking of assessment, when looking at the monitoring requirements, all the monitoring requirements in the administrative draft permit

were shaped and formed around assessment requirements, including what is coming out of the MS4 (non-stormwater and stormwater; what pollutants; how much). The receiving water is something that the RWQCB does not think needs to be monitored every year, but some monitoring data are still needed to establish trends over time. It could take decades to see the trend, but a record is needed to see it. The Copermittees should be using the monitoring data from this administrative draft permit and from the last 20 years to improve their programs.

Richard Boon (County of Orange) shared an approach to dry weather monitoring that had been in a prior permit: a hybrid dry weather reconnaissance program. It included monthly monitoring at over 60 stations across South Orange County. The program was designed to clearly identify aberrant anthropogenic sources (IDIC). It gave really good spatial coverage, directed resources very effectively, and created and established jurisdictional accountability. Richard would be happy to do a presentation on the merits of this approach. He spoke with US EPA headquarters' staff last Friday because they are trying to get the merits of this approach into national rulemaking expected next summer. The dry weather reconnaissance program has dry weather action levels that force the investigation of non-fecal sources of bacteria to identify conditions or pursue elevated bacteria levels that may be the consequence of vegetative decay, or pursue metal concentrations that are most likely from natural shallow groundwater sources. The dry weather reconnaissance program talks about adaptive management, prioritization, accountability, and focusing resources on the issues of real concern. Throughout this process and commentary on the draft permit, Orange County will be advocating for the statistical dry weather reconnaissance approach.

Claudio Padres (Riverside County Flood Control District) recognized that all information has value to the RWQCB. The Copermittees should be looking and focusing on data that have value as they relate to the high priority issues. Claudio asked if it was the intent of the RWQCB staff with the administrative draft permit to have the monitoring requirements be consistent with tailoring to high priority issues or if the intent to was to have monitoring requirements implemented irrespective of priorities.

Wayne Chiu (RWQCB) responded that the Board is trying to build in the ability for the Copermittees to use the monitoring data to inform their priorities. First year monitoring would take a look and make sure priorities are correct. Subsequent years of monitoring would primarily analyze the highest priority pollutants; however, there is a need to go back to make sure priorities are correct.

Claudio Padres (Riverside County Flood Control District) pointed out that one year of monitoring data (i.e., the first year monitoring mentioned previously) is not sufficient to establish priorities. Copermittees must also use historical data to create valid priorities. With that in mind, Claudio is unsure of the benefit of the blitz of first year monitoring currently in the administrative draft permit. Wayne Chiu (RWQCB) responded that RWQCB staff is open to revising that portion of the administrative draft permit.

Ted Von Bitner (County of Orange) reiterated Richard Boon's point about the hybrid dry weather reconnaissance program. It allows Copermittees to draw statistical inferences on a region-wide basis about overall conditions and priorities. Using the numeric approach, it

tells Copermittees what the background levels are across a large-scale region. From there, Copermittees can determine what the region's floor is. As sites are fixed and removed, the average begins to lower on a region-wide basis. With this method, the Copermittees have a robust physical model through which a more cost-effective, smaller-scale monitoring program can be developed that provides an increased power of analysis. Ted would prefer the permit to come back to this type of monitoring. Ted clarified that this monitoring would fit into the blue areas of the San Diego County Copermittees' diagram. Mary Anne Skorpanich (County of Orange) voiced concern that the Copermittees still need to pay attention to the top level (blue level) of the San Diego County Copermittees' diagram. Those top level questions are important to understanding the conditions in the receiving waters and protecting beneficial uses.

Jill Wittkowski (SD Coastkeeper) acknowledged that the regional clearinghouse is a great idea. If done well, it could be huge resource, and she would love to see it housed on the Regional Board's website. She believes there also needs to be public input into the process of creating the regional clearinghouse.

Jill Wittkowski (SD Coastkeeper) recognized the main point of the permit is that pollution has to be controlled to the MEP; however, it is very frustrating that even in the San Diego region people are doing inconsistent practices across the region. Jill would like to see a BMP clearinghouse or other mechanism that gives everyone access to the information gained from the special studies in the yellow and green areas of the diagram. Once jurisdictions have access to the information, they must use it unless they can prove they can't.

Alison Witheridge (City of Oceanside) replied that it goes back to prioritization and adaptive management. Not every watershed or jurisdiction will operate the same way. Jill Wittkowski (SD Coastkeeper) disagreed. All jurisdictions should be operating to the standard of MEP; therefore, BMPs should be implemented the same across jurisdictions. Laurie Walsh (RWQCB) clarified that if something is determined to be MEP, then it is upon the jurisdiction to enforce that on all their sites, and on the RWQCB to enforce that on the jurisdictions.

Andre Sonksen (City of San Diego) explained that monitoring is meant to be one small component of the iterative process of the overall stormwater management program. The street sweeping study is a perfect example. Instead of the general SMC questions, the street sweeping pilot program had specific questions and that is where the monitoring kicked in. Andre reiterated that Copermittees would be using the entire chart as one large process, not ignoring portions of the flowchart. He further stated that monitoring does nothing unless the correct questions are answered, followed by changes to programs based on the monitoring results.

VI. Parking Lot Discussion

The group re-visited off-topic items from the previous focused meeting.

- CalGreen/Hydromodification Dedicated Meeting: There will be a dedicated hydromodification meeting. Richard Boon (County of Orange) is taking the lead. CalGreen will not be included in the meeting.
- Legal Issues: Copermittees' counsels are attempting to proceed with a parallel track of meetings with Regional Board Counsel; however, Regional Board Counsel does not see a purpose to meeting at this time and does need more time to respond to the letter from the County of Orange. This will be updated at the next focus meeting.
- Aliso Creek / specific areas of geography / BET and Other Technologies: This topic has to do with to what degree does the new permit structure speak to or promote emerging technologies. This should be covered in a future focused meeting.
- Ninth Circuit Court Decision – The administrative draft permit has two central provisions dealing with compliance: one is compliance with water quality standards, and one is compliance with water quality standards being obtained through the iterative process. The RWQCB is discussing this internally; however, they have had no conversations with legal counsel yet, although it is a legal issue. David Barker (RWQCB) recognized that this is one of the high priority issues that have been raised and will put some thought into how to address it at the next meeting.
- Regional BMP Funding and Implementation: There is concern that the permit as currently written does not encourage regional BMPs although regional BMPs have great promise for improving water quality. This will be covered in the next focused meeting.
- Review time for permit: The deadline for written comments on the administrative draft permit is September 14. In light of the newly added meeting on hydromodification, scheduled for the last week in August, Mike McSweeney (BIA) asked for an extension on the written comment period. Jill Wittkowski (SD Coastkeeper) disagreed that one topic should push the process out additional weeks. RWQCB staff stated there will be no change to the written comment deadline.
- Monitoring Presentation by San Diego County Copermittees: This was provided at today's focused meeting.

VII. Other Topics / Audience Comments

Comment: Claudio Padres (Riverside County Flood Control District) stated that it would be helpful to know the RWQCB's vision for adaptive management to better provide comments on the administrative draft permit.

Response: David Barker (RWQCB) will address this at the beginning of the next focused meeting.

Comment: Colin Kelly (OC Coastkeeper) stated that the handout from the San Diego County Copermittees was useful; however, some advance notice would be helpful in having valuable discussion. Colin asked for distribution ahead of time for the next focused meeting, if possible.

Response: Materials for future meetings will be distributed ahead of time when possible.

Comment: Mo Lahsaie (City of Oceanside) stated that Federal regulation does not take economics into consideration but Porter Cologne does. Since 2008, with the economy going down, the budget in Oceanside is getting leaner every year, not staying the same.

Comment: Richard Gardner (Capistrano Beach) identified himself as an advocate of water quality, stating that he wished the discussion could have gone into more detail on monitoring, including the constituents (nutrients, dissolved oxygen, toxicity). There are narrative ways to look at toxicity and ways of changing water quality without going after numeric standards or TMDLs. Richard further stated that the health of the riverine system needs to be evaluated. In other areas, regulators should be open minded to looking at different criteria for monitoring in different areas. He does not feel this is covered in the permit. Furthermore, treatment plants, sterilization of water, permits that allow that to continue without monitoring requirements; those should be interim as they could impact the way to deal with FEID. This is also not in the permit now and needs to be dealt with.

Comment: Rosanna Lacarra (City of Coronado) shared that in 2001 the City of Coronado had great results with IC/ID. They yielded good results and were able to eliminate transient and persistent discharges. Now the focus should be on revamping the program to re-strategize and continue efforts under the proposed permit.

Comment: Mikhail Ogawa (City of Del Mar) requested that existing development be the first topic at the next focused meeting.

Comment: Karen Holman (Unified Port of San Diego) stated that this process has been a real asset to all those around the table, allowing for communication and valuable discussion prior to formal issuance of the permit. Karen appreciates the open process and correspondence throughout the process with the RWQCB and other stakeholders.

VIII. Meeting Adjourned

San Diego RWQCB
Permit Reissuance Focused Meeting

July 25, 2012

Adaptive Management Areas of Permit: Monitoring & Assessment Program (MAP)

025695

Concept: Develop MAP as part of each Water Quality Improvement Plan to provide information needed to answer management questions & support effective adaptive management

MAP Elements:

- Receiving Water Conditions
- MS4 Discharges – Non-stormwater & stormwater
- Sources/Pollutant Generating Activities
- BMP Studies/Program Assessments

Example: Increase efficiencies in IDDE Programs with observational methods (or other strategies); monitoring includes activities beyond water quality sampling

Action Items:

- Structure initial requirements according to above in Section II.D.
- Coordinate Prov. II.D requirements with Section II.B. language requiring a strategic monitoring & assessment program as a part of the WQIPs.

Adaptive Management Areas of Permit: Long-Term vs. Annual Processes

025696

- Data / Findings
- Priorities/Targets
- Strategies
- Schedules
- RWQCB approval

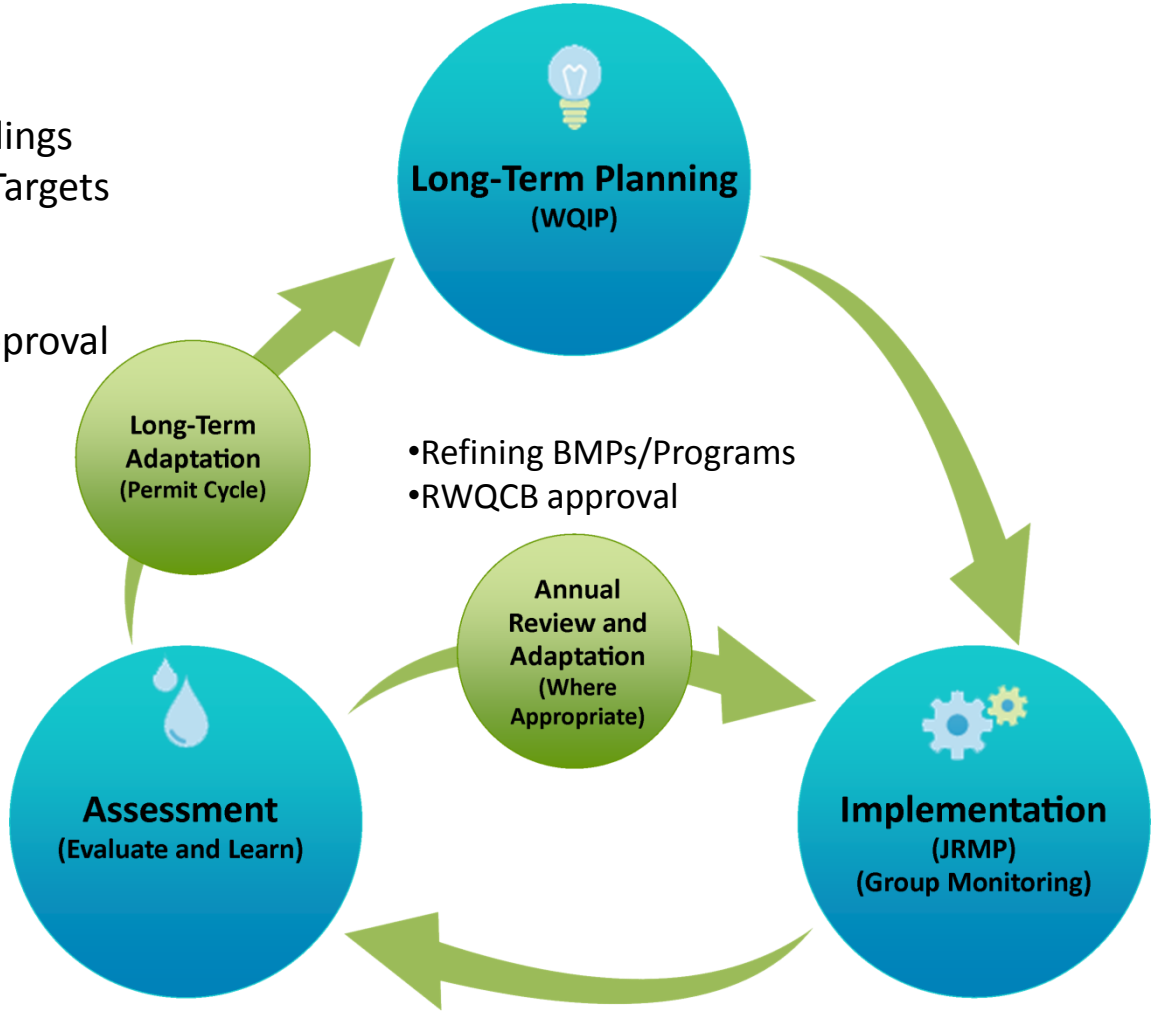

- Refining BMPs/Programs
- RWQCB approval

Implementation

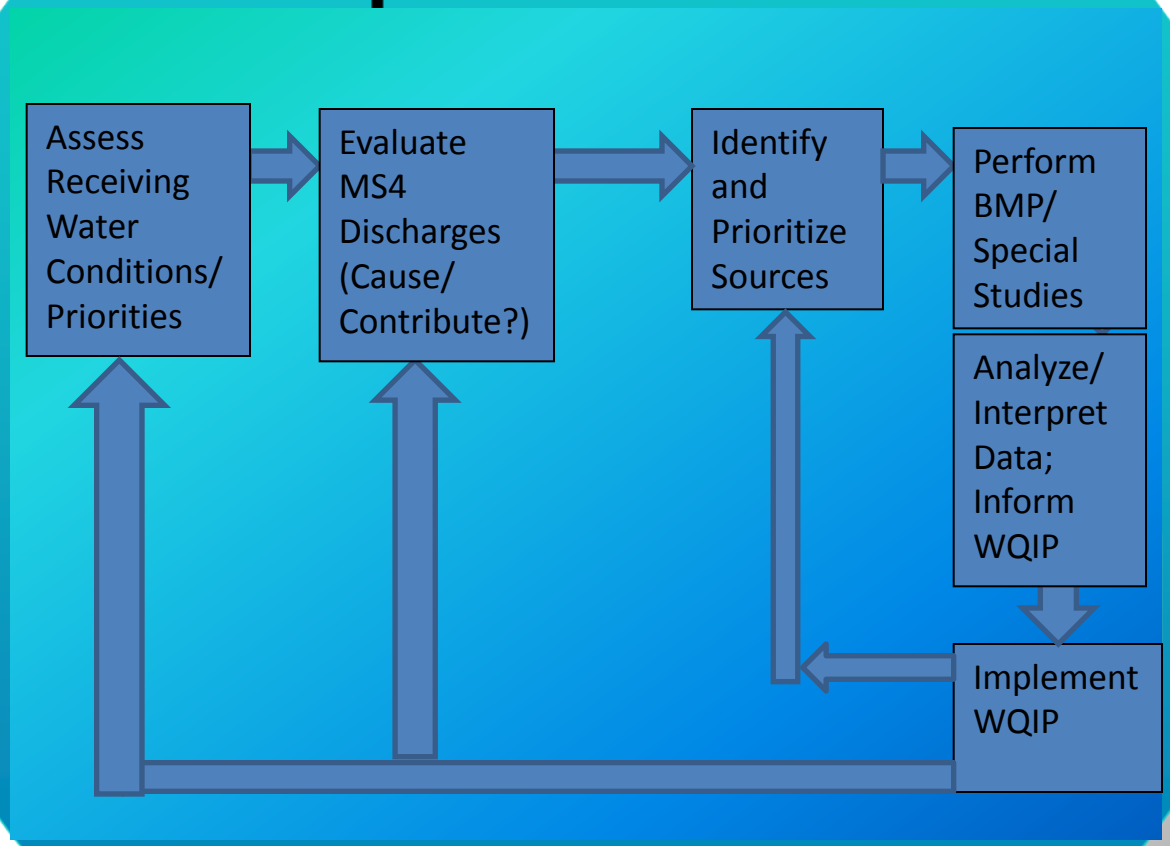

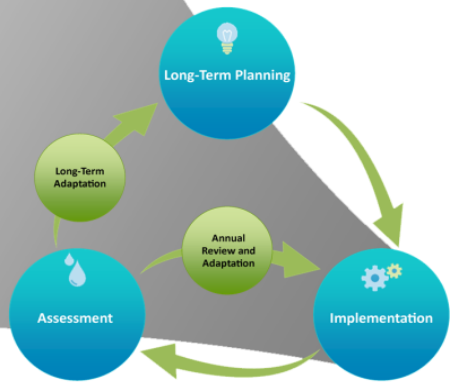

Alternate Provision II.D Rationale

- More effective & efficient use of resources to maximize benefit
- Support **Adaptive Management** needs
- **Question-Driven** Monitoring Approach Design based on Assessment Questions
- Based on 15-20 years of **experience**
- **Monitoring = more than water sampling**
- Ultimately support **WQIP priorities** (strategic, prioritized monitoring approach)

Purpose & Phasing of Alternate Provision II.D

Purpose:

Provide program managers with needed information to support effective adaptive management

Phasing:

- **Pre WQIP (transitional period)** – Proposed Alternate to Provision II.D
- **Post WQIP** – Develop Monitoring & Assessment Program (MAP) to support WQIP priorities

Scientific Basis of Question-Driven Approach

- A Framework for Monitoring & Assessment in the San Diego Region (SDRWQCB, 2012)
- Southern California Stormwater Monitoring Coalition's Model Monitoring Program (SMC, 2004)
- SWAMP Assessment Framework (SWAMP, 2010)
- Elements of a State Water Monitoring and Assessment Program (EPA, 2003)

Key Proposed Changes

- Jurisdictional Non-stormwater Monitoring **(D.1.a)** - Instead of extensive MS4 outfall chemical testing, reduce persistent flows that threaten receiving water quality & eliminate IC/IDs.
- Jurisdictional Stormwater Monitoring **(D.1.b)** - Instead of extensive MS4 outfall chemical monitoring, monitor homogeneous land uses as input to model.
- Jurisdictional Boundary Monitoring **(D.1.a(2))** - Insufficient technical power to differentiate small changes in upstream & downstream water quality due to the inherent variability of water quality data; Determine receiving water monitoring in MAP.
- Bacteria TMDL Monitoring **(Att. E)** – Instead of extensive prescriptive monitoring, rely on monitoring plans prepared as part of the current implementation planning process due to RWQCB October 2012.

Management Questions	Adaptive Management Actions/Recommendations	Assessment Questions
Are conditions in the receiving waters protective, or likely to be protective, of beneficial uses?	Receiving Water Monitoring (Condition Assessment)	Are receiving water conditions improving by implementation of WQIPs?
What is the extent and magnitude of the current or potential receiving water problem(s)?		
Are conditions in the receiving waters getting better or worse?		
What is the relative urban runoff contribution to the receiving water problem(s)?	Discharge Monitoring (Cause or Contribute)	Are WQIPs effective in prohibiting non-stormwater discharges?
		Are WQIPs reducing stormwater pollutants to the MEP?
What are the sources of urban runoff that contribute to receiving water problem(s)?	Source ID Monitoring (Source Prioritization)	Are sources & pollutant generating activities well characterized?
What additional information is needed for stormwater programs to be effective in reducing urban runoff contributions to receiving water problems?	BMP + Special Studies	Do BMPs effectively reduce discharges of pollutants from high priority sources?
	Analysis/ Interpretation	

Receiving Water

Management Questions	Adaptive Management Actions/Recommendations	Assessment Questions
Are conditions in the receiving waters protective, or likely to be protective, of beneficial uses?	**Receiving Water Monitoring (Condition Assessment)**	**Are receiving water conditions improving by implementation of WQIPs?**
What is the extent and magnitude of the current or potential receiving water problem(s)?		
Are conditions in the receiving waters getting better or worse?		
What is the relative urban runoff contribution to the receiving water problem(s)?	Discharge Monitoring (Cause or Contribute)	Are WQIPs effective in prohibiting non-stormwater discharges?
		Are WQIPs reducing stormwater pollutants to the MEP?
What are the sources of urban runoff that contribute to receiving water problem(s)?	Source ID Monitoring (Source Prioritization)	Are sources and pollutant generating activities well characterized?
What additional information is needed for stormwater programs to be effective in reducing urban runoff contributions to receiving water problems?	BMP + Special Studies	Do BMPs effectively reduce discharges of pollutants from high priority sources?
	Analysis/ Interpretation	

Receiving Water Monitoring

Assessment Question

Are the physical, chemical, and biological conditions of receiving waters being improved by the WQIPs?

Management Questions

Are conditions in receiving waters protective, or likely to be protective, of beneficial uses?

What is the extent and magnitude of the current or potential receiving water problems?

Are conditions in receiving waters getting better or worse?

Specific Questions

What are the status & trends in enclosed bays harbors estuaries and lagoons?

What are the status & trends in coastal waters?

What is the progress in achieving & complying with adopted TMDL targets?

Specific Activities

SMC Regional Monitoring

Southern California Bight Regional Monitoring

Sediment Quality Monitoring

HMP Monitoring

ASBS Monitoring

TMDL Monitoring

San Diego Regional Reference Stream Study

Pre WQIP: 5 WMA mass loading stations every other year

Pre WQIP: 1 temporary Watershed Station per WMA annually

Post WQIP (example): Receiving Water Monitoring to be based on watershed priorities, TMDL, & 303d listings

Alternate Provision II.D: Receiving Waters Element

Purpose	Assess Conditions of Receiving Waters, Extent/Magnitude, Trends
Methods	• Stormwater Monitoring Coalition (creeks) • Bight (estuaries, coastal waters) • Sediment Quality Monitoring (estuaries) • TMDL Monitoring (creeks/beaches) • Areas of Special Biological Significance • Mass Loading Stations • Temporary Watershed Stations • Third Party Data
Rationale & Benefits	• Broad Spatial and Temporal Coverage • Integrates existing programs • Preserves long -term trend assessments • Supports assessment-driven, adaptive management approach

Discharge Monitoring

Management Questions	Adaptive Management Actions/Recommendations	Assessment Questions
Are conditions in the receiving waters protective, or likely to be protective, of beneficial uses?	Receiving Water Monitoring (Condition Assessment)	Are receiving water conditions improving by implementation of WQIPs?
What is the extent and magnitude of the current or potential receiving water problem(s)?		
Are conditions in the receiving waters getting better or worse?		
What is the relative urban runoff contribution to the receiving water problem(s)?	**Discharge Monitoring (Cause or Contribute)**	**Are WQIPs effective in prohibiting non-stormwater discharges?**
		Are WQIPs reducing stormwater pollutants to the MEP?
What are the sources of urban runoff that contribute to receiving water problem(s)?	Source ID Monitoring (Source Prioritization)	Are sources and pollutant generating activities well characterized?
What additional information is needed for stormwater programs to be effective in reducing urban runoff contributions to receiving water problems?	BMP + Special Studies	Do BMPs effectively reduce discharges of pollutants from high priority sources?
	Analysis/ Interpretation	

Non-Stormwater Discharge Monitoring

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Assessment Question

Are jurisdictional runoff management programs effectively prohibiting non-storm water discharges to their MS4s?

Management Questions

What is the relative urban runoff contribution to receiving water problem(s)?

What are the sources of urban runoff that contribute to receiving water problems(s)?

Specific Questions

Are the numbers of ICIDs identified &/or eliminated increasing or decreasing?

Do discharge concentrations at outfalls meet applicable permit action levels?

Which discharges should be investigated as potential IC/IDs?

Which non-storm water discharges are transient?

Which MS4 outfalls exhibit persistent dry weather flows?

Which MS4 outfalls impact receiving water quality during dry weather?

Specific Activities

Pre/Post WQIP: Conduct visual Inspections of prioritized major outfalls annually

Compile a prioritized list of major outfalls with persistent dry weather discharges to receiving waters

Identify& map one major outfall to monitor in each urbanized HSA twice annually (approximately 70)

Pre-WQIP: Semi-annual field measurements & lab analyses

Post-WQIP (example): Semi-annual analyses of watershed priorities based on TMDL, 303(d), & NAL constituents

Evaluate data, rank outfalls by potential threat to receiving water quality, & produce prioritized list of outfalls for follow-up

Alternate Provision II.D: Discharge Element – Non-Stormwater

Purpose	Address effective prohibition of non-stormwater discharges
Methods	**Transient Flow Programs (IDDE)** • Source identification: existing development inspections • MS4 system programs: patrols, complaint response, MS4 cleaning • Outfall program: visual inspections for transient flows & prioritization, investigations **Persistent Flow Programs** • Current MS4 outfall program to completion • Prioritized monitoring at one outfall per urbanized HSA (NALs)
Rationale & Benefits	• Broad spatial & temporal coverage • Supports assessment-driven, adaptive management approach • Distinction between persistent & transient flows focuses resources on eliminating &/or controlling high priority threats to receiving waters quality • Utilizing other elements of the stormwater programs (inspections, complaint calls) & third party information will efficiently & effectively assist jurisdictions in eliminating non-storm water discharges

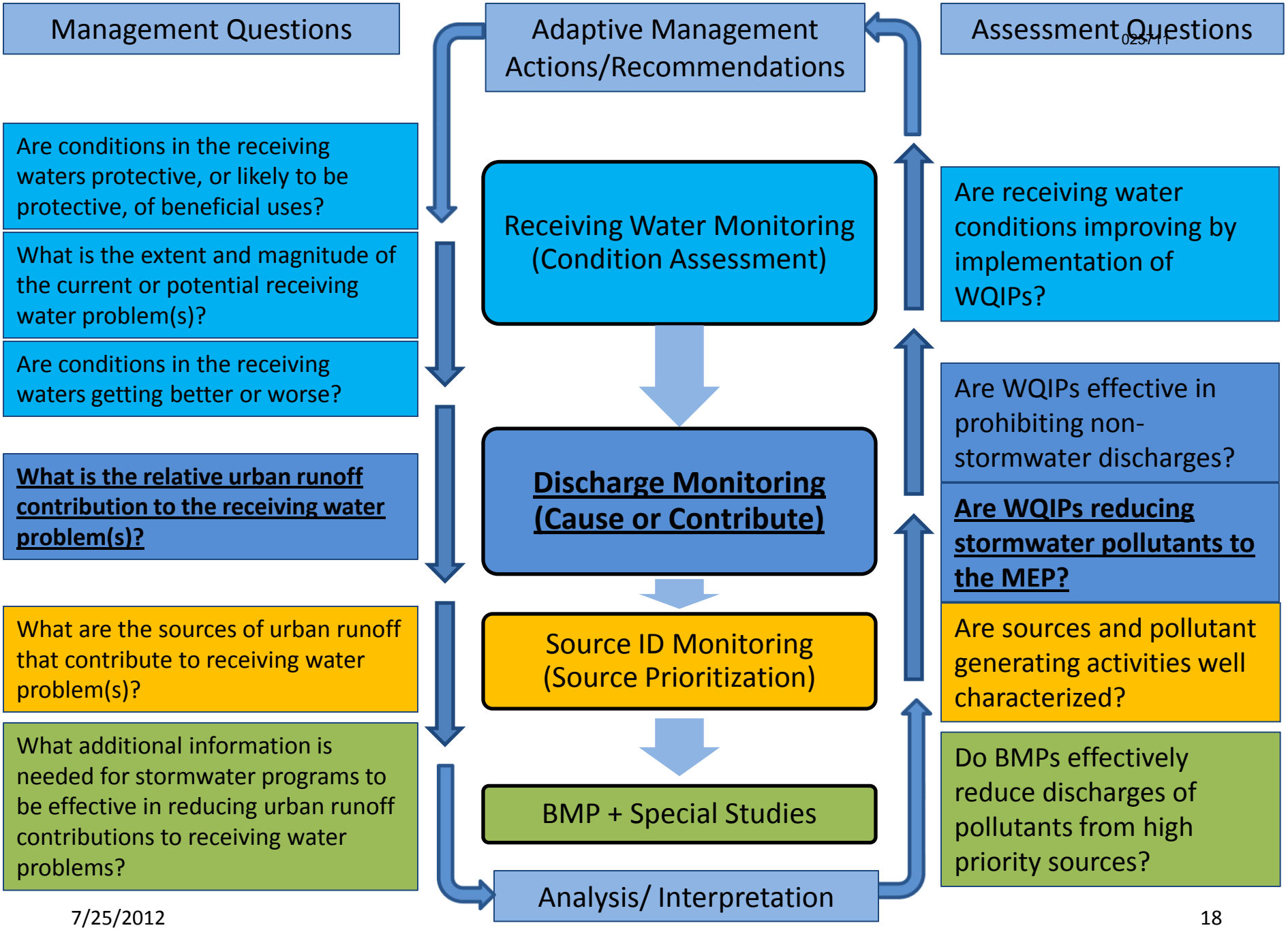
Management Questions
Adaptive Management Actions/Recommendations
Assessment Questions
Are conditions in the receiving waters protective, or likely to be protective, of beneficial uses?
What is the extent and magnitude of the current or potential receiving water problem(s)?
Are conditions in the receiving waters getting better or worse?
What is the relative urban runoff contribution to the receiving water problem(s)?
What are the sources of urban runoff that contribute to receiving water problem(s)?
What additional information is needed for stormwater programs to be effective in reducing urban runoff contributions to receiving water problems?
Receiving Water Monitoring (Condition Assessment)
Discharge Monitoring (Cause or Contribute)
Source ID Monitoring (Source Prioritization)
BMP + Special Studies
Analysis/ Interpretation
Are receiving water conditions improving by implementation of WQIPs?
Are WQIPs effective in prohibiting non-stormwater discharges?
Are WQIPs reducing stormwater pollutants to the MEP?
Are sources and pollutant generating activities well characterized?
Do BMPs effectively reduce discharges of pollutants from high priority sources?

Storm Water Discharge Monitoring

Assessment Question

Are jurisdictional runoff management programs reducing pollutants in storm water to the MEP?

Management Questions

What is the relative urban runoff contribution to receiving water problem(s)?

What are the sources of urban runoff that contribute to receiving water problem(s)?

Specific Questions

Do discharge concentrations & loads from MS4 outfalls meet applicable permit action levels?

How do representative MS4 outfall discharge concentrations, loads, & flows change over time?

Which MS4 outfalls impact receiving water quality during wet weather?

Specific Activities

Pre-WQIP: perform storm water discharge monitoring during two wet weather events annually:

(a) Complete the MS4 outfall monitoring program

(b) Narrative descriptions & field measurements

(c) three monitoring stations at representative major outfalls per WMA

Post-WQIP (example): perform storm water discharge monitoring based on representative outfalls

(a) Develop & implement a monitoring frequency appropriate to characterize pollutant discharges from outfalls in each WMA

(b) analyze parameters identified as watershed priorities, TMDLs, SALs, 303d

Alternate Provision II.D: Discharge Element – Stormwater

Purpose	Address stormwater pollutant reduction to the MEP
Methods	• Complete the current MS4 outfall program • Monitoring at three major outfalls per WMA per year to facilitate modeling based on land use characteristics • Utilize Stormwater Action Levels for prioritization
Rationale & Benefits	• Broad spatial & temporal coverage • Supports assessment-driven, adaptive management approach • Flexibility in site selection will focus resources on the highest watershed priorities, whether it be for representative drainage area data or homogeneous land-use based data.

Source/Stressor Identification

Management Questions	Adaptive Management Actions/Recommendations	Assessment Questions
Are conditions in the receiving waters protective, or likely to be protective, of beneficial uses?	Receiving Water Monitoring (Condition Assessment)	Are receiving water conditions improving by implementation of WQIPs?
What is the extent and magnitude of the current or potential receiving water problem(s)?		
Are conditions in the receiving waters getting better or worse?		
What is the relative urban runoff contribution to the receiving water problem(s)?	Discharge Monitoring (Cause or Contribute)	Are WQIPs effective in prohibiting non-stormwater discharges?
		Are WQIPs reducing stormwater pollutants to the MEP?
What are the sources of urban runoff that contribute to receiving water problem(s)?	**Source ID Monitoring (Source Prioritization)**	**Are sources and pollutant generating activities well characterized?**
What additional information is needed for stormwater programs to be effective in reducing urban runoff contributions to receiving water problems?	BMP + Special Studies	Do BMPs effectively reduce discharges of pollutants from high priority sources?
	Analysis/ Interpretation	

Source/Stressor Identification Monitoring

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Assessment Question

Are sources & pollutant generating activities well characterized?

Management Question

What are the sources of urban runoff that contribute to receiving water problems?

Specific Questions

What are the land use sources contributing to the receiving water problems identified in the WQIP?

What are the relative loadings of sources contributing to the receiving water problems identified in the WQIP?

What are the specific pollutant generating activities (PGAs) contributing to the receiving water problems?

Specific Activities

Constituent-specific source ID

Conduct source/stressor identification studies to address program management needs related to watershed priorities.

Step 1: Compile known information on priority constituent(s).

Step 2: Identify data gaps based on information compiled in Step 1

Step 3: Based on information compiled in Step 1, develop a source inventory & a prioritization scheme within the watershed for potential follow-up action

Step 4: Develop a prioritized list of sources for the priority constituent(s) & deliver to the staff responsible for implementing WQIPs

Pre-WQIP: Continue source identification studies pertaining to compliance with TMDLs & development of the CLRP as applicable

Post-WQIP (example): Conduct PGA investigations for nutrients as part of the MAP for watersheds where WQIPs identified nutrients as a high priority.

Alternate Provision II.D Source/Stressor Identification Element

Purpose	Identify & Prioritize Pollutant Sources & Pollutant Generating Activities (PGAs)
Methods	• Pollutant-Specific Source Inventories • Source/PGA Studies • Prioritization of Sources for Follow-up
Rationale & Benefits	• Responsive to Program Management needs • Provides programs with information to verify, quantify, & prioritize sources • Provides links between sources, activities & effects on runoff quantity & quality

BMPs & Special Studies

Management Questions	Adaptive Management Actions/Recommendations	Assessment Questions
Are conditions in the receiving waters protective, or likely to be protective, of beneficial uses?	Receiving Water Monitoring (Condition Assessment)	Are receiving water conditions improving by implementation of WQIPs?
What is the extent and magnitude of the current or potential receiving water problem(s)?		
Are conditions in the receiving waters getting better or worse?		
What is the relative urban runoff contribution to the receiving water problem(s)?	Discharge Monitoring (Cause or Contribute)	Are WQIPs effective in prohibiting non-stormwater discharges?
		Are WQIPs reducing stormwater pollutants to the MEP?
What are the sources of urban runoff that contribute to receiving water problem(s)?	Source ID Monitoring (Source Prioritization)	Are sources and pollutant generating activities well characterized?
What additional information is needed for stormwater programs to be effective in reducing urban runoff contributions to receiving water problems?	**BMP + Special Studies**	**Do BMPs effectively reduce discharges of pollutants from high priority sources?**
	Analysis/ Interpretation	

Special Studies – BMP, Programmatic, & Water Quality

Assessment Question

Do BMPs effectively reduce discharges of pollutants from high priority sources?

Management Question

Are stormwater program BMPs effective in reducing urban runoff contributions to receiving water problems?

Are pollutant sources being effectively addressed to reduce urban runoff contributions to receiving water problems?

Specific Questions

Specific questions developed to address information needs identified in Source/Stressor Identification studies.

Example: Are sources from outside of the MS4 (e.g., natural sources) contributing to receiving water problems?

Specific Activities

Examples of Special Studies

- Assess background concentrations of contaminants in San Diego reference streams
- Evaluate the effectiveness of enhancing outreach & education (i.e., residential BMP rebate programs, over-irrigation enforcement, rainwater harvesting, turf conversion)
- Evaluate the effectiveness of catch basin inlet cleaning
- Evaluate the effectiveness of residential & commercial area patrolling (commercial patrolling may include inspections)
- Evaluate the effectiveness of targeted aggressive street sweeping
- Evaluate the effectiveness of watershed-based inspections

Alternate Provision II.D BMPs & Special Studies

Purpose	• Support effective adaptive management • Assess BMP effectiveness • Perform scientific investigations to address data gaps
Methods	• Pilot BMP Studies • Source ID Special Studies • Water Quality Studies
Rationale & Benefits	• Answers questions related to program & BMP effectiveness • Addresses data gaps to allow more effective program implementation • Provides scientifically valid information related to regulatory principles

Developing Monitoring & Assessment Programs (MAPs) for Each WQIP

STRATEGIC MONITORING APPROACH:

1. Establish stormwater management priorities specific for each WMA ("Watershed Priorities") as part of WQIP development.
2. Compile existing monitoring data & assess available information for receiving waters, MS4 discharges, & sources or stressors within the watershed.
3. Identify regulatory & non-regulatory drivers that apply to water quality monitoring within the watershed, & list all associated monitoring responsibilities assigned to the Copermittees.
4. Evaluate the watershed priorities in context of available monitoring data & existing monitoring responsibilities, & develop specific management questions for each priority issue.
5. Establish metrics & identify assessments that should be performed to supply information needed to address the management questions.
6. Identify elements of a watershed-based monitoring program needed to address the watershed management questions & perform the necessary assessments.
7. Develop detailed monitoring plan to address the identified monitoring needs, coordinated with other ongoing monitoring in the watershed.

Proposed Provision II.D Development of MAP Components

- HYPOTHETICAL WATERSHED EXAMPLE

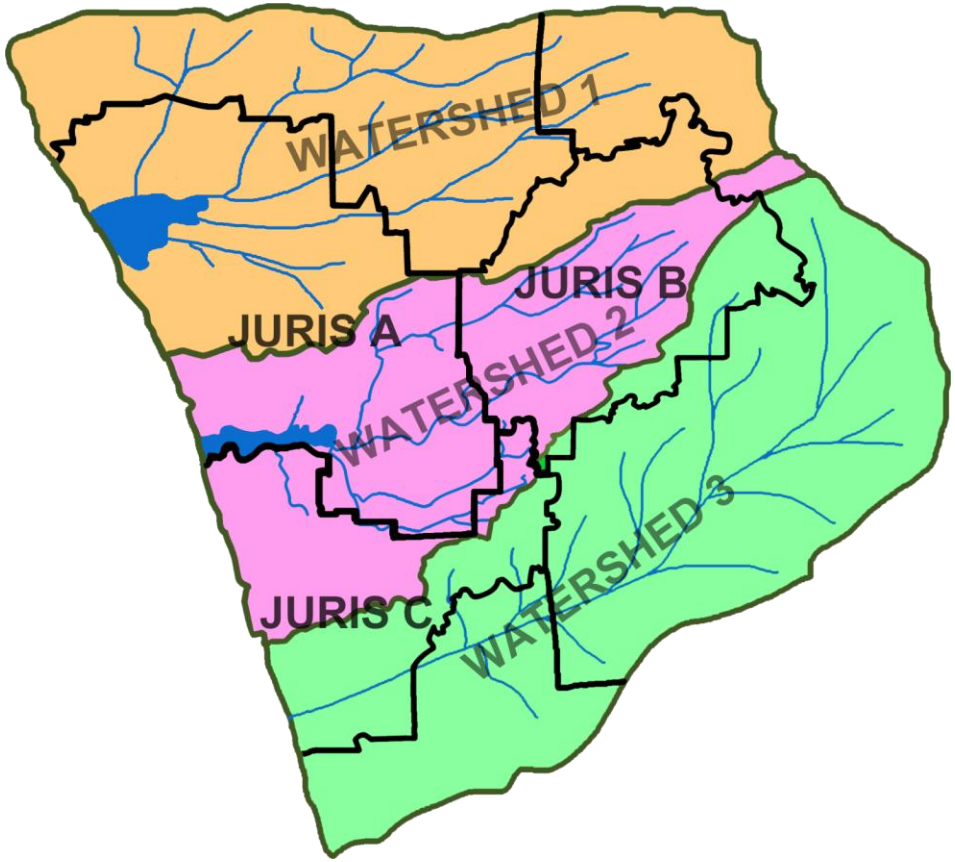

Proposed Provision II.D
WQIP/MAP - Stormwater Discharge Example

- Example WQIP priorities
  - TMDLs: bacteria
  - 303(d) Listings: copper & nutrients
- Likely Assessment question:
  - Are jurisdictional runoff management programs reducing pollutants in storm water to the maximum extent practical?
- Management question:
  - What are the sources of urban runoff that contribute to receiving water problem(s)?

WQIP MAP Example: Stormwater Discharge Monitoring

- Develop Specific questions using available information:
  - MS4s are known sources of bacteria & copper
  - MS4s are less well known as sources of nutrients
  - Loadings from land uses are not well quantified to support planning of wet weather management actions or evaluate their effectiveness
- Specific question
  - *What are the representative MS4 outfall discharge concentrations, loads, & flows?*

WQIP MAP Example: Stormwater Discharge Monitoring

- Approach to answer specific question is to support model development/ calibration/ validation
- Number of sites based on appropriate land use characterization for modeling
  - Characterize individual land uses (i.e., residential) or refine categories of land uses (i.e., SFR & HDR)
- Frequency = 2 storms/year (composite)
- Constituents = bacteria, copper, nutrients, & special study needs
- Duration = at least one adaptive management planning cycle to allow for:
  - Minimum data requirement for adequate characterization
  - Data usability to update management actions for WQIP

Next Steps

- Alternate Provision II.D will be provided
- Technical Memo with Support/Rationale for Alternate Provision II.D

QUESTIONS?

From: lyris@swrcb18.waterboards.ca.gov
To: Chiu, Wayne@Waterboards
Subject: Regional MS4 Permit August 22, 2012 Focused Meeting Agenda
Date: Friday, August 17, 2012 11:58:54 AM
Attachments: Final Focused Meeting August 22 Agenda.pdf

Regional MS4 Stakeholders,

Attached is the agenda for the August 22, 2012 Focused Meeting held at the City of Vista Civic Center. A map is attached for your convenience.

See you all there,

Regional MS4 Permit Team Member
Laurie Walsh P.E.
San Diego Water Board
858-467-2970
lwalsh@waterboards.ca.gov

You are currently subscribed to reg9_sandiegoco_ms4permit as: wchiu@waterboards.ca.gov.
To unsubscribe click here: http://swrcb18.waterboards.ca.gov/u?id=508208.cee2a373662e566393e62f0af18d11cf&n=T&l=reg9_sandiegoco_ms4permit&o=375629
(It may be necessary to cut and paste the above URL if the line is broken)
or send a blank email to leave-375629-508208.cee2a373662e566393e62f0af18d11cf@swrcb18.waterboards.ca.gov

FOCUSED MEETING AGENDA

Administrative Draft of
Tentative Order No. R9-2012-0011, NPDES No. CAS0109266
Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region

Wednesday, August 22, 2012
9:30 a.m. - 3:30 p.m.

9:30 a.m. - 9:40 a.m.	Introductions, Table Participants
9:40 a.m. - 9:50 a.m.	Meeting Recap & Feedback, Lewis Michaelson, Katz & Associates
9:50 a.m. - 10:00 a.m.	Focused Meeting Highlights, David Barker, San Diego Water Board
10:00 a.m. - 11:30 a.m.	Watershed and Jurisdictional Planning, Table Participants
11:30 a.m. - 12:30 p.m.	Lunch
12:30 p.m. - 1:30 p.m.	Jurisdictional Implementation, Table Participants
1:30 p.m. - 1:45 p.m.	Break
1:45 p.m. - 3:00 p.m.	Design and Performance Standards, and Alternative Compliance, Table Participants
3:00 p.m. - 3:30 p.m.	Comments & Questions All

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CITY OF VISTA - COMMUNITY ROOM
200 CIVIC CENTER DR
VISTA, CA 92084

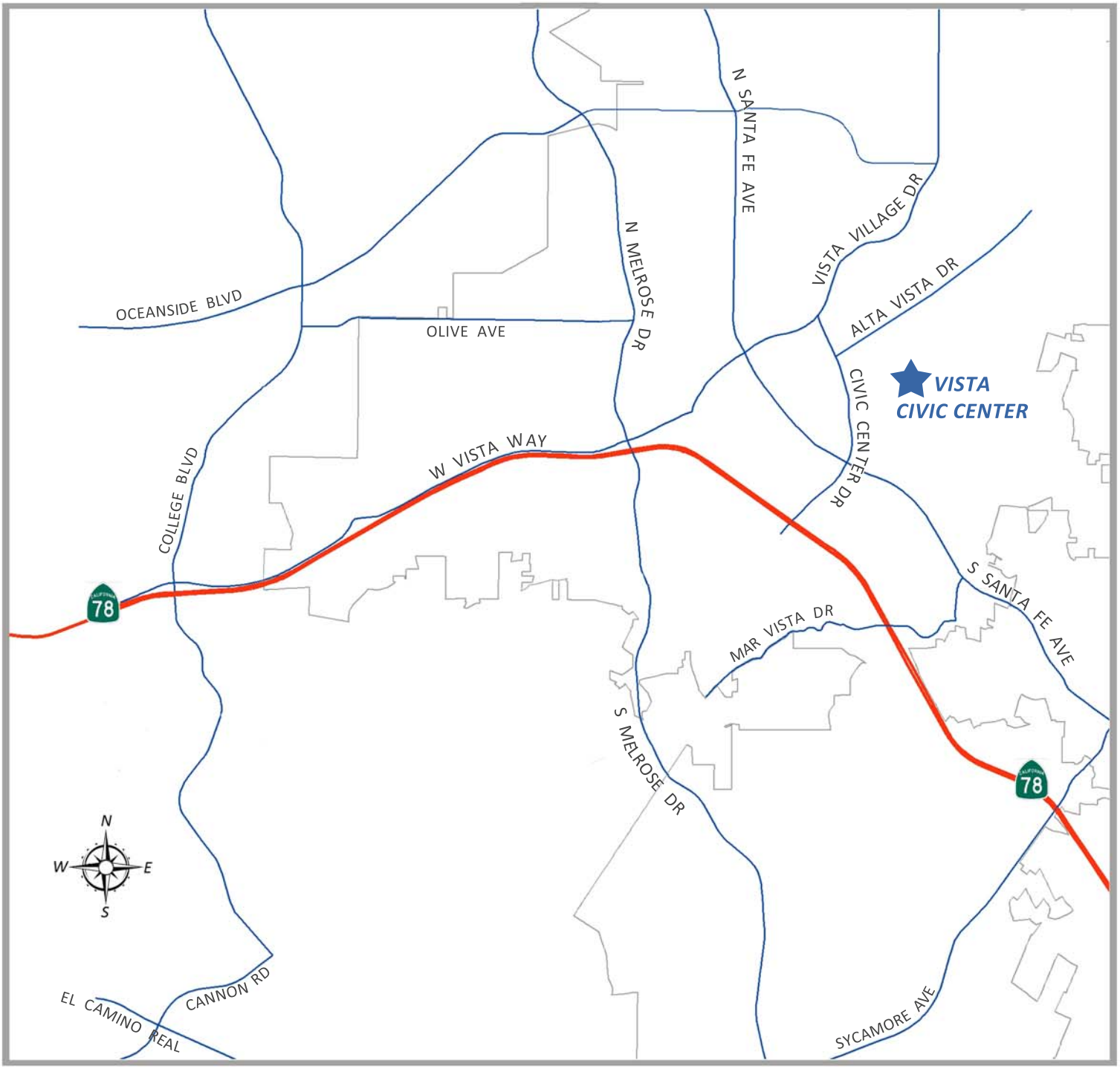

DIRECTIONS

TAKE INTERSTATE 15 TO SR-78 WEST OR TAKE INTERSTATE 5 TO SR-78 EAST
EXIT CIVIC CENTER DRIVE,, GO NORTH ON CIVIC CENTER DRIVE APPROXIMATELY 1.1 MILES TO STOPLIGHT AT ALTA VISTA DRIVE, TURN RIGHT ON ALTA VISTA DRIVE AND TURN RIGHT INTO PARKING LOT.

The entrance to the Community Room is on the upper level - you can access from the staircase by parking lot.

From: Jo Ann Weber
To: Becker, Eric@Waterboards
Cc: Chiu, Wayne@Waterboards; Walsh, Laurie@Waterboards
Subject: RE: Request for Follow-Up Meeting - Monitoring & Assessment
Date: Monday, August 13, 2012 2:48:03 PM

Great, Thanks. It will be at the City of San Diego Office on Chesapeake- SW #2- 10 am to 1 pm.

Jo Ann Weber
Water Quality Program Coordinator
County of San Diego/DPW/Watershed Protection
5510 Overland Avenue, Ste. 410
San Diego, CA 92123-1239
Tel: 858-495-5317
Fax: 858-495-5263
joann.weber@sdcounty.ca.gov

Please Note: New address above effective on 8/13/2012

From: Becker, Eric@Waterboards [mailto:Eric.Becker@waterboards.ca.gov]
Sent: Monday, August 13, 2012 2:36 PM
To: Weber, Jo Ann
Cc: Walsh, Laurie@Waterboards; Chiu, Wayne@Waterboards
Subject: RE: Request for Follow-Up Meeting - Monitoring & Assessment

Hi JoAnn-

Let's plan on the 23rd. At the City of San Diego or another location? Thanks.

Eric Becker, P.E.
Senior Water Resources Control Engineer
Southern Watershed Unit
SDRWQCB
9174 Sky Park Court, Suite 100
San Diego, CA 92123
(858) 492-1785
(858) 571-6972
EBecker@waterboards.ca.gov

From: Jo Ann Weber [mailto:JoAnn.Weber@sdcounty.ca.gov]
Sent: Monday, August 13, 2012 10:06 AM
To: Becker, Eric@Waterboards
Cc: Walsh, Laurie@Waterboards; Chiu, Wayne@Waterboards
Subject: Request for Follow-Up Meeting - Monitoring & Assessment

Dear Eric, The Monitoring Sub-workgroup to support permit reissuance respectfully requests another meeting with you to provide and discuss additional details of the Copermittees' monitoring proposal. Can your team accommodate either of the times below?

1st choice: Thursday, Aug 23rd – 10:00 am to 1 pm

2nd choice: Thursday, Sept 6th – 10:30 am to 1 pm

We value your input and I thank you in advance for your consideration. Best regards, Jo Ann

Jo Ann Weber
Water Quality Program Coordinator
County of San Diego/DPW/Watershed Protection
5201 Ruffin Road, Suite P
San Diego, CA 92123, MS 0326
Tel: 858-495-5317
Fax: 858-495-5263
joann.weber@sdcounty.ca.gov

Hagan, Catherine@Waterboards

From: James R O'Day <James.ODay@sdcounty.ca.gov>
Sent: Friday, August 17, 2012 3:52 PM
To: Hagan, Catherine@Waterboards
Subject: RE: Administrative Draft R9-2012-0011

Hi Catherine: I just wanted to send a note to keep in contact about these issues on behalf of our informal attorney group for copermittees. We have delayed sending our summary of legal comments to you, mostly due to pressing demands assisting our staff in the workshop process with RB staff (as well as the usual other distractions). We have not abandoned the idea of getting you something, and have of course through our client staff conveyed some of those concerns to Wayne and the team in the ongoing process. We are currently most concerned with the Receiving Water Limitations language and its potential impact in light of the *NRDC v. County of Los Angeles* Ninth Circuit opinion. We hope you might join with us in urging the State Board to hold its workshop on Receiving Water Limitations language as soon as possible and before the permit final approval process. We view the exposure to third party litigation from the RWL language, highlighted by the NRDC case, to be one of the biggest detriments to the otherwise collaborative effort to design a permit that captures the iterative approach to long term water quality improvement. As the workshop process draws to a close, and the Tentative Order is due to be issued, we will revisit getting you the written summary and perhaps meeting with you during the public review and comment period. Thanks.

From: Hagan, Catherine@Waterboards [mailto:CHagan@waterboards.ca.gov]
Sent: Tuesday, July 10, 2012 12:42 PM
To: O'Day, James R
Subject: RE: Administrative Draft R9-2012-0011

Hi Jim,
I am sorry for the delay in responding to your e-mail. Due to competing priorities, I have not yet had an opportunity to complete my legal opinion memo requested by both Orange and Riverside Counties regarding the Board's position on legal authority to issue an eventual "Regional" MS4 permit and regarding their concerns about the viability of the ROWD process for their respective counties. While discussion about technical issues in the focused workgroups can obviously proceed absent a legal opinion memo, I appreciate the counties' desire to have a legal memorandum to review so that they understand the Board's legal perspective on these issues. I am hopeful that I will have an opportunity to complete a legal memorandum within the next couple of weeks. With regard to additional legal issues, I think it would be most useful for the copermittees to provide their legal concerns in writing at their earliest convenience so that I can evaluate them and, if warranted, advise Regional Board staff about any revisions I think would be appropriate in light of the copermittees' concerns. Certainly if it appears that subsequent in-person meetings may be productive in terms of fleshing out misunderstandings or legal nuances, I remain open to such meetings but I do not think it would be useful to schedule such a meeting at this juncture.

Sincerely,

Catherine

Catherine George Hagan
Senior Staff Counsel
Office of Chief Counsel
State Water Resources Control Board
Tel. 858-467-2958

From: James R O'Day [mailto:James.ODay@sdcounty.ca.gov]
Sent: Friday, July 06, 2012 12:07 PM
To: Hagan, Catherine@Waterboards
Subject: Administrative Draft R9-2012-0011

Hi Catherine: I am writing on behalf of a co-permittee attorney group working on the new stormwater permit review process and the focused workshops with RWQCB staff. I think Shawn Hagerty discussed the possibility of legal counsel meeting with you about legal issues associated with the draft permit, which we think is important because of the specific directive in the workshops not to get into legal issues, but focus on technical matters.

We would like to set up a meeting at your convenience within the next two weeks, if possible. We propose to have about 5-6 attorneys participate representing Orange, Riverside, and San Diego co-permittees and can come to your offices. We know you requested a summary of issues for discussion in advance, and can certainly get that to you fairly quickly and in advance of the meeting. If you can confirm that you are still willing to meet with us, and that time frame is acceptable, I will circulate your available dates and try to coordinate setting the meeting. I suggest setting aside about 2 hours to be on the safe side with time. We see the proposed meeting as beneficial to the co-permittees' counsel and your legal team as you advise your clients on the eventual content of the formal draft permit.

I look forward to hearing back at your early convenience. As always, best regards.

James R. O'Day, Senior Deputy
Office of County Counsel
1600 Pacific Highway, Room 355
San Diego, CA 92101
(619) 531-4869
james.oday@sdcounty.ca.gov

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From: lyris@swrcb18.waterboards.ca.gov
To: Chiu, Wayne@Waterboards
Subject: August 10, 2012 Hydromodification Management Meeting
Date: Thursday, August 23, 2012 2:15:48 PM
Attachments: HMP Mgt Mtg flyer and map_8-30-12.pdf

Greetings Regional MS4 Permit Stakeholders,

At the request of several stakeholders participating in the Focused Meetings for the Administrative Draft Regional MS4 Permit, the San Diego Water Board agreed to attend a meeting, in addition to but separate from the Focused Meetings, that will provide information about issues related to hydromodification management.

The meeting was organized and arranged by the Copermittees. Members of the San Diego Water Board Regional Permit Team will attend the meeting as an interested party.

The following information about the meeting was provided to the Regional Permit Team to be distributed via the Lyris lists maintained by the San Diego Water Board for the Orange County MS4 Permit, Riverside County MS4 Permit, and the San Diego County MS4 Permit.

To attend the meeting, please see the information provided below and attached. Please note that RSVPs are requested for this meeting. **Please RSVP** at the following link: https://docs.google.com/spreadsheet/viewform?formkey=dHJaVWxEQkwtcEt3VGNsQlJHQXRFR2c6MQ#gid=0)

Laurie Walsh, PE
San Diego Water Board
Lwalsh@waterboards.ca.gov
858-467-2970

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or send a blank email to leave-377699-508208.cee2a373662e566393e62f0af18d11cf@swrcb18.waterboards.ca.gov

HYDROMODIFICATION MANAGEMENT MEETING
AUGUST 30, 2012
10:00 AM – 3:30 PM
SAN DIEGO, CA

The San Diego Water Board is developing a Regional Municipal Separate Storm Sewer System (MS4) Storm Water Permit that will cover municipal copermitees in San Diego County, Southern Orange County, and Southern Riverside County (Tentative Order No R9-2012-0011).

This hydromodification management meeting is being convened to specifically address stakeholder comments and concerns raised regarding the issue of hydromodification management.

Meeting Goal and Objectives

The goal of the meeting will be to provide the Regional Board Permit team, Copermittee storm water program managers, non-governmental environmental organizations, and the development/business community with a greater understanding of the practice of hydromodification management in the urban watershed. Although there are several areas of concern regarding the implementation of hydromodification requirements, the primary objective of the meeting is to consider and provide direction regarding the following questions:

<u>Key Questions</u>

1. *What are key decision factors in applicability of hydromodification management requirements?*
2. *Where in the watershed, and using what criteria, should hydromodification management requirements be applied?*

<u>Second Tier Topics</u>

3. *Constraints and incentives (in lieu, hydromod trading/credits)*
4. *Prioritization*

Meeting Structure

The meeting will comprise a series of brief presentations followed by an expert panel discussion of the aforementioned questions in the context of the San Diego River watershed.

The presenters and panel will include:

- Chris Bowles, PhD, PE, CBEC
- Derek Booth, UCSB, Bren School of Environmental Science and Management
- Eric Stein, PhD, Southern California Coastal Water Research Project
- Eric Berntsen, PH, CPESC, CPSWQ, State Water Resources Control Board
- Flood Control Expert – To Be Announced

The meeting and panel discussion will be facilitated by Matt Yeager, D.Env, CPSWQ, QSD/QSP, Yeager Environmental Associates.

Meeting Schedule and Location

August 30, 2012, from 10:00 a.m. to 3:30 p.m.
(registration begins at 9:30; meeting begins at 10:00)

San Diego Concourse
Copper Room
202 C Street
San Diego, CA 92101

Lunch will be provided—a donation of $10 will be appreciated

Please RSVP at the following link:

Hydromod Registration Form*

(if you receive a hard copy of this flyer or if the link does not work, please enter the following address into your web browser: https://docs.google.com/spreadsheet/viewform?formkey=dHJaVWxEQkwtcEt3VGNsQlJHQXRFR2c6MQ#gid=0)

In order to secure copies of material provided to attendees and have lunch ordered for you, please RSVP no later than 10:00 a.m. on Wednesday, August 29, 2012.

Parking is available at the Concourse Parkade Structure
$2/20 mins OR $18/day max
Cash or Check only

Contacts for Additional Information

Matt A. Yeager, D.Env, CPSWQ, QSD/QSP
Yeager Environmental Associates
(909) 659-8038; matt@yeagerenvironmental.com

SAN DIEGO CONCOURSE

025739

202 C Street MS57C, San Diego Ca. 92101 / 619-236-7029 / 619-236-7016

Driving Directions to the San Diego Concourse

South on Interstate 5

- 5 south to Front St./Civic Center off ramp
- Take left fork on off ramp to 2nd Ave.
- Turn right onto 2nd Ave.
- Travel 3 blocks to where 2nd Ave. intersects A St.
- Enter Concourse Parkade structure

North on Interstate 5

- 5 north to 6th Ave off ramp
- Turn left onto 6th Ave.
- Turn right onto Ash St.
- Turn left on 2nd Ave., travel one block to where 2nd Ave. intersects A St.
- Enter Concourse Parkade structure

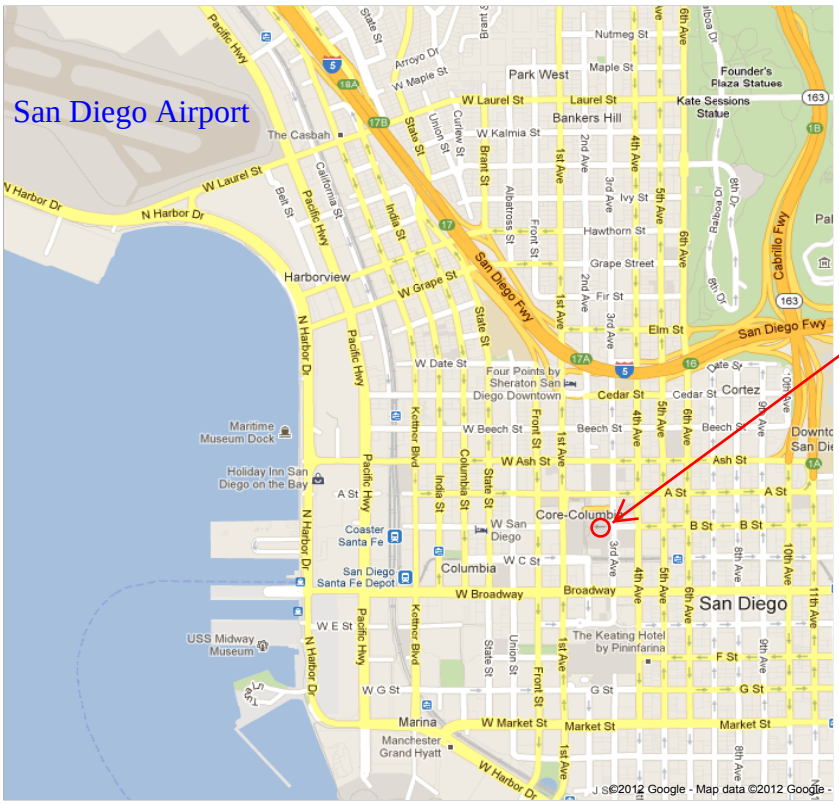

South on Interstate 15

- 15 south to 163 south
- 163 becomes 10th Ave.
- Right on B St.
- Right on 3rd Ave.
- Concourse Parkade entrance is first driveway on left.

West on 94 Freeway

- 94 west into Downtown
- 94 becomes F St.
- Right on 5th Ave.
- Left on B St.
- Right on 3rd Ave.
- Concourse Parkade entrance is first driveway on left.

Second Level

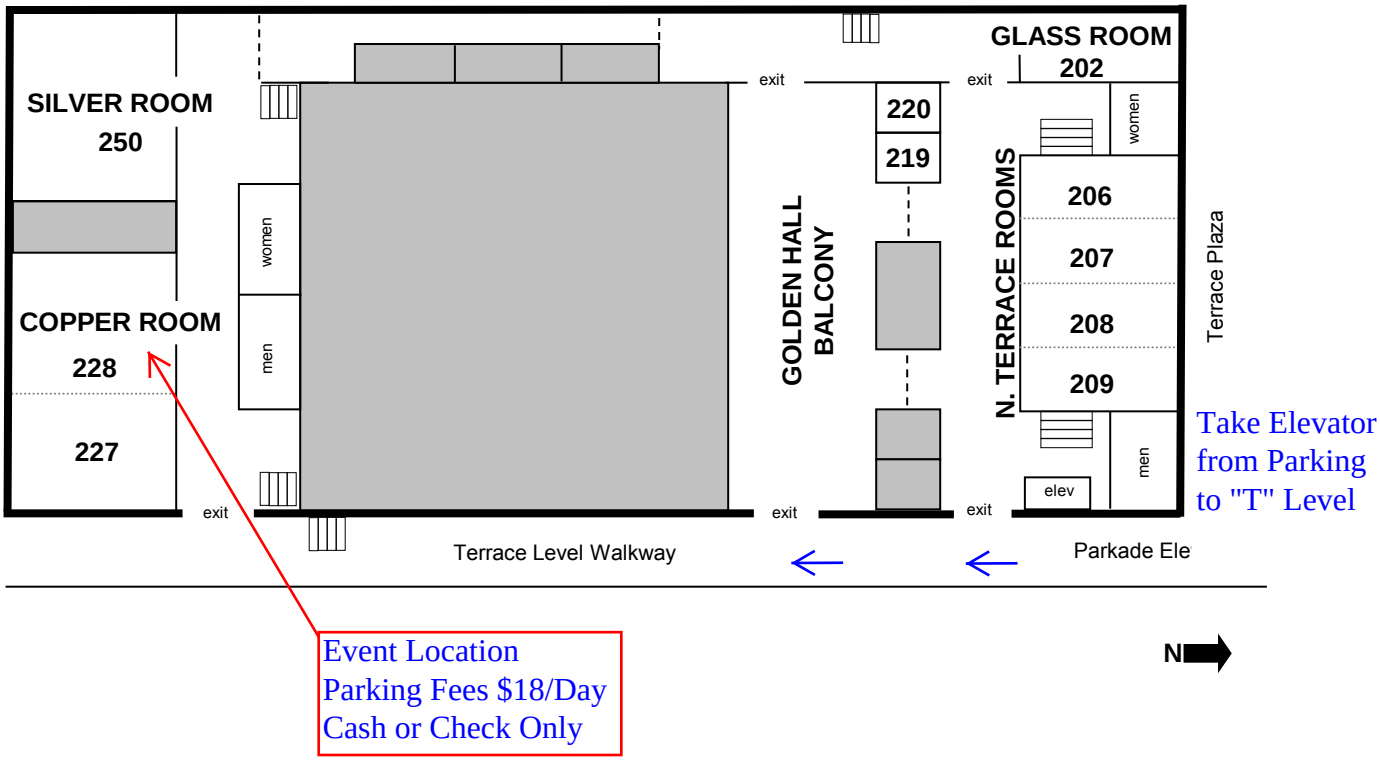

From:	Jill Witkowski
To:	Becker, Eric@Waterboards; Walsh, Laurie@Waterboards; Chiu, Wayne@Waterboards; Barker, David@Waterboards
Cc:	Doug Kot
Subject:	RE: Meeting with Green Builders?
Date:	Friday, August 24, 2012 12:12:43 PM

Excellent. We'll see you then!
Jill

From: Becker, Eric@Waterboards [mailto:Eric.Becker@waterboards.ca.gov]
Sent: Friday, August 24, 2012 12:10 PM
To: Jill Witkowski; Walsh, Laurie@Waterboards; Chiu, Wayne@Waterboards; Barker, David@Waterboards
Cc: Doug Kot
Subject: RE: Meeting with Green Builders?

Hi Jill-

Looks like most of us are available 1000 on Friday the 31rst. Want to confirm?

Eric Becker, P.E.
Senior Water Resources Control Engineer
Southern Watershed Unit
SDRWQCB
9174 Sky Park Court, Suite 100
San Diego, CA 92123
(858) 492-1785
(858) 571-6972
EBecker@waterboards.ca.gov

From: Jill Witkowski [mailto:jill@sdcoastkeeper.org]
Sent: Friday, August 24, 2012 11:49 AM
To: Walsh, Laurie@Waterboards; Chiu, Wayne@Waterboards; Becker, Eric@Waterboards; Barker, David@Waterboards
Cc: Doug Kot
Subject: Meeting with Green Builders?

Hi MS4 Permit team,
As I mentioned on Wednesday, I was hoping to set up a meeting with your team and Doug Kot, Executive Director of the San Diego Green Building Council. We were aiming for Friday, August 31st. I will already be at the Regional Board offices from 8-10am for a meeting on the Shipyards Sediment Cleanup, so a meeting at 10am (or even 10:30) would be ideal.
Would it be possible to set a meeting for Friday, August 31st at 10am? If not, are there other times when you are available to meet?
Thanks,
Jill

Jill Witkowski
Waterkeeper
San Diego Coastkeeper®

www.sdcoastkeeper.org
2825 Dewey Rd, Suite 200
San Diego, CA 92106
619.758.7743 x119

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From: lyris@swrcb18.waterboards.ca.gov
To: Chiu, Wayne@Waterboards
Subject: Regional MS4 Permit Focused Meeting - July 25 Meeting Notes
Date: Monday, August 13, 2012 8:49:10 AM
Attachments: 2012-0725_MeetingNotes.pdf

Regional MS4 Permit Stakeholders,

Attached are the Regional MS4 Permit Meeting Minutes from the July 25, 2012 Focused Meeting. The San Diego Regional Permit Team will be forwarding the agenda for the next Focused Meeting scheduled on August 22, 2012 by Friday.

Laurie Walsh P.E.
San Diego Water Board
858-467-2970
lwalsh@waterboards.ca.gov

You are currently subscribed to reg9_sandiegoco_ms4permit as: wchiu@waterboards.ca.gov.
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California Regional Water Quality Control Board, San Diego Region
Regional MS4 Permit Focused Meeting

Meeting Notes

Date	Location	Agenda Topics
7/25/2012 Start time: 9:30 AM End time: 2:50 PM	City of Carlsbad Faraday Center 1635 Faraday Ave, Rm 173 Carlsbad, CA 92008	• Focused Meeting Highlights • Monitoring Requirements Introduction • Stakeholder Monitoring Presentation • Discussion on Monitoring Proposals Related to Permit Requirements • Parking Lot Discussion • Other Topics / Audience Comments

I. Introductions

Table participants introduced themselves. Lewis Michaelson (Facilitator) ensured the appropriate representatives were at the table, per the June 20, 2012, San Diego Regional Water Quality Control Board (SD RWQCB) Notice.

San Diego County Copermittees (5): Jo Ann Weber (County of San Diego), Andre Sonksen (City of San Diego), Paul Hartman (City of Vista), Karen Holman (Unified Port of San Diego), Alison Witheridge (City of Oceanside), Mikhail Ogawa* (City of Del Mar), Drew Kleis* (City of San Diego) **Indicates representatives rotated during the meeting.*

Orange County Copermittees (5): Grant Sharp (Orange County Flood Control District), Mary Anne Skorpanich (County of Orange), Ted Von Bitner (County of Orange), Richard Boon (County of Orange), Devin Slaven (City of Lake Forest, Lisa Zawaski* (City of Dana Point) **Indicates representatives rotated during the meeting.*

Riverside County Copermittees (3): Claudio Padres (Riverside County Flood Control District), Bob Collacott (Riverside County Flood Control District), Mike Shetler (County of Riverside)

Environmental Community (3): Colin Kelly (Orange County Coastkeeper), Jill Witkowski (San Diego Coastkeeper), Roger Butow (Clean Water Now! Coalition), Thom Spanos* (San Diego Coastkeeper) **Indicates representatives rotated during the meeting.*

Development/Business Community (3): Bryn Evans (Industrial Environmental Association), Wayne Rosenbaum (BIA), Mike McSweeney (BIA), Mark Grey* (BIA) **Indicates representatives rotated during the meeting.*

U.S. Environmental Protection Agency (US EPA) (1): John Kemmerer

San Diego Water Board Permit Team: David Barker, Wayne Chiu, Laurie Walsh, Eric Becker

II. Focused Meeting Highlights

David Barker (RWQCB) announced that there will be an additional meeting on the topic of hydromodification. The County of Orange has taken the lead on organizing the event, which will run in the same manner as the other focused meetings. Details will be sent out once they are available. A tentative decision has been made to have the meeting the last week of August.

David Barker (RWQCB) provided brief remarks on some of the points raised in the past focused meetings that are resonating with the RWQCB staff.

1. Monitoring doesn't have to be water quality sampling. Water quality data are not the only assessment tool that can be used. There were requests that monitoring programs should include field observations as monitoring data, especially for non-stormwater discharges.
2. Adding language to the permit, not just the fact sheet, about the non-enforceability of action levels.
3. Adaptive management in the permit should be flexible enough for the Copermittees to learn without fear of being out of compliance with the permit.
4. Including more specific public participation requirements for development of Water Quality Improvement Plans, and for development of priorities for the Water Quality Improvement Plans.
5. Clarifying Board approval process for all plan submittals, reports, and updates.
6. Making it clearer in the permit what is eligible for adaptive management practices and clarifying the points of compliance in the permit.
7. Consideration of other means of demonstrating compliance with TMDL requirements that are consistent with the assumptions and requirements of the TMDL. The Board does see some flexibility in how waste load allocations are incorporated into the permit.
8. Examining the proposal to change the permit language from "prohibit" to "effectively prohibit" non-stormwater discharges.

David Barker (RWQCB) did caveat that this is not a complete list, and the omission of any points does not mean the Board is ignoring the issue or has made a final decision on the issue.

III. Monitoring Requirements Introduction

Eric Becker (RWQCB) explained how RWQCB staff developed the monitoring provision in the administrative draft permit, almost starting from scratch. The Board looked at what is truly required in federal regulations of the monitoring program and included that in the

monitoring provisions. The Board also listened to feedback from the Copermittees from meetings, as well as recommendations from the Report of Waste Discharge (ROWD). It was a conscious change to include monitoring as a provision within the permit instead of as an attachment. The main goals of the monitoring program are to ensure non-stormwater discharges are eliminated, pollutants in storm water discharges are reduced to the maximum extent practicable (MEP), and that water quality limits are met in the receiving waters. The Board also wants to increase jurisdictional accountability, make sure that monitoring is used as a feedback loop to adapt programs, and identify illicit discharge sources within the MS4, including those outside of the control of the Copermittees. RWQCB staff expects significant changes to this Provision.

IV. Stakeholder Monitoring Presentation

All stakeholders were provided the opportunity in advance to formally present materials at the focused meeting. The San Diego County Copermittees took advantage of the opportunity.

Jo Ann Weber (County of San Diego) stated that we all share a common goal of protecting beneficial uses in waterways. The purpose today is to build on the considerable level of effort already done and provide insights as to what works and what doesn't work. The program as written in Provision D does not support adaptive management. The San Diego County Copermittees have developed a new approach using specific questions provided by RWQCB staff.

The approach proposed by the San Diego County Copermittees is to require development of a Monitoring and Assessment Program (MAP) as part of each Water Quality Improvement Plan to provide information needed to answer management questions and support effective adaptive management. To do so, the San Diego County Copermittees propose to coordinate Provision II.D requirements with Provision II.B language. The goal is to answer the three big assessment questions as efficiently as possible.

Adaptive management has three phases: long-term planning, implementation, and assessment. To provide useful feedback, the MAP is proposed to be developed during the long-term planning process during the first twelve months after permit adoption. Monitoring needs to be coordinated with the other programmatic elements to provide the most useful information.

The San Diego County Copermittees see monitoring fitting in with overall program management. It fits in with the other implementation elements; it is not an element outside the program. To illustrate this, see the following figure.

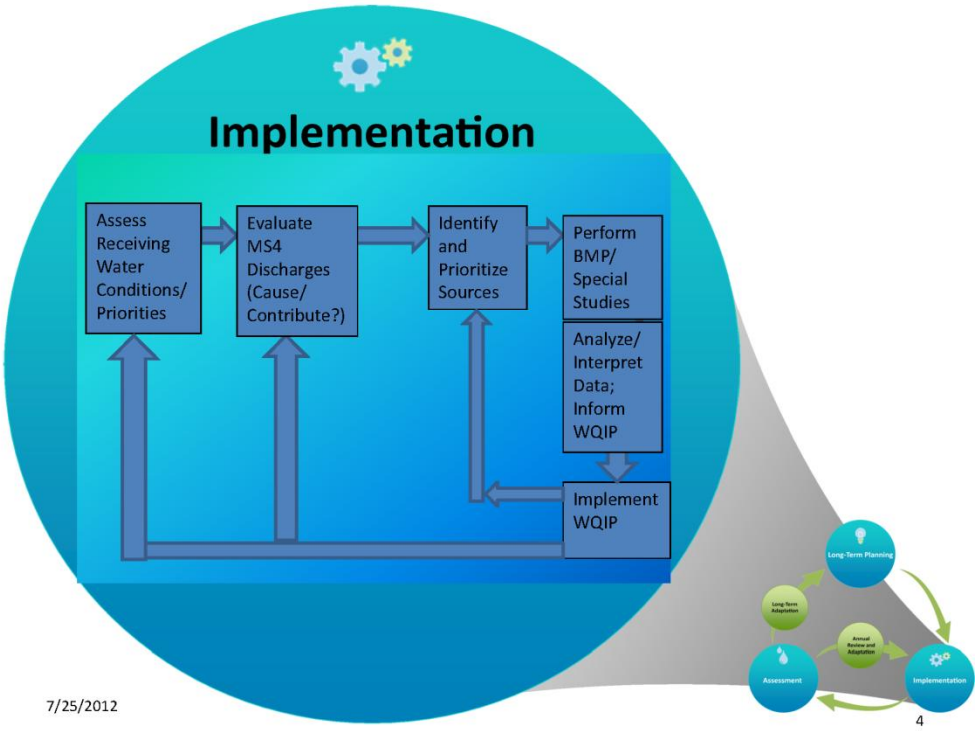

The four overall components of the monitoring program (assess receiving water conditions/priorities; evaluate MS4 discharges; identify and prioritize sources; perform BMP/Special Studies) are shown across the top of the above diagram. The loop across the bottom of the diagram is the adaptive management, or feedback, process.

The San Diego County Copermittees have been monitoring receiving waters for close to 20 years now and have a high level of understanding of the problems in many of the receiving waters. In the 2007 San Diego Permit, the San Diego County Copermittees began to incorporate MS4 stormwater conveyance monitoring to determine how MS4s were impacting the receiving waters. The San Diego County Copermittees are now looking to move this information forward by placing more focus on identifying and prioritizing sources. In earlier permits, a lot of time has been spent in the first box on the left. The focus now should be taking resources and moving forward in the process.

The San Diego County Copermittees believe that this is the nexus to effective implementation because it fits into adaptive management and can guide and utilize other programmatic implementation efforts to improve water quality. For example, if nutrients and bacteria are priority problems, then sources of each must be considered separately. Different strategies for implementation will be necessary to target each audience. Pilot BMPs and other special studies will provide specific information to improve and target implementation activities. These studies may involve more than just water sampling. The loop at the bottom of the diagram represents the adaptive management process.

The San Diego County Copermittees recognize that watersheds are at different levels of understanding with respect to each of the four components. Those with TMDLs have a more mature program. The goal of the MAPs will be to strategically tailor the balance of

monitoring to the prioritized needs of the specific watershed management area. The result will be efficient, coordinated monitoring with an enhanced watershed and TMDL focus.

Provision D in the administrative draft permit has a lot of focus on the first two boxes, but does not allow Copermittees to shift effort to the third and fourth boxes. The San Diego County Copermittees would like that flexibility. The Copermittees want to coordinate the monitoring in Provision D with the assessment plan required in Provision B. To do so, the San Diego County Copermittees propose an Alternate Provision II.D to maximize the benefits of the programs overall. The concept is to use an informed design strategy that tailors a question-driven approach, starting with general questions that lead to more specific questions. The Copermittees would not be starting from scratch; rather, they would be building on the last 20 years of monitoring strategies. Also, as monitoring is not just water sampling, the Copermittees want to incorporate alternate monitoring methods better than has been done in the past. Ultimately, this will support watershed priorities and allow Copermittees to focus water resources on high priorities within each watershed.

The San Diego County Copermittees are proposing alternate language for Provision D that will better provide program managers with needed information to support effective adaptive management. The proposal includes having monitoring within the overall planning process of the Water Quality Improvement Plan. To accomplish this, the San Diego County Copermittees propose a phased approach with pre- and post- Water Quality Improvement Plan phases. The MAP would be developed as part of the Water Quality Improvement Plan. With this approach, the first and second year monitoring requirements would be set forth in the permit as part of a transitional monitoring program. The monitoring requirements would be re-assessed and adjusted as necessary to support the highest priorities in each watershed.

If the permit is adopted in spring 2013, then the current Order No. R9- 2007-0001 monitoring would continue until September 30, 2013 to accommodate the resource commitments for the current fiscal year. The transitional (pre-WQIP) monitoring program would run from October 1, 2013 to September 30, 2015 to accommodate the public review, RWQCB review, and lead time necessary for budgeting. The MAP as part of the Water Quality Improvement Plan (post-WQIP phase) would be implemented from October 1, 2015 forward.

The scientific basis of the San Diego Copermittees' proposed Alternate Provision II.D is an informed, question-driven approach. This approach is strongly endorsed at local, regional, state, and federal levels. At the June 2012 RWQCB meeting, RWQCB staff presented a similar approach that was well-received by the Board. The process proposed by the San Diego County Copermittees aligns well with the condition assessment process proposed by RWQCB Staff with an emphasis on setting priorities. All of these documents (A Framework for Monitoring & Assessment in the San Diego Region (SDRWQCB, 2012), Southern California Stormwater Monitoring Coalition's Model Monitoring Program (SMC, 2004), SWAMP Assessment Framework (SWMP, 2010), Elements of a State Water Monitoring and Assessment Program (EPA, 2003)) stress the importance of basing monitoring on clear questions that support explicit decisions ensuring that data are

gathered only when there is a validated framework in place. These documents follow an earlier National Research Council report on monitoring, which emphasized the importance of building on clear conceptual models and questions that are linked to management needs.

Jo Ann Weber (County of San Diego) stated that today she will summarize key technical issues that support Alternate Provision II.D. Detailed explanation will be provided in a separate memorandum to the RWQCB, including specific permit language revisions.

One key proposed change includes jurisdictional non-stormwater monitoring in Section II.D.1.a. Instead of extensive MS4 outfall testing, the San Diego County Copermittees propose to conduct a targeted program to reduce persistent flows that impact receiving water quality, thus allowing resources to focus on actions to ultimately improve water quality. The San Diego County Copermittees also propose a broad program to eliminate transient illicit discharges/illicit connections (ID/IC) getting the spatial coverage by using visual surveys and appropriate follow up criteria.

In addition, for the jurisdictional stormwater monitoring, instead of extensive MS4 outfall monitoring, the Copermittees propose monitoring homogeneous land uses as input to a model. This wet weather runoff modeling would better inform the planning process by prioritizing drainages for implementation efforts. Representative typical mixed-use sites could be used as a cross-check for model results. Selection of representative outfalls with homogeneous land use types may be coordinated and shared among Copermittees to provide the most efficient representation and characterization of major land use categories. Modeling currently being done as part of the bacteria TMDL implementation plan efforts may be built upon.

The San Diego County Copermittees recognize that the RWQCB wants to see jurisdictional accountability. Jurisdictional accountability should focus on completion of the iterative process and would be supported by data collected at prioritized targeted MS4 outfalls. The San Diego County Copermittees feel that the administrative draft permit's jurisdictional boundary monitoring does not support their goals. In the past, data have shown that jurisdictional boundary monitoring has little value, due to a combination of typically high variability of the concentrations of constituents in receiving waters and discharges, and a relatively small percentage of discharge flows and pollutant loading in the receiving waters. This combination of high variability and relatively small impacts or differences requires extremely high numbers of samples to detect significant differences and would be unlikely to result in any programmatic changes or improvements to water quality.

In addition, instead of the extensive compliance monitoring proposed to comply with the Bacteria TMDL in Attachment E, Copermittees have already developed monitoring programs to comply with Bacteria TMDL requirements that are due October 2012. The current language in Attachment E would replace the monitoring planning effort just completed.

Andre Sonksen (City of San Diego) continued that the workgroup has spent significant time and effort developing their proposed approach. One key point is that this is an ordered process that leads to solving specific water quality problems. This process can be applied at

any level – watershed, jurisdictional, or pollutant level. There are three different components to this: management questions (on the left), monitoring components (in the center), and assessment components (on the right). All three components are essential for this to work.

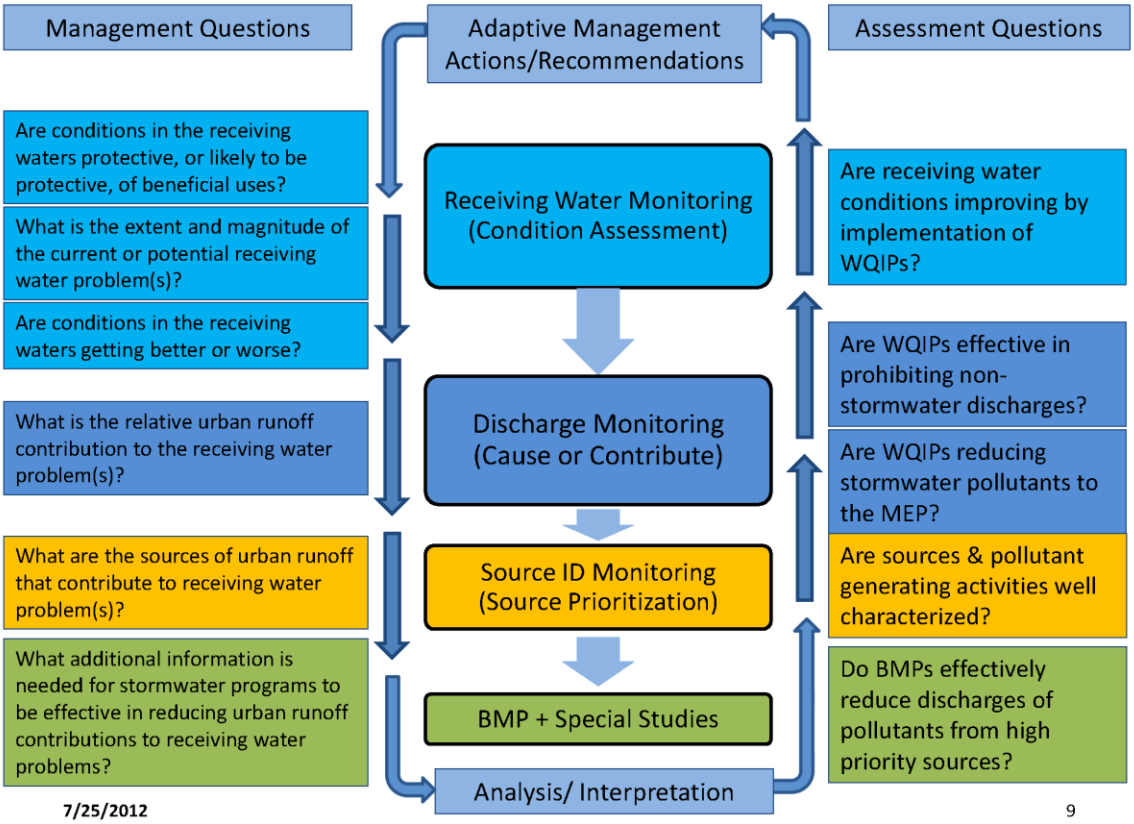

The administrative draft permit focuses on the top four management questions, the receiving water and discharge monitoring, and assessment. There are two more levels needed: source identification and special studies/BMPs. The top three (blue) deal with receiving waters. The next one (darker blue) is discharge monitoring. Yellow is source identification and pollutant-generating activity (PGA) monitoring and identification. The bottom (green) is special studies.

The process starts at the top and moves down. When starting at the top in receiving waters, information is collected that feeds down into discharge monitoring, which feeds into source identification, which then feeds into BMPs. These have to work together. Collecting information at a lower level without collecting information at higher levels will not work. The top question needs to be answered first, or else significant time and effort might be spent looking at something that is not a problem.

The assessment train works in reverse, going back up the process: start with data collected through special studies/BMPs, analyze if the BMPs were effective or if the special

study gives information for feedback into source identification or prioritization, and so on, up the ladder.

The Copermittees have spent a significant amount of time developing how each of these different components are outlined, how they work from top to bottom, left to right, and this is a very well thought out, organized, and methodical process to collect information with direct impacts on how to implement programs.

Andre provided Chollas Creek as an example. In Chollas Creek, the Copermittees have been doing a significant effort for the past 20 years that has culminated into TMDLs for bacteria and metals. Extensive receiving water information has already been collected, the Copermittees already have information at the MS4 discharge level, and there have been special studies completed in Chollas Creek. Looking at the proposed flowchart, some of the questions have already been answered in Chollas Creek. Special studies and BMPs are the next phase for Chollas Creek. Other watersheds don't have the plethora of data that Chollas Creek does, so they would start towards the top of the flowchart.

Claudio Padres (Riverside County Flood Control District) asked if the intent is that this process would be integrally part of the Water Quality Improvement Plan and if the types of monitoring being described would be focused on the high priority issues identified in the Water Quality Improvement Plan or if it would be discharge monitoring everywhere. Andre replied that the MAP would be integrally part of the Water Quality Improvement Plan. This is a methodology for implementing monitoring and how monitoring should be used to inform program planning, program implementation, and adaptive management. For watersheds that have developed high priorities already, the process would be used to tailor the monitoring to get at the issues that are further down in the monitoring tree.

Paul Hartman (City of Vista) stated that the point of the monitoring programs is to allow Copermittees to focus resources on strategic areas identified in the Water Quality Improvement Plan. The way monitoring is laid out in the current administrative draft permit is too prescriptive. Ultimately, the focus needs to be further down in the above diagram, focusing on source identification and special studies.

Claudio Padres (Riverside County Flood Control District) stated that if the intent of the permit is to allow the Copermittees to focus their resources on those high priority issues, then one way to do that is to allow them to focus their monitoring resources, and staffing and time and money, and not spread resources too thin trying to assess everything everywhere.

Colin Kelly (OC Coastkeeper) asked how far the San Diego County Copermittees reached out to Riverside and Orange County about these general ideas. Claudio Padres (Riverside County Flood Control District) responded that the San Diego County Copermittees have been reaching out to Riverside. Unfortunately, due to deliverables under the current Riverside MS4 permit, the County of Riverside has not been able to be involved; however, he has heard a lot of good points and is so far in support of the San Diego County Copermittees presentation today. Richard Boon (County of Orange) stated that Jo Ann Weber has been studiously involving Orange County in conference calls with the group that

developed this approach. Orange County certainly endorses and supports the question-driven approach.

Colin Kelly (OC Coastkeeper) asked if the RWQCB anticipates each program doing every step in this process or if findings can be shared across the jurisdictions, such that if the City of San Diego has done an air deposition study, can those results be taken and used by Orange County so they aren't all doing the same special studies.

David Barker (RWQCB) replied that one reason they are pushing the regional permit is to allow collaborative use of studies.

Mary Anne Skorpanich (County of Orange) shared that she sees this approach very much fitting in with some of their own thoughts that these Water Quality Improvement Plans should take a much more central role in the permit overall. She is completely in concurrence with the overall monitoring required by the permit being linked to the Water Quality Improvement Plan.

Jo Ann Weber (County of San Diego) stepped through the pre-Water Quality Improvement Plan (transitional) monitoring and examples of post-Water Quality Improvement Plan monitoring proposed in Alternate Provision II.D, beginning with receiving waters. The San Diego County Copermittees recognize their responsibilities and commitment to maintaining a level of effort of monitoring during the pre-Water Quality Improvement Plan or transitional phase similar to the current 2007 permit, but adapted to provide more useful information to support Program Managers' needs.

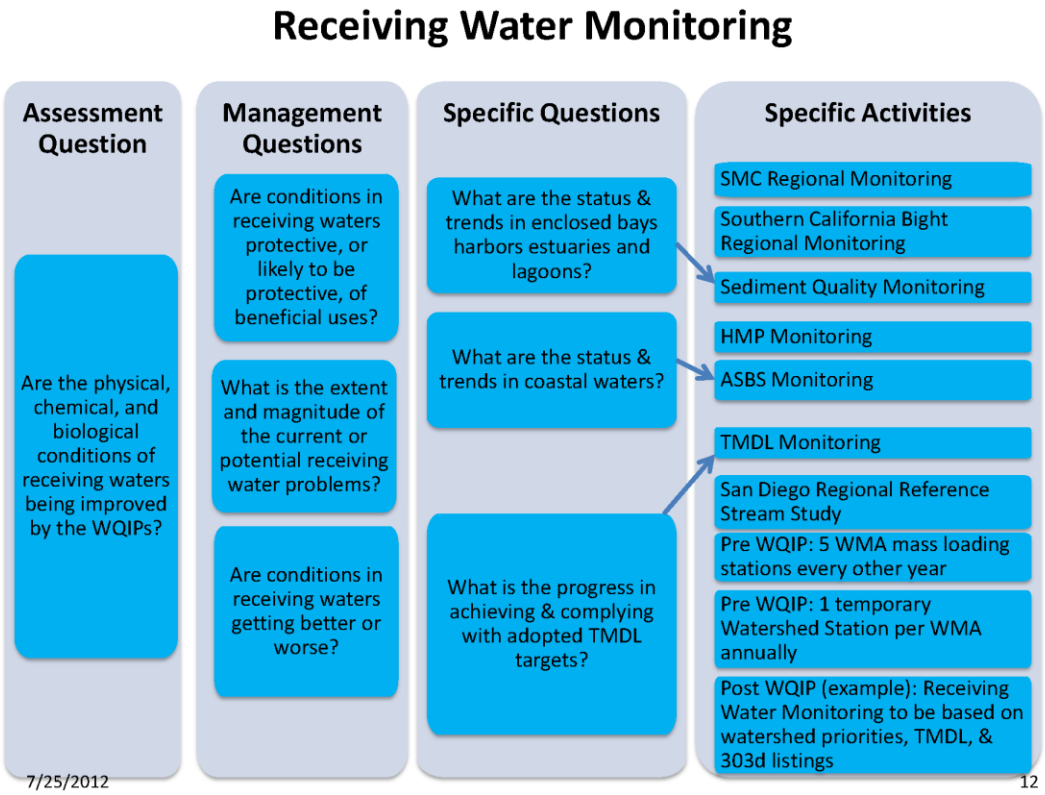

The above diagram illustrates the use of the question-driven approach in designing activities for receiving water monitoring. The process goes from left to right. The Assessment Questions (left side) are from the current Provision II.D ("Are there improvements in the receiving waters conditions?"). The second column lists the appropriate broad Stormwater Monitoring Coalition (SMC) questions that can be summarized as a status question, an extent and magnitude question, and a long-term trend question. These management questions provide context for the more specific, technical questions (third column) and associated monitoring activities (fourth column). Monitoring results from any given activity may only partially contribute to answers for the "big picture" management questions. The specific questions (third column) are examples of detailed study questions that could be used to design the monitoring program. When study questions are answered by specific activities, then the next prioritized study question can begin as part of the adaptive process.

The purpose of the monitoring is to assess trends of receiving waters and magnitude, highlighting rationale and benefits of specific activities. Copermittees are committed to continuing many of the receiving water monitoring programs and balancing sampling needs so that long-term receiving water trends will continue to be addressed. This process supports the question-driven adaptive management approach.

Paul Hartman (City of Vista) presented the Jurisdictional Non-stormwater Discharge Component of the Alternate Provision II.D.

Non-Stormwater Discharge Monitoring

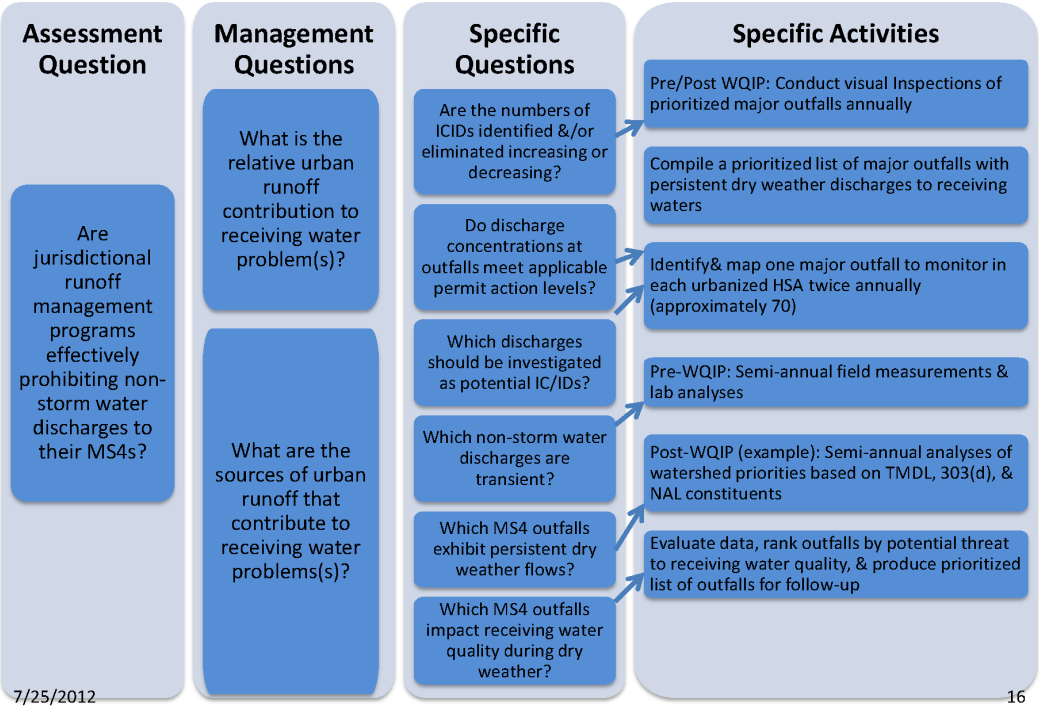

The primary assessment question on the left side is: Are jurisdictional runoff management programs effectively prohibiting non-stormwater discharges to their MS4s? To answer this overall question, the focus is on answering the management questions (second column). From these two management questions, specific monitoring questions have been developed to drive the design of the program. Examples of specific monitoring questions are provided above in the third column. These questions have led to the development of two distinct programs to address non-stormwater discharges during dry weather: one program targeting transient discharges focusing on IDDE; another program targeting persistent flows, designed to strategically prioritize and address outfalls with continuous non-stormwater discharges.

The transient flow program is rooted in a three-pronged approach designed to provide broad spatial and increase temporal coverage. The focus is on sources, the MS4 itself, and the MS4 outfalls discharging to receiving waters. This program would be implemented during both the pre-Water Quality Improvement Plan (transitional) and post-Water Quality Improvement Plan phases. The idea is that the main sources of non-stormwater discharges are addressed via programs such as Industrial, Commercial, and Municipal inspections. Based on analysis of recent data, this program appears effective in preventing discharge impacts. The second part of the transient flow program is to provide coverage of the MS4 system throughout the year, via jurisdictional programs such as complaint response, MS4 cleaning, and staff/citizen reporting of illicit discharges. The third part of the transient flow program consists of visual monitoring at major MS4 outfalls. This would require the updating of inventories and periodic surveys of major outfalls, looking for flow indicative of illicit discharges.

The persistent flow program is based on historical data gathered via existing dry weather programs, MS4 outfall programs, GIS information, and data from the visual observations program discussed previously to identify and prioritize major outfalls that exhibit persistent flows. The current MS4 outfall program will continue to its completion. Once identified and prioritized, one major outfall per hydrologic sub area would be selected for monitoring two times per year. This means approximately 70 outfalls would be under investigation throughout San Diego County at any time. As pollutants are reduced and non-stormwater flows are eliminated, the operation would continue through the prioritized list of outfalls. Comparison to numeric action limits would be used to prioritize outfalls within the Water Quality Improvement Plans.

By implementing the non-stormwater discharge program in two parts (transient and persistent), the Copermittees will be able to best utilize resources to eliminate and control the highest priority threats to receiving water quality.

Jo Ann Weber (County of San Diego) spoke to the stormwater discharge monitoring program.

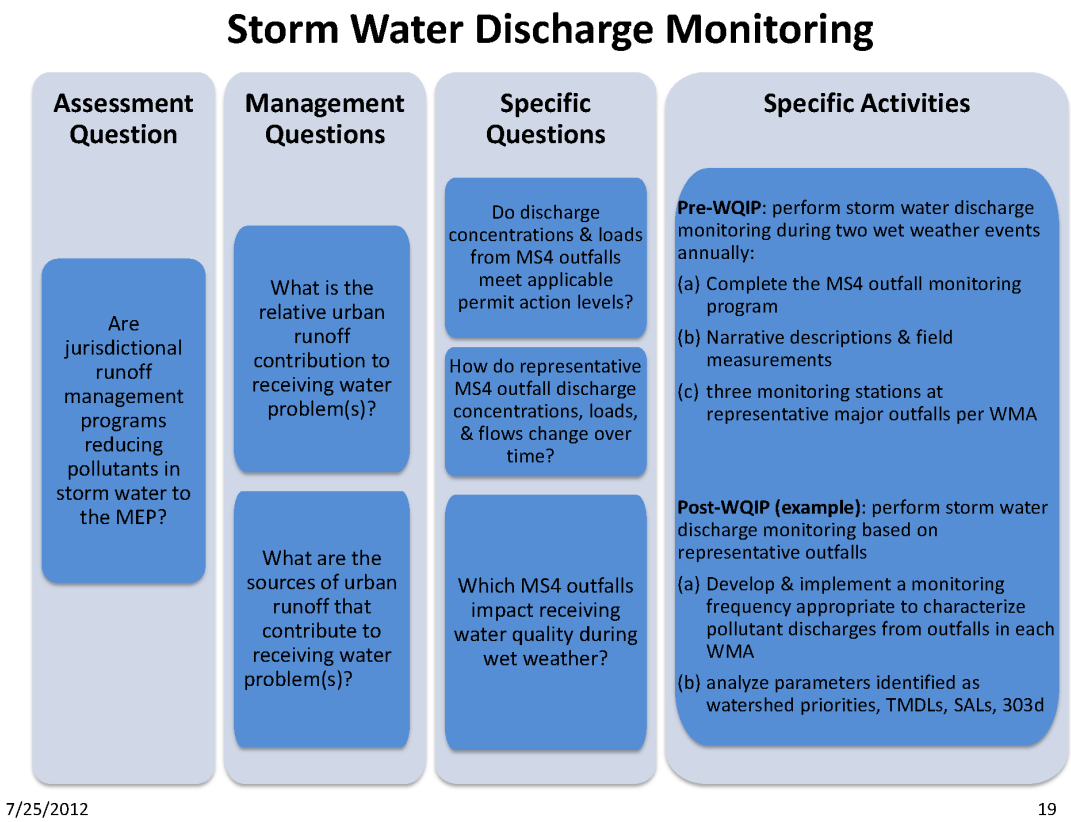

The overall assessment question from the administrative draft permit is if runoff management programs are reducing pollutants to the MEP (first column). The same two over-arching questions are: what is the relative contribution and, if significant, then what are the sources (second column)?

Using the specific questions to guide design, the pre-Water Quality Improvement Plan (transitional) monitoring program commits to completing the current outfall monitoring program (fourth column). In addition, the outfall monitoring in the pre-Water Quality Improvement Plan (transitional) phase would consist of at least three monitoring stations at representative major outfalls per watershed management area. Selection of representative outfalls may be coordinated and shared among Copermittees to provide the most efficient representation and characterization of major land uses. This will allow for more efficient and informed characterization of the MS4 discharges. This effort builds on the rainfall runoff models that use land use coefficients to estimate runoff loads. Sophisticated models developed as part of the implementation plans for the regional bacteria TMDL can be used to inform where additional data for local homogeneous land uses is needed. This proposed MS4 program will be more resource-intensive than the current MS4 program and demonstrates the Copermittees' commitment to gather useful data to target implementation activities.

The post-Water Quality Improvement Plan phase program continues a commitment to perform monitoring of outfalls to characterize pollutants from the MS4s; however, the

design of the program will evolve depending on the specific questions and needs of the watershed management area.

Benefits of this approach are multifold, including broad spatial and temporal coverage; support for assessment-driven, adaptive management approach; and, flexibility in site selection allowing jurisdictions to focus resources on the highest watershed priorities.

JoAnn Weber (County of San Diego) spoke to source/stressor identification (yellow layer). To provide the necessary feedback to improve program implementation, Copermittees have increased emphasis on the Source Identification and BMP/Special Studies, adding the assessment question: "Are sources and pollutants well characterized?" The Copermittees recognize that an increased understanding of sources allows implementation efforts to be focused.

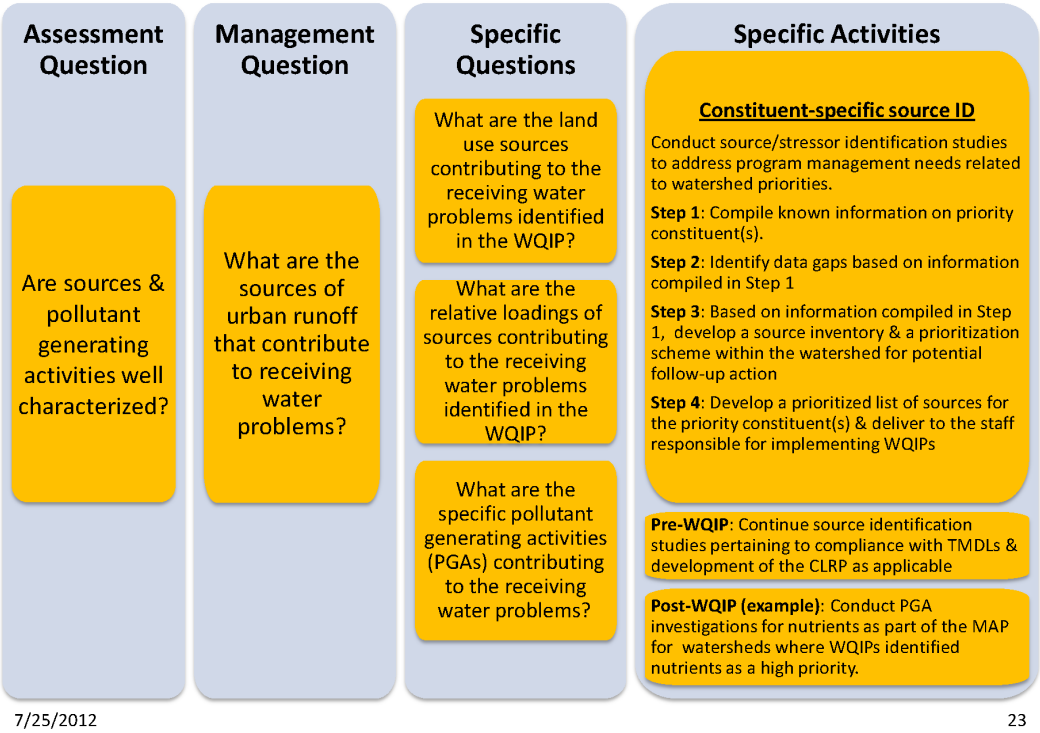

The principle role of identification is to identify and prioritize pollutant generating activities (PGAs) and source categories. PGAs can result in release of pollutants. Once PGAs are identified and prioritized, then behavioral changes and education can take place. Identification of high priority sources is an important step in support of the Water Quality Implementation Plan process, to help inform the development of effective pollutant control strategies for particular priority constituents on a watershed-specific basis.

The key benefits of the source/stressor identification studies are to provide program management with information to verify, quantify, and prioritize sources and provide links between sources, activities, and effects of runoff.

Andre Sonksen (City of San Diego) spoke to Special Studies/BMPs (green layer).

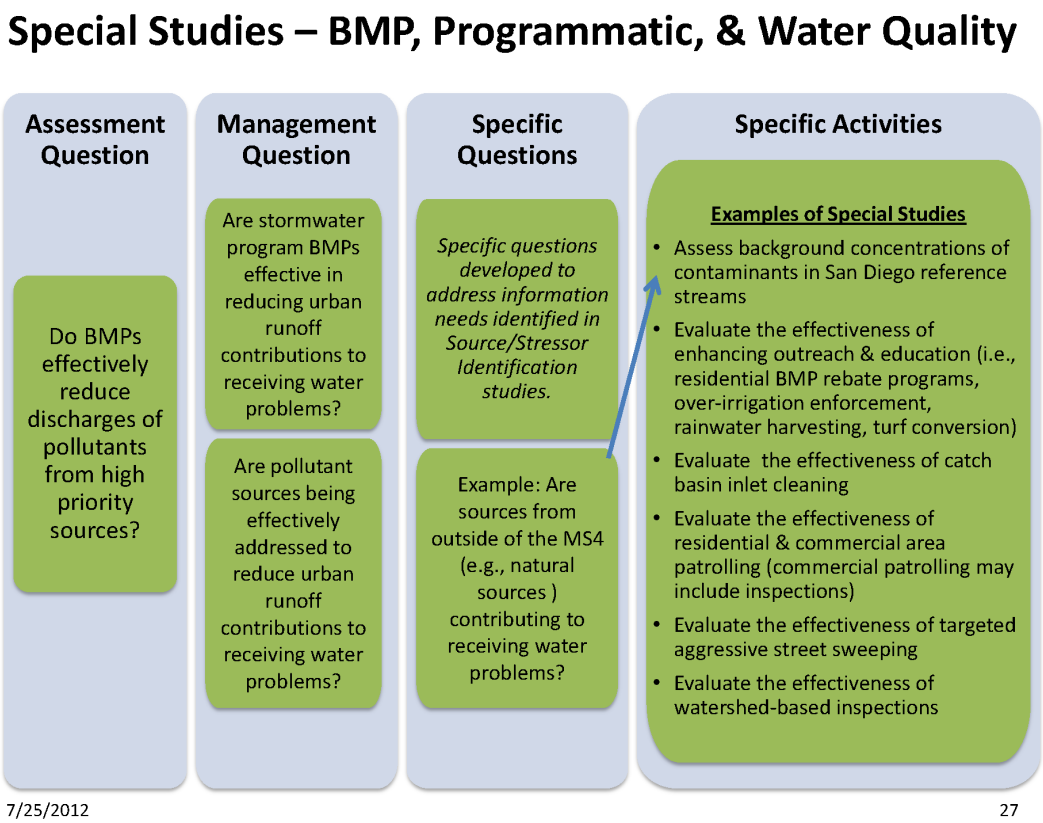

The BMP special studies program follows the same general format seen for receiving waters, etc. Assessment questions are from the administrative draft permit, management questions were developed similar to scope and language as that in the SMC, then specific questions are developed based on specific information needed or desired (third column).

The City of San Diego has used this process to evaluate one of the BMPs in the current permit: street sweeping. As an example, the management question was “Can street sweeping effectiveness be improved?” The City then conducted a pilot study in four phases; each phase had its own specific question. The question for the first phase was “Is there an optimum sweeping frequency? How often do you need to sweep streets to get the maximum benefit?” The question for phase two was “Is there a sweeper type that is better than the others? (vacuum vs. mechanical sweepers).” Phase three asked “How much pollutant removal does sweeping the median in streets add?” Finally, phase four asked “Is there an optimum sweeper speed?” Each phase of the study built upon the results of the previous phases. As a result of the study, the City implemented changes to their street sweeping program.

The purpose of special studies/BMPs is to support effective adaptive management, assess BMP effectiveness, and perform scientific investigations to address data gaps. The methods are very focused (pilot BMP studies, source identification special studies, water quality studies). The benefits are that this all feeds into adaptive management and how to improve programs to improve water quality.

Roger Butow (Clean Water Now! Coalition) asked who creates the questions for this question-driven approach and how much input or influence do watchdog NGOs have over the questions, as the questions are the beginning of the entire flow chart.

Karen Holman (Unified Port of San Diego) responded that the Copermittees started with RWQCB assessment questions from the original permit and SMC questions, especially in the blue areas of the below diagram.

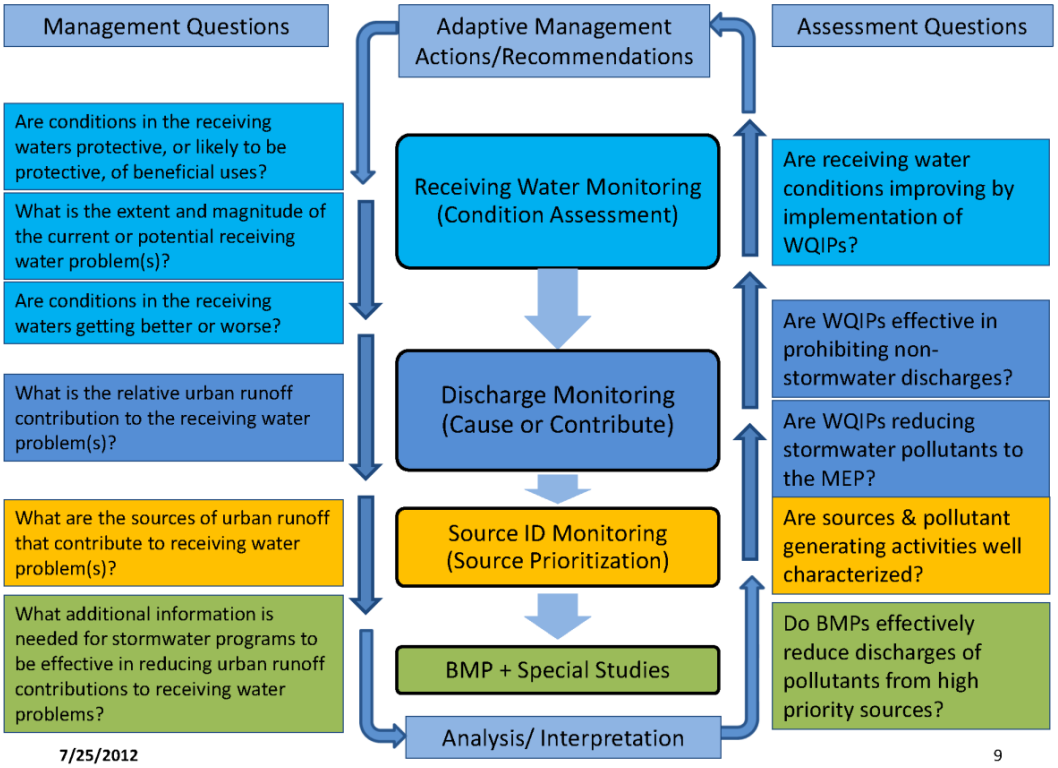

Karen continued that the next two levels (yellow and green) are where adaptive management starts, and that is where the Copermittees are focusing on making the nexus between monitoring and the rest of the permit programs. For these areas, the questions are being developed by the Copermittees based on needs. Questions could be driven by priorities in the Water Quality Improvement Plans; other focused questions could be on whether BMPs are working as expected. Karen hypothesized that NGO involvement could begin there, with the more focused questions that are aligning with Water Quality Improvement Plan priorities.

Jill Wittkowski (SD Coastkeeper) shared that the questions look to be along the right lines. If this is done hand-in-hand with the Water Quality Improvement Plan process, it

makes sense that the public participation process for the Water Quality Improvement Plan would result in a collaborative public process for developing some of the monitoring questions.

Jo Ann Weber (County of San Diego) provided an example of how a MAP might be developed in an example watershed. The slide below lists the steps for the strategic monitoring approach.

Developing Monitoring & Assessment Programs (MAPs) for Each WQIP

STRATEGIC MONITORING APPROACH:

1. Establish stormwater management priorities specific for each WMA ("Watershed Priorities") as part of WQIP development.
2. Compile existing monitoring data & assess available information for receiving waters, MS4 discharges, & sources or stressors within the watershed.
3. Identify regulatory & non-regulatory drivers that apply to water quality monitoring within the watershed, & list all associated monitoring responsibilities assigned to the Copermittees.
4. Evaluate the watershed priorities in context of available monitoring data & existing monitoring responsibilities, & develop specific management questions for each priority issue.
5. Establish metrics & identify assessments that should be performed to supply information needed to address the management questions.
6. Identify elements of a watershed-based monitoring program needed to address the watershed management questions & perform the necessary assessments.
7. Develop detailed monitoring plan to address the identified monitoring needs, coordinated with other ongoing monitoring in the watershed.

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For a sample watershed, assume priorities are TMDL for bacteria and 303(d) listing for copper and nutrients. A likely assessment question would be "Are jurisdictional runoff management programs reducing pollutants in storm water to the maximum extent practicable?" A likely management question would be "What are the sources of urban runoff that contribute to receiving water problems?" Following the previously presented flowchart, the next step would be to develop specific questions using available information. For bacteria and copper, MS4s are known sources; however, MS4s are less well known sources of nutrients. In this watershed example, loadings from land uses are not well quantified to support planning of wet weather management actions or evaluate their effectiveness. A specific question in this case would be "What are the representative MS4 outfall discharge concentrations, loads and flows?" The approach to answering the specific question is to support model development, calibration, and validation. Stormwater discharges should then be monitored at a determined number of sites based on appropriate land use characterization for modeling, at a determined frequency (e.g., 2 storms per year), for specific constituents (e.g., bacteria, copper, nutrients, and any other special study

needs), and for a specific duration (e.g., at least one adaptive management planning cycle to allow for data usability).

To include the San Diego County Copermittees' proposal in the draft permit, the next steps are to provide the RWQCB with Alternate Provision II.D and a technical memorandum with support and rationale for the alternate provision.

In closing, Jo Ann Weber (County of San Diego) stated that the purpose of monitoring is to provide information to program managers to inform implementation of the stormwater programs. A thorough and thoughtful planning process using a question-driven approach provides the roadmap for success. The San Diego County Copermittees have metaphorically traveled the freeways and will now venture onto the roads less traveled, including conducting source identification studies, BMP studies, and targeted special studies. The Copermittees admit they may meet dead ends along the way and through the adaptive planning process will be adjusting the strategic route. The Copermittees look forward to partnering with all stakeholders in the challenging journey ahead.

Roger Butow (Clean Water Now! Coalition) asked how and under what circumstances would the monitoring look at contaminants of emerging concern and take into account any recalibration of trigger levels or metrics. Claudio Padres (Riverside County Flood Control District) responded that there would still be a component of receiving water monitoring to detect emerging issues. The idea would be to assess each issue as it arises, annually go back and review data and review priorities. For example, if perchlorate became an issue, that would get on the priority list and would be set in order as far as doing specific programs to target that particular constituent. It would be addressed in the context of the Water Quality Improvement Plan and its priorities.

Paul Hartman (City of Vista) agreed that it is a matter of striking a balance in the monitoring program: some parts will be monitoring for a broad suite of constituents over the long term; other parts will drill down to activities and BMPs effective at preventing pollutants of concern. The monitoring program will keep a broad approach but will not be monitoring everything everywhere.

Mike Shetler (County of Riverside) shared that Riverside County actually developed a demonstration on flood control district property where they are evaluating different BMPs that could be used in the field. He encouraged Roger Butow to visit the demonstration project.

Jill Wittkowski (SD Coastkeeper) stated that having this presentation in so much detail shows the benefit of the workgroups that the San Diego County Copermittees have. It does not look like these workgroups will be going forward with the new permit. Jill believes it would be valuable to the overall process to continue these workgroups with the next permit.

Jill Wittkowski (SD Coastkeeper) mentioned that the purpose of monitoring that has been repeated a few times is to make the programs better. Another purpose is to keep the pulse of the waterways; to know if the waterways are healthy or not.

Jill Wittkowski (SD Coastkeeper) asked what parts of the administrative draft permit are prohibiting the San Diego County Copermittees' proposed process.

Paul Hartman (City of Vista) replied that there are certain portions of the permit that are focused prescriptively on receiving water and MS4 monitoring. A specific example is the current dry weather program which appears to look for more broad spatial coverage, increasing sampling sites to a ¼-mile grid system (from 40 sites to more than 380 sites for Vista) while also going from quarterly to monthly monitoring. The San Diego County Copermittees are looking for flexibility to dial back those requirements and focus resources through adaptive management monitoring to get valuable feedback.

Claudio Padres (Riverside County Flood Control District) stated that he sees the difference from a high level of what is currently in the administrative draft permit versus the adaptive management strategies presented by the San Diego County Copermittees is the difference between monitoring for monitoring's sake versus strategic monitoring. The current administrative draft permit is a broad brush to do everything everywhere, not the focused approach presented by the San Diego County Copermittees.

Mike McSweeney (BIA) appreciated the approach presented by the San Diego County Copermittees and appreciated that he could understand the thought process from looking at the flowchart. Mike agreed that sampling should not be done so infrequently that if something bad happens it is not caught. He complimented the Copermittees on developing a smart way to address what the RWQCB is looking for. He agrees with Paul Hartman (City of Vista) that the grid pattern seems to be sampling for the sake of sampling, not smart or strategic sampling.

Roger Butow (Clean Water Now! Coalition) asked RWQCB staff if the language "economic feasibility" and "technological possibility" will no longer be used as metrics in the permit.

Wayne Chiu (RWQCB) replied that those terms are not used in this permit. Everything in the permit is a technical possibility and is feasible. The question of whether it is cost effective is part of the equation as well. What the RWQCB has proposed here are the minimum federal requirements, but those are put in as a starting point to basically provide the Copermittees an understanding of what can be in a permit. Those terms are not being used anymore.

Richard Boon (County of Orange) spoke on the definition of MEP as it is a crux issue for this process. The State of California did define MEP in 1993 and used the language "public acceptance," "cost," and "technical feasibility." Until State Board Counsel withdraws that memorandum, Orange County would very much expect to see those discussions in this permit. With respect to monitoring, it would mean that the resources available for monitoring are finite; therefore, Copermittees must be careful with how they allocate resources to monitoring because every dollar spent on monitoring is a dollar not spent on implementation of BMPs.

David Barker (RWQCB) replied that in the administrative draft permit, the State's definition of MEP is listed as part of the definition of MEP; therefore, what Richard has stated is fully consistent with how the administrative draft permit is defining MEP.

Bryn Evans (IEA) stated that the IEA has comments on the permit with regard to permitted non-stormwater discharges, such as groundwater dewatering, that have their

own permits. These activities can be mapped and utilized in the other elements of stormwater programs, including third party data. This would allow Copermittees to cost efficiently understand where those permitted non-stormwater discharges are currently and then focus on non-stormwater discharges that do not have authorization.

Grant Sharp (Orange County Flood Control District) mentioned that Monday was the Phase II Small MS4 permit comment deadline. That permit will target small communities and non-traditional Copermittees, such as school districts, state beaches, state parks, etc. One of the interesting things is the requirement for these non-traditional Copermittees to begin to do water quality monitoring to develop IDDE programs. In addition, the draft Phase II permit also has action levels in it for non-stormwater discharges and when compared to the Phase I MS4 permit, they are very different. With the action levels in the Phase II permit, one of the conceivable situations is one of the new non-traditional Copermittees will be doing their own IDDE monitoring and determine they don't have a problem because findings are below their discharge action levels, but the findings could be above the Phase I MS4 non-stormwater discharge action levels. This results in double investigations with different standards. Grant suggested partnering with the Phase II Copermittees to reduce the chance of double investigations.

Jill Wittkowski (SD Coastkeeper) stated that the modeling makes her nervous. The value of any model is based on the validity of the data being used to create the model. If a bad model is used, then bad decisions may be made based on the bad model. She would like to see the modeling concept developed further so that modeling will be robust and give good information to make good decisions.

Andre Sonksen (City of San Diego) explained that the problem with the current models for the San Diego region is that most of the data for the models are not from the San Diego region. Moving forward, the Copermittees would collect region-specific information that would go into current models or refine models to make them applicable to the appropriate region.

V. Discussion on Monitoring Proposals Related to Permit Requirements

Jill Wittkowski (SD Coastkeeper) stated that Coastkeeper is not the only environmental group involved and interested in this permit. Coastkeeper understands that Copermittees are concerned about the cost and breadth of dry weather monitoring; however, some of the environmental groups do not think that cost should be an issue. It should not be the case that Copermittees are required to comply unless it is too expensive. Dry weather monitoring should be kept in the permit. Jill recognized that Copermittees seem worried about the ¼-mile grid system. An alternative view is that this is a dry weather blitz for the first year and maybe it does make sense for the first year to do a blitz and acquire a broad view of the health of our waters throughout the watersheds. Another possibility may be a tradeoff of dry weather monitoring in exchange for the Copermittees agreeing to the inclusion of numeric effluent limitations in the permit.

Jill Wittkowski (SD Coastkeeper) raised the issue of third party data; the permit allows use of third party data but it is not clear how and when that happens. Coastkeeper would like to see in the permit specific requirements for being able to use the third party data, such as requiring use of that data so long as Quality Control training is done. There is a perception that Copermittees only use the data that looks good for them. The permit should require all data to be used. Coastkeeper would also like to see a useful database where all of the data from the region comes together, including Copermittee data and third party data. The database should be accessible by the public and perhaps show green, yellow, and red as an overview of water health. If people knew better that there are serious problems in waterways, then they may support water quality improvement efforts more and there might not be huge budget struggles.

Jill Wittkoswki (SD Coastkeeper) stated that she heard earlier today there are some places for which the Copermittees do not have a lot of data. If they don't have data, Jill questioned how they are setting priorities.

Jill Wittkowski (SD Coastkeeper) acknowledged that commercial, industrial, and municipal inspections are doing a good job looking at non-stormwater discharges. The big question now is residential sources and what should be done about them. Jill would like to see a commitment from Copermittees to crack down on this issue; to really have a plan for residential sources and be willing to take a stand on it. Jill has seen in watershed reports that there is a problem. She also questioned that if non-stormwater discharges are supposed to be prohibited, then why are there numeric limits for the discharges and why should money be spent on analyzing the discharges rather than locating the sources.

Jill Wittkowski (SD Coastkeeper) recognized the discussion earlier about pollutant-generating activities (PGAs) and using studies to determine which PGAs need to be cracked down on. This information should already be known. Coastkeeper did an audit in the Agua Hedionda Watershed, identified a nutrients problem, and determined it was probably coming from nurseries. They did not see any big problems when doing inspections, but also have not seen any follow up or alternate plans. Coastkeeper would like to see work continued and followed up on.

Jill Wittkowski (SD Coastkeeper) had a general question about having one monitoring station per HSA. She would like to understand how that was chosen, as some areas it may be that more than one would be appropriate.

Colin Kelly (OC Coastkeeper) stated that some issues that Coastkeeper is concerned about were first discussed about an hour ago with the Clean Water Now! Coalition. Colin would like to know what the County believes that this modification might do to impact the prioritization of different waterbodies as constituents of emerging concern (CECs).

Colin wants to make sure that waterbodies not on the priority list are not ignored. Minimum monitoring should be required on the non-priority waterbodies to get a baseline. Colin clarified that he is not specifically asking for Copermittees to test for CECs, but he would like to know the minimum requirements.

Colin Kelly (OC Coastkeeper), regarding the use of historical data, would like to know what is considered to be historical data. There has been a significant adjustment in

technology and lower detection limits between now and the 1970s and 1980s. If there is a ten year term, Colin would like to know at what point will historical data not be useful, or what data can be used by third parties. Colin does not think money should be wasted in duplicative efforts between citizen water monitoring and Copermittee water monitoring. Third parties should be able to provide data to the Copermittees. Colin continued that with the use of historical data, there has been significant land development in Southern California. If there is a certain area that has data from the 1990s but has been developed since then with changed hydrology, then that may be a higher priority.

Thom Spanos (SD Coastkeeper) recognized that there are much more stringent requirements for monitoring during the first year of this permit, but after that it seems to allow much flexibility and the prioritization that the Copermittees desire. Thom asked Copermittees to take a step back and look from the broader perspective; it is not too much to ask that once in every five years Copermittees go back and make sure they are not missing anything. Thom continued that Coastkeeper does understand that costs can be significant, but the Clean Water Act is supposed to be a technology-forcing statute. If they are not made a requirement, then there will be no development in these fields. Copermittees should find ways to make this a more efficient process, into which adaptive management does feed. Coastkeeper does not want Copermittees held responsible for something that is not their fault. If action levels in Phase II permits are higher than Phase I permits, then this is the perfect opportunity for the RWQCB to implement more stringent requirements within their region. Thom hopes that everyone is keeping in mind not just the short term costs, but also the other factors involved.

Roger Butow (Clean Water Now! Coalition) thanked Coastkeeper for their comments on contaminants of emerging concern and that increased science does give a better ability to detect lower limits.

Roger Butow (Clean Water Now! Coalition) mentioned Aliso Creek as an example of sampling where sampling was done week 1 on Monday at 9 am, week 2 on a different day of the week at noon, etc., which resulted in a better window of sampling. He would like to see that type of sampling written into the permit itself, as well as integrating sampling by non-governmental organizations (NGOs). Roger agreed that sampling must take place in a manner that maximizes funds and maximizes the database being developed. Sampling the same time, the same day of the week at one site does not give a general concept of fluctuations and the ability to lead to source tracking.

Ted Von Bitner (County of Orange) stated that the RWQCB's goal is to answer basic questions: what is the condition of the watershed, are beneficial uses being protected, and how are those conditions changing over time? Each permit cycle, the Copermittees have changed their monitoring program. Losing that continuity causes the data set to become less valuable.

Ted von Bitner (County of Orange) continued that one of the primary principles of the NPDES Program in general has been that while you can judge the quality of your discharge by sampling at a specific point, you cannot judge the health of the watershed, which is the mission objective of the RWQCB. Orange County has started on that effort by coming up

with new programs, new monitoring designs that are designed to answer that question. Orange County has the Stormwater Monitoring Coalition's Regional Watershed Monitoring Program which gives a holistic view of the watersheds in general. That approach has also been used by the San Diego RWQCB for the San Diego River Integrated Regional Program, and they are now starting on a coastal program. There seems to be a common approach there that should be adapted for this permit. Following what Coastkeeper said and in context of the approach that San Diego provided, there are some basic questions that need to be answered first about the MS4: What is the condition of the MS4? What needs to be worried about? The Copermittees also need to answer basic questions like: What are the frequency and magnitude of PGAs? Who are the priority pollutant dischargers? The Copermittees cannot answer those questions at this point because they have tried in the past with programs, but each time the permit changes, the Copermittees lose their ability to answer those key questions. The Copermittees would hope to follow what has been proposed and bring back to their previous program. Thinking about the MS4 program, it should be an overall design, recognizing how much of the MS4 creates an impact on receiving waters. It should also be a comprehensive program where everyone comes together, including Phase II dischargers and the Industrial General Permit dischargers. With identical submittal dates, it is difficult to incorporate their program findings with the Copermittees' reports. There is no mechanism to incorporate that data. At same time, Ted does not get a sense from the administrative draft permit of when the RWQCB and Copermittees stop and meet; when does the adaptive management process kick in.

Karen Holman (Unified Port of San Diego) acknowledged that attendees are asking a lot of questions, and that is encouraging because that is why the San Diego County Copermittees developed this question-driven strategy. There are two types of questions: management questions and assessment questions. Looking at the diagram, it is structured in a way that makes sense, asking bigger general questions first, then moving down toward source identification and BMPs.

This approach envisions more time and effort spent on the yellow and green areas, then moving up to answer the larger questions. Going up the ladder focuses more on the assessment questions. At the end of this long phase, the Copermittees should be able to answer the receiving water questions. Adaptive management kicks in throughout the entire process, but especially in the yellow and green areas.

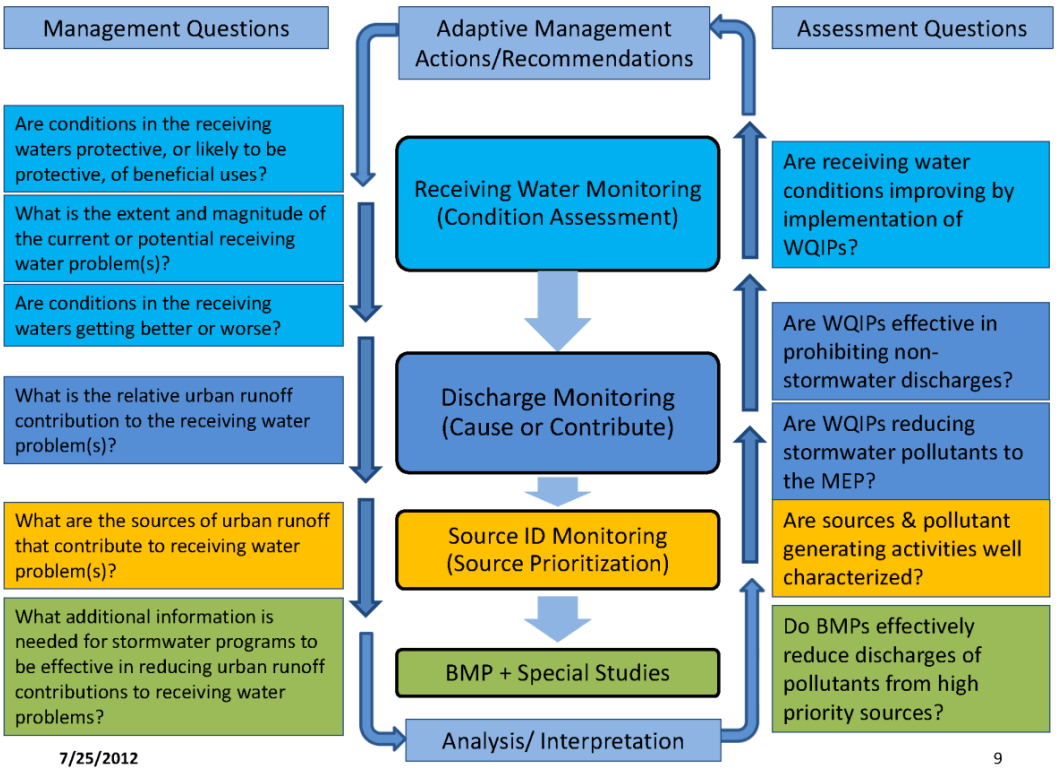

Alison Witheridge (City of Oceanside) shared that as a monitoring person for the last 5-10 years, she wants to believe that monitoring is the answer; that monitoring will indicate if water quality gets better or worse each year; however, she is disappointed each year when the data are analyzed that the variability in water quality data does not allow for indicating changes year after year or even in decades; the amount of data does not seem to help identify or eliminate sources. More data does not always mean more knowledge. That is why the San Diego County Copermittees are proposing a heavier visual observation program instead of straight water quality data collection. As a public employee, Alison needs to spend public funds in a responsible, efficient, and effective manner. For the City of Oceanside alone, it would cost 2 million dollars the first year to implement dry weather monitoring per the current administrative draft permit.

Jo Ann Weber (County of San Diego) continued that for Copermittees in San Diego it is a ten-fold increase in costs the first year with 94 percent for MS4 dry and wet weather monitoring, but at least 70 to 80 percent of that just for dry weather monitoring. In subsequent years, although it does decrease, it is still three to four times what is spent now. The Copermittees want to use their money where they get the greatest value for it. The quarter-mile grid was in the early programs in the mid-1990s and was a guidance document, somewhere to begin. Looking at the current permit writer's guide, it is perfectly reasonable to build on historical record instead of using such a prescriptive grid.

Jo Ann Weber (County of San Diego) is open to discussion on what threshold of monitoring is sufficient, considering visual observations as a key factor to get there. It is

hard to go through an entire MS4 system on an annual or biannual basis for larger jurisdictions, but the County would be okay with prioritizing efforts.

Claudio Padres (Riverside County Flood Control District) stated that regarding cost, his perspective is that everyone can toss around numbers all day, and really what it is not about is not spending money on monitoring; the Copermittees are not trying to avoid monitoring. The Copermittees have to answer to their constituents that they are using their money in an effective way; it needs to be effective monitoring.

Regarding the issue of "cherry-picking" of data, Claudio called attention to the fact that all MS4 permits require the MS4 Copermittees to report all collected data under penalty of perjury.

Claudio Padres (Riverside County Flood Control District) stated that monitoring does not solve problems by itself. Entire city budgets could be spent analyzing the situation without having solved a single problem. The Copermittees need to focus on the type of monitoring needed to take action on high priority issues. Monitoring is an easy way to steal large portions of budgets. The monitoring needs to be taken with an appropriate baseline to assess emerging conditions, taken into the Water Quality Improvement Plan process, and then engaged at the right level to locate sources and measure effectiveness.

Mike McSweeney (BIA) stated that it needs to be realized where our State is financially. It needs to be how smart work is done; not how much money is spent but how the money is spent. Copermittees are trying to figure out the best way to spend money. We all want the same outcome; therefore, there needs to be a sort of triage for priorities. The system should be focused on the outcome and what the best, most efficient way to reach that outcome is.

Andre Sonksen (City of San Diego) explained that when coming up with the proposed monitoring plan and proposing how to implement the program, the workgroup looked at dry weather monitoring program data for the last two years and found it was less than two percent effective in eliminating illicit discharges. The Copermittees do not anticipate that a shotgun approach during the initial year of the new permit would be any more effective than past programs. In developing the proposed process presented today by the San Diego County Copermittees, the workgroup looked at almost twenty years of data from their programs and other related water quality programs not only in San Diego but throughout the country and how to have real, effective changes in water quality.

Colin Kelly (OC Coastkeeper) acknowledged that everyone seems to be broke, and he is not hearing that prioritization is the wrong way to go. He does not, however, want this to be a program where the pause button is hit, causing the Copermittees to not know what is going on with non-priority issues for the next five years. Colin would like to know if there is a floor, and what it is. Focusing all jurisdictional resources on a small portion of a watershed and ignoring everything else is a concern.

Karen Holman (Unified Port of San Diego) agreed with Colin; the intent is not to look at one area in a Water Quality Improvement Plan and ignore the rest. She volunteered the best way to explain the proposed program in more detail may be to meet with Coastkeeper and explain the intent and potential details of the program.

Paul Hartman (City of Vista) stated that one way the Copermittees are looking to address that is through long-term monitoring at existing mass loading stations for a large suite of constituents, including monitoring for contaminants of emerging concern. Also proposed are temporary watershed assessment stations to cover water bodies where information is needed on those outfalls.

Karen Holman (Unified Port of San Diego) responded to Jill Wittkowski's earlier comment about why characterize non-stormwater discharges if they are prohibited. The San Diego County Copermittees are now proposing to look at the transient flows and eliminate transient flows by using observations or other monitoring efforts instead of analytical characterization of the flows. In areas with perpetual flow with sources that cannot be identified easily, those flows would be put into the prioritization program and steps would be taken in the yellow and green areas.

Paul Hartman (City of Vista) responded to Jill Wittkowski's earlier comment about one monitoring station per hydrologic subarea for persistent flows. That provides a broad look at the region, amounting to approximately 70 sites throughout San Diego. The idea came up when working through the Lagoon Investigative Order with SCWRRP, where it was noted that generally one to two outfalls contribute 80 to 90% of the pollutants found in a watershed. As the Copermittees can't monitor everywhere all time, they are trying to use resources effectively and this approach is practical from a staff perspective.

Wayne Chiu (RWQCB) expressed gratitude to the San Diego County Copermittees for providing their proposal as an alternative to what is currently in the administrative draft permit. Throughout this process the RWQCB has asked for recommendations, ideas, etc., and the San Diego County Copermittees have stepped up to the plate. Wayne continued that there are a lot of elements in what he heard today on which all can agree and buy into. The devil will be in the details, and there are a couple aspects where the Board may have its own thoughts. Generally, the approach is sound. In terms of considerations of cost and working smarter, the Board is in favor of that. What is currently in the administrative draft permit is quite onerous, and the Board was not expecting it to make it through to the final draft. The Board hoped to stimulate thinking among Copermittees and send the message that they want to see things done differently, with an increased effort toward eliminating non-stormwater discharges. This permit focuses on elimination first, analysis second for non-stormwater discharges. Stormwater discharges will be a much longer effort.

In terms of historical data, all data collected at any time can be useful. Whether or not it is comparable at all times is a different question. All data can provide historical context and show changes; therefore, any data collected can be used to inform the programs. Wayne agrees that monitoring does not solve problems, but it does indicate if a problem is being solved. Monitoring is needed to identify problems and then to indicate if progress is being made toward solving those problems.

This process is part of the iterative and adaptive management process the RWQCB is trying to incorporate into the permit. Monitoring is an integral part of this; that is why it is the central portion of the permit.

Wayne Chiu (RWQCB) continued that there are two major aspects of the monitoring that the RWQCB would like to make sure are still in the monitoring program: (1) the concept of individual jurisdictional accountability and responsibility and (2) identification of non-Phase I MS4 sources. Wayne is not sure that there is anything with what has been proposed that would inform RWQCB Staff as to what improvements are being shown or demonstrated within a receiving water within a Copermittee's jurisdiction. Wayne would also like to see non-Phase I MS4 sources identified through data. If the monitoring data being collected by non-Phase I MS4 sources are not enough to inform, then the RWQCB has the ability to compel additional information from those dischargers. With a common goal and common understanding through this permit, Wayne believes resources can be jointly used to address the problem.

Karen Holman (Unified Port of San Diego) stated that jurisdictional accountability needs to be in the programs because that is how budget is allocated by City managers. As the Copermittees have been presenting their proposal and talking in depth, it is understood that jurisdictional accountability is a key point for the RWQCB. One of the things the Copermittees are looking at is to see jurisdictional accountability in the green and yellow areas (BMP/Special Studies and Source ID Monitoring). Jurisdictional accountability may not be evident in receiving waters because problems may originate elsewhere.

Paul Hartman (City of Vista) stated that he heard several times in the first focused meetings that the RWQCB is looking for accountability via the iterative process and implementation but that assessment and adaptation of the Copermittees' programs would be more focused on improving the programs. The yellow and green processes are one of the ways to do that. Accountability of items in the blue areas is going to take years to see change unless the RWQCB is only looking at the elimination of non-stormwater flows.

Wayne Chiu (RWQCB) recognized that it will take a long time to see changes in stormwater. The Board expects to see changes in non-stormwater quicker if efforts are placed in the correct places. The Board also still expects monitoring to be done to establish the long-term stormwater trend.

Paul Hartman (City of Vista) stated that one of the places where the Copermittees experience discomfort is where the assessment question is what are the monthly flows and pollutant loads from all outfalls in a jurisdiction.

Wayne Chiu (RWQCB) responded that a lot of the requirements in the monitoring and assessment sections stem from 40 CFR stormwater regulations. There is one assessment requirement in the 40 CFR regulations concerning pollutant loads. That is where the pollutant loading assessment requirement came from. The RWQCB believes that is valuable information, whether it is obtained through modeling, statistics, or empirical data. The RWQCB wants a record of flows and pollutant loads coming out of each Copermittee's MS4; that record can be used to track how improvements are being achieved over time. The RWQCB does not expect everything to happen within a year or 10 years; however, they still need those records to see the trend.

Wayne Chiu (RWQCB) continued, speaking of assessment, when looking at the monitoring requirements, all the monitoring requirements in the administrative draft permit

were shaped and formed around assessment requirements, including what is coming out of the MS4 (non-stormwater and stormwater; what pollutants; how much). The receiving water is something that the RWQCB does not think needs to be monitored every year, but some monitoring data are still needed to establish trends over time. It could take decades to see the trend, but a record is needed to see it. The Copermittees should be using the monitoring data from this administrative draft permit and from the last 20 years to improve their programs.

Richard Boon (County of Orange) shared an approach to dry weather monitoring that had been in a prior permit: a hybrid dry weather reconnaissance program. It included monthly monitoring at over 60 stations across South Orange County. The program was designed to clearly identify aberrant anthropogenic sources (IDIC). It gave really good spatial coverage, directed resources very effectively, and created and established jurisdictional accountability. Richard would be happy to do a presentation on the merits of this approach. He spoke with US EPA headquarters' staff last Friday because they are trying to get the merits of this approach into national rulemaking expected next summer. The dry weather reconnaissance program has dry weather action levels that force the investigation of non-fecal sources of bacteria to identify conditions or pursue elevated bacteria levels that may be the consequence of vegetative decay, or pursue metal concentrations that are most likely from natural shallow groundwater sources. The dry weather reconnaissance program talks about adaptive management, prioritization, accountability, and focusing resources on the issues of real concern. Throughout this process and commentary on the draft permit, Orange County will be advocating for the statistical dry weather reconnaissance approach.

Claudio Padres (Riverside County Flood Control District) recognized that all information has value to the RWQCB. The Copermittees should be looking and focusing on data that have value as they relate to the high priority issues. Claudio asked if it was the intent of the RWQCB staff with the administrative draft permit to have the monitoring requirements be consistent with tailoring to high priority issues or if the intent to was to have monitoring requirements implemented irrespective of priorities.

Wayne Chiu (RWQCB) responded that the Board is trying to build in the ability for the Copermittees to use the monitoring data to inform their priorities. First year monitoring would take a look and make sure priorities are correct. Subsequent years of monitoring would primarily analyze the highest priority pollutants; however, there is a need to go back to make sure priorities are correct.

Claudio Padres (Riverside County Flood Control District) pointed out that one year of monitoring data (i.e., the first year monitoring mentioned previously) is not sufficient to establish priorities. Copermittees must also use historical data to create valid priorities. With that in mind, Claudio is unsure of the benefit of the blitz of first year monitoring currently in the administrative draft permit. Wayne Chiu (RWQCB) responded that RWQCB staff is open to revising that portion of the administrative draft permit.

Ted Von Bitner (County of Orange) reiterated Richard Boon's point about the hybrid dry weather reconnaissance program. It allows Copermittees to draw statistical inferences on a region-wide basis about overall conditions and priorities. Using the numeric approach, it

tells Copermittees what the background levels are across a large-scale region. From there, Copermittees can determine what the region's floor is. As sites are fixed and removed, the average begins to lower on a region-wide basis. With this method, the Copermittees have a robust physical model through which a more cost-effective, smaller-scale monitoring program can be developed that provides an increased power of analysis. Ted would prefer the permit to come back to this type of monitoring. Ted clarified that this monitoring would fit into the blue areas of the San Diego County Copermittees' diagram. Mary Anne Skorpanich (County of Orange) voiced concern that the Copermittees still need to pay attention to the top level (blue level) of the San Diego County Copermittees' diagram. Those top level questions are important to understanding the conditions in the receiving waters and protecting beneficial uses.

Jill Wittkowski (SD Coastkeeper) acknowledged that the regional clearinghouse is a great idea. If done well, it could be huge resource, and she would love to see it housed on the Regional Board's website. She believes there also needs to be public input into the process of creating the regional clearinghouse.

Jill Wittkowski (SD Coastkeeper) recognized the main point of the permit is that pollution has to be controlled to the MEP; however, it is very frustrating that even in the San Diego region people are doing inconsistent practices across the region. Jill would like to see a BMP clearinghouse or other mechanism that gives everyone access to the information gained from the special studies in the yellow and green areas of the diagram. Once jurisdictions have access to the information, they must use it unless they can prove they can't.

Alison Witheridge (City of Oceanside) replied that it goes back to prioritization and adaptive management. Not every watershed or jurisdiction will operate the same way. Jill Wittkowski (SD Coastkeeper) disagreed. All jurisdictions should be operating to the standard of MEP; therefore, BMPs should be implemented the same across jurisdictions. Laurie Walsh (RWQCB) clarified that if something is determined to be MEP, then it is upon the jurisdiction to enforce that on all their sites, and on the RWQCB to enforce that on the jurisdictions.

Andre Sonksen (City of San Diego) explained that monitoring is meant to be one small component of the iterative process of the overall stormwater management program. The street sweeping study is a perfect example. Instead of the general SMC questions, the street sweeping pilot program had specific questions and that is where the monitoring kicked in. Andre reiterated that Copermittees would be using the entire chart as one large process, not ignoring portions of the flowchart. He further stated that monitoring does nothing unless the correct questions are answered, followed by changes to programs based on the monitoring results.

VI. Parking Lot Discussion

The group re-visited off-topic items from the previous focused meeting.

- CalGreen/Hydromodification Dedicated Meeting: There will be a dedicated hydromodification meeting. Richard Boon (County of Orange) is taking the lead. CalGreen will not be included in the meeting.
- Legal Issues: Copermittees' counsels are attempting to proceed with a parallel track of meetings with Regional Board Counsel; however, Regional Board Counsel does not see a purpose to meeting at this time and does need more time to respond to the letter from the County of Orange. This will be updated at the next focus meeting.
- Aliso Creek / specific areas of geography / BET and Other Technologies: This topic has to do with to what degree does the new permit structure speak to or promote emerging technologies. This should be covered in a future focused meeting.
- Ninth Circuit Court Decision – The administrative draft permit has two central provisions dealing with compliance: one is compliance with water quality standards, and one is compliance with water quality standards being obtained through the iterative process. The RWQCB is discussing this internally; however, they have had no conversations with legal counsel yet, although it is a legal issue. David Barker (RWQCB) recognized that this is one of the high priority issues that have been raised and will put some thought into how to address it at the next meeting.
- Regional BMP Funding and Implementation: There is concern that the permit as currently written does not encourage regional BMPs although regional BMPs have great promise for improving water quality. This will be covered in the next focused meeting.
- Review time for permit: The deadline for written comments on the administrative draft permit is September 14. In light of the newly added meeting on hydromodification, scheduled for the last week in August, Mike McSweeney (BIA) asked for an extension on the written comment period. Jill Wittkowski (SD Coastkeeper) disagreed that one topic should push the process out additional weeks. RWQCB staff stated there will be no change to the written comment deadline.
- Monitoring Presentation by San Diego County Copermittees: This was provided at today's focused meeting.

VII. Other Topics / Audience Comments

Comment: Claudio Padres (Riverside County Flood Control District) stated that it would be helpful to know the RWQCB's vision for adaptive management to better provide comments on the administrative draft permit.

Response: David Barker (RWQCB) will address this at the beginning of the next focused meeting.

Comment: Colin Kelly (OC Coastkeeper) stated that the handout from the San Diego County Copermittees was useful; however, some advance notice would be helpful in having valuable discussion. Colin asked for distribution ahead of time for the next focused meeting, if possible.

Response: Materials for future meetings will be distributed ahead of time when possible.

Comment: Mo Lahsaie (City of Oceanside) stated that Federal regulation does not take economics into consideration but Porter Cologne does. Since 2008, with the economy going down, the budget in Oceanside is getting leaner every year, not staying the same.

Comment: Richard Gardner (Capistrano Beach) identified himself as an advocate of water quality, stating that he wished the discussion could have gone into more detail on monitoring, including the constituents (nutrients, dissolved oxygen, toxicity). There are narrative ways to look at toxicity and ways of changing water quality without going after numeric standards or TMDLs. Richard further stated that the health of the riverine system needs to be evaluated. In other areas, regulators should be open minded to looking at different criteria for monitoring in different areas. He does not feel this is covered in the permit. Furthermore, treatment plants, sterilization of water, permits that allow that to continue without monitoring requirements; those should be interim as they could impact the way to deal with FEID. This is also not in the permit now and needs to be dealt with.

Comment: Rosanna Lacarra (City of Coronado) shared that in 2001 the City of Coronado had great results with IC/ID. They yielded good results and were able to eliminate transient and persistent discharges. Now the focus should be on revamping the program to re-strategize and continue efforts under the proposed permit.

Comment: Mikhail Ogawa (City of Del Mar) requested that existing development be the first topic at the next focused meeting.

Comment: Karen Holman (Unified Port of San Diego) stated that this process has been a real asset to all those around the table, allowing for communication and valuable discussion prior to formal issuance of the permit. Karen appreciates the open process and correspondence throughout the process with the RWQCB and other stakeholders.

VIII. Meeting Adjourned

San Diego RWQCB
Permit Reissuance Focused Meeting

July 25, 2012

Adaptive Management Areas of Permit: Monitoring & Assessment Program (MAP)

025774

Concept: Develop MAP as part of each Water Quality Improvement Plan to provide information needed to answer management questions & support effective adaptive management

MAP Elements:

- Receiving Water Conditions
- MS4 Discharges – Non-stormwater & stormwater
- Sources/Pollutant Generating Activities
- BMP Studies/Program Assessments

Example: Increase efficiencies in IDDE Programs with observational methods (or other strategies); monitoring includes activities beyond water quality sampling

Action Items:

- Structure initial requirements according to above in Section II.D.
- Coordinate Prov. II.D requirements with Section II.B. language requiring a strategic monitoring & assessment program as a part of the WQIPs.

Adaptive Management Areas of Permit: Long-Term vs. Annual Processes

025775

- Data / Findings
- Priorities/Targets
- Strategies
- Schedules
- RWQCB approval

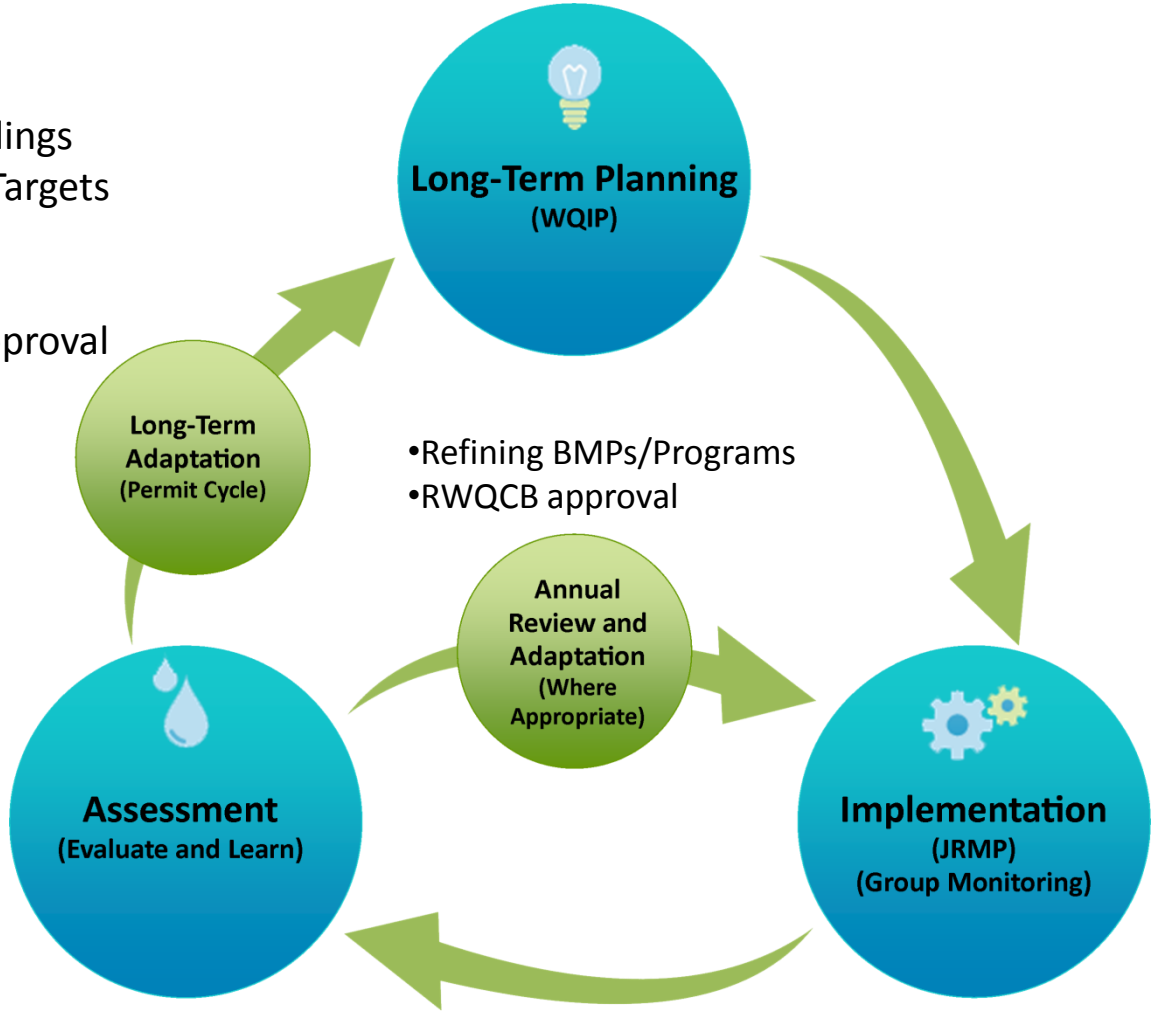

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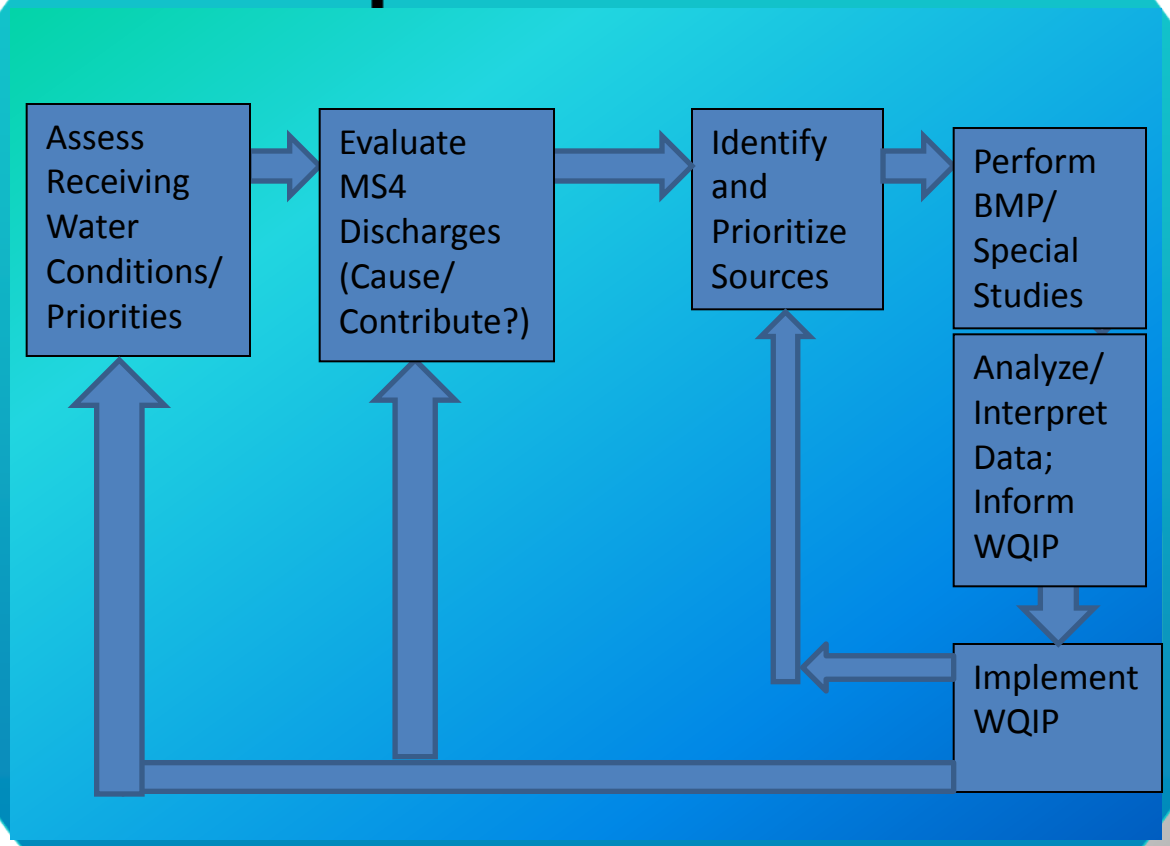

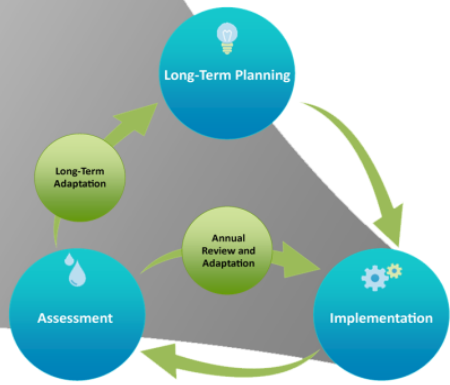

Alternate Provision II.D Rationale

- More effective & efficient use of resources to maximize benefit
- Support **Adaptive Management** needs
- **Question-Driven** Monitoring Approach Design based on Assessment Questions
- Based on 15-20 years of **experience**
- **Monitoring = more than water sampling**
- Ultimately support **WQIP priorities** (strategic, prioritized monitoring approach)

Purpose & Phasing of Alternate Provision II.D

Purpose:

Provide program managers with needed information to support effective adaptive management

Phasing:

- **Pre WQIP (transitional period)** – Proposed Alternate to Provision II.D
- **Post WQIP** – Develop Monitoring & Assessment Program (MAP) to support WQIP priorities

Scientific Basis of Question-Driven Approach

- A Framework for Monitoring & Assessment in the San Diego Region (SDRWQCB, 2012)
- Southern California Stormwater Monitoring Coalition's Model Monitoring Program (SMC, 2004)
- SWAMP Assessment Framework (SWAMP, 2010)
- Elements of a State Water Monitoring and Assessment Program (EPA, 2003)

Key Proposed Changes

- Jurisdictional Non-stormwater Monitoring **(D.1.a)** - Instead of extensive MS4 outfall chemical testing, reduce persistent flows that threaten receiving water quality & eliminate IC/IDs.
- Jurisdictional Stormwater Monitoring **(D.1.b)** - Instead of extensive MS4 outfall chemical monitoring, monitor homogeneous land uses as input to model.
- Jurisdictional Boundary Monitoring **(D.1.a(2))** - Insufficient technical power to differentiate small changes in upstream & downstream water quality due to the inherent variability of water quality data; Determine receiving water monitoring in MAP.
- Bacteria TMDL Monitoring **(Att. E)** – Instead of extensive prescriptive monitoring, rely on monitoring plans prepared as part of the current implementation planning process due to RWQCB October 2012.

025781

Management Questions

- Are conditions in the receiving waters protective, or likely to be protective, of beneficial uses?
- What is the extent and magnitude of the current or potential receiving water problem(s)?
- Are conditions in the receiving waters getting better or worse?
- What is the relative urban runoff contribution to the receiving water problem(s)?
- What are the sources of urban runoff that contribute to receiving water problem(s)?
- What additional information is needed for stormwater programs to be effective in reducing urban runoff contributions to receiving water problems?

Adaptive Management Actions/Recommendations

- Receiving Water Monitoring (Condition Assessment)
- Discharge Monitoring (Cause or Contribute)
- Source ID Monitoring (Source Prioritization)
- BMP + Special Studies
- Analysis/ Interpretation

Assessment Questions

- Are receiving water conditions improving by implementation of WQIPs?
- Are WQIPs effective in prohibiting non-stormwater discharges?
- Are WQIPs reducing stormwater pollutants to the MEP?
- Are sources & pollutant generating activities well characterized?
- Do BMPs effectively reduce discharges of pollutants from high priority sources?

Receiving Water

Management Questions	Adaptive Management Actions/Recommendations	Assessment Questions
Are conditions in the receiving waters protective, or likely to be protective, of beneficial uses?	**Receiving Water Monitoring (Condition Assessment)**	**Are receiving water conditions improving by implementation of WQIPs?**
What is the extent and magnitude of the current or potential receiving water problem(s)?		
Are conditions in the receiving waters getting better or worse?		
What is the relative urban runoff contribution to the receiving water problem(s)?	Discharge Monitoring (Cause or Contribute)	Are WQIPs effective in prohibiting non-stormwater discharges?
		Are WQIPs reducing stormwater pollutants to the MEP?
What are the sources of urban runoff that contribute to receiving water problem(s)?	Source ID Monitoring (Source Prioritization)	Are sources and pollutant generating activities well characterized?
What additional information is needed for stormwater programs to be effective in reducing urban runoff contributions to receiving water problems?	BMP + Special Studies	Do BMPs effectively reduce discharges of pollutants from high priority sources?
	Analysis/ Interpretation	

Receiving Water Monitoring

Assessment Question

Are the physical, chemical, and biological conditions of receiving waters being improved by the WQIPs?

Management Questions

Are conditions in receiving waters protective, or likely to be protective, of beneficial uses?

What is the extent and magnitude of the current or potential receiving water problems?

Are conditions in receiving waters getting better or worse?

Specific Questions

What are the status & trends in enclosed bays harbors estuaries and lagoons?

What are the status & trends in coastal waters?

What is the progress in achieving & complying with adopted TMDL targets?

Specific Activities

SMC Regional Monitoring

Southern California Bight Regional Monitoring

Sediment Quality Monitoring

HMP Monitoring

ASBS Monitoring

TMDL Monitoring

San Diego Regional Reference Stream Study

Pre WQIP: 5 WMA mass loading stations every other year

Pre WQIP: 1 temporary Watershed Station per WMA annually

Post WQIP (example): Receiving Water Monitoring to be based on watershed priorities, TMDL, & 303d listings

Alternate Provision II.D: Receiving Waters Element

Purpose	Assess Conditions of Receiving Waters, Extent/Magnitude, Trends
Methods	• Stormwater Monitoring Coalition (creeks) • Bight (estuaries, coastal waters) • Sediment Quality Monitoring (estuaries) • TMDL Monitoring (creeks/beaches) • Areas of Special Biological Significance • Mass Loading Stations • Temporary Watershed Stations • Third Party Data
Rationale & Benefits	• Broad Spatial and Temporal Coverage • Integrates existing programs • Preserves long -term trend assessments • Supports assessment-driven, adaptive management approach

Discharge Monitoring

025787

Management Questions	Adaptive Management Actions/Recommendations	Assessment Questions
Are conditions in the receiving waters protective, or likely to be protective, of beneficial uses?	Receiving Water Monitoring (Condition Assessment)	Are receiving water conditions improving by implementation of WQIPs?
What is the extent and magnitude of the current or potential receiving water problem(s)?		
Are conditions in the receiving waters getting better or worse?		
What is the relative urban runoff contribution to the receiving water problem(s)?	**Discharge Monitoring (Cause or Contribute)**	**Are WQIPs effective in prohibiting non-stormwater discharges?**
		Are WQIPs reducing stormwater pollutants to the MEP?
What are the sources of urban runoff that contribute to receiving water problem(s)?	Source ID Monitoring (Source Prioritization)	Are sources and pollutant generating activities well characterized?
What additional information is needed for stormwater programs to be effective in reducing urban runoff contributions to receiving water problems?	BMP + Special Studies	Do BMPs effectively reduce discharges of pollutants from high priority sources?
	Analysis/ Interpretation	

Non-Stormwater Discharge Monitoring

025788

Assessment Question

Are jurisdictional runoff management programs effectively prohibiting non-storm water discharges to their MS4s?

Management Questions

What is the relative urban runoff contribution to receiving water problem(s)?

What are the sources of urban runoff that contribute to receiving water problems(s)?

Specific Questions

Are the numbers of ICIDs identified &/or eliminated increasing or decreasing?

Do discharge concentrations at outfalls meet applicable permit action levels?

Which discharges should be investigated as potential IC/IDs?

Which non-storm water discharges are transient?

Which MS4 outfalls exhibit persistent dry weather flows?

Which MS4 outfalls impact receiving water quality during dry weather?

Specific Activities

Pre/Post WQIP: Conduct visual Inspections of prioritized major outfalls annually

Compile a prioritized list of major outfalls with persistent dry weather discharges to receiving waters

Identify& map one major outfall to monitor in each urbanized HSA twice annually (approximately 70)

Pre-WQIP: Semi-annual field measurements & lab analyses

Post-WQIP (example): Semi-annual analyses of watershed priorities based on TMDL, 303(d), & NAL constituents

Evaluate data, rank outfalls by potential threat to receiving water quality, & produce prioritized list of outfalls for follow-up

Alternate Provision II.D: Discharge Element – Non-Stormwater

Purpose	Address effective prohibition of non-stormwater discharges
Methods	**Transient Flow Programs (IDDE)** • Source identification: existing development inspections • MS4 system programs: patrols, complaint response, MS4 cleaning • Outfall program: visual inspections for transient flows & prioritization, investigations **Persistent Flow Programs** • Current MS4 outfall program to completion • Prioritized monitoring at one outfall per urbanized HSA (NALs)
Rationale & Benefits	• Broad spatial & temporal coverage • Supports assessment-driven, adaptive management approach • Distinction between persistent & transient flows focuses resources on eliminating &/or controlling high priority threats to receiving waters quality • Utilizing other elements of the stormwater programs (inspections, complaint calls) & third party information will efficiently & effectively assist jurisdictions in eliminating non-storm water discharges

Management Questions	Adaptive Management Actions/Recommendations	Assessment Questions
Are conditions in the receiving waters protective, or likely to be protective, of beneficial uses?	Receiving Water Monitoring (Condition Assessment)	Are receiving water conditions improving by implementation of WQIPs?
What is the extent and magnitude of the current or potential receiving water problem(s)?		
Are conditions in the receiving waters getting better or worse?		
What is the relative urban runoff contribution to the receiving water problem(s)?	**Discharge Monitoring (Cause or Contribute)**	Are WQIPs effective in prohibiting non-stormwater discharges?
		Are WQIPs reducing stormwater pollutants to the MEP?
What are the sources of urban runoff that contribute to receiving water problem(s)?	Source ID Monitoring (Source Prioritization)	Are sources and pollutant generating activities well characterized?
What additional information is needed for stormwater programs to be effective in reducing urban runoff contributions to receiving water problems?	BMP + Special Studies	Do BMPs effectively reduce discharges of pollutants from high priority sources?
	Analysis/ Interpretation	

Storm Water Discharge Monitoring

Assessment Question

Are jurisdictional runoff management programs reducing pollutants in storm water to the MEP?

Management Questions

What is the relative urban runoff contribution to receiving water problem(s)?

What are the sources of urban runoff that contribute to receiving water problem(s)?

Specific Questions

Do discharge concentrations & loads from MS4 outfalls meet applicable permit action levels?

How do representative MS4 outfall discharge concentrations, loads, & flows change over time?

Which MS4 outfalls impact receiving water quality during wet weather?

Specific Activities

Pre-WQIP: perform storm water discharge monitoring during two wet weather events annually:

(a) Complete the MS4 outfall monitoring program

(b) Narrative descriptions & field measurements

(c) three monitoring stations at representative major outfalls per WMA

Post-WQIP (example): perform storm water discharge monitoring based on representative outfalls

(a) Develop & implement a monitoring frequency appropriate to characterize pollutant discharges from outfalls in each WMA

(b) analyze parameters identified as watershed priorities, TMDLs, SALs, 303d

Alternate Provision II.D: Discharge Element – Stormwater

Purpose	Address stormwater pollutant reduction to the MEP
Methods	• Complete the current MS4 outfall program • Monitoring at three major outfalls per WMA per year to facilitate modeling based on land use characteristics • Utilize Stormwater Action Levels for prioritization
Rationale & Benefits	• Broad spatial & temporal coverage • Supports assessment-driven, adaptive management approach • Flexibility in site selection will focus resources on the highest watershed priorities, whether it be for representative drainage area data or homogeneous land-use based data.

Source/Stressor Identification

025794

Management Questions	Adaptive Management Actions/Recommendations	Assessment Questions
Are conditions in the receiving waters protective, or likely to be protective, of beneficial uses?	Receiving Water Monitoring (Condition Assessment)	Are receiving water conditions improving by implementation of WQIPs?
What is the extent and magnitude of the current or potential receiving water problem(s)?		
Are conditions in the receiving waters getting better or worse?		
What is the relative urban runoff contribution to the receiving water problem(s)?	Discharge Monitoring (Cause or Contribute)	Are WQIPs effective in prohibiting non-stormwater discharges?
		Are WQIPs reducing stormwater pollutants to the MEP?
What are the sources of urban runoff that contribute to receiving water problem(s)?	**Source ID Monitoring (Source Prioritization)**	**Are sources and pollutant generating activities well characterized?**
What additional information is needed for stormwater programs to be effective in reducing urban runoff contributions to receiving water problems?	BMP + Special Studies	Do BMPs effectively reduce discharges of pollutants from high priority sources?
	Analysis/ Interpretation	

Source/Stressor Identification Monitoring

025795

Assessment Question

Are sources & pollutant generating activities well characterized?

Management Question

What are the sources of urban runoff that contribute to receiving water problems?

Specific Questions

What are the land use sources contributing to the receiving water problems identified in the WQIP?

What are the relative loadings of sources contributing to the receiving water problems identified in the WQIP?

What are the specific pollutant generating activities (PGAs) contributing to the receiving water problems?

Specific Activities

Constituent-specific source ID

Conduct source/stressor identification studies to address program management needs related to watershed priorities.

Step 1: Compile known information on priority constituent(s).

Step 2: Identify data gaps based on information compiled in Step 1

Step 3: Based on information compiled in Step 1, develop a source inventory & a prioritization scheme within the watershed for potential follow-up action

Step 4: Develop a prioritized list of sources for the priority constituent(s) & deliver to the staff responsible for implementing WQIPs

Pre-WQIP: Continue source identification studies pertaining to compliance with TMDLs & development of the CLRP as applicable

Post-WQIP (example): Conduct PGA investigations for nutrients as part of the MAP for watersheds where WQIPs identified nutrients as a high priority.

Alternate Provision II.D Source/Stressor Identification Element

Purpose	Identify & Prioritize Pollutant Sources & Pollutant Generating Activities (PGAs)
Methods	• Pollutant-Specific Source Inventories • Source/PGA Studies • Prioritization of Sources for Follow-up
Rationale & Benefits	• Responsive to Program Management needs • Provides programs with information to verify, quantify, & prioritize sources • Provides links between sources, activities & effects on runoff quantity & quality

BMPs & Special Studies

Management Questions	Adaptive Management Actions/Recommendations	Assessment Questions
Are conditions in the receiving waters protective, or likely to be protective, of beneficial uses?	Receiving Water Monitoring (Condition Assessment)	Are receiving water conditions improving by implementation of WQIPs?
What is the extent and magnitude of the current or potential receiving water problem(s)?		
Are conditions in the receiving waters getting better or worse?		
What is the relative urban runoff contribution to the receiving water problem(s)?	Discharge Monitoring (Cause or Contribute)	Are WQIPs effective in prohibiting non-stormwater discharges?
		Are WQIPs reducing stormwater pollutants to the MEP?
What are the sources of urban runoff that contribute to receiving water problem(s)?	Source ID Monitoring (Source Prioritization)	Are sources and pollutant generating activities well characterized?
What additional information is needed for stormwater programs to be effective in reducing urban runoff contributions to receiving water problems?	**BMP + Special Studies**	**Do BMPs effectively reduce discharges of pollutants from high priority sources?**
	Analysis/ Interpretation	

Special Studies – BMP, Programmatic, & Water Quality

Assessment Question

Do BMPs effectively reduce discharges of pollutants from high priority sources?

Management Question

Are stormwater program BMPs effective in reducing urban runoff contributions to receiving water problems?

Are pollutant sources being effectively addressed to reduce urban runoff contributions to receiving water problems?

Specific Questions

Specific questions developed to address information needs identified in Source/Stressor Identification studies.

Example: Are sources from outside of the MS4 (e.g., natural sources) contributing to receiving water problems?

Specific Activities

Examples of Special Studies

- Assess background concentrations of contaminants in San Diego reference streams
- Evaluate the effectiveness of enhancing outreach & education (i.e., residential BMP rebate programs, over-irrigation enforcement, rainwater harvesting, turf conversion)
- Evaluate the effectiveness of catch basin inlet cleaning
- Evaluate the effectiveness of residential & commercial area patrolling (commercial patrolling may include inspections)
- Evaluate the effectiveness of targeted aggressive street sweeping
- Evaluate the effectiveness of watershed-based inspections

Alternate Provision II.D BMPs & Special Studies

Purpose	• Support effective adaptive management • Assess BMP effectiveness • Perform scientific investigations to address data gaps
Methods	• Pilot BMP Studies • Source ID Special Studies • Water Quality Studies
Rationale & Benefits	• Answers questions related to program & BMP effectiveness • Addresses data gaps to allow more effective program implementation • Provides scientifically valid information related to regulatory principles

Developing Monitoring & Assessment Programs (MAPs) for Each WQIP

025301

STRATEGIC MONITORING APPROACH:

1. Establish stormwater management priorities specific for each WMA ("Watershed Priorities") as part of WQIP development.
2. Compile existing monitoring data & assess available information for receiving waters, MS4 discharges, & sources or stressors within the watershed.
3. Identify regulatory & non-regulatory drivers that apply to water quality monitoring within the watershed, & list all associated monitoring responsibilities assigned to the Copermittees.
4. Evaluate the watershed priorities in context of available monitoring data & existing monitoring responsibilities, & develop specific management questions for each priority issue.
5. Establish metrics & identify assessments that should be performed to supply information needed to address the management questions.
6. Identify elements of a watershed-based monitoring program needed to address the watershed management questions & perform the necessary assessments.
7. Develop detailed monitoring plan to address the identified monitoring needs, coordinated with other ongoing monitoring in the watershed.

Proposed Provision II.D Development of MAP Components

- HYPOTHETICAL WATERSHED EXAMPLE

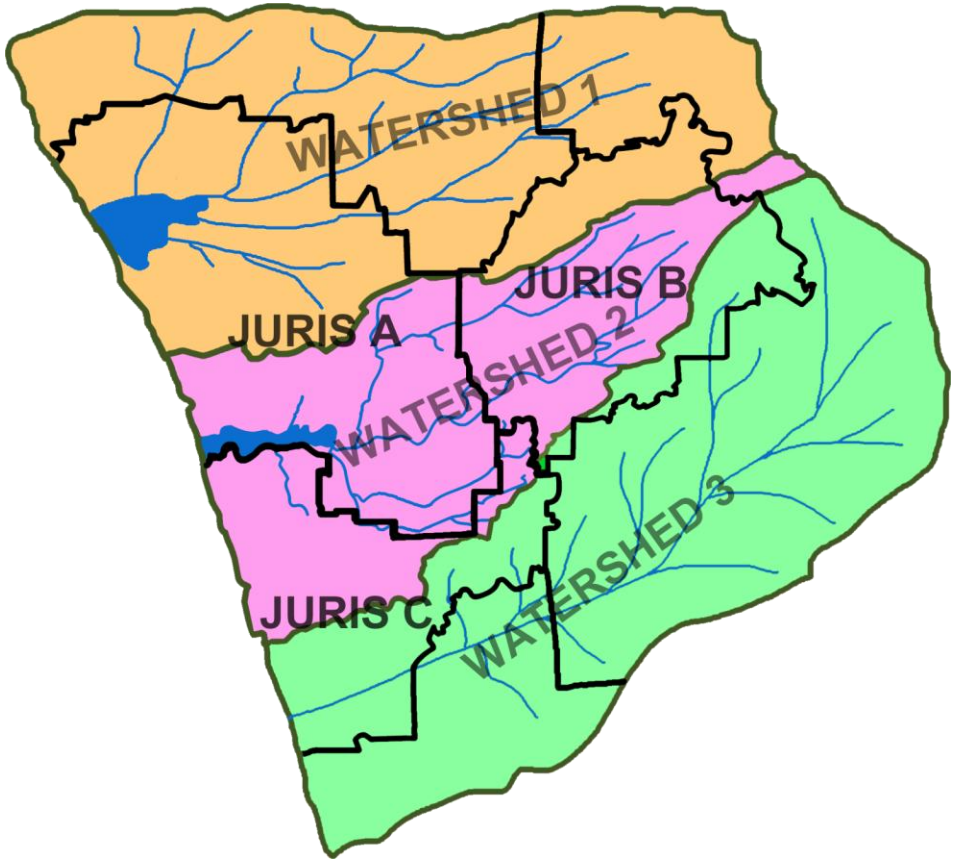

Proposed Provision II.D
WQIP/MAP - Stormwater Discharge Example

- Example WQIP priorities
  - TMDLs: bacteria
  - 303(d) Listings: copper & nutrients
- Likely Assessment question:
  - Are jurisdictional runoff management programs reducing pollutants in storm water to the maximum extent practical?
- Management question:
  - What are the sources of urban runoff that contribute to receiving water problem(s)?

WQIP MAP Example: Stormwater Discharge Monitoring

- Develop Specific questions using available information:
  - MS4s are known sources of bacteria & copper
  - MS4s are less well known as sources of nutrients
  - Loadings from land uses are not well quantified to support planning of wet weather management actions or evaluate their effectiveness
- Specific question
  - *What are the representative MS4 outfall discharge concentrations, loads, & flows?*

WQIP MAP Example: Stormwater Discharge Monitoring

- Approach to answer specific question is to support model development/ calibration/ validation
- Number of sites based on appropriate land use characterization for modeling
  - Characterize individual land uses (i.e., residential) or refine categories of land uses (i.e., SFR & HDR)
- Frequency = 2 storms/year (composite)
- Constituents = bacteria, copper, nutrients, & special study needs
- Duration = at least one adaptive management planning cycle to allow for:
  - Minimum data requirement for adequate characterization
  - Data usability to update management actions for WQIP

Next Steps

- Alternate Provision II.D will be provided
- Technical Memo with Support/Rationale for Alternate Provision II.D

QUESTIONS?

From: lyris@swrcb18.waterboards.ca.gov
To: Chiu, Wayne@Waterboards
Subject: Regional MS4 Permit Regional Board Legal Response Letter
Date: Friday, September 07, 2012 11:56:26 AM
Attachments: legalresponseltr090712.pdf

Stakeholders,

Attached is the Regional Board legal response to the May 10, 2012 Letter from County of Orange County Counsel and the May 21, 2012 Letter from County of Riverside, County Counsel Re Regional Municipal Separate Storm Sewer System Permit.

Laurie Walsh P.E.
San Diego Water Board
858-467-2970
lwalsh@waterboards.ca.gov

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GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

September 7, 2012

Via U.S. Mail and E-Mail

Ryan M. F. Baron, Senior Deputy
Office of the County Counsel
County of Orange
333 W. Santa Ana Blvd., Suite 407
Santa Ana, CA 92701

David H. K. Huff, Deputy County Counsel
Office of County Counsel
County of Riverside
3960 Orange Street, Suite 500
Riverside, CA 92501-3674

Subject: May 10, 2012, Letter from County of Orange, County Counsel and May 21, 2012, Letter from County of Riverside, County Counsel Re Regional Municipal Separate Storm Sewer System Permit

Messrs. Baron and Huff:

This letter responds to legal concerns raised in a May 10, 2012, letter from the County of Orange and the Orange County Flood Control District (collectively Orange County) and in a May 21, 2012, letter from the County of Riverside and Riverside County Flood Control & Water Conservation District (collectively Riverside County). Both letters question whether legal authority exists to support a Regional Municipal Separate Storm Sewer System (MS4) Permit (Regional MS4 Permit), as is under development by the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board). Orange County questions whether and how a regional MS4 permit application process is consistent with and can satisfy the individual permit application requirements in federal law as neither County is yet required to submit, nor has submitted a Report of Waste Discharge (ROWD) for the discharges covered under their respective MS4 Permits.

As a foundation for their concerns, the Counties maintain that the three groups of Copermittees (San Diego County, portions of Orange County and portions of Riverside County) presently regulated under three separate MS4 permits do not share an interconnected MS4, are not under common jurisdiction, contain separate and distinct watersheds, are

characterized by different hydrologic and climatic conditions and possess distinctly different water quality concerns.

The San Diego Water Board has the legal authority to issue a regional MS4 permit through its authority in the Clean Water Act. Section 402, subpart (p)(3)(B) of the Clean Water Act states that "Permits for discharges from municipal storm sewers—(i) may be issued on a system- or jurisdiction-wide basis . . . ." The federal storm water regulations in 40 Code of Federal Regulations (CFR) at Part 122.26, subdivision (a)(1)(v) also state that the Director may designate dischargers from municipal separate storm sewers on a system-wide or jurisdiction-wide basis. In making this determination, the Director may consider the following factors: (A) the location of the discharge with respect to waters of the United States; (B) the size of the discharge; (c) the quantity and nature of the pollutants discharged to waters of the United States; and (D) other relevant factors. (40 CFR Part 122.26(a)(1)(v).)

More specifically, the federal regulations provide that for large and medium MS4 systems, the San Diego Water Board may issue a regional permit. Specifically, the regulations provide:

> "(ii) The Director may either issue one system-wide permit covering all discharges from municipal separate storm sewers within a large or medium municipal storm sewer system or issue distinct permits for appropriate categories of discharges within a large or municipal separate storm sewer system including, but not limited to: all discharges owned or operated by the same municipality; located within the same jurisdiction; all discharges within a system that discharge to the same watershed; discharges within a system that are similar in nature; or for individual discharges from municipal separate storm sewers within the system.
>
> (iii) The operator of a discharge from a municipal separate storm sewer which is part of a large or medium municipal separate storm sewer system must either: (A) Participate in a permit application (to be a permittee or a co-permittee) with one or more other operator of discharges from the large or medium municipal storm sewer system which covers all, or a portion of all, discharges from the municipal separate storm sewer system; (B) Submit a distinct permit application which only covers discharges from the municipal separate storm sewers for which the operator is responsible; or (C) A regional authority may be responsible for submitting a permit application under the following guidelines . . . .
>
> (iv) One permit application may be submitted for all or a portion of all municipal separate storm sewers within adjacent or interconnected large or medium municipal separate storm sewer systems. The Director may issue one system-wide permit covering all, or a portion of all municipal separate storm sewers in adjacent or interconnected large or medium municipal separate storm sewer systems.
>
> (v) Permits for all or a portion of all discharges from large or medium municipal separate storm sewer systems that are issued on a system-wide, jurisdiction-

> wide, watershed or other basis may specify different conditions relating to different discharges covered by the permit, including different management programs for different drainage areas which contribute storm water to the system."

(40 CFR Part 122.26 (a)(3)(ii)-(v).)[1]

These regulations make it clear that the San Diego Water Board may issue a regional MS4 permit. The regulations also clarify that the permit may include different conditions for separate discharges covered by the permit. This allows the San Diego Water Board to ensure that suitable water quality conditions and provisions are identified for each watershed.

The United States Environmental Protection Agency's (USEPA) responses to comments for the above-mentioned regulations also make it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide permits. In the Final Rule published in the Federal Register and containing the responses to comments, USEPA notes that that paragraph (iv) (40 CFR § 122.26(a)(3)(iv)) would allow an entire system in a geographical region under the purview of a State agency to be designated under a permit. (National Pollutant Discharge Elimination System Permit Application Regulations for Storm Water Discharges, 55 FR 47990-01, 48042.) USEPA also states that many commenters wanted to allow the permitting authority broad discretion to establish system-wide permits, and that EPA believes that paragraphs (a)(1)(v) and (a)(3)(ii) allow for such broad discretion. (*Id.*, 47990-01, 48039-48042.)

Not only is it legally allowable for the San Diego Water Board to issue a regional MS4 permit, it is also appropriate for the San Diego Water Board to do so. Orange County argues that the three large metropolitan counties "do not share an interconnected municipal storm sewer system, are not under common jurisdiction, and contain separate and distinct watersheds."[2] However, the counties are connected through shared watersheds and/or are adjacent to each other. For example, the Santa Margarita watershed begins in Riverside County but drains into San Diego County. The Regional MS4 Permit creates watershed requirements that apply to multiple counties, which will ensure consistency of regulations in a watershed and result in overall cost savings for the Copermittees due to reduced redundancy in water quality monitoring. Even if the MS4s were not interconnected, the regulations make it clear the San Diego Water Board can require one permit for all MS4s that are adjacent. (40 CFR Part 122.26(a)(3)(iv).) Managing storm water on a watershed basis is expected to result in improved water quality, as the Regional MS4 Permit focuses the monitoring and management practices necessary to improve each watershed rather than arbitrary political boundaries. A single permit also allows San Diego Water Board staff to expend fewer resources developing multiple permits and more resources working cooperatively with all three current groups of Copermittees to ensure implementation of the permit results in improved water quality.

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[1] These regulations are applicable to California's NPDES program. (40 CFR §123.25.)

[2] Letter from the County of Orange, dated May 10, 2012, on page 1.

A regional MS4 permit also does not expand the requirements for each municipality beyond its borders as each municipality is only responsible for discharge within its jurisdictional boundaries. The federal regulations make it clear that Copermittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators. (40 CFR Part 122.26(a)(3)(vi).) The Administrative Draft Regional MS4 Permit does not require the Counties to manage storm water outside of their jurisdictional boundaries, but rather to work collectively to improve storm water management within watersheds.

The San Francisco region-wide permit from the Regional Water Quality Control Board, San Francisco Region, provides an example of a regional MS4 permit. Neither the USEPA nor the State Water Resources Control Board (State Water Board) objected to the San Francisco regional MS4 permit. While that permit was developed with consensus among the Copermittees, the Federal Regulations make it clear that the San Diego Water Board may impose a regional MS4 permit without a consensus. Another example of a regional MS4 permit is in Alaska, where the City of Fairbanks, the City of North Pole, the University of Alaska, and Department of Transportation and Public Facilities received a single permit, NPDES Permit No. AKS-053406.

The Regional MS4 Permit will continue to use the ROWD process prior to initially enrolling any Orange or Riverside County Copermittee into the Regional MS4 Permit or renewing the permit. The San Diego Water Board understands that each municipality is unique although the Counties share watersheds and geographical boundaries. As provided in their current MS4 permits, the Orange and Riverside County Copermittees will submit a ROWD no later than 180 days prior to expiration of their current permits. Staff at the San Diego Water Board will review the ROWDs to determine whether the Copermittees should be enrolled in the Regional MS4 Permit, what changes to the Regional MS4 Permit proposed in the ROWD are appropriate, and what is the proper level of public process for consideration of the issues raised in the ROWDs. The regional MS4 permit will continue to rely on the ROWD process to frame prospective revisions to the permit. Prior to release of the Public Comment Draft Permit, San Diego Water Board staff will consider whether changes to the text of the Administrative Draft are necessary for consistency with the intent to fully evaluate the ROWDs submitted by the Orange and Riverside County Copermittees as outlined above.

Please contact either me at 916-341-5168 or by e-mail at Jessica.jahr@waterboards.ca.gov or Catherine George Hagan at 858-467-2958 or by e-mail at catherine.hagan@waterboards.ca.gov if you have questions.

Respectfully,

Catherine George Hagan for

Jessica Jahr

cc: See next page

cc: David W. Gibson, Executive Officer (via e-mail only)
San Diego Water Board Interested Persons List (via e-mail only)

California Stormwater Quality Association®

Dedicated to the Advancement of Stormwater Quality Management, Science and Regulation

Meeting / Webcast Notice & Agenda

Thursday, September 13, 2012, 9:00 am to 3:00 pm

DoubleTree by Hilton Hotel, Sacramento
2001 Point West Way, Sacramento, CA 95815; (916) 924-4913

Meeting Fee: Pre-register by 5:00 pm Friday, September 7, $55 – Members / $55 – Regulators / $75 – Non-members
Meeting Fee: After 5:00 pm September 7 and at door, $75 – Members / $75 – Regulators / $95 – Non-members
Online registration open **until 5:00 pm, Wednesday, September 12**
LIVE Webcast option available – Purchase individual or site use online until NOON Wednesday, September 12
Meeting fee payable at the door beginning at 8:00 am
Credit Cards preferred - Visa, MasterCard, American Express, Discover. Cash or check also accepted
Meeting fee includes lunch. CASQA is a 501(c)(3) non-profit corporation. CASQA Tax Identification Number: 55-0797265.
Refund Policy: No refund available, but substitution of the attendee or viewer is allowed without charge or deadline.

New Permits – What Are They Telling Us?

I.	**Welcome / Introductions / Announcements** Richard Boon, Chair	(9:00 – 9:15)
II.	**State of Stormwater Permits–The Focus for the Next Five Years** Jonathan Bishop, Chief Deputy Director, State Water Board	(9:15 – 9:45)
III.	**Update on Pending Statewide Permits** Greg Gearheart, State Water Board (Industrial General Permit) Walt Shannon, State Water Board (Caltrans Permit) Christine Sotelo, State Water Board (Phase II MS4 Permit)	(9:45 – 11:30)
IV.	**Commendation Presentation to Department of Pesticide Regulation** Geoff Brosseau, Executive Director	(11:30 – 11:45)
V.	**State and Federal Reports** USEPA, State Water Board, and Regional Water Boards	(11:45 – 12:00)
	Lunch	(12:00 – 1:00)
VI.	**Overview of the Draft San Diego MS4 Permit** David Gibson, Executive Officer, San Diego Regional Water Board	(1:00 – 1:45)
VII.	**Overview of the Los Angeles MS4 Tentative Order** Mack Walker, Larry Walker Associates Heather Maloney, City of Monrovia / LA Permit Group	(1:45 – 2:30)
VIII.	**Update on Activities of Statewide Stormwater Permitting Work Group** Geoff Brosseau, Executive Director	(2:30 – 2:55)
IX.	**Closing** Richard Boon, Chair	(2:55 – 3:00)

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Any opinions or conclusions expressed in the presentations are the opinions and conclusions of the speakers and are not necessarily the opinions or conclusions of CASQA or any of its employees or agents.

P.O. Box 2105 Menlo Park CA 94026-2105 650.366.1042 www.casqa.org info@casqa.org

From: lyris@swrcb18.waterboards.ca.gov
To: Chiu, Wayne@Waterboards
Subject: POSTED - Comments Received on the Administrative Draft MS4 Permit
Date: Thursday, September 20, 2012 11:36:11 AM

CoPermittee's and Stakeholders,

The comments received on the Administrative Draft MS4 Permit are now posted on the Regional Boards Website at

http://www.waterboards.ca.gov/rwqcb9/water_issues/programs/stormwater/index.shtml

If you have any questions regarding the postings please contact me.

Laurie Walsh, PE
San Diego Water Board
Lwalsh@waterboards.ca.gov
858-467-2970

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WATER QUALITY
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2012 OCT -4 P 12: 13

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To All Executive Officers – California Regional Water Quality Control Boards

Dear Ladies and Gentlemen:

PENDING MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) PERMITS: RECEIVING WATER LIMITATIONS

I am drafting this letter to encourage you to modify any draft MS4 permits that you currently have pending to include a reopener provision for the receiving water limitations.

The State Water Board adopted the Caltrans NPDES MS4 permit on September 19, 2012. In adopting the permit, the State Water Board considered a number of comments that were submitted on the receiving water limitations and iterative process provisions of the permit. The State Water Board has scheduled a workshop on November 20, 2012 to address the issues of receiving water limitations in MS4 permits and the iterative process in a broader context. Several of the commenters at the Board meeting requested the State Water Board to delay adoption of the permit until after the scheduled workshop to provide policy direction to staff on how such provisions should be addressed in MS4 permits. The State Water Board decided not to delay adoption of the Caltrans MS4 permit further, but included reopener language in the permit to facilitate revisions, if necessary, to the receiving water limitations and iterative process provisions after consideration of the issue at the workshop.

The complete text of the adopted permit is on the Caltrans program page on the Board's storm water web site below, and the reopener provision may be found at E.11 on page 66:

http://www.waterboards.ca.gov/water_issues/programs/stormwater/caltrans_permits.shtml

For your convenience, I have excerpted it below:

> "The State Water Board may reopen and modify this Order at any time prior to its expiration under any of the following circumstances:
>
> The State Water Board determines, after opportunity for public comment and a public workshop, that revisions are warranted to those provisions of the Order addressing compliance with water quality standards in the receiving water and/or those provisions of the Order establishing an iterative process for implementation of management practices to assure compliance with water quality standards in the receiving water."

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E.Rosenbaum Time: 8:20

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OCT 1 2012

Also please note the extensive discussion in the *fact sheet* on this issue beginning on page 8.

Please call me at (916) 341-5615 or Chief Deputy Director Jonathan Bishop at (916) 341-5820 if you have any questions on this issue.

Sincerely,

Thomas Howard
Executive Director

cc: Mathew St. John
North Coast Bay Regional Water Quality Control Board
5550 Skylane Boulevard, Suite A
Santa Rosa, CA 95403

Bruce H. Wolfe
San Francisco Bay Regional Water Quality Control Board
1515 Clay Street, Suite 1400
Oakland, CA 94612

Ken Harris
Central Coast Bay Regional Water Quality Control Board
895 Aerovista Place, Suite 101
San Luis Obispo, CA 93401

Samuel Unger
Los Angeles Bay Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, CA 90013

Pamela Creedon
Central Valley Bay Regional Water Quality Control Board
11020 Sun Center Drive #200
Rancho Cordova, CA 95670

Patty Z. Kouyoumdjian
Lahontan Bay Regional Water Quality Control Board
2501 Lake Tahoe Boulevard.
South Lake Tahoe, CA 96150

Robert E. Perdue
Colorado River Basin Bay Regional Water Quality Control Board
73-720 Fred Waring Drive, Suite 100
Palm Desert, CA 92260

Kurt Berchtold
Santa Ana Regional Water Quality Control Board
3737 Main Street, Suite 500
Riverside, CA 92501

David W. Gibson
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

From: lyris@swrcb18.waterboards.ca.gov
To: Chiu, Wayne@Waterboards
Subject: Final Focused Meeting on the Administrative Draft Regional MS4 Permit
Date: Friday, September 28, 2012 10:52:51 AM

Regional Copermittees and other Interested Parties,

The San Diego Water Board will host a final Focused Meeting on the Administrative Draft Regional MS4 Permit to review proposed changes to the Administrative Draft Permit based on the comments we received by September 14, 2012. The Permit Team will send out a meeting agenda and a redlined strike-out version of the Administrative Draft Permit prior to the meeting.

The meeting will be held at the City of Vista Civic Center on Wednesday, October 24, 2012 from 9:30 a.m. to 3:00 p.m.

Laurie Walsh P.E.
San Diego Water Board
858-467-2970
lwalsh@waterboards.ca.gov

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FOCUSED MEETING AGENDA

Administrative Draft of
Tentative Order No. R9-2012-0011, NPDES No. CAS0109266
Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region

Wednesday, October 24, 2012
9:30 a.m. - 3:00 p.m.

City of Vista
Community Room
200 Civic Center Drive
Vista, CA 92084

9:30 a.m. - 9:40 a.m.	Introductions Table Participants
9:40 a.m. - 9:50 a.m.	Meeting Recap & Feedback Lewis Michaelson, Katz & Associates
9:50 a.m. - 10:00 a.m.	Public Draft Process David Barker, San Diego Water Board
10:00 a.m. - 10:45 a.m.	Discharge Prohibitions & Limitations Table Participants
10:45 a.m. - 11:30 a.m.	Development Standards/Existing Development Table Participants
11:30 a.m. - 12:30 p.m.	Lunch
12:30 p.m. - 1:15 p.m.	TMDL Implementation Table Participants
1:15 p.m. - 2:15 p.m.	Monitoring Table Participants
2:15 p.m. - 3:00 p.m.	Other Topics & Questions All

From: lyris@swrcb18.waterboards.ca.gov
To: Chiu, Wayne@Waterboards
Subject: REVISED Administrative Draft Regional MS4 Permit is now Posted on the San Diego Water Board Website
Date: Friday, October 12, 2012 3:57:48 PM

Interested Parties,

The **Revised Administrative Draft MS4 Permit** is now posted on the San Diego Water Boards Website at http://www.waterboards.ca.gov/sandiego/. The Revised Administrative Draft includes proposed changes to the Administrative Draft Regional MS4 Permit originally released on April 9, 2012. This redline/strikeout version of the Administrative Draft shows proposed changes to the Regional MS4 Permit after considering comments received on September 14, 2012. The San Diego Water Board Permit Team greatly appreciated all of the effort Copermittees, Stakeholders, and other Interested Parties put into the comments.

The Revised Administrative Draft will be discussed during the upcoming October 24, 2012 Final Focused Meeting. We also have scheduled a Public Workshop on November 13, 2012 to introduce Tentative Order R9-2013-0001 to the Regional Board. Please note that the November Public Workshop is NOT at the Regional Board Office. It is going to be held on Tuesday, November 13, 2012 at 9:00 a.m. at the

NOVEMBER 13 TH PUBLIC WORKSHOP
City of San Diego Public Utilities Department
Wastewater Branch Auditorium
9192 Topaz Way, San Diego, California
San Diego, CA 92123

For more information on the October 24, 2012 Final Focus Meeting, the November 13, 2012 Public Workshop, and copies of any of the Regional MS4 documents released to date visit the Storm Water page on the San Diego Water Boards Website at
http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

If you have any questions please contact me.

Laurie Walsh P.E.
San Diego Water Board
858-467-2970
lwalsh@waterboards.ca.gov

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From: lyris@swrcb18.waterboards.ca.gov
To: Chiu, Wayne@Waterboards
Subject: REVISED Administrative Draft Regional MS4 Permit -Clean Version
Date: Monday, October 22, 2012 3:55:08 PM

In addition to the redline/strikeout version of the Administrative Draft Regional MS4 Permit, a clean version was posted on the San Diego Water Boards website on October 19, 2012.

The clean version can also be accessed here:
http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/docs/updates101912/2012-1012_Tentative_Order_Clean.pdf

We look forward to seeing all interested parties at this Wednesdays Final Focused Meeting, held at the City of Vista Community Room at 9:30 am.

Laurie Walsh P.E.
San Diego Water Board
858-467-2970
lwalsh@waterboards.ca.gov

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From: lyris@swrcb18.waterboards.ca.gov
To: Chiu, Wayne@Waterboards
Subject: Web Posting of Hydromodification Panel Recommendations Summary
Date: Thursday, October 25, 2012 11:16:00 AM

The Hydromodification Panel Recommendations Summary document and cover letter are now available on the San Diego Water Boards Web Site at:

http://www.waterboards.ca.gov/rwqcb9/water_issues/programs/stormwater/index.shtml

under the August 30, 2012 Hydromodification Management Workshop heading.

Laurie Walsh, PE
San Diego Water Board
Lwalsh@waterboards.ca.gov
858-467-2970

You are currently subscribed to reg9_sandiegoco_ms4permit as: wchiu@waterboards.ca.gov.

To unsubscribe click here: http://swrcb18.waterboards.ca.gov/u?id=508208.cee2a373662e566393e62f0af18d11cf&n=T&l=reg9_sandiegoco_ms4permit&o=402564

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From: lyris@swrcb18.waterboards.ca.gov
To: Chiu, Wayne@Waterboards
Subject: Notice of November 13, 2012 Public Workshop on Regional MS4 Permit
Date: Friday, October 12, 2012 9:47:46 AM
Attachments: Final_Workshop_Notice.pdf

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) will hold an informational public workshop at its regularly scheduled public meeting to receive information and discuss requirements in the public draft of a Regional NPDES Permit for Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region (Regional MS4 Permit) (Tentative Order No. R9-2013-0001). The November 13, 2012 public workshop will be informal and conducted to provide San Diego Water Board members with information about the Regional MS4 Permit.

Attached is the Public Notice for the November 13, 2012 Workshop. The Workshop Notice can also be accessed from the San Diego Water Boards website at: http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml. The Workshop will be held at the:

City of San Diego Public Utilities Department
Wastewater Branch Auditorium
9192 Topaz Way, San Diego, California
San Diego, CA 92123

The Tentative Order will be available **on or before October 31, 2012** and will be accessible electronically at: http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

If you have any questions or wish to receive a hard copy of the Tentative Order when it is released, please contact Wayne Chiu at (858) 637-5558 or via e-mail at wchiu@waterboards.ca.gov or me (858) 467-2970 or via e-mail at lwalsh@waterboards.ca.gov.

Laurie Walsh P.E.
San Diego Water Board
858-467-2970
lwalsh@waterboards.ca.gov

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San Diego Region

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http:// www.waterboards.ca.gov/sandiego

NOTICE OF PUBLIC WORKSHOP

A workshop will be held to discuss
Tentative Order No. R9-2013-0001, NPDES No. CAS0109266
Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region

Tuesday, November 13, 2012
9:00 a.m.
City of San Diego Public Utilities Department
Wastewater Branch Auditorium
9192 Topaz Way, San Diego, California
San Diego, CA 92123

SUBJECT OF WORKSHOP

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) will hold an informational public workshop at its regularly scheduled public meeting to receive information and discuss requirements in the public draft of a Regional NPDES Permit for Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region (Regional MS4 Permit) (Tentative Order No. R9-2013-0001). The Tentative Order will be available **on or before October 31, 2012** and will be accessible electronically at:

http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

BACKGROUND

The San Diego Water Board is considering the adoption of a Regional MS4 Permit that will be issued to municipal Copermittees in San Diego County, Southern Orange County and Southwest Riverside County. Currently, each of these counties within the San Diego Region has its own MS4 Storm Water Permit. In order to better achieve regulatory consistency as well as maximum efficiency and economy of resources, the San Diego Water Board has drafted a single MS4 Permit based on the boundaries of the San Diego Region instead of county political boundaries. Under this approach, the Regional MS4 Permit will uniformly regulate all three counties within the San Diego Region once it becomes effective for all Copermittees. The Regional MS4 Permit will also provide opportunities for a comprehensive monitoring framework, incentive for a regional collaborative approach, and opportunities for regional cost efficiencies among Copermittees. Upon adoption by the San Diego Water Board, this Regional MS4 Permit will be issued to all 39 Copermittees in a phased manner according to the expiration dates of their current MS4 Storm Water Permits and after consideration of Reports of Waste Discharge filed by the Orange County and Riverside County Copermittees.

PROCEDURAL MATTERS
The November 13, 2012 public workshop will be informal and conducted to provide San Diego Water Board members with information about the Regional MS4 Permit and to facilitate discussion. There will be no sworn testimony or cross-examination of participants. San Diego Water Board staff will explain the permit development process and summarize significant elements of the Regional MS4 Permit for the San Diego Water Board and the public. Copermittees, interested stakeholders, and the public will also have an opportunity to provide oral comments as set forth below. The San Diego Water Board may provide general feedback to staff on development of the permit; however, no action or voting will take place at this workshop.

To ensure a productive and efficient Workshop, and to ensure that all attending have an opportunity to participate, oral presentations from Copermittees, stakeholders, and any interested persons may be limited at the discretion of the Chair. This item has significant interest and to provide enough time for all interested parties to participate, participants with similar comments are requested to make joint presentations.

The San Diego Water Board will issue a separate public hearing notice announcing the release of the draft Regional MS4 Permit as a Tentative Order for public review and comment at a later date. The public hearing notice will establish the deadline for submission of comments, the date of the public hearing, and the procedures that the San Diego Water Board will follow at the public hearing to consider adoption of the Tentative Order. Once released, the Tentative Order will serve as the public comment draft permit for purposes of applicable public notice requirements under the Code of Federal Regulations (40 C.F.R. § 124.10) and Water Code section 13167.5, subdivision (b).

ELECTRONIC MAIL LIST SUBSCRIPTION
The San Diego Water Board has established an electronic mail list specifically for information and notices on the development of a Regional MS4 Permit. The San Diego Water Board will use the email list to notify interested persons of upcoming important events and the availability of on-line documents. Persons interested in receiving future notices and information on this specific project can subscribe to one of the electronic mail lists titled “Orange County MS4 Permit,“ “Riverside County MS4 Permit, or “San Diego MS4 Permit” located on the San Diego Water Board website at:

http://www.waterboards.ca.gov/resources/email_subscriptions/reg9_subscribe.shtml

Persons who wish to receive hard copy notices of future notices or meetings on the Regional MS4 Storm Water Permit in lieu of electronic notices should submit a request to Mr. Wayne Chiu, Water Resource Control Engineer, 9174 Sky Park Court, Suite 100, San Diego, CA 92123.

Please bring this matter to the attention of any person known to you who may be affected by the Regional MS4 Permit.

INFORMATION REGARDING WORKSHOP
If you have any questions or wish to receive a hard copy of the Tentative Order when it is released, please contact Wayne Chiu at (858) 637-5558 or via e-mail at wchiu@waterboards.ca.gov or Laurie Walsh at (858) 467-2970 or via e-mail at lwalsh@waterboards.ca.gov.

From: lyris@swrcb18.waterboards.ca.gov
To: Chiu, Wayne@Waterboards
Subject: Notice - Release of San Diego Region MS4 Permit, Tentative Order R9-2013-0001 for Public Review and Comment
Date: Wednesday, October 31, 2012 7:40:00 PM

Copermittees and Interested Persons,
The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) is pleased to release for public review and comment Tentative Order No. R9-2013-0001 *National Pollutant Discharge Elimination System (*NPDES*) Permit* (NPDES No. CAS0109266) *and Waste Discharge Requirements for Discharges* of *Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Tentative Order).

Copermittees covered by the San Diego County MS4 permit (Order No. R9-2007-0001) must submit any written comments on the Tentative Order during the comment period described in the Notice. The Notice can be found on the San Diego Water Boards Website
at: http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

Copermittees covered by the Orange County and Riverside County MS4 permits (Order Nos. R9-2009-0002 and R9-20100016, respectively), for which Reports of Waste Discharge have not yet been filed, are strongly encouraged to submit written comments on the Tentative Order during the comment period described in the Notice.

For complete information on the public process, submittal of comments, and to retrieve copies of the Tentative Order and its attachments visit the San Diego Water Board's website:
http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

Laurie Walsh P.E.
San Diego Water Board
858-467-2970
lwalsh@waterboards.ca.gov

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To unsubscribe click here: http://swrcb18.waterboards.ca.gov/u?id=508208.cee2a373662e566393e62f0af18d11cf&n=T&l=reg9_sandiegoco_ms4permit&o=404703
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or send a blank email to leave-404703-508208.cee2a373662e566393e62f0af18d11cf@swrcb18.waterboards.ca.gov

From: lyris@swrcb18.waterboards.ca.gov
To: Chiu, Wayne@Waterboards
Subject: REMINDER - Tentative Order No. R9-2013-0001 Public Workshop
Date: Thursday, November 08, 2012 6:55:42 AM

I want to remind everyone that the Public Workshop on Tentative Order R9-2013-0001, NPDES Permit for Discharges from Municipal Separate Storm Sewer Systems Draining the Watersheds within the San Diego Region is coming up next week. The meeting will be held on:

TUESDAY, NOVEMBER 13, 2012

At the…

City of San Diego Public Utilities Department
Wastewater Branch Auditorium
9192 Topaz Way
San Diego, CA 92123

The meeting **Begins at 9:00 a.m.**

If you have any questions please contact me. For more information and to get a copy of the Notice please visit our website http://www.waterboards.ca.gov/rwqcb9/water_issues/programs/stormwater/index.shtml

Laurie Walsh, PE
San Diego Water Board
Lwalsh@waterboards.ca.gov
858-467-2970

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From: lyris@swrcb18.waterboards.ca.gov
To: Chiu, Wayne@Waterboards
Subject: Tentative Order No. R9-2013-0001 December 12, 2012 Public Workshop Continuation
Date: Tuesday, November 27, 2012 12:27:12 PM
Attachments: Workshop_Continuation_Notice_final.pdf
Workshop_Board_Members_Questions_11252012.pdf

Greetings,

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) will continue an informational public workshop on December 12, 2012 at its regularly scheduled public meeting to receive information and discuss proposed requirements in the public draft of a Regional NPDES Permit for Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region (Regional MS4 Permit) (Tentative Order No. R9-2013-0001). A public workshop was held on November 13, 2012, regarding the Tentative Order; however, the workshop was continued because more time is warranted to discuss certain proposed requirements of the Tentative Order.

The December Workshop Notice and the list of questions presented by the Board members at the November Workshop are attached. All other materials related to the Tentative Order are on the San Diego Water Boards website at:

http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

Should you have any questions, please contact a member of the Team.

Laurie Walsh, PE
San Diego Water Board
Lwalsh@waterboards.ca.gov
858-467-2970

Wayne Chiu, wchiu@waterboards.ca.gov
Christina Arias, carias@waterboards.ca.gov
Eric Becker, ebecker@waterboards.ca.gov
David Barker, dbarker@waterboards.ca.gov

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To unsubscribe click here: http://swrcb18.waterboards.ca.gov/u?id=508208.cee2a373662e566393e62f0af18d11cf&n=T&l=reg9_sandiegoco_ms4permit&o=411036

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California Water Boards

Edmund G. Brown Jr. Governor

Matthew Rodriguez Secretary for Environmental Protection

California Regional Water Quality Control Board, San Diego Region

NOTICE OF WORKSHOP CONTINUATION

The public workshop held on November 13, 2012 will be continued to discuss

Tentative Order No. R9-2013-0001, NPDES No. CAS0109266
Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region

Wednesday, December 12, 2012
9:00 a.m.
California Regional Water Quality Control Board, San Diego Region
Regional Water Board Room
San Diego Water Board Office Building
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

SUBJECT OF WORKSHOP

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) will continue an informational public workshop on December 12, 2012 at its regularly scheduled public meeting to receive information and discuss proposed requirements in the public draft of a Regional NPDES Permit for Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region (Regional MS4 Permit) (Tentative Order No. R9-2013-0001). A public workshop was held on November 13, 2012, regarding the Tentative Order; however, the workshop was continued because more time is warranted to discuss certain proposed requirements of the Tentative Order. The San Diego Water Board posted the Tentative Order on October 31, 2012 at the following website:

http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

BACKGROUND

The San Diego Water Board is considering the adoption of a Regional MS4 Permit that will be issued to municipal Copermittees in San Diego County, Southern Orange County and Southwest Riverside County. Currently, each of these counties within the San Diego Region has its own MS4 Storm Water Permit. In order to better achieve regulatory consistency as well as maximum efficiency and economy of resources, the San Diego Water Board has drafted a single MS4 Permit based on the boundaries of the San Diego Region instead of county political boundaries. Under this approach, the Regional MS4 Permit will uniformly regulate all three counties within the San Diego Region once it becomes effective for all Copermittees. The Regional MS4 Permit will also provide opportunities for a comprehensive monitoring framework, incentive for a regional collaborative approach, and opportunities for regional cost efficiencies among Copermittees. Upon adoption by the San Diego Water Board, this Regional MS4 Permit will be issued to all 39 Copermittees in a phased manner according to the expiration dates

of their current MS4 Storm Water Permits and after consideration of Reports of Waste Discharge filed by the Orange County and Riverside County Copermittees.

PROCEDURAL MATTERS

The San Diego Water Board held a public workshop on November 13, 2012 in which Water Board staff explained the permit development process and summarized significant elements of the Regional MS4 Permit for the San Diego Water Board Members and the public. Many Copermittees and other interested stakeholders voiced comments and concerns regarding the Tentative Order. At the conclusion of the item, San Diego Water Board members asked staff to prepare responses to specific questions (see attachment). The specific questions pertain to items of concern voiced at the public workshop and generally fall into one of three areas: hydromodification management, total maximum daily loads (TMDLs), and costs associated with storm water programs.

On December 12, 2012, the San Diego Water Board will continue the public workshop for this item. Water Board staff will provide oral responses to the questions posed by the San Diego Water Board members. Copermittees and members of the public are also invited to provide comments on the subject matter as permitted by the Chair. The San Diego Water Board may provide general feedback to staff on development of the Tentative Order; however, no action or voting will take place at this workshop.

INFORMATION REGARDING WORKSHOP

If you have any questions regarding the workshop, please contact Wayne Chiu at (858) 637-5558 or via e-mail at wchiu@waterboards.ca.gov or Laurie Walsh at (858) 467-2970 or via e-mail at lwalsh@waterboards.ca.gov.

Questions from San Diego Water Board Members
November 13, 2012 Public Workshop
on
Tentative Order No. R9-2013-0001
Regional Municipal Separate Storm Sewer Systems (MS4) Permit

Hydromodification

1. When accounting for the impacts caused by hydromodification at a development or redevelopment site, how far back should the analysis go, preproject or predevelopment? {*Grant Destache*}

2. How can the San Diego County Hydromodification Plan (HMP) be implemented into the MS4 Permit in a more succinct manner? How can we implement the rules and regulations in the San Diego County HMP, because we really have not had it in place for very long before we, "throw it down the drain?" {*Grant Destache*}

3. How do you document predevelopment or naturally occurring on a map? How is "naturally occurring" defined? How far back do you go to document predevelopment? 100 years? 500 years? Before the Indians were picking up acorns? {*Gary Strawn*}

4. Why was the concrete/hardened channel exemptions removed? {*Eric Anderson*}

5. Copermittees commented that road projects have unique space limitations and may not be able to meet retention & HMP requirements. Should road projects be treated differently and could requirements in the new CALTRANS Storm Water Permit be used to provide more options? {*Grant Destache*}

6. If a project is unable to comply with the HMP requirements at the site, how far away from the site can the project proponent place their retention basins? What other limitations exist when not placing a BMP on site? There is a concern that low income areas will become targets for placement of the retention basins. {*Tomas Morales*}

Cost

1. What is the cost of not implementing the provisions in the Tentative Order? (e.g. beach closures, ill health that taxpayers have to pay for through their private health plans or public costs, deaths ....) {*Henry Abarbanel*}

2. Lots of big cost numbers were used during the meeting. (e.g. $2 to $4 billion over 20 years) How much do the Copermittees spend now? What is being spent now and on what? {*Henry Abarbanel*}

3. What is the breakdown of costs? What is the timeframe of these costs? How much is already being spent? {*Tomas Morales*}

Total Maximum Daily Load (TMDL)

1. Can the Copermittees meet the bacteria levels that are specified in the Total Maximum Daily Loads (TMDLs)? What sorts of technologies are available to the Copermittees to treat bacteria to the levels specified in the TMDLs? {*Grant Destache*}

2. Can the Copermittees achieve adequate waste load reductions in MS4 discharges to meet the effluent limitations and compliance dates for bacteria in the Tentative Order? {*Grant Destache*}

3. What are the benefits of BMP based compliance with the TMDLs for bacteria compared to compliance with Water Quality Based Effluent Limitations (WQBELs)? {*Grant Destache*}

4. Address the issues that Ruth Kolb, City of San Diego raised regarding the Bacteria TMDLs. Clarify how we incorporated the Bacteria TMDLs into the Tentative Order to demonstrate that we incorporated it into the Tentative Order the way it was intended to be implemented. {*Eric Anderson*}

5. Throughout the presentations, it was said that it is infeasible to cleanup bacteria. Provide an explanation as to why, it is not the case, that cleanup of bacteria is infeasible. IN OTHER WORDS… Explain why it is in fact feasible to cleanup bacteria. Is it feasible to cleanup bacteria to the levels in the TMDLs? {*Tomas Morales*}

Other

1. Clarify if the Tentative Order is a one size fits all approach. Is the Water Quality Improvement Plan a one size fits all approach? {*Grant Destache*}

2. Further explain the Illicit Discharge Detection and Elimination requirement in Provision E.2.a.(1) and (3) of the Tentative Order that pertains to discharges from footing drains and fountain drains. {*Eric Anderson*}

From: lyris@swrcb18.waterboards.ca.gov
To: Chiu, Wayne@Waterboards
Subject: REVISED Notice of Public Workshop Continuation - Tentative Order R9-2013-0001 Regional Storm Water Permit
Date: Friday, December 07, 2012 10:19:45 AM

Greetings Copermittees and Interested Persons,

Attached is the REVISED Notice of the Public Workshop Continuation on Tentative Order R9-2013-0001. This revised Notice provides direction from the San Diego Water Board's Chairman on procedures for hearing input from the Copermittees and other interested persons at the upcoming San Diego Water Board's December 12, 2012 meeting.

Additionally, a copy of the San Diego Water Board's list of questions posed by the Board at the November 13, 2012 Public Workshop are also attached.

This REVISED Notice of the Public Workshop Continuation, list of Board member questions, and all other documents pertaining to Tentative Order R9-2013-0001 can be found on the San Diego Water Board website at http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

Questions can be directed to either myself or Wayne Chiu at (858) 637-5558 or wchiu@waterboards.ca.gov.

Laurie Walsh P.E.
San Diego Water Board
858-467-2970
lwalsh@waterboards.ca.gov

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California Water Boards

Edmund G. Brown Jr.
Governor

Matthew Rodriquez
Secretary for
Environmental Protection

California Regional Water Quality Control Board, San Diego Region

REVISED[1]
NOTICE OF WORKSHOP CONTINUATION

The public workshop held on November 13, 2012 will be continued to discuss

Tentative Order No. R9-2013-0001, NPDES No. CAS0109266
Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region

Wednesday, December 12, 2012
9:00 a.m.
California Regional Water Quality Control Board, San Diego Region
Regional Water Board Room
San Diego Water Board Office Building
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

SUBJECT OF WORKSHOP

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) will continue an informational public workshop on December 12, 2012 at its regularly scheduled public meeting to receive information and discuss proposed requirements in the public draft of a Regional NPDES Permit for Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region (Regional MS4 Permit) (Tentative Order No. R9-2013-0001). A public workshop was held on November 13, 2012, regarding the Tentative Order; however, the workshop was continued because more time is warranted to discuss certain proposed requirements of the Tentative Order. The San Diego Water Board posted the Tentative Order on October 31, 2012 at the following website:

http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

BACKGROUND

The San Diego Water Board is considering the adoption of a Regional MS4 Permit that will be issued to municipal Copermittees in San Diego County, Southern Orange County and Southwest Riverside County. Currently, each of these counties within the San Diego Region has its own MS4 Storm Water Permit. In order to better achieve regulatory consistency as well as maximum efficiency and economy of resources, the San Diego Water Board has drafted a single MS4 Permit based on the boundaries of the San Diego Region instead of county political boundaries. Under this approach, the Regional MS4 Permit will uniformly regulate all three counties within the San Diego Region once it becomes effective

[1] Text changes to the original November 26, 2012 notice are indicated in red.

for all Copermittees. The Regional MS4 Permit will also provide opportunities for a comprehensive monitoring framework, incentive for a regional collaborative approach, and opportunities for regional cost efficiencies among Copermittees. Upon adoption by the San Diego Water Board, this Regional MS4 Permit will be issued to all 39 Copermittees in a phased manner according to the expiration dates of their current MS4 Storm Water Permits and after consideration of Reports of Waste Discharge filed by the Orange County and Riverside County Copermittees.

PROCEDURAL MATTERS

The San Diego Water Board held a public workshop on November 13, 2012 in which Water Board staff explained the permit development process and summarized significant elements of the Regional MS4 Permit for the San Diego Water Board Members and the public. Many Copermittees and other interested stakeholders voiced comments and concerns regarding the Tentative Order. At the conclusion of the item, San Diego Water Board members asked staff to prepare responses to specific questions (see attachment). The specific questions pertain to items of concern voiced at the public workshop and generally fall into one of three areas: hydromodification management, total maximum daily loads (TMDLs), and costs associated with storm water programs.

On December 12, 2012, the San Diego Water Board will continue the public workshop for this item. Water Board staff will provide oral responses to the questions posed by the San Diego Water Board members. Copermittees and members of the public are also invited to provide comments on the subject matter as permitted by the Chair. The San Diego Water Board may provide general feedback to staff on development of the Tentative Order; however, no action or voting will take place at this workshop.

The San Diego Water Board's acting Chair, Gary Strawn, has issued the following additional direction in response to requests from Copermittees and other interested persons wishing to make formal presentations at the December 12, 2012 workshop. The San Diego Water Board is not seeking formal presentations from the Copermittees or other interested persons on all of the questions posed to staff at the conclusion of the November 13, 2012 workshop and is not interested in rehashing presentations made at the November 13 workshop. The San Diego Water Board is seeking comments from Copermittees or other interested persons specifically on the questions related to 1) the projected costs of implementing the Tentative Order, including cost breakdowns, timeframes and comparisons with current expenditures and 2) the projected costs of not implementing the Tentative Order in terms of beach closures, public health effects, public costs and other pertinent considerations. The San Diego Water Board will allow comments pertaining to the other questions if the Copermittees or other interested persons wish to provide additional information not previously presented. Presentations may be informal, and if visual aids are necessary to convey information they will be permitted. To ensure a productive and efficient workshop, and to ensure that all attending have an opportunity to participate, presentations by Copermittees or other interested persons may be limited at the discretion of the acting Chair. This workshop has significant interest and to provide enough time for all interested persons to participate, participants with similar comments are requested to make joint presentations.

INFORMATION REGARDING WORKSHOP

If you have any questions regarding the workshop, please contact Wayne Chiu at (858) 637-5558 or via e-mail at wchiu@waterboards.ca.gov or Laurie Walsh at (858) 467-2970 or via e-mail at lwalsh@waterboards.ca.gov.

Questions from San Diego Water Board Members
November 13, 2012 Public Workshop
on
Tentative Order No. R9-2013-0001
Regional Municipal Separate Storm Sewer Systems (MS4) Permit

Hydromodification

1. When accounting for the impacts caused by hydromodification at a development or redevelopment site, how far back should the analysis go, preproject or predevelopment? {*Grant Destache*}

2. How can the San Diego County Hydromodification Plan (HMP) be implemented into the MS4 Permit in a more succinct manner? How can we implement the rules and regulations in the San Diego County HMP, because we really have not had it in place for very long before we, "throw it down the drain?" {*Grant Destache*}

3. How do you document predevelopment or naturally occurring on a map? How is "naturally occurring" defined? How far back do you go to document predevelopment? 100 years? 500 years? Before the Indians were picking up acorns? {*Gary Strawn*}

4. Why was the concrete/hardened channel exemptions removed? {*Eric Anderson*}

5. Copermittees commented that road projects have unique space limitations and may not be able to meet retention & HMP requirements. Should road projects be treated differently and could requirements in the new CALTRANS Storm Water Permit be used to provide more options? {*Grant Destache*}

6. If a project is unable to comply with the HMP requirements at the site, how far away from the site can the project proponent place their retention basins? What other limitations exist when not placing a BMP on site? There is a concern that low income areas will become targets for placement of the retention basins. {*Tomas Morales*}

Cost

1. What is the cost of not implementing the provisions in the Tentative Order? (e.g. beach closures, ill health that taxpayers have to pay for through their private health plans or public costs, deaths ....) {*Henry Abarbanel*}

2. Lots of big cost numbers were used during the meeting. (e.g. $2 to $4 billion over 20 years) How much do the Copermittees spend now? What is being spent now and on what? {*Henry Abarbanel*}

3. What is the breakdown of costs? What is the timeframe of these costs? How much is already being spent? {*Tomas Morales*}

Total Maximum Daily Load (TMDL)

1. Can the Copermittees meet the bacteria levels that are specified in the Total Maximum Daily Loads (TMDLs)? What sorts of technologies are available to the Copermittees to treat bacteria to the levels specified in the TMDLs? {*Grant Destache*}

2. Can the Copermittees achieve adequate waste load reductions in MS4 discharges to meet the effluent limitations and compliance dates for bacteria in the Tentative Order? {*Grant Destache*}

3. What are the benefits of BMP based compliance with the TMDLs for bacteria compared to compliance with Water Quality Based Effluent Limitations (WQBELs)? {*Grant Destache*}

4. Address the issues that Ruth Kolb, City of San Diego raised regarding the Bacteria TMDLs. Clarify how we incorporated the Bacteria TMDLs into the Tentative Order to demonstrate that we incorporated it into the Tentative Order the way it was intended to be implemented. {*Eric Anderson*}

5. Throughout the presentations, it was said that it is infeasible to cleanup bacteria. Provide an explanation as to why, it is not the case, that cleanup of bacteria is infeasible. IN OTHER WORDS… Explain why it is in fact feasible to cleanup bacteria. Is it feasible to cleanup bacteria to the levels in the TMDLs? {*Tomas Morales*}

Other

1. Clarify if the Tentative Order is a one size fits all approach. Is the Water Quality Improvement Plan a one size fits all approach? {*Grant Destache*}

2. Further explain the Illicit Discharge Detection and Elimination requirement in Provision E.2.a.(1) and (3) of the Tentative Order that pertains to discharges from footing drains and fountain drains. {*Eric Anderson*}

CITY OF LAKE FOREST

Mayor
Scott Voigts

Mayor Pro Tem
Kathryn McCullough

Council Members
Peter Herzog
Adam Nick
Dwight Robinson

City Manager
Robert C. Dunek

January 14, 2013

Via US Mail and E-mail

Mr. Kurt Berchtold
Executive Officer
California Regional Water Quality Control Board, Santa Ana Region
3737 Main Street, Suite 500
Riverside, CA 92501-3339

Mr. David W. Gibson
Executive Officer
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Re: Request to Designate the Santa Ana Regional Water Quality Control Board to Regulate Discharges from the MS4 owned by the City of Lake Forest

Dear Messrs. Berchtold and Gibson:

The City of Lake Forest (City) is located within southwestern Orange County, and covers an area of approximately 17 square miles. Approximately 70% of the City's land area is located within the Newport Bay/San Diego Creek Watershed which is under the jurisdiction of the California Regional Water Quality Control Board, Santa Ana Region (SARWQCB). The remaining 30% of the City's land area is located within the Aliso Creek Watershed which is under the jurisdiction of the California Regional Water Quality Control Board, San Diego Region (SDRWQCB). Attached for your reference, is a map of the City depicting the jurisdictional boundary between the SARWQCB and SDRWQCB (Regional Boards).

Because of this situation, the City is subject to two separate Municipal Separate Storm Sewer System (MS4) Permits issued by the respective Regional Boards. Both jurisdictions issue comprehensive large MS4 Permits that require the City to implement extensive compliance programs. Differences in the substantive requirements of both Regions' Large MS4 Permits have significant impacts on City operations. Major program level differences force the City to implement what amounts to two different compliance programs within City limits. This results in a significant resource and administrative burden which, in turn, causes valuable resources to be diverted away from program implementation.

Mr. Kurt Berchtold
Santa Ana Regional Water Quality Control Board
Mr. David W. Gibson
San Diego Regional Water Quality Control Board
Re: Request for Singular Regulation

Based upon the issues outlined above and consistent with California Water Code section 13228, the City of Lake Forest hereby requests that the Regional Boards agree to designate the SARWQCB for regulation of all portions of the City for matters pertaining to MS4 permitting, regardless of Regional Board jurisdictional boundaries. In this manner, the City of Lake Forest would be subject to a single MS4 permit.

City staff is aware that similar requests have been granted to the Cities of Murrieta, Menifee, and Wildomar in Riverside County. We are also aware that the SARWQCB is working with the Los Angeles Regional Water Quality Control Board to regulate discharges of bacteria from the cities of Claremont and Pomona. In addition, we are aware that the City of Laguna Hills will be submitting a similar request to this one; however, it is our understanding that Laguna Hills will be requesting to be singularly regulated by the SDRWQCB as the majority of their land area is located within the SDRWQCB jurisdiction.

Below, please find a discussion of the basis for this request and a description of the portion of the city that is proposed to be regulated by the Santa Ana Regional Water Quality Control Board.

Basis for the request

The City is currently named as a Permittee in Order R8-2009-0030 issued by the SARWQCB (Santa Ana Permit), and Order R9-2009-0002 issued by the SDRWQCB (San Diego Permit). It is also notable that the SDRWQCB is currently in the process to consider adoption of a new MS4 permit covering the entire region of the SDRWQCB jurisdiction, including the Counties of San Diego, Riverside, and Orange. While both of the above referenced Orders indicate the same goal of reducing the discharge of pollutants from the MS4 system, these two Orders require the City to implement extensive, but different, compliance programs. Differences in the substantive requirements of each Region Board's Orders can have significant impacts on City operations and compels the City to implement what amounts to two different compliance programs within its jurisdiction. In turn, this results in increased resource and administrative burden, which can cause inherent and unavoidable inefficiencies in program implementation. For example, there are inherent duplicative administrative and financial burdens related to the development and implementation of two different programs; staff training for different requirements; development of different compliance information for staff, contractors, developers, businesses, and the general public; development and implementation compliance program components such as differing inventory, prioritization, inspection, and documentation requirements, and different annual reporting requirements; etc. In addition, attempting to implement two differing programs creates difficulties, inefficiencies, and confusion for City staff and the public. The overarching goal and purpose of the City's request is to reduce the aforementioned complexity to allow for the more effective and focused utilization of the City's resources to the benefit of water quality.

Mr. Kurt Berchtold
Santa Ana Regional Water Quality Control Board
Mr. David W. Gibson
San Diego Regional Water Quality Control Board
Re: Request for Singular Regulation

Description of the area of the City subject to the designation:

Some facts about the City of Lake Forest and the portions of the City located within different watersheds and different Regional Board jurisdictions. A map of the City depicting the Regional Board boundary is enclosed with this letter.

- 17 Square Miles*- Total Land Area of the City
- 11.5 Square Miles* – Total Land Area located in the Newport Bay/San Diego Creek Watershed (SARWQCB Jurisdiction)
- Approximately 5.5 Square Miles* - Total Land Area located in the Aliso Creek Watershed (SDRWCQB jurisdiction)
- 70% of Total Land Area* - Percent of City in the Newport Bay/San Diego Creek Watershed (SARWQCB Jurisdiction)
- 30% of Total Land Area* – Percent of City in the Aliso Creek Watershed (SDRWQCB Jurisdiction)

(* approximate)

Additional Request for Municipal Construction Projects Requiring Coverage Under the State Construction General Permit:

Understanding that the requested designation applies to the MS4 permit requirements, the SARWQCB implements a simplified process for applying for coverage under the General Construction Permit (Order 2009-0009-DWQ) for municipal projects. This process includes submission of Permit Registration Documents (PRDs) through a special category within the Storm Water Multiple Application and Reporting Tracking System (SMARTS) and waived application fees. To avoid unnecessary confusion among staff, and potential for inadvertent non-compliance, the City hereby requests to utilize the SARWQCB process to obtain coverage under the Construction General Permit for all municipal construction projects within the City limits (including those portions of the City located within the Aliso Creek Watershed).

In conclusion, the requested designation of regulatory authority to the SARWQCB will not only reduce the complexity and administrative burden upon the City of Lake Forest, but will allow the City to better focus and effectively utilize their available resources to the best benefit to water quality in both regions.

Mr. Kurt Berchtold
Santa Ana Regional Water Quality Control Board
Mr. David W. Gibson
San Diego Regional Water Quality Control Board
Re: Request for Singular Regulation

If you have any questions regarding this request, please contact Devin Slaven, Water Quality Administrator, at 949-461-3436 or dslaven@lakeforestca.gov.

Sincerely,
City of Lake Forest

Thomas Wheeler, P.E.
Director of Public Works/City Engineer

Attachments:

Map of the City of Lake Forest Depicting Regional Board Boundary

cc:

Robert Dunek, City Manager
Devin Slaven, CPSWQ, QSD/QSP, Water Quality Administrator
Scott Smith, City Attorney, Best Best & Krieger, LLP
Mary Anne Skorpanich, County of Orange, OC Watersheds

025842

CITY OF LAKE FOREST WATERSHED BOUNDARIES

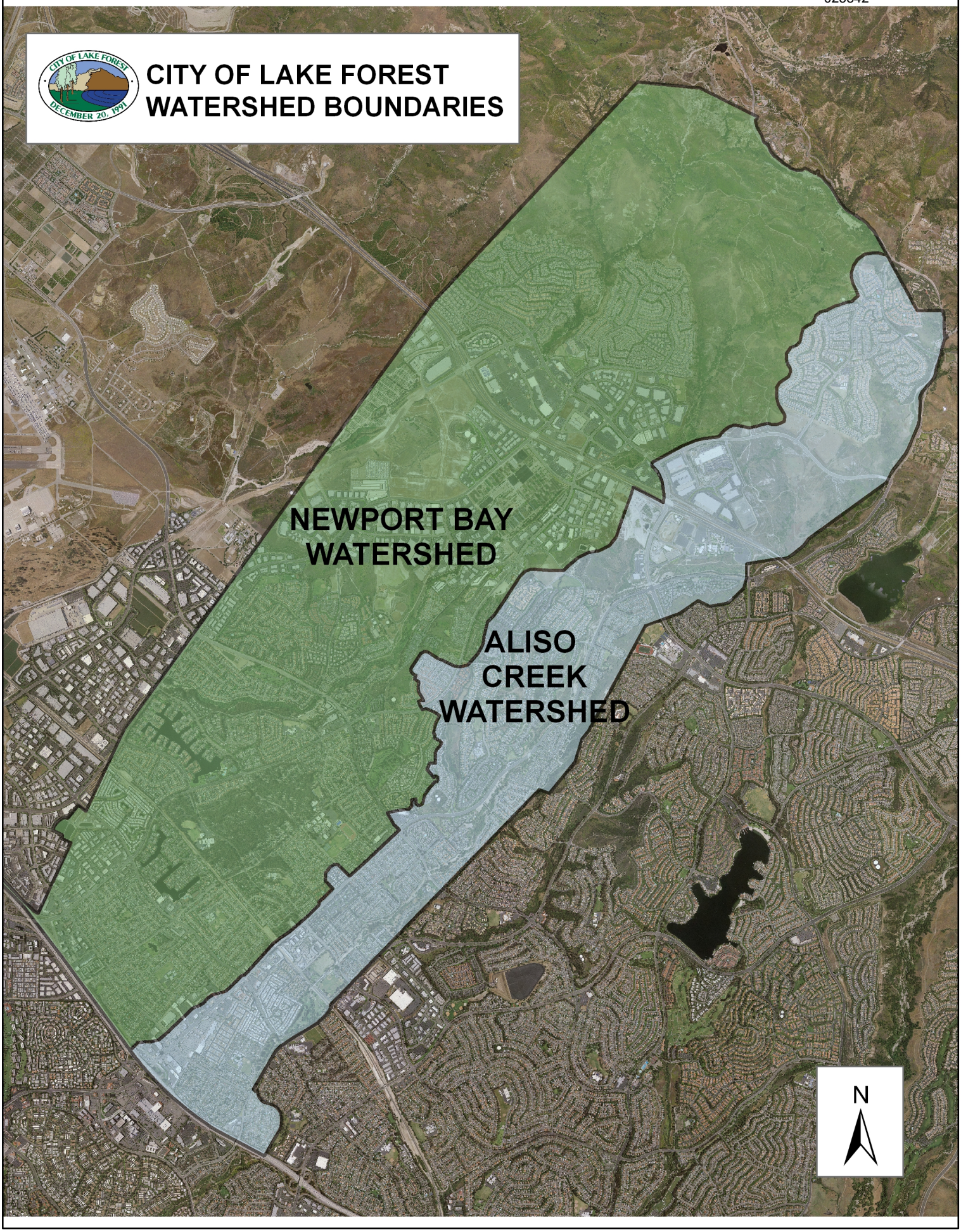

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AFFILIATES
California Building Industry Association
National Association of Home Builders

January 24, 2013

David Gibson
Executive Officer
San Diego RWQCB
9174 Sky Park Court, Ste. 100
San Diego, CA 92123

Dear Mr. Gibson:

Happy New Year.

As you may remember at the December RWQCB hearing, Board member Henry Abarbanel, stated to Michael McSweeney-BIA's Sr. Public Policy Advisor, during his remarks to the Board, "if you can draft a better permit, bring it to the February meeting and we'll consider it (my paraphrase of his comment).

The BIA and our Coalition partners wish to present to your Board a version of the Permit as Board member Abarbanel had requested. As both the co-permittees and Coastkeeper did at the November hearing, we'd like to request 30 minutes to make our presentation to the Board. We will have slides in a PowerPoint format because in many instances, a picture is worth a thousand words.

We are presenting our ideas and suggested permit language in a spirit of cooperation and good faith. We are incorporating ideas from outside our Coalition, including environmentalists and co-permittees. We are excited to share our ideas, because we believe we can demonstrate an accelerated way to reduce pollutants in our region's watersheds.

It is not, nor has it been our intent, to diminish the work of your staff or the RWQCB. Our sincere intent is to unleash our experts engineering knowledge base to benefit the entire community.

By continuing to work together, we believe great strides can be made in pollutant removal regionally.

I look forward to your favorable reply.

Repectfully,

Borre Winckel
On behalf of the Coalition

Building Industry Association of San Diego County
9201 Spectrum Center Blvd., Suite 110, San Diego, CA 92123-1407
P 858-450-1221 F 858-552-1445 www.biasandiego.org

From: Bromley.Eugene@epamail.epa.gov
To: Chiu, Wayne@Waterboards
Cc: Smith.DavidW@epamail.epa.gov; Becker, Eric@Waterboards; Barker, David@Waterboards; Kemmerer.John@epamail.epa.gov; Lin.Cindy@epamail.epa.gov; Brown.Samuel@epamail.epa.gov; Marincola.JamesPaul@epamail.epa.gov
Subject: Re: Fw: San Diego Regional Permit Compliance Option for Prohibitions and Receiving Water Limitations
Date: Tuesday, February 12, 2013 1:31:00 PM
Attachments: USEPA Review.pdf

Wayne,

Here's a few comments on your new proposal:

1) Regarding compliance with receiving water limitations (RWLs), our first preference would be to just continue using the current RWLs language. However, if you choose to include the new B.3.c compliance option, the proposal should clarify when the potential "safe harbor" period would begin; we would recommend that any such "safe harbor" period begin only after approval of an appropriate WQIP by the Board. Providing "safe harbor" coverage based solely upon submittal by a jurisdiction of a notice of intent to develop a WQIP is legally questionable. This approach could be read to provide the functional equivalent of a compliance schedule without satisfying the requirements that must be met to grant a compliance schedule (e.g., provisions of 40 CFR 122.47 requiring that such schedules result in attainment as soon as possible and include specific interim milestones and schedules leading to attainment of effluent limitations). In reviewing and approving a proposed WQIP, the Board can ensure that the plan will be robust enough to result in attainment within a reasonable period of time.

2) to better ensure that permittees provide a robust demonstration that proposed strategies and activities in a WQIP would lead to compliance with WLAs/RWLs, we suggest revising the second sentence in B.3.c.(2) to the following:

"the results must be included in the water quality improvement plan to quantitatively demonstrate that the implementation of the water quality improvement strategies. . ."

3) in the new proposed B.3.c.(1)(c) the phrase "protect the physical and biological conditions of the receiving waters" is somewhat vague and should be clarified. We believe your overall intent is to require compliance with RWLs (provisions A.1.a, A.1.c and A.2.a of the permit) and B.3.c.(1)(c) would fill in any gaps not covered by B.3.c.(1)(a) and (b). We recommend the requirement to revised to provide this clarification. The phrase "protect the physical and biological conditions of the receiving water" could be read to provide only for protection of existing conditions, not to require reduction of pollutant discharges necessary to result in attainment of applicable water quality standards. It would be much more defensible to simply revise the phrase to something like "protect and restore the physical and biological conditions of receiving waters and attain water quality objectives."

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NPDES Permits Office (WTR-5)
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San Francisco, CA 94105
bromley.eugene@epa.gov
(415) 972-3510
(415 947-3549 (fax)

From: DavidW Smith/R9/USEPA/US
To: Eugene Bromley/R9/USEPA/US@EPA,
Date: 02/07/2013 03:26 PM
Subject: Fw: San Diego Regional Permit Compliance Option for Prohibitions and Receiving Water Limitations

---

David Smith
Manager
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EPA Region 9
75 Hawthorne Street
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(415) 972-3464
(415 947-3545 (fax)

----- Forwarded by DavidW Smith/R9/USEPA/US on 02/07/2013 03:26 PM -----

From: "Chiu, Wayne@Waterboards" <Wayne.Chiu@waterboards.ca.gov>
To: Cindy Lin/R9/USEPA/US@EPA, John Kemmerer/R9/USEPA/US@EPA, DavidW Smith/R9/USEPA/US@EPA
Cc: "Becker, Eric@Waterboards" <Eric.Becker@waterboards.ca.gov>, "Barker, David@Waterboards" <David.Barker@waterboards.ca.gov>, "Arias, Christina@Waterboards" <Christina.Arias@waterboards.ca.gov>, "Walsh, Laurie@Waterboards" <Laurie.Walsh@waterboards.ca.gov>
Date: 02/06/2013 01:45 PM
Subject: San Diego Regional Permit Compliance Option for Prohibitions and Receiving Water Limitations

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Hi John, Cindy and Dave,

We have developed some language that we plan on including in our Regional MS4 Permit to lay out a pathway for demonstrating compliance with the discharge prohibitions and receiving water limitations. I've attached the pertinent sections of the permit to generally show where it would go into the permit.

The attachment begins with an excerpt of most of Provision A, which lays out the discharge prohibitions (A.1) and receiving water limitations (A.2), as well as the "iterative process" language (A.4). We do not plan on making any changes to this language other than Provision A.1.b.

Following the excerpt from Provision A is a new section we plan on putting into the Water Quality Improvement Goals, Strategies and Schedules section of the Water Quality Improvement Plan requirements under Provision B. Provision B.3.c is where we provide the option for each Copermittee to develop a robust set of goals, strategies and schedules that can demonstrate they will achieve the discharge prohibitions and receiving water limitations in Provision A. The review of the goals, strategies, and schedules for the compliance option will go through a rigorous public process, as well as review by a Water Quality Improvement Consultation Panel which is described in Provision F.1.a.(1)(b), before being reviewed for acceptance by the San Diego Water Board.

Provision F.1.a.(1) describes the public participation process that will be required for the development of each Water Quality Improvement Plan. You will find the details about the Water Quality Improvement Consultation Panel under this section.

Provision B.3.c is a fairly important piece of our response to the comments we've heard and received. We are currently trying to finalize the changes we want to make to the permit so we can start responding to all the comments we've received. Our current direction is to get the permit to our Board in April. In order for that to

happen, we need to finalize our changes and finish responding to comments by the end of this month.

We'd like to get your feedback on the language before we finalize it. We need your feedback by February 22 if we want to make sure we have enough time to get all our ducks in a row for the April Board meeting.

Let me know if you have any questions. Otherwise, hope to get your feedback on or before February 22.

Thanks,

Wayne Chiu, PE
Water Resource Control Engineer
Southern Watershed Unit
California Regional Water Quality Control Board
San Diego Region
9174 Sky Park Court
San Diego, California 92123
858-637-5558
858-571-6972 Fax

From: Becker, Eric@Waterboards
To: Kemmerer.John@epamail.epa.gov; Lin.Cindy@epamail.epa.gov; Smith.DavidW@epamail.epa.gov
Cc: Barker, David@Waterboards; Hagan, Catherine@Waterboards; Chiu, Wayne@Waterboards
Subject: San Diego Regional Storm Water Permit Response to Comments & Tentative Order w/ changes
Date: Tuesday, March 05, 2013 10:01:18 AM
Attachments: 2013-0305 Tentative Order_USEPA Review Draft.pdf
Response to Comments Table COMPLETE.pdf

Hi All-

Please see attached proposed changes to our Regional Storm Water Permit in response to comments. I also attached our response to comments document. Both documents are draft and we are still making some minor changes. Also, we are meeting with our Board members for briefings starting March 18th. So if possible, we would like to set up a conference call next week to discuss any comments you might have on our proposed changes or anything else.

Thanks.

Eric Becker, P.E.
Senior Water Resources Control Engineer
Southern Watershed Unit
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9174 Sky Park Court, Suite 100
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(858) 571-6972
EBecker@waterboards.ca.gov

From: lyris@swrcb18.waterboards.ca.gov
To: Chiu, Wayne@Waterboards
Subject: Notice of Public Hearing to consider adoption of Tentative Order R9-2013-0001
Date: Wednesday, March 06, 2013 5:11:03 PM
Attachments: 2013-0306 _Final Regional MS4 Public Notice 2 Day.pdf

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This is a message from the California Regional Water Quality Control Board, San Diego Region (9).

Copermittees and Interested Persons;

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) is scheduled to hold a public hearing to consider adoption of Tentative Order No. R9-2013-0001, NPDES No. CAS0109266, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region.

The public hearing on this matter is scheduled on April 10 and 11, 2013 in the Board Room, San Diego Water Board, 9174 Sky Park Court, Suite 100, San Diego, CA 92123-4340. This item will be heard during the meetings that will start at 9:00 A.M. on each day.

Attached to this email is a copy of the public hearing notice. This notice was sent via US Mail on March 6, 2013 to the cc'd list of Copermittees and Resource Agencies. A copy of the public hearing notice can also be found on the San Diego Water Board's Website at http://www.waterboards.ca.gov/rwqcb9/

A more detailed Notice of Public Hearing will be available on or about March 15, 2013.

Laurie Walsh, PE
Water Resource Control Engineer
San Diego Regional Water Quality Control Board
Tel. 858-467-2970

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD
www.waterboards.ca.gov/sandiego/

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This Notice was sent via US Mail on 3/06/2013 to the list of cc'd Copermittees and Resource Agencies.

025849

CALIFORNIA Water Boards

EDMUND G. BROWN JR. GOVERNOR

MATTHEW RODRIQUEZ SECRETARY FOR ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

NOTICE OF PUBLIC HEARING

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) is scheduled to hold a public hearing to consider adoption of Tentative Order No. R9-2013-0001, NPDES No. CAS0109266, *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Tentative Order).

The Tentative Order is a regional MS4 permit that proposes to jointly cover all 39 Copermittees within the San Diego Region (i.e., South Orange County, Southwestern Riverside County, and San Diego County), in a phased manner as their current MS4 permits expire or upon request for earlier coverage prior to permit expiration. The Tentative Order covers multiple discharge points to multiple receiving waters throughout the San Diego Water Board Region. All MS4 Copermittees in the San Diego Region are therefore on notice that they may ultimately be regulated under the Tentative Order, if adopted.

The public hearing on this matter is scheduled on April 10 and 11, 2013 in the Board Room, San Diego Water Board, 9174 Sky Park Court, Suite 100, San Diego, CA 92123-4340. The item will be heard during the meetings that will start at 9:00 A.M. on each day. The location, however, may be changed prior to the meetings. The meeting agendas, which will indicate any changes, will be posted at http://www.waterboards.ca.gov/sandiego/board_info/agendas/, at least two weeks prior to the meeting dates.

All written comments including testimony, technical documentation and factual information pertaining to the terms and conditions of the Tentative Order to be considered by the San Diego Water Board were required to be submitted **by 5:00 pm on January 11, 2013**. The scope of oral testimony at the public hearing will be strictly limited to summarizing the previously submitted written comments, commenting on revisions to the Tentative Order made in response to comments, and making policy statements. No additional written materials will be accepted or provided to the San Diego Water Board Members.

Information related to this matter, including the Tentative Order is available and may be reviewed at the San Diego Water Board's office or on the San Diego Water Board's web page at: http://www.waterboards.ca.gov/rwqcb9/water_issues/programs/stormwater/index.shtml

A more detailed Notice of Public Hearing will be available on or about March 15, 2013.

Please contact Wayne Chiu at (858) 637-5558 or wchiu@waterboards.ca.gov for questions or comments regarding this hearing notice.

Please bring the foregoing to the attention of any person known to you who would be interested in this matter.

DAVID W. GIBSON
Executive Officer
March 5, 2013

San Diego County Copermittees

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Chiu 025852

DEPARTMENT OF THE NAVY
COMMANDER NAVY REGION SOUTHWEST
937 N. HARBOR DRIVE
SAN DIEGO, CA 92132-0058

SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD

2013 MAR 21 P 12:59

IN REPLY REFER TO:
5090
Ser N00/130
March 11, 2013

Mr. Tomas Morales, Chair
California Region Water Quality Control Board
San Diego - Region 9
9174 Sky Park Court, Suite 100, San Diego, CA 92123-4340

SUBJ: CONSISTENT REGULATION OF STORM WATER DISCHARGES

Dear Chair Morales:

The Board will be considering a number of storm water permits over the next few months and we believe that this is a good time to consider storm water regulation consistency. Federal and state regulations support consistent application of regulations that seek to protect water quality and maintain beneficial uses of our surface waters. The storm water permits currently being considered take very different approaches to regulating potential toxicity from these discharges, even though all the discharges are into San Diego Bay. Both receiving water toxicity requirements and end of pipe toxicity requirements are used. The Navy supports receiving water toxicity requirements as directly indicative of water quality and protective of beneficial uses.

Toxicity of municipal and industrial storm water discharges is well documented when measured at the end of the pipe and is largely due to copper and zinc. Further, storm water from nearly every urban parking lot state wide is toxic. This is a community issue requiring all of us to do our part.

Toxicity in the receiving water is rarely observed following storm events, because stormwater discharges are intermittent, flow is variable, and they are of short duration, representing a very temporary condition in the receiving water. Toxicity testing in the receiving water appropriately addresses this uniqueness while protecting water quality.

This Board recently adopted "A Framework for Monitoring and Assessment in the San Diego Region". This framework suggests that coordinated regional receiving water monitoring is generally preferred as a means of assessing compliance with water quality standards. In addition, the State Board is currently working on a "Plan for Toxicity Assessment and Control". Toxicity testing in the receiving water is consistent

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KRUIZ Time: 1:38

5090
Ser N00/130
March 11, 2013

with the current draft of the State's plan and San Diego's framework.

We also believe that the long term solution to copper and zinc toxicity involves source control, as the largest sources of these metals are not regulated by storm water permits, coming primarily from transportation related sources. The Navy supports Assembly Bill 1251 that proposes a comprehensive look at source identification and control to improve water quality.

In summary, storm water discharges in the San Diego Region should be regulated consistently. The short term focus should be on 'best management practices' with toxicity requirements in the receiving water. In the longer term, source identification and control are necessary to meet water quality objectives. The Navy supports the use of receiving water toxicity requirements as protective of water quality, particularly when addressing storm water toxicity.

My point of contact for this issue is Mr. Brian Gordon, who can be reached at (619) 532-2273 or email at brian.gordon@navy.mil.

Sincerely,

Dixon R. SMITH
Rear Admiral, U. S. Navy

Copy to: Mr. David Gibson

025854

SAN DIEGO REGIONAL
WATER QUALITY
CONTROL BOARD
2013 MAR 15 PM 3 55

City of San Diego

County of San Diego

March 15, 2013

COPY

Mr. David Gibson
California Regional Water Quality Control Board
San Diego Region 9
9174 Sky Park Court, Suite 100
San Diego, CA 92123

NOTICE OF PUBLIC HEARING – NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WATER DISCHARGE REQUIREMENTS FOR DISCHARGES OF URBAN RUNOFF FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4S) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

Dear Mr. Gibson:

On March 6, 2013 the San Diego Regional Water Quality Control Board (Regional Board) announced that hearings for the proposed Municipal Storm Water Permit for the San Diego Region would be held on April 10 and 11, 2013. The City of San Diego (City) and the County of San Diego (County) submitted lengthy written comments during the public comment period for the draft permit and is concerned that the hearings will be held without our respective jurisdictions being given an opportunity to review responses to their comments. Furthermore, we believe that it would be prudent to postpone any approval of the Municipal Storm Water Permit until the California State Water Resources Control Board provides guidance on the Receiving Waters Limitation language, which if not included in the initial approval of our regional permit, could necessitate that the Regional Board amend its regulations in the immediate future.

The City and the County appreciate the difficulties and challenges in implementing such complex regulatory matters as the Municipal Storm Water Permit, but as copermittees regulated by this permit, we are concerned that the Regional Board has decided to move this hearing forward without providing sufficient time to appropriately respond to and address stakeholders' concerns.

Locally and on a statewide level there continue to be numerous outstanding issues with this proposed permit. We believe it would be inappropriate and irresponsible to rush adoption

without continued dialog between the stakeholders and Regional Board staff. The City and County are committed to the goal of improving water quality through the storm water management programs that have been developed in conjunction with the Regional Board, but the current proposed permit include provisions that are flawed and need to be addressed.

Considering the significant financial burden this permit will have on so many local governments, we believe it is more important to create a permit that incorporates sound regulation than to needlessly rush toward an arbitrary deadline. The Regional Board staff has acknowledged on the record that the impacts of some of the proposed standards and regulations are not fully understood. We do not even know that compliance can be achieved with the tools and science available today. However, we do know for certain, based on the Regional Board's own studies, that significant cost in the range of billions of dollars will be incurred as a result of copermittees trying to comply with the proposed regulations if implemented.

As stewards entrusted with managing public tax dollars, we do not believe it is prudent to implement policy without having a clear understanding of whether it will mitigate the problem it was created to address. The City and the County believe it would be more productive to postpone any hearing in order to step back and continue working with all stakeholders to clearly define goals that are achievable and do not have such detrimental financial impacts to local governmental services.

Thank you for your consideration of this request. If the Regional Board does choose to move forward with holding the hearing in April, the City and County respectfully request to speak at the designated meeting to have the record reflect our respective positions on this matter. We would also respectfully request a time certain be allocated at the beginning of such hearing so that the City and County representatives can provide testimony.

If you have any questions, please contact Richard Crompton, County of San Diego Director of Public Works at (858) 694-2233 or Kip Sturdevan, City of San Diego Director of Transportation and Storm Water at (619) 236-6594.

Respectfully,

Hon. Bob Filner
Mayor
City of San Diego

Hon. Greg Cox
Chairman
San Diego County Board of Supervisors

From: lyris@swrcb18.waterboards.ca.gov
To: Chiu, Wayne@Waterboards
Subject: Hearing Procedures and Order of Proceedings - Tent Order No. R9-2013-0001 - Regional MS4 Permit
Date: Monday, March 18, 2013 9:29:29 AM
Attachments: Supp Hearing Procedures and Order of Proceedings Sig.pdf

---

This is a message from the California Regional Water Quality Control Board, San Diego Region (9).

The attached notice of Hearing Procedures and Order of Proceedings sets forth additional details on the procedures and order of presentations the San Diego Water Board will follow at the public hearing on April 10 and 11, 2013 to consider adoption of Tentative Order No. R9-2013-0001 – the Regional MS4 Permit.

Respectfully,

David Barker
San Diego Water Board

David T. Barker, P.E.
Supervising Engineer
California Regional Water Quality Control Board
San Diego Region
(858) 467-2989
e-Mail: dbarker@waterboards.ca.gov

You are currently subscribed to reg9_sandiegoco_ms4permit as: wchiu@waterboards.ca.gov.

To unsubscribe click here: leave-454899-508208.cee2a373662e566393e62f0af18d11cf@swrcb18.waterboards.ca.gov

California Water Boards

Edmund G. Brown Jr.
Governor

Matthew Rodriquez
Secretary for
Environmental Protection

California Regional Water Quality Control Board, San Diego Region

HEARING PROCEDURES AND ORDER OF PROCEEDINGS

Public Hearing to Consider Adoption of Tentative Order No. R9-2013-0001, NPDES No. CAS01092662 and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds Within the San Diego Region

April 10 and 11, 2013
Beginning at 9:00 a.m. Each Day
California Regional Water Quality Control Board, San Diego Region
Regional Water Board Room
San Diego Water Board Office Building
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

By prior public notice dated March 5, 2013, the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) announced its intent to conduct a public hearing on April 10 and 11, 2013, to receive testimony and comments and consider adoption of Tentative Order No. R9-2013-0001, NPDES No. CAS0109266, *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Tentative Order). This Order of Proceedings sets forth additional details on the procedures and order of presentations the San Diego Water Board will follow at the public hearing.

SCOPE OF HEARING

The Tentative Order was released for public review and comment on October 31, 2012. The written comment period ended January 11, 2013. All timely written comments received are posted on the San Diego Water Board website, at http://www.waterboards.ca.gov/rwqcb9/water_issues/programs/stormwater/index.shtml. No subsequently filed written comments have been accepted into the record at this time. Other than speaker cards and copies of electronic presentations (see below) no new written materials will be accepted into the record at the April 10-11, 2013 hearing. As indicated in prior notices, the scope of oral testimony at the public hearing will be strictly limited to summarizing the previously submitted written comments, commenting on revisions to the Tentative Order made since the written comment period closed, and making policy statements. No new issues may be raised at the hearing.

HEARING PROCESS

During the public hearing, San Diego Water Board staff will present an overview of the Tentative Order, written responses to comments received and recommended revisions to the Tentative Order. For this proceeding, San Diego Water Board staff will begin, followed by representatives of the following parties: 1) the San Diego County, Orange County and Riverside County Copermittees; 2) U.S. Environmental Protection Agency; 3) Environmental Non-governmental Organizations (NGOs); and 4) Building Industry Groups.[1] Participants within these groups are encouraged to consolidate their presentations to save hearing time and/or avoid duplication.

After these presentations, the San Diego Water Board will hear from the public (interested persons), subject to times certain (see below). Interested persons with similar concerns or opinions are encouraged to choose one representative to speak, and are encouraged to coordinate their presentations with each other and to summarize their written comments. Interested persons may not cede their unused time to others, but the Chair will entertain requests for extra time from interested persons speaking on behalf of multiple interested persons.

Speakers will be interrupted not earlier than 4:00 p.m. on April 10 so that the San Diego Water Board can hear from interested persons other than representatives of the groups identified by name in this order of proceedings. At 9:15 a.m. on April 11, or as soon thereafter as practicable, elected officials will be invited to speak.

ORDER OF PROCEEDINGS

Chair's opening remarks, introductory items, administration of the oath to persons who intend to testify	**10 minutes**
San Diego Water Board Staff Presentation	**1.5 Hours**
San Diego County, Orange County and Riverside County Copermittees	**3 Hours (Total)**
US Environmental Protection Agency	**30 Minutes (Total)**
Environmental NGOs – (The Escondido Creek Conservancy, Coastkeeper, San Diego Canyonlands, Natural Resources Defense Council, Los Penasquitos Lagoon Foundation, Laguna Bluebelt Coalition, Friends of Rose Canyon Creek, Clean Water Now, Coastal Environmental Rights Foundation, Environmental Health Coalition, San Elijo Lagoon Conservancy, South Laguna Civic Association)	**1 Hour (Total)**

[1] These participants have been identified based upon prior participation through written comments, stakeholder meetings and public workshops held in November and December 2012.

Building Industry/Industry- (Association of General Contractors, Otay Land Company, Otay Ranch New Homes, American Society of Landscape Architects, BIA Regulated Coalition, BIA of Southern California, Industrial Environmental Association, San Diego Gas & Electric, San Diego Green Building Council, Southern California Gas Company)	**1 Hour (Total)**
Interested Persons (Time Certain at 4 p.m. on April 10, 2013)	**3 Minutes Each**
Elected Officials' comments (Time Certain at 9:15 a.m. on April 11, 2013)	**5 Minutes Each**

This allocated time includes time for any opening statement, main presentation, rebuttal and/or closing argument. San Diego Water Board Members and Counsel may ask questions at any time. Time for questions and answers will not count against the above time limits.

OBJECTIONS TO PROCEDURES

Other than as provided in this document, the San Diego Water Board intends to conduct this public hearing in a generally informal manner. Participants requesting alternative procedures, with procedural requests outside of the scope of this notice, or requesting more time to speak, must submit their requests or objections in writing to the San Diego Water Board staff member identified below no later than 5:00 pm on March 22, 2013. The San Diego Water Board will endeavor to accommodate reasonable requests and to respond to procedural objections and requests prior to the hearing. Untimely objections will be deemed waived.

POWER POINT AND OTHER COMPUTER DISPLAYS

Participants may use PowerPoint and other computer displays during their presentation to convey information electronically on the San Diego Water Board's computer. These displays will only be accepted if they summarize the information contained in documents that were timely submitted in compliance with deadlines cited above and in prior notices. They will not be accepted if they contain any new testimony or evidence. Please note that any person planning to use an electronic presentation at the hearing is required to provide a sufficient number of printed copies of the presentation for distribution to board members and staff and a reasonable number of copies to be available for the public to access during the hearing. An electronic copy of any presentation used during the hearing must be left with the San Diego Water Board's Executive Assistant for inclusion in the record. Electronic presentations will be posted on the San Diego Water Board's website as soon as practicable.

DOCUMENT AVAILABILITY

The Tentative Order, and attachments thereto, timely received comment letters on the Tentative Order, and other information and documents relied upon are posted on the San Diego Water Board website at: http://www.waterboards.ca.gov/rwqcb9/water_issues/programs/stormwater/index.shtml. A revised Tentative Order reflecting revisions since the written comment deadline and a

responses to comments document will be available shortly. Parties and interested persons will be notified by e-mail when those documents are posted on the Board's website.

These documents are also available for inspection and copying between the hours of 8:00 a.m. and 5:00 p.m. at the following address:

California Regional Water Quality Control Board
San Diego Region
9174 Sky Park Court, Suite 100,
San Diego, California 92123-4340

Arrangements for file review and/or obtaining copies of documents in the Administrative Record may be made by contacting the San Diego Water Board at (858) 467-2952. Appointments are encouraged so the documents can be readily available upon arrival. All timely received comment letters on the Tentative Order and responses to comments and other subsequent relevant documents will be available online as they are generated.

Staff Contact for Further Information
For questions or comments concerning this notice, please contact Wayne Chiu by phone at (858) 637-5558, or by email at wchiu@waterboards.ca.gov.

James G. Smith, AEO
for David W. Gibson

March 15, 2013

cc:
Distribution via email:
(see attached address list)

San Diego County Copermittees
Orange County Copermittees
Riverside County Copermittees
Resource Agencies

Distribution list via email:

San Diego County MS4 Permit Lyris List
Riverside County MS4 Permit Lyris List
Orange County MS4 Permit Lyris List
San Diego Water Board Agenda Lyris List

Tech Staff Info & Use	
Order No.	R9-2013-0001
Party (GT/CIWQS) ID	536787
File No.	n/a
WDID	n/a
NPDES No.	CAS0109266
Reg. Measure ID	387335
Place ID	786088
Person ID	n/a
Inspection ID	n/a

San Diego County Copermittees

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tdzmura@cityofwildomar.org

From:	Roger Butow
To:	Gibson, David@Waterboards
Cc:	Smith, James@Waterboards; Barker, David@Waterboards; Chiu, Wayne@Waterboards; Walsh, Laurie@Waterboards; Becker, Eric@Waterboards; Hagan, Catherine@Waterboards
Subject:	Clarification re allotted time
Date:	Monday, March 18, 2013 10:28:25 AM
Attachments:	Supp Hearing Procedures and Order of Proceedings Sig.pdf

---

SDRWQCB staff:

CWN wishes to avoid a repeat of last October's staff rollout/presentation to the Board.

We felt marginalized, given short shrift and especially experienced gruff disrespect shown by the Chair.

We made our feelings known to the Board, staff and attendees at that time and are seeking a path that doesn't stir up yet more animosity or enmity.

EX.: It was ridiculous to be forced to watch Jill Witkowski give a time-consuming, redundant PP that included her personal recreational activities. What's next, baby pictures of NGO personnel's children?

Ms. Witkowski, as we pointed out, was given preferential positioning and extended time that could have been spent in a more valuable, a more pertinent way.

We are seeking a more egalitarian approach by staff and Board in the future. One that is indiscriminate and treats **ALL** interested parties more alike instead of the preferential auspice given to enviro-NGOs with hefty budgets and intern attorneys galore that we now observe.

CWN is **NOT** aligned with, nor working conjunctively with any of the NGOs listed in this procedural notification. Presently, going through our 1 year reorganization, it might eventually produce such collaborations---but not right now.

As we build out our new board, re-prioritize our goals, etc., we are carefully reviewing who we wish to be engaged in dialogue with.....Thus we are an anomaly, we have no communication or negotiation mechanism to get our properly deserved slot. So we won't be **"consolidating"** as the notice encourages.

Question: As only 1 hour total is allotted on April 10th for ALL enviro-NGOs, under the circumstances, how might CWN procure an assured speaking timeframe and what is our guaranteed minimum allotted time for comments?

Thanks in advance for your considered attention and timely response,

Roger E. Bütow
Executive Director
Clean Water Now

Phone: (949) 715.1912
Address: PO Box 4711 Laguna Beach CA 92652

Email: roger@clean-water-now.org
Web: www.clean-water-now.org

CLEAN WATER NOW is an innovative, science-based organization committed to solution-oriented collaboration as a means of developing safe, sustainable water supplies and preserving healthy ecosystems.

From: Roger Butow
To: Gibson, David@Waterboards
Cc: Smith, James@Waterboards; Barker, David@Waterboards; Chiu, Wayne@Waterboards; Walsh, Laurie@Waterboards; Becker, Eric@Waterboards; Hagan, Catherine@Waterboards
Subject: 5-6 Minutes
Date: Monday, March 18, 2013 4:07:55 PM

I have left a VM @ both office & cell numbers for Asst. XO & Ombudsman James Smith requesting 5-6 minutes maximum.....There are about 12 NGOs on your list, many have already **"consolidated"** presentations in prior sessions/written submissions/testimony, so our proposed proportional share is estimated by my Board at approximately that number of minutes anyway.

I would appreciate an email response that confirms that amount of approved minutes in advance and we'll consider it agreed upon.
To assure us that others don't run on and (once again) use up or run into our dedicated allotment, we'll agree to **"bat leadoff"** (go first).
Please confirm that as well.
Done deal.

On Mar 18, 2013, at 10:28 AM, Roger Butow wrote:

> SDRWQCB staff:
>
> CWN wishes to avoid a repeat of last October's staff rollout/presentation to the Board.
>
> We felt marginalized, given short shrift and especially experienced gruff disrespect shown by the Chair.
>
> We made our feelings known to the Board, staff and attendees at that time and are seeking a path that doesn't stir up yet more animosity or enmity.
>
> EX.: It was ridiculous to be forced to watch Jill Witkowski give a time-consuming, redundant PP that included her personal recreational activities. What's next, baby pictures of NGO personnel's children?
>
> Ms. Witkowski, as we pointed out, was given preferential positioning and extended time that could have been spent in a more valuable, a more pertinent way.
>
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>
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>
> As we build out our new board, re-prioritize our goals, etc., we are carefully reviewing who we wish to be engaged in dialogue with.....Thus we are an anomaly, we have no communication or negotiation mechanism to get our properly deserved slot. So we won't be

"consolidating" as the notice encourages.

Question: As only 1 hour total is allotted on April 10th for ALL enviro-NGOs, under the circumstances, how might CWN procure an assured speaking timeframe and what is our guaranteed minimum allotted time for comments?

<Supp Hearing Procedures and Order of Proceedings Sig.pdf>

Thanks in advance for your considered attention and timely response,

Roger E. Bütow
Executive Director
Clean Water Now

Phone: (949) 715.1912
Address: PO Box 4711 Laguna Beach CA 92652
Email: **roger@clean-water-now.org**
Web: **www.clean-water-now.org**

CLEAN WATER NOW is an innovative, science-based organization committed to solution-oriented collaboration as a means of developing safe, sustainable water supplies and preserving healthy ecosystems.

From: sdcampaigncoordinator@gmail.com on behalf of Julia Chunn
To: Chiu, Wayne@Waterboards
Subject: correction for Hearing Procedures and Order of Proceedings - Tent Order No. R9-2013-0001 - Regional MS4 Permit
Date: Monday, March 18, 2013 3:06:14 PM
Attachments: Supp Hearing Procedures and Order of Proceedings Sig.pdf

---

Hi Wayne,

I spoke with Katherine last week, and we really appreciate the Board's willingness to take public comment at the time certain time of 4pm on April 10th! Our members will appreciate it, and it facilities their participation in the process.

I noticed one small error on the notice, and that is, that Surfrider Foundation is not listed under the group of NGOs even though we submitted a joint comment letter with Coastkeeper and some of the other groups mentioned there. I just wanted to bring it to your attention to ensure that it does not cause a procedure issue.

We will be coordinating with the other NGOs to decide how to divide up the hour we were allotted.

Thanks for assistance with this matter.

Sincerely,
--
Julia Chunn-Heer
Campaign Coordinator
Surfrider Foundation, San Diego Chapter
julia@surfridersd.org

Help protect your oceans, waves and beaches by becoming a Surfrider Foundation member today!
---------- Forwarded message ----------
From: <lyris@swrcb18.waterboards.ca.gov>
Date: Mon, Mar 18, 2013 at 9:24 AM
Subject: Hearing Procedures and Order of Proceedings - Tent Order No. R9-2013-0001 - Regional MS4 Permit
To: Julia Chunn-Heer <julia@surfridersd.org>

This is a message from the California Regional Water Quality Control Board, San Diego Region (9).

The attached notice of Hearing Procedures and Order of Proceedings sets forth additional details on the procedures and order of presentations the San Diego Water Board will follow at the public hearing on April 10 and 11, 2013 to consider adoption of Tentative Order No. R9-2013-0001 – the Regional MS4 Permit.

Respectfully,

David Barker

San Diego Water Board

David T. Barker, P.E.

Supervising Engineer

California Regional Water Quality Control Board

San Diego Region

(858) 467-2989

e-Mail: dbarker@waterboards.ca.gov

You are currently subscribed to reg9_sandiegoco_ms4permit as: julia@surfridersd.org.

To unsubscribe click here: leave-454899-529747.85311a0683fbe7803484b4f897a53397@swrcb18.waterboards.ca.gov

--
Julia Chunn-Heer
Campaign Coordinator
Surfrider Foundation, San Diego Chapter
julia@surfridersd.org

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COUNTY OF RIVERSIDE

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WATER QUALITY
CONTROL BOARD
2013 MAR 25 AM 9 49

Board of Supervisors

District 1	Kevin Jeffries 951-955-1010
District 2	John F. Tavaglione 951-955-1020
District 3	Jeff Stone 951-955-1030
District 4	John Benoit 951-955-1040
District 5	Marion Ashley 951-955-1050

March 20, 2013

Mr. David Gibson
Executive Officer
California Regional Water Quality
Control Board, San Diego Region
9174 Skypark Court, Suite 100
San Diego, CA 92123

Re: Notice of Public Hearing – National Pollutant Discharge Elimination System NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds Within the San Diego Region

Dear Mr. Gibson:

We are writing as members of the Riverside County Board of Supervisors and the Riverside County Flood Control and Water Conservation District Board of Supervisors whose districts include the Cities of Murrieta, Temecula and Wildomar as well as unincorporated areas of Riverside County, which are proposed to be covered by the above-referenced Municipal Storm Water Permit (Permit). We understand that Regional Board staff has scheduled the public hearing for adoption of the Permit on April 10 and 11, 2013.

We are writing to request that these dates be continued, as the current hearing dates do not provide the Riverside County stakeholders sufficient time to review proposed changes in the Permit or the responses of your staff to the substantive and substantial comments made by stakeholders. To date, neither the draft Permit nor the response to comments has been released by Board staff.

We understand that the Regional Board had previously informed stakeholders of its strong desire to solicit and incorporate stakeholder comments during the development of the Permit. Unfortunately, with neither the final proposed Permit language nor staff's responses to stakeholder comments, the Regional Board is stifling the public review and comment process by not allowing sufficient time to review comment responses and any resultant changes in the draft Permit before holding the adoption hearing. This raises significant due process concerns, as well as concerns as to the treatment of local governments by a state agency.

Stormwater permits have become increasingly complex and expensive over time, and require local governments (including those in Riverside County) to undertake significant activities with no or minimal state and federal funding. Given the financial pressures on local governments, state agencies must provide every opportunity for local government input to ensure that Permit requirements are aligned with local programs, resources and conditions so as to minimize unintended and unnecessary negative impacts on residents, business and local government services. The regional nature of this Permit, which proposes to cover municipalities in three counties and multiple watersheds, adds additional complexities for comment coordination beyond a typical permit renewal process and also requires new levels of coordination between local agencies after permit adoption. It is thus vitally important that local governments, and all stakeholders, have a full opportunity both to review the final draft Permit language and the comment responses in order to provide informed and complete testimony to the Regional Board.

Given the short time between now and April 10, and without even final permit language or responses to comments to review, the stakeholders, including those in Riverside County, will not have this opportunity.

We therefore request that the Regional Board re-schedule the hearing on the proposed Permit from the April 10 - 11, 2013 current scheduled dates to a later date and also provide a minimum of 45 days opportunity for the stakeholders to review and, if appropriate, comment on significant changes from the earlier draft of the Permit. We also understand that the Riverside County stakeholders also have specific concerns with the proposed hearing procedures for Permit adoption, which will be set forth in a separate letter.

Sincerely,

Supervisor Kevin Jeffries
District 1

Supervisor Jeff Stone
Vice-Chairman, Board of Supervisors
District 3

cc: George Johnson, Executive Office
Steven Horn, Executive Office
Pam Walls, County Counsel
Dusty Williams, Flood Control
Jason Uhley, Flood Control
Juan Perez, TLMA
David W. Burhenn & Gest LLP

From: Garrison, Noah
To: Chiu, Wayne@Waterboards
Cc: Jill Witkowski (jill@sdcoastkeeper.org); Colin Kelly (colin@coastkeeper.org); Arias, Christina@Waterboards
Subject: Hearing Procedure for San Diego MS4 Permit hearing April 10-11 - request for time for presentation
Date: Thursday, March 21, 2013 3:47:34 PM

Dear Mr. Chiu,

I am writing to you with regard to the recently released letter on Hearing Procedure and Order of Proceedings for the April 10-11 hearing on the draft San Diego MS4 permit. While we understand the Board's interest in ensuring that the hearing proceeds in an orderly and timely fashion, NRDC in concerned with the manner in which the Board has allotted time for presentation to "Environmental NGOs" at the hearing. In particular, the Board has given a lump sum of time for presentation to these groups of 1-hour, to be parceled out among organizations that NRDC neither coordinates with, nor necessarily holds the same positions as on any or all issues related to adoption of the Regional MS4 permit. We further note that "Coastkeeper," could refer to either or both of two different organizations that have a longstanding interest in the proceeding—San Diego Coastkeeper and Orange County Coastkeeper.

NRDC is interested in coordinating a presentation with the two Coastkeeper organizations in order to ensure that the hearing proceeds efficiently, but we ask that our 3 groups, which have been deeply involved in the permitting process, be allotted a total of 40 minutes of time for presentation, separate from time allotted to any other Environmental NGOs that may wish to present independently of NRDC and the Coastkeepers.

Thank you for your attention to this matter, please do not hesitate to contact me with any questions you may have.

Sincerely,

Noah Garrison

Noah Garrison | Project Attorney - Water Program | Natural Resources Defense Council
Office: 310-434-2300 | 1314 2nd Street, Santa Monica, CA 90401
ngarrison@nrdc.org | www.nrdc.org |
Admitted in California

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From: Uhley, Jason
To: Chiu, Wayne@Waterboards
Cc: Garcia, David; Lomeli, Eric; Horn, Steven; Watts-Bazan, Karin
Subject: Request for alternate hearing procedures for April 10/11 Hearing
Date: Thursday, March 21, 2013 5:38:47 PM
Attachments: Hearing Procedures - Proposal Regional MS4 Permit.pdf

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Wayne,

At this time, and pursuant to March 18, 2013 Hearing Notice, please find enclosed a respectful request for alternative hearing procedures for the April 10/11 Regional Permit Hearing. The District may modify this request at a later date pending review of the revised tentative order and response to comments.

The original should arrive via fed-ex tomorrow.

Please feel free to call if you have any questions.

Regards,

Jason Uhley
Chief of Watershed Protection
Riverside County Flood Control and Water Conservation District
1995 Market Street
Riverside, CA 92501
951.955.1273

WARREN D. WILLIAMS
General Manager-Chief Engineer

025874

1995 MARKET STREET
RIVERSIDE, CA 92501
951.955.1200
FAX 951.788.9965
www.rcflood.org

RIVERSIDE COUNTY FLOOD CONTROL
AND WATER CONSERVATION DISTRICT

March 21, 2013

Emailed this date to:
wchiu@waterboards.ca.gov with e-mail
subject line: Hearing Procedures – Proposed Regional MS4 Permit

Wayne Chiu, P.E.
WRC Engineer
California Regional Water
Quality Control Board - San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123

Dear Mr. Chiu:

Re: Hearing Procedures – Proposed Regional MS4 Permit

I am writing on behalf of the Riverside County Flood Control and Water Conservation District (District) with regard to the Hearing Notice and Order of Proceedings (Hearing Notice) released on March 18, 2013 governing the proposed adoption of Tentative Order No. R9-2013-0001 (Tentative Order). The District, in consultation with the other Co-permittees within the Santa Margarita Region (the County of Riverside and the Cities of Murrieta, Temecula and Wildomar), is sending this letter in response to the requirement in the Hearing Notice for request for alternative procedures to those set forth in the Hearing Notice. The District notes that this letter does not waive the District's previously expressed objection to coverage under the proposed Tentative Order in the absence of a Report of Waste Discharge, or questions regarding the Water Board's jurisdiction to issue a regional permit.

Before addressing the specific items set forth in this letter, I draw your attention to the letter to Executive Officer David Gibson from Riverside County Supervisors Kevin Jeffries and Jeff Stone dated March 20, 2013, which requested a continuance of the April 10-11 hearing and also a 45-day opportunity for stakeholders to review and comment on changes to the revised Tentative Order (which has not been released). The comments and concerns expressed in this letter relate in large part to the very short time between the anticipated release dates of the Tentative Order and staff's responses to comments and the hearing dates.

Scope of Hearing

The District first notes that the adoption of an NPDES permit or waste discharge requirement is subject to the formal adjudicatory proceedings set forth in the California Administrative Procedure Act (APA) (Govt. Code Sections 11400 *et seq.*), Evidence Code Ssections 801-805, Govt. Code Section 11513 and title 23 of the California Code of Regulations, Sections 648 *et seq.* At this time, the District requests that a formal adjudicatory process, in accordance with the requirements of those statutory and regulatory provisions, be conducted for the adoption of the Tentative Order, and respectfully objects to having the hearing conducted in the "generally informal manner" set forth in the Hearing Notice.

The District also objects to the limitation in the Hearing Notice and in the earlier hearing notice dated March 6, 2013 regarding the scope of oral testimony or Powerpoint/computer displays at the hearing. Under the above-noted statutory and regulatory provisions, testimony and exhibits cannot be limited to summarizing earlier written comments, commenting on revisions to the Tentative Order and making policy statements. Any testimony will, of course, need to be relevant to the issues before the Board. Additionally, those provisions provide stakeholders with the opportunity to provide exhibits as part of their testimony, and to the extent that the Hearing Notice purports to limit that right, the District objects.

Hearing Process

With regard to the Hearing Process, the District requests that the order of proceedings follow the model set forth in Title 23 Cal. Code Reg. Section 648.5. This model provides an efficient and orderly process for the taking of testimony, and the District, therefore, requests that it be substituted for the order of proceedings set forth in the Hearing Notice.

Additionally, the District requests that the US Environmental Protection Agency's (USEPA) presentation be scheduled after that of the Water Board staff and prior to that of the stakeholders. Since the USEPA, like the Water Board, is a regulatory agency, its presentation should follow that of Water Board staff.

With regard to the amount of time required for the District's testimony, due to the current unavailability of the revised Tentative Order or staff's responses to comments, the District is now requesting at least two hours to make its presentation (including testimony, rebuttal, cross-examination, and opening and closing statements). This estimate is subject to revision following receipt of the revised Tentative Order and staff's responses to comments. The Riverside County Co-permittees may also require additional time.

The Hearing Notice requests that participants within each of the major party groups (permittees, NGOs, building industry) to "consolidate their presentations to save hearing time and/or avoid duplication". While the District agrees that such consolidation would be preferable, the short time between the release of the revised Tentative Order, and response to comments and the hearing will make it impossible for such coordination to occur. If the Water Board continues the hearing dates, as requested by Supervisors Jeffries and Stone (and by other stakeholder representatives), we believe that such coordination can be done.

As a final comment, the District has no objection to the scheduling of elected official testimony for a time certain. However, given such officials' busy schedules, we request that the Board agree to hear elected officials outside of that time slot, as appropriate to accommodate those schedules.

Thank you for your consideration of these issues.

Very truly yours,

Steve Thomas

FOR WARREN D. WILLIAMS
General Manager–Chief Engineer

DB:JU:bjp:cw
P8/152274

THE COUNTY COUNSEL
COUNTY OF ORANGE
333 W. SANTA ANA BLVD., SUITE 407
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SANTA ANA, CA 92702-1379
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Ryan M. F. Baron
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NICHOLAS S. CHRISOS
COUNTY COUNSEL

JACK W. GOLDEN
CHIEF ASSISTANT

JEFFREY M. RICHARD
SENIOR ASSISTANT

WANDA S. FLORENCE
SENIOR ASSISTANT

ADRIENNE SAURO HECKMAN
KAREN R. PRATHER
GEOFFREY K. HUNT
CHRISTOPHER J. MILLER
JOHN H. ABBOTT
JANELLE B. PRICE
ANN E. FLETCHER
MARGARET E. EASTMAN
MARK R. HOWE
DANA J. STITS
MARIANNE VAN RIPER
JAMES C. HARMAN
JULIE J. AGIN
LAURIE A. SHADE
DANIEL H. SHEPHARD
JOYCE RILEY
PAULA A. WHALEY
THOMAS A. MILLER
STEVEN C. MILLER
CAROLYN S. FROST
ROBERT N. ERVAIS
LAURA D. KNAPP
ROGER P. FREEMAN
NICOLE A. SIMS
NIKHIL G. DAFTARY
JEANNIE SU
JAMES C. HARVEY
WENDY J. PHILLIPS
TERI L. MAKSOUDIAN
LEON J. PAGE
ANGELICA CASTILLO DAFTARY
KAREN L. CHRISTENSEN
MICHAEL A. HAUBERT
RYAN M. F. BARON
BRAD R. POSIN
SAUL REYES
AURELIO TORRE
MARK D. SERVINO
DEBBIE TORREZ
JACQUELINE GUZMAN
ANDREA COLLER
PAUL M. ALBARIAN
D. KEVIN DUNN
LORI A. TORRISI
MASSOUD SHAMEL
SHARON VICTORIA DURBIN
REBECCA S. LEEDS
NICOLE M. WALSH
MARISA MATSUMURA
ELIZABETH A. PEJEAU
LAUREN C. BAUER
GABRIEL J. BOWNE
JULIA C. WOO
LAUREL M. TIPPETT
MARK A. BATARSE
ADAM C. CLANTON
KRISTEN K. LECONG
ERIC A. DIVINE
COURTNEY S. WUCETICH
JAMES D. P. STEINMANN
VANESSA D. ATKINS
SUZANNE E. SHOAI
DEBORAH B. MORSE
DEPUTIES

Wayne Chiu
San Diego Water Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Re: Tentative Order – Formal Adjudicatory Proceedings

Dear Mr. Chiu:

Our office is writing you on behalf of the County of Orange and the Orange County Flood Control District ("County") regarding the Hearing Notice and Order of Proceedings (Hearing Notice) released on March 18, 2013 governing the proposed adoption of Tentative Order No. R9-2013-0001 (Tentative Order).

We are concerned that the co-permittees have not been provided basic due process in the Hearing Notice and have not had adequate opportunity to provide written comment. While an adoption hearing has been scheduled for April 10 and 11, a revised Tentative Order and a response to comments have not been released. The Hearing Notice encourages co-permittees to consolidate their presentations, but given the extremely short time frame between the time those documents might be released and the informal hearing, such coordination is impossible. Furthermore, we are concerned that the Hearing Notice improperly attempts to limit the oral presentations to the original prior written comments of the permittees, and that there may be material additions to a revised Tentative Order that are not a logical outgrowth of the originally circulated Order that could necessitate additional written comments.

For these reasons, the County is concerned that comments will be inadequately limited in the record due to the informality of the current proceeding. We also note that our detailed written comments submitted on January 11, 2013 demonstrated strong factual and legal opposition to numerous provisions in the Tentative Order. As such, our office requests that a formal adjudicatory proceeding be conducted in accordance with California Administrative Procedure Act (APA) (Govt. Code sections 11400 *et seq.*), Evidence Code sections 801-805, Govt. Code section 11513 and title 23 of the California Code of Regulations, sections 648 *et seq.*, and that the order of proceedings follow the model set forth in title 23 Cal. Code Reg. section 648.5. The County

requests that a minimum of three to four hours be set aside for the County to call witnesses, introduce evidence, cross examine Water Board staff and designated parties and conduct open and closing arguments and other presentations. The County reserves the right to modify the request for time depending on the timing and substance of the revised Tentative Order and Response to Comments.

We believe this request is consistent with the August 2, 2006 Memo from Chief Counsel regarding the Summary of Regulations Governing Adjudicative Proceedings before the California Water Boards.

Very truly yours,

NICHOLAS S. CHRISOS
COUNTY COUNSEL

By _____
Ryan M.F. Baron

RMFB:po

From: Odette Diaz
To: Chiu, Wayne@Waterboards
Cc: Chiu, Wayne@Waterboards
Subject: FW: Public Hearing to Consider Adoption of Tentative Order R9-2013-0001
Date: Friday, March 22, 2013 1:09:05 PM
Attachments: S0130961.pdf

Per Ms. Devaney's request, please see attached. Kindly note this transmission will follow via U.S. Mail as well.

Kindly reply back to confirm receipt of the attachment.

Odette Diaz on behalf of
Leslie E. Devaney
Attorney at Law
Stutz Artiano Shinoff & Holtz
2488 Historic Decatur Road, Suite 200
San Diego, CA 92106
P: 619.232.3122
D: 619.881.1321
F: 619.232.3264
E: ldevaney@stutzartiano.com

City of Del Mar

March 22, 2013

Mr. David Gibson
Executive Officer
Regional Water Quality Control Board
San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340
dgibson@waterboards.ca.gov

Re: Public Hearing to Consider Adoption of Tentative Order R9-2013-0001
NPDES No. CAS01092662

Dear Mr. Gibson:

On behalf of our client the City of Del Mar, we formally object to the "Hearing Procedures and Order of Proceedings" dated March 15, 2013, and received on March 18, 2013 ("Hearing Procedures"). The proposed Hearing Procedures are not in compliance with the California Government Code, California Code of Regulations, and the Code of Federal Regulations applicable to NPDES Permit adoption proceedings. There are two main issues with the Hearing Procedures: 1) the Tentative Order has not been released, so no informed decision with regard to formal/informal proceedings can be made; and 2) the proposed process has significant limitations on what can be presented to the RWQCB ("Board") and how the public may interact. Specifically, the Hearing Procedures limit the time for all parties to present and be heard and it limits the scope of what may be presented:

> "…the scope of oral testimony at the public hearing will be strictly limited to summarizing the previously submitted written comments, commenting on revisions to the Tentative Order made since the written comment period closed, and making policy statements. No new issues may be raised at the hearing." [emphasis added]

Given the level of interest and potential controversy in this proceeding, the prohibition of additional written comments and the ability to raise new issues based on the yet-to-be-released Tentative Order, the Board violates the provisions of state and federal law with respect to due process by barring their right to comment for the administrative record. Any "new" issues raised by the Tentative Order (which has not yet been issued) would be deemed waived, and deprive the City of Del Mar the opportunity to be heard and present evidence based on the to-be released Tentative Order. In addition, the proposed time limitations are inappropriate and inconsistent with the City of Del Mar's rights and obligations to create an administrative record for review.

Because of the (i) potentially significant changes made to the prior draft permit as a result of public comment and testimony, (ii) the proposed limitations on written comments, and (iii) proposed ban on raising new issues at the hearing and the informal hearing process as proposed, the City of Del Mar requests the following:

1. The public hearing on April 10 and 11, 2013, to receive testimony and comments and consider adoption of Tentative Order No. R9-2013-0001, NPDES No. CAS0109266 be postponed and/or continued to allow a reasonable review of the proposed permit language and requirements by the permitee(s).

City of Del Mar

Mr. David Gibson
Executive Officer
Regional Water Quality Control Board
San Diego Region
March 22, 2013

2. The limitations on the time for all parties to present and be heard and the prohibition of new issues to be presented based on the new/revised permit must be removed. However, because the revised Permit has not been issued, the City does not know at this time whether a formal or an informal hearing process would be necessary and/or appropriate. The City of Del Mar specifically requests a formal hearing pursuant to 23 CCR § 648.7 as a reservation of its rights to such formal proceedings.

Thank you for your consideration of the above.

STUTZ ARTIANO SHINOFF & HOLTZ
A Professional Corporation

Leslie E. Devaney
City Attorney of Del Mar

cc: Scott Huth, Del Mar City Manager *(shuth@delmar.ca.us)*
Wayne Chiu, RWQCB San Diego Region *(atwchiu@waterboards.ca.gov)*

1050 Camino Del Mar, Del Mar, California 92014-2698. Telephone: (858) 755-9313.Fax: (858) 755-2794
www.delmar.ca.us

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2013 MAR 26 PM 2 43

Sam Abed
Mayor
201 North Broadway, Escondido, CA 92025
Phone: 760-839-4610 Fax: 760-839-4578

March 22, 2013

Mr. David Gibson
California Regional Water Quality Control Board
San Diego Region 9
9174 Sky Park Court, Suite 100
San Diego, CA 92123

Notice of Public Hearing to Consider Adoption - National Pollutant Discharge Elimination System (NPDES) Permit and Waste Water Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining Watersheds within the San Diego Region – ORDER NO. R9-2013-0001 (Tentative Order)

Mr. Gibson:

The City of Escondido (City) received the recent release of the "Notice of Public Hearing to Consider Adoption of the Tentative Order" on March 6, 2013. The City co-drafted comments which appeared with comments from other jurisdictions in San Diego County's letter regarding the Administrative Draft Order. Additionally, several similar letters were submitted to the San Diego Regional Water Quality Control Board (Regional Board) from the Building Industry, Community Planning Groups, Environmental Organizations, Engineering Organizations, and the State and Federal Governments among others. Overall, approximately 90 letters from a broad range of interested parties were submitted to the Regional Board voicing concerns and questions regarding the Administrative Draft Order.

To date, the newest edition of the Tentative Order (third edition), which will be proposed for adoption on April 10-11, has not been released for public review. Depending on the timing of the Tentative Order's release, copermittees will have no more than a few weeks to review it prior to the public hearing to consider adoption.

The City greatly appreciated the Administrative Draft Order public review process (i.e., workshops) employed in 2012. This process allowed for all interested stakeholders to discuss the Administrative Draft Order with Regional Board Staff, the building industry, MS4 Dischargers, and environmental organizations. The City believes the workshop process should continue with the next draft of the Tentative Order to address the unresolved issues raised by all parties. The City is committed to the goal of improving water quality through NPDES permit programs that have been developed by the

Regional Board. However, dialog between the stakeholders and Regional Board staff is critical at this stage and adoption of the order without further collaboration will affect the success of the program.

The financial burden of this Order is significant. As disclosed by the Regional Board's own studies, compliance with the proposed Tentative Order will cost the region's tax payers billions of dollars. The City strives to manage tax dollars efficiently, and believes that compliance with the most recent draft of the Order is not an efficient or effective use of tax payer money.

The City believes it is very important to develop a MS4 permit that incorporates justified regulations which work to meet the overall goals of the program. Previous collaboration efforts (i.e., 2012 workshops) among stakeholders and regulators during the drafting period produced an excellent template for accomplishing these goals.

The City believes that adoption of the proposed Tentative Order should be postponed, and that the Regional Board should reestablish open communication and collaboration with all applicable stakeholders (i.e., workshops). This will allow for all parties to define goals that are achievable, streamline permit development, and will lessen the financial impact of the Tentative Order.

The City thanks you for your consideration of this request. If you have any questions please contact Mr. Jeff Warner, acting Stormwater Program Manager, at 760-839-4528 or jwarner@escondido.org.

Respectfully,

Sam Abed

Sam Abed
Mayor

Chiu, Wayne@Waterboards

From: Stroud, Heather <HStroud@sandiego.gov>
Sent: Friday, March 22, 2013 1:37 PM
To: Gibson, David@Waterboards
Cc: Hagan, Catherine@Waterboards; McFadden, Kris
Subject: Objection to Hearing Procedures and Order of Proceedings
Attachments: City of San Diego Objection to Hearing Procedures.pdf

Dear Mr. Gibson:

Please find attached the City of San Diego's letter of objection to the hearing procedures and order of proceedings.

Thank you,
Heather

Heather L. Stroud
Deputy City Attorney
Office of the San Diego City Attorney
1200 Third Avenue, Suite 1100
San Diego, California 92101

(619) 533-5872 (phone)
(619) 533-5856 (fax)
hstroud@sandiego.gov

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025884

MARY JO LANZAFAME
ASSISTANT CITY ATTORNEY

HEATHER L. STROUD
DEPUTY CITY ATTORNEY

OFFICE OF

THE CITY ATTORNEY

CITY OF SAN DIEGO

Jan I. Goldsmith
City Attorney

CIVIL ADVISORY DIVISION
1200 THIRD AVENUE, SUITE 1100
SAN DIEGO, CALIFORNIA 92101-4100
TELEPHONE (619) 533-5800
FAX (619) 533-5856

March 22, 2013

VIA E-MAIL

David W. Gibson
San Diego Regional Water Quality Control Board
9174 Sky Park Ct., Suite 100
San Diego, CA 92123-4340
DGibson@waterboards.ca.gov

RE: Objection to Hearing Procedures and Order of Proceedings

Dear Mr. Gibson:

The City of San Diego has serious concerns about the Hearing Procedures and Order of Proceedings for the Municipal Separate Storm Sewer System (MS4) permit hearing, which we received on March 18, 2013. We were hoping to be able to review the forthcoming revisions to the Tentative Order before deciding whether to file this formal objection, but unfortunately the revised Tentative Order is not yet available. Given the warning in the notice that objections made after today will be "deemed waived," the City files this objection to preserve its due process rights. Specifically, the City objects to the following:

1. **Limitations on Testimony and Evidence.** The City objects to the attempt to limit the parties' ability to present testimony and evidence. This permit hearing is an adjudicative proceeding.[1] Under the State Board's own regulations, a party to an adjudicative hearing has a right to submit any "relevant" oral or written evidence.[2] Further, under the Clean Water Act regulations, the comment period must remain open until the close of the public hearing.[3] This provision is applicable to state permit proceedings.

Contrary to these regulations, the notice states: "the scope of oral testimony will be strictly limited to summarizing the previously submitted comments, commenting on revisions to the Tentative Order made since the written comment period closed, and making policy statements. No new issues may be raised at the hearing." The notice further states that

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[1] Memorandum from Office of Chief Counsel to State Water Resources Control Board and California Regional Water Quality Control Boards, regarding Summary of Regulations Governing Adjudicative Proceedings Before the California Water Boards (Aug. 2, 2006).
[2] *Id.*; 23 Cal. Code Regs. § 648.5.1; Gov't Code § 11513(c).
[3] 40 C.F.R. § 124.12(c).

PowerPoint presentations "will not be accepted if they contain any new testimony or evidence." The parties have a right to submit any relevant evidence and testimony prior to the close of the public hearing. The Regional Board must honor this vital due process right.

2. **Limitations on Submission of Written Comments on Permit Revisions.** The City objects to the proposal to limit the parties to the written comments already submitted on the prior version of the Tentative Order, which we understand has undergone substantial revision. The City requests a limited 30-day written comment period to allow the parties to address revisions to the Tentative Order. This will allow for a more complete administrative record, a more orderly permit adoption hearing, and more informed decision-making by the Regional Board.

3. **Order of Proceedings.** The City objects to the informal hearing procedures proposed, and requests that hearing be conducted according to the formal hearing procedures in Section 648.5 of Title 23 of the California Code of Regulations. Specifically, the City reserves its right to present any relevant evidence, cross-examine witnesses, and present a closing statement. The Regional Board must grant this request because the State Board regulations provide that "[a] matter shall not be heard pursuant to an informal hearing procedure over timely objection . . . unless an informal hearing is authorized under subdivision (a), (b), or (d) of section 11445.20 of the Government Code."[4] None of those exceptions apply here.

Further, the three hours allotted for thirty-nine Copermittees to share is unacceptable. This works out to less than five minutes per Copermittee. The City would have liked to coordinate its presentation with the other Copermittees as we have done in the past, but the late release of the revised Tentative Order and responses to comments has limited our ability to do so. We understand that the revised Tentative Order may not be available until the meeting agenda packet is mailed, which could give us less than two weeks to prepare for the hearing. Should the hearing go forth on April 10 and 11 as proposed, the City requests its own block of time of one hour, with 30 minutes for a staff presentation and presentation of evidence and 30 minutes for cross examination and a closing statement, if necessary.

4. **Timing of Hearing.** The City objects to holding the permit adoption hearing on April 10 and 11. The City believes that delaying the hearing to provide the parties time to digest the forthcoming revised Tentative Order may remedy many of the City's concerns and result in a more orderly and productive hearing. The City also understands that two new Regional Board members may be appointed soon, and delaying the hearing would give them time to settle into their duties before being asked to rule on an extremely complicated and controversial permit with serious fiscal and legal implications on the Copermittees. It would also be appropriate to delay the hearing to allow the State Board to provide guidance on the Receiving Waters Limitations language, as urged in the letter from Mayor Filner dated March 15, 2013.

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[4] 23 Cal. Code Regs. § 648.7.

For all of these reasons, the City respectfully requests that the Regional Board issue a revised Hearing Procedures and Order of Proceedings that complies with the Clean Water Act and State Board regulations.

Sincerely yours,

JAN I. GOLDSMITH, City Attorney

By

Heather L. Stroud
Deputy City Attorney

HLS:cw

Enclosures: Memorandum from Office of Chief Counsel to State Water Resources Control Board and California Regional Water Quality Control Boards, regarding Summary of Regulations Governing Adjudicative Proceedings Before the California Water Boards (Aug. 2, 2006).
Letter from Mayor Bob Filner and San Diego County Board of Supervisors Chair Greg Cox to David Gibson (Mar. 15, 2013).

cc: Kris McFadden, Deputy Director, City of San Diego Transportation & Storm Water Department
Catherine Hagan, Esq., San Diego Regional Water Quality Control Board Counsel

Doc. No.: 535085

State Water Resources Control Board

Linda S. Adams
Secretary for Environmental Protection

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Arnold Schwarzenegger
Governor

TO: [via e-mail and U.S. Mail]
Board Members
STATE WATER RESOURCES CONTROL BOARD AND CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARDS

FROM: Michael A.M. Lauffer
Chief Counsel
OFFICE OF CHIEF COUNSEL

DATE: August 2, 2006

SUBJECT: SUMMARY OF REGULATIONS GOVERNING ADJUDICATIVE PROCEEDINGS BEFORE THE CALIFORNIA WATER BOARDS

This memorandum outlines and reinforces some of the primary requirements that apply when the State Water Resources Control Board (State Water Board) and the nine California Regional Water Quality Control Boards conduct adjudicative proceedings. Adjudicative proceedings are the evidentiary hearings used to determine the facts by which a water board reaches a decision that determines the rights and duties of a particular person or persons. Adjudicative proceedings include, but are not limited to, enforcement actions and permit issuance.

Background

The California Water Boards perform a variety of functions. The boards set broad policy consistent with the laws passed by Congress and the Legislature. The boards also routinely determine the rights and duties of individual dischargers or even a class of dischargers. In this regard, the boards perform a judicial function. The judicial function manifests itself when the boards adopt permits and conditional waivers or take enforcement actions.

Different rules apply depending on the type of action pending before a water board. One of the distinctions between the two types of proceedings is the prohibition against ex parte communications. A prohibition on ex parte communications only applies to adjudicative proceedings.[1] Besides the ex parte communications prohibition, additional rules, procedures, and participant rights adhere in adjudicative proceedings. This memorandum outlines some of the more important procedural mechanisms associated with adjudicative proceedings.

[1] The Office of Chief Counsel addressed ex parte communications in a July 25, 2006 memorandum and questions and answers document.

Adjudicative Proceedings

What is an adjudicative proceeding?
Adjudicative proceedings are the evidentiary hearings used to determine the facts by which a water board reaches a decision that determines the rights and duties of a particular person or persons. Generally, this includes permitting and enforcement actions, but does not include planning and general regulatory functions such as Basin Plan amendments and Total Maximum Daily Loads.

Below is a partial list of common water board actions that are of an adjudicative nature:

- National Pollutant Discharge Elimination System (NPDES) permits;
- Waste discharge requirements (WDRs);
- Water right permits and requests for reconsideration;
- Orders conditionally waiving waste discharge requirements;
- Administrative civil liability (ACL) orders;
- Cease and desist orders;
- Cleanup and abatement orders;
- Water quality certification orders (401 certification);
- Permit revocations.

What laws govern adjudicative proceedings?
Adjudicative proceedings are governed by Chapter 4.5 of the Administrative Procedure Act[2] and by regulations adopted by the State Water Board[3]. By regulation, the State Water Board has chosen not to apply several sections of the Administrative Procedure Act to the California Water Boards' proceedings. These sections are Language Assistance, Emergency Decisions, Declaratory Decision, and Code of Ethics. All other sections and provisions of Administrative Procedure Act Chapter 4.5 apply.

Who are the parties to an adjudicative proceeding?
Parties to an adjudicative proceeding are any person or persons to whom a water board's action is directed as well as any other person or persons that the board chooses to designate as a party. In some cases, certain members of a water board's staff will be a party to an adjudicative proceeding. If some water board staff are designated as a party, other staff will be assigned to advise the board members. Anyone who is not a party, but who participates in the proceedings (other than staff advisers to the water board), is considered an interested person. The process for deciding who is a party is left to the discretion of a water board. A hearing may be held on the issue or the chair may be delegated to make such determinations. When a party is designated, the chair should provide notice in advance of the hearing to the water board staff and the discharger.

What is a formal hearing?
Most of the time an adjudicative proceeding will be a formal hearing in which a water board requires parties to follow a pre-determined process that may include such procedural issues as

[2] Gov. Code, § 11400 et seq.

[3] Cal. Code Regs., tit. 23, §§ 648-648.8.

submittal of the names of witnesses, qualifications of experts, exhibits, proposed testimony, and legal argument. A hearing notice will be drafted spelling out the requirements and the timeframes. The terms and conditions of the notice are left to the discretion of the water board conducting the proceeding, though it is suggested that some level of formality is useful in preserving decorum and fostering efficiency. A hearing under Chapter 4.5 of the Administrative Procedure Act and the State Water Board's regulations is considered a "formal hearing," even if it does not have some attributes of hearing formality, unless it is officially designated as an "informal hearing" under Government Code section 11445.20 and California Code of Regulations, title 23, section 648.7.

The order of proceedings is within the discretion of a water board as well. However, the regulations suggest a specific order and should generally be followed unless the facts and circumstances of a particular case indicate otherwise. Normally, the proceedings begin with an opening statement by the chair followed by the administration of the oath to those indicating that they intend to participate. Then the parties make their presentations through testimony and the introduction of exhibits. Typically, witnesses may be cross-examined by other parties but the timing of such cross-examination is within the discretion of the regional board. If the re-direct examination has been specified in the notice, re-direct examination follows cross-examination. A water board should decide in advance how it would like to handle questions from board members. Interruptions and questions by board members should not count against time allotted to a party. At some point during the proceeding, comments from interested persons must be admitted. Thereafter, the regulations anticipate a closing statement from each party.

What are the rules of evidence in an adjudicative proceeding?
The rules of evidence are not those that apply in the courtroom. Any relevant evidence will be admitted if it is the sort of evidence on which responsible persons are accustomed to rely in the conduct of serious affairs, no matter what the statutory or customary rule may be. Hearsay evidence is admissible, but only for the purpose of supplementing or explaining other evidence. If an objection is raised that certain testimony constitutes hearsay evidence, the chair should note for the record that the evidence will be admitted but that it cannot, by itself, support a finding. If no other evidence is introduced in support of that finding, a water board must ignore the hearsay evidence and decline to make such a finding.

A water board may accept evidence by taking official notice of certain things such as laws, court decisions, regulations, and facts and propositions that are common knowledge or not in reasonable dispute.

What are informal hearings?
Informal hearings may be used in place of formal hearings in some instances, if a water board thinks it advisable. Generally, this process can be used where significant facts are not in issue and the proceeding held is to determine only what consequences flow from those facts. In deciding whether to use the informal process, a water board should consider how many parties are involved, whether any of the parties have requested a more formal process, how many interested persons there are, how complex the issues facing the water board may be, and how important a formal record may be if petitions and appeals result. If any party objects to the informality of the process, a water board or its chair must address and resolve the objections before proceeding.

Because of the flexibility the regulations provide for formal hearings, a water board may find it advisable to conduct its hearings as formal hearings with streamlined procedures, as opposed to conducting an informal hearing. The regulations provide that a water board may waive any of the regulatory requirements that are not required by a statute. While this is certainly within the prerogative of a water board, caution should be exercised before any such waiver. These regulations generally seek to preserve the fairness of the process and omission of any of these provisions may result in unnecessary disputes over procedural issues.

How can the chair control the conduct of the adjudicative proceeding?
A water board need not tolerate disruption of an adjudicative proceeding. The Administrative Procedure Act and State Water Board regulations provide that a water board may cite for contempt any person who defies a lawful order, refuses to take an oath, obstructs or interrupts a meeting by disorderly conduct or breach of the peace, violates the ex parte communication rules, or refuses to comply with a subpoena or similar order of a water board. No immediate action can be taken, but the matter may be referred to the local Superior Court for action, including sanctions and attorneys fees.

cc: [All via e-mail only]

Celeste Cantú, EXEC
Tom Howard, EXEC
Beth Jines, EXEC
All Division Deputy Directors
All Executive Officers
Regional Water Boards
All Assistant Executive Officers
Regional Water Boards, Branch Offices
All Office of Chief Counsel attorneys

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SAN DIEGO REGIONAL
WATER QUALITY
CONTROL BOARD
2013 MAR 15 PM 3 55

City of San Diego

County of San Diego

March 15, 2013

Mr. David Gibson
California Regional Water Quality Control Board
San Diego Region 9
9174 Sky Park Court, Suite 100
San Diego, CA 92123

NOTICE OF PUBLIC HEARING – NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WATER DISCHARGE REQUIREMENTS FOR DISCHARGES OF URBAN RUNOFF FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4S) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

Dear Mr. Gibson:

On March 6, 2013 the San Diego Regional Water Quality Control Board (Regional Board) announced that hearings for the proposed Municipal Storm Water Permit for the San Diego Region would be held on April 10 and 11, 2013. The City of San Diego (City) and the County of San Diego (County) submitted lengthy written comments during the public comment period for the draft permit and is concerned that the hearings will be held without our respective jurisdictions being given an opportunity to review responses to their comments. Furthermore, we believe that it would be prudent to postpone any approval of the Municipal Storm Water Permit until the California State Water Resources Control Board provides guidance on the Receiving Waters Limitation language, which if not included in the initial approval of our regional permit, could necessitate that the Regional Board amend its regulations in the immediate future.

The City and the County appreciate the difficulties and challenges in implementing such complex regulatory matters as the Municipal Storm Water Permit, but as copermittees regulated by this permit, we are concerned that the Regional Board has decided to move this hearing forward without providing sufficient time to appropriately respond to and address stakeholders' concerns.

Locally and on a statewide level there continue to be numerous outstanding issues with this proposed permit. We believe it would be inappropriate and irresponsible to rush adoption

without continued dialog between the stakeholders and Regional Board staff. The City and County are committed to the goal of improving water quality through the storm water management programs that have been developed in conjunction with the Regional Board, but the current proposed permit include provisions that are flawed and need to be addressed.

Considering the significant financial burden this permit will have on so many local governments, we believe it is more important to create a permit that incorporates sound regulation than to needlessly rush toward an arbitrary deadline. The Regional Board staff has acknowledged on the record that the impacts of some of the proposed standards and regulations are not fully understood. We do not even know that compliance can be achieved with the tools and science available today. However, we do know for certain, based on the Regional Board's own studies, that significant cost in the range of billions of dollars will be incurred as a result of copermittees trying to comply with the proposed regulations if implemented.

As stewards entrusted with managing public tax dollars, we do not believe it is prudent to implement policy without having a clear understanding of whether it will mitigate the problem it was created to address. The City and the County believe it would be more productive to postpone any hearing in order to step back and continue working with all stakeholders to clearly define goals that are achievable and do not have such detrimental financial impacts to local governmental services.

Thank you for your consideration of this request. If the Regional Board does choose to move forward with holding the hearing in April, the City and County respectfully request to speak at the designated meeting to have the record reflect our respective positions on this matter. We would also respectfully request a time certain be allocated at the beginning of such hearing so that the City and County representatives can provide testimony.

If you have any questions, please contact Richard Crompton, County of San Diego Director of Public Works at (858) 694-2233 or Kip Sturdevan, City of San Diego Director of Transportation and Storm Water at (619) 236-6594.

Respectfully,

Hon. Bob Filner
Mayor
City of San Diego

Hon. Greg Cox
Chairman
San Diego County Board of Supervisors

From:	Wendy House
To:	Gibson, David@Waterboards
Cc:	Chiu, Wayne@Waterboards; jgriffin@san-marcos.net; MEdwards@san-marcos.net; mbabaki@san-marcos.net; ERyan@san-marcos.net; Helen Peak
Subject:	Public Hearing to Consider Tentative Order No. R9-2013-0001, NPDES No. CAS0109266
Date:	Friday, March 22, 2013 2:00:24 PM
Attachments:	City of San Marcos Ltr RE Public Hearing 03222013.pdf

Mr. Gibson:

Attached please find a letter from the City of San Marcos regarding the upcoming public hearing to consider Tentative Order No. R9-2013-0001, NPDES No. CAS0109266.

Please confirm that you received this email and the attachment. The original version will follow via U.S. mail. Thank you – Wendy

Wendy L. House
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22 March 2013

David W. Gibson, Executive Officer
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

RE: Public Hearing to Consider Tentative Order R9-2013-0001, NPDES No. CAS0109266

Dear Mr. Gibson:

I write to you in my capacity as City Attorney of the City of San Marcos ("City"). The purpose of this letter is to respond to the Notice of Public Hearing and subsequent Hearing Procedures and Order of Proceedings (collectively, the "Public Hearing Documents") issued by the California Regional Water Quality Control Board, San Diego Region ("Board"). The Public Hearing Documents relate to the Board's intent to conduct an informal public hearing ("Public Hearing") scheduled for April 10-11, 2013 to receive testimony and consider adoption of Tentative Order No. R9-2013-001, NPDES No. CAS0109266, *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds Within the San Diego Region.*

The City believes that the dates for the Public Hearing should be postponed, and hereby submits its request for such a postponement, as the currently-scheduled dates do not provide sufficient time to evaluate the revisions to the draft Regional Municipal Separate Storm Sewer System Storm Water NPDES Permit ("Permit"). The revised Permit has not yet been released, and it is our understanding that it is not expected to be available until March 27, 2013 at the earliest. Twelve days is not enough time to review and prepare a response to the Permit for the Public Hearing.

Additionally, the Public Hearing Documents state that the Public Hearing will be conducted in a "generally informal manner". However, because the revised Permit has not been issued, the City does not know at this time whether formal adjudicatory proceedings as set forth in the California Administrative Procedure Act, rather than an informal hearing process, would be necessary and/or appropriate. This letter serves as notice that the City reserves its right to object to the informal hearing process for the Public Hearing following its receipt and review of the revised Permit.

Lastly, the Public Hearing Documents state that municipal Co-permittees from San Diego, Orange and Riverside Counties are limited to three (3) hours total to address the Board during the Public Hearing. The Public Hearing Documents also provide that those participants requesting additional time to speak may submit their written requests to the Board. This letter also serves as a request by the City to seek additional time for City comments given the truncated time period specified for consolidated presentations by Co-permittees. If that time is not extended significantly, the City presently anticipates that it will need approximately forty-five (45) minutes to address the Board during the Public Hearing. If the Co-permittees' comment period is extended, we anticipate we will be able to coordinate our comments in a consolidated fashion with Co-permittees.

Thank you for your consideration of the foregoing issues raised by the City relating to the Public Hearing. Please do not hesitate to contact me if you have any questions.

Sincerely,

Wendy L. House

FOR: HELEN HOLMES PEAK
City Attorney

cc: Wayne Chiu, P.E., WRC Engineer, Regional Water Quality Control Board
Jack Griffin, City Manager
Michael D. Edwards, Public Works Director/City Engineer
Maryam Babaki, Deputy City Engineer
Erica Ryan, Storm Water Program Manager

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SAN DIEGO REGIONAL
WATER QUALITY
CONTROL BOARD
2013 MAR 22 PM 4 07

March 22, 2013

Wayne Chiu
WRC Engineer D
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Re: Public Hearing to Consider Adoption of Tentative Order R9-2013-0001
NPDES No. CAS01092662

Dear Mr. Chui:

Best Best & Krieger serves as city attorney for the cities of Lake Forest, Aliso Viejo and Santee, California (the "Cities"). This letter provides the Cities' formal objection to the "Hearing Procedures and Order of Proceedings" dated March 15, 2013 ("Proposed Hearing Procedures"), and their request for a formal hearing according to procedures set forth in California Government Code section 11500 et seq. and State Water Resources Control Board regulations.

The San Diego Regional Water Quality Control Board ("Regional Board") is planning to use the Proposed Hearing Procedures at the April 10 and 11, 2013, hearing during which the Regional Board will consider adoption of Tentative Order No. R9-2013-0001, NPDES No. CAS01092662, Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region ("Tentative Order").

The Cities object to the Proposed Hearing Procedures on the grounds that they violate applicable provisions of the California Government Code, the California Code of Regulations and the Code of Federal Regulations. Specifically, under California Government Code section 11513(b), during the hearing on the Tentative Order, the cities are entitled to:

- call and examine witnesses;
- introduce exhibits;
- cross-examine opposing witnesses on any matter relevant to the issues even though that matter was not covered in the direct examination;
- impeach any witness regardless of which party first called him or her to testify; and
- rebut the evidence presented by the Regional Board.

BEST BEST & KRIEGER LLP
ATTORNEYS AT LAW

The Cities hereby request the opportunity and sufficient time to conduct the introduction of evidence and cross-examination to which they are statutorily entitled. The Cities will need at least forty-five (45) minutes each to present evidence and cross-examine witnesses. The Cities additionally object to the order of proceedings set forth in the Proposed Hearing Procedures and request that their presentation of evidence follow the United States Environmental Protection Agency.

Lastly, the Cities object to the fact that they have yet to see the provisions of the Tentative Order as of today, twenty (20) days before the hearing. The Cities request that the Regional Board continue the proposed hearing dates a minimum of thirty (30) days to provide the Cities with an appropriate amount of time to review the Tentative Order and prepare for the hearing. If the Cities are given this additional time it is possible they will not need the forty-five (45) minutes for presentation of evidence and rebuttal requested herein.

Thank you for your attention to this matter. If you have any questions on the Cities position on the Tentative Order, and the matters discussed herein, please do not hesitate to contact us.

Very truly yours,

Shawn Hagerty
of BEST BEST & KRIEGER LLP

SXH:djg

cc: David W. Gibson, Executive Officer
Catherine Hagan, Esq., SWRCB Counsel

THOMAS E. MONTGOMERY
COUNTY COUNSEL

DEBORAH A. McCARTHY
ASSISTANT COUNTY COUNSEL

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March 22, 2013

David W. Gibson, Executive Officer
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, California 92123-4340

VIA HAND DELIVERY

Re: Public Hearing to Consider Adoption of Tentative Order R9-2013-0001
NPDES No. CAS01092662

Dear Mr. Gibson:

On behalf of the County of San Diego, we formally object to the "Hearing Procedures and Order of Proceedings" dated March 15, 2013 and received on March 18, 2013. We find this document does not comply with the provisions of the California Government Code, California Code of Regulations and the Code of Federal Regulations applicable to this NPDES Permit adoption proceeding. Specifically, we call to your attention the following:

1. **Proposed Limitation on Written Comments.** Your Board has issued a notice of public hearing on the permit adoption, certainly appropriate given the level of interest in this proceeding. However, in purporting to ban additional written comment, you would violate 40 C.F.R. § 124.12(c), which provides that, "The public comment period under §124.10 shall automatically be extended to the close of any public hearing under this section." This provision applies to state permit proceedings. Because we understand significant changes will be made to the prior draft permit as a result of public comment and testimony at your November workshop, a refusal to permit additional written comment for the record will violate procedural due process by not accepting written comment for the administrative record on those substantive permit changes.

2. **Proposed Ban on Raising New Issues at the Hearing.** Under well-established legal precedent, parties to an administrative proceeding must raise and address all issues for review by an administrative body or court in the proceeding, or risk being deemed to have waived those issues. It is very likely that the anticipated changes in the draft permit will present new issues for the County that must be addressed in this proceeding. Your purported ban on "new" issues could effectively deprive the County of its right (and obligation) to present objections to the provisions of the revised Tentative Order at the hearing. We believe this rule would also violate procedural due process rights and the above-cited C.F.R. provisions.

3. **Conducting an Informal Proceeding.** California Government Code § 11513(b) provides that parties shall have certain rights as specified therein. Those rights are not being provided in your planned hearing procedures and restrictions. The March 15, 2013 notice's stated procedures and limitations, and intention to proceed informally in what is clearly an adjudicative proceeding, appears to conflict with the provisions of Division 3 of Title 23 of the California Code of Regulations (see 23 C.C.R. § 648 et seq.).

Accordingly, on behalf of the County of San Diego, we respectfully request that this proceeding be conducted under formal hearing procedures. We make this timely request pursuant to 23 C.C.R. § 648.7 and Gov't Code §§ 11445.20 and 11445.30.

We respectfully submit that the "Order of Proceedings" time limitations are understated because of parties' rights to present witnesses, exhibits, and conduct cross-examination. Given the likelihood that a permit this controversial will be appealed or otherwise challenged, it is imperative that your procedures provide our client with its opportunity to confront witnesses and otherwise create a complete record, including any additional written comments it may have on the Tentative Order.

At this point in time, without having seen the Tentative Order, and assuming that the formal hearing request from the County will be granted, we respectfully request that the County of San Diego be allotted two hours for presentation of its witnesses, evidence and summary statements. This request may be modified by the County, dependent upon the Tentative Order provisions and whether or not the proceedings are continued to a later date to permit time for coordination of presentations among the parties.

If, however, the County's request for formal hearing procedures is not granted, and your Board still intends to proceed informally and with the limitations described, the County of San Diego still requests its own block of time of at least 30 minutes for its presentation under that format, in addition to participating with other co-permittees as already allotted.

We continue to object to the fact that our client has yet to see the provisions of the Tentative Order as of today, 19 days before a hearing on a lengthy, complex and controversial permit. Your staff has requested co-permittees to coordinate and consolidate presentations within the blocks of allotted time. That seems logical and desirable, but it is going to be impossible given the extremely short window you are creating to review and react to the Tentative Order, whenever it is issued.

We request that you revise your procedure and order of proceedings to comply with applicable provisions of law and regulation, as well as practical realities. Given the County's formal hearing request, and the need to better define the parameters of the adoption hearing procedures, the County requests that you postpone the April 10 and 11 dates in order to properly conduct the proceeding at least at the May meeting or some other later date. We suggest using the April 10 regular meeting to discuss hearing procedures with designated parties, and to try to reach a consensus on the conduct of the eventual hearing.

Thank you in advance for considering the above objections and request.

Very truly yours,

THOMAS E. MONTGOMERY, County Counsel

By James R. O'Day

James R. O'Day, Senior Deputy

JRO/tlm
12-00802

cc: Wayne Chiu, P.E., (via E-mail)
Catherine Hagan, Esq., SWRCB Counsel (via E-mail)

SAN DIEGO COUNTY
REGIONAL AIRPORT AUTHORITY

P.O. BOX 82776, SAN DIEGO, CA 92138-2776
619.400.2400 WWW.SAN.ORG

March 22, 2013

Mr. Wayne Chiu, P.E.
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

RE: Public Hearing to Consider Adoption of Tentative Order R9-2013-0001 NPDES No. CAS01092662 ("Tentative Order")

Dear Mr. Chiu:

The undersigned represents the San Diego County Regional Airport Authority ("Authority") concerning the above-referenced matter. This letter constitutes: (1) the Authority's formal objection to the Hearing Procedures and Order of Proceedings ("Procedures") dated March 15, 2013, issued by the California Regional Water Quality Control Board, San Diego Region ("San Diego Water Board"); and (2) a formal request for an evidentiary hearing in accordance with Cal. Code Regs., Tit. 23 § 648, *et seq.*

The San Diego Water Board's Meeting Notice and Agenda sets the hearing on this matter for April 10 and 11, 2013. To date, however, the San Diego Water Board has not issued the revised Tentative Order that is the subject of that hearing. The Procedures further require participants to file any objections or requests for alternative procedures no later than 5:00 pm on March 22, 2013. The aggressive hearing schedule and proposed Procedures are antithetical to the most basic tenants of due process: adequate notice and an opportunity to be heard. They also run contrary to the spirit of collaboration, which has been the principle championed by the San Diego Water Board throughout this process. Without the benefit of knowing what revisions, if any, have been made to the Tentative Order, the Authority is compelled to preserve its due process rights.

1. <u>Banning Additional Substantive Comment Violates The Code of Federal Regulations.</u>

Under the heading "Scope of Hearing," the proposed Procedures purport to severely restrict the substantive content and format of additional comment on the

Tentative Order. Such restrictions are contrary to 40 C.F.R. § 124.12 (c), which states, in relevant part: "The public comment period under § 124.10 shall automatically be extended to the close of any public hearing under this section." Because the San Diego Water Board has yet to publish the revised Tentative Order, it is impossible for the Authority to know whether additional written or oral comment will be necessary at this time. Accordingly, to preserve its right to a complete administrative record in this matter, the Authority objects to these purported limitations.

2. The Authority requests a formal evidentiary hearing in accordance with Cal. Code Regs. Tit. 23 § 648, *et seq.*

The Procedures state that the San Diego Water Board intends to conduct this hearing in an "informal manner". The Authority respectfully submits that both the time and procedural limitations proposed are inappropriate for a Tentative Order of this magnitude and complexity. This matter is currently set for hearing in less than three weeks and the stakeholders have not yet been afforded an opportunity to review the Tentative Order. Without knowing what is contained in the Tentative Order, the Authority is compelled to preserve its right to, and hereby requests, a formal hearing on this matter conducted in accordance with Cal. Code Regs, Tit. 23 § 648, *et seq.*, and Cal. Govt. Code § 11513.

Because it does not know the contents of the revised Tentative Order at this time and will not have adequate time to coordinate the presentation of evidence with other co-permittees, the Authority respectfully requests a minimum of one (1) hour for the presentation of oral evidence, introduction of witnesses, cross examination of witnesses, rebuttal testimony and other rights afforded by Cal. Govt. Code § 11513.

The Authority requests the San Diego Water Board reconsider its decision to hold the hearing now scheduled to begin on April 10, 2013, and instead postpone it for a minimum of forty-five (45) days from the date of issuance of the revised Tentative Order. In that way, stakeholders will have an opportunity to review/analyze it, to coordinate the presentation of common concerns and to generally present comments and evidence in a more efficient way.

Sincerely,

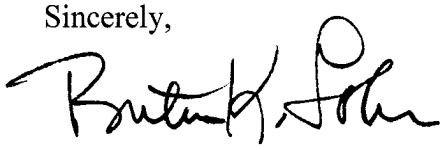

Breton K. Lobner
General Counsel

cc: David Gibson, Executive Officer
Catherine Hagan, SWRCB Counsel

Chia
025903

Vista Chamber of Commerce
127 Main Street
Vista, CA 92084
760-726-1122 Voice
760-726-8654 Fax
www.VistaChamber.org

SAN DIEGO REGIONAL
WATER QUALITY
CONTROL BOARD

2013 MAR 26 PM 2 41

March 22, 2013

Mr. David Gibson
California Regional Water Quality Control Board ~ San Diego Region 9
9174 Sky Park Court, Suite 100
San Diego, CA 92123

SUBJECT: Municipal Storm Water Permit

Dear Mr. Gibson:

The Vista Chamber of Commerce believes that it would be prudent to postpone any approval of the Municipal Storm Water Permit until the California State Water Resources Control Board provides direction on the Receiving Waters Limitation wording.

Locally and on a statewide level there continue to be numerous outstanding issues with this proposed permit. Our particular concerns involve the requirement to retain onsite almost all storm water runoff; the removal or modification of hydromodification management exemptions; the prohibition of discharges that "cause or contribute" to an exceedance of a water quality objective (based on a Basin Plan for the Region that is outdated); and others.

It is questionable as to whether these water quality objectives are even achievable. However, we do know for certain, based on the Regional Board's own studies, that significant cost in the range of billions of dollars will be incurred as a result of copermittees trying to comply with the proposed regulations if implemented. The provision creates strict liability for the Copermittees, subject to mandatory minimum penalties. As such, the Regional Water Board does not have discretion to ignore these violations. Moreover, because this permit is also an NPDES permit, these strict liability provisions are also enforceable by Citizen Suit.

The Vista Chamber believes it would be more productive to postpone any hearing in order to continue working with all stakeholders to define goals that are achievable and do not have detrimental financial impacts to local businesses and governmental services.

Sincerely,

Bret Schanzenbach
Chief Executive Officer

Chiu
025904

OCEANSIDE CHAMBER OF COMMERCE

SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD
2013 APR 3 PM 12 31

March 26, 2013

Mr. David Gibson
California Regional Water Quality Control Board
San Diego Region 9
9174 Sky Park Court, Ste. 100
San Diego, CA 92123

April 2013 Public Hearing - Municipal Storm Water Permit Proposed Changes

Dear Mr. Gibson:

Many public and private parties responded to the Board's draft permit late last year and early this year. We are concerned that there has been insufficient time for review of the Regional Board's responses to that input.

We are also concerned that the proposed new regulations will result in billions of dollars in new costs to copermittees, land owners and tax payers of the State of California. Another concern is that the proposed regulations have not had the benefit of a serious environmental review, so that the full impact of these changes is not known.

A task of this magnitude requires that we consider the best possible and most effective method of achieving the result of cleaner storm water. We feel that there are other more practical methods of treating storm water runoff that would address a larger portion of the hydrologic drainage basins at a lower cost to the taxpayer.

We realize that the task of improving storm water quality is a serious and complex challenge. Further dialogue between all of the stakeholders could result in area wide or community wide solutions that would be both practical and effective. For this reason, we urge the Board to postpone any hearing on the matter.

Sincerely,

David L. Nydegger
President and CEO
Oceanside Chamber of Commerce

928 North Coast Highway • Oceanside, California 92054
phone (760) 722-1534 • fax (760) 722-8336 • www.oceansidechamber.com

COUNTY OF ORANGE

BOARD OF SUPERVISORS

ROBERT E. THOMAS HALL OF ADMINISTRATION
10 CIVIC CENTER PLAZA
P. O. BOX 687
SANTA ANA, CA 92702-0687

March 26, 2013

David Gibson, Executive Officer
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4353

Subject: Notice of Public Hearing – National Pollutant Discharge Elimination System Permit and Waste Discharge Requirements for the Municipal Separate Storm Sewer Systems Draining the Watersheds within the San Diego Region

Dear Mr. Gibson:

In keeping with our staff's comments at your meeting of March 13, the County of Orange wishes to express its serious concerns about the approach your Board is taking for the adoption of the subject permit. Because the municipal stormwater permit has wide-reaching impacts on the County, the Orange County Flood Control District, and our constituents, it deserves careful and deliberate consideration by all parties.

The public hearing for adoption of the permit is scheduled for April 10 and 11, 2013. However, your Board has not yet released the revised permit or your staff's response to comments for review by permittees and public. In the interest of providing all parties sufficient time to prepare thoughtful comments and to ensure a meaningful public process, we respectfully request the hearing be postponed to allow a minimum 45-day public comment period once the upcoming draft and response to comments are posted.

We also take exception to your Board's moves to restrict public comments at this stage of the process. The ability of interested parties to submit written comments is a standard operating procedure for public agencies throughout the state and a key principle of good governance. Likewise, the ability to present both oral and written comments pertinent to the item under consideration without restrictions on the content is standard operating procedure for all public agencies.

It is our hope that the San Diego Regional Board will consider both the letter of the law and the spirit of the law with respect to due process in this important regulatory action.

We seek to have a fully open, transparent, and participatory public process but require revised procedures and scheduled for the upcoming permit adoption.

Respectfully,

Shawn Nelson
Chairman of the Board
Fourth District Supervisor

Patricia C. Bates
Vice-Chairman of the Board
Fifth District Supervisor

From: lyris@swrcb18.waterboards.ca.gov
To: Chiu, Wayne@Waterboards
Subject: POSTED - Revised Tentative Order R9-2013-0001 and Responses to Comments
Date: Wednesday, March 27, 2013 5:14:45 PM

This is a message from the California Regional Water Quality Control Board, San Diego Region (9).

Regional MS4 Copermittees and Interested Stakeholders,

The San Diego Water Board posted all documents to be considered by the Board at its April 10 and 11, 2013 Board Meeting on its website at http://www.waterboards.ca.gov/sandiego/board_info/agendas/2013/Apr/Apr10.shtml

For your added convenience you may access the documents directly from the links below:

- Executive Officer Summary Report
- Supporting Document No. 1 - Map
- Supporting Document No. 2 - Tentative Order, released on October 31, 2012
- Supporting Document No. 3 - Regional MS4 Permit Development Timeline
- Supporting Document No. 4 - Notice of Public Review and Comment for Tentative Order No. R9-2013-0001, dated October 31, 2012
- Supporting Document No. 5 - Comments Received by January 11, 2013
- Supporting Document No. 6 - San Diego Water Board Responses to Comments
- Supporting Document No. 7 - Revised Tentative Order No. R9-2013-0001 with Changes in Redline/Strikeout, released March 27, 2013
- Supporting Document No. 8 - Notice of Public Hearing, dated March 5, 2013, Hearing Procedures and Order of Proceedings, dated March 15, 2013

Please be patient when accessing Supporting Document No. 5 as it is quite large (2270 pages=all comment letters received with their attachments). You can access each individual comment letter the San Diego Water Board received by January 11, 2013 on the Boards Storm Water Webpage at http://www.waterboards.ca.gov/rwqcb9/water_issues/programs/stormwater/index.shtml.

Should you have any questions, please contact any member of the Permit Team.

Wayne Chiu, PE wchiu@waterboards.ca.gov 858-637-5558
Christina Arias, PE carias@waterboards.ca.gov 858-627-3931
Eric Becker, PE ebecker@waterboards.ca.gov 858-492-1785

Laurie Walsh, PE
lwalsh@waterboards.ca.gov
Water Resource Control Engineer
San Diego Regional Water Quality Control Board
Tel. 858-467-2970

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD
www.waterboards.ca.gov/sandiego/

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From: lyris@swrcb18.waterboards.ca.gov
To: Chiu, Wayne@Waterboards
Subject: San Diego Water Board Counsel Memorandum Regarding Designated Party Status during the April 10 and 11, 2013 Public Hearing on Tentative Order R9-2013-0001
Date: Wednesday, March 27, 2013 5:40:45 PM
Attachments: 032713memo.pdf

This is a message from the California Regional Water Quality Control Board, San Diego Region (9).

Regional MS4 Copermittees and Interested Stakeholders,

Please see the attached San Diego Water Board Counsel Memorandum dated March 27, 2013, regarding requests for designated party status during the April 10 and 11, 2013 Public Hearing on Tentative Order R9-2013-0001, NPDES No. CAS0109266, *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges of Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region.*

Laurie Walsh, PE
lwalsh@waterboards.ca.gov
Water Resource Control Engineer
San Diego Regional Water Quality Control Board
Tel. 858-467-2970

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
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CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

TO: Parties and Interested Persons, Tentative Order No. R9-2013-0001, Via Lyris List

FROM: Catherine George Hagan, Senior Staff Counsel

DATE: March 27, 2013

SUBJECT: **Requests for Designated Party Status**

The San Diego Water Board received numerous requests for alternate procedures and objections to the March 15, 2013, "Hearing Procedures and Order of Proceedings." The San Diego Water Board is currently considering the requests, including the requests for additional time to make presentations at the upcoming hearing.

Participants in this proceeding are identified as either "designated parties" or "interested persons." It is not necessary to be designated as a party in order to participate in the hearing for this proceeding. Both interested persons and designated parties will have the opportunity to present oral comments, to make arguments about the appropriateness, wisdom or utility of all or portions of the Tentative Order, and to comment on revisions to the Tentative Order. Both interested persons and designated parties may be asked to respond to clarifying questions from the San Diego Water Board, staff, or others, at the discretion of the San Diego Water Board. However, interested persons may not present evidence and are not subject to cross-examination. An interested person may request more time to speak than is typically allotted to interested persons and such requests may be granted at the Chair's discretion.

San Diego County, Riverside County and Orange County Copermittees are already designated as parties in this proceeding under the applicable State Water Resources Control Board's regulations set forth in California Code of Regulations, title 23, article 2, section 648, et seq. (See Cal. Code Regs., *tit.* 23, § 648.1(a).) The San Diego Water Board has discretion to determine who, in addition to the Copermittees, should be designated as a party for purposes of this proceeding. Factors the San Diego Water Board considers when deciding whom to designate include a person's history of involvement in the proceeding, how a person (or an entity's members) may be affected by the outcome of the proceeding, and/or to what extent a person's interests are different from or are not adequately represented by the interests of other designated parties.[1] Determinations are based on the extent to

[1] The San Diego Water Board staff is not a party to the proceeding. This is a proceeding to consider adoption of a permit, which does not involve investigative, prosecutorial or advocacy functions. Staff's proposals, recommendations and participation in this proceeding are for the purpose of advising and assisting the San Diego Water Board in considering the Tentative Order.

which participation as a designated party will further the development of the issues before the San Diego Water Board.

In light of the requests for additional procedures received on March 22, 2013, persons (other than the Copermittees) who wish to be designated as a party to the proceeding for the purposes of presenting evidence and participating in cross-examination must inform the Board, in writing, of their request and the reasons supporting their request not later than **10 a.m. on April 2, 2013**. Requests must be received by 10:00 a.m. and may be submitted electronically to Wayne Chiu, wchiu@waterboards.ca.gov and to Catherine George Hagan, Catherine.hagan@waterboards.ca.gov.

The San Diego Water Board will resolve the March 22, 2013, objections and requests for alternate procedures, as well as any requests for designated party status, promptly after receipt of designated party status requests.

Brownstein Hyatt
Farber Schreck

April 1, 2013

Lisabeth D. Rothman
Attorney at Law
310.500.4616 tel
310.500.4602 fax
LRothman@bhfs.com

VIA ELECTRONIC MAIL
wchiu@waterboards.ca.gov
Catherine.hagan@waterboards.ca.gov

Wayne Chiu, P.E., Water Resource Control Engineer
Catherine George Hagan, Senior Staff Counsel
California Regional Water Quality
Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4353

RE: Revised Tentative Order R9-2013-0001 Published March 26, 2013

Dear Mr. Chiu and Ms. Hagan:

This firm represents members of the Coalition that have participated in the process of the San Diego Regional Water Quality Control Board, Region 9's (RWQCB) development of Revised Tentative Order R9-2013-0001, published March 26, 2013. The Coalition consists of the following trade and professional associations, known as the regulated community: Building Industry Association of San Diego County (BIASD), Business Leadership Alliance (BLA), Associated General Contractors, San Diego (AGC), NAIOP (National Association of Industrial & Office Properties), Associated Builders & Contractors (ABC), the San Diego Regional Chamber of Commerce (SDRRC), the San Diego Association of Realtors® (SDAR), the Alliance for Habitat Conservation, the Building Owners & Managers Association (BOMA), and the San Diego Chapter of the American Society of Landscape Architects. The Coalition respectfully requests that the RWQCB provide additional time to review, consider, and comment upon Revised Tentative Order R9-2013-0001, and postpone the hearing on the Revised Tentative Order currently scheduled for April 10 and 11, 2013.

The Coalition experts and counsel have spent hundreds of hours reviewing and commenting on previous drafts of the permit. The Coalition became aware that the most current version of the permit, consisting of approximately 338 pages, was available for review March 27, 2013, at approximately 4:30 PM. Almost every substantive provision in the draft permit has been substantially revised. Concurrent with the release of this new draft permit, the RWQCB staff released 272 pages of responses to comments dealing with the staff's rationale for revising or not revising almost every substantive portion of the permit. The comment period on the previous draft of the permit closed on January 11, 2013. Thus, at least four RWQCB full-time staff have dedicated the last 69 days to review the comments and consider changes to the permit while the public and RWQCB board members working on a volunteer basis have been allotted just six business days to review over 600 pages of materials and analyze the potential effects of those changes. The Coalition strongly recommends that the RWQCB postpone the public hearing on the draft permit for at least 60 days to allow sufficient time for board members, affected parties, and the public to review and consider the major changes to water quality strategies and regulation envisioned in this permit, and provide comments to the

RWQCB. This is without doubt a situation that requires a comment period extension. *See* 40 C.F.R. §124.14(a)(4), (b).

Section 124.14(b) of Title 40 of the Code of Federal Regulations, prescribing decision-making procedures for NPDES permits, provides that, if any data information or arguments submitted during the public comment period appear to raise substantial new questions concerning a permit, the permit writer may prepare a new draft permit, appropriately modified, or may prepare a revised fact sheet and reopen the comment period on the same. With the substantial revisions to the draft permit and changes to the Fact Sheet, this provision requires reopening the comment period. *See also* 40 C.F.R. §124.10 (requiring notice and at least 30 days for public comment for a draft permit). Water Code section 13167.5 requires that the Regional Water Quality Control Boards provide notice and a period of at least 30 days for public comment prior to the adoption of waste discharge requirements. When a Regional Water Quality Control Board modifies a Water Quality Control Plan, it must comply with the California Administrative Procedure Act, including its notice and recirculation requirements. *State Water Resources Control Board v. Office of Administrative Law* (1993) 12 Cal.App.4th 697. As described above, the RWQCB's release of its modified permit, along with over 200 pages of response to comments regarding the proposed changes, should be considered, in effect, the preparation of a modified draft permit and revised fact sheet, with fewer than two working weeks to review these revisions prior to the meetings at which the RWQCB will consider the Revised Tentative Order for adoption. Under the authority cited above, the release of this modified permit must be accompanied by a corresponding additional comment period on the significantly revised draft Order.

Thank you for considering the Coalition's request. Please let us know at your earliest convenience whether you will allow additional written comments on the revised draft permit, when the deadline for submission of such comments will be, and whether you will postpone a final hearing on adoption of the permit.

Sincerely,

Lisabeth D. Rothman MD

LDR:mld
030009\0112\53843.1

April 1, 2013

Via electronic mail

Mr. David Gibson
Executive Officer and Members of the Board
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123
Email: wchiu@waterboards.ca.gov

Re: Request of NRDC, San Diego Coastkeeper, and Orange County Coastkeeper/Inland Empire Waterkeeper for Party Status and Request for San Diego Regional Board to Delay Hearing on the San Diego Regional MS4 Permit and Reissue the Permit for Public Comment.

Dear Mr. Gibson:

On behalf of the Natural Resources Defense Council ("NRDC"), the San Diego Coastkeeper ("SDCK"), and the Orange County Coastkeeper ("OCCK")/Inland Empire Waterkeeper ("IEWK"), we are writing with regard to the San Diego Regional Water Quality Control Board ("Regional Board") Hearing on the Tentative National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds Within the San Diego Region, Tentative Order No. R9-2013-0001, NPDES Permit No. CAS0109266 ("Tentative Order"), scheduled for April 10-11, 2013 ("Permit Hearing").

I. NRDC, SDCK, and OCCK Request Party Status for the Permit Hearing

Pursuant to Public Notice issued by the Regional Board on March 27, 2013 for the April 10-11, 2013 hearing on the Tentative Order, the NRDC, SDCK, and OCCK/IEWK (collectively, "Environmental Groups") each hereby request party status. Environmental Groups have been deeply involved with the permit process for the draft Tentative Order and have been among the most active public interest organizations in the stormwater and urban runoff field in southern California, particularly in San Diego, Orange, and Riverside Counties, investing an enormous effort over many years to reduce water quality degradation related to stormwater runoff.

A. NRDC, SDCK, and OCCK/IEWK Have Direct and Substantial Interests in This Proceeding that Justify Their Designation as Parties

First, Environmental Groups represent members who recreate in the waters to which the Tentative Order regulates discharges of stormwater runoff. The groups' members are impacted by pollution in stormwater runoff and its resulting health impacts, and by beach closures which restrict the ability of residents and visitors in San Diego, Orange, and Riverside Counties to use the beach and other local waters for recreation and other purposes.

Second, Environmental Groups submitted extensive written comments and expert analysis on the Tentative Order on January 11, 2013. NRDC and SDCK additionally submitted written comments on prior staff working proposals for the permit on September 14, 2012. Environmental Groups also presented testimony at the Regional Board Meeting on the draft Tentative Order on November 13, 2012, and SDCK and OCCK/IEWK participated in the Regional Board meeting on the Tentative Order on December 12, 2012, and in stakeholder discussions convened by Regional Board staff on the Tentative Order on July 11, July 25, and August 22, 2012. SDCK participated in additional stakeholder discussions on June 27 and October 24, 2012. Each of our organizations have also met with other stakeholders, representatives of the building industry, permittees, elected officials, and Regional Board staff to discuss draft permit terms on numerous additional occasions in 2012 and 2013. We have worked throughout the drafting process to ensure the adopted Order will meet the requirements of federal and state law, and achieve relevant requirements for water quality in San Diego, Orange, and Riverside Counties.

Third, Environmental Groups have a long history of working to adopt, strengthen and enforce prior MS4 permits for San Diego, Orange, and Riverside Counties, the TMDLs these permits implement, and the water quality standards that they are designed to achieve. For example, SDCK and NRDC successfully intervened in a lawsuit filed by the Building Industry Association of San Diego County against the Regional Board challenging the 2001 San Diego County MS4 permit, including the permit's application of water quality standards to stormwater. (See, *Building Industry Association of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866.) The California Appellate Court rejected the Building Industry's arguments and found that the Permit's restrictions on pollutant discharges were lawful. (*Id.*)

NRDC and SDCK were both active in Regional Board proceedings regarding the 2007 San Diego MS4 Permit and subsequent adoption process for the San Diego Countywide SUSMP, attending stakeholder meetings, submitting written comments and expert reports, and presenting testimony at Regional Board hearings.[1] NRDC additionally

[1] See, e.g., NRDC and SDCK letters to Regional Board on Nov. 7, 2008 letter to San Diego County, and Feb. 23, 2009 letter to Regional Board re: Countywide SUSMP.

petitioned the adoption of the 2007 San Diego MS4 Permit before the State Board in 2007, though voluntarily dismissed the petition in 2010.

NRDC participated in proceedings before the Regional Board for the adoption of the 2009 Orange County MS4 Permit for Region 9, including submitting comments, participating in stakeholder meetings convened by the Regional Board, and presenting testimony at Board hearings on the Permit.[2] NRDC also submitted written comments on the 2010 Permit for Riverside County within Region 9.[3] OCCK/IEWK have additionally brought approximately 40 third-party civil actions in federal court in the surrounding region over the past decade, focused on improving water quality and enforcement of the federal Clean Water Act. Our organizations have substantial interest in the quality of the region's waters generally, and in this proceeding specifically.

B. Without Party Status, the Action of the Board May Impair Environmental Groups' Ability to Protect Their Interests

The disposition of this action may impair or impede Environmental Groups' ability to protect their interests in several ways. Most notably, Environmental Groups members recreate in the waters the Tentative Order regulates discharges of stormwater discharges for. As detailed above, Environmental Groups have a long history of working to adopt and strengthen the same stormwater permits now proposed for coverage under the Tentative Order, as well as the Tentative Order itself, both in the administrative arena before this Board and as a party in other actions. In the event we are denied party status, and additional substantive changes to the Tentative Order are made at the hearing that contravene the interests of Environmental Groups, or in the event that provisions in the Order which fail to meet the requirements of state or federal law are not corrected at the Permit Hearing, our participation to this point will have been rendered a meaningless exercise. This action's disposition may further directly affect Environmental Groups' ability to protect their interests as they relate to further administrative proceedings concerning the implementation of the Tentative Order or TMDLs incorporated within it, or our interests related to any potential action challenging the Tentative Order before the State Board or in Superior Court.

Clean Water Act regulations explicitly require that agencies shall "provide for, encourage, and assist the participation of the public" and use "all feasible means to create opportunities for public participation, and to stimulate and support public participation." (40 C.F.R. §§ 25.3(a), (c)(7).) Given Environmental Groups' clear past and present

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[2] See, e.g., NRDC letters to Regional Board on Aug. 22, 2007, May 15, 2009, June 19, 2009, Sept. 28, 2009, and Dec. 12, 2009, regarding the draft MS4 Permit for South Orange County.

[3] See NRDC letter to Regional Board on August 13, 2010 re: draft MS4 Permit for Riverside County.

interests in the adoption and enforcement of the Tentative Order, the Regional Board should grant our request for Party Status.

C. Environmental Groups' Interests Are Not Adequately Represented by the Existing Parties to this Hearing

The current parties to these permit proceedings are municipal and county entities that will be regulated under the Tentative Order and ultimately responsible for implementing the requirements it imposes. Conversely, Environmental Groups are nonprofit organizations focused on protecting San Diego, Orange, and Riverside Counties' aquatic resources and its inland waterway users and beachgoers. Environmental Groups have throughout the Tentative Order drafting process presented, and undoubtedly will at the hearing present, arguments that are in opposition to positions taken by the existing parties and will add necessary elements to the hearing that the existing parties will likely neglect. These include full discussion of the impacts and costs of failing to adequately reduce pollution in stormwater runoff; providing discussion of federal and state legal requirements that mandate many of the terms contained in the Tentative Order, including the Order's Receiving Water Limitations ("RWLs"), TMDL, and Low Impact Development Requirements; discussion of the federal process for adoption of the permit and that this process cannot be undercut by state law; and presentation of case studies, scientific research, and other documentation demonstrating the feasibility of terms in the Tentative Order or of additional provisions that are currently lacking in the Tentative Order. As no existing or other party will adequately represent the Environmental Groups and their unique interests, they are properly given party status here.

Environmental Groups are regular, consistent participants in water quality matters large and small before the Regional Board, State Board, as well as in litigation related to water quality issues, including directly involving the MS4 permit for San Diego County. We have been deeply involved with the adoption process for the draft Tentative Order for nearly a year. As such, we each request designation as a party to the proceeding.

II. <u>Environmental Groups Request 50 minutes for Presentation and Hearing Practice</u>

Environmental Groups request that the Regional Board allocate to them a total of fifty (50) minutes of time for presentation, cross examination, and rebuttal as necessary. This time would be divided roughly as follows: Presentation (35 minutes); Cross-Examination of Staff/Witnesses/Other Parties (as needed, 10 minutes) and time for rebuttal or remaining hearing practice (5 minutes). This amount of time is necessary to ensure a proper vetting of the issues and complexities raised by the Tentative Order and comments submitted by permittees.

III. Environmental Groups Request that the Regional Board Designate a Time or Date Certain for Public Comment at the Permit Hearing

Environmental Groups appreciate the Regional Board's past effort to establish a date certain for their presentation at the Permit Hearing. However, in light of the potential changes to the hearing procedure signaled by the Regional Board in its March 27, 2013 letter, and in order to accommodate the travel and lodging needs of representatives of the Environmental Groups, we respectfully request that, to the extent possible, the Regional Board confirm the date certain no later than Friday, April 5, 2013.

IV. Designated Contact for Receipt of Notices About this Proceeding

Communications related to this proceeding or to the Environmental Groups' request for Party Status may be directed to:

Noah Garrison
Natural Resources Defense Counsel
1314 Second Street
Santa Monica, CA 90405
Tel: 310-434-2300 / Email: ngarrison@nrdc.org

Jill Witkowski
San Diego Coastkeeper
2825 Dewey Rd., Suite 200
San Diego, CA 92106
Tel: 619-758-7743 / Email: jill@sdcoastkeeper.org

Colin Kelly
Orange County Coastkeeper/Inland Empire Waterkeeper
3151 Airway Ave, Suite F-110
Coast Mesa, CA 92626
Tel: 714-850-1965 / Email: colin@coastkeeper.org

V. Environmental Groups Object to the Potential Adoption of the Tentative Order at the Permit Hearing, and Request that the Regional Board Reissue the Tentative Order for Public Comment.

On March 27, 2013, the Regional Board released a revised draft Tentative Order that contained sweeping, substantive changes from the previously issued draft released for public comment on October 31, 2012. Courts have found that where a "final rule deviates too sharply from the proposal," interested or "affected parties will have been deprived of notice and an opportunity to respond to the rule." (*Natural Resources Defense Council, Inc. v. U.S.EPA.* (9th Cir. 1988) 863 F.2d 1420, 1429.) Such a situation is presented here. In particular, changes to the Tentative Order's Water Quality

Improvement Plan requirements under section II.B., including a "safe harbor" provision under section II.B.3.c., which renders the permit's overarching receiving water limitation's prohibition against discharges that "cause or contribute to the violation of water quality standards in any receiving waters" inoperative in certain circumstances, represent a significant change from the prior version of the Tentative Order.

The potential repercussions of this new language, which involve complex, technical matters that entirely alter the overall framework for enforcement of the Tentative Order, cannot be properly evaluated or responded to in the short time frame remaining prior to the currently specified Permit Hearing dates of April 10-11. Should the Regional Board elect to proceed with adoption of the Tentative Order on April 10-11, Environmental Groups, as well as other affected parties will be deprived of proper opportunity to respond to the proposed permit provisions. As a result, we respectfully request that the Regional Board delay the proceeding, and reissue the permit for additional public comment.

VI. Conclusion

Environmental Groups request party status to the April 10-11 Hearing on the Tentative Order. However, Environmental Groups also request that the Regional Board delay this proceeding, and reissue the Tentative Order for further public comment. Environmental Groups further reserve our right to raise objections on procedural or other grounds that may arise during, or prior to, the Permit Hearing. Thank you for your attention to this matter, and please do not hesitate to contact us with any questions you might have.

Sincerely,

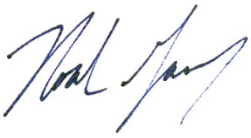

Noah Garrison
Project Attorney
Natural Resources Defense Council

/s/
Jill Witkowski
Waterkeeper
San Diego Coastkeeper

/s/
Colin Kelly
Staff Attorney
Orange County Coastkeeper
Inland Empire Waterkeeper

Congress of the United States
Washington, DC 20515

April 2, 2013

Bob Perciasepe
Acting Administrator
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Jared Blumenfeld
Regional Administrator, EPA Region IX
75 Hawthorne Street
San Francisco, CA, 94105

Dear Administrator Perciasepe and Regional Administrator Blumenfeld:

As Members of Congress who represent San Diego County, California, we urge your immediate review of the San Diego region Municipal Separate Storm Sewer Systems Permit (Permit). The San Diego Regional Water Quality Control Board (RWQCB) has scheduled a Permit adoption hearing for April 10, 2013. Although this Permit will be issued by the State of California under its authority to regulate permit activity of the Clean Water Act (CWA), we request that the Environmental Protection Agency (EPA) review the Permit and its potential impact on local communities to ensure that compliance costs and schedules are sustainable and reasonable.

Achieving the common goal of clean water is dependent on cooperation with local governments, which bear the burden of implementing CWA obligations. Implementation costs and compliance schedules must be carefully reviewed and balanced with projected scientific benefits to ensure that the goals of the CWA are met. Specifically, stormwater regulations must to be reviewed with a cost-benefit analysis that adheres to the Maximum Extent Practicable (MEP) standard established by the CWA.[1]

In January 2013, EPA released a memorandum to regional authorities and local governments to clarify how the financial capability of permittees will be considered when developing compliance schedules for municipal projects to meet CWA obligations.[2] In the memorandum, EPA states that it is "essential that long-term approaches to meeting CWA objectives are sustainable and within a community's financial capability." However, we are concerned that EPA is adhering to unfinalized guidance still under review by the Office of Management and Budget would require the draft Permit to exceed the MEP standard intended by Congress, particularly regarding the bacteria Total Maximum Daily Load (TDML) numeric

[1] Clean Water Act Section 402(p)(3)(B)(iii)
[2] U.S. Environmental Protection Agency Memorandum, January 2013, "Assessing Financial Capability for Municipal Clean Water Act Requirements."

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limit.[3] Additionally, as the April 10 hearing approaches, numerous comments to the Permit from the last public review have yet to be released to ensure a fair and thorough process for the Permit adoption.

The County of San Diego has formed a coalition that includes representatives from six other southern California counties, businesses, and technical experts that have expressed concerns about the financial capability of the co-permittees and potential scientific deficiencies in the Permit's development. We are concerned that the high cost to the co-permitees, in the absence of a cost-benefit analysis, will strain public finances when the coalition is already facing difficult economic challenges. Together, the co-permitees for the Permit spend approximately $100 million annually to comply with existing stormwater permit requirements. The regional cost of compliance for the new Permit, including the TMDL for bacteria, could exceed $4.2 billion over the next 18 years, as projected by the RWQCB's TMDL documentation. We urge you to work with State and local government to use taxpayer dollars responsibly to achieve attainable water quality goals, including TMDL numeric limits, which should be based on sound science.

We would welcome a briefing on this issue from your staff before the Permit is adopted, and we appreciate your attention to this matter. As EPA reviews the Permit and continues to develop a financial capability framework for regions, we urge you to finalize guidance that does not exceed the MEP standard and will allow local, State, and Federal authorities to achieve mutually agreeable and scientifically based standards for clean water.

Sincerely,

Darrell Issa
Member of Congress

Juan Vargas
Member of Congress

Susan Davis
Member of Congress

Duncan Hunter
Member of Congress

Scott Peters
Member of Congress

[3] U.S. Environmental Protection Agency Memorandum, November 12, 2010, "Revisions to the November 22, 2002 Memorandum 'Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Watrer Sources and NPDES Permit Requirements Based on Those WLAs."

CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

TO: Parties and Interested Persons, Tentative Order No. R9-2013-0001, Via Lyris List

FROM: Tomas Morales, Chair
SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD

DATE: April 3, 2013

SUBJECT: Ruling on Objections, Requests for Alternative Procedures, and Requests for Designation as Additional Parties to the Proceeding

The San Diego Water Board received numerous objections and/or requests for alternative procedures from many Copermittees as well as from Natural Resources Defense Council, San Diego Coastkeeper, Orange County Coastkeeper, Inland Empire Waterkeeper and Clean Water Now.[1] The objections and requests for alternative procedures are addressed below. In addition, the San Diego Water Board received two sets of requests from entities seeking party status in this proceeding. As explained below, the requests for party status are granted. Finally, the San Diego Water Board has prepared a revised Hearing Procedures and Order of Proceedings to reflect modifications to the procedures for the upcoming hearing based upon requests from the parties. The Revised Hearing Procedures and Order of Proceedings document is attached.

OBJECTIONS TO HEARING PROCEDURES AND ORDER OF PROCEEDINGS AND REQUESTS FOR ALTERNATIVE PROCEDURES

The objections to the hearing procedures and requests for alternate process can generally be grouped into five categories.

1. Requests to Postpone the April 10/11 Hearing/Requests for Additional Written Comment Period and Opportunity to Introduce New Issues and Evidence

The revisions to the Tentative Order do not rise to the level of significance that require a new notice and comment period and therefore do not warrant postponement of the hearing. The revisions were made in response to written and oral comments received by the Board and concern matters that the Parties and interested persons knew to be at issue. Both state and federal law require a notice and comment

[1] The San Diego Water Board received late objections from the Orange County Board of Supervisors (March 26, 2013) and a Coalition of trade and industry organizations including Building Industry Association of San Diego County and others (April 1, 2013). These late comments are not accepted into the record, however neither comment letter raises novel objections and this ruling addresses the issues raised therein.

period prior to the adoption of an NPDES permit. California Water Code section 13167.5 prescribes a notice and public comment period of at least thirty days prior to the adoption of waste discharge requirements, including NPDES permits. The section explicitly states, however, that it does not require the regional board "to provide more than one notice or more than one public comment period prior to the adoption of waste discharge requirements . . . ." State law therefore does not require a new notice and comment period.

Federal regulations promulgated pursuant to the Clean Water Act also require a thirty day public comment period on draft NPDES permits. As stated in section 124.10(b) of title 40 of the Code of Federal Regulations (40 C.F.R.), "public notice of the preparation of a draft permit shall allow at least 30 days for public comment." Nowhere do the regulations suggest that revisions to a draft permit, however significant, require an additional public comment period. In fact, 40 C.F.R. section 124.14(b) grants discretion to the EPA Regional Administrator to either "reopen or extend the comment period," "prepare a new draft permit, appropriately modified," or both – "if any data, information, or arguments submitted during the public comment period . . . appear to raise substantial new questions concerning a permit." Although not directly controlling on the States' authority, section 124.14 illustrates that the decision to reopen the comment period is discretionary, even if the comments raise substantial new questions concerning the permit.

Though the comments may trigger permit drafters to modify the permit, as was the case here, a new comment period is permissible but not required. (*See, e.g., In re Dominion Energy Brayton Point, L.L.C.* (Feb. 1, 2006, NPDES Appeal 03-12, 2006 WL 3361084.) In the context of administrative rulemaking, revisions to a proposed rule only require a new comment period if the modifications are not the "logical outgrowth" of the rule as it was initially proposed. (*NRDC v. USEPA* (9th Cir. 2002) 279 F.3d 1180, 1186-1188.) Even a substantial variation does not necessitate a new comment period so long as the final regulation is "in character with the original proposal." (*Id.,* quoting *Hodge v. Dalton* (9th Cir. 1997) 107 F.3d 705, 712.) Analagously, in the context of a permit proceeding, a new comment period is only required if the revised permit is essentially a new draft permit because the revisions are not the "logical outgrowth of" or "in character with" the permit as initially proposed. Here, the revisions to the Tentative Order are the direct consequence of the written and oral comments received during the written comment period and the two board workshops held in November and December 2012. As reflected by the tracked changes, the revisions to the Tentative Order address particular comments and do not fundamentally alter the character of the Tentative Order.

The purpose of the notice and comment requirements is not to lead to the circular result that agency proceedings are subject to a new round of written comments with every substantive revision. This scenario would result in an endless loop of comments and revisions. Rather, the public has a one-time right to comment on the issues raised by the Tentative Order. One of the purposes of the comment period is to provide the agency with additional information upon which it may choose to revise the draft language. Where the character and issues raised by the tentative permit remain substantially the same, however, and as is true here, there is no additional right to comment on those revisions. (*See Rybachek v. USEPA* (9th Cir. 1990) 904 F.2d 1276, 1286.)

Some parties assert that the Board is obligated to extend the public comment period to the close of the public hearing in this matter, citing 40 C.F.R., section 124.12(c). Reliance on section 124.12, subsection (c) is misplaced as it is inapplicable to the San Diego Water Board. (See 40 C.F.R. § 123.25.) Nonetheless, the parties and interested persons will have an opportunity to comment on the revisions to the Tentative Order at the hearing. At that time, commenters will have an opportunity to orally address the Board with concerns or other comments regarding the revisions. The parties are on notice that the Board is not obligated to and will not allow the introduction of new issues that do not concern the revisions to the Tentative Order.

Because a new written comment period is unnecessary, the San Diego Water Board will not postpone the hearing scheduled for April 10 and 11. The San Diego Water Board provided more than 70 days to review and submit written comments on the Tentative Order. Federal regulations only require that the Board provide at least 30 days for public comment. Accordingly, Parties and interested persons were provided with more time than the federal law requires. The Board has made extraordinary efforts to make the Tentative Order development process open, transparent, and inclusive. The permit development process began almost two years ago. Since that time, the Board has provided countless opportunities for Copermittees and stakeholders to raise concerns, ask questions, and engage in dialogue with Board staff regarding permit provisions. There were numerous facilitated staff-level stakeholder workshops. As a result, the draft Tentative Order was revised to address many of the concerns raised by Parties during meetings. The Tentative Order that was released on October 31, 2012 reflected these changes. Recent revisions to the Tentative Order are based upon oral comments at two public board-level workshops in November and December 2012 and on extensive written public comment received in January 2013.

While not specifically raised in written objections, neither applicable regulations nor due process require the Board to provide more time for parties and interested persons to review and respond to responses to comments prepared by San Diego Water Board staff. Federal regulations at 40 C.F.R. section 124.17 address responding to comments. 40 C.F.R. section 124.17(a) specifies that the response to comments must be issued when a final permit is issued and the "response shall: (1) Specify which provisions, if any, of the draft permit have been changed in the final permit decision, and the reasons for the change; and (2) Briefly describe and respond to all significant comments on the draft permit . . . raised during the public comment period, or during any hearing. Section 124.17(c) requires that the response to comments "shall be available to the public." Nowhere do the regulations require that the Board's response to comments be provided in advance with opportunity to review and comment. As required by applicable regulations, the San Diego Water Board has prepared and made available to the public a response to significant comments on the draft permit received during the written comment period. Staff will respond orally to significant comments raised during the hearing.

2. Objection to Informal Process and Requests for Additional Process Including Cross-Examination, Rebuttal Testimony and Introduction of Exhibits

Many of the Copermittees object to the San Diego Water Board's proposed use of the streamlined or generally "informal" process the Board ordinarily uses for adjudicative proceedings at which it considers adoption of permits (as opposed to prosecutorial proceedings such as those imposing administrative civil liability). One group of Copermittees requests that the Board invoke the processes in Chapter 5 of the Administrative Procedures Act.[2] In general, the Copermittees request the procedures that are enumerated under section 11513 of the Government Code, which is incorporated by reference in the applicable State Water Board regulations governing adjudicative proceedings (commencing with section 648 of title 23 of the California Code of Regulations). The Parties object to procedures for this hearing that do not specifically allow for parties to make opening or closing statements, present witnesses, submit exhibits, conduct cross-examination and provide rebuttal testimony.

After considering the specific requests, the Board will allow parties to use their allocated presentation times to complete their main presentation, opening or closing statements, introduce exhibits, present witnesses, present rebuttal testimony, and conduct cross-examination of other Parties. Questions from

[2] Other than section 11513, Chapter 5 of the Administrative Procedures Act (Gov. Code section 11500 et seq.) is inapplicable to San Diego Water Board proceedings. See Cal. Code Regs., *tit.* 23, § 648(c).

the Board and the time to answer them will not be charged against the Parties' time. If groups of designated parties sharing time wish to conduct cross-examination, they shall appoint a single person to do cross examination so the Board does not have multiple individual attorneys lined up to ask one or a handful of questions each. Additionally, Parties are reminded that direct testimony by party witnesses, if any, should be in narrative form to expedite the hearing process. Since the written comment period already closed, parties are also reminded that they may use exhibits as long as they are graphic depictions of evidence already in the record and are not a vehicle for seeking to introduce new evidence.

3. Requests for More Time to Make Presentations and for Individual Copermittee Time Allocations

Many of the Copermittees requested that they be allocated individual blocks of time in which to make their presentations asserting that coordination with other parties was not possible because, at the time objections and requests for alternate procedures were due, the revised Tentative Order and response to comments had not been released. In light of the extensive opportunities for participation in the development of this Tentative Order and the limited scope of revisions to the Tentative Order (responding directly to stakeholder comments), it is not necessary to allocate additional time to the Parties. Nonetheless, the Board has considered the requests and number of Parties to this proceeding and will increase the previous allocations of time to Parties and some interested persons. The Hearing Procedures and Order of Proceedings will be revised to reflect that Copermittees will have four hours instead of three in which to coordinate their presentations, the Coalition of trade and industry groups (see Ruling on Designated Party Requests, below) will have 1.5 hours in which to make its presentation and the Environmental Group consisting of NRDC, San Diego Coastkeeper, Orange County Coastkeeper and Inland Empire Waterkeeper will have one hour in which to complete its presentation. Clean Water Now, although not a designated party, will have its requested six minutes in which to make its presentation and may comment prior to the coordinated Environmental Group.

4. Objections to Order of Proceedings/Presentations and Request for Greater Accommodation for Elected Officials

Several Parties requested that the United States Environmental Protection Agency speak in the order of presentations immediately after Board staff. This request is reasonable and will be granted. One Party requested that the Board follow the order of proceedings set forth in section 648.5 of title 23 of the California Code of Regulations. The Board retains discretion to conduct the hearing in the manner it determines is most suitable to this particular matter, given the number and complexity of issues, parties and available hearing time. The Board declines to follow the Order of Proceedings set forth in section 648.5. Finally, one Party requests more flexibility to accommodate the different schedules of elected officials so that they may be heard other than at the 9:15 a.m. time certain established for April 11. The Board encourages elected officials wishing to speak to appear during the time certain established by the Board. If some elected officials are not able to attend during the time certain, they may speak along with other interested persons beginning at 4 p.m. on April 10 or may request the Board's permission to speak at a different time. The Board will endeavor to accommodate special requests while minimizing disruption to the orderly conduct of the hearing.

5. The Hearing Procedures and Order of Proceedings, including refusal to Postpone the Hearing, Violate the Parties' Rights to Due Process

The Hearing Procedures, particularly as modified today, are not unfair and do not violate the Administrative Procedures Act or due process. Government Code section 11425.10, subdivision (a)(1), requires that an administrative agency provide "the person to which the agency action is directed notice

and an opportunity to be heard, including the opportunity to present and rebut evidence." The Law Revision Commission Comments to that subdivision further state: "Subdivision (a)(1), providing a person the opportunity to present and rebut evidence, is subject to reasonable control and limitation by the agency conducting the hearing, including the manner of presentation of evidence, whether oral, written, or electronic, limitation on lengthy or repetitious testimony or other evidence, and other controls or limitations appropriate to the character of the hearing." Government Code section 11425.10, subdivision (a)(1), also does not equate any specific procedures with an "opportunity." (*Drummey v. State Bd. Of Funeral Directors* (1939) 13 Cal.2d 75, 80-81.) Rather, in administrative adjudicative proceedings, hearing officers are conferred substantial discretion and explicit authority to waive any requirement relating to adjudicative proceedings, except where in conflict with statutory or constitutional guarantees. (Cal. Code Regs., tit. 23, section 648, subd. (d); Cal. Code Regs., tit. 23, section 648.5, subd. (a). ["Adjudicative proceedings shall be conducted in a manner as the Board deems most suitable to the particular case with a view towards securing relevant information expeditiously without unnecessary delay and expense to the parties and to the Board."] This regulatory flexibility to control a proceeding is completely consistent with the statutory right to "notice and opportunity to be heard." Courts have likewise acknowledged the ability of agencies to streamline hearings, while preserving the right to notice and comment. As the U.S. Supreme Court has noted, what constitutes a fair hearing before an administrative body varies with the circumstances. (*Gilbert v. Homer* (1997) 520 U.S. 924, 930.) Courts should also give "substantial weight" to the good-faith judgments of the hearing officer. (*Zuckerman v. State Bd. Of Chiropractic Examiners* (2002) 29 Cal.4th 32, 46.) This is particularly true where the permit process, which grants a privilege, is only subject to minimal due process. (See, e.g., *Sucn. Suarez v. Gelabert* (D.P.R. 1982) 541 F.Supp. 1253, 1264 [citing *Mathews v. Eldridge* (1976) 424 U.S. 319, 335]; see also Wat. Code § 13263, ["All discharges of waste into waters of the state are privileges, not rights."].) Consistent with these standards, the Parties have had and will continue to have notice and opportunity to be heard at the hearing.

RULING ON REQUESTS FOR DESIGNATION AS PARTIES

On April 2, 2013, the San Diego Water Board received two separate sets of requests for designation as parties to the proceeding. For the reasons explained below, the requests are granted.

Request by Environmental Groups

The requests made by the Natural Resources Defense Council, the San Diego Coastkeeper, and Orange County Coastkeeper and Inland Empire Waterkeeper (collectively the Environmental Group) are granted. The Environmental Groups are each hereby designated as additional parties to this proceeding, pursuant to section 648.1(a) of title 23 of the California Code of Regulations. In their request, the Environmental Groups note that they have been deeply involved in the development of the Tentative Order and have been extremely active as public interest organizations in storm water efforts. They state that they represent numerous members who recreate in the waters affected by the discharges regulated by the Tentative Order and who are impacted by pollution in storm water runoff and its resulting health impacts. Like other designated parties, the Environmental Groups have an interest in, and will be affected by, the Board's decision in this proceeding. The Environmental Groups also have demonstrated that their interests are not adequately represented by existing Parties to the proceeding. Accordingly, the Board finds that the Environmental Groups' perspective and participation as a party will be beneficial to further develop the issues before the Board. In addition, because all parties and interested persons will be subject to reasonable time limits to make presentations, there is no impact on the efficient conduct of the hearing itself.

While the members of the Environmental Group are each designated as parties, the Board expects the Environmental Group to complete their presentations (including opening/closing statements, argument, presentation of any witnesses, cross examination, presentation of evidence and/or rebuttal testimony)

within the requested allocation of one hour. Other than Clean Water Now (see below) non-governmental organizations and environmental entities with similar interests in the outcome of the proceeding but not included in the membership of the Environmental Groups may speak as interested persons.

Clean Water Now, represented by Roger Butow, has not formally requested designated party status but has requested that it have six minutes to speak. The request for six minutes just prior to the commencement of the Environmental Groups joint presentation is granted.

Request by Coalition of Trade and Professional Associations (Building Industry Coalition)
The second set of requests for designation as parties is from a group of trade and professional associations referring to itself as the Coalition. The Board will refer to this coalition as the Building Industry Coalition for purposes of participation in this proceeding. The Building Industry Coalition consists of (1) Building Industry Association of San Diego County (BIASD), (2) Building Industry Association of Southern California (BIASC), (3) Associated General Contractors, San Diego (AGC), (4) San Diego Regional Chamber of Commerce (SDRCC), (5) Building Owners and Managers Association (BOMA), (6) San Diego County Apartment Association (SDCAA), (7) San Diego Association of Realtors (SDAR), (8) Alliance for Habitat Conservation, (9) San Diego Chapter of the American Association of Landscape Architects, (10) Associated Builders and Contractors (ABC), (11) Business Leadership Alliance (BLA) and (12) National Association of Industrial and Office Properties. The Coalition is a not a legal entity but instead is a group of trade and professional associations sharing similar interests in the outcome of this proceeding. Like the Environmental Groups, the Building Industry Coalition's membership has participated extensively in the development of this Tentative Order. The Coalition's request for designation as a party cites that its 20,000 members will be significantly and directly affected by the outcome of these proceedings. The Building Industry Coalition has also distinguished its interests in the proceedings from existing Parties and from the Environmental Groups identified above. Accordingly, the Board finds that the Building Coalition's perspective and participation as a party will be beneficial to further develop the issues before the board. In addition, because all parties and interested persons will be subject to reasonable time limits to make presentations, there is no impact on the efficient conduct of the hearing itself.

While the members of the Coalition are each designated as Parties, the Board expects the Coalition and its members to share allocated time for making presentations of one hour for its complete presentation (including opening/closing statements, argument, presentation of witnesses, cross-examination and presentation of evidence). Other entities with similar interests in the outcome of the proceeding but not included in the membership of the Coalition may speak as interested persons.

Attachment: Revised Hearing Procedures and Order of Proceedings, April 3, 2013

cc:	Distribution via email:	San Diego County Copermittees
	(see attached address list)	Orange County Copermittees
		Riverside County Copermittees
		Resource Agencies
	Distribution list via email:	San Diego County MS4 Permit Lyris List
		Orange County MS4 Permit Lyris List
		Riverside County MS4 Permit Lyris List
		San Diego Water Board Agenda Lyris List

San Diego County Copermittees

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California Water Boards

Edmund G. Brown Jr., Governor

Matthew Rodriquez, Secretary for Environmental Protection

California Regional Water Quality Control Board, San Diego Region

REVISED[1] HEARING PROCEDURES AND ORDER OF PROCEEDINGS

Public Hearing to Consider Adoption of Tentative Order No. R9-2013-0001, NPDES No. CAS01092662 and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds Within the San Diego Region

April 10 and 11, 2013
Beginning at 9:00 a.m. Each Day
California Regional Water Quality Control Board, San Diego Region
Regional Water Board Room
San Diego Water Board Office Building
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

By prior public notice dated March 5, 2013, the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) announced its intent to conduct a public hearing on April 10 and 11, 2013, to receive testimony and comments and consider adoption of Tentative Order No. R9-2013-0001, NPDES No. CAS0109266, *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Tentative Order). After consideration of all requests, taking into account that oral comments are limited to revisions to the Tentative Order, that the revisions were made in response to oral and written comments, the complexity and number of issues under consideration, the extent to which parties have coordinated, the number of parties and members of the public participating, the opportunity to submit written comments that are part of the administrative record, the extent to which the parties have identified unique interests, the time available for the hearing, and to allow the Board ample time to ask questions and deliberate, the following Procedures and Order of Proceedings, including time allocated to each Party or group of Parties and members of the public, will be followed at the April 10 and 11, 2013, public hearing.~~This Order of Proceedings sets forth additional details on the procedures and order of presentations the San Diego Water Board will follow at the public hearing.~~

[1] The applicable Hearing Procedures and Order of Proceedings are revised to reflect procedural rulings made on April 3, 2013.

SCOPE OF HEARING

The Tentative Order was released for public review and comment on October 31, 2012. The written comment period ended January 11, 2013. All timely written comments received are posted on the San Diego Water Board website, at http://www.waterboards.ca.gov/rwqcb9/water_issues/programs/stormwater/index.shtml. No subsequently filed written comments have been accepted into the record at this time. Other than speaker cards and copies of electronic presentations or exhibits (see below) no new written materials will be accepted into the record at the April 10-11, 2013 hearing. As indicated in prior notices, the scope of oral testimony at the public hearing will be ~~strictly~~ limited to summarizing the previously submitted written comments, commenting on revisions to the Tentative Order~~-~~ made since the written comment period closed, and making policy statements. ~~No new issues may be raised at the hearing.~~As determined by the Board in Rulings issued April 3, 2013, within the above constraints, Parties to the proceeding will also be allowed to use their presentation time to present witnesses, introduce exhibits, conduct cross-examination and offer rebuttal testimony. Parties are reminded that testimony and exhibits may not include the introduction of new evidence.

PARTICIPANTS IN THIS PROCEEDING

Participants in this proceeding are identified as either "Parties" or "interested persons." It is not necessary to be designated as a party in order to participate in the hearing for this proceeding. Both interested persons and Parties will have the opportunity to present oral comments, to make arguments about the appropriateness, wisdom or utility of all or portions of the Tentative Order, and to comment on revisions to the Tentative Order. Both interested persons and Parties may be asked to respond to clarifying questions from the San Diego Water Board, staff, or others, at the discretion of the San Diego Water Board. However, interested persons may not present evidence and are not subject to cross-examination. An interested person may request more time to speak than is typically allotted to interested persons and such requests may be granted at the Chair's discretion.

San Diego County, Riverside County and Orange County Copermittees are designated as parties in this proceeding under the applicable State Water Resources Control Board's regulations set forth in California Code of Regulations, title 23, article 2, section 648, et seq. (See Cal. Code Regs., *tit.* 23, § 648.1(a).) The San Diego Water Board has discretion to determine who, in addition to the Copermittees, should be designated as a party for purposes of this proceeding. In its Ruling issued April 3, 2013, the Board has determined that the following entities are appropriate additional Parties to this proceeding.[2]

[2] The San Diego Water Board staff is not a party to the proceeding. This is a proceeding to consider adoption of a permit, which does not involve investigative, prosecutorial or advocacy functions. Staff's proposals, recommendations and participation in this proceeding are for the purpose of advising and assisting the San Diego Water Board in considering the Tentative Order.

Additional Parties:

1. Natural Resources Defense Council
2. San Diego Coastkeeper
3. Orange County Coastkeeper
4. Inland Empire Waterkeeper

(Additional Parties 1 through 4 are collectively referred to as the Environmental Group)

5. Building Industry Association of San Diego County (BIASD)
6. Building Industry Association of Southern California
7. Associated General Contractors, San Diego
8. San Diego Regional Chamber of Commerce
9. Building Owners and Managers Association
10. San Diego County Apartment Association
11. San Diego Association of Realtors
12. Alliance for Habitat Conservation
13. San Diego Chapter of the American Association of Landscape Architects
14. Associated Builders and Contractors
15. Business Leadership Alliance
16. National Association of Industrial and Office Properties

(Additional Parties 5 through 16 are collectively referred to as the Building Industry Coalition)

HEARING PROCESS

During the public hearing, San Diego Water Board staff will present an overview of the Tentative Order, written responses to comments received and recommended revisions to the Tentative Order. -For this proceeding, San Diego Water Board staff will begin, followed by representatives of the following Pparties or interested persons: 1) U.S. Environmental Protection Agencythe San Diego County, Orange County and Riverside County Copermittees; 2) U.S. Environmental Protection Agency the San Diego County, Orange County and Riverside County Copermittees; 3) Clean Water Now 4) the Environmental Group consisting of Natural Resources Defense Council, San Diego Coastkeeper, Orange County Coastkeeper and Inland Empire Waterkeeper,Non-governmental Organizations (NGOs); and 54) a Coalition of Building Industry trade and professional associations (Building Industry Coalition)Building Industry Groups.[34] Participants within these groups are encouraged to consolidate their presentations to save hearing time and/or avoid duplication.

[3] The groups within the Building Industry Coalition are: (1) Building Industry Association of San Diego County (BIASD), (2) Building Industry Association of Southern California, (3) Associated General Contractors, San Diego, (4) San Diego Regional Chamber of Commerce, (5) Building Owners and Managers Association, (6) San Diego County Apartment Association, (7) San Diego Association of Realtors, (8) Alliance for Habitat Conservation, (9) San Diego Chapter of the American Association of Landscape Architects, (10) Associated Builders and Contractors, (11) Business Leadership Alliance and (12) National Association of Industrial and Office Properties.

[4] These participants have been identified based upon prior participation through written comments, stakeholder meetings and public workshops held in November and December 2012.

For Parties, the allocated times below include time for any opening statement, main presentation, presentation of witnesses, introduction of exhibits, cross-examination, rebuttal and/or closing argument. Direct testimony should be presented in narrative format. To facilitate the orderly conduct of the hearing, to the extent Parties within a consolidated Group wish to cross-examine other Parties' witnesses, they should designate one representative to conduct the cross-examination.

After these presentations, the San Diego Water Board will hear from the public (interested persons) and elected officials, subject to times certain (see below). Interested persons with similar concerns or opinions are encouraged to choose one representative to speak, and are encouraged to coordinate their presentations with each other and to summarize their written comments. Interested persons may not cede their unused time to others, but the Chair will entertain requests for extra time from interested persons speaking on behalf of multiple interested persons.

Speakers will be interrupted not earlier than 4:00 p.m. on April 10 so that the San Diego Water Board can hear from interested persons other than representatives of the groups identified by name in this order of proceedings. At 9:15 a.m. on April 11, ~~or as soon thereafter as practicable,~~ elected officials will be invited to comment.[5] ~~elected officials will be invited to speak.~~
Interested persons may present comments and arguments about the appropriateness, wisdom or utility of all or portions of the Tentative Order, and may comment on revisions to the Tentative Order. However, interested persons may not present evidence and are not subject to cross-examination.

ORDER OF PROCEEDINGS

Chair's opening remarks, introductory items, administration of the oath to persons who intend to testify	**10 minutes**
San Diego Water Board Staff Presentation	**1.5 Hours**
US Environmental Protection Agency ~~San Diego County, Orange County and Riverside County Copermittees~~	**30 Minutes~~3 Hours (Total)~~**
~~US Environmental Protection Agency~~ San Diego County, Orange County and Riverside County Copermittees	**4~~3~~ Hours ~~0 Minutes~~ (Total)**
Clean Water Now	**6 minutes (Total)**

[5] If elected officials wishing to speak are unable to attend at this time certain, they may speak with interested persons on April 10 beginning at 4 p.m. and will be provided 5 minutes each. They may ask the chair to accommodate their schedule if they are unable to speak at either of these times certain.

Environmental Group~~NGOs~~ (Natural Resources Defense Council, San Diego Coastkeeper, Orange County Coastkeeper, Inland Empire Waterkeeper~~ – (The Escondido Creek Conservancy, Coastkeeper, San Diego Canyonlands, Natural Resources Defense Council, Los Penasquitos Lagoon Foundation, Laguna Bluebelt Coalition, Friends of Rose Canyon Creek, Clean Water Now, Coastal Environmental Rights Foundation, Environmental Health Coalition, San Elijo Lagoon Conservancy, South Laguna Civic Association)~~	**1 Hour (Total)**
Building Industry Coalition: (1) Building Industry Association of San Diego County (BIASD), (2) Building Industry Association of Southern California, (3) Associated General Contractors, San Diego, (4) San Diego Regional Chamber of Commerce, (5) Building Owners and Managers Association, (6) San Diego County Apartment Association, (7) San Diego Association of Realtors, (8) Alliance for Habitat Conservation, (9) San Diego Chapter of the American Association of Landscape Architects, (10) Associated Builders and Contractors, (11) Business Leadership Alliance and (12) National Association of Industrial and Office Properties ~~Building Industry/Industry- (Association of General Contractors, Otay Land Company, Otay Ranch New Homes, American Society of Landscape Architects, BIA Regulated Coalition, BIA of Southern California, Industrial Environmental Association, San Diego Gas & Electric, San Diego Green Building Council, Southern California Gas Company)~~	**1.5 Hours (Total)**
Interested Persons (Time Certain at 4 p.m. on April 10, 2013)	**3 Minutes Each**
Elected Officials' comments (Time Certain at 9:15 a.m. on April 11, 2013)	**5 Minutes Each**

San Diego Water Board Members and Counsel may ask questions of Parties or interested persons at any time. Time for questions and answers will not count against the above time limits.
~~This allocated time includes time for any opening statement, main presentation, rebuttal and/or closing argument. San Diego Water Board Members and Counsel may ask questions at any time. Time for questions and answers will not count against the above time limits.~~

OBJECTIONS TO PROCEDURES

Other than as provided in this document, the San Diego Water Board intends to conduct this public hearing in a generally informal manner. Participants requesting alternative procedures, with procedural requests outside of the scope of this notice, or requesting more time to speak, must submit their requests or objections in writing to the San Diego Water Board staff member identified below no later than 5:00 pm on March 22, 2013. The San Diego Water Board will

endeavor to accommodate reasonable requests and to respond to procedural objections and requests prior to the hearing. Untimely objections will be deemed waived. The San Diego Water Board retains the discretion to modify the procedures set forth herein for good cause.

EXHIBITS, POWER POINT AND OTHER COMPUTER DISPLAYS

Participants may introduce Exhibits or use PowerPoint and other computer displays during their presentation to convey information electronically on the San Diego Water Board's computer. These displays will only be accepted if they summarize the information contained in documents that were timely submitted~~ in compliance with deadlines cited above and in prior notices~~. They will not be accepted if they contain any new testimony or evidence. Please note that any person planning to use an electronic presentation at the hearing is required to provide a sufficient number of printed copies of the presentation for distribution to board members and staff and a reasonable number of copies to be available for the public to access during the hearing. An electronic copy of any exhibit or presentation used during the hearing must be left with the San Diego Water Board's Executive Assistant for inclusion in the record. Electronic presentations will be posted on the San Diego Water Board's website as soon as practicable.

DOCUMENT AVAILABILITY

The Tentative Order, and attachments thereto, timely received comment letters on the Tentative Order, the Revised Tentative Order, Response to Comments, and other information and documents relied upon are posted on the San Diego Water Board website at: http://www.waterboards.ca.gov/rwqcb9/water_issues/programs/stormwater/index.shtml. A revised Tentative Order reflecting revisions since the written comment deadline and a responses to comments document will be available shortly. Parties and interested persons will be notified by e-mail when those documents are posted on the Board's website.

These documents are also available for inspection and copying between the hours of 8:00 a.m. and 5:00 p.m. at the following address:

California Regional Water Quality Control Board
San Diego Region
9174 Sky Park Court, Suite 100,
San Diego, California 92123-4340

Arrangements for file review and/or obtaining copies of documents in the Administrative Record may be made by contacting the San Diego Water Board at (858) 467-2952. Appointments are encouraged so the documents can be readily available upon arrival. All timely received comment letters on the Tentative Order and responses to comments and other subsequent relevant documents will be available online as they are generated.

Staff Contact for Further Information

For questions or comments concerning this notice, please contact Wayne Chiu by phone at (858) 637-5558, or by email at wchiu@waterboards.ca.gov.

April 3, 2013

cc:

Distribution via email:
(see attached address list)

San Diego County Copermittees
Orange County Copermittees
Riverside County Copermittees
Resource Agencies

Distribution list via email:

San Diego County MS4 Permit Lyris List
Riverside County MS4 Permit Lyris List
Orange County MS4 Permit Lyris List

San Diego Water Board Agenda Lyris List

Tech Staff Info & Use	
Order No.	R9-2013-0001
Party (GT/CIWQS) ID	536787
File No.	n/a
WDID	n/a
NPDES No.	CAS0109266
Reg. Measure ID	387335
Place ID	786088
Person ID	n/a
Inspection ID	n/a

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Assembly
California Legislature

TONI ATKINS
ASSEMBLYMEMBER, SEVENTY-EIGHTH DISTRICT
MAJORITY LEADER

025941

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AGRICULTURE
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BIOTECHNOLOGY
COASTAL PROTECTION
PORTS
SEA LEVEL RISE AND THE CALIFORNIA ECONOMY

JOINT COMMITTEES
RULES
JOINT LEGISLATIVE AUDIT

April 4, 2013

Chairman Tomas Morales
California Region Water Quality Control Board
San Diego – Region 9
9174 Sky Park Court, Suite 100
San Diego, CA 92123

Dear Chairman Morales:

On behalf of members of the California State Legislature who represent the San Diego Region, we are writing to encourage you and your colleagues on the San Diego Regional Water Quality Control Board to delay the hearing when you will consider adoption of Tentative Order No. R9-2013-0001, NPDES No. CAS0109266, *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (MS4 permit).

The adoption hearing is scheduled for April 10 and 11, 2013, but there are still important and outstanding issues that must be resolved. In particular, concerns have been raised about the receiving water limitations (RWL) language that was present in the most recent draft MS4 permit. A recent court decision has made the inclusion of this language highly problematic and will leave public entities under the permit vulnerable to excessive litigation. The State Water Resources Control Board (SWRCB) is reviewing the current situation and is considering whether to make changes to the RWL language, but has not yet come to any conclusions. It is expected that a decision on how to proceed with solving the problems with the current RWL language will be made in the next few months. Any adoption action should be postponed until this issue is settled.

Important concerns have also been raised by agencies that will be impacted by the prohibitive costs associated with the requirements imposed under the permit for the Bacteria TMDL, and your staff only released the new version of the draft MS4 permit language late in the day on March 27, 2013, which included the responses to the large volume of comment letters you received and concerns raised at previous hearings. This gives stakeholders less than two weeks to review the documents. Given the scope and impact of the new MS4 permit, it is important that your Board and the stakeholders covered by the permit all receive adequate time to review these documents.

A brief delay of your scheduled adoption hearing will allow the SWRCB to address the RWL language, while also allowing for complete and thoughtful review of the next draft version of the MS4 permit. Thank you for your consideration of this important issue.

Printed on Recycled Paper

Sincerely,

ASSEMBLY MAJORITY LEADER
TONI ATKINS

ASSEMBLY MEMBER SHIRLEY WEBER

ASSEMBLY MEMBER ROCKY CHAVEZ

SENATOR JOEL ANDERSON

ASSEMBLY MEMBER BRIAN JONES

SENATOR MARTY BLOCK

ASSEMBLY MEMBER
BRIAN MAIENSCHEIN

SENATOR BEN HUESO

ASSEMBLY MEMBER MARIE WALDRON

SENATOR MARK WYLAND

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Susan Baumann
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Gregory Boeh
GB Capital Holdings, LLC
Terry Buis
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* **Raymond Carpenter**
R.E. Staite Engineering
Paul Corso
Pro Build
Thomas Driscoll
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Uri Feldman
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Tom Fetter
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Scott Hermes
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Barrett Jung
Dole Fresh Fruit Co.
Jennifer Klein
BNSF Railway
Eric Leslie
Harbor Island West Marina
Giovanni LoCoco
Knight & Carver
Russell McCarthy
Continental Maritime
Mac McLaughlin
USS Midway Museum
Jack Monger
Industrial Environmental Association
Reyna Novelo
Chesapeake Fish Company
Steve Pagano
San Diego Marriott Marquis & Marina
* **George Palermo**
Flagship Cruises & Events
John Pasha
Pasha Automotive Services
* **Edward Plant**
Harborside Refrigerated Services
* **H.P. "Sandy" Purdon**
Shelter Cove Marina
Bill Roberts
Shelter Island Boatyard
Todd Roberts
Marine Group Boat Works
John Schafer
Manchester Grand Hyatt San Diego
* **James Unger**
Hornblower Cruises & Events
Claudia Valenzuela
SDG&E
Bruce Walton
Terramar Retail Centers
Perry Wright
Considine & Considine

Director Emeritus
* **Arthur Engel**
* **Rick Ghio**
Douglas Manchester
Karen McElliott
* **Lee Wilson**

Staff
Sharon Bernie-Cloward
President
Sophie Silvestri
Director of Operations

* **SDPTA Past Chairmen**

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SAN DIEGO REGIONAL
WATER QUALITY
CONTROL BOARD

San Diego Port Tenants Association

2013 APR 11 PM 2 08

April 9, 2013

Mr. David Gibson, Executive Director
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA92123

Dear Mr. Gibson:

Subject: Request for delay in adoption of MS4 Stormwater Permit to allow for more dialog and understanding among stakeholders

On March 6, 2013 the San Diego Regional Water Quality Control Board (Regional Board) announced that hearings for the proposed Municipal Storm Water Permit for the San Diego Region would be held on April 10 and 11, 2013. The San Diego Port Tenants Association is particularly concerned with this permit, as the association represents businesses that lease land from the San Diego Unified Port District; their operations are on Port Tidelands surrounding San Diego Bay, and range from hospitality & tourism to maritime, marine industrial and marine recreation. We strongly believe that it would be prudent to postpone any approval of the Municipal Storm Water Permit until the California State Water Resources Control Board provides guidance on the Receiving Waters Limitation language, which if not included in the initial approval of this regional permit, could necessitate that the Regional Board amend its regulations in the immediate future. Secondly, we are concerned that the Regional Board has decided to move this hearing forward without providing sufficient time to appropriately respond to and address stakeholders' concerns. The Port Tenants wish for more time to fully understand this permit as it relates to their business operations, future development, sustainable practices and liability. Locally, and on a statewide level, there continue to be numerous outstanding issues with this proposed permit. We believe it would be inappropriate and irresponsible to rush adoption without continued dialog between the stakeholders and Regional Board staff. Considering the significant financial burden this permit will have on so many local governments, we believe it is more important to create a permit that incorporates sound regulation than to needlessly rush toward an arbitrary deadline.

The Regional Board staff has acknowledged on the record that the impacts of some of the proposed standards and regulations are not fully understood. We do not even know that compliance can be achieved with the tools and science available today. However, we do know for certain, based on the Regional Board's own studies, that significant cost in the range of billions of dollars will be incurred as a result of copermittees trying to comply with the proposed regulations if implemented.

Respectfully,

Sharon Bernie-Cloward

Sharon Bernie-Cloward, President
San Diego Port Tenants Association

2390 Shelter Island Drive, Suite 210 • San Diego, California 92106 • (619) 226-6546 • Fax (619) 226-6557 • Email: sharon@sdpta.com, sophie@sdpta.com
www.sdpta.com

Agenda

Discussion of Tentative Order No. R9-2013-0001

April 18, 2013
1-4pm
Council Chambers, City of Dana Point

1. Introduction – Mary Anne Skorpanich/Chris Crompton
2. Discussion
    a. LID Performance Standard – Lisa Austin/Aaron Poresky
    b. Bacteria TMDL – Nancy Palmer/Karen Cowan
    c. Road Projects – Daniel Apt
    d. Hydromodification – Daniel Apt/Richard Boon
    e. Receiving Water Limitations – Richard Boon/Karen Cowan
3. Next Steps

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Comparison of Alternative Biofiltration Sizing Standards

Biofiltration Geometry Schematic

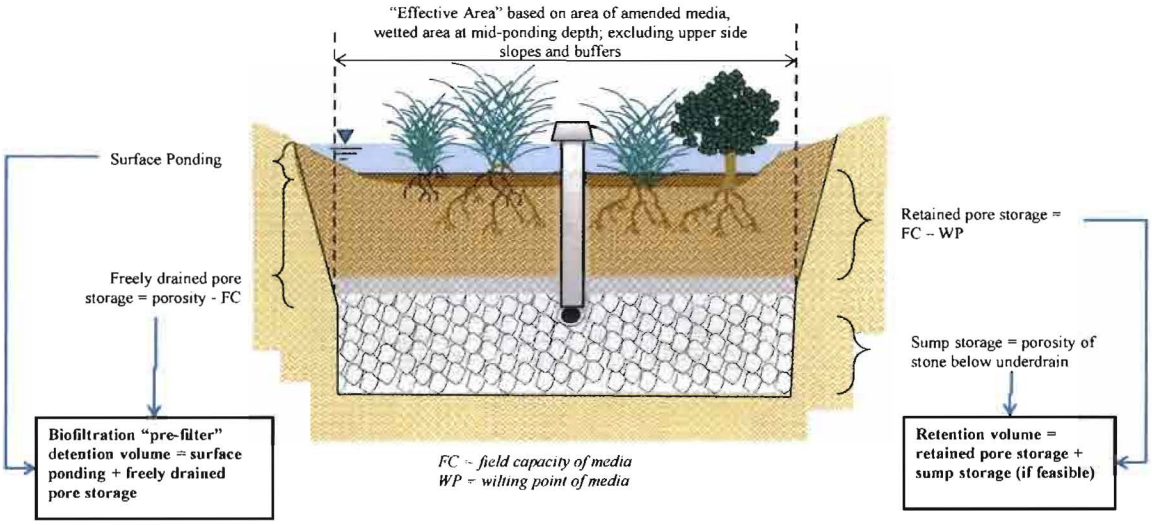

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Comparison of Alternative Biofiltration Sizing Standards

Scenario 1 - Typical Biofiltration - Median Routing Time; Typical Media Filtration Rate

Tributary Area Characteristics	Value	Explanation
85th Percentile, 24-hour Storm Depth, d, inches	0.85	Typical of SOC
Tributary Area, A, ac	1	For illustration purposes
Imperviousness	0.7	Typical mix of land uses
Runoff coefficient, RC	0.675	TGD runoff coefficient equation
Design Capture Volume, cu-ft	2083	A × d × RC × (43560 sf/ac) / (12 in/ft)

Baseline Biofiltration BMP Design Parameters	Value	Explanation
Ponding Depth, inches	12	Typical design; per TGD and other guidance
Media Thickness, inches	24	Typical design; per TGD and other guidance
Media Available Pore Space, in/in (porosity - FC)	0.25	Porosity, minus portion wetted by irrigation and/or previous event
Design Media Filtration Rate, in/hr	2.5	Default design; per TGD; LAMS4 guidance with 2.0 clogging facgtor

Assumptions and Baseline Calculations	Value	Explanation
Portion of DCV Reliably Retained, cu-ft	0	Assumption; theoretically yields largest difference between alternative biofiltration design approaches
Remaining DCV	2083	
Routing Period, hrs	7	Typical storm duration, storms similar to 85th pctl depth; sensitivity assumption
Depth filtered during routing period, inches	17.5	Media filtration rate × routing period
Depth of detention storage, inches	18	Ponding depth + pore space
Total Depth Treated, during and following event	35.5	Depth filtered + detention storage
Storage drawdown time, hours	7.2	Depth stored / media filtration rate

Results - Biofiltration Alternative 1 - Treat 150% of the remaining DCV.	Value	Explanation
Required Biofiltration Treated Volume, cu-ft	3124	1.5 × remaining DCV
Biofiltration Footprint Required, cu-ft	1056	Req'd Biofiltration Volume / Total Depth Treated + Stored
Storage Volume as fraction of remaining DCV	0.76	Storage volume / Remaining DCV
Average Annual Capture Efficiency	92%	From TGD nomograph; see below

Results - Biofiltration Alternative 2 - Store 0.75 of remaining DCV in pores and ponding.	Value	Explanation
Required Biofiltation Storage Volume, surface + pores	1562	0.75 × remaining DCV
Footprint Area, sq-ft	1041	required biofiltration storage volume / total storage depth (ponding + pores)
Effective storm volume filtered and stored during routing period, cu-ft	3081	Total stored plus filtered depth; multiplied by footprint area
Storage Volume as fraction of remaining DCV	0.75	
Average Annual Capture Efficiency	92%	From TGD nomograph; see below

Summary Comparison	Biofiltration Sizing Alternatives	
	Alt 1 - 150% treat	Alt 2 - 0.75 storage
Footprint	1,056	1,041
Effective Storm Volume Treated	3,124	3,081
Average Annual Capture Efficiency	92%	92%

Support for Percent Capture Calculations - Nomographs from TGD

Red = 150 percent treat; Blue = 75 percent store

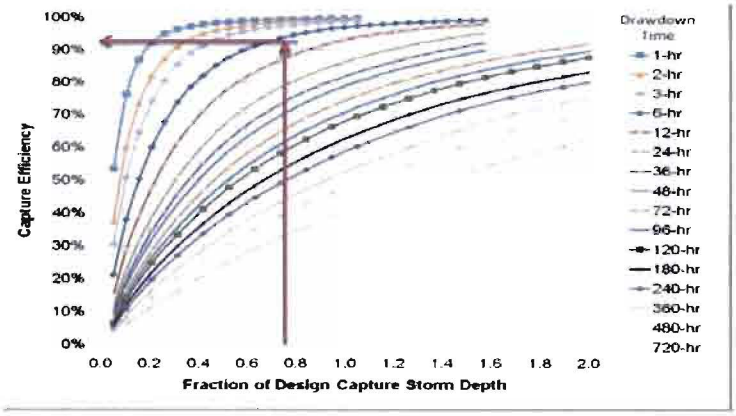

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Comparison of Alternative Biofiltration Sizing Standards

Scenario 2 - Typical Biofiltration - Longer Routing Time

Tributary Area Characteristics	Value	Explanation
85th Percentile, 24-hour Storm Depth, d, inches	0.85	Typical of SOC
Tributary Area, A, ac	1	For illustration purposes
Imperviousness	0.7	Typical mix of land uses
Runoff coefficient, RC	0.675	TGD runoff coefficient equation
Design Capture Volume, cu-ft	2083	A × d × RC × (43560 sf/ac) / (12 in/ft)

Baseline Biofiltration BMP Design Parameters	Value	Explanation
Ponding Depth, inches	12	Typical design; per TGD and other guidance
Media Thickness, inches	24	Typical design; per TGD and other guidance
Media Available Pore Space, in/in (porosity - FC)	0.25	Porosity, minus portion wetted by irrigation and/or previous event
Design Media Filtration Rate, in/hr	2.5	Default design; per TGD; LAMS4 guidance with 2.0 clogging facgtor

Assumptions and Baseline Calculations	Value	Explanation
Portion of DCV Reliably Retained, cu-ft	0	Assumption; theoretically yields largest difference between alternative biofiltration design approaches
Remaining DCV	2083	
Routing Period, hrs	12	Upper bound on potentially acceptable routing time
Depth filtered during routing period, inches	30	Media filtration rate × routing period
Depth of detention storage, inches	18	Ponding depth + pore space
Total Depth Treated, during and following event	48	Depth filtered + detention storage
Storage drawdown time, hours	7.2	Depth stored / media filtration rate

Results - Biofiltration Alternative 1 - Treat 150% of the remaining DCV.	Value	Explanation
Required Biofiltration Treated Volume, cu-ft	3124	1.5 × remaining DCV
Biofiltration Footprint Required, cu-ft	781	Req'd Biofiltration Volume / Total Depth Treated + Stored
Storage Volume as fraction of remaining DCV	0.56	Storage volume / Remaining DCV
Average Annual Capture Efficiency	87%	From TGD nomograph; see below

Results - Biofiltration Alternative 2 - Store 0.75 of remaining DCV in pores and ponding.	Value	Explanation
Required Biofiltation Storage Volume, surface + pores	1562	0.75 × remaining DCV
Footprint Area, sq-ft	1041	required biofiltration storage volume / total storage depth (ponding + pores)
Effective storm volume filtered and stored during routing period, cu-ft	4165	Total stored plus filtered depth; multiplied by footprint area
Storage Volume as fraction of remaining DCV	0.75	
Average Annual Capture Efficiency	92%	From TGD nomograph; see below

Summary Comparison	Biofiltration Sizing Alternatives	
	Alt 1 - 150% treat	Alt 2 - 0.75 storage
Footprint	781	1,041
Effective Storm Volume Treated	3,124	4,165
Average Annual Capture Efficiency	87%	92%

Support for Percent Capture Calculations - Nomographs from TGD

Red = 150 percent treat; Blue = 75 percent store

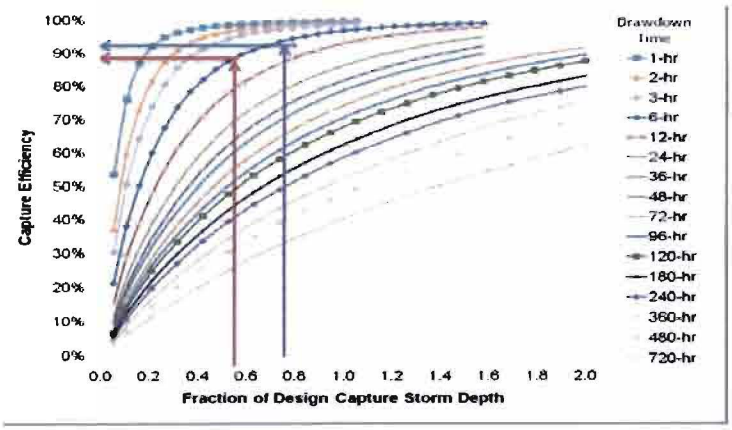

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Comparison of Alternative Biofiltration Sizing Standards

Scenario 3 - Typical Biofiltration - Shorter Routing Time

Tributary Area Characteristics	Value	Explanation
85th Percentile, 24-hour Storm Depth, d, inches	0.85	Typical of SOC
Tributary Area, A, ac	1	For illustration purposes
Imperviousness	0.7	Typical mix of land uses
Runoff coefficient, RC	0.675	TGD runoff coefficient equation
Design Capture Volume, cu-ft	2083	A × d × RC × (43560 sf/ac) / (12 in/ft)

Baseline Biofiltration BMP Design Parameters	Value	Explanation
Ponding Depth, inches	12	Typical design; per TGD and other guidance
Media Thickness, inches	24	Typical design; per TGD and other guidance
Media Available Pore Space, in/in (porosity - FC)	0.25	Porosity, minus portion wetted by irrigation and/or previous event
Design Media Filtration Rate, in/hr	2.5	Default design; per TGD; LAMS4 guidance with 2.0 clogging facgtor

Assumptions and Baseline Calculations	Value	Explanation
Portion of DCV Reliably Retained, cu-ft	0	Assumption; theoretically yields largest difference between alternative biofiltration design approaches
Remaining DCV	2083	
Routing Period, hrs	4	Lower bound on acceptable routing time
Depth filtered during routing period, inches	10	Media filtration rate × routing period
Depth of detention storage, inches	18	Ponding depth + pore space
Total Depth Treated, during and following event	28	Depth filtered + detention storage
Storage drawdown time, hours	7.2	Depth stored / media filtration rate

Results - Biofiltration Alternative 1 - Treat 150% of the remaining DCV.	Value	Explanation
Required Biofiltration Treated Volume, cu-ft	3124	1.5 × remaining DCV
Biofiltration Footprint Required, cu-ft	1339	Req'd Biofiltration Volume / Total Depth Treated + Stored
Storage Volume as fraction of remaining DCV	0.96	Storage volume / Remaining DCV
Average Annual Capture Efficiency	95%	From TGD nomograph; see below

Results - Biofiltration Alternative 2 - Store 0.75 of remaining DCV in pores and ponding.	Value	Explanation
Required Biofiltation Storage Volume, surface + pores	1562	0.75 × remaining DCV
Footprint Area, sq-ft	1041	required biofiltration storage volume / total storage depth (ponding + pores)
Effective storm volume filtered and stored during routing period, cu-ft	2430	Total stored plus filtered depth; multiplied by footprint area
Storage Volume as fraction of remaining DCV	0.75	
Average Annual Capture Efficiency	92%	From TGD nomograph; see below

Summary Comparison	Biofiltration Sizing Alternatives	
	Alt 1 - 150% treat	Alt 2 - 0.75 storage
Footprint	1,339	1,041
Effective Storm Volume Treated	3,124	2,430
Average Annual Capture Efficiency	95%	92%

Support for Percent Capture Calculations - Nomographs from TGD

Red = 150 percent treat; Blue = 75 percent store

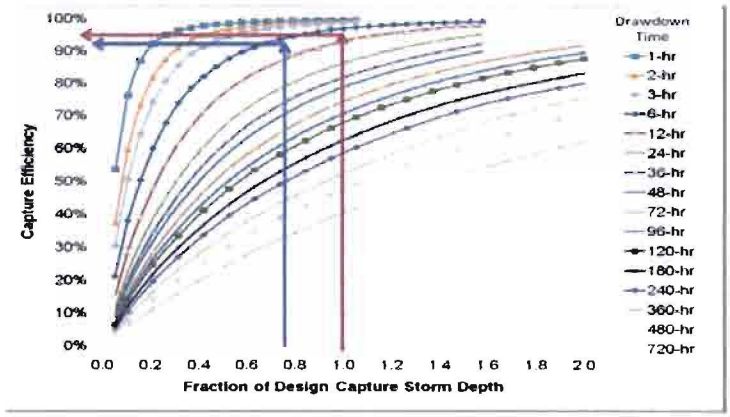

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Comparison of Alternative Biofiltration Sizing Standards

Scenario 4 - Typical Biofiltration - Higher Media Flowrate

Tributary Area Characteristics	Value	Explanation
85th Percentile, 24-hour Storm Depth, d, inches	0.85	Typical of SOC
Tributary Area, A, ac	1	For illustration purposes
Imperviousness	0.7	Typical mix of land uses
Runoff coefficient, RC	0.675	TGD runoff coefficient equation
Design Capture Volume, cu-ft	2083	A × d × RC × (43560 sf/ac) / (12 in/ft)

Baseline Biofiltration BMP Design Parameters	Value	Explanation
Ponding Depth, inches	12	Typical design; per TGD and other guidance
Media Thickness, inches	24	Typical design; per TGD and other guidance
Media Available Pore Space, in/in (porosity - FC)	0.25	Porosity, minus portion wetted by irrigation and/or previous event
Design Media Filtration Rate, in/hr	5	Default design; per TGD; LAMS4 guidance without clogging facgtor

Assumptions and Baseline Calculations	Value	Explanation
Portion of DCV Reliably Retained, cu-ft	0	Assumption; theoretically yields largest difference between alternative biofiltration design approaches
Remaining DCV	2083	
Routing Period, hrs	7	Typical storm duration, storms similar to 85th pctl depth; sensitivity assumption
Depth filtered during routing period, inches	35	Media filtration rate × routing period
Depth of detention storage, inches	18	Ponding depth + pore space
Total Depth Treated, during and following event	53	Depth filtered + detention storage
Storage drawdown time, hours	3.6	Depth stored / media filtration rate

Results - Biofiltration Alternative 1 - Treat 150% of the remaining DCV.	Value	Explanation
Required Biofiltration Treated Volume, cu-ft	3124	1.5 × remaining DCV
Biofiltration Footprint Required, cu-ft	707	Req'd Biofiltration Volume / Total Depth Treated + Stored
Storage Volume as fraction of remaining DCV	0.51	Storage volume / Remaining DCV
Average Annual Capture Efficiency	93%	From TGD nomograph; see below

Results - Biofiltration Alternative 2 - Store 0.75 of remaining DCV in pores and ponding.	Value	Explanation
Required Biofiltation Storage Volume, surface + pores	1562	0.75 × remaining DCV
Footprint Area, sq-ft	1041	required biofiltration storage volume / total storage depth (ponding + pores)
Effective storm volume filtered and stored during routing period, cu-ft	4599	Total stored plus filtered depth; multiplied by footprint area
Storage Volume as fraction of remaining DCV	0.75	
Average Annual Capture Efficiency	96%	From TGD nomograph; see below

Summary Comparison	Biofiltration Sizing Alternatives	
	Alt 1 - 150% treat	Alt 2 - 0.75 storage
Footprint	707	1,041
Effective Storm Volume Treated	3,124	4,599
Average Annual Capture Efficiency	93%	96%

Support for Percent Capture Calculations - Nomographs from TGD

Red = 150 percent treat; Blue = 75 percent store

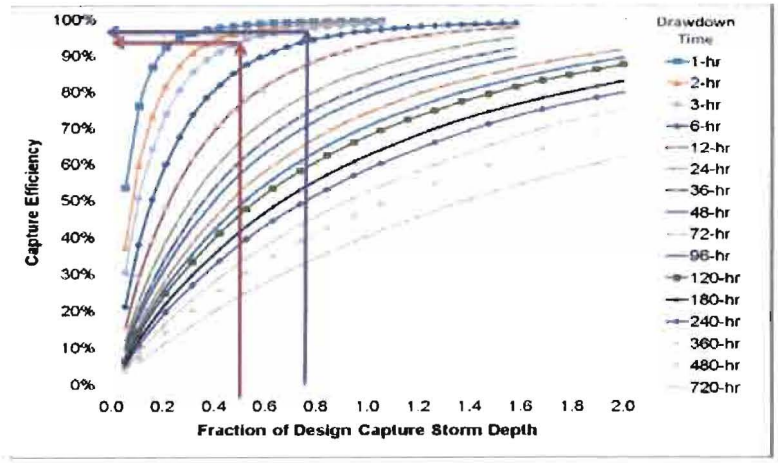

LID Performance Standard
Lisa Austin/Aaron Poresky

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Revisions to Part E (JURMP) are necessary in order to address LID performance standard.

c. Priority Development Project Structural BMP Performance Requirements

In addition to the BMP requirements listed for all development projects under Provision E.3.a, Priority Development Projects must also implement structural BMPs that conform to performance requirements described below.

(1) Storm Water Pollutant Control BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite structural BMPs to control pollutants in storm water that may be discharged from a project as follows:

(a) Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite ~~100 percent of the pollutants contained in~~ the volume of storm water runoff produced from a 24-hour 85th percentile storm event (design capture volume);[1]

(b) If a Copermittee determines that implementing LID BMPs to retain the full design capture volume onsite for a Priority Development Project is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize flow-thru treatment control BMPs to treat the remaining portion of the design capture volume ~~to achieve the equivalent pollutant load removal~~ that cannot be reliably retained onsite, per one of the following options listed in (i) through (iii): ~~described in Provision E.3.c.(1)(a).~~

(i) LID BMPs including Biofiltration shall treat 1.5 times the portion of the design capture volume that is not reliably retained onsite, or

(ii) LID biofiltration BMPs shall treat the remaining portion of the design capture volume that is not reliably retained onsite. The LID biofiltration BMPs must be designed for an appropriate surface loading rate to prevent erosion, scour and channeling within the BMP. Due to the flow through design of biofiltration BMPs, the total volume of the BMP, including pore spaces and prefilter detention

[1] This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals.

volume, must be sized to hold at least 0.75 times the portion of the design capture volume that is not reliably retained onsite, or. ~~Biofiltration LID BMPs must be considered as a first option before other types of flow-thru treatment control BMPs may be considered~~

(iii) If LID BMPs are not feasible per option (i) or (ii) above, a priority development project is allowed to utilize other flow-thru treatment control BMPs pursuant to Provision E.3.c.(1)(d) below.

(c) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1)(a). The Priority Development Project alternative compliance project must mitigate for the portion of the pollutant load in the design capture volume not retained onsite if Provision E.3.(c)(3) is utilized.

(d) ~~If a Priority Development project is allowed to utilize alternative compliance, flow-thru treatment control BMPs must be implemented to treat the portion of the design capture volume that is not retained onsite.~~ Flow-thru treatment control BMPs must be sized and designed to:

(i) Remove pollutants from storm water to the MEP;

(ii) Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;

(iii) Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Flow-thru treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of flow-thru treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

Bacteria TMDL
Nancy Palmer/Karen Cowan

Issue 1: Recognize delisted beaches under the Bacteria TMDL for Baby Beach (Attachment 5) and under the Revised TMDL for Indicator Bacteria, Project 1 (Attachment 6). Add compliance option for formal de-listing from the 303(d) list for interim and final compliance with the TMDLs. Recommend four changes.

Recommendation 1: Modify Attachment E, Provision 5.b(3) as follows:

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible Copermittees' MS4 outfalls; OR

(d) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.c.(2)(b)(ii); OR

(e) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 5.c.(2)(b)(iii); OR

(f) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(g) The waterbody is delisted from the 303(d) list for bacterial indicators related to REC-1 use; OR

~~(g)~~ (h) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 5.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 5.b.(2)(c) achieves compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 5.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 5.d, to demonstrate compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f).

Recommendation 2: Modify Attachment E, Provision 5.c.(1)(b) as follows:

(b) Interim Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(i) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water; OR

(ii) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(iii) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible Copermittees' MS4 outfalls; OR

(iv) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.b(2)(b)(ii); OR

(v) The Responsible Copermittees can demonstrate that exceedances of the applicable receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(vi) The pollutant loads discharging from the Responsible Copermittees'

MS4 outfalls do not exceed the interim effluent limitations under Table 5.6a of Specific Provision 5.c.(1)(a); OR

(vii) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the interim effluent limitations under Table 5.6b of Specific Provision 5.c.(1)(a); OR

(viii) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates; OR

(ix) The waterbody is delisted from the 303(d) list for bacterial indicators related to REC-1 use.

Recommendation 3: Modify Attachment E, Provision 6.b.(3) as follows:

(1) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible Copermittees' MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(f) The waterbody is delisted from the 303(d) list for bacterial indicators

related to REC-1 use; OR

(g) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 6.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 6.b.(2)(c) achieves compliance with Specific Provisions 6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), and/or 6.b.(3)(e),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 6.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 6.d, to demonstrate compliance with Specific Provisions 5.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), 6.b.(3)(e) and/or 6.b.(3)(f).

Recommendation 4: Modify Attachment E, Provision 6.c.(3) as follows:

(2) Interim TMDL Compliance Determination

Compliance with the interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittees' MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible Copermittees' MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the

final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(f) There are no exceedances of the interim receiving water limitations under Specific Provision 6.c.(2)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(g) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the interim effluent limitations under Specific Provision 6.c.(2)(b); OR

(h) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates; OR

(i) The waterbody is delisted from the 303(d) list for bacterial indicators related to REC-1 use.

Issue 2: Receiving water limitations in the permit must be the same as the receiving water limitations in the adopted TMDL. Tables 6.2a and 6.2b, including footnotes, should be modified to be consistent with Receiving Water Limitations in Tables 7-48 and 7-49 from the San Diego Basin Plan. Table 6.2 should also be modified for consistency with the receiving water limitations. Recommend three changes.

Recommendation 5: Modify Table 6.2a (and Footnotes b and c) of Attachment E to be consistent with Table 7-48 from the San Diego Basin Plan.

Table 6.2a
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Beaches

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform	10,000	22% ~~/ 0%~~	1,000	0%
Fecal Coliform	400	22% ~~/ 0%~~	200	0%
Enterococcus	104	22% ~~/ 0%~~	35	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the ~~single sample maximum and~~ 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. The 0% geometric mean ~~single sample maximum~~ allowable exceedance frequency applies to dry weather days.

Recommendation 6: Modify Table 6.2b (and footnotes b and c) of Attachment E to be consistent with Table 7-49 from the San Diego Basin Plan.

Table 6.2b
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Creeks

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Fecal Coliform	400	22% ~~/ 0%~~	200	0%
Enterococcus	61 (104)	22% ~~/ 0%~~	33	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the ~~single sample maximum and~~ 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. The 0% ~~single sample maximum~~geometric mean allowable exceedance frequency applies to dry weather days.
d. A single sample maximum of 104 MPN/100ml for *Enterococcus* may be applied as a receiving water limitation for creeks, instead of 60 MPN/100mL, if one or more of the creeks addressed by these TMDLs (San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek, San Diego River, and/or Chollas Creek) is designated with a "moderately to lightly used area" or less frequent usage frequency in the Basin Plan. Otherwise, the single sample ~~axmimum~~maximum of 61 MPN/100mL for *Enterococcus* must be used to assess compliance with the allowable exceedance frequency.

Recommendation 7: Modify Table 6.2 (and footnotes b and c) of Attachment E to be consistent with receiving water limitations from the San Diego Basin Plan and recommended changes above.

Table 6.2
Final Effluent Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies in MS4 Discharges to the Water Body

Constituent	Concentration-Based Effluent Limitations			
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform[d]	10,000	22% ~~/ 0%~~	1,000	0%
Fecal Coliform	400	22% ~~/ 0%~~	200	0%
Enterococcus	104[e] / 61[f]	22% ~~/ 0%~~	35[e] / 33[f]	0%

Notes:
a. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
b. During dry weather days, the ~~single sample maximum and~~ 30-day geometric mean effluent limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. The 0% ~~single sample maximum~~geometric mean allowable exceedance frequency applies to dry weather days.
d. Total coliform effluent limitations only apply to MS4 outfalls that discharge to the Pacific Ocean Shorelines and creek mouths listed in Table 6.0.
e. This *Enterococcus* effluent limitation applies to MS4 discharges to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
f. This *Enterococcus* effluent limitation applies to MS4 discharges to segments or areas of creeks or creek mouths listed in Table 6.0.

Issue 3: Calculations of exceedance frequencies in the permit must be consistent with the requirements in the TMDLs. Attachment E, Provision 6.d(1)(c)(iii)[c] should be deleted. Recommend one change.

Recommendation 8: Modify Attachment E, Provision 6.d.(1)(c)(iii) as follows.

(iii) Wet weather exceedance frequencies must be calculated as follows:

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;

[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;

~~[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the highest bacteria density result reported from wet weather samples collected; and~~

[~~d~~c] The single sample maximum exceedance frequency must be

calculated by dividing the number of wet weather days that exceed the single sample maximum receiving water limitations in Table 6.2 by the total number of wet weather days during the rainy season.

[~~e~~d] The data collected for dry weather must be used in addition to the data collected for wet weather to calculate the wet weather 30-day geometric means. The exceedance frequency of the wet weather 30-day geometric means must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the wet season.

Road Projects
Daniel Apt

Revisions to Part E (JURMP) are necessary in order to address road projects

Section E.3.b.(3)(b)

Retrofitting and redevelopment of existing paved alleys, streets or roads that are designed and constructed in accordance with the USEPA Green Streets guidance.[24]

Section E.3.b.(3)(c) (New provision)

For Permittee capital improvement projects, any impervious surface that is 5,000 square feet or more used for the transportation of automobiles, trucks, motorcycles, and other vehicles the Copermittees may develop post-construction BMP roadway guidance which shall meet the following criteria:

(i) Be developed by the Copermittees and reviewed by Regional Board staff within 18 months of the adoption date of the Tentative Order.

(ii) Be based on the USEPA guidance regarding Managing Wet Weather with Green Infrastructure: Green Streets to the MEP

Hydromodification
Daniel Apt/Richard Boon

Revisions to Part E (JURMP) are necessary in order to address hydromodification

Hydromodification

Section E.3.c.(2)(b)

(b) Each Priority Development Project must avoid known critical sediment yield areas or implement measures that allow critical coarse sediment to be discharged to receiving waters, such that the sediment supply to the receiving water is unaffected by the project to the MEP.

Section E.3.c.(2)(d)

(d) Exemptions

Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provisions E.3.c.(2)(a), pending completion of the Watershed Management Area Analysis incorporated into the Water Quality Improvement Plan pursuant to Provision B.3.b.(4), where the project discharges storm water runoff to:

(i) Existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;

(ii) Conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;

(iii) An area identified by the Copermittees as appropriate for an exemption by the Watershed Management Area Analysis incorporated into the Water Quality Improvement Plan pursuant to Provision B.3.b.(4).

(iv) Storm water runoff into conveyance channels that are engineered for the capacity to convey the 10-year ultimate build out condition flow and are regularly maintained to ensure flow capacity all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean.

(v) Large rivers where large rivers are defined as reaches for which the contributing drainage area exceeds 100 square miles and with a 100-year design flow in excess of 20,000 cfs.

(vi) Areas that receive discharges from infill redevelopment projects that meet criteria to be established in updates to the Copermittees' HMPs.

(vii) Flood control and stream restoration projects.

Revisions to Part E (JURMP) are necessary in order to address road projects

Section E.3.b.(3)(b)

Retrofitting and redevelopment of existing paved alleys, streets or roads that are designed and constructed in accordance with the USEPA Green Streets guidance.[24]

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For Permittee capital improvement projects, any impervious surface that is 5,000 square feet or more used for the transportation of automobiles, trucks, motorcycles, and other vehicles the Copermittees may develop post-construction BMP roadway guidance which shall meet the following criteria:

(i) Be developed by the Copermittees and reviewed by Regional Board staff within 18 months of the adoption date of the Tentative Order.

(ii) Be based on the USEPA guidance regarding Managing Wet Weather with Green Infrastructure: Green Streets to the MEP

Receiving Water Limitations
Richard Boon/Karen Cowan

Revisions to Part A (Prohibitions and Limitations) are necessary in order to address the decision by the 9th Circuit Court of Appeals.

Recommendation (Alternative #1): Modify Provision A to explicitly cross-reference the compliance option provided under Provision B.3.c. [Note: this version also includes recommended revisions to the compliance option under B.3.c].

II. PROVISIONS

A. PROHIBITIONS AND LIMITATIONS

The purpose of this provision is to describe the conditions under which storm water from and non-storm water discharges into ~~and from~~the MS4s are effectively prohibited or limited. The goal of the prohibitions and limitations is to protect the water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through the implementation of water quality improvement strategies and runoff management programs that effectively prohibit non-storm water discharges into the Copermittees' MS4s, and reduce pollutants in storm water discharges from the Copermittees' MS4s to the MEP. The process for determining compliance with the Discharge Prohibitions (A.1), Receiving Water Limitations (A.2), and Effluent Limitations (A.3, including effluent limitations derived from the TMDL requirements – Attachment E) is defined in Provision A.4.

1. Discharge Prohibitions

a. Except as provided in Provision A.1.e, A.1.f, and A.4.d., ~~D~~discharges from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the state are prohibited.

b. Non-storm water discharges into MS4s are to be effectively prohibited, through the implementation of Provision E.2, unless such discharges are authorized by a separate NPDES permit.

c. Discharges from MS4s are subject to all waste discharge prohibitions in the Basin Plan, included in Attachment A to this Order.

d. Storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 applicable to these discharges, included in Attachment A to this

Order. All other discharges from the Copermittees' MS4s to ASBS are prohibited.

e. If a Permittee has complied with the procedures outlined in Part B.3.c, the Permittee shall not be considered in violation of Part A.1 of this Order.

f. For discharges associated with water body pollutant combinations addressed in a TMDL in Attachment E of this Order, the affected Copermittees shall achieve compliance as outlined in Attachment E.

2. Receiving Water Limitations

a. Discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters, including but not limited to all applicable provisions contained in the list below to the extent that they remain in effect and are operative, unless such discharges are being addressed by the Copermittee(s) through the processes set forth in this Order (Provision A.4, Provision B.3.c., and Attachment E). Where a TMDL has been developed and its terms have been incorporated into this Order (in a manner that is consistent with the waste load allocations set forth in the TMDL), a Permittee shall also be considered in compliance with such TMDL-related requirements provided in this Order, if it is timely and in good faith implementing the MEP-compliant control measures otherwise established by this Order:

(1) The San Diego Water Board's Basin Plan, including beneficial uses, water quality objectives, and implementation plans;

(2) State Water Board plans for water quality control including the following:

(a) Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries (Thermal Plan), and

(b) The Ocean Plan, including beneficial uses, water quality objectives, and implementation plans;

(3) State Water Board policies for water and sediment quality control including the following:

(a) Water Quality Control Policy for the Enclosed Bays and Estuaries of California,

Revisions to Part A (Prohibitions and Limitations) are necessary in order to address the decision by the 9th Circuit Court of Appeals.

Recommendation (Alternative #2): Provide for an explicit reopener in Provision H to reconsider Part A after State Water Resources Control Board action regarding precedential language of Order WQ 99-05.

H. Modification of Order

1. Modifications of the Order may be initiated by the San Diego Water Board or by the Copermittees. Requests by Copermittees must be made to the San Diego Water Board.

2. Minor modifications to the Order may be made by the San Diego Water Board where the proposed modification complies with all the prohibitions and limitations, and other requirements of this Order.

3. This Order may also be re-opened and modified, revoked and, reissued or terminated in accordance with the provisions of 40 CFR 122.44, 122.62 to 122.64, and 124.5. Causes for taking such actions include, but are not limited to, failure to comply with any condition of this Order and permit, and endangerment to human health or the environment resulting from the permitted activity.

4. This Order may be re-opened for modification for cause including but not limited to the following:

   a. ~~The State Water Board determines that revisions are warranted, and the San Diego Water Board concurs that revisions are necessary to those provisions of the Order addressing compliance with water quality standards in the receiving water and/or those provisions of the Order establishing an iterative process for implementation of management practices to assure compliance with water quality standards in the receiving water~~To incorporate provisions as a result of new or amended statewide water quality control plans or policies adopted by the State Water Board, or in consideration of any State Water Board action regarding the precedential language of State Water Board Order WQ 99-05;

   b. An application for early coverage under this Order is received pursuant to Provision F.6;

   c. Any of the TMDLs in Attachment E to this Order are amended in the Basin Plan by San Diego Water Board, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA;

   d. The Basin Plan is amended by San Diego Water Board to incorporate a new TMDL, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA; or

   e. Updating or revising the monitoring and reporting requirements is determined to be necessary, at the discretion of the San Diego Water Board. Such modification(s) may

include, but is (are) not limited to, revision(s) to: (i) implement recommendations from Southern California Coastal Water Research Project (SCCWRP), (ii) develop, refine, implement, and/or coordinate a regional monitoring program, (iii) develop and implement improved monitoring and assessment programs in keeping with San Diego Water Board Resolution No. R9-2012-0069, Resolution in Support of a Regional Monitoring Framework, and/or (iv) add provisions to require the Copermittees to evaluate and provide information on cost and values of the monitoring and reporting program.

5. The San Diego Water Board, after opportunity for public comment and a public hearing, will re-open and consider modifications to this Order when the Orange County Copermittees or the Riverside County Copermittees submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders.

From: lyris@swrcb18.waterboards.ca.gov
To: Chiu, Wayne@Waterboards
Subject: NOW POSTED ! Proposed Errata to Tentative Order R9-2013-0001 & Public Hearing Continuation Notice
Date: Friday, April 19, 2013 4:03:24 PM

This is a message from the California Regional Water Quality Control Board, San Diego Region (9).

The San Diego Water Board has continued the public hearing regarding Tentative Order R9-2013-0001 *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Tentative Order) opened on April 10, 2013 because more time is warranted to discuss proposed changes to the requirements of the Tentative Order.

During the April 10 and 11 hearing, San Diego Water Board staff proposed additional changes to the Tentative Order based on testimony received. The proposed changes summarized by staff on April 11 are presented in Errata Sheet Tentative Order R9-2013-0001 - Option 1, which reflects removal of Provision B.3.c, and Errata Sheet - Tentative Order R9-2013-0001 - Option 2 which reflects specific changes to Provision B.3.c. Otherwise the Errata Sheets are identical.

Also available is the May 8, 2013 Public Hearing Continuation Notice on Tentative Order R9-2013-0001. The Public Hearing Continuation Notice describes the procedural matters set by the San Diego Water Board for the May 8, 2013 continued hearing on Tentative Order R9-2013-0001.

The Errata Sheets and the May 8, 2013 Public Hearing Continuation Notice are now available on the San Diego Water Board website.
http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

Laurie Walsh P.E.
San Diego Water Board
858-467-2970
lwalsh@waterboards.ca.gov

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

APR 24 2013

OFFICE OF THE
REGIONAL ADMINISTRATOR

The Honorable Darrell Issa
U.S. House of Representatives
Attention: Ellen Dargie
2347 Rayburn House Office Building
Washington, DC 20515

Dear Congressman Issa:

Thank you for your letter of April 2, 2013 to Acting EPA Administrator Bob Perciasepe and me concerning the draft Municipal Separate Storm Sewer System (MS4) permit proposed for the San Diego Region by the San Diego Regional Water Quality Control Board (Regional Board).

We have been working closely with the Regional Board in developing the draft San Diego Regional MS4 permit over the past two years, and have carefully reviewed the draft MS4 permit to ensure it implements federal statutory and regulatory requirements and is sensitive to the challenges permittees face in funding and implementing stormwater controls. Stormwater management is a very high priority for us, as urban stormwater runoff is the principal cause of numerous water quality impairments that affect beaches, streams, lakes, and rivers throughout Southern California. (see http://waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml)

The draft MS4 permit represents the fifth iteration of MS4 permits developed by the Regional Board since 1990. Over the past 10 years, the Regional Board also developed six total maximum daily loads (TMDLs) which evaluate discharge sources causing pollution problems and identify needed pollutant load reductions. These TMDLs indicate that substantial reduction of pollutants from municipal stormwater sources is needed to restore the health of beaches and other waters in the San Diego Region. The draft MS4 permit incorporates specific requirements based on these TMDLs to reduce pollutants in stormwater discharges. We believe the draft MS4 permit appropriately reconciles the need for more effective action to restore our polluted waters with the practical realities municipalities face in controlling stormwater pollution.

Your letter expresses concern regarding the potential costs that complying with the draft MS4 permit requirements would entail, particularly those associated with TMDL implementation; similar concerns have been expressed by the permittees. Over the past few months, we have met several times with representatives of San Diego County and other municipal jurisdictions to discuss their concerns.

The TMDL that has generated the most concern among the permittees is the bacteria TMDL adopted by the Regional Board in 2010. Implementation of the TMDL will result in improved controls on stormwater and other sources that cause bacterial water quality impairment at San Diego area beaches and will address widespread concerns about beach closures and illnesses suffered by swimmers. We recognize stormwater controls are costly, but ineffective stormwater control already imposes high costs to the local economy when swimmers in polluted water get sick and beach visitation declines. The Regional Board recognized that TMDL implementation may require a considerable amount of time and provided for a 20-year timeframe, while indicating it would be willing to consider extending the timeframe, if new information supports those changes. TMDL implementation schedules were based on the best information at the time of adoption, but the State acknowledges the difficulty of accurately forecasting the time needed for implementation. For this reason, the draft MS4 permit recognizes that modification of the initial requirements in the permit implementing the TMDL may be necessary. As set forth in Provision B.5 of the permit, the Board is committed to an iterative, adaptive management process through which permit requirements will be periodically revised as new information becomes available. Provision II.H.4.c also provides a specific permit reopener to modify permit requirements related to TMDLs when appropriate.

The draft MS4 permit would also provide a new, innovative mechanism through which permittees can implement permit requirements through watershed-based implementation plans that allow for focusing first on highest priority, cost-effective pollution controls. Through the development and implementation of these Water Quality Improvement Plans, permittees can have substantial flexibility to determine how best to sequence implementation actions. This planning process would also afford permittees the ability to collect information needed to support potential revisions in permit schedules and requirements. While the draft MS4 permit and associated TMDLs provide several "reopener" opportunities, the permit needs to be renewed every five years, which provides another opportunity for the State, permittees, and other stakeholders to consider revisions in permit implementation requirements and timeframes. Thus, we believe the draft MS4 permit is sensitive to the concerns raised by San Diego County and that its implementation can be reasonably and practicably guided by the permittees' progress.

Your letter also noted that Permittees have raised concerns regarding the science and analysis underlying the TMDLs, in particular the bacteria TMDL. The Regional Board developed the bacteria TMDL through a multi-year process which provided numerous opportunities for input by stakeholders. That process included review of the science underlying the TMDL by third-party peer reviewers, and extensive analysis of TMDL implementation costs prior to State adoption of the TMDL. We also carefully reviewed the basis for the TMDL and believe the science and analysis are sound. Nevertheless, given the TMDL reopener provisions and draft MS4 permit's adaptive management process noted above, the State has clearly signaled its willingness to consider modifying the TMDLs and permit if new information supports changes.

Finally, in response to the request in your letter, EPA held a conference call with your staff on April 9, 2013. We discussed details of the draft MS4 permit and TMDLs and, more generally, opportunities to address the funding concerns raised by San Diego County. We noted

that to help address stormwater control costs, low cost loans are available through the California State Revolving Fund program. We also described EPA's new Clean Water Act integrated planning initiative started in 2012. This initiative provides the opportunity for municipalities to work with States and EPA to develop plans designed to reduce overall compliance costs by considering all wastewater and stormwater management obligations in an integrated fashion and sequencing implementation of control projects to address the most significant water quality issues first. While we have discussed this initiative with many municipalities in California, none have yet opted to pursue this opportunity. Lastly, as mentioned in your letter, EPA is currently working with municipalities to clarify how financial capabilities of local governments should be considered in determining Clean Water Act obligations. We welcome the opportunity to discuss these initiatives further with municipal governments.

We trust this information is helpful in addressing your concerns. If we can be of further assistance, please call me or our Congressional Liaison Officer, Brent Maier at (415) 947-4256.

Sincerely,

Jared Blumenfeld

MS4 Permit

Applicability of Post-Construction Requirements
to
Linear Underground/ Overhead Projects (LUPs)
4/24/13

- Linear Underground/ Overhead Projects (LUPs)
- MS4 Permit Language
- Other Options
- Discussion

Development Project Example

Linear Underground/ Overhead Project Example

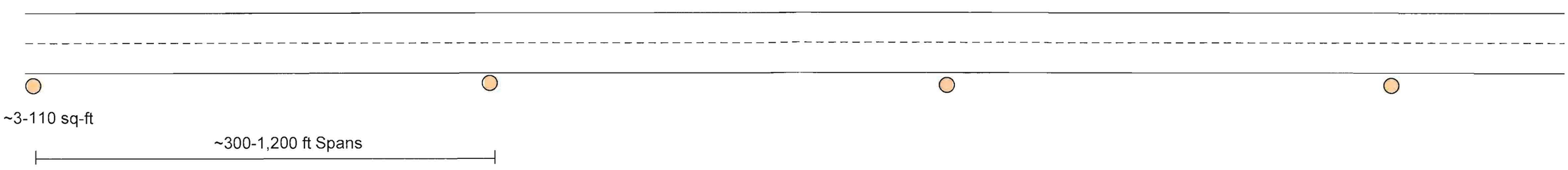

From: lyris@swrcb18.waterboards.ca.gov
To: Chiu, Wayne@Waterboards
Subject: May 8, 2013 Continuation of Public Hearing on Tentative Order No. R9-2013-0001 San Diego Regional MS4 Permit
Date: Thursday, May 02, 2013 3:00:45 PM

This is a message from the California Regional Water Quality Control Board, San Diego Region (9).

Parties and Interested Persons,

All documents pertaining to Item No. 9, Issuance of a NPDES Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region are now posted on the San Diego Water Boards website at http://www.waterboards.ca.gov/sandiego/board_info/agendas/2013/May/May8.shtml

Laurie Walsh, PE
Water Resource Control Engineer
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123
Tel. 858-467-2970

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
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From: lyris@swrcb18.waterboards.ca.gov
To: Chiu, Wayne@Waterboards
Subject: San Diego Regional MS4 Tentative Order -- Order on Procedural Issues and Order of Proceedings for May 8, 2013 Continued Public Hearing
Date: Thursday, May 02, 2013 10:10:48 AM
Attachments: 2013-0501 Order_Proceedings ContinuedPH.pdf

This is a message from the California Regional Water Quality Control Board, San Diego Region (9).

Parties and Interested Persons,

Attached is a memo signed by the San Diego Water Board Chair resolving outstanding procedural issues related to the San Diego Regional Water Quality Control Board's proceeding to consider Tentative Order No. R9-2013-0001, the San Diego Regional MS4 Permit.

The Chair's memo will also be posted on the San Diego Water Board's website at http://www.waterboards.ca.gov/rwqcb9/water_issues/programs/stormwater/index.shtml

Laurie Walsh, PE
Water Resource Control Engineer
San Diego Regional Water Quality Control Board
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MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

May 2, 2013

The Honorable Shirley Weber
California State Assembly
State Capitol, Room 5158
Sacramento, CA 95814

In reply refer to / attn:
786088:DGibson

Dear Assembly Member Weber:

Subject: Request For Public Hearing Delay on Tentative Order No. R9-2013-0001, Regional Municipal Separate Storm Sewer Systems (MS4) Permit

Thank you for your April 4th letter to Tomas Morales, Chair of the San Diego Regional Water Quality Control Board (San Diego Water Board) requesting a delay of the San Diego Water Board's April 10 and 11, 2013 public hearing, to consider the adoption of the National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region (Regional MS4 Permit). Chairman Morales has asked me to respond on his behalf.

Your letter, which was cosigned by nine other members of the Legislature, requested that the San Diego Water Board delay hearing the permit, due to concerns regarding (1) the pending action by the State Water Resources Control Board to address receiving water limitations (RWL) language in response to a recent court decision and (2) the costs associated with the incorporation of Bacteria Total Maximum Daily Loads (TMDLs) into the Regional MS4 Permit. Your letter also expresses concern that the stakeholders had less than two weeks to review the document before the scheduled April 10th and 11th public hearing.

Chairman Morales carefully considered your request. Chairman Morales ultimately decided, however, to proceed with the scheduled public hearing on April 10th and 11th, but also to continue the public hearing until the San Diego Water Board's May 8, 2013 meeting to allow for more time to discuss the outstanding issues, proposed requirements, and potential changes to the Regional MS4 Permit.

Together with the Copermittees, environmental organizations, building industry organizations, and interested persons, the San Diego Water Board has put considerable effort into developing a Regional MS4 Permit that will jointly cover municipal Copermittees in San Diego, southern Riverside and southern Orange Counties. The proposed Regional MS4 Permit would shift the MS4 permitting paradigm from the current prescriptive action-based regulatory approach of the MS4 permits to an environmental outcome-based approach, with a focus on

measuring and achieving improvements in MS4 discharges and receiving water quality. We believe that this approach will provide the Copermittees with greater flexibility for meeting the permit requirements, while at the same time better achieving improvements in water quality. A key feature of the Regional MS4 Permit is that it provides an adaptive management pathway for the Copermittees to select and address the highest priority water quality issues through an iterative process. The San Diego Water Board believes the proposed adaptive management permit provisions hold great promise and will allow the Copermittees more flexibility to deploy resources to achieve goals that will yield the greatest water quality improvements. The regional approach offers the opportunity to better achieve regulatory consistency, as well as maximum efficiency and economy of resources for both the San Diego Water Board and the Copermittees.

This Regional MS4 Permit was developed over a two-year period through a participatory approach designed to actively engage key stakeholders. This transparent and comprehensive stakeholder participation process included 4 public workshops, over 60 meetings and presentations, and extensive opportunities for stakeholders to review various drafts of the proposed Regional MS4 Permit and to provide written and oral comments. The San Diego Water Board staff carefully considered the comments that it received and significantly revised the draft permit over the two-year period in response to the comments received. The two main issues identified in your April 4th letter, RWL language and incorporation of Bacteria TMDLs, were extensively discussed and commented on during the permit development process. As a result, the Regional MS4 Permit has gone through many substantial revisions over this time period and now incorporates many stakeholder recommendations on the issues you and many others raised throughout the permit.

Receiving Water Limitation Language

The latest version of the Regional MS4 Permit contains RWL language that is mandated by State Water Resources Control Board (State Water Board) precedential Order WQ 99-05 and has been included in San Diego Water Board MS4 permits, and many other MS4 Permits throughout the State, since 2001. We understand that some public entities in the San Diego Region covered by these MS4 permits feel the language may leave them vulnerable to San Diego Water Board enforcement action(s) and citizen suit litigation, if they are shown to be causing or contributing to an exceedance of water quality standards. However, I would note that this same language which has been in MS4 permits since 2001 has not resulted in undue San Diego Water Board enforcement action(s) or citizen suits for RWL exceedances within the San Diego Region.

As your letter suggests, the State Water Board is aware of the concerns that have been raised by stakeholders regarding the RWL language and is evaluating the issue on a statewide level. We don't believe, however, that it is necessary to delay the San Diego Water Board's consideration of the Regional MS4 Permit pending the outcome of the State Water Board's discussions of the RWL issue. We expect those discussions on the RWL issue will likely continue for some time, and it will be some time before the State Water Board determines

whether to make changes to the RWL language or Order WQ 99-05. In the meantime, at the request of the State Water Board, we have included a specific re-opener provision in the Regional MS4 Permit to allow for changes if the State Water Board directs changes to the RWL language. In addition, the Regional MS4 Permit includes an alternative compliance option for the Copermittees, which, if properly implemented, would constitute compliance with the RWL and actually address the concerns raised by the public entities referenced in your letter. The permit language clearly states that the Copermittees will be in compliance with RWL if the specific set of requirements of the Regional MS4 Permit are incorporated and implemented as part of an accepted Water Quality Improvement Plan.

The court case to which your letter refers--- Los Angeles County Flood Control District v. Natural Resources Defense Council-- has been remanded by the United States Supreme Court to the United States Ninth Circuit Court of Appeals. The issue before the Ninth Circuit Court is limited in scope and the Court may not act on this case for many months. To the extent that a ruling in this case would affect MS4 permit requirements, the San Diego Water Board can address any necessary changes by reopening the Regional MS4 Permit consistent with the provision of the draft Regional MS4 Permit that allows for modifications based on judicial decisions.

Total Maximum Daily Loads

Your letter also indicates concerns that have been raised by public entities that will be impacted by the Bacteria TMDL requirements regarding the costs of meeting those requirements. Federal regulations require that NPDES permit conditions be consistent with the assumptions and requirements of adopted TMDLs. The San Diego Water Board's draft Regional MS4 Permit is designed to comply with federal requirements.

The process for developing the Bacteria TMDLs involved extensive opportunities for public participation, review and comment, as well as scientific peer review. The proceedings included consideration of the dischargers' ability to comply with the TMDL, development of appropriate compliance time schedules, economic considerations (e.g., costs to implement and comply with the TMDLs) and compliance with the appropriate provisions of the California Environmental Quality Act. The load allocations and compliance schedules established in the Bacteria TMDLs were developed as an amendment to the San Diego Water Board's *Water Quality Control Plan for the San Diego Basin* (Basin Plan) in 2008 and 2010 and are in fact duly adopted regulations of the San Diego Water Board. Furthermore, these TMDLs were approved by State Water Board, the California Office of Administrative Law, and the United States Environmental Protection Agency.

I would note that the upper range of cost estimates provided by stakeholders during the Bacteria TMDL process incorrectly assumed that compliance requirements found in the permit would necessitate the construction of new wastewater treatment facilities throughout the region. This is not the case. In response to comments on the draft Regional MS4 Permit, however, we have added an explicit re-opener provision to the Regional MS4 Permit that will

allow for changes to TMDL requirements, if the TMDLs are changed by the San Diego Water Board in the future. We also have added language to the TMDL requirements of the Regional MS4 Permit that clarify methods and provide flexibility for the Copermittees to demonstrate compliance.

Timing of Hearing

The latest revised Regional MS4 Permit, provided two weeks prior to the public hearing on April 10 and 11, did not include significant changes. Modifications were made in response to comments from the Copermittees and other stakeholders, to clarify specified provisions of the Regional MS4 Permit and to provide stakeholders more flexibility to comply with the requirements. Stakeholders have had extensive opportunity to review and comment on the Regional MS4 Permit. Most of the requirements, including the RWL language and inclusion of the Bacteria TMDLs, have been available for review and comment since an administrative draft of the Regional MS4 Permit was issued over one year ago on April 9, 2012. However, to allow for more time to discuss the outstanding issues, proposed requirements, and potential changes, the San Diego Water Board continued the public hearing, opened on April 10 and 11, until the May 8, 2013 Board meeting.

We sincerely appreciate the importance of the concerns expressed in your letter of April 4, 2013 regarding the pending NPDES permit for the largest discharge of wastes in the San Diego Region. Over 450 impaired water body-pollutant combinations have been identified throughout the region and nearly all urban streams are rated as Poor or Very Poor for biological condition. Attaining the objectives of the Clean Water Act remains a significant challenge and the San Diego Water Board very carefully considers the economic effects resulting from its permitting of these discharges. The approach of the new Regional MS4 Permit is to achieve a scientifically based, environmental outcomes focused, adaptive management program for storm water throughout the region that is likely to realize meaningful improvement in the health of our waters as well as cost efficiencies.

If you have further questions or concerns, please feel free to contact me at (858) 467-4837 or by email at dgibson@waterboards.ca.gov or James Smith, Assistant Executive Officer at (858) 467-2732 or email at jsmith@waterboards.ca.gov. In the subject line of any response, please include the reference number **786088:DGibson.**

Respectfully,

DAVID W. GIBSON
Executive Officer
San Diego Water Board

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Subject: Adopted Order No. R9-2013-0001 NPDES Regional MS4 Permit
Attachments: 2013-0523 Transmittal Letter.pdf; 2013-0523 Order No. R9-2013-0001 COMPLETE.pdf

Regional Phase I MS4 Copermittees,

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) is pleased to transmit to you a copy of Order No. R9-2013-0001, NPDES No. CAS0109266, *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Order), as adopted by the San Diego Water Board May 8, 2013.

The Order has been transmitted to you as an electronic copy. An electronic copy of the Order is also available to download on the San Diego Water Board website at:
http://www.waterboards.ca.gov/rwqcb9/water_issues/programs/stormwater/index.shtml

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CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

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SECRETARY FOR
ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

May 23, 2013

San Diego County Copermittees
Orange County Copermittees
Riverside County Copermittees

In reply refer to / attn:
Place ID: 786088Wchiu

Subject: Order No. R9-2013-0001, NPDES No. CAS0109266 National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) is pleased to transmit to you a copy of Order No. R9-2013-0001, NPDES No. CAS0109266, *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Order), as adopted by the San Diego Water Board May 8, 2013.

The Order has been transmitted to you as an electronic copy. An electronic copy of the Order is also available to download on the San Diego Water Board website at: http://www.waterboards.ca.gov/rwqcb9/water_issues/programs/stormwater/index.shtml

If a Copermittee or interested persons who would like to receive a hard copy of the Order, please contact Wayne Chiu at (858) 637-5558 or wchiu@waterboards.ca.gov or visit the San Diego Water Board's office at 9174 Sky Park Court, Suite 100, San Diego, California 92123-4340, weekdays between 8:00 a.m. and 5:00 p.m., telephone 858-467-2952.

Respectfully,

David W. Gibson
Executive Officer
San Diego Regional Water Quality Control Board

DWG:dtb esb:wc

cc:

Distribution via US Mail and email:
(see attached address list)

San Diego County Copermittees
Orange County Copermittees
Riverside County Copermittees

Distribution list via email:

San Diego County MS4 Permit Lyris List
Riverside County MS4 Permit Lyris List
Orange County MS4 Permit Lyris List

Tech Staff Info & Use	
Order No.	R9-2013-0001
Party (GT/CIWQS) ID	536787
File No.	n/a
WDID	n/a
NPDES No.	CAS0109266
Reg. Measure ID	387335
Place ID	786088
Person ID	n/a
Inspection ID	n/a

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CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

ORDER NO. R9-2013-0001
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The San Diego County Copermittees in Table 1a are subject to waste discharge requirements set forth in this Order.

Table 1a. San Diego County Copermittees

City of Carlsbad	City of Oceanside
City of Chula Vista	City of Poway
City of Coronado	City of San Diego
City of Del Mar	City of San Marcos
City of El Cajon	City of Santee
City of Encinitas	City of Solana Beach
City of Escondido	City of Vista
City of Imperial Beach	County of San Diego
City of La Mesa	San Diego County Regional Airport Authority
City of Lemon Grove	San Diego Unified Port District
City of National City	

After the San Diego Water Board receives and considers the Orange County Copermittees' Report of Waste Discharge and makes any necessary changes to this Order, the Orange County Copermittees in Table 1b will become subject to waste discharge requirements set forth in this Order after expiration of Order No. R9-2009-0002, NPDES No. CAS0108740 on or after December 16, 2014.

Table 1b. Orange County Copermittees

City of Aliso Viejo	City of Rancho Santa Margarita
City of Dana Point	City of San Clemente
City of Laguna Beach	City of San Juan Capistrano
City of Laguna Hills	City of Laguna Woods
City of Laguna Niguel	County of Orange
City of Lake Forest	Orange County Flood Control District
City of Mission Viejo	

After the San Diego Water Board receives and considers the Riverside County Copermittees' Report of Waste Discharge and makes any necessary changes to this Order, the Riverside County Copermittees in Table 1c will become subject to waste discharge requirements set forth in this Order after expiration of Order No. R9-2010-0016, NPDES No. CAS0108766 on or after November 10, 2015.

Table 1c. Riverside County Copermittees

City of Murrieta	County of Riverside
City of Temecula	Riverside County Flood Control and Water Conservation District
City of Wildomar	

The Orange County Copermittees and Riverside County Copermittees may become subject to the requirements of this Order at a date earlier than the expiration date of their current Orders subject to the conditions described in Provision F.6 of this Order if the Copermittees in the respective county receive a notification of coverage from the San Diego Water Board.

The term Copermittee in this Order refers to any San Diego County, Orange County, or Riverside County Copermittee covered under this Order, unless specified otherwise.

This Order provides permit coverage for the Copermittee discharges described in Table 2.

Table 2. Discharge Locations and Receiving Waters

Discharge Points	Locations throughout San Diego Region
Discharge Description	Municipal Separate Storm Sewer System (MS4) Discharges
Receiving Waters	Inland Surface Waters, Enclosed Bays and Estuaries, and Coastal Ocean Waters of the San Diego Region

Table 3. Administrative Information

This Order was adopted by the San Diego Water Board on:	**May 8, 2013**
This Order will become effective on:	**June 27, 2013**
This Order will expire on:	**June 27, 2018**
The Copermittees must file a Report of Waste Discharge in accordance with Title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than 180 days in advance of the Order expiration date.	

I, David W. Gibson, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on May 8, 2013.

David W. Gibson
Executive Officer

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Attachment B - Standard Permit Provisions and General Provisions B-1
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Attachment F - Fact Sheet / Technical Report for Order No. R9-2013-0001 ..... F-1

I. FINDINGS

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), finds that:

JURISDICTION

1. **MS4 Ownership or Operation.** Each of the Copermittees owns or operates an MS4, through which it discharges storm water and non-storm water into waters of the U.S. within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the U.S.

2. **Legal and Regulatory Authority.** This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]) adopted by the United States Environmental Protection Agency (USEPA), and chapter 5.5, division 7 of the California Water Code (CWC) (commencing with section 13370). This Order serves as an NPDES permit for discharges from MS4s to surface waters. This Order also serves as waste discharge requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

   The San Diego Water Board has the legal authority to issue a regional MS4 permit pursuant to its authority under CWA section 402(p)(3)(B) and 40 CFR 122.26(a)(1)(v). The USEPA also made it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide permits (55 Federal Register [FR] 47990, 48039-48042). The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees and San Diego Water Board.

   The federal regulations make it clear that the Copermittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators (40 CFR 122.26(a)(3)(vi)). This Order does not require the Copermittees to manage storm water outside of their jurisdictional boundaries, but rather to work collectively to improve storm water management within watersheds.

3. **CWA NPDES Permit Conditions.** Pursuant to CWA section 402(p)(3)(B), NPDES permits for storm water discharges from MS4s must include requirements to effectively prohibit non-storm water discharges into MS4s, and require controls to reduce the discharge of pollutants in storm water to the maximum extent practicable (MEP), and to require other provisions as the San Diego Water Board determines are appropriate to control such pollutants. This Order prescribes conditions to assure compliance with the CWA requirements for owners and operators of MS4s to

effectively prohibit non-storm water discharges into the MS4s, and require controls to reduce the discharge of pollutants in storm water from the MS4s to the MEP.

4. **CWA and CWC Monitoring Requirements.** CWA section 308(a) and 40 CFR 122.41(h),(j)-(l) and 122.48 require that NPDES permits must specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s also specify additional monitoring and reporting requirements in 40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c). CWC section 13383 authorizes the San Diego Water Board to establish monitoring, inspection, entry, reporting and recordkeeping requirements. This Order establishes monitoring and reporting requirements to implement federal and State requirements.

5. **Total Maximum Daily Loads.** CWA section 303(d)(1)(A) requires that "[e]ach state shall identify those waters within its boundaries for which the effluent limitations…are not stringent enough to implement any water quality standard applicable to such waters." The CWA also requires states to establish a priority ranking of impaired water bodies known as Water Quality Limited Segments and to establish Total Maximum Daily Loads (TMDLs) for such waters. This priority list of impaired water bodies is called the Clean Water Act Section 303(d) List of Water Quality Limited Segments, commonly referred to as the 303(d) List. The CWA requires the 303(d) List to be updated every two years.

   TMDLs are numerical calculations of the maximum amount of a pollutant that a water body can assimilate and still meet water quality standards. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point sources (waste load allocations or WLAs) and non-point sources (load allocations or LAs), background contribution, plus a margin of safety. Discharges from MS4s are point source discharges. The federal regulations (40 CFR 122.44(d)(1)(vii)(B)) require that NPDES permits incorporate water quality based effluent limitations (WQBELs) developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, consistent with the assumptions and requirements of any available WLA for the discharge. Requirements of this Order implement the TMDLs adopted by the San Diego Water Board and approved by USEPA as of the time this Order is issued. This Order establishes WQBELs consistent with the assumptions and requirements of all available TMDL WLAs assigned to discharges from the Copermittees' MS4s.

6. **Non-Storm Water Discharges.** Pursuant to CWA section 402(p)(3)(B)(ii), this Order requires each Copermittee to effectively prohibit discharges of non-storm water into its MS4. Nevertheless, non-storm water discharges into and from the MS4s continue to be reported to the San Diego Water Board by the Copermittees and other persons. Monitoring conducted by the Copermittees, as well as the 303(d) List, have identified dry weather, non-storm water discharges from the MS4s as a source of pollutants causing or contributing to receiving water quality impairments in the San Diego Region. The federal regulations (40 CFR 122.26(d)(2)(iv)(B)(1)) require the Copermittees to have a program to prevent illicit discharges to the MS4.

The federal regulations, however, allow for specific categories of non-storm water discharges or flows to be addressed as illicit discharges only where such discharges are identified as sources of pollutants to waters of the U.S.

7. **In-Stream Treatment Systems.** Pursuant to federal regulations (40 CFR 131.10(a)), in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S. Authorizing the construction of a runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to accepting waste assimilation as an appropriate use for that water body. Runoff treatment must occur prior to the discharge of runoff into receiving waters. Treatment control best management practices (BMPs) must not be constructed in waters of the U.S. Construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body.

DISCHARGE CHARACTERISTICS AND RUNOFF MANAGEMENT

8. **Point Source Discharges of Pollutants.** Discharges from the MS4s contain waste, as defined in the CWC, and pollutants that adversely affect the quality of the waters of the state. A discharge from an MS4 is a “discharge of pollutants from a point source” into waters of the U.S. as defined in the CWA. Storm water and non-storm water discharges from the MS4s contain pollutants that cause or threaten to cause a violation of surface water quality standards, as outlined in the Water Quality Control Plan for the San Diego Basin (Basin Plan). Storm water and non-storm water discharges from the MS4s are subject to the conditions and requirements established in the Basin Plan for point source discharges.

9. **Potential Beneficial Use Impairment.** The discharge of pollutants and/or increased flows from MS4s may cause or threaten to cause the concentration of pollutants to exceed applicable receiving water quality objectives and impair or threaten to impair designated beneficial uses resulting in a condition of pollution, contamination, or nuisance.

10. **Pollutants Generated by Land Development.** Land development has created and continues to create new sources of non-storm water discharges and pollutants in storm water discharges as human population density increases. This brings higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash. Pollutants from these sources are dumped or washed off the surface by non-storm water or storm water flows into and from the MS4s. When development converts natural vegetated pervious ground cover to impervious surfaces such as paved highways, streets, rooftops, and parking lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving a developed area without BMPs that can maintain pre-development runoff conditions will contain greater pollutant loads and have significantly greater runoff volume, velocity, and peak flow rate than pre-development runoff conditions from the same area.

11. **Runoff Discharges to Receiving Waters.** The MS4s discharge runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within the eleven hydrologic units comprising the San Diego Region. Historic and current development makes use of natural drainage patterns and features as conveyances for runoff. Rivers, streams and creeks in developed areas used in this manner are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and receiving water. Numerous receiving water bodies and water body segments have been designated as impaired by the San Diego Water Board pursuant to CWA section 303(d).

12. **Pollutants in Runoff.** The most common pollutants in runoff discharged from the MS4s include total suspended solids, sediment, pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., cadmium, copper, lead, and zinc), petroleum products and polynuclear aromatic hydrocarbons, synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus), oxygen-demanding substances (e.g., decaying vegetation, animal waste), detergents, and trash. As operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not prohibit or otherwise control. These discharges may cause or contribute to a condition of pollution or a violation of water quality standards.

13. **Human Health and Aquatic Life Impairment.** Pollutants in runoff discharged from the MS4s can threaten and adversely affect human health and aquatic organisms. Adverse responses of organisms to chemicals or physical agents in runoff range from physiological responses such as impaired reproduction or growth anomalies to mortality. Increased volume, velocity, rate, and duration of storm water runoff greatly accelerate the erosion of downstream natural channels. This alters stream channels and habitats and can adversely affect aquatic and terrestrial organisms.

14. **Water Quality Effects.** The Copermittees' water quality monitoring data submitted to date documents persistent exceedances of Basin Plan water quality objectives for runoff-related pollutants at various watershed monitoring stations. Persistent toxicity has also been observed at several watershed monitoring stations. In addition, bioassessment data indicate that the majority of the monitored receiving waters have Poor to Very Poor Index of Biological Integrity (IBI) ratings. These findings indicate that runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in the San Diego Region. Non-storm water discharges from the MS4s have been shown to contribute significant levels of pollutants and flow in arid, developed Southern California watersheds, and contribute significantly to exceedances of applicable receiving water quality objectives.

15. **Non-Storm Water and Storm Water Discharges.** Non-storm water discharges from the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard of CWA section 402(p)(3)(B)(iii), which is explicitly for "Municipal … *Stormwater Discharges* (emphasis added)" from the MS4s. Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s must be effectively prohibited.

16. **Best Management Practices.** Waste and pollutants which are deposited and accumulate in MS4 drainage structures will be discharged from these structures to waters of the U.S. unless they are removed. These discharges may cause or contribute to, or threaten to cause or contribute to, a condition of pollution in receiving waters. For this reason, pollutants in storm water discharges from the MS4s can be and must be effectively reduced in runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Pollution prevention is the reduction or elimination of pollutant generation at its source and is the best "first line of defense". Source control BMPs (both structural and non-structural) minimize the contact between pollutants and runoff, therefore keeping pollutants onsite and out of receiving waters. Treatment control BMPs remove pollutants that have been mobilized by storm water or non-storm water flows.

17. **BMP Implementation.** Runoff needs to be addressed during the three major phases of development (planning, construction, and use) in order to reduce the discharge of storm water pollutants to the MEP, effectively prohibit non-storm water discharges, and protect receiving waters. Development which is not guided by water quality planning policies and principles can result in increased pollutant load discharges, flow rates, and flow durations which can negatively affect receiving water beneficial uses. Construction sites without adequate BMP implementation result in sediment runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. Existing development can generate substantial pollutant loads which are discharged in runoff to receiving waters. Retrofitting areas of existing development with storm water pollutant control and hydromodification management BMPs is necessary to address storm water discharges from existing development that may cause or contribute to a condition of pollution or a violation of water quality standards.

18. **Water Quality Improvements.** Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges to the MS4s and control pollutants in storm water discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the CWA.

19. **Long Term Planning and Implementation.** Federal regulations require municipal storm water permits to expire 5 years from adoption, after which the permit must be renewed and reissued. The San Diego Water Board recognizes that the degradation of water quality and impacts to beneficial uses of the waters in the San Diego Region occurred over several decades. The San Diego Water Board further recognizes that a decade or more may be necessary to realize demonstrable improvement to the quality of waters in the San Diego Region. This Order includes a long term planning and implementation approach that will require more than a single permit term to complete.

WATER QUALITY STANDARDS

20. **Basin Plan.** The San Diego Water Board adopted the Water Quality Control Plan for the San Diego Basin (Basin Plan) on September 8, 1994 that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for receiving waters addressed through the plan. The Basin Plan was subsequently approved by the State Water Resources Control Board (State Water Board) on December 13, 1994. Subsequent revisions to the Basin Plan have also been adopted by the San Diego Water Board and approved by the State Water Board. Requirements of this Order implement the Basin Plan.

    The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Process Supply (PROC), Industrial Service Supply (IND), Ground Water Recharge (GWR), Contact Water Recreation (REC1), Non-contact Water Recreation (REC2), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Freshwater Replenishment (FRSH), Hydropower Generation (POW), and Preservation of Biological Habitats of Special Significance (BIOL). The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region: Navigation (NAV), Commercial and Sport Fishing (COMM), Estuarine Habitat (EST), Marine Habitat (MAR), Aquaculture (AQUA), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN), and Shellfish Harvesting (SHELL).

21. **Ocean Plan.** The State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, and 2005. The State Water Board adopted the latest amendment on April 21, 2005 and it became effective on February 14, 2006. The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean. Requirements of this Order implement the Ocean Plan.

    The Ocean Plan identifies the following beneficial uses of ocean waters of the state to be protected: Industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture;

preservation and enhancement of designated Areas of Special Biological Significance; rare and endangered species; marine habitat; fish spawning and shellfish harvesting

22. **Sediment Quality Control Plan**. On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes: 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

23. **National Toxics Rule and California Toxics Rule.** USEPA adopted the National Toxics Rule (NTR) on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the NTR applied in California. On May 18, 2000, USEPA adopted the California Toxics Rule (CTR). The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants.

24. **Antidegradation Policy.** This Order is in conformance with the federal Antidegradation Policy described in 40 CFR 131.12, and State Water Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality Waters in California*. Federal regulations at 40 CFR 131.12 require that the State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. State Water Board Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies.

25. **Anti-Backsliding Requirements.** Section 402(o)(2) of the CWA and federal regulations at 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations may be relaxed. All effluent limitations in this Order are at least as stringent as effluent limitations in the previous permits.

CONSIDERATIONS UNDER FEDERAL AND STATE LAW

26. **Coastal Zone Act Reauthorization Amendments.** Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states with approved coastal zone management programs to address non-point source

pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point source pollution: agriculture, silviculture, urban, marinas, and hydromodification. This Order addresses the management measures required for the urban category, with the exception of septic systems. The runoff management programs developed pursuant to this Order fulfills the need for coastal cities to develop a runoff non-point source plan identified in the Non-Point Source Program Strategy and Implementation Plan. The San Diego Water Board addresses septic systems through the administration of other programs.

27. **Endangered Species Act.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 USC sections 1531 to 1544). This Order requires compliance with receiving water limits, and other requirements to protect the beneficial uses of waters of the State. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

28. **Report of Waste Discharge Process.** The waste discharge requirements set forth in this Order are based upon the Report of Waste Discharge submitted by the San Diego County Copermittees prior to the expiration of Order No. R9-2007-0001 (NPDES No. CAS0109266). The Orange County and Riverside County Copermittees are not immediately covered by the waste discharge requirements in this Order. The San Diego Water Board understands that each municipality is unique although the Counties share watersheds and/or geographical boundaries. The Order will continue to use the Report of Waste Discharge process prior to initially making Orange County or Riverside County Copermittees subject to the requirements of this Order.

    The federal regulations (40 CFR 122.21(d)(2)) and CWC section 13376 impose a duty on the Copermittees to reapply for continued coverage through submittal of a Report of Waste Discharge no later than 180 days prior to expiration of a currently effective permit. This requirement is set forth in the Orange County Copermittees' and Riverside County Copermittees' currently effective permits at Provisions K.2.b and K.2.c, respectively. The Orange County Permit, Order No. R9-2009-0002 (NPDES No. CAS0108740) expires on December 16, 2014 and the Riverside County MS4 Permit, Order No. R9-2010-0016 (NPDES No. CAS0108766) expires on November 10, 2015.

    Unless the Orange County or Riverside County Copermittees apply for and receive early coverage under this Order, the Orange County Copermittees' and the Riverside County Copermittees' respective permits will be superseded by this Order upon expiration of their respective permits, subject to any necessary revisions to the requirements of this Order made after the San Diego Water Board considers their respective Reports of Waste Discharge through the public process provided in 40 CFR Part 124.

29. **Integrated Report and Clean Water Act Section 303(d) List.** The San Diego Water Board and State Water Board submit an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. USEPA issued its *Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act* on July 29, 2005, which advocates the use of a five category approach for classifying the attainment status of water quality standards for water bodies in the Integrated Report. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 in the Integrated Report are placed on the 303(d) List.

    Water bodies with available data and/or information that indicate at least one beneficial use is not being supported or is threatened, but a TMDL is not required, are included in Category 4 in the Integrated Report. Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

    Implementation of the requirements of this Order may allow the San Diego Water Board to include surface waters impaired by discharges from the Copermittees' MS4s in Category 4 in the Integrated Report for consideration during the next 303(d) List submittal by the State to USEPA.

30. **Economic Considerations.** The California Supreme Court has ruled that although CWC section 13263 requires the State and Regional Water Boards (collectively Water Boards) to consider factors set forth in CWC section 13241 when issuing an NPDES permit, the Water Board may not consider the factors to justify imposing pollutant restrictions that are less stringent than the applicable federal regulations require. (*City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 618, 626-627.) However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

    As noted in the following finding, the San Diego Water Board finds that the requirements in this Order are not more stringent than the minimum federal requirements. Therefore, a CWC section 13241 analysis is not required for permit requirements that implement the effective prohibition on the discharge of non-storm water into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determined appropriate to control such pollutants, as those requirements are mandated by federal law. Notwithstanding the above, the San Diego Water Board has developed an economic analysis of the requirements in this Order. The economic analysis is provided in the Fact Sheet.

31. **Unfunded Mandates.** This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following:

    a. This Order implements federally mandated requirements under CWA section 402 (33 USC section 1342(p)(3)(B)).

    b. The local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental and new dischargers who are issued NPDES permits for storm water and non-storm water discharges.

    c. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order.

    d. The Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)) and in lieu of numeric restrictions on their MS4 discharges (i.e. effluent limitations).

    e. The local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under State law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

    f. The provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state develops a TMDL, federal law requires that permits must contain water quality based effluent limitations consistent with the assumptions and requirements of any applicable wasteload allocation (40 CFR 122.44(d)(1)(vii)(B)).

    See the Fact Sheet for further discussion of unfunded mandates.

32. **California Environmental Quality Act.** The issuance of waste discharge requirements and an NPDES permit for the discharge of runoff from MS4s to waters of the U.S. is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 et seq.) in accordance with CWC section 13389.

STATE WATER BOARD DECISIONS

33. **Compliance with Prohibitions and Limitations.** The receiving water limitation language specified in this Order is consistent with language recommended by the USEPA and established in State Water Board Order WQ 99-05, *Own Motion Review of the Petition of Environmental Health Coalition to Review Waste Discharge Requirements Order No. 96-03, NPDES Permit No. CAS0108740*, adopted by the

State Water Board on June 17, 1999. The receiving water limitation language in this Order requires storm water discharges from MS4s to not cause or contribute to a violation of water quality standards, which is to be achieved through an iterative approach requiring the implementation of improved and better-tailored BMPs over time. Implementation of the iterative approach to comply with receiving water limitations based on applicable water quality standards is necessary to ensure that storm water discharges from the MS4 will not ultimately cause or contribute to violations of water quality standards and will not create conditions of pollution, contamination, or nuisance.

34. **Special Conditions for Areas of Special Biological Significance.** On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving an exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges. State Water Board Resolution No. 2012-0012 requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject terms and conditions of State Water Board Resolution No. 2012-0012. The Special Protections contained in Attachment B to Resolution No. 2012-0012, applicable to these discharges, are hereby incorporated into this Order as if fully set forth herein.

ADMINISTRATIVE FINDINGS

35. **Executive Officer Delegation of Authority.** The San Diego Water Board by prior resolution has delegated all matters that may legally be delegated to its Executive Officer to act on its behalf pursuant to CWC section 13223. Therefore, the Executive Officer is authorized to act on the San Diego Water Board's behalf on any matter within this Order unless such delegation is unlawful under CWC section 13223 or this Order explicitly states otherwise.

36. **Standard Provisions.** Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR 122.42, are provided in Attachment B to this Order.

37. **Fact Sheet.** The Fact Sheet for this Order contains background information, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of this Order. The Fact Sheet is hereby incorporated into this Order and constitutes part of the Findings of this Order.

38. **Public Notice.** In accordance with State and federal laws and regulations, the San Diego Water Board notified the Copermittees, and interested agencies and persons of its intent to prescribe waste discharge requirements for the control of discharges into and from the MS4s to waters of the U.S. and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet.

39. **Public Hearing.** The San Diego Water Board held a public hearing on April 10 and 11, 2013, that was continued to May 8, 2013 and heard and considered all comments pertaining to the terms and conditions of this Order. Details of the public hearing are provided in the Fact Sheet.

40. **Effective Date.** This Order serves as an NPDES permit pursuant to CWA section 402 or amendments thereto, and becomes effective fifty (50) days after the date of its adoption, provided that the Regional Administrator, USEPA, Region IX, does not object to this Order.

41. **Review by the State Water Board.** Any person aggrieved by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with CWC section 13320 and California Code of Regulations, title 23, sections 2050, et seq. The State Water Board must receive the petition by 5:00 p.m., 30 days after the San Diego Water Board action, except that if the thirtieth day following the action falls on a Saturday, Sunday or State holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

THEREFORE, IT IS HEREBY ORDERED that the Copermittees, in order to meet the provisions contained in division 7 of the CWC (commencing with section 13000) and regulations adopted thereunder, and the provisions of the CWA and regulations adopted thereunder, must each comply with the requirements of this Order. This action in no way prevents the San Diego Water Board from taking enforcement action for past violations of the previous Order. If any part of this Order is subject to a temporary stay of enforcement, unless otherwise specified, the Copermittees must comply with the analogous portions of the previous Order, which will remain in effect for all purposes during the pendency of the stay.

II. PROVISIONS

A. PROHIBITIONS AND LIMITATIONS

The purpose of this provision is to describe the conditions under which storm water and non-storm water discharges into and from MS4s are prohibited or limited. The goal of the prohibitions and limitations is to protect the water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through the implementation of water quality improvement strategies and runoff management programs that effectively prohibit non-storm water discharges into the Copermittees' MS4s, and reduce pollutants in storm water discharges from the Copermittees' MS4s to the MEP.

1. Discharge Prohibitions

a. Discharges from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the state are prohibited.

b. Non-storm water discharges into MS4s are to be effectively prohibited, through the implementation of Provision E.2, unless such discharges are authorized by a separate NPDES permit.

c. Discharges from MS4s are subject to all waste discharge prohibitions in the Basin Plan, included in Attachment A to this Order.

d. Storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 applicable to these discharges, included in Attachment A to this Order. All other discharges from the Copermittees' MS4s to ASBS are prohibited.

2. Receiving Water Limitations

a. Discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters, including but not limited to all applicable provisions contained in:

(1) The San Diego Water Board's Basin Plan, including beneficial uses, water quality objectives, and implementation plans;

(2) State Water Board plans for water quality control including the following:

(a) Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries (Thermal Plan), and

(b) The Ocean Plan, including beneficial uses, water quality objectives, and implementation plans;

(3) State Water Board policies for water and sediment quality control including the following:

(a) Water Quality Control Policy for the Enclosed Bays and Estuaries of California,

(b) Sediment Quality Control Plan which includes the following narrative objectives for bays and estuaries:

(i) Pollutants in sediments shall not be present in quantities that, alone or in combination, are toxic to benthic communities, and

(ii) Pollutants shall not be present in sediments at levels that will bioaccumulate in aquatic life to levels that are harmful to human health,

(c) The Statement of Policy with Respect to Maintaining High Quality of Waters in California;[1]

(4) Priority pollutant criteria promulgated by the USEPA through the following:

(a) National Toxics Rule (NTR)[2] (promulgated on December 22, 1992 and amended on May 4, 1995), and

(b) California Toxics Rule (CTR).[3,4]

b. Discharges from MS4s composed of storm water runoff must not alter natural ocean water quality in an ASBS.

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[1] State Water Board Resolution No. 68-16
[2] 40 CFR 131.36
[3] 65 Federal Register 31682-31719 (May 18, 2000), adding Section 131.38 to 40 CFR
[4] If a water quality objective and a CTR criterion are in effect for the same priority pollutant, the more stringent of the two applies.

3. Effluent Limitations

a. Technology Based Effluent Limitations

Pollutants in storm water discharges from MS4s must be reduced to the MEP.[5]

b. Water Quality Based Effluent Limitations

Each Copermittee must comply with applicable WQBELs established for the TMDLs in Attachment E to this Order, pursuant to the applicable TMDL compliance schedules.

4. Compliance with Discharge Prohibitions and Receiving Water Limitations

Each Copermittee must achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order through timely implementation of control measures and other actions as specified in Provisions B and E of this Order, including any modifications. The Water Quality Improvement Plans required under Provision B must be designed and adapted to ultimately achieve compliance with Provisions A.1.a, A.1.c and A.2.a.

a. If exceedance(s) of water quality standards persist in receiving waters notwithstanding implementation of this Order, the Copermittees must comply with the following procedures:

(1) For exceedance(s) of a water quality standard in the process of being addressed by the Water Quality Improvement Plan, the Copermittee(s) must implement the Water Quality Improvement Plan as accepted by the San Diego Water Board, and update the Water Quality Improvement Plan, as necessary, pursuant to Provision F.2.c;

(2) Upon a determination by either the Copermittees or the San Diego Water Board that discharges from the MS4 are causing or contributing to a new exceedance of an applicable water quality standard not addressed by the Water Quality Improvement Plan, the Copermittees must submit the following updates to the Water Quality Improvement Plan pursuant to Provision F.2.c or as part of the Water Quality Improvement Plan Annual Report required under Provision F.3.b, unless the San Diego Water Board directs an earlier submittal:

(a) The water quality improvement strategies being implemented that are effective and will continue to be implemented,

[5] This does not apply to MS4 discharges which receive subsequent treatment to reduce pollutants in storm water discharges to the MEP prior to entering receiving waters (e.g., low flow diversions to the sanitary sewer). Runoff treatment must occur prior to the discharge of runoff into receiving waters per Finding 7.

(b) Water quality improvement strategies (i.e. BMPs, retrofitting projects, stream and/or habitat rehabilitation projects, adjustments to jurisdictional runoff management programs, etc.) that will be implemented to reduce or eliminate any pollutants or conditions that are causing or contributing to the exceedance of water quality standards,

(c) Updates to the schedule for implementation of the existing and additional water quality improvement strategies, and

(d) Updates to the monitoring and assessment program to track progress toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a of this Order;

(3) The San Diego Water Board may require the incorporation of additional modifications to the Water Quality Improvement Plan required under Provision B. The applicable Copermittees must submit any modifications to the update to the Water Quality Improvement Plan within 90 days of notification that additional modifications are required by the San Diego Water Board, or as otherwise directed;

(4) Within 90 days of the San Diego Water Board determination that the modifications to the Water Quality Improvement Plan required under Provision A.4.a.(3) meet the requirements of this Order, the applicable Copermittees must revise the jurisdictional runoff management program documents to incorporate the modified water quality improvement strategies that have been and will be implemented, the implementation schedule, and any additional monitoring required; and

(5) Each Copermittee must implement the updated Water Quality Improvement Plan.

b. The procedure set forth above to achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order do not have to be repeated for continuing or recurring exceedances of the same water quality standard(s) following implementation of scheduled actions unless directed to do otherwise by the San Diego Water Board.

c. Nothing in Provisions A.4.a and A.4.b prevents the San Diego Water Board from enforcing any provision of this Order while the applicable Copermittees prepare and implement the above update to the Water Quality Improvement Plan and jurisdictional runoff management programs.

B. WATER QUALITY IMPROVEMENT PLANS

The purpose of this provision is to develop Water Quality Improvement Plans that guide the Copermittees' jurisdictional runoff management programs towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plans is to further the Clean Water Act's objective to protect, preserve, enhance, and restore the water quality and designated beneficial uses of waters of the state. This goal will be accomplished through an adaptive planning and management process that identifies the highest priority water quality conditions within a watershed and implements strategies through the jurisdictional runoff management programs to achieve improvements in the quality of discharges from the MS4s and receiving waters.

1. Watershed Management Areas

The Copermittees must develop a Water Quality Improvement Plan for each of the Watershed Management Areas in Table B-1. A total of ten Water Quality Improvement Plans must be developed for the San Diego Region.

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
San Juan (901.00)	South Orange County	- Aliso Creek - San Juan Creek - San Mateo Creek - Pacific Ocean - Heisler Park ASBS	- City of Aliso Viejo[1] - City of Dana Point[1] - City of Laguna Beach[1] - City of Laguna Hills[1] - City of Laguna Niguel[1] - City of Laguna Woods[1] - City of Lake Forest[1] - City of Mission Viejo[1] - City of Rancho Santa Margarita[1] - City of San Clemente[1] - City of San Juan Capistrano[1] - County of Orange[1] - Orange County Flood Control District[1]
Santa Margarita (902.00)	Santa Margarita River	- Murrieta Creek - Temecula Creek - Santa Margarita River - Santa Margarita Lagoon - Pacific Ocean	- City of Murrieta[2] - City of Temecula[2] - City of Wildomar[2] - County of Riverside[2] - County of San Diego[3] - Riverside County Flood Control and Water Conservation District[2]
San Luis Rey (903.00)	San Luis Rey River	- San Luis Rey River - San Luis Rey Estuary - Pacific Ocean	- City of Oceanside - City of Vista - County of San Diego

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
Carlsbad (904.00)	Carlsbad	- Loma Alta Slough - Buena Vista Lagoon - Agua Hedionda Lagoon - Batiquitos Lagoon - San Elijo Lagoon - Pacific Ocean	- City of Carlsbad - City of Encinitas - City of Escondido - City of Oceanside - City of San Marcos - City of Solana Beach - City of Vista - County of San Diego
San Dieguito (905.00)	San Dieguito River	- San Dieguito River - San Dieguito Lagoon - Pacific Ocean	- City of Del Mar - City of Escondido - City of Poway - City of San Diego - City of Solana Beach - County of San Diego
Penasquitos (906.00)	Penasquitos	- Los Penasquitos Lagoon - Pacific Ocean	- City of Del Mar - City of Poway - City of San Diego - County of San Diego
	Mission Bay	- Mission Bay - Pacific Ocean - San Diego Marine Life Refuge ASBS	- City of San Diego
San Diego (907.00)	San Diego River	- San Diego River - Pacific Ocean	- City of El Cajon - City of La Mesa - City of San Diego - City of Santee - County of San Diego
Pueblo San Diego (908.00) Sweetwater (909.00) Otay (910.00)	San Diego Bay	- Sweetwater River - Otay River - San Diego Bay - Pacific Ocean	- City of Chula Vista - City of Coronado - City of Imperial Beach - City of La Mesa - City of Lemon Grove - City of National City - City of San Diego - County of San Diego - San Diego County Regional Airport Authority - San Diego Unified Port District
Tijuana (911.00)	Tijuana River	- Tijuana River - Tijuana Estuary - Pacific Ocean	- City of Imperial Beach - City of San Diego - County of San Diego

Notes:
1. The Orange County Copermittees will be covered under this Order after expiration of Order No. R9-2009-0002, or earlier if the Orange County Copermittees meet the conditions in Provision F.6.
2. The Riverside County Copermittees will be covered under this Order after expiration of Order No. R9-2010-0016, or earlier if the Riverside County Copermittees meet the conditions in Provision F.6.
3. The County of San Diego is not required to implement the requirements of Provision B for its jurisdiction within the Santa Margarita River Watershed Management Area until the Riverside County Copermittees have been notified of coverage under this Order. The County of San Diego is required to implement the requirements of Provisions D, F.3.b, and Attachment E until the Riverside County Copermittees have been notified of coverage under this Order.

2. Priority Water Quality Conditions

The Copermittees must identify the water quality priorities within each Watershed Management Area that will be addressed by the Water Quality Improvement Plan. Where appropriate, Watershed Management Areas may be separated into subwatersheds to focus water quality prioritization and jurisdictional runoff management program implementation efforts by receiving water.

a. Assessment of Receiving Water Conditions

The Copermittees must consider the following, at a minimum, to identify water quality priorities based on impacts of MS4 discharges on receiving water beneficial uses:

(1) Receiving waters listed as impaired on the CWA Section 303(d) List of Water Quality Limited Segments (303(d) List);

(2) TMDLs adopted and under development by the San Diego Water Board;

(3) Receiving waters recognized as sensitive or highly valued by the Copermittees, including estuaries designated under the National Estuary Program under CWA section 320, wetlands defined by the State or U.S. Fish and Wildlife Service's National Wetlands Inventory as wetlands, waters having the Preservation of Biological Habitats of Special Significance (BIOL) beneficial use designation, and receiving waters identified as ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(4) The receiving water limitations of Provision A.2;

(5) Known historical versus current physical, chemical, and biological water quality conditions;

(6) Available, relevant, and appropriately collected and analyzed physical, chemical, and biological receiving water monitoring data, including, but not limited to, data describing:

(a) Chemical constituents,

(b) Water quality parameters (i.e. pH, temperature, conductivity, etc.),

(c) Toxicity Identification Evaluations for both receiving water column and sediment,

(d) Trash impacts,

(e) Bioassessments, and

(f) Physical habitat;

(7) Available evidence of erosional impacts in receiving waters due to accelerated flows (i.e. hydromodification);

(8) Available evidence of adverse impacts to the chemical, physical, and biological integrity of receiving waters; and

(9) The potential improvements in the overall condition of the Watershed Management Area that can be achieved.

b. ASSESSMENT OF IMPACTS FROM MS4 DISCHARGES

The Copermittees must consider the following, at a minimum, to identify the potential impacts to receiving waters that may be caused or contributed to by discharges from the Copermittees' MS4s:

(1) The discharge prohibitions of Provision A.1 and effluent limitations of Provision A.3; and

(2) Available, relevant, and appropriately collected and analyzed storm water and non-storm water monitoring data from the Copermittees' MS4 outfalls;

(3) Locations of each Copermittee's MS4 outfalls that discharge to receiving waters;

(4) Locations of MS4 outfalls that are known to persistently discharge non-storm water to receiving waters likely causing or contributing to impacts on receiving water beneficial uses;

(5) Locations of MS4 outfalls that are known to discharge pollutants in storm water causing or contributing to impacts on receiving water beneficial uses; and

(6) The potential improvements in the quality of discharges from the MS4 that can be achieved.

c. IDENTIFICATION OF PRIORITY WATER QUALITY CONDITIONS

(1) The Copermittees must use the information gathered for Provisions B.2.a and B.2.b to develop a list of priority water quality conditions as pollutants, stressors and/or receiving water conditions that are the highest threat to receiving water quality or that most adversely affect the quality of receiving waters. The list must include the following information for each priority water quality condition:

(a) The beneficial use(s) associated with the priority water quality condition;

(b) The geographic extent of the priority water quality condition within the Watershed Management Area, if known;

(c) The temporal extent of the priority water quality condition (e.g., dry weather and/or wet weather);

(d) The Copermittees with MS4s discharges that may cause or contribute to the priority water quality condition; and

(e) An assessment of the adequacy of and data gaps in the monitoring data to characterize the conditions causing or contributing to the priority water quality condition, including a consideration of spatial and temporal variation.

(2) The Copermittees must identify the highest priority water quality conditions to be addressed by the Water Quality Improvement Plan, and provide a rationale for selecting a subset of the water quality conditions identified pursuant to Provision B.2.c.(1) as the highest priorities.

d. IDENTIFICATION OF MS4 SOURCES OF POLLUTANTS AND/OR STRESSORS

The Copermittees must identify and prioritize known and suspected sources of storm water and non-storm water pollutants and/or other stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c. The identification of known and suspected sources of pollutants and/or stressors that cause or contribute to the highest priority water quality conditions as identified for Provision B.2.c must consider the following:

(1) Pollutant generating facilities, areas, and/or activities within the Watershed Management Area, including:

(a) Each Copermittee's inventory of construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas,

(b) Publicly owned parks and/or recreational areas,

(c) Open space areas,

(d) All currently operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste, and

(e) Areas not within the Copermittees' jurisdictions (e.g., Phase II MS4s, tribal lands, state lands, federal lands) that are known or suspected to be discharging to the Copermittees' MS4s;

(2) Locations of the Copermittees' MS4s, including the following:

(a) All MS4 outfalls that discharge to receiving waters, and

(b) Locations of major structural controls for storm water and non-storm water (e.g., retention basins, detention basins, major infiltration devices, etc.);

(3) Other known and suspected sources of non-storm water or pollutants in storm water discharges to receiving waters within the Watershed Management Area, including the following:

(a) Other MS4 outfalls (e.g., Phase II Municipal and Caltrans),

(b) Other NPDES permitted discharges,

(c) Any other discharges that may be considered point sources (e.g., private outfalls), and

(d) Any other discharges that may be considered non-point sources (e.g., agriculture, wildlife or other natural sources);

(4) Review of available data, including but not limited to:

(a) Findings from the Copermittees' illicit discharge detection and elimination programs,

(b) Findings from the Copermittees' MS4 outfall discharge monitoring,

(c) Findings from the Copermittees' receiving water monitoring,

(d) Findings from the Copermittees' MS4 outfall discharge and receiving water assessments, and

(e) Other available, relevant, and appropriately collected data, information, or studies related to pollutant sources and/or stressors that contribute to the highest priority water quality conditions as identified for Provision B.2.c.

(5) The adequacy of the available data to identify and prioritize sources and/or stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c.

e. IDENTIFICATION OF POTENTIAL WATER QUALITY IMPROVEMENT STRATEGIES

The Copermittees must evaluate the findings identified under Provisions B.2.a-d, and identify potential strategies that can result in improvements to water quality

in MS4 discharges and/or receiving waters within the Watershed Management Area. Potential water quality improvement strategies that may be implemented within the Watershed Management Area must include the following:

(1) Structural BMPs, non-structural BMPs, incentives, or programs that can potentially be implemented to address the highest priority water quality conditions identified under Provision B.2.c, or MS4 sources of pollutants or stressors identified under Provision B.2.d,

(2) Retrofitting projects in areas of existing development within the Watershed Management Area that can potentially be implemented to reduce MS4 sources of pollutants or stressors identified under Provision B.2.d causing or contributing to the highest priority water quality conditions identified under Provision B.2.c, and

(3) Stream, channel, and/or habitat rehabilitation projects within the Watershed Management Area that can potentially be implemented to protect and/or improve conditions in receiving waters from MS4 pollutants and/or stressors identified under Provision B.2.d causing or contributing to the highest priority water quality conditions identified under Provision B.2.c.

3. Water Quality Improvement Goals, Strategies and Schedules

The Copermittees must identify and develop specific water quality improvement goals and strategies to address the highest priority water quality conditions identified within a Watershed Management Area. The water quality improvement goals and strategies must address the highest priority water quality conditions by effectively prohibiting non-storm water discharges to the MS4, reducing pollutants in storm water discharges from the MS4 to the MEP, and protecting the water quality standards of receiving waters.

a. WATER QUALITY IMPROVEMENT GOALS AND SCHEDULES

(1) Numeric Goals

The Copermittees must develop and incorporate numeric goals[6] into the Water Quality Improvement Plan. Numeric goals must be used to support Water Quality Improvement Plan implementation and measure reasonable progress towards addressing the highest priority water quality conditions identified under Provision B.2.c. The Copermittees must establish and

[6] Interim and final numeric goals may take a variety of forms such as TMDL established WQBELs, action levels, pollutant concentration, load reductions, number of impaired water bodies delisted from the List of Water Quality Impaired Segments, Index of Biotic Integrity (IBI) scores, or other appropriate metrics. Interim and final numeric goals are not necessarily limited to one criterion or indicator, but may include multiple criteria and/or indicators. Except for TMDL established WQBELs, interim and final numeric goals and corresponding schedules may be revised through the adaptive management process under Provision B.5.

incorporate the following numeric goals in the Water Quality Improvement Plan:

(a) Final numeric goals must be based on measureable criteria or indicators capable of demonstrating one or more of the following:

(i) Discharges from the Copermittees' MS4s will not cause or contribute to exceedances of water quality standards in receiving waters, AND/OR

(ii) The conditions of receiving waters and associated habitat are protected from MS4 discharges, AND/OR

(iii) Beneficial uses of receiving waters are protected from MS4 discharges and will be supported.

(b) Interim numeric goals must be based on measureable criteria or indicators capable of demonstrating reasonable incremental progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges as follows:

(i) One or more interim numeric goals may be established to demonstrate progress toward achieving each final numeric goal,

(ii) For each final numeric goal, at least one interim numeric goal must be expressed as a reasonable increment toward achievement of the final numeric goal,

(iii) For each final numeric goal, reasonable interim numeric goals must be established to be accomplished during each 5 year period between the acceptance of the Water Quality Improvement Plan and the achievement of the final numeric goals.

(2) Schedules for Achieving Numeric Goals

The Copermittees must develop and incorporate schedules for achieving the numeric goals into the Water Quality Improvement Plan. The schedules must demonstrate reasonable progress toward achieving the final numeric goals required for Provision B.3.a.(1). The Copermittees must incorporate the schedules for achieving the numeric goals into the Water Quality Improvement Plan based on the following considerations:

(a) Final dates for achieving all final numeric goals must be established considering the following:

(i) Final compliance dates for any applicable TMDLs in Attachment E to this Order;

(ii) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(iii) Achievement of the final numeric goals for the highest water quality priorities must be as soon as possible;

(iv) Final dates for achieving the final numeric goals must reflect a realistic assessment of the shortest practicable time required based on the temporal and spatial extent and factors associated with the highest priority water quality conditions identified under Provision B.2.c, and taking into account the time reasonably required to implement the water quality improvement strategies required pursuant to Provision B.3.b.

(b) Interim dates for achieving all interim numeric goals must be established considering the following:

(i) Interim compliance dates for any applicable TMDLs in Attachment E to this Order;

(ii) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(iii) Interim dates for achieving the interim numeric goals must reflect a realistic assessment of the shortest practicable time reasonably required, taking into account the time needed to implement new or significantly expanded programs and securing financing, if necessary; and

(iv) For each final numeric goal, at least one interim numeric goal must be established that the Copermittees will work toward achieving within the term of this Order.

b. WATER QUALITY IMPROVEMENT STRATEGIES AND SCHEDULES

Based on the likely effectiveness and efficiency of the potential water quality improvement strategies identified under Provision B.2.e to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a, the Copermittees must identify the strategies that will be implemented in each Watershed Management Area as follows:

(1) Jurisdictional Strategies

(a) Each Copermittee in the Watershed Management Area must identify the strategies that will be implemented within its jurisdiction as part of its jurisdictional runoff management program requirements under Provisions E.2 through E.7, including descriptions of the following:

(i) For each of the inventories developed for its jurisdiction, as required under Provisions D.2.a.(1), E.3.e.(2), E.4.b, and E.5.a, each Copermittee must identify the known and suspected areas or sources causing or contributing to the highest priority water quality conditions in the Watershed Management Area that the Copermittee will focus on in its efforts to effectively prohibit non-storm water discharges to its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, and achieve the interim and final numeric goals identified under Provision B.3.a;

(ii) BMPs that each Copermittee will implement, or require to be implemented, as applicable, for those areas or sources within its jurisdiction;

(iii) Education programs that each Copermittee will implement, as applicable, for those areas or sources within its jurisdiction;

(iv) Frequencies that each Copermittee will conduct inspections on those areas or sources within its jurisdiction;

(v) Incentive and enforcement programs that each Copermittee will implement, as applicable, for those areas or sources within its jurisdiction; and

(vi) Any other BMPs, incentives, or programs that each Copermittee will implement for those areas or sources within its jurisdiction.

(b) Identify the optional jurisdictional strategies that each Copermittee will implement within its jurisdiction, as necessary, to effectively prohibit non-storm water discharges to its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. Descriptions of the optional jurisdictional strategies must include:

(i) BMPs, incentives, or programs that may be implemented by the Copermittee within its jurisdiction in addition to the requirements of Provisions B.3.b.(1)(a);

(ii) Incentives or programs that may be implemented by the Copermittee to encourage or implement projects to retrofit areas of existing development within its jurisdiction;

(iii) Incentives or programs that may be implemented by the Copermittee to encourage or implement projects that will rehabilitate the conditions of channels or habitats within its jurisdiction;

(iv) The funds and/or resources that must be secured by the Copermittee to implement the optional strategies described for Provisions B.3.b.(1)(b)(i)-(iii) within its jurisdiction; and

(v) The circumstances necessary to trigger implementation of the optional jurisdictional strategies, in addition to the requirements of Provision B.3.b.(1)(a), to achieve the interim and final numeric goals within the schedules established under Provision B.3.a.

(c) Identify the strategies that will be implemented by the Copermittee in coordination with or with the cooperation of other agencies (e.g. Caltrans, water districts, school districts) and/or entities (e.g. non-governmental organizations) within its jurisdiction.

(2) Watershed Management Area Strategies

The Copermittees must identify the optional regional or multi-jurisdictional strategies that will be implemented in the Watershed Management Area, as necessary, to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. Descriptions of the optional regional or multi-jurisdictional strategies must include:

(a) Regional or multi-jurisdictional BMPs, incentives, or programs that may be implemented by the Copermittees in the Watershed Management Area;

(b) Incentives or programs that may be implemented by the Copermittees in the Watershed Management Area to encourage or implement regional or multi-jurisdictional projects to retrofit areas of existing development;

(c) Incentives or programs that may be implemented by the Copermittees to encourage or implement regional or multi-jurisdictional projects that will rehabilitate the conditions of channels, streams, or habitats within the Watershed Management Area;

(d) The funds and/or resources that must be secured by the Copermittees to implement the optional strategies described for Provisions B.3.b.(2)(a)-(c) within the Watershed Management Area; and

(e) The circumstances necessary to trigger implementation of the optional regional or multi-jurisdictional strategies to achieve the interim and final numeric goals within the schedules established under Provision B.3.a.

(3) Schedules for Implementing Strategies

The Copermittees must develop reasonable schedules for implementing the water quality improvement strategies identified under Provisions B.3.b.(1) and B.3.b.(2) to achieve the interim and final numeric goals identified and

schedules established under Provision B.3.a. The Copermittees must incorporate the schedules to implement the water quality improvement strategies into the Water Quality Improvement Plan as follows:

(a) Each Copermittee must develop schedules for the jurisdictional strategies identified pursuant to Provisions B.3.b.(1)(a)-(b). Each schedule must specify:

(i) If each jurisdictional strategy identified pursuant to Provision B.3.b.(1)(a) will or will not be initiated upon acceptance of the Water Quality Improvement Plan;

(ii) For each jurisdictional strategy identified pursuant to Provision B.3.b.(1)(a) that will not be initiated upon approval of the Water Quality Improvement Plan, the shortest practicable time in which each jurisdictional strategy will be initiated after acceptance of the Water Quality Improvement Plan;

(iii) For each optional jurisdictional strategy identified pursuant to Provision B.3.b.(1)(b), a realistic assessment of the shortest practicable time required to:

[a] Secure the resources needed to fund the optional jurisdictional strategy, and
[b] Procure the resources, materials, labor, and applicable permits necessary to initiate implementation of the optional jurisdictional strategy;

(iv) If each jurisdictional strategy identified pursuant to Provisions B.3.b.(1)(a)-(b) is expected to be continuously implemented (e.g. inspections) or completed within a schedule (e.g. construction of structural BMP); and

(v) If a jurisdictional strategy identified pursuant to Provisions B.3.b.(1)(a)-(b) is expected to be completed within a schedule, the anticipated time to complete based on a realistic assessment of the shortest practicable time required.

(b) The Copermittees in the Watershed Management Area must develop schedules for the regional or multi-jurisdictional strategies identified pursuant to Provision B.3.b.(2). Each schedule must specify:

(i) A realistic assessment of the shortest practicable time to:

[a] Secure the resources needed to fund the optional regional or multi-jurisdictional strategy, and
[b] Procure the resources, materials, labor, and permits necessary to initiate the implementation of the optional regional or multi-jurisdictional strategy;

(ii) If each regional or multi-jurisdictional strategy identified pursuant to Provision B.3.b.(2) is expected to be continuously implemented (e.g. inspections) or completed within a schedule (e.g. construction of structural BMP); and

(iii) If a regional or multi-jurisdictional strategy and/or activity identified pursuant to Provisions B.3.b.(2) is expected to be completed within a schedule, the anticipated time to complete based on a realistic assessment of the shortest practicable time required.

(4) Optional Watershed Management Area Analysis

(a) For each Watershed Management Area, the Copermittees have the option to perform a Watershed Management Area Analysis for the purpose of developing watershed-specific requirements for structural BMP implementation, as described in Provision E.3.c.(3). The Watershed Management Area Analysis must include GIS layers (maps) as output. The analysis must include the following information, to the extent it is available, in order to characterize the Watershed Management Areas:

(i) A description of dominant hydrologic processes, such as areas where infiltration or overland flow likely dominates;

(ii) A description of existing streams in the watershed, including bed material and composition, and if they are perennial or ephemeral;

(iii) Current and anticipated future land uses;

(iv) Potential coarse sediment yield areas; and

(v) Locations of existing flood control structures and channel structures, such as stream armoring, constrictions, grade control structures, and hydromodification or flood management basins.

(b) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify and compile a list of candidate projects that could potentially be used as alternative compliance options for Priority Development Projects, to be implemented in lieu of onsite structural BMP performance requirements described in Provisions E.3.c.(1) and E.3.c.(2). Specifically, the Copermittees must identify opportunities to be included in the list of candidate projects in each Watershed Management Area, such as:

(i) Stream or riparian area rehabilitation;

(ii) Retrofitting existing infrastructure to incorporate storm water retention or treatment;

(iii) Regional BMPs;

(iv) Groundwater recharge projects;

(v) Water supply augmentation projects; and

(vi) Land purchases to preserve floodplain functions.

(c) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify areas within the Watershed Management Area where it is appropriate to allow Priority Development Projects to be exempt from the hydromodification management BMP performance requirements described in Provision E.3.c.(2), including supporting rationale.

4. Water Quality Improvement Monitoring and Assessment Program

a. The Copermittees in each Watershed Management Area must develop and incorporate an integrated monitoring and assessment program into the Water Quality Improvement Plan that assesses: 1) the progress toward achieving the numeric goals and schedules, 2) the progress toward addressing the highest priority water quality conditions for each Watershed Management Area, and 3) each Copermittee's overall efforts to implement the Water Quality Improvement Plan.

b. The monitoring and assessment program must incorporate the monitoring and assessment requirements of Provision D, which may allow the Copermittees to modify the program to be consistent with and focus on the highest priority water quality conditions for each Watershed Management Area.

c. For Watershed Management Areas with applicable TMDLs, the monitoring and assessment program must incorporate the specific monitoring and assessment requirements of Attachment E.

d. For Watershed Management Areas with any ASBS, the water quality monitoring and assessment program must incorporate the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

5. Iterative Approach and Adaptive Management Process

The Copermittees in each Watershed Management Area must implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a, and must include the following:

a. RE-EVALUATION OF PRIORITY WATER QUALITY CONDITIONS

The priority water quality conditions and potential water quality improvement strategies included in the Water Quality Improvement Plan pursuant to Provisions B.2.c and B.2.e may be re-evaluated by the Copermittees as needed during the term of this Order as part of the Water Quality Improvement Plan Annual Report. Re-evaluation and recommendations for modifications to the priority water quality conditions and potential water quality improvement strategies must be provided in the Report of Waste Discharge, and must consider the following:

(1) Achieving the outcome of improved water quality in MS4 discharges and receiving waters through implementation of the water quality improvement strategies identified in the Water Quality Improvement Plan;

(2) New information developed when the requirements of Provisions B.2.a-c have been re-evaluated;

(3) Spatial and temporal accuracy of monitoring data collected to inform prioritization of water quality conditions and implementation strategies to address the highest priority water quality conditions;

(4) Availability of new information and data from sources other than the jurisdictional runoff management programs within the Watershed Management Area that informs the effectiveness of the actions implemented by the Copermittees;

(5) San Diego Water Board recommendations; and

(6) Recommendations for modifications solicited through a public participation process.

b. ADAPTATION OF GOALS, STRATEGIES AND SCHEDULES

The water quality improvement goals, strategies and schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.3, must be re-evaluated and adapted as new information becomes available to result in more effective and efficient measures to address the highest priority water quality conditions identified pursuant to Provision B.2.c. Re-evaluation of and modifications to the water quality improvement goals, strategies and schedules must be provided in the Water Quality Improvement Plan Annual Report, and must consider the following:

(1) Modifications to the priority water quality conditions based on Provision B.5.a;

(2) Progress toward achieving interim and final numeric goals in receiving waters and MS4 discharges for the highest priority water quality conditions in the Watershed Management Area,

(3) Progress toward achieving outcomes according to established schedules;

(4) New policies or regulations that may affect identified numeric goals;

(5) Measurable or demonstrable reductions of non-storm water discharges to and from each Copermittee's MS4;

(6) Measurable or demonstrable reductions of pollutants in storm water discharges from each Copermittee's MS4 to the MEP;

(7) New information developed when the requirements of Provisions B.2.b and B.2.d have been re-evaluated;

(8) Efficiency in implementing the Water Quality Improvement Plan;

(9) San Diego Water Board recommendations; and

(10) Recommendations for modifications solicited through a public participation process.

c. ADAPTATION OF MONITORING AND ASSESSMENT PROGRAM

The water quality improvement monitoring and assessment program, included in the Water Quality Improvement Plan pursuant to Provision B.4, must be re-evaluated and adapted when new information becomes available. Re-evaluation and recommendations for modifications to the monitoring and assessment program, pursuant to the requirements of Provision D, may be provided in the Water Quality Improvement Plan Annual Report, but must be provided in the Report of Waste Discharge.

6. Water Quality Improvement Plan Submittal, Updates, and Implementation

a. The Copermittees must submit and commence implementation of the Water Quality Improvement Plans in accordance with the requirements of Provision F.1.

b. The Copermittees must submit proposed updates to the Water Quality Improvement Plan for acceptance by the San Diego Water Board Executive Officer in accordance with the requirements of Provision F.2.c.

C. ACTION LEVELS

The purpose of this provision is for the Copermittees to incorporate numeric action levels in the Water Quality Improvement Plans. The goal of the action levels is to guide Water Quality Improvement Plan implementation efforts and measure progress towards the protection of water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through monitoring and assessing the quality of the MS4 discharges during the implementation of the Water Quality Improvement Plans.

1. Non-Storm Water Action Levels[7]

The Copermittees must develop and incorporate numeric non-storm water action levels (NALs) into the Water Quality Improvement Plan to: 1) support the development and prioritization of water quality improvement strategies for effectively prohibiting non-storm water discharges to the MS4s, 2) assess the effectiveness of the water quality improvement strategies toward addressing MS4 non-storm water discharges, required pursuant to Provision D.4.b.(1), and 3) support the detection and elimination of non-storm water and illicit discharges to the MS4, required pursuant to Provision E.2.[8]

a. The following NALs must be incorporated:

(1) Non-Storm Water Discharges from MS4s to Ocean Surf Zone

Table C-1. Non-Storm Water Action Levels for Discharges from MS4s to Ocean Surf Zone

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Total Coliform	MPN/100 ml	1,000	-	10,000/1,000[1]	OP
Fecal Coliform	MPN/100 ml	200[2]	-	400	OP
Enterococci	MPN/100 ml	35	-	104[3]	OP

Abbreviations/Acronyms
AMAL – average monthly action level
MDAL – maximum daily action level
OP – Ocean Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Total coliform density NAL is 1,000 MPN/100 ml when the fecal/total coliform ratio exceeds 0.1.
2. Fecal coliform density NAL is 200 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas."

[7] NALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, unless the NAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed.
[8] The Copermittees may utilize NALs or other benchmarks currently established by the Copermittees as interim NALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

(2) Non-Storm Water Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Table C-2. Non-Storm Water Action Levels for Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Turbidity	NTU	75	-	225	OP
pH	Units	Within limit of 6.0 to 9.0 at all times			OP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	35	-	104[3]	BP
Priority Pollutants	µg/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
OP – Ocean Plan water quality objective
NTU – Nephelometric Turbidity Units
µg/L – micrograms per liter
MDAL – maximum daily action level
BP – Basin Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas" and is not applicable to water bodies that are not designated with the water contact recreation (REC-1) beneficial use.

Table C-3. Non-Storm Water Action Levels for Priority Pollutants

Parameter	Units	Freshwater (CTR)		Saltwater (CTR)	
		MDAL	AMAL	MDAL	AMAL
Cadmium	µg/L	**	**	16	8
Copper	µg/L	*	*	5.8	2.9
Chromium III	µg/L	**	**	-	-
Chromium VI	µg/L	16	8.1	83	41
Lead	µg/L	*	*	14	2.9
Nickel	µg/L	**	**	14	6.8
Silver	µg/L	*	*	2.2	1.1
Zinc	µg/L	*	*	95	47

Abbreviations/Acronyms:
CTR – California Toxic Rule
AMAL – average monthly action level
µg/L – micrograms per liter
MDAL – maximum daily action level

Notes:
* Action levels developed on a case-by-case basis (see below)
** Action levels developed on a case-by-case basis (see below), but calculated criteria are not to exceed Maximum Contaminant Levels (MCLs) under the California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64431

The Cadmium, Copper, Chromium (III), Lead, Nickel, Silver and Zinc NALs for MS4 discharges to freshwater receiving waters will be developed on a case-by-case basis based on site-specific water quality data (receiving water hardness). For these priority pollutants, refer to 40 CFR 131.38(b)(2).

(3) Non-Storm Water Discharges from MS4s to Inland Surface Waters

Table C-4. Non-Storm Water Action Levels for Discharges from MS4s to Inland Surface Waters

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Dissolved Oxygen	mg/L	Not less than 5.0 in WARM waters and not less than 6.0 in COLD waters			BP
Turbidity	NTU	-	20	See MDAL	BP
pH	Units	Within limit of 6.5 to 8.5 at all times			BP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	33	-	61[3]	BP
Total Nitrogen	mg/L	-	1.0	See MDAL	BP
Total Phosphorus	mg/L	-	0.1	See MDAL	BP
MBAS	mg/L	-	0.5	See MDAL	BP
Iron	mg/L	-	0.3	See MDAL	BP
Manganese	mg/L	-	0.05	See MDAL	BP
Priority Pollutants	µg/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
BP – Basin Plan water quality objective
COLD – cold freshwater habitat beneficial use
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
MDAL – maximum daily action level
WARM – warm freshwater habitat beneficial use
MBAS – Methylene Blue Active Substances
MPN/100 ml – most probable number per 100 milliliters
µg/L – micrograms per liter

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for freshwater "designated beach areas" and is not applicable to water bodies that are not designated with the water contact recreation (REC-1) beneficial use.

b. If not identified in Provision C.1.a, NALs must be identified, developed and incorporated in the Water Quality Improvement Plan for any pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in receiving waters associated with the highest priority water quality conditions related to non-storm water discharges from the MS4s. NALs must be based on:

(1) Applicable water quality standards which may be dependent upon site-specific or receiving water-specific conditions or assumptions to be identified by the Copermittees; or

(2) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the NALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary NALs specific to the Watershed Management Area at levels greater than the NALs required by Provisions C.1.a and C.1.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for effectively prohibiting non-storm water discharges to the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and from the MS4. The

secondary NALs may be developed using an approach acceptable to the San Diego Water Board.

d. Dry weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.b may be utilized to develop or revise NALs based on watershed-specific data, subject to San Diego Water Board Executive Officer approval.

2. Storm Water Action Levels[9]

The Copermittees must develop and incorporate numeric storm water action levels (SALs) in the Water Quality Improvement Plans to: 1) support the development and prioritization of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s, and 2) assess the effectiveness of the water quality improvement strategies toward reducing pollutants in storm water discharges, required pursuant to Provision D.4.b.(2).[10]

a. The following SALs for discharges of storm water from the MS4 must be incorporated:

Table C-5. Storm Water Action Levels for Discharges from MS4s to Receiving Waters

Parameter	Units	Action Level
Turbidity	NTU	126
Nitrate & Nitrite (Total)	mg/L	2.6
Phosphorus (Total P)	mg/L	1.46
Cadmium (Total Cd)*	µg/L	3.0
Copper (Total Cu)*	µg/L	127
Lead (Total Pb)*	µg/L	250
Zinc (Total Zn)*	µg/L	976

Abbreviations/Acronyms:
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
µg/L – micrograms per liter

Notes:
* The sampling must include a measure of receiving water hardness at each MS4 outfall. If a total metal concentration exceeds the corresponding metals SAL in Table C-5, that concentration must be compared to the California Toxics Rule criteria and the USEPA 1-hour maximum concentration for the detected level of receiving water hardness associated with that sample. If it is determined that the sample's total metal concentration for that specific metal exceeds that SAL, but does not exceed the applicable USEPA 1-hour maximum concentration criterion for the measured level of hardness, then the sample result will not be considered above the SAL for that measurement.

[9] SALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, unless the SAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed.
[10] The Copermittees may utilize SALs or other benchmarks currently established by the Copermittees as interim SALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

b. If not identified in Provision C.2.a, SALs must be identified, developed and incorporated in the Water Quality Improvement Plan for pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in receiving waters associated with the highest priority water quality conditions related to storm water discharges from the MS4s. SALs must be based on:

(1) Federal and State water quality guidance and/or water quality standards; and

(2) Site-specific or receiving water-specific conditions; or

(3) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the SALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary SALs specific to the Watershed Management Area at levels greater than the SALs required by Provisions C.2.a and C.2.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s. The secondary SALs may be developed based on the approaches recommended by the State Water Board's Storm Water Panel[11] or using an approach acceptable to the San Diego Water Board.

d. Wet weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.c may be used to develop or revise SALs based upon watershed-specific data, subject to San Diego Water Board Executive Officer approval.

[11] Storm Water Panel Recommendations to the California State Water Resources Control Board: The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities (June 2006)

D. MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS

The purpose of this provision is for the Copermittees to monitor and assess the impact on the conditions of receiving waters caused by discharges from the Copermittees' MS4s under wet weather and dry weather conditions. The goal of the monitoring and assessment program is to inform the Copermittees about the nexus between the health of receiving waters and the water quality condition of the discharges from their MS4s. This goal will be accomplished through monitoring and assessing the conditions of the receiving waters, discharges from the MS4s, pollutant sources and/or stressors, and effectiveness of the water quality improvement strategies implemented as part of the Water Quality Improvement Plans.

1. Receiving Water Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the condition of the receiving waters in each Watershed Management Area during dry weather and wet weather. Following San Diego Water Board acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct long-term receiving water monitoring during implementation of the Water Quality Improvement Plan to assess the long term trends and determine if conditions in receiving waters are improving. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following receiving water monitoring procedures:

a. TRANSITIONAL RECEIVING WATER MONITORING

Until the monitoring requirements and schedules of Provisions D.1.b-e are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following receiving water monitoring in the Watershed Management Area:

(1) Continue the receiving water monitoring programs required in Order Nos. R9-2007-0001 (Monitoring and Reporting Program No. R9-2007-0001 Sections II.A.1-A.5), R9-2009-0002, and R9-2010-0016;

(2) Continue the monitoring in the Hydromodification Management Plans approved by the San Diego Water Board;

(3) Participate in the following regional receiving water monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring,

(b) Southern California Bight Regional Monitoring, and

(c) Sediment Quality Monitoring;

(4) Implement the monitoring programs developed as part of any implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) for the TMDLs in Attachment E to this Order; and

(5) For Watershed Management Areas with ASBS, implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

b. LONG-TERM RECEIVING WATER MONITORING STATIONS

The Copermittees must select at least one long-term receiving water monitoring station from among the existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees to be representative of the receiving water quality in the Watershed Management Area. Additional long-term receiving water monitoring stations must be selected where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

c. DRY WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three dry weather monitoring events at each of the long-term receiving water monitoring stations. At least one monitoring event must be conducted during the dry season (May 1 – September 30) and at least one monitoring event must be conducted during a dry weather period during the wet season (October 1 – April 30), after the first wet weather event of the season, with an antecedent dry period of at least 72 hours following a storm event producing measureable rainfall of greater than 0.1 inch.

(1) Dry Weather Receiving Water Field Observations

For each dry weather monitoring event, the Copermittees must record field observations consistent with Table D-1 at each long-term receiving water monitoring station.

Table D-1. Field Observations for Receiving Water Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) • Station description (i.e. deposits or stains, vegetation condition, structural condition, and observable biology) • Presence and assessment of trash in and around station

(2) Dry Weather Receiving Water Field Monitoring

For each dry weather monitoring event, if conditions allow the collection of the data, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

Table D-2. Field Monitoring Parameters for Receiving Water Monitoring Stations

Parameters
• pH • Temperature • Specific conductivity • Dissolved oxygen • Turbidity

(3) Dry Weather Receiving Water Analytical Monitoring

For each dry weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable NAL constituents, and

(v) Constituents listed in Table D-3.

Table D-3. Analytical Monitoring Constituents for Receiving Water Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Pesticides	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Mercury • Nickel • Selenium • Thallium • Zinc	• Organophosphate Pesticides • Pyrethroid Pesticides	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(4) Dry Weather Receiving Water Toxicity Monitoring

For each dry weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for aquatic toxicity in accordance with Table D-4. When the State Water Board's Policy for Toxicity Assessment and Control (Toxicity Policy) is approved and in effect, the San Diego Water Board Executive Officer may direct the Copermittees to replace current toxicity program elements with standardized procedures in the Toxicity Policy.

Table D-4. Dry Weather Chronic[1] Toxicity Testing for Receiving Water Monitoring Stations

Organism	Units	Test	USEPA Protocol
Freshwater			
Pimephales promelas (Fathead Minnow)	Pass / Fail	Larval Survival and Growth	EPA-821-R-02-013
Ceriodaphnia dubia (*Daphnid*)	Pass / Fail	Survival and Production	EPA-821-R-02-013
Selenastrum capricornutum (Green Algae)	Pass / Fail	Growth	EPA-821-R-02-013
Marine and Estuarine			
Strongylocentrotus purpuratus *(Purple Sea Urchin)*	Pass / Fail	Embryo-Larval Development	EPA-600-R-95-136

Notes:
1. Chronic toxicity testing is not required at receiving water monitoring stations located at mass loading stations if the channel flows are diverted year-round during dry weather conditions to the sanitary sewer for treatment.

(a) Freshwater Test Species and Methods: If samples are collected in receiving waters with salinity less than 1 ppt, the Copermittees must follow the methods for chronic toxicity tests as established in 40 CFR 136.3 using a single-concentration test design for routine monitoring, or a five-concentration test design for additional toxicity testing if the limitation is exceeded. The Copermittees must estimate the critical life stage chronic toxicity on undiluted samples in accordance with species and short term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms (EPA-821-R-02-013; Table IA, 40 CFR 136). Additional test species may be used by the Copermittees if approved by the San Diego Water Board Executive Officer. The Copermittees must conduct:

(i) A static renewal toxicity test with the fathead minnow, *Pimephales promelas* (Larval Survival and Growth Test Method 1000.0);

(ii) A static renewal toxicity test with the daphnid, *Ceriodaphnia dubia* (Survival and Reproduction Test Method 1002.0); and

(iii) A static renewal toxicity test with the green alga, *Selenastrum capricornutum* (also named *Raphidocelis subcapitata*) (Growth Test Method 1003.0).

(b) Marine and Estuarine Test Species and Methods: If samples are collected in receiving waters with salinity greater or equal to 1 ppt, the Copermittees must follow the methods for chronic toxicity tests as established in 40 CFR 136.3 using a single-concentration test design for routine monitoring, or a five-concentration test design for additional toxicity testing if the limitation is exceeded. The Copermittees must conduct the following critical life state chronic toxicity tests on undiluted samples in accordance with species and short term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms (EPA-600-R-95-136; 1995). Artificial sea salts must be used to increase sample salinity. The Copermittees must conduct a static non-renewal toxicity test with the purple sea urchin, *Strongylocentrotus purpuratus* (Embryo-larval Development Test Method). Additional species may be used by the Copermittees if approved by the San Diego Water Board Executive Officer.

(c) Holding Times: All toxicity tests must be conducted as soon as possible following sample collection. The 36-hour sample holding time for test initiation shall be targeted. However, no more than 72 hours shall elapse before the conclusion of sample collection and test initiation.

(d) Test Species Sensitivity Screening: To determine the most sensitive test species for freshwater, the Copermittees must screen 2 wet weather and 2 dry weather toxicity tests with a vertebrate, an invertebrate, and a plant species. After this screening period, subsequent monitoring must be conducted using the most sensitive test species. Alternatively, if a sensitive test species has already been determined, or if there is prior knowledge of potential toxicant(s) and a test species is sensitive to such toxicant(s), then monitoring must be conducted using only that test species. Sensitive test species determinations must also consider the most sensitive test species used for proximal receiving water monitoring. Rescreening must occur once each permit term.

(e) Chronic toxicity test biological endpoint data must be analyzed using the Test of Significant Toxicity t-test approach specified in *National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document* (USEPA, Office of Wastewater Management, Washington, D.C., EPA-833-R-10-003, 2010). For this monitoring program, the critical chronic instream waste concentration (IWC) is set at 100 percent receiving water (i.e. no dilution) for receiving water samples. A 100 percent receiving water and a control must be tested.

(f) Toxicity Identification Evaluation (TIE) / Toxicity Reduction Evaluation (TRE): If chronic toxicity is detected in receiving waters, the Copermittees must discuss the need for conducting a TIE/TRE in the assessments required under Provision D.4.a.(2), and develop a plan for implementing the TIE/TRE to be incorporated in the Water Quality Improvement Plan.

(5) Dry Weather Receiving Water Bioassessment Monitoring

Bioassessment monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must conduct bioassessment monitoring during at least one dry weather monitoring event at each long-term receiving water monitoring station as follows:

(a) The following bioassessment samples and measurements must be collected:

(i) Macroinvertebrate samples must be collected in accordance with the "Reachwide Benthos (Multihabitat) Procedure" in the most current Surface Water Ambient Monitoring Program (SWAMP) Bioassessment Standard Operating Procedures (SOP), and amendments, as applicable;[12]

(ii) The "Full" suite of physical habitat characterization measurements must be collected in accordance with the most current SWAMP Bioassessment SOP, and as summarized in the SWAMP Stream Habitat Characterization Form – Full Version;[13] and

(iii) Freshwater algae samples must be collected in accordance with the SWAMP Standard Operating Procedures for Collecting Algae Samples.[14] Analysis of samples must include algal taxonomic composition (diatoms and soft algae) and algal biomass.

(b) The bioassessment samples, measurements, and appropriate water chemistry data must be used to calculate the following:

(i) An Index of Biological Integrity (IBI) for macroinvertebrates for each monitoring station where bioassessment monitoring was conducted, based on the most current calculation method;[15] and

[12] Ode, P.R.. 2007. Standard operating procedures for collecting macroinvertebrate samples and associated physical and chemical data for ambient bioassessments in California. California State Water Resources Control Board Surface Water Ambient Monitoring Program (SWAMP) Bioassessment SOP 001. http://www.swrcb.ca.gov/water_issues/programs/swamp/tools.shtml#monitoring

[13] Available at: http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/reports/fieldforms_fullversion052908.pdf

[14] Fetscher et al. 2009. Standard Operating Procedures for Collecting Stream Algae Samples and Associated Physical Habitat and Chemical Data for Ambient Bioassessments in California.

[15] The most current calculation method at the time the Order was adopted is outlined in "A Quantitative Tool for Assessing the Integrity of Southern California Coastal Streams" (Ode, et al. 2005. Environmental Management. Vol. 35, No. 1, pp. 1-13). If an updated or new calculation method is developed, either both (i.e. current and updated/new) methods must be used, or historical IBIs must be recalculated with the updated or new calculation method.

(ii) An IBI for algae for each monitoring station where bioassessment monitoring was conducted, when a calculation method is developed.[16]

(c) In lieu of the requirements of Provision D.1.c.(5)(a), the Copermittees may conduct the bioassessment monitoring in accordance with the "Triad" assessment approach[17] to calculate the IBIs required for Provision D.1.c.(5)(b). The Copermittees must conduct sampling, analysis, and reporting of specified in-stream biological and habitat data according to the protocols specified in the SCCWRP Technical Report No. 539, or subsequent protocols, if developed.

(6) Dry Weather Receiving Water Hydromodification Monitoring

In addition to the hydromodification monitoring conducted as part of the Copermittees' Hydromodification Management Plans, hydromodification monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must collect the following hydromodification monitoring observations and measurements within an appropriate domain of analysis during at least one dry weather monitoring event for each long-term receiving water monitoring station:

(a) Channel conditions, including:

(i) Channel dimensions,

(ii) Hydrologic and geomorphic conditions, and

(iii) Presence and condition of vegetation and habitat;

(b) Location of discharge points;

(c) Habitat integrity;

(d) Photo documentation of existing erosion and habitat impacts, with location (i.e. latitude and longitude coordinates) where photos were taken;

(e) Measurement or estimate of dimensions of any existing channel bed or bank eroded areas, including length, width, and depth of any incisions; and

[16] When a calculation method is developed, IBIs must be calculated for all available and appropriate historical data.
[17] Stormwater Monitoring Coalition Model Monitoring Technical Committee, 2004. Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California. Technical Report #419. August 2004.

(f) Known or suspected cause(s) of existing downstream erosion or habitat impact, including flow, soil, slope, and vegetation conditions, as well as upstream land uses and contributing new and existing development.

d. WET WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three wet weather monitoring events at each long-term receiving water monitoring station. At least one wet weather monitoring event must be conducted during the first wet weather event of the wet season (October 1 – April 30), and at least one wet weather monitoring event during a wet weather event that occurs after February 1.

(1) Wet Weather Receiving Water Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each long-term receiving water monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event;

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(d) Presence and assessment of trash in and around station.

(2) Wet Weather Receiving Water Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

(3) Wet Weather Receiving Water Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) Constituents listed in Table D-3.

(4) Wet Weather Receiving Water Toxicity Monitoring

For each wet weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for chronic aquatic toxicity in accordance with Provisions D.1.c.(4)(a)-(f).

e. OTHER RECEIVING WATER MONITORING REQUIREMENTS

(1) Regional Monitoring

The Copermittees must participate in the following regional receiving waters monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring; and

(b) Southern California Bight Regional Monitoring.

(2) Sediment Quality Monitoring

The Copermittees must perform sediment monitoring to assess compliance with sediment quality receiving water limits applicable to MS4 discharges to enclosed bays and estuaries. The monitoring may be performed either by individual or multiple Copermittees to assess compliance with receiving water limits, or through participation in a water body monitoring coalition. A Sediment Monitoring Plan which satisfies the requirements of the State Water Board's Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part 1 Sediment Quality (Sediment Control Plan) must be submitted as part of the monitoring and assessment program in the Water Quality Improvement Plan.

(a) The Sediment Monitoring Plan design must include the following:

(i) The elements required under Section VII.D (Receiving Water Limits Monitoring Frequency) and Section VII.E (Sediment Monitoring) of the Sediment Control Plan;

(ii) A Quality Assurance Project Plan (QAPP) describing the project objectives and organization, functional activities, and quality assurance/quality control protocols for the water and sediment monitoring; and

(iii) A schedule for completion of all sample collection and analysis activities and submission of Sediment Monitoring Reports.

(b) The Copermittees must implement the Sediment Monitoring Plan in accordance with the schedule contained in the Sediment Monitoring Plan, unless otherwise directed in writing by the San Diego Water Board Executive Officer.

(c) The Copermittees must incorporate a Sediment Monitoring Report as part of the Water Quality Improvement Plan Annual Report in accordance with the schedule contained in the Sediment Monitoring Plan, unless otherwise directed in writing by the San Diego Water Board Executive Officer. The Sediment Monitoring Report must contain the following information:

(i) Analysis: An evaluation, interpretation and tabulation of the water and sediment monitoring data, including interpretations and conclusions as to whether applicable Receiving Water Limitations in this Order have been attained at each sample station;

(ii) Sample Location Map: The locations, type, and number of samples must be identified and shown on a site map; and

(iii) California Environmental Data Exchange Network: A statement certifying that the monitoring data and results have been uploaded into the California Environmental Data Exchange Network (CEDEN).

(d) Based on the Sediment Monitoring Report conclusions the San Diego Water Board may require a human health risk assessment to determine if the human health objective contained in Receiving Water Limitations in Provision A.2.a.(3)(b)(ii) has been attained at each sample station. In conducting a risk assessment, the Copermittees must consider any applicable and relevant information, including California Environmental Protection Agency's (Cal/EPA) Office of Environmental Health Hazard Assessment (OEHHA) policies for fish consumption and risk assessment, Cal/EPA's Department of Toxic Substances Control (DTSC) Risk Assessment, and USEPA Human Health Risk Assessment policies.

(3) ASBS Monitoring

For Watershed Management Areas with ASBS, the Copermittees must implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

f. ALTERNATIVE WATERSHED MONITORING REQUIREMENTS

The San Diego Water Board may direct the Copermittees to participate in an effort to develop alternative watershed monitoring with other regulated entities, other interested parties, and the San Diego Water Board to refine, coordinate, and implement regional monitoring and assessment programs to determine the status and trends of water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams.

2. MS4 Outfall Discharge Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the discharges from the MS4 outfalls in each Watershed Management Area during dry weather and wet weather. Following San Diego Water Board acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct MS4 outfall discharge monitoring during implementation of the Water Quality Improvement Plan to assess the effectiveness of their jurisdictional runoff

management programs toward effectively prohibiting non-storm water discharges into the MS4 and reducing pollutants in storm water discharges from their MS4s to the MEP. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following MS4 outfall monitoring procedures:

a. TRANSITIONAL MS4 OUTFALL DISCHARGE MONITORING

Until the monitoring requirements and schedules of Provisions D.2.b-c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following MS4 outfall discharge monitoring in the Watershed Management Area:

(1) MS4 Outfall Discharge Monitoring Station Inventory

Each Copermittee must identify all major MS4 outfalls that discharge directly to receiving waters within its jurisdiction and geo-locate those outfalls on a map of the MS4 pursuant to Provision E.2.b.(1). This information must be compiled into a MS4 outfall discharge monitoring station inventory, and must include the following information:

(a) Latitude and longitude of MS4 outfall point of discharge;

(b) Watershed Management Area;

(c) Hydrologic subarea;

(d) Outlet size;

(e) Accessibility (i.e. safety and without disturbance of critical habitat);

(f) Approximate drainage area; and

(g) Classification of whether the MS4 outfall is known to have persistent dry weather flows, transient dry weather flows, no dry weather flows, or unknown dry weather flows.

(2) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Until the monitoring requirements and schedules of Provision D.2.b are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, each Copermittee must perform dry weather MS4 outfall field screening monitoring to identify non-storm water and illicit discharges within its jurisdiction in accordance with

Provision E.2.c, to determine which discharges are transient flows and which are persistent flows, and prioritize the dry weather MS4 discharges that will be investigated and eliminated in accordance with Provision E.2.d.

(a) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Frequency

Each Copermittee must field screen the MS4 outfalls in its inventory developed pursuant to Provision D.2.a.(1) as follows:

(i) For Copermittees with less than 125 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 80 percent of the outfalls must be visually inspected two times per year during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv).

(ii) For Copermittees with 125 major MS4 outfalls or more, but less than or equal to 500 that discharge to receiving waters within a Watershed Management Area, all the outfalls must be visually inspected at least annually during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv).

(iii) For Copermittees with more than 500 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 500 outfalls must be visually inspected at least annually during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv). Copermittees with more than 500 major MS4 outfalls within a Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(iv) For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major MS4 outfalls within its jurisdiction, at least 500 major MS4 outfalls within its inventory must be visually inspected at least annually during dry

weather conditions. Copermittees with more than 500 major MS4 outfalls in more than one Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(v) Inspections of major MS4 outfalls conducted in response to public reports and staff or contractor reports and notifications may count toward the required visual inspections of MS4 outfall discharge monitoring stations.

(b) Transitional Dry Weather MS4 Outfall Discharge Field Screening Visual Observations

(i) An antecedent dry period of at least 72 hours following any storm event producing measurable rainfall greater than 0.1 inch is required prior to conducting field screening visual observations during a field screening monitoring event.

(ii) During the field screening monitoring event, each Copermittee must record visual observations consistent with Table D-5 at each MS4 outfall discharge monitoring station inspected.

Table D-5. Field Screening Visual Observations for MS4 Outfall Discharge Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) - Flow source(s) suspected or identified from non-storm water source investigation - Flow source(s) eliminated during non-storm water source identification • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) - Known or suspected source(s) of pooled or ponded water • Station description (i.e. deposits or stains, vegetation condition, structural condition, observable biology) • Presence and assessment of trash in and around station • Evidence or signs of illicit connections or illegal dumping

(iii) Each Copermittee must implement the requirements of Provisions E.2.d.(2)(c)-(e) based on the field observations required pursuant to Provision D.2.a.(2)(b)(ii).

(iv) Each Copermittee must evaluate field observations together with existing information available from prior reports, inspections and monitoring results to determine whether any observed flowing, pooled, or ponded waters are likely to be transient or persistent flow.[18]

(c) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Records

Based upon the results of the transitional dry weather MS4 outfall discharge field screening monitoring conducted pursuant to Provisions D.2.a.(2)(a)-(b), each Copermittee must update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow.

(3) Transitional Wet Weather MS4 Outfall Discharge Monitoring

Until the monitoring requirements and schedules of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(a) Transitional Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees must select wet weather MS4 outfall discharge monitoring stations from the inventories developed pursuant to Provision D.2.a.(1) for each Watershed Management Area as follows:

(i) At least five wet weather MS4 outfall discharge monitoring stations that are representative of storm water discharges from areas consisting primarily of residential, commercial, industrial, and typical mixed-use land uses present within the Watershed Management Area;

(ii) At least one wet weather MS4 outfall discharge monitoring station for each Copermittee within the Watershed Management Area; and

[18] Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

(iii) The County of San Diego may select at least two (2) wet weather MS4 outfall discharge monitoring stations for the portion of the Santa Margarita River Watershed Management Area within its jurisdiction to be monitored during the transitional period until the Riverside County Copermittees are notified of coverage under this Order. After the Riverside County Copermittees are notified of coverage under this Order, the Copermittees in the Watershed Management Area must select wet weather MS4 outfall discharge monitoring stations consistent with the requirements above.

(b) Transitional Wet Weather MS4 Outfall Discharge Monitoring Frequency

Each wet weather MS4 outfall discharge monitoring station selected pursuant to Provision D.2.a.(3)(a) must be monitored once during the wet season (October 1 – April 30). The wet weather monitoring events must be selected to be representative of the range of hydrological conditions experienced in the region. At least 10 percent of samples must be conducted during the first wet weather event of the wet season, to include at least one such sample in each Watershed Management Area..

(c) Transitional Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(i) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(ii) The flow rates and volumes measured or estimated from the MS4 outfall (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(d) Transitional Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(e) Transitional Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, and indicator bacteria;

(iv) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

[a] Time-weighted composites collected over the length of the storm event or the first 24 hour period whichever is shorter, composed of discrete samples, which may be collected through the use of automated equipment, or

[b] Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

[c] If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours;

(v) Only one analysis of the composite of aliquots is required;

(vi) The samples must be analyzed for the following constituents:

[a] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

[b] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and

[c] Constituents listed in in Table D-6.

Table D-6. Analytical Monitoring Constituents for Wet Weather MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Nickel • Selenium • Thallium • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(f) Other Transitional Wet Weather MS4 Outfall Discharge Monitoring

The San Diego County Copermittees must continue the wet weather MS4 outfall monitoring program developed under Order No. R9-2007-0001, as approved by the San Diego Water Board, through its planned completion.

b. DRY WEATHER MS4 OUTFALL DISCHARGE MONITORING

Each Copermittee must perform dry weather MS4 outfall monitoring to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. Each Copermittee must conduct the following dry weather MS4 outfall discharge monitoring within its jurisdiction:

(1) Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Each Copermittee must continue to perform the dry weather MS4 outfall discharge field screening monitoring in accordance with the requirements of Provision D.2.a.(2). The Copermittee may adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of persistent flow non-storm water discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of visual inspections performed is equivalent to the number of visual inspections required under Provision D.2.a.(2)(a).

(2) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring

Each Copermittee must perform non-storm water persistent flow MS4 outfall discharge monitoring to determine which persistent non-storm water discharges contain concentrations of pollutants below NALs, and which persistent non-storm water discharges impact receiving water quality during dry weather. Each Copermittee must conduct the following non-storm water persistent flow MS4 outfall discharge monitoring within its jurisdiction:

(a) Prioritization of Non-Storm Water Persistent Flow MS4 Outfalls

Based upon the dry weather MS4 outfall discharge field screening monitoring records developed pursuant to Provision D.2.a.(2)(c), each Copermittee must identify and prioritize the MS4 outfalls with persistent flows based on the highest priority water quality conditions identified in the Water Quality Improvement Plan and any additional criteria developed by the Copermittee, which may include historical data and data from sources other than what the Copermittee collects.

(b) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring Frequency

(i) Based on the prioritization of major MS4 outfalls developed under Provision D.2.b.(2)(a), each Copermittee must identify, at a minimum, the 5 highest priority major MS4 outfalls with non-storm water persistent flows that the Copermittee will monitor within its jurisdiction in each Watershed Management Area. For Responsible Copermittees identified by a TMDL in Attachment E to this Order, if the 5 chosen outfall locations are not sufficient to determine compliance with the TMDL(s), then each Responsible Copermittee must identify additional MS4 outfall monitoring locations within its jurisdiction sufficient to address compliance with the TMDL(s). If a Copermittee has less than 5 major outfalls within a Watershed Management Area, then the Copermittee must monitor all of its major MS4 outfalls with persistent flows within each Watershed Management Area. The location of the highest priority non-storm water persistent flow MS4 outfall monitoring stations must be identified on the map required pursuant to Provision E.2.b.(1). The map must specify which MS4 outfalls are being monitored for compliance with a TMDL.

(ii) Each of the highest priority non-storm water persistent flow MS4 outfall monitoring stations identified pursuant to Provision D.2.b.(2)(b)(i) must be monitored under dry weather conditions at least semi-annually until one of the following occurs:

[a] The non-storm water discharges have been effectively eliminated (i.e. no flowing, pooled, or ponded water) for three consecutive dry weather monitoring events; or

[b] The source(s) of the persistent flows has been identified as a category of non-storm water discharges that does not require an NPDES permit and does not have to be addressed as an illicit discharge because it was not identified as a source of pollutants (i.e. constituents in non-storm water discharge do not exceed NALs), and the persistent flow can be re-prioritized to a lower priority; or

[c] The constituents in the persistent flow non-storm water discharge do not exceed NALs, and the persistent flow can be re-prioritized to a lower priority; or

[d] The source(s) of the persistent flows has been identified as a non-storm water discharge authorized by a separate NPDES permit.

(iii) Where the criteria under Provision D.2.b.(2)(b)(ii) are not met, but the threat to water quality has been reduced by the Copermittee, the highest priority persistent flow MS4 outfall monitoring stations may be reprioritized accordingly for continued dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1).

(iv) Each Copermittee must document removal or re-prioritization of the highest priority persistent flow MS4 outfall monitoring stations identified under Provision D.2.b.(2)(a) in the Water Quality Improvement Plan Annual Report. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized major MS4 outfall in the Watershed Management Area within its jurisdiction, unless there are no remaining qualifying major MS4 outfalls within the Copermittee's jurisdiction in the Watershed Management Area.

(c) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Observations

During each semi-annual monitoring event, each Copermittee must record field observations consistent with Table D-5 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(d) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Monitoring

During each semi-annual monitoring event, if conditions allow the collection of the data, each Copermittee must monitor and record the parameters in Table D-2 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(e) Non-Storm Water Persistent Flow MS4 Outfall Discharge Analytical Monitoring

During each semi-annual monitoring event in which measurable flow is present, each Copermittee must collect and analyze samples from each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Collect grab or composite samples to be analyzed at a qualified laboratory for the following constituents:

[a] Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,
[b] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,
[c] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,
[d] Applicable NAL constituents, and
[e] Constituents listed in Table D-7. The Copermittees may adjust the list of constituents for the Watershed Management Area if historical data or supporting information can be provided that demonstrates or justifies the analysis of a constituent is not necessary.

Table D-7. Analytical Monitoring Constituents for Persistent Flow MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Total Hardness • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Cadmium • Copper • Lead • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(iv) If the Copermittee identifies and eliminates the source of the persistent flow non-storm water discharge, analysis of the sample is not required.

c. WET WEATHER MS4 OUTFALL DISCHARGE MONITORING

The Copermittees must perform wet weather MS4 outfall monitoring to identify pollutants in storm water discharges from the MS4s, to guide pollutant source identification efforts, and to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order. The Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(1) Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees may adjust the wet weather MS4 outfall discharge monitoring locations in the Watershed Management Area, as needed, to identify pollutants in storm water discharges from MS4s, to guide pollutant source identification efforts, and to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of stations is at least equivalent to the number of stations required under Provision D.2.a.(3)(a). Additional outfall monitoring locations, above the minimum per jurisdiction, may be required to demonstrate compliance with the WQBELs associated with the applicable TMDLs in Attachment E.

(2) Wet Weather MS4 Outfall Discharge Monitoring Frequency

The Copermittees must monitor the wet weather MS4 outfall discharge monitoring stations in the Watershed Management Area at least once (1) per year. The Copermittees may need to increase the frequency of monitoring in order to identify pollutants in storm water discharges from the MS4s causing or contributing to the highest priority water quality conditions, to guide pollutant source identification efforts, or to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order.

(3) Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm

event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(4) Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(5) Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites collected over the length of the storm event or the first 24 hour period, whichever is shorter , composed of discrete samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

(iii) If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours.

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) The Copermittees may adjust the analytical monitoring required for the Watershed Management Area, if the Copermittees have historical data or supporting information that can demonstrate or provide justification that the analysis of a constituent is not necessary.

3. Special Studies

a. Within the term of this Order, the Copermittees must initiate the following special studies:

(1) At least two special studies in each Watershed Management Area to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that cause or contribute to highest priority water quality conditions identified in the Water Quality Improvement Plan.

(2) At least one special study for the San Diego Region to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that are impacting receiving waters on a regional basis in the San Diego Region.

(3) One of the two special studies in each Watershed Management Area required pursuant to Provision D.3.a.(1) may be replaced by a special study implemented pursuant to Provision D.3.a.(2).

b. The special studies must, at a minimum, be in conformance with the following criteria:

(1) The special studies must be related to the highest priority water quality conditions identified by the Copermittees in the Watershed Management Area and/or for the entire San Diego Region;

(2) The special studies developed pursuant to Provision D.3.a.(1) must:

(a) Be implemented within the applicable Watershed Management Area, and

(b) Require some form of participation by all the Copermittees within the Watershed Management Area;

(3) The special studies developed pursuant to Provision D.3.a.(2) must:

(a) Be implemented within the San Diego Region, and

(b) Require some form of participation by all Copermittees covered under the requirements of this Order.

(4) The Copermittees are encouraged to partner with environmental groups or third parties knowledgeable of watershed conditions to complete the required special studies.

c. Special studies developed to identify sources of pollutants and/or stressors should be pollutant and/or stressor specific and based on historical monitoring data and monitoring performed pursuant to Provisions D.1 and D.2. Development of source identification special studies should include the following:

(1) A compilation of known information on the specific pollutant and/or stressor, including data on potential sources and movement of the pollutant and/or stressor within the watershed. Data generated by the Copermittees and others, as well as information available from a literature research on the pollutant and/or stressor should be compiled and analyzed as appropriate.

(2) An identification of data gaps, based on the compiled information generated on the specific pollutant and/or stressor identified in Provision D.3.c.(1). Source identification special studies should be developed to fill identified data gaps.

(3) A monitoring plan that will collect and provide data the Copermittees can utilize to do the following:

(a) Quantify the relative loading or impact of a pollutant and/or stressor from a particular source or pollutant generating activity;

(b) Improve understanding of the fate of a pollutant and/or stressor in the environment;

(c) Develop an inventory of known and suspected sources of a pollutant and/or stressor in the Watershed Management Area; and/or

(d) Prioritize known and suspected sources of a pollutant and/or stressor based on relative magnitude in discharges, geographical distribution (i.e., regional or localized), frequency of occurrence in discharges, human health risk, and controllability.

d. Special studies initiated prior to the effective date of this Order that meet the requirements of Provision D.3.b and are implemented during the term of this Order as part of the Water Quality Improvement Plan may be utilized to fulfill the special study requirements of Provision D.3.a. Special studies completed before the effective date of this Order cannot be utilized to fulfill the special study requirements of Provision D.3.a.

e. The Copermittees must submit the monitoring plans for the special studies in the Water Quality Improvement Plans required pursuant to Provision F.1.

f. The Copermittees are encouraged to share the results of the special studies regionally among the Copermittees to provide information useful in improving and adapting the management of non-storm water and storm water runoff through the implementation of the Water Quality Improvement Plans.

4. Assessment Requirements

Each Copermittee must evaluate the data collected pursuant to Provisions D.1, D.2 and D.3, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E, to assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a. Assessments must be performed as described in the following provisions:

a. Receiving Waters Assessments

(1) The Copermittees must assess and report the conditions of the receiving waters in the Watershed Management Area as follows:

(a) Based on data collected pursuant to Provision D.1.a, the assessments under Provision D.4.a.(2) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(b) Based on the data collected pursuant to Provisions D.1.a-e, the assessments required under Provision D.4.a.(2) must be included in the Report of Waste Discharge required pursuant to Provision F.5.b.

(2) The Copermittees must assess the status and trends of receiving water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under dry weather and wet weather conditions. For each of the three types of receiving waters in each Watershed Management Area the Copermittees must:

(a) Determine whether or not the conditions of the receiving waters are meeting the numeric goals established pursuant to Provision B.3.a;

(b) Identify the most critical beneficial uses that must be protected to ensure overall health of the receiving water;

(c) Determine whether or not those critical beneficial uses are being protected;

(d) Identify short-term and/or long-term improvements or degradation of those critical beneficial uses;

(e) Determine whether or not the strategies established in the Water Quality Improvement Plan contribute towards progress in achieving the interim and final numeric goals of the Water Quality Improvement Plan; and

(f) Identify data gaps in the monitoring data necessary to assess Provisions D.4.a.(2)(a)-(e).

b. MS4 OUTFALL DISCHARGES ASSESSMENTS

(1) Non-Storm Water Discharges Reduction Assessments

(a) Each Copermittee must assess and report the progress of its illicit discharge detection and elimination program, required to be implemented pursuant to Provision E.2, toward effectively prohibiting non-storm water and illicit discharges into the MS4 within its jurisdiction as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(2), the assessments under Provision D.4.b.(1)(b) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(ii) Based on the data collected pursuant to Provisions D.2.b, the assessments required under Provision D.4.b.(1)(c) must be included in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

(iii) Based on the data collected pursuant to Provisions D.2.b, the assessment required under Provision D.4.b.(1)(c) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.a.(2), each Copermittee must assess and report the following:

(i) Identify the known and suspected controllable sources (e.g. facilities, areas, land uses, pollutant generating activities) of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area;

(ii) Identify sources of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area that have been reduced or eliminated; and

(iii) Identify modifications to the field screening monitoring locations and frequencies for the MS4 outfalls in its inventory necessary to identify and eliminate sources of persistent flow non-storm water discharges pursuant to Provision D.2.b.

(c) Based on the dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1), each Copermittee must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(1)(b);

(ii) Based on the data collected and applicable NALs in the Water Quality Improvement Plan, rank the MS4 outfalls in the Copermittee's jurisdiction according to potential threat to receiving water quality, and produce a prioritized list of major MS4 outfalls for follow-up action to update the Water Quality Improvement Plan, with the goal of eliminating persistent flow non-storm water discharges and/or pollutant loads in order of the ranked priority list through targeted programmatic actions and source investigations;

(iii) For the highest priority major MS4 outfalls with persistent flows that are in exceedance of NALs, identify the known and suspected sources within the Copermittee's jurisdiction in the Watershed Management Area that may cause or contribute to the NAL exceedances;

(iv) Each Copermittee must analyze the data collected pursuant to Provision D.2.b, and utilize a model or other method, to calculate or estimate the non-storm water volumes and pollutant loads collectively discharged from all the major MS4s outfalls in its jurisdiction identified as having persistent dry weather flows during the monitoring year. These calculations or estimates must be updated annually.

[a] Each Copermittee must calculate or estimate the annual non-storm water volumes and pollutant loads collectively discharged

from the Copermittee's major MS4 outfalls to receiving waters within the Copermittee's jurisdiction, with an estimate of the percent contribution from each known source for each MS4 outfall;

[b] Each Copermittee must annually identify and quantify (i.e. volume and pollutant loads) sources of non-storm water not subject to the Copermittee's legal authority that are discharged from the Copermittee's major MS4 outfalls to downstream receiving waters.

(v) Each Copermittee must review the data collected pursuant to Provision D.2.b and findings from the assessments required pursuant to Provision D.4.b.(1)(c)(i)-(iv) at least once during the term of this Order to:

[a] Identify reductions and progress in achieving reductions in non-storm water and illicit discharges to the Copermittee's MS4 in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction, with an estimate, if possible, of the non-storm water volume and/or pollutant load reductions attributable to specific water quality strategies implemented by the Copermittee; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittee in the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction.

(vi) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(1)(c)(i)-(v).

(2) <u>Storm Water Pollutant Discharges Reduction Assessments</u>

(a) The Copermittees must assess and report the progress of the water quality improvement strategies, required to be implemented pursuant to Provisions B and E, toward reducing pollutants in storm water discharges from the MS4s within the Watershed Management Area as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(3), the assessments under Provision D.4.b.(2)(b) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(ii) Based on the data collected pursuant to Provisions D.2.c, the assessments required under Provision D.4.b.(2)(c) must be included

in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

(iii) Based on the data collected pursuant to Provisions D.2.c, the assessment required under Provisions D.4.b.(2)(c)-(d) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.a.(3) the Copermittees must assess and report the following:

(i) The Copermittees must analyze the monitoring data collected pursuant to Provision D.2.a.(3), and utilize a watershed model or other method, to calculate or estimate the following for each monitoring year:

[a] The average storm water runoff coefficient for each land use type within the Watershed Management Area;
[b] The volume of storm water and pollutant loads discharged from each of the Copermittee's monitored MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch;
[c] The total flow volume and pollutant loadings discharged from the Copermittee's jurisdiction within the Watershed Management Area over the course of the wet season, extrapolated from the data produced from the monitored MS4 outfalls; and
[d] The percent contribution of storm water volumes and pollutant loads discharged from each land use type within each hydrologic subarea with a major MS4 outfall to receiving waters or within each major MS4 outfall to receiving waters in the Copermittee's jurisdiction within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch.

(ii) Identify modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify pollutants in storm water discharges from the MS4s in the Watershed Management Area pursuant to Provision D.2.c.(1).

(c) Based on the wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.c the Copermittees must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(2)(b);

(ii) Based on the data collected and applicable SALs in the Water Quality Improvement Plan, analyze and compare the monitoring data to the analyses and assumptions used to develop the Water Quality

Improvement Plans, including strategies developed pursuant to Provision B.3, and evaluate whether those analyses and assumptions should be updated as a component of the adaptive management efforts pursuant to Provision B.5 for follow-up action to update the Water Quality Improvement Plan;

(iii) The Copermittees must review the data collected pursuant to Provision D.2.c and findings from the assessments required pursuant to Provisions D.4.b.(2)(c)(i)-(ii) at least once during the term of this Order to:

[a] Identify reductions or progress in achieving reductions in pollutant concentrations and/or pollutant loads from different land uses and/or drainage areas discharging from the Copermittees' MS4s in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters within the Watershed Management Area to the MEP, with an estimate, if possible, of the pollutant load reductions attributable to specific water quality strategies implemented by the Copermittees; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittees in the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters in the Watershed Management Area to the MEP.

(iv) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(iii).

(d) The Copermittees must evaluate all the data collected pursuant to Provision D.2.c, and incorporate new outfall monitoring data into time series plots for each long-term monitoring constituent for the Watershed Management Area, and perform statistical trends analysis on the cumulative long-term wet weather MS4 outfall discharge water quality data set.

c. Special Studies Assessments

The Copermittees must annually evaluate the results and findings from the special studies developed and implemented pursuant to Provision D.3, and assess their relevance to the Copermittees' efforts to characterize receiving water conditions, understand sources of pollutants and/or stressors, and control and reduce the discharges of pollutants from the MS4 outfalls to receiving waters in the Watershed Management Area. The Copermittees must report the results of the special studies assessments applicable to the Watershed Management Area, and identify any necessary modifications or updates to the Water Quality

Improvement Plan based on the results in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

d. INTEGRATED ASSESSMENT OF WATER QUALITY IMPROVEMENT PLAN

As part of the iterative approach and adaptive management process required for the Water Quality Improvement Plan pursuant to Provision B.5, the Copermittees in each Watershed Management Area must integrate the data collected pursuant to Provisions D.1-D.3, the findings from the assessments required pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to assess the effectiveness of, and identify necessary modifications to, the Water Quality Improvement Plan as follows:

(1) The Copermittees must re-evaluate the priority water quality conditions and numeric goals for the Watershed Management Area, as needed, during the term of this Order pursuant to Provision B.5.a. The re-evaluation and recommendations for modifications to the priority water quality conditions, and/or numeric goals and corresponding schedules may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The priority water quality conditions and numeric goals for the Watershed Management Area must be re-evaluated as follows:

(a) Re-evaluate the receiving water conditions in the Watershed Management Area in accordance with Provision B.2.a;

(b) Re-evaluate the impacts on receiving waters in the Watershed Management Area from MS4 discharges in accordance with Provision B.2.b;

(c) Re-evaluate the identification of MS4 sources of pollutants and/or stressors in accordance with Provision B.2.d;

(d) Identify beneficial uses of the receiving waters that are protected in accordance with Provision D.4.a;

(e) Evaluate the progress toward achieving the interim and final numeric goals for protecting impacted beneficial uses in the receiving waters.

(2) The Copermittees must re-evaluate the water quality improvement strategies for the Watershed Management Area during the term of this Order pursuant to Provision B.5.b. The re-evaluation and recommendations for modifications to the water quality improvement strategies and schedules may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The water quality improvement

strategies for the Watershed Management Area must be re-evaluated as follows:

(a) Identify the non-storm water and storm water pollutant loads from the Copermittees' MS4 outfalls in the Watershed Management Area, calculated or estimated pursuant to Provisions D.4.b;

(b) Identify the non-storm water and storm water pollutant load reductions, or other improvements to receiving water or water quality conditions, that are necessary to attain the interim and final numeric goals identified in the Water Quality Improvement Plan for protecting beneficial uses in the receiving waters;

(c) Identify the non-storm water and storm water pollutant load reductions, or other improvements to the quality of MS4 discharges, that are necessary for the Copermittees to demonstrate that non-storm water and storm water discharges from their MS4s are not causing or contributing to exceedances of receiving water limitations;

(d) Evaluate the progress of the water quality improvement strategies toward achieving the interim and final numeric goals identified in the Water Quality Improvement Plan for protecting beneficial uses in the receiving waters.

(3) The Copermittees must re-evaluate and adapt the water quality monitoring and assessment program for the Watershed Management Area when new information becomes available to improve the monitoring and assessment program pursuant to Provision B.5.c. The re-evaluation and recommendations for modifications to the monitoring and assessment program may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. Modifications to the water quality monitoring and assessment program must be consistent with the requirements of Provision D.1-D.3. The re-evaluation of the water quality monitoring and assessment program for the Watershed Management Area must consider the data gaps identified by the assessments required pursuant to Provisions D.4.a-b, and results of the special studies implemented pursuant to Provision D.4.c.

5. Monitoring Provisions

Each Copermittee must comply with all the monitoring, reporting, and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

E. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS

The purpose of this provision is for each Copermittee to implement a program to control the contribution of pollutants to and the discharges from the MS4 within its jurisdiction. The goal of the jurisdictional runoff management programs is to implement strategies that effectively prohibit non-storm water discharges to the MS4 and reduce the discharge of pollutants in storm water to the MEP. This goal will be accomplished through implementing the jurisdictional runoff management programs in accordance with the strategies identified in the Water Quality Improvement Plans.

Each Copermittee must update its jurisdictional runoff management program document, in accordance with Provision F.2.a, to incorporate all the requirements of Provision E. Until the Copermittee has updated its jurisdictional runoff management program document with the requirements of Provision E, the Copermittee must continue implementing its current jurisdictional runoff management program.

1. Legal Authority Establishment and Enforcement

a. Each Copermittee must establish, maintain, and enforce adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 through statute, ordinance, permit, contract, order, or similar means. This legal authority must, at a minimum, authorize the Copermittee to:

(1) Prohibit and eliminate all illicit discharges and illicit connections to its MS4;

(2) Control the contribution of pollutants in discharges of runoff associated with industrial and construction activity to its MS4 and control the quality of runoff from industrial and construction sites, including industrial and construction sites which have coverage under the statewide General Permit for Discharges of Storm Water Associated with Industrial Activities (Industrial General Permit) or General Permit for Discharges of Storm Water Associated with Construction Activities (Construction General Permit), as well as to those sites which do not;

(3) Control the discharge of spills, dumping, or disposal of materials other than storm water into its MS4;

(4) Control through interagency agreements among Copermittees the contribution of pollutants from one portion of the MS4 to another portion of the MS4;

(5) Control, by coordinating and cooperating with other owners of the MS4 such as Caltrans, the U.S. federal government, or sovereign Native American Tribes through interagency agreements, where possible, the contribution of pollutants from their portion of the MS4 to the portion of the MS4 within the Copermittee's jurisdiction;

(6) Require compliance with conditions in its statutes, ordinances, permits, contracts, orders, or similar means to hold dischargers to its MS4 accountable for their contributions of pollutants and flows;

(7) Require the use of BMPs to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(8) Require documentation on the effectiveness of BMPs implemented to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(9) Utilize enforcement mechanisms to require compliance with its statutes, ordinances, permits, contracts, orders, or similar means; and

(10) Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with its statutes, ordinances, permits, contracts, orders, or similar means and with the requirements of this Order, including the prohibition of illicit discharges and connections to its MS4; the Copermittee must also have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from industrial facilities, including construction sites, discharging into its MS4.

b. With the first Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3), each Copermittee must submit a statement certified by its Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative that the Copermittee has taken the necessary steps to obtain and maintain full legal authority within its jurisdiction to implement and enforce each of the requirements contained in this Order.

2. Illicit Discharge Detection and Elimination

Each Copermittee must implement a program to actively detect and eliminate illicit discharges and improper disposal into the MS4, or otherwise require the discharger to apply for and obtain a separate NPDES permit. The illicit discharge detection and elimination program must be implemented in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include, at a minimum, the following requirements:

a. Non-Storm Water Discharges

Each Copermittee must address all non-storm water discharges as illicit discharges unless a non-storm water discharge is either identified as a discharge authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to the following requirements:

(1) Discharges of non-storm water to the MS4 from the following categories must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG919001 (Order No. R9-2007-0034, or subsequent order) for discharges to San Diego Bay, or NPDES Permit No. CAG919002 (Order No. R9-2008-0002, or subsequent order) for discharges to surface waters other than San Diego Bay:

(1) Uncontaminated pumped ground water;

(2) Discharges from foundation drains;[19]

(3) Water from crawl space pumps; and

(4) Water from footing drains.[19]

(2) Discharges of non-storm water from water line flushing and water main breaks to the MS4 must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG 679001 (Order No. R9-2010-0003 or subsequent order). This category includes water line flushing and water main break discharges from water purveyors issued a water supply permit by the California Department of Public Health or federal military installations. Discharges from recycled or reclaimed water lines to the MS4 must be addressed as illicit discharges, unless the discharges have coverage under a separate NPDES permit.

(3) Discharges of non-storm water to the MS4 from the following categories must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a source of pollutants to receiving waters:

(a) Diverted stream flows;

(b) Rising ground waters;

(c) Uncontaminated ground water infiltration to MS4s;

(d) Springs;

(e) Flows from riparian habitats and wetlands;

(f) Discharges from potable water sources;

[19] Provision E.2.a.(1) only applies to this category of non-storm water if the system is designed to be located at or below the groundwater table to actively or passively extract groundwater during any part of the year.

(g) Discharges from foundation drains;[20] and

(h) Discharges from footing drains.[20]

(4) Discharges of non-storm water to the MS4 from the following categories must be controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means. Discharges of non-storm water to the MS4 from the following categories not controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means must be addressed by the Copermittee as illicit discharges.

(a) Air conditioning condensation

The discharge of air conditioning condensation should be directed to landscaped areas or other pervious surfaces, or to the sanitary sewer, where feasible.

(b) Individual residential vehicle washing

(i) The discharge of wash water should be directed to landscaped areas or other pervious surfaces where feasible; and

(ii) The minimization of water, washing detergent and other vehicle wash products used for residential vehicle washing, and the implementation of other practices or behaviors that will prevent the discharge of pollutants associated with individual residential vehicle washing from entering the MS4 must be encouraged.

(c) Dechlorinated swimming pool discharges

(i) Residual chlorine, algaecide, filter backwash, or other pollutants from swimming pools must be eliminated prior to discharging to the MS4; and

(ii) The discharge of saline swimming pool water must be directed to the sanitary sewer, landscaped areas, or other pervious surfaces that can accommodate the volume of water, unless the saline swimming pool water can be discharged via a pipe or concrete channel directly to a naturally saline water body (e.g. Pacific Ocean).

(5) Firefighting discharges to the MS4 must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a significant source of pollutants to receiving waters. Firefighting discharges to the MS4 not identified as a significant source of pollutants to receiving waters, must be addressed, at a minimum, as follows:

[20] Provision E.2.a.(3) only applies to this category of non-storm water discharge if the system is designed to be located above the groundwater table at all times of the year, and the system is only expected to discharge non-storm water under unusual circumstances.

(a) Non-emergency firefighting discharges

(i) Building fire suppression system maintenance discharges (e.g. sprinkler line flushing) to the MS4 must be addressed as illicit discharges unless BMPs are implemented to prevent pollutants associated with such discharges to the MS4.

(ii) Non-emergency firefighting discharges (i.e., discharges from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems) must be addressed by a program, to be developed and implemented by the Copermittee, to reduce or eliminate pollutants in such discharges from entering the MS4.

(b) Emergency firefighting discharges

Each Copermittee should develop and encourage implementation of BMPs to reduce or eliminate pollutants in emergency firefighting discharges to the MS4s and receiving waters within its jurisdiction. During emergency situations, priority of efforts should be directed toward life, property, and the environment (in descending order). BMPs should not interfere with immediate emergency response operations or impact public health and safety.

(6) If the Copermittee or San Diego Water Board identifies any category of non-storm water discharges listed under Provisions E.2.a.(1)-(4) as a source of pollutants to receiving waters, the category must be prohibited through ordinance, order, or similar means and addressed as an illicit discharge. Alternatively, the Copermittee may propose controls to be implemented for the category of non-storm water discharges as part of the Water Quality Improvement Plan instead of prohibiting the category of non-storm water discharges, and implement the controls if accepted by the San Diego Water Board as part of the Water Quality Improvement Plan.

(7) Each Copermittee must, where feasible and priorities and resources allow, reduce or eliminate non-storm water discharges listed under Provisions E.2.a.(1)-(4) into its MS4, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit.

b. PREVENT AND DETECT ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to prevent and detect illicit discharges to the MS4:

(1) Each Copermittee must maintain an updated map of its entire MS4 and the corresponding drainage areas. The accuracy of the MS4 map must be confirmed during the field screening required pursuant to Provision E.2.c.

The MS4 map must be included as part of the jurisdictional runoff management program document. Any geographic information system (GIS) layers or files used by the Copermittee to maintain the MS4 map must be made available to the San Diego Water Board upon request. The MS4 map must identify the following:

(a) All segments of the MS4 owned, operated, and maintained by the Copermittee;

(b) All known locations of inlets that discharge and/or collect runoff into the Copermittee's MS4;

(c) All known locations of connections with other MS4s not owned or operated by the Copermittee (e.g. Caltrans MS4s);

(d) All known locations of MS4 outfalls and private outfalls that discharge runoff collected from areas within the Copermittee's jurisdiction;

(e) All segments of receiving waters within the Copermittee's jurisdiction that receive and convey runoff discharged from the Copermittee's MS4 outfalls;

(f) Locations of the MS4 outfalls, identified pursuant to Provision D.2.a.(1), within its jurisdiction; and

(g) Locations of the non-storm water persistent flow MS4 outfall discharge monitoring stations, identified pursuant to Provision D.2.b.(2), within its jurisdiction.

(2) Each Copermittee must use Copermittee personnel and contractors to assist in identifying and reporting illicit discharges and connections during their daily employment activities.

(3) Each Copermittee must promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges to or from the MS4, including the following methods for public reporting:

(a) Operate a public hotline, which can be Copermittee-specific or shared by the Copermittees, and must be capable of receiving reports in both English and Spanish 24 hours per day and seven days per week; and

(b) Designate an e-mail address for receiving electronic reports from the public, which can be Copermittee-specific or shared by the Copermittees, and must be prominently displayed on the Copermittee's webpage and the Regional Clearinghouse required pursuant to Provision F.4.

(4) Each Copermittee must implement practices and procedures (including a notification mechanism) to prevent, respond to, contain, and clean up any spills that may discharge into the MS4 within its jurisdiction from any source. The Copermittee must coordinate, to the extent possible, with spill response teams to prevent entry of spills into the MS4, and prevent contamination of surface water, ground water, and soil. The Copermittee must coordinate spill prevention, containment, and response activities throughout all appropriate Copermittee departments, programs, and agencies.

(5) Each Copermittee must implement practices and procedures to prevent and limit infiltration of seepage from sanitary sewers (including private laterals and failing septic systems) to the MS4.

(6) Each Copermittee must coordinate, when necessary, with upstream Copermittees and/or entities to prevent illicit discharges from upstream sources into the MS4 within its jurisdiction.

c. FIELD SCREENING

Each Copermittee must conduct field screening (i.e. visual observations, field testing, and/or analytical testing) of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4 in accordance with the dry weather MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

d. INVESTIGATE AND ELIMINATE ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to investigate and eliminate illicit discharges to the MS4:

(1) Each Copermittee must prioritize and determine when follow-up investigations will be performed in response to visual observations and/or water quality monitoring data collected during an investigation of a detected non-storm water or illicit discharge to or from the MS4. The criteria for prioritizing investigations must consider the following:

(a) Pollutants identified as causing or contributing to the highest water quality priorities identified in the Water Quality Improvement Plan;

(b) Pollutants identified as causing or contributing, or threatening to cause or contribute to impairments in water bodies on the 303(d) List and/or in environmentally sensitive areas (ESAs), located within its jurisdiction;

(c) Pollutants identified from sources or land uses known to exist within the area, drainage basin, or watershed that discharges to the portion of the MS4 within its jurisdiction included in the investigation;

(d) Pollutants identified as causing or contributing to an exceedance of a NAL in the Water Quality Improvement Plan; and

(e) Pollutants identified as a threat to human health or the environment.

(2) Each Copermittee must implement procedures to investigate and inspect portions of its MS4 that, based on reports or notifications, field screening, or other appropriate information, indicate a reasonable potential of receiving, containing, or discharging pollutants due to illicit discharges, illicit connections, or other sources of non-storm water. The procedures must include the following:

(a) Each Copermittee must develop criteria to:

(i) Assess the validity of each report or notification received; and

(ii) Prioritize the response to each report or notification received.

(b) Each Copermittee must prioritize and respond to each valid report or notification (e.g., public reports, staff or contractor reports and notifications, etc.) of an incident in a timely manner.

(c) In accordance with the requirements of Provision E.2.d.(1), each Copermittee must investigate and seek to identify the source(s) of discharges of non-storm water where flows are observed in and from the MS4 during the field screening required pursuant to Provision D.2.b.(1) as follows:

(i) Obvious illicit discharges must be immediately investigated to identify the source(s) of non-storm water discharges;

(ii) The investigation must include field investigations to identify sources or potential sources for the discharge, unless the source or potential source has already been identified during previous investigations; and

(iii) The investigation may include follow-up field investigations and/or reviewing Copermittee inventories and other land use data to identify potential sources of the discharge.

(d) Each Copermittee must maintain records and a database of the following information:

(i) Location of incident, including hydrologic subarea, portion of MS4 receiving the non-storm water or illicit discharge, and point of discharge or potential discharge from MS4 to receiving water;

(ii) Source of information initiating the investigation (e.g., public reports, staff or contractor reports and notifications, field screening, etc.);

(iii) Date the information used to initiate the investigation was received;

(iv) Date the investigation was initiated;

(v) Dates of follow-up investigations;

(vi) Identified or suspected source of the illicit discharge or connection, if determined;

(vii) Known or suspected related incidents, if any;

(viii) Result of the investigation; and

(ix) If a source cannot be identified and the investigation is not continued, document the response pursuant to the requirements of Provision E.2.d.(4).

(e) Each Copermittee must maintain records and, in accordance with the priorities of the Water Quality Improvement Plan, seek to identify the source(s) of non-storm water discharges from the MS4 where there is evidence of non-storm water having been discharged into or from the MS4 (e.g., pooled water), in accordance with MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

(3) Each Copermittee must initiate the implementation of procedures, in a timely manner, to eliminate all detected and identified illicit discharges and connections within its jurisdiction. The procedures must include the following responses:

(a) Each Copermittee must enforce its legal authority, as required under Provision E.1, to eliminate illicit discharges and connections to the MS4.

(b) If the Copermittee identifies the source as a controllable source of non-storm water or illicit discharge or connection, the Copermittee must implement its Enforcement Response Plan pursuant to Provision E.6 and enforce its legal authority to prohibit and eliminate illicit discharges and connections to its MS4.

(c) If the Copermittee identifies the source of the discharge as a category of non-storm water discharges in Provision E.2.a, and the discharge is in exceedance of NALs in the Water Quality Improvement Plan, then the Copermittee must determine if: (1) this is an isolated incident or set of circumstances that will be addressed through its Enforcement Response Plan pursuant to Provision E.6, or (2) the category of discharge must be addressed through the prohibition of that category of discharge as an illicit discharge pursuant to Provision E.2.a.(6).

(d) If the Copermittee suspects the source of the non-storm water discharge as natural in origin (i.e. non-anthropogenically influenced) and in conveyance into the MS4, then the Copermittee must document and

provide the data and evidence necessary to demonstrate to the San Diego Water Board that it is natural in origin and does not require further investigation.

(e) If the Copermittee is unable to identify and document the source of a recurring non-storm water discharge to or from the MS4, then the Copermittee must address the discharge as an illicit discharge and update its jurisdictional runoff management program to address the common and suspected sources of the non-storm water discharge within its jurisdiction in accordance with the Copermittee's priorities.

(4) Each Copermittee must submit a summary of the non-storm water discharges and illicit discharges and connections investigated and eliminated within its jurisdiction with each Water Quality Improvement Plan Annual Report required under Provision F.3.b.(3) of this Order.

3. Development Planning

Each Copermittee must use their land use and planning authorities to implement a development planning program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. BMP Requirements for All Development Projects

Each Copermittee must prescribe the following BMP requirements during the planning process (i.e. prior to project approval and issuance of local permits) for all development projects (regardless of project type or size), where local permits are issued, including unpaved roads and flood management projects:

(1) General Requirements

(a) Onsite BMPs must be located so as to remove pollutants from runoff prior to its discharge to any receiving waters, and as close to the source as possible;

(b) Structural BMPs must not be constructed within waters of the U.S.

(c) Onsite BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors (e.g. mosquitos, rodents, or flies).

(2) Source Control BMP Requirements

The following source control BMPs must be implemented at all development projects where applicable and feasible:

(a) Prevention of illicit discharges into the MS4;

(b) Storm drain system stenciling or signage;

(c) Protect outdoor material storage areas from rainfall, run-on, runoff, and wind dispersal;

(d) Protect materials stored in outdoor work areas from rainfall, run-on, runoff, and wind dispersal;

(e) Protect trash storage areas from rainfall, run-on, runoff, and wind dispersal; and

(f) Any additional BMPs determined to be necessary by the Copermittee to minimize pollutant generation at each project.

(3) Low Impact Development (LID) BMP Requirements

The following LID BMPs must be implemented at all development projects where applicable and feasible:

(a) Maintenance or restoration of natural storage reservoirs and drainage corridors (including topographic depressions, areas of permeable soils, natural swales, and ephemeral and intermittent streams);[21]

(b) Buffer zones for natural water bodies (where buffer zones are technically infeasible, require project applicant to include other buffers such as trees, access restrictions, etc.);

(c) Conservation of natural areas within the project footprint including existing trees, other vegetation, and soils;

(d) Construction of streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided public safety is not compromised;

(e) Minimization of the impervious footprint of the project;

(f) Minimization of soil compaction to landscaped areas;

(g) Disconnection of impervious surfaces through distributed pervious areas;

[21] Development projects proposing to dredge or fill materials in waters of the U.S. must obtain a CWA Section 401 Water Quality Certification. Projects proposing to dredge or fill waters of the state must obtain waste discharge requirements.

(h) Landscaped or other pervious areas designed and constructed to effectively receive and infiltrate, retain and/or treat runoff from impervious areas, prior to discharging to the MS4;

(i) Small collection strategies located at, or as close as possible to, the source (i.e. the point where storm water initially meets the ground) to minimize the transport of runoff and pollutants to the MS4 and receiving waters;

(j) Use of permeable materials for projects with low traffic areas and appropriate soil conditions;

(k) Landscaping with native or drought tolerant species; and

(l) Harvesting and using precipitation.

b. PRIORITY DEVELOPMENT PROJECTS

Priority Development Projects are land development projects that fall under the planning and building authority of the Copermittee for which the Copermittee must impose specific requirements, in addition to those described in Provision E.3.a, including the implementation of structural BMPs to meet the performance requirements described in Provision E.3.c.

(1) Definition of Priority Development Project

Priority Development Projects include the following:

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(b) Redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site on an existing site of 10,000 square feet or more of impervious surfaces). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(c) New and redevelopment projects that create 5,000 square feet or more of impervious surface (collectively over the entire project site), and support one or more of the following uses:

(i) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812).

(ii) Hillside development projects. This category includes development on any natural slope that is twenty-five percent or greater.

(iii) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce.

(iv) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

(d) New or redevelopment projects that create or replace 2,500 square feet or more of impervious surface (collectively over the entire project site), and discharging directly to an Environmentally Sensitive Area (ESA). "Discharging directly to" includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands).

(e) New development projects that support one or more of the following uses:

(i) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

(ii) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

(f) New or redevelopment projects that result in the disturbance of one or more acres of land and are expected to generate pollutants post construction.

(2) <u>Special Considerations for Redevelopment Projects</u>

The structural BMP performance requirements of Provision E.3.c are applicable to redevelopment Priority Development Projects, as defined in E.3.b.(1), as follows:

(a) Where redevelopment results in the creation or replacement of impervious surface in an amount of less than fifty percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provision E.3.c apply only to the creation or replacement of impervious surface, and not the entire development; or

(b) Where redevelopment results in the creation or replacement of impervious surface in an amount of more than fifty percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provision E.3.c apply to the entire development.

(3) Priority Development Project Exemptions

Each Copermittee has the discretion to exempt the following projects from being defined as Priority Development Projects:

(a) New or retrofit paved sidewalks, bicycle lanes, or trails that meet the following criteria:

(i) Designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas; OR

(ii) Designed and constructed to be hydraulically disconnected from paved streets or roads; OR

(iii) Designed and constructed with permeable pavements or surfaces in accordance with USEPA Green Streets guidance.[22]

(b) Retrofitting or redevelopment of existing paved alleys, streets or roads that are designed and constructed in accordance with the USEPA Green Streets guidance.[23]

c. Priority Development Project Structural BMP Performance Requirements

In addition to the BMP requirements listed for all development projects under Provision E.3.a, Priority Development Projects must also implement structural BMPs that conform to performance requirements described below.

(1) Storm Water Pollutant Control BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite structural BMPs to control pollutants in storm water that may be discharged from a project as follows:

(a) Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite the pollutants contained in the volume of storm water runoff produced from a 24-hour 85th percentile storm event (design capture volume);[24]

[22] See "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).
[23] Ibid.
[24] This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are

(i) If a Copermittee determines that implementing BMPs to retain the full design capture volume onsite for a Priority Development Project is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize biofiltration BMPs. Biofiltration BMPs must be designed to have an appropriate hydraulic loading rate to maximize storm water retention and pollutant removal, as well as to prevent erosion, scour, and channeling within the BMP,[25] and must be sized to:

[a] Treat 1.5 times the design capture volume not reliably retained onsite, OR

[b] Treat the design capture volume not reliably retained onsite with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite.

(ii) If a Copermittee determines that biofiltration is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize flow-thru treatment control BMPs to treat runoff leaving the site, AND mitigate for the design capture volume not reliably retained onsite pursuant to Provision E.3.c.(1)(b). Flow thru treatment control BMPs must be sized and designed to:

[a] Remove pollutants from storm water to the MEP;

[b] Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;

[c] Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Flow-thru treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of flow-thru treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

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encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals.

[25] As part of the Copermittee's update to its BMP Design Manual, pursuant to Provision E.3.d, the Copermittee must provide guidance for hydraulic loading rates and other biofiltration design criteria necessary to maximize storm water retention and pollutant removal.

(b) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1)(a). The Priority Development Project must mitigate for the portion of the pollutant load in the design capture volume not retained onsite if Provision E.3.c.(3) is utilized. If a Priority Development Project is allowed to utilize alternative compliance, flow-thru treatment control BMPs must be implemented to treat the portion of the design capture volume that is not reliably retained onsite. Flow-thru treatment control BMPs must be sized and designed in accordance with Provisions E.3.c.(1)(a)(ii)[a]-[c].

(2) Hydromodification Management BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite BMPs to manage hydromodification that may be caused by storm water runoff discharged from a project as follows:

(a) Post-project runoff conditions (flow rates and durations) must not exceed pre-development runoff conditions by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat downstream of Priority Development Projects).

(i) In evaluating the range of flows that results in increased potential for erosion of natural (non-hardened) channels, the lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks.

(ii) The Copermittees may use monitoring results collected pursuant to Provision D.1.a.(2) to re-define the range of flows resulting in increased potential for erosion, or degraded instream habitat conditions, as warranted by the data.

(b) Each Priority Development Project must avoid critical sediment yield areas known to the Copermittee or identified by the optional Watershed Management Area Analysis pursuant to Provision B.3.b.(4), or implement measures that allow critical coarse sediment to be discharged to receiving waters, such that there is no net impact to the receiving water.

(c) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the performance requirements of Provision E.3.c.(2)(a). The Priority Development Project must mitigate for the post-project runoff conditions not fully managed onsite if Provision E.3.c.(3) is utilized.

(d) Exemptions

Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provisions E.3.c.(2) where the project discharges storm water runoff to:

(i) Existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;

(ii) Conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; or

(iii) An area identified by the Copermittees as appropriate for an exemption by the optional Watershed Management Area Analysis incorporated into the Water Quality Improvement Plan pursuant to Provision B.3.b.(4).

(3) Alternative Compliance Program to Onsite Structural BMP Implementation

At the discretion of each Copermittee, Priority Development Projects may be allowed to participate in an alternative compliance program in lieu of implementing the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2), provided that the Water Quality Improvement Plan includes the optional Watershed Management Area Analysis described in Provision B.3.b.(4). The alternative compliance program is available to a Priority Development Project only if the Priority Development Project applicant enters into a voluntary agreement with the Copermittee authorizing this arrangement. In addition to the voluntary agreement, relief from implementing structural BMPs onsite may be authorized by the Copermittee under the following conditions:

(a) Watershed Management Area Analysis Candidate Projects

The Priority Development Project applicant agrees to fund, contribute funds to, or implement a candidate project identified by the Copermittees in the Watershed Management Area Analysis included in the Water Quality Improvement Plan, pursuant to Provisions B.3.b.(4) subject to the following conditions:

(i) The Copermittee must determine that implementation of the candidate project will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite;

(ii) If the Priority Development Project applicant chooses to fully or partially fund a candidate project, then the in-lieu fee structure described in Provision E.3.c.(3)(c) must be followed;

(iii) If the Priority Development Project applicant chooses to fully or partially fund a candidate project, then the Copermittee must ensure that the funds to be obtained from the Priority Development Project applicant are sufficient to mitigate for impacts caused by not fully implementing structural BMPs onsite, pursuant to the performance requirements described in Provisions E.3.c.(1) and E.3.c.(2);

(iv) If the Priority Development Project applicant chooses to implement a candidate project, then the Copermittee must ensure that pollutant control and/or hydromodification management within the candidate project are sufficient to mitigate for impacts caused by not implementing structural BMPs fully onsite, pursuant to the performance requirements described in Provisions E.3.c.(1) and E.3.c.(2);

(v) The voluntary agreement to fund, partially fund, or implement a candidate project must include reliable sources of funding for operation and maintenance of the candidate project;

(vi) Design of the candidate project must be conducted under an appropriately qualified engineer, geologist, architect, landscape architect, or other professional, licenses where applicable, and competent and proficient in the fields pertinent to the candidate project design;

(vii) The candidate project must be constructed as soon as possible, but no later than 4 years after the certificate of occupancy is granted for the first Priority Development Project that contributed funds toward the construction of the candidate project, unless a longer period of time is authorized by the San Diego Water Board Executive Officer; and

(viii) If the candidate project is constructed after the Priority Development Project is constructed, the Copermittee must require temporal mitigation for pollutant loads and altered flows that are discharged from the Priority Development Project.

(b) Project Applicant Proposed Alternative Compliance Projects

The Copermittee may allow a Priority Development Project applicant to propose and fund, contribute funds to, or implement an alternative compliance project not identified by the Watershed Management Area Analysis included in the Water Quality Improvement Plan pursuant to Provisions B.3.b.(4). This option is allowed provided the Copermittee determines that implementation of the alternative compliance project will have a greater overall water quality benefit for the Watershed

Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite, and is subject to the requirements described in Provisions E.3.c.(3)(a)(ii)-(viii).

(c) Alternative Compliance In-Lieu Fee Structure

If a Copermittee chooses to allow a Priority Development Project applicant to fund, or partially fund a candidate project or an alternative compliance project, then the Copermittee must develop and implement an in-lieu fee structure. This may be developed individually or with other Copermittees and/or entities, as a means for designing, developing, constructing, operating and maintaining offsite alternative compliance projects. The in-lieu fee must be transferred to the Copermittee (for public projects) or an escrow account (for private projects) prior to the construction of the Priority Development Project.

(d) Alternative Compliance Water Quality Credit System Option

The Copermittee may develop and implement an alternative compliance water quality credit system option, individually or with other Copermittees and/or entities, provided that such a credit system clearly exhibits that it will not allow discharges from Priority Development Projects to cause or contribute to a net impact over and above the impact caused by projects meeting the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2). Any credit system that a Copermittee chooses to implement must be submitted to the San Diego Water Board Executive Officer for review and acceptance as part of the Water Quality Improvement Plan.

(4) Long-Term Structural BMP Maintenance

Each Copermittee must require the project applicant to submit proof of the mechanism under which ongoing long-term maintenance of all structural BMPs will be conducted.

(5) Infiltration and Groundwater Protection

(a) Structural BMPs designed to primarily function as large, centralized infiltration devices (such as large infiltration trenches and infiltration basins) must not cause or contribute to an exceedance of an applicable groundwater quality objective. At a minimum, such infiltration BMPs must be in conformance with the design criteria listed below, unless the development project applicant demonstrates to the Copermittee that one or more of the specific design criteria listed below are not necessary to protect groundwater quality. The design criteria listed below do not apply to small infiltration systems dispersed throughout a development project.

(i) Runoff must undergo pretreatment such as sedimentation or filtration prior to infiltration;

(ii) Pollution prevention and source control BMPs must be implemented at a level appropriate to protect groundwater quality at sites where infiltration BMPs are to be used;

(iii) Infiltration BMPs must be adequately maintained to remove pollutants in storm water to the MEP;

(iv) The vertical distance from the base of any infiltration BMP to the seasonal high groundwater mark must be at least 10 feet. Where groundwater basins do not support beneficial uses, this vertical distance criteria may be reduced, provided groundwater quality is maintained;

(v) The soil through which infiltration is to occur must have physical and chemical characteristics (e.g., appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses;

(vi) Infiltration BMPs must not be used for areas of industrial or light industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee, unless source control BMPs to prevent exposure of high threat activities are implemented, or runoff from such activities is first treated or filtered to remove pollutants prior to infiltration; and

(vii) Infiltration BMPs must be located a minimum of 100 feet horizontally from any water supply wells.

(b) The Copermittee may develop, individually or with other Copermittees, alternative mandatory design criteria to that listed above for infiltration BMPs which are designed to primarily function as centralized infiltration devices. Before implementing the alternative design criteria in the development planning process the Copermitee(s) must:

(i) Notify the San Diego Water Board of the intent to implement the alternative design criteria submitted; and

(ii) Comply with any conditions set by the San Diego Water Board.

d. BMP DESIGN MANUAL UPDATE

Each Copermittee must update its BMP Design Manual[26] pursuant to Provision F.2.b. Until the Copermittee has updated its BMP Design Manual with the

[26] The BMP Design Manual was formerly known as the Standard Storm Water Mitigation Plan under Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016.

requirements of Provisions E.3.a-c, the Copermittee must continue implementing its current BMP Design Manual. Unless directed otherwise by the San Diego Water Board, the Copermittee must implement the BMP Design Manual within 180 days of completing the update. The update of the BMP Design Manual must include the following:

(1) Updated procedures to determine the nature and extent of storm water requirements applicable to a potential development or redevelopment projects. These procedures must inform project applicants of the storm water management requirements applicable to their project including, but not limited to, general requirements for all development projects, structural BMP design procedures and requirements, hydromodification management requirements, requirements specific to phased projects, and procedures specific to private developments and public improvement projects;

(2) Updated procedures to identify pollutants and conditions of concern for selecting the most appropriate structural BMPs that consider, at a minimum, the following:

(a) Receiving water quality (including pollutants for which receiving waters are listed as impaired under the CWA section 303(d) List);

(b) Pollutants, stressors, and/or receiving water conditions that cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(c) Land use type of the project and pollutants associated with that land use type; and

(d) Pollutants expected to be present onsite.

(3) Updated procedures for designing structural BMPs, including any updated performance requirements to be consistent with the requirements of Provision E.3.c for all structural BMPs listed in the BMP Design Manual;

(4) Long-term maintenance criteria for each structural BMP listed in the BMP Design Manual; and

(5) Alternative compliance criteria, in accordance with the requirements under Provision E.3.c.(3), if the Copermittee elects to allow Priority Development Projects within its jurisdiction to utilize alternative compliance.

e. PRIORITY DEVELOPMENT PROJECT BMP IMPLEMENTATION AND OVERSIGHT

Each Copermittee must implement a program that requires and confirms structural BMPs on all Priority Development Projects are designed, constructed, and maintained to remove pollutants in storm water to the MEP.

(1) Structural BMP Approval and Verification Process

(a) Each Copermittee must require and confirm that for all Priority Development Project applications that have not received prior lawful approval by the Copermittee by the time the BMP Design Manual is updated pursuant to Provision E.3.d, the requirements of Provision E.3 are implemented. For project applications that have received prior lawful approval before the BMP Design Manual is updated pursuant to Provision E.3.d, the Copermittee may allow previous land development requirements to apply.

(b) Each Copermittee must identify the roles and responsibilities of its various municipal departments in implementing the structural BMP requirements, including each stage of a project from application review and approval through BMP maintenance and inspections.

(c) Each Copermittee must require and confirm that appropriate easements and ownerships are properly recorded in public records and the information is conveyed to all appropriate parties when there is a change in project or site ownership.

(d) Each Copermittee must require and confirm that prior to occupancy and/or intended use of any portion of the Priority Development Project, each structural BMP is inspected to verify that it has been constructed and is operating in compliance with all of its specifications, plans, permits, ordinances, and the requirements of this Order.

(2) Priority Development Project Inventory and Prioritization

(a) Each Copermittee must develop, maintain, and update at least annually, a watershed-based database to track and inventory all Priority Development Projects and associated structural BMPs within its jurisdiction. Inventories must be accurate and complete beginning from December 2002 for the San Diego County Copermittees, February 2003 for the Orange County Copermittees, and July 2005 for the Riverside County Copermittees. The use of an automated database system, such as GIS, is highly recommended. The database must include, at a minimum, the following information:

(i) Priority Development Project location (address and hydrologic subarea);

(ii) Descriptions of structural BMP type(s);

(iii) Date(s) of construction;

(iv) Party responsible for structural BMP maintenance;

(v) Dates and findings of structural BMP maintenance verifications; and

(vi) Corrective actions and/or resolutions, when applicable.

(b) Each Copermittee must prioritize the Priority Development Projects with structural BMPs within its jurisdiction. The designation of Priority Development Projects as high priority must consider the following:

(i) The highest water quality priorities identified in the Water Quality Improvement Plan;

(ii) Receiving water quality;

(iii) Number and sizes of structural BMPs;

(iv) Recommended maintenance frequency of structural BMPs;

(v) Likelihood of operation and maintenance issues of structural BMPs;

(vi) Land use and expected pollutants generated; and

(vii) Compliance record.

(3) Structural BMP Maintenance Verifications and Inspections

Each Copermittee is required to verify that structural BMPs on each Priority Development Project are adequately maintained, and continue to operate effectively to remove pollutants in storm water to the MEP through inspections, self-certifications, surveys, or other equally effective approaches.

(a) All (100 percent) of the structural BMPs at Priority Development Projects that are designated as high priority must be inspected directly by the Copermittee annually prior to each rainy season;

(b) For verifications performed through a means other than direct Copermittee inspection, adequate documentation must be required by the Copermittee to provide assurance that the required maintenance of structural BMPs at each Priority Development Project has been completed; and

(c) Appropriate follow-up measures (including re-inspections, enforcement, etc.) must be conducted to ensure that structural BMPs at each Priority Development Project continue to reduce pollutants in storm water to the MEP as originally designed.

f. DEVELOPMENT PROJECT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all development projects, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

4. Construction Management

Each Copermittee must implement a construction management program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. Project Approval Process

Prior to issuance of any local permit(s) that allows the commencement of construction projects that involve ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff, each Copermittee must:

(1) Require a pollution control plan, construction BMP plan, and/or an erosion and sediment control plan, to be submitted by the project applicant to the Copermittee;

(2) Confirm the pollution control plan, construction BMP plan, and/or erosion and sediment control plan, complies with the local grading ordinance, other applicable local ordinances, and the requirements of this Order;

(3) Confirm the pollution control, construction BMP, and/or erosion and sediment control plan, includes seasonally appropriate and effective BMPs and management measures described in Provision E.4.c, as applicable to the project; and

(4) Verify that the project applicant has obtained coverage under the statewide Construction General Permit (Order 2012-0006-DWQ or subsequent Order), if applicable.

b. Construction Site Inventory and Tracking

(1) Each Copermittee must maintain and update, at least quarterly, a watershed-based inventory of all construction projects issued a local permit that allows ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff. The use of an automated database system, such as GIS, is highly recommended. The inventory must include:

(a) Relevant contact information for each site (e.g., name, address, phone, and email for the owner and contractor);

(b) The basic site information including location (address and hydrologic subarea), Waste Discharge Identification (WDID) number (if applicable), size of the site, and approximate area of disturbance;

(c) Whether or not the site is considered a high threat to water quality, as defined in Provision E.4.b.(2) below;

(d) The project start and completion dates;

(e) The required inspection frequency, as defined in the Copermittee's jurisdictional runoff management program document;

(f) The date the Copermittee accepted or approved the pollution control plan, construction BMP plan, and/or erosion and sediment control plan; and

(g) Whether or not there are ongoing enforcement actions administered to the site.

(2) Each Copermittee must identify all construction sites within its jurisdiction that represent a high threat to downstream surface water quality. The designation of construction sites as high threat to water quality must consider the following:

(a) Sites located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Sites located within the same hydrologic subarea and tributary to a water body segment listed as impaired for sediment on the CWA section 303(d) List;

(c) Sites located within, directly adjacent to, or discharging directly to a receiving water within an ESA; and

(d) Other sites determined by the Copermittees or the San Diego Water Board as a high threat to water quality.

c. CONSTRUCTION SITE BMP IMPLEMENTATION

Each Copermittee must implement, or require the implementation of effective BMPs to reduce discharges of pollutants in storm water from construction sites to the MEP, and effectively prohibit non-storm water discharges from construction sites into the MS4. These BMPs must be site specific, seasonally appropriate, and construction phase appropriate. BMPs must be implemented at each construction site year round. Dry season BMP implementation must plan for and address unseasonal rain events that may occur during the dry season (May 1 through September 30). Copermittees must implement, or require the implementation of, BMPs in the following categories:

(1) Project Planning;

(2) Good Site Management "Housekeeping", including waste management;

(3) Non-storm Water Management;

(4) Erosion Control;

(5) Sediment Control;

(6) Run-on and Run-off Control; and

(7) Active/Passive Sediment Treatment Systems, where applicable.

d. CONSTRUCTION SITE INSPECTIONS

Each Copermittee must conduct construction site inspections to require and confirm compliance with its local permits and applicable local ordinances, and the requirements of this Order. Priority for site inspections must consider threat to water quality pursuant to Provision E.4.b as well as the nature of the construction activity, topography, and the characteristics of soils and receiving water quality.

(1) Inspection Frequency

(a) Each Copermittee must conduct inspections at all inventoried sites, including high threat to water quality sites, at an appropriate frequency for each phase of construction to confirm the site reduces the discharge of pollutants in storm water from construction sites to the MEP, and effectively prohibits non-storm water discharges from entering the MS4.

(b) Each Copermittee must establish appropriate inspection frequencies for high threat to water quality sites, and all other sites, for each phase of construction. Inspection frequencies appropriate for addressing the highest water quality priorities identified in the Water Quality Improvement Plan, and for complying with the requirements of this Order must be identified in each Copermittee's jurisdictional runoff management program document.

(c) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e., re-inspection, enforcement) necessary to require and confirm site compliance with its local permits and applicable local ordinances, and the requirements of this Order.

(2) Inspection Content

Inspections of construction sites by the Copermittee must include, at a minimum:

(a) Verification of coverage under the Construction General Permit (Notice of Intent (NOI) and/or WDID number) during initial inspections, when applicable;

(b) Assessment of compliance with its local permits and applicable local ordinances related to pollution prevention, including the implementation and maintenance of applicable BMPs;

(c) Assessment of BMP adequacy and effectiveness;

(d) Visual observations of actual non-storm water discharges;

(e) Visual observations of actual or potential discharge of sediment and/or construction related materials from the site;

(f) Visual observations of actual or potential illicit connections; and

(g) If any violations are found and BMP corrections are needed, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried construction sites. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Site name, location (address and hydrologic subarea), and WDID number (if applicable);

(b) Inspection date;

(c) Approximate amount of rainfall since last inspection;

(d) Description of problems observed with BMPs and indication of need for BMP addition/repair/replacement and any scheduled re-inspection, and date of re-inspection;

(e) Descriptions of any other specific inspection comments which must, at a minimum, include rationales for longer compliance time;

(f) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(g) Resolution of problems noted and date problems fixed.

e. CONSTRUCTION SITE ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried construction sites, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

5. Existing Development Management

Each Copermittee must implement an existing development management program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. EXISTING DEVELOPMENT INVENTORY AND TRACKING

Each Copermittee must maintain, and update at least annually, a watershed-based inventory of the existing development within its jurisdiction that may discharge a pollutant load to and from the MS4. The use of an automated database system, such as GIS, is highly recommended. The inventory must, at a minimum, include:

(1) Name, location (hydrological subarea and address, if applicable) of the following types of existing development with its jurisdiction:

(a) Commercial facilities or areas;

(b) Industrial facilities;

(c) Municipal facilities, including:

(i) MS4 and related structures;[27]
(ii) Roads, streets, and highways;
(iii) Parking facilities;
(iv) Municipal airfields;
(v) Parks and recreation facilities;
(vi) Flood management facilities, flood control devices and structures;
(vii) Operating or closed municipal landfills;
(viii) Publicly owned treatment works (including water and wastewater treatment plants) and sanitary sewer collection systems;
(ix) Corporate yards, including maintenance and storage yards for materials, waste, equipment, and vehicles;

[27] The inventory may refer to the MS4 map required to be maintained pursuant to Provision E.2.b.(1).

(x) Hazardous waste collection facilities;

(xi) Other treatment, storage or disposal facilities for municipal waste; and

(xii) Other municipal facilities that the Copermittee determines may contribute a significant pollutant load to the MS4.

(d) Residential areas, which may be designated by one or more of the following:

(i) Residential management area;

(ii) Drainage basin or area;

(iii) Land use (e.g., single family, multi-family, rural);

(iv) Neighborhood;

(v) Common Interest Area;

(vi) Home Owner Association;

(vii) Mobile home park; and/or

(viii) Other designations accepted by the San Diego Water Board Executive Officer.

(2) A description of the facility or area, including the following information:

(a) Classification as commercial, industrial, municipal, or residential;

(b) Status of facility or area as active or inactive;

(c) Identification if a business is a mobile business;

(d) SIC Code or NAICS Code, if applicable;

(e) Industrial General Permit NOI and/or WDID number, if applicable;

(f) Identification if a residential area is or includes a Common Interest Area / Home Owner Association, or mobile home park;

(g) Identification of pollutants generated and potentially generated by the facility or area;

(h) Whether the facility or area is adjacent to an ESA;

(i) Whether the facility or area is tributary to and within the same hydrologic subarea as a water body segment listed as impaired on the CWA section 303(d) List and generates pollutants for which the water body segment is impaired; and

(3) An annually updated map showing the location of inventoried existing development, watershed boundaries, and water bodies.

b. EXISTING DEVELOPMENT BMP IMPLEMENTATION AND MAINTENANCE

Each Copermittee must designate a minimum set of BMPs required for all inventoried existing development, including special event venues. The designated minimum BMPs must be specific to facility or area types and pollutant generating activities, as appropriate.

(1) Commercial, Industrial, and Municipal Facilities and Areas

(a) Pollution Prevention

Each Copermittee must require the use of pollution prevention methods by the commercial, industrial, and municipal facilities and areas in its inventoried existing development to address the priorities and strategies in the Water Quality Improvement Plan.

(b) BMP Implementation

Each Copermittee must require the implementation of designated BMPs at commercial facilities and areas, industrial facilities, and implement designated BMPs at municipal facilities in its inventoried existing development.

(c) BMP Operation and Maintenance

(i) Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development.

(ii) Each Copermittee must implement a schedule of operation and maintenance activities for its MS4 and related structures (including but not limited to catch basins, storm drain inlets, detention basins, etc.), and verify proper operation of all its municipal structural treatment controls designed to reduce pollutants (including floatables) in storm water discharges to or from its MS4s and related drainage structures. Operation and maintenance activities may include, but is not limited to, the following:

[a] Inspections of the MS4 and related structures;
[b] Cleaning of the MS4 and related structures; and
[c] Proper disposal of materials removed from cleaning of the MS4 and related structures.

(iii) Each Copermittee must implement a schedule of operation and maintenance for public streets, unpaved roads, paved roads, and paved highways within its jurisdiction to minimize pollutants that can be discharged in storm water.

(iv) Each Copermittee must implement controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers. Copermittees that operate both a municipal sanitary sewer system and a MS4 must implement controls and measures to prevent and eliminate seeping sewage from infiltrating the MS4. Copermittees that do not operate both a municipal sanitary sewer system and a MS4 must coordinate with sewering agencies to keep themselves informed of relevant and appropriate maintenance activities and sanitary sewage projects in their jurisdiction that may cause or contribute to seepage of sewage into the MS4.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must require the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from commercial facilities and areas and industrial facilities, and implement BMPs at municipal facilities in its inventoried existing development. Such BMPs must include, as appropriate, educational activities, permits, certifications and other measures for applicators and distributors.

(2) <u>Residential Areas</u>

(a) Pollution Prevention

Each Copermittee must promote and encourage the use of pollution prevention methods, where appropriate, by the residential areas in its inventoried existing development.

(b) BMP Implementation

Each Copermittee must promote and encourage the implementation of designated BMPs at residential areas in its inventoried existing development.

(c) BMP Operation and Maintenance

Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at residential areas in its inventoried existing development.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must promote and encourage the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the

application, storage, and disposal of pesticides, herbicides and fertilizers from residential areas in its inventoried existing development.

c. EXISTING DEVELOPMENT INSPECTIONS

Each Copermittee must conduct inspections of inventoried existing development to ensure compliance with applicable local ordinances and permits, and the requirements of this Order.

(1) Inspection Frequency

(a) Each Copermittee must establish appropriate inspection frequencies for inventoried existing development in accordance with the following requirements:

(i) At a minimum, inventoried existing development must be inspected once every five years utilizing one or more of the following methods:

[a] Drive-by inspections by Copermittee municipal and contract staff;
[b] Onsite inspections by Copermittee municipal and contract staff; and/or
[c] Visual inspections of publicly accessible inventoried facilities or areas by volunteer monitoring or patrol programs that have been trained by the Copermittee;

(ii) The frequency of inspections must be appropriate to confirm that BMPs are being implemented to reduce the discharge of pollutants in storm water from the MS4 to the MEP and effectively prohibit non-storm water discharges to the MS4;

(iii) The frequency of inspections must be based on the potential for a facility or area to discharge non-storm water and pollutants in storm water, and should reflect the priorities set forth in the Water Quality Improvement Plan;

(iv) Each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development;[28] and

(v) Inventoried existing development must be inspected by the Copermittee, as needed, in response to valid public complaints.

(b) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e. education and outreach, re-inspection, enforcement)

[28] If any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspection may count toward the total annual inspection requirement. This requirement excludes linear municipal facilities (i.e., MS4 linear channels, sanitary sewer collection systems, streets, roads and highways).

necessary to require and confirm compliance with its applicable local ordinances and permits and the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

(2) Inspection Content

(a) Inspections of existing development must include, at a minimum:

(i) Visual inspections for the presence of actual non-storm water discharges;

(ii) Visual inspections for the presence of actual or potential discharge of pollutants;

(iii) Visual inspections for the presence of actual or potential illicit connections; and

(iv) Verification that the description of the facility or area in the inventory, required pursuant to Provision E.5.a.(2), has not changed.

(b) Onsite inspections of existing development by the Copermittee must include, at a minimum:

(i) Assessment of compliance with its applicable local ordinances and permits related to non-storm water and storm water discharges and runoff;

(ii) Assessment of the implementation of the designated BMPs;

(iii) Verification of coverage under the Industrial General Permit, when applicable; and

(iv) If any problems or violations are found, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried existing development. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Name and location of the facility or area (address and hydrologic subarea) consistent with the inventory name and location, pursuant to Provision E.5.a.(1);

(b) Inspection and re-inspection date(s);

(c) Inspection method(s) (i.e. drive-by, onsite);

(d) Observations and findings from the inspection(s);

(e) For onsite inspections of existing development by Copermittee municipal or contract staff, the records must also include, as applicable:

(i) Description of any problems or violations found during the inspection(s);

(ii) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(iii) The date problems or violations were resolved.

d. EXISTING DEVELOPMENT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried existing development, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

e. RETROFITTING AND REHABILITATING AREAS OF EXISTING DEVELOPMENT

(1) Retrofitting Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to retrofit areas of existing development within its jurisdiction to address identified sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify areas of existing development as candidates for retrofitting, focusing on areas where retrofitting will address pollutants and/or stressors that contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for retrofitting projects may be utilized to reduce pollutants that may be discharged in storm water from areas of existing development, and/or address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of retrofitting projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting projects; and

(e) Where retrofitting projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional retrofitting projects (i.e. projects that can receive and/or treat storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment) adjacent to and/or downstream of the areas of existing development.

(2) Stream, Channel and/or Habitat Rehabilitation in Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to rehabilitate streams, channels, and/or habitats in areas of existing development within its jurisdiction to address the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify streams, channels, and/or habitats in areas of existing development as candidates for rehabilitation, focusing on areas where stream, channel, and/or habitat rehabilitation projects will address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for stream, channel, and/or habitat rehabilitation projects may be utilized to address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters, rehabilitate channelized or hydromodified streams, restore wetland and riparian habitat, restore watershed functions, and/or restore beneficial uses of receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of stream, channel, and/or habitat rehabilitation projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance stream, channel, and/or habitat rehabilitation projects; and

(e) Where stream, channel, and/or habitat rehabilitation projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional stream, channel, and/or habitat rehabilitation projects (i.e. projects that can receive storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment).

6. Enforcement Response Plans

Each Copermittee must develop and implement an Enforcement Response Plan as part of its jurisdictional runoff management program document. The Enforcement Response Plan must describe the applicable approaches and options to enforce its legal authority established pursuant to Provision E.1, as necessary, to achieve compliance with the requirements of this Order. The Enforcement Response Plan must be in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include the following:

a. Enforcement Response Plan Components

The Enforcement Response Plan must include the following individual components:

(1) Illicit Discharge Detection and Elimination Enforcement Component;

(2) Development Planning Enforcement Component;

(3) Construction Management Enforcement Component; and

(4) Existing Development Enforcement Component.

b. Enforcement Response Approaches and Options

Each component of the Enforcement Response Plan must describe the enforcement response approaches that the Copermittee will implement to compel compliance with its statutes, ordinances, permits, contracts, orders, or similar means, and the requirements of this Order. The description must include the protocols for implementing progressively stricter enforcement responses. The enforcement response approaches must include appropriate sanctions to compel compliance, including, at a minimum, the following tools or their equivalent:

(1) Verbal and written notices of violation;

(2) Cleanup requirements;

(3) Fines;

(4) Bonding requirements;

(5) Administrative and criminal penalties;

(6) Liens;

(7) Stop work orders; and

(8) Permit and occupancy denials.

c. CORRECTION OF VIOLATIONS

(1) Violations must be corrected in a timely manner with the goal of correcting the violations within 30 calendar days after the violations are discovered, or prior to the next predicted rain event, whichever is sooner.

(2) If more than 30 calendar days are required to achieve compliance, then a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

d. ESCALATED ENFORCEMENT

(1) The Enforcement Response Plan must include a definition of "escalated enforcement." Escalated enforcement must include any enforcement scenario where a violation or other non-compliance is determined to cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan. Escalated enforcement may be defined differently for development planning, construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas.

(2) Where the Copermittee determines escalated enforcement is not required, a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

(3) Escalated enforcement actions must continue to increase in severity, as necessary, to compel compliance as soon as possible.

e. REPORTING OF NON-COMPLIANT SITES

(1) Each Copermittee must notify the San Diego Water Board in writing within five (5) calendar days of issuing escalated enforcement (as defined in the Copermittee's Enforcement Response Plan) to a construction site that poses a significant threat to water quality as a result of violations or other non-compliance with its permits and applicable local ordinances, and the

requirements of this Order. Written notification may be provided electronically by email to the appropriate San Diego Water Board staff.

(2) Each Copermittee must notify the San Diego Water Board any persons required to obtain coverage under the statewide Industrial General Permit and Construction General Permit and failing to do so, within five (5) calendar days from the time the Copermittee become aware of the circumstances. Written notification may be provided electronically by email to Nonfilers_R9@waterboards.ca.gov.

7. Public Education and Participation

Each Copermittee must implement, individually or with other Copermittees, a public education and participation program in accordance with the strategies identified in the Water Quality Improvement Plan to promote and encourage the development of programs, management practices, and behaviors that reduce the discharge of pollutants in storm water to the MEP, prevent controllable non-storm water discharges from entering the MS4, and protect water quality standards in receiving waters. The public education and participation program must be implemented in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include, at a minimum, the following requirements:

a. PUBLIC EDUCATION

The public education program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) Educational activities, public information activities, and other appropriate outreach activities intended to reduce pollutants associated with the application of pesticides, herbicides and fertilizer and other pollutants of concern in storm water discharges to and from its MS4 to the MEP, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed to address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(2) Educational activities, public information activities, and other appropriate outreach activities to facilitate the proper management and disposal of used oil and toxic materials; and

(3) Appropriate education and training measures for specific target audiences, such as construction site operators, residents, underserved target audiences and school-aged children, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed, based on high risk behaviors and pollutants of concern.

b. PUBLIC PARTICIPATION

The public participation program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) A process for members of the public to participate in updating the highest priority water quality conditions, numeric goals, and water quality improvement strategies in the Water Quality Improvement Plan;

(2) Opportunities for members of the public to participate in providing the Copermittee recommendations for improving the effectiveness of the water quality improvement strategies implemented within its jurisdiction; and

(3) Opportunities for members of the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or protection of the quality of receiving waters.

8. Fiscal Analysis

a. Each Copermittee must secure the resources necessary to meet all the requirements of this Order.

b. Each Copermittee must conduct an annual fiscal analysis of its jurisdictional runoff management program in its entirety. The fiscal analysis must include the following:

(1) Identification of the various categories of expenditures necessary to implement the requirements of this Order, including a description of the specific capital, operation and maintenance, and other expenditure items to be accounted for in each category of expenditures;

(2) The staff resources needed and allocated to meet the requirements of this Order, including any development, implementation, and enforcement activities required;

(3) The estimated expenditures for Provisions E.8.b.(1) and E.8.b.(2) for the current fiscal year; and

(4) The source(s) of funds that are proposed to meet the necessary expenditures described in Provisions E.8.b.(1) and E.8.b.(2), including legal restrictions on the use of such funds, for the current fiscal year and next fiscal year.

c. Each Copermittee must submit a summary of the annual fiscal analysis with each Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3).

d. Each Copermittee must provide the documentation used to develop the summary of the annual fiscal analysis upon request by the San Diego Water Board.

F. REPORTING

The purpose of this provision is to determine and document compliance with the requirements set forth in this Order. The goal of reporting is to communicate to the San Diego Water Board and the people of the State of California the implementation status of each jurisdictional runoff management program and compliance with the requirements of this Order. This goal is to be accomplished through the submittal of specific deliverables to the San Diego Water Board by the Copermittees.

1. Water Quality Improvement Plans

The Copermittees for each Watershed Management Area must develop and submit the Water Quality Improvement Plan in accordance with the following requirements:

a. WATER QUALITY IMPROVEMENT PLAN DEVELOPMENT

Each Water Quality Improvement Plan must be developed in accordance with the following process:

(1) Public Participation Process

The Copermittees must implement a public participation process to solicit data, information, and recommendations to be utilized in the development of the Water Quality Improvement Plan. The public participation process must include the following:

(a) The Copermittees must develop a publicly available and noticed schedule of the opportunities for the public to participate and provide comments during the development of the Water Quality Improvement Plan. The schedule may be adjusted as necessary by the Copermittees, provided the public is provided timely notification of the changes to the schedule.

(b) The Copermittees must form a Water Quality Improvement Consultation Panel to provide recommendations during the development of the Water Quality Improvement Plan. The Water Quality Improvement Consultation Panel must consist of at least the following members:

(i) A representative of the San Diego Water Board;

(ii) A representative of the environmental community familiar with the water quality conditions of concern of the receiving waters in the Watershed Management Area, preferably from an environmental interest group associated with a water body within the Watershed Management Area; and

(iii) A representative of the development community familiar with the opportunities and constraints for implementing structural BMPs, retrofitting projects, and stream, channel or habitat rehabilitation

projects in the Watershed Management Area, preferably with relevant engineering, hydrology, and/or geomorphology experience in the Watershed Management Area.

(c) The Copermittees must coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public time and opportunity to participate during the development of the Water Quality Improvement Plans.

(2) Priority Water Quality Conditions

(a) The Copermittees must solicit data, information and recommendations from the public to be utilized in the development and identification of the priority water quality conditions and potential water quality improvement strategies for the Watershed Management Area.

(b) The Copermittees must review the priority water quality conditions the Copermittees plan on including in the Water Quality Improvement Plan with the Water Quality Improvement Consultation Panel to receive recommendations or concurrence.

(c) The Copermittees must consider revisions to the priority water quality conditions based on recommendations from the Water Quality Improvement Consultation Panel.

(d) The Copermittees must include all the potential water quality improvement strategies identified by the public and the Water Quality Improvement Consultation Panel with the submittal of the priority water quality conditions to the San Diego Water Board.

(e) The Copermittees must submit the Water Quality Improvement Plan requirements of Provision B.2 to the San Diego Water Board as early as 6 months and no later than 12 months after the commencement of coverage under this Order. Upon receipt, the San Diego Water Board will issue a public notice and release the proposed priority water quality conditions and potential water quality improvement strategies for public review and comment for a minimum of 30 days.

(f) The Copermittees must consider revisions to the priority water quality conditions and potential water quality improvement strategies developed pursuant to Provision B.2 based on public comments received by the close of the comment period.

(3) Water Quality Improvement Goals, Strategies and Schedules

(a) The Copermittees must solicit recommendations from the public on potential numeric goals for the highest priority water quality conditions

identified for the Watershed Management Area, and recommendations on the strategies that should be implemented to achieve the potential numeric goals.

(b) The Copermittees must consult with the Water Quality Improvement Consultation Panel and consider revisions to the following items based on the Panel's recommendations:

(i) The numeric goals and schedules the Copermittees propose to include in the Water Quality Improvement Plan;

(ii) The water quality improvement strategies and schedules the Copermittees propose to implement in the Watershed Management Area and include in the Water Quality Improvement Plan; and

(iii) If the Copermittees choose to implement Provision B.3.b.(4), the results of the Watershed Management Area Analysis the Copermittees proposed to incorporate into the Water Quality Improvement Plan.

(c) The Copermittees must submit the Water Quality Improvement Plan requirements of Provision B.3 to the San Diego Water Board as early as 9 months and no later than 18 months after the commencement of coverage under this Order. Upon receipt, the San Diego Water Board will issue a public notice and release the proposed water quality improvement goals, strategies and schedules for public review and comment for a minimum of 30 days.

(d) The Copermittees must consider revisions to the water quality improvement goals, strategies and schedules developed pursuant to Provision B.3 based on public comments received by the close of the comment period.

b. WATER QUALITY IMPROVEMENT PLAN SUBMITTAL AND IMPLEMENTATION

(1) Within 24 months after the commencement of coverage under this Order, the Copermittees for each Watershed Management Area must submit a complete Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order to the San Diego Water Board. The San Diego Water Board will issue a public notice and release the Water Quality Improvement Plan for public review and comment for a minimum of 30 days.

(2) The Copermittees must consider revisions to the Water Quality Improvement Plan based on written comments received by the close of the public comment period.

(3) The Copermittees must promptly submit any revisions to the Water Quality Improvement Plan to the San Diego Water Board no later than 60 days after the close of the public comment period.

(4) If issues concerning the Water Quality Improvement Plan are resolved informally through discussions among the Copermittees, the San Diego Water Board and interested parties, the San Diego Water Board Executive Officer may provide written notification of acceptance to the Copermittees that the Water Quality Improvement Plan meets the requirements of Provision B. However, if the Executive Officer determines that significant issues with the Water Quality Improvement Plan remain, the matter will be scheduled for San Diego Water Board consideration at a public meeting.

(5) The Copermittees must commence with implementation of the Water Quality Improvement Plan, in accordance with the water quality improvement strategies and schedules therein, upon written notification of acceptance with the Water Quality Improvement Plan by the San Diego Water Board Executive Officer.

(6) During implementation of the Water Quality Improvement Plan the Copermittees must correct any deficiencies in the Plan identified by the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report following a request by the Board to do so.

(7) The Water Quality Improvement Plan must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of receiving notification of acceptance with the Water Quality Improvement Plan by the San Diego Water Board Executive Officer.

2. Updates

a. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATES

Each Copermittee must update its jurisdictional runoff management program document in accordance with the following requirements:

(1) Each Copermittee is encouraged to seek public and key stakeholder participation and comments, as early and often as possible during the process of developing updates to its jurisdictional runoff management program document;

(2) Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E concurrent with the submittal of the Water Quality Improvement Plan. Each Copermittee must correct any deficiencies in the jurisdictional runoff management program document based on comments received from the San Diego Water Board in

the updates submitted with the Water Quality Improvement Plan Annual Report;

(3) Each Copermittee must submit updates to its jurisdictional runoff management program, with the supporting rationale for the modifications, either in the Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b;

(4) The Copermittee must revise proposed modifications to its jurisdictional runoff management program as directed by the San Diego Water Board Executive Officer; and

(5) Updated jurisdictional runoff management program documents must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of submitting the Water Quality Improvement Plan Annual Report.

b. BMP DESIGN MANUAL UPDATES

Each Copermittee must update its BMP Design Manual in accordance with the following requirements:

(1) Each Copermittee must update its BMP Design Manual to incorporate the requirements of Provisions E.3.a-d concurrent with the submittal of the Water Quality Improvement Plan. Each Copermittee must correct any deficiencies in the BMP Design Manual based on comments received from the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report;

(2) Subsequent updates to the BMP Design Manual must be consistent with the requirements of Provisions E.3.a-d and must be submitted as part of the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b; and

(3) Updated BMP Design Manuals must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of completing the update.

c. WATER QUALITY IMPROVEMENT PLAN UPDATES

(1) The Water Quality Improvement Plans must be updated in accordance with the following process:

(a) The Copermittees must develop and implement a public participation process to obtain data, information and recommendations for updating the Water Quality Improvement Plan. The public participation process must provide for a publicly available and noticed schedule of opportunities for the public to participate and provide comments during the development of updates to the Water Quality Improvement Plan;

(b) The Copermittees must consult with the Water Quality Improvement Consultation Panel on proposed updates of the Water Quality Improvement Plan, and consider the Water Quality Improvement Consultation Panel's recommendations in finalizing the proposed updates;

(c) The Copermittees for each Watershed Management Area must submit 1) proposed updates to the Water Quality Improvement Plan and supporting rationale, and 2) recommendations received from the public and the Water Quality Improvement Consultation Panel and the rationale for the requested updates, either in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The updates submitted will be deemed accepted for inclusion in the Water Quality Improvement Plan ninety (90) days after submission unless otherwise directed in writing by the San Diego Water Board Executive Officer;

(d) The Copermittees must revise the requested updates as directed by the San Diego Water Board Executive Officer; and

(e) Updated Water Quality Improvement Plans must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance of the requested updates by the San Diego Water Board.

(2) No later than six months following Office of Administrative Law and USEPA approval of any TMDL Basin Plan amendment with wasteload allocations (WLAs) assigned to the Copermittees during the term of this Order, the Copermittees must initiate an update to the applicable Water Quality Improvement Plans in accordance with Provision F.1 or Provision F.2.c.(1) to incorporate the requirements of the TMDL WLAs.

3. Progress Reporting

a. Progress Report Presentations

The Copermittees for each Watershed Management Area must periodically appear before the San Diego Water Board, as requested by the Board, to provide progress reports on the implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs.

b. Annual Reports

(1) Transitional Jurisdictional Runoff Management Program Annual Reports

(a) Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) no later than October 31 of each year for each jurisdictional runoff management program reporting period (i.e. July 1 to June 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted.

(b) Each Copermittee must submit the information on the Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) specific to the area within its jurisdiction in each Watershed Management Area.

(c) In addition to submitting the Jurisdictional Runoff Management Program Annual Report Form during the transitional reporting period, each Copermittee may continue to utilize and submit the jurisdictional runoff management program annual reporting format of its previous NPDES permit until the first Water Quality Improvement Plan Annual Report is required to be submitted.

(2) Transitional Monitoring and Assessment Program Annual Reports

The Copermittees for each Watershed Management Area must submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted under this Order. The Transitional Monitoring and Assessment Program Annual Reports must include:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1.a and D.2.a, summarized and presented in tabular and graphical form; and

(b) The findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

(3) Water Quality Improvement Plan Annual Reports

The Copermittees for each Watershed Management Area must submit a Water Quality Improvement Plan Annual Report for each reporting period no later than January 31 of the following year. The annual reporting period consists of two different periods: 1) July 1 to June 30 of the following year for the jurisdictional runoff management programs, 2) October 1 to September 30 of the following year for the monitoring and assessment programs. The Water Quality Improvement Plan Annual Reports must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Each Annual Report must include the following:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, summarized and presented in tabular and graphical form;

(b) The progress of the special studies required pursuant to Provision D.3, and the findings, interpretations and conclusions of a special study, or each phase of a special study, upon its completion;

(c) The findings, interpretations and conclusions from the assessments required pursuant to Provision D.4;

(d) The progress of implementing the Water Quality Improvement Plan, including, but not limited to, the following:

(i) The progress toward achieving the interim and final numeric goals for the highest water quality priorities for the Watershed Management Area;

(ii) The water quality improvement strategies that were implemented and/or no longer implemented by each of the Copermittees during the reporting period and previous reporting periods;

(iii) The water quality improvement strategies planned for implementation during the next reporting period;

(iv) Proposed modifications to the water quality improvement strategies, the public comments received and the supporting rationale for the proposed modifications;

(v) Previous modifications or updates incorporated into the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document and implemented by the Copermittees in the Watershed Management Area; and

(vi) Proposed modifications or updates to the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document;

(e) A completed Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) for each Copermittee in the Watershed Management Area, certified by a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative; and

(f) Each Copermittee must provide any data or documentation utilized in developing the Water Quality Improvement Plan Annual Report upon request by the San Diego Water Board. Any Copermittee monitoring data utilized in developing the Water Quality Improvement Plan Annual Report must be uploaded to the California Environmental Data Exchange Network (CEDEN).[29] Any Copermittee monitoring and assessment data utilized in developing the Water Quality Improvement Plan Annual Report must be available for access on the Regional Clearinghouse required pursuant to Provision F.4.

c. Regional Monitoring and Assessment Report

(1) The Copermittees must submit a Regional Monitoring and Assessment Report no later than 180 days prior to the expiration date of this Order. The Regional Monitoring and Assessment Report may be submitted as part of the Report of Waste Discharge required pursuant to Provision F.5.b. In preparing the report the Copermittees must consider the receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, and the findings, interpretations, and conclusions from the assessments required pursuant to Provision D.4. Based on these considerations the report must assess the following:

(a) The beneficial uses of the receiving waters within the San Diego Region that are supported and not adversely affected by the Copermittees' MS4 discharges;

(b) The beneficial uses of the receiving waters within the San Diego Region that are adversely impacted by the Copermittees' MS4 discharges;

(c) The progress toward protecting the beneficial uses in the receiving waters within the San Diego Region from the Copermittees' discharges; and

[29] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

(d) Pollutants or conditions of emerging concern that may impact beneficial uses in the receiving waters within the San Diego Region.

(2) The Regional Monitoring and Assessment Report must include recommendations for improving the implementation and assessment of the Water Quality Improvement Plans and jurisdictional runoff management programs.

(3) Each Copermittee must provide any data or documentation utilized in developing the Regional Monitoring and Assessment Report upon request by the San Diego Water Board. Any Copermittee monitoring and assessment data utilized in developing the Regional Monitoring and Assessment Report must be available for access on the Regional Clearinghouse required pursuant to Provision F.4.

4. Regional Clearinghouse

The Copermittees must develop, update, and maintain an internet-based Regional Clearinghouse that is made available to the public no later than 18 months after the effective date of this Order.[30]

a. The Copermittees, through the Regional Clearinghouse, must make the following documents and data available for access, and organized by Watershed Management Area. The documents and data may be linked to other internet-based data portals and databases where the original documents are stored:

(1) Water Quality Improvement Plan for the Watershed Management Area, and all updated versions with date of update;

(2) Annual Reports for the Watershed Management Area;

(3) Jurisdictional Runoff Management Program document for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(4) BMP Design Manual for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(5) Reports from special studies (e.g. source identification, BMP effectiveness assessment) conducted in the Watershed Management Area;

[30] The Copermittees may develop, update and maintain the clearinghouse(s) of other Copermittees or agencies.

(6) Monitoring data collected pursuant to Provision D for each Watershed Management Area must be uploaded to CEDEN,[31] with links to the uploaded data; and

(7) Available GIS data, layers, and/or shapefiles used to develop the maps generated and maintained by the Copermittees for the Water Quality Improvement Plans, Annual Reports, and jurisdictional runoff management program documents.

b. The Copermittees, through the Regional Clearinghouse, must make the following information and documents available for access:

(1) Contact information (point of contact, phone number, email address, and mailing address) for each Copermittee;

(2) Public hotline number for reporting non-storm water and illicit discharges for each Copermittee;

(3) Email address for reporting non-storm water and illicit discharges for each Copermittee;

(4) Link to each Copermittee's website, if available, where the public may find additional information about the Copermittee's storm water management program and for requesting records for the implementation of its program;

(5) Information about opportunities for the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or protection of the quality of receiving waters; and

(6) Reports from regional monitoring programs in which the Copermittees participate (e.g. Southern California Monitoring Coalition, Southern California Coastal Water Research Project Bight Monitoring);

(7) Regional Monitoring and Assessment Reports; and

(8) Any other information, data, and documents the Copermittees determine as appropriate for making available to the public.

[31] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

5. Report of Waste Discharge

a. The Orange County Copermittees and the Riverside County Copermittees are required to submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders. The San Diego Water Board will review and consider the Reports of Waste Discharge to determine whether modification to this Order, pursuant to the requirements of Provision H, will be required prior to the Orange County Copermittees and/or Riverside County Copermittees obtaining coverage under this Order. The current Orders for the Orange County Copermittees and Riverside County Copermittees are rescinded upon the date of effective coverage under this Order except for enforcement purposes.

b. The Copermittees subject to the requirements of this Order must submit to the San Diego Water Board a complete Report of Waste Discharge as an application for the re-issuance of this Order and NPDES permit. The Report of Waste Discharge must be submitted no later than 180 days in advance of the expiration date of this Order. The Report of Waste Discharge must contain the following minimum information:

(1) Names and addresses of the Copermittees;

(2) Names and titles of the primary contacts of the Copermittees;

(3) Proposed changes to the Copermittees' Water Quality Improvement Plans and the supporting justification;

(4) Proposed changes to the Copermittees' jurisdictional runoff management programs and the supporting justification;

(5) Any other information necessary for the re-issuance of this Order;

(6) Any information to be included as part of the Report of Waste Discharge pursuant to the requirements of this Order; and

(7) Any other information required by federal regulations for NPDES permit reissuance.

6. Application for Early Coverage

a. The Orange County Copermittees, collectively, or Riverside County Copermittees, collectively, may apply for early coverage under this Order by submitting a Report of Waste Discharge Form 200, with a written request for early coverage under this Order.

b. The San Diego Water Board will review the application for early coverage. A notification of coverage under this Order will be issued to the Copermittees in the

respective county by the San Diego Water Board upon completion of the early coverage application requirements. The effective coverage date will be specified in the notification of coverage. The Copermittees in the respective county are authorized to have MS4 discharges pursuant to the requirements of this Order starting on the effective coverage date specified in the notification of coverage. The existing Order for the respective county is rescinded upon the effective coverage date specified in the notification of coverage except for enforcement purposes.

7. Reporting Provisions

Each Copermittee must comply with all the reporting and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

G. PRINCIPAL WATERSHED COPERMITTEE RESPONSIBILITIES

1. The Copermittees within each Watershed Management Area must designate a Principal Watershed Copermittee and notify the San Diego Water Board of the name of the Principal Watershed Copermittee. An individual Copermittee should not be designated a Principal Watershed Copermittee for more than two Watershed Management Areas. The notification may be submitted with the Water Quality Improvement Plan required pursuant to Provision F.1 of this Order.

2. The Principal Watershed Copermittee is responsible for, at a minimum, the following:

a. Serving as liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues, and when necessary and appropriate, representing the Copermittees in the Watershed Management Area before the San Diego Water Board;

b. Facilitating the development of the Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order;

c. Coordinating the submittal of the deliverables required by Provisions F.1, F.2, F.3.a, and F.3.b of this Order; and

d. Coordinating and developing, with the other Principal Watershed Copermittees, the requirements of Provisions F.3.c, F.4, and F.5.b of this Order.

3. The Principal Watershed Copermittee is not responsible for ensuring that the other Copermittees within the Watershed Management Area are in compliance with the requirements of this Order. Each Copermittee within the Watershed Management Area is responsible for complying with the requirements of this Order.

H. MODIFICATION OF ORDER

1. Modifications of the Order may be initiated by the San Diego Water Board or by the Copermittees. Requests by Copermittees must be made to the San Diego Water Board.

2. Minor modifications to the Order may be made by the San Diego Water Board where the proposed modification complies with all the prohibitions and limitations, and other requirements of this Order.

3. This Order may also be re-opened and modified, revoked and, reissued or terminated in accordance with the provisions of 40 CFR 122.44, 122.62 to 122.64, and 124.5. Causes for taking such actions include, but are not limited to, failure to comply with any condition of this Order and permit, and endangerment to human health or the environment resulting from the permitted activity.

4. This Order may be re-opened for modification for cause including but not limited to the following:

a. The State Water Board determines that revisions are warranted, and the San Diego Water Board concurs that revisions are necessary to those provisions of the Order addressing compliance with water quality standards in the receiving water and/or those provisions of the Order establishing an iterative process for implementation of management practices to assure compliance with water quality standards in the receiving water;

b. An application for early coverage under this Order is received pursuant to Provision F.6;

c. Any of the TMDLs in Attachment E to this Order are amended in the Basin Plan by San Diego Water Board, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA;

d. The Basin Plan is amended by the San Diego Water Board to incorporate a new TMDL, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA; or

e. Updating or revising the monitoring and reporting requirements is determined to be necessary, at the discretion of the San Diego Water Board. Such modification(s) may include, but is (are) not limited to, revision(s) to: (i) implement recommendations from Southern California Coastal Water Research Project (SCCWRP), (ii) develop, refine, implement, and/or coordinate a regional monitoring program, (iii) develop and implement improved monitoring and assessment programs in keeping with San Diego Water Board Resolution No. R9-2012-0069, Resolution in Support of a Regional Monitoring Framework, and/or (iv) add provisions to require the Copermittees to evaluate and provide information on cost and values of the monitoring and reporting program.

5. The San Diego Water Board, after opportunity for public comment and a public hearing, will re-open and consider modifications to this Order when the Orange County Copermittees or the Riverside County Copermittees submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders.

I. STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

Each Copermittee must comply with all the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

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ATTACHMENT A

DISCHARGE PROHIBITIONS AND SPECIAL PROTECTIONS

1. Basin Plan Waste Discharge Prohibitions

California Water Code Section 13243 provides that a Regional Water Board, in a water quality control plan, may specify certain conditions or areas where the discharge of waste or certain types of waste is not permitted. The following waste discharge prohibitions in the Water Quality Control Plan for the San Diego Basin (Basin Plan) are applicable to any person, as defined by Section 13050(c) of the California Water Code, who is a citizen, domiciliary, or political agency or entity of California whose activities in California could affect the quality of waters of the state within the boundaries of the San Diego Region.

1. The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in California Water Code Section 13050, is prohibited.

2. The discharge of waste to land, except as authorized by waste discharge requirements or the terms described in California Water Code Section 13264 is prohibited.

3. The discharge of pollutants or dredged or fill material to waters of the United States except as authorized by a National Pollutant Discharge Elimination System (NPDES) permit or a dredged or fill material permit (subject to the exemption described in California Water Code Section 13376) is prohibited.

4. Discharges of recycled water to lakes or reservoirs used for municipal water supply or to inland surface water tributaries thereto are prohibited, unless this San Diego Water Board issues a NPDES permit authorizing such a discharge; the proposed discharge has been approved by the State Department of Health Services (DHS) and the operating agency of the impacted reservoir; and the discharger has an approved fail-safe long-term disposal alternative.

5. The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the San Diego Water Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

6. The discharge of waste in a manner causing flow, ponding, or surfacing on lands not owned or under the control of the discharger is prohibited, unless the discharge is authorized by the San Diego Water Board.

7. The dumping, deposition, or discharge of waste directly into waters of the state, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the San Diego Water Board.

8. Any discharge to a storm water conveyance system that is not composed entirely of "*storm water*" is prohibited unless authorized by the San Diego Water Board. [The federal regulations, 40 CFR 122.26(b)(13), define storm water as storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from firefighting activities.] [§122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

9. The unauthorized discharge of treated or untreated sewage to waters of the state or to a storm water conveyance system is prohibited.

10. The discharge of industrial wastes to conventional septic tank/subsurface disposal systems, except as authorized by the terms described in California Water Code Section 13264, is prohibited.

11. The discharge of radioactive wastes amenable to alternative methods of disposal into the waters of the state is prohibited.

12. The discharge of any radiological, chemical, or biological warfare agent into waters of the state is prohibited.

13. The discharge of waste into a natural or excavated site below historic water levels is prohibited unless the discharge is authorized by the San Diego Water Board.

14. The discharge of sand, silt, clay, or other earthen materials from any activity, including land grading and construction, in quantities which cause deleterious bottom deposits, turbidity or discoloration in waters of the state or which unreasonably affect, or threaten to affect, beneficial uses of such waters is prohibited.

15. The discharge of treated or untreated sewage from vessels to Mission Bay, Oceanside Harbor, Dana Point Harbor, or other small boat harbors is prohibited.

16. The discharge of untreated sewage from vessels to San Diego Bay is prohibited.

17. The discharge of treated sewage from vessels to portions of San Diego Bay that are less than 30 feet deep at mean lower low water (MLLW) is prohibited.

18. The discharge of treated sewage from vessels, which do not have a properly functioning US Coast Guard certified Type I or Type II marine sanitation device, to portions of San Diego Bay that are greater than 30 feet deep at mean lower low water (MLLW) is prohibited.

2. Attachment B to State Water Board Resolution 2012-0012

Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges

I. PROVISIONS FOR POINT SOURCE DISCHARGES OF STORM WATER AND NONPOINT SOURCE WASTE DISCHARGES

The following terms, prohibitions, and special conditions (hereafter collectively referred to as special conditions) are established as limitations on point source storm water and nonpoint source discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in Areas of Special Biological Significance (ASBS), as required for State Water Quality Protection Areas pursuant to California Public Resources Code Sections 36700(f) and 36710(f). These Special Protections are adopted by the State Water Board as part of the California Ocean Plan (Ocean Plan) General Exception.

The special conditions are organized by category of discharge. The State Water Resources Control Board (State Water Board) and Regional Water Quality Control Boards (Regional Water Boards) will determine categories and the means of regulation for those categories [e.g., Point Source Storm Water National Pollutant Discharge Elimination System (NPDES) or Nonpoint Source].

A. PERMITTED POINT SOURCE DISCHARGES OF STORM WATER

1. General Provisions for Permitted Point Source Discharges of Storm Water

   a. Existing storm water discharges into an ASBS are allowed only under the following conditions:

      (1) The discharges are authorized by an NPDES permit issued by the State Water Board or Regional Water Board;

      (2) The discharges comply with all of the applicable terms, prohibitions, and special conditions contained in these Special Protections; and

      (3) The discharges:

         (i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

         (ii) Are designed to prevent soil erosion;

         (iii) Occur only during wet weather;

         (iv) Are composed of only storm water runoff.

   b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

   c. The discharge of trash is prohibited.

d. Only discharges from existing storm water outfalls are allowed. Any proposed or new storm water runoff discharge shall be routed to existing storm water discharge outfalls and shall not result in any new contribution of waste to an ASBS (i.e., no additional pollutant loading). “Existing storm water outfalls” are those that were constructed or under construction prior to January 1, 2005. “New contribution of waste” is defined as any addition of waste beyond what would have occurred as of January 1, 2005. A change to an existing storm water outfall, in terms of re-location or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges are prohibited except as provided below:

(1) The term “non-storm water discharges” means any waste discharges from a municipal separate storm sewer system (MS4) or other NPDES permitted storm drain system to an ASBS that are not composed entirely of storm water.

(2) (i) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability or occur naturally:

(a) Discharges associated with emergency firefighting operations.

(b) Foundation and footing drains.

(c) Water from crawl space or basement pumps.

(d) Hillside dewatering.

(e) Naturally occurring groundwater seepage via a storm drain.

(f) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(ii) An NPDES permitting authority may authorize non-storm water discharges to an MS4 with a direct discharge to an ASBS only to the extent the NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

2. Compliance Plans for Inclusion in Storm Water Management Plans (SWMP) and Storm Water Pollution Prevention Plans (SWPPP).

The discharger shall specifically address the prohibition of non-storm water runoff and the requirement to maintain natural water quality for storm water discharges to an ASBS in an ASBS Compliance Plan to be included in its SWMP or a SWPPP, as appropriate to permit type. If a statewide permit includes a SWMP, then the discharger shall prepare a stand-alone compliance plan for ASBS discharges. The ASBS Compliance Plan is subject to approval by the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (for permits issued by Regional Water Boards).

a. The Compliance Plan shall include a map of surface drainage of storm water runoff, showing areas of sheet runoff, prioritize discharges, and describe any structural Best Management Practices (BMPs) already employed and/or BMPs to be employed in the future. Priority discharges are those that pose the greatest water quality threat and which are identified to require installation of structural BMPs. The map shall also show the storm water conveyances in relation to other features such as service areas, sewage conveyances and treatment facilities, landslides, areas prone to erosion, and waste and hazardous material storage areas, if applicable. The SWMP or SWPPP shall also include a procedure for updating the map and plan when changes are made to the storm water conveyance facilities.

b. The ASBS Compliance Plan shall describe the measures by which all non-authorized non-storm water runoff (e.g., dry weather flows) has been eliminated, how these measures will be maintained over time, and how these measures are monitored and documented.

c. For Municipal Separate Storm Sewer System (MS4s), the ASBS Compliance Plan shall require minimum inspection frequencies as follows:

   (1) The minimum inspection frequency for construction sites shall be weekly during rainy season;

   (2) The minimum inspection frequency for industrial facilities shall be monthly during the rainy season;

   (3) The minimum inspection frequency for commercial facilities (e.g., restaurants) shall be twice during the rainy season; and

   (4) Storm water outfall drains equal to or greater than 18 inches (457 mm) in diameter or width shall be inspected once prior to the beginning of the rainy season and once during the rainy season and maintained to remove trash and other anthropogenic debris.

d. The ASBS Compliance Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff, that are necessary to comply with these special conditions, will be achieved through BMPs. Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that such installation would pose a threat to health or safety. BMPs to control storm water runoff discharges (at the end-of-pipe) during a design storm shall be designed to achieve on average the following target levels:

   (1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

   (2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges. The baseline for the reduction is the effective date of the Exception. The baseline for these determinations is the effective date of the Exception, and the

reductions must be achieved and documented within four (4) years of the effective date.

e. The ASBS Compliance Plan shall address erosion control and the prevention of anthropogenic sedimentation in ASBS. The natural habitat conditions in the ASBS shall not be altered as a result of anthropogenic sedimentation.

f. The ASBS Compliance Plan shall describe the non-structural BMPs currently employed and planned in the future (including those for construction activities), and include an implementation schedule. The ASBS Compliance Plan shall include non-structural BMPs that address public education and outreach. Education and outreach efforts must adequately inform the public that direct discharges of pollutants from private property not entering an MS4 are prohibited. The ASBS Compliance Plan shall also describe the structural BMPs, including any low impact development (LID) measures, currently employed and planned for higher threat discharges and include an implementation schedule. To control storm water runoff discharges (at the end-of-pipe) during a design storm, permittees must first consider using LID practices to infiltrate, use, or evapotranspirate storm water runoff on-site.

g. The BMPs and implementation schedule shall be designed to ensure that natural water quality conditions in the receiving water are achieved and maintained by either reducing flows from impervious surfaces or reducing pollutant loading, or some combination thereof.

h. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents in storm water runoff that alter natural ocean water quality and the sources of these constituents.

(2) The report shall describe BMPs that are currently being implemented, BMPs that are identified in the SWMP or SWPPP for future implementation, and any additional BMPs that may be added to the SWMP or SWPPP to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the BMPs.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits), the discharger shall revise its ASBS Compliance Plan to incorporate any new or modified BMPs that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised SWMP or SWPPP, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural ocean water quality conditions due to the same constituent.

(5) Compliance with this section does not excuse violations of any term, prohibition, or condition contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within one year from the effective date of the Exception, the discharger shall submit a written ASBS Compliance Plan to the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that describes its strategy to comply with these special conditions, including the requirement to maintain natural water quality in the affected ASBS. The ASBS Compliance Plan shall include a time schedule to implement appropriate non-structural and structural controls (implementation schedule) to comply with these special conditions for inclusion in the discharger's SWMP or SWPPP, as appropriate to permit type.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these special conditions shall be implemented.

d. Within four (4) years of the effective date of the Exception, any structural controls identified in the ASBS Compliance Plan that are necessary to comply with these special conditions shall be operational.

e. Within four (4) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water, pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data, and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

   If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

   The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

(1) for municipalities, a demonstration of significant hardship to discharger ratepayers, by showing the relationship of storm water fees to annual household income for residents within the discharger's jurisdictional area, and the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or
(2) for other governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process.

B. NONPOINT SOURCE DISCHARGES

[NOT INCLUDED]
[PROVISIONS FOR NONPOINT SOURCE DISCHARGES NOT APPLICABLE]

II. ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES

[NOT INCLUDED]
[ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES NOT APPLICABLE]

III. ADDITIONAL REQUIREMENTS – WATERFRONT AND MARINE OPERATIONS

[NOT INCLUDED]
[ADDITIONAL REQUIREMENTS FOR WATERFRONT AND MARINE OPERATIONS NOT APPLICABLE]

IV. MONITORING REQUIREMENTS

Monitoring is mandatory for all dischargers to assure compliance with the Ocean Plan. Monitoring requirements include both: (A) core discharge monitoring, and (B) ocean receiving water monitoring. The State and Regional Water Boards must approve sampling site locations and any adjustments to the monitoring programs. All ocean receiving water and reference area monitoring must be comparable with the Water Boards' Surface Water Ambient Monitoring Program (SWAMP).

Safety concerns: Sample locations and sampling periods must be determined considering safety issues. Sampling may be postponed upon notification to the State and Regional Water Boards if hazardous conditions prevail.

Analytical Chemistry Methods: All constituents must be analyzed using the lowest minimum detection limits comparable to the Ocean Plan water quality objectives. For metal analysis, all samples, including storm water effluent, reference samples, and ocean receiving water samples, must be analyzed by the approved analytical method with the lowest minimum detection limits (currently Inductively Coupled Plasma/Mass Spectrometry) described in the Ocean Plan.

A. CORE DISCHARGE MONITORING PROGRAM

1. General sampling requirements for timing and storm size:

   Runoff must be collected during a storm event that is greater than 0.1 inch and generates runoff, and at least 72 hours from the previously measurable storm event. Runoff samples shall be collected when post-storm receiving water is sampled, and analyzed for the same constituents as receiving water and reference site samples (see section IV B) as described below.

2. Runoff flow measurements

   a. For municipal/industrial storm water outfalls in existence as of December 31, 2007, 18 inches (457mm) or greater in diameter/width (including multiple outfall pipes in combination having a width of 18 inches, runoff flows must be measured or calculated, using a method acceptable to and approved by the State and Regional Water Boards.
   b. This will be reported annually for each precipitation season to the State and Regional Water Boards.

3. Runoff samples – storm events

   a. For outfalls equal to or greater than 18 inches (0.46m) in diameter or width:

      (1) Samples of storm water runoff shall be analyzed during the same storm as receiving water samples for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

      (2) Samples of storm water runoff shall be analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS

      (3) If an applicant has no outfall greater than 36 inches, then storm water runoff from the applicant's largest outfall shall be further analyzed during the same storm as receiving water samples for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates).

   b. For outfalls equal to or greater than 36 inches (0.91m) in diameter or width:

      (1) Samples of storm water runoff shall be analyzed during the same storm as receiving water samples for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

      (2) Samples of storm water runoff shall be further analyzed during the same storm as receiving water samples for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates) and

(3) Samples of storm water runoff shall be analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

c. For an applicant not participating in a regional monitoring program [see below in Section IV (B)] in addition to (a.) and (b.) above, a minimum of the two largest outfalls or 20 percent of the larger outfalls, whichever is greater, shall be sampled (flow weighted composite samples) at least three times annually during wet weather (storm event) and analyzed for all Ocean Plan Table A constituents, Table B constituents for marine aquatic life protection (except for toxicity, only chronic toxicity for three species shall be required), DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, and Ocean Plan indicator bacteria. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one (the largest) such discharge shall be sampled annually in each Region.

4. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may reduce or suspend core monitoring once the storm runoff is fully characterized. This determination may be made at any point after the discharge is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

B. OCEAN RECEIVING WATER AND REFERENCE AREA MONITORING PROGRAM

In addition to performing the Core Discharge Monitoring Program in Section II.A above, all applicants having authorized discharges must perform ocean receiving water monitoring. In order to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS, dischargers may choose either (1) an individual monitoring program, or (2) participation in a regional integrated monitoring program.

1. Individual Monitoring Program: The requirements listed below are for those dischargers who elect to perform an individual monitoring program to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within the affected ASBS. In addition to Core Discharge Monitoring, the following additional monitoring requirements shall be met:

   a. Three times annually, during wet weather (storm events), the receiving water at the point of discharge from the outfalls described in section (IV)(A)(3)(c) above shall be sampled and analyzed for Ocean Plan Table A constituents, Table B constituents for marine aquatic life, DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, salinity, chronic toxicity (three species), and Ocean Plan indicator bacteria.

      The sample location for the ocean receiving water shall be in the surf zone at the point of discharges; this must be at the same location where storm water runoff is sampled. Receiving water shall be sampled at approximately the same time prior to (pre-storm) and during (or immediately after) the same storm (post storm). Reference water quality shall also be sampled and analyzed for the same constituents pre-storm and post-storm, during the same storms when receiving water is sampled. Reference stations will be determined by the State Water Board's Division of Water Quality and the applicable Regional Water Board(s).

b. Sediment sampling shall occur at least three times during every five (5) year period. The subtidal sediment (sand or finer, if present) at the discharge shall be sampled and analyzed for Ocean Plan Table B constituents for marine aquatic life, DDT, PCBs, PAHs, pyrethroids, and OP pesticides. For sediment toxicity testing, only an acute toxicity test using the amphipod Eohaustorius estuarius must be performed.

c. A quantitative survey of intertidal benthic marine life shall be performed at the discharge and at a reference site. The survey shall be performed at least once every five (5) year period. The survey design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The results of the survey shall be completed and submitted to the State Water Board and Regional Water Board at least six months prior to the end of the permit cycle.

d. Once during each five (5) year period, a bioaccumulation study shall be conducted to determine the concentrations of metals and synthetic organic pollutants at representative discharge sites and at representative reference sites. The study design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The bioaccumulation study may include California mussels (Mytilus californianus) and/or sand crabs (Emerita analoga or Blepharipoda occidentalis). Based on the study results, the Regional Water Board and the State Water Board's Division of Water Quality, may adjust the study design in subsequent permits, or add or modify additional test organisms (such as shore crabs or fish), or modify the study design appropriate for the area and best available sensitive measures of contaminant exposure.

e. Marine Debris: Representative quantitative observations for trash by type and source shall be performed along the coast of the ASBS within the influence of the discharger's outfalls. The design, including locations and frequency, of the marine debris observations is subject to approval by the Regional Water Board and State Water Board's Division of Water Quality.

f. The monitoring requirements of the Individual Monitoring Program in this section are minimum requirements. After a minimum of one (1) year of continuous water quality monitoring of the discharges and ocean receiving waters, the Executive Director of the State Water Board (statewide permits) or Executive officer of the Regional Water Board (Regional Water Board permits) may require additional monitoring, or adjust, reduce or suspend receiving water and reference station monitoring. This determination may be made at any point after the discharge and receiving water is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

2. Regional Integrated Monitoring Program: Dischargers may elect to participate in a regional integrated monitoring program, in lieu of an individual monitoring program, to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS. This regional approach shall characterize natural water quality, pre- and post-storm, in ocean reference areas near the mouths of identified open space watersheds and the effects of the discharges on natural water quality (physical, chemical, and toxicity) in the ASBS receiving waters, and should include benthic marine aquatic life and bioaccumulation components. The design of the ASBS stratum of a regional integrated monitoring program may deviate from the otherwise prescribed individual monitoring approach (in Section IV.B.1) if approved by the State Water Board's Division of Water Quality and the Regional Water Boards.

a. Ocean reference areas shall be located at the drainages of flowing watersheds with minimal development (in no instance more than 10% development), and shall not be located in CWA Section 303(d) listed waterbodies or have tributaries that are 303(d) listed. Reference areas shall be free of wastewater discharges and anthropogenic non-storm water runoff. A minimum of low threat storm runoff discharges (e.g. stream highway overpasses and campgrounds) may be allowed on a case-by-case basis. Reference areas shall be located in the same region as the ASBS receiving water monitoring occurs. The reference areas for each Region are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean reference water samples must be collected from each station, each from a separate storm. A minimum of one reference location shall be sampled for each ASBS receiving water site sampled per responsible party. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

b. ASBS ocean receiving water must be sampled in the surf zone at the location where the runoff makes contact with ocean water (i.e. at "point zero"). Ocean receiving water stations must be representative of worst-case discharge conditions (i.e. co-located at a large drain greater than 36 inches, or if drains greater than 36 inches are not present in the ASBS then the largest drain greater than18 inches.) Ocean receiving water stations are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean receiving water samples must be collected during each storm season from each station, each from a separate storm. A minimum of one receiving water location shall be sampled in each ASBS per responsible party in that ASBS. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

c. Reference and receiving water sampling shall commence during the first full storm season following the adoption of these special conditions, and post-storm samples shall be collected when annual storm water runoff is sampled. Sampling shall occur in a minimum of two storm seasons. For those ASBS dischargers that have already participated in the Southern California Bight 2008 ASBS regional monitoring effort, sampling may be limited to only one storm season.

d. Receiving water and reference samples shall be analyzed for the same constituents as storm water runoff samples. At a minimum, constituents to be sampled and analyzed in reference and discharge receiving waters must include oil and grease, total suspended solids, Ocean Plan Table B metals for protection of marine life, Ocean Plan PAHs, pyrethroids, OP pesticides, ammonia, nitrate, phosphates, and critical life stage chronic toxicity for three species. In addition, within the range of the southern sea otter, indicator bacteria or some other measure of fecal contamination shall be analyzed.

3. Waterfront and Marine Operations: In addition to the above requirements for ocean receiving water monitoring, additional monitoring must be performed for marinas and boat launch and pier facilities:

a. For all marina or mooring field operators, in mooring fields with 10 or more occupied moorings, the ocean receiving water must be sampled for Ocean Plan indicator bacteria, residual chlorine, copper, zinc, grease and oil, methylene blue active substances (MBAS), and ammonia nitrogen.

   (1) For mooring field operators opting for an individual monitoring program (Section IV.B.1 above), this sampling must occur weekly (on the weekend) from May through October.

   (2) For mooring field operators opting to participate in a regional integrated monitoring program (Section IV.B.2 above), this sampling must occur monthly from May through October on a high use weekend in each month. The Water Boards may allow a reduction in the frequency of sampling, through the regional monitoring program, after the first year of monitoring.

b. For all mooring field operators, the subtidal sediment (sand or finer, if present) within mooring fields and below piers shall be sampled and analyzed for Ocean Plan Table B metals (for marine aquatic life beneficial use), acute toxicity, PAHs, and tributyltin. For sediment toxicity testing, only an acute toxicity test using the amphipod Eohaustorius estuarius must be performed. This sampling shall occur at least three times during a five (5) year period. For mooring field operators opting to participate in a regional integrated monitoring program, the Water Boards may allow a reduction in the frequency of sampling after the first sampling effort's results are assessed.

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ATTACHMENT B

STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

1. Standard Permit Provisions

Code of Federal Regulations Title 40 Section 122.41 (40 CFR 122.41) includes conditions, or provisions, that apply to all National Pollutant Discharge Elimination System (NPDES) permits. Additional provisions applicable to NPDES permits are in 40 CFR 122.42. All applicable provisions in 40 CFR 122.41 and 40 CFR 122.42 must be incorporated into this Order and NPDES permit. The applicable 40 CFR 122.41 and 40 CFR 122.42 provisions are as follows:

a. DUTY TO COMPLY [40 CFR 122.41(a)]

The Copermittee must comply with all of the provisions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

(1) The Copermittee must comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement. [40 CFR 122.41(a)(1)]

(2) The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to a civil penalty not to exceed $25,000 per day for each violation. The CWA provides that any person who *negligently* violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than 2 years, or both. Any person who *knowingly* violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both. Any person who knowingly violates Section 301, 302, 303, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, and who knows at that time that he thereby places another person in imminent danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of

not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.
[40 CFR 122.41(a)(2)]

(3) Any person may be assessed an administrative penalty by the San Diego Regional Water Quality Control Board (San Diego Water Board), State Water Resources Control Board (State Water Board), or United States Environmental Protection Agency (USEPA) for violating Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.
[40 CFR 122.41(a)(3)]

b. DUTY TO REAPPLY [40 CFR 122.41(b)]

If a Copermittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Copermittee must apply for and obtain a new permit.

c. NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE [40 CFR 122.41(c)]

It shall not be a defense for a Copermittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

d. DUTY TO MITIGATE [40 CFR 122.41(d)]

The Copermittee must take all reasonable steps to minimize or prevent any discharge or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

e. PROPER OPERATION AND MAINTENANCE [40 CFR 122.41(e)]

The Copermittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Copermittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by a Copermittee only when the operation is necessary to achieve compliance with the conditions of this permit.

f. PERMIT ACTIONS [40 CFR 122.41(f)]

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Copermittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

g. PROPERTY RIGHTS [40 CFR 122.41(g)]

This permit does not convey any property rights of any sort, or any exclusive privilege.

h. DUTY TO PROVIDE INFORMATION [40 CFR 122.41(h)]

The Copermittee must furnish to the San Diego Water Board, State Water Board, or USEPA within a reasonable time, any information which the San Diego Water Board, State Water Board, or USPEA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Copermittee must also furnish to the San Diego Water Board, State Water Board, or USPEA upon request, copies of records required to be kept by this permit.

i. INSPECTION AND ENTRY [40 CFR 122.41(i)]

The Copermittee must allow the San Diego Water Board, State Water Board, USEPA, and/or their authorized representative (including an authorized contractor acting as their representative), upon presentation of credentials and other documents as may be required by law, to:

(1) Enter upon the Copermittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit; [40 CFR 122.41(i)(1)]

(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit; [40 CFR 122.41(i)(2)]

(3) Inspect and photograph at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; [40 CFR 122.41(i)(3)] and

(4) Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location. [40 CFR 122.41(i)(4)]

j. MONITORING AND RECORDS [40 CFR 122.41(j)]

(1) Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity. [40 CFR 122.41(j)(1)]

(2) Except for records of monitoring information required by this permit related to the Copermittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five (5) years (or longer as required by 40 CFR Part 503), the

Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time. [40 CFR 122.41(j)(2)]

(3) Records for monitoring information must include: [40 CFR 122.41(j)(3)]

(a) The date, exact place, and time of sampling or measurements; [40 CFR 122.41(j)(3)(i)]
(b) The individual(s) who performed the sampling or measurements; [40 CFR 122.41(j)(3)(ii)]
(c) The date(s) analyses were performed; [40 CFR 122.41(j)(3)(iii)]
(d) The individual(s) who performed the analyses; [40 CFR 122.41(j)(3)(iv)]
(e) The analytical techniques or methods used; [40 CFR 122.41(j)(3)(v)] and
(f) The results of such analyses. [40 CFR 122.41(j)(3)(vi)]

(4) Monitoring must be conducted according to test procedures under 40 CFR Part 136 unless another method is required under 40 CFR Subchapters N or O. [40 CFR 122.41(j)(4)]

In the case of pollutants for which there are no approved methods under 40 CFR Part 136 or otherwise required under 40 CFR Subchapters N and O, monitoring must be conducted according to a test procedure specified in the permit for such pollutants. [40 CFR 122.44(i)(1)(iv)]

(5) The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. [40 CFR 122.41(j)(5)]

k. SIGNATORY REQUIREMENT [40 CFR 122.41(k)]

(1) All applications, reports, or information submitted to the San Diego Water Board, State Water Board, or USEPA must be signed and certified. (See 40 CFR 122.22) [40 CFR 122.41(k)(1)]

(a) *For a municipality, State, Federal, or other public agency.* [All applications must be signed] by either a principal executive officer or ranking elected official. [40 CFR 122.22(a)(3)]

(b) All reports required by permits, and other information requested by the San Diego Water Board, State Water Board, or USEPA must be signed by a person described in paragraph (a) of this section, or by a duly authorized representative of that person. A person is a duly authorized representative only if: [40 CFR 122.22(b)]

(i) The authorization is made in writing by a person described in paragraph (a) of this section; [40 CFR 122.22(b)(1)]

(ii) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company, (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) [40 CFR 122.22(b)(2)] and,

(iii) The written authorization is submitted to the San Diego Water Board and State Water Board. [40 CFR 122.22(b)(3)]

(c) *Changes to authorization.* If an authorization under paragraph (b) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (b) of this section must be submitted to the San Diego Water Board prior to or together with any reports, information, or applications to be signed by an authorized representative. [40 CFR 122.22(c)]

(d) *Certification.* Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." [40 CFR 122.22(d)]

(2) The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both. [40 CFR 122.41(k)(2)]

I. REPORTING REQUIREMENTS [40 CFR 122.41(l)]

(1) *Planned changes.* The Copermittee must give notice to the San Diego Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when: [40 CFR 122.41(l)(1)]

(a) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); [40 CFR 122.41(l)(1)(i)] or

(b) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which

are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1).
[40 CFR 122.41(l)(1)(ii)]

(c) The alteration or addition results in a significant change in the Copermittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. [40 CFR 122.41(l)(1)(iii)]

(2) *Anticipated noncompliance*. The Copermittee must give advance notice to the San Diego Water Board or State Water Board of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.
[40 CFR 122.41(l)(2)]

(3) *Transfers*. This permit is not transferable to any person except after notice to the San Diego Water Board. The San Diego Water Board may require modification or revocation and reissuance of the permit to change the name of the Copermittee and incorporate such other requirements as may be necessary under the CWA.
[40 CFR 122.41(l)(3)]

(4) *Monitoring reports.* Monitoring results must be reported at the intervals specified elsewhere in this permit. [40 CFR 122.41(l)(4)]

(a) Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the San Diego Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices. [40 CFR 122.41(l)(4)(i)]

(b) If the Copermittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or another method required for an industry-specific waste stream under 40 CFR Subchapters N or O, the results of this monitoring must be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the San Diego Water Board or State Water Board.
[40 CFR 122.41(l)(4)(ii)]

(c) Calculations for all limitations which require averaging of measurements must utilize an arithmetic mean unless otherwise specified in the permit.
[40 CFR 122.41(l)(4)(iii)]

(5) *Compliance schedules*. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date. [40 CFR 122.41(l)(5)]

(6) *Twenty-four hour reporting.*

(a) The Copermittee must report any noncompliance that may endanger health or the environment. Any information must be provided orally within 24 hours from the time the Copermittee becomes aware of the circumstances. A written submission must also be provided within five (5) days of the time the Copermittee becomes aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6)(i)]

(b) The following must be included as information which must be reported within 24 hours under this paragraph: [40 CFR 122.41(l)(6)(ii)]

(i) Any unanticipated bypass that exceeds any effluent limitation in the permit (See 40 CFR 122.41(g)). [40 CFR 122.41(l)(6)(ii)(A)]
(ii) Any upset which exceeds any effluent limitation in the permit. [40 CFR 122.41(l)(6)(ii)(B)] and,
(iii) Violation of a maximum daily discharge limitation for any of the pollutants listed by the San Diego Water Board in the permit to be reported within 24 hours. (See 40 CFR 122.44(g)) [40 CFR 122.41(l)(6)(ii)(C)]

(c) The San Diego Water Board may waive the above-required written report on a case-by-case basis if the oral report has been received within 24 hours. [40 CFR 122.41(l)(6)(iii)]

(7) *Other noncompliance.* The Copermittee must report all instances of noncompliance not reported in accordance with the standard provisions required under 40 CFR 122.41(l)(4), (5), and (6), at the time monitoring reports are submitted. The reports must contain the information listed in the standard provisions required under 40 CFR 122.41(l)(6). [40 CFR 122.41(l)(7))]

(8) *Other information.* When the Copermittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the San Diego Water Board, State Water Board, or USEPA, the Copermittee must promptly submit such facts or information. [40 CFR 122.41(l)(8)]

m. BYPASS [40 CFR 122.41(m)]

(1) *Definitions.*

(a) "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. [40 CFR 122.41(m)(1)(i)] or

(b) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be

expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
[40 CFR 122.41(m)(1)(ii)]

(2) *Bypass not exceeding limitations*. The Copermittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the standard provisions required under 40 CFR 122.41(m)(3) and (4).
[40 CFR 122.41(m)(2)]

(3) *Notice.*

(a) *Anticipated bypass*. If the Copermittee knows in advance of the need for a bypass, it must submit a notice, if possible at least ten days before the date of the bypass. [40 CFR 122.41(m)(3)(i)] or

(b) *Unanticipated bypass*. The Copermittee must submit notice of an unanticipated bypass in accordance with the standard provisions required under 40 CFR 122.41(l)(6) (24-hour notice).
[40 CFR 122.41(m)(3)(ii)]

(4) *Prohibition of Bypass.*

(a) Bypass is prohibited, and the San Diego Water Board may take enforcement action against a Copermittee for bypass, unless:
[40 CFR 122.41(m)(4)(i)]

(i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; [40 CFR 122.41(m)(4)(i)(A)]
(ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance;
[40 CFR 122.41(m)(4)(i)(B)] and,
(iii) The Copermittee submitted notice in accordance with the standard provisions required under 40 CFR 122.41(m)(3).
[40 CFR 122.41(m)(4)(i)(C)]

(b) The San Diego Water Board may approve an anticipated bypass, after considering its adverse effects, if the San Diego Water Board determines that it will meet the three conditions listed above.
[40 CFR 122.41(m)(4)(ii)]

n. UPSET [40 CFR 122.41(n)]

(1) *Definition.* "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Copermittee. An upset does not

include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. [40 CFR 122.41(n)(1)]

(2) *Effect of an upset*. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the standard provisions required under 40 CFR 122.41(n)(3) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. [40 CFR 122.41(n)(2)]

(3) *Conditions necessary for a demonstration of upset*. A Copermittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that: [40 CFR 122.41(n)(3)]

(a) An upset occurred and that the Copermittee can identify the cause(s) of the upset; [40 CFR 122.41(n)(3)(i)]
(b) The permitted facility was at the time being properly operated; [40 CFR 122.41(n)(3)(ii)] and
(c) The Copermittee submitted notice of the upset in accordance with the standard provisions required under 40 CFR 122.41(l)(6)(ii)(B) (24-hour notice). [40 CFR 122.41(n)(3)(iii)]
(d) The Copermittee complied with any remedial measures pursuant to the standard provisions required under 40 CFR 122.41(d). [40 CFR 122.41(n)(3)(iii)]

(4) *Burden of proof*. In any enforcement proceeding, the Copermittee seeking to establish the occurrence of an upset has the burden of proof. [40 CFR 122.41(n)(4)]

o. STANDARD PERMIT PROVISIONS FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS [40 CFR 122.42(c)]

The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the San Diego Water Board or State Water Board under 40 CFR 122.26(a)(1)(v) must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report must include:

(1) The status of implementing the components of the storm water management program that are established as permit conditions; [40 CFR 122.42(c)(1)]

(2) Proposed changes to the storm water management programs that are established as permit conditions. Such proposed changes must be consistent with 40 CFR 122.26(d)(2)(iii); [40 CFR 122.42(c)(2)] and

(3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under 40 CFR 122.26(d)(2)(iv) and (v); [40 CFR 122.42(c)(3)]

(4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; [40 CFR 122.42(c)(4)]

(5) Annual expenditures and budget for year following each annual report; [40 CFR 122.42(c)(5)]

(6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; [40 CFR 122.42(c)(6)]

(7) Identification of water quality improvements or degradation. [40 CFR 122.42(c)(7)]

p. STANDARD PERMIT PROVISIONS FOR STORM WATER DISCHARGES [40 CFR 122.42(d)]

The initial permits for discharges composed entirely of storm water issued pursuant to 40 CFR 122.26(e)(7) must require compliance with the conditions of the permit as expeditiously as practicable, but in no event later than three years after the date of issuance of the permit.

2. General Provisions

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. The general provisions applicable to this Order and NPDES permit are as follows:

a. DISCHARGE OF WASTE IS A PRIVILEGE

No discharge of waste into the waters of the State, whether or not such discharge is made pursuant to waste discharge requirements, shall create a vested right to continue such discharge. All discharges of waste into waters of the State are privileges, not rights. [CWC Section 13263(g)]

b. DURATION OF ORDER AND NPDES PERMIT

(1) *Effective date*. This Order and NPDES permit becomes effective on the 50th day after its adoption provided the USEPA has no objection. If the USEPA objects to its issuance, this Order shall not become effective until such objection is withdrawn. This Order supersedes Order No. R9-2007-0001 upon the effective date of this Order, and supersedes Order Nos. R9-2009-0002 and R9-2010-0016 upon their expiration or earlier notice of coverage.

(2) *Expiration*. This Order and NPDES permit expires five years after its effective date. [40 CFR 122.46(a)]

(3) *Continuation of expired order*. After this Order and NPDES permit expires, the terms and conditions of this Order and NPDES permit are automatically continued pending issuance of a new permit if all requirements of the federal NPDES regulations on the continuation of expired permits (40 CFR 122.6) are complied with.

c. AVAILABILITY

A copy of this Order must be kept at a readily accessible location and must be available to on-site personnel at all times.

d. CONFIDENTIALITY OF INFORMATION

Except as provided for in 40 CFR 122.7, no information or documents submitted in accordance with or in application for this Order will be considered confidential, and all such information and documents shall be available for review by the public at the San Diego Water Board office.

Claims of confidentiality for the following information will be denied:
[40 CFR 122.7(b)]

(1) The name and address of any permit applicant or Copermittee; [40 CFR 122.7(b)(1)] and

(2) Permit applications and attachments, permits, and effluent data. [40 CFR 122.7(b)(2)]

e. EFFLUENT LIMITATIONS

(1) *Interim effluent limitations*. The Copermittee must comply with any interim effluent limitations as established by addendum, enforcement action, or revised waste discharge requirements which have been, or may be, adopted by the San Diego Water Board.

(2) *Other effluent limitations and standards*. If any applicable toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant and that standard or prohibition is more stringent than any limitation on the pollutant in the permit, the San Diego Water Board shall institute proceedings under these regulations to modify or revoke and reissue the permit to conform to the toxic effluent standard or prohibition. [40 CFR 122.44(b)(1)]

f. DUTY TO MINIMIZE OR CORRECT ADVERSE IMPACTS

The Copermittee must take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this Order, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the noncompliance.

g. PERMIT ACTIONS

The filing of a request by the Copermittee for modification, revocation and reissuance, or termination of this Order, or a notification of planned change in or anticipated noncompliance with this Order does not stay any condition of this Order. (See 40 CFR 122.41(f)) In addition, the following provisions apply to this Order:

(1) Upon application by any affected person, or on its own motion, the San Diego Water Board may review and revise the requirements in this Order. All requirements must be reviewed periodically. [CWC Section 13263(e)]

(2) This Order may be terminated or modified for cause, including, but not limited to, all of the following: [CWC Section 13381]

(a) Violation of any condition contained in the requirements of this Order. [CWC Section 13381(a)]

(b) Obtaining the requirements in this Order by misrepresentation, or failure to disclose fully all relevant facts. [CWC Section 13381(b)]

(c) A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge. [CWC Section 13381(c)]

(3) When this Order is transferred to a new owner or operator, such requirements as may be necessary under the CWC may be incorporated into this Order.

h. NPDES Permitted Non-Storm Water Discharges

The San Diego Water Board has, in prior years, issued a limited number of individual NPDES permits for non-storm water discharges to MS4s. The San Diego Water Board or State Water Board may in the future, upon prior notice to the Copermittee(s), issue an NPDES permit for any non-storm water discharge (or class of non-storm water discharges) to an MS4.

i. Monitoring

In addition to the standard provisions required under 40 CFR 122.41(j) and (l)(4), the following general monitoring provisions apply to this Order:

(1) Where procedures are not otherwise specified in Order, sampling, analysis and quality assurance/quality control must be conducted in accordance with the Quality Assurance Management Plan (QAMP) for the State of California's Surface Water Ambient Monitoring Program (SWAMP), adopted by the State Water Resources Control Board (State Water Board).

(2) Pursuant to 40 CFR 122.41(j)(2) and CWC Section 13383(a), each Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five (5) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time.

(3) All chemical, bacteriological, and toxicity analyses must be conducted at a laboratory certified for such analyses by the California Department of Public Health or a laboratory approved by the San Diego Water Board.

(4) For priority toxic pollutants that are identified in the California Toxics Rule (CTR) (65 Fed. Reg. 31682), the Copermittees must instruct their laboratories to establish calibration standards that are equivalent to or lower than the Minimum Levels (MLs) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP). If a Copermittee can demonstrate that a particular ML is not attainable, in accordance with procedures set forth in 40 CFR Part 136, the lowest quantifiable concentration of the lowest calibration standard analyzed by a specific analytical procedure (assuming that all the method specified sample weights, volumes, and processing steps have been followed) may be used instead of the ML listed in Appendix 4 of the SIP. The Copermittee must submit documentation from the laboratory to the San Diego Water Board for approval prior to raising the ML for any priority toxic pollutant.

j. ENFORCEMENT

(1) The San Diego Water Board is authorized to enforce the terms of this Order under several provisions of the CWC, including, but not limited to, CWC Sections 13385, 13386, and 13387.

(2) Nothing in this Order shall be construed to protect the Copermittee from its liabilities under federal, state, or local laws.

(3) The CWC provides for civil and criminal penalties comparable to, and in some cases greater than, those provided for under the CWA.

(4) Except as provided in the standard conditions required under 40 CFR 122.41(m) and (n), nothing in this Order shall be construed to relieve the Copermittee from civil or criminal penalties for noncompliance.

(5) Nothing in this Order shall be construed to preclude the institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties to which the Copermittee is or may be subject to under Section 311 of the CWA.

(6) Nothing in this Order shall be construed to preclude institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authoring preserved by Section 510 of the CWA.

k. SEVERABILITY

The provisions of this Order are severable, and if any provision of this Order, or the application of any provisions of this Order to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this Order shall not be affected thereby.

l. APPLICATIONS

Any application submitted by a Copermittee for reissuance or modification of this Order must satisfy all applicable requirements specified in federal regulations as well as any additional requirements for submittal of a Report of Waste Discharge specified in the CWC and the California Code of Regulations.

m. IMPLEMENTATION

All plans, reports and subsequent amendments submitted in compliance with this Order must be implemented immediately (or as otherwise specified). All submittals by Copermittees must be adequate to implement the requirements of this Order.

n. REPORT SUBMITTALS

(1) All report submittals must include an executive summary, introduction, conclusion, recommendations, and signed certified statement.

(2) Each Copermittee must submit a signed certified statement covering its responsibilities for each applicable submittal.

(3) The Principal Watershed Copermittee(s) must submit a signed certified statement covering its responsibilities for each applicable submittal and the sections of the submittals for which it is responsible.

(4) Unless otherwise directed, the Copermittees must submit one hard copy and one electronic copy of each report required under this Order to the San Diego Water Board, and one electronic copy to the USEPA.

(5) The Copermittees must submit reports and provide notifications as required by this Order to the following:

EXECUTIVE OFFICER
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
9174 SKY PARK COURT, SUITE 100
SAN DIEGO CA 92123-4340
Telephone: (858) 467-2952 Fax: (858) 571-6972

EUGENE BROMLEY
US ENVIRONMENTAL PROTECTION AGENCY
REGION IX
PERMITS ISSUANCE SECTION (W-5-1)
75 HAWTHORNE STREET
SAN FRANCISCO CA 94105

ATTACHMENT C

ACRONYMS AND ABBREVIATIONS

AMAL	Average Monthly Action Level
ASBS	Area(s) of Special Biological Significance
BMP	Best Management Practice
Basin Plan	Water Quality Control Plan for the San Diego Basin
CEQA	California Environmental Quality Act
CCR	California Code of Regulations
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWC	California Water Code
CZARA	Coastal Zone Act Reauthorization Amendments of 1990
ESAs	Environmentally Sensitive Areas
GIS	Geographic Information System
IBI	Index of Biological Integrity
LID	Low Impact Development
MDAL	Maximum Daily Action Level
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
NAL	Non-Storm Water Action Level
NAICS	North American Industry Classification System
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
ROWD	Report of Waste Discharge (application for NPDES reissuance)
SAL	Storm Water Action Level
San Diego Water Board	California Regional Water Quality Control Board, San Diego Region
SIC	Standard Industrial Classification Code
State Water Board	State Water Resources Control Board
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
WDID	Waste Discharge Identification Number
WLA	Waste Load Allocation
WQBEL	Water Quality Based Effluent Limitation

DEFINITIONS

Active/Passive Sediment Treatment - Using mechanical, electrical or chemical means to flocculate or coagulate suspended sediment for removal from runoff from construction sites prior to discharge.

Anthropogenic Litter – Trash generated from human activities, not including sediment.

Average Monthly Action Level – The highest allowable average of daily discharges over a calendar month.

Beneficial Uses - The uses of water necessary for the survival or wellbeing of man, plants, and wildlife. These uses of water serve to promote tangible and intangible economic, social, and environmental goals. "Beneficial Uses" of the waters of the State that may be protected include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. Existing beneficial uses are uses that were attained in the surface or ground water on or after November 28, 1975; and potential beneficial uses are uses that would probably develop in future years through the implementation of various control measures. "Beneficial Uses" are equivalent to "Designated Uses" under federal law. [California Water Code Section 13050(f)].

Best Management Practices (BMPs) - Defined in 40 CFR 122.2 as schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Bioassessment - The use of biological community information to evaluate the biological integrity of a water body and its watershed. With respect to aquatic ecosystems, bioassessment is the collection and analysis of samples of the benthic macroinvertebrate community together with physical/habitat quality measurements associated with the sampling site and the watershed to evaluate the biological condition (i.e. biotic integrity) of a water body.

Biofiltration - Practices that use vegetation and amended soils to detain and treat runoff from impervious areas. Treatment is through filtration, infiltration, adsorption, ion exchange, and biological uptake of pollutants.

Biological Integrity - Defined in Karr J.R. and D.R. Dudley. 1981. Ecological perspective on water quality goals. *Environmental Management* 5:55-68 as: "A balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitat of the region." Also referred to as ecosystem health.

BMP Design Manual – A plan developed to eliminate, reduce, or mitigate the impacts of runoff from development projects, including Priority Development Projects.

Chronic Toxicity – A measurement of sublethal effect (e.g. reduced growth, reproduction) to experimental test organisms exposed to an effluent or receiving waters compared to that of the control organisms.

Clean Water Act Section 303(d) Water Body - An impaired water body in which water quality does not meet applicable water quality standards and/or is not expected to meet water quality standards, even after the application of technology based pollution controls required by the CWA. The discharge of runoff to these water bodies by the Copermittees is significant because these discharges can cause or contribute to violations of applicable water quality standards.

Construction Site – Any project, including projects requiring coverage under the Construction General Permit, that involves soil disturbing activities including, but not limited to, clearing, grading, disturbances to ground such as stockpiling, and excavation.

Contamination - As defined in the Porter-Cologne Water Quality Control Act, contamination is "an impairment of the quality of waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste whether or not waters of the State are affected."

Copermittee – A permittee to a NPDES permit that is only responsible for permit conditions relating to the discharge for which it is operator [40 CFR 122.26(b)(1)]. For the purposes of this Order, a Copermittee is one of the individual permittees identified in Tables 1a-1c of this Order.

Copermittees – All of the individual Copermittees, collectively.

Critical Channel Flow (Qc) – The channel flow that produces the critical shear stress that initiates bed movement or that erodes the toe of channel banks. When measuring Qc, it should be based on the weakest boundary material – either bed or bank.

Daily Discharge – Defined as either: (1) the total mass of the constituent discharged over the calendar day or any 24 hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g. concentration.)

The Daily Discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day, or other 24 hour period other than a day), or by the arithmetic mean of analytical results from one or more grab samples taken over the course of a day.

Development Projects - Construction, rehabilitation, redevelopment, or reconstruction of any public or private projects.

Dry Season –May 1 to September 30.

Dry Weather – Weather is considered dry if the preceding 72 hours has been without measurable precipitation (>0.1 inch).

Enclosed Bays – Enclosed bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost bay works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays do not include inland surface waters or ocean waters.

Erosion – When land is diminished or worn away due to wind, water, or glacial ice. Often the eroded debris (silt or sediment) becomes a pollutant via storm water runoff. Erosion occurs naturally but can be intensified by land clearing activities such as farming, development, road building, and timber harvesting.

Environmentally Sensitive Areas (ESAs) - Areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; areas designated as preserves or their equivalent under the Natural Communities Conservation Program within the Cities and County of Orange; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.

Estuaries – Waters, including coastal lagoons, located at the mouth of streams that serve as areas of mixing fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and ocean water. Estuaries do not include inland surface waters or ocean waters.

Existing Development – Any area that has been developed and exists for municipal, commercial, industrial, or residential purposes, uses, or activities. May include areas that are not actively used for its originally developed purpose, but may be re-purposed or redeveloped for another use or activity.

Flow Duration – The long-term period of time that flows occur above a threshold that causes significant sediment transport and may cause excessive erosion damage to creeks and streams (not a single storm event duration). The simplest way to visualize this is to consider a histogram of pre- and post-project flows using long-term records of hourly data. To maintain pre-development flow duration means that the total number of hours (counts) within each range of flows in a flow-duration histogram cannot increase between the pre- and post-development condition. Flow duration within the range of geomorphologically significant flows is important for managing erosion.

Grading - The cutting and/or filling of the land surface to a desired slope or elevation.

Groundwater – Subsurface water that occurs beneath the water table in soils and geologic formations that are fully saturated.

Hazardous Material – Any substance that poses a threat to human health or the environment due to its toxicity, corrosiveness, ignitability, explosive nature or chemical reactivity. These also include materials named by the USEPA in 40 CFR 116 to be reported if a designated quantity of the material is spilled into the waters of the U.S. or emitted into the environment.

Hazardous Waste - Hazardous waste is defined as “any waste which, under Section 600 of Title 22 of this code, is required to be managed according to Chapter 30 of Division 4.5 of Title 22 of this code” [CCR Title 22, Division 4.5, Chapter 11, Article 1].

Household Hazardous Waste – Paints, cleaning products, and other hazardous wastes generated during home improvement or maintenance activities.

Hydromodification – The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

Illicit Connection – Any man-made conveyance or drainage system through which a non-storm water discharge to the storm water drainage system occurs or may occur. Any connection to the MS4 that conveys an illicit discharge.

Illicit Discharge - Any discharge to the MS4 that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from firefighting activities [40 CFR 122.26(b)(2)].

Inactive Areas – Areas of construction activity that are not active and those that have been active and are not scheduled to be re-disturbed for at least 14 days.

Infiltration – In the context of low impact development, infiltration is defined as the percolation of water into the ground. Infiltration is often expressed as a rate (inches per hour), which is determined through an infiltration test. In the context of non-storm water, infiltration is water other than wastewater that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow [40 CFR 35.2005(20)].

Inland Surface Waters – Includes all surface waters of the State that do not include the ocean, enclosed bays, or estuaries.

Jurisdictional Runoff Management Program Document – A written description of the specific jurisdictional runoff management measures and programs that each Copermittee will implement to comply with this Order and ensure that storm water pollutant discharges in runoff are reduced to the MEP and do not cause or contribute to a violation of water quality standards.

Low Impact Development (LID) – A storm water management and land development strategy that emphasizes conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions.

Low Impact Development Best Management Practices (LID BMPs) – LID BMPs include schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States through storm water management and land development strategies that emphasize conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions. LID BMPs include retention practices that do not allow runoff, such as infiltration, rain water harvesting and reuse, and evapotranspiration. LID BMPs also include flow-through practices such as biofiltration that may have some discharge of storm water following pollutant reduction.

Major Outfall – As defined in the Code of Federal Regulations, a major outfall is a MS4 outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (i.e. discharge from a single conveyance other than a circular pipe which is associated with a drainage area of more than 50 acres); or, for MS4s that receive storm water from lands zoned for industrial activity (based on comprehensive zoning plans or equivalent), a MS4 outfall that discharges from a single pipe with an inside diameter of 12 inches or more or from its equivalent (i.e. discharge from other than a circular pipe associated with a drainage area of 2 acres or more).

Maximum Daily Action Level (MDAL) –The highest allowable daily discharge of a pollutant, over a calendar day (or 24 hour period). For pollutants with action levels expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with action levels expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

Maximum Extent Practicable (MEP) – The technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) for storm water that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) in combination with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than BAT. A definition for MEP is not provided either in the statute or in the regulations. Instead the definition of MEP is dynamic and will be defined by the following process over time: municipalities propose their definition of MEP by way of their runoff management programs. Their total collective and individual activities conducted pursuant to the runoff management programs becomes their proposal for MEP as it applies both to their overall effort, as well as to specific activities (e.g., MEP for street sweeping, or MEP for MS4 maintenance). In the absence of a proposal acceptable to the San Diego Water Board, the San Diego Water Board defines MEP.

In a memo dated February 11, 1993, entitled "Definition of Maximum Extent Practicable," Elizabeth Jennings, Senior Staff Counsel, SWRCB addressed the achievement of the MEP standard as follows:

> "*To achieve the MEP standard, municipalities must employ whatever Best Management Practices (BMPs) are technically feasible (i.e., are likely to be effective) and are not cost prohibitive. The major emphasis is on technical feasibility. Reducing pollutants to the MEP means choosing effective BMPs, and rejecting applicable BMPs only where other effective BMPs will serve the same purpose, or the BMPs would not be technically feasible, or the cost would be prohibitive. In selecting BMPs to achieve the MEP standard, the following factors may be useful to consider:*
>
> a. *Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?*
> b. *Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?*
> c. *Public Acceptance: Does the BMP have public support?*
> d. *Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?*
> e. *Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc.?*

The final determination regarding whether a municipality has reduced pollutants to the maximum extent practicable can only be made by the Regional or State Water Boards, and not by the municipal discharger. If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit derived, it would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs that would address a pollutant source, or to pick a BMP based solely on cost, which would be clearly less effective. In selecting BMPs the municipality must make a serious attempt to comply and practical solutions may not be lightly rejected. In any case, the burden would be on the municipal discharger to show compliance with its permit. After selecting a menu of BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented."

Monitoring Year – October 1 to September 30

Municipal Separate Storm Sewer System (MS4) – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designated or used for collecting or conveying storm water; (iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.26.

National Pollutant Discharge Elimination System (NPDES) - The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the CWA.

Non-Storm Water - All discharges to and from a MS4 that do not originate from precipitation events (i.e., all discharges from a MS4 other than storm water). Non-storm water includes illicit discharges and NPDES permitted discharges.

Nuisance - As defined in the Porter-Cologne Water Quality Control Act, a nuisance is "anything which meets all of the following requirements: 1) Is injurious to health, or is indecent, or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. 2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. 3) Occurs during, or as a result of, the treatment or disposal of wastes."

Ocean Waters – The territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the State Board's California Ocean Plan.

Order – Unless otherwise specified, refers to this Order, Order No. R9-2013-0001 (NPDES No. CAS0109266)

Outfall - Outfall means a point source as defined by 40 CFR 122.2 at the point where a municipal separate storm sewer discharges to waters of the US and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels or other conveyances which connect segments of the same stream or other waters of the US and are used to convey waters of the US.

Persistent Flow - Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

Person - A person is defined as an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof [40 CFR 122.2].

Point Source - Any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, landfill leachate collection systems, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

Pollutant - Any agent that may cause or contribute to the degradation of water quality such that a condition of pollution or contamination is created or aggravated.

Pollution - As defined in the Porter-Cologne Water Quality Control Act, pollution is "the alteration of the quality of the waters of the State by waste, to a degree which unreasonably affects either of the following: 1) The waters for beneficial uses; or 2) Facilities that serve these beneficial uses." Pollution may include contamination.

Pollution Prevention - Pollution prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control BMPs, treatment control BMPs, or disposal.

Pre-Development Runoff Conditions – Approximate flow rates and durations that exist or existed onsite before land development occurs. For new development projects, this equates to runoff conditions immediately before project construction. For redevelopment projects, this equates to runoff conditions from the project footprint assuming infiltration characteristics of the underlying soil, and existing grade. Runoff coefficients of concrete or asphalt must not be used. A redevelopment Priority Development Project must use available information pertaining to existing underlying soil type and onsite existing grade to estimate pre-development runoff conditions.

Priority Development Projects - New development and redevelopment projects defined under Provision E.3.b of Order No. R9-2013-0001.

Rainy Season (aka Wet Season) –October 1 to April 30

Receiving Waters – Waters of the United States.

Receiving Water Limitations - Waste discharge requirements issued by the San Diego Water Board typically include both: (1) "Effluent Limitations" (or "Discharge Limitations") that specify the technology-based or water-quality-based effluent limitations; and (2) "Receiving Water Limitations" that specify the water quality objectives in the Basin Plan as well as any other limitations necessary to attain those objectives. In summary, the "Receiving Water Limitations" provision is the provision used to implement the requirements of CWA section 402(p)(3)(B).

Redevelopment - The creation and/or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include trenching and resurfacing associated with utility work; resurfacing existing roadways; new sidewalk construction, pedestrian ramps, or bike lane on existing roads; and routine replacement of damaged pavement, such as pothole repair.

Regional Clearinghouse – A central location for the collection and distribution of information developed and maintained by the Copermittees including, but not limited to, plans, reports, manuals, data, contact information, and/or links to such documents and information.

Rehabilitation - Remedial measures or activities for the purpose of improving or restoring the beneficial uses of streams, channels or river systems. Techniques may vary from in-stream restoration techniques to off-line storm water management practices installed in the system corridor or upland areas, or a combination of in-stream and out of stream techniques. Rehabilitation techniques may include, but are not limited to the following: riparian zone restoration, constructed wetlands, channel modifications that improve habitat and stability, and daylighting of drainage systems.

Reporting Period – The period of information that is reported in the Water Quality Improvement Plan Annual Report. The reporting period consists of two components: 1) July 1 to June 30, consistent with the fiscal year, for the implementation of the jurisdictional runoff management programs, and 2) October 1 to September 30, consistent with the monitoring year for the monitoring and assessment programs. Together, these two time periods constitute the reporting year for the Water Quality Improvement Plan Annual Report due January 31 following the end of the monitoring year.

Retain – Keep or hold in a particular place, condition, or position without discharge to surface waters.

Retrofitting – Storm water management practice put into place after development has occurred in watersheds where the practices previously did not exist or are ineffective. Retrofitting of developed areas is intended to improve water quality, protect downstream channels, reduce flooding, or meet other specific objectives. Retrofitting developed areas may include, but is not limited to replacing roofs with green roofs, disconnecting downspouts or impervious surfaces to drain to pervious surfaces, replacing impervious surfaces with pervious surfaces, installing rain barrels, installing rain gardens, and trash area enclosures.

Runoff - All flows in a storm water conveyance system that consists of the following components: (1) storm water (wet weather flows) and (2) non-storm water including dry weather flows.

San Diego Water Board – As used in this document the term "San Diego Water Board" is synonymous with the term "Regional Board" as defined in Water Code section 13050(b) and is intended to refer to the California Regional Water Quality Control Board for the San Diego Region as specified in Water Code Section 13200.

Sediment - Soil, sand, and minerals washed from land into water. Sediment resulting from anthropogenic sources (i.e. human induced land disturbance activities) is considered a pollutant. This Order regulates only the discharges of sediment from anthropogenic sources and does not regulate naturally occurring sources of sediment. Sediment can destroy fish-nesting areas, clog animal habitats, and cloud waters so that sunlight does not reach aquatic plants.

Source Control BMP – Land use or site planning practices, or structural or nonstructural measures that aim to prevent runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between pollutants and runoff.

Storm Water – Per 40 CFR 122.26(b)(13), means storm water runoff, snowmelt runoff and surface runoff and drainage. Surface runoff and drainage pertains to runoff and drainage resulting from precipitation events.

Structural BMPs - A subset of BMPs which detains, retains, filters, removes, or prevents the release of pollutants to surface waters from development projects in perpetuity, after construction of a project is completed.

Test of Significant Toxicity (TST) - A statistical approach used to analyze toxicity test data. The TST incorporates a restated null hypothesis, Welch's t-test, and biological effect thresholds for chronic and acute toxicity.

Total Maximum Daily Load (TMDL) - The maximum amount of a pollutant that can be discharged into a water body from all sources (point and non-point) and still maintain water quality standards. Under CWA section 303(d), TMDLs must be developed for all water bodies that do not meet water quality standards after application of technology-based controls.

Toxicity - Adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies. The water quality objectives for toxicity provided in the Basin Plan, state in part…"All waters shall be free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life….The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge."

Toxicity Identification Evaluation (TIE) - A set of procedures for identifying the specific chemical(s) responsible for toxicity. These procedures are performed in three phases (characterization, identification, and confirmation) using aquatic organism toxicity tests.

Toxicity Reduction Evaluation (TRE) - A study conducted in a step-wise process designed to identify the causative agents of effluent or ambient toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in toxicity. The first steps of the TRE consist of the collection of data relevant to the toxicity, including additional toxicity testing, and an evaluation of facility operations and maintenance practices, and best management practices. A Toxicity Identification Evaluation (TIE) may be required as part of the TRE, if appropriate.

Treatment Control BMP – Any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media absorption or any other physical, biological, or chemical process.

Unpaved Road – Any long, narrow stretch without pavement used for traveling by motor passenger vehicles between two or more points. Unpaved roads are generally constructed of dirt, gravel, aggregate or macadam and may be improved or unimproved.

Waste - As defined in CWC Section 13050(d), "waste includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal."

Article 2 of CCR Title 23, Chapter 15 (Chapter 15) contains a waste classification system that applies to solid and semi-solid waste, which cannot be discharged directly or indirectly to water of the state and which therefore must be discharged to land for treatment, storage, or disposal in accordance with Chapter 15. There are four classifications of waste (listed in order of highest to lowest threat to water quality): hazardous waste, designated waste, non-hazardous solid waste, and inert waste.

Water Quality Objective - Numerical or narrative limits on constituents or characteristics of water designated to protect designated beneficial uses of the water. [California Water Code Section 13050 (h)]. California's water quality objectives are established by the State and Regional Water Boards in the Water Quality Control Plans. Numeric or narrative limits for pollutants or characteristics of water designed to protect the beneficial uses of the water. In other words, a water quality objective is the maximum concentration of a pollutant that can exist in a receiving water and still generally ensure that the beneficial uses of the receiving water remain protected (i.e., not impaired). Since water quality objectives are designed specifically to protect the beneficial uses, when the objectives are violated the beneficial uses are, by definition, no longer protected and become impaired. This is a fundamental concept under the Porter Cologne Act. Equally fundamental is Porter Cologne's definition of pollution. A condition of pollution exists when the water quality needed to support designated beneficial uses has become unreasonably affected or impaired; in other words, when the water quality objectives have been violated. These underlying definitions (regarding beneficial use protection) are the reason why all waste discharge requirements implementing the federal NPDES regulations require compliance with water quality objectives. (Water quality objectives are also called water quality criteria in the CWA.)

Water Quality Standards - Water quality standards, as defined in Clean Water Act section 303(c) consist of the beneficial uses (e.g., swimming, fishing, municipal drinking water supply, etc.,) of a water body and criteria (referred to as water quality objectives in the California Water Code) necessary to protect those uses. Under the Water Code, the water boards establish beneficial uses and water quality objectives in water quality control or basin plans. Together with an anti-degradation policy, these beneficial uses and water quality objectives serve as water quality standards under the Clean Water Act. In Clean Water Act parlance, state beneficial uses are called "designated uses" and state water quality objectives are called "criteria." Throughout this Order, the relevant term is used depending on the statutory scheme.

Waters of the State - Any water, surface or underground, including saline waters within the boundaries of the State [CWC section 13050 (e)]. The definition of the Waters of the State is broader than that for the Waters of the United States in that all water in the State is considered to be a Waters of the State regardless of circumstances or condition.

Waters of the United States - As defined in the 40 CFR 122.2, the Waters of the U.S. are defined as: "(a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate "wetlands;" (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters otherwise defined as waters of the United States under this definition: (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial seas; and (g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA."

Watershed - That geographical area which drains to a specified point on a water course, usually a confluence of streams or rivers (also known as drainage area, catchment, or river basin).

Wet Season (aka Rainy Season) – October 1 to April 30

Wet Weather – Weather is considered wet up to 72 hours after a storm event of 0.1 inches and greater, unless otherwise defined by another regulatory mechanism (e.g. a TMDL).

ATTACHMENT D

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

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JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

FY _____

I. COPERMITTEE INFORMATION

Copermittee Name:

Copermittee Primary Contact Name:

Copermittee Primary Contact Information:
Address:
City: County: State: Zip:
Telephone: Fax: Email:

II. LEGAL AUTHORITY

Has the Copermittee established adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐
A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority?	**YES**	☐
	NO	☐

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

Was an update of the jurisdictional runoff management program document required or recommended by the San Diego Water Board?	**YES**	☐
	NO	☐
If YES to the question above, did the Copermittee update its jurisdictional runoff management program document and make it available on the Regional Clearinghouse?	**YES**	☐
	NO	☐

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

Has the Copermittee implemented a program to actively detect and eliminate illicit discharges and connections to its MS4 that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

Number of non-storm water discharges reported by the public	
Number of non-storm water discharges detected by Copermittee staff or contractors	
Number of non-storm water discharges investigated by the Copermittee	
Number of sources of non-storm water discharges identified	
Number of non-storm water discharges eliminated	
Number of sources of illicit discharges or connections identified	
Number of illicit discharges or connections eliminated	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

V. DEVELOPMENT PLANNING PROGRAM

Has the Copermittee implemented a development planning program that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐
Was an update to the BMP Design Manual required or recommended by the San Diego Water Board?	**YES**	☐
	NO	☐
If YES to the question above, did the Copermittee update its BMP Design Manual and make it available on the Regional Clearinghouse?	**YES**	☐
	NO	☐

Number of proposed development projects in review	
Number of Priority Development Projects in review	
Number of Priority Development Projects approved	
Number of approved Priority Development Projects exempt from any BMP requirements	
Number of approved Priority Development Projects allowed alternative compliance	
Number of Priority Development Projects granted occupancy	

Number of completed Priority Development Projects in inventory	
Number of high priority Priority Development Project structural BMP inspections	
Number of Priority Development Project structural BMP violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM
FY _____

VI. CONSTRUCTION MANAGEMENT PROGRAM

Has the Copermittee implemented a construction management program that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

Number of construction sites in inventory	
Number of active construction sites in inventory	
Number of inactive construction sites in inventory	
Number of construction sites closed/completed during reporting period	
Number of construction site inspections	
Number of construction site violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

Has the Copermittee implemented an existing development management program that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

	Municipal	Commercial	Industrial	Residential
Number of facilities or areas in inventory				
Number of existing development inspections				
Number of follow-up inspections				
Number of violations				
Number of enforcement actions issued				
Number of escalated enforcement actions issued				

VIII. PUBLIC EDUCATION AND PARTICIPATION

Has the Copermittee implemented a public education program component that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐
Has the Copermittee implemented a public participation program component that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

IX. FISCAL ANALYSIS

Has the Copermittee attached to this form a summary of its fiscal analysis that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

X. CERTIFICATION

I [☐ Principal Executive Officer ☐ Ranking Elected Official ☐ Duly Authorized Representative] certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature	Date
Print Name	Title
Telephone Number	Email

ATTACHMENT E

SPECIFIC PROVISIONS FOR TOTAL MAXIMUM DAILY LOADS APPLICABLE TO ORDER NO. R9-2013-0001

These provisions implement load allocations (LAs) and wasteload allocations (WLAs) of the Total Maximum Daily Loads (TMDLs) adopted by the San Diego Water Board and approved by USEPA under Clean Water Act section 303(c), applicable to discharges regulated under this Order. The provisions and schedules for implementation of the TMDLs described below must be incorporated into the Water Quality Improvement Plans, required pursuant to Provision B of this Order, for the specified Watershed Management Areas.

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed
2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin
3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed
4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek
5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay
6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2002-0123

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	August 14, 2002
State Water Board Approval Date:	July 16, 2003
Office of Administrative Law Approval Date:	September 11, 2003
US EPA Approval Date:	November 3, 2003

(3) TMDL Effective Date: September 11, 2003

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final diazinon TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must be in compliance with the final TMDL compliance requirements as of December 31, 2010.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations:

Table 1.1
Final Receiving Water Limitations Expressed as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Diazinon	Acute	0.08 µg/L	1 hour
	Chronic	0.05 µg/L	4 days

(b) Final Effluent Limitations

Discharges from the MS4s containing concentrations that do not exceed the following effluent limitations will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 1.b.(2)(a):

Table 1.2
Final Effluent Limitations Expressed as Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation	Averaging Period
Diazinon	Acute	0.072 µg/L	1 hour
	Chronic	0.045 µg/L	4 days

(c) Best Management Practices

The following BMPs for Chollas Creek must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area and implemented by the Responsible Copermittees:

(i) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 1.b.(2)(a) and/or the effluent limitations under Specific Provision 1.b.(2)(b) for Chollas Creek.

(ii) The Responsible Copermittees must implement the Diazinon Toxicity Control Plan and Diazinon Public Outreach/Education Program as described in the report titled, *Technical Report for Total Maximum Daily Load for Diazinon in Chollas Creek Watershed, San Diego County*, dated August 14, 2002, including subsequent modifications, in order to achieve the receiving water limitations under Specific Provision 1.b.(2)(a) and/or the effluent limitations under Specific Provision 1.b.(2)(b).

(iii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 1.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 1.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 1.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 1.b.(2)(c) achieves compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 1.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 1.d, to demonstrate compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The Responsible Copermittees must be in compliance with the final diazinon TMDL compliance requirements as of December 31, 2010.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls for diazinon within the Chollas Creek watershed, and calculate or estimate the annual diazinon loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 1.b.(2)(b), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0019

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	September 22, 2005
Office of Administrative Law Approval Date:	December 2, 2005
US EPA Approval Date:	February 8, 2006

(3) TMDL Effective Date: December 2, 2005

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Shelter Island Yacht Basin

(6) Responsible Copermittee: City of San Diego

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final dissolved copper TMDL compliance requirements for Shelter Island Yacht Basin consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittee must be in compliance with the final TMDL compliance requirements as of December 2, 2005.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations:

Table 2.1
Final Receiving Water Limitations Expressed as Concentrations in Shelter Island Yacht Basin

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Dissolved Copper	Acute	4.8 µg/L x WER*	1 hour
	Chronic	3.1 µg/L x WER*	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 2.b.(3)(a):

Table 2.2
Final Effluent Limitations as Expressed as Annual Loads in MS4 Discharges to Shelter Island Yacht Basin

Constituent	Effluent Limitation
Dissolved Copper	30 kg/yr*

* If the water quality objectives for dissolved copper in Shelter Island Yacht Basin are changed in the future, then the margin of safety (MOS), TMDL and allocations will be recalculated using the *Method for Recalculation of the Total Maximum Daily Load for Dissolved Copper in the Shelter Island Yacht Basin, San Diego Bay* in the Basin Plan (p. 7-14).

(c) Best Management Practices

The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 2.b.(2)(a) and/or the effluent limitations under Specific Provision 2.b.(2)(b) for Shelter Island Yacht Basin. The BMPs must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 2.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 2.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittee develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 2.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate

that the implementation of the BMPs required under Provision 2.b.(2)(c) achieves compliance with Specific Provisions 2.b.(3)(a), 2.b.(3)(b) and/or 2.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 2.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 2.d, to demonstrate compliance with Specific Provisions 2.b.(3)(a), 2.b.(3)(b) and/or 2.b.(3)(c).

c. Interim TMDL Compliance Requirements

The Responsible Copermittees must be in compliance with the final dissolved copper TMDL compliance requirements as of December 2, 2005.

d. Specific Monitoring and Assessment Requirements

The Responsible Copermittee must monitor the effluent of its MS4 outfalls for dissolved copper, and calculate or estimate the monthly and annual dissolved copper loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.(b)(2)of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0036

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	November 16, 2005
Office of Administrative Law Approval Date:	February 1, 2006
US EPA Approval Date:	March 22, 2006

(3) TMDL Effective Date: February 1, 2006

(4) Watershed Management Area: Santa Margarita River

(5) Water Body: Rainbow Creek

(6) Responsible Copermittee: County of San Diego

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final total nitrogen and total phosphorus TMDL compliance requirements for Rainbow Creek consist of the following

(1) Final TMDL Compliance Date

The Responsible Copermittee must comply with final TMDL compliance requirements by December 31, 2021.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance date under Specific Provision 3.b.(1):

Table 3.1
Final Receiving Water Limitations Expressed as Concentrations in Rainbow Creek

Constituent	Receiving Water Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing concentrations that do not exceed the following effluent limitations by the compliance date under Specific Provision 3.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 3.b.(2)(a):

Table 3.2
Final Effluent Limitations Expressed as Concentrations in MS4 Discharges to Rainbow Creek

Constituent	Effluent Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(ii) Annual pollutant loads from given land uses discharging to and from the MS4s that do not exceed the following annual loads by the compliance date under Specific Provision 3.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 3.b.(2)(a):

Table 3.3
Final Effluent Limitations Expressed as Annual Loads in MS4 Discharges to Rainbow Creek

Land Use	Total N	Total P
Commercial nurseries	116 kg/yr	3 kg/yr
Park	3 kg/yr	0.1 kg/yr
Residential areas	149 kg/yr	12 kg/yr
Urban areas	27 kg/yr	6 kg/yr

(c) Best Management Practices

(i) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 3.b.(2)(a) and/or the effluent limitations under Specific Provision 3.b.(2)(b) for Rainbow Creek.

(ii) The Responsible Copermittee should coordinate any BMPs implemented to address this TMDL with Caltrans and other sources as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 3.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 3.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the final effluent limitations under Specific Provision 3.b.(2)(b)(ii); OR

(e) The Responsible Copermittee develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 3.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Specific Provision 3.b.(2)(c) achieves compliance with Specific Provisions 3.b.(3)(a), 3.b.(3)(b), 3.b.(3)(c) and/or 3.b.(3)(d),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 3.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 3.d, to demonstrate compliance with Specific Provisions 3.b.(3)(a), 3.b.(3)(b), 3.b.(3)(c) and/or 3.b.(3)(d).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim total nitrogen and total phosphorus TMDL compliance requirements for Rainbow Creek consist of the following:

(1) Interim Compliance Dates and WQBELs

The Responsible Copermittee must comply with the interim WQBELs, expressed as annual loads, by December 31 of the interim compliance year given in Table 3.4.

Table 3.4
Interim Water Quality Based Effluent Limitations Expressed as Annual Loads in MS4 Discharges from Specific Land Uses to Rainbow Creek

	Total N Interim Effluent Limitations (kg/yr)			Total P Interim Effluent Limitations (kg/yr)		
	Interim Compliance Date			Interim Compliance Date		
Land Use	**2009**	**2013**	**2017**	**2009**	**2013**	**2017**
Commercial nurseries	390	299	196	20	16	10
Park	5	3	3	0.15	0.10	0.10
Residential areas	507	390	260	99	74	47
Urban areas	40	27	27	9	6	6

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 3.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 3.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the final effluent limitations under Specific Provision 3.b.(2)(b)(ii); OR

(e) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the interim effluent limitations under Specific Provision 3.c.(1); OR

(f) The Responsible Copermittee has submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

d. Specific Monitoring and Assessment Requirements

(1) The Responsible Copermittee must incorporate into the Water Quality Improvement Plan and implement the Sampling and Analysis Plan for Rainbow Creek Nutrient Reduction TMDL Implementation Water Quality Monitoring, dated January 2010.

(2) The results of any monitoring conducted during the reporting period, and assessment of whether the interim and final TMDL compliance requirements have been achieved must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 3.b.(2)(b)(i), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2007-0043

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2007
State Water Board Approval Date:	July 15, 2008
Office of Administrative Law Approval Date:	October 22, 2008
US EPA Approval Date:	December 18, 2008

(3) TMDL Effective Date: October 22, 2008

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final dissolved copper, lead, and zinc TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must comply with the final TMDL compliance requirements by October 22, 2028.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance date under Specific Provision 4.b.(1):

Table 4.1
Final Receiving Water Limitations Expressed as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$(0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$(0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$(0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$(0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations by the compliance date under Specific Provision 4.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 4.b.(2)(a):

Table 4.2
Final Effluent Limitations as Expressed Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(c) Best Management Practices

(i) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 4.b.(2)(a) and/or the effluent limitations under Specific Provision 4.b.(2)(b) for Chollas Creek.

(ii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans and the U.S. Navy as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 4.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 4.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 4.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 4.b.(2)(c) achieves compliance with Specific Provisions 4.b.(3)(a), 4.b.(3)(b) and/or 4.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 4.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 4.d, to demonstrate compliance with Specific Provisions 4.b.(3)(a), 4.b.(3)(b) and/or 4.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim dissolved copper, lead, and zinc TMDL compliance requirements for Chollas Creek consist of the following:

(1) Interim Compliance Date and WQBELs

The Responsible Copermittee must comply with the interim WQBELs, expressed as concentrations, by the interim compliance date given in Table 4.3:

Table 4.3
Interim Water Quality Based Effluent Limitations Expressed as Concentrations in MS4 Discharges to Chollas Creek

Interim Compliance Date	Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
October 22, 2018	Dissolved Copper	Acute	$1.2 \times 90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
	Dissolved Lead	Acute	$1.2 \times 90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
	Dissolved Zinc	Acute	$1.2 \times 90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 4.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 4.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) There are no exceedances of the interim effluent limitations under Specific Provision 4.c.(1) at the Responsible Copermittee's MS4 outfalls; OR

(e) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance date.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*, when it is amended to include monitoring requirements for the Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls discharging to Chollas Creek for dissolved copper, lead, and zinc, and calculate or estimate the monthly and annual dissolved copper, lead, and zinc loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 4.b.(2)(b) or 4.c.(1), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2008-0027

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 11, 2008
State Water Board Approval Date:	June 16, 2009
Office of Administrative Law Approval Date:	September 15, 2009
US EPA Approval Date:	October 26, 2009

(3) TMDL Effective Date: September 15, 2009

(4) Watershed Management Areas: See Table 5.0

(5) Water Bodies: See Table 5.0

(6) Responsible Copermittees: See Table 5.0

Table 5.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County	Dana Point Harbor	Baby Beach	-City of Dana Point -County of Orange
San Diego Bay	San Diego Bay	Shelter Island Shoreline Park	- San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final indicator bacteria TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Final TMDL Compliance Dates

(a) Baby Beach in Dana Point Harbor

The Responsible Copermittees for MS4 discharges to Baby Beach must be in compliance with the final TMDL compliance requirements according to the following compliance dates:

Table 5.1
Compliance Dates to Achieve Final TMDL Compliance Requirements For Baby Beach in Dana Point Harbor

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform	September 15, 2014	September 15, 2009
Fecal Coliform		September 15, 2009
Enterococcus		September 15, 2019

(b) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park must be in compliance with the final TMDL compliance requirements as of December 31, 2012.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance dates under Specific Provision 5.b.(1):

Table 5.2
Final Receiving Water Limitations Expressed as Bacteria Densities in the Water Body

	Receiving Water Limitations	
Constituent	Single Sample Maximum[1,2]	30-Day Geometric Mean[2]
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing indicator bacteria densities that do not exceed the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.3a
Final Effluent Limitations as Expressed as Bacteria Densities in MS4 Discharges to the Water Body

	Effluent Limitations	
Constituent	**Single Sample Maximum[1,2]**	**30-Day Geometric Mean[2]**
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.

(ii) Discharges from the MS4s containing indicator bacteria loads that do not exceed the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.4a
Final Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to the Baby Beach in Dana Point Harbor

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0.86×10^9 MPN/day	$3{,}254 \times 10^9$ MPN/30days
Fecal Coliform	0.17×10^9 MPN/day	112×10^9 MPN/30days
Enterococcus	0.03×10^9 MPN/day	114×10^9 MPN/30days

Table 5.4b
Final Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to the Shelter Island Shoreline Park in San Diego Bay

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0 MPN/day	198×10^9 MPN/30days
Fecal Coliform	0 MPN/day	8×10^9 MPN/30days
Enterococcus	0 MPN/day	26×10^9 MPN/30days

(iii) Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.5a
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to Baby Beach in Dana Point Harbor*

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	90.4%	0%
Fecal Coliform	82.7%	0%
Enterococcus	96.2%	62.2%

Notes:
* The percent load reductions are relative to data collected between 1996-2002. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittees' MS4s must not exceed the loads in Table 5.4a, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the water body.

Table 5.5b
*Final Effluent Limitations Expressed as Percent Load Reductions** in MS4 Discharges to Shelter Island Shoreline Park in San Diego Bay*

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0%	0%
Fecal Coliform	0%	0%
Enterococcus	0%	0%

Notes:
* The percent load reductions are relative to data collected between 1999-2004. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittee's MS4s must not exceed the loads in Table 5.4b, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the water body.

(c) Best Management Practices

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 5.0 must incorporate the Bacteria Load Reduction Plan (BLRP) required to be developed pursuant to Resolution No. R9-2008-0027.

(ii) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 5.b.(2)(a) and/or the effluent limitations under Specific Provision 5.b.(2)(b) for the segments or areas of the water bodies listed in Table 5.0

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.b.(2)(b)(ii); OR

(e) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 5.b.(2)(b)(iii); OR

(f) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(g) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 5.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 5.b.(2)(c) achieves compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 5.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 5.d, to demonstrate compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim indicator bacteria TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Baby Beach in Dana Point Harbor

(a) Interim TMDL Compliance Dates and WQBELs

The Responsible Copermittees for MS4 discharges to Baby Beach must comply with the following interim WQBELs by the interim compliance dates given in Tables 5.6a and/or 5.6b:

Table 5.6a
Interim Water Quality Based Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to Baby Beach in Dana Point Harbor

Constituent	Interim Compliance Dates	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	4.93×10^9 MPN/day	$3{,}254 \times 10^9$ MPN/30days*
Fecal Coliform	September 15, 2012	0.59×10^9 MPN/day	112×10^9 MPN/30days*
Enterococcus	September 15, 2012	0.42×10^9 MPN/day	301×10^9 MPN/30days
	September 15, 2016	0.03×10^9 MPN/day *	207×10^9 MPN/30days

Notes:
* Same as the final effluent limitations in Table 5.4a.

Table 5.6b
Interim Water Quality Based Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to Baby Beach in Dana Point Harbor*

Constituent	Interim Compliance Dates	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	45.2%	0%**
Fecal Coliform	September 15, 2012	41.4%	0%**
Enterococcus	September 15, 2012	48.1%	0%
	September 15, 2016	96.2%**	31.1%

Notes:
* The percent load reductions are relative to data collected between 1996-2002. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittees' MS4s must not exceed the loads in Table 5.6a, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the waterbody.
** Same as the final effluent limitations in Table 5.5a.

(b) Interim Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(i) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(ii) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(iii) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(iv) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.b(2)(b)(ii); OR

(v) The Responsible Copermittees can demonstrate that exceedances of the applicable receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(vi) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the interim effluent limitations under Table 5.6a of Specific Provision 5.c.(1)(a); OR

(vii) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the interim effluent limitations under Table 5.6b of Specific Provision 5.c.(1)(a); OR

(viii) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

(2) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park must be in compliance with the final indicator bacteria TMDL requirements as of December 31, 2012.

d. Specific Monitoring and Assessment Requirements

(1) Monitoring Stations

Monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[32] If discharges of bacteria from the MS4 exceed the applicable interim or final WQBELs, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(2) Monitoring Procedures

(a) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) The Responsible Copermittees must collect wet weather monitoring samples within the first 24 hours of a storm event[33] of the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(c) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

[32] Commonly referred to as AB 411 monitoring

[33] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs have been achieved.

(b) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 5.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(c) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to correlate elevated bacteria levels with known or suspected sewage spills from wastewater collection systems and treatment plants or boats.

(d) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2010-0001

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 10, 2010
State Water Board Approval Date:	December 14, 2010
Office of Administrative Law Approval Date:	April 4, 2011
US EPA Approval Date:	June 22, 2011

(3) TMDL Effective Date: April 4, 2011

(4) Watershed Management Areas: See Table 6.0

(5) Water Bodies: See Table 6.0

(6) Responsible Copermittees: See Table 6.0

Table 6.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	-City of Laguna Beach -County of Orange -Orange County Flood Control District
		at Heisler Park - North	
	Pacific Ocean Shoreline	at Main Laguna Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Woods -County of Orange -Orange County Flood Control District
		Laguna Beach at Ocean Avenue	
		Laguna Beach at Cleo Street	
		Arch Cove at Bluebird Canyon Road	
		Laguna Beach at Dumond Drive	
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Hills -City of Laguna Niguel -City of Laguna Woods -City of Lake Forest -City of Mission Viejo -County of Orange -Orange County Flood Control District
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	
	Aliso Creek Mouth	at mouth	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	-City of Dana Point -City of Laguna Beach -City of Laguna Niguel -County of Orange -Orange County Flood Control District
		Aliso Beach at Table Rock Drive	
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)	
		at Salt Creek (large outlet)	
		Salt Creek Beach at Salt Creek service road	
		Salt Creek Beach at Strand Road	
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	-City of Dana Point -City of Laguna Hills -City of Laguna Niguel -City of Mission Viejo -City of Rancho Santa Margarita -City of San Juan Capistrano -County of Orange -Orange County Flood Control District
	San Juan Creek	lower 1 mile	
	San Juan Creek Mouth	at mouth	
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	-City of Dana Point -City of San Clemente -County of Orange -Orange County Flood Control District
		Ole Hanson Beach Club Beach at Pico Drain	
		San Clemente City Beach at El Portal Street Stairs	
		San Clemente City Beach at Mariposa Street	
		San Clemente City Beach at Linda Lane	
		San Clemente City Beach at South Linda Lane	
		San Clemente City Beach at Lifeguard Headquarters	
		under San Clemente Municipal Pier	
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	
		San Clemente State Beach at Riviera Beach	
		Can Clemente State Beach at Cypress Shores	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	-City of Oceanside -City of Vista -County of San Diego
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	-City of Carlsbad -City of Encinitas -City of Escondido -City of San Marcos -County of San Diego
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	-City of Del Mar -City of Escondido -City of Poway -City of San Diego -City of Solana Beach -County of San Diego
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	-City of Del Mar -City of Poway -City of San Diego -County of San Diego
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	-City of San Diego
		La Jolla Shores Beach at Caminito del Oro	
		La Jolla Shores Beach at Vallecitos	
		La Jolla Shores Beach at Avenida de la Playa	
		at Casa Beach, Children's Pool	
		South Casa Beach at Coast Boulevard	
		Whispering Sands Beach at Ravina Street	
		Windansea Beach at Vista de la Playa	
		Windansea Beach at Bonair Street	
		Windansea Beach at Playa del Norte	
		Windansea Beach at Palomar Avenue	
		at Tourmaline Surf Park	
		Pacific Beach at Grand Avenue	
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I- Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	-City of El Cajon -City of Santee -County of San Diego
	San Diego River	lower 6 miles	-City of El Cajon -City of La Mesa -City of San Diego -City of Santee -County of San Diego
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	-City of La Mesa -City of Lemon Grove -City of San Diego -County of San Diego - San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final indicator bacteria TMDL compliance requirements for the water bodies listed in Table 6.0 consist of the following:

(1) Final TMDL Compliance Dates

The Responsible Copermittees for MS4 discharges to the water bodies listed in Table 6.0 must be in compliance with the final TMDL compliance requirements according to the following compliance dates:

Table 6.1
Compliance Dates to Achieve Final TMDL Compliance Requirements

Constituent	Dry Weather TMDL Compliance Date	Wet Weather TMDL Compliance Date
Total Coliform	April 4, 2021	April 4, 2031
Fecal Coliform		
Enterococcus		

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance dates under Specific Provision 6.b.(1):

Table 6.2a
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Beaches

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform	10,000	22%	1,000	0%
Fecal Coliform	400	22%	200	0%
Enterococcus	104	22%	35	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan.

Table 6.2b
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Creeks

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Fecal Coliform	400	22%	200	0%
Enterococcus	61 (104)	22%	33	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Basin Plan.
d. A single sample maximum of 104 MPN/100ml for *Enterococcus* may be applied as a receiving water limitation for creeks, instead of 61 MPN/100mL, if one or more of the creeks addressed by these TMDLs (San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek, San Diego River, and/or Chollas Creek) is designated with a "moderately to lightly used area" or less frequent usage frequency in the Basin Plan. Otherwise, the single sample maximum of 61 MPN/100mL for *Enterococcus* must be used to assess compliance with the allowable exceedance frequency.

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing indicator bacteria densities that do not exceed the following effluent limitations by the compliance dates under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a):

Table 6.2c
Final Effluent Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies in MS4 Discharges to the Water Body

Constituent	Concentration-Based Effluent Limitations			
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform[d]	10,000	22%	1,000	0%
Fecal Coliform	400	22%	200	0%
Enterococcus	104[e] / 61[f]	22%	35[e] / 33[f]	0%

Notes:
a. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan for discharges to beaches, and the Basin Plan for discharges to creeks and creek mouths.
d. Total coliform effluent limitations only apply to MS4 outfalls that discharge to the Pacific Ocean Shorelines and creek mouths listed in Table 6.0.
e. This *Enterococcus* effluent limitation applies to MS4 discharges to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
f. This *Enterococcus* effluent limitation applies to MS4 discharges to segments or areas of creeks or creek mouths listed in Table 6.0.

(ii) Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the compliance dates under Specific Provision 6.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a):

Table 6.3
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watershed and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
South Orange County	**San Joaquin Hills HSA** (901.11) and **Laguna Hills HSA** (901.12) - Pacific Ocean Shoreline	91.78%	91.72%	98.28%	46.85%	52.07%	51.26%
	Aliso HSA (901.13) - Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	95.47%	95.58%	99.13%	25.29%	26.62%	27.52% (27.37%)**
	Dana Point HSA (901.14) - Pacific Ocean Shoreline	95.04%	95.03%	98.98%	13.15%	14.86%	15.16%
	Lower San Juan HSA (901.27) - Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	72.96%	74.21%	94.94%	19.21%	12.82%	27.12% (26.90%)**
	San Clemente HA (901.30) - Pacific Ocean Shoreline	94.28%	94.23%	98.83%	23.85%	24.58%	25.26%
San Luis Rey River	**San Luis Rey HU** (903.00) - Pacific Ocean Shoreline	38.13%	39.09%	87.38%	5.62%	3.12%	11.69%

Table 6.3 (Cont'd)
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watershed and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
Carlsbad	**San Marcos HA** (904.50) - Pacific Ocean Shoreline	82.82%	82.55%	96.03%	18.47%	18.98%	20.19%
San Dieguito River	**San Dieguito HU** (905.00) - Pacific Ocean Shoreline	14.39%	20.72%	83.48%	4.29%	1.46%	7.72%
Penasquitos	**Miramar Reservoir HA** (906.10) - Pacific Ocean Shoreline	96.50%	96.59%	99.42%	1.61%	1.99%	1.93%
Mission Bay	**Scripps HA** (906.30) - Pacific Ocean Shoreline	96.44%	96.42%	99.25%	16.32%	21.14%	18.82%
	Tecolote HA (906.50) - Tecolote Creek	94.51%	94.59%	98.94%	16.51%	20.47%	18.15% (18.08%)**
San Diego River	**Mission San Diego HSA** (907.11) and **Santee HSA** (907.12) - Pacific Ocean Shoreline - Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles)	74.03%	69.44%	93.96%	38.14%	53.22%	42.74% (42.47%)**
San Diego Bay	**Chollas HSA** (908.22) - Chollas Creek	92.06%	92.15%	98.46%	17.82%	24.84%	21.46% (21.36%)**

Notes:
* The percent load reductions are based on reducing loads compared to pollutant loads from 2001 to 2002.
** The alternative *Enterococcus* percent load reduction was calculated based on a numeric target of 104 MPN/100mL instead of 61 MPN/100mL, protective of the REC-1 "moderately to lightly used area" usage frequency that is protective of freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative pollutant load reductions can be utilized.

(c) Best Management Practices

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 6.0 must incorporate the Comprehensive Load Reduction Plans (CLRPs) required to be developed pursuant to Resolution No. R9-2010-0001.

(ii) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 6.b.(2)(a) and/or the effluent limitations under Specific Provision 6.b.(2)(b) for the segments or areas of the water bodies listed in Table 6.0.

(iii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans, owners/operators of small MS4s, and agricultural dischargers as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(f) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 6.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 6.b.(2)(c) achieves compliance with Specific Provisions 6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), and/or 6.b.(3)(e),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 6.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 6.d, to demonstrate compliance with Specific Provisions 6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), 6.b.(3)(e) and/or 6.b.(3)(f).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim indicator bacteria TMDL compliance requirements for the water bodies listed in Table 6.0 consist of the following:

(1) Interim TMDL Compliance Dates

The Responsible Copermittees must achieve compliance with the interim TMDL compliance requirements, as determined in accordance with Specific Provision 6.c.(3), by the interim compliance dates given in Table 6.4, unless alternative interim compliance dates are accepted by the San Diego Water Board Executive Officer as part of the Water Quality Improvement Plan.

Table 6.4
Interim Compliance Dates to Achieve Interim TMDL Compliance Requirements

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	April 4, 2016	April 4, 2021
		at Heisler Park - North		
	Pacific Ocean Shoreline	at Main Laguna Beach	April 4, 2016	April 4, 2021
		Laguna Beach at Ocean Avenue		
		Laguna Beach at Cleo Street		
		Arch Cove at Bluebird Canyon Road		
		Laguna Beach at Dumond Drive		
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	April 4, 2016	April 4, 2021
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	April 4, 2018	April 4, 2021
	Aliso Creek Mouth	at mouth	April 4, 2018	April 4, 2021
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	April 4, 2016	April 4, 2021
		Aliso Beach at Table Rock Drive		
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)		
		at Salt Creek (large outlet)		
		Salt Creek Beach at Salt Creek service road	April 4, 2017	April 4, 2021
		Salt Creek Beach at Strand Road	April 4, 2017	April 4, 2021

Table 6.4 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates	
			Interim Dry Weather WQBELs	Interim Wet Weather WQBELs
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	April 4, 2016	April 4, 2021
	San Juan Creek	lower 1 mile	April 4, 2018	April 4, 2021
	San Juan Creek Mouth	at mouth	April 4, 2016	April 4, 2021
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	April 4, 2016	April 4, 2021
		Ole Hanson Beach Club Beach at Pico Drain	April 4, 2016	April 4, 2021
		San Clemente City Beach at El Portal Street Stairs	April 4, 2017	April 4, 2021
		San Clemente City Beach at Mariposa Street		
		San Clemente City Beach at Linda Lane	April 4, 2016	April 4, 2021
		San Clemente City Beach at South Linda Lane	April 4, 2018	April 4, 2021
		San Clemente City Beach at Lifeguard Headquarters	April 4, 2017	April 4, 2021
		under San Clemente Municipal Pier		
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	April 4, 2018	April 4, 2021
		San Clemente State Beach at Riviera Beach	April 4, 2016	April 4, 2021
		Can Clemente State Beach at Cypress Shores	April 4, 2017	April 4, 2021
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	April 4, 2017	April 4, 2021
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	April 4, 2016	April 4, 2021
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	April 4, 2016	April 4, 2021

Table 6.4 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates	
			Interim Dry Weather WQBELs	Interim Wet Weather WQBELs
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	April 4, 2016	April 4, 2021
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	April 4, 2016	April 4, 2021
		La Jolla Shores Beach at Caminito del Oro		
		La Jolla Shores Beach at Vallecitos		
		La Jolla Shores Beach at Avenida de la Playa		
		at Casa Beach, Children's Pool		
		South Casa Beach at Coast Boulevard		
		Whispering Sands Beach at Ravina Street		
		Windansea Beach at Vista de la Playa		
		Windansea Beach at Bonair Street		
		Windansea Beach at Playa del Norte		
		Windansea Beach at Palomar Avenue		
		at Tourmaline Surf Park		
		Pacific Beach at Grand Avenue		
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries		
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	April 4, 2018	April 4, 2021
	San Diego River	lower 6 miles		
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach		
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	April 4, 2018	April 4, 2021

(2) Interim Water Quality Based Effluent Limitations

The Responsible Copermittees for discharges to the water bodies in Table 6.0 must comply with the following interim WQBELs by the interim compliance dates given in Specific Provision 6.c.(1):

(a) Interim Receiving Water Limitations

(i) *Interim Dry Weather Receiving Water Limitations*

The Responsible Copermittee must calculate the "existing" exceedance frequencies of the 30-day geometric mean water quality objectives for each of the indicator bacteria by analyzing the available monitoring data collected between January 1, 1996 and December 31, 2002. "Existing" exceedance frequencies may be calculated by water body and/or by Watershed Management Area listed in Table 6.0. Separate "existing" exceedance frequencies must be calculated for beaches and creeks/creek mouths.

The Responsible Copermittees must achieve a 50 percent reduction in the "existing" exceedance frequency of the 30-day geometric mean WQBELs for the water bodies listed in Table 6.0 by the interim compliance dates given in Table 6.4. A 50 percent reduction in the "existing" exceedance frequency is equivalent to half of the "existing" exceedance frequency of the 30-day geometric mean WQBELs.

The "existing" exceedance frequencies and the interim dry weather allowable exceedance frequencies (i.e. interim dry weather receiving water limitations) calculated by the Responsible Copermittees must be included in the Water Quality Improvement Plans for the applicable Watershed Management Areas.

(ii) *Interim Wet Weather Receiving Water Limitations*

The Responsible Copermittees must achieve the interim wet weather receiving water limitations in Table 6.5, expressed as interim wet weather allowable exceedance frequencies, by the interim compliance dates given in Table 6.4.

Table 6.5
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	38%	37%	39%
		at Heisler Park - North			
	Pacific Ocean Shoreline	at Main Laguna Beach			
		Laguna Beach at Ocean Avenue			
		Laguna Beach at Cleo Street			
		Arch Cove at Bluebird Canyon Road			
		Laguna Beach at Dumond Drive			
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	41%	41%	42%
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	41%	41%	42%
	Aliso Creek Mouth	at mouth	41%	41%	42%
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	36%	36%	36%
		Aliso Beach at Table Rock Drive			
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)			
		at Salt Creek (large outlet)			
		Salt Creek Beach at Salt Creek service road			
		Salt Creek Beach at Strand Road			

Table 6.5 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	44%	44%	48%
	San Juan Creek	lower 1 mile	44%	44%	47%
	San Juan Creek Mouth	at mouth	44%	44%	47%
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	35%	35%	36%
		Ole Hanson Beach Club Beach at Pico Drain			
		San Clemente City Beach at El Portal Street Stairs			
		San Clemente City Beach at Mariposa Street			
		San Clemente City Beach at Linda Lane			
		San Clemente City Beach at South Linda Lane			
		San Clemente City Beach at Lifeguard Headquarters			
		under San Clemente Municipal Pier			
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)			
		San Clemente State Beach at Riviera Beach			
		Can Clemente State Beach at Cypress Shores			
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	45%	44%	47%
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	40%	40%	41%
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	33%	33%	36%

Table 6.5 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	26%	26%	26%
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	37%	37%	37%
		La Jolla Shores Beach at Caminito del Oro			
		La Jolla Shores Beach at Vallecitos			
		La Jolla Shores Beach at Avenida de la Playa			
		at Casa Beach, Children's Pool			
		South Casa Beach at Coast Boulevard			
		Whispering Sands Beach at Ravina Street			
		Windansea Beach at Vista de la Playa			
		Windansea Beach at Bonair Street			
		Windansea Beach at Playa del Norte			
		Windansea Beach at Palomar Avenue			
		at Tourmaline Surf Park			
		Pacific Beach at Grand Avenue			
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries	49%	49%	51%
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	46%	43%	49%
	San Diego River	lower 6 miles	46%	43%	49%
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	46%	43%	51%
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	41%	41%	43%

(b) Interim Effluent Limitations

Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the interim compliance dates under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.c.(2)(a):

Table 6.6
Interim Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watersheds and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
South Orange County	**San Joaquin Hills HSA** (901.11) and **Laguna Hills HSA** (901.12) - Pacific Ocean Shoreline	45.89%	45.86%	49.14%	23.43%	26.04%	25.63%
	Aliso HSA (901.13) - Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	47.74%	47.79%	49.57%	12.65%	13.31%	13.76% (13.69%)**
	Dana Point HSA (901.14) - Pacific Ocean Shoreline	47.52%	47.52%	49.49%	6.58%	7.43%	7.58%
	Lower San Juan HSA (901.27) - Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	36.48%	37.11%	47.47%	9.61%	6.41%	13.56% (13.45%)**
	San Clemente HA (901.30) - Pacific Ocean Shoreline	47.14%	47.12%	49.42%	11.93%	12.29%	12.63%
San Luis Rey River	**San Luis Rey HU** (903.00) - Pacific Ocean Shoreline	19.07%	19.55%	43.69%	2.81%	1.56%	5.85%
Carlsbad	**San Marcos HA** (904.50) - Pacific Ocean Shoreline	41.41%	41.28%	48.02%	9.24%	9.49%	10.10%

Table 6.6 (Cont'd)
Interim Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watersheds and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
San Dieguito River	**San Dieguito HU** (905.00) - Pacific Ocean Shoreline	7.20%	10.36%	41.74%	2.15%	0.73%	3.86%
Penasquitos	**Miramar Reservoir HA** (906.10) - Pacific Ocean Shoreline	48.25%	48.30%	49.71%	0.81%	1.00%	0.97%
Mission Bay	**Scripps HA** (906.30) - Pacific Ocean Shoreline	48.22%	48.21%	49.63%	8.16%	10.57%	9.41%
	Tecolote HA (906.50) - Tecolote Creek	47.26%	47.30%	49.47%	8.26%	10.24%	9.08% (9.04%)**
San Diego River	**Mission San Diego HSA** (907.11) and **Santee HSA** (907.12) - Pacific Ocean Shoreline - Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles)	37.02%	34.72%	46.98%	19.07%	26.61%	21.37% (21.24%)**
San Diego Bay	**Chollas HSA** (908.22) - Chollas Creek	46.03%	46.08%	49.23%	8.91%	12.42%	10.73% (10.68%)**

Notes:
* The percent load reductions are based on reducing loads compared to pollutant loads from 2001 to 2002.
** The alternative *Enterococcus* percent load reduction was calculated based on a numeric target of 104 MPN/100mL instead of 61 MPN/100mL, protective of the REC-1 "moderately to lightly used area" usage frequency that is protective of freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative pollutant load reductions can be utilized.

(3) Interim TMDL Compliance Determination

Compliance with the interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(f) There are no exceedances of the interim receiving water limitations under Specific Provision 6.c.(2)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(g) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the interim effluent limitations under Specific Provision 6.c.(2)(b); OR

(h) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

d. Specific Monitoring and Assessment Requirements

(1) Monitoring and Assessment Requirements for Beaches

(a) Monitoring Stations

For beaches addressed by the TMDL, monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[34] If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources

[34] Commonly referred to as AB 411 monitoring

causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations at least once within the first 24 hours of the end of a storm event[35] during the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer in exceedance of the allowable exceedance frequencies in the receiving waters.

(iii) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(iv) For Pacific Ocean Shoreline segments or areas listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final

[35] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

WQBELs for the Pacific Ocean Shoreline segments or areas listed in Table 6.0 have been achieved.

(ii) Dry weather exceedance frequencies must be calculated as follows:

[a] 30-day geometric means must be calculated from the results of any dry weather samples collected from the segments or areas for each water body listed in Table 6.0;
[b] The method and number of samples need for calculating the 30-day geometric means must be consistent with the number of samples required by the Ocean Plan;
[c] Where there are multiple segments or areas associated with a water body listed in Table 6.0, the Copermittees may calculate geometric means for each segment or area, or combine the dry weather monitoring data from all the segments or areas to calculate geometric means for the water body;
[d] The exceedance frequency must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the dry season.

(iii) Wet weather exceedance frequencies must be calculated as follows:

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;
[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;
[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria densities reported from each storm event sampled; and
[d] The single sample maximum exceedance frequency must be calculated by dividing the number of wet weather days that exceed the single sample maximum receiving water limitations in Table 6.2 by the total number of wet weather days during the rainy season.
[e] The data collected for dry weather must be used in addition to the data collected for wet weather to calculate the wet weather 30-day geometric means. The exceedance frequency of the wet weather 30-day geometric means must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of

geometric means calculated from samples collected during the wet season.

(iv) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(v) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) Monitoring and Assessment Requirements for Creeks and Creek Mouths

(a) Monitoring Stations

For creeks addressed by the TMDL, monitoring locations should consist of, at a minimum, a location at or near the mouth of the creek (e.g. Mass Loading Station or Mass Emission Station) and one or more locations upstream of the mouth (e.g. Watershed Assessment Station). If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations in accordance with the requirements of Provision D.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations within the first 24 hours of the end of a storm event[36] during the rainy season (i.e. October 1 through April 30).

(iii) Samples collected from receiving water monitoring stations must be analyzed for fecal coliform and *Enterococcus* indicator bacteria.

[36] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(iv) For creeks or creek mouths listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the receiving water monitoring data to assess whether the interim and final receiving water WQBELs for the creeks and creek mouths listed in Table 6.0 have been achieved.

(ii) Dry weather exceedance frequencies must be calculated as follows:

[a] 30-day geometric means must be calculated from the results of any dry weather samples collected from the segment or area for each water body listed in Table 6.0;
[b] The method and number of samples need for calculating the 30-day geometric means must be consistent with the number of samples required by the Basin Plan;
[c] The exceedance frequency must be calculated by dividing the number of 30-day geometric means that exceed the 30-day geometric mean receiving water limitations in Table 6.2 by the total number of 30-day geometric means calculated from samples collected during the dry season.

(iii) Wet weather exceedance frequencies must be calculated as follows:

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;
[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;
[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria densities reported from each of the storm events sampled; and

[d] The exceedance frequency must be calculated by dividing the number of wet weather days that exceed the single sample maximum receiving water limitations in Table 6.2 by the total number of wet weather days during the rainy season.

[e] The data collected for dry weather must be used in addition to the data collected for wet weather to calculate the wet weather 30-day geometric means. The exceedance frequency of the wet weather 30-day geometric means must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the wet season.

(iv) The Responsible Copermittee must identify and incorporate additional MS4 outfall and receiving water monitoring stations and/or adjust monitoring frequencies to identify sources causing exceedances of the receiving water WQBELs.

(v) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(vi) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

ATTACHMENT F

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

FACT SHEET / TECHNICAL REPORT

FOR

ORDER NO. R9-2013-0001
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

MAY 8, 2013

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I. FACT SHEET FORMAT

This Fact Sheet briefly sets forth the principal facts and the significant factual, legal, methodological, and policy questions that the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) considered in preparing Order No. R9-2013-0001 (Order). In accordance with the Code of Federal Regulations (CFR) Title 40 Parts 124.8 and 124.56 (40 CFR 124.8 and 40 CFR 124.56), this Fact Sheet includes, but is not limited to, the following information:

1. Contact information
2. Public process and notification procedures
3. Background of municipal storm water permits
4. Regional MS4 Permit approach
5. Economic considerations
6. Applicable statutes, regulations, plans and policies
7. Discussion of the provisions in the Order

Tentative Order No. R9-2013-0001 was distributed for public review on October 31, 2012. The San Diego Water Board accepted written comments on the Tentative Order until January 11, 2013. A public hearing was subsequently held on April 10 and 11, 2013, that was continued to May 8, 2013 to receive oral comments from interested persons.

The San Diego Water Board files applicable to the issuance of Order No. R9-2013-0001 are incorporated into the administrative record in support of the findings and requirements of the Order.

II. CONTACT INFORMATION

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The Order and other related documents can be downloaded from the San Diego Water Board website at

http://www.swrcb.ca.gov/rwqcb9/water_issues/programs/stormwater/index.shtml

The documents referenced in this Fact Sheet and in Order No. R9-2013-0001 are available for public review at the San Diego Water Board office, located at the address listed above. Public records are available for inspection during regular business hours, from 8:00 am to 5:00 pm Monday through Friday. To schedule an appointment to inspect public records, contact the San Diego Water Board Records Management Officer at 858-467-2952.

COPERMITTEES

Orange County Copermittees

- County of Orange
  - City of Aliso Viejo
  - City of Dana Point
  - City of Laguna Beach
  - City of Laguna Hills
  - City of Laguna Niguel
  - City of Laguna Woods
  - City of Lake Forest
  - City of Mission Viejo
  - City of Ranch Santa Margarita
  - City of San Clemente
  - City of San Juan Capistrano
  - Orange County Flood Control District

Riverside County Copermittees

- County of Riverside
  - City of Murrieta
  - City of Temecula
  - City of Wildomar
  - Riverside County Flood Control and Water Conservation District

San Diego County Copermittees

- County of San Diego
  - City of Carlsbad
  - City of Chula Vista
  - City of Coronado
  - City of Del Mar
  - City of El Cajon
  - City of Encinitas
  - City of Escondido
  - City of Imperial Beach
  - City of La Mesa
  - City of Lemon Grove
  - City of National City
  - City of Oceanside
  - City of Poway
  - City of San Diego
  - City of San Marcos
  - City of Santee
  - City of Solana Beach
  - City of Vista
  - San Diego County Regional Airport Authority
  - San Diego Unified Port District

III. PUBLIC PROCESS AND NOTIFICATION PROCEDURES

The San Diego Water Board followed the schedule listed below for the preparation of Order No. R9-2013-0001:

1. On February 8, 2011, the San Diego Water Board met with the San Diego County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No. R9-2007-0001.

2. Between February and May 2011, the San Diego Water Board met with select San Diego County, Orange County, and Riverside County Copermittees, as well as representatives of the environmental community to discuss concepts and receive recommendations for elements to be incorporated in a Regional Municipal Separate Storm Sewer System Permit (Regional MS4 Permit).

3. On June 27, 2011 the San Diego Water Board received the Report of Waste Discharge from the San Diego County Copermittees for the renewal of their NPDES permit, Order No. R9-2007-0001.

4. On April 9, 2012, the San Diego Water Board released an administrative draft of Tentative Order No. R9-2013-0001 for preliminary informal comments and feedback.

5. On April 25, 2012, the San Diego Water Board held an informal public workshop to present the administrative draft of Tentative Order No. R9-2013-0001 and receive verbal comments.

6. Between June and August 2012, the San Diego Water Board held four (4) focused meetings with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community, and USEPA) to discuss and receive preliminary comments and feedback about specific elements in the administrative draft of Tentative Order No. R9-2013-0001.

7. On September 5, 2012, the San Diego Water Board held an informal public workshop to present the modifications that were expected to be incorporated into the Tentative Order based on the preliminary comments and feedback received during the focused meetings held between June and August 2012.

8. Informal written comments on the administrative draft of Tentative Order No. R9-2013-0001 were accepted until September 14, 2012.

9. On October 12, 2012, the San Diego Water Board released a revised administrative draft of Tentative Order No. R9-2013-0001.

10. On October 24, 2012, the San Diego Water Board held a focused meeting with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community, and USEPA) to discuss modifications incorporated into the administrative draft of Tentative Order No. R9-2013-0001.

11. On October 31, 2012, the San Diego Water Board released Tentative Order No. R9-2013-0001 for formal public review and comment.

12. On November 13, 2012 and December 12, 2012, the San Diego Water Board held a formal public Board workshop to present the public draft of Tentative Order No. R9-2013-0001 and receive verbal comments.

13. Formal written comments on the public draft of Tentative Order No. R9-2013-0001 were accepted until January 11, 2013.

14. A public hearing of Tentative Order No. R9-2013-0001 was conducted on April 10 and 11, 2013, that was continued to May 8, 2013.

IV. BACKGROUND OF THE SAN DIEGO REGION MUNICIPAL STORM WATER PERMITS

In developed and developing areas, storm water runoff is commonly transported through municipal separate storm sewer systems (MS4s) and discharged into local receiving water bodies. As the storm water runs off and flows over the land or impervious surfaces (e.g., paved streets, parking lots, and building rooftops), it accumulates debris, chemicals, sediment, and other pollutants that can adversely affect receiving water quality if discharged untreated. The United States Environmental Protection Agency (USEPA) recognizes wet weather flows from urban areas as the number one source of estuarine pollution in coastal communities,[1] such as those within the San Diego Region.

The federal Clean Water Act (CWA) was amended in 1987 to address and regulate discharges of storm water associated with industrial activities and from municipal storm sewers. With the amendments, many municipalities throughout the United States were obligated for the first time to obtain National Pollutant Discharge Elimination System (NPDES) permits for discharges of storm water from their MS4s.

In response to the CWA 1987 amendment, as well as the pending federal NPDES regulations which would implement the amendment, the San Diego Water Board issued "early" MS4 permits. The San Diego Water Board adopted and issued Order Nos. 90-38, 90-42, and 90-46 to regulate storm water discharges from the MS4s in Orange County, San Diego County, and Riverside County, respectively, within the San Diego Region on July 16, 1990.

The "early" MS4 permits, or First Term Permits, were issued prior to the November 1990 promulgation of the final federal NPDES storm water regulations. By issuing these First Term Permits before the federal regulations took effect, the San Diego Water Board was able to provide the Copermittees additional flexibility in addressing and managing storm water discharges. The First Term Permits contained the essentials of the 1990 regulations, and required the Copermittees to develop and implement runoff management programs, but provided little specificity about what was required to be included in or actually achieved by those programs.

The flexibility provided in the First Term Permits was generally continued through the Second Term Permits. The combination of the lack of specificity in the First and Second Term Permits, a general lack of meaningful action by the Copermittees and a general lack of corresponding reaction (i.e. enforcement) by the San Diego Water Board during the first ten years of the storm water program, resulted in few substantive steps towards achieving improvements in the quality of receiving waters or storm water discharges from the MS4s.

[1] US EPA. 1999. 40 CFR Parts 9, 122, 123, and 124. National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. 64 FR 68727.

From 2001, the regulatory approach incorporated into Third Term Permits was a significant departure from the regulatory approach of the First and Second Term Permits. The Third Term Permits issued by the San Diego Water Board included more detailed requirements that outlined the minimum level of implementation required for the Copermittees' programs to meet the maximum extent practicable (MEP) standard for storm water. The Third Term Permits included more detail to emphasize and enhance the jurisdictional runoff management programs developed by the Copermittees and introduced requirements for developing and implementing watershed-based programs.

The Third Term Permits also incorporated two precedent setting decisions by the State Water Board. In Order WQ 99-05, the State Water Board established receiving water limitation language to be included in all MS4 permits. The State Water Board's precedential language clarified that municipal storm water permits must include provisions requiring discharges to be controlled to attain water quality standards in receiving waters. Unlike previously adopted versions of the receiving water limitation language in the First and Second Term Permits, the language no longer stated that "*violations of water quality standards are not violations of the municipal storm water permit under certain conditions*." In addition, the receiving water limitation language no longer indicated that the "*implementation of best management practices is the 'functional equivalent' of meeting water quality standards*." State Water Board Order WQ 99-05 specifically requires language in MS4 permits for the Copermittees to comply with water quality standards based discharge prohibitions and receiving water limitations through timely implementation of control measures and other actions to reduce pollutants in discharges. (See State Water Board Order WQ 99-05 (*Environmental Health Coalition*)).

In Order WQ 2000-11, also a precedential decision, the State Water Board addressed design standards for structural post-construction best management practices (BMPs) for new development and significant redevelopment. The State Water Board found that the design standards, which require that runoff generated by 85 percent of storm events from specific development categories be infiltrated or treated, reflect the MEP standard. State Water Board Order WQ 2000-11 also found that the post-construction BMP provisions, or Standard Storm Water Mitigation Plan (SSMP) provisions, constitute MEP for addressing storm water pollutant discharges resulting from specific development categories.

The Third Term San Diego County and Orange County Permits (Order Nos. 2001-01 and R9-2002-0001, respectively) were appealed to the State Water Board. Minor modifications were made by the State Water Board, but the requirements were largely upheld. In State Water Board Order WQ 2001-15, the State Water Board upheld the Third Term San Diego County Permit requirements with certain modifications. The State Water Board removed the prohibition of storm water discharges *into* the MS4 that cause or contribute to exceedances of water quality objectives. The revision allows for treatment of pollutants in storm water runoff after the pollutants have entered the MS4. State Water Board Order WQ 2001-15 otherwise upheld all the other requirements of the permit.

In addition to the modification to the discharge prohibition in Order WQ 2001-15, the State Water Board refined Order WQ 99-05 by making clear that the Copermittees may use an iterative approach to achieving compliance with water quality standards that involves ongoing assessments and revisions. Thus, the language for the discharge prohibitions and receiving water limitations was revised to explicitly require the Copermittees to implement an iterative process of assessments and revisions to comply with the discharge prohibitions and receiving water limitations. The San Diego Water Board retained the authority to enforce receiving water limitations and discharge prohibitions even if the Copermittee is engaged in the iterative process.

The Third Term San Diego County Permit was subsequently challenged in the Superior Court of the State of California and the Court of Appeal, Fourth Appellate District. The Court of Appeal, Fourth Appellate District, found that the approach of the Third Term San Diego County Permit to regulating discharges into the MS4 was appropriate (*Building Industry Ass'n. v. State Water Resources Control Bd., et al.,* 124 Cal.App.4th 866 (2004)). The State of California Supreme Court denied review sought by the Building Industry Association in March 2005.

The Fourth Term Permits, or current MS4 permits, began with the adoption of Order No. R9-2007-0001 issued to the Copermittees of San Diego County in January 2007. Order Nos. R9-2009-0002 and R9-2010-0016 were subsequently issued to the Copermittees of Orange County and Riverside County. The Fourth Term Permits continued to include more detailed requirements to be implemented by each Copermittee's jurisdictional runoff management program. The Fourth Term Permits also include requirements to further emphasize a watershed management approach and for more coordination among jurisdictional runoff management programs. In addition, the Fourth Term Permits included more requirements for assessing the effectiveness of the runoff management programs being implemented by the Copermittees. The intent of the inclusion of additional requirements was to enhance and better define elements of the permit that were expected to be incorporated into the iterative process for managing runoff from each Copermittee's jurisdiction and within the watersheds of the San Diego Region.

The Fourth Term Permits include several new and emerging approaches for managing storm water runoff and discharges. Low impact development (LID) requirements are included for development and significant redevelopment to reduce pollutants in storm water runoff from sites through more natural processes such as infiltration and biofiltration closer to the source, rather than utilizing conventional mechanical end-of-pipe treatment systems. Hydrograph modification (hydromodification) management requirements also are included to mitigate the potential for increased erosion in receiving waters due to increased runoff rates and durations often caused by development and increased impervious surfaces. The Fourth Term Orange County and Riverside County Permits introduced requirements to identify areas of existing development where retrofitting with LID projects would be feasible and could be implemented to reduce storm water runoff and pollutants in storm water discharges.

The Fourth Term Orange County and Riverside County Permits included a clearer distinction between storm water and non-storm water discharges. The term “urban runoff” was completely removed, and a distinction between storm water (wet weather) runoff and non-storm water (dry weather) runoff was emphasized. This clarification was made to prevent any potential misunderstanding that regulation under the MS4 permits is limited only to urbanized areas, and to prevent non-storm water runoff from being managed in the same manner as storm water runoff. The term “urban runoff” is not defined in the Code of Federal Regulations (CFR) or Federal Register (FR) in the regulation of MS4 discharges. According to the CWA 402(p)(3)(B)(ii), MS4 permits must include a requirement to effectively prohibit non-storm water discharges into the MS4s.

Finally, for the Fourth Term Orange County and Riverside County Permits the San Diego Water Board found that non-storm water discharges to the MS4 from over application of irrigation water are sources of pollutants. The San Diego Water Board found that non-storm water discharges resulting from over-irrigation must be prohibited from entering the MS4 in accordance with the requirements of the CWA and pursuant to 40 CFR 122.26(d)(2)(iv)(B)(1).

The requirements of the Fourth Term Permits issued to the Copermittees in each county within the San Diego Region now have substantively the same core requirements such as discharge prohibitions, receiving water limitations, jurisdictional runoff management program components, and monitoring program requirements. There are, however, several inconsistencies that exist among the three Fourth Term Permits which complicate oversight and implementation of the permits by the San Diego Water Board.

The Fourth Term San Diego County Permit expired in January 2012. The Fourth Term Orange County and Riverside County Permits will expire in December 2014 and November 2015, respectively. Issuing the Fifth Term Permits within five years for three counties under three different permits would require the San Diego Water Board to expend significant time and resources for the issuance of the permits through three separate public proceedings, thereby greatly reducing the time and resources available to oversee implementation and compliance. Multiple permits also create confusion for determining compliance among regulated entities, especially for the land development community.

The San Diego Water Board has acknowledged that issuing a single MS4 permit for all the Copermittees in the San Diego Region can and is expected to result in more consistent implementation, improve communication among agencies within watersheds crossing multiple jurisdictions, and minimize resources spent with each permit renewal process. Within the findings of the Fourth Term Riverside County Permit issued in November 2010, the San Diego Water Board notified the public of its intent to develop and issue a single Regional MS4 Permit.

V. REGIONAL MS4 PERMIT APPROACH

The Fifth Term Permit, or Regional MS4 Permit, shifts the focus of the permit requirements from a minimum level of actions to be implemented by the Copermittees to identifying outcomes to be achieved by those actions. Order No. R9-2013-0001 represents an important paradigm shift in the approach for MS4 permits within the San Diego Region.

Historical Permitting Approach

The First and Second Term Permits were very broad and provided little specificity about what was required to be developed and implemented by the Copermittees. The Third Term Permits began to become more specific about the minimum level of implementation required by the Copermittees. The Fourth Term Permits, or current permits, subsequently increased in specificity. The MS4 permits have progressively become more detailed and focused on specifying the minimum level of actions expected to be implemented by the Copermittees. As detailed and specific as the MS4 permits have become, however, they include very little detail about what the desired outcomes of the required actions are expected to achieve. Compliance with the permit requirements has essentially been tracking numbers of actions and reporting, not tracking progress or actual improvements in the quality of receiving waters or discharges from the MS4s. The result has been an increase in actions being implemented by the Copermittees with little or no ability or expectations to determine whether or not improvements in water quality are being achieved.

The Fourth Term Permits result in significant resource expenditure by the Copermittees to report permit compliance information to the San Diego Water Board in the form of annual jurisdictional runoff management program, watershed program, and monitoring program reports. The San Diego Water Board must then expend much of its limited resources on reviewing more than 50 voluminous reports submitted annually by the Copermittees. The information currently reported by the Copermittees is of limited value when trying to measure progress toward achieving improvements in the quality of receiving waters or discharges from the MS4s. Oversight of the MS4 permits is further complicated by the inconsistencies among the requirements issued to the Orange County, San Diego County, and Riverside County Copermittees under three separate MS4 permits.

Under the Fourth Term Permits, the Copermittees must expend a significant portion of their limited resources collecting data of limited value, and putting together reports to submit that information to the San Diego Water Board. Likewise, the San Diego Water Board must expend most of its limited resources reviewing reports, and developing permits instead of working directly with the Copermittees to identify solutions to problems causing impacts to water quality. This is an unsustainable course that will continue to demand more resources from the Copermittees and the San Diego Water Board, and would continue to result in unknown water quality benefits.

New Permitting Approach

The goal of the Regional MS4 Permit is twofold: 1) bring a consistent set of MS4 permit requirements to all of the Copermittees within the San Diego Region; and, 2) provide an MS4 permit with requirements that will allow the Copermittees to focus their efforts and resources on achieving goals and desired outcomes toward the improvement of water quality rather than completing specific actions.

The overall approach included in the Regional MS4 Permit with respect to the jurisdictional runoff management programs will not differ significantly from the current permits. The general requirements for the jurisdictional runoff management program components and compliance with those requirements will remain and be applied consistently throughout the San Diego Region under the Regional MS4 Permit.

The most significant difference in the new permitting approach is the specific manner of implementation for those jurisdictional runoff management programs. Implementation will be based on decisions made by the Copermittees in accordance with what they have identified as their highest priority water quality conditions. In other words, the Copermittees will have significant control in how to implement the jurisdictional runoff management programs to best utilize their available resources in addressing a specific set of priorities effectively, instead of trying to address all the water quality priorities ineffectively.

The Copermittees are given the responsibility of identifying their highest priority water quality conditions that they intend to address. The Copermittees will develop goals that can be used to measure and demonstrate progress or improvements toward addressing those priorities. In addition to the goals, the Copermittees will provide a schedule for achieving the goals for those highest priorities. The measurement of progress toward achieving the goals for those highest priorities requires a better defined and more focused program of monitoring and assessment than under the Fourth Term Permits.

The monitoring and assessment program must be designed to inform the Copermittees of their progress, and the need for modifications in their jurisdictional runoff management programs and schedules to achieve their goals to improve water quality. The monitoring and assessment program requirements will have a more central role in the Regional MS4 Permit than in earlier permits. The monitoring and assessment requirements must also be designed to enable the Copermittees to focus and direct their efforts in implementing their jurisdictional runoff management programs toward their stated desired outcomes to improve the quality of receiving waters and/or discharges from the MS4s.

By providing an MS4 permit that allows the Copermittees to make more decisions about how to utilize and focus their resources, along with a better defined monitoring and assessment program to inform their water quality management decisions, the Copermittees will have the opportunity to:

1) *Plan strategically*. The Copermittees must have the ability to identify their available resources and develop and implement long term plans that can organize, collect, and use those resources in the most strategically advantageous and efficient manner possible. This ability to develop long term plans will allow the Copermittees to focus and utilize their resources in a more concerted way over the short term and long term to address specific water quality priorities through stated desired outcomes.

2) *Manage adaptively*. The Copermittees must be given the ability to modify their plans as additional information and data are collected from the monitoring and assessment programs. The Copermittees' plans may require modifications to the programs, priorities, goals, strategies, and/or schedules in order for the Copermittees to achieve a stated desired outcome.

3) *Identify synergies*. The Copermittees must be given more flexibility to identify efficiencies within and among their jurisdictional runoff management programs as the strategies are developed and implemented to increase the Copermittees' collective effectiveness. The Copermittees must also be able to identify and utilize resources available from other agencies and entities to further augment and enhance their jurisdictional runoff management programs and/or to collectively work with those other agencies and entities toward achieving a stated desired outcome.

The Regional MS4 Permit requirements will provide the Copermittees the flexibility and responsibility to decide what actions will be necessary to achieve an outcome that is tailored and designed by the Copermittees to improve specific prioritized water quality conditions. The San Diego Water Board expects the approach of the Regional MS4 Permit to give the Copermittees a greater sense of ownership for restoring the quality of receiving waters in the San Diego Region by becoming an integral part of the decision making process in identifying water quality conditions to be addressed, as well as determining the best use of their resources.

VI. ECONOMIC CONSIDERATIONS

Statutory Considerations

California Water Code (CWC) section 13241 requires the San Diego Water Board to consider certain factors, including economic considerations, in the adoption of water quality objectives. CWC section 13263 requires the San Diego Water Board to take into consideration the provisions of CWC section 13241 in adopting waste discharge requirements.

In *City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, the California Supreme Court considered whether Regional Water Boards must comply with CWC section 13241 when issuing waste discharge requirements under CWC section 13263(a) by taking into account the costs a permittee will incur in complying with the permit requirements. The Court concluded that whether it is necessary to consider such cost information "*depends on whether those restrictions meet or exceed the requirements of the federal Clean Water Act.*" (*Id.* at p. 627.) The Court ruled that Regional Water Boards may not consider the factors in CWC section 13241, including economics, to justify imposing pollutant restrictions that are less stringent than applicable federal law requires. (*Id.* At pp. 618, 626-627 ["*[Water Code section 13377 specifies that [] discharge permits issued by California's regional boards must meet the federal standards set by federal law. In effect, section 13377 forbids a regional board's consideration of any economic hardship on the part of the permit holder if doing so would result in the dilution of the requirements set by Congress in the Clean Water Act...Because CWC section 13263 cannot authorize what federal law forbids, it cannot authorize a regional board, when issuing a [] discharge permit, to use compliance costs to justify pollutant restrictions that do not comply with federal clean water standards*."]). However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Regional Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

As discussed in Section VII.F, Unfunded State Mandates, the San Diego Water Board finds that the requirements in this Order are not more stringent than the minimum federal requirements. Among other requirements, federal law requires MS4 permits to include requirements to effectively prohibit non-storm water discharges into the MS4s, in addition to requiring controls to reduce the discharge of pollutants in storm water to the MEP, and other provisions as USEPA or the State determines are appropriate for the control of pollutants in MS4 discharges.

The requirements in this Order may be more specific or detailed than those enumerated in federal regulations under 40 CFR 122.26 or in the USEPA guidance. However, the requirements have been designed to be consistent with and within the federal statutory mandates described in CWA section 402(p)(3)(B)(ii) and (iii) and the related federal regulations and guidance. Consistent with federal law, all of the

conditions in this Order could have been included in a permit adopted by USEPA in the absence of the in lieu authority of California to issue NPDES permits.

Moreover, the inclusion of numeric WQBELs in this Order does not cause this Order to be more stringent than federal law. Federal law authorizes both narrative and numeric effluent limitations to meet state water quality standards. The inclusion of WQBELs as discharge specifications in an NPDES permit in order to achieve compliance with water quality standards is not a more stringent requirement than the inclusion of BMP based permit limitations to achieve water quality standards (State Water Board Order No. WQ 2006-0012 (*Boeing*)). Therefore, consideration of the factors set forth in CWC section 13241 is not required for permit requirements to implement the effective prohibition on the discharge of non-storm water discharges into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determine appropriate to control such pollutants, as those requirements are mandated by federal law.

Included in the provisions of the Order are monitoring and reporting requirements that are designed to demonstrate that the Copermittees are implementing programs to comply with the CWA municipal storm water requirements. CWA section 308(a) and 40 CFR 122.41(h), (j)-(l), 122.44(i) and 122.48 require that all NPDES permits specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s (40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c)) also specify additional monitoring and reporting requirements. In addition to the federal requirements of the CWA, the San Diego Water Board also has the authority in CWC 13383 to establish monitoring, reporting, and recordkeeping requirements that implement federal and state laws and regulations through NPDES permits. .

The monitoring and assessment information that will be reported to the San Diego Water Board is necessary to determine if the Copermittees are making progress toward achieving compliance with the discharge prohibitions, receiving water limitations, and effluent limitations under Provision A of the Order. The monitoring and assessment information that will be reported is also expected to be key to the iterative approach and adaptive management process that is required to be implemented by the Copermittees if they cannot meet the discharge prohibitions and receiving water limitations under the present conditions, which is also part of the requirements under Provision A of the Order.

Notwithstanding the above, the San Diego Water Board has considered cost information in issuing this Order, as discussed below. The San Diego Water Board has also considered all of the evidence that has been presented to the San Diego Water Board regarding the CWC section 13241 factors in adopting this Order. The San Diego Water Board finds that the requirements in this Order are reasonably necessary to protect beneficial uses identified in the Basin Plan and the economic information related to costs of compliance and other CWC section 13241 factors are not sufficient to justify failing to protect those beneficial uses. Where appropriate, the

San Diego Water Board has provided or will consider providing the Copermittees with additional time to implement control measures to achieve final WQBELs and/or water quality standards.

Cost Information

Discussions of the financial and economic ramifications of municipal storm water management programs tend to focus on the significant costs incurred by municipalities in developing and implementing the programs. When considering the cost of implementing the programs, however, it is also important to consider the alternative costs that are incurred when programs are not fully implemented, as well as the economic benefits which result from effective program implementation.

The recent financial and economic conditions have amplified the concerns about the costs incurred by the municipalities in developing and implementing their programs. The reduction in resources resulting from the recent financial and economic conditions has been cited by many of the Copermittees as a justification for reducing the requirements that must be met by their programs. While the recent conditions are a cause for concern in the short term, these programs also have an opportunity to identify and implement improvements and efficiencies before the next period of growth and development, resulting in more effective and sustainable programs over the long term.

In addition, it is very difficult to ascertain the true cost of implementation of the Copermittees' management programs because of inconsistencies in reporting by the Copermittees. Reported costs of compliance for the same program element can vary widely from city to city, often by a very wide margin that is not easily explained.[2] Despite these problems, efforts have been made to identify management program costs, which can be helpful in understanding the costs of program implementation.

The San Diego Water Board recognizes that the Copermittees will incur costs in implementing this Order, potentially above and beyond the costs from the Copermittees' prior permits. The San Diego Water Board also recognizes that, due to California's current economic condition, many Copermittees currently have limited staff and resources to implement actions to address its MS4 discharges. Based on the economic considerations below, the San Diego Water Board has provided the Copermittees a significant amount of flexibility to choose how to implement the requirements of the Order.

The Order also allows the Copermittees to customize their plans, programs, and monitoring requirements. In the end, it is up to the Copermittees to determine the effective BMPs and measures necessary to comply with this Order. The Copermittees can choose to implement the least expensive measures that are effective in meeting the requirements of this Order. This Order also does not require the Copermittees to

[2] LARWQCB, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.

fully implement all requirements within a single permit term. Where appropriate, the Board has provided the Copermittees with additional time outside of the permit term to implement control measures to achieve final WQBELs and/or water quality standards.

The San Diego Water Board has considered available cost information associated with compliance with this Order. It is not possible to predict accurately the cost impact of the requirements that involve an unknown level of implementation or that depend on environmental variables that are as yet undefined. Only general conclusions can be drawn from this information.

Estimated Municipal Storm Water Program Implementation Costs

The USEPA, the State Water Board, and the California Regional Water Quality Control Boards (Regional Water Boards) have attempted to evaluate the costs of implementing municipal storm water programs. The assessments have demonstrated that the true costs are difficult to ascertain and reported costs vary widely. In addition, reported fiscal analyses tend to neglect the costs incurred to municipalities when storm water and non-storm water runoff is not effectively managed, which are incurred as a result of pollution, contamination, nuisance, and damage to ecosystems, property, and human health. Nonetheless, they provide a useful context for considering the costs of requirements within Order No. R9-2013-0001.

In 1999, the USEPA reported on multiple studies it conducted to determine the cost of management programs. A study of Phase II municipalities determined that the annual cost of the Phase II program was expected to be $9.16 per household. The USEPA also studied 35 Phase I municipalities, finding costs to be $9.08 per household annually, similar to those anticipated for Phase II municipalities.[3]

The State Water Board commissioned a study by the California State University, Sacramento to assess costs of the Phase I MS4 program. This study includes an assessment of costs incurred by Phase I MS4s throughout the state to implement their programs. Annual cost per household in the study ranged from $18 to $46, with the Fresno-Clovis Metropolitan Area representing the lower end of the range, and the City of Encinitas (in San Diego County) representing the upper end of the range.[4]

A study on Phase I MS4 program costs was also conducted by the California Regional Water Quality Control Board, Los Angeles Region (Los Angeles Water Board), where program costs reported in the municipalities' annual reports were assessed. The Los Angeles Water Board estimated that average per household cost to implement the MS4 program in Los Angeles County was $12.50. [5]

[3] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791-68792.
[4] State Water Board, 2005. NPDES Stormwater Cost Survey. P. ii.
[5] Los Angeles Water Board, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.

It is important to note that reported program costs are not all attributable to solely complying with MS4 permits. Many program components, and their associated costs, existed before any MS4 permits were ever issued. For example, street sweeping and trash collection costs cannot be solely or even principally attributable to MS4 permit compliance, since these practices have long been expected from and implemented by municipalities.

Therefore, true program cost resulting from MS4 permit requirements is some fraction of reported costs. The California State University, Sacramento study found that only 38 percent of program costs are new costs fully attributable to MS4 permits. The remainder of the program costs was either pre-existing or resulted from enhancement of pre-existing programs.[6] In 2000, the County of Orange found that even lower amounts of program costs are solely attributable to MS4 permit compliance, reporting that the amount attributable to implement the County or Orange Drainage Area Management Plan (DAMP), was less than 20 percent of the total budget. The remaining 80 percent was attributable to pre-existing programs.[7] More current data from the County of Orange is not used in this discussion because the County of Orange no longer reports such information.

Estimated Value of Healthy Water Quality

Economic considerations of municipal storm water management programs cannot be limited only to program costs. Evaluation of programs must also consider information on the benefits derived from environmental protection and improvement.[8] Attention is often focused on municipal storm water management program costs, but the programs must also be viewed in terms of their value to the public.

Placing a value on healthy receiving waters is very difficult. Often the value of receiving waters with good water quality manifests in other forms, such as tourism, recreational opportunities, and/or increased property values. When surface water bodies are degraded, thereby degrading the habitat within and adjacent to the water bodies, the public loses the value and benefits associated with being able to use the area in and around the water bodies. Surface waters that are able to support the beneficial uses designated in the Basin Plan can sustain plants and wildlife that can attract visitors and residents, providing aesthetic, recreational, as well as monetary value to the public. At this time, however, there have been no studies for the San Diego Region to quantify the added value that surface waters with healthy water quality can provide.

[6] State Water Board, 2005. NPDES Stormwater Cost Survey. P. 58.
[7] County of Orange, 2000. A NPDES Annual Progress Report. P. 60.
[8] Ribaudo M.O. and D. Heelerstein. 1992, *Estimating Water Quality Benefits: Theoretical and Methodological Issues.* U.S. Department of Agriculture. Technical Bulletin No. 1808.

USEPA has estimated that household willingness to pay for improvements in fresh water quality for fishing and boating is approximately $158-$210.[9] This estimate can be considered conservative, since it does not include important considerations such as marine waters benefits, wildlife benefits, or flood control benefits. Another study conducted by California State University, Sacramento reported that the annual household willingness to pay for statewide clean water is approximately $180.[10]

A study conducted by the University of Southern California and University of California, Los Angeles assessed the costs and benefits of implementing various approaches for achieving compliance with the MS4 permits in the Los Angeles region. The study found that non-structural systems would cost $2.8 billion but provide $5.6 billion in benefit. If structural systems were determined to be needed, the study found that total costs would be $5.7 to $7.4 billion, while benefits could reach $18 billion.[11] Costs are anticipated to be borne over many years, probably at least ten years.

As can be seen, the benefits of the municipal storm water management programs are expected to considerably exceed their costs. Such findings are corroborated by USEPA, which found that the benefits of implementation of its Phase II storm water rule would also outweigh the costs.[12]

[9] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68793.
[10] State Water Board, 2005. NPDES Stormwater Cost Survey. P. iv.
[11] Los Angeles Water Board, 2004. Alternative Approaches to Stormwater Control.
[12] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791.

VII. APPLICABLE STATUTES, REGULATIONS, PLANS AND POLICIES

A. Legal Authorities – Federal Clean Water Act and California Water Code

This Order is issued pursuant to section 402 of the CWA and implementing regulations adopted by the USEPA and chapter 5.5, division 7 of the CWC (commencing with section 13370). This Order serves as an NPDES permit for point source discharges to surface waters. This Order also serves as waste discharge requirements pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

The objective of the CWA is "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*." To carry out this objective, the CWA requires the implementation of permit programs to regulate the discharge of pollutants and dredged or fill material to the navigable waters of the U.S. and to regulate the use and disposal of sewage sludge. CWA section 402 provides the legal authority to issue a permit for the discharge of pollutants to waters of the U.S. under the NPDES. The CWA provides that NPDES permits may be issued by states which are authorized to implement the provisions of that act. California became authorized to implement the NPDES permit program on May 14, 1973.

The Porter-Cologne Water Quality Control Act (Division 7, commencing with CWC section 13000) established the State Water Resources Control Board (State Water Board) and nine Regional Water Quality Control Boards (Regional Water Boards) as the principal state agencies with primary responsibility for the coordination and control of water quality. CWC section 13200(f) established the San Diego Water Board, which has the primary responsibility for the coordination and control of water quality in the San Diego Region, which includes all the basins draining into the Pacific Ocean between the southern boundary of the Santa Ana Region and the California-Mexico boundary. The San Diego Water Board implements the CWA through Chapter 5.5 of the CWC, commencing with section 13370. CWC section 13377 provides the San Diego Water Board the legal authority to issue waste discharge requirements to ensure compliance with all applicable provisions of the CWA and acts amendatory thereof or supplementary, thereto, to implement water quality control plans, or for the protection of beneficial uses, or to prevent nuisance.

CWA section 402(p) requires the USEPA or authorized state to issue NPDES permits for storm water discharges from municipal separate storm sewer systems (MS4s) to waters of the U.S. CWA section 402(p)(3)(B)(ii) requires that NPDES permits for storm water discharges from MS4s "*effectively prohibit non-storm water discharges*" into the MS4s. CWA section 402(p)(3)(B)(iii) requires that NPDES permits for storm water discharges from MS4s to "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable* [MEP], *including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*."

The USEPA published implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]), which prescribe permit application requirements for storm water discharges from MS4s pursuant to CWA 402(p), on November 16, 1990. The USEPA published an Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems, which provided guidance on permit application requirements for regulated MS4s, on May 17, 1996. The federal regulations in 40 CFR 122 and guidance issued by USEPA serve as the foundation for the provisions of Order No. R9-2013-0001. The legal authorities provided by the above statutes and regulations are included as part of the discussions in Section VIII of this Fact Sheet.

B. Legal Authority for the Permit Issued on a Region-wide Basis

CWA section 402(p)(3)(B) provides the San Diego Water Board the legal authority to issue an NPDES permit for the San Diego Region as compared to separate MS4 permits based upon County- and partial County-wide boundaries as they exist within the San Diego Region. CWA section 402(p)(3)(B) states that "*Permits for discharges from municipal storm sewers- (i) may be issued on a system- or jurisdiction-wide basis ....*" The federal regulations in 40 CFR 122.26(a)(1)(v) also state that the San Diego Water Board "*may designate dischargers from municipal separate storm sewers on a system-wide or jurisdiction-wide basis. In making this determination, the [San Diego Water Board] may consider the following factors: (A) the location of the discharge with respect to waters of the United States; (B) the size of the discharge; (C) the quantity and nature of the pollutants discharged to waters of the United States; and (D) other relevant factors*."

More specifically, the federal regulations provide that for large and medium MS4 systems, the San Diego Water Board may issue a regional permit. Specifically, the federal regulation in 40 CFR 122.26(a)(3) provide:

"*(ii) The Director may either issue one system-wide permit covering all discharges from municipal separate storm sewers within a large or medium municipal storm sewer system or issue distinct permits for appropriate categories of discharges within a large or municipal separate storm sewer system including, but not limited to: all discharges owned or operated by the same municipality; located within the same jurisdiction; all discharges within a system that discharge to the same watershed; discharges within a system that are similar in nature; or for individual discharges from municipal separate storm sewers within the system.*

(iii) The operator of a discharge from a municipal separate storm sewer which is part of a large or medium municipal separate storm sewer system must either: (A) Participate in a permit application (to be a permittee or a co-permittee) with one or more other operator of discharges from the large or medium municipal storm sewer system which covers all, or a portion of all, discharges from the municipal separate storm sewer system; (B) Submit a distinct permit application

which only covers discharges from the municipal separate storm sewers for which the operator is responsible; or (C) A regional authority may be responsible for submitting a permit application under the following guidelines....

(iv) One permit application may be submitted for all or a portion of all municipal separate storm sewers within adjacent or interconnected large or medium municipal separate storm sewer systems. The Director may issue one systemwide permit covering all, or a portion of all municipal separate storm sewers in adjacent or interconnected large or medium municipal separate storm sewer systems.

(v) Permits for all or a portion of all discharges from large or medium municipal separate storm sewer systems that are issued on a system-wide, jurisdiction-wide, watershed or other basis may specify different conditions relating to different discharges covered by the permit, including different management programs for different drainage areas which contribute storm water to the system."

Based on these regulations, the San Diego Water Board may issue a region-wide MS4 permit. The regulations also clarify that the permit may include different conditions for separate discharges covered by the permit. This allows the San Diego Water Board to ensure that suitable water quality conditions and provisions are identified for each watershed.

The USEPA's responses to comments in the Final Rule for the above-mentioned regulations also make it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide, permits. In the Final Rule published in the Federal Register and containing the responses to comments, USEPA notes that 40 CFR 122.26(a)(3)(iv) would allow an entire system in a geographical region under the purview of a State agency to be designated under a permit.[13] USEPA also states that many commenters wanted to allow the permitting authority broad discretion to establish system-wide permits, and that EPA believes that paragraphs 40 CFR 122.26 (a)(1)(v) and (a)(3)(ii) allow for such broad discretion.[14]

This Order creates watershed requirements that apply to multiple counties. The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees. Managing storm water on a regional and watershed basis is expected to result in improved water quality, as the Order focuses on monitoring and management practices necessary to improve each watershed rather than political boundaries. A single permit also allows the San Diego Water Board staff to expend fewer resources developing successive multiple permits and allows more resources to be devoted to working cooperatively with all three current groups of Copermittees to ensure implementation of this Order results in improved water quality.

[13] 55 Federal Register 47990-01, 48042
[14] Ibid

C. Federal and California Endangered Species Acts

This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2115.5) or the Federal Endangered Species Act (16 United States Code [USC] sections 1531 to 1544). This Order requires compliance with requirements to protect the beneficial uses of waters of the U.S. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

D. California Environmental Quality Act

The action to adopt an NPDES Permit is exempt from the provisions of Chapter 3 of the California Environmental Quality Act (CEQA) (Public Resources Code section 21100, et seq.) pursuant to CWC section 13389. (*County of Los Angeles v. Cal. Water Boards* (2006) 143 Cal.App.4th 985.)

E. State and Federal Regulations, Plans and Policies

The legal authority provided by the following regulations, plans, and policies are also included as part of the discussions in Section VIII of this Fact Sheet.

Water Quality Control Plan for the San Diego Basin

The CWA requires the San Diego Water Board to establish water quality standards for each water body in its region. Water quality standards include beneficial uses, water quality objectives and criteria that are established at levels sufficient to protect beneficial uses, and an antidegradation policy to prevent degrading of waters. On September 8, 1994, the San Diego Water Board adopted the *Water Quality Control Plan for the San Diego Basin (*Basin Plan). The Basin Plan designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters in the San Diego Region. The San Diego Water Board has amended the Basin Plan on multiple occasions since 1994. In addition, the Basin Plan implements State Water Board Resolution No. 88-63, which established state policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply. Beneficial uses applicable to the surface water bodies that receive discharges from the MS4s within the San Diego Region generally include those listed below:

The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region:

- Municipal and Domestic Supply (MUN)
- Agricultural Supply (AGR)

- Industrial Process Supply (PROC)
- Industrial Service Supply (IND)
- Ground Water Recharge (GWR)
- Contact Water Recreation (REC1)
- Non-contact Water Recreation (REC2)
- Warm Freshwater Habitat (WARM)
- Cold Freshwater Habitat (COLD)
- Wildlife Habitat (WILD)
- Rare, Threatened, or Endangered Species (RARE)
- Freshwater Replenishment (FRSH)
- Hydropower Generation (POW)
- Preservation of Biological Habitats of Special Significance (BIOL)

The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region:

- Navigation (NAV)
- Commercial and Sport Fishing (COMM)
- Estuarine Habitat (EST)
- Marine Habitat (MAR)
- Aquaculture (AQUA)
- Migration of Aquatic Organisms (MIGR)
- Spawning, Reproduction, and/or Early Development (SPWN)
- Shellfish Harvesting (SHELL)

Pursuant to Water Code sections 13263 and 13377, the requirements of this Order implement the Basin Plan.

Water Quality Control Plan for Ocean Waters of California, California Ocean Plan

In 1972, the State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan). The State Water Board adopted the most recent amended Ocean Plan on September 15, 2009. The Office of Administrative Law approved it on March 10, 2010. On October 8, 2010, USEPA approved the 2009 Ocean Plan. The Ocean Plan is applicable, in its entirety, to ocean waters of the State. In order to protect beneficial uses, the Ocean Plan establishes water quality objectives and a program of implementation. Pursuant to Water Code sections 13263 and 13377, the requirements of this Order implement the Ocean Plan. The Ocean Plan identifies the beneficial uses of ocean waters of the State to be protected as summarized below:

- Industrial water supply
- Water contact and non-contact recreation, including aesthetic enjoyment; navigation
- Commercial and sport fishing

- Mariculture
- Preservation and enhancement of designated Areas of Special Biological Significance
- Rare and endangered species
- Marine habitat
- Fish spawning and shellfish harvesting

On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving an exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges. The State Water Board Resolution No. 2012-0012 requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject terms and conditions of State Water Board Resolution No. 2012-0012. The Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 applicable to these discharges are hereby incorporated in this Order as if fully set forth herein. Requirements of this Order implement the Ocean Plan.

Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality

On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

Antidegradation Policy

Federal regulations (40 CFR 131.12) require that the state water quality standards include an antidegradation policy consistent with the federal antidegradation policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16 ("Statement of Policy with Respect to Maintaining the Quality of the Waters of the State"). State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law.

The San Diego Water Board's Basin Plan implements and incorporates by reference both the State and federal antidegradation policies. State Water Board Resolution No. 68-16 and 40 CFR 131.12 require the San Diego Water Board to maintain high quality

waters of the State until it is demonstrated that any change in quality will be consistent with maximum benefit to the people of the State, will not unreasonably affect beneficial uses, and will not result in water quality less than that described in the San Diego Water Boards' policies. State Water Board Resolution No. 68-16 requires that discharges of waste be regulated to meet best practicable treatment or control to assure that pollution or nuisance will not occur and the highest water quality consistent with the maximum benefit to the people of the State be maintained.

The discharges permitted in this Order are consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Board Resolution No. 68-16. Many of the water bodies within the area covered by this Order are of high quality. The Order requires the Copermittees to meet best practicable treatment or control to meet water quality standards. As required by 40 CFR 122.44(a), the Copermittees must comply with the "maximum extent practicable" technology-based standard set forth in CWA section 402(p) for discharges of pollutants in storm water from the MS4s.

Many of the waters within the area covered by this Order are impaired and listed on the State's CWA Section 303(d) List and the San Diego Water Board has established TMDLs to address the impairments. This Order requires the Copermittees to comply with permit provisions to implement the WLAs set forth in the TMDLs in order to restore the beneficial uses of the impaired water bodies consistent with the assumptions and requirements of the TMDLs. This Order includes requirements to develop and implement storm water management programs, achieve WQBELs, and effectively prohibit non-storm water discharges into the MS4. The issuance of this Order does not authorize an increase in the amount of discharge of waste.

Anti-Backsliding Requirements

CWA sections 402(o) and 303(d)(4) and 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations or conditions may be relaxed. All effluent limitations and other conditions in this Order are at least as stringent as the effluent limitations in the previous permits issued to the San Diego County Copermittees, the Orange County Copermittees and the Riverside County Copermittees.

Clean Water Act Section 303(d) List

CWA section 303(d)(1) requires each State to identify specific water bodies within its boundaries where water quality standards are not being met or are not expected to be met after implementation of technology-based effluent limitations on point sources. Water bodies that do not meet water quality standards are considered impaired and are placed on the state's "303(d) List." Periodically, USEPA approves the State's 303(d) List.

Most recently, USEPA approved the State's 2010 303(d) List of impaired water bodies on October 11, 2011, which includes certain receiving waters in the San Diego Region. For each listed water body, the state or USEPA is required to establish a TMDL of each pollutant impairing the water quality standards in that water body. A TMDL is a tool for implementing water quality standards and is based on the relationship between pollution sources and in-stream water quality conditions. The TMDL establishes the allowable pollutant loadings for a water body and thereby provides the basis to establish water quality-based controls. These controls should provide the pollution reduction necessary for a water body to meet water quality standards.

A TMDL is the sum of the allowable pollutant loads of a single pollutant from all contributing point sources (the waste load allocations or WLAs) and non-point sources (load allocations of LAs) plus the contribution from background sources and a margin of safety (40 CFR 130.2(i)). MS4 discharges are considered point source discharges. For 303(d)-listed water bodies and pollutants in the San Diego Region, the San Diego Water Board or USEPA develops and adopts TMDLs that specify these requirements.

Since 2002, the San Diego Water Board has established six (6) TMDLs to remedy water quality impairments in various water bodies within the San Diego Region (see Attachment E to the Order). These TMDLs identify MS4 discharges as a source of pollutants to these water bodies, and, as required, establish WLAs for MS4 discharges to reduce the amount of pollutant discharged to receiving waters. CWA section 402(p)(3)(B)(iii) requires the San Diego Water Board to impose permit conditions, including: "management practices, control techniques and system, design and engineering methods, and *such other provisions as the Administrator or the State determines appropriate for the control of such pollutants."* (Emphasis added.) CWA section 402(a)(1) also requires states to issue permits with conditions necessary to carry out the provisions of the CWA. Federal regulations also require that NDPES permits contain WQBELs consistent with the assumptions and requirements of all available WLAs (40 CFR 122.44(d)(1)(vii)(B)). CWC section 13377 also requires that NPDES permits include limitations necessary to implement water quality control plans. Therefore, this Order includes WQBELs and other provisions to implement the TMDL WLAs assigned to Copermittees regulated by this Order.

<u>Other Regulations, Plans and Policies</u>

This Order implements all other applicable federal regulations and State regulations, plans and policies, including the California Toxics Rule at 40 CFR 131.38 (Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California Rule [California Toxics Rule or CTR]), and State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP).

F. Unfunded State Mandates

Article XIII B, Section 6(a) of the California Constitution provides that whenever "*any state agency mandates a new program or higher level of service on any local government, the state shall provide a subvention of funds to reimburse that local government for the costs of the program or increased level of service*." The requirements of this Order do not constitute state mandates that are subject to a subvention of funds for several reasons, including, but not limited to, the following.

First, the requirements of this Order do not constitute a new program or a higher level of service as compared to the requirements contained in the previous Fourth Term Permits. The overarching requirement to impose controls to reduce the pollutants in discharges from MS4s is dictated by the CWA and is not new to this permit cycle (33 USC section 1342(p)(3)(B)). The inclusion of new and advanced measures as the MS4 programs evolve and mature over time is anticipated under the CWA (55 FR 47990, 48052 (Nov. 16, 1990)), and to the extent requirements in this Order are interpreted as new advanced measures, they do not constitute a new program or higher level of service.

Second, and more broadly, mandates imposed by federal law, rather than by a state agency, are exempt from the requirement that the local agency's expenditures be reimbursed (Cal. Const., art. XIII B, section 9, subd. (b)). This Order implements federally mandated requirements under the CWA and its requirements are therefore not subject to subvention of funds. This includes federal requirements to effectively prohibit non-storm water discharges, to reduce the discharge of pollutants in storm water to the MEP, and to include such other provisions as the Administrator or the State determines appropriate for the control of such pollutants (33 USC section 1342(p)(3)(B)). Federal cases have held these provisions require the development of permits and permit provisions on a case-by-case basis to satisfy federal requirements. (*Natural Resources Defense Council, Inc., v. USEPA* (9th Cir. 1992) 966 F.2d 1292, 1308, fn. 17.)

The authority exercised under this Order is not reserved state authority under the CWA's savings clause (cf. *Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 627-628 [relying on 33 USC section 1370, which allows a state to develop requirements which are not "less stringent" than federal requirements]), but instead is part of a federal mandate to develop pollutant reduction requirements for municipal separate storm sewer systems. To this extent, it is entirely federal authority that forms the legal basis to establish the permit provisions. (See, *City of Rancho Cucamonga v. Regional Water Quality Control Board, Santa Ana Region* (2006) 135 Cal.App.4th 1377, 1389; *Building Industry Ass'n of San Diego Co. v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 882-883.)

The MEP standard is a flexible standard that balances a number of considerations, including technical feasibility, cost, public acceptance, regulatory compliance, and effectiveness. (*Building Ind. Ass'n., supra,* 124 Cal.App.4th at pp. 873-874, 889.) Such considerations change over time with advances in technology and with experience

gained in storm water management (55 FR 47990, 48052 (Nov. 16, 1990)). Accordingly, a determination of whether the conditions contained in this Order exceed the requirements of federal law cannot be based on a point by point comparison of the permit conditions and the minimum control measures that are required "at a minimum" to reduce pollutants to the maximum extent practicable and to protect water quality (40 CFR 122.34). Rather, the appropriate focus is whether the permit conditions, as a whole, exceed the MEP standard.

In recent months, the County of Los Angeles and County of Sacramento Superior Courts have granted writs setting aside decisions of the Commission on State Mandates that held certain requirements in Phase I permits constituted unfunded mandates. In both cases, the courts have found that the correct analysis in determining whether an MS4 permit constituted a state mandate was to evaluate whether the permit as a whole exceeds the MEP standard. (*State of Cal. v. Comm. on State Mandates* (Super. Ct. Sacramento County, 2012, No. 34-2010-80000604), *State of California v. County of Los Angeles* (Super. Ct. Los Angeles County, 2011, No. BS130730.) Both cases are currently pending appeal.

The requirements of the Order, taken as a whole rather than individually, are necessary to reduce the discharge of pollutants to the MEP and to protect water quality. The San Diego Water Board finds that the requirements of the Order are practicable, do not exceed federal law, and thus do not constitute an unfunded mandate. These findings are the expert conclusions of the principal state agency charged with implementing the NPDES program in California (CWC sections 13001, 13370).

It should also be noted that the provisions in this Order to effectively prohibit non-storm water discharges are also mandated by the CWA (33 USC section 1342(p)(3)(B)(ii)). Likewise, the provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state establishes or adopts a TMDL, federal law requires that permits must contain effluent limitations consistent with the assumptions and requirements of any applicable waste load allocation in a TMDL (40 CFR 122.44(d)(1)(vii)(B)).

Third, the local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental dischargers who are issued NPDES permits for storm water discharges. With a few inapplicable exceptions, the CWA regulates the discharge of pollutants from point sources (33 USC section 1342) and the Porter-Cologne Act regulates the discharge of waste (CWC section 13263), both without regard to the source of the pollutant or waste. As a result, the "costs incurred by local agencies" to protect water quality reflect an overarching regulatory scheme that places similar requirements on governmental and non-governmental dischargers. (See *County of Los Angeles v. State of California* (1987) 43 Cal.3d 46, 57-58 [finding comprehensive workers' compensation scheme did not create a cost for local agencies that was subject to state subvention].)

The CWA and the Porter-Cologne Act largely regulate storm water with an even hand, but to the extent there is any relaxation of this even-handed regulation, it is in favor of the local agencies. Generally, the CWA requires point source dischargers, including dischargers of storm water associated with industrial or construction activity, to comply strictly with water quality standards (33 USC section 1311(b)(1)(C); *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159, 1164-1165 [noting that industrial discharges must strictly comply with water quality standards]). As discussed in prior State Water Board decisions, certain provisions of this Order do not require strict compliance with water quality standards (State Water Board Order No. WQ 2001-0015, p. 7). Those provisions of this Order regulate the discharge of waste in municipal storm water under the CWA's MEP standard, not the BAT/BCT standard that applies to other types of discharges. These provisions, therefore, regulate the discharge of waste in municipal storm water more leniently than the discharge of waste from non-governmental sources.

Fourth, the Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)). To the extent that the local agency Copermittees have voluntarily availed themselves of the permit, the program is not a state mandate. (Accord, *County of San Diego v. State of California* (1997) 15 Cal.4th 68, 107-108.)

Fifth, the local agency Copermittees' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under state law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

Finally, even if any of the permit provisions could be considered unfunded mandates, under Government Code section 17556, subdivision (d), a state mandate is not subject to reimbursement if the local agency has the authority to charge a fee. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order, subject to certain voting requirements contained in the California Constitution. (See Cal. Const., Art. XIII D, section 6, subd. (c); see also *Howard Jarvis Taxpayers Ass'n v. City of Salinas* (2002) 98 Cal.App.4th 1351, 1358-1359.) The Fact Sheet demonstrates that numerous activities contribute to the pollutant loading in the MS4. Local agencies can levy service charges, fees, or assessments on these activities, independent of real property ownership. (See, e.g., *Apartment Ass'n of Los Angeles County, Inc., v. City of Los Angeles* (2001(24 Cal.4th 830, 842 [upholding inspection fees associated with renting property].) The authority and ability of a local agency to defray the cost of a program without raising taxes indicates that a program does not entail a cost subject to subvention. (*Clovis Unified School Dist. V. Chiang* (2010) 188 Cal.App.4th 794, 812, citing *Connell v. Sup. Ct.* (1997) 59 Cal.App.4th 382, 401; *County of Fresno v. State of California* (1991) 53 Cal. 3d. 482, 487-488.)

VIII. PROVISIONS

The provisions (i.e. NPDES permit requirements) of the Order are discussed below.

A. Prohibitions and Limitations

Purpose: Provision A includes the prohibitions and limitations requirements that are the foundation of all the subsequent requirements included in the Order. Compliance with the prohibitions and limitations will restore and protect receiving waters from impacts that may be caused by discharges into and from the Copermittees' MS4s and ultimately achieve the objective of the CWA.

In meeting the requirements set forth in the Order, the Copermittees must be cognizant that the prohibitions and limitations exist and will be the standard by which the San Diego Water Board will be measuring the progress and success of their implementation of the NPDES permit requirements.

***Discussion*:** The objective of the CWA is to "*restore and maintain the chemical, physical, and biological integrity of the Nation's waters*." The CWA requires the implementation of NPDES permit programs to regulate discharges of pollutants and dredged or fill material to the navigable waters of the U.S. For discharges into and from MS4s, the CWA requires the NPDES permits to "*effectively prohibit non-stormwater discharges into the storm sewers*" and "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable.*"

Provision A includes limitations, consistent with the requirements of the CWA for discharges from MS4s. Provision A expresses these limitations as discharge prohibitions, receiving water limitations, and effluent limitations. Compliance with the discharge prohibitions and receiving water limitations is also explicitly described, in conformance with precedential State Water Board Orders.

More specific and detailed discussions of the requirements of Provision A are provided below.

Provision A.1 (Discharge Prohibitions) prohibits the discharge of specific types of waste into and/or from the Copermittees' MS4s.

Provision A.1.a restates and reiterates Basin Plan Waste Discharge Prohibition 1, by prohibiting discharges into and from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the

state. The terms pollution,[15] contamination,[16] and nuisance[17] are defined under CWC 13050. Provision A.1.c incorporates all the waste discharge prohibitions of the Basin Plan into the requirements of the Order. The waste discharge prohibitions from the Basin Plan have been reproduced and provided in Attachment A to the Order.

Provision A.1.b requires non-storm water discharges into the MS4s to be effectively prohibited, consistent with the requirements of the CWA for MS4 permits to "*effectively prohibit non-stormwater discharges into the storm sewers*." The effective prohibition is required to be implemented by each Copermittee within its jurisdiction through the illicit discharge detection and elimination requirements under Provision E.2. The prohibition does not apply to NPDES permitted discharges into the Copermittees' MS4s.

The CWA employs the strategy of prohibiting the discharge of any pollutant from a point source into waters of the United States unless the discharger of the pollutant(s) obtains an NPDES permit pursuant to CWA Section 402. The 1987 amendment to the CWA includes provision 402(p) that specifically addresses NPDES permitting requirements for storm water discharges from MS4s. CWA section 402(p) prohibits the discharge of pollutants from specified MS4s to waters of the U.S. except as authorized by an NPDES permit and identifies two substantive standards for MS4 storm water permits. MS4 permits (1) "*shall include a requirement to effectively prohibit nonstormwater discharges into the storm sewers*" and (2) "*shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or State determines appropriate for the control of such pollutants*." (CWA section 402(p)(3)(B)(ii-iii).)

In November 1990, the USEPA published regulations addressing storm water discharges from MS4s (55 FR 47990 and following (Nov. 16, 1990) (Phase I Final Rule)). The regulations establish minimum requirements for MS4 permits, and generally focus on the requirement that MS4s implement programs to reduce the amount of pollutants found in storm water discharges to the MEP. The CWA's municipal storm water MEP standard does not require storm water discharges to strictly meet water quality standards, as is required for other NPDES permitted discharges. Compliance is achieved through an iterative approach of continuous

[15] CWC 13050(l): "(1) 'Pollution' means an alteration of the quality of waters of the state by waste to a degree which unreasonably affects either of the following: (A) The water for beneficial uses. (B) Facilities which serve beneficial uses. (2) 'Pollution' may include "contamination.

[16] CWC 13050(k): "Contamination' means an impairment of the quality of waters of the state by waste to a degree which creates a hazard to public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste, whether or not waters of the state are affected."

[17] CWC 13050(m): "Nuisance' means anything which meets all of the following requirements: (1) Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. (2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. (3) Occurs during, or as a result of, the treatment or disposal of wastes."

implementation of improved BMPs. This distinction reflects Congress's recognition that variability in flow and intensity of storm events render difficult strict compliance with water quality standards by MS4 permittees. In describing the controls that permits must include to reduce pollutants in storm water discharges to the MEP, the statute (CWA section 402(p)(3)(B)(iii)) states that the controls shall include: "*management practices, control techniques and system, design and engineering methods, and such other provisions as the [permit writer] determines appropriate for the control of such pollutants*."

In contrast, non-storm water discharges from the MS4 that are not authorized by separate NPDES permits are subject to requirements under the NPDES program, including discharge prohibitions, technology based effluent limitations and water quality-based effluent limitations (40 CFR 122.44). The regulations also require the Copermittee's program to include an element to detect and remove illicit discharges and improper disposal into the storm sewer (40 CFR 122.26(d)(2)(iv)(B)).

While "non-storm water" is not defined in the CWA or federal regulations, the federal regulations (at 40 CFR 122.26(b)(2)) define "*illicit discharge*" as *"any discharge to a municipal separate storm sewer that is not composed entirely of storm water and that is not covered by an NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer and discharges resulting from fire fighting activities)*." This definition is the most closely applicable definition of "non-storm water" contained in federal law. As stated in the Phase I Final Rule, USEPA added the illicit discharge program requirement to begin implementation of the 'effective prohibition' requirement to detect and control non-storm water discharges to their municipal system.

Thus, federal law mandates that permits issued to MS4s must require management practices that will result in reducing storm water pollutants to the MEP yet at the same time requires that non-storm water discharges be effectively prohibited from entering the MS4. "Effectively" prohibit does not mean that non-storm water discharges are authorized to be discharged into and from the Copermittees' MS4s. The Phase I Final Rule clarifies what "effectively prohibit" means (55 FR 47995):

> "*Section 402(p)(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…<u>Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit</u> (other than the permit for the discharge from the municipal separate storm sewer)*" [Emphasis added].

Consistent with federal law, unless non-storm water discharges to the MS4 are authorized by a separate NPDES permit, non-storm water discharges are appropriately subject to the effective prohibition requirement in the CWA and Regional

Water Boards are not limited by the iterative MEP approach to storm water regulation in crafting appropriate regulations for non-storm water discharges.

The federal regulations (40CFR122.26(d)(2)(i)(B)) require the Copermittees to establish the legal authority which authorizes or enables the Copermittees to prohibit illicit discharges to the MS4s. The federal regulations (40 CFR 122.26(d)(2)(vi)(B)(1)) require the Copermittees to "*implement and enforce an ordinance, order or similar means*" to prevent non-storm water discharges to their MS4s. Thus, the Copermittees are required to "*effectively*" prohibit non-storm water discharges to their MS4s through enforcing their legal authority established under "*ordinance, order or similar means*" and either remove those discharges to their MS4s, or require those discharges to obtain coverage under a separate NPDES permit. More detail about the program that must be implemented to "*effectively*" prohibit non-storm water discharges to the Copermittees' MS4s is provided under the discussion for Provision E.2.

Provision A.1.d was included to be consistent Resolution No. 2012-0012, adopted by the State Water Board on March 20, 2012. Provision A.1.d prohibits discharges from MS4s to Areas of Special Biological Significance (ASBS), except for storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach to the Heisler Park ASBS subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012. The pertinent Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 are provided in Attachment A to the Order.

Provision A.2 (Receiving Water Limitations) specifies the condition of the receiving waters that must be achieved when there are discharges from the Copermittees' MS4s. Receiving water limitations are included in all NPDES permits issued pursuant to the CWA section 402. CWA section 402(p)(3)(B)(iii) authorizes the inclusion of "*such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." This requirement gives USEPA or the State permitting authority, in this case the San Diego Water Board, discretion to determine what permit conditions are necessary to control pollutants.

In its Phase I Final Rule (see 55 FR 47990, 47994 (Nov. 16, 1990)), USEPA elaborated on these requirements, stating that, "*permits for discharges from municipal separate storm sewer systems must require controls to reduce the discharge of pollutants to the maximum extent practicable, and where necessary water quality-based controls*." USEPA reiterated in its Phase II Final Rule (64 FR 68722, 68737), that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL*." CWC section 13377 also requires that NPDES permits include limitations necessary to implement water quality control plans. Both the State Water Board and the San Diego Water Board have previously concluded that discharges from the MS4 contain pollutants that have the reasonable potential to cause or contribute to excursions above water quality

standards. As such, inclusion of receiving water limitations is appropriate to control MS4 discharges.

The inclusion of receiving water limitations is also consistent with the Ninth Circuit Court of Appeals' ruling in *Defenders of Wildlife v. Browner* (191 F.3d 1159, 1166 (1999)) that the permitting authority has discretion regarding the nature and timing of requirements that it includes as MS4 permit conditions to attain water quality standards. The Ninth Circuit Court of Appeals recently explained that, "*[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*" (*Natural Resources Defense Council v. County of Los Angeles* (9th Cir. 2011) 673 F.3d 880, 886 (revd. On other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013)))

The receiving water limitations included in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan or in water quality control plans or policies adopted by the State Water Board, including State Water Board Resolution No. 68-16, or in federal regulations, including but not limited to 40 CFR 131.12 and 131.38. The water quality objectives in the Basin Plan and other State Water Board plans and policies have been approved by USEPA and combined with designated beneficial uses constitute the water quality standards required under federal law.

Provision A.2.a requires that discharges from the Copermittees' MS4s must not cause or contribute to the violation of water quality standards in receiving waters. The water quality standards of the receiving waters must be protected from the impacts that may be caused by the Copermittees' MS4 discharges. Water quality standards applicable to the surface waters in the San Diego Region must be achieved through meeting the technology based standard of MEP through an iterative process of improved management actions. Provision A.2.a is also consistent with State Water Board Order WQ 99-05 precedent-setting language requiring discharges from MS4s to attain receiving water quality standards. The water quality control plans and policies with water quality standards applicable to the waters in the San Diego Region are included under Provision A.2.a.

Provisions A.2.b was included to be consistent with the requirements of State Water Board Resolution No. 2012-0012, adopted on March 20, 2012.

<u>Provision A.3 (Effluent Limitations)</u> specifies the condition of the discharges from the Copermittees' MS4s that must be achieved if and when there are discharges.

Consistent with CWA section 301(b)(1)(A) and 40 CFR 122.44(a), Provision A.3.a includes the technology-based effluent limitations that must be included in the Order.

The technology-based effluent limits, representing the minimum level of control that must be imposed in a permit under CWA section 402, requires that pollutants in discharges of storm water from the Copermittees' MS4s be reduced to the MEP. This provision applies specifically to storm water discharges. Non-storm water discharges must be effectively prohibited, as required under Provision A.1.b. Non-storm water (dry weather) discharges from the MS4 are not considered storm water (wet weather) discharges and therefore are not subject to the MEP standard.

The technology-based MEP standard is an ever-evolving, flexible, and advancing concept. Neither Congress nor USEPA has specifically defined the term "maximum extent practicable." Congress established this flexible MEP standard so that the administrative bodies would have "*the tools to meet the fundamental goals of the Clean Water Act in the context of storm water pollution*." (*Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 884.) As knowledge about controlling storm water runoff and discharges continues to evolve, so does the knowledge which constitutes MEP. Reducing the discharge of pollutants in storm water from the MS4 to the MEP requires the Copermittees to assess each program component and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP.

The San Diego Water Board or the State Water Board ultimately define MEP, and may include requirements that provide specific guidance on what is expected to demonstrate MEP. It is the responsibility of the Copermittees to propose actions that implement BMPs to reduce storm water pollution to the MEP. In other words, the Copermittees' runoff management programs developed and implemented under the Order are the Copermittees' proposals for achieving MEP. Their total collective and individual activities conducted pursuant to their runoff management programs become their proposal for achieving MEP as it applies both to their overall effort, as well as to specific activities. Provisions B through E of the Order provides a minimum framework to guide the Copermittees in achieving the MEP standard for discharges of pollutants in storm water.

Provision A.3.b incorporates any water quality based effluent limitations (WQBELs) applicable to the MS4s established for TMDLs adopted and approved for the San Diego Region and requires the Copermittees to comply with those WQBELs. This is consistent with 40 CFR 122.44(d)(1)(vii)(B), which requires that NPDES permits to incorporate WQBELs "*developed to protect a narrative water quality criterion, a numeric water quality criterion, or both…consistent with the assumptions and requirements of any available wasteload allocation for the discharge...*"

Pursuant to CWA section 303(d), for surface water bodies identified as impaired by one or more pollutants, the San Diego Water Board is required to establish TMDLs "*at a level necessary to implement the applicable water quality standards with seasonal variations and a margin of safety which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality*." The

TMDLs identify sources of the pollutants causing the impairments and assign portions of the TMDL as WLAs to point sources, which include MS4s.

WLAs must be expressed in NPDES permits as WQBELs, which may include one or more numeric components such as numeric effluent limits, and/or receiving water limitations, and/or BMP requirements. Because numeric targets for TMDLs typically include a component that will be protective of water quality standards, a TMDL will likely include one or more numeric receiving water limitations and/or effluent limitations as part of the assumptions or requirements of the TMDL. Any numeric receiving water limitations and/or effluent limitations developed as part of the assumptions or requirements of a TMDL must be incorporated and included as part of WQBELs for the MS4s.

Because the development and approval of new TMDLs, or modification of existing TMDLs, may occur during the term of this Order, the specific provisions of those TMDLs, including effluent limitations applicable to MS4s are provided within Attachment E to the Order. Attachment E will be updated with new TMDLs and modifications to existing TMDLs in a timely manner as they occur.

Provision A.4 (Compliance with Discharge Prohibitions and Receiving Water Limitations) describes the process required to be implemented by the Copermittees if compliance with the discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a are not being achieved under current conditions.

In its Phase II Stormwater Regulations, Final Rule, USEPA states that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL.*"[18] In a series of comment letters on MS4 permits issued by various Regional Water Boards, USEPA has also reiterated that MS4 discharges must meet water quality standards.[19] In addition, the Ninth Circuit Court of Appeals explained in a recent ruling that, *"[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*"[20]

[18] Phase II Stormwater Regulations, Final Rule, 64 Fed. Reg. 68722, 68737.
[19] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.
[20] NRDC v. County of Los Angeles (9th Cir. 2011), 673 F.3d 880, 886 (revd. on other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013))). See also, *Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 884-886, citing *Defenders of Wildlife v. Browning,* (9th Cir. 1999) 191 F.3d 1159.)

Water quality standards for the San Diego Region are established in the Basin Plan. The water quality standards of the Basin Plan are incorporated into this Order as the discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a. The discharge prohibitions and receiving water limitations in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations or prohibitions to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan, water quality control plans or policies adopted by the State Water Board, including Resolution No. 68-16, or federal regulations, including but not limited to, 40 CFR 131.12 and 131.38. The waste discharge prohibitions and water quality objectives in the Basin Plan have been approved by USEPA and combined with the designated beneficial uses constitute the water quality standards required under federal law.

Under federal law (CWA section 402(p)(3)(B)(iii)), an MS4 permit must include "*controls to reduce the discharge of pollutants to the maximum extent practicable...and such other provision as...the State determines appropriate for control of such pollutants*." The State Water Board has previously determined that limitations necessary to meet water quality standards are appropriate for the control of pollutants discharged by MS4s and must be included in MS4 permits. (State Water Board Orders WQ 91-03, 98-01, 99-05, 2001-15; see also *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159.) This Order prohibits discharges that cause or contribute to violations of water quality standards.

The discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a are included in this Order to ensure that discharges from the MS4s do not cause or contribute to exceedances of water quality objectives necessary to protect the beneficial uses of the receiving waters.

Provision A.4 is consistent with the precedent-setting language in State Water Board Order WQ 99-05 required to be included in municipal storm water permits. State Water Board Order WQ 2001-15 refined Order WQ 99-05 by requiring an iterative approach to compliance with water quality standards involving ongoing assessments and revisions, as referred to as the "iterative process." The "iterative process" is a fundamental NPDES requirement for municipal storm water permits to achieve the objectives of the CWA.

The State Water Board and Regional Water Boards have stated that the provisions under Provisions A.1.a, A.1.c, A.2.a, and A.4 are independently applicable, meaning that compliance with one provision does not provide a "safe harbor" where there is non-compliance with another provision (i.e., compliance with the Provision A.4 does not shield a Copermittee who may have violated Provision A.1.a, A.1.c, or A.2.a from an enforcement action). The intent of Provision A.4 is to ensure that the Copermittees have the necessary storm water management programs and controls in place, and that they are modified by the Copermittees in a timely fashion when necessary, so that compliance with Provisions A.1.a, A.1.c, and/or A.2.a is achieved as soon as possible. USEPA expressed the importance of this independent applicability in a series of

comment letters on MS4 permits proposed by various Regional Water Boards. At that time, USEPA expressly objected to certain MS4 permits that included language stating, *"permittees will not be in violation of this [receiving water limitation] provision … [if certain steps are taken to evaluate and improve the effectiveness of the jurisdictional runoff management programs],"* concluding that this phrase would not comply with the CWA.[21]

The Ninth Circuit held in *Natural Resources Defense Council v. County of Los Angeles* (2011) 673 F3d. 880, 886 (revd. on other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013))) that engagement in the iterative process does not provide a safe harbor from liability for violations of permit terms prohibiting exceedances of water quality standards. The Ninth Circuit holding is consistent with the position of the State and Regional Water Boards that exceedances of water quality standards in an MS4 permit constitute violations of permit terms subject to enforcement by the Water Boards or through a citizen suit. While the Water Boards have generally directed dischargers to achieve compliance by improving control measures through the iterative process, the San Diego Water Board retains the discretion to take other appropriate enforcement and the iterative process does not shield dischargers from citizen suits under the CWA.

The requirements of Provision A.4, therefore, are required to be implemented until the water quality standards expressed under Provisions A.1.a, A.1.c, and A.2.a are achieved. The CWA requires MS4 permits to "*require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." The requirements of this Order have been deemed or determined to be "appropriate" to achieve water quality standards in receiving waters.

Part of the "*controls*" required by the Order is the process described in Provision A.4. Provision A.4 includes the process that is ultimately expected to achieve compliance with the requirement that discharges from the MS4 do not cause or contribute to violations of water quality standards in the receiving waters. The implementation of Provision A.4 is required when the Copermittees or the San Diego Water Board have determined that discharges from the MS4 are causing or contributing to violations of water quality standards in the receiving waters.

The Copermittees must effectively prohibit non-storm water discharges into the MS4s, reduce the discharge of pollutants in storm water from the MS4s to the MEP, and ensure that their MS4 discharges do not cause or contribute to violations of water quality standards. If the Copermittees have effectively prohibited non-storm water

[21] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.

discharges and reduced storm water pollutant discharges to the MEP, but their discharges are still causing or contributing to violations of water quality standards, Provision A.4 provides a clear "iterative process" for the Copermittees to follow.

Provision A.4 essentially requires the Copermittees to implement additional BMPs until MS4 discharges no longer cause or contribute to a violation of water quality standards.

In assessing compliance and potential enforcement actions, the San Diego Water Board looks at the Copermittees' efforts in total to meet the requirements of Provisions A.1.a, A.1.c, A.2.a and Provision A.4. The Copermittees need to demonstrate that they are making improvements to their programs and making progress toward achieving the discharge prohibitions and receiving water limitations in Provisions A.1.a, A.1.c, and A.2.a by implementing the requirements of Provision A.4. The San Diego Water Board would consider these efforts prior to strictly enforcing the requirements of Provisions A.1.a, A.1.c, and A.2.a. Causes of exceedances of the receiving water limitations can often be more difficult to identify and attribute solely to the Copermittees' MS4s. The intent of the Order is to provide the Copermittees more clarity and flexibility in addressing these exceedances through the iterative approach and adaptive management process until the requirements under Provisions A.1.a, A.1.c, and A.2.a are fully achieved.

An exception to the iterative approach and adaptive management process would be in receiving waters subject to adopted and approved TMDLs. For TMDLs that are incorporated into the Order, there is a specific date for compliance to be achieved, after which the iterative approach and adaptive management process required under Provision A.4 no longer provides the flexibility to achieve compliance. Where compliance dates for a TMDL have passed, compliance with the WQBELs incorporated into the Order established by a TMDL in Attachment E to protect water quality standards is required. Thus, after the interim or final compliance dates for a TMDL have passed, if the discharges from the Copermittees' MS4s are causing or contributing to a violation of WQBELs, exceedances of WQBELs must be strictly enforced by the San Diego Water Board. In the meantime, however, the Copermittees are in compliance with the interim or final TMDL requirements in Attachment E as long as the interim or final WQBELs are being achieved in accordance with the interim or final compliance dates.

B. Water Quality Improvement Plans

Purpose: Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges to the MS4s and control pollutants in storm water discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the Clean Water Act.

Provision B includes requirements for the Copermittees to develop and implement Water Quality Improvement Plans to ultimately comply with the prohibitions and limitations under Provision A. The Water Quality Improvement Plans will provide the Copermittees a comprehensive program that can achieve the requirements and further the objectives of the CWA. Implementation of the Water Quality Improvement Plans will also improve the quality of the receiving waters in the San Diego Region.

The Water Quality Improvement Plan is the backbone of the Regional MS4 Permit requirements. Provision B provides the guidance, criteria, and minimum expectations and requirements for the elements of the Water Quality Improvement Plan to be developed and implemented by the Copermittees. The Water Quality Improvement Plans will be implemented in the Watershed Management Area by the Copermittees within their jurisdictions through their jurisdictional runoff management programs.

The Water Quality Improvement Plan also incorporates a program to monitor and assess the progress of the Copermittees' jurisdictional runoff management programs toward improving the quality of discharges from the MS4s, as well as tracking improvements to the quality of receiving waters. A process to adapt and improve the effectiveness of the Water Quality Improvement Plans has also been incorporated into the requirements of Provision B to be consistent with the "iterative approach" required to achieve compliance with discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a, pursuant to the requirements of Provision A.4.

The Water Quality Improvement Plans have also been structured to incorporate the requirements of any TMDLs that have been adopted for the San Diego Region. Incorporating the requirements of the TMDLs into the requirements of Provision B allows the Copermittees to develop a single plan, instead of separate plans, to coordinate their non-storm water and storm water runoff management programs. The Water Quality Improvement Plans allow the Copermittees to meet the requirements of this Order, as well as fulfill the requirements of the TMDLs.

As an added benefit, if the Copermittees demonstrate that impaired water bodies within the Watershed Management Area listed on the 303(d) List will be addressed with their Water Quality Improvement Plans in a reasonable period of time, the San Diego Water Board may be able to remove the water bodies from the 303(d) List, which would greatly reduce the need for the San Diego Water Board to develop additional TMDLs that would have to be incorporated into the Order and implemented by the Copermittees.

***Discussion*:** The federal NPDES regulations require the Copermittees to develop a proposed management program (40 CFR 122.26(d)(2)(iv)). The proposed management program must include "*a comprehensive planning process*" and "*where necessary intergovernmental coordination*" for the "*duration of the permit.*" The Water Quality Improvement Plan is the Copermittees' "*comprehensive planning process*" document for the proposed management program that will be implemented within a Watershed Management Area. Implementation of the Water Quality Improvement Plan requires "*intergovernmental coordination*" among the Copermittees for at least the "*duration of the permit*," and likely into and beyond the next iteration of the permit.

Developing Water Quality Improvement Plans based upon watersheds is consistent with federal regulations that support the development of permit conditions, as well as implementation of storm water management programs, at a watershed scale (40 CFR 122.26(a)(3)(ii), 122.26(a)(3)(v), and 122.26(d)(2)(iv)). In 2003, USEPA issued a Watershed-Based NPDES Permitting Policy Statement (USEPA, 2003) that defines watershed-based permitting as an approach that produces NPDES permits that are issued to point sources on a geographic or watershed basis. In this policy statement, USEPA explains that "*[t]he utility of this tool relies heavily on a detailed, integrated, and inclusive watershed planning process*." USEPA identifies a number of important benefits of watershed permitting, including more environmentally effective results, the ability to emphasize measuring the effectiveness of targeted actions on improvements in water quality, reduced cost of improving the quality of the nation's waters and more effective implementation of watershed plans, including TMDLs, among others.

An emphasis on watersheds is appropriate at this stage in the San Diego Region's MS4 program to shift the focus to more targeted, water quality driven planning and implementation. Addressing discharges on a watershed scale focuses on water quality results by emphasizing the receiving waters in the watershed. The conditions of the receiving waters drive management actions, which in turn focus measures to address pollutant contributions from MS4 discharges.

The Water Quality Improvement Plan gives the Copermittees the responsibility of developing a comprehensive plan to coordinate the efforts of their jurisdictional runoff management programs for addressing the problems related to MS4 discharges causing impacts to water quality in the Watershed Management Area. The development of the plan provides the Copermittees the opportunity to provide significant input on how to implement their jurisdictional runoff management programs, and how to best utilize their available resources in addressing a focused set of

priorities that they believe will result in measureable improvements to water quality within the Watershed Management Area.

The Copermittees are encouraged to separate the Watershed Management Area into subwatersheds, as appropriate. This allows the Copermittees to identify priorities applicable to a subset of the Copermittees or specific water bodies or areas within the Watershed Management Area.

Included in the requirements for the elements to be included in the Water Quality Improvement Plan are monitoring and assessment requirements that are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order. In addition to the federal requirements of the CWA section 308(a) and 40 CFR 122.26(d), the San Diego Water Board has the authority to establish monitoring, reporting, and recordkeeping requirements for NPDES permits under CWC 13383.

More specific and detailed discussions of the requirements of Provision B are provided below.

Provision B.1 (Watershed Management Areas) requires the Copermittees to develop a Water Quality Improvement Plan for each of the Watershed Management Areas defined by the San Diego Water Board.

Pursuant to 40 CFR 122.26(d)(2)(iv), proposed management programs "*may impose controls on a…watershed basis…*" The Water Quality Improvement Plan is the Copermittees' proposed management program. A Water Quality Improvement Plan must be developed for each Watershed Management Area identified in the Order.

The Watershed Management Areas are identified in Table B-1. Table B-1 establishes ten (10) Watershed Management Areas, and identifies the Copermittees that are responsible for developing and implementing the Water Quality Improvement Plan for each Watershed Management Area.

The Copermittees from each of the three counties within the San Diego Region are expected to be phased in as their respective NPDES municipal storm water permits expire. Because Order No. R9-2007-0001 expired in January 2012, the San Diego County Copermittees are covered under the Regional MS4 Permit on the effective date of the Order.

After San Diego Water Board receives and considers the Reports of Waste Discharge required to be submitted by the Orange County Copermittees and Riverside County Copermittees pursuant to the requirements of their current permits, and make any necessary changes to the Order, the Orange County Copermittees and Riverside County Copermittees will be covered under the Regional MS4 Permit after Order No. R9-2009-0002 expires in November 2014, and Order No. R9-2010-0016 expires in December 2015, respectively.

The Orange County Copermittees and Riverside County Copermittees also have the option to obtain coverage under the Regional MS4 Permit earlier than their respective permit expiration dates. The process to apply for early coverage is described Provision F.6.

Because the Santa Margarita River Watershed Management Area includes Copermittees from both San Diego County and Riverside County, a footnote to Table B-1 has been included to specify that the requirements of Provision B are not required to be implemented by the County of San Diego until the Riverside County Copermittees have received a notice of coverage under the Order. Until the Riverside County Copermittees are notified of coverage under the Order, the County of San Diego is subject to the prohibitions and limitations under Provision A, responsible for continuing to implement its existing jurisdictional runoff management program, and responsible for implementing the transitional monitoring and assessment requirements of Provision D, the transitional annual reporting requirements of Provision F.3.b, and the TMDL requirements of Attachment E to the Order.

Provision B.2 (Priority Water Quality Conditions) requires the Copermittees in each Watershed Management Area to identify the highest priority water quality conditions which will be the focus of the Water Quality Improvement Plan implementation.

Provisions B.2.a and B.2.b provide the criteria that must be assessed when characterizing the receiving water quality and potential impacts from MS4 discharges of the receiving waters within the Watershed Management Area. The criteria are based primarily on the requirements in 40 CFR 122.26(d)(1)(iv)(C) and (C)(1)-(9). Characterizing the receiving water quality and identifying the potential impacts caused by MS4 discharges to receiving waters in the Watershed Management Area is necessary to identify the impacts to receiving waters associated with MS4 discharges that are of the most concern to the Copermittees.

Based on the information required to be considered under Provisions B.2.a and B.2.b, Provision B.2.c requires to Copermittees to identify the highest priority water quality conditions related to discharges from the MS4s that will be the primary focus of the Water Quality Improvement Plan in the Watershed Management Area. Addressing and improving these highest priority water quality conditions will become the focus of each Copermittee's jurisdictional runoff management program as the Water Quality Improvement Plan is implemented in the Watershed Management Area. The highest priority water quality conditions are expected to include source of pollutants and/or stressors, and/or receiving water conditions, that the Copermittees consider the highest threats or most likely to have adverse impacts on the physical, chemical, and biological integrity of receiving waters. Addressing these threats and/or adverse impacts should restore the physical, chemical, and biological integrity of receiving waters, and result in the restoration and protection of the beneficial uses of the receiving waters in the Watershed Management Area.

Provision B.2.d requires the Copermittees to identify known and suspected sources of pollutants and/or stressors contributing to the highest priority water quality conditions. The requirements of Provision B.2.d are based primarily on the requirements in 40 CFR 122.26(d)(1)(iii)(B)(1)-(6). The Copermittees are required to evaluate several factors in the identification of those sources. The Copermittees must consider and evaluate the following: (1) the land uses that may contribute toward impacts to receiving waters, (2) the locations of the Copermittees' MS4s that can convey and discharge runoff and pollutants to receiving waters, (3) other sources that discharge into the Copermittees' MS4s and receiving waters, and (4) other information and data that can help the Copermittees to evaluate the relative importance of or contribution from those sources toward the highest priority water quality conditions. Identifying the known and suspected sources, and their relative contribution toward the highest priority water quality conditions, will help the Copermittees to focus, direct, and prioritize their resources and implementation efforts within their jurisdictions.

Provision B.2.e requires the Copermittees to identify potential strategies that can result in improvements to water quality in MS4 discharges and/or receiving waters within the Watershed Management Area. Potential water quality improvement strategies will not necessarily be implemented by the Copermittees, but provide a "menu" of options that the Copermittees will consider for implementation. The public participation process that will be implemented during the development of the Water Quality Improvement Plan is where the potential water quality improvement strategies will be identified.

Provision B.3 (Water Quality Improvement Goals, Strategies and Schedules) requires the Copermittees in each Watershed Management Area to identify the goals that the Copermittees' jurisdictional runoff management programs will work toward achieving to address and improve the highest priority water quality conditions identified under Provision B.2.c; the strategies that will be implemented by the Copermittees within their jurisdictions and the Watershed Management Area to achieve the goals; and, the schedules for implementing the strategies and achieving the goals. The element of the Water Quality Improvement Plan required under Provision B.3 is where the "*comprehensive planning*" and "*intergovernmental coordination*" [40 CFR 122.26(d)(2)(iv)] of the Copermittees' actions for the proposed management programs within the Watershed Management Area is required to be described.

Provision B.3.a requires the Copermittees to identify interim and final numeric goals, and schedules to achieve those goals as part of the Water Quality Improvement Plans. Provision B.3.a.(1) requires the Copermittees to identify two types of numeric goals to be achieved:

(1) Final numeric goals in the receiving waters and/or MS4 discharges that will result in the protection of the water quality standards of the receiving waters for the highest priority water quality conditions identified by the Copermittees for Provision B.2.c. These final numeric goals are the ultimate goals for the Water Quality Improvement Plan, and the achievement and maintenance of these final numeric goals will indicate that one or more beneficial uses have been successfully restored and/or protected from MS4 discharges.

(2) Interim numeric goals that can be used by the Copermittees to demonstrate progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges for the highest priority water quality conditions in the Watershed Management Area. Achievement of the interim numeric goals will demonstrate to the San Diego Water Board that the Copermittees' implementation efforts are progressing toward achieving the final numeric goals.

Provision B.3.a.(1) does not specify what the interim and final numeric goals must be based on, but they essentially must be designed to achieve compliance with water quality standards in the receiving waters. To that end, the interim goals must be based on measureable criteria or indicators capable of demonstrating progress toward achieving the numeric goals."

The interim and final numeric goals can be based on the water quality objectives in the Basin Plan. The water quality objectives in the Basin Plan, however, consist of numeric and narrative water quality objectives. Numeric water quality objectives can be directly used as numeric goals. Narrative water quality objectives, on the other hand, will require some interpretation to identify numeric goals. The achievement of multiple numeric goals based on the water quality objectives, used in combination, may be necessary to demonstrate that beneficial uses have been restored and/or protected.

The Copermittees could also propose other numeric goals that are not necessarily water quality objectives from the Basin Plan. For example, the Copermittees could propose a numeric goal that consists of achieving some percent improvement of a measureable indicator, such as acreage of a specific habitat or increase in a specific plant or animal species population. Other examples may include pollutant load reductions, number of impaired waterbodies delisted from the List of Water Quality Impaired Segments, Index of Biological Integrity (IBI) scores, etc.

The Copermittees may choose to develop interim numeric goals based on the final numeric goals they develop, such as incremental steps toward ultimately achieving the final numeric goals. The Copermittees may also choose to develop interim numeric goals that are based on other measureable indicators that can indirectly indicate improvements and progress toward the final numeric goals.

There are no limits to the types of interim numeric goals that could be proposed by the Copermittees, other than the goals must be based on measureable criteria or indicators capable of demonstrating progress toward achieving the numeric goals. Likewise, there are no limits to the types of final numeric goals that could be proposed by the Copermittees, other than the goals must "*restore and protect the water quality standards of the receiving waters.*"

Finally, Provision B.3.a.(2) also requires the Copermittees to develop schedules for measuring progress and achieving the interim and final numeric goals. Several criteria

are included for the development of the schedules, but the Copermittees are required to achieve the numeric goals as soon as possible, consistent with federal NPDES regulations (40 CFR 122.47(a)(1)).

The Copermittees are also required to incorporate any compliance schedules for any applicable ASBS or TMDL requirements. Applicable ASBS and TMDL compliance schedules are set forth in Attachment A and Attachment E to the Order, respectively. The information provided by the Copermittees under Provision B.3.a.(2) will be used by the Copermittees and the San Diego Water Board to gauge and track the progress of the Copermittees' efforts in addressing the highest priority water quality conditions identified in the Water Quality Improvement Plan.

Provision B.3.b requires the Copermittees to identify the strategies and schedules to implement those strategies as part of the Water Quality Improvement Plans. Provision B.3.b requires the Copermittees to identify the water quality improvement strategies that will be and may be implemented within the Watershed Management Area to 1) reduce of pollutants in storm water discharged from the MS4 to the MEP, 2) effectively prohibit non-storm water discharges from entering the MS4, 3) protect water quality standards in receiving waters by controlling MS4 discharges so that they do not cause or contribute to exceedances of receiving water limitations, and 4) achieve applicable WQBELs that implement TMDLs. The Copermittees will select the strategies to be implemented based on the likely effectiveness and efficiency of the potential water quality improvement strategies identified under Provision B.2.e to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, and/or achieve the interim and final numeric goals identified under Provision B.3.a.

Provision B.3.b.(1) requires each Copermittee to identify the strategies that will be or may be implemented within its jurisdiction. Each Copermittee is required to describe the strategies it is committed to implementing as part of its jurisdictional runoff management requirements under Provisions E.2 through E.7, and the optional jurisdictional strategies that the Copermittee will implement, as necessary, to achieve the numeric goals.

Each Copermittee is expected to implement the optional jurisdictional strategies identified under Provisions B.3.b.(1)(b) when the jurisdictional strategies it has committed to implement under Provision B.3.b.(1)(a) are not making adequate progress toward the interim and final numeric goals in accordance with the schedules established under Provision B.3.a. Provision B.3.b.(1)(b)(v) requires each Copermittee to describe the circumstances necessary to trigger implementation of the optional jurisdictional strategies, in addition to the requirements of Provisions B.3.b.(1)(a).

The San Diego Water Board recognizes that there may be optional jurisdictional strategies that will likely require funding and/or resources for planning, permitting, procurement of labor and materials, and implementation. Thus, Provision

B.3.b.(1)(b)(iv) requires each Copermittee to describe the funding and/or resources that are necessary to implement these optional jurisdictional strategies. This information may provide interested groups and members of the public an understanding of the resources that they could provide or assist in obtaining to implement these optional jurisdictional strategies.

Provision B.3.b.(2) requires the Copermittees in the Watershed Management Area to identify the regional or multi-jurisdictional strategies that may be implemented, as necessary, to achieve the numeric goals. Similar to the requirements of Provision B.3.b.(1)(b), these regional or multi-jurisdictional strategies will likely require funding and/or resources for planning, permitting, procurement of labor and materials, and implementation, and San Diego Water Board recognizes that these strategies may be difficult to implement with only Copermittee resources. Thus, Provision B.3.b.(2)(d) requires the Copermittees to describe the funding and/or resources necessary to implement these optional regional or multi-jurisdictional strategies. This information may provide interested groups and members of the public an understanding of the resources that they could provide or assist in obtaining to implement these optional regional or multi-jurisdictional strategies.

Provision B.3.b.(3) requires the Copermittees to develop and include schedules in the Water Quality Improvement Plan for implementing the water quality improvement strategies identified under Provisions B.3.b.(1) and B.3.b.(2). The schedule for implementing the water quality improvement strategies will be used by the Copermittees and San Diego Water Board to measure and demonstrate the progress of the Copermittees' implementation efforts toward reducing pollutants in storm water discharged from the MS4 to the MEP, and eliminating illicit non-storm water discharges from entering the MS4.

Provision B.3.b.(4) provides the Copermittees in each Watershed Management Area the option of implementing watershed-specific structural BMP requirements for Priority Development Projects. Historically, storm water permits have included very specific performance standards for permanent, structural BMPs. These standards describe the expectation for the capture or treatment of pollutants and control of excessive flow before storm water is discharged from a site. The Copermittees were also allowed to develop waiver programs for Priority Development Projects to avoid implementing the structural BMPs; however, the waiver programs were not necessarily tied into any sort of holistic watershed strategy. The result is that implementation of BMP requirements is largely done on a site-by-site basis. This requires proper design on the part of the Priority Development Project and strict oversight on the part of the Copermittee.

Provision B.3.b.(4) promotes the evaluation of multiple strategies for water quality improvement, in addition to the implementation of permanent structural BMPs, on a watershed-scale versus the site-by-site approach. In a report issued by the Southern California Coastal Water Research Project (SCCWRP) and several other research institutions, the report emphasized that a successful hydromodification management program will involve watershed analysis as a first step, and that integrating multiple

watershed-based strategies is preferable over a site-by-site approach. Indeed, the report states that the watershed analysis "…*should lead to identification of existing opportunities and constraints that can be used to help prioritize areas of greater concern, areas of restoration potential, infrastructure constraints, and pathways for potential cumulative effects*."[22] Provision B.3.b.(4) promotes the findings and recommendations of the report by providing a pathway for Copermittees to develop an integrated approach to their land development programs.

Under Provision B.3.b.(4), the Copermittees in a Watershed Management Area must first perform an analysis by gathering as much information pertaining to the physical characteristics of the Watershed Management Area as possible. This includes, for example, identifying potential areas of coarse sediment supply, present and anticipated future land uses, and locations of physical structures within receiving streams and upland areas that affect the watershed hydrology (such as bridges, culverts, and flood management basins). Once this information is collected, the Copermittees must produce GIS layers (maps) that include this information.

From there, the Copermittees must use the results of the Watershed Management Area Analysis to identify and compile a list of candidate projects that could potentially be used as alternative compliance options for Priority Development Projects. Such projects include, for example, opportunities for stream or riparian area rehabilitation, opportunities for retrofitting existing infrastructure to incorporate storm water retention or treatment, and opportunities for regional BMPs, among others. Once these candidate projects are identified, Copermittees may allow Priority Development Projects to fund, partially fund, or completely implement these candidate projects. The Copermittees must first find that implementing such a candidate project would provide greater overall benefit to the watershed than requiring implementation of the structural BMPs onsite, and also enter into a voluntary agreement with the Priority Development Project that authorizes this arrangement. The Copermittees may use Provision B.3.b.(4) as both 1) a mechanism to reach their stated goals of the Water Quality Improvement Plan by using Priority Development Projects to either fund or implement projects that will provide water quality benefit, and 2) an alternative to requiring strict adherence to the structural BMP design standards.

Additionally, Provision B.3.b.(4) allows the Copermittees to use the results of the Watershed Management Area Analysis to identify areas within the Watershed Management Area where it is appropriate to allow Priority Development Projects to be exempt from the hydromodification management BMP performance requirements. Provision E.3.c.(2) already allows exemptions for Priority Development Projects that discharge to a conveyance channel whose bed and bank are concrete lined from the point of discharge to an enclosed embayment or the Pacific Ocean. However, there may be cases where further exemptions are warranted. The Copermittees may identify such cases on a watershed basis and include them in the Watershed

[22] 2012. ED Stein, F Federico, DB Booth, BP Bledsoe, C Bowles, Z Rubin, GM Kondolf, A Sengupta. Technical Report 667. Southern California Coastal Water Research Project. Costa Mesa, CA.

Management Area Analysis; however, they must provide the supporting rationale to support all claims for exemptions.

Provision B.3.b.(4) provides an innovative pathway for Copermittees to regulate their land development programs by allowing alternative compliance in lieu of implementing structural BMPs on each and every Priority Development Project. This approach facilitates the integration of watershed-scale solutions for improving overall water quality and assisting Copermittees to achieve their stated goals of the Water Quality Improvement Plan. The San Diego Water Board understands, however, that undertaking this approach, which involves extensive planning, could be resource intensive for the Copermittees. Therefore, the Watershed Management Area Analysis is optional and not a requirement. The Copermittees can choose not to perform the watershed planning and mapping exercise described in Provision B.3.b.(4), and instead choose to require strict implementation of the structural BMPs onsite, pursuant to Provision E.3.b.

Provision B.4 (Water Quality Improvement Monitoring and Assessment) requires the Copermittees to develop an integrated monitoring and assessment program to track the progress of the Water Quality Improvement Plan toward meeting the implementation goals and schedules, and improving the water quality of the Watershed Management Area. Provision B.4 is the part of the Water Quality Improvement Plan where the Copermittees describe the monitoring data that will be collected, which is not only necessary to implement the "iterative approach" required by Provision A.4, but inform the adaptive management and "*comprehensive planning process*" that allows the Copermittees to make adjustments and modifications to the Water Quality Improvement Plans and the jurisdictional runoff management programs.

Provision B.4 requires the Copermittees, at a minimum, to include the requirements of Provision D as part of the water quality improvement monitoring and assessment program for the Water Quality Improvement Plan. The Copermittees, however, are not limited to the requirements of Provision D and may include additional monitoring and assessment methods to track progress toward improving water quality in the Watershed Management Area.

In addition to incorporating the requirements of Provision D, the water quality improvement monitoring and assessment program must incorporate any monitoring and assessment requirements specified for any applicable TMDLs included in Attachment E to the Order, and the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 for Watershed Management Areas with ASBS.

The monitoring and assessments required to be incorporated into the Water Quality Improvement Plan are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order.

Provision B.5 (Iterative Approach and Adaptive Management Process) requires the Copermittees to implement the iterative approach pursuant to Provision A.4 to adapt

the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a.

Provision B.5 requires the Copermittees in each Watershed Management Area to re-evaluate the highest priority water quality conditions and potential water quality improvement strategies, the water quality improvement goals, strategies and schedules, and the water quality improvement monitoring and assessment program and provide recommendations for modifying those elements to improve the effectiveness of the Water Quality Improvement Plan. The re-evaluation of the Water Quality Improvement Plan is part of the assessment requirements of Provision D.

Provision B.6 (Water Quality Improvement Plan Submittal, Updates, and Implementation) requires to Copermittees to submit, update, and implement the Water Quality Improvement Plans.

The requirements for the process to develop and submit the Water Quality Improvement Plans is described in more detail under the discussion for Provision F.1. The process will include several opportunities for the public to provide input during the development of the Water Quality Improvement Plans. The process for updating the Water Quality Improvement Plans is described in more detail under the discussion for Provision F.3.c. Upon acceptance of the Water Quality Improvement Plan and updates, the Copermittees are required to immediately begin implementing the Water Quality Improvement Plan and subsequent updates.

The Water Quality Improvement Plan is expected to be a dynamic document that will evolve over time. The Water Quality Improvement Plan is also expected to be a long term plan that focuses the Copermittees' efforts and resources on a limited set of priority water quality conditions, with the ultimate goal of protecting all the beneficial uses of the receiving waters within the Watershed Management Area from impacts that may be caused or contributed to by MS4 discharges. As the Copermittees collect data, implement their jurisdictional runoff management programs, and review the results from their water quality improvement monitoring and assessment program, the Water Quality Improvement Plan is expected to be continually reviewed and updated until compliance with Provisions A.1.a, A.1.b, and A.2.a is achieved.

However, in specific cases supported by robust analytical documentation the implementation of the Water Quality Improvement Plans may demonstrate that TMDLs are not necessary for identified impaired water bodies within the Watershed Management Area if the analytical record demonstrates that technology-based effluent limitations required by the CWA, more stringent effluent limitations required by state, local, or federal authority, and/or other pollution control requirements (e.g., best management practices) required by local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time.[23]

[23] 40 CFR 130.7(b)(1)

The San Diego Water Board submits an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. According to USEPA guidance for the Integrated Report,[24] water bodies are placed in one of five categories. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 are placed on the 303(d) List.

Category 4 in the Integrated Report is for water bodies where available data and/or information indicate that at least one beneficial use is not being supported or is threatened, but a TMDL is not needed.[25] Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

Impaired water bodies can be included in Category 4a if a TMDL has been adopted and approved. The TMDLs in Attachment E to the Order implement the requirements of the TMDLs adopted by the San Diego Water Board, and approved by the State Water Board and USEPA. The water bodies in Attachment E will be included in Category 4a in the Integrated Report and removed from the 303(d) List.

Impaired water bodies can be included in Category 4b if there are *acceptable* "pollution control requirements" required by a local, state or federal authority stringent enough to implement applicable water quality standards within a reasonable period of time (e.g., a compliance date is set). When evaluating whether a particular set of pollution controls are "requirements," the USEPA considers a number of factors, including: (1) the authority (local, state, federal) under which the controls are required and will be implemented with respect to sources contributing to the water quality impairment (examples may include: self-executing state or local regulations, permits, and contracts and grant/funding agreements that require implementation of necessary controls), (2) existing commitments made by the sources and completion or soon to be completed implementation of the controls (including an analysis of the amount of actual implementation that has already occurred), (3) the certainty of dedicated funding for the implementation of the controls, and (4) other relevant factors as determined by USEPA depending on case-specific circumstances.[26]

[24] USEPA, 2005. Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act
[25] Ibid
[26] Ibid

Impaired water bodies can be included in Category 4c if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution. Pollution, as defined by the CWA is "the man-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of water."[27] In other cases, pollution does not result from a pollutant and a TMDL is not required. Examples of circumstances where an impaired segment may be placed in Category 4c include segments impaired solely due to lack of adequate flow, stream channelization, or hydromodification. In these situations, there may be water quality management actions that can address the cause(s) of the impairment, but a TMDL may not be required to implement the actions.

The Water Quality Improvement Plans will require the implementation of pollution controls and water quality management actions (i.e. water quality improvement strategies) which can result in the attainment of water quality standards in water bodies impaired by discharges from the Copermittees' MS4s. The Water Quality Improvement Plans also include requirements that are expected to attain water quality standards in a reasonable period of time. The San Diego Water Board considers the Water Quality Improvement Plans to be a commitment by the Copermittees to develop, plan, budget for, and implement pollution controls that will attain water quality standards in receiving waters in a reasonable period of time, or as soon as possible. The results of the Copermittees' efforts in implementing the Water Quality Improvement Plans can be used to re-evaluate the condition of the impaired water bodies during the next update to the 303(d) List.

After the Copermittees submit the Water Quality Improvement Plans and demonstrate that water quality standards are being attained or will be attained in a reasonable period of time, the San Diego Water Board may re-evaluate the water bodies on the 303(d) List. These water bodies on the 303(d) List may be re-evaluated and placed into Category 4b or Category 4c in the Integrated Report. The water bodies placed in Category 4b or Category 4c in the Integrated Report must show a record that the water bodies are attaining water quality standards or supporting the identified beneficial uses, or will attain water quality standards or support identified beneficial uses in a reasonable period of time, in order for the water bodies to be appropriately removed from the 303(d) List.

[27] CWA section 502(19)

C. Action Levels

Purpose: Provision C includes requirements for the Copermittees to identify and include numeric action levels in the Water Quality Improvement Plan to direct and focus the Copermittees' jurisdictional runoff management program implementation efforts for controlling MS4 discharges to receiving waters.

***Discussion*:** Under Provision C, the numeric action levels required are for non-storm water discharges and storm water discharges. The non-storm water action levels (NALs) are applicable to non-storm water discharges from the Copermittees' MS4s, which can occur year-round. The storm water action levels (SALs) are applicable to storm water discharges from the Copermittees' MS4s, which occur during the rainy season defined as the period between October 1 and April 30.

The action levels required by Provision C are based on the action level requirements that were developed and incorporated into Order Nos. R9-2009-0002 and R9-2010-0016, the Orange County and Riverside County MS4 Permits, respectively. The Fact Sheets for these Orders provide detailed discussions about the development of the numeric NALs and SALs included in this Order.

Order Nos. R9-2009-0002 and R9-2010-0016 required the Copermittees to perform prescribed actions if the NALs or SALs are exceeded. The actions required under Order Nos. R9-2009-0002 and R9-2010-0016 generally included conducting additional monitoring and source investigations when a discharge from the MS4 is observed to exceed one or more NALs and/or SALs.

For this Order, however, the action levels of Provision C are to be used by the Copermittees to prioritize the actions to be implemented as part of the Water Quality Improvement Plan. Monitoring data collected by the Copermittees from MS4 outfalls will be compared with the NALs and SALs. Exceedances of the NALs and SALs will not require the Copermittees to immediately identify sources causing exceedances, but will provide some numeric indicator levels that can give the Copermittees a way to measure the relative severity of a pollutant contributing to receiving water quality impacts.

NALs and SALs must be included in the Water Quality Improvement Plans to be used by the Copermittees in directing and focusing their water quality improvement strategies. The Copermittees are expected to utilize the NALs and SALs to help focus their implementation efforts on addressing pollutants that have the most significant potential or observed impacts to receiving waters. The NALs and SALs will be used as part of the MS4 discharges assessments required under Provision D.4.b. The NALs and SALs may also be used by the Copermittees as the numeric goals to be achieved in MS4 discharges and/or receiving waters as the Water Quality Improvement Plans are implemented.

More specific and detailed discussions of the requirements of Provision C are provided below.

Provision C.1 (Non-storm Water Action Levels) requires the Copermittees to incorporate NALs into the Water Quality Improvement Plan for pollutants and/or constituents that are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions identified in the Water Quality Improvement Plan related to non-storm water discharges from the MS4s. NALs generally must be consistent with the water quality objectives found within the Basin Plan.

The NALs have been included to ensure that the Copermittees are implementing and complying with several requirements of the MS4 permit. The federal CWA requires permits for municipal storm sewer systems to "*effectively prohibit non-storm water discharges into the storm sewers*." The federal NPDES regulations, which were promulgated to implement the CWA requirements for discharges from municipal storm sewers, require a program to address illicit discharges, which are non-storm water discharges. Provision A.1.b prohibits "*[n]on-storm water discharges into MS4s*" unless the non-storm water discharge authorized by a separate NPDES permit. The NALs will be used as part of the illicit discharge detection and elimination program required pursuant to Provision E.2, as well as part of the MS4 discharges assessments required pursuant to Provision D.4.b.

Provision A.1.a prohibits non-storm water discharges from the MS4 from "*causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state.*" In addition, pursuant to Provision A.2.a, non-storm water discharges "*must not cause or contribute to the violation of water quality standards in any receiving waters*."

Ideally, the Copermittees' jurisdictional runoff management programs will eliminate all non-storm water discharges entering the MS4s within their jurisdictions. The complete elimination of non-storm water discharges to the Copermittees' MS4s would be in compliance with the CWA requirements for non-storm water discharges, as well as the prohibitions and limitations of Provisions A.1.a and A.2.a.

The federal regulations, however, also refer to several non-storm water discharge categories that must be addressed as illicit discharges if they are found to be a source of pollutants. The federal regulations thus identify some non-storm water discharges that are not required to be addressed as illicit discharges if they are not a source of pollutants (e.g. non-storm water discharges specified in Provisions E.2.a.(1)-(5)). Thus, these regulations imply that some non-storm water discharges into and from the MS4 may occur even if non-storm water discharges are "effectively" prohibited by the Copermittees.

If the source of a non-storm water discharge is identified as a category of non-storm water specified in Provisions E.2.a.(1)-(5), the NALs can be used to determine the category of non-storm water discharges is a source of pollutants. For other non-storm

water discharges not specified in Provisions E.2.a.(1)-(5), the CWA requires those discharges to be "*effectively"* prohibited by removing the discharge to the MS4 through enforcement of the Copermittees' legal authority established under "*ordinance, order or similar means*" to prohibit illicit discharges to the MS4s.

If there are non-storm water discharges that are not required to be addressed as illicit discharges, those discharges must comply, at a minimum, with the discharge prohibitions and receiving water limitations of Provision A. Thus, the non-storm water discharges from the MS4 must be at levels that will not cause or contribute to a condition of pollution, contamination, or nuisance (Provision A.1.a), and must not cause or contribute to a violation of water quality standards in receiving waters (Provision A.2.a) to be consistent with the discharge prohibitions and receiving water limitations of Provisions A.1.a and A.2.a.

Furthermore, the San Diego Region has predominantly intermittent and ephemeral rivers and streams which vary in flow volume and duration at spatial and temporal scales. For most of these river and stream systems, non-storm water discharges from the MS4 are likely to be the most significant or the only source contributing to surface flows present within the receiving water, especially during the dry season.

Therefore, because of the prohibitions and limitations of Provision A.1.a and A.2.a, and the likelihood that non-storm water discharges from the MS4 are the most significant or only source contributing to surface flows present within the receiving water, NALs generally must be consistent with the water quality objectives found within the Basin Plan. Non-storm water discharges that are meeting the NALs would not be expected to cause or contribute to an exceedance of water quality objectives in receiving waters, which would be consistent with the discharge prohibitions and receiving water limitations of Provisions A.1.a and A.2.a.

Exceedances of the NALs would then provide an indication of the relative severity of a pollutant in non-storm water discharges from the MS4 contributing to potential or observed receiving water quality impacts. The relative severity or significance of a pollutant in non-storm water discharges from the MS4 will provide the Copermittees a valuable source of information that can be used to identify priority water quality conditions within a Watershed Management Area and within each Copermittee's jurisdiction.

Tables C-1 through C-4 under Provision C.1.a specify numeric NALs for several parameters or pollutant constituents for non-storm water discharges from the MS4 to several water body types. The NALs for MS4 discharges given under Provision C.1.a are based on the water quality objectives for inland surface waters in the Basin Plan, and the water quality objectives for ocean waters in the Ocean Plan. The NALs for most of the metals were calculated based on the State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP). The NALs provided in Tables C-1

through C-4 must be included in the Water Quality Improvement Plans required to be developed pursuant to Provision B.

Provision C.1.b requires the Copermittees to identify NALs for pollutants and/or constituents, not specified in Provision C.1.a, which are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions of the Watershed Management Area related to non-storm water discharges from the MS4s. The NALs must be based on the water quality objectives in the Basin Plan. The NALs identified under Provision C.1.b must be included in the Water Quality Improvement Plan.

The San Diego Water Board recognizes that some of the NALs required pursuant to Provisions C.1.a and C.1.b may be exceeded more frequently than not. Thus, Provision C.1.c has been included in the Order to provide the Copermittees the option to develop secondary NALs that are set at levels greater than the levels required pursuant to Provisions C.1.a and C.1.b to further refine the prioritization and assessment of water quality improvement strategies for addressing non-storm water discharges to and from the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and from the MS4.

Provision C.2 (Storm Water Action Levels) requires the Copermittees to incorporate SALs into the Water Quality Improvement Plan for pollutants and/or constituents causing or contributing, or may be causing or contributing, to the highest priority water quality conditions identified in the Water Quality Improvement Plan related to storm water discharges from the MS4s.

The SALs have been included to ensure that the Copermittees are implementing and complying with several requirements of the MS4 permit. Provision A.1.a prohibits storm water discharges from the MS4 from "*causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state.*" In addition, pursuant to Provision A.2.a, storm water discharges "*must not cause or contribute to the violation of water quality standards in any receiving waters*."

Provision A.3.a, however, implicitly acknowledges that compliance with Provisions A.1.a and A.2.a cannot be achieved immediately for discharges of storm water from the MS4 by applying the MEP standard. Thus, Provision A.4 requires the Copermittees to implement an iterative approach to demonstrate that MEP is being achieved. This approach is supported by USEPA.

The federal CWA requires permits for municipal storm sewer systems to "*require controls to reduce the discharge of pollutants [in storm water] to the maximum extent practicable*, *including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants.*" MEP is an ever-evolving, flexible, and advancing concept. As knowledge about controlling storm water runoff

and discharges evolves, so does the knowledge which constitutes MEP. Reducing the discharge of storm water pollutants from the MS4 to the MEP requires the Copermittees to assess their jurisdictional runoff management programs and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP. The SALs provide the Copermittees measureable goals that may be used to demonstrate the achievement of MEP for reducing pollutants in storm water discharges from the MS4. The SALs will be used as part of the MS4 discharges assessments required under Provision D.4.a.

In June of 2006, the State Water Board's Blue Ribbon Storm Water Panel released its report titled "*The Feasibility of Numerical Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities*." In the recommendations, the Blue Ribbon panel proposed storm water effluent limitations which are computed using statistical based population approaches. The SALs specified in Table C-5 under Provision C.2.a were developed from a regional subset of nationwide Phase I MS4 data by using USEPA Rain Zone 6 (arid west) data.[28] Additionally, utilization of regional data is appropriate due to the addition of data into the nationwide Phase I MS4 monitoring dataset in February 2008. This additional data increased the number of USEPA Rain Zone 6 samples to more than 400, and included additional monitoring events within Southern California.

Utilizing data from USEPA Rain Zone 6 resulted in SALs which closely reflect the environmental conditions experienced in the San Diego Region. The localized subset of data includes sampling events from multiple Southern California locations including Orange, San Diego, Riverside, Los Angeles, and San Bernardino Counties. The dataset includes samples taken from highly built-out impervious areas and from storm events representative of Southern California conditions.

The SALs for cadmium, copper, lead and zinc require the measurement of hardness and to provide more specificity in the assessment of samples with SALs for total metal concentrations. While USEPA Rain Zone 6 data include a large sample size for concentrations of total metals, the impact the concentration will have on receiving waters will vary with receiving water hardness. Since it is the goal of the SALs, through the iterative process and MEP standard, to have MS4 storm water discharges meet all applicable water quality objectives, the hardness of the receiving water should be used when assessing the total metal concentration of a sample.

Thus, when there is an exceedance of a SAL for a metal, the Copermittee must determine if that exceedance is above the existing applicable water quality objectives based upon the hardness of the receiving water. The water quality objectives Copermittees must use to assess total metal SAL exceedances are the California Toxic Rule (CTR) and USEPA National Recommended Water Quality Criteria for Freshwater Aquatic Life 1 hour maximum concentrations. The 1 hour maximum

[28] Data used to develop SAL were obtained from http://rpitt.eng.ua.edu/Research/ms4/mainms4.shtml

concentration is to be used for comparison since it is expected to most replicate the impacts to waters of the State from the first flush following a precipitation event.

The statistically calculated SALs given in Table C-5 are at levels greater than the water quality objectives in the Basin Plan or Ocean Plan. Because the objective of the CWA is to "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*", meaning eventually pollutants in storm water discharges must be reduced to a level that cannot cause or contribute to an exceedance of water quality objectives in receiving waters, over time the SALs are expected to be reduced to a level that is based on the water quality objectives rather than statistical calculations. The San Diego Water Board will review the SALs as more data for discharges of storm water from the MS4s are collected, and revise them as conditions improve and the MEP standard advances. For the Water Quality Improvement Plans required under this Order, the SALs identified under Provision C.2.a must be included.

Provision C.2.b requires the Copermittees to identify SALs for pollutants and/or constituents, not specified in Provision C.2.a, which are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions of the Watershed Management Area related to storm water discharges from the MS4s. The SALs identified under Provision C.2.b must be included in the Water Quality Improvement Plan.

The San Diego Water Board recognizes that some of the SALs required pursuant to Provisions C.2.a and C.2.b may be exceeded more frequently than not. Thus, Provision C.2.c has been included in the Order to provide the Copermittees the option to develop secondary SALs that are set at levels greater than the levels required pursuant to Provisions C.2.a and C.2.b to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s.

D. Monitoring and Assessment Program Requirements

Purpose: Provision D includes minimum monitoring and assessment requirements that must be developed and implemented by the Copermittees as part of the Water Quality Improvement Plans. Implementation of the monitoring and assessment requirements of Provision D will allow the Copermittees to demonstrate that the requirements of the CWA to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP are being achieved. Implementation of the monitoring and assessment requirements of Provision D will also allow the Copermittees and the San Diego Water Board to track improvements to the water quality in the San Diego Region. The monitoring and assessment program requirements are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order.

***Discussion*:** The San Diego Water Board recognized that changes to the monitoring and assessment requirements of the Fourth Term Permit were necessary to improve the usefulness and usability of monitoring data collected by the Copermittees to support their jurisdictional storm water programs more efficiently and with increased effectiveness. The data collected are needed to better inform the Copermittees' understanding of the physical, chemical, and biological condition of the receiving waters and the quality of the MS4 discharges. The monitoring program needs to provide opportunities for the Copermittees to integrate regional monitoring efforts into municipal storm water monitoring requirements to provide a cost-effective approach to monitoring and avoid duplication of efforts.

The requirements in Provision D were largely recommended by the Copermittees as an outcome of the San Diego Water Boards Focused Meeting process. The monitoring and assessment program requirements now require collection of more specific information necessary for each Copermittee to adapt its jurisdictional runoff management program in such a way that focuses resources on a watershed's highest priority water quality conditions. The monitoring and assessment program will require the Copermittees to collect data that can be utilized to answer both watershed level management questions (e.g. Are the chemical, physical, and biological conditions of a receiving water protective, or likely protective of beneficial uses?), and specific jurisdictional runoff management program activity questions (e.g. Are the water quality improvement strategies of the jurisdictional program effectively eliminating non-storm water discharges to the MS4?).

The monitoring data collected and assessment information that will be reported to the San Diego Water Board are necessary to determine if the Copermittees are complying with the prohibitions and limitations of Provision A. The required monitoring and assessments that must be reported to the San Diego Water Board will be utilized for three purposes:

(1) Inform the Copermittees, San Diego Water Board, and the public on the progress of the Copermittees' efforts to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP;

(2) Inform the Copermittees, San Diego Water Board, and the public on the condition of water bodies receiving discharges from the Copermittees' MS4, and the progress of the Copermittees' water quality improvement implementation efforts toward improving the receiving water quality; and

(3) Inform the Copermittees, the San Diego Water Board, and the public on the effectiveness of the Water Quality Improvement Plan toward achieving (1) and (2).

The monitoring and assessment information reported pursuant to Provision F is also expected to be key to the iterative approach and adaptive management process required under Provision A.4 and implemented through the Water Quality Improvement Plan required under Provision B. As required by Provision A.4, the iterative approach and adaptive management process is required if the Copermittees cannot meet the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c, and/or A.2.a under the present conditions.

Provision D provides the minimum monitoring and assessment requirements that must be included in each Water Quality Improvement Plan to be developed and implemented by the Copermittees. The Copermittees, however, are not limited to the requirements of Provision D and may include additional methods to track progress toward improving water quality in a Watershed Management Area.

More specific and detailed discussions of the requirements of Provision D are provided below.

<u>Provision D.1 (Receiving Water Monitoring Requirements)</u> specifies the minimum receiving water monitoring that the Copermittees must conduct within the Watershed Management Area and include as part of the Water Quality Improvement Plan.

Provision D.1 establishes minimum monitoring requirements that must be conducted by the Copermittees within each Watershed Management Area. Provision D.1 requires the Copermittees to collect and develop the data and information necessary to determine potential impacts to the beneficial uses in the receiving waters due to discharges from the MS4s. The monitoring required under Provision D.1 will also provide the data that will allow the Copermittees to gauge the effectiveness and progress of its Water Quality Improvement Plan implementation efforts toward improving the quality of receiving waters.

The receiving water monitoring requirements of Provision D.1 are focused primarily on monitoring the conditions and response of the receiving waters to the Copermittees'

collective implementation efforts to reduce receiving water impacts that may be caused by the discharges from the MS4s. The preference of the San Diego Water Board is for the Copermittees to spend their resources achieving tangible and observable improvements in receiving water conditions instead of collecting samples and analyzing data that has consistently indicated that receiving water conditions are degraded and require improvement. In general, the ability to measure potential improvements in receiving water conditions due to any actions implemented by the Copermittees as part of the Water Quality Improvement Plan may require several years before a response can be observed. Thus, the frequency of collecting receiving water monitoring data has been kept to a minimum.

During the transitional period between adoption of this Order and San Diego Water Board acceptance of a Water Quality Improvement Plan, the Copermittees must conduct receiving water monitoring in accordance with Provision D.1.a. This approach to collecting receiving water data is different from what was required in the Fourth Term Permits, but one that truly embraces the concept of an integrated, cost-effective, streamlined receiving water monitoring approach.

Provision D.1.a requires Copermittees to continue performing the receiving water monitoring programs required in Order Nos. R-2007-0001, R9-2009-002, and R9-2010-0016; plus participation in: hydromodification management plan monitoring approved by the San Diego Water Board, monitoring plans as part of load reduction plans (either Bacteria Load Reduction Plans or Comprehensive Load Reduction Plans) for TMDLs in Attachment E of the Order, Storm Water Monitoring Coalition Regional Monitoring, Southern California Bight Regional Monitoring, Sediment Quality Monitoring, and ASBS Monitoring as applicable to a Watershed Management Area.

Provision D.1.a also provides an opportunity for the Copermittees to use third party data to meet receiving water monitoring requirements where feasible. Allowing the Copermittees to use the data currently collected through its participation in existing regional receiving water programs and that of third parties provides an efficiency of resources in obtaining the data necessary to inform the Copermittees and the San Diego Water Board about the physical, chemical, and biological conditions of the receiving waters, which can also help to focus the receiving water monitoring during the implementation of the Water Quality Improvement Plan. Once a Water Quality Improvement Plan is developed for a Watershed Management Area in compliance with Provision B of this Order, the transitional period is over and Copermittees are required to conduct receiving water monitoring according to the requirements of Provisions D.1.b-e.

Provision D.1.b requires each Copermittee to identify at least one long term receiving water monitoring station to be representative of receiving water quality within each Watershed Management Area. Long term receiving water monitoring stations can be located at any existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees. The requirements under Provision D.1.b. are

consistent with 40 CFR 122.26(d)(2)(iii)(D), which specifies that a "*monitoring program for representative data collection for the term of the permit*" may include "*instream locations.*" For each Watershed Management Area, at least one long term watershed monitoring station is required to be established and monitored. The Copermittees may choose to establish additional long term monitoring stations where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

Provision D.1.b. requires the Copermittees to locate the long term receiving water monitoring station at one of these existing receiving water monitoring stations to provide the Copermittees an opportunity to experience monitoring cost savings while continuing to collect the necessary data to assess the status and trends of receiving water quality conditions in 1) coastal water, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under both dry weather and wet weather conditions. Ideally these stations will continue to be monitored as part of the receiving water monitoring for each Watershed Management Area to maintain a consistent set of locations and a period of data that can be built upon with the monitoring required under this Order.

The receiving water monitoring requirements are separated into monitoring required during dry weather conditions pursuant to Provision D.1.c, and wet weather conditions pursuant to Provision D.1.d.

At each long term monitoring station the Copermittees must conduct at least three dry weather monitoring events as required pursuant to Provision D.1.c and at least three wet weather monitoring events as required pursuant to Provision D.1.d per permit term. Provisions D.1.c and D.1.d require the Copermittees to monitor priority water quality conditions identified in the Water Quality Improvement Plan, constituents listed as causing impairment of receiving waters in the Watershed Management Area, applicable NALs, toxicity, constituents listed in Tables D-2 and D-3, and constituents for implementation plans (e.g. Bacteria Load Reduction Plans and Comprehensive Load Reduction Plans). Required toxicity monitoring was changed to reflect an updated understanding of the unique challenges associated with sampling storm water for toxicity. Copermittees are required to sample storm water for toxicity during each dry weather and each wet weather event pursuant to Provision D.1.c.(4) and D.1.d.(4). Required toxicity monitoring is now consistent with the State Water Resources Control Board Policy for Toxicity Assessment and Control (Draft June 2012) and recently adopted MS4 permits for Caltrans and Los Angeles Water Board. Receiving water monitoring efforts in this Order have been streamlined to redirect resources to monitoring efforts that better support pollutant reduction solutions with an increasing emphasis on MS4 outfall monitoring, source identification and source abatement activities.

In addition to the receiving water monitoring requirements under Provisions D.1.b-d, Provision D.1.e requires the Copermittees participate in and/or conduct other types of receiving water monitoring. As recommended and requested by the Copermittees, Provision D.1.e.(1) requires the Copermittees to participate in existing regional monitoring, as applicable to each Watershed Management Area. Existing regional

monitoring includes monitoring conducted by the Storm Water Monitoring Coalition and for the Southern California Bight. Participation in and use of monitoring data collected from these existing regional water quality monitoring programs provide the Copermittees a greater opportunity for efficiency in the use of their resources to manage their storm water programs and those controllable discharges under their authority.

The State Water Resources Control Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part 1 Sediment Quality which became effective August 25, 2009 (Sediment Quality Monitoring Policy). Provision D.1.e.(2) requires any Copermittees with MS4 discharges to an enclosed bay or estuary to monitoring the sediments in the enclosed bay or estuary receiving water in accordance with the sediment quality monitoring procedures as prescribed in the Sediment Quality Monitoring Policy.

The State Water Board adopted Resolution No. 2012-0012 which approved exceptions to the California Ocean Plan for selected discharges into Areas of Special Biological Significance (ASBS), including special protections for beneficial uses. State Board Resolution No. 2012-0012 became effective on March 20, 2012, and Attachment B to the Resolution established limitations on point source storm water discharges to ASBS. Copermittees with MS4s that discharge to an ASBS must monitor its discharge to assure compliance with State Board Resolution No. 2012-0012 as required pursuant to Provision D.1.e.(3).

The San Diego Water Board is currently developing a regional monitoring strategy to assess the conditions of receiving waters in the San Diego Region. The monitoring requirements of Provision D.1 are expected to be incorporated or serve as a foundation of this regional monitoring strategy, but may require some modifications. When the San Diego Water Board develops an alternative regional monitoring strategy, the Copermittees will be required to participate in the development and implementation of the alternative regional monitoring program pursuant to Provision D.1.f.

Provision D.2 (MS4 Outfall Discharge Monitoring Requirements) specifies the minimum MS4 outfall discharge monitoring requirements that the Copermittees must incorporate and implement as part of the Water Quality Improvement Plan.

The dry weather MS4 outfall discharge monitoring requirements are included under Provisions D.2.a.(2) and D.2.b. The dry weather MS4 outfall discharge monitoring requirements are part of the "*program, including a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer*" required by 40 CFR 122.26(d)(2)(iv)(B), which is expected to achieve compliance with the CWA section 402(p)(3)(B)(ii) statutory requirement for municipal storm water permits to require the Copermittees to "*effectively prohibit non-storm water discharges into the storm sewers*." The dry weather MS4 outfall discharge monitoring data

collection requirements are based on requirements under 40 CFR 122.26(d)(1)(iv)(D) and 122.26(d)(2)(iv)(B)(3).

The dry weather MS4 outfall discharge monitoring requirements are designed to provide wide spatial and temporal coverage of each jurisdiction to better understand the extent and magnitude of non-storm water discharges to receiving waters, and make a distinction between persistent and transient non-storm water flows. This information is expected to allow each Copermittee to focus its resources on eliminating and controlling the highest priority threats to receiving water quality, as well as integrating other elements of the storm water programs (e.g. complaint call response) and third party data to efficiently and effectively assist in efforts to eliminate non-storm water discharges.

The dry weather MS4 outfall discharge monitoring requirements of Provision D.2.a.(2) and D.2.b are separated into monitoring required before and after the San Diego Water Board accepts the Copermittees' Water Quality Improvement Plan. Outfall monitoring conducted prior to acceptance of the Water Quality Improvement Plan is referred to in the Order as Transitional MS4 Outfall Discharge Monitoring. Provision D.2.a.(2) includes the transitional dry weather MS4 outfall discharge monitoring requirements.

The requirements under Provision D.2.a.(2) are based on the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B), which include the requirements for a monitoring program to identify, detect, and eliminate illicit connections and illegal discharges to the MS4s. The federal regulations (40 CFR 122.26(d)(1)(iv)(D)) require the monitoring program to include "*a field screening analysis for illicit connections and illegal dumping [that]…[a]t a minimum, include[s] a narrative description, for either each field screening point or major outfall, of visual observations made during dry weather periods.*" The federal regulations (40 CFR 122.26(d)(1)(v)(B)) require the monitoring program to include "*inspection procedures and methods for detecting and preventing illicit discharges, and describe areas where this program has been implemented.*" Furthermore, the monitoring program is required by federal regulations (40 CFR 122.26(d)(2)(iv)(B)) to include "*a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer.*"

Dry weather transitional MS4 outfall discharge monitoring requires each Copermittee to field screen (inspect) its major MS4 outfalls to classify the MS4 outfall locations as having persistent dry weather flows, transient dry weather flows, or no dry weather flows. To account for the variance in size of the 39 jurisdictions covered under this Order, the Copermittees recommended a tiered approach to the number of major MS4 outfalls that must be inspected. Provision D.2.a.(2)(a) provides a tiered approach to the number of major MS4 outfalls that must be visually inspected per jurisdiction as well as a minimum frequency each Copermittee must inspect each major MS4 outfall per year. This tiered approach is based on the total number of major MS4 outfalls within a Copermittees jurisdiction within each Watershed Management Area.

Based on the field screening, each Copermittee is required to make a determination whether any observed flowing, pooled, or ponded waters are transient or persistent flows. Based on this field screening information, other jurisdictional program information, and third party information, each Copermittee is required to prioritize the MS4 outfalls within its jurisdiction for follow up investigation and elimination of the non-storm water discharge, as part of its illicit discharge detection and elimination program required pursuant to Provision E.2. In accordance with the requirements of Provision E.2, each Copermittee is required to immediately investigate obvious illicit discharges (e.g. outfall discharges with unusual color, unusual odor, or high flows).

This approach allows a Copermittee to use all of its resources, as well as leverage resources and information provided by third parties, to effectively eliminate non-storm water discharges from its MS4 outfalls. If the source of the non-storm water discharge cannot be immediately eliminated, the Copermittee uses the persistent flow or transient flow classification along with other programmatic implementation data to prioritize the MS4 outfalls for future investigation. In accordance with the adaptive management approach deployed throughout this Order, Provision D.2.a.(2)(c) requires each Copermittee to update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow. The requirement of Provision D.2.a.(2)(c) assures that each Copermittee is collecting data that can be used to demonstrate compliance with the CWA requirement that each Copermittee must implement a program to "*effectively prohibit non-storm water discharges into the [MS4]*" and with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

Provision D.2.b describes the dry weather MS4 outfall discharge monitoring required to be incorporated and implemented as part of the Water Quality Improvement Plan. Dry weather MS4 outfall discharge monitoring must be performed by each Copermittee to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. The emphasis of the dry weather MS4 outfall discharge monitoring required pursuant to Provision D.2.b is consistent with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

Provision D.2.b.(1) requires each Copermittee to continue field screening its major MS4 outfalls and identifying those with persistent flows and transient flows, as conducted during the transitional period (i.e. before the Water Quality Improvement Plan was developed). However, each Copermittee now has the flexibility to adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of non-storm water persistent flow discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan. In order to ensure a minimum number of outfalls are inspected, Provision D.2.b.(1) requires the number of visual

inspections be equal to the number of visual inspections required in the tiered inspection program pursuant to Provision D.2.a.(2)(a).

Provision D.2.b.(2)(b) requires each Copermittee to monitor a minimum of 5 major MS4 outfalls with persistent flows identified as the highest priorities within a Copermittee's jurisdiction, within each Watershed Management Area. In other words, Copermittees located in more than one Watershed Management Area must identify at least 5 major MS4 outfalls with persistent flows in its jurisdiction in each Watershed Management Area. If a Copermittee is located in more than one Watershed Management Area, and they have less than 5 major MS4 outfalls with persistent flows per jurisdictional area per Watershed Management Area, all of the major MS4 outfalls must be identified as high priority dry weather persistent flow MS4 outfalls. The Copermittees identified as Responsible Copermittees by a TMDL in Attachment E of the Order may need to monitor more than 5 dry weather major MS4 outfall locations to determine compliance with the requirements of the TMDL(s).

Monitoring must occur at the highest priority outfall locations at least semi-annually until the non-storm water discharges have been eliminated for three consecutive dry weather monitoring events; identified to be authorized by a separate NPDES Permit; or reprioritized to a lower priority. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized MS4 major outfall in the Copermittee's jurisdiction within the Watershed Management Area, unless there are no remaining qualifying major MS4 outfalls within the Copermittees jurisdiction. The Copermittees must continually update their dry weather persistent flow MS4 outfall discharge monitoring locations with the next highest priority non-storm water flow that have yet to be eliminated until all persistent and transient flows are eliminated or its threat reduced.

Non-storm water persistent flow MS4 outfall discharge monitoring data collected during each semi-annual monitoring event, must be collected and analyzed according to the requirements of Provision D.2.b.(2)(b)–(e). These monitoring requirements are consistent with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

The wet weather MS4 outfall discharge monitoring requirements are included under Provisions D.2.a.(3) and D.2.c. The wet weather MS4 outfall discharge monitoring requirements are necessary for the Copermittees to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable, using management practices, control techniques and system, design and engineering methods, and such other provisions which are appropriate*" required by 40CFR 122.26(d)(2)(iv), which is expected to achieve compliance with the CWA section 402(p)(3)(B)(iii) statutory requirement for municipal storm water permits to require "*controls to reduce the discharge of pollutants [in storm water] to the maximum extent practicable*." The wet weather MS4 outfall discharge monitoring data collection requirements are based on requirements under 40 CFR 122.26(d)(2)(iii), 122.26(d)(2)(iii)(A) and 122.26(d)(2)(iii)(A)(1)-(4), and 40 CFR 122.21(g)(7)(i)-(ii).

The wet weather MS4 outfall discharge monitoring requirements of Provision D.2.a.(3) and D.2.c are separated into monitoring required before and after the San Diego Water Board accepts the Copermittees' Water Quality Improvement Plan. Outfall monitoring conducted prior to acceptance of the Water Quality Improvement Plan is referred to in the Order as Transitional MS4 Outfall Discharge Monitoring. Provision D.2.a.(3) includes the transitional wet weather MS4 outfall discharge monitoring requirements.

Until the wet weather MS4 outfall discharge monitoring requirements of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board, the Copermittees must comply with the requirements of transitional wet weather MS4 outfall monitoring requirements pursuant to Provision D.2.a.(3). Provision D.2.a.(3) requires the Copermittees in each Watershed Management Area to sample, at least five of the major MS4 outfalls inventoried pursuant to Provision D.2.a.(1) once per wet season for the monitoring data required to be collected pursuant to Provision D.2.a.(3)(c)-(e). Provision D.2.a.(3) further requires at least one major MS4 outfall monitoring station be located in each Copermittee's jurisdiction within the Watershed Management Area.

At a minimum, the five sampling locations chosen must be representative of storm water discharges from residential, commercial, industrial, and typical mixed-use land uses present within a Watershed Management Area. The San Diego Water Board expects the Copermittees to extrapolate from these data to similar land uses throughout the Watershed Management Area to better inform the Water Quality Improvement Plan development process by prioritizing drainages for implementation of storm water control efforts required pursuant to Provision E.

Provision D.2.c describes the wet weather MS4 outfall discharge monitoring required to be included and implemented as part of the Water Quality Improvement Plan. Provision D.2.c provides the Copermittees the flexibility to adjust the wet weather MS4 outfall discharge monitoring locations and frequencies in the Watershed Management Area, as needed, to identify sources of pollutants in storm water discharges from MS4s in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan.

Although Provision D.2.c.(1) allows the Copermittees to adaptively manage the wet weather MS4 outfall discharge monitoring locations and frequencies, the provision requires a minimum of at least five wet weather outfall stations to be monitored. Provision D.2.c.(2) further allows the Copermittees to modify the monitoring frequency at each wet weather MS4 outfall station to meet the goals of the Water Quality Improvement Plan as long as the monitoring frequency occurs at least once per year and is at an appropriate frequency to identify sources of pollutants in storm water discharges, guide pollutant source identification efforts, or determine compliance with the requirements of the applicable TMDLs in Attachment E to the Order.

The wet weather MS4 outfall discharge monitoring requirements of Provisions D.2.c.(3) and D.2.c.(4) are the same as the transitional wet weather MS4 outfall discharge monitoring. In contrast, the requirements of Provision D.2.c.(5) are focused on collecting analytical data specific to the highest priority water quality conditions in the Watershed Management Area identified in the Water Quality Improvement Plan. The wet weather MS4 outfall discharge monitoring data collection requirements are consistent with the requirements under 40 CFR 122.26(d)(2)(iii), 122.26(d)(2)(iii)(A) and 122.26(d)(2)(iii)(A)(1)-(4), and 40 CFR 122.21(g)(7)(i)-(ii).

Provision D.3 (Special Studies) requires the Copermittees to develop special studies that will be conducted for each Watershed Management Area and the entire San Diego Region. Data collected pursuant to Provision D.3 is to be used by the Copermittees to improve the effectiveness of the strategies implemented by the jurisdictional runoff management programs toward achieving the numeric goals identified in the Water Quality Improvement Plans and ultimately achieve compliance with the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c, and A.2.a, which is consistent with the requirements of Provision A.4.

Special studies are often necessary to fill data gaps or provide more refined information that allow the Copermittees to better manage the generation or elimination of pollutants and discharges to and from the MS4. In the Fourth Term Permits, the Copermittees have been required to implement special studies as directed by the San Diego Water Board. The special studies required by this Order provide the Copermittees more flexibility to identify and implement special studies that will be most useful to improving the effectiveness of their jurisdictional runoff management programs.

Provision D.3.a.(1) requires the Copermittees to develop and conduct at least two special studies per Watershed Management Area, to be determined by the Copermittees. One of the two special studies may be accomplished through participation in a Regional Special Study required under Provision D.3.a.(2). The requirements provide the Copermittees great latitude in identifying and developing the special studies. Watershed Management Area special studies are required, at a minimum, to: (a) relate in some way to the highest water quality priorities identified by the Copermittees in the Water Quality Improvement Plan, (b) be conducted within the Watershed Management Area, and (c) include some form of participation (e.g. contribution of funds, personnel services, project management) by all the responsible Copermittees within the Watershed Management Area.

Examples of Watershed Management Area special studies might include, but are not limited to: (1) focused pollutant source identification studies, (2) BMP effectiveness and/or comparison studies, (3) pilot tests for new or emerging pollutant control methods, (4) receiving water pollutant or stressor source identification and/or mitigation studies, or (5) pollutant fate and transport studies. The Watershed Management Area special studies are expected to provide data that can be utilized by the Copermittees to improve the Water Quality Improvement Plan or implementation of

the Copermittees' jurisdictional runoff management programs to address the highest priority water quality conditions.

Provision D.3.a.(2) requires the Copermittees to develop at least one special study that will be conducted for the entire San Diego region. The regional special study is expected to provide data that can be utilized by the Copermittees to improve the Water Quality Improvement Plan or implementation of the Copermittees' jurisdictional runoff management programs to identify or address regional water quality concerns and priorities.

An example of a regional special study would be to develop and establish allowable exceedance frequencies of the bacteria water quality objectives for several types of water bodies, during different wet and dry weather conditions the San Diego region. The special study would be related to bacteria, which is a priority for the San Diego region due to the adoption of "*Bacteria TMDL Project I – Beaches and Creeks in the San Diego Region*." The study results could be used to inform the Copermittees and the San Diego Water Board about the indictor bacteria water quality objective exceedance frequencies that occur in natural or reference watersheds.

Provision D.4 (Assessment Requirements) specifies the assessments that the Copermittees are required to perform, based on the monitoring data collected, and will be reported as part of the Annual Report for the Water Quality Improvement Plan implementation. Provision D.4 requires the Copermittees assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c, and A.2.a.

Provision D.4 specifies the assessments that Copermittees must perform for each Watershed Management Area to assess the effectiveness of each Copermittee's jurisdictional runoff management program and the Water Quality Improvement Plan. The effectiveness of each Copermittee's jurisdictional runoff management program and Water Quality Improvement Plan is measured through these types of assessments: (a) Receiving Waters Assessments (b) MS4 Outfall Discharges Assessments, (c) Special Studies Assessments, and (d) Integrated Assessment of Water Quality Improvement Plan.

Provision D.4.a requires the Copermittees to assess the status of receiving water conditions annually during the transitional monitoring period (during development of the Water Quality Improvement Plan) and after acceptance of the Water Quality Improvement Plan. The monitoring data collected pursuant to Provision D.1 will be evaluated, among other information, to assess the condition of a Watershed Management Area's streams, coastal waters, enclosed bays, harbors, estuaries, and lagoons. The focus of the receiving waters assessments is to measure progress toward the objective of the CWA to "*restore and maintain the chemical, physical, and biological integrity of the Nation's waters*" as the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program are implemented within a Watershed Management Area. Provision D.4.a is consistent with 40 CFR

122.42(c)(7) which requires the Copermittees to annually report the *"[i]dentification of water quality improvements or degradation."*

Provision D.4.b includes the MS4 outfall discharges assessment requirements. The focus of MS4 outfall discharges assessments is to determine if the Copermittees' are implementing programs that comply with the requirements of the CWA for MS4 permits to "*effectively prohibit non-stormwater discharges into the storm sewers*" and "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable.*" The monitoring data collected pursuant to Provisions D.2 will be evaluated, among other information, to assess the effectiveness of the transitional MS4 outfall field screening monitoring, the implementation of the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program. The MS4 outfall discharge assessments consist of Non-Storm Water Discharges Reduction Assessments and Storm Water Pollutant Discharges Reduction Assessments.

The Non-Storm Water Discharges Reduction Assessments are how each Copermittee will demonstrate that its jurisdictional runoff management program implementation efforts are achieving the CWA requirement to "*effectively prohibit non-stormwater discharges into the storm sewers.*" Provision D.4.b.(1) requires each Copermittee to assess and report on its illicit discharge detection and elimination program required pursuant to Provision E.2 to reduce and effectively prohibit non-storm water and illicit discharges into the MS4 within its jurisdiction. The Non-Storm Water Discharges Reduction Assessments include specific assessment requirements applicable to each Copermittee.

As each Copermittee collects and analyzes the data collected pursuant to dry weather MS4 outfall discharges monitoring requirements of Provisions D.2.a.(2) and D.2.b, Provision D.4.b.(1) requires each Copermittee to assess the progress, assess the effectiveness of its current actions, and identify modifications necessary to increase the effectiveness of its actions toward reducing and eliminating non-storm water and illicit discharges to its MS4. The findings from these assessments are expected to be utilized by the Copermittee as part of its procedures to prioritize the non-storm water discharges that will be addressed by its Illicit Discharge Detection and Elimination program required pursuant to Provision E.2.

The assessment requirements of Provision D.4.a.(1) are consistent with 40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(3) which require "*procedures…to investigate portions of the separate storm sewer system that, <u>based on the results of the field screen, or other appropriate information</u> [emphasis added], indicate a reasonable potential of contain illicit discharges or other sources of non-storm water*" as part of a "*program…to detect and remove…illicit discharges and improper disposal into the storm sewer.*" The assessment requirements of Provision D.4.a.(1) are also consistent with 40 CFR122.42(c)(1) requires the Copermittees to annually report the "*status of implementing the components of the storm water management program that are established as permit conditions.*"

The Storm Water Pollutant Discharges Reduction Assessment is how the Copermittees in each Watershed Management Area will demonstrate that their jurisdictional runoff management program implementation efforts are achieving the CWA requirement to "*reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable*." Provision D.4.b.(2) requires the Copermittees in each Watershed Management Area to assess and report the progress of the Copermittees' efforts to reduce pollutants in storm water discharges from the MS4s to the MEP. The Storm Water Pollutant Discharges Reduction Assessments include specific assessment requirements during both the transitional monitoring period and after acceptance of the Water Quality Improvement Plan applicable to the Watershed Management Area and each Copermittee.

As the Copermittees collect and analyze the data collected pursuant to wet weather MS4 outfall discharges monitoring requirements of Provisions D.2.a.(3) and D.2.c, Provision D.4.b.(2) requires the Copermittees to assess runoff conditions during the transitional period, and the progress of the Water Quality Improvement Plan strategies toward reducing pollutants in storm water from the MS4 to the MEP. The findings from these assessments are expected to be utilized by the Copermittees to identify any modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify sources of pollutants in storm water discharges from the MS4s, as well as focus, modify, and improve the water quality improvement strategies implemented by each Copermittee within its jurisdiction to reduce pollutants in storm water discharges to the MEP.

The assessment requirements of Provision D.4.b.(2) are consistent with 40 CFR 122.26(d)(2)(iii)(B) which requires "*[e]stimates of the annual pollutant load of the cumulative discharges to waters of the United States from all identified municipal outfalls…during a storm event…accompanied by a description of the procedures for estimating constituent loads and concentrations, including any modeling, data analysis, and calculation methods.*" The assessment requirements of Provision D.4.a.(2) are consistent with 40 CFR 122.26(d)(2)(v) which requires that each Copermittee assesses the *"estimated reductions in loadings of pollutants from discharges of municipal storm sewer constituents from municipal storm sewer systems expected as the result of the municipal storm water quality management program."* The assessment requirements of Provision D.4.b.(2) are also consistent with 40 CFR122.42(c)(1) requires the Copermittees to annually report the "*status of implementing the components of the storm water management program that are established as permit conditions.*"

Provision D.4.c includes the special studies assessment requirements. Performing special studies are how the Copermittees will address data gaps identified during the development of and updates to the Water Quality Improvement Plan. The relevant findings from the special studies assessments are expected to be incorporated as part of the applicable receiving water assessments, MS4 outfall discharge assessments,

and integrated water quality improvement assessments required in Provision D.4.a, D.4.b, and D.4.d, respectively.

The assessment requirements in Provision D.4.d are part of the iterative approach and adaptive management process required by Provision A.4. The Copermittees are required to integrate the data collected pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to re-evaluate the Water Quality Improvement Plan.

The monitoring data collected pursuant to Provisions D.1 and D.2, and the results of the assessment required pursuant to Provisions D.4.a-c, will be used to determine whether the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program are effective, or require modifications or improvements to become more effective to achieve the requirements of the CWA. The assessments required by Provision D.4.d are consistent with 40 CFR 122.42(c)(1) which requires that the Copermittees to report the *"[t]he status of implementing the components of the storm water management program that are established as permit conditions."*

E. Jurisdictional Runoff Management Programs

Purpose: Provision E includes the requirements for the jurisdictional runoff management programs to be implemented by each of the Copermittees. Compliance with the requirements for the jurisdictional runoff management programs will allow the Copermittees to demonstrate that they are implementing programs to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP. The jurisdictional runoff management program document prepared by each Copermittee will also provide the details for implementing the water quality improvement strategies identified in the Water Quality Improvement Plan specifically within its jurisdiction.

***Discussion*:** Implementation of the jurisdictional runoff management program requirements under Provision E is how the Copermittees "*effectively prohibit non-stormwater discharges into the storm sewer,*" and outlines the "*controls to reduce the discharge of pollutants to the maximum extent practicable"* consistent with the federal regulations under 40 CFR 122.26. The jurisdictional runoff management program is part of the "*comprehensive planning process*" that is required pursuant to 40 CFR 122.26(d)(2)(iv). Where the Water Quality Improvement Plan is the "*comprehensive planning process*" on a Watershed Management Area scale, requiring "*intergovernmental coordination,*" the jurisdictional runoff management program document is the "*comprehensive planning process*" on a jurisdictional scale that should be coordinated with the other Copermittees in the Watershed Management Area to achieve the goals of the Water Quality Improvement Plan.

The jurisdictional runoff management program requirements are included to provide each Copermittee criteria that can be used to demonstrate that its storm water management program is implementing the "*comprehensive planning process*" within its jurisdiction to "*effectively prohibit non-stormwater discharges into the storm sewers,*" and to identify and implement the most effective "*controls to reduce the discharge of pollutants to the maximum extent practicable"* in accordance with the performance standards given in the CWA.

Provision E includes the requirements for each of the components that must be included in the Copermittee's jurisdictional runoff management program document that will be implemented by the Copermittee within its jurisdiction. Implementation of the components of each Copermittee's jurisdictional runoff management program must incorporate the water quality improvement strategies identified by each Copermittee in the Water Quality Improvement Plans, described pursuant to Provision B.3.b.(1)(a).

More specific and detailed discussions of the requirements of Provision E are provided below.

Provision E.1 (Legal Authority Establishment and Enforcement) requires each Copermittee to establish and enforce sufficient legal authority to control discharges to the MS4 within its jurisdiction.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system*" and be able to demonstrate that it can "*operate pursuant to legal authority established by statute, ordinance or series of contracts.*" Provision E.1.a describes the minimum legal authorities each Copermittee must establish for itself within its jurisdiction to control discharges to its MS4. The requirements of Provision E.1.a are consistent with the requirements set forth in 40 CFR 122.26(d)(2)(i)(A)-(F).

The certification statement required from each Copermittee by Provision E.1.b is included to provide the San Diego Water Board additional documentation that each Copermittee has established the legal authorities consistent with Provision E.1.a and 40 CFR 122.26(d)(2)(i)(A)-(F), and the Copermittee can "*operate pursuant to legal authority established by statute, ordinance or series of contracts.*"

Provision E.2 (Illicit Discharge Detection and Elimination) requires each Copermittee to implement an illicit discharge detection and elimination program to effectively prohibit non-storm water discharges to the MS4 by actively detecting and eliminating illicit discharges and disposal into its MS4.

Provision E.2 establishes the minimum requirements that each Copermittee must implement within its jurisdiction to effectively prohibit non-storm water discharges from entering its MS4. The federal CWA requires permits for municipal storm sewer systems to "*effectively prohibit non-storm water discharges into the storm sewers*." The federal regulations (40CFR122.26(d)(2)(i)(B)) require each Copermitee to establish the legal authority to prohibit illicit discharges to its MS4s. Under 40 CFR 122.26(d)(2)(iv)(B), each Copermittee must implement a "*program…to detect and remove…illicit discharges and improper disposal into the storm sewer.*" The federal NPDES regulations, under 40 CFR 122.26(b)(2), define illicit discharges as "*any discharge to a municipal separate storm sewer that is not composed entirely of storm water*." Thus, non-storm water discharges are not authorized to enter the MS4 and are considered to be illicit discharges, unless authorized by a separate NPDES permit.

The Phase I Final Rule clarifies that non-storm water discharges through an MS4 are not authorized under the CWA (55 FR 47995):

> "*Today's rule defines the term "illicit discharge" to describe any discharge through a municipal separate storm sewer system that is not composed entirely of storm water and that is not covered by an NPDES permit. Such illicit discharges are not authorized under the Clean Water Act. Section 402(p)(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…Ultimately, such non-storm water discharges through a municipal separate*

storm sewer must either be removed from the system or become subject to an NPDES permit."

The federal NPDES requirements for the program to address illicit discharges must include "*inspections, to implement and enforce an ordinance, orders, or other similar means to prevent illicit discharges to the MS4*." The federal NPDES regulations also reference several categories of "*non-storm water discharges or flows* [which] *shall be addressed where such discharges are identified…as sources of pollutants to waters of the United States*." The Phase I Final Rule (55 FR 48037) further clarified the requirements of 40 CFR 122.26(d)(2)(iv)(B)(1) as follows:

"*EPA is clarifying that section 402(p)(3)(B) of the CWA (which requires permits for municipal separate storm sewers to 'effectively' prohibit non-storm water discharges) does not require permits for municipalities to prohibit certain discharges or flows of nonstorm water to waters of the United States through municipal separate storm sewers in all cases*."

In previous iterations of the municipal storm water permits for the San Diego Region, these categories were simply listed and referred to as categories of non-storm water discharges "not prohibited" unless identified as a source of pollutants. The Copermittees have often referred to these categories as "exempt" discharges. In both cases, however, the language is inconsistent with the federal CWA and NPDES regulations. And, the clarification provided in the Phase I Final Rule does not specifically state that such discharges are "not prohibited" or "exempt" or in any way authorized. The federal NPDES regulations do, however, state that specific categories of non-storm water discharges must be "*addressed*" if identified as "*sources of pollutants to waters of the United States*."

The language of Provision E.2.a has been revised to be fully consistent with the language of the CWA and the requirements of the federal regulations under 40 CFR 122.26(d)(2)(iv)(B)(1). Provision E.2.a requires each Copermittee to address <u>all</u> types of non-storm water discharges into its MS4 as illicit discharges, <u>unless</u> the discharge is authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to Provisions E.2.a.(1) through E.2.a.(5). Only non-NPDES-permitted non-storm water discharges identified as a category of non-storm water discharges under Provisions E.2.a.(1) through E.2.a.(5) <u>and</u> *not identified as a source of pollutants* do not have to be addressed as illicit discharges. Categories of non-storm water discharges that meet the requirements of Provisions E.2.a.(1) through E.2.a.(5) do not have to be addressed by the Copermittee as illicit discharges.

Several of the non-storm water categories listed in 40 CFR 122.26(d)(2)(iv)(B)(1) have not been included in Provisions E.2.a.(1) through E.2.a.(5), including: street wash water, landscape irrigation, irrigation water, and lawn watering. Because these are no longer included within the categories listed under Provisions E.2.a.(1) through E.2.a.(5), the Copermittees must prohibit these types of non-storm water discharges

from entering the MS4. This is consistent with the clarification of 40 CFR 122.26(d)(2)(iv)(B)(1) in the Phase I Final Rule (55 FR 48037), which states:

> "*[T]he Director may include permit conditions that either require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*."

Street wash water is a category of non-storm water discharges that was removed when the Third Term Permits were issued. Street wash water is a source of several pollutants (e.g., metals, oil and grease, petroleum hydrocarbons, chlorinated solvents, sediment) which are generated during the street washing process. The removal of this category requires the Copermittees to prohibit this type of non-storm water discharge from entering the MS4.

The landscape irrigation, irrigation water, and lawn watering categories, collectively referred to hereafter as "over-irrigation" discharges, were removed from the list of non-storm water discharge categories in the Fourth Term Orange County and Riverside County Permits. Non-storm water discharges resulting from over-irrigation have been found to be a source of several types of pollutants (e.g., nutrients, bacteria, pesticides, sediment) in receiving waters. The San Diego Water Board and the Copermittees have identified categories of non-storm water discharges associated with over-irrigation as a source of pollutants and conveyance of pollutants to the MS4 and waters of the United States in the following documents:

- **SmartTimer/Edgescape Evaluation Program (SEEP) Grant Application**

  The State Water Board allocated grant funding to the SEEP project grant application submitted in 2006, which targeted irrigation runoff by retrofitting areas of existing development and documenting the conservation and runoff improvements. The basis of this grant project is that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 is a source and conveyance of pollutants. In addition, the grant application indicated that this alteration of natural flows is impacting the beneficial uses of waters of the state and U.S. Results from the study indicate that that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 *is* a source and conveyance of pollutants. The results of this study can be applied broadly to any area where over-irrigation takes place. The grant application included the following statements:

  > "*Irrigation runoff contributes flow & pollutant loads to creeks and beaches that are 303(d) listed for bacteria indicators.*"
  >
  > "*Regional program managers agree that the reduction and/or elimination of irrigation-related urban flows and associated pollutant loads may be key to successful attainment of water quality and beneficial use goals as outlined in the San Diego Basin Plan and Bacteria TMDL over the long term.*"

"*Elevated dry-weather storm drain flows, composed primarily … of landscape irrigation water wasted as runoff, carry pollutants that impair recreational use and aquatic habitats all along Southern California's urbanized coastline. Storm drain systems carry the wasted water, along with landscape derived pollutants such as bacteria, nutrients and pesticides, to local creeks and the ocean. Given the local Mediterranean climate, excessive perennial dry season stream flows are an unnatural hydrologic pattern, causing species shifts in local riparian communities and warm, unseasonal contaminated freshwater plumes in the near-shore marine environment.*"

- **2006-2007 Orange County Watershed Action Plan Annual Reports**

The Watershed Action Plan Annual Reports for the 2006-2007 reporting period were submitted by the County of Orange, Orange County Flood Control District and Copermittees within the San Juan Creek, Laguna Coastal Streams, Aliso Creek, and Dana Point Coastal Streams Watersheds. San Juan Creek, Laguna Coastal Streams, Aliso Creek and Dana Point Coastal Streams are all currently 303(d) listed as impaired for indicator bacteria within their watersheds and/or in the Pacific Ocean at the discharge points of their watersheds. The Orange County Copermittees, within their Watershed Action Strategy Table for fecal indicator bacteria included the following:

"*Support programs to reduce or eliminate the discharge of anthropogenic dry weather nuisance flow throughout the…watershed. Dry weather flow is the transport medium for bacteria and other 303(d) constituents of concern.*"

Additionally, they state that "*conditions in the MS4 contribute to high seasonal bacteria propagation in-pipe during warm weather. Landscape irrigation is a major contributor to dry weather flow, both as surface runoff due to over-irrigation and overspray onto pavements; and as subsurface seepage that finds its way into the MS4*."

- **Fiscal Year 2008 Carlsbad Watershed Urban Runoff Management Program Annual Report**

The Carlsbad Watershed Urban Runoff Management Program Annual Report for Fiscal Year 2008 was submitted by the Carlsbad Watershed Copermittees (Cities of Carlsbad, Encinitas, Escondido, Oceanside, San Marcos, Solana Beach, and Vista, and the County of San Diego). In the Annual Report, the Carlsbad Watershed Copermittees stated the following:

"The Carlsbad Watershed Management Area (WMA) collective watershed strategy identifies bacteria, sediment, and nutrients as high priority water quality pollutants in the Agua Hedionda (904.3 – bacteria and sediment), Buena Vista (904.2 – bacteria), and San Marcos Creek (904.5 – nutrients) Hydrologic Areas.

Bacteria, sediment, and nutrients have been identified as potential discharges from over-irrigation."

- **2007-2008 San Diego Bay Watershed Urban Runoff Management Program Annual Report**

  The San Diego Bay Watershed Urban Runoff Management Program 2007-2008 Annual Report was submitted by the San Diego Bay Watershed Copermittees (Cities of Chula Vista, Coronado, Imperial Beach, La Mesa, Lemon Grove, National City, and San Diego, the County of San Diego, the Port of San Diego, and the San Diego County Airport Authority). In Appendix D of the Annual Report, titled "Likely Sources of Pollutants," the San Diego Bay Watershed Copermittees identified over-irrigation of lawns as a pollutant generating activity from business and/or residential land uses for bacteria, pesticides, and sediment.

- **Copermittee Public Education Materials**

  The Orange County Public Works *Tips for Landscape & Gardening* public education brochure states: "*Fertilizers, pesticides and other chemicals that are left on yards or driveways can be blown or washed into storm drains that flow to the ocean. Overwatering lawns can also send materials into storm drains*."

  The Riverside County Flood Control and Water Conservation District *Landscape and Garden* public education brochure states: *"Soil, yard wastes, over-watering and garden chemicals become part of the urban runoff mix that winds its way through streets, gutters and storm drains before entering lakes, rivers, streams, etc. Urban runoff pollution contaminates water and harms aquatic life!"*

- **Los Penasquitos Lagoon Sedimentation/Siltation TMDL Technical Report**

  The Los Penasquitos Lagoon Sedimentation/Siltation TMDL technical report was prepared for the City of San Diego and USEPA in October 2010. The technical report was included as a technical supporting document attached to the Sediment TMDL for Los Penasquitos Lagoon staff report prepared by the San Diego Water Board, dated June 13, 2012. Under the Source Assessment section, the technical report states the following:

  "*Dry weather loading is dominated by nuisance flows from urban land use activities such as car washing, sidewalk washing, and lawn over-irrigation, which pick up and transport sediment into receiving waters.*"

These documents confirm that non-storm water discharges associated with over-irrigation are a source of pollutants and should be addressed as illicit discharges to the MS4. Prohibiting non-storm water discharges associated with over-irrigation, however,

is not a new requirement for the Copermittees because it is also consistent with and required by the Water Conservation in Landscaping Act (AB 1881, Laird).

The Water Conservation in Landscaping Act required the Department of Water Resources (DWR) to prepare a Model Water Efficient Landscape Ordinance for use by local agencies (e.g. the Copermittees). All local agencies were required to adopt a water efficient landscape ordinance by January 1, 2010. Local agencies could adopt the Water Efficient Landscape Ordinance developed by DWR, or an ordinance considered at least as effective as the Model Ordinance. The Water Efficient Landscape Ordinance includes a requirement that local agencies prohibit runoff from irrigation (§ 493.2):

> "*Local agencies shall prevent water waste resulting from inefficient landscape irrigation by* <u>*prohibiting runoff from leaving the target landscape*</u> *[emphasis added] due to low head drainage, overspray, or other similar conditions where water flows onto adjacent property, non-irrigated areas, walks, roadways, parking lots, or structures. Penalties for violation of these prohibitions shall be established locally*."

Furthermore, non-storm water discharges from over-irrigation not only transport and discharge pollutants to receiving waters, but are also a likely source of the dry weather flows causing changes to habitat within and along the receiving water bodies. Examples of habitat changes from the dry weather flows include perennialization of ephemeral streams, and conversion of saltwater and brackish water marsh habitats to freshwater marsh habitats (e.g. Los Penasquitos Lagoon). Both of these examples have resulted in the promotion of invasive species in several areas of the San Diego Region.

The removal of the over-irrigation discharges categories does not require the Copermittees to strictly prohibit lawn and landscape irrigation, but does require the prohibition of excessive irrigation water that results in non-storm water discharges to the MS4. Non-storm water discharges to the MS4 from over-irrigation must be addressed as illicit discharges by the Copermittees pursuant to the requirements of Provision E.2.

The remaining non-storm water categories listed in 40 CFR 122.26(d)(2)(iv)(B)(1) are listed under Provisions E.2.a.(1) through E.2.a.(5) and generally fall into four categories: (1) non-storm water discharges subject to existing San Diego Water Board waste discharge requirements and NPDES permits; (2) non-storm water discharges generally not expected to be a source of pollutants to receiving waters; (3) non-storm water discharges likely to contain pollutants requiring some form of control to address the pollutants prior to discharging to the MS4; and (4) non-storm water discharges or flows associated with firefighting.

Provisions E.2.a.(1) and E.2.a.(2) include several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) for which the San Diego Water Board already has developed general waste discharge requirements and NPDES

permits to address the discharges. The Copermittees are only required to address these types of non-storm water discharges as illicit discharges if the Copermittees or the San Diego Water Board identifies these non-storm water discharges not having coverage under the applicable NPDES permit.

Provision E.2.a.(3) includes several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) which are generally not expected to be a source of pollutants to receiving waters, many of which originate from what are typically natural, uncontrollable sources. The Copermittees are only required to address these types of non-storm water discharges as illicit discharges if the Copermittees or the San Diego Water Board identifies these non-storm water discharges as a source of pollutants to receiving waters. Because many of these sources are generally uncontrollable, enforcing a prohibition may not be a possibility for the Copermittees. The Copermittees would be able to address these non-storm water discharges by preventing these non-storm water discharges from entering the MS4. This could potentially be achieved by sealing their MS4 structures so the discharges cannot enter the MS4.

Provision E.2.a.(4) includes several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) that are likely to contain pollutants requiring some form of control to address the pollutants prior to discharging to the MS4. At this time, an outright prohibition of these types of non-storm water discharges does not yet appear to be warranted. Thus, Provision E.2.a.(4) includes several requirements for the Copermittees to control the pollutants from these types of non-storm water discharges. This is consistent with the clarification of the federal regulations in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board has the authority to require the Copermittees to "*control any of these types of discharges where appropriate*."

Unlike non-storm water discharges from over-irrigation, these types of non-storm water discharges are not expected to occur in close proximity to each other or very frequently. Provided these types of non-storm water discharges are controlled as required in Provision E.2.a.(4), the Copermittees would only be required to address these types of non-storm water discharges as illicit discharges if the Copermittee or the San Diego Water Board identifies these non-storm water discharges as a source of pollutants to receiving waters.

Provision E.2.a.(5) includes specific requirements for fire fighting discharges and flows. The requirements for non-storm water discharges and flows associated with fire fighting have been separated into requirements for: a) non-emergency fire fighting discharges and flows, and b) emergency fire fighting discharges and flows.

The San Diego Water Board has found that discharges from building fire suppression system maintenance (e.g. fire sprinklers) contain waste and potentially a significant source of pollutants to receiving waters. As such, the San Diego Water Board is requiring these discharges be addressed as illicit discharges by the Copermittees.

Thus, the discharges to the MS4 are to be prohibited via ordinance, order or similar means. For other non-emergency firefighting discharges and flows (i.e. flows from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems), the Copermittees are required to develop and implement a program to address pollutants in these non-storm water discharges and flows. This is consistent with the clarification of the federal regulations in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board has the authority to require the Copermittees to "*control any of these types of discharges where appropriate*."

For emergency firefighting discharges and flows, the Phase I Final Rule (55 FR 48037) has clarified the requirements of 40 CFR 122.26(d)(2)(iv)(B)(1) pertaining to emergency firefighting flows and discharges, which states:

> "*In the case of firefighting it is not the intention of these rules to prohibit in any circumstances the protection of life and public or private property through the use of water or other fire retardants that flow into separate storm sewers*."

Thus, the requirements have been made to be consistent with the guidance provided by the Phase I Final Rule. The Order recommends that the Copermittees develop and encourage implementation of BMPs to reduce or eliminate the discharge of pollutants from emergency firefighting flows to the MS4s and receiving waters. The Order does not include any requirements that should be interpreted as requiring the implementation of BMPs for emergency firefighting flows to the MS4s and receiving waters.

The Copermittees are expected to review the dry weather MS4 outfall discharge monitoring data they collect to determine if and when there are non-storm water discharges to or from their MS4s that are a source of pollutants to receiving waters. If the Copermittees identify one of the types of non-storm water discharges listed in Provisions E.2.a.(1) through E.2.a.(4) as a source of pollutants to receiving waters based on the review and evaluation of monitoring data, Provision E.2.a.(6) requires the Copermittees to prohibit those categories of discharges from entering the MS4 through ordinance, order or similar means. In addition, Provision E.2.a.(6) clarifies that the San Diego Water Board may identify categories of non-storm water discharges or flows listed under Provisions E.2.a.(1) through E.2.a.(4) that must be prohibited.

Provision E.2.a.(6) also provides the Copermittees an option to propose controls to be implemented for the category of non-storm water discharges as part of the Water Quality Improvement Plan instead of prohibiting the category of non-storm water discharges. If the Water Quality Improvement Plan is accepted by the San Diego Water Board with the proposed controls, the Copermittees will not be required to prohibit the category of non-storm water discharges to their MS4s as long as the controls are implemented. This is consistent with the clarification of 40 CFR 122.26(d)(2)(iv)(B)(1) in the Phase I Final Rule (55 FR 48037), which states the San

Diego Water Board may "*require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*."

Finally, Provision E.2.a.(7) has been included in the requirements for non-storm water discharges to clarify that any non-storm water discharges to the Copermittee's MS4, even those identified pursuant to Provisions E.2.a.(1) through E.2.a.(4), must be reduced or eliminated, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit. Provision E.2.a.(7) is consistent with the requirements of CWA section 402(p)(3)(B)(ii) and 40 CFR 122.26(d)(1)(v)(B), as clarified in the Phase I Final Rule (55 FR 47995) that "*[u]ltimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit*." However, the reduction or elimination of those non-storm water discharges are expected to be achieved as feasible, in accordance with the priorities in the Water Quality Improvement Plan and when the resources are available to the Copermittee.

Consistent with 40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(1), each Copermittee must implement a "*program…to prevent illicit discharges to the municipal storm sewer system*" and "*detect…illicit discharges and improper disposal into the storm sewer.*" Provision E.2.b requires each Copermittee to implement measures to prevent and detect illicit discharges and connections to its MS4 as part of its illicit discharge detection and elimination program.

As part of the program to prevent and detect illicit discharges to the MS4, 40 CFR 122.26(d)(2)(iv)(B)(2) requires "*procedures to conduct on-going field screening activities during the life of the permit, including areas or locations that will be evaluated by such field screens*." As part of the procedures, each Copermittee is required to maintain an updated map of its entire MS4 and the corresponding drainage areas within its jurisdiction. Having knowledge about where inlets, access points, connections with other MS4s, and outfalls are located is necessary for each Copermittee to track, identify, and eliminate illicit discharges and connections. Thus, Provision E.2.b.(1) of the Order specifies that the map must include the segments of the storm sewer system owned, operated, and maintained by the Copermittee, and include locations of all known inlets, connections with other MS4s, and outfalls to the Copermittee's MS4. The remaining requirements of Provision E.2.b are consistent with the requirements of 40 CFR 122.26(d)(2)(iv)(B)(3)-(7) related to implementing measures to prevent and detect illicit discharges and connections to the MS4.

Provision E.2.c requires each Copermittee to conduct field screening and monitoring of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4. Field screening is a required element of the program to detect and eliminate illicit discharges and connections to the MS4, pursuant to 40 CFR 122.26(d)(2)(iv)(B)(2). The field screening requirement will be implemented through the dry weather MS4 outfall discharge monitoring required under Provisions D.2.a.(2) and D.2.b.(1).

Provision E.2.d specifies the measures each Copermittee must implement to eliminate illicit discharges and connections to its MS4. Elimination of illicit discharges and connections to the MS4 is consistent with the requirement of 40 CFR 122.26(d)(2)(iv)(B) "*to detect and remove [emphasis added]…illicit discharges and improper disposal into the storm sewer*" and will achieve the CWA requirement for MS4 permits to "*effectively prohibit non-storm water discharges into the storm sewers*."

Generally, each Copermittee is responsible for prioritizing its efforts to eliminate non-storm water and illicit discharges or connections to its MS4 based on field screening and monitoring data, NALs, illicit discharge investigation records, and the known or suspected sources. Sources of non-storm water and illicit discharges or connections must be eliminated by enforcing the legal authority established by each Copermittee pursuant to Provision E.1.

Provision E.3 (Development Planning) requires each Copermittee to use its land use and planning authority to implement a development planning program to control and reduce the discharge of pollutants in storm water from new development and significant redevelopment to the MEP. Proper implementation of the development planning program will also contribute toward effectively prohibiting non-storm water discharges from development projects to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." As part of the management program, 40 CFR 122.26(d)(2)(iv)(A)(2) requires "*planning procedures including a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment*."

Land development generally alters the natural conditions of the land by removing vegetative cover, compacting soil, and/or placement of concrete, asphalt, or other impervious surfaces. These impervious surfaces concentrate urban pollutants (such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not found in high concentrations in the natural environment. Pollutants that accumulate on impervious surfaces are not easily biodegraded nor subject to natural treatment processes.

Impervious surfaces greatly affect the natural hydrology of the land because they do not allow natural infiltration and treatment of storm water runoff to take place. Instead, storm water runoff from impervious surfaces is typically directed through pipes, curbs, gutters, and other hardscape into receiving waters, with little treatment, at significantly increased volumes and accelerated flow rates over what would occur naturally. The increased pollutant loads, storm water volume, discharge rates and velocities, and discharge durations from the MS4 adversely impact stream habitat by causing accelerated, unnatural erosion and scouring within creek bed and banks. Placement

of impervious surfaces also encapsulates "good" sediment (such as sand, gravel, rocks and cobbles) that would normally replenish creek beds and banks to help stabilize them. Collectively, these changes to natural hydrologic processes are termed hydrograph modification, or hydromodification.

Hydromodification, which is caused by both altered storm water flow and altered sediment flow regimes, is largely responsible for degradation of creeks, streams, and associated habitats in the San Diego Region. In an ongoing study by the Stormwater Monitoring Coalition to assess the health of streams throughout Southern California, researchers found that three of the four highest risk stressors to creeks (percent sands and fines present, channel alteration, and riparian disturbance) were related to physical habitat.[29] Researchers studying flood frequencies in Riverside County have found that increases in watershed imperviousness of only 9-22 percent can result in increases in peak flow rates for the two-year storm event of up to 100 percent.[30] Such changes in runoff have significant impacts on channel morphology.

In addition, a technical report issued by the Southern California Coastal Water Research Project (SCCWRP) stated that "*[r]ecent studies indicate that California's intermittent and ephemeral streams are more susceptible to the effects of hydromodification than streams from other parts of the United States. Physical degradation of stream channels in the central and eastern United States can initially be detected when watershed impervious cover approaches 10 percent, although biological effects (which may be more difficult to detect) may occur at lower levels. In contrast, initial response of streams in the semi-arid portions of California appears to occur between 3 and 5 percent impervious cover*."[31] These studies highlight the extent to which impacts originating from impervious surfaces created by land development are responsible for the degradation of creek and stream habitat.

This is consistent with what USEPA has noted, that "*[m]ost stormwater runoff is the result of the man-made hydrologic modifications that normally accompany development. The addition of impervious surfaces, soil compaction, and tree and vegetation removal result in alterations to the movement of water through the environment. As interception, evapotranspiration, and infiltration are reduced and precipitation is converted to overland flow, these modifications affect not only the characteristics of the developed site but also the watershed in which the development is located. Stormwater has been identified as one of the leading sources of pollution for all waterbody types in the United States. Furthermore, the impacts of stormwater*

[29] Assessing the Health of Southern California Streams, Stormwater Monitoring Coalition, Fact Sheet
[30] Schueler and Holland, 2000. Storm Water Strategies for Arid and Semi-Arid Watersheds (Article 66). The Practice of Watershed Protection.
[31] Stein, E. and Zaleski, S., 2005. Technical Report 475, Managing Runoff to Protect Natural Streams: The Latest Development on Investigation and Management of Hydromodification in California. December 30, 2005.

pollution are not static; they usually increase with more development and urbanization."[32]

Reducing the impact from the increased pollutant loads and flows generated by impervious surfaces within a watershed is essential to protecting and restoring the integrity of the receiving waters. Provision E.3 includes the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment*." The requirements of Provision E.3 will 1) minimize the generation and discharge of pollutants in storm water from the MS4, and 2) minimize the potential of storm water discharges from the MS4 from causing altered flow regimes and excessive downstream erosion in receiving waters.

The requirements of Provision E.3.a include the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment*" applicable to all development projects, regardless of size or purpose of development. In general, all development projects must implement onsite BMPs to remove pollutants from runoff prior to its discharge to any receiving waters, as close to the pollutant generating source as possible, and structural BMPs must not be constructed within waters of the U.S.

Furthermore, the onsite BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors (e.g. mosquitos, rodents, and flies). If not properly designed or maintained, certain BMPs implemented or required by municipalities may create a habitat for vectors. Monitoring studies conducted by the California Department of Public Health (CDPH) have documented that mosquitoes opportunistically breed in structural storm water BMPs, particularly those that hold standing water for over 96 hours. Certain site design features that hold standing water may similarly produce mosquitoes.

Structural BMPs and site design features should incorporate design, construction, and maintenance principles to promote drainage within 96 hours to minimize standing water available to mosquitoes. Nuisances and public health impacts resulting from vector breeding can be prevented with close collaboration and cooperative effort between municipalities and local vector control agencies and the CDPH during the development and implementation of storm water runoff management programs. The CDPH also has issued guidance for BMP implementation that will minimize potential nuisances and public health impacts resulting from vector breeding.[33]

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[32] USEPA, 2007. Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices, December 2007.

[33] California Department of Public Health, 2012. Best Management Practices for Mosquito Control in California. (http://www.cdph.ca.gov/HealthInfo/discond/Documents/BMPforMosquitoControl07-12.pdf)

All development projects are required to implement source control BMPs that will minimize the generation of pollutants. Additionally, each development project must implement, where applicable and feasible, low impact development (LID) BMPs to mimic the natural hydrology of the site and retain and/or treat pollutants in storm water runoff prior to discharging to and from the MS4.

The LID Center defines LID as "*a comprehensive land planning and engineering design approach with a goal of maintaining and enhancing the pre-development hydrologic regime of urban and developing watersheds.*"[34] LID designs seek to control storm water at the source, using small-scale integrated site design and management practices to mimic the natural hydrology of a site, retain storm water runoff by minimizing soil compaction and impervious surfaces, and disconnect storm water runoff from conveyances to the storm drain system.

LID BMPs may utilize interception, storage, evaporation, evapotranspiration, infiltration, and filtration processes to retain and/or treat pollutants in storm water before it is discharged from a site. Because of these numerous options, the San Diego Water Board expects that every development project will be able to implement some form of LID BMPs. Examples of LID BMPs include using permeable pavements, rain gardens, rain barrels, grassy swales, soil amendments, and native plants.

Provision E.3.a also includes requirements for all development projects to, where feasible, landscape with native and/or low water use plants to minimize the discharge of non-storm water discharges associated with excessive irrigation, as well as harvest (i.e., storage) and use precipitation to promote the concept of utilizing storm water as a resource.

While all development projects are subject to the requirements of Provision E.3.a, Provision E.3.b identifies Priority Development Projects that exceed given size thresholds and/or fit under specific use categories. Priority Development Projects are required to incorporate specific performance criteria for structural BMPs into the project plan to reduce the generation of pollutants, and address potential impacts from hydromodification.

The Priority Development Project categories are based on the requirements of the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), and do not differ significantly from the Fourth Term Permit for San Diego County. Furthermore, the Priority Development Project categories are consistent with Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), and Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit).

[34] www.lowimpactdevelopment.org

Because of the impact of relatively small increases in watershed impervious surfaces to receiving waters, Provision E.3.b.(1)(c)(iv) has been updated to include large driveways that are 5,000 square feet or more. The San Diego Water Board finds that large driveways can exacerbate altered flow regimes if not properly controlled.

Provision E.3.b.(3) describes projects that are exempt from Priority Development Project status. These include new or retrofit paved sidewalks, bicycle lanes, or trails that are designed and constructed to direct runoff to vegetated areas or be hydraulically disconnected from paved areas. The exemptions have been provided to encourage these types of projects because they provide multiple environmental benefits, such as promoting walking rather than driving, which will in turn improve air quality. Additionally, retrofitting of existing alleys, streets, or roads are exempt from Priority Development Project status if they are constructed using USEPA Green Streets guidance.[35] By doing so, retrofitting of these types of projects is encouraged. The San Diego Water Board recognizes that there are spatial constraints associated with these projects, and implementation of structural BMPs are not always feasible.

For development projects identified as Priority Development Projects, the requirements of Provision E.3.c are the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment.*" Provisions E.3.c.(1)-(3) describe the performance criteria for the structural BMPs that must be implemented for each Priority Development Project defined by Provision E.3.b.

Provision E.3.c.(1) describes the storm water pollutant control BMP requirements that must be implemented by all Priority Development Projects. The purpose of Provision E.3.c.(1) is to reduce pollutants in storm water runoff to the MEP from Priority Development Projects before it is discharged to the MS4. Of all the available treatment processes available, retention of storm water, and therefore capture of the pollutants in the storm water, will achieve 100 percent pollutant removal efficiency for the volume of storm water retained. No other method of treatment can achieve 100 percent pollutant removal efficiency. Thus, retention of as much storm water onsite is the most effective way to reduce pollutants in storm water discharges to, and consequently from the MS4, and controls pollutants in storm water discharges from a site to the MEP.

Under Provision E.3.c.(1)(a), retention of the pollutants in the runoff produced from the 85th percentile storm event ("design capture volume") is the design standard to which Priority Development Projects must comply. Since the 85th percentile storm event has previously been used as the numeric design standard for treatment control BMPs, this same size storm event is used as the numeric design standard for storm water

[35] "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).

retention. This is the MEP standard recognized by the San Diego Water Board and is consistent with the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), as well as Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit), and Los Angeles Water Board Order No. R4-2012-0175 (Los Angeles County MS4 Permit).

The 85th percentile storm event is the event that has a precipitation total greater than or equal to 85 percent of all storm events over a given period of record in a specific area or location. For example, to determine what the 85th percentile storm event is in a specific location, all 24 hour storms that have recorded values over a 30 year period would be tabulated and a 85th percentile storm would be determined from this record (i.e. 15 percent of the storms would be greater than the number determined to be the 85th percentile storm). Most jurisdictions in the San Diego Region have already developed isopluvial maps that can provide this type of information. The 85th percentile storm might be determined to be a number such as 1.0 inch, and this would be multiplied by the total area of the project footprint producing runoff to calculate the design capture volume. The Priority Development Project designer would then select a system of BMPs that would retain (i.e. intercept, store, infiltrate, evaporate, or evapotranspire) the pollutants contained in the design capture volume onsite.

Retention BMPs are necessary to capture and retain pollutants generated from a Priority Development Project. In a recent study performed by SCCWRP in the Los Angeles Region, they found "*that the magnitude of constituent load associated with storm water runoff depends, at least in part, on the amount of time available for pollutant build-up on land surfaces. The extended dry period that typically occurs in arid climates such as southern California maximizes the time for constituents to build-up on land surfaces, resulting in proportionally higher concentrations and loads during initial storms of the season*."[36] This implies that the "first flush" of a rainy season and the first storm events after long antecedent dry periods tend to have the highest pollutant loads. Capturing and retaining the pollutant loads of the "first flush" of a rainy season and the first storm events after long antecedent dry periods will reduce a significant portion of the pollutants in storm water discharged to and from the MS4.

The San Diego Water Board, however, acknowledges that in some situations retention of the full design capture volume onsite may not be technically feasible. In this event, the Copermittee may allow the Priority Development Project to use biofiltration BMPs to treat 1.5 times the design capture volume not reliably retained onsite, or biofiltration BMPs with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite.

[36] Stein, E.D., Tiefenthaler, L.L., and Schiff, K.C., 2007. Technical Report 510, Sources, Patterns and Mechanisms of Storm Water Pollutant Loading from Watershed and Land Uses of the Greater Los Angeles Area, California, USA. March 20, 2007.

The 1.5 multiplier is based on the finding in the Ventura County Technical Guidance Manual that biofiltration of 1.5 times the design capture volume not retained onsite will provide approximately the same pollutant removal as retention of the design capture volume on an annual basis.[37] This standard is consistent with the Los Angeles Water Board's Los Angeles County and Ventura County municipal storm water permits (Order Nos. R4-2012-0175 and R4-2010-0108, respectively). The flow-thru design of 0.75 times the portion of the design capture volume not reliably retained onsite is consistent with the San Diego Water Board's Orange County and Riverside County municipal storm water permits (Order Nos. R9-2009-0002 and R9-2010-0016, respectively). In either case, the biofiltration BMPs must be designed with an appropriate hydraulic loading rate to maximize storm water retention and pollutant removal, as well as to prevent erosion, scour, and channeling within the BMP. Each Copermittee is required to update its BMP Design Manual to provide guidance for hydraulic loading rates and other biofiltration design criteria necessary to maximize storm water retention and pollutant removal.

The San Diego Water Board further recognizes that, in addition to not being technically feasible, retention of the full design capture storm onsite may be cost prohibitive, or may not provide as much water quality benefit to the Watershed Management Area as would implementing BMPs elsewhere in the watershed. Thus, Provision E.3.c.(1)(b) allows for the use of a combination of onsite retention BMPs, and the implementation of an Alternative Compliance Program described in Provision E.3.c.(3). Provision E.3.c.(3) is discussed in more detail below.

If the full design capture volume is not retained onsite either because biofiltration is not technically feasible, or a Copermittee grants a Priority Development Project permission to utilize the Alternative Compliance Program, then the pollutants in the portion of the design capture volume that are not reliably retained onsite must still be reduced to the MEP. Thus, flow-thru treatment control BMPs are required to be implemented on Priority Development Projects in addition to the retention BMPs. The requirements of Provisions E.3.c.(1)(a)(ii)[a]-[c] include the performance standards for flow-thru treatment control BMPs, consistent with the Fourth Term Permits in the San Diego Region.

Whereas the purpose of the requirements under Provision E.3.c.(1) is to reduce pollutants in storm water runoff to the MEP, the purpose of the requirements under Provision E.3.c.(2) is to maintain or restore more natural hydrologic flow regimes to prevent accelerated, unnatural erosion in downstream receiving waters, also to the MEP standard. Provision E.3.c.(2) describes hydromodification management BMP requirements that must be implemented by all Priority Development Projects.

[37] Ventura Countywide Stormwater Management Program. 2011. Ventura Technical Guidance Manual, Manual Update, 2011.

The performance criteria for the implementation of hydromodification management BMPs on Priority Development Projects are consistent with the requirements in the Fourth Term Permits for Orange and Riverside Counties (Order Nos. R9-2009-0002 and R9-2010-0016, respectively). Modifications to the Orange County and Riverside County Hydromodification Management Plans (HMPs) will likely be minor, or may not be necessary. The HMP for San Diego County will likely require some minor modifications to incorporate the requirements of Provision E.3.c.(2) and become consistent with the Orange County and Riverside County HMPs. The San Diego Water Board does not, however, expect that it will be necessary for the San Diego County Copermittees to develop a new approach or significantly re-write the San Diego County HMP. This is because the premise of the hydromodification management BMP requirements, which are to control storm water runoff conditions (flow rates and durations) for Copermittee-defined range of flows, is unchanged from all Fourth Term Permits in the San Diego Region.

Provision E.3.c.(2)(a) requires that post-project runoff conditions mimic the *pre-development* runoff conditions, and not the *pre-project* runoff conditions. Fundamentally, the San Diego Water Board believes that using a hydrology baseline that approximates that of an undeveloped, natural watershed is the only way to facilitate the return of more natural hydrological conditions to already built-out watersheds, and ultimately improved stream health. On the other hand, using the *pre-project* hydrology as a baseline for redevelopment projects results in propagating the unnatural hydrology of urbanized areas. Propagating the urbanized flow regime does not support conditions for restoring degraded or channelized stream segments, and would forever sentence such streams to the degraded state. Furthermore, reducing the volume of storm water runoff associated with the urbanized flow regime will also result in reducing the discharge of pollutants into receiving waters, since storm water runoff from impervious surfaces contains untreated pollutants.

The San Diego Water Board understands that approximating the pre-development runoff condition associated with a redevelopment site is not necessarily straightforward because factors such as natural grade and native vegetation for the site cannot be precisely known. Therefore, the San Diego Water Board does not expect project designers to estimate historical conditions associated with redevelopment sites. Rather, the San Diego Water Board expects project designers and the Copermittees to approximate pre-development runoff conditions using the parameters of a *pervious* area rather than an *impervious* area. This means that for redevelopment sites, approximating pre-development runoff conditions equates to using existing onsite grade and assuming the infiltration characteristics of the underlying soil. A redevelopment Priority Development Project must not use runoff coefficients of concrete or asphalt to estimate pre-development runoff conditions. Rather, redevelopment projects must use available information pertaining to existing underlying soil type (such as soil maps published by the National Resource Conservation Service), onsite existing grade, and any other readily available pertinent information to estimate pre-development runoff conditions.

The San Diego Water Board understands, indeed asserts, that the pre-development hydrology of an area in question can only be roughly estimated and cannot be precisely known. However, using the hydrology of a natural condition, even if not precisely known, will provide significant benefit to receiving waters over using the hydrology associated with pervious (developed) surfaces. Therefore in order to achieve the goals of the Clean Water Act, which are to "*restore and maintain the chemical, physical, and biological integrity of the nation's waters* [emphasis added]," the most appropriate standard to use for hydromodification management is the standard associated with the pre-development condition.

Provision E.3.c.(2)(b) requires Priority Development Projects to avoid known critical sediment yield areas or implement measures that would allow coarse sediment to be discharged to receiving waters, such that the natural sediment supply is unaffected by the project. This is necessary because coarse sediment supply is as much an issue for causing erosive conditions to receiving streams as are accelerated flows.

The San Diego Water Board recognizes that in some situations implementing the hydromodification management BMP requirements fully onsite may not be technically feasible, may be cost prohibitive, or may not provide any overall water quality benefits to the Watershed Management Area. Thus, Provision E.3.c.(2)(c) allows for the use of a combination of onsite hydromodification management BMPs and alternative compliance options described in Provision E.3.c.(3).

Provision E.3.c.(3) allows for alternative compliance in instances where the Copermittee determines that offsite measures will have a greater overall water quality benefit for the Watershed Management Area than if the Priority Development Project were to implement structural BMPs onsite. Consequently, watershed-specific structural BMP requirements are present in this Order in the form of allowable compliance offsite. The Alternative Compliance Program to Onsite Structural BMP Implementation Provision is intended to integrate with the Copermittees' planning efforts in the Water Quality Improvement Plans.

The Alternative Compliance Program is an option for Priority Development Projects where the governing Copermittee has participated in the development of a Watershed Management Area Analysis as part of the Water Quality Improvement Plan (described in Provision B.3.b.(4)). Such an approach is consistent with the latest findings in hydromodification management by the scientific community. In a Technical Report entitled *Hydromodification Assessment and Management in California,*[38] the report states:

> *"An effective [hydromodification] management program will likely include combinations of on-site measures (e.g., low-impact development techniques, flow-control basins), in-stream measures (e.g., stream habitat restoration), floodplain*

[38] 2012. ED Stein, F Federico, DB Booth, BP Bledsoe, C Bowles, Z Rubin, GM Kondolf, A Sengupta. Technical Report 667. Southern California Coastal Water Research Project. Costa Mesa, CA.

and riparian zone actions, and off-site measures. Off-site measures may include compensatory mitigation measures at upstream locations that are designed to help restore and manage flow and sediment yield in the watershed."

Consistent with the ideas brought forth in the report, in the Watershed Management Area Analysis of Provision B.3.b.(4), which is optional, the Copermittees will develop watershed maps that include as much detail about factors that affect the hydrology of the watershed as is available. Such factors included identification of areas suitable for infiltration, coarse sediment supply areas, and locating stream channel structures and constrictions. Once these factors are mapped and studied, the Copermittees can identify areas in the watershed where candidate projects may be implemented that are expected to improve water quality in the watershed by providing more opportunity for infiltration, slowing down storm water flows, or attenuation of pollutants naturally via healthy stream habitat. These candidate projects may be in the form of retrofitting existing development, rehabilitating degraded stream segments, identifying regional BMPs, purchasing land to preserve valuable floodplain functions, and any other project(s) that the Copermittees identify.

Under the Alternative Compliance Program, Priority Development Projects may be allowed to fund, partially fund, or implement a candidate project, in lieu of implementing structural BMPs onsite, if they enter into a voluntary agreement with the governing Copermittee permitting this arrangement. Project proponents may also propose an alternative project not previously identified by the Copermittees. In either case, whether a project proponent implements a candidate project identified by the Copermittees or a separate alternative compliance project, the governing Copermittee must determine that implementation of the project will have a greater overall water quality benefit for the Watershed Management Area than fully implementing structural BMPs onsite. If alternative compliance involves funding or implementing a project that is outside the jurisdiction of the governing Copermittee, then that Copermittee may enter into an inter-agency agreement with the appropriate jurisdiction.

Finally, Provision E.3.c.(2)(d) allows Priority Development Projects to be exempt from the hydromodification management BMP requirements if there is no threat of erosion to downstream receiving waters (i.e. the receiving stream is concrete lined from the point of discharge all the way to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean). If the Copermittees believe that more exemptions are warranted, then they must perform the optional Watershed Management Area Analysis of Provision B.3.b.(4). Additional exemptions other than those specified in this Order may be established on a watershed basis, provided the Copermittees perform the analysis, provide supporting rationale for the exemptions, and complete the Water Quality Improvement Plan approval process pursuant to Provision F.1.

Provisions E.3.c.(4) and E.3.c.(5) were included under the BMP requirements applicable to all development projects in the Fourth Term Permits for San Diego, Orange, and Riverside Counties (Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016, respectively). In this Order, the long-term BMP maintenance and

infiltration and groundwater protection requirements apply to structural BMPs implemented by Priority Development Projects only.

Provision E.3.d requires the Copermittees to update their BMP Design Manual as needed to incorporate the requirements of Provision E.3. The BMP Design Manual is formerly known as the Standard Storm Water Mitigation Plan, or SSMP, and was renamed so that the title has a more accurate description of the document content. The contents of the BMP Design Manual are largely unchanged from the previous Standard Storm Water Mitigation Plans required under the Fourth Term Permits. The BMP Design Manual fulfills the 40 CFR 122.26(d)(2)(iv)(A)(2) requirement that the Copermittee's development planning program includes "*a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment*."

As part of the "*planning procedures,*" 40 CFR 122.26(d)(2)(iv)(A)(2) requires the procedures to "*address controls to reduce pollutants in discharges from municipal separate storm sewers after construction is completed*." The requirements applicable to the implementation and oversight of structural BMPs at Priority Development Projects are provided under Provision E.3.e.

Proper installation of the structural BMPs approved for a Priority Development Project is necessary to ensure that pollutants in storm water discharges will be reduced to the MEP after the project is completed. In addition to the proper installation of structural BMPs, the maintenance of structural BMPs on Priority Development Projects is necessary to ensure that pollutants in storm water discharges will continue to be reduced to the MEP. Provision E.3.e.(1) includes the minimum requirements that each Copermittee must implement to ensure structural BMPs are properly installed and will be properly maintained.

The requirements under Provision E.3.e.(2)-(3) are necessary to demonstrate each Copermittee is implementing a program that complies with Provisions E.3.b-c and E.3.e.(1), and ensure structural BMPs at Priority Development Project will continue to be able to reduce pollutants in storm water discharges to the MEP.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary for any development projects to compel compliance with the requirements of Provision E.3 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.3.f requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

<u>Provision E.4 (Construction Management)</u> requires each Copermittee to implement a construction management program to control and reduce the discharge of pollutants in

storm water from construction sites to the MEP. Proper implementation of the construction management program will also contribute toward effectively prohibiting non-storm water discharges from construction sites to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." As part of the management program, 40 CFR 122.26(d)(2)(iv)(D) requires "*a program to implement and maintain structural and non-structural best management practices to reduce pollutants in storm water runoff from construction sites to the municipal storm sewer system.*"

Construction sites can be significant sources of sediment, trash, and other pollutants to receiving waters. Although sediment is naturally occurring in the natural environment, the discharge of sediment under unnatural conditions is problematic to receiving waters. Fine sediment in creeks causes high turbidity that interferes with the functionality of native flora and fauna in local creeks. For example, turbidity interferes with both photosynthesis of water-philic plants, as well as successful foraging and reproduction of benthic macroinvertebrates. Sediment can also make it difficult for fish to breathe because it clogs fish gills. Other pollutants such as heavy metals or pesticides can adhere to sediment and are transported to receiving waters during storm events, where they dissolve in the water column and become bioavailable to aquatic organisms. Sediment is recognized as a major stressor to surface waters and is responsible for the impairment of several lagoons and creeks in the San Diego Region.

Provision E.4 includes requirements that each Copermittee must implement to minimize the discharge of sediment and other pollutants from construction sites to the MS4 within its jurisdiction. The requirements under Provision E.4 are consistent with the Fourth Term Permits for San Diego, Orange, and Riverside Counties. Therefore, Copermittees are expected to implement the requirements seamlessly, with minimal changes to their existing construction management programs. The Copermittees, however, are given more flexibility to run their programs as needed to maximize efficiency, and also to be consistent with the Water Quality Improvement Plan for the Watershed Management Area.

As part of the construction management program, 40 CFR 122.26(d)(2)(iv)(D)(1) requires "*procedures for site planning which incorporate consideration of potential water quality impacts.*" Provision E.4.a describes the minimum elements each Copermittee is required to include as part of the construction site planning and project approval process. The construction site planning and approval process is based primarily on ensuring each project had an adequate site-specific pollution control, construction BMP, and/or erosion and sediment control plan that will be implemented to minimize the discharge of pollutants in storm water to the MEP, and minimize impacts to receiving waters.

The requirements under Provision E.4.b provide the data and information necessary to identify "*priorities for inspecting sites and enforcing control measures*" required pursuant to 40 CFR 122.26(d)(2)(iv)(D)(3). Under Provision E.4.b, each Copermittee must identify construction sites that are considered a high threat to downstream surface waters. Designation of "high threat to water quality" construction sites will necessitate the Copermittees to develop criteria to identify such sites. Provision E.4.b.(2) describes a list of factors that must be considered when the Copermittee considers threat to water quality. For example, a Copermittee must identify sites as "high threat to water quality" if it is located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions, according to the Water Quality Improvement Plan. This ensures that construction management program implementation is compatible with the Copermittee's identified highest priority water quality conditions.

Pursuant to 40 CFR 122.26(d)(2)(iv)(D)(2) each Copermittee is required describe "*requirements for nonstructural and structural best management practices*" at construction sites. Provision E.4.c includes the types of construction site BMPs that the Copermittees must implement, or require the implementation of, at each construction site to reduce pollutants in storm water discharges to the MEP.

Each Copermittee is expected to require the implementation of appropriate BMPs given specific site conditions, the season and likelihood of rain events, and construction phase (i.e. grading vs. vertical construction). This means that throughout the life of the project construction, the appropriate BMPs will vary, especially if the construction of the project spans multiple wet seasons. As opposed to describing specific minimum BMPs that must be implemented, the Order describes major BMP categories that should be considered for each site.

Each Copermittee is expected to use its 20 years of storm water experience and knowledge to require implementation of appropriate BMPs from the various categories at each construction site within its jurisdiction. For example, the San Diego Water Board expects that each site will be required to implement erosion control and sediment control. The San Diego Water Board also expects each Copermittee to require implementation of active/passive sediment treatment systems at sites where other BMPs have been tried and are known to be inadequate, and discharges of sediment are causing or contributing to water quality impairment downstream. Each Copermittee is granted flexibility in specifying the minimum level of BMP requirements at each site, but the San Diego Water Board expects each site to be capable of controlling pollutants in storm water discharges to the MEP and preventing illicit discharges.

The requirements under Provision E.4.d are necessary to demonstrate that each Copermittee is implementing a program that complies with Provisions E.4.a and E.4.c and ensure BMPs at construction sites will reduce pollutants in storm water discharges to the MEP.

Provision E.4.d does not include minimum required inspection frequencies for construction sites. Each Copermittee must use its experience and knowledge to specify an appropriate inspection frequency for both high priority and lower priority sites in their jurisdictional runoff management program documents, and in accordance with the Water Quality Improvement Plan. Appropriate inspection frequencies may vary by Copermittee, but the San Diego Water Board expects that the stated frequency will be adequate for each Copermittee to properly oversee the construction sites within its jurisdiction, confirm BMPs are implemented to reduce pollutants in storm water discharges from constructions sites to the MEP, and make needed changes to its program on an ongoing basis as necessary.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary for any development projects to compel compliance with the requirements of Provision E.4 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.4.e requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Provision E.5 (Existing Development Management) requires each Copermittee to implement an existing development management program to control and reduce the discharge of pollutants in storm water from areas of existing development to the MEP. Proper implementation of the existing development management program will also contribute toward effectively prohibiting non-storm water discharges from areas of existing development to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." Within 40 CFR 122.26(d)(2)(iv)(A) and (C), the management program is required to reduce impacts on receiving waters and reduce pollutants in storm water discharges to the MEP from commercial and residential areas, industrial facilities, and municipal facilities.

Commercial and residential areas, industrial facilities, and municipal facilities must be addressed by each Copermittee with the existing development management program required under Provision E.5. All other areas within each Copermittee's jurisdiction should be either undeveloped open space, or areas that are being developed or under construction. Areas being developed or under construction will be addressed by the Copermittee under the requirements of Provision E.3 (Development Planning) or Provision E.4 (Construction Management).

Areas of existing development typically include impervious surfaces such as sidewalks, driveways, roads, and rooftops, which generate and concentrate pollutants

(such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not found in high concentrations in the natural environment. Pollutants that accumulate on impervious surfaces are not easily biodegraded or not subject to natural treatment processes. When it rains, these pollutants are transported in storm water runoff from these impervious surfaces into receiving waters, resulting in poor water quality and degradation of beneficial uses.

In addition to the generation of pollutants, areas of existing development have generally altered the natural conditions of the land and removed vegetative cover, reduced the perviousness of the surface, and reduced the capacity of storm water that can be intercepted, captured, stored, infiltrated, evaporated, and/or evapotranspired. The alteration of the natural conditions and the impervious surfaces associated with areas of existing development causes water quality problems due to the alteration of natural flow regimes within the watersheds; resulting in hydromodification of channels, streams, and habitats that exist within or adjacent to the areas of existing development.

Thus, storm water discharges from areas of existing development are responsible for poor water quality, degraded habitats, and hydromodified channels throughout the developed portions of the watersheds in the San Diego Region. To improve the health and functionality of the receiving waters in a Watershed Management Area, land use practices and the amount of impervious surfaces in areas of existing development must change to reduce the various impacts caused by hydromodification and pollutants from storm water runoff generated in developed areas. Each Copermittee must be aggressive to address pollutant sources and runoff from areas of existing development to be able to reduce pollutants in storm water discharges from the MS4 to the MEP.

There is some overlap in the requirements under Provision E.5 with the requirements under Provisions E.2 (Illicit Discharge Detection and Elimination), E.3 (Development Planning), and E.4 (Construction Management). Illicit discharges frequently originate from areas of existing development. New development projects, when completed will become some type of residential, commercial, industrial or municipal existing development. Redevelopment projects are, by definition, redeveloping areas of existing development. And, redevelopment projects become construction sites located in areas of existing development. Much of the data and information collected, inspections performed, and enforcement actions taken for the requirements under Provisions E.2 to E.4 may also be utilized by the existing development management program. The requirements under Provision E.5, however, are focused primarily on reducing pollutants generated in areas of existing development that can be transported in storm water runoff and discharged to and from the MS4.

The requirements under Provision E.5 build upon existing program elements being implemented by the Copermittees. Provision E.5 is generally consistent with the existing development requirements of the Fourth Term Permits for Orange and Riverside Counties (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), but

modified to provide more flexibility to implement the programs so resources can be better focused toward addressing the highest priority water quality conditions identified in the Water Quality Improvement Plans.

For a Copermittee to properly manage areas of existing development, having knowledge of what development exists within its jurisdiction is essential. Provision E.5.a requires each Copermittee to maintain a watershed-based inventory of all the existing development within its jurisdiction. This requirement is necessary for each Copermittee to implement the requirements of Provision E.5.b-e.

As opposed to just maintaining separate inventories based on the type of site, each Copermittee must maintain a watershed-based inventory that includes all types of existing development within its jurisdiction. By utilizing a watershed-based inventory, the Copermittees within a Watershed Management Area can combine their inventories and review the inventories by watershed in addition to by jurisdiction. Pollutant sources and strategies for abatement can then be evaluated on a watershed level, as opposed to evaluating sources and strategies strictly by type of site.

Provision E.5.a includes the information that must be included in the inventory. Provision E.5.a.(1) specifies what facilities or areas must be included in the inventory. A commercial type of existing development may be identified in the inventory as a facility (e.g. individual building, individual business) or an area (e.g. shopping center, commercial zone). An industrial type of existing development must be identified in the inventory by facility (e.g. individual industrial entity). A municipal type of existing development must be identified in the inventory by facility, with a list of specific municipal facilities that must be included in the inventory. A residential type of existing development must be identified by areas to be designated by the Copermittee. For each of the facilities and areas identified in the Copermittee's inventory developed pursuant to Provision E.5.a.(1), Provision E.5.a.(2) specifies the information that must be included in the description for the facility or area.

Provision E.5.a.(3) requires each Copermittee to maintain an updated map showing the location of inventoried existing development, watershed boundaries, and water bodies. This requirement was included because this information is expected to help the Copermittees in a Watershed Management Area identify and prioritize sources of pollutants and/or stressors in areas of existing development that contribute toward the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Knowledge of the existing development that are likely to be sources of pollutants contributing to the highest priority water quality conditions is expected to be a key element in the Copermittees' development of the water quality improvement strategies that will be included in the Water Quality Improvement Plans. The strategies described in the Water Quality Improvement Plans will direct efforts within the existing development management programs implemented by each Copermittee.

Pursuant to 40 CFR 122.26(d)(2)(iv)(A) each Copermittee is required describe "*structural and source control measures to reduce pollutants*" in storm water runoff discharged from areas of existing development. Provision E.5.b includes the BMP implementation and maintenance requirements that the each Copermittee must require at areas of existing development to reduce pollutants in storm water discharges to the MEP. The San Diego Water Board, however, recognizes that BMP implementation and maintenance for residential areas will require much more education and encouragement through less authoritative measures than for commercial, industrial and municipal facilities and areas. Thus, the BMP implementation and maintenance requirements have been separated between requirements under Provision E.5.b.(1) for commercial, industrial and municipal facilities and areas, and Provision E.5.b.(2) for residential areas.

Most of the requirements in Provision E.5.b are consistent with the related requirements in the Fourth Term Permits. The level of specificity, however, has been changed to allow each Copermittee the flexibility to implement its program to achieve maximum efficiency, and to perform functions that will address the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Each Copermittee is expected to require the implementation of appropriate BMPs to address the expected pollutants from each facility or area. The Third and Fourth Term Permits described specific minimum BMPs that must be implemented at various sites. This Order, however, requires each Copermittee to designate minimum BMPs themselves and require implementation. Consistent with the Fourth Term Permits, each Copermittee is required to maintain, or require the maintenance of, all BMPs as needed.

The BMP implementation and maintenance requirements include a schedule of operation and maintenance activities for the MS4 and related structures (such as catch basins, storm drain inlets, and detention basins), as well as public streets and roads. Public streets and roads specifically include public unpaved roads. The San Diego Water Board identified, through investigations and complaints, sediment discharges from unpaved roads as a significant source of water quality problems in the San Diego Region. Inspection activities conducted by the San Diego Water Board since the Third Term Permits have found a lack of source control for many unpaved roads within the jurisdiction of the Copermittees.

Unpaved roads are a source of sediment that can be discharged in runoff to receiving waters, especially during storm events. Erosion of unpaved roadways occurs when soil particles are loosened and carried away from the roadway base, ditch, or road bank by water, wind, traffic, or other transport means. Exposed soils, high runoff velocities and volumes, sandy or silty soil types, and poor compaction increase the potential for erosion.

Road construction, culvert installation, and other maintenance activities can disturb the soil and drainage patterns to streams in undeveloped areas, causing excess runoff

and thereby erosion and the release of sediment. Poorly designed unpaved roads can act as preferential drainage pathways that carry runoff and sediment into natural streams, impacting water quality. In addition, other public works activities along unpaved roads have the potential to significantly affect sediment discharge and transport within streams and other waterways, which can degrade the beneficial uses of those waterways.

USEPA also recognizes that discharges from unpaved roads pose a significant potential threat to water quality. USEPA guidance[39] emphasizes the threat of unpaved roads to water quality:

> "*Dirt and gravel roads are a major potential source of these pollutants [sediment] and pollutants that bind to sediment such as oils, nutrients, pesticides, herbicides, and other toxic substances. Many roads have unstable surfaces and bases. Roads act like dams, concentrating flows that accelerate erosion of road materials and roadsides. Both unstable surfaces and accelerated erosion then lead to sediment and dust.*"

There are several guidance documents, developed by the USEPA,[40] the US Forest Service,[41] the University of California,[42] and others, that include design and construction specifications and BMPs that are readily available for implementation by public entities. Implementing design and other source control BMPs for unpaved roads in the region is necessary to reduce and minimize the impacts of sediment discharged during storm events from unpaved roads to the MS4s and receiving waters.

Provision E.5.c describes existing development site inspection frequency, content, and tracking that each Copermittee must incorporate into their existing development management programs. The requirements under Provision E.5.c are necessary to demonstrate each Copermittee is implementing a program that complies with Provision E.5.b and ensure BMPs implemented in areas of existing development will reduce pollutants in storm water discharges to the MEP. Provision E.5.c has been modified to include a minimum of once every 5 years for all inventoried facilities and areas of existing development, utilizing one or more methods of inspection.

In addition to onsite inspections, the methods of inspection have been expanded to include drive-by inspections. Inspections may be performed by the Copermittee's municipal and contract staff, or by volunteer monitoring or patrol programs. Volunteer monitoring or patrol programs are not expected to enforce the Copermittee's

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[39] USEPA, 2006. Environmentally Sensitive Maintenance for Dirt and Gravel Roads. Gesford and Anderson, USEPA-PA-2005.
[40] Ibid
[41] US Forest Service, 1996. Forest Service Specifications for Construction of Roads & Bridges. EM-7720-100. Revised August 1996.
[42] University of California Division of Agriculture and Natural Resources, 2007. Rural Roads: A Construction and Maintenance Guide of California Landowners. Publication 8262.

ordinances, or to inspect areas or facilities where members of the public are not allowed access. Volunteer monitoring or patrol programs must be trained by the Copermittee, and are only expected to collect visual observations. By utilizing drive-by inspections and volunteer monitoring or patrol programs, the Copermittees will be able to maximize and efficiently use their resources to identify and address sources of pollutants in areas of existing development.

The municipal and contract staff of each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial, industrial, and municipal facilities and areas in its inventoried existing development pursuant to Provision E.5.c.(1)(a)(iv). An "equivalent" of at least 20 percent means if any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspections may count toward the total annual inspection requirement. Linear municipal facilities (i.e. MS4 linear channels, sanitary sewer collection systems, streets, roads and highways) in the Copermittee's existing development inventory are not subject to the inspection frequency requirement of Provision E.5.c.(1)(a)(iv).

The inspection content specified in Provision E.5.c.(2)(a) includes the information required to be collected during an inspection by any method. The inspection content specified in Provision E.5.c.(2)(b) includes additional information that must be collected when a Copermittee's municipal or contract staff perform an onsite inspection. Provision E.5.c.(3) specifies the information that each Copermittee must maintain in its existing development inspection records.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary to compel compliance with the requirements of Provision E.5 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.5.d requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Provisions E.5.e.(1)-(2) specifically require the Copermittee to identify areas of existing development as candidates for retrofitting, and streams, channels, and/or habitats as candidates for rehabilitation. Provisions E.5.e.(1)-(2) are based on the retrofitting requirements of the Fourth Term Permits for Orange and Riverside Counties, but modified to also include identifying projects to rehabilitate channels within areas of existing development. The requirements have also been modified to be more focused on utilizing these types of projects for addressing the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Interest and opportunity to retrofit areas of existing development and rehabilitate channels located in areas of existing development has been observed in several programs the San Diego Water Board oversees (e.g., CWA Section 401 Water Quality

Certification program, supplemental environmental projects, and grant programs). Each jurisdiction has miles and miles of streets that could be retrofitted to become green streets. Reshaping landscaped areas from convex to concave configurations can detain storm water instead of directing runoff as quickly as possible to the MS4. Retrofit projects could also include simply replacing impervious surfaces with permeable surfaces.

Retrofitting projects do not necessarily have to be expensive. Retrofitting projects could be as simple as redirecting downspouts from roofs to pervious or landscaped areas instead of to hardscaped areas discharging directly to the MS4, providing rain barrels to harvest storm water from downspouts for use at a later time, or planting more trees in areas with little vegetation to provide canopy that can intercept storm water. The San Diego Water Board encourages the Copermittees to identify simple, low-cost retrofitting opportunities that can be easily implemented, in addition to other more expensive retrofitting and channel rehabilitation projects.

Rehabilitation of channels, streams, and/or habitat will require more significant planning and resources to implement. There are, however, also abundant opportunities to rehabilitate channels, streams and/or habitats in or adjacent to areas of existing development. Each Watershed Management Area likely has several creeks and stream reaches that have been undergrounded, artificially hardened, or hydromodified that could be rehabilitated to be more sustainably configured, which would slow down storm water flows and potentially have more assimilative capacity for pollutants while still being supportive of designated beneficial uses.

The San Diego Water Board recognizes that it may be infeasible to implement retrofitting or channel rehabilitation projects within certain areas of a Copermittee's jurisdictions. For such areas, the Copermittee must instead identify, develop, and implement regional retrofitting and channel rehabilitation projects (i.e. projects that can retain and/or treat storm water from one or more areas of existing development) adjacent to and/or downstream of the areas of existing development.

Provisions E.5.e.(1)-(2) do not require the implementation of retrofitting and rehabilitation projects, but do require the Copermittee to develop a program with strategies to facilitate the implementation of these types of projects in areas of existing development. The strategies are expected to include allowing and encouraging Priority Development Projects to implement retrofitting types of projects as a means of compliance with the structural BMP performance criteria requirements of Provisions E.3.c.(1) and E.3.c.(2).

Provision E.6 (Enforcement Response Plans) requires each Copermittee to develop an Enforcement Response Plan as part of its jurisdictional runoff management program document. Proper implementation of the Enforcement Response Plans is necessary to effectively prohibit non-storm water discharges to the MS4, and reduce the discharge of pollutants in storm water from the MS4 to the MEP.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system*" and be able to demonstrate that it can "*operate pursuant to legal authority established by statute, ordinance or series of contracts*" to control the discharge of non-storm water and pollutants in storm water to and from its MS4. Pursuant to 40 CFR 122.26(d)(2)(i)(E) each Copermittee is specifically required to have the legal authority to "*[r]equire compliance with conditions in ordinances, permits, contracts or order*s."

The requirements under Provision E.6 are necessary to demonstrate that each Copermittee can enforce its legal authority to *"effectively prohibit non-stormwater discharges"* and "*reduce the discharge of pollutants to the maximum extent practicable*" as well as "*[r]equire compliance with conditions in ordinances, permits, contracts or order*."

The Enforcement Response Plan required under Provision E.6 will serve as a reference for the Copermittee and the San Diego Water Board to determine if consistent enforcement actions are being implemented to achieve timely and effective compliance from all public and private entities that are not in compliance with the Copermittee's ordinances, permits, or other requirements. The Enforcement Response Plan must contain clear direction for the Copermittee to take immediate enforcement action, when appropriate and necessary, in their illicit discharge detection and elimination, development planning, construction management, and existing development management programs.

If the entities subject to the Copermittee's legal authority do not implement appropriate corrective actions in a timely manner, or if violations repeat, the Copermittee must take progressively stricter responses to enforce its legal authority and achieve compliance with its ordinances, permits, or other requirements to *"effectively prohibit non-stormwater discharges"* and "*reduce the discharge of pollutants to the maximum extent practicable.*"

<u>Provision E.7 (Public Education and Participation)</u> requires each Copermittee to implement a public education and participation program. Proper implementation of the public education and participation program as part of its jurisdictional runoff management program will contribute toward effectively prohibiting non-storm water discharges to the MS4, and toward the reduction of pollutants in storm water from the MS4 to the MEP.

Provision E.7 establishes the minimum requirements that each Copermittee must implement to engage members of the public as part of its jurisdictional runoff management program. In the Fourth Term Permits, the public education program requirements and the public participation requirements were included as separate jurisdictional runoff management program components. In this Order, the public education requirements have been consolidated with the public participation requirements, as both sets of requirements are related to the engagement of the public

by each Copermittee. Engagement of the public is critical for the success of each Copermittee's jurisdictional runoff management program.

The Copermittees have been implementing public education programs for the last 20 years, which are now well established. The specificity of expected public education program elements of the Fourth Term Permits has been removed. For the most part, the public education program requirements in Provision E.7.a have been reduced to a set of requirements that are specifically included in the federal regulations under 40 CFR 122.26(d)(2)(iv)(A)(6), 122.26(d)(2)(B)(6) and 122.26(d)(2)(D)(4), which should already be incorporated into each Copermittee's existing public education program. Each Copermittee is expected to utilize the information and data collected from the monitoring and assessments conducted within the Watershed Management Area, and from its inventories and inspections to best direct its public education program resources toward addressing the highest priority water quality conditions identified within the Water Quality Improvement Plan.

According to 40 CFR 122.26(d)(2)(iv), public participation is required to be included as part of the "*comprehensive planning process*", which includes the development and implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs. The requirements under Provision E.7.b specify the opportunities that the public must be provided to be involved in the "*comprehensive planning process*", as required by to 40 CFR 122.26(d)(2)(iv).

Provision E.8 (Fiscal Analysis) requires each Copermittee to secure the resources and provide an analysis of the resources that will be necessary to implement the requirements of the Order. Adequate fiscal resources are necessary for a jurisdictional runoff management program to effectively prohibit non-storm water discharges to the MS4, and reduce pollutants in storm water from the MS4 to the MEP.

According to 40 CFR 122.26(d)(2)(vi), each Copermittee is responsible for providing "*a fiscal analysis of the necessary capital and operation and maintenance expenditures necessary to accomplish the activities*" required by this Order, including "*a description of the source of funds that are proposed to meet the necessary expenditures, including legal restrictions on the use of such funds.*" The fiscal analysis requirements of Provision E.8 are consistent with 40 CFR 122.26(d)(2)(vi).

The San Diego Water Board has chosen not to require a description of fiscal benefits realized from implementation of the jurisdictional runoff management programs. This is a recommendation from the National Association of Flood and Stormwater Management Agencies.[43] For instance, the fiscal analysis requirements do not address city-wide fiscal benefits of protection (e.g., public health, tourism, property values, economic activity, beneficial uses, etc.), even though many costs currently

[43] National Association of Flood and Stormwater Management Agencies. 2006. *Guidance for Municipal Stormwater Funding.* Prepared under a grant provided by the USEPA.

reported to the San Diego Water Board are for related activities. This type of assessment may help Copermittees improve the allocation of resources and it may help the Copermittees secure adequate funding for the program. Qualitative assessments, however, could be overly subjective and most Copermittees likely lack the ability to provide accurate quantitative assessments. The San Diego Water Board encourages the Copermittees to consider means for conducting assessments of fiscal benefits derived from the programs. Such assessments could be conducted on a regional scale similar to studies of program costs conducted by the State Water Board.[44]

[44] State Water Board, 2005. NPDES Stormwater Cost Survey.

F. Reporting

Purpose: Provision F includes the requirements for the documents and reports that the Copermittees must prepare and provide to the San Diego Water Board. The documents prepared by the Copermittees and provided to the San Diego Water Board and made available to the public will provide the documentation that the Copermittees are complying with the requirements of the Order.

***Discussion*:** Provision F requires the Copermittees to prepare several documents and reports that must be provided to the San Diego Water Board and made available to the public. The reporting requirements have been significantly reduced compared to the Fourth Term Permit reporting requirements. The reduction in reporting requirements was recommended by the San Diego County Copermittees in the Report of Water Discharge submitted in June 2011.

More specific and detailed discussions of the requirements of Provision F are provided below.

Provision F.1 (Water Quality Improvement Plans) requires the Copermittees in each Watershed Management Area to develop and submit a Water Quality Improvement Plan in accordance with the requirements of Provision B.

Of all the requirements of Provision F, the Water Quality Improvement Plans will likely be the documents requiring the most significant effort to develop. The content of the Water Quality Improvement Plans, however, is expected to include content that should already have been developed for the Watershed Plans and several elements that are included in the Monitoring and Reporting Programs required under the Fourth Term Permits.

Because the Water Quality Improvement Plan is part of the "*comprehensive planning process which involves public participation*," Provision F.1 includes requirements to give multiple opportunities to the public to provide input on the content of the plans.

Provision F.1.a.(1) specifies the elements that the Copermittees must include in the public participation process for the development of the Water Quality Improvement Plans. In order for the public to be aware of the opportunities to provide input, Provision F.1.a.(1)(a) requires the Copermittees to develop a publicly available and noticed schedule of the opportunities for the public to participate and provide comments during the development of the Water Quality Improvement Plan. These opportunities are when the public can provide the data, information, and recommendations that the Copermittees can consider during the development of the Water Quality Improvement Plans.

The San Diego Water Board recognizes, however, that the Copermittees cannot be expected to incorporate all the data, information, and recommendations that the public

may provide into the Water Quality Improvement Plans. The Copermittees will have to review the data, information, and recommendations received and make some decisions on what to incorporate into the Water Quality Improvement Plans. Before the Copermittees finalize their decisions, members of the public should be allowed to review the Copermittees' decisions. Thus, Provision F.1.a.(1)(b) requires the Copermittees to form a Water Quality Improvement Consultation Panel (Panel).

The Panel will consist of a member from the environmental community and a member from the development community familiar with the Watershed Management Area. A representative from the San Diego Water Board staff will also be part of the Panel. The Copermittees may choose to include additional members, but the Panel is only required to include three panel members.

The Panel will serve as an additional public participation and input mechanism during the development of the Water Quality Improvement Plans. The knowledge and expertise from these Panel members are expected to provide the Copermittees valuable direction during their decision-making process. The Copermittees will review the content of their planned submittals with the Panel members to receive recommendations. If the Panel provides recommendations, the Copermittees must consider revisions to the Water Quality Improvement Plan submittals.

The San Diego Water Board recognizes that the development of multiple Water Quality Improvement Plans concurrently may limit the ability of the public to review and provide comments to the Copermittees. Thus, Provision F.1.a.(1)(c) requires the Copermittees to coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public time and opportunity to participate during the development of the Water Quality Improvement Plans.

Provision F.1.a.(2) requires the Copermittees to develop and submit the first Water Quality Improvement Plan component, in accordance with the requirements of Provision B.2, which includes the identification of the priority water quality conditions and potential water quality improvement strategies. The public must be provided an opportunity to provide data, information and recommendations to be utilized in the development and identification of the priority water quality conditions and potential water quality improvement strategies for the Watershed Management Area. The Copermittees must consult with the Panel and consider making revisions. The Copermittees may submit the requirements of Provision B.2 as early as 6 months and no later than 12 months after the commencement of coverage under this Order. After the requirements of Provision B.2 are submitted to the San Diego Water Board, the public will be provided another opportunity to provide comments.

Provision F.1.a.(3) requires the Copermittees to develop and submit the second Water Quality Improvement Plan component, in accordance with the requirements of Provision B.3, which includes the identification of the numeric goals for the highest priority water quality conditions identified for the Watershed Management Area, and the strategies that will be implemented to achieve the potential numeric goals. The

Copermittees may also develop the Optional Watershed Management Area Analysis, in accordance with the requirements of Provision B.3.b.(4), as part of this submittal. The public must be provided an opportunity to provide data, information and recommendations to be utilized in the development and identification of the numeric goals and water quality improvement strategies for the Watershed Management Area. The Copermittees must consult with the Panel and consider making revisions. The Copermittees may submit the requirements of Provision B.3 as early as 9 months and no later than 18 months after the commencement of coverage under this Order. After the requirements of Provision B.3 are submitted to the San Diego Water Board, the public will be provided another opportunity to provide comments.

Finally, Provision F.1.b describes the process for the submittal and implementation of the Water Quality Improvement Plans. The complete Water Quality Improvement Plans are required to be submitted by the Copermittees within 24 months after the commencement of coverage under this Order. The San Diego Water Board will provide the public an opportunity to provide comments on each complete Water Quality Improvement Plan.

The San Diego Water Board will review each Water Quality Improvement Plan and the public comments received to determine if the Copermittees have submitted a Water Quality Improvement Plan that meets the requirements of Provision B. If a Water Quality Improvement Plan does not meet the requirements of Provision B, the Copermittees will be considered out of compliance and directed in writing by the San Diego Water Board Executive Officer to correct the deficiencies.

When a Water Quality Improvement Plan meets the requirements of Provision B, the San Diego Water Board will determine whether to hold a public hearing or to limit public input to submittal of written comments before accepting the Water Quality Improvement Plan. Implementation of the Water Quality Improvement Plan must begin within 30 days of acceptance.

The San Diego Water Board expects that any deficiencies in the Water Quality Improvement Plan will be identified either in the public comments or during the review by the San Diego Water Board before implementation begins. In the event any deficiencies are identified after the implementation of the Water Quality Improvement Plan, Provision F.1.b.(7) clarifies that the San Diego Water Board maintains the right to require the Copermittees to correct any deficiencies that may be identified.

<u>Provision F.2 (Updates)</u> requires the Copermittees to update specific documents that the Copermittees will utilize to implement the requirements of this Order.

Each Copermittee is required to continue implementing a jurisdictional runoff management program, as required under Provision E. Implementation of each Copermittee's jurisdictional runoff management program is directed by its jurisdictional runoff management program document. Provision F.2.a requires each Copermittee to update its jurisdictional runoff management program document to be consistent with

the requirements of Provision E concurrent with the submittal of the Water Quality Improvement Plan.

Likewise, each Copermittee must continue to require new development and redevelopment projects to implement BMPs to control pollutants in storm water runoff. The control of pollutants in storm water runoff from development and redevelopment projects within each Copermittee's jurisdiction is guided and directed by its BMP Design Manual, formerly known as a Standard Storm Water Mitigation Plan (SSMP). Provision F.2.b requires each Copermittee to update its BMP Design Manual to be consistent with the requirements of Provision E.3 concurrent with the submittal of the Water Quality Improvement Plan.

In general, the requirements of the Order should not necessitate a complete rewrite of each Copermittee's jurisdictional runoff management program document or BMP Design Manual, as was required by the Third Term Permits. The jurisdictional runoff management program and BMP Design Manual requirements of this Order are not significantly different than the requirements of the Fourth Term Permits. Thus, only sections of the Order which are new or have been significantly changed should warrant revisions to specific sections of the Copermittee's jurisdictional runoff management program document and BMP Design Manual.

Finally, the Water Quality Improvement Plans are expected to require updates as the iterative approach and adaptive management process included in the Water Quality Improvement Plan, as required under Provision B.5, is implemented by the Copermittees. Provision F.2.c.(1) requires the Copermittees to implement a public participation process for the proposed updates, review the proposed updates with the Panel, and submit the updates to the Water Quality Improvement Plan as part of the Annual Reports required under Provision F.3.b.

Also, because TMDLs are likely to be developed, adopted and approved during the term of the Order, Provision F.2.c.(2) has been included to expedite the incorporation of TMDLs into the Copermittees' Water Quality Improvement Plans as part of the update process, potentially before the Order is re-opened to incorporated the requirements of the new TMDLs.

Provision F.3 (Progress Reporting) requires the Copermittees to report on the progress of implementing the Water Quality Improvement Plans.

The requirements of Provision F.3 are to report the progress toward improving water quality that the Copermittees are achieving with the implementation of the Water Quality Improvement Plans and each Copermittee's jurisdictional runoff management program. The Progress Report Presentations required under Provision F.3.a are included to provide the Copermittees an opportunity to communicate directly with the San Diego Water Board and the public. The Progress Report Presentations will also provide the members of the San Diego Water Board and members of the public an opportunity to become more acquainted with the Copermittees and their projects and

programs to address non-storm water and storm water discharges into and from their MS4s.

The Annual Report requirements of Provision F.3.b are a consolidation of several reporting requirements from the Fourth Term Permits, including the Jurisdictional Runoff Management Program Annual Reports, the Watershed Annual Reports, and the Monitoring and Reporting Program Annual Reports. Furthermore, the Annual Report requirements are consistent with the requirements under 40 CFR 122.42(c).

Pursuant to 40 CFR 122.42(c), "*[t]he operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the Director…must submit an annual report*", which must include the following:

(1) *The status of implementing the components of the storm water management program that are established as permit conditions* [40 CFR 122.42(c)(1)];

(2) *Proposed changes to the storm water management programs that are established as permit conditions* [40 CFR 122.42(c)(2)];

(3) *Revisions, if necessary, to the assessment of controls and fiscal analysis* [40 CFR 122.42(c)(3)];

(4) *A summary of data, including monitoring data, that is accumulated throughout the reporting year* [40 CFR 122.42(c)(4)];

(5) *Annual expenditures and budget for year following each annual report* [40 CFR 122.42(c)(5)];

(6) *A summary describing the number and nature of enforcement actions, inspections, and public education programs* [40 CFR 122.42(c)(6)];

(7) *Identification of water quality improvements or degradation* [40 CFR 122.42(c)(7)].

Under the Fourth Term Permits, each Copermittee is responsible for submitting a Jurisdictional Runoff Management Program Annual Report; the Copermittees in each designated watershed are responsible for submitting a Watershed Annual Report; and the Copermittees from each county are responsible for submitting a Monitoring and Reporting Program Annual Report.

There are 39 Copermittees in the San Diego Region, each required to prepare and submit a Jurisdictional Runoff Management Program Annual Report. There are 9 designated watersheds in San Diego County, 6 designated watersheds in Orange County, and 1 designated watershed in Riverside County for a total of 16 designated watersheds, each requiring a Watershed Annual Report. There are 3 sets of Copermittees in 3 counties in the San Diego Region, requiring Copermittees from each county to prepare and submit a Monitoring and Reporting Program Annual Report.

Thus each Copermittee is currently required to prepare, or participate in the preparation of at least 3 annual reports. In addition, the San Diego County Copermittees are required to prepare and submit a Regional Urban Runoff Management Plan Annual Report.

In total, there are 59 annual reports that are prepared by the Copermittees and submitted to the San Diego Water Board for the Fourth Term Permits. The preparation of these annual reports requires significant time and resources from each Copermittee, which could otherwise be expended on actions that could improve water quality within its jurisdiction. In turn, significant time and resources are required from the San Diego Water Board staff to review these reports, which could otherwise be expended on working directly with the Copermittees to improve their implementation efforts toward restoring and protecting water quality.

Until the Water Quality Improvement Plans are developed, there will be a transitional period during which the Copermittees will continue to implement their existing jurisdictional runoff management programs. There will also be a transitional period during which the Copermittees will implement the transitional monitoring and assessment requirements of Provision D. During the transitional period, the Copermittees will submit annual reports pursuant to the requirements of Provisions F.3.b.(1) and F.3.b.(2).

Provision F.3.b.(1) includes the transitional annual reporting requirements for each Copermittee's jurisdictional runoff management program. The reporting of the jurisdictional runoff management program implementation efforts have been reduced to a single 2-page form. Each Copermittee is required to complete and submit a Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D or a revised form accepted by the San Diego Water Board) no later than October 31 of each year for each jurisdictional runoff management program reporting period (i.e. July 1 to June 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted. The Jurisdictional Runoff Management Program Annual Report Form will certify that each Copermittee has implemented its jurisdictional runoff management program in accordance with the requirements of Provision E. Each Copermittee may choose to continue to utilize and submit the jurisdictional runoff management program annual reporting format of its current Order until the first Water Quality Improvement Plan Annual Report is required to be submitted.

Provision F.3.b.(2) includes the transitional annual reporting requirements for the transitional monitoring and assessment program for each Watershed Management Area. The Copermittees in the Watershed Management Area are required to submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted. The Transitional Monitoring and Assessment Program Annual Report is required to include

the transitional period monitoring data collected pursuant to Provisions D.1.a and D.2.a, and the findings from the transitional period findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

Provision F.3.b.(3) includes the Water Quality Improvement Plan Annual Report requirements. Only one Water Quality Improvement Plan Annual Report is required for each of the ten (10) Watershed Management Areas designated under Provision B.1, which is a significant reduction in the number of annual reports required to be prepared and submitted by the Copermittees. The Water Quality Improvement Plan Annual Report will document the Copermittees' efforts to implement the Water Quality Improvement Plan. Each Water Quality Improvement Plan Annual Report will be focused primarily on reporting the analysis of the monitoring data collected pursuant to Provisions D.1-D.3 during the reporting period, and the assessments that are required pursuant to Provision D.4 based on the data. The monitoring data analyses and the assessments that are provided in the Water Quality Improvement Plan Annual Report will be the core of the report. The reporting of the jurisdictional runoff management program implementation efforts have been reduced to a single 2-page form, and will no longer be the primary focus of the reporting requirements as in the Third and Fourth Term Permits.

Each Copermittee will continue to prepare and submit a Jurisdictional Runoff Management Program Annual Report Form as part of the Water Quality Improvement Plan Annual Report to certify that each Copermittee has implemented its jurisdictional runoff management program in accordance with the requirements of Provision E. Instead of reviewing a voluminous report from each Copermittee, as was required under the Third and Fourth Term Permits, the San Diego Water Board will conduct audits of each Copermittee's jurisdictional runoff management program to investigate and confirm the information provided by each Copermittee on its Jurisdictional Runoff Management Program Annual Report Form. The audits will allow the San Diego Water Board to become more familiar with the each Copermittee's jurisdictional runoff management program, and each Copermittee will become more informed about the expectations of the San Diego Water Board.

The reduction in the number and content of the Water Quality Improvement Plan Annual Reports should result in significant time, cost and resource savings for the Copermittees, as well as the San Diego Water Board. Those savings should offset a significant portion of any additional costs that may be incurred to develop the Water Quality Improvement Plans and to implement the monitoring and assessment program requirements of Provision D.

The reporting period for the Water Quality Improvement Plan Annual Reports consists of two periods. Because the jurisdictional runoff management programs are typically budgeted and implemented during a fiscal year, the information provided on the Jurisdictional Runoff Management Program Annual Report Forms will cover the period from July 1 to June 30 of the following year.

The Water Quality Improvement Plan Annual Reports, however, are focused primarily on the monitoring data and the assessments based on the monitoring data. The monitoring data is collected during the monitoring year, which begins October 1 and ends September 30 of the following year. The monitoring year begins after the beginning of the fiscal year and ends after the end of the fiscal year. Therefore, to accommodate and capture the information collected during the fiscal year and the monitoring year, the Annual Report reporting period incorporates both periods.

Finally, Provision F.3.c requires the Copermittees to develop and submit a Regional Monitoring and Assessment Report. The Regional Monitoring and Assessment Report is similar to the Long Term Effectiveness Assessment required under the Fourth Term San Diego County Permit. The Regional Monitoring and Assessment Report is expected to utilize the entire body of data and information collected by the Copermittees during the term of this Order to assess improvements to water quality on a regional scale.

Provision F.4 (Regional Clearinghouse) requires the Copermittees to develop, update, and maintain an internet-based Regional Clearinghouse that can be used to store, disseminate, and share the Copermittees' documents, monitoring data, special studies, and any other data or information.

Most of the documents and data that are generated by the Copermittees can be provided in electronic format, and made available to the San Diego Water Board and the public on the internet. The San Diego Water Board has been gradually transitioning its document submittal requirements to electronic submittals. Provision F.4 has been included to further these efforts.

Provision F.4 has also been included to improve the exchange and availability of information among the Copermittees, as well as between the Copermittees and the San Diego Water Board. Provision F.4 will also make the information generated during the implementation of the Order more accessible to the public.

Provision F.5 (Report of Waste Discharge) requires the Copermittees to submit a Report of Waste Discharge to reapply for renewal of the Order prior to its expiration, in accordance with 40 CFR 122.21(d)(2) and CWC section 13376.

Because the Orange County and Riverside County Copermittees will not be subject to the requirements of this Order until they are notified of coverage, Provision F.5.a describes the process of submitting their Reports of Waste Discharge pursuant to the requirements of their current permits to obtain coverage under this Order.

For the Copermittees subject to the requirements of this Order, Provision F.5.b requires the Copermittees to submit a Report of Waste Discharge 180 days in advance of the expiration of this Order Provision F.5.b also describes the minimum information to be included in the Report of Waste Discharge, based on USEPA

guidance “Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems,” dated May 17, 1996.

Provision F.6 (Application for Early Coverage) describes the process that would allow the Orange County and/or Riverside County Copermittees to obtain coverage under this Order earlier than the expiration of their current Orders.

If the Orange County and/or Riverside County Copermittees choose to obtain coverage under this Order earlier than the expiration of their current Orders, the preparation and submittal of a Report of Waste Discharge, as required by the Fourth Term Permits, will not be necessary. The existing Order for the respective county will be rescinded upon the effective coverage date under this Order, except for enforcement purposes.

G. Principal Watershed Copermittee Responsibilities

Purpose: Provision G includes the requirements for the Principal Watershed Copermittee designated by the Copermittees in each Watershed Management Area.

***Discussion*:** Unlike previous NPDES requirements, there will no longer be a single Principal Copermittee. Provision G.1 requires the Copermittees to designate a Principal Watershed Copermittee for each Watershed Management Area. There are ten (10) Watershed Management Areas in the San Diego Region, as defined in Table B-1 under Provision B.1 of the Order. An individual Copermittee should not be the Principal Watershed Copermittee for more than two (2) Watershed Management Areas. There could be up to ten (10) Principal Water Copermittees designated for the Watershed Management Areas in the San Diego Region.

Provision G.2 describes the minimum responsibilities of each Principal Watershed Copermittee. The primary responsibility of the Principal Watershed Copermittees is to serve as the liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues. Ideally, the Principal Watershed Copermittee can represent the interests of all the Copermittees within a Watershed Management Area during discussions or meetings to facilitate communication with the San Diego Water Board. The Principal Watershed Copermittees are also responsible for facilitating and coordinating the implementation efforts of the Copermittees and submittals of required documents and reports.

The Principal Watershed Copermittee is responsible for facilitating the efforts of the Copermittees within the Watershed Management Area to develop the Water Quality Improvement Plan required under Provision B, and submit it for approval in accordance with Provision F.1. The Principal Watershed Copermittee is also responsible for coordinating the submittal of the document updates, Progress Report Presentations, and Annual Reports required from the Copermittees within each Watershed Management Area under Provisions F.2, F.3.a, and F.3.b. The Principal Watershed Copermittees are responsible for coordinating with each other to develop and submit the Regional Clearinghouse, Regional Monitoring and Assessment Report, and the Report of Waste Discharge required under Provisions F.3.c, F.4, and F.5.

The designated Principal Watershed Copermittee for each Watershed Management Area does not necessarily have to serve as the Principal Watershed Copermittee for the entire term of the Order. If the Copermittees in a Watershed Management Area choose to designate a new Principal Watershed Copermittee, the change may be submitted as part of the Annual Report required under Provision F.3.b, with an update to the Water Quality Improvement Plan in accordance with Provision F.2.c.

Provision G.3 specifies that the Principal Watershed Copermittee is not responsible for ensuring that the other Copermittees within the Watershed Management Area are in compliance with the requirements of this Order

H. Modification of Order

Purpose: Provision H provides the conditions under which modifications to Order No. R9-2013-0001 may occur.

***Discussion*:** Provision H allows for modifications to Order No. R9-2013-0001. Minor modifications may be made by the San Diego Water Board Executive Officer without a public notice or public hearing. Minor modifications are defined under 40 CFR 122.63. Minor modifications under 40 CFR 122.63 potentially applicable to this Order are the following:

- Correcting typographical errors;
- Requiring more frequent monitoring or reporting by the Copermittees;
- Changing an interim compliance date in a schedule of compliance, provided the new date is not more than 120 days after the date specified in the existing permit and does not interfere with attainment of the final compliance date requirement.

Modifications that are not one of the above minor modifications will require re-opening the Order, subject to the requirements of 40 CFR 122.44, 122.62 to 122.64, and 124.5, but only for the specific provisions subject to the modification. Modifications of the Order that are not minor require a draft Order with the proposed modifications made available for public review, a public notice and comment period, and a public hearing. Comments on the provisions not subject to the proposed modifications are not required to be considered in the San Diego Water Board's responses to comments or during the public hearing.

Provision H.4 was included to specify that the Order will be re-opened for modifications if the State Water Board determines revisions to Provision A are warranted, an application for early coverage under the Order is received pursuant to Provision F.6, the Basin Plan is amended to modify an existing TMDL or incorporate a new TMDL, or the monitoring and assessment program requirements need to be updated or revised.

Provision H.5 was included to specify that the San Diego Water Board will re-open and consider modifications to this Order when the Orange County Copermittees or the Riverside County Copermittees submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders

I. Standard Permit Provisions and General Provisions

Purpose: Provision I incorporates the standard permit provisions required to be included in all NPDES permits, as well as several other general provisions.

***Discussion*:** Provision I refers to Attachment B to the Order. Attachment B expressly incorporates the conditions applicable to all NPDES permits as provided under 40 CFR 122.41(a)-(n), as well as the applicable conditions for MS4s and storm water discharges provided under 40 CFR 122.42(c) and 40 CFR 122.42(d), respectively. Attachment B also includes several general provisions that are typically included in or applicable to waste discharge requirements issued by the San Diego Water Board.

IX. ATTACHMENTS

The attachments to the Order are discussed below. The discussions describe the content of the attachments.

Attachment A – Discharge Prohibitions and Special Protections

Section 1 of Attachment A includes the Waste Discharge Prohibitions from the Basin Plan. They have been provided verbatim in their entirety.

Section 2 of Attachment A includes the "*Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges*" applicable to permitted point source discharges of storm water, adopted under State Water Board Resolution No. 2012-0012. The terms, prohibitions, and special conditions (collectively referred to as special conditions) are established as limitations on point source storm water discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in ASBS, as required for State Water Quality Protection Areas pursuant to California Public Resources Code sections 36700(f) and 36710(f). These Special Protections were adopted by the State Water Board as part of the Ocean Plan General Exception.

Attachment B – Standard Permit Provisions and General Provisions

Conditions applicable to all NPDES permits, as required under 40 CFR 122.41, and conditions applicable to MS4s and storm water discharges, as required under 40 CFR 122.42(c) and 122.42(d), respectively are provided in Attachment B to the Order. They have been provided expressly in their entirety.

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. These general provisions are typically included in or applicable to waste discharge requirements issued by the San Diego Water Board. Many of the general provisions were developed by the State Water Board. Where a general provision is derived from statute or regulation, a citation of the statute or regulation section is provided. General provisions that do not provide a citation are included under the authority provided CWC 13377.

Attachment C – Acronyms, Abbreviations and Definitions

The acronyms and abbreviations that are used in the Order are provided in Attachment C. Attachment C also includes definitions that may provide an explanation or description of the meaning or intent of specific terms or phrases included in the Order.

Attachment D – Jurisdictional Runoff Management Program Annual Report Form

An example of the Jurisdictional Runoff Management Program Annual Report Form required to be submitted by each Copermittee as part of the Annual Reports required under Provision F.3.b.(1)(e) is provided as Attachment D to the Order. An electronic version of the form will be available from the San Diego Water Board after the adoption of the Order.

The Jurisdictional Runoff Management Program Annual Report Form includes the minimum information necessary to demonstrate that the Copermittee is implementing and in compliance with the requirements of Provision E, and includes much of the information required to be reported pursuant to 40 CFR 122.42(c).

The information that must be provided on the Jurisdictional Runoff Management Program Annual Report Form is limited to the fiscal year, which begins July 1 and ends June 30 of the following year. The information expected to be provided by the Copermittees in each section of the Jurisdictional Runoff Management Program Annual Report Form is discussed below.

I. COPERMITTEE INFORMATION

The name of the Copermittee (e.g. name of city, county, or special district) and the contact information for the storm water program manager are provided under this section.

II. LEGAL AUTHORITY

The Copermittee must confirm whether or not the legal authorities under Provision E.1.a have been established for itself within its jurisdiction.

The Copermittee must also confirm whether or not a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority, as required under Provision E.1.b. The certification statement required by Provision E.1.b is only required to be submitted with the first Annual Report required under Provision F.3.b.

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

The Copermittee must inform the San Diego Water Board whether or not an update to its jurisdictional runoff management program document was required or recommended by the San Diego Water Board during the reporting period. An update to the jurisdictional runoff management program is required under Provision F.2.a. The San Diego Water Board may recommend modifications to the jurisdictional runoff management program as part of the iterative approach and adaptive management process required under Provision B.5, which may result in an update that is necessary for the Copermittee's jurisdictional runoff management document.

If an update was required or recommended, the Copermittee must confirm whether or not the update was completed and made available on the Regional Clearinghouse within the reporting period. If no update was required or recommended, an answer is not required. If the answer is NO, meaning the required or recommended update was not completed and/or made available on the Regional Clearinghouse, the Copermittee must attach a schedule for the completion of the update and/or posting of the updated document on the Regional Clearinghouse.

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

The Copermittee must confirm whether or not a program was implemented during the fiscal year to actively detect and eliminate illicit discharges and connections in accordance with the requirements under Provision E.2.

In addition to confirming that a program to detect and eliminate illicit discharges was implemented during the reporting period, the Copermittee is also required to report on several items related to the program. The information that must be reported is limited to the fiscal year for the Annual Report.

All non-storm water discharges are considered illicit discharges unless the source is identified as one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5). If a non-storm water discharge is identified as one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5), the discharge is a non-storm water discharge, but not an illicit discharge. If a non-storm water discharge is identified but not in one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5), the discharge is both a non-storm water discharge and an illicit discharge.

V. DEVELOPMENT PLANNING PROGRAM

The Copermittee must confirm whether or not a development planning program was implemented during the fiscal year in accordance with the requirements under Provision E.3.

The Copermittee must also inform the San Diego Water Board whether or not an update to its BMP Design Manual was required or recommended by the San Diego Water Board during the fiscal year. An update to the BMP Design Manual is required under Provision F.2.b. The San Diego Water Board may recommend modifications to the BMP Design Manual, which may result in an update that is necessary for Copermittee's the BMP Design Manual.

If an update was required or recommended, the Copermittee must confirm whether or not the update was completed and made available on the Regional Clearinghouse within the reporting period. If no update was required or recommended, an answer is not required. If the answer is NO, meaning the required or recommended update was not completed and/or made available on the Regional Clearinghouse, the Copermittee must attach a schedule for the completion of the update and/or posting of the updated document on the Regional Clearinghouse.

The Copermittee is also required to report on several items related to the program. For the development and redevelopment projects that are reviewed under the program, the Copermittee must report the total number projects submitted for review during the fiscal year. Of those projects, the Copermittee must report the number that are Priority Development Projects, as defined under Provision E.3.b.(1). The Copermittee must also report the number of Priority Development Projects that were approved and/or granted occupancy during the fiscal year, regardless of when the project was originally submitted for review. Any projects that were approved during the fiscal year and granted any exemptions from the BMP Design Manual requirements and/or allowed to implement alternative compliance options in accordance with Provision E.3.c.(3) must be reported.

Finally, the Copermittee must also report on several items related to its oversight of permanent BMPs on Priority Development Projects within its jurisdiction, as required under Provision E.3.e. The information that must be reported is limited to the fiscal year for the Annual Report.

VI. CONSTRUCTION MANAGEMENT PROGRAM

The Copermittee must confirm whether or not a construction management program was implemented during the fiscal year in accordance with the requirements under Provision E.4.

The Copermittee is also required to report on several items related to its oversight construction projects within its jurisdiction. The information that must be reported is limited to the fiscal year for the Annual Report.

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

The Copermittee must confirm whether or not an existing development management program was implemented during the fiscal year in accordance with the requirements under Provision E.5.

The Copermittee is also required to report on several items related to its oversight in areas of existing development within its jurisdiction. The information that must be reported is limited to the fiscal year for the Annual Report. The information must also be separated into four categories of existing development: municipal, commercial, industrial, and residential.

VIII. PUBLIC EDUCATION AND PARTICIPATION

The Copermittee must confirm whether or not a public education program component was implemented during the fiscal year in accordance with the requirements under Provision E.7.a.

The Copermittee must also confirm whether or not a public participation program component was implemented during the fiscal year in accordance with the requirements under Provision E.7.b.

IX. FISCAL ANALYSIS

The Copermittee must confirm a summary of its fiscal analysis, conducted in accordance with the requirements under Provision E.8, has been attached to the form.

X. CERTIFICATION

A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative must sign and certify the Jurisdictional Runoff Management Program Annual Report Form. The appropriate box must be checked to indicate the whether a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative is signing the form.

Attachment E – Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2013-0001

Attachment E provides specific provisions for implementing the load allocations (LAs) and wasteload allocations (WLAs) of Total Maximum Daily Loads (TMDLs) adopted by the San Diego Water Board and approved by USEPA in which the Copermittees are identified as responsible for discharges subject to the requirements of the TMDLs. Federal regulations require that NPDES requirements incorporate water quality based effluent limitations (WQBELs) that must be consistent with the requirements and assumptions of any available WLAs,[45] which may be expressed as numeric effluent limitations, when feasible, and/or as a best management practice (BMP) program of expanded or better-tailored BMPs.[46] Where the TMDL includes WLAs that provide numeric pollutant load or pollutant parameter objectives, the WLA has been, where feasible, translated into numeric WQBELs.[47]

For each TMDL in Attachment E, four sections are included:

a. Applicability: This section provides the resolution under which the TMDL Basin Plan amendment was adopted and approved, with the applicable adoption and approval dates. This section also gives the effective date of the TMDL and where the TMDL is applicable (i.e. Watershed Management Area and water body). The Copermittees that are responsible for implementing the specific provisions are also given in this section.

b. Final TMDL Compliance Requirements: For each TMDL, the final TMDL compliance requirements consist of the final TMDL compliance date(s), the final WQBELs, and the final TMDL compliance determination requirements. The final WQBELs are expressed in terms of receiving water limitations, effluent limitations, and/or best management practices (BMPs). The final WQBELs for the TMDLs are incorporated by reference into Provision A of the Order. The final WQBELs become enforceable when the final TMDL compliance dates have passed. Applicable BMPs within the final WQBELs must be incorporated into the Water Quality Improvement Plans. Compliance with the final WQBELs will be determined in accordance with the options provided under the final TMDL compliance determination requirements.

c. Interim TMDL Compliance Requirements: If the final TMDL compliance date has not passed and there are interim TMDL compliance requirements, they are included in this section. If there are interim WQBELs with interim compliance dates, the interim WQBELs become enforceable when the corresponding interim compliance dates have passed. Compliance with the interim WQBELs will be determined in accordance with the options provided under the interim TMDL compliance determination requirements.

d. Specific Monitoring and Assessment Requirements: If there are specific monitoring and assessment requirements that cannot be met with the monitoring and assessment program

[45] 40 CFR 122.44(d)(1)(vii)(B)
[46] 40 CFR 122.44(k)(2) and 40 CFR 122.44(k)(3)
[47] November 12, 2010 Memorandum from the USEPA, Revisions to the November 22, 2002 Memorandum "Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLA""

requirements under Provision D of the Order, the additional requirements are included in this section.

The requirements of the TMDLs are based on and consistent with the assumptions and requirements of any available adopted and approved TMDLs that have been incorporated into the Basin Plan. Modifications to the requirements for the TMDLs in Attachment E cannot be made unless the TMDLs are modified in the Basin Plan.

A modification to any aspect of a TMDL in the Basin Plan requires a Basin Plan amendment. A Basin Plan amendment to modify a TMDL will require the San Diego Water Board to adopt a resolution to amend the Basin Plan, which includes a separate public process. When the San Diego Water Board adopts a Basin Plan amendment, it subsequently requires approval from the State Water Board, the Office of Administrative Law, and the USEPA before it becomes effective.

If and when the TMDLs are a modified in the Basin Plan, the San Diego Water Board will revise the requirements of the TMDL in accordance with the Basin Plan amendment. When a Basin Plan amendment to modify a TMDL becomes effective, the San Diego Water Board will modify the requirements of the TMDL pursuant to the requirements of Provision H.4 of the Order as soon as possible.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

ORDER NO. R9-2013-0001
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The San Diego County Copermittees in Table 1a are subject to waste discharge requirements set forth in this Order.

Table 1a. San Diego County Copermittees

City of Carlsbad	City of Oceanside
City of Chula Vista	City of Poway
City of Coronado	City of San Diego
City of Del Mar	City of San Marcos
City of El Cajon	City of Santee
City of Encinitas	City of Solana Beach
City of Escondido	City of Vista
City of Imperial Beach	County of San Diego
City of La Mesa	San Diego County Regional Airport Authority
City of Lemon Grove	San Diego Unified Port District
City of National City	

After the San Diego Water Board receives and considers the Orange County Copermittees' Report of Waste Discharge and makes any necessary changes to this Order, the Orange County Copermittees in Table 1b will become subject to waste discharge requirements set forth in this Order after expiration of Order No. R9-2009-0002, NPDES No. CAS0108740 on or after December 16, 2014.

Table 1b. Orange County Copermittees

City of Aliso Viejo	City of Rancho Santa Margarita
City of Dana Point	City of San Clemente
City of Laguna Beach	City of San Juan Capistrano
City of Laguna Hills	City of Laguna Woods
City of Laguna Niguel	County of Orange
City of Lake Forest	Orange County Flood Control District
City of Mission Viejo	

After the San Diego Water Board receives and considers the Riverside County Copermittees' Report of Waste Discharge and makes any necessary changes to this Order, the Riverside County Copermittees in Table 1c will become subject to waste discharge requirements set forth in this Order after expiration of Order No. R9-2010-0016, NPDES No. CAS0108766 on or after November 10, 2015.

Table 1c. Riverside County Copermittees

City of Murrieta	County of Riverside
City of Temecula	Riverside County Flood Control and Water Conservation District
City of Wildomar	

The Orange County Copermittees and Riverside County Copermittees may become subject to the requirements of this Order at a date earlier than the expiration date of their current Orders subject to the conditions described in Provision F.6 of this Order if the Copermittees in the respective county receive a notification of coverage from the San Diego Water Board.

The term Copermittee in this Order refers to any San Diego County, Orange County, or Riverside County Copermittee covered under this Order, unless specified otherwise.

This Order provides permit coverage for the Copermittee discharges described in Table 2.

Table 2. Discharge Locations and Receiving Waters

Discharge Points	Locations throughout San Diego Region
Discharge Description	Municipal Separate Storm Sewer System (MS4) Discharges
Receiving Waters	Inland Surface Waters, Enclosed Bays and Estuaries, and Coastal Ocean Waters of the San Diego Region

Table 3. Administrative Information

This Order was adopted by the San Diego Water Board on:	**May 8, 2013**
This Order will become effective on:	**June 27, 2013**
This Order will expire on:	**June 27, 2018**
The Copermittees must file a Report of Waste Discharge in accordance with Title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than 180 days in advance of the Order expiration date.	

I, David W. Gibson, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on May 8, 2013.

David W. Gibson
Executive Officer

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I. FINDINGS

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), finds that:

JURISDICTION

1. **MS4 Ownership or Operation.** Each of the Copermittees owns or operates an MS4, through which it discharges storm water and non-storm water into waters of the U.S. within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the U.S.

2. **Legal and Regulatory Authority.** This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]) adopted by the United States Environmental Protection Agency (USEPA), and chapter 5.5, division 7 of the California Water Code (CWC) (commencing with section 13370). This Order serves as an NPDES permit for discharges from MS4s to surface waters. This Order also serves as waste discharge requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

   The San Diego Water Board has the legal authority to issue a regional MS4 permit pursuant to its authority under CWA section 402(p)(3)(B) and 40 CFR 122.26(a)(1)(v). The USEPA also made it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide permits (55 Federal Register [FR] 47990, 48039-48042). The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees and San Diego Water Board.

   The federal regulations make it clear that the Copermittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators (40 CFR 122.26(a)(3)(vi)). This Order does not require the Copermittees to manage storm water outside of their jurisdictional boundaries, but rather to work collectively to improve storm water management within watersheds.

3. **CWA NPDES Permit Conditions.** Pursuant to CWA section 402(p)(3)(B), NPDES permits for storm water discharges from MS4s must include requirements to effectively prohibit non-storm water discharges into MS4s, and require controls to reduce the discharge of pollutants in storm water to the maximum extent practicable (MEP), and to require other provisions as the San Diego Water Board determines are appropriate to control such pollutants. This Order prescribes conditions to assure compliance with the CWA requirements for owners and operators of MS4s to

effectively prohibit non-storm water discharges into the MS4s, and require controls to reduce the discharge of pollutants in storm water from the MS4s to the MEP.

4. **CWA and CWC Monitoring Requirements.** CWA section 308(a) and 40 CFR 122.41(h),(j)-(l) and 122.48 require that NPDES permits must specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s also specify additional monitoring and reporting requirements in 40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c). CWC section 13383 authorizes the San Diego Water Board to establish monitoring, inspection, entry, reporting and recordkeeping requirements. This Order establishes monitoring and reporting requirements to implement federal and State requirements.

5. **Total Maximum Daily Loads.** CWA section 303(d)(1)(A) requires that "[e]ach state shall identify those waters within its boundaries for which the effluent limitations…are not stringent enough to implement any water quality standard applicable to such waters." The CWA also requires states to establish a priority ranking of impaired water bodies known as Water Quality Limited Segments and to establish Total Maximum Daily Loads (TMDLs) for such waters. This priority list of impaired water bodies is called the Clean Water Act Section 303(d) List of Water Quality Limited Segments, commonly referred to as the 303(d) List. The CWA requires the 303(d) List to be updated every two years.

   TMDLs are numerical calculations of the maximum amount of a pollutant that a water body can assimilate and still meet water quality standards. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point sources (waste load allocations or WLAs) and non-point sources (load allocations or LAs), background contribution, plus a margin of safety. Discharges from MS4s are point source discharges. The federal regulations (40 CFR 122.44(d)(1)(vii)(B)) require that NPDES permits incorporate water quality based effluent limitations (WQBELs) developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, consistent with the assumptions and requirements of any available WLA for the discharge. Requirements of this Order implement the TMDLs adopted by the San Diego Water Board and approved by USEPA as of the time this Order is issued. This Order establishes WQBELs consistent with the assumptions and requirements of all available TMDL WLAs assigned to discharges from the Copermittees' MS4s.

6. **Non-Storm Water Discharges.** Pursuant to CWA section 402(p)(3)(B)(ii), this Order requires each Copermittee to effectively prohibit discharges of non-storm water into its MS4. Nevertheless, non-storm water discharges into and from the MS4s continue to be reported to the San Diego Water Board by the Copermittees and other persons. Monitoring conducted by the Copermittees, as well as the 303(d) List, have identified dry weather, non-storm water discharges from the MS4s as a source of pollutants causing or contributing to receiving water quality impairments in the San Diego Region. The federal regulations (40 CFR 122.26(d)(2)(iv)(B)(1)) require the Copermittees to have a program to prevent illicit discharges to the MS4.

The federal regulations, however, allow for specific categories of non-storm water discharges or flows to be addressed as illicit discharges only where such discharges are identified as sources of pollutants to waters of the U.S.

7. **In-Stream Treatment Systems.** Pursuant to federal regulations (40 CFR 131.10(a)), in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S. Authorizing the construction of a runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to accepting waste assimilation as an appropriate use for that water body. Runoff treatment must occur prior to the discharge of runoff into receiving waters. Treatment control best management practices (BMPs) must not be constructed in waters of the U.S. Construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body.

DISCHARGE CHARACTERISTICS AND RUNOFF MANAGEMENT

8. **Point Source Discharges of Pollutants.** Discharges from the MS4s contain waste, as defined in the CWC, and pollutants that adversely affect the quality of the waters of the state. A discharge from an MS4 is a “discharge of pollutants from a point source” into waters of the U.S. as defined in the CWA. Storm water and non-storm water discharges from the MS4s contain pollutants that cause or threaten to cause a violation of surface water quality standards, as outlined in the Water Quality Control Plan for the San Diego Basin (Basin Plan). Storm water and non-storm water discharges from the MS4s are subject to the conditions and requirements established in the Basin Plan for point source discharges.

9. **Potential Beneficial Use Impairment.** The discharge of pollutants and/or increased flows from MS4s may cause or threaten to cause the concentration of pollutants to exceed applicable receiving water quality objectives and impair or threaten to impair designated beneficial uses resulting in a condition of pollution, contamination, or nuisance.

10. **Pollutants Generated by Land Development.** Land development has created and continues to create new sources of non-storm water discharges and pollutants in storm water discharges as human population density increases. This brings higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash. Pollutants from these sources are dumped or washed off the surface by non-storm water or storm water flows into and from the MS4s. When development converts natural vegetated pervious ground cover to impervious surfaces such as paved highways, streets, rooftops, and parking lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving a developed area without BMPs that can maintain pre-development runoff conditions will contain greater pollutant loads and have significantly greater runoff volume, velocity, and peak flow rate than pre-development runoff conditions from the same area.

11. **Runoff Discharges to Receiving Waters.** The MS4s discharge runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within the eleven hydrologic units comprising the San Diego Region. Historic and current development makes use of natural drainage patterns and features as conveyances for runoff. Rivers, streams and creeks in developed areas used in this manner are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and receiving water. Numerous receiving water bodies and water body segments have been designated as impaired by the San Diego Water Board pursuant to CWA section 303(d).

12. **Pollutants in Runoff.** The most common pollutants in runoff discharged from the MS4s include total suspended solids, sediment, pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., cadmium, copper, lead, and zinc), petroleum products and polynuclear aromatic hydrocarbons, synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus), oxygen-demanding substances (e.g., decaying vegetation, animal waste), detergents, and trash. As operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not prohibit or otherwise control. These discharges may cause or contribute to a condition of pollution or a violation of water quality standards.

13. **Human Health and Aquatic Life Impairment.** Pollutants in runoff discharged from the MS4s can threaten and adversely affect human health and aquatic organisms. Adverse responses of organisms to chemicals or physical agents in runoff range from physiological responses such as impaired reproduction or growth anomalies to mortality. Increased volume, velocity, rate, and duration of storm water runoff greatly accelerate the erosion of downstream natural channels. This alters stream channels and habitats and can adversely affect aquatic and terrestrial organisms.

14. **Water Quality Effects.** The Copermittees' water quality monitoring data submitted to date documents persistent exceedances of Basin Plan water quality objectives for runoff-related pollutants at various watershed monitoring stations. Persistent toxicity has also been observed at several watershed monitoring stations. In addition, bioassessment data indicate that the majority of the monitored receiving waters have Poor to Very Poor Index of Biological Integrity (IBI) ratings. These findings indicate that runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in the San Diego Region. Non-storm water discharges from the MS4s have been shown to contribute significant levels of pollutants and flow in arid, developed Southern California watersheds, and contribute significantly to exceedances of applicable receiving water quality objectives.

15. **Non-Storm Water and Storm Water Discharges.** Non-storm water discharges from the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard of CWA section 402(p)(3)(B)(iii), which is explicitly for "Municipal … *Stormwater Discharges* (emphasis added)" from the MS4s. Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s must be effectively prohibited.

16. **Best Management Practices.** Waste and pollutants which are deposited and accumulate in MS4 drainage structures will be discharged from these structures to waters of the U.S. unless they are removed. These discharges may cause or contribute to, or threaten to cause or contribute to, a condition of pollution in receiving waters. For this reason, pollutants in storm water discharges from the MS4s can be and must be effectively reduced in runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Pollution prevention is the reduction or elimination of pollutant generation at its source and is the best "first line of defense". Source control BMPs (both structural and non-structural) minimize the contact between pollutants and runoff, therefore keeping pollutants onsite and out of receiving waters. Treatment control BMPs remove pollutants that have been mobilized by storm water or non-storm water flows.

17. **BMP Implementation.** Runoff needs to be addressed during the three major phases of development (planning, construction, and use) in order to reduce the discharge of storm water pollutants to the MEP, effectively prohibit non-storm water discharges, and protect receiving waters. Development which is not guided by water quality planning policies and principles can result in increased pollutant load discharges, flow rates, and flow durations which can negatively affect receiving water beneficial uses. Construction sites without adequate BMP implementation result in sediment runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. Existing development can generate substantial pollutant loads which are discharged in runoff to receiving waters. Retrofitting areas of existing development with storm water pollutant control and hydromodification management BMPs is necessary to address storm water discharges from existing development that may cause or contribute to a condition of pollution or a violation of water quality standards.

18. **Water Quality Improvements.** Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges to the MS4s and control pollutants in storm water discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the CWA.

19. **Long Term Planning and Implementation.** Federal regulations require municipal storm water permits to expire 5 years from adoption, after which the permit must be renewed and reissued. The San Diego Water Board recognizes that the degradation of water quality and impacts to beneficial uses of the waters in the San Diego Region occurred over several decades. The San Diego Water Board further recognizes that a decade or more may be necessary to realize demonstrable improvement to the quality of waters in the San Diego Region. This Order includes a long term planning and implementation approach that will require more than a single permit term to complete.

WATER QUALITY STANDARDS

20. **Basin Plan.** The San Diego Water Board adopted the Water Quality Control Plan for the San Diego Basin (Basin Plan) on September 8, 1994 that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for receiving waters addressed through the plan. The Basin Plan was subsequently approved by the State Water Resources Control Board (State Water Board) on December 13, 1994. Subsequent revisions to the Basin Plan have also been adopted by the San Diego Water Board and approved by the State Water Board. Requirements of this Order implement the Basin Plan.

    The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Process Supply (PROC), Industrial Service Supply (IND), Ground Water Recharge (GWR), Contact Water Recreation (REC1), Non-contact Water Recreation (REC2), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Freshwater Replenishment (FRSH), Hydropower Generation (POW), and Preservation of Biological Habitats of Special Significance (BIOL). The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region: Navigation (NAV), Commercial and Sport Fishing (COMM), Estuarine Habitat (EST), Marine Habitat (MAR), Aquaculture (AQUA), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN), and Shellfish Harvesting (SHELL).

21. **Ocean Plan.** The State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, and 2005. The State Water Board adopted the latest amendment on April 21, 2005 and it became effective on February 14, 2006. The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean. Requirements of this Order implement the Ocean Plan.

    The Ocean Plan identifies the following beneficial uses of ocean waters of the state to be protected: Industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture;

preservation and enhancement of designated Areas of Special Biological Significance; rare and endangered species; marine habitat; fish spawning and shellfish harvesting

22. **Sediment Quality Control Plan**. On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes: 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

23. **National Toxics Rule and California Toxics Rule.** USEPA adopted the National Toxics Rule (NTR) on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the NTR applied in California. On May 18, 2000, USEPA adopted the California Toxics Rule (CTR). The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants.

24. **Antidegradation Policy.** This Order is in conformance with the federal Antidegradation Policy described in 40 CFR 131.12, and State Water Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality Waters in California*. Federal regulations at 40 CFR 131.12 require that the State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. State Water Board Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies.

25. **Anti-Backsliding Requirements.** Section 402(o)(2) of the CWA and federal regulations at 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations may be relaxed. All effluent limitations in this Order are at least as stringent as effluent limitations in the previous permits.

CONSIDERATIONS UNDER FEDERAL AND STATE LAW

26. **Coastal Zone Act Reauthorization Amendments.** Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states with approved coastal zone management programs to address non-point source

pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point source pollution: agriculture, silviculture, urban, marinas, and hydromodification. This Order addresses the management measures required for the urban category, with the exception of septic systems. The runoff management programs developed pursuant to this Order fulfills the need for coastal cities to develop a runoff non-point source plan identified in the Non-Point Source Program Strategy and Implementation Plan. The San Diego Water Board addresses septic systems through the administration of other programs.

27. **Endangered Species Act.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 USC sections 1531 to 1544). This Order requires compliance with receiving water limits, and other requirements to protect the beneficial uses of waters of the State. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

28. **Report of Waste Discharge Process.** The waste discharge requirements set forth in this Order are based upon the Report of Waste Discharge submitted by the San Diego County Copermittees prior to the expiration of Order No. R9-2007-0001 (NPDES No. CAS0109266). The Orange County and Riverside County Copermittees are not immediately covered by the waste discharge requirements in this Order. The San Diego Water Board understands that each municipality is unique although the Counties share watersheds and/or geographical boundaries. The Order will continue to use the Report of Waste Discharge process prior to initially making Orange County or Riverside County Copermittees subject to the requirements of this Order.

    The federal regulations (40 CFR 122.21(d)(2)) and CWC section 13376 impose a duty on the Copermittees to reapply for continued coverage through submittal of a Report of Waste Discharge no later than 180 days prior to expiration of a currently effective permit. This requirement is set forth in the Orange County Copermittees' and Riverside County Copermittees' currently effective permits at Provisions K.2.b and K.2.c, respectively. The Orange County Permit, Order No. R9-2009-0002 (NPDES No. CAS0108740) expires on December 16, 2014 and the Riverside County MS4 Permit, Order No. R9-2010-0016 (NPDES No. CAS0108766) expires on November 10, 2015.

    Unless the Orange County or Riverside County Copermittees apply for and receive early coverage under this Order, the Orange County Copermittees' and the Riverside County Copermittees' respective permits will be superseded by this Order upon expiration of their respective permits, subject to any necessary revisions to the requirements of this Order made after the San Diego Water Board considers their respective Reports of Waste Discharge through the public process provided in 40 CFR Part 124.

29. **Integrated Report and Clean Water Act Section 303(d) List.** The San Diego Water Board and State Water Board submit an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. USEPA issued its *Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act* on July 29, 2005, which advocates the use of a five category approach for classifying the attainment status of water quality standards for water bodies in the Integrated Report. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 in the Integrated Report are placed on the 303(d) List.

    Water bodies with available data and/or information that indicate at least one beneficial use is not being supported or is threatened, but a TMDL is not required, are included in Category 4 in the Integrated Report. Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

    Implementation of the requirements of this Order may allow the San Diego Water Board to include surface waters impaired by discharges from the Copermittees' MS4s in Category 4 in the Integrated Report for consideration during the next 303(d) List submittal by the State to USEPA.

30. **Economic Considerations.** The California Supreme Court has ruled that although CWC section 13263 requires the State and Regional Water Boards (collectively Water Boards) to consider factors set forth in CWC section 13241 when issuing an NPDES permit, the Water Board may not consider the factors to justify imposing pollutant restrictions that are less stringent than the applicable federal regulations require. (*City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 618, 626-627.) However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

    As noted in the following finding, the San Diego Water Board finds that the requirements in this Order are not more stringent than the minimum federal requirements. Therefore, a CWC section 13241 analysis is not required for permit requirements that implement the effective prohibition on the discharge of non-storm water into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determined appropriate to control such pollutants, as those requirements are mandated by federal law. Notwithstanding the above, the San Diego Water Board has developed an economic analysis of the requirements in this Order. The economic analysis is provided in the Fact Sheet.

31. **Unfunded Mandates.** This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following:

    a. This Order implements federally mandated requirements under CWA section 402 (33 USC section 1342(p)(3)(B)).

    b. The local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental and new dischargers who are issued NPDES permits for storm water and non-storm water discharges.

    c. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order.

    d. The Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)) and in lieu of numeric restrictions on their MS4 discharges (i.e. effluent limitations).

    e. The local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under State law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

    f. The provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state develops a TMDL, federal law requires that permits must contain water quality based effluent limitations consistent with the assumptions and requirements of any applicable wasteload allocation (40 CFR 122.44(d)(1)(vii)(B)).

    See the Fact Sheet for further discussion of unfunded mandates.

32. **California Environmental Quality Act.** The issuance of waste discharge requirements and an NPDES permit for the discharge of runoff from MS4s to waters of the U.S. is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 et seq.) in accordance with CWC section 13389.

STATE WATER BOARD DECISIONS

33. **Compliance with Prohibitions and Limitations.** The receiving water limitation language specified in this Order is consistent with language recommended by the USEPA and established in State Water Board Order WQ 99-05, *Own Motion Review of the Petition of Environmental Health Coalition to Review Waste Discharge Requirements Order No. 96-03, NPDES Permit No. CAS0108740*, adopted by the

State Water Board on June 17, 1999. The receiving water limitation language in this Order requires storm water discharges from MS4s to not cause or contribute to a violation of water quality standards, which is to be achieved through an iterative approach requiring the implementation of improved and better-tailored BMPs over time. Implementation of the iterative approach to comply with receiving water limitations based on applicable water quality standards is necessary to ensure that storm water discharges from the MS4 will not ultimately cause or contribute to violations of water quality standards and will not create conditions of pollution, contamination, or nuisance.

34. **Special Conditions for Areas of Special Biological Significance.** On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving an exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges. State Water Board Resolution No. 2012-0012 requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject terms and conditions of State Water Board Resolution No. 2012-0012. The Special Protections contained in Attachment B to Resolution No. 2012-0012, applicable to these discharges, are hereby incorporated into this Order as if fully set forth herein.

ADMINISTRATIVE FINDINGS

35. **Executive Officer Delegation of Authority.** The San Diego Water Board by prior resolution has delegated all matters that may legally be delegated to its Executive Officer to act on its behalf pursuant to CWC section 13223. Therefore, the Executive Officer is authorized to act on the San Diego Water Board's behalf on any matter within this Order unless such delegation is unlawful under CWC section 13223 or this Order explicitly states otherwise.

36. **Standard Provisions.** Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR 122.42, are provided in Attachment B to this Order.

37. **Fact Sheet.** The Fact Sheet for this Order contains background information, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of this Order. The Fact Sheet is hereby incorporated into this Order and constitutes part of the Findings of this Order.

38. **Public Notice.** In accordance with State and federal laws and regulations, the San Diego Water Board notified the Copermittees, and interested agencies and persons of its intent to prescribe waste discharge requirements for the control of discharges into and from the MS4s to waters of the U.S. and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet.

39. **Public Hearing.** The San Diego Water Board held a public hearing on April 10 and 11, 2013, that was continued to May 8, 2013 and heard and considered all comments pertaining to the terms and conditions of this Order. Details of the public hearing are provided in the Fact Sheet.

40. **Effective Date.** This Order serves as an NPDES permit pursuant to CWA section 402 or amendments thereto, and becomes effective fifty (50) days after the date of its adoption, provided that the Regional Administrator, USEPA, Region IX, does not object to this Order.

41. **Review by the State Water Board.** Any person aggrieved by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with CWC section 13320 and California Code of Regulations, title 23, sections 2050, et seq. The State Water Board must receive the petition by 5:00 p.m., 30 days after the San Diego Water Board action, except that if the thirtieth day following the action falls on a Saturday, Sunday or State holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

THEREFORE, IT IS HEREBY ORDERED that the Copermittees, in order to meet the provisions contained in division 7 of the CWC (commencing with section 13000) and regulations adopted thereunder, and the provisions of the CWA and regulations adopted thereunder, must each comply with the requirements of this Order. This action in no way prevents the San Diego Water Board from taking enforcement action for past violations of the previous Order. If any part of this Order is subject to a temporary stay of enforcement, unless otherwise specified, the Copermittees must comply with the analogous portions of the previous Order, which will remain in effect for all purposes during the pendency of the stay.

II. PROVISIONS

A. PROHIBITIONS AND LIMITATIONS

The purpose of this provision is to describe the conditions under which storm water and non-storm water discharges into and from MS4s are prohibited or limited. The goal of the prohibitions and limitations is to protect the water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through the implementation of water quality improvement strategies and runoff management programs that effectively prohibit non-storm water discharges into the Copermittees' MS4s, and reduce pollutants in storm water discharges from the Copermittees' MS4s to the MEP.

1. Discharge Prohibitions

a. Discharges from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the state are prohibited.

b. Non-storm water discharges into MS4s are to be effectively prohibited, through the implementation of Provision E.2, unless such discharges are authorized by a separate NPDES permit.

c. Discharges from MS4s are subject to all waste discharge prohibitions in the Basin Plan, included in Attachment A to this Order.

d. Storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 applicable to these discharges, included in Attachment A to this Order. All other discharges from the Copermittees' MS4s to ASBS are prohibited.

2. Receiving Water Limitations

a. Discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters, including but not limited to all applicable provisions contained in:

(1) The San Diego Water Board's Basin Plan, including beneficial uses, water quality objectives, and implementation plans;

(2) State Water Board plans for water quality control including the following:

(a) Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries (Thermal Plan), and

(b) The Ocean Plan, including beneficial uses, water quality objectives, and implementation plans;

(3) State Water Board policies for water and sediment quality control including the following:

(a) Water Quality Control Policy for the Enclosed Bays and Estuaries of California,

(b) Sediment Quality Control Plan which includes the following narrative objectives for bays and estuaries:

(i) Pollutants in sediments shall not be present in quantities that, alone or in combination, are toxic to benthic communities, and

(ii) Pollutants shall not be present in sediments at levels that will bioaccumulate in aquatic life to levels that are harmful to human health,

(c) The Statement of Policy with Respect to Maintaining High Quality of Waters in California;[1]

(4) Priority pollutant criteria promulgated by the USEPA through the following:

(a) National Toxics Rule (NTR)[2] (promulgated on December 22, 1992 and amended on May 4, 1995), and

(b) California Toxics Rule (CTR).[3,4]

b. Discharges from MS4s composed of storm water runoff must not alter natural ocean water quality in an ASBS.

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[1] State Water Board Resolution No. 68-16
[2] 40 CFR 131.36
[3] 65 Federal Register 31682-31719 (May 18, 2000), adding Section 131.38 to 40 CFR
[4] If a water quality objective and a CTR criterion are in effect for the same priority pollutant, the more stringent of the two applies.

3. Effluent Limitations

a. Technology Based Effluent Limitations

Pollutants in storm water discharges from MS4s must be reduced to the MEP.[5]

b. Water Quality Based Effluent Limitations

Each Copermittee must comply with applicable WQBELs established for the TMDLs in Attachment E to this Order, pursuant to the applicable TMDL compliance schedules.

4. Compliance with Discharge Prohibitions and Receiving Water Limitations

Each Copermittee must achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order through timely implementation of control measures and other actions as specified in Provisions B and E of this Order, including any modifications. The Water Quality Improvement Plans required under Provision B must be designed and adapted to ultimately achieve compliance with Provisions A.1.a, A.1.c and A.2.a.

a. If exceedance(s) of water quality standards persist in receiving waters notwithstanding implementation of this Order, the Copermittees must comply with the following procedures:

(1) For exceedance(s) of a water quality standard in the process of being addressed by the Water Quality Improvement Plan, the Copermittee(s) must implement the Water Quality Improvement Plan as accepted by the San Diego Water Board, and update the Water Quality Improvement Plan, as necessary, pursuant to Provision F.2.c;

(2) Upon a determination by either the Copermittees or the San Diego Water Board that discharges from the MS4 are causing or contributing to a new exceedance of an applicable water quality standard not addressed by the Water Quality Improvement Plan, the Copermittees must submit the following updates to the Water Quality Improvement Plan pursuant to Provision F.2.c or as part of the Water Quality Improvement Plan Annual Report required under Provision F.3.b, unless the San Diego Water Board directs an earlier submittal:

(a) The water quality improvement strategies being implemented that are effective and will continue to be implemented,

[5] This does not apply to MS4 discharges which receive subsequent treatment to reduce pollutants in storm water discharges to the MEP prior to entering receiving waters (e.g., low flow diversions to the sanitary sewer). Runoff treatment must occur prior to the discharge of runoff into receiving waters per Finding 7.

(b) Water quality improvement strategies (i.e. BMPs, retrofitting projects, stream and/or habitat rehabilitation projects, adjustments to jurisdictional runoff management programs, etc.) that will be implemented to reduce or eliminate any pollutants or conditions that are causing or contributing to the exceedance of water quality standards,

(c) Updates to the schedule for implementation of the existing and additional water quality improvement strategies, and

(d) Updates to the monitoring and assessment program to track progress toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a of this Order;

(3) The San Diego Water Board may require the incorporation of additional modifications to the Water Quality Improvement Plan required under Provision B. The applicable Copermittees must submit any modifications to the update to the Water Quality Improvement Plan within 90 days of notification that additional modifications are required by the San Diego Water Board, or as otherwise directed;

(4) Within 90 days of the San Diego Water Board determination that the modifications to the Water Quality Improvement Plan required under Provision A.4.a.(3) meet the requirements of this Order, the applicable Copermittees must revise the jurisdictional runoff management program documents to incorporate the modified water quality improvement strategies that have been and will be implemented, the implementation schedule, and any additional monitoring required; and

(5) Each Copermittee must implement the updated Water Quality Improvement Plan.

b. The procedure set forth above to achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order do not have to be repeated for continuing or recurring exceedances of the same water quality standard(s) following implementation of scheduled actions unless directed to do otherwise by the San Diego Water Board.

c. Nothing in Provisions A.4.a and A.4.b prevents the San Diego Water Board from enforcing any provision of this Order while the applicable Copermittees prepare and implement the above update to the Water Quality Improvement Plan and jurisdictional runoff management programs.

B. WATER QUALITY IMPROVEMENT PLANS

The purpose of this provision is to develop Water Quality Improvement Plans that guide the Copermittees' jurisdictional runoff management programs towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plans is to further the Clean Water Act's objective to protect, preserve, enhance, and restore the water quality and designated beneficial uses of waters of the state. This goal will be accomplished through an adaptive planning and management process that identifies the highest priority water quality conditions within a watershed and implements strategies through the jurisdictional runoff management programs to achieve improvements in the quality of discharges from the MS4s and receiving waters.

1. Watershed Management Areas

The Copermittees must develop a Water Quality Improvement Plan for each of the Watershed Management Areas in Table B-1. A total of ten Water Quality Improvement Plans must be developed for the San Diego Region.

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
San Juan (901.00)	South Orange County	- Aliso Creek - San Juan Creek - San Mateo Creek - Pacific Ocean - Heisler Park ASBS	- City of Aliso Viejo[1] - City of Dana Point[1] - City of Laguna Beach[1] - City of Laguna Hills[1] - City of Laguna Niguel[1] - City of Laguna Woods[1] - City of Lake Forest[1] - City of Mission Viejo[1] - City of Rancho Santa Margarita[1] - City of San Clemente[1] - City of San Juan Capistrano[1] - County of Orange[1] - Orange County Flood Control District[1]
Santa Margarita (902.00)	Santa Margarita River	- Murrieta Creek - Temecula Creek - Santa Margarita River - Santa Margarita Lagoon - Pacific Ocean	- City of Murrieta[2] - City of Temecula[2] - City of Wildomar[2] - County of Riverside[2] - County of San Diego[3] - Riverside County Flood Control and Water Conservation District[2]
San Luis Rey (903.00)	San Luis Rey River	- San Luis Rey River - San Luis Rey Estuary - Pacific Ocean	- City of Oceanside - City of Vista - County of San Diego

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
Carlsbad (904.00)	Carlsbad	- Loma Alta Slough - Buena Vista Lagoon - Agua Hedionda Lagoon - Batiquitos Lagoon - San Elijo Lagoon - Pacific Ocean	- City of Carlsbad - City of Encinitas - City of Escondido - City of Oceanside - City of San Marcos - City of Solana Beach - City of Vista - County of San Diego
San Dieguito (905.00)	San Dieguito River	- San Dieguito River - San Dieguito Lagoon - Pacific Ocean	- City of Del Mar - City of Escondido - City of Poway - City of San Diego - City of Solana Beach - County of San Diego
Penasquitos (906.00)	Penasquitos	- Los Penasquitos Lagoon - Pacific Ocean	- City of Del Mar - City of Poway - City of San Diego - County of San Diego
	Mission Bay	- Mission Bay - Pacific Ocean - San Diego Marine Life Refuge ASBS	- City of San Diego
San Diego (907.00)	San Diego River	- San Diego River - Pacific Ocean	- City of El Cajon - City of La Mesa - City of San Diego - City of Santee - County of San Diego
Pueblo San Diego (908.00) Sweetwater (909.00) Otay (910.00)	San Diego Bay	- Sweetwater River - Otay River - San Diego Bay - Pacific Ocean	- City of Chula Vista - City of Coronado - City of Imperial Beach - City of La Mesa - City of Lemon Grove - City of National City - City of San Diego - County of San Diego - San Diego County Regional Airport Authority - San Diego Unified Port District
Tijuana (911.00)	Tijuana River	- Tijuana River - Tijuana Estuary - Pacific Ocean	- City of Imperial Beach - City of San Diego - County of San Diego

Notes:
1. The Orange County Copermittees will be covered under this Order after expiration of Order No. R9-2009-0002, or earlier if the Orange County Copermittees meet the conditions in Provision F.6.
2. The Riverside County Copermittees will be covered under this Order after expiration of Order No. R9-2010-0016, or earlier if the Riverside County Copermittees meet the conditions in Provision F.6.
3. The County of San Diego is not required to implement the requirements of Provision B for its jurisdiction within the Santa Margarita River Watershed Management Area until the Riverside County Copermittees have been notified of coverage under this Order. The County of San Diego is required to implement the requirements of Provisions D, F.3.b, and Attachment E until the Riverside County Copermittees have been notified of coverage under this Order.

2. Priority Water Quality Conditions

The Copermittees must identify the water quality priorities within each Watershed Management Area that will be addressed by the Water Quality Improvement Plan. Where appropriate, Watershed Management Areas may be separated into subwatersheds to focus water quality prioritization and jurisdictional runoff management program implementation efforts by receiving water.

a. Assessment of Receiving Water Conditions

The Copermittees must consider the following, at a minimum, to identify water quality priorities based on impacts of MS4 discharges on receiving water beneficial uses:

(1) Receiving waters listed as impaired on the CWA Section 303(d) List of Water Quality Limited Segments (303(d) List);

(2) TMDLs adopted and under development by the San Diego Water Board;

(3) Receiving waters recognized as sensitive or highly valued by the Copermittees, including estuaries designated under the National Estuary Program under CWA section 320, wetlands defined by the State or U.S. Fish and Wildlife Service's National Wetlands Inventory as wetlands, waters having the Preservation of Biological Habitats of Special Significance (BIOL) beneficial use designation, and receiving waters identified as ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(4) The receiving water limitations of Provision A.2;

(5) Known historical versus current physical, chemical, and biological water quality conditions;

(6) Available, relevant, and appropriately collected and analyzed physical, chemical, and biological receiving water monitoring data, including, but not limited to, data describing:

(a) Chemical constituents,

(b) Water quality parameters (i.e. pH, temperature, conductivity, etc.),

(c) Toxicity Identification Evaluations for both receiving water column and sediment,

(d) Trash impacts,

(e) Bioassessments, and

(f) Physical habitat;

(7) Available evidence of erosional impacts in receiving waters due to accelerated flows (i.e. hydromodification);

(8) Available evidence of adverse impacts to the chemical, physical, and biological integrity of receiving waters; and

(9) The potential improvements in the overall condition of the Watershed Management Area that can be achieved.

b. ASSESSMENT OF IMPACTS FROM MS4 DISCHARGES

The Copermittees must consider the following, at a minimum, to identify the potential impacts to receiving waters that may be caused or contributed to by discharges from the Copermittees' MS4s:

(1) The discharge prohibitions of Provision A.1 and effluent limitations of Provision A.3; and

(2) Available, relevant, and appropriately collected and analyzed storm water and non-storm water monitoring data from the Copermittees' MS4 outfalls;

(3) Locations of each Copermittee's MS4 outfalls that discharge to receiving waters;

(4) Locations of MS4 outfalls that are known to persistently discharge non-storm water to receiving waters likely causing or contributing to impacts on receiving water beneficial uses;

(5) Locations of MS4 outfalls that are known to discharge pollutants in storm water causing or contributing to impacts on receiving water beneficial uses; and

(6) The potential improvements in the quality of discharges from the MS4 that can be achieved.

c. IDENTIFICATION OF PRIORITY WATER QUALITY CONDITIONS

(1) The Copermittees must use the information gathered for Provisions B.2.a and B.2.b to develop a list of priority water quality conditions as pollutants, stressors and/or receiving water conditions that are the highest threat to receiving water quality or that most adversely affect the quality of receiving waters. The list must include the following information for each priority water quality condition:

(a) The beneficial use(s) associated with the priority water quality condition;

(b) The geographic extent of the priority water quality condition within the Watershed Management Area, if known;

(c) The temporal extent of the priority water quality condition (e.g., dry weather and/or wet weather);

(d) The Copermittees with MS4s discharges that may cause or contribute to the priority water quality condition; and

(e) An assessment of the adequacy of and data gaps in the monitoring data to characterize the conditions causing or contributing to the priority water quality condition, including a consideration of spatial and temporal variation.

(2) The Copermittees must identify the highest priority water quality conditions to be addressed by the Water Quality Improvement Plan, and provide a rationale for selecting a subset of the water quality conditions identified pursuant to Provision B.2.c.(1) as the highest priorities.

d. IDENTIFICATION OF MS4 SOURCES OF POLLUTANTS AND/OR STRESSORS

The Copermittees must identify and prioritize known and suspected sources of storm water and non-storm water pollutants and/or other stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c. The identification of known and suspected sources of pollutants and/or stressors that cause or contribute to the highest priority water quality conditions as identified for Provision B.2.c must consider the following:

(1) Pollutant generating facilities, areas, and/or activities within the Watershed Management Area, including:

(a) Each Copermittee's inventory of construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas,

(b) Publicly owned parks and/or recreational areas,

(c) Open space areas,

(d) All currently operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste, and

(e) Areas not within the Copermittees' jurisdictions (e.g., Phase II MS4s, tribal lands, state lands, federal lands) that are known or suspected to be discharging to the Copermittees' MS4s;

(2) Locations of the Copermittees' MS4s, including the following:

(a) All MS4 outfalls that discharge to receiving waters, and

(b) Locations of major structural controls for storm water and non-storm water (e.g., retention basins, detention basins, major infiltration devices, etc.);

(3) Other known and suspected sources of non-storm water or pollutants in storm water discharges to receiving waters within the Watershed Management Area, including the following:

(a) Other MS4 outfalls (e.g., Phase II Municipal and Caltrans),

(b) Other NPDES permitted discharges,

(c) Any other discharges that may be considered point sources (e.g., private outfalls), and

(d) Any other discharges that may be considered non-point sources (e.g., agriculture, wildlife or other natural sources);

(4) Review of available data, including but not limited to:

(a) Findings from the Copermittees' illicit discharge detection and elimination programs,

(b) Findings from the Copermittees' MS4 outfall discharge monitoring,

(c) Findings from the Copermittees' receiving water monitoring,

(d) Findings from the Copermittees' MS4 outfall discharge and receiving water assessments, and

(e) Other available, relevant, and appropriately collected data, information, or studies related to pollutant sources and/or stressors that contribute to the highest priority water quality conditions as identified for Provision B.2.c.

(5) The adequacy of the available data to identify and prioritize sources and/or stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c.

e. IDENTIFICATION OF POTENTIAL WATER QUALITY IMPROVEMENT STRATEGIES

The Copermittees must evaluate the findings identified under Provisions B.2.a-d, and identify potential strategies that can result in improvements to water quality

in MS4 discharges and/or receiving waters within the Watershed Management Area. Potential water quality improvement strategies that may be implemented within the Watershed Management Area must include the following:

(1) Structural BMPs, non-structural BMPs, incentives, or programs that can potentially be implemented to address the highest priority water quality conditions identified under Provision B.2.c, or MS4 sources of pollutants or stressors identified under Provision B.2.d,

(2) Retrofitting projects in areas of existing development within the Watershed Management Area that can potentially be implemented to reduce MS4 sources of pollutants or stressors identified under Provision B.2.d causing or contributing to the highest priority water quality conditions identified under Provision B.2.c, and

(3) Stream, channel, and/or habitat rehabilitation projects within the Watershed Management Area that can potentially be implemented to protect and/or improve conditions in receiving waters from MS4 pollutants and/or stressors identified under Provision B.2.d causing or contributing to the highest priority water quality conditions identified under Provision B.2.c.

3. Water Quality Improvement Goals, Strategies and Schedules

The Copermittees must identify and develop specific water quality improvement goals and strategies to address the highest priority water quality conditions identified within a Watershed Management Area. The water quality improvement goals and strategies must address the highest priority water quality conditions by effectively prohibiting non-storm water discharges to the MS4, reducing pollutants in storm water discharges from the MS4 to the MEP, and protecting the water quality standards of receiving waters.

a. WATER QUALITY IMPROVEMENT GOALS AND SCHEDULES

(1) Numeric Goals

The Copermittees must develop and incorporate numeric goals[6] into the Water Quality Improvement Plan. Numeric goals must be used to support Water Quality Improvement Plan implementation and measure reasonable progress towards addressing the highest priority water quality conditions identified under Provision B.2.c. The Copermittees must establish and

[6] Interim and final numeric goals may take a variety of forms such as TMDL established WQBELs, action levels, pollutant concentration, load reductions, number of impaired water bodies delisted from the List of Water Quality Impaired Segments, Index of Biotic Integrity (IBI) scores, or other appropriate metrics. Interim and final numeric goals are not necessarily limited to one criterion or indicator, but may include multiple criteria and/or indicators. Except for TMDL established WQBELs, interim and final numeric goals and corresponding schedules may be revised through the adaptive management process under Provision B.5.

incorporate the following numeric goals in the Water Quality Improvement Plan:

(a) Final numeric goals must be based on measureable criteria or indicators capable of demonstrating one or more of the following:

(i) Discharges from the Copermittees' MS4s will not cause or contribute to exceedances of water quality standards in receiving waters, AND/OR

(ii) The conditions of receiving waters and associated habitat are protected from MS4 discharges, AND/OR

(iii) Beneficial uses of receiving waters are protected from MS4 discharges and will be supported.

(b) Interim numeric goals must be based on measureable criteria or indicators capable of demonstrating reasonable incremental progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges as follows:

(i) One or more interim numeric goals may be established to demonstrate progress toward achieving each final numeric goal,

(ii) For each final numeric goal, at least one interim numeric goal must be expressed as a reasonable increment toward achievement of the final numeric goal,

(iii) For each final numeric goal, reasonable interim numeric goals must be established to be accomplished during each 5 year period between the acceptance of the Water Quality Improvement Plan and the achievement of the final numeric goals.

(2) Schedules for Achieving Numeric Goals

The Copermittees must develop and incorporate schedules for achieving the numeric goals into the Water Quality Improvement Plan. The schedules must demonstrate reasonable progress toward achieving the final numeric goals required for Provision B.3.a.(1). The Copermittees must incorporate the schedules for achieving the numeric goals into the Water Quality Improvement Plan based on the following considerations:

(a) Final dates for achieving all final numeric goals must be established considering the following:

(i) Final compliance dates for any applicable TMDLs in Attachment E to this Order;

(ii) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(iii) Achievement of the final numeric goals for the highest water quality priorities must be as soon as possible;

(iv) Final dates for achieving the final numeric goals must reflect a realistic assessment of the shortest practicable time required based on the temporal and spatial extent and factors associated with the highest priority water quality conditions identified under Provision B.2.c, and taking into account the time reasonably required to implement the water quality improvement strategies required pursuant to Provision B.3.b.

(b) Interim dates for achieving all interim numeric goals must be established considering the following:

(i) Interim compliance dates for any applicable TMDLs in Attachment E to this Order;

(ii) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(iii) Interim dates for achieving the interim numeric goals must reflect a realistic assessment of the shortest practicable time reasonably required, taking into account the time needed to implement new or significantly expanded programs and securing financing, if necessary; and

(iv) For each final numeric goal, at least one interim numeric goal must be established that the Copermittees will work toward achieving within the term of this Order.

b. WATER QUALITY IMPROVEMENT STRATEGIES AND SCHEDULES

Based on the likely effectiveness and efficiency of the potential water quality improvement strategies identified under Provision B.2.e to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a, the Copermittees must identify the strategies that will be implemented in each Watershed Management Area as follows:

(1) Jurisdictional Strategies

(a) Each Copermittee in the Watershed Management Area must identify the strategies that will be implemented within its jurisdiction as part of its jurisdictional runoff management program requirements under Provisions E.2 through E.7, including descriptions of the following:

(i) For each of the inventories developed for its jurisdiction, as required under Provisions D.2.a.(1), E.3.e.(2), E.4.b, and E.5.a, each Copermittee must identify the known and suspected areas or sources causing or contributing to the highest priority water quality conditions in the Watershed Management Area that the Copermittee will focus on in its efforts to effectively prohibit non-storm water discharges to its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, and achieve the interim and final numeric goals identified under Provision B.3.a;

(ii) BMPs that each Copermittee will implement, or require to be implemented, as applicable, for those areas or sources within its jurisdiction;

(iii) Education programs that each Copermittee will implement, as applicable, for those areas or sources within its jurisdiction;

(iv) Frequencies that each Copermittee will conduct inspections on those areas or sources within its jurisdiction;

(v) Incentive and enforcement programs that each Copermittee will implement, as applicable, for those areas or sources within its jurisdiction; and

(vi) Any other BMPs, incentives, or programs that each Copermittee will implement for those areas or sources within its jurisdiction.

(b) Identify the optional jurisdictional strategies that each Copermittee will implement within its jurisdiction, as necessary, to effectively prohibit non-storm water discharges to its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. Descriptions of the optional jurisdictional strategies must include:

(i) BMPs, incentives, or programs that may be implemented by the Copermittee within its jurisdiction in addition to the requirements of Provisions B.3.b.(1)(a);

(ii) Incentives or programs that may be implemented by the Copermittee to encourage or implement projects to retrofit areas of existing development within its jurisdiction;

(iii) Incentives or programs that may be implemented by the Copermittee to encourage or implement projects that will rehabilitate the conditions of channels or habitats within its jurisdiction;

(iv) The funds and/or resources that must be secured by the Copermittee to implement the optional strategies described for Provisions B.3.b.(1)(b)(i)-(iii) within its jurisdiction; and

(v) The circumstances necessary to trigger implementation of the optional jurisdictional strategies, in addition to the requirements of Provision B.3.b.(1)(a), to achieve the interim and final numeric goals within the schedules established under Provision B.3.a.

(c) Identify the strategies that will be implemented by the Copermittee in coordination with or with the cooperation of other agencies (e.g. Caltrans, water districts, school districts) and/or entities (e.g. non-governmental organizations) within its jurisdiction.

(2) Watershed Management Area Strategies

The Copermittees must identify the optional regional or multi-jurisdictional strategies that will be implemented in the Watershed Management Area, as necessary, to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. Descriptions of the optional regional or multi-jurisdictional strategies must include:

(a) Regional or multi-jurisdictional BMPs, incentives, or programs that may be implemented by the Copermittees in the Watershed Management Area;

(b) Incentives or programs that may be implemented by the Copermittees in the Watershed Management Area to encourage or implement regional or multi-jurisdictional projects to retrofit areas of existing development;

(c) Incentives or programs that may be implemented by the Copermittees to encourage or implement regional or multi-jurisdictional projects that will rehabilitate the conditions of channels, streams, or habitats within the Watershed Management Area;

(d) The funds and/or resources that must be secured by the Copermittees to implement the optional strategies described for Provisions B.3.b.(2)(a)-(c) within the Watershed Management Area; and

(e) The circumstances necessary to trigger implementation of the optional regional or multi-jurisdictional strategies to achieve the interim and final numeric goals within the schedules established under Provision B.3.a.

(3) Schedules for Implementing Strategies

The Copermittees must develop reasonable schedules for implementing the water quality improvement strategies identified under Provisions B.3.b.(1) and B.3.b.(2) to achieve the interim and final numeric goals identified and

schedules established under Provision B.3.a. The Copermittees must incorporate the schedules to implement the water quality improvement strategies into the Water Quality Improvement Plan as follows:

(a) Each Copermittee must develop schedules for the jurisdictional strategies identified pursuant to Provisions B.3.b.(1)(a)-(b). Each schedule must specify:

(i) If each jurisdictional strategy identified pursuant to Provision B.3.b.(1)(a) will or will not be initiated upon acceptance of the Water Quality Improvement Plan;

(ii) For each jurisdictional strategy identified pursuant to Provision B.3.b.(1)(a) that will not be initiated upon approval of the Water Quality Improvement Plan, the shortest practicable time in which each jurisdictional strategy will be initiated after acceptance of the Water Quality Improvement Plan;

(iii) For each optional jurisdictional strategy identified pursuant to Provision B.3.b.(1)(b), a realistic assessment of the shortest practicable time required to:

[a] Secure the resources needed to fund the optional jurisdictional strategy, and
[b] Procure the resources, materials, labor, and applicable permits necessary to initiate implementation of the optional jurisdictional strategy;

(iv) If each jurisdictional strategy identified pursuant to Provisions B.3.b.(1)(a)-(b) is expected to be continuously implemented (e.g. inspections) or completed within a schedule (e.g. construction of structural BMP); and

(v) If a jurisdictional strategy identified pursuant to Provisions B.3.b.(1)(a)-(b) is expected to be completed within a schedule, the anticipated time to complete based on a realistic assessment of the shortest practicable time required.

(b) The Copermittees in the Watershed Management Area must develop schedules for the regional or multi-jurisdictional strategies identified pursuant to Provision B.3.b.(2). Each schedule must specify:

(i) A realistic assessment of the shortest practicable time to:

[a] Secure the resources needed to fund the optional regional or multi-jurisdictional strategy, and
[b] Procure the resources, materials, labor, and permits necessary to initiate the implementation of the optional regional or multi-jurisdictional strategy;

(ii) If each regional or multi-jurisdictional strategy identified pursuant to Provision B.3.b.(2) is expected to be continuously implemented (e.g. inspections) or completed within a schedule (e.g. construction of structural BMP); and

(iii) If a regional or multi-jurisdictional strategy and/or activity identified pursuant to Provisions B.3.b.(2) is expected to be completed within a schedule, the anticipated time to complete based on a realistic assessment of the shortest practicable time required.

(4) Optional Watershed Management Area Analysis

(a) For each Watershed Management Area, the Copermittees have the option to perform a Watershed Management Area Analysis for the purpose of developing watershed-specific requirements for structural BMP implementation, as described in Provision E.3.c.(3). The Watershed Management Area Analysis must include GIS layers (maps) as output. The analysis must include the following information, to the extent it is available, in order to characterize the Watershed Management Areas:

(i) A description of dominant hydrologic processes, such as areas where infiltration or overland flow likely dominates;

(ii) A description of existing streams in the watershed, including bed material and composition, and if they are perennial or ephemeral;

(iii) Current and anticipated future land uses;

(iv) Potential coarse sediment yield areas; and

(v) Locations of existing flood control structures and channel structures, such as stream armoring, constrictions, grade control structures, and hydromodification or flood management basins.

(b) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify and compile a list of candidate projects that could potentially be used as alternative compliance options for Priority Development Projects, to be implemented in lieu of onsite structural BMP performance requirements described in Provisions E.3.c.(1) and E.3.c.(2). Specifically, the Copermittees must identify opportunities to be included in the list of candidate projects in each Watershed Management Area, such as:

(i) Stream or riparian area rehabilitation;

(ii) Retrofitting existing infrastructure to incorporate storm water retention or treatment;

(iii) Regional BMPs;

(iv) Groundwater recharge projects;

(v) Water supply augmentation projects; and

(vi) Land purchases to preserve floodplain functions.

(c) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify areas within the Watershed Management Area where it is appropriate to allow Priority Development Projects to be exempt from the hydromodification management BMP performance requirements described in Provision E.3.c.(2), including supporting rationale.

4. Water Quality Improvement Monitoring and Assessment Program

a. The Copermittees in each Watershed Management Area must develop and incorporate an integrated monitoring and assessment program into the Water Quality Improvement Plan that assesses: 1) the progress toward achieving the numeric goals and schedules, 2) the progress toward addressing the highest priority water quality conditions for each Watershed Management Area, and 3) each Copermittee's overall efforts to implement the Water Quality Improvement Plan.

b. The monitoring and assessment program must incorporate the monitoring and assessment requirements of Provision D, which may allow the Copermittees to modify the program to be consistent with and focus on the highest priority water quality conditions for each Watershed Management Area.

c. For Watershed Management Areas with applicable TMDLs, the monitoring and assessment program must incorporate the specific monitoring and assessment requirements of Attachment E.

d. For Watershed Management Areas with any ASBS, the water quality monitoring and assessment program must incorporate the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

5. Iterative Approach and Adaptive Management Process

The Copermittees in each Watershed Management Area must implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a, and must include the following:

a. Re-Evaluation of Priority Water Quality Conditions

The priority water quality conditions and potential water quality improvement strategies included in the Water Quality Improvement Plan pursuant to Provisions B.2.c and B.2.e may be re-evaluated by the Copermittees as needed during the term of this Order as part of the Water Quality Improvement Plan Annual Report. Re-evaluation and recommendations for modifications to the priority water quality conditions and potential water quality improvement strategies must be provided in the Report of Waste Discharge, and must consider the following:

(1) Achieving the outcome of improved water quality in MS4 discharges and receiving waters through implementation of the water quality improvement strategies identified in the Water Quality Improvement Plan;

(2) New information developed when the requirements of Provisions B.2.a-c have been re-evaluated;

(3) Spatial and temporal accuracy of monitoring data collected to inform prioritization of water quality conditions and implementation strategies to address the highest priority water quality conditions;

(4) Availability of new information and data from sources other than the jurisdictional runoff management programs within the Watershed Management Area that informs the effectiveness of the actions implemented by the Copermittees;

(5) San Diego Water Board recommendations; and

(6) Recommendations for modifications solicited through a public participation process.

b. Adaptation of Goals, Strategies and Schedules

The water quality improvement goals, strategies and schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.3, must be re-evaluated and adapted as new information becomes available to result in more effective and efficient measures to address the highest priority water quality conditions identified pursuant to Provision B.2.c. Re-evaluation of and modifications to the water quality improvement goals, strategies and schedules must be provided in the Water Quality Improvement Plan Annual Report, and must consider the following:

(1) Modifications to the priority water quality conditions based on Provision B.5.a;

(2) Progress toward achieving interim and final numeric goals in receiving waters and MS4 discharges for the highest priority water quality conditions in the Watershed Management Area,

(3) Progress toward achieving outcomes according to established schedules;

(4) New policies or regulations that may affect identified numeric goals;

(5) Measurable or demonstrable reductions of non-storm water discharges to and from each Copermittee's MS4;

(6) Measurable or demonstrable reductions of pollutants in storm water discharges from each Copermittee's MS4 to the MEP;

(7) New information developed when the requirements of Provisions B.2.b and B.2.d have been re-evaluated;

(8) Efficiency in implementing the Water Quality Improvement Plan;

(9) San Diego Water Board recommendations; and

(10) Recommendations for modifications solicited through a public participation process.

c. ADAPTATION OF MONITORING AND ASSESSMENT PROGRAM

The water quality improvement monitoring and assessment program, included in the Water Quality Improvement Plan pursuant to Provision B.4, must be re-evaluated and adapted when new information becomes available. Re-evaluation and recommendations for modifications to the monitoring and assessment program, pursuant to the requirements of Provision D, may be provided in the Water Quality Improvement Plan Annual Report, but must be provided in the Report of Waste Discharge.

6. Water Quality Improvement Plan Submittal, Updates, and Implementation

a. The Copermittees must submit and commence implementation of the Water Quality Improvement Plans in accordance with the requirements of Provision F.1.

b. The Copermittees must submit proposed updates to the Water Quality Improvement Plan for acceptance by the San Diego Water Board Executive Officer in accordance with the requirements of Provision F.2.c.

C. ACTION LEVELS

The purpose of this provision is for the Copermittees to incorporate numeric action levels in the Water Quality Improvement Plans. The goal of the action levels is to guide Water Quality Improvement Plan implementation efforts and measure progress towards the protection of water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through monitoring and assessing the quality of the MS4 discharges during the implementation of the Water Quality Improvement Plans.

1. Non-Storm Water Action Levels[7]

The Copermittees must develop and incorporate numeric non-storm water action levels (NALs) into the Water Quality Improvement Plan to: 1) support the development and prioritization of water quality improvement strategies for effectively prohibiting non-storm water discharges to the MS4s, 2) assess the effectiveness of the water quality improvement strategies toward addressing MS4 non-storm water discharges, required pursuant to Provision D.4.b.(1), and 3) support the detection and elimination of non-storm water and illicit discharges to the MS4, required pursuant to Provision E.2.[8]

a. The following NALs must be incorporated:

(1) Non-Storm Water Discharges from MS4s to Ocean Surf Zone

Table C-1. Non-Storm Water Action Levels for Discharges from MS4s to Ocean Surf Zone

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Total Coliform	MPN/100 ml	1,000	-	10,000/1,000[1]	OP
Fecal Coliform	MPN/100 ml	200[2]	-	400	OP
Enterococci	MPN/100 ml	35	-	104[3]	OP

Abbreviations/Acronyms
AMAL – average monthly action level
MDAL – maximum daily action level
OP – Ocean Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Total coliform density NAL is 1,000 MPN/100 ml when the fecal/total coliform ratio exceeds 0.1.
2. Fecal coliform density NAL is 200 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas."

[7] NALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, unless the NAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed.
[8] The Copermittees may utilize NALs or other benchmarks currently established by the Copermittees as interim NALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

(2) Non-Storm Water Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Table C-2. Non-Storm Water Action Levels for Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Turbidity	NTU	75	-	225	OP
pH	Units	Within limit of 6.0 to 9.0 at all times			OP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	35	-	104[3]	BP
Priority Pollutants	µg/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
OP – Ocean Plan water quality objective
NTU – Nephelometric Turbidity Units
µg/L – micrograms per liter
MDAL – maximum daily action level
BP – Basin Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas" and is not applicable to water bodies that are not designated with the water contact recreation (REC-1) beneficial use.

Table C-3. Non-Storm Water Action Levels for Priority Pollutants

Parameter	Units	Freshwater (CTR)		Saltwater (CTR)	
		MDAL	AMAL	MDAL	AMAL
Cadmium	µg/L	**	**	16	8
Copper	µg/L	*	*	5.8	2.9
Chromium III	µg/L	**	**	-	-
Chromium VI	µg/L	16	8.1	83	41
Lead	µg/L	*	*	14	2.9
Nickel	µg/L	**	**	14	6.8
Silver	µg/L	*	*	2.2	1.1
Zinc	µg/L	*	*	95	47

Abbreviations/Acronyms:
CTR – California Toxic Rule
AMAL – average monthly action level
µg/L – micrograms per liter
MDAL – maximum daily action level

Notes:
* Action levels developed on a case-by-case basis (see below)
** Action levels developed on a case-by-case basis (see below), but calculated criteria are not to exceed Maximum Contaminant Levels (MCLs) under the California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64431

The Cadmium, Copper, Chromium (III), Lead, Nickel, Silver and Zinc NALs for MS4 discharges to freshwater receiving waters will be developed on a case-by-case basis based on site-specific water quality data (receiving water hardness). For these priority pollutants, refer to 40 CFR 131.38(b)(2).

(3) Non-Storm Water Discharges from MS4s to Inland Surface Waters

Table C-4. Non-Storm Water Action Levels for Discharges from MS4s to Inland Surface Waters

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Dissolved Oxygen	mg/L	Not less than 5.0 in WARM waters and not less than 6.0 in COLD waters			BP
Turbidity	NTU	-	20	See MDAL	BP
pH	Units	Within limit of 6.5 to 8.5 at all times			BP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	33	-	61[3]	BP
Total Nitrogen	mg/L	-	1.0	See MDAL	BP
Total Phosphorus	mg/L	-	0.1	See MDAL	BP
MBAS	mg/L	-	0.5	See MDAL	BP
Iron	mg/L	-	0.3	See MDAL	BP
Manganese	mg/L	-	0.05	See MDAL	BP
Priority Pollutants	µg/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
BP – Basin Plan water quality objective
COLD – cold freshwater habitat beneficial use
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
MDAL – maximum daily action level
WARM – warm freshwater habitat beneficial use
MBAS – Methylene Blue Active Substances
MPN/100 ml – most probable number per 100 milliliters
µg/L – micrograms per liter

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for freshwater "designated beach areas" and is not applicable to water bodies that are not designated with the water contact recreation (REC-1) beneficial use.

b. If not identified in Provision C.1.a, NALs must be identified, developed and incorporated in the Water Quality Improvement Plan for any pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in receiving waters associated with the highest priority water quality conditions related to non-storm water discharges from the MS4s. NALs must be based on:

(1) Applicable water quality standards which may be dependent upon site-specific or receiving water-specific conditions or assumptions to be identified by the Copermittees; or

(2) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the NALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary NALs specific to the Watershed Management Area at levels greater than the NALs required by Provisions C.1.a and C.1.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for effectively prohibiting non-storm water discharges to the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and from the MS4. The

secondary NALs may be developed using an approach acceptable to the San Diego Water Board.

d. Dry weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.b may be utilized to develop or revise NALs based on watershed-specific data, subject to San Diego Water Board Executive Officer approval.

2. Storm Water Action Levels[9]

The Copermittees must develop and incorporate numeric storm water action levels (SALs) in the Water Quality Improvement Plans to: 1) support the development and prioritization of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s, and 2) assess the effectiveness of the water quality improvement strategies toward reducing pollutants in storm water discharges, required pursuant to Provision D.4.b.(2).[10]

a. The following SALs for discharges of storm water from the MS4 must be incorporated:

Table C-5. Storm Water Action Levels for Discharges from MS4s to Receiving Waters

Parameter	Units	Action Level
Turbidity	NTU	126
Nitrate & Nitrite (Total)	mg/L	2.6
Phosphorus (Total P)	mg/L	1.46
Cadmium (Total Cd)*	µg/L	3.0
Copper (Total Cu)*	µg/L	127
Lead (Total Pb)*	µg/L	250
Zinc (Total Zn)*	µg/L	976

Abbreviations/Acronyms:
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
µg/L – micrograms per liter

Notes:
* The sampling must include a measure of receiving water hardness at each MS4 outfall. If a total metal concentration exceeds the corresponding metals SAL in Table C-5, that concentration must be compared to the California Toxics Rule criteria and the USEPA 1-hour maximum concentration for the detected level of receiving water hardness associated with that sample. If it is determined that the sample's total metal concentration for that specific metal exceeds that SAL, but does not exceed the applicable USEPA 1-hour maximum concentration criterion for the measured level of hardness, then the sample result will not be considered above the SAL for that measurement.

[9] SALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, unless the SAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed.
[10] The Copermittees may utilize SALs or other benchmarks currently established by the Copermittees as interim SALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

b. If not identified in Provision C.2.a, SALs must be identified, developed and incorporated in the Water Quality Improvement Plan for pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in receiving waters associated with the highest priority water quality conditions related to storm water discharges from the MS4s. SALs must be based on:

(1) Federal and State water quality guidance and/or water quality standards; and

(2) Site-specific or receiving water-specific conditions; or

(3) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the SALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary SALs specific to the Watershed Management Area at levels greater than the SALs required by Provisions C.2.a and C.2.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s. The secondary SALs may be developed based on the approaches recommended by the State Water Board's Storm Water Panel[11] or using an approach acceptable to the San Diego Water Board.

d. Wet weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.c may be used to develop or revise SALs based upon watershed-specific data, subject to San Diego Water Board Executive Officer approval.

[11] Storm Water Panel Recommendations to the California State Water Resources Control Board: The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities (June 2006)

D. MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS

The purpose of this provision is for the Copermittees to monitor and assess the impact on the conditions of receiving waters caused by discharges from the Copermittees' MS4s under wet weather and dry weather conditions. The goal of the monitoring and assessment program is to inform the Copermittees about the nexus between the health of receiving waters and the water quality condition of the discharges from their MS4s. This goal will be accomplished through monitoring and assessing the conditions of the receiving waters, discharges from the MS4s, pollutant sources and/or stressors, and effectiveness of the water quality improvement strategies implemented as part of the Water Quality Improvement Plans.

1. Receiving Water Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the condition of the receiving waters in each Watershed Management Area during dry weather and wet weather. Following San Diego Water Board acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct long-term receiving water monitoring during implementation of the Water Quality Improvement Plan to assess the long term trends and determine if conditions in receiving waters are improving. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following receiving water monitoring procedures:

a. TRANSITIONAL RECEIVING WATER MONITORING

Until the monitoring requirements and schedules of Provisions D.1.b-e are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following receiving water monitoring in the Watershed Management Area:

(1) Continue the receiving water monitoring programs required in Order Nos. R9-2007-0001 (Monitoring and Reporting Program No. R9-2007-0001 Sections II.A.1-A.5), R9-2009-0002, and R9-2010-0016;

(2) Continue the monitoring in the Hydromodification Management Plans approved by the San Diego Water Board;

(3) Participate in the following regional receiving water monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring,

(b) Southern California Bight Regional Monitoring, and

(c) Sediment Quality Monitoring;

(4) Implement the monitoring programs developed as part of any implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) for the TMDLs in Attachment E to this Order; and

(5) For Watershed Management Areas with ASBS, implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

b. LONG-TERM RECEIVING WATER MONITORING STATIONS

The Copermittees must select at least one long-term receiving water monitoring station from among the existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees to be representative of the receiving water quality in the Watershed Management Area. Additional long-term receiving water monitoring stations must be selected where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

c. DRY WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three dry weather monitoring events at each of the long-term receiving water monitoring stations. At least one monitoring event must be conducted during the dry season (May 1 – September 30) and at least one monitoring event must be conducted during a dry weather period during the wet season (October 1 – April 30), after the first wet weather event of the season, with an antecedent dry period of at least 72 hours following a storm event producing measureable rainfall of greater than 0.1 inch.

(1) Dry Weather Receiving Water Field Observations

For each dry weather monitoring event, the Copermittees must record field observations consistent with Table D-1 at each long-term receiving water monitoring station.

Table D-1. Field Observations for Receiving Water Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) • Station description (i.e. deposits or stains, vegetation condition, structural condition, and observable biology) • Presence and assessment of trash in and around station

(2) Dry Weather Receiving Water Field Monitoring

For each dry weather monitoring event, if conditions allow the collection of the data, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

Table D-2. Field Monitoring Parameters for Receiving Water Monitoring Stations

Parameters
• pH • Temperature • Specific conductivity • Dissolved oxygen • Turbidity

(3) Dry Weather Receiving Water Analytical Monitoring

For each dry weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable NAL constituents, and

(v) Constituents listed in Table D-3.

Table D-3. Analytical Monitoring Constituents for Receiving Water Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Pesticides	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Mercury • Nickel • Selenium • Thallium • Zinc	• Organophosphate Pesticides • Pyrethroid Pesticides	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(4) Dry Weather Receiving Water Toxicity Monitoring

For each dry weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for aquatic toxicity in accordance with Table D-4. When the State Water Board's Policy for Toxicity Assessment and Control (Toxicity Policy) is approved and in effect, the San Diego Water Board Executive Officer may direct the Copermittees to replace current toxicity program elements with standardized procedures in the Toxicity Policy.

Table D-4. Dry Weather Chronic[1] Toxicity Testing for Receiving Water Monitoring Stations

Organism	Units	Test	USEPA Protocol
Freshwater			
Pimephales promelas (Fathead Minnow)	Pass / Fail	Larval Survival and Growth	EPA-821-R-02-013
Ceriodaphnia dubia (*Daphnid*)	Pass / Fail	Survival and Production	EPA-821-R-02-013
Selenastrum capricornutum (Green Algae)	Pass / Fail	Growth	EPA-821-R-02-013
Marine and Estuarine			
Strongylocentrotus purpuratus *(Purple Sea Urchin)*	Pass / Fail	Embryo-Larval Development	EPA-600-R-95-136

Notes:
1. Chronic toxicity testing is not required at receiving water monitoring stations located at mass loading stations if the channel flows are diverted year-round during dry weather conditions to the sanitary sewer for treatment.

(a) Freshwater Test Species and Methods: If samples are collected in receiving waters with salinity less than 1 ppt, the Copermittees must follow the methods for chronic toxicity tests as established in 40 CFR 136.3 using a single-concentration test design for routine monitoring, or a five-concentration test design for additional toxicity testing if the limitation is exceeded. The Copermittees must estimate the critical life stage chronic toxicity on undiluted samples in accordance with species and short term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms (EPA-821-R-02-013; Table IA, 40 CFR 136). Additional test species may be used by the Copermittees if approved by the San Diego Water Board Executive Officer. The Copermittees must conduct:

(i) A static renewal toxicity test with the fathead minnow, *Pimephales promelas* (Larval Survival and Growth Test Method 1000.0);

(ii) A static renewal toxicity test with the daphnid, *Ceriodaphnia dubia* (Survival and Reproduction Test Method 1002.0); and

(iii) A static renewal toxicity test with the green alga, *Selenastrum capricornutum* (also named *Raphidocelis subcapitata*) (Growth Test Method 1003.0).

(b) Marine and Estuarine Test Species and Methods: If samples are collected in receiving waters with salinity greater or equal to 1 ppt, the Copermittees must follow the methods for chronic toxicity tests as established in 40 CFR 136.3 using a single-concentration test design for routine monitoring, or a five-concentration test design for additional toxicity testing if the limitation is exceeded. The Copermittees must conduct the following critical life state chronic toxicity tests on undiluted samples in accordance with species and short term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms (EPA-600-R-95-136; 1995). Artificial sea salts must be used to increase sample salinity. The Copermittees must conduct a static non-renewal toxicity test with the purple sea urchin, *Strongylocentrotus purpuratus* (Embryo-larval Development Test Method). Additional species may be used by the Copermittees if approved by the San Diego Water Board Executive Officer.

(c) Holding Times: All toxicity tests must be conducted as soon as possible following sample collection. The 36-hour sample holding time for test initiation shall be targeted. However, no more than 72 hours shall elapse before the conclusion of sample collection and test initiation.

(d) Test Species Sensitivity Screening: To determine the most sensitive test species for freshwater, the Copermittees must screen 2 wet weather and 2 dry weather toxicity tests with a vertebrate, an invertebrate, and a plant species. After this screening period, subsequent monitoring must be conducted using the most sensitive test species. Alternatively, if a sensitive test species has already been determined, or if there is prior knowledge of potential toxicant(s) and a test species is sensitive to such toxicant(s), then monitoring must be conducted using only that test species. Sensitive test species determinations must also consider the most sensitive test species used for proximal receiving water monitoring. Rescreening must occur once each permit term.

(e) Chronic toxicity test biological endpoint data must be analyzed using the Test of Significant Toxicity t-test approach specified in *National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document* (USEPA, Office of Wastewater Management, Washington, D.C., EPA-833-R-10-003, 2010). For this monitoring program, the critical chronic instream waste concentration (IWC) is set at 100 percent receiving water (i.e. no dilution) for receiving water samples. A 100 percent receiving water and a control must be tested.

(f) Toxicity Identification Evaluation (TIE) / Toxicity Reduction Evaluation (TRE): If chronic toxicity is detected in receiving waters, the Copermittees must discuss the need for conducting a TIE/TRE in the assessments required under Provision D.4.a.(2), and develop a plan for implementing the TIE/TRE to be incorporated in the Water Quality Improvement Plan.

(5) Dry Weather Receiving Water Bioassessment Monitoring

Bioassessment monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must conduct bioassessment monitoring during at least one dry weather monitoring event at each long-term receiving water monitoring station as follows:

(a) The following bioassessment samples and measurements must be collected:

(i) Macroinvertebrate samples must be collected in accordance with the "Reachwide Benthos (Multihabitat) Procedure" in the most current Surface Water Ambient Monitoring Program (SWAMP) Bioassessment Standard Operating Procedures (SOP), and amendments, as applicable;[12]

(ii) The "Full" suite of physical habitat characterization measurements must be collected in accordance with the most current SWAMP Bioassessment SOP, and as summarized in the SWAMP Stream Habitat Characterization Form – Full Version;[13] and

(iii) Freshwater algae samples must be collected in accordance with the SWAMP Standard Operating Procedures for Collecting Algae Samples.[14] Analysis of samples must include algal taxonomic composition (diatoms and soft algae) and algal biomass.

(b) The bioassessment samples, measurements, and appropriate water chemistry data must be used to calculate the following:

(i) An Index of Biological Integrity (IBI) for macroinvertebrates for each monitoring station where bioassessment monitoring was conducted, based on the most current calculation method;[15] and

[12] Ode, P.R.. 2007. Standard operating procedures for collecting macroinvertebrate samples and associated physical and chemical data for ambient bioassessments in California. California State Water Resources Control Board Surface Water Ambient Monitoring Program (SWAMP) Bioassessment SOP 001. http://www.swrcb.ca.gov/water_issues/programs/swamp/tools.shtml#monitoring

[13] Available at: http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/reports/fieldforms_fullversion052908.pdf

[14] Fetscher et al. 2009. Standard Operating Procedures for Collecting Stream Algae Samples and Associated Physical Habitat and Chemical Data for Ambient Bioassessments in California.

[15] The most current calculation method at the time the Order was adopted is outlined in "A Quantitative Tool for Assessing the Integrity of Southern California Coastal Streams" (Ode, et al. 2005. Environmental Management. Vol. 35, No. 1, pp. 1-13). If an updated or new calculation method is developed, either both (i.e. current and updated/new) methods must be used, or historical IBIs must be recalculated with the updated or new calculation method.

(ii) An IBI for algae for each monitoring station where bioassessment monitoring was conducted, when a calculation method is developed.[16]

(c) In lieu of the requirements of Provision D.1.c.(5)(a), the Copermittees may conduct the bioassessment monitoring in accordance with the "Triad" assessment approach[17] to calculate the IBIs required for Provision D.1.c.(5)(b). The Copermittees must conduct sampling, analysis, and reporting of specified in-stream biological and habitat data according to the protocols specified in the SCCWRP Technical Report No. 539, or subsequent protocols, if developed.

(6) Dry Weather Receiving Water Hydromodification Monitoring

In addition to the hydromodification monitoring conducted as part of the Copermittees' Hydromodification Management Plans, hydromodification monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must collect the following hydromodification monitoring observations and measurements within an appropriate domain of analysis during at least one dry weather monitoring event for each long-term receiving water monitoring station:

(a) Channel conditions, including:

(i) Channel dimensions,

(ii) Hydrologic and geomorphic conditions, and

(iii) Presence and condition of vegetation and habitat;

(b) Location of discharge points;

(c) Habitat integrity;

(d) Photo documentation of existing erosion and habitat impacts, with location (i.e. latitude and longitude coordinates) where photos were taken;

(e) Measurement or estimate of dimensions of any existing channel bed or bank eroded areas, including length, width, and depth of any incisions; and

[16] When a calculation method is developed, IBIs must be calculated for all available and appropriate historical data.
[17] Stormwater Monitoring Coalition Model Monitoring Technical Committee, 2004. Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California. Technical Report #419. August 2004.

(f) Known or suspected cause(s) of existing downstream erosion or habitat impact, including flow, soil, slope, and vegetation conditions, as well as upstream land uses and contributing new and existing development.

d. WET WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three wet weather monitoring events at each long-term receiving water monitoring station. At least one wet weather monitoring event must be conducted during the first wet weather event of the wet season (October 1 – April 30), and at least one wet weather monitoring event during a wet weather event that occurs after February 1.

(1) Wet Weather Receiving Water Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each long-term receiving water monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event;

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(d) Presence and assessment of trash in and around station.

(2) Wet Weather Receiving Water Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

(3) Wet Weather Receiving Water Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) Constituents listed in Table D-3.

(4) Wet Weather Receiving Water Toxicity Monitoring

For each wet weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for chronic aquatic toxicity in accordance with Provisions D.1.c.(4)(a)-(f).

e. OTHER RECEIVING WATER MONITORING REQUIREMENTS

(1) Regional Monitoring

The Copermittees must participate in the following regional receiving waters monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring; and

(b) Southern California Bight Regional Monitoring.

(2) Sediment Quality Monitoring

The Copermittees must perform sediment monitoring to assess compliance with sediment quality receiving water limits applicable to MS4 discharges to enclosed bays and estuaries. The monitoring may be performed either by individual or multiple Copermittees to assess compliance with receiving water limits, or through participation in a water body monitoring coalition. A Sediment Monitoring Plan which satisfies the requirements of the State Water Board's Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part 1 Sediment Quality (Sediment Control Plan) must be submitted as part of the monitoring and assessment program in the Water Quality Improvement Plan.

(a) The Sediment Monitoring Plan design must include the following:

(i) The elements required under Section VII.D (Receiving Water Limits Monitoring Frequency) and Section VII.E (Sediment Monitoring) of the Sediment Control Plan;

(ii) A Quality Assurance Project Plan (QAPP) describing the project objectives and organization, functional activities, and quality assurance/quality control protocols for the water and sediment monitoring; and

(iii) A schedule for completion of all sample collection and analysis activities and submission of Sediment Monitoring Reports.

(b) The Copermittees must implement the Sediment Monitoring Plan in accordance with the schedule contained in the Sediment Monitoring Plan, unless otherwise directed in writing by the San Diego Water Board Executive Officer.

(c) The Copermittees must incorporate a Sediment Monitoring Report as part of the Water Quality Improvement Plan Annual Report in accordance with the schedule contained in the Sediment Monitoring Plan, unless otherwise directed in writing by the San Diego Water Board Executive Officer. The Sediment Monitoring Report must contain the following information:

(i) Analysis: An evaluation, interpretation and tabulation of the water and sediment monitoring data, including interpretations and conclusions as to whether applicable Receiving Water Limitations in this Order have been attained at each sample station;

(ii) Sample Location Map: The locations, type, and number of samples must be identified and shown on a site map; and

(iii) California Environmental Data Exchange Network: A statement certifying that the monitoring data and results have been uploaded into the California Environmental Data Exchange Network (CEDEN).

(d) Based on the Sediment Monitoring Report conclusions the San Diego Water Board may require a human health risk assessment to determine if the human health objective contained in Receiving Water Limitations in Provision A.2.a.(3)(b)(ii) has been attained at each sample station. In conducting a risk assessment, the Copermittees must consider any applicable and relevant information, including California Environmental Protection Agency's (Cal/EPA) Office of Environmental Health Hazard Assessment (OEHHA) policies for fish consumption and risk assessment, Cal/EPA's Department of Toxic Substances Control (DTSC) Risk Assessment, and USEPA Human Health Risk Assessment policies.

(3) ASBS Monitoring

For Watershed Management Areas with ASBS, the Copermittees must implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

f. ALTERNATIVE WATERSHED MONITORING REQUIREMENTS

The San Diego Water Board may direct the Copermittees to participate in an effort to develop alternative watershed monitoring with other regulated entities, other interested parties, and the San Diego Water Board to refine, coordinate, and implement regional monitoring and assessment programs to determine the status and trends of water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams.

2. MS4 Outfall Discharge Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the discharges from the MS4 outfalls in each Watershed Management Area during dry weather and wet weather. Following San Diego Water Board acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct MS4 outfall discharge monitoring during implementation of the Water Quality Improvement Plan to assess the effectiveness of their jurisdictional runoff

management programs toward effectively prohibiting non-storm water discharges into the MS4 and reducing pollutants in storm water discharges from their MS4s to the MEP. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following MS4 outfall monitoring procedures:

a. TRANSITIONAL MS4 OUTFALL DISCHARGE MONITORING

Until the monitoring requirements and schedules of Provisions D.2.b-c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following MS4 outfall discharge monitoring in the Watershed Management Area:

(1) MS4 Outfall Discharge Monitoring Station Inventory

Each Copermittee must identify all major MS4 outfalls that discharge directly to receiving waters within its jurisdiction and geo-locate those outfalls on a map of the MS4 pursuant to Provision E.2.b.(1). This information must be compiled into a MS4 outfall discharge monitoring station inventory, and must include the following information:

(a) Latitude and longitude of MS4 outfall point of discharge;

(b) Watershed Management Area;

(c) Hydrologic subarea;

(d) Outlet size;

(e) Accessibility (i.e. safety and without disturbance of critical habitat);

(f) Approximate drainage area; and

(g) Classification of whether the MS4 outfall is known to have persistent dry weather flows, transient dry weather flows, no dry weather flows, or unknown dry weather flows.

(2) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Until the monitoring requirements and schedules of Provision D.2.b are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, each Copermittee must perform dry weather MS4 outfall field screening monitoring to identify non-storm water and illicit discharges within its jurisdiction in accordance with

Provision E.2.c, to determine which discharges are transient flows and which are persistent flows, and prioritize the dry weather MS4 discharges that will be investigated and eliminated in accordance with Provision E.2.d.

(a) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Frequency

Each Copermittee must field screen the MS4 outfalls in its inventory developed pursuant to Provision D.2.a.(1) as follows:

(i) For Copermittees with less than 125 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 80 percent of the outfalls must be visually inspected two times per year during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv).

(ii) For Copermittees with 125 major MS4 outfalls or more, but less than or equal to 500 that discharge to receiving waters within a Watershed Management Area, all the outfalls must be visually inspected at least annually during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv).

(iii) For Copermittees with more than 500 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 500 outfalls must be visually inspected at least annually during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv). Copermittees with more than 500 major MS4 outfalls within a Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(iv) For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major MS4 outfalls within its jurisdiction, at least 500 major MS4 outfalls within its inventory must be visually inspected at least annually during dry

weather conditions. Copermittees with more than 500 major MS4 outfalls in more than one Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(v) Inspections of major MS4 outfalls conducted in response to public reports and staff or contractor reports and notifications may count toward the required visual inspections of MS4 outfall discharge monitoring stations.

(b) Transitional Dry Weather MS4 Outfall Discharge Field Screening Visual Observations

(i) An antecedent dry period of at least 72 hours following any storm event producing measurable rainfall greater than 0.1 inch is required prior to conducting field screening visual observations during a field screening monitoring event.

(ii) During the field screening monitoring event, each Copermittee must record visual observations consistent with Table D-5 at each MS4 outfall discharge monitoring station inspected.

Table D-5. Field Screening Visual Observations for MS4 Outfall Discharge Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) - Flow source(s) suspected or identified from non-storm water source investigation - Flow source(s) eliminated during non-storm water source identification • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) - Known or suspected source(s) of pooled or ponded water • Station description (i.e. deposits or stains, vegetation condition, structural condition, observable biology) • Presence and assessment of trash in and around station • Evidence or signs of illicit connections or illegal dumping

(iii) Each Copermittee must implement the requirements of Provisions E.2.d.(2)(c)-(e) based on the field observations required pursuant to Provision D.2.a.(2)(b)(ii).

(iv) Each Copermittee must evaluate field observations together with existing information available from prior reports, inspections and monitoring results to determine whether any observed flowing, pooled, or ponded waters are likely to be transient or persistent flow.[18]

(c) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Records

Based upon the results of the transitional dry weather MS4 outfall discharge field screening monitoring conducted pursuant to Provisions D.2.a.(2)(a)-(b), each Copermittee must update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow.

(3) Transitional Wet Weather MS4 Outfall Discharge Monitoring

Until the monitoring requirements and schedules of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(a) Transitional Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees must select wet weather MS4 outfall discharge monitoring stations from the inventories developed pursuant to Provision D.2.a.(1) for each Watershed Management Area as follows:

(i) At least five wet weather MS4 outfall discharge monitoring stations that are representative of storm water discharges from areas consisting primarily of residential, commercial, industrial, and typical mixed-use land uses present within the Watershed Management Area;

(ii) At least one wet weather MS4 outfall discharge monitoring station for each Copermittee within the Watershed Management Area; and

[18] Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

(iii) The County of San Diego may select at least two (2) wet weather MS4 outfall discharge monitoring stations for the portion of the Santa Margarita River Watershed Management Area within its jurisdiction to be monitored during the transitional period until the Riverside County Copermittees are notified of coverage under this Order. After the Riverside County Copermittees are notified of coverage under this Order, the Copermittees in the Watershed Management Area must select wet weather MS4 outfall discharge monitoring stations consistent with the requirements above.

(b) Transitional Wet Weather MS4 Outfall Discharge Monitoring Frequency

Each wet weather MS4 outfall discharge monitoring station selected pursuant to Provision D.2.a.(3)(a) must be monitored once during the wet season (October 1 – April 30). The wet weather monitoring events must be selected to be representative of the range of hydrological conditions experienced in the region. At least 10 percent of samples must be conducted during the first wet weather event of the wet season, to include at least one such sample in each Watershed Management Area..

(c) Transitional Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(i) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(ii) The flow rates and volumes measured or estimated from the MS4 outfall (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(d) Transitional Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(e) Transitional Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, and indicator bacteria;

(iv) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

[a] Time-weighted composites collected over the length of the storm event or the first 24 hour period whichever is shorter, composed of discrete samples, which may be collected through the use of automated equipment, or

[b] Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

[c] If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours;

(v) Only one analysis of the composite of aliquots is required;

(vi) The samples must be analyzed for the following constituents:

[a] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

[b] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and

[c] Constituents listed in in Table D-6.

Table D-6. Analytical Monitoring Constituents for Wet Weather MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Nickel • Selenium • Thallium • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(f) Other Transitional Wet Weather MS4 Outfall Discharge Monitoring

The San Diego County Copermittees must continue the wet weather MS4 outfall monitoring program developed under Order No. R9-2007-0001, as approved by the San Diego Water Board, through its planned completion.

b. DRY WEATHER MS4 OUTFALL DISCHARGE MONITORING

Each Copermittee must perform dry weather MS4 outfall monitoring to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. Each Copermittee must conduct the following dry weather MS4 outfall discharge monitoring within its jurisdiction:

(1) Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Each Copermittee must continue to perform the dry weather MS4 outfall discharge field screening monitoring in accordance with the requirements of Provision D.2.a.(2). The Copermittee may adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of persistent flow non-storm water discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of visual inspections performed is equivalent to the number of visual inspections required under Provision D.2.a.(2)(a).

(2) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring

Each Copermittee must perform non-storm water persistent flow MS4 outfall discharge monitoring to determine which persistent non-storm water discharges contain concentrations of pollutants below NALs, and which persistent non-storm water discharges impact receiving water quality during dry weather. Each Copermittee must conduct the following non-storm water persistent flow MS4 outfall discharge monitoring within its jurisdiction:

(a) Prioritization of Non-Storm Water Persistent Flow MS4 Outfalls

Based upon the dry weather MS4 outfall discharge field screening monitoring records developed pursuant to Provision D.2.a.(2)(c), each Copermittee must identify and prioritize the MS4 outfalls with persistent flows based on the highest priority water quality conditions identified in the Water Quality Improvement Plan and any additional criteria developed by the Copermittee, which may include historical data and data from sources other than what the Copermittee collects.

(b) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring Frequency

(i) Based on the prioritization of major MS4 outfalls developed under Provision D.2.b.(2)(a), each Copermittee must identify, at a minimum, the 5 highest priority major MS4 outfalls with non-storm water persistent flows that the Copermittee will monitor within its jurisdiction in each Watershed Management Area. For Responsible Copermittees identified by a TMDL in Attachment E to this Order, if the 5 chosen outfall locations are not sufficient to determine compliance with the TMDL(s), then each Responsible Copermittee must identify additional MS4 outfall monitoring locations within its jurisdiction sufficient to address compliance with the TMDL(s). If a Copermittee has less than 5 major outfalls within a Watershed Management Area, then the Copermittee must monitor all of its major MS4 outfalls with persistent flows within each Watershed Management Area. The location of the highest priority non-storm water persistent flow MS4 outfall monitoring stations must be identified on the map required pursuant to Provision E.2.b.(1). The map must specify which MS4 outfalls are being monitored for compliance with a TMDL.

(ii) Each of the highest priority non-storm water persistent flow MS4 outfall monitoring stations identified pursuant to Provision D.2.b.(2)(b)(i) must be monitored under dry weather conditions at least semi-annually until one of the following occurs:

[a] The non-storm water discharges have been effectively eliminated (i.e. no flowing, pooled, or ponded water) for three consecutive dry weather monitoring events; or

[b] The source(s) of the persistent flows has been identified as a category of non-storm water discharges that does not require an NPDES permit and does not have to be addressed as an illicit discharge because it was not identified as a source of pollutants (i.e. constituents in non-storm water discharge do not exceed NALs), and the persistent flow can be re-prioritized to a lower priority; or

[c] The constituents in the persistent flow non-storm water discharge do not exceed NALs, and the persistent flow can be re-prioritized to a lower priority; or

[d] The source(s) of the persistent flows has been identified as a non-storm water discharge authorized by a separate NPDES permit.

(iii) Where the criteria under Provision D.2.b.(2)(b)(ii) are not met, but the threat to water quality has been reduced by the Copermittee, the highest priority persistent flow MS4 outfall monitoring stations may be reprioritized accordingly for continued dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1).

(iv) Each Copermittee must document removal or re-prioritization of the highest priority persistent flow MS4 outfall monitoring stations identified under Provision D.2.b.(2)(a) in the Water Quality Improvement Plan Annual Report. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized major MS4 outfall in the Watershed Management Area within its jurisdiction, unless there are no remaining qualifying major MS4 outfalls within the Copermittee's jurisdiction in the Watershed Management Area.

(c) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Observations

During each semi-annual monitoring event, each Copermittee must record field observations consistent with Table D-5 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(d) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Monitoring

During each semi-annual monitoring event, if conditions allow the collection of the data, each Copermittee must monitor and record the parameters in Table D-2 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(e) Non-Storm Water Persistent Flow MS4 Outfall Discharge Analytical Monitoring

During each semi-annual monitoring event in which measurable flow is present, each Copermittee must collect and analyze samples from each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Collect grab or composite samples to be analyzed at a qualified laboratory for the following constituents:

[a] Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,
[b] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,
[c] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,
[d] Applicable NAL constituents, and
[e] Constituents listed in Table D-7. The Copermittees may adjust the list of constituents for the Watershed Management Area if historical data or supporting information can be provided that demonstrates or justifies the analysis of a constituent is not necessary.

Table D-7. Analytical Monitoring Constituents for Persistent Flow MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Total Hardness • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Cadmium • Copper • Lead • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(iv) If the Copermittee identifies and eliminates the source of the persistent flow non-storm water discharge, analysis of the sample is not required.

c. WET WEATHER MS4 OUTFALL DISCHARGE MONITORING

The Copermittees must perform wet weather MS4 outfall monitoring to identify pollutants in storm water discharges from the MS4s, to guide pollutant source identification efforts, and to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order. The Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(1) Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees may adjust the wet weather MS4 outfall discharge monitoring locations in the Watershed Management Area, as needed, to identify pollutants in storm water discharges from MS4s, to guide pollutant source identification efforts, and to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of stations is at least equivalent to the number of stations required under Provision D.2.a.(3)(a). Additional outfall monitoring locations, above the minimum per jurisdiction, may be required to demonstrate compliance with the WQBELs associated with the applicable TMDLs in Attachment E.

(2) Wet Weather MS4 Outfall Discharge Monitoring Frequency

The Copermittees must monitor the wet weather MS4 outfall discharge monitoring stations in the Watershed Management Area at least once (1) per year. The Copermittees may need to increase the frequency of monitoring in order to identify pollutants in storm water discharges from the MS4s causing or contributing to the highest priority water quality conditions, to guide pollutant source identification efforts, or to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order.

(3) Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm

event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(4) Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(5) Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites collected over the length of the storm event or the first 24 hour period, whichever is shorter , composed of discrete samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

(iii) If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours.

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) The Copermittees may adjust the analytical monitoring required for the Watershed Management Area, if the Copermittees have historical data or supporting information that can demonstrate or provide justification that the analysis of a constituent is not necessary.

3. Special Studies

a. Within the term of this Order, the Copermittees must initiate the following special studies:

(1) At least two special studies in each Watershed Management Area to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that cause or contribute to highest priority water quality conditions identified in the Water Quality Improvement Plan.

(2) At least one special study for the San Diego Region to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that are impacting receiving waters on a regional basis in the San Diego Region.

(3) One of the two special studies in each Watershed Management Area required pursuant to Provision D.3.a.(1) may be replaced by a special study implemented pursuant to Provision D.3.a.(2).

b. The special studies must, at a minimum, be in conformance with the following criteria:

(1) The special studies must be related to the highest priority water quality conditions identified by the Copermittees in the Watershed Management Area and/or for the entire San Diego Region;

(2) The special studies developed pursuant to Provision D.3.a.(1) must:

(a) Be implemented within the applicable Watershed Management Area, and

(b) Require some form of participation by all the Copermittees within the Watershed Management Area;

(3) The special studies developed pursuant to Provision D.3.a.(2) must:

(a) Be implemented within the San Diego Region, and

(b) Require some form of participation by all Copermittees covered under the requirements of this Order.

(4) The Copermittees are encouraged to partner with environmental groups or third parties knowledgeable of watershed conditions to complete the required special studies.

c. Special studies developed to identify sources of pollutants and/or stressors should be pollutant and/or stressor specific and based on historical monitoring data and monitoring performed pursuant to Provisions D.1 and D.2. Development of source identification special studies should include the following:

(1) A compilation of known information on the specific pollutant and/or stressor, including data on potential sources and movement of the pollutant and/or stressor within the watershed. Data generated by the Copermittees and others, as well as information available from a literature research on the pollutant and/or stressor should be compiled and analyzed as appropriate.

(2) An identification of data gaps, based on the compiled information generated on the specific pollutant and/or stressor identified in Provision D.3.c.(1). Source identification special studies should be developed to fill identified data gaps.

(3) A monitoring plan that will collect and provide data the Copermittees can utilize to do the following:

(a) Quantify the relative loading or impact of a pollutant and/or stressor from a particular source or pollutant generating activity;

(b) Improve understanding of the fate of a pollutant and/or stressor in the environment;

(c) Develop an inventory of known and suspected sources of a pollutant and/or stressor in the Watershed Management Area; and/or

(d) Prioritize known and suspected sources of a pollutant and/or stressor based on relative magnitude in discharges, geographical distribution (i.e., regional or localized), frequency of occurrence in discharges, human health risk, and controllability.

d. Special studies initiated prior to the effective date of this Order that meet the requirements of Provision D.3.b and are implemented during the term of this Order as part of the Water Quality Improvement Plan may be utilized to fulfill the special study requirements of Provision D.3.a. Special studies completed before the effective date of this Order cannot be utilized to fulfill the special study requirements of Provision D.3.a.

e. The Copermittees must submit the monitoring plans for the special studies in the Water Quality Improvement Plans required pursuant to Provision F.1.

f. The Copermittees are encouraged to share the results of the special studies regionally among the Copermittees to provide information useful in improving and adapting the management of non-storm water and storm water runoff through the implementation of the Water Quality Improvement Plans.

4. Assessment Requirements

Each Copermittee must evaluate the data collected pursuant to Provisions D.1, D.2 and D.3, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E, to assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a. Assessments must be performed as described in the following provisions:

a. Receiving Waters Assessments

(1) The Copermittees must assess and report the conditions of the receiving waters in the Watershed Management Area as follows:

(a) Based on data collected pursuant to Provision D.1.a, the assessments under Provision D.4.a.(2) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(b) Based on the data collected pursuant to Provisions D.1.a-e, the assessments required under Provision D.4.a.(2) must be included in the Report of Waste Discharge required pursuant to Provision F.5.b.

(2) The Copermittees must assess the status and trends of receiving water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under dry weather and wet weather conditions. For each of the three types of receiving waters in each Watershed Management Area the Copermittees must:

(a) Determine whether or not the conditions of the receiving waters are meeting the numeric goals established pursuant to Provision B.3.a;

(b) Identify the most critical beneficial uses that must be protected to ensure overall health of the receiving water;

(c) Determine whether or not those critical beneficial uses are being protected;

(d) Identify short-term and/or long-term improvements or degradation of those critical beneficial uses;

(e) Determine whether or not the strategies established in the Water Quality Improvement Plan contribute towards progress in achieving the interim and final numeric goals of the Water Quality Improvement Plan; and

(f) Identify data gaps in the monitoring data necessary to assess Provisions D.4.a.(2)(a)-(e).

b. MS4 OUTFALL DISCHARGES ASSESSMENTS

(1) Non-Storm Water Discharges Reduction Assessments

(a) Each Copermittee must assess and report the progress of its illicit discharge detection and elimination program, required to be implemented pursuant to Provision E.2, toward effectively prohibiting non-storm water and illicit discharges into the MS4 within its jurisdiction as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(2), the assessments under Provision D.4.b.(1)(b) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(ii) Based on the data collected pursuant to Provisions D.2.b, the assessments required under Provision D.4.b.(1)(c) must be included in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

(iii) Based on the data collected pursuant to Provisions D.2.b, the assessment required under Provision D.4.b.(1)(c) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.a.(2), each Copermittee must assess and report the following:

(i) Identify the known and suspected controllable sources (e.g. facilities, areas, land uses, pollutant generating activities) of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area;

(ii) Identify sources of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area that have been reduced or eliminated; and

(iii) Identify modifications to the field screening monitoring locations and frequencies for the MS4 outfalls in its inventory necessary to identify and eliminate sources of persistent flow non-storm water discharges pursuant to Provision D.2.b.

(c) Based on the dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1), each Copermittee must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(1)(b);

(ii) Based on the data collected and applicable NALs in the Water Quality Improvement Plan, rank the MS4 outfalls in the Copermittee's jurisdiction according to potential threat to receiving water quality, and produce a prioritized list of major MS4 outfalls for follow-up action to update the Water Quality Improvement Plan, with the goal of eliminating persistent flow non-storm water discharges and/or pollutant loads in order of the ranked priority list through targeted programmatic actions and source investigations;

(iii) For the highest priority major MS4 outfalls with persistent flows that are in exceedance of NALs, identify the known and suspected sources within the Copermittee's jurisdiction in the Watershed Management Area that may cause or contribute to the NAL exceedances;

(iv) Each Copermittee must analyze the data collected pursuant to Provision D.2.b, and utilize a model or other method, to calculate or estimate the non-storm water volumes and pollutant loads collectively discharged from all the major MS4s outfalls in its jurisdiction identified as having persistent dry weather flows during the monitoring year. These calculations or estimates must be updated annually.

[a] Each Copermittee must calculate or estimate the annual non-storm water volumes and pollutant loads collectively discharged

from the Copermittee's major MS4 outfalls to receiving waters within the Copermittee's jurisdiction, with an estimate of the percent contribution from each known source for each MS4 outfall;

[b] Each Copermittee must annually identify and quantify (i.e. volume and pollutant loads) sources of non-storm water not subject to the Copermittee's legal authority that are discharged from the Copermittee's major MS4 outfalls to downstream receiving waters.

(v) Each Copermittee must review the data collected pursuant to Provision D.2.b and findings from the assessments required pursuant to Provision D.4.b.(1)(c)(i)-(iv) at least once during the term of this Order to:

[a] Identify reductions and progress in achieving reductions in non-storm water and illicit discharges to the Copermittee's MS4 in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction, with an estimate, if possible, of the non-storm water volume and/or pollutant load reductions attributable to specific water quality strategies implemented by the Copermittee; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittee in the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction.

(vi) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(1)(c)(i)-(v).

(2) <u>Storm Water Pollutant Discharges Reduction Assessments</u>

(a) The Copermittees must assess and report the progress of the water quality improvement strategies, required to be implemented pursuant to Provisions B and E, toward reducing pollutants in storm water discharges from the MS4s within the Watershed Management Area as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(3), the assessments under Provision D.4.b.(2)(b) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(ii) Based on the data collected pursuant to Provisions D.2.c, the assessments required under Provision D.4.b.(2)(c) must be included

in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

(iii) Based on the data collected pursuant to Provisions D.2.c, the assessment required under Provisions D.4.b.(2)(c)-(d) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.a.(3) the Copermittees must assess and report the following:

(i) The Copermittees must analyze the monitoring data collected pursuant to Provision D.2.a.(3), and utilize a watershed model or other method, to calculate or estimate the following for each monitoring year:

[a] The average storm water runoff coefficient for each land use type within the Watershed Management Area;
[b] The volume of storm water and pollutant loads discharged from each of the Copermittee's monitored MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch;
[c] The total flow volume and pollutant loadings discharged from the Copermittee's jurisdiction within the Watershed Management Area over the course of the wet season, extrapolated from the data produced from the monitored MS4 outfalls; and
[d] The percent contribution of storm water volumes and pollutant loads discharged from each land use type within each hydrologic subarea with a major MS4 outfall to receiving waters or within each major MS4 outfall to receiving waters in the Copermittee's jurisdiction within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch.

(ii) Identify modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify pollutants in storm water discharges from the MS4s in the Watershed Management Area pursuant to Provision D.2.c.(1).

(c) Based on the wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.c the Copermittees must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(2)(b);

(ii) Based on the data collected and applicable SALs in the Water Quality Improvement Plan, analyze and compare the monitoring data to the analyses and assumptions used to develop the Water Quality

Improvement Plans, including strategies developed pursuant to Provision B.3, and evaluate whether those analyses and assumptions should be updated as a component of the adaptive management efforts pursuant to Provision B.5 for follow-up action to update the Water Quality Improvement Plan;

(iii) The Copermittees must review the data collected pursuant to Provision D.2.c and findings from the assessments required pursuant to Provisions D.4.b.(2)(c)(i)-(ii) at least once during the term of this Order to:

[a] Identify reductions or progress in achieving reductions in pollutant concentrations and/or pollutant loads from different land uses and/or drainage areas discharging from the Copermittees' MS4s in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters within the Watershed Management Area to the MEP, with an estimate, if possible, of the pollutant load reductions attributable to specific water quality strategies implemented by the Copermittees; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittees in the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters in the Watershed Management Area to the MEP.

(iv) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(iii).

(d) The Copermittees must evaluate all the data collected pursuant to Provision D.2.c, and incorporate new outfall monitoring data into time series plots for each long-term monitoring constituent for the Watershed Management Area, and perform statistical trends analysis on the cumulative long-term wet weather MS4 outfall discharge water quality data set.

c. Special Studies Assessments

The Copermittees must annually evaluate the results and findings from the special studies developed and implemented pursuant to Provision D.3, and assess their relevance to the Copermittees' efforts to characterize receiving water conditions, understand sources of pollutants and/or stressors, and control and reduce the discharges of pollutants from the MS4 outfalls to receiving waters in the Watershed Management Area. The Copermittees must report the results of the special studies assessments applicable to the Watershed Management Area, and identify any necessary modifications or updates to the Water Quality

Improvement Plan based on the results in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

d. INTEGRATED ASSESSMENT OF WATER QUALITY IMPROVEMENT PLAN

As part of the iterative approach and adaptive management process required for the Water Quality Improvement Plan pursuant to Provision B.5, the Copermittees in each Watershed Management Area must integrate the data collected pursuant to Provisions D.1-D.3, the findings from the assessments required pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to assess the effectiveness of, and identify necessary modifications to, the Water Quality Improvement Plan as follows:

(1) The Copermittees must re-evaluate the priority water quality conditions and numeric goals for the Watershed Management Area, as needed, during the term of this Order pursuant to Provision B.5.a. The re-evaluation and recommendations for modifications to the priority water quality conditions, and/or numeric goals and corresponding schedules may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The priority water quality conditions and numeric goals for the Watershed Management Area must be re-evaluated as follows:

(a) Re-evaluate the receiving water conditions in the Watershed Management Area in accordance with Provision B.2.a;

(b) Re-evaluate the impacts on receiving waters in the Watershed Management Area from MS4 discharges in accordance with Provision B.2.b;

(c) Re-evaluate the identification of MS4 sources of pollutants and/or stressors in accordance with Provision B.2.d;

(d) Identify beneficial uses of the receiving waters that are protected in accordance with Provision D.4.a;

(e) Evaluate the progress toward achieving the interim and final numeric goals for protecting impacted beneficial uses in the receiving waters.

(2) The Copermittees must re-evaluate the water quality improvement strategies for the Watershed Management Area during the term of this Order pursuant to Provision B.5.b. The re-evaluation and recommendations for modifications to the water quality improvement strategies and schedules may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The water quality improvement

strategies for the Watershed Management Area must be re-evaluated as follows:

(a) Identify the non-storm water and storm water pollutant loads from the Copermittees' MS4 outfalls in the Watershed Management Area, calculated or estimated pursuant to Provisions D.4.b;

(b) Identify the non-storm water and storm water pollutant load reductions, or other improvements to receiving water or water quality conditions, that are necessary to attain the interim and final numeric goals identified in the Water Quality Improvement Plan for protecting beneficial uses in the receiving waters;

(c) Identify the non-storm water and storm water pollutant load reductions, or other improvements to the quality of MS4 discharges, that are necessary for the Copermittees to demonstrate that non-storm water and storm water discharges from their MS4s are not causing or contributing to exceedances of receiving water limitations;

(d) Evaluate the progress of the water quality improvement strategies toward achieving the interim and final numeric goals identified in the Water Quality Improvement Plan for protecting beneficial uses in the receiving waters.

(3) The Copermittees must re-evaluate and adapt the water quality monitoring and assessment program for the Watershed Management Area when new information becomes available to improve the monitoring and assessment program pursuant to Provision B.5.c. The re-evaluation and recommendations for modifications to the monitoring and assessment program may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. Modifications to the water quality monitoring and assessment program must be consistent with the requirements of Provision D.1-D.3. The re-evaluation of the water quality monitoring and assessment program for the Watershed Management Area must consider the data gaps identified by the assessments required pursuant to Provisions D.4.a-b, and results of the special studies implemented pursuant to Provision D.4.c.

5. Monitoring Provisions

Each Copermittee must comply with all the monitoring, reporting, and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

E. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS

The purpose of this provision is for each Copermittee to implement a program to control the contribution of pollutants to and the discharges from the MS4 within its jurisdiction. The goal of the jurisdictional runoff management programs is to implement strategies that effectively prohibit non-storm water discharges to the MS4 and reduce the discharge of pollutants in storm water to the MEP. This goal will be accomplished through implementing the jurisdictional runoff management programs in accordance with the strategies identified in the Water Quality Improvement Plans.

Each Copermittee must update its jurisdictional runoff management program document, in accordance with Provision F.2.a, to incorporate all the requirements of Provision E. Until the Copermittee has updated its jurisdictional runoff management program document with the requirements of Provision E, the Copermittee must continue implementing its current jurisdictional runoff management program.

1. Legal Authority Establishment and Enforcement

a. Each Copermittee must establish, maintain, and enforce adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 through statute, ordinance, permit, contract, order, or similar means. This legal authority must, at a minimum, authorize the Copermittee to:

(1) Prohibit and eliminate all illicit discharges and illicit connections to its MS4;

(2) Control the contribution of pollutants in discharges of runoff associated with industrial and construction activity to its MS4 and control the quality of runoff from industrial and construction sites, including industrial and construction sites which have coverage under the statewide General Permit for Discharges of Storm Water Associated with Industrial Activities (Industrial General Permit) or General Permit for Discharges of Storm Water Associated with Construction Activities (Construction General Permit), as well as to those sites which do not;

(3) Control the discharge of spills, dumping, or disposal of materials other than storm water into its MS4;

(4) Control through interagency agreements among Copermittees the contribution of pollutants from one portion of the MS4 to another portion of the MS4;

(5) Control, by coordinating and cooperating with other owners of the MS4 such as Caltrans, the U.S. federal government, or sovereign Native American Tribes through interagency agreements, where possible, the contribution of pollutants from their portion of the MS4 to the portion of the MS4 within the Copermittee's jurisdiction;

(6) Require compliance with conditions in its statutes, ordinances, permits, contracts, orders, or similar means to hold dischargers to its MS4 accountable for their contributions of pollutants and flows;

(7) Require the use of BMPs to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(8) Require documentation on the effectiveness of BMPs implemented to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(9) Utilize enforcement mechanisms to require compliance with its statutes, ordinances, permits, contracts, orders, or similar means; and

(10) Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with its statutes, ordinances, permits, contracts, orders, or similar means and with the requirements of this Order, including the prohibition of illicit discharges and connections to its MS4; the Copermittee must also have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from industrial facilities, including construction sites, discharging into its MS4.

b. With the first Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3), each Copermittee must submit a statement certified by its Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative that the Copermittee has taken the necessary steps to obtain and maintain full legal authority within its jurisdiction to implement and enforce each of the requirements contained in this Order.

2. Illicit Discharge Detection and Elimination

Each Copermittee must implement a program to actively detect and eliminate illicit discharges and improper disposal into the MS4, or otherwise require the discharger to apply for and obtain a separate NPDES permit. The illicit discharge detection and elimination program must be implemented in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include, at a minimum, the following requirements:

a. Non-Storm Water Discharges

Each Copermittee must address all non-storm water discharges as illicit discharges unless a non-storm water discharge is either identified as a discharge authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to the following requirements:

(1) Discharges of non-storm water to the MS4 from the following categories must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG919001 (Order No. R9-2007-0034, or subsequent order) for discharges to San Diego Bay, or NPDES Permit No. CAG919002 (Order No. R9-2008-0002, or subsequent order) for discharges to surface waters other than San Diego Bay:

(1) Uncontaminated pumped ground water;

(2) Discharges from foundation drains;[19]

(3) Water from crawl space pumps; and

(4) Water from footing drains.[19]

(2) Discharges of non-storm water from water line flushing and water main breaks to the MS4 must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG 679001 (Order No. R9-2010-0003 or subsequent order). This category includes water line flushing and water main break discharges from water purveyors issued a water supply permit by the California Department of Public Health or federal military installations. Discharges from recycled or reclaimed water lines to the MS4 must be addressed as illicit discharges, unless the discharges have coverage under a separate NPDES permit.

(3) Discharges of non-storm water to the MS4 from the following categories must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a source of pollutants to receiving waters:

(a) Diverted stream flows;

(b) Rising ground waters;

(c) Uncontaminated ground water infiltration to MS4s;

(d) Springs;

(e) Flows from riparian habitats and wetlands;

(f) Discharges from potable water sources;

[19] Provision E.2.a.(1) only applies to this category of non-storm water if the system is designed to be located at or below the groundwater table to actively or passively extract groundwater during any part of the year.

(g) Discharges from foundation drains;[20] and

(h) Discharges from footing drains.[20]

(4) Discharges of non-storm water to the MS4 from the following categories must be controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means. Discharges of non-storm water to the MS4 from the following categories not controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means must be addressed by the Copermittee as illicit discharges.

(a) Air conditioning condensation

The discharge of air conditioning condensation should be directed to landscaped areas or other pervious surfaces, or to the sanitary sewer, where feasible.

(b) Individual residential vehicle washing

(i) The discharge of wash water should be directed to landscaped areas or other pervious surfaces where feasible; and

(ii) The minimization of water, washing detergent and other vehicle wash products used for residential vehicle washing, and the implementation of other practices or behaviors that will prevent the discharge of pollutants associated with individual residential vehicle washing from entering the MS4 must be encouraged.

(c) Dechlorinated swimming pool discharges

(i) Residual chlorine, algaecide, filter backwash, or other pollutants from swimming pools must be eliminated prior to discharging to the MS4; and

(ii) The discharge of saline swimming pool water must be directed to the sanitary sewer, landscaped areas, or other pervious surfaces that can accommodate the volume of water, unless the saline swimming pool water can be discharged via a pipe or concrete channel directly to a naturally saline water body (e.g. Pacific Ocean).

(5) Firefighting discharges to the MS4 must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a significant source of pollutants to receiving waters. Firefighting discharges to the MS4 not identified as a significant source of pollutants to receiving waters, must be addressed, at a minimum, as follows:

[20] Provision E.2.a.(3) only applies to this category of non-storm water discharge if the system is designed to be located above the groundwater table at all times of the year, and the system is only expected to discharge non-storm water under unusual circumstances.

(a) Non-emergency firefighting discharges

(i) Building fire suppression system maintenance discharges (e.g. sprinkler line flushing) to the MS4 must be addressed as illicit discharges unless BMPs are implemented to prevent pollutants associated with such discharges to the MS4.

(ii) Non-emergency firefighting discharges (i.e., discharges from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems) must be addressed by a program, to be developed and implemented by the Copermittee, to reduce or eliminate pollutants in such discharges from entering the MS4.

(b) Emergency firefighting discharges

Each Copermittee should develop and encourage implementation of BMPs to reduce or eliminate pollutants in emergency firefighting discharges to the MS4s and receiving waters within its jurisdiction. During emergency situations, priority of efforts should be directed toward life, property, and the environment (in descending order). BMPs should not interfere with immediate emergency response operations or impact public health and safety.

(6) If the Copermittee or San Diego Water Board identifies any category of non-storm water discharges listed under Provisions E.2.a.(1)-(4) as a source of pollutants to receiving waters, the category must be prohibited through ordinance, order, or similar means and addressed as an illicit discharge. Alternatively, the Copermittee may propose controls to be implemented for the category of non-storm water discharges as part of the Water Quality Improvement Plan instead of prohibiting the category of non-storm water discharges, and implement the controls if accepted by the San Diego Water Board as part of the Water Quality Improvement Plan.

(7) Each Copermittee must, where feasible and priorities and resources allow, reduce or eliminate non-storm water discharges listed under Provisions E.2.a.(1)-(4) into its MS4, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit.

b. PREVENT AND DETECT ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to prevent and detect illicit discharges to the MS4:

(1) Each Copermittee must maintain an updated map of its entire MS4 and the corresponding drainage areas. The accuracy of the MS4 map must be confirmed during the field screening required pursuant to Provision E.2.c.

The MS4 map must be included as part of the jurisdictional runoff management program document. Any geographic information system (GIS) layers or files used by the Copermittee to maintain the MS4 map must be made available to the San Diego Water Board upon request. The MS4 map must identify the following:

(a) All segments of the MS4 owned, operated, and maintained by the Copermittee;

(b) All known locations of inlets that discharge and/or collect runoff into the Copermittee's MS4;

(c) All known locations of connections with other MS4s not owned or operated by the Copermittee (e.g. Caltrans MS4s);

(d) All known locations of MS4 outfalls and private outfalls that discharge runoff collected from areas within the Copermittee's jurisdiction;

(e) All segments of receiving waters within the Copermittee's jurisdiction that receive and convey runoff discharged from the Copermittee's MS4 outfalls;

(f) Locations of the MS4 outfalls, identified pursuant to Provision D.2.a.(1), within its jurisdiction; and

(g) Locations of the non-storm water persistent flow MS4 outfall discharge monitoring stations, identified pursuant to Provision D.2.b.(2), within its jurisdiction.

(2) Each Copermittee must use Copermittee personnel and contractors to assist in identifying and reporting illicit discharges and connections during their daily employment activities.

(3) Each Copermittee must promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges to or from the MS4, including the following methods for public reporting:

(a) Operate a public hotline, which can be Copermittee-specific or shared by the Copermittees, and must be capable of receiving reports in both English and Spanish 24 hours per day and seven days per week; and

(b) Designate an e-mail address for receiving electronic reports from the public, which can be Copermittee-specific or shared by the Copermittees, and must be prominently displayed on the Copermittee's webpage and the Regional Clearinghouse required pursuant to Provision F.4.

(4) Each Copermittee must implement practices and procedures (including a notification mechanism) to prevent, respond to, contain, and clean up any spills that may discharge into the MS4 within its jurisdiction from any source. The Copermittee must coordinate, to the extent possible, with spill response teams to prevent entry of spills into the MS4, and prevent contamination of surface water, ground water, and soil. The Copermittee must coordinate spill prevention, containment, and response activities throughout all appropriate Copermittee departments, programs, and agencies.

(5) Each Copermittee must implement practices and procedures to prevent and limit infiltration of seepage from sanitary sewers (including private laterals and failing septic systems) to the MS4.

(6) Each Copermittee must coordinate, when necessary, with upstream Copermittees and/or entities to prevent illicit discharges from upstream sources into the MS4 within its jurisdiction.

c. FIELD SCREENING

Each Copermittee must conduct field screening (i.e. visual observations, field testing, and/or analytical testing) of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4 in accordance with the dry weather MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

d. INVESTIGATE AND ELIMINATE ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to investigate and eliminate illicit discharges to the MS4:

(1) Each Copermittee must prioritize and determine when follow-up investigations will be performed in response to visual observations and/or water quality monitoring data collected during an investigation of a detected non-storm water or illicit discharge to or from the MS4. The criteria for prioritizing investigations must consider the following:

(a) Pollutants identified as causing or contributing to the highest water quality priorities identified in the Water Quality Improvement Plan;

(b) Pollutants identified as causing or contributing, or threatening to cause or contribute to impairments in water bodies on the 303(d) List and/or in environmentally sensitive areas (ESAs), located within its jurisdiction;

(c) Pollutants identified from sources or land uses known to exist within the area, drainage basin, or watershed that discharges to the portion of the MS4 within its jurisdiction included in the investigation;

(d) Pollutants identified as causing or contributing to an exceedance of a NAL in the Water Quality Improvement Plan; and

(e) Pollutants identified as a threat to human health or the environment.

(2) Each Copermittee must implement procedures to investigate and inspect portions of its MS4 that, based on reports or notifications, field screening, or other appropriate information, indicate a reasonable potential of receiving, containing, or discharging pollutants due to illicit discharges, illicit connections, or other sources of non-storm water. The procedures must include the following:

(a) Each Copermittee must develop criteria to:

(i) Assess the validity of each report or notification received; and

(ii) Prioritize the response to each report or notification received.

(b) Each Copermittee must prioritize and respond to each valid report or notification (e.g., public reports, staff or contractor reports and notifications, etc.) of an incident in a timely manner.

(c) In accordance with the requirements of Provision E.2.d.(1), each Copermittee must investigate and seek to identify the source(s) of discharges of non-storm water where flows are observed in and from the MS4 during the field screening required pursuant to Provision D.2.b.(1) as follows:

(i) Obvious illicit discharges must be immediately investigated to identify the source(s) of non-storm water discharges;

(ii) The investigation must include field investigations to identify sources or potential sources for the discharge, unless the source or potential source has already been identified during previous investigations; and

(iii) The investigation may include follow-up field investigations and/or reviewing Copermittee inventories and other land use data to identify potential sources of the discharge.

(d) Each Copermittee must maintain records and a database of the following information:

(i) Location of incident, including hydrologic subarea, portion of MS4 receiving the non-storm water or illicit discharge, and point of discharge or potential discharge from MS4 to receiving water;

(ii) Source of information initiating the investigation (e.g., public reports, staff or contractor reports and notifications, field screening, etc.);

(iii) Date the information used to initiate the investigation was received;

(iv) Date the investigation was initiated;

(v) Dates of follow-up investigations;

(vi) Identified or suspected source of the illicit discharge or connection, if determined;

(vii) Known or suspected related incidents, if any;

(viii) Result of the investigation; and

(ix) If a source cannot be identified and the investigation is not continued, document the response pursuant to the requirements of Provision E.2.d.(4).

(e) Each Copermittee must maintain records and, in accordance with the priorities of the Water Quality Improvement Plan, seek to identify the source(s) of non-storm water discharges from the MS4 where there is evidence of non-storm water having been discharged into or from the MS4 (e.g., pooled water), in accordance with MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

(3) Each Copermittee must initiate the implementation of procedures, in a timely manner, to eliminate all detected and identified illicit discharges and connections within its jurisdiction. The procedures must include the following responses:

(a) Each Copermittee must enforce its legal authority, as required under Provision E.1, to eliminate illicit discharges and connections to the MS4.

(b) If the Copermittee identifies the source as a controllable source of non-storm water or illicit discharge or connection, the Copermittee must implement its Enforcement Response Plan pursuant to Provision E.6 and enforce its legal authority to prohibit and eliminate illicit discharges and connections to its MS4.

(c) If the Copermittee identifies the source of the discharge as a category of non-storm water discharges in Provision E.2.a, and the discharge is in exceedance of NALs in the Water Quality Improvement Plan, then the Copermittee must determine if: (1) this is an isolated incident or set of circumstances that will be addressed through its Enforcement Response Plan pursuant to Provision E.6, or (2) the category of discharge must be addressed through the prohibition of that category of discharge as an illicit discharge pursuant to Provision E.2.a.(6).

(d) If the Copermittee suspects the source of the non-storm water discharge as natural in origin (i.e. non-anthropogenically influenced) and in conveyance into the MS4, then the Copermittee must document and

provide the data and evidence necessary to demonstrate to the San Diego Water Board that it is natural in origin and does not require further investigation.

(e) If the Copermittee is unable to identify and document the source of a recurring non-storm water discharge to or from the MS4, then the Copermittee must address the discharge as an illicit discharge and update its jurisdictional runoff management program to address the common and suspected sources of the non-storm water discharge within its jurisdiction in accordance with the Copermittee's priorities.

(4) Each Copermittee must submit a summary of the non-storm water discharges and illicit discharges and connections investigated and eliminated within its jurisdiction with each Water Quality Improvement Plan Annual Report required under Provision F.3.b.(3) of this Order.

3. Development Planning

Each Copermittee must use their land use and planning authorities to implement a development planning program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. BMP Requirements for All Development Projects

Each Copermittee must prescribe the following BMP requirements during the planning process (i.e. prior to project approval and issuance of local permits) for all development projects (regardless of project type or size), where local permits are issued, including unpaved roads and flood management projects:

(1) General Requirements

(a) Onsite BMPs must be located so as to remove pollutants from runoff prior to its discharge to any receiving waters, and as close to the source as possible;

(b) Structural BMPs must not be constructed within waters of the U.S.

(c) Onsite BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors (e.g. mosquitos, rodents, or flies).

(2) Source Control BMP Requirements

The following source control BMPs must be implemented at all development projects where applicable and feasible:

(a) Prevention of illicit discharges into the MS4;

(b) Storm drain system stenciling or signage;

(c) Protect outdoor material storage areas from rainfall, run-on, runoff, and wind dispersal;

(d) Protect materials stored in outdoor work areas from rainfall, run-on, runoff, and wind dispersal;

(e) Protect trash storage areas from rainfall, run-on, runoff, and wind dispersal; and

(f) Any additional BMPs determined to be necessary by the Copermittee to minimize pollutant generation at each project.

(3) Low Impact Development (LID) BMP Requirements

The following LID BMPs must be implemented at all development projects where applicable and feasible:

(a) Maintenance or restoration of natural storage reservoirs and drainage corridors (including topographic depressions, areas of permeable soils, natural swales, and ephemeral and intermittent streams);[21]

(b) Buffer zones for natural water bodies (where buffer zones are technically infeasible, require project applicant to include other buffers such as trees, access restrictions, etc.);

(c) Conservation of natural areas within the project footprint including existing trees, other vegetation, and soils;

(d) Construction of streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided public safety is not compromised;

(e) Minimization of the impervious footprint of the project;

(f) Minimization of soil compaction to landscaped areas;

(g) Disconnection of impervious surfaces through distributed pervious areas;

[21] Development projects proposing to dredge or fill materials in waters of the U.S. must obtain a CWA Section 401 Water Quality Certification. Projects proposing to dredge or fill waters of the state must obtain waste discharge requirements.

(h) Landscaped or other pervious areas designed and constructed to effectively receive and infiltrate, retain and/or treat runoff from impervious areas, prior to discharging to the MS4;

(i) Small collection strategies located at, or as close as possible to, the source (i.e. the point where storm water initially meets the ground) to minimize the transport of runoff and pollutants to the MS4 and receiving waters;

(j) Use of permeable materials for projects with low traffic areas and appropriate soil conditions;

(k) Landscaping with native or drought tolerant species; and

(l) Harvesting and using precipitation.

b. PRIORITY DEVELOPMENT PROJECTS

Priority Development Projects are land development projects that fall under the planning and building authority of the Copermittee for which the Copermittee must impose specific requirements, in addition to those described in Provision E.3.a, including the implementation of structural BMPs to meet the performance requirements described in Provision E.3.c.

(1) Definition of Priority Development Project

Priority Development Projects include the following:

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(b) Redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site on an existing site of 10,000 square feet or more of impervious surfaces). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(c) New and redevelopment projects that create 5,000 square feet or more of impervious surface (collectively over the entire project site), and support one or more of the following uses:

(i) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812).

(ii) Hillside development projects. This category includes development on any natural slope that is twenty-five percent or greater.

(iii) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce.

(iv) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

(d) New or redevelopment projects that create or replace 2,500 square feet or more of impervious surface (collectively over the entire project site), and discharging directly to an Environmentally Sensitive Area (ESA). "Discharging directly to" includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands).

(e) New development projects that support one or more of the following uses:

(i) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

(ii) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

(f) New or redevelopment projects that result in the disturbance of one or more acres of land and are expected to generate pollutants post construction.

(2) <u>Special Considerations for Redevelopment Projects</u>

The structural BMP performance requirements of Provision E.3.c are applicable to redevelopment Priority Development Projects, as defined in E.3.b.(1), as follows:

(a) Where redevelopment results in the creation or replacement of impervious surface in an amount of less than fifty percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provision E.3.c apply only to the creation or replacement of impervious surface, and not the entire development; or

(b) Where redevelopment results in the creation or replacement of impervious surface in an amount of more than fifty percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provision E.3.c apply to the entire development.

(3) Priority Development Project Exemptions

Each Copermittee has the discretion to exempt the following projects from being defined as Priority Development Projects:

(a) New or retrofit paved sidewalks, bicycle lanes, or trails that meet the following criteria:

(i) Designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas; OR

(ii) Designed and constructed to be hydraulically disconnected from paved streets or roads; OR

(iii) Designed and constructed with permeable pavements or surfaces in accordance with USEPA Green Streets guidance.[22]

(b) Retrofitting or redevelopment of existing paved alleys, streets or roads that are designed and constructed in accordance with the USEPA Green Streets guidance.[23]

c. PRIORITY DEVELOPMENT PROJECT STRUCTURAL BMP PERFORMANCE REQUIREMENTS

In addition to the BMP requirements listed for all development projects under Provision E.3.a, Priority Development Projects must also implement structural BMPs that conform to performance requirements described below.

(1) Storm Water Pollutant Control BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite structural BMPs to control pollutants in storm water that may be discharged from a project as follows:

(a) Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite the pollutants contained in the volume of storm water runoff produced from a 24-hour 85th percentile storm event (design capture volume);[24]

[22] See "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).
[23] Ibid.
[24] This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are

(i) If a Copermittee determines that implementing BMPs to retain the full design capture volume onsite for a Priority Development Project is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize biofiltration BMPs. Biofiltration BMPs must be designed to have an appropriate hydraulic loading rate to maximize storm water retention and pollutant removal, as well as to prevent erosion, scour, and channeling within the BMP,[25] and must be sized to:

[a] Treat 1.5 times the design capture volume not reliably retained onsite, OR

[b] Treat the design capture volume not reliably retained onsite with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite.

(ii) If a Copermittee determines that biofiltration is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize flow-thru treatment control BMPs to treat runoff leaving the site, AND mitigate for the design capture volume not reliably retained onsite pursuant to Provision E.3.c.(1)(b). Flow thru treatment control BMPs must be sized and designed to:

[a] Remove pollutants from storm water to the MEP;

[b] Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;

[c] Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Flow-thru treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of flow-thru treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

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encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals.

[25] As part of the Copermittee's update to its BMP Design Manual, pursuant to Provision E.3.d, the Copermittee must provide guidance for hydraulic loading rates and other biofiltration design criteria necessary to maximize storm water retention and pollutant removal.

(b) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1)(a). The Priority Development Project must mitigate for the portion of the pollutant load in the design capture volume not retained onsite if Provision E.3.c.(3) is utilized. If a Priority Development Project is allowed to utilize alternative compliance, flow-thru treatment control BMPs must be implemented to treat the portion of the design capture volume that is not reliably retained onsite. Flow-thru treatment control BMPs must be sized and designed in accordance with Provisions E.3.c.(1)(a)(ii)[a]-[c].

(2) Hydromodification Management BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite BMPs to manage hydromodification that may be caused by storm water runoff discharged from a project as follows:

(a) Post-project runoff conditions (flow rates and durations) must not exceed pre-development runoff conditions by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat downstream of Priority Development Projects).

(i) In evaluating the range of flows that results in increased potential for erosion of natural (non-hardened) channels, the lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks.

(ii) The Copermittees may use monitoring results collected pursuant to Provision D.1.a.(2) to re-define the range of flows resulting in increased potential for erosion, or degraded instream habitat conditions, as warranted by the data.

(b) Each Priority Development Project must avoid critical sediment yield areas known to the Copermittee or identified by the optional Watershed Management Area Analysis pursuant to Provision B.3.b.(4), or implement measures that allow critical coarse sediment to be discharged to receiving waters, such that there is no net impact to the receiving water.

(c) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the performance requirements of Provision E.3.c.(2)(a). The Priority Development Project must mitigate for the post-project runoff conditions not fully managed onsite if Provision E.3.c.(3) is utilized.

(d) Exemptions

Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provisions E.3.c.(2) where the project discharges storm water runoff to:

(i) Existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;

(ii) Conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; or

(iii) An area identified by the Copermittees as appropriate for an exemption by the optional Watershed Management Area Analysis incorporated into the Water Quality Improvement Plan pursuant to Provision B.3.b.(4).

(3) Alternative Compliance Program to Onsite Structural BMP Implementation

At the discretion of each Copermittee, Priority Development Projects may be allowed to participate in an alternative compliance program in lieu of implementing the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2), provided that the Water Quality Improvement Plan includes the optional Watershed Management Area Analysis described in Provision B.3.b.(4). The alternative compliance program is available to a Priority Development Project only if the Priority Development Project applicant enters into a voluntary agreement with the Copermittee authorizing this arrangement. In addition to the voluntary agreement, relief from implementing structural BMPs onsite may be authorized by the Copermittee under the following conditions:

(a) Watershed Management Area Analysis Candidate Projects

The Priority Development Project applicant agrees to fund, contribute funds to, or implement a candidate project identified by the Copermittees in the Watershed Management Area Analysis included in the Water Quality Improvement Plan, pursuant to Provisions B.3.b.(4) subject to the following conditions:

(i) The Copermittee must determine that implementation of the candidate project will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite;

(ii) If the Priority Development Project applicant chooses to fully or partially fund a candidate project, then the in-lieu fee structure described in Provision E.3.c.(3)(c) must be followed;

(iii) If the Priority Development Project applicant chooses to fully or partially fund a candidate project, then the Copermittee must ensure that the funds to be obtained from the Priority Development Project applicant are sufficient to mitigate for impacts caused by not fully implementing structural BMPs onsite, pursuant to the performance requirements described in Provisions E.3.c.(1) and E.3.c.(2);

(iv) If the Priority Development Project applicant chooses to implement a candidate project, then the Copermittee must ensure that pollutant control and/or hydromodification management within the candidate project are sufficient to mitigate for impacts caused by not implementing structural BMPs fully onsite, pursuant to the performance requirements described in Provisions E.3.c.(1) and E.3.c.(2);

(v) The voluntary agreement to fund, partially fund, or implement a candidate project must include reliable sources of funding for operation and maintenance of the candidate project;

(vi) Design of the candidate project must be conducted under an appropriately qualified engineer, geologist, architect, landscape architect, or other professional, licenses where applicable, and competent and proficient in the fields pertinent to the candidate project design;

(vii) The candidate project must be constructed as soon as possible, but no later than 4 years after the certificate of occupancy is granted for the first Priority Development Project that contributed funds toward the construction of the candidate project, unless a longer period of time is authorized by the San Diego Water Board Executive Officer; and

(viii) If the candidate project is constructed after the Priority Development Project is constructed, the Copermittee must require temporal mitigation for pollutant loads and altered flows that are discharged from the Priority Development Project.

(b) Project Applicant Proposed Alternative Compliance Projects

The Copermittee may allow a Priority Development Project applicant to propose and fund, contribute funds to, or implement an alternative compliance project not identified by the Watershed Management Area Analysis included in the Water Quality Improvement Plan pursuant to Provisions B.3.b.(4). This option is allowed provided the Copermittee determines that implementation of the alternative compliance project will have a greater overall water quality benefit for the Watershed

Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite, and is subject to the requirements described in Provisions E.3.c.(3)(a)(ii)-(viii).

(c) Alternative Compliance In-Lieu Fee Structure

If a Copermittee chooses to allow a Priority Development Project applicant to fund, or partially fund a candidate project or an alternative compliance project, then the Copermittee must develop and implement an in-lieu fee structure. This may be developed individually or with other Copermittees and/or entities, as a means for designing, developing, constructing, operating and maintaining offsite alternative compliance projects. The in-lieu fee must be transferred to the Copermittee (for public projects) or an escrow account (for private projects) prior to the construction of the Priority Development Project.

(d) Alternative Compliance Water Quality Credit System Option

The Copermittee may develop and implement an alternative compliance water quality credit system option, individually or with other Copermittees and/or entities, provided that such a credit system clearly exhibits that it will not allow discharges from Priority Development Projects to cause or contribute to a net impact over and above the impact caused by projects meeting the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2). Any credit system that a Copermittee chooses to implement must be submitted to the San Diego Water Board Executive Officer for review and acceptance as part of the Water Quality Improvement Plan.

(4) Long-Term Structural BMP Maintenance

Each Copermittee must require the project applicant to submit proof of the mechanism under which ongoing long-term maintenance of all structural BMPs will be conducted.

(5) Infiltration and Groundwater Protection

(a) Structural BMPs designed to primarily function as large, centralized infiltration devices (such as large infiltration trenches and infiltration basins) must not cause or contribute to an exceedance of an applicable groundwater quality objective. At a minimum, such infiltration BMPs must be in conformance with the design criteria listed below, unless the development project applicant demonstrates to the Copermittee that one or more of the specific design criteria listed below are not necessary to protect groundwater quality. The design criteria listed below do not apply to small infiltration systems dispersed throughout a development project.

(i) Runoff must undergo pretreatment such as sedimentation or filtration prior to infiltration;

(ii) Pollution prevention and source control BMPs must be implemented at a level appropriate to protect groundwater quality at sites where infiltration BMPs are to be used;

(iii) Infiltration BMPs must be adequately maintained to remove pollutants in storm water to the MEP;

(iv) The vertical distance from the base of any infiltration BMP to the seasonal high groundwater mark must be at least 10 feet. Where groundwater basins do not support beneficial uses, this vertical distance criteria may be reduced, provided groundwater quality is maintained;

(v) The soil through which infiltration is to occur must have physical and chemical characteristics (e.g., appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses;

(vi) Infiltration BMPs must not be used for areas of industrial or light industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee, unless source control BMPs to prevent exposure of high threat activities are implemented, or runoff from such activities is first treated or filtered to remove pollutants prior to infiltration; and

(vii) Infiltration BMPs must be located a minimum of 100 feet horizontally from any water supply wells.

(b) The Copermittee may develop, individually or with other Copermittees, alternative mandatory design criteria to that listed above for infiltration BMPs which are designed to primarily function as centralized infiltration devices. Before implementing the alternative design criteria in the development planning process the Copermitee(s) must:

(i) Notify the San Diego Water Board of the intent to implement the alternative design criteria submitted; and

(ii) Comply with any conditions set by the San Diego Water Board.

d. BMP DESIGN MANUAL UPDATE

Each Copermittee must update its BMP Design Manual[26] pursuant to Provision F.2.b. Until the Copermittee has updated its BMP Design Manual with the

[26] The BMP Design Manual was formerly known as the Standard Storm Water Mitigation Plan under Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016.

requirements of Provisions E.3.a-c, the Copermittee must continue implementing its current BMP Design Manual. Unless directed otherwise by the San Diego Water Board, the Copermittee must implement the BMP Design Manual within 180 days of completing the update. The update of the BMP Design Manual must include the following:

(1) Updated procedures to determine the nature and extent of storm water requirements applicable to a potential development or redevelopment projects. These procedures must inform project applicants of the storm water management requirements applicable to their project including, but not limited to, general requirements for all development projects, structural BMP design procedures and requirements, hydromodification management requirements, requirements specific to phased projects, and procedures specific to private developments and public improvement projects;

(2) Updated procedures to identify pollutants and conditions of concern for selecting the most appropriate structural BMPs that consider, at a minimum, the following:

(a) Receiving water quality (including pollutants for which receiving waters are listed as impaired under the CWA section 303(d) List);

(b) Pollutants, stressors, and/or receiving water conditions that cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(c) Land use type of the project and pollutants associated with that land use type; and

(d) Pollutants expected to be present onsite.

(3) Updated procedures for designing structural BMPs, including any updated performance requirements to be consistent with the requirements of Provision E.3.c for all structural BMPs listed in the BMP Design Manual;

(4) Long-term maintenance criteria for each structural BMP listed in the BMP Design Manual; and

(5) Alternative compliance criteria, in accordance with the requirements under Provision E.3.c.(3), if the Copermittee elects to allow Priority Development Projects within its jurisdiction to utilize alternative compliance.

e. PRIORITY DEVELOPMENT PROJECT BMP IMPLEMENTATION AND OVERSIGHT

Each Copermittee must implement a program that requires and confirms structural BMPs on all Priority Development Projects are designed, constructed, and maintained to remove pollutants in storm water to the MEP.

(1) Structural BMP Approval and Verification Process

(a) Each Copermittee must require and confirm that for all Priority Development Project applications that have not received prior lawful approval by the Copermittee by the time the BMP Design Manual is updated pursuant to Provision E.3.d, the requirements of Provision E.3 are implemented. For project applications that have received prior lawful approval before the BMP Design Manual is updated pursuant to Provision E.3.d, the Copermittee may allow previous land development requirements to apply.

(b) Each Copermittee must identify the roles and responsibilities of its various municipal departments in implementing the structural BMP requirements, including each stage of a project from application review and approval through BMP maintenance and inspections.

(c) Each Copermittee must require and confirm that appropriate easements and ownerships are properly recorded in public records and the information is conveyed to all appropriate parties when there is a change in project or site ownership.

(d) Each Copermittee must require and confirm that prior to occupancy and/or intended use of any portion of the Priority Development Project, each structural BMP is inspected to verify that it has been constructed and is operating in compliance with all of its specifications, plans, permits, ordinances, and the requirements of this Order.

(2) Priority Development Project Inventory and Prioritization

(a) Each Copermittee must develop, maintain, and update at least annually, a watershed-based database to track and inventory all Priority Development Projects and associated structural BMPs within its jurisdiction. Inventories must be accurate and complete beginning from December 2002 for the San Diego County Copermittees, February 2003 for the Orange County Copermittees, and July 2005 for the Riverside County Copermittees. The use of an automated database system, such as GIS, is highly recommended. The database must include, at a minimum, the following information:

(i) Priority Development Project location (address and hydrologic subarea);

(ii) Descriptions of structural BMP type(s);

(iii) Date(s) of construction;

(iv) Party responsible for structural BMP maintenance;

(v) Dates and findings of structural BMP maintenance verifications; and

(vi) Corrective actions and/or resolutions, when applicable.

(b) Each Copermittee must prioritize the Priority Development Projects with structural BMPs within its jurisdiction. The designation of Priority Development Projects as high priority must consider the following:

(i) The highest water quality priorities identified in the Water Quality Improvement Plan;

(ii) Receiving water quality;

(iii) Number and sizes of structural BMPs;

(iv) Recommended maintenance frequency of structural BMPs;

(v) Likelihood of operation and maintenance issues of structural BMPs;

(vi) Land use and expected pollutants generated; and

(vii) Compliance record.

(3) Structural BMP Maintenance Verifications and Inspections

Each Copermittee is required to verify that structural BMPs on each Priority Development Project are adequately maintained, and continue to operate effectively to remove pollutants in storm water to the MEP through inspections, self-certifications, surveys, or other equally effective approaches.

(a) All (100 percent) of the structural BMPs at Priority Development Projects that are designated as high priority must be inspected directly by the Copermittee annually prior to each rainy season;

(b) For verifications performed through a means other than direct Copermittee inspection, adequate documentation must be required by the Copermittee to provide assurance that the required maintenance of structural BMPs at each Priority Development Project has been completed; and

(c) Appropriate follow-up measures (including re-inspections, enforcement, etc.) must be conducted to ensure that structural BMPs at each Priority Development Project continue to reduce pollutants in storm water to the MEP as originally designed.

f. DEVELOPMENT PROJECT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all development projects, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

4. Construction Management

Each Copermittee must implement a construction management program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. Project Approval Process

Prior to issuance of any local permit(s) that allows the commencement of construction projects that involve ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff, each Copermittee must:

(1) Require a pollution control plan, construction BMP plan, and/or an erosion and sediment control plan, to be submitted by the project applicant to the Copermittee;

(2) Confirm the pollution control plan, construction BMP plan, and/or erosion and sediment control plan, complies with the local grading ordinance, other applicable local ordinances, and the requirements of this Order;

(3) Confirm the pollution control, construction BMP, and/or erosion and sediment control plan, includes seasonally appropriate and effective BMPs and management measures described in Provision E.4.c, as applicable to the project; and

(4) Verify that the project applicant has obtained coverage under the statewide Construction General Permit (Order 2012-0006-DWQ or subsequent Order), if applicable.

b. Construction Site Inventory and Tracking

(1) Each Copermittee must maintain and update, at least quarterly, a watershed-based inventory of all construction projects issued a local permit that allows ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff. The use of an automated database system, such as GIS, is highly recommended. The inventory must include:

(a) Relevant contact information for each site (e.g., name, address, phone, and email for the owner and contractor);

(b) The basic site information including location (address and hydrologic subarea), Waste Discharge Identification (WDID) number (if applicable), size of the site, and approximate area of disturbance;

(c) Whether or not the site is considered a high threat to water quality, as defined in Provision E.4.b.(2) below;

(d) The project start and completion dates;

(e) The required inspection frequency, as defined in the Copermittee's jurisdictional runoff management program document;

(f) The date the Copermittee accepted or approved the pollution control plan, construction BMP plan, and/or erosion and sediment control plan; and

(g) Whether or not there are ongoing enforcement actions administered to the site.

(2) Each Copermittee must identify all construction sites within its jurisdiction that represent a high threat to downstream surface water quality. The designation of construction sites as high threat to water quality must consider the following:

(a) Sites located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Sites located within the same hydrologic subarea and tributary to a water body segment listed as impaired for sediment on the CWA section 303(d) List;

(c) Sites located within, directly adjacent to, or discharging directly to a receiving water within an ESA; and

(d) Other sites determined by the Copermittees or the San Diego Water Board as a high threat to water quality.

c. CONSTRUCTION SITE BMP IMPLEMENTATION

Each Copermittee must implement, or require the implementation of effective BMPs to reduce discharges of pollutants in storm water from construction sites to the MEP, and effectively prohibit non-storm water discharges from construction sites into the MS4. These BMPs must be site specific, seasonally appropriate, and construction phase appropriate. BMPs must be implemented at each construction site year round. Dry season BMP implementation must plan for and address unseasonal rain events that may occur during the dry season (May 1 through September 30). Copermittees must implement, or require the implementation of, BMPs in the following categories:

(1) Project Planning;

(2) Good Site Management "Housekeeping", including waste management;

(3) Non-storm Water Management;

(4) Erosion Control;

(5) Sediment Control;

(6) Run-on and Run-off Control; and

(7) Active/Passive Sediment Treatment Systems, where applicable.

d. CONSTRUCTION SITE INSPECTIONS

Each Copermittee must conduct construction site inspections to require and confirm compliance with its local permits and applicable local ordinances, and the requirements of this Order. Priority for site inspections must consider threat to water quality pursuant to Provision E.4.b as well as the nature of the construction activity, topography, and the characteristics of soils and receiving water quality.

(1) Inspection Frequency

(a) Each Copermittee must conduct inspections at all inventoried sites, including high threat to water quality sites, at an appropriate frequency for each phase of construction to confirm the site reduces the discharge of pollutants in storm water from construction sites to the MEP, and effectively prohibits non-storm water discharges from entering the MS4.

(b) Each Copermittee must establish appropriate inspection frequencies for high threat to water quality sites, and all other sites, for each phase of construction. Inspection frequencies appropriate for addressing the highest water quality priorities identified in the Water Quality Improvement Plan, and for complying with the requirements of this Order must be identified in each Copermittee's jurisdictional runoff management program document.

(c) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e., re-inspection, enforcement) necessary to require and confirm site compliance with its local permits and applicable local ordinances, and the requirements of this Order.

(2) Inspection Content

Inspections of construction sites by the Copermittee must include, at a minimum:

(a) Verification of coverage under the Construction General Permit (Notice of Intent (NOI) and/or WDID number) during initial inspections, when applicable;

(b) Assessment of compliance with its local permits and applicable local ordinances related to pollution prevention, including the implementation and maintenance of applicable BMPs;

(c) Assessment of BMP adequacy and effectiveness;

(d) Visual observations of actual non-storm water discharges;

(e) Visual observations of actual or potential discharge of sediment and/or construction related materials from the site;

(f) Visual observations of actual or potential illicit connections; and

(g) If any violations are found and BMP corrections are needed, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried construction sites. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Site name, location (address and hydrologic subarea), and WDID number (if applicable);

(b) Inspection date;

(c) Approximate amount of rainfall since last inspection;

(d) Description of problems observed with BMPs and indication of need for BMP addition/repair/replacement and any scheduled re-inspection, and date of re-inspection;

(e) Descriptions of any other specific inspection comments which must, at a minimum, include rationales for longer compliance time;

(f) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(g) Resolution of problems noted and date problems fixed.

e. CONSTRUCTION SITE ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried construction sites, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

5. Existing Development Management

Each Copermittee must implement an existing development management program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. EXISTING DEVELOPMENT INVENTORY AND TRACKING

Each Copermittee must maintain, and update at least annually, a watershed-based inventory of the existing development within its jurisdiction that may discharge a pollutant load to and from the MS4. The use of an automated database system, such as GIS, is highly recommended. The inventory must, at a minimum, include:

(1) Name, location (hydrological subarea and address, if applicable) of the following types of existing development with its jurisdiction:

(a) Commercial facilities or areas;

(b) Industrial facilities;

(c) Municipal facilities, including:

(i) MS4 and related structures;[27]
(ii) Roads, streets, and highways;
(iii) Parking facilities;
(iv) Municipal airfields;
(v) Parks and recreation facilities;
(vi) Flood management facilities, flood control devices and structures;
(vii) Operating or closed municipal landfills;
(viii) Publicly owned treatment works (including water and wastewater treatment plants) and sanitary sewer collection systems;
(ix) Corporate yards, including maintenance and storage yards for materials, waste, equipment, and vehicles;

[27] The inventory may refer to the MS4 map required to be maintained pursuant to Provision E.2.b.(1).

(x) Hazardous waste collection facilities;

(xi) Other treatment, storage or disposal facilities for municipal waste; and

(xii) Other municipal facilities that the Copermittee determines may contribute a significant pollutant load to the MS4.

(d) Residential areas, which may be designated by one or more of the following:

(i) Residential management area;

(ii) Drainage basin or area;

(iii) Land use (e.g., single family, multi-family, rural);

(iv) Neighborhood;

(v) Common Interest Area;

(vi) Home Owner Association;

(vii) Mobile home park; and/or

(viii) Other designations accepted by the San Diego Water Board Executive Officer.

(2) A description of the facility or area, including the following information:

(a) Classification as commercial, industrial, municipal, or residential;

(b) Status of facility or area as active or inactive;

(c) Identification if a business is a mobile business;

(d) SIC Code or NAICS Code, if applicable;

(e) Industrial General Permit NOI and/or WDID number, if applicable;

(f) Identification if a residential area is or includes a Common Interest Area / Home Owner Association, or mobile home park;

(g) Identification of pollutants generated and potentially generated by the facility or area;

(h) Whether the facility or area is adjacent to an ESA;

(i) Whether the facility or area is tributary to and within the same hydrologic subarea as a water body segment listed as impaired on the CWA section 303(d) List and generates pollutants for which the water body segment is impaired; and

(3) An annually updated map showing the location of inventoried existing development, watershed boundaries, and water bodies.

b. EXISTING DEVELOPMENT BMP IMPLEMENTATION AND MAINTENANCE

Each Copermittee must designate a minimum set of BMPs required for all inventoried existing development, including special event venues. The designated minimum BMPs must be specific to facility or area types and pollutant generating activities, as appropriate.

(1) Commercial, Industrial, and Municipal Facilities and Areas

(a) Pollution Prevention

Each Copermittee must require the use of pollution prevention methods by the commercial, industrial, and municipal facilities and areas in its inventoried existing development to address the priorities and strategies in the Water Quality Improvement Plan.

(b) BMP Implementation

Each Copermittee must require the implementation of designated BMPs at commercial facilities and areas, industrial facilities, and implement designated BMPs at municipal facilities in its inventoried existing development.

(c) BMP Operation and Maintenance

(i) Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development.

(ii) Each Copermittee must implement a schedule of operation and maintenance activities for its MS4 and related structures (including but not limited to catch basins, storm drain inlets, detention basins, etc.), and verify proper operation of all its municipal structural treatment controls designed to reduce pollutants (including floatables) in storm water discharges to or from its MS4s and related drainage structures. Operation and maintenance activities may include, but is not limited to, the following:

[a] Inspections of the MS4 and related structures;
[b] Cleaning of the MS4 and related structures; and
[c] Proper disposal of materials removed from cleaning of the MS4 and related structures.

(iii) Each Copermittee must implement a schedule of operation and maintenance for public streets, unpaved roads, paved roads, and paved highways within its jurisdiction to minimize pollutants that can be discharged in storm water.

(iv) Each Copermittee must implement controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers. Copermittees that operate both a municipal sanitary sewer system and a MS4 must implement controls and measures to prevent and eliminate seeping sewage from infiltrating the MS4. Copermittees that do not operate both a municipal sanitary sewer system and a MS4 must coordinate with sewering agencies to keep themselves informed of relevant and appropriate maintenance activities and sanitary sewage projects in their jurisdiction that may cause or contribute to seepage of sewage into the MS4.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must require the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from commercial facilities and areas and industrial facilities, and implement BMPs at municipal facilities in its inventoried existing development. Such BMPs must include, as appropriate, educational activities, permits, certifications and other measures for applicators and distributors.

(2) <u>Residential Areas</u>

(a) Pollution Prevention

Each Copermittee must promote and encourage the use of pollution prevention methods, where appropriate, by the residential areas in its inventoried existing development.

(b) BMP Implementation

Each Copermittee must promote and encourage the implementation of designated BMPs at residential areas in its inventoried existing development.

(c) BMP Operation and Maintenance

Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at residential areas in its inventoried existing development.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must promote and encourage the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the

application, storage, and disposal of pesticides, herbicides and fertilizers from residential areas in its inventoried existing development.

c. EXISTING DEVELOPMENT INSPECTIONS

Each Copermittee must conduct inspections of inventoried existing development to ensure compliance with applicable local ordinances and permits, and the requirements of this Order.

(1) Inspection Frequency

(a) Each Copermittee must establish appropriate inspection frequencies for inventoried existing development in accordance with the following requirements:

(i) At a minimum, inventoried existing development must be inspected once every five years utilizing one or more of the following methods:

[a] Drive-by inspections by Copermittee municipal and contract staff;
[b] Onsite inspections by Copermittee municipal and contract staff; and/or
[c] Visual inspections of publicly accessible inventoried facilities or areas by volunteer monitoring or patrol programs that have been trained by the Copermittee;

(ii) The frequency of inspections must be appropriate to confirm that BMPs are being implemented to reduce the discharge of pollutants in storm water from the MS4 to the MEP and effectively prohibit non-storm water discharges to the MS4;

(iii) The frequency of inspections must be based on the potential for a facility or area to discharge non-storm water and pollutants in storm water, and should reflect the priorities set forth in the Water Quality Improvement Plan;

(iv) Each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development;[28] and

(v) Inventoried existing development must be inspected by the Copermittee, as needed, in response to valid public complaints.

(b) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e. education and outreach, re-inspection, enforcement)

[28] If any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspection may count toward the total annual inspection requirement. This requirement excludes linear municipal facilities (i.e., MS4 linear channels, sanitary sewer collection systems, streets, roads and highways).

necessary to require and confirm compliance with its applicable local ordinances and permits and the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

(2) Inspection Content

(a) Inspections of existing development must include, at a minimum:

(i) Visual inspections for the presence of actual non-storm water discharges;

(ii) Visual inspections for the presence of actual or potential discharge of pollutants;

(iii) Visual inspections for the presence of actual or potential illicit connections; and

(iv) Verification that the description of the facility or area in the inventory, required pursuant to Provision E.5.a.(2), has not changed.

(b) Onsite inspections of existing development by the Copermittee must include, at a minimum:

(i) Assessment of compliance with its applicable local ordinances and permits related to non-storm water and storm water discharges and runoff;

(ii) Assessment of the implementation of the designated BMPs;

(iii) Verification of coverage under the Industrial General Permit, when applicable; and

(iv) If any problems or violations are found, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried existing development. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Name and location of the facility or area (address and hydrologic subarea) consistent with the inventory name and location, pursuant to Provision E.5.a.(1);

(b) Inspection and re-inspection date(s);

(c) Inspection method(s) (i.e. drive-by, onsite);

(d) Observations and findings from the inspection(s);

(e) For onsite inspections of existing development by Copermittee municipal or contract staff, the records must also include, as applicable:

(i) Description of any problems or violations found during the inspection(s);

(ii) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(iii) The date problems or violations were resolved.

d. EXISTING DEVELOPMENT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried existing development, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

e. RETROFITTING AND REHABILITATING AREAS OF EXISTING DEVELOPMENT

(1) Retrofitting Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to retrofit areas of existing development within its jurisdiction to address identified sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify areas of existing development as candidates for retrofitting, focusing on areas where retrofitting will address pollutants and/or stressors that contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for retrofitting projects may be utilized to reduce pollutants that may be discharged in storm water from areas of existing development, and/or address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of retrofitting projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting projects; and

(e) Where retrofitting projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional retrofitting projects (i.e. projects that can receive and/or treat storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment) adjacent to and/or downstream of the areas of existing development.

(2) Stream, Channel and/or Habitat Rehabilitation in Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to rehabilitate streams, channels, and/or habitats in areas of existing development within its jurisdiction to address the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify streams, channels, and/or habitats in areas of existing development as candidates for rehabilitation, focusing on areas where stream, channel, and/or habitat rehabilitation projects will address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for stream, channel, and/or habitat rehabilitation projects may be utilized to address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters, rehabilitate channelized or hydromodified streams, restore wetland and riparian habitat, restore watershed functions, and/or restore beneficial uses of receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of stream, channel, and/or habitat rehabilitation projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance stream, channel, and/or habitat rehabilitation projects; and

(e) Where stream, channel, and/or habitat rehabilitation projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional stream, channel, and/or habitat rehabilitation projects (i.e. projects that can receive storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment).

6. Enforcement Response Plans

Each Copermittee must develop and implement an Enforcement Response Plan as part of its jurisdictional runoff management program document. The Enforcement Response Plan must describe the applicable approaches and options to enforce its legal authority established pursuant to Provision E.1, as necessary, to achieve compliance with the requirements of this Order. The Enforcement Response Plan must be in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include the following:

a. Enforcement Response Plan Components

The Enforcement Response Plan must include the following individual components:

(1) Illicit Discharge Detection and Elimination Enforcement Component;

(2) Development Planning Enforcement Component;

(3) Construction Management Enforcement Component; and

(4) Existing Development Enforcement Component.

b. Enforcement Response Approaches and Options

Each component of the Enforcement Response Plan must describe the enforcement response approaches that the Copermittee will implement to compel compliance with its statutes, ordinances, permits, contracts, orders, or similar means, and the requirements of this Order. The description must include the protocols for implementing progressively stricter enforcement responses. The enforcement response approaches must include appropriate sanctions to compel compliance, including, at a minimum, the following tools or their equivalent:

(1) Verbal and written notices of violation;

(2) Cleanup requirements;

(3) Fines;

(4) Bonding requirements;

(5) Administrative and criminal penalties;

(6) Liens;

(7) Stop work orders; and

(8) Permit and occupancy denials.

c. CORRECTION OF VIOLATIONS

(1) Violations must be corrected in a timely manner with the goal of correcting the violations within 30 calendar days after the violations are discovered, or prior to the next predicted rain event, whichever is sooner.

(2) If more than 30 calendar days are required to achieve compliance, then a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

d. ESCALATED ENFORCEMENT

(1) The Enforcement Response Plan must include a definition of "escalated enforcement." Escalated enforcement must include any enforcement scenario where a violation or other non-compliance is determined to cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan. Escalated enforcement may be defined differently for development planning, construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas.

(2) Where the Copermittee determines escalated enforcement is not required, a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

(3) Escalated enforcement actions must continue to increase in severity, as necessary, to compel compliance as soon as possible.

e. REPORTING OF NON-COMPLIANT SITES

(1) Each Copermittee must notify the San Diego Water Board in writing within five (5) calendar days of issuing escalated enforcement (as defined in the Copermittee's Enforcement Response Plan) to a construction site that poses a significant threat to water quality as a result of violations or other non-compliance with its permits and applicable local ordinances, and the

requirements of this Order. Written notification may be provided electronically by email to the appropriate San Diego Water Board staff.

(2) Each Copermittee must notify the San Diego Water Board any persons required to obtain coverage under the statewide Industrial General Permit and Construction General Permit and failing to do so, within five (5) calendar days from the time the Copermittee become aware of the circumstances. Written notification may be provided electronically by email to Nonfilers_R9@waterboards.ca.gov.

7. Public Education and Participation

Each Copermittee must implement, individually or with other Copermittees, a public education and participation program in accordance with the strategies identified in the Water Quality Improvement Plan to promote and encourage the development of programs, management practices, and behaviors that reduce the discharge of pollutants in storm water to the MEP, prevent controllable non-storm water discharges from entering the MS4, and protect water quality standards in receiving waters. The public education and participation program must be implemented in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include, at a minimum, the following requirements:

a. PUBLIC EDUCATION

The public education program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) Educational activities, public information activities, and other appropriate outreach activities intended to reduce pollutants associated with the application of pesticides, herbicides and fertilizer and other pollutants of concern in storm water discharges to and from its MS4 to the MEP, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed to address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(2) Educational activities, public information activities, and other appropriate outreach activities to facilitate the proper management and disposal of used oil and toxic materials; and

(3) Appropriate education and training measures for specific target audiences, such as construction site operators, residents, underserved target audiences and school-aged children, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed, based on high risk behaviors and pollutants of concern.

b. PUBLIC PARTICIPATION

The public participation program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) A process for members of the public to participate in updating the highest priority water quality conditions, numeric goals, and water quality improvement strategies in the Water Quality Improvement Plan;

(2) Opportunities for members of the public to participate in providing the Copermittee recommendations for improving the effectiveness of the water quality improvement strategies implemented within its jurisdiction; and

(3) Opportunities for members of the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or protection of the quality of receiving waters.

8. Fiscal Analysis

a. Each Copermittee must secure the resources necessary to meet all the requirements of this Order.

b. Each Copermittee must conduct an annual fiscal analysis of its jurisdictional runoff management program in its entirety. The fiscal analysis must include the following:

(1) Identification of the various categories of expenditures necessary to implement the requirements of this Order, including a description of the specific capital, operation and maintenance, and other expenditure items to be accounted for in each category of expenditures;

(2) The staff resources needed and allocated to meet the requirements of this Order, including any development, implementation, and enforcement activities required;

(3) The estimated expenditures for Provisions E.8.b.(1) and E.8.b.(2) for the current fiscal year; and

(4) The source(s) of funds that are proposed to meet the necessary expenditures described in Provisions E.8.b.(1) and E.8.b.(2), including legal restrictions on the use of such funds, for the current fiscal year and next fiscal year.

c. Each Copermittee must submit a summary of the annual fiscal analysis with each Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3).

d. Each Copermittee must provide the documentation used to develop the summary of the annual fiscal analysis upon request by the San Diego Water Board.

F. REPORTING

The purpose of this provision is to determine and document compliance with the requirements set forth in this Order. The goal of reporting is to communicate to the San Diego Water Board and the people of the State of California the implementation status of each jurisdictional runoff management program and compliance with the requirements of this Order. This goal is to be accomplished through the submittal of specific deliverables to the San Diego Water Board by the Copermittees.

1. Water Quality Improvement Plans

The Copermittees for each Watershed Management Area must develop and submit the Water Quality Improvement Plan in accordance with the following requirements:

a. WATER QUALITY IMPROVEMENT PLAN DEVELOPMENT

Each Water Quality Improvement Plan must be developed in accordance with the following process:

(1) Public Participation Process

The Copermittees must implement a public participation process to solicit data, information, and recommendations to be utilized in the development of the Water Quality Improvement Plan. The public participation process must include the following:

(a) The Copermittees must develop a publicly available and noticed schedule of the opportunities for the public to participate and provide comments during the development of the Water Quality Improvement Plan. The schedule may be adjusted as necessary by the Copermittees, provided the public is provided timely notification of the changes to the schedule.

(b) The Copermittees must form a Water Quality Improvement Consultation Panel to provide recommendations during the development of the Water Quality Improvement Plan. The Water Quality Improvement Consultation Panel must consist of at least the following members:

(i) A representative of the San Diego Water Board;

(ii) A representative of the environmental community familiar with the water quality conditions of concern of the receiving waters in the Watershed Management Area, preferably from an environmental interest group associated with a water body within the Watershed Management Area; and

(iii) A representative of the development community familiar with the opportunities and constraints for implementing structural BMPs, retrofitting projects, and stream, channel or habitat rehabilitation

projects in the Watershed Management Area, preferably with relevant engineering, hydrology, and/or geomorphology experience in the Watershed Management Area.

(c) The Copermittees must coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public time and opportunity to participate during the development of the Water Quality Improvement Plans.

(2) Priority Water Quality Conditions

(a) The Copermittees must solicit data, information and recommendations from the public to be utilized in the development and identification of the priority water quality conditions and potential water quality improvement strategies for the Watershed Management Area.

(b) The Copermittees must review the priority water quality conditions the Copermittees plan on including in the Water Quality Improvement Plan with the Water Quality Improvement Consultation Panel to receive recommendations or concurrence.

(c) The Copermittees must consider revisions to the priority water quality conditions based on recommendations from the Water Quality Improvement Consultation Panel.

(d) The Copermittees must include all the potential water quality improvement strategies identified by the public and the Water Quality Improvement Consultation Panel with the submittal of the priority water quality conditions to the San Diego Water Board.

(e) The Copermittees must submit the Water Quality Improvement Plan requirements of Provision B.2 to the San Diego Water Board as early as 6 months and no later than 12 months after the commencement of coverage under this Order. Upon receipt, the San Diego Water Board will issue a public notice and release the proposed priority water quality conditions and potential water quality improvement strategies for public review and comment for a minimum of 30 days.

(f) The Copermittees must consider revisions to the priority water quality conditions and potential water quality improvement strategies developed pursuant to Provision B.2 based on public comments received by the close of the comment period.

(3) Water Quality Improvement Goals, Strategies and Schedules

(a) The Copermittees must solicit recommendations from the public on potential numeric goals for the highest priority water quality conditions

identified for the Watershed Management Area, and recommendations on the strategies that should be implemented to achieve the potential numeric goals.

(b) The Copermittees must consult with the Water Quality Improvement Consultation Panel and consider revisions to the following items based on the Panel's recommendations:

(i) The numeric goals and schedules the Copermittees propose to include in the Water Quality Improvement Plan;

(ii) The water quality improvement strategies and schedules the Copermittees propose to implement in the Watershed Management Area and include in the Water Quality Improvement Plan; and

(iii) If the Copermittees choose to implement Provision B.3.b.(4), the results of the Watershed Management Area Analysis the Copermittees proposed to incorporate into the Water Quality Improvement Plan.

(c) The Copermittees must submit the Water Quality Improvement Plan requirements of Provision B.3 to the San Diego Water Board as early as 9 months and no later than 18 months after the commencement of coverage under this Order. Upon receipt, the San Diego Water Board will issue a public notice and release the proposed water quality improvement goals, strategies and schedules for public review and comment for a minimum of 30 days.

(d) The Copermittees must consider revisions to the water quality improvement goals, strategies and schedules developed pursuant to Provision B.3 based on public comments received by the close of the comment period.

b. WATER QUALITY IMPROVEMENT PLAN SUBMITTAL AND IMPLEMENTATION

(1) Within 24 months after the commencement of coverage under this Order, the Copermittees for each Watershed Management Area must submit a complete Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order to the San Diego Water Board. The San Diego Water Board will issue a public notice and release the Water Quality Improvement Plan for public review and comment for a minimum of 30 days.

(2) The Copermittees must consider revisions to the Water Quality Improvement Plan based on written comments received by the close of the public comment period.

(3) The Copermittees must promptly submit any revisions to the Water Quality Improvement Plan to the San Diego Water Board no later than 60 days after the close of the public comment period.

(4) If issues concerning the Water Quality Improvement Plan are resolved informally through discussions among the Copermittees, the San Diego Water Board and interested parties, the San Diego Water Board Executive Officer may provide written notification of acceptance to the Copermittees that the Water Quality Improvement Plan meets the requirements of Provision B. However, if the Executive Officer determines that significant issues with the Water Quality Improvement Plan remain, the matter will be scheduled for San Diego Water Board consideration at a public meeting.

(5) The Copermittees must commence with implementation of the Water Quality Improvement Plan, in accordance with the water quality improvement strategies and schedules therein, upon written notification of acceptance with the Water Quality Improvement Plan by the San Diego Water Board Executive Officer.

(6) During implementation of the Water Quality Improvement Plan the Copermittees must correct any deficiencies in the Plan identified by the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report following a request by the Board to do so.

(7) The Water Quality Improvement Plan must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of receiving notification of acceptance with the Water Quality Improvement Plan by the San Diego Water Board Executive Officer.

2. Updates

a. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATES

Each Copermittee must update its jurisdictional runoff management program document in accordance with the following requirements:

(1) Each Copermittee is encouraged to seek public and key stakeholder participation and comments, as early and often as possible during the process of developing updates to its jurisdictional runoff management program document;

(2) Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E concurrent with the submittal of the Water Quality Improvement Plan. Each Copermittee must correct any deficiencies in the jurisdictional runoff management program document based on comments received from the San Diego Water Board in

the updates submitted with the Water Quality Improvement Plan Annual Report;

(3) Each Copermittee must submit updates to its jurisdictional runoff management program, with the supporting rationale for the modifications, either in the Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b;

(4) The Copermittee must revise proposed modifications to its jurisdictional runoff management program as directed by the San Diego Water Board Executive Officer; and

(5) Updated jurisdictional runoff management program documents must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of submitting the Water Quality Improvement Plan Annual Report.

b. BMP DESIGN MANUAL UPDATES

Each Copermittee must update its BMP Design Manual in accordance with the following requirements:

(1) Each Copermittee must update its BMP Design Manual to incorporate the requirements of Provisions E.3.a-d concurrent with the submittal of the Water Quality Improvement Plan. Each Copermittee must correct any deficiencies in the BMP Design Manual based on comments received from the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report;

(2) Subsequent updates to the BMP Design Manual must be consistent with the requirements of Provisions E.3.a-d and must be submitted as part of the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b; and

(3) Updated BMP Design Manuals must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of completing the update.

c. WATER QUALITY IMPROVEMENT PLAN UPDATES

(1) The Water Quality Improvement Plans must be updated in accordance with the following process:

(a) The Copermittees must develop and implement a public participation process to obtain data, information and recommendations for updating the Water Quality Improvement Plan. The public participation process must provide for a publicly available and noticed schedule of opportunities for the public to participate and provide comments during the development of updates to the Water Quality Improvement Plan;

(b) The Copermittees must consult with the Water Quality Improvement Consultation Panel on proposed updates of the Water Quality Improvement Plan, and consider the Water Quality Improvement Consultation Panel's recommendations in finalizing the proposed updates;

(c) The Copermittees for each Watershed Management Area must submit 1) proposed updates to the Water Quality Improvement Plan and supporting rationale, and 2) recommendations received from the public and the Water Quality Improvement Consultation Panel and the rationale for the requested updates, either in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The updates submitted will be deemed accepted for inclusion in the Water Quality Improvement Plan ninety (90) days after submission unless otherwise directed in writing by the San Diego Water Board Executive Officer;

(d) The Copermittees must revise the requested updates as directed by the San Diego Water Board Executive Officer; and

(e) Updated Water Quality Improvement Plans must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance of the requested updates by the San Diego Water Board.

(2) No later than six months following Office of Administrative Law and USEPA approval of any TMDL Basin Plan amendment with wasteload allocations (WLAs) assigned to the Copermittees during the term of this Order, the Copermittees must initiate an update to the applicable Water Quality Improvement Plans in accordance with Provision F.1 or Provision F.2.c.(1) to incorporate the requirements of the TMDL WLAs.

3. Progress Reporting

a. Progress Report Presentations

The Copermittees for each Watershed Management Area must periodically appear before the San Diego Water Board, as requested by the Board, to provide progress reports on the implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs.

b. Annual Reports

(1) Transitional Jurisdictional Runoff Management Program Annual Reports

(a) Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) no later than October 31 of each year for each jurisdictional runoff management program reporting period (i.e. July 1 to June 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted.

(b) Each Copermittee must submit the information on the Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) specific to the area within its jurisdiction in each Watershed Management Area.

(c) In addition to submitting the Jurisdictional Runoff Management Program Annual Report Form during the transitional reporting period, each Copermittee may continue to utilize and submit the jurisdictional runoff management program annual reporting format of its previous NPDES permit until the first Water Quality Improvement Plan Annual Report is required to be submitted.

(2) Transitional Monitoring and Assessment Program Annual Reports

The Copermittees for each Watershed Management Area must submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted under this Order. The Transitional Monitoring and Assessment Program Annual Reports must include:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1.a and D.2.a, summarized and presented in tabular and graphical form; and

(b) The findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

(3) Water Quality Improvement Plan Annual Reports

The Copermittees for each Watershed Management Area must submit a Water Quality Improvement Plan Annual Report for each reporting period no later than January 31 of the following year. The annual reporting period consists of two different periods: 1) July 1 to June 30 of the following year for the jurisdictional runoff management programs, 2) October 1 to September 30 of the following year for the monitoring and assessment programs. The Water Quality Improvement Plan Annual Reports must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Each Annual Report must include the following:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, summarized and presented in tabular and graphical form;

(b) The progress of the special studies required pursuant to Provision D.3, and the findings, interpretations and conclusions of a special study, or each phase of a special study, upon its completion;

(c) The findings, interpretations and conclusions from the assessments required pursuant to Provision D.4;

(d) The progress of implementing the Water Quality Improvement Plan, including, but not limited to, the following:

(i) The progress toward achieving the interim and final numeric goals for the highest water quality priorities for the Watershed Management Area;

(ii) The water quality improvement strategies that were implemented and/or no longer implemented by each of the Copermittees during the reporting period and previous reporting periods;

(iii) The water quality improvement strategies planned for implementation during the next reporting period;

(iv) Proposed modifications to the water quality improvement strategies, the public comments received and the supporting rationale for the proposed modifications;

(v) Previous modifications or updates incorporated into the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document and implemented by the Copermittees in the Watershed Management Area; and

(vi) Proposed modifications or updates to the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document;

(e) A completed Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) for each Copermittee in the Watershed Management Area, certified by a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative; and

(f) Each Copermittee must provide any data or documentation utilized in developing the Water Quality Improvement Plan Annual Report upon request by the San Diego Water Board. Any Copermittee monitoring data utilized in developing the Water Quality Improvement Plan Annual Report must be uploaded to the California Environmental Data Exchange Network (CEDEN).[29] Any Copermittee monitoring and assessment data utilized in developing the Water Quality Improvement Plan Annual Report must be available for access on the Regional Clearinghouse required pursuant to Provision F.4.

c. Regional Monitoring and Assessment Report

(1) The Copermittees must submit a Regional Monitoring and Assessment Report no later than 180 days prior to the expiration date of this Order. The Regional Monitoring and Assessment Report may be submitted as part of the Report of Waste Discharge required pursuant to Provision F.5.b. In preparing the report the Copermittees must consider the receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, and the findings, interpretations, and conclusions from the assessments required pursuant to Provision D.4. Based on these considerations the report must assess the following:

(a) The beneficial uses of the receiving waters within the San Diego Region that are supported and not adversely affected by the Copermittees' MS4 discharges;

(b) The beneficial uses of the receiving waters within the San Diego Region that are adversely impacted by the Copermittees' MS4 discharges;

(c) The progress toward protecting the beneficial uses in the receiving waters within the San Diego Region from the Copermittees' discharges; and

[29] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

(d) Pollutants or conditions of emerging concern that may impact beneficial uses in the receiving waters within the San Diego Region.

(2) The Regional Monitoring and Assessment Report must include recommendations for improving the implementation and assessment of the Water Quality Improvement Plans and jurisdictional runoff management programs.

(3) Each Copermittee must provide any data or documentation utilized in developing the Regional Monitoring and Assessment Report upon request by the San Diego Water Board. Any Copermittee monitoring and assessment data utilized in developing the Regional Monitoring and Assessment Report must be available for access on the Regional Clearinghouse required pursuant to Provision F.4.

4. Regional Clearinghouse

The Copermittees must develop, update, and maintain an internet-based Regional Clearinghouse that is made available to the public no later than 18 months after the effective date of this Order.[30]

a. The Copermittees, through the Regional Clearinghouse, must make the following documents and data available for access, and organized by Watershed Management Area. The documents and data may be linked to other internet-based data portals and databases where the original documents are stored:

(1) Water Quality Improvement Plan for the Watershed Management Area, and all updated versions with date of update;

(2) Annual Reports for the Watershed Management Area;

(3) Jurisdictional Runoff Management Program document for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(4) BMP Design Manual for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(5) Reports from special studies (e.g. source identification, BMP effectiveness assessment) conducted in the Watershed Management Area;

[30] The Copermittees may develop, update and maintain the clearinghouse(s) of other Copermittees or agencies.

(6) Monitoring data collected pursuant to Provision D for each Watershed Management Area must be uploaded to CEDEN,[31] with links to the uploaded data; and

(7) Available GIS data, layers, and/or shapefiles used to develop the maps generated and maintained by the Copermittees for the Water Quality Improvement Plans, Annual Reports, and jurisdictional runoff management program documents.

b. The Copermittees, through the Regional Clearinghouse, must make the following information and documents available for access:

(1) Contact information (point of contact, phone number, email address, and mailing address) for each Copermittee;

(2) Public hotline number for reporting non-storm water and illicit discharges for each Copermittee;

(3) Email address for reporting non-storm water and illicit discharges for each Copermittee;

(4) Link to each Copermittee's website, if available, where the public may find additional information about the Copermittee's storm water management program and for requesting records for the implementation of its program;

(5) Information about opportunities for the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or protection of the quality of receiving waters; and

(6) Reports from regional monitoring programs in which the Copermittees participate (e.g. Southern California Monitoring Coalition, Southern California Coastal Water Research Project Bight Monitoring);

(7) Regional Monitoring and Assessment Reports; and

(8) Any other information, data, and documents the Copermittees determine as appropriate for making available to the public.

[31] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

5. Report of Waste Discharge

a. The Orange County Copermittees and the Riverside County Copermittees are required to submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders. The San Diego Water Board will review and consider the Reports of Waste Discharge to determine whether modification to this Order, pursuant to the requirements of Provision H, will be required prior to the Orange County Copermittees and/or Riverside County Copermittees obtaining coverage under this Order. The current Orders for the Orange County Copermittees and Riverside County Copermittees are rescinded upon the date of effective coverage under this Order except for enforcement purposes.

b. The Copermittees subject to the requirements of this Order must submit to the San Diego Water Board a complete Report of Waste Discharge as an application for the re-issuance of this Order and NPDES permit. The Report of Waste Discharge must be submitted no later than 180 days in advance of the expiration date of this Order. The Report of Waste Discharge must contain the following minimum information:

(1) Names and addresses of the Copermittees;

(2) Names and titles of the primary contacts of the Copermittees;

(3) Proposed changes to the Copermittees' Water Quality Improvement Plans and the supporting justification;

(4) Proposed changes to the Copermittees' jurisdictional runoff management programs and the supporting justification;

(5) Any other information necessary for the re-issuance of this Order;

(6) Any information to be included as part of the Report of Waste Discharge pursuant to the requirements of this Order; and

(7) Any other information required by federal regulations for NPDES permit reissuance.

6. Application for Early Coverage

a. The Orange County Copermittees, collectively, or Riverside County Copermittees, collectively, may apply for early coverage under this Order by submitting a Report of Waste Discharge Form 200, with a written request for early coverage under this Order.

b. The San Diego Water Board will review the application for early coverage. A notification of coverage under this Order will be issued to the Copermittees in the

respective county by the San Diego Water Board upon completion of the early coverage application requirements. The effective coverage date will be specified in the notification of coverage. The Copermittees in the respective county are authorized to have MS4 discharges pursuant to the requirements of this Order starting on the effective coverage date specified in the notification of coverage. The existing Order for the respective county is rescinded upon the effective coverage date specified in the notification of coverage except for enforcement purposes.

7. Reporting Provisions

Each Copermittee must comply with all the reporting and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

G. PRINCIPAL WATERSHED COPERMITTEE RESPONSIBILITIES

1. The Copermittees within each Watershed Management Area must designate a Principal Watershed Copermittee and notify the San Diego Water Board of the name of the Principal Watershed Copermittee. An individual Copermittee should not be designated a Principal Watershed Copermittee for more than two Watershed Management Areas. The notification may be submitted with the Water Quality Improvement Plan required pursuant to Provision F.1 of this Order.

2. The Principal Watershed Copermittee is responsible for, at a minimum, the following:

a. Serving as liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues, and when necessary and appropriate, representing the Copermittees in the Watershed Management Area before the San Diego Water Board;

b. Facilitating the development of the Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order;

c. Coordinating the submittal of the deliverables required by Provisions F.1, F.2, F.3.a, and F.3.b of this Order; and

d. Coordinating and developing, with the other Principal Watershed Copermittees, the requirements of Provisions F.3.c, F.4, and F.5.b of this Order.

3. The Principal Watershed Copermittee is not responsible for ensuring that the other Copermittees within the Watershed Management Area are in compliance with the requirements of this Order. Each Copermittee within the Watershed Management Area is responsible for complying with the requirements of this Order.

H. MODIFICATION OF ORDER

1. Modifications of the Order may be initiated by the San Diego Water Board or by the Copermittees. Requests by Copermittees must be made to the San Diego Water Board.

2. Minor modifications to the Order may be made by the San Diego Water Board where the proposed modification complies with all the prohibitions and limitations, and other requirements of this Order.

3. This Order may also be re-opened and modified, revoked and, reissued or terminated in accordance with the provisions of 40 CFR 122.44, 122.62 to 122.64, and 124.5. Causes for taking such actions include, but are not limited to, failure to comply with any condition of this Order and permit, and endangerment to human health or the environment resulting from the permitted activity.

4. This Order may be re-opened for modification for cause including but not limited to the following:

a. The State Water Board determines that revisions are warranted, and the San Diego Water Board concurs that revisions are necessary to those provisions of the Order addressing compliance with water quality standards in the receiving water and/or those provisions of the Order establishing an iterative process for implementation of management practices to assure compliance with water quality standards in the receiving water;

b. An application for early coverage under this Order is received pursuant to Provision F.6;

c. Any of the TMDLs in Attachment E to this Order are amended in the Basin Plan by San Diego Water Board, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA;

d. The Basin Plan is amended by the San Diego Water Board to incorporate a new TMDL, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA; or

e. Updating or revising the monitoring and reporting requirements is determined to be necessary, at the discretion of the San Diego Water Board. Such modification(s) may include, but is (are) not limited to, revision(s) to: (i) implement recommendations from Southern California Coastal Water Research Project (SCCWRP), (ii) develop, refine, implement, and/or coordinate a regional monitoring program, (iii) develop and implement improved monitoring and assessment programs in keeping with San Diego Water Board Resolution No. R9-2012-0069, Resolution in Support of a Regional Monitoring Framework, and/or (iv) add provisions to require the Copermittees to evaluate and provide information on cost and values of the monitoring and reporting program.

5. The San Diego Water Board, after opportunity for public comment and a public hearing, will re-open and consider modifications to this Order when the Orange County Copermittees or the Riverside County Copermittees submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders.

I. STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

Each Copermittee must comply with all the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

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ATTACHMENT A

DISCHARGE PROHIBITIONS AND SPECIAL PROTECTIONS

1. Basin Plan Waste Discharge Prohibitions

California Water Code Section 13243 provides that a Regional Water Board, in a water quality control plan, may specify certain conditions or areas where the discharge of waste or certain types of waste is not permitted. The following waste discharge prohibitions in the Water Quality Control Plan for the San Diego Basin (Basin Plan) are applicable to any person, as defined by Section 13050(c) of the California Water Code, who is a citizen, domiciliary, or political agency or entity of California whose activities in California could affect the quality of waters of the state within the boundaries of the San Diego Region.

1. The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in California Water Code Section 13050, is prohibited.

2. The discharge of waste to land, except as authorized by waste discharge requirements or the terms described in California Water Code Section 13264 is prohibited.

3. The discharge of pollutants or dredged or fill material to waters of the United States except as authorized by a National Pollutant Discharge Elimination System (NPDES) permit or a dredged or fill material permit (subject to the exemption described in California Water Code Section 13376) is prohibited.

4. Discharges of recycled water to lakes or reservoirs used for municipal water supply or to inland surface water tributaries thereto are prohibited, unless this San Diego Water Board issues a NPDES permit authorizing such a discharge; the proposed discharge has been approved by the State Department of Health Services (DHS) and the operating agency of the impacted reservoir; and the discharger has an approved fail-safe long-term disposal alternative.

5. The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the San Diego Water Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

6. The discharge of waste in a manner causing flow, ponding, or surfacing on lands not owned or under the control of the discharger is prohibited, unless the discharge is authorized by the San Diego Water Board.

7. The dumping, deposition, or discharge of waste directly into waters of the state, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the San Diego Water Board.

8. Any discharge to a storm water conveyance system that is not composed entirely of "*storm water*" is prohibited unless authorized by the San Diego Water Board. [The federal regulations, 40 CFR 122.26(b)(13), define storm water as storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from firefighting activities.] [§122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

9. The unauthorized discharge of treated or untreated sewage to waters of the state or to a storm water conveyance system is prohibited.

10. The discharge of industrial wastes to conventional septic tank/subsurface disposal systems, except as authorized by the terms described in California Water Code Section 13264, is prohibited.

11. The discharge of radioactive wastes amenable to alternative methods of disposal into the waters of the state is prohibited.

12. The discharge of any radiological, chemical, or biological warfare agent into waters of the state is prohibited.

13. The discharge of waste into a natural or excavated site below historic water levels is prohibited unless the discharge is authorized by the San Diego Water Board.

14. The discharge of sand, silt, clay, or other earthen materials from any activity, including land grading and construction, in quantities which cause deleterious bottom deposits, turbidity or discoloration in waters of the state or which unreasonably affect, or threaten to affect, beneficial uses of such waters is prohibited.

15. The discharge of treated or untreated sewage from vessels to Mission Bay, Oceanside Harbor, Dana Point Harbor, or other small boat harbors is prohibited.

16. The discharge of untreated sewage from vessels to San Diego Bay is prohibited.

17. The discharge of treated sewage from vessels to portions of San Diego Bay that are less than 30 feet deep at mean lower low water (MLLW) is prohibited.

18. The discharge of treated sewage from vessels, which do not have a properly functioning US Coast Guard certified Type I or Type II marine sanitation device, to portions of San Diego Bay that are greater than 30 feet deep at mean lower low water (MLLW) is prohibited.

2. Attachment B to State Water Board Resolution 2012-0012

Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges

I. PROVISIONS FOR POINT SOURCE DISCHARGES OF STORM WATER AND NONPOINT SOURCE WASTE DISCHARGES

The following terms, prohibitions, and special conditions (hereafter collectively referred to as special conditions) are established as limitations on point source storm water and nonpoint source discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in Areas of Special Biological Significance (ASBS), as required for State Water Quality Protection Areas pursuant to California Public Resources Code Sections 36700(f) and 36710(f). These Special Protections are adopted by the State Water Board as part of the California Ocean Plan (Ocean Plan) General Exception.

The special conditions are organized by category of discharge. The State Water Resources Control Board (State Water Board) and Regional Water Quality Control Boards (Regional Water Boards) will determine categories and the means of regulation for those categories [e.g., Point Source Storm Water National Pollutant Discharge Elimination System (NPDES) or Nonpoint Source].

A. PERMITTED POINT SOURCE DISCHARGES OF STORM WATER

1. General Provisions for Permitted Point Source Discharges of Storm Water

   a. Existing storm water discharges into an ASBS are allowed only under the following conditions:

      (1) The discharges are authorized by an NPDES permit issued by the State Water Board or Regional Water Board;

      (2) The discharges comply with all of the applicable terms, prohibitions, and special conditions contained in these Special Protections; and

      (3) The discharges:

         (i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

         (ii) Are designed to prevent soil erosion;

         (iii) Occur only during wet weather;

         (iv) Are composed of only storm water runoff.

   b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

   c. The discharge of trash is prohibited.

d. Only discharges from existing storm water outfalls are allowed. Any proposed or new storm water runoff discharge shall be routed to existing storm water discharge outfalls and shall not result in any new contribution of waste to an ASBS (i.e., no additional pollutant loading). “Existing storm water outfalls” are those that were constructed or under construction prior to January 1, 2005. “New contribution of waste” is defined as any addition of waste beyond what would have occurred as of January 1, 2005. A change to an existing storm water outfall, in terms of re-location or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges are prohibited except as provided below:

(1) The term “non-storm water discharges” means any waste discharges from a municipal separate storm sewer system (MS4) or other NPDES permitted storm drain system to an ASBS that are not composed entirely of storm water.

(2) (i) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability or occur naturally:

(a) Discharges associated with emergency firefighting operations.

(b) Foundation and footing drains.

(c) Water from crawl space or basement pumps.

(d) Hillside dewatering.

(e) Naturally occurring groundwater seepage via a storm drain.

(f) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(ii) An NPDES permitting authority may authorize non-storm water discharges to an MS4 with a direct discharge to an ASBS only to the extent the NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

2. Compliance Plans for Inclusion in Storm Water Management Plans (SWMP) and Storm Water Pollution Prevention Plans (SWPPP).

The discharger shall specifically address the prohibition of non-storm water runoff and the requirement to maintain natural water quality for storm water discharges to an ASBS in an ASBS Compliance Plan to be included in its SWMP or a SWPPP, as appropriate to permit type. If a statewide permit includes a SWMP, then the discharger shall prepare a stand-alone compliance plan for ASBS discharges. The ASBS Compliance Plan is subject to approval by the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (for permits issued by Regional Water Boards).

a. The Compliance Plan shall include a map of surface drainage of storm water runoff, showing areas of sheet runoff, prioritize discharges, and describe any structural Best Management Practices (BMPs) already employed and/or BMPs to be employed in the future. Priority discharges are those that pose the greatest water quality threat and which are identified to require installation of structural BMPs. The map shall also show the storm water conveyances in relation to other features such as service areas, sewage conveyances and treatment facilities, landslides, areas prone to erosion, and waste and hazardous material storage areas, if applicable. The SWMP or SWPPP shall also include a procedure for updating the map and plan when changes are made to the storm water conveyance facilities.

b. The ASBS Compliance Plan shall describe the measures by which all non-authorized non-storm water runoff (e.g., dry weather flows) has been eliminated, how these measures will be maintained over time, and how these measures are monitored and documented.

c. For Municipal Separate Storm Sewer System (MS4s), the ASBS Compliance Plan shall require minimum inspection frequencies as follows:

   (1) The minimum inspection frequency for construction sites shall be weekly during rainy season;

   (2) The minimum inspection frequency for industrial facilities shall be monthly during the rainy season;

   (3) The minimum inspection frequency for commercial facilities (e.g., restaurants) shall be twice during the rainy season; and

   (4) Storm water outfall drains equal to or greater than 18 inches (457 mm) in diameter or width shall be inspected once prior to the beginning of the rainy season and once during the rainy season and maintained to remove trash and other anthropogenic debris.

d. The ASBS Compliance Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff, that are necessary to comply with these special conditions, will be achieved through BMPs. Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that such installation would pose a threat to health or safety. BMPs to control storm water runoff discharges (at the end-of-pipe) during a design storm shall be designed to achieve on average the following target levels:

   (1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

   (2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges. The baseline for the reduction is the effective date of the Exception. The baseline for these determinations is the effective date of the Exception, and the

reductions must be achieved and documented within four (4) years of the effective date.

e. The ASBS Compliance Plan shall address erosion control and the prevention of anthropogenic sedimentation in ASBS. The natural habitat conditions in the ASBS shall not be altered as a result of anthropogenic sedimentation.

f. The ASBS Compliance Plan shall describe the non-structural BMPs currently employed and planned in the future (including those for construction activities), and include an implementation schedule. The ASBS Compliance Plan shall include non-structural BMPs that address public education and outreach. Education and outreach efforts must adequately inform the public that direct discharges of pollutants from private property not entering an MS4 are prohibited. The ASBS Compliance Plan shall also describe the structural BMPs, including any low impact development (LID) measures, currently employed and planned for higher threat discharges and include an implementation schedule. To control storm water runoff discharges (at the end-of-pipe) during a design storm, permittees must first consider using LID practices to infiltrate, use, or evapotranspirate storm water runoff on-site.

g. The BMPs and implementation schedule shall be designed to ensure that natural water quality conditions in the receiving water are achieved and maintained by either reducing flows from impervious surfaces or reducing pollutant loading, or some combination thereof.

h. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents in storm water runoff that alter natural ocean water quality and the sources of these constituents.

(2) The report shall describe BMPs that are currently being implemented, BMPs that are identified in the SWMP or SWPPP for future implementation, and any additional BMPs that may be added to the SWMP or SWPPP to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the BMPs.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits), the discharger shall revise its ASBS Compliance Plan to incorporate any new or modified BMPs that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised SWMP or SWPPP, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural ocean water quality conditions due to the same constituent.

(5) Compliance with this section does not excuse violations of any term, prohibition, or condition contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within one year from the effective date of the Exception, the discharger shall submit a written ASBS Compliance Plan to the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that describes its strategy to comply with these special conditions, including the requirement to maintain natural water quality in the affected ASBS. The ASBS Compliance Plan shall include a time schedule to implement appropriate non-structural and structural controls (implementation schedule) to comply with these special conditions for inclusion in the discharger's SWMP or SWPPP, as appropriate to permit type.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these special conditions shall be implemented.

d. Within four (4) years of the effective date of the Exception, any structural controls identified in the ASBS Compliance Plan that are necessary to comply with these special conditions shall be operational.

e. Within four (4) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water, pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data, and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

   If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

   The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

(1) for municipalities, a demonstration of significant hardship to discharger ratepayers, by showing the relationship of storm water fees to annual household income for residents within the discharger's jurisdictional area, and the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or
(2) for other governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process.

B. NONPOINT SOURCE DISCHARGES

[NOT INCLUDED]
[PROVISIONS FOR NONPOINT SOURCE DISCHARGES NOT APPLICABLE]

II. ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES

[NOT INCLUDED]
[ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES NOT APPLICABLE]

III. ADDITIONAL REQUIREMENTS – WATERFRONT AND MARINE OPERATIONS

[NOT INCLUDED]
[ADDITIONAL REQUIREMENTS FOR WATERFRONT AND MARINE OPERATIONS NOT APPLICABLE]

IV. MONITORING REQUIREMENTS

Monitoring is mandatory for all dischargers to assure compliance with the Ocean Plan. Monitoring requirements include both: (A) core discharge monitoring, and (B) ocean receiving water monitoring. The State and Regional Water Boards must approve sampling site locations and any adjustments to the monitoring programs. All ocean receiving water and reference area monitoring must be comparable with the Water Boards' Surface Water Ambient Monitoring Program (SWAMP).

Safety concerns: Sample locations and sampling periods must be determined considering safety issues. Sampling may be postponed upon notification to the State and Regional Water Boards if hazardous conditions prevail.

Analytical Chemistry Methods: All constituents must be analyzed using the lowest minimum detection limits comparable to the Ocean Plan water quality objectives. For metal analysis, all samples, including storm water effluent, reference samples, and ocean receiving water samples, must be analyzed by the approved analytical method with the lowest minimum detection limits (currently Inductively Coupled Plasma/Mass Spectrometry) described in the Ocean Plan.

A. CORE DISCHARGE MONITORING PROGRAM

1. General sampling requirements for timing and storm size:

   Runoff must be collected during a storm event that is greater than 0.1 inch and generates runoff, and at least 72 hours from the previously measurable storm event. Runoff samples shall be collected when post-storm receiving water is sampled, and analyzed for the same constituents as receiving water and reference site samples (see section IV B) as described below.

2. Runoff flow measurements

   a. For municipal/industrial storm water outfalls in existence as of December 31, 2007, 18 inches (457mm) or greater in diameter/width (including multiple outfall pipes in combination having a width of 18 inches, runoff flows must be measured or calculated, using a method acceptable to and approved by the State and Regional Water Boards.
   b. This will be reported annually for each precipitation season to the State and Regional Water Boards.

3. Runoff samples – storm events

   a. For outfalls equal to or greater than 18 inches (0.46m) in diameter or width:

      (1) Samples of storm water runoff shall be analyzed during the same storm as receiving water samples for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

      (2) Samples of storm water runoff shall be analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS

      (3) If an applicant has no outfall greater than 36 inches, then storm water runoff from the applicant's largest outfall shall be further analyzed during the same storm as receiving water samples for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates).

   b. For outfalls equal to or greater than 36 inches (0.91m) in diameter or width:

      (1) Samples of storm water runoff shall be analyzed during the same storm as receiving water samples for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

      (2) Samples of storm water runoff shall be further analyzed during the same storm as receiving water samples for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates) and

(3) Samples of storm water runoff shall be analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

c. For an applicant not participating in a regional monitoring program [see below in Section IV (B)] in addition to (a.) and (b.) above, a minimum of the two largest outfalls or 20 percent of the larger outfalls, whichever is greater, shall be sampled (flow weighted composite samples) at least three times annually during wet weather (storm event) and analyzed for all Ocean Plan Table A constituents, Table B constituents for marine aquatic life protection (except for toxicity, only chronic toxicity for three species shall be required), DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, and Ocean Plan indicator bacteria. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one (the largest) such discharge shall be sampled annually in each Region.

4. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may reduce or suspend core monitoring once the storm runoff is fully characterized. This determination may be made at any point after the discharge is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

B. OCEAN RECEIVING WATER AND REFERENCE AREA MONITORING PROGRAM

In addition to performing the Core Discharge Monitoring Program in Section II.A above, all applicants having authorized discharges must perform ocean receiving water monitoring. In order to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS, dischargers may choose either (1) an individual monitoring program, or (2) participation in a regional integrated monitoring program.

1. Individual Monitoring Program: The requirements listed below are for those dischargers who elect to perform an individual monitoring program to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within the affected ASBS. In addition to Core Discharge Monitoring, the following additional monitoring requirements shall be met:

   a. Three times annually, during wet weather (storm events), the receiving water at the point of discharge from the outfalls described in section (IV)(A)(3)(c) above shall be sampled and analyzed for Ocean Plan Table A constituents, Table B constituents for marine aquatic life, DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, salinity, chronic toxicity (three species), and Ocean Plan indicator bacteria.

      The sample location for the ocean receiving water shall be in the surf zone at the point of discharges; this must be at the same location where storm water runoff is sampled. Receiving water shall be sampled at approximately the same time prior to (pre-storm) and during (or immediately after) the same storm (post storm). Reference water quality shall also be sampled and analyzed for the same constituents pre-storm and post-storm, during the same storms when receiving water is sampled. Reference stations will be determined by the State Water Board's Division of Water Quality and the applicable Regional Water Board(s).

b. Sediment sampling shall occur at least three times during every five (5) year period. The subtidal sediment (sand or finer, if present) at the discharge shall be sampled and analyzed for Ocean Plan Table B constituents for marine aquatic life, DDT, PCBs, PAHs, pyrethroids, and OP pesticides. For sediment toxicity testing, only an acute toxicity test using the amphipod Eohaustorius estuarius must be performed.

c. A quantitative survey of intertidal benthic marine life shall be performed at the discharge and at a reference site. The survey shall be performed at least once every five (5) year period. The survey design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The results of the survey shall be completed and submitted to the State Water Board and Regional Water Board at least six months prior to the end of the permit cycle.

d. Once during each five (5) year period, a bioaccumulation study shall be conducted to determine the concentrations of metals and synthetic organic pollutants at representative discharge sites and at representative reference sites. The study design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The bioaccumulation study may include California mussels (Mytilus californianus) and/or sand crabs (Emerita analoga or Blepharipoda occidentalis). Based on the study results, the Regional Water Board and the State Water Board's Division of Water Quality, may adjust the study design in subsequent permits, or add or modify additional test organisms (such as shore crabs or fish), or modify the study design appropriate for the area and best available sensitive measures of contaminant exposure.

e. Marine Debris: Representative quantitative observations for trash by type and source shall be performed along the coast of the ASBS within the influence of the discharger's outfalls. The design, including locations and frequency, of the marine debris observations is subject to approval by the Regional Water Board and State Water Board's Division of Water Quality.

f. The monitoring requirements of the Individual Monitoring Program in this section are minimum requirements. After a minimum of one (1) year of continuous water quality monitoring of the discharges and ocean receiving waters, the Executive Director of the State Water Board (statewide permits) or Executive officer of the Regional Water Board (Regional Water Board permits) may require additional monitoring, or adjust, reduce or suspend receiving water and reference station monitoring. This determination may be made at any point after the discharge and receiving water is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

2. Regional Integrated Monitoring Program: Dischargers may elect to participate in a regional integrated monitoring program, in lieu of an individual monitoring program, to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS. This regional approach shall characterize natural water quality, pre- and post-storm, in ocean reference areas near the mouths of identified open space watersheds and the effects of the discharges on natural water quality (physical, chemical, and toxicity) in the ASBS receiving waters, and should include benthic marine aquatic life and bioaccumulation components. The design of the ASBS stratum of a regional integrated monitoring program may deviate from the otherwise prescribed individual monitoring approach (in Section IV.B.1) if approved by the State Water Board's Division of Water Quality and the Regional Water Boards.

a. Ocean reference areas shall be located at the drainages of flowing watersheds with minimal development (in no instance more than 10% development), and shall not be located in CWA Section 303(d) listed waterbodies or have tributaries that are 303(d) listed. Reference areas shall be free of wastewater discharges and anthropogenic non-storm water runoff. A minimum of low threat storm runoff discharges (e.g. stream highway overpasses and campgrounds) may be allowed on a case-by-case basis. Reference areas shall be located in the same region as the ASBS receiving water monitoring occurs. The reference areas for each Region are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean reference water samples must be collected from each station, each from a separate storm. A minimum of one reference location shall be sampled for each ASBS receiving water site sampled per responsible party. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

b. ASBS ocean receiving water must be sampled in the surf zone at the location where the runoff makes contact with ocean water (i.e. at "point zero"). Ocean receiving water stations must be representative of worst-case discharge conditions (i.e. co-located at a large drain greater than 36 inches, or if drains greater than 36 inches are not present in the ASBS then the largest drain greater than18 inches.) Ocean receiving water stations are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean receiving water samples must be collected during each storm season from each station, each from a separate storm. A minimum of one receiving water location shall be sampled in each ASBS per responsible party in that ASBS. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

c. Reference and receiving water sampling shall commence during the first full storm season following the adoption of these special conditions, and post-storm samples shall be collected when annual storm water runoff is sampled. Sampling shall occur in a minimum of two storm seasons. For those ASBS dischargers that have already participated in the Southern California Bight 2008 ASBS regional monitoring effort, sampling may be limited to only one storm season.

d. Receiving water and reference samples shall be analyzed for the same constituents as storm water runoff samples. At a minimum, constituents to be sampled and analyzed in reference and discharge receiving waters must include oil and grease, total suspended solids, Ocean Plan Table B metals for protection of marine life, Ocean Plan PAHs, pyrethroids, OP pesticides, ammonia, nitrate, phosphates, and critical life stage chronic toxicity for three species. In addition, within the range of the southern sea otter, indicator bacteria or some other measure of fecal contamination shall be analyzed.

3. Waterfront and Marine Operations: In addition to the above requirements for ocean receiving water monitoring, additional monitoring must be performed for marinas and boat launch and pier facilities:

a. For all marina or mooring field operators, in mooring fields with 10 or more occupied moorings, the ocean receiving water must be sampled for Ocean Plan indicator bacteria, residual chlorine, copper, zinc, grease and oil, methylene blue active substances (MBAS), and ammonia nitrogen.

   (1) For mooring field operators opting for an individual monitoring program (Section IV.B.1 above), this sampling must occur weekly (on the weekend) from May through October.

   (2) For mooring field operators opting to participate in a regional integrated monitoring program (Section IV.B.2 above), this sampling must occur monthly from May through October on a high use weekend in each month. The Water Boards may allow a reduction in the frequency of sampling, through the regional monitoring program, after the first year of monitoring.

b. For all mooring field operators, the subtidal sediment (sand or finer, if present) within mooring fields and below piers shall be sampled and analyzed for Ocean Plan Table B metals (for marine aquatic life beneficial use), acute toxicity, PAHs, and tributyltin. For sediment toxicity testing, only an acute toxicity test using the amphipod Eohaustorius estuarius must be performed. This sampling shall occur at least three times during a five (5) year period. For mooring field operators opting to participate in a regional integrated monitoring program, the Water Boards may allow a reduction in the frequency of sampling after the first sampling effort's results are assessed.

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ATTACHMENT B

STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

1. Standard Permit Provisions

Code of Federal Regulations Title 40 Section 122.41 (40 CFR 122.41) includes conditions, or provisions, that apply to all National Pollutant Discharge Elimination System (NPDES) permits. Additional provisions applicable to NPDES permits are in 40 CFR 122.42. All applicable provisions in 40 CFR 122.41 and 40 CFR 122.42 must be incorporated into this Order and NPDES permit. The applicable 40 CFR 122.41 and 40 CFR 122.42 provisions are as follows:

a. DUTY TO COMPLY [40 CFR 122.41(a)]

The Copermittee must comply with all of the provisions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

(1) The Copermittee must comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement. [40 CFR 122.41(a)(1)]

(2) The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to a civil penalty not to exceed $25,000 per day for each violation. The CWA provides that any person who *negligently* violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than 2 years, or both. Any person who *knowingly* violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both. Any person who knowingly violates Section 301, 302, 303, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, and who knows at that time that he thereby places another person in imminent danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of

not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.
[40 CFR 122.41(a)(2)]

(3) Any person may be assessed an administrative penalty by the San Diego Regional Water Quality Control Board (San Diego Water Board), State Water Resources Control Board (State Water Board), or United States Environmental Protection Agency (USEPA) for violating Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.
[40 CFR 122.41(a)(3)]

b. DUTY TO REAPPLY [40 CFR 122.41(b)]

If a Copermittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Copermittee must apply for and obtain a new permit.

c. NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE [40 CFR 122.41(c)]

It shall not be a defense for a Copermittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

d. DUTY TO MITIGATE [40 CFR 122.41(d)]

The Copermittee must take all reasonable steps to minimize or prevent any discharge or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

e. PROPER OPERATION AND MAINTENANCE [40 CFR 122.41(e)]

The Copermittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Copermittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by a Copermittee only when the operation is necessary to achieve compliance with the conditions of this permit.

f. PERMIT ACTIONS [40 CFR 122.41(f)]

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Copermittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

g. PROPERTY RIGHTS [40 CFR 122.41(g)]

This permit does not convey any property rights of any sort, or any exclusive privilege.

h. DUTY TO PROVIDE INFORMATION [40 CFR 122.41(h)]

The Copermittee must furnish to the San Diego Water Board, State Water Board, or USEPA within a reasonable time, any information which the San Diego Water Board, State Water Board, or USPEA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Copermittee must also furnish to the San Diego Water Board, State Water Board, or USPEA upon request, copies of records required to be kept by this permit.

i. INSPECTION AND ENTRY [40 CFR 122.41(i)]

The Copermittee must allow the San Diego Water Board, State Water Board, USEPA, and/or their authorized representative (including an authorized contractor acting as their representative), upon presentation of credentials and other documents as may be required by law, to:

(1) Enter upon the Copermittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit; [40 CFR 122.41(i)(1)]

(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit; [40 CFR 122.41(i)(2)]

(3) Inspect and photograph at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; [40 CFR 122.41(i)(3)] and

(4) Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location. [40 CFR 122.41(i)(4)]

j. MONITORING AND RECORDS [40 CFR 122.41(j)]

(1) Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity. [40 CFR 122.41(j)(1)]

(2) Except for records of monitoring information required by this permit related to the Copermittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five (5) years (or longer as required by 40 CFR Part 503), the

Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time. [40 CFR 122.41(j)(2)]

(3) Records for monitoring information must include: [40 CFR 122.41(j)(3)]

(a) The date, exact place, and time of sampling or measurements; [40 CFR 122.41(j)(3)(i)]
(b) The individual(s) who performed the sampling or measurements; [40 CFR 122.41(j)(3)(ii)]
(c) The date(s) analyses were performed; [40 CFR 122.41(j)(3)(iii)]
(d) The individual(s) who performed the analyses; [40 CFR 122.41(j)(3)(iv)]
(e) The analytical techniques or methods used; [40 CFR 122.41(j)(3)(v)] and
(f) The results of such analyses. [40 CFR 122.41(j)(3)(vi)]

(4) Monitoring must be conducted according to test procedures under 40 CFR Part 136 unless another method is required under 40 CFR Subchapters N or O. [40 CFR 122.41(j)(4)]

In the case of pollutants for which there are no approved methods under 40 CFR Part 136 or otherwise required under 40 CFR Subchapters N and O, monitoring must be conducted according to a test procedure specified in the permit for such pollutants. [40 CFR 122.44(i)(1)(iv)]

(5) The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. [40 CFR 122.41(j)(5)]

k. SIGNATORY REQUIREMENT [40 CFR 122.41(k)]

(1) All applications, reports, or information submitted to the San Diego Water Board, State Water Board, or USEPA must be signed and certified. (See 40 CFR 122.22) [40 CFR 122.41(k)(1)]

(a) *For a municipality, State, Federal, or other public agency.* [All applications must be signed] by either a principal executive officer or ranking elected official. [40 CFR 122.22(a)(3)]

(b) All reports required by permits, and other information requested by the San Diego Water Board, State Water Board, or USEPA must be signed by a person described in paragraph (a) of this section, or by a duly authorized representative of that person. A person is a duly authorized representative only if: [40 CFR 122.22(b)]

(i) The authorization is made in writing by a person described in paragraph (a) of this section; [40 CFR 122.22(b)(1)]

(ii) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company, (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) [40 CFR 122.22(b)(2)] and,

(iii) The written authorization is submitted to the San Diego Water Board and State Water Board. [40 CFR 122.22(b)(3)]

(c) *Changes to authorization.* If an authorization under paragraph (b) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (b) of this section must be submitted to the San Diego Water Board prior to or together with any reports, information, or applications to be signed by an authorized representative. [40 CFR 122.22(c)]

(d) *Certification.* Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." [40 CFR 122.22(d)]

(2) The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both. [40 CFR 122.41(k)(2)]

I. REPORTING REQUIREMENTS [40 CFR 122.41(l)]

(1) *Planned changes.* The Copermittee must give notice to the San Diego Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when: [40 CFR 122.41(l)(1)]

(a) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); [40 CFR 122.41(l)(1)(i)] or

(b) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which

are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1).
[40 CFR 122.41(l)(1)(ii)]

(c) The alteration or addition results in a significant change in the Copermittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. [40 CFR 122.41(l)(1)(iii)]

(2) *Anticipated noncompliance*. The Copermittee must give advance notice to the San Diego Water Board or State Water Board of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.
[40 CFR 122.41(l)(2)]

(3) *Transfers*. This permit is not transferable to any person except after notice to the San Diego Water Board. The San Diego Water Board may require modification or revocation and reissuance of the permit to change the name of the Copermittee and incorporate such other requirements as may be necessary under the CWA.
[40 CFR 122.41(l)(3)]

(4) *Monitoring reports.* Monitoring results must be reported at the intervals specified elsewhere in this permit. [40 CFR 122.41(l)(4)]

(a) Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the San Diego Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices. [40 CFR 122.41(l)(4)(i)]

(b) If the Copermittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or another method required for an industry-specific waste stream under 40 CFR Subchapters N or O, the results of this monitoring must be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the San Diego Water Board or State Water Board.
[40 CFR 122.41(l)(4)(ii)]

(c) Calculations for all limitations which require averaging of measurements must utilize an arithmetic mean unless otherwise specified in the permit.
[40 CFR 122.41(l)(4)(iii)]

(5) *Compliance schedules*. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date. [40 CFR 122.41(l)(5)]

(6) *Twenty-four hour reporting.*

(a) The Copermittee must report any noncompliance that may endanger health or the environment. Any information must be provided orally within 24 hours from the time the Copermittee becomes aware of the circumstances. A written submission must also be provided within five (5) days of the time the Copermittee becomes aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6)(i)]

(b) The following must be included as information which must be reported within 24 hours under this paragraph: [40 CFR 122.41(l)(6)(ii)]

(i) Any unanticipated bypass that exceeds any effluent limitation in the permit (See 40 CFR 122.41(g)). [40 CFR 122.41(l)(6)(ii)(A)]
(ii) Any upset which exceeds any effluent limitation in the permit. [40 CFR 122.41(l)(6)(ii)(B)] and,
(iii) Violation of a maximum daily discharge limitation for any of the pollutants listed by the San Diego Water Board in the permit to be reported within 24 hours. (See 40 CFR 122.44(g)) [40 CFR 122.41(l)(6)(ii)(C)]

(c) The San Diego Water Board may waive the above-required written report on a case-by-case basis if the oral report has been received within 24 hours. [40 CFR 122.41(l)(6)(iii)]

(7) *Other noncompliance.* The Copermittee must report all instances of noncompliance not reported in accordance with the standard provisions required under 40 CFR 122.41(l)(4), (5), and (6), at the time monitoring reports are submitted. The reports must contain the information listed in the standard provisions required under 40 CFR 122.41(l)(6). [40 CFR 122.41(l)(7))]

(8) *Other information.* When the Copermittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the San Diego Water Board, State Water Board, or USEPA, the Copermittee must promptly submit such facts or information. [40 CFR 122.41(l)(8)]

m. BYPASS [40 CFR 122.41(m)]

(1) *Definitions.*

(a) "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. [40 CFR 122.41(m)(1)(i)] or

(b) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be

expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
[40 CFR 122.41(m)(1)(ii)]

(2) *Bypass not exceeding limitations*. The Copermittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the standard provisions required under 40 CFR 122.41(m)(3) and (4).
[40 CFR 122.41(m)(2)]

(3) *Notice.*

(a) *Anticipated bypass*. If the Copermittee knows in advance of the need for a bypass, it must submit a notice, if possible at least ten days before the date of the bypass. [40 CFR 122.41(m)(3)(i)] or

(b) *Unanticipated bypass*. The Copermittee must submit notice of an unanticipated bypass in accordance with the standard provisions required under 40 CFR 122.41(l)(6) (24-hour notice).
[40 CFR 122.41(m)(3)(ii)]

(4) *Prohibition of Bypass.*

(a) Bypass is prohibited, and the San Diego Water Board may take enforcement action against a Copermittee for bypass, unless:
[40 CFR 122.41(m)(4)(i)]

(i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; [40 CFR 122.41(m)(4)(i)(A)]
(ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance;
[40 CFR 122.41(m)(4)(i)(B)] and,
(iii) The Copermittee submitted notice in accordance with the standard provisions required under 40 CFR 122.41(m)(3).
[40 CFR 122.41(m)(4)(i)(C)]

(b) The San Diego Water Board may approve an anticipated bypass, after considering its adverse effects, if the San Diego Water Board determines that it will meet the three conditions listed above.
[40 CFR 122.41(m)(4)(ii)]

n. UPSET [40 CFR 122.41(n)]

(1) *Definition.* "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Copermittee. An upset does not

include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. [40 CFR 122.41(n)(1)]

(2) *Effect of an upset*. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the standard provisions required under 40 CFR 122.41(n)(3) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. [40 CFR 122.41(n)(2)]

(3) *Conditions necessary for a demonstration of upset*. A Copermittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that: [40 CFR 122.41(n)(3)]

(a) An upset occurred and that the Copermittee can identify the cause(s) of the upset; [40 CFR 122.41(n)(3)(i)]
(b) The permitted facility was at the time being properly operated; [40 CFR 122.41(n)(3)(ii)] and
(c) The Copermittee submitted notice of the upset in accordance with the standard provisions required under 40 CFR 122.41(l)(6)(ii)(B) (24-hour notice). [40 CFR 122.41(n)(3)(iii)]
(d) The Copermittee complied with any remedial measures pursuant to the standard provisions required under 40 CFR 122.41(d). [40 CFR 122.41(n)(3)(iii)]

(4) *Burden of proof*. In any enforcement proceeding, the Copermittee seeking to establish the occurrence of an upset has the burden of proof. [40 CFR 122.41(n)(4)]

o. STANDARD PERMIT PROVISIONS FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS [40 CFR 122.42(c)]

The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the San Diego Water Board or State Water Board under 40 CFR 122.26(a)(1)(v) must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report must include:

(1) The status of implementing the components of the storm water management program that are established as permit conditions; [40 CFR 122.42(c)(1)]

(2) Proposed changes to the storm water management programs that are established as permit conditions. Such proposed changes must be consistent with 40 CFR 122.26(d)(2)(iii); [40 CFR 122.42(c)(2)] and

(3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under 40 CFR 122.26(d)(2)(iv) and (v); [40 CFR 122.42(c)(3)]

(4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; [40 CFR 122.42(c)(4)]

(5) Annual expenditures and budget for year following each annual report; [40 CFR 122.42(c)(5)]

(6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; [40 CFR 122.42(c)(6)]

(7) Identification of water quality improvements or degradation. [40 CFR 122.42(c)(7)]

p. STANDARD PERMIT PROVISIONS FOR STORM WATER DISCHARGES [40 CFR 122.42(d)]

The initial permits for discharges composed entirely of storm water issued pursuant to 40 CFR 122.26(e)(7) must require compliance with the conditions of the permit as expeditiously as practicable, but in no event later than three years after the date of issuance of the permit.

2. General Provisions

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. The general provisions applicable to this Order and NPDES permit are as follows:

a. DISCHARGE OF WASTE IS A PRIVILEGE

No discharge of waste into the waters of the State, whether or not such discharge is made pursuant to waste discharge requirements, shall create a vested right to continue such discharge. All discharges of waste into waters of the State are privileges, not rights. [CWC Section 13263(g)]

b. DURATION OF ORDER AND NPDES PERMIT

(1) *Effective date*. This Order and NPDES permit becomes effective on the 50th day after its adoption provided the USEPA has no objection. If the USEPA objects to its issuance, this Order shall not become effective until such objection is withdrawn. This Order supersedes Order No. R9-2007-0001 upon the effective date of this Order, and supersedes Order Nos. R9-2009-0002 and R9-2010-0016 upon their expiration or earlier notice of coverage.

(2) *Expiration*. This Order and NPDES permit expires five years after its effective date. [40 CFR 122.46(a)]

(3) *Continuation of expired order*. After this Order and NPDES permit expires, the terms and conditions of this Order and NPDES permit are automatically continued pending issuance of a new permit if all requirements of the federal NPDES regulations on the continuation of expired permits (40 CFR 122.6) are complied with.

c. AVAILABILITY

A copy of this Order must be kept at a readily accessible location and must be available to on-site personnel at all times.

d. CONFIDENTIALITY OF INFORMATION

Except as provided for in 40 CFR 122.7, no information or documents submitted in accordance with or in application for this Order will be considered confidential, and all such information and documents shall be available for review by the public at the San Diego Water Board office.

Claims of confidentiality for the following information will be denied:
[40 CFR 122.7(b)]

(1) The name and address of any permit applicant or Copermittee; [40 CFR 122.7(b)(1)] and

(2) Permit applications and attachments, permits, and effluent data. [40 CFR 122.7(b)(2)]

e. EFFLUENT LIMITATIONS

(1) *Interim effluent limitations*. The Copermittee must comply with any interim effluent limitations as established by addendum, enforcement action, or revised waste discharge requirements which have been, or may be, adopted by the San Diego Water Board.

(2) *Other effluent limitations and standards*. If any applicable toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant and that standard or prohibition is more stringent than any limitation on the pollutant in the permit, the San Diego Water Board shall institute proceedings under these regulations to modify or revoke and reissue the permit to conform to the toxic effluent standard or prohibition. [40 CFR 122.44(b)(1)]

f. DUTY TO MINIMIZE OR CORRECT ADVERSE IMPACTS

The Copermittee must take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this Order, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the noncompliance.

g. PERMIT ACTIONS

The filing of a request by the Copermittee for modification, revocation and reissuance, or termination of this Order, or a notification of planned change in or anticipated noncompliance with this Order does not stay any condition of this Order. (See 40 CFR 122.41(f)) In addition, the following provisions apply to this Order:

(1) Upon application by any affected person, or on its own motion, the San Diego Water Board may review and revise the requirements in this Order. All requirements must be reviewed periodically. [CWC Section 13263(e)]

(2) This Order may be terminated or modified for cause, including, but not limited to, all of the following: [CWC Section 13381]

(a) Violation of any condition contained in the requirements of this Order. [CWC Section 13381(a)]

(b) Obtaining the requirements in this Order by misrepresentation, or failure to disclose fully all relevant facts. [CWC Section 13381(b)]

(c) A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge. [CWC Section 13381(c)]

(3) When this Order is transferred to a new owner or operator, such requirements as may be necessary under the CWC may be incorporated into this Order.

h. NPDES Permitted Non-Storm Water Discharges

The San Diego Water Board has, in prior years, issued a limited number of individual NPDES permits for non-storm water discharges to MS4s. The San Diego Water Board or State Water Board may in the future, upon prior notice to the Copermittee(s), issue an NPDES permit for any non-storm water discharge (or class of non-storm water discharges) to an MS4.

i. Monitoring

In addition to the standard provisions required under 40 CFR 122.41(j) and (l)(4), the following general monitoring provisions apply to this Order:

(1) Where procedures are not otherwise specified in Order, sampling, analysis and quality assurance/quality control must be conducted in accordance with the Quality Assurance Management Plan (QAMP) for the State of California's Surface Water Ambient Monitoring Program (SWAMP), adopted by the State Water Resources Control Board (State Water Board).

(2) Pursuant to 40 CFR 122.41(j)(2) and CWC Section 13383(a), each Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five (5) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time.

(3) All chemical, bacteriological, and toxicity analyses must be conducted at a laboratory certified for such analyses by the California Department of Public Health or a laboratory approved by the San Diego Water Board.

(4) For priority toxic pollutants that are identified in the California Toxics Rule (CTR) (65 Fed. Reg. 31682), the Copermittees must instruct their laboratories to establish calibration standards that are equivalent to or lower than the Minimum Levels (MLs) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP). If a Copermittee can demonstrate that a particular ML is not attainable, in accordance with procedures set forth in 40 CFR Part 136, the lowest quantifiable concentration of the lowest calibration standard analyzed by a specific analytical procedure (assuming that all the method specified sample weights, volumes, and processing steps have been followed) may be used instead of the ML listed in Appendix 4 of the SIP. The Copermittee must submit documentation from the laboratory to the San Diego Water Board for approval prior to raising the ML for any priority toxic pollutant.

j. ENFORCEMENT

(1) The San Diego Water Board is authorized to enforce the terms of this Order under several provisions of the CWC, including, but not limited to, CWC Sections 13385, 13386, and 13387.

(2) Nothing in this Order shall be construed to protect the Copermittee from its liabilities under federal, state, or local laws.

(3) The CWC provides for civil and criminal penalties comparable to, and in some cases greater than, those provided for under the CWA.

(4) Except as provided in the standard conditions required under 40 CFR 122.41(m) and (n), nothing in this Order shall be construed to relieve the Copermittee from civil or criminal penalties for noncompliance.

(5) Nothing in this Order shall be construed to preclude the institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties to which the Copermittee is or may be subject to under Section 311 of the CWA.

(6) Nothing in this Order shall be construed to preclude institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authoring preserved by Section 510 of the CWA.

k. SEVERABILITY

The provisions of this Order are severable, and if any provision of this Order, or the application of any provisions of this Order to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this Order shall not be affected thereby.

l. APPLICATIONS

Any application submitted by a Copermittee for reissuance or modification of this Order must satisfy all applicable requirements specified in federal regulations as well as any additional requirements for submittal of a Report of Waste Discharge specified in the CWC and the California Code of Regulations.

m. IMPLEMENTATION

All plans, reports and subsequent amendments submitted in compliance with this Order must be implemented immediately (or as otherwise specified). All submittals by Copermittees must be adequate to implement the requirements of this Order.

n. REPORT SUBMITTALS

(1) All report submittals must include an executive summary, introduction, conclusion, recommendations, and signed certified statement.

(2) Each Copermittee must submit a signed certified statement covering its responsibilities for each applicable submittal.

(3) The Principal Watershed Copermittee(s) must submit a signed certified statement covering its responsibilities for each applicable submittal and the sections of the submittals for which it is responsible.

(4) Unless otherwise directed, the Copermittees must submit one hard copy and one electronic copy of each report required under this Order to the San Diego Water Board, and one electronic copy to the USEPA.

(5) The Copermittees must submit reports and provide notifications as required by this Order to the following:

EXECUTIVE OFFICER
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
9174 SKY PARK COURT, SUITE 100
SAN DIEGO CA 92123-4340
Telephone: (858) 467-2952 Fax: (858) 571-6972

EUGENE BROMLEY
US ENVIRONMENTAL PROTECTION AGENCY
REGION IX
PERMITS ISSUANCE SECTION (W-5-1)
75 HAWTHORNE STREET
SAN FRANCISCO CA 94105

ATTACHMENT C

ACRONYMS AND ABBREVIATIONS

AMAL	Average Monthly Action Level
ASBS	Area(s) of Special Biological Significance
BMP	Best Management Practice
Basin Plan	Water Quality Control Plan for the San Diego Basin
CEQA	California Environmental Quality Act
CCR	California Code of Regulations
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWC	California Water Code
CZARA	Coastal Zone Act Reauthorization Amendments of 1990
ESAs	Environmentally Sensitive Areas
GIS	Geographic Information System
IBI	Index of Biological Integrity
LID	Low Impact Development
MDAL	Maximum Daily Action Level
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
NAL	Non-Storm Water Action Level
NAICS	North American Industry Classification System
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
ROWD	Report of Waste Discharge (application for NPDES reissuance)
SAL	Storm Water Action Level
San Diego Water Board	California Regional Water Quality Control Board, San Diego Region
SIC	Standard Industrial Classification Code
State Water Board	State Water Resources Control Board
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
WDID	Waste Discharge Identification Number
WLA	Waste Load Allocation
WQBEL	Water Quality Based Effluent Limitation

DEFINITIONS

Active/Passive Sediment Treatment - Using mechanical, electrical or chemical means to flocculate or coagulate suspended sediment for removal from runoff from construction sites prior to discharge.

Anthropogenic Litter – Trash generated from human activities, not including sediment.

Average Monthly Action Level – The highest allowable average of daily discharges over a calendar month.

Beneficial Uses - The uses of water necessary for the survival or wellbeing of man, plants, and wildlife. These uses of water serve to promote tangible and intangible economic, social, and environmental goals. "Beneficial Uses" of the waters of the State that may be protected include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. Existing beneficial uses are uses that were attained in the surface or ground water on or after November 28, 1975; and potential beneficial uses are uses that would probably develop in future years through the implementation of various control measures. "Beneficial Uses" are equivalent to "Designated Uses" under federal law. [California Water Code Section 13050(f)].

Best Management Practices (BMPs) - Defined in 40 CFR 122.2 as schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Bioassessment - The use of biological community information to evaluate the biological integrity of a water body and its watershed. With respect to aquatic ecosystems, bioassessment is the collection and analysis of samples of the benthic macroinvertebrate community together with physical/habitat quality measurements associated with the sampling site and the watershed to evaluate the biological condition (i.e. biotic integrity) of a water body.

Biofiltration - Practices that use vegetation and amended soils to detain and treat runoff from impervious areas. Treatment is through filtration, infiltration, adsorption, ion exchange, and biological uptake of pollutants.

Biological Integrity - Defined in Karr J.R. and D.R. Dudley. 1981. Ecological perspective on water quality goals. *Environmental Management* 5:55-68 as: "A balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitat of the region." Also referred to as ecosystem health.

BMP Design Manual – A plan developed to eliminate, reduce, or mitigate the impacts of runoff from development projects, including Priority Development Projects.

Chronic Toxicity – A measurement of sublethal effect (e.g. reduced growth, reproduction) to experimental test organisms exposed to an effluent or receiving waters compared to that of the control organisms.

Clean Water Act Section 303(d) Water Body - An impaired water body in which water quality does not meet applicable water quality standards and/or is not expected to meet water quality standards, even after the application of technology based pollution controls required by the CWA. The discharge of runoff to these water bodies by the Copermittees is significant because these discharges can cause or contribute to violations of applicable water quality standards.

Construction Site – Any project, including projects requiring coverage under the Construction General Permit, that involves soil disturbing activities including, but not limited to, clearing, grading, disturbances to ground such as stockpiling, and excavation.

Contamination - As defined in the Porter-Cologne Water Quality Control Act, contamination is "an impairment of the quality of waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste whether or not waters of the State are affected."

Copermittee – A permittee to a NPDES permit that is only responsible for permit conditions relating to the discharge for which it is operator [40 CFR 122.26(b)(1)]. For the purposes of this Order, a Copermittee is one of the individual permittees identified in Tables 1a-1c of this Order.

Copermittees – All of the individual Copermittees, collectively.

Critical Channel Flow (Qc) – The channel flow that produces the critical shear stress that initiates bed movement or that erodes the toe of channel banks. When measuring Qc, it should be based on the weakest boundary material – either bed or bank.

Daily Discharge – Defined as either: (1) the total mass of the constituent discharged over the calendar day or any 24 hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g. concentration.)

The Daily Discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day, or other 24 hour period other than a day), or by the arithmetic mean of analytical results from one or more grab samples taken over the course of a day.

Development Projects - Construction, rehabilitation, redevelopment, or reconstruction of any public or private projects.

Dry Season –May 1 to September 30.

Dry Weather – Weather is considered dry if the preceding 72 hours has been without measurable precipitation (>0.1 inch).

Enclosed Bays – Enclosed bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost bay works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays do not include inland surface waters or ocean waters.

Erosion – When land is diminished or worn away due to wind, water, or glacial ice. Often the eroded debris (silt or sediment) becomes a pollutant via storm water runoff. Erosion occurs naturally but can be intensified by land clearing activities such as farming, development, road building, and timber harvesting.

Environmentally Sensitive Areas (ESAs) - Areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; areas designated as preserves or their equivalent under the Natural Communities Conservation Program within the Cities and County of Orange; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.

Estuaries – Waters, including coastal lagoons, located at the mouth of streams that serve as areas of mixing fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and ocean water. Estuaries do not include inland surface waters or ocean waters.

Existing Development – Any area that has been developed and exists for municipal, commercial, industrial, or residential purposes, uses, or activities. May include areas that are not actively used for its originally developed purpose, but may be re-purposed or redeveloped for another use or activity.

Flow Duration – The long-term period of time that flows occur above a threshold that causes significant sediment transport and may cause excessive erosion damage to creeks and streams (not a single storm event duration). The simplest way to visualize this is to consider a histogram of pre- and post-project flows using long-term records of hourly data. To maintain pre-development flow duration means that the total number of hours (counts) within each range of flows in a flow-duration histogram cannot increase between the pre- and post-development condition. Flow duration within the range of geomorphologically significant flows is important for managing erosion.

Grading - The cutting and/or filling of the land surface to a desired slope or elevation.

Groundwater – Subsurface water that occurs beneath the water table in soils and geologic formations that are fully saturated.

Hazardous Material – Any substance that poses a threat to human health or the environment due to its toxicity, corrosiveness, ignitability, explosive nature or chemical reactivity. These also include materials named by the USEPA in 40 CFR 116 to be reported if a designated quantity of the material is spilled into the waters of the U.S. or emitted into the environment.

Hazardous Waste - Hazardous waste is defined as “any waste which, under Section 600 of Title 22 of this code, is required to be managed according to Chapter 30 of Division 4.5 of Title 22 of this code” [CCR Title 22, Division 4.5, Chapter 11, Article 1].

Household Hazardous Waste – Paints, cleaning products, and other hazardous wastes generated during home improvement or maintenance activities.

Hydromodification – The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

Illicit Connection – Any man-made conveyance or drainage system through which a non-storm water discharge to the storm water drainage system occurs or may occur. Any connection to the MS4 that conveys an illicit discharge.

Illicit Discharge - Any discharge to the MS4 that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from firefighting activities [40 CFR 122.26(b)(2)].

Inactive Areas – Areas of construction activity that are not active and those that have been active and are not scheduled to be re-disturbed for at least 14 days.

Infiltration – In the context of low impact development, infiltration is defined as the percolation of water into the ground. Infiltration is often expressed as a rate (inches per hour), which is determined through an infiltration test. In the context of non-storm water, infiltration is water other than wastewater that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow [40 CFR 35.2005(20)].

Inland Surface Waters – Includes all surface waters of the State that do not include the ocean, enclosed bays, or estuaries.

Jurisdictional Runoff Management Program Document – A written description of the specific jurisdictional runoff management measures and programs that each Copermittee will implement to comply with this Order and ensure that storm water pollutant discharges in runoff are reduced to the MEP and do not cause or contribute to a violation of water quality standards.

Low Impact Development (LID) – A storm water management and land development strategy that emphasizes conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions.

Low Impact Development Best Management Practices (LID BMPs) – LID BMPs include schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States through storm water management and land development strategies that emphasize conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions. LID BMPs include retention practices that do not allow runoff, such as infiltration, rain water harvesting and reuse, and evapotranspiration. LID BMPs also include flow-through practices such as biofiltration that may have some discharge of storm water following pollutant reduction.

Major Outfall – As defined in the Code of Federal Regulations, a major outfall is a MS4 outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (i.e. discharge from a single conveyance other than a circular pipe which is associated with a drainage area of more than 50 acres); or, for MS4s that receive storm water from lands zoned for industrial activity (based on comprehensive zoning plans or equivalent), a MS4 outfall that discharges from a single pipe with an inside diameter of 12 inches or more or from its equivalent (i.e. discharge from other than a circular pipe associated with a drainage area of 2 acres or more).

Maximum Daily Action Level (MDAL) –The highest allowable daily discharge of a pollutant, over a calendar day (or 24 hour period). For pollutants with action levels expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with action levels expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

Maximum Extent Practicable (MEP) – The technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) for storm water that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) in combination with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than BAT. A definition for MEP is not provided either in the statute or in the regulations. Instead the definition of MEP is dynamic and will be defined by the following process over time: municipalities propose their definition of MEP by way of their runoff management programs. Their total collective and individual activities conducted pursuant to the runoff management programs becomes their proposal for MEP as it applies both to their overall effort, as well as to specific activities (e.g., MEP for street sweeping, or MEP for MS4 maintenance). In the absence of a proposal acceptable to the San Diego Water Board, the San Diego Water Board defines MEP.

In a memo dated February 11, 1993, entitled "Definition of Maximum Extent Practicable," Elizabeth Jennings, Senior Staff Counsel, SWRCB addressed the achievement of the MEP standard as follows:

> "*To achieve the MEP standard, municipalities must employ whatever Best Management Practices (BMPs) are technically feasible (i.e., are likely to be effective) and are not cost prohibitive. The major emphasis is on technical feasibility. Reducing pollutants to the MEP means choosing effective BMPs, and rejecting applicable BMPs only where other effective BMPs will serve the same purpose, or the BMPs would not be technically feasible, or the cost would be prohibitive. In selecting BMPs to achieve the MEP standard, the following factors may be useful to consider:*
>
> a. *Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?*
> b. *Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?*
> c. *Public Acceptance: Does the BMP have public support?*
> d. *Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?*
> e. *Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc.?*

The final determination regarding whether a municipality has reduced pollutants to the maximum extent practicable can only be made by the Regional or State Water Boards, and not by the municipal discharger. If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit derived, it would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs that would address a pollutant source, or to pick a BMP based solely on cost, which would be clearly less effective. In selecting BMPs the municipality must make a serious attempt to comply and practical solutions may not be lightly rejected. In any case, the burden would be on the municipal discharger to show compliance with its permit. After selecting a menu of BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented."

Monitoring Year – October 1 to September 30

Municipal Separate Storm Sewer System (MS4) – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designated or used for collecting or conveying storm water; (iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.26.

National Pollutant Discharge Elimination System (NPDES) - The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the CWA.

Non-Storm Water - All discharges to and from a MS4 that do not originate from precipitation events (i.e., all discharges from a MS4 other than storm water). Non-storm water includes illicit discharges and NPDES permitted discharges.

Nuisance - As defined in the Porter-Cologne Water Quality Control Act, a nuisance is "anything which meets all of the following requirements: 1) Is injurious to health, or is indecent, or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. 2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. 3) Occurs during, or as a result of, the treatment or disposal of wastes."

Ocean Waters – The territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the State Board's California Ocean Plan.

Order – Unless otherwise specified, refers to this Order, Order No. R9-2013-0001 (NPDES No. CAS0109266)

Outfall - Outfall means a point source as defined by 40 CFR 122.2 at the point where a municipal separate storm sewer discharges to waters of the US and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels or other conveyances which connect segments of the same stream or other waters of the US and are used to convey waters of the US.

Persistent Flow - Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

Person - A person is defined as an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof [40 CFR 122.2].

Point Source - Any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, landfill leachate collection systems, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

Pollutant - Any agent that may cause or contribute to the degradation of water quality such that a condition of pollution or contamination is created or aggravated.

Pollution - As defined in the Porter-Cologne Water Quality Control Act, pollution is "the alteration of the quality of the waters of the State by waste, to a degree which unreasonably affects either of the following: 1) The waters for beneficial uses; or 2) Facilities that serve these beneficial uses." Pollution may include contamination.

Pollution Prevention - Pollution prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control BMPs, treatment control BMPs, or disposal.

Pre-Development Runoff Conditions – Approximate flow rates and durations that exist or existed onsite before land development occurs. For new development projects, this equates to runoff conditions immediately before project construction. For redevelopment projects, this equates to runoff conditions from the project footprint assuming infiltration characteristics of the underlying soil, and existing grade. Runoff coefficients of concrete or asphalt must not be used. A redevelopment Priority Development Project must use available information pertaining to existing underlying soil type and onsite existing grade to estimate pre-development runoff conditions.

Priority Development Projects - New development and redevelopment projects defined under Provision E.3.b of Order No. R9-2013-0001.

Rainy Season (aka Wet Season) –October 1 to April 30

Receiving Waters – Waters of the United States.

Receiving Water Limitations - Waste discharge requirements issued by the San Diego Water Board typically include both: (1) "Effluent Limitations" (or "Discharge Limitations") that specify the technology-based or water-quality-based effluent limitations; and (2) "Receiving Water Limitations" that specify the water quality objectives in the Basin Plan as well as any other limitations necessary to attain those objectives. In summary, the "Receiving Water Limitations" provision is the provision used to implement the requirements of CWA section 402(p)(3)(B).

Redevelopment - The creation and/or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include trenching and resurfacing associated with utility work; resurfacing existing roadways; new sidewalk construction, pedestrian ramps, or bike lane on existing roads; and routine replacement of damaged pavement, such as pothole repair.

Regional Clearinghouse – A central location for the collection and distribution of information developed and maintained by the Copermittees including, but not limited to, plans, reports, manuals, data, contact information, and/or links to such documents and information.

Rehabilitation - Remedial measures or activities for the purpose of improving or restoring the beneficial uses of streams, channels or river systems. Techniques may vary from in-stream restoration techniques to off-line storm water management practices installed in the system corridor or upland areas, or a combination of in-stream and out of stream techniques. Rehabilitation techniques may include, but are not limited to the following: riparian zone restoration, constructed wetlands, channel modifications that improve habitat and stability, and daylighting of drainage systems.

Reporting Period – The period of information that is reported in the Water Quality Improvement Plan Annual Report. The reporting period consists of two components: 1) July 1 to June 30, consistent with the fiscal year, for the implementation of the jurisdictional runoff management programs, and 2) October 1 to September 30, consistent with the monitoring year for the monitoring and assessment programs. Together, these two time periods constitute the reporting year for the Water Quality Improvement Plan Annual Report due January 31 following the end of the monitoring year.

Retain – Keep or hold in a particular place, condition, or position without discharge to surface waters.

Retrofitting – Storm water management practice put into place after development has occurred in watersheds where the practices previously did not exist or are ineffective. Retrofitting of developed areas is intended to improve water quality, protect downstream channels, reduce flooding, or meet other specific objectives. Retrofitting developed areas may include, but is not limited to replacing roofs with green roofs, disconnecting downspouts or impervious surfaces to drain to pervious surfaces, replacing impervious surfaces with pervious surfaces, installing rain barrels, installing rain gardens, and trash area enclosures.

Runoff - All flows in a storm water conveyance system that consists of the following components: (1) storm water (wet weather flows) and (2) non-storm water including dry weather flows.

San Diego Water Board – As used in this document the term "San Diego Water Board" is synonymous with the term "Regional Board" as defined in Water Code section 13050(b) and is intended to refer to the California Regional Water Quality Control Board for the San Diego Region as specified in Water Code Section 13200.

Sediment - Soil, sand, and minerals washed from land into water. Sediment resulting from anthropogenic sources (i.e. human induced land disturbance activities) is considered a pollutant. This Order regulates only the discharges of sediment from anthropogenic sources and does not regulate naturally occurring sources of sediment. Sediment can destroy fish-nesting areas, clog animal habitats, and cloud waters so that sunlight does not reach aquatic plants.

Source Control BMP – Land use or site planning practices, or structural or nonstructural measures that aim to prevent runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between pollutants and runoff.

Storm Water – Per 40 CFR 122.26(b)(13), means storm water runoff, snowmelt runoff and surface runoff and drainage. Surface runoff and drainage pertains to runoff and drainage resulting from precipitation events.

Structural BMPs - A subset of BMPs which detains, retains, filters, removes, or prevents the release of pollutants to surface waters from development projects in perpetuity, after construction of a project is completed.

Test of Significant Toxicity (TST) - A statistical approach used to analyze toxicity test data. The TST incorporates a restated null hypothesis, Welch's t-test, and biological effect thresholds for chronic and acute toxicity.

Total Maximum Daily Load (TMDL) - The maximum amount of a pollutant that can be discharged into a water body from all sources (point and non-point) and still maintain water quality standards. Under CWA section 303(d), TMDLs must be developed for all water bodies that do not meet water quality standards after application of technology-based controls.

Toxicity - Adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies. The water quality objectives for toxicity provided in the Basin Plan, state in part…"All waters shall be free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life….The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge."

Toxicity Identification Evaluation (TIE) - A set of procedures for identifying the specific chemical(s) responsible for toxicity. These procedures are performed in three phases (characterization, identification, and confirmation) using aquatic organism toxicity tests.

Toxicity Reduction Evaluation (TRE) - A study conducted in a step-wise process designed to identify the causative agents of effluent or ambient toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in toxicity. The first steps of the TRE consist of the collection of data relevant to the toxicity, including additional toxicity testing, and an evaluation of facility operations and maintenance practices, and best management practices. A Toxicity Identification Evaluation (TIE) may be required as part of the TRE, if appropriate.

Treatment Control BMP – Any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media absorption or any other physical, biological, or chemical process.

Unpaved Road – Any long, narrow stretch without pavement used for traveling by motor passenger vehicles between two or more points. Unpaved roads are generally constructed of dirt, gravel, aggregate or macadam and may be improved or unimproved.

Waste - As defined in CWC Section 13050(d), "waste includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal."

Article 2 of CCR Title 23, Chapter 15 (Chapter 15) contains a waste classification system that applies to solid and semi-solid waste, which cannot be discharged directly or indirectly to water of the state and which therefore must be discharged to land for treatment, storage, or disposal in accordance with Chapter 15. There are four classifications of waste (listed in order of highest to lowest threat to water quality): hazardous waste, designated waste, non-hazardous solid waste, and inert waste.

Water Quality Objective - Numerical or narrative limits on constituents or characteristics of water designated to protect designated beneficial uses of the water. [California Water Code Section 13050 (h)]. California's water quality objectives are established by the State and Regional Water Boards in the Water Quality Control Plans. Numeric or narrative limits for pollutants or characteristics of water designed to protect the beneficial uses of the water. In other words, a water quality objective is the maximum concentration of a pollutant that can exist in a receiving water and still generally ensure that the beneficial uses of the receiving water remain protected (i.e., not impaired). Since water quality objectives are designed specifically to protect the beneficial uses, when the objectives are violated the beneficial uses are, by definition, no longer protected and become impaired. This is a fundamental concept under the Porter Cologne Act. Equally fundamental is Porter Cologne's definition of pollution. A condition of pollution exists when the water quality needed to support designated beneficial uses has become unreasonably affected or impaired; in other words, when the water quality objectives have been violated. These underlying definitions (regarding beneficial use protection) are the reason why all waste discharge requirements implementing the federal NPDES regulations require compliance with water quality objectives. (Water quality objectives are also called water quality criteria in the CWA.)

Water Quality Standards - Water quality standards, as defined in Clean Water Act section 303(c) consist of the beneficial uses (e.g., swimming, fishing, municipal drinking water supply, etc.,) of a water body and criteria (referred to as water quality objectives in the California Water Code) necessary to protect those uses. Under the Water Code, the water boards establish beneficial uses and water quality objectives in water quality control or basin plans. Together with an anti-degradation policy, these beneficial uses and water quality objectives serve as water quality standards under the Clean Water Act. In Clean Water Act parlance, state beneficial uses are called "designated uses" and state water quality objectives are called "criteria." Throughout this Order, the relevant term is used depending on the statutory scheme.

Waters of the State - Any water, surface or underground, including saline waters within the boundaries of the State [CWC section 13050 (e)]. The definition of the Waters of the State is broader than that for the Waters of the United States in that all water in the State is considered to be a Waters of the State regardless of circumstances or condition.

Waters of the United States - As defined in the 40 CFR 122.2, the Waters of the U.S. are defined as: "(a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate "wetlands;" (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters otherwise defined as waters of the United States under this definition: (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial seas; and (g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA."

Watershed - That geographical area which drains to a specified point on a water course, usually a confluence of streams or rivers (also known as drainage area, catchment, or river basin).

Wet Season (aka Rainy Season) – October 1 to April 30

Wet Weather – Weather is considered wet up to 72 hours after a storm event of 0.1 inches and greater, unless otherwise defined by another regulatory mechanism (e.g. a TMDL).

ATTACHMENT D

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

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JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

FY _____

I. COPERMITTEE INFORMATION

Copermittee Name:

Copermittee Primary Contact Name:

Copermittee Primary Contact Information:
Address:
City: County: State: Zip:
Telephone: Fax: Email:

II. LEGAL AUTHORITY

Has the Copermittee established adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐
A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority?	**YES**	☐
	NO	☐

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

Was an update of the jurisdictional runoff management program document required or recommended by the San Diego Water Board?	**YES**	☐
	NO	☐
If YES to the question above, did the Copermittee update its jurisdictional runoff management program document and make it available on the Regional Clearinghouse?	**YES**	☐
	NO	☐

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

Has the Copermittee implemented a program to actively detect and eliminate illicit discharges and connections to its MS4 that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

Number of non-storm water discharges reported by the public	
Number of non-storm water discharges detected by Copermittee staff or contractors	
Number of non-storm water discharges investigated by the Copermittee	
Number of sources of non-storm water discharges identified	
Number of non-storm water discharges eliminated	
Number of sources of illicit discharges or connections identified	
Number of illicit discharges or connections eliminated	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

V. DEVELOPMENT PLANNING PROGRAM

Has the Copermittee implemented a development planning program that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐
Was an update to the BMP Design Manual required or recommended by the San Diego Water Board?	**YES**	☐
	NO	☐
If YES to the question above, did the Copermittee update its BMP Design Manual and make it available on the Regional Clearinghouse?	**YES**	☐
	NO	☐

Number of proposed development projects in review	
Number of Priority Development Projects in review	
Number of Priority Development Projects approved	
Number of approved Priority Development Projects exempt from any BMP requirements	
Number of approved Priority Development Projects allowed alternative compliance	
Number of Priority Development Projects granted occupancy	

Number of completed Priority Development Projects in inventory	
Number of high priority Priority Development Project structural BMP inspections	
Number of Priority Development Project structural BMP violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM
FY _____

VI. CONSTRUCTION MANAGEMENT PROGRAM

Has the Copermittee implemented a construction management program that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

Number of construction sites in inventory	
Number of active construction sites in inventory	
Number of inactive construction sites in inventory	
Number of construction sites closed/completed during reporting period	
Number of construction site inspections	
Number of construction site violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

Has the Copermittee implemented an existing development management program that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

	Municipal	Commercial	Industrial	Residential
Number of facilities or areas in inventory				
Number of existing development inspections				
Number of follow-up inspections				
Number of violations				
Number of enforcement actions issued				
Number of escalated enforcement actions issued				

VIII. PUBLIC EDUCATION AND PARTICIPATION

Has the Copermittee implemented a public education program component that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐
Has the Copermittee implemented a public participation program component that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

IX. FISCAL ANALYSIS

Has the Copermittee attached to this form a summary of its fiscal analysis that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

X. CERTIFICATION

I [☐ Principal Executive Officer ☐ Ranking Elected Official ☐ Duly Authorized Representative] certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature	Date
Print Name	Title
Telephone Number	Email

ATTACHMENT E

SPECIFIC PROVISIONS FOR TOTAL MAXIMUM DAILY LOADS APPLICABLE TO ORDER NO. R9-2013-0001

These provisions implement load allocations (LAs) and wasteload allocations (WLAs) of the Total Maximum Daily Loads (TMDLs) adopted by the San Diego Water Board and approved by USEPA under Clean Water Act section 303(c), applicable to discharges regulated under this Order. The provisions and schedules for implementation of the TMDLs described below must be incorporated into the Water Quality Improvement Plans, required pursuant to Provision B of this Order, for the specified Watershed Management Areas.

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed
2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin
3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed
4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek
5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay
6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2002-0123

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	August 14, 2002
State Water Board Approval Date:	July 16, 2003
Office of Administrative Law Approval Date:	September 11, 2003
US EPA Approval Date:	November 3, 2003

(3) TMDL Effective Date: September 11, 2003

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final diazinon TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must be in compliance with the final TMDL compliance requirements as of December 31, 2010.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations:

Table 1.1
Final Receiving Water Limitations Expressed as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Diazinon	Acute	0.08 µg/L	1 hour
	Chronic	0.05 µg/L	4 days

(b) Final Effluent Limitations

Discharges from the MS4s containing concentrations that do not exceed the following effluent limitations will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 1.b.(2)(a):

Table 1.2
Final Effluent Limitations Expressed as Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation	Averaging Period
Diazinon	Acute	0.072 µg/L	1 hour
	Chronic	0.045 µg/L	4 days

(c) Best Management Practices

The following BMPs for Chollas Creek must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area and implemented by the Responsible Copermittees:

(i) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 1.b.(2)(a) and/or the effluent limitations under Specific Provision 1.b.(2)(b) for Chollas Creek.

(ii) The Responsible Copermittees must implement the Diazinon Toxicity Control Plan and Diazinon Public Outreach/Education Program as described in the report titled, *Technical Report for Total Maximum Daily Load for Diazinon in Chollas Creek Watershed, San Diego County*, dated August 14, 2002, including subsequent modifications, in order to achieve the receiving water limitations under Specific Provision 1.b.(2)(a) and/or the effluent limitations under Specific Provision 1.b.(2)(b).

(iii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 1.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 1.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 1.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 1.b.(2)(c) achieves compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 1.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 1.d, to demonstrate compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The Responsible Copermittees must be in compliance with the final diazinon TMDL compliance requirements as of December 31, 2010.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls for diazinon within the Chollas Creek watershed, and calculate or estimate the annual diazinon loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 1.b.(2)(b), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0019

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	September 22, 2005
Office of Administrative Law Approval Date:	December 2, 2005
US EPA Approval Date:	February 8, 2006

(3) TMDL Effective Date: December 2, 2005

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Shelter Island Yacht Basin

(6) Responsible Copermittee: City of San Diego

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final dissolved copper TMDL compliance requirements for Shelter Island Yacht Basin consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittee must be in compliance with the final TMDL compliance requirements as of December 2, 2005.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations:

Table 2.1
Final Receiving Water Limitations Expressed as Concentrations in Shelter Island Yacht Basin

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Dissolved Copper	Acute	4.8 µg/L x WER*	1 hour
	Chronic	3.1 µg/L x WER*	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 2.b.(3)(a):

Table 2.2
Final Effluent Limitations as Expressed as Annual Loads in MS4 Discharges to Shelter Island Yacht Basin

Constituent	Effluent Limitation
Dissolved Copper	30 kg/yr*

* If the water quality objectives for dissolved copper in Shelter Island Yacht Basin are changed in the future, then the margin of safety (MOS), TMDL and allocations will be recalculated using the *Method for Recalculation of the Total Maximum Daily Load for Dissolved Copper in the Shelter Island Yacht Basin, San Diego Bay* in the Basin Plan (p. 7-14).

(c) Best Management Practices

The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 2.b.(2)(a) and/or the effluent limitations under Specific Provision 2.b.(2)(b) for Shelter Island Yacht Basin. The BMPs must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 2.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 2.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittee develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 2.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate

that the implementation of the BMPs required under Provision 2.b.(2)(c) achieves compliance with Specific Provisions 2.b.(3)(a), 2.b.(3)(b) and/or 2.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 2.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 2.d, to demonstrate compliance with Specific Provisions 2.b.(3)(a), 2.b.(3)(b) and/or 2.b.(3)(c).

c. Interim TMDL Compliance Requirements

The Responsible Copermittees must be in compliance with the final dissolved copper TMDL compliance requirements as of December 2, 2005.

d. Specific Monitoring and Assessment Requirements

The Responsible Copermittee must monitor the effluent of its MS4 outfalls for dissolved copper, and calculate or estimate the monthly and annual dissolved copper loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.(b)(2)of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0036

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	November 16, 2005
Office of Administrative Law Approval Date:	February 1, 2006
US EPA Approval Date:	March 22, 2006

(3) TMDL Effective Date: February 1, 2006

(4) Watershed Management Area: Santa Margarita River

(5) Water Body: Rainbow Creek

(6) Responsible Copermittee: County of San Diego

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final total nitrogen and total phosphorus TMDL compliance requirements for Rainbow Creek consist of the following

(1) Final TMDL Compliance Date

The Responsible Copermittee must comply with final TMDL compliance requirements by December 31, 2021.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance date under Specific Provision 3.b.(1):

Table 3.1
Final Receiving Water Limitations Expressed as Concentrations in Rainbow Creek

Constituent	Receiving Water Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing concentrations that do not exceed the following effluent limitations by the compliance date under Specific Provision 3.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 3.b.(2)(a):

Table 3.2
Final Effluent Limitations Expressed as Concentrations in MS4 Discharges to Rainbow Creek

Constituent	Effluent Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(ii) Annual pollutant loads from given land uses discharging to and from the MS4s that do not exceed the following annual loads by the compliance date under Specific Provision 3.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 3.b.(2)(a):

Table 3.3
Final Effluent Limitations Expressed as Annual Loads in MS4 Discharges to Rainbow Creek

Land Use	Total N	Total P
Commercial nurseries	116 kg/yr	3 kg/yr
Park	3 kg/yr	0.1 kg/yr
Residential areas	149 kg/yr	12 kg/yr
Urban areas	27 kg/yr	6 kg/yr

(c) Best Management Practices

(i) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 3.b.(2)(a) and/or the effluent limitations under Specific Provision 3.b.(2)(b) for Rainbow Creek.

(ii) The Responsible Copermittee should coordinate any BMPs implemented to address this TMDL with Caltrans and other sources as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 3.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 3.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the final effluent limitations under Specific Provision 3.b.(2)(b)(ii); OR

(e) The Responsible Copermittee develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 3.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Specific Provision 3.b.(2)(c) achieves compliance with Specific Provisions 3.b.(3)(a), 3.b.(3)(b), 3.b.(3)(c) and/or 3.b.(3)(d),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 3.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 3.d, to demonstrate compliance with Specific Provisions 3.b.(3)(a), 3.b.(3)(b), 3.b.(3)(c) and/or 3.b.(3)(d).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim total nitrogen and total phosphorus TMDL compliance requirements for Rainbow Creek consist of the following:

(1) Interim Compliance Dates and WQBELs

The Responsible Copermittee must comply with the interim WQBELs, expressed as annual loads, by December 31 of the interim compliance year given in Table 3.4.

Table 3.4
Interim Water Quality Based Effluent Limitations Expressed as Annual Loads in MS4 Discharges from Specific Land Uses to Rainbow Creek

	Total N Interim Effluent Limitations (kg/yr)			Total P Interim Effluent Limitations (kg/yr)		
	Interim Compliance Date			Interim Compliance Date		
Land Use	**2009**	**2013**	**2017**	**2009**	**2013**	**2017**
Commercial nurseries	390	299	196	20	16	10
Park	5	3	3	0.15	0.10	0.10
Residential areas	507	390	260	99	74	47
Urban areas	40	27	27	9	6	6

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 3.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 3.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the final effluent limitations under Specific Provision 3.b.(2)(b)(ii); OR

(e) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the interim effluent limitations under Specific Provision 3.c.(1); OR

(f) The Responsible Copermittee has submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

d. Specific Monitoring and Assessment Requirements

(1) The Responsible Copermittee must incorporate into the Water Quality Improvement Plan and implement the Sampling and Analysis Plan for Rainbow Creek Nutrient Reduction TMDL Implementation Water Quality Monitoring, dated January 2010.

(2) The results of any monitoring conducted during the reporting period, and assessment of whether the interim and final TMDL compliance requirements have been achieved must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 3.b.(2)(b)(i), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2007-0043

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2007
State Water Board Approval Date:	July 15, 2008
Office of Administrative Law Approval Date:	October 22, 2008
US EPA Approval Date:	December 18, 2008

(3) TMDL Effective Date: October 22, 2008

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final dissolved copper, lead, and zinc TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must comply with the final TMDL compliance requirements by October 22, 2028.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance date under Specific Provision 4.b.(1):

Table 4.1
Final Receiving Water Limitations Expressed as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$(0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$(0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$(0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$(0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations by the compliance date under Specific Provision 4.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 4.b.(2)(a):

Table 4.2
Final Effluent Limitations as Expressed Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(c) Best Management Practices

(i) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 4.b.(2)(a) and/or the effluent limitations under Specific Provision 4.b.(2)(b) for Chollas Creek.

(ii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans and the U.S. Navy as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 4.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 4.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 4.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 4.b.(2)(c) achieves compliance with Specific Provisions 4.b.(3)(a), 4.b.(3)(b) and/or 4.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 4.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 4.d, to demonstrate compliance with Specific Provisions 4.b.(3)(a), 4.b.(3)(b) and/or 4.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim dissolved copper, lead, and zinc TMDL compliance requirements for Chollas Creek consist of the following:

(1) Interim Compliance Date and WQBELs

The Responsible Copermittee must comply with the interim WQBELs, expressed as concentrations, by the interim compliance date given in Table 4.3:

Table 4.3
Interim Water Quality Based Effluent Limitations Expressed as Concentrations in MS4 Discharges to Chollas Creek

Interim Compliance Date	Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
October 22, 2018	Dissolved Copper	Acute	$1.2 \times 90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
	Dissolved Lead	Acute	$1.2 \times 90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
	Dissolved Zinc	Acute	$1.2 \times 90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 4.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 4.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) There are no exceedances of the interim effluent limitations under Specific Provision 4.c.(1) at the Responsible Copermittee's MS4 outfalls; OR

(e) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance date.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*, when it is amended to include monitoring requirements for the Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls discharging to Chollas Creek for dissolved copper, lead, and zinc, and calculate or estimate the monthly and annual dissolved copper, lead, and zinc loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 4.b.(2)(b) or 4.c.(1), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2008-0027

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 11, 2008
State Water Board Approval Date:	June 16, 2009
Office of Administrative Law Approval Date:	September 15, 2009
US EPA Approval Date:	October 26, 2009

(3) TMDL Effective Date: September 15, 2009

(4) Watershed Management Areas: See Table 5.0

(5) Water Bodies: See Table 5.0

(6) Responsible Copermittees: See Table 5.0

Table 5.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County	Dana Point Harbor	Baby Beach	-City of Dana Point -County of Orange
San Diego Bay	San Diego Bay	Shelter Island Shoreline Park	- San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final indicator bacteria TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Final TMDL Compliance Dates

(a) Baby Beach in Dana Point Harbor

The Responsible Copermittees for MS4 discharges to Baby Beach must be in compliance with the final TMDL compliance requirements according to the following compliance dates:

Table 5.1
Compliance Dates to Achieve Final TMDL Compliance Requirements For Baby Beach in Dana Point Harbor

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform	September 15, 2014	September 15, 2009
Fecal Coliform		September 15, 2009
Enterococcus		September 15, 2019

(b) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park must be in compliance with the final TMDL compliance requirements as of December 31, 2012.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance dates under Specific Provision 5.b.(1):

Table 5.2
Final Receiving Water Limitations Expressed as Bacteria Densities in the Water Body

	Receiving Water Limitations	
Constituent	Single Sample Maximum[1,2]	30-Day Geometric Mean[2]
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing indicator bacteria densities that do not exceed the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.3a
Final Effluent Limitations as Expressed as Bacteria Densities in MS4 Discharges to the Water Body

	Effluent Limitations	
Constituent	**Single Sample Maximum[1,2]**	**30-Day Geometric Mean[2]**
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.

(ii) Discharges from the MS4s containing indicator bacteria loads that do not exceed the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.4a
Final Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to the Baby Beach in Dana Point Harbor

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0.86×10^9 MPN/day	$3{,}254 \times 10^9$ MPN/30days
Fecal Coliform	0.17×10^9 MPN/day	112×10^9 MPN/30days
Enterococcus	0.03×10^9 MPN/day	114×10^9 MPN/30days

Table 5.4b
Final Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to the Shelter Island Shoreline Park in San Diego Bay

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0 MPN/day	198×10^9 MPN/30days
Fecal Coliform	0 MPN/day	8×10^9 MPN/30days
Enterococcus	0 MPN/day	26×10^9 MPN/30days

(iii) Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.5a
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to Baby Beach in Dana Point Harbor*

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	90.4%	0%
Fecal Coliform	82.7%	0%
Enterococcus	96.2%	62.2%

Notes:
* The percent load reductions are relative to data collected between 1996-2002. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittees' MS4s must not exceed the loads in Table 5.4a, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the water body.

Table 5.5b
*Final Effluent Limitations Expressed as Percent Load Reductions** in MS4 Discharges to Shelter Island Shoreline Park in San Diego Bay*

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0%	0%
Fecal Coliform	0%	0%
Enterococcus	0%	0%

Notes:
* The percent load reductions are relative to data collected between 1999-2004. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittee's MS4s must not exceed the loads in Table 5.4b, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the water body.

(c) Best Management Practices

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 5.0 must incorporate the Bacteria Load Reduction Plan (BLRP) required to be developed pursuant to Resolution No. R9-2008-0027.

(ii) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 5.b.(2)(a) and/or the effluent limitations under Specific Provision 5.b.(2)(b) for the segments or areas of the water bodies listed in Table 5.0

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.b.(2)(b)(ii); OR

(e) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 5.b.(2)(b)(iii); OR

(f) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(g) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 5.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 5.b.(2)(c) achieves compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 5.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 5.d, to demonstrate compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim indicator bacteria TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Baby Beach in Dana Point Harbor

(a) Interim TMDL Compliance Dates and WQBELs

The Responsible Copermittees for MS4 discharges to Baby Beach must comply with the following interim WQBELs by the interim compliance dates given in Tables 5.6a and/or 5.6b:

Table 5.6a
Interim Water Quality Based Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to Baby Beach in Dana Point Harbor

Constituent	Interim Compliance Dates	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	4.93×10^9 MPN/day	$3{,}254 \times 10^9$ MPN/30days*
Fecal Coliform	September 15, 2012	0.59×10^9 MPN/day	112×10^9 MPN/30days*
Enterococcus	September 15, 2012	0.42×10^9 MPN/day	301×10^9 MPN/30days
	September 15, 2016	0.03×10^9 MPN/day *	207×10^9 MPN/30days

Notes:
* Same as the final effluent limitations in Table 5.4a.

Table 5.6b
Interim Water Quality Based Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to Baby Beach in Dana Point Harbor*

Constituent	Interim Compliance Dates	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	45.2%	0%**
Fecal Coliform	September 15, 2012	41.4%	0%**
Enterococcus	September 15, 2012	48.1%	0%
	September 15, 2016	96.2%**	31.1%

Notes:
* The percent load reductions are relative to data collected between 1996-2002. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittees' MS4s must not exceed the loads in Table 5.6a, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the waterbody.
** Same as the final effluent limitations in Table 5.5a.

(b) Interim Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(i) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(ii) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(iii) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(iv) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.b(2)(b)(ii); OR

(v) The Responsible Copermittees can demonstrate that exceedances of the applicable receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(vi) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the interim effluent limitations under Table 5.6a of Specific Provision 5.c.(1)(a); OR

(vii) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the interim effluent limitations under Table 5.6b of Specific Provision 5.c.(1)(a); OR

(viii) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

(2) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park must be in compliance with the final indicator bacteria TMDL requirements as of December 31, 2012.

d. Specific Monitoring and Assessment Requirements

(1) Monitoring Stations

Monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[32] If discharges of bacteria from the MS4 exceed the applicable interim or final WQBELs, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(2) Monitoring Procedures

(a) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) The Responsible Copermittees must collect wet weather monitoring samples within the first 24 hours of a storm event[33] of the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(c) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

[32] Commonly referred to as AB 411 monitoring

[33] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs have been achieved.

(b) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 5.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(c) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to correlate elevated bacteria levels with known or suspected sewage spills from wastewater collection systems and treatment plants or boats.

(d) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2010-0001

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 10, 2010
State Water Board Approval Date:	December 14, 2010
Office of Administrative Law Approval Date:	April 4, 2011
US EPA Approval Date:	June 22, 2011

(3) TMDL Effective Date: April 4, 2011

(4) Watershed Management Areas: See Table 6.0

(5) Water Bodies: See Table 6.0

(6) Responsible Copermittees: See Table 6.0

Table 6.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	-City of Laguna Beach -County of Orange -Orange County Flood Control District
		at Heisler Park - North	
	Pacific Ocean Shoreline	at Main Laguna Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Woods -County of Orange -Orange County Flood Control District
		Laguna Beach at Ocean Avenue	
		Laguna Beach at Cleo Street	
		Arch Cove at Bluebird Canyon Road	
		Laguna Beach at Dumond Drive	
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Hills -City of Laguna Niguel -City of Laguna Woods -City of Lake Forest -City of Mission Viejo -County of Orange -Orange County Flood Control District
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	
	Aliso Creek Mouth	at mouth	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	-City of Dana Point -City of Laguna Beach -City of Laguna Niguel -County of Orange -Orange County Flood Control District
		Aliso Beach at Table Rock Drive	
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)	
		at Salt Creek (large outlet)	
		Salt Creek Beach at Salt Creek service road	
		Salt Creek Beach at Strand Road	
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	-City of Dana Point -City of Laguna Hills -City of Laguna Niguel -City of Mission Viejo -City of Rancho Santa Margarita -City of San Juan Capistrano -County of Orange -Orange County Flood Control District
	San Juan Creek	lower 1 mile	
	San Juan Creek Mouth	at mouth	
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	-City of Dana Point -City of San Clemente -County of Orange -Orange County Flood Control District
		Ole Hanson Beach Club Beach at Pico Drain	
		San Clemente City Beach at El Portal Street Stairs	
		San Clemente City Beach at Mariposa Street	
		San Clemente City Beach at Linda Lane	
		San Clemente City Beach at South Linda Lane	
		San Clemente City Beach at Lifeguard Headquarters	
		under San Clemente Municipal Pier	
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	
		San Clemente State Beach at Riviera Beach	
		Can Clemente State Beach at Cypress Shores	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	-City of Oceanside -City of Vista -County of San Diego
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	-City of Carlsbad -City of Encinitas -City of Escondido -City of San Marcos -County of San Diego
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	-City of Del Mar -City of Escondido -City of Poway -City of San Diego -City of Solana Beach -County of San Diego
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	-City of Del Mar -City of Poway -City of San Diego -County of San Diego
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	-City of San Diego
		La Jolla Shores Beach at Caminito del Oro	
		La Jolla Shores Beach at Vallecitos	
		La Jolla Shores Beach at Avenida de la Playa	
		at Casa Beach, Children's Pool	
		South Casa Beach at Coast Boulevard	
		Whispering Sands Beach at Ravina Street	
		Windansea Beach at Vista de la Playa	
		Windansea Beach at Bonair Street	
		Windansea Beach at Playa del Norte	
		Windansea Beach at Palomar Avenue	
		at Tourmaline Surf Park	
		Pacific Beach at Grand Avenue	
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I- Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	-City of El Cajon -City of Santee -County of San Diego
	San Diego River	lower 6 miles	-City of El Cajon -City of La Mesa -City of San Diego -City of Santee -County of San Diego
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	-City of La Mesa -City of Lemon Grove -City of San Diego -County of San Diego - San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final indicator bacteria TMDL compliance requirements for the water bodies listed in Table 6.0 consist of the following:

(1) Final TMDL Compliance Dates

The Responsible Copermittees for MS4 discharges to the water bodies listed in Table 6.0 must be in compliance with the final TMDL compliance requirements according to the following compliance dates:

Table 6.1
Compliance Dates to Achieve Final TMDL Compliance Requirements

Constituent	Dry Weather TMDL Compliance Date	Wet Weather TMDL Compliance Date
Total Coliform	April 4, 2021	April 4, 2031
Fecal Coliform		
Enterococcus		

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance dates under Specific Provision 6.b.(1):

Table 6.2a
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Beaches

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform	10,000	22%	1,000	0%
Fecal Coliform	400	22%	200	0%
Enterococcus	104	22%	35	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan.

Table 6.2b
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Creeks

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Fecal Coliform	400	22%	200	0%
Enterococcus	61 (104)	22%	33	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Basin Plan.
d. A single sample maximum of 104 MPN/100ml for *Enterococcus* may be applied as a receiving water limitation for creeks, instead of 61 MPN/100mL, if one or more of the creeks addressed by these TMDLs (San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek, San Diego River, and/or Chollas Creek) is designated with a "moderately to lightly used area" or less frequent usage frequency in the Basin Plan. Otherwise, the single sample maximum of 61 MPN/100mL for *Enterococcus* must be used to assess compliance with the allowable exceedance frequency.

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing indicator bacteria densities that do not exceed the following effluent limitations by the compliance dates under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a):

Table 6.2c
Final Effluent Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies in MS4 Discharges to the Water Body

Constituent	Concentration-Based Effluent Limitations			
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform[d]	10,000	22%	1,000	0%
Fecal Coliform	400	22%	200	0%
Enterococcus	104[e] / 61[f]	22%	35[e] / 33[f]	0%

Notes:
a. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan for discharges to beaches, and the Basin Plan for discharges to creeks and creek mouths.
d. Total coliform effluent limitations only apply to MS4 outfalls that discharge to the Pacific Ocean Shorelines and creek mouths listed in Table 6.0.
e. This *Enterococcus* effluent limitation applies to MS4 discharges to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
f. This *Enterococcus* effluent limitation applies to MS4 discharges to segments or areas of creeks or creek mouths listed in Table 6.0.

(ii) Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the compliance dates under Specific Provision 6.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a):

Table 6.3
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watershed and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
South Orange County	**San Joaquin Hills HSA** (901.11) and **Laguna Hills HSA** (901.12) - Pacific Ocean Shoreline	91.78%	91.72%	98.28%	46.85%	52.07%	51.26%
	Aliso HSA (901.13) - Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	95.47%	95.58%	99.13%	25.29%	26.62%	27.52% (27.37%)**
	Dana Point HSA (901.14) - Pacific Ocean Shoreline	95.04%	95.03%	98.98%	13.15%	14.86%	15.16%
	Lower San Juan HSA (901.27) - Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	72.96%	74.21%	94.94%	19.21%	12.82%	27.12% (26.90%)**
	San Clemente HA (901.30) - Pacific Ocean Shoreline	94.28%	94.23%	98.83%	23.85%	24.58%	25.26%
San Luis Rey River	**San Luis Rey HU** (903.00) - Pacific Ocean Shoreline	38.13%	39.09%	87.38%	5.62%	3.12%	11.69%

Table 6.3 (Cont'd)
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watershed and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
Carlsbad	**San Marcos HA** (904.50) - Pacific Ocean Shoreline	82.82%	82.55%	96.03%	18.47%	18.98%	20.19%
San Dieguito River	**San Dieguito HU** (905.00) - Pacific Ocean Shoreline	14.39%	20.72%	83.48%	4.29%	1.46%	7.72%
Penasquitos	**Miramar Reservoir HA** (906.10) - Pacific Ocean Shoreline	96.50%	96.59%	99.42%	1.61%	1.99%	1.93%
Mission Bay	**Scripps HA** (906.30) - Pacific Ocean Shoreline	96.44%	96.42%	99.25%	16.32%	21.14%	18.82%
	Tecolote HA (906.50) - Tecolote Creek	94.51%	94.59%	98.94%	16.51%	20.47%	18.15% (18.08%)**
San Diego River	**Mission San Diego HSA** (907.11) and **Santee HSA** (907.12) - Pacific Ocean Shoreline - Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles)	74.03%	69.44%	93.96%	38.14%	53.22%	42.74% (42.47%)**
San Diego Bay	**Chollas HSA** (908.22) - Chollas Creek	92.06%	92.15%	98.46%	17.82%	24.84%	21.46% (21.36%)**

Notes:
* The percent load reductions are based on reducing loads compared to pollutant loads from 2001 to 2002.
** The alternative *Enterococcus* percent load reduction was calculated based on a numeric target of 104 MPN/100mL instead of 61 MPN/100mL, protective of the REC-1 "moderately to lightly used area" usage frequency that is protective of freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative pollutant load reductions can be utilized.

(c) Best Management Practices

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 6.0 must incorporate the Comprehensive Load Reduction Plans (CLRPs) required to be developed pursuant to Resolution No. R9-2010-0001.

(ii) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 6.b.(2)(a) and/or the effluent limitations under Specific Provision 6.b.(2)(b) for the segments or areas of the water bodies listed in Table 6.0.

(iii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans, owners/operators of small MS4s, and agricultural dischargers as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(f) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 6.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 6.b.(2)(c) achieves compliance with Specific Provisions 6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), and/or 6.b.(3)(e),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 6.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 6.d, to demonstrate compliance with Specific Provisions 6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), 6.b.(3)(e) and/or 6.b.(3)(f).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim indicator bacteria TMDL compliance requirements for the water bodies listed in Table 6.0 consist of the following:

(1) Interim TMDL Compliance Dates

The Responsible Copermittees must achieve compliance with the interim TMDL compliance requirements, as determined in accordance with Specific Provision 6.c.(3), by the interim compliance dates given in Table 6.4, unless alternative interim compliance dates are accepted by the San Diego Water Board Executive Officer as part of the Water Quality Improvement Plan.

Table 6.4
Interim Compliance Dates to Achieve Interim TMDL Compliance Requirements

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	April 4, 2016	April 4, 2021
		at Heisler Park - North		
	Pacific Ocean Shoreline	at Main Laguna Beach	April 4, 2016	April 4, 2021
		Laguna Beach at Ocean Avenue		
		Laguna Beach at Cleo Street		
		Arch Cove at Bluebird Canyon Road		
		Laguna Beach at Dumond Drive		
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	April 4, 2016	April 4, 2021
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	April 4, 2018	April 4, 2021
	Aliso Creek Mouth	at mouth	April 4, 2018	April 4, 2021
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	April 4, 2016	April 4, 2021
		Aliso Beach at Table Rock Drive		
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)		
		at Salt Creek (large outlet)		
		Salt Creek Beach at Salt Creek service road	April 4, 2017	April 4, 2021
		Salt Creek Beach at Strand Road	April 4, 2017	April 4, 2021

Table 6.4 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates	
			Interim Dry Weather WQBELs	Interim Wet Weather WQBELs
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	April 4, 2016	April 4, 2021
	San Juan Creek	lower 1 mile	April 4, 2018	April 4, 2021
	San Juan Creek Mouth	at mouth	April 4, 2016	April 4, 2021
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	April 4, 2016	April 4, 2021
		Ole Hanson Beach Club Beach at Pico Drain	April 4, 2016	April 4, 2021
		San Clemente City Beach at El Portal Street Stairs	April 4, 2017	April 4, 2021
		San Clemente City Beach at Mariposa Street		
		San Clemente City Beach at Linda Lane	April 4, 2016	April 4, 2021
		San Clemente City Beach at South Linda Lane	April 4, 2018	April 4, 2021
		San Clemente City Beach at Lifeguard Headquarters	April 4, 2017	April 4, 2021
		under San Clemente Municipal Pier		
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	April 4, 2018	April 4, 2021
		San Clemente State Beach at Riviera Beach	April 4, 2016	April 4, 2021
		Can Clemente State Beach at Cypress Shores	April 4, 2017	April 4, 2021
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	April 4, 2017	April 4, 2021
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	April 4, 2016	April 4, 2021
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	April 4, 2016	April 4, 2021

Table 6.4 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates	
			Interim Dry Weather WQBELs	Interim Wet Weather WQBELs
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	April 4, 2016	April 4, 2021
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	April 4, 2016	April 4, 2021
		La Jolla Shores Beach at Caminito del Oro		
		La Jolla Shores Beach at Vallecitos		
		La Jolla Shores Beach at Avenida de la Playa		
		at Casa Beach, Children's Pool		
		South Casa Beach at Coast Boulevard		
		Whispering Sands Beach at Ravina Street		
		Windansea Beach at Vista de la Playa		
		Windansea Beach at Bonair Street		
		Windansea Beach at Playa del Norte		
		Windansea Beach at Palomar Avenue		
		at Tourmaline Surf Park		
		Pacific Beach at Grand Avenue		
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries		
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	April 4, 2018	April 4, 2021
	San Diego River	lower 6 miles		
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach		
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	April 4, 2018	April 4, 2021

(2) Interim Water Quality Based Effluent Limitations

The Responsible Copermittees for discharges to the water bodies in Table 6.0 must comply with the following interim WQBELs by the interim compliance dates given in Specific Provision 6.c.(1):

(a) Interim Receiving Water Limitations

(i) *Interim Dry Weather Receiving Water Limitations*

The Responsible Copermittee must calculate the "existing" exceedance frequencies of the 30-day geometric mean water quality objectives for each of the indicator bacteria by analyzing the available monitoring data collected between January 1, 1996 and December 31, 2002. "Existing" exceedance frequencies may be calculated by water body and/or by Watershed Management Area listed in Table 6.0. Separate "existing" exceedance frequencies must be calculated for beaches and creeks/creek mouths.

The Responsible Copermittees must achieve a 50 percent reduction in the "existing" exceedance frequency of the 30-day geometric mean WQBELs for the water bodies listed in Table 6.0 by the interim compliance dates given in Table 6.4. A 50 percent reduction in the "existing" exceedance frequency is equivalent to half of the "existing" exceedance frequency of the 30-day geometric mean WQBELs.

The "existing" exceedance frequencies and the interim dry weather allowable exceedance frequencies (i.e. interim dry weather receiving water limitations) calculated by the Responsible Copermittees must be included in the Water Quality Improvement Plans for the applicable Watershed Management Areas.

(ii) *Interim Wet Weather Receiving Water Limitations*

The Responsible Copermittees must achieve the interim wet weather receiving water limitations in Table 6.5, expressed as interim wet weather allowable exceedance frequencies, by the interim compliance dates given in Table 6.4.

Table 6.5
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	38%	37%	39%
		at Heisler Park - North			
	Pacific Ocean Shoreline	at Main Laguna Beach			
		Laguna Beach at Ocean Avenue			
		Laguna Beach at Cleo Street			
		Arch Cove at Bluebird Canyon Road			
		Laguna Beach at Dumond Drive			
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	41%	41%	42%
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	41%	41%	42%
	Aliso Creek Mouth	at mouth	41%	41%	42%
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	36%	36%	36%
		Aliso Beach at Table Rock Drive			
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)			
		at Salt Creek (large outlet)			
		Salt Creek Beach at Salt Creek service road			
		Salt Creek Beach at Strand Road			

Table 6.5 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	44%	44%	48%
	San Juan Creek	lower 1 mile	44%	44%	47%
	San Juan Creek Mouth	at mouth	44%	44%	47%
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	35%	35%	36%
		Ole Hanson Beach Club Beach at Pico Drain			
		San Clemente City Beach at El Portal Street Stairs			
		San Clemente City Beach at Mariposa Street			
		San Clemente City Beach at Linda Lane			
		San Clemente City Beach at South Linda Lane			
		San Clemente City Beach at Lifeguard Headquarters			
		under San Clemente Municipal Pier			
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)			
		San Clemente State Beach at Riviera Beach			
		Can Clemente State Beach at Cypress Shores			
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	45%	44%	47%
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	40%	40%	41%
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	33%	33%	36%

Table 6.5 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	26%	26%	26%
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	37%	37%	37%
		La Jolla Shores Beach at Caminito del Oro			
		La Jolla Shores Beach at Vallecitos			
		La Jolla Shores Beach at Avenida de la Playa			
		at Casa Beach, Children's Pool			
		South Casa Beach at Coast Boulevard			
		Whispering Sands Beach at Ravina Street			
		Windansea Beach at Vista de la Playa			
		Windansea Beach at Bonair Street			
		Windansea Beach at Playa del Norte			
		Windansea Beach at Palomar Avenue			
		at Tourmaline Surf Park			
		Pacific Beach at Grand Avenue			
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries	49%	49%	51%
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	46%	43%	49%
	San Diego River	lower 6 miles	46%	43%	49%
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	46%	43%	51%
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	41%	41%	43%

(b) Interim Effluent Limitations

Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the interim compliance dates under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.c.(2)(a):

Table 6.6
Interim Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watersheds and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
South Orange County	**San Joaquin Hills HSA** (901.11) and **Laguna Hills HSA** (901.12) - Pacific Ocean Shoreline	45.89%	45.86%	49.14%	23.43%	26.04%	25.63%
	Aliso HSA (901.13) - Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	47.74%	47.79%	49.57%	12.65%	13.31%	13.76% (13.69%)**
	Dana Point HSA (901.14) - Pacific Ocean Shoreline	47.52%	47.52%	49.49%	6.58%	7.43%	7.58%
	Lower San Juan HSA (901.27) - Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	36.48%	37.11%	47.47%	9.61%	6.41%	13.56% (13.45%)**
	San Clemente HA (901.30) - Pacific Ocean Shoreline	47.14%	47.12%	49.42%	11.93%	12.29%	12.63%
San Luis Rey River	**San Luis Rey HU** (903.00) - Pacific Ocean Shoreline	19.07%	19.55%	43.69%	2.81%	1.56%	5.85%
Carlsbad	**San Marcos HA** (904.50) - Pacific Ocean Shoreline	41.41%	41.28%	48.02%	9.24%	9.49%	10.10%

Table 6.6 (Cont'd)
Interim Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watersheds and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
San Dieguito River	**San Dieguito HU** (905.00) - Pacific Ocean Shoreline	7.20%	10.36%	41.74%	2.15%	0.73%	3.86%
Penasquitos	**Miramar Reservoir HA** (906.10) - Pacific Ocean Shoreline	48.25%	48.30%	49.71%	0.81%	1.00%	0.97%
Mission Bay	**Scripps HA** (906.30) - Pacific Ocean Shoreline	48.22%	48.21%	49.63%	8.16%	10.57%	9.41%
	Tecolote HA (906.50) - Tecolote Creek	47.26%	47.30%	49.47%	8.26%	10.24%	9.08% (9.04%)**
San Diego River	**Mission San Diego HSA** (907.11) and **Santee HSA** (907.12) - Pacific Ocean Shoreline - Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles)	37.02%	34.72%	46.98%	19.07%	26.61%	21.37% (21.24%)**
San Diego Bay	**Chollas HSA** (908.22) - Chollas Creek	46.03%	46.08%	49.23%	8.91%	12.42%	10.73% (10.68%)**

Notes:
* The percent load reductions are based on reducing loads compared to pollutant loads from 2001 to 2002.
** The alternative *Enterococcus* percent load reduction was calculated based on a numeric target of 104 MPN/100mL instead of 61 MPN/100mL, protective of the REC-1 "moderately to lightly used area" usage frequency that is protective of freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative pollutant load reductions can be utilized.

(3) Interim TMDL Compliance Determination

Compliance with the interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(f) There are no exceedances of the interim receiving water limitations under Specific Provision 6.c.(2)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(g) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the interim effluent limitations under Specific Provision 6.c.(2)(b); OR

(h) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

d. Specific Monitoring and Assessment Requirements

(1) Monitoring and Assessment Requirements for Beaches

(a) Monitoring Stations

For beaches addressed by the TMDL, monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[34] If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources

[34] Commonly referred to as AB 411 monitoring

causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations at least once within the first 24 hours of the end of a storm event[35] during the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer in exceedance of the allowable exceedance frequencies in the receiving waters.

(iii) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(iv) For Pacific Ocean Shoreline segments or areas listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final

[35] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

WQBELs for the Pacific Ocean Shoreline segments or areas listed in Table 6.0 have been achieved.

(ii) Dry weather exceedance frequencies must be calculated as follows:

[a] 30-day geometric means must be calculated from the results of any dry weather samples collected from the segments or areas for each water body listed in Table 6.0;
[b] The method and number of samples need for calculating the 30-day geometric means must be consistent with the number of samples required by the Ocean Plan;
[c] Where there are multiple segments or areas associated with a water body listed in Table 6.0, the Copermittees may calculate geometric means for each segment or area, or combine the dry weather monitoring data from all the segments or areas to calculate geometric means for the water body;
[d] The exceedance frequency must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the dry season.

(iii) Wet weather exceedance frequencies must be calculated as follows:

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;
[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;
[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria densities reported from each storm event sampled; and
[d] The single sample maximum exceedance frequency must be calculated by dividing the number of wet weather days that exceed the single sample maximum receiving water limitations in Table 6.2 by the total number of wet weather days during the rainy season.
[e] The data collected for dry weather must be used in addition to the data collected for wet weather to calculate the wet weather 30-day geometric means. The exceedance frequency of the wet weather 30-day geometric means must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of

geometric means calculated from samples collected during the wet season.

(iv) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(v) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) Monitoring and Assessment Requirements for Creeks and Creek Mouths

(a) Monitoring Stations

For creeks addressed by the TMDL, monitoring locations should consist of, at a minimum, a location at or near the mouth of the creek (e.g. Mass Loading Station or Mass Emission Station) and one or more locations upstream of the mouth (e.g. Watershed Assessment Station). If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations in accordance with the requirements of Provision D.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations within the first 24 hours of the end of a storm event[36] during the rainy season (i.e. October 1 through April 30).

(iii) Samples collected from receiving water monitoring stations must be analyzed for fecal coliform and *Enterococcus* indicator bacteria.

[36] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(iv) For creeks or creek mouths listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the receiving water monitoring data to assess whether the interim and final receiving water WQBELs for the creeks and creek mouths listed in Table 6.0 have been achieved.

(ii) Dry weather exceedance frequencies must be calculated as follows:

[a] 30-day geometric means must be calculated from the results of any dry weather samples collected from the segment or area for each water body listed in Table 6.0;
[b] The method and number of samples need for calculating the 30-day geometric means must be consistent with the number of samples required by the Basin Plan;
[c] The exceedance frequency must be calculated by dividing the number of 30-day geometric means that exceed the 30-day geometric mean receiving water limitations in Table 6.2 by the total number of 30-day geometric means calculated from samples collected during the dry season.

(iii) Wet weather exceedance frequencies must be calculated as follows:

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;
[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;
[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria densities reported from each of the storm events sampled; and

[d] The exceedance frequency must be calculated by dividing the number of wet weather days that exceed the single sample maximum receiving water limitations in Table 6.2 by the total number of wet weather days during the rainy season.

[e] The data collected for dry weather must be used in addition to the data collected for wet weather to calculate the wet weather 30-day geometric means. The exceedance frequency of the wet weather 30-day geometric means must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the wet season.

(iv) The Responsible Copermittee must identify and incorporate additional MS4 outfall and receiving water monitoring stations and/or adjust monitoring frequencies to identify sources causing exceedances of the receiving water WQBELs.

(v) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(vi) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

ATTACHMENT F

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

FACT SHEET / TECHNICAL REPORT

FOR

ORDER NO. R9-2013-0001
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

MAY 8, 2013

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I. FACT SHEET FORMAT

This Fact Sheet briefly sets forth the principal facts and the significant factual, legal, methodological, and policy questions that the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) considered in preparing Order No. R9-2013-0001 (Order). In accordance with the Code of Federal Regulations (CFR) Title 40 Parts 124.8 and 124.56 (40 CFR 124.8 and 40 CFR 124.56), this Fact Sheet includes, but is not limited to, the following information:

1. Contact information
2. Public process and notification procedures
3. Background of municipal storm water permits
4. Regional MS4 Permit approach
5. Economic considerations
6. Applicable statutes, regulations, plans and policies
7. Discussion of the provisions in the Order

Tentative Order No. R9-2013-0001 was distributed for public review on October 31, 2012. The San Diego Water Board accepted written comments on the Tentative Order until January 11, 2013. A public hearing was subsequently held on April 10 and 11, 2013, that was continued to May 8, 2013 to receive oral comments from interested persons.

The San Diego Water Board files applicable to the issuance of Order No. R9-2013-0001 are incorporated into the administrative record in support of the findings and requirements of the Order.

II. CONTACT INFORMATION

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The Order and other related documents can be downloaded from the San Diego Water Board website at

http://www.swrcb.ca.gov/rwqcb9/water_issues/programs/stormwater/index.shtml

The documents referenced in this Fact Sheet and in Order No. R9-2013-0001 are available for public review at the San Diego Water Board office, located at the address listed above. Public records are available for inspection during regular business hours, from 8:00 am to 5:00 pm Monday through Friday. To schedule an appointment to inspect public records, contact the San Diego Water Board Records Management Officer at 858-467-2952.

COPERMITTEES

Orange County Copermittees

- County of Orange
  - City of Aliso Viejo
  - City of Dana Point
  - City of Laguna Beach
  - City of Laguna Hills
  - City of Laguna Niguel
  - City of Laguna Woods
  - City of Lake Forest
  - City of Mission Viejo
  - City of Ranch Santa Margarita
  - City of San Clemente
  - City of San Juan Capistrano
  - Orange County Flood Control District

Riverside County Copermittees

- County of Riverside
  - City of Murrieta
  - City of Temecula
  - City of Wildomar
  - Riverside County Flood Control and Water Conservation District

San Diego County Copermittees

- County of San Diego
  - City of Carlsbad
  - City of Chula Vista
  - City of Coronado
  - City of Del Mar
  - City of El Cajon
  - City of Encinitas
  - City of Escondido
  - City of Imperial Beach
  - City of La Mesa
  - City of Lemon Grove
  - City of National City
  - City of Oceanside
  - City of Poway
  - City of San Diego
  - City of San Marcos
  - City of Santee
  - City of Solana Beach
  - City of Vista
  - San Diego County Regional Airport Authority
  - San Diego Unified Port District

III. PUBLIC PROCESS AND NOTIFICATION PROCEDURES

The San Diego Water Board followed the schedule listed below for the preparation of Order No. R9-2013-0001:

1. On February 8, 2011, the San Diego Water Board met with the San Diego County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No. R9-2007-0001.

2. Between February and May 2011, the San Diego Water Board met with select San Diego County, Orange County, and Riverside County Copermittees, as well as representatives of the environmental community to discuss concepts and receive recommendations for elements to be incorporated in a Regional Municipal Separate Storm Sewer System Permit (Regional MS4 Permit).

3. On June 27, 2011 the San Diego Water Board received the Report of Waste Discharge from the San Diego County Copermittees for the renewal of their NPDES permit, Order No. R9-2007-0001.

4. On April 9, 2012, the San Diego Water Board released an administrative draft of Tentative Order No. R9-2013-0001 for preliminary informal comments and feedback.

5. On April 25, 2012, the San Diego Water Board held an informal public workshop to present the administrative draft of Tentative Order No. R9-2013-0001 and receive verbal comments.

6. Between June and August 2012, the San Diego Water Board held four (4) focused meetings with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community, and USEPA) to discuss and receive preliminary comments and feedback about specific elements in the administrative draft of Tentative Order No. R9-2013-0001.

7. On September 5, 2012, the San Diego Water Board held an informal public workshop to present the modifications that were expected to be incorporated into the Tentative Order based on the preliminary comments and feedback received during the focused meetings held between June and August 2012.

8. Informal written comments on the administrative draft of Tentative Order No. R9-2013-0001 were accepted until September 14, 2012.

9. On October 12, 2012, the San Diego Water Board released a revised administrative draft of Tentative Order No. R9-2013-0001.

10. On October 24, 2012, the San Diego Water Board held a focused meeting with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community, and USEPA) to discuss modifications incorporated into the administrative draft of Tentative Order No. R9-2013-0001.

11. On October 31, 2012, the San Diego Water Board released Tentative Order No. R9-2013-0001 for formal public review and comment.

12. On November 13, 2012 and December 12, 2012, the San Diego Water Board held a formal public Board workshop to present the public draft of Tentative Order No. R9-2013-0001 and receive verbal comments.

13. Formal written comments on the public draft of Tentative Order No. R9-2013-0001 were accepted until January 11, 2013.

14. A public hearing of Tentative Order No. R9-2013-0001 was conducted on April 10 and 11, 2013, that was continued to May 8, 2013.

IV. BACKGROUND OF THE SAN DIEGO REGION MUNICIPAL STORM WATER PERMITS

In developed and developing areas, storm water runoff is commonly transported through municipal separate storm sewer systems (MS4s) and discharged into local receiving water bodies. As the storm water runs off and flows over the land or impervious surfaces (e.g., paved streets, parking lots, and building rooftops), it accumulates debris, chemicals, sediment, and other pollutants that can adversely affect receiving water quality if discharged untreated. The United States Environmental Protection Agency (USEPA) recognizes wet weather flows from urban areas as the number one source of estuarine pollution in coastal communities,[1] such as those within the San Diego Region.

The federal Clean Water Act (CWA) was amended in 1987 to address and regulate discharges of storm water associated with industrial activities and from municipal storm sewers. With the amendments, many municipalities throughout the United States were obligated for the first time to obtain National Pollutant Discharge Elimination System (NPDES) permits for discharges of storm water from their MS4s.

In response to the CWA 1987 amendment, as well as the pending federal NPDES regulations which would implement the amendment, the San Diego Water Board issued "early" MS4 permits. The San Diego Water Board adopted and issued Order Nos. 90-38, 90-42, and 90-46 to regulate storm water discharges from the MS4s in Orange County, San Diego County, and Riverside County, respectively, within the San Diego Region on July 16, 1990.

The "early" MS4 permits, or First Term Permits, were issued prior to the November 1990 promulgation of the final federal NPDES storm water regulations. By issuing these First Term Permits before the federal regulations took effect, the San Diego Water Board was able to provide the Copermittees additional flexibility in addressing and managing storm water discharges. The First Term Permits contained the essentials of the 1990 regulations, and required the Copermittees to develop and implement runoff management programs, but provided little specificity about what was required to be included in or actually achieved by those programs.

The flexibility provided in the First Term Permits was generally continued through the Second Term Permits. The combination of the lack of specificity in the First and Second Term Permits, a general lack of meaningful action by the Copermittees and a general lack of corresponding reaction (i.e. enforcement) by the San Diego Water Board during the first ten years of the storm water program, resulted in few substantive steps towards achieving improvements in the quality of receiving waters or storm water discharges from the MS4s.

[1] US EPA. 1999. 40 CFR Parts 9, 122, 123, and 124. National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. 64 FR 68727.

From 2001, the regulatory approach incorporated into Third Term Permits was a significant departure from the regulatory approach of the First and Second Term Permits. The Third Term Permits issued by the San Diego Water Board included more detailed requirements that outlined the minimum level of implementation required for the Copermittees' programs to meet the maximum extent practicable (MEP) standard for storm water. The Third Term Permits included more detail to emphasize and enhance the jurisdictional runoff management programs developed by the Copermittees and introduced requirements for developing and implementing watershed-based programs.

The Third Term Permits also incorporated two precedent setting decisions by the State Water Board. In Order WQ 99-05, the State Water Board established receiving water limitation language to be included in all MS4 permits. The State Water Board's precedential language clarified that municipal storm water permits must include provisions requiring discharges to be controlled to attain water quality standards in receiving waters. Unlike previously adopted versions of the receiving water limitation language in the First and Second Term Permits, the language no longer stated that "*violations of water quality standards are not violations of the municipal storm water permit under certain conditions*." In addition, the receiving water limitation language no longer indicated that the "*implementation of best management practices is the 'functional equivalent' of meeting water quality standards*." State Water Board Order WQ 99-05 specifically requires language in MS4 permits for the Copermittees to comply with water quality standards based discharge prohibitions and receiving water limitations through timely implementation of control measures and other actions to reduce pollutants in discharges. (See State Water Board Order WQ 99-05 (*Environmental Health Coalition*)).

In Order WQ 2000-11, also a precedential decision, the State Water Board addressed design standards for structural post-construction best management practices (BMPs) for new development and significant redevelopment. The State Water Board found that the design standards, which require that runoff generated by 85 percent of storm events from specific development categories be infiltrated or treated, reflect the MEP standard. State Water Board Order WQ 2000-11 also found that the post-construction BMP provisions, or Standard Storm Water Mitigation Plan (SSMP) provisions, constitute MEP for addressing storm water pollutant discharges resulting from specific development categories.

The Third Term San Diego County and Orange County Permits (Order Nos. 2001-01 and R9-2002-0001, respectively) were appealed to the State Water Board. Minor modifications were made by the State Water Board, but the requirements were largely upheld. In State Water Board Order WQ 2001-15, the State Water Board upheld the Third Term San Diego County Permit requirements with certain modifications. The State Water Board removed the prohibition of storm water discharges *into* the MS4 that cause or contribute to exceedances of water quality objectives. The revision allows for treatment of pollutants in storm water runoff after the pollutants have entered the MS4. State Water Board Order WQ 2001-15 otherwise upheld all the other requirements of the permit.

In addition to the modification to the discharge prohibition in Order WQ 2001-15, the State Water Board refined Order WQ 99-05 by making clear that the Copermittees may use an iterative approach to achieving compliance with water quality standards that involves ongoing assessments and revisions. Thus, the language for the discharge prohibitions and receiving water limitations was revised to explicitly require the Copermittees to implement an iterative process of assessments and revisions to comply with the discharge prohibitions and receiving water limitations. The San Diego Water Board retained the authority to enforce receiving water limitations and discharge prohibitions even if the Copermittee is engaged in the iterative process.

The Third Term San Diego County Permit was subsequently challenged in the Superior Court of the State of California and the Court of Appeal, Fourth Appellate District. The Court of Appeal, Fourth Appellate District, found that the approach of the Third Term San Diego County Permit to regulating discharges into the MS4 was appropriate (*Building Industry Ass'n. v. State Water Resources Control Bd., et al.,* 124 Cal.App.4th 866 (2004)). The State of California Supreme Court denied review sought by the Building Industry Association in March 2005.

The Fourth Term Permits, or current MS4 permits, began with the adoption of Order No. R9-2007-0001 issued to the Copermittees of San Diego County in January 2007. Order Nos. R9-2009-0002 and R9-2010-0016 were subsequently issued to the Copermittees of Orange County and Riverside County. The Fourth Term Permits continued to include more detailed requirements to be implemented by each Copermittee's jurisdictional runoff management program. The Fourth Term Permits also include requirements to further emphasize a watershed management approach and for more coordination among jurisdictional runoff management programs. In addition, the Fourth Term Permits included more requirements for assessing the effectiveness of the runoff management programs being implemented by the Copermittees. The intent of the inclusion of additional requirements was to enhance and better define elements of the permit that were expected to be incorporated into the iterative process for managing runoff from each Copermittee's jurisdiction and within the watersheds of the San Diego Region.

The Fourth Term Permits include several new and emerging approaches for managing storm water runoff and discharges. Low impact development (LID) requirements are included for development and significant redevelopment to reduce pollutants in storm water runoff from sites through more natural processes such as infiltration and biofiltration closer to the source, rather than utilizing conventional mechanical end-of-pipe treatment systems. Hydrograph modification (hydromodification) management requirements also are included to mitigate the potential for increased erosion in receiving waters due to increased runoff rates and durations often caused by development and increased impervious surfaces. The Fourth Term Orange County and Riverside County Permits introduced requirements to identify areas of existing development where retrofitting with LID projects would be feasible and could be implemented to reduce storm water runoff and pollutants in storm water discharges.

The Fourth Term Orange County and Riverside County Permits included a clearer distinction between storm water and non-storm water discharges. The term “urban runoff” was completely removed, and a distinction between storm water (wet weather) runoff and non-storm water (dry weather) runoff was emphasized. This clarification was made to prevent any potential misunderstanding that regulation under the MS4 permits is limited only to urbanized areas, and to prevent non-storm water runoff from being managed in the same manner as storm water runoff. The term “urban runoff” is not defined in the Code of Federal Regulations (CFR) or Federal Register (FR) in the regulation of MS4 discharges. According to the CWA 402(p)(3)(B)(ii), MS4 permits must include a requirement to effectively prohibit non-storm water discharges into the MS4s.

Finally, for the Fourth Term Orange County and Riverside County Permits the San Diego Water Board found that non-storm water discharges to the MS4 from over application of irrigation water are sources of pollutants. The San Diego Water Board found that non-storm water discharges resulting from over-irrigation must be prohibited from entering the MS4 in accordance with the requirements of the CWA and pursuant to 40 CFR 122.26(d)(2)(iv)(B)(1).

The requirements of the Fourth Term Permits issued to the Copermittees in each county within the San Diego Region now have substantively the same core requirements such as discharge prohibitions, receiving water limitations, jurisdictional runoff management program components, and monitoring program requirements. There are, however, several inconsistencies that exist among the three Fourth Term Permits which complicate oversight and implementation of the permits by the San Diego Water Board.

The Fourth Term San Diego County Permit expired in January 2012. The Fourth Term Orange County and Riverside County Permits will expire in December 2014 and November 2015, respectively. Issuing the Fifth Term Permits within five years for three counties under three different permits would require the San Diego Water Board to expend significant time and resources for the issuance of the permits through three separate public proceedings, thereby greatly reducing the time and resources available to oversee implementation and compliance. Multiple permits also create confusion for determining compliance among regulated entities, especially for the land development community.

The San Diego Water Board has acknowledged that issuing a single MS4 permit for all the Copermittees in the San Diego Region can and is expected to result in more consistent implementation, improve communication among agencies within watersheds crossing multiple jurisdictions, and minimize resources spent with each permit renewal process. Within the findings of the Fourth Term Riverside County Permit issued in November 2010, the San Diego Water Board notified the public of its intent to develop and issue a single Regional MS4 Permit.

V. REGIONAL MS4 PERMIT APPROACH

The Fifth Term Permit, or Regional MS4 Permit, shifts the focus of the permit requirements from a minimum level of actions to be implemented by the Copermittees to identifying outcomes to be achieved by those actions. Order No. R9-2013-0001 represents an important paradigm shift in the approach for MS4 permits within the San Diego Region.

Historical Permitting Approach

The First and Second Term Permits were very broad and provided little specificity about what was required to be developed and implemented by the Copermittees. The Third Term Permits began to become more specific about the minimum level of implementation required by the Copermittees. The Fourth Term Permits, or current permits, subsequently increased in specificity. The MS4 permits have progressively become more detailed and focused on specifying the minimum level of actions expected to be implemented by the Copermittees. As detailed and specific as the MS4 permits have become, however, they include very little detail about what the desired outcomes of the required actions are expected to achieve. Compliance with the permit requirements has essentially been tracking numbers of actions and reporting, not tracking progress or actual improvements in the quality of receiving waters or discharges from the MS4s. The result has been an increase in actions being implemented by the Copermittees with little or no ability or expectations to determine whether or not improvements in water quality are being achieved.

The Fourth Term Permits result in significant resource expenditure by the Copermittees to report permit compliance information to the San Diego Water Board in the form of annual jurisdictional runoff management program, watershed program, and monitoring program reports. The San Diego Water Board must then expend much of its limited resources on reviewing more than 50 voluminous reports submitted annually by the Copermittees. The information currently reported by the Copermittees is of limited value when trying to measure progress toward achieving improvements in the quality of receiving waters or discharges from the MS4s. Oversight of the MS4 permits is further complicated by the inconsistencies among the requirements issued to the Orange County, San Diego County, and Riverside County Copermittees under three separate MS4 permits.

Under the Fourth Term Permits, the Copermittees must expend a significant portion of their limited resources collecting data of limited value, and putting together reports to submit that information to the San Diego Water Board. Likewise, the San Diego Water Board must expend most of its limited resources reviewing reports, and developing permits instead of working directly with the Copermittees to identify solutions to problems causing impacts to water quality. This is an unsustainable course that will continue to demand more resources from the Copermittees and the San Diego Water Board, and would continue to result in unknown water quality benefits.

New Permitting Approach

The goal of the Regional MS4 Permit is twofold: 1) bring a consistent set of MS4 permit requirements to all of the Copermittees within the San Diego Region; and, 2) provide an MS4 permit with requirements that will allow the Copermittees to focus their efforts and resources on achieving goals and desired outcomes toward the improvement of water quality rather than completing specific actions.

The overall approach included in the Regional MS4 Permit with respect to the jurisdictional runoff management programs will not differ significantly from the current permits. The general requirements for the jurisdictional runoff management program components and compliance with those requirements will remain and be applied consistently throughout the San Diego Region under the Regional MS4 Permit.

The most significant difference in the new permitting approach is the specific manner of implementation for those jurisdictional runoff management programs. Implementation will be based on decisions made by the Copermittees in accordance with what they have identified as their highest priority water quality conditions. In other words, the Copermittees will have significant control in how to implement the jurisdictional runoff management programs to best utilize their available resources in addressing a specific set of priorities effectively, instead of trying to address all the water quality priorities ineffectively.

The Copermittees are given the responsibility of identifying their highest priority water quality conditions that they intend to address. The Copermittees will develop goals that can be used to measure and demonstrate progress or improvements toward addressing those priorities. In addition to the goals, the Copermittees will provide a schedule for achieving the goals for those highest priorities. The measurement of progress toward achieving the goals for those highest priorities requires a better defined and more focused program of monitoring and assessment than under the Fourth Term Permits.

The monitoring and assessment program must be designed to inform the Copermittees of their progress, and the need for modifications in their jurisdictional runoff management programs and schedules to achieve their goals to improve water quality. The monitoring and assessment program requirements will have a more central role in the Regional MS4 Permit than in earlier permits. The monitoring and assessment requirements must also be designed to enable the Copermittees to focus and direct their efforts in implementing their jurisdictional runoff management programs toward their stated desired outcomes to improve the quality of receiving waters and/or discharges from the MS4s.

By providing an MS4 permit that allows the Copermittees to make more decisions about how to utilize and focus their resources, along with a better defined monitoring and assessment program to inform their water quality management decisions, the Copermittees will have the opportunity to:

1) *Plan strategically*. The Copermittees must have the ability to identify their available resources and develop and implement long term plans that can organize, collect, and use those resources in the most strategically advantageous and efficient manner possible. This ability to develop long term plans will allow the Copermittees to focus and utilize their resources in a more concerted way over the short term and long term to address specific water quality priorities through stated desired outcomes.

2) *Manage adaptively*. The Copermittees must be given the ability to modify their plans as additional information and data are collected from the monitoring and assessment programs. The Copermittees' plans may require modifications to the programs, priorities, goals, strategies, and/or schedules in order for the Copermittees to achieve a stated desired outcome.

3) *Identify synergies*. The Copermittees must be given more flexibility to identify efficiencies within and among their jurisdictional runoff management programs as the strategies are developed and implemented to increase the Copermittees' collective effectiveness. The Copermittees must also be able to identify and utilize resources available from other agencies and entities to further augment and enhance their jurisdictional runoff management programs and/or to collectively work with those other agencies and entities toward achieving a stated desired outcome.

The Regional MS4 Permit requirements will provide the Copermittees the flexibility and responsibility to decide what actions will be necessary to achieve an outcome that is tailored and designed by the Copermittees to improve specific prioritized water quality conditions. The San Diego Water Board expects the approach of the Regional MS4 Permit to give the Copermittees a greater sense of ownership for restoring the quality of receiving waters in the San Diego Region by becoming an integral part of the decision making process in identifying water quality conditions to be addressed, as well as determining the best use of their resources.

VI. ECONOMIC CONSIDERATIONS

Statutory Considerations

California Water Code (CWC) section 13241 requires the San Diego Water Board to consider certain factors, including economic considerations, in the adoption of water quality objectives. CWC section 13263 requires the San Diego Water Board to take into consideration the provisions of CWC section 13241 in adopting waste discharge requirements.

In *City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, the California Supreme Court considered whether Regional Water Boards must comply with CWC section 13241 when issuing waste discharge requirements under CWC section 13263(a) by taking into account the costs a permittee will incur in complying with the permit requirements. The Court concluded that whether it is necessary to consider such cost information "*depends on whether those restrictions meet or exceed the requirements of the federal Clean Water Act.*" (*Id.* at p. 627.) The Court ruled that Regional Water Boards may not consider the factors in CWC section 13241, including economics, to justify imposing pollutant restrictions that are less stringent than applicable federal law requires. (*Id.* At pp. 618, 626-627 ["*[Water Code section 13377 specifies that [] discharge permits issued by California's regional boards must meet the federal standards set by federal law. In effect, section 13377 forbids a regional board's consideration of any economic hardship on the part of the permit holder if doing so would result in the dilution of the requirements set by Congress in the Clean Water Act...Because CWC section 13263 cannot authorize what federal law forbids, it cannot authorize a regional board, when issuing a [] discharge permit, to use compliance costs to justify pollutant restrictions that do not comply with federal clean water standards*."]). However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Regional Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

As discussed in Section VII.F, Unfunded State Mandates, the San Diego Water Board finds that the requirements in this Order are not more stringent than the minimum federal requirements. Among other requirements, federal law requires MS4 permits to include requirements to effectively prohibit non-storm water discharges into the MS4s, in addition to requiring controls to reduce the discharge of pollutants in storm water to the MEP, and other provisions as USEPA or the State determines are appropriate for the control of pollutants in MS4 discharges.

The requirements in this Order may be more specific or detailed than those enumerated in federal regulations under 40 CFR 122.26 or in the USEPA guidance. However, the requirements have been designed to be consistent with and within the federal statutory mandates described in CWA section 402(p)(3)(B)(ii) and (iii) and the related federal regulations and guidance. Consistent with federal law, all of the

conditions in this Order could have been included in a permit adopted by USEPA in the absence of the in lieu authority of California to issue NPDES permits.

Moreover, the inclusion of numeric WQBELs in this Order does not cause this Order to be more stringent than federal law. Federal law authorizes both narrative and numeric effluent limitations to meet state water quality standards. The inclusion of WQBELs as discharge specifications in an NPDES permit in order to achieve compliance with water quality standards is not a more stringent requirement than the inclusion of BMP based permit limitations to achieve water quality standards (State Water Board Order No. WQ 2006-0012 (*Boeing*)). Therefore, consideration of the factors set forth in CWC section 13241 is not required for permit requirements to implement the effective prohibition on the discharge of non-storm water discharges into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determine appropriate to control such pollutants, as those requirements are mandated by federal law.

Included in the provisions of the Order are monitoring and reporting requirements that are designed to demonstrate that the Copermittees are implementing programs to comply with the CWA municipal storm water requirements. CWA section 308(a) and 40 CFR 122.41(h), (j)-(l), 122.44(i) and 122.48 require that all NPDES permits specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s (40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c)) also specify additional monitoring and reporting requirements. In addition to the federal requirements of the CWA, the San Diego Water Board also has the authority in CWC 13383 to establish monitoring, reporting, and recordkeeping requirements that implement federal and state laws and regulations through NPDES permits. .

The monitoring and assessment information that will be reported to the San Diego Water Board is necessary to determine if the Copermittees are making progress toward achieving compliance with the discharge prohibitions, receiving water limitations, and effluent limitations under Provision A of the Order. The monitoring and assessment information that will be reported is also expected to be key to the iterative approach and adaptive management process that is required to be implemented by the Copermittees if they cannot meet the discharge prohibitions and receiving water limitations under the present conditions, which is also part of the requirements under Provision A of the Order.

Notwithstanding the above, the San Diego Water Board has considered cost information in issuing this Order, as discussed below. The San Diego Water Board has also considered all of the evidence that has been presented to the San Diego Water Board regarding the CWC section 13241 factors in adopting this Order. The San Diego Water Board finds that the requirements in this Order are reasonably necessary to protect beneficial uses identified in the Basin Plan and the economic information related to costs of compliance and other CWC section 13241 factors are not sufficient to justify failing to protect those beneficial uses. Where appropriate, the

San Diego Water Board has provided or will consider providing the Copermittees with additional time to implement control measures to achieve final WQBELs and/or water quality standards.

Cost Information

Discussions of the financial and economic ramifications of municipal storm water management programs tend to focus on the significant costs incurred by municipalities in developing and implementing the programs. When considering the cost of implementing the programs, however, it is also important to consider the alternative costs that are incurred when programs are not fully implemented, as well as the economic benefits which result from effective program implementation.

The recent financial and economic conditions have amplified the concerns about the costs incurred by the municipalities in developing and implementing their programs. The reduction in resources resulting from the recent financial and economic conditions has been cited by many of the Copermittees as a justification for reducing the requirements that must be met by their programs. While the recent conditions are a cause for concern in the short term, these programs also have an opportunity to identify and implement improvements and efficiencies before the next period of growth and development, resulting in more effective and sustainable programs over the long term.

In addition, it is very difficult to ascertain the true cost of implementation of the Copermittees' management programs because of inconsistencies in reporting by the Copermittees. Reported costs of compliance for the same program element can vary widely from city to city, often by a very wide margin that is not easily explained.[2] Despite these problems, efforts have been made to identify management program costs, which can be helpful in understanding the costs of program implementation.

The San Diego Water Board recognizes that the Copermittees will incur costs in implementing this Order, potentially above and beyond the costs from the Copermittees' prior permits. The San Diego Water Board also recognizes that, due to California's current economic condition, many Copermittees currently have limited staff and resources to implement actions to address its MS4 discharges. Based on the economic considerations below, the San Diego Water Board has provided the Copermittees a significant amount of flexibility to choose how to implement the requirements of the Order.

The Order also allows the Copermittees to customize their plans, programs, and monitoring requirements. In the end, it is up to the Copermittees to determine the effective BMPs and measures necessary to comply with this Order. The Copermittees can choose to implement the least expensive measures that are effective in meeting the requirements of this Order. This Order also does not require the Copermittees to

[2] LARWQCB, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.

fully implement all requirements within a single permit term. Where appropriate, the Board has provided the Copermittees with additional time outside of the permit term to implement control measures to achieve final WQBELs and/or water quality standards.

The San Diego Water Board has considered available cost information associated with compliance with this Order. It is not possible to predict accurately the cost impact of the requirements that involve an unknown level of implementation or that depend on environmental variables that are as yet undefined. Only general conclusions can be drawn from this information.

Estimated Municipal Storm Water Program Implementation Costs

The USEPA, the State Water Board, and the California Regional Water Quality Control Boards (Regional Water Boards) have attempted to evaluate the costs of implementing municipal storm water programs. The assessments have demonstrated that the true costs are difficult to ascertain and reported costs vary widely. In addition, reported fiscal analyses tend to neglect the costs incurred to municipalities when storm water and non-storm water runoff is not effectively managed, which are incurred as a result of pollution, contamination, nuisance, and damage to ecosystems, property, and human health. Nonetheless, they provide a useful context for considering the costs of requirements within Order No. R9-2013-0001.

In 1999, the USEPA reported on multiple studies it conducted to determine the cost of management programs. A study of Phase II municipalities determined that the annual cost of the Phase II program was expected to be $9.16 per household. The USEPA also studied 35 Phase I municipalities, finding costs to be $9.08 per household annually, similar to those anticipated for Phase II municipalities.[3]

The State Water Board commissioned a study by the California State University, Sacramento to assess costs of the Phase I MS4 program. This study includes an assessment of costs incurred by Phase I MS4s throughout the state to implement their programs. Annual cost per household in the study ranged from $18 to $46, with the Fresno-Clovis Metropolitan Area representing the lower end of the range, and the City of Encinitas (in San Diego County) representing the upper end of the range.[4]

A study on Phase I MS4 program costs was also conducted by the California Regional Water Quality Control Board, Los Angeles Region (Los Angeles Water Board), where program costs reported in the municipalities' annual reports were assessed. The Los Angeles Water Board estimated that average per household cost to implement the MS4 program in Los Angeles County was $12.50. [5]

[3] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791-68792.
[4] State Water Board, 2005. NPDES Stormwater Cost Survey. P. ii.
[5] Los Angeles Water Board, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.

It is important to note that reported program costs are not all attributable to solely complying with MS4 permits. Many program components, and their associated costs, existed before any MS4 permits were ever issued. For example, street sweeping and trash collection costs cannot be solely or even principally attributable to MS4 permit compliance, since these practices have long been expected from and implemented by municipalities.

Therefore, true program cost resulting from MS4 permit requirements is some fraction of reported costs. The California State University, Sacramento study found that only 38 percent of program costs are new costs fully attributable to MS4 permits. The remainder of the program costs was either pre-existing or resulted from enhancement of pre-existing programs.[6] In 2000, the County of Orange found that even lower amounts of program costs are solely attributable to MS4 permit compliance, reporting that the amount attributable to implement the County or Orange Drainage Area Management Plan (DAMP), was less than 20 percent of the total budget. The remaining 80 percent was attributable to pre-existing programs.[7] More current data from the County of Orange is not used in this discussion because the County of Orange no longer reports such information.

Estimated Value of Healthy Water Quality

Economic considerations of municipal storm water management programs cannot be limited only to program costs. Evaluation of programs must also consider information on the benefits derived from environmental protection and improvement.[8] Attention is often focused on municipal storm water management program costs, but the programs must also be viewed in terms of their value to the public.

Placing a value on healthy receiving waters is very difficult. Often the value of receiving waters with good water quality manifests in other forms, such as tourism, recreational opportunities, and/or increased property values. When surface water bodies are degraded, thereby degrading the habitat within and adjacent to the water bodies, the public loses the value and benefits associated with being able to use the area in and around the water bodies. Surface waters that are able to support the beneficial uses designated in the Basin Plan can sustain plants and wildlife that can attract visitors and residents, providing aesthetic, recreational, as well as monetary value to the public. At this time, however, there have been no studies for the San Diego Region to quantify the added value that surface waters with healthy water quality can provide.

[6] State Water Board, 2005. NPDES Stormwater Cost Survey. P. 58.
[7] County of Orange, 2000. A NPDES Annual Progress Report. P. 60.
[8] Ribaudo M.O. and D. Heelerstein. 1992, *Estimating Water Quality Benefits: Theoretical and Methodological Issues.* U.S. Department of Agriculture. Technical Bulletin No. 1808.

USEPA has estimated that household willingness to pay for improvements in fresh water quality for fishing and boating is approximately $158-$210.[9] This estimate can be considered conservative, since it does not include important considerations such as marine waters benefits, wildlife benefits, or flood control benefits. Another study conducted by California State University, Sacramento reported that the annual household willingness to pay for statewide clean water is approximately $180.[10]

A study conducted by the University of Southern California and University of California, Los Angeles assessed the costs and benefits of implementing various approaches for achieving compliance with the MS4 permits in the Los Angeles region. The study found that non-structural systems would cost $2.8 billion but provide $5.6 billion in benefit. If structural systems were determined to be needed, the study found that total costs would be $5.7 to $7.4 billion, while benefits could reach $18 billion.[11] Costs are anticipated to be borne over many years, probably at least ten years.

As can be seen, the benefits of the municipal storm water management programs are expected to considerably exceed their costs. Such findings are corroborated by USEPA, which found that the benefits of implementation of its Phase II storm water rule would also outweigh the costs.[12]

[9] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68793.
[10] State Water Board, 2005. NPDES Stormwater Cost Survey. P. iv.
[11] Los Angeles Water Board, 2004. Alternative Approaches to Stormwater Control.
[12] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791.

VII. APPLICABLE STATUTES, REGULATIONS, PLANS AND POLICIES

A. Legal Authorities – Federal Clean Water Act and California Water Code

This Order is issued pursuant to section 402 of the CWA and implementing regulations adopted by the USEPA and chapter 5.5, division 7 of the CWC (commencing with section 13370). This Order serves as an NPDES permit for point source discharges to surface waters. This Order also serves as waste discharge requirements pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

The objective of the CWA is "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*." To carry out this objective, the CWA requires the implementation of permit programs to regulate the discharge of pollutants and dredged or fill material to the navigable waters of the U.S. and to regulate the use and disposal of sewage sludge. CWA section 402 provides the legal authority to issue a permit for the discharge of pollutants to waters of the U.S. under the NPDES. The CWA provides that NPDES permits may be issued by states which are authorized to implement the provisions of that act. California became authorized to implement the NPDES permit program on May 14, 1973.

The Porter-Cologne Water Quality Control Act (Division 7, commencing with CWC section 13000) established the State Water Resources Control Board (State Water Board) and nine Regional Water Quality Control Boards (Regional Water Boards) as the principal state agencies with primary responsibility for the coordination and control of water quality. CWC section 13200(f) established the San Diego Water Board, which has the primary responsibility for the coordination and control of water quality in the San Diego Region, which includes all the basins draining into the Pacific Ocean between the southern boundary of the Santa Ana Region and the California-Mexico boundary. The San Diego Water Board implements the CWA through Chapter 5.5 of the CWC, commencing with section 13370. CWC section 13377 provides the San Diego Water Board the legal authority to issue waste discharge requirements to ensure compliance with all applicable provisions of the CWA and acts amendatory thereof or supplementary, thereto, to implement water quality control plans, or for the protection of beneficial uses, or to prevent nuisance.

CWA section 402(p) requires the USEPA or authorized state to issue NPDES permits for storm water discharges from municipal separate storm sewer systems (MS4s) to waters of the U.S. CWA section 402(p)(3)(B)(ii) requires that NPDES permits for storm water discharges from MS4s "*effectively prohibit non-storm water discharges*" into the MS4s. CWA section 402(p)(3)(B)(iii) requires that NPDES permits for storm water discharges from MS4s to "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable* [MEP], *including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*."

The USEPA published implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]), which prescribe permit application requirements for storm water discharges from MS4s pursuant to CWA 402(p), on November 16, 1990. The USEPA published an Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems, which provided guidance on permit application requirements for regulated MS4s, on May 17, 1996. The federal regulations in 40 CFR 122 and guidance issued by USEPA serve as the foundation for the provisions of Order No. R9-2013-0001. The legal authorities provided by the above statutes and regulations are included as part of the discussions in Section VIII of this Fact Sheet.

B. Legal Authority for the Permit Issued on a Region-wide Basis

CWA section 402(p)(3)(B) provides the San Diego Water Board the legal authority to issue an NPDES permit for the San Diego Region as compared to separate MS4 permits based upon County- and partial County-wide boundaries as they exist within the San Diego Region. CWA section 402(p)(3)(B) states that "*Permits for discharges from municipal storm sewers- (i) may be issued on a system- or jurisdiction-wide basis ....*" The federal regulations in 40 CFR 122.26(a)(1)(v) also state that the San Diego Water Board "*may designate dischargers from municipal separate storm sewers on a system-wide or jurisdiction-wide basis. In making this determination, the [San Diego Water Board] may consider the following factors: (A) the location of the discharge with respect to waters of the United States; (B) the size of the discharge; (C) the quantity and nature of the pollutants discharged to waters of the United States; and (D) other relevant factors*."

More specifically, the federal regulations provide that for large and medium MS4 systems, the San Diego Water Board may issue a regional permit. Specifically, the federal regulation in 40 CFR 122.26(a)(3) provide:

"*(ii) The Director may either issue one system-wide permit covering all discharges from municipal separate storm sewers within a large or medium municipal storm sewer system or issue distinct permits for appropriate categories of discharges within a large or municipal separate storm sewer system including, but not limited to: all discharges owned or operated by the same municipality; located within the same jurisdiction; all discharges within a system that discharge to the same watershed; discharges within a system that are similar in nature; or for individual discharges from municipal separate storm sewers within the system.*

(iii) The operator of a discharge from a municipal separate storm sewer which is part of a large or medium municipal separate storm sewer system must either: (A) Participate in a permit application (to be a permittee or a co-permittee) with one or more other operator of discharges from the large or medium municipal storm sewer system which covers all, or a portion of all, discharges from the municipal separate storm sewer system; (B) Submit a distinct permit application

which only covers discharges from the municipal separate storm sewers for which the operator is responsible; or (C) A regional authority may be responsible for submitting a permit application under the following guidelines....

(iv) One permit application may be submitted for all or a portion of all municipal separate storm sewers within adjacent or interconnected large or medium municipal separate storm sewer systems. The Director may issue one systemwide permit covering all, or a portion of all municipal separate storm sewers in adjacent or interconnected large or medium municipal separate storm sewer systems.

(v) Permits for all or a portion of all discharges from large or medium municipal separate storm sewer systems that are issued on a system-wide, jurisdiction-wide, watershed or other basis may specify different conditions relating to different discharges covered by the permit, including different management programs for different drainage areas which contribute storm water to the system."

Based on these regulations, the San Diego Water Board may issue a region-wide MS4 permit. The regulations also clarify that the permit may include different conditions for separate discharges covered by the permit. This allows the San Diego Water Board to ensure that suitable water quality conditions and provisions are identified for each watershed.

The USEPA's responses to comments in the Final Rule for the above-mentioned regulations also make it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide, permits. In the Final Rule published in the Federal Register and containing the responses to comments, USEPA notes that 40 CFR 122.26(a)(3)(iv) would allow an entire system in a geographical region under the purview of a State agency to be designated under a permit.[13] USEPA also states that many commenters wanted to allow the permitting authority broad discretion to establish system-wide permits, and that EPA believes that paragraphs 40 CFR 122.26 (a)(1)(v) and (a)(3)(ii) allow for such broad discretion.[14]

This Order creates watershed requirements that apply to multiple counties. The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees. Managing storm water on a regional and watershed basis is expected to result in improved water quality, as the Order focuses on monitoring and management practices necessary to improve each watershed rather than political boundaries. A single permit also allows the San Diego Water Board staff to expend fewer resources developing successive multiple permits and allows more resources to be devoted to working cooperatively with all three current groups of Copermittees to ensure implementation of this Order results in improved water quality.

[13] 55 Federal Register 47990-01, 48042
[14] Ibid

C. Federal and California Endangered Species Acts

This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2115.5) or the Federal Endangered Species Act (16 United States Code [USC] sections 1531 to 1544). This Order requires compliance with requirements to protect the beneficial uses of waters of the U.S. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

D. California Environmental Quality Act

The action to adopt an NPDES Permit is exempt from the provisions of Chapter 3 of the California Environmental Quality Act (CEQA) (Public Resources Code section 21100, et seq.) pursuant to CWC section 13389. (*County of Los Angeles v. Cal. Water Boards* (2006) 143 Cal.App.4th 985.)

E. State and Federal Regulations, Plans and Policies

The legal authority provided by the following regulations, plans, and policies are also included as part of the discussions in Section VIII of this Fact Sheet.

Water Quality Control Plan for the San Diego Basin

The CWA requires the San Diego Water Board to establish water quality standards for each water body in its region. Water quality standards include beneficial uses, water quality objectives and criteria that are established at levels sufficient to protect beneficial uses, and an antidegradation policy to prevent degrading of waters. On September 8, 1994, the San Diego Water Board adopted the *Water Quality Control Plan for the San Diego Basin (*Basin Plan). The Basin Plan designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters in the San Diego Region. The San Diego Water Board has amended the Basin Plan on multiple occasions since 1994. In addition, the Basin Plan implements State Water Board Resolution No. 88-63, which established state policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply. Beneficial uses applicable to the surface water bodies that receive discharges from the MS4s within the San Diego Region generally include those listed below:

The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region:

- Municipal and Domestic Supply (MUN)
- Agricultural Supply (AGR)

- Industrial Process Supply (PROC)
- Industrial Service Supply (IND)
- Ground Water Recharge (GWR)
- Contact Water Recreation (REC1)
- Non-contact Water Recreation (REC2)
- Warm Freshwater Habitat (WARM)
- Cold Freshwater Habitat (COLD)
- Wildlife Habitat (WILD)
- Rare, Threatened, or Endangered Species (RARE)
- Freshwater Replenishment (FRSH)
- Hydropower Generation (POW)
- Preservation of Biological Habitats of Special Significance (BIOL)

The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region:

- Navigation (NAV)
- Commercial and Sport Fishing (COMM)
- Estuarine Habitat (EST)
- Marine Habitat (MAR)
- Aquaculture (AQUA)
- Migration of Aquatic Organisms (MIGR)
- Spawning, Reproduction, and/or Early Development (SPWN)
- Shellfish Harvesting (SHELL)

Pursuant to Water Code sections 13263 and 13377, the requirements of this Order implement the Basin Plan.

Water Quality Control Plan for Ocean Waters of California, California Ocean Plan

In 1972, the State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan). The State Water Board adopted the most recent amended Ocean Plan on September 15, 2009. The Office of Administrative Law approved it on March 10, 2010. On October 8, 2010, USEPA approved the 2009 Ocean Plan. The Ocean Plan is applicable, in its entirety, to ocean waters of the State. In order to protect beneficial uses, the Ocean Plan establishes water quality objectives and a program of implementation. Pursuant to Water Code sections 13263 and 13377, the requirements of this Order implement the Ocean Plan. The Ocean Plan identifies the beneficial uses of ocean waters of the State to be protected as summarized below:

- Industrial water supply
- Water contact and non-contact recreation, including aesthetic enjoyment; navigation
- Commercial and sport fishing

- Mariculture
- Preservation and enhancement of designated Areas of Special Biological Significance
- Rare and endangered species
- Marine habitat
- Fish spawning and shellfish harvesting

On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving an exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges. The State Water Board Resolution No. 2012-0012 requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject terms and conditions of State Water Board Resolution No. 2012-0012. The Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 applicable to these discharges are hereby incorporated in this Order as if fully set forth herein. Requirements of this Order implement the Ocean Plan.

Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality

On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

Antidegradation Policy

Federal regulations (40 CFR 131.12) require that the state water quality standards include an antidegradation policy consistent with the federal antidegradation policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16 ("Statement of Policy with Respect to Maintaining the Quality of the Waters of the State"). State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law.

The San Diego Water Board's Basin Plan implements and incorporates by reference both the State and federal antidegradation policies. State Water Board Resolution No. 68-16 and 40 CFR 131.12 require the San Diego Water Board to maintain high quality

waters of the State until it is demonstrated that any change in quality will be consistent with maximum benefit to the people of the State, will not unreasonably affect beneficial uses, and will not result in water quality less than that described in the San Diego Water Boards' policies. State Water Board Resolution No. 68-16 requires that discharges of waste be regulated to meet best practicable treatment or control to assure that pollution or nuisance will not occur and the highest water quality consistent with the maximum benefit to the people of the State be maintained.

The discharges permitted in this Order are consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Board Resolution No. 68-16. Many of the water bodies within the area covered by this Order are of high quality. The Order requires the Copermittees to meet best practicable treatment or control to meet water quality standards. As required by 40 CFR 122.44(a), the Copermittees must comply with the "maximum extent practicable" technology-based standard set forth in CWA section 402(p) for discharges of pollutants in storm water from the MS4s.

Many of the waters within the area covered by this Order are impaired and listed on the State's CWA Section 303(d) List and the San Diego Water Board has established TMDLs to address the impairments. This Order requires the Copermittees to comply with permit provisions to implement the WLAs set forth in the TMDLs in order to restore the beneficial uses of the impaired water bodies consistent with the assumptions and requirements of the TMDLs. This Order includes requirements to develop and implement storm water management programs, achieve WQBELs, and effectively prohibit non-storm water discharges into the MS4. The issuance of this Order does not authorize an increase in the amount of discharge of waste.

Anti-Backsliding Requirements

CWA sections 402(o) and 303(d)(4) and 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations or conditions may be relaxed. All effluent limitations and other conditions in this Order are at least as stringent as the effluent limitations in the previous permits issued to the San Diego County Copermittees, the Orange County Copermittees and the Riverside County Copermittees.

Clean Water Act Section 303(d) List

CWA section 303(d)(1) requires each State to identify specific water bodies within its boundaries where water quality standards are not being met or are not expected to be met after implementation of technology-based effluent limitations on point sources. Water bodies that do not meet water quality standards are considered impaired and are placed on the state's "303(d) List." Periodically, USEPA approves the State's 303(d) List.

Most recently, USEPA approved the State's 2010 303(d) List of impaired water bodies on October 11, 2011, which includes certain receiving waters in the San Diego Region. For each listed water body, the state or USEPA is required to establish a TMDL of each pollutant impairing the water quality standards in that water body. A TMDL is a tool for implementing water quality standards and is based on the relationship between pollution sources and in-stream water quality conditions. The TMDL establishes the allowable pollutant loadings for a water body and thereby provides the basis to establish water quality-based controls. These controls should provide the pollution reduction necessary for a water body to meet water quality standards.

A TMDL is the sum of the allowable pollutant loads of a single pollutant from all contributing point sources (the waste load allocations or WLAs) and non-point sources (load allocations of LAs) plus the contribution from background sources and a margin of safety (40 CFR 130.2(i)). MS4 discharges are considered point source discharges. For 303(d)-listed water bodies and pollutants in the San Diego Region, the San Diego Water Board or USEPA develops and adopts TMDLs that specify these requirements.

Since 2002, the San Diego Water Board has established six (6) TMDLs to remedy water quality impairments in various water bodies within the San Diego Region (see Attachment E to the Order). These TMDLs identify MS4 discharges as a source of pollutants to these water bodies, and, as required, establish WLAs for MS4 discharges to reduce the amount of pollutant discharged to receiving waters. CWA section 402(p)(3)(B)(iii) requires the San Diego Water Board to impose permit conditions, including: "management practices, control techniques and system, design and engineering methods, and *such other provisions as the Administrator or the State determines appropriate for the control of such pollutants."* (Emphasis added.) CWA section 402(a)(1) also requires states to issue permits with conditions necessary to carry out the provisions of the CWA. Federal regulations also require that NDPES permits contain WQBELs consistent with the assumptions and requirements of all available WLAs (40 CFR 122.44(d)(1)(vii)(B)). CWC section 13377 also requires that NPDES permits include limitations necessary to implement water quality control plans. Therefore, this Order includes WQBELs and other provisions to implement the TMDL WLAs assigned to Copermittees regulated by this Order.

<u>Other Regulations, Plans and Policies</u>

This Order implements all other applicable federal regulations and State regulations, plans and policies, including the California Toxics Rule at 40 CFR 131.38 (Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California Rule [California Toxics Rule or CTR]), and State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP).

F. Unfunded State Mandates

Article XIII B, Section 6(a) of the California Constitution provides that whenever "*any state agency mandates a new program or higher level of service on any local government, the state shall provide a subvention of funds to reimburse that local government for the costs of the program or increased level of service*." The requirements of this Order do not constitute state mandates that are subject to a subvention of funds for several reasons, including, but not limited to, the following.

First, the requirements of this Order do not constitute a new program or a higher level of service as compared to the requirements contained in the previous Fourth Term Permits. The overarching requirement to impose controls to reduce the pollutants in discharges from MS4s is dictated by the CWA and is not new to this permit cycle (33 USC section 1342(p)(3)(B)). The inclusion of new and advanced measures as the MS4 programs evolve and mature over time is anticipated under the CWA (55 FR 47990, 48052 (Nov. 16, 1990)), and to the extent requirements in this Order are interpreted as new advanced measures, they do not constitute a new program or higher level of service.

Second, and more broadly, mandates imposed by federal law, rather than by a state agency, are exempt from the requirement that the local agency's expenditures be reimbursed (Cal. Const., art. XIII B, section 9, subd. (b)). This Order implements federally mandated requirements under the CWA and its requirements are therefore not subject to subvention of funds. This includes federal requirements to effectively prohibit non-storm water discharges, to reduce the discharge of pollutants in storm water to the MEP, and to include such other provisions as the Administrator or the State determines appropriate for the control of such pollutants (33 USC section 1342(p)(3)(B)). Federal cases have held these provisions require the development of permits and permit provisions on a case-by-case basis to satisfy federal requirements. (*Natural Resources Defense Council, Inc., v. USEPA* (9th Cir. 1992) 966 F.2d 1292, 1308, fn. 17.)

The authority exercised under this Order is not reserved state authority under the CWA's savings clause (cf. *Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 627-628 [relying on 33 USC section 1370, which allows a state to develop requirements which are not "less stringent" than federal requirements]), but instead is part of a federal mandate to develop pollutant reduction requirements for municipal separate storm sewer systems. To this extent, it is entirely federal authority that forms the legal basis to establish the permit provisions. (See, *City of Rancho Cucamonga v. Regional Water Quality Control Board, Santa Ana Region* (2006) 135 Cal.App.4th 1377, 1389; *Building Industry Ass'n of San Diego Co. v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 882-883.)

The MEP standard is a flexible standard that balances a number of considerations, including technical feasibility, cost, public acceptance, regulatory compliance, and effectiveness. (*Building Ind. Ass'n., supra,* 124 Cal.App.4th at pp. 873-874, 889.) Such considerations change over time with advances in technology and with experience

gained in storm water management (55 FR 47990, 48052 (Nov. 16, 1990)). Accordingly, a determination of whether the conditions contained in this Order exceed the requirements of federal law cannot be based on a point by point comparison of the permit conditions and the minimum control measures that are required "at a minimum" to reduce pollutants to the maximum extent practicable and to protect water quality (40 CFR 122.34). Rather, the appropriate focus is whether the permit conditions, as a whole, exceed the MEP standard.

In recent months, the County of Los Angeles and County of Sacramento Superior Courts have granted writs setting aside decisions of the Commission on State Mandates that held certain requirements in Phase I permits constituted unfunded mandates. In both cases, the courts have found that the correct analysis in determining whether an MS4 permit constituted a state mandate was to evaluate whether the permit as a whole exceeds the MEP standard. (*State of Cal. v. Comm. on State Mandates* (Super. Ct. Sacramento County, 2012, No. 34-2010-80000604), *State of California v. County of Los Angeles* (Super. Ct. Los Angeles County, 2011, No. BS130730.) Both cases are currently pending appeal.

The requirements of the Order, taken as a whole rather than individually, are necessary to reduce the discharge of pollutants to the MEP and to protect water quality. The San Diego Water Board finds that the requirements of the Order are practicable, do not exceed federal law, and thus do not constitute an unfunded mandate. These findings are the expert conclusions of the principal state agency charged with implementing the NPDES program in California (CWC sections 13001, 13370).

It should also be noted that the provisions in this Order to effectively prohibit non-storm water discharges are also mandated by the CWA (33 USC section 1342(p)(3)(B)(ii)). Likewise, the provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state establishes or adopts a TMDL, federal law requires that permits must contain effluent limitations consistent with the assumptions and requirements of any applicable waste load allocation in a TMDL (40 CFR 122.44(d)(1)(vii)(B)).

Third, the local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental dischargers who are issued NPDES permits for storm water discharges. With a few inapplicable exceptions, the CWA regulates the discharge of pollutants from point sources (33 USC section 1342) and the Porter-Cologne Act regulates the discharge of waste (CWC section 13263), both without regard to the source of the pollutant or waste. As a result, the "costs incurred by local agencies" to protect water quality reflect an overarching regulatory scheme that places similar requirements on governmental and non-governmental dischargers. (See *County of Los Angeles v. State of California* (1987) 43 Cal.3d 46, 57-58 [finding comprehensive workers' compensation scheme did not create a cost for local agencies that was subject to state subvention].)

The CWA and the Porter-Cologne Act largely regulate storm water with an even hand, but to the extent there is any relaxation of this even-handed regulation, it is in favor of the local agencies. Generally, the CWA requires point source dischargers, including dischargers of storm water associated with industrial or construction activity, to comply strictly with water quality standards (33 USC section 1311(b)(1)(C); *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159, 1164-1165 [noting that industrial discharges must strictly comply with water quality standards]). As discussed in prior State Water Board decisions, certain provisions of this Order do not require strict compliance with water quality standards (State Water Board Order No. WQ 2001-0015, p. 7). Those provisions of this Order regulate the discharge of waste in municipal storm water under the CWA's MEP standard, not the BAT/BCT standard that applies to other types of discharges. These provisions, therefore, regulate the discharge of waste in municipal storm water more leniently than the discharge of waste from non-governmental sources.

Fourth, the Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)). To the extent that the local agency Copermittees have voluntarily availed themselves of the permit, the program is not a state mandate. (Accord, *County of San Diego v. State of California* (1997) 15 Cal.4th 68, 107-108.)

Fifth, the local agency Copermittees' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under state law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

Finally, even if any of the permit provisions could be considered unfunded mandates, under Government Code section 17556, subdivision (d), a state mandate is not subject to reimbursement if the local agency has the authority to charge a fee. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order, subject to certain voting requirements contained in the California Constitution. (See Cal. Const., Art. XIII D, section 6, subd. (c); see also *Howard Jarvis Taxpayers Ass'n v. City of Salinas* (2002) 98 Cal.App.4th 1351, 1358-1359.) The Fact Sheet demonstrates that numerous activities contribute to the pollutant loading in the MS4. Local agencies can levy service charges, fees, or assessments on these activities, independent of real property ownership. (See, e.g., *Apartment Ass'n of Los Angeles County, Inc., v. City of Los Angeles* (2001(24 Cal.4th 830, 842 [upholding inspection fees associated with renting property].) The authority and ability of a local agency to defray the cost of a program without raising taxes indicates that a program does not entail a cost subject to subvention. (*Clovis Unified School Dist. V. Chiang* (2010) 188 Cal.App.4th 794, 812, citing *Connell v. Sup. Ct.* (1997) 59 Cal.App.4th 382, 401; *County of Fresno v. State of California* (1991) 53 Cal. 3d. 482, 487-488.)

VIII. PROVISIONS

The provisions (i.e. NPDES permit requirements) of the Order are discussed below.

A. Prohibitions and Limitations

Purpose: Provision A includes the prohibitions and limitations requirements that are the foundation of all the subsequent requirements included in the Order. Compliance with the prohibitions and limitations will restore and protect receiving waters from impacts that may be caused by discharges into and from the Copermittees' MS4s and ultimately achieve the objective of the CWA.

In meeting the requirements set forth in the Order, the Copermittees must be cognizant that the prohibitions and limitations exist and will be the standard by which the San Diego Water Board will be measuring the progress and success of their implementation of the NPDES permit requirements.

***Discussion*:** The objective of the CWA is to "*restore and maintain the chemical, physical, and biological integrity of the Nation's waters*." The CWA requires the implementation of NPDES permit programs to regulate discharges of pollutants and dredged or fill material to the navigable waters of the U.S. For discharges into and from MS4s, the CWA requires the NPDES permits to "*effectively prohibit non-stormwater discharges into the storm sewers*" and "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable.*"

Provision A includes limitations, consistent with the requirements of the CWA for discharges from MS4s. Provision A expresses these limitations as discharge prohibitions, receiving water limitations, and effluent limitations. Compliance with the discharge prohibitions and receiving water limitations is also explicitly described, in conformance with precedential State Water Board Orders.

More specific and detailed discussions of the requirements of Provision A are provided below.

Provision A.1 (Discharge Prohibitions) prohibits the discharge of specific types of waste into and/or from the Copermittees' MS4s.

Provision A.1.a restates and reiterates Basin Plan Waste Discharge Prohibition 1, by prohibiting discharges into and from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the

state. The terms pollution,[15] contamination,[16] and nuisance[17] are defined under CWC 13050. Provision A.1.c incorporates all the waste discharge prohibitions of the Basin Plan into the requirements of the Order. The waste discharge prohibitions from the Basin Plan have been reproduced and provided in Attachment A to the Order.

Provision A.1.b requires non-storm water discharges into the MS4s to be effectively prohibited, consistent with the requirements of the CWA for MS4 permits to "*effectively prohibit non-stormwater discharges into the storm sewers*." The effective prohibition is required to be implemented by each Copermittee within its jurisdiction through the illicit discharge detection and elimination requirements under Provision E.2. The prohibition does not apply to NPDES permitted discharges into the Copermittees' MS4s.

The CWA employs the strategy of prohibiting the discharge of any pollutant from a point source into waters of the United States unless the discharger of the pollutant(s) obtains an NPDES permit pursuant to CWA Section 402. The 1987 amendment to the CWA includes provision 402(p) that specifically addresses NPDES permitting requirements for storm water discharges from MS4s. CWA section 402(p) prohibits the discharge of pollutants from specified MS4s to waters of the U.S. except as authorized by an NPDES permit and identifies two substantive standards for MS4 storm water permits. MS4 permits (1) "*shall include a requirement to effectively prohibit nonstormwater discharges into the storm sewers*" and (2) "*shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or State determines appropriate for the control of such pollutants*." (CWA section 402(p)(3)(B)(ii-iii).)

In November 1990, the USEPA published regulations addressing storm water discharges from MS4s (55 FR 47990 and following (Nov. 16, 1990) (Phase I Final Rule)). The regulations establish minimum requirements for MS4 permits, and generally focus on the requirement that MS4s implement programs to reduce the amount of pollutants found in storm water discharges to the MEP. The CWA's municipal storm water MEP standard does not require storm water discharges to strictly meet water quality standards, as is required for other NPDES permitted discharges. Compliance is achieved through an iterative approach of continuous

[15] CWC 13050(l): "(1) 'Pollution' means an alteration of the quality of waters of the state by waste to a degree which unreasonably affects either of the following: (A) The water for beneficial uses. (B) Facilities which serve beneficial uses. (2) 'Pollution' may include "contamination.

[16] CWC 13050(k): "Contamination' means an impairment of the quality of waters of the state by waste to a degree which creates a hazard to public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste, whether or not waters of the state are affected."

[17] CWC 13050(m): "Nuisance' means anything which meets all of the following requirements: (1) Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. (2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. (3) Occurs during, or as a result of, the treatment or disposal of wastes."

implementation of improved BMPs. This distinction reflects Congress's recognition that variability in flow and intensity of storm events render difficult strict compliance with water quality standards by MS4 permittees. In describing the controls that permits must include to reduce pollutants in storm water discharges to the MEP, the statute (CWA section 402(p)(3)(B)(iii)) states that the controls shall include: "*management practices, control techniques and system, design and engineering methods, and such other provisions as the [permit writer] determines appropriate for the control of such pollutants*."

In contrast, non-storm water discharges from the MS4 that are not authorized by separate NPDES permits are subject to requirements under the NPDES program, including discharge prohibitions, technology based effluent limitations and water quality-based effluent limitations (40 CFR 122.44). The regulations also require the Copermittee's program to include an element to detect and remove illicit discharges and improper disposal into the storm sewer (40 CFR 122.26(d)(2)(iv)(B)).

While "non-storm water" is not defined in the CWA or federal regulations, the federal regulations (at 40 CFR 122.26(b)(2)) define "*illicit discharge*" as *"any discharge to a municipal separate storm sewer that is not composed entirely of storm water and that is not covered by an NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer and discharges resulting from fire fighting activities)*." This definition is the most closely applicable definition of "non-storm water" contained in federal law. As stated in the Phase I Final Rule, USEPA added the illicit discharge program requirement to begin implementation of the 'effective prohibition' requirement to detect and control non-storm water discharges to their municipal system.

Thus, federal law mandates that permits issued to MS4s must require management practices that will result in reducing storm water pollutants to the MEP yet at the same time requires that non-storm water discharges be effectively prohibited from entering the MS4. "Effectively" prohibit does not mean that non-storm water discharges are authorized to be discharged into and from the Copermittees' MS4s. The Phase I Final Rule clarifies what "effectively prohibit" means (55 FR 47995):

> "*Section 402(p)(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…<u>Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit</u> (other than the permit for the discharge from the municipal separate storm sewer)*" [Emphasis added].

Consistent with federal law, unless non-storm water discharges to the MS4 are authorized by a separate NPDES permit, non-storm water discharges are appropriately subject to the effective prohibition requirement in the CWA and Regional

Water Boards are not limited by the iterative MEP approach to storm water regulation in crafting appropriate regulations for non-storm water discharges.

The federal regulations (40CFR122.26(d)(2)(i)(B)) require the Copermittees to establish the legal authority which authorizes or enables the Copermittees to prohibit illicit discharges to the MS4s. The federal regulations (40 CFR 122.26(d)(2)(vi)(B)(1)) require the Copermittees to "*implement and enforce an ordinance, order or similar means*" to prevent non-storm water discharges to their MS4s. Thus, the Copermittees are required to "*effectively*" prohibit non-storm water discharges to their MS4s through enforcing their legal authority established under "*ordinance, order or similar means*" and either remove those discharges to their MS4s, or require those discharges to obtain coverage under a separate NPDES permit. More detail about the program that must be implemented to "*effectively*" prohibit non-storm water discharges to the Copermittees' MS4s is provided under the discussion for Provision E.2.

Provision A.1.d was included to be consistent Resolution No. 2012-0012, adopted by the State Water Board on March 20, 2012. Provision A.1.d prohibits discharges from MS4s to Areas of Special Biological Significance (ASBS), except for storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach to the Heisler Park ASBS subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012. The pertinent Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 are provided in Attachment A to the Order.

Provision A.2 (Receiving Water Limitations) specifies the condition of the receiving waters that must be achieved when there are discharges from the Copermittees' MS4s. Receiving water limitations are included in all NPDES permits issued pursuant to the CWA section 402. CWA section 402(p)(3)(B)(iii) authorizes the inclusion of "*such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." This requirement gives USEPA or the State permitting authority, in this case the San Diego Water Board, discretion to determine what permit conditions are necessary to control pollutants.

In its Phase I Final Rule (see 55 FR 47990, 47994 (Nov. 16, 1990)), USEPA elaborated on these requirements, stating that, "*permits for discharges from municipal separate storm sewer systems must require controls to reduce the discharge of pollutants to the maximum extent practicable, and where necessary water quality-based controls*." USEPA reiterated in its Phase II Final Rule (64 FR 68722, 68737), that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL*." CWC section 13377 also requires that NPDES permits include limitations necessary to implement water quality control plans. Both the State Water Board and the San Diego Water Board have previously concluded that discharges from the MS4 contain pollutants that have the reasonable potential to cause or contribute to excursions above water quality

standards. As such, inclusion of receiving water limitations is appropriate to control MS4 discharges.

The inclusion of receiving water limitations is also consistent with the Ninth Circuit Court of Appeals' ruling in *Defenders of Wildlife v. Browner* (191 F.3d 1159, 1166 (1999)) that the permitting authority has discretion regarding the nature and timing of requirements that it includes as MS4 permit conditions to attain water quality standards. The Ninth Circuit Court of Appeals recently explained that, "*[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*" (*Natural Resources Defense Council v. County of Los Angeles* (9th Cir. 2011) 673 F.3d 880, 886 (revd. On other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013)))

The receiving water limitations included in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan or in water quality control plans or policies adopted by the State Water Board, including State Water Board Resolution No. 68-16, or in federal regulations, including but not limited to 40 CFR 131.12 and 131.38. The water quality objectives in the Basin Plan and other State Water Board plans and policies have been approved by USEPA and combined with designated beneficial uses constitute the water quality standards required under federal law.

Provision A.2.a requires that discharges from the Copermittees' MS4s must not cause or contribute to the violation of water quality standards in receiving waters. The water quality standards of the receiving waters must be protected from the impacts that may be caused by the Copermittees' MS4 discharges. Water quality standards applicable to the surface waters in the San Diego Region must be achieved through meeting the technology based standard of MEP through an iterative process of improved management actions. Provision A.2.a is also consistent with State Water Board Order WQ 99-05 precedent-setting language requiring discharges from MS4s to attain receiving water quality standards. The water quality control plans and policies with water quality standards applicable to the waters in the San Diego Region are included under Provision A.2.a.

Provisions A.2.b was included to be consistent with the requirements of State Water Board Resolution No. 2012-0012, adopted on March 20, 2012.

<u>Provision A.3 (Effluent Limitations)</u> specifies the condition of the discharges from the Copermittees' MS4s that must be achieved if and when there are discharges.

Consistent with CWA section 301(b)(1)(A) and 40 CFR 122.44(a), Provision A.3.a includes the technology-based effluent limitations that must be included in the Order.

The technology-based effluent limits, representing the minimum level of control that must be imposed in a permit under CWA section 402, requires that pollutants in discharges of storm water from the Copermittees' MS4s be reduced to the MEP. This provision applies specifically to storm water discharges. Non-storm water discharges must be effectively prohibited, as required under Provision A.1.b. Non-storm water (dry weather) discharges from the MS4 are not considered storm water (wet weather) discharges and therefore are not subject to the MEP standard.

The technology-based MEP standard is an ever-evolving, flexible, and advancing concept. Neither Congress nor USEPA has specifically defined the term "maximum extent practicable." Congress established this flexible MEP standard so that the administrative bodies would have "*the tools to meet the fundamental goals of the Clean Water Act in the context of storm water pollution*." (*Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 884.) As knowledge about controlling storm water runoff and discharges continues to evolve, so does the knowledge which constitutes MEP. Reducing the discharge of pollutants in storm water from the MS4 to the MEP requires the Copermittees to assess each program component and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP.

The San Diego Water Board or the State Water Board ultimately define MEP, and may include requirements that provide specific guidance on what is expected to demonstrate MEP. It is the responsibility of the Copermittees to propose actions that implement BMPs to reduce storm water pollution to the MEP. In other words, the Copermittees' runoff management programs developed and implemented under the Order are the Copermittees' proposals for achieving MEP. Their total collective and individual activities conducted pursuant to their runoff management programs become their proposal for achieving MEP as it applies both to their overall effort, as well as to specific activities. Provisions B through E of the Order provides a minimum framework to guide the Copermittees in achieving the MEP standard for discharges of pollutants in storm water.

Provision A.3.b incorporates any water quality based effluent limitations (WQBELs) applicable to the MS4s established for TMDLs adopted and approved for the San Diego Region and requires the Copermittees to comply with those WQBELs. This is consistent with 40 CFR 122.44(d)(1)(vii)(B), which requires that NPDES permits to incorporate WQBELs "*developed to protect a narrative water quality criterion, a numeric water quality criterion, or both…consistent with the assumptions and requirements of any available wasteload allocation for the discharge...*"

Pursuant to CWA section 303(d), for surface water bodies identified as impaired by one or more pollutants, the San Diego Water Board is required to establish TMDLs "*at a level necessary to implement the applicable water quality standards with seasonal variations and a margin of safety which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality*." The

TMDLs identify sources of the pollutants causing the impairments and assign portions of the TMDL as WLAs to point sources, which include MS4s.

WLAs must be expressed in NPDES permits as WQBELs, which may include one or more numeric components such as numeric effluent limits, and/or receiving water limitations, and/or BMP requirements. Because numeric targets for TMDLs typically include a component that will be protective of water quality standards, a TMDL will likely include one or more numeric receiving water limitations and/or effluent limitations as part of the assumptions or requirements of the TMDL. Any numeric receiving water limitations and/or effluent limitations developed as part of the assumptions or requirements of a TMDL must be incorporated and included as part of WQBELs for the MS4s.

Because the development and approval of new TMDLs, or modification of existing TMDLs, may occur during the term of this Order, the specific provisions of those TMDLs, including effluent limitations applicable to MS4s are provided within Attachment E to the Order. Attachment E will be updated with new TMDLs and modifications to existing TMDLs in a timely manner as they occur.

Provision A.4 (Compliance with Discharge Prohibitions and Receiving Water Limitations) describes the process required to be implemented by the Copermittees if compliance with the discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a are not being achieved under current conditions.

In its Phase II Stormwater Regulations, Final Rule, USEPA states that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL.*"[18] In a series of comment letters on MS4 permits issued by various Regional Water Boards, USEPA has also reiterated that MS4 discharges must meet water quality standards.[19] In addition, the Ninth Circuit Court of Appeals explained in a recent ruling that, *"[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*"[20]

[18] Phase II Stormwater Regulations, Final Rule, 64 Fed. Reg. 68722, 68737.
[19] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.
[20] NRDC v. County of Los Angeles (9th Cir. 2011), 673 F.3d 880, 886 (revd. on other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013))). See also, *Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 884-886, citing *Defenders of Wildlife v. Browning,* (9th Cir. 1999) 191 F.3d 1159.)

Water quality standards for the San Diego Region are established in the Basin Plan. The water quality standards of the Basin Plan are incorporated into this Order as the discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a. The discharge prohibitions and receiving water limitations in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations or prohibitions to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan, water quality control plans or policies adopted by the State Water Board, including Resolution No. 68-16, or federal regulations, including but not limited to, 40 CFR 131.12 and 131.38. The waste discharge prohibitions and water quality objectives in the Basin Plan have been approved by USEPA and combined with the designated beneficial uses constitute the water quality standards required under federal law.

Under federal law (CWA section 402(p)(3)(B)(iii)), an MS4 permit must include "*controls to reduce the discharge of pollutants to the maximum extent practicable...and such other provision as...the State determines appropriate for control of such pollutants*." The State Water Board has previously determined that limitations necessary to meet water quality standards are appropriate for the control of pollutants discharged by MS4s and must be included in MS4 permits. (State Water Board Orders WQ 91-03, 98-01, 99-05, 2001-15; see also *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159.) This Order prohibits discharges that cause or contribute to violations of water quality standards.

The discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a are included in this Order to ensure that discharges from the MS4s do not cause or contribute to exceedances of water quality objectives necessary to protect the beneficial uses of the receiving waters.

Provision A.4 is consistent with the precedent-setting language in State Water Board Order WQ 99-05 required to be included in municipal storm water permits. State Water Board Order WQ 2001-15 refined Order WQ 99-05 by requiring an iterative approach to compliance with water quality standards involving ongoing assessments and revisions, as referred to as the "iterative process." The "iterative process" is a fundamental NPDES requirement for municipal storm water permits to achieve the objectives of the CWA.

The State Water Board and Regional Water Boards have stated that the provisions under Provisions A.1.a, A.1.c, A.2.a, and A.4 are independently applicable, meaning that compliance with one provision does not provide a "safe harbor" where there is non-compliance with another provision (i.e., compliance with the Provision A.4 does not shield a Copermittee who may have violated Provision A.1.a, A.1.c, or A.2.a from an enforcement action). The intent of Provision A.4 is to ensure that the Copermittees have the necessary storm water management programs and controls in place, and that they are modified by the Copermittees in a timely fashion when necessary, so that compliance with Provisions A.1.a, A.1.c, and/or A.2.a is achieved as soon as possible. USEPA expressed the importance of this independent applicability in a series of

comment letters on MS4 permits proposed by various Regional Water Boards. At that time, USEPA expressly objected to certain MS4 permits that included language stating, *"permittees will not be in violation of this [receiving water limitation] provision … [if certain steps are taken to evaluate and improve the effectiveness of the jurisdictional runoff management programs],"* concluding that this phrase would not comply with the CWA.[21]

The Ninth Circuit held in *Natural Resources Defense Council v. County of Los Angeles* (2011) 673 F3d. 880, 886 (revd. on other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013))) that engagement in the iterative process does not provide a safe harbor from liability for violations of permit terms prohibiting exceedances of water quality standards. The Ninth Circuit holding is consistent with the position of the State and Regional Water Boards that exceedances of water quality standards in an MS4 permit constitute violations of permit terms subject to enforcement by the Water Boards or through a citizen suit. While the Water Boards have generally directed dischargers to achieve compliance by improving control measures through the iterative process, the San Diego Water Board retains the discretion to take other appropriate enforcement and the iterative process does not shield dischargers from citizen suits under the CWA.

The requirements of Provision A.4, therefore, are required to be implemented until the water quality standards expressed under Provisions A.1.a, A.1.c, and A.2.a are achieved. The CWA requires MS4 permits to "*require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." The requirements of this Order have been deemed or determined to be "appropriate" to achieve water quality standards in receiving waters.

Part of the "*controls*" required by the Order is the process described in Provision A.4. Provision A.4 includes the process that is ultimately expected to achieve compliance with the requirement that discharges from the MS4 do not cause or contribute to violations of water quality standards in the receiving waters. The implementation of Provision A.4 is required when the Copermittees or the San Diego Water Board have determined that discharges from the MS4 are causing or contributing to violations of water quality standards in the receiving waters.

The Copermittees must effectively prohibit non-storm water discharges into the MS4s, reduce the discharge of pollutants in storm water from the MS4s to the MEP, and ensure that their MS4 discharges do not cause or contribute to violations of water quality standards. If the Copermittees have effectively prohibited non-storm water

[21] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.

discharges and reduced storm water pollutant discharges to the MEP, but their discharges are still causing or contributing to violations of water quality standards, Provision A.4 provides a clear "iterative process" for the Copermittees to follow.

Provision A.4 essentially requires the Copermittees to implement additional BMPs until MS4 discharges no longer cause or contribute to a violation of water quality standards.

In assessing compliance and potential enforcement actions, the San Diego Water Board looks at the Copermittees' efforts in total to meet the requirements of Provisions A.1.a, A.1.c, A.2.a and Provision A.4. The Copermittees need to demonstrate that they are making improvements to their programs and making progress toward achieving the discharge prohibitions and receiving water limitations in Provisions A.1.a, A.1.c, and A.2.a by implementing the requirements of Provision A.4. The San Diego Water Board would consider these efforts prior to strictly enforcing the requirements of Provisions A.1.a, A.1.c, and A.2.a. Causes of exceedances of the receiving water limitations can often be more difficult to identify and attribute solely to the Copermittees' MS4s. The intent of the Order is to provide the Copermittees more clarity and flexibility in addressing these exceedances through the iterative approach and adaptive management process until the requirements under Provisions A.1.a, A.1.c, and A.2.a are fully achieved.

An exception to the iterative approach and adaptive management process would be in receiving waters subject to adopted and approved TMDLs. For TMDLs that are incorporated into the Order, there is a specific date for compliance to be achieved, after which the iterative approach and adaptive management process required under Provision A.4 no longer provides the flexibility to achieve compliance. Where compliance dates for a TMDL have passed, compliance with the WQBELs incorporated into the Order established by a TMDL in Attachment E to protect water quality standards is required. Thus, after the interim or final compliance dates for a TMDL have passed, if the discharges from the Copermittees' MS4s are causing or contributing to a violation of WQBELs, exceedances of WQBELs must be strictly enforced by the San Diego Water Board. In the meantime, however, the Copermittees are in compliance with the interim or final TMDL requirements in Attachment E as long as the interim or final WQBELs are being achieved in accordance with the interim or final compliance dates.

B. Water Quality Improvement Plans

Purpose: Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges to the MS4s and control pollutants in storm water discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the Clean Water Act.

Provision B includes requirements for the Copermittees to develop and implement Water Quality Improvement Plans to ultimately comply with the prohibitions and limitations under Provision A. The Water Quality Improvement Plans will provide the Copermittees a comprehensive program that can achieve the requirements and further the objectives of the CWA. Implementation of the Water Quality Improvement Plans will also improve the quality of the receiving waters in the San Diego Region.

The Water Quality Improvement Plan is the backbone of the Regional MS4 Permit requirements. Provision B provides the guidance, criteria, and minimum expectations and requirements for the elements of the Water Quality Improvement Plan to be developed and implemented by the Copermittees. The Water Quality Improvement Plans will be implemented in the Watershed Management Area by the Copermittees within their jurisdictions through their jurisdictional runoff management programs.

The Water Quality Improvement Plan also incorporates a program to monitor and assess the progress of the Copermittees' jurisdictional runoff management programs toward improving the quality of discharges from the MS4s, as well as tracking improvements to the quality of receiving waters. A process to adapt and improve the effectiveness of the Water Quality Improvement Plans has also been incorporated into the requirements of Provision B to be consistent with the "iterative approach" required to achieve compliance with discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a, pursuant to the requirements of Provision A.4.

The Water Quality Improvement Plans have also been structured to incorporate the requirements of any TMDLs that have been adopted for the San Diego Region. Incorporating the requirements of the TMDLs into the requirements of Provision B allows the Copermittees to develop a single plan, instead of separate plans, to coordinate their non-storm water and storm water runoff management programs. The Water Quality Improvement Plans allow the Copermittees to meet the requirements of this Order, as well as fulfill the requirements of the TMDLs.

As an added benefit, if the Copermittees demonstrate that impaired water bodies within the Watershed Management Area listed on the 303(d) List will be addressed with their Water Quality Improvement Plans in a reasonable period of time, the San Diego Water Board may be able to remove the water bodies from the 303(d) List, which would greatly reduce the need for the San Diego Water Board to develop additional TMDLs that would have to be incorporated into the Order and implemented by the Copermittees.

***Discussion*:** The federal NPDES regulations require the Copermittees to develop a proposed management program (40 CFR 122.26(d)(2)(iv)). The proposed management program must include "*a comprehensive planning process*" and "*where necessary intergovernmental coordination*" for the "*duration of the permit.*" The Water Quality Improvement Plan is the Copermittees' "*comprehensive planning process*" document for the proposed management program that will be implemented within a Watershed Management Area. Implementation of the Water Quality Improvement Plan requires "*intergovernmental coordination*" among the Copermittees for at least the "*duration of the permit*," and likely into and beyond the next iteration of the permit.

Developing Water Quality Improvement Plans based upon watersheds is consistent with federal regulations that support the development of permit conditions, as well as implementation of storm water management programs, at a watershed scale (40 CFR 122.26(a)(3)(ii), 122.26(a)(3)(v), and 122.26(d)(2)(iv)). In 2003, USEPA issued a Watershed-Based NPDES Permitting Policy Statement (USEPA, 2003) that defines watershed-based permitting as an approach that produces NPDES permits that are issued to point sources on a geographic or watershed basis. In this policy statement, USEPA explains that "*[t]he utility of this tool relies heavily on a detailed, integrated, and inclusive watershed planning process*." USEPA identifies a number of important benefits of watershed permitting, including more environmentally effective results, the ability to emphasize measuring the effectiveness of targeted actions on improvements in water quality, reduced cost of improving the quality of the nation's waters and more effective implementation of watershed plans, including TMDLs, among others.

An emphasis on watersheds is appropriate at this stage in the San Diego Region's MS4 program to shift the focus to more targeted, water quality driven planning and implementation. Addressing discharges on a watershed scale focuses on water quality results by emphasizing the receiving waters in the watershed. The conditions of the receiving waters drive management actions, which in turn focus measures to address pollutant contributions from MS4 discharges.

The Water Quality Improvement Plan gives the Copermittees the responsibility of developing a comprehensive plan to coordinate the efforts of their jurisdictional runoff management programs for addressing the problems related to MS4 discharges causing impacts to water quality in the Watershed Management Area. The development of the plan provides the Copermittees the opportunity to provide significant input on how to implement their jurisdictional runoff management programs, and how to best utilize their available resources in addressing a focused set of

priorities that they believe will result in measureable improvements to water quality within the Watershed Management Area.

The Copermittees are encouraged to separate the Watershed Management Area into subwatersheds, as appropriate. This allows the Copermittees to identify priorities applicable to a subset of the Copermittees or specific water bodies or areas within the Watershed Management Area.

Included in the requirements for the elements to be included in the Water Quality Improvement Plan are monitoring and assessment requirements that are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order. In addition to the federal requirements of the CWA section 308(a) and 40 CFR 122.26(d), the San Diego Water Board has the authority to establish monitoring, reporting, and recordkeeping requirements for NPDES permits under CWC 13383.

More specific and detailed discussions of the requirements of Provision B are provided below.

Provision B.1 (Watershed Management Areas) requires the Copermittees to develop a Water Quality Improvement Plan for each of the Watershed Management Areas defined by the San Diego Water Board.

Pursuant to 40 CFR 122.26(d)(2)(iv), proposed management programs "*may impose controls on a…watershed basis…*" The Water Quality Improvement Plan is the Copermittees' proposed management program. A Water Quality Improvement Plan must be developed for each Watershed Management Area identified in the Order.

The Watershed Management Areas are identified in Table B-1. Table B-1 establishes ten (10) Watershed Management Areas, and identifies the Copermittees that are responsible for developing and implementing the Water Quality Improvement Plan for each Watershed Management Area.

The Copermittees from each of the three counties within the San Diego Region are expected to be phased in as their respective NPDES municipal storm water permits expire. Because Order No. R9-2007-0001 expired in January 2012, the San Diego County Copermittees are covered under the Regional MS4 Permit on the effective date of the Order.

After San Diego Water Board receives and considers the Reports of Waste Discharge required to be submitted by the Orange County Copermittees and Riverside County Copermittees pursuant to the requirements of their current permits, and make any necessary changes to the Order, the Orange County Copermittees and Riverside County Copermittees will be covered under the Regional MS4 Permit after Order No. R9-2009-0002 expires in November 2014, and Order No. R9-2010-0016 expires in December 2015, respectively.

The Orange County Copermittees and Riverside County Copermittees also have the option to obtain coverage under the Regional MS4 Permit earlier than their respective permit expiration dates. The process to apply for early coverage is described Provision F.6.

Because the Santa Margarita River Watershed Management Area includes Copermittees from both San Diego County and Riverside County, a footnote to Table B-1 has been included to specify that the requirements of Provision B are not required to be implemented by the County of San Diego until the Riverside County Copermittees have received a notice of coverage under the Order. Until the Riverside County Copermittees are notified of coverage under the Order, the County of San Diego is subject to the prohibitions and limitations under Provision A, responsible for continuing to implement its existing jurisdictional runoff management program, and responsible for implementing the transitional monitoring and assessment requirements of Provision D, the transitional annual reporting requirements of Provision F.3.b, and the TMDL requirements of Attachment E to the Order.

Provision B.2 (Priority Water Quality Conditions) requires the Copermittees in each Watershed Management Area to identify the highest priority water quality conditions which will be the focus of the Water Quality Improvement Plan implementation.

Provisions B.2.a and B.2.b provide the criteria that must be assessed when characterizing the receiving water quality and potential impacts from MS4 discharges of the receiving waters within the Watershed Management Area. The criteria are based primarily on the requirements in 40 CFR 122.26(d)(1)(iv)(C) and (C)(1)-(9). Characterizing the receiving water quality and identifying the potential impacts caused by MS4 discharges to receiving waters in the Watershed Management Area is necessary to identify the impacts to receiving waters associated with MS4 discharges that are of the most concern to the Copermittees.

Based on the information required to be considered under Provisions B.2.a and B.2.b, Provision B.2.c requires to Copermittees to identify the highest priority water quality conditions related to discharges from the MS4s that will be the primary focus of the Water Quality Improvement Plan in the Watershed Management Area. Addressing and improving these highest priority water quality conditions will become the focus of each Copermittee's jurisdictional runoff management program as the Water Quality Improvement Plan is implemented in the Watershed Management Area. The highest priority water quality conditions are expected to include source of pollutants and/or stressors, and/or receiving water conditions, that the Copermittees consider the highest threats or most likely to have adverse impacts on the physical, chemical, and biological integrity of receiving waters. Addressing these threats and/or adverse impacts should restore the physical, chemical, and biological integrity of receiving waters, and result in the restoration and protection of the beneficial uses of the receiving waters in the Watershed Management Area.

Provision B.2.d requires the Copermittees to identify known and suspected sources of pollutants and/or stressors contributing to the highest priority water quality conditions. The requirements of Provision B.2.d are based primarily on the requirements in 40 CFR 122.26(d)(1)(iii)(B)(1)-(6). The Copermittees are required to evaluate several factors in the identification of those sources. The Copermittees must consider and evaluate the following: (1) the land uses that may contribute toward impacts to receiving waters, (2) the locations of the Copermittees' MS4s that can convey and discharge runoff and pollutants to receiving waters, (3) other sources that discharge into the Copermittees' MS4s and receiving waters, and (4) other information and data that can help the Copermittees to evaluate the relative importance of or contribution from those sources toward the highest priority water quality conditions. Identifying the known and suspected sources, and their relative contribution toward the highest priority water quality conditions, will help the Copermittees to focus, direct, and prioritize their resources and implementation efforts within their jurisdictions.

Provision B.2.e requires the Copermittees to identify potential strategies that can result in improvements to water quality in MS4 discharges and/or receiving waters within the Watershed Management Area. Potential water quality improvement strategies will not necessarily be implemented by the Copermittees, but provide a "menu" of options that the Copermittees will consider for implementation. The public participation process that will be implemented during the development of the Water Quality Improvement Plan is where the potential water quality improvement strategies will be identified.

Provision B.3 (Water Quality Improvement Goals, Strategies and Schedules) requires the Copermittees in each Watershed Management Area to identify the goals that the Copermittees' jurisdictional runoff management programs will work toward achieving to address and improve the highest priority water quality conditions identified under Provision B.2.c; the strategies that will be implemented by the Copermittees within their jurisdictions and the Watershed Management Area to achieve the goals; and, the schedules for implementing the strategies and achieving the goals. The element of the Water Quality Improvement Plan required under Provision B.3 is where the "*comprehensive planning*" and "*intergovernmental coordination*" [40 CFR 122.26(d)(2)(iv)] of the Copermittees' actions for the proposed management programs within the Watershed Management Area is required to be described.

Provision B.3.a requires the Copermittees to identify interim and final numeric goals, and schedules to achieve those goals as part of the Water Quality Improvement Plans. Provision B.3.a.(1) requires the Copermittees to identify two types of numeric goals to be achieved:

(1) Final numeric goals in the receiving waters and/or MS4 discharges that will result in the protection of the water quality standards of the receiving waters for the highest priority water quality conditions identified by the Copermittees for Provision B.2.c. These final numeric goals are the ultimate goals for the Water Quality Improvement Plan, and the achievement and maintenance of these final numeric goals will indicate that one or more beneficial uses have been successfully restored and/or protected from MS4 discharges.

(2) Interim numeric goals that can be used by the Copermittees to demonstrate progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges for the highest priority water quality conditions in the Watershed Management Area. Achievement of the interim numeric goals will demonstrate to the San Diego Water Board that the Copermittees' implementation efforts are progressing toward achieving the final numeric goals.

Provision B.3.a.(1) does not specify what the interim and final numeric goals must be based on, but they essentially must be designed to achieve compliance with water quality standards in the receiving waters. To that end, the interim goals must be based on measureable criteria or indicators capable of demonstrating progress toward achieving the numeric goals."

The interim and final numeric goals can be based on the water quality objectives in the Basin Plan. The water quality objectives in the Basin Plan, however, consist of numeric and narrative water quality objectives. Numeric water quality objectives can be directly used as numeric goals. Narrative water quality objectives, on the other hand, will require some interpretation to identify numeric goals. The achievement of multiple numeric goals based on the water quality objectives, used in combination, may be necessary to demonstrate that beneficial uses have been restored and/or protected.

The Copermittees could also propose other numeric goals that are not necessarily water quality objectives from the Basin Plan. For example, the Copermittees could propose a numeric goal that consists of achieving some percent improvement of a measureable indicator, such as acreage of a specific habitat or increase in a specific plant or animal species population. Other examples may include pollutant load reductions, number of impaired waterbodies delisted from the List of Water Quality Impaired Segments, Index of Biological Integrity (IBI) scores, etc.

The Copermittees may choose to develop interim numeric goals based on the final numeric goals they develop, such as incremental steps toward ultimately achieving the final numeric goals. The Copermittees may also choose to develop interim numeric goals that are based on other measureable indicators that can indirectly indicate improvements and progress toward the final numeric goals.

There are no limits to the types of interim numeric goals that could be proposed by the Copermittees, other than the goals must be based on measureable criteria or indicators capable of demonstrating progress toward achieving the numeric goals. Likewise, there are no limits to the types of final numeric goals that could be proposed by the Copermittees, other than the goals must "*restore and protect the water quality standards of the receiving waters.*"

Finally, Provision B.3.a.(2) also requires the Copermittees to develop schedules for measuring progress and achieving the interim and final numeric goals. Several criteria

are included for the development of the schedules, but the Copermittees are required to achieve the numeric goals as soon as possible, consistent with federal NPDES regulations (40 CFR 122.47(a)(1)).

The Copermittees are also required to incorporate any compliance schedules for any applicable ASBS or TMDL requirements. Applicable ASBS and TMDL compliance schedules are set forth in Attachment A and Attachment E to the Order, respectively. The information provided by the Copermittees under Provision B.3.a.(2) will be used by the Copermittees and the San Diego Water Board to gauge and track the progress of the Copermittees' efforts in addressing the highest priority water quality conditions identified in the Water Quality Improvement Plan.

Provision B.3.b requires the Copermittees to identify the strategies and schedules to implement those strategies as part of the Water Quality Improvement Plans. Provision B.3.b requires the Copermittees to identify the water quality improvement strategies that will be and may be implemented within the Watershed Management Area to 1) reduce of pollutants in storm water discharged from the MS4 to the MEP, 2) effectively prohibit non-storm water discharges from entering the MS4, 3) protect water quality standards in receiving waters by controlling MS4 discharges so that they do not cause or contribute to exceedances of receiving water limitations, and 4) achieve applicable WQBELs that implement TMDLs. The Copermittees will select the strategies to be implemented based on the likely effectiveness and efficiency of the potential water quality improvement strategies identified under Provision B.2.e to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, and/or achieve the interim and final numeric goals identified under Provision B.3.a.

Provision B.3.b.(1) requires each Copermittee to identify the strategies that will be or may be implemented within its jurisdiction. Each Copermittee is required to describe the strategies it is committed to implementing as part of its jurisdictional runoff management requirements under Provisions E.2 through E.7, and the optional jurisdictional strategies that the Copermittee will implement, as necessary, to achieve the numeric goals.

Each Copermittee is expected to implement the optional jurisdictional strategies identified under Provisions B.3.b.(1)(b) when the jurisdictional strategies it has committed to implement under Provision B.3.b.(1)(a) are not making adequate progress toward the interim and final numeric goals in accordance with the schedules established under Provision B.3.a. Provision B.3.b.(1)(b)(v) requires each Copermittee to describe the circumstances necessary to trigger implementation of the optional jurisdictional strategies, in addition to the requirements of Provisions B.3.b.(1)(a).

The San Diego Water Board recognizes that there may be optional jurisdictional strategies that will likely require funding and/or resources for planning, permitting, procurement of labor and materials, and implementation. Thus, Provision

B.3.b.(1)(b)(iv) requires each Copermittee to describe the funding and/or resources that are necessary to implement these optional jurisdictional strategies. This information may provide interested groups and members of the public an understanding of the resources that they could provide or assist in obtaining to implement these optional jurisdictional strategies.

Provision B.3.b.(2) requires the Copermittees in the Watershed Management Area to identify the regional or multi-jurisdictional strategies that may be implemented, as necessary, to achieve the numeric goals. Similar to the requirements of Provision B.3.b.(1)(b), these regional or multi-jurisdictional strategies will likely require funding and/or resources for planning, permitting, procurement of labor and materials, and implementation, and San Diego Water Board recognizes that these strategies may be difficult to implement with only Copermittee resources. Thus, Provision B.3.b.(2)(d) requires the Copermittees to describe the funding and/or resources necessary to implement these optional regional or multi-jurisdictional strategies. This information may provide interested groups and members of the public an understanding of the resources that they could provide or assist in obtaining to implement these optional regional or multi-jurisdictional strategies.

Provision B.3.b.(3) requires the Copermittees to develop and include schedules in the Water Quality Improvement Plan for implementing the water quality improvement strategies identified under Provisions B.3.b.(1) and B.3.b.(2). The schedule for implementing the water quality improvement strategies will be used by the Copermittees and San Diego Water Board to measure and demonstrate the progress of the Copermittees' implementation efforts toward reducing pollutants in storm water discharged from the MS4 to the MEP, and eliminating illicit non-storm water discharges from entering the MS4.

Provision B.3.b.(4) provides the Copermittees in each Watershed Management Area the option of implementing watershed-specific structural BMP requirements for Priority Development Projects. Historically, storm water permits have included very specific performance standards for permanent, structural BMPs. These standards describe the expectation for the capture or treatment of pollutants and control of excessive flow before storm water is discharged from a site. The Copermittees were also allowed to develop waiver programs for Priority Development Projects to avoid implementing the structural BMPs; however, the waiver programs were not necessarily tied into any sort of holistic watershed strategy. The result is that implementation of BMP requirements is largely done on a site-by-site basis. This requires proper design on the part of the Priority Development Project and strict oversight on the part of the Copermittee.

Provision B.3.b.(4) promotes the evaluation of multiple strategies for water quality improvement, in addition to the implementation of permanent structural BMPs, on a watershed-scale versus the site-by-site approach. In a report issued by the Southern California Coastal Water Research Project (SCCWRP) and several other research institutions, the report emphasized that a successful hydromodification management program will involve watershed analysis as a first step, and that integrating multiple

watershed-based strategies is preferable over a site-by-site approach. Indeed, the report states that the watershed analysis "…*should lead to identification of existing opportunities and constraints that can be used to help prioritize areas of greater concern, areas of restoration potential, infrastructure constraints, and pathways for potential cumulative effects*."[22] Provision B.3.b.(4) promotes the findings and recommendations of the report by providing a pathway for Copermittees to develop an integrated approach to their land development programs.

Under Provision B.3.b.(4), the Copermittees in a Watershed Management Area must first perform an analysis by gathering as much information pertaining to the physical characteristics of the Watershed Management Area as possible. This includes, for example, identifying potential areas of coarse sediment supply, present and anticipated future land uses, and locations of physical structures within receiving streams and upland areas that affect the watershed hydrology (such as bridges, culverts, and flood management basins). Once this information is collected, the Copermittees must produce GIS layers (maps) that include this information.

From there, the Copermittees must use the results of the Watershed Management Area Analysis to identify and compile a list of candidate projects that could potentially be used as alternative compliance options for Priority Development Projects. Such projects include, for example, opportunities for stream or riparian area rehabilitation, opportunities for retrofitting existing infrastructure to incorporate storm water retention or treatment, and opportunities for regional BMPs, among others. Once these candidate projects are identified, Copermittees may allow Priority Development Projects to fund, partially fund, or completely implement these candidate projects. The Copermittees must first find that implementing such a candidate project would provide greater overall benefit to the watershed than requiring implementation of the structural BMPs onsite, and also enter into a voluntary agreement with the Priority Development Project that authorizes this arrangement. The Copermittees may use Provision B.3.b.(4) as both 1) a mechanism to reach their stated goals of the Water Quality Improvement Plan by using Priority Development Projects to either fund or implement projects that will provide water quality benefit, and 2) an alternative to requiring strict adherence to the structural BMP design standards.

Additionally, Provision B.3.b.(4) allows the Copermittees to use the results of the Watershed Management Area Analysis to identify areas within the Watershed Management Area where it is appropriate to allow Priority Development Projects to be exempt from the hydromodification management BMP performance requirements. Provision E.3.c.(2) already allows exemptions for Priority Development Projects that discharge to a conveyance channel whose bed and bank are concrete lined from the point of discharge to an enclosed embayment or the Pacific Ocean. However, there may be cases where further exemptions are warranted. The Copermittees may identify such cases on a watershed basis and include them in the Watershed

[22] 2012. ED Stein, F Federico, DB Booth, BP Bledsoe, C Bowles, Z Rubin, GM Kondolf, A Sengupta. Technical Report 667. Southern California Coastal Water Research Project. Costa Mesa, CA.

Management Area Analysis; however, they must provide the supporting rationale to support all claims for exemptions.

Provision B.3.b.(4) provides an innovative pathway for Copermittees to regulate their land development programs by allowing alternative compliance in lieu of implementing structural BMPs on each and every Priority Development Project. This approach facilitates the integration of watershed-scale solutions for improving overall water quality and assisting Copermittees to achieve their stated goals of the Water Quality Improvement Plan. The San Diego Water Board understands, however, that undertaking this approach, which involves extensive planning, could be resource intensive for the Copermittees. Therefore, the Watershed Management Area Analysis is optional and not a requirement. The Copermittees can choose not to perform the watershed planning and mapping exercise described in Provision B.3.b.(4), and instead choose to require strict implementation of the structural BMPs onsite, pursuant to Provision E.3.b.

Provision B.4 (Water Quality Improvement Monitoring and Assessment) requires the Copermittees to develop an integrated monitoring and assessment program to track the progress of the Water Quality Improvement Plan toward meeting the implementation goals and schedules, and improving the water quality of the Watershed Management Area. Provision B.4 is the part of the Water Quality Improvement Plan where the Copermittees describe the monitoring data that will be collected, which is not only necessary to implement the "iterative approach" required by Provision A.4, but inform the adaptive management and "*comprehensive planning process*" that allows the Copermittees to make adjustments and modifications to the Water Quality Improvement Plans and the jurisdictional runoff management programs.

Provision B.4 requires the Copermittees, at a minimum, to include the requirements of Provision D as part of the water quality improvement monitoring and assessment program for the Water Quality Improvement Plan. The Copermittees, however, are not limited to the requirements of Provision D and may include additional monitoring and assessment methods to track progress toward improving water quality in the Watershed Management Area.

In addition to incorporating the requirements of Provision D, the water quality improvement monitoring and assessment program must incorporate any monitoring and assessment requirements specified for any applicable TMDLs included in Attachment E to the Order, and the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 for Watershed Management Areas with ASBS.

The monitoring and assessments required to be incorporated into the Water Quality Improvement Plan are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order.

Provision B.5 (Iterative Approach and Adaptive Management Process) requires the Copermittees to implement the iterative approach pursuant to Provision A.4 to adapt

the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a.

Provision B.5 requires the Copermittees in each Watershed Management Area to re-evaluate the highest priority water quality conditions and potential water quality improvement strategies, the water quality improvement goals, strategies and schedules, and the water quality improvement monitoring and assessment program and provide recommendations for modifying those elements to improve the effectiveness of the Water Quality Improvement Plan. The re-evaluation of the Water Quality Improvement Plan is part of the assessment requirements of Provision D.

Provision B.6 (Water Quality Improvement Plan Submittal, Updates, and Implementation) requires to Copermittees to submit, update, and implement the Water Quality Improvement Plans.

The requirements for the process to develop and submit the Water Quality Improvement Plans is described in more detail under the discussion for Provision F.1. The process will include several opportunities for the public to provide input during the development of the Water Quality Improvement Plans. The process for updating the Water Quality Improvement Plans is described in more detail under the discussion for Provision F.3.c. Upon acceptance of the Water Quality Improvement Plan and updates, the Copermittees are required to immediately begin implementing the Water Quality Improvement Plan and subsequent updates.

The Water Quality Improvement Plan is expected to be a dynamic document that will evolve over time. The Water Quality Improvement Plan is also expected to be a long term plan that focuses the Copermittees' efforts and resources on a limited set of priority water quality conditions, with the ultimate goal of protecting all the beneficial uses of the receiving waters within the Watershed Management Area from impacts that may be caused or contributed to by MS4 discharges. As the Copermittees collect data, implement their jurisdictional runoff management programs, and review the results from their water quality improvement monitoring and assessment program, the Water Quality Improvement Plan is expected to be continually reviewed and updated until compliance with Provisions A.1.a, A.1.b, and A.2.a is achieved.

However, in specific cases supported by robust analytical documentation the implementation of the Water Quality Improvement Plans may demonstrate that TMDLs are not necessary for identified impaired water bodies within the Watershed Management Area if the analytical record demonstrates that technology-based effluent limitations required by the CWA, more stringent effluent limitations required by state, local, or federal authority, and/or other pollution control requirements (e.g., best management practices) required by local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time.[23]

[23] 40 CFR 130.7(b)(1)

The San Diego Water Board submits an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. According to USEPA guidance for the Integrated Report,[24] water bodies are placed in one of five categories. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 are placed on the 303(d) List.

Category 4 in the Integrated Report is for water bodies where available data and/or information indicate that at least one beneficial use is not being supported or is threatened, but a TMDL is not needed.[25] Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

Impaired water bodies can be included in Category 4a if a TMDL has been adopted and approved. The TMDLs in Attachment E to the Order implement the requirements of the TMDLs adopted by the San Diego Water Board, and approved by the State Water Board and USEPA. The water bodies in Attachment E will be included in Category 4a in the Integrated Report and removed from the 303(d) List.

Impaired water bodies can be included in Category 4b if there are *acceptable* "pollution control requirements" required by a local, state or federal authority stringent enough to implement applicable water quality standards within a reasonable period of time (e.g., a compliance date is set). When evaluating whether a particular set of pollution controls are "requirements," the USEPA considers a number of factors, including: (1) the authority (local, state, federal) under which the controls are required and will be implemented with respect to sources contributing to the water quality impairment (examples may include: self-executing state or local regulations, permits, and contracts and grant/funding agreements that require implementation of necessary controls), (2) existing commitments made by the sources and completion or soon to be completed implementation of the controls (including an analysis of the amount of actual implementation that has already occurred), (3) the certainty of dedicated funding for the implementation of the controls, and (4) other relevant factors as determined by USEPA depending on case-specific circumstances.[26]

[24] USEPA, 2005. Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act
[25] Ibid
[26] Ibid

Impaired water bodies can be included in Category 4c if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution. Pollution, as defined by the CWA is "the man-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of water."[27] In other cases, pollution does not result from a pollutant and a TMDL is not required. Examples of circumstances where an impaired segment may be placed in Category 4c include segments impaired solely due to lack of adequate flow, stream channelization, or hydromodification. In these situations, there may be water quality management actions that can address the cause(s) of the impairment, but a TMDL may not be required to implement the actions.

The Water Quality Improvement Plans will require the implementation of pollution controls and water quality management actions (i.e. water quality improvement strategies) which can result in the attainment of water quality standards in water bodies impaired by discharges from the Copermittees' MS4s. The Water Quality Improvement Plans also include requirements that are expected to attain water quality standards in a reasonable period of time. The San Diego Water Board considers the Water Quality Improvement Plans to be a commitment by the Copermittees to develop, plan, budget for, and implement pollution controls that will attain water quality standards in receiving waters in a reasonable period of time, or as soon as possible. The results of the Copermittees' efforts in implementing the Water Quality Improvement Plans can be used to re-evaluate the condition of the impaired water bodies during the next update to the 303(d) List.

After the Copermittees submit the Water Quality Improvement Plans and demonstrate that water quality standards are being attained or will be attained in a reasonable period of time, the San Diego Water Board may re-evaluate the water bodies on the 303(d) List. These water bodies on the 303(d) List may be re-evaluated and placed into Category 4b or Category 4c in the Integrated Report. The water bodies placed in Category 4b or Category 4c in the Integrated Report must show a record that the water bodies are attaining water quality standards or supporting the identified beneficial uses, or will attain water quality standards or support identified beneficial uses in a reasonable period of time, in order for the water bodies to be appropriately removed from the 303(d) List.

[27] CWA section 502(19)

C. Action Levels

Purpose: Provision C includes requirements for the Copermittees to identify and include numeric action levels in the Water Quality Improvement Plan to direct and focus the Copermittees' jurisdictional runoff management program implementation efforts for controlling MS4 discharges to receiving waters.

***Discussion*:** Under Provision C, the numeric action levels required are for non-storm water discharges and storm water discharges. The non-storm water action levels (NALs) are applicable to non-storm water discharges from the Copermittees' MS4s, which can occur year-round. The storm water action levels (SALs) are applicable to storm water discharges from the Copermittees' MS4s, which occur during the rainy season defined as the period between October 1 and April 30.

The action levels required by Provision C are based on the action level requirements that were developed and incorporated into Order Nos. R9-2009-0002 and R9-2010-0016, the Orange County and Riverside County MS4 Permits, respectively. The Fact Sheets for these Orders provide detailed discussions about the development of the numeric NALs and SALs included in this Order.

Order Nos. R9-2009-0002 and R9-2010-0016 required the Copermittees to perform prescribed actions if the NALs or SALs are exceeded. The actions required under Order Nos. R9-2009-0002 and R9-2010-0016 generally included conducting additional monitoring and source investigations when a discharge from the MS4 is observed to exceed one or more NALs and/or SALs.

For this Order, however, the action levels of Provision C are to be used by the Copermittees to prioritize the actions to be implemented as part of the Water Quality Improvement Plan. Monitoring data collected by the Copermittees from MS4 outfalls will be compared with the NALs and SALs. Exceedances of the NALs and SALs will not require the Copermittees to immediately identify sources causing exceedances, but will provide some numeric indicator levels that can give the Copermittees a way to measure the relative severity of a pollutant contributing to receiving water quality impacts.

NALs and SALs must be included in the Water Quality Improvement Plans to be used by the Copermittees in directing and focusing their water quality improvement strategies. The Copermittees are expected to utilize the NALs and SALs to help focus their implementation efforts on addressing pollutants that have the most significant potential or observed impacts to receiving waters. The NALs and SALs will be used as part of the MS4 discharges assessments required under Provision D.4.b. The NALs and SALs may also be used by the Copermittees as the numeric goals to be achieved in MS4 discharges and/or receiving waters as the Water Quality Improvement Plans are implemented.

More specific and detailed discussions of the requirements of Provision C are provided below.

Provision C.1 (Non-storm Water Action Levels) requires the Copermittees to incorporate NALs into the Water Quality Improvement Plan for pollutants and/or constituents that are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions identified in the Water Quality Improvement Plan related to non-storm water discharges from the MS4s. NALs generally must be consistent with the water quality objectives found within the Basin Plan.

The NALs have been included to ensure that the Copermittees are implementing and complying with several requirements of the MS4 permit. The federal CWA requires permits for municipal storm sewer systems to "*effectively prohibit non-storm water discharges into the storm sewers*." The federal NPDES regulations, which were promulgated to implement the CWA requirements for discharges from municipal storm sewers, require a program to address illicit discharges, which are non-storm water discharges. Provision A.1.b prohibits "*[n]on-storm water discharges into MS4s*" unless the non-storm water discharge authorized by a separate NPDES permit. The NALs will be used as part of the illicit discharge detection and elimination program required pursuant to Provision E.2, as well as part of the MS4 discharges assessments required pursuant to Provision D.4.b.

Provision A.1.a prohibits non-storm water discharges from the MS4 from "*causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state.*" In addition, pursuant to Provision A.2.a, non-storm water discharges "*must not cause or contribute to the violation of water quality standards in any receiving waters*."

Ideally, the Copermittees' jurisdictional runoff management programs will eliminate all non-storm water discharges entering the MS4s within their jurisdictions. The complete elimination of non-storm water discharges to the Copermittees' MS4s would be in compliance with the CWA requirements for non-storm water discharges, as well as the prohibitions and limitations of Provisions A.1.a and A.2.a.

The federal regulations, however, also refer to several non-storm water discharge categories that must be addressed as illicit discharges if they are found to be a source of pollutants. The federal regulations thus identify some non-storm water discharges that are not required to be addressed as illicit discharges if they are not a source of pollutants (e.g. non-storm water discharges specified in Provisions E.2.a.(1)-(5)). Thus, these regulations imply that some non-storm water discharges into and from the MS4 may occur even if non-storm water discharges are "effectively" prohibited by the Copermittees.

If the source of a non-storm water discharge is identified as a category of non-storm water specified in Provisions E.2.a.(1)-(5), the NALs can be used to determine the category of non-storm water discharges is a source of pollutants. For other non-storm

water discharges not specified in Provisions E.2.a.(1)-(5), the CWA requires those discharges to be "*effectively"* prohibited by removing the discharge to the MS4 through enforcement of the Copermittees' legal authority established under "*ordinance, order or similar means*" to prohibit illicit discharges to the MS4s.

If there are non-storm water discharges that are not required to be addressed as illicit discharges, those discharges must comply, at a minimum, with the discharge prohibitions and receiving water limitations of Provision A. Thus, the non-storm water discharges from the MS4 must be at levels that will not cause or contribute to a condition of pollution, contamination, or nuisance (Provision A.1.a), and must not cause or contribute to a violation of water quality standards in receiving waters (Provision A.2.a) to be consistent with the discharge prohibitions and receiving water limitations of Provisions A.1.a and A.2.a.

Furthermore, the San Diego Region has predominantly intermittent and ephemeral rivers and streams which vary in flow volume and duration at spatial and temporal scales. For most of these river and stream systems, non-storm water discharges from the MS4 are likely to be the most significant or the only source contributing to surface flows present within the receiving water, especially during the dry season.

Therefore, because of the prohibitions and limitations of Provision A.1.a and A.2.a, and the likelihood that non-storm water discharges from the MS4 are the most significant or only source contributing to surface flows present within the receiving water, NALs generally must be consistent with the water quality objectives found within the Basin Plan. Non-storm water discharges that are meeting the NALs would not be expected to cause or contribute to an exceedance of water quality objectives in receiving waters, which would be consistent with the discharge prohibitions and receiving water limitations of Provisions A.1.a and A.2.a.

Exceedances of the NALs would then provide an indication of the relative severity of a pollutant in non-storm water discharges from the MS4 contributing to potential or observed receiving water quality impacts. The relative severity or significance of a pollutant in non-storm water discharges from the MS4 will provide the Copermittees a valuable source of information that can be used to identify priority water quality conditions within a Watershed Management Area and within each Copermittee's jurisdiction.

Tables C-1 through C-4 under Provision C.1.a specify numeric NALs for several parameters or pollutant constituents for non-storm water discharges from the MS4 to several water body types. The NALs for MS4 discharges given under Provision C.1.a are based on the water quality objectives for inland surface waters in the Basin Plan, and the water quality objectives for ocean waters in the Ocean Plan. The NALs for most of the metals were calculated based on the State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP). The NALs provided in Tables C-1

through C-4 must be included in the Water Quality Improvement Plans required to be developed pursuant to Provision B.

Provision C.1.b requires the Copermittees to identify NALs for pollutants and/or constituents, not specified in Provision C.1.a, which are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions of the Watershed Management Area related to non-storm water discharges from the MS4s. The NALs must be based on the water quality objectives in the Basin Plan. The NALs identified under Provision C.1.b must be included in the Water Quality Improvement Plan.

The San Diego Water Board recognizes that some of the NALs required pursuant to Provisions C.1.a and C.1.b may be exceeded more frequently than not. Thus, Provision C.1.c has been included in the Order to provide the Copermittees the option to develop secondary NALs that are set at levels greater than the levels required pursuant to Provisions C.1.a and C.1.b to further refine the prioritization and assessment of water quality improvement strategies for addressing non-storm water discharges to and from the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and from the MS4.

Provision C.2 (Storm Water Action Levels) requires the Copermittees to incorporate SALs into the Water Quality Improvement Plan for pollutants and/or constituents causing or contributing, or may be causing or contributing, to the highest priority water quality conditions identified in the Water Quality Improvement Plan related to storm water discharges from the MS4s.

The SALs have been included to ensure that the Copermittees are implementing and complying with several requirements of the MS4 permit. Provision A.1.a prohibits storm water discharges from the MS4 from "*causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state.*" In addition, pursuant to Provision A.2.a, storm water discharges "*must not cause or contribute to the violation of water quality standards in any receiving waters*."

Provision A.3.a, however, implicitly acknowledges that compliance with Provisions A.1.a and A.2.a cannot be achieved immediately for discharges of storm water from the MS4 by applying the MEP standard. Thus, Provision A.4 requires the Copermittees to implement an iterative approach to demonstrate that MEP is being achieved. This approach is supported by USEPA.

The federal CWA requires permits for municipal storm sewer systems to "*require controls to reduce the discharge of pollutants [in storm water] to the maximum extent practicable*, *including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants.*" MEP is an ever-evolving, flexible, and advancing concept. As knowledge about controlling storm water runoff

and discharges evolves, so does the knowledge which constitutes MEP. Reducing the discharge of storm water pollutants from the MS4 to the MEP requires the Copermittees to assess their jurisdictional runoff management programs and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP. The SALs provide the Copermittees measureable goals that may be used to demonstrate the achievement of MEP for reducing pollutants in storm water discharges from the MS4. The SALs will be used as part of the MS4 discharges assessments required under Provision D.4.a.

In June of 2006, the State Water Board's Blue Ribbon Storm Water Panel released its report titled "*The Feasibility of Numerical Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities*." In the recommendations, the Blue Ribbon panel proposed storm water effluent limitations which are computed using statistical based population approaches. The SALs specified in Table C-5 under Provision C.2.a were developed from a regional subset of nationwide Phase I MS4 data by using USEPA Rain Zone 6 (arid west) data.[28] Additionally, utilization of regional data is appropriate due to the addition of data into the nationwide Phase I MS4 monitoring dataset in February 2008. This additional data increased the number of USEPA Rain Zone 6 samples to more than 400, and included additional monitoring events within Southern California.

Utilizing data from USEPA Rain Zone 6 resulted in SALs which closely reflect the environmental conditions experienced in the San Diego Region. The localized subset of data includes sampling events from multiple Southern California locations including Orange, San Diego, Riverside, Los Angeles, and San Bernardino Counties. The dataset includes samples taken from highly built-out impervious areas and from storm events representative of Southern California conditions.

The SALs for cadmium, copper, lead and zinc require the measurement of hardness and to provide more specificity in the assessment of samples with SALs for total metal concentrations. While USEPA Rain Zone 6 data include a large sample size for concentrations of total metals, the impact the concentration will have on receiving waters will vary with receiving water hardness. Since it is the goal of the SALs, through the iterative process and MEP standard, to have MS4 storm water discharges meet all applicable water quality objectives, the hardness of the receiving water should be used when assessing the total metal concentration of a sample.

Thus, when there is an exceedance of a SAL for a metal, the Copermittee must determine if that exceedance is above the existing applicable water quality objectives based upon the hardness of the receiving water. The water quality objectives Copermittees must use to assess total metal SAL exceedances are the California Toxic Rule (CTR) and USEPA National Recommended Water Quality Criteria for Freshwater Aquatic Life 1 hour maximum concentrations. The 1 hour maximum

[28] Data used to develop SAL were obtained from http://rpitt.eng.ua.edu/Research/ms4/mainms4.shtml

concentration is to be used for comparison since it is expected to most replicate the impacts to waters of the State from the first flush following a precipitation event.

The statistically calculated SALs given in Table C-5 are at levels greater than the water quality objectives in the Basin Plan or Ocean Plan. Because the objective of the CWA is to "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*", meaning eventually pollutants in storm water discharges must be reduced to a level that cannot cause or contribute to an exceedance of water quality objectives in receiving waters, over time the SALs are expected to be reduced to a level that is based on the water quality objectives rather than statistical calculations. The San Diego Water Board will review the SALs as more data for discharges of storm water from the MS4s are collected, and revise them as conditions improve and the MEP standard advances. For the Water Quality Improvement Plans required under this Order, the SALs identified under Provision C.2.a must be included.

Provision C.2.b requires the Copermittees to identify SALs for pollutants and/or constituents, not specified in Provision C.2.a, which are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions of the Watershed Management Area related to storm water discharges from the MS4s. The SALs identified under Provision C.2.b must be included in the Water Quality Improvement Plan.

The San Diego Water Board recognizes that some of the SALs required pursuant to Provisions C.2.a and C.2.b may be exceeded more frequently than not. Thus, Provision C.2.c has been included in the Order to provide the Copermittees the option to develop secondary SALs that are set at levels greater than the levels required pursuant to Provisions C.2.a and C.2.b to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s.

D. Monitoring and Assessment Program Requirements

Purpose: Provision D includes minimum monitoring and assessment requirements that must be developed and implemented by the Copermittees as part of the Water Quality Improvement Plans. Implementation of the monitoring and assessment requirements of Provision D will allow the Copermittees to demonstrate that the requirements of the CWA to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP are being achieved. Implementation of the monitoring and assessment requirements of Provision D will also allow the Copermittees and the San Diego Water Board to track improvements to the water quality in the San Diego Region. The monitoring and assessment program requirements are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order.

***Discussion*:** The San Diego Water Board recognized that changes to the monitoring and assessment requirements of the Fourth Term Permit were necessary to improve the usefulness and usability of monitoring data collected by the Copermittees to support their jurisdictional storm water programs more efficiently and with increased effectiveness. The data collected are needed to better inform the Copermittees' understanding of the physical, chemical, and biological condition of the receiving waters and the quality of the MS4 discharges. The monitoring program needs to provide opportunities for the Copermittees to integrate regional monitoring efforts into municipal storm water monitoring requirements to provide a cost-effective approach to monitoring and avoid duplication of efforts.

The requirements in Provision D were largely recommended by the Copermittees as an outcome of the San Diego Water Boards Focused Meeting process. The monitoring and assessment program requirements now require collection of more specific information necessary for each Copermittee to adapt its jurisdictional runoff management program in such a way that focuses resources on a watershed's highest priority water quality conditions. The monitoring and assessment program will require the Copermittees to collect data that can be utilized to answer both watershed level management questions (e.g. Are the chemical, physical, and biological conditions of a receiving water protective, or likely protective of beneficial uses?), and specific jurisdictional runoff management program activity questions (e.g. Are the water quality improvement strategies of the jurisdictional program effectively eliminating non-storm water discharges to the MS4?).

The monitoring data collected and assessment information that will be reported to the San Diego Water Board are necessary to determine if the Copermittees are complying with the prohibitions and limitations of Provision A. The required monitoring and assessments that must be reported to the San Diego Water Board will be utilized for three purposes:

(1) Inform the Copermittees, San Diego Water Board, and the public on the progress of the Copermittees' efforts to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP;

(2) Inform the Copermittees, San Diego Water Board, and the public on the condition of water bodies receiving discharges from the Copermittees' MS4, and the progress of the Copermittees' water quality improvement implementation efforts toward improving the receiving water quality; and

(3) Inform the Copermittees, the San Diego Water Board, and the public on the effectiveness of the Water Quality Improvement Plan toward achieving (1) and (2).

The monitoring and assessment information reported pursuant to Provision F is also expected to be key to the iterative approach and adaptive management process required under Provision A.4 and implemented through the Water Quality Improvement Plan required under Provision B. As required by Provision A.4, the iterative approach and adaptive management process is required if the Copermittees cannot meet the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c, and/or A.2.a under the present conditions.

Provision D provides the minimum monitoring and assessment requirements that must be included in each Water Quality Improvement Plan to be developed and implemented by the Copermittees. The Copermittees, however, are not limited to the requirements of Provision D and may include additional methods to track progress toward improving water quality in a Watershed Management Area.

More specific and detailed discussions of the requirements of Provision D are provided below.

<u>Provision D.1 (Receiving Water Monitoring Requirements)</u> specifies the minimum receiving water monitoring that the Copermittees must conduct within the Watershed Management Area and include as part of the Water Quality Improvement Plan.

Provision D.1 establishes minimum monitoring requirements that must be conducted by the Copermittees within each Watershed Management Area. Provision D.1 requires the Copermittees to collect and develop the data and information necessary to determine potential impacts to the beneficial uses in the receiving waters due to discharges from the MS4s. The monitoring required under Provision D.1 will also provide the data that will allow the Copermittees to gauge the effectiveness and progress of its Water Quality Improvement Plan implementation efforts toward improving the quality of receiving waters.

The receiving water monitoring requirements of Provision D.1 are focused primarily on monitoring the conditions and response of the receiving waters to the Copermittees'

collective implementation efforts to reduce receiving water impacts that may be caused by the discharges from the MS4s. The preference of the San Diego Water Board is for the Copermittees to spend their resources achieving tangible and observable improvements in receiving water conditions instead of collecting samples and analyzing data that has consistently indicated that receiving water conditions are degraded and require improvement. In general, the ability to measure potential improvements in receiving water conditions due to any actions implemented by the Copermittees as part of the Water Quality Improvement Plan may require several years before a response can be observed. Thus, the frequency of collecting receiving water monitoring data has been kept to a minimum.

During the transitional period between adoption of this Order and San Diego Water Board acceptance of a Water Quality Improvement Plan, the Copermittees must conduct receiving water monitoring in accordance with Provision D.1.a. This approach to collecting receiving water data is different from what was required in the Fourth Term Permits, but one that truly embraces the concept of an integrated, cost-effective, streamlined receiving water monitoring approach.

Provision D.1.a requires Copermittees to continue performing the receiving water monitoring programs required in Order Nos. R-2007-0001, R9-2009-002, and R9-2010-0016; plus participation in: hydromodification management plan monitoring approved by the San Diego Water Board, monitoring plans as part of load reduction plans (either Bacteria Load Reduction Plans or Comprehensive Load Reduction Plans) for TMDLs in Attachment E of the Order, Storm Water Monitoring Coalition Regional Monitoring, Southern California Bight Regional Monitoring, Sediment Quality Monitoring, and ASBS Monitoring as applicable to a Watershed Management Area.

Provision D.1.a also provides an opportunity for the Copermittees to use third party data to meet receiving water monitoring requirements where feasible. Allowing the Copermittees to use the data currently collected through its participation in existing regional receiving water programs and that of third parties provides an efficiency of resources in obtaining the data necessary to inform the Copermittees and the San Diego Water Board about the physical, chemical, and biological conditions of the receiving waters, which can also help to focus the receiving water monitoring during the implementation of the Water Quality Improvement Plan. Once a Water Quality Improvement Plan is developed for a Watershed Management Area in compliance with Provision B of this Order, the transitional period is over and Copermittees are required to conduct receiving water monitoring according to the requirements of Provisions D.1.b-e.

Provision D.1.b requires each Copermittee to identify at least one long term receiving water monitoring station to be representative of receiving water quality within each Watershed Management Area. Long term receiving water monitoring stations can be located at any existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees. The requirements under Provision D.1.b. are

consistent with 40 CFR 122.26(d)(2)(iii)(D), which specifies that a "*monitoring program for representative data collection for the term of the permit*" may include "*instream locations.*" For each Watershed Management Area, at least one long term watershed monitoring station is required to be established and monitored. The Copermittees may choose to establish additional long term monitoring stations where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

Provision D.1.b. requires the Copermittees to locate the long term receiving water monitoring station at one of these existing receiving water monitoring stations to provide the Copermittees an opportunity to experience monitoring cost savings while continuing to collect the necessary data to assess the status and trends of receiving water quality conditions in 1) coastal water, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under both dry weather and wet weather conditions. Ideally these stations will continue to be monitored as part of the receiving water monitoring for each Watershed Management Area to maintain a consistent set of locations and a period of data that can be built upon with the monitoring required under this Order.

The receiving water monitoring requirements are separated into monitoring required during dry weather conditions pursuant to Provision D.1.c, and wet weather conditions pursuant to Provision D.1.d.

At each long term monitoring station the Copermittees must conduct at least three dry weather monitoring events as required pursuant to Provision D.1.c and at least three wet weather monitoring events as required pursuant to Provision D.1.d per permit term. Provisions D.1.c and D.1.d require the Copermittees to monitor priority water quality conditions identified in the Water Quality Improvement Plan, constituents listed as causing impairment of receiving waters in the Watershed Management Area, applicable NALs, toxicity, constituents listed in Tables D-2 and D-3, and constituents for implementation plans (e.g. Bacteria Load Reduction Plans and Comprehensive Load Reduction Plans). Required toxicity monitoring was changed to reflect an updated understanding of the unique challenges associated with sampling storm water for toxicity. Copermittees are required to sample storm water for toxicity during each dry weather and each wet weather event pursuant to Provision D.1.c.(4) and D.1.d.(4). Required toxicity monitoring is now consistent with the State Water Resources Control Board Policy for Toxicity Assessment and Control (Draft June 2012) and recently adopted MS4 permits for Caltrans and Los Angeles Water Board. Receiving water monitoring efforts in this Order have been streamlined to redirect resources to monitoring efforts that better support pollutant reduction solutions with an increasing emphasis on MS4 outfall monitoring, source identification and source abatement activities.

In addition to the receiving water monitoring requirements under Provisions D.1.b-d, Provision D.1.e requires the Copermittees participate in and/or conduct other types of receiving water monitoring. As recommended and requested by the Copermittees, Provision D.1.e.(1) requires the Copermittees to participate in existing regional monitoring, as applicable to each Watershed Management Area. Existing regional

monitoring includes monitoring conducted by the Storm Water Monitoring Coalition and for the Southern California Bight. Participation in and use of monitoring data collected from these existing regional water quality monitoring programs provide the Copermittees a greater opportunity for efficiency in the use of their resources to manage their storm water programs and those controllable discharges under their authority.

The State Water Resources Control Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part 1 Sediment Quality which became effective August 25, 2009 (Sediment Quality Monitoring Policy). Provision D.1.e.(2) requires any Copermittees with MS4 discharges to an enclosed bay or estuary to monitoring the sediments in the enclosed bay or estuary receiving water in accordance with the sediment quality monitoring procedures as prescribed in the Sediment Quality Monitoring Policy.

The State Water Board adopted Resolution No. 2012-0012 which approved exceptions to the California Ocean Plan for selected discharges into Areas of Special Biological Significance (ASBS), including special protections for beneficial uses. State Board Resolution No. 2012-0012 became effective on March 20, 2012, and Attachment B to the Resolution established limitations on point source storm water discharges to ASBS. Copermittees with MS4s that discharge to an ASBS must monitor its discharge to assure compliance with State Board Resolution No. 2012-0012 as required pursuant to Provision D.1.e.(3).

The San Diego Water Board is currently developing a regional monitoring strategy to assess the conditions of receiving waters in the San Diego Region. The monitoring requirements of Provision D.1 are expected to be incorporated or serve as a foundation of this regional monitoring strategy, but may require some modifications. When the San Diego Water Board develops an alternative regional monitoring strategy, the Copermittees will be required to participate in the development and implementation of the alternative regional monitoring program pursuant to Provision D.1.f.

Provision D.2 (MS4 Outfall Discharge Monitoring Requirements) specifies the minimum MS4 outfall discharge monitoring requirements that the Copermittees must incorporate and implement as part of the Water Quality Improvement Plan.

The dry weather MS4 outfall discharge monitoring requirements are included under Provisions D.2.a.(2) and D.2.b. The dry weather MS4 outfall discharge monitoring requirements are part of the "*program, including a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer*" required by 40 CFR 122.26(d)(2)(iv)(B), which is expected to achieve compliance with the CWA section 402(p)(3)(B)(ii) statutory requirement for municipal storm water permits to require the Copermittees to "*effectively prohibit non-storm water discharges into the storm sewers*." The dry weather MS4 outfall discharge monitoring data

collection requirements are based on requirements under 40 CFR 122.26(d)(1)(iv)(D) and 122.26(d)(2)(iv)(B)(3).

The dry weather MS4 outfall discharge monitoring requirements are designed to provide wide spatial and temporal coverage of each jurisdiction to better understand the extent and magnitude of non-storm water discharges to receiving waters, and make a distinction between persistent and transient non-storm water flows. This information is expected to allow each Copermittee to focus its resources on eliminating and controlling the highest priority threats to receiving water quality, as well as integrating other elements of the storm water programs (e.g. complaint call response) and third party data to efficiently and effectively assist in efforts to eliminate non-storm water discharges.

The dry weather MS4 outfall discharge monitoring requirements of Provision D.2.a.(2) and D.2.b are separated into monitoring required before and after the San Diego Water Board accepts the Copermittees' Water Quality Improvement Plan. Outfall monitoring conducted prior to acceptance of the Water Quality Improvement Plan is referred to in the Order as Transitional MS4 Outfall Discharge Monitoring. Provision D.2.a.(2) includes the transitional dry weather MS4 outfall discharge monitoring requirements.

The requirements under Provision D.2.a.(2) are based on the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B), which include the requirements for a monitoring program to identify, detect, and eliminate illicit connections and illegal discharges to the MS4s. The federal regulations (40 CFR 122.26(d)(1)(iv)(D)) require the monitoring program to include "*a field screening analysis for illicit connections and illegal dumping [that]…[a]t a minimum, include[s] a narrative description, for either each field screening point or major outfall, of visual observations made during dry weather periods.*" The federal regulations (40 CFR 122.26(d)(1)(v)(B)) require the monitoring program to include "*inspection procedures and methods for detecting and preventing illicit discharges, and describe areas where this program has been implemented.*" Furthermore, the monitoring program is required by federal regulations (40 CFR 122.26(d)(2)(iv)(B)) to include "*a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer.*"

Dry weather transitional MS4 outfall discharge monitoring requires each Copermittee to field screen (inspect) its major MS4 outfalls to classify the MS4 outfall locations as having persistent dry weather flows, transient dry weather flows, or no dry weather flows. To account for the variance in size of the 39 jurisdictions covered under this Order, the Copermittees recommended a tiered approach to the number of major MS4 outfalls that must be inspected. Provision D.2.a.(2)(a) provides a tiered approach to the number of major MS4 outfalls that must be visually inspected per jurisdiction as well as a minimum frequency each Copermittee must inspect each major MS4 outfall per year. This tiered approach is based on the total number of major MS4 outfalls within a Copermittees jurisdiction within each Watershed Management Area.

Based on the field screening, each Copermittee is required to make a determination whether any observed flowing, pooled, or ponded waters are transient or persistent flows. Based on this field screening information, other jurisdictional program information, and third party information, each Copermittee is required to prioritize the MS4 outfalls within its jurisdiction for follow up investigation and elimination of the non-storm water discharge, as part of its illicit discharge detection and elimination program required pursuant to Provision E.2. In accordance with the requirements of Provision E.2, each Copermittee is required to immediately investigate obvious illicit discharges (e.g. outfall discharges with unusual color, unusual odor, or high flows).

This approach allows a Copermittee to use all of its resources, as well as leverage resources and information provided by third parties, to effectively eliminate non-storm water discharges from its MS4 outfalls. If the source of the non-storm water discharge cannot be immediately eliminated, the Copermittee uses the persistent flow or transient flow classification along with other programmatic implementation data to prioritize the MS4 outfalls for future investigation. In accordance with the adaptive management approach deployed throughout this Order, Provision D.2.a.(2)(c) requires each Copermittee to update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow. The requirement of Provision D.2.a.(2)(c) assures that each Copermittee is collecting data that can be used to demonstrate compliance with the CWA requirement that each Copermittee must implement a program to "*effectively prohibit non-storm water discharges into the [MS4]*" and with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

Provision D.2.b describes the dry weather MS4 outfall discharge monitoring required to be incorporated and implemented as part of the Water Quality Improvement Plan. Dry weather MS4 outfall discharge monitoring must be performed by each Copermittee to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. The emphasis of the dry weather MS4 outfall discharge monitoring required pursuant to Provision D.2.b is consistent with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

Provision D.2.b.(1) requires each Copermittee to continue field screening its major MS4 outfalls and identifying those with persistent flows and transient flows, as conducted during the transitional period (i.e. before the Water Quality Improvement Plan was developed). However, each Copermittee now has the flexibility to adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of non-storm water persistent flow discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan. In order to ensure a minimum number of outfalls are inspected, Provision D.2.b.(1) requires the number of visual

inspections be equal to the number of visual inspections required in the tiered inspection program pursuant to Provision D.2.a.(2)(a).

Provision D.2.b.(2)(b) requires each Copermittee to monitor a minimum of 5 major MS4 outfalls with persistent flows identified as the highest priorities within a Copermittee's jurisdiction, within each Watershed Management Area. In other words, Copermittees located in more than one Watershed Management Area must identify at least 5 major MS4 outfalls with persistent flows in its jurisdiction in each Watershed Management Area. If a Copermittee is located in more than one Watershed Management Area, and they have less than 5 major MS4 outfalls with persistent flows per jurisdictional area per Watershed Management Area, all of the major MS4 outfalls must be identified as high priority dry weather persistent flow MS4 outfalls. The Copermittees identified as Responsible Copermittees by a TMDL in Attachment E of the Order may need to monitor more than 5 dry weather major MS4 outfall locations to determine compliance with the requirements of the TMDL(s).

Monitoring must occur at the highest priority outfall locations at least semi-annually until the non-storm water discharges have been eliminated for three consecutive dry weather monitoring events; identified to be authorized by a separate NPDES Permit; or reprioritized to a lower priority. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized MS4 major outfall in the Copermittee's jurisdiction within the Watershed Management Area, unless there are no remaining qualifying major MS4 outfalls within the Copermittees jurisdiction. The Copermittees must continually update their dry weather persistent flow MS4 outfall discharge monitoring locations with the next highest priority non-storm water flow that have yet to be eliminated until all persistent and transient flows are eliminated or its threat reduced.

Non-storm water persistent flow MS4 outfall discharge monitoring data collected during each semi-annual monitoring event, must be collected and analyzed according to the requirements of Provision D.2.b.(2)(b)–(e). These monitoring requirements are consistent with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

The wet weather MS4 outfall discharge monitoring requirements are included under Provisions D.2.a.(3) and D.2.c. The wet weather MS4 outfall discharge monitoring requirements are necessary for the Copermittees to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable, using management practices, control techniques and system, design and engineering methods, and such other provisions which are appropriate*" required by 40CFR 122.26(d)(2)(iv), which is expected to achieve compliance with the CWA section 402(p)(3)(B)(iii) statutory requirement for municipal storm water permits to require "*controls to reduce the discharge of pollutants [in storm water] to the maximum extent practicable*." The wet weather MS4 outfall discharge monitoring data collection requirements are based on requirements under 40 CFR 122.26(d)(2)(iii), 122.26(d)(2)(iii)(A) and 122.26(d)(2)(iii)(A)(1)-(4), and 40 CFR 122.21(g)(7)(i)-(ii).

The wet weather MS4 outfall discharge monitoring requirements of Provision D.2.a.(3) and D.2.c are separated into monitoring required before and after the San Diego Water Board accepts the Copermittees' Water Quality Improvement Plan. Outfall monitoring conducted prior to acceptance of the Water Quality Improvement Plan is referred to in the Order as Transitional MS4 Outfall Discharge Monitoring. Provision D.2.a.(3) includes the transitional wet weather MS4 outfall discharge monitoring requirements.

Until the wet weather MS4 outfall discharge monitoring requirements of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board, the Copermittees must comply with the requirements of transitional wet weather MS4 outfall monitoring requirements pursuant to Provision D.2.a.(3). Provision D.2.a.(3) requires the Copermittees in each Watershed Management Area to sample, at least five of the major MS4 outfalls inventoried pursuant to Provision D.2.a.(1) once per wet season for the monitoring data required to be collected pursuant to Provision D.2.a.(3)(c)-(e). Provision D.2.a.(3) further requires at least one major MS4 outfall monitoring station be located in each Copermittee's jurisdiction within the Watershed Management Area.

At a minimum, the five sampling locations chosen must be representative of storm water discharges from residential, commercial, industrial, and typical mixed-use land uses present within a Watershed Management Area. The San Diego Water Board expects the Copermittees to extrapolate from these data to similar land uses throughout the Watershed Management Area to better inform the Water Quality Improvement Plan development process by prioritizing drainages for implementation of storm water control efforts required pursuant to Provision E.

Provision D.2.c describes the wet weather MS4 outfall discharge monitoring required to be included and implemented as part of the Water Quality Improvement Plan. Provision D.2.c provides the Copermittees the flexibility to adjust the wet weather MS4 outfall discharge monitoring locations and frequencies in the Watershed Management Area, as needed, to identify sources of pollutants in storm water discharges from MS4s in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan.

Although Provision D.2.c.(1) allows the Copermittees to adaptively manage the wet weather MS4 outfall discharge monitoring locations and frequencies, the provision requires a minimum of at least five wet weather outfall stations to be monitored. Provision D.2.c.(2) further allows the Copermittees to modify the monitoring frequency at each wet weather MS4 outfall station to meet the goals of the Water Quality Improvement Plan as long as the monitoring frequency occurs at least once per year and is at an appropriate frequency to identify sources of pollutants in storm water discharges, guide pollutant source identification efforts, or determine compliance with the requirements of the applicable TMDLs in Attachment E to the Order.

The wet weather MS4 outfall discharge monitoring requirements of Provisions D.2.c.(3) and D.2.c.(4) are the same as the transitional wet weather MS4 outfall discharge monitoring. In contrast, the requirements of Provision D.2.c.(5) are focused on collecting analytical data specific to the highest priority water quality conditions in the Watershed Management Area identified in the Water Quality Improvement Plan. The wet weather MS4 outfall discharge monitoring data collection requirements are consistent with the requirements under 40 CFR 122.26(d)(2)(iii), 122.26(d)(2)(iii)(A) and 122.26(d)(2)(iii)(A)(1)-(4), and 40 CFR 122.21(g)(7)(i)-(ii).

Provision D.3 (Special Studies) requires the Copermittees to develop special studies that will be conducted for each Watershed Management Area and the entire San Diego Region. Data collected pursuant to Provision D.3 is to be used by the Copermittees to improve the effectiveness of the strategies implemented by the jurisdictional runoff management programs toward achieving the numeric goals identified in the Water Quality Improvement Plans and ultimately achieve compliance with the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c, and A.2.a, which is consistent with the requirements of Provision A.4.

Special studies are often necessary to fill data gaps or provide more refined information that allow the Copermittees to better manage the generation or elimination of pollutants and discharges to and from the MS4. In the Fourth Term Permits, the Copermittees have been required to implement special studies as directed by the San Diego Water Board. The special studies required by this Order provide the Copermittees more flexibility to identify and implement special studies that will be most useful to improving the effectiveness of their jurisdictional runoff management programs.

Provision D.3.a.(1) requires the Copermittees to develop and conduct at least two special studies per Watershed Management Area, to be determined by the Copermittees. One of the two special studies may be accomplished through participation in a Regional Special Study required under Provision D.3.a.(2). The requirements provide the Copermittees great latitude in identifying and developing the special studies. Watershed Management Area special studies are required, at a minimum, to: (a) relate in some way to the highest water quality priorities identified by the Copermittees in the Water Quality Improvement Plan, (b) be conducted within the Watershed Management Area, and (c) include some form of participation (e.g. contribution of funds, personnel services, project management) by all the responsible Copermittees within the Watershed Management Area.

Examples of Watershed Management Area special studies might include, but are not limited to: (1) focused pollutant source identification studies, (2) BMP effectiveness and/or comparison studies, (3) pilot tests for new or emerging pollutant control methods, (4) receiving water pollutant or stressor source identification and/or mitigation studies, or (5) pollutant fate and transport studies. The Watershed Management Area special studies are expected to provide data that can be utilized by the Copermittees to improve the Water Quality Improvement Plan or implementation of

the Copermittees' jurisdictional runoff management programs to address the highest priority water quality conditions.

Provision D.3.a.(2) requires the Copermittees to develop at least one special study that will be conducted for the entire San Diego region. The regional special study is expected to provide data that can be utilized by the Copermittees to improve the Water Quality Improvement Plan or implementation of the Copermittees' jurisdictional runoff management programs to identify or address regional water quality concerns and priorities.

An example of a regional special study would be to develop and establish allowable exceedance frequencies of the bacteria water quality objectives for several types of water bodies, during different wet and dry weather conditions the San Diego region. The special study would be related to bacteria, which is a priority for the San Diego region due to the adoption of "*Bacteria TMDL Project I – Beaches and Creeks in the San Diego Region*." The study results could be used to inform the Copermittees and the San Diego Water Board about the indictor bacteria water quality objective exceedance frequencies that occur in natural or reference watersheds.

Provision D.4 (Assessment Requirements) specifies the assessments that the Copermittees are required to perform, based on the monitoring data collected, and will be reported as part of the Annual Report for the Water Quality Improvement Plan implementation. Provision D.4 requires the Copermittees assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c, and A.2.a.

Provision D.4 specifies the assessments that Copermittees must perform for each Watershed Management Area to assess the effectiveness of each Copermittee's jurisdictional runoff management program and the Water Quality Improvement Plan. The effectiveness of each Copermittee's jurisdictional runoff management program and Water Quality Improvement Plan is measured through these types of assessments: (a) Receiving Waters Assessments (b) MS4 Outfall Discharges Assessments, (c) Special Studies Assessments, and (d) Integrated Assessment of Water Quality Improvement Plan.

Provision D.4.a requires the Copermittees to assess the status of receiving water conditions annually during the transitional monitoring period (during development of the Water Quality Improvement Plan) and after acceptance of the Water Quality Improvement Plan. The monitoring data collected pursuant to Provision D.1 will be evaluated, among other information, to assess the condition of a Watershed Management Area's streams, coastal waters, enclosed bays, harbors, estuaries, and lagoons. The focus of the receiving waters assessments is to measure progress toward the objective of the CWA to "*restore and maintain the chemical, physical, and biological integrity of the Nation's waters*" as the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program are implemented within a Watershed Management Area. Provision D.4.a is consistent with 40 CFR

122.42(c)(7) which requires the Copermittees to annually report the *"[i]dentification of water quality improvements or degradation."*

Provision D.4.b includes the MS4 outfall discharges assessment requirements. The focus of MS4 outfall discharges assessments is to determine if the Copermittees' are implementing programs that comply with the requirements of the CWA for MS4 permits to "*effectively prohibit non-stormwater discharges into the storm sewers*" and "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable.*" The monitoring data collected pursuant to Provisions D.2 will be evaluated, among other information, to assess the effectiveness of the transitional MS4 outfall field screening monitoring, the implementation of the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program. The MS4 outfall discharge assessments consist of Non-Storm Water Discharges Reduction Assessments and Storm Water Pollutant Discharges Reduction Assessments.

The Non-Storm Water Discharges Reduction Assessments are how each Copermittee will demonstrate that its jurisdictional runoff management program implementation efforts are achieving the CWA requirement to "*effectively prohibit non-stormwater discharges into the storm sewers.*" Provision D.4.b.(1) requires each Copermittee to assess and report on its illicit discharge detection and elimination program required pursuant to Provision E.2 to reduce and effectively prohibit non-storm water and illicit discharges into the MS4 within its jurisdiction. The Non-Storm Water Discharges Reduction Assessments include specific assessment requirements applicable to each Copermittee.

As each Copermittee collects and analyzes the data collected pursuant to dry weather MS4 outfall discharges monitoring requirements of Provisions D.2.a.(2) and D.2.b, Provision D.4.b.(1) requires each Copermittee to assess the progress, assess the effectiveness of its current actions, and identify modifications necessary to increase the effectiveness of its actions toward reducing and eliminating non-storm water and illicit discharges to its MS4. The findings from these assessments are expected to be utilized by the Copermittee as part of its procedures to prioritize the non-storm water discharges that will be addressed by its Illicit Discharge Detection and Elimination program required pursuant to Provision E.2.

The assessment requirements of Provision D.4.a.(1) are consistent with 40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(3) which require "*procedures…to investigate portions of the separate storm sewer system that, <u>based on the results of the field screen, or other appropriate information</u> [emphasis added], indicate a reasonable potential of contain illicit discharges or other sources of non-storm water*" as part of a "*program…to detect and remove…illicit discharges and improper disposal into the storm sewer.*" The assessment requirements of Provision D.4.a.(1) are also consistent with 40 CFR122.42(c)(1) requires the Copermittees to annually report the "*status of implementing the components of the storm water management program that are established as permit conditions.*"

The Storm Water Pollutant Discharges Reduction Assessment is how the Copermittees in each Watershed Management Area will demonstrate that their jurisdictional runoff management program implementation efforts are achieving the CWA requirement to "*reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable*." Provision D.4.b.(2) requires the Copermittees in each Watershed Management Area to assess and report the progress of the Copermittees' efforts to reduce pollutants in storm water discharges from the MS4s to the MEP. The Storm Water Pollutant Discharges Reduction Assessments include specific assessment requirements during both the transitional monitoring period and after acceptance of the Water Quality Improvement Plan applicable to the Watershed Management Area and each Copermittee.

As the Copermittees collect and analyze the data collected pursuant to wet weather MS4 outfall discharges monitoring requirements of Provisions D.2.a.(3) and D.2.c, Provision D.4.b.(2) requires the Copermittees to assess runoff conditions during the transitional period, and the progress of the Water Quality Improvement Plan strategies toward reducing pollutants in storm water from the MS4 to the MEP. The findings from these assessments are expected to be utilized by the Copermittees to identify any modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify sources of pollutants in storm water discharges from the MS4s, as well as focus, modify, and improve the water quality improvement strategies implemented by each Copermittee within its jurisdiction to reduce pollutants in storm water discharges to the MEP.

The assessment requirements of Provision D.4.b.(2) are consistent with 40 CFR 122.26(d)(2)(iii)(B) which requires "*[e]stimates of the annual pollutant load of the cumulative discharges to waters of the United States from all identified municipal outfalls…during a storm event…accompanied by a description of the procedures for estimating constituent loads and concentrations, including any modeling, data analysis, and calculation methods.*" The assessment requirements of Provision D.4.a.(2) are consistent with 40 CFR 122.26(d)(2)(v) which requires that each Copermittee assesses the *"estimated reductions in loadings of pollutants from discharges of municipal storm sewer constituents from municipal storm sewer systems expected as the result of the municipal storm water quality management program."* The assessment requirements of Provision D.4.b.(2) are also consistent with 40 CFR122.42(c)(1) requires the Copermittees to annually report the "*status of implementing the components of the storm water management program that are established as permit conditions.*"

Provision D.4.c includes the special studies assessment requirements. Performing special studies are how the Copermittees will address data gaps identified during the development of and updates to the Water Quality Improvement Plan. The relevant findings from the special studies assessments are expected to be incorporated as part of the applicable receiving water assessments, MS4 outfall discharge assessments,

and integrated water quality improvement assessments required in Provision D.4.a, D.4.b, and D.4.d, respectively.

The assessment requirements in Provision D.4.d are part of the iterative approach and adaptive management process required by Provision A.4. The Copermittees are required to integrate the data collected pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to re-evaluate the Water Quality Improvement Plan.

The monitoring data collected pursuant to Provisions D.1 and D.2, and the results of the assessment required pursuant to Provisions D.4.a-c, will be used to determine whether the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program are effective, or require modifications or improvements to become more effective to achieve the requirements of the CWA. The assessments required by Provision D.4.d are consistent with 40 CFR 122.42(c)(1) which requires that the Copermittees to report the *"[t]he status of implementing the components of the storm water management program that are established as permit conditions."*

E. Jurisdictional Runoff Management Programs

Purpose: Provision E includes the requirements for the jurisdictional runoff management programs to be implemented by each of the Copermittees. Compliance with the requirements for the jurisdictional runoff management programs will allow the Copermittees to demonstrate that they are implementing programs to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP. The jurisdictional runoff management program document prepared by each Copermittee will also provide the details for implementing the water quality improvement strategies identified in the Water Quality Improvement Plan specifically within its jurisdiction.

***Discussion*:** Implementation of the jurisdictional runoff management program requirements under Provision E is how the Copermittees "*effectively prohibit non-stormwater discharges into the storm sewer,*" and outlines the "*controls to reduce the discharge of pollutants to the maximum extent practicable"* consistent with the federal regulations under 40 CFR 122.26. The jurisdictional runoff management program is part of the "*comprehensive planning process*" that is required pursuant to 40 CFR 122.26(d)(2)(iv). Where the Water Quality Improvement Plan is the "*comprehensive planning process*" on a Watershed Management Area scale, requiring "*intergovernmental coordination,*" the jurisdictional runoff management program document is the "*comprehensive planning process*" on a jurisdictional scale that should be coordinated with the other Copermittees in the Watershed Management Area to achieve the goals of the Water Quality Improvement Plan.

The jurisdictional runoff management program requirements are included to provide each Copermittee criteria that can be used to demonstrate that its storm water management program is implementing the "*comprehensive planning process*" within its jurisdiction to "*effectively prohibit non-stormwater discharges into the storm sewers,*" and to identify and implement the most effective "*controls to reduce the discharge of pollutants to the maximum extent practicable"* in accordance with the performance standards given in the CWA.

Provision E includes the requirements for each of the components that must be included in the Copermittee's jurisdictional runoff management program document that will be implemented by the Copermittee within its jurisdiction. Implementation of the components of each Copermittee's jurisdictional runoff management program must incorporate the water quality improvement strategies identified by each Copermittee in the Water Quality Improvement Plans, described pursuant to Provision B.3.b.(1)(a).

More specific and detailed discussions of the requirements of Provision E are provided below.

Provision E.1 (Legal Authority Establishment and Enforcement) requires each Copermittee to establish and enforce sufficient legal authority to control discharges to the MS4 within its jurisdiction.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system*" and be able to demonstrate that it can "*operate pursuant to legal authority established by statute, ordinance or series of contracts.*" Provision E.1.a describes the minimum legal authorities each Copermittee must establish for itself within its jurisdiction to control discharges to its MS4. The requirements of Provision E.1.a are consistent with the requirements set forth in 40 CFR 122.26(d)(2)(i)(A)-(F).

The certification statement required from each Copermittee by Provision E.1.b is included to provide the San Diego Water Board additional documentation that each Copermittee has established the legal authorities consistent with Provision E.1.a and 40 CFR 122.26(d)(2)(i)(A)-(F), and the Copermittee can "*operate pursuant to legal authority established by statute, ordinance or series of contracts.*"

Provision E.2 (Illicit Discharge Detection and Elimination) requires each Copermittee to implement an illicit discharge detection and elimination program to effectively prohibit non-storm water discharges to the MS4 by actively detecting and eliminating illicit discharges and disposal into its MS4.

Provision E.2 establishes the minimum requirements that each Copermittee must implement within its jurisdiction to effectively prohibit non-storm water discharges from entering its MS4. The federal CWA requires permits for municipal storm sewer systems to "*effectively prohibit non-storm water discharges into the storm sewers*." The federal regulations (40CFR122.26(d)(2)(i)(B)) require each Copermitee to establish the legal authority to prohibit illicit discharges to its MS4s. Under 40 CFR 122.26(d)(2)(iv)(B), each Copermittee must implement a "*program…to detect and remove…illicit discharges and improper disposal into the storm sewer.*" The federal NPDES regulations, under 40 CFR 122.26(b)(2), define illicit discharges as "*any discharge to a municipal separate storm sewer that is not composed entirely of storm water*." Thus, non-storm water discharges are not authorized to enter the MS4 and are considered to be illicit discharges, unless authorized by a separate NPDES permit.

The Phase I Final Rule clarifies that non-storm water discharges through an MS4 are not authorized under the CWA (55 FR 47995):

> "*Today's rule defines the term "illicit discharge" to describe any discharge through a municipal separate storm sewer system that is not composed entirely of storm water and that is not covered by an NPDES permit. Such illicit discharges are not authorized under the Clean Water Act. Section 402(p)(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…Ultimately, such non-storm water discharges through a municipal separate*

storm sewer must either be removed from the system or become subject to an NPDES permit."

The federal NPDES requirements for the program to address illicit discharges must include "*inspections, to implement and enforce an ordinance, orders, or other similar means to prevent illicit discharges to the MS4*." The federal NPDES regulations also reference several categories of "*non-storm water discharges or flows* [which] *shall be addressed where such discharges are identified…as sources of pollutants to waters of the United States*." The Phase I Final Rule (55 FR 48037) further clarified the requirements of 40 CFR 122.26(d)(2)(iv)(B)(1) as follows:

"*EPA is clarifying that section 402(p)(3)(B) of the CWA (which requires permits for municipal separate storm sewers to 'effectively' prohibit non-storm water discharges) does not require permits for municipalities to prohibit certain discharges or flows of nonstorm water to waters of the United States through municipal separate storm sewers in all cases*."

In previous iterations of the municipal storm water permits for the San Diego Region, these categories were simply listed and referred to as categories of non-storm water discharges "not prohibited" unless identified as a source of pollutants. The Copermittees have often referred to these categories as "exempt" discharges. In both cases, however, the language is inconsistent with the federal CWA and NPDES regulations. And, the clarification provided in the Phase I Final Rule does not specifically state that such discharges are "not prohibited" or "exempt" or in any way authorized. The federal NPDES regulations do, however, state that specific categories of non-storm water discharges must be "*addressed*" if identified as "*sources of pollutants to waters of the United States*."

The language of Provision E.2.a has been revised to be fully consistent with the language of the CWA and the requirements of the federal regulations under 40 CFR 122.26(d)(2)(iv)(B)(1). Provision E.2.a requires each Copermittee to address <u>all</u> types of non-storm water discharges into its MS4 as illicit discharges, <u>unless</u> the discharge is authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to Provisions E.2.a.(1) through E.2.a.(5). Only non-NPDES-permitted non-storm water discharges identified as a category of non-storm water discharges under Provisions E.2.a.(1) through E.2.a.(5) <u>and</u> *not identified as a source of pollutants* do not have to be addressed as illicit discharges. Categories of non-storm water discharges that meet the requirements of Provisions E.2.a.(1) through E.2.a.(5) do not have to be addressed by the Copermittee as illicit discharges.

Several of the non-storm water categories listed in 40 CFR 122.26(d)(2)(iv)(B)(1) have not been included in Provisions E.2.a.(1) through E.2.a.(5), including: street wash water, landscape irrigation, irrigation water, and lawn watering. Because these are no longer included within the categories listed under Provisions E.2.a.(1) through E.2.a.(5), the Copermittees must prohibit these types of non-storm water discharges

from entering the MS4. This is consistent with the clarification of 40 CFR 122.26(d)(2)(iv)(B)(1) in the Phase I Final Rule (55 FR 48037), which states:

> "*[T]he Director may include permit conditions that either require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*."

Street wash water is a category of non-storm water discharges that was removed when the Third Term Permits were issued. Street wash water is a source of several pollutants (e.g., metals, oil and grease, petroleum hydrocarbons, chlorinated solvents, sediment) which are generated during the street washing process. The removal of this category requires the Copermittees to prohibit this type of non-storm water discharge from entering the MS4.

The landscape irrigation, irrigation water, and lawn watering categories, collectively referred to hereafter as "over-irrigation" discharges, were removed from the list of non-storm water discharge categories in the Fourth Term Orange County and Riverside County Permits. Non-storm water discharges resulting from over-irrigation have been found to be a source of several types of pollutants (e.g., nutrients, bacteria, pesticides, sediment) in receiving waters. The San Diego Water Board and the Copermittees have identified categories of non-storm water discharges associated with over-irrigation as a source of pollutants and conveyance of pollutants to the MS4 and waters of the United States in the following documents:

- **SmartTimer/Edgescape Evaluation Program (SEEP) Grant Application**

  The State Water Board allocated grant funding to the SEEP project grant application submitted in 2006, which targeted irrigation runoff by retrofitting areas of existing development and documenting the conservation and runoff improvements. The basis of this grant project is that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 is a source and conveyance of pollutants. In addition, the grant application indicated that this alteration of natural flows is impacting the beneficial uses of waters of the state and U.S. Results from the study indicate that that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 *is* a source and conveyance of pollutants. The results of this study can be applied broadly to any area where over-irrigation takes place. The grant application included the following statements:

  > "*Irrigation runoff contributes flow & pollutant loads to creeks and beaches that are 303(d) listed for bacteria indicators.*"
  >
  > "*Regional program managers agree that the reduction and/or elimination of irrigation-related urban flows and associated pollutant loads may be key to successful attainment of water quality and beneficial use goals as outlined in the San Diego Basin Plan and Bacteria TMDL over the long term.*"

"*Elevated dry-weather storm drain flows, composed primarily … of landscape irrigation water wasted as runoff, carry pollutants that impair recreational use and aquatic habitats all along Southern California's urbanized coastline. Storm drain systems carry the wasted water, along with landscape derived pollutants such as bacteria, nutrients and pesticides, to local creeks and the ocean. Given the local Mediterranean climate, excessive perennial dry season stream flows are an unnatural hydrologic pattern, causing species shifts in local riparian communities and warm, unseasonal contaminated freshwater plumes in the near-shore marine environment.*"

- **2006-2007 Orange County Watershed Action Plan Annual Reports**

The Watershed Action Plan Annual Reports for the 2006-2007 reporting period were submitted by the County of Orange, Orange County Flood Control District and Copermittees within the San Juan Creek, Laguna Coastal Streams, Aliso Creek, and Dana Point Coastal Streams Watersheds. San Juan Creek, Laguna Coastal Streams, Aliso Creek and Dana Point Coastal Streams are all currently 303(d) listed as impaired for indicator bacteria within their watersheds and/or in the Pacific Ocean at the discharge points of their watersheds. The Orange County Copermittees, within their Watershed Action Strategy Table for fecal indicator bacteria included the following:

"*Support programs to reduce or eliminate the discharge of anthropogenic dry weather nuisance flow throughout the…watershed. Dry weather flow is the transport medium for bacteria and other 303(d) constituents of concern.*"

Additionally, they state that "*conditions in the MS4 contribute to high seasonal bacteria propagation in-pipe during warm weather. Landscape irrigation is a major contributor to dry weather flow, both as surface runoff due to over-irrigation and overspray onto pavements; and as subsurface seepage that finds its way into the MS4*."

- **Fiscal Year 2008 Carlsbad Watershed Urban Runoff Management Program Annual Report**

The Carlsbad Watershed Urban Runoff Management Program Annual Report for Fiscal Year 2008 was submitted by the Carlsbad Watershed Copermittees (Cities of Carlsbad, Encinitas, Escondido, Oceanside, San Marcos, Solana Beach, and Vista, and the County of San Diego). In the Annual Report, the Carlsbad Watershed Copermittees stated the following:

"The Carlsbad Watershed Management Area (WMA) collective watershed strategy identifies bacteria, sediment, and nutrients as high priority water quality pollutants in the Agua Hedionda (904.3 – bacteria and sediment), Buena Vista (904.2 – bacteria), and San Marcos Creek (904.5 – nutrients) Hydrologic Areas.

Bacteria, sediment, and nutrients have been identified as potential discharges from over-irrigation."

- **2007-2008 San Diego Bay Watershed Urban Runoff Management Program Annual Report**

  The San Diego Bay Watershed Urban Runoff Management Program 2007-2008 Annual Report was submitted by the San Diego Bay Watershed Copermittees (Cities of Chula Vista, Coronado, Imperial Beach, La Mesa, Lemon Grove, National City, and San Diego, the County of San Diego, the Port of San Diego, and the San Diego County Airport Authority). In Appendix D of the Annual Report, titled "Likely Sources of Pollutants," the San Diego Bay Watershed Copermittees identified over-irrigation of lawns as a pollutant generating activity from business and/or residential land uses for bacteria, pesticides, and sediment.

- **Copermittee Public Education Materials**

  The Orange County Public Works *Tips for Landscape & Gardening* public education brochure states: "*Fertilizers, pesticides and other chemicals that are left on yards or driveways can be blown or washed into storm drains that flow to the ocean. Overwatering lawns can also send materials into storm drains*."

  The Riverside County Flood Control and Water Conservation District *Landscape and Garden* public education brochure states: *"Soil, yard wastes, over-watering and garden chemicals become part of the urban runoff mix that winds its way through streets, gutters and storm drains before entering lakes, rivers, streams, etc. Urban runoff pollution contaminates water and harms aquatic life!"*

- **Los Penasquitos Lagoon Sedimentation/Siltation TMDL Technical Report**

  The Los Penasquitos Lagoon Sedimentation/Siltation TMDL technical report was prepared for the City of San Diego and USEPA in October 2010. The technical report was included as a technical supporting document attached to the Sediment TMDL for Los Penasquitos Lagoon staff report prepared by the San Diego Water Board, dated June 13, 2012. Under the Source Assessment section, the technical report states the following:

  "*Dry weather loading is dominated by nuisance flows from urban land use activities such as car washing, sidewalk washing, and lawn over-irrigation, which pick up and transport sediment into receiving waters.*"

These documents confirm that non-storm water discharges associated with over-irrigation are a source of pollutants and should be addressed as illicit discharges to the MS4. Prohibiting non-storm water discharges associated with over-irrigation, however,

is not a new requirement for the Copermittees because it is also consistent with and required by the Water Conservation in Landscaping Act (AB 1881, Laird).

The Water Conservation in Landscaping Act required the Department of Water Resources (DWR) to prepare a Model Water Efficient Landscape Ordinance for use by local agencies (e.g. the Copermittees). All local agencies were required to adopt a water efficient landscape ordinance by January 1, 2010. Local agencies could adopt the Water Efficient Landscape Ordinance developed by DWR, or an ordinance considered at least as effective as the Model Ordinance. The Water Efficient Landscape Ordinance includes a requirement that local agencies prohibit runoff from irrigation (§ 493.2):

> "*Local agencies shall prevent water waste resulting from inefficient landscape irrigation by* <u>*prohibiting runoff from leaving the target landscape*</u> *[emphasis added] due to low head drainage, overspray, or other similar conditions where water flows onto adjacent property, non-irrigated areas, walks, roadways, parking lots, or structures. Penalties for violation of these prohibitions shall be established locally*."

Furthermore, non-storm water discharges from over-irrigation not only transport and discharge pollutants to receiving waters, but are also a likely source of the dry weather flows causing changes to habitat within and along the receiving water bodies. Examples of habitat changes from the dry weather flows include perennialization of ephemeral streams, and conversion of saltwater and brackish water marsh habitats to freshwater marsh habitats (e.g. Los Penasquitos Lagoon). Both of these examples have resulted in the promotion of invasive species in several areas of the San Diego Region.

The removal of the over-irrigation discharges categories does not require the Copermittees to strictly prohibit lawn and landscape irrigation, but does require the prohibition of excessive irrigation water that results in non-storm water discharges to the MS4. Non-storm water discharges to the MS4 from over-irrigation must be addressed as illicit discharges by the Copermittees pursuant to the requirements of Provision E.2.

The remaining non-storm water categories listed in 40 CFR 122.26(d)(2)(iv)(B)(1) are listed under Provisions E.2.a.(1) through E.2.a.(5) and generally fall into four categories: (1) non-storm water discharges subject to existing San Diego Water Board waste discharge requirements and NPDES permits; (2) non-storm water discharges generally not expected to be a source of pollutants to receiving waters; (3) non-storm water discharges likely to contain pollutants requiring some form of control to address the pollutants prior to discharging to the MS4; and (4) non-storm water discharges or flows associated with firefighting.

Provisions E.2.a.(1) and E.2.a.(2) include several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) for which the San Diego Water Board already has developed general waste discharge requirements and NPDES

permits to address the discharges. The Copermittees are only required to address these types of non-storm water discharges as illicit discharges if the Copermittees or the San Diego Water Board identifies these non-storm water discharges not having coverage under the applicable NPDES permit.

Provision E.2.a.(3) includes several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) which are generally not expected to be a source of pollutants to receiving waters, many of which originate from what are typically natural, uncontrollable sources. The Copermittees are only required to address these types of non-storm water discharges as illicit discharges if the Copermittees or the San Diego Water Board identifies these non-storm water discharges as a source of pollutants to receiving waters. Because many of these sources are generally uncontrollable, enforcing a prohibition may not be a possibility for the Copermittees. The Copermittees would be able to address these non-storm water discharges by preventing these non-storm water discharges from entering the MS4. This could potentially be achieved by sealing their MS4 structures so the discharges cannot enter the MS4.

Provision E.2.a.(4) includes several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) that are likely to contain pollutants requiring some form of control to address the pollutants prior to discharging to the MS4. At this time, an outright prohibition of these types of non-storm water discharges does not yet appear to be warranted. Thus, Provision E.2.a.(4) includes several requirements for the Copermittees to control the pollutants from these types of non-storm water discharges. This is consistent with the clarification of the federal regulations in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board has the authority to require the Copermittees to "*control any of these types of discharges where appropriate*."

Unlike non-storm water discharges from over-irrigation, these types of non-storm water discharges are not expected to occur in close proximity to each other or very frequently. Provided these types of non-storm water discharges are controlled as required in Provision E.2.a.(4), the Copermittees would only be required to address these types of non-storm water discharges as illicit discharges if the Copermittee or the San Diego Water Board identifies these non-storm water discharges as a source of pollutants to receiving waters.

Provision E.2.a.(5) includes specific requirements for fire fighting discharges and flows. The requirements for non-storm water discharges and flows associated with fire fighting have been separated into requirements for: a) non-emergency fire fighting discharges and flows, and b) emergency fire fighting discharges and flows.

The San Diego Water Board has found that discharges from building fire suppression system maintenance (e.g. fire sprinklers) contain waste and potentially a significant source of pollutants to receiving waters. As such, the San Diego Water Board is requiring these discharges be addressed as illicit discharges by the Copermittees.

Thus, the discharges to the MS4 are to be prohibited via ordinance, order or similar means. For other non-emergency firefighting discharges and flows (i.e. flows from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems), the Copermittees are required to develop and implement a program to address pollutants in these non-storm water discharges and flows. This is consistent with the clarification of the federal regulations in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board has the authority to require the Copermittees to "*control any of these types of discharges where appropriate*."

For emergency firefighting discharges and flows, the Phase I Final Rule (55 FR 48037) has clarified the requirements of 40 CFR 122.26(d)(2)(iv)(B)(1) pertaining to emergency firefighting flows and discharges, which states:

> "*In the case of firefighting it is not the intention of these rules to prohibit in any circumstances the protection of life and public or private property through the use of water or other fire retardants that flow into separate storm sewers*."

Thus, the requirements have been made to be consistent with the guidance provided by the Phase I Final Rule. The Order recommends that the Copermittees develop and encourage implementation of BMPs to reduce or eliminate the discharge of pollutants from emergency firefighting flows to the MS4s and receiving waters. The Order does not include any requirements that should be interpreted as requiring the implementation of BMPs for emergency firefighting flows to the MS4s and receiving waters.

The Copermittees are expected to review the dry weather MS4 outfall discharge monitoring data they collect to determine if and when there are non-storm water discharges to or from their MS4s that are a source of pollutants to receiving waters. If the Copermittees identify one of the types of non-storm water discharges listed in Provisions E.2.a.(1) through E.2.a.(4) as a source of pollutants to receiving waters based on the review and evaluation of monitoring data, Provision E.2.a.(6) requires the Copermittees to prohibit those categories of discharges from entering the MS4 through ordinance, order or similar means. In addition, Provision E.2.a.(6) clarifies that the San Diego Water Board may identify categories of non-storm water discharges or flows listed under Provisions E.2.a.(1) through E.2.a.(4) that must be prohibited.

Provision E.2.a.(6) also provides the Copermittees an option to propose controls to be implemented for the category of non-storm water discharges as part of the Water Quality Improvement Plan instead of prohibiting the category of non-storm water discharges. If the Water Quality Improvement Plan is accepted by the San Diego Water Board with the proposed controls, the Copermittees will not be required to prohibit the category of non-storm water discharges to their MS4s as long as the controls are implemented. This is consistent with the clarification of 40 CFR 122.26(d)(2)(iv)(B)(1) in the Phase I Final Rule (55 FR 48037), which states the San

Diego Water Board may "*require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*."

Finally, Provision E.2.a.(7) has been included in the requirements for non-storm water discharges to clarify that any non-storm water discharges to the Copermittee's MS4, even those identified pursuant to Provisions E.2.a.(1) through E.2.a.(4), must be reduced or eliminated, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit. Provision E.2.a.(7) is consistent with the requirements of CWA section 402(p)(3)(B)(ii) and 40 CFR 122.26(d)(1)(v)(B), as clarified in the Phase I Final Rule (55 FR 47995) that "*[u]ltimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit*." However, the reduction or elimination of those non-storm water discharges are expected to be achieved as feasible, in accordance with the priorities in the Water Quality Improvement Plan and when the resources are available to the Copermittee.

Consistent with 40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(1), each Copermittee must implement a "*program…to prevent illicit discharges to the municipal storm sewer system*" and "*detect…illicit discharges and improper disposal into the storm sewer.*" Provision E.2.b requires each Copermittee to implement measures to prevent and detect illicit discharges and connections to its MS4 as part of its illicit discharge detection and elimination program.

As part of the program to prevent and detect illicit discharges to the MS4, 40 CFR 122.26(d)(2)(iv)(B)(2) requires "*procedures to conduct on-going field screening activities during the life of the permit, including areas or locations that will be evaluated by such field screens*." As part of the procedures, each Copermittee is required to maintain an updated map of its entire MS4 and the corresponding drainage areas within its jurisdiction. Having knowledge about where inlets, access points, connections with other MS4s, and outfalls are located is necessary for each Copermittee to track, identify, and eliminate illicit discharges and connections. Thus, Provision E.2.b.(1) of the Order specifies that the map must include the segments of the storm sewer system owned, operated, and maintained by the Copermittee, and include locations of all known inlets, connections with other MS4s, and outfalls to the Copermittee's MS4. The remaining requirements of Provision E.2.b are consistent with the requirements of 40 CFR 122.26(d)(2)(iv)(B)(3)-(7) related to implementing measures to prevent and detect illicit discharges and connections to the MS4.

Provision E.2.c requires each Copermittee to conduct field screening and monitoring of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4. Field screening is a required element of the program to detect and eliminate illicit discharges and connections to the MS4, pursuant to 40 CFR 122.26(d)(2)(iv)(B)(2). The field screening requirement will be implemented through the dry weather MS4 outfall discharge monitoring required under Provisions D.2.a.(2) and D.2.b.(1).

Provision E.2.d specifies the measures each Copermittee must implement to eliminate illicit discharges and connections to its MS4. Elimination of illicit discharges and connections to the MS4 is consistent with the requirement of 40 CFR 122.26(d)(2)(iv)(B) "*to detect and remove [emphasis added]…illicit discharges and improper disposal into the storm sewer*" and will achieve the CWA requirement for MS4 permits to "*effectively prohibit non-storm water discharges into the storm sewers*."

Generally, each Copermittee is responsible for prioritizing its efforts to eliminate non-storm water and illicit discharges or connections to its MS4 based on field screening and monitoring data, NALs, illicit discharge investigation records, and the known or suspected sources. Sources of non-storm water and illicit discharges or connections must be eliminated by enforcing the legal authority established by each Copermittee pursuant to Provision E.1.

Provision E.3 (Development Planning) requires each Copermittee to use its land use and planning authority to implement a development planning program to control and reduce the discharge of pollutants in storm water from new development and significant redevelopment to the MEP. Proper implementation of the development planning program will also contribute toward effectively prohibiting non-storm water discharges from development projects to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." As part of the management program, 40 CFR 122.26(d)(2)(iv)(A)(2) requires "*planning procedures including a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment*."

Land development generally alters the natural conditions of the land by removing vegetative cover, compacting soil, and/or placement of concrete, asphalt, or other impervious surfaces. These impervious surfaces concentrate urban pollutants (such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not found in high concentrations in the natural environment. Pollutants that accumulate on impervious surfaces are not easily biodegraded nor subject to natural treatment processes.

Impervious surfaces greatly affect the natural hydrology of the land because they do not allow natural infiltration and treatment of storm water runoff to take place. Instead, storm water runoff from impervious surfaces is typically directed through pipes, curbs, gutters, and other hardscape into receiving waters, with little treatment, at significantly increased volumes and accelerated flow rates over what would occur naturally. The increased pollutant loads, storm water volume, discharge rates and velocities, and discharge durations from the MS4 adversely impact stream habitat by causing accelerated, unnatural erosion and scouring within creek bed and banks. Placement

of impervious surfaces also encapsulates "good" sediment (such as sand, gravel, rocks and cobbles) that would normally replenish creek beds and banks to help stabilize them. Collectively, these changes to natural hydrologic processes are termed hydrograph modification, or hydromodification.

Hydromodification, which is caused by both altered storm water flow and altered sediment flow regimes, is largely responsible for degradation of creeks, streams, and associated habitats in the San Diego Region. In an ongoing study by the Stormwater Monitoring Coalition to assess the health of streams throughout Southern California, researchers found that three of the four highest risk stressors to creeks (percent sands and fines present, channel alteration, and riparian disturbance) were related to physical habitat.[29] Researchers studying flood frequencies in Riverside County have found that increases in watershed imperviousness of only 9-22 percent can result in increases in peak flow rates for the two-year storm event of up to 100 percent.[30] Such changes in runoff have significant impacts on channel morphology.

In addition, a technical report issued by the Southern California Coastal Water Research Project (SCCWRP) stated that "*[r]ecent studies indicate that California's intermittent and ephemeral streams are more susceptible to the effects of hydromodification than streams from other parts of the United States. Physical degradation of stream channels in the central and eastern United States can initially be detected when watershed impervious cover approaches 10 percent, although biological effects (which may be more difficult to detect) may occur at lower levels. In contrast, initial response of streams in the semi-arid portions of California appears to occur between 3 and 5 percent impervious cover*."[31] These studies highlight the extent to which impacts originating from impervious surfaces created by land development are responsible for the degradation of creek and stream habitat.

This is consistent with what USEPA has noted, that "*[m]ost stormwater runoff is the result of the man-made hydrologic modifications that normally accompany development. The addition of impervious surfaces, soil compaction, and tree and vegetation removal result in alterations to the movement of water through the environment. As interception, evapotranspiration, and infiltration are reduced and precipitation is converted to overland flow, these modifications affect not only the characteristics of the developed site but also the watershed in which the development is located. Stormwater has been identified as one of the leading sources of pollution for all waterbody types in the United States. Furthermore, the impacts of stormwater*

[29] Assessing the Health of Southern California Streams, Stormwater Monitoring Coalition, Fact Sheet
[30] Schueler and Holland, 2000. Storm Water Strategies for Arid and Semi-Arid Watersheds (Article 66). The Practice of Watershed Protection.
[31] Stein, E. and Zaleski, S., 2005. Technical Report 475, Managing Runoff to Protect Natural Streams: The Latest Development on Investigation and Management of Hydromodification in California. December 30, 2005.

pollution are not static; they usually increase with more development and urbanization."[32]

Reducing the impact from the increased pollutant loads and flows generated by impervious surfaces within a watershed is essential to protecting and restoring the integrity of the receiving waters. Provision E.3 includes the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment*." The requirements of Provision E.3 will 1) minimize the generation and discharge of pollutants in storm water from the MS4, and 2) minimize the potential of storm water discharges from the MS4 from causing altered flow regimes and excessive downstream erosion in receiving waters.

The requirements of Provision E.3.a include the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment*" applicable to all development projects, regardless of size or purpose of development. In general, all development projects must implement onsite BMPs to remove pollutants from runoff prior to its discharge to any receiving waters, as close to the pollutant generating source as possible, and structural BMPs must not be constructed within waters of the U.S.

Furthermore, the onsite BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors (e.g. mosquitos, rodents, and flies). If not properly designed or maintained, certain BMPs implemented or required by municipalities may create a habitat for vectors. Monitoring studies conducted by the California Department of Public Health (CDPH) have documented that mosquitoes opportunistically breed in structural storm water BMPs, particularly those that hold standing water for over 96 hours. Certain site design features that hold standing water may similarly produce mosquitoes.

Structural BMPs and site design features should incorporate design, construction, and maintenance principles to promote drainage within 96 hours to minimize standing water available to mosquitoes. Nuisances and public health impacts resulting from vector breeding can be prevented with close collaboration and cooperative effort between municipalities and local vector control agencies and the CDPH during the development and implementation of storm water runoff management programs. The CDPH also has issued guidance for BMP implementation that will minimize potential nuisances and public health impacts resulting from vector breeding.[33]

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[32] USEPA, 2007. Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices, December 2007.

[33] California Department of Public Health, 2012. Best Management Practices for Mosquito Control in California. (http://www.cdph.ca.gov/HealthInfo/discond/Documents/BMPforMosquitoControl07-12.pdf)

All development projects are required to implement source control BMPs that will minimize the generation of pollutants. Additionally, each development project must implement, where applicable and feasible, low impact development (LID) BMPs to mimic the natural hydrology of the site and retain and/or treat pollutants in storm water runoff prior to discharging to and from the MS4.

The LID Center defines LID as "*a comprehensive land planning and engineering design approach with a goal of maintaining and enhancing the pre-development hydrologic regime of urban and developing watersheds.*"[34] LID designs seek to control storm water at the source, using small-scale integrated site design and management practices to mimic the natural hydrology of a site, retain storm water runoff by minimizing soil compaction and impervious surfaces, and disconnect storm water runoff from conveyances to the storm drain system.

LID BMPs may utilize interception, storage, evaporation, evapotranspiration, infiltration, and filtration processes to retain and/or treat pollutants in storm water before it is discharged from a site. Because of these numerous options, the San Diego Water Board expects that every development project will be able to implement some form of LID BMPs. Examples of LID BMPs include using permeable pavements, rain gardens, rain barrels, grassy swales, soil amendments, and native plants.

Provision E.3.a also includes requirements for all development projects to, where feasible, landscape with native and/or low water use plants to minimize the discharge of non-storm water discharges associated with excessive irrigation, as well as harvest (i.e., storage) and use precipitation to promote the concept of utilizing storm water as a resource.

While all development projects are subject to the requirements of Provision E.3.a, Provision E.3.b identifies Priority Development Projects that exceed given size thresholds and/or fit under specific use categories. Priority Development Projects are required to incorporate specific performance criteria for structural BMPs into the project plan to reduce the generation of pollutants, and address potential impacts from hydromodification.

The Priority Development Project categories are based on the requirements of the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), and do not differ significantly from the Fourth Term Permit for San Diego County. Furthermore, the Priority Development Project categories are consistent with Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), and Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit).

[34] www.lowimpactdevelopment.org

Because of the impact of relatively small increases in watershed impervious surfaces to receiving waters, Provision E.3.b.(1)(c)(iv) has been updated to include large driveways that are 5,000 square feet or more. The San Diego Water Board finds that large driveways can exacerbate altered flow regimes if not properly controlled.

Provision E.3.b.(3) describes projects that are exempt from Priority Development Project status. These include new or retrofit paved sidewalks, bicycle lanes, or trails that are designed and constructed to direct runoff to vegetated areas or be hydraulically disconnected from paved areas. The exemptions have been provided to encourage these types of projects because they provide multiple environmental benefits, such as promoting walking rather than driving, which will in turn improve air quality. Additionally, retrofitting of existing alleys, streets, or roads are exempt from Priority Development Project status if they are constructed using USEPA Green Streets guidance.[35] By doing so, retrofitting of these types of projects is encouraged. The San Diego Water Board recognizes that there are spatial constraints associated with these projects, and implementation of structural BMPs are not always feasible.

For development projects identified as Priority Development Projects, the requirements of Provision E.3.c are the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment.*" Provisions E.3.c.(1)-(3) describe the performance criteria for the structural BMPs that must be implemented for each Priority Development Project defined by Provision E.3.b.

Provision E.3.c.(1) describes the storm water pollutant control BMP requirements that must be implemented by all Priority Development Projects. The purpose of Provision E.3.c.(1) is to reduce pollutants in storm water runoff to the MEP from Priority Development Projects before it is discharged to the MS4. Of all the available treatment processes available, retention of storm water, and therefore capture of the pollutants in the storm water, will achieve 100 percent pollutant removal efficiency for the volume of storm water retained. No other method of treatment can achieve 100 percent pollutant removal efficiency. Thus, retention of as much storm water onsite is the most effective way to reduce pollutants in storm water discharges to, and consequently from the MS4, and controls pollutants in storm water discharges from a site to the MEP.

Under Provision E.3.c.(1)(a), retention of the pollutants in the runoff produced from the 85th percentile storm event ("design capture volume") is the design standard to which Priority Development Projects must comply. Since the 85th percentile storm event has previously been used as the numeric design standard for treatment control BMPs, this same size storm event is used as the numeric design standard for storm water

[35] "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).

retention. This is the MEP standard recognized by the San Diego Water Board and is consistent with the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), as well as Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit), and Los Angeles Water Board Order No. R4-2012-0175 (Los Angeles County MS4 Permit).

The 85th percentile storm event is the event that has a precipitation total greater than or equal to 85 percent of all storm events over a given period of record in a specific area or location. For example, to determine what the 85th percentile storm event is in a specific location, all 24 hour storms that have recorded values over a 30 year period would be tabulated and a 85th percentile storm would be determined from this record (i.e. 15 percent of the storms would be greater than the number determined to be the 85th percentile storm). Most jurisdictions in the San Diego Region have already developed isopluvial maps that can provide this type of information. The 85th percentile storm might be determined to be a number such as 1.0 inch, and this would be multiplied by the total area of the project footprint producing runoff to calculate the design capture volume. The Priority Development Project designer would then select a system of BMPs that would retain (i.e. intercept, store, infiltrate, evaporate, or evapotranspire) the pollutants contained in the design capture volume onsite.

Retention BMPs are necessary to capture and retain pollutants generated from a Priority Development Project. In a recent study performed by SCCWRP in the Los Angeles Region, they found "*that the magnitude of constituent load associated with storm water runoff depends, at least in part, on the amount of time available for pollutant build-up on land surfaces. The extended dry period that typically occurs in arid climates such as southern California maximizes the time for constituents to build-up on land surfaces, resulting in proportionally higher concentrations and loads during initial storms of the season*."[36] This implies that the "first flush" of a rainy season and the first storm events after long antecedent dry periods tend to have the highest pollutant loads. Capturing and retaining the pollutant loads of the "first flush" of a rainy season and the first storm events after long antecedent dry periods will reduce a significant portion of the pollutants in storm water discharged to and from the MS4.

The San Diego Water Board, however, acknowledges that in some situations retention of the full design capture volume onsite may not be technically feasible. In this event, the Copermittee may allow the Priority Development Project to use biofiltration BMPs to treat 1.5 times the design capture volume not reliably retained onsite, or biofiltration BMPs with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite.

[36] Stein, E.D., Tiefenthaler, L.L., and Schiff, K.C., 2007. Technical Report 510, Sources, Patterns and Mechanisms of Storm Water Pollutant Loading from Watershed and Land Uses of the Greater Los Angeles Area, California, USA. March 20, 2007.

The 1.5 multiplier is based on the finding in the Ventura County Technical Guidance Manual that biofiltration of 1.5 times the design capture volume not retained onsite will provide approximately the same pollutant removal as retention of the design capture volume on an annual basis.[37] This standard is consistent with the Los Angeles Water Board's Los Angeles County and Ventura County municipal storm water permits (Order Nos. R4-2012-0175 and R4-2010-0108, respectively). The flow-thru design of 0.75 times the portion of the design capture volume not reliably retained onsite is consistent with the San Diego Water Board's Orange County and Riverside County municipal storm water permits (Order Nos. R9-2009-0002 and R9-2010-0016, respectively). In either case, the biofiltration BMPs must be designed with an appropriate hydraulic loading rate to maximize storm water retention and pollutant removal, as well as to prevent erosion, scour, and channeling within the BMP. Each Copermittee is required to update its BMP Design Manual to provide guidance for hydraulic loading rates and other biofiltration design criteria necessary to maximize storm water retention and pollutant removal.

The San Diego Water Board further recognizes that, in addition to not being technically feasible, retention of the full design capture storm onsite may be cost prohibitive, or may not provide as much water quality benefit to the Watershed Management Area as would implementing BMPs elsewhere in the watershed. Thus, Provision E.3.c.(1)(b) allows for the use of a combination of onsite retention BMPs, and the implementation of an Alternative Compliance Program described in Provision E.3.c.(3). Provision E.3.c.(3) is discussed in more detail below.

If the full design capture volume is not retained onsite either because biofiltration is not technically feasible, or a Copermittee grants a Priority Development Project permission to utilize the Alternative Compliance Program, then the pollutants in the portion of the design capture volume that are not reliably retained onsite must still be reduced to the MEP. Thus, flow-thru treatment control BMPs are required to be implemented on Priority Development Projects in addition to the retention BMPs. The requirements of Provisions E.3.c.(1)(a)(ii)[a]-[c] include the performance standards for flow-thru treatment control BMPs, consistent with the Fourth Term Permits in the San Diego Region.

Whereas the purpose of the requirements under Provision E.3.c.(1) is to reduce pollutants in storm water runoff to the MEP, the purpose of the requirements under Provision E.3.c.(2) is to maintain or restore more natural hydrologic flow regimes to prevent accelerated, unnatural erosion in downstream receiving waters, also to the MEP standard. Provision E.3.c.(2) describes hydromodification management BMP requirements that must be implemented by all Priority Development Projects.

[37] Ventura Countywide Stormwater Management Program. 2011. Ventura Technical Guidance Manual, Manual Update, 2011.

The performance criteria for the implementation of hydromodification management BMPs on Priority Development Projects are consistent with the requirements in the Fourth Term Permits for Orange and Riverside Counties (Order Nos. R9-2009-0002 and R9-2010-0016, respectively). Modifications to the Orange County and Riverside County Hydromodification Management Plans (HMPs) will likely be minor, or may not be necessary. The HMP for San Diego County will likely require some minor modifications to incorporate the requirements of Provision E.3.c.(2) and become consistent with the Orange County and Riverside County HMPs. The San Diego Water Board does not, however, expect that it will be necessary for the San Diego County Copermittees to develop a new approach or significantly re-write the San Diego County HMP. This is because the premise of the hydromodification management BMP requirements, which are to control storm water runoff conditions (flow rates and durations) for Copermittee-defined range of flows, is unchanged from all Fourth Term Permits in the San Diego Region.

Provision E.3.c.(2)(a) requires that post-project runoff conditions mimic the *pre-development* runoff conditions, and not the *pre-project* runoff conditions. Fundamentally, the San Diego Water Board believes that using a hydrology baseline that approximates that of an undeveloped, natural watershed is the only way to facilitate the return of more natural hydrological conditions to already built-out watersheds, and ultimately improved stream health. On the other hand, using the *pre-project* hydrology as a baseline for redevelopment projects results in propagating the unnatural hydrology of urbanized areas. Propagating the urbanized flow regime does not support conditions for restoring degraded or channelized stream segments, and would forever sentence such streams to the degraded state. Furthermore, reducing the volume of storm water runoff associated with the urbanized flow regime will also result in reducing the discharge of pollutants into receiving waters, since storm water runoff from impervious surfaces contains untreated pollutants.

The San Diego Water Board understands that approximating the pre-development runoff condition associated with a redevelopment site is not necessarily straightforward because factors such as natural grade and native vegetation for the site cannot be precisely known. Therefore, the San Diego Water Board does not expect project designers to estimate historical conditions associated with redevelopment sites. Rather, the San Diego Water Board expects project designers and the Copermittees to approximate pre-development runoff conditions using the parameters of a *pervious* area rather than an *impervious* area. This means that for redevelopment sites, approximating pre-development runoff conditions equates to using existing onsite grade and assuming the infiltration characteristics of the underlying soil. A redevelopment Priority Development Project must not use runoff coefficients of concrete or asphalt to estimate pre-development runoff conditions. Rather, redevelopment projects must use available information pertaining to existing underlying soil type (such as soil maps published by the National Resource Conservation Service), onsite existing grade, and any other readily available pertinent information to estimate pre-development runoff conditions.

The San Diego Water Board understands, indeed asserts, that the pre-development hydrology of an area in question can only be roughly estimated and cannot be precisely known. However, using the hydrology of a natural condition, even if not precisely known, will provide significant benefit to receiving waters over using the hydrology associated with pervious (developed) surfaces. Therefore in order to achieve the goals of the Clean Water Act, which are to "*restore and maintain the chemical, physical, and biological integrity of the nation's waters* [emphasis added]," the most appropriate standard to use for hydromodification management is the standard associated with the pre-development condition.

Provision E.3.c.(2)(b) requires Priority Development Projects to avoid known critical sediment yield areas or implement measures that would allow coarse sediment to be discharged to receiving waters, such that the natural sediment supply is unaffected by the project. This is necessary because coarse sediment supply is as much an issue for causing erosive conditions to receiving streams as are accelerated flows.

The San Diego Water Board recognizes that in some situations implementing the hydromodification management BMP requirements fully onsite may not be technically feasible, may be cost prohibitive, or may not provide any overall water quality benefits to the Watershed Management Area. Thus, Provision E.3.c.(2)(c) allows for the use of a combination of onsite hydromodification management BMPs and alternative compliance options described in Provision E.3.c.(3).

Provision E.3.c.(3) allows for alternative compliance in instances where the Copermittee determines that offsite measures will have a greater overall water quality benefit for the Watershed Management Area than if the Priority Development Project were to implement structural BMPs onsite. Consequently, watershed-specific structural BMP requirements are present in this Order in the form of allowable compliance offsite. The Alternative Compliance Program to Onsite Structural BMP Implementation Provision is intended to integrate with the Copermittees' planning efforts in the Water Quality Improvement Plans.

The Alternative Compliance Program is an option for Priority Development Projects where the governing Copermittee has participated in the development of a Watershed Management Area Analysis as part of the Water Quality Improvement Plan (described in Provision B.3.b.(4)). Such an approach is consistent with the latest findings in hydromodification management by the scientific community. In a Technical Report entitled *Hydromodification Assessment and Management in California,*[38] the report states:

> *"An effective [hydromodification] management program will likely include combinations of on-site measures (e.g., low-impact development techniques, flow-control basins), in-stream measures (e.g., stream habitat restoration), floodplain*

[38] 2012. ED Stein, F Federico, DB Booth, BP Bledsoe, C Bowles, Z Rubin, GM Kondolf, A Sengupta. Technical Report 667. Southern California Coastal Water Research Project. Costa Mesa, CA.

and riparian zone actions, and off-site measures. Off-site measures may include compensatory mitigation measures at upstream locations that are designed to help restore and manage flow and sediment yield in the watershed."

Consistent with the ideas brought forth in the report, in the Watershed Management Area Analysis of Provision B.3.b.(4), which is optional, the Copermittees will develop watershed maps that include as much detail about factors that affect the hydrology of the watershed as is available. Such factors included identification of areas suitable for infiltration, coarse sediment supply areas, and locating stream channel structures and constrictions. Once these factors are mapped and studied, the Copermittees can identify areas in the watershed where candidate projects may be implemented that are expected to improve water quality in the watershed by providing more opportunity for infiltration, slowing down storm water flows, or attenuation of pollutants naturally via healthy stream habitat. These candidate projects may be in the form of retrofitting existing development, rehabilitating degraded stream segments, identifying regional BMPs, purchasing land to preserve valuable floodplain functions, and any other project(s) that the Copermittees identify.

Under the Alternative Compliance Program, Priority Development Projects may be allowed to fund, partially fund, or implement a candidate project, in lieu of implementing structural BMPs onsite, if they enter into a voluntary agreement with the governing Copermittee permitting this arrangement. Project proponents may also propose an alternative project not previously identified by the Copermittees. In either case, whether a project proponent implements a candidate project identified by the Copermittees or a separate alternative compliance project, the governing Copermittee must determine that implementation of the project will have a greater overall water quality benefit for the Watershed Management Area than fully implementing structural BMPs onsite. If alternative compliance involves funding or implementing a project that is outside the jurisdiction of the governing Copermittee, then that Copermittee may enter into an inter-agency agreement with the appropriate jurisdiction.

Finally, Provision E.3.c.(2)(d) allows Priority Development Projects to be exempt from the hydromodification management BMP requirements if there is no threat of erosion to downstream receiving waters (i.e. the receiving stream is concrete lined from the point of discharge all the way to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean). If the Copermittees believe that more exemptions are warranted, then they must perform the optional Watershed Management Area Analysis of Provision B.3.b.(4). Additional exemptions other than those specified in this Order may be established on a watershed basis, provided the Copermittees perform the analysis, provide supporting rationale for the exemptions, and complete the Water Quality Improvement Plan approval process pursuant to Provision F.1.

Provisions E.3.c.(4) and E.3.c.(5) were included under the BMP requirements applicable to all development projects in the Fourth Term Permits for San Diego, Orange, and Riverside Counties (Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016, respectively). In this Order, the long-term BMP maintenance and

infiltration and groundwater protection requirements apply to structural BMPs implemented by Priority Development Projects only.

Provision E.3.d requires the Copermittees to update their BMP Design Manual as needed to incorporate the requirements of Provision E.3. The BMP Design Manual is formerly known as the Standard Storm Water Mitigation Plan, or SSMP, and was renamed so that the title has a more accurate description of the document content. The contents of the BMP Design Manual are largely unchanged from the previous Standard Storm Water Mitigation Plans required under the Fourth Term Permits. The BMP Design Manual fulfills the 40 CFR 122.26(d)(2)(iv)(A)(2) requirement that the Copermittee's development planning program includes "*a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment*."

As part of the "*planning procedures,*" 40 CFR 122.26(d)(2)(iv)(A)(2) requires the procedures to "*address controls to reduce pollutants in discharges from municipal separate storm sewers after construction is completed*." The requirements applicable to the implementation and oversight of structural BMPs at Priority Development Projects are provided under Provision E.3.e.

Proper installation of the structural BMPs approved for a Priority Development Project is necessary to ensure that pollutants in storm water discharges will be reduced to the MEP after the project is completed. In addition to the proper installation of structural BMPs, the maintenance of structural BMPs on Priority Development Projects is necessary to ensure that pollutants in storm water discharges will continue to be reduced to the MEP. Provision E.3.e.(1) includes the minimum requirements that each Copermittee must implement to ensure structural BMPs are properly installed and will be properly maintained.

The requirements under Provision E.3.e.(2)-(3) are necessary to demonstrate each Copermittee is implementing a program that complies with Provisions E.3.b-c and E.3.e.(1), and ensure structural BMPs at Priority Development Project will continue to be able to reduce pollutants in storm water discharges to the MEP.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary for any development projects to compel compliance with the requirements of Provision E.3 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.3.f requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

<u>Provision E.4 (Construction Management)</u> requires each Copermittee to implement a construction management program to control and reduce the discharge of pollutants in

storm water from construction sites to the MEP. Proper implementation of the construction management program will also contribute toward effectively prohibiting non-storm water discharges from construction sites to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." As part of the management program, 40 CFR 122.26(d)(2)(iv)(D) requires "*a program to implement and maintain structural and non-structural best management practices to reduce pollutants in storm water runoff from construction sites to the municipal storm sewer system.*"

Construction sites can be significant sources of sediment, trash, and other pollutants to receiving waters. Although sediment is naturally occurring in the natural environment, the discharge of sediment under unnatural conditions is problematic to receiving waters. Fine sediment in creeks causes high turbidity that interferes with the functionality of native flora and fauna in local creeks. For example, turbidity interferes with both photosynthesis of water-philic plants, as well as successful foraging and reproduction of benthic macroinvertebrates. Sediment can also make it difficult for fish to breathe because it clogs fish gills. Other pollutants such as heavy metals or pesticides can adhere to sediment and are transported to receiving waters during storm events, where they dissolve in the water column and become bioavailable to aquatic organisms. Sediment is recognized as a major stressor to surface waters and is responsible for the impairment of several lagoons and creeks in the San Diego Region.

Provision E.4 includes requirements that each Copermittee must implement to minimize the discharge of sediment and other pollutants from construction sites to the MS4 within its jurisdiction. The requirements under Provision E.4 are consistent with the Fourth Term Permits for San Diego, Orange, and Riverside Counties. Therefore, Copermittees are expected to implement the requirements seamlessly, with minimal changes to their existing construction management programs. The Copermittees, however, are given more flexibility to run their programs as needed to maximize efficiency, and also to be consistent with the Water Quality Improvement Plan for the Watershed Management Area.

As part of the construction management program, 40 CFR 122.26(d)(2)(iv)(D)(1) requires "*procedures for site planning which incorporate consideration of potential water quality impacts.*" Provision E.4.a describes the minimum elements each Copermittee is required to include as part of the construction site planning and project approval process. The construction site planning and approval process is based primarily on ensuring each project had an adequate site-specific pollution control, construction BMP, and/or erosion and sediment control plan that will be implemented to minimize the discharge of pollutants in storm water to the MEP, and minimize impacts to receiving waters.

The requirements under Provision E.4.b provide the data and information necessary to identify "*priorities for inspecting sites and enforcing control measures*" required pursuant to 40 CFR 122.26(d)(2)(iv)(D)(3). Under Provision E.4.b, each Copermittee must identify construction sites that are considered a high threat to downstream surface waters. Designation of "high threat to water quality" construction sites will necessitate the Copermittees to develop criteria to identify such sites. Provision E.4.b.(2) describes a list of factors that must be considered when the Copermittee considers threat to water quality. For example, a Copermittee must identify sites as "high threat to water quality" if it is located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions, according to the Water Quality Improvement Plan. This ensures that construction management program implementation is compatible with the Copermittee's identified highest priority water quality conditions.

Pursuant to 40 CFR 122.26(d)(2)(iv)(D)(2) each Copermittee is required describe "*requirements for nonstructural and structural best management practices*" at construction sites. Provision E.4.c includes the types of construction site BMPs that the Copermittees must implement, or require the implementation of, at each construction site to reduce pollutants in storm water discharges to the MEP.

Each Copermittee is expected to require the implementation of appropriate BMPs given specific site conditions, the season and likelihood of rain events, and construction phase (i.e. grading vs. vertical construction). This means that throughout the life of the project construction, the appropriate BMPs will vary, especially if the construction of the project spans multiple wet seasons. As opposed to describing specific minimum BMPs that must be implemented, the Order describes major BMP categories that should be considered for each site.

Each Copermittee is expected to use its 20 years of storm water experience and knowledge to require implementation of appropriate BMPs from the various categories at each construction site within its jurisdiction. For example, the San Diego Water Board expects that each site will be required to implement erosion control and sediment control. The San Diego Water Board also expects each Copermittee to require implementation of active/passive sediment treatment systems at sites where other BMPs have been tried and are known to be inadequate, and discharges of sediment are causing or contributing to water quality impairment downstream. Each Copermittee is granted flexibility in specifying the minimum level of BMP requirements at each site, but the San Diego Water Board expects each site to be capable of controlling pollutants in storm water discharges to the MEP and preventing illicit discharges.

The requirements under Provision E.4.d are necessary to demonstrate that each Copermittee is implementing a program that complies with Provisions E.4.a and E.4.c and ensure BMPs at construction sites will reduce pollutants in storm water discharges to the MEP.

Provision E.4.d does not include minimum required inspection frequencies for construction sites. Each Copermittee must use its experience and knowledge to specify an appropriate inspection frequency for both high priority and lower priority sites in their jurisdictional runoff management program documents, and in accordance with the Water Quality Improvement Plan. Appropriate inspection frequencies may vary by Copermittee, but the San Diego Water Board expects that the stated frequency will be adequate for each Copermittee to properly oversee the construction sites within its jurisdiction, confirm BMPs are implemented to reduce pollutants in storm water discharges from constructions sites to the MEP, and make needed changes to its program on an ongoing basis as necessary.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary for any development projects to compel compliance with the requirements of Provision E.4 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.4.e requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Provision E.5 (Existing Development Management) requires each Copermittee to implement an existing development management program to control and reduce the discharge of pollutants in storm water from areas of existing development to the MEP. Proper implementation of the existing development management program will also contribute toward effectively prohibiting non-storm water discharges from areas of existing development to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." Within 40 CFR 122.26(d)(2)(iv)(A) and (C), the management program is required to reduce impacts on receiving waters and reduce pollutants in storm water discharges to the MEP from commercial and residential areas, industrial facilities, and municipal facilities.

Commercial and residential areas, industrial facilities, and municipal facilities must be addressed by each Copermittee with the existing development management program required under Provision E.5. All other areas within each Copermittee's jurisdiction should be either undeveloped open space, or areas that are being developed or under construction. Areas being developed or under construction will be addressed by the Copermittee under the requirements of Provision E.3 (Development Planning) or Provision E.4 (Construction Management).

Areas of existing development typically include impervious surfaces such as sidewalks, driveways, roads, and rooftops, which generate and concentrate pollutants

(such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not found in high concentrations in the natural environment. Pollutants that accumulate on impervious surfaces are not easily biodegraded or not subject to natural treatment processes. When it rains, these pollutants are transported in storm water runoff from these impervious surfaces into receiving waters, resulting in poor water quality and degradation of beneficial uses.

In addition to the generation of pollutants, areas of existing development have generally altered the natural conditions of the land and removed vegetative cover, reduced the perviousness of the surface, and reduced the capacity of storm water that can be intercepted, captured, stored, infiltrated, evaporated, and/or evapotranspired. The alteration of the natural conditions and the impervious surfaces associated with areas of existing development causes water quality problems due to the alteration of natural flow regimes within the watersheds; resulting in hydromodification of channels, streams, and habitats that exist within or adjacent to the areas of existing development.

Thus, storm water discharges from areas of existing development are responsible for poor water quality, degraded habitats, and hydromodified channels throughout the developed portions of the watersheds in the San Diego Region. To improve the health and functionality of the receiving waters in a Watershed Management Area, land use practices and the amount of impervious surfaces in areas of existing development must change to reduce the various impacts caused by hydromodification and pollutants from storm water runoff generated in developed areas. Each Copermittee must be aggressive to address pollutant sources and runoff from areas of existing development to be able to reduce pollutants in storm water discharges from the MS4 to the MEP.

There is some overlap in the requirements under Provision E.5 with the requirements under Provisions E.2 (Illicit Discharge Detection and Elimination), E.3 (Development Planning), and E.4 (Construction Management). Illicit discharges frequently originate from areas of existing development. New development projects, when completed will become some type of residential, commercial, industrial or municipal existing development. Redevelopment projects are, by definition, redeveloping areas of existing development. And, redevelopment projects become construction sites located in areas of existing development. Much of the data and information collected, inspections performed, and enforcement actions taken for the requirements under Provisions E.2 to E.4 may also be utilized by the existing development management program. The requirements under Provision E.5, however, are focused primarily on reducing pollutants generated in areas of existing development that can be transported in storm water runoff and discharged to and from the MS4.

The requirements under Provision E.5 build upon existing program elements being implemented by the Copermittees. Provision E.5 is generally consistent with the existing development requirements of the Fourth Term Permits for Orange and Riverside Counties (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), but

modified to provide more flexibility to implement the programs so resources can be better focused toward addressing the highest priority water quality conditions identified in the Water Quality Improvement Plans.

For a Copermittee to properly manage areas of existing development, having knowledge of what development exists within its jurisdiction is essential. Provision E.5.a requires each Copermittee to maintain a watershed-based inventory of all the existing development within its jurisdiction. This requirement is necessary for each Copermittee to implement the requirements of Provision E.5.b-e.

As opposed to just maintaining separate inventories based on the type of site, each Copermittee must maintain a watershed-based inventory that includes all types of existing development within its jurisdiction. By utilizing a watershed-based inventory, the Copermittees within a Watershed Management Area can combine their inventories and review the inventories by watershed in addition to by jurisdiction. Pollutant sources and strategies for abatement can then be evaluated on a watershed level, as opposed to evaluating sources and strategies strictly by type of site.

Provision E.5.a includes the information that must be included in the inventory. Provision E.5.a.(1) specifies what facilities or areas must be included in the inventory. A commercial type of existing development may be identified in the inventory as a facility (e.g. individual building, individual business) or an area (e.g. shopping center, commercial zone). An industrial type of existing development must be identified in the inventory by facility (e.g. individual industrial entity). A municipal type of existing development must be identified in the inventory by facility, with a list of specific municipal facilities that must be included in the inventory. A residential type of existing development must be identified by areas to be designated by the Copermittee. For each of the facilities and areas identified in the Copermittee's inventory developed pursuant to Provision E.5.a.(1), Provision E.5.a.(2) specifies the information that must be included in the description for the facility or area.

Provision E.5.a.(3) requires each Copermittee to maintain an updated map showing the location of inventoried existing development, watershed boundaries, and water bodies. This requirement was included because this information is expected to help the Copermittees in a Watershed Management Area identify and prioritize sources of pollutants and/or stressors in areas of existing development that contribute toward the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Knowledge of the existing development that are likely to be sources of pollutants contributing to the highest priority water quality conditions is expected to be a key element in the Copermittees' development of the water quality improvement strategies that will be included in the Water Quality Improvement Plans. The strategies described in the Water Quality Improvement Plans will direct efforts within the existing development management programs implemented by each Copermittee.

Pursuant to 40 CFR 122.26(d)(2)(iv)(A) each Copermittee is required describe "*structural and source control measures to reduce pollutants*" in storm water runoff discharged from areas of existing development. Provision E.5.b includes the BMP implementation and maintenance requirements that the each Copermittee must require at areas of existing development to reduce pollutants in storm water discharges to the MEP. The San Diego Water Board, however, recognizes that BMP implementation and maintenance for residential areas will require much more education and encouragement through less authoritative measures than for commercial, industrial and municipal facilities and areas. Thus, the BMP implementation and maintenance requirements have been separated between requirements under Provision E.5.b.(1) for commercial, industrial and municipal facilities and areas, and Provision E.5.b.(2) for residential areas.

Most of the requirements in Provision E.5.b are consistent with the related requirements in the Fourth Term Permits. The level of specificity, however, has been changed to allow each Copermittee the flexibility to implement its program to achieve maximum efficiency, and to perform functions that will address the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Each Copermittee is expected to require the implementation of appropriate BMPs to address the expected pollutants from each facility or area. The Third and Fourth Term Permits described specific minimum BMPs that must be implemented at various sites. This Order, however, requires each Copermittee to designate minimum BMPs themselves and require implementation. Consistent with the Fourth Term Permits, each Copermittee is required to maintain, or require the maintenance of, all BMPs as needed.

The BMP implementation and maintenance requirements include a schedule of operation and maintenance activities for the MS4 and related structures (such as catch basins, storm drain inlets, and detention basins), as well as public streets and roads. Public streets and roads specifically include public unpaved roads. The San Diego Water Board identified, through investigations and complaints, sediment discharges from unpaved roads as a significant source of water quality problems in the San Diego Region. Inspection activities conducted by the San Diego Water Board since the Third Term Permits have found a lack of source control for many unpaved roads within the jurisdiction of the Copermittees.

Unpaved roads are a source of sediment that can be discharged in runoff to receiving waters, especially during storm events. Erosion of unpaved roadways occurs when soil particles are loosened and carried away from the roadway base, ditch, or road bank by water, wind, traffic, or other transport means. Exposed soils, high runoff velocities and volumes, sandy or silty soil types, and poor compaction increase the potential for erosion.

Road construction, culvert installation, and other maintenance activities can disturb the soil and drainage patterns to streams in undeveloped areas, causing excess runoff

and thereby erosion and the release of sediment. Poorly designed unpaved roads can act as preferential drainage pathways that carry runoff and sediment into natural streams, impacting water quality. In addition, other public works activities along unpaved roads have the potential to significantly affect sediment discharge and transport within streams and other waterways, which can degrade the beneficial uses of those waterways.

USEPA also recognizes that discharges from unpaved roads pose a significant potential threat to water quality. USEPA guidance[39] emphasizes the threat of unpaved roads to water quality:

> "*Dirt and gravel roads are a major potential source of these pollutants [sediment] and pollutants that bind to sediment such as oils, nutrients, pesticides, herbicides, and other toxic substances. Many roads have unstable surfaces and bases. Roads act like dams, concentrating flows that accelerate erosion of road materials and roadsides. Both unstable surfaces and accelerated erosion then lead to sediment and dust.*"

There are several guidance documents, developed by the USEPA,[40] the US Forest Service,[41] the University of California,[42] and others, that include design and construction specifications and BMPs that are readily available for implementation by public entities. Implementing design and other source control BMPs for unpaved roads in the region is necessary to reduce and minimize the impacts of sediment discharged during storm events from unpaved roads to the MS4s and receiving waters.

Provision E.5.c describes existing development site inspection frequency, content, and tracking that each Copermittee must incorporate into their existing development management programs. The requirements under Provision E.5.c are necessary to demonstrate each Copermittee is implementing a program that complies with Provision E.5.b and ensure BMPs implemented in areas of existing development will reduce pollutants in storm water discharges to the MEP. Provision E.5.c has been modified to include a minimum of once every 5 years for all inventoried facilities and areas of existing development, utilizing one or more methods of inspection.

In addition to onsite inspections, the methods of inspection have been expanded to include drive-by inspections. Inspections may be performed by the Copermittee's municipal and contract staff, or by volunteer monitoring or patrol programs. Volunteer monitoring or patrol programs are not expected to enforce the Copermittee's

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[39] USEPA, 2006. Environmentally Sensitive Maintenance for Dirt and Gravel Roads. Gesford and Anderson, USEPA-PA-2005.
[40] Ibid
[41] US Forest Service, 1996. Forest Service Specifications for Construction of Roads & Bridges. EM-7720-100. Revised August 1996.
[42] University of California Division of Agriculture and Natural Resources, 2007. Rural Roads: A Construction and Maintenance Guide of California Landowners. Publication 8262.

ordinances, or to inspect areas or facilities where members of the public are not allowed access. Volunteer monitoring or patrol programs must be trained by the Copermittee, and are only expected to collect visual observations. By utilizing drive-by inspections and volunteer monitoring or patrol programs, the Copermittees will be able to maximize and efficiently use their resources to identify and address sources of pollutants in areas of existing development.

The municipal and contract staff of each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial, industrial, and municipal facilities and areas in its inventoried existing development pursuant to Provision E.5.c.(1)(a)(iv). An "equivalent" of at least 20 percent means if any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspections may count toward the total annual inspection requirement. Linear municipal facilities (i.e. MS4 linear channels, sanitary sewer collection systems, streets, roads and highways) in the Copermittee's existing development inventory are not subject to the inspection frequency requirement of Provision E.5.c.(1)(a)(iv).

The inspection content specified in Provision E.5.c.(2)(a) includes the information required to be collected during an inspection by any method. The inspection content specified in Provision E.5.c.(2)(b) includes additional information that must be collected when a Copermittee's municipal or contract staff perform an onsite inspection. Provision E.5.c.(3) specifies the information that each Copermittee must maintain in its existing development inspection records.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary to compel compliance with the requirements of Provision E.5 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.5.d requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Provisions E.5.e.(1)-(2) specifically require the Copermittee to identify areas of existing development as candidates for retrofitting, and streams, channels, and/or habitats as candidates for rehabilitation. Provisions E.5.e.(1)-(2) are based on the retrofitting requirements of the Fourth Term Permits for Orange and Riverside Counties, but modified to also include identifying projects to rehabilitate channels within areas of existing development. The requirements have also been modified to be more focused on utilizing these types of projects for addressing the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Interest and opportunity to retrofit areas of existing development and rehabilitate channels located in areas of existing development has been observed in several programs the San Diego Water Board oversees (e.g., CWA Section 401 Water Quality

Certification program, supplemental environmental projects, and grant programs). Each jurisdiction has miles and miles of streets that could be retrofitted to become green streets. Reshaping landscaped areas from convex to concave configurations can detain storm water instead of directing runoff as quickly as possible to the MS4. Retrofit projects could also include simply replacing impervious surfaces with permeable surfaces.

Retrofitting projects do not necessarily have to be expensive. Retrofitting projects could be as simple as redirecting downspouts from roofs to pervious or landscaped areas instead of to hardscaped areas discharging directly to the MS4, providing rain barrels to harvest storm water from downspouts for use at a later time, or planting more trees in areas with little vegetation to provide canopy that can intercept storm water. The San Diego Water Board encourages the Copermittees to identify simple, low-cost retrofitting opportunities that can be easily implemented, in addition to other more expensive retrofitting and channel rehabilitation projects.

Rehabilitation of channels, streams, and/or habitat will require more significant planning and resources to implement. There are, however, also abundant opportunities to rehabilitate channels, streams and/or habitats in or adjacent to areas of existing development. Each Watershed Management Area likely has several creeks and stream reaches that have been undergrounded, artificially hardened, or hydromodified that could be rehabilitated to be more sustainably configured, which would slow down storm water flows and potentially have more assimilative capacity for pollutants while still being supportive of designated beneficial uses.

The San Diego Water Board recognizes that it may be infeasible to implement retrofitting or channel rehabilitation projects within certain areas of a Copermittee's jurisdictions. For such areas, the Copermittee must instead identify, develop, and implement regional retrofitting and channel rehabilitation projects (i.e. projects that can retain and/or treat storm water from one or more areas of existing development) adjacent to and/or downstream of the areas of existing development.

Provisions E.5.e.(1)-(2) do not require the implementation of retrofitting and rehabilitation projects, but do require the Copermittee to develop a program with strategies to facilitate the implementation of these types of projects in areas of existing development. The strategies are expected to include allowing and encouraging Priority Development Projects to implement retrofitting types of projects as a means of compliance with the structural BMP performance criteria requirements of Provisions E.3.c.(1) and E.3.c.(2).

Provision E.6 (Enforcement Response Plans) requires each Copermittee to develop an Enforcement Response Plan as part of its jurisdictional runoff management program document. Proper implementation of the Enforcement Response Plans is necessary to effectively prohibit non-storm water discharges to the MS4, and reduce the discharge of pollutants in storm water from the MS4 to the MEP.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system*" and be able to demonstrate that it can "*operate pursuant to legal authority established by statute, ordinance or series of contracts*" to control the discharge of non-storm water and pollutants in storm water to and from its MS4. Pursuant to 40 CFR 122.26(d)(2)(i)(E) each Copermittee is specifically required to have the legal authority to "*[r]equire compliance with conditions in ordinances, permits, contracts or order*s."

The requirements under Provision E.6 are necessary to demonstrate that each Copermittee can enforce its legal authority to *"effectively prohibit non-stormwater discharges"* and "*reduce the discharge of pollutants to the maximum extent practicable*" as well as "*[r]equire compliance with conditions in ordinances, permits, contracts or order*."

The Enforcement Response Plan required under Provision E.6 will serve as a reference for the Copermittee and the San Diego Water Board to determine if consistent enforcement actions are being implemented to achieve timely and effective compliance from all public and private entities that are not in compliance with the Copermittee's ordinances, permits, or other requirements. The Enforcement Response Plan must contain clear direction for the Copermittee to take immediate enforcement action, when appropriate and necessary, in their illicit discharge detection and elimination, development planning, construction management, and existing development management programs.

If the entities subject to the Copermittee's legal authority do not implement appropriate corrective actions in a timely manner, or if violations repeat, the Copermittee must take progressively stricter responses to enforce its legal authority and achieve compliance with its ordinances, permits, or other requirements to *"effectively prohibit non-stormwater discharges"* and "*reduce the discharge of pollutants to the maximum extent practicable.*"

<u>Provision E.7 (Public Education and Participation)</u> requires each Copermittee to implement a public education and participation program. Proper implementation of the public education and participation program as part of its jurisdictional runoff management program will contribute toward effectively prohibiting non-storm water discharges to the MS4, and toward the reduction of pollutants in storm water from the MS4 to the MEP.

Provision E.7 establishes the minimum requirements that each Copermittee must implement to engage members of the public as part of its jurisdictional runoff management program. In the Fourth Term Permits, the public education program requirements and the public participation requirements were included as separate jurisdictional runoff management program components. In this Order, the public education requirements have been consolidated with the public participation requirements, as both sets of requirements are related to the engagement of the public

by each Copermittee. Engagement of the public is critical for the success of each Copermittee's jurisdictional runoff management program.

The Copermittees have been implementing public education programs for the last 20 years, which are now well established. The specificity of expected public education program elements of the Fourth Term Permits has been removed. For the most part, the public education program requirements in Provision E.7.a have been reduced to a set of requirements that are specifically included in the federal regulations under 40 CFR 122.26(d)(2)(iv)(A)(6), 122.26(d)(2)(B)(6) and 122.26(d)(2)(D)(4), which should already be incorporated into each Copermittee's existing public education program. Each Copermittee is expected to utilize the information and data collected from the monitoring and assessments conducted within the Watershed Management Area, and from its inventories and inspections to best direct its public education program resources toward addressing the highest priority water quality conditions identified within the Water Quality Improvement Plan.

According to 40 CFR 122.26(d)(2)(iv), public participation is required to be included as part of the "*comprehensive planning process*", which includes the development and implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs. The requirements under Provision E.7.b specify the opportunities that the public must be provided to be involved in the "*comprehensive planning process*", as required by to 40 CFR 122.26(d)(2)(iv).

Provision E.8 (Fiscal Analysis) requires each Copermittee to secure the resources and provide an analysis of the resources that will be necessary to implement the requirements of the Order. Adequate fiscal resources are necessary for a jurisdictional runoff management program to effectively prohibit non-storm water discharges to the MS4, and reduce pollutants in storm water from the MS4 to the MEP.

According to 40 CFR 122.26(d)(2)(vi), each Copermittee is responsible for providing "*a fiscal analysis of the necessary capital and operation and maintenance expenditures necessary to accomplish the activities*" required by this Order, including "*a description of the source of funds that are proposed to meet the necessary expenditures, including legal restrictions on the use of such funds.*" The fiscal analysis requirements of Provision E.8 are consistent with 40 CFR 122.26(d)(2)(vi).

The San Diego Water Board has chosen not to require a description of fiscal benefits realized from implementation of the jurisdictional runoff management programs. This is a recommendation from the National Association of Flood and Stormwater Management Agencies.[43] For instance, the fiscal analysis requirements do not address city-wide fiscal benefits of protection (e.g., public health, tourism, property values, economic activity, beneficial uses, etc.), even though many costs currently

[43] National Association of Flood and Stormwater Management Agencies. 2006. *Guidance for Municipal Stormwater Funding.* Prepared under a grant provided by the USEPA.

reported to the San Diego Water Board are for related activities. This type of assessment may help Copermittees improve the allocation of resources and it may help the Copermittees secure adequate funding for the program. Qualitative assessments, however, could be overly subjective and most Copermittees likely lack the ability to provide accurate quantitative assessments. The San Diego Water Board encourages the Copermittees to consider means for conducting assessments of fiscal benefits derived from the programs. Such assessments could be conducted on a regional scale similar to studies of program costs conducted by the State Water Board.[44]

[44] State Water Board, 2005. NPDES Stormwater Cost Survey.

F. Reporting

Purpose: Provision F includes the requirements for the documents and reports that the Copermittees must prepare and provide to the San Diego Water Board. The documents prepared by the Copermittees and provided to the San Diego Water Board and made available to the public will provide the documentation that the Copermittees are complying with the requirements of the Order.

***Discussion*:** Provision F requires the Copermittees to prepare several documents and reports that must be provided to the San Diego Water Board and made available to the public. The reporting requirements have been significantly reduced compared to the Fourth Term Permit reporting requirements. The reduction in reporting requirements was recommended by the San Diego County Copermittees in the Report of Water Discharge submitted in June 2011.

More specific and detailed discussions of the requirements of Provision F are provided below.

Provision F.1 (Water Quality Improvement Plans) requires the Copermittees in each Watershed Management Area to develop and submit a Water Quality Improvement Plan in accordance with the requirements of Provision B.

Of all the requirements of Provision F, the Water Quality Improvement Plans will likely be the documents requiring the most significant effort to develop. The content of the Water Quality Improvement Plans, however, is expected to include content that should already have been developed for the Watershed Plans and several elements that are included in the Monitoring and Reporting Programs required under the Fourth Term Permits.

Because the Water Quality Improvement Plan is part of the "*comprehensive planning process which involves public participation*," Provision F.1 includes requirements to give multiple opportunities to the public to provide input on the content of the plans.

Provision F.1.a.(1) specifies the elements that the Copermittees must include in the public participation process for the development of the Water Quality Improvement Plans. In order for the public to be aware of the opportunities to provide input, Provision F.1.a.(1)(a) requires the Copermittees to develop a publicly available and noticed schedule of the opportunities for the public to participate and provide comments during the development of the Water Quality Improvement Plan. These opportunities are when the public can provide the data, information, and recommendations that the Copermittees can consider during the development of the Water Quality Improvement Plans.

The San Diego Water Board recognizes, however, that the Copermittees cannot be expected to incorporate all the data, information, and recommendations that the public

may provide into the Water Quality Improvement Plans. The Copermittees will have to review the data, information, and recommendations received and make some decisions on what to incorporate into the Water Quality Improvement Plans. Before the Copermittees finalize their decisions, members of the public should be allowed to review the Copermittees' decisions. Thus, Provision F.1.a.(1)(b) requires the Copermittees to form a Water Quality Improvement Consultation Panel (Panel).

The Panel will consist of a member from the environmental community and a member from the development community familiar with the Watershed Management Area. A representative from the San Diego Water Board staff will also be part of the Panel. The Copermittees may choose to include additional members, but the Panel is only required to include three panel members.

The Panel will serve as an additional public participation and input mechanism during the development of the Water Quality Improvement Plans. The knowledge and expertise from these Panel members are expected to provide the Copermittees valuable direction during their decision-making process. The Copermittees will review the content of their planned submittals with the Panel members to receive recommendations. If the Panel provides recommendations, the Copermittees must consider revisions to the Water Quality Improvement Plan submittals.

The San Diego Water Board recognizes that the development of multiple Water Quality Improvement Plans concurrently may limit the ability of the public to review and provide comments to the Copermittees. Thus, Provision F.1.a.(1)(c) requires the Copermittees to coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public time and opportunity to participate during the development of the Water Quality Improvement Plans.

Provision F.1.a.(2) requires the Copermittees to develop and submit the first Water Quality Improvement Plan component, in accordance with the requirements of Provision B.2, which includes the identification of the priority water quality conditions and potential water quality improvement strategies. The public must be provided an opportunity to provide data, information and recommendations to be utilized in the development and identification of the priority water quality conditions and potential water quality improvement strategies for the Watershed Management Area. The Copermittees must consult with the Panel and consider making revisions. The Copermittees may submit the requirements of Provision B.2 as early as 6 months and no later than 12 months after the commencement of coverage under this Order. After the requirements of Provision B.2 are submitted to the San Diego Water Board, the public will be provided another opportunity to provide comments.

Provision F.1.a.(3) requires the Copermittees to develop and submit the second Water Quality Improvement Plan component, in accordance with the requirements of Provision B.3, which includes the identification of the numeric goals for the highest priority water quality conditions identified for the Watershed Management Area, and the strategies that will be implemented to achieve the potential numeric goals. The

Copermittees may also develop the Optional Watershed Management Area Analysis, in accordance with the requirements of Provision B.3.b.(4), as part of this submittal. The public must be provided an opportunity to provide data, information and recommendations to be utilized in the development and identification of the numeric goals and water quality improvement strategies for the Watershed Management Area. The Copermittees must consult with the Panel and consider making revisions. The Copermittees may submit the requirements of Provision B.3 as early as 9 months and no later than 18 months after the commencement of coverage under this Order. After the requirements of Provision B.3 are submitted to the San Diego Water Board, the public will be provided another opportunity to provide comments.

Finally, Provision F.1.b describes the process for the submittal and implementation of the Water Quality Improvement Plans. The complete Water Quality Improvement Plans are required to be submitted by the Copermittees within 24 months after the commencement of coverage under this Order. The San Diego Water Board will provide the public an opportunity to provide comments on each complete Water Quality Improvement Plan.

The San Diego Water Board will review each Water Quality Improvement Plan and the public comments received to determine if the Copermittees have submitted a Water Quality Improvement Plan that meets the requirements of Provision B. If a Water Quality Improvement Plan does not meet the requirements of Provision B, the Copermittees will be considered out of compliance and directed in writing by the San Diego Water Board Executive Officer to correct the deficiencies.

When a Water Quality Improvement Plan meets the requirements of Provision B, the San Diego Water Board will determine whether to hold a public hearing or to limit public input to submittal of written comments before accepting the Water Quality Improvement Plan. Implementation of the Water Quality Improvement Plan must begin within 30 days of acceptance.

The San Diego Water Board expects that any deficiencies in the Water Quality Improvement Plan will be identified either in the public comments or during the review by the San Diego Water Board before implementation begins. In the event any deficiencies are identified after the implementation of the Water Quality Improvement Plan, Provision F.1.b.(7) clarifies that the San Diego Water Board maintains the right to require the Copermittees to correct any deficiencies that may be identified.

Provision F.2 (Updates) requires the Copermittees to update specific documents that the Copermittees will utilize to implement the requirements of this Order.

Each Copermittee is required to continue implementing a jurisdictional runoff management program, as required under Provision E. Implementation of each Copermittee's jurisdictional runoff management program is directed by its jurisdictional runoff management program document. Provision F.2.a requires each Copermittee to update its jurisdictional runoff management program document to be consistent with

the requirements of Provision E concurrent with the submittal of the Water Quality Improvement Plan.

Likewise, each Copermittee must continue to require new development and redevelopment projects to implement BMPs to control pollutants in storm water runoff. The control of pollutants in storm water runoff from development and redevelopment projects within each Copermittee's jurisdiction is guided and directed by its BMP Design Manual, formerly known as a Standard Storm Water Mitigation Plan (SSMP). Provision F.2.b requires each Copermittee to update its BMP Design Manual to be consistent with the requirements of Provision E.3 concurrent with the submittal of the Water Quality Improvement Plan.

In general, the requirements of the Order should not necessitate a complete rewrite of each Copermittee's jurisdictional runoff management program document or BMP Design Manual, as was required by the Third Term Permits. The jurisdictional runoff management program and BMP Design Manual requirements of this Order are not significantly different than the requirements of the Fourth Term Permits. Thus, only sections of the Order which are new or have been significantly changed should warrant revisions to specific sections of the Copermittee's jurisdictional runoff management program document and BMP Design Manual.

Finally, the Water Quality Improvement Plans are expected to require updates as the iterative approach and adaptive management process included in the Water Quality Improvement Plan, as required under Provision B.5, is implemented by the Copermittees. Provision F.2.c.(1) requires the Copermittees to implement a public participation process for the proposed updates, review the proposed updates with the Panel, and submit the updates to the Water Quality Improvement Plan as part of the Annual Reports required under Provision F.3.b.

Also, because TMDLs are likely to be developed, adopted and approved during the term of the Order, Provision F.2.c.(2) has been included to expedite the incorporation of TMDLs into the Copermittees' Water Quality Improvement Plans as part of the update process, potentially before the Order is re-opened to incorporated the requirements of the new TMDLs.

Provision F.3 (Progress Reporting) requires the Copermittees to report on the progress of implementing the Water Quality Improvement Plans.

The requirements of Provision F.3 are to report the progress toward improving water quality that the Copermittees are achieving with the implementation of the Water Quality Improvement Plans and each Copermittee's jurisdictional runoff management program. The Progress Report Presentations required under Provision F.3.a are included to provide the Copermittees an opportunity to communicate directly with the San Diego Water Board and the public. The Progress Report Presentations will also provide the members of the San Diego Water Board and members of the public an opportunity to become more acquainted with the Copermittees and their projects and

programs to address non-storm water and storm water discharges into and from their MS4s.

The Annual Report requirements of Provision F.3.b are a consolidation of several reporting requirements from the Fourth Term Permits, including the Jurisdictional Runoff Management Program Annual Reports, the Watershed Annual Reports, and the Monitoring and Reporting Program Annual Reports. Furthermore, the Annual Report requirements are consistent with the requirements under 40 CFR 122.42(c).

Pursuant to 40 CFR 122.42(c), "*[t]he operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the Director…must submit an annual report*", which must include the following:

(1) *The status of implementing the components of the storm water management program that are established as permit conditions* [40 CFR 122.42(c)(1)];

(2) *Proposed changes to the storm water management programs that are established as permit conditions* [40 CFR 122.42(c)(2)];

(3) *Revisions, if necessary, to the assessment of controls and fiscal analysis* [40 CFR 122.42(c)(3)];

(4) *A summary of data, including monitoring data, that is accumulated throughout the reporting year* [40 CFR 122.42(c)(4)];

(5) *Annual expenditures and budget for year following each annual report* [40 CFR 122.42(c)(5)];

(6) *A summary describing the number and nature of enforcement actions, inspections, and public education programs* [40 CFR 122.42(c)(6)];

(7) *Identification of water quality improvements or degradation* [40 CFR 122.42(c)(7)].

Under the Fourth Term Permits, each Copermittee is responsible for submitting a Jurisdictional Runoff Management Program Annual Report; the Copermittees in each designated watershed are responsible for submitting a Watershed Annual Report; and the Copermittees from each county are responsible for submitting a Monitoring and Reporting Program Annual Report.

There are 39 Copermittees in the San Diego Region, each required to prepare and submit a Jurisdictional Runoff Management Program Annual Report. There are 9 designated watersheds in San Diego County, 6 designated watersheds in Orange County, and 1 designated watershed in Riverside County for a total of 16 designated watersheds, each requiring a Watershed Annual Report. There are 3 sets of Copermittees in 3 counties in the San Diego Region, requiring Copermittees from each county to prepare and submit a Monitoring and Reporting Program Annual Report.

Thus each Copermittee is currently required to prepare, or participate in the preparation of at least 3 annual reports. In addition, the San Diego County Copermittees are required to prepare and submit a Regional Urban Runoff Management Plan Annual Report.

In total, there are 59 annual reports that are prepared by the Copermittees and submitted to the San Diego Water Board for the Fourth Term Permits. The preparation of these annual reports requires significant time and resources from each Copermittee, which could otherwise be expended on actions that could improve water quality within its jurisdiction. In turn, significant time and resources are required from the San Diego Water Board staff to review these reports, which could otherwise be expended on working directly with the Copermittees to improve their implementation efforts toward restoring and protecting water quality.

Until the Water Quality Improvement Plans are developed, there will be a transitional period during which the Copermittees will continue to implement their existing jurisdictional runoff management programs. There will also be a transitional period during which the Copermittees will implement the transitional monitoring and assessment requirements of Provision D. During the transitional period, the Copermittees will submit annual reports pursuant to the requirements of Provisions F.3.b.(1) and F.3.b.(2).

Provision F.3.b.(1) includes the transitional annual reporting requirements for each Copermittee's jurisdictional runoff management program. The reporting of the jurisdictional runoff management program implementation efforts have been reduced to a single 2-page form. Each Copermittee is required to complete and submit a Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D or a revised form accepted by the San Diego Water Board) no later than October 31 of each year for each jurisdictional runoff management program reporting period (i.e. July 1 to June 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted. The Jurisdictional Runoff Management Program Annual Report Form will certify that each Copermittee has implemented its jurisdictional runoff management program in accordance with the requirements of Provision E. Each Copermittee may choose to continue to utilize and submit the jurisdictional runoff management program annual reporting format of its current Order until the first Water Quality Improvement Plan Annual Report is required to be submitted.

Provision F.3.b.(2) includes the transitional annual reporting requirements for the transitional monitoring and assessment program for each Watershed Management Area. The Copermittees in the Watershed Management Area are required to submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted. The Transitional Monitoring and Assessment Program Annual Report is required to include

the transitional period monitoring data collected pursuant to Provisions D.1.a and D.2.a, and the findings from the transitional period findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

Provision F.3.b.(3) includes the Water Quality Improvement Plan Annual Report requirements. Only one Water Quality Improvement Plan Annual Report is required for each of the ten (10) Watershed Management Areas designated under Provision B.1, which is a significant reduction in the number of annual reports required to be prepared and submitted by the Copermittees. The Water Quality Improvement Plan Annual Report will document the Copermittees' efforts to implement the Water Quality Improvement Plan. Each Water Quality Improvement Plan Annual Report will be focused primarily on reporting the analysis of the monitoring data collected pursuant to Provisions D.1-D.3 during the reporting period, and the assessments that are required pursuant to Provision D.4 based on the data. The monitoring data analyses and the assessments that are provided in the Water Quality Improvement Plan Annual Report will be the core of the report. The reporting of the jurisdictional runoff management program implementation efforts have been reduced to a single 2-page form, and will no longer be the primary focus of the reporting requirements as in the Third and Fourth Term Permits.

Each Copermittee will continue to prepare and submit a Jurisdictional Runoff Management Program Annual Report Form as part of the Water Quality Improvement Plan Annual Report to certify that each Copermittee has implemented its jurisdictional runoff management program in accordance with the requirements of Provision E. Instead of reviewing a voluminous report from each Copermittee, as was required under the Third and Fourth Term Permits, the San Diego Water Board will conduct audits of each Copermittee's jurisdictional runoff management program to investigate and confirm the information provided by each Copermittee on its Jurisdictional Runoff Management Program Annual Report Form. The audits will allow the San Diego Water Board to become more familiar with the each Copermittee's jurisdictional runoff management program, and each Copermittee will become more informed about the expectations of the San Diego Water Board.

The reduction in the number and content of the Water Quality Improvement Plan Annual Reports should result in significant time, cost and resource savings for the Copermittees, as well as the San Diego Water Board. Those savings should offset a significant portion of any additional costs that may be incurred to develop the Water Quality Improvement Plans and to implement the monitoring and assessment program requirements of Provision D.

The reporting period for the Water Quality Improvement Plan Annual Reports consists of two periods. Because the jurisdictional runoff management programs are typically budgeted and implemented during a fiscal year, the information provided on the Jurisdictional Runoff Management Program Annual Report Forms will cover the period from July 1 to June 30 of the following year.

The Water Quality Improvement Plan Annual Reports, however, are focused primarily on the monitoring data and the assessments based on the monitoring data. The monitoring data is collected during the monitoring year, which begins October 1 and ends September 30 of the following year. The monitoring year begins after the beginning of the fiscal year and ends after the end of the fiscal year. Therefore, to accommodate and capture the information collected during the fiscal year and the monitoring year, the Annual Report reporting period incorporates both periods.

Finally, Provision F.3.c requires the Copermittees to develop and submit a Regional Monitoring and Assessment Report. The Regional Monitoring and Assessment Report is similar to the Long Term Effectiveness Assessment required under the Fourth Term San Diego County Permit. The Regional Monitoring and Assessment Report is expected to utilize the entire body of data and information collected by the Copermittees during the term of this Order to assess improvements to water quality on a regional scale.

Provision F.4 (Regional Clearinghouse) requires the Copermittees to develop, update, and maintain an internet-based Regional Clearinghouse that can be used to store, disseminate, and share the Copermittees' documents, monitoring data, special studies, and any other data or information.

Most of the documents and data that are generated by the Copermittees can be provided in electronic format, and made available to the San Diego Water Board and the public on the internet. The San Diego Water Board has been gradually transitioning its document submittal requirements to electronic submittals. Provision F.4 has been included to further these efforts.

Provision F.4 has also been included to improve the exchange and availability of information among the Copermittees, as well as between the Copermittees and the San Diego Water Board. Provision F.4 will also make the information generated during the implementation of the Order more accessible to the public.

Provision F.5 (Report of Waste Discharge) requires the Copermittees to submit a Report of Waste Discharge to reapply for renewal of the Order prior to its expiration, in accordance with 40 CFR 122.21(d)(2) and CWC section 13376.

Because the Orange County and Riverside County Copermittees will not be subject to the requirements of this Order until they are notified of coverage, Provision F.5.a describes the process of submitting their Reports of Waste Discharge pursuant to the requirements of their current permits to obtain coverage under this Order.

For the Copermittees subject to the requirements of this Order, Provision F.5.b requires the Copermittees to submit a Report of Waste Discharge 180 days in advance of the expiration of this Order Provision F.5.b also describes the minimum information to be included in the Report of Waste Discharge, based on USEPA

guidance “Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems,” dated May 17, 1996.

Provision F.6 (Application for Early Coverage) describes the process that would allow the Orange County and/or Riverside County Copermittees to obtain coverage under this Order earlier than the expiration of their current Orders.

If the Orange County and/or Riverside County Copermittees choose to obtain coverage under this Order earlier than the expiration of their current Orders, the preparation and submittal of a Report of Waste Discharge, as required by the Fourth Term Permits, will not be necessary. The existing Order for the respective county will be rescinded upon the effective coverage date under this Order, except for enforcement purposes.

G. Principal Watershed Copermittee Responsibilities

Purpose: Provision G includes the requirements for the Principal Watershed Copermittee designated by the Copermittees in each Watershed Management Area.

***Discussion*:** Unlike previous NPDES requirements, there will no longer be a single Principal Copermittee. Provision G.1 requires the Copermittees to designate a Principal Watershed Copermittee for each Watershed Management Area. There are ten (10) Watershed Management Areas in the San Diego Region, as defined in Table B-1 under Provision B.1 of the Order. An individual Copermittee should not be the Principal Watershed Copermittee for more than two (2) Watershed Management Areas. There could be up to ten (10) Principal Water Copermittees designated for the Watershed Management Areas in the San Diego Region.

Provision G.2 describes the minimum responsibilities of each Principal Watershed Copermittee. The primary responsibility of the Principal Watershed Copermittees is to serve as the liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues. Ideally, the Principal Watershed Copermittee can represent the interests of all the Copermittees within a Watershed Management Area during discussions or meetings to facilitate communication with the San Diego Water Board. The Principal Watershed Copermittees are also responsible for facilitating and coordinating the implementation efforts of the Copermittees and submittals of required documents and reports.

The Principal Watershed Copermittee is responsible for facilitating the efforts of the Copermittees within the Watershed Management Area to develop the Water Quality Improvement Plan required under Provision B, and submit it for approval in accordance with Provision F.1. The Principal Watershed Copermittee is also responsible for coordinating the submittal of the document updates, Progress Report Presentations, and Annual Reports required from the Copermittees within each Watershed Management Area under Provisions F.2, F.3.a, and F.3.b. The Principal Watershed Copermittees are responsible for coordinating with each other to develop and submit the Regional Clearinghouse, Regional Monitoring and Assessment Report, and the Report of Waste Discharge required under Provisions F.3.c, F.4, and F.5.

The designated Principal Watershed Copermittee for each Watershed Management Area does not necessarily have to serve as the Principal Watershed Copermittee for the entire term of the Order. If the Copermittees in a Watershed Management Area choose to designate a new Principal Watershed Copermittee, the change may be submitted as part of the Annual Report required under Provision F.3.b, with an update to the Water Quality Improvement Plan in accordance with Provision F.2.c.

Provision G.3 specifies that the Principal Watershed Copermittee is not responsible for ensuring that the other Copermittees within the Watershed Management Area are in compliance with the requirements of this Order

H. Modification of Order

Purpose: Provision H provides the conditions under which modifications to Order No. R9-2013-0001 may occur.

***Discussion*:** Provision H allows for modifications to Order No. R9-2013-0001. Minor modifications may be made by the San Diego Water Board Executive Officer without a public notice or public hearing. Minor modifications are defined under 40 CFR 122.63. Minor modifications under 40 CFR 122.63 potentially applicable to this Order are the following:

- Correcting typographical errors;
- Requiring more frequent monitoring or reporting by the Copermittees;
- Changing an interim compliance date in a schedule of compliance, provided the new date is not more than 120 days after the date specified in the existing permit and does not interfere with attainment of the final compliance date requirement.

Modifications that are not one of the above minor modifications will require re-opening the Order, subject to the requirements of 40 CFR 122.44, 122.62 to 122.64, and 124.5, but only for the specific provisions subject to the modification. Modifications of the Order that are not minor require a draft Order with the proposed modifications made available for public review, a public notice and comment period, and a public hearing. Comments on the provisions not subject to the proposed modifications are not required to be considered in the San Diego Water Board's responses to comments or during the public hearing.

Provision H.4 was included to specify that the Order will be re-opened for modifications if the State Water Board determines revisions to Provision A are warranted, an application for early coverage under the Order is received pursuant to Provision F.6, the Basin Plan is amended to modify an existing TMDL or incorporate a new TMDL, or the monitoring and assessment program requirements need to be updated or revised.

Provision H.5 was included to specify that the San Diego Water Board will re-open and consider modifications to this Order when the Orange County Copermittees or the Riverside County Copermittees submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders

I. Standard Permit Provisions and General Provisions

Purpose: Provision I incorporates the standard permit provisions required to be included in all NPDES permits, as well as several other general provisions.

***Discussion*:** Provision I refers to Attachment B to the Order. Attachment B expressly incorporates the conditions applicable to all NPDES permits as provided under 40 CFR 122.41(a)-(n), as well as the applicable conditions for MS4s and storm water discharges provided under 40 CFR 122.42(c) and 40 CFR 122.42(d), respectively. Attachment B also includes several general provisions that are typically included in or applicable to waste discharge requirements issued by the San Diego Water Board.

IX. ATTACHMENTS

The attachments to the Order are discussed below. The discussions describe the content of the attachments.

Attachment A – Discharge Prohibitions and Special Protections

Section 1 of Attachment A includes the Waste Discharge Prohibitions from the Basin Plan. They have been provided verbatim in their entirety.

Section 2 of Attachment A includes the "*Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges*" applicable to permitted point source discharges of storm water, adopted under State Water Board Resolution No. 2012-0012. The terms, prohibitions, and special conditions (collectively referred to as special conditions) are established as limitations on point source storm water discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in ASBS, as required for State Water Quality Protection Areas pursuant to California Public Resources Code sections 36700(f) and 36710(f). These Special Protections were adopted by the State Water Board as part of the Ocean Plan General Exception.

Attachment B – Standard Permit Provisions and General Provisions

Conditions applicable to all NPDES permits, as required under 40 CFR 122.41, and conditions applicable to MS4s and storm water discharges, as required under 40 CFR 122.42(c) and 122.42(d), respectively are provided in Attachment B to the Order. They have been provided expressly in their entirety.

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. These general provisions are typically included in or applicable to waste discharge requirements issued by the San Diego Water Board. Many of the general provisions were developed by the State Water Board. Where a general provision is derived from statute or regulation, a citation of the statute or regulation section is provided. General provisions that do not provide a citation are included under the authority provided CWC 13377.

Attachment C – Acronyms, Abbreviations and Definitions

The acronyms and abbreviations that are used in the Order are provided in Attachment C. Attachment C also includes definitions that may provide an explanation or description of the meaning or intent of specific terms or phrases included in the Order.

Attachment D – Jurisdictional Runoff Management Program Annual Report Form

An example of the Jurisdictional Runoff Management Program Annual Report Form required to be submitted by each Copermittee as part of the Annual Reports required under Provision F.3.b.(1)(e) is provided as Attachment D to the Order. An electronic version of the form will be available from the San Diego Water Board after the adoption of the Order.

The Jurisdictional Runoff Management Program Annual Report Form includes the minimum information necessary to demonstrate that the Copermittee is implementing and in compliance with the requirements of Provision E, and includes much of the information required to be reported pursuant to 40 CFR 122.42(c).

The information that must be provided on the Jurisdictional Runoff Management Program Annual Report Form is limited to the fiscal year, which begins July 1 and ends June 30 of the following year. The information expected to be provided by the Copermittees in each section of the Jurisdictional Runoff Management Program Annual Report Form is discussed below.

I. COPERMITTEE INFORMATION

The name of the Copermittee (e.g. name of city, county, or special district) and the contact information for the storm water program manager are provided under this section.

II. LEGAL AUTHORITY

The Copermittee must confirm whether or not the legal authorities under Provision E.1.a have been established for itself within its jurisdiction.

The Copermittee must also confirm whether or not a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority, as required under Provision E.1.b. The certification statement required by Provision E.1.b is only required to be submitted with the first Annual Report required under Provision F.3.b.

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

The Copermittee must inform the San Diego Water Board whether or not an update to its jurisdictional runoff management program document was required or recommended by the San Diego Water Board during the reporting period. An update to the jurisdictional runoff management program is required under Provision F.2.a. The San Diego Water Board may recommend modifications to the jurisdictional runoff management program as part of the iterative approach and adaptive management process required under Provision B.5, which may result in an update that is necessary for the Copermittee's jurisdictional runoff management document.

If an update was required or recommended, the Copermittee must confirm whether or not the update was completed and made available on the Regional Clearinghouse within the reporting period. If no update was required or recommended, an answer is not required. If the answer is NO, meaning the required or recommended update was not completed and/or made available on the Regional Clearinghouse, the Copermittee must attach a schedule for the completion of the update and/or posting of the updated document on the Regional Clearinghouse.

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

The Copermittee must confirm whether or not a program was implemented during the fiscal year to actively detect and eliminate illicit discharges and connections in accordance with the requirements under Provision E.2.

In addition to confirming that a program to detect and eliminate illicit discharges was implemented during the reporting period, the Copermittee is also required to report on several items related to the program. The information that must be reported is limited to the fiscal year for the Annual Report.

All non-storm water discharges are considered illicit discharges unless the source is identified as one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5). If a non-storm water discharge is identified as one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5), the discharge is a non-storm water discharge, but not an illicit discharge. If a non-storm water discharge is identified but not in one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5), the discharge is both a non-storm water discharge and an illicit discharge.

V. DEVELOPMENT PLANNING PROGRAM

The Copermittee must confirm whether or not a development planning program was implemented during the fiscal year in accordance with the requirements under Provision E.3.

The Copermittee must also inform the San Diego Water Board whether or not an update to its BMP Design Manual was required or recommended by the San Diego Water Board during the fiscal year. An update to the BMP Design Manual is required under Provision F.2.b. The San Diego Water Board may recommend modifications to the BMP Design Manual, which may result in an update that is necessary for Copermittee's the BMP Design Manual.

If an update was required or recommended, the Copermittee must confirm whether or not the update was completed and made available on the Regional Clearinghouse within the reporting period. If no update was required or recommended, an answer is not required. If the answer is NO, meaning the required or recommended update was not completed and/or made available on the Regional Clearinghouse, the Copermittee must attach a schedule for the completion of the update and/or posting of the updated document on the Regional Clearinghouse.

The Copermittee is also required to report on several items related to the program. For the development and redevelopment projects that are reviewed under the program, the Copermittee must report the total number projects submitted for review during the fiscal year. Of those projects, the Copermittee must report the number that are Priority Development Projects, as defined under Provision E.3.b.(1). The Copermittee must also report the number of Priority Development Projects that were approved and/or granted occupancy during the fiscal year, regardless of when the project was originally submitted for review. Any projects that were approved during the fiscal year and granted any exemptions from the BMP Design Manual requirements and/or allowed to implement alternative compliance options in accordance with Provision E.3.c.(3) must be reported.

Finally, the Copermittee must also report on several items related to its oversight of permanent BMPs on Priority Development Projects within its jurisdiction, as required under Provision E.3.e. The information that must be reported is limited to the fiscal year for the Annual Report.

VI. CONSTRUCTION MANAGEMENT PROGRAM

The Copermittee must confirm whether or not a construction management program was implemented during the fiscal year in accordance with the requirements under Provision E.4.

The Copermittee is also required to report on several items related to its oversight construction projects within its jurisdiction. The information that must be reported is limited to the fiscal year for the Annual Report.

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

The Copermittee must confirm whether or not an existing development management program was implemented during the fiscal year in accordance with the requirements under Provision E.5.

The Copermittee is also required to report on several items related to its oversight in areas of existing development within its jurisdiction. The information that must be reported is limited to the fiscal year for the Annual Report. The information must also be separated into four categories of existing development: municipal, commercial, industrial, and residential.

VIII. PUBLIC EDUCATION AND PARTICIPATION

The Copermittee must confirm whether or not a public education program component was implemented during the fiscal year in accordance with the requirements under Provision E.7.a.

The Copermittee must also confirm whether or not a public participation program component was implemented during the fiscal year in accordance with the requirements under Provision E.7.b.

IX. FISCAL ANALYSIS

The Copermittee must confirm a summary of its fiscal analysis, conducted in accordance with the requirements under Provision E.8, has been attached to the form.

X. CERTIFICATION

A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative must sign and certify the Jurisdictional Runoff Management Program Annual Report Form. The appropriate box must be checked to indicate the whether a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative is signing the form.

Attachment E – Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2013-0001

Attachment E provides specific provisions for implementing the load allocations (LAs) and wasteload allocations (WLAs) of Total Maximum Daily Loads (TMDLs) adopted by the San Diego Water Board and approved by USEPA in which the Copermittees are identified as responsible for discharges subject to the requirements of the TMDLs. Federal regulations require that NPDES requirements incorporate water quality based effluent limitations (WQBELs) that must be consistent with the requirements and assumptions of any available WLAs,[45] which may be expressed as numeric effluent limitations, when feasible, and/or as a best management practice (BMP) program of expanded or better-tailored BMPs.[46] Where the TMDL includes WLAs that provide numeric pollutant load or pollutant parameter objectives, the WLA has been, where feasible, translated into numeric WQBELs.[47]

For each TMDL in Attachment E, four sections are included:

a. Applicability: This section provides the resolution under which the TMDL Basin Plan amendment was adopted and approved, with the applicable adoption and approval dates. This section also gives the effective date of the TMDL and where the TMDL is applicable (i.e. Watershed Management Area and water body). The Copermittees that are responsible for implementing the specific provisions are also given in this section.

b. Final TMDL Compliance Requirements: For each TMDL, the final TMDL compliance requirements consist of the final TMDL compliance date(s), the final WQBELs, and the final TMDL compliance determination requirements. The final WQBELs are expressed in terms of receiving water limitations, effluent limitations, and/or best management practices (BMPs). The final WQBELs for the TMDLs are incorporated by reference into Provision A of the Order. The final WQBELs become enforceable when the final TMDL compliance dates have passed. Applicable BMPs within the final WQBELs must be incorporated into the Water Quality Improvement Plans. Compliance with the final WQBELs will be determined in accordance with the options provided under the final TMDL compliance determination requirements.

c. Interim TMDL Compliance Requirements: If the final TMDL compliance date has not passed and there are interim TMDL compliance requirements, they are included in this section. If there are interim WQBELs with interim compliance dates, the interim WQBELs become enforceable when the corresponding interim compliance dates have passed. Compliance with the interim WQBELs will be determined in accordance with the options provided under the interim TMDL compliance determination requirements.

d. Specific Monitoring and Assessment Requirements: If there are specific monitoring and assessment requirements that cannot be met with the monitoring and assessment program

[45] 40 CFR 122.44(d)(1)(vii)(B)
[46] 40 CFR 122.44(k)(2) and 40 CFR 122.44(k)(3)
[47] November 12, 2010 Memorandum from the USEPA, Revisions to the November 22, 2002 Memorandum "Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLA""

requirements under Provision D of the Order, the additional requirements are included in this section.

The requirements of the TMDLs are based on and consistent with the assumptions and requirements of any available adopted and approved TMDLs that have been incorporated into the Basin Plan. Modifications to the requirements for the TMDLs in Attachment E cannot be made unless the TMDLs are modified in the Basin Plan.

A modification to any aspect of a TMDL in the Basin Plan requires a Basin Plan amendment. A Basin Plan amendment to modify a TMDL will require the San Diego Water Board to adopt a resolution to amend the Basin Plan, which includes a separate public process. When the San Diego Water Board adopts a Basin Plan amendment, it subsequently requires approval from the State Water Board, the Office of Administrative Law, and the USEPA before it becomes effective.

If and when the TMDLs are a modified in the Basin Plan, the San Diego Water Board will revise the requirements of the TMDL in accordance with the Basin Plan amendment. When a Basin Plan amendment to modify a TMDL becomes effective, the San Diego Water Board will modify the requirements of the TMDL pursuant to the requirements of Provision H.4 of the Order as soon as possible.

Walsh

026704

SAN DIEGO REGIONAL
WATER QUALITY
CONTROL BOARD

2014 MAR 21 AM 10 47

CITY OF LAGUNA HILLS

City Manager

March 12, 2014

Mr. Kurt Berchtold
Executive Officer
California Regional Water Quality
Control Board - Santa Ana Region
3737 Main Street, Suite 500
Riverside, CA 92501-3339

Mr. David W. Gibson
Executive Officer
California Regional Water Quality
Control Board – San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

SUBJECT: REQUEST TO DESIGNATE THE SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD AS THE REGULATORY AUTHORITY FOR ALL STORMWATER DISCHARGES IN THE CITY OF LAGUNA HILLS

Dear Messrs. Berchtold and Gibson:

The City of Laguna Hills is located within south Orange County and covers an area of approximately 6.6 square miles. About 82% of the City's land area is located within the Aliso Creek and San Juan Creek Watersheds under the jurisdiction of the San Diego Regional Water Quality Control Board (SDRWQCB) with the remaining 18% (1.2 square miles) of the City in the Newport Bay/San Diego Creek Watershed under the jurisdiction of the Santa Ana Regional Water Quality Control Board (SARWQCB). Attached for your reference is a map of the City overlaid with the jurisdictional boundary between the two Regional Boards.

The City is a co-permittee in two Municipal Separate Storm Sewer System (MS4) Permits, Order R9-2009-0002 and Order R8-2009-0030 issued by the SDRWQCB and the SARWQCB, respectively. Both jurisdictions issue comprehensive Large MS4 Permits that require the City to implement extensive compliance programs. Differences in the requirements of both Regions' Large MS4 Permits have significant impacts on City operations. Major program level differences force the City to implement what

Doc Scanned On: 3/24/14
K. Ruiz Time: 8:49

24035 El Toro Road • Laguna Hills, California 92653 • (949) 707-2610 • FAX (949) 7
website: www.ci.laguna-hills.ca.us

amounts to two different compliance programs within City limits. This results in a significant resource and administrative burden which, in turn, reduces available resources for program implementation. Therefore, in accordance with California Water Code Section 13228, the City of Laguna Hills requests that the SARWQCB and the SDRWQCB both agree to designate SDRWQCB for regulation of all portions of the City, regardless of Regional Board jurisdictional boundaries, for matters pertaining to MS4 permitting.

The City is currently a named co-permittee on Order R8-2009-0030 issued by the SARWQCB (Santa Ana Permit), and Order R9-2009-0002 with the SDRWQCB (San Diego Permit). While having the same goal of reducing the discharge of pollutants from the MS4 system, these two Permits include different requirements. As a result, programs designed to be in compliance with the Santa Ana Permit are similar, but necessarily different than programs designed for compliance with the San Diego Permit. When this situation is applied within a single City, such as the City of Laguna Hills, having two different Permits and related implementation programs creates significant confusion among both City staff and the public, which can lead to inconsistent and inefficient protection of water quality. Additionally, and no less significant, there is a duplicative administrative and financial burden that is inherent in complying with two MS4 Permits: two sets of programs have to be developed; staff has to be trained on two sets of requirements with differing frequencies; business inspections must inspect for and track different information at differing frequencies; and two sets of annual reports have to be created with each report being required to include different information; among other differing requirements.

The City of Laguna Hills' request is not unique in that similar requests regulating MS4 discharges to a single Regional Board jurisdiction, despite being split across a watershed boundary, have been granted in 2010 in Riverside County to the cities of Murrieta, Wildomar, and Menefe; the SARWQCB is working with the Los Angeles Regional Water Quality Control Board to regulate discharges of bacteria from the cities of Claremont and Pomona across boundaries; and the City of Lake Forest has requested single jurisdictional coverage into the SARWQCB.

This request by the City of Laguna Hills is made with the understanding that:

- For the purposes of MS4 permitting only, the SDRWQCB would regulate the entirety of the City of Laguna Hills. As a result, the City of Laguna Hills would be subject to a single MS4 permit, which would be issued by the SDRWQCB.
- Enforcement of any provisions of the MS4 permit issued to the City of Laguna Hills would be performed by the SDRWQCB.
- Any TMDLs and associated MS4 permit requirements issued by the SARWQCB, which include the City of Laguna Hills as a responsible party, will

be incorporated into the MS4 permit issued by the SDRWQCB by reference, including any associated provisions, findings or elements of the fact sheet.

- Enforcement of any TMDL will remain with the Regional Board that has jurisdiction over the targeted impaired water body.
- Other Waste Discharge Requirements, or other Orders issued or enforced by the SARWQCB would remain wholly under the jurisdiction of the SARWQCB.

Some facts about the City of Laguna Hills and the portion within the jurisdiction of the SARWQCB are described below. Also enclosed with this letter is a map of the City with the subject area highlighted.

- Total Area of the City = 6.6 square miles
- Area within the Santa Ana Region Watershed = 1.2 square miles
- Percent of City in the Santa Ana Region Watershed = 18%

The requested designation of regulatory authority to the SDRWQCB will not only reduce the complexity and administrative burden upon the City of Laguna Hills, but will allow the City to better focus and effectively utilize its available resources to the best benefit of stormwater quality in both Regions.

If you have any questions regarding this request, please contact Director of Public Services Kenneth Rosenfield at (949) 707-2655 or krosenfield@ci.laguna-hills.ca.us.

Sincerely,

BRUCE E. CHANNING
City Manager

Attachment: Map of the City of Laguna Hills

c: Kenneth Rosenfield, Director of Public Services
Humza Javed, Associate Civil Engineer
Greg Simonian, City Attorney
Chris Crompton, OC Public Works

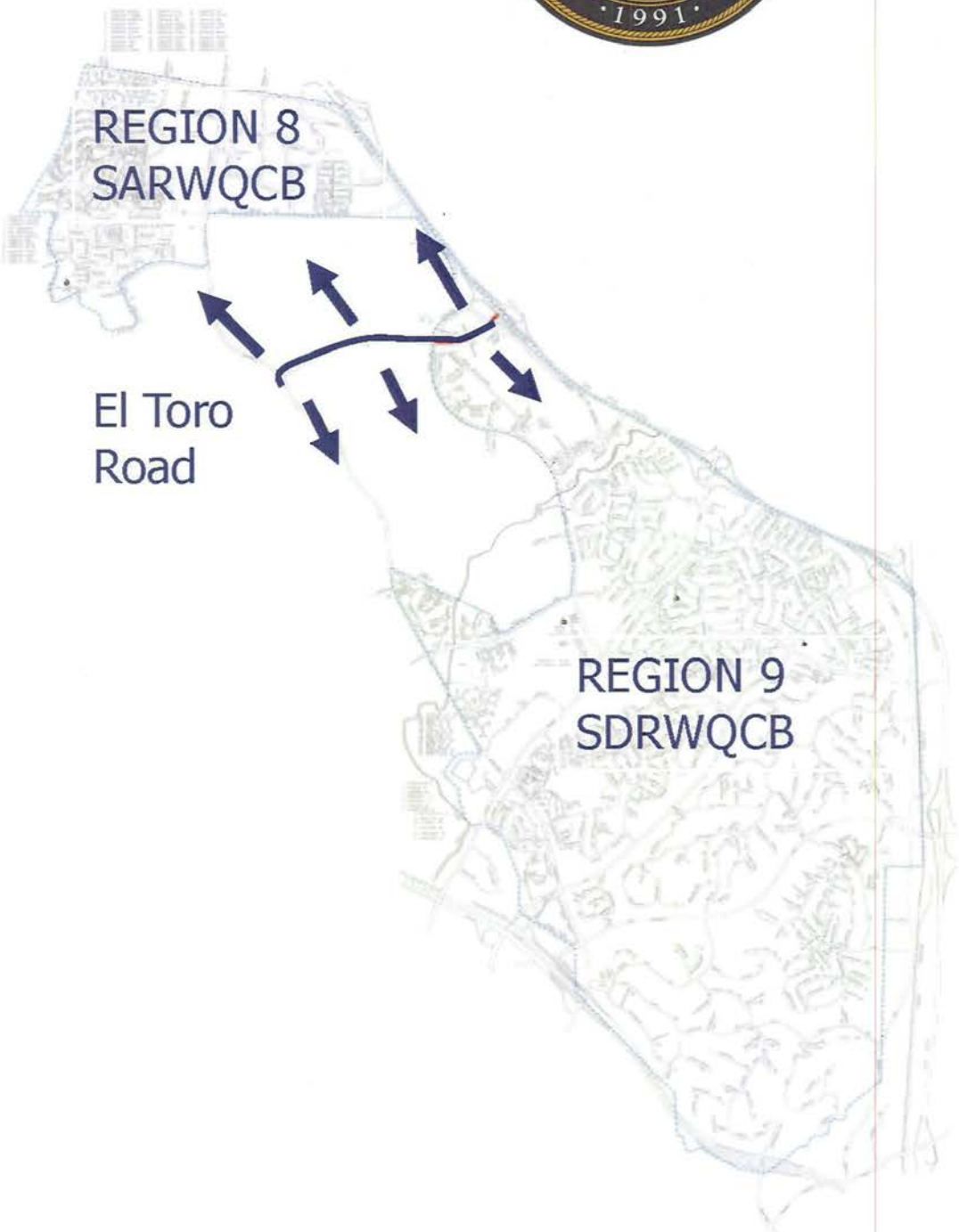

CITY OF LAGUNA HILLS
CITY MAP

Chill 026708

CITY OF LAKE FOREST

SAN DIEGO REGIONAL
WATER QUALITY
CONTROL BOARD

2014 APR 10 PM 12 32

Mayor
Dwight Robinson

Mayor Pro Tem
Adam Nick

Council Members
David A. Bass
Kathryn McCullough
Scott Voigts

City Manager
Robert C. Dunek

April 4, 2014

Mr. David Gibson
Executive Officer
California Regional Water Quality Control Board,
San Diego Region
2375 Northside Drive, Suite 100
San Diego, CA 92108-2700

Subject: Clarification of the City of Lake Forest Request as Outlined in the City's January 14, 2013 correspondence.

Dear Mr. Gibson:

Thank you for returning my call. Although we haven't had the opportunity to speak in person, your message was helpful in understanding the current status of the City's request. I am writing with confidence that my staff and I can provide clarification that may add to your understanding of the nature of our request and note the opportunities and importance of present timing.

Clarification of Request

A little over a year ago, the City of Lake Forest (City) submitted a formal request to both regional boards having regulatory oversight for stormwater in the City; namely, the San Diego and Santa Ana Regional Water Quality Control Boards (SDRWQCB and SARWQCB, respectively). We wish to clarify that our intent and request is to be regulated by the SARWQCB only for MS4 permitting purposes. The City recognizes that a written agreement between the two Regional Boards would have limitations including, probably most significantly, the Bacterial TMDL in the San Diego Region. It continues to be the City's intent to participate in the Bacterial TMDL. Indeed, considering that bacteria indicator issues appear to be a watershed/regional issue we recognize the value in developing a watershed/regional solution(s). The City has a long and successful history of collaboration with the County of Orange and the other south Orange County cities regulated by the San Diego Board, and we wish to continue these efforts in the same manner. It is our intent to continue development and implementation of programs related to the Bacteria TMDL through the Comprehensive Load Reduction Plan along with the other Co-Permittees working together within the Aliso Creek Watershed.

Significance to the City of Lake Forest

Designating the SARWQCB as the single Regional Board regulator represents a significant and important solution for the City in implementing the day-to-day activities typically associated with MS4 permit compliance. Reducing and/or eliminating regulatory

DRUG USE IS LIFE ABUSE

disparities, confusion and overlap is a priority for the City and the public we serve who are subject to these same regulatory requirements. Even minor disparities between the two MS4 permits can and do have significant impacts to the City and to the public's financial and resource burdens. We are aware that other cities (please see references below) have successfully requested and have been approved for similar/same requests. The importance and significance of purpose for these regulatory modifications has not been lost on City staff. We respectfully submit that it is a prudent and necessary solution to achieve responsible governance that is long overdue. Based upon our discussions with SARWQCB staff and the other successfully implemented cases referenced below, the mechanism required to institute regulation of the MS4 permit activities by a single Regional Board is through a relatively brief letter agreement and potentially brief recognition in the MS4 permit itself. In addition, it is our understanding that the City of Laguna Hills also recognizes the significant value of a single MS4 permit and they may be interested in being regulated by the SDRWQCB as a single regulator. Since much can be gained through relatively little effort, the City believes this opportunity to be a worthy effort and we ask for your support to make it happen.

Timing

The City is aware of SDRWQCB staff's suggestion to wait until the Report of Waste Discharge (ROWD) is submitted by the south Orange County cities for regulation under the new SDRWQCB Regional MS4 Permit. However, we would like to bring to your attention that the SARWQCB MS4 permit adoption schedule is ahead of the schedule for the San Diego Region. In consideration that approximately 70% of the City's land area resides within the jurisdiction of the SARWQCB, and the City is requesting the SARWQCB to be designated as the single regulator for MS4 permit compliance, an agreement to proceed from you and your staff would be very timely, and is urgently requested. Based upon our discussions with SARWQCB staff, they are very supportive of our request, but would like to receive your concurrence.

Examples of Precedence and Previous Successful Implementation

The City is aware of a letter agreement between the SDRWQCB and the SARWQCB that established a single designated Regional Board to regulate the Cities of Murrieta, Meniffee, and Wildomar, pursuant to Water Code Section 13228, subdivision (a).

Similar to the above example, the City is aware of another letter agreement between the Los Angeles Regional Water Quality Control Board and the SARWQCB designating the SARWQCB as the single regulator of discharges of bacteria by the Cities of Claremont and Pomona through their MS4s to receiving waters within the Middle Santa Ana River Watershed.

We appreciate the opportunity to provide clarification for our January 14, 2013 request and bring your attention to the importance of present timing related to the SARWQCB MS4 permit adoption schedule. We are optimistic you will find our request to be consistent with the five examples provided above and we request your concurrence at your earliest convenience in order to facilitate a path forward under the SARWQCB MS4 permit adoption schedule.

I will be in contact with you to set up a meeting between the SARWQCB and SDRWQCB staff in addition to the Cities of Lake Forest and Laguna Hills staff to further discuss this opportunity.

If you should have any questions, please contact Devin Slaven, Water Quality Administrator at (949) 461-3436 or me at (949) 461-3481.

Sincerely,

CITY OF LAKE FOREST

Tom Wheeler

Thomas Wheeler, P.E.
Director of Public Work/City Engineer

cc: Kurt Berchtold, Executive Officer, SARWQCB
Robert Dunek, City Manager
Devin Slaven, Water Quality Administrator

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026711

Orange County Permit Renewal Process July 1, 2014 Meeting Notice

lyris@swrcb18.waterboards.ca.gov

Sent: Thursday, June 05, 2014 3:37 PM
To: Chiu, Wayne@Waterboards
Cc: Arias, Christina@Waterboards; Becker, Eric@Waterboards; Chiu, Wayne@Waterboards
Attachments: OC MS4 2014-0401 Meeting N~1.pdf (2 MB)

Water Boards This is a message from the California Regional Water Quality Control Board, San Diego Region (9).

Interested Persons,

The San Diego Water Board is initiating the permit renewal process for the Orange County Copermittees. We would like to invite you to a meeting to discuss topic-specific recommended permit changes described in the Report of Waste Discharge (ROWD) and enrollment of the Orange County Copermittees into the Regional MS4 Permit.

Representatives of Orange County, Riverside County, and San Diego County Copermittees, Non-government Environmental Organizations, and the Business/Construction/Development Community are invited to attend the meeting with the San Diego Water Board staff on July 1, 2014 from 9:30 a.m. to 3:30 p.m. at the City of San Juan Capistrano Community Center.

See the attached notice for more information. The notice and all information regarding the Orange County Permit Renewal Process can be found on our website at http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/oc_stormwater.shtml

If you have any questions please contact me.

Laurie Walsh, PE
San Diego Water Board

2375 Northside Drive, Suite 100
San Diego, CA 92108
Direct Phone: 619-521-3373
Main Line: 619-516-1990
Fax No. (619) 516-1994
lwalsh@waterboards.ca.gov

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD
www.waterboards.ca.gov/sandiego/

You are currently subscribed to reg9_sandiegoco_ms4permit as: wchiu@waterboards.ca.gov.
To unsubscribe click here: leave-1945907-508208.cee2a373662e566393e62f0af18d11cf@swrcb18.waterboards.ca.gov

CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

June 5, 2014

To: Municipal Storm Water Interested Persons

Subject: Invitation to Meeting to Discuss Report of Waste Discharge and Enrollment of Orange County Copermittees In the Regional Municipal Separate Storm Sewer System (MS4) Permit

Storm water and non-storm water discharges from southern Orange County are regulated by Municipal Separate Storm Sewer Systems (MS4s) permit Order No. R9-2009-0002. Municipalities regulated by Order No. R9-2009-0002 include the County of Orange, Orange County Flood Control District and the cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Lake Forest, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano (Orange County Copermittees). Order No. R9-2009-0002 will expire on December 16, 2014, and the Orange County Copermittees have submitted a Report of Waste Discharge (ROWD) in application for NPDES permit reissuance that summarizes their existing storm water programs and makes recommendations for updates and other modifications to the MS4 permit coverage.

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) is reviewing the information in the ROWD and considering enrollment of Orange County Copermittees into the Regional NPDES Permit for MS4s Draining the Watersheds within the San Diego Region, Order No. R9-2013-0001(Regional MS4 Permit). As discussed below the San Diego Water Board staff will be holding a meeting on **July 1, 2014** with interested stakeholders to discuss the ROWD and enrollment process details.

The Regional MS4 Permit is available on the following webpage:
http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

The Regional MS4 Permit was adopted by the San Diego Water Board in May 2013 and is an area-wide permit based on the boundaries of the San Diego Region, instead of county political boundaries. Under this approach, the Regional MS4 Permit provides a basis for uniformly regulating all Copermittees in San Diego, Riverside, and southern Orange Counties within the San Diego Water Board's jurisdiction. The Regional MS4 Permit also provides opportunities for a comprehensive monitoring framework, regional collaborative approaches, and regional cost efficiencies among the Copermittees region-wide.

The San Diego County Copermittees are currently regulated by the Regional MS4 Permit. Orange and Riverside County Copermittees will be enrolled in a phased manner as their current MS4 permits expire or upon request for earlier coverage prior to permit expiration. However, as provided in the Regional MS4 Permit, the San Diego Water Board, after opportunity for public comment and a public hearing, will re-open and consider any necessary changes to the Regional MS4 Permit prior to enrollment of the Orange and Riverside County Copermittees. The San Diego Water Board has tentatively scheduled the Orange County Copermitees enrollment in the Regional MS4 Permit for San Diego Water Board consideration at a regularly scheduled public meeting in early 2015.

Representatives of Orange County, Riverside County, and San Diego County Copermittees, Non-government Environmental Organizations, and the Business/Construction/Development Community are invited to attend a meeting with the San Diego Water Board staff on July 1, 2014, to discuss the ROWD and planned enrollment process for the Orange County Copermitees in greater detail.

Details on the meeting time, location and issues to be discussed are provided below.

Meeting Time and Location
Tuesday, July 1, 2014
9:30 a.m. to 3:30 p.m.
City of San Juan Capistrano Community Center
25925 Camino Del Avion
San Juan Capistrano, CA 92675

Meeting Objective and Agenda
The objective of the July 1, 2014 meeting is for the San Diego Water Board to facilitate discussion on topic-specific recommended changes to the Regional MS4 Permit described in the ROWD and enrollment of the Orange County Copermittees. The San Diego Water Board is seeking input from the Copermittees, Non-governmental Environmental Organizations, and the Building Business/Construction/Development Community on the following specific topics:

1. **Report of Waste Discharge.** Information and recommendations contained in the ROWD.

2. **Enrollment Process**. The San Diego Water Board's proposed process and schedule for enrollment of the Orange County Copermittees into the Regional MS4 Permit.

3. **Future Stakeholder Meetings.** The San Diego Water Board's proposed schedule of focused meetings, workshops, and public hearings.

Stakeholder Participation at Meeting

Similar to the process used during the development of the Regional MS4 Permit, participation at this meeting will be structured to provide for an appropriate level of participation by key stakeholder groups, while preserving staff's ability to ensure a collaborative discussion on the agenda topics. Meeting participants will be divided into two groups: a limited group to be seated at the meeting table and an audience group. The total number of participants at the meeting table will be limited to twenty-five (25) persons subdivided into representative stakeholder groups as described in the table below. Groups of stakeholders can share their seats at the table and rotate particular topic experts from the audience to the table depending on the topic being discussed.

Stakeholder Group	Participants at the Table
Orange County Copermittees	8
San Diego County Copermittees	3
Riverside County Copermittees	3
Environmental Community	3
Business/Construction/Development Community	3
USEPA	1
San Diego Water Board	4

Ample audience seating will be provided so that interested persons can attend the meeting. Audience members will be allowed to ask questions and make comments at the end of each meeting.

For questions or comments, please contact Laurie Walsh by phone at (619) 521-3373, or by email at laurie.walsh@waterboards.ca.gov.

Respectfully,

David W. Gibson
Executive Officer
San Diego Regional Water Quality Control Board

DWG:jgs:dtb esb

Distribution list via email:

San Diego County MS4 Permit Lyris List
Riverside County MS4 Permit Lyris List
Orange County MS4 Permit Lyris List

Tech Staff Info & Use	
Order No.	R9-2009-0002
Party (GT/CIWQS) ID	525473
NPDES No.	CAS0108740
Reg. Measure ID	332672
PIN	658018

California Regional Water Quality Control Board
San Diego Region

MEETING AGENDA

ORANGE COUNTY COPERMITTEES REPORT OF WASTE DISCHARGE FOR REISSUANCE OF THE PHASE I MUNICIPAL STORM WATER PERMIT

Tuesday, June 24, 2014
1:00 to 3:00 p.m.

City of Dana Point Public Works Conference Room (2nd Floor)
33282 Golden Lantern, Dana Point

I. Introductions (All) — 5 min

II. ROWD Overview (Orange County Copermittees) — 60 min

A. Orange County Copermittees Presentation on ROWD Phase I MS4 Program Priorities

- Implement an approach to hydromodification management that is informed by a watershed analysis and channel-specific protection and restoration goals
- Modifying the LID hierarchy to establish the equivalency of “On-site BMP” and “Off-site / Regional BMP” solutions
- Creating an alternative compliance pathway
- Monitoring – 1. integration of the regional monitoring program initiatives (e.g. coastal monitoring) 2. New monitoring regime & timing of reporting.

B. Discuss obstacles in Regional Permit that limit Orange County Copermittees’ ability to run their countywide program

III. Proposed Permit Reissuance Process & Schedule (All) — 10 min

IV. Focused Meeting Topics (All) — 45 min

A. Orange County Copermittees Suggestions on Meeting Topics

California Regional Water Quality Control Board
San Diego Region

6/24/14
CITY of DANA POINT

NAME	AGENCY
ZIAD MAZBOUDI	SAN JUAN CAPISTRANO.
LAURIE Walsh	SDRWQCB
Jian Peng	County of Orange
Lisa Zawaski	Dana Point
James Fortuna	County of Orange
MIKE FENNESSY	County of Orange
Grant Sharp	OC Public Works
HUMZA JAVED	City of Laguna Hills
Moy Yahya	Aliso Viejo / Laguna Woods
Christina Arias	RWQCB - San Diego
Rae Beimer	City of RSM
Nancy Palmer	City of Laguna Niguel
JC HERRERA	CITY OF LAGUNA NIGUEL
Sarah Eskandari	City of Laguna Niguel
JONATHAN ORDUÑA	CITY OF LAGUNA NIGUEL
ANDRE MONETTE	LAKE FOREST / ALISO VIEJO
JOE AMES	CITY OF MISSION VIEJO
Deborah Cain	"
Eric Becker	San Diego Water Bd
Jennifer Shook	OC Public Works
Mary Vondrak	City of San Clemente
Zak Ponsen	City of San Clemente

026717

Mary Anne Skorpanich - OC

Ryan Baron - OC

Terry Ingebrigtsen - Laguna Beach

RICHARD BOON - OC

Chiu, Wayne@Waterboards

From: Marincola, JamesPaul <Marincola.JamesPaul@epa.gov>
Sent: Monday, July 21, 2014 9:58 AM
To: Beckwith, Michelle@Waterboards; Kemmerer, John; Kozelka, Peter@epa.gov; Walsh, Laurie@Waterboards; Fischer, Adam@Waterboards; Smythe, Hope@Waterboards; Becker, Eric@Waterboards; Bromley, Eugene
Subject: Orange County MS4 Permits Coordination Proposed Agenda
Attachments: July 23 EPA_RB agenda.docx

Looking forward to Wednesday's discussion.

Please see the proposed agenda and let me know if you have any comments or suggestions by tomorrow.

Thanks!

Jamie Marincola
Water Division
US EPA, Region IX
San Francisco, CA
415-972-3520

From: Beckwith, Michelle@Waterboards [mailto:Michelle.Beckwith@waterboards.ca.gov]
Sent: Monday, July 07, 2014 1:33 PM
To: Marincola, JamesPaul
Cc: Kemmerer, John; Kozelka, Peter; Walsh, Laurie@Waterboards; Fischer, Adam@Waterboards; Smythe, Hope@Waterboards; Becker, Eric@Waterboards
Subject: RE: Orange County MS4 Permits Coordination

Jamie –

Could you please provide an agenda for this proposed meeting? As you are aware, Region 8 is anticipating permit adoption at our September 19th Board meeting. Due to the tight timeline, any comments/recommendations should be made as soon as possible to avoid delays. Also, is the County of Orange aware of EPA's permit alignment proposal?

If you have any questions, please contact me.

Thank you,

Michelle R. Beckwith, Chief
Senior Environmental Scientist
Coastal Storm Water Unit

Santa Ana Regional Water Quality Control Board
3737 Main Street, Suite 500
Riverside, CA 92501
Phone: 951-782-4433
Fax: 951-781-6288
www.waterboards.ca.gov/santaana

From: Becker, Eric@Waterboards
Sent: Thursday, July 03, 2014 9:27 AM
To: Beckwith, Michelle@Waterboards; Marincola, JamesPaul@epamail.epa.gov
Cc: Kemmerer, John; Kozelka, Peter@epa.gov; Walsh, Laurie@Waterboards; Fischer, Adam@Waterboards; Smythe, Hope@Waterboards
Subject: RE: Orange County MS4 Permits Coordination

7/23 and both August dates will work for me. 7/16 is now out. Thanks.

ESB

Eric Becker, P.E.
Senior Water Resources Control Engineer
Storm Water Management
SDRWQCB
2375 Northside Drive, Suite 100
San Diego, CA 92108
(619) 521-3364
Eric.Becker@waterboards.ca.gov

From: Beckwith, Michelle@Waterboards
Sent: Wednesday, July 02, 2014 4:55 PM
To: Marincola, JamesPaul@epamail.epa.gov
Cc: Kemmerer, John; Kozelka, Peter@epa.gov; Walsh, Laurie@Waterboards; Fischer, Adam@Waterboards; Smythe, Hope@Waterboards; Becker, Eric@Waterboards
Subject: RE: Orange County MS4 Permits Coordination

Jamie –

I have a few dates/times that seem to be open for most of the Board staff. Unfortunately, the R8 OC MS4 permit author will be unavailable the last week of July, thus the possible August dates/times.

7/16 1:30-3pm
7/23 1-3pm
8/5 1-3pm
8/6 1-3pm

Please let me know which dates/times work for your group and I'll set up a meeting appointment with a teleconference number.

Thanks,

Michelle R. Beckwith, Chief
Senior Environmental Scientist
Coastal Storm Water Unit

Santa Ana Regional Water Quality Control Board
3737 Main Street, Suite 500
Riverside, CA 92501
Phone: 951-782-4433

Fax: 951-781-6288
www.waterboards.ca.gov/santaana

From: Becker, Eric@Waterboards
Sent: Wednesday, July 02, 2014 12:13 PM
To: Marincola, JamesPaul@epamail.epa.gov; Beckwith, Michelle@Waterboards
Cc: Kemmerer, John; Kozelka, Peter@epa.gov; Walsh, Laurie@Waterboards
Subject: RE: Orange County MS4 Permits Coordination

Hi Jaime-

Sounds good. I am available on the 16th and most of that week. The last week in July is fairly open.

Eric Becker, P.E.
Senior Water Resources Control Engineer
Storm Water Management
SDRWQCB
2375 Northside Drive, Suite 100
San Diego, CA 92108
(619) 521-3364
Eric.Becker@waterboards.ca.gov

From: Marincola, JamesPaul [mailto:Marincola.JamesPaul@epa.gov]
Sent: Wednesday, July 02, 2014 11:34 AM
To: Beckwith, Michelle@Waterboards; Becker, Eric@Waterboards
Cc: Kemmerer, John; Kozelka, Peter@epa.gov
Subject: Orange County MS4 Permits Coordination

Michelle and Eric,

Would you guys be available to sit down with us and talk about opportunities for permit alignment between your two boards? Since both your OC MS4 permit reissuances are looming, I think it would be good timing to get together and see where each other stand and look for ways to coordinate requirements.

I understand we are meeting to discuss our comments with the Santa Ana Board on 7/16, so maybe this could be a follow-up to that meeting later in July? Please let us know what your availability considerations are.

Thanks!

Jamie Marincola
Water Division
US EPA, Region IX
San Francisco, CA
415-972-3520

Regional Board 8/Regional Board 9/US Environmental Protection Agency
Discussion of OC MS4 Permits

July 23, 2014
1:00-2:00

Conference phone: 866-680-0146
Code: 764743

Meeting purpose: to discuss issues and strategies for Orange County MS4 permitting and seek areas for coordination.

1. Introductions (All)

2. Permit Status Updates (RB8/RB9)- Brief overview of permit statuses and planned timelines. Recap of July 1 Board Workshop (RB9).

3. Discussion of upcoming issues for RB9 Permit (RB9)-
    a. Over-irrigation prohibition.
    b. Off-site compliance options for the development of planning requirements.

4. Discussion of differing permitting approaches (all)-
    a. TMDL compliance: level of specificity for plan requirements and necessary BMPs; receiving water limits.
    b. Action levels (RB9) vs data-analysis approach (RB8).
    c. New development/significant redevelopment and identifying areas of private development as candidates for retrofitting.

5. Next Steps- Potential follow-up opportunities?

Walsh, Laurie@Waterboards

From: Slaven, Devin <dslaven@lakeforestca.gov>
Sent: Friday, August 22, 2014 4:58 PM
To: Walsh, Laurie@Waterboards
Cc: Becker, Eric@Waterboards; Arias, Christina@Waterboards; Chiu, Wayne@Waterboards; Smythe, Hope@Waterboards; Beckwith, Michelle@Waterboards; Fischer, Adam@Waterboards; Chris Crompton; Humza Javed; Moy Yahya (moyyahya@caaprofessionals.com); Christopher Macon ; Wheeler, Thomas; Rosenfield, Ken@CI.LAGUNA-HILLS@DOT; Berchtold, Kurt@Waterboards; Gibson, David@Waterboards; maryanne.skorpanich@ocpw.ocgov.com
Subject: RE: Single Board regulations of Lake Forest, Laguna Hills, and Laguna Woods
Attachments: Summary of MS4 Permit Differences.docx

Laurie,

In accordance with our discussion at the July 30, 2014 meeting, and the request made by the San Diego Regional Water Quality Control Board staff, please find attached, a summary of MS4 permit differences. The proposed language to be used in the fifth-term MS4 permits to facilitate single Regional Board regulation is still under review by legal counsel; however, it will be submitted to you on Monday, August, 25, 2014.

Please let me know if you have any questions.

Thank you,

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Gentlemen,

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Your attention to this matter is greatly appreciated.

Laurie Walsh, PE
San Diego Water Board

2375 Northside Drive, Suite 100
San Diego, CA 92108
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CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
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Summary of Regional MS4 Permit Differences

Forward

In general accordance with the request to identify areas of disparity between the two MS4 permits that cause significant administrative burden to split jurisdictions, a table summarizing many of the disparities is presented below. However, it should be noted that this table is inherently limited as a summary and does not capture many of the nuances that are otherwise captured in the details of each permit and have been incorporated into the principal guidance and policy documents utilized for program implementation such as the Orange County Drainage Area Management Plan (DAMP) and the cities' respective Local Implementation Plans (LIPs). The complexity of the task is significant as is best and most simply illustrated by the size and complexity of each of the permits themselves, as well as the size and complexity of the DAMP & LIP policy/guidance documents. To capture all or most of those nuanced details would yield a table that would be too unwieldy. One example is that many of the specific data fields that are required for construction site data base inventories are different between the permits, but to list required data points for each permit would be impractical. Suffice it to say, the specific data and tracking requirements are different enough to essentially require two data bases for the same construction program component. Moreover, it should be noted that the site inspections that generate the specific data are handled differently by the permits, so that each has a separate and distinct prioritization and inspection frequency depending on the region. It should also be emphasized that these differences that are too nuanced and detailed to capture in a summary table, should not be considered insignificant; indeed these are the details that cause some of the most significant administrative burden and confusion with data management, tracking, and reporting.

Further to the above, some general comments are also provided below that capture examples of the administrative burden that is more process-driven and not necessarily highlighted in a summary of permit differences.

General

- Although each MS4 Permit has a five year term, each permit inevitably gets adopted at different times. Therefore, cities that are split between Regional Boards go through two re-adoption processes which in and of itself, can be a relatively significant administrative burden. After a new MS4 permit is adopted, a split jurisdiction will need to assimilate, organize, and develop a programmatic approach to comply with the individual permit requirements. Subsequently, this process continues into staff training, necessary adjustment to processes and protocols and eventual proficiency in its implementation. However, since another permit is adopted at a later time, this process is repeated for the second permit. In this way, the staggered permit adoption leads to an extended duration of this development process and becomes further complicated when trying to assimilate two permits into a single program wherever feasible and creating a de facto "third permit" generated in an attempt to blend two permits with distinct requirements. The process can be lengthy and hinder progress toward the actually goal of the permits and the Permittees' program goals to improve water quality. The split and hybrid approaches can lead to confusion for agency staff as well as the public, and produce inefficiencies where efforts

become overly focused on administrative tasks that don't necessarily lead to improved water quality outcomes. Since the staff of all agencies are public servants, it seems prudent and necessary to provide clear regulatory governance and a clear, feasible path to achieve compliance.

- Related to above, various time requirements are established within each permit that direct the development and implementation of program components; however, because the two permits are disparate in the specific requirements and timing, each program component essentially goes through two staggered updates. For example, each permit will often require the development and/or implementation of new requirements "within 18 months of the adoption of this order." Due to the offset timing of each permit, a permittee may finish new updates to one program component only to initiate the development of the same program component for a different region or attempt to reconcile and incorporate the different/new requirements into a final program update. In this manner, permittees must devote a significant duration of time to incorporate new requirements and program development which diminish time available for implementation.

- Land development requirements are one of the most complicated areas for the public to understand and comply with. Each permit has distinct water quality requirements that an applicant must comply with depending on the location of the development within the city. While each region requires the project applicant to submit a Water Quality Management Plan (also known as a Standard Storm Water Mitigation Plan in the San Diego Region) there are significant and unique requirements for project prioritization, Low Impact Development BMPs and sizing criteria, hydromodification management BMPs and sizing criteria, defining hydrologic conditions of concern, and application of USEPA Green Streets guidance for street, highway, and roadway projects. These differences also pose additional burden and confusion for City staff in the Planning, Building & Safety, and Engineering Divisions.

- Data collection and management is another area impacted by two different MS4 permits. Many program components require development and maintenance of information in an electronic-format database. Since each permit has specific requirements, split-jurisdiction cities must effectively develop and manage two different databases for each program area requirement.

- Compiling the information from different databases, reporting the data in different formats, and submitting the annual Program Effectiveness Assessments to two Regional Boards also adds a significant workload on the Permittees that are split in two jurisdictions.

Below is a table comparing and summarizing the disparities of the two current MS4 Permits and the Regional Permit for the San Diego Region as adopted for the San Diego County agencies. As both of the fifth- term (Region 8 and Region 9) MS4 Permits are in draft format, are currently under revision, and the Permittees do not have experience in their implementation, we are focusing on the current fourth-term MS4 permits as providing the best examples:

	General	R8-2009-030	R9-2009-0002	R9-2013-0001
Legal Authority	Each permit must be reviewed and compared with the City's municipal code. Any necessary code updates must be completed, and the City Attorney must provide certifications of adequate legal authority. Since the permits are adopted at different times, this process is most often, if not always, completed twice.			
Municipal Activities	Each permit requires an inventory of municipal facilities and field activities	§XIV - Requires inventory of specified municipal facilities and field programs (There are detailed inventory database differences between regions). Facilities/field programs specified by permit. Inventory must be prioritized as high, medium, low. BMPs per fact sheets.	§F.3 – Requires a watershed-based inventory of specified facilities/field programs (There are detailed inventory database differences between regions). No prioritization. Designate minimum BMPs. Inventory must contain specific requirements such as potential pollutants. BMPs must be developed/implemented for special events.	§E.5 – Municipal facilities now grouped with existing development. §E.5.c – A minimum of 20% of the inventoried industrial, commercial and municipal sites are required to be inspected each year; all inventoried facilities must be inspected once every five years. Drive-by, onsite, and/or visual inspections are acceptable.

	General	R8-2009-030	R9-2009-0002	R9-2013-0001
			Designate enhanced BMPs for certain impaired or other environmentally significant water bodies.	
		Storm drain system inspection/cleaning – 80% annually, with 100% every 2 years.	Storm drain system inspection/cleaning required between May 1 and September 30 on annual basis. Additional cleaning between Oct 1 and April 30 for high volumes of trash/debris.	§E.5.b – Each Copermittee must implement a schedule of operation and maintenance activities for its MS4 and related structures (including but not limited to catch basins, storm drain inlets, detention basins, etc.), and verify proper operation of all its municipal structural treatment controls designed to reduce pollutants (including floatables) in storm water discharges to or from its MS4s and related drainage structures.
New Development/ Significant Redevelopment	Each permit contains significant differences in land development requirements. To address this issue, the Permittees have developed two distinct Model Water Quality Management Plans (WQMPs [also known as Standard Storm Water Mitigation Plans in the San Diego	§XII – Requires WQMPs for certain non-priority and priority sites. Priority projects include street roads, highways, and freeways of 5,000 square feet or more with ability to utilize USEPA Green Streets guidance. WQMPs	§F.1.d – Requires WQMPs for priority sites. Priority projects include street roads, highways, and freeways of 5,000 square feet or more. Low Impact Development (LID) requirements include use of “biofiltration” BMPs to	In additional to the differences between R8-2009-0030 and R9-2009-002, there are additional differences included in R9-2013-0001. These differences between R9-2009-0002 and R9-2013-0001 are summarized

	General	R8-2009-030	R9-2009-0002	R9-2013-0001
	Region]) to capture specific requirements and attempt to reduce the confusion of the general public as well as implementing municipal staff. The Technical Guidance Document (TGD); however, remains as a single document but attempts to highlight the differences in requirements pertaining to BMP selection, sizing criteria and calculations, hydromodification management, etc.	incorporate the use of Watershed Infiltration and Hydromodification Management Plans (WIHMPs). Low Impact Development (LID) requirements include use of "biotreatment" BMPs to meet any remaining Design Capture Volume not able to be retained onsite. Hydromodification management requirements are applicable to sites only if there is a hydrologic condition of concern in downstream receiving waters. The permit allows for use of Water Quality Credits in certain cases to reduce the necessary Design Capture Volume for the water quality alternative compliance program and to reduce the volume of water retained to meet hydromodification management requirements within the LID compliance program. Priority Development	meet any remaining Design Capture Volume not able to be retained onsite (excluding some biotreatment BMPs that are not biofiltration BMPs). The Permit and Model WQMP apply constraints for selection and sizing methods such that the total volume of the biofiltration BMP, including pore spaces and pre-filter detention volume, must be sized to hold at least 0.75 times the design storm volume that is not retained onsite by LID retention BMPs. The land development requirements also include considerations for water rights when using infiltration and harvest and use of stormwater. Hydromodification management requirements are essentially applicable to all projects regardless of existing conditions of the project site.	below: • WQMP/SSMP now called "BMP Design Manual." • TGD will need to include long-term maintenance criteria for each structural BMP listed in the BMP Design Manual. • Exemptions for Priority Development Projects are available for new or retrofit paved sidewalks, bicycle lanes, or trails that meet the criteria in section E.3.b.3. • If full capture of design storm not feasible, biofiltration BMPs may be used but must be designed to treat 1.5 times the design capture volume not reliably retained onsite. • The Regional Permit requires a Watershed Management Area Analysis as part of the

	General	R8-2009-030	R9-2009-0002	R9-2013-0001
		Projects have an option to satisfy LID BMP sizing criteria through participation in a regional/sub-regional LID BMP. Hydromodification management requirements apply when the volumes and time of concentration of stormwater runoff for the post-development condition do not significantly (5% or less) exceed those of the predevelopment condition (i.e. current site conditions) for a two year frequency storm event, or the site infiltrates at least the volume of a two year frequency storm event.	Regional/sub-regional LID BMPs are only an option as part of a waiver request/alternative compliance program. Hydromodification management requirements apply per the approved Hydromodification Management Plan and must use continuous simulation to ensure that post-project runoff flow rates and do not exceed pre-development (i.e. undeveloped site conditions) runoff flow rates and durations by more than 10% of the time, from 10% of the 2-year runoff event up to the 10-year runoff event.	WQIP. Technical feasibility analysis not required if the Permittees determine that a mitigation project under the Alternative Compliance Program will have a greater overall water quality benefit for the Watershed Management Area. • A PDP may be allowed to utilize alternative compliance under the hydromodification provision. • Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals. • As part of the Copermittee's update to its BMP Design Manual, pursuant to Provision E.3.d, the Copermittee

	General	R8-2009-030	R9-2009-0002	R9-2013-0001
				must provide guidance for hydraulic loading rates and other biofiltration design criteria necessary to maximize storm water retention and pollutant removal. • Each Copermittee must require and confirm that for all PDP applications that have not received prior lawful approval by the Copermittee by the time the BMP Design Manual is updated pursuant to Provision E.3.d, the requirements of Provision E.3 are implemented. For project applications that have received prior lawful approval before the BMP Design Manual is updated pursuant to Provision E.3.d, the Copermittee may allow previous land development requirements to apply. • Each Priority Development Project must

	General	R8-2009-030	R9-2009-0002	R9-2013-0001
				avoid critical sediment yield areas known to the Copermittee or identified by the optional Watershed Management Area Analysis pursuant to Provision B.3.b.(4), or implement measures that allow critical coarse sediment to be discharged to receiving waters, such that there is no net impact to the receiving water. • The Copermittee may develop, individually or with other Copermittees, alternative mandatory design criteria to that listed above for infiltration BMPs which are designed to primarily function as centralized infiltration devices.
Construction	Each permit requires inventory and inspection of construction sites	§VIII – Inventory must be developed and updated in September and in May of each year. (There are detailed inventory database & required information tracking differences between	§F.2 – Requires review and update of grading ordinance. A watershed-based inventory must be developed. (There are detailed inventory database & required information tracking	§e.4.b – Each Copermittee must maintain and update, at least quarterly, a watershed-based inventory of all construction projects issued a local permit that allows ground disturbance

	General	R8-2009-030	R9-2009-0002	R9-2013-0001
		regions). Inventory must be prioritized as high, medium and low. Inspections during the wet season: once a month for high priority sites, twice during wet season for medium priority sites, and at least once during wet season for low priority sites. Inspections during the dry season: at a frequency sufficient to ensure compliance. Inspections must be conducted using a checklist.	differences between regions). Designate minimum BMPs. Designate enhanced BMPs. Inspections during wet season: bi-weekly for all sites 30 acres or more in size, or one acre or more and tributary to a sediment impaired water body, or environmentally sensitive area, or sites that pose a significant threat to water quality. At least monthly for sites one acre or more and not subject to bi-weekly inspections. Inspections during the dry season: at least once in August or September each year for all sites 30 acres or more, one or more acre and tributary to a sediment impaired water body or environmentally sensitive area, or significant threat site. As needed inspections for all other sites.	or soil disturbing activities that can potentially generate pollutants in storm water runoff. Each Copermittee must implement, or require the implementation of effective BMPs to reduce discharges of pollutants in storm water from construction sites to the MEP, and effectively prohibit non-storm water discharges from construction sites into the MS4. These BMPs must be site specific, seasonally appropriate, and construction phase appropriate. BMPs must be implemented at each construction site year round. Dry season BMP implementation must plan for and address unseasonal rain events that may occur during the dry season. Each Copermittee must establish appropriate inspection frequencies for high threat to water

	General	R8-2009-030	R9-2009-0002	R9-2013-0001
				quality sites, and all other sites, for each phase of construction. Inspection frequencies appropriate for addressing the highest water quality priorities identified in the Water Quality Improvement Plan, and for complying with the requirements of this Order must be identified in each Copermittee's jurisdictional runoff management program document.
Industrial Facilities	Each permit requires inventory and inspection of industrial sites	§IX – Inventory must be developed and updated annually. Inventory must be prioritized as high, medium and low sites. All high priority sites must be inspected at least once a year. Medium priority sites must be inspected at least once every two years. Low priority sites must be inspected at least once per permit cycle.	§F.3.b – Watershed-based inventory must be developed. Minimum and enhanced BMPs must be designated. A minimum of 20% of the inventoried industrial and commercial sites are required to be inspected each year.	§E.5.c – A minimum of 20% of the inventoried industrial, commercial and municipal sites are required to be inspected each year; all inventoried facilities must be inspected once every five years. Drive-by, onsite, and/or visual inspections are acceptable.
Commercial Facilities	Each permit requires inventory and inspection of commercial sites	§X – Inventory must be developed and updated quarterly. Inventory must include various	§F.3.b – Watershed-based inventory must be developed. Inventory must include specific	§E.5.c – A minimum of 20% of the inventoried industrial, commercial and municipal sites are

	General	R8-2009-030	R9-2009-0002	R9-2013-0001
		commercial facilities including transport, storage or transfer of pre-production plastic pellets. Inventory must be prioritized as high, medium and low sites. At least 10% of the inventory (not including food service facilities) must be ranked as high priority, 20% of the inventory (not including food service facilities) must be ranked medium priority, and the remaining 70% of the inventory may be ranked low priority. All high priority sites must be inspected at least once a year. Medium priority sites must be inspected at least once every two years. Low priority sites must be inspected at least once per permit cycle.	sites/sources and includes mobile vehicle washing, mobile carpet cleaning, mobile pet services, and cemeteries. A minimum of 20% of the inventoried industrial and commercial sites are required to be inspected each year.	required to be inspected each year; all inventoried facilities must be inspected once every five years. Drive-by, onsite, and/or visual inspections are acceptable.
Water Quality Monitoring		Dry Weather Monitoring Program- A seasonal monitoring program in order to comply with the permit requirements, which occurs between May and October of each	Non-stormwater Dry Weather Action Levels (NALs) - For the San Diego Region, the NALs program is conducted year-round with each site monitored once during the dry season	Non-stormwater Dry Weather Action Levels (NALs) will be incorporated into the Water Quality Improvement Plans (WQIPs). City must participate in a transitional

	General	R8-2009-030	R9-2009-0002	R9-2013-0001
		calendar year. It involves monthly sampling (5 times total) at targeted sites which are strategically selected by each jurisdiction. Random sites which were selected randomly throughout the MS4 at the inception of the program are sampled every month and a half (3 times total). Upon receiving data tables from the Principal Permitee for the monitoring season, City Staff compares the data to the "Tolerance Intervals" which are set as the upper bound of the 90th percentile as calculated from random site data for each constituent. Tolerance intervals are used to guide NPDES Program Managers as to when source investigations are necessary. Immediate inspections are typically performed when monitoring staff notices exceedances for field	(May 1 – September 30) and once during the wet season (October 1 – April 30). The NALs were based on narrative and numeric objectives and criteria as outlined in the Basin Plan, the Water Quality Control Plan for Ocean Waters of California (Ocean Plan), and State Policy for Implementation of Toxic Standards for Inland Surface Waters, Enclosed Bays and Estuaries (State Implementation Plan or SIP). During NALs monitoring, County staff notify the municipality with jurisdiction over the drainage area of any NALs exceedances or any other condition that would suggest an illegal discharge or illicit connection impacting a storm drain outfall. City Staff is required conduct a source investigation and attempt to reach one of five specific end-point determinations with	monitoring plan until the WQIP is approved. Each Copermittee must identify all major MS4 outfalls that discharge directly to receiving waters within its jurisdiction and geo-locate those outfalls on a map of the MS4 pursuant to Provision E.2.b.(1). This information must be compiled into a MS4 outfall discharge monitoring station inventory. Additionally, each Copermittee must perform dry weather MS4 outfall field screening monitoring to identify non-storm water and illicit discharges within its jurisdiction in accordance with Provision E.2.c, to determine which discharges are transient flows and which are persistent flows, and prioritize the dry weather MS4 discharges that will be investigated and eliminated in accordance with Provision E.2.d. For

	General	R8-2009-030	R9-2009-0002	R9-2013-0001
		monitoring data such as electrical conductivity, water temperature, ammonia, nitrate, and total chlorine levels. These warning levels combined with visual observations of unusual conditions are used to notify the municipalities of immediate problems found in the field. City Staff provides information to the Regional Board annually in its Program Effectiveness Assessment report.	corresponding actions and reporting requirements. If the source remains unidentified, then the exceedance is identified as a high priority pollutant of concern in the sub-watershed and additional sampling is performed with reporting in the Program Effectiveness Assessment report.	Copermittees with 125 major MS4 outfalls or more, but less than or equal to 500 that discharge to receiving waters within a Watershed Management Area, all the outfalls must be visually inspected at least annually during dry weather conditions.

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Sent: Monday, August 25, 2014 11:05 AM
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Subject: Single Board regulations of Lake Forest, Laguna Hills, and Laguna Woods
Attachments: Single Permit Findings and Provisions.DOCX

Good Morning Laurie,

Please find attached, proposed permit language to facilitate MS4 permit regulation through a single Regional Board.

Again, please contact me should you have any questions.

Thank you,

Devin Slaven, CPSWQ, QSD/QSP
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Your attention to this matter is greatly appreciated.

Laurie Walsh, PE
San Diego Water Board

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CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
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Proposed Language for use in the San Diego Region Regional Permit for OC (to be modified, as appropriate, for use in the Santa Ana Region MS4 Permit)

Findings

Cities of Lake Forest and Laguna Hills

The Cities of Lake Forest and Laguna Hills are hydrologically divided into watersheds draining into the Newport Bay and Aliso Creek Watersheds under the jurisdiction separately of the Santa Ana and San Diego Regional Water Quality Control Boards, respectively. Pursuant to California Water Code Section 13228, both cities have requested a consolidation of program compliance and reporting under one Regional Board (the Santa Ana Regional Water Quality Control Board for Lake Forest and the San Diego Regional Water Quality Control Board for Laguna Hills) in order to achieve administrative efficiency. The San Diego Regional Water Quality Control Board and the Santa Ana Regional Water Quality Control Board have agreed with the cities to include provisions in their respective municipal NPDES permits regulating discharges in Orange County that would allow the City of Lake Forest to implement the Santa Ana Regional Water Quality Control Board's municipal NPDES permit in those portions of the City that are within the San Diego Regional Water Quality Control Board's jurisdiction, and allow the City of Laguna Hills to implement the San Diego Regional Water Quality Control Board's municipal NPDES permit in those portions of the City that are within the Santa Ana Regional Water Quality Control Board's jurisdiction. Both cities shall be exempt from the requirements of the NPDES permit that they are not implementing provided that they continue to participate in the watershed and TMDL programs in both watersheds as detailed in Section ____, below.

Order Language (to be placed in a general section toward the front of the permit)

A. Lake Forest

In lieu of being subject to this Order, the City of Lake Forest may elect to be subject to and regulated under Santa Ana Regional Water Quality Control Board Order No _R8-2009-0030 (amended by R8-2010-0062), or the most recent iteration thereof throughout the City's entire jurisdiction. The City shall be exempt from this Order provided it meets the following conditions:

1) Within thirty (30) days of adoption of this Order the City of Lake Forest implements all applicable provisions of Santa Ana Regional Water Quality Control Board Order No R8-2009-0030 (amended by R8-2010-0062), or the most recent iteration thereof throughout the City's entire jurisdiction.

2) The City of Lake Forest remains in compliance with all applicable requirements of Santa Ana Regional Water Quality Control Board Order No R8-2009-0030 (amended by R8-2010-0062), or the most recent iteration thereof.

3) The City of Lake Forest implements the Aliso Creek Watershed Comprehensive Load Reduction Plan updated and submitted to the San Diego Regional Water Quality Control Board in July 2014.
4) The City of Lake Forest implements all applicable TMDL requirements in Attachment E of this Order.

Failure to comply with any of the above requirements will result in the exemption provided by this section being revoked and the City being subject to this Order throughout all portions of the City that are within the jurisdiction of the San Diego Regional Water Quality Control Board. If the City chooses to be regulated under Santa Ana Regional Water Quality Control Board Order No R8-2009-0030 (amended by R8-2010-0062), or the most recent iteration thereof pursuant to this section, the San Diego Regional Water Quality Control Board shall retain enforcement authority in those portions of the City that are within the jurisdiction of the San Diego Regional Water Quality Control Board.

B. Laguna Hills

In lieu of being subject to and regulated under Santa Ana Regional Water Quality Control Board Order No _R8-2009-0030 (amended by R8-2010-0062), or the most recent iteration thereof, in those portions of the City of Laguna Hills that are within the jurisdiction of the Santa Ana Regional Water Quality Control Board, the City may elect to be regulated under this Order only throughout the City's entire jurisdiction. Following such election, the municipal stormwater runoff in all portions of the City, including those that fall within the Santa Ana Regional Water Quality Control Board's geographic jurisdiction, shall be subject to regulation by San Diego Regional Water Quality Control Board pursuant to this Order, subject to the terms of any designation agreement(s) entered into between the City, the San Diego Regional Water Quality Control Board, and the Santa Ana Regional Water Quality Control Board pursuant to Water Code Section 13228. Those TMDLs and associated MS4 permit requirements issued by the Santa Ana Regional Water Quality Control Board which include the City of Laguna Hills as a responsible party are set forth in Attachment __ of this Order and incorporated into this Order by reference.

Walsh, Laurie@Waterboards

From: lyris@swrcb18.waterboards.ca.gov
Sent: Friday, September 05, 2014 1:45 PM
To: Walsh, Laurie@Waterboards
Subject: Public Workshop Notice on Tentative Order No. R9-2015-0001 proposing modifications to the Regional MS4 Permit
Attachments: 2014-1008_WorkshopNotice.pdf

This is a message from the California Regional Water Quality Control Board, San Diego Region (9).

Interested Persons,

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) will hold an informational public workshop to receive information and discuss requirements in a public draft of Tentative Order No. R9-2015-0001. Tentative Order No. R9-2015-0001 proposes to amend the National Pollutant Discharge Elimination System (NPDES) Permit for Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region, Order No. R9-2013-0001 (Regional MS4 Permit).

The Public Workshop is scheduled during the San Diego Water Boards' regular Board Meeting on:

Wednesday, October 8, 2014 – 9:00 a.m.

City of Mission Viejo
Council Chambers
200 Civic Center
Mission Viejo, California

Attached is the Public Workshop Notice. You can also access this notice on our website at:
http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/oc_stormwater.shtml

If you have any questions please feel free to contact me.

Laurie Walsh P.E.

San Diego Water Board

619-521-3373

lwalsh@waterboards.ca.gov

You are currently subscribed to reg9_sandiegoco_ms4permit as: Laurie.Walsh@waterboards.ca.gov.

To unsubscribe click here: leave-2665981-517889.992bd9006c3392a974839ac12d93b37b@swrcb18.waterboards.ca.gov

California Water Boards

Edmund G. Brown Jr.
Governor

Matthew Rodriquez
Secretary for
Environmental Protection

California Regional Water Quality Control Board, San Diego Region

NOTICE OF PUBLIC WORKSHOP

A Workshop Will Be Held To Discuss

Tentative Order No. R9-2015-0001
An Order Amending the Regional Municipal Separate Storm Sewer (MS4) NPDES Permit for the San Diego Region

The Location and Time Are Specified Below.

Wednesday, October 8, 2014 – 9:00 a.m.
City of Mission Viejo
Council Chambers
200 Civic Center
Mission Viejo, California

NOTICE IS HEREBY GIVEN that the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) will hold an informational public workshop to receive information and discuss requirements in a public draft of Tentative Order No. R9-2015-0001. Tentative Order No. R9-2015-0001 proposes to amend the National Pollutant Discharge Elimination System (NPDES) Permit for Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region, Order No. R9-2013-0001 (Regional MS4 Permit). Tentative Order No. R9-2015-0001 will be available on or about September 12, 2014 and will be accessible electronically at:

http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/oc_stormwater.shtml.

The workshop will be held at the San Diego Water Board's regularly scheduled public meeting on October 8, 2014. To view the meeting agenda in advance of the meeting, please visit the San Diego Water Board's website at:

http://www.waterboards.ca.gov/sandiego/board_info/agendas/.

Except for items designated as time certain, there are no set times for agenda items. Items including the workshop may be taken out of order at the discretion of the Chairman.

BACKGROUND INFORMATION

The San Diego Water Board adopted the Regional MS4 Permit on May 8, 2013 in response to a Report of Waste Discharge (RoWD) application from the municipal Copermittees in San Diego County for reissuance of an MS4 NPDES permit. The Copermittees in San Diego County are currently enrolled under the Regional MS4 Permit. The San Diego Water Board is considering enrollment of Copermittees in Orange County and Riverside County under the Regional MS4 Permit in a phased manner as their current MS4 permits expire and after consideration of their RoWD submittal.

Copermittees in Orange County consisting of the County of Orange, Orange County Flood Control District and the cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Lake Forest, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano are currently regulated by MS4 Permit Order No. R9-2009-0002. This MS4 permit will expire on December 16, 2014, and the Orange County Copermittees have jointly submitted a RoWD in application for MS4 NPDES permit reissuance. Tentative Order No. R9-2015-0001 proposes to amend the Regional MS4 Permit in response to the RoWD and enroll the Orange County Copermittees under the Permit as MS4 dischargers responsible for compliance with the terms and the conditions of the Permit. The Tentative Order also proposes to amend the Regional MS4 Permit to address a variety of other issues including 1) Regional Water Board designation to consolidate regulation of MS4 discharges for the Cities of Laguna Hills, Laguna Woods, and Lake Forest, 2) incorporation of the Los Peñasquitos Lagoon Sediment Total Maximum Daily Load (TMDL) requirements, 3) incorporation of interim exemptions for hydromodification management, 4) the extension of a pollutant reduction deadline for MS4 discharges to Areas of Special Biological Significance (ASBS) and 5) implementation of a unified approach for monitoring beach water quality in south Orange County.

PROCEDURAL MATTERS

The October 8, 2014 public workshop will be informal and conducted to provide San Diego Water Board members with information about the Tentative Order and to facilitate discussion. There will be no sworn testimony or cross-examination of participants. San Diego Water Board staff will explain the Regional MS4 Permit amendment process and summarize significant elements of the Tentative Order for the San Diego Water Board and the public. Orange County Copermittees, other Copermittees within the San Diego Region, and any interested persons will also have an opportunity to provide oral comments as set forth below. The San Diego Water Board may provide general feedback to staff on proposed modifications of the Regional MS4 Permit; however, no action or voting will take place at this workshop.

To ensure a productive and efficient public workshop, and to ensure that all attending have an opportunity to participate, oral presentations may be limited at the discretion of the Chair. This item has significant interest to the public and regulated community, and in order to provide enough time for all interested parties to participate, participants with similar comments are requested to make joint presentations. San Diego Water Board staff may, but will not necessarily, respond to comments made at the workshop.

The San Diego Water Board will issue a separate public hearing and comment period notice announcing the release of the Tentative Order for public review and comment on or about September 12, 2014. The public hearing notice will establish the deadline for submission of written comments, the time, date and location of the public hearing, and the procedures that the San Diego Water Board will follow at the public hearing to consider adoption of the Tentative Order. Once released, the Tentative Order will serve as the public comment draft permit amendment for purposes of applicable public notice requirements under the Code of Federal Regulations (40 C.F.R. § 124.10) and Water Code section 13167.5, subdivision (b).

DOCUMENT AVAILABILITY

The Tentative Order will be available on or about September 12, 2014 and will be accessible electronically at:

http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/oc_stormwater.shtml.

ELECTRONIC MAIL LIST SUBSCRIPTION

The San Diego Water Board has established an electronic mail list specifically for information and notices on the development of the Regional MS4 Permit. The San Diego Water Board will use the email list to notify interested persons of upcoming important events and the availability of on-line documents. Persons interested in receiving future notices and information on this specific project can subscribe to one (1) of the electronic mail lists titled “Orange County MS4 Permit, “ Riverside County MS4 Permit, or “San Diego MS4 Permit ”, located on the San Diego Water Board website at:

http://www.waterboards.ca.gov/resources/email_subscriptions/reg9_subscribe.shtml.

PARKING AND ACCESSIBILITY

For directions to the City of Mission Viejo, please refer to:
http://cityofmissionviejo.org/CityDirectory/.

A parking lot is available for your convenience; however, please refrain from using the area between the library and City Hall. The facility is accessible to persons with disabilities. Persons requiring additional accommodations should contact Chris Blank at Chris.Blank@waterboards.ca.gov or 619-521-3382 at least five (5) days prior to the workshop.

INFORMATION REGARDING WORKSHOP

If you have any questions or wish to receive a hard copy of the Tentative Order, please contact Laurie Walsh at (619) 521-3373 or via e-mail at Laurie.Walsh@waterboards.ca.gov.

CITY of LAGUNA WOODS

Bert Hack
Mayor

Cynthia Conners
Mayor Pro Tem

Noel Hatch
Councilmember

Shari L. Horne
Councilmember

Bob Ring
Councilmember

Christopher Macon
City Manager

September 8, 2014

Mr. Kurt Berchtold, Executive Officer
Santa Ana Regional Water Quality Control Board
3737 Main Street, Suite 500
Riverside, CA 92501-3348

Mr. David W. Gibson, Executive Officer
San Diego Regional Water Quality Control Board
2375 Northside Drive, Suite 100
San Diego, CA 92108-2700

SUBJECT: Request to Obtain Coverage Under a Single National Pollutant Discharge Elimination System (NPDES) Permit

Dear Mr. Berchtold and Mr. Gibson:

Thank you for your continued consideration of the City of Laguna Woods' request to obtain coverage under a single National Pollutant Discharge Elimination System (NPDES) Permit, in lieu of the split coverage that the City currently experiences between the Santa Ana and San Diego regional water quality control boards. Like our colleagues in the cities of Laguna Hills and Lake Forest, the City is seeking this regulatory change in the interest of being able to better focus our water quality improvement and protection efforts through the reduction of unintentionally duplicative and cumbersome administrative burdens.

It is the City's belief that obtaining single coverage under the San Diego Regional Water Quality Control Board's NPDES Permit would most efficiently and effectively leverage the public and private relationships that have been key in making positive environmental strides in the past, while also respecting the significance of the Water Code Section 13225-impaired waterbody to which Laguna Woods discharges directly. The City recognizes and accepts that our obligations for Total Maximum Daily Loads (TMDLs) and waste discharge orders issued or enforced by either regional water quality control board would remain unchanged.

If you have any questions or concerns, or would like to discuss this request further, please do not hesitate to contact me at (949) 639-0525 or cmacon@lagunawoodscity.org.

Sincerely,

Christopher Macon
City Manager

24264 El Toro Road • Laguna Woods, CA 92637 • Phone (949) 639-0500 • Fax (949) 639-0591 • Website: www.lagunawoodscity.org

026747

Prior Lawful Approval Discussion with Copermittees

September 8, 2014

Name	Agency/ Affiliation	Telephone	E-mail Address
David Barker	SDRWQCB	619 521-3007	David.Barker@waterboards.ca.gov
Christina Arias	"	619 5213361	christina.arias@waterboards.ca.gov
Brendan Hastie	Rick Eng.	619 291-0707	bhastie@rickengineering.com
Guy Asaro	McMillin Co's / BIA	619-794.1311	gasaro@mcmillin.com
Wayne Rosenkranz	Opper & Varco / BIA	619-231-5858	SDR@envirolawyer.com
Michael McSweeney	BIA	858-514-7004	mmcsweeney@bias[illegible]1660.org
Sumer Hasenin	city of SD	858-540-4330	syhasenin@sandiego.gov
Jeff Strohminger	City of SD / DSD	619-557-7920	JSTROHMINGER@SANDIEGO.GOV
Corrine Neuffer	City of SD / CHO	619-236-6226	cneuffer@sandiego.gov
Kelly Broughton	City of Chula Vista	619 691 5233	kbroughton@chulavistaca.gov
Bill Valle	City of Chula Vista	619 540 0705	wvalle@chulavistaca.gov
Dave Gibson	SDRWQCB	619 521 3005	dgibson@waterboards.ca.gov
Laurie Walsh	"	619-521-3373	lwalsh@waterboards.ca.gov
Michael De La Rosa	County of S.D. / Office of Sup. Greg Cox	619-531-5990	michael.delarosa@sdcounty.ca.gov
Tom Bosworth	County of San Diego	619-531-4729	thomas.bosworth@sdcounty.ca.gov
David Hennis	" " " "	619-550-8423	david.hennis@sdcounty.ca.gov
Troy Bankston	" " " "	858 694-2125	troy.bankston@sdcounty.ca.gov
Akram Bassyouni	City of San Diego	619-446-5442	ABASSYOUNI@sandiego.gov
Shawn Hagerty	For San Diego City Attorney Association	619-525-1327	Shawn.hagerty@bbklaw.com
HELEN DAVIES	CITY OF ESCONDIDO	760 839 6315	hdavies@ci.escondido.ca.us

026748

Prior Lawful Approval Discussion with Copermittees

September 8, 2014

Name	Agency/ Affiliation	Telephone	E-mail Address
Jon Van Rhyn	County of San Diego	858-495-5133	jon.vanrhyn@sdcounty.ca.gov
Drew Kleis	City of San Diego	858-541-4320	akleis@sandiego.gov
Mike Hansen	City of San Diego	619 533 3983	mhansen@sandiego.gov
Heather Stroud	City of San Diego	619 533 5872	hstroud@sandiego.gov

Walsh, Laurie@Waterboards

From: Wayne Rosenbaum <swr@envirolawyer.com>
Sent: Tuesday, September 09, 2014 7:23 AM
To: jon.vanrhyn@sdcounty.ca.gov
Cc: Mike McSweeney [MMcSweeney@biasandiego.org] (MMcSweeney@biasandiego.org); Brendan Hastie (bhastie@rickengineering.com); Bosworth, Thomas L; Hasenin, Sumer (SYHasenin@sandiego.gov); Bankston, Troy; O'Day, James R; Celia Brewer; Helen M. Davies (hdavies@ci.escondido.ca.us); elaine.lukey@carlsbadca.gov; Kelly Broughton (kbroughton@chulavistaca.gov); Pat Laughlin (plaughlin@chulavistaca.gov); William Valle; Tom Adler; Jeremy Riddle; Jason Geldert; James Wood; Helen M. Davies (hdavies@ci.escondido.ca.us); Hasenin, Sumer (SYHasenin@sandiego.gov); 'Kleis, Andrew' (AKleis@sandiego.gov); Guy, Amanda (AGuy@sandiego.gov); Neuffer, Corrine (CNeuffer@sandiego.gov); Strohminger, Jeff (JStrohminger@sandiego.gov); Stroud, Heather; Bassyouni, Akram; Bosworth, Thomas L; O'Day, James R; Hennis, David; Vidales, Rene A.; 'hhp@lfap.com'; 'jcampos@cityofelcajon.us'; 'ddavies@cityofelcajon.us'; 'sjohnson@Cityofsanteeca.gov'; porso@ci.santee.ca.us; 'Mike McSweeney'; Guy Asaro; 'Mark Radelow'; Matt Adams; 'Hammar, Dave'; Todd Galarneau; 'thom.fuller@decatur-advisors.com'; 'Ranie Hunter'; 'Jeff W. O'Connor (jeff@hfc-ca.com)'; 'William Ostrem'; 'Fischer, Beth(Pardee Homes)'; 'dpcrls@aol.com'; 'Robert L. Pippin (rlpippin@me.com)'; Borre Winckel (borre@biasandiego.org); Gibson, David@Waterboards; Becker, Eric@Waterboards; Walsh, Laurie@Waterboards; Arias, Christina@Waterboards; Chiu, Wayne@Waterboards; (matt@sdcoastkeeper.org); 'Jo Brooks'; Jeffrey Epp
Subject: Proposed Prior Lawful Approval Language for the MS4 Permit
Attachments: 2014-09-09Proposed Prior Lawful Approval Language for the MS4 Permit.docx

Jon,

Thanks for all of your help in facilitating a solution to the Prior Lawful Approval (PLA) conundrum and the coordination of the meeting yesterday.

As promised, I have attached a redline version of language which I believe address the last remaining concern. That is, to provide the Copermittees clear authority to use their land use discretion to protect water quality. I believe that this revised language accomplishes the four goals we set out for ourselves and for which I believe there was consensus among all the parties at yesterday's meeting.

- Provide a clear minimum standard that each Copermittee can rely on as a basis for MS4 permit compliance.
- Recognize and honor vested rights in order to protect Copermittees from takings claims and to avoid budgetary crisis for CIP, FPPF and assessment district financing.
- Protect Copermittee land use authority by allowing each Copermittee to impose higher standards where required to protect water quality.

- Reflect statewide trends in addressing the meaning and implementation of PLA provisions, which are not unique to this permit.
- Develop a strategy and language to address PLA that can be carried forward to future MS4 permits.

I believe we all agreed that the optimal way to memorialize this clarification to PLA was through an amendment to the Permit. I have made minor revisions to the language to make it possible to simply insert the language into the permit. Given the exigencies of time, if there is any hope of having this language incorporated into the permit amendments currently being drafted by RWQCB staff, I have taken the liberty of copying all the stakeholders. I suggest that each of us poll our constituencies and report back to Eric regarding any objections to the proposed language by Friday.

Please note that I made one other minor revision at the request of Brendan Hastie. The previous draft included the phrase "last ministerial permit". Brendan believes that what is intended is "first ministerial permit" as the last ministerial permit would general be a certificate of occupancy and would make the provision meaningless. If the group concurs than we would like to make this change as well.

Thanks again. Let me know what else we can do the expedite this process.

Wayne

S. Wayne Rosenbaum
Opper & Varco LLP
The Environmental Law Group
225 Broadway, Suite 1900
San Diego, CA 92101
Phone: (619) 231-5858
Cell: (619) 518-6618
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SWR@Envirolawyer.com
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Proposed Prior Lawful Approval Language for the MS4 Permit

(1) Structural BMP Approval and Verification Process

a. Each Copermittee must require and confirm that for all Priority Development Project applications that have not receive prior lawful approval by the Copermittee by the time the BMP Design Manual is updated pursuant to Provision E.3.d, the requirements of Provision E.3 are implemented.

i. For private development projects, Prior Lawful Approval is defined to be projects that have entered into a development agreement as defined by the California Government Code or have received a discretionary or the ~~last~~ first ministerial entitlement prior to the effective date of Section E.3.e.(1)(a) are subject to the storm water requirements in effect at the time of the initial project approval and that includes the ultimate design or performance standards of the storm water drainage system for the project as accepted by the Copermittee. Project design plans, specifications, and storm water management details must comply with the standards in effect at the time of the initial approval including all discretionary entitlements, CEQA reviews or statutorily vested rights per the California Government Code. Projects shall include any subsequent discretionary or ministerial entitlement necessary to implement the initial project approval.

ii. For public projects, the Copermittee shall develop and adopt through ordinance an equivalent approach to that for private projects.

iii. For project applications that have received prior lawful approval before the BMP Design Manual is updated pursuant to Provision E.3.d, the Copermittee may allow previous land development requirements to apply provided that a Copermittee may modify or suspend the provisions of a development agreement, discretionary permit or ministerial permit regarding Section E.3.e.(1)(a) of ~~the 2013 MS4 Permit~~ this Order if the Copermittee determines, in its reasonable discretion, ~~a~~ that failure to suspend or modify the provisions of a development agreement, discretionary permit or ministerial permit will result in a violation of the prohibitions and limitations described in Provision A of this Order. ~~create a condition that is dangerous to the health or safety of residents, or both per Government Code sections 65865.3(b), 66498.1(c)(1), and 66498.6 or constitutes a nuisance as that term is defined by this permit.~~

Walsh, Laurie@Waterboards

From: Hasenin, Sumer <SYHasenin@sandiego.gov>
Sent: Friday, September 12, 2014 8:43 AM
To: Becker, Eric@Waterboards
Cc: Chiu, Wayne@Waterboards; Walsh, Laurie@Waterboards; Arias, Christina@Waterboards
Subject: Prior Lawful Approval Options
Attachments: Draft PLA Permit Language - Option (1).pdf; Draft PLA Permit Language - Option (2).pdf

Hi Eric,
I wanted to share with you and your staff couple of other prior lawful approval (PLA) options that have been kicked around in addition to the one discussed at the September 8th meeting. All of these options have pros and cons but serve as a basis for discussion. I realize that a unified proposal has not been submitted and it's very unlikely that one will be submitted, but I am hopeful that your staff would take the lead on drafting language for inclusion in the upcoming permit amendment. Sorry to put the burden on you, but if we were able to resolve this with other stakeholders we would not have come to you!! It is really imperative to include permit language at this point and it is very beneficial for the Board members and the public to have written PLA language for consideration at the Oct 8th workshop; otherwise it would be difficult to have a productive discussion.

None of these options represent the City's position at this point, so if you decide to move one of these options forward, please don't attribute it to the City as we have not firmed our position on the issue yet.
Please feel free to call me or email me back if you'd like to discuss further.
Thank you,

Sumer Hasenin, P.E., QSD, QSP
Senior Civil Engineer
Storm Water Division
Syhasenin@sandiego.gov
858-541-4330

Provision E.3.e.(1)
Proposed Amendment
Option 1

(1) Structural BMP Approval and Verification Process

(a) Each Copermittee must require and confirm that for all Priority Development Project applications that have not received prior lawful approval by the Copermittee by the time the BMP Design Manual requirements go into effect pursuant to Provision E.3.d, the requirements of Provision E.3 are implemented. For private development projects, prior lawful approval is a development approval or construction permit that complies with the Priority Development Project requirements of Order No. R9-2007-0001 and that includes the ultimate design of the storm water drainage system for the project in its entirety as accepted by the Copermittee. For any applicable portion(s) of the project, approvals may be extended to any subsequent discretionary or ministerial approval necessary to implement the initial project approval with the following conditions:

i. All subsequent permits must be issued within 5 years of the effective date of Provision E.3.e.

ii. Work completed under subsequent approvals must remain in substantial conformity with the design of the storm water drainage system included in the initial approval.

For public projects, the Copermittee shall develop an equivalent approach to that for private development projects. For project applications that have received prior lawful approval before the BMP Design Manual is updated pursuant to Provision E.3.d, the Copermittee may allow previous land development requirements to apply.

(b) Each Copermittee must identify the roles and responsibilities of its various municipal departments in implementing the structural BMP requirements, including each stage of a project from application review and approval through BMP maintenance and inspections.

(c) Each Copermittee must require and confirm that appropriate easements and ownerships are properly recorded in public records and the information is conveyed to all appropriate parties when there is a change in project or site ownership.

(d) Each Copermittee must require and confirm that prior to occupancy and/or intended use of any portion of the Priority Development Project, each structural BMP is inspected to verify that it has been constructed and is operating in compliance with all of its specifications, plans, permits, ordinances, and the requirements of this Order.

Provision E.3.e.(1)
Proposed Amendment
Option 2

(1) Structural BMP Approval and Verification Process

(a) Each Copermittee must require and confirm that for all Priority Development Project applications that have not received prior lawful approval by the Copermittee by the time the BMP Design Manual requirements become effective pursuant to Provision E.3.d, the requirements of Provision E.3 are implemented. For private development projects, prior lawful approval is a development approval or construction permit that complies with the Priority Development Project requirements of Order No. R9-2007-0001 and that includes the ultimate design of the storm water drainage system for the project in its entirety as accepted by the Copermittee, or phases of projects that have BMPs in operation in accordance with Order No. 2001-01. For any applicable portion(s) of the project, approvals may be extended to any subsequent discretionary or ministerial approval necessary to implement the initial project approval with the following conditions:

i. All subsequent permits must be issued within 5 years of the effective date of Provision E.3.e.

ii. Work completed under subsequent approvals must remain in substantial conformity with the design of the storm water drainage system included in the initial approval.

For public projects, the Copermittee shall develop an equivalent approach to that for private development projects. For project applications that have received prior lawful approval before the BMP Design Manual is updated pursuant to Provision E.3.d, the Copermittee may allow previous land development requirements to apply.

(b) Each Copermittee must identify the roles and responsibilities of its various municipal departments in implementing the structural BMP requirements, including each stage of a project from application review and approval through BMP maintenance and inspections.

(c) Each Copermittee must require and confirm that appropriate easements and ownerships are properly recorded in public records and the information is conveyed to all appropriate parties when there is a change in project or site ownership.

(d) Each Copermittee must require and confirm that prior to occupancy and/or intended use of any portion of the Priority Development Project, each structural BMP is inspected to verify that it has been constructed and is operating in compliance with all of its specifications, plans, permits, ordinances, and the requirements of this Order.

Walsh, Laurie@Waterboards

From: Becker, Eric@Waterboards
Sent: Thursday, September 18, 2014 9:46 AM
To: Wayne Rosenbaum; 'jon.vanrhyn@sdcounty.ca.gov'; Arias, Christina@Waterboards; Walsh, Laurie@Waterboards; Hagan, Catherine@Waterboards; Barker, David@Waterboards
Cc: 'Mike McSweeney [MMcSweeney@biasandiego.org] (MMcSweeney@biasandiego.org)'; 'Brendan Hastie (bhastie@rickengineering.com)'; 'Bosworth, Thomas L'; 'Hasenin, Sumer (SYHasenin@sandiego.gov)'; 'Bankston, Troy'; 'O'Day, James R'; 'Celia Brewer'; 'Helen M. Davies (hdavies@ci.escondido.ca.us)'; 'elaine.lukey@carlsbadca.gov'; 'Kelly Broughton (kbroughton@chulavistaca.gov)'; 'Pat Laughlin (plaughlin@chulavistaca.gov)'; 'William Valle'; 'Tom Adler'; 'Jeremy Riddle'; 'Jason Geldert'; 'James Wood'; 'Helen M. Davies (hdavies@ci.escondido.ca.us)'; 'Hasenin, Sumer (SYHasenin@sandiego.gov)'; ''Kleis, Andrew' (AKleis@sandiego.gov)'; 'Guy, Amanda (AGuy@sandiego.gov)'; 'Neuffer, Corrine (CNeuffer@sandiego.gov)'; 'Strohminger, Jeff (JStrohminger@sandiego.gov)'; 'Stroud, Heather'; 'Bassyouni, Akram'; 'Bosworth, Thomas L'; 'O'Day, James R'; 'Hennis, David'; 'Vidales, Rene A.'; 'hhp@lfap.com'; 'jcampos@cityofelcajon.us'; 'ddavies@cityofelcajon.us'; 'sjohnson@Cityofsanteeca.gov'; porso@ci.santee.ca.us; 'Mike McSweeney'; 'Guy Asaro'; 'Mark Radelow'; 'Matt Adams'; 'Hammar, Dave'; 'Todd Galarneau'; 'thom.fuller@decatur-advisors.com'; 'Ranie Hunter'; 'Jeff W. O'Connor (jeff@hfc-ca.com)'; 'William Ostrem'; 'Fischer, Beth(Pardee Homes)'; 'dpcrls@aol.com'; 'Robert L. Pippin (rlpippin@me.com)'; 'Borre Winckel (borre@biasandiego.org)'; Gibson, David@Waterboards; Walsh, Laurie@Waterboards; Arias, Christina@Waterboards; Chiu, Wayne@Waterboards; ' (matt@sdcoastkeeper.org)'; 'Jo Brooks'; 'Jeffrey Epp'; 'mgrey@biasc.org'
Subject: RE: Proposed Prior Lawful Approval Language for the MS4 Permit

All-

Thank you for the input and suggested language on prior lawful approval. It has really helped to understand the issues the Copermittees and regulated community face during the plan development and approval process. We reviewed the proposed language, but have not included any changes to Tentative Order No. 2015-0001 that will go out this week for public comment. However, we are willing to continue the discussion and still consider suggested changes to the Regional MS4 Permit to address this issue. It would be helpful that any proposed permit language is supported by most stakeholders.
Please provide comments on this issue during the 60-day public comment period. We also encourage you to attend the October 8th Public Workshop to inform the San Diego Water Board on the importance of this issue.

Eric Becker, P.E.
Senior Water Resources Control Engineer
Storm Water Management
SDRWQCB
2375 Northside Drive, Suite 100
San Diego, CA 92108
(619) 521-3364
Eric.Becker@waterboards.ca.gov

CALIFORNIA Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

September 18, 2014

Sent via E-mail

San Diego County Copermittees
Orange County Copermittees
Riverside County Copermittees

In reply refer to / attn:
Place ID: 658018Lwalsh

Subject: NOTICE OF OPPORTUNITY TO COMMENT
Tentative Order No. R9-2015-0001, An Order Amending the Regional Municipal Separate Storm Sewer (MS4) Permit for the San Diego Region (Order No. R9-2013-0001)

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) is releasing for public review and comment Tentative Order No. R9-2015-0001 (Tentative Order). The Tentative Order proposes to amend the National Pollutant Discharge Elimination System (NPDES) Permit for *Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region*, Order No. R9-2013-0001 (Regional MS4 Permit). Notice is hereby given that the San Diego Water Board will receive written comments on the Tentative Order and proposed changes to the Regional MS4 Permit in accordance with title 40 Code of Federal Regulations (CFR) section 124.10 and Water Code section 13167.5.

The Tentative Order proposes to amend the Regional MS4 Permit in response to the Orange County Copermittees' Report of Waste Discharge (RoWD) submitted by letter dated May 20, 2014, and designate the Orange County Copermittees as MS4 dischargers responsible for compliance with the terms and the conditions of the Permit. The Tentative Order also proposes to amend the Regional MS4 Permit to address a variety of other issues including 1) Regional Water Board designation to consolidate regulation of Phase I MS4 discharges for the Cities of Laguna Hills, Laguna Woods, and Lake Forest pursuant to Water Code section 13228, 2) incorporation of the Los Peñasquitos Lagoon Sediment Total Maximum Daily Load requirements, 3) the extension of a pollutant reduction deadline for MS4 discharges to Areas of Special Biological Significance, 4) incorporation of interim exemptions for hydromodification management, and 5) implementation of a uniform approach for monitoring beach water quality in south Orange County. The uniform monitoring approach referenced in the Tentative Order is contained in a San Diego Water Board report entitled "*Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County,*" dated September 2014. This report will be available for public review during the public review and comment period on the Tentative Order.

The Tentative Order amends the Regional MS4 Permit and the Fact Sheet (Attachment F of the Permit) as described in Attachments 1 and 2 of the Tentative Order. Changes to the Regional MS4 Permit and its Fact Sheet based upon the Tentative Order are displayed in blue-underline text and red-strikeout text in the attachments to the Tentative Order.

If the San Diego Water Board adopts Tentative Order No. R9-2015-0001, the Orange County Copermittees will be the second group of Copermittees to obtain coverage under the Regional MS4 Permit. San Diego County Copermittees obtained coverage upon the effective date of the Regional MS4 Permit following its adoption on May 8, 2013. The last remaining group, the Riverside County Copermittees, will be considered for coverage under the Regional MS4 Permit in a future action following the expiration of their current MS4 Permit in November 2015, and after consideration of their RoWD submittal for MS4 Permit reissuance. Thus the intent of the Regional MS4 Permit is to ultimately cover multiple MS4 discharge points to receiving waters throughout areas of San Diego, Orange, and Riverside Counties that fall within the San Diego Water Board's jurisdiction. Therefore, the Copermittees currently covered by Order No. R9-2013-0001 (i.e. the Copermittees in San Diego County) and Orange County Copermittees have an opportunity to submit any written comments on the Tentative Order and proposed changes to the Regional MS4 Permit during the comment period described below. Copermittees covered by the current Riverside County MS4 permit (Order No. R9-2010-0016), for which a RoWD NPDES reissuance application has not yet been filed, are strongly encouraged to submit written comments during the comment period described below.

Document Availability

The Tentative Order and attachments thereto, are available on the San Diego Water Board website at:

http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/oc_stormwater.shtml.

Interested persons may also receive a copy of the Tentative Order and its attachments by contacting Laurie Walsh at (619) 521-3373, email Laurie.Walsh@waterboards.ca.gov or by visiting the San Diego Water Board's office at 2375 Northside Drive, Suite 100, San Diego, California 92108, weekdays between 8:00 a.m. and 5:00 p.m., telephone (619) 516-1990. San Diego, Orange, and Riverside County Copermittees are requested to confirm by e-mail to Laurie Walsh that they *do not* wish to receive a copy of the Tentative Order and its attachments in paper form.

Submission of Written Comments

The submission of written comments is the opportunity for the Copermittees and interested persons to raise and comment on issues pertaining to the terms and conditions of the Tentative Order. All written comments pertaining to the terms and conditions of the Tentative Order to be considered by the San Diego Water Board at the as-yet unscheduled public hearing must be received no later than **12:00 noon on Wednesday November 19, 2014.**

Written comments must be sent to the San Diego Water Board's office at 2375 Northside Drive, Suite 100, San Diego, CA 92108, faxed to (619) 516-1994, or e-mailed to Laurie Walsh at Laurie.Walsh@waterboards.ca.gov. Please indicate in the subject line of all written comments "Comment - Tentative Order No. R9-2015-0001, Place ID:658018LWalsh". The early submission of written comments on the Tentative Order is encouraged.

Written comments received by **12:00 noon on Wednesday, November 19, 2014** will be provided to the San Diego Water Board members for their review in advance of a public hearing to consider adoption of the Tentative Order. All timely written comments will also be posted as they are received on the San Diego Water Board website at: http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/oc_stormwater.shtml.

Consistent with State Water Board regulations that apply to this proceeding, written comments received after the close of the comment period will not be accepted and will not be incorporated into the administrative record if doing so would prejudice any party. Written comments received by the close of the comment period will be provided to the San Diego Water Board members for their review in advance of a public hearing to consider adoption of the Tentative Order. The San Diego Water Board will prepare written responses to significant comments that are timely received.

Public Hearing for Consideration of Tentative Order Adoption
The San Diego Water Board will issue a separate notice announcing a public hearing to receive oral comments and consider adoption of the Tentative Order at a later date. Notice of the public hearing will be provided to the Copermittees and interested persons at least thirty (30) days in advance of the hearing. Participants will have an opportunity to address the San Diego Water Board members subject to reasonable limitations prior to the Board taking action on the Tentative Order. The public notice providing the specific date for the San Diego Water Board adoption meeting and any other public notices related to the Tentative Order will be distributed through the e-mail list service specified below and posted on the San Diego Water Board website at:
http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/oc_stormwater.shtml

Public Workshop on Tentative Order
The San Diego Water Board will hold a public workshop to receive information and discuss requirements of the Tentative Order as part of the Board's regularly scheduled public meeting on October 8, 2014 in the City of Mission Viejo, Council Chambers, Mission Viejo, California. Additional information on the public workshop is contained in the Notice of Public Workshop which is available on the San Diego Water Board website at:
http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/oc_stormwater.shtml

E-Mail List Service
Interested persons desiring to receive future public notices regarding the Tentative Order and potential future modifications to the Regional MS4 Permit can subscribe to one of the electronic e-mail service lists titled "Orange County MS4 Permit," "Riverside County MS4 Permit," or "San Diego MS4 Permit" located on the San Diego Water Board website at:
http://www.waterboards.ca.gov/resources/email_subscriptions/reg9_subscribe.shtml

Persons without access to email may request paper copies of future notices and other documents by contacting Laurie Walsh as specified in the Document Availability section of this notice.

Contact for further Information
For questions or comments concerning this notice, please contact Laurie Walsh by phone at (619) 521-3373, or by email at Laurie.Walsh@waterboards.ca.gov .

Respectfully,

David Barker, P.E.
Supervising Engineer
San Diego Regional Water Quality Control Board

DWG:dtb esb:law

Cc (via email):

San Diego County Copermittees
Orange County Copermittees
Riverside County Copermittees
Natural Resource Agencies
San Diego County MS4 Permit E-mail Service List
Riverside County MS4 Permit E-mail Service List
Orange County MS4 Permit E-mail Service List
San Diego Water Board Agenda E-mail Service List

Tech Staff Info & Use	
Tentative Order No.	R9-2015-0001
NPDES No.	CAS0109266
Place ID	658018

San Diego County Copermittees

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Natural Resource Agencies

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Orange County Copermittees

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Riverside County Copermittees

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Matt Bennett
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mbennett@interwestgrp.com

Walsh, Laurie@Waterboards

From: lyris@swrcb18.waterboards.ca.gov
Sent: Thursday, September 18, 2014 12:11 PM
To: Walsh, Laurie@Waterboards
Subject: Availability of Tentative Order R9-2015-0001 revising the San Diego Regional MS4 Permit Order No. R9-2013-0001 and Fact Sheet
Attachments: Public Workshop Notice.pdf

This is a message from the California Regional Water Quality Control Board, San Diego Region (9).

Stakeholders,

The Tentative Order R9-2015-0001 which seeks to revise the Regional MS4 Permit Order No. R9-2013-0001 and Fact Sheet will be available on the San Diego Water Boards' website on or before COB Friday, September 19, 2014. The Tentative Order includes proposed revisions to the San Diego Water Board Regional MS4 Permit Order R9-2013-0001 and Fact Sheet. Proposed revisions are indicated in redline –strikeout format. Information on document availability, submission of written comments, e-mail lists to receive additional information, and additional contact information will be available on the San Diego Water Boards' website:

http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/oc_stormwater.shtml

Attached is the Notice of Public Workshop to be held during the next regularly scheduled San Diego Water Board meeting on October 8, 2014 at 9 am.

Public Workshop
Wednesday, October 8, 2014 – 9:00 a.m.
City of Mission Viejo
Council Chambers
200 Civic Center
Mission Viejo, California

If you have any questions please contact me or Christina Arias at (619) 521-3361 or Christina.arias@waterboards.ca.gov

Laurie Walsh, PE
San Diego Water Board

2375 Northside Drive, Suite 100
San Diego, CA 92108
Direct Phone: 619-521-3373
Main Line: 619-516-1990
Fax No. (619) 516-1994
lwalsh@waterboards.ca.gov

Walsh, Laurie@Waterboards

From: Walsh, Laurie@Waterboards
Sent: Tuesday, September 30, 2014 3:59 PM
To: 'ptsunoda@cityofalisoviejo.com'
Cc: Moy Yahya
Subject: Invitation to attend San Diego Water Board Public Workshop - Orange County Storm Water Permit Renewal
Attachments: 2014-0930 Aliso Viejo.pdf

Mayor Tsunoda,

You are invited to attend the San Diego Water Boards' Public Workshop to discuss proposed amendments to the Regional Storm Water Permit to include several incorporated cities in south Orange County and the County of Orange as Copermittees. The San Diego Water Board values your perspective and input on how the Regional Permit affect your municipality.

Please see the attached invitation from the San Diego Water Board.

Laurie Walsh, PE
San Diego Water Board

2375 Northside Drive, Suite 100
San Diego, CA 92108
Direct Phone: 619-521-3373
Main Line: 619-516-1990
Fax No. (619) 516-1994
lwalsh@waterboards.ca.gov

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD
www.waterboards.ca.gov/sandiego/

026764

CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

September 30, 2014

Mayor Phillip Tsunoda
City of Aliso Viejo
12 Journey, Suite 100
Aliso Viejo, CA 92656-5335
ptsunoda@cityofalisoviejo.com

In reply refer to / attn:
Place ID: 658018Lwalsh

Subject: INVITATION TO SAN DIEGO WATER BOARD PUBLIC WORKSHOP REGIONAL MUNICIPAL STORM WATER PERMIT REISSUANCE

I, on behalf of the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), invite you to attend our public workshop on October 8, 2014, in the City of Mission Viejos' Council Chambers. A workshop notice with detailed meeting information is attached. At the workshop, the San Diego Water Board will discuss Tentative Order No. R9-2015-0001, proposed amendments to Order No. R9-2013-0001, *Regional NPDES Permit for Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Regional MS4 Permit), including the incorporation of the County of Orange, several incorporated cities in south Orange County, and the Orange County Flood Control District as Copermittees. The intent of the proposed amendments to the Regional MS4 Permit is to advance the storm water program and achieve regulatory consistency throughout the San Diego Water Boards' jurisdiction.

The Copermittees currently covered by Order No. R9-2013-0001 (i.e. the Copermittees in San Diego County), the proposed Orange County Copermittees, and other interested stakeholders will have an opportunity at the workshop to provide comments and other information regarding Tentative Order No. R9-2015-0001 to the San Diego Water Board. No action will be taken by the Board. Elected officials intending to speak during the workshop will be given an opportunity to address the San Diego Water Board immediately following presentations by Board staff and the representatives of the south Orange County Copermittees. I encourage you to also invite other elected officials from your municipality to attend.

The San Diego Water Board values your perspective and input on how the Regional MS4 Permit affects your municipality. If you have any questions concerning this invitation please contact me at (619) 521-3005, or by email at David.Gibson@waterboards.ca.gov.

Respectfully,

David W. Gibson
Executive Officer
San Diego Regional Water Quality Control Board

DWG:js:bb:esb:law

Cc: Moy Yahya, myahya@cityofalisoviejo.com

CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

NOTICE OF PUBLIC WORKSHOP

A Workshop Will Be Held To Discuss

Tentative Order No. R9-2015-0001
An Order Amending the Regional Municipal Separate Storm Sewer (MS4) NPDES Permit for the San Diego Region

The Location and Time Are Specified Below.

Wednesday, October 8, 2014 – 9:00 a.m.
City of Mission Viejo
Council Chambers
200 Civic Center
Mission Viejo, California

NOTICE IS HEREBY GIVEN that the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) will hold an informational public workshop to receive information and discuss requirements in a public draft of Tentative Order No. R9-2015-0001. Tentative Order No. R9-2015-0001 proposes to amend the National Pollutant Discharge Elimination System (NPDES) Permit for Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region, Order No. R9-2013-0001 (Regional MS4 Permit). Tentative Order No. R9-2015-0001 will be available on or about September 12, 2014 and will be accessible electronically at:

http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/oc_stormwater.shtml.

The workshop will be held at the San Diego Water Board's regularly scheduled public meeting on October 8, 2014. To view the meeting agenda in advance of the meeting, please visit the San Diego Water Board's website at:

http://www.waterboards.ca.gov/sandiego/board_info/agendas/.

Except for items designated as time certain, there are no set times for agenda items. Items including the workshop may be taken out of order at the discretion of the Chairman.

BACKGROUND INFORMATION

The San Diego Water Board adopted the Regional MS4 Permit on May 8, 2013 in response to a Report of Waste Discharge (RoWD) application from the municipal Copermittees in San Diego County for reissuance of an MS4 NPDES permit. The Copermittees in San Diego County are currently enrolled under the Regional MS4 Permit. The San Diego Water Board is considering enrollment of Copermittees in Orange County and Riverside County under the Regional MS4 Permit in a phased manner as their current MS4 permits expire and after consideration of their RoWD submittal.

Copermittees in Orange County consisting of the County of Orange, Orange County Flood Control District and the cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Lake Forest, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano are currently regulated by MS4 Permit Order No. R9-2009-0002. This MS4 permit will expire on December 16, 2014, and the Orange County Copermittees have jointly submitted a RoWD in application for MS4 NPDES permit reissuance. Tentative Order No. R9-2015-0001 proposes to amend the Regional MS4 Permit in response to the RoWD and enroll the Orange County Copermittees under the Permit as MS4 dischargers responsible for compliance with the terms and the conditions of the Permit. The Tentative Order also proposes to amend the Regional MS4 Permit to address a variety of other issues including 1) Regional Water Board designation to consolidate regulation of MS4 discharges for the Cities of Laguna Hills, Laguna Woods, and Lake Forest, 2) incorporation of the Los Peñasquitos Lagoon Sediment Total Maximum Daily Load (TMDL) requirements, 3) incorporation of interim exemptions for hydromodification management, 4) the extension of a pollutant reduction deadline for MS4 discharges to Areas of Special Biological Significance (ASBS) and 5) implementation of a unified approach for monitoring beach water quality in south Orange County.

PROCEDURAL MATTERS

The October 8, 2014 public workshop will be informal and conducted to provide San Diego Water Board members with information about the Tentative Order and to facilitate discussion. There will be no sworn testimony or cross-examination of participants. San Diego Water Board staff will explain the Regional MS4 Permit amendment process and summarize significant elements of the Tentative Order for the San Diego Water Board and the public. Orange County Copermittees, other Copermittees within the San Diego Region, and any interested persons will also have an opportunity to provide oral comments as set forth below. The San Diego Water Board may provide general feedback to staff on proposed modifications of the Regional MS4 Permit; however, no action or voting will take place at this workshop.

To ensure a productive and efficient public workshop, and to ensure that all attending have an opportunity to participate, oral presentations may be limited at the discretion of the Chair. This item has significant interest to the public and regulated community, and in order to provide enough time for all interested parties to participate, participants with similar comments are requested to make joint presentations. San Diego Water Board staff may, but will not necessarily, respond to comments made at the workshop.

The San Diego Water Board will issue a separate public hearing and comment period notice announcing the release of the Tentative Order for public review and comment on or about September 12, 2014. The public hearing notice will establish the deadline for submission of written comments, the time, date and location of the public hearing, and the procedures that the San Diego Water Board will follow at the public hearing to consider adoption of the Tentative Order. Once released, the Tentative Order will serve as the public comment draft permit amendment for purposes of applicable public notice requirements under the Code of Federal Regulations (40 C.F.R. § 124.10) and Water Code section 13167.5, subdivision (b).

DOCUMENT AVAILABILITY

The Tentative Order will be available on or about September 12, 2014 and will be accessible electronically at:

http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/oc_stormwater.shtml.

ELECTRONIC MAIL LIST SUBSCRIPTION

The San Diego Water Board has established an electronic mail list specifically for information and notices on the development of the Regional MS4 Permit. The San Diego Water Board will use the email list to notify interested persons of upcoming important events and the availability of on-line documents. Persons interested in receiving future notices and information on this specific project can subscribe to one (1) of the electronic mail lists titled "Orange County MS4 Permit, " Riverside County MS4 Permit, or "San Diego MS4 Permit ", located on the San Diego Water Board website at:

http://www.waterboards.ca.gov/resources/email_subscriptions/reg9_subscribe.shtml.

PARKING AND ACCESSIBILITY

For directions to the City of Mission Viejo, please refer to:
http://cityofmissionviejo.org/CityDirectory/.

A parking lot is available for your convenience; however, please refrain from using the area between the library and City Hall. The facility is accessible to persons with disabilities. Persons requiring additional accommodations should contact Chris Blank at Chris.Blank@waterboards.ca.gov or 619-521-3382 at least five (5) days prior to the workshop.

INFORMATION REGARDING WORKSHOP

If you have any questions or wish to receive a hard copy of the Tentative Order, please contact Laurie Walsh at (619) 521-3373 or via e-mail at Laurie.Walsh@waterboards.ca.gov.

Walsh, Laurie@Waterboards

From: Walsh, Laurie@Waterboards
Sent: Tuesday, September 30, 2014 4:02 PM
To: 'lbartlett@danapoint.org'
Cc: Lisa Zawaski
Subject: Invitation to attend San Diego Water Board Public Workshop - Orange County Storm Water Permit Renewal
Attachments: 2014-0930 Dana Point.pdf

Mayor Bartlett,

You are invited to attend the San Diego Water Boards' Public Workshop to discuss proposed amendments to the Regional Storm Water Permit to include several incorporated cities in south Orange County and the County of Orange as Copermittees. The San Diego Water Board values your perspective and input on how the Regional Permit affect your municipality.

Please see the attached invitation from the San Diego Water Board.

Laurie Walsh, PE
San Diego Water Board

2375 Northside Drive, Suite 100
San Diego, CA 92108
Direct Phone: 619-521-3373
Main Line: 619-516-1990
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lwalsh@waterboards.ca.gov

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD
www.waterboards.ca.gov/sandiego/

CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

September 30, 2014

Mayor Lisa Bartlett
City of Dana Point
33282 Golden Lantern
Dana Point, CA 92629
lbartlett@danapoint.org

In reply refer to / attn:
Place ID: 658018Lwalsh

Subject: INVITATION TO SAN DIEGO WATER BOARD PUBLIC WORKSHOP REGIONAL MUNICIPAL STORM WATER PERMIT REISSUANCE

I, on behalf of the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), invite you to attend our public workshop on October 8, 2014, in the City of Mission Viejos' Council Chambers. A workshop notice with detailed meeting information is attached. At the workshop, the San Diego Water Board will discuss Tentative Order No. R9-2015-0001, proposed amendments to Order No. R9-2013-0001, *Regional NPDES Permit for Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Regional MS4 Permit), including the incorporation of the County of Orange, several incorporated cities in south Orange County, and the Orange County Flood Control District as Copermittees. The intent of the proposed amendments to the Regional MS4 Permit is to advance the storm water program and achieve regulatory consistency throughout the San Diego Water Boards' jurisdiction.

The Copermittees currently covered by Order No. R9-2013-0001 (i.e. the Copermittees in San Diego County), the proposed Orange County Copermittees, and other interested stakeholders will have an opportunity at the workshop to provide comments and other information regarding Tentative Order No. R9-2015-0001 to the San Diego Water Board. No action will be taken by the Board. Elected officials intending to speak during the workshop will be given an opportunity to address the San Diego Water Board immediately following presentations by Board staff and the representatives of the south Orange County Copermittees. I encourage you to also invite other elected officials from your municipality to attend.

The San Diego Water Board values your perspective and input on how the Regional MS4 Permit affects your municipality. If you have any questions concerning this invitation please contact me at (619) 521-3005, or by email at David.Gibson@waterboards.ca.gov.

Respectfully,

David W. Gibson
Executive Officer
San Diego Regional Water Quality Control Board

DWG:js:bb:esb:law

Cc: Lisa Zawaski, lzawaski@danapoint.org

CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

NOTICE OF PUBLIC WORKSHOP

A Workshop Will Be Held To Discuss

Tentative Order No. R9-2015-0001
An Order Amending the Regional Municipal Separate Storm Sewer (MS4) NPDES Permit for the San Diego Region

The Location and Time Are Specified Below.

Wednesday, October 8, 2014 – 9:00 a.m.
City of Mission Viejo
Council Chambers
200 Civic Center
Mission Viejo, California

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The workshop will be held at the San Diego Water Board's regularly scheduled public meeting on October 8, 2014. To view the meeting agenda in advance of the meeting, please visit the San Diego Water Board's website at:

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BACKGROUND INFORMATION

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PROCEDURAL MATTERS

The October 8, 2014 public workshop will be informal and conducted to provide San Diego Water Board members with information about the Tentative Order and to facilitate discussion. There will be no sworn testimony or cross-examination of participants. San Diego Water Board staff will explain the Regional MS4 Permit amendment process and summarize significant elements of the Tentative Order for the San Diego Water Board and the public. Orange County Copermittees, other Copermittees within the San Diego Region, and any interested persons will also have an opportunity to provide oral comments as set forth below. The San Diego Water Board may provide general feedback to staff on proposed modifications of the Regional MS4 Permit; however, no action or voting will take place at this workshop.

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INFORMATION REGARDING WORKSHOP

If you have any questions or wish to receive a hard copy of the Tentative Order, please contact Laurie Walsh at (619) 521-3373 or via e-mail at Laurie.Walsh@waterboards.ca.gov.

Walsh, Laurie@Waterboards

From: Walsh, Laurie@Waterboards
Sent: Tuesday, September 30, 2014 4:06 PM
To: 'elizabethpearson2@cox.net'
Cc: Tracy Ingebrigtsen
Subject: Invitation to attend San Diego Water Board Public Workshop - Orange County Storm Water Permit Renewal
Attachments: 2014-0930 Laguna Beach.pdf

Mayor Pearson,

You are invited to attend the San Diego Water Boards' Public Workshop to discuss proposed amendments to the Regional Storm Water Permit to include several incorporated cities in south Orange County and the County of Orange as Copermittees. The San Diego Water Board values your perspective and input on how the Regional Permit affects your municipality.

Please see the attached invitation from the San Diego Water Board.

Laurie Walsh, PE
San Diego Water Board

2375 Northside Drive, Suite 100
San Diego, CA 92108
Direct Phone: 619-521-3373
Main Line: 619-516-1990
Fax No. (619) 516-1994
lwalsh@waterboards.ca.gov

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD
www.waterboards.ca.gov/sandiego/

026774

CALIFORNIA Water Boards

EDMUND G. BROWN JR. GOVERNOR

MATTHEW RODRIQUEZ SECRETARY FOR ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

September 30, 2014

Mayor Elizabeth Pearson
City of Laguna Beach
505 Forest Avenue
Laguna Beach, CA 92651
elizabethpearson2@cox.net

In reply refer to / attn:
Place ID: 658018Lwalsh

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David W. Gibson
Executive Officer
San Diego Regional Water Quality Control Board

DWG:js:bb:esb:law

Cc: Tracy Ingebrigtsen, tingebrigtsen@lagunabeachcity.net

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Walsh, Laurie@Waterboards

From: Walsh, Laurie@Waterboards
Sent: Tuesday, September 30, 2014 4:35 PM
To: 'ccouncil@ci.laguna-hills.ca.us'
Cc: Humza Javed
Subject: Invitation to attend San Diego Water Board Public Workshop - Orange County Storm Water Permit Renewal
Attachments: 2014-0930 Laguna Hills.pdf

Mayor Blount,

You are invited to attend the San Diego Water Boards' Public Workshop to discuss proposed amendments to the Regional Storm Water Permit to include several incorporated cities in south Orange County and the County of Orange as Copermittees. The San Diego Water Board values your perspective and input on how the Regional Permit affects your municipality.

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Laurie Walsh, PE
San Diego Water Board

2375 Northside Drive, Suite 100
San Diego, CA 92108
Direct Phone: 619-521-3373
Main Line: 619-516-1990
Fax No. (619) 516-1994
lwalsh@waterboards.ca.gov

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GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

September 30, 2014

Mayor Andrew Blount
City of Laguna Hills
24035 El Toro Rd
Laguna Hills, CA 92653
ccouncil@ci.laguna-hills.ca.us

In reply refer to / attn:
Place ID: 658018Lwalsh

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Respectfully,

David W. Gibson
Executive Officer
San Diego Regional Water Quality Control Board

DWG:js:bb:esb:law

Cc: Humza Javed, hjaved@ci.laguna-hills.ca.us

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Walsh, Laurie@Waterboards

From: Walsh, Laurie@Waterboards
Sent: Tuesday, September 30, 2014 4:10 PM
To: 'llindholm@cityoflagunaniguel.org'
Cc: Nancy Palmer
Subject: Invitation to attend San Diego Water Board Public Workshop - Orange County Storm Water Permit Renewal
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ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

September 30, 2014

Mayor Linda Lindholm
City of Laguna Niguel
30111 Crown Valley Parkway
Laguna Niguel, CA 92677
llindholm@cityoflagunaniguel.org

In reply refer to / attn:
Place ID: 658018Lwalsh

Subject: INVITATION TO SAN DIEGO WATER BOARD PUBLIC WORKSHOP REGIONAL MUNICIPAL STORM WATER PERMIT REISSUANCE

I, on behalf of the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), invite you to attend our public workshop on October 8, 2014, in the City of Mission Viejos' Council Chambers. A workshop notice with detailed meeting information is attached. At the workshop, the San Diego Water Board will discuss Tentative Order No. R9-2015-0001, proposed amendments to Order No. R9-2013-0001, *Regional NPDES Permit for Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Regional MS4 Permit), including the incorporation of the County of Orange, several incorporated cities in south Orange County, and the Orange County Flood Control District as Copermittees. The intent of the proposed amendments to the Regional MS4 Permit is to advance the storm water program and achieve regulatory consistency throughout the San Diego Water Boards' jurisdiction.

The Copermittees currently covered by Order No. R9-2013-0001 (i.e. the Copermittees in San Diego County), the proposed Orange County Copermittees, and other interested stakeholders will have an opportunity at the workshop to provide comments and other information regarding Tentative Order No. R9-2015-0001 to the San Diego Water Board. No action will be taken by the Board. Elected officials intending to speak during the workshop will be given an opportunity to address the San Diego Water Board immediately following presentations by Board staff and the representatives of the south Orange County Copermittees. I encourage you to also invite other elected officials from your municipality to attend.

The San Diego Water Board values your perspective and input on how the Regional MS4 Permit affects your municipality. If you have any questions concerning this invitation please contact me at (619) 521-3005, or by email at David.Gibson@waterboards.ca.gov.

Respectfully,

David W. Gibson
Executive Officer
San Diego Regional Water Quality Control Board

DWG:js:bb:esb:law

Cc: Nancy Palmer, npalmer@cityoflagunaniguel.org

CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

NOTICE OF PUBLIC WORKSHOP

A Workshop Will Be Held To Discuss

Tentative Order No. R9-2015-0001
An Order Amending the Regional Municipal Separate Storm Sewer (MS4) NPDES Permit for the San Diego Region

The Location and Time Are Specified Below.

Wednesday, October 8, 2014 – 9:00 a.m.
City of Mission Viejo
Council Chambers
200 Civic Center
Mission Viejo, California

NOTICE IS HEREBY GIVEN that the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) will hold an informational public workshop to receive information and discuss requirements in a public draft of Tentative Order No. R9-2015-0001. Tentative Order No. R9-2015-0001 proposes to amend the National Pollutant Discharge Elimination System (NPDES) Permit for Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region, Order No. R9-2013-0001 (Regional MS4 Permit). Tentative Order No. R9-2015-0001 will be available on or about September 12, 2014 and will be accessible electronically at:

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The workshop will be held at the San Diego Water Board's regularly scheduled public meeting on October 8, 2014. To view the meeting agenda in advance of the meeting, please visit the San Diego Water Board's website at:

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Except for items designated as time certain, there are no set times for agenda items. Items including the workshop may be taken out of order at the discretion of the Chairman.

BACKGROUND INFORMATION

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PROCEDURAL MATTERS

The October 8, 2014 public workshop will be informal and conducted to provide San Diego Water Board members with information about the Tentative Order and to facilitate discussion. There will be no sworn testimony or cross-examination of participants. San Diego Water Board staff will explain the Regional MS4 Permit amendment process and summarize significant elements of the Tentative Order for the San Diego Water Board and the public. Orange County Copermittees, other Copermittees within the San Diego Region, and any interested persons will also have an opportunity to provide oral comments as set forth below. The San Diego Water Board may provide general feedback to staff on proposed modifications of the Regional MS4 Permit; however, no action or voting will take place at this workshop.

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INFORMATION REGARDING WORKSHOP

If you have any questions or wish to receive a hard copy of the Tentative Order, please contact Laurie Walsh at (619) 521-3373 or via e-mail at Laurie.Walsh@waterboards.ca.gov.

Walsh, Laurie@Waterboards

From: Walsh, Laurie@Waterboards
Sent: Tuesday, September 30, 2014 4:17 PM
To: 'cityhall@lagunawoodscity.org'
Cc: Moy Yahya (moyyahya@caaprofessionals.com)
Subject: Invitation to attend San Diego Water Board Public Workshop - Orange County Storm Water Permit Renewal
Attachments: 2014-0930 Laguna Woods.pdf

Mayor Hack,

You are invited to attend the San Diego Water Boards' Public Workshop to discuss proposed amendments to the Regional Storm Water Permit to include several incorporated cities in south Orange County and the County of Orange as Copermittees. The San Diego Water Board values your perspective and input on how the Regional Permit affects your municipality.

Please see the attached invitation from the San Diego Water Board.

Laurie Walsh, PE
San Diego Water Board

2375 Northside Drive, Suite 100
San Diego, CA 92108
Direct Phone: 619-521-3373
Main Line: 619-516-1990
Fax No. (619) 516-1994
lwalsh@waterboards.ca.gov

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD
www.waterboards.ca.gov/sandiego/

CALIFORNIA
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EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

September 30, 2014

Mayor Bert Hack
City of Laguna Woods
24264 El Toro Rd
Laguna Woods, CA 92637
cityhall@lagunawoodscity.org

In reply refer to / attn:
Place ID: 658018Lwalsh

Subject: INVITATION TO SAN DIEGO WATER BOARD PUBLIC WORKSHOP REGIONAL MUNICIPAL STORM WATER PERMIT REISSUANCE

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Respectfully,

David W. Gibson
Executive Officer
San Diego Regional Water Quality Control Board

DWG:js:bb:esb:law

Cc: Moy Yahya, moyyahya@caaprofessionals.com

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Walsh, Laurie@Waterboards

From: Walsh, Laurie@Waterboards
Sent: Tuesday, September 30, 2014 4:21 PM
To: 'drobinson@lakeforestca.gov'
Cc: Devin Slaven
Subject: Invitation to attend San Diego Water Board Public Workshop - Orange County Storm Water Permit Renewal
Attachments: 2014-0930 Lake Forest.pdf

Mayor Robinson,

You are invited to attend the San Diego Water Boards' Public Workshop to discuss proposed amendments to the Regional Storm Water Permit to include several incorporated cities in south Orange County and the County of Orange as Copermittees. The San Diego Water Board values your perspective and input on how the Regional Permit affects your municipality.

Please see the attached invitation from the San Diego Water Board.

Laurie Walsh, PE
San Diego Water Board

2375 Northside Drive, Suite 100
San Diego, CA 92108
Direct Phone: 619-521-3373
Main Line: 619-516-1990
Fax No. (619) 516-1994
lwalsh@waterboards.ca.gov

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SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD
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GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

September 30, 2014

Mayor Dwight Robinson
City of Lake Forest
25550 Commercentre Drive, Suite 100
Lake Forest, CA 92630
drobinson@lakeforestca.gov

In reply refer to / attn:
Place ID: 658018Lwalsh

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Respectfully,

David W. Gibson
Executive Officer
San Diego Regional Water Quality Control Board

DWG:js:bb:esb:law

Cc: Devin Slaven, dslaven@lakeforestca.gov

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Walsh, Laurie@Waterboards

From: Walsh, Laurie@Waterboards
Sent: Tuesday, September 30, 2014 4:23 PM
To: 'tkelly@cityofmissionviejo.org'
Cc: Joe Ames
Subject: Invitation to attend San Diego Water Board Public Workshop - Orange County Storm Water Permit Renewal
Attachments: 2014-0930 Mission Viejo.pdf

Mayor Kelly,

You are invited to attend the San Diego Water Boards' Public Workshop to discuss proposed amendments to the Regional Storm Water Permit to include several incorporated cities in south Orange County and the County of Orange as Copermittees. The San Diego Water Board values your perspective and input on how the Regional Permit affects your municipality.

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Laurie Walsh, PE
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ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

September 30, 2014

Mayor Patricia Kelley
City of Mission Viejo
200 Civic Center
Mission Viejo, CA 92691
tkelley@cityofmissionviejo.org

In reply refer to / attn:
Place ID: 658018Lwalsh

Subject: INVITATION TO SAN DIEGO WATER BOARD PUBLIC WORKSHOP REGIONAL MUNICIPAL STORM WATER PERMIT REISSUANCE

I, on behalf of the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), invite you to attend our public workshop on October 8, 2014, in the City of Mission Viejos' Council Chambers. A workshop notice with detailed meeting information is attached. At the workshop, the San Diego Water Board will discuss Tentative Order No. R9-2015-0001, proposed amendments to Order No. R9-2013-0001, *Regional NPDES Permit for Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Regional MS4 Permit), including the incorporation of the County of Orange, several incorporated cities in south Orange County, and the Orange County Flood Control District as Copermittees. The intent of the proposed amendments to the Regional MS4 Permit is to advance the storm water program and achieve regulatory consistency throughout the San Diego Water Boards' jurisdiction.

The Copermittees currently covered by Order No. R9-2013-0001 (i.e. the Copermittees in San Diego County), the proposed Orange County Copermittees, and other interested stakeholders will have an opportunity at the workshop to provide comments and other information regarding Tentative Order No. R9-2015-0001 to the San Diego Water Board. No action will be taken by the Board. Elected officials intending to speak during the workshop will be given an opportunity to address the San Diego Water Board immediately following presentations by Board staff and the representatives of the south Orange County Copermittees. I encourage you to also invite other elected officials from your municipality to attend.

The San Diego Water Board values your perspective and input on how the Regional MS4 Permit affects your municipality. If you have any questions concerning this invitation please contact me at (619) 521-3005, or by email at David.Gibson@waterboards.ca.gov.

Respectfully,

David W. Gibson
Executive Officer
San Diego Regional Water Quality Control Board

DWG:js:bb:esb:law

Cc: Joe Ames, james@cityofmissionviejo.org

CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

NOTICE OF PUBLIC WORKSHOP

A Workshop Will Be Held To Discuss

Tentative Order No. R9-2015-0001
An Order Amending the Regional Municipal Separate Storm Sewer (MS4) NPDES Permit for the San Diego Region

The Location and Time Are Specified Below.

Wednesday, October 8, 2014 – 9:00 a.m.
City of Mission Viejo
Council Chambers
200 Civic Center
Mission Viejo, California

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PROCEDURAL MATTERS

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INFORMATION REGARDING WORKSHOP

If you have any questions or wish to receive a hard copy of the Tentative Order, please contact Laurie Walsh at (619) 521-3373 or via e-mail at Laurie.Walsh@waterboards.ca.gov.

Walsh, Laurie@Waterboards

From: Walsh, Laurie@Waterboards
Sent: Tuesday, September 30, 2014 4:32 PM
To: 'PatBates@ocgov.com'
Cc: Richard Boon; Greg Yi
Subject: Invitation to attend San Diego Water Board Public Workshop - Orange County Storm Water Permit Renewal
Attachments: 2014-0930 County of Orange-OC Flood.pdf

Supervisor Bates,

You are invited to attend the San Diego Water Boards' Public Workshop to discuss proposed amendments to the Regional Storm Water Permit to include several incorporated cities in south Orange County and the County of Orange as Copermittees. The San Diego Water Board values your perspective and input on how the Regional Permit affects your municipality.

Please see the attached invitation from the San Diego Water Board.

Laurie Walsh, PE
San Diego Water Board

2375 Northside Drive, Suite 100
San Diego, CA 92108
Direct Phone: 619-521-3373
Main Line: 619-516-1990
Fax No. (619) 516-1994
lwalsh@waterboards.ca.gov

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD
www.waterboards.ca.gov/sandiego/

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GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

September 30, 2014

Supervisor Patricia Bates
County of Orange
333 W. Santa Ana Blvd
Santa Ana, CA 92701
PatBates@ocgov.com

In reply refer to / attn:
Place ID: 658018Lwalsh

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Respectfully,

David W. Gibson
Executive Officer
San Diego Regional Water Quality Control Board

DWG:js:bb:esb:law

Cc: Richard Boon, Richard.boon@ocpw.ocgov.com
Greg Yi, greg.yi@ocpw.ocgov.com

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Walsh, Laurie@Waterboards

From: Walsh, Laurie@Waterboards
Sent: Tuesday, September 30, 2014 4:40 PM
To: 'cgamble@cityofrsm.org'
Cc: Rae Beimer
Subject: Invitation to attend San Diego Water Board Public Workshop - Orange County Storm Water Permit Renewal
Attachments: 2014-0930 Rancho Santa Margarita.pdf

Mayor Gamble,

You are invited to attend the San Diego Water Boards' Public Workshop to discuss proposed amendments to the Regional Storm Water Permit to include several incorporated cities in south Orange County and the County of Orange as Copermittees. The San Diego Water Board values your perspective and input on how the Regional Permit affects your municipality.

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Laurie Walsh, PE
San Diego Water Board

2375 Northside Drive, Suite 100
San Diego, CA 92108
Direct Phone: 619-521-3373
Main Line: 619-516-1990
Fax No. (619) 516-1994
lwalsh@waterboards.ca.gov

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD
www.waterboards.ca.gov/sandiego/

026809

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EDMUND G. BROWN JR.
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MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

September 30, 2014

Mayor Carol Gamble
City of Rancho Santa Margarita
22112 El Paseo
Rancho Santa Margarita, CA 92688
cgamble@cityofrsm.org

In reply refer to / attn:
Place ID: 658018Lwalsh

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Respectfully,

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San Diego Regional Water Quality Control Board

DWG:js:bb:esb:law

Cc: Rae Beimer, rbeimer@cityofrsm.org

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Walsh, Laurie@Waterboards

From: Walsh, Laurie@Waterboards
Sent: Tuesday, September 30, 2014 4:26 PM
To: 'brownt@san-clemente.org'
Cc: Mary Vondrak
Subject: Invitation to attend San Diego Water Board Public Workshop - Orange County Storm Water Permit Renewal
Attachments: 2014-0930 San Clemente.pdf

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California Regional Water Quality Control Board, San Diego Region

September 30, 2014

Mayor Tim Brown
City of San Clemente
100 Avenida Presidio
San Clemente, CA 92672
Brownt@san-clemente.org

In reply refer to / attn:
Place ID: 658018Lwalsh

Subject: INVITATION TO SAN DIEGO WATER BOARD PUBLIC WORKSHOP REGIONAL MUNICIPAL STORM WATER PERMIT REISSUANCE

I, on behalf of the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), invite you to attend our public workshop on October 8, 2014, in the City of Mission Viejos' Council Chambers. A workshop notice with detailed meeting information is attached. At the workshop, the San Diego Water Board will discuss Tentative Order No. R9-2015-0001, proposed amendments to Order No. R9-2013-0001, *Regional NPDES Permit for Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Regional MS4 Permit), including the incorporation of the County of Orange, several incorporated cities in south Orange County, and the Orange County Flood Control District as Copermittees. The intent of the proposed amendments to the Regional MS4 Permit is to advance the storm water program and achieve regulatory consistency throughout the San Diego Water Boards' jurisdiction.

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The San Diego Water Board values your perspective and input on how the Regional MS4 Permit affects your municipality. If you have any questions concerning this invitation please contact me at (619) 521-3005, or by email at David.Gibson@waterboards.ca.gov.

Respectfully,

David W. Gibson
Executive Officer
San Diego Regional Water Quality Control Board

DWG:js:bb:esb:law

Cc: Mary Vondrak, vondrakM@san-clemente.org

CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

NOTICE OF PUBLIC WORKSHOP

A Workshop Will Be Held To Discuss

Tentative Order No. R9-2015-0001
An Order Amending the Regional Municipal Separate Storm Sewer (MS4) NPDES Permit for the San Diego Region

The Location and Time Are Specified Below.

Wednesday, October 8, 2014 – 9:00 a.m.
City of Mission Viejo
Council Chambers
200 Civic Center
Mission Viejo, California

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BACKGROUND INFORMATION

The San Diego Water Board adopted the Regional MS4 Permit on May 8, 2013 in response to a Report of Waste Discharge (RoWD) application from the municipal Copermittees in San Diego County for reissuance of an MS4 NPDES permit. The Copermittees in San Diego County are currently enrolled under the Regional MS4 Permit. The San Diego Water Board is considering enrollment of Copermittees in Orange County and Riverside County under the Regional MS4 Permit in a phased manner as their current MS4 permits expire and after consideration of their RoWD submittal.

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PROCEDURAL MATTERS

The October 8, 2014 public workshop will be informal and conducted to provide San Diego Water Board members with information about the Tentative Order and to facilitate discussion. There will be no sworn testimony or cross-examination of participants. San Diego Water Board staff will explain the Regional MS4 Permit amendment process and summarize significant elements of the Tentative Order for the San Diego Water Board and the public. Orange County Copermittees, other Copermittees within the San Diego Region, and any interested persons will also have an opportunity to provide oral comments as set forth below. The San Diego Water Board may provide general feedback to staff on proposed modifications of the Regional MS4 Permit; however, no action or voting will take place at this workshop.

To ensure a productive and efficient public workshop, and to ensure that all attending have an opportunity to participate, oral presentations may be limited at the discretion of the Chair. This item has significant interest to the public and regulated community, and in order to provide enough time for all interested parties to participate, participants with similar comments are requested to make joint presentations. San Diego Water Board staff may, but will not necessarily, respond to comments made at the workshop.

The San Diego Water Board will issue a separate public hearing and comment period notice announcing the release of the Tentative Order for public review and comment on or about September 12, 2014. The public hearing notice will establish the deadline for submission of written comments, the time, date and location of the public hearing, and the procedures that the San Diego Water Board will follow at the public hearing to consider adoption of the Tentative Order. Once released, the Tentative Order will serve as the public comment draft permit amendment for purposes of applicable public notice requirements under the Code of Federal Regulations (40 C.F.R. § 124.10) and Water Code section 13167.5, subdivision (b).

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INFORMATION REGARDING WORKSHOP

If you have any questions or wish to receive a hard copy of the Tentative Order, please contact Laurie Walsh at (619) 521-3373 or via e-mail at Laurie.Walsh@waterboards.ca.gov.

Walsh, Laurie@Waterboards

From: Walsh, Laurie@Waterboards
Sent: Tuesday, September 30, 2014 4:29 PM
To: 'sallevato@sanjuancapistrano.org'
Cc: 'zmazboudi@sanjuancapistrano.org'
Subject: Invitation to attend San Diego Water Board Public Workshop - Orange County Storm Water Permit Renewal
Attachments: 2014-0930 San Juan Capistrano.pdf

Mayor Allevato,

You are invited to attend the San Diego Water Boards' Public Workshop to discuss proposed amendments to the Regional Storm Water Permit to include several incorporated cities in south Orange County and the County of Orange as Copermittees. The San Diego Water Board values your perspective and input on how the Regional Permit affects your municipality.

Please see the attached invitation from the San Diego Water Board.

Laurie Walsh, PE
San Diego Water Board

2375 Northside Drive, Suite 100
San Diego, CA 92108
Direct Phone: 619-521-3373
Main Line: 619-516-1990
Fax No. (619) 516-1994
lwalsh@waterboards.ca.gov

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD
www.waterboards.ca.gov/sandiego/

026819

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Water Boards

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GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

September 30, 2014

Mayor Sam Allevato
City of San Juan Capistrano
32400 Paseo Adelanto
San Juan Capistrano, CA 92675
sallevato@sanjuancapistrano.org

In reply refer to / attn:
Place ID: 658018Lwalsh

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Respectfully,

David W. Gibson
Executive Officer
San Diego Regional Water Quality Control Board

DWG:js:bb:esb:law

Cc:Ziad Mazboudi, zmazboudi@sanjuancapistrano.org

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Walsh, Laurie@Waterboards

From: Wayne Rosenbaum <swr@envirolawyer.com>
Sent: Thursday, October 02, 2014 1:18 PM
To: Gibson, David@Waterboards
Cc: Walsh, Laurie@Waterboards; Becker, Eric@Waterboards; 'Hansen, Mike'; 'michael.delarosa@sdcounty.ca.gov'; Guy Asaro; 'Mike McSweeney'; bhastie@rickengineering.com
Subject: Request for time at the RWQCB October 8th Workshop

Dear Dave,

I write on behalf of the Coalition to request 20 minutes for a group presentation at the RWQCB MS4 permit workshop on October 8th in Mission Viejo, to present the Coalition's thoughts on the issue of Prior Lawful Approval. Coalition members include: San Diego Building Industry Association, Building Industry Association of Southern California; Associated General Contractors; Associated Builders and Contractors; San Diego Regional Chamber of Commerce; Business Leadership Alliance; San Diego Association of Realtors; San Diego Apartment Association; NAIOP (National Association of Industrial & Office Properties); BOMA (Building Office & Management Association; San Diego Chapter of the American Society of Landscape Architects.

On May 8, 2013 the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), adopted the New MS4 Permit. RWQCB staff proposes to revise Section E.3.e.(1)(a) of the New MS4 Permit to read as follows: Each Copermittee must require and confirm that for all Priority Development Project applications **that have not received prior lawful approval** by the Copermittee by the time the BMP Design Manual is implemented pursuant to Provision E.3.d, the requirements of Provision E.3 are implemented. For **project applications that have received prior lawful approval** before the BMP Design Manual is implemented pursuant to Provision E.3.d, the Copermittee **may** allow previous land development requirements to apply. [Emphasis added.] Please note that neither the adopted permit nor the proposed revision define "Prior Lawful Approval". Moreover, the permit fails to provide the Copermittees with any guidance concerning how or when they may use their discretion to allow previous land development requirements to apply.

The Coalition has worked with the Copermittees for seven months in an attempt to better define what constitutes a Prior Lawful Approval and when the Copermittee should use its discretion to allow previous land development requirements to apply to the requirements of Provision E.3 of the Permit. While the Coalition does not believe that its position is antithetical to most of the various positions expressed by various Copermittees, it is apparent that the Copermittees have not yet come to a consensus on this issue. Thus, we believe that direction from your board on this issue is essential at this time.

As the entities that design, permit, finance and build most of the public and private projects in the Region, Coalition members bring a unique prospective to the question of the appropriate application of Provision E.3 to projects that have progressed through the entitlement and permitting process but may not yet have commenced, much less, completed the construction of that project. Please understand that the Coalition is not proposing some broad exemption from Provision E.3, rather we are seeking guidance from the board regarding what it intended to be within the scope of a Prior Lawful Approval and how much discretion the Copermittees were intended to have pursuant to Provision We believe that given 20 minutes, the Coalition can present information to the Board Members that will be of significant value in coming to terms with a very complex problem that is likely to reoccur with every iteration of the permit.

Thanks,

Wayne

S. Wayne Rosenbaum
Opper & Varco LLP
The Environmental Law Group
225 Broadway, Suite 1900
San Diego, CA 92101
Phone: (619) 231-5858
Cell: (619) 518-6618
Fax: (619) 231-5853
SWR@Envirolawyer.com
www.envirolawyer.com

The information contained in this electronic mail transmission is confidential and intended to be sent only to the stated recipient of the transmission. It may therefore be protected from unauthorized use or dissemination by the attorney-client and/or attorney work-product privileges. If you are not the intended recipient or the intended recipient's agent, you are hereby notified that any review, use, dissemination, distribution or copying of this communication is strictly prohibited. You are also asked to notify us immediately by telephone and to return the original document to us immediately by mail at the address above. Thank you in advance for your cooperation.

Walsh, Laurie@Waterboards

From: Posthumus, Bruce@Waterboards
Sent: Wednesday, October 29, 2014 5:24 PM
To: WB-RB9-Senior Staff; Arias, Christina@Waterboards; Walsh, Laurie@Waterboards; Lim, Joann@Waterboards; Woodward, Deborah@Waterboards; Nagoda, Carey@Waterboards; Yu, Helen@Waterboards
Subject: FW: Notice of Availability of Draft Letter Directive to Establish Requirements for Implementation of a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County
Attachments: monitoringsoOCbeachWQNotice3signed.pdf; monitoringSoOCBeachWQstaffreport10.7final.pdf; monitoringSoOCbeachWQdirectiveletter6.pdf

The Email below was sent to affected permittees and interested parties late this afternoon.

From: Posthumus, Bruce@Waterboards
Sent: Wednesday, October 29, 2014 5:08 PM
To: Posthumus, Bruce@Waterboards
Cc: Yu, Helen@Waterboards; Nagoda, Carey@Waterboards
Subject: Notice of Availability of Draft Letter Directive to Establish Requirements for Implementation of a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County

Please find the subject notice attached.

Also attached are the:

- Report entitled "Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County"
  and
- Proposed Water Code section 13383 letter directive.

The notice, report, and proposed letter directive are also available online under "ANNOUNCEMENTS" at http://www.waterboards.ca.gov/sandiego/.

Please submit written comments on the proposed action to sandiego@waterboards.ca.gov.

If you have any questions regarding the proposed action, please contact Bruce Posthumus at 619-521-3379 or bposthumus@waterboards.ca.gov.

Thank you.

Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County

California Regional Water Quality Control Board, San Diego Region

Staff Report

Prepared by

Bruce Posthumus, Senior Water Resource Control Engineer

and

Carey Nagoda, Water Resource Control Engineer

and

Helen Yu, Water Resource Control Engineer

October 2014

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Executive Summary

In April 2012, the San Diego Water Board asked its staff to review beach water quality monitoring conducted in south Orange County, which is part of the San Diego Region. To assist in responding to that request, staff of the Board convened a workgroup that included representatives of the three public agencies (South Orange County Wastewater Authority, Orange County Public Works, and Orange County Health Care Agency) that currently conduct almost all of the routine, ongoing beach water quality monitoring in south Orange County. The workgroup also included other interested parties, including representatives of the Sierra Club and Surfrider Foundation.

Recommendation: Unified Beach Water Quality Monitoring and Assessment Program

The workgroup developed and recommends implementation of a unified regional beach water quality monitoring and assessment program in south Orange County. San Diego Water Board staff participated in the workgroup and concurs with the workgroup's recommendation. This unified program would meet or go beyond meeting the requirements for beach water quality monitoring and related public notification and reporting established by State law. The unified program is intended to be protective, reasonable, and equitable. It would supersede the existing routine, ongoing beach water quality monitoring programs conducted in south Orange County and would eliminate duplicative monitoring.

Features of the Recommended Unified Program

Noteworthy features of the unified program include the following:

- Monitoring and assessment would be question-driven and beneficial use-oriented.
    - The primary purpose of the unified program would be to answer the question "Does beach water quality meet standards for the beneficial use of water contact recreation?"
- Responsibility for implementation of the unified program would be shared and implementation arrangements would be flexible.
    - The responsible agencies would jointly make arrangements to implement the program and would have the flexibility to jointly make short and/or long term changes in those arrangements.
- Triggers for public notification would be in effect at all sampling stations year-round and would be the same for all stations.
- Triggers for additional sampling would be in effect at all sampling stations year-round and would be the same for all stations.
- Where beach water quality standards are not consistently met, investigations would be conducted to assess human health risks, identify sources of FIB, and/or evaluate other pertinent factors, as appropriate.
- The same reporting procedures would be used for all sampling stations.
- An annual review of the unified program and assessment of monitoring results would be conducted by a workgroup representing a variety of responsibilities for and interests in beach water quality monitoring.
- Timely beach water quality information would be easily accessible to the public.
- Annual reports would be submitted to the San Diego Water Board; at the request of the Board, presentations would be made at public Board meetings.

This report outlines the workgroup's efforts, the unified program developed and recommended by the workgroup, and the rationale for the elements and features of the unified program.

Acknowledgements

San Diego Water Board staff expresses its sincere appreciation to each of the participants in the workgroup that developed the unified beach water quality monitoring program outlined in this report. Table 1 lists the core workgroup participants and their affiliations. The participants provided much-needed knowledge, experience, insight, ideas, suggestions, information, perspective, and cooperation. The participants also devoted considerable time to workgroup meetings and to workgroup tasks in between meetings. These contributions represent a substantial commitment to ensuring that beach water quality monitoring in south Orange County is protective, reasonable, and equitable.

Workgroup participants Penny Elia, Monica Mazur, and Jack Skinner participated entirely on their own time, without compensation.

In 2009 and 2010, before the workgroup was convened, workgroup participants Mike Fennessy, Brennon Flahive, Larry Honeybourne, and Ted Von Bitner jointly developed a proposed monitoring program that was outlined in a report entitled “A Collaborative, Integrated, Regional Ocean Water Quality Monitoring Program for Orange County” (see Appendix 2 and Attachment 1). This report was an excellent starting point for the efforts of the workgroup; it was used by the workgroup and much of it was incorporated into the unified program developed by the workgroup and outlined in this report.

Introduction

Background

In southern California, including south Orange County, coastal beach waters are used year-round for swimming, surfing, and a variety of other water contact recreational activities. Beach water quality monitoring is an important part of protecting the health of those who use beach waters for water contact recreation. Several different public agencies conduct routine, ongoing beach water quality monitoring in south Orange County in accordance with several different sets of requirements. The monitoring programs implemented to meet those requirements overlap temporally and spatially. Currently, these monitoring programs are partially but not fully integrated. Appendix 3 provides a brief description of the south Orange County coastline. Appendix 4 provides a brief description of beach water quality monitoring that is currently conducted in south Orange County.

In 2009 and 2010, representatives of two county agencies and two special districts responsible for conducting beach water quality monitoring in Orange County jointly developed a proposed regional monitoring program, with the intent of improving coordination of beach water quality monitoring in Orange County (see Appendix 2 and Attachment 1).

In November 2010, the State Water Board adopted a resolution[1] directing regional water boards to work with dischargers to modify beach water quality monitoring programs required by regional board-issued permits so as to eliminate redundancies and incorporate beach water quality monitoring required by beach water quality statutes, where appropriate. Beach water quality statutes[2] also encourage integration of beach water quality monitoring programs.

San Diego Water Board Request

South Orange County is part of the San Diego Region, where the San Diego Water Board has jurisdiction. At its April 11, 2012 meeting, the San Diego Water Board considered adoption of orders to reissue permits for discharges of wastewater to the ocean through two ocean outfalls owned and operated by South Orange County Wastewater Authority (SOCWA). In written comments submitted during the public comment period before that meeting and during the public hearing at that meeting, SOCWA expressed concerns about beach water quality monitoring requirements in the tentative permits. The Board reissued the permits without making changes to the monitoring requirements in the tentative permits but also asked its staff to review beach water quality monitoring conducted in south Orange County.

San Diego Water Board staff convened a workgroup to assist in responding to that request. The workgroup met fifteen times, from July 2012 through September 2014. This report outlines the workgroup's efforts, the unified program developed and recommended by the workgroup, and the rationale for the elements and features of the unified program.

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[1] Resolution No. 2010-0053; see http://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2010/rs2010_0053.pdf.

[2] See http://www.leginfo.ca.gov/pub/11-12/bill/sen/sb_0451-0500/sb_482_bill_20111008_chaptered.pdf

Workgroup Participants
The workgroup included representatives of the three public agencies (SOCWA, Orange County Public Works [OCPW], and Orange County Health Care Agency [OCHCA]) that currently conduct almost all of the routine, ongoing beach water quality monitoring in south Orange County. The workgroup also included other interested parties, including representatives of the Sierra Club and Surfrider Foundation. Table 1 lists the core workgroup participants and their affiliations.

Monitoring and Assessment Framework
The workgroup was convened during the period when San Diego Water Board staff was developing the report entitled "A Framework for Monitoring and Assessment in the San Diego Region"[3] (Framework). Development of the unified beach water quality monitoring and assessment program by the workgroup overlapped with development of the Framework by San Diego Water Board staff. The San Diego Water Board adopted a resolution[4] endorsing the Framework in December 2012.

Formation of the workgroup was in keeping with the Framework, which emphasizes the importance of stakeholder participation in development and implementation of monitoring and assessment programs. Because it was important for the workgroup to represent a variety of interests, perspectives, and experiences, and because it was also important for the workgroup to be small enough to conduct business efficiently, San Diego Water Board staff invited a select group of individuals with a variety of backgrounds and affiliations to participate in the workgroup.

The unified beach water quality monitoring and assessment program developed by the workgroup and outlined in this report is in keeping with and would help implement the Framework, which also emphasizes the need for question-driven, beneficial use-oriented monitoring and assessment with a focus on water body conditions rather than on discharges. The primary purpose of the unified program is to answer the question "Does beach water quality meet standards for the beneficial use of water contact recreation?" (see ***Purpose and Intent***, below), so the unified program is question-driven and beneficial use-oriented and it focuses on water body conditions.

[3] See http://www.waterboards.ca.gov/sandiego/water_issues/programs/swamp/docs/MonitoringFrameworkForSDR-final.pdf.

[4] Resolution No. R9-2012-0069, "A Resolution in Support of a Regional Monitoring Framework;" see *http://www.waterboards.ca.gov/sandiego/water_issues/programs/swamp/docs/Monitoring_Resolution_R9-2012-0069.pdf*.

TABLE 1
Core Workgroup Participants

	Participant	Affiliation
1	Larry Brennler	Orange County Health Care Agency
2	Kacen Clapper	Orange County Public Works
3	Penny Elia	Sierra Club
4	Mike Fennessy	Orange County Public Works*
5	Brennon Flahive	South Orange County Wastewater Authority
6	James Fortuna	Orange County Public Works
7	Michael Gjerde	State Water Resources Control Board
8	Larry Honeybourne	Orange County Health Care Agency
9	Monica Mazur	Orange County Health Care Agency (retired)
10	Carey Nagoda	San Diego Regional Water Quality Control Board
11	Bruce Posthumus	San Diego Regional Water Quality Control Board
12	Robert Rodarte	Orange County Public Works
13	Grant Sharp	Orange County Public Works
14	Jack Skinner	Stop Polluting Our Newport
15	Ted Von Bitner	Orange County Public Works**
16	Rick Wilson	Surfrider Foundation
17	Helen Yu	San Diego Regional Water Quality Control Board

*Current affiliation; participated on behalf of OCHCA through November 2013; participated on behalf of OCPW starting December 2013

**Affiliation at time of participation; affiliation has since changed

Scope of Workgroup Efforts

The workgroup's efforts focused on:

- *Monitoring*;
- Monitoring related to *water contact recreation*;
- *Beach* water quality monitoring;
- *Routine, ongoing* beach water quality monitoring; and
- The *"where and when"* of beach water quality monitoring.

The workgroup's efforts focused on *monitoring* related to water quality standards for water contact recreation, not on the actual standards. The workgroup did not attempt to review or make recommendations about the indicators on which such standards are based or the levels at which such standards are set.

The workgroup's efforts focused on water quality monitoring related to the beneficial use of *water contact recreation* (REC-1), not on monitoring related to other beneficial uses. Because water quality standards for the beneficial use of water contact recreation (REC-1 standards) are expressed in terms of fecal indicator bacteria (FIB) densities, monitoring related to REC-1 involves monitoring FIB densities. Although water quality standards related to the beneficial use of shellfish harvesting (SHELL) are also expressed in terms of FIB densities, the workgroup did not attempt to review or make recommendations about monitoring related to SHELL.

The workgroup's efforts focused on *beach* water quality monitoring, not on water quality monitoring in other areas. For purposes of the workgroup's efforts and this report, "beach water quality monitoring" refers to monitoring to determine if water quality meets REC-1 standards in (a) the surf zone along the open coast of south Orange County and (b) Dana Point Harbor. The workgroup focused on monitoring in these areas because casual observations suggest that the intensity of REC-1 activity in these areas is considerably greater than elsewhere in south Orange County coastal waters. The workgroup did not attempt to review or make recommendations about monitoring related to REC-1 in areas other than in the surf zone or Dana Point Harbor, except for sampling stations that are not located in those areas but that are currently monitored as part of existing routine, ongoing beach water quality monitoring programs.[5]

The workgroup's efforts focused on *routine, ongoing* beach water quality monitoring, not on investigations or other studies related to or triggered by such monitoring. As part of the unified program developed by the workgroup, investigations would be conducted where REC-1 standards are not consistently met, but the workgroup did not attempt to review or make recommendations about how human health risk assessments, source identification investigations, epidemiological studies, sanitary surveys, studies related to TMDLs, or other investigations or studies about or related to beach water quality should be conducted.

The workgroup's efforts focused primarily on the *"where and when"* of beach water quality monitoring, not on the "how." The workgroup did not attempt to review or make recommendations about sample collection, handling, or analysis protocols specified in State law.

[5] Some of the sampling stations referred to as "surf zone stations" in current NPDES permit monitoring requirements are not actually located in the surf zone.

Recommended Unified Beach Water Quality Monitoring and Assessment Program

This section outlines the unified regional beach water quality monitoring and assessment program developed and recommended by the workgroup and the rationale for the elements and features of the unified program. Table 2 provides a comparison of elements and features of the existing programs and the unified program. Appendix 5 lists and shows the location of each sampling station in the existing programs and the unified program.

Purpose and Intent

The primary purpose of the unified program is to answer the question "Does beach water quality meet standards for the beneficial use of water contact recreation?" By answering this question, the unified program is intended to be protective, in other words to help protect the health of those who use beach waters for water contact recreation – and to do so without unnecessarily discouraging such use. The unified program is also intended to be reasonable and equitable and to meet or go beyond meeting the requirements for beach water quality monitoring and related public notification and reporting established by State law.

Rationale

The workgroup agreed that it was important for the unified program to determine whether beach water quality meets REC-1 standards, not only to help protect the health of those who use beach waters for REC-1, but also to avoid unnecessarily discouraging such use by having public notifications remain in effect when beach water quality meets REC-1 standards. (This is addressed further in ***Public Notification*** and ***Additional Sampling***, below.)

The workgroup agreed that it was important for the unified program to be reasonable, as well as protective. The workgroup agreed that monitoring conducted as part of the unified program should be considered reasonable only if it produces meaningful information that is useful for protecting the health of those who use beach waters for REC-1 and/or for making decisions about whether public notifications should be issued and/or remain in effect. Accordingly, the workgroup agreed that it would not be reasonable for the unified program to include duplicative monitoring or other monitoring that does not produce such information. (This is addressed further in ***Sampling Locations***, below.)

The workgroup agreed that it was important for the unified program to be equitable, as well as reasonable and protective. The workgroup agreed that the agencies responsible for implementation of the unified program could and should determine how to equitably allocate implementation tasks and associated costs. (This is addressed further in ***Responsibility and Arrangements for Implementation***, below.)

The workgroup agreed that it was important for the unified program to meet existing requirements for beach water quality monitoring and related public notification and reporting established by State law. Because the workgroup recognized that such requirements have changed in the past and could change in the future, the workgroup agreed that it would be helpful if the language and mechanisms for requiring implementation of the unified program would facilitate expeditious implementation of future revisions to the unified program. (This is addressed further in **Language and Mechanisms for Requiring Implementation of the Unified Program**, below).

TABLE 2
Comparison: Existing Programs and the Unified Program

	Monitoring Program Element or Feature		Existing Programs	Proposed Unified Program	Reason for Change
1	**Purpose & intent**	primary purpose	not explicitly stated	answer the question: "does beach water quality meet standards for REC-1?"	monitoring & assessment should be question-driven & should focus on conditions in water bodies as they relate to beneficial uses
		intent	help protect the health of those who use beach waters for REC-1; meet requirements of State law	help protect the health of those who use beach waters for REC-1; be reasonable & equitable; meet requirements of State law	monitoring & assessment should be protective, reasonable & equitable
2	**Responsibility & arrangements for implementation**		SOCWA, OCPW & OCHCA are separately responsible for implementing different monitoring programs that are partially integrated; implementation flexibility is limited	SOCWA, OCPW & OCHCA share responsibility for implementation of one fully integrated program & have the flexibility to make changes in arrangements for implementation	improve protection of the health of those who use beach waters for REC-1; improve efficiency & ability to deal with out-of-the-ordinary situations; be equitable
3	**Indicators**		enterococcus, fecal coliform & total coliform	enterococcus, fecal coliform & total coliform	(no change)
4	**Sample collection, handling, & analysis**		as specified by State law	as specified by State law	(no change)
5	**Sampling station locations**	total number of sampling stations	81	67	(see next two rows)
		number of sampling stations in creeks & cross-beach flows from creeks, canyons, or storm drains to the ocean	2	0	to protect the health of those who use beach waters for REC-1, samples should be collected where intensity of REC-1 use is highest, i.e., in the surf zone and in Dana Point Harbor
		number of pairs of nearby sampling stations with similar monitoring results	12	0	sampling at stations that are close together & have similar monitoring results is duplicative; monitoring would continue at one station in each pair
6	**Sampling station types (sample collection)**	fixed stations	one sample	one sample	(no change)
		outlet stations: when there is surface flow to the ocean	one sample in the flow to the ocean; one sample in the surf zone 75 feet up-coast from point zero & one sample in the surf zone 75 feet down-coast from point zero	one sample in the surf zone at point zero; one sample in the surf zone 75 feet up-coast from point zero & one sample in the surf zone 75 feet down-coast from point zero	improve protection of the health of those who use beach waters for REC-1, conform to the Ocean Plan & meet conditions attached to State funding OCHCA receives to meet requirements of beach water quality statutes
		outlet stations: when there is no surface flow to the ocean	one sample in the surf zone 75 feet down-coast from virtual point zero	one sample in the surf zone at virtual point zero	improve protection of the health of those who use beach waters for REC-1
7	**Sampling seasons**		62 stations: year-round; 19 stations: April-October	all 67 stations: year-round	REC-1 activities occur year-round
8	**Sampling frequency**		16 stations: 2/week year-round; 17 stations: 2/week May-October & 1/week November-April; 29 stations: 1/week year-round; 19 stations: 1/week April-October	all 67 stations: 1/week year-round	if REC-1 standards are met, 1/week sampling frequency is adequate
9	**Public notification**		triggers apply to some (49) stations; April-October only	triggers apply to all 67 stations year-round	the same triggers should apply to all stations and should apply year-round
10	**Additional sampling**		triggers apply to some (33) stations	triggers apply to all 67 stations	the same triggers should apply to all stations
11	**Investigations**		not included	investigations to be conducted where REC-1 standards are not consistently met	assessment of human health risks and identification of sources of elevated FIB levels is needed to guide decision-making and management actions
12	**Annual review & assessment**		no	yes	monitoring programs & results should be reviewed regularly
13	**Reporting**		separate reporting	unified reporting	improve dissemination of information; improve accountability & transparency
14	**Public access to information**		different information available at different websites	all information easily available at or through the websites of SOCWA, OCPW, OCHCA, & SD Water Board	improve public access to information

Responsibility and Arrangements for Implementation
SOCWA, OCPW, and OCHCA would share responsibility for implementing the unified program. These agencies would jointly make arrangements for implementing the unified program and would have the flexibility to jointly make short and/or long term changes in those arrangements (to change the agency that collects and/or analyzes samples from any particular sampling station, for example).

Rationale
The workgroup agreed that SOCWA, OCPW, and OCHCA, the public agencies that currently conduct almost all of the routine, ongoing beach water quality monitoring in south Orange County, should be responsible for implementation of the unified program. The workgroup agreed that, because the responsibilities and interests of these agencies may overlap in some respects and differ in others, the best way to ensure an equitable allocation of the tasks and associated costs of the unified program would be to allow these agencies to jointly make arrangements for implementing the unified program and to have the flexibility to jointly change those arrangements. The workgroup agreed that this approach could also result in efficiencies and make it easier to deal with out-of-the-ordinary situations.

The workgroup agreed that other entities, such as those that operate wastewater collection systems, should participate in investigations, as appropriate, but not in the routine, ongoing monitoring conducted as part of the unified program (see ***Investigations***, below).

Indicators
All samples collected in the routine, ongoing monitoring conducted as part of the unified program, including repeat samples and samples collected at a frequency of more than once per week (see ***Additional Sampling***, below), would be analyzed for all three types of FIB for which REC-1 standards or REC-1 monitoring requirements are established by State law.

Rationale
The workgroup agreed that monitoring for all three types of FIB (enterococcus, fecal coliform, and total coliform) for which State law establishes REC-1 standards or monitoring requirements should continue at all stations.

The workgroup recognized that "Recreational Water Criteria,"[6] released by USEPA in November 2012, recommends that REC-1 standards be based only on enterococcus (not fecal coliform or total coliform). Although the workgroup agreed with that recommendation, it also agreed that monitoring enterococcus, fecal coliform, and total coliform in coastal beach waters should continue as long as State law includes REC-1 standards or monitoring requirements for these types of FIB in such waters.

[6] See http://water.epa.gov/scitech/swguidance/standards/criteria/health/recreation/index.cfm.

Sample Collection, Handling, and Analysis
The protocols specified in State law for FIB sample collection, handling, and analysis for coastal beach waters used for REC-1 would be used for all sampling stations in the unified program.

Rationale
The workgroup agreed that approved standard methods for FIB sample collection, handling, and analysis should be used for all stations in the unified program. The workgroup agreed that it would be appropriate and reasonable to use the protocols specified in State law. Although the workgroup agreed that analytical methods that enable FIB results to be produced rapidly would be very useful for purposes of protecting the health of those who use beach waters for REC-1 and avoiding unnecessarily prolonged public notifications, it recognized that such "rapid methods" have not yet been approved for purposes of meeting requirements of State law.

Sampling Station Locations
The unified program includes sixty-seven sampling stations, all of which are stations in the existing programs. Two stations in the existing programs would not be included in the unified program. Twelve stations in the existing programs would be combined with twelve other nearby stations in the existing programs. Appendix 5 lists and shows the location of each station in the existing programs and the unified program.

All of the sampling stations in the unified program are located along the open coast or in Dana Point Harbor. At stations located along the open coast, samples would be collected in ankle depth water in the surf zone. At stations located at Baby Beach in Dana Point Harbor, samples would be collected in ankle depth water. At stations located on a pier or dock in Dana Point Harbor, samples would be collected at the water surface.

Rationale
The workgroup agreed that routine, ongoing monitoring conducted as part of the unified program should focus on waters in the surf zone along the open coast and in Dana Point Harbor, which are the areas where the intensity of REC-1 activity is highest. The workgroup agreed that monitoring in these areas produces meaningful information that is useful for protecting the health of those who use beach waters for REC-1. Although the workgroup recognized that sampling creeks, ponded water at beaches, and/or or cross-beach flows from creeks, canyons, or storm drains to the surf zone might be useful as part of source identification investigations or other special studies, it agreed that the intensity of REC-1 activity in such areas is low and agreed that such waters should not be included in routine, ongoing monitoring conducted as part of the unified program. The two stations in the existing programs that would not be included in the unified program are both located in such areas.

The workgroup agreed that collecting samples from stations that are in close proximity and that have consistently similar FIB levels is duplicative and does not produce meaningful information that is useful for protecting the health of those who use beach waters for REC-1. The workgroup agreed that FIB levels at twelve pairs of existing stations that are close together (not more than 600 feet apart) have been consistently similar (see Appendix 2 and Attachment 1). The workgroup agreed that such paired stations should be combined and that sampling should continue at only one station in each pair. Where a pair of stations that would be combined includes a "fixed" station and an "outlet" station (see ***Types of Sampling Stations***, below), the workgroup agreed that sampling should continue at the outlet station.

The workgroup agreed that the current practice of collecting samples in ankle depth water in the surf zone at open coast stations is appropriate and in conformance with the Ocean Plan and should continue. The workgroup also agreed that the current practice of collecting samples in ankle depth water at the Baby Beach stations and from the water surface at the pier and dock stations in Dana Point Harbor is appropriate and should continue.

Sampling Station Types

The unified program includes two types of sampling stations: fixed stations and outlet stations.

Fixed stations are located at positions along the shoreline (up-coast / down-coast) that do not change. Each time a fixed station is sampled, one sample would be collected in the surf zone.

Outlet stations are located where flows from creeks, canyons, or storm drains enter the ocean. Because the positions along the shoreline where such flows enter the ocean sometimes move up-coast or down-coast as a result of beach sand movement, the position along the shoreline where samples would be collected at each outlet station would move accordingly. The number of samples collected at an outlet station would depend on whether there is surface flow from a creek, canyon, or storm drain entering the ocean at that station. Each time an outlet station is sampled when there is such a flow at that station, three samples would be collected in the surf zone, one at each of the following:

- "Point zero," which is the position along the shoreline where the surface flow enters the ocean;
- Seventy-five feet up-coast from point zero; and
- Seventy-five feet down-coast from point zero.

Each time an outlet station is sampled when there is no such flow at that station, one sample would be collected in the surf zone; that sample would be collected at:

- "Virtual point zero," which is the position along the shoreline where it appears that surface flow would enter the ocean if there were a surface flow (immediately adjacent to the low point in the sand berm separating ponded water from the ocean, for example).

Appendix 5 indicates the type of each station in the existing programs and the unified program.

<u>Rationale</u>

The workgroup agreed that when there is surface flow from a creek, canyon, or storm drain to the ocean at an outlet station, samples should be collected at point zero in the surf zone rather than in the surface flow, as is the current practice at most outlet stations. The workgroup agreed that doing so would conform to the Ocean Plan, meet conditions attached to State funding OCHCA receives to meet requirements of beach water quality statutes, and produce information that is more useful for protecting the health of those who use beach waters for REC-1 than that produced by collecting samples in the surface flow. The workgroup agreed that when there is surface flow to the ocean at an outlet station, the current practice of also collecting samples in the surf zone seventy-five feet up-coast and down-coast from point zero is useful in determining the length of shoreline where REC-1 standards are not met and should be continued.

The workgroup agreed that when there is no surface flow to the surf zone at an outlet station, samples should be collected at virtual point zero in the surf zone, rather than seventy-five feet down-coast from virtual point zero in the surf zone, as is the current practice at outlet stations. The workgroup agreed that this would provide for better protection of the health of those who use beach waters for REC-1 than the current practice.

Sampling Seasons
All sampling stations in the unified program would be sampled year-round. Appendix 5 indicates the sampling season at each station in the existing programs and the unified program.

Rationale
Although beach water quality statutes require beach water quality monitoring only in the months of April through October, beach waters in south Orange County are used for REC-1 activities year-round. Consequently, the workgroup agreed that all sampling stations should be sampled year-round, in keeping with the intent that the unified program help to protect the health of those who use beach waters for REC-1. The workgroup agreed that the additional cost of sampling all stations year-round would be modest, because a large majority of the stations that would be included in the unified program are currently sampled year-round.

Sampling Frequency
All sampling stations in the unified program would be sampled at a minimum frequency of once per week unless sampling would be hazardous. Appendix 5 indicates the minimum sampling frequency at each station in the existing programs and the unified program.

Rationale
The workgroup agreed that sampling should be done at a minimum frequency of once per week at all sampling stations, as specified in the Ocean Plan. Beach water quality statutes also require weekly sampling, but only for the April through October period. In the existing programs, the required minimum sampling frequencies are different at different stations and/or at different times of the year (see Appendix 4 and Appendix 5). The workgroup agreed that sampling at a minimum frequency of once per week at all stations, combined with additional sampling when a REC-1 standard is not met, would provide for reasonable protection of the health of those who use beach waters for REC-1 (see ***Additional Sampling***, below).

Public Notification
The criteria and procedures for monitoring-based public notification established by beach water quality statutes would be used for all sampling stations in the unified program and would be used year-round. Such public notification would be based on the results of the monitoring conducted as part of the unified program. Public notification based on circumstances other than monitoring results (such as sanitary sewer overflows and wet weather) would be provided in accordance with beach water quality statutes, but such public notification would not be considered part of the unified program. Table 3 lists triggers for monitoring-based public notification.

Rationale
In keeping with the intent that the unified program help to protect the health of those who use beach waters for REC-1, the workgroup agreed that, regardless of sampling station location or time of year, the same public notification should be provided for any given set of monitoring results. The workgroup agreed that using the criteria and procedures for monitoring-based public notification established by beach water quality statutes for all stations in the unified program (rather than only those stations currently used to meet requirements of beach water quality statutes) and doing so year-round (rather than only in the months of April through October, as required by beach water quality statutes) would better protect the health of those who use beach waters for REC-1 than current public notification practices. The workgroup agreed that providing public notification as outlined above could be done at modest additional cost.

TABLE 3
Triggers for Monitoring-Based Public Notification and Additional Sampling

Triggers for	Trigger	Action
Public Notification	single sample maximum (SSM) standard not met	public notification in accordance with beach water quality statutes (year-round); such public notification to remain in effect until SSM and 30-day geometric mean standards are met
Additional Sampling	SSM standard not met in dry weather*	repeat sampling in accordance with the Ocean Plan until SSM standard is met
	30-day geometric mean standard not met in dry weather*	additional sampling as deemed appropriate by OCHCA until 30-day geometric mean standard is met

*Each storm event starting when 0.2" of precipitation has fallen and continuing until 72 hours after precipitation ends is considered "wet weather;" all other periods are considered "dry weather."

Additional Sampling

When a REC-1 standard is not met at a sampling station in the unified program during dry weather, additional sampling would be done at that station unless sampling would be hazardous. When a single sample maximum (SSM) standard is not met, repeat sampling, as specified in the Ocean Plan, would be done until that standard is met. When a 30-day geometric mean standard is not met, additional sampling, as deemed appropriate by OCHCA, would be done until that standard is met. Additional sampling triggered by circumstances other than monitoring results (such as sanitary sewer overflows) would be done in accordance with beach water quality statutes, but such additional sampling would not be considered part of the unified program. Table 3 lists triggers for monitoring-based additional sampling.

Samples collected as part of additional sampling triggered when a station does not meet a REC-1 standard would be analyzed for all three types of FIB, regardless of which type(s) of FIB did not meet the REC-1 standard(s). Additional sampling triggered when a station does not meet a REC-1 standard would be part of the unified program and the results from all samples collected during any 30-day period would be used to calculate 30-day geometric mean values.

Rationale

The workgroup agreed that when a REC-1 standard established by State law is not met at a sampling station in the unified program during dry weather, additional sampling should be done in order to determine if levels of FIB continue to be elevated and if public notification should remain in effect.

The workgroup agreed that when a REC-1 standard expressed as an SSM is not met during dry weather, repeat sampling would be done, as specified in the Ocean Plan. The workgroup noted that the Ocean Plan specifies that results from such repeat sampling are to be used to calculate 30-day geometric mean values.

The workgroup recognized that the Ocean Plan does not require repeat sampling if a sanitary survey has been conducted to determine the source of elevated FIB levels. The workgroup agreed, however, that additional sampling may be appropriate even if such a sanitary survey has been conducted, in order to determine if public notification should remain in effect. The workgroup agreed that OCHCA should determine if and when additional sampling is appropriate under such circumstances because OCHCA is the local agency with primary responsibility for protecting public health in Orange County.

The workgroup recognized that State law does not require additional sampling when a REC-1 standard expressed as a 30-day geometric mean is not met during dry weather. Nevertheless, the workgroup agreed that additional sampling may be appropriate under such circumstances in order to better characterize variability in beach water quality and to ensure that public notifications do not remain in effect longer than necessary. The workgroup agreed that OCHCA should determine if and when additional sampling is appropriate under such circumstances because OCHCA is the local agency with primary responsibility for protecting public health in Orange County.

The workgroup agreed that, because there are REC-1 standards for three types of FIB, all samples collected as part of additional sampling triggered when a REC-1 standard is not met should be analyzed for all three types of FIB, regardless of which type(s) of FIB did not meet the REC-1 standard(s).

Investigations

Where REC-1 standards are not consistently met, investigations would be conducted to produce information needed to guide decision-making and management actions. Accordingly, these investigations would assess human health risks, identify sources of elevated FIB levels, and/or evaluate other pertinent factors, as appropriate. Such investigations would be conducted systematically, using a hypothesis-driven approach.

The results of routine, ongoing beach water quality monitoring conducted as part of the unified program would be analyzed to determine where REC-1 standards are not consistently met. The protocols and criteria used to determine whether waters should be listed as "impaired" with regard to REC-1 standards for purposes of CWA §303(d), as well as other pertinent factors, would be considered in determining where REC-1 standards are not consistently met. Investigations would be undertaken proactively, without waiting until the San Diego Water Board issues a directive requiring an investigation to be done. Investigations would be conducted in a timely manner but would also be prioritized so that agency staff and other resources can be used strategically. The highest priority would be given to areas where potential human health risks appear to be greatest, considering the intensity of REC-1 activity, levels of FIB, the frequency and timing of when REC-1 standards have not been met, the length of time over which REC-1 standards have not been consistently met, and other factors as appropriate.

Where such an investigation has already been satisfactorily completed, it would not be necessary to repeat the investigation. Where such an investigation is underway and is making satisfactory progress, it would not be necessary to re-start the investigation.

Such an investigation could be suspended if continued monitoring indicates that REC-1 standards are consistently met or if, in the judgment of SOCWA, OCPW, OCHCA, and the San Diego Water Board, (a) continuation of the investigation is not warranted or (b) resources should be reallocated to conducting an investigation in an area where potential human health risks appear to be greater.

Monitoring conducted as part of investigations, including studies related to TMDLs, would not be considered part of the routine, ongoing monitoring conducted as part of the unified program.

<u>Rationale</u>

The workgroup agreed that it is important to know where REC-1 standards are not consistently met. The workgroup also agreed that, where REC-1 standards are not consistently met, investigations should be conducted in order to produce information needed to guide decision-making and management actions. Because it recognized that the details of various situations in which REC-1 standards are not consistently met could be quite different, the workgroup agreed that the scope and specifics of investigations should be determined on a case-by-case basis. Nevertheless, the workgroup also agreed that, in general, investigations should focus on assessment of human health risks and identification of sources of elevated FIB levels, because such information is often essential to guide decision-making and management actions.

The workgroup agreed that such investigations and management actions should, over time, obviate CWA §303(d) "impaired waters" listings for south Orange County beach waters related to REC-1 standards, as well as subsequent development of TMDLs associated with those listings. Accordingly, the workgroup agreed that, in determining where REC-1 standards are not consistently met, it would be important to consider the protocols and criteria used for making CWA §303(d) listings related to REC-1 standards.

The workgroup agreed that initiation of investigations should not be postponed until the San Diego Water Board issues a directive requiring an investigation. Although the workgroup recognized the desirability of conducting investigations in a timely manner, it also recognized the importance of making strategic use of agency staff and other resources. Accordingly, the workgroup agreed that investigations should be prioritized and that potential human health risks would be the most appropriate basis for prioritizing.

The workgroup recognized that some investigations have already been completed or started and agreed that it would not be appropriate to repeat investigations that have been satisfactorily completed or re-start investigations that are making satisfactory progress.

The workgroup also agreed that it might be appropriate to suspend an investigation under some circumstances and agreed that provision should be made for doing so.

The workgroup agreed that, although routine, ongoing monitoring conducted as part of the unified program should be used to determine the need for investigations, monitoring conducted as part of such investigations, including studies related to TMDLs, should not be considered part of the routine, ongoing monitoring conducted as part of the unified program.

The workgroup noted that useful guidance for conducting source identification investigations is provided by the "California Microbial Source Identification Manual: A Tiered Approach to Identifying Fecal Pollution Sources to Beaches,"[7] which was developed by the Southern California Coastal Water Research Project (SCCWRP) with funding from the State Water Resources Control Board Clean Beach Initiative Grant Program and completed in December 2013.

Annual Review and Assessment

As part of the unified program, an annual review and assessment would be done to:

- Review monitoring results;
- Assess beach water quality status and trends;
- Evaluate the progress of investigations;
- Evaluate the effectiveness of management actions taken to address beach water quality problems, issues, and concerns;
- Discuss issues related to the unified program;
- Develop recommendations for revisions to the unified program; and
- Discuss other pertinent matters, as appropriate.

The annual review and assessment would be done by a workgroup that would include individuals representing a variety of responsibilities for and interests in beach water quality monitoring in south Orange County, including representatives of SOCWA, OCPW, and OCHCA, the San Diego Water Board, and other entities and individuals; in other words, its composition would be similar to that of the workgroup that developed the unified program outlined in this report.

[7] See http://ftp.sccwrp.org/pub/download/DOCUMENTS/TechnicalReports/804_SIPP_MST_ManualPag.pdf.

Rationale

The workgroup agreed that an annual review and assessment would help ensure that:

- Entities and individuals with responsibilities for and interests in beach water quality are familiar with monitoring results;
- Monitoring results are put to use;
- Beach water quality concerns are addressed in an appropriate and timely manner;
- The effectiveness of management actions is evaluated;
- The unified program is updated and revised appropriately and in a timely manner in response to monitoring results, changes in circumstances, and/or changes in requirements (of State law, for example).

The workgroup agreed that the annual review and assessment would best be done by a workgroup with a variety of experiences, backgrounds, and affiliations related to beach water quality in south Orange County.

Reporting

The unified program would include reporting of public notifications of beach water quality health threats, as required by beach water quality statutes. As part of the unified program, annual reports would be submitted to the San Diego Water Board. These annual reports would summarize the results of monitoring conducted as part of the unified program for each 12-month period of April through March and would include:

- A summary of public notifications of beach water quality health threats;
- Assessment of beach water quality status and trends in south Orange County;
- Description of the progress and results of investigations;
- Description of management actions taken to address beach water quality problems, issues, and concerns and an assessment of the effectiveness of those actions;
- Recommendations for updates and revisions to the unified program.

SOCWA, OCPW, and OCHCA would make presentations on the results of the unified program at public meetings of the San Diego Water Board when requested to do so by the Board.

Rationale

The workgroup agreed that annual reports to the San Diego Water Board would be useful for purposes of compiling and disseminating information that could help inform decision-making and guide management actions. The workgroup also agreed that such annual reports would be important for purposes of accountability and transparency, particularly because the unified program is intended to help protect the health of those who use *public* beach waters for REC-1, because three *public* agencies (SOCWA, OCPW, and OCHCA) would be responsible for implementing the unified program, because another *public* agency (San Diego Water Board) would be requiring implementation of the unified program, and because yet another *public* agency (State Water Board) would be providing funding to OCHCA for part of the unified program.

The workgroup agreed that, like the annual reports, presentations to the San Diego Water Board at public meetings would help disseminate information and provide accountability and transparency.

Public Access to Information

All public notifications, monitoring results, reports, and presentations produced by or about the unified program, including archives of such information and materials, would be readily accessible to the public in a timely manner and in a user-friendly format at or through the websites of SOCWA, OCPW, OCHCA, and the San Diego Water Board. Public notifications would also be available via social media.

Rationale

The workgroup agreed that it is important for the public to be able to easily access useful, understandable, and timely information and materials produced by and about the unified program.

Language and Mechanisms for Requiring Implementation of the Unified Program

In addition to considering what elements and features should be part of the unified program, the workgroup considered what language and mechanisms should be used to formally establish requirements for implementation of the unified program. The workgroup recognized that the agencies conducting ongoing, routine beach water quality monitoring in south Orange County do so in accordance with different sets of and different kinds of requirements (see Appendix 4). SOCWA and OCPW conduct their monitoring programs in accordance with requirements established by NPDES permits issued by the San Diego Water Board. In contrast, OCHCA conducts its beach water quality monitoring program in accordance with requirements of beach water quality statutes – and those requirements are in effect only if the State provides sufficient funding for such monitoring.

Although the workgroup recognized that in years past there were concerns about whether the State would provide sufficient funding for such monitoring, it also noted that the way the State provides that funding has since changed. The workgroup agreed that it now appears unlikely that the State would not provide sufficient funding. Accordingly, the workgroup agreed that it was not necessary (a) to determine in advance what changes should be made to the unified program if the State does not provide sufficient funding or (b) for language requiring implementation of the unified program to address the possibility that the State would not provide sufficient funding.

The workgroup recognized that OCHCA has strongly supported collaborative, integrated, regional beach water quality monitoring in Orange County, has actively participated in and supported development of the unified program, and has indicated its willingness to share responsibility for implementation of the unified program. The workgroup also recognized that the requirements for OCHCA to conduct beach water quality monitoring come from beach water quality statutes, not NPDES permits or the Ocean Plan. Accordingly, the workgroup agreed that it would not be necessary or appropriate for the San Diego Water Board to formally direct OCHCA to participate in the unified program.

The workgroup agreed that requirements for participation in the unified program would need to be added to three NPDES permits issued by the San Diego Water Board: the two permits for discharges from the SOCWA ocean outfalls and the permit for discharges from south Orange County MS4s. Because of how monitoring requirements are set forth in the SOCWA permits, those permits would also need to be modified to delete the existing requirements for monitoring "surf zone" stations. Because of how monitoring requirements are set forth in the existing permit for discharges from south Orange County MS4s, and because that permit is scheduled to be replaced early in 2015, that permit would not need to be modified to delete any existing requirements.

The workgroup recognized that future revisions to the unified program may be appropriate, for example if changes are made to the requirements of State law for beach water quality monitoring or related public notification or reporting. Since different permits would include requirements for implementation of the unified program, the workgroup agreed that it would be important for the effective date of any revision to the unified program to be the same for all of the permits that include such requirements. The workgroup also agreed that it would be helpful for the permit language to facilitate putting such revisions into effect expeditiously, for example by allowing the San Diego Water Board Executive Officer to direct that such revisions be made, without need for formal action by the Board itself. This could be done with a directive issued by the Executive Officer pursuant to California Water Code sections 13225, 13267, and/or 13383.

In keeping with the above, the workgroup agreed that, to require participation in the unified program, (a) the following language should be added to the NPDES permits for the SOCWA ocean outfall discharges and (b) corresponding language should be added to the NPDES permit for south Orange County MS4 discharges.

> Unified Beach Water Quality Monitoring and Assessment Program
> South Orange County Wastewater Authority shall participate in and, together with the south Orange County MS4 permittees and Orange County Health Care Agency, shall share responsibility for implementation of a unified regional beach water quality monitoring and assessment program in south Orange County, as directed by the San Diego Water Board Executive Officer pursuant to California Water Code section 13225, 13267, and/or 13383. The unified program shall be implemented no later than April 1, 2015.
>
> Future revisions to the unified program may be made by the San Diego Water Board Executive Officer, provided that the unified program, as revised, remains consistent with and meets the requirements of State law, including the California Ocean Plan, for beach water quality monitoring and related public notification and reporting. Following a thirty day public comment period, and subject to a request for a hearing before the San Diego Water Board, any such revision shall take effect as specified in a written directive issued by the Executive Officer pursuant to California Water Code section 13225, 13267, and/or 13383.

Appendices

Appendix 1
Glossary

ACOO: Aliso Creek Ocean Outfall, which is owned and operated by South Orange County Wastewater Authority (SOCWA)

average monthly flow: average flowrate over any consecutive 30-day period

beach water quality: characteristics of waters at coastal beaches as they relate to the suitability of those waters for water contact recreation; beach water quality is typically expressed in terms of densities of three types of fecal indicator bacteria (FIB): fecal coliform, total coliform, and enterococcus

beach water quality statutes: California statutes (other than the Porter-Cologne Act) and associated regulations that establish or provide for establishment of REC-1 standards for coastal beach waters and/or related requirements for monitoring, public notification, reporting, and/or investigations; individual beach water quality statutes are commonly referred to by the legislative bills that were enacted to establish or provide for the establishment of such standards and requirements, AB 411, AB 538, AB 1946, and SB 482, for example; see
AB 411: http://www.waterboards.ca.gov/water_issues/programs/beaches/beach_surveys/bills/ab_411_bill_19971008_chaptered.pdf
AB 538: http://www.waterboards.ca.gov/water_issues/programs/beaches/beach_surveys/bills/ab_538_bill_19990927_chaptered.pdf
AB 1946: http://www.leginfo.ca.gov/pub/99-00/bill/asm/ab_1901-1950/ab_1946_bill_20000721_chaptered.pdf
SB 482: http://www.leginfo.ca.gov/pub/11-12/bill/sen/sb_0451-0500/sb_482_bill_20111008_chaptered.pdf

beneficial use: a desirable and reasonable use of State waters that the State deems worthy of protection; beneficial uses of coastal waters in the San Diego Region include water contact recreation (REC-1), non-contact recreation (REC-2), shellfish harvesting (SHELL), commercial and sport fishing (COMM), marine habitat (MAR), and wildlife habitat (WILD), among others

BWQW: Beach Water Quality Workgroup, a group convened by the State Water Board circa 1999 to provide a forum for the exchange of information about beach water quality issues; BWQW consists of individuals and representatives of a variety of entities with interests in beach water quality; BWQW usually meets quarterly

CWA: Clean Water Act (also known as Federal Water Pollution Control Act), the primary federal statute for water quality control; see http://www.waterboards.ca.gov/laws_regulations/docs/fedwaterpollutioncontrolact.pdf

CWA: Clean Water Act (also known as Federal Water Pollution Control Act), the primary federal statute for water quality control; see http://www.waterboards.ca.gov/laws_regulations/docs/fedwaterpollutioncontrolact.pdf

dry weather: each storm event, starting when 0.2" of precipitation has fallen and continuing until 72 hours after precipitation ends, is considered "wet weather;" all other periods are considered "dry weather"

enterococcus: a type of fecal indicator bacteria (FIB)

fecal coliform: a type of fecal indicator bacteria (FIB)

FIB: fecal indicator bacteria; types of bacteria used to determine the suitability of water quality for water contact recreation (REC-1) in California; total coliform, fecal coliform, and enterococcus are different types of fecal indicator bacteria; the presence of FIB indicate the possible presence of fecal contamination and associated human pathogens, but FIB are not necessarily pathogenic, and sources of FIB are not necessarily human and not necessarily fecal

fixed station: sampling station located at a position along the shoreline (up-coast / down-coast) that does not change

Monitoring and Assessment Framework: A Framework for Monitoring and Assessment in the San Diego Region; San Diego Water Board staff report outlining a recommended approach for monitoring and assessment; the framework was endorsed by the San Diego Water Board in its Resolution No. R9-2012-0069; see http://www.waterboards.ca.gov/sandiego/water_issues/programs/swamp/docs/MonitoringFrameworkForSDR-final.pdf and http://www.waterboards.ca.gov/sandiego/water_issues/programs/swamp/docs/Monitoring_Resolution_R9-2012-0069.pdf

MS4: municipal separate storm sewer system, also referred to as municipal storm drain system

NPDES: National Pollutant Discharge Elimination System, a regulatory program created by the federal Clean Water Act to protect the quality and beneficial uses of waters of the United States; NPDES permits establish limits and other requirements that apply to discharges to those waters; NPDES permits for discharges to waters of the State of California also serve as waste discharge requirements for purposes of the State Porter-Cologne Water Quality Control Act; NPDES permits typically include requirements for monitoring, including monitoring of conditions, such as beach water quality, in the water bodies where discharges occur

Ocean Plan (also known as California Ocean Plan): Water Quality Control Plan, Ocean Waters of California; formulation, adoption, and periodic review of the Ocean Plan is required by the Porter-Cologne Act; the Ocean Plan was adopted by the State Water Board in 1972 and has been amended by the State Water Board several times since then, most recently in 2012; the Ocean Plan is legally applicable to ocean waters of California, but not to other types of coastal waters, such as enclosed bays, harbors, (including Dana Point Harbor) and estuaries; the Ocean Plan identifies water contact recreation (REC-1) as a beneficial use of ocean waters of the State and includes REC-1 standards; the Ocean Plan also includes monitoring provisions related to REC-1 and provides for monitoring requirements related to REC-1 to be met through participation in a regional monitoring program, such as the unified program outlined in this report; the Ocean Plan does not specify criteria for determining how many locations should be monitored with regard to REC-1; the requirements of the Ocean Plan, including its monitoring provisions, are implemented largely through provisions, limits, and requirements in NPDES permits issued for discharges to the ocean; when NPDES permits for ocean discharges are reissued, usually about every five years, those permits are supposed to be revised to be consistent with the most recent version of the Ocean Plan; see http://www.waterboards.ca.gov/water_issues/programs/ocean/docs/cop2012.pdf

OCHCA: Orange County Health Care Agency, an agency of the County of Orange; the OCHCA Ocean Water Protection Program webpage is at http://ocbeachinfo.com/

OCPW: Orange County Public Works, a department of the County of Orange

OCSD: Orange County Sanitation District, a special district serving central and northwest Orange County

outlet station: sampling station located where flow from a creek, canyon, or storm drain enters the ocean; the position along the shoreline (up-coast / down-coast) of an outlet station moves with the location where such flow enters the ocean

PCA: Porter-Cologne Act (also known as Porter-Cologne Water Quality Control Act), the primary California statute for water quality control; the PCA requires formulation, adoption, and periodic review of the Ocean Plan; see http://www.waterboards.ca.gov/laws_regulations/docs/portercologne.pdf

point zero: position along the shoreline where the surface flow from a creek, canyon, or storm drain enters the ocean

public notification: warning to inform the public about beach water quality conditions that are or may be unsafe for water contact recreation; these include beach closure postings, beach warning postings, and rain advisories; beach water quality statutes require public notification under certain circumstances

REC-1: the beneficial use of "contact water recreation" (also referred to as water contact recreation or body contact recreation), which is the use of water for recreational activities that involve body contact with water and where ingestion of water is reasonably possible

REC-1 standards: numeric thresholds established by State law to protect the health of those who use waters for water contact recreation (REC-1); the REC-1 standards established by beach water quality statutes are the same as those established by the Ocean Plan; REC-1 standards for coastal waters currently established by State law are expressed as single sample maximum (SSM) and 30-day geometric mean levels of the densities of each of three different types of fecal indicator bacteria (FIB) (total coliform, fecal coliform, and enterococcus); the levels of FIB at which REC-1 standards are set are not zero-risk levels but water quality that meets REC-1 standards is considered suitable for water contact recreation

Recreational Water Criteria: USEPA recommendations provided as guidance to assist states in developing REC-1 standards; see http://water.epa.gov/scitech/swguidance/standards/criteria/health/recreation/index.cfm

San Diego Region: the area in which the San Diego Water Board has jurisdiction, including State coastal waters from north of Laguna Beach to the Mexican border

San Diego Water Board: California Regional Water Quality Control Board, San Diego Region, the State agency with primary responsibility for overseeing implementation of California and federal water quality control law in the San Diego Region

Santa Ana Region: the area to the north of the San Diego Region in which the Santa Ana Water Board has jurisdiction, including State coastal waters from Seal Beach to north of Laguna Beach

Santa Ana Water Board: California Regional Water Quality Control Board, Santa Ana Region, the State agency with primary responsibility for overseeing implementation of California and federal water quality control law in the Santa Ana Region

SHELL: the beneficial use of shellfish harvesting, which includes uses of water that support habitats suitable for the collection of filter-feeding shellfish (clams, oysters and mussels, for example) for human consumption, commercial, or sport purposes

SJCOO: San Juan Creek Ocean Outfall, which is owned and operated by South Orange County Wastewater Authority (SOCWA)

SOCWA: South Orange County Wastewater Authority, a joint powers authority serving south Orange County

South Orange County: the part of Orange County in the San Diego Region, where the San Diego Water Board has jurisdiction; the south Orange County coastline extends approximately eighteen miles from the northern boundary of the San Diego Region, at the northern end of El Moro Beach, north of Laguna Beach, down-coast to the southernmost end of San Clemente, at the San Diego County line; see Appendix 3

SSM: single sample maximum

State law: California statutes, regulations, and water quality control plans; notably, for purposes of this report, the Porter-Cologne Act, the Ocean Plan, and beach water quality statutes, as defined above

State Water Board: State Water Resources Control Board, the State agency with primary responsibility for overseeing implementation of California and federal water quality control law throughout California

TMDLs: total maximum daily loads, formal regulatory approaches used to identify sources of and reduce levels of pollutants or pollution indicators in parts of water bodies listed as “impaired” for purposes of CWA §303(d); for example, TMDLs for FIB might be developed where it is determined that the frequency at which REC-1 standards are not met is unacceptably high

total coliform: a type of fecal indicator bacteria (FIB)

unified program: Unified Beach Water Quality Monitoring and Assessment Program for South Orange County, as outlined in this report

USEPA: United States Environmental Protection Agency

virtual point zero: position along the shoreline where it appears that surface flow would enter the surf zone if there were a surface flow (immediately adjacent to the low point in the sand berm separating ponded water from the surf zone, for example)

visitor-day: a measure of beach use intensity; one person visiting a beach for all or part of one day represents one visitor-day

waste discharge requirements: regulatory documents, sometimes referred to as “permits,” that establish limits and other requirements that apply to discharges to waters of the State of California in order to protect the quality and beneficial uses of those waters; waste discharge requirements are issued pursuant to the State Porter-Cologne Water Quality Control Act

wet weather: each storm event, starting when 0.2” of precipitation has fallen and continuing until 72 hours after precipitation ends, is considered “wet weather;” all other periods are considered “dry weather”

Appendix 2
Previous Work to Improve Coordination of Beach Water Quality Monitoring in Orange County

In August 2009, in response to concerns about the availability of State funding for beach water quality monitoring and related work, representatives of OCHCA, OCPW, SOCWA, and Orange County Sanitation District (OCSD) initiated an effort to better coordinate routine, ongoing beach water quality monitoring conducted in Orange County. The proposed monitoring program resulting from that effort was outlined in a report, completed in 2010, entitled "A Collaborative, Integrated, Regional Ocean Water Quality Monitoring Program for Orange County" (2010 Report), which is included in this report as Attachment 1. The 2010 Report and the work that went into developing it proved to be extremely valuable to the workgroup effort outlined in this report.

Development of the 2010 Report included statistical analyses of monitoring results to determine if monitoring results at nearby stations were similar. Those analyses are described in the 2010 Report. Development of the 2010 Report also made use of "model monitoring matrices" developed by the Monitoring and Reporting Subcommittee of the southern California Beach Water Quality Workgroup (BWQW) in 2009. Those matrices are included in the 2010 report.

Appendix 3
South Orange County Coastline

The south Orange County coastline extends approximately eighteen miles from the northern boundary of the San Diego Region, at the northern end of El Moro Beach, north of Laguna Beach, to the southernmost end of San Clemente, at the San Diego County line. Dana Point Harbor is located about ten miles down-coast from El Moro Beach and about eight miles up-coast from the San Diego County line.

From El Moro Beach to Dana Point Harbor, the shoreline consists of naturally rocky areas interspersed with sandy beaches, with some armored areas. The shoreline of Dana Point Harbor is armored, except for Baby Beach, a small sandy beach located in the northwestern part of the harbor. From Dana Point Harbor to the San Diego County line, most of the shoreline consists of sandy beaches, with some armored areas.

The south Orange County coastline includes parts of the cities of Laguna Beach, Dana Point, and San Clemente, as well as unincorporated areas. Part of Crystal Cove State Park, all of Doheny State Beach, all of San Clemente State Beach, and various county and city parks and beaches are located along the south Orange County coastline. Use of coastal beaches in south Orange County is estimated to be roughly six million visitor-days per year.[8]

Flows from a number of creeks, canyons, and storm drains enter the ocean along the south Orange County coastline; Aliso Creek and San Juan Creek are the two largest creeks. The location where the flow from any particular creek, canyon, or storm drain enters the ocean sometimes moves up-coast or down-coast as a result of beach sand movement. Sand berms sometimes block surface flows from entering the ocean, but do not necessarily prevent subsurface percolation through the sand to the ocean.

Treated wastewater is discharged to the ocean through the Aliso Creek Ocean Outfall (ACOO), which extends offshore from Aliso Beach County Park near the mouth of Aliso Creek in Laguna Beach. The inshore end of the ACOO diffuser is approximately 6700 feet offshore at a depth of approximately 170 feet. The current NPDES permit for the ACOO requires that wastewater receive at least secondary treatment prior to discharge and establishes an average monthly flow limit of about 34 MGD. ACOO is owned and operated by SOCWA.

Treated wastewater is also discharged to the ocean through the San Juan Creek Ocean Outfall (SJCOO), which extends offshore from Doheny State Beach near the mouth of San Juan Creek in Dana Point. The inshore end of the SJCOO diffuser is approximately 10,300 feet offshore at a depth of approximately 100 feet. The current NPDES permit for the SJCOO requires that wastewater receive at least secondary treatment prior to discharge and establishes an average monthly flow limit of about 39 MGD. SJCOO is also owned and operated by SOCWA.

[8] United States Lifesaving Association; see http://arc.usla.org/Statistics/public.asp

Appendix 4
Existing Beach Water Quality Monitoring in South Orange County

SOCWA, OCPW, and OCHCA currently conduct four different routine, ongoing beach water quality monitoring programs in south Orange County, in accordance with four different sets of requirements. The Orange County Sanitation District (OCSD) also conducts a routine, ongoing beach water quality monitoring program that includes one sampling station in south Orange County. These five existing programs include eighty-one sampling stations in south Orange County. Most but not all of these stations are located in the surf zone along the shoreline of the open coast or in Dana Point Harbor. Appendix 5 lists and shows the locations of these stations.

The following sections briefly describe these requirements and the routine, ongoing beach water quality monitoring conducted by SOCWA, OCPW, OCHCA, and OCSD in south Orange County.

Monitoring Conducted by SOCWA

SOCWA is responsible for conducting routine, ongoing beach water quality monitoring in accordance with requirements of the NPDES permits for the discharge of treated wastewater through its two ocean outfalls.

The NPDES permit for discharges to the ocean through the SOCWA Aliso Creek Ocean Outfall (ACOO), which was most recently reissued by the San Diego Water Board in 2012 (Order No. R9-2012-0013[9]), requires FIB monitoring at sixteen "surf zone stations" from Main Beach in Laguna Beach to Dana Strands in Dana Point. All of these stations are "fixed" stations, so their positions along the shoreline do not change. FIB monitoring at these stations is required at a minimum frequency of twice per week year-round. The permit for the ACOO requires repeat sampling when REC-1 standards expressed as a single sample maximum (SSM) are not met, in accordance with the Ocean Plan monitoring requirements that were first included in the 2009 version of the Ocean Plan, the version that was in effect when Order No. R9-2012-0013 was adopted.

The NPDES permit for discharges to the ocean through the SOCWA San Juan Creek Ocean Outfall (SJCOO), which was most recently reissued by the San Diego Water Board in 2012 (Order No. R9-2012-0012[10]), requires FIB monitoring at seventeen "surf zone stations"[11] from immediately up-coast of Dana Point Harbor in Dana Point to the southern part of San Clemente near the San Diego County line. All of these stations are "fixed" stations, so their positions along the shoreline do not change. FIB monitoring at these stations is required at a minimum frequency of twice per week from May 1 through October 31 and once per week from November 1 through April 30. The permit for the SJCOO requires repeat sampling when REC-1 standards expressed as an SSM are not met, in accordance with the Ocean Plan monitoring requirements that were first included in the 2009 version of the Ocean Plan, the version that was in effect when Order No. R9-2012-0012 was adopted.

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[9] See http://www.waterboards.ca.gov/sandiego/board_decisions/adopted_orders/2012/R9-2012-0013.pdf.

[10] See http://www.waterboards.ca.gov/sandiego/board_decisions/adopted_orders/2012/R9-2012-0012.pdf.

[11] Two of the sampling stations referred to as "surf zone stations" in the current NPDES permit monitoring requirements for the SJCOO are actually located in San Juan Creek, not in the surf zone.

Monitoring Conducted by OCPW

The entities subject to the NPDES permit for discharges from the municipal storm drain systems (also referred to as municipal separate storm sewer systems or MS4s) in south Orange County are responsible for conducting routine, ongoing beach water quality monitoring in accordance with requirements of that permit. The County of Orange is one of the entities subject to that permit; OCPW conducts the beach water quality monitoring required by that permit on behalf of all of the entities subject to that permit. That permit, which was most recently reissued by the San Diego Water Board in 2009 (Order No. R9-2009-0002[12]), requires FIB monitoring at twenty-eight shoreline stations from Emerald Bay, near the northern part of Laguna Beach, to the southern part of San Clemente, near the San Diego County line. All of these stations are "outlet" stations; they are located where flows from creeks, canyons, and storm drains enter the ocean. Because the location where flow from any particular creek, canyon, or storm drain enters the ocean sometimes moves up-coast or down-coast as a result of beach sand movement, the position (up-coast / down-coast) along the shoreline where samples are collected at these stations moves accordingly. Each time one of these stations is sampled when there is surface flow from a creek, canyon, or storm drain into the ocean at that station, three samples are collected; one in the water flowing into the ocean, one in the surf zone seventy-five feet up-coast from where the surface flow enters the ocean, and one in the surf zone seventy-five feet down-coast from where the surface flow enters the ocean. Each time one of these stations is sampled when there is no surface flow into the ocean at that station, one sample is collected and that sample is collected in the surf zone seventy-five feet down-coast from where a surface flow would be expected to enter the ocean. FIB monitoring at these stations is required at a frequency of once per week year-round.

Monitoring Conducted by OCHCA

County health agencies are responsible for meeting the requirements of beach water quality statutes for beach water quality monitoring, public notification, and reporting; OCHCA is the agency responsible for meeting these requirements in Orange County. Beach water quality statutes require "waters adjacent to public beaches" to be monitored for FIB once per week in the months of April through October at beaches that are both (a) "visited by more than 50,000 people annually" and (b) "located on an area adjacent to a storm drain that flows in the summer."[13] Beach water quality statutes also require public notification when a REC-1 standard expressed as a single sample maximum (SSM) is not met and under other circumstances when beach water quality conditions are or may be unsafe for water contact recreation. Beach water quality statutes also require reporting of such public notifications to the State Water Board. These requirements of beach water quality statutes apply only if the State provides sufficient funding for such work.

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[12] See http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/docs/oc_permit/updates_012710/FINAL_R9_2009_0002.pdf and http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/docs/oc_permit/updates_012710/FINAL_Attachments.pdf.

[13] Beach water quality statutes do not specify criteria for what constitutes (a) "a beach visited by more than 50,000 people annually" or (b) "a beach located on an area adjacent to a storm drain that flows in the summer." To date, such criteria have not been established by the two State agencies that have been responsible for administering the State program that provides funding to county health agencies to meet the monitoring requirements of beach water quality statutes. The State Water Board currently administers that program, which was previously administered by the State Department of Public Health.

To meet the requirements of beach water quality statutes as they apply to south Orange County, OCHCA uses results of monitoring at forty-nine sampling stations from El Moro Beach, north of Laguna Beach, to the southern part of San Clemente, near the San Diego County line. Monitoring at some of these stations is required by NPDES permits issued to SOCWA.

Monitoring Conducted by OCSD

Orange County Sanitation District (OCSD) is responsible for conducting routine, ongoing beach water quality monitoring in accordance with requirements of an NPDES permit issued by the Santa Ana Water Board and USEPA for the discharge of treated wastewater through an ocean outfall that extends offshore from the mouth of the Santa Ana River in the Santa Ana Region. One of the sampling stations in the OCSD beach water quality monitoring program is in the San Diego Region, at El Moro Beach, approximately nine miles down-coast from the mouth of the Santa Ana River and just down-coast from the boundary between the Santa Ana Region and the San Diego Region. This station is an “outlet” station; it is located where flow from Moro Canyon enters the ocean. Because the location where this flow enters the ocean sometimes moves up-coast or down-coast as a result of beach sand movement, the position (up-coast / down-coast) along the shoreline where samples are collected at this station moves accordingly. Each time this station is sampled when there is surface flow from Moro Canyon, three samples are collected; one in the surf zone where the surface flow Moro Canyon enters the ocean, one in the surf zone seventy-five feet up-coast from where the surface flow enters the ocean, and one in the surf zone seventy-five feet down-coast from where the surface flow enters the ocean. Each time this station is sampled when there is no surface flow into the ocean from Moro Canyon, one sample is collected and that sample is collected in the surf zone seventy-five feet down-coast from where a surface flow would be expected to enter the ocean. FIB monitoring at the El Moro Beach station is required at a minimum frequency of once per week year-round.

Appendix 5
Sampling Stations

Figure A-5-1
Sampling Stations: Crystal Cove State Park and Laguna Beach

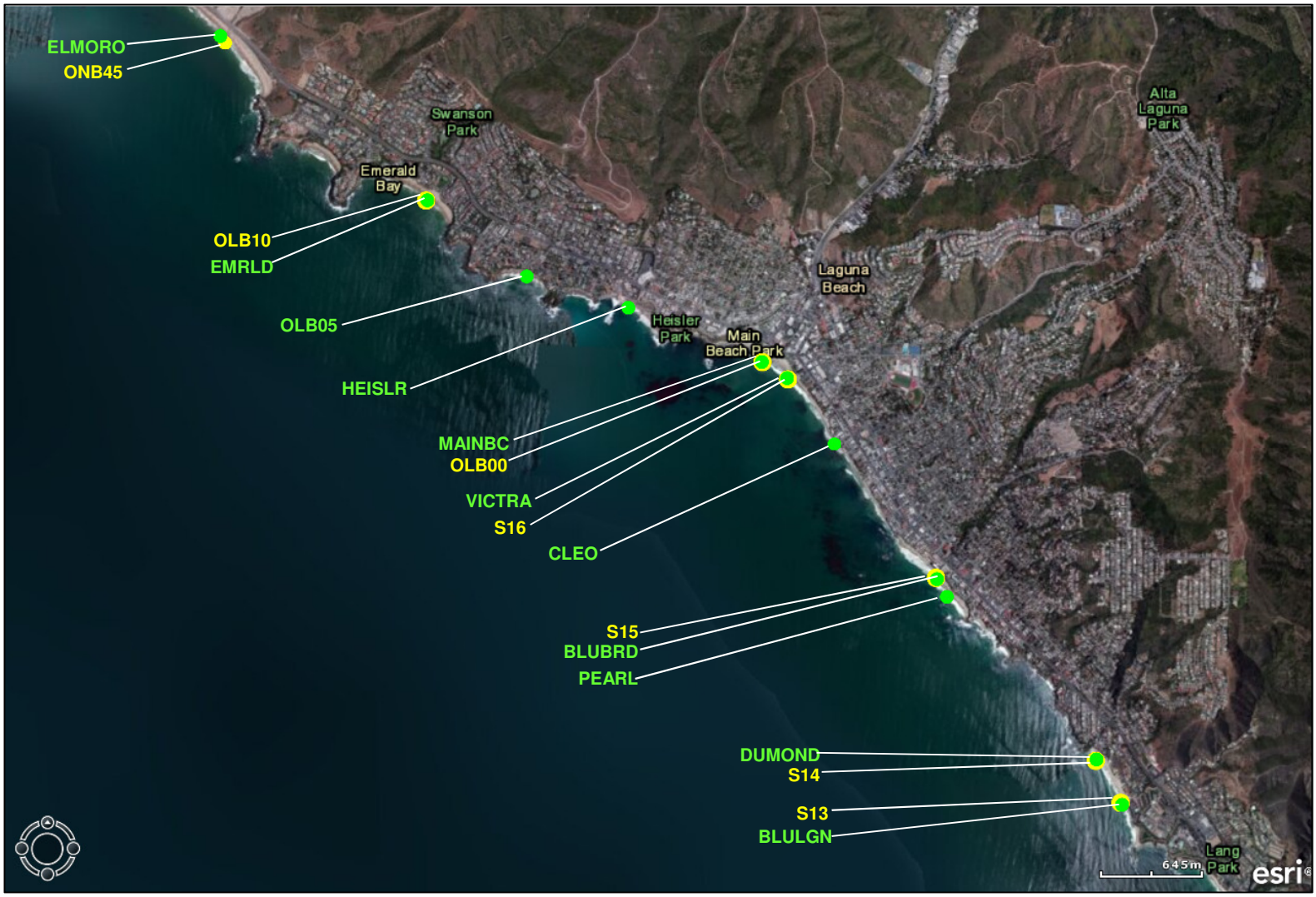

Table A-5-1
Sampling Stations: Crystal Cove State Park and Laguna Beach

Area		Sampling Station Identification	Sampling Station Location	Existing Programs				Recommended Unified Program		
				Program(s)	Sampling Station Type	Sampling Season	Minimum Sampling Frequency	Sampling Station Type	Sampling Season	Minimum Sampling Frequency
Crystal Cove State Park	1	ELMORO	surf at El Moro Beach adjacent to Moro Canyon outlet	OCSD	outlet	year-round	once/week	outlet	year-round	once/week
	2	*ONB45*	*surf at El Moro Beach*	*OCHCA*	*fixed*	*April-October*	*once/week*	*this station would be combined with ELMORO*		
Laguna Beach	*3*	*OLB10*	*surf at Emerald Bay Beach*	*OCHCA*	*fixed*	*April-October*	*once/week*	*this station would be combined with EMRLD*		
	4	EMRLD	surf at Emerald Bay Beach adjacent to drain outlet	OCPW	outlet	year-round	once/week	outlet	year-round	once/week
	5	OLB05	surf at Crescent Bay Beach	OCHCA	fixed	April-October	once/week	fixed	year-round	once/week
	6	HEISLR	surf at Divers Cove adjacent to Cliff Drive drain outlet	OCPW	outlet	year-round	once/week	outlet	year-round	once/week
	7	MAINBC	surf at Laguna Main Beach adjacent to Broadway Creek outlet	OCPW	outlet	year-round	once/week	outlet	year-round	once/week
	8	*OLB00*	*surf at Laguna Main Beach*	*OCHCA*	*fixed*	*April-October*	*once/week*	*this station would be combined with MAINBC*		
	9	VICTRA	surf adjacent to drain outlet immediately up-coast from Hotel Laguna	OCPW	outlet	year-round	once/week	outlet	year-round	once/week
	10	*S16*	*surf adjacent to Hotel Laguna*	*SOCWA (ACOO) & OCHCA*	*fixed*	*year-round*	*twice/week*	*this station would be combined with VICTRA*		
	11	CLEO	surf adjacent to Cleo Street drain outlet	OCPW	outlet	year-round	once/week	outlet	year-round	once/week
	12	*S15*	*surf at Bluebird Canyon Beach*	*SOCWA (ACOO) & OCHCA*	*fixed*	*year-round*	*twice/week*	*this station would be combined with BLUBRD*		
	13	BLUBRD	surf at Bluebird Canyon Beach adjacent to drain outlet	OCPW	outlet	year-round	once/week	outlet	year-round	once/week
	14	PEARL	surf adjacent to drain outlet between Agate Street and Pearl Street	OCPW	outlet	year-round	once/week	outlet	year-round	once/week
	15	DUMOND	surf at Victoria Beach adjacent to drain outlet	OCPW	outlet	year-round	once/week	outlet	year-round	once/week
	16	*S14*	*surf at Victoria Beach*	*SOCWA (ACOO) & OCHCA*	*fixed*	*year-round*	*twice/week*	*this station would be combined with DUMOND*		
	17	*S13*	*surf at Blue Lagoon Beach*	*SOCWA (ACOO) & OCHCA*	*fixed*	*year-round*	*twice/week*	*this station would be combined with BLULGN*		
	18	BLULGN	surf at Blue Lagoon Beach adjacent to drain outlet	OCPW	outlet	year-round	once/week	outlet	year-round	once/week

Figure A-5-2
Sampling Stations: South Laguna and Dana Point

Table A-5-2
Sampling Stations: South Laguna and Dana Point

Area		Sampling Station Identification	Sampling Station Location	Existing Programs				Recommended Unified Program		
				Program(s)	Sampling Station Type	Sampling Season	Minimum Sampling Frequency	Sampling Station Type	Sampling Season	Minimum Sampling Frequency
South Laguna	19	S12	surf at Goff Island Beach	SOCWA (ACOO) & OCHCA	fixed	year-round	twice/week	fixed	year-round	once/week
	20	S11	surf at Treasure Island Beach	SOCWA (ACOO) & OCHCA	fixed	year-round	twice/week	fixed	year-round	once/week
	21	S10	surf at Aliso Beach adjacent to pedestrian bridge up-coast from Aliso Creek	SOCWA (ACOO) & OCHCA	fixed	year-round	twice/week	fixed	year-round	once/week
	22	ACM1	surf at Aliso Beach at Aliso Creek mouth	OCPW	outlet	year-round	once/week	outlet	year-round	once/week
	23	S9	surf at Aliso Beach adjacent to parking lot down-coast from Aliso Creek	SOCWA (ACOO) & OCHCA	fixed	year-round	twice/week	fixed	year-round	once/week
	24	S8	surf at Aliso Beach near down-coast end	SOCWA (ACOO) & OCHCA	fixed	year-round	twice/week	fixed	year-round	once/week
	25	S7	surf at Camel Point Beach	SOCWA (ACOO) & OCHCA	fixed	year-round	twice/week	fixed	year-round	once/week
	26	WEST	surf at West Street beach adjacent to drain outlet	OCPW	outlet	year-round	once/week	outlet	year-round	once/week
	27	S6	surf at Table Rock Beach	SOCWA (ACOO) & OCHCA	fixed	year-round	twice/week	fixed	year-round	once/week
	28	S5	surf at Laguna Lido Beach	SOCWA (ACOO) & OCHCA	fixed	year-round	twice/week	fixed	year-round	once/week
	29	S4	surf at 1000 Steps Beach	SOCWA (ACOO) & OCHCA	fixed	year-round	twice/week	fixed	year-round	once/week
	30	S3	surf at Mussel Cove Beach, Three Arch Bay	SOCWA (ACOO) & OCHCA	fixed	year-round	twice/week	fixed	year-round	once/week
Dana Point	*31*	*OSL25*	*surf at Monarch Beach, up-coast end*	*OCHCA*	*fixed*	*April-October*	*once/week*	*this station would be combined with SCM1*		
	32	SCM1	surf at Monarch Beach at Salt Creek mouth	OCPW	outlet	year-round	once/week	outlet	year-round	once/week
	33	S2	surf at Salt Creek Beach down-coast from Salt Creek	SOCWA (ACOO) & OCHCA		year-round	twice/week	fixed	year-round	once/week
	34	S1	surf at Dana Strands Beach	SOCWA (ACOO) & OCHCA	fixed	year-round	twice/week	fixed	year-round	once/week
	35	S-6	surf at Marine Science Institute Beach, outside and just west of Dana Point Harbor breakwater	SOCWA (SJCOO) & OCHCA	fixed	May-October	twice/week	fixed	year-round	once/week
						November-April	once/week			

Figure A-5-3
Sampling Stations: Dana Point Harbor

Table A-5-3
Sampling Stations: Dana Point Harbor

Area		Sampling Station Identification	Sampling Station Location	Existing Programs				Recommended Unified Program		
				Program(s)	Sampling Station Type	Sampling Season	Minimum Sampling Frequency	Sampling Station Type	Sampling Season	Minimum Sampling Frequency
Dana Point Harbor	36	BDP16	Dana Point Harbor Pilgrim Dock	OCHCA	fixed	April-October	once/week	fixed	year-round	once/week
	37	BDP08	Dana Point Harbor pier	OCHCA	fixed	April-October	once/week	fixed	year-round	once/week
	38	BDP12	Dana Point Harbor Baby Beach, west end	OCHCA	fixed	April-October	once/week	fixed	year-round	once/week
	39	BDP13	Dana Point Harbor Baby Beach, buoy line	OCHCA	fixed	April-October	once/week	fixed	year-round	once/week
	40	BDP14	Dana Point Harbor Baby Beach, swim area	OCHCA	fixed	April-October	once/week	fixed	year-round	once/week
	41	BDP15	Dana Point Harbor Baby Beach, east end	OCHCA	fixed	April-October	once/week	fixed	year-round	once/week
	42	BDP17	Dana Point Harbor Youth Dock	OCHCA	fixed	April-October	once/week	fixed	year-round	once/week
	43	MDP11	Dana Point Harbor Guest Dock (West Basin)	OCHCA	fixed	April-October	once/week	fixed	year-round	once/week
	44	MDP18	Dana Point Harbor "M" Dock (East Basin)	OCHCA	fixed	April-October	once/week	fixed	year-round	once/week
	45	MDP10	Dana Point Harbor Harbor Patrol Dock (East Basin)	OCHCA	fixed	April-October	once/week	fixed	year-round	once/week
	46	BDP07	Dana Point Harbor Fuel Dock	OCHCA	fixed	April-October	once/week	fixed	year-round	once/week

Figure A-5-4
Sampling Stations: Doheny State Beach

Table A-5-4
Sampling Stations: Doheny State Beach

Area		Sampling Station Identification	Sampling Station Location	Existing Programs				Recommended Unified Program		
				Program(s)	Sampling Station Type	Sampling Season	Minimum Sampling Frequency	Sampling Station Type	Sampling Season	Minimum Sampling Frequency
Doheny State Beach	47	DSB 5	surf at Doheny State Beach at "North Creek" outlet	OCPW	outlet	year-round	once/week	outlet	year-round	once/week
	48	*ODB02*	*surf at Doheny State Beach outside and just east of Dana Point Harbor jetty*	*OCHCA*	*fixed*	*April-October*	*once/week*	*this station would be combined with DSB 5*		
	49	S-2	surf at Doheny State Beach, midway between Dana Point Harbor jetty and San Juan Creek	SOCWA (SJCOO) & OCHCA	fixed	May-October	twice/week	fixed	year-round	once/week
						November-April	once/week			
	50	SJC1	surf at Doheny State Beach at San Juan Creek mouth	OCPW	outlet	year-round	once/week	outlet	year-round	once/week
	51	*C-2*	*in San Juan Creek above SOCWA Latham treatment plant*	*SOCWA (SJCOO)*	*in-stream*	*May-October*	*twice/week (when flowing)*	*this station would not be included in the unified program*		
						November-April	*once/week (when flowing)*			
	52	*C-1*	*in San Juan Creek cross-beach flow*	*SOCWA (SJCOO)*	*in-stream*	*May-October*	*twice/week (when flowing)*	*this station would not be included in the unified program*		
						November-April	*once/week (when flowing)*			
	53	S-0	surf at Doheny State Beach adjacent to the down-coast side of the San Juan Creek mouth pond area	SOCWA (SJCOO) & OCHCA	fixed	May-October	twice/week	fixed	year-round	once/week
						November-April	once/week			
	54	*ODB05*	*surf at Doheny State Beach adjacent to the fence between San Juan Creek and the up-coast end of the campground area*	*OCHCA*	*fixed*	*April-October*	*once/week*	*this station would be combined with S-0*		
	55	S-1	surf at Doheny State Beach adjacent to the down-coast end of the campground area	SOCWA (SJCOO) & OCHCA	fixed	May-October	twice/week	fixed	year-round	once/week
						November-April	once/week			
	56	DSB 4	surf at Doheny State Beach adjacent to the drain outlet next to the south day use area restrooms that are closest to the campground area	OCPW	outlet	year-round	once/week	outlet	year-round	once/week
	57	S-3	surf at Doheny State Beach adjacent to the south day use area restrooms that are closest to the campground area	SOCWA (SJCOO) & OCHCA	fixed	May-October	twice/week	fixed	year-round	once/week
						November-April	once/week			
	58	S-5	surf at Doheny State Beach adjacent to the pedestrian bridge	SOCWA (SJCOO) & OCHCA	fixed	May-October	twice/week	fixed	year-round	once/week
						November-April	once/week			
	59	DSB 1	surf at Doheny State Beach adjacent to the first drain outlet up-coast of the down-coast boundary of the state beach	OCPW	outlet	year-round	once/week	outlet	year-round	once/week
	60	*S-7*	*surf at Doheny State Beach adjacent to the palm trees near the down-coast boundary of the state beach*	*SOCWA (SJCOO)*	*fixed*	*May-October*	*twice/week*	*this station would be combined with DSB 1*		
						November-April	*once/week*			

Figure A-5-5
Sampling Stations: Capistrano Beach

Table A-5-5
Sampling Stations: Capistrano Beach

Area		Sampling Station Identification	Sampling Station Location	Existing Programs				Recommended Unified Program		
				Program(s)	Sampling Station Type	Sampling Season	Minimum Sampling Frequency	Sampling Station Type	Sampling Season	Minimum Sampling Frequency
Capistrano Beach	61	S-9	surf at Capistrano Beach County Park adjacent to the guard shack at the entrance to the park	SOCWA (SJCOO) & OCHCA	fixed	May-October	twice/week	fixed	year-round	once/week
						November-April	once/week			
	62	CSBMP1	surf at Capistrano Beach County Park adjacent to the drain outlet just down-coast from basketball court	OCPW	outlet	year-round	once/week	outlet	year-round	once/week
	63	CSBBR1	surf adjacent to the first drain outlet down-coast from the down-coast boundary of Capistrano Beach County Park	OCPW	outlet	year-round	once/week	outlet	year-round	once/week
	64	S-11	surf adjacent to the home at 35197 Beach Road	SOCWA (SJCOO) & OCHCA	fixed	May-October	twice/week	fixed	year-round	once/week
						November-April	once/week			
	65	S-13	surf adjacent to the home at 35535 Beach Road	SOCWA (SJCOO) & OCHCA	fixed	May-October	twice/week	fixed	year-round	once/week
						November-April	once/week			

Figure A-5-6
Sampling Stations: San Clemente

Table A-5-6
Sampling Stations: San Clemente

Area		Sampling Station Identification	Sampling Station Location	Existing Programs				Recommended Unified Program		
				Program(s)	Sampling Station Type	Sampling Season	Minimum Sampling Frequency	Sampling Station Type	Sampling Season	Minimum Sampling Frequency
San Clemente	66	POCHE	surf at Poche Beach adjacent to drain outlet	OCPW	outlet	year-round	once/week	outlet	year-round	once/week
	67	S-15	surf at Poche Beach near drain outlet	SOCWA (SJCOO) & OCHCA	fixed	May-October	twice/week	fixed	year-round	once/week
						November-April	once/week			
	68	SCCS52	surf adjacent to drain outlet, Capistrano Shores up-coast	OCPW	outlet	year-round	once/week	outlet	year-round	once/week
	69	SCCS17	surf adjacent to drain outlet, Capistrano Shores down-coast	OCPW	outlet	year-round	once/week	outlet	year-round	once/week
	70	PICO	surf adjacent to Pico Drain outlet	OCPW	outlet	year-round	once/week	outlet	year-round	once/week
	71	S-17	surf adjacent to the concession stand across the RR tracks from Ole Hanson Beach Club	SOCWA (SJCOO) & OCHCA	fixed	May-October	twice/week	fixed	year-round	once/week
						November-April	once/week			
	72	MARIPO	surf adjacent to Mariposa drain outlet	OCPW	outlet	year-round	once/week	outlet	year-round	once/week
	73	LINDAL	surf adjacent to Linda Lane drain outlet	OCPW	outlet	year-round	once/week	outlet	year-round	once/week
	74	S-19	surf adjacent to lifeguard headquarters up-coast from San Clemente Pier	SOCWA (SJCOO) & OCHCA	fixed	May-October	twice/week	fixed	year-round	once/week
						November-April	once/week			
	75	PIER	surf adjacent to the drain outlet at San Clemente Pier	OCPW	outlet	year-round	once/week	outlet	year-round	once/week
	76	TRFCYN	surf adjacent to Trafalgar Canyon outlet	OCPW	outlet	year-round	once/week	outlet	year-round	once/week
	77	*OSC01*	*surf near Trafalgar Canyon outlet*	*OCHCA*	*fixed*	*April-October*	*once/week*	*this station would be combined with TRFCYN*		
	78	LADERA	surf adjacent to Ladera drain outlet	OCPW		year-round	once/week	outlet	year-round	once/week
	79	RIVERA	surf adjacent to the drain outlet across the RR tracks from the up-coast end of Plaza la Playa	OCPW		year-round	once/week	outlet	year-round	once/week
	80	S-21	surf at San Clemente State Beach across the RR tracks from the parking lot at the end of Avenida Calafia	SOCWA (SJCOO) & OCHCA	fixed	May-October	twice/week	fixed	year-round	once/week
						November-April	once/week			
	81	S-23	surf across the RR tracks from the bottom of the access road extending from the end of Avenida de las Palmeras	SOCWA (SJCOO) & OCHCA	fixed	May-October	twice/week	fixed	year-round	once/week
						November-April	once/week			

Attachment

Attachment 1
"A Collaborative, Integrated, Regional Ocean Water Quality Monitoring Program for Orange County"
(May 13, 2010)

A Collaborative, Integrated, Regional Ocean Water Quality Monitoring Program for Orange County

County of Orange Health Care Agency

May 13, 2010

Background

Orange County's coastal ocean waters are an important integral part of the county's lifestyle and a significant economic asset. Over the last 40 years, ocean water quality monitoring has successfully provided assurances to the public that recreational ocean waters meet appropriate health related standards for swimming, surfing, and diving. Through a collaborative monitoring program with several regional wastewater agencies, the Health Care Agency has been responsible for protecting the public from exposure to ocean and bay waters that may be contaminated with sewage or cause illness.

Currently, four separate public agencies conduct microbial ocean water quality monitoring along 42 miles of open coastline and 72 miles of harbor and bay frontage under various discharge permit requirements or statutory mandates. Annually, the four agencies collect over 15,000 samples and perform over 40,000 individual analyses. Historically, National Pollutant Discharge Elimination System (NPDES) permit requirements including monitoring locations, frequencies, types of microbial analyses and reporting criteria, have been established without regard to an integration of regional monitoring needs. In some cases this has created redundancy and a less than effective use of limited resources to address public health protection and permit compliance. Legacy compliance monitoring for the NPDES POTW permits date back over 40 years. Recent iterations of the NPDES MS4 storm water permits have focused on the microbial water quality of non-point source urban runoff. Microbial monitoring is utilized to assess potential public health impacts associated with point and non-point source discharges.

The uncertainty of state funding for local health programs coupled with upcoming NPDES POTW and MS4 permit renewals provides an opportunity to design a collaborative and integrated ocean water quality monitoring program that meets long-term public health and permit compliance needs.

Proposed Plan

The proposed plan is to establish a collaborative and integrated regional monitoring program through enhanced partnerships with other public agencies who currently sample ocean and bay waters for regulatory purposes. This will provide a more efficient and effective way to leverage limited monitoring resources and sampling results while increasing the current level of public health protection for recreational water users. This conceptual regional monitoring program has been presented to, and endorsed by, the State Water Resources Control Board.

By eliminating current redundancies and integrating all ocean and bay coastal microbial monitoring being conducted by HCA/Environmental Health (HCA), Orange County Sanitation District (OCSD), South Orange County Wastewater Authority (SOCWA) and OC Public Works (OC Watersheds), it will create a sustainable recreational ocean water quality monitoring program, satisfy regulatory compliance requirements and benefit public health.

Criteria Used in Developing Multi-Agency Regional Monitoring Program

On August 25, 2009 representatives from the four separate public agencies that conduct microbial ocean water quality monitoring in Orange County met and conceptually agreed to collaborate on establishing an integrated regional monitoring program for the region. Because of limited resource availability, representatives from HCA, OCSD, SOCWA and OC Watersheds agreed that a viable multi-agency regional monitoring program would have to focus on meeting three primary objectives. The regional monitoring program would have to:

1. Maintain existing regulatory compliance and public health monitoring locations;
2. Consolidate redundant and overlapping sampling stations; and
3. Establish and maintain a level of coastal monitoring that provides the appropriate balance between regulatory compliance and public health protection.

To meet these objectives, agency representatives agreed to use the following criteria in designing a regional monitoring program:

- Agency collaboration will be based on public health protection and equitable resource sharing using current resource availability and not based on a prescribed formula or by a financial arrangement.
- The regional monitoring being proposed is strictly the routine weekly shoreline monitoring currently being conducted by each agency and does not include sampling for special studies, research, adaptive sampling, and/or storm sampling.
- The focus of collecting shoreline samples will be to satisfy the bacteriological water quality monitoring requirements of each public agency while protecting public health.
- Coastal monitoring stations that are considered individual and unique locations for regulatory compliance or public health purposes will be preserved.
- Subject to Regional Water Quality Control Board (RWQCB) approval, NPDES POTW and MS4 coastal monitoring stations located within close proximity to each other will be reconciled and consolidated if there is no statistically significant difference between the monitoring stations based on analyses of historical water quality sampling data.
- A minimum of one bacteriological sample will be collected at each coastal sampling station.
- The minimum sampling frequency at each coastal sampling station will be 1x/week, year round.
- The minimum sampling frequency will be increased at the coastal sampling stations considered to have an elevated public health risk.
- HCA will continue to collect weekly bacteriological water samples year-round at all harbor and bay monitoring stations.
- Current samples collected at storm drain, creek and river monitoring stations that are not used for regulatory compliance or public health purposes will be discontinued.
- Samples collected by each agency will be analyzed for total coliform, fecal coliform and enterococcus using approved laboratory test methods.
- Sample results will be provided to each agency by e-mail in the current format used by the laboratory providing analysis.
- It will be the responsibility of HCA to conduct recheck and/or confirmation sampling to determine compliance with State Ocean Water-Contact Sport Standards (AB411).

- An annual review of data will be conducted to assess and adjust monitoring location sampling frequencies based on an evaluation of the rolling 30-day geometric mean standard exceedance rates and the single sample standard exceedance rates.
- Upon agreement by the four public agencies on the conceptual design of a regional monitoring program, stakeholder groups will be invited to participate in the development of the program.
- Prior to implementation of a regional monitoring program, a detailed work plan of the specific monitoring responsibilities of each agency will be put into place which has been agreed upon and approved by each of the participating agencies.
- Upon implementation of a regional ocean water quality monitoring program, the four public agencies have agreed to establish regular meetings to review and discuss regional monitoring program operations, regulatory compliance and public health issues along with program effectiveness and efficiency. Stakeholder groups will be invited to attend and participate in the regional monitoring program regular meetings.

Proposed Regional Monitoring Program

Sample Stations to be Discontinued

A review of all current coastal monitoring locations was conducted with representatives from HCA, OCSD, SOCWA and OC Watersheds to identify monitoring locations where bacteriological samples are being collected but are not required for regulatory compliance purposes. It was agreed that monitoring these sampling stations should be discontinued and make preserving the regulatory compliance and public health monitoring locations a priority. The following table (Table 1) lists the specific sampling stations which will be discontinued. The stations listed in the table are monitoring locations which are not required to be sampled for regulatory compliance or public health purposes by any of the participating agencies.

Table 1 - Sample Stations to be Discontinued

Sampling Agency
HCA
OCSD

Station	Location
CSGRM	San Gabriel River @ Marina Dr.
CSGR1	San Gabriel River @ 1st Street
CBCW1	Bolsa Chica Wetlands Channel
SAR-N	Santa Ana River - North
SAR-S	Santa Ana River - South
CNBPM	Pelican Point Middle Creek
CNBCC	Crystal Cove Creek
CNBCU	Crystal Cove Creek Upstream
CNBEU	El Moro Upstream

Sample Stations to be Consolidated

A multi-agency review of coastal monitoring locations was conducted and redundant and overlapping sampling stations were identified for potential consolidation. A determination was made to consolidate two agency sampling stations if they were located within 25 yards distance of another and exhibit a less than 5% exceeded rate for all AB 411 single sample standards for the five year AB 411 period (April 1 – October 31) from 2005 – 2009. A listing of all AB 411 monitoring locations and the 5-year dry weather single sample standard exceedance rate for total coliform, fecal coliform and enterococcus is provided in Appendix A.

The following table (Table 2) lists the agency sampling stations which would be consolidated under these conditions.

Table 2 – Sample Stations to be Consolidated

Sampling Agency
OC Watersheds
HCA
SOCWA

Station	Location
BGC / ONB31	Little Corona Beach
PPC / ONB35	Pelican Point Beach
MDC / ONB43	Muddy Beach
ELMORO / ONB45	El Moro Beach
EMRLD / OLB10	Emerald Bay
MAINBC / OLB00	Laguna Main Beach
VICTRA / S16	Hotel Laguna
BLUBRD / S15	Bluebird Canyon
DUMOND / S14	Victoria Beach
BLULG / S13	Blue Lagoon
TRFCYN / OSC01	Trafalgar Canyon

In addition, coastal receiving waters fecal indicator bacteria data were statistically evaluated to assess the feasibility of consolidating sampling efforts for monitoring locations which exhibited a greater than 5% exceeded rate for any of the AB 411 standards. Consolidation analyses was performed for a select number of candidate monitoring stations that were determined to have redundant sampling efforts by two or more agencies at sampling stations located within 200 yards distance of another agency and exhibit a greater than 5% AB 411 exceedance rate from 2005 - 2009. The specific analysis used for the consolidation of these candidate monitoring stations and case examples are provided in Appendix B. The following table (Table 3) lists the sampling stations which would be consolidated under these conditions.

Table 3 - Sample Stations to be Consolidated

Sampling Agency
OC Watersheds
HCA
SOCWA

Station	Location
DSB5 / ODB02	North Beach (Doheny)
SJC1 / C1	San Juan Creek
S-0 / ODB05	San Juan Creek Ocean Interface
DSB 4 / S-1	~1000 Feet South of Outfall (Doheny)
DSB 1 / S-7	~4000 Feet South of Outfall (Doheny)

Monitoring Location Sampling Frequency

A review of NPDES POTW and MS4 permits show that the frequency of shoreline bacteriological monitoring required by each agency is inconsistent and varies widely between monitoring locations and by sampling agencies. To establish and maintain a level of coastal monitoring that provides the appropriate balance between regulatory compliance and public health protection it was determined by the participating agencies that monitoring location sampling frequencies should be consistent and based on a public health approach.

In December 2009, the Monitoring and Reporting (M&R) Subcommittee of the Southern California Beach Water Quality Workgroup (BWQW) developed a set of Model Monitoring Matrices identifying three sampling protocols that would be used to protect public health at a series of different types of beaches (Appendix C). The matrices establish a minimum weekly sampling frequency at high, medium and low use beaches based on potential health risks associated with the beach location. The matrices are structured to provide the highest level of

public health protection by offering sampling protocols to local health agencies based on multiple agency participation and resource availability. To provide the highest level of public health protection with current agency participation and resource availability, the regional monitoring program would implement a modified "Preferred Monitoring Matrix" sampling protocol.

Although the Preferred Monitoring Matrix sampling protocol provides that no weekly samples are to be collected at some medium and low use beaches, the participating agencies for the regional monitoring program agree to establish and maintain a minimum sampling frequency of one bacteriological sample being collected 1x/week, year round at each of the proposed coastal sampling stations due to year round recreational water use. In addition, the minimum sampling frequency would be increased to 2x/week at each of the proposed coastal sampling stations considered to have an elevated public health risk and increased to 3x/week at each of the proposed coastal sampling stations considered to have a chronic public health risk. The M&R Subcommittee determined that beaches with sampling stations that exhibit a 5% or greater exceedance rate for any of the AB 411 single sample standards during the most recent 5-year AB 411 period would be considered to have an elevated public health risk and sampling stations that exhibit a 15% or greater exceedance rate for any of the AB 411 single sample standards during the most recent 5-year AB 411 period would be considered to have a chronic public health risk. A list of all AB 411 monitoring locations and their 5-year single sample exceedance rates are provided in Appendix A.

Using a modified Preferred Monitoring Matrix sampling protocol and the AB 411 single sample standards exceedance rates in Appendix A, the minimum sampling frequency would be increased from 1x/week to 2x/week at the monitoring locations listed in Table 4 and 3x/week at the monitoring locations listed in Table 5. All other monitoring locations would be sampled 1x/week.

Table 4 – Monitoring Locations to be Sampled 2x/Week

Sampling Agency
HCA
OCSD
SOCWA

Station	Location
OSB02	1st Street
9N	Newland Street
6N	Magnolia Street
3N	Brookhurst Street
0	Santa Ana River Mouth
OSL25	Monarch Beach
S-2	Mid North Beach (Doheny)
S-1	1000 Feet S. of Outfall (Doheny)
S-3	2000 Feet S. of Outfall (Doheny)
S-5	3000 Feet S. of Outfall (Doheny)
S-9	5000 Feet S. of Outfall (Capistrano)
S-11	7500 Feet S. of Outfall (Capistrano)
S-13	10000 Feet S. of Outfall (Capistrano)

Table 5 – Monitoring Locations to be Sampled 3x/Week

Station	Location
ODB02	North Beach (Doheny)
S-0	SJC / Ocean Interface (Doheny)
S-15	14000 Feet S. of Outfall (Poche)

Agency Collaboration and Integration

A collaborative and integrated regional monitoring program that meets the criteria listed above and has been endorsed by the four participating public agencies that conduct ocean water quality monitoring in Orange County. Each agency has agreed to share the costs and resources that would be required to collect and analyze samples at all the proposed NPDES POTW and MS4 regulatory compliance monitoring stations. In addition, the participating agencies have agreed to share costs and resources to maintain all individual and unique coastal monitoring stations that are used for AB 411 compliance purposes only.

By collaborating and integrating all ocean and bay coastal microbial monitoring being conducted by HCA, OCSD, SOCWA and OC Watersheds, it creates a functional coastal ocean water quality monitoring program that can satisfy regulatory compliance requirements and benefit public health. The planned agency partnership will result in a sustainable regional monitoring program that provides a more efficient and effective way to leverage limited monitoring resources and is critical for maintaining the current level of public health protection to recreational water users in Orange County. This draft proposal seeks to integrate NPDES POTW permit, MS4 permit and AB 411 shoreline monitoring to establish and maintain a level of coastal monitoring that provides an appropriate balance between regulatory compliance and public health protection which will be endorsed by the public, stakeholder groups and regulatory agencies.

Current and Proposed Sampling Locations

The current and proposed sampling stations, monitoring locations and sampling frequencies conducted by each agency are provided in following tables which are organized by geographical area and color-coded by sampling agency and sampling frequency.

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North County Monitoring Stations (Seal Beach – Crystal Cove)

Current

SEAL BEACH / SURFSIDE / SUNSET BEACH	
Station / Agency	**Location / Frequency**
CSGRM	San Gabriel River @ Marina Dr.
CSGR1	San Gabriel River @ 1st Street
OSB02	1st Street
OSB03	8th Street
OSB05	100 Yards South of Pier
OSB04	14th Street
OSB01	Sea Way
OSUB1	Broadway
BOLSA CHICA / HUNTINGTON / NEWPORT	
39N	Bolsa Chica Beach
33N	Bolsa Chica Reserve
CBCW1	Bolsa Chica Wetlands Channel
27N	Bluffs
HB1	PCH & Goldenwest St
HB2	PCH & 22nd St.
HB3	PCH & 20th St
21N	17th Street
HB4	PCH & 13th St.
HB5	PCH & 6th St.
15N	Jacks Snack Bar
12N	Beach Blvd.
9N	Newland Street
6N	Magnolia Street
3N	Brookhurst Street
0	Santa Ana River Mouth
SAR-N	Santa Ana River - North
SAR-S	Santa Ana River - South
3S	Orange Street
6S	52nd / 53rd Street
9S	38th Street
15S	15th / 16th Street
21S	Balboa Pier
27S	The Wedge
29S	Corona Del Mar Beach
ONB31	Little Corona Beach
BGC	Buck Gully Creek
CRYSTAL COVE	
ONB35	Pelican Point
PPC	Pelican Point Creek
CNBPP	Pelican Point Creek
39S	Crystal Cove - Pelican Point
CNBPM	Pelican Point Middle Creek
WFC	Pelican Hill Waterfall
CNBPW	Pelican Hill Waterfall
ONB39	Crystal Cove – Los Trancos
CNBCC	Crystal Cove Creek
CNBCU	Crystal Cove Creek Upstream
MDC	Muddy Creek
CNBMC	Muddy Creek
ONB43	Muddy Beach
ELMORO	El Moro Creek
CNB45	El Moro Creek
ONB45	El Moro Beach
CNBEU	El Moro Upstream

Proposed

SEAL BEACH / SURFSIDE / SUNSET BEACH	
Station / Agency	**Location / Frequency**
OSB02	1st Street
OSB03	8th Street
OSB05	100 Yards South of Pier
OSB04	14th Street
OSB01	Sea Way
OSUB1	Broadway
BOLSA CHICA / HUNTINGTON / NEWPORT	
39N	Bolsa Chica Beach
33N	Bolsa Chica Reserve
27N	Bluffs
HB1	PCH & Goldenwest St
HB2	PCH & 22nd St.
HB3	PCH & 20th St
21N	17th Street
HB4	PCH & 13th St.
HB5	PCH & 6th St.
15N	Jacks Snack Bar
12N	Beach Blvd.
9N	Newland Street
6N	Magnolia Street
3N	Brookhurst Street
0	Santa Ana River Mouth
SAR-N	Santa Ana River - North
SAR-S	Santa Ana River - South
3S	Orange Street
6S	52nd / 53rd Street
9S	38th Street
15S	15th / 16th Street
21S	Balboa Pier
27S	The Wedge
29S	Corona Del Mar Beach
BGC	Little Corona Beach / Buck Gully Creek
CRYSTAL COVE	
PPC	Pelican Point Beach / Pelican Point Creek
39S	Crystal Cove - Pelican Point
WFC	Pelican Hill Waterfall
ONB39	Crystal Cove – Los Trancos
MDC	Muddy Creek Beach / Muddy Creek
ELMORO	El Moro Beach / El Moro Creek

Sampling Agency
OCSD
HCA
OC Watersheds

Sampling Frequency
1 bacteriological sample - 1x / week
1 bacteriological sample - 2x / week
1 bacteriological sample - 5x / week
If creek / storm drain flowing to ocean: 3 bacteriological samples – 1x /week, also temperature reading and flow rate estimation. **If creek / storm drain *not* flowing to ocean:** 1 bacteriological sample - 1x / week

South County Monitoring Stations (Laguna Beach – Dana Point)

Current

LAGUNA BEACH	
Station / Agency	**Location / Frequency**
EMRLD	Emerald Bay Drain
CLBEB	Emerald Bay Drain
OLB10	Emerald Bay Beach
OLB05	Crescent Bay Beach
HEISLR	Cliff Drive
OLB00	Laguna Main Beach
MAINBC	Broadway Creek
CLBBC	Broadway Creek
VICTRA	Hotel Laguna
S16	Hotel Laguna
CLEO	Cleo St.
BLUBRD	Bluebird Canyon
S15	Bluebird Canyon
PEARL	Pearl Street
DUMOND	Victoria Beach
S14	Victoria Beach
BLULGN	Blue Lagoon
S13	Blue Lagoon
S12	Goff Island Beach
S11	Treasure Island Beach
S10	Aliso Beach - North
ACM1	Aliso Creek
S9	Aliso Beach – Middle
S8	Aliso Beach - South
S7	Camel Point
WEST	West St.
S6	Table Rock
S5	Laguna Lido
S4	9th Street / 1000 Steps Beach
S3	Three Arch Bay
DANA POINT	
OSL25	Monarch Beach
SCM1	Salt Creek
CSLSC	Salt Creek
S2	Salt Creek Beach
S1	Dana Strands
S-6	Ocean Institute Beach
S-4	Dana Point Harbor Entrance

Proposed

LAGUNA BEACH	
Station / Agency	**Location / Frequency**
EMRLD	Emerald Bay Drain / Emerald Beach
OLB05	Crescent Bay Beach
HEISLR	Cliff Drive
MAINBC	Broadway Creek / Laguna Main Beach
VICTRA	Hotel Laguna / S16
CLEO	Cleo St.
BLUBRD	Bluebird Canyon / S15
PEARL	Pearl Street
DUMOND	Victoria Beach / S14
BLULGN	Blue Lagoon / S13
S12	Goff Island Beach
S11	Treasure Island Beach
S10	Aliso Beach - North
ACM1	Aliso Creek
S9	Aliso Beach - Middle
S8	Aliso Beach - South
S7	Camel Point
WEST	West St.
S6	Table Rock
S5	Laguna Lido
S4	9th Street / 1000 Steps Beach
S3	Three Arch Bay
DANA POINT	
OSL25	Monarch Beach
SCM1	Salt Creek
S2	Salt Creek Beach
S1	Dana Strands
S-6	Ocean Institute Beach
S-4	Dana Point Harbor Entrance

Sampling Agency
HCA
OC Watersheds
SOCWA

Sampling Frequency
1 bacteriological sample - 1x / week
1 bacteriological sample - 2x / week
If creek / storm drain flowing to ocean: 3 bacteriological samples – 1x /week, also temperature reading and flow rate estimation. **If creek / storm drain *not* flowing to ocean:** 1 bacteriological sample - 1x / week
May 1 – October 31: 1 bacteriological sample - 2x / week **November 1 - April 30:** 1 bacteriological sample - 1x / week

South County Monitoring Stations (Doheny State Beach – San Clemente)

Current

DOHENY STATE BEACH	
Station / Agency	**Location / Frequency**
CDBNC	North Beach Creek
DSB5	North Beach Creek
ODB02	North Beach - Doheny
S-2	Mid North Beach
S-0	San Juan Creek / Ocean Interface
SJC1	San Juan Creek
C-1	San Juan Creek Mouth
C-2	San Juan Creek - North
ODB05	Doheny 250' S. SJC
S-1	1000 Feet South of Outfall
DSB 4	~1000 Feet South of Outfall
S-3	2000 Feet South of Outfall
S-5	3000 Feet South of Outfall
S-7	4000 Feet South of Outfall
DSB 1	~4000 Feet South of Outfall
CAPISTRANO BEACH	
S-9	5000 Feet South of Outfall
CSBMP1	~4500 Feet South of Outfall
CSBBR1	~5500 Feet South of Outfall
S-11	7500 Feet South of Outfall
S-13	10000 Feet South of Outfall
SAN CLEMENTE	
S-15	14000 Feet South of Outfall
POCHE	Poche Creek
SCCS52	Capistrano Shores
SCCS17	Capistrano Shores
PICO	Pico Drain
S-17	20000 Feet South of Outfall
MARIPO	Mariposa
LINDAL	Linda Lane
S-19	450 Feet North of Pier
PIER	San Clemente Pier
OSC01	T Street Bridge
TRFCYN	Trafalgar Canyon
LADERA	Ladera
RIVERA	Riveria
S-21	Avenida Calafia
S-23	Las Palmeras

Proposed

DOHENY STATE BEACH	
Station / Agency	**Location / Frequency**
ODB02	North Beach
DSB5	North Beach Creek
S-2	Mid North Beach
SJC1	San Juan Creek / C1
S-0	SJ Creek Ocean Interface / ODB05
C-2	San Juan Creek - North
S-1	1000 Feet South of Outfall
DSB 4	~1000 Feet South of Outfall
S-3	2000 Feet South of Outfall
S-5	3000 Feet South of Outfall
DSB 1	~4000 Feet South of Outfall / S-7
CAPISTRANO BEACH	
CSBMP1	~4500 Feet South of Outfall
S-9	5000 Feet South of Outfall
CSBBR1	~5500 Feet South of Outfall
S-11	7500 Feet South of Outfall
S-13	10000 Feet South of Outfall
SAN CLEMENTE	
S-15	14000 Feet South of Outfall
POCHE	Poche Creek
SCCS52	Capistrano Shores
SCCS17	Capistrano Shores
PICO	Pico Drain
S-17	20000 Feet South of Outfall
MARIPO	Mariposa
LINDAL	Linda Lane
PIER	San Clemente Pier
S-19	450 Feet North of Pier
TRFCYN	Trafalgar Canyon / OSC01
LADERA	Ladera
RIVERA	Riveria
S-21	Avenida Calafia
S-23	Las Palmeras

Sampling Agency
HCA
OC Watersheds
SOCWA

Sampling Frequency
1 bacteriological sample - 1x / week
1 bacteriological sample - 2x / week
If creek / storm drain flowing to ocean: 3 bacteriological samples – 1x /week, also temperature reading and flow rate estimation. **If creek / storm drain *not* flowing to ocean:** 1 bacteriological sample - 1x / week
May 1 – October 31: 1 bacteriological sample - 2x / week **November 1 - April 30:** 1 bacteriological sample - 1x / week

Appendix A

County of Orange Health Care Agency/Environmental Health
AB 411 Period - Dry Weather Single Sample Standard Exceedance Rate for Total Coliform, Fecal Coliform and Enterococcus
2005 - 2009

Station	Monitoring Location	% Exceeds	Station	Monitoring Location	% Exceeds	Station	Monitoring Location	% Exceeds
Seal Beach / Surfside / Sunset Beach			**Laguna Beach**			**Capistrano Beach**		
OSB02	1st Street	**8.6%**	OLB10	Emerald Bay	1.4%	S-9	5000 Feet S. of Outfall	**5.0%**
OSB03	8th Street	2.8%	OLB05	Crescent Bay Beach	0.0%	S-11	7500 Feet S. of Outfall .	**5.0%**
OSB05	100 Yards South of Pier	2.8%	OLB00	Laguna Main Beach	0.0%	S-13	10000 Feet S. of Outfall	**5.4%**
OSB04	14th Street	0.7%	S16	Hotel Laguna	0.7%	**San Clemente**		
OSB01	Sea Way	0.0%	S15	Bluebird Canyon	1.7%	S-15	14000 Feet S. of Outfall	**37.7%**
OSUB1	Broadway	0.0%	S14	Victoria Beach	1.4%	S-17	20000 Feet S. of Outfall	3.2%
Bolsa Chica State Beach			S13	Blue Lagoon	0.7%	S-19	450 Feet North of Pier	2.6%
39N	Parking Area #20	0.4%	S12	Goff Island Beach	1.4%	OSC01	Trafalgar "T" Street	0.7%
33N	Parking Area #14	1.8%	S11	Treasure Island Beach	0.0%	S-21	Avenida Califia	1.1%
Huntington City & State Beach			S10	Aliso Beach - North	0.7%	S-23	Las Palmeras	0.7%
27N	Bluffs	1.6%	S9	Aliso Beach - Middle	3.0%			
21N	17th Street	0.1%	S8	Aliso Beach - South	0.3%			
15N	Jacks Snack Bar	0.8%	S7	Camel Point	0.7%			
12N	Beach Blvd.	1.5%	S6	Table Rock	0.3%			
9N	Newland Street	**7.0%**	S5	Laguna Lido	0.0%			
6N	Magnolia Street	**11.5%**	S4	9th Street / 1000 Steps	0.3%			
3N	Brookhurst Street	**10.5%**	S3	Three Arch Bay	1.0%			
0	Santa Ana River Mouth	**7.7%**	**Dana Point**					
Newport Beach			OSL25	Monarch Beach	**8.7%**			
3S	Orange Street	1.4%	S2	Salt Creek Beach	1.1%			
6S	52nd / 53rd Street	0.7%	S1	Dana Strands	0.7%			
9S	38th Street	0.4%	S-6	Ocean Institute Beach	0.4%			
15S	15th / 16th Street	1.2%	S-4	DP Harbor Entrance	0.7%			
21S	Balboa Pier	0.3%	**Doheny State Beach**					
27S	The Wedge	0.0%	ODB02	North Beach	**18.7%**			
29S	Corona Del Mar Beach	1.6%	S-2	Mid North Beach	**10.1%**			
ONB31	Little Corona Beach	1.4%	S-0	SJC / Ocean Interface	**17.3%**			
Crystal Cove State Beach			S-1	1000 Feet S. of Outfall	**7.8%**			
ONB35	Pelican Point	0.0%	S-3	2000 Feet S. of Outfall	**10.6%**			
39S	Pelican Point Beach	0.1%	S-5	3000 Feet S. of Outfall	**12.2%**			
ONB39	Crystal Cove Beach	0.0%	S-7	4000 Feet S. of Outfall	4.6%			
ONB43	Muddy Creek Beach	0.6%						
ONB45	El Moro Beach	0.7%						

Denotes >=5.0% exceedance rate

Denotes >=15.0% exceedance rate

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Appendix B

INTRODUCTION

A subset of the coastal receiving water monitoring locations for the regional monitoring program represent areas of concern for public health issues that are currently sampled by two or more of the stakeholder agencies. An information review of the historic data was performed to determine if monitoring efforts could be consolidated that would afford appropriate protection of public health while at the same time maintaining the management intent of a unified coastal receiving waters regional monitoring program. Coastal receiving waters fecal indicator bacteria data were statistically evaluated to assess the feasibility of consolidating sampling efforts for monitoring locations which exhibited a greater than 5% exceeded rate for any of the Assembly Bill 411 (AB-411) ocean recreational contact water quality standards. Consolidation analyses were performed for a select number of candidate monitoring stations as shown in table 1 that were determined to have redundant sampling efforts by two or more agencies, to be located within the 200 yards distance of another agency, and exhibit greater than 5% exceedances rates.

Table 1. Consolidation Candidate Station List

Location	OCPW	SOCWA	OCEH
Pacific Ocean at San Juan Creek	SJC1u,d	S-0	ODB05
San Juan Creek pond	SJC1	C-1	
Pacific Ocean at Capistrano County Beach	CSBMP1u,d	S-9	
Pacific Ocean at Poche Beach	POCHEu,d	S-15	
Pacific Ocean at San Clemente City North Beach	PICOu,d	S-17	
Pacific Ocean at San Clemente Pier	PIERu,d	S-19	

*The suffix (u,d) indicates shoreline sampling locations 25 yards upcoast (u) and 25 yards downcoast (d) of the freshwater-ocean interface.

The ocean recreational contact water quality exceedances rates of the Enterococcus AB-411 standard for the candidate station over the period of January 2003 to June 2009 are provided in table 2 shown below. Receiving water data were evaluated against the single sample standard (104 CFU/100mL) and the geomean standard (35 CFU/100mL).

Table 2. Exceedances of AB-411 Enterococcus water quality standard

Location	OCPW	SOCWA	OCEH
Pacific Ocean at San Juan Creek	51.8%	44.7%	40.5%
San Juan Creek pond	92.2%	91.6%	
Pacific Ocean at Capistrano County Beach	26.0%	18.8%	
Pacific Ocean at Poche Beach	43.6%	41.2%	
Pacific Ocean at San Clemente City North Beach	21.9%	11.6%	
Pacific Ocean at San Clemente Pier	9.4%	5.5%	

*Data from the San Juan Creek pond were only compared to the single sample standard.

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Appendix B
cont.

Consolidation Criteria:

The candidate monitoring sites were analyzed using four different data review criteria to evaluate consolidation feasibility based on multiple lines of information.

1. Are the long term baselines statistically different?
2. Do stations exhibit within year baseline differences?
3. Are the exceedance rate percentages for shoreline samples significantly different within years?
4. Are trends in public health protection consistent?

A recommendation to consolidate redundant sampling efforts is based on the premise that the candidate station pair(s) must meet all of the review criteria at an adequate level of data agreement.

Data Inventory

Historic data sets were compiled from South Orange County Wastewater Authority (SOCWA), Orange County Public Works (OCPW), and Orange County Health Care Agency – Environmental Health Division (OCEH) for the period of January 2003 until June 2009. The data time period was selected to cover the duration of the Coastal Storm Drain Outfall monitoring program for Orange County Public Works which was enacted under NPDES Order No. R9-2002-0001 in January 2003 through fiscal year end 2009.

METHODS

Data Analysis

Bacteria data were analyzed for spatial and temporal differences in Enterococcus densities with a significance level of $\alpha = 0.05$. Differences amongst groups were tested using a Kruskal-Wallis one-way analysis of variance (ANOVA) on ranks with a Dunn's post-hoc test for multiple comparisons between data sets of unequal sample sizes. Differences between specific pairs of interest were evaluated using a Mann-Whitney Rank Sum test for comparison of baseline averages or a proportion test for differences in exceedances rates. Relationships in exceedances rate trends over time were analyzed using univariate regression. Statistical analyses were performed using commercial available software from Systat Software Inc.

Statistical Reconciliation

Outliers data points in environmental data sets can lead to spurious or incorrect baseline assessments of fecal indicator bacteria conditions of receiving waters. The addition of outliers in environmental data sets further creates complications when attempting to establish comparability of data sets. The data sets for the station consolidation review were evaluated for outliers contributing to significant differences using a standard Grubb's test statistical method. Additional review criteria for outlier deletion were established to ensure that events contributing to elevated indicator levels were not improperly removed. The removal criteria for outliers from data sets are:

1. Are differences associated with storm drain flows?
   NO – Outlier removed
   YES – Data point stays

2. Are differences associated with sanitary sewer overflows?
   NO – Outlier removed
   YES – Data point stays

Appendix B
cont.

3. Are differences associated with deviation from dry weather protocols by sampling days occurring within 72 hours of storm event?
   YES – Outlier removed
   NO – Data point stays

The removal of outlier data points in the consolidation data sets was solely restricted to comparisons of the baselines trends over time between stations. Outlier points were not excluded in any of the data sets for calculation of the AB-411 exceedance rate percentages.

Rejection Criteria

Candidate station pairs were evaluated in a stepwise fashion using specific rejection criteria to screen data sets that would deny consolidation of monitoring efforts. The first review criterion establishes whether monitoring locations have tracked the same environmental conditions over a long term period. The consolidation review was terminated if the station pair(s) demonstrated significantly different long term baselines. If the data sets did not demonstrate statistically different long term baselines, a population based ranking system approach was used to evaluate the within year differences of data sets.

The evaluation criteria to assess within year differences consist of a pass or fail grading approach to evaluate whether random variations within years account for major environmental differences or whether an “anomalous” year contributes minor variability to the overall conditions. The rejection criteria applied to determine whether significant differences account for non-comparability of the data set use multiple lines of information to review data sets.

The stepwise rejection criteria for consolidation are:

1. Station pair exhibits significantly different long term baselines.

2. Annual baseline exhibiting significant differences between sites are significantly different compared to the cumulative data set.

3. Station pairs exhibit significantly differences in annual exceedances rates and/or cumulative exceedances rates and the outstanding years account for more than 5% of the total exceedance rates.

4. Relationships in annual exceedances rates demonstrate a statistically insignificant regression or the regression coefficient is less than $R^2 = 0.500$. The slope of the least squares best fit line is less than or more than 1.0 ± 0.25.

CASE EXAMPLES

The Pacific Ocean shoreline along south Orange County is the focus of several public and regulatory agencies. In December 2007 the California Regional Water Quality Control Board San Diego adopted the Beaches and Creeks Total Maximum Daily Load directive in order to address the persistent elevated levels of fecal indicator bacteria in the receiving waters. The consolidation of environmental sampling efforts from the candidate station list benefits the stakeholder agencies involved in the TMDL and at the same time the Unified Coastal Receiving Water Regional Monitoring Program will be supported by the complimentary management effort to reduce fecal indicator bacteria pollution from the watershed. The consolidation of monitoring efforts for the two case examples involves data sets from each of the stakeholders agencies in the unified monitoring program.

*The probability values (p-values) for statistically significant relationships at the 95% confidence level are indicated by bold entries

Appendix B
cont.

Case Example 1: Pacific Ocean Shoreline at Poche Beach

Data Analysis Objective 1. Do stations exhibit long term baseline differences?

Station Pair(s)	Significantly Different	P value
POCHEu,d; S-15	NO	0.263
POCHEu,POCHEd	NO	0.265
POCHEu; S-15	NO	0.762
POCHEd; S-15	NO	0.104

The station pairs do not demonstrate long term significant differences in environmental conditions for receiving waters.

Data Analysis Objective 2 and 3. Do stations exhibit within year differences?

Baseline

Year	2003	2004	2005	2006	2007	2008	2009
p-value	0.95	0.25	0.277	0.122	**0.002**	0.439	330
n	178	185	170	196	187	182	80

The baseline differences between the OCPW monitoring station (POCHEu,d) and SOCWA monitoring station (S-15) in year 2007 are in addition statistically significant compared to the remaining data sets of these two sampling locations

Station Pair(s)	**Significantly Different**	**P value**
POCHE in 2007; POCHE	YES	**<0.001**
POCHE in 2007; S-15	YES	**<0.001**
S-15 in 2007; POCHE	YES	**0.020**
S-15 in 2007; S-15	YES	**0.013**

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cont.

Percent Exceedances AB-411 Standard

POCHE(u,d)

Year	2003	2004	2005	2006	2007	2008	2009	All Years
%exceed	30.8	34.3	23.7	51.7	70.1	56.9	25.6	43.6
n	133	137	131	151	154	137	86	929

S-15

Year	2003	2004	2005	2006	2007	2008	2009	All Years
%exceed	32.0	39.6	24.0	41.3	56.5	54.9	37.6	41.2
n	172	182	154	184	161	173	101	1127

p-value*					**<0.05**			

*Blank entries indicate that the proportion differences are not statistically significant

Although the proportion of AB-411exceedances for the combined data sets, including 2007, are not statistically significant, the AB-411 exceedances in 2007 contribute to 9.7% of the total exceedances rate for the complete data period.

Data Analysis Objective 4. Are trends in public health protection consistent?

Corresponding Relationship for Exceedances in AB-411 Standard

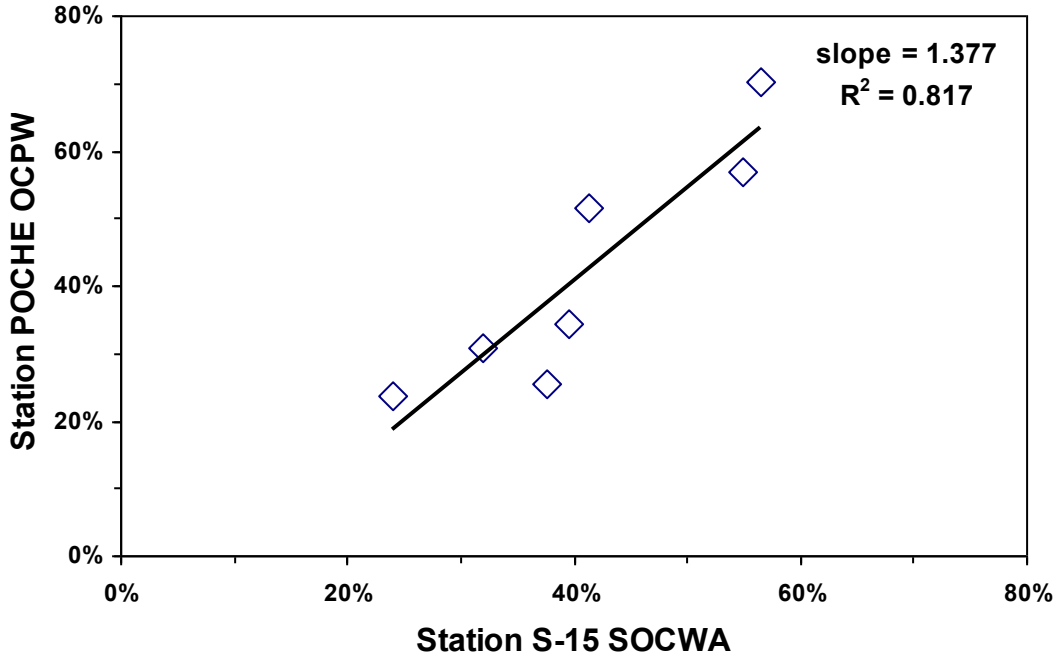

Appendix B
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Although the annual exceedances rates track similarly over time, the slope of the best fit line does not conform to an reasonably level of agreement in annual trends. Exceedance rates that differ by more than 25% represent a probability that two samples could result in a false negative detection for an Enterococcus level exceeding the public health standard.

Consolidation Review Recommendation Summary

	Points Earned	Total Points	% Agreement	Recommendation
Consolidation Ranking	14	22	63.6%	Do Not Consolidate

Case Example 2: Pacific Ocean Shoreline at Doheny State Beach

Data Analysis Objective 1. Do stations exhibit long term baseline differences?

Station Pair(s)	Significantly Different	P value
SJC1u,d; S-0; ODB05	YES	**0.002**
SJC1u; SJC1d	NO	0.586
SJC1u,d; S-0	YES	**0.015**
SJC1u,d; ODB05	YES	**0.002**
S-0; ODB05	NO	0.667

The OCPW monitoring station pair SJC1u,d form an existing sampling location at the freshwater-ocean interface of San Juan Creek and will not be analyzed further for consolidation. The following data analysis section applies only to the consolidation review of SOCWA station S-0 and OCEH station ODB05.

Data Analysis Objective 2 and 3. Do stations exhibit within year differences?

Baseline **Year**	2003	2004	2005	2006	2007	2008	2009
p-value	0.427	0.859	0.510	0.761	0.411	0.786	0.732
n	146	137	123	143	131	145	63

These results show that station S-0 and ODB05 do not exhibit within year significant differences.

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Appendix B
cont.

Percent Exceedances AB-411 Standard

S-0

Year	2003	2004	2005	2006	2007	2008	2009	All Years
%exceed	68.4	51.8	54.5	51.2	38.8	51.5	41.5	52.9
n	177	164	145	170	147	171	65	1056

ODB05

Year	2003	2004	2005	2006	2007	2008	2009	All Years
%exceed	69.5	52.1	49.3	49.5	45.7	53.8	34.7	51.8
n	95	94	69	101	94	104	49	689

p-value*								

*Blank entries indicate that the proportion differences are not statistically significant

The station pair does not exhibit any within year significant difference for percent samples exceeding the AB-411 standard.

Data Analysis Objective 4. Are trends in public health protection consistent?

Corresponding Relationship for Exceedances in AB-411 Standard

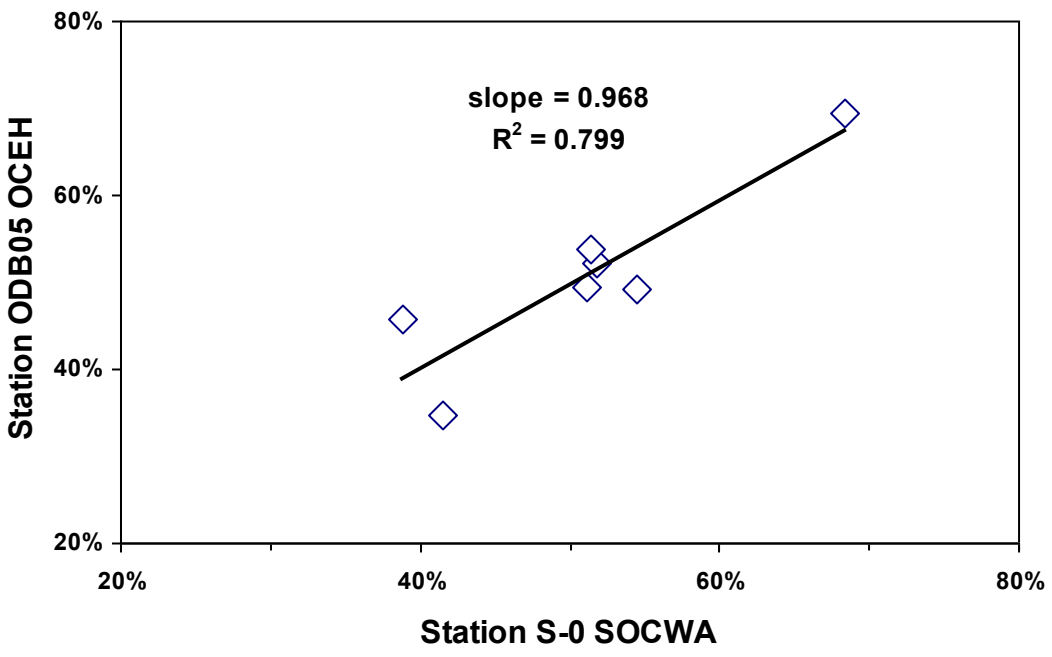

Appendix B
cont.

Consolidation Review Recommendation Summary

	Points Earned	Total Points	% Agreement	Recommendation
Consolidation Ranking	16	16	100%	Consolidate

Summary of Results for Candidate Station Pairs

Candidate Pair(s)	Recommendation	Consolidation Review
SJC1u,d; S-0; ODB05	Do Not Consolidate	Significantly Different Baselines
S-0; ODB05	Consolidate	100% Agreement
SJC1, C-1	Consolidate	94.1% Agreement
CSBMP1u,d; S-9	Do Not Consolidate	38.1% Agreement
POCHEu,d; S-15	Do Not Consolidate	63.6% Agreement
PICOu,d; S-17	Do Not Consolidate	Significantly Different Baselines
PIERu,d; S-19	Do Not Consolidate	61.9% Agreement

DRAFT

Appendix C

State Water Resources Control Board
Beach Water Quality Workgroup
Monitoring and Reporting Subcommittee
Model Monitoring Matrices

Minimum Monitoring Matrix:

Swimming Season AB 411 (April 1 - October 31st) Note: % for dry weather season	Sites near storm drains BMP successfully implemented (diversions)	Sites near storm drains with history of Indicator problems (>=5%)	Sites near storm drains and without history of pollution (<5%)	No nearby sources or history of problems (<5%) (mostly open coastal)	Permanent signage (Sample as per AB 411 requirement)**
High Use Beach -lifeguards, high usage >50,000	1/week*	1/week*	1/week*	1/week*	1/week
Medium Use Beach - nearby parking, moderate usage summer and/or winter	1/week*	1/week*	1/week*	0/week	0/week
Low Use Beach - low access and/or usage	0/week	0/week	0/week	0/week	0/week

Preferred Monitoring Matrix:

Swimming Season AB 411 (April 1 - October 31st) Note: % for dry weather season	Sites near storm drains BMP successfully implemented (diversions)	Sites near storm drains with history of Indicator problems (>=5%)	Sites near storm drains and without history of pollution (<5%)	No nearby sources or history of problems (<5%) (mostly open coastal)	Permanent signage (Sample as per AB 411 requirement)**
High Use Beach -lifeguards, high usage >50,000	1/week*	2-3/week*	1/week*	1/week*	1/week
Medium Use Beach - nearby parking, moderate usage summer and/or winter	1/week*	2/week*	1/week*	0/week	0/week
Low Use Beach -low access and/or usage	0/week	1/week	0/week	0/week	0/week

Optimal Monitoring Matrix:

Swimming Season AB 411 (April 1 - October 31st) Note: % for dry weather season	Sites near storm drains BMP successfully implemented (diversions)	Sites near storm drains with history of Indicator problems (>=5%)	Sites near storm drains and without history of pollution (<5%)	No nearby sources or history of problems (<5%) (mostly open coastal)	Permanent signage (Sample as per AB 411 requirement)**
High Use Beach -lifeguards, high usage >50,000	1/week*	5/week*	1/week*	1/week*	1/week
Medium Use Beach - nearby parking, moderate usage summer and/or winter	1/week*	3/week*	1/week*	0/week	0/week
Low Use Beach -low access and/or usage	0/week	1/week	0/week	0/week	0/week

*If AB 411 single sample standard violation - adaptive confirmation resampling conducted to help identify source, spatial area impact and temporal period.

**Permanent signage can be used when spatial area impact has been fully delineated and defined.

DRAFT

CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

October 30, 2014

In reply refer to / attn:
257590:bposthumus
257592:bposthumus
658018:bposthumus

NOTICE OF AVAILABILITY OF DRAFT LETTER DIRECTIVE TO ESTABLISH REQUIREMENTS FOR IMPLEMENTATION OF A UNIFIED BEACH WATER QUALITY MONITORING AND ASSESSMENT PROGRAM IN SOUTH ORANGE COUNTY (WATER CODE SECTION 13383)

This letter is a notification that, following a 30-day written public comment period that starts today and after consideration of comments received, I propose to establish requirements[1] that South Orange County Wastewater Authority (SOCWA) and the south Orange County municipal separate storm sewer system (MS4) copermittees participate in, and, together with Orange County Health Care Agency (OCHCA), share responsibility for implementation of the unified regional monitoring program (Unified Program) set forth in the attached report ("Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County"). The requirements would become effective April 1, 2015. The proposed Section 13383 letter directive that would establish these requirements is attached.

The San Diego Water Board will consider proposed amendments to affected NPDES permits to ensure that the requirements established through the Section 13383 letter directive are enforceable components of the monitoring and reporting requirements of those permits. The affected permits are for discharges from the (a) SOCWA Aliso Creek Ocean Outfall, (b) SOCWA San Juan Creek Ocean Outfall, and (c) south Orange County MS4s. The tentative orders that would amend these NPDES permits are currently available for public comment.[2] The Unified Program requirements would supersede the existing beach water quality monitoring requirements in the NPDES permits for SOCWA and the south Orange County MS4 copermittees effective April 1, 2015.

[1] The requirements would be issued pursuant to California Water Code section 13383. Use of an Executive Officer-issued directive, e.g., pursuant to Water Code section 13383, to require participation in and shared responsibility for implementation of the Unified Program and to specify the effective date of any revisions thereto facilitates putting the program and any such revisions into effect expeditiously and with the same effective date for all parties.

[2] The proposed revisions to the monitoring and reporting requirements of these NPDES permits are available as follows:
(a) SOCWA Aliso Creek Ocean Outfall (Tentative Order No. R9-2014-0098) (amendments to NPDES No. CA0107611): http://www.waterboards.ca.gov/sandiego/board_decisions/tentative_orders/;
(b) SOCWA San Juan Creek Ocean Outfall (Tentative Order No. R9-2014-0105) (amendments to NPDES No. CA0107417): http://www.waterboards.ca.gov/sandiego/board_decisions/tentative_orders/; and
(c) south Orange County MS4s (Tentative Order No. R9-2015-0001) (amendments to NPDES No. CAS0109266): http://www.waterboards.ca.gov/rwqcb9/water_issues/programs/stormwater/oc_stormwater.shtml.

The San Diego Water Board is currently scheduled to consider making these permit revisions at its public meetings on the following dates:

- December 11, 2014: NPDES permits for SOCWA; and
- February 11, 2015: NPDES permit for south Orange County MS4 copermittees (through amendments to the San Diego Regional MS4 Permit).

Please submit written comments on the proposed action to sandiego@waterboards.ca.gov. In the subject line of any written response, please include the reference numbers 257590:257592:and 658018:bposthumus.

I very much appreciate the efforts of the workgroup that developed the Unified Program. The workgroup, which developed the Unified Program during the period from July 2012 to September 2014, included representatives of SOCWA, Orange County Public Works, OCHCA, and other entities and individuals with interests in beach water quality in south Orange County. I commend the workgroup participants for their significant contributions to making meaningful, practical, and valuable improvements in beach water quality monitoring in south Orange County.

If you have any questions regarding the proposed action, please contact Bruce Posthumus, Senior Water Resource Control Engineer, at 619-521-3379 or bposthumus@waterboards.ca.gov.

Respectfully,

DAVID W. GIBSON
Executive Officer

DWG:jgs:jch:bwp

Attachments:

1. "Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County"
2. Proposed Water Code section 13383 letter directive

Tech Staff Info & Use	
Place ID	257590
Place ID	257592
Place ID	658018

CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

TO: South Orange County Wastewater Authority (SOCWA)
South Orange County Municipal Separate Storm Sewer System (MS4) Copermittees
(via Email; see attached mailing list)

In reply refer to / attn:
257590:bposthumus
257592:bposthumus
658018:bposthumus

Subject: Requirements for Implementation of a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County (Water Code Section 13383)

The Code of Federal Regulations (CFR) at 40 CFR section 122.48 requires that all National Pollutant Discharge Elimination System (NPDES) permits specify monitoring and reporting requirements. California Water Code section 13383 also authorizes the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) to establish monitoring and reporting requirements for discharges to surface waters regulated by NPDES permits within the San Diego Region.

This letter serves to establish requirements, pursuant to Water Code section 13383,[1] that your agencies participate in, and, together with Orange County Health Care Agency (OCHCA), share responsibility for implementation of the unified regional monitoring program (Unified Program) set forth in the attached report ("Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County"), effective April 1, 2015.

The Unified Program, which is incorporated herein, was developed during the period from July 2012 to September 2014 by a workgroup that included representatives of SOCWA, Orange County Public Works, OCHCA, and other entities and individuals with interests in beach water quality in south Orange County. The Unified Program is intended to be protective, reasonable, and equitable and to meet or go beyond meeting the requirements for beach water quality monitoring and related public notification and reporting established by State law.

Effective April 1, 2015, the requirements established through issuance of this Water Code section 13383 letter directive will become enforceable components of the monitoring and reporting requirements of the NPDES permits for discharges from the (a) SOCWA Aliso Creek Ocean Outfall, (b) SOCWA San Juan Creek Ocean Outfall, and (c) south Orange County MS4s.[2] This letter directive is being issued to the NPDES permittees for those discharges, i.e., SOCWA (permittee for discharges from the Aliso Creek Ocean Outfall and the San Juan Creek Ocean Outfall) and the County of Orange, Orange County Flood Control District, and the cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Lake Forest, Mission Viejo, Rancho Santa Margarita, San

[1] Use of an Executive Officer-issued directive, e.g., pursuant to Water Code section 13383, to require participation in and shared responsibility for implementation of the Unified Program and to specify the effective date of any revisions thereto facilitates putting the program and any such revisions into effect expeditiously and with the same effective date for all parties.

[2] The order numbers and NPDES numbers of these three permits, respectively, are:
(a) SOCWA Aliso Creek Ocean Outfall: Order No. R9-2012-0013 (NPDES No. CA0107611);
(b) SOCWA San Juan Ocean Outfall: Order No. R9-2012-0012 (NPDES No. CA0107417); and
(c) south Orange County MS4s: Order No. R9-2013-0001, (NPDES No. CAS0109266)

Clemente and San Juan Capistrano (copermittees for discharges from the south Orange County MS4s).

The Executive Officer or the San Diego Water Board may approve future revisions to the Unified Program by updating this letter directive, provided that the Unified Program, as revised, will continue to meet the requirements of State law, including the California Ocean Plan, for beach water quality monitoring and related public notification and reporting requirements. Any future revisions requested by affected permittees or interested parties, or as deemed necessary and/or appropriate by the Executive Officer, will be subject to a 30 (thirty) day public comment period and request for hearing before the San Diego Water Board.

Under Water Code section 13389, issuance of this Water Code section 13383 letter directive is exempt from the provisions of the California Environmental Quality Act (Public Resources Code sections 21100-21177).

Any person aggrieved by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with Water Code section 13320 and California Code of Regulations, title 23, sections 2050 and following. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date of this Order. Copies of the law and regulations applicable to filing petitions may be found on the Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

Ordered by _____
DAVID W. GIBSON
Executive Officer

DATE: _____

DWG:jgs:jch:bwp

Attachments:
1. Mailing List
2. "Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County"

Tech Staff Info & Use	
Place ID	257590
Place ID	257592
Place ID	658018

DRAFT

ATTACHMENT 1

Mailing List

Addressees (Affected Permittees)

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Patricia Martz
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SDRWQCB Email list: Orange County MS4 Permit

SWRCB Email list: Beach Water Quality Workgroup – Southern California

DRAFT

Walsh, Laurie@Waterboards

From: lyris@swrcb18.waterboards.ca.gov
Sent: Tuesday, November 25, 2014 10:17 AM
To: Walsh, Laurie@Waterboards
Subject: Comments Received on Tentative Order R9-2015-0001 Orange County MS4 Permit - Proposed Revisions to Regional MS4 Permit

This is a message from the California Regional Water Quality Control Board, San Diego Region (9).

Copermittees and Interested Persons,

The San Diego Water Board has posted comment letters it received on Tentative Order R9-2015-0001 *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* during the public comment period ending November 19, 2014 on our website at:

http://www.swrcb.ca.gov/sandiego/water_issues/programs/stormwater/oc_stormwater.shtml

Regards,

Laurie Walsh P.E.

San Diego Water Board

619-521-3373

lwalsh@waterboards.ca.gov

You are currently subscribed to reg9_sandiegoco_ms4permit as: Laurie.Walsh@waterboards.ca.gov.

To unsubscribe click here: leave-3076124-517889.992bd9006c3392a974839ac12d93b37b@swrcb18.waterboards.ca.gov

Walsh, Laurie@Waterboards

From: lyris@swrcb18.waterboards.ca.gov
Sent: Friday, January 09, 2015 1:56 PM
To: Walsh, Laurie@Waterboards
Subject: NOTICE OF PUBLIC HEARING, MS4 PERMIT REISSUANCE
Attachments: 2015-0108 Cvr Ltr Hearing Notice.pdf; 2015-0108 Public Hearing Notice.pdf

Water Boards This is a message from the California Regional Water Quality Control Board, San Diego Region (9).

Dear Interested Persons,

The San Diego Water Board is scheduled to hold a public hearing to consider adoption of Tentative Order No. R9-2015-0001, An Order Amending Order No. R9-2013-0001, the Regional Municipal Separate Storm Sewer (MS4) Permit for the San Diego Region.

The public hearing to consider the Tentative Order will be held at the San Diego Water Board meeting at the following date and location:

February 11, 2015, beginning at 9 a.m.
Council Chambers of the City of Mission Viejo
200 Civic Center, Mission Viejo, CA 92691

Please see attached Notice of Public Hearing for further details.

You are currently subscribed to reg9_board_meetings as: lwalsh@waterboards.ca.gov.

To unsubscribe click here: leave-3318869-582080.2b1a8f503bf3f4d830f4f0246161fb81@swrcb18.waterboards.ca.gov

CALIFORNIA Water Boards

EDMUND G. BROWN JR. GOVERNOR

MATTHEW RODRIQUEZ SECRETARY FOR ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

NOTICE OF PUBLIC HEARING

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) is scheduled to hold a public hearing to consider adoption of Tentative Order No. R9-2015-0001, *An Order Amending Order No. R9-2013-0001, NPDES No. CAS010266*, *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Tentative Order).

The Tentative Order proposes to amend Order No. R9-2013-0001, the Regional MS4 Permit, to address a variety of issues including coverage for Copermittees in Orange County consisting of the County of Orange, Orange County Flood Control District, and the cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano, and incorporation of limited permit provisions applicable to the City of Lake Forest. If adopted, the Tentative Order will supersede the Orange County Copermittees' current Fourth Term MS4 Permit, Order No. R9-2009-0002.

The public hearing on this matter will be held during the San Diego Water Board meeting scheduled for **February 11, 2015 in the Council Chambers of the City of Mission Viejo, located at 200 Civic Center, Mission Viejo, CA 92691**. The item will be heard during the meeting that starts at 9:00 A.M. The meeting notice and agenda, which will indicate any changes in the meeting location and may provide other specific information concerning this hearing, will be posted at least two weeks prior to the meeting date at http://www.waterboards.ca.gov/sandiego/board_info/agendas/.

Written comments including testimony, technical documentation and factual information pertaining to the terms and conditions of the Tentative Order are no longer being accepted. However, oral testimony at the public hearing will be allowed. The scope of oral testimony at the public hearing will be strictly limited to summarizing the previously submitted written comments, comments on revisions to the Tentative Order made in response to comments, and making policy statements. Oral testimony will be limited in time by the Board Chair.

The procedures governing San Diego Water Board meetings may be found at Title 23, California Code of Regulations, section 647, et seq. and are available upon request. The hearing facilities will be accessible to persons with disabilities. The meeting notice and agenda for this meeting will provide contact information for persons requesting special accommodations.

Information related to this matter, including revisions made to the Tentative Order in response to written comments timely submitted, as well as the San Diego Water Board's responses to written comments timely submitted, will be available at the San Diego Water Board's office and the San Diego Water Board's storm water web page in advance of the public hearing. A separate notice will be sent announcing the availability of the revised Tentative Order and the responses to comments upon website posting of the documents.

Please contact Laurie Walsh at (619) 521-3382 or Laurie.Walsh@waterboards.ca.gov for questions or comments regarding this hearing notice.

Please bring the foregoing to the attention of any person known to you who would be interested in this matter.

DAVID W. GIBSON
Executive Officer
January 9, 2015

CALIFORNIA Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

January 9, 2015

Sent via E-mail

San Diego County Copermittees
Orange County Copermittees
Riverside County Copermittees

In reply refer to / attn:
Place ID: 658018Lwalsh

Subject: NOTICE OF PUBLIC HEARING
Tentative Order No. R9-2015-0001, An Order Amending Order No. R9-2013-0001, the Regional Municipal Separate Storm Sewer (MS4) Permit for the San Diego Region

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) is scheduled to hold a public hearing to consider adoption of Tentative Order No. R9-2015-0001, *An Order Amending Order No. R9-2013-0001, NPDES No. CAS010266*, *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Tentative Order).

The Tentative Order proposes to amend Order No. R9-2013-0001, the Regional MS4 Permit, in response to the Orange County Copermittees' Report of Waste Discharge submitted by letter dated May 20, 2014, to designate the Orange County Copermittees (the County of Orange, Orange County Flood Control District, and the cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano) as MS4 dischargers responsible for compliance with the terms and the conditions of the Permit. The Tentative Order also proposes to amend the Regional MS4 Permit to address a variety of other issues including 1) Regional Water Board designation to consolidate regulation of Phase I MS4 discharges for the Cities of Laguna Hills, Laguna Woods, and Lake Forest pursuant to Water Code section 13228, 2) incorporation of the Los Peñasquitos Lagoon Sediment Total Maximum Daily Load requirements, 3) extension of a pollutant reduction deadline for MS4 discharges to Areas of Special Biological Significance, 4) incorporation of interim exemptions for hydromodification management, and 5) implementation of a uniform approach for monitoring beach water quality in south Orange County.

The public hearing on this matter will be held during the San Diego Water Board meeting scheduled for **9:00 a.m. on February 11, 2015 in the Council Chambers of the City of Mission Viejo, located at 200 Civic Center, Mission Viejo, CA 92691.** Please see the

attached *Notice of Public Hearing* for further details regarding the San Diego Water Board meeting and public hearing to consider the Tentative Order.

Availability of Revised Tentative Order
The Tentative Order was released for a 60-day public review and comment period on September 18, 2014. Revisions made to the Tentative Order in response to written comments timely submitted, as well as the San Diego Water Board's responses to written comments timely submitted, will be available at the San Diego Water Board's office and the San Diego Water Board's storm water web page in advance of the public hearing. A separate notice will be sent announcing the availability of the revised Tentative Order and the responses to comments upon website posting of the documents.

Contact for further Information
For questions or comments concerning this notice, please contact Laurie Walsh by phone at (619) 521-3373, or by email at Laurie.Walsh@waterboards.ca.gov .

Respectfully,

David Barker

David Barker, P.E.
Supervising Engineer
San Diego Regional Water Quality Control Board

DTB:esb:law

cc (via email):

San Diego County Copermittees
Orange County Copermittees
Riverside County Copermittees
Natural Resource Agencies
San Diego County MS4 Permit E-mail Service List
Riverside County MS4 Permit E-mail Service List
Orange County MS4 Permit E-mail Service List
San Diego Water Board Agenda E-mail Service List

Tech Staff Info & Use	
Tentative Order No.	R9-2015-0001
NPDES No.	CAS0109266
Place ID	658018

San Diego County Copermittees

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Orange County Copermittees

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Riverside County Copermittees

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Public Comment
LA MS4 Permit A-2236(a)-(kk)
Deadline: 01/21/15 by 12:00 noon

036905

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

RECEIVED
1-20-15
SWRCB Clerk

JAN 20 2015

Ms. Jeanine Townsend
Clerk to the Board
State Water Resources Control Board
1001 I Street, 24th Floor (95814)
P.O. Box 100
Sacramento, CA 95812-0100

Re: Comments to A-2236(a)-(kk)

Dear Ms. Townsend:

The following are EPA Region 9's comments on the State Water Board's draft WQ Order released on November 21, 2014, responding to the petitions (SWRCB/OCC files A-2236(a) through (kk)) submitted challenging NPDES permit No. CAS004001. This permit was issued in November 2012 by the Los Angeles Regional Board and authorizes discharges from the municipal separate storm sewer system (MS4) serving most of Los Angeles County. Region 9 offers the following comments on certain aspects of the Order.

A. "Safe Harbor" During the Planning Phase for a WMP/EWMP

Section VI.C.3.b of the LA MS4 permit provides that permittees are deemed in compliance with receiving water limitations (RWLs) upon notification to the Regional Board of their intent to develop a watershed management program (WMP) or enhanced watershed management program (EWMP). In our testimony at the November 2012 adoption hearing for the permit (and in a subsequent August 14, 2013 letter to the State Water Board), we recommended a change in the timing of when a permittee would be deemed in compliance. Rather than being deemed in compliance upon notification of intent to prepare a WMP/EWMP, we recommended that a permittee be deemed in compliance only after approval of a WMP/EWMP.

Section II.B.6 of the draft WQ Order supports the LA MS4 permit with regards to the timing of when the "safe harbor" period would begin. Establishing a safe harbor during this planning phase is not warranted. The requirement that LA County permittees meet RWLs was in place for over eleven years prior to the issuance of this permit. We disagree that permittees should be considered in compliance with these limits solely based on a notification of intent to prepare a plan.

A provision consistent with our recommendation was drafted as one option for the draft Regional MS4 permit (NPDES permit No. CAS0109266) proposed by the San Diego Regional Board in April 2013. The San Diego Regional Board chose to stick with

an approach for compliance with RWLs that closely aligned with State Board Order WQ 99-05 (i.e., not this draft WQ Order's proposed option). In conclusion, the San Diego Board's option for finding permittees in compliance with RWLs only when a plan is approved should be incorporated into the State Water Board's final WQ Order responding to the LA MS4 permit petitions.

B. Compliance with RWLs Via Retention of the 85%, 24-Hour Storm for Drainage Areas with EWMPs

Section VI.E.2.e.i.4 of the LA MS4 permit provides that for drainage areas where a EWMP is developed, retention of the runoff from the 85%, 24-hour storm would constitute compliance with applicable Water Quality Based Effluent Limits (WQBELs) and RWLs for pollutants associated with TMDL Waste Load Allocations (WLAs). We raised concerns with this provision in our testimony at the November 2012 adoption hearing. It has been a long-standing EPA policy that where a MS4 permit does not incorporate TMDL WLAs as numeric limits, the permit's administrative record must demonstrate that specified control measures will be sufficient to ensure compliance with WLAs. In a December 4, 2012 letter, we requested that the Los Angeles Regional Board identify documents in the permit's administrative record which are the basis for the conclusion that the specified retention would result in achieving WLAs. Based on the Regional Board's April 11, 2013 response, we do not believe that the permit's record supports the conclusion that this retention will result in achievement of WLAs.

The draft WQ Order in section II.B.5 recognizes that the LA MS4 permit does not verify that TMDL-specific limitations will be met as a result of retention of the 85%, 24-hour storm. The draft WQ Order addresses this issue by requiring the submittal of a plan of additional control measures if the specified volume is retained, but water quality monitoring shows that RWLs and WQBELs associated with TMDLs are not in fact being achieved. While this is a step in the right direction, we are concerned that only requiring submittal of a plan could lead to an ineffective iterative process without any assurance that water quality will be protected. We recommend that the provision be strengthened to specify that the expectations for this plan must include: (1) a quantitative analysis demonstrating that proposed additional control measures will result in attainment of WLAs, and (2) a provision for the Executive Officer to have the option to require strict compliance with numeric WLAs if continued progress is not being made towards achieving these water quality limitations.

C. Applicability of the WQ Order to All Regional Boards

We note that some commenters on the draft WQ Order recommended that the State Water Board require that all Regional Boards follow the WMP/EWMP approach in the LA MS4 permit when issuing MS4 permits. As drafted, the proposed WQ Order (section II.B.7) directs all Regional Boards to consider the approach in the LA MS4 permit, but does not require its use. We believe it would be premature and inappropriate

to require the LA MS4 permit approach throughout the State, especially considering the previous two issues we've identified in this letter.

We appreciate the opportunity to provide our views on the draft WQ Order. If you have any questions regarding this matter, please contact Eugene Bromley of the NPDES Permits Section at (415) 972-3510.

Sincerely,

David Smith, Manager
NPDES Permits Section (WTR-2-3)

Walsh, Laurie@Waterboards

From: lyris@swrcb18.waterboards.ca.gov
Sent: Wednesday, January 21, 2015 5:14 PM
To: Walsh, Laurie@Waterboards
Subject: Response to Comments and Revised Tentative Order R9-2015-0001 with Revised Attachments
Attachments: 2015-0108 Public Hearing Notice.pdf

Water Boards This is a message from the California Regional Water Quality Control Board, San Diego Region (9).

Copermittees and Interested Stakeholder,

The Response to Comments and Revised Tentative Order R9-2015-0001, *An Order Amending Order No. R9-2013-0001, NPDES No. CAS010266, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Tentative Order) are now available on the Regional Board's website at http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/oc_stormwater.shtml. Revisions made in response to comments to the Tentative Order and its Attachments are highlighted yellow.

For your convenience, the public hearing notice on this matter is attached. The public hearing will be held during the San Diego Water Board meeting scheduled for **9:00 a.m. on February 11, 2015 in the Council Chambers of the City of Mission Viejo, located at 200 Civic Center, Mission Viejo, CA 92691.**

Please Note: Elected officials will be invited to speak on this item no sooner than 1:30 p.m.

Laurie Walsh, PE
San Diego Water Board

2375 Northside Drive, Suite 100
San Diego, CA 92108
Direct Phone: 619-521-3373
Main Line: 619-516-1990
Fax No. (619) 516-1994
lwalsh@waterboards.ca.gov

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD
www.waterboards.ca.gov/sandiego/

You are currently subscribed to reg9_sandiegoco_ms4permit as: Laurie.Walsh@waterboards.ca.gov.

To unsubscribe click here: leave-3417967-517889.992bd9006c3392a974839ac12d93b37b@swrcb18.waterboards.ca.gov

CALIFORNIA Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

NOTICE OF PUBLIC HEARING

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) is scheduled to hold a public hearing to consider adoption of Tentative Order No. R9-2015-0001, *An Order Amending Order No. R9-2013-0001, NPDES No. CAS010266*, *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Tentative Order).

The Tentative Order proposes to amend Order No. R9-2013-0001, the Regional MS4 Permit, to address a variety of issues including coverage for Copermittees in Orange County consisting of the County of Orange, Orange County Flood Control District, and the cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano, and incorporation of limited permit provisions applicable to the City of Lake Forest. If adopted, the Tentative Order will supersede the Orange County Copermittees' current Fourth Term MS4 Permit, Order No. R9-2009-0002.

The public hearing on this matter will be held during the San Diego Water Board meeting scheduled for **February 11, 2015 in the Council Chambers of the City of Mission Viejo, located at 200 Civic Center, Mission Viejo, CA 92691**. The item will be heard during the meeting that starts at 9:00 A.M. The meeting notice and agenda, which will indicate any changes in the meeting location and may provide other specific information concerning this hearing, will be posted at least two weeks prior to the meeting date at http://www.waterboards.ca.gov/sandiego/board_info/agendas/.

Written comments including testimony, technical documentation and factual information pertaining to the terms and conditions of the Tentative Order are no longer being accepted. However, oral testimony at the public hearing will be allowed. The scope of oral testimony at the public hearing will be strictly limited to summarizing the previously submitted written comments, comments on revisions to the Tentative Order made in response to comments, and making policy statements. Oral testimony will be limited in time by the Board Chair.

The procedures governing San Diego Water Board meetings may be found at Title 23, California Code of Regulations, section 647, et seq. and are available upon request. The hearing facilities will be accessible to persons with disabilities. The meeting notice and agenda for this meeting will provide contact information for persons requesting special accommodations.

Information related to this matter, including revisions made to the Tentative Order in response to written comments timely submitted, as well as the San Diego Water Board's responses to written comments timely submitted, will be available at the San Diego Water Board's office and the San Diego Water Board's storm water web page in advance of the public hearing. A separate notice will be sent announcing the availability of the revised Tentative Order and the responses to comments upon website posting of the documents.

Please contact Laurie Walsh at (619) 521-3382 or Laurie.Walsh@waterboards.ca.gov for questions or comments regarding this hearing notice.

Please bring the foregoing to the attention of any person known to you who would be interested in this matter.

DAVID W. GIBSON
Executive Officer
January 9, 2015

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Ryan M. F. Baron
Senior Deputy
(714) 834-5206

January 30, 2015

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David Gibson, Executive Officer
San Diego Regional Water Quality Control Board
2375 Northside Drive, Suite 100
San Diego, CA 92108-2700

Re: Orange County Request for Continuance

Dear Mr. Gibson:

On behalf of the County of Orange and the Orange County Flood Control District ("County"), our office is requesting a 30-day continuance of the February 11, 2015 adoption hearing for Tentative Order No. R9-2015-0001, which would enroll the Orange County permittees into the Regional Permit. A significantly revised Tentative Order, along with 133 pages of response to comments, was released on January 21, 2015 just 15 working days prior to the proposed adoption hearing. In order to properly review staff's detailed responses and timely prepare for a potentially lengthy adjudicatory proceeding, the County respectfully requests that more time be granted so that the County may properly prepare evidence and testimony. At the initial adoption of the Regional Permit, the permittees, stakeholders and the public participated in a lengthy formal adjudicatory proceeding where numerous witnesses provided testimony and presented evidence on the permit, a hearing that lasted for three full days (April 10 and 11, May 8, 2013). At that time, the County and other stakeholders requested a reasonable continuance that was ultimately denied. It is our opinion that a continuance in that case could have minimized some of the questions and controversy generated at that hearing so the permittees could have properly prepared and understood the revisions. We believe the same to be true here.

I will note that the County will also be filing comments on February 13, 2015 regarding its permit with the Santa Ana Regional Water Board, which has just been released for a second revision. For that permit, staff is allowing an additional comment period and a proposed adoption hearing at least two months after the Response to Comments were released. For the San Diego hearing, however, the County is only requesting a modest 30-day extension.

The County would also like to discuss with you the potential for an alternative compliance option in the Regional Permit and the reasoning behind why an option was not proposed in the Tentative Oder. Both the Fact Sheet and your letter to the State Water Board regarding its Proposed Order on the Los Angeles MS4 permit upholding an alternative compliance option note that an option will be developed upon enrollment of the Riverside County permittees. We believe this issue should be discussed prior to Orange

County enrolling into the permit, so as to avoid any confusion or unnecessary time spent at the February 11 hearing. It should be further noted that in proposed permit for the Santa Ana region, staff has just proposed an alternative compliance option similar to the one upheld by the State Board. It is our belief that an alternative compliance option for Orange County could be developed in due time without significantly delaying our enrollment.

In addition, the Hearing Notice for the February 11, 2015 hearing appears to limit the permittees' rights to provide oral testimony by limiting comments to summarizing prior written comments and comments on the revisions to the Tentative Order. Under Government Code sections 11400 *et seq.*, Evidence Code sections 801-805, Gov't Code section 11513 and title 23 of the California Code of Regulations, sections 648 *et seq.,* and applicable case law, the County has the right to request a formal proceeding and provide any oral comments relevant to the proceedings. Furthermore federal law allows the public comment process to be extended to the close of any hearing on an MS4 permit. 40 C.F.R. § 124.10. As such, we request that the permittees be allowed to right of cross-examination if needed as well as the ability to present on all issues relevant to the permit.

Lastly, the County requests that the Orange County permittees be collectively provided a two-hour time period by which to make presentations, provide testimony, submit evidence and cross-examine witnesses, as such right is provided by the aforementioned statutes. We also request that an order of proceedings be published establishing the time periods for presentations and testimony and recognizing parties that will be designated to participate in the proceedings.

Thank you for your consideration.

Very truly yours,

NICHOLAS S. CHRISOS
COUNTY COUNSEL

By /s/ Ryan Baron

Ryan M. F. Baron, Senior Deputy

RMFB:azs
Mary Anne Skorpanich, OC Public Works
Chris Crompton, OC Public Works
Richard Boon, OC Public Works
Catherine Hagen, San Diego Regional Water Board

Hagan, Catherine@Waterboards

From: Hagan, Catherine@Waterboards
Sent: Tuesday, February 10, 2015 3:34 PM
To: ryan.baron@coco.ocgov.com
Cc: Barker, David@Waterboards; Becker, Eric@Waterboards; Arias, Christina@Waterboards; Walsh, Laurie@Waterboards
Subject: Response to Procedural Points in January 30, 2015 Letter
Attachments: 013015 Baron Letter.pdf

Dear Mr. Baron:

David Gibson asked me to respond to the procedural requests in your letter to him dated January 30, 2015. In the interest of time, I am responding by e-mail rather than formal letter but will include this email along with your letter (attached) in the record for this proceeding.

Request for 30-day Continuance
The San Diego Regional Water Quality Control Board (San Diego Water Board) Chair has considered the County of Orange and Orange County Flood Control District's (Orange County) request for a 30 day continuance of the public hearing in the matter of Tentative Order No. R9-2015-0001, An Order Amending Order No. R9-2013-0001, NPDES No. CAS010266, National Pollutant Discharge Elimination System Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region
(Tentative Order). I understand Mr. Gibson already conveyed to you that the San Diego Water Board plans to proceed with the public hearing scheduled on February 11, 2015. There are relatively few new issues involved in this amendment proceeding, especially compared to the volume of contentious issues extensively considered during the public hearings to consider and adopt San Diego Water Board Order No. R9-2013-0001 (Regional MS4 Permit). The San Diego Water Board provided a 60-day rather than the legally required 30-day (see 40 CFR sec. 124.10(b)(2)) written public comment period and held a public workshop at its meeting in Orange County on October 2014. Revisions to the Tentative Order were released three weeks before the scheduled hearing and arise from comments submitted during the written comment period and the revisions are highlighted to facilitate focused review. While the written responses to comments report is lengthy, the vast majority of comments submitted on the Tentative Order largely incorporated or duplicated comments submitted during the 2013 Regional MS4 Permit proceeding and are therefore not new. The San Diego Water Board is not obligated to provide responses to comments to the public for their review in advance of the hearing. (See 40 CFR sec. 124.17(a) and (c).) The Chair determined it was not necessary to continue the hearing based on the reasons cited in your letter.

Scope of Comments and Testimony
The scope of oral comments at the public hearing was identified in the Notice of Public Hearing dated January 9, 2015. The San Diego Water Board is permitted to place reasonable controls on public comment and, as indicated above, already provided a 60-day written comment period and an additional 21-day opportunity for oral comment on revisions to the Tentative Order. Reliance on Title 40 CFR section 124.10 (as referenced in sections 124.12(c) and 124.13) as requiring the board to allow the identification of new issues at the public hearing is misplaced. Neither of these sections providing that the public comment period extend to the close of the public hearing is applicable to the San Diego Water Board as it considers this permit amendment. (See 40 CFR sec. 123.25(a).)

Request for Formal Hearing Procedures
You have requested a more formal hearing process than the board typically uses at its NPDES hearings but the Chair will allow questions of staff or parties subject to reasonable limitations at the discretion of the Chair. The Chair has considered your request for two hours for the Orange County Copermittees but given the relatively narrow scope of new issues in this proceeding, will grant 45 minutes, including time for questions and closing comments. As always, requests for more time based on good cause may be granted at the discretion of the Chair. To clarify, oral and written comments submitted during the 2013 Regional MS4 Permit proceeding are considered part of the record carried forward to this amendment proceeding. In written comments on the Tentative Order, most commenters incorporated by reference all of their earlier submitted comments and objections. The San Diego Water Board likewise incorporates its 2013 written and oral responses to comments in the responses to comments report prepared by staff.

Please let me know if you have further questions.

Sincerely,

-Catherine
Catherine George Hagan
Senior Staff Counsel
Office of Chief Counsel
State Water Resources Control Board
2375 Northside Drive, Suite 100
San Diego, CA 92108
Tel. 619-521-3012
Fax 619-516-1994
E-mail: catherine.hagan@waterboards.ca.gov

Please note my new mailing address and telephone/fax numbers.

Catherine George Hagan
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Please note my new mailing address and telephone/fax numbers.

Walsh, Laurie@Waterboards

From: Barker, David@Waterboards
Sent: Tuesday, February 10, 2015 5:08 PM
To: cmacon@lagunawoodscity.org; twheeler@lakeforestca.gov; csands@ci.laguna-hills.ca.us
Cc: Slaven, Devin (dslaven@lakeforestca.gov); Andre Monette (Andre.Monette@bbklaw.com); Rosenfield, Ken@CI.LAGUNA-HILLS@DOT; Becker, Eric@Waterboards
Subject: San Diego Water Board Agreement Letter - RWQCB Designation for MS4 Discharges- Cities of Laguna Hills, Laguna Woods and Lake Forest
Attachments: 2015-0210 SDWaterBoard Agreement.pdf; Exhibit 1 2014-0312 Laguna Hills RWQCB Designation.pdf; Exhibit 2 2014-09-08 Laguna Woods RWQCB Designation.pdf; Exhibit 3 2014-0404 & 2013-0114 Lake Forest RWQCB Designation.pdf; Exhibit 4 Uniform Beach Water Quality Monitoring.pdf

Messrs. Macon, Channing, and Wheeler:

The attached finalized letter of agreement (with Exhibits 1 through 4) has been prepared by the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) in response to the requests submitted by the Cities of Laguna Hills, Laguna Woods and Lake Forest seeking designation of a single Regional Water Board to regulate matters pertaining to Phase 1 municipal separate storm sewer (MS4) discharges. The requests were consolidated for review and this letter
is being issued in response to all three requests.

The attached letter constitutes the San Diego Water Board agreement to the Regional Water Board designations. A separate letter constituting Santa Ana Water Board's agreement to the Regional Water Board designations will be submitted to you by Santa Ana Water Board.

If you have any questions or wish to discuss further please contact me at the e-mail address or phone number specified below.

Regards,

David Barker
San Diego Water Board

David T. Barker, P.E.
Supervising Engineer
California Regional Water Quality Control Board
San Diego Region
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026917
EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

CALIFORNIA
Water Boards

California Regional Water Quality Control Board, San Diego Region

February 10, 2015

In reply refer to / attn:
Place ID 658018:LWalsh

Mr. Christopher Macon
City Manager
City of Laguna Woods
24264 El Toro Road
Laguna Woods, CA 92637

Mr. Bruce Channing
City Manager
City of Laguna Hills
24035 El Toro Road
Laguna Hills, CA 92653

Mr. Thomas Wheeler, PE
Director of Public Works/City Engineer
City of Lake Forest
25550 Commercentre Drive, Suite 100
Lake Forest, CA 92630

Subject: Regional Water Board Designation for Regulating Municipal Separate Storm Sewer System Discharges in the Cities of Laguna Woods, Laguna Hills, and Lake Forest, Orange County

Messrs. Macon, Channing, and Wheeler:

This is in response to your separately submitted requests seeking designation of a single Regional Water Board to regulate matters pertaining to Phase 1 municipal separate storm sewer system (MS4) discharges in the Cities of Laguna Hills, Laguna Woods and Lake Forest (jointly referred to herein as Cities). The requests were consolidated for review and this letter is being issued in response to all three requests.

As provided in Water Code section 13228(a), this letter constitutes the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) agreement (Agreement) to the Regional Water Board designations specified below.

1. Except as otherwise provided in this Agreement, the Santa Ana Regional Water Quality Control Board (Santa Ana Water Board) is designated to regulate the entire jurisdictional area of the City of Lake Forest under the Santa Ana Water Board's *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Orange County Flood Control District, the County of Orange and the Incorporated Cities therein within the Santa Ana Region, Area-wide Urban Runoff, Santa Ana Region* (Order No. R8-2015-0001, NPDES No. CAS618030, as it may be amended or reissued) (Santa

Ana Phase 1 MS4 Permit),[1] including those areas of the City located within the San Diego Water Board's geographic jurisdiction; *and*

2. Except as otherwise provided in this Agreement, the San Diego Water Board is designated to regulate the entire jurisdictional areas of the City of Laguna Woods and the City of Laguna Hills under San Diego Water Board's *NPDES Permit and Waste Discharge Requirements for Discharges from the MS4s Draining the Watersheds Within the San Diego Region* (Order No. R9-2013-0001, as amended by Order No. R9-2015-0001, NPDES No. CAS0109266, as it may be further amended or reissued) (San Diego Phase 1 MS4 Permit),[2] including those areas of each City located within the Santa Ana Water Board's geographic jurisdiction.

This Agreement is based upon the written request submitted by each City, factual considerations and other conditions as summarized below. To the extent of any inconsistencies between the terms of this Agreement and the permit provisions implementing the Agreement, the permit provisions prevail.

Regional Water Board Designation Request

Written requests for designation of a single Regional Water Board to regulate matters pertaining to permitting of Phase I MS4 discharges were submitted to the San Diego Water Board by the City of Laguna Hills by letter dated March 12, 2014 (attached hereto as Exhibit 1), the City of Laguna Woods by letter dated September 8, 2014 (attached hereto as Exhibit 2), and the City of Lake Forest by letters dated January 14, 2013, and April 4, 2014 (attached hereto as Exhibit 3). The City of Laguna Hills and the City of Laguna Woods requested designation of the San Diego Water Board, and the City of Lake Forest requested designation of the Santa Ana Water Board. Water Code section 13228 specifies the circumstances that allow, and the process for, designation of a Regional Water Board.

Factual Considerations

The Cities each lay partially within the geographic jurisdictional boundaries of the San Diego Water Board and the Santa Ana Water Board. Phase 1 MS4 discharges in portions of the Cities are currently regulated under separate Phase 1 MS4 NPDES permits issued by the Santa Ana Water Board and by the San Diego Water Board.

The Santa Ana Water Board and San Diego Water Board establish generally consistent requirements for MS4 dischargers to a) meet the technology-based standard of reducing pollutants in MS4 discharges to the maximum extent practicable (MEP); b) implement a related iterative process to ensure MS4 discharges meet receiving water quality standards; and c) effectively prohibit non-storm water discharges from entering the MS4. However due to the unique nature of watersheds and water quality issues in the San Diego Region and Santa Ana Region, MS4 permit requirements between the two Regional Water Boards may also vary to

[1] While the Santa Ana Phase 1 MS4 Permit has not been adopted as of the date of this letter, the effective date of this Agreement is contingent upon its adoption (see paragraph 1., Effective Date, below).

[2] While the San Diego Phase 1 MS4 Permit has not been adopted as of the date of this letter, the effective date of this Agreement is contingent upon its adoption (see paragraph 1., Effective Date, below)

address region specific pollutant discharges and watershed conditions. The Cities report that management and implementation of municipal programs to comply with two different MS4 permits creates a significant administrative and financial burden that is not contributing to greater overall water quality improvements in either region.

The San Diego Water Board is scheduled to hold a public hearing on February 11, 2015 to consider adoption of Tentative Order No. R9-2015-0001, *An Order Amending Order No. R9-2013-0001, NPDES No. CAS010266, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Tentative Order). The Tentative Order proposes to amend the San Diego Phase 1 MS4 Permit for a variety of reasons including incorporation of the County of Orange, Orange County Flood Control District, and the cities of Aliso Viejo, Dana Point, Lake Forest[3] Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano as MS4 dischargers responsible for compliance with the terms and the conditions of the San Diego Phase 1 MS4 Permit. The Tentative Order also proposes limited permit provisions addressing Regional Water Board designation to consolidate regulation of the Cities of Laguna Hills, Laguna Woods, and Lake Forest pursuant to Water Code section 13228, in accordance with the terms of this Agreement.

The Santa Ana Water Board recently released for public comment a Second Draft of the Santa Ana Phase I MS4 Permit. The current written public comment period is scheduled to close February 13, 2015. The Santa Ana Water Board has not yet scheduled a hearing date to consider adoption of the Santa Ana Phase 1 MS4 Permit.

San Diego Water Board Conditions for Regional Water Board Designation

This Agreement is conditional upon the following:

1. **Effective Date**. The San Diego Water Board intends to consider amending the San Diego Phase 1 MS4 Permit at a hearing on February 11, 2015. The Santa Ana Water Board has not yet scheduled a hearing to consider adoption of the Santa Ana Phase 1 MS4 Permit. To avoid gaps or duplication in regulation until both Regional Water Boards have acted to adopt their Phase 1 MS4 Permits, the Regional Water Board designations described in this Agreement shall become effective on the last date on which both the San Diego Phase 1 MS4 Permit and the Santa Ana Phase 1 MS4 Permit are adopted and effective.

2. **Applicability of Designation**. Except as otherwise provided herein, this Agreement enables each City to be regulated under a single Phase 1 MS4 Permit.

3. **Conformance with Written Request.** Upon the effective date of this Agreement, each City shall implement the water quality protection measures described in its written request for designation and attached as Exhibits 1, 2 and 3 hereto as reflected in the San Diego

[3] Until this Agreement is effective, the City of Lake Forest within the San Diego Water Board's geographical region will be covered under Order No. R9-2013-0001 as amended by Order No. R9-2015-0001.

and Santa Ana Phase I Permits. These water quality protection measures are incorporated by reference into this Agreement as if fully stated herein. The conditions of this Agreement shall supersede any conflicting provisions in the Cities' written requests.

4. **Enforcement Authority**. Each Regional Water Board reserves its right to take any enforcement action against a City, as authorized by law for any violations of the terms and conditions of the applicable Phase 1 MS4 Permit which affects that Regional Water Board pursuant to Water Code section 13228(b). Responsibility for undertaking enforcement to compel compliance with permit conditions will generally be assumed by the Regional Water Board that issued the Phase 1 MS4 Permit.

5. **Total Maximum Daily Load Requirements for the City of Laguna Woods or the City of Laguna Hills.** Any Total Maximum Daily Load (TMDL) and associated Phase 1 MS4 permit requirements issued by the Santa Ana Water Board and applicable to the City of Laguna Woods or the City of Laguna Hills will be incorporated into the appropriate Phase 1 MS4 permit by reference and remain applicable.

6. **Total Maximum Daily Load Requirements for the City of Lake Forest.** Any TMDL and associated Phase 1 MS4 permit requirements issued by the San Diego Water Board and applicable to the City of Lake Forest will be incorporated into the appropriate Phase I MS4 Permit by reference and remain applicable.

7. **Construction Site Storm Water Program.** Construction sites in the Cities regulated under the statewide *General Permit for Construction Discharges of Storm Water Associated with Construction Activities,* Order No. 2009-0009-DWQ and any subsequent reissuance (Construction General Storm Water Permit) will continue to be subject to regulation by the San Diego Water Board or the Santa Ana Water Board as determined by the geographical jurisdictional area of each Regional Water Board. The Santa Ana Water Board will notify the San Diego Water Board of any incidents of noncompliance discovered during inspections of construction sites within its geographic jurisdictional boundary that discharge into an MS4 owned or operated by the City of Laguna Woods or the City of Laguna Hills. The San Diego Water Board will notify the Santa Ana Water Board of any incidents of noncompliance discovered during inspections of construction sites within its geographic jurisdictional boundary that discharge into an MS4 owned or operated by the City of Lake Forest.

8. **Industrial Site Storm Water Program.** Industrial sites in the Cities subject to regulation under the statewide *General Permit for Industrial Discharges of Storm Water Associated with Industrial Activities*, Order No. 97-03-DWQ and any subsequent reissuance (Industrial General Storm Water Permit) will continue to be subject to regulation by the San Diego Water Board or the Santa Ana Water Board as determined by the geographical jurisdictional area of each Regional Water Board. The Santa Ana Water Board will notify the San Diego Water Board of any incidents of noncompliance discovered during inspections of industrial sites within its geographic jurisdictional boundary that discharge into an MS4 owned or operated by the City of Laguna Woods or the City of Laguna Hills.

The San Diego Water Board will notify the Santa Ana Water Board of any incidents of noncompliance discovered during inspections of industrial sites within its geographic jurisdictional boundary that discharge into an MS4 owned or operated by the City of Lake Forest.

9. **Municipal Construction Projects.** For all municipal construction projects, including those projects located within the jurisdictional area of the Santa Ana Water Board, the City of Laguna Woods and the City of Laguna Hills will submit Permit Registration Documents (PRDs) in the form of a Notice of Intent (NOI) with appropriate fees in accordance with the manner prescribed in the statewide Construction General Storm Water Permit. For all municipal construction projects, including those projects located within the jurisdictional area of the San Diego Water Board, the City of Lake Forest will use the process established by the Santa Ana Water Board for obtaining coverage under the Construction General Storm Water Permit.

10. **Municipal Corporate Yards**. The City of Laguna Woods and the City of Laguna Hills currently do not have municipal corporate yards. If either City creates a municipal corporate yard during the term of this Agreement, the City shall obtain coverage under the statewide Industrial General Storm Water Permit for the municipal corporate yard.

11. **Water Quality Improvement Plan**. The San Diego Phase 1 MS4 Permit requires responsible agencies within designated Watershed Management Areas to develop and implement a Water Quality Improvement Plan. The Water Quality Improvement Plan is a comprehensive watershed plan that identifies priority water quality conditions, water quality improvement goals, pollutant control strategies, and implementation schedules to achieve the goals. The requirements of TMDLs adopted by the San Diego Water Board have been incorporated into the requirements of the Water Quality Improvement Plan allowing the City of Lake Forest and the other responsible agencies within the South Orange County Watershed Management Area to develop a single plan to coordinate their non-storm water and storm water runoff management programs. The City of Lake Forest will continue to actively participate in the development and implementation of the Water Quality Improvement Plan for the Aliso Creek Watershed Management Area.

12. **Over-Irrigation Prohibitions**. The City of Lake Forest will continue to retain and implement its prohibition in the City Municipal Code against non-storm water discharges from over-irrigation practices throughout its jurisdiction. The City of Laguna Woods will continue to retain and implement its prohibition in the City Municipal Code against non-storm water discharges from over-irrigation practices throughout its jurisdiction, including those areas that drain to an MS4 within the geographic jurisdictional boundary of the Santa Ana Water Board. The City of Laguna Hills will continue to retain and implement its prohibition in the City Municipal Code against non-storm water discharges from over-irrigation practices throughout its jurisdiction, including those areas that drain to an MS4 within the geographic jurisdictional boundary of the Santa Ana Water Board.

13. **Unified Beach Water Quality Monitoring**. The Cities, together with Orange County Health Care Agency, and South Orange County Wastewater Authority, will participate in and share responsibility for implementation of the unified regional beach water quality monitoring and assessment program in south Orange County established in the California Water Code section 13383 directive issued by the San Diego Water Board Executive Officer on December 5, 2014 (attached hereto as Exhibit 4).

14. **Citizen Complaints**. Citizen complaints received regarding discharges from municipal, construction, industrial, and commercial sites to MS4s within the jurisdiction of the City of Laguna Woods or the City of Laguna Hills will be referred to the San Diego Water Board for review. Citizen complaints received regarding discharges from municipal, construction, industrial, and commercial sites to MS4s within the City of Lake Forest will be referred to the Santa Ana Water Board for review.

15. **Annual Reports**. Annual Reports prepared by each City pursuant to its Phase 1 MS4 Permit requirements shall be a single report encompassing the entire geographic jurisdictional area of the City, using the format prescribed in the applicable Phase 1 MS4 Permit. The Annual Reports shall be submitted to the Regional Water Board that issued the applicable Phase 1 MS4 NPDES Permit.

16. **Periodic Review of Agreement**. The basis supporting the Cities of Laguna Woods, Laguna Hills, and Lake Forest's requests to designate a single Regional Water Board for regulatory oversight may change under future conditions and circumstances. Therefore the San Diego Water Board will periodically review the effectiveness of this Agreement during each Phase 1 MS4 Permit reissuance. Based on this periodic review the San Diego Water Board may terminate the Agreement with the Santa Ana Water Board or otherwise modify the Agreement subject to the approval of the Santa Ana Water Board.

Please send any written correspondence in response to this letter to SanDiego@waterboards.ca.gov. These electronic documents must be submitted as a single file, in Portable Document Format (PDF) format, and converted to text searchable format using Optical Character Recognition (OCR). All electronic documents must also include scanned copies of all signature pages; electronic signatures will not be accepted. Electronic documents submitted to the San Diego Water Board must include the following identification numbers in the header or subject line **Place ID 658018:LWalsh.**

For questions or comments, please contact Laurie Walsh by phone at (619) 521-3373 or by email at Laurie.Walsh@waterboards.ca.gov.

Respectfully,

DAVID W. GIBSON
Executive Officer

DWG:dtb:esb:law

Enclosures: Exhibit 1. City of Laguna Woods, September 8, 2014 written request
Exhibit 2. City of Laguna Hills, March 12, 2014 written request
Exhibit 3. City of Lake Forest, January 14, 2013 and April 4, 2014 written requests
Exhibit 4. Unified Beach Water Quality Monitoring and Assessment Program

cc: Kurt Berchtold, Executive Officer, Santa Ana Water Board

Tech Staff Info & Use	
Tentative Order No.	R9-2015-0001(revising R9-2013-0001)
Party (GT/CIWQS) ID	Laguna Woods CW-38102 Laguna Hills CW-382239 Lake Forest CW-525638
NPDES No.	CAS0109266
Reg. Measure ID	332672 (OC Permit)
Place IDs	CW-658018 OC Copermittees CW-236148 Laguna Woods CW-236131 Laguna Hills CW-236212 Lake Forest

Walsh
026924
Exhibit 1.

SAN DIEGO REGIONAL
WATER QUALITY
CONTROL BOARD

2014 MAR 21 AM 10 47

CITY OF LAGUNA HILLS

City Manager

March 12, 2014

Mr. Kurt Berchtold
Executive Officer
California Regional Water Quality
Control Board - Santa Ana Region
3737 Main Street, Suite 500
Riverside, CA 92501-3339

Mr. David W. Gibson
Executive Officer
California Regional Water Quality
Control Board – San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

SUBJECT: REQUEST TO DESIGNATE THE SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD AS THE REGULATORY AUTHORITY FOR ALL STORMWATER DISCHARGES IN THE CITY OF LAGUNA HILLS

Dear Messrs. Berchtold and Gibson:

The City of Laguna Hills is located within south Orange County and covers an area of approximately 6.6 square miles. About 82% of the City's land area is located within the Aliso Creek and San Juan Creek Watersheds under the jurisdiction of the San Diego Regional Water Quality Control Board (SDRWQCB) with the remaining 18% (1.2 square miles) of the City in the Newport Bay/San Diego Creek Watershed under the jurisdiction of the Santa Ana Regional Water Quality Control Board (SARWQCB). Attached for your reference is a map of the City overlaid with the jurisdictional boundary between the two Regional Boards.

The City is a co-permittee in two Municipal Separate Storm Sewer System (MS4) Permits, Order R9-2009-0002 and Order R8-2009-0030 issued by the SDRWQCB and the SARWQCB, respectively. Both jurisdictions issue comprehensive Large MS4 Permits that require the City to implement extensive compliance programs. Differences in the requirements of both Regions' Large MS4 Permits have significant impacts on City operations. Major program level differences force the City to implement what

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K. Ruiz Time: 8:49

24035 El Toro Road • Laguna Hills, California 92653 • (949) 707-2610 • FAX (949) 7
website: www.ci.laguna-hills.ca.us

amounts to two different compliance programs within City limits. This results in a significant resource and administrative burden which, in turn, reduces available resources for program implementation. Therefore, in accordance with California Water Code Section 13228, the City of Laguna Hills requests that the SARWQCB and the SDRWQCB both agree to designate SDRWQCB for regulation of all portions of the City, regardless of Regional Board jurisdictional boundaries, for matters pertaining to MS4 permitting.

The City is currently a named co-permittee on Order R8-2009-0030 issued by the SARWQCB (Santa Ana Permit), and Order R9-2009-0002 with the SDRWQCB (San Diego Permit). While having the same goal of reducing the discharge of pollutants from the MS4 system, these two Permits include different requirements. As a result, programs designed to be in compliance with the Santa Ana Permit are similar, but necessarily different than programs designed for compliance with the San Diego Permit. When this situation is applied within a single City, such as the City of Laguna Hills, having two different Permits and related implementation programs creates significant confusion among both City staff and the public, which can lead to inconsistent and inefficient protection of water quality. Additionally, and no less significant, there is a duplicative administrative and financial burden that is inherent in complying with two MS4 Permits: two sets of programs have to be developed; staff has to be trained on two sets of requirements with differing frequencies; business inspections must inspect for and track different information at differing frequencies; and two sets of annual reports have to be created with each report being required to include different information; among other differing requirements.

The City of Laguna Hills' request is not unique in that similar requests regulating MS4 discharges to a single Regional Board jurisdiction, despite being split across a watershed boundary, have been granted in 2010 in Riverside County to the cities of Murrieta, Wildomar, and Menefe; the SARWQCB is working with the Los Angeles Regional Water Quality Control Board to regulate discharges of bacteria from the cities of Claremont and Pomona across boundaries; and the City of Lake Forest has requested single jurisdictional coverage into the SARWQCB.

This request by the City of Laguna Hills is made with the understanding that:

- For the purposes of MS4 permitting only, the SDRWQCB would regulate the entirety of the City of Laguna Hills. As a result, the City of Laguna Hills would be subject to a single MS4 permit, which would be issued by the SDRWQCB.
- Enforcement of any provisions of the MS4 permit issued to the City of Laguna Hills would be performed by the SDRWQCB.
- Any TMDLs and associated MS4 permit requirements issued by the SARWQCB, which include the City of Laguna Hills as a responsible party, will

be incorporated into the MS4 permit issued by the SDRWQCB by reference, including any associated provisions, findings or elements of the fact sheet.

- Enforcement of any TMDL will remain with the Regional Board that has jurisdiction over the targeted impaired water body.
- Other Waste Discharge Requirements, or other Orders issued or enforced by the SARWQCB would remain wholly under the jurisdiction of the SARWQCB.

Some facts about the City of Laguna Hills and the portion within the jurisdiction of the SARWQCB are described below. Also enclosed with this letter is a map of the City with the subject area highlighted.

- Total Area of the City = 6.6 square miles
- Area within the Santa Ana Region Watershed = 1.2 square miles
- Percent of City in the Santa Ana Region Watershed = 18%

The requested designation of regulatory authority to the SDRWQCB will not only reduce the complexity and administrative burden upon the City of Laguna Hills, but will allow the City to better focus and effectively utilize its available resources to the best benefit of stormwater quality in both Regions.

If you have any questions regarding this request, please contact Director of Public Services Kenneth Rosenfield at (949) 707-2655 or krosenfield@ci.laguna-hills.ca.us.

Sincerely,

BRUCE E. CHANNING
City Manager

Attachment: Map of the City of Laguna Hills

c: Kenneth Rosenfield, Director of Public Services
Humza Javed, Associate Civil Engineer
Greg Simonian, City Attorney
Chris Crompton, OC Public Works

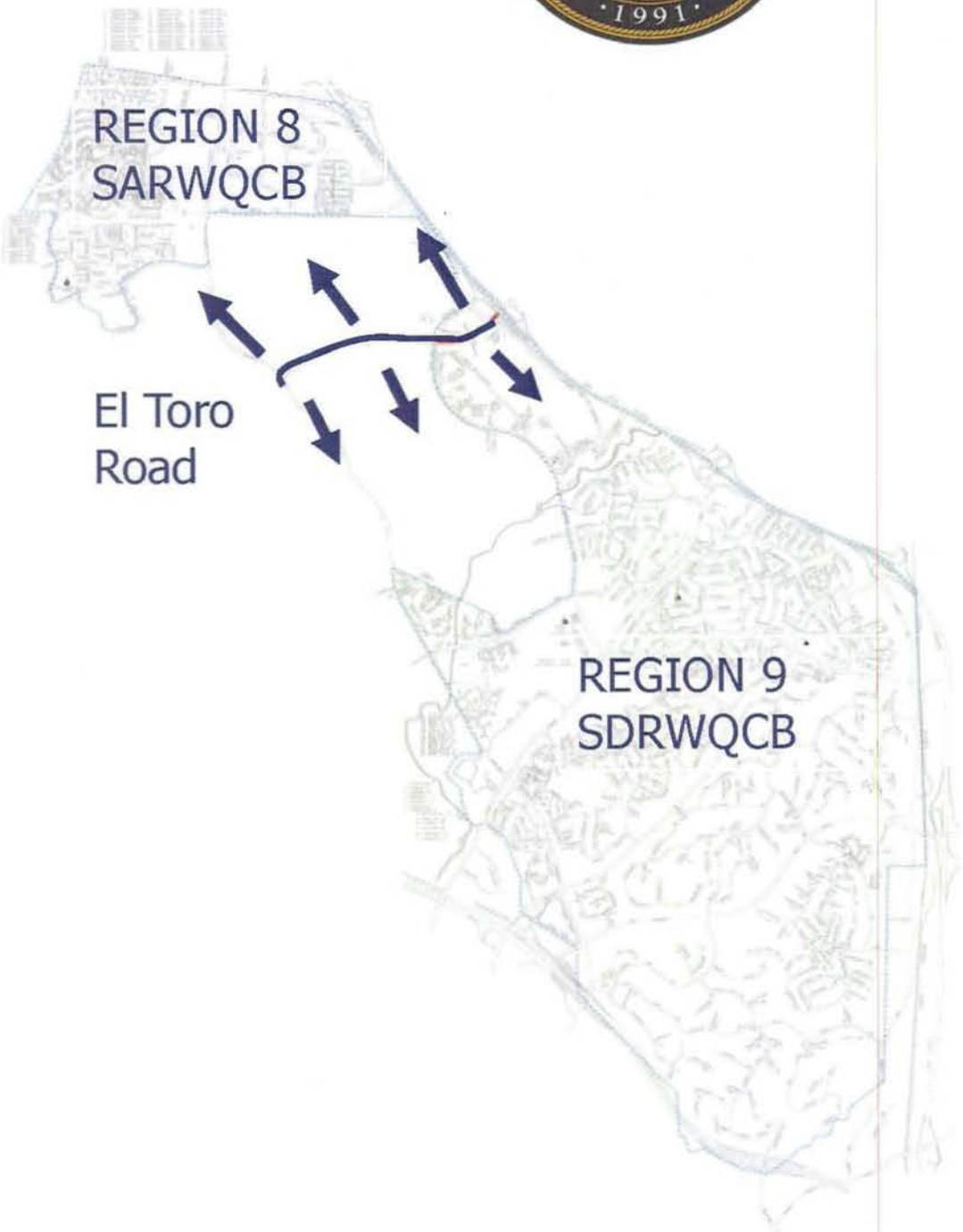

CITY OF LAGUNA HILLS
CITY MAP

CITY of LAGUNA WOODS

Bert Hack
Mayor

Cynthia Conners
Mayor Pro Tem

Noel Hatch
Councilmember

Shari L. Horne
Councilmember

Bob Ring
Councilmember

Christopher Macon
City Manager

September 8, 2014

Mr. Kurt Berchtold, Executive Officer
Santa Ana Regional Water Quality Control Board
3737 Main Street, Suite 500
Riverside, CA 92501-3348

Mr. David W. Gibson, Executive Officer
San Diego Regional Water Quality Control Board
2375 Northside Drive, Suite 100
San Diego, CA 92108-2700

SUBJECT: Request to Obtain Coverage Under a Single National Pollutant Discharge Elimination System (NPDES) Permit

Dear Mr. Berchtold and Mr. Gibson:

Thank you for your continued consideration of the City of Laguna Woods' request to obtain coverage under a single National Pollutant Discharge Elimination System (NPDES) Permit, in lieu of the split coverage that the City currently experiences between the Santa Ana and San Diego regional water quality control boards. Like our colleagues in the cities of Laguna Hills and Lake Forest, the City is seeking this regulatory change in the interest of being able to better focus our water quality improvement and protection efforts through the reduction of unintentionally duplicative and cumbersome administrative burdens.

It is the City's belief that obtaining single coverage under the San Diego Regional Water Quality Control Board's NPDES Permit would most efficiently and effectively leverage the public and private relationships that have been key in making positive environmental strides in the past, while also respecting the significance of the Water Code Section 13225-impaired waterbody to which Laguna Woods discharges directly. The City recognizes and accepts that our obligations for Total Maximum Daily Loads (TMDLs) and waste discharge orders issued or enforced by either regional water quality control board would remain unchanged.

If you have any questions or concerns, or would like to discuss this request further, please do not hesitate to contact me at (949) 639-0525 or cmacon@lagunawoodscity.org.

Sincerely,

Christopher Macon
City Manager

24264 El Toro Road • Laguna Woods, CA 92637 • Phone (949) 639-0500 • Fax (949) 639-0591 • Website: www.lagunawoodscity.org

026929
Exhibit 3.

CITY OF LAKE FOREST

SAN DIEGO REGIONAL
WATER QUALITY
CONTROL BOARD

2014 APR 10 PM 12 32

April 4, 2014

Mayor
Dwight Robinson

Mayor Pro Tem
Adam Nick

Council Members
David A. Bass
Kathryn McCullough
Scott Voigts

City Manager
Robert C. Dunek

Mr. David Gibson
Executive Officer
California Regional Water Quality Control Board,
San Diego Region
2375 Northside Drive, Suite 100
San Diego, CA 92108-2700

Subject: Clarification of the City of Lake Forest Request as Outlined in the City's January 14, 2013 correspondence.

Dear Mr. Gibson:

Thank you for returning my call. Although we haven't had the opportunity to speak in person, your message was helpful in understanding the current status of the City's request. I am writing with confidence that my staff and I can provide clarification that may add to your understanding of the nature of our request and note the opportunities and importance of present timing.

Clarification of Request

A little over a year ago, the City of Lake Forest (City) submitted a formal request to both regional boards having regulatory oversight for stormwater in the City; namely, the San Diego and Santa Ana Regional Water Quality Control Boards (SDRWQCB and SARWQCB, respectively). We wish to clarify that our intent and request is to be regulated by the SARWQCB only for MS4 permitting purposes. The City recognizes that a written agreement between the two Regional Boards would have limitations including, probably most significantly, the Bacterial TMDL in the San Diego Region. It continues to be the City's intent to participate in the Bacterial TMDL. Indeed, considering that bacteria indicator issues appear to be a watershed/regional issue we recognize the value in developing a watershed/regional solution(s). The City has a long and successful history of collaboration with the County of Orange and the other south Orange County cities regulated by the San Diego Board, and we wish to continue these efforts in the same manner. It is our intent to continue development and implementation of programs related to the Bacteria TMDL through the Comprehensive Load Reduction Plan along with the other Co-Permittees working together within the Aliso Creek Watershed.

Significance to the City of Lake Forest

Designating the SARWQCB as the single Regional Board regulator represents a significant and important solution for the City in implementing the day-to-day activities typically associated with MS4 permit compliance. Reducing and/or eliminating regulatory

DRUG USE IS LIFE ABUSE

disparities, confusion and overlap is a priority for the City and the public we serve who are subject to these same regulatory requirements. Even minor disparities between the two MS4 permits can and do have significant impacts to the City and to the public's financial and resource burdens. We are aware that other cities (please see references below) have successfully requested and have been approved for similar/same requests. The importance and significance of purpose for these regulatory modifications has not been lost on City staff. We respectfully submit that it is a prudent and necessary solution to achieve responsible governance that is long overdue. Based upon our discussions with SARWQCB staff and the other successfully implemented cases referenced below, the mechanism required to institute regulation of the MS4 permit activities by a single Regional Board is through a relatively brief letter agreement and potentially brief recognition in the MS4 permit itself. In addition, it is our understanding that the City of Laguna Hills also recognizes the significant value of a single MS4 permit and they may be interested in being regulated by the SDRWQCB as a single regulator. Since much can be gained through relatively little effort, the City believes this opportunity to be a worthy effort and we ask for your support to make it happen.

Timing

The City is aware of SDRWQCB staff's suggestion to wait until the Report of Waste Discharge (ROWD) is submitted by the south Orange County cities for regulation under the new SDRWQCB Regional MS4 Permit. However, we would like to bring to your attention that the SARWQCB MS4 permit adoption schedule is ahead of the schedule for the San Diego Region. In consideration that approximately 70% of the City's land area resides within the jurisdiction of the SARWQCB, and the City is requesting the SARWQCB to be designated as the single regulator for MS4 permit compliance, an agreement to proceed from you and your staff would be very timely, and is urgently requested. Based upon our discussions with SARWQCB staff, they are very supportive of our request, but would like to receive your concurrence.

Examples of Precedence and Previous Successful Implementation

The City is aware of a letter agreement between the SDRWQCB and the SARWQCB that established a single designated Regional Board to regulate the Cities of Murrieta, Meniffee, and Wildomar, pursuant to Water Code Section 13228, subdivision (a).

Similar to the above example, the City is aware of another letter agreement between the Los Angeles Regional Water Quality Control Board and the SARWQCB designating the SARWQCB as the single regulator of discharges of bacteria by the Cities of Claremont and Pomona through their MS4s to receiving waters within the Middle Santa Ana River Watershed.

We appreciate the opportunity to provide clarification for our January 14, 2013 request and bring your attention to the importance of present timing related to the SARWQCB MS4 permit adoption schedule. We are optimistic you will find our request to be consistent with the five examples provided above and we request your concurrence at your earliest convenience in order to facilitate a path forward under the SARWQCB MS4 permit adoption schedule.

I will be in contact with you to set up a meeting between the SARWQCB and SDRWQCB staff in addition to the Cities of Lake Forest and Laguna Hills staff to further discuss this opportunity.

If you should have any questions, please contact Devin Slaven, Water Quality Administrator at (949) 461-3436 or me at (949) 461-3481.

Sincerely,

CITY OF LAKE FOREST

Thomas Wheeler, P.E.
Director of Public Work/City Engineer

cc: Kurt Berchtold, Executive Officer, SARWQCB
Robert Dunek, City Manager
Devin Slaven, Water Quality Administrator

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CITY OF LAKE FOREST

Mayor
Scott Voigts

Mayor Pro Tem
Kathryn McCullough

Council Members
Peter Herzog
Adam Nick
Dwight Robinson

City Manager
Robert C. Dunek

January 14, 2013

Via US Mail and E-mail

Mr. Kurt Berchtold
Executive Officer
California Regional Water Quality Control Board, Santa Ana Region
3737 Main Street, Suite 500
Riverside, CA 92501-3339

Mr. David W. Gibson
Executive Officer
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Re: Request to Designate the Santa Ana Regional Water Quality Control Board to Regulate Discharges from the MS4 owned by the City of Lake Forest

Dear Messrs. Berchtold and Gibson:

The City of Lake Forest (City) is located within southwestern Orange County, and covers an area of approximately 17 square miles. Approximately 70% of the City's land area is located within the Newport Bay/San Diego Creek Watershed which is under the jurisdiction of the California Regional Water Quality Control Board, Santa Ana Region (SARWQCB). The remaining 30% of the City's land area is located within the Aliso Creek Watershed which is under the jurisdiction of the California Regional Water Quality Control Board, San Diego Region (SDRWQCB). Attached for your reference, is a map of the City depicting the jurisdictional boundary between the SARWQCB and SDRWQCB (Regional Boards).

Because of this situation, the City is subject to two separate Municipal Separate Storm Sewer System (MS4) Permits issued by the respective Regional Boards. Both jurisdictions issue comprehensive large MS4 Permits that require the City to implement extensive compliance programs. Differences in the substantive requirements of both Regions' Large MS4 Permits have significant impacts on City operations. Major program level differences force the City to implement what amounts to two different compliance programs within City limits. This results in a significant resource and administrative burden which, in turn, causes valuable resources to be diverted away from program implementation.

Mr. Kurt Berchtold
Santa Ana Regional Water Quality Control Board
Mr. David W. Gibson
San Diego Regional Water Quality Control Board
Re: Request for Singular Regulation

Based upon the issues outlined above and consistent with California Water Code section 13228, the City of Lake Forest hereby requests that the Regional Boards agree to designate the SARWQCB for regulation of all portions of the City for matters pertaining to MS4 permitting, regardless of Regional Board jurisdictional boundaries. In this manner, the City of Lake Forest would be subject to a single MS4 permit.

City staff is aware that similar requests have been granted to the Cities of Murrieta, Menifee, and Wildomar in Riverside County. We are also aware that the SARWQCB is working with the Los Angeles Regional Water Quality Control Board to regulate discharges of bacteria from the cities of Claremont and Pomona. In addition, we are aware that the City of Laguna Hills will be submitting a similar request to this one; however, it is our understanding that Laguna Hills will be requesting to be singularly regulated by the SDRWQCB as the majority of their land area is located within the SDRWQCB jurisdiction.

Below, please find a discussion of the basis for this request and a description of the portion of the city that is proposed to be regulated by the Santa Ana Regional Water Quality Control Board.

Basis for the request

The City is currently named as a Permittee in Order R8-2009-0030 issued by the SARWQCB (Santa Ana Permit), and Order R9-2009-0002 issued by the SDRWQCB (San Diego Permit). It is also notable that the SDRWQCB is currently in the process to consider adoption of a new MS4 permit covering the entire region of the SDRWQCB jurisdiction, including the Counties of San Diego, Riverside, and Orange. While both of the above referenced Orders indicate the same goal of reducing the discharge of pollutants from the MS4 system, these two Orders require the City to implement extensive, but different, compliance programs. Differences in the substantive requirements of each Region Board's Orders can have significant impacts on City operations and compels the City to implement what amounts to two different compliance programs within its jurisdiction. In turn, this results in increased resource and administrative burden, which can cause inherent and unavoidable inefficiencies in program implementation. For example, there are inherent duplicative administrative and financial burdens related to the development and implementation of two different programs; staff training for different requirements; development of different compliance information for staff, contractors, developers, businesses, and the general public; development and implementation compliance program components such as differing inventory, prioritization, inspection, and documentation requirements, and different annual reporting requirements; etc. In addition, attempting to implement two differing programs creates difficulties, inefficiencies, and confusion for City staff and the public. The overarching goal and purpose of the City's request is to reduce the aforementioned complexity to allow for the more effective and focused utilization of the City's resources to the benefit of water quality.

Mr. Kurt Berchtold
Santa Ana Regional Water Quality Control Board
Mr. David W. Gibson
San Diego Regional Water Quality Control Board
Re: Request for Singular Regulation

Description of the area of the City subject to the designation:

Some facts about the City of Lake Forest and the portions of the City located within different watersheds and different Regional Board jurisdictions. A map of the City depicting the Regional Board boundary is enclosed with this letter.

- 17 Square Miles*- Total Land Area of the City
- 11.5 Square Miles* – Total Land Area located in the Newport Bay/San Diego Creek Watershed (SARWQCB Jurisdiction)
- Approximately 5.5 Square Miles* - Total Land Area located in the Aliso Creek Watershed (SDRWCQB jurisdiction)
- 70% of Total Land Area* - Percent of City in the Newport Bay/San Diego Creek Watershed (SARWQCB Jurisdiction)
- 30% of Total Land Area* – Percent of City in the Aliso Creek Watershed (SDRWQCB Jurisdiction)

(* approximate)

Additional Request for Municipal Construction Projects Requiring Coverage Under the State Construction General Permit:

Understanding that the requested designation applies to the MS4 permit requirements, the SARWQCB implements a simplified process for applying for coverage under the General Construction Permit (Order 2009-0009-DWQ) for municipal projects. This process includes submission of Permit Registration Documents (PRDs) through a special category within the Storm Water Multiple Application and Reporting Tracking System (SMARTS) and waived application fees. To avoid unnecessary confusion among staff, and potential for inadvertent non-compliance, the City hereby requests to utilize the SARWQCB process to obtain coverage under the Construction General Permit for all municipal construction projects within the City limits (including those portions of the City located within the Aliso Creek Watershed).

In conclusion, the requested designation of regulatory authority to the SARWQCB will not only reduce the complexity and administrative burden upon the City of Lake Forest, but will allow the City to better focus and effectively utilize their available resources to the best benefit to water quality in both regions.

Mr. Kurt Berchtold
Santa Ana Regional Water Quality Control Board
Mr. David W. Gibson
San Diego Regional Water Quality Control Board
Re: Request for Singular Regulation

If you have any questions regarding this request, please contact Devin Slaven, Water Quality Administrator, at 949-461-3436 or dslaven@lakeforestca.gov.

Sincerely,
City of Lake Forest

Thomas Wheeler, P.E.
Director of Public Works/City Engineer

Attachments:

Map of the City of Lake Forest Depicting Regional Board Boundary

cc:

Robert Dunek, City Manager
Devin Slaven, CPSWQ, QSD/QSP, Water Quality Administrator
Scott Smith, City Attorney, Best Best & Krieger, LLP
Mary Anne Skorpanich, County of Orange, OC Watersheds

Exhibit 3.

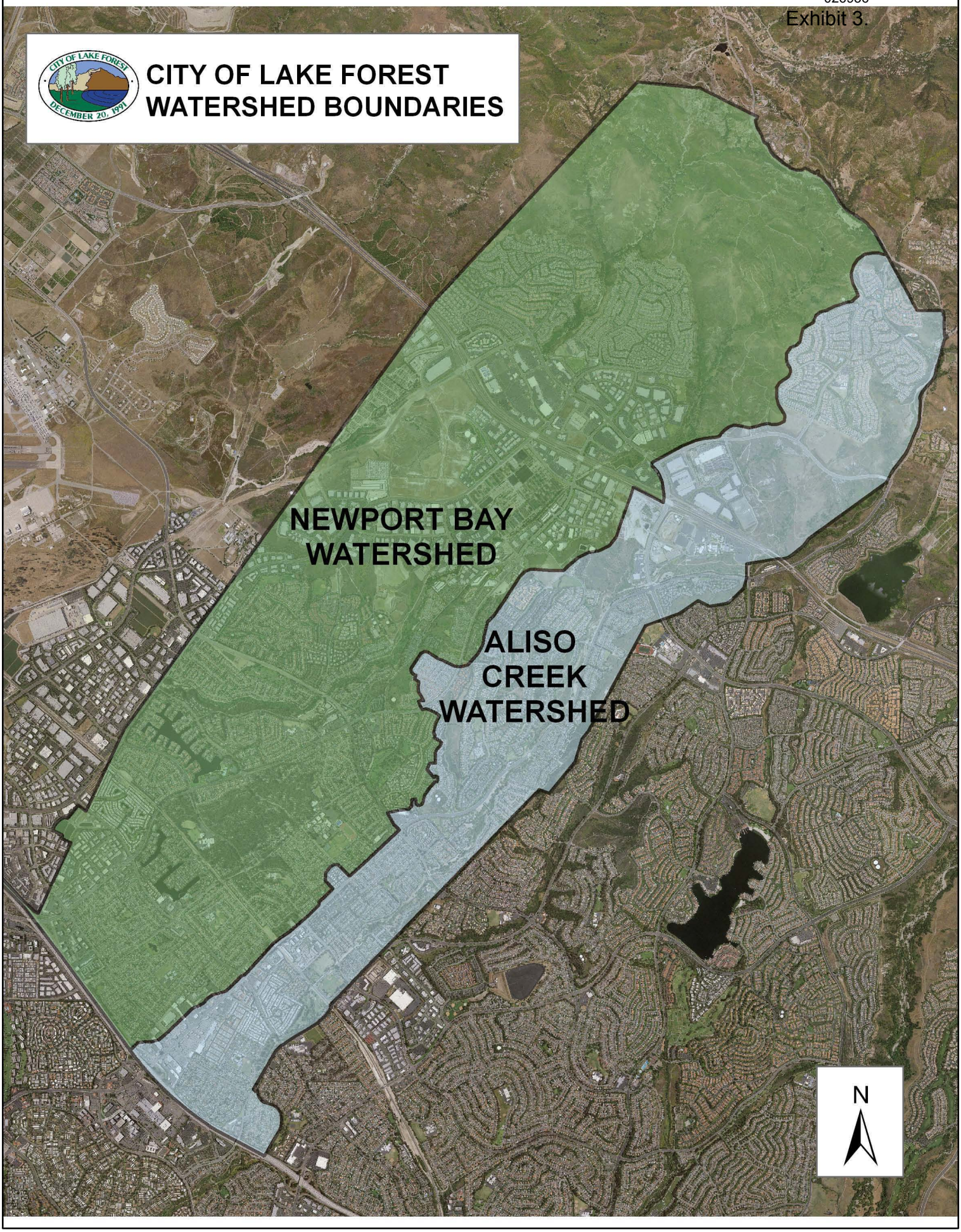
CITY OF LAKE FOREST
WATERSHED BOUNDARIES
CITY OF LAKE FOREST
DECEMBER 20, 1991
NEWPORT BAY
WATERSHED
ALISO
CREEK
WATERSHED
N

CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

TO: South Orange County Wastewater Authority (SOCWA)
South Orange County Municipal Separate Storm Sewer System (MS4) Copermittees
(via Email; see attached mailing list)

In reply refer to / attn:
257590:bposthumus
257592:bposthumus
658018:bposthumus

Subject: Requirements for Implementation of a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County (Water Code Section 13383)

The Code of Federal Regulations (CFR) at 40 CFR section 122.48 requires that all National Pollutant Discharge Elimination System (NPDES) permits specify monitoring and reporting requirements. California Water Code section 13383 also authorizes the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) to establish monitoring and reporting requirements for discharges to surface waters regulated by NPDES permits within the San Diego Region.

This letter serves to establish requirements, pursuant to Water Code section 13383,[1] that your agencies participate in, and, together with Orange County Health Care Agency (OCHCA), share responsibility for implementation of the unified regional monitoring program (Unified Program) set forth in the attached report ("Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County"), effective April 1, 2015. A draft of this letter was made available for public review and written comments for a 30-day period starting on October 30, 2014; no written comments were received.

The Unified Program, which is incorporated herein, was developed during the period from July 2012 to September 2014 by a workgroup that included representatives of SOCWA, Orange County Public Works, OCHCA, and other entities and individuals with interests in beach water quality in south Orange County. The Unified Program is intended to be protective, reasonable, and equitable and to meet or go beyond meeting the requirements for beach water quality monitoring and related public notification and reporting established by State law.

Effective April 1, 2015, the requirements established through issuance of this Water Code section 13383 letter directive will become enforceable components of the monitoring and reporting requirements of the NPDES permits for discharges from the (a) SOCWA Aliso Creek Ocean Outfall, (b) SOCWA San Juan Creek Ocean Outfall, and (c) south Orange County MS4s.[2] This letter directive is being issued to the NPDES permittees for those discharges, i.e., SOCWA (permittee for discharges from the Aliso Creek Ocean Outfall and the San Juan Creek Ocean Outfall) and the County of Orange,

[1] Use of an Executive Officer-issued directive, e.g., pursuant to Water Code section 13383, to require participation in and shared responsibility for implementation of the Unified Program and to specify the effective date of any revisions thereto facilitates putting the program and any such revisions into effect expeditiously and with the same effective date for all parties.

[2] The order numbers and NPDES numbers of these three permits, respectively, are:
(a) SOCWA Aliso Creek Ocean Outfall: Order No. R9-2012-0013 (NPDES No. CA0107611);
(b) SOCWA San Juan Ocean Outfall: Order No. R9-2012-0012 (NPDES No. CA0107417); and
(c) south Orange County MS4s: Order No. R9-2013-0001, (NPDES No. CAS0109266)

Orange County Flood Control District, and the cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Lake Forest, Mission Viejo, Rancho Santa Margarita, San Clemente and San Juan Capistrano (copermittees for discharges from the south Orange County MS4s).

The Executive Officer or the San Diego Water Board may approve future revisions to the Unified Program by updating this letter directive, provided that the Unified Program, as revised, will continue to meet the requirements of State law, including the California Ocean Plan, for beach water quality monitoring and related public notification and reporting requirements. Any future revisions requested by affected permittees or interested parties, or as deemed necessary and/or appropriate by the Executive Officer, will be subject to a 30 (thirty) day public comment period and request for hearing before the San Diego Water Board.

Under Water Code section 13389, issuance of this Water Code section 13383 letter directive is exempt from the provisions of the California Environmental Quality Act (Public Resources Code sections 21100-21177).

Any person aggrieved by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with Water Code section 13320 and California Code of Regulations, title 23, sections 2050 and following. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date of this Order. Copies of the law and regulations applicable to filing petitions may be found on the Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

Ordered by James G. Smith, AEO
for DAVID W. GIBSON
Executive Officer

DATE: December 5, 2014

DWG:jgs:jch:bwp

Attachments:
1. Mailing List
2. "Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County"

Tech Staff Info & Use	
Place ID	257590
Place ID	257592
Place ID	658018

ATTACHMENT 1

Mailing List

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SDRWQCB Email list: Orange County MS4 Permit

SWRCB Email list: Beach Water Quality Workgroup – Southern California

CALIFORNIA Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

March 3, 2015

Sent via E-mail

San Diego County Copermittees
Orange County Copermittees
Riverside County Copermittees

In reply refer to / attn:
Place ID: 786088:Lwalsh

Subject: Order No. R9-2015-0001, An Order Amending Order No. R9-2013-0001, NPDES No. CAS010266 National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) is pleased to transmit to you the enclosed finalized copy of Order No. R9-2015-0001, NPDES No. CAS010266, *An Order Amending Order No. R9-2013-0001, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Amending Order), as adopted by the San Diego Water Board February 11, 2015. This Order identifies specific changes made to Order R9-2013-0001 and Attachments in blue underline and red-strikeout text. Also enclosed is a conformed copy of Order R9-2013-0001 and Attachments which incorporates all adopted changes.

An electronic copy of both the Amending Order and a conformed copy of Order R9-2013-0001 and Attachments are available from the San Diego Water Board website at: http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml If a Copermittee or other interested person would like to receive a hard copy of either the Amending Order or a conformed copy of Order No. R9-2013-0001 with Attachments, please contact Laurie Walsh at (619) 521-3373 or Laurie.Walsh@waterboards.ca.gov or visit the San Diego Water Board's office at 2375 Northside Drive, Suite 100, San Diego, California 92108, weekdays between 8:00 a.m. and 5:00 p.m.

Please submit any written correspondence in response to this letter to SanDiego@waterboards.ca.gov. Electronic documents must be submitted as a single file, in Portable Document Format (PDF) format, and converted to text searchable format using Optical Character Recognition (OCR). All electronic documents must also include scanned copies of all signature pages; electronic signatures will not be accepted. Electronic documents submitted to the San Diego Water Board must include the following identification numbers in the header or subject line: **PIN: CW-786088:lwalsh.**

Respectfully,

David T. Barker P.E.
Supervising WRC Engineer
San Diego Regional Water Quality Control Board

DTB:esb:law

Enclosure: Order No. R9-2015-0001 with Attachments
Conformed Copy of Order No. R9-2013-0001 with Attachments

cc:

Distribution via US Mail and email:
(see attached address list)

San Diego County Copermittees
Orange County Copermittees
Riverside County Copermittees
Natural Resources Agencies

Distribution list via email:

San Diego County MS4 Permit E-mail Service List
Orange County MS4 Permit E-mail Service List
Riverside County MS4 Permit E-mail Service List

Tech Staff Info & Use	
Order No.	R9-2015-0001 (An Order Amending Order R9-2013-0001 and Fact Sheet)
NPDES No.	CAS0109266
Place ID	786088

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CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

2375 Northside Drive, Suite 100, San Diego, CA 92108
Phone (619) 516-1990 Fax (619) 516-1994
http://www.waterboards.ca.gov/sandiego

ORDER NO. R9-2015-0001

AN ORDER AMENDING ORDER NO. R9-2013-0001, NPDES NO. CAS010266 NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The California Regional Water Quality Control Board, San Diego Region (hereinafter San Diego Water Board), finds that:

ENROLLMENT OF ORANGE COUNTY COPERMITTEES

1. **Enrollment Process.** On May 8, 2013, the San Diego Water Board adopted Order No. R9-2013-0001, NPDES No. CAS019266, *National Pollutant Discharge Elimination System Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Order No. R9-2013-0001, Order or Regional MS4 Permit). Provision F.5 of that Order outlines a process to designate (enroll) the County of Orange, the Orange County Flood Control District and the south Orange County Cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Lake Forest, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano (collectively Orange County) as Copermittees under Order No. R9-2013-0001, responsible for compliance with the terms and the conditions of the Order. Provision F.5 provides that prior to such enrollment the San Diego Water Board must first review and consider a Report of Waste Discharge (RoWD), submitted by the Orange County Copermittees under their current MS4 NPDES Order No. R9-2009-0002, to determine whether the Copermittees should be enrolled under Order No. R9-2013-0001 and what changes to the Order proposed in the RoWD are appropriate.

2. **Report of Waste Discharge.** By letter dated May 20, 2014, the Orange County Copermittees jointly submitted a RoWD in application for the reissuance of waste discharge requirements, pursuant to the requirements of section K.2.b of Order No. R9-2009-0002, for MS4 discharges draining the San Juan Hydraulic Unit within the San Diego Region. The RoWD discusses the MS4 Permit compliance activities and accomplishments of the Orange County Copermittees over the period June 2009 through June 2013. The RoWD also identifies all of the activities, research, and pilot studies the Copermittees propose to undertake during the next permit term based

upon consideration of the effectiveness of the Orange County Storm Water Program and the need for additional pollutant control initiatives. Development of a watershed-based planning approach is portrayed in the RoWD as the most important next step to take in the development of the storm water programs in Orange County. The RoWD concludes that such a comprehensive approach offers the opportunity to identify the environmental and recreational benefits that can be realized in each watershed and the management strategies that will most effectively ensure their realization. Among several recommendations, the RoWD included a request that permit requirements be amended to provide an initial or time limited exemption from hydromodification control best management practices (BMPs) for conveyance channels that are engineered and regularly maintained with the capacity to convey peak flows generated from the 10-year or greater storm event from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean. The County of Orange also separately requested a second exemption for discharges to “large river” low gradient reaches with a very wide flood plain by letter dated November 22, 2013. The San Diego Water Board has reviewed the RoWD and determined it is complete.

3. **Permit Hydromodification Control Requirement Modifications.** The hydromodification control BMP requirements in Provision E.3.c.(2) of Order No. R9-2013-0001 require modification to address the hydromodification exemption issues identified in the Orange County Copermittees’ RoWD application and November 22, 2013 letter. To facilitate the transition of the Orange County Copermittees (and eventually the Riverside County Copermittees) to the Regional MS4 Permit from the current Phase I MS4 NPDES permit (Order No. R9-2009-0002), two temporary exemptions from hydromodification control BMP requirements should be provided. The first temporary exemption would allow relief from hydromodification control BMP requirements for Priority Development Projects discharging directly to an engineered channel conveyance system with a capacity to convey peak flows generate by the 10-year storm event all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean. The second temporary exemption would allow relief from hydromodification control BMP requirements for Priority Development Projects discharging directly to large river reaches with drainage areas larger than 100 square miles and a 100-year flow capacity in excess of 20,000 cubic feet per second.

4. **Orange County Copermittees Enrollment.** After consideration of the Orange County RoWD and changes needed to Order No. R9-2013-0001, the San Diego Water Board has determined that the County of Orange, the Orange County Flood Control District and the south Orange County Cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano should be enrolled as Copermittees under Order No. R9-2013-0001 (Order) and responsible for compliance with the terms and the conditions of the Order. Enrolling the Orange County Copermittees into Order No. R9-2013-0001 (and the eventual enrollment of Riverside County Copermittees upon expiration of their current MS4 permit) will

provide regulatory consistency in the implementation of MS4 permit requirements throughout the San Diego Region, improve communication and coordination among Copermittees within watersheds crossing multiple jurisdictions, and maximize efficiency and economy of resources for the San Diego Water Board achieved through the redirection of staff permitting resources to better advance the storm water program. The enrollment of the Cities of Laguna Hills, Laguna Woods and Lake Forest is subject to a California Water Code (Water Code) section 13228 agreement as set forth in the findings of this Order.

DESIGNATION OF A REGIONAL WATER BOARD

5. **Regional Water Board Designation.** The Cities of Laguna Woods, Laguna Hills and Lake Forest (Cities) are located partially within the jurisdictions of both the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board) and the San Diego Water Board. Written requests for designation of a single Regional Water Board to regulate matters pertaining to permitting of Phase I MS4 discharges were submitted to the San Diego Water Board by the City of Laguna Woods by letter dated September 8, 2014, the City of Laguna Hills by letter dated March 12, 2014, and the City of Lake Forest by letters dated January 14, 2013, and April 4, 2014. The Cities of Laguna Hills and Laguna Woods requested designation of the San Diego Water Board, and the City of Lake Forest requested designation of the Santa Ana Water Board. Water Code section 13228 specifies the circumstances that allow, and the process for, designation of a Regional Water Board.

6. **Factual Considerations**. The Santa Ana Water Board and San Diego Water Board establish generally consistent requirements for MS4 discharges to meet the technology-based standard of reducing pollutants in the discharge to the maximum extent practicable (MEP), a related iterative process to ensure MS4 discharges meet receiving water quality standards, and non-storm water discharges to be effectively prohibited from entering the MS4. However due to the unique nature of watersheds and water quality issues in the San Diego Region and Santa Ana Region, MS4 permit requirements between the two Regional Water Boards may also vary to address region specific pollutant discharges and watershed conditions. The Cities of Laguna Woods, Laguna Hills, and Lake Forest report that management and implementation of municipal programs to comply with two different MS4 permits creates a significant administrative and financial burden that is not contributing to greater overall water quality improvements in either region.

7. **Regional Water Board Agreement**. In an effort to address the concerns of the Cities, the San Diego Water Board and the Santa Ana Water Board have entered into an agreement whereby the San Diego Water Board is designated to regulate Phase I MS4 discharges within the jurisdiction of the Cities of Laguna Woods and Laguna Hills and the Santa Ana Water Board is designated to regulate Phase I MS4 discharges within the jurisdiction of the City of Lake Forest. Both the Santa Ana Water Board and the San Diego Water Board Phase I MS4 permits for Orange County Copermittees, including Cities, require amendments to make the

designations effective. To avoid gaps or duplication in regulation for the Cities, the agreement, dated February 10, 2015, is effective on the later effective date of this Order or the Santa Ana Water Board's reissuance (Tentative Order No. R8-2015-0001). Under the terms of the agreement the City of Lake Forest will be required to retain and continue implementing the prohibition of over-irrigation discharges identified in Title 15, Chapter 15, Section 14.030 of the City Municipal Code for regulating storm water quality throughout its jurisdiction, which was established during the permit term of Order No. R9-2009-0002. The City of Lake Forest will also be required to actively participate in the development and implementation of the Aliso Creek Watershed Management Area Water Quality Improvement Plan required pursuant to the San Diego Water Board's Regional MS4 Permit, Order No. R9-2013-0001. Under the terms of the agreement, any Total Maximum Daily Load (TMDL) and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Laguna Woods, Laguna Hills or Lake Forest as a responsible party, will be incorporated into the appropriate MS4 permit by reference. Enforcement of the applicable TMDL would remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's San Diego Creek/Newport Bay TMDL and the San Diego Water Board's Indicator Bacteria Project I Beaches and Creeks TMDL.

8. **Periodic Review of Regional Water Board Agreement.** The basis supporting the Cities of Laguna Woods, Laguna Hills, and Lake Forest requests to designate a specific Regional Water Board for regulatory oversight of MS4 discharges may change under future conditions and circumstances. Therefore the San Diego Water Board will periodically review the effectiveness of the agreement during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate the agreement with the Santa Ana Water Board or otherwise modify the agreement subject to the approval of the Santa Ana Water Board.

WATER QUALITY CONTROL PLANS AND POLICIES

9. **Cause for Modification.** Federal NPDES regulations at 40 CFR 122.62(a)(3) provide that NPDES permits may be modified when the standards or regulations on which the permit was based have been changed by promulgation of amended standards or regulations or by judicial decision after the permit was issued. Standard Permit Provision 1.f of Attachment B to Order No. R9-2013-0001 provides in relevant part that the Order may be modified for cause. Section II.H.4.d. of the Order provides that the Order may be reopened during its term for cause including when the *Water Quality Control Plan for the San Diego Basin (9)* (Basin Plan) is amended by the San Diego Water Board to incorporate a new TMDL, and the amendment is approved by the State Water Resources Control Board (State Water Board), Office of Administrative Law, and the United State Environmental Protection Agency (USEPA). The amended changes to water quality control plans and policies set forth in the findings below represent changes to standards on which Order No. R9-2013-0001 was based.

10. **Special Conditions for Areas of Special Biological Significance**. On March 20, 2012, in Resolution No. 2012-0012, the State Water Board adopted a General Exception to the Ocean Plan Areas of Special Biological Significance (ASBS) waste discharge prohibition for storm water and nonpoint source discharges, including Special Protections for Beneficial Uses. On June 19, 2012, in Resolution No. 2012-0031, the State Water Board amended the General Exception to require pollutant load reductions to be achieved over a six year term. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject to the terms and conditions of State Water Board General Exception, as amended.

11. **Total Maximum Daily Loads (TMDLs)**. On June 13 2012 the San Diego Water Board in Resolution No. R9-2012-0033 amended the Basin Plan to incorporate the Los Penasquitos Lagoon Sediment TMDL. This TMDL Basin Plan amendment was approved by the State Water Board on January 21, 2014, by the Office of Administrative Law (OAL) on July 14, 2014, and USEPA on October 30, 2014. The County of San Diego, City of San Diego, City of Del Mar, and the City of Poway are among the responsible parties collectively assigned a single wasteload allocation applicable to MS4 discharges under the terms and conditions of the TMDL.

BEACH WATER QUALITY MONITORING AND ASSESSMENT PROGRAM

12. **Unified Approach Beach Water Quality Monitoring.** In November 2010, the State Water Board adopted Resolution No. 2010-0053, directing regional water boards to work with dischargers to modify beach water quality monitoring programs required by regional water board-issued permits in order to eliminate redundancies and incorporate beach water quality monitoring required by applicable statutes, where appropriate. Beginning in 2012, the San Diego Water Board reviewed the various beach water quality monitoring programs conducted in south Orange County and convened a stakeholder workgroup to develop a unified regional beach water quality monitoring and assessment program (Unified Program). The Unified Program is outlined in the San Diego Water Board report entitled "*Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County,*" dated September 2014. The Unified Program is consistent with and will meet or exceed the minimum requirements for beach water quality monitoring and related public notification and reporting established by State law, including the California Ocean Plan. The Unified Program will help protect the health of swimmers, surfers, and others who use south Orange County beach waters for water contact recreational activities.

13. **Monitoring Framework Consistency**. The Unified Program is consistent with and will help implement "*A Framework for Monitoring and Assessment in the San Diego Region*," which emphasizes the need for question-driven, beneficial use-oriented monitoring and assessment. The primary purpose of the Unified Program will be to answer the question "Does beach water quality meet standards for the beneficial use of water contact recreation?"

14. **Unified Program Implementation**. The San Diego Water Board Executive Officer has issued a written directive, pursuant to California Water Code sections 13225, 13267, and 13383, for the South Orange County Wastewater Authority (SOCWA) and the south Orange County Copermittees to implement the Unified Program, in cooperation with the Orange County Health Care Agency (OCHCA). After appropriate opportunity for public input, the Executive Officer may make revisions to the Unified Program, provided that the Unified Program, as revised, continues to be consistent with and meet the requirements of State law, including the California Ocean Plan, for beach water quality monitoring and related public notification and reporting. The Unified Program will supersede the existing routine, ongoing, beach water quality monitoring programs in south Orange County that are conducted in accordance with the existing requirements of the NPDES permits for discharges from SOCWA ocean outfalls and the south Orange County Copermittees' MS4s. The requirement for the Orange County Copermittees to participate in "regional monitoring" of beach water quality replaces requirements to conduct "core monitoring" of beach water quality, as provided for in Appendix III of the 2012 California Ocean Plan.

ADMINISTRATIVE FINDINGS

15. **Effect of this Order.** This Order amends Order No. R9-2013-0001 to:

    a. Enroll the County of Orange, the Orange County Flood Control District and the south Orange County Cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano as Copermittees responsible for compliance with the terms and conditions of Order No. R9-2013-0001,as amended by this Order;

    b. Designate the San Diego Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the Cities of Laguna Woods and Laguna Hills and the Santa Ana Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the City of Lake Forest, subject to the terms of the agreement between San Diego Water Board and the Santa Ana Water Board described in Finding 7 of this Order;

c. Establish interim exceptions to land development requirements for those Priority Development Projects that discharge to engineered channels and large river reaches described in Finding 3 of this Order;

d. Incorporate the amended requirements of the State Water Board's General Exception to require that pollutant reductions be achieved within 6 years for storm water and nonpoint source discharges to ASBS;

e. Incorporate applicable requirements of the Los Peñasquitos Lagoon Sediment TMDL; *and*

f. Require the Orange County Copermittees to implement the "*Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County,*" dated September 2014, made effective in the Monitoring and Reporting Program/Order issued pursuant to California Water Code sections 13225, 13267, and 13383 and subject to future revisions by the Executive Officer after appropriate public input.

16. **Effect of this Order.** Order No. R9-2013-0001 is not being reopened for any other purpose than the revisions contained herein. Except as contradicted or superseded by the findings and directives set forth in this Order, all of the previous findings and directives of Order No. R9-2013-0001 shall remain in full force and effect.

17. **Future Consideration of Alternative Compliance Option.** San Diego, Orange County, and Riverside County Copermittees have asserted that the prohibitions and receiving water limitations in Provision A.1.a, A.1.c, and A.2 of Order No. R9-2013-0001 may result in many years of noncompliance because years of technical efforts may ultimately be required to achieve compliance with the receiving water limitations, especially for wet weather discharges. To address this issue, the San Diego Water Board plans to consider the incorporation of a well-defined, transparent, and finite alternative path to compliance in Order No. R9-2013-0001, as amended by Order No. R9-2015-0001, during the MS4 NPDES permit reissuance proceedings for the Riverside County Copermittees scheduled for fiscal year 2015-16. This alternative compliance option would allow the Copermittees that are willing to pursue significant receiving water quality improvements beyond the iterative process to be deemed in compliance with the receiving water limitations. An alternative compliance option of this type was previously considered by the San Diego Water Board during the adoption proceedings for Order No. R9-2013-0001.

18. **California Environmental Quality Act**. This action is exempt from the requirement of preparation of environmental documents under the California Environmental Quality Act [Public Resources Code, Division 13, Chapter 3, Section 21000 et seq.] in accordance with California Water Code section 13389.

19. **Public Notice.** In accordance with State and federal laws and regulations, the San Diego Water Board has notified San Diego County, Orange County and Riverside

County Copermittees, and all known interested agencies and persons of its intent to adopt this Order and has provided them with an opportunity to submit their written comments and recommendations.

20. **Public Hearing.** The San Diego Water Board held a public hearing on February 11, 2015 and heard and considered all comments pertaining to the adoption of this Order.

21. **Notification.** Any person aggrieved by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with California Water Code section 13320 and California Code of Regulations, title 23, sections 2050 et seq. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date of this Order. Copies of the law and regulations applicable to filing petitions may be found on the Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

THEREFORE, IT IS HEREBY ORDERED,

1. This Order amends the Regional MS4 Permit, Order No. R9-2013-0001 and the Fact Sheet (Attachment F of the Order) as described in the revised versions of Order No. R9-2013-0001 and Fact Sheet included as Attachments 1 and 2 to this Order. Added text to Order No. R9-2013-0001 and the Fact Sheet is displayed in blue-underline text and deleted text is displayed as red-strikeout text.

2. The amended version of Order No. 2013-0001 and Fact Sheet included as Attachments 1 and 2 to this Order shall become effective on April 1, 2015.

3. Amended Order No. R9-2013-0001 shall supersede Order No. R9-2009-0002 for the Orange County Copermittees except for enforcement purposes.

4. San Diego Water Board staff is directed to prepare and post a conformed copy of Order No. R9-2013-0001 and the Fact Sheet incorporating the revisions made by this Order.

I, David W. Gibson, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on February 11, 2015.

David W. Gibson
Executive Officer

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

ORDER NO. R9-2013-0001, AS AMENDED BY ORDER NO. R9-2015-0001
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The San Diego County Copermittees in Table 1a are subject to waste discharge requirements set forth in this Order.

Table 1a. San Diego County Copermittees

City of Carlsbad	City of Oceanside
City of Chula Vista	City of Poway
City of Coronado	City of San Diego
City of Del Mar	City of San Marcos
City of El Cajon	City of Santee
City of Encinitas	City of Solana Beach
City of Escondido	City of Vista
City of Imperial Beach	County of San Diego
City of La Mesa	San Diego County Regional Airport Authority
City of Lemon Grove	San Diego Unified Port District
City of National City	

~~After the San Diego Water Board receives and considers~~ T~~t~~he Orange County Copermittees~~' Report of Waste Discharge and makes any necessary changes to this Order, the Orange County Copermittees~~ in Table 1b are ~~will become~~ subject to waste discharge requirements set forth in this Order. ~~after expiration of Order No. R9-2009-0002, NPDES No. CAS0108740 on or after December 16, 2014.~~

Table 1b. Orange County Copermittees[1]

City of Aliso Viejo	City of Rancho Santa Margarita
City of Dana Point	City of San Clemente
City of Laguna Beach	City of San Juan Capistrano
City of Laguna Hills	City of Laguna Woods
City of Laguna Niguel	County of Orange
~~City of Lake Forest[1]~~	Orange County Flood Control District
City of Mission Viejo	

[1] While not listed in Table 1b., the City of Lake Forest remains a Copermittee under this Order until the later effective date of this Order or the effective date of Santa Ana Water Board Tentative Order No. R8-2015-0001. Thereafter, the City of Lake Forest will no longer be considered a Copermittee under this Order because its Phase I MS4 discharges will be regulated by the Santa Ana Water Board pursuant to Water Code section 13228 designation. The requirements of this Order that apply to the City of Lake Forest for the duration of this Order, however, are described in Finding 29 and Footnote 2 to Table B-1.

After the San Diego Water Board receives and considers the Riverside County Copermittees' Report of Waste Discharge and makes any necessary changes to this Order, the Riverside County Copermittees in Table 1c will become subject to waste discharge requirements set forth in this Order after expiration of Order No.R9-2010-0016, NPDES No. CAS0108766 on or after November 10, 2015.

Table 1c. Riverside County Copermittees

City of Murrieta	County of Riverside
City of Temecula	Riverside County Flood Control and Water Conservation District
City of Wildomar	

The ~~Orange County Copermittees and~~ Riverside County Copermittees may become subject to the requirements of this Order at a date earlier than the expiration date of their current Order~~s~~ subject to the conditions described in Provision F.6 of this Order if the Riverside County Copermittees ~~in the respective county~~ receive ~~a~~ notification of coverage from the San Diego Water Board.

The term Copermittee in this Order refers to any San Diego County, Orange County, or Riverside County Copermittee covered under this Order, unless specified otherwise.

This Order provides permit coverage for the Copermittee discharges described in Table 2.

Table 2. Discharge Locations and Receiving Waters

Discharge Points	Locations throughout San Diego Region
Discharge Description	Municipal Separate Storm Sewer System (MS4) Discharges
Receiving Waters	Inland Surface Waters, Enclosed Bays and Estuaries, and Coastal Ocean Waters of the San Diego Region

Table 3. Administrative Information

This Order was adopted by the San Diego Water Board on:	**May 8, 2013**
~~This~~ Order No. R9-2013-0001 ~~will become~~ became effective on:	**June 27, 2013**
This Order as amended by R9-2015-0001 became effective on:	**April 1, 2015**
This Order will expire on:	**June 27, 2018**
The Copermittees must file a Report of Waste Discharge in accordance with Title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than 180 days in advance of the Order expiration date.	

I, David W. Gibson, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on May 8, 2013, as amended by adoption of Order No. R9-2015-0001 on February 11, 2015.

David W. Gibson
Executive Officer

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ATTACHMENTS
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Attachment B - Standard Permit Provisions and General Provisions B-1
Attachment C - Acronyms, Abbreviations and Definitions C-1
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Attachment F - Fact Sheet / Technical Report for Order No. R9-2013-0001 as amended by Order No. R9-2015-0001 ..... F-1

I. FINDINGS

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), finds that:

JURISDICTION

1. **MS4 Ownership or Operation.** Each of the Copermittees owns or operates an MS4, through which it discharges storm water and non-storm water into waters of the U.S. within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the U.S.

2. **Legal and Regulatory Authority.** This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]) adopted by the United States Environmental Protection Agency (USEPA), and chapter 5.5, division 7 of the California Water Code (CWC) (commencing with section 13370). This Order serves as an NPDES permit for discharges from MS4s to surface waters. This Order also serves as waste discharge requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

   The San Diego Water Board has the legal authority to issue a regional MS4 permit pursuant to its authority under CWA section 402(p)(3)(B) and 40 CFR 122.26(a)(1)(v). The USEPA also made it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide permits (55 Federal Register [FR] 47990, 48039-48042). The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees and San Diego Water Board.

   The federal regulations make it clear that the Copermittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators (40 CFR 122.26(a)(3)(vi)). This Order does not require the Copermittees to manage storm water outside of their jurisdictional boundaries, but rather to work collectively to improve storm water management within watersheds.

3. **CWA NPDES Permit Conditions.** Pursuant to CWA section 402(p)(3)(B), NPDES permits for storm water discharges from MS4s must include requirements to effectively prohibit non-storm water discharges into MS4s, and require controls to reduce the discharge of pollutants in storm water to the maximum extent practicable (MEP), and to require other provisions as the San Diego Water Board determines are appropriate to control such pollutants. This Order prescribes conditions to assure

compliance with the CWA requirements for owners and operators of MS4s to effectively prohibit non-storm water discharges into the MS4s, and require controls to reduce the discharge of pollutants in storm water from the MS4s to the MEP.

4. **CWA and CWC Monitoring Requirements.** CWA section 308(a) and 40 CFR 122.41(h),(j)-(l) and 122.48 require that NPDES permits must specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s also specify additional monitoring and reporting requirements in 40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c). CWC section 13383 authorizes the San Diego Water Board to establish monitoring, inspection, entry, reporting and recordkeeping requirements. This Order establishes monitoring and reporting requirements to implement federal and State requirements. This Order also includes requirements for the Orange County Copermittees to participate in, and together with South Orange County Wastewater Authority and Orange County Health Care Agency, share responsibility for implementing the unified approach to beach water quality monitoring and assessment program set forth in the October 2014 report, *Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County*, issued pursuant to CWC section 13383 in the San Diego Water Board December 5, 2014 Letter Directive.

5. **Total Maximum Daily Loads.** CWA section 303(d)(1)(A) requires that "[e]ach state shall identify those waters within its boundaries for which the effluent limitations are not stringent enough to implement any water quality standard applicable to such waters." The CWA also requires states to establish a priority ranking of impaired water bodies known as Water Quality Limited Segments and to establish Total Maximum Daily Loads (TMDLs) for such waters. This priority list of impaired water bodies is called the Clean Water Act Section 303(d) List of Water Quality Limited Segments, commonly referred to as the 303(d) List. The CWA requires the 303(d) List to be updated every two years.

   TMDLs are numerical calculations of the maximum amount of a pollutant that a water body can assimilate and still meet water quality standards. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point sources (waste load allocations or WLAs) and non-point sources (load allocations or LAs), background contribution, plus a margin of safety. Discharges from MS4s are point source discharges. The federal regulations (40 CFR 122.44(d)(1)(vii)(B)) require that NPDES permits incorporate water quality based effluent limitations (WQBELs) developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, consistent with the assumptions and requirements of any available WLA for the discharge. Requirements of this Order implement the TMDLs established ~~adopted~~ by the San Diego Water Board or ~~and~~ ~~approved by~~ USEPA as of the ~~time~~ date this Order was ~~is~~ ~~issued~~ amended in 2015. This Order establishes WQBELs consistent with the assumptions and requirements of all available TMDL WLAs assigned to discharges from the Copermittees' MS4s.

6. **Non-Storm Water Discharges.** Pursuant to CWA section 402(p)(3)(B)(ii), this Order requires each Copermittee to effectively prohibit discharges of non-storm water into its MS4. Nevertheless, non-storm water discharges into and from the MS4s continue to be reported to the San Diego Water Board by the Copermittees and other persons. Monitoring conducted by the Copermittees, as well as the 303(d) List, have identified dry weather, non-storm water discharges from the MS4s as a source of pollutants causing or contributing to receiving water quality impairments in the San Diego Region. The federal regulations (40 CFR 122.26(d)(2)(iv)(B)(1)) require the Copermittees to have a program to prevent illicit discharges to the MS4. The federal regulations, however, allow for specific categories of non-storm water discharges or flows to be addressed as illicit discharges only where such discharges are identified as sources of pollutants to waters of the U.S.

7. **In-Stream Treatment Systems.** Pursuant to federal regulations (40 CFR 131.10(a)), in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S. Authorizing the construction of a runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to accepting waste assimilation as an appropriate use for that water body. Runoff treatment must occur prior to the discharge of runoff into receiving waters. Treatment control best management practices (BMPs) must not be constructed in waters of the U.S. Construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body.

DISCHARGE CHARACTERISTICS AND RUNOFF MANAGEMENT

8. **Point Source Discharges of Pollutants.** Discharges from the MS4s contain waste, as defined in the CWC, and pollutants that adversely affect the quality of the waters of the state. A discharge from an MS4 is a “discharge of pollutants from a point source” into waters of the U.S. as defined in the CWA. Storm water and non-storm water discharges from the MS4s contain pollutants that cause or threaten to cause a violation of surface water quality standards, as outlined in the Water Quality Control Plan for the San Diego Basin (Basin Plan). Storm water and non-storm water discharges from the MS4s are subject to the conditions and requirements established in the Basin Plan for point source discharges.

9. **Potential Beneficial Use Impairment.** The discharge of pollutants and/or increased flows from MS4s may cause or threaten to cause the concentration of pollutants to exceed applicable receiving water quality objectives and impair or threaten to impair designated beneficial uses resulting in a condition of pollution, contamination, or nuisance.

10. **Pollutants Generated by Land Development.** Land development has created and continues to create new sources of non-storm water discharges and pollutants in storm water discharges as human population density increases. This brings higher

levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash. Pollutants from these sources are dumped or washed off the surface by non-storm water or storm water flows into and from the MS4s. When development converts natural vegetated pervious ground cover to impervious surfaces such as paved highways, streets, rooftops, and parking lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving a developed area without BMPs that can maintain pre-development runoff conditions will contain greater pollutant loads and have significantly greater runoff volume, velocity, and peak flow rate than pre-development runoff conditions from the same area.

11. **Runoff Discharges to Receiving Waters.** The MS4s discharge runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within the eleven hydrologic units comprising the San Diego Region. Historic and current development makes use of natural drainage patterns and features as conveyances for runoff. Rivers, streams and creeks in developed areas used in this manner are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and receiving water. Numerous receiving water bodies and water body segments have been designated as impaired by the San Diego Water Board pursuant to CWA section 303(d).

12. **Pollutants in Runoff.** The most common pollutants in runoff discharged from the MS4s include total suspended solids, sediment, pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., cadmium, copper, lead, and zinc), petroleum products and polynuclear aromatic hydrocarbons, synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus), oxygen-demanding substances (e.g., decaying vegetation, animal waste), detergents, and trash. As operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not prohibit or otherwise control. These discharges may cause or contribute to a condition of pollution or a violation of water quality standards.

13. **Human Health and Aquatic Life Impairment.** Pollutants in runoff discharged from the MS4s can threaten and adversely affect human health and aquatic organisms. Adverse responses of organisms to chemicals or physical agents in runoff range from physiological responses such as impaired reproduction or growth anomalies to mortality. Increased volume, velocity, rate, and duration of storm water runoff greatly accelerate the erosion of downstream natural channels. This alters stream channels and habitats and can adversely affect aquatic and terrestrial organisms.

14. **Water Quality Effects.** The Copermittees' water quality monitoring data submitted to date documents persistent exceedances of Basin Plan water quality objectives for

runoff-related pollutants at various watershed monitoring stations. Persistent toxicity has also been observed at several watershed monitoring stations. In addition, bioassessment data indicate that the majority of the monitored receiving waters have Poor to Very Poor Index of Biological Integrity (IBI) ratings. These findings indicate that runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in the San Diego Region. Non-storm water discharges from the MS4s have been shown to contribute significant levels of pollutants and flow in arid, developed Southern California watersheds, and contribute significantly to exceedances of applicable receiving water quality objectives.

15. **Non-Storm Water and Storm Water Discharges.** Non-storm water discharges from the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard of CWA section 402(p)(3)(B)(iii), which is explicitly for "Municipal … *Stormwater Discharges* (emphasis added)" from the MS4s. Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s must be effectively prohibited.

16. **Best Management Practices.** Waste and pollutants which are deposited and accumulate in MS4 drainage structures will be discharged from these structures to waters of the U.S. unless they are removed. These discharges may cause or contribute to, or threaten to cause or contribute to, a condition of pollution in receiving waters. For this reason, pollutants in storm water discharges from the MS4s can be and must be effectively reduced in runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Pollution prevention is the reduction or elimination of pollutant generation at its source and is the best "first line of defense." Source control BMPs (both structural and non-structural) minimize the contact between pollutants and runoff, therefore keeping pollutants onsite and out of receiving waters. Treatment control BMPs remove pollutants that have been mobilized by storm water or non-storm water flows.

17. **BMP Implementation.** Runoff needs to be addressed during the three major phases of development (planning, construction, and use) in order to reduce the discharge of storm water pollutants to the MEP, effectively prohibit non-storm water discharges, and protect receiving waters. Development which is not guided by water quality planning policies and principles can result in increased pollutant load discharges, flow rates, and flow durations which can negatively affect receiving water beneficial uses. Construction sites without adequate BMP implementation result in sediment runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. Existing development can generate substantial pollutant loads which are discharged in runoff to receiving waters. Retrofitting areas of existing development with storm water pollutant control and hydromodification management BMPs is necessary to address storm water discharges from existing development that may cause or contribute to a condition of pollution or a violation of water quality standards.

18. **Water Quality Improvements.** Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges to the MS4s and control pollutants in storm water discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the CWA.

19. **Long Term Planning and Implementation.** Federal regulations require municipal storm water permits to expire 5 years from adoption, after which the permit must be renewed and reissued. The San Diego Water Board recognizes that the degradation of water quality and impacts to beneficial uses of the waters in the San Diego Region occurred over several decades. The San Diego Water Board further recognizes that a decade or more may be necessary to realize demonstrable improvement to the quality of waters in the San Diego Region. This Order includes a long term planning and implementation approach that will require more than a single permit term to complete.

WATER QUALITY STANDARDS

20. **Basin Plan.** The San Diego Water Board adopted the Water Quality Control Plan for the San Diego Basin (Basin Plan) on September 8, 1994, that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for receiving waters addressed through the plan. The Basin Plan was subsequently approved by the State Water Resources Control Board (State Water Board) on December 13, 1994. Subsequent revisions to the Basin Plan have also been adopted by the San Diego Water Board and approved by the State Water Board. Requirements of this Order implement the Basin Plan.

    The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Process Supply (PROC), Industrial Service Supply (IND), Ground Water Recharge (GWR), Contact Water Recreation (REC1), Non-contact Water Recreation (REC2), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Freshwater Replenishment (FRSH), Hydropower Generation (POW), and Preservation of Biological Habitats of Special Significance (BIOL). The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region: Navigation (NAV), Commercial and Sport Fishing (COMM), Estuarine Habitat (EST), Marine Habitat (MAR), Aquaculture (AQUA), Migration of Aquatic Organisms (MIGR), Spawning,

Reproduction, and/or Early Development (SPWN), and Shellfish Harvesting (SHELL).

21. **Ocean Plan.** The State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, and 2005. The State Water Board adopted the latest amendment on April 21, 2005 and it became effective on February 14, 2006. The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean. Requirements of this Order implement the Ocean Plan.

    The Ocean Plan identifies the following beneficial uses of ocean waters of the state to be protected: Industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture; preservation and enhancement of designated Areas of Special Biological Significance; rare and endangered species; marine habitat; fish spawning and shellfish harvesting.

22. **Sediment Quality Control Plan**. On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes: 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

23. **National Toxics Rule and California Toxics Rule.** USEPA adopted the National Toxics Rule (NTR) on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the NTR applied in California. On May 18, 2000, USEPA adopted the California Toxics Rule (CTR). The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants.

24. **Antidegradation Policy.** This Order is in conformance with the federal Antidegradation Policy described in 40 CFR 131.12, and State Water Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality Waters in California*. Federal regulations at 40 CFR 131.12 require that the State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. State Water Board Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies.

25. **Anti-Backsliding Requirements.** Section 402(o)(2) of the CWA and federal regulations at 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations may be relaxed. All effluent limitations in this Order are at least as stringent as effluent limitations in the previous permits.

CONSIDERATIONS UNDER FEDERAL AND STATE LAW

26. **Coastal Zone Act Reauthorization Amendments.** Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states with approved coastal zone management programs to address non-point source pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point source pollution: agriculture, silviculture, urban, marinas, and hydromodification. This Order addresses the management measures required for the urban category, with the exception of septic systems. The runoff management programs developed pursuant to this Order fulfills the need for coastal cities to develop a runoff non-point source plan identified in the Non-Point Source Program Strategy and Implementation Plan. The San Diego Water Board addresses septic systems through the administration of other programs.

27. **Endangered Species Act.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 USC sections 1531 to 1544). This Order requires compliance with receiving water limits, and other requirements to protect the beneficial uses of waters of the State. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

28. **Report of Waste Discharge Process.** The waste discharge requirements set forth in this Order are based upon the Report of Waste Discharge submitted by the San Diego County Copermittees prior to the expiration of Order No. R9-2007-0001 (NPDES No. CAS0109266) and the Report of Waste Discharge submitted by the Orange County Copermittees prior to the expiration of Order No. R9-2009-0002 (CAS0108740). The ~~Orange County and~~ Riverside County Copermittees are not immediately covered by the waste discharge requirements in this Order. The San Diego Water Board understands that each municipality is unique although the Counties share watersheds and/or geographical boundaries. The Order will continue to use the Report of Waste Discharge process prior to initially making ~~Orange County or~~ Riverside County Copermittees subject to the requirements of this Order.

The federal regulations (40 CFR 122.21(d)(2)) and CWC section 13376 impose a duty on the Copermittees to reapply for continued coverage through submittal of a

Report of Waste Discharge no later than 180 days prior to expiration of a currently effective permit. This requirement is set forth in the ~~Orange County Copermittees' and~~ Riverside County Copermittees' currently effective permit~~s~~ at Provision~~s K.2.b and~~ K.2.c~~, respectively~~. The ~~Orange County Permit, Order No. R9-2009-0002 (NPDES No. CAS0108740) expires on December 16, 2014 and the~~ Riverside County MS4 Permit, Order No. R9-2010-0016 (NPDES No. CAS0108766) expires on November 10, 2015.

Unless the ~~Orange County or~~ Riverside County Copermittees apply for and receive early coverage under this Order, ~~the Orange County Copermittees' and~~ the Riverside County Copermittees' ~~respective~~ permit~~s~~ will be superseded by this Order upon expiration of their ~~respective~~ permit~~s~~, subject to any necessary revisions to the requirements of this Order made after the San Diego Water Board considers their ~~respective~~ Report~~s~~ of Waste Discharge through the public process provided in 40 CFR Part 124.

29. Regional Water Board Designation. The Cities of Laguna Hills, Laguna Woods, and Lake Forest are located partially within the jurisdictions of the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board) and the San Diego Water Board and their discharges are subject to regulation by both Regional Water Boards. Pursuant to CWC section 13228, the Cities of Laguna Hills, Laguna Woods, and Lake Forest submitted written requests that one Regional Water Board be designated to regulate Phase I MS4 discharges for each of the Cities. The Santa Ana Water Board and the San Diego Water Board have entered into an agreement dated February 10, 2015, whereby the Cities of Laguna Woods and Laguna Hills are largely regulated by the San Diego Water Board under this Order, including those portions of the Cities of Laguna Woods and Laguna Hills not within the San Diego Water Board's jurisdiction, upon the effective date of this Order or Santa Ana Water Board Order No. R8-2015-0001, whichever is later. Similarly, the City of Lake Forest, including those portions of the City of Lake Forest within the San Diego Water Board's jurisdiction, is largely regulated by the Santa Ana Water Board under Order No. R8-2015-0001 (NPDES No. CAS618030) upon the later effective date of this Order or Order No. R8-2015-0001. The agreement provides that the City of Lake Forest is required to retain, and continue implementation of, its over-irrigation discharge prohibition in Title 15, Chapter 14.030, List (b) of the City Municipal Code for regulating storm water quality throughout its jurisdiction. The agreement also requires the City of Lake Forest to actively participate during development and implementation of the Aliso Creek Watershed Management Area Water Quality Improvement Plan required pursuant to this Order. Each Regional Water Board retains the authority to enforce provisions of its Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee under the terms of the agreement (Water Code section 13228 (b)). Under the terms of the agreement, any TMDL and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Laguna Woods, Laguna Hills or Lake Forest as a responsible party, will be incorporated into the

appropriate Phase I MS4 permit by reference. Enforcement of the applicable TMDL will remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's San Diego Creek/Newport Bay TMDL and the San Diego Water Board's Indicator Bacteria Project I Beaches and Creeks TMDL. The San Diego Water Board will periodically review the effectiveness of the agreement during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate the agreement with Santa Ana Water Board or otherwise modify the agreement subject to the approval of the Santa Ana Water Board.

~~29.~~30. **Integrated Report and Clean Water Act Section 303(d) List.** The San Diego Water Board and State Water Board submit an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. USEPA issued its *Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act* on July 29, 2005, which advocates the use of a five category approach for classifying the attainment status of water quality standards for water bodies in the Integrated Report. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 in the Integrated Report are placed on the 303(d) List.

Water bodies with available data and/or information that indicate at least one beneficial use is not being supported or is threatened, but a TMDL is not required, are included in Category 4 in the Integrated Report. Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

Implementation of the requirements of this Order may allow the San Diego Water Board to include surface waters impaired by discharges from the Copermittees' MS4s in Category 4 in the Integrated Report for consideration during the next 303(d) List submittal by the State to USEPA.

~~30.~~31. **Economic Considerations.** The California Supreme Court has ruled that although CWC section 13263 requires the State and Regional Water Boards (collectively Water Boards) to consider factors set forth in CWC section 13241 when issuing an NPDES permit, the Water Board may not consider the factors to justify imposing pollutant restrictions that are less stringent than the applicable federal regulations require. (*City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 618, 626-627.) However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires

that the Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

As noted in the following finding, the San Diego Water Board finds that the requirements in this Order are not more stringent than the minimum federal requirements. Therefore, a CWC section 13241 analysis is not required for permit requirements that implement the effective prohibition on the discharge of non-storm water into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determined appropriate to control such pollutants, as those requirements are mandated by federal law. Notwithstanding the above, the San Diego Water Board has developed an economic analysis of the requirements in this Order. The economic analysis is provided in the Fact Sheet.

~~31.~~32. **Unfunded Mandates.** This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following:

a. This Order implements federally mandated requirements under CWA section 402 (33 USC section 1342(p)(3)(B)).

b. The local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental and new dischargers who are issued NPDES permits for storm water and non-storm water discharges.

c. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order.

d. The Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)) and in lieu of numeric restrictions on their MS4 discharges (i.e. effluent limitations).

e. The local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under State law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

f. The provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state develops a TMDL, federal law requires that permits must contain water quality based effluent limitations consistent with the assumptions and requirements of any applicable wasteload allocation (40 CFR 122.44(d)(1)(vii)(B)).

See the Fact Sheet for further discussion of unfunded mandates.

32.33. **California Environmental Quality Act.** The issuance of waste discharge requirements and an NPDES permit for the discharge of runoff from MS4s to waters of the U.S. is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 et seq.) in accordance with CWC section 13389.

STATE WATER BOARD DECISIONS

33.34. **Compliance with Prohibitions and Limitations.** The receiving water limitation language specified in this Order is consistent with language recommended by the USEPA and established in State Water Board Order WQ 99-05, *Own Motion Review of the Petition of Environmental Health Coalition to Review Waste Discharge Requirements Order No. 96-03, NPDES Permit No. CAS0108740*, adopted by the State Water Board on June 17, 1999. The receiving water limitation language in this Order requires storm water discharges from MS4s to not cause or contribute to a violation of water quality standards, which is to be achieved through an iterative approach requiring the implementation of improved and better-tailored BMPs over time. Implementation of the iterative approach to comply with receiving water limitations based on applicable water quality standards is necessary to ensure that storm water discharges from the MS4 will not ultimately cause or contribute to violations of water quality standards and will not create conditions of pollution, contamination, or nuisance.

34.35. **Special Conditions for Areas of Special Biological Significance.** On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving an general exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges (General Exception). On June 19, 2012, the State Water Board adopted Order No. 2012-0031, amending the General Exception to require pollutant reductions to be achieved within six years in accordance with ASBS Compliance Plans and ASBS Pollution Prevention Plans. The General Exception State Water Board Resolution No. 2012-0012 requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject to the terms and conditions of the General Exception as amended State Water Board Resolution No. 2012-0012. The Special Protections contained in Attachment B to the General Exception as amendedResolution No. 2012-0012, are applicable to these discharges, and are hereby incorporated into Attachment A of this Order. as if fully set forth herein.

ADMINISTRATIVE FINDINGS

~~35.~~36. **Executive Officer Delegation of Authority.** The San Diego Water Board by prior resolution has delegated all matters that may legally be delegated to its Executive Officer to act on its behalf pursuant to CWC section 13223. Therefore, the Executive Officer is authorized to act on the San Diego Water Board's behalf on any matter within this Order unless such delegation is unlawful under CWC section 13223 or this Order explicitly states otherwise.

~~36.~~37. **Standard Provisions.** Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR 122.42, are provided in Attachment B to this Order.

~~37.~~38. **Fact Sheet.** The Fact Sheet for this Order contains background information, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of this Order. The Fact Sheet is hereby incorporated into this Order and constitutes part of the Findings of this Order.

~~38.~~39. **Public Notice.** In accordance with State and federal laws and regulations, the San Diego Water Board notified the Copermittees, and interested agencies and persons of its intent to prescribe waste discharge requirements for the control of discharges into and from the MS4s to waters of the U.S. and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet.

~~39.~~40. **Public Hearings.** The San Diego Water Board held a public hearing on April 10 and 11, 2013, that was continued to May 8, 2013 and heard and considered all comments pertaining to the terms and conditions of this Order. The San Diego Water Board also held a public workshop on October 8, 2015, and a public hearing on February 11, 2015, and heard and considered all comments pertaining to the amendment of this Order through Order No. R9-2015-0001. Details of these public hearings are provided in the Fact Sheet.

~~40.~~41. **Effective Date.** This Order serves as an NPDES permit pursuant to CWA section 402 or amendments thereto, and as to the San Diego County Copermittees listed in Table 2.a., became ~~becomes~~ effective fifty (50) days after the date of its adoption, and as to the Orange County Copermittees listed in Table 2.b., becomes effective on April 1, 2015, after Order R9-2015-0001 is adopted, provided that the Regional Administrator, USEPA, Region IX, does not object to this Order.

~~41.~~42. **Review by the State Water Board.** Any person aggrieved by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with CWC section 13320 and California Code of Regulations, title 23, sections 2050, ~~et seq~~ and following. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date of this Order ~~San Diego Water Board~~

~~action~~, except that if the thirtieth day following the ~~action~~date of this Order falls on a Saturday, Sunday or State holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

THEREFORE, IT IS HEREBY ORDERED that the Copermittees, in order to meet the provisions contained in division 7 of the CWC (commencing with section 13000) and regulations adopted thereunder, and the provisions of the CWA and regulations adopted thereunder, must each comply with the requirements of this Order. This action in no way prevents the San Diego Water Board from taking enforcement action for past violations of the previous Order. If any part of this Order is subject to a temporary stay of enforcement, unless otherwise specified, the Copermittees must comply with the analogous portions of the previous Order, which will remain in effect for all purposes during the pendency of the stay.

II. PROVISIONS

A. PROHIBITIONS AND LIMITATIONS

The purpose of this provision is to describe the conditions under which storm water and non-storm water discharges into and from MS4s are prohibited or limited. The goal of the prohibitions and limitations is to protect the water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through the implementation of water quality improvement strategies and runoff management programs that effectively prohibit non-storm water discharges into the Copermittees' MS4s, and reduce pollutants in storm water discharges from the Copermittees' MS4s to the MEP.

1. Discharge Prohibitions

a. Discharges from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the state are prohibited.

b. Non-storm water discharges into MS4s are to be effectively prohibited, through the implementation of Provision E.2, unless such discharges are authorized by a separate NPDES permit.

c. Discharges from MS4s are subject to all waste discharge prohibitions in the Basin Plan, included in Attachment A to this Order.

d. Storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 applicable to these discharges, included in Attachment A to this Order. All other discharges from the Copermittees' MS4s to ASBS are prohibited.

2. Receiving Water Limitations

a. Discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters, including but not limited to all applicable provisions contained in:

(1) The San Diego Water Board's Basin Plan, including beneficial uses, water quality objectives, and implementation plans;

(2) State Water Board plans for water quality control including the following:

(a) Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries (Thermal Plan), and

(b) The Ocean Plan, including beneficial uses, water quality objectives, and implementation plans;

(3) State Water Board policies for water and sediment quality control including the following:

(a) Water Quality Control Policy for the Enclosed Bays and Estuaries of California,

(b) Sediment Quality Control Plan which includes the following narrative objectives for bays and estuaries:

(i) Pollutants in sediments shall not be present in quantities that, alone or in combination, are toxic to benthic communities, and

(ii) Pollutants shall not be present in sediments at levels that will bioaccumulate in aquatic life to levels that are harmful to human health,

(c) The Statement of Policy with Respect to Maintaining High Quality of Waters in California;[2]

(4) Priority pollutant criteria promulgated by the USEPA through the following:

(a) National Toxics Rule (NTR)[3] (promulgated on December 22, 1992 and amended on May 4, 1995), and

(b) California Toxics Rule (CTR).[4,5]

b. Discharges from MS4s composed of storm water runoff must not alter natural ocean water quality in an ASBS.

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[2] State Water Board Resolution No. 68-16
[3] 40 CFR 131.36
[4] 65 Federal Register 31682-31719 (May 18, 2000), adding Section 131.38 to 40 CFR
[5] If a water quality objective and a CTR criterion are in effect for the same priority pollutant, the more stringent of the two applies.

3. Effluent Limitations

a. Technology Based Effluent Limitations

Pollutants in storm water discharges from MS4s must be reduced to the MEP.[6]

b. Water Quality Based Effluent Limitations

Each Copermittee must comply with applicable WQBELs established for the TMDLs in Attachment E to this Order, pursuant to the applicable TMDL compliance schedules.

4. Compliance with Discharge Prohibitions and Receiving Water Limitations

Each Copermittee must achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order through timely implementation of control measures and other actions as specified in Provisions B and E of this Order, including any modifications. The Water Quality Improvement Plans required under Provision B must be designed and adapted to ultimately achieve compliance with Provisions A.1.a, A.1.c and A.2.a.

a. If exceedance(s) of water quality standards persist in receiving waters notwithstanding implementation of this Order, the Copermittees must comply with the following procedures:

(1) For exceedance(s) of a water quality standard in the process of being addressed by the Water Quality Improvement Plan, the Copermittee(s) must implement the Water Quality Improvement Plan as accepted by the San Diego Water Board, and update the Water Quality Improvement Plan, as necessary, pursuant to Provision F.2.c;

(2) Upon a determination by either the Copermittees or the San Diego Water Board that discharges from the MS4 are causing or contributing to a new exceedance of an applicable water quality standard not addressed by the Water Quality Improvement Plan, the Copermittees must submit the following updates to the Water Quality Improvement Plan pursuant to Provision F.2.c or as part of the Water Quality Improvement Plan Annual Report required under Provision F.3.b, unless the San Diego Water Board directs an earlier submittal:

(a) The water quality improvement strategies being implemented that are effective and will continue to be implemented,

[6] This does not apply to MS4 discharges which receive subsequent treatment to reduce pollutants in storm water discharges to the MEP prior to entering receiving waters (e.g., low flow diversions to the sanitary sewer). Runoff treatment must occur prior to the discharge of runoff into receiving waters per Finding 7.

(b) Water quality improvement strategies (i.e. BMPs, retrofitting projects, stream and/or habitat rehabilitation projects, adjustments to jurisdictional runoff management programs, etc.) that will be implemented to reduce or eliminate any pollutants or conditions that are causing or contributing to the exceedance of water quality standards,

(c) Updates to the schedule for implementation of the existing and additional water quality improvement strategies, and

(d) Updates to the monitoring and assessment program to track progress toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a of this Order;

(3) The San Diego Water Board may require the incorporation of additional modifications to the Water Quality Improvement Plan required under Provision B. The applicable Copermittees must submit any modifications to the update to the Water Quality Improvement Plan within 90 days of notification that additional modifications are required by the San Diego Water Board, or as otherwise directed;

(4) Within 90 days of the San Diego Water Board determination that the modifications to the Water Quality Improvement Plan required under Provision A.4.a.(3) meet the requirements of this Order, the applicable Copermittees must revise the jurisdictional runoff management program documents to incorporate the modified water quality improvement strategies that have been and will be implemented, the implementation schedule, and any additional monitoring required; and

(5) Each Copermittee must implement the updated Water Quality Improvement Plan.

b. The procedure set forth above to achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order do not have to be repeated for continuing or recurring exceedances of the same water quality standard(s) following implementation of scheduled actions unless directed to do otherwise by the San Diego Water Board.

c. Nothing in Provisions A.4.a and A.4.b prevents the San Diego Water Board from enforcing any provision of this Order while the applicable Copermittees prepare and implement the above update to the Water Quality Improvement Plan and jurisdictional runoff management programs.

B. WATER QUALITY IMPROVEMENT PLANS

The purpose of this provision is to develop Water Quality Improvement Plans that guide the Copermittees' jurisdictional runoff management programs towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plans is to further the Clean Water Act's objective to protect, preserve, enhance, and restore the water quality and designated beneficial uses of waters of the state. This goal will be accomplished through an adaptive planning and management process that identifies the highest priority water quality conditions within a watershed and implements strategies through the jurisdictional runoff management programs to achieve improvements in the quality of discharges from the MS4s and receiving waters.

1. Watershed Management Areas

The Copermittees must develop a Water Quality Improvement Plan for each of the Watershed Management Areas in Table B-1. A total of ten Water Quality Improvement Plans must be developed for the San Diego Region.

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
San Juan (901.00)	South Orange County	- Aliso Creek - San Juan Creek - San Mateo Creek - Pacific Ocean - Heisler Park ASBS	- City of Aliso Viejo[~~1~~] - City of Dana Point[~~1~~] - City of Laguna Beach[~~1~~] - City of Laguna Hills[1] - City of Laguna Niguel[~~1~~] - City of Laguna Woods[1] - City of Lake Forest[~~1~~2] - City of Mission Viejo[~~1~~] - City of Rancho Santa Margarita[~~1~~] - City of San Clemente[~~1~~] - City of San Juan Capistrano[~~1~~] - County of Orange[~~1~~] - Orange County Flood Control District[~~1~~]
Santa Margarita (902.00)	Santa Margarita River	- Murrieta Creek - Temecula Creek - Santa Margarita River - Santa Margarita Lagoon - Pacific Ocean	- City of Murrieta[~~2~~3] - City of Temecula[~~2~~3] - City of Wildomar[~~2~~3] - County of Riverside[~~2~~3] - County of San Diego[~~3~~4] - Riverside County Flood Control and Water Conservation District[~~2~~3]
San Luis Rey (903.00)	San Luis Rey River	- San Luis Rey River - San Luis Rey Estuary - Pacific Ocean	- City of Oceanside - City of Vista - County of San Diego

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
Carlsbad (904.00)	Carlsbad	- Loma Alta Slough - Buena Vista Lagoon - Agua Hedionda Lagoon - Batiquitos Lagoon - San Elijo Lagoon - Pacific Ocean	- City of Carlsbad - City of Encinitas - City of Escondido - City of Oceanside - City of San Marcos - City of Solana Beach - City of Vista - County of San Diego
San Dieguito (905.00)	San Dieguito River	- San Dieguito River - San Dieguito Lagoon - Pacific Ocean	- City of Del Mar - City of Escondido - City of Poway - City of San Diego - City of Solana Beach - County of San Diego
Penasquitos (906.00)	Penasquitos	- Los Penasquitos Lagoon - Pacific Ocean	- City of Del Mar - City of Poway - City of San Diego - County of San Diego
	Mission Bay	- Mission Bay - Pacific Ocean - San Diego Marine Life Refuge ASBS	- City of San Diego
San Diego (907.00)	San Diego River	- San Diego River - Pacific Ocean	- City of El Cajon - City of La Mesa - City of San Diego - City of Santee - County of San Diego
Pueblo San Diego (908.00) Sweetwater (909.00) Otay (910.00)	San Diego Bay	- Sweetwater River - Otay River - San Diego Bay - Pacific Ocean	- City of Chula Vista - City of Coronado - City of Imperial Beach - City of La Mesa - City of Lemon Grove - City of National City - City of San Diego - County of San Diego - San Diego County Regional Airport Authority - San Diego Unified Port District
Tijuana (911.00)	Tijuana River	- Tijuana River - Tijuana Estuary - Pacific Ocean	- City of Imperial Beach - City of San Diego - County of San Diego

Notes:

1. ~~The Orange County Copermittees will be covered under this Order after expiration of Order No. R9-2009-0002, or earlier if the Orange County Copermittees meet the conditions in Provision F.6.~~By agreement dated February 10, 2015, pursuant to Water Code section 13228, the Phase I MS4 discharges within the jurisdiction of the City of Laguna Hills and the City of Laguna Woods located in the Santa Ana Region are regulated by San Diego Water Board Order No. R9-2013-0001 as amended by Order No. R9-2015-0001, upon the later effective date of Order No. R9-2015-0001 or Santa Ana Water Board Tentative Order No. R8-2015-0001. The City of Laguna Hills and Laguna Woods must also comply with the requirements of the San Diego Creek/Newport Bay TMDL in section XVIII of Santa Ana Water Board Order No. R8-2015-0001.
2. ~~The Riverside County Copermittees will be covered under this Order after expiration of Order No. R9-2010-0016, or earlier if the Riverside County Copermittees meet the conditions in Provision F.6.~~ By agreement dated February 10, 2015, pursuant to Water Code section 13228, Phase I MS4 discharges within the City of Lake Forest located within the San Diego Water Board Region are regulated by the Santa Ana Water Board Order No. R8-2015-0001 (NPDES No. CAS618030) upon the later effective date of this Order or Santa Ana Water Board Tentative Order No. R8-2015-0001. In accordance with the terms of the agreement between the San Diego Water Board and the Santa Ana Water Board, the City of Lake Forest must implement the requirements of the Bacteria TMDL in Attachment E of this Order, participate in preparation and implementation of the Water Quality Improvement Plan for the Aliso Creek Watershed Management Area as described in Provision B of this Order and continue implementation of its over-irrigation discharge prohibition in its City Ordinance, Title 15, Chapter 15, section 14.030, List (b).

~~2.~~3. The Riverside County Copermittees will be covered under this Order after expiration of Order No. R9-2010-0016~~,~~ or earlier if the Riverside County Copermittees meet the conditions in Provision F.6, upon further amendment of this Order.

~~3~~4. The County of San Diego is not required to implement the requirements of Provision B for its jurisdiction within the Santa Margarita River Watershed Management Area until the Riverside County Copermittees have been notified of coverage under this Order. The County of San Diego is required to implement the requirements of Provisions D, F.3.b, and Attachment E until the Riverside County Copermittees have been notified of coverage under this Order.

2. Priority Water Quality Conditions

The Copermittees must identify the water quality priorities within each Watershed Management Area that will be addressed by the Water Quality Improvement Plan. Where appropriate, Watershed Management Areas may be separated into subwatersheds to focus water quality prioritization and jurisdictional runoff management program implementation efforts by receiving water.

a. Assessment of Receiving Water Conditions

The Copermittees must consider the following, at a minimum, to identify water quality priorities based on impacts of MS4 discharges on receiving water beneficial uses:

(1) Receiving waters listed as impaired on the CWA Section 303(d) List of Water Quality Limited Segments (303(d) List);

(2) TMDLs adopted and under development by the San Diego Water Board;

(3) Receiving waters recognized as sensitive or highly valued by the Copermittees, including estuaries designated under the National Estuary Program under CWA section 320, marine protected areas, wetlands defined by the State or U.S. Fish and Wildlife Service's National Wetlands Inventory as wetlands, waters having the Preservation of Biological Habitats of Special Significance (BIOL) beneficial use designation, and receiving waters identified as ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(4) The receiving water limitations of Provision A.2;

(5) Known historical versus current physical, chemical, and biological water quality conditions;

(6) Available, relevant, and appropriately collected and analyzed physical, chemical, and biological receiving water monitoring data, including, but not limited to, data describing:

(a) Chemical constituents,

(b) Water quality parameters (i.e. pH, temperature, conductivity, etc.),

(c) Toxicity Identification Evaluations for both receiving water column and sediment,

(d) Trash impacts,

(e) Bioassessments, and

(f) Physical habitat;

(7) Available evidence of erosional impacts in receiving waters due to accelerated flows (i.e. hydromodification);

(8) Available evidence of adverse impacts to the chemical, physical, and biological integrity of receiving waters; and

(9) The potential improvements in the overall condition of the Watershed Management Area that can be achieved.

b. ASSESSMENT OF IMPACTS FROM MS4 DISCHARGES

The Copermittees must consider the following, at a minimum, to identify the potential impacts to receiving waters that may be caused or contributed to by discharges from the Copermittees' MS4s:

(1) The discharge prohibitions of Provision A.1 and effluent limitations of Provision A.3; and

(2) Available, relevant, and appropriately collected and analyzed storm water and non-storm water monitoring data from the Copermittees' MS4 outfalls;

(3) Locations of each Copermittee's MS4 outfalls that discharge to receiving waters;

(4) Locations of MS4 outfalls that are known to persistently discharge non-storm water to receiving waters likely causing or contributing to impacts on receiving water beneficial uses;

(5) Locations of MS4 outfalls that are known to discharge pollutants in storm water causing or contributing to impacts on receiving water beneficial uses; and

(6) The potential improvements in the quality of discharges from the MS4 that can be achieved.

c. IDENTIFICATION OF PRIORITY WATER QUALITY CONDITIONS

(1) The Copermittees must use the information gathered for Provisions B.2.a and B.2.b to develop a list of priority water quality conditions as pollutants, stressors and/or receiving water conditions that are the highest threat to receiving water quality or that most adversely affect the quality of receiving waters. The list must include the following information for each priority water

quality condition:

(a) The beneficial use(s) associated with the priority water quality condition;

(b) The geographic extent of the priority water quality condition within the Watershed Management Area, if known;

(c) The temporal extent of the priority water quality condition (e.g., dry weather and/or wet weather);

(d) The Copermittees with MS4s discharges that may cause or contribute to the priority water quality condition; and

(e) An assessment of the adequacy of and data gaps in the monitoring data to characterize the conditions causing or contributing to the priority water quality condition, including a consideration of spatial and temporal variation.

(2) The Copermittees must identify the highest priority water quality conditions to be addressed by the Water Quality Improvement Plan, and provide a rationale for selecting a subset of the water quality conditions identified pursuant to Provision B.2.c.(1) as the highest priorities.

d. IDENTIFICATION OF MS4 SOURCES OF POLLUTANTS AND/OR STRESSORS

The Copermittees must identify and prioritize known and suspected sources of storm water and non-storm water pollutants and/or other stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c. The identification of known and suspected sources of pollutants and/or stressors that cause or contribute to the highest priority water quality conditions as identified for Provision B.2.c must consider the following:

(1) Pollutant generating facilities, areas, and/or activities within the Watershed Management Area, including:

(a) Each Copermittee's inventory of construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas,

(b) Publicly owned parks and/or recreational areas,

(c) Open space areas,

(d) All currently operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste, and

(e) Areas not within the Copermittees' jurisdictions (e.g., Phase II MS4s, tribal

lands, state lands, federal lands) that are known or suspected to be discharging to the Copermittees' MS4s;

(2) Locations of the Copermittees' MS4s, including the following:

(a) All MS4 outfalls that discharge to receiving waters, and

(b) Locations of major structural controls for storm water and non-storm water (e.g., retention basins, detention basins, major infiltration devices, etc.);

(3) Other known and suspected sources of non-storm water or pollutants in storm water discharges to receiving waters within the Watershed Management Area, including the following:

(a) Other MS4 outfalls (e.g., Phase II Municipal and Caltrans),

(b) Other NPDES permitted discharges,

(c) Any other discharges that may be considered point sources (e.g., private outfalls), and

(d) Any other discharges that may be considered non-point sources (e.g., agriculture, wildlife or other natural sources);

(4) Review of available data, including but not limited to:

(a) Findings from the Copermittees' illicit discharge detection and elimination programs,

(b) Findings from the Copermittees' MS4 outfall discharge monitoring,

(c) Findings from the Copermittees' receiving water monitoring,

(d) Findings from the Copermittees' MS4 outfall discharge and receiving water assessments, and

(e) Other available, relevant, and appropriately collected data, information, or studies related to pollutant sources and/or stressors that contribute to the highest priority water quality conditions as identified for Provision B.2.c.

(5) The adequacy of the available data to identify and prioritize sources and/or stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c.

e. IDENTIFICATION OF POTENTIAL WATER QUALITY IMPROVEMENT STRATEGIES

The Copermittees must evaluate the findings identified under Provisions B.2.a-d, and identify potential strategies that can result in improvements to water quality in MS4 discharges and/or receiving waters within the Watershed Management

Area. Potential water quality improvement strategies that may be implemented within the Watershed Management Area must include the following:

(1) Structural BMPs, non-structural BMPs, incentives, or programs that can potentially be implemented to address the highest priority water quality conditions identified under Provision B.2.c, or MS4 sources of pollutants or stressors identified under Provision B.2.d,

(2) Retrofitting projects in areas of existing development within the Watershed Management Area that can potentially be implemented to reduce MS4 sources of pollutants or stressors identified under Provision B.2.d causing or contributing to the highest priority water quality conditions identified under Provision B.2.c, and

(3) Stream, channel, and/or habitat rehabilitation projects within the Watershed Management Area that can potentially be implemented to protect and/or improve conditions in receiving waters from MS4 pollutants and/or stressors identified under Provision B.2.d causing or contributing to the highest priority water quality conditions identified under Provision B.2.c.

3. Water Quality Improvement Goals, Strategies and Schedules

The Copermittees must identify and develop specific water quality improvement goals and strategies to address the highest priority water quality conditions identified within a Watershed Management Area. The water quality improvement goals and strategies must address the highest priority water quality conditions by effectively prohibiting non-storm water discharges to the MS4, reducing pollutants in storm water discharges from the MS4 to the MEP, and protecting the water quality standards of receiving waters.

a. WATER QUALITY IMPROVEMENT GOALS AND SCHEDULES

(1) Numeric Goals

The Copermittees must develop and incorporate numeric goals[7] into the Water Quality Improvement Plan. Numeric goals must be used to support Water Quality Improvement Plan implementation and measure reasonable progress towards addressing the highest priority water quality conditions identified under Provision B.2.c. The Copermittees must establish and incorporate the following numeric goals in the Water Quality Improvement

[7] Interim and final numeric goals may take a variety of forms such as TMDL established WQBELs, action levels, pollutant concentration, load reductions, number of impaired water bodies delisted from the List of Water Quality Impaired Segments, Index of Biotic Integrity (IBI) scores, or other appropriate metrics. Interim and final numeric goals are not necessarily limited to one criterion or indicator, but may include multiple criteria and/or indicators. Except for TMDL established WQBELs, interim and final numeric goals and corresponding schedules may be revised through the adaptive management process under Provision B.5.

Plan:

(a) Final numeric goals must be based on measureable criteria or indicators capable of demonstrating one or more of the following:

(i) Discharges from the Copermittees' MS4s will not cause or contribute to exceedances of water quality standards in receiving waters, AND/OR

(ii) The conditions of receiving waters and associated habitat are protected from MS4 discharges, AND/OR

(iii) Beneficial uses of receiving waters are protected from MS4 discharges and will be supported.

(b) Interim numeric goals must be based on measureable criteria or indicators capable of demonstrating reasonable incremental progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges as follows:

(i) One or more interim numeric goals may be established to demonstrate progress toward achieving each final numeric goal,

(ii) For each final numeric goal, at least one interim numeric goal must be expressed as a reasonable increment toward achievement of the final numeric goal,

(iii) For each final numeric goal, reasonable interim numeric goals must be established to be accomplished during each 5 year period between the acceptance of the Water Quality Improvement Plan and the achievement of the final numeric goals.

(2) Schedules for Achieving Numeric Goals

The Copermittees must develop and incorporate schedules for achieving the numeric goals into the Water Quality Improvement Plan. The schedules must demonstrate reasonable progress toward achieving the final numeric goals required for Provision B.3.a.(1). The Copermittees must incorporate the schedules for achieving the numeric goals into the Water Quality Improvement Plan based on the following considerations:

(a) Final dates for achieving all final numeric goals must be established considering the following:

(i) Final compliance dates for any applicable TMDLs in Attachment E to this Order;

(ii) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(iii) Achievement of the final numeric goals for the highest water quality priorities must be as soon as possible;

(iv) Final dates for achieving the final numeric goals must reflect a realistic assessment of the shortest practicable time required based on the temporal and spatial extent and factors associated with the highest priority water quality conditions identified under Provision B.2.c, and taking into account the time reasonably required to implement the water quality improvement strategies required pursuant to Provision B.3.b.

(b) Interim dates for achieving all interim numeric goals must be established considering the following:

(i) Interim compliance dates for any applicable TMDLs in Attachment E to this Order;

(ii) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(iii) Interim dates for achieving the interim numeric goals must reflect a realistic assessment of the shortest practicable time reasonably required, taking into account the time needed to implement new or significantly expanded programs and securing financing, if necessary; and

(iv) For each final numeric goal, at least one interim numeric goal must be established that the Copermittees will work toward achieving within the term of this Order.

b. WATER QUALITY IMPROVEMENT STRATEGIES AND SCHEDULES

Based on the likely effectiveness and efficiency of the potential water quality improvement strategies identified under Provision B.2.e to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a, the Copermittees must identify the strategies that will be implemented in each Watershed Management Area as follows:

(1) Jurisdictional Strategies

(a) Each Copermittee in the Watershed Management Area must identify the strategies that will be implemented within its jurisdiction as part of its jurisdictional runoff management program requirements under Provisions E.2 through E.7, including descriptions of the following:

(i) For each of the inventories developed for its jurisdiction, as required

under Provisions D.2.a.(1), E.3.e.(2), E.4.b, and E.5.a, each Copermittee must identify the known and suspected areas or sources causing or contributing to the highest priority water quality conditions in the Watershed Management Area that the Copermittee will focus on in its efforts to effectively prohibit non-storm water discharges to its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, and achieve the interim and final numeric goals identified under Provision B.3.a;

(ii) BMPs that each Copermittee will implement, or require to be implemented, as applicable, for those areas or sources within its jurisdiction;

(iii) Education programs that each Copermittee will implement, as applicable, for those areas or sources within its jurisdiction;

(iv) Frequencies that each Copermittee will conduct inspections on those areas or sources within its jurisdiction;

(v) Incentive and enforcement programs that each Copermittee will implement, as applicable, for those areas or sources within its jurisdiction; and

(vi) Any other BMPs, incentives, or programs that each Copermittee will implement for those areas or sources within its jurisdiction.

(b) Identify the optional jurisdictional strategies that each Copermittee will implement within its jurisdiction, as necessary, to effectively prohibit non-storm water discharges to its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. Descriptions of the optional jurisdictional strategies must include:

(i) BMPs, incentives, or programs that may be implemented by the Copermittee within its jurisdiction in addition to the requirements of Provisions B.3.b.(1)(a);

(ii) Incentives or programs that may be implemented by the Copermittee to encourage or implement projects to retrofit areas of existing development within its jurisdiction;

(iii) Incentives or programs that may be implemented by the Copermittee to encourage or implement projects that will rehabilitate the conditions of channels or habitats within its jurisdiction;

(iv) The funds and/or resources that must be secured by the Copermittee to implement the optional strategies described for Provisions B.3.b.(1)(b)(i)-(iii) within its jurisdiction; and

(v) The circumstances necessary to trigger implementation of the optional jurisdictional strategies, in addition to the requirements of Provision B.3.b.(1)(a), to achieve the interim and final numeric goals within the schedules established under Provision B.3.a.

(c) Identify the strategies that will be implemented by the Copermittee in coordination with or with the cooperation of other agencies (e.g. Caltrans, water districts, school districts) and/or entities (e.g. non-governmental organizations) within its jurisdiction.

(2) Watershed Management Area Strategies

The Copermittees must identify the optional regional or multi-jurisdictional strategies that will be implemented in the Watershed Management Area, as necessary, to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. Descriptions of the optional regional or multi-jurisdictional strategies must include:

(a) Regional or multi-jurisdictional BMPs, incentives, or programs that may be implemented by the Copermittees in the Watershed Management Area;

(b) Incentives or programs that may be implemented by the Copermittees in the Watershed Management Area to encourage or implement regional or multi-jurisdictional projects to retrofit areas of existing development;

(c) Incentives or programs that may be implemented by the Copermittees to encourage or implement regional or multi-jurisdictional projects that will rehabilitate the conditions of channels, streams, or habitats within the Watershed Management Area;

(d) The funds and/or resources that must be secured by the Copermittees to implement the optional strategies described for Provisions B.3.b.(2)(a)-(c) within the Watershed Management Area; and

(e) The circumstances necessary to trigger implementation of the optional regional or multi-jurisdictional strategies to achieve the interim and final numeric goals within the schedules established under Provision B.3.a.

(3) Schedules for Implementing Strategies

The Copermittees must develop reasonable schedules for implementing the water quality improvement strategies identified under Provisions B.3.b.(1) and B.3.b.(2) to achieve the interim and final numeric goals identified and

schedules established under Provision B.3.a. The Copermittees must incorporate the schedules to implement the water quality improvement strategies into the Water Quality Improvement Plan as follows:

(a) Each Copermittee must develop schedules for the jurisdictional strategies identified pursuant to Provisions B.3.b.(1)(a)-(b). Each schedule must specify:

(i) If each jurisdictional strategy identified pursuant to Provision B.3.b.(1)(a) will or will not be initiated upon acceptance of the Water Quality Improvement Plan;

(ii) For each jurisdictional strategy identified pursuant to Provision B.3.b.(1)(a) that will not be initiated upon acceptance~~approval~~ of the Water Quality Improvement Plan, the shortest practicable time in which each jurisdictional strategy will be initiated after acceptance of the Water Quality Improvement Plan;

(iii) For each optional jurisdictional strategy identified pursuant to Provision B.3.b.(1)(b), a realistic assessment of the shortest practicable time required to:

[a] Secure the resources needed to fund the optional jurisdictional strategy, and
[b] Procure the resources, materials, labor, and applicable permits necessary to initiate implementation of the optional jurisdictional strategy;

(iv) If each jurisdictional strategy identified pursuant to Provisions B.3.b.(1)(a)-(b) is expected to be continuously implemented (e.g. inspections) or completed within a schedule (e.g. construction of structural BMP); and

(v) If a jurisdictional strategy identified pursuant to Provisions B.3.b.(1)(a)-(b) is expected to be completed within a schedule, the anticipated time to complete based on a realistic assessment of the shortest practicable time required.

(b) The Copermittees in the Watershed Management Area must develop schedules for the regional or multi-jurisdictional strategies identified pursuant to Provision B.3.b.(2). Each schedule must specify:

(i) A realistic assessment of the shortest practicable time to:

[a] Secure the resources needed to fund the optional regional or multi-jurisdictional strategy, and
[b] Procure the resources, materials, labor, and permits necessary to initiate the implementation of the optional regional or multi-jurisdictional strategy;

(ii) If each regional or multi-jurisdictional strategy identified pursuant to Provision B.3.b.(2) is expected to be continuously implemented (e.g. inspections) or completed within a schedule (e.g. construction of structural BMP); and

(iii) If a regional or multi-jurisdictional strategy and/or activity identified pursuant to Provisions B.3.b.(2) is expected to be completed within a schedule, the anticipated time to complete based on a realistic assessment of the shortest practicable time required.

(4) Optional Watershed Management Area Analysis

(a) For each Watershed Management Area, the Copermittees have the option to perform a Watershed Management Area Analysis for the purpose of developing watershed-specific requirements for structural BMP implementation, as described in Provision E.3.c.(3). The Watershed Management Area Analysis must include GIS layers (maps) as output. The analysis must include the following information, to the extent it is available, in order to characterize the Watershed Management Areas:

(i) A description of dominant hydrologic processes, such as areas where infiltration or overland flow likely dominates;

(ii) A description of existing streams in the watershed, including bed material and composition, and if they are perennial or ephemeral;

(iii) Current and anticipated future land uses;

(iv) Potential coarse sediment yield areas; and

(v) Locations of existing flood control structures and channel structures, such as stream armoring, constrictions, grade control structures, and hydromodification or flood management basins.

(b) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify and compile a list of candidate projects that could potentially be used as alternative compliance options for Priority Development Projects, to be implemented in lieu of onsite structural BMP performance requirements described in Provisions E.3.c.(1) and E.3.c.(2). Specifically, the Copermittees must identify opportunities to be included in the list of candidate projects in each Watershed Management Area, such as:

(i) Stream or riparian area rehabilitation;

(ii) Retrofitting existing infrastructure to incorporate storm water retention or treatment;

(iii) Regional BMPs;

(iv) Groundwater recharge projects;

(v) Water supply augmentation projects; and

(vi) Land purchases to preserve floodplain functions.

(c) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify areas within the Watershed Management Area where it is appropriate to allow Priority Development Projects to be exempt from the hydromodification management BMP performance requirements described in Provision E.3.c.(2), including supporting rationale.

4. Water Quality Improvement Monitoring and Assessment Program

a. The Copermittees in each Watershed Management Area must develop and incorporate an integrated monitoring and assessment program into the Water Quality Improvement Plan that assesses: 1) the progress toward achieving the numeric goals and schedules, 2) the progress toward addressing the highest priority water quality conditions for each Watershed Management Area, and 3) each Copermittee's overall efforts to implement the Water Quality Improvement Plan.

b. The monitoring and assessment program must incorporate the monitoring and assessment requirements of Provision D, which may allow the Copermittees to modify the program to be consistent with and focus on the highest priority water quality conditions for each Watershed Management Area.

c. For Watershed Management Areas with applicable TMDLs, the monitoring and assessment program must incorporate the specific monitoring and assessment requirements of Attachment E.

d. For Watershed Management Areas with any ASBS, the water quality monitoring and assessment program must incorporate the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

5. Iterative Approach and Adaptive Management Process

The Copermittees in each Watershed Management Area must implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a, and must include the following:

a. RE-EVALUATION OF PRIORITY WATER QUALITY CONDITIONS

The priority water quality conditions and potential water quality improvement strategies included in the Water Quality Improvement Plan pursuant to Provisions B.2.c and B.2.e may be re-evaluated by the Copermittees as needed during the term of this Order as part of the Water Quality Improvement Plan Annual Report. Re-evaluation and recommendations for modifications to the priority water quality conditions and potential water quality improvement strategies must be provided in the Report of Waste Discharge, and must consider the following:

(1) Achieving the outcome of improved water quality in MS4 discharges and receiving waters through implementation of the water quality improvement strategies identified in the Water Quality Improvement Plan;

(2) New information developed when the requirements of Provisions B.2.a-c have been re-evaluated;

(3) Spatial and temporal accuracy of monitoring data collected to inform prioritization of water quality conditions and implementation strategies to address the highest priority water quality conditions;

(4) Availability of new information and data from sources other than the jurisdictional runoff management programs within the Watershed Management Area that informs the effectiveness of the actions implemented by the Copermittees;

(5) San Diego Water Board recommendations; and

(6) Recommendations for modifications solicited through a public participation process.

b. ADAPTATION OF GOALS, STRATEGIES AND SCHEDULES

The water quality improvement goals, strategies and schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.3, must be re-evaluated and adapted as new information becomes available to result in more effective and efficient measures to address the highest priority water quality conditions identified pursuant to Provision B.2.c. Re-evaluation of and modifications to the water quality improvement goals, strategies and schedules must be provided in the Water Quality Improvement Plan Annual Report, and must consider the following:

(1) Modifications to the priority water quality conditions based on Provision B.5.a;

(2) Progress toward achieving interim and final numeric goals in receiving waters and MS4 discharges for the highest priority water quality conditions in the Watershed Management Area,

(3) Progress toward achieving outcomes according to established schedules;

(4) New policies or regulations that may affect identified numeric goals;

(5) Measurable or demonstrable reductions of non-storm water discharges to and from each Copermittee's MS4;

(6) Measurable or demonstrable reductions of pollutants in storm water discharges from each Copermittee's MS4 to the MEP;

(7) New information developed when the requirements of Provisions B.2.b and B.2.d have been re-evaluated;

(8) Efficiency in implementing the Water Quality Improvement Plan;

(9) San Diego Water Board recommendations; and

(10) Recommendations for modifications solicited through a public participation process.

c. ADAPTATION OF MONITORING AND ASSESSMENT PROGRAM

The water quality improvement monitoring and assessment program, included in the Water Quality Improvement Plan pursuant to Provision B.4, must be re-evaluated and adapted when new information becomes available. Re-evaluation and recommendations for modifications to the monitoring and assessment program, pursuant to the requirements of Provision D, may be provided in the Water Quality Improvement Plan Annual Report, but must be provided in the Report of Waste Discharge.

6. Water Quality Improvement Plan Submittal, Updates, and Implementation

a. The Copermittees must submit and commence implementation of the Water Quality Improvement Plans in accordance with the requirements of Provision F.1.

b. The Copermittees must submit proposed updates to the Water Quality Improvement Plan for acceptance by the San Diego Water Board Executive Officer in accordance with the requirements of Provision F.2.c.

C. ACTION LEVELS

The purpose of this provision is for the Copermittees to incorporate numeric action levels in the Water Quality Improvement Plans. The goal of the action levels is to guide Water Quality Improvement Plan implementation efforts and measure progress towards the protection of water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through monitoring and assessing the quality of the MS4 discharges during the implementation of the Water Quality Improvement Plans.

1. Non-Storm Water Action Levels[8]

The Copermittees must develop and incorporate numeric non-storm water action levels (NALs) into the Water Quality Improvement Plan to: 1) support the development and prioritization of water quality improvement strategies for effectively prohibiting non-storm water discharges to the MS4s, 2) assess the effectiveness of the water quality improvement strategies toward addressing MS4 non-storm water discharges, required pursuant to Provision D.4.b.(1), and 3) support the detection and elimination of non-storm water and illicit discharges to the MS4, required pursuant to Provision E.2.[9]

a. The following NALs must be incorporated:

(1) Non-Storm Water Discharges from MS4s to Ocean Surf Zone

Table C-1. Non-Storm Water Action Levels for Discharges from MS4s to Ocean Surf Zone

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Total Coliform	MPN/100 ml	1,000	-	10,000/1,000[1]	OP
Fecal Coliform	MPN/100 ml	200[2]	-	400	OP
Enterococci	MPN/100 ml	35	-	104[3]	OP

Abbreviations/Acronyms
AMAL – average monthly action level
MDAL – maximum daily action level
OP – Ocean Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Total coliform density NAL is 1,000 MPN/100 ml when the fecal/total coliform ratio exceeds 0.1.
2. Fecal coliform density NAL is 200 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas."

[8] NALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, unless the NAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed.
[9] The Copermittees may utilize NALs or other benchmarks currently established by the Copermittees as interim NALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

(2) Non-Storm Water Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Table C-2. Non-Storm Water Action Levels for Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Turbidity	NTU	75	-	225	OP
pH	Units	Within limit of 6.0 to 9.0 at all times			OP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	35	-	104[3]	BP
Priority Pollutants	µg/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
OP – Ocean Plan water quality objective
NTU – Nephelometric Turbidity Units
µg/L – micrograms per liter
MDAL – maximum daily action level
BP – Basin Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas" and is not applicable to water bodies that are not designated with the water contact recreation (REC-1) beneficial use.

Table C-3. Non-Storm Water Action Levels for Priority Pollutants

Parameter	Units	Freshwater (CTR)		Saltwater (CTR)	
		MDAL	AMAL	MDAL	AMAL
Cadmium	µg/L	**	**	16	8
Copper	µg/L	*	*	5.8	2.9
Chromium III	µg/L	**	**	-	-
Chromium VI	µg/L	16	8.1	83	41
Lead	µg/L	*	*	14	2.9
Nickel	µg/L	**	**	14	6.8
Silver	µg/L	*	*	2.2	1.1
Zinc	µg/L	*	*	95	47

Abbreviations/Acronyms:
CTR – California Toxic Rule
AMAL – average monthly action level
µg/L – micrograms per liter
MDAL – maximum daily action level

Notes:
* Action levels developed on a case-by-case basis (see below)
** Action levels developed on a case-by-case basis (see below), but calculated criteria are not to exceed Maximum Contaminant Levels (MCLs) under the California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64431

The Cadmium, Copper, Chromium (III), Lead, Nickel, Silver and Zinc NALs for MS4 discharges to freshwater receiving waters will be developed on a case-by-case basis based on site-specific water quality data (receiving water hardness). For these priority pollutants, refer to 40 CFR 131.38(b)(2).

(3) Non-Storm Water Discharges from MS4s to Inland Surface Waters

Table C-4. Non-Storm Water Action Levels for Discharges from MS4s to Inland Surface Waters

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Dissolved Oxygen	mg/L	Not less than 5.0 in WARM waters and not less than 6.0 in COLD waters			BP
Turbidity	NTU	-	20	See MDAL	BP
pH	Units	Within limit of 6.5 to 8.5 at all times			BP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	33	-	61[3]	BP
Total Nitrogen	mg/L	-	1.0	See MDAL	BP
Total Phosphorus	mg/L	-	0.1	See MDAL	BP
MBAS	mg/L	-	0.5	See MDAL	BP
Iron	mg/L	-	0.3	See MDAL	BP
Manganese	mg/L	-	0.05	See MDAL	BP
Priority Pollutants	µg/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
BP – Basin Plan water quality objective
COLD – cold freshwater habitat beneficial use
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
MDAL – maximum daily action level
WARM – warm freshwater habitat beneficial use
MBAS – Methylene Blue Active Substances
MPN/100 ml – most probable number per 100 milliliters
µg/L – micrograms per liter

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for freshwater "designated beach areas" and is not applicable to water bodies that are not designated with the water contact recreation (REC-1) beneficial use.

b. If not identified in Provision C.1.a, NALs must be identified, developed and incorporated in the Water Quality Improvement Plan for any pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in receiving waters associated with the highest priority water quality conditions related to non-storm water discharges from the MS4s. NALs must be based on:

(1) Applicable water quality standards which may be dependent upon site-specific or receiving water-specific conditions or assumptions to be identified by the Copermittees; or

(2) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the NALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary NALs specific to the Watershed Management Area at levels greater than the NALs required by Provisions C.1.a and C.1.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for effectively prohibiting non-storm water discharges to the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and from the MS4. The

secondary NALs may be developed using an approach acceptable to the San Diego Water Board.

d. Dry weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.b may be utilized to develop or revise NALs based on watershed-specific data, subject to San Diego Water Board Executive Officer approval.

2. Storm Water Action Levels[10]

The Copermittees must develop and incorporate numeric storm water action levels (SALs) in the Water Quality Improvement Plans to: 1) support the development and prioritization of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s, and 2) assess the effectiveness of the water quality improvement strategies toward reducing pollutants in storm water discharges, required pursuant to Provision D.4.b.(2).[11]

a. The following SALs for discharges of storm water from the MS4 must be incorporated:

Table C-5. Storm Water Action Levels for Discharges from MS4s to Receiving Waters

Parameter	Units	Action Level
Turbidity	NTU	126
Nitrate & Nitrite (Total)	mg/L	2.6
Phosphorus (Total P)	mg/L	1.46
Cadmium (Total Cd)*	µg/L	3.0
Copper (Total Cu)*	µg/L	127
Lead (Total Pb)*	µg/L	250
Zinc (Total Zn)*	µg/L	976

Abbreviations/Acronyms:
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
µg/L – micrograms per liter

Notes:
* The sampling must include a measure of receiving water hardness at each MS4 outfall. If a total metal concentration exceeds the corresponding metals SAL in Table C-5, that concentration must be compared to the California Toxics Rule criteria and the USEPA 1-hour maximum concentration for the detected level of receiving water hardness associated with that sample. If it is determined that the sample's total metal concentration for that specific metal exceeds that SAL, but does not exceed the applicable USEPA 1-hour maximum concentration criterion for the measured level of hardness, then the sample result will not be considered above the SAL for that measurement.

[10] SALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, unless the SAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed.

[11] The Copermittees may utilize SALs or other benchmarks currently established by the Copermittees as interim SALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

b. If not identified in Provision C.2.a, SALs must be identified, developed and incorporated in the Water Quality Improvement Plan for pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in receiving waters associated with the highest priority water quality conditions related to storm water discharges from the MS4s. SALs must be based on:

(1) Federal and State water quality guidance and/or water quality standards; and

(2) Site-specific or receiving water-specific conditions; or

(3) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the SALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary SALs specific to the Watershed Management Area at levels greater than the SALs required by Provisions C.2.a and C.2.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s. The secondary SALs may be developed based on the approaches recommended by the State Water Board's Storm Water Panel[12] or using an approach acceptable to the San Diego Water Board.

d. Wet weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.c may be used to develop or revise SALs based upon watershed-specific data, subject to San Diego Water Board Executive Officer approval.

[12] Storm Water Panel Recommendations to the California State Water Resources Control Board: The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities (June 2006)

D. MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS

The purpose of this provision is for the Copermittees to monitor and assess the impact on the conditions of receiving waters caused by discharges from the Copermittees' MS4s under wet weather and dry weather conditions. The goal of the monitoring and assessment program is to inform the Copermittees about the nexus between the health of receiving waters and the water quality condition of the discharges from their MS4s. This goal will be accomplished through monitoring and assessing the conditions of the receiving waters, discharges from the MS4s, pollutant sources and/or stressors, and effectiveness of the water quality improvement strategies implemented as part of the Water Quality Improvement Plans.

1. Receiving Water Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the condition of the receiving waters in each Watershed Management Area during dry weather and wet weather. Following San Diego Water Board acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct long-term receiving water monitoring during implementation of the Water Quality Improvement Plan to assess the long term trends and determine if conditions in receiving waters are improving. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following receiving water monitoring procedures:

a. TRANSITIONAL RECEIVING WATER MONITORING

Until the monitoring requirements and schedules of Provisions D.1.b-e are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following receiving water monitoring in the Watershed Management Area:

(1) Continue the receiving water monitoring programs required in Order Nos. R9-2007-0001 (Monitoring and Reporting Program No. R9-2007-0001 Sections II.A.1-A.5), R9-2009-0002, and R9-2010-0016, unless the Executive Officer provides conditional approval for Copermittees to proceed with implementation of the proposed monitoring and assessment program developed in accordance with Provision B.4;

(2) Continue the monitoring in the Hydromodification Management Plans approved by the San Diego Water Board;

(3) Participate in the following regional receiving water monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring,

(b) Southern California Bight Regional Monitoring, and

(c) Sediment Quality Monitoring;

(4) Implement the monitoring programs developed as part of any implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) for the TMDLs in Attachment E to this Order; and

(5) For Watershed Management Areas with ASBS, implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

b. LONG-TERM RECEIVING WATER MONITORING STATIONS

The Copermittees must select at least one long-term receiving water monitoring station from among the existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees to be representative of the receiving water quality in the Watershed Management Area. Additional long-term receiving water monitoring stations must be selected where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

c. DRY WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three dry weather monitoring events at each of the long-term receiving water monitoring stations. At least one monitoring event must be conducted during the dry season (May 1 – September 30) and at least one monitoring event must be conducted during a dry weather period during the wet season (October 1 – April 30), after the first wet weather event of the season, with an antecedent dry period of at least 72 hours following a storm event producing measureable rainfall of greater than 0.1 inch.

(1) Dry Weather Receiving Water Field Observations

For each dry weather monitoring event, the Copermittees must record field observations consistent with Table D-1 at each long-term receiving water monitoring station.

Table D-1. Field Observations for Receiving Water Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) • Station description (i.e. deposits or stains, vegetation condition, structural condition, and observable biology) • Presence and assessment of trash in and around station

(2) Dry Weather Receiving Water Field Monitoring

For each dry weather monitoring event, if conditions allow the collection of the data, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

Table D-2. Field Monitoring Parameters for Receiving Water Monitoring Stations

Parameters
• pH • Temperature • Specific conductivity • Dissolved oxygen • Turbidity

(3) Dry Weather Receiving Water Analytical Monitoring

For each dry weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable NAL constituents, and

(v) Constituents listed in Table D-3.

Table D-3. Analytical Monitoring Constituents for Receiving Water Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Pesticides	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Mercury • Nickel • Selenium • Thallium • Zinc	• Organophosphate Pesticides • Pyrethroid Pesticides	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(4) Dry Weather Receiving Water Toxicity Monitoring

For each dry weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for aquatic toxicity in accordance with Table D-4. When the State Water Board's Policy for Toxicity Assessment and Control (Toxicity Policy) is approved and in effect, the San Diego Water Board Executive Officer may direct the Copermittees to replace current toxicity program elements with standardized procedures in the Toxicity Policy.

Table D-4. Dry Weather Chronic[1] Toxicity Testing for Receiving Water Monitoring Stations

Organism	Units	Test	USEPA Protocol
Freshwater			
Pimephales promelas (Fathead Minnow)	Pass / Fail	Larval Survival and Growth	EPA-821-R-02-013
Ceriodaphnia dubia (*Daphnid*)	Pass / Fail	Survival and Production	EPA-821-R-02-013
Selenastrum capricornutum (Green Algae)	Pass / Fail	Growth	EPA-821-R-02-013
Marine and Estuarine			
Strongylocentrotus purpuratus *(Purple Sea Urchin)*	Pass / Fail	Embryo-Larval Development	EPA-600-R-95-136

Notes:
1. Chronic toxicity testing is not required at receiving water monitoring stations located at mass loading stations if the channel flows are diverted year-round during dry weather conditions to the sanitary sewer for treatment.

(a) Freshwater Test Species and Methods: If samples are collected in receiving waters with salinity less than 1 ppt, the Copermittees must follow the methods for chronic toxicity tests as established in 40 CFR 136.3 using a single-concentration test design for routine monitoring, or a five-concentration test design for additional toxicity testing if the limitation is exceeded. The Copermittees must estimate the critical life stage chronic toxicity on undiluted samples in accordance with species and short term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms (EPA-821-R-02-013; Table IA, 40 CFR 136). Additional test species may be used by the Copermittees if approved by the San Diego Water Board Executive Officer. The Copermittees must conduct:

(i) A static renewal toxicity test with the fathead minnow, *Pimephales promelas* (Larval Survival and Growth Test Method 1000.0);

(ii) A static renewal toxicity test with the daphnid, *Ceriodaphnia dubia* (Survival and Reproduction Test Method 1002.0); and

(iii) A static renewal toxicity test with the green alga, *Selenastrum capricornutum* (also named *Raphidocelis subcapitata*) (Growth Test Method 1003.0).

(b) Marine and Estuarine Test Species and Methods: If samples are collected in receiving waters with salinity greater or equal to 1 ppt, the Copermittees must follow the methods for chronic toxicity tests as established in 40 CFR 136.3 using a single-concentration test design for routine monitoring, or a five-concentration test design for additional toxicity testing if the limitation is exceeded. The Copermittees must conduct the following critical life state chronic toxicity tests on undiluted samples in accordance with species and short term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms (EPA-600-R-95-136; 1995). Artificial sea salts must be used to increase sample salinity. The Copermittees must conduct a static non-renewal toxicity test with the purple sea urchin, *Strongylocentrotus purpuratus* (Embryo-larval Development Test Method). Additional species may be used by the Copermittees if approved by the San Diego Water Board Executive Officer.

(c) Holding Times: All toxicity tests must be conducted as soon as possible following sample collection. The 36-hour sample holding time for test initiation shall be targeted. However, no more than 72 hours shall elapse before the conclusion of sample collection and test initiation.

(d) Test Species Sensitivity Screening: To determine the most sensitive test species for freshwater, the Copermittees must screen 2 wet weather and 2 dry weather toxicity tests with a vertebrate, an invertebrate, and a plant species. After this screening period, subsequent monitoring must be conducted using the most sensitive test species. Alternatively, if a sensitive test species has already been determined, or if there is prior knowledge of potential toxicant(s) and a test species is sensitive to such toxicant(s), then monitoring must be conducted using only that test species. Sensitive test species determinations must also consider the most sensitive test species used for proximal receiving water monitoring. Rescreening must occur once each permit term.

(e) Chronic toxicity test biological endpoint data must be analyzed using the Test of Significant Toxicity t-test approach specified in *National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document* (USEPA, Office of Wastewater Management, Washington, D.C., EPA-833-R-10-003, 2010). For this monitoring program, the critical chronic instream waste concentration (IWC) is set at 100 percent receiving water (i.e. no dilution) for receiving water samples. A 100 percent receiving water and a control must be tested.

(f) Toxicity Identification Evaluation (TIE) / Toxicity Reduction Evaluation (TRE): If chronic toxicity is detected in receiving waters, the Copermittees must discuss the need for conducting a TIE/TRE in the assessments required under Provision D.4.a.(2), and develop a plan for implementing the TIE/TRE to be incorporated in the Water Quality Improvement Plan.

(5) Dry Weather Receiving Water Bioassessment Monitoring

Bioassessment monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must conduct bioassessment monitoring during at least one dry weather monitoring event at each long-term receiving water monitoring station as follows:

(a) The following bioassessment samples and measurements must be collected:

(i) Macroinvertebrate samples must be collected in accordance with the "Reachwide Benthos (Multihabitat) Procedure" in the most current Surface Water Ambient Monitoring Program (SWAMP) Bioassessment Standard Operating Procedures (SOP), and amendments, as applicable;[13]

(ii) The "Full" suite of physical habitat characterization measurements must be collected in accordance with the most current SWAMP Bioassessment SOP, and as summarized in the SWAMP Stream Habitat Characterization Form – Full Version;[14] and

(iii) Freshwater algae samples must be collected in accordance with the SWAMP Standard Operating Procedures for Collecting Algae Samples.[15] Analysis of samples must include algal taxonomic composition (diatoms and soft algae) and algal biomass.

(b) The bioassessment samples, measurements, and appropriate water chemistry data must be used to calculate the following:

(i) An Index of Biological Integrity (IBI) for macroinvertebrates for each monitoring station where bioassessment monitoring was conducted, based on the most current calculation method;[16] and

[13] Ode, P.R.. 2007. Standard operating procedures for collecting macroinvertebrate samples and associated physical and chemical data for ambient bioassessments in California. California State Water Resources Control Board Surface Water Ambient Monitoring Program (SWAMP) Bioassessment SOP 001. http://www.swrcb.ca.gov/water_issues/programs/swamp/tools.shtml#monitoring

[14] Available at: http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/reports/fieldforms_fullversion052908.pdf

[15] Fetscher et al. 2009. Standard Operating Procedures for Collecting Stream Algae Samples and Associated Physical Habitat and Chemical Data for Ambient Bioassessments in California.

[16] The most current calculation method at the time the Order was adopted is outlined in "A Quantitative Tool for Assessing the Integrity of Southern California Coastal Streams" (Ode, et al. 2005. Environmental Management. Vol. 35, No. 1, pp. 1-13). If an updated or new calculation method is developed, either both (i.e. current and updated/new) methods must be used, or historical IBIs must be recalculated with the updated or new calculation method.

(ii) An IBI for algae for each monitoring station where bioassessment monitoring was conducted, when a calculation method is developed.[17]

(c) In lieu of the requirements of Provision D.1.c.(5)(a), the Copermittees may conduct the bioassessment monitoring in accordance with the "Triad" assessment approach[18] to calculate the IBIs required for Provision D.1.c.(5)(b). The Copermittees must conduct sampling, analysis, and reporting of specified in-stream biological and habitat data according to the protocols specified in the SCCWRP Technical Report No. 539, or subsequent protocols, if developed.

(6) Dry Weather Receiving Water Hydromodification Monitoring

In addition to the hydromodification monitoring conducted as part of the Copermittees' Hydromodification Management Plans, hydromodification monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must collect the following hydromodification monitoring observations and measurements within an appropriate domain of analysis during at least one dry weather monitoring event for each long-term receiving water monitoring station:

(a) Channel conditions, including:

(i) Channel dimensions,

(ii) Hydrologic and geomorphic conditions, and

(iii) Presence and condition of vegetation and habitat;

(b) Location of discharge points;

(c) Habitat integrity;

(d) Photo documentation of existing erosion and habitat impacts, with location (i.e. latitude and longitude coordinates) where photos were taken;

(e) Measurement or estimate of dimensions of any existing channel bed or bank eroded areas, including length, width, and depth of any incisions; and

[17] When a calculation method is developed, IBIs must be calculated for all available and appropriate historical data.
[18] Stormwater Monitoring Coalition Model Monitoring Technical Committee, 2004. Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California. Technical Report #419. August 2004.

(f) Known or suspected cause(s) of existing downstream erosion or habitat impact, including flow, soil, slope, and vegetation conditions, as well as upstream land uses and contributing new and existing development.

d. WET WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three wet weather monitoring events at each long-term receiving water monitoring station. At least one wet weather monitoring event must be conducted during the first wet weather event of the wet season (October 1 – April 30), and at least one wet weather monitoring event during a wet weather event that occurs after February 1.

(1) Wet Weather Receiving Water Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each long-term receiving water monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event;

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(d) Presence and assessment of trash in and around station.

(2) Wet Weather Receiving Water Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

(3) Wet Weather Receiving Water Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) Constituents listed in Table D-3.

(4) Wet Weather Receiving Water Toxicity Monitoring

For each wet weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for chronic aquatic toxicity in accordance with Provisions D.1.c.(4)(a)-(f).

e. OTHER RECEIVING WATER MONITORING REQUIREMENTS

(1) Regional Monitoring

The Copermittees must participate in the following regional receiving waters monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring; and

(b) Southern California Bight Regional Monitoring~~.~~ and

(c) Unified Beach Water Quality Monitoring and Assessment Program. The Orange County Copermittees shall participate in and, together with South Orange County Wastewater Authority and Orange County Health Care Agency, shall share responsibility for implementation of a unified regional beach water quality monitoring and assessment program in south Orange County, as set forth in the October 2014 report, *Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County* , issued pursuant to CWC section 13383 and subject to future revision in the San Diego Water Board December 5, 2014 Letter Directive.

(2) Sediment Quality Monitoring

The Copermittees must perform sediment monitoring to assess compliance with sediment quality receiving water limits applicable to MS4 discharges to enclosed bays and estuaries. The monitoring may be performed either by individual or multiple Copermittees to assess compliance with receiving water limits, or through participation in a water body monitoring coalition. A Sediment Monitoring Plan which satisfies the requirements of the State Water Board's Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part 1 Sediment Quality (Sediment Control Plan) must be submitted as part of the monitoring and assessment program in the Water Quality Improvement Plan.

(a) The Sediment Monitoring Plan design must include the following:

(i) The elements required under Section VII.D (Receiving Water Limits Monitoring Frequency) and Section VII.E (Sediment Monitoring) of the Sediment Control Plan;

(ii) A Quality Assurance Project Plan (QAPP) describing the project objectives and organization, functional activities, and quality assurance/quality control protocols for the water and sediment monitoring; and

(iii) A schedule for completion of all sample collection and analysis activities and submission of Sediment Monitoring Reports.

(b) The Copermittees must implement the Sediment Monitoring Plan in accordance with the schedule contained in the Sediment Monitoring Plan, unless otherwise directed in writing by the San Diego Water Board Executive Officer.

(c) The Copermittees must incorporate a Sediment Monitoring Report as part of the Water Quality Improvement Plan Annual Report in accordance with the schedule contained in the Sediment Monitoring Plan, unless otherwise directed in writing by the San Diego Water Board Executive Officer. The Sediment Monitoring Report must contain the following information:

(i) Analysis: An evaluation, interpretation and tabulation of the water and sediment monitoring data, including interpretations and conclusions as to whether applicable Receiving Water Limitations in this Order have been attained at each sample station;

(ii) Sample Location Map: The locations, type, and number of samples must be identified and shown on a site map; and

(iii) California Environmental Data Exchange Network: A statement certifying that the monitoring data and results have been uploaded into the California Environmental Data Exchange Network (CEDEN).

(d) Based on the Sediment Monitoring Report conclusions the San Diego Water Board may require a human health risk assessment to determine if the human health objective contained in Receiving Water Limitations in Provision A.2.a.(3)(b)(ii) has been attained at each sample station. In conducting a risk assessment, the Copermittees must consider any applicable and relevant information, including California Environmental Protection Agency's (Cal/EPA) Office of Environmental Health Hazard Assessment (OEHHA) policies for fish consumption and risk assessment, Cal/EPA's Department of Toxic Substances Control (DTSC) Risk Assessment, and USEPA Human Health Risk Assessment policies.

(3) ASBS Monitoring

For Watershed Management Areas with ASBS, the Copermittees must implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

f. ALTERNATIVE WATERSHED MONITORING REQUIREMENTS

The San Diego Water Board may direct the Copermittees to participate in an effort to develop alternative watershed monitoring with other regulated entities, other interested parties, and the San Diego Water Board to refine, coordinate, and implement regional monitoring and assessment programs to determine the status and trends of water quality conditions in 1) coastal waters, 2) enclosed

bays, harbors, estuaries, and lagoons, and 3) streams.

2. MS4 Outfall Discharge Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the discharges from the MS4 outfalls in each Watershed Management Area during dry weather and wet weather. Following San Diego Water Board acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct MS4 outfall discharge monitoring during implementation of the Water Quality Improvement Plan to assess the effectiveness of their jurisdictional runoff management programs toward effectively prohibiting non-storm water discharges into the MS4 and reducing pollutants in storm water discharges from their MS4s to the MEP. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following MS4 outfall monitoring procedures:

a. TRANSITIONAL MS4 OUTFALL DISCHARGE MONITORING

Until the monitoring requirements and schedules of Provisions D.2.b-c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following MS4 outfall discharge monitoring in the Watershed Management Area:

(1) MS4 Outfall Discharge Monitoring Station Inventory

Each Copermittee must identify all major MS4 outfalls that discharge directly to receiving waters within its jurisdiction and geo-locate those outfalls on a map of the MS4 pursuant to Provision E.2.b.(1). This information must be compiled into a MS4 outfall discharge monitoring station inventory, and must include the following information:

(a) Latitude and longitude of MS4 outfall point of discharge;

(b) Watershed Management Area;

(c) Hydrologic subarea;

(d) Outlet size;

(e) Accessibility (i.e. safety and without disturbance of critical habitat);

(f) Approximate drainage area; and

(g) Classification of whether the MS4 outfall is known to have persistent dry weather flows, transient dry weather flows, no dry weather flows, or unknown dry weather flows.

(2) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Until the monitoring requirements and schedules of Provision D.2.b are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, each Copermittee must perform dry weather MS4 outfall field screening monitoring to identify non-storm water and illicit discharges within its jurisdiction in accordance with Provision E.2.c, to determine which discharges are transient flows and which are persistent flows, and prioritize the dry weather MS4 discharges that will be investigated and eliminated in accordance with Provision E.2.d.

(a) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Frequency

Each Copermittee must field screen the MS4 outfalls in its inventory developed pursuant to Provision D.2.a.(1) as follows:

(i) For Copermittees with less than 125 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 80 percent of the outfalls must be visually inspected two times per year during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv).

(ii) For Copermittees with 125 major MS4 outfalls or more, but less than or equal to 500 that discharge to receiving waters within a Watershed Management Area, all the outfalls must be visually inspected at least annually during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv).

(iii) For Copermittees with more than 500 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 500 outfalls must be visually inspected at least annually during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv). Copermittees with more than 500 major MS4 outfalls within a Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;

[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(iv) For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major MS4 outfalls within its jurisdiction, at least 500 major MS4 outfalls within its inventory must be visually inspected at least annually during dry weather conditions. Copermittees with more than 500 major MS4 outfalls in more than one Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(v) Inspections of major MS4 outfalls conducted in response to public reports and staff or contractor reports and notifications may count toward the required visual inspections of MS4 outfall discharge monitoring stations.

(b) Transitional Dry Weather MS4 Outfall Discharge Field Screening Visual Observations

(i) An antecedent dry period of at least 72 hours following any storm event producing measurable rainfall greater than 0.1 inch is required prior to conducting field screening visual observations during a field screening monitoring event.

(ii) During the field screening monitoring event, each Copermittee must record visual observations consistent with Table D-5 at each MS4 outfall discharge monitoring station inspected.

Table D-5. Field Screening Visual Observations for MS4 Outfall Discharge Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) - Flow source(s) suspected or identified from non-storm water source investigation - Flow source(s) eliminated during non-storm water source identification • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) - Known or suspected source(s) of pooled or ponded water • Station description (i.e. deposits or stains, vegetation condition, structural condition, observable biology) • Presence and assessment of trash in and around station • Evidence or signs of illicit connections or illegal dumping

(iii) Each Copermittee must implement the requirements of Provisions E.2.d.(2)(c)-(e) based on the field observations required pursuant to Provision D.2.a.(2)(b)(ii).

(iv) Each Copermittee must evaluate field observations together with existing information available from prior reports, inspections and monitoring results to determine whether any observed flowing, pooled, or ponded waters are likely to be transient or persistent flow.[19]

(c) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Records

Based upon the results of the transitional dry weather MS4 outfall discharge field screening monitoring conducted pursuant to Provisions D.2.a.(2)(a)-(b), each Copermittee must update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow.

(3) Transitional Wet Weather MS4 Outfall Discharge Monitoring

Until the monitoring requirements and schedules of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the

[19] Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(a) Transitional Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees must select wet weather MS4 outfall discharge monitoring stations from the inventories developed pursuant to Provision D.2.a.(1) for each Watershed Management Area as follows:

(i) At least five wet weather MS4 outfall discharge monitoring stations that are representative of storm water discharges from areas consisting primarily of residential, commercial, industrial, and typical mixed-use land uses present within the Watershed Management Area;

(ii) At least one wet weather MS4 outfall discharge monitoring station for each Copermittee within the Watershed Management Area; and

(iii) The County of San Diego may select at least two (2) wet weather MS4 outfall discharge monitoring stations for the portion of the Santa Margarita River Watershed Management Area within its jurisdiction to be monitored during the transitional period until the Riverside County Copermittees are notified of coverage under this Order. After the Riverside County Copermittees are notified of coverage under this Order, the Copermittees in the Watershed Management Area must select wet weather MS4 outfall discharge monitoring stations consistent with the requirements above.

(b) Transitional Wet Weather MS4 Outfall Discharge Monitoring Frequency

Each wet weather MS4 outfall discharge monitoring station selected pursuant to Provision D.2.a.(3)(a) must be monitored once during the wet season (October 1 – April 30). The wet weather monitoring events must be selected to be representative of the range of hydrological conditions experienced in the region. At least 10 percent of samples must be conducted during the first wet weather event of the wet season, to include at least one such sample in each Watershed Management Area..

(c) Transitional Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(i) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the

storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(ii) The flow rates and volumes measured or estimated from the MS4 outfall (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(d) Transitional Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(e) Transitional Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, and indicator bacteria;

(iv) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

[a] Time-weighted composites collected over the length of the storm event or the first 24 hour period whichever is shorter, composed of discrete samples, which may be collected through the use of automated equipment, or

[b] Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

[c] If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours;

(v) Only one analysis of the composite of aliquots is required;

(vi) The samples must be analyzed for the following constituents:

[a] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

[b] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and

[c] Constituents listed in Table D-6.

Table D-6. Analytical Monitoring Constituents for Wet Weather MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Nickel • Selenium • Thallium • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(f) Other Transitional Wet Weather MS4 Outfall Discharge Monitoring

The San Diego County Copermittees must continue the wet weather MS4 outfall monitoring program developed under Order No. R9-2007-0001, as approved by the San Diego Water Board, through its planned completion.

b. Dry Weather MS4 Outfall Discharge Monitoring

Each Copermittee must perform dry weather MS4 outfall monitoring to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. Each Copermittee must conduct the following dry weather MS4 outfall discharge monitoring within its jurisdiction:

(1) Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Each Copermittee must continue to perform the dry weather MS4 outfall discharge field screening monitoring in accordance with the requirements of Provision D.2.a.(2). The Copermittee may adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of persistent flow non-storm water discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of visual inspections performed is equivalent to the number of visual inspections required under Provision D.2.a.(2)(a).

(2) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring

Each Copermittee must perform non-storm water persistent flow MS4 outfall discharge monitoring to determine which persistent non-storm water discharges contain concentrations of pollutants below NALs, and which persistent non-storm water discharges impact receiving water quality during dry weather. Each Copermittee must conduct the following non-storm water persistent flow MS4 outfall discharge monitoring within its jurisdiction:

(a) Prioritization of Non-Storm Water Persistent Flow MS4 Outfalls

Based upon the dry weather MS4 outfall discharge field screening monitoring records developed pursuant to Provision D.2.a.(2)(c), each Copermittee must identify and prioritize the MS4 outfalls with persistent flows based on the highest priority water quality conditions identified in the Water Quality Improvement Plan and any additional criteria developed by the Copermittee, which may include historical data and data from sources other than what the Copermittee collects.

(b) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring Frequency

(i) Based on the prioritization of major MS4 outfalls developed under Provision D.2.b.(2)(a), each Copermittee must identify, at a minimum, the 5 highest priority major MS4 outfalls with non-storm water persistent flows that the Copermittee will monitor within its jurisdiction in each Watershed Management Area. For Responsible Copermittees identified by a TMDL in Attachment E to this Order, if the 5 chosen outfall locations are not sufficient to determine compliance with the TMDL(s), then each Responsible Copermittee must identify additional MS4 outfall monitoring locations within its jurisdiction sufficient to address compliance with the TMDL(s). If a Copermittee has less than 5 major outfalls within a Watershed

Management Area, then the Copermittee must monitor all of its major MS4 outfalls with persistent flows within each Watershed Management Area. The location of the highest priority non-storm water persistent flow MS4 outfall monitoring stations must be identified on the map required pursuant to Provision E.2.b.(1). The map must specify which MS4 outfalls are being monitored for compliance with a TMDL.

(ii) Each of the highest priority non-storm water persistent flow MS4 outfall monitoring stations identified pursuant to Provision D.2.b.(2)(b)(i) must be monitored under dry weather conditions at least semi-annually until one of the following occurs:

[a] The non-storm water discharges have been effectively eliminated (i.e. no flowing, pooled, or ponded water) for three consecutive dry weather monitoring events; or

[b] The source(s) of the persistent flows has been identified as a category of non-storm water discharges that does not require an NPDES permit and does not have to be addressed as an illicit discharge because it was not identified as a source of pollutants (i.e. constituents in non-storm water discharge do not exceed NALs), and the persistent flow can be re-prioritized to a lower priority; or

[c] The constituents in the persistent flow non-storm water discharge do not exceed NALs, and the persistent flow can be re-prioritized to a lower priority; or

[d] The source(s) of the persistent flows has been identified as a non-storm water discharge authorized by a separate NPDES permit.

(iii) Where the criteria under Provision D.2.b.(2)(b)(ii) are not met, but the threat to water quality has been reduced by the Copermittee, the highest priority persistent flow MS4 outfall monitoring stations may be reprioritized accordingly for continued dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1).

(iv) Each Copermittee must document removal or re-prioritization of the highest priority persistent flow MS4 outfall monitoring stations identified under Provision D.2.b.(2)(a) in the Water Quality Improvement Plan Annual Report. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized major MS4 outfall in the Watershed Management Area within its jurisdiction, unless there are no remaining qualifying major MS4 outfalls within the Copermittee's jurisdiction in the Watershed Management Area.

(c) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Observations

During each semi-annual monitoring event, each Copermittee must record field observations consistent with Table D-5 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(d) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Monitoring

During each semi-annual monitoring event, if conditions allow the collection of the data, each Copermittee must monitor and record the parameters in Table D-2 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(e) Non-Storm Water Persistent Flow MS4 Outfall Discharge Analytical Monitoring

During each semi-annual monitoring event in which measurable flow is present, each Copermittee must collect and analyze samples from each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Collect grab or composite samples to be analyzed at a qualified laboratory for the following constituents:

[a] Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,
[b] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,
[c] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,
[d] Applicable NAL constituents, and
[e] Constituents listed in Table D-7. The Copermittees may adjust the list of constituents for the Watershed Management Area if historical data or supporting information can be provided that demonstrates or justifies the analysis of a constituent is not necessary.

Table D-7. Analytical Monitoring Constituents for Persistent Flow MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Total Hardness • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Cadmium • Copper • Lead • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(iv) If the Copermittee identifies and eliminates the source of the persistent flow non-storm water discharge, analysis of the sample is not required.

c. WET WEATHER MS4 OUTFALL DISCHARGE MONITORING

The Copermittees must perform wet weather MS4 outfall monitoring to identify pollutants in storm water discharges from the MS4s, to guide pollutant source identification efforts, and to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order. The Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(1) Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees may adjust the wet weather MS4 outfall discharge monitoring locations in the Watershed Management Area, as needed, to identify pollutants in storm water discharges from MS4s, to guide pollutant source identification efforts, and to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of stations is at least equivalent to the number of stations required under Provision D.2.a.(3)(a). Additional outfall monitoring locations, above the minimum per jurisdiction, may be required to demonstrate compliance with the WQBELs associated with the applicable TMDLs in Attachment E.

(2) Wet Weather MS4 Outfall Discharge Monitoring Frequency

The Copermittees must monitor the wet weather MS4 outfall discharge monitoring stations in the Watershed Management Area at least once (1) per year. The Copermittees may need to increase the frequency of monitoring in order to identify pollutants in storm water discharges from the MS4s causing or contributing to the highest priority water quality conditions, to guide pollutant source identification efforts, or to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order.

(3) Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(4) Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(5) Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate

the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites collected over the length of the storm event or the first 24 hour period, whichever is shorter , composed of discrete samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

(iii) If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours.

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) The Copermittees may adjust the analytical monitoring required for the Watershed Management Area, if the Copermittees have historical data or supporting information that can demonstrate or provide justification that the analysis of a constituent is not necessary.

3. Special Studies

a. Within the term of this Order, the Copermittees must initiate the following special studies:

(1) At least two special studies in each Watershed Management Area to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that cause or contribute to highest priority water quality conditions identified in the Water Quality Improvement Plan.

(2) At least one special study for the San Diego Region to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that are impacting receiving waters on a regional basis in the San Diego Region.

(3) One of the two special studies in each Watershed Management Area required pursuant to Provision D.3.a.(1) may be replaced by a special study implemented pursuant to Provision D.3.a.(2).

b. The special studies must, at a minimum, be in conformance with the following criteria:

(1) The special studies must be related to the highest priority water quality conditions identified by the Copermittees in the Watershed Management Area and/or for the entire San Diego Region;

(2) The special studies developed pursuant to Provision D.3.a.(1) must:

(a) Be implemented within the applicable Watershed Management Area, and

(b) Require some form of participation by all the Copermittees within the Watershed Management Area;

(3) The special studies developed pursuant to Provision D.3.a.(2) must:

(a) Be implemented within the San Diego Region, and

(b) Require some form of participation by all Copermittees covered under the requirements of this Order.

(4) The Copermittees are encouraged to partner with environmental groups or third parties knowledgeable of watershed conditions to complete the required special studies.

c. Special studies developed to identify sources of pollutants and/or stressors should be pollutant and/or stressor specific and based on historical monitoring data and monitoring performed pursuant to Provisions D.1 and D.2. Development of source identification special studies should include the following:

(1) A compilation of known information on the specific pollutant and/or stressor,

including data on potential sources and movement of the pollutant and/or stressor within the watershed. Data generated by the Copermittees and others, as well as information available from a literature research on the pollutant and/or stressor should be compiled and analyzed as appropriate.

(2) An identification of data gaps, based on the compiled information generated on the specific pollutant and/or stressor identified in Provision D.3.c.(1). Source identification special studies should be developed to fill identified data gaps.

(3) A monitoring plan that will collect and provide data the Copermittees can utilize to do the following:

(a) Quantify the relative loading or impact of a pollutant and/or stressor from a particular source or pollutant generating activity;

(b) Improve understanding of the fate of a pollutant and/or stressor in the environment;

(c) Develop an inventory of known and suspected sources of a pollutant and/or stressor in the Watershed Management Area; and/or

(d) Prioritize known and suspected sources of a pollutant and/or stressor based on relative magnitude in discharges, geographical distribution (i.e., regional or localized), frequency of occurrence in discharges, human health risk, and controllability.

d. Special studies initiated prior to the effective date of this Order that meet the requirements of Provision D.3.b and are implemented during the term of this Order as part of the Water Quality Improvement Plan may be utilized to fulfill the special study requirements of Provision D.3.a. Special studies completed before the effective date of this Order cannot be utilized to fulfill the special study requirements of Provision D.3.a.

e. The Copermittees must submit the monitoring plans for the special studies in the Water Quality Improvement Plans required pursuant to Provision F.1.

f. The Copermittees are encouraged to share the results of the special studies regionally among the Copermittees to provide information useful in improving and adapting the management of non-storm water and storm water runoff through the implementation of the Water Quality Improvement Plans.

4. Assessment Requirements

Each Copermittee must evaluate the data collected pursuant to Provisions D.1, D.2 and D.3, and information collected during the implementation of the jurisdictional

runoff management programs required pursuant to Provision E, to assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a. Assessments must be performed as described in the following provisions:

a. RECEIVING WATERS ASSESSMENTS

(1) The Copermittees must assess and report the conditions of the receiving waters in the Watershed Management Area as follows:

(a) Based on data collected pursuant to Provision D.1.a, the assessments under Provision D.4.a.(2) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(b) Based on the data collected pursuant to Provisions D.1.a-e, the assessments required under Provision D.4.a.(2) must be included in the Report of Waste Discharge required pursuant to Provision F.5.b.

(2) The Copermittees must assess the status and trends of receiving water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under dry weather and wet weather conditions. For each of the three types of receiving waters in each Watershed Management Area the Copermittees must:

(a) Determine whether or not the conditions of the receiving waters are meeting the numeric goals established pursuant to Provision B.3.a;

(b) Identify the most critical beneficial uses that must be protected to ensure overall health of the receiving water;

(c) Determine whether or not those critical beneficial uses are being protected;

(d) Identify short-term and/or long-term improvements or degradation of those critical beneficial uses;

(e) Determine whether or not the strategies established in the Water Quality Improvement Plan contribute towards progress in achieving the interim and final numeric goals of the Water Quality Improvement Plan; and

(f) Identify data gaps in the monitoring data necessary to assess Provisions D.4.a.(2)(a)-(e).

b. MS4 OUTFALL DISCHARGES ASSESSMENTS

(1) Non-Storm Water Discharges Reduction Assessments

(a) Each Copermittee must assess and report the progress of its illicit discharge detection and elimination program, required to be implemented pursuant to Provision E.2, toward effectively prohibiting non-storm water and illicit discharges into the MS4 within its jurisdiction as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(2), the assessments under Provision D.4.b.(1)(b) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(ii) Based on the data collected pursuant to Provisions D.2.b, the assessments required under Provision D.4.b.(1)(c) must be included in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

(iii) Based on the data collected pursuant to Provisions D.2.b, the assessment required under Provision D.4.b.(1)(c) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.a.(2), each Copermittee must assess and report the following:

(i) Identify the known and suspected controllable sources (e.g. facilities, areas, land uses, pollutant generating activities) of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area;

(ii) Identify sources of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area that have been reduced or eliminated; and

(iii) Identify modifications to the field screening monitoring locations and frequencies for the MS4 outfalls in its inventory necessary to identify and eliminate sources of persistent flow non-storm water discharges pursuant to Provision D.2.b.

(c) Based on the dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1), each Copermittee must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(1)(b);

(ii) Based on the data collected and applicable NALs in the Water Quality Improvement Plan, rank the MS4 outfalls in the Copermittee's jurisdiction according to potential threat to receiving water quality, and produce a prioritized list of major MS4 outfalls for follow-up action to update the Water Quality Improvement Plan, with the goal of eliminating persistent flow non-storm water discharges and/or pollutant loads in order of the ranked priority list through targeted programmatic actions and source investigations;

(iii) For the highest priority major MS4 outfalls with persistent flows that are in exceedance of NALs, identify the known and suspected sources within the Copermittee's jurisdiction in the Watershed Management Area that may cause or contribute to the NAL exceedances;

(iv) Each Copermittee must analyze the data collected pursuant to Provision D.2.b, and utilize a model or other method, to calculate or estimate the non-storm water volumes and pollutant loads collectively discharged from all the major MS4s outfalls in its jurisdiction identified as having persistent dry weather flows during the monitoring year. These calculations or estimates must be updated annually.

[a] Each Copermittee must calculate or estimate the annual non-storm water volumes and pollutant loads collectively discharged from the Copermittee's major MS4 outfalls to receiving waters within the Copermittee's jurisdiction, with an estimate of the percent contribution from each known source for each MS4 outfall;

[b] Each Copermittee must annually identify and quantify (i.e. volume and pollutant loads) sources of non-storm water not subject to the Copermittee's legal authority that are discharged from the Copermittee's major MS4 outfalls to downstream receiving waters.

(v) Each Copermittee must review the data collected pursuant to Provision D.2.b and findings from the assessments required pursuant to Provision D.4.b.(1)(c)(i)-(iv) at least once during the term of this Order to:

[a] Identify reductions and progress in achieving reductions in non-storm water and illicit discharges to the Copermittee's MS4 in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction, with an estimate, if possible, of the non-storm water volume and/or pollutant load reductions

attributable to specific water quality strategies implemented by the Copermittee; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittee in the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction.

(vi) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(1)(c)(i)-(v).

(2) Storm Water Pollutant Discharges Reduction Assessments

(a) The Copermittees must assess and report the progress of the water quality improvement strategies, required to be implemented pursuant to Provisions B and E, toward reducing pollutants in storm water discharges from the MS4s within the Watershed Management Area as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(3), the assessments under Provision D.4.b.(2)(b) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(ii) Based on the data collected pursuant to Provisions D.2.c, the assessments required under Provision D.4.b.(2)(c) must be included in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

(iii) Based on the data collected pursuant to Provisions D.2.c, the assessment required under Provisions D.4.b.(2)(c)-(d) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.a.(3) the Copermittees must assess and report the following:

(i) The Copermittees must analyze the monitoring data collected pursuant to Provision D.2.a.(3), and utilize a watershed model or other method, to calculate or estimate the following for each monitoring year:

[a] The average storm water runoff coefficient for each land use type within the Watershed Management Area;

[b] The volume of storm water and pollutant loads discharged from each of the Copermittee's monitored MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch;

[c] The total flow volume and pollutant loadings discharged from the Copermittee's jurisdiction within the Watershed Management Area over the course of the wet season, extrapolated from the data produced from the monitored MS4 outfalls; and

[d] The percent contribution of storm water volumes and pollutant loads discharged from each land use type within each hydrologic subarea with a major MS4 outfall to receiving waters or within each major MS4 outfall to receiving waters in the Copermittee's jurisdiction within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch.

(ii) Identify modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify pollutants in storm water discharges from the MS4s in the Watershed Management Area pursuant to Provision D.2.c.(1).

(c) Based on the wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.c the Copermittees must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(2)(b);

(ii) Based on the data collected and applicable SALs in the Water Quality Improvement Plan, analyze and compare the monitoring data to the analyses and assumptions used to develop the Water Quality Improvement Plans, including strategies developed pursuant to Provision B.3, and evaluate whether those analyses and assumptions should be updated as a component of the adaptive management efforts pursuant to Provision B.5 for follow-up action to update the Water Quality Improvement Plan;

(iii) The Copermittees must review the data collected pursuant to Provision D.2.c and findings from the assessments required pursuant to Provisions D.4.b.(2)(c)(i)-(ii) at least once during the term of this Order to:

[a] Identify reductions or progress in achieving reductions in pollutant concentrations and/or pollutant loads from different land uses and/or drainage areas discharging from the Copermittees' MS4s in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters within the Watershed Management Area to the MEP, with an estimate, if possible, of the pollutant load reductions attributable to specific water quality strategies implemented by the Copermittees; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittees in the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters in the Watershed Management Area to the MEP.

(iv) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(iii).

(d) The Copermittees must evaluate all the data collected pursuant to Provision D.2.c, and incorporate new outfall monitoring data into time series plots for each long-term monitoring constituent for the Watershed Management Area, and perform statistical trends analysis on the cumulative long-term wet weather MS4 outfall discharge water quality data set.

c. Special Studies Assessments

The Copermittees must annually evaluate the results and findings from the special studies developed and implemented pursuant to Provision D.3, and assess their relevance to the Copermittees' efforts to characterize receiving water conditions, understand sources of pollutants and/or stressors, and control and reduce the discharges of pollutants from the MS4 outfalls to receiving waters in the Watershed Management Area. The Copermittees must report the results of the special studies assessments applicable to the Watershed Management Area, and identify any necessary modifications or updates to the Water Quality Improvement Plan based on the results in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

d. Integrated Assessment of Water Quality Improvement Plan

As part of the iterative approach and adaptive management process required for the Water Quality Improvement Plan pursuant to Provision B.5, the Copermittees in each Watershed Management Area must integrate the data collected pursuant to Provisions D.1-D.3, the findings from the assessments required pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to assess the effectiveness of, and identify necessary modifications to, the Water Quality Improvement Plan as follows:

(1) The Copermittees must re-evaluate the priority water quality conditions and numeric goals for the Watershed Management Area, as needed, during the term of this Order pursuant to Provision B.5.a. The re-evaluation and recommendations for modifications to the priority water quality conditions, and/or numeric goals and corresponding schedules may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to

Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The priority water quality conditions and numeric goals for the Watershed Management Area must be re-evaluated as follows:

(a) Re-evaluate the receiving water conditions in the Watershed Management Area in accordance with Provision B.2.a;

(b) Re-evaluate the impacts on receiving waters in the Watershed Management Area from MS4 discharges in accordance with Provision B.2.b;

(c) Re-evaluate the identification of MS4 sources of pollutants and/or stressors in accordance with Provision B.2.d;

(d) Identify beneficial uses of the receiving waters that are protected in accordance with Provision D.4.a;

(e) Evaluate the progress toward achieving the interim and final numeric goals for protecting impacted beneficial uses in the receiving waters.

(2) The Copermittees must re-evaluate the water quality improvement strategies for the Watershed Management Area during the term of this Order pursuant to Provision B.5.b. The re-evaluation and recommendations for modifications to the water quality improvement strategies and schedules may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The water quality improvement strategies for the Watershed Management Area must be re-evaluated as follows:

(a) Identify the non-storm water and storm water pollutant loads from the Copermittees' MS4 outfalls in the Watershed Management Area, calculated or estimated pursuant to Provisions D.4.b;

(b) Identify the non-storm water and storm water pollutant load reductions, or other improvements to receiving water or water quality conditions, that are necessary to attain the interim and final numeric goals identified in the Water Quality Improvement Plan for protecting beneficial uses in the receiving waters;

(c) Identify the non-storm water and storm water pollutant load reductions, or other improvements to the quality of MS4 discharges, that are necessary for the Copermittees to demonstrate that non-storm water and storm water discharges from their MS4s are not causing or contributing to exceedances of receiving water limitations;

(d) Evaluate the progress of the water quality improvement strategies toward

achieving the interim and final numeric goals identified in the Water Quality Improvement Plan for protecting beneficial uses in the receiving waters.

(3) The Copermittees must re-evaluate and adapt the water quality monitoring and assessment program for the Watershed Management Area when new information becomes available to improve the monitoring and assessment program pursuant to Provision B.5.c. The re-evaluation and recommendations for modifications to the monitoring and assessment program may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. Modifications to the water quality monitoring and assessment program must be consistent with the requirements of Provision D.1-D.3. The re-evaluation of the water quality monitoring and assessment program for the Watershed Management Area must consider the data gaps identified by the assessments required pursuant to Provisions D.4.a-b, and results of the special studies implemented pursuant to Provision D.4.c.

5. Monitoring Provisions

Each Copermittee must comply with all the monitoring, reporting, and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

E. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS

The purpose of this provision is for each Copermittee to implement a program to control the contribution of pollutants to and the discharges from the MS4 within its jurisdiction. The goal of the jurisdictional runoff management programs is to implement strategies that effectively prohibit non-storm water discharges to the MS4 and reduce the discharge of pollutants in storm water to the MEP. This goal will be accomplished through implementing the jurisdictional runoff management programs in accordance with the strategies identified in the Water Quality Improvement Plans.

Each Copermittee must update its jurisdictional runoff management program document, in accordance with Provision F.2.a, to incorporate all the requirements of Provision E. Until the Copermittee has updated its jurisdictional runoff management program document with the requirements of Provision E, the Copermittee must continue implementing its current jurisdictional runoff management program.

1. Legal Authority Establishment and Enforcement

a. Each Copermittee must establish, maintain, and enforce adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 through statute, ordinance, permit, contract, order, or similar means. This legal authority must, at a minimum, authorize the Copermittee to:

(1) Prohibit and eliminate all illicit discharges and illicit connections to its MS4;

(2) Control the contribution of pollutants in discharges of runoff associated with industrial and construction activity to its MS4 and control the quality of runoff from industrial and construction sites, including industrial and construction sites which have coverage under the statewide General Permit for Discharges of Storm Water Associated with Industrial Activities (Industrial General Permit) or General Permit for Discharges of Storm Water Associated with Construction Activities (Construction General Permit), as well as to those sites which do not;

(3) Control the discharge of spills, dumping, or disposal of materials other than storm water into its MS4;

(4) Control through interagency agreements among Copermittees the contribution of pollutants from one portion of the MS4 to another portion of the MS4;

(5) Control, by coordinating and cooperating with other owners of the MS4 such as Caltrans, the U.S. federal government, or sovereign Native American Tribes through interagency agreements, where possible, the contribution of pollutants from their portion of the MS4 to the portion of the MS4 within the Copermittee's jurisdiction;

(6) Require compliance with conditions in its statutes, ordinances, permits, contracts, orders, or similar means to hold dischargers to its MS4 accountable for their contributions of pollutants and flows;

(7) Require the use of BMPs to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(8) Require documentation on the effectiveness of BMPs implemented to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(9) Utilize enforcement mechanisms to require compliance with its statutes, ordinances, permits, contracts, orders, or similar means; and

(10) Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with its statutes, ordinances, permits, contracts, orders, or similar means and with the requirements of this Order, including the prohibition of illicit discharges and connections to its MS4; the Copermittee must also have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from industrial facilities, including construction sites, discharging into its MS4.

b. With the first Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3), each Copermittee must submit a statement certified by its Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative that the Copermittee has taken the necessary steps to obtain and maintain full legal authority within its jurisdiction to implement and enforce each of the requirements contained in this Order.

2. Illicit Discharge Detection and Elimination

Each Copermittee must implement a program to actively detect and eliminate illicit discharges and improper disposal into the MS4, or otherwise require the discharger to apply for and obtain a separate NPDES permit. The illicit discharge detection and elimination program must be implemented in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include, at a minimum, the following requirements:

a. Non-Storm Water Discharges

Each Copermittee must address all non-storm water discharges as illicit discharges unless a non-storm water discharge is either identified as a discharge authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to the following requirements:

(1) Discharges of non-storm water to the MS4 from the following categories must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG919001 (Order No. R9-2007-0034, or subsequent order) for discharges to San Diego Bay, or NPDES Permit No. CAG919002 (Order No. R9-2008-0002, or subsequent order) for discharges to surface waters other than San Diego Bay:

(1) Uncontaminated pumped ground water;

(2) Discharges from foundation drains;[20]

(3) Water from crawl space pumps; and

(4) Water from footing drains.[20]

(2) Discharges of non-storm water from water line flushing and water main breaks to the MS4 must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG 679001 (Order No. R9-2010-0003 or subsequent order). This category includes water line flushing and water main break discharges from water purveyors issued a water supply permit by the California Department of Public Health or federal military installations. Discharges from recycled or reclaimed water lines to the MS4 must be addressed as illicit discharges, unless the discharges have coverage under a separate NPDES permit.

(3) Discharges of non-storm water to the MS4 from the following categories must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a source of pollutants to receiving waters:

(a) Diverted stream flows;

(b) Rising ground waters;

(c) Uncontaminated ground water infiltration to MS4s;

(d) Springs;

(e) Flows from riparian habitats and wetlands;

(f) Discharges from potable water sources;

[20] Provision E.2.a.(1) only applies to this category of non-storm water if the system is designed to be located at or below the groundwater table to actively or passively extract groundwater during any part of the year.

(g) Discharges from foundation drains;[21] and

(h) Discharges from footing drains.[21]

(4) Discharges of non-storm water to the MS4 from the following categories must be controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means. Discharges of non-storm water to the MS4 from the following categories not controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means must be addressed by the Copermittee as illicit discharges.

(a) Air conditioning condensation

The discharge of air conditioning condensation should be directed to landscaped areas or other pervious surfaces, or to the sanitary sewer, where feasible.

(b) Individual residential vehicle washing

(i) The discharge of wash water should be directed to landscaped areas or other pervious surfaces where feasible; and

(ii) The minimization of water, washing detergent and other vehicle wash products used for residential vehicle washing, and the implementation of other practices or behaviors that will prevent the discharge of pollutants associated with individual residential vehicle washing from entering the MS4 must be encouraged.

(c) Dechlorinated swimming pool discharges

(i) Residual chlorine, algaecide, filter backwash, or other pollutants from swimming pools must be eliminated prior to discharging to the MS4; and

(ii) The discharge of saline swimming pool water must be directed to the sanitary sewer, landscaped areas, or other pervious surfaces that can accommodate the volume of water, unless the saline swimming pool water can be discharged via a pipe or concrete channel directly to a naturally saline water body (e.g. Pacific Ocean).

(5) Firefighting discharges to the MS4 must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a significant source of pollutants to receiving waters. Firefighting discharges to the MS4 not identified as a significant source of pollutants to receiving waters, must be addressed, at a minimum, as follows:

[21] Provision E.2.a.(3) only applies to this category of non-storm water discharge if the system is designed to be located above the groundwater table at all times of the year, and the system is only expected to discharge non-storm water under unusual circumstances.

(a) Non-emergency firefighting discharges

(i) Building fire suppression system maintenance discharges (e.g. sprinkler line flushing) to the MS4 must be addressed as illicit discharges unless BMPs are implemented to prevent pollutants associated with such discharges to the MS4.

(ii) Non-emergency firefighting discharges (i.e., discharges from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems) must be addressed by a program, to be developed and implemented by the Copermittee, to reduce or eliminate pollutants in such discharges from entering the MS4.

(b) Emergency firefighting discharges

Each Copermittee should develop and encourage implementation of BMPs to reduce or eliminate pollutants in emergency firefighting discharges to the MS4s and receiving waters within its jurisdiction. During emergency situations, priority of efforts should be directed toward life, property, and the environment (in descending order). BMPs should not interfere with immediate emergency response operations or impact public health and safety.

(6) If the Copermittee or San Diego Water Board identifies any category of non-storm water discharges listed under Provisions E.2.a.(1)-(4) as a source of pollutants to receiving waters, the category must be prohibited through ordinance, order, or similar means and addressed as an illicit discharge. Alternatively, the Copermittee may propose controls to be implemented for the category of non-storm water discharges as part of the Water Quality Improvement Plan instead of prohibiting the category of non-storm water discharges, and implement the controls if accepted by the San Diego Water Board as part of the Water Quality Improvement Plan.

(7) Each Copermittee must, where feasible and priorities and resources allow, reduce or eliminate non-storm water discharges listed under Provisions E.2.a.(1)-(4) into its MS4, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit.

b. PREVENT AND DETECT ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to prevent and detect illicit discharges to the MS4:

(1) Each Copermittee must maintain an updated map of its entire MS4 and the corresponding drainage areas. The accuracy of the MS4 map must be confirmed during the field screening required pursuant to Provision E.2.c.

The MS4 map must be included as part of the jurisdictional runoff management program document. Any geographic information system (GIS) layers or files used by the Copermittee to maintain the MS4 map must be made available to the San Diego Water Board upon request. The MS4 map must identify the following:

(a) All segments of the MS4 owned, operated, and maintained by the Copermittee;

(b) All known locations of inlets that discharge and/or collect runoff into the Copermittee's MS4;

(c) All known locations of connections with other MS4s not owned or operated by the Copermittee (e.g. Caltrans MS4s);

(d) All known locations of MS4 outfalls and private outfalls that discharge runoff collected from areas within the Copermittee's jurisdiction;

(e) All segments of receiving waters within the Copermittee's jurisdiction that receive and convey runoff discharged from the Copermittee's MS4 outfalls;

(f) Locations of the MS4 outfalls, identified pursuant to Provision D.2.a.(1), within its jurisdiction; and

(g) Locations of the non-storm water persistent flow MS4 outfall discharge monitoring stations, identified pursuant to Provision D.2.b.(2), within its jurisdiction.

(2) Each Copermittee must use Copermittee personnel and contractors to assist in identifying and reporting illicit discharges and connections during their daily employment activities.

(3) Each Copermittee must promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges to or from the MS4, including the following methods for public reporting:

(a) Operate a public hotline, which can be Copermittee-specific or shared by the Copermittees, and must be capable of receiving reports in both English and Spanish 24 hours per day and seven days per week; and

(b) Designate an e-mail address for receiving electronic reports from the public, which can be Copermittee-specific or shared by the Copermittees, and must be prominently displayed on the Copermittee's webpage and the Regional Clearinghouse required pursuant to Provision F.4.

(4) Each Copermittee must implement practices and procedures (including a notification mechanism) to prevent, respond to, contain, and clean up any spills that may discharge into the MS4 within its jurisdiction from any source. The Copermittee must coordinate, to the extent possible, with spill response teams to prevent entry of spills into the MS4, and prevent contamination of surface water, ground water, and soil. The Copermittee must coordinate spill prevention, containment, and response activities throughout all appropriate Copermittee departments, programs, and agencies.

(5) Each Copermittee must implement practices and procedures to prevent and limit infiltration of seepage from sanitary sewers (including private laterals and failing septic systems) to the MS4.

(6) Each Copermittee must coordinate, when necessary, with upstream Copermittees and/or entities to prevent illicit discharges from upstream sources into the MS4 within its jurisdiction.

c. FIELD SCREENING

Each Copermittee must conduct field screening (i.e. visual observations, field testing, and/or analytical testing) of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4 in accordance with the dry weather MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

d. INVESTIGATE AND ELIMINATE ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to investigate and eliminate illicit discharges to the MS4:

(1) Each Copermittee must prioritize and determine when follow-up investigations will be performed in response to visual observations and/or water quality monitoring data collected during an investigation of a detected non-storm water or illicit discharge to or from the MS4. The criteria for prioritizing investigations must consider the following:

(a) Pollutants identified as causing or contributing to the highest water quality priorities identified in the Water Quality Improvement Plan;

(b) Pollutants identified as causing or contributing, or threatening to cause or contribute to impairments in water bodies on the 303(d) List and/or in environmentally sensitive areas (ESAs), located within its jurisdiction;

(c) Pollutants identified from sources or land uses known to exist within the area, drainage basin, or watershed that discharges to the portion of the MS4 within its jurisdiction included in the investigation;

(d) Pollutants identified as causing or contributing to an exceedance of a NAL in the Water Quality Improvement Plan; and

(e) Pollutants identified as a threat to human health or the environment.

(2) Each Copermittee must implement procedures to investigate and inspect portions of its MS4 that, based on reports or notifications, field screening, or other appropriate information, indicate a reasonable potential of receiving, containing, or discharging pollutants due to illicit discharges, illicit connections, or other sources of non-storm water. The procedures must include the following:

(a) Each Copermittee must develop criteria to:

(i) Assess the validity of each report or notification received; and

(ii) Prioritize the response to each report or notification received.

(b) Each Copermittee must prioritize and respond to each valid report or notification (e.g., public reports, staff or contractor reports and notifications, etc.) of an incident in a timely manner.

(c) In accordance with the requirements of Provision E.2.d.(1), each Copermittee must investigate and seek to identify the source(s) of discharges of non-storm water where flows are observed in and from the MS4 during the field screening required pursuant to Provision D.2.b.(1) as follows:

(i) Obvious illicit discharges must be immediately investigated to identify the source(s) of non-storm water discharges;

(ii) The investigation must include field investigations to identify sources or potential sources for the discharge, unless the source or potential source has already been identified during previous investigations; and

(iii) The investigation may include follow-up field investigations and/or reviewing Copermittee inventories and other land use data to identify potential sources of the discharge.

(d) Each Copermittee must maintain records and a database of the following information:

(i) Location of incident, including hydrologic subarea, portion of MS4 receiving the non-storm water or illicit discharge, and point of discharge or potential discharge from MS4 to receiving water;

(ii) Source of information initiating the investigation (e.g., public reports, staff or contractor reports and notifications, field screening, etc.);

(iii) Date the information used to initiate the investigation was received;

(iv) Date the investigation was initiated;

(v) Dates of follow-up investigations;

(vi) Identified or suspected source of the illicit discharge or connection, if determined;

(vii) Known or suspected related incidents, if any;

(viii) Result of the investigation; and

(ix) If a source cannot be identified and the investigation is not continued, document the response pursuant to the requirements of Provision E.2.d.(4).

(e) Each Copermittee must maintain records and, in accordance with the priorities of the Water Quality Improvement Plan, seek to identify the source(s) of non-storm water discharges from the MS4 where there is evidence of non-storm water having been discharged into or from the MS4 (e.g., pooled water), in accordance with MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

(3) Each Copermittee must initiate the implementation of procedures, in a timely manner, to eliminate all detected and identified illicit discharges and connections within its jurisdiction. The procedures must include the following responses:

(a) Each Copermittee must enforce its legal authority, as required under Provision E.1, to eliminate illicit discharges and connections to the MS4.

(b) If the Copermittee identifies the source as a controllable source of non-storm water or illicit discharge or connection, the Copermittee must implement its Enforcement Response Plan pursuant to Provision E.6 and enforce its legal authority to prohibit and eliminate illicit discharges and connections to its MS4.

(c) If the Copermittee identifies the source of the discharge as a category of non-storm water discharges in Provision E.2.a, and the discharge is in exceedance of NALs in the Water Quality Improvement Plan, then the Copermittee must determine if: (1) this is an isolated incident or set of circumstances that will be addressed through its Enforcement Response Plan pursuant to Provision E.6, or (2) the category of discharge must be addressed through the prohibition of that category of discharge as an illicit discharge pursuant to Provision E.2.a.(6).

(d) If the Copermittee suspects the source of the non-storm water discharge as natural in origin (i.e. non-anthropogenically influenced) and in conveyance into the MS4, then the Copermittee must document and

provide the data and evidence necessary to demonstrate to the San Diego Water Board that it is natural in origin and does not require further investigation.

(e) If the Copermittee is unable to identify and document the source of a recurring non-storm water discharge to or from the MS4, then the Copermittee must address the discharge as an illicit discharge and update its jurisdictional runoff management program to address the common and suspected sources of the non-storm water discharge within its jurisdiction in accordance with the Copermittee's priorities.

(4) Each Copermittee must submit a summary of the non-storm water discharges and illicit discharges and connections investigated and eliminated within its jurisdiction with each Water Quality Improvement Plan Annual Report required under Provision F.3.b.(3) of this Order.

3. Development Planning

Each Copermittee must use their land use and planning authorities to implement a development planning program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. BMP Requirements for All Development Projects

Each Copermittee must prescribe the following BMP requirements during the planning process (i.e. prior to project approval and issuance of local permits) for all development projects (regardless of project type or size), where local permits are issued, including unpaved roads and flood management projects:

(1) General Requirements

(a) Onsite BMPs must be located so as to remove pollutants from runoff prior to its discharge to any receiving waters, and as close to the source as possible;

(b) Structural BMPs must not be constructed within waters of the U.S.

(c) Onsite BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors (e.g. mosquitos, rodents, or flies).

(2) Source Control BMP Requirements

The following source control BMPs must be implemented at all development projects where applicable and feasible:

(a) Prevention of illicit discharges into the MS4;

(b) Storm drain system stenciling or signage;

(c) Protect outdoor material storage areas from rainfall, run-on, runoff, and wind dispersal;

(d) Protect materials stored in outdoor work areas from rainfall, run-on, runoff, and wind dispersal;

(e) Protect trash storage areas from rainfall, run-on, runoff, and wind dispersal; and

(f) Any additional BMPs determined to be necessary by the Copermittee to minimize pollutant generation at each project.

(3) Low Impact Development (LID) BMP Requirements

The following LID BMPs must be implemented at all development projects where applicable and feasible:

(a) Maintenance or restoration of natural storage reservoirs and drainage corridors (including topographic depressions, areas of permeable soils, natural swales, and ephemeral and intermittent streams);[22]

(b) Buffer zones for natural water bodies (where buffer zones are technically infeasible, require project applicant to include other buffers such as trees, access restrictions, etc.);

(c) Conservation of natural areas within the project footprint including existing trees, other vegetation, and soils;

(d) Construction of streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided public safety is not compromised;

(e) Minimization of the impervious footprint of the project;

(f) Minimization of soil compaction to landscaped areas;

(g) Disconnection of impervious surfaces through distributed pervious areas;

[22] Development projects proposing to dredge or fill materials in waters of the U.S. must obtain a CWA Section 401 Water Quality Certification. Projects proposing to dredge or fill waters of the state must obtain waste discharge requirements.

(h) Landscaped or other pervious areas designed and constructed to effectively receive and infiltrate, retain and/or treat runoff from impervious areas, prior to discharging to the MS4;

(i) Small collection strategies located at, or as close as possible to, the source (i.e. the point where storm water initially meets the ground) to minimize the transport of runoff and pollutants to the MS4 and receiving waters;

(j) Use of permeable materials for projects with low traffic areas and appropriate soil conditions;

(k) Landscaping with native or drought tolerant species; and

(l) Harvesting and using precipitation.

b. PRIORITY DEVELOPMENT PROJECTS

Priority Development Projects are land development projects that fall under the planning and building authority of the Copermittee for which the Copermittee must impose specific requirements, in addition to those described in Provision E.3.a, including the implementation of structural BMPs to meet the performance requirements described in Provision E.3.c.

(1) Definition of Priority Development Project

Priority Development Projects include the following:

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(b) Redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site on an existing site of 10,000 square feet or more of impervious surfaces). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(c) New and redevelopment projects that create 5,000 square feet or more of impervious surface (collectively over the entire project site), and support one or more of the following uses:

(i) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812).

(ii) Hillside development projects. This category includes development on any natural slope that is twenty-five percent or greater.

(iii) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce.

(iv) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

(d) New or redevelopment projects that create or replace 2,500 square feet or more of impervious surface (collectively over the entire project site), and discharging directly to an Environmentally Sensitive Area (ESA). "Discharging directly to" includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands).

(e) New development projects that support one or more of the following uses:

(i) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

(ii) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

(f) New or redevelopment projects that result in the disturbance of one or more acres of land and are expected to generate pollutants post construction.

(2) <u>Special Considerations for Redevelopment Projects</u>

The structural BMP performance requirements of Provision E.3.c are applicable to redevelopment Priority Development Projects, as defined in E.3.b.(1), as follows:

(a) Where redevelopment results in the creation or replacement of impervious surface in an amount of less than fifty percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provision E.3.c apply only to the creation or replacement of impervious surface, and not the entire development; or

(b) Where redevelopment results in the creation or replacement of impervious surface in an amount of more than fifty percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provision E.3.c apply to the entire development.

(3) Priority Development Project Exemptions

Each Copermittee has the discretion to exempt the following projects from being defined as Priority Development Projects:

(a) New or retrofit paved sidewalks, bicycle lanes, or trails that meet the following criteria:

(i) Designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas; OR

(ii) Designed and constructed to be hydraulically disconnected from paved streets or roads; OR

(iii) Designed and constructed with permeable pavements or surfaces in accordance with USEPA Green Streets guidance.[23]

(b) Retrofitting or redevelopment of existing paved alleys, streets or roads that are designed and constructed in accordance with the USEPA Green Streets guidance.[24]

c. Priority Development Project Structural BMP Performance Requirements

In addition to the BMP requirements listed for all development projects under Provision E.3.a, Priority Development Projects must also implement structural BMPs that conform to performance requirements described below.

(1) Storm Water Pollutant Control BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite structural BMPs to control pollutants in storm water that may be discharged from a project as follows:

(a) Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite the pollutants contained in the volume of storm water runoff produced from a 24-hour 85th percentile storm event (design capture volume);[25]

[23] See "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).
[24] Ibid.
[25] This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are

(i) If a Copermittee determines that implementing BMPs to retain the full design capture volume onsite for a Priority Development Project is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize biofiltration BMPs. Biofiltration BMPs must be designed to have an appropriate hydraulic loading rate to maximize storm water retention and pollutant removal, as well as to prevent erosion, scour, and channeling within the BMP,[26] and must be sized to:

[a] Treat 1.5 times the design capture volume not reliably retained onsite, OR

[b] Treat the design capture volume not reliably retained onsite with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite.

(ii) If a Copermittee determines that biofiltration is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize flow-thru treatment control BMPs to treat runoff leaving the site, AND mitigate for the design capture volume not reliably retained onsite pursuant to Provision E.3.c.(1)(b). Flow thru treatment control BMPs must be sized and designed to:

[a] Remove pollutants from storm water to the MEP;

[b] Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;

[c] Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Flow-thru treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of flow-thru treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

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encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals.

[26] As part of the Copermittee's update to its BMP Design Manual, pursuant to Provision E.3.d, the Copermittee must provide guidance for hydraulic loading rates and other biofiltration design criteria necessary to maximize storm water retention and pollutant removal.

(b) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1)(a). The Priority Development Project must mitigate for the portion of the pollutant load in the design capture volume not retained onsite if Provision E.3.c.(3) is utilized. If a Priority Development Project is allowed to utilize alternative compliance, flow-thru treatment control BMPs must be implemented to treat the portion of the design capture volume that is not reliably retained onsite. Flow-thru treatment control BMPs must be sized and designed in accordance with Provisions E.3.c.(1)(a)(ii)[a]-[c].

(2) Hydromodification Management BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite BMPs to manage hydromodification that may be caused by storm water runoff discharged from a project as follows:

(a) Post-project runoff conditions (flow rates and durations) must not exceed pre-development runoff conditions by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat downstream of Priority Development Projects).

(i) In evaluating the range of flows that results in increased potential for erosion of natural (non-hardened) channels, the lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks.

(ii) The Copermittees may use monitoring results collected pursuant to Provision D.1.a.(2) to re-define the range of flows resulting in increased potential for erosion, or degraded instream habitat conditions, as warranted by the data.

(b) Each Priority Development Project must avoid critical sediment yield areas known to the Copermittee or identified by the optional Watershed Management Area Analysis pursuant to Provision B.3.b.(4), or implement measures that allow critical coarse sediment to be discharged to receiving waters, such that there is no net impact to the receiving water.

(c) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the performance requirements of Provision E.3.c.(2)(a). The Priority Development Project must mitigate for the post-project runoff conditions not fully managed onsite if Provision E.3.c.(3) is utilized.

(d) Exemptions

Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provisions E.3.c.(2) where the project discharges storm water runoff to:

(i) Existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;

(ii) Conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; or

(iii) An area identified by the Copermittees as appropriate for an exemption by the optional Watershed Management Area Analysis incorporated into the Water Quality Improvement Plan pursuant to Provision B.3.b.(4).

(e) Interim Timeframe Exemptions

Until the Copermittees have updated their BMP Design Manual in accordance with Provision F.2.b with the requirements of Provision E, the Copermittees have the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provision E.3.c.(2) where the project discharges storm water runoff directly to:

(i) An engineered channel conveyance system with a capacity to convey peak flows generated by the 10-year storm event all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; and

(ii) Large river reaches with a drainage area larger than 100 square miles and a 100-year flow capacity in excess of 20,000 cubic feet per second, provided that properly sized energy dissipation is included at all Priority Development Project discharge points.

(3) Alternative Compliance Program to Onsite Structural BMP Implementation

At the discretion of each Copermittee, Priority Development Projects may be allowed to participate in an alternative compliance program in lieu of implementing the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a), provided that the Water Quality Improvement Plan includes the optional Watershed Management Area Analysis described in Provision B.3.b.(4)~~.~~, and Water Quality Equivalency

calculations have been accepted by the San Diego Water Board's Executive Officer pursuant to Provision E.3.c.(3)(a). The alternative compliance program is available to a Priority Development Project only if the Priority Development Project applicant enters into a voluntary agreement with the Copermittee authorizing this arrangement. In addition to the voluntary agreement, relief from implementing structural BMPs onsite may be authorized by the Copermittee under the following conditions:

(a) Water Quality Equivalency

Copermittees must submit Water Quality Equivalency calculations for acceptance by the San Diego Water Board's Executive Officer prior to administering an alternative compliance program in order to establish a regional and technical basis for determining the water quality benefits associated with alternative compliance projects. Accepted Water Quality Equivalency calculations must be incorporated as part of any Copermittee's alternative compliance program necessary for evaluating Watershed Management Area Analysis candidate projects, project applicant-proposed alternative compliance projects, alternative compliance in lieu fee structures, and alternative compliance water quality credit systems as described in Provisions E.3.c.(3)(b)-(e).

~~(a)~~(b) Watershed Management Area Analysis Candidate Projects

The Priority Development Project applicant agrees to fund, contribute funds to, or implement a candidate project identified by the Copermittees in the Watershed Management Area Analysis included in the Water Quality Improvement Plan, pursuant to Provisions B.3.b.(4) subject to the following conditions:

(i) The Copermittee must determine that implementation of the candidate project will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a) onsite;

(ii) If the Priority Development Project applicant chooses to fully or partially fund a candidate project, then the in-lieu fee structure described in Provision E.3.c.(3)(c) must be followed;

(iii) If the Priority Development Project applicant chooses to fully or partially fund a candidate project, then the Copermittee must ensure that the funds to be obtained from the Priority Development Project applicant are sufficient to mitigate for impacts caused by not fully implementing structural BMPs onsite, pursuant to the performance requirements described in Provisions E.3.c.(1) and E.3.c.(2)(a);

(iv) If the Priority Development Project applicant chooses to implement a candidate project, then the Copermittee must ensure that pollutant

control and/or hydromodification management within the candidate project are sufficient to mitigate for impacts caused by not implementing structural BMPs fully onsite, pursuant to the performance requirements described in Provisions E.3.c.(1) and E.3.c.(2)(a);

(v) The voluntary agreement to fund, partially fund, or implement a candidate project must include reliable sources of funding for operation and maintenance of the candidate project;

(vi) Design of the candidate project must be conducted under an appropriately qualified engineer, geologist, architect, landscape architect, or other professional, licenses where applicable, and competent and proficient in the fields pertinent to the candidate project design;

(vii) The candidate project must be constructed as soon as possible, but no later than 4 years after the certificate of occupancy is granted for the first Priority Development Project that contributed funds toward the construction of the candidate project, unless a longer period of time is authorized by the San Diego Water Board Executive Officer; and

(viii) If the candidate project is constructed after the Priority Development Project is constructed, the Copermittee must require temporal mitigation for pollutant loads and altered flows that are discharged from the Priority Development Project.

~~(b)~~(c) Project Applicant Proposed Alternative Compliance Projects

The Copermittee may allow a Priority Development Project applicant to propose and fund, contribute funds to, or implement an alternative compliance project not identified by the Watershed Management Area Analysis included in the Water Quality Improvement Plan pursuant to Provisions B.3.b.(4). This option is allowed provided the Copermittee determines that implementation of the alternative compliance project will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a) onsite, and is subject to the requirements described in Provisions E.3.c.(3)(a)(ii)-(viii).

~~(c)~~(d) Alternative Compliance In-Lieu Fee Structure

If a Copermittee chooses to allow a Priority Development Project applicant to fund, or partially fund a candidate project or an alternative compliance project, then the Copermittee must develop and implement an in-lieu fee structure. This may be developed individually or with other Copermittees and/or entities, as a means for designing, developing, constructing, operating and maintaining offsite alternative compliance projects. The in-

lieu fee must be transferred to the Copermittee (for public projects) or an escrow account (for private projects) prior to the construction of the Priority Development Project.

~~(d)~~(e) Alternative Compliance Water Quality Credit System Option

The Copermittee may develop and implement an alternative compliance water quality credit system option, individually or with other Copermittees and/or entities, provided that such a credit system clearly exhibits that it will not allow discharges from Priority Development Projects to cause or contribute to a net impact over and above the impact caused by projects meeting the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a). Any credit system that a Copermittee chooses to implement must be submitted to the San Diego Water Board Executive Officer for review and acceptance as part of the Water Quality Improvement Plan.

(4) Long-Term Structural BMP Maintenance

Each Copermittee must require the project applicant to submit proof of the mechanism under which ongoing long-term maintenance of all structural BMPs will be conducted.

(5) Infiltration and Groundwater Protection

(a) Structural BMPs designed to primarily function as large, centralized infiltration devices (such as large infiltration trenches and infiltration basins) must not cause or contribute to an exceedance of an applicable groundwater quality objective. At a minimum, such infiltration BMPs must be in conformance with the design criteria listed below, unless the development project applicant demonstrates to the Copermittee that one or more of the specific design criteria listed below are not necessary to protect groundwater quality. The design criteria listed below do not apply to small infiltration systems dispersed throughout a development project.

(i) Runoff must undergo pretreatment such as sedimentation or filtration prior to infiltration;

(ii) Pollution prevention and source control BMPs must be implemented at a level appropriate to protect groundwater quality at sites where infiltration BMPs are to be used;

(iii) Infiltration BMPs must be adequately maintained to remove pollutants in storm water to the MEP;

(iv) The vertical distance from the base of any infiltration BMP to the seasonal high groundwater mark must be at least 10 feet. Where groundwater basins do not support beneficial uses, this vertical

distance criteria may be reduced, provided groundwater quality is maintained;

(v) The soil through which infiltration is to occur must have physical and chemical characteristics (e.g., appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses;

(vi) Infiltration BMPs must not be used for areas of industrial or light industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee, unless source control BMPs to prevent exposure of high threat activities are implemented, or runoff from such activities is first treated or filtered to remove pollutants prior to infiltration; and

(vii) Infiltration BMPs must be located a minimum of 100 feet horizontally from any water supply wells.

(b) The Copermittee may develop, individually or with other Copermittees, alternative mandatory design criteria to that listed above for infiltration BMPs which are designed to primarily function as centralized infiltration devices. Before implementing the alternative design criteria in the development planning process the Copermitee(s) must:

(i) Notify the San Diego Water Board of the intent to implement the alternative design criteria submitted; and

(ii) Comply with any conditions set by the San Diego Water Board.

d. BMP DESIGN MANUAL UPDATE

Each Copermittee must update its BMP Design Manual[27] pursuant to Provision F.2.b. Until the Copermittee has updated its BMP Design Manual with the requirements of Provisions E.3.a-c, the Copermittee must continue implementing its current BMP Design Manual. Unless directed otherwise by the San Diego Water Board, the Copermittee must implement the BMP Design Manual within 180 days of completing the update. The update of the BMP Design Manual must include the following:

(1) Updated procedures to determine the nature and extent of storm water requirements applicable to a potential development or redevelopment projects. These procedures must inform project applicants of the storm water management requirements applicable to their project including, but not limited to, general requirements for all development projects, structural BMP design procedures and requirements, hydromodification management requirements,

[27] The BMP Design Manual was formerly known as the Standard Storm Water Mitigation Plan under Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016.

requirements specific to phased projects, and procedures specific to private developments and public improvement projects;

(2) Updated procedures to identify pollutants and conditions of concern for selecting the most appropriate structural BMPs that consider, at a minimum, the following:

(a) Receiving water quality (including pollutants for which receiving waters are listed as impaired under the CWA section 303(d) List);

(b) Pollutants, stressors, and/or receiving water conditions that cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(c) Land use type of the project and pollutants associated with that land use type; and

(d) Pollutants expected to be present onsite.

(3) Updated procedures for designing structural BMPs, including any updated performance requirements to be consistent with the requirements of Provision E.3.c for all structural BMPs listed in the BMP Design Manual;

(4) Long-term maintenance criteria for each structural BMP listed in the BMP Design Manual; and

(5) Alternative compliance criteria, in accordance with the requirements under Provision E.3.c.(3), if the Copermittee elects to allow Priority Development Projects within its jurisdiction to utilize alternative compliance.

e. PRIORITY DEVELOPMENT PROJECT BMP IMPLEMENTATION AND OVERSIGHT

Each Copermittee must implement a program that requires and confirms structural BMPs on all Priority Development Projects are designed, constructed, and maintained to remove pollutants in storm water to the MEP.

(1) Structural BMP Approval and Verification Process

(a) Each Copermittee must require and confirm that for all Priority Development Project applications that have not received prior lawful approval by the Copermittee by the ~~time~~ effective date of the BMP Design Manual ~~is updated~~ pursuant to Provision E.3.d, the requirements of Provision E.3 ~~are~~ must be implemented. For project applications that have received prior lawful approval before the effective date of the BMP Design Manual ~~is updated~~ pursuant to Provision E.3.d, the Copermittee may allow previous land development requirements to apply.

(b) Each Copermittee must identify the roles and responsibilities of its various municipal departments in implementing the structural BMP requirements, including each stage of a project from application review and approval through BMP maintenance and inspections.

(c) Each Copermittee must require and confirm that appropriate easements and ownerships are properly recorded in public records and the information is conveyed to all appropriate parties when there is a change in project or site ownership.

(d) Each Copermittee must require and confirm that prior to occupancy and/or intended use of any portion of the Priority Development Project, each structural BMP is inspected to verify that it has been constructed and is operating in compliance with all of its specifications, plans, permits, ordinances, and the requirements of this Order.

(2) Priority Development Project Inventory and Prioritization

(a) Each Copermittee must develop, maintain, and update at least annually, a watershed-based database to track and inventory all Priority Development Projects and associated structural BMPs within its jurisdiction. Inventories must be accurate and complete beginning from December 2002 for the San Diego County Copermittees, February 2003 for the Orange County Copermittees, and July 2005 for the Riverside County Copermittees. The use of an automated database system, such as GIS, is highly recommended. The database must include, at a minimum, the following information:

(i) Priority Development Project location (address and hydrologic subarea);

(ii) Descriptions of structural BMP type(s);

(iii) Date(s) of construction;

(iv) Party responsible for structural BMP maintenance;

(v) Dates and findings of structural BMP maintenance verifications; and

(vi) Corrective actions and/or resolutions, when applicable.

(b) Each Copermittee must prioritize the Priority Development Projects with structural BMPs within its jurisdiction. The designation of Priority Development Projects as high priority must consider the following:

(i) The highest water quality priorities identified in the Water Quality Improvement Plan;

(ii) Receiving water quality;

(iii) Number and sizes of structural BMPs;

(iv) Recommended maintenance frequency of structural BMPs;

(v) Likelihood of operation and maintenance issues of structural BMPs;

(vi) Land use and expected pollutants generated; and

(vii) Compliance record.

(3) Structural BMP Maintenance Verifications and Inspections

Each Copermittee is required to verify that structural BMPs on each Priority Development Project are adequately maintained, and continue to operate effectively to remove pollutants in storm water to the MEP through inspections, self-certifications, surveys, or other equally effective approaches.

(a) All (100 percent) of the structural BMPs at Priority Development Projects that are designated as high priority must be inspected directly by the Copermittee annually prior to each rainy season;

(b) For verifications performed through a means other than direct Copermittee inspection, adequate documentation must be required by the Copermittee to provide assurance that the required maintenance of structural BMPs at each Priority Development Project has been completed; and

(c) Appropriate follow-up measures (including re-inspections, enforcement, etc.) must be conducted to ensure that structural BMPs at each Priority Development Project continue to reduce pollutants in storm water to the MEP as originally designed.

f. Development Project Enforcement

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all development projects, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

4. Construction Management

Each Copermittee must implement a construction management program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. Project Approval Process

Prior to issuance of any local permit(s) that allows the commencement of construction projects that involve ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff, each Copermittee must:

(1) Require a pollution control plan, construction BMP plan, and/or an erosion and sediment control plan, to be submitted by the project applicant to the Copermittee;

(2) Confirm the pollution control plan, construction BMP plan, and/or erosion and sediment control plan, complies with the local grading ordinance, other applicable local ordinances, and the requirements of this Order;

(3) Confirm the pollution control, construction BMP, and/or erosion and sediment control plan, includes seasonally appropriate and effective BMPs and management measures described in Provision E.4.c, as applicable to the project; and

(4) Verify that the project applicant has obtained coverage under the statewide Construction General Permit (Order ~~2012-0006~~2009-0009-DWQ or subsequent Order), if applicable.

b. CONSTRUCTION SITE INVENTORY AND TRACKING

(1) Each Copermittee must maintain and update, at least quarterly, a watershed-based inventory of all construction projects issued a local permit that allows ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff. The use of an automated database system, such as GIS, is highly recommended. The inventory must include:

(a) Relevant contact information for each site (e.g., name, address, phone, and email for the owner and contractor);

(b) The basic site information including location (address and hydrologic subarea), Waste Discharge Identification (WDID) number (if applicable), size of the site, and approximate area of disturbance;

(c) Whether or not the site is considered a high threat to water quality, as defined in Provision E.4.b.(2) below;

(d) The project start and completion dates;

(e) The required inspection frequency, as defined in the Copermittee's jurisdictional runoff management program document;

(f) The date the Copermittee accepted or approved the pollution control plan, construction BMP plan, and/or erosion and sediment control plan; and

(g) Whether or not there are ongoing enforcement actions administered to the site.

(2) Each Copermittee must identify all construction sites within its jurisdiction that represent a high threat to downstream surface water quality. The designation of construction sites as high threat to water quality must consider the following:

(a) Sites located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Sites located within the same hydrologic subarea and tributary to a water body segment listed as impaired for sediment on the CWA section 303(d) List;

(c) Sites located within, directly adjacent to, or discharging directly to a receiving water within an ESA; and

(d) Other sites determined by the Copermittees or the San Diego Water Board as a high threat to water quality.

c. Construction Site BMP Implementation

Each Copermittee must implement, or require the implementation of effective BMPs to reduce discharges of pollutants in storm water from construction sites to the MEP, and effectively prohibit non-storm water discharges from construction sites into the MS4. These BMPs must be site specific, seasonally appropriate, and construction phase appropriate. BMPs must be implemented at each construction site year round. Dry season BMP implementation must plan for and address unseasonal rain events that may occur during the dry season (May 1 through September 30). Copermittees must implement, or require the implementation of, BMPs in the following categories:

(1) Project Planning;

(2) Good Site Management “Housekeeping”, including waste management;

(3) Non-storm Water Management;

(4) Erosion Control;

(5) Sediment Control;

(6) Run-on and Run-off Control; and

(7) Active/Passive Sediment Treatment Systems, where applicable.

d. CONSTRUCTION SITE INSPECTIONS

Each Copermittee must conduct construction site inspections to require and confirm compliance with its local permits and applicable local ordinances, and the requirements of this Order. Priority for site inspections must consider threat to water quality pursuant to Provision E.4.b as well as the nature of the construction activity, topography, and the characteristics of soils and receiving water quality.

(1) Inspection Frequency

(a) Each Copermittee must conduct inspections at all inventoried sites, including high threat to water quality sites, at an appropriate frequency for each phase of construction to confirm the site reduces the discharge of pollutants in storm water from construction sites to the MEP, and effectively prohibits non-storm water discharges from entering the MS4.

(b) Each Copermittee must establish appropriate inspection frequencies for high threat to water quality sites, and all other sites, for each phase of construction. Inspection frequencies appropriate for addressing the highest water quality priorities identified in the Water Quality Improvement Plan, and for complying with the requirements of this Order must be identified in each Copermittee's jurisdictional runoff management program document.

(c) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e., re-inspection, enforcement) necessary to require and confirm site compliance with its local permits and applicable local ordinances, and the requirements of this Order.

(2) Inspection Content

Inspections of construction sites by the Copermittee must include, at a minimum:

(a) Verification of coverage under the Construction General Permit (Notice of Intent (NOI) and/or WDID number) during initial inspections, when applicable;

(b) Assessment of compliance with its local permits and applicable local ordinances related to pollution prevention, including the implementation and maintenance of applicable BMPs;

(c) Assessment of BMP adequacy and effectiveness;

(d) Visual observations of actual non-storm water discharges;

(e) Visual observations of actual or potential discharge of sediment and/or

construction related materials from the site;

(f) Visual observations of actual or potential illicit connections; and

(g) If any violations are found and BMP corrections are needed, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried construction sites. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Site name, location (address and hydrologic subarea), and WDID number (if applicable);

(b) Inspection date;

(c) Approximate amount of rainfall since last inspection;

(d) Description of problems observed with BMPs and indication of need for BMP addition/repair/replacement and any scheduled re-inspection, and date of re-inspection;

(e) Descriptions of any other specific inspection comments which must, at a minimum, include rationales for longer compliance time;

(f) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(g) Resolution of problems noted and date problems fixed.

e. CONSTRUCTION SITE ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried construction sites, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

5. Existing Development Management

Each Copermittee must implement an existing development management program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following

requirements:

a. EXISTING DEVELOPMENT INVENTORY AND TRACKING

Each Copermittee must maintain, and update at least annually, a watershed-based inventory of the existing development within its jurisdiction that may discharge a pollutant load to and from the MS4. The use of an automated database system, such as GIS, is highly recommended. The inventory must, at a minimum, include:

(1) Name, location (hydrological subarea and address, if applicable) of the following types of existing development with its jurisdiction:

(a) Commercial facilities or areas;

(b) Industrial facilities;

(c) Municipal facilities, including:

(i) MS4 and related structures;[28]
(ii) Roads, streets, and highways;
(iii) Parking facilities;
(iv) Municipal airfields;
(v) Parks and recreation facilities;
(vi) Flood management facilities, flood control devices and structures;
(vii) Operating or closed municipal landfills;
(viii) Publicly owned treatment works (including water and wastewater treatment plants) and sanitary sewer collection systems;
(ix) Corporate yards, including maintenance and storage yards for materials, waste, equipment, and vehicles;
(x) Hazardous waste collection facilities;
(xi) Other treatment, storage or disposal facilities for municipal waste; and
(xii) Other municipal facilities that the Copermittee determines may contribute a significant pollutant load to the MS4.

(d) Residential areas, which may be designated by one or more of the following:

(i) Residential management area;
(ii) Drainage basin or area;

[28] The inventory may refer to the MS4 map required to be maintained pursuant to Provision E.2.b.(1).

(iii) Land use (e.g., single family, multi-family, rural);

(iv) Neighborhood;

(v) Common Interest Area;

(vi) Home Owner Association;

(vii) Mobile home park; and/or

(viii) Other designations accepted by the San Diego Water Board Executive Officer.

(2) A description of the facility or area, including the following information:

(a) Classification as commercial, industrial, municipal, or residential;

(b) Status of facility or area as active or inactive;

(c) Identification if a business is a mobile business;

(d) SIC Code or NAICS Code, if applicable;

(e) Industrial General Permit NOI and/or WDID number, if applicable;

(f) Identification if a residential area is or includes a Common Interest Area / Home Owner Association, or mobile home park;

(g) Identification of pollutants generated and potentially generated by the facility or area;

(h) Whether the facility or area is adjacent to an ESA;

(i) Whether the facility or area is tributary to and within the same hydrologic subarea as a water body segment listed as impaired on the CWA section 303(d) List and generates pollutants for which the water body segment is impaired; and

(3) An annually updated map showing the location of inventoried existing development, watershed boundaries, and water bodies.

b. EXISTING DEVELOPMENT BMP IMPLEMENTATION AND MAINTENANCE

Each Copermittee must designate a minimum set of BMPs required for all inventoried existing development, including special event venues. The designated minimum BMPs must be specific to facility or area types and pollutant generating activities, as appropriate.

(1) <u>Commercial, Industrial, and Municipal Facilities and Areas</u>

(a) Pollution Prevention

Each Copermittee must require the use of pollution prevention methods by the commercial, industrial, and municipal facilities and areas in its inventoried existing development to address the priorities and strategies in the Water Quality Improvement Plan.

(b) BMP Implementation

Each Copermittee must require the implementation of designated BMPs at commercial facilities and areas, industrial facilities, and implement designated BMPs at municipal facilities in its inventoried existing development.

(c) BMP Operation and Maintenance

(i) Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development.

(ii) Each Copermittee must implement a schedule of operation and maintenance activities for its MS4 and related structures (including but not limited to catch basins, storm drain inlets, detention basins, etc.), and verify proper operation of all its municipal structural treatment controls designed to reduce pollutants (including floatables) in storm water discharges to or from its MS4s and related drainage structures. Operation and maintenance activities may include, but is not limited to, the following:

[a] Inspections of the MS4 and related structures;
[b] Cleaning of the MS4 and related structures; and
[c] Proper disposal of materials removed from cleaning of the MS4 and related structures.

(iii) Each Copermittee must implement a schedule of operation and maintenance for public streets, unpaved roads, paved roads, and paved highways within its jurisdiction to minimize pollutants that can be discharged in storm water.

(iv) Each Copermittee must implement controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers. Copermittees that operate both a municipal sanitary sewer system and a MS4 must implement controls and measures to prevent and eliminate seeping sewage from infiltrating the MS4. Copermittees that do not operate both a municipal sanitary sewer system and a MS4 must coordinate with sewering agencies to keep themselves informed of relevant and appropriate maintenance activities and sanitary sewage projects in their jurisdiction that may cause or contribute to seepage of sewage into the MS4.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must require the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from commercial facilities and areas and industrial facilities, and implement BMPs at municipal facilities in its inventoried existing development. Such BMPs must include, as appropriate, educational activities, permits, certifications and other measures for applicators and distributors.

(2) Residential Areas

(a) Pollution Prevention

Each Copermittee must promote and encourage the use of pollution prevention methods, where appropriate, by the residential areas in its inventoried existing development.

(b) BMP Implementation

Each Copermittee must promote and encourage the implementation of designated BMPs at residential areas in its inventoried existing development.

(c) BMP Operation and Maintenance

Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at residential areas in its inventoried existing development.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must promote and encourage the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from residential areas in its inventoried existing development.

c. Existing Development Inspections

Each Copermittee must conduct inspections of inventoried existing development to ensure compliance with applicable local ordinances and permits, and the requirements of this Order.

(1) Inspection Frequency

(a) Each Copermittee must establish appropriate inspection frequencies for inventoried existing development in accordance with the following requirements:

(i) At a minimum, inventoried existing development must be inspected once every five years utilizing one or more of the following methods:

[a] Drive-by inspections by Copermittee municipal and contract staff;
[b] Onsite inspections by Copermittee municipal and contract staff; and/or
[c] Visual inspections of publicly accessible inventoried facilities or areas by volunteer monitoring or patrol programs that have been trained by the Copermittee;

(ii) The frequency of inspections must be appropriate to confirm that BMPs are being implemented to reduce the discharge of pollutants in storm water from the MS4 to the MEP and effectively prohibit non-storm water discharges to the MS4;

(iii) The frequency of inspections must be based on the potential for a facility or area to discharge non-storm water and pollutants in storm water, and should reflect the priorities set forth in the Water Quality Improvement Plan;

(iv) Each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development;[29] and

(v) Inventoried existing development must be inspected by the Copermittee, as needed, in response to valid public complaints.

(b) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e. education and outreach, re-inspection, enforcement) necessary to require and confirm compliance with its applicable local ordinances and permits and the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

(2) <u>Inspection Content</u>

(a) Inspections of existing development must include, at a minimum:

(i) Visual inspections for the presence of actual non-storm water discharges;

[29] If any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspection may count toward the total annual inspection requirement. This requirement excludes linear municipal facilities (i.e., MS4 linear channels, sanitary sewer collection systems, streets, roads and highways).

(ii) Visual inspections for the presence of actual or potential discharge of pollutants;

(iii) Visual inspections for the presence of actual or potential illicit connections; and

(iv) Verification that the description of the facility or area in the inventory, required pursuant to Provision E.5.a.(2), has not changed.

(b) Onsite inspections of existing development by the Copermittee must include, at a minimum:

(i) Assessment of compliance with its applicable local ordinances and permits related to non-storm water and storm water discharges and runoff;

(ii) Assessment of the implementation of the designated BMPs;

(iii) Verification of coverage under the Industrial General Permit, when applicable; and

(iv) If any problems or violations are found, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried existing development. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Name and location of the facility or area (address and hydrologic subarea) consistent with the inventory name and location, pursuant to Provision E.5.a.(1);

(b) Inspection and re-inspection date(s);

(c) Inspection method(s) (i.e. drive-by, onsite);

(d) Observations and findings from the inspection(s);

(e) For onsite inspections of existing development by Copermittee municipal or contract staff, the records must also include, as applicable:

(i) Description of any problems or violations found during the inspection(s);

(ii) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(iii) The date problems or violations were resolved.

d. EXISTING DEVELOPMENT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried existing development, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

e. RETROFITTING AND REHABILITATING AREAS OF EXISTING DEVELOPMENT

(1) Retrofitting Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to retrofit areas of existing development within its jurisdiction to address identified sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify areas of existing development as candidates for retrofitting, focusing on areas where retrofitting will address pollutants and/or stressors that contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for retrofitting projects may be utilized to reduce pollutants that may be discharged in storm water from areas of existing development, and/or address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of retrofitting projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting projects; and

(e) Where retrofitting projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement

regional retrofitting projects (i.e. projects that can receive and/or treat storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment) adjacent to and/or downstream of the areas of existing development.

(2) Stream, Channel and/or Habitat Rehabilitation in Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to rehabilitate streams, channels, and/or habitats in areas of existing development within its jurisdiction to address the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify streams, channels, and/or habitats in areas of existing development as candidates for rehabilitation, focusing on areas where stream, channel, and/or habitat rehabilitation projects will address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for stream, channel, and/or habitat rehabilitation projects may be utilized to address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters, rehabilitate channelized or hydromodified streams, restore wetland and riparian habitat, restore watershed functions, and/or restore beneficial uses of receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of stream, channel, and/or habitat rehabilitation projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance stream, channel, and/or habitat rehabilitation projects; and

(e) Where stream, channel, and/or habitat rehabilitation projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional stream, channel, and/or habitat rehabilitation projects (i.e. projects that can receive storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment).

6. Enforcement Response Plans

Each Copermittee must develop and implement an Enforcement Response Plan as part of its jurisdictional runoff management program document. The Enforcement Response Plan must describe the applicable approaches and options to enforce its legal authority established pursuant to Provision E.1, as necessary, to achieve compliance with the requirements of this Order. The Enforcement Response Plan must be in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include the following:

a. Enforcement Response Plan Components

The Enforcement Response Plan must include the following individual components:

(1) Illicit Discharge Detection and Elimination Enforcement Component;

(2) Development Planning Enforcement Component;

(3) Construction Management Enforcement Component; and

(4) Existing Development Enforcement Component.

b. Enforcement Response Approaches and Options

Each component of the Enforcement Response Plan must describe the enforcement response approaches that the Copermittee will implement to compel compliance with its statutes, ordinances, permits, contracts, orders, or similar means, and the requirements of this Order. The description must include the protocols for implementing progressively stricter enforcement responses. The enforcement response approaches must include appropriate sanctions to compel compliance, including, at a minimum, the following tools or their equivalent:

(1) Verbal and written notices of violation;

(2) Cleanup requirements;

(3) Fines;

(4) Bonding requirements;

(5) Administrative and criminal penalties;

(6) Liens;

(7) Stop work orders; and

(8) Permit and occupancy denials.

c. CORRECTION OF VIOLATIONS

(1) Violations must be corrected in a timely manner with the goal of correcting the violations within 30 calendar days after the violations are discovered, or prior to the next predicted rain event, whichever is sooner.

(2) If more than 30 calendar days are required to achieve compliance, then a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

d. ESCALATED ENFORCEMENT

(1) The Enforcement Response Plan must include a definition of "escalated enforcement." Escalated enforcement must include any enforcement scenario where a violation or other non-compliance is determined to cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan. Escalated enforcement may be defined differently for development planning, construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas.

(2) Where the Copermittee determines escalated enforcement is not required, a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

(3) Escalated enforcement actions must continue to increase in severity, as necessary, to compel compliance as soon as possible.

e. REPORTING OF NON-COMPLIANT SITES

(1) Each Copermittee must notify the San Diego Water Board in writing within five (5) calendar days of issuing escalated enforcement (as defined in the Copermittee's Enforcement Response Plan) to a construction site that poses a significant threat to water quality as a result of violations or other non-compliance with its permits and applicable local ordinances, and the requirements of this Order. Written notification may be provided electronically by email to the appropriate San Diego Water Board staff.

(2) Each Copermittee must notify the San Diego Water Board of any persons required to obtain coverage under the statewide Industrial General Permit and Construction General Permit and failing to do so, within five (5) calendar days from the time the Copermittee become aware of the circumstances. Written notification may be provided electronically by email to R9_Nonfilers@waterboards.ca.gov ~~Nonfilers_R9@waterboards.ca.gov~~.

7. Public Education and Participation

Each Copermittee must implement, individually or with other Copermittees, a public education and participation program in accordance with the strategies identified in the Water Quality Improvement Plan to promote and encourage the development of programs, management practices, and behaviors that reduce the discharge of pollutants in storm water to the MEP, prevent controllable non-storm water discharges from entering the MS4, and protect water quality standards in receiving waters. The public education and participation program must be implemented in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include, at a minimum, the following requirements:

a. PUBLIC EDUCATION

The public education program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) Educational activities, public information activities, and other appropriate outreach activities intended to reduce pollutants associated with the application of pesticides, herbicides and fertilizer and other pollutants of concern in storm water discharges to and from its MS4 to the MEP, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed to address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(2) Educational activities, public information activities, and other appropriate outreach activities to facilitate the proper management and disposal of used oil and toxic materials; and

(3) Appropriate education and training measures for specific target audiences, such as construction site operators, residents, underserved target audiences and school-aged children, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed, based on high risk behaviors and pollutants of concern.

b. PUBLIC PARTICIPATION

The public participation program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) A process for members of the public to participate in updating the highest priority water quality conditions, numeric goals, and water quality improvement strategies in the Water Quality Improvement Plan;

(2) Opportunities for members of the public to participate in providing the Copermittee recommendations for improving the effectiveness of the water

quality improvement strategies implemented within its jurisdiction; and

(3) Opportunities for members of the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or protection of the quality of receiving waters.

8. Fiscal Analysis

a. Each Copermittee must secure the resources necessary to meet all the requirements of this Order.

b. Each Copermittee must conduct an annual fiscal analysis of its jurisdictional runoff management program in its entirety. The fiscal analysis must include the following:

(1) Identification of the various categories of expenditures necessary to implement the requirements of this Order, including a description of the specific capital, operation and maintenance, and other expenditure items to be accounted for in each category of expenditures;

(2) The staff resources needed and allocated to meet the requirements of this Order, including any development, implementation, and enforcement activities required;

(3) The estimated expenditures for Provisions E.8.b.(1) and E.8.b.(2) for the current fiscal year; and

(4) The source(s) of funds that are proposed to meet the necessary expenditures described in Provisions E.8.b.(1) and E.8.b.(2), including legal restrictions on the use of such funds, for the current fiscal year and next fiscal year.

c. Each Copermittee must submit a summary of the annual fiscal analysis with each Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3).

d. Each Copermittee must provide the documentation used to develop the summary of the annual fiscal analysis upon request by the San Diego Water Board.

F. REPORTING

The purpose of this provision is to determine and document compliance with the requirements set forth in this Order. The goal of reporting is to communicate to the San Diego Water Board and the people of the State of California the implementation status of each jurisdictional runoff management program and compliance with the requirements of this Order. This goal is to be accomplished through the submittal of specific deliverables to the San Diego Water Board by the Copermittees.

1. Water Quality Improvement Plans

The Copermittees for each Watershed Management Area must develop and submit the Water Quality Improvement Plan in accordance with the following requirements:

a. WATER QUALITY IMPROVEMENT PLAN DEVELOPMENT

Each Water Quality Improvement Plan must be developed in accordance with the following process:

(1) Public Participation Process

The Copermittees must implement a public participation process to solicit data, information, and recommendations to be utilized in the development of the Water Quality Improvement Plan. The public participation process must include the following:

(a) The Copermittees must develop a publicly available and noticed schedule of the opportunities for the public to participate and provide comments during the development of the Water Quality Improvement Plan. The schedule may be adjusted as necessary by the Copermittees, provided the public is provided timely notification of the changes to the schedule.

(b) The Copermittees must form a Water Quality Improvement Consultation Panel to provide recommendations during the development of the Water Quality Improvement Plan. The Water Quality Improvement Consultation Panel must consist of at least the following members:

(i) A representative of the San Diego Water Board;

(ii) A representative of the environmental community familiar with the water quality conditions of concern of the receiving waters in the Watershed Management Area, preferably from an environmental interest group associated with a water body within the Watershed Management Area; and

(iii) A representative of the development community familiar with the opportunities and constraints for implementing structural BMPs, retrofitting projects, and stream, channel or habitat rehabilitation

projects in the Watershed Management Area, preferably with relevant engineering, hydrology, and/or geomorphology experience in the Watershed Management Area.

(c) The Copermittees must coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public time and opportunity to participate during the development of the Water Quality Improvement Plans.

(2) Priority Water Quality Conditions

(a) The Copermittees must solicit data, information and recommendations from the public to be utilized in the development and identification of the priority water quality conditions and potential water quality improvement strategies for the Watershed Management Area.

(b) The Copermittees must review the priority water quality conditions the Copermittees plan on including in the Water Quality Improvement Plan with the Water Quality Improvement Consultation Panel to receive recommendations or concurrence.

(c) The Copermittees must consider revisions to the priority water quality conditions based on recommendations from the Water Quality Improvement Consultation Panel.

(d) The Copermittees must include all the potential water quality improvement strategies identified by the public and the Water Quality Improvement Consultation Panel with the submittal of the priority water quality conditions to the San Diego Water Board.

(e) The Copermittees must submit the Water Quality Improvement Plan requirements of Provision B.2 to the San Diego Water Board as early as 6 months and no later than 12 months after the commencement of coverage under this Order. Upon receipt, the San Diego Water Board will issue a public notice and release the proposed priority water quality conditions and potential water quality improvement strategies for public review and comment for a minimum of 30 days.

(f) The Copermittees must consider revisions to the priority water quality conditions and potential water quality improvement strategies developed pursuant to Provision B.2 based on public comments received by the close of the comment period.

(3) Water Quality Improvement Goals, Strategies and Schedules

(a) The Copermittees must solicit recommendations from the public on potential numeric goals for the highest priority water quality conditions

identified for the Watershed Management Area, and recommendations on the strategies that should be implemented to achieve the potential numeric goals.

(b) The Copermittees must consult with the Water Quality Improvement Consultation Panel and consider revisions to the following items based on the Panel's recommendations:

(i) The numeric goals and schedules the Copermittees propose to include in the Water Quality Improvement Plan;

(ii) The water quality improvement strategies and schedules the Copermittees propose to implement in the Watershed Management Area and include in the Water Quality Improvement Plan; and

(iii) If the Copermittees choose to implement Provision B.3.b.(4), the results of the Watershed Management Area Analysis the Copermittees proposed to incorporate into the Water Quality Improvement Plan.

(c) The Copermittees must submit the Water Quality Improvement Plan requirements of Provision B.3 to the San Diego Water Board as early as 9 months and no later than 18 months after the commencement of coverage under this Order. Upon receipt, the San Diego Water Board will issue a public notice and release the proposed water quality improvement goals, strategies and schedules for public review and comment for a minimum of 30 days.

(d) The Copermittees must consider revisions to the water quality improvement goals, strategies and schedules developed pursuant to Provision B.3 based on public comments received by the close of the comment period.

b. WATER QUALITY IMPROVEMENT PLAN SUBMITTAL AND IMPLEMENTATION

(1) Within 24 months after the commencement of coverage under this Order, the Copermittees for each Watershed Management Area must submit a complete Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order to the San Diego Water Board. The San Diego Water Board will issue a public notice and release the Water Quality Improvement Plan for public review and comment for a minimum of 30 days.

(2) The Copermittees must consider revisions to the Water Quality Improvement Plan based on written comments received by the close of the public comment period.

(3) The Copermittees must promptly submit any revisions to the Water Quality Improvement Plan to the San Diego Water Board no later than 60 days after the close of the public comment period.

(4) If issues concerning the Water Quality Improvement Plan are resolved informally through discussions among the Copermittees, the San Diego Water Board and interested parties, the San Diego Water Board Executive Officer may provide written notification of acceptance to the Copermittees that the Water Quality Improvement Plan meets the requirements of Provision B. However, if the Executive Officer determines that significant issues with the Water Quality Improvement Plan remain, the matter will be scheduled for San Diego Water Board consideration at a public meeting.

(5) The Copermittees must commence with implementation of the Water Quality Improvement Plan, in accordance with the water quality improvement strategies and schedules therein, upon written notification of acceptance with the Water Quality Improvement Plan by the San Diego Water Board Executive Officer.

(6) During implementation of the Water Quality Improvement Plan the Copermittees must correct any deficiencies in the Plan identified by the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report following a request by the Board to do so.

(7) The Water Quality Improvement Plan must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of receiving notification of acceptance with the Water Quality Improvement Plan by the San Diego Water Board Executive Officer.

2. Updates

a. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATES

Each Copermittee must update its jurisdictional runoff management program document in accordance with the following requirements:

(1) Each Copermittee is encouraged to seek public and key stakeholder participation and comments, as early and often as possible during the process of developing updates to its jurisdictional runoff management program document;

(2) Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E concurrent with the submittal of the Water Quality Improvement Plan. Each Copermittee must correct any deficiencies in the jurisdictional runoff management program document based on comments received from the San Diego Water Board in

the updates submitted with the Water Quality Improvement Plan Annual Report;

(3) Each Copermittee must submit updates to its jurisdictional runoff management program, with the supporting rationale for the modifications, either in the Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b;

(4) The Copermittee must revise proposed modifications to its jurisdictional runoff management program as directed by the San Diego Water Board Executive Officer; and

(5) Updated jurisdictional runoff management program documents must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of submitting the Water Quality Improvement Plan Annual Report.

b. BMP DESIGN MANUAL UPDATES

Each Copermittee must update its BMP Design Manual in accordance with the following requirements:

(1) Each Copermittee must update its BMP Design Manual to incorporate the requirements of Provisions E.3.a-d concurrent with the submittal of the Water Quality Improvement Plan. Each Copermittee must correct any deficiencies in the BMP Design Manual based on comments received from the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report;

(2) Subsequent updates to the BMP Design Manual must be consistent with the requirements of Provisions E.3.a-d and must be submitted as part of the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b; and

(3) Updated BMP Design Manuals must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of completing the update.

c. WATER QUALITY IMPROVEMENT PLAN UPDATES

(1) The Water Quality Improvement Plans must be updated in accordance with the following process:

(a) The Copermittees must develop and implement a public participation process to obtain data, information and recommendations for updating the Water Quality Improvement Plan. The public participation process must provide for a publicly available and noticed schedule of opportunities for the public to participate and provide comments during the development of updates to the Water Quality Improvement Plan;

(b) The Copermittees must consult with the Water Quality Improvement Consultation Panel on proposed updates of the Water Quality Improvement Plan, and consider the Water Quality Improvement Consultation Panel's recommendations in finalizing the proposed updates;

(c) The Copermittees for each Watershed Management Area must submit 1) proposed updates to the Water Quality Improvement Plan and supporting rationale, and 2) recommendations received from the public and the Water Quality Improvement Consultation Panel and the rationale for the requested updates, either in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The updates submitted will be deemed accepted for inclusion in the Water Quality Improvement Plan ninety (90) days after submission unless otherwise directed in writing by the San Diego Water Board Executive Officer;

(d) The Copermittees must revise the requested updates as directed by the San Diego Water Board Executive Officer; and

(e) Updated Water Quality Improvement Plans must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance of the requested updates by the San Diego Water Board.

(2) No later than six months following Office of Administrative Law and USEPA approval of any TMDL Basin Plan amendment with wasteload allocations (WLAs) assigned to the Copermittees during the term of this Order, the Copermittees must initiate an update to the applicable Water Quality Improvement Plans in accordance with Provision F.1 or Provision F.2.c.(1) to incorporate the requirements of the TMDL WLAs.

3. Progress Reporting

a. Progress Report Presentations

The Copermittees for each Watershed Management Area must periodically appear before the San Diego Water Board, as requested by the Board, to provide progress reports on the implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs.

b. Annual Reports

(1) Transitional Jurisdictional Runoff Management Program Annual Reports

(a) Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) no later than October 31 of each year for each jurisdictional runoff management program reporting period (i.e. July 1 to June 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted.

(b) Each Copermittee must submit the information on the Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) specific to the area within its jurisdiction in each Watershed Management Area.

(c) In addition to submitting the Jurisdictional Runoff Management Program Annual Report Form during the transitional reporting period, each Copermittee may continue to utilize and submit the jurisdictional runoff management program annual reporting format of its previous NPDES permit until the first Water Quality Improvement Plan Annual Report is required to be submitted.

(2) Transitional Monitoring and Assessment Program Annual Reports

The Copermittees for each Watershed Management Area must submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted under this Order. The Transitional Monitoring and Assessment Program Annual Reports must include:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1.a and D.2.a, summarized and presented in tabular and graphical form; and

(b) The findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

(3) Water Quality Improvement Plan Annual Reports

The Copermittees for each Watershed Management Area must submit a Water Quality Improvement Plan Annual Report for each reporting period no later than January 31 of the following year. The annual reporting period consists of two different periods: 1) July 1 to June 30 of the following year for the jurisdictional runoff management programs, 2) October 1 to September 30 of the following year for the monitoring and assessment programs. The Water Quality Improvement Plan Annual Reports must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Each Annual Report must include the following:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, summarized and presented in tabular and graphical form;

(b) The progress of the special studies required pursuant to Provision D.3, and the findings, interpretations and conclusions of a special study, or each phase of a special study, upon its completion;

(c) The findings, interpretations and conclusions from the assessments required pursuant to Provision D.4;

(d) The progress of implementing the Water Quality Improvement Plan, including, but not limited to, the following:

(i) The progress toward achieving the interim and final numeric goals for the highest water quality priorities for the Watershed Management Area;

(ii) The water quality improvement strategies that were implemented and/or no longer implemented by each of the Copermittees during the reporting period and previous reporting periods;

(iii) The water quality improvement strategies planned for implementation during the next reporting period;

(iv) Proposed modifications to the water quality improvement strategies, the public comments received and the supporting rationale for the proposed modifications;

(v) Previous modifications or updates incorporated into the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document and implemented by the Copermittees in the Watershed Management Area; and

(vi) Proposed modifications or updates to the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document;

(e) A completed Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) for each Copermittee in the Watershed Management Area, certified by a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative; and

(f) Each Copermittee must provide any data or documentation utilized in developing the Water Quality Improvement Plan Annual Report upon request by the San Diego Water Board. Any Copermittee monitoring data utilized in developing the Water Quality Improvement Plan Annual Report must be uploaded to the California Environmental Data Exchange Network (CEDEN).[30] Any Copermittee monitoring and assessment data utilized in developing the Water Quality Improvement Plan Annual Report must be available for access on the Regional Clearinghouse required pursuant to Provision F.4.

C. REGIONAL MONITORING AND ASSESSMENT REPORT

(1) The Copermittees must submit a Regional Monitoring and Assessment Report no later than 180 days prior to the expiration date of this Order. The Regional Monitoring and Assessment Report may be submitted as part of the Report of Waste Discharge required pursuant to Provision F.5.b. In preparing the report the Copermittees must consider the receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, and the findings, interpretations, and conclusions from the assessments required pursuant to Provision D.4. Based on these considerations the report must assess the following:

(a) The beneficial uses of the receiving waters within the San Diego Region that are supported and not adversely affected by the Copermittees' MS4 discharges;

(b) The beneficial uses of the receiving waters within the San Diego Region that are adversely impacted by the Copermittees' MS4 discharges;

(c) The progress toward protecting the beneficial uses in the receiving waters within the San Diego Region from the Copermittees' discharges; and

[30] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

(d) Pollutants or conditions of emerging concern that may impact beneficial uses in the receiving waters within the San Diego Region.

(2) The Regional Monitoring and Assessment Report must include recommendations for improving the implementation and assessment of the Water Quality Improvement Plans and jurisdictional runoff management programs.

(3) Each Copermittee must provide any data or documentation utilized in developing the Regional Monitoring and Assessment Report upon request by the San Diego Water Board. Any Copermittee monitoring and assessment data utilized in developing the Regional Monitoring and Assessment Report must be available for access on the Regional Clearinghouse required pursuant to Provision F.4.

4. Regional Clearinghouse

The Copermittees must develop, update, and maintain an internet-based Regional Clearinghouse that is made available to the public no later than 18 months after the effective date of this Order.[31]

a. The Copermittees, through the Regional Clearinghouse, must make the following documents and data available for access, and organized by Watershed Management Area. The documents and data may be linked to other internet-based data portals and databases where the original documents are stored:

(1) Water Quality Improvement Plan for the Watershed Management Area, and all updated versions with date of update;

(2) Annual Reports for the Watershed Management Area;

(3) Jurisdictional Runoff Management Program document for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(4) BMP Design Manual for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(5) Reports from special studies (e.g. source identification, BMP effectiveness assessment) conducted in the Watershed Management Area;

[31] The Copermittees may develop, update and maintain the clearinghouse(s) of other Copermittees or agencies.

(6) Monitoring data collected pursuant to Provision D for each Watershed Management Area must be uploaded to CEDEN,[32] with links to the uploaded data; and

(7) Available GIS data, layers, and/or shapefiles used to develop the maps generated and maintained by the Copermittees for the Water Quality Improvement Plans, Annual Reports, and jurisdictional runoff management program documents.

b. The Copermittees, through the Regional Clearinghouse, must make the following information and documents available for access:

(1) Contact information (point of contact, phone number, email address, and mailing address) for each Copermittee;

(2) Public hotline number for reporting non-storm water and illicit discharges for each Copermittee;

(3) Email address for reporting non-storm water and illicit discharges for each Copermittee;

(4) Link to each Copermittee's website, if available, where the public may find additional information about the Copermittee's storm water management program and for requesting records for the implementation of its program;

(5) Information about opportunities for the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or protection of the quality of receiving waters; and

(6) Reports from regional monitoring programs in which the Copermittees participate (e.g. Southern California Monitoring Coalition, Southern California Coastal Water Research Project Bight Monitoring);

(7) Regional Monitoring and Assessment Reports; and

(8) Any other information, data, and documents the Copermittees determine as appropriate for making available to the public.

[32] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

5. Report of Waste Discharge

a. The ~~Orange County Copermittees and the~~ Riverside County Copermittees are required to submit a complete Report of Waste Discharge pursuant to the requirements of their current Order~~s~~. The San Diego Water Board will review and consider the Report~~s~~ of Waste Discharge to determine whether modification to this Order, pursuant to the requirements of Provision H, will be required prior to the ~~Orange County Copermittees and/or~~ Riverside County Copermittees obtaining coverage under this Order. The current Order ~~s~~ for ~~the Orange County Copermittees and~~ Riverside County Copermittees is ~~are~~ rescinded upon the date of effective coverage under this Order except for enforcement purposes.

b. The Copermittees subject to the requirements of this Order must submit to the San Diego Water Board a complete Report of Waste Discharge as an application for the re-issuance of this Order and NPDES permit. The Report of Waste Discharge must be submitted no later than 180 days in advance of the expiration date of this Order. The Report of Waste Discharge must contain the following minimum information:

(1) Names and addresses of the Copermittees;

(2) Names and titles of the primary contacts of the Copermittees;

(3) Proposed changes to the Copermittees' Water Quality Improvement Plans and the supporting justification;

(4) Proposed changes to the Copermittees' jurisdictional runoff management programs and the supporting justification;

(5) Any other information necessary for the re-issuance of this Order;

(6) Any information to be included as part of the Report of Waste Discharge pursuant to the requirements of this Order; and

(7) Any other information required by federal regulations for NPDES permit reissuance.

6. Application for Early Coverage

a. The ~~Orange County Copermittees, collectively, or~~ Riverside County Copermittees~~, collectively,~~ may apply for early coverage under this Order by submitting a Report of Waste Discharge Form 200, with a written request for early coverage under this Order.

b. The San Diego Water Board will review the application for early coverage. A notification of coverage under this Order will be issued to the Copermittees in the

respective county by the San Diego Water Board upon completion of the early coverage application requirements. The effective coverage date will be specified in the notification of coverage. The Copermittees in the respective county are authorized to have MS4 discharges pursuant to the requirements of this Order starting on the effective coverage date specified in the notification of coverage. The existing Order for the respective county is rescinded upon the effective coverage date specified in the notification of coverage except for enforcement purposes.

7. Reporting Provisions

Each Copermittee must comply with all the reporting and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

G. PRINCIPAL WATERSHED COPERMITTEE RESPONSIBILITIES

1. The Copermittees within each Watershed Management Area must designate a Principal Watershed Copermittee and notify the San Diego Water Board of the name of the Principal Watershed Copermittee. An individual Copermittee should not be designated a Principal Watershed Copermittee for more than two Watershed Management Areas. The notification may be submitted with the Water Quality Improvement Plan required pursuant to Provision F.1 of this Order.

2. The Principal Watershed Copermittee is responsible for, at a minimum, the following:

a. Serving as liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues, and when necessary and appropriate, representing the Copermittees in the Watershed Management Area before the San Diego Water Board;

b. Facilitating the development of the Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order;

c. Coordinating the submittal of the deliverables required by Provisions F.1, F.2, F.3.a, and F.3.b of this Order; and

d. Coordinating and developing, with the other Principal Watershed Copermittees, the requirements of Provisions F.3.c, F.4, and F.5.b of this Order.

3. The Principal Watershed Copermittee is not responsible for ensuring that the other Copermittees within the Watershed Management Area are in compliance with the requirements of this Order. Each Copermittee within the Watershed Management Area is responsible for complying with the requirements of this Order.

H. MODIFICATION OF ORDER

1. Modifications of the Order may be initiated by the San Diego Water Board or by the Copermittees. Requests by Copermittees must be made to the San Diego Water Board.

2. Minor modifications to the Order may be made by the San Diego Water Board where the proposed modification complies with all the prohibitions and limitations, and other requirements of this Order.

3. This Order may also be re-opened and modified, revoked and, reissued or terminated in accordance with the provisions of 40 CFR 122.44, 122.62 to 122.64, and 124.5. Causes for taking such actions include, but are not limited to, failure to comply with any condition of this Order and permit, and endangerment to human health or the environment resulting from the permitted activity.

4. This Order may be re-opened for modification for cause including but not limited to the following:

a. The State Water Board determines that revisions are warranted, and the San Diego Water Board concurs that revisions are necessary to those provisions of the Order addressing compliance with water quality standards in the receiving water and/or those provisions of the Order establishing an iterative process for implementation of management practices to assure compliance with water quality standards in the receiving water;

b. An application for early coverage under this Order is received pursuant to Provision F.6;

c. Any of the TMDLs in Attachment E to this Order are amended in the Basin Plan by San Diego Water Board, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA;

d. The Basin Plan is amended by the San Diego Water Board to incorporate a new TMDL, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA; or

e. Updating or revising the monitoring and reporting requirements is determined to be necessary, at the discretion of the San Diego Water Board. Such modification(s) may include, but is (are) not limited to, revision(s) to: (i) implement recommendations from Southern California Coastal Water Research Project (SCCWRP), (ii) develop, refine, implement, and/or coordinate a regional monitoring program, (iii) develop and implement improved monitoring and assessment programs in keeping with San Diego Water Board Resolution No. R9-2012-0069, Resolution in Support of a Regional Monitoring Framework, and/or (iv) add provisions to require the Copermittees to evaluate and provide information on cost and values of the monitoring and reporting program.

5. The San Diego Water Board, after opportunity for public comment and a public hearing, will re-open and consider modifications to this Order when the ~~Orange County Copermittees or the~~ Riverside County Copermittees submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders.

I. STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

Each Copermittee must comply with all the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

ATTACHMENT A

DISCHARGE PROHIBITIONS AND SPECIAL PROTECTIONS

1. Basin Plan Waste Discharge Prohibitions

California Water Code Section 13243 provides that a Regional Water Board, in a water quality control plan, may specify certain conditions or areas where the discharge of waste or certain types of waste is not permitted. The following waste discharge prohibitions in the Water Quality Control Plan for the San Diego Basin (Basin Plan) are applicable to any person, as defined by Section 13050(c) of the California Water Code, who is a citizen, domiciliary, or political agency or entity of California whose activities in California could affect the quality of waters of the state within the boundaries of the San Diego Region.

1. The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in California Water Code Section 13050, is prohibited.

2. The discharge of waste to land, except as authorized by waste discharge requirements or the terms described in California Water Code Section 13264 is prohibited.

3. The discharge of pollutants or dredged or fill material to waters of the United States except as authorized by a National Pollutant Discharge Elimination System (NPDES) permit or a dredged or fill material permit (subject to the exemption described in California Water Code Section 13376) is prohibited.

4. Discharges of recycled water to lakes or reservoirs used for municipal water supply or to inland surface water tributaries thereto are prohibited, unless this San Diego Water Board issues a NPDES permit authorizing such a discharge; the proposed discharge has been approved by the State Department of Health Services (DHS) and the operating agency of the impacted reservoir; and the discharger has an approved fail-safe long-term disposal alternative.

5. The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the San Diego Water Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

6. The discharge of waste in a manner causing flow, ponding, or surfacing on lands not owned or under the control of the discharger is prohibited, unless the discharge is authorized by the San Diego Water Board.

7. The dumping, deposition, or discharge of waste directly into waters of the state, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the San Diego Water Board.

8. Any discharge to a storm water conveyance system that is not composed entirely of "*storm water*" is prohibited unless authorized by the San Diego Water Board. [The federal regulations, 40 CFR 122.26(b)(13), define storm water as storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from firefighting activities.] [§122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

9. The unauthorized discharge of treated or untreated sewage to waters of the state or to a storm water conveyance system is prohibited.

10. The discharge of industrial wastes to conventional septic tank/subsurface disposal systems, except as authorized by the terms described in California Water Code Section 13264, is prohibited.

11. The discharge of radioactive wastes amenable to alternative methods of disposal into the waters of the state is prohibited.

12. The discharge of any radiological, chemical, or biological warfare agent into waters of the state is prohibited.

13. The discharge of waste into a natural or excavated site below historic water levels is prohibited unless the discharge is authorized by the San Diego Water Board.

14. The discharge of sand, silt, clay, or other earthen materials from any activity, including land grading and construction, in quantities which cause deleterious bottom deposits, turbidity or discoloration in waters of the state or which unreasonably affect, or threaten to affect, beneficial uses of such waters is prohibited.

15. The discharge of treated or untreated sewage from vessels to Mission Bay, Oceanside Harbor, Dana Point Harbor, or other small boat harbors is prohibited.

16. The discharge of untreated sewage from vessels to San Diego Bay is prohibited.

17. The discharge of treated sewage from vessels to portions of San Diego Bay that are less than 30 feet deep at mean lower low water (MLLW) is prohibited.

18. The discharge of treated sewage from vessels, which do not have a properly functioning US Coast Guard certified Type I or Type II marine sanitation device, to portions of San Diego Bay that are greater than 30 feet deep at mean lower low water (MLLW) is prohibited.

2. Attachment B to State Water Board Resolution 2012-0012, as amended by State Water Board Resolution No. 2012-0031.

Special Protections for Areas of Special Biological Significance (ASBS), Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges

I. PROVISIONS FOR POINT SOURCE DISCHARGES OF STORM WATER AND NONPOINT SOURCE WASTE DISCHARGES

The following terms, prohibitions, and special conditions (hereafter collectively referred to as special conditions) are established as limitations on point source storm water and nonpoint source discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in Areas of Special Biological Significance (ASBS), as required for State Water Quality Protection Areas pursuant to California Public Resources Code Sections 36700(f) and 36710(f). These Special Protections are adopted by the State Water Board as part of the California Ocean Plan (Ocean Plan) General Exception.

The special conditions are organized by category of discharge. The State Water Resources Control Board (State Water Board) and Regional Water Quality Control Boards (Regional Water Boards) will determine categories and the means of regulation for those categories [e.g., Point Source Storm Water National Pollutant Discharge Elimination System (NPDES) or Nonpoint Source].

A. PERMITTED POINT SOURCE DISCHARGES OF STORM WATER

1. General Provisions for Permitted Point Source Discharges of Storm Water

a. Existing storm water discharges into an ASBS are allowed only under the following conditions:

(1) The discharges are authorized by an NPDES permit issued by the State Water Board or Regional Water Board;

(2) The discharges comply with all of the applicable terms, prohibitions, and special conditions contained in these Special Protections; and

(3) The discharges:

(i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

(ii) Are designed to prevent soil erosion;

(iii) Occur only during wet weather;

(iv) Are composed of only storm water runoff.

b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

c. The discharge of trash is prohibited.

d. Only discharges from existing storm water outfalls are allowed. Any proposed or new storm water runoff discharge shall be routed to existing storm water discharge outfalls and shall not result in any new contribution of waste to an ASBS (i.e., no additional pollutant loading). "Existing storm water outfalls" are those that were constructed or under construction prior to January 1, 2005. "New contribution of waste" is defined as any addition of waste beyond what would have occurred as of January 1, 2005. A change to an existing storm water outfall, in terms of re-location or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges are prohibited except as provided below:

(1) The term "non-storm water discharges" means any waste discharges from a municipal separate storm sewer system (MS4) or other NPDES permitted storm drain system to an ASBS that are not composed entirely of storm water.

(2) (i) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability or occur naturally:

(a) Discharges associated with emergency fire fighting operations.

(b) Foundation and footing drains.

(c) Water from crawl space or basement pumps.

(d) Hillside dewatering.

(e) Naturally occurring groundwater seepage via a storm drain.

(f) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(ii) An NPDES permitting authority may authorize non-storm water discharges to an MS4 with a direct discharge to an ASBS only to the extent the NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

2. Compliance Plans for Inclusion in Storm Water Management Plans (SWMP) and Storm Water Pollution Prevention Plans (SWPPP).

The discharger shall specifically address the prohibition of non-storm water runoff and the requirement to maintain natural water quality for storm water discharges to an ASBS in an ASBS Compliance Plan to be included in its SWMP or a SWPPP, as appropriate to permit

type. If a statewide permit includes a SWMP, then the discharger shall prepare a stand-alone compliance plan for ASBS discharges. The ASBS Compliance Plan is subject to approval by the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (for permits issued by Regional Water Boards).

a. The Compliance Plan shall include a map of surface drainage of storm water runoff, showing areas of sheet runoff, prioritize discharges, and describe any structural Best Management Practices (BMPs) already employed and/or BMPs to be employed in the future. Priority discharges are those that pose the greatest water quality threat and which are identified to require installation of structural BMPs. The map shall also show the storm water conveyances in relation to other features such as service areas, sewage conveyances and treatment facilities, landslides, areas prone to erosion, and waste and hazardous material storage areas, if applicable. The SWMP or SWPPP shall also include a procedure for updating the map and plan when changes are made to the storm water conveyance facilities.

b. The ASBS Compliance Plan shall describe the measures by which all non-authorized non-storm water runoff (e.g., dry weather flows) has been eliminated, how these measures will be maintained over time, and how these measures are monitored and documented.

c. For Municipal Separate Storm Sewer System (MS4s), the ASBS Compliance Plan shall require minimum inspection frequencies as follows:

(1) The minimum inspection frequency for construction sites shall be weekly during rainy season;

(2) The minimum inspection frequency for industrial facilities shall be monthly during the rainy season;

(3) The minimum inspection frequency for commercial facilities (e.g., restaurants) shall be twice during the rainy season; and

(4) Storm water outfall drains equal to or greater than 18 inches (457 mm) in diameter or width shall be inspected once prior to the beginning of the rainy season and once during the rainy season and maintained to remove trash and other anthropogenic debris.

d. The ASBS Compliance Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff, that are necessary to comply with these special conditions, will be achieved through BMPs. Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that such installation would pose a threat to health or safety. BMPs to control storm water runoff discharges (at the end-of-pipe) during a design storm shall be designed to achieve on average the following target levels:

(1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

(2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges.

The baseline for these determinations is the effective date of the Exception, except for those structural BMPs installed between January 1, 2005 and adoption of these Special Protections, and the reductions must be achieved and documented within six (6) years of the effective date.

e. The ASBS Compliance Plan shall address erosion control and the prevention of anthropogenic sedimentation in ASBS. The natural habitat conditions in the ASBS shall not be altered as a result of anthropogenic sedimentation.

f. The ASBS Compliance Plan shall describe the non-structural BMPs currently employed and planned in the future (including those for construction activities), and include an implementation schedule. The ASBS Compliance Plan shall include non-structural BMPs that address public education and outreach. Education and outreach efforts must adequately inform the public that direct discharges of pollutants from private property not entering an MS4 are prohibited. The ASBS Compliance Plan shall also describe the structural BMPs, including any low impact development (LID) measures, currently employed and planned for higher threat discharges and include an implementation schedule. To control storm water runoff discharges (at the end-of-pipe) during a design storm, permittees must first consider, and use where feasible, LID practices to infiltrate, use, or evapotranspirate storm water runoff on-site, if LID practices would be the most effective at reducing pollutants from entering the ASBS.

g. The BMPs and implementation schedule shall be designed to ensure that natural water quality conditions in the receiving water are achieved and maintained by either reducing flows from impervious surfaces or reducing pollutant loading, or some combination thereof.

h. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents in storm water runoff that alter natural ocean water quality and the sources of these constituents.

(2) The report shall describe BMPs that are currently being implemented, BMPs that are identified in the SWMP or SWPPP for future implementation, and any additional BMPs that may be added to the SWMP or SWPPP to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the BMPs.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits), the discharger shall revise its ASBS Compliance Plan to incorporate any new or modified BMPs that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised SWMP or SWPPP, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural ocean water quality conditions due to the same constituent.

(5) The requirements of this section are in addition to the terms, prohibitions, and conditions contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within eighteen (18) months from the effective date of the Exception, the discharger shall submit a draft written ASBS Compliance Plan to the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that describes its strategy to comply with these special conditions, including the requirement to maintain natural water quality in the affected ASBS. The ASBS Compliance Plan shall include a description of appropriate non-structural controls and a time schedule to implement structural controls (implementation schedule) to comply with these special conditions for inclusion in the discharger's SWMP or SWPPP, as appropriate to permit type. The final ASBS Compliance Plan, including a description and final schedule for structural controls based on the results of runoff and receiving water monitoring, must be submitted within thirty (30) months from the effective date of the Exception.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these special conditions shall be implemented.

d. Within six (6) years of the effective date of the Exception, any structural controls identified in the ASBS Compliance Plan that are necessary to comply with these special conditions shall be operational.

e. Within six (6) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water, pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data, and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe

the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. for municipalities, a demonstration of significant hardship to discharger ratepayers, by showing the relationship of storm water fees to annual household income for residents within the discharger's jurisdictional area, and the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or

2. for other governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

B. NONPOINT SOURCE DISCHARGES

1. General Provisions for Nonpoint Sources

a. Existing nonpoint source waste discharges are allowed into an ASBS only under the following conditions:

(1) The discharges are authorized under waste discharge requirements, a conditional waiver of waste discharge requirements, or a conditional prohibition issued by the State Water Board or a Regional Water Board.

(2) The discharges are in compliance with the applicable terms, prohibitions, and special conditions contained in these Special Protections.

(3) The discharges:

(i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

(ii) Are designed to prevent soil erosion;

(iii) Occur only during wet weather;

(iv) Are composed of only storm water runoff.

b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

c. The discharge of trash is prohibited.

d. Only existing nonpoint source waste discharges are allowed. "Existing nonpoint source waste discharges" are discharges that were ongoing prior to January 1, 2005. "New nonpoint source discharges" are defined as those that commenced on or after January 1, 2005. A change to an existing nonpoint source discharge, in terms of relocation or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges from nonpoint sources (those not subject to an NPDES Permit) are prohibited except as provided below:

(1) The term "non-storm water discharges" means any waste discharges that are not composed entirely of storm water.

(2) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability, or occur naturally:

(i) Discharges associated with emergency fire fighting operations.

(ii) Foundation and footing drains.

(iii) Water from crawl space or basement pumps.

(iv) Hillside dewatering.

(v) Naturally occurring groundwater seepage via a storm drain.

(vi) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

f. At the San Clemente Island ASBS, discharges incidental to military training and research, development, test, and evaluation operations are allowed. Discharges incidental to underwater demolition and other in-water explosions are not allowed in the two military closure areas in the vicinity of Wilson Cove and Castle Rock. Discharges must not result in a violation of the water quality objectives, including the protection of the marine aquatic life beneficial use, anywhere in the ASBS.

g. At the San Nicolas Island and Begg Rock ASBS, discharges incidental to military research, development, testing, and evaluation of, and training with, guided missile and other weapons systems, fleet training exercises, small-scale amphibious warfare training, and special warfare training are allowed. Discharges incidental to underwater demolition and other in-water explosions are not allowed. Discharges must not result in a violation of the water quality objectives, including the protection of the marine aquatic life beneficial use, anywhere in the ASBS.

h. All other nonpoint source discharges not specifically authorized above are prohibited.

2. Planning and Reporting

a. The nonpoint source discharger shall develop an ASBS Pollution Prevention ~~P~~lan, including an implementation schedule, to address storm water runoff and any other nonpoint source discharges from its facilities. The ASBS Pollution Prevention Plan must be equivalent in contents to an ASBS Compliance Plan as described in I (A)(2) in this document. The ASBS Pollution Prevention Plan is subject to approval by the Executive Director of the State Water Board (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements).

b. The ASBS Pollution Prevention Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff that are necessary to comply with these special conditions, will be achieved through Management Measures and associated Management Practices (Management Measures/Practices). Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director or Regional Water Board Executive Officer that such installation would pose a threat to health or safety. Management Measures to control storm water runoff during a design storm shall achieve on average the following target levels:

(1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

(2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges.

The baseline for these determinations is the effective date of the Exception, except for those structural BMPs installed between January 1, 2005 and adoption of these Special Protections, and the reductions must be achieved and documented within six (6) years of the effective date.

c. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff or other nonpoint source pollution is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and the Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents that alter natural water quality and the sources of these constituents.

(2) The report shall describe Management Measures/Practices that are currently being implemented, Management Measures/Practices that are identified in the ASBS Pollution Prevention Plan for future implementation, and any additional Management Measures/Practices that may be added to the Pollution Prevention Plan to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the Management Measures/Practices.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of

the Regional Water Board (Regional Water Board waivers or waste discharge requirements), the discharger shall revise its ASBS Pollution Prevention Plan to incorporate any new or modified Management Measures/Practices that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised ASBS Pollution Prevention Plan, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural water quality conditions due to the same constituent.

(5) The requirements of this section are in addition to the terms, prohibitions, and conditions contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within eighteen (18) months from the effective date of the Exception, the discharger~~s~~ shall submit a draft written ASBS Pollution Prevention Plan to the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) that describes its strategy to comply with these special conditions, including the requirement to maintain natural ocean water quality in the affected ASBS. The Pollution Prevention Plan shall include a description of appropriate non-structural controls and a time schedule to implement structural controls to comply with these special conditions for inclusion in the discharger's Pollution Prevention Plan. The final ASBS Pollution Prevention Plan, including a description and final schedule for structural controls based on the results of runoff and receiving water monitoring, must be submitted within thirty (30) months from the effective date of the Exception.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these Special Protections shall be implemented.

d. Within six (6) years of the effective date of the Exception, any structural controls identified in the ASBS Pollution Prevention Plan that are necessary to comply with these special conditions shall be operational.

e. Within six (6) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board

waivers or waste discharge requirements) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. a demonstration that the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or

2. for governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

II. ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES

In addition to the provisions in Section I (A) or I (B), respectively, a discharger with parks and recreation facilities shall comply with the following:

A. The discharger shall include a section in an ASBS Compliance Plan (for NPDES dischargers) or an ASBS Pollution Prevention Plan (for nonpoint source dischargers) to address storm water runoff from parks and recreation facilities.

1. The plan shall identify all pollutant sources, including sediment sources, which may result in waste entering storm water runoff. Pollutant sources include, but are not limited to, roadside rest areas and vistas, picnic areas, campgrounds, trash receptacles, maintenance facilities, park personnel housing, portable toilets, leach fields, fuel tanks, roads, piers, and boat launch facilities.

2. The plan shall describe BMPs or Management Measures/Practices that will be implemented to control soil erosion (both temporary and permanent erosion controls) and reduce or eliminate pollutants in storm water runoff in order to achieve and maintain natural water quality conditions in the affected ASBS. The plan shall include BMPs or Management Measures/Practices to ensure that trails and culverts are maintained to prevent erosion and minimize waste discharges to ASBS.

3. The plan shall include BMPs or Management Measures/Practices to prevent the discharge of pesticides or other chemicals, including agricultural chemicals, in storm water runoff to the affected ASBS.

4. The plan shall include BMPs or Management Measures/Practices that address public education and outreach. The goal of these BMPs or Management Measures/Practices is to ensure that the public is adequately informed that waste discharges to the affected ASBS are prohibited or limited by special conditions in these Special Protections. The BMPs or Management Measures/Practices shall include signage at camping, picnicking, beach and roadside parking areas, and visitor centers, or other appropriate measures, which notify the public of any applicable requirements of these Special Protections and identify the ASBS boundaries.

5. The plan shall include BMPs or Management Measures/Practices that address the prohibition against the discharge of trash to ASBS. The BMPs or Management Measures/Practices shall include measures to ensure that adequate trash receptacles are available for public use at visitor facilities, including parking areas, and that the receptacles are adequately maintained to prevent trash discharges into the ASBS. Appropriate measures include covering trash receptacles to prevent trash from being wind blown and periodically emptying the receptacles to prevent overflows.

6. The plan shall include BMPs or Management Measures/Practices to address runoff from parking areas and other developed features to ensure that the runoff does not alter natural water quality in the affected ASBS. BMPs or Management Measures/Practices shall include measures to reduce pollutant loading in runoff to the ASBS through installation of natural area buffers (LID), treatment, or other appropriate measures.

B. Maintenance and repair of park and recreation facilities must not result in waste discharges to the ASBS. The practice of road oiling must be minimized or eliminated, and must not result in waste discharges to the ASBS.

III. ADDITIONAL REQUIREMENTS – WATERFRONT AND MARINE OPERATIONS

In addition to the provisions in Section I (A) or I (B), respectively, a discharger with waterfront and marine operations shall comply with the following:

A. For discharges related to waterfront and marine operations, the discharger shall develop a Waterfront and Marine Operations Management Plan (Waterfront Plan). This plan shall contain appropriate Management Measures/Practices to address nonpoint source pollutant discharges to the affected ASBS.

1. The Waterfront Plan shall contain appropriate Management Measures/Practices for any waste discharges associated with the operation and maintenance of vessels, moorings, piers, launch ramps, and cleaning stations in order to ensure that beneficial uses are protected and natural water quality is maintained in the affected ASBS.

2. For discharges from marinas and recreational boating activities, the Waterfront Plan shall include appropriate Management Measures, described in The Plan for California's Nonpoint Source Pollution Control Program, for marinas and recreational boating, or equivalent practices, to ensure that nonpoint source pollutant discharges do not alter natural water quality in the affected ASBS.

3. The Waterfront Plan shall include Management Practices to address public education and outreach to ensure that the public is adequately informed that waste discharges to the affected ASBS are prohibited or limited by special conditions in these Special Protections. The management practices shall include appropriate signage, or similar measures, to inform the public of the ASBS restrictions and to identify the ASBS boundaries.

4. The Waterfront Plan shall include Management Practices to address the prohibition against trash discharges to ASBS. The Management Practices shall include the provision of adequate trash receptacles for marine recreation areas, including parking areas, launch ramps, and docks. The plan shall also include appropriate Management Practices to ensure that the receptacles are adequately maintained and secured in order to prevent trash discharges into the ASBS. Appropriate Management Practices include covering the trash receptacles to prevent trash from being windblown, staking or
securing the trash receptacles so they don't tip over, and periodically emptying the receptacles to prevent overflow.

5. The discharger shall submit its Waterfront Plan to the by the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) within six months of the effective date of these special conditions. The Waterfront Plan is subject to approval by the State Water Board Executive Director or the Regional Water Board Executive Officer, as appropriate. The plan must be fully implemented within 18 months of the effective date of the Exception.

B. The discharge of chlorine, soaps, petroleum, other chemical contaminants, trash, fish offal, or human sewage to ASBS is prohibited. Sinks and fish cleaning stations are point source discharges of wastes and are prohibited from discharging into ASBS. Anthropogenic accumulations of discarded fouling organisms on the sea floor must be minimized.

C. Limited-term activities, such as the repair, renovation, or maintenance of waterfront facilities, including, but not limited to, piers, docks, moorings, and breakwaters, are authorized only in accordance with Chapter III.E.2 of the Ocean Plan.

D. If the discharger anticipates that the discharger will fail to fully implement the approved Waterfront Plan within the 18 month deadline, the discharger shall submit a technical report as soon as practicable to the State Water Board Executive Director or the Regional Water Board Executive Officer, as appropriate. The technical report shall contain reasons for failing to meet the deadline and propose a revised schedule to fully implement the plan.

E. The State Water Board or the Regional Water Board may, for good cause, authorize additional time to comply with the Waterfront Plan. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that

caused or would cause it to fail to meet the deadline in Section III.A.5. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality. The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. a demonstration of significant hardship by showing that the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate.

2. for governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

IV. MONITORING REQUIREMENTS

Monitoring is mandatory for all dischargers to assure compliance with the Ocean Plan. Monitoring requirements include both: (A) core discharge monitoring, and (B) ocean receiving water monitoring. The State and Regional Water Boards must approve sampling site locations and any adjustments to the monitoring programs. All ocean receiving water and reference area monitoring must be comparable with the Water Boards' Surface Water Ambient Monitoring Program (SWAMP).

Safety concerns: Sample locations and sampling periods must be determined considering safety issues. Sampling may be postponed upon notification to the State and Regional Water Boards if hazardous conditions prevail.

Analytical Chemistry Methods: All constituents must be analyzed using the lowest minimum detection limits comparable to the Ocean Plan water quality objectives. For metal analysis, all samples, including storm water effluent, reference samples, and ocean receiving water samples, must be analyzed by the approved analytical method with the lowest minimum detection limits (currently Inductively Coupled Plasma/Mass Spectrometry) described in the Ocean Plan.

A. CORE DISCHARGE MONITORING PROGRAM

1. General sampling requirements for timing and storm size:

Runoff must be collected during a storm event that is greater than 0.1 inch and generates runoff, and at least 72 hours from the previously measurable storm event. Runoff samples shall be collected during the same storm and at approximately the same time when post-storm receiving water is sampled, and analyzed for the same constituents as receiving water and reference site samples (see section IV B) as described below.

2. Runoff flow measurements

a. For municipal/industrial storm water outfalls in existence as of December 31, 2007, 18 inches (457mm) or greater in diameter/width (including multiple outfall pipes in combination having a width of 18 inches, runoff flows must be measured or calculated, using a method acceptable to and approved by the State and Regional Water Boards.

b. This will be reported annually for each precipitation season to the State and Regional Water Boards.

3. Runoff samples – storm events

a. For outfalls equal to or greater than 18 inches (0.46m) in diameter or width:

(1) samples of storm water runoff shall be collected during the same storm as receiving water samples and analyzed for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

(2) samples of storm water runoff shall be collected and analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

(3) If an applicant has no outfall greater than 36 inches, then storm water runoff from the applicant's largest outfall shall be further collected during the same storm as receiving water samples and analyzed for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates).

b. For outfalls equal to or greater than 36 inches (0.91m) in diameter or width:

(1) samples of storm water runoff shall be collected during the same storm as receiving water samples and analyzed for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

(2) samples of storm water runoff shall be further collected during the same storm as receiving water samples and analyzed for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates); and

(3) samples of storm water runoff shall be collected and analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

c. For an applicant not participating in a regional monitoring program [see below in Section IV (B)] in addition to (a.) and (b.) above, a minimum of the two largest outfalls or 20 percent of the larger outfalls, whichever is greater, shall be sampled (flow weighted composite samples) at least three times annually during wet weather (storm event)

and analyzed for all Ocean Plan Table A constituents, Table B constituents for marine aquatic life protection (except for toxicity, only chronic toxicity for three species shall be required), DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, and Ocean Plan indicator bacteria. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one (the largest) such discharge shall be sampled annually in each Region.

4. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may reduce or suspend core monitoring once the storm runoff is fully characterized. This determination may be made at any point after the discharge is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

B. Ocean Receiving Water and Reference Area Monitoring Program

In addition to performing the Core Discharge Monitoring Program in Section II.A above, all applicants having authorized discharges must perform ocean receiving water monitoring. In order to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS, dischargers may choose either (1) an individual monitoring program, or (2) participation in a regional integrated monitoring program.

1. Individual Monitoring Program: The requirements listed below are for those dischargers who elect to perform an individual monitoring program to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within the affected ASBS. In addition to Core Discharge Monitoring, the following additional monitoring requirements shall be met:

   a. Three times annually, during wet weather (storm events), the receiving water at the point of discharge from the outfalls described in section (IV)(A)(3)(c) above shall be sampled and analyzed for Ocean Plan Table A constituents, Table B constituents for marine aquatic life, DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, salinity, chronic toxicity (three species), and Ocean Plan indicator bacteria.

      The sample location for the ocean receiving water shall be in the surf zone at the point of discharges; this must be at the same location where storm water runoff is sampled. Receiving water shall be sampled prior to (pre-storm) and during (or immediately after) the same storm (post storm). Post storm sampling shall be during the same storm and at approximately the same time as when the runoff is sampled. Reference water quality shall also be sampled three times annually and analyzed for the same constituents pre-storm and post-storm, during the same storm seasons when receiving water is sampled. Reference stations will be determined by the State Water Board's Division of Water Quality and the applicable Regional Water Board(s).

   b. Sediment sampling shall occur at least three times during every five (5) year period. The subtidal sediment (sand or finer, if present) at the discharge shall be sampled and analyzed for Ocean Plan Table B constituents for marine aquatic life, DDT, PCBs, PAHs, pyrethroids, and OP pesticides. For sediment toxicity testing, only an acute toxicity test using the amphipod *Eohaustorius estuarius* must be performed.

c. A quantitative survey of intertidal benthic marine life shall be performed at the discharge and at a reference site. The survey shall be performed at least once every five (5) year period. The survey design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The results of the survey shall be completed and submitted to the State Water Board and Regional Water Board at least six months prior to the end of the permit cycle.

d. Once during each five (5) year period, a bioaccumulation study shall be conducted to determine the concentrations of metals and synthetic organic pollutants at representative discharge sites and at representative reference sites. The study design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The bioaccumulation study may include California mussels (*Mytilus californianus*) and/or sand crabs (*Emerita analoga* or *Blepharipoda occidentalis*). Based on the study results, the Regional Water Board and the State Water Board's Division of Water Quality, may adjust the study design in subsequent permits, or add or modify additional test organisms (such as shore crabs or fish), or modify the study design appropriate for the area and best available sensitive measures of contaminant exposure.

e. Marine Debris: Representative quantitative observations for trash by type and source shall be performed along the coast of the ASBS within the influence of the discharger's outfalls. The design, including locations and frequency, of the marine debris observations is subject to approval by the Regional Water Board and State Water Board's Division of Water Quality.

f. The monitoring requirements of the Individual Monitoring Program in this section are minimum requirements. After a minimum of one (1) year of continuous water quality monitoring of the discharges and ocean receiving waters, the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may require additional monitoring, or adjust, reduce or suspend receiving water and reference station monitoring. This determination may be made at any point after the discharge and receiving water is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

2. Regional Integrated Monitoring Program: Dischargers may elect to participate in a regional integrated monitoring program, in lieu of an individual monitoring program, to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS. This regional approach shall characterize natural water quality, pre- and post-storm, in ocean reference areas near the mouths of identified open space watersheds and the effects of the discharges on natural water quality (physical, chemical, and toxicity) in the ASBS receiving waters, and should include benthic marine aquatic life and bioaccumulation components. The design of the ASBS stratum of a regional integrated monitoring program may deviate from the otherwise prescribed individual monitoring approach (in Section IV.B.1) if approved by the State Water Board's Division of Water Quality and the Regional Water Boards.

a. Ocean reference areas shall be located at the drainages of flowing watersheds with minimal development (in no instance more than 10% development), and shall not be located in CWA Section 303(d) listed waterbodies or have tributaries that are 303(d) listed. Reference areas shall be free of wastewater discharges and anthropogenic non- storm water runoff. A minimum of low threat storm runoff discharges (e.g.

stream highway overpasses and campgrounds) may be allowed on a case-by-case basis. Reference areas shall be located in the same region as the ASBS receiving water monitoring occurs. The reference areas for each Region are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean reference water samples must be collected from each station, each from a separate storm during the same storm season that receiving water is sampled. A minimum of one reference location shall be sampled for each ASBS receiving water site sampled per responsible party. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

b. ASBS ocean receiving water must be sampled in the surf zone at the location where the runoff makes contact with ocean water (i.e. at "point zero"). Ocean receiving water stations must be representative of worst-case discharge conditions (i.e. co-located at a large drain greater than 36 inches, or if drains greater than 36 inches are not present in the ASBS then the largest drain greater than18 inches.) Ocean receiving water stations are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean receiving water samples must be collected during each storm season from each station, each from a separate storm. A minimum of one receiving water location shall be sampled in each ASBS per responsible party in that ASBS. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

c. Reference and receiving water sampling shall commence during the first full storm season following the adoption of these special conditions, and post-storm samples shall be collected during the same storm event when storm water runoff is sampled. Sampling shall occur in a minimum of two storm seasons. For those ASBS dischargers that have already participated in the Southern California Bight 2008 ASBS regional monitoring effort, sampling may be limited to only one storm season.

d. Receiving water and reference samples shall be analyzed for the same constituents as storm water runoff samples. At a minimum, constituents to be sampled and analyzed in reference and discharge receiving waters must include oil and grease, total suspended solids, Ocean Plan Table B metals for protection of marine life, Ocean Plan PAHs, pyrethroids, OP pesticides, ammonia, nitrate, phosphates, and critical life stage chronic toxicity for three species. In addition, within the range of the southern sea otter, indicator bacteria or some other measure of fecal contamination shall be analyzed.

3. Waterfront and Marine Operations: In addition to the above requirements for ocean receiving water monitoring, additional monitoring must be performed for marinas and boat launch and pier facilities:

a. For all marina or mooring field operators, in mooring fields with 10 or more occupied moorings, the ocean receiving water must be sampled for Ocean Plan indicator bacteria, residual chlorine, copper, zinc, grease and oil, methylene blue active substances (MBAS), and ammonia nitrogen.

(1) For mooring field operators opting for an individual monitoring program (Section IV.B.1 above), this sampling must occur weekly (on the weekend) from May through October.

(2) For mooring field operators opting to participate in a regional integrated monitoring program (Section IV.B.2 above), this sampling must occur monthly from May through October on a high use weekend in each month. The Water Boards may allow a reduction in the frequency of sampling, through the regional monitoring program, after the first year of monitoring.

b. For all mooring field operators, the subtidal sediment (sand or finer, if present) within mooring fields and below piers shall be sampled and analyzed for Ocean Plan Table B metals (for marine aquatic life beneficial use), acute toxicity, PAHs, and tributyltin. For sediment toxicity testing, only an acute toxicity test using the amphipod *Eohaustorius estuarius* must be performed. This sampling shall occur at least three times during a five (5) year period. For mooring field operators opting to participate in a regional integrated monitoring program, the Water Boards may allow a reduction in the frequency of sampling after the first sampling effort's results are assessed.

Glossary

At the point of discharge(s) – Means in the surf zone immediately where runoff from an outfall meets the ocean water (a.k.a., at point zero).

Areas of Special Biological Significance (ASBS) – Those areas designated by the State Water Board as ocean areas requiring protection of species or biological communities to the extent that alteration of natural water quality is undesirable. All Areas of Special Biological Significance are also classified as a subset of State Water Quality Protection Areas.

Design storm – For purposes of these Special Protections, a design storm is defined as the volume of runoff produced from one inch of precipitation per day or, if this definition is inconsistent with the discharger's applicable storm water permit, then the design storm shall be the definition included in the discharger's applicable storm water permit.

Development – Relevant to reference monitoring sites, means urban, industrial, agricultural, grazing, mining, and timber harvesting land uses.

Higher threat discharges - Permitted storm drains discharging equal to or greater than 18 inches, industrial storm drains, agricultural runoff discharged through an MS4, discharges associated with waterfront and marina operations (e.g., piers, launch ramps, mooring fields, and associated vessel support activities, except for passive discharges defined below), and direct discharges associated with commercial or industrial activities to ASBS.

Low Impact Development (LID) – A sustainable practice that benefits water supply and contributes to water quality protection. Unlike traditional storm water management, which entails collecting and conveying storm water runoff through storm drains, pipes, or other conveyances to a centralized storm water facility, LID focuses on using site design and storm water management to maintain the site's pre-development runoff rates and volumes. The goal of LID is to mimic a site's predevelopment hydrology by using design techniques that infiltrate, filter, store, evaporate, and detain runoff close to the source of rainfall.

Marine Operations – Marinas or mooring fields that contain slips or mooring locations for 10 or more vessels.

Management Measure (MM) - Economically achievable measures for the control of the addition of pollutants from various classes of nonpoint sources of pollution, which reflect the greatest degree of pollutant reduction achievable through the application of the best available nonpoint pollution control practices, technologies, processes, siting criteria, operating methods, or other alternatives. For example, in the "marinas and recreational boating" land- use category specified in the Plan for California's Nonpoint Source Pollution Control Program (NPS Program Plan) (SWRCB, 1999), "boat cleaning and maintenance" is considered a MM or the source of a specific class or type of NPS pollution.

Management Practice (MP) - The practices (e.g., structural, non-structural, operational, or other alternatives) that can be used either individually or in combination to address a specific MM class or classes of NPS pollution. For example, for the "boat cleaning and maintenance" MM, specific MPs can include, but are not limited to, methods for the selection of environmentally sensitive hull paints or methods for cleaning/removal of hull copper anti- fouling paints.

Municipal Separate Storm Sewer System (MS4) – A municipally-owned storm sewer system regulated under the Phase I or Phase II storm water program implemented in compliance with Clean Water Act section 402(p). Note that an MS4 program's boundaries are not necessarily congruent with the permittee's political boundaries.

Natural Ocean Water Quality - The water quality (based on selected physical, chemical and biological characteristics) that is required to sustain marine ecosystems, and which is without apparent human influence, *i.e.*, an absence of significant amounts of: (a) man-made constituents (*e.g.,* DDT); (b) other chemical (*e.g.,* trace metals), physical (temperature/thermal pollution, sediment burial), and biological (*e.g.*, bacteria) constituents at concentrations that have been elevated due to man's activities above those resulting from the naturally occurring processes that affect the area in question; and (c) non-indigenous biota (*e.g.,* invasive algal bloom species) that have been introduced either deliberately or accidentally by man. Discharges "*shall not alter natural ocean water quality*" as determined by a comparison to the range of constituent concentrations in reference areas agreed upon via the regional monitoring program(s). If monitoring information indicates that *natural ocean water quality* is not maintained, but there is sufficient evidence that a discharge is not contributing to the alteration of natural water quality, then the Regional Water Board may make that determination. In this case, sufficient information must include runoff sample data that has equal or lower concentrations for the range of constituents at the applicable reference area(s).

Nonpoint source – Nonpoint pollution sources generally are sources that do not meet the definition of a point source. Nonpoint source pollution typically results from land runoff, precipitation, atmospheric deposition, agricultural drainage, marine/boating operations or hydrologic modification. Nonpoint sources, for purposes of these Special Protections, include discharges that are not required to be regulated under an NPDES permit.

Non-storm water discharge – Any runoff that is not the result of a precipitation event. This is often referred to as "dry weather flow."

Non-structural control – A Best Management Practice that involves operational, maintenance, regulatory (e.g., ordinances) or educational activities designed to reduce or eliminate pollutants in runoff, and that are not structural controls (i.e. there are no physical structures involved).

Physical impossibility - Means any act of God, war, fire, earthquake, windstorm, flood or natural catastrophe; unexpected and unintended accidents not caused by discharger or its employees' negligence; civil disturbance, vandalism, sabotage or terrorism; restrain by court order or public authority or agency; or action or non-action by, or inability to

obtain the necessary authorizations or approvals from any governmental agency other than the permittee.

Representative sites and monitoring procedures – Are to be proposed by the discharger, with appropriate rationale, and subject to approval by Water Board staff.

Sheet-flow – Runoff that flows across land surfaces at a shallow depth relative to the cross- sectional width of the flow. These types of flow may or may not enter a storm drain system before discharge to receiving waters.

Storm Season – Also referred to as rainy season, means the months of the year from the onset of rainfall during autumn until the cessation of rainfall in the spring.

Structural control – A Best Management Practice that involves the installation of engineering solutions to the physical treatment or infiltration of runoff.

Surf Zone - The surf zone is defined as the submerged area between the breaking waves and the shoreline at any one time.

Surface Water Ambient Monitoring Program (SWAMP) comparable – Means that the monitoring program must 1) meet or exceed 2008 SWAMP Quality Assurance Program Management Plan (QAPP) Measurement Quality Objectives, or 2) have a Quality Assurance Project Plan that has been approved by SWAMP; in addition data must be formatted to match the database requirements of the SWAMP Information Management System. Adherence to the measurement quality objectives in the Southern California Bight 2008 ASBS Regional Monitoring Program QAPP and data base management comprises being SWAMP comparable.

Waterfront Operations - Piers, launch ramps, and cleaning stations in the water or on the adjacent shoreline.

Attachment 1
Special Protections Sections I(A)(3)(e) and I(B)(3)(e)
Flowchart to Deteremine Compliance with natural Water Quality

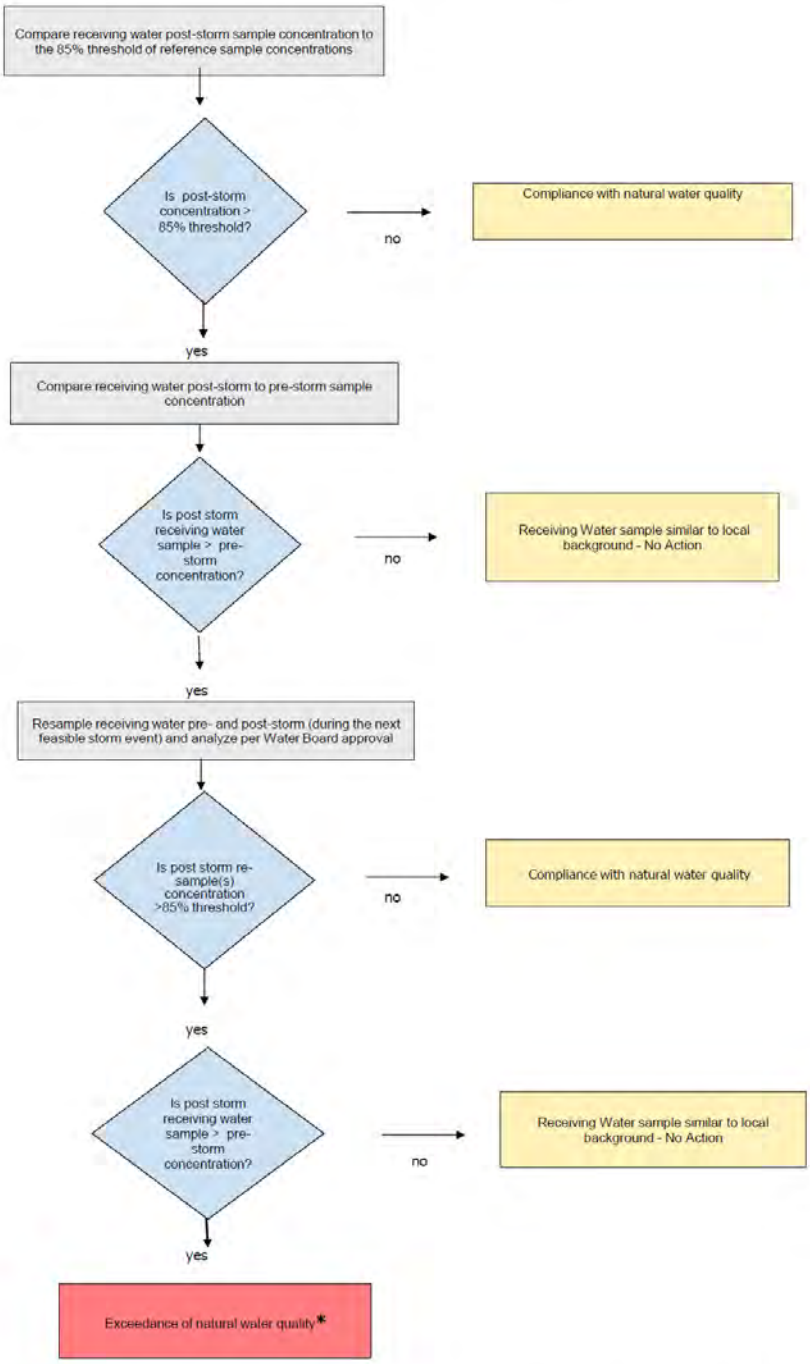

*** When an exceedance of natural water quality occurs, the discharger must comply with section I.A.2.h (for permitted storm water) or section I.B.2.c (for nonpoint sources). Note, when sampling data is available, end-of-pipe effluent concentrations will be considered by the Water Boards in making this determination.**

ATTACHMENT B

STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

1. Standard Permit Provisions

Code of Federal Regulations Title 40 Section 122.41 (40 CFR 122.41) includes conditions, or provisions, that apply to all National Pollutant Discharge Elimination System (NPDES) permits. Additional provisions applicable to NPDES permits are in 40 CFR 122.42. All applicable provisions in 40 CFR 122.41 and 40 CFR 122.42 must be incorporated into this Order and NPDES permit. The applicable 40 CFR 122.41 and 40 CFR 122.42 provisions are as follows:

a. DUTY TO COMPLY [40 CFR 122.41(a)]

The Copermittee must comply with all of the provisions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

(1) The Copermittee must comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement. [40 CFR 122.41(a)(1)]

(2) The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to a civil penalty not to exceed $25,000 per day for each violation. The CWA provides that any person who *negligently* violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than 2 years, or both. Any person who *knowingly* violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both. Any person who knowingly violates Section 301, 302, 303, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, and who knows at that time that he thereby places another person in imminent

danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.
[40 CFR 122.41(a)(2)]

(3) Any person may be assessed an administrative penalty by the San Diego Regional Water Quality Control Board (San Diego Water Board), State Water Resources Control Board (State Water Board), or United States Environmental Protection Agency (USEPA) for violating Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.
[40 CFR 122.41(a)(3)]

b. DUTY TO REAPPLY [40 CFR 122.41(b)]

If a Copermittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Copermittee must apply for and obtain a new permit.

c. NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE [40 CFR 122.41(c)]

It shall not be a defense for a Copermittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

d. DUTY TO MITIGATE [40 CFR 122.41(d)]

The Copermittee must take all reasonable steps to minimize or prevent any discharge or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

e. PROPER OPERATION AND MAINTENANCE [40 CFR 122.41(e)]

The Copermittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Copermittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by a Copermittee only when the operation is necessary to achieve compliance with the conditions of this permit.

f. PERMIT ACTIONS [40 CFR 122.41(f)]

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Copermittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

g. PROPERTY RIGHTS [40 CFR 122.41(g)]

This permit does not convey any property rights of any sort, or any exclusive privilege.

h. DUTY TO PROVIDE INFORMATION [40 CFR 122.41(h)]

The Copermittee must furnish to the San Diego Water Board, State Water Board, or USEPA within a reasonable time, any information which the San Diego Water Board, State Water Board, or USPEA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Copermittee must also furnish to the San Diego Water Board, State Water Board, or USPEA upon request, copies of records required to be kept by this permit.

i. INSPECTION AND ENTRY [40 CFR 122.41(i)]

The Copermittee must allow the San Diego Water Board, State Water Board, USEPA, and/or their authorized representative (including an authorized contractor acting as their representative), upon presentation of credentials and other documents as may be required by law, to:

(1) Enter upon the Copermittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit; [40 CFR 122.41(i)(1)]

(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit; [40 CFR 122.41(i)(2)]

(3) Inspect and photograph at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; [40 CFR 122.41(i)(3)] and

(4) Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location. [40 CFR 122.41(i)(4)]

j. MONITORING AND RECORDS [40 CFR 122.41(j)]

(1) Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity. [40 CFR 122.41(j)(1)]

(2) Except for records of monitoring information required by this permit related to the Copermittee's sewage sludge use and disposal activities, which shall be retained for

a period of at least five (5) years (or longer as required by 40 CFR Part 503), the Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time. [40 CFR 122.41(j)(2)]

(3) Records for monitoring information must include: [40 CFR 122.41(j)(3)]

(a) The date, exact place, and time of sampling or measurements; [40 CFR 122.41(j)(3)(i)]
(b) The individual(s) who performed the sampling or measurements; [40 CFR 122.41(j)(3)(ii)]
(c) The date(s) analyses were performed; [40 CFR 122.41(j)(3)(iii)]
(d) The individual(s) who performed the analyses; [40 CFR 122.41(j)(3)(iv)]
(e) The analytical techniques or methods used; [40 CFR 122.41(j)(3)(v)] and
(f) The results of such analyses. [40 CFR 122.41(j)(3)(vi)]

(4) Monitoring must be conducted according to test procedures under 40 CFR Part 136 unless another method is required under 40 CFR Subchapters N or O. [40 CFR 122.41(j)(4)]

In the case of pollutants for which there are no approved methods under 40 CFR Part 136 or otherwise required under 40 CFR Subchapters N and O, monitoring must be conducted according to a test procedure specified in the permit for such pollutants. [40 CFR 122.44(i)(1)(iv)]

(5) The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. [40 CFR 122.41(j)(5)]

k. SIGNATORY REQUIREMENT [40 CFR 122.41(k)]

(1) All applications, reports, or information submitted to the San Diego Water Board, State Water Board, or USEPA must be signed and certified. (See 40 CFR 122.22) [40 CFR 122.41(k)(1)]

(a) *For a municipality, State, Federal, or other public agency.* [All applications must be signed] by either a principal executive officer or ranking elected official. [40 CFR 122.22(a)(3)]

(b) All reports required by permits, and other information requested by the San Diego Water Board, State Water Board, or USEPA must be signed by a person described in paragraph (a) of this section, or by a duly authorized

representative of that person. A person is a duly authorized representative only if: [40 CFR 122.22(b)]

(i) The authorization is made in writing by a person described in paragraph (a) of this section; [40 CFR 122.22(b)(1)]

(ii) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company, (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) [40 CFR 122.22(b)(2)] and,

(iii) The written authorization is submitted to the San Diego Water Board and State Water Board. [40 CFR 122.22(b)(3)]

(c) *Changes to authorization.* If an authorization under paragraph (b) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (b) of this section must be submitted to the San Diego Water Board prior to or together with any reports, information, or applications to be signed by an authorized representative. [40 CFR 122.22(c)]

(d) *Certification.* Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." [40 CFR 122.22(d)]

(2) The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both. [40 CFR 122.41(k)(2)]

I. REPORTING REQUIREMENTS [40 CFR 122.41(l)]

(1) *Planned changes.* The Copermittee must give notice to the San Diego Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when: [40 CFR 122.41(l)(1)]

(a) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); [40 CFR 122.41(l)(1)(i)] or

(b) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1). [40 CFR 122.41(l)(1)(ii)]

(c) The alteration or addition results in a significant change in the Copermittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. [40 CFR 122.41(l)(1)(iii)]

(2) *Anticipated noncompliance*. The Copermittee must give advance notice to the San Diego Water Board or State Water Board of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements. [40 CFR 122.41(l)(2)]

(3) *Transfers*. This permit is not transferable to any person except after notice to the San Diego Water Board. The San Diego Water Board may require modification or revocation and reissuance of the permit to change the name of the Copermittee and incorporate such other requirements as may be necessary under the CWA. [40 CFR 122.41(l)(3)]

(4) *Monitoring reports.* Monitoring results must be reported at the intervals specified elsewhere in this permit. [40 CFR 122.41(l)(4)]

(a) Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the San Diego Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices. [40 CFR 122.41(l)(4)(i)]

(b) If the Copermittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or another method required for an industry-specific waste stream under 40 CFR Subchapters N or O, the results of this monitoring must be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the San Diego Water Board or State Water Board. [40 CFR 122.41(l)(4)(ii)]

(c) Calculations for all limitations which require averaging of measurements must utilize an arithmetic mean unless otherwise specified in the permit. [40 CFR 122.41(l)(4)(iii)]

(5) *Compliance schedules*. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date. [40 CFR 122.41(l)(5)]

(6) *Twenty-four hour reporting.*

(a) The Copermittee must report any noncompliance that may endanger health or the environment. Any information must be provided orally within 24 hours from the time the Copermittee becomes aware of the circumstances. A written submission must also be provided within five (5) days of the time the Copermittee becomes aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6)(i)]

(b) The following must be included as information which must be reported within 24 hours under this paragraph: [40 CFR 122.41(l)(6)(ii)]

(i) Any unanticipated bypass that exceeds any effluent limitation in the permit (See 40 CFR 122.41(g)). [40 CFR 122.41(l)(6)(ii)(A)]
(ii) Any upset which exceeds any effluent limitation in the permit. [40 CFR 122.41(l)(6)(ii)(B)] and,
(iii) Violation of a maximum daily discharge limitation for any of the pollutants listed by the San Diego Water Board in the permit to be reported within 24 hours. (See 40 CFR 122.44(g)) [40 CFR 122.41(l)(6)(ii)(C)]

(c) The San Diego Water Board may waive the above-required written report on a case-by-case basis if the oral report has been received within 24 hours. [40 CFR 122.41(l)(6)(iii)]

(7) *Other noncompliance.* The Copermittee must report all instances of noncompliance not reported in accordance with the standard provisions required under 40 CFR 122.41(l)(4), (5), and (6), at the time monitoring reports are submitted. The reports must contain the information listed in the standard provisions required under 40 CFR 122.41(l)(6). [40 CFR 122.41(l)(7))]

(8) *Other information.* When the Copermittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the San Diego Water Board, State Water Board, or USEPA, the Copermittee must promptly submit such facts or information. [40 CFR 122.41(l)(8)]

m. BYPASS [40 CFR 122.41(m)]

(1) *Definitions.*

(a) "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. [40 CFR 122.41(m)(1)(i)] or

(b) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or

substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
[40 CFR 122.41(m)(1)(ii)]

(2) *Bypass not exceeding limitations*. The Copermittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the standard provisions required under 40 CFR 122.41(m)(3) and (4).
[40 CFR 122.41(m)(2)]

(3) *Notice.*

(a) *Anticipated bypass*. If the Copermittee knows in advance of the need for a bypass, it must submit a notice, if possible at least ten days before the date of the bypass. [40 CFR 122.41(m)(3)(i)] or

(b) *Unanticipated bypass*. The Copermittee must submit notice of an unanticipated bypass in accordance with the standard provisions required under 40 CFR 122.41(l)(6) (24-hour notice).
[40 CFR 122.41(m)(3)(ii)]

(4) *Prohibition of Bypass.*

(a) Bypass is prohibited, and the San Diego Water Board may take enforcement action against a Copermittee for bypass, unless:
[40 CFR 122.41(m)(4)(i)]

(i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; [40 CFR 122.41(m)(4)(i)(A)]
(ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance;
[40 CFR 122.41(m)(4)(i)(B)] and,
(iii) The Copermittee submitted notice in accordance with the standard provisions required under 40 CFR 122.41(m)(3).
[40 CFR 122.41(m)(4)(i)(C)]

(b) The San Diego Water Board may approve an anticipated bypass, after considering its adverse effects, if the San Diego Water Board determines that it will meet the three conditions listed above.
[40 CFR 122.41(m)(4)(ii)]

n. UPSET [40 CFR 122.41(n)]

(1) *Definition.* "Upset" means an exceptional incident in which there is unintentional and

temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Copermittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. [40 CFR 122.41(n)(1)]

(2) *Effect of an upset*. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the standard provisions required under 40 CFR 122.41(n)(3) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. [40 CFR 122.41(n)(2)]

(3) *Conditions necessary for a demonstration of upset*. A Copermittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that: [40 CFR 122.41(n)(3)]

(a) An upset occurred and that the Copermittee can identify the cause(s) of the upset; [40 CFR 122.41(n)(3)(i)]
(b) The permitted facility was at the time being properly operated; [40 CFR 122.41(n)(3)(ii)] and
(c) The Copermittee submitted notice of the upset in accordance with the standard provisions required under 40 CFR 122.41(l)(6)(ii)(B) (24-hour notice). [40 CFR 122.41(n)(3)(iii)]
(d) The Copermittee complied with any remedial measures pursuant to the standard provisions required under 40 CFR 122.41(d). [40 CFR 122.41(n)(3)(iii)]

(4) *Burden of proof*. In any enforcement proceeding, the Copermittee seeking to establish the occurrence of an upset has the burden of proof. [40 CFR 122.41(n)(4)]

o. STANDARD PERMIT PROVISIONS FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS [40 CFR 122.42(c)]

The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the San Diego Water Board or State Water Board under 40 CFR 122.26(a)(1)(v) must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report must include:

(1) The status of implementing the components of the storm water management program that are established as permit conditions; [40 CFR 122.42(c)(1)]

(2) Proposed changes to the storm water management programs that are established as permit conditions. Such proposed changes must be consistent with 40 CFR 122.26(d)(2)(iii); [40 CFR 122.42(c)(2)] and

(3) Revisions, if necessary, to the assessment of controls and the fiscal analysis

reported in the permit application under 40 CFR 122.26(d)(2)(iv) and (v); [40 CFR 122.42(c)(3)]

(4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; [40 CFR 122.42(c)(4)]

(5) Annual expenditures and budget for year following each annual report; [40 CFR 122.42(c)(5)]

(6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; [40 CFR 122.42(c)(6)]

(7) Identification of water quality improvements or degradation. [40 CFR 122.42(c)(7)]

p. STANDARD PERMIT PROVISIONS FOR STORM WATER DISCHARGES [40 CFR 122.42(d)]

The initial permits for discharges composed entirely of storm water issued pursuant to 40 CFR 122.26(e)(7) must require compliance with the conditions of the permit as expeditiously as practicable, but in no event later than three years after the date of issuance of the permit.

2. General Provisions

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. The general provisions applicable to this Order and NPDES permit are as follows:

a. DISCHARGE OF WASTE IS A PRIVILEGE

No discharge of waste into the waters of the State, whether or not such discharge is made pursuant to waste discharge requirements, shall create a vested right to continue such discharge. All discharges of waste into waters of the State are privileges, not rights. [CWC Section 13263(g)]

b. DURATION OF ORDER AND NPDES PERMIT

(1) *Effective date*. ~~This Order and NPDES permit becomes effective on the 50th day after its adoption provided the USEPA has no objection. If the USEPA objects to its issuance, this Order shall not become effective until such objection is withdrawn.~~ This Order supersedes Order No. R9-2007-0001 for the San Diego County Copermittees listed in Table 2.a and became effective on June 27, 2013 for those Copermittees.~~upon the effective date of this Order~~. This Order as amended by Order R9-2015-0001~~, and~~ supersedes Order No~~s~~. R9-2009-0002 and becomes effective ~~fifty (50) days~~ April 1, 2015, following ~~after~~ the date Order No. R9-2015-0001 is adopted. This Order supersedes Order No. R9-2010-0016 upon ~~their expiration~~further amendment or earlier notice of coverage.

(2) *Expiration*. This Order and NPDES permit expires five years after its effective date.

[40 CFR 122.46(a)]

(3) *Continuation of expired order*. After this Order and NPDES permit expires, the terms and conditions of this Order and NPDES permit are automatically continued pending issuance of a new permit if all requirements of the federal NPDES regulations on the continuation of expired permits (40 CFR 122.6) are complied with.

c. AVAILABILITY

A copy of this Order must be kept at a readily accessible location and must be available to on-site personnel at all times.

d. CONFIDENTIALITY OF INFORMATION

Except as provided for in 40 CFR 122.7, no information or documents submitted in accordance with or in application for this Order will be considered confidential, and all such information and documents shall be available for review by the public at the San Diego Water Board office.

Claims of confidentiality for the following information will be denied:
[40 CFR 122.7(b)]

(1) The name and address of any permit applicant or Copermittee;
[40 CFR 122.7(b)(1)] and

(2) Permit applications and attachments, permits, and effluent data.
[40 CFR 122.7(b)(2)]

e. EFFLUENT LIMITATIONS

(1) *Interim effluent limitations*. The Copermittee must comply with any interim effluent limitations as established by addendum, enforcement action, or revised waste discharge requirements which have been, or may be, adopted by the San Diego Water Board.

(2) *Other effluent limitations and standards*. If any applicable toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant and that standard or prohibition is more stringent than any limitation on the pollutant in the permit, the San Diego Water Board shall institute proceedings under these regulations to modify or revoke and reissue the permit to conform to the toxic effluent standard or prohibition. [40 CFR 122.44(b)(1)]

f. DUTY TO MINIMIZE OR CORRECT ADVERSE IMPACTS

The Copermittee must take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this Order, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the noncompliance.

g. PERMIT ACTIONS

The filing of a request by the Copermittee for modification, revocation and reissuance, or termination of this Order, or a notification of planned change in or anticipated noncompliance with this Order does not stay any condition of this Order. (See 40 CFR 122.41(f)) In addition, the following provisions apply to this Order:

(1) Upon application by any affected person, or on its own motion, the San Diego Water Board may review and revise the requirements in this Order. All requirements must be reviewed periodically. [CWC Section 13263(e)]

(2) This Order may be terminated or modified for cause, including, but not limited to, all of the following: [CWC Section 13381]

(a) Violation of any condition contained in the requirements of this Order. [CWC Section 13381(a)]

(b) Obtaining the requirements in this Order by misrepresentation, or failure to disclose fully all relevant facts. [CWC Section 13381(b)]

(c) A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge. [CWC Section 13381(c)]

(3) When this Order is transferred to a new owner or operator, such requirements as may be necessary under the CWC may be incorporated into this Order.

h. NPDES PERMITTED NON-STORM WATER DISCHARGES

The San Diego Water Board has, in prior years, issued a limited number of individual NPDES permits for non-storm water discharges to MS4s. The San Diego Water Board or State Water Board may in the future, upon prior notice to the Copermittee(s), issue an NPDES permit for any non-storm water discharge (or class of non-storm water discharges) to an MS4.

i. MONITORING

In addition to the standard provisions required under 40 CFR 122.41(j) and (l)(4), the following general monitoring provisions apply to this Order:

(1) Where procedures are not otherwise specified in Order, sampling, analysis and quality assurance/quality control must be conducted in accordance with the Quality Assurance Management Plan (QAMP) for the State of California's Surface Water Ambient Monitoring Program (SWAMP), adopted by the State Water Resources Control Board (State Water Board).

(2) Pursuant to 40 CFR 122.41(j)(2) and CWC Section 13383(a), each Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring

instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five (5) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time.

(3) All chemical, bacteriological, and toxicity analyses must be conducted at a laboratory certified for such analyses by the California Department of Public Health or a laboratory approved by the San Diego Water Board.

(4) For priority toxic pollutants that are identified in the California Toxics Rule (CTR) (65 Fed. Reg. 31682), the Copermittees must instruct their laboratories to establish calibration standards that are equivalent to or lower than the Minimum Levels (MLs) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP). If a Copermittee can demonstrate that a particular ML is not attainable, in accordance with procedures set forth in 40 CFR Part 136, the lowest quantifiable concentration of the lowest calibration standard analyzed by a specific analytical procedure (assuming that all the method specified sample weights, volumes, and processing steps have been followed) may be used instead of the ML listed in Appendix 4 of the SIP. The Copermittee must submit documentation from the laboratory to the San Diego Water Board for approval prior to raising the ML for any priority toxic pollutant.

j. ENFORCEMENT

(1) The San Diego Water Board is authorized to enforce the terms of this Order under several provisions of the CWC, including, but not limited to, CWC Sections 13385, 13386, and 13387.

(2) Nothing in this Order shall be construed to protect the Copermittee from its liabilities under federal, state, or local laws.

(3) The CWC provides for civil and criminal penalties comparable to, and in some cases greater than, those provided for under the CWA.

(4) Except as provided in the standard conditions required under 40 CFR 122.41(m) and (n), nothing in this Order shall be construed to relieve the Copermittee from civil or criminal penalties for noncompliance.

(5) Nothing in this Order shall be construed to preclude the institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties to which the Copermittee is or may be subject to under Section 311 of the CWA.

(6) Nothing in this Order shall be construed to preclude institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authoring preserved by Section 510 of the CWA.

k. SEVERABILITY

The provisions of this Order are severable, and if any provision of this Order, or the

application of any provisions of this Order to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this Order shall not be affected thereby.

l. APPLICATIONS

Any application submitted by a Copermittee for reissuance or modification of this Order must satisfy all applicable requirements specified in federal regulations as well as any additional requirements for submittal of a Report of Waste Discharge specified in the CWC and the California Code of Regulations.

m. IMPLEMENTATION

All plans, reports and subsequent amendments submitted in compliance with this Order must be implemented immediately (or as otherwise specified). All submittals by Copermittees must be adequate to implement the requirements of this Order.

n. REPORT SUBMITTALS

(1) All report submittals must include an executive summary, introduction, conclusion, recommendations, and signed certified statement.

(2) Each Copermittee must submit a signed certified statement covering its responsibilities for each applicable submittal.

(3) The Principal Watershed Copermittee(s) must submit a signed certified statement covering its responsibilities for each applicable submittal and the sections of the submittals for which it is responsible.

(4) Unless otherwise directed, the Copermittees must submit one hard copy and one electronic copy of each report required under this Order to the San Diego Water Board, and one electronic copy to the USEPA.

(5) The Copermittees must submit reports and provide notifications as required by this Order to the following:

EXECUTIVE OFFICER
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
2375 NORTHSIDE DRIVE~~9174 SKY PARK COURT~~, SUITE 100
SAN DIEGO CA 92108~~23-4340~~
Telephone: ~~(858) 467-2952~~(619) 516-1990~~-~~ Fax: ~~(858) 571-6972~~(619) 516-1994

EUGENE BROMLEY
US ENVIRONMENTAL PROTECTION AGENCY
REGION IX
PERMITS ISSUANCE SECTION (W-5-1)
75 HAWTHORNE STREET
SAN FRANCISCO CA 94105

ATTACHMENT C

ACRONYMS AND ABBREVIATIONS

AMAL	Average Monthly Action Level
ASBS	Area(s) of Special Biological Significance
BMP	Best Management Practice
Basin Plan	Water Quality Control Plan for the San Diego Basin
CEQA	California Environmental Quality Act
CCR	California Code of Regulations
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWC	California Water Code
CZARA	Coastal Zone Act Reauthorization Amendments of 1990
ESAs	Environmentally Sensitive Areas
GIS	Geographic Information System
IBI	Index of Biological Integrity
LID	Low Impact Development
MDAL	Maximum Daily Action Level
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
NAL	Non-Storm Water Action Level
NAICS	North American Industry Classification System
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
ROWD	Report of Waste Discharge (application for NPDES reissuance)
SAL	Storm Water Action Level
San Diego Water Board	California Regional Water Quality Control Board, San Diego Region
SIC	Standard Industrial Classification Code
State Water Board	State Water Resources Control Board
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
WDID	Waste Discharge Identification Number
WLA	Waste Load Allocation
WQBEL	Water Quality Based Effluent Limitation

DEFINITIONS

Active/Passive Sediment Treatment - Using mechanical, electrical or chemical means to flocculate or coagulate suspended sediment for removal from runoff from construction sites prior to discharge.

Anthropogenic Litter – Trash generated from human activities, not including sediment.

Average Monthly Action Level – The highest allowable average of daily discharges over a calendar month.

Beneficial Uses - The uses of water necessary for the survival or wellbeing of man, plants, and wildlife. These uses of water serve to promote tangible and intangible economic, social, and environmental goals. "Beneficial Uses" of the waters of the State that may be protected include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. Existing beneficial uses are uses that were attained in the surface or ground water on or after November 28, 1975; and potential beneficial uses are uses that would probably develop in future years through the implementation of various control measures. "Beneficial Uses" are equivalent to "Designated Uses" under federal law. [California Water Code Section 13050(f)].

Best Management Practices (BMPs) - Defined in 40 CFR 122.2 as schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Bioassessment - The use of biological community information to evaluate the biological integrity of a water body and its watershed. With respect to aquatic ecosystems, bioassessment is the collection and analysis of samples of the benthic macroinvertebrate community together with physical/habitat quality measurements associated with the sampling site and the watershed to evaluate the biological condition (i.e. biotic integrity) of a water body.

Biofiltration - Practices that use vegetation and amended soils to detain and treat runoff from impervious areas. Treatment is through filtration, infiltration, adsorption, ion exchange, and biological uptake of pollutants.

Biological Integrity - Defined in Karr J.R. and D.R. Dudley. 1981. Ecological perspective on water quality goals. *Environmental Management* 5:55-68 as: "A balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitat of the region." Also referred to as ecosystem health.

BMP Design Manual – A plan developed to eliminate, reduce, or mitigate the impacts of runoff from development projects, including Priority Development Projects.

Chronic Toxicity – A measurement of sublethal effect (e.g. reduced growth, reproduction) to experimental test organisms exposed to an effluent or receiving waters compared to that of the

control organisms.

Clean Water Act Section 303(d) Water Body - An impaired water body in which water quality does not meet applicable water quality standards and/or is not expected to meet water quality standards, even after the application of technology based pollution controls required by the CWA. The discharge of runoff to these water bodies by the Copermittees is significant because these discharges can cause or contribute to violations of applicable water quality standards.

Construction Site – Any project, including projects requiring coverage under the Construction General Permit, that involves soil disturbing activities including, but not limited to, clearing, grading, disturbances to ground such as stockpiling, and excavation.

Contamination - As defined in the Porter-Cologne Water Quality Control Act, contamination is "an impairment of the quality of waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste whether or not waters of the State are affected."

Copermittee – A permittee to a NPDES permit that is only responsible for permit conditions relating to the discharge for which it is operator [40 CFR 122.26(b)(1)]. For the purposes of this Order, a Copermittee is one of the individual permittees identified in Tables 1a-1c of this Order.

Copermittees – All of the individual Copermittees, collectively.

Critical Channel Flow (Qc) – The channel flow that produces the critical shear stress that initiates bed movement or that erodes the toe of channel banks. When measuring Qc, it should be based on the weakest boundary material – either bed or bank.

Daily Discharge – Defined as either: (1) the total mass of the constituent discharged over the calendar day or any 24 hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g. concentration.)

The Daily Discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day, or other 24 hour period other than a day), or by the arithmetic mean of analytical results from one or more grab samples taken over the course of a day.

Development Projects - Construction, rehabilitation, redevelopment, or reconstruction of any public or private projects.

Dry Season –May 1 to September 30.

Dry Weather – Weather is considered dry if the preceding 72 hours has been without measurable precipitation (>0.1 inch).

Enclosed Bays – Enclosed bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost bay works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays do not include

inland surface waters or ocean waters.

Erosion – When land is diminished or worn away due to wind, water, or glacial ice. Often the eroded debris (silt or sediment) becomes a pollutant via storm water runoff. Erosion occurs naturally but can be intensified by land clearing activities such as farming, development, road building, and timber harvesting.

Environmentally Sensitive Areas (ESAs) - Areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; areas designated as preserves or their equivalent under the Natural Communities Conservation Program within the Cities and County of Orange; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.

Estuaries – Waters, including coastal lagoons, located at the mouth of streams that serve as areas of mixing fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and ocean water. Estuaries do not include inland surface waters or ocean waters.

Existing Development – Any area that has been developed and exists for municipal, commercial, industrial, or residential purposes, uses, or activities. May include areas that are not actively used for its originally developed purpose, but may be re-purposed or redeveloped for another use or activity.

Flow Duration – The long-term period of time that flows occur above a threshold that causes significant sediment transport and may cause excessive erosion damage to creeks and streams (not a single storm event duration). The simplest way to visualize this is to consider a histogram of pre- and post-project flows using long-term records of hourly data. To maintain pre-development flow duration means that the total number of hours (counts) within each range of flows in a flow-duration histogram cannot increase between the pre- and post-development condition. Flow duration within the range of geomorphologically significant flows is important for managing erosion.

Grading - The cutting and/or filling of the land surface to a desired slope or elevation.

Groundwater – Subsurface water that occurs beneath the water table in soils and geologic formations that are fully saturated.

Hazardous Material – Any substance that poses a threat to human health or the environment due to its toxicity, corrosiveness, ignitability, explosive nature or chemical reactivity. These also include materials named by the USEPA in 40 CFR 116 to be reported if a designated quantity of the material is spilled into the waters of the U.S. or emitted into the environment.

Hazardous Waste - Hazardous waste is defined as “any waste which, under Section 600 of Title 22 of this code, is required to be managed according to Chapter 30 of Division 4.5 of Title 22 of this code” [CCR Title 22, Division 4.5, Chapter 11, Article 1].

Household Hazardous Waste – Paints, cleaning products, and other hazardous wastes generated during home improvement or maintenance activities.

Hydromodification – The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

Illicit Connection – Any man-made conveyance or drainage system through which a non-storm water discharge to the storm water drainage system occurs or may occur. Any connection to the MS4 that conveys an illicit discharge.

Illicit Discharge - Any discharge to the MS4 that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from firefighting activities [40 CFR 122.26(b)(2)].

Inactive Areas – Areas of construction activity that are not active and those that have been active and are not scheduled to be re-disturbed for at least 14 days.

Infiltration – In the context of low impact development, infiltration is defined as the percolation of water into the ground. Infiltration is often expressed as a rate (inches per hour), which is determined through an infiltration test. In the context of non-storm water, infiltration is water other than wastewater that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow [40 CFR 35.2005(20)].

Inland Surface Waters – Includes all surface waters of the State that do not include the ocean, enclosed bays, or estuaries.

Jurisdictional Runoff Management Program Document – A written description of the specific jurisdictional runoff management measures and programs that each Copermittee will implement to comply with this Order and ensure that storm water pollutant discharges in runoff are reduced to the MEP and do not cause or contribute to a violation of water quality standards.

Low Impact Development (LID) – A storm water management and land development strategy that emphasizes conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions.

Low Impact Development Best Management Practices (LID BMPs) – LID BMPs include schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States through storm water management and land development strategies that emphasize conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions. LID BMPs include retention

practices that do not allow runoff, such as infiltration, rain water harvesting and reuse, and evapotranspiration. LID BMPs also include flow-through practices such as biofiltration that may have some discharge of storm water following pollutant reduction.

Major Outfall – As defined in the Code of Federal Regulations, a major outfall is a MS4 outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (i.e. discharge from a single conveyance other than a circular pipe which is associated with a drainage area of more than 50 acres); or, for MS4s that receive storm water from lands zoned for industrial activity (based on comprehensive zoning plans or equivalent), a MS4 outfall that discharges from a single pipe with an inside diameter of 12 inches or more or from its equivalent (i.e. discharge from other than a circular pipe associated with a drainage area of 2 acres or more).

Maximum Daily Action Level (MDAL) –The highest allowable daily discharge of a pollutant, over a calendar day (or 24 hour period). For pollutants with action levels expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with action levels expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

Maximum Extent Practicable (MEP) – The technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) for storm water that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) in combination with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than BAT. A definition for MEP is not provided either in the statute or in the regulations. Instead the definition of MEP is dynamic and will be defined by the following process over time: municipalities propose their definition of MEP by way of their runoff management programs. Their total collective and individual activities conducted pursuant to the runoff management programs becomes their proposal for MEP as it applies both to their overall effort, as well as to specific activities (e.g., MEP for street sweeping, or MEP for MS4 maintenance). In the absence of a proposal acceptable to the San Diego Water Board, the San Diego Water Board defines MEP.

In a memo dated February 11, 1993, entitled "Definition of Maximum Extent Practicable," Elizabeth Jennings, Senior Staff Counsel, SWRCB addressed the achievement of the MEP standard as follows:

> "*To achieve the MEP standard, municipalities must employ whatever Best Management Practices (BMPs) are technically feasible (i.e., are likely to be effective) and are not cost prohibitive. The major emphasis is on technical feasibility. Reducing pollutants to the MEP means choosing effective BMPs, and rejecting applicable BMPs only where other effective BMPs will serve the same purpose, or the BMPs would not be technically feasible, or the cost would be prohibitive. In selecting BMPs to achieve the MEP standard, the following factors may be useful to consider:*
>
> *a. Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?*
> *b. Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?*
> *c. Public Acceptance: Does the BMP have public support?*

d. Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?
e. Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc.?

The final determination regarding whether a municipality has reduced pollutants to the maximum extent practicable can only be made by the Regional or State Water Boards, and not by the municipal discharger. If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit derived, it would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs that would address a pollutant source, or to pick a BMP based solely on cost, which would be clearly less effective. In selecting BMPs the municipality must make a serious attempt to comply and practical solutions may not be lightly rejected. In any case, the burden would be on the municipal discharger to show compliance with its permit. After selecting a menu of BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented."

Monitoring Year – October 1 to September 30

Municipal Separate Storm Sewer System (MS4) – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designated or used for collecting or conveying storm water; (iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.26.

National Pollutant Discharge Elimination System (NPDES) - The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the CWA.

Non-Storm Water - All discharges to and from a MS4 that do not originate from precipitation events (i.e., all discharges from a MS4 other than storm water). Non-storm water includes illicit discharges and NPDES permitted discharges.

Nuisance - As defined in the Porter-Cologne Water Quality Control Act, a nuisance is "anything which meets all of the following requirements: 1) Is injurious to health, or is indecent, or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. 2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or

damage inflicted upon individuals may be unequal. 3) Occurs during, or as a result of, the treatment or disposal of wastes."

Ocean Waters – The territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the State Board's California Ocean Plan.

Order – Unless otherwise specified, refers to this Order, Order No. R9-2013-0001 (NPDES No. CAS0109266)

Outfall - Outfall means a point source as defined by 40 CFR 122.2 at the point where a municipal separate storm sewer discharges to waters of the US and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels or other conveyances which connect segments of the same stream or other waters of the US and are used to convey waters of the US.

Persistent Flow - Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

Person - A person is defined as an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof [40 CFR 122.2].

Point Source - Any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, landfill leachate collection systems, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

Pollutant - Any agent that may cause or contribute to the degradation of water quality such that a condition of pollution or contamination is created or aggravated.

Pollution - As defined in the Porter-Cologne Water Quality Control Act, pollution is "the alteration of the quality of the waters of the State by waste, to a degree which unreasonably affects either of the following: 1) The waters for beneficial uses; or 2) Facilities that serve these beneficial uses." Pollution may include contamination.

Pollution Prevention - Pollution prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control BMPs, treatment control BMPs, or disposal.

Pre-Development Runoff Conditions – Approximate flow rates and durations that exist or existed onsite before land development occurs. For new development projects, this equates to runoff conditions immediately before project construction. For redevelopment projects, this equates to runoff conditions from the project footprint assuming infiltration characteristics of the underlying soil, and existing grade. Runoff coefficients of concrete or asphalt must not be used. A redevelopment Priority Development Project must use available information pertaining to existing underlying soil type and onsite existing grade to estimate pre-development runoff conditions.

Priority Development Projects - New development and redevelopment projects defined under Provision E.3.b of Order No. R9-2013-0001.

Rainy Season (aka Wet Season) –October 1 to April 30

Receiving Waters – Waters of the United States.

Receiving Water Limitations - Waste discharge requirements issued by the San Diego Water Board typically include both: (1) "Effluent Limitations" (or "Discharge Limitations") that specify the technology-based or water-quality-based effluent limitations; and (2) "Receiving Water Limitations" that specify the water quality objectives in the Basin Plan as well as any other limitations necessary to attain those objectives. In summary, the "Receiving Water Limitations" provision is the provision used to implement the requirements of CWA section 402(p)(3)(B).

Redevelopment - The creation and/or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include trenching and resurfacing associated with utility work; resurfacing existing roadways; new sidewalk construction, pedestrian ramps, or bike lane on existing roads; and routine replacement of damaged pavement, such as pothole repair.

Regional Clearinghouse – A central location for the collection and distribution of information developed and maintained by the Copermittees including, but not limited to, plans, reports, manuals, data, contact information, and/or links to such documents and information.

Rehabilitation - Remedial measures or activities for the purpose of improving or restoring the beneficial uses of streams, channels or river systems. Techniques may vary from in-stream restoration techniques to off-line storm water management practices installed in the system corridor or upland areas, or a combination of in-stream and out of stream techniques. Rehabilitation techniques may include, but are not limited to the following: riparian zone restoration, constructed wetlands, channel modifications that improve habitat and stability, and daylighting of drainage systems.

Reporting Period – The period of information that is reported in the Water Quality Improvement Plan Annual Report. The reporting period consists of two components: 1) July 1 to June 30, consistent with the fiscal year, for the implementation of the jurisdictional runoff management programs, and 2) October 1 to September 30, consistent with the monitoring year for the monitoring and assessment programs. Together, these two time periods constitute the reporting year for the Water Quality Improvement Plan Annual Report due January 31 following the end of the monitoring year.

Retain – Keep or hold in a particular place, condition, or position without discharge to surface waters.

Retrofitting – Storm water management practice put into place after development has occurred in watersheds where the practices previously did not exist or are ineffective. Retrofitting of developed areas is intended to improve water quality, protect downstream channels, reduce

flooding, or meet other specific objectives. Retrofitting developed areas may include, but is not limited to replacing roofs with green roofs, disconnecting downspouts or impervious surfaces to drain to pervious surfaces, replacing impervious surfaces with pervious surfaces, installing rain barrels, installing rain gardens, and trash area enclosures.

Runoff - All flows in a storm water conveyance system that consists of the following components: (1) storm water (wet weather flows) and (2) non-storm water including dry weather flows.

San Diego Water Board – As used in this document the term "San Diego Water Board" is synonymous with the term "Regional Board" as defined in Water Code section 13050(b) and is intended to refer to the California Regional Water Quality Control Board for the San Diego Region as specified in Water Code Section 13200.

Sediment - Soil, sand, and minerals washed from land into water. Sediment resulting from anthropogenic sources (i.e. human induced land disturbance activities) is considered a pollutant. This Order regulates only the discharges of sediment from anthropogenic sources and does not regulate naturally occurring sources of sediment. Sediment can destroy fish-nesting areas, clog animal habitats, and cloud waters so that sunlight does not reach aquatic plants.

Source Control BMP – Land use or site planning practices, or structural or nonstructural measures that aim to prevent runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between pollutants and runoff.

Storm Water – Per 40 CFR 122.26(b)(13), means storm water runoff, snowmelt runoff and surface runoff and drainage. Surface runoff and drainage pertains to runoff and drainage resulting from precipitation events.

Structural BMPs - A subset of BMPs which detains, retains, filters, removes, or prevents the release of pollutants to surface waters from development projects in perpetuity, after construction of a project is completed.

Test of Significant Toxicity (TST) - A statistical approach used to analyze toxicity test data. The TST incorporates a restated null hypothesis, Welch's t-test, and biological effect thresholds for chronic and acute toxicity.

Total Maximum Daily Load (TMDL) - The maximum amount of a pollutant that can be discharged into a water body from all sources (point and non-point) and still maintain water quality standards. Under CWA section 303(d), TMDLs must be developed for all water bodies that do not meet water quality standards after application of technology-based controls.

Toxicity - Adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies. The water quality objectives for toxicity provided in the Basin Plan, state in part…"All waters shall be free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life….The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge."

Toxicity Identification Evaluation (TIE) - A set of procedures for identifying the specific

chemical(s) responsible for toxicity. These procedures are performed in three phases (characterization, identification, and confirmation) using aquatic organism toxicity tests.

Toxicity Reduction Evaluation (TRE) - A study conducted in a step-wise process designed to identify the causative agents of effluent or ambient toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in toxicity. The first steps of the TRE consist of the collection of data relevant to the toxicity, including additional toxicity testing, and an evaluation of facility operations and maintenance practices, and best management practices. A Toxicity Identification Evaluation (TIE) may be required as part of the TRE, if appropriate.

Treatment Control BMP – Any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media absorption or any other physical, biological, or chemical process.

Unpaved Road – Any long, narrow stretch without pavement used for traveling by motor passenger vehicles between two or more points. Unpaved roads are generally constructed of dirt, gravel, aggregate or macadam and may be improved or unimproved.

Waste - As defined in CWC Section 13050(d), "waste includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal."

Article 2 of CCR Title 23, Chapter 15 (Chapter 15) contains a waste classification system that applies to solid and semi-solid waste, which cannot be discharged directly or indirectly to water of the state and which therefore must be discharged to land for treatment, storage, or disposal in accordance with Chapter 15. There are four classifications of waste (listed in order of highest to lowest threat to water quality): hazardous waste, designated waste, non-hazardous solid waste, and inert waste.

Water Quality Objective - Numerical or narrative limits on constituents or characteristics of water designated to protect designated beneficial uses of the water. [California Water Code Section 13050 (h)]. California's water quality objectives are established by the State and Regional Water Boards in the Water Quality Control Plans. Numeric or narrative limits for pollutants or characteristics of water designed to protect the beneficial uses of the water. In other words, a water quality objective is the maximum concentration of a pollutant that can exist in a receiving water and still generally ensure that the beneficial uses of the receiving water remain protected (i.e., not impaired). Since water quality objectives are designed specifically to protect the beneficial uses, when the objectives are violated the beneficial uses are, by definition, no longer protected and become impaired. This is a fundamental concept under the Porter Cologne Act. Equally fundamental is Porter Cologne's definition of pollution. A condition of pollution exists when the water quality needed to support designated beneficial uses has become unreasonably affected or impaired; in other words, when the water quality objectives have been violated. These underlying definitions (regarding beneficial use protection) are the reason why all waste discharge requirements implementing the federal NPDES regulations require compliance with water quality objectives. (Water quality objectives are also called water quality criteria in the CWA.)

Water Quality Standards - Water quality standards, as defined in Clean Water Act section 303(c) consist of the beneficial uses (e.g., swimming, fishing, municipal drinking water supply, etc.,) of a water body and criteria (referred to as water quality objectives in the California Water Code) necessary to protect those uses. Under the Water Code, the water boards establish beneficial uses and water quality objectives in water quality control or basin plans. Together with an anti-degradation policy, these beneficial uses and water quality objectives serve as water quality standards under the Clean Water Act. In Clean Water Act parlance, state beneficial uses are called "designated uses" and state water quality objectives are called "criteria." Throughout this Order, the relevant term is used depending on the statutory scheme.

Waters of the State - Any water, surface or underground, including saline waters within the boundaries of the State [CWC section 13050 (e)]. The definition of the Waters of the State is broader than that for the Waters of the United States in that all water in the State is considered to be a Waters of the State regardless of circumstances or condition.

Waters of the United States - As defined in the 40 CFR 122.2, the Waters of the U.S. are defined as: "(a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate "wetlands;" (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters otherwise defined as waters of the United States under this definition: (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial seas; and (g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA."

Watershed - That geographical area which drains to a specified point on a water course, usually a confluence of streams or rivers (also known as drainage area, catchment, or river basin).

Wet Season (aka Rainy Season) – October 1 to April 30

Wet Weather – Weather is considered wet up to 72 hours after a storm event of 0.1 inches and greater, unless otherwise defined by another regulatory mechanism (e.g. a TMDL).

ATTACHMENT D

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM

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JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM
FY _____

I. COPERMITTEE INFORMATION			
Copermittee Name:			
Copermittee Primary Contact Name:			
Copermittee Primary Contact Information: Address: City:	County:	State:	Zip:
Telephone:	Fax:	Email:	

II. LEGAL AUTHORITY		
Has the Copermittee established adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 that complies with Order No. R9-2013-0001?	YES NO	☐ ☐
A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority?	YES NO	☐ ☐

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE		
Was an update of the jurisdictional runoff management program document required or recommended by the San Diego Water Board?	YES NO	☐ ☐
If YES to the question above, did the Copermittee update its jurisdictional runoff management program document and make it available on the Regional Clearinghouse?	YES NO	☐ ☐

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM		
Has the Copermittee implemented a program to actively detect and eliminate illicit discharges and connections to its MS4 that complies with Order No. R9-2013-0001?	YES NO	☐ ☐

Number of non-storm water discharges reported by the public	
Number of non-storm water discharges detected by Copermittee staff or contractors	
Number of non-storm water discharges investigated by the Copermittee	
Number of sources of non-storm water discharges identified	
Number of non-storm water discharges eliminated	
Number of sources of illicit discharges or connections identified	
Number of illicit discharges or connections eliminated	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

V. DEVELOPMENT PLANNING PROGRAM		
Has the Copermittee implemented a development planning program that complies with Order No. R9-2013-0001?	YES NO	☐ ☐
Was an update to the BMP Design Manual required or recommended by the San Diego Water Board?	YES NO	☐ ☐
If YES to the question above, did the Copermittee update its BMP Design Manual and make it available on the Regional Clearinghouse?	YES NO	☐ ☐

Number of proposed development projects in review	
Number of Priority Development Projects in review	
Number of Priority Development Projects approved	
Number of approved Priority Development Projects exempt from any BMP requirements	
Number of approved Priority Development Projects allowed alternative compliance	
Number of Priority Development Projects granted occupancy	

Number of completed Priority Development Projects in inventory	
Number of high priority Priority Development Project structural BMP inspections	
Number of Priority Development Project structural BMP violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM

FY _____

VI. CONSTRUCTION MANAGEMENT PROGRAM

Has the Copermittee implemented a construction management program that complies with Order No. R9-2013-0001?	YES ☐ NO ☐

Number of construction sites in inventory	
Number of active construction sites in inventory	
Number of inactive construction sites in inventory	
Number of construction sites closed/completed during reporting period	
Number of construction site inspections	
Number of construction site violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

Has the Copermittee implemented an existing development management program that complies with Order No. R9-2013-0001?	YES ☐ NO ☐

	Municipal	Commercial	Industrial	Residential
Number of facilities or areas in inventory				
Number of existing development inspections				
Number of follow-up inspections				
Number of violations				
Number of enforcement actions issued				
Number of escalated enforcement actions issued				

VIII. PUBLIC EDUCATION AND PARTICIPATION

Has the Copermittee implemented a public education program component that complies with Order No. R9-2013-0001?	YES ☐ NO ☐
Has the Copermittee implemented a public participation program component that complies with Order No. R9-2013-0001?	YES ☐ NO ☐

IX. FISCAL ANALYSIS

Has the Copermittee attached to this form a summary of its fiscal analysis that complies with Order No. R9-2013-0001?	YES ☐ NO ☐

X. CERTIFICATION

I [☐ Principal Executive Officer ☐ Ranking Elected Official ☐ Duly Authorized Representative] certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature	Date
Print Name	Title
Telephone Number	Email

ATTACHMENT E

SPECIFIC PROVISIONS FOR TOTAL MAXIMUM DAILY LOADS APPLICABLE TO ORDER NO. R9-2013-0001

These provisions implement load allocations (LAs) and wasteload allocations (WLAs) of the Total Maximum Daily Loads (TMDLs) ~~adopted~~ established by the San Diego Water Board or ~~and approved by~~ USEPA under Clean Water Act section 303(c), applicable to discharges regulated under this Order. The provisions and schedules for implementation of the TMDLs described below must be incorporated into the Water Quality Improvement Plans, required pursuant to Provision B of this Order, for the specified Watershed Management Areas.

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed
2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin
3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed
4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek
5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay
6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)
7. Total Maximum Daily Load for Sediment in Los Peñasquitos Lagoon

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2002-0123

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	August 14, 2002
State Water Board Approval Date:	July 16, 2003
Office of Administrative Law Approval Date:	September 11, 2003
US EPA Approval Date:	November 3, 2003

(3) TMDL Effective Date: September 11, 2003

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final diazinon TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must be in compliance with the final TMDL compliance requirements as of December 31, 2010.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations:

Table 1.1
Final Receiving Water Limitations Expressed as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Diazinon	Acute	0.08 µg/L	1 hour
	Chronic	0.05 µg/L	4 days

(b) Final Effluent Limitations

Discharges from the MS4s containing concentrations that do not exceed the following effluent limitations will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 1.b.(2)(a):

Table 1.2
Final Effluent Limitations Expressed as Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation	Averaging Period
Diazinon	Acute	0.072 µg/L	1 hour
	Chronic	0.045 µg/L	4 days

(c) Best Management Practices

The following BMPs for Chollas Creek must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area and implemented by the Responsible Copermittees:

(i) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 1.b.(2)(a) and/or the effluent limitations under Specific Provision 1.b.(2)(b) for Chollas Creek.

(ii) The Responsible Copermittees must implement the Diazinon Toxicity Control Plan and Diazinon Public Outreach/Education Program as described in the report titled, *Technical Report for Total Maximum Daily Load for Diazinon in Chollas Creek Watershed, San Diego County*, dated August 14, 2002, including subsequent modifications, in order to achieve the receiving water limitations under Specific Provision 1.b.(2)(a) and/or the effluent limitations under Specific Provision 1.b.(2)(b).

(iii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 1.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 1.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 1.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 1.b.(2)(c) achieves compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 1.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 1.d, to demonstrate compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The Responsible Copermittees must be in compliance with the final diazinon TMDL compliance requirements as of December 31, 2010.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls for diazinon within the Chollas Creek watershed, and calculate or estimate the annual diazinon loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment

Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 1.b.(2)(b), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0019

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	September 22, 2005
Office of Administrative Law Approval Date:	December 2, 2005
US EPA Approval Date:	February 8, 2006

(3) TMDL Effective Date: December 2, 2005

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Shelter Island Yacht Basin

(6) Responsible Copermittee: City of San Diego

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final dissolved copper TMDL compliance requirements for Shelter Island Yacht Basin consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittee must be in compliance with the final TMDL compliance requirements as of December 2, 2005.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations:

Table 2.1
Final Receiving Water Limitations Expressed as Concentrations in Shelter Island Yacht Basin

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Dissolved Copper	Acute	4.8 µg/L x WER*	1 hour
	Chronic	3.1 µg/L x WER*	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 2.b.(3)(a):

Table 2.2
Final Effluent Limitations as Expressed as Annual Loads in MS4 Discharges to Shelter Island Yacht Basin

Constituent	Effluent Limitation
Dissolved Copper	30 kg/yr*

* If the water quality objectives for dissolved copper in Shelter Island Yacht Basin are changed in the future, then the margin of safety (MOS), TMDL and allocations will be recalculated using the *Method for Recalculation of the Total Maximum Daily Load for Dissolved Copper in the Shelter Island Yacht Basin, San Diego Bay* in the Basin Plan (p. 7-14).

(c) Best Management Practices

The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 2.b.(2)(a) and/or the effluent limitations under Specific Provision 2.b.(2)(b) for Shelter Island Yacht Basin. The BMPs must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 2.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 2.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittee develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 2.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 2.b.(2)(c) achieves compliance with Specific Provisions 2.b.(3)(a), 2.b.(3)(b) and/or 2.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 2.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 2.d, to demonstrate compliance with Specific Provisions 2.b.(3)(a), 2.b.(3)(b) and/or 2.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The Responsible Copermittees must be in compliance with the final dissolved copper TMDL compliance requirements as of December 2, 2005.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

The Responsible Copermittee must monitor the effluent of its MS4 outfalls for dissolved copper, and calculate or estimate the monthly and annual dissolved copper loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.(b)(2)of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0036

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	November 16, 2005
Office of Administrative Law Approval Date:	February 1, 2006
US EPA Approval Date:	March 22, 2006

(3) TMDL Effective Date: February 1, 2006

(4) Watershed Management Area: Santa Margarita River

(5) Water Body: Rainbow Creek

(6) Responsible Copermittee: County of San Diego

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final total nitrogen and total phosphorus TMDL compliance requirements for Rainbow Creek consist of the following

(1) Final TMDL Compliance Date

The Responsible Copermittee must comply with final TMDL compliance requirements by December 31, 2021.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance date under Specific Provision 3.b.(1):

Table 3.1
Final Receiving Water Limitations Expressed as Concentrations in Rainbow Creek

Constituent	Receiving Water Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing concentrations that do not exceed the following effluent limitations by the compliance date under Specific Provision 3.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 3.b.(2)(a):

Table 3.2
Final Effluent Limitations Expressed as Concentrations in MS4 Discharges to Rainbow Creek

Constituent	Effluent Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(ii) Annual pollutant loads from given land uses discharging to and from the MS4s that do not exceed the following annual loads by the compliance date under Specific Provision 3.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 3.b.(2)(a):

Table 3.3
Final Effluent Limitations Expressed as Annual Loads in MS4 Discharges to Rainbow Creek

Land Use	Total N	Total P
Commercial nurseries	116 kg/yr	3 kg/yr
Park	3 kg/yr	0.1 kg/yr
Residential areas	149 kg/yr	12 kg/yr
Urban areas	27 kg/yr	6 kg/yr

(c) Best Management Practices

(i) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 3.b.(2)(a) and/or the effluent limitations under Specific Provision 3.b.(2)(b) for Rainbow Creek.

(ii) The Responsible Copermittee should coordinate any BMPs implemented to address this TMDL with Caltrans and other sources as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under

Specific Provision 3.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 3.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the final effluent limitations under Specific Provision 3.b.(2)(b)(ii); OR

(e) The Responsible Copermittee develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 3.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Specific Provision 3.b.(2)(c) achieves compliance with Specific Provisions 3.b.(3)(a), 3.b.(3)(b), 3.b.(3)(c) and/or 3.b.(3)(d),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 3.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 3.d, to demonstrate compliance with Specific Provisions 3.b.(3)(a), 3.b.(3)(b), 3.b.(3)(c) and/or 3.b.(3)(d).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim total nitrogen and total phosphorus TMDL compliance requirements for Rainbow Creek consist of the following:

(1) Interim Compliance Dates and WQBELs

The Responsible Copermittee must comply with the interim WQBELs, expressed as annual loads, by December 31 of the interim compliance year given in Table 3.4.

Table 3.4
Interim Water Quality Based Effluent Limitations Expressed as Annual Loads in MS4 Discharges from Specific Land Uses to Rainbow Creek

	Total N Interim Effluent Limitations (kg/yr)			Total P Interim Effluent Limitations (kg/yr)		
	Interim Compliance Date			Interim Compliance Date		
Land Use	**2009**	**2013**	**2017**	**2009**	**2013**	**2017**
Commercial nurseries	390	299	196	20	16	10
Park	5	3	3	0.15	0.10	0.10
Residential areas	507	390	260	99	74	47
Urban areas	40	27	27	9	6	6

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 3.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 3.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the final effluent limitations under Specific Provision 3.b.(2)(b)(ii); OR

(e) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the interim effluent limitations under Specific Provision 3.c.(1); OR

(f) The Responsible Copermittee has submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittee must incorporate into the Water Quality Improvement Plan and implement the Sampling and Analysis Plan for Rainbow Creek Nutrient Reduction TMDL Implementation Water Quality Monitoring, dated January 2010.

(2) The results of any monitoring conducted during the reporting period, and assessment of whether the interim and final TMDL compliance requirements have been achieved must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 3.b.(2)(b)(i), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2007-0043

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2007
State Water Board Approval Date:	July 15, 2008
Office of Administrative Law Approval Date:	October 22, 2008
US EPA Approval Date:	December 18, 2008

(3) TMDL Effective Date: October 22, 2008

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final dissolved copper, lead, and zinc TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must comply with the final TMDL compliance requirements by October 22, 2028.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance date under Specific Provision 4.b.(1):

Table 4.1
Final Receiving Water Limitations Expressed as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$(0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$(0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$(0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$(0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations by the compliance date under Specific Provision 4.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 4.b.(2)(a):

Table 4.2
Final Effluent Limitations as Expressed Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(c) Best Management Practices

(i) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 4.b.(2)(a) and/or the effluent limitations under Specific Provision 4.b.(2)(b) for Chollas Creek.

(ii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans and the U.S. Navy as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 4.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 4.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 4.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 4.b.(2)(c) achieves compliance with Specific Provisions 4.b.(3)(a), 4.b.(3)(b) and/or 4.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 4.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 4.d, to demonstrate compliance with Specific Provisions 4.b.(3)(a), 4.b.(3)(b) and/or 4.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim dissolved copper, lead, and zinc TMDL compliance requirements for Chollas Creek consist of the following:

(1) Interim Compliance Date and WQBELs

The Responsible Copermittee must comply with the interim WQBELs, expressed as concentrations, by the interim compliance date given in Table 4.3:

Table 4.3
Interim Water Quality Based Effluent Limitations Expressed as Concentrations in MS4 Discharges to Chollas Creek

Interim Compliance Date	Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
October 22, 2018	Dissolved Copper	Acute	$1.2 \times 90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
	Dissolved Lead	Acute	$1.2 \times 90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
	Dissolved Zinc	Acute	$1.2 \times 90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 4.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 4.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) There are no exceedances of the interim effluent limitations under Specific

Provision 4.c.(1) at the Responsible Copermittee's MS4 outfalls; OR

(e) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance date.

d. Specific Monitoring and Assessment Requirements

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*, when it is amended to include monitoring requirements for the Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls discharging to Chollas Creek for dissolved copper, lead, and zinc, and calculate or estimate the monthly and annual dissolved copper, lead, and zinc loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 4.b.(2)(b) or 4.c.(1), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2008-0027

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 11, 2008
State Water Board Approval Date:	June 16, 2009
Office of Administrative Law Approval Date:	September 15, 2009
US EPA Approval Date:	October 26, 2009

(3) TMDL Effective Date: September 15, 2009

(4) Watershed Management Areas: See Table 5.0

(5) Water Bodies: See Table 5.0

(6) Responsible Copermittees: See Table 5.0

Table 5.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County	Dana Point Harbor	Baby Beach	-City of Dana Point -County of Orange
San Diego Bay	San Diego Bay	Shelter Island Shoreline Park	- San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final indicator bacteria TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Final TMDL Compliance Dates

(a) Baby Beach in Dana Point Harbor

The Responsible Copermittees for MS4 discharges to Baby Beach must be in compliance with the final TMDL compliance requirements according to the following compliance dates:

Table 5.1
Compliance Dates to Achieve Final TMDL Compliance Requirements For Baby Beach in Dana Point Harbor

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform	September 15, 2014	September 15, 2009
Fecal Coliform		September 15, 2009
Enterococcus		September 15, 2019

(b) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park must be in compliance with the final TMDL compliance requirements as of December 31, 2012.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance dates under Specific Provision 5.b.(1):

Table 5.2
Final Receiving Water Limitations Expressed as Bacteria Densities in the Water Body

	Receiving Water Limitations	
Constituent	Single Sample Maximum[1,2]	30-Day Geometric Mean[2]
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing indicator bacteria densities that do not exceed the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.3a
Final Effluent Limitations as Expressed as Bacteria Densities in MS4 Discharges to the Water Body

	Effluent Limitations	
Constituent	**Single Sample Maximum[1,2]**	**30-Day Geometric Mean[2]**
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.

(ii) Discharges from the MS4s containing indicator bacteria loads that do not exceed the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.4a
Final Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to the Baby Beach in Dana Point Harbor

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0.86×10^9 MPN/day	$3{,}254 \times 10^9$ MPN/30days
Fecal Coliform	0.17×10^9 MPN/day	112×10^9 MPN/30days
Enterococcus	0.03×10^9 MPN/day	114×10^9 MPN/30days

Table 5.4b
Final Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to the Shelter Island Shoreline Park in San Diego Bay

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0 MPN/day	198×10^9 MPN/30days
Fecal Coliform	0 MPN/day	8×10^9 MPN/30days
Enterococcus	0 MPN/day	26×10^9 MPN/30days

(iii) Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.5a
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to Baby Beach in Dana Point Harbor*

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	90.4%	0%
Fecal Coliform	82.7%	0%
Enterococcus	96.2%	62.2%

Notes:
* The percent load reductions are relative to data collected between 1996-2002. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittees' MS4s must not exceed the loads in Table 5.4a, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the water body.

Table 5.5b
*Final Effluent Limitations Expressed as Percent Load Reductions** in MS4 Discharges to Shelter Island Shoreline Park in San Diego Bay*

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0%	0%
Fecal Coliform	0%	0%
Enterococcus	0%	0%

Notes:
* The percent load reductions are relative to data collected between 1999-2004. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittee's MS4s must not exceed the loads in Table 5.4b, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the water body.

(c) Best Management Practices

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 5.0 must incorporate the Bacteria Load Reduction Plan (BLRP) required to be developed pursuant to Resolution No. R9-2008-0027.

(ii) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 5.b.(2)(a) and/or the effluent limitations under Specific Provision 5.b.(2)(b) for the segments or areas of the water bodies listed in Table 5.0

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.b.(2)(b)(ii); OR

(e) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 5.b.(2)(b)(iii); OR

(f) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(g) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 5.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 5.b.(2)(c) achieves compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 5.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 5.d, to demonstrate compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim indicator bacteria TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Baby Beach in Dana Point Harbor

(a) Interim TMDL Compliance Dates and WQBELs

The Responsible Copermittees for MS4 discharges to Baby Beach must comply with the following interim WQBELs by the interim compliance dates given in Tables 5.6a and/or 5.6b:

Table 5.6a
Interim Water Quality Based Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to Baby Beach in Dana Point Harbor

Constituent	Interim Compliance Dates	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	4.93×10^9 MPN/day	$3{,}254 \times 10^9$ MPN/30days*
Fecal Coliform	September 15, 2012	0.59×10^9 MPN/day	112×10^9 MPN/30days*
Enterococcus	September 15, 2012	0.42×10^9 MPN/day	301×10^9 MPN/30days
	September 15, 2016	0.03×10^9 MPN/day *	207×10^9 MPN/30days

Notes:
* Same as the final effluent limitations in Table 5.4a.

Table 5.6b
Interim Water Quality Based Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to Baby Beach in Dana Point Harbor*

Constituent	Interim Compliance Dates	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	45.2%	0%**
Fecal Coliform	September 15, 2012	41.4%	0%**
Enterococcus	September 15, 2012	48.1%	0%
	September 15, 2016	96.2%**	31.1%

Notes:
* The percent load reductions are relative to data collected between 1996-2002. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittees' MS4s must not exceed the loads in Table 5.6a, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the waterbody.
** Same as the final effluent limitations in Table 5.5a.

(b) Interim Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(i) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(ii) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(iii) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(iv) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.b(2)(b)(ii); OR

(v) The Responsible Copermittees can demonstrate that exceedances of the applicable receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(vi) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the interim effluent limitations under Table 5.6a of Specific Provision 5.c.(1)(a); OR

(vii) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the interim effluent limitations under Table 5.6b of Specific Provision 5.c.(1)(a); OR

(viii) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

(2) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park must be in compliance with the final indicator bacteria TMDL requirements as of December 31, 2012.

d. Specific Monitoring and Assessment Requirements

(1) Monitoring Stations

Monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[33] If discharges of bacteria from the MS4 exceed the applicable interim or final WQBELs, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(2) Monitoring Procedures

(a) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) The Responsible Copermittees must collect wet weather monitoring samples within the first 24 hours of a storm event[34] of the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(c) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

[33] Commonly referred to as AB 411 monitoring
[34] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs have been achieved.

(b) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 5.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(c) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to correlate elevated bacteria levels with known or suspected sewage spills from wastewater collection systems and treatment plants or boats.

(d) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2010-0001

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 10, 2010
State Water Board Approval Date:	December 14, 2010
Office of Administrative Law Approval Date:	April 4, 2011
US EPA Approval Date:	June 22, 2011

(3) TMDL Effective Date: April 4, 2011

(4) Watershed Management Areas: See Table 6.0

(5) Water Bodies: See Table 6.0

(6) Responsible Copermittees: See Table 6.0

Table 6.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	-City of Laguna Beach -County of Orange -Orange County Flood Control District
		at Heisler Park - North	
	Pacific Ocean Shoreline	at Main Laguna Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Woods -County of Orange -Orange County Flood Control District
		Laguna Beach at Ocean Avenue	
		Laguna Beach at Cleo Street	
		Arch Cove at Bluebird Canyon Road	
		Laguna Beach at Dumond Drive	
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Hills -City of Laguna Niguel -City of Laguna Woods -City of Lake Forest -City of Mission Viejo -County of Orange -Orange County Flood Control District
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	
	Aliso Creek Mouth	at mouth	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	-City of Dana Point -City of Laguna Beach -City of Laguna Niguel -County of Orange -Orange County Flood Control District
		Aliso Beach at Table Rock Drive	
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)	
		at Salt Creek (large outlet)	
		Salt Creek Beach at Salt Creek service road	
		Salt Creek Beach at Strand Road	
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	-City of Dana Point -City of Laguna Hills -City of Laguna Niguel -City of Mission Viejo -City of Rancho Santa Margarita -City of San Juan Capistrano -County of Orange -Orange County Flood Control District
	San Juan Creek	lower 1 mile	
	San Juan Creek Mouth	at mouth	
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	-City of Dana Point -City of San Clemente -County of Orange -Orange County Flood Control District
		Ole Hanson Beach Club Beach at Pico Drain	
		San Clemente City Beach at El Portal Street Stairs	
		San Clemente City Beach at Mariposa Street	
		San Clemente City Beach at Linda Lane	
		San Clemente City Beach at South Linda Lane	
		San Clemente City Beach at Lifeguard Headquarters	
		under San Clemente Municipal Pier	
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	
		San Clemente State Beach at Riviera Beach	
		Can Clemente State Beach at Cypress Shores	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	-City of Oceanside -City of Vista -County of San Diego
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	-City of Carlsbad -City of Encinitas -City of Escondido -City of San Marcos -County of San Diego
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	-City of Del Mar -City of Escondido -City of Poway -City of San Diego -City of Solana Beach -County of San Diego
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	-City of Del Mar -City of Poway -City of San Diego -County of San Diego
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	-City of San Diego
		La Jolla Shores Beach at Caminito del Oro	
		La Jolla Shores Beach at Vallecitos	
		La Jolla Shores Beach at Avenida de la Playa	
		at Casa Beach, Children's Pool	
		South Casa Beach at Coast Boulevard	
		Whispering Sands Beach at Ravina Street	
		Windansea Beach at Vista de la Playa	
		Windansea Beach at Bonair Street	
		Windansea Beach at Playa del Norte	
		Windansea Beach at Palomar Avenue	
		at Tourmaline Surf Park	
		Pacific Beach at Grand Avenue	
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I- Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	-City of El Cajon -City of Santee -County of San Diego
	San Diego River	lower 6 miles	-City of El Cajon -City of La Mesa -City of San Diego -City of Santee -County of San Diego
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	-City of La Mesa -City of Lemon Grove -City of San Diego -County of San Diego - San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final indicator bacteria TMDL compliance requirements for the water bodies listed in Table 6.0 consist of the following:

(1) Final TMDL Compliance Dates

The Responsible Copermittees for MS4 discharges to the water bodies listed in Table 6.0 must be in compliance with the final TMDL compliance requirements according to the following compliance dates:

Table 6.1
Compliance Dates to Achieve Final TMDL Compliance Requirements

Constituent	Dry Weather TMDL Compliance Date	Wet Weather TMDL Compliance Date
Total Coliform	April 4, 2021	April 4, 2031
Fecal Coliform		
Enterococcus		

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance dates under Specific Provision 6.b.(1):

Table 6.2a
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Beaches

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform	10,000	22%	1,000	0%
Fecal Coliform	400	22%	200	0%
Enterococcus	104	22%	35	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan.

Table 6.2b
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Creeks

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Fecal Coliform	400	22%	200	0%
Enterococcus	61 (104)	22%	33	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Basin Plan.
d. A single sample maximum of 104 MPN/100ml for *Enterococcus* may be applied as a receiving water limitation for creeks, instead of 61 MPN/100mL, if one or more of the creeks addressed by these TMDLs (San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek, San Diego River, and/or Chollas Creek) is designated with a "moderately to lightly used area" or less frequent usage frequency in the Basin Plan. Otherwise, the single sample maximum of 61 MPN/100mL for *Enterococcus* must be used to assess compliance with the allowable exceedance frequency.

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing indicator bacteria densities that do not exceed the following effluent limitations by the compliance dates under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a):

Table 6.2c
Final Effluent Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies in MS4 Discharges to the Water Body

Constituent	Concentration-Based Effluent Limitations			
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform[d]	10,000	22%	1,000	0%
Fecal Coliform	400	22%	200	0%
Enterococcus	104[e] / 61[f]	22%	35[e] / 33[f]	0%

Notes:
a. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan for discharges to beaches, and the Basin Plan for discharges to creeks and creek mouths.
d. Total coliform effluent limitations only apply to MS4 outfalls that discharge to the Pacific Ocean Shorelines and creek mouths listed in Table 6.0.
e. This *Enterococcus* effluent limitation applies to MS4 discharges to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
f. This *Enterococcus* effluent limitation applies to MS4 discharges to segments or areas of creeks or creek mouths listed in Table 6.0.

(ii) Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the compliance dates under Specific Provision 6.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a):

Table 6.3
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	*Watershed and Water Bodies*	*Load-Based Effluent Limitations*					
		Dry Weather			*Wet Weather*		
		Total Coliform	*Fecal Coliform*	*Entero-coccus*	*Total Coliform*	*Fecal Coliform*	*Entero-coccus*
South Orange County	San Joaquin Hills HSA (901.11) and Laguna Hills HSA (901.12) - Pacific Ocean Shoreline	91.78%	91.72%	98.28%	46.85%	52.07%	51.26%
	Aliso HSA (901.13) - Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	95.47%	95.58%	99.13%	25.29%	26.62%	27.52% (27.37%)**
	Dana Point HSA (901.14) - Pacific Ocean Shoreline	95.04%	95.03%	98.98%	13.15%	14.86%	15.16%
	Lower San Juan HSA (901.27) - Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	72.96%	74.21%	94.94%	19.21%	12.82%	27.12% (26.90%)**
	San Clemente HA (901.30) - Pacific Ocean Shoreline	94.28%	94.23%	98.83%	23.85%	24.58%	25.26%
San Luis Rey River	San Luis Rey HU (903.00) - Pacific Ocean Shoreline	38.13%	39.09%	87.38%	5.62%	3.12%	11.69%

Table 6.3 (Cont'd)
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watershed and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
Carlsbad	San Marcos HA (904.50) - Pacific Ocean Shoreline	82.82%	82.55%	96.03%	18.47%	18.98%	20.19%
San Dieguito River	San Dieguito HU (905.00) - Pacific Ocean Shoreline	14.39%	20.72%	83.48%	4.29%	1.46%	7.72%
Penasquitos	Miramar Reservoir HA (906.10) - Pacific Ocean Shoreline	96.50%	96.59%	99.42%	1.61%	1.99%	1.93%
Mission Bay	Scripps HA (906.30) - Pacific Ocean Shoreline	96.44%	96.42%	99.25%	16.32%	21.14%	18.82%
	Tecolote HA (906.50) - Tecolote Creek	94.51%	94.59%	98.94%	16.51%	20.47%	18.15% (18.08%)**
San Diego River	Mission San Diego HSA (907.11) and Santee HSA (907.12) - Pacific Ocean Shoreline - Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles)	74.03%	69.44%	93.96%	38.14%	53.22%	42.74% (42.47%)**
San Diego Bay	Chollas HSA (908.22) - Chollas Creek	92.06%	92.15%	98.46%	17.82%	24.84%	21.46% (21.36%)**

Notes:
* The percent load reductions are based on reducing loads compared to pollutant loads from 2001 to 2002.
** The alternative *Enterococcus* percent load reduction was calculated based on a numeric target of 104 MPN/100mL instead of 61 MPN/100mL, protective of the REC-1 "moderately to lightly used area" usage frequency that is protective of freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative pollutant load reductions can be utilized.

(c) Best Management Practices

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 6.0 must incorporate the Comprehensive Load Reduction Plans (CLRPs) required to be developed pursuant to Resolution No. R9-2010-0001.

(ii) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 6.b.(2)(a) and/or the effluent limitations under Specific Provision 6.b.(2)(b) for the segments or areas of the water bodies listed in Table 6.0.

(iii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans, owners/operators of small MS4s, and agricultural dischargers as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(f) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 6.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 6.b.(2)(c) achieves compliance with Specific Provisions 6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), and/or 6.b.(3)(e),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 6.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 6.d, to demonstrate compliance with Specific Provisions 6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), 6.b.(3)(e) and/or 6.b.(3)(f).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim indicator bacteria TMDL compliance requirements for the water bodies listed in Table 6.0 consist of the following:

(1) Interim TMDL Compliance Dates

The Responsible Copermittees must achieve compliance with the interim TMDL compliance requirements, as determined in accordance with Specific Provision 6.c.(3), by the interim compliance dates given in Table 6.4, unless alternative interim compliance dates are accepted by the San Diego Water Board Executive Officer as part of the Water Quality Improvement Plan.

Table 6.4
Interim Compliance Dates to Achieve Interim TMDL Compliance Requirements

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	April 4, 2016	April 4, 2021
		at Heisler Park - North		
	Pacific Ocean Shoreline	at Main Laguna Beach	April 4, 2016	April 4, 2021
		Laguna Beach at Ocean Avenue		
		Laguna Beach at Cleo Street		
		Arch Cove at Bluebird Canyon Road		
		Laguna Beach at Dumond Drive		
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	April 4, 2016	April 4, 2021
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	April 4, 2018	April 4, 2021
	Aliso Creek Mouth	at mouth	April 4, 2018	April 4, 2021
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	April 4, 2016	April 4, 2021
		Aliso Beach at Table Rock Drive		
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)		
		at Salt Creek (large outlet)		
		Salt Creek Beach at Salt Creek service road	April 4, 2017	April 4, 2021
		Salt Creek Beach at Strand Road	April 4, 2017	April 4, 2021

Table 6.4 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates	
			Interim Dry Weather WQBELs	Interim Wet Weather WQBELs
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	April 4, 2016	April 4, 2021
	San Juan Creek	lower 1 mile	April 4, 2018	April 4, 2021
	San Juan Creek Mouth	at mouth	April 4, 2016	April 4, 2021
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	April 4, 2016	April 4, 2021
		Ole Hanson Beach Club Beach at Pico Drain	April 4, 2016	April 4, 2021
		San Clemente City Beach at El Portal Street Stairs	April 4, 2017	April 4, 2021
		San Clemente City Beach at Mariposa Street		
		San Clemente City Beach at Linda Lane	April 4, 2016	April 4, 2021
		San Clemente City Beach at South Linda Lane	April 4, 2018	April 4, 2021
		San Clemente City Beach at Lifeguard Headquarters	April 4, 2017	April 4, 2021
		under San Clemente Municipal Pier		
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	April 4, 2018	April 4, 2021
		San Clemente State Beach at Riviera Beach	April 4, 2016	April 4, 2021
		Can Clemente State Beach at Cypress Shores	April 4, 2017	April 4, 2021
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	April 4, 2017	April 4, 2021
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	April 4, 2016	April 4, 2021
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	April 4, 2016	April 4, 2021

Table 6.4 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates	
			Interim Dry Weather WQBELs	Interim Wet Weather WQBELs
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	April 4, 2016	April 4, 2021
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	April 4, 2016	April 4, 2021
		La Jolla Shores Beach at Caminito del Oro		
		La Jolla Shores Beach at Vallecitos		
		La Jolla Shores Beach at Avenida de la Playa		
		at Casa Beach, Children's Pool		
		South Casa Beach at Coast Boulevard		
		Whispering Sands Beach at Ravina Street		
		Windansea Beach at Vista de la Playa		
		Windansea Beach at Bonair Street		
		Windansea Beach at Playa del Norte		
		Windansea Beach at Palomar Avenue		
		at Tourmaline Surf Park		
		Pacific Beach at Grand Avenue		
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries		
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	April 4, 2018	April 4, 2021
	San Diego River	lower 6 miles		
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach		
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	April 4, 2018	April 4, 2021

(2) Interim Water Quality Based Effluent Limitations

The Responsible Copermittees for discharges to the water bodies in Table 6.0 must comply with the following interim WQBELs by the interim compliance dates given in Specific Provision 6.c.(1):

(a) Interim Receiving Water Limitations

(i) *Interim Dry Weather Receiving Water Limitations*

The Responsible Copermittee must calculate the "existing" exceedance frequencies of the 30-day geometric mean water quality objectives for each of the indicator bacteria by analyzing the available monitoring data collected between January 1, 1996 and December 31, 2002. "Existing" exceedance frequencies may be calculated by water body and/or by Watershed Management Area listed in Table 6.0. Separate "existing" exceedance frequencies must be calculated for beaches and creeks/creek mouths.

The Responsible Copermittees must achieve a 50 percent reduction in the "existing" exceedance frequency of the 30-day geometric mean WQBELs for the water bodies listed in Table 6.0 by the interim compliance dates given in Table 6.4. A 50 percent reduction in the "existing" exceedance frequency is equivalent to half of the "existing" exceedance frequency of the 30-day geometric mean WQBELs.

The "existing" exceedance frequencies and the interim dry weather allowable exceedance frequencies (i.e. interim dry weather receiving water limitations) calculated by the Responsible Copermittees must be included in the Water Quality Improvement Plans for the applicable Watershed Management Areas.

(ii) *Interim Wet Weather Receiving Water Limitations*

The Responsible Copermittees must achieve the interim wet weather receiving water limitations in Table 6.5, expressed as interim wet weather allowable exceedance frequencies, by the interim compliance dates given in Table 6.4.

Table 6.5
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	38%	37%	39%
		at Heisler Park - North			
	Pacific Ocean Shoreline	at Main Laguna Beach			
		Laguna Beach at Ocean Avenue			
		Laguna Beach at Cleo Street			
		Arch Cove at Bluebird Canyon Road			
		Laguna Beach at Dumond Drive			
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	41%	41%	42%
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	41%	41%	42%
	Aliso Creek Mouth	at mouth	41%	41%	42%
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	36%	36%	36%
		Aliso Beach at Table Rock Drive			
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)			
		at Salt Creek (large outlet)			
		Salt Creek Beach at Salt Creek service road			
		Salt Creek Beach at Strand Road			

Table 6.5 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	44%	44%	48%
	San Juan Creek	lower 1 mile	44%	44%	47%
	San Juan Creek Mouth	at mouth	44%	44%	47%
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	35%	35%	36%
		Ole Hanson Beach Club Beach at Pico Drain			
		San Clemente City Beach at El Portal Street Stairs			
		San Clemente City Beach at Mariposa Street			
		San Clemente City Beach at Linda Lane			
		San Clemente City Beach at South Linda Lane			
		San Clemente City Beach at Lifeguard Headquarters			
		under San Clemente Municipal Pier			
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)			
		San Clemente State Beach at Riviera Beach			
		Can Clemente State Beach at Cypress Shores			
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	45%	44%	47%
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	40%	40%	41%
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	33%	33%	36%

Table 6.5 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	26%	26%	26%
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	37%	37%	37%
		La Jolla Shores Beach at Caminito del Oro			
		La Jolla Shores Beach at Vallecitos			
		La Jolla Shores Beach at Avenida de la Playa			
		at Casa Beach, Children's Pool			
		South Casa Beach at Coast Boulevard			
		Whispering Sands Beach at Ravina Street			
		Windansea Beach at Vista de la Playa			
		Windansea Beach at Bonair Street			
		Windansea Beach at Playa del Norte			
		Windansea Beach at Palomar Avenue			
		at Tourmaline Surf Park			
		Pacific Beach at Grand Avenue			
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries	49%	49%	51%
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	46%	43%	49%
	San Diego River	lower 6 miles	46%	43%	49%
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	46%	43%	51%
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	41%	41%	43%

(b) Interim Effluent Limitations

Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the interim compliance dates under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.c.(2)(a):

Table 6.6
Interim Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	*Watersheds and Water Bodies*	*Load-Based Effluent Limitations*					
		Dry Weather			*Wet Weather*		
		Total Coliform	*Fecal Coliform*	*Entero-coccus*	*Total Coliform*	*Fecal Coliform*	*Entero-coccus*
South Orange County	San Joaquin Hills HSA (901.11) and Laguna Hills HSA (901.12) - Pacific Ocean Shoreline	45.89%	45.86%	49.14%	23.43%	26.04%	25.63%
	Aliso HSA (901.13) - Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	47.74%	47.79%	49.57%	12.65%	13.31%	13.76% (13.69%)**
	Dana Point HSA (901.14) - Pacific Ocean Shoreline	47.52%	47.52%	49.49%	6.58%	7.43%	7.58%
	Lower San Juan HSA (901.27) - Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	36.48%	37.11%	47.47%	9.61%	6.41%	13.56% (13.45%)**
	San Clemente HA (901.30) - Pacific Ocean Shoreline	47.14%	47.12%	49.42%	11.93%	12.29%	12.63%
San Luis Rey River	San Luis Rey HU (903.00) - Pacific Ocean Shoreline	19.07%	19.55%	43.69%	2.81%	1.56%	5.85%
Carlsbad	San Marcos HA (904.50) - Pacific Ocean Shoreline	41.41%	41.28%	48.02%	9.24%	9.49%	10.10%

Table 6.6 (Cont'd)
Interim Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watersheds and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
San Dieguito River	San Dieguito HU (905.00) - Pacific Ocean Shoreline	7.20%	10.36%	41.74%	2.15%	0.73%	3.86%
Penasquitos	Miramar Reservoir HA (906.10) - Pacific Ocean Shoreline	48.25%	48.30%	49.71%	0.81%	1.00%	0.97%
Mission Bay	Scripps HA (906.30) - Pacific Ocean Shoreline	48.22%	48.21%	49.63%	8.16%	10.57%	9.41%
	Tecolote HA (906.50) - Tecolote Creek	47.26%	47.30%	49.47%	8.26%	10.24%	9.08% (9.04%)**
San Diego River	Mission San Diego HSA (907.11) and Santee HSA (907.12) - Pacific Ocean Shoreline - Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles)	37.02%	34.72%	46.98%	19.07%	26.61%	21.37% (21.24%)**
San Diego Bay	Chollas HSA (908.22) - Chollas Creek	46.03%	46.08%	49.23%	8.91%	12.42%	10.73% (10.68%)**

Notes:
* The percent load reductions are based on reducing loads compared to pollutant loads from 2001 to 2002.
** The alternative *Enterococcus* percent load reduction was calculated based on a numeric target of 104 MPN/100mL instead of 61 MPN/100mL, protective of the REC-1 "moderately to lightly used area" usage frequency that is protective of freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative pollutant load reductions can be utilized.

(3) Interim TMDL Compliance Determination

Compliance with the interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(f) There are no exceedances of the interim receiving water limitations under Specific Provision 6.c.(2)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(g) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the interim effluent limitations under Specific Provision 6.c.(2)(b); OR

(h) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

d. Specific Monitoring and Assessment Requirements

(1) Monitoring and Assessment Requirements for Beaches

(a) Monitoring Stations

For beaches addressed by the TMDL, monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[35] If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source

[35] Commonly referred to as AB 411 monitoring

identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations at least once within the first 24 hours of the end of a storm event[36] during the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer in exceedance of the allowable exceedance frequencies in the receiving waters.

(iii) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(iv) For Pacific Ocean Shoreline segments or areas listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the dry weather and

[36] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

wet weather monitoring data to assess whether the interim and final WQBELs for the Pacific Ocean Shoreline segments or areas listed in Table 6.0 have been achieved.

(ii) Dry weather exceedance frequencies must be calculated as follows:

[a] 30-day geometric means must be calculated from the results of any dry weather samples collected from the segments or areas for each water body listed in Table 6.0;
[b] The method and number of samples need for calculating the 30-day geometric means must be consistent with the number of samples required by the Ocean Plan;
[c] Where there are multiple segments or areas associated with a water body listed in Table 6.0, the Copermittees may calculate geometric means for each segment or area, or combine the dry weather monitoring data from all the segments or areas to calculate geometric means for the water body;
[d] The exceedance frequency must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the dry season.

(iii) Wet weather exceedance frequencies must be calculated as follows:

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;
[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;
[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria densities reported from each storm event sampled; and
[d] The single sample maximum exceedance frequency must be calculated by dividing the number of wet weather days that exceed the single sample maximum receiving water limitations in Table 6.2 by the total number of wet weather days during the rainy season.
[e] The data collected for dry weather must be used in addition to the data collected for wet weather to calculate the wet weather 30-day geometric means. The exceedance frequency of the wet weather 30-day geometric means must be calculated by dividing the number of geometric means that exceed the geometric mean

receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the wet season.

(iv) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(v) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) Monitoring and Assessment Requirements for Creeks and Creek Mouths

(a) Monitoring Stations

For creeks addressed by the TMDL, monitoring locations should consist of, at a minimum, a location at or near the mouth of the creek (e.g. Mass Loading Station or Mass Emission Station) and one or more locations upstream of the mouth (e.g. Watershed Assessment Station). If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations in accordance with the requirements of Provision D.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations within the first 24 hours of the end of a storm event[37] during the rainy season (i.e. October 1 through April 30).

[37] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(iii) Samples collected from receiving water monitoring stations must be analyzed for fecal coliform and *Enterococcus* indicator bacteria.

(iv) For creeks or creek mouths listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the receiving water monitoring data to assess whether the interim and final receiving water WQBELs for the creeks and creek mouths listed in Table 6.0 have been achieved.

(ii) Dry weather exceedance frequencies must be calculated as follows:

[a] 30-day geometric means must be calculated from the results of any dry weather samples collected from the segment or area for each water body listed in Table 6.0;
[b] The method and number of samples need for calculating the 30-day geometric means must be consistent with the number of samples required by the Basin Plan;
[c] The exceedance frequency must be calculated by dividing the number of 30-day geometric means that exceed the 30-day geometric mean receiving water limitations in Table 6.2 by the total number of 30-day geometric means calculated from samples collected during the dry season.

(iii) Wet weather exceedance frequencies must be calculated as follows:

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;
[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;
[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria densities reported from each of the storm events sampled; and

[d] The exceedance frequency must be calculated by dividing the number of wet weather days that exceed the single sample maximum receiving water limitations in Table 6.2 by the total number of wet weather days during the rainy season.

[e] The data collected for dry weather must be used in addition to the data collected for wet weather to calculate the wet weather 30-day geometric means. The exceedance frequency of the wet weather 30-day geometric means must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the wet season.

(iv) The Responsible Copermittee must identify and incorporate additional MS4 outfall and receiving water monitoring stations and/or adjust monitoring frequencies to identify sources causing exceedances of the receiving water WQBELs.

(v) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(vi) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

7. Total Maximum Daily Loads for Sediment in Los Peñasquitos Lagoon

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2012-0033

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2012
State Water Board Approval Date:	January 21, 2014
Office of Administrative Law Approval Date:	July 14, 2014
US EPA Approval Date:	October 30,2014

(3) TMDL Effective Date: July 14, 2014

(4) Watershed Management Area: Los Peñasquitos

(5) Water Body: Los Peñasquitos Lagoon

(6) Responsible Copermittees: County of San Diego, City of San Diego, City of Del Mar, and City of Poway

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final sediment TMDL compliance requirements for Los Peñasquitos Lagoon consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must be in compliance with the final TMDL compliance requirements by December 31, 2034.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not prohibit the sustainable restoration of tidal and non-tidal saltmarsh vegetation of at least 346 acres.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations by the compliance date under Provision 7.b(1) will not cause or contribute to a failure of the receiving water condition specified under Specific Provision 7.b.(2)(a):

Table 7.1
*Final Effluent Limitations as Expressed as Wet Season Loads in MS4 Discharges to Los Peñasquitos Lagoon**

Constituent	Effluent Limitation
Sediment	2,580 tons/wet season

*Final effluent limitations are to be achieved by the following Responsible Parties: County of San Diego, City of San Diego, City of Del Mar, City of Poway, Phase II MS4 permittees, Caltrans, general construction storm water NPDES permittees, and general industrial storm water NPDES permittees.

(c) Best Management Practices

(i) The Water Quality Improvement Plan for the Los Peñasquitos Watershed Management Area must incorporate the Sediment Load Reduction Plan required to be developed pursuant to Resolution No. R9-2012-0033.

(ii) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 7.b.(2)(a) and/or the Copermittee's portion of the effluent limitations under Specific Provision 7.b.(2)(b) for Los Peñasquitos Lagoon.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) Successful restoration of 80 percent of the 1973 acreage of tidal and non-tidal lagoon salt marsh (346 acres); OR

(b) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 7.b.(2)(c)(ii) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 7.b.(2)(c)(ii) or other implementation actions achieve compliance with Specific Provision 7.b.(3)(a),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 7.b.(2)(c)(ii) or other implementation actions, AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 7.d to demonstrate compliance with Specific Provision 7.b.(3)(a).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim sediment TMDL compliance requirements for Los Penasquitos Lagoon consist of the following:

(1) Interim Compliance Dates and WQBELs

The Responsible Copermittees must comply with the interim WQBELs, expressed as wet season loads, by December 31 of the interim compliance year set forth in Table 7.2.

Table 7.2
*Interim Water Quality Based Effluent Limitations Expressed as Wet Season Loads in MS4 Discharges**

Interim Compliance Date	Interim Effluent Limitations (tons/wet season)
December 31, 2019	6,691
December 31, 2023	5,663
December 31, 2027	4,636
December 31, 2029	3,608

*Interim effluent limitations are to be achieved by the following Responsible Parties: County of San Diego, City of San Diego, City of Del Mar, City of Poway, Phase II MS4 permittees, Caltrans, general construction storm water NPDES permittees, and general industrial storm water NPDES permittees.

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) The final receiving water limitation under Specific Provision 7.b.(2)(a) is met; OR

(c) There are no exceedances of the Copermittee's portion of interim effluent limitations under Table 7.2 at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the Copermittee's portion of the

interim TMDL compliance requirements described in Attachment A of Resolution No. R9-2010-0033 will be achieved by the interim compliance date.

d. Specific Monitoring and Assessment Requirements

(1) Watershed Monitoring

The Responsible Copermittees must conduct suspended sediment, bed load, and flow monitoring to calculate total sediment loading to the Los Peñasquitos Lagoon for each wet season (October 1 thru April 30) as set forth below:

(a) The Responsible Copermittees must monitor enough storm events throughout the season to quantify sediment loading over each wet season, and

(b) The Responsible Copermittees must monitor at least 3 stations to quantify cumulative sediment loading into Los Peñasquitos Lagoon. Stations must be located within the Los Peñasquitos, Carroll Canyon, and Carmel Creek tributaries prior to discharging into Los Peñasquitos Lagoon.

(2) Lagoon Monitoring

The Responsible Copermittees must monitor Los Peñasquitos Lagoon each Fall for changes in the extent of the vegetation types as set forth below:

(a) The Responsible Copermittees must acquire aerial photos of Los Peñasquitos Lagoon and digitize them at an approximate scale of 1:2,500,

(b) The Responsible Copermittees must appropriately interpret the vegetation and classify the various types as saltmarsh, non-tidal saltmarsh, freshwater marsh, non-tidal saltmarsh –*Lolium perrene* infested, southern willow scrub/mulefat scrub, herbaceous wetland, or upland land cover.

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the monitoring data collected under Specific Provision 7.d(1) and 7.d(2) to assess whether the interim and final WQBELs have been achieved.

(b) For assessing and determining compliance with the final receiving water limitations under Specific Provision 7.b.(2)(a), the Responsible Copermittees must use the data acquired under Specific Provision 7.d.(2) to estimate the acreage of tidal and non-tidal saltmarsh actually restored.

(c) For assessing and determining compliance with the final effluent limitations under Specific Provision 7.b.(2)(b), the Responsible Copermittees must use the data acquired under Specific Provision 7.d.(1) to estimate sediment loading into Los Peñasquitos Lagoon. Sediment loading must be evaluated using a 3-year, weighted rolling average. The first reported average shall be calculated using data collected in the year 2015-2016, 2016-2017, and 2017-2018 wet seasons.

(d) The monitoring and assessment results must be submitted as part of the Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

ATTACHMENT F

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

FACT SHEET / TECHNICAL REPORT

FOR

ORDER NO. R9-2013-0001
AS AMENDED BY ORDER No. R9-2015-0001
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

MAY 8, 2013
Amended on February 11, 2015

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I. FACT SHEET FORMAT

This Fact Sheet briefly sets forth the principal facts and the significant factual, legal, methodological, and policy questions that the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) considered in preparing Order No. R9-2013-0001 (Order) as amended by Order No. R9-2015-0001. In accordance with the Code of Federal Regulations (CFR) Title 40 Parts 124.8 and 124.56 (40 CFR 124.8 and 40 CFR 124.56), this Fact Sheet includes, but is not limited to, the following information:

1. Contact information
2. Public process and notification procedures
3. Background of municipal storm water permits
4. Regional MS4 Permit approach
5. Economic considerations
6. Applicable statutes, regulations, plans and policies
7. Discussion of the provisions in the Order

Tentative Order No. R9-2013-0001 was distributed for public review on October 31, 2012. The San Diego Water Board accepted written comments on the Tentative Order until January 11, 2013. A public hearing was subsequently held on April 10 and 11, 2013, that was continued to May 8, 2013 to receive oral comments from interested persons. The San Diego Water Board adopted Order No. R9-2013-0001 on May 8, 2013.

Order No. R9-2015-0001, an Order amending Order No. R9-2013-0001, was distributed for public review on September 19, 2014. Order No. R9-2015-0001 amended the findings and provisions of Order No. R9-2013-0001 to:

a. Enroll the County of Orange, the Orange County Flood Control District and the south Orange County Cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano as Copermittees responsible for compliance with the terms and conditions of Order No. R9-2013-0001, as amended by Order No. R9-2015-0001;

b. Designate the San Diego Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the Cities of Laguna Woods and Laguna Hills and agree to the designation of the Santa Ana Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the City of Lake Forest, subject to the terms of the February 10, 2015 agreement between San Diego Water Board and the Santa Ana Water Board described in Finding 29 of this Order, upon the later effective date of Order No. R9-2015-0001 or Order No. R8-2015-0001 (superseding Order No. R8-2009-0030);

c. Establish interim exceptions to land development requirements for those priority development projects that discharge to engineered channels and large river reaches as described in Provision E.3.c(2)(e) of this Order;

d. Incorporate the amended requirements of the State Water Resources Control Board's (State Water Board) General Exception to require that pollutant reductions be achieved within 6 years for storm water and nonpoint source discharges to ASBS within the Region;

e. Incorporate applicable requirements of the Los Peñasquitos Lagoon Sediment TMDL;

f. Require the Orange County Copermittees to implement the "*Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County*," dated October 2014, made effective in the Monitoring and Reporting Program/Order issued pursuant to California Water Code section 13383 in the December 5, 2014 San Diego Water Board Letter Directive and subject to future revisions by the Executive Officer after appropriate public input;

A public hearing was held on February 11, 2015, to receive oral comments from Copermittees and interested persons. The San Diego Water Board adopted Order No. R9-2015-0001 amending Order No. R9-2013-0001 on February 11, 2015.

The San Diego Water Board files applicable to the issuance of Order No. R9-2013-0001 and amendments thereto are incorporated into the administrative record in support of the findings and requirements of the Order.

II. CONTACT INFORMATION

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The Order and other related documents can be downloaded from the San Diego Water Board website at

http://www.swrcb.ca.gov/rwqcb9/water_issues/programs/stormwater/index.shtml
http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/oc_stormwater.shtml

The documents referenced in this Fact Sheet and in Order No. R9-2013-0001 and amendments thereto are available for public review at the San Diego Water Board office, located at the address listed above. Public records are available for inspection during regular business hours, from 8:00 am to 5:00 pm Monday through Friday. To schedule an appointment to inspect public records, contact the San Diego Water Board Records Management Officer at 858-467-2952619-516-1990.

COPERMITTEES

Orange County Copermittees

- County of Orange
- City of Aliso Viejo
- City of Dana Point
- City of Laguna Beach
- City of Laguna Hills
- City of Laguna Niguel
- City of Laguna Woods
- City of Lake Forest*
- City of Mission Viejo
- City of Ranch Santa Margarita
- City of San Clemente
- City of San Juan Capistrano
- Orange County Flood Control District

* While not listed in the above table, the City of Lake Forest remains a Copermittee under this Order until the later effective date of this Order or Santa Ana Water Board Tentative Order No. R8-2015-0001. Thereafter, the City of Lake Forest will no longer be considered a Copermittee under this Order because its Phase I MS4 discharges will be regulated by the Santa Ana Water Board pursuant to Water Code section 13328 designation. The requirements of this Order that apply to the City of Lake Forest for the duration of this Order, consistent with the Water Code section 13228 agreement dated February 10, 2015, are described in Finding 29 and Footnote 2 to Table B-1.

Riverside County Copermittees

- County of Riverside
- City of Murrieta
- City of Temecula
- City of Wildomar
- Riverside County Flood Control and Water Conservation District

San Diego County Copermittees

- County of San Diego
- City of Carlsbad
- City of Chula Vista
- City of Coronado
- City of Del Mar
- City of El Cajon
- City of Encinitas
- City of Escondido
- City of Imperial Beach
- City of La Mesa
- City of Lemon Grove
- City of National City
- City of Oceanside
- City of Poway
- City of San Diego
- City of San Marcos
- City of Santee
- City of Solana Beach
- City of Vista
- San Diego County Regional Airport Authority
- San Diego Unified Port District

III. PUBLIC PROCESS AND NOTIFICATION PROCEDURES

The San Diego Water Board followed the schedule listed below for the preparation of Order No. R9-2013-0001:

San Diego County Copermittee Permit Reissuance Process

1. On February 8, 2011, the San Diego Water Board met with the San Diego County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No. R9-2007-0001.

2. Between February and May 2011, the San Diego Water Board met with select San Diego County, Orange County, and Riverside County Copermittees, as well as representatives of the environmental community to discuss concepts and receive recommendations for elements to be incorporated in a Regional Municipal Separate Storm Sewer System Permit (Regional MS4 Permit).

3. On June 27, 2011 the San Diego Water Board received the Report of Waste Discharge from the San Diego County Copermittees for the renewal of their NPDES permit, Order No. R9-2007-0001.

4. On April 9, 2012, the San Diego Water Board released an administrative draft of Tentative Order No. R9-2013-0001 for preliminary informal comments and feedback.

5. On April 25, 2012, the San Diego Water Board held an informal public workshop to present the administrative draft of Tentative Order No. R9-2013-0001 and receive verbal comments.

6. Between June and August 2012, the San Diego Water Board held four (4) focused meetings with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community, and USEPA) to discuss and receive preliminary comments and feedback about specific elements in the administrative draft of Tentative Order No. R9-2013-0001.

7. On September 5, 2012, the San Diego Water Board held an informal public workshop to present the modifications that were expected to be incorporated into the Tentative Order based on the preliminary comments and feedback received during the focused meetings held between June and August 2012.

8. Informal written comments on the administrative draft of Tentative Order No. R9-2013-0001 were accepted until September 14, 2012.

9. On October 12, 2012, the San Diego Water Board released a revised administrative draft of Tentative Order No. R9-2013-0001.

10. On October 24, 2012, the San Diego Water Board held a focused meeting with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community, and USEPA) to discuss modifications incorporated into the administrative draft of Tentative Order No. R9-2013-0001.

11. On October 31, 2012, the San Diego Water Board released Tentative Order No. R9-2013-0001 for formal public review and comment.

12. On November 13, 2012 and December 12, 2012, the San Diego Water Board held a formal public Board workshop to present the public draft of Tentative Order No. R9-2013-0001 and receive verbal comments.

13. Formal written comments on the public draft of Tentative Order No. R9-2013-0001 were accepted until January 11, 2013.

14. A public hearing of Tentative Order No. R9-2013-0001 was conducted on April 10 and 11, 2013, that was continued to May 8, 2013.

Orange County Copermittee Permit Reissuance Process

15. On May 20, 2014 the San Diego Water Board received the Report of Waste Discharge from the Orange County Copermittees for the renewal of their MS4 NPDES permit, Order No. R9-2009-0002.

16. On June 24, 2014, the San Diego Water Board met with the Orange County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No.R9-2009-0002 and the process for enrollment as Copermittees under Regional MS4 Permit Order No. R9-2013-0001.

17. On July 1, 2014, the San Diego Water Board held a public meeting to discuss the Orange County Report of Waste Discharge (RoWD) and receive comments on potential modifications to Order No. R9-2013-0001. Based on comments received from the Orange County Copermittees and other interested persons at this meeting, the San Diego Water Board determined that additional public meetings were not needed prior to release of Tentative Order No. R9-2015-0001, amending Order No. R9-2013-0001 in redlined – strikeout format for public review and comment.

18. On September 19, 2014, the San Diego Water Board released Tentative Order No. R9-2015-0001 for a 60 day public review and comment period.

19. On October 8, 2014, the San Diego Water Board held a formal public workshop at a regular board meeting to receive information and discuss the proposed amendments to Order No. R9-2013-0001 described in Tentative Order No. R9-2015-0001.

20. In accordance with State and federal laws and regulations, the San Diego Water Board notified San Diego County, Orange County and Riverside County Copermittees, and all known interested agencies and persons of its intent to adopt Tentative Order No. R9-2015-0001 and provided them with an opportunity to submit their written comments and recommendations. Written comments and recommendations on Tentative Order No. R9-2015-0001 were accepted until November 19, 2014.

21. The San Diego Water Board held a public workshop on October 8, 2014, and a public hearing on February 11, 2015, and heard and considered all comments pertaining to the adoption of Tentative Order No. R9-2015-0001 on February 11, 2015.

IV. BACKGROUND OF THE SAN DIEGO REGION MUNICIPAL STORM WATER PERMITS

In developed and developing areas, storm water runoff is commonly transported through municipal separate storm sewer systems (MS4s) and discharged into local receiving water bodies. As the storm water runs off and flows over the land or impervious surfaces (e.g., paved streets, parking lots, and building rooftops), it accumulates debris, chemicals, sediment, and other pollutants that can adversely affect receiving water quality if discharged untreated. The United States Environmental Protection Agency (USEPA) recognizes wet weather flows from urban areas as the number one source of estuarine pollution in coastal communities,[1] such as those within the San Diego Region.

The federal Clean Water Act (CWA) was amended in 1987 to address and regulate discharges of storm water associated with industrial activities and from municipal storm sewers. With the amendments, many municipalities throughout the United States were obligated for the first time to obtain National Pollutant Discharge Elimination System (NPDES) permits for discharges of storm water from their MS4s.

In response to the CWA 1987 amendment, as well as the pending federal NPDES regulations which would implement the amendment, the San Diego Water Board issued "early" MS4 permits. The San Diego Water Board adopted and issued Order Nos. 90-38, 90-42, and 90-46 to regulate storm water discharges from the MS4s in Orange County, San Diego County, and Riverside County, respectively, within the San Diego Region on July 16, 1990.

The "early" MS4 permits, or First Term Permits, were issued prior to the November 1990 promulgation of the final federal NPDES storm water regulations. By issuing these First Term Permits before the federal regulations took effect, the San Diego Water Board was able to provide the Copermittees additional flexibility in addressing and managing storm water discharges. The First Term Permits contained the essentials of the 1990 regulations, and required the Copermittees to develop and implement runoff management programs, but provided little specificity about what was required to be included in or actually achieved by those programs.

The flexibility provided in the First Term Permits was generally continued through the Second Term Permits. The combination of the lack of specificity in the First and Second Term Permits, a general lack of meaningful action by the Copermittees and a general lack of corresponding reaction (i.e. enforcement) by the San Diego Water Board during the first ten years of the storm water program, resulted in few substantive steps

[1] US EPA. 1999. 40 CFR Parts 9, 122, 123, and 124. National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. 64 FR 68727.

towards achieving improvements in the quality of receiving waters or storm water discharges from the MS4s.

From 2001, the regulatory approach incorporated into Third Term Permits was a significant departure from the regulatory approach of the First and Second Term Permits. The Third Term Permits issued by the San Diego Water Board included more detailed requirements that outlined the minimum level of implementation required for the Copermittees' programs to meet the maximum extent practicable (MEP) standard for storm water. The Third Term Permits included more detail to emphasize and enhance the jurisdictional runoff management programs developed by the Copermittees and introduced requirements for developing and implementing watershed-based programs.

The Third Term Permits also incorporated two precedent setting decisions by the State Water Board. In Order WQ 99-05, the State Water Board established receiving water limitation language to be included in all MS4 permits. The State Water Board's precedential language clarified that municipal storm water permits must include provisions requiring discharges to be controlled to attain water quality standards in receiving waters. Unlike previously adopted versions of the receiving water limitation language in the First and Second Term Permits, the language no longer stated that "*violations of water quality standards are not violations of the municipal storm water permit under certain conditions*." In addition, the receiving water limitation language no longer indicated that the "*implementation of best management practices is the 'functional equivalent' of meeting water quality standards*." State Water Board Order WQ 99-05 specifically requires language in MS4 permits for the Copermittees to comply with water quality standards based discharge prohibitions and receiving water limitations through timely implementation of control measures and other actions to reduce pollutants in discharges. (See State Water Board Order WQ 99-05 (*Environmental Health Coalition*)).

In Order WQ 2000-11, also a precedential decision, the State Water Board addressed design standards for structural post-construction best management practices (BMPs) for new development and significant redevelopment. The State Water Board found that the design standards, which require that runoff generated by 85 percent of storm events from specific development categories be infiltrated or treated, reflect the MEP standard. State Water Board Order WQ 2000-11 also found that the post-construction BMP provisions, or Standard Storm Water Mitigation Plan (SSMP) provisions, constitute MEP for addressing storm water pollutant discharges resulting from specific development categories.

The Third Term San Diego County and Orange County Permits (Order Nos. 2001-01 and R9-2002-0001, respectively) were appealed to the State Water Board. Minor modifications were made by the State Water Board, but the requirements were largely upheld. In State Water Board Order WQ 2001-15, the State Water Board upheld the Third Term San Diego County Permit requirements with certain modifications. The State Water Board removed the prohibition of storm water discharges *into* the MS4 that cause or contribute to exceedances of water quality objectives. The revision allows for

treatment of pollutants in storm water runoff after the pollutants have entered the MS4. State Water Board Order WQ 2001-15 otherwise upheld all the other requirements of the permit.

In addition to the modification to the discharge prohibition in Order WQ 2001-15, the State Water Board refined Order WQ 99-05 by making clear that the Copermittees may use an iterative approach to achieving compliance with water quality standards that involves ongoing assessments and revisions. Thus, the language for the discharge prohibitions and receiving water limitations was revised to explicitly require the Copermittees to implement an iterative process of assessments and revisions to comply with the discharge prohibitions and receiving water limitations. The San Diego Water Board retained the authority to enforce receiving water limitations and discharge prohibitions even if the Copermittee is engaged in the iterative process.

The Third Term San Diego County Permit was subsequently challenged in the Superior Court of the State of California and the Court of Appeal, Fourth Appellate District. The Court of Appeal, Fourth Appellate District, found that the approach of the Third Term San Diego County Permit to regulating discharges into the MS4 was appropriate (*Building Industry Ass'n. v. State Water Resources Control Bd., et al.,* 124 Cal.App.4th 866 (2004)). The State of California Supreme Court denied review sought by the Building Industry Association in March 2005.

The Fourth Term Permits, or current MS4 permits, began with the adoption of Order No. R9-2007-0001 issued to the Copermittees of San Diego County in January 2007. Order Nos. R9-2009-0002 and R9-2010-0016 were subsequently issued to the Copermittees of Orange County and Riverside County. The Fourth Term Permits continued to include more detailed requirements to be implemented by each Copermittee's jurisdictional runoff management program. The Fourth Term Permits also include requirements to further emphasize a watershed management approach and for more coordination among jurisdictional runoff management programs. In addition, the Fourth Term Permits included more requirements for assessing the effectiveness of the runoff management programs being implemented by the Copermittees. The intent of the inclusion of additional requirements was to enhance and better define elements of the permit that were expected to be incorporated into the iterative process for managing runoff from each Copermittee's jurisdiction and within the watersheds of the San Diego Region.

The Fourth Term Permits include several new and emerging approaches for managing storm water runoff and discharges. Low impact development (LID) requirements are included for development and significant redevelopment to reduce pollutants in storm water runoff from sites through more natural processes such as infiltration and biofiltration closer to the source, rather than utilizing conventional mechanical end-of-pipe treatment systems. Hydrograph modification (hydromodification) management requirements also are included to mitigate the potential for increased erosion in receiving waters due to increased runoff rates and durations often caused by development and increased impervious surfaces. The Fourth Term Orange County and

Riverside County Permits introduced requirements to identify areas of existing development where retrofitting with LID projects would be feasible and could be implemented to reduce storm water runoff and pollutants in storm water discharges.

The Fourth Term Orange County and Riverside County Permits included a clearer distinction between storm water and non-storm water discharges. The term "urban runoff" was completely removed, and a distinction between storm water (wet weather) runoff and non-storm water (dry weather) runoff was emphasized. This clarification was made to prevent any potential misunderstanding that regulation under the MS4 permits is limited only to urbanized areas, and to prevent non-storm water runoff from being managed in the same manner as storm water runoff. The term "urban runoff" is not defined in the Code of Federal Regulations (CFR) or Federal Register (FR) in the regulation of MS4 discharges. According to the CWA 402(p)(3)(B)(ii), MS4 permits must include a requirement to effectively prohibit non-storm water discharges into the MS4s.

Finally, for the Fourth Term Orange County and Riverside County Permits the San Diego Water Board found that non-storm water discharges to the MS4 from over application of irrigation water are sources of pollutants. The San Diego Water Board found that non-storm water discharges resulting from over-irrigation must be prohibited from entering the MS4 in accordance with the requirements of the CWA and pursuant to 40 CFR 122.26(d)(2)(iv)(B)(1).

The requirements of the Fourth Term Permits issued to the Copermittees in each county within the San Diego Region now have substantively the same core requirements such as discharge prohibitions, receiving water limitations, jurisdictional runoff management program components, and monitoring program requirements. There are, however, several inconsistencies that exist among the three Fourth Term Permits which complicate oversight and implementation of the permits by the San Diego Water Board.

The Fourth Term San Diego County Permit expired in January 2012. The Fourth Term Orange County permit ~~and Riverside County Permits will~~ expired in December 2014 and the Fourth Term Riverside County Permit will expire in November 2015. ~~, respectively.~~ Issuing the Fifth Term Permits within five years for three counties under three different permits would require the San Diego Water Board to expend significant time and resources for the issuance of the permits through three separate public proceedings, thereby greatly reducing the time and resources available to oversee implementation and compliance. Multiple permits also create confusion for determining compliance among regulated entities, especially for the land development community.

The San Diego Water Board has acknowledged that issuing a single MS4 permit for all the Copermittees in the San Diego Region can and is expected to result in more consistent implementation, improve communication among agencies within watersheds crossing multiple jurisdictions, and minimize resources spent with each permit renewal process. Within the findings of the Fourth Term Riverside County Permit issued in

November 2010, the San Diego Water Board notified the public of its intent to develop and issue a single Regional MS4 Permit.

V. REGIONAL MS4 PERMIT APPROACH

The Fifth Term Permit, or Regional MS4 Permit, shifts the focus of the permit requirements from a minimum level of actions to be implemented by the Copermittees to identifying outcomes to be achieved by those actions. Order No. R9-2013-0001 represents an important paradigm shift in the approach for MS4 permits within the San Diego Region.

Historical Permitting Approach

The First and Second Term Permits were very broad and provided little specificity about what was required to be developed and implemented by the Copermittees. The Third Term Permits began to become more specific about the minimum level of implementation required by the Copermittees. The Fourth Term Permits~~, or current permits,~~ subsequently increased in specificity. The MS4 permits have progressively become more detailed and focused on specifying the minimum level of actions expected to be implemented by the Copermittees. As detailed and specific as the MS4 permits have become, however, they include very little detail about what the desired outcomes of the required actions are expected to achieve. Compliance with the permit requirements has essentially been tracking numbers of actions and reporting, not tracking progress or actual improvements in the quality of receiving waters or discharges from the MS4s. The result has been an increase in actions being implemented by the Copermittees with little or no ability or expectations to determine whether or not improvements in water quality are being achieved.

The Fourth Term Permits result in significant resource expenditure by the Copermittees to report permit compliance information to the San Diego Water Board in the form of annual jurisdictional runoff management program, watershed program, and monitoring program reports. The San Diego Water Board must then expend much of its limited resources on reviewing more than 50 voluminous reports submitted annually by the Copermittees. The information currently reported by the Copermittees is of limited value when trying to measure progress toward achieving improvements in the quality of receiving waters or discharges from the MS4s. Oversight of the MS4 permits is further complicated by the inconsistencies among the requirements issued to the Orange County, San Diego County, and Riverside County Copermittees under three separate MS4 permits.

Under the Fourth Term Permits, the Copermittees must expend a significant portion of their limited resources collecting data of limited value, and putting together reports to submit that information to the San Diego Water Board. Likewise, the San Diego Water Board must expend most of its limited resources reviewing reports, and developing permits instead of working directly with the Copermittees to identify solutions to problems causing impacts to water quality. This is an unsustainable course that will continue to demand more resources from the Copermittees and the San Diego Water Board, and would continue to result in unknown water quality benefits.

New Permitting Approach

The goal of the Regional MS4 Permit is twofold: 1) bring a consistent set of MS4 permit requirements to all of the Copermittees within the San Diego Region; and, 2) provide an MS4 permit with requirements that will allow the Copermittees to focus their efforts and resources on achieving goals and desired outcomes toward the improvement of water quality rather than completing specific actions.

The overall approach included in the Regional MS4 Permit with respect to the jurisdictional runoff management programs will not differ significantly from the current permits. The general requirements for the jurisdictional runoff management program components and compliance with those requirements will remain and be applied consistently throughout the San Diego Region under the Regional MS4 Permit.

The most significant difference in the new permitting approach is the specific manner of implementation for those jurisdictional runoff management programs. Implementation will be based on decisions made by the Copermittees in accordance with what they have identified as their highest priority water quality conditions. In other words, the Copermittees will have significant control in how to implement the jurisdictional runoff management programs to best utilize their available resources in addressing a specific set of priorities effectively, instead of trying to address all the water quality priorities ineffectively.

The Copermittees are given the responsibility of identifying their highest priority water quality conditions that they intend to address. The Copermittees will develop goals that can be used to measure and demonstrate progress or improvements toward addressing those priorities. In addition to the goals, the Copermittees will provide a schedule for achieving the goals for those highest priorities. The measurement of progress toward achieving the goals for those highest priorities requires a better defined and more focused program of monitoring and assessment than under the Fourth Term Permits.

The monitoring and assessment program must be designed to inform the Copermittees of their progress, and the need for modifications in their jurisdictional runoff management programs and schedules to achieve their goals to improve water quality. The monitoring and assessment program requirements will have a more central role in the Regional MS4 Permit than in earlier permits. The monitoring and assessment requirements must also be designed to enable the Copermittees to focus and direct their efforts in implementing their jurisdictional runoff management programs toward their stated desired outcomes to improve the quality of receiving waters and/or discharges from the MS4s.

By providing an MS4 permit that allows the Copermittees to make more decisions about how to utilize and focus their resources, along with a better defined monitoring and assessment program to inform their water quality management decisions, the Copermittees will have the opportunity to:

1) *Plan strategically*. The Copermittees must have the ability to identify their available resources and develop and implement long term plans that can organize, collect, and use those resources in the most strategically advantageous and efficient manner possible. This ability to develop long term plans will allow the Copermittees to focus and utilize their resources in a more concerted way over the short term and long term to address specific water quality priorities through stated desired outcomes.

2) *Manage adaptively*. The Copermittees must be given the ability to modify their plans as additional information and data are collected from the monitoring and assessment programs. The Copermittees' plans may require modifications to the programs, priorities, goals, strategies, and/or schedules in order for the Copermittees to achieve a stated desired outcome.

3) *Identify synergies*. The Copermittees must be given more flexibility to identify efficiencies within and among their jurisdictional runoff management programs as the strategies are developed and implemented to increase the Copermittees' collective effectiveness. The Copermittees must also be able to identify and utilize resources available from other agencies and entities to further augment and enhance their jurisdictional runoff management programs and/or to collectively work with those other agencies and entities toward achieving a stated desired outcome.

The Regional MS4 Permit requirements will provide the Copermittees the flexibility and responsibility to decide what actions will be necessary to achieve an outcome that is tailored and designed by the Copermittees to improve specific prioritized water quality conditions. The San Diego Water Board expects the approach of the Regional MS4 Permit to give the Copermittees a greater sense of ownership for restoring the quality of receiving waters in the San Diego Region by becoming an integral part of the decision making process in identifying water quality conditions to be addressed, as well as determining the best use of their resources.

VI. ECONOMIC CONSIDERATIONS

Statutory Considerations

California Water Code (CWC) section 13241 requires the San Diego Water Board to consider certain factors, including economic considerations, in the adoption of water quality objectives. CWC section 13263 requires the San Diego Water Board to take into consideration the provisions of CWC section 13241 in adopting waste discharge requirements.

In *City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, the California Supreme Court considered whether Regional Water Boards must comply with CWC section 13241 when issuing waste discharge requirements under CWC section 13263(a) by taking into account the costs a permittee will incur in complying with the permit requirements. The Court concluded that whether it is necessary to consider such cost information "*depends on whether those restrictions meet or exceed the requirements of the federal Clean Water Act.*" (*Id.* at p. 627.) The Court ruled that Regional Water Boards may not consider the factors in CWC section 13241, including economics, to justify imposing pollutant restrictions that are less stringent than applicable federal law requires. (*Id.* At pp. 618, 626-627 ["*[Water Code section 13377 specifies that [] discharge permits issued by California's regional boards must meet the federal standards set by federal law. In effect, section 13377 forbids a regional board's consideration of any economic hardship on the part of the permit holder if doing so would result in the dilution of the requirements set by Congress in the Clean Water Act...Because CWC section 13263 cannot authorize what federal law forbids, it cannot authorize a regional board, when issuing a [] discharge permit, to use compliance costs to justify pollutant restrictions that do not comply with federal clean water standards*."]). However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Regional Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

As discussed in Section VII.F, Unfunded State Mandates, the San Diego Water Board finds that the requirements in this Order are not more stringent than the minimum federal requirements. Among other requirements, federal law requires MS4 permits to include requirements to effectively prohibit non-storm water discharges into the MS4s, in addition to requiring controls to reduce the discharge of pollutants in storm water to the MEP, and other provisions as USEPA or the State determines are appropriate for the control of pollutants in MS4 discharges.

The requirements in this Order may be more specific or detailed than those enumerated in federal regulations under 40 CFR 122.26 or in the USEPA guidance. However, the requirements have been designed to be consistent with and within the federal statutory mandates described in CWA section 402(p)(3)(B)(ii) and (iii) and the related federal regulations and guidance. Consistent with federal law, all of the

conditions in this Order could have been included in a permit adopted by USEPA in the absence of the in lieu authority of California to issue NPDES permits.

Moreover, the inclusion of numeric WQBELs in this Order does not cause this Order to be more stringent than federal law. Federal law authorizes both narrative and numeric effluent limitations to meet state water quality standards. The inclusion of WQBELs as discharge specifications in an NPDES permit in order to achieve compliance with water quality standards is not a more stringent requirement than the inclusion of BMP based permit limitations to achieve water quality standards (State Water Board Order No. WQ 2006-0012 (*Boeing*)). Therefore, consideration of the factors set forth in CWC section 13241 is not required for permit requirements to implement the effective prohibition on the discharge of non-storm water discharges into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determine appropriate to control such pollutants, as those requirements are mandated by federal law.

Included in the provisions of the Order are monitoring and reporting requirements that are designed to demonstrate that the Copermittees are implementing programs to comply with the CWA municipal storm water requirements. CWA section 308(a) and 40 CFR 122.41(h), (j)-(l), 122.44(i) and 122.48 require that all NPDES permits specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s (40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c)) also specify additional monitoring and reporting requirements. In addition to the federal requirements of the CWA, the San Diego Water Board also has the authority in CWC 13383 to establish monitoring, reporting, and recordkeeping requirements that implement federal and state laws and regulations through NPDES permits.

The monitoring and assessment information that will be reported to the San Diego Water Board is necessary to determine if the Copermittees are making progress toward achieving compliance with the discharge prohibitions, receiving water limitations, and effluent limitations under Provision A of the Order. The monitoring and assessment information that will be reported is also expected to be key to the iterative approach and adaptive management process that is required to be implemented by the Copermittees if they cannot meet the discharge prohibitions and receiving water limitations under the present conditions, which is also part of the requirements under Provision A of the Order.

Notwithstanding the above, the San Diego Water Board has considered cost information in issuing this Order, as discussed below. The San Diego Water Board has also considered all of the evidence that has been presented to the San Diego Water Board regarding the CWC section 13241 factors in adopting this Order. The San Diego Water Board finds that the requirements in this Order are reasonably necessary to protect beneficial uses identified in the Basin Plan and the economic information related to costs of compliance and other CWC section 13241 factors are not sufficient to justify failing to protect those beneficial uses. Where appropriate, the

San Diego Water Board has provided or will consider providing the Copermittees with additional time to implement control measures to achieve final WQBELs and/or water quality standards.

Cost Information

Discussions of the financial and economic ramifications of municipal storm water management programs tend to focus on the significant costs incurred by municipalities in developing and implementing the programs. When considering the cost of implementing the programs, however, it is also important to consider the alternative costs that are incurred when programs are not fully implemented, as well as the economic benefits which result from effective program implementation.

The recent financial and economic conditions have amplified the concerns about the costs incurred by the municipalities in developing and implementing their programs. The reduction in resources resulting from the recent financial and economic conditions has been cited by many of the Copermittees as a justification for reducing the requirements that must be met by their programs. While the recent conditions are a cause for concern in the short term, these programs also have an opportunity to identify and implement improvements and efficiencies before the next period of growth and development, resulting in more effective and sustainable programs over the long term.

In addition, it is very difficult to ascertain the true cost of implementation of the Copermittees' management programs because of inconsistencies in reporting by the Copermittees. Reported costs of compliance for the same program element can vary widely from city to city, often by a very wide margin that is not easily explained.[2] Despite these problems, efforts have been made to identify management program costs, which can be helpful in understanding the costs of program implementation.

The San Diego Water Board recognizes that the Copermittees will incur costs in implementing this Order, potentially above and beyond the costs from the Copermittees' prior permits. The San Diego Water Board also recognizes that, due to California's current economic condition, many Copermittees currently have limited staff and resources to implement actions to address its MS4 discharges. Based on the economic considerations below, the San Diego Water Board has provided the Copermittees a significant amount of flexibility to choose how to implement the requirements of the Order.

The Order also allows the Copermittees to customize their plans, programs, and monitoring requirements. In the end, it is up to the Copermittees to determine the effective BMPs and measures necessary to comply with this Order. The Copermittees can choose to implement the least expensive measures that are effective in meeting

[2] LARWQCB, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.

the requirements of this Order. This Order also does not require the Copermittees to fully implement all requirements within a single permit term. Where appropriate, the Board has provided the Copermittees with additional time outside of the permit term to implement control measures to achieve final WQBELs and/or water quality standards.

The San Diego Water Board has considered available cost information associated with compliance with this Order. It is not possible to predict accurately the cost impact of the requirements that involve an unknown level of implementation or that depend on environmental variables that are as yet undefined. Only general conclusions can be drawn from this information.

Estimated Municipal Storm Water Program Implementation Costs

The USEPA, the State Water Board, and the California Regional Water Quality Control Boards (Regional Water Boards) have attempted to evaluate the costs of implementing municipal storm water programs. The assessments have demonstrated that the true costs are difficult to ascertain and reported costs vary widely. In addition, reported fiscal analyses tend to neglect the costs incurred to municipalities when storm water and non-storm water runoff is not effectively managed, which are incurred as a result of pollution, contamination, nuisance, and damage to ecosystems, property, and human health. Nonetheless, they provide a useful context for considering the costs of requirements within Order No. R9-2013-0001.

In 1999, the USEPA reported on multiple studies it conducted to determine the cost of management programs. A study of Phase II municipalities determined that the annual cost of the Phase II program was expected to be $9.16 per household. The USEPA also studied 35 Phase I municipalities, finding costs to be $9.08 per household annually, similar to those anticipated for Phase II municipalities.[3]

The State Water Board commissioned a study by the California State University, Sacramento to assess costs of the Phase I MS4 program. This study includes an assessment of costs incurred by Phase I MS4s throughout the state to implement their programs. Annual cost per household in the study ranged from $18 to $46, with the Fresno-Clovis Metropolitan Area representing the lower end of the range, and the City of Encinitas (in San Diego County) representing the upper end of the range.[4]

A study on Phase I MS4 program costs was also conducted by the California Regional Water Quality Control Board, Los Angeles Region (Los Angeles Water Board), where program costs reported in the municipalities' annual reports were assessed. The Los

[3] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791-68792.
[4] State Water Board, 2005. NPDES Stormwater Cost Survey. P. ii.

Angeles Water Board estimated that average per household cost to implement the MS4 program in Los Angeles County was $12.50. [5]

It is important to note that reported program costs are not all attributable to solely complying with MS4 permits. Many program components, and their associated costs, existed before any MS4 permits were ever issued. For example, street sweeping and trash collection costs cannot be solely or even principally attributable to MS4 permit compliance, since these practices have long been expected from and implemented by municipalities.

Therefore, true program cost resulting from MS4 permit requirements is some fraction of reported costs. The California State University, Sacramento study found that only 38 percent of program costs are new costs fully attributable to MS4 permits. The remainder of the program costs was either pre-existing or resulted from enhancement of pre-existing programs.[6] In 2000, the County of Orange found that even lower amounts of program costs are solely attributable to MS4 permit compliance, reporting that the amount attributable to implement the County or Orange Drainage Area Management Plan (DAMP), was less than 20 percent of the total budget. The remaining 80 percent was attributable to pre-existing programs.[7] More current data from the County of Orange is not used in this discussion because the County of Orange no longer reports such information.

Estimated Value of Healthy Water Quality

Economic considerations of municipal storm water management programs cannot be limited only to program costs. Evaluation of programs must also consider information on the benefits derived from environmental protection and improvement.[8] Attention is often focused on municipal storm water management program costs, but the programs must also be viewed in terms of their value to the public.

Placing a value on healthy receiving waters is very difficult. Often the value of receiving waters with good water quality manifests in other forms, such as tourism, recreational opportunities, and/or increased property values. When surface water bodies are degraded, thereby degrading the habitat within and adjacent to the water bodies, the public loses the value and benefits associated with being able to use the area in and around the water bodies. Surface waters that are able to support the beneficial uses designated in the Basin Plan can sustain plants and wildlife that can attract visitors and residents, providing aesthetic, recreational, as well as monetary value to the public. At this time, however, there have been no studies for the San

[5] Los Angeles Water Board, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.
[6] State Water Board, 2005. NPDES Stormwater Cost Survey. P. 58.
[7] County of Orange, 2000. A NPDES Annual Progress Report. P. 60.
[8] Ribaudo M.O. and D. Heelerstein. 1992, *Estimating Water Quality Benefits: Theoretical and Methodological Issues.* U.S. Department of Agriculture. Technical Bulletin No. 1808.

Diego Region to quantify the added value that surface waters with healthy water quality can provide.

USEPA has estimated that household willingness to pay for improvements in fresh water quality for fishing and boating is approximately $158-$210.[9] This estimate can be considered conservative, since it does not include important considerations such as marine waters benefits, wildlife benefits, or flood control benefits. Another study conducted by California State University, Sacramento reported that the annual household willingness to pay for statewide clean water is approximately $180.[10]

A study conducted by the University of Southern California and University of California, Los Angeles assessed the costs and benefits of implementing various approaches for achieving compliance with the MS4 permits in the Los Angeles region. The study found that non-structural systems would cost $2.8 billion but provide $5.6 billion in benefit. If structural systems were determined to be needed, the study found that total costs would be $5.7 to $7.4 billion, while benefits could reach $18 billion.[11] Costs are anticipated to be borne over many years, probably at least ten years.

As can be seen, the benefits of the municipal storm water management programs are expected to considerably exceed their costs. Such findings are corroborated by USEPA, which found that the benefits of implementation of its Phase II storm water rule would also outweigh the costs.[12]

[9] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68793.
[10] State Water Board, 2005. NPDES Stormwater Cost Survey. P. iv.
[11] Los Angeles Water Board, 2004. Alternative Approaches to Stormwater Control.
[12] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791.

VII. APPLICABLE STATUTES, REGULATIONS, PLANS AND POLICIES

A. Legal Authorities – Federal Clean Water Act and California Water Code

This Order is issued pursuant to section 402 of the CWA and implementing regulations adopted by the USEPA and chapter 5.5, division 7 of the CWC (commencing with section 13370). This Order serves as an NPDES permit for point source discharges to surface waters. This Order also serves as waste discharge requirements pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

The objective of the CWA is "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*." To carry out this objective, the CWA requires the implementation of permit programs to regulate the discharge of pollutants and dredged or fill material to the navigable waters of the U.S. and to regulate the use and disposal of sewage sludge. CWA section 402 provides the legal authority to issue a permit for the discharge of pollutants to waters of the U.S. under the NPDES. The CWA provides that NPDES permits may be issued by states which are authorized to implement the provisions of that act. California became authorized to implement the NPDES permit program on May 14, 1973.

The Porter-Cologne Water Quality Control Act (Division 7, commencing with CWC section 13000) established the State Water Resources Control Board (State Water Board) and nine Regional Water Quality Control Boards (Regional Water Boards) as the principal state agencies with primary responsibility for the coordination and control of water quality. CWC section 13200(f) established the San Diego Water Board, which has the primary responsibility for the coordination and control of water quality in the San Diego Region, which includes all the basins draining into the Pacific Ocean between the southern boundary of the Santa Ana Region and the California-Mexico boundary. The San Diego Water Board implements the CWA through Chapter 5.5 of the CWC, commencing with section 13370. CWC section 13377 provides the San Diego Water Board the legal authority to issue waste discharge requirements to ensure compliance with all applicable provisions of the CWA and acts amendatory thereof or supplementary, thereto, to implement water quality control plans, or for the protection of beneficial uses, or to prevent nuisance.

CWA section 402(p) requires the USEPA or authorized state to issue NPDES permits for storm water discharges from municipal separate storm sewer systems (MS4s) to waters of the U.S. CWA section 402(p)(3)(B)(ii) requires that NPDES permits for storm water discharges from MS4s "*effectively prohibit non-storm water discharges*" into the MS4s. CWA section 402(p)(3)(B)(iii) requires that NPDES permits for storm water discharges from MS4s to "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable* [MEP], *including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control*

of such pollutants."

The USEPA published implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]), which prescribe permit application requirements for storm water discharges from MS4s pursuant to CWA 402(p), on November 16, 1990. The USEPA published an Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems, which provided guidance on permit application requirements for regulated MS4s, on May 17, 1996. The federal regulations in 40 CFR 122 and guidance issued by USEPA serve as the foundation for the provisions of Order No. R9-2013-0001. The legal authorities provided by the above statutes and regulations are included as part of the discussions in Section VIII of this Fact Sheet.

B. Legal Authority for the Permit Issued on a Region-wide Basis

CWA section 402(p)(3)(B) provides the San Diego Water Board the legal authority to issue an NPDES permit for the San Diego Region as compared to separate MS4 permits based upon County- and partial County-wide boundaries as they exist within the San Diego Region. CWA section 402(p)(3)(B) states that "*Permits for discharges from municipal storm sewers- (i) may be issued on a system- or jurisdiction-wide basis ....*" The federal regulations in 40 CFR 122.26(a)(1)(v) also state that the San Diego Water Board "*may designate dischargers from municipal separate storm sewers on a system-wide or jurisdiction-wide basis. In making this determination, the [San Diego Water Board] may consider the following factors: (A) the location of the discharge with respect to waters of the United States; (B) the size of the discharge; (C) the quantity and nature of the pollutants discharged to waters of the United States; and (D) other relevant factors*."

More specifically, the federal regulations provide that for large and medium MS4 systems, the San Diego Water Board may issue a regional permit. Specifically, the federal regulation in 40 CFR 122.26(a)(3) provide:

"*(ii) The Director may either issue one system-wide permit covering all discharges from municipal separate storm sewers within a large or medium municipal storm sewer system or issue distinct permits for appropriate categories of discharges within a large or municipal separate storm sewer system including, but not limited to: all discharges owned or operated by the same municipality; located within the same jurisdiction; all discharges within a system that discharge to the same watershed; discharges within a system that are similar in nature; or for individual discharges from municipal separate storm sewers within the system.*

(iii) The operator of a discharge from a municipal separate storm sewer which is part of a large or medium municipal separate storm sewer system must either: (A) Participate in a permit application (to be a permittee or a co-permittee) with one or more other operator of discharges from the large or medium municipal

storm sewer system which covers all, or a portion of all, discharges from the municipal separate storm sewer system; (B) Submit a distinct permit application which only covers discharges from the municipal separate storm sewers for which the operator is responsible; or (C) A regional authority may be responsible for submitting a permit application under the following guidelines....

(iv) One permit application may be submitted for all or a portion of all municipal separate storm sewers within adjacent or interconnected large or medium municipal separate storm sewer systems. The Director may issue one systemwide permit covering all, or a portion of all municipal separate storm sewers in adjacent or interconnected large or medium municipal separate storm sewer systems.

(v) Permits for all or a portion of all discharges from large or medium municipal separate storm sewer systems that are issued on a system-wide, jurisdiction-wide, watershed or other basis may specify different conditions relating to different discharges covered by the permit, including different management programs for different drainage areas which contribute storm water to the system."

Based on these regulations, the San Diego Water Board may issue a region-wide MS4 permit. The regulations also clarify that the permit may include different conditions for separate discharges covered by the permit. This allows the San Diego Water Board to ensure that suitable water quality conditions and provisions are identified for each watershed.

The USEPA's responses to comments in the Final Rule for the above-mentioned regulations also make it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide, permits. In the Final Rule published in the Federal Register and containing the responses to comments, USEPA notes that 40 CFR 122.26(a)(3)(iv) would allow an entire system in a geographical region under the purview of a State agency to be designated under a permit.[13] USEPA also states that many commenters wanted to allow the permitting authority broad discretion to establish system-wide permits, and that EPA believes that paragraphs 40 CFR 122.26 (a)(1)(v) and (a)(3)(ii) allow for such broad discretion.[14]

This Order creates watershed requirements that apply to multiple counties. The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees. Managing storm water on a regional and watershed basis is expected to result in improved water quality, as the Order focuses on monitoring and management practices necessary to improve each watershed rather than political boundaries. A single permit also allows the San Diego Water Board staff to expend fewer resources developing successive multiple permits and allows more resources to be devoted to working cooperatively with all three

[13] 55 Federal Register 47990-01, 48042
[14] Ibid

current groups of Copermittees to ensure implementation of this Order results in improved water quality.

C. Federal and California Endangered Species Acts

This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2115.5) or the Federal Endangered Species Act (16 United States Code [USC] sections 1531 to 1544). This Order requires compliance with requirements to protect the beneficial uses of waters of the U.S. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

D. California Environmental Quality Act

The action to adopt an NPDES Permit is exempt from the provisions of Chapter 3 of the California Environmental Quality Act (CEQA) (Public Resources Code section 21100, et seq.) pursuant to CWC section 13389. (*County of Los Angeles v. Cal. Water Boards* (2006) 143 Cal.App.4th 985.)

E. State and Federal Regulations, Plans and Policies

The legal authority provided by the following regulations, plans, and policies are also included as part of the discussions in Section VIII of this Fact Sheet.

Water Quality Control Plan for the San Diego Basin

The CWA requires the San Diego Water Board to establish water quality standards for each water body in its region. Water quality standards include beneficial uses, water quality objectives and criteria that are established at levels sufficient to protect beneficial uses, and an antidegradation policy to prevent degrading of waters. On September 8, 1994, the San Diego Water Board adopted the *Water Quality Control Plan for the San Diego Basin (*Basin Plan). The Basin Plan designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters in the San Diego Region. The San Diego Water Board has amended the Basin Plan on multiple occasions since 1994. In addition, the Basin Plan implements State Water Board Resolution No. 88-63, which established state policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply. Beneficial uses applicable to the surface water bodies that receive discharges from the MS4s within the San Diego Region generally include those listed below:

The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region:

- Municipal and Domestic Supply (MUN)
- Agricultural Supply (AGR)
- Industrial Process Supply (PROC)
- Industrial Service Supply (IND)
- Ground Water Recharge (GWR)
- Contact Water Recreation (REC1)
- Non-contact Water Recreation (REC2)
- Warm Freshwater Habitat (WARM)
- Cold Freshwater Habitat (COLD)
- Wildlife Habitat (WILD)
- Rare, Threatened, or Endangered Species (RARE)
- Freshwater Replenishment (FRSH)
- Hydropower Generation (POW)
- Preservation of Biological Habitats of Special Significance (BIOL)

The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region:

- Navigation (NAV)
- Commercial and Sport Fishing (COMM)
- Estuarine Habitat (EST)
- Marine Habitat (MAR)
- Aquaculture (AQUA)
- Migration of Aquatic Organisms (MIGR)
- Spawning, Reproduction, and/or Early Development (SPWN)
- Shellfish Harvesting (SHELL)

Pursuant to Water Code sections 13263 and 13377, the requirements of this Order implement the Basin Plan.

Water Quality Control Plan for Ocean Waters of California, California Ocean Plan

In 1972, the State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan). The State Water Board adopted the most recent amended Ocean Plan on September 15, 2009. The Office of Administrative Law approved it on March 10, 2010. On October 8, 2010, USEPA approved the 2009 Ocean Plan. The Ocean Plan is applicable, in its entirety, to ocean waters of the State. In order to protect beneficial uses, the Ocean Plan establishes water quality objectives and a program of implementation. Pursuant to Water Code sections 13263 and 13377, the requirements of this Order implement the Ocean Plan. The Ocean Plan identifies the beneficial uses of ocean waters of the State to be

protected as summarized below:

- Industrial water supply
- Water contact and non-contact recreation, including aesthetic enjoyment; navigation
- Commercial and sport fishing
- Mariculture
- Preservation and enhancement of designated Areas of Special Biological Significance
- Rare and endangered species
- Marine habitat
- Fish spawning and shellfish harvesting

On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving an exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges. On June 19, 2012, the State Water Board adopted Order No. 2012-0031, amending Order No. 2012-0012 to require pollutant load reductions to be achieved within six years for the ASBS Compliance Plans, section A.2.d(2) and ASBS Pollution Prevention Plans, section B.2.b(2). The State Water Board Resolution No. 2012-0012, as amended requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject terms and conditions of State Water Board Resolution No. 2012-0012, as amended. The Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012, as amended, applicable to these discharges, are ~~hereby~~ incorporated in Attachment A of this Order ~~as if fully set forth herein~~. Requirements of this Order implement the Ocean Plan.

Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality

On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

Antidegradation Policy

Federal regulations (40 CFR 131.12) require that the state water quality standards include an antidegradation policy consistent with the federal antidegradation policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16 ("Statement of Policy with Respect to Maintaining the Quality of the Waters of the State"). State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law.

The San Diego Water Board's Basin Plan implements and incorporates by reference both the State and federal antidegradation policies. State Water Board Resolution No. 68-16 and 40 CFR 131.12 require the San Diego Water Board to maintain high quality waters of the State until it is demonstrated that any change in quality will be consistent with maximum benefit to the people of the State, will not unreasonably affect beneficial uses, and will not result in water quality less than that described in the San Diego Water Boards' policies. State Water Board Resolution No. 68-16 requires that discharges of waste be regulated to meet best practicable treatment or control to assure that pollution or nuisance will not occur and the highest water quality consistent with the maximum benefit to the people of the State be maintained.

The discharges permitted in this Order are consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Board Resolution No. 68-16. Many of the water bodies within the area covered by this Order are of high quality. The Order requires the Copermittees to meet best practicable treatment or control to meet water quality standards. As required by 40 CFR 122.44(a), the Copermittees must comply with the "maximum extent practicable" technology-based standard set forth in CWA section 402(p) for discharges of pollutants in storm water from the MS4s.

Many of the waters within the area covered by this Order are impaired and listed on the State's CWA Section 303(d) List and the San Diego Water Board has established TMDLs to address the impairments. This Order requires the Copermittees to comply with permit provisions to implement the WLAs set forth in the TMDLs in order to restore the beneficial uses of the impaired water bodies consistent with the assumptions and requirements of the TMDLs. This Order includes requirements to develop and implement storm water management programs, achieve WQBELs, and effectively prohibit non-storm water discharges into the MS4. The issuance of this Order does not authorize an increase in the amount of discharge of waste.

Anti-Backsliding Requirements

CWA sections 402(o) and 303(d)(4) and 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations or conditions may be relaxed. All effluent limitations and other conditions in this Order are at least as stringent as the effluent limitations in the previous permits issued to the San Diego County Copermittees, the Orange County Copermittees and the Riverside County Copermittees.

Clean Water Act Section 303(d) List

CWA section 303(d)(1) requires each State to identify specific water bodies within its boundaries where water quality standards are not being met or are not expected to be met after implementation of technology-based effluent limitations on point sources. Water bodies that do not meet water quality standards are considered impaired and are placed on the state's "303(d) List." Periodically, USEPA approves the State's 303(d) List.

Most recently, USEPA approved the State's 2010 303(d) List of impaired water bodies on October 11, 2011, which includes certain receiving waters in the San Diego Region. For each listed water body, the state or USEPA is required to establish a TMDL of each pollutant impairing the water quality standards in that water body. A TMDL is a tool for implementing water quality standards and is based on the relationship between pollution sources and in-stream water quality conditions. The TMDL establishes the allowable pollutant loadings for a water body and thereby provides the basis to establish water quality-based controls. These controls should provide the pollution reduction necessary for a water body to meet water quality standards.

A TMDL is the sum of the allowable pollutant loads of a single pollutant from all contributing point sources (the waste load allocations or WLAs) and non-point sources (load allocations of LAs) plus the contribution from background sources and a margin of safety (40 CFR 130.2(i)). MS4 discharges are considered point source discharges. For 303(d)-listed water bodies and pollutants in the San Diego Region, the San Diego Water Board or USEPA develops and adopts TMDLs that specify these requirements.

Since 2002, the San Diego Water Board has established ~~six (6)~~ seven (7) TMDLs to remedy water quality impairments in various water bodies within the San Diego Region (see Attachment E to the Order). These TMDLs identify MS4 discharges as a source of pollutants to these water bodies, and, as required, establish WLAs for MS4 discharges to reduce the amount of pollutant discharged to receiving waters. CWA section 402(p)(3)(B)(iii) requires the San Diego Water Board to impose permit conditions, including: "management practices, control techniques and system, design and engineering methods, and *such other provisions as the Administrator or the State determines appropriate for the control of such pollutants."* (Emphasis added.) CWA section 402(a)(1) also requires states to issue permits with conditions necessary to carry out the provisions of the CWA. Federal regulations also require that NDPES permits contain WQBELs consistent with the assumptions and requirements of all available WLAs (40 CFR 122.44(d)(1)(vii)(B)). CWC section 13377 also requires that NPDES permits include limitations necessary to implement water quality control plans. Therefore, this Order includes WQBELs and other provisions to implement the TMDL WLAs assigned to Copermittees regulated by this Order.

Other Regulations, Plans and Policies

This Order implements all other applicable federal regulations and State regulations, plans and policies, including the California Toxics Rule at 40 CFR 131.38 (Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California Rule [California Toxics Rule or CTR]), and State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP).

F. Unfunded State Mandates

Article XIII B, Section 6(a) of the California Constitution provides that whenever "*any state agency mandates a new program or higher level of service on any local government, the state shall provide a subvention of funds to reimburse that local government for the costs of the program or increased level of service*." The requirements of this Order do not constitute state mandates that are subject to a subvention of funds for several reasons, including, but not limited to, the following.

First, the requirements of this Order do not constitute a new program or a higher level of service as compared to the requirements contained in the previous Fourth Term Permits. The overarching requirement to impose controls to reduce the pollutants in discharges from MS4s is dictated by the CWA and is not new to this permit cycle (33 USC section 1342(p)(3)(B)). The inclusion of new and advanced measures as the MS4 programs evolve and mature over time is anticipated under the CWA (55 FR 47990, 48052 (Nov. 16, 1990)), and to the extent requirements in this Order are interpreted as new advanced measures, they do not constitute a new program or higher level of service.

Second, and more broadly, mandates imposed by federal law, rather than by a state agency, are exempt from the requirement that the local agency's expenditures be reimbursed (Cal. Const., art. XIII B, section 9, subd. (b)). This Order implements federally mandated requirements under the CWA and its requirements are therefore not subject to subvention of funds. This includes federal requirements to effectively prohibit non-storm water discharges, to reduce the discharge of pollutants in storm water to the MEP, and to include such other provisions as the Administrator or the State determines appropriate for the control of such pollutants (33 USC section 1342(p)(3)(B)). Federal cases have held these provisions require the development of permits and permit provisions on a case-by-case basis to satisfy federal requirements. (*Natural Resources Defense Council, Inc., v. USEPA* (9th Cir. 1992) 966 F.2d 1292, 1308, fn. 17.)

The authority exercised under this Order is not reserved state authority under the CWA's savings clause (cf. *Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 627-628 [relying on 33 USC section 1370, which allows a state to develop requirements which are not "less stringent" than federal requirements]), but instead is part of a federal mandate to develop pollutant reduction requirements for municipal separate storm sewer systems. To this extent, it is entirely federal authority that forms the legal basis to establish the permit provisions. (See, *City of Rancho Cucamonga v. Regional Water Quality Control Board, Santa Ana Region* (2006) 135 Cal.App.4th 1377, 1389; *Building Industry Ass'n of San Diego Co. v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 882-883.)

The MEP standard is a flexible standard that balances a number of considerations, including technical feasibility, cost, public acceptance, regulatory compliance, and effectiveness. (*Building Ind. Ass'n., supra,* 124 Cal.App.4th at pp. 873-874, 889.) Such

considerations change over time with advances in technology and with experience gained in storm water management (55 FR 47990, 48052 (Nov. 16, 1990)). Accordingly, a determination of whether the conditions contained in this Order exceed the requirements of federal law cannot be based on a point by point comparison of the permit conditions and the minimum control measures that are required "at a minimum" to reduce pollutants to the maximum extent practicable and to protect water quality (40 CFR 122.34). Rather, the appropriate focus is whether the permit conditions, as a whole, exceed the MEP standard.

In recent months, the County of Los Angeles and County of Sacramento Superior Courts have granted writs setting aside decisions of the Commission on State Mandates that held certain requirements in Phase I permits constituted unfunded mandates. In both cases, the courts have found that the correct analysis in determining whether an MS4 permit constituted a state mandate was to evaluate whether the permit as a whole exceeds the MEP standard. (*State of Cal. v. Comm. on State Mandates* (Super. Ct. Sacramento County, 2012, No. 34-2010-80000604), *State of California v. County of Los Angeles* (Super. Ct. Los Angeles County, 2011, No. BS130730.) Both cases are currently pending appeal.

The requirements of the Order, taken as a whole rather than individually, are necessary to reduce the discharge of pollutants to the MEP and to protect water quality. The San Diego Water Board finds that the requirements of the Order are practicable, do not exceed federal law, and thus do not constitute an unfunded mandate. These findings are the expert conclusions of the principal state agency charged with implementing the NPDES program in California (CWC sections 13001, 13370).

It should also be noted that the provisions in this Order to effectively prohibit non-storm water discharges are also mandated by the CWA (33 USC section 1342(p)(3)(B)(ii)). Likewise, the provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state establishes or adopts a TMDL, federal law requires that permits must contain effluent limitations consistent with the assumptions and requirements of any applicable waste load allocation in a TMDL (40 CFR 122.44(d)(1)(vii)(B)).

Third, the local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental dischargers who are issued NPDES permits for storm water discharges. With a few inapplicable exceptions, the CWA regulates the discharge of pollutants from point sources (33 USC section 1342) and the Porter-Cologne Act regulates the discharge of waste (CWC section 13263), both without regard to the source of the pollutant or waste. As a result, the "costs incurred by local agencies" to protect water quality reflect an overarching regulatory scheme that places similar requirements on governmental and non-governmental dischargers. (See *County of Los Angeles v. State of California* (1987) 43 Cal.3d 46, 57-58 [finding comprehensive workers' compensation scheme did not create a cost for local agencies that was subject to state subvention].)

The CWA and the Porter-Cologne Act largely regulate storm water with an even hand, but to the extent there is any relaxation of this even-handed regulation, it is in favor of the local agencies. Generally, the CWA requires point source dischargers, including dischargers of storm water associated with industrial or construction activity, to comply strictly with water quality standards (33 USC section 1311(b)(1)(C); *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159, 1164-1165 [noting that industrial discharges must strictly comply with water quality standards]). As discussed in prior State Water Board decisions, certain provisions of this Order do not require strict compliance with water quality standards (State Water Board Order No. WQ 2001-0015, p. 7). Those provisions of this Order regulate the discharge of waste in municipal storm water under the CWA's MEP standard, not the BAT/BCT standard that applies to other types of discharges. These provisions, therefore, regulate the discharge of waste in municipal storm water more leniently than the discharge of waste from non-governmental sources.

Fourth, the Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)). To the extent that the local agency Copermittees have voluntarily availed themselves of the permit, the program is not a state mandate. (Accord, *County of San Diego v. State of California* (1997) 15 Cal.4th 68, 107-108.)

Fifth, the local agency Copermittees' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under state law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

Finally, even if any of the permit provisions could be considered unfunded mandates, under Government Code section 17556, subdivision (d), a state mandate is not subject to reimbursement if the local agency has the authority to charge a fee. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order, subject to certain voting requirements contained in the California Constitution. (See Cal. Const., Art. XIII D, section 6, subd. (c); see also *Howard Jarvis Taxpayers Ass'n v. City of Salinas* (2002) 98 Cal.App.4th 1351, 1358-1359.) The Fact Sheet demonstrates that numerous activities contribute to the pollutant loading in the MS4. Local agencies can levy service charges, fees, or assessments on these activities, independent of real property ownership. (See, e.g., *Apartment Ass'n of Los Angeles County, Inc., v. City of Los Angeles* (2001(24 Cal.4th 830, 842 [upholding inspection fees associated with renting property].) The authority and ability of a local agency to defray the cost of a program without raising taxes indicates that a program does not entail a cost subject to subvention. (*Clovis Unified School Dist. V. Chiang* (2010) 188 Cal.App.4th 794, 812, citing *Connell v. Sup. Ct.* (1997) 59 Cal.App.4th 382, 401; *County of Fresno v. State of California* (1991) 53 Cal. 3d. 482, 487-488.)

VIII. PROVISIONS

The provisions (i.e. NPDES permit requirements) of the Order are discussed below.

A. Prohibitions and Limitations

Purpose: Provision A includes the prohibitions and limitations requirements that are the foundation of all the subsequent requirements included in the Order. Compliance with the prohibitions and limitations will restore and protect receiving waters from impacts that may be caused by discharges into and from the Copermittees' MS4s and ultimately achieve the objective of the CWA.

In meeting the requirements set forth in the Order, the Copermittees must be cognizant that the prohibitions and limitations exist and will be the standard by which the San Diego Water Board will be measuring the progress and success of their implementation of the NPDES permit requirements.

***Discussion*:** The objective of the CWA is to "*restore and maintain the chemical, physical, and biological integrity of the Nation's waters*." The CWA requires the implementation of NPDES permit programs to regulate discharges of pollutants and dredged or fill material to the navigable waters of the U.S. For discharges into and from MS4s, the CWA requires the NPDES permits to "*effectively prohibit non-stormwater discharges into the storm sewers*" and "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable.*"

Provision A includes limitations, consistent with the requirements of the CWA for discharges from MS4s. Provision A expresses these limitations as discharge prohibitions, receiving water limitations, and effluent limitations. Compliance with the discharge prohibitions and receiving water limitations is also explicitly described, in conformance with precedential State Water Board Orders.

More specific and detailed discussions of the requirements of Provision A are provided below.

Provision A.1 (Discharge Prohibitions) prohibits the discharge of specific types of waste into and/or from the Copermittees' MS4s.

Provision A.1.a restates and reiterates Basin Plan Waste Discharge Prohibition 1, by prohibiting discharges into and from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the

state. The terms pollution,[15] contamination,[16] and nuisance[17] are defined under CWC 13050. Provision A.1.c incorporates all the waste discharge prohibitions of the Basin Plan into the requirements of the Order. The waste discharge prohibitions from the Basin Plan have been reproduced and provided in Attachment A to the Order.

Provision A.1.b requires non-storm water discharges into the MS4s to be effectively prohibited, consistent with the requirements of the CWA for MS4 permits to "*effectively prohibit non-stormwater discharges into the storm sewers*." The effective prohibition is required to be implemented by each Copermittee within its jurisdiction through the illicit discharge detection and elimination requirements under Provision E.2. The prohibition does not apply to NPDES permitted discharges into the Copermittees' MS4s.

The CWA employs the strategy of prohibiting the discharge of any pollutant from a point source into waters of the United States unless the discharger of the pollutant(s) obtains an NPDES permit pursuant to CWA Section 402. The 1987 amendment to the CWA includes provision 402(p) that specifically addresses NPDES permitting requirements for storm water discharges from MS4s. CWA section 402(p) prohibits the discharge of pollutants from specified MS4s to waters of the U.S. except as authorized by an NPDES permit and identifies two substantive standards for MS4 storm water permits. MS4 permits (1) "*shall include a requirement to effectively prohibit nonstormwater discharges into the storm sewers*" and (2) "*shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or State determines appropriate for the control of such pollutants*." (CWA section 402(p)(3)(B)(ii-iii).)

In November 1990, the USEPA published regulations addressing storm water discharges from MS4s (55 FR 47990 and following (Nov. 16, 1990) (Phase I Final Rule)). The regulations establish minimum requirements for MS4 permits, and generally focus on the requirement that MS4s implement programs to reduce the amount of pollutants found in storm water discharges to the MEP. The CWA's municipal storm water MEP standard does not require storm water discharges to strictly meet water quality standards, as is required for other NPDES permitted

[15] CWC 13050(l): "(1) 'Pollution' means an alteration of the quality of waters of the state by waste to a degree which unreasonably affects either of the following: (A) The water for beneficial uses. (B) Facilities which serve beneficial uses. (2) 'Pollution' may include "contamination.
[16] CWC 13050(k): "Contamination' means an impairment of the quality of waters of the state by waste to a degree which creates a hazard to public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste, whether or not waters of the state are affected."
[17] CWC 13050(m): "Nuisance' means anything which meets all of the following requirements: (1) Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. (2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. (3) Occurs during, or as a result of, the treatment or disposal of wastes."

discharges. Compliance is achieved through an iterative approach of continuous implementation of improved BMPs. This distinction reflects Congress's recognition that variability in flow and intensity of storm events render difficult strict compliance with water quality standards by MS4 permittees. In describing the controls that permits must include to reduce pollutants in storm water discharges to the MEP, the statute (CWA section 402(p)(3)(B)(iii)) states that the controls shall include: "*management practices, control techniques and system, design and engineering methods, and such other provisions as the [permit writer] determines appropriate for the control of such pollutants*."

In contrast, non-storm water discharges from the MS4 that are not authorized by separate NPDES permits are subject to requirements under the NPDES program, including discharge prohibitions, technology based effluent limitations and water quality-based effluent limitations (40 CFR 122.44). The regulations also require the Copermittee's program to include an element to detect and remove illicit discharges and improper disposal into the storm sewer (40 CFR 122.26(d)(2)(iv)(B)).

While "non-storm water" is not defined in the CWA or federal regulations, the federal regulations (at 40 CFR 122.26(b)(2)) define "*illicit discharge*" as *"any discharge to a municipal separate storm sewer that is not composed entirely of storm water and that is not covered by an NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer and discharges resulting from fire fighting activities)*." This definition is the most closely applicable definition of "non-storm water" contained in federal law. As stated in the Phase I Final Rule, USEPA added the illicit discharge program requirement to begin implementation of the 'effective prohibition' requirement to detect and control non-storm water discharges to their municipal system.

Thus, federal law mandates that permits issued to MS4s must require management practices that will result in reducing storm water pollutants to the MEP yet at the same time requires that non-storm water discharges be effectively prohibited from entering the MS4. "Effectively" prohibit does not mean that non-storm water discharges are authorized to be discharged into and from the Copermittees' MS4s. The Phase I Final Rule clarifies what "effectively prohibit" means (55 FR 47995):

> "*Section 402(p)(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…<u>Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit</u> (other than the permit for the discharge from the municipal separate storm sewer)*" [Emphasis added].

Consistent with federal law, unless non-storm water discharges to the MS4 are authorized by a separate NPDES permit, non-storm water discharges are

appropriately subject to the effective prohibition requirement in the CWA and Regional Water Boards are not limited by the iterative MEP approach to storm water regulation in crafting appropriate regulations for non-storm water discharges.

The federal regulations (40CFR122.26(d)(2)(i)(B)) require the Copermittees to establish the legal authority which authorizes or enables the Copermittees to prohibit illicit discharges to the MS4s. The federal regulations (40 CFR 122.26(d)(2)(vi)(B)(1)) require the Copermittees to "*implement and enforce an ordinance, order or similar means*" to prevent non-storm water discharges to their MS4s. Thus, the Copermittees are required to "*effectively*" prohibit non-storm water discharges to their MS4s through enforcing their legal authority established under "*ordinance, order or similar means*" and either remove those discharges to their MS4s, or require those discharges to obtain coverage under a separate NPDES permit. More detail about the program that must be implemented to "*effectively*" prohibit non-storm water discharges to the Copermittees' MS4s is provided under the discussion for Provision E.2.

Provision A.1.d was included to be consistent Resolution No. 2012-0012, adopted by the State Water Board on March 20, 2012. Provision A.1.d prohibits discharges from MS4s to Areas of Special Biological Significance (ASBS), except for storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach to the Heisler Park ASBS subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012. The pertinent Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 are provided in Attachment A to the Order.

Provision A.2 (Receiving Water Limitations) specifies the condition of the receiving waters that must be achieved when there are discharges from the Copermittees' MS4s. Receiving water limitations are included in all NPDES permits issued pursuant to the CWA section 402. CWA section 402(p)(3)(B)(iii) authorizes the inclusion of "*such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." This requirement gives USEPA or the State permitting authority, in this case the San Diego Water Board, discretion to determine what permit conditions are necessary to control pollutants.

In its Phase I Final Rule (see 55 FR 47990, 47994 (Nov. 16, 1990)), USEPA elaborated on these requirements, stating that, "*permits for discharges from municipal separate storm sewer systems must require controls to reduce the discharge of pollutants to the maximum extent practicable, and where necessary water quality-based controls*." USEPA reiterated in its Phase II Final Rule (64 FR 68722, 68737), that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL*." CWC section 13377 also requires that NPDES permits include limitations necessary to implement water quality control plans. Both the State Water Board and the San Diego Water Board have previously concluded that discharges from the MS4 contain pollutants that have

the reasonable potential to cause or contribute to excursions above water quality standards. As such, inclusion of receiving water limitations is appropriate to control MS4 discharges.

The inclusion of receiving water limitations is also consistent with the Ninth Circuit Court of Appeals' ruling in *Defenders of Wildlife v. Browner* (191 F.3d 1159, 1166 (1999)) that the permitting authority has discretion regarding the nature and timing of requirements that it includes as MS4 permit conditions to attain water quality standards. The Ninth Circuit Court of Appeals recently explained that, "*[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*" (*Natural Resources Defense Council v. County of Los Angeles* (9th Cir. 2011) 673 F.3d 880, 886 (revd. On other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013)))

The receiving water limitations included in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan or in water quality control plans or policies adopted by the State Water Board, including State Water Board Resolution No. 68-16, or in federal regulations, including but not limited to 40 CFR 131.12 and 131.38. The water quality objectives in the Basin Plan and other State Water Board plans and policies have been approved by USEPA and combined with designated beneficial uses constitute the water quality standards required under federal law.

Provision A.2.a requires that discharges from the Copermittees' MS4s must not cause or contribute to the violation of water quality standards in receiving waters. The water quality standards of the receiving waters must be protected from the impacts that may be caused by the Copermittees' MS4 discharges. Water quality standards applicable to the surface waters in the San Diego Region must be achieved through meeting the technology based standard of MEP through an iterative process of improved management actions. Provision A.2.a is also consistent with State Water Board Order WQ 99-05 precedent-setting language requiring discharges from MS4s to attain receiving water quality standards. The water quality control plans and policies with water quality standards applicable to the waters in the San Diego Region are included under Provision A.2.a.

Provisions A.2.b was included to be consistent with the requirements of State Water Board Resolution No. 2012-0012, adopted on March 20, 2012.

<u>Provision A.3 (Effluent Limitations)</u> specifies the condition of the discharges from the Copermittees' MS4s that must be achieved if and when there are discharges.

Consistent with CWA section 301(b)(1)(A) and 40 CFR 122.44(a), Provision A.3.a includes the technology-based effluent limitations that must be included in the Order. The technology-based effluent limits, representing the minimum level of control that must be imposed in a permit under CWA section 402, requires that pollutants in discharges of storm water from the Copermittees' MS4s be reduced to the MEP. This provision applies specifically to storm water discharges. Non-storm water discharges must be effectively prohibited, as required under Provision A.1.b. Non-storm water (dry weather) discharges from the MS4 are not considered storm water (wet weather) discharges and therefore are not subject to the MEP standard.

The technology-based MEP standard is an ever-evolving, flexible, and advancing concept. Neither Congress nor USEPA has specifically defined the term "maximum extent practicable." Congress established this flexible MEP standard so that the administrative bodies would have "*the tools to meet the fundamental goals of the Clean Water Act in the context of storm water pollution*." (*Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 884.) As knowledge about controlling storm water runoff and discharges continues to evolve, so does the knowledge which constitutes MEP. Reducing the discharge of pollutants in storm water from the MS4 to the MEP requires the Copermittees to assess each program component and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP.

The San Diego Water Board or the State Water Board ultimately define MEP, and may include requirements that provide specific guidance on what is expected to demonstrate MEP. It is the responsibility of the Copermittees to propose actions that implement BMPs to reduce storm water pollution to the MEP. In other words, the Copermittees' runoff management programs developed and implemented under the Order are the Copermittees' proposals for achieving MEP. Their total collective and individual activities conducted pursuant to their runoff management programs become their proposal for achieving MEP as it applies both to their overall effort, as well as to specific activities. Provisions B through E of the Order provides a minimum framework to guide the Copermittees in achieving the MEP standard for discharges of pollutants in storm water.

Provision A.3.b incorporates any water quality based effluent limitations (WQBELs) applicable to the MS4s established for TMDLs adopted and approved for the San Diego Region and requires the Copermittees to comply with those WQBELs. This is consistent with 40 CFR 122.44(d)(1)(vii)(B), which requires that NPDES permits to incorporate WQBELs "*developed to protect a narrative water quality criterion, a numeric water quality criterion, or both…consistent with the assumptions and requirements of any available wasteload allocation for the discharge...*"

Pursuant to CWA section 303(d), for surface water bodies identified as impaired by one or more pollutants, the San Diego Water Board is required to establish TMDLs "*at a level necessary to implement the applicable water quality standards with seasonal*

variations and a margin of safety which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality." The TMDLs identify sources of the pollutants causing the impairments and assign portions of the TMDL as WLAs to point sources, which include MS4s.

WLAs must be expressed in NPDES permits as WQBELs, which may include one or more numeric components such as numeric effluent limits, and/or receiving water limitations, and/or BMP requirements. Because numeric targets for TMDLs typically include a component that will be protective of water quality standards, a TMDL will likely include one or more numeric receiving water limitations and/or effluent limitations as part of the assumptions or requirements of the TMDL. Any numeric receiving water limitations and/or effluent limitations developed as part of the assumptions or requirements of a TMDL must be incorporated and included as part of WQBELs for the MS4s.

Because the development and approval of new TMDLs, or modification of existing TMDLs, may occur during the term of this Order, the specific provisions of those TMDLs, including effluent limitations applicable to MS4s are provided within Attachment E to the Order. Attachment E will be updated with new TMDLs and modifications to existing TMDLs in a timely manner as they occur.

Provision A.4 (Compliance with Discharge Prohibitions and Receiving Water Limitations) describes the process required to be implemented by the Copermittees if compliance with the discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a are not being achieved under current conditions.

In its Phase II Stormwater Regulations, Final Rule, USEPA states that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL.*"[18] In a series of comment letters on MS4 permits issued by various Regional Water Boards, USEPA has also reiterated that MS4 discharges must meet water quality standards.[19] In addition, the Ninth Circuit Court of Appeals explained in a recent ruling that, *"[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*"[20]

[18] Phase II Stormwater Regulations, Final Rule, 64 Fed. Reg. 68722, 68737.
[19] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.
[20] NRDC v. County of Los Angeles (9th Cir. 2011), 673 F.3d 880, 886 (revd. on other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013))). See also, *Building Industry Ass'n of San Diego County v. State Water Resources*

Water quality standards for the San Diego Region are established in the Basin Plan. The water quality standards of the Basin Plan are incorporated into this Order as the discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a. The discharge prohibitions and receiving water limitations in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations or prohibitions to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan, water quality control plans or policies adopted by the State Water Board, including Resolution No. 68-16, or federal regulations, including but not limited to, 40 CFR 131.12 and 131.38. The waste discharge prohibitions and water quality objectives in the Basin Plan have been approved by USEPA and combined with the designated beneficial uses constitute the water quality standards required under federal law.

Under federal law (CWA section 402(p)(3)(B)(iii)), an MS4 permit must include "*controls to reduce the discharge of pollutants to the maximum extent practicable...and such other provision as...the State determines appropriate for control of such pollutants*." The State Water Board has previously determined that limitations necessary to meet water quality standards are appropriate for the control of pollutants discharged by MS4s and must be included in MS4 permits. (State Water Board Orders WQ 91-03, 98-01, 99-05, 2001-15; see also *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159.) This Order prohibits discharges that cause or contribute to violations of water quality standards.

The discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a are included in this Order to ensure that discharges from the MS4s do not cause or contribute to exceedances of water quality objectives necessary to protect the beneficial uses of the receiving waters.

Provision A.4 is consistent with the precedent-setting language in State Water Board Order WQ 99-05 required to be included in municipal storm water permits. State Water Board Order WQ 2001-15 refined Order WQ 99-05 by requiring an iterative approach to compliance with water quality standards involving ongoing assessments and revisions, as referred to as the "iterative process." The "iterative process" is a fundamental NPDES requirement for municipal storm water permits to achieve the objectives of the CWA.

The State Water Board and Regional Water Boards have stated that the provisions under Provisions A.1.a, A.1.c, A.2.a, and A.4 are independently applicable, meaning that compliance with one provision does not provide a "safe harbor" where there is non-compliance with another provision (i.e., compliance with the Provision A.4 does not shield a Copermittee who may have violated Provision A.1.a, A.1.c, or A.2.a from

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Control Bd. (2004) 124 Cal.App.4th 866, 884-886, citing *Defenders of Wildlife v. Browning,* (9th Cir. 1999) 191 F.3d 1159.)

an enforcement action). The intent of Provision A.4 is to ensure that the Copermittees have the necessary storm water management programs and controls in place, and that they are modified by the Copermittees in a timely fashion when necessary, so that compliance with Provisions A.1.a, A.1.c, and/or A.2.a is achieved as soon as possible. USEPA expressed the importance of this independent applicability in a series of comment letters on MS4 permits proposed by various Regional Water Boards. At that time, USEPA expressly objected to certain MS4 permits that included language stating, *"permittees will not be in violation of this [receiving water limitation] provision … [if certain steps are taken to evaluate and improve the effectiveness of the jurisdictional runoff management programs],"* concluding that this phrase would not comply with the CWA.[21]

The Ninth Circuit held in *Natural Resources Defense Council v. County of Los Angeles* (2011) 673 F3d. 880, 886 (revd. on other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013))) that engagement in the iterative process does not provide a safe harbor from liability for violations of permit terms prohibiting exceedances of water quality standards. The Ninth Circuit holding is consistent with the position of the State and Regional Water Boards that exceedances of water quality standards in an MS4 permit constitute violations of permit terms subject to enforcement by the Water Boards or through a citizen suit. While the Water Boards have generally directed dischargers to achieve compliance by improving control measures through the iterative process, the San Diego Water Board retains the discretion to take other appropriate enforcement and the iterative process does not shield dischargers from citizen suits under the CWA.

The requirements of Provision A.4, therefore, are required to be implemented until the water quality standards expressed under Provisions A.1.a, A.1.c, and A.2.a are achieved. The CWA requires MS4 permits to "*require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." The requirements of this Order have been deemed or determined to be "appropriate" to achieve water quality standards in receiving waters.

Part of the "*controls*" required by the Order is the process described in Provision A.4. Provision A.4 includes the process that is ultimately expected to achieve compliance with the requirement that discharges from the MS4 do not cause or contribute to violations of water quality standards in the receiving waters. The implementation of Provision A.4 is required when the Copermittees or the San Diego Water Board have

[21] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.

determined that discharges from the MS4 are causing or contributing to violations of water quality standards in the receiving waters.

The Copermittees must effectively prohibit non-storm water discharges into the MS4s, reduce the discharge of pollutants in storm water from the MS4s to the MEP, and ensure that their MS4 discharges do not cause or contribute to violations of water quality standards. If the Copermittees have effectively prohibited non-storm water discharges and reduced storm water pollutant discharges to the MEP, but their discharges are still causing or contributing to violations of water quality standards, Provision A.4 provides a clear "iterative process" for the Copermittees to follow.

Provision A.4 essentially requires the Copermittees to implement additional BMPs until MS4 discharges no longer cause or contribute to a violation of water quality standards.

In assessing compliance and potential enforcement actions, the San Diego Water Board looks at the Copermittees' efforts in total to meet the requirements of Provisions A.1.a, A.1.c, A.2.a and Provision A.4. The Copermittees need to demonstrate that they are making improvements to their programs and making progress toward achieving the discharge prohibitions and receiving water limitations in Provisions A.1.a, A.1.c, and A.2.a by implementing the requirements of Provision A.4. The San Diego Water Board would consider these efforts prior to strictly enforcing the requirements of Provisions A.1.a, A.1.c, and A.2.a. Causes of exceedances of the receiving water limitations can often be more difficult to identify and attribute solely to the Copermittees' MS4s. The intent of the Order is to provide the Copermittees more clarity and flexibility in addressing these exceedances through the iterative approach and adaptive management process until the requirements under Provisions A.1.a, A.1.c, and A.2.a are fully achieved.

An exception to the iterative approach and adaptive management process would be in receiving waters subject to adopted and approved TMDLs. For TMDLs that are incorporated into the Order, there is a specific date for compliance to be achieved, after which the iterative approach and adaptive management process required under Provision A.4 no longer provides the flexibility to achieve compliance. Where compliance dates for a TMDL have passed, compliance with the WQBELs incorporated into the Order established by a TMDL in Attachment E to protect water quality standards is required. Thus, after the interim or final compliance dates for a TMDL have passed, if the discharges from the Copermittees' MS4s are causing or contributing to a violation of WQBELs, exceedances of WQBELs must be strictly enforced by the San Diego Water Board. In the meantime, however, the Copermittees are in compliance with the interim or final TMDL requirements in Attachment E as long as the interim or final WQBELs are being achieved in accordance with the interim or final compliance dates.

B. Water Quality Improvement Plans

Purpose: Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges to the MS4s and control pollutants in storm water discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the Clean Water Act.

Provision B includes requirements for the Copermittees to develop and implement Water Quality Improvement Plans to ultimately comply with the prohibitions and limitations under Provision A. The Water Quality Improvement Plans will provide the Copermittees a comprehensive program that can achieve the requirements and further the objectives of the CWA. Implementation of the Water Quality Improvement Plans will also improve the quality of the receiving waters in the San Diego Region.

The Water Quality Improvement Plan is the backbone of the Regional MS4 Permit requirements. Provision B provides the guidance, criteria, and minimum expectations and requirements for the elements of the Water Quality Improvement Plan to be developed and implemented by the Copermittees. The Water Quality Improvement Plans will be implemented in the Watershed Management Area by the Copermittees within their jurisdictions through their jurisdictional runoff management programs.

The Water Quality Improvement Plan also incorporates a program to monitor and assess the progress of the Copermittees' jurisdictional runoff management programs toward improving the quality of discharges from the MS4s, as well as tracking improvements to the quality of receiving waters. A process to adapt and improve the effectiveness of the Water Quality Improvement Plans has also been incorporated into the requirements of Provision B to be consistent with the "iterative approach" required to achieve compliance with discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a, pursuant to the requirements of Provision A.4.

The Water Quality Improvement Plans have also been structured to incorporate the requirements of any TMDLs that have been adopted for the San Diego Region. Incorporating the requirements of the TMDLs into the requirements of Provision B allows the Copermittees to develop a single plan, instead of separate plans, to coordinate their non-storm water and storm water runoff management programs. The Water Quality Improvement Plans allow the Copermittees to meet the requirements of this Order, as well as fulfill the requirements of the TMDLs.

As an added benefit, if the Copermittees demonstrate that impaired water bodies within the Watershed Management Area listed on the 303(d) List will be addressed with their Water Quality Improvement Plans in a reasonable period of time, the San Diego Water Board may be able to remove the water bodies from the 303(d) List, which would greatly reduce the need for the San Diego Water Board to develop additional TMDLs that would have to be incorporated into the Order and implemented by the Copermittees.

***Discussion*:** The federal NPDES regulations require the Copermittees to develop a proposed management program (40 CFR 122.26(d)(2)(iv)). The proposed management program must include "*a comprehensive planning process*" and "*where necessary intergovernmental coordination*" for the "*duration of the permit.*" The Water Quality Improvement Plan is the Copermittees' "*comprehensive planning process*" document for the proposed management program that will be implemented within a Watershed Management Area. Implementation of the Water Quality Improvement Plan requires "*intergovernmental coordination*" among the Copermittees for at least the "*duration of the permit*," and likely into and beyond the next iteration of the permit.

Developing Water Quality Improvement Plans based upon watersheds is consistent with federal regulations that support the development of permit conditions, as well as implementation of storm water management programs, at a watershed scale (40 CFR 122.26(a)(3)(ii), 122.26(a)(3)(v), and 122.26(d)(2)(iv)). In 2003, USEPA issued a Watershed-Based NPDES Permitting Policy Statement (USEPA, 2003) that defines watershed-based permitting as an approach that produces NPDES permits that are issued to point sources on a geographic or watershed basis. In this policy statement, USEPA explains that "*[t]he utility of this tool relies heavily on a detailed, integrated, and inclusive watershed planning process*." USEPA identifies a number of important benefits of watershed permitting, including more environmentally effective results, the ability to emphasize measuring the effectiveness of targeted actions on improvements in water quality, reduced cost of improving the quality of the nation's waters and more effective implementation of watershed plans, including TMDLs, among others.

An emphasis on watersheds is appropriate at this stage in the San Diego Region's MS4 program to shift the focus to more targeted, water quality driven planning and implementation. Addressing discharges on a watershed scale focuses on water quality results by emphasizing the receiving waters in the watershed. The conditions of the receiving waters drive management actions, which in turn focus measures to address pollutant contributions from MS4 discharges.

The Water Quality Improvement Plan gives the Copermittees the responsibility of developing a comprehensive plan to coordinate the efforts of their jurisdictional runoff management programs for addressing the problems related to MS4 discharges causing impacts to water quality in the Watershed Management Area. The development of the plan provides the Copermittees the opportunity to provide

significant input on how to implement their jurisdictional runoff management programs, and how to best utilize their available resources in addressing a focused set of priorities that they believe will result in measureable improvements to water quality within the Watershed Management Area.

The Copermittees are encouraged to separate the Watershed Management Area into subwatersheds, as appropriate. This allows the Copermittees to identify priorities applicable to a subset of the Copermittees or specific water bodies or areas within the Watershed Management Area.

Included in the requirements for the elements to be included in the Water Quality Improvement Plan are monitoring and assessment requirements that are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order. In addition to the federal requirements of the CWA section 308(a) and 40 CFR 122.26(d), the San Diego Water Board has the authority to establish monitoring, reporting, and recordkeeping requirements for NPDES permits under CWC 13383.

More specific and detailed discussions of the requirements of Provision B are provided below.

Provision B.1 (Watershed Management Areas) requires the Copermittees to develop a Water Quality Improvement Plan for each of the Watershed Management Areas defined by the San Diego Water Board.

Pursuant to 40 CFR 122.26(d)(2)(iv), proposed management programs "*may impose controls on a…watershed basis…*" The Water Quality Improvement Plan is the Copermittees' proposed management program. A Water Quality Improvement Plan must be developed for each Watershed Management Area identified in the Order.

The Watershed Management Areas are identified in Table B-1. Table B-1 establishes ten (10) Watershed Management Areas, and identifies the Copermittees that are responsible for developing and implementing the Water Quality Improvement Plan for each Watershed Management Area.

The Copermittees from each of the three counties within the San Diego Region are expected to be phased in as their respective NPDES municipal storm water permits expire. Because Order No. R9-2007-0001 expired in January 2012, the San Diego County Copermittees ~~are~~were covered under the Regional MS4 Permit on June 27, 2013, the effective date of the Order. Because Order No. R9-2009-0002 expired in December 2014, the Orange County Copermittees are covered under the Regional MS4 Permit on April 1, 2015, the effective date of Order No. R9-2013-0001 as amended by Order No. R9-2015-0001.

After the San Diego Water Board receives and considers the Report~~s~~ of Waste

Discharge required to be submitted by the ~~Orange County Copermittees and~~ Riverside County Copermittees pursuant to the requirements of their current permit~~s~~, and makes any necessary changes to the Order, the ~~Orange County Copermittees and~~ Riverside County Copermittees will be covered under the Regional MS4 Permit after ~~Order No. R9-2009-0002 expires in November 2014, and~~ Order No. R9-2010-0016 expires in December 2015~~, respectively~~.

The ~~Orange County Copermittees and~~ Riverside County Copermittees also have the option to obtain coverage under the Regional MS4 Permit earlier than their respective permit expiration dates. The process to apply for early coverage is described Provision F.6.

Because the Santa Margarita River Watershed Management Area includes Copermittees from both San Diego County and Riverside County, a footnote to Table B-1 has been included to specify that the requirements of Provision B are not required to be implemented by the County of San Diego until the Riverside County Copermittees have received a notice of coverage under the Order. Until the Riverside County Copermittees are notified of coverage under the Order, the County of San Diego is subject to the prohibitions and limitations under Provision A, responsible for continuing to implement its existing jurisdictional runoff management program, and responsible for implementing the transitional monitoring and assessment requirements of Provision D, the transitional annual reporting requirements of Provision F.3.b, and the TMDL requirements of Attachment E to the Order.

The City of Laguna Woods and Laguna Hills are located partially within the jurisdictions of both the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board) and the San Diego Water Board. Written requests for designation of a single Regional Water Board to regulate matters pertaining to permitting of Phase I MS4 discharges were submitted to the San Diego Water Board and the Santa Ana Water Board by the City of Laguna Woods by letter dated September 8, 2014, and the City of Laguna Hills by letter dated March 12, 2014. The Cities of Laguna Woods and Laguna Hills requested designation of the San Diego Water Board pursuant to CWC section 13228. The Cities of Laguna Woods and Laguna Hills reported that management and implementation of municipal programs to comply with two different Phase I MS4 permits creates a significant administrative and financial burden and inhibits their ability to contribute to greater overall water quality improvements in either Region. In an effort to address these concerns, the San Diego Water Board and the Santa Ana Water Board have entered into an agreement dated February 10, 2015, whereby the San Diego Water Board is designated to regulate Phase I MS4 discharges within the jurisdiction of the Cities of Laguna Woods and Laguna Hills including areas in the Santa Region upon the later effective date of this Order or Tentative Order No. R8-2015-0001. Under the terms of the agreement, each Regional Water Board retains the authority to enforce provisions of the Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee (Water

Code section 13228 (b)). Also under the terms of the agreement, any TMDL and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Laguna Woods or Laguna Hills as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement of the applicable TMDL would remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Boards' San Diego Creek/Newport Bay TMDL and the San Diego Water Boards indicator Bacteria Project I Beaches and Creeks TMDL. In conformance with this agreement, a footnote to Table B-1 has been included to specify coverage under Order No. R9-2013-0001 for those Phase I MS4 discharges within the jurisdictional boundaries of the Cities of Laguna Woods and Laguna Hills within the Santa Ana Region. The footnote specifies that the City of Laguna Woods and Laguna Hills are identified as responsible Copermittees in the San Diego Creek/Newport Bay TMDL in the Santa Ana Region and remain obligated to comply with the San Diego Creek/Newport Bay TMDL pursuant to section XVIII of Tentative Order No. R8-2015-0001 (NPDES No. CAS618030) and any reissuance thereof.

The City of Lake Forest is located partially within the jurisdictions of both the Santa Ana Water Board and the San Diego Water Board. By letters dated January 14, 2013 and April 4, 2014 the City of Lake Forest submitted a written request, pursuant to CWC section 13228, to the San Diego Water Board and the Santa Ana Water Board requesting the Santa Ana Water Board be designated to regulate matters within the City of Lake Forest pertaining to permitting of their Phase I MS4 discharges. The City of Lake Forest reported that management and implementation of municipal programs to comply with two different Phase I MS4 permits creates a significant administrative and financial burden and inhibits their ability to contribute to greater overall water quality improvements in either Region. In an effort to address these concerns, the San Diego Water Board and the Santa Ana Water Board have entered into an agreement dated February 10, 2015, whereby the Santa Ana Water Board is designated to regulate Phase I MS4 discharges within the jurisdiction of the City of Lake Forest within the San Diego Region upon the later date of this Order or Santa Ana Water Board Tentative Order No. R8-2015-0001. Under the terms of the agreement, each Regional Water Board retains the authority to enforce provisions of the Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee (Water Code section 13228 (b)). Also under the terms of the agreement, any TMDL and associated Phase I MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the City of Lake Forest as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement authority for the applicable TMDL would remain with the Regional Water Board which has the jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Boards' San Diego Creek/Newport Bay TMDL and the San Diego Water Boards' indicator Bacteria Project I Beaches and Creeks TMDL. In conformance with this

agreement, a footnote to Table B-1 has been included to specify that Phase I MS4 discharges within the jurisdictional boundaries of the City of Lake Forest located within the San Diego Region will be regulated under Santa Ana Water Board Order No. R8-2015-0001 (NPDES No. CAS618030) and any reissuance thereof. The footnote specifies that the City of Lake Forest is an identified responsible Copermittee in the Indicator Bacteria Project I Beaches and Creeks TMDL (Bacteria TMDL) in the San Diego Region and remains obligated to comply with the Bacteria TMDL pursuant to Attachment E of Order No. R9-2013-0001 and any reissuance thereto. The City is also identified as a responsible Copermittee in the San Diego Creek/Newport Bay TMDL established by the Santa Ana Water Board. The City remains obligated to comply with the San Diego Creek/New Port Bay TMDL pursuant to the Santa Ana Water Board's Phase I MS4 Permit (Tentative Order No. R8-2015-0001 (NPDES No. CAS618030). Under the terms of the agreement, the City of Lake Forest must retain and continue implementation of the over irrigation prohibition in Title 15, Chapter 15, Section 14.030, List (b) of the City Municipal Code throughout its jurisdiction. Also under the terms of the agreement, the City of Lake Forest must actively participate in the development and implementation of the Aliso Creek Watershed Management Area Water Quality Improvement Plan required pursuant to Order No. R9-2013-0001, and any reissuance thereof.

The bases supporting the Cities of Laguna Woods, Laguna Hills, and Lake Forest requests to designate a specific Regional Water Board for regulatory oversight of Phase I MS4 discharges may change under future conditions and circumstances, therefore the San Diego Water Board will periodically review the effectiveness of the agreement during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate the agreement with the Santa Ana Water Board or otherwise modify the agreement subject to the approval of the Santa Ana Water Board.

Provision B.2 (Priority Water Quality Conditions) requires the Copermittees in each Watershed Management Area to identify the highest priority water quality conditions which will be the focus of the Water Quality Improvement Plan implementation.

Provisions B.2.a and B.2.b provide the criteria that must be assessed when characterizing the receiving water quality and potential impacts from MS4 discharges of the receiving waters within the Watershed Management Area. The criteria are based primarily on the requirements in 40 CFR 122.26(d)(1)(iv)(C) and (C)(1)-(9). Characterizing the receiving water quality and identifying the potential impacts caused by MS4 discharges to receiving waters in the Watershed Management Area is necessary to identify the impacts to receiving waters associated with MS4 discharges that are of the most concern to the Copermittees.

Based on the information required to be considered under Provisions B.2.a and B.2.b, Provision B.2.c requires to Copermittees to identify the highest priority water quality conditions related to discharges from the MS4s that will be the primary focus of the

Water Quality Improvement Plan in the Watershed Management Area. Addressing and improving these highest priority water quality conditions will become the focus of each Copermittee's jurisdictional runoff management program as the Water Quality Improvement Plan is implemented in the Watershed Management Area. The highest priority water quality conditions are expected to include source of pollutants and/or stressors, and/or receiving water conditions, that the Copermittees consider the highest threats or most likely to have adverse impacts on the physical, chemical, and biological integrity of receiving waters. Addressing these threats and/or adverse impacts should restore the physical, chemical, and biological integrity of receiving waters, and result in the restoration and protection of the beneficial uses of the receiving waters in the Watershed Management Area.

Provision B.2.d requires the Copermittees to identify known and suspected sources of pollutants and/or stressors contributing to the highest priority water quality conditions. The requirements of Provision B.2.d are based primarily on the requirements in 40 CFR 122.26(d)(1)(iii)(B)(1)-(6). The Copermittees are required to evaluate several factors in the identification of those sources. The Copermittees must consider and evaluate the following: (1) the land uses that may contribute toward impacts to receiving waters, (2) the locations of the Copermittees' MS4s that can convey and discharge runoff and pollutants to receiving waters, (3) other sources that discharge into the Copermittees' MS4s and receiving waters, and (4) other information and data that can help the Copermittees to evaluate the relative importance of or contribution from those sources toward the highest priority water quality conditions. Identifying the known and suspected sources, and their relative contribution toward the highest priority water quality conditions, will help the Copermittees to focus, direct, and prioritize their resources and implementation efforts within their jurisdictions.

Provision B.2.e requires the Copermittees to identify potential strategies that can result in improvements to water quality in MS4 discharges and/or receiving waters within the Watershed Management Area. Potential water quality improvement strategies will not necessarily be implemented by the Copermittees, but provide a "menu" of options that the Copermittees will consider for implementation. The public participation process that will be implemented during the development of the Water Quality Improvement Plan is where the potential water quality improvement strategies will be identified.

<u>Provision B.3 (Water Quality Improvement Goals, Strategies and Schedules)</u> requires the Copermittees in each Watershed Management Area to identify the goals that the Copermittees' jurisdictional runoff management programs will work toward achieving to address and improve the highest priority water quality conditions identified under Provision B.2.c; the strategies that will be implemented by the Copermittees within their jurisdictions and the Watershed Management Area to achieve the goals; and, the schedules for implementing the strategies and achieving the goals. The element of the Water Quality Improvement Plan required under Provision B.3 is where the "*comprehensive planning*" and "*intergovernmental coordination*" [40 CFR 122.26(d)(2)(iv)] of the Copermittees' actions for the proposed management programs

within the Watershed Management Area is required to be described.

Provision B.3.a requires the Copermittees to identify interim and final numeric goals, and schedules to achieve those goals as part of the Water Quality Improvement Plans. Provision B.3.a.(1) requires the Copermittees to identify two types of numeric goals to be achieved:

(1) Final numeric goals in the receiving waters and/or MS4 discharges that will result in the protection of the water quality standards of the receiving waters for the highest priority water quality conditions identified by the Copermittees for Provision B.2.c. These final numeric goals are the ultimate goals for the Water Quality Improvement Plan, and the achievement and maintenance of these final numeric goals will indicate that one or more beneficial uses have been successfully restored and/or protected from MS4 discharges.

(2) Interim numeric goals that can be used by the Copermittees to demonstrate progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges for the highest priority water quality conditions in the Watershed Management Area. Achievement of the interim numeric goals will demonstrate to the San Diego Water Board that the Copermittees' implementation efforts are progressing toward achieving the final numeric goals.

Provision B.3.a.(1) does not specify what the interim and final numeric goals must be based on, but they essentially must be designed to achieve compliance with water quality standards in the receiving waters. To that end, the interim goals must be based on measureable criteria or indicators capable of demonstrating progress toward achieving the numeric goals."

The interim and final numeric goals can be based on the water quality objectives in the Basin Plan. The water quality objectives in the Basin Plan, however, consist of numeric and narrative water quality objectives. Numeric water quality objectives can be directly used as numeric goals. Narrative water quality objectives, on the other hand, will require some interpretation to identify numeric goals. The achievement of multiple numeric goals based on the water quality objectives, used in combination, may be necessary to demonstrate that beneficial uses have been restored and/or protected.

The Copermittees could also propose other numeric goals that are not necessarily water quality objectives from the Basin Plan. For example, the Copermittees could propose a numeric goal that consists of achieving some percent improvement of a measureable indicator, such as acreage of a specific habitat or increase in a specific plant or animal species population. Other examples may include pollutant load reductions, number of impaired waterbodies delisted from the List of Water Quality Impaired Segments, Index of Biological Integrity (IBI) scores, etc.

The Copermittees may choose to develop interim numeric goals based on the final numeric goals they develop, such as incremental steps toward ultimately achieving the final numeric goals. The Copermittees may also choose to develop interim numeric goals that are based on other measureable indicators that can indirectly indicate improvements and progress toward the final numeric goals.

There are no limits to the types of interim numeric goals that could be proposed by the Copermittees, other than the goals must be based on measureable criteria or indicators capable of demonstrating progress toward achieving the numeric goals. Likewise, there are no limits to the types of final numeric goals that could be proposed by the Copermittees, other than the goals must "*restore and protect the water quality standards of the receiving waters.*"

Finally, Provision B.3.a.(2) also requires the Copermittees to develop schedules for measuring progress and achieving the interim and final numeric goals. Several criteria are included for the development of the schedules, but the Copermittees are required to achieve the numeric goals as soon as possible, consistent with federal NPDES regulations (40 CFR 122.47(a)(1)).

The Copermittees are also required to incorporate any compliance schedules for any applicable ASBS or TMDL requirements. Applicable ASBS and TMDL compliance schedules are set forth in Attachment A and Attachment E to the Order, respectively. The information provided by the Copermittees under Provision B.3.a.(2) will be used by the Copermittees and the San Diego Water Board to gauge and track the progress of the Copermittees' efforts in addressing the highest priority water quality conditions identified in the Water Quality Improvement Plan.

Provision B.3.b requires the Copermittees to identify the strategies and schedules to implement those strategies as part of the Water Quality Improvement Plans. Provision B.3.b requires the Copermittees to identify the water quality improvement strategies that will be and may be implemented within the Watershed Management Area to 1) reduce of pollutants in storm water discharged from the MS4 to the MEP, 2) effectively prohibit non-storm water discharges from entering the MS4, 3) protect water quality standards in receiving waters by controlling MS4 discharges so that they do not cause or contribute to exceedances of receiving water limitations, and 4) achieve applicable WQBELs that implement TMDLs. The Copermittees will select the strategies to be implemented based on the likely effectiveness and efficiency of the potential water quality improvement strategies identified under Provision B.2.e to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, and/or achieve the interim and final numeric goals identified under Provision B.3.a.

Provision B.3.b.(1) requires each Copermittee to identify the strategies that will be or may be implemented within its jurisdiction. Each Copermittee is required to describe the strategies it is committed to implementing as part of its jurisdictional runoff

management requirements under Provisions E.2 through E.7, and the optional jurisdictional strategies that the Copermittee will implement, as necessary, to achieve the numeric goals.

Each Copermittee is expected to implement the optional jurisdictional strategies identified under Provisions B.3.b.(1)(b) when the jurisdictional strategies it has committed to implement under Provision B.3.b.(1)(a) are not making adequate progress toward the interim and final numeric goals in accordance with the schedules established under Provision B.3.a. Provision B.3.b.(1)(b)(v) requires each Copermittee to describe the circumstances necessary to trigger implementation of the optional jurisdictional strategies, in addition to the requirements of Provisions B.3.b.(1)(a).

The San Diego Water Board recognizes that there may be optional jurisdictional strategies that will likely require funding and/or resources for planning, permitting, procurement of labor and materials, and implementation. Thus, Provision B.3.b.(1)(b)(iv) requires each Copermittee to describe the funding and/or resources that are necessary to implement these optional jurisdictional strategies. This information may provide interested groups and members of the public an understanding of the resources that they could provide or assist in obtaining to implement these optional jurisdictional strategies.

Provision B.3.b.(2) requires the Copermittees in the Watershed Management Area to identify the regional or multi-jurisdictional strategies that may be implemented, as necessary, to achieve the numeric goals. Similar to the requirements of Provision B.3.b.(1)(b), these regional or multi-jurisdictional strategies will likely require funding and/or resources for planning, permitting, procurement of labor and materials, and implementation, and San Diego Water Board recognizes that these strategies may be difficult to implement with only Copermittee resources. Thus, Provision B.3.b.(2)(d) requires the Copermittees to describe the funding and/or resources necessary to implement these optional regional or multi-jurisdictional strategies. This information may provide interested groups and members of the public an understanding of the resources that they could provide or assist in obtaining to implement these optional regional or multi-jurisdictional strategies.

Provision B.3.b.(3) requires the Copermittees to develop and include schedules in the Water Quality Improvement Plan for implementing the water quality improvement strategies identified under Provisions B.3.b.(1) and B.3.b.(2). The schedule for implementing the water quality improvement strategies will be used by the Copermittees and San Diego Water Board to measure and demonstrate the progress of the Copermittees' implementation efforts toward reducing pollutants in storm water discharged from the MS4 to the MEP, and eliminating illicit non-storm water discharges from entering the MS4.

Provision B.3.b.(4) provides the Copermittees in each Watershed Management Area

the option of implementing watershed-specific structural BMP requirements for Priority Development Projects. Historically, storm water permits have included very specific performance standards for permanent, structural BMPs. These standards describe the expectation for the capture or treatment of pollutants and control of excessive flow before storm water is discharged from a site. The Copermittees were also allowed to develop waiver programs for Priority Development Projects to avoid implementing the structural BMPs; however, the waiver programs were not necessarily tied into any sort of holistic watershed strategy. The result is that implementation of BMP requirements is largely done on a site-by-site basis. This requires proper design on the part of the Priority Development Project and strict oversight on the part of the Copermittee.

Provision B.3.b.(4) promotes the evaluation of multiple strategies for water quality improvement, in addition to the implementation of permanent structural BMPs, on a watershed-scale versus the site-by-site approach. In a report issued by the Southern California Coastal Water Research Project (SCCWRP) and several other research institutions, the report emphasized that a successful hydromodification management program will involve watershed analysis as a first step, and that integrating multiple watershed-based strategies is preferable over a site-by-site approach. Indeed, the report states that the watershed analysis "…*should lead to identification of existing opportunities and constraints that can be used to help prioritize areas of greater concern, areas of restoration potential, infrastructure constraints, and pathways for potential cumulative effects*."[22] Provision B.3.b.(4) promotes the findings and recommendations of the report by providing a pathway for Copermittees to develop an integrated approach to their land development programs.

Under Provision B.3.b.(4), the Copermittees in a Watershed Management Area must first perform an analysis by gathering as much information pertaining to the physical characteristics of the Watershed Management Area as possible. This includes, for example, identifying potential areas of coarse sediment supply, present and anticipated future land uses, and locations of physical structures within receiving streams and upland areas that affect the watershed hydrology (such as bridges, culverts, and flood management basins). Once this information is collected, the Copermittees must produce GIS layers (maps) that include this information.

From there, the Copermittees must use the results of the Watershed Management Area Analysis to identify and compile a list of candidate projects that could potentially be used as alternative compliance options for Priority Development Projects. Such projects include, for example, opportunities for stream or riparian area rehabilitation, opportunities for retrofitting existing infrastructure to incorporate storm water retention or treatment, and opportunities for regional BMPs, among others. Once these candidate projects are identified, Copermittees may allow Priority Development Projects to fund, partially fund, or completely implement these candidate projects. The

[22] 2012. ED Stein, F Federico, DB Booth, BP Bledsoe, C Bowles, Z Rubin, GM Kondolf, A Sengupta. Technical Report 667. Southern California Coastal Water Research Project. Costa Mesa, CA.

Copermittees must first find that implementing such a candidate project would provide greater overall benefit to the watershed than requiring implementation of the structural BMPs onsite, and also enter into a voluntary agreement with the Priority Development Project that authorizes this arrangement. The Copermittees may use Provision B.3.b.(4) as both 1) a mechanism to reach their stated goals of the Water Quality Improvement Plan by using Priority Development Projects to either fund or implement projects that will provide water quality benefit, and 2) an alternative to requiring strict adherence to the structural BMP design standards.

Additionally, Provision B.3.b.(4) allows the Copermittees to use the results of the Watershed Management Area Analysis to identify areas within the Watershed Management Area where it is appropriate to allow Priority Development Projects to be exempt from the hydromodification management BMP performance requirements. Provision E.3.c.(2) already allows exemptions for Priority Development Projects that discharge to a conveyance channel whose bed and bank are concrete lined from the point of discharge to an enclosed embayment or the Pacific Ocean. However, there may be cases where further exemptions are warranted. The Copermittees may identify such cases on a watershed basis and include them in the Watershed Management Area Analysis; however, they must provide the supporting rationale to support all claims for exemptions.

Provision B.3.b.(4) provides an innovative pathway for Copermittees to regulate their land development programs by allowing alternative compliance in lieu of implementing structural BMPs on each and every Priority Development Project. This approach facilitates the integration of watershed-scale solutions for improving overall water quality and assisting Copermittees to achieve their stated goals of the Water Quality Improvement Plan. The San Diego Water Board understands, however, that undertaking this approach, which involves extensive planning, could be resource intensive for the Copermittees. Therefore, the Watershed Management Area Analysis is optional and not a requirement. The Copermittees can choose not to perform the watershed planning and mapping exercise described in Provision B.3.b.(4), and instead choose to require strict implementation of the structural BMPs onsite, pursuant to Provision E.3.b.

Provision B.4 (Water Quality Improvement Monitoring and Assessment) requires the Copermittees to develop an integrated monitoring and assessment program to track the progress of the Water Quality Improvement Plan toward meeting the implementation goals and schedules, and improving the water quality of the Watershed Management Area. Provision B.4 is the part of the Water Quality Improvement Plan where the Copermittees describe the monitoring data that will be collected, which is not only necessary to implement the “iterative approach” required by Provision A.4, but inform the adaptive management and “*comprehensive planning process*” that allows the Copermittees to make adjustments and modifications to the Water Quality Improvement Plans and the jurisdictional runoff management programs.

Provision B.4 requires the Copermittees, at a minimum, to include the requirements of Provision D as part of the water quality improvement monitoring and assessment program for the Water Quality Improvement Plan. The Copermittees, however, are not limited to the requirements of Provision D and may include additional monitoring and assessment methods to track progress toward improving water quality in the Watershed Management Area.

In addition to incorporating the requirements of Provision D, the water quality improvement monitoring and assessment program must incorporate any monitoring and assessment requirements specified for any applicable TMDLs included in Attachment E to the Order, and the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 for Watershed Management Areas with ASBS.

The monitoring and assessments required to be incorporated into the Water Quality Improvement Plan are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order.

Provision B.5 (Iterative Approach and Adaptive Management Process) requires the Copermittees to implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a.

Provision B.5 requires the Copermittees in each Watershed Management Area to re-evaluate the highest priority water quality conditions and potential water quality improvement strategies, the water quality improvement goals, strategies and schedules, and the water quality improvement monitoring and assessment program and provide recommendations for modifying those elements to improve the effectiveness of the Water Quality Improvement Plan. The re-evaluation of the Water Quality Improvement Plan is part of the assessment requirements of Provision D.

Provision B.6 (Water Quality Improvement Plan Submittal, Updates, and Implementation) requires to Copermittees to submit, update, and implement the Water Quality Improvement Plans.

The requirements for the process to develop and submit the Water Quality Improvement Plans is described in more detail under the discussion for Provision F.1. The process will include several opportunities for the public to provide input during the development of the Water Quality Improvement Plans. The process for updating the Water Quality Improvement Plans is described in more detail under the discussion for Provision F.3.c. Upon acceptance of the Water Quality Improvement Plan and updates, the Copermittees are required to immediately begin implementing the Water Quality Improvement Plan and subsequent updates.

The Water Quality Improvement Plan is expected to be a dynamic document that will evolve over time. The Water Quality Improvement Plan is also expected to be a long

term plan that focuses the Copermittees' efforts and resources on a limited set of priority water quality conditions, with the ultimate goal of protecting all the beneficial uses of the receiving waters within the Watershed Management Area from impacts that may be caused or contributed to by MS4 discharges. As the Copermittees collect data, implement their jurisdictional runoff management programs, and review the results from their water quality improvement monitoring and assessment program, the Water Quality Improvement Plan is expected to be continually reviewed and updated until compliance with Provisions A.1.a, A.1.b, and A.2.a is achieved.

However, in specific cases supported by robust analytical documentation the implementation of the Water Quality Improvement Plans may demonstrate that TMDLs are not necessary for identified impaired water bodies within the Watershed Management Area if the analytical record demonstrates that technology-based effluent limitations required by the CWA, more stringent effluent limitations required by state, local, or federal authority, and/or other pollution control requirements (e.g., best management practices) required by local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time.[23]

The San Diego Water Board submits an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. According to USEPA guidance for the Integrated Report,[24] water bodies are placed in one of five categories. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 are placed on the 303(d) List.

Category 4 in the Integrated Report is for water bodies where available data and/or information indicate that at least one beneficial use is not being supported or is threatened, but a TMDL is not needed. [25] Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

Impaired water bodies can be included in Category 4a if a TMDL has been adopted and approved. The TMDLs in Attachment E to the Order implement the requirements of the TMDLs adopted by the San Diego Water Board, and approved by the State Water Board and USEPA. The water bodies in Attachment E will be included in

[23] 40 CFR 130.7(b)(1)
[24] USEPA, 2005. Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act
[25] Ibid

Category 4a in the Integrated Report and removed from the 303(d) List.

Impaired water bodies can be included in Category 4b if there are *acceptable* "pollution control requirements" required by a local, state or federal authority stringent enough to implement applicable water quality standards within a reasonable period of time (e.g., a compliance date is set). When evaluating whether a particular set of pollution controls are "requirements," the USEPA considers a number of factors, including: (1) the authority (local, state, federal) under which the controls are required and will be implemented with respect to sources contributing to the water quality impairment (examples may include: self-executing state or local regulations, permits, and contracts and grant/funding agreements that require implementation of necessary controls), (2) existing commitments made by the sources and completion or soon to be completed implementation of the controls (including an analysis of the amount of actual implementation that has already occurred), (3) the certainty of dedicated funding for the implementation of the controls, and (4) other relevant factors as determined by USEPA depending on case-specific circumstances.[26]

Impaired water bodies can be included in Category 4c if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution. Pollution, as defined by the CWA is "the man-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of water."[27] In other cases, pollution does not result from a pollutant and a TMDL is not required. Examples of circumstances where an impaired segment may be placed in Category 4c include segments impaired solely due to lack of adequate flow, stream channelization, or hydromodification. In these situations, there may be water quality management actions that can address the cause(s) of the impairment, but a TMDL may not be required to implement the actions.

The Water Quality Improvement Plans will require the implementation of pollution controls and water quality management actions (i.e. water quality improvement strategies) which can result in the attainment of water quality standards in water bodies impaired by discharges from the Copermittees' MS4s. The Water Quality Improvement Plans also include requirements that are expected to attain water quality standards in a reasonable period of time. The San Diego Water Board considers the Water Quality Improvement Plans to be a commitment by the Copermittees to develop, plan, budget for, and implement pollution controls that will attain water quality standards in receiving waters in a reasonable period of time, or as soon as possible. The results of the Copermittees' efforts in implementing the Water Quality Improvement Plans can be used to re-evaluate the condition of the impaired water bodies during the next update to the 303(d) List.

[26] Ibid
[27] CWA section 502(19)

After the Copermittees submit the Water Quality Improvement Plans and demonstrate that water quality standards are being attained or will be attained in a reasonable period of time, the San Diego Water Board may re-evaluate the water bodies on the 303(d) List. These water bodies on the 303(d) List may be re-evaluated and placed into Category 4b or Category 4c in the Integrated Report. The water bodies placed in Category 4b or Category 4c in the Integrated Report must show a record that the water bodies are attaining water quality standards or supporting the identified beneficial uses, or will attain water quality standards or support identified beneficial uses in a reasonable period of time, in order for the water bodies to be appropriately removed from the 303(d) List.

C. Action Levels

Purpose: Provision C includes requirements for the Copermittees to identify and include numeric action levels in the Water Quality Improvement Plan to direct and focus the Copermittees' jurisdictional runoff management program implementation efforts for controlling MS4 discharges to receiving waters.

***Discussion*:** Under Provision C, the numeric action levels required are for non-storm water discharges and storm water discharges. The non-storm water action levels (NALs) are applicable to non-storm water discharges from the Copermittees' MS4s, which can occur year-round. The storm water action levels (SALs) are applicable to storm water discharges from the Copermittees' MS4s, which occur during the rainy season defined as the period between October 1 and April 30.

The action levels required by Provision C are based on the action level requirements that were developed and incorporated into Order Nos. R9-2009-0002 and R9-2010-0016, the Orange County and Riverside County MS4 Permits, respectively. The Fact Sheets for these Orders provide detailed discussions about the development of the numeric NALs and SALs included in this Order.

Order Nos. R9-2009-0002 and R9-2010-0016 required the Copermittees to perform prescribed actions if the NALs or SALs are exceeded. The actions required under Order Nos. R9-2009-0002 and R9-2010-0016 generally included conducting additional monitoring and source investigations when a discharge from the MS4 is observed to exceed one or more NALs and/or SALs.

For this Order, however, the action levels of Provision C are to be used by the Copermittees to prioritize the actions to be implemented as part of the Water Quality Improvement Plan. Monitoring data collected by the Copermittees from MS4 outfalls will be compared with the NALs and SALs. Exceedances of the NALs and SALs will not require the Copermittees to immediately identify sources causing exceedances, but will provide some numeric indicator levels that can give the Copermittees a way to measure the relative severity of a pollutant contributing to receiving water quality impacts.

NALs and SALs must be included in the Water Quality Improvement Plans to be used by the Copermittees in directing and focusing their water quality improvement strategies. The Copermittees are expected to utilize the NALs and SALs to help focus their implementation efforts on addressing pollutants that have the most significant potential or observed impacts to receiving waters. The NALs and SALs will be used as part of the MS4 discharges assessments required under Provision D.4.b. The NALs and SALs may also be used by the Copermittees as the numeric goals to be achieved in MS4 discharges and/or receiving waters as the Water Quality Improvement Plans are implemented.

More specific and detailed discussions of the requirements of Provision C are provided below.

Provision C.1 (Non-storm Water Action Levels) requires the Copermittees to incorporate NALs into the Water Quality Improvement Plan for pollutants and/or constituents that are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions identified in the Water Quality Improvement Plan related to non-storm water discharges from the MS4s. NALs generally must be consistent with the water quality objectives found within the Basin Plan.

The NALs have been included to ensure that the Copermittees are implementing and complying with several requirements of the MS4 permit. The federal CWA requires permits for municipal storm sewer systems to "*effectively prohibit non-storm water discharges into the storm sewers*." The federal NPDES regulations, which were promulgated to implement the CWA requirements for discharges from municipal storm sewers, require a program to address illicit discharges, which are non-storm water discharges. Provision A.1.b prohibits "*[n]on-storm water discharges into MS4s*" unless the non-storm water discharge authorized by a separate NPDES permit. The NALs will be used as part of the illicit discharge detection and elimination program required pursuant to Provision E.2, as well as part of the MS4 discharges assessments required pursuant to Provision D.4.b.

Provision A.1.a prohibits non-storm water discharges from the MS4 from "*causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state.*" In addition, pursuant to Provision A.2.a, non-storm water discharges "*must not cause or contribute to the violation of water quality standards in any receiving waters*."

Ideally, the Copermittees' jurisdictional runoff management programs will eliminate all non-storm water discharges entering the MS4s within their jurisdictions. The complete elimination of non-storm water discharges to the Copermittees' MS4s would be in compliance with the CWA requirements for non-storm water discharges, as well as the prohibitions and limitations of Provisions A.1.a and A.2.a.

The federal regulations, however, also refer to several non-storm water discharge categories that must be addressed as illicit discharges if they are found to be a source of pollutants. The federal regulations thus identify some non-storm water discharges that are not required to be addressed as illicit discharges if they are not a source of pollutants (e.g. non-storm water discharges specified in Provisions E.2.a.(1)-(5)). Thus, these regulations imply that some non-storm water discharges into and from the MS4 may occur even if non-storm water discharges are "effectively" prohibited by the Copermittees.

If the source of a non-storm water discharge is identified as a category of non-storm water specified in Provisions E.2.a.(1)-(5), the NALs can be used to determine the category of non-storm water discharges is a source of pollutants. For other non-storm water discharges not specified in Provisions E.2.a.(1)-(5), the CWA requires those discharges to be "*effectively"* prohibited by removing the discharge to the MS4 through enforcement of the Copermittees' legal authority established under "*ordinance, order or similar means*" to prohibit illicit discharges to the MS4s.

If there are non-storm water discharges that are not required to be addressed as illicit discharges, those discharges must comply, at a minimum, with the discharge prohibitions and receiving water limitations of Provision A. Thus, the non-storm water discharges from the MS4 must be at levels that will not cause or contribute to a condition of pollution, contamination, or nuisance (Provision A.1.a), and must not cause or contribute to a violation of water quality standards in receiving waters (Provision A.2.a) to be consistent with the discharge prohibitions and receiving water limitations of Provisions A.1.a and A.2.a.

Furthermore, the San Diego Region has predominantly intermittent and ephemeral rivers and streams which vary in flow volume and duration at spatial and temporal scales. For most of these river and stream systems, non-storm water discharges from the MS4 are likely to be the most significant or the only source contributing to surface flows present within the receiving water, especially during the dry season.

Therefore, because of the prohibitions and limitations of Provision A.1.a and A.2.a, and the likelihood that non-storm water discharges from the MS4 are the most significant or only source contributing to surface flows present within the receiving water, NALs generally must be consistent with the water quality objectives found within the Basin Plan. Non-storm water discharges that are meeting the NALs would not be expected to cause or contribute to an exceedance of water quality objectives in receiving waters, which would be consistent with the discharge prohibitions and receiving water limitations of Provisions A.1.a and A.2.a.

Exceedances of the NALs would then provide an indication of the relative severity of a pollutant in non-storm water discharges from the MS4 contributing to potential or observed receiving water quality impacts. The relative severity or significance of a pollutant in non-storm water discharges from the MS4 will provide the Copermittees a valuable source of information that can be used to identify priority water quality conditions within a Watershed Management Area and within each Copermittee's jurisdiction.

Tables C-1 through C-4 under Provision C.1.a specify numeric NALs for several parameters or pollutant constituents for non-storm water discharges from the MS4 to several water body types. The NALs for MS4 discharges given under Provision C.1.a are based on the water quality objectives for inland surface waters in the Basin Plan, and the water quality objectives for ocean waters in the Ocean Plan. The NALs for

most of the metals were calculated based on the State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP). The NALs provided in Tables C-1 through C-4 must be included in the Water Quality Improvement Plans required to be developed pursuant to Provision B.

Provision C.1.b requires the Copermittees to identify NALs for pollutants and/or constituents, not specified in Provision C.1.a, which are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions of the Watershed Management Area related to non-storm water discharges from the MS4s. The NALs must be based on the water quality objectives in the Basin Plan. The NALs identified under Provision C.1.b must be included in the Water Quality Improvement Plan.

The San Diego Water Board recognizes that some of the NALs required pursuant to Provisions C.1.a and C.1.b may be exceeded more frequently than not. Thus, Provision C.1.c has been included in the Order to provide the Copermittees the option to develop secondary NALs that are set at levels greater than the levels required pursuant to Provisions C.1.a and C.1.b to further refine the prioritization and assessment of water quality improvement strategies for addressing non-storm water discharges to and from the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and from the MS4.

Provision C.2 (Storm Water Action Levels) requires the Copermittees to incorporate SALs into the Water Quality Improvement Plan for pollutants and/or constituents causing or contributing, or may be causing or contributing, to the highest priority water quality conditions identified in the Water Quality Improvement Plan related to storm water discharges from the MS4s.

The SALs have been included to ensure that the Copermittees are implementing and complying with several requirements of the MS4 permit. Provision A.1.a prohibits storm water discharges from the MS4 from "*causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state.*" In addition, pursuant to Provision A.2.a, storm water discharges "*must not cause or contribute to the violation of water quality standards in any receiving waters*."

Provision A.3.a, however, implicitly acknowledges that compliance with Provisions A.1.a and A.2.a cannot be achieved immediately for discharges of storm water from the MS4 by applying the MEP standard. Thus, Provision A.4 requires the Copermittees to implement an iterative approach to demonstrate that MEP is being achieved. This approach is supported by USEPA.

The federal CWA requires permits for municipal storm sewer systems to "*require controls to reduce the discharge of pollutants [in storm water] to the maximum extent*

practicable, *including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants.*" MEP is an ever-evolving, flexible, and advancing concept. As knowledge about controlling storm water runoff and discharges evolves, so does the knowledge which constitutes MEP. Reducing the discharge of storm water pollutants from the MS4 to the MEP requires the Copermittees to assess their jurisdictional runoff management programs and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP. The SALs provide the Copermittees measureable goals that may be used to demonstrate the achievement of MEP for reducing pollutants in storm water discharges from the MS4. The SALs will be used as part of the MS4 discharges assessments required under Provision D.4.a.

In June of 2006, the State Water Board's Blue Ribbon Storm Water Panel released its report titled "*The Feasibility of Numerical Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities*." In the recommendations, the Blue Ribbon panel proposed storm water effluent limitations which are computed using statistical based population approaches. The SALs specified in Table C-5 under Provision C.2.a were developed from a regional subset of nationwide Phase I MS4 data by using USEPA Rain Zone 6 (arid west) data.[28] Additionally, utilization of regional data is appropriate due to the addition of data into the nationwide Phase I MS4 monitoring dataset in February 2008. This additional data increased the number of USEPA Rain Zone 6 samples to more than 400, and included additional monitoring events within Southern California.

Utilizing data from USEPA Rain Zone 6 resulted in SALs which closely reflect the environmental conditions experienced in the San Diego Region. The localized subset of data includes sampling events from multiple Southern California locations including Orange, San Diego, Riverside, Los Angeles, and San Bernardino Counties. The dataset includes samples taken from highly built-out impervious areas and from storm events representative of Southern California conditions.

The SALs for cadmium, copper, lead and zinc require the measurement of hardness and to provide more specificity in the assessment of samples with SALs for total metal concentrations. While USEPA Rain Zone 6 data include a large sample size for concentrations of total metals, the impact the concentration will have on receiving waters will vary with receiving water hardness. Since it is the goal of the SALs, through the iterative process and MEP standard, to have MS4 storm water discharges meet all applicable water quality objectives, the hardness of the receiving water should be used when assessing the total metal concentration of a sample.

Thus, when there is an exceedance of a SAL for a metal, the Copermittee must determine if that exceedance is above the existing applicable water quality objectives

[28] Data used to develop SAL were obtained from http://rpitt.eng.ua.edu/Research/ms4/mainms4.shtml

based upon the hardness of the receiving water. The water quality objectives Copermittees must use to assess total metal SAL exceedances are the California Toxic Rule (CTR) and USEPA National Recommended Water Quality Criteria for Freshwater Aquatic Life 1 hour maximum concentrations. The 1 hour maximum concentration is to be used for comparison since it is expected to most replicate the impacts to waters of the State from the first flush following a precipitation event.

The statistically calculated SALs given in Table C-5 are at levels greater than the water quality objectives in the Basin Plan or Ocean Plan. Because the objective of the CWA is to "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*", meaning eventually pollutants in storm water discharges must be reduced to a level that cannot cause or contribute to an exceedance of water quality objectives in receiving waters, over time the SALs are expected to be reduced to a level that is based on the water quality objectives rather than statistical calculations. The San Diego Water Board will review the SALs as more data for discharges of storm water from the MS4s are collected, and revise them as conditions improve and the MEP standard advances. For the Water Quality Improvement Plans required under this Order, the SALs identified under Provision C.2.a must be included.

Provision C.2.b requires the Copermittees to identify SALs for pollutants and/or constituents, not specified in Provision C.2.a, which are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions of the Watershed Management Area related to storm water discharges from the MS4s. The SALs identified under Provision C.2.b must be included in the Water Quality Improvement Plan.

The San Diego Water Board recognizes that some of the SALs required pursuant to Provisions C.2.a and C.2.b may be exceeded more frequently than not. Thus, Provision C.2.c has been included in the Order to provide the Copermittees the option to develop secondary SALs that are set at levels greater than the levels required pursuant to Provisions C.2.a and C.2.b to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s.

D. Monitoring and Assessment Program Requirements

Purpose: Provision D includes minimum monitoring and assessment requirements that must be developed and implemented by the Copermittees as part of the Water Quality Improvement Plans. Implementation of the monitoring and assessment requirements of Provision D will allow the Copermittees to demonstrate that the requirements of the CWA to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP are being achieved. Implementation of the monitoring and assessment requirements of Provision D will also allow the Copermittees and the San Diego Water Board to track improvements to the water quality in the San Diego Region. The monitoring and assessment program requirements are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order.

***Discussion*:** The San Diego Water Board recognized that changes to the monitoring and assessment requirements of the Fourth Term Permit were necessary to improve the usefulness and usability of monitoring data collected by the Copermittees to support their jurisdictional storm water programs more efficiently and with increased effectiveness. The data collected are needed to better inform the Copermittees' understanding of the physical, chemical, and biological condition of the receiving waters and the quality of the MS4 discharges. The monitoring program needs to provide opportunities for the Copermittees to integrate regional monitoring efforts into municipal storm water monitoring requirements to provide a cost-effective approach to monitoring and avoid duplication of efforts.

The requirements in Provision D were largely recommended by the Copermittees as an outcome of the San Diego Water Boards Focused Meeting process. The monitoring and assessment program requirements now require collection of more specific information necessary for each Copermittee to adapt its jurisdictional runoff management program in such a way that focuses resources on a watershed's highest priority water quality conditions. The monitoring and assessment program will require the Copermittees to collect data that can be utilized to answer both watershed level management questions (e.g. Are the chemical, physical, and biological conditions of a receiving water protective, or likely protective of beneficial uses?), and specific jurisdictional runoff management program activity questions (e.g. Are the water quality improvement strategies of the jurisdictional program effectively eliminating non-storm water discharges to the MS4?).

The monitoring data collected and assessment information that will be reported to the San Diego Water Board are necessary to determine if the Copermittees are complying with the prohibitions and limitations of Provision A. The required monitoring and assessments that must be reported to the San Diego Water Board will be utilized for three purposes:

(1) Inform the Copermittees, San Diego Water Board, and the public on the progress of the Copermittees' efforts to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP;

(2) Inform the Copermittees, San Diego Water Board, and the public on the condition of water bodies receiving discharges from the Copermittees' MS4, and the progress of the Copermittees' water quality improvement implementation efforts toward improving the receiving water quality; and

(3) Inform the Copermittees, the San Diego Water Board, and the public on the effectiveness of the Water Quality Improvement Plan toward achieving (1) and (2).

The monitoring and assessment information reported pursuant to Provision F is also expected to be key to the iterative approach and adaptive management process required under Provision A.4 and implemented through the Water Quality Improvement Plan required under Provision B. As required by Provision A.4, the iterative approach and adaptive management process is required if the Copermittees cannot meet the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c, and/or A.2.a under the present conditions.

Provision D provides the minimum monitoring and assessment requirements that must be included in each Water Quality Improvement Plan to be developed and implemented by the Copermittees. The Copermittees, however, are not limited to the requirements of Provision D and may include additional methods to track progress toward improving water quality in a Watershed Management Area.

More specific and detailed discussions of the requirements of Provision D are provided below.

Provision D.1 (Receiving Water Monitoring Requirements) specifies the minimum receiving water monitoring that the Copermittees must conduct within the Watershed Management Area and include as part of the Water Quality Improvement Plan.

Provision D.1 establishes minimum monitoring requirements that must be conducted by the Copermittees within each Watershed Management Area. Provision D.1 requires the Copermittees to collect and develop the data and information necessary to determine potential impacts to the beneficial uses in the receiving waters due to discharges from the MS4s. The monitoring required under Provision D.1 will also provide the data that will allow the Copermittees to gauge the effectiveness and progress of its Water Quality Improvement Plan implementation efforts toward improving the quality of receiving waters.

The receiving water monitoring requirements of Provision D.1 are focused primarily on monitoring the conditions and response of the receiving waters to the Copermittees' collective implementation efforts to reduce receiving water impacts that may be caused by the discharges from the MS4s. The preference of the San Diego Water Board is for the Copermittees to spend their resources achieving tangible and observable improvements in receiving water conditions instead of collecting samples and analyzing data that has consistently indicated that receiving water conditions are degraded and require improvement. In general, the ability to measure potential improvements in receiving water conditions due to any actions implemented by the Copermittees as part of the Water Quality Improvement Plan may require several years before a response can be observed. Thus, the frequency of collecting receiving water monitoring data has been kept to a minimum.

During the transitional period between adoption of this Order and San Diego Water Board acceptance of a Water Quality Improvement Plan, the Copermittees must conduct receiving water monitoring in accordance with Provision D.1.a. This approach to collecting receiving water data is different from what was required in the Fourth Term Permits, but one that truly embraces the concept of an integrated, cost-effective, streamlined receiving water monitoring approach.

Provision D.1.a requires Copermittees to continue performing the receiving water monitoring programs required in Order Nos. R-2007-0001, R9-2009-002, and R9-2010-0016; plus participation in: hydromodification management plan monitoring approved by the San Diego Water Board, monitoring plans as part of load reduction plans (either Bacteria Load Reduction Plans or Comprehensive Load Reduction Plans) for TMDLs in Attachment E of the Order, Storm Water Monitoring Coalition Regional Monitoring, Southern California Bight Regional Monitoring, Sediment Quality Monitoring, and ASBS Monitoring as applicable to a Watershed Management Area.

Provision D.1.a also provides an opportunity for the Copermittees to use third party data to meet receiving water monitoring requirements where feasible. Allowing the Copermittees to use the data currently collected through its participation in existing regional receiving water programs and that of third parties provides an efficiency of resources in obtaining the data necessary to inform the Copermittees and the San Diego Water Board about the physical, chemical, and biological conditions of the receiving waters, which can also help to focus the receiving water monitoring during the implementation of the Water Quality Improvement Plan. Once a Water Quality Improvement Plan is developed for a Watershed Management Area in compliance with Provision B of this Order, the transitional period is over and Copermittees are required to conduct receiving water monitoring according to the requirements of Provisions D.1.b-e.

Provision D.1.b requires each Copermittee to identify at least one long term receiving water monitoring station to be representative of receiving water quality within each Watershed Management Area. Long term receiving water monitoring stations can be

located at any existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees. The requirements under Provision D.1.b. are consistent with 40 CFR 122.26(d)(2)(iii)(D), which specifies that a "*monitoring program for representative data collection for the term of the permit*" may include "*instream locations.*" For each Watershed Management Area, at least one long term watershed monitoring station is required to be established and monitored. The Copermittees may choose to establish additional long term monitoring stations where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

Provision D.1.b. requires the Copermittees to locate the long term receiving water monitoring station at one of these existing receiving water monitoring stations to provide the Copermittees an opportunity to experience monitoring cost savings while continuing to collect the necessary data to assess the status and trends of receiving water quality conditions in 1) coastal water, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under both dry weather and wet weather conditions. Ideally these stations will continue to be monitored as part of the receiving water monitoring for each Watershed Management Area to maintain a consistent set of locations and a period of data that can be built upon with the monitoring required under this Order.

The receiving water monitoring requirements are separated into monitoring required during dry weather conditions pursuant to Provision D.1.c, and wet weather conditions pursuant to Provision D.1.d.

At each long term monitoring station the Copermittees must conduct at least three dry weather monitoring events as required pursuant to Provision D.1.c and at least three wet weather monitoring events as required pursuant to Provision D.1.d per permit term. Provisions D.1.c and D.1.d require the Copermittees to monitor priority water quality conditions identified in the Water Quality Improvement Plan, constituents listed as causing impairment of receiving waters in the Watershed Management Area, applicable NALs, toxicity, constituents listed in Tables D-2 and D-3, and constituents for implementation plans (e.g. Bacteria Load Reduction Plans and Comprehensive Load Reduction Plans). Required toxicity monitoring was changed to reflect an updated understanding of the unique challenges associated with sampling storm water for toxicity. Copermittees are required to sample storm water for toxicity during each dry weather and each wet weather event pursuant to Provision D.1.c.(4) and D.1.d.(4). Required toxicity monitoring is now consistent with the State Water Resources Control Board Policy for Toxicity Assessment and Control (Draft June 2012) and recently adopted MS4 permits for Caltrans and Los Angeles Water Board. Receiving water monitoring efforts in this Order have been streamlined to redirect resources to monitoring efforts that better support pollutant reduction solutions with an increasing emphasis on MS4 outfall monitoring, source identification and source abatement activities.

In addition to the receiving water monitoring requirements under Provisions D.1.b-d, Provision D.1.e requires the Copermittees participate in and/or conduct other types of receiving water monitoring. As recommended and requested by the Copermittees, Provision D.1.e.(1) requires the Copermittees to participate in existing regional monitoring, as applicable to each Watershed Management Area. Existing regional monitoring includes monitoring conducted by the Storm Water Monitoring Coalition and for the Southern California Bight. Participation in and use of monitoring data collected from these existing regional water quality monitoring programs provide the Copermittees a greater opportunity for efficiency in the use of their resources to manage their storm water programs and those controllable discharges under their authority. Provision D.1.e.(1)(c) requires the south Orange County MS4 Copermittees to participate in "unified regional beach water quality monitoring." This monitoring replaces requirements to conduct "core monitoring" of beach water quality, as provided for in Appendix III of the 2012 California Ocean Plan.

Several different public agencies currently conduct routine, ongoing beach water quality monitoring in south Orange County in accordance with several different sets of requirements. The monitoring programs implemented to meet those requirements overlap temporally and spatially. These monitoring programs are partially but not fully integrated. In November 2010, the State Water Board adopted Resolution No. 2010-0053, which directed regional water boards to work with dischargers to modify beach water quality monitoring programs required by regional board-issued permits in order to eliminate redundancies and incorporate beach water quality monitoring required by beach water quality statutes, where appropriate.

In April 2012, the San Diego Water Board requested that its staff review beach water quality monitoring conducted in south Orange County. To assist in responding to that request, staff of the Board convened a workgroup that included representatives of the three public agencies that currently conduct almost all of the routine, ongoing beach water quality monitoring in south Orange County, i.e., South Orange County Wastewater Authority (SOCWA), Orange County Public Works, and Orange County Health Care Agency (OCHCA). The workgroup also included other interested parties, including representatives of the Sierra Club and Surfrider Foundation. In December 2012, the San Diego Water Board adopted Resolution No. R9-2012-0069, which endorsed the San Diego Water Board staff report entitled "A Framework for Monitoring and Assessment in the San Diego Region," dated November 2012.

The unified program is consistent with and will meet or exceed the minimum requirements for beach water quality monitoring and related public notification and reporting established by State law, including the California Ocean Plan. The unified program is consistent with State Water Board Resolution No. 2010-0053. The unified program is also consistent with and will help implement, "A Framework for Monitoring and Assessment in the San Diego Region," which emphasizes the need for question-driven, beneficial use-oriented monitoring and assessment. The primary purpose of

the unified program will be to answer the question "Does beach water quality meet standards for the beneficial use of water contact recreation?"

The unified program is intended to be protective; it will help protect the health of swimmers, surfers, and others who use south Orange County beach waters for water contact recreational activities. The unified program is also intended to be reasonable; it will eliminate duplicative monitoring and will include triggers for public notification and additional sampling at all sampling stations year-round. The unified program is intended to be equitable; responsibility for implementation of the unified program will be shared and the responsible agencies will jointly make arrangements to implement the program and will have the flexibility to jointly make short and/or long term changes in those arrangements.

The San Diego Water Board Executive Officer issued a written directive on December 5, 2014, pursuant to California Water Code section 13383, for SOCWA and the south Orange County MS4 Copermittees to implement the unified program in cooperation with OCHCA. The Executive Officer may make revisions to the unified program, provided that the unified program, as revised, continues to be consistent with and meet the requirements of State law, including the California Ocean Plan, for beach water quality monitoring and related public notification and reporting. Following a thirty day public comment period, and subject to a request for a hearing before the San Diego Water Board, any such revision shall take effect as specified in a written directive issued by the Executive Officer pursuant to California Water Code sections 13383. The program and any Executive Officer issued revisions to the program are subject to California Water Code section 13320 right of review from the date of issuance.

The unified program will supersede the existing routine, ongoing, beach water quality monitoring programs in south Orange County that are conducted in accordance with the existing requirements of the NPDES permits for discharges from the SOCWA ocean outfalls and the south Orange County MS4s. The requirement to participate in "regional monitoring" of beach water quality replaces requirements to conduct "core monitoring" of beach water quality, as provided for in Appendix III of the 2012 California Ocean Plan.

The State Water Resources Control Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part 1 Sediment Quality which became effective August 25, 2009 (Sediment Quality Monitoring Policy). Provision D.1.e.(2) requires any Copermittees with MS4 discharges to an enclosed bay or estuary to monitoring the sediments in the enclosed bay or estuary receiving water in accordance with the sediment quality monitoring procedures as prescribed in the Sediment Quality Monitoring Policy.

The State Water Board adopted Resolution No. 2012-0012 which approved exceptions to the California Ocean Plan for selected discharges into Areas of Special Biological

Significance (ASBS), including special protections for beneficial uses. State Board Resolution No. 2012-0012 became effective on March 20, 2012, and Attachment B to the Resolution established limitations on point source storm water discharges to ASBS. Copermittees with MS4s that discharge to an ASBS must monitor its discharge to assure compliance with State Board Resolution No. 2012-0012 as required pursuant to Provision D.1.e.(3).

The San Diego Water Board is currently developing a regional monitoring strategy to assess the conditions of receiving waters in the San Diego Region. The monitoring requirements of Provision D.1 are expected to be incorporated or serve as a foundation of this regional monitoring strategy, but may require some modifications. When the San Diego Water Board develops an alternative regional monitoring strategy, the Copermittees will be required to participate in the development and implementation of the alternative regional monitoring program pursuant to Provision D.1.f.

Provision D.2 (MS4 Outfall Discharge Monitoring Requirements) specifies the minimum MS4 outfall discharge monitoring requirements that the Copermittees must incorporate and implement as part of the Water Quality Improvement Plan.

The dry weather MS4 outfall discharge monitoring requirements are included under Provisions D.2.a.(2) and D.2.b. The dry weather MS4 outfall discharge monitoring requirements are part of the "*program, including a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer*" required by 40 CFR 122.26(d)(2)(iv)(B), which is expected to achieve compliance with the CWA section 402(p)(3)(B)(ii) statutory requirement for municipal storm water permits to require the Copermittees to "*effectively prohibit non-storm water discharges into the storm sewers*." The dry weather MS4 outfall discharge monitoring data collection requirements are based on requirements under 40 CFR 122.26(d)(1)(iv)(D) and 122.26(d)(2)(iv)(B)(3).

The dry weather MS4 outfall discharge monitoring requirements are designed to provide wide spatial and temporal coverage of each jurisdiction to better understand the extent and magnitude of non-storm water discharges to receiving waters, and make a distinction between persistent and transient non-storm water flows. This information is expected to allow each Copermittee to focus its resources on eliminating and controlling the highest priority threats to receiving water quality, as well as integrating other elements of the storm water programs (e.g. complaint call response) and third party data to efficiently and effectively assist in efforts to eliminate non-storm water discharges.

The dry weather MS4 outfall discharge monitoring requirements of Provision D.2.a.(2) and D.2.b are separated into monitoring required before and after the San Diego Water Board accepts the Copermittees' Water Quality Improvement Plan. Outfall

monitoring conducted prior to acceptance of the Water Quality Improvement Plan is referred to in the Order as Transitional MS4 Outfall Discharge Monitoring. Provision D.2.a.(2) includes the transitional dry weather MS4 outfall discharge monitoring requirements.

The requirements under Provision D.2.a.(2) are based on the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B), which include the requirements for a monitoring program to identify, detect, and eliminate illicit connections and illegal discharges to the MS4s. The federal regulations (40 CFR 122.26(d)(1)(iv)(D)) require the monitoring program to include "*a field screening analysis for illicit connections and illegal dumping [that]…[a]t a minimum, include[s] a narrative description, for either each field screening point or major outfall, of visual observations made during dry weather periods.*" The federal regulations (40 CFR 122.26(d)(1)(v)(B)) require the monitoring program to include "*inspection procedures and methods for detecting and preventing illicit discharges, and describe areas where this program has been implemented.*" Furthermore, the monitoring program is required by federal regulations (40 CFR 122.26(d)(2)(iv)(B)) to include "*a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer.*"

Dry weather transitional MS4 outfall discharge monitoring requires each Copermittee to field screen (inspect) its major MS4 outfalls to classify the MS4 outfall locations as having persistent dry weather flows, transient dry weather flows, or no dry weather flows. To account for the variance in size of the 39 jurisdictions covered under this Order, the Copermittees recommended a tiered approach to the number of major MS4 outfalls that must be inspected. Provision D.2.a.(2)(a) provides a tiered approach to the number of major MS4 outfalls that must be visually inspected per jurisdiction as well as a minimum frequency each Copermittee must inspect each major MS4 outfall per year. This tiered approach is based on the total number of major MS4 outfalls within a Copermittees jurisdiction within each Watershed Management Area.

Based on the field screening, each Copermittee is required to make a determination whether any observed flowing, pooled, or ponded waters are transient or persistent flows. Based on this field screening information, other jurisdictional program information, and third party information, each Copermittee is required to prioritize the MS4 outfalls within its jurisdiction for follow up investigation and elimination of the non-storm water discharge, as part of its illicit discharge detection and elimination program required pursuant to Provision E.2. In accordance with the requirements of Provision E.2, each Copermittee is required to immediately investigate obvious illicit discharges (e.g. outfall discharges with unusual color, unusual odor, or high flows).

This approach allows a Copermittee to use all of its resources, as well as leverage resources and information provided by third parties, to effectively eliminate non-storm water discharges from its MS4 outfalls. If the source of the non-storm water discharge cannot be immediately eliminated, the Copermittee uses the persistent flow or

transient flow classification along with other programmatic implementation data to prioritize the MS4 outfalls for future investigation. In accordance with the adaptive management approach deployed throughout this Order, Provision D.2.a.(2)(c) requires each Copermittee to update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow. The requirement of Provision D.2.a.(2)(c) assures that each Copermittee is collecting data that can be used to demonstrate compliance with the CWA requirement that each Copermittee must implement a program to "*effectively prohibit non-storm water discharges into the [MS4]*" and with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

Provision D.2.b describes the dry weather MS4 outfall discharge monitoring required to be incorporated and implemented as part of the Water Quality Improvement Plan. Dry weather MS4 outfall discharge monitoring must be performed by each Copermittee to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. The emphasis of the dry weather MS4 outfall discharge monitoring required pursuant to Provision D.2.b is consistent with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

Provision D.2.b.(1) requires each Copermittee to continue field screening its major MS4 outfalls and identifying those with persistent flows and transient flows, as conducted during the transitional period (i.e. before the Water Quality Improvement Plan was developed). However, each Copermittee now has the flexibility to adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of non-storm water persistent flow discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan. In order to ensure a minimum number of outfalls are inspected, Provision D.2.b.(1) requires the number of visual inspections be equal to the number of visual inspections required in the tiered inspection program pursuant to Provision D.2.a.(2)(a).

Provision D.2.b.(2)(b) requires each Copermittee to monitor a minimum of 5 major MS4 outfalls with persistent flows identified as the highest priorities within a Copermittee's jurisdiction, within each Watershed Management Area. In other words, Copermittees located in more than one Watershed Management Area must identify at least 5 major MS4 outfalls with persistent flows in its jurisdiction in each Watershed Management Area. If a Copermittee is located in more than one Watershed Management Area, and they have less than 5 major MS4 outfalls with persistent flows per jurisdictional area per Watershed Management Area, all of the major MS4 outfalls must be identified as high priority dry weather persistent flow MS4 outfalls. The Copermittees identified as Responsible Copermittees by a TMDL in Attachment E of

the Order may need to monitor more than 5 dry weather major MS4 outfall locations to determine compliance with the requirements of the TMDL(s).

Monitoring must occur at the highest priority outfall locations at least semi-annually until the non-storm water discharges have been eliminated for three consecutive dry weather monitoring events; identified to be authorized by a separate NPDES Permit; or reprioritized to a lower priority. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized MS4 major outfall in the Copermittee's jurisdiction within the Watershed Management Area, unless there are no remaining qualifying major MS4 outfalls within the Copermittees jurisdiction. The Copermittees must continually update their dry weather persistent flow MS4 outfall discharge monitoring locations with the next highest priority non-storm water flow that have yet to be eliminated until all persistent and transient flows are eliminated or its threat reduced.

Non-storm water persistent flow MS4 outfall discharge monitoring data collected during each semi-annual monitoring event, must be collected and analyzed according to the requirements of Provision D.2.b.(2)(b)–(e). These monitoring requirements are consistent with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

The wet weather MS4 outfall discharge monitoring requirements are included under Provisions D.2.a.(3) and D.2.c. The wet weather MS4 outfall discharge monitoring requirements are necessary for the Copermittees to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable, using management practices, control techniques and system, design and engineering methods, and such other provisions which are appropriate*" required by 40CFR 122.26(d)(2)(iv), which is expected to achieve compliance with the CWA section 402(p)(3)(B)(iii) statutory requirement for municipal storm water permits to require "*controls to reduce the discharge of pollutants [in storm water] to the maximum extent practicable*." The wet weather MS4 outfall discharge monitoring data collection requirements are based on requirements under 40 CFR 122.26(d)(2)(iii), 122.26(d)(2)(iii)(A) and 122.26(d)(2)(iii)(A)(1)-(4), and 40 CFR 122.21(g)(7)(i)-(ii).

The wet weather MS4 outfall discharge monitoring requirements of Provision D.2.a.(3) and D.2.c are separated into monitoring required before and after the San Diego Water Board accepts the Copermittees' Water Quality Improvement Plan. Outfall monitoring conducted prior to acceptance of the Water Quality Improvement Plan is referred to in the Order as Transitional MS4 Outfall Discharge Monitoring. Provision D.2.a.(3) includes the transitional wet weather MS4 outfall discharge monitoring requirements.

Until the wet weather MS4 outfall discharge monitoring requirements of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board, the Copermittees must comply with the requirements of

transitional wet weather MS4 outfall monitoring requirements pursuant to Provision D.2.a.(3). Provision D.2.a.(3) requires the Copermittees in each Watershed Management Area to sample, at least five of the major MS4 outfalls inventoried pursuant to Provision D.2.a.(1) once per wet season for the monitoring data required to be collected pursuant to Provision D.2.a.(3)(c)-(e). Provision D.2.a.(3) further requires at least one major MS4 outfall monitoring station be located in each Copermittee's jurisdiction within the Watershed Management Area.

At a minimum, the five sampling locations chosen must be representative of storm water discharges from residential, commercial, industrial, and typical mixed-use land uses present within a Watershed Management Area. The San Diego Water Board expects the Copermittees to extrapolate from these data to similar land uses throughout the Watershed Management Area to better inform the Water Quality Improvement Plan development process by prioritizing drainages for implementation of storm water control efforts required pursuant to Provision E.

Provision D.2.c describes the wet weather MS4 outfall discharge monitoring required to be included and implemented as part of the Water Quality Improvement Plan. Provision D.2.c provides the Copermittees the flexibility to adjust the wet weather MS4 outfall discharge monitoring locations and frequencies in the Watershed Management Area, as needed, to identify sources of pollutants in storm water discharges from MS4s in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan.

Although Provision D.2.c.(1) allows the Copermittees to adaptively manage the wet weather MS4 outfall discharge monitoring locations and frequencies, the provision requires a minimum of at least five wet weather outfall stations to be monitored. Provision D.2.c.(2) further allows the Copermittees to modify the monitoring frequency at each wet weather MS4 outfall station to meet the goals of the Water Quality Improvement Plan as long as the monitoring frequency occurs at least once per year and is at an appropriate frequency to identify sources of pollutants in storm water discharges, guide pollutant source identification efforts, or determine compliance with the requirements of the applicable TMDLs in Attachment E to the Order.

The wet weather MS4 outfall discharge monitoring requirements of Provisions D.2.c.(3) and D.2.c.(4) are the same as the transitional wet weather MS4 outfall discharge monitoring. In contrast, the requirements of Provision D.2.c.(5) are focused on collecting analytical data specific to the highest priority water quality conditions in the Watershed Management Area identified in the Water Quality Improvement Plan. The wet weather MS4 outfall discharge monitoring data collection requirements are consistent with the requirements under 40 CFR 122.26(d)(2)(iii), 122.26(d)(2)(iii)(A) and 122.26(d)(2)(iii)(A)(1)-(4), and 40 CFR 122.21(g)(7)(i)-(ii).

Provision D.3 (Special Studies) requires the Copermittees to develop special studies that will be conducted for each Watershed Management Area and the entire San

Diego Region. Data collected pursuant to Provision D.3 is to be used by the Copermittees to improve the effectiveness of the strategies implemented by the jurisdictional runoff management programs toward achieving the numeric goals identified in the Water Quality Improvement Plans and ultimately achieve compliance with the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c, and A.2.a, which is consistent with the requirements of Provision A.4.

Special studies are often necessary to fill data gaps or provide more refined information that allow the Copermittees to better manage the generation or elimination of pollutants and discharges to and from the MS4. In the Fourth Term Permits, the Copermittees have been required to implement special studies as directed by the San Diego Water Board. The special studies required by this Order provide the Copermittees more flexibility to identify and implement special studies that will be most useful to improving the effectiveness of their jurisdictional runoff management programs.

Provision D.3.a.(1) requires the Copermittees to develop and conduct at least two special studies per Watershed Management Area, to be determined by the Copermittees. One of the two special studies may be accomplished through participation in a Regional Special Study required under Provision D.3.a.(2). The requirements provide the Copermittees great latitude in identifying and developing the special studies. Watershed Management Area special studies are required, at a minimum, to: (a) relate in some way to the highest water quality priorities identified by the Copermittees in the Water Quality Improvement Plan, (b) be conducted within the Watershed Management Area, and (c) include some form of participation (e.g. contribution of funds, personnel services, project management) by all the responsible Copermittees within the Watershed Management Area.

Examples of Watershed Management Area special studies might include, but are not limited to: (1) focused pollutant source identification studies, (2) BMP effectiveness and/or comparison studies, (3) pilot tests for new or emerging pollutant control methods, (4) receiving water pollutant or stressor source identification and/or mitigation studies, or (5) pollutant fate and transport studies. The Watershed Management Area special studies are expected to provide data that can be utilized by the Copermittees to improve the Water Quality Improvement Plan or implementation of the Copermittees' jurisdictional runoff management programs to address the highest priority water quality conditions.

Provision D.3.a.(2) requires the Copermittees to develop at least one special study that will be conducted for the entire San Diego region. The regional special study is expected to provide data that can be utilized by the Copermittees to improve the Water Quality Improvement Plan or implementation of the Copermittees' jurisdictional runoff management programs to identify or address regional water quality concerns and priorities.

An example of a regional special study would be to develop and establish allowable exceedance frequencies of the bacteria water quality objectives for several types of water bodies, during different wet and dry weather conditions the San Diego region. The special study would be related to bacteria, which is a priority for the San Diego region due to the adoption of "*Bacteria TMDL Project I – Beaches and Creeks in the San Diego Region*." The study results could be used to inform the Copermittees and the San Diego Water Board about the indictor bacteria water quality objective exceedance frequencies that occur in natural or reference watersheds.

Provision D.4 (Assessment Requirements) specifies the assessments that the Copermittees are required to perform, based on the monitoring data collected, and will be reported as part of the Annual Report for the Water Quality Improvement Plan implementation. Provision D.4 requires the Copermittees assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c, and A.2.a.

Provision D.4 specifies the assessments that Copermittees must perform for each Watershed Management Area to assess the effectiveness of each Copermittee's jurisdictional runoff management program and the Water Quality Improvement Plan. The effectiveness of each Copermittee's jurisdictional runoff management program and Water Quality Improvement Plan is measured through these types of assessments: (a) Receiving Waters Assessments (b) MS4 Outfall Discharges Assessments, (c) Special Studies Assessments, and (d) Integrated Assessment of Water Quality Improvement Plan.

Provision D.4.a requires the Copermittees to assess the status of receiving water conditions annually during the transitional monitoring period (during development of the Water Quality Improvement Plan) and after acceptance of the Water Quality Improvement Plan. The monitoring data collected pursuant to Provision D.1 will be evaluated, among other information, to assess the condition of a Watershed Management Area's streams, coastal waters, enclosed bays, harbors, estuaries, and lagoons. The focus of the receiving waters assessments is to measure progress toward the objective of the CWA to "*restore and maintain the chemical, physical, and biological integrity of the Nation's waters*" as the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program are implemented within a Watershed Management Area. Provision D.4.a is consistent with 40 CFR 122.42(c)(7) which requires the Copermittees to annually report the *"[i]dentification of water quality improvements or degradation."*

Provision D.4.b includes the MS4 outfall discharges assessment requirements. The focus of MS4 outfall discharges assessments is to determine if the Copermittees' are implementing programs that comply with the requirements of the CWA for MS4 permits to "*effectively prohibit non-stormwater discharges into the storm sewers*" and "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable.*" The monitoring data collected pursuant to Provisions D.2 will be

evaluated, among other information, to assess the effectiveness of the transitional MS4 outfall field screening monitoring, the implementation of the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program. The MS4 outfall discharge assessments consist of Non-Storm Water Discharges Reduction Assessments and Storm Water Pollutant Discharges Reduction Assessments.

The Non-Storm Water Discharges Reduction Assessments are how each Copermittee will demonstrate that its jurisdictional runoff management program implementation efforts are achieving the CWA requirement to "*effectively prohibit non-stormwater discharges into the storm sewers.*" Provision D.4.b.(1) requires each Copermittee to assess and report on its illicit discharge detection and elimination program required pursuant to Provision E.2 to reduce and effectively prohibit non-storm water and illicit discharges into the MS4 within its jurisdiction. The Non-Storm Water Discharges Reduction Assessments include specific assessment requirements applicable to each Copermittee.

As each Copermittee collects and analyzes the data collected pursuant to dry weather MS4 outfall discharges monitoring requirements of Provisions D.2.a.(2) and D.2.b, Provision D.4.b.(1) requires each Copermittee to assess the progress, assess the effectiveness of its current actions, and identify modifications necessary to increase the effectiveness of its actions toward reducing and eliminating non-storm water and illicit discharges to its MS4. The findings from these assessments are expected to be utilized by the Copermittee as part of its procedures to prioritize the non-storm water discharges that will be addressed by its Illicit Discharge Detection and Elimination program required pursuant to Provision E.2.

The assessment requirements of Provision D.4.a.(1) are consistent with 40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(3) which require "*procedures…to investigate portions of the separate storm sewer system that, <u>based on the results of the field screen, or other appropriate information</u> [emphasis added], indicate a reasonable potential of contain illicit discharges or other sources of non-storm water*" as part of a "*program…to detect and remove…illicit discharges and improper disposal into the storm sewer.*" The assessment requirements of Provision D.4.a.(1) are also consistent with 40 CFR122.42(c)(1) requires the Copermittees to annually report the "*status of implementing the components of the storm water management program that are established as permit conditions.*"

The Storm Water Pollutant Discharges Reduction Assessment is how the Copermittees in each Watershed Management Area will demonstrate that their jurisdictional runoff management program implementation efforts are achieving the CWA requirement to "*reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable*." Provision D.4.b.(2) requires the Copermittees in each Watershed Management Area to assess and report the progress of the Copermittees' efforts to reduce pollutants in storm water discharges from the MS4s to the MEP. The

Storm Water Pollutant Discharges Reduction Assessments include specific assessment requirements during both the transitional monitoring period and after acceptance of the Water Quality Improvement Plan applicable to the Watershed Management Area and each Copermittee.

As the Copermittees collect and analyze the data collected pursuant to wet weather MS4 outfall discharges monitoring requirements of Provisions D.2.a.(3) and D.2.c, Provision D.4.b.(2) requires the Copermittees to assess runoff conditions during the transitional period, and the progress of the Water Quality Improvement Plan strategies toward reducing pollutants in storm water from the MS4 to the MEP. The findings from these assessments are expected to be utilized by the Copermittees to identify any modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify sources of pollutants in storm water discharges from the MS4s, as well as focus, modify, and improve the water quality improvement strategies implemented by each Copermittee within its jurisdiction to reduce pollutants in storm water discharges to the MEP.

The assessment requirements of Provision D.4.b.(2) are consistent with 40 CFR 122.26(d)(2)(iii)(B) which requires "*[e]stimates of the annual pollutant load of the cumulative discharges to waters of the United States from all identified municipal outfalls…during a storm event…accompanied by a description of the procedures for estimating constituent loads and concentrations, including any modeling, data analysis, and calculation methods.*" The assessment requirements of Provision D.4.a.(2) are consistent with 40 CFR 122.26(d)(2)(v) which requires that each Copermittee assesses the *"estimated reductions in loadings of pollutants from discharges of municipal storm sewer constituents from municipal storm sewer systems expected as the result of the municipal storm water quality management program."* The assessment requirements of Provision D.4.b.(2) are also consistent with 40 CFR122.42(c)(1) requires the Copermittees to annually report the "*status of implementing the components of the storm water management program that are established as permit conditions.*"

Provision D.4.c includes the special studies assessment requirements. Performing special studies are how the Copermittees will address data gaps identified during the development of and updates to the Water Quality Improvement Plan. The relevant findings from the special studies assessments are expected to be incorporated as part of the applicable receiving water assessments, MS4 outfall discharge assessments, and integrated water quality improvement assessments required in Provision D.4.a, D.4.b, and D.4.d, respectively.

The assessment requirements in Provision D.4.d are part of the iterative approach and adaptive management process required by Provision A.4. The Copermittees are required to integrate the data collected pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to re-evaluate the Water Quality Improvement Plan.

The monitoring data collected pursuant to Provisions D.1 and D.2, and the results of the assessment required pursuant to Provisions D.4.a-c, will be used to determine whether the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program are effective, or require modifications or improvements to become more effective to achieve the requirements of the CWA. The assessments required by Provision D.4.d are consistent with 40 CFR 122.42(c)(1) which requires that the Copermittees to report the *"[t]he status of implementing the components of the storm water management program that are established as permit conditions."*

E. Jurisdictional Runoff Management Programs

Purpose: Provision E includes the requirements for the jurisdictional runoff management programs to be implemented by each of the Copermittees. Compliance with the requirements for the jurisdictional runoff management programs will allow the Copermittees to demonstrate that they are implementing programs to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP. The jurisdictional runoff management program document prepared by each Copermittee will also provide the details for implementing the water quality improvement strategies identified in the Water Quality Improvement Plan specifically within its jurisdiction.

***Discussion*:** Implementation of the jurisdictional runoff management program requirements under Provision E is how the Copermittees "*effectively prohibit non-stormwater discharges into the storm sewer,*" and outlines the "*controls to reduce the discharge of pollutants to the maximum extent practicable"* consistent with the federal regulations under 40 CFR 122.26. The jurisdictional runoff management program is part of the "*comprehensive planning process*" that is required pursuant to 40 CFR 122.26(d)(2)(iv). Where the Water Quality Improvement Plan is the "*comprehensive planning process*" on a Watershed Management Area scale, requiring "*intergovernmental coordination,*" the jurisdictional runoff management program document is the "*comprehensive planning process*" on a jurisdictional scale that should be coordinated with the other Copermittees in the Watershed Management Area to achieve the goals of the Water Quality Improvement Plan.

The jurisdictional runoff management program requirements are included to provide each Copermittee criteria that can be used to demonstrate that its storm water management program is implementing the "*comprehensive planning process*" within its jurisdiction to "*effectively prohibit non-stormwater discharges into the storm sewers,*" and to identify and implement the most effective "*controls to reduce the discharge of pollutants to the maximum extent practicable"* in accordance with the performance standards given in the CWA.

Provision E includes the requirements for each of the components that must be included in the Copermittee's jurisdictional runoff management program document that will be implemented by the Copermittee within its jurisdiction. Implementation of the components of each Copermittee's jurisdictional runoff management program must incorporate the water quality improvement strategies identified by each Copermittee in the Water Quality Improvement Plans, described pursuant to Provision B.3.b.(1)(a).

More specific and detailed discussions of the requirements of Provision E are provided below.

Provision E.1 (Legal Authority Establishment and Enforcement) requires each Copermittee to establish and enforce sufficient legal authority to control discharges to the MS4 within its jurisdiction.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system*" and be able to demonstrate that it can "*operate pursuant to legal authority established by statute, ordinance or series of contracts.*" Provision E.1.a describes the minimum legal authorities each Copermittee must establish for itself within its jurisdiction to control discharges to its MS4. The requirements of Provision E.1.a are consistent with the requirements set forth in 40 CFR 122.26(d)(2)(i)(A)-(F).

The certification statement required from each Copermittee by Provision E.1.b is included to provide the San Diego Water Board additional documentation that each Copermittee has established the legal authorities consistent with Provision E.1.a and 40 CFR 122.26(d)(2)(i)(A)-(F), and the Copermittee can "*operate pursuant to legal authority established by statute, ordinance or series of contracts.*"

Provision E.2 (Illicit Discharge Detection and Elimination) requires each Copermittee to implement an illicit discharge detection and elimination program to effectively prohibit non-storm water discharges to the MS4 by actively detecting and eliminating illicit discharges and disposal into its MS4.

Provision E.2 establishes the minimum requirements that each Copermittee must implement within its jurisdiction to effectively prohibit non-storm water discharges from entering its MS4. The federal CWA requires permits for municipal storm sewer systems to "*effectively prohibit non-storm water discharges into the storm sewers*." The federal regulations (40CFR122.26(d)(2)(i)(B)) require each Copermittee to establish the legal authority to prohibit illicit discharges to its MS4s. Under 40 CFR 122.26(d)(2)(iv)(B), each Copermittee must implement a "*program…to detect and remove…illicit discharges and improper disposal into the storm sewer.*" The federal NPDES regulations, under 40 CFR 122.26(b)(2), define illicit discharges as "*any discharge to a municipal separate storm sewer that is not composed entirely of storm water*." Thus, non-storm water discharges are not authorized to enter the MS4 and are considered to be illicit discharges, unless authorized by a separate NPDES permit.

The Phase I Final Rule clarifies that non-storm water discharges through an MS4 are not authorized under the CWA (55 FR 47995):

> "*Today's rule defines the term "illicit discharge" to describe any discharge through a municipal separate storm sewer system that is not composed entirely of storm water and that is not covered by an NPDES permit. Such illicit discharges are not authorized under the Clean Water Act. Section 402(p)(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm*

sewer…Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit."

The federal NPDES requirements for the program to address illicit discharges must include "*inspections, to implement and enforce an ordinance, orders, or other similar means to prevent illicit discharges to the MS4*." The federal NPDES regulations also reference several categories of "*non-storm water discharges or flows* [which] *shall be addressed where such discharges are identified…as sources of pollutants to waters of the United States*." The Phase I Final Rule (55 FR 48037) further clarified the requirements of 40 CFR 122.26(d)(2)(iv)(B)(1) as follows:

"*EPA is clarifying that section 402(p)(3)(B) of the CWA (which requires permits for municipal separate storm sewers to 'effectively' prohibit non-storm water discharges) does not require permits for municipalities to prohibit certain discharges or flows of nonstorm water to waters of the United States through municipal separate storm sewers in all cases*."

In previous iterations of the municipal storm water permits for the San Diego Region, these categories were simply listed and referred to as categories of non-storm water discharges "not prohibited" unless identified as a source of pollutants. The Copermittees have often referred to these categories as "exempt" discharges. In both cases, however, the language is inconsistent with the federal CWA and NPDES regulations. And, the clarification provided in the Phase I Final Rule does not specifically state that such discharges are "not prohibited" or "exempt" or in any way authorized. The federal NPDES regulations do, however, state that specific categories of non-storm water discharges must be "*addressed*" if identified as "*sources of pollutants to waters of the United States*."

The language of Provision E.2.a has been revised to be fully consistent with the language of the CWA and the requirements of the federal regulations under 40 CFR 122.26(d)(2)(iv)(B)(1). Provision E.2.a requires each Copermittee to address <u>all</u> types of non-storm water discharges into its MS4 as illicit discharges, <u>unless</u> the discharge is authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to Provisions E.2.a.(1) through E.2.a.(5). Only non-NPDES-permitted non-storm water discharges identified as a category of non-storm water discharges under Provisions E.2.a.(1) through E.2.a.(5) <u>and</u> *not identified as a source of pollutants* do not have to be addressed as illicit discharges. Categories of non-storm water discharges that meet the requirements of Provisions E.2.a.(1) through E.2.a.(5) do not have to be addressed by the Copermittee as illicit discharges.

Several of the non-storm water categories listed in 40 CFR 122.26(d)(2)(iv)(B)(1) have not been included in Provisions E.2.a.(1) through E.2.a.(5), including: street wash water, landscape irrigation, irrigation water, and lawn watering. Because these are no

longer included within the categories listed under Provisions E.2.a.(1) through E.2.a.(5), the Copermittees must prohibit these types of non-storm water discharges from entering the MS4. This is consistent with the clarification of 40 CFR 122.26(d)(2)(iv)(B)(1) in the Phase I Final Rule (55 FR 48037), which states:

> "*[T]he Director may include permit conditions that either require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*."

Street wash water is a category of non-storm water discharges that was removed when the Third Term Permits were issued. Street wash water is a source of several pollutants (e.g., metals, oil and grease, petroleum hydrocarbons, chlorinated solvents, sediment) which are generated during the street washing process. The removal of this category requires the Copermittees to prohibit this type of non-storm water discharge from entering the MS4.

The landscape irrigation, irrigation water, and lawn watering categories, collectively referred to hereafter as "over-irrigation" discharges, were removed from the list of non-storm water discharge categories in the Fourth Term Orange County and Riverside County Permits. Non-storm water discharges resulting from over-irrigation have been found to be a source of several types of pollutants (e.g., nutrients, bacteria, pesticides, sediment) in receiving waters. The San Diego Water Board and the Copermittees have identified categories of non-storm water discharges associated with over-irrigation as a source of pollutants and conveyance of pollutants to the MS4 and waters of the United States in the following documents:

- **SmartTimer/Edgescape Evaluation Program (SEEP) Grant Application**

  The State Water Board allocated grant funding to the SEEP project grant application submitted in 2006, which targeted irrigation runoff by retrofitting areas of existing development and documenting the conservation and runoff improvements. The basis of this grant project is that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 is a source and conveyance of pollutants. In addition, the grant application indicated that this alteration of natural flows is impacting the beneficial uses of waters of the state and U.S. Results from the study indicate that that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 *is* a source and conveyance of pollutants. The results of this study can be applied broadly to any area where over-irrigation takes place. The grant application included the following statements:

  > "*Irrigation runoff contributes flow & pollutant loads to creeks and beaches that are 303(d) listed for bacteria indicators.*"
  >
  > "*Regional program managers agree that the reduction and/or elimination of irrigation-related urban flows and associated pollutant loads may be key to successful attainment of water quality and beneficial use goals as outlined in*

the San Diego Basin Plan and Bacteria TMDL over the long term."

"*Elevated dry-weather storm drain flows, composed primarily … of landscape irrigation water wasted as runoff, carry pollutants that impair recreational use and aquatic habitats all along Southern California's urbanized coastline. Storm drain systems carry the wasted water, along with landscape derived pollutants such as bacteria, nutrients and pesticides, to local creeks and the ocean. Given the local Mediterranean climate, excessive perennial dry season stream flows are an unnatural hydrologic pattern, causing species shifts in local riparian communities and warm, unseasonal contaminated freshwater plumes in the near-shore marine environment.*"

- **2006-2007 Orange County Watershed Action Plan Annual Reports**

The Watershed Action Plan Annual Reports for the 2006-2007 reporting period were submitted by the County of Orange, Orange County Flood Control District and Copermittees within the San Juan Creek, Laguna Coastal Streams, Aliso Creek, and Dana Point Coastal Streams Watersheds. San Juan Creek, Laguna Coastal Streams, Aliso Creek and Dana Point Coastal Streams are all currently 303(d) listed as impaired for indicator bacteria within their watersheds and/or in the Pacific Ocean at the discharge points of their watersheds. The Orange County Copermittees, within their Watershed Action Strategy Table for fecal indicator bacteria included the following:

"*Support programs to reduce or eliminate the discharge of anthropogenic dry weather nuisance flow throughout the…watershed. Dry weather flow is the transport medium for bacteria and other 303(d) constituents of concern.*"

Additionally, they state that "*conditions in the MS4 contribute to high seasonal bacteria propagation in-pipe during warm weather. Landscape irrigation is a major contributor to dry weather flow, both as surface runoff due to over-irrigation and overspray onto pavements; and as subsurface seepage that finds its way into the MS4*."

- **Fiscal Year 2008 Carlsbad Watershed Urban Runoff Management Program Annual Report**

The Carlsbad Watershed Urban Runoff Management Program Annual Report for Fiscal Year 2008 was submitted by the Carlsbad Watershed Copermittees (Cities of Carlsbad, Encinitas, Escondido, Oceanside, San Marcos, Solana Beach, and Vista, and the County of San Diego). In the Annual Report, the Carlsbad Watershed Copermittees stated the following:

"The Carlsbad Watershed Management Area (WMA) collective watershed

strategy identifies bacteria, sediment, and nutrients as high priority water quality pollutants in the Agua Hedionda (904.3 – bacteria and sediment), Buena Vista (904.2 – bacteria), and San Marcos Creek (904.5 – nutrients) Hydrologic Areas. Bacteria, sediment, and nutrients have been identified as potential discharges from over-irrigation."

- **2007-2008 San Diego Bay Watershed Urban Runoff Management Program Annual Report**

  The San Diego Bay Watershed Urban Runoff Management Program 2007-2008 Annual Report was submitted by the San Diego Bay Watershed Copermittees (Cities of Chula Vista, Coronado, Imperial Beach, La Mesa, Lemon Grove, National City, and San Diego, the County of San Diego, the Port of San Diego, and the San Diego County Airport Authority). In Appendix D of the Annual Report, titled "Likely Sources of Pollutants," the San Diego Bay Watershed Copermittees identified over-irrigation of lawns as a pollutant generating activity from business and/or residential land uses for bacteria, pesticides, and sediment.

- **Copermittee Public Education Materials**

  The Orange County Public Works *Tips for Landscape & Gardening* public education brochure states: "*Fertilizers, pesticides and other chemicals that are left on yards or driveways can be blown or washed into storm drains that flow to the ocean. Overwatering lawns can also send materials into storm drains*."

  The Riverside County Flood Control and Water Conservation District *Landscape and Garden* public education brochure states: *"Soil, yard wastes, over-watering and garden chemicals become part of the urban runoff mix that winds its way through streets, gutters and storm drains before entering lakes, rivers, streams, etc. Urban runoff pollution contaminates water and harms aquatic life!"*

- **Los Peñasquitos Lagoon Sedimentation/Siltation TMDL Technical Report**

  The Los Peñasquitos Lagoon Sedimentation/Siltation TMDL technical report was prepared for the City of San Diego and USEPA in October 2010. The technical report was included as a technical supporting document attached to the Sediment TMDL for Los Peñasquitos Lagoon staff report prepared by the San Diego Water Board, dated June 13, 2012. Under the Source Assessment section, the technical report states the following:

  "*Dry weather loading is dominated by nuisance flows from urban land use activities such as car washing, sidewalk washing, and lawn over-irrigation, which pick up and transport sediment into receiving waters.*"

These documents confirm that non-storm water discharges associated with over-irrigation are a source of pollutants and should be addressed as illicit discharges to the MS4. Prohibiting non-storm water discharges associated with over-irrigation, however, is not a new requirement for the Copermittees because it is also consistent with and required by the Water Conservation in Landscaping Act (AB 1881, Laird).

The Water Conservation in Landscaping Act required the Department of Water Resources (DWR) to prepare a Model Water Efficient Landscape Ordinance for use by local agencies (e.g. the Copermittees). All local agencies were required to adopt a water efficient landscape ordinance by January 1, 2010. Local agencies could adopt the Water Efficient Landscape Ordinance developed by DWR, or an ordinance considered at least as effective as the Model Ordinance. The Water Efficient Landscape Ordinance includes a requirement that local agencies prohibit runoff from irrigation (§ 493.2):

> "*Local agencies shall prevent water waste resulting from inefficient landscape irrigation by* <u>*prohibiting runoff from leaving the target landscape*</u> *[emphasis added] due to low head drainage, overspray, or other similar conditions where water flows onto adjacent property, non-irrigated areas, walks, roadways, parking lots, or structures. Penalties for violation of these prohibitions shall be established locally*."

Furthermore, non-storm water discharges from over-irrigation not only transport and discharge pollutants to receiving waters, but are also a likely source of the dry weather flows causing changes to habitat within and along the receiving water bodies. Examples of habitat changes from the dry weather flows include perennialization of ephemeral streams, and conversion of saltwater and brackish water marsh habitats to freshwater marsh habitats (e.g. Los Peñasquitos Lagoon). Both of these examples have resulted in the promotion of invasive species in several areas of the San Diego Region.

The removal of the over-irrigation discharges categories does not require the Copermittees to strictly prohibit lawn and landscape irrigation, but does require the prohibition of excessive irrigation water that results in non-storm water discharges to the MS4. Non-storm water discharges to the MS4 from over-irrigation must be addressed as illicit discharges by the Copermittees pursuant to the requirements of Provision E.2.

The remaining non-storm water categories listed in 40 CFR 122.26(d)(2)(iv)(B)(1) are listed under Provisions E.2.a.(1) through E.2.a.(5) and generally fall into four categories: (1) non-storm water discharges subject to existing San Diego Water Board waste discharge requirements and NPDES permits; (2) non-storm water discharges generally not expected to be a source of pollutants to receiving waters; (3) non-storm water discharges likely to contain pollutants requiring some form of control to address the pollutants prior to discharging to the MS4; and (4) non-storm water discharges or flows associated with firefighting.

Provisions E.2.a.(1) and E.2.a.(2) include several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) for which the San Diego Water Board already has developed general waste discharge requirements and NPDES permits to address the discharges. The Copermittees are only required to address these types of non-storm water discharges as illicit discharges if the Copermittees or the San Diego Water Board identifies these non-storm water discharges not having coverage under the applicable NPDES permit.

Provision E.2.a.(3) includes several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) which are generally not expected to be a source of pollutants to receiving waters, many of which originate from what are typically natural, uncontrollable sources. The Copermittees are only required to address these types of non-storm water discharges as illicit discharges if the Copermittees or the San Diego Water Board identifies these non-storm water discharges as a source of pollutants to receiving waters. Because many of these sources are generally uncontrollable, enforcing a prohibition may not be a possibility for the Copermittees. The Copermittees would be able to address these non-storm water discharges by preventing these non-storm water discharges from entering the MS4. This could potentially be achieved by sealing their MS4 structures so the discharges cannot enter the MS4.

Provision E.2.a.(4) includes several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) that are likely to contain pollutants requiring some form of control to address the pollutants prior to discharging to the MS4. At this time, an outright prohibition of these types of non-storm water discharges does not yet appear to be warranted. Thus, Provision E.2.a.(4) includes several requirements for the Copermittees to control the pollutants from these types of non-storm water discharges. This is consistent with the clarification of the federal regulations in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board has the authority to require the Copermittees to "*control any of these types of discharges where appropriate*."

Unlike non-storm water discharges from over-irrigation, these types of non-storm water discharges are not expected to occur in close proximity to each other or very frequently. Provided these types of non-storm water discharges are controlled as required in Provision E.2.a.(4), the Copermittees would only be required to address these types of non-storm water discharges as illicit discharges if the Copermittee or the San Diego Water Board identifies these non-storm water discharges as a source of pollutants to receiving waters.

Provision E.2.a.(5) includes specific requirements for fire fighting discharges and flows. The requirements for non-storm water discharges and flows associated with fire fighting have been separated into requirements for: a) non-emergency fire fighting discharges and flows, and b) emergency fire fighting discharges and flows.

The San Diego Water Board has found that discharges from building fire suppression system maintenance (e.g. fire sprinklers) contain waste and potentially a significant source of pollutants to receiving waters. As such, the San Diego Water Board is requiring these discharges be addressed as illicit discharges by the Copermittees. Thus, the discharges to the MS4 are to be prohibited via ordinance, order or similar means. For other non-emergency firefighting discharges and flows (i.e. flows from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems), the Copermittees are required to develop and implement a program to address pollutants in these non-storm water discharges and flows. This is consistent with the clarification of the federal regulations in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board has the authority to require the Copermittees to "*control any of these types of discharges where appropriate*."

For emergency firefighting discharges and flows, the Phase I Final Rule (55 FR 48037) has clarified the requirements of 40 CFR 122.26(d)(2)(iv)(B)(1) pertaining to emergency firefighting flows and discharges, which states:

> "*In the case of firefighting it is not the intention of these rules to prohibit in any circumstances the protection of life and public or private property through the use of water or other fire retardants that flow into separate storm sewers*."

Thus, the requirements have been made to be consistent with the guidance provided by the Phase I Final Rule. The Order recommends that the Copermittees develop and encourage implementation of BMPs to reduce or eliminate the discharge of pollutants from emergency firefighting flows to the MS4s and receiving waters. The Order does not include any requirements that should be interpreted as requiring the implementation of BMPs for emergency firefighting flows to the MS4s and receiving waters.

The Copermittees are expected to review the dry weather MS4 outfall discharge monitoring data they collect to determine if and when there are non-storm water discharges to or from their MS4s that are a source of pollutants to receiving waters. If the Copermittees identify one of the types of non-storm water discharges listed in Provisions E.2.a.(1) through E.2.a.(4) as a source of pollutants to receiving waters based on the review and evaluation of monitoring data, Provision E.2.a.(6) requires the Copermittees to prohibit those categories of discharges from entering the MS4 through ordinance, order or similar means. In addition, Provision E.2.a.(6) clarifies that the San Diego Water Board may identify categories of non-storm water discharges or flows listed under Provisions E.2.a.(1) through E.2.a.(4) that must be prohibited.

Provision E.2.a.(6) also provides the Copermittees an option to propose controls to be implemented for the category of non-storm water discharges as part of the Water Quality Improvement Plan instead of prohibiting the category of non-storm water

discharges. If the Water Quality Improvement Plan is accepted by the San Diego Water Board with the proposed controls, the Copermittees will not be required to prohibit the category of non-storm water discharges to their MS4s as long as the controls are implemented. This is consistent with the clarification of 40 CFR 122.26(d)(2)(iv)(B)(1) in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board may "*require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*."

Finally, Provision E.2.a.(7) has been included in the requirements for non-storm water discharges to clarify that any non-storm water discharges to the Copermittee's MS4, even those identified pursuant to Provisions E.2.a.(1) through E.2.a.(4), must be reduced or eliminated, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit. Provision E.2.a.(7) is consistent with the requirements of CWA section 402(p)(3)(B)(ii) and 40 CFR 122.26(d)(1)(v)(B), as clarified in the Phase I Final Rule (55 FR 47995) that "*[u]ltimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit*." However, the reduction or elimination of those non-storm water discharges are expected to be achieved as feasible, in accordance with the priorities in the Water Quality Improvement Plan and when the resources are available to the Copermittee.

Consistent with 40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(1), each Copermittee must implement a "*program…to prevent illicit discharges to the municipal storm sewer system*" and "*detect…illicit discharges and improper disposal into the storm sewer.*" Provision E.2.b requires each Copermittee to implement measures to prevent and detect illicit discharges and connections to its MS4 as part of its illicit discharge detection and elimination program.

As part of the program to prevent and detect illicit discharges to the MS4, 40 CFR 122.26(d)(2)(iv)(B)(2) requires "*procedures to conduct on-going field screening activities during the life of the permit, including areas or locations that will be evaluated by such field screens*." As part of the procedures, each Copermittee is required to maintain an updated map of its entire MS4 and the corresponding drainage areas within its jurisdiction. Having knowledge about where inlets, access points, connections with other MS4s, and outfalls are located is necessary for each Copermittee to track, identify, and eliminate illicit discharges and connections. Thus, Provision E.2.b.(1) of the Order specifies that the map must include the segments of the storm sewer system owned, operated, and maintained by the Copermittee, and include locations of all known inlets, connections with other MS4s, and outfalls to the Copermittee's MS4. The remaining requirements of Provision E.2.b are consistent with the requirements of 40 CFR 122.26(d)(2)(iv)(B)(3)-(7) related to implementing measures to prevent and detect illicit discharges and connections to the MS4.

Provision E.2.c requires each Copermittee to conduct field screening and monitoring of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm

water and illicit discharges and connections to the MS4. Field screening is a required element of the program to detect and eliminate illicit discharges and connections to the MS4, pursuant to 40 CFR 122.26(d)(2)(iv)(B)(2). The field screening requirement will be implemented through the dry weather MS4 outfall discharge monitoring required under Provisions D.2.a.(2) and D.2.b.(1).

Provision E.2.d specifies the measures each Copermittee must implement to eliminate illicit discharges and connections to its MS4. Elimination of illicit discharges and connections to the MS4 is consistent with the requirement of 40 CFR 122.26(d)(2)(iv)(B) "*to detect and remove [emphasis added]…illicit discharges and improper disposal into the storm sewer*" and will achieve the CWA requirement for MS4 permits to "*effectively prohibit non-storm water discharges into the storm sewers*."

Generally, each Copermittee is responsible for prioritizing its efforts to eliminate non-storm water and illicit discharges or connections to its MS4 based on field screening and monitoring data, NALs, illicit discharge investigation records, and the known or suspected sources. Sources of non-storm water and illicit discharges or connections must be eliminated by enforcing the legal authority established by each Copermittee pursuant to Provision E.1.

Provision E.3 (Development Planning) requires each Copermittee to use its land use and planning authority to implement a development planning program to control and reduce the discharge of pollutants in storm water from new development and significant redevelopment to the MEP. Proper implementation of the development planning program will also contribute toward effectively prohibiting non-storm water discharges from development projects to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." As part of the management program, 40 CFR 122.26(d)(2)(iv)(A)(2) requires "*planning procedures including a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment*."

Land development generally alters the natural conditions of the land by removing vegetative cover, compacting soil, and/or placement of concrete, asphalt, or other impervious surfaces. These impervious surfaces concentrate urban pollutants (such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not found in high concentrations in the natural environment. Pollutants that accumulate on impervious surfaces are not easily biodegraded nor subject to natural treatment processes.

Impervious surfaces greatly affect the natural hydrology of the land because they do not allow natural infiltration and treatment of storm water runoff to take place. Instead, storm water runoff from impervious surfaces is typically directed through pipes, curbs, gutters, and other hardscape into receiving waters, with little treatment, at significantly increased volumes and accelerated flow rates over what would occur naturally. The increased pollutant loads, storm water volume, discharge rates and velocities, and discharge durations from the MS4 adversely impact stream habitat by causing accelerated, unnatural erosion and scouring within creek bed and banks. Placement of impervious surfaces also encapsulates "good" sediment (such as sand, gravel, rocks and cobbles) that would normally replenish creek beds and banks to help stabilize them. Collectively, these changes to natural hydrologic processes are termed hydrograph modification, or hydromodification.

Hydromodification, which is caused by both altered storm water flow and altered sediment flow regimes, is largely responsible for degradation of creeks, streams, and associated habitats in the San Diego Region. In an ongoing study by the Stormwater Monitoring Coalition to assess the health of streams throughout Southern California, researchers found that three of the four highest risk stressors to creeks (percent sands and fines present, channel alteration, and riparian disturbance) were related to physical habitat.[29] Researchers studying flood frequencies in Riverside County have found that increases in watershed imperviousness of only 9-22 percent can result in increases in peak flow rates for the two-year storm event of up to 100 percent.[30] Such changes in runoff have significant impacts on channel morphology.

In addition, a technical report issued by the Southern California Coastal Water Research Project (SCCWRP) stated that "*[r]ecent studies indicate that California's intermittent and ephemeral streams are more susceptible to the effects of hydromodification than streams from other parts of the United States. Physical degradation of stream channels in the central and eastern United States can initially be detected when watershed impervious cover approaches 10 percent, although biological effects (which may be more difficult to detect) may occur at lower levels. In contrast, initial response of streams in the semi-arid portions of California appears to occur between 3 and 5 percent impervious cover*."[31] These studies highlight the extent to which impacts originating from impervious surfaces created by land development are responsible for the degradation of creek and stream habitat.

This is consistent with what USEPA has noted, that "*[m]ost stormwater runoff is the result of the man-made hydrologic modifications that normally accompany development. The addition of impervious surfaces, soil compaction, and tree and*

[29] Assessing the Health of Southern California Streams, Stormwater Monitoring Coalition, Fact Sheet
[30] Schueler and Holland, 2000. Storm Water Strategies for Arid and Semi-Arid Watersheds (Article 66). The Practice of Watershed Protection.
[31] Stein, E. and Zaleski, S., 2005. Technical Report 475, Managing Runoff to Protect Natural Streams: The Latest Development on Investigation and Management of Hydromodification in California. December 30, 2005.

vegetation removal result in alterations to the movement of water through the environment. As interception, evapotranspiration, and infiltration are reduced and precipitation is converted to overland flow, these modifications affect not only the characteristics of the developed site but also the watershed in which the development is located. Stormwater has been identified as one of the leading sources of pollution for all waterbody types in the United States. Furthermore, the impacts of stormwater pollution are not static; they usually increase with more development and urbanization."[32]

Reducing the impact from the increased pollutant loads and flows generated by impervious surfaces within a watershed is essential to protecting and restoring the integrity of the receiving waters. Provision E.3 includes the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment*." The requirements of Provision E.3 will 1) minimize the generation and discharge of pollutants in storm water from the MS4, and 2) minimize the potential of storm water discharges from the MS4 from causing altered flow regimes and excessive downstream erosion in receiving waters.

The requirements of Provision E.3.a include the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment*" applicable to all development projects, regardless of size or purpose of development. In general, all development projects must implement onsite BMPs to remove pollutants from runoff prior to its discharge to any receiving waters, as close to the pollutant generating source as possible, and structural BMPs must not be constructed within waters of the U.S.

Furthermore, the onsite BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors (e.g. mosquitos, rodents, and flies). If not properly designed or maintained, certain BMPs implemented or required by municipalities may create a habitat for vectors. Monitoring studies conducted by the California Department of Public Health (CDPH) have documented that mosquitoes opportunistically breed in structural storm water BMPs, particularly those that hold standing water for over 96 hours. Certain site design features that hold standing water may similarly produce mosquitoes.

Structural BMPs and site design features should incorporate design, construction, and maintenance principles to promote drainage within 96 hours to minimize standing water available to mosquitoes. Nuisances and public health impacts resulting from

[32] USEPA, 2007. Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices, December 2007.

vector breeding can be prevented with close collaboration and cooperative effort between municipalities and local vector control agencies and the CDPH during the development and implementation of storm water runoff management programs. The CDPH also has issued guidance for BMP implementation that will minimize potential nuisances and public health impacts resulting from vector breeding.[33]

All development projects are required to implement source control BMPs that will minimize the generation of pollutants. Additionally, each development project must implement, where applicable and feasible, low impact development (LID) BMPs to mimic the natural hydrology of the site and retain and/or treat pollutants in storm water runoff prior to discharging to and from the MS4.

The LID Center defines LID as "*a comprehensive land planning and engineering design approach with a goal of maintaining and enhancing the pre-development hydrologic regime of urban and developing watersheds.*"[34] LID designs seek to control storm water at the source, using small-scale integrated site design and management practices to mimic the natural hydrology of a site, retain storm water runoff by minimizing soil compaction and impervious surfaces, and disconnect storm water runoff from conveyances to the storm drain system.

LID BMPs may utilize interception, storage, evaporation, evapotranspiration, infiltration, and filtration processes to retain and/or treat pollutants in storm water before it is discharged from a site. Because of these numerous options, the San Diego Water Board expects that every development project will be able to implement some form of LID BMPs. Examples of LID BMPs include using permeable pavements, rain gardens, rain barrels, grassy swales, soil amendments, and native plants.

Provision E.3.a also includes requirements for all development projects to, where feasible, landscape with native and/or low water use plants to minimize the discharge of non-storm water discharges associated with excessive irrigation, as well as harvest (i.e., storage) and use precipitation to promote the concept of utilizing storm water as a resource.

While all development projects are subject to the requirements of Provision E.3.a, Provision E.3.b identifies Priority Development Projects that exceed given size thresholds and/or fit under specific use categories. Priority Development Projects are required to incorporate specific performance criteria for structural BMPs into the project plan to reduce the generation of pollutants, and address potential impacts from hydromodification.

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[33] California Department of Public Health, 2012. Best Management Practices for Mosquito Control in California. (http://www.cdph.ca.gov/HealthInfo/discond/Documents/BMPforMosquitoControl07-12.pdf)
[34] www.lowimpactdevelopment.org

The Priority Development Project categories are based on the requirements of the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), and do not differ significantly from the Fourth Term Permit for San Diego County. Furthermore, the Priority Development Project categories are consistent with Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), and Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit).

Because of the impact of relatively small increases in watershed impervious surfaces to receiving waters, Provision E.3.b.(1)(c)(iv) has been updated to include large driveways that are 5,000 square feet or more. The San Diego Water Board finds that large driveways can exacerbate altered flow regimes if not properly controlled.

Provision E.3.b.(3) describes projects that are exempt from Priority Development Project status. These include new or retrofit paved sidewalks, bicycle lanes, or trails that are designed and constructed to direct runoff to vegetated areas or be hydraulically disconnected from paved areas. The exemptions have been provided to encourage these types of projects because they provide multiple environmental benefits, such as promoting walking rather than driving, which will in turn improve air quality. Additionally, retrofitting of existing alleys, streets, or roads are exempt from Priority Development Project status if they are constructed using USEPA Green Streets guidance.[35] By doing so, retrofitting of these types of projects is encouraged. The San Diego Water Board recognizes that there are spatial constraints associated with these projects, and implementation of structural BMPs are not always feasible.

For development projects identified as Priority Development Projects, the requirements of Provision E.3.c are the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment.*" Provisions E.3.c.(1)-(3) describe the performance criteria for the structural BMPs that must be implemented for each Priority Development Project defined by Provision E.3.b.

Provision E.3.c.(1) describes the storm water pollutant control BMP requirements that must be implemented by all Priority Development Projects. The purpose of Provision E.3.c.(1) is to reduce pollutants in storm water runoff to the MEP from Priority Development Projects before it is discharged to the MS4. Of all the available treatment processes available, retention of storm water, and therefore capture of the pollutants in the storm water, will achieve 100 percent pollutant removal efficiency for the volume of storm water retained. No other method of treatment can achieve 100 percent pollutant removal efficiency. Thus, retention of as much storm water onsite is

[35] "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).

the most effective way to reduce pollutants in storm water discharges to, and consequently from the MS4, and controls pollutants in storm water discharges from a site to the MEP.

Under Provision E.3.c.(1)(a), retention of the pollutants in the runoff produced from the 85th percentile storm event ("design capture volume") is the design standard to which Priority Development Projects must comply. Since the 85th percentile storm event has previously been used as the numeric design standard for treatment control BMPs, this same size storm event is used as the numeric design standard for storm water retention. This is the MEP standard recognized by the San Diego Water Board and is consistent with the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), as well as Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit), and Los Angeles Water Board Order No. R4-2012-0175 (Los Angeles County MS4 Permit).

The 85th percentile storm event is the event that has a precipitation total greater than or equal to 85 percent of all storm events over a given period of record in a specific area or location. For example, to determine what the 85th percentile storm event is in a specific location, all 24 hour storms that have recorded values over a 30 year period would be tabulated and a 85th percentile storm would be determined from this record (i.e. 15 percent of the storms would be greater than the number determined to be the 85th percentile storm). Most jurisdictions in the San Diego Region have already developed isopluvial maps that can provide this type of information. The 85th percentile storm might be determined to be a number such as 1.0 inch, and this would be multiplied by the total area of the project footprint producing runoff to calculate the design capture volume. The Priority Development Project designer would then select a system of BMPs that would retain (i.e. intercept, store, infiltrate, evaporate, or evapotranspire) the pollutants contained in the design capture volume onsite.

Retention BMPs are necessary to capture and retain pollutants generated from a Priority Development Project. In a recent study performed by SCCWRP in the Los Angeles Region, they found "*that the magnitude of constituent load associated with storm water runoff depends, at least in part, on the amount of time available for pollutant build-up on land surfaces. The extended dry period that typically occurs in arid climates such as southern California maximizes the time for constituents to build-up on land surfaces, resulting in proportionally higher concentrations and loads during initial storms of the season*."[36] This implies that the "first flush" of a rainy season and the first storm events after long antecedent dry periods tend to have the highest pollutant loads. Capturing and retaining the pollutant loads of the "first flush" of a rainy

[36] Stein, E.D., Tiefenthaler, L.L., and Schiff, K.C., 2007. Technical Report 510, Sources, Patterns and Mechanisms of Storm Water Pollutant Loading from Watershed and Land Uses of the Greater Los Angeles Area, California, USA. March 20, 2007.

season and the first storm events after long antecedent dry periods will reduce a significant portion of the pollutants in storm water discharged to and from the MS4.

The San Diego Water Board, however, acknowledges that in some situations retention of the full design capture volume onsite may not be technically feasible. In this event, the Copermittee may allow the Priority Development Project to use biofiltration BMPs to treat 1.5 times the design capture volume not reliably retained onsite, or biofiltration BMPs with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite.

The 1.5 multiplier is based on the finding in the Ventura County Technical Guidance Manual that biofiltration of 1.5 times the design capture volume not retained onsite will provide approximately the same pollutant removal as retention of the design capture volume on an annual basis.[37] This standard is consistent with the Los Angeles Water Board's Los Angeles County and Ventura County municipal storm water permits (Order Nos. R4-2012-0175 and R4-2010-0108, respectively). The flow-thru design of 0.75 times the portion of the design capture volume not reliably retained onsite is consistent with the San Diego Water Board's Fourth Term Permits for Orange County and Riverside County ~~municipal storm water permits~~ (Order Nos. R9-2009-0002 and R9-2010-0016, respectively). In either case, the biofiltration BMPs must be designed with an appropriate hydraulic loading rate to maximize storm water retention and pollutant removal, as well as to prevent erosion, scour, and channeling within the BMP. Each Copermittee is required to update its BMP Design Manual to provide guidance for hydraulic loading rates and other biofiltration design criteria necessary to maximize storm water retention and pollutant removal.

The San Diego Water Board further recognizes that, in addition to not being technically feasible, retention of the full design capture storm onsite may be cost prohibitive, or may not provide as much water quality benefit to the Watershed Management Area as would implementing BMPs elsewhere in the watershed. Thus, Provision E.3.c.(1)(b) allows for the use of a combination of onsite retention BMPs, and the implementation of an Alternative Compliance Program described in Provision E.3.c.(3). Provision E.3.c.(3) is discussed in more detail below.

If the full design capture volume is not retained onsite either because biofiltration is not technically feasible, or a Copermittee grants a Priority Development Project permission to utilize the Alternative Compliance Program, then the pollutants in the portion of the design capture volume that are not reliably retained onsite must still be reduced to the MEP. Thus, flow-thru treatment control BMPs are required to be implemented on Priority Development Projects in addition to the retention BMPs. The requirements of Provisions E.3.c.(1)(a)(ii)[a]-[c] include the performance standards for flow-thru

[37] Ventura Countywide Stormwater Management Program. 2011. Ventura Technical Guidance Manual, Manual Update, 2011.

treatment control BMPs, consistent with the Fourth Term Permits in the San Diego Region.

Whereas the purpose of the requirements under Provision E.3.c.(1) is to reduce pollutants in storm water runoff to the MEP, the purpose of the requirements under Provision E.3.c.(2) is to maintain or restore more natural hydrologic flow regimes to prevent accelerated, unnatural erosion in downstream receiving waters, also to the MEP standard. Provision E.3.c.(2) describes hydromodification management BMP requirements that must be implemented by all Priority Development Projects.

The performance criteria for the implementation of hydromodification management BMPs on Priority Development Projects are consistent with the requirements in the Fourth Term Permits for Orange and Riverside Counties (Order Nos. R9-2009-0002 and R9-2010-0016, respectively). Modifications to the Orange County and Riverside County Hydromodification Management Plans (HMPs) will likely be minor, or may not be necessary. The HMP for San Diego County will likely require some minor modifications to incorporate the requirements of Provision E.3.c.(2) and become consistent with the Orange County and Riverside County HMPs. The San Diego Water Board does not, however, expect that it will be necessary for the San Diego County Copermittees to develop a new approach or significantly re-write the San Diego County HMP. This is because the premise of the hydromodification management BMP requirements, which are to control storm water runoff conditions (flow rates and durations) for Copermittee-defined range of flows, is unchanged from all Fourth Term Permits in the San Diego Region.

Provision E.3.c.(2)(a) requires that post-project runoff conditions mimic the *pre-development* runoff conditions, and not the *pre-project* runoff conditions. Fundamentally, the San Diego Water Board believes that using a hydrology baseline that approximates that of an undeveloped, natural watershed is the only way to facilitate the return of more natural hydrological conditions to already built-out watersheds, and ultimately improved stream health. On the other hand, using the *pre-project* hydrology as a baseline for redevelopment projects results in propagating the unnatural hydrology of urbanized areas. Propagating the urbanized flow regime does not support conditions for restoring degraded or channelized stream segments, and would forever sentence such streams to the degraded state. Furthermore, reducing the volume of storm water runoff associated with the urbanized flow regime will also result in reducing the discharge of pollutants into receiving waters, since storm water runoff from impervious surfaces contains untreated pollutants.

The San Diego Water Board understands that approximating the pre-development runoff condition associated with a redevelopment site is not necessarily straightforward because factors such as natural grade and native vegetation for the site cannot be precisely known. Therefore, the San Diego Water Board does not expect project designers to estimate historical conditions associated with redevelopment sites. Rather, the San Diego Water Board expects project designers and the Copermittees to

approximate pre-development runoff conditions using the parameters of a *pervious* area rather than an *impervious* area. This means that for redevelopment sites, approximating pre-development runoff conditions equates to using existing onsite grade and assuming the infiltration characteristics of the underlying soil. A redevelopment Priority Development Project must not use runoff coefficients of concrete or asphalt to estimate pre-development runoff conditions. Rather, redevelopment projects must use available information pertaining to existing underlying soil type (such as soil maps published by the National Resource Conservation Service), onsite existing grade, and any other readily available pertinent information to estimate pre-development runoff conditions.

The San Diego Water Board understands, indeed asserts, that the pre-development hydrology of an area in question can only be roughly estimated and cannot be precisely known. However, using the hydrology of a natural condition, even if not precisely known, will provide significant benefit to receiving waters over using the hydrology associated with impervious (developed) surfaces. Therefore in order to achieve the goals of the Clean Water Act, which are to "*restore and maintain the chemical, physical, and biological integrity of the nation's waters* [emphasis added]," the most appropriate standard to use for hydromodification management is the standard associated with the pre-development condition.

Provision E.3.c.(2)(b) requires Priority Development Projects to avoid known critical sediment yield areas or implement measures that would allow coarse sediment to be discharged to receiving waters, such that the natural sediment supply is unaffected by the project. This is necessary because the availability of coarse sediment supply is as much an issue for causing erosive conditions to receiving streams as are accelerated flows.

The San Diego Water Board recognizes that in some situations implementing the hydromodification management BMP requirements for flow control fully onsite may not be technically feasible, may be cost prohibitive, or may not provide any overall water quality benefits to the Watershed Management Area. Thus, Provision E.3.c.(2)(c) allows for the use of a combination of onsite hydromodification management BMPs for flow control and alternative compliance options described in Provision E.3.c.(3).

Provision E.3.c.(3) allows for alternative compliance in instances where the Copermittee determines that offsite measures will have a greater overall water quality benefit for the Watershed Management Area than if the Priority Development Project were to implement structural BMPs onsite. Consequently, watershed-specific structural BMP requirements are present in this Order in the form of allowable compliance offsite. The Alternative Compliance Program to Onsite Structural BMP Implementation Provision is intended to integrate with the Copermittees' planning efforts in the Water Quality Improvement Plans.

The Alternative Compliance Program is an option for Priority Development Projects where the governing Copermittee has participated in the development of a Watershed Management Area Analysis as part of the Water Quality Improvement Plan (described in Provision B.3.b.(4)). Such an approach is consistent with the latest findings in hydromodification management by the scientific community. In a Technical Report entitled *Hydromodification Assessment and Management in California,*[38] the report states:

> *"An effective [hydromodification] management program will likely include combinations of on-site measures (e.g., low-impact development techniques, flow-control basins), in-stream measures (e.g., stream habitat restoration), floodplain and riparian zone actions, and off-site measures. Off-site measures may include compensatory mitigation measures at upstream locations that are designed to help restore and manage flow and sediment yield in the watershed."*

Consistent with the ideas brought forth in the report, in the Watershed Management Area Analysis of Provision B.3.b.(4), which is optional, the Copermittees will develop watershed maps that include as much detail about factors that affect the hydrology of the watershed as is available. Such factors included identification of areas suitable for infiltration, coarse sediment supply areas, and locating stream channel structures and constrictions. Once these factors are mapped and studied, the Copermittees can identify areas in the watershed where candidate projects may be implemented that are expected to improve water quality in the watershed by providing more opportunity for infiltration, slowing down storm water flows, or attenuation of pollutants naturally via healthy stream habitat. These candidate projects may be in the form of retrofitting existing development, rehabilitating degraded stream segments, identifying regional BMPs, purchasing land to preserve valuable floodplain functions, and any other project(s) that the Copermittees identify.

Under the Alternative Compliance Program, Priority Development Projects may be allowed to fund, partially fund, or implement a candidate project, in lieu of implementing structural BMPs onsite, if they enter into a voluntary agreement with the governing Copermittee permitting this arrangement. Project proponents may also propose an alternative project not previously identified by the Copermittees. In either case, whether a project proponent implements a candidate project identified by the Copermittees or a separate alternative compliance project, the governing Copermittee must determine that implementation of the project will have a greater overall water quality benefit for the Watershed Management Area than fully implementing structural BMPs onsite. Determination of greater overall water quality benefits associated with alternative compliance projects would be accomplished by utilizing Water Quality Equivalency calculations developed pursuant to Provision E.3.c.(3)(a). Water Quality Equivalency calculations are necessary to establish a regional and technical basis for

[38] 2012. ED Stein, F Federico, DB Booth, BP Bledsoe, C Bowles, Z Rubin, GM Kondolf, A Sengupta. Technical Report 667. Southern California Coastal Water Research Project. Costa Mesa, CA.

determining water quality benefits associated with alternative compliance projects, which can be consistently used by all Copermittees in the San Diego Region. Finally, if ~~I~~f alternative compliance involves funding or implementing a project that is outside the jurisdiction of the governing Copermittee, then that Copermittee may enter into an inter-agency agreement with the appropriate jurisdiction.

Finally, Provision E.3.c.(2)(d) allows Priority Development Projects to be exempt from the hydromodification management BMP requirements if there is no threat of erosion to downstream receiving waters (i.e. the receiving stream is concrete lined from the point of discharge all the way to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean). If the Copermittees believe that more exemptions are warranted, then they must perform the optional Watershed Management Area Analysis of Provision B.3.b.(4). Additional exemptions other than those specified in this Order may be established on a watershed basis, provided the Copermittees perform the analysis, provide supporting rationale for the exemptions, and complete the Water Quality Improvement Plan approval process pursuant to Provision F.1.

To facilitate the transition to this Order from the Fourth Term Permits for Orange and Riverside County Copermittees, Provision E.3.c.(2)(e) allows two additional temporary exemptions from hydromodification management BMP implementation. The first temporary exemption allows relief from hydromodification management BMP implementation for Priority Development Projects discharging directly to an engineered channel conveyance system with a capacity to convey peak flows generated by the 10-year storm event all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean. Similar to the exemption allowed for concrete-lined channels, this exemption is premised on the concept that there is little threat of erosion to these types of engineered channel systems.

The second temporary exemption allows relief from hydromodification management BMP implementation for Priority Development Projects discharging directly to large river reaches with drainage areas larger than 100 square miles and a 100-year flow capacity in excess of 20,000 cubic feet per second. If this exemption is claimed, then properly sized energy dissipation is required at all discharge points associated with the Priority Development Project. This exemption is premised on the concept that large river reaches can essentially assimilate the accelerated flow rates associated with individual Priority Development Projects because they are inconsequential compared to the flow rate in the large river reach. Both of these exemptions are included in the Hydromodification Management Plan for San Diego County[39].

These temporary exemptions are allowed as a means to facilitate Orange and Riverside County Copermittees' transition to this Order from the Fourth Term Permits and are not meant to reside as permanent exemptions without additional rigorous

[39] Final Hydromodification Management Plan Prepared for County of San Diego, March 2011

technical analyses specific to each County. Therefore, these exemptions will no longer apply once the Copermittees' land development programs are fully updated to reflect the requirements of this Order, i.e., upon implementation of the BMP Design Manual pursuant to Provision F.2.b. If the Copermittees believe that these or other exemptions are warranted in the context of water quality improvement and stream restoration opportunities, then the Copermittees must perform the optional Watershed Management Area Analysis of Provision B.3.b.(4) and provide supporting rationale for the exemptions. The San Diego County Copermittees are also required to perform the optional Watershed Management Area Analysis to provide supporting rationale to justify use of these and other exemptions. Updated BMP Design Manuals including rationale to justify use of exemptions will be reviewed by the San Diego Water Board pursuant to Provision F.2.b.

Provisions E.3.c.(4) and E.3.c.(5) were included under the BMP requirements applicable to all development projects in the Fourth Term Permits for San Diego, Orange, and Riverside Counties (Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016, respectively). In this Order, the long-term BMP maintenance and infiltration and groundwater protection requirements apply to structural BMPs implemented by Priority Development Projects only.

Provision E.3.d requires the Copermittees to update their BMP Design Manual as needed to incorporate the requirements of Provision E.3. The BMP Design Manual is formerly known as the Standard Storm Water Mitigation Plan, or SSMP, and was renamed so that the title has a more accurate description of the document content. The contents of the BMP Design Manual are largely unchanged from the previous Standard Storm Water Mitigation Plans required under the Fourth Term Permits. The BMP Design Manual fulfills the 40 CFR 122.26(d)(2)(iv)(A)(2) requirement that the Copermittee's development planning program includes "*a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment*."

As part of the "*planning procedures,*" 40 CFR 122.26(d)(2)(iv)(A)(2) requires the procedures to "*address controls to reduce pollutants in discharges from municipal separate storm sewers after construction is completed*." The requirements applicable to the implementation and oversight of structural BMPs at Priority Development Projects are provided under Provision E.3.e.

Proper installation of the structural BMPs approved for a Priority Development Project is necessary to ensure that pollutants in storm water discharges will be reduced to the MEP after the project is completed. In addition to the proper installation of structural BMPs, the maintenance of structural BMPs on Priority Development Projects is necessary to ensure that pollutants in storm water discharges will continue to be reduced to the MEP. Provision E.3.e.(1) includes the minimum requirements that each

Copermittee must implement to ensure structural BMPs are properly installed and will be properly maintained.

The requirements under Provision E.3.e.(2)-(3) are necessary to demonstrate each Copermittee is implementing a program that complies with Provisions E.3.b-c and E.3.e.(1), and ensure structural BMPs at Priority Development Project will continue to be able to reduce pollutants in storm water discharges to the MEP.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary for any development projects to compel compliance with the requirements of Provision E.3 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.3.f requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Provision E.4 (Construction Management) requires each Copermittee to implement a construction management program to control and reduce the discharge of pollutants in storm water from construction sites to the MEP. Proper implementation of the construction management program will also contribute toward effectively prohibiting non-storm water discharges from construction sites to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." As part of the management program, 40 CFR 122.26(d)(2)(iv)(D) requires "*a program to implement and maintain structural and non-structural best management practices to reduce pollutants in storm water runoff from construction sites to the municipal storm sewer system.*"

Construction sites can be significant sources of sediment, trash, and other pollutants to receiving waters. Although sediment is naturally occurring in the natural environment, the discharge of sediment under unnatural conditions is problematic to receiving waters. Fine sediment in creeks causes high turbidity that interferes with the functionality of native flora and fauna in local creeks. For example, turbidity interferes with both photosynthesis of water-philic plants, as well as successful foraging and reproduction of benthic macroinvertebrates. Sediment can also make it difficult for fish to breathe because it clogs fish gills. Other pollutants such as heavy metals or pesticides can adhere to sediment and are transported to receiving waters during storm events, where they dissolve in the water column and become bioavailable to aquatic organisms. Sediment is recognized as a major stressor to surface waters and is responsible for the impairment of several lagoons and creeks in the San Diego Region.

Provision E.4 includes requirements that each Copermittee must implement to minimize the discharge of sediment and other pollutants from construction sites to the MS4 within its jurisdiction. The requirements under Provision E.4 are consistent with the Fourth Term Permits for San Diego, Orange, and Riverside Counties. Therefore, Copermittees are expected to implement the requirements seamlessly, with minimal changes to their existing construction management programs. The Copermittees, however, are given more flexibility to run their programs as needed to maximize efficiency, and also to be consistent with the Water Quality Improvement Plan for the Watershed Management Area.

As part of the construction management program, 40 CFR 122.26(d)(2)(iv)(D)(1) requires "*procedures for site planning which incorporate consideration of potential water quality impacts.*" Provision E.4.a describes the minimum elements each Copermittee is required to include as part of the construction site planning and project approval process. The construction site planning and approval process is based primarily on ensuring each project had an adequate site-specific pollution control, construction BMP, and/or erosion and sediment control plan that will be implemented to minimize the discharge of pollutants in storm water to the MEP, and minimize impacts to receiving waters.

The requirements under Provision E.4.b provide the data and information necessary to identify "*priorities for inspecting sites and enforcing control measures*" required pursuant to 40 CFR 122.26(d)(2)(iv)(D)(3). Under Provision E.4.b, each Copermittee must identify construction sites that are considered a high threat to downstream surface waters. Designation of "high threat to water quality" construction sites will necessitate the Copermittees to develop criteria to identify such sites. Provision E.4.b.(2) describes a list of factors that must be considered when the Copermittee considers threat to water quality. For example, a Copermittee must identify sites as "high threat to water quality" if it is located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions, according to the Water Quality Improvement Plan. This ensures that construction management program implementation is compatible with the Copermittee's identified highest priority water quality conditions.

Pursuant to 40 CFR 122.26(d)(2)(iv)(D)(2) each Copermittee is required describe "*requirements for nonstructural and structural best management practices*" at construction sites. Provision E.4.c includes the types of construction site BMPs that the Copermittees must implement, or require the implementation of, at each construction site to reduce pollutants in storm water discharges to the MEP.

Each Copermittee is expected to require the implementation of appropriate BMPs given specific site conditions, the season and likelihood of rain events, and construction phase (i.e. grading vs. vertical construction). This means that throughout the life of the project construction, the appropriate BMPs will vary, especially if the

construction of the project spans multiple wet seasons. As opposed to describing specific minimum BMPs that must be implemented, the Order describes major BMP categories that should be considered for each site.

Each Copermittee is expected to use its 20 years of storm water experience and knowledge to require implementation of appropriate BMPs from the various categories at each construction site within its jurisdiction. For example, the San Diego Water Board expects that each site will be required to implement erosion control and sediment control. The San Diego Water Board also expects each Copermittee to require implementation of active/passive sediment treatment systems at sites where other BMPs have been tried and are known to be inadequate, and discharges of sediment are causing or contributing to water quality impairment downstream. Each Copermittee is granted flexibility in specifying the minimum level of BMP requirements at each site, but the San Diego Water Board expects each site to be capable of controlling pollutants in storm water discharges to the MEP and preventing illicit discharges.

The requirements under Provision E.4.d are necessary to demonstrate that each Copermittee is implementing a program that complies with Provisions E.4.a and E.4.c and ensure BMPs at construction sites will reduce pollutants in storm water discharges to the MEP.

Provision E.4.d does not include minimum required inspection frequencies for construction sites. Each Copermittee must use its experience and knowledge to specify an appropriate inspection frequency for both high priority and lower priority sites in their jurisdictional runoff management program documents, and in accordance with the Water Quality Improvement Plan. Appropriate inspection frequencies may vary by Copermittee, but the San Diego Water Board expects that the stated frequency will be adequate for each Copermittee to properly oversee the construction sites within its jurisdiction, confirm BMPs are implemented to reduce pollutants in storm water discharges from constructions sites to the MEP, and make needed changes to its program on an ongoing basis as necessary.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary for any development projects to compel compliance with the requirements of Provision E.4 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.4.e requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

<u>Provision E.5 (Existing Development Management)</u> requires each Copermittee to implement an existing development management program to control and reduce the discharge of pollutants in storm water from areas of existing development to the MEP.

Proper implementation of the existing development management program will also contribute toward effectively prohibiting non-storm water discharges from areas of existing development to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." Within 40 CFR 122.26(d)(2)(iv)(A) and (C), the management program is required to reduce impacts on receiving waters and reduce pollutants in storm water discharges to the MEP from commercial and residential areas, industrial facilities, and municipal facilities.

Commercial and residential areas, industrial facilities, and municipal facilities must be addressed by each Copermittee with the existing development management program required under Provision E.5. All other areas within each Copermittee's jurisdiction should be either undeveloped open space, or areas that are being developed or under construction. Areas being developed or under construction will be addressed by the Copermittee under the requirements of Provision E.3 (Development Planning) or Provision E.4 (Construction Management).

Areas of existing development typically include impervious surfaces such as sidewalks, driveways, roads, and rooftops, which generate and concentrate pollutants (such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not found in high concentrations in the natural environment. Pollutants that accumulate on impervious surfaces are not easily biodegraded or not subject to natural treatment processes. When it rains, these pollutants are transported in storm water runoff from these impervious surfaces into receiving waters, resulting in poor water quality and degradation of beneficial uses.

In addition to the generation of pollutants, areas of existing development have generally altered the natural conditions of the land and removed vegetative cover, reduced the perviousness of the surface, and reduced the capacity of storm water that can be intercepted, captured, stored, infiltrated, evaporated, and/or evapotranspired. The alteration of the natural conditions and the impervious surfaces associated with areas of existing development causes water quality problems due to the alteration of natural flow regimes within the watersheds; resulting in hydromodification of channels, streams, and habitats that exist within or adjacent to the areas of existing development.

Thus, storm water discharges from areas of existing development are responsible for poor water quality, degraded habitats, and hydromodified channels throughout the developed portions of the watersheds in the San Diego Region. To improve the health and functionality of the receiving waters in a Watershed Management Area, land use practices and the amount of impervious surfaces in areas of existing development must change to reduce the various impacts caused by hydromodification and

pollutants from storm water runoff generated in developed areas. Each Copermittee must be aggressive to address pollutant sources and runoff from areas of existing development to be able to reduce pollutants in storm water discharges from the MS4 to the MEP.

There is some overlap in the requirements under Provision E.5 with the requirements under Provisions E.2 (Illicit Discharge Detection and Elimination), E.3 (Development Planning), and E.4 (Construction Management). Illicit discharges frequently originate from areas of existing development. New development projects, when completed will become some type of residential, commercial, industrial or municipal existing development. Redevelopment projects are, by definition, redeveloping areas of existing development. And, redevelopment projects become construction sites located in areas of existing development. Much of the data and information collected, inspections performed, and enforcement actions taken for the requirements under Provisions E.2 to E.4 may also be utilized by the existing development management program. The requirements under Provision E.5, however, are focused primarily on reducing pollutants generated in areas of existing development that can be transported in storm water runoff and discharged to and from the MS4.

The requirements under Provision E.5 build upon existing program elements being implemented by the Copermittees. Provision E.5 is generally consistent with the existing development requirements of the Fourth Term Permits for Orange and Riverside Counties (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), but modified to provide more flexibility to implement the programs so resources can be better focused toward addressing the highest priority water quality conditions identified in the Water Quality Improvement Plans.

For a Copermittee to properly manage areas of existing development, having knowledge of what development exists within its jurisdiction is essential. Provision E.5.a requires each Copermittee to maintain a watershed-based inventory of all the existing development within its jurisdiction. This requirement is necessary for each Copermittee to implement the requirements of Provision E.5.b-e.

As opposed to just maintaining separate inventories based on the type of site, each Copermittee must maintain a watershed-based inventory that includes all types of existing development within its jurisdiction. By utilizing a watershed-based inventory, the Copermittees within a Watershed Management Area can combine their inventories and review the inventories by watershed in addition to by jurisdiction. Pollutant sources and strategies for abatement can then be evaluated on a watershed level, as opposed to evaluating sources and strategies strictly by type of site.

Provision E.5.a includes the information that must be included in the inventory. Provision E.5.a.(1) specifies what facilities or areas must be included in the inventory. A commercial type of existing development may be identified in the inventory as a facility (e.g. individual building, individual business) or an area (e.g. shopping center,

commercial zone). An industrial type of existing development must be identified in the inventory by facility (e.g. individual industrial entity). A municipal type of existing development must be identified in the inventory by facility, with a list of specific municipal facilities that must be included in the inventory. A residential type of existing development must be identified by areas to be designated by the Copermittee. For each of the facilities and areas identified in the Copermittee's inventory developed pursuant to Provision E.5.a.(1), Provision E.5.a.(2) specifies the information that must be included in the description for the facility or area.

Provision E.5.a.(3) requires each Copermittee to maintain an updated map showing the location of inventoried existing development, watershed boundaries, and water bodies. This requirement was included because this information is expected to help the Copermittees in a Watershed Management Area identify and prioritize sources of pollutants and/or stressors in areas of existing development that contribute toward the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Knowledge of the existing development that are likely to be sources of pollutants contributing to the highest priority water quality conditions is expected to be a key element in the Copermittees' development of the water quality improvement strategies that will be included in the Water Quality Improvement Plans. The strategies described in the Water Quality Improvement Plans will direct efforts within the existing development management programs implemented by each Copermittee.

Pursuant to 40 CFR 122.26(d)(2)(iv)(A) each Copermittee is required describe "*structural and source control measures to reduce pollutants*" in storm water runoff discharged from areas of existing development. Provision E.5.b includes the BMP implementation and maintenance requirements that the each Copermittee must require at areas of existing development to reduce pollutants in storm water discharges to the MEP. The San Diego Water Board, however, recognizes that BMP implementation and maintenance for residential areas will require much more education and encouragement through less authoritative measures than for commercial, industrial and municipal facilities and areas. Thus, the BMP implementation and maintenance requirements have been separated between requirements under Provision E.5.b.(1) for commercial, industrial and municipal facilities and areas, and Provision E.5.b.(2) for residential areas.

Most of the requirements in Provision E.5.b are consistent with the related requirements in the Fourth Term Permits. The level of specificity, however, has been changed to allow each Copermittee the flexibility to implement its program to achieve maximum efficiency, and to perform functions that will address the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Each Copermittee is expected to require the implementation of appropriate BMPs to address the expected pollutants from each facility or area. The Third and Fourth Term

Permits described specific minimum BMPs that must be implemented at various sites. This Order, however, requires each Copermittee to designate minimum BMPs themselves and require implementation. Consistent with the Fourth Term Permits, each Copermittee is required to maintain, or require the maintenance of, all BMPs as needed.

The BMP implementation and maintenance requirements include a schedule of operation and maintenance activities for the MS4 and related structures (such as catch basins, storm drain inlets, and detention basins), as well as public streets and roads. Public streets and roads specifically include public unpaved roads. The San Diego Water Board identified, through investigations and complaints, sediment discharges from unpaved roads as a significant source of water quality problems in the San Diego Region. Inspection activities conducted by the San Diego Water Board since the Third Term Permits have found a lack of source control for many unpaved roads within the jurisdiction of the Copermittees.

Unpaved roads are a source of sediment that can be discharged in runoff to receiving waters, especially during storm events. Erosion of unpaved roadways occurs when soil particles are loosened and carried away from the roadway base, ditch, or road bank by water, wind, traffic, or other transport means. Exposed soils, high runoff velocities and volumes, sandy or silty soil types, and poor compaction increase the potential for erosion.

Road construction, culvert installation, and other maintenance activities can disturb the soil and drainage patterns to streams in undeveloped areas, causing excess runoff and thereby erosion and the release of sediment. Poorly designed unpaved roads can act as preferential drainage pathways that carry runoff and sediment into natural streams, impacting water quality. In addition, other public works activities along unpaved roads have the potential to significantly affect sediment discharge and transport within streams and other waterways, which can degrade the beneficial uses of those waterways.

USEPA also recognizes that discharges from unpaved roads pose a significant potential threat to water quality. USEPA guidance[40] emphasizes the threat of unpaved roads to water quality:

> "*Dirt and gravel roads are a major potential source of these pollutants [sediment] and pollutants that bind to sediment such as oils, nutrients, pesticides, herbicides, and other toxic substances. Many roads have unstable surfaces and bases. Roads act like dams, concentrating flows that accelerate erosion of road materials and roadsides. Both unstable surfaces and accelerated erosion then lead to sediment and dust.*"

[40] USEPA, 2006. Environmentally Sensitive Maintenance for Dirt and Gravel Roads. Gesford and Anderson, USEPA-PA-2005.

There are several guidance documents, developed by the USEPA,[41] the US Forest Service,[42] the University of California,[43] and others, that include design and construction specifications and BMPs that are readily available for implementation by public entities. Implementing design and other source control BMPs for unpaved roads in the region is necessary to reduce and minimize the impacts of sediment discharged during storm events from unpaved roads to the MS4s and receiving waters.

Provision E.5.c describes existing development site inspection frequency, content, and tracking that each Copermittee must incorporate into their existing development management programs. The requirements under Provision E.5.c are necessary to demonstrate each Copermittee is implementing a program that complies with Provision E.5.b and ensure BMPs implemented in areas of existing development will reduce pollutants in storm water discharges to the MEP. Provision E.5.c has been modified to include a minimum of once every 5 years for all inventoried facilities and areas of existing development, utilizing one or more methods of inspection.

In addition to onsite inspections, the methods of inspection have been expanded to include drive-by inspections. Inspections may be performed by the Copermittee's municipal and contract staff, or by volunteer monitoring or patrol programs. Volunteer monitoring or patrol programs are not expected to enforce the Copermittee's ordinances, or to inspect areas or facilities where members of the public are not allowed access. Volunteer monitoring or patrol programs must be trained by the Copermittee, and are only expected to collect visual observations. By utilizing drive-by inspections and volunteer monitoring or patrol programs, the Copermittees will be able to maximize and efficiently use their resources to identify and address sources of pollutants in areas of existing development.

The municipal and contract staff of each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial, industrial, and municipal facilities and areas in its inventoried existing development pursuant to Provision E.5.c.(1)(a)(iv). An "equivalent" of at least 20 percent means if any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspections may count toward the total annual inspection requirement. Linear municipal facilities (i.e. MS4 linear channels, sanitary sewer collection systems, streets, roads and highways) in the Copermittee's existing development inventory are not subject to the inspection frequency requirement of Provision E.5.c.(1)(a)(iv).

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[41] Ibid
[42] US Forest Service, 1996. Forest Service Specifications for Construction of Roads & Bridges. EM-7720-100. Revised August 1996.
[43] University of California Division of Agriculture and Natural Resources, 2007. Rural Roads: A Construction and Maintenance Guide of California Landowners. Publication 8262.

The inspection content specified in Provision E.5.c.(2)(a) includes the information required to be collected during an inspection by any method. The inspection content specified in Provision E.5.c.(2)(b) includes additional information that must be collected when a Copermittee's municipal or contract staff perform an onsite inspection. Provision E.5.c.(3) specifies the information that each Copermittee must maintain in its existing development inspection records.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary to compel compliance with the requirements of Provision E.5 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.5.d requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Provisions E.5.e.(1)-(2) specifically require the Copermittee to identify areas of existing development as candidates for retrofitting, and streams, channels, and/or habitats as candidates for rehabilitation. Provisions E.5.e.(1)-(2) are based on the retrofitting requirements of the Fourth Term Permits for Orange and Riverside Counties, but modified to also include identifying projects to rehabilitate channels within areas of existing development. The requirements have also been modified to be more focused on utilizing these types of projects for addressing the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Interest and opportunity to retrofit areas of existing development and rehabilitate channels located in areas of existing development has been observed in several programs the San Diego Water Board oversees (e.g., CWA Section 401 Water Quality Certification program, supplemental environmental projects, and grant programs). Each jurisdiction has miles and miles of streets that could be retrofitted to become green streets. Reshaping landscaped areas from convex to concave configurations can detain storm water instead of directing runoff as quickly as possible to the MS4. Retrofit projects could also include simply replacing impervious surfaces with permeable surfaces.

Retrofitting projects do not necessarily have to be expensive. Retrofitting projects could be as simple as redirecting downspouts from roofs to pervious or landscaped areas instead of to hardscaped areas discharging directly to the MS4, providing rain barrels to harvest storm water from downspouts for use at a later time, or planting more trees in areas with little vegetation to provide canopy that can intercept storm water. The San Diego Water Board encourages the Copermittees to identify simple, low-cost retrofitting opportunities that can be easily implemented, in addition to other more expensive retrofitting and channel rehabilitation projects.

Rehabilitation of channels, streams, and/or habitat will require more significant planning and resources to implement. There are, however, also abundant opportunities to rehabilitate channels, streams and/or habitats in or adjacent to areas of existing development. Each Watershed Management Area likely has several creeks and stream reaches that have been undergrounded, artificially hardened, or hydromodified that could be rehabilitated to be more sustainably configured, which would slow down storm water flows and potentially have more assimilative capacity for pollutants while still being supportive of designated beneficial uses.

The San Diego Water Board recognizes that it may be infeasible to implement retrofitting or channel rehabilitation projects within certain areas of a Copermittee's jurisdictions. For such areas, the Copermittee must instead identify, develop, and implement regional retrofitting and channel rehabilitation projects (i.e. projects that can retain and/or treat storm water from one or more areas of existing development) adjacent to and/or downstream of the areas of existing development.

Provisions E.5.e.(1)-(2) do not require the implementation of retrofitting and rehabilitation projects, but do require the Copermittee to develop a program with strategies to facilitate the implementation of these types of projects in areas of existing development. The strategies are expected to include allowing and encouraging Priority Development Projects to implement retrofitting types of projects as a means of compliance with the structural BMP performance criteria requirements of Provisions E.3.c.(1) and E.3.c.(2).

Provision E.6 (Enforcement Response Plans) requires each Copermittee to develop an Enforcement Response Plan as part of its jurisdictional runoff management program document. Proper implementation of the Enforcement Response Plans is necessary to effectively prohibit non-storm water discharges to the MS4, and reduce the discharge of pollutants in storm water from the MS4 to the MEP.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system*" and be able to demonstrate that it can "*operate pursuant to legal authority established by statute, ordinance or series of contracts*" to control the discharge of non-storm water and pollutants in storm water to and from its MS4. Pursuant to 40 CFR 122.26(d)(2)(i)(E) each Copermittee is specifically required to have the legal authority to "*[r]equire compliance with conditions in ordinances, permits, contracts or order*s."

The requirements under Provision E.6 are necessary to demonstrate that each Copermittee can enforce its legal authority to *"effectively prohibit non-stormwater discharges"* and "*reduce the discharge of pollutants to the maximum extent practicable*" as well as "*[r]equire compliance with conditions in ordinances, permits, contracts or order*."

The Enforcement Response Plan required under Provision E.6 will serve as a reference for the Copermittee and the San Diego Water Board to determine if consistent enforcement actions are being implemented to achieve timely and effective compliance from all public and private entities that are not in compliance with the Copermittee's ordinances, permits, or other requirements. The Enforcement Response Plan must contain clear direction for the Copermittee to take immediate enforcement action, when appropriate and necessary, in their illicit discharge detection and elimination, development planning, construction management, and existing development management programs.

If the entities subject to the Copermittee's legal authority do not implement appropriate corrective actions in a timely manner, or if violations repeat, the Copermittee must take progressively stricter responses to enforce its legal authority and achieve compliance with its ordinances, permits, or other requirements to *"effectively prohibit non-stormwater discharges"* and "*reduce the discharge of pollutants to the maximum extent practicable.*"

Provision E.7 (Public Education and Participation) requires each Copermittee to implement a public education and participation program. Proper implementation of the public education and participation program as part of its jurisdictional runoff management program will contribute toward effectively prohibiting non-storm water discharges to the MS4, and toward the reduction of pollutants in storm water from the MS4 to the MEP.

Provision E.7 establishes the minimum requirements that each Copermittee must implement to engage members of the public as part of its jurisdictional runoff management program. In the Fourth Term Permits, the public education program requirements and the public participation requirements were included as separate jurisdictional runoff management program components. In this Order, the public education requirements have been consolidated with the public participation requirements, as both sets of requirements are related to the engagement of the public by each Copermittee. Engagement of the public is critical for the success of each Copermittee's jurisdictional runoff management program.

The Copermittees have been implementing public education programs for the last 20 years, which are now well established. The specificity of expected public education program elements of the Fourth Term Permits has been removed. For the most part, the public education program requirements in Provision E.7.a have been reduced to a set of requirements that are specifically included in the federal regulations under 40 CFR 122.26(d)(2)(iv)(A)(6), 122.26(d)(2)(B)(6) and 122.26(d)(2)(D)(4), which should already be incorporated into each Copermittee's existing public education program. Each Copermittee is expected to utilize the information and data collected from the monitoring and assessments conducted within the Watershed Management Area, and from its inventories and inspections to best direct its public education program

resources toward addressing the highest priority water quality conditions identified within the Water Quality Improvement Plan.

According to 40 CFR 122.26(d)(2)(iv), public participation is required to be included as part of the "*comprehensive planning process*", which includes the development and implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs. The requirements under Provision E.7.b specify the opportunities that the public must be provided to be involved in the "*comprehensive planning process*", as required by to 40 CFR 122.26(d)(2)(iv).

Provision E.8 (Fiscal Analysis) requires each Copermittee to secure the resources and provide an analysis of the resources that will be necessary to implement the requirements of the Order. Adequate fiscal resources are necessary for a jurisdictional runoff management program to effectively prohibit non-storm water discharges to the MS4, and reduce pollutants in storm water from the MS4 to the MEP.

According to 40 CFR 122.26(d)(2)(vi), each Copermittee is responsible for providing "*a fiscal analysis of the necessary capital and operation and maintenance expenditures necessary to accomplish the activities*" required by this Order, including "*a description of the source of funds that are proposed to meet the necessary expenditures, including legal restrictions on the use of such funds.*" The fiscal analysis requirements of Provision E.8 are consistent with 40 CFR 122.26(d)(2)(vi).

The San Diego Water Board has chosen not to require a description of fiscal benefits realized from implementation of the jurisdictional runoff management programs. This is a recommendation from the National Association of Flood and Stormwater Management Agencies.[44] For instance, the fiscal analysis requirements do not address city-wide fiscal benefits of protection (e.g., public health, tourism, property values, economic activity, beneficial uses, etc.), even though many costs currently reported to the San Diego Water Board are for related activities. This type of assessment may help Copermittees improve the allocation of resources and it may help the Copermittees secure adequate funding for the program. Qualitative assessments, however, could be overly subjective and most Copermittees likely lack the ability to provide accurate quantitative assessments. The San Diego Water Board encourages the Copermittees to consider means for conducting assessments of fiscal benefits derived from the programs. Such assessments could be conducted on a regional scale similar to studies of program costs conducted by the State Water Board.[45]

[44] National Association of Flood and Stormwater Management Agencies. 2006. *Guidance for Municipal Stormwater Funding.* Prepared under a grant provided by the USEPA.
[45] State Water Board, 2005. NPDES Stormwater Cost Survey.

F. Reporting

Purpose: Provision F includes the requirements for the documents and reports that the Copermittees must prepare and provide to the San Diego Water Board. The documents prepared by the Copermittees and provided to the San Diego Water Board and made available to the public will provide the documentation that the Copermittees are complying with the requirements of the Order.

***Discussion*:** Provision F requires the Copermittees to prepare several documents and reports that must be provided to the San Diego Water Board and made available to the public. The reporting requirements have been significantly reduced compared to the Fourth Term Permit reporting requirements. The reduction in reporting requirements was recommended by the San Diego County Copermittees in the Report of Water Discharge submitted in June 2011.

More specific and detailed discussions of the requirements of Provision F are provided below.

Provision F.1 (Water Quality Improvement Plans) requires the Copermittees in each Watershed Management Area to develop and submit a Water Quality Improvement Plan in accordance with the requirements of Provision B.

Of all the requirements of Provision F, the Water Quality Improvement Plans will likely be the documents requiring the most significant effort to develop. The content of the Water Quality Improvement Plans, however, is expected to include content that should already have been developed for the Watershed Plans and several elements that are included in the Monitoring and Reporting Programs required under the Fourth Term Permits.

Because the Water Quality Improvement Plan is part of the "*comprehensive planning process which involves public participation*," Provision F.1 includes requirements to give multiple opportunities to the public to provide input on the content of the plans.

Provision F.1.a.(1) specifies the elements that the Copermittees must include in the public participation process for the development of the Water Quality Improvement Plans. In order for the public to be aware of the opportunities to provide input, Provision F.1.a.(1)(a) requires the Copermittees to develop a publicly available and noticed schedule of the opportunities for the public to participate and provide comments during the development of the Water Quality Improvement Plan. These opportunities are when the public can provide the data, information, and recommendations that the Copermittees can consider during the development of the Water Quality Improvement Plans.

The San Diego Water Board recognizes, however, that the Copermittees cannot be expected to incorporate all the data, information, and recommendations that the public may provide into the Water Quality Improvement Plans. The Copermittees will have to review the data, information, and recommendations received and make some decisions on what to incorporate into the Water Quality Improvement Plans. Before the Copermittees finalize their decisions, members of the public should be allowed to review the Copermittees' decisions. Thus, Provision F.1.a.(1)(b) requires the Copermittees to form a Water Quality Improvement Consultation Panel (Panel).

The Panel will consist of a member from the environmental community and a member from the development community familiar with the Watershed Management Area. A representative from the San Diego Water Board staff will also be part of the Panel. The Copermittees may choose to include additional members, but the Panel is only required to include three panel members.

The Panel will serve as an additional public participation and input mechanism during the development of the Water Quality Improvement Plans. The knowledge and expertise from these Panel members are expected to provide the Copermittees valuable direction during their decision-making process. The Copermittees will review the content of their planned submittals with the Panel members to receive recommendations. If the Panel provides recommendations, the Copermittees must consider revisions to the Water Quality Improvement Plan submittals.

The San Diego Water Board recognizes that the development of multiple Water Quality Improvement Plans concurrently may limit the ability of the public to review and provide comments to the Copermittees. Thus, Provision F.1.a.(1)(c) requires the Copermittees to coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public time and opportunity to participate during the development of the Water Quality Improvement Plans.

Provision F.1.a.(2) requires the Copermittees to develop and submit the first Water Quality Improvement Plan component, in accordance with the requirements of Provision B.2, which includes the identification of the priority water quality conditions and potential water quality improvement strategies. The public must be provided an opportunity to provide data, information and recommendations to be utilized in the development and identification of the priority water quality conditions and potential water quality improvement strategies for the Watershed Management Area. The Copermittees must consult with the Panel and consider making revisions. The Copermittees may submit the requirements of Provision B.2 as early as 6 months and no later than 12 months after the commencement of coverage under this Order. After the requirements of Provision B.2 are submitted to the San Diego Water Board, the public will be provided another opportunity to provide comments.

Provision F.1.a.(3) requires the Copermittees to develop and submit the second Water Quality Improvement Plan component, in accordance with the requirements of

Provision B.3, which includes the identification of the numeric goals for the highest priority water quality conditions identified for the Watershed Management Area, and the strategies that will be implemented to achieve the potential numeric goals. The Copermittees may also develop the Optional Watershed Management Area Analysis, in accordance with the requirements of Provision B.3.b.(4), as part of this submittal. The public must be provided an opportunity to provide data, information and recommendations to be utilized in the development and identification of the numeric goals and water quality improvement strategies for the Watershed Management Area. The Copermittees must consult with the Panel and consider making revisions. The Copermittees may submit the requirements of Provision B.3 as early as 9 months and no later than 18 months after the commencement of coverage under this Order. After the requirements of Provision B.3 are submitted to the San Diego Water Board, the public will be provided another opportunity to provide comments.

Finally, Provision F.1.b describes the process for the submittal and implementation of the Water Quality Improvement Plans. The complete Water Quality Improvement Plans are required to be submitted by the Copermittees within 24 months after the commencement of coverage under this Order. The San Diego Water Board will provide the public an opportunity to provide comments on each complete Water Quality Improvement Plan.

The San Diego Water Board will review each Water Quality Improvement Plan and the public comments received to determine if the Copermittees have submitted a Water Quality Improvement Plan that meets the requirements of Provision B. If a Water Quality Improvement Plan does not meet the requirements of Provision B, the Copermittees will be considered out of compliance and directed in writing by the San Diego Water Board Executive Officer to correct the deficiencies.

When a Water Quality Improvement Plan meets the requirements of Provision B, the San Diego Water Board will determine whether to hold a public hearing or to limit public input to submittal of written comments before accepting the Water Quality Improvement Plan. Implementation of the Water Quality Improvement Plan must begin within 30 days of acceptance.

The San Diego Water Board expects that any deficiencies in the Water Quality Improvement Plan will be identified either in the public comments or during the review by the San Diego Water Board before implementation begins. In the event any deficiencies are identified after the implementation of the Water Quality Improvement Plan, Provision F.1.b.(7) clarifies that the San Diego Water Board maintains the right to require the Copermittees to correct any deficiencies that may be identified.

Provision F.2 (Updates) requires the Copermittees to update specific documents that the Copermittees will utilize to implement the requirements of this Order.

Each Copermittee is required to continue implementing a jurisdictional runoff management program, as required under Provision E. Implementation of each Copermittee's jurisdictional runoff management program is directed by its jurisdictional runoff management program document. Provision F.2.a requires each Copermittee to update its jurisdictional runoff management program document to be consistent with the requirements of Provision E concurrent with the submittal of the Water Quality Improvement Plan.

Likewise, each Copermittee must continue to require new development and redevelopment projects to implement BMPs to control pollutants in storm water runoff. The control of pollutants in storm water runoff from development and redevelopment projects within each Copermittee's jurisdiction is guided and directed by its BMP Design Manual, formerly known as a Standard Storm Water Mitigation Plan (SSMP). Provision F.2.b requires each Copermittee to update its BMP Design Manual to be consistent with the requirements of Provision E.3 concurrent with the submittal of the Water Quality Improvement Plan.

In general, the requirements of the Order should not necessitate a complete rewrite of each Copermittee's jurisdictional runoff management program document or BMP Design Manual, as was required by the Third Term Permits. The jurisdictional runoff management program and BMP Design Manual requirements of this Order are not significantly different than the requirements of the Fourth Term Permits. Thus, only sections of the Order which are new or have been significantly changed should warrant revisions to specific sections of the Copermittee's jurisdictional runoff management program document and BMP Design Manual.

Finally, the Water Quality Improvement Plans are expected to require updates as the iterative approach and adaptive management process included in the Water Quality Improvement Plan, as required under Provision B.5, is implemented by the Copermittees. Provision F.2.c.(1) requires the Copermittees to implement a public participation process for the proposed updates, review the proposed updates with the Panel, and submit the updates to the Water Quality Improvement Plan as part of the Annual Reports required under Provision F.3.b.

Also, because TMDLs are likely to be developed, adopted and approved during the term of the Order, Provision F.2.c.(2) has been included to expedite the incorporation of TMDLs into the Copermittees' Water Quality Improvement Plans as part of the update process, potentially before the Order is re-opened to incorporated the requirements of the new TMDLs.

Provision F.3 (Progress Reporting) requires the Copermittees to report on the progress of implementing the Water Quality Improvement Plans.

The requirements of Provision F.3 are to report the progress toward improving water quality that the Copermittees are achieving with the implementation of the Water

Quality Improvement Plans and each Copermittee's jurisdictional runoff management program. The Progress Report Presentations required under Provision F.3.a are included to provide the Copermittees an opportunity to communicate directly with the San Diego Water Board and the public. The Progress Report Presentations will also provide the members of the San Diego Water Board and members of the public an opportunity to become more acquainted with the Copermittees and their projects and programs to address non-storm water and storm water discharges into and from their MS4s.

The Annual Report requirements of Provision F.3.b are a consolidation of several reporting requirements from the Fourth Term Permits, including the Jurisdictional Runoff Management Program Annual Reports, the Watershed Annual Reports, and the Monitoring and Reporting Program Annual Reports. Furthermore, the Annual Report requirements are consistent with the requirements under 40 CFR 122.42(c).

Pursuant to 40 CFR 122.42(c), "*[t]he operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the Director…must submit an annual report*", which must include the following:

(1) *The status of implementing the components of the storm water management program that are established as permit conditions* [40 CFR 122.42(c)(1)];

(2) *Proposed changes to the storm water management programs that are established as permit conditions* [40 CFR 122.42(c)(2)];

(3) *Revisions, if necessary, to the assessment of controls and fiscal analysis* [40 CFR 122.42(c)(3)];

(4) *A summary of data, including monitoring data, that is accumulated throughout the reporting year* [40 CFR 122.42(c)(4)];

(5) *Annual expenditures and budget for year following each annual report* [40 CFR 122.42(c)(5)];

(6) *A summary describing the number and nature of enforcement actions, inspections, and public education programs* [40 CFR 122.42(c)(6)];

(7) *Identification of water quality improvements or degradation* [40 CFR 122.42(c)(7)].

Under the Fourth Term Permits, each Copermittee is responsible for submitting a Jurisdictional Runoff Management Program Annual Report; the Copermittees in each designated watershed are responsible for submitting a Watershed Annual Report; and the Copermittees from each county are responsible for submitting a Monitoring and Reporting Program Annual Report.

There are 39 Copermittees in the San Diego Region, each required to prepare and submit a Jurisdictional Runoff Management Program Annual Report. There are 9 designated watersheds in San Diego County, 6 designated watersheds in Orange County, and 1 designated watershed in Riverside County for a total of 16 designated watersheds, each requiring a Watershed Annual Report. There are 3 sets of Copermittees in 3 counties in the San Diego Region, requiring Copermittees from each county to prepare and submit a Monitoring and Reporting Program Annual Report. Thus each Copermittee is currently required to prepare, or participate in the preparation of at least 3 annual reports. In addition, the San Diego County Copermittees are required to prepare and submit a Regional Urban Runoff Management Plan Annual Report.

In total, there are 59 annual reports that are prepared by the Copermittees and submitted to the San Diego Water Board for the Fourth Term Permits. The preparation of these annual reports requires significant time and resources from each Copermittee, which could otherwise be expended on actions that could improve water quality within its jurisdiction. In turn, significant time and resources are required from the San Diego Water Board staff to review these reports, which could otherwise be expended on working directly with the Copermittees to improve their implementation efforts toward restoring and protecting water quality.

Until the Water Quality Improvement Plans are developed, there will be a transitional period during which the Copermittees will continue to implement their existing jurisdictional runoff management programs. There will also be a transitional period during which the Copermittees will implement the transitional monitoring and assessment requirements of Provision D. During the transitional period, the Copermittees will submit annual reports pursuant to the requirements of Provisions F.3.b.(1) and F.3.b.(2).

Provision F.3.b.(1) includes the transitional annual reporting requirements for each Copermittee's jurisdictional runoff management program. The reporting of the jurisdictional runoff management program implementation efforts have been reduced to a single 2-page form. Each Copermittee is required to complete and submit a Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D or a revised form accepted by the San Diego Water Board) no later than October 31 of each year for each jurisdictional runoff management program reporting period (i.e. July 1 to June 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted. The Jurisdictional Runoff Management Program Annual Report Form will certify that each Copermittee has implemented its jurisdictional runoff management program in accordance with the requirements of Provision E. Each Copermittee may choose to continue to utilize and submit the jurisdictional runoff management program annual reporting format of its current Order until the first Water Quality Improvement Plan Annual Report is required to be submitted.

Provision F.3.b.(2) includes the transitional annual reporting requirements for the transitional monitoring and assessment program for each Watershed Management Area. The Copermittees in the Watershed Management Area are required to submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted. The Transitional Monitoring and Assessment Program Annual Report is required to include the transitional period monitoring data collected pursuant to Provisions D.1.a and D.2.a, and the findings from the transitional period findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

Provision F.3.b.(3) includes the Water Quality Improvement Plan Annual Report requirements. Only one Water Quality Improvement Plan Annual Report is required for each of the ten (10) Watershed Management Areas designated under Provision B.1, which is a significant reduction in the number of annual reports required to be prepared and submitted by the Copermittees. The Water Quality Improvement Plan Annual Report will document the Copermittees' efforts to implement the Water Quality Improvement Plan. Each Water Quality Improvement Plan Annual Report will be focused primarily on reporting the analysis of the monitoring data collected pursuant to Provisions D.1-D.3 during the reporting period, and the assessments that are required pursuant to Provision D.4 based on the data. The monitoring data analyses and the assessments that are provided in the Water Quality Improvement Plan Annual Report will be the core of the report. The reporting of the jurisdictional runoff management program implementation efforts have been reduced to a single 2-page form, and will no longer be the primary focus of the reporting requirements as in the Third and Fourth Term Permits.

Each Copermittee will continue to prepare and submit a Jurisdictional Runoff Management Program Annual Report Form as part of the Water Quality Improvement Plan Annual Report to certify that each Copermittee has implemented its jurisdictional runoff management program in accordance with the requirements of Provision E. Instead of reviewing a voluminous report from each Copermittee, as was required under the Third and Fourth Term Permits, the San Diego Water Board will conduct audits of each Copermittee's jurisdictional runoff management program to investigate and confirm the information provided by each Copermittee on its Jurisdictional Runoff Management Program Annual Report Form. The audits will allow the San Diego Water Board to become more familiar with the each Copermittee's jurisdictional runoff management program, and each Copermittee will become more informed about the expectations of the San Diego Water Board.

The reduction in the number and content of the Water Quality Improvement Plan Annual Reports should result in significant time, cost and resource savings for the Copermittees, as well as the San Diego Water Board. Those savings should offset a significant portion of any additional costs that may be incurred to develop the Water

Quality Improvement Plans and to implement the monitoring and assessment program requirements of Provision D.

The reporting period for the Water Quality Improvement Plan Annual Reports consists of two periods. Because the jurisdictional runoff management programs are typically budgeted and implemented during a fiscal year, the information provided on the Jurisdictional Runoff Management Program Annual Report Forms will cover the period from July 1 to June 30 of the following year.

The Water Quality Improvement Plan Annual Reports, however, are focused primarily on the monitoring data and the assessments based on the monitoring data. The monitoring data is collected during the monitoring year, which begins October 1 and ends September 30 of the following year. The monitoring year begins after the beginning of the fiscal year and ends after the end of the fiscal year. Therefore, to accommodate and capture the information collected during the fiscal year and the monitoring year, the Annual Report reporting period incorporates both periods.

Finally, Provision F.3.c requires the Copermittees to develop and submit a Regional Monitoring and Assessment Report. The Regional Monitoring and Assessment Report is similar to the Long Term Effectiveness Assessment required under the Fourth Term San Diego County Permit. The Regional Monitoring and Assessment Report is expected to utilize the entire body of data and information collected by the Copermittees during the term of this Order to assess improvements to water quality on a regional scale.

Provision F.4 (Regional Clearinghouse) requires the Copermittees to develop, update, and maintain an internet-based Regional Clearinghouse that can be used to store, disseminate, and share the Copermittees' documents, monitoring data, special studies, and any other data or information.

Most of the documents and data that are generated by the Copermittees can be provided in electronic format, and made available to the San Diego Water Board and the public on the internet. The San Diego Water Board has been gradually transitioning its document submittal requirements to electronic submittals. Provision F.4 has been included to further these efforts.

Provision F.4 has also been included to improve the exchange and availability of information among the Copermittees, as well as between the Copermittees and the San Diego Water Board. Provision F.4 will also make the information generated during the implementation of the Order more accessible to the public.

Provision F.5 (Report of Waste Discharge) requires the Copermittees to submit a Report of Waste Discharge to reapply for renewal of the Order prior to its expiration, in accordance with 40 CFR 122.21(d)(2) and CWC section 13376.

Because the ~~Orange County and~~ Riverside County Copermittees will not be subject to the requirements of this Order until they are notified of coverage, Provision F.5.a describes the process of submitting a ~~their~~ Report~~s~~ of Waste Discharge pursuant to the requirements of their current permit~~s~~ to obtain coverage under this Order.

For the Copermittees subject to the requirements of this Order, Provision F.5.b requires the Copermittees to submit a Report of Waste Discharge 180 days in advance of the expiration of this Order. Provision F.5.b also describes the minimum information to be included in the Report of Waste Discharge, based on USEPA guidance "Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems," dated May 17, 1996.

Provision F.6 (Application for Early Coverage) describes the process that would allow the Orange County and/or Riverside County Copermittees to obtain coverage under this Order earlier than the expiration of their current Orders.

If the ~~Orange County and/or~~ Riverside County Copermittees choose to obtain coverage under this Order earlier than the expiration of their current Orders, the preparation and submittal of a Report of Waste Discharge, as required by the Fourth Term Permits, will not be necessary. The existing Order for the respective county will be rescinded upon the effective coverage date under this Order, except for enforcement purposes.

G. Principal Watershed Copermittee Responsibilities

Purpose: Provision G includes the requirements for the Principal Watershed Copermittee designated by the Copermittees in each Watershed Management Area.

***Discussion*:** Unlike previous NPDES requirements, there will no longer be a single Principal Copermittee. Provision G.1 requires the Copermittees to designate a Principal Watershed Copermittee for each Watershed Management Area. There are ten (10) Watershed Management Areas in the San Diego Region, as defined in Table B-1 under Provision B.1 of the Order. An individual Copermittee should not be the Principal Watershed Copermittee for more than two (2) Watershed Management Areas. There could be up to ten (10) Principal Water Copermittees designated for the Watershed Management Areas in the San Diego Region.

Provision G.2 describes the minimum responsibilities of each Principal Watershed Copermittee. The primary responsibility of the Principal Watershed Copermittees is to serve as the liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues. Ideally, the Principal Watershed Copermittee can represent the interests of all the Copermittees within a Watershed Management Area during discussions or meetings to facilitate communication with the San Diego Water Board. The Principal Watershed Copermittees are also responsible for facilitating and coordinating the implementation efforts of the Copermittees and submittals of required documents and reports.

The Principal Watershed Copermittee is responsible for facilitating the efforts of the Copermittees within the Watershed Management Area to develop the Water Quality Improvement Plan required under Provision B, and submit it for approval in accordance with Provision F.1. The Principal Watershed Copermittee is also responsible for coordinating the submittal of the document updates, Progress Report Presentations, and Annual Reports required from the Copermittees within each Watershed Management Area under Provisions F.2, F.3.a, and F.3.b. The Principal Watershed Copermittees are responsible for coordinating with each other to develop and submit the Regional Clearinghouse, Regional Monitoring and Assessment Report, and the Report of Waste Discharge required under Provisions F.3.c, F.4, and F.5.

The designated Principal Watershed Copermittee for each Watershed Management Area does not necessarily have to serve as the Principal Watershed Copermittee for the entire term of the Order. If the Copermittees in a Watershed Management Area choose to designate a new Principal Watershed Copermittee, the change may be submitted as part of the Annual Report required under Provision F.3.b, with an update to the Water Quality Improvement Plan in accordance with Provision F.2.c.

Provision G.3 specifies that the Principal Watershed Copermittee is not responsible for ensuring that the other Copermittees within the Watershed Management Area are in compliance with the requirements of this Order

H. Modification of Order

Purpose: Provision H provides the conditions under which modifications to Order No. R9-2013-0001, as amended, may occur.

***Discussion*:** Provision H allows for modifications to Order No. R9-2013-0001, as amended, for bases in addition to modifications (minor and major) allowed under the federal regulations at~~. Minor modifications may be made by the San Diego Water Board Executive Officer without a public notice or public hearing. Minor modifications are defined under~~ 40 CFR 122.62 and 122.63. ~~Minor modifications under 40 CFR 122.63 potentially applicable to this Order are the following:~~

~~Correcting typographical errors;~~

~~Requiring more frequent monitoring or reporting by the Copermittees;~~

~~Changing an interim compliance date in a schedule of compliance, provided the new date is not more than 120 days after the date specified in the existing permit and does not interfere with attainment of the final compliance date requirement.~~

Modifications ~~that are not one of the above minor modifications will~~to the Order require re-opening the Order (see Water Code section 13223), subject to the requirements of 40 CFR 122.44, 122.62 to 122.64, and 124.5, but only for the specific provisions subject to the modification. Proposed m~~M~~odifications of the Order ~~that are not minor require a draft Order with the proposed modifications~~will be made available for public review, a public notice and comment period, and a public hearing if requested. Comments on the provisions not subject to the proposed modifications are not required to be considered in the San Diego Water Board's responses to comments or during the public hearing.

Provision H.4 was included to specify that the Order will be re-opened for modifications if the State Water Board determines revisions to Provision A are warranted, an application for early coverage under the Order is received pursuant to Provision F.6, the Basin Plan is amended to modify an existing TMDL or incorporate a new TMDL, or the monitoring and assessment program requirements need to be updated or revised.

Provision H.5 was included to specify that the San Diego Water Board will re-open and consider modifications to this Order when the Orange County Copermittees or the Riverside County Copermittees submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders

I. Standard Permit Provisions and General Provisions

Purpose: Provision I incorporates the standard permit provisions required to be included in all NPDES permits, as well as several other general provisions.

***Discussion*:** Provision I refers to Attachment B to the Order. Attachment B expressly incorporates the conditions applicable to all NPDES permits as provided under 40 CFR 122.41(a)-(n), as well as the applicable conditions for MS4s and storm water discharges provided under 40 CFR 122.42(c) and 40 CFR 122.42(d), respectively. Attachment B also includes several general provisions that are typically included in or applicable to waste discharge requirements issued by the San Diego Water Board.

IX. ATTACHMENTS

The attachments to the Order are discussed below. The discussions describe the content of the attachments.

Attachment A – Discharge Prohibitions and Special Protections

Section 1 of Attachment A includes the Waste Discharge Prohibitions from the Basin Plan. They have been provided verbatim in their entirety.

Section 2 of Attachment A includes the "*Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges*" applicable to permitted point source discharges of storm water, adopted under State Water Board Resolution No. 2012-0012, as amended by Resolution No. 2012-0031. The terms, prohibitions, and special conditions (collectively referred to as special conditions) are established as limitations on point source storm water discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in ASBS, as required for State Water Quality Protection Areas pursuant to California Public Resources Code sections 36700(f) and 36710(f). These Special Protections were adopted by the State Water Board as part of the Ocean Plan General Exception.

Attachment B – Standard Permit Provisions and General Provisions

Conditions applicable to all NPDES permits, as required under 40 CFR 122.41, and conditions applicable to MS4s and storm water discharges, as required under 40 CFR 122.42(c) and 122.42(d), respectively are provided in Attachment B to the Order. They have been provided expressly in their entirety.

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. These general provisions are typically included in or applicable to waste discharge requirements issued by the San Diego Water Board. Many of the general provisions were developed by the State Water Board. Where a general provision is derived from statute or regulation, a citation of the statute or regulation section is provided. General provisions that do not provide a citation are included under the authority provided CWC 13377.

Attachment C – Acronyms, Abbreviations and Definitions

The acronyms and abbreviations that are used in the Order are provided in Attachment C. Attachment C also includes definitions that may provide an explanation or description of the meaning or intent of specific terms or phrases included in the Order.

Attachment D – Jurisdictional Runoff Management Program Annual Report Form

An example of the Jurisdictional Runoff Management Program Annual Report Form required to be submitted by each Copermittee as part of the Annual Reports required under Provision F.3.b.(1)(e) is provided as Attachment D to the Order. An electronic version of the form will be available from the San Diego Water Board after the adoption of the Order.

The Jurisdictional Runoff Management Program Annual Report Form includes the minimum information necessary to demonstrate that the Copermittee is implementing and in compliance with the requirements of Provision E, and includes much of the information required to be reported pursuant to 40 CFR 122.42(c).

The information that must be provided on the Jurisdictional Runoff Management Program Annual Report Form is limited to the fiscal year, which begins July 1 and ends June 30 of the following year. The information expected to be provided by the Copermittees in each section of the Jurisdictional Runoff Management Program Annual Report Form is discussed below.

I. COPERMITTEE INFORMATION

The name of the Copermittee (e.g. name of city, county, or special district) and the contact information for the storm water program manager are provided under this section.

II. LEGAL AUTHORITY

The Copermittee must confirm whether or not the legal authorities under Provision E.1.a have been established for itself within its jurisdiction.

The Copermittee must also confirm whether or not a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority, as required under Provision E.1.b. The certification statement required by Provision E.1.b is only required to be submitted with the first Annual Report required under Provision F.3.b.

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

The Copermittee must inform the San Diego Water Board whether or not an update to its jurisdictional runoff management program document was required or recommended by the San Diego Water Board during the reporting period. An update to the jurisdictional runoff management program is required under Provision F.2.a. The San Diego Water Board may recommend modifications to the jurisdictional runoff management program as part of the iterative approach and adaptive management process required under Provision B.5, which may result in an update that is necessary for the Copermittee's jurisdictional runoff management document.

If an update was required or recommended, the Copermittee must confirm whether or not the update was completed and made available on the Regional Clearinghouse within the reporting period. If no update was required or recommended, an answer is not required. If the answer is NO, meaning the required or recommended update was not completed and/or made available on the Regional Clearinghouse, the Copermittee must attach a

schedule for the completion of the update and/or posting of the updated document on the Regional Clearinghouse.

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

The Copermittee must confirm whether or not a program was implemented during the fiscal year to actively detect and eliminate illicit discharges and connections in accordance with the requirements under Provision E.2.

In addition to confirming that a program to detect and eliminate illicit discharges was implemented during the reporting period, the Copermittee is also required to report on several items related to the program. The information that must be reported is limited to the fiscal year for the Annual Report.

All non-storm water discharges are considered illicit discharges unless the source is identified as one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5). If a non-storm water discharge is identified as one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5), the discharge is a non-storm water discharge, but not an illicit discharge. If a non-storm water discharge is identified but not in one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5), the discharge is both a non-storm water discharge and an illicit discharge.

V. DEVELOPMENT PLANNING PROGRAM

The Copermittee must confirm whether or not a development planning program was implemented during the fiscal year in accordance with the requirements under Provision E.3.

The Copermittee must also inform the San Diego Water Board whether or not an update to its BMP Design Manual was required or recommended by the San Diego Water Board during the fiscal year. An update to the BMP Design Manual is required under Provision F.2.b. The San Diego Water Board may recommend modifications to the BMP Design Manual, which may result in an update that is necessary for Copermittee's the BMP Design Manual.

If an update was required or recommended, the Copermittee must confirm whether or not the update was completed and made available on the Regional Clearinghouse within the reporting period. If no update was required or recommended, an answer is not required. If the answer is NO, meaning the required or recommended update was not completed and/or made available on the Regional Clearinghouse, the Copermittee must attach a schedule for the completion of the update and/or posting of the updated document on the Regional Clearinghouse.

The Copermittee is also required to report on several items related to the program. For the development and redevelopment projects that are reviewed under the program, the Copermittee must report the total number projects submitted for review during the fiscal year. Of those projects, the Copermittee must report the number that are Priority Development Projects, as defined under Provision E.3.b.(1). The Copermittee must also report the number of Priority Development Projects that were approved and/or granted occupancy during the fiscal year, regardless of when the project was originally submitted for review. Any projects that were approved during the fiscal year and granted any

exemptions from the BMP Design Manual requirements and/or allowed to implement alternative compliance options in accordance with Provision E.3.c.(3) must be reported.

Finally, the Copermittee must also report on several items related to its oversight of permanent BMPs on Priority Development Projects within its jurisdiction, as required under Provision E.3.e. The information that must be reported is limited to the fiscal year for the Annual Report.

VI. CONSTRUCTION MANAGEMENT PROGRAM

The Copermittee must confirm whether or not a construction management program was implemented during the fiscal year in accordance with the requirements under Provision E.4.

The Copermittee is also required to report on several items related to its oversight construction projects within its jurisdiction. The information that must be reported is limited to the fiscal year for the Annual Report.

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

The Copermittee must confirm whether or not an existing development management program was implemented during the fiscal year in accordance with the requirements under Provision E.5.

The Copermittee is also required to report on several items related to its oversight in areas of existing development within its jurisdiction. The information that must be reported is limited to the fiscal year for the Annual Report. The information must also be separated into four categories of existing development: municipal, commercial, industrial, and residential.

VIII. PUBLIC EDUCATION AND PARTICIPATION

The Copermittee must confirm whether or not a public education program component was implemented during the fiscal year in accordance with the requirements under Provision E.7.a.

The Copermittee must also confirm whether or not a public participation program component was implemented during the fiscal year in accordance with the requirements under Provision E.7.b.

IX. FISCAL ANALYSIS

The Copermittee must confirm a summary of its fiscal analysis, conducted in accordance with the requirements under Provision E.8, has been attached to the form.

X. CERTIFICATION

A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative must sign and certify the Jurisdictional Runoff Management Program Annual Report Form. The appropriate box must be checked to indicate the whether a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative is signing the form.

Attachment E – Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2013-0001

Attachment E provides specific provisions for implementing the load allocations (LAs) and wasteload allocations (WLAs) of Total Maximum Daily Loads (TMDLs) adopted by the San Diego Water Board and approved by USEPA in which the Copermittees are identified as responsible for discharges subject to the requirements of the TMDLs. Federal regulations require that NPDES requirements incorporate water quality based effluent limitations (WQBELs) that must be consistent with the requirements and assumptions of any available WLAs,[46] which may be expressed as numeric effluent limitations, when feasible, and/or as a best management practice (BMP) program of expanded or better-tailored BMPs.[47] Where the TMDL includes WLAs that provide numeric pollutant load or pollutant parameter objectives, the WLA has been, where feasible, translated into numeric WQBELs.[48]

For each TMDL in Attachment E, four sections are included:

a. Applicability: This section provides the resolution under which the TMDL Basin Plan amendment was adopted and approved, with the applicable adoption and approval dates. This section also gives the effective date of the TMDL and where the TMDL is applicable (i.e. Watershed Management Area and water body). The Copermittees that are responsible for implementing the specific provisions are also given in this section.

b. Final TMDL Compliance Requirements: For each TMDL, the final TMDL compliance requirements consist of the final TMDL compliance date(s), the final WQBELs, and the final TMDL compliance determination requirements. The final WQBELs are expressed in terms of receiving water limitations, effluent limitations, and/or best management practices (BMPs). The final WQBELs for the TMDLs are incorporated by reference into Provision A of the Order. The final WQBELs become enforceable when the final TMDL compliance dates have passed. Applicable BMPs within the final WQBELs must be incorporated into the Water Quality Improvement Plans. Compliance with the final WQBELs will be determined in accordance with the options provided under the final TMDL compliance determination requirements.

c. Interim TMDL Compliance Requirements: If the final TMDL compliance date has not passed and there are interim TMDL compliance requirements, they are included in this section. If there are interim WQBELs with interim compliance dates, the interim WQBELs become enforceable when the corresponding interim compliance dates have passed. Compliance with the interim WQBELs will be determined in accordance with the options provided under the interim TMDL compliance determination requirements.

d. Specific Monitoring and Assessment Requirements: If there are specific monitoring and assessment requirements that cannot be met with the monitoring and assessment program

[46] 40 CFR 122.44(d)(1)(vii)(B)
[47] 40 CFR 122.44(k)(2) and 40 CFR 122.44(k)(3)
[48] November ~~12, 2010~~26, 2014 Memorandum from the USEPA, Revisions to the November 22, 2002 Memorandum "Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLA""

requirements under Provision D of the Order, the additional requirements are included in this section.

The requirements of the TMDLs are based on and consistent with the assumptions and requirements of any available adopted and approved TMDLs that have been incorporated into the Basin Plan. Modifications to the requirements for the TMDLs in Attachment E cannot be made unless the TMDLs are modified in the Basin Plan.

A modification to any aspect of a TMDL in the Basin Plan requires a Basin Plan amendment. A Basin Plan amendment to modify a TMDL will require the San Diego Water Board to adopt a resolution to amend the Basin Plan, which includes a separate public process. When the San Diego Water Board adopts a Basin Plan amendment, it subsequently requires approval from the State Water Board, the Office of Administrative Law, and the USEPA before it becomes effective.

If and when the TMDLs are a modified in the Basin Plan, the San Diego Water Board will revise the requirements of the Order ~~TMDL~~ in accordance with the Basin Plan amendment. When a Basin Plan amendment to modify a TMDL becomes effective, the San Diego Water Board will modify the requirements of the Order~~TMDL~~ pursuant to the requirements of Provision H.4 of the Order as soon as possible.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

ORDER NO. R9-2013-0001, AS AMENDED BY ORDER NO. R9-2015-0001
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The San Diego County Copermittees in Table 1a are subject to waste discharge requirements set forth in this Order.

Table 1a. San Diego County Copermittees

City of Carlsbad	City of Oceanside
City of Chula Vista	City of Poway
City of Coronado	City of San Diego
City of Del Mar	City of San Marcos
City of El Cajon	City of Santee
City of Encinitas	City of Solana Beach
City of Escondido	City of Vista
City of Imperial Beach	County of San Diego
City of La Mesa	San Diego County Regional Airport Authority
City of Lemon Grove	San Diego Unified Port District
City of National City	

The Orange County Copermittees in Table 1b are subject to waste discharge requirements set forth in this Order.

Table 1b. Orange County Copermittees[1]

City of Aliso Viejo	City of Rancho Santa Margarita
City of Dana Point	City of San Clemente
City of Laguna Beach	City of San Juan Capistrano
City of Laguna Hills	City of Laguna Woods
City of Laguna Niguel	County of Orange
City of Mission Viejo	Orange County Flood Control District

After the San Diego Water Board receives and considers the Riverside County Copermittees' Report of Waste Discharge and makes any necessary changes to this Order, the Riverside County Copermittees in Table 1c will become subject to waste discharge requirements set forth in this Order after expiration of Order No.R9-2010-0016, NPDES No. CAS0108766 on or after November 10, 2015.

[1] While not listed in Table 1b., the City of Lake Forest remains a Copermittee under this Order until the later effective date of this Order or the effective date of Santa Ana Water Board Tentative Order No. R8-2015-0001. Thereafter, the City of Lake Forest will no longer be considered a Copermittee under this Order because its Phase I MS4 discharges will be regulated by the Santa Ana Water Board pursuant to Water Code section 13228 designation. The requirements of this Order that apply to the City of Lake Forest for the duration of this Order, however, are described in Finding 29 and Footnote 2 to Table B-1.

Table 1c. Riverside County Copermittees

City of Murrieta	County of Riverside
City of Temecula	Riverside County Flood Control and Water Conservation District
City of Wildomar	

The Riverside County Copermittees may become subject to the requirements of this Order at a date earlier than the expiration date of their current Order subject to the conditions described in Provision F.6 of this Order if the Riverside County Copermittees receive notification of coverage from the San Diego Water Board.

The term Copermittee in this Order refers to any San Diego County, Orange County, or Riverside County Copermittee covered under this Order, unless specified otherwise.

This Order provides permit coverage for the Copermittee discharges described in Table 2.

Table 2. Discharge Locations and Receiving Waters

Discharge Points	Locations throughout San Diego Region
Discharge Description	Municipal Separate Storm Sewer System (MS4) Discharges
Receiving Waters	Inland Surface Waters, Enclosed Bays and Estuaries, and Coastal Ocean Waters of the San Diego Region

Table 3. Administrative Information

This Order was adopted by the San Diego Water Board on:	**May 8, 2013**
Order No. R9-2013-0001 became effective on:	**June 27, 2013**
This Order as amended by R9-2015-0001 became effective on:	**April 1, 2015**
This Order will expire on:	**June 27, 2018**
The Copermittees must file a Report of Waste Discharge in accordance with Title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than 180 days in advance of the Order expiration date.	

I, David W. Gibson, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on May 8, 2013, as amended by adoption of Order No. R9-2015-0001 on February 11, 2015.

David W. Gibson
Executive Officer

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I. FINDINGS

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), finds that:

JURISDICTION

1. **MS4 Ownership or Operation.** Each of the Copermittees owns or operates an MS4, through which it discharges storm water and non-storm water into waters of the U.S. within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the U.S.

2. **Legal and Regulatory Authority.** This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]) adopted by the United States Environmental Protection Agency (USEPA), and chapter 5.5, division 7 of the California Water Code (CWC) (commencing with section 13370). This Order serves as an NPDES permit for discharges from MS4s to surface waters. This Order also serves as waste discharge requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

   The San Diego Water Board has the legal authority to issue a regional MS4 permit pursuant to its authority under CWA section 402(p)(3)(B) and 40 CFR 122.26(a)(1)(v). The USEPA also made it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide permits (55 Federal Register [FR] 47990, 48039-48042). The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees and San Diego Water Board.

   The federal regulations make it clear that the Copermittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators (40 CFR 122.26(a)(3)(vi)). This Order does not require the Copermittees to manage storm water outside of their jurisdictional boundaries, but rather to work collectively to improve storm water management within watersheds.

3. **CWA NPDES Permit Conditions.** Pursuant to CWA section 402(p)(3)(B), NPDES permits for storm water discharges from MS4s must include requirements to effectively prohibit non-storm water discharges into MS4s, and require controls to reduce the discharge of pollutants in storm water to the maximum extent practicable (MEP), and to require other provisions as the San Diego Water Board determines are appropriate to control such pollutants. This Order prescribes conditions to assure compliance with the CWA requirements for owners and operators of MS4s to effectively prohibit non-storm water discharges into the MS4s, and require controls to reduce the discharge of pollutants in storm water from the MS4s to the MEP.

4. **CWA and CWC Monitoring Requirements.** CWA section 308(a) and 40 CFR 122.41(h),(j)-(l) and 122.48 require that NPDES permits must specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s also specify additional monitoring and reporting requirements in 40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c). CWC section 13383 authorizes the San Diego Water Board to establish monitoring, inspection, entry, reporting and recordkeeping requirements. This Order establishes monitoring and reporting requirements to implement federal and State requirements. This Order also includes requirements for the Orange County Copermittees to participate in, and together with South Orange County Wastewater Authority and Orange County Health Care Agency, share responsibility for implementing the unified approach to beach water quality monitoring and assessment program set forth in the October 2014 report, *Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County*, issued pursuant to CWC section 13383 in the San Diego Water Board December 5, 2014 Letter Directive.

5. **Total Maximum Daily Loads.** CWA section 303(d)(1)(A) requires that "[e]ach state shall identify those waters within its boundaries for which the effluent limitations are not stringent enough to implement any water quality standard applicable to such waters." The CWA also requires states to establish a priority ranking of impaired water bodies known as Water Quality Limited Segments and to establish Total Maximum Daily Loads (TMDLs) for such waters. This priority list of impaired water bodies is called the Clean Water Act Section 303(d) List of Water Quality Limited Segments, commonly referred to as the 303(d) List. The CWA requires the 303(d) List to be updated every two years.

   TMDLs are numerical calculations of the maximum amount of a pollutant that a water body can assimilate and still meet water quality standards. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point sources (waste load allocations or WLAs) and non-point sources (load allocations or LAs), background contribution, plus a margin of safety. Discharges from MS4s are point source discharges. The federal regulations (40 CFR 122.44(d)(1)(vii)(B)) require that NPDES permits incorporate water quality based effluent limitations (WQBELs) developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, consistent with the assumptions and requirements of any available WLA for the discharge. Requirements of this Order implement the TMDLs established by the San Diego Water Board or USEPA as of the date this Order was amended in 2015. This Order establishes WQBELs consistent with the assumptions and requirements of all available TMDL WLAs assigned to discharges from the Copermittees' MS4s.

6. **Non-Storm Water Discharges.** Pursuant to CWA section 402(p)(3)(B)(ii), this Order requires each Copermittee to effectively prohibit discharges of non-storm water into its MS4. Nevertheless, non-storm water discharges into and from the MS4s continue to be reported to the San Diego Water Board by the Copermittees

and other persons. Monitoring conducted by the Copermittees, as well as the 303(d) List, have identified dry weather, non-storm water discharges from the MS4s as a source of pollutants causing or contributing to receiving water quality impairments in the San Diego Region. The federal regulations (40 CFR 122.26(d)(2)(iv)(B)(1)) require the Copermittees to have a program to prevent illicit discharges to the MS4. The federal regulations, however, allow for specific categories of non-storm water discharges or flows to be addressed as illicit discharges only where such discharges are identified as sources of pollutants to waters of the U.S.

7. **In-Stream Treatment Systems.** Pursuant to federal regulations (40 CFR 131.10(a)), in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S. Authorizing the construction of a runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to accepting waste assimilation as an appropriate use for that water body. Runoff treatment must occur prior to the discharge of runoff into receiving waters. Treatment control best management practices (BMPs) must not be constructed in waters of the U.S. Construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body.

DISCHARGE CHARACTERISTICS AND RUNOFF MANAGEMENT

8. **Point Source Discharges of Pollutants.** Discharges from the MS4s contain waste, as defined in the CWC, and pollutants that adversely affect the quality of the waters of the state. A discharge from an MS4 is a “discharge of pollutants from a point source” into waters of the U.S. as defined in the CWA. Storm water and non-storm water discharges from the MS4s contain pollutants that cause or threaten to cause a violation of surface water quality standards, as outlined in the Water Quality Control Plan for the San Diego Basin (Basin Plan). Storm water and non-storm water discharges from the MS4s are subject to the conditions and requirements established in the Basin Plan for point source discharges.

9. **Potential Beneficial Use Impairment.** The discharge of pollutants and/or increased flows from MS4s may cause or threaten to cause the concentration of pollutants to exceed applicable receiving water quality objectives and impair or threaten to impair designated beneficial uses resulting in a condition of pollution, contamination, or nuisance.

10. **Pollutants Generated by Land Development.** Land development has created and continues to create new sources of non-storm water discharges and pollutants in storm water discharges as human population density increases. This brings higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash. Pollutants from these sources are dumped or washed off the surface by non-storm water or storm water flows into and from the MS4s. When development converts natural vegetated pervious ground cover to impervious surfaces such as paved highways, streets, rooftops, and parking

lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving a developed area without BMPs that can maintain pre-development runoff conditions will contain greater pollutant loads and have significantly greater runoff volume, velocity, and peak flow rate than pre-development runoff conditions from the same area.

11. **Runoff Discharges to Receiving Waters.** The MS4s discharge runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within the eleven hydrologic units comprising the San Diego Region. Historic and current development makes use of natural drainage patterns and features as conveyances for runoff. Rivers, streams and creeks in developed areas used in this manner are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and receiving water. Numerous receiving water bodies and water body segments have been designated as impaired by the San Diego Water Board pursuant to CWA section 303(d).

12. **Pollutants in Runoff.** The most common pollutants in runoff discharged from the MS4s include total suspended solids, sediment, pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., cadmium, copper, lead, and zinc), petroleum products and polynuclear aromatic hydrocarbons, synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus), oxygen-demanding substances (e.g., decaying vegetation, animal waste), detergents, and trash. As operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not prohibit or otherwise control. These discharges may cause or contribute to a condition of pollution or a violation of water quality standards.

13. **Human Health and Aquatic Life Impairment.** Pollutants in runoff discharged from the MS4s can threaten and adversely affect human health and aquatic organisms. Adverse responses of organisms to chemicals or physical agents in runoff range from physiological responses such as impaired reproduction or growth anomalies to mortality. Increased volume, velocity, rate, and duration of storm water runoff greatly accelerate the erosion of downstream natural channels. This alters stream channels and habitats and can adversely affect aquatic and terrestrial organisms.

14. **Water Quality Effects.** The Copermittees' water quality monitoring data submitted to date documents persistent exceedances of Basin Plan water quality objectives for runoff-related pollutants at various watershed monitoring stations. Persistent toxicity has also been observed at several watershed monitoring stations. In addition, bioassessment data indicate that the majority of the monitored receiving waters have Poor to Very Poor Index of Biological Integrity (IBI) ratings. These findings indicate that runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in the San Diego Region. Non-storm water

discharges from the MS4s have been shown to contribute significant levels of pollutants and flow in arid, developed Southern California watersheds, and contribute significantly to exceedances of applicable receiving water quality objectives.

15. **Non-Storm Water and Storm Water Discharges.** Non-storm water discharges from the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard of CWA section 402(p)(3)(B)(iii), which is explicitly for "Municipal … *Stormwater Discharges* (emphasis added)" from the MS4s. Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s must be effectively prohibited.

16. **Best Management Practices.** Waste and pollutants which are deposited and accumulate in MS4 drainage structures will be discharged from these structures to waters of the U.S. unless they are removed. These discharges may cause or contribute to, or threaten to cause or contribute to, a condition of pollution in receiving waters. For this reason, pollutants in storm water discharges from the MS4s can be and must be effectively reduced in runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Pollution prevention is the reduction or elimination of pollutant generation at its source and is the best "first line of defense." Source control BMPs (both structural and non-structural) minimize the contact between pollutants and runoff, therefore keeping pollutants onsite and out of receiving waters. Treatment control BMPs remove pollutants that have been mobilized by storm water or non-storm water flows.

17. **BMP Implementation.** Runoff needs to be addressed during the three major phases of development (planning, construction, and use) in order to reduce the discharge of storm water pollutants to the MEP, effectively prohibit non-storm water discharges, and protect receiving waters. Development which is not guided by water quality planning policies and principles can result in increased pollutant load discharges, flow rates, and flow durations which can negatively affect receiving water beneficial uses. Construction sites without adequate BMP implementation result in sediment runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. Existing development can generate substantial pollutant loads which are discharged in runoff to receiving waters. Retrofitting areas of existing development with storm water pollutant control and hydromodification management BMPs is necessary to address storm water discharges from existing development that may cause or contribute to a condition of pollution or a violation of water quality standards.

18. **Water Quality Improvements.** Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges to the MS4s and control pollutants in storm water discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality

issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the CWA.

19. **Long Term Planning and Implementation.** Federal regulations require municipal storm water permits to expire 5 years from adoption, after which the permit must be renewed and reissued. The San Diego Water Board recognizes that the degradation of water quality and impacts to beneficial uses of the waters in the San Diego Region occurred over several decades. The San Diego Water Board further recognizes that a decade or more may be necessary to realize demonstrable improvement to the quality of waters in the San Diego Region. This Order includes a long term planning and implementation approach that will require more than a single permit term to complete.

WATER QUALITY STANDARDS

20. **Basin Plan.** The San Diego Water Board adopted the Water Quality Control Plan for the San Diego Basin (Basin Plan) on September 8, 1994, that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for receiving waters addressed through the plan. The Basin Plan was subsequently approved by the State Water Resources Control Board (State Water Board) on December 13, 1994. Subsequent revisions to the Basin Plan have also been adopted by the San Diego Water Board and approved by the State Water Board. Requirements of this Order implement the Basin Plan.

    The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Process Supply (PROC), Industrial Service Supply (IND), Ground Water Recharge (GWR), Contact Water Recreation (REC1), Non-contact Water Recreation (REC2), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Freshwater Replenishment (FRSH), Hydropower Generation (POW), and Preservation of Biological Habitats of Special Significance (BIOL). The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region: Navigation (NAV), Commercial and Sport Fishing (COMM), Estuarine Habitat (EST), Marine Habitat (MAR), Aquaculture (AQUA), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN), and Shellfish Harvesting (SHELL).

21. **Ocean Plan.** The State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, and 2005. The State Water Board adopted the latest amendment on April 21, 2005 and it became effective on February 14, 2006. The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean. Requirements of this Order implement the Ocean Plan.

The Ocean Plan identifies the following beneficial uses of ocean waters of the state to be protected: Industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture; preservation and enhancement of designated Areas of Special Biological Significance; rare and endangered species; marine habitat; fish spawning and shellfish harvesting.

22. **Sediment Quality Control Plan**. On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes: 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

23. **National Toxics Rule and California Toxics Rule.** USEPA adopted the National Toxics Rule (NTR) on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the NTR applied in California. On May 18, 2000, USEPA adopted the California Toxics Rule (CTR). The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants.

24. **Antidegradation Policy.** This Order is in conformance with the federal Antidegradation Policy described in 40 CFR 131.12, and State Water Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality Waters in California*. Federal regulations at 40 CFR 131.12 require that the State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. State Water Board Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies.

25. **Anti-Backsliding Requirements.** Section 402(o)(2) of the CWA and federal regulations at 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations may be relaxed. All effluent limitations in this Order are at least as stringent as effluent limitations in the previous permits.

CONSIDERATIONS UNDER FEDERAL AND STATE LAW

26. **Coastal Zone Act Reauthorization Amendments.** Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states with approved coastal zone management programs to address non-point source pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point source pollution: agriculture, silviculture, urban, marinas, and hydromodification. This Order addresses the management measures required for the urban category, with the exception of septic systems. The runoff management programs developed pursuant to this Order fulfills the need for coastal cities to develop a runoff non-point source plan identified in the Non-Point Source Program Strategy and Implementation Plan. The San Diego Water Board addresses septic systems through the administration of other programs.

27. **Endangered Species Act.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 USC sections 1531 to 1544). This Order requires compliance with receiving water limits, and other requirements to protect the beneficial uses of waters of the State. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

28. **Report of Waste Discharge Process.** The waste discharge requirements set forth in this Order are based upon the Report of Waste Discharge submitted by the San Diego County Copermittees prior to the expiration of Order No. R9-2007-0001 (NPDES No. CAS0109266) and the Report of Waste Discharge submitted by the Orange County Copermittees prior to the expiration of Order No. R9-2009-0002 (CAS0108740). The Riverside County Copermittees are not immediately covered by the waste discharge requirements in this Order. The San Diego Water Board understands that each municipality is unique although the Counties share watersheds and/or geographical boundaries. The Order will continue to use the Report of Waste Discharge process prior to initially making Riverside County Copermittees subject to the requirements of this Order.

    The federal regulations (40 CFR 122.21(d)(2)) and CWC section 13376 impose a duty on the Copermittees to reapply for continued coverage through submittal of a Report of Waste Discharge no later than 180 days prior to expiration of a currently effective permit. This requirement is set forth in the Riverside County Copermittees' currently effective permit at ProvisionK.2.c. The Riverside County MS4 Permit, Order No. R9-2010-0016 (NPDES No. CAS0108766) expires on November 10, 2015.

    Unless the Riverside County Copermittees apply for and receive early coverage under this Order, the Riverside County Copermittees' permit will be superseded by this Order upon expiration of their permit, subject to any necessary revisions to the

requirements of this Order made after the San Diego Water Board considers their Report of Waste Discharge through the public process provided in 40 CFR Part 124.

29. **Regional Water Board Designation.** The Cities of Laguna Hills, Laguna Woods, and Lake Forest are located partially within the jurisdictions of the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board) and the San Diego Water Board and their discharges are subject to regulation by both Regional Water Boards. Pursuant to CWC section 13228, the Cities of Laguna Hills, Laguna Woods, and Lake Forest submitted written requests that one Regional Water Board be designated to regulate Phase I MS4 discharges for each of the Cities. The Santa Ana Water Board and the San Diego Water Board have entered into an agreement dated February 10, 2015, whereby the Cities of Laguna Woods and Laguna Hills are largely regulated by the San Diego Water Board under this Order, including those portions of the Cities of Laguna Woods and Laguna Hills not within the San Diego Water Board's jurisdiction, upon the effective date of this Order or Santa Ana Water Board Order No. R8-2015-0001, whichever is later. Similarly, the City of Lake Forest, including those portions of the City of Lake Forest within the San Diego Water Board's jurisdiction, is largely regulated by the Santa Ana Water Board under Order No. R8-2015-0001 (NPDES No. CAS618030) upon the later effective date of this Order or Order No. R8-2015-0001. The agreement provides that the City of Lake Forest is required to retain, and continue implementation of, its over-irrigation discharge prohibition in Title 15, Chapter 14.030, List (b) of the City Municipal Code for regulating storm water quality throughout its jurisdiction. The agreement also requires the City of Lake Forest to actively participate during development and implementation of the Aliso Creek Watershed Management Area Water Quality Improvement Plan required pursuant to this Order. Each Regional Water Board retains the authority to enforce provisions of its Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee under the terms of the agreement (Water Code section 13228 (b)). Under the terms of the agreement, any TMDL and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Laguna Woods, Laguna Hills or Lake Forest as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement of the applicable TMDL will remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's San Diego Creek/Newport Bay TMDL and the San Diego Water Board's Indicator Bacteria Project I Beaches and Creeks TMDL. The San Diego Water Board will periodically review the effectiveness of the agreement during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate the agreement with Santa Ana Water Board or otherwise modify the agreement subject to the approval of the Santa Ana Water Board.

30. **Integrated Report and Clean Water Act Section 303(d) List.** The San Diego Water Board and State Water Board submit an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. USEPA issued its *Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act* on July 29, 2005, which advocates the use of a five category approach for classifying the attainment status of water quality standards for water bodies in the Integrated Report. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 in the Integrated Report are placed on the 303(d) List.

    Water bodies with available data and/or information that indicate at least one beneficial use is not being supported or is threatened, but a TMDL is not required, are included in Category 4 in the Integrated Report. Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

    Implementation of the requirements of this Order may allow the San Diego Water Board to include surface waters impaired by discharges from the Copermittees' MS4s in Category 4 in the Integrated Report for consideration during the next 303(d) List submittal by the State to USEPA.

31. **Economic Considerations.** The California Supreme Court has ruled that although CWC section 13263 requires the State and Regional Water Boards (collectively Water Boards) to consider factors set forth in CWC section 13241 when issuing an NPDES permit, the Water Board may not consider the factors to justify imposing pollutant restrictions that are less stringent than the applicable federal regulations require. (*City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 618, 626-627.) However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

    As noted in the following finding, the San Diego Water Board finds that the requirements in this Order are not more stringent than the minimum federal requirements. Therefore, a CWC section 13241 analysis is not required for permit requirements that implement the effective prohibition on the discharge of non-storm water into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determined appropriate to control such pollutants, as those requirements are mandated by federal law. Notwithstanding the above, the San Diego Water Board has developed an economic analysis of the requirements in this Order. The economic analysis is provided in the Fact Sheet.

32. **Unfunded Mandates.** This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following:

    a. This Order implements federally mandated requirements under CWA section 402 (33 USC section 1342(p)(3)(B)).

    b. The local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental and new dischargers who are issued NPDES permits for storm water and non-storm water discharges.

    c. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order.

    d. The Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)) and in lieu of numeric restrictions on their MS4 discharges (i.e. effluent limitations).

    e. The local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under State law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

    f. The provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state develops a TMDL, federal law requires that permits must contain water quality based effluent limitations consistent with the assumptions and requirements of any applicable wasteload allocation (40 CFR 122.44(d)(1)(vii)(B)).

    See the Fact Sheet for further discussion of unfunded mandates.

33. **California Environmental Quality Act.** The issuance of waste discharge requirements and an NPDES permit for the discharge of runoff from MS4s to waters of the U.S. is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 et seq.) in accordance with CWC section 13389.

STATE WATER BOARD DECISIONS

34. **Compliance with Prohibitions and Limitations.** The receiving water limitation language specified in this Order is consistent with language recommended by the USEPA and established in State Water Board Order WQ 99-05, *Own Motion Review of the Petition of Environmental Health Coalition to Review Waste Discharge Requirements Order No. 96-03, NPDES Permit No. CAS0108740*, adopted by the

State Water Board on June 17, 1999. The receiving water limitation language in this Order requires storm water discharges from MS4s to not cause or contribute to a violation of water quality standards, which is to be achieved through an iterative approach requiring the implementation of improved and better-tailored BMPs over time. Implementation of the iterative approach to comply with receiving water limitations based on applicable water quality standards is necessary to ensure that storm water discharges from the MS4 will not ultimately cause or contribute to violations of water quality standards and will not create conditions of pollution, contamination, or nuisance.

35. **Special Conditions for Areas of Special Biological Significance.** On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving a general exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges (General Exception). On June 19, 2012, the State Water Board adopted Order No. 2012-0031, amending the General Exception to require pollutant reductions to be achieved within six years in accordance with ASBS Compliance Plans and ASBS Pollution Prevention Plans. The General Exception requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject to the terms and conditions of the General Exception as amended. The Special Protections contained in Attachment B to the General Exception as amended are applicable to these discharges, and are hereby incorporated into Attachment A of this Order.

ADMINISTRATIVE FINDINGS

36. **Executive Officer Delegation of Authority.** The San Diego Water Board by prior resolution has delegated all matters that may legally be delegated to its Executive Officer to act on its behalf pursuant to CWC section 13223. Therefore, the Executive Officer is authorized to act on the San Diego Water Board's behalf on any matter within this Order unless such delegation is unlawful under CWC section 13223 or this Order explicitly states otherwise.

37. **Standard Provisions.** Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR 122.42, are provided in Attachment B to this Order.

38. **Fact Sheet.** The Fact Sheet for this Order contains background information, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of this Order. The Fact Sheet is hereby incorporated into this Order and constitutes part of the Findings of this Order.

39. **Public Notice.** In accordance with State and federal laws and regulations, the San Diego Water Board notified the Copermittees, and interested agencies and persons of its intent to prescribe waste discharge requirements for the control of discharges into and from the MS4s to waters of the U.S. and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet.

40. **Public Hearings.** The San Diego Water Board held a public hearing on April 10 and 11, 2013, that was continued to May 8, 2013 and heard and considered all comments pertaining to the terms and conditions of this Order. The San Diego Water Board also held a public workshop on October 8, 2015, and a public hearing on February 11, 2015, and heard and considered all comments pertaining to the amendment of this Order through Order No. R9-2015-0001. Details of these public hearings are provided in the Fact Sheet.

41. **Effective Date.** This Order serves as an NPDES permit pursuant to CWA section 402 or amendments thereto, and as to the San Diego County Copermittees listed in Table 2.a., became effective fifty (50) days after the date of its adoption, and as to the Orange County Copermittees listed in Table 2.b., becomes effective on April 1, 2015, after Order R9-2015-0001 is adopted, provided that the Regional Administrator, USEPA, Region IX, does not object to this Order.

42. **Review by the State Water Board.** Any person aggrieved by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with CWC section 13320 and California Code of Regulations, title 23, sections 2050, and following. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date of this Order, except that if the thirtieth day following the date of this Order falls on a Saturday, Sunday or State holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

THEREFORE, IT IS HEREBY ORDERED that the Copermittees, in order to meet the provisions contained in division 7 of the CWC (commencing with section 13000) and regulations adopted thereunder, and the provisions of the CWA and regulations adopted thereunder, must each comply with the requirements of this Order. This action in no way prevents the San Diego Water Board from taking enforcement action for past violations of the previous Order. If any part of this Order is subject to a temporary stay of enforcement, unless otherwise specified, the Copermittees must comply with the analogous portions of the previous Order, which will remain in effect for all purposes during the pendency of the stay.

II. PROVISIONS

A. PROHIBITIONS AND LIMITATIONS

The purpose of this provision is to describe the conditions under which storm water and non-storm water discharges into and from MS4s are prohibited or limited. The goal of the prohibitions and limitations is to protect the water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through the implementation of water quality improvement strategies and runoff management programs that effectively prohibit non-storm water discharges into the Copermittees' MS4s, and reduce pollutants in storm water discharges from the Copermittees' MS4s to the MEP.

1. Discharge Prohibitions

a. Discharges from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the state are prohibited.

b. Non-storm water discharges into MS4s are to be effectively prohibited, through the implementation of Provision E.2, unless such discharges are authorized by a separate NPDES permit.

c. Discharges from MS4s are subject to all waste discharge prohibitions in the Basin Plan, included in Attachment A to this Order.

d. Storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 applicable to these discharges, included in Attachment A to this Order. All other discharges from the Copermittees' MS4s to ASBS are prohibited.

2. Receiving Water Limitations

a. Discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters, including but not limited to all applicable provisions contained in:

(1) The San Diego Water Board's Basin Plan, including beneficial uses, water quality objectives, and implementation plans;

(2) State Water Board plans for water quality control including the following:

(a) Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries (Thermal Plan), and

(b) The Ocean Plan, including beneficial uses, water quality objectives, and implementation plans;

(3) State Water Board policies for water and sediment quality control including the following:

(a) Water Quality Control Policy for the Enclosed Bays and Estuaries of California,

(b) Sediment Quality Control Plan which includes the following narrative objectives for bays and estuaries:

(i) Pollutants in sediments shall not be present in quantities that, alone or in combination, are toxic to benthic communities, and

(ii) Pollutants shall not be present in sediments at levels that will bioaccumulate in aquatic life to levels that are harmful to human health,

(c) The Statement of Policy with Respect to Maintaining High Quality of Waters in California;[2]

(4) Priority pollutant criteria promulgated by the USEPA through the following:

(a) National Toxics Rule (NTR)[3] (promulgated on December 22, 1992 and amended on May 4, 1995), and

(b) California Toxics Rule (CTR).[4,5]

b. Discharges from MS4s composed of storm water runoff must not alter natural ocean water quality in an ASBS.

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[2] State Water Board Resolution No. 68-16
[3] 40 CFR 131.36
[4] 65 Federal Register 31682-31719 (May 18, 2000), adding Section 131.38 to 40 CFR
[5] If a water quality objective and a CTR criterion are in effect for the same priority pollutant, the more stringent of the two applies.

3. Effluent Limitations

a. TECHNOLOGY BASED EFFLUENT LIMITATIONS

Pollutants in storm water discharges from MS4s must be reduced to the MEP.[6]

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

Each Copermittee must comply with applicable WQBELs established for the TMDLs in Attachment E to this Order, pursuant to the applicable TMDL compliance schedules.

4. Compliance with Discharge Prohibitions and Receiving Water Limitations

Each Copermittee must achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order through timely implementation of control measures and other actions as specified in Provisions B and E of this Order, including any modifications. The Water Quality Improvement Plans required under Provision B must be designed and adapted to ultimately achieve compliance with Provisions A.1.a, A.1.c and A.2.a.

a. If exceedance(s) of water quality standards persist in receiving waters notwithstanding implementation of this Order, the Copermittees must comply with the following procedures:

(1) For exceedance(s) of a water quality standard in the process of being addressed by the Water Quality Improvement Plan, the Copermittee(s) must implement the Water Quality Improvement Plan as accepted by the San Diego Water Board, and update the Water Quality Improvement Plan, as necessary, pursuant to Provision F.2.c;

(2) Upon a determination by either the Copermittees or the San Diego Water Board that discharges from the MS4 are causing or contributing to a new exceedance of an applicable water quality standard not addressed by the Water Quality Improvement Plan, the Copermittees must submit the following updates to the Water Quality Improvement Plan pursuant to Provision F.2.c or as part of the Water Quality Improvement Plan Annual Report required under Provision F.3.b, unless the San Diego Water Board directs an earlier submittal:

(a) The water quality improvement strategies being implemented that are effective and will continue to be implemented,

[6] This does not apply to MS4 discharges which receive subsequent treatment to reduce pollutants in storm water discharges to the MEP prior to entering receiving waters (e.g., low flow diversions to the sanitary sewer). Runoff treatment must occur prior to the discharge of runoff into receiving waters per Finding 7.

(b) Water quality improvement strategies (i.e. BMPs, retrofitting projects, stream and/or habitat rehabilitation projects, adjustments to jurisdictional runoff management programs, etc.) that will be implemented to reduce or eliminate any pollutants or conditions that are causing or contributing to the exceedance of water quality standards,

(c) Updates to the schedule for implementation of the existing and additional water quality improvement strategies, and

(d) Updates to the monitoring and assessment program to track progress toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a of this Order;

(3) The San Diego Water Board may require the incorporation of additional modifications to the Water Quality Improvement Plan required under Provision B. The applicable Copermittees must submit any modifications to the update to the Water Quality Improvement Plan within 90 days of notification that additional modifications are required by the San Diego Water Board, or as otherwise directed;

(4) Within 90 days of the San Diego Water Board determination that the modifications to the Water Quality Improvement Plan required under Provision A.4.a.(3) meet the requirements of this Order, the applicable Copermittees must revise the jurisdictional runoff management program documents to incorporate the modified water quality improvement strategies that have been and will be implemented, the implementation schedule, and any additional monitoring required; and

(5) Each Copermittee must implement the updated Water Quality Improvement Plan.

b. The procedure set forth above to achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order do not have to be repeated for continuing or recurring exceedances of the same water quality standard(s) following implementation of scheduled actions unless directed to do otherwise by the San Diego Water Board.

c. Nothing in Provisions A.4.a and A.4.b prevents the San Diego Water Board from enforcing any provision of this Order while the applicable Copermittees prepare and implement the above update to the Water Quality Improvement Plan and jurisdictional runoff management programs.

B. WATER QUALITY IMPROVEMENT PLANS

The purpose of this provision is to develop Water Quality Improvement Plans that guide the Copermittees' jurisdictional runoff management programs towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plans is to further the Clean Water Act's objective to protect, preserve, enhance, and restore the water quality and designated beneficial uses of waters of the state. This goal will be accomplished through an adaptive planning and management process that identifies the highest priority water quality conditions within a watershed and implements strategies through the jurisdictional runoff management programs to achieve improvements in the quality of discharges from the MS4s and receiving waters.

1. Watershed Management Areas

The Copermittees must develop a Water Quality Improvement Plan for each of the Watershed Management Areas in Table B-1. A total of ten Water Quality Improvement Plans must be developed for the San Diego Region.

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
San Juan (901.00)	South Orange County	- Aliso Creek - San Juan Creek - San Mateo Creek - Pacific Ocean - Heisler Park ASBS	- City of Aliso Viejo - City of Dana Point - City of Laguna Beach - City of Laguna Hills[1] - City of Laguna Niguel - City of Laguna Woods[1] - City of Lake Forest[2] - City of Mission Viejo - City of Rancho Santa Margarita - City of San Clemente - City of San Juan Capistrano - County of Orange - Orange County Flood Control District
Santa Margarita (902.00)	Santa Margarita River	- Murrieta Creek - Temecula Creek - Santa Margarita River - Santa Margarita Lagoon - Pacific Ocean	- City of Murrieta[3] - City of Temecula[3] - City of Wildomar[3] - County of Riverside[3] - County of San Diego[4] - Riverside County Flood Control and Water Conservation District[3]
San Luis Rey (903.00)	San Luis Rey River	- San Luis Rey River - San Luis Rey Estuary - Pacific Ocean	- City of Oceanside - City of Vista - County of San Diego

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
Carlsbad (904.00)	Carlsbad	- Loma Alta Slough - Buena Vista Lagoon - Agua Hedionda Lagoon - Batiquitos Lagoon - San Elijo Lagoon - Pacific Ocean	- City of Carlsbad - City of Encinitas - City of Escondido - City of Oceanside - City of San Marcos - City of Solana Beach - City of Vista - County of San Diego
San Dieguito (905.00)	San Dieguito River	- San Dieguito River - San Dieguito Lagoon - Pacific Ocean	- City of Del Mar - City of Escondido - City of Poway - City of San Diego - City of Solana Beach - County of San Diego
Penasquitos (906.00)	Penasquitos	- Los Penasquitos Lagoon - Pacific Ocean	- City of Del Mar - City of Poway - City of San Diego - County of San Diego
	Mission Bay	- Mission Bay - Pacific Ocean - San Diego Marine Life Refuge ASBS	- City of San Diego
San Diego (907.00)	San Diego River	- San Diego River - Pacific Ocean	- City of El Cajon - City of La Mesa - City of San Diego - City of Santee - County of San Diego
Pueblo San Diego (908.00) Sweetwater (909.00) Otay (910.00)	San Diego Bay	- Sweetwater River - Otay River - San Diego Bay - Pacific Ocean	- City of Chula Vista - City of Coronado - City of Imperial Beach - City of La Mesa - City of Lemon Grove - City of National City - City of San Diego - County of San Diego - San Diego County Regional Airport Authority - San Diego Unified Port District
Tijuana (911.00)	Tijuana River	- Tijuana River - Tijuana Estuary - Pacific Ocean	- City of Imperial Beach - City of San Diego - County of San Diego

Notes:

1. By agreement dated February 10, 2015, pursuant to Water Code section 13228, the Phase I MS4 discharges within the jurisdiction of the City of Laguna Hills and the City of Laguna Woods located in the Santa Ana Region are regulated by San Diego Water Board Order No. R9-2013-0001 as amended by Order No. R9-2015-0001, upon the later effective date of Order No. R9-2015-0001 or Santa Ana Water Board Tentative Order No. R8-2015-0001. The City of Laguna Hills and Laguna Woods must also comply with the requirements of the San Diego Creek/Newport Bay TMDL in section XVIII of Santa Ana Water Board Order No. R8-2015-0001.
2. By agreement dated February 10, 2015, pursuant to Water Code section 13228, Phase I MS4 discharges within the City of Lake Forest located within the San Diego Water Board Region are regulated by the Santa Ana Water Board Order No. R8-2015-0001 (NPDES No. CAS618030) upon the later effective date of this Order or Santa Ana Water Board Tentative Order No. R8-2015-0001. In accordance with the terms of the agreement between the San Diego Water Board and the Santa Ana Water Board, the City of Lake Forest must implement the requirements of the Bacteria TMDL in Attachment E of this Order, participate in preparation and implementation of the Water Quality Improvement Plan for the Aliso Creek Watershed Management Area as described in Provision B of this Order and continue implementation of its over-irrigation discharge prohibition in its City Ordinance, Title 15, Chapter 15, section 14.030, List (b).
3. The Riverside County Copermittees will be covered under this Order after expiration of Order No. R9-2010-0016 or earlier if the Riverside County Copermittees meet the conditions in Provision F.6, upon further amendment of this Order.
4. The County of San Diego is not required to implement the requirements of Provision B for its jurisdiction within the Santa Margarita River Watershed Management Area until the Riverside County Copermittees have been notified of coverage under this Order. The County of San Diego is required to implement the requirements of Provisions D, F.3.b, and Attachment E until the Riverside County Copermittees have been notified of coverage under this Order.

2. Priority Water Quality Conditions

The Copermittees must identify the water quality priorities within each Watershed Management Area that will be addressed by the Water Quality Improvement Plan. Where appropriate, Watershed Management Areas may be separated into subwatersheds to focus water quality prioritization and jurisdictional runoff management program implementation efforts by receiving water.

a. Assessment of Receiving Water Conditions

The Copermittees must consider the following, at a minimum, to identify water quality priorities based on impacts of MS4 discharges on receiving water beneficial uses:

(1) Receiving waters listed as impaired on the CWA Section 303(d) List of Water Quality Limited Segments (303(d) List);

(2) TMDLs adopted and under development by the San Diego Water Board;

(3) Receiving waters recognized as sensitive or highly valued by the Copermittees, including estuaries designated under the National Estuary Program under CWA section 320, marine protected areas, wetlands defined by the State or U.S. Fish and Wildlife Service's National Wetlands Inventory as wetlands, waters having the Preservation of Biological Habitats of Special Significance (BIOL) beneficial use designation, and receiving waters identified as ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(4) The receiving water limitations of Provision A.2;

(5) Known historical versus current physical, chemical, and biological water quality conditions;

(6) Available, relevant, and appropriately collected and analyzed physical, chemical, and biological receiving water monitoring data, including, but not limited to, data describing:

(a) Chemical constituents,

(b) Water quality parameters (i.e. pH, temperature, conductivity, etc.),

(c) Toxicity Identification Evaluations for both receiving water column and sediment,

(d) Trash impacts,

(e) Bioassessments, and

(f) Physical habitat;

(7) Available evidence of erosional impacts in receiving waters due to accelerated flows (i.e. hydromodification);

(8) Available evidence of adverse impacts to the chemical, physical, and biological integrity of receiving waters; and

(9) The potential improvements in the overall condition of the Watershed Management Area that can be achieved.

b. ASSESSMENT OF IMPACTS FROM MS4 DISCHARGES

The Copermittees must consider the following, at a minimum, to identify the potential impacts to receiving waters that may be caused or contributed to by discharges from the Copermittees' MS4s:

(1) The discharge prohibitions of Provision A.1 and effluent limitations of Provision A.3; and

(2) Available, relevant, and appropriately collected and analyzed storm water and non-storm water monitoring data from the Copermittees' MS4 outfalls;

(3) Locations of each Copermittee's MS4 outfalls that discharge to receiving waters;

(4) Locations of MS4 outfalls that are known to persistently discharge non-storm water to receiving waters likely causing or contributing to impacts on receiving water beneficial uses;

(5) Locations of MS4 outfalls that are known to discharge pollutants in storm water causing or contributing to impacts on receiving water beneficial uses; and

(6) The potential improvements in the quality of discharges from the MS4 that can be achieved.

c. IDENTIFICATION OF PRIORITY WATER QUALITY CONDITIONS

(1) The Copermittees must use the information gathered for Provisions B.2.a and B.2.b to develop a list of priority water quality conditions as pollutants, stressors and/or receiving water conditions that are the highest threat to receiving water quality or that most adversely affect the quality of receiving waters. The list must include the following information for each priority water quality condition:

(a) The beneficial use(s) associated with the priority water quality condition;

(b) The geographic extent of the priority water quality condition within the Watershed Management Area, if known;

(c) The temporal extent of the priority water quality condition (e.g., dry weather and/or wet weather);

(d) The Copermittees with MS4s discharges that may cause or contribute to the priority water quality condition; and

(e) An assessment of the adequacy of and data gaps in the monitoring data to characterize the conditions causing or contributing to the priority water quality condition, including a consideration of spatial and temporal variation.

(2) The Copermittees must identify the highest priority water quality conditions to be addressed by the Water Quality Improvement Plan, and provide a rationale for selecting a subset of the water quality conditions identified pursuant to Provision B.2.c.(1) as the highest priorities.

d. IDENTIFICATION OF MS4 SOURCES OF POLLUTANTS AND/OR STRESSORS

The Copermittees must identify and prioritize known and suspected sources of storm water and non-storm water pollutants and/or other stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c. The identification of known and suspected sources of pollutants and/or stressors that cause or contribute to the highest priority water quality conditions as identified for Provision B.2.c must consider the following:

(1) Pollutant generating facilities, areas, and/or activities within the Watershed Management Area, including:

(a) Each Copermittee's inventory of construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas,

(b) Publicly owned parks and/or recreational areas,

(c) Open space areas,

(d) All currently operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste, and

(e) Areas not within the Copermittees' jurisdictions (e.g., Phase II MS4s, tribal lands, state lands, federal lands) that are known or suspected to be discharging to the Copermittees' MS4s;

(2) Locations of the Copermittees' MS4s, including the following:

(a) All MS4 outfalls that discharge to receiving waters, and

(b) Locations of major structural controls for storm water and non-storm water (e.g., retention basins, detention basins, major infiltration devices, etc.);

(3) Other known and suspected sources of non-storm water or pollutants in storm water discharges to receiving waters within the Watershed Management Area, including the following:

(a) Other MS4 outfalls (e.g., Phase II Municipal and Caltrans),

(b) Other NPDES permitted discharges,

(c) Any other discharges that may be considered point sources (e.g., private outfalls), and

(d) Any other discharges that may be considered non-point sources (e.g., agriculture, wildlife or other natural sources);

(4) Review of available data, including but not limited to:

(a) Findings from the Copermittees' illicit discharge detection and elimination programs,

(b) Findings from the Copermittees' MS4 outfall discharge monitoring,

(c) Findings from the Copermittees' receiving water monitoring,

(d) Findings from the Copermittees' MS4 outfall discharge and receiving water assessments, and

(e) Other available, relevant, and appropriately collected data, information, or studies related to pollutant sources and/or stressors that contribute to the highest priority water quality conditions as identified for Provision B.2.c.

(5) The adequacy of the available data to identify and prioritize sources and/or stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c.

e. IDENTIFICATION OF POTENTIAL WATER QUALITY IMPROVEMENT STRATEGIES

The Copermittees must evaluate the findings identified under Provisions B.2.a-d, and identify potential strategies that can result in improvements to water quality in MS4 discharges and/or receiving waters within the Watershed Management Area. Potential water quality improvement strategies that may be implemented within the Watershed Management Area must include the following:

(1) Structural BMPs, non-structural BMPs, incentives, or programs that can potentially be implemented to address the highest priority water quality conditions identified under Provision B.2.c, or MS4 sources of pollutants or stressors identified under Provision B.2.d,

(2) Retrofitting projects in areas of existing development within the Watershed Management Area that can potentially be implemented to reduce MS4 sources of pollutants or stressors identified under Provision B.2.d causing or contributing to the highest priority water quality conditions identified under Provision B.2.c, and

(3) Stream, channel, and/or habitat rehabilitation projects within the Watershed Management Area that can potentially be implemented to protect and/or improve conditions in receiving waters from MS4 pollutants and/or stressors identified under Provision B.2.d causing or contributing to the highest priority water quality conditions identified under Provision B.2.c.

3. Water Quality Improvement Goals, Strategies and Schedules

The Copermittees must identify and develop specific water quality improvement goals and strategies to address the highest priority water quality conditions identified within a Watershed Management Area. The water quality improvement goals and strategies must address the highest priority water quality conditions by effectively prohibiting non-storm water discharges to the MS4, reducing pollutants in storm water discharges from the MS4 to the MEP, and protecting the water quality standards of receiving waters.

a. WATER QUALITY IMPROVEMENT GOALS AND SCHEDULES

(1) <u>Numeric Goals</u>

The Copermittees must develop and incorporate numeric goals[7] into the Water Quality Improvement Plan. Numeric goals must be used to support

[7] Interim and final numeric goals may take a variety of forms such as TMDL established WQBELs, action levels, pollutant concentration, load reductions, number of impaired water bodies delisted from the List of Water Quality Impaired Segments, Index of Biotic Integrity (IBI) scores, or other appropriate metrics. Interim and final numeric goals are not necessarily limited to one criterion or indicator, but may include multiple criteria and/or indicators. Except for TMDL established WQBELs, interim and final numeric goals and corresponding schedules may be revised through the adaptive management process under Provision B.5.

Water Quality Improvement Plan implementation and measure reasonable progress towards addressing the highest priority water quality conditions identified under Provision B.2.c. The Copermittees must establish and incorporate the following numeric goals in the Water Quality Improvement Plan:

(a) Final numeric goals must be based on measureable criteria or indicators capable of demonstrating one or more of the following:

(i) Discharges from the Copermittees' MS4s will not cause or contribute to exceedances of water quality standards in receiving waters, AND/OR

(ii) The conditions of receiving waters and associated habitat are protected from MS4 discharges, AND/OR

(iii) Beneficial uses of receiving waters are protected from MS4 discharges and will be supported.

(b) Interim numeric goals must be based on measureable criteria or indicators capable of demonstrating reasonable incremental progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges as follows:

(i) One or more interim numeric goals may be established to demonstrate progress toward achieving each final numeric goal,

(ii) For each final numeric goal, at least one interim numeric goal must be expressed as a reasonable increment toward achievement of the final numeric goal,

(iii) For each final numeric goal, reasonable interim numeric goals must be established to be accomplished during each 5 year period between the acceptance of the Water Quality Improvement Plan and the achievement of the final numeric goals.

(2) <u>Schedules for Achieving Numeric Goals</u>

The Copermittees must develop and incorporate schedules for achieving the numeric goals into the Water Quality Improvement Plan. The schedules must demonstrate reasonable progress toward achieving the final numeric goals required for Provision B.3.a.(1). The Copermittees must incorporate the schedules for achieving the numeric goals into the Water Quality Improvement Plan based on the following considerations:

(a) Final dates for achieving all final numeric goals must be established considering the following:

(i) Final compliance dates for any applicable TMDLs in Attachment E to this Order;

(ii) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(iii) Achievement of the final numeric goals for the highest water quality priorities must be as soon as possible;

(iv) Final dates for achieving the final numeric goals must reflect a realistic assessment of the shortest practicable time required based on the temporal and spatial extent and factors associated with the highest priority water quality conditions identified under Provision B.2.c, and taking into account the time reasonably required to implement the water quality improvement strategies required pursuant to Provision B.3.b.

(b) Interim dates for achieving all interim numeric goals must be established considering the following:

(i) Interim compliance dates for any applicable TMDLs in Attachment E to this Order;

(ii) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(iii) Interim dates for achieving the interim numeric goals must reflect a realistic assessment of the shortest practicable time reasonably required, taking into account the time needed to implement new or significantly expanded programs and securing financing, if necessary; and

(iv) For each final numeric goal, at least one interim numeric goal must be established that the Copermittees will work toward achieving within the term of this Order.

b. WATER QUALITY IMPROVEMENT STRATEGIES AND SCHEDULES

Based on the likely effectiveness and efficiency of the potential water quality improvement strategies identified under Provision B.2.e to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a, the Copermittees must identify the strategies that will be implemented in each Watershed Management Area as follows:

(1) <u>Jurisdictional Strategies</u>

(a) Each Copermittee in the Watershed Management Area must identify the strategies that will be implemented within its jurisdiction as part of its

jurisdictional runoff management program requirements under Provisions E.2 through E.7, including descriptions of the following:

(i) For each of the inventories developed for its jurisdiction, as required under Provisions D.2.a.(1), E.3.e.(2), E.4.b, and E.5.a, each Copermittee must identify the known and suspected areas or sources causing or contributing to the highest priority water quality conditions in the Watershed Management Area that the Copermittee will focus on in its efforts to effectively prohibit non-storm water discharges to its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, and achieve the interim and final numeric goals identified under Provision B.3.a;

(ii) BMPs that each Copermittee will implement, or require to be implemented, as applicable, for those areas or sources within its jurisdiction;

(iii) Education programs that each Copermittee will implement, as applicable, for those areas or sources within its jurisdiction;

(iv) Frequencies that each Copermittee will conduct inspections on those areas or sources within its jurisdiction;

(v) Incentive and enforcement programs that each Copermittee will implement, as applicable, for those areas or sources within its jurisdiction; and

(vi) Any other BMPs, incentives, or programs that each Copermittee will implement for those areas or sources within its jurisdiction.

(b) Identify the optional jurisdictional strategies that each Copermittee will implement within its jurisdiction, as necessary, to effectively prohibit non-storm water discharges to its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. Descriptions of the optional jurisdictional strategies must include:

(i) BMPs, incentives, or programs that may be implemented by the Copermittee within its jurisdiction in addition to the requirements of Provisions B.3.b.(1)(a);

(ii) Incentives or programs that may be implemented by the Copermittee to encourage or implement projects to retrofit areas of existing development within its jurisdiction;

(iii) Incentives or programs that may be implemented by the Copermittee to encourage or implement projects that will rehabilitate the conditions of channels or habitats within its jurisdiction;

(iv) The funds and/or resources that must be secured by the Copermittee to implement the optional strategies described for Provisions B.3.b.(1)(b)(i)-(iii) within its jurisdiction; and

(v) The circumstances necessary to trigger implementation of the optional jurisdictional strategies, in addition to the requirements of Provision B.3.b.(1)(a), to achieve the interim and final numeric goals within the schedules established under Provision B.3.a.

(c) Identify the strategies that will be implemented by the Copermittee in coordination with or with the cooperation of other agencies (e.g. Caltrans, water districts, school districts) and/or entities (e.g. non-governmental organizations) within its jurisdiction.

(2) Watershed Management Area Strategies

The Copermittees must identify the optional regional or multi-jurisdictional strategies that will be implemented in the Watershed Management Area, as necessary, to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. Descriptions of the optional regional or multi-jurisdictional strategies must include:

(a) Regional or multi-jurisdictional BMPs, incentives, or programs that may be implemented by the Copermittees in the Watershed Management Area;

(b) Incentives or programs that may be implemented by the Copermittees in the Watershed Management Area to encourage or implement regional or multi-jurisdictional projects to retrofit areas of existing development;

(c) Incentives or programs that may be implemented by the Copermittees to encourage or implement regional or multi-jurisdictional projects that will rehabilitate the conditions of channels, streams, or habitats within the Watershed Management Area;

(d) The funds and/or resources that must be secured by the Copermittees to implement the optional strategies described for Provisions B.3.b.(2)(a)-(c) within the Watershed Management Area; and

(e) The circumstances necessary to trigger implementation of the optional regional or multi-jurisdictional strategies to achieve the interim and final numeric goals within the schedules established under Provision B.3.a.

(3) Schedules for Implementing Strategies

The Copermittees must develop reasonable schedules for implementing the water quality improvement strategies identified under Provisions B.3.b.(1) and B.3.b.(2) to achieve the interim and final numeric goals identified and schedules established under Provision B.3.a. The Copermittees must incorporate the schedules to implement the water quality improvement strategies into the Water Quality Improvement Plan as follows:

(a) Each Copermittee must develop schedules for the jurisdictional strategies identified pursuant to Provisions B.3.b.(1)(a)-(b). Each schedule must specify:

(i) If each jurisdictional strategy identified pursuant to Provision B.3.b.(1)(a) will or will not be initiated upon acceptance of the Water Quality Improvement Plan;

(ii) For each jurisdictional strategy identified pursuant to Provision B.3.b.(1)(a) that will not be initiated upon acceptance of the Water Quality Improvement Plan, the shortest practicable time in which each jurisdictional strategy will be initiated after acceptance of the Water Quality Improvement Plan;

(iii) For each optional jurisdictional strategy identified pursuant to Provision B.3.b.(1)(b), a realistic assessment of the shortest practicable time required to:

[a] Secure the resources needed to fund the optional jurisdictional strategy, and
[b] Procure the resources, materials, labor, and applicable permits necessary to initiate implementation of the optional jurisdictional strategy;

(iv) If each jurisdictional strategy identified pursuant to Provisions B.3.b.(1)(a)-(b) is expected to be continuously implemented (e.g. inspections) or completed within a schedule (e.g. construction of structural BMP); and

(v) If a jurisdictional strategy identified pursuant to Provisions B.3.b.(1)(a)-(b) is expected to be completed within a schedule, the anticipated time to complete based on a realistic assessment of the shortest practicable time required.

(b) The Copermittees in the Watershed Management Area must develop schedules for the regional or multi-jurisdictional strategies identified pursuant to Provision B.3.b.(2). Each schedule must specify:

(i) A realistic assessment of the shortest practicable time to:

[a] Secure the resources needed to fund the optional regional or multi-jurisdictional strategy, and

[b] Procure the resources, materials, labor, and permits necessary to initiate the implementation of the optional regional or multi-jurisdictional strategy;

(ii) If each regional or multi-jurisdictional strategy identified pursuant to Provision B.3.b.(2) is expected to be continuously implemented (e.g. inspections) or completed within a schedule (e.g. construction of structural BMP); and

(iii) If a regional or multi-jurisdictional strategy and/or activity identified pursuant to Provisions B.3.b.(2) is expected to be completed within a schedule, the anticipated time to complete based on a realistic assessment of the shortest practicable time required.

(4) Optional Watershed Management Area Analysis

(a) For each Watershed Management Area, the Copermittees have the option to perform a Watershed Management Area Analysis for the purpose of developing watershed-specific requirements for structural BMP implementation, as described in Provision E.3.c.(3). The Watershed Management Area Analysis must include GIS layers (maps) as output. The analysis must include the following information, to the extent it is available, in order to characterize the Watershed Management Areas:

(i) A description of dominant hydrologic processes, such as areas where infiltration or overland flow likely dominates;

(ii) A description of existing streams in the watershed, including bed material and composition, and if they are perennial or ephemeral;

(iii) Current and anticipated future land uses;

(iv) Potential coarse sediment yield areas; and

(v) Locations of existing flood control structures and channel structures, such as stream armoring, constrictions, grade control structures, and hydromodification or flood management basins.

(b) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify and compile a list of candidate projects that could potentially be used as alternative compliance options for Priority Development Projects, to be implemented in lieu of onsite structural BMP performance requirements described in Provisions E.3.c.(1) and E.3.c.(2)(a). Specifically, the Copermittees must identify opportunities to be included in the list of candidate projects in each Watershed Management Area, such as:

(i) Stream or riparian area rehabilitation;

(ii) Retrofitting existing infrastructure to incorporate storm water retention or treatment;

(iii) Regional BMPs;

(iv) Groundwater recharge projects;

(v) Water supply augmentation projects; and

(vi) Land purchases to preserve floodplain functions.

(c) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify areas within the Watershed Management Area where it is appropriate to allow Priority Development Projects to be exempt from the hydromodification management BMP performance requirements described in Provision E.3.c.(2), including supporting rationale.

4. Water Quality Improvement Monitoring and Assessment Program

a. The Copermittees in each Watershed Management Area must develop and incorporate an integrated monitoring and assessment program into the Water Quality Improvement Plan that assesses: 1) the progress toward achieving the numeric goals and schedules, 2) the progress toward addressing the highest priority water quality conditions for each Watershed Management Area, and 3) each Copermittee's overall efforts to implement the Water Quality Improvement Plan.

b. The monitoring and assessment program must incorporate the monitoring and assessment requirements of Provision D, which may allow the Copermittees to modify the program to be consistent with and focus on the highest priority water quality conditions for each Watershed Management Area.

c. For Watershed Management Areas with applicable TMDLs, the monitoring and assessment program must incorporate the specific monitoring and assessment requirements of Attachment E.

d. For Watershed Management Areas with any ASBS, the water quality monitoring and assessment program must incorporate the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

5. Iterative Approach and Adaptive Management Process

The Copermittees in each Watershed Management Area must implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a, and must include the following:

a. RE-EVALUATION OF PRIORITY WATER QUALITY CONDITIONS

The priority water quality conditions and potential water quality improvement strategies included in the Water Quality Improvement Plan pursuant to Provisions B.2.c and B.2.e may be re-evaluated by the Copermittees as needed during the term of this Order as part of the Water Quality Improvement Plan Annual Report. Re-evaluation and recommendations for modifications to the priority water quality conditions and potential water quality improvement strategies must be provided in the Report of Waste Discharge, and must consider the following:

(1) Achieving the outcome of improved water quality in MS4 discharges and receiving waters through implementation of the water quality improvement strategies identified in the Water Quality Improvement Plan;

(2) New information developed when the requirements of Provisions B.2.a-c have been re-evaluated;

(3) Spatial and temporal accuracy of monitoring data collected to inform prioritization of water quality conditions and implementation strategies to address the highest priority water quality conditions;

(4) Availability of new information and data from sources other than the jurisdictional runoff management programs within the Watershed Management Area that informs the effectiveness of the actions implemented by the Copermittees;

(5) San Diego Water Board recommendations; and

(6) Recommendations for modifications solicited through a public participation process.

b. ADAPTATION OF GOALS, STRATEGIES AND SCHEDULES

The water quality improvement goals, strategies and schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.3, must be re-evaluated and adapted as new information becomes available to result in more effective and efficient measures to address the highest priority water quality conditions identified pursuant to Provision B.2.c. Re-evaluation of and modifications to the water quality improvement goals, strategies and schedules must be provided in the Water Quality Improvement Plan Annual Report, and must consider the following:

(1) Modifications to the priority water quality conditions based on Provision B.5.a;

(2) Progress toward achieving interim and final numeric goals in receiving waters and MS4 discharges for the highest priority water quality conditions in the Watershed Management Area,

(3) Progress toward achieving outcomes according to established schedules;

(4) New policies or regulations that may affect identified numeric goals;

(5) Measurable or demonstrable reductions of non-storm water discharges to and from each Copermittee's MS4;

(6) Measurable or demonstrable reductions of pollutants in storm water discharges from each Copermittee's MS4 to the MEP;

(7) New information developed when the requirements of Provisions B.2.b and B.2.d have been re-evaluated;

(8) Efficiency in implementing the Water Quality Improvement Plan;

(9) San Diego Water Board recommendations; and

(10) Recommendations for modifications solicited through a public participation process.

c. ADAPTATION OF MONITORING AND ASSESSMENT PROGRAM

The water quality improvement monitoring and assessment program, included in the Water Quality Improvement Plan pursuant to Provision B.4, must be re-evaluated and adapted when new information becomes available. Re-evaluation and recommendations for modifications to the monitoring and assessment program, pursuant to the requirements of Provision D, may be provided in the Water Quality Improvement Plan Annual Report, but must be provided in the Report of Waste Discharge.

6. Water Quality Improvement Plan Submittal, Updates, and Implementation

a. The Copermittees must submit and commence implementation of the Water Quality Improvement Plans in accordance with the requirements of Provision F.1.

b. The Copermittees must submit proposed updates to the Water Quality Improvement Plan for acceptance by the San Diego Water Board Executive Officer in accordance with the requirements of Provision F.2.c.

C. ACTION LEVELS

The purpose of this provision is for the Copermittees to incorporate numeric action levels in the Water Quality Improvement Plans. The goal of the action levels is to guide Water Quality Improvement Plan implementation efforts and measure progress towards the protection of water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through monitoring and assessing the quality of the MS4 discharges during the implementation of the Water Quality Improvement Plans.

1. Non-Storm Water Action Levels[8]

The Copermittees must develop and incorporate numeric non-storm water action levels (NALs) into the Water Quality Improvement Plan to: 1) support the development and prioritization of water quality improvement strategies for effectively prohibiting non-storm water discharges to the MS4s, 2) assess the effectiveness of the water quality improvement strategies toward addressing MS4 non-storm water discharges, required pursuant to Provision D.4.b.(1), and 3) support the detection and elimination of non-storm water and illicit discharges to the MS4, required pursuant to Provision E.2.[9]

a. The following NALs must be incorporated:

(1) Non-Storm Water Discharges from MS4s to Ocean Surf Zone

Table C-1. Non-Storm Water Action Levels for Discharges from MS4s to Ocean Surf Zone

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Total Coliform	MPN/100 ml	1,000	-	10,000/1,000[1]	OP
Fecal Coliform	MPN/100 ml	200[2]	-	400	OP
Enterococci	MPN/100 ml	35	-	104[3]	OP

Abbreviations/Acronyms
AMAL – average monthly action level
MDAL – maximum daily action level
OP – Ocean Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Total coliform density NAL is 1,000 MPN/100 ml when the fecal/total coliform ratio exceeds 0.1.
2. Fecal coliform density NAL is 200 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas."

[8] NALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, unless the NAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed.
[9] The Copermittees may utilize NALs or other benchmarks currently established by the Copermittees as interim NALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

(2) Non-Storm Water Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Table C-2. Non-Storm Water Action Levels for Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Turbidity	NTU	75	-	225	OP
pH	Units	Within limit of 6.0 to 9.0 at all times			OP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	35	-	104[3]	BP
Priority Pollutants	µg/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
OP – Ocean Plan water quality objective
NTU – Nephelometric Turbidity Units
µg/L – micrograms per liter
MDAL – maximum daily action level
BP – Basin Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas" and is not applicable to water bodies that are not designated with the water contact recreation (REC-1) beneficial use.

Table C-3. Non-Storm Water Action Levels for Priority Pollutants

Parameter	Units	Freshwater (CTR)		Saltwater (CTR)	
		MDAL	AMAL	MDAL	AMAL
Cadmium	µg/L	**	**	16	8
Copper	µg/L	*	*	5.8	2.9
Chromium III	µg/L	**	**	-	-
Chromium VI	µg/L	16	8.1	83	41
Lead	µg/L	*	*	14	2.9
Nickel	µg/L	**	**	14	6.8
Silver	µg/L	*	*	2.2	1.1
Zinc	µg/L	*	*	95	47

Abbreviations/Acronyms:
CTR – California Toxic Rule
AMAL – average monthly action level
µg/L – micrograms per liter
MDAL – maximum daily action level

Notes:
* Action levels developed on a case-by-case basis (see below)
** Action levels developed on a case-by-case basis (see below), but calculated criteria are not to exceed Maximum Contaminant Levels (MCLs) under the California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64431

The Cadmium, Copper, Chromium (III), Lead, Nickel, Silver and Zinc NALs for MS4 discharges to freshwater receiving waters will be developed on a case-by-case basis based on site-specific water quality data (receiving water hardness). For these priority pollutants, refer to 40 CFR 131.38(b)(2).

(3) Non-Storm Water Discharges from MS4s to Inland Surface Waters

Table C-4. Non-Storm Water Action Levels for Discharges from MS4s to Inland Surface Waters

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Dissolved Oxygen	mg/L	Not less than 5.0 in WARM waters and not less than 6.0 in COLD waters			BP
Turbidity	NTU	-	20	See MDAL	BP
pH	Units	Within limit of 6.5 to 8.5 at all times			BP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	33	-	61[3]	BP
Total Nitrogen	mg/L	-	1.0	See MDAL	BP
Total Phosphorus	mg/L	-	0.1	See MDAL	BP
MBAS	mg/L	-	0.5	See MDAL	BP
Iron	mg/L	-	0.3	See MDAL	BP
Manganese	mg/L	-	0.05	See MDAL	BP
Priority Pollutants	µg/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
BP – Basin Plan water quality objective
COLD – cold freshwater habitat beneficial use
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
MDAL – maximum daily action level
WARM – warm freshwater habitat beneficial use
MBAS – Methylene Blue Active Substances
MPN/100 ml – most probable number per 100 milliliters
µg/L – micrograms per liter

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for freshwater "designated beach areas" and is not applicable to water bodies that are not designated with the water contact recreation (REC-1) beneficial use.

b. If not identified in Provision C.1.a, NALs must be identified, developed and incorporated in the Water Quality Improvement Plan for any pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in receiving waters associated with the highest priority water quality conditions related to non-storm water discharges from the MS4s. NALs must be based on:

(1) Applicable water quality standards which may be dependent upon site-specific or receiving water-specific conditions or assumptions to be identified by the Copermittees; or

(2) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the NALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary NALs specific to the Watershed Management Area at levels greater than the NALs required by Provisions C.1.a and C.1.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for effectively prohibiting non-storm water discharges to the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and from the MS4. The

secondary NALs may be developed using an approach acceptable to the San Diego Water Board.

d. Dry weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.b may be utilized to develop or revise NALs based on watershed-specific data, subject to San Diego Water Board Executive Officer approval.

2. Storm Water Action Levels[10]

The Copermittees must develop and incorporate numeric storm water action levels (SALs) in the Water Quality Improvement Plans to: 1) support the development and prioritization of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s, and 2) assess the effectiveness of the water quality improvement strategies toward reducing pollutants in storm water discharges, required pursuant to Provision D.4.b.(2).[11]

a. The following SALs for discharges of storm water from the MS4 must be incorporated:

Table C-5. Storm Water Action Levels for Discharges from MS4s to Receiving Waters

Parameter	Units	Action Level
Turbidity	NTU	126
Nitrate & Nitrite (Total)	mg/L	2.6
Phosphorus (Total P)	mg/L	1.46
Cadmium (Total Cd)*	µg/L	3.0
Copper (Total Cu)*	µg/L	127
Lead (Total Pb)*	µg/L	250
Zinc (Total Zn)*	µg/L	976

Abbreviations/Acronyms:
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
µg/L – micrograms per liter

Notes:
* The sampling must include a measure of receiving water hardness at each MS4 outfall. If a total metal concentration exceeds the corresponding metals SAL in Table C-5, that concentration must be compared to the California Toxics Rule criteria and the USEPA 1-hour maximum concentration for the detected level of receiving water hardness associated with that sample. If it is determined that the sample's total metal concentration for that specific metal exceeds that SAL, but does not exceed the applicable USEPA 1-hour maximum concentration criterion for the measured level of hardness, then the sample result will not be considered above the SAL for that measurement.

[10] SALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, unless the SAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed.

[11] The Copermittees may utilize SALs or other benchmarks currently established by the Copermittees as interim SALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

b. If not identified in Provision C.2.a, SALs must be identified, developed and incorporated in the Water Quality Improvement Plan for pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in receiving waters associated with the highest priority water quality conditions related to storm water discharges from the MS4s. SALs must be based on:

(1) Federal and State water quality guidance and/or water quality standards; and

(2) Site-specific or receiving water-specific conditions; or

(3) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the SALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary SALs specific to the Watershed Management Area at levels greater than the SALs required by Provisions C.2.a and C.2.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s. The secondary SALs may be developed based on the approaches recommended by the State Water Board's Storm Water Panel[12] or using an approach acceptable to the San Diego Water Board.

d. Wet weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.c may be used to develop or revise SALs based upon watershed-specific data, subject to San Diego Water Board Executive Officer approval.

[12] Storm Water Panel Recommendations to the California State Water Resources Control Board: The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities (June 2006)

D. MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS

The purpose of this provision is for the Copermittees to monitor and assess the impact on the conditions of receiving waters caused by discharges from the Copermittees' MS4s under wet weather and dry weather conditions. The goal of the monitoring and assessment program is to inform the Copermittees about the nexus between the health of receiving waters and the water quality condition of the discharges from their MS4s. This goal will be accomplished through monitoring and assessing the conditions of the receiving waters, discharges from the MS4s, pollutant sources and/or stressors, and effectiveness of the water quality improvement strategies implemented as part of the Water Quality Improvement Plans.

1. Receiving Water Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the condition of the receiving waters in each Watershed Management Area during dry weather and wet weather. Following San Diego Water Board acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct long-term receiving water monitoring during implementation of the Water Quality Improvement Plan to assess the long term trends and determine if conditions in receiving waters are improving. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following receiving water monitoring procedures:

a. TRANSITIONAL RECEIVING WATER MONITORING

Until the monitoring requirements and schedules of Provisions D.1.b-e are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following receiving water monitoring in the Watershed Management Area:

(1) Continue the receiving water monitoring programs required in Order Nos. R9-2007-0001 (Monitoring and Reporting Program No. R9-2007-0001 Sections II.A.1-A.5), R9-2009-0002, and R9-2010-0016, unless the Executive Officer provides conditional approval for Copermittees to proceed with implementation of the proposed monitoring and assessment program developed in accordance with Provision B.4;

(2) Continue the monitoring in the Hydromodification Management Plans approved by the San Diego Water Board;

(3) Participate in the following regional receiving water monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring,

(b) Southern California Bight Regional Monitoring, and

(c) Sediment Quality Monitoring;

(4) Implement the monitoring programs developed as part of any implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) for the TMDLs in Attachment E to this Order; and

(5) For Watershed Management Areas with ASBS, implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

b. LONG-TERM RECEIVING WATER MONITORING STATIONS

The Copermittees must select at least one long-term receiving water monitoring station from among the existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees to be representative of the receiving water quality in the Watershed Management Area. Additional long-term receiving water monitoring stations must be selected where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

c. DRY WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three dry weather monitoring events at each of the long-term receiving water monitoring stations. At least one monitoring event must be conducted during the dry season (May 1 – September 30) and at least one monitoring event must be conducted during a dry weather period during the wet season (October 1 – April 30), after the first wet weather event of the season, with an antecedent dry period of at least 72 hours following a storm event producing measureable rainfall of greater than 0.1 inch.

(1) <u>Dry Weather Receiving Water Field Observations</u>

For each dry weather monitoring event, the Copermittees must record field observations consistent with Table D-1 at each long-term receiving water monitoring station.

Table D-1. Field Observations for Receiving Water Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) • Station description (i.e. deposits or stains, vegetation condition, structural condition, and observable biology) • Presence and assessment of trash in and around station

(2) Dry Weather Receiving Water Field Monitoring

For each dry weather monitoring event, if conditions allow the collection of the data, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

Table D-2. Field Monitoring Parameters for Receiving Water Monitoring Stations

Parameters
• pH • Temperature • Specific conductivity • Dissolved oxygen • Turbidity

(3) Dry Weather Receiving Water Analytical Monitoring

For each dry weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable NAL constituents, and

(v) Constituents listed in Table D-3.

Table D-3. Analytical Monitoring Constituents for Receiving Water Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Pesticides	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Mercury • Nickel • Selenium • Thallium • Zinc	• Organophosphate Pesticides • Pyrethroid Pesticides	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(4) Dry Weather Receiving Water Toxicity Monitoring

For each dry weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for aquatic toxicity in accordance with Table D-4. When the State Water Board's Policy for Toxicity Assessment and Control (Toxicity Policy) is approved and in effect, the San Diego Water Board Executive Officer may direct the Copermittees to replace current toxicity program elements with standardized procedures in the Toxicity Policy.

Table D-4. Dry Weather Chronic[1] Toxicity Testing for Receiving Water Monitoring Stations

Organism	Units	Test	USEPA Protocol
Freshwater			
Pimephales promelas (Fathead Minnow)	Pass / Fail	Larval Survival and Growth	EPA-821-R-02-013
Ceriodaphnia dubia (*Daphnid*)	Pass / Fail	Survival and Production	EPA-821-R-02-013
Selenastrum capricornutum (Green Algae)	Pass / Fail	Growth	EPA-821-R-02-013
Marine and Estuarine			
Strongylocentrotus purpuratus *(Purple Sea Urchin)*	Pass / Fail	Embryo-Larval Development	EPA-600-R-95-136

Notes:
1. Chronic toxicity testing is not required at receiving water monitoring stations located at mass loading stations if the channel flows are diverted year-round during dry weather conditions to the sanitary sewer for treatment.

(a) Freshwater Test Species and Methods: If samples are collected in receiving waters with salinity less than 1 ppt, the Copermittees must follow the methods for chronic toxicity tests as established in 40 CFR 136.3 using a single-concentration test design for routine monitoring, or a five-concentration test design for additional toxicity testing if the limitation is exceeded. The Copermittees must estimate the critical life stage chronic toxicity on undiluted samples in accordance with species and short term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms (EPA-821-R-02-013; Table IA, 40 CFR 136). Additional test species may be used by the Copermittees if approved by the San Diego Water Board Executive Officer. The Copermittees must conduct:

(i) A static renewal toxicity test with the fathead minnow, *Pimephales promelas* (Larval Survival and Growth Test Method 1000.0);

(ii) A static renewal toxicity test with the daphnid, *Ceriodaphnia dubia* (Survival and Reproduction Test Method 1002.0); and

(iii) A static renewal toxicity test with the green alga, *Selenastrum capricornutum* (also named *Raphidocelis subcapitata*) (Growth Test Method 1003.0).

(b) Marine and Estuarine Test Species and Methods: If samples are collected in receiving waters with salinity greater or equal to 1 ppt, the Copermittees must follow the methods for chronic toxicity tests as established in 40 CFR 136.3 using a single-concentration test design for routine monitoring, or a five-concentration test design for additional toxicity testing if the limitation is exceeded. The Copermittees must conduct the following critical life state chronic toxicity tests on undiluted samples in accordance with species and short term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms (EPA-600-R-95-136; 1995). Artificial sea salts must be used to increase sample salinity. The Copermittees must conduct a static non-renewal toxicity test with the purple sea urchin, *Strongylocentrotus purpuratus* (Embryo-larval Development Test Method). Additional species may be used by the Copermittees if approved by the San Diego Water Board Executive Officer.

(c) Holding Times: All toxicity tests must be conducted as soon as possible following sample collection. The 36-hour sample holding time for test initiation shall be targeted. However, no more than 72 hours shall elapse before the conclusion of sample collection and test initiation.

(d) Test Species Sensitivity Screening: To determine the most sensitive test species for freshwater, the Copermittees must screen 2 wet weather and 2 dry weather toxicity tests with a vertebrate, an invertebrate, and a plant species. After this screening period, subsequent monitoring must be conducted using the most sensitive test species. Alternatively, if a sensitive test species has already been determined, or if there is prior knowledge of potential toxicant(s) and a test species is sensitive to such toxicant(s), then monitoring must be conducted using only that test species. Sensitive test species determinations must also consider the most sensitive test species used for proximal receiving water monitoring. Rescreening must occur once each permit term.

(e) Chronic toxicity test biological endpoint data must be analyzed using the Test of Significant Toxicity t-test approach specified in *National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document* (USEPA, Office of Wastewater Management, Washington, D.C., EPA-833-R-10-003, 2010). For this monitoring program, the critical chronic instream waste concentration (IWC) is set at 100 percent receiving water (i.e. no dilution) for receiving water samples. A 100 percent receiving water and a control must be tested.

(f) Toxicity Identification Evaluation (TIE) / Toxicity Reduction Evaluation (TRE): If chronic toxicity is detected in receiving waters, the Copermittees must discuss the need for conducting a TIE/TRE in the assessments required under Provision D.4.a.(2), and develop a plan for implementing the TIE/TRE to be incorporated in the Water Quality Improvement Plan.

(5) Dry Weather Receiving Water Bioassessment Monitoring

Bioassessment monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must conduct bioassessment monitoring during at least one dry weather monitoring event at each long-term receiving water monitoring station as follows:

(a) The following bioassessment samples and measurements must be collected:

(i) Macroinvertebrate samples must be collected in accordance with the "Reachwide Benthos (Multihabitat) Procedure" in the most current Surface Water Ambient Monitoring Program (SWAMP) Bioassessment Standard Operating Procedures (SOP), and amendments, as applicable;[13]

(ii) The "Full" suite of physical habitat characterization measurements must be collected in accordance with the most current SWAMP Bioassessment SOP, and as summarized in the SWAMP Stream Habitat Characterization Form – Full Version;[14] and

(iii) Freshwater algae samples must be collected in accordance with the SWAMP Standard Operating Procedures for Collecting Algae Samples.[15] Analysis of samples must include algal taxonomic composition (diatoms and soft algae) and algal biomass.

(b) The bioassessment samples, measurements, and appropriate water chemistry data must be used to calculate the following:

(i) An Index of Biological Integrity (IBI) for macroinvertebrates for each monitoring station where bioassessment monitoring was conducted, based on the most current calculation method;[16] and

[13] Ode, P.R.. 2007. Standard operating procedures for collecting macroinvertebrate samples and associated physical and chemical data for ambient bioassessments in California. California State Water Resources Control Board Surface Water Ambient Monitoring Program (SWAMP) Bioassessment SOP 001. http://www.swrcb.ca.gov/water_issues/programs/swamp/tools.shtml#monitoring

[14] Available at: http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/reports/fieldforms_fullversion052908.pdf

[15] Fetscher et al. 2009. Standard Operating Procedures for Collecting Stream Algae Samples and Associated Physical Habitat and Chemical Data for Ambient Bioassessments in California.

[16] The most current calculation method at the time the Order was adopted is outlined in "A Quantitative Tool for Assessing the Integrity of Southern California Coastal Streams" (Ode, et al. 2005. Environmental Management. Vol. 35, No. 1, pp. 1-13). If an updated or new calculation method is developed, either both (i.e. current and updated/new) methods must be used, or historical IBIs must be recalculated with the updated or new calculation method.

(ii) An IBI for algae for each monitoring station where bioassessment monitoring was conducted, when a calculation method is developed.[17]

(c) In lieu of the requirements of Provision D.1.c.(5)(a), the Copermittees may conduct the bioassessment monitoring in accordance with the "Triad" assessment approach[18] to calculate the IBIs required for Provision D.1.c.(5)(b). The Copermittees must conduct sampling, analysis, and reporting of specified in-stream biological and habitat data according to the protocols specified in the SCCWRP Technical Report No. 539, or subsequent protocols, if developed.

(6) Dry Weather Receiving Water Hydromodification Monitoring

In addition to the hydromodification monitoring conducted as part of the Copermittees' Hydromodification Management Plans, hydromodification monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must collect the following hydromodification monitoring observations and measurements within an appropriate domain of analysis during at least one dry weather monitoring event for each long-term receiving water monitoring station:

(a) Channel conditions, including:

(i) Channel dimensions,

(ii) Hydrologic and geomorphic conditions, and

(iii) Presence and condition of vegetation and habitat;

(b) Location of discharge points;

(c) Habitat integrity;

(d) Photo documentation of existing erosion and habitat impacts, with location (i.e. latitude and longitude coordinates) where photos were taken;

(e) Measurement or estimate of dimensions of any existing channel bed or bank eroded areas, including length, width, and depth of any incisions; and

[17] When a calculation method is developed, IBIs must be calculated for all available and appropriate historical data.
[18] Stormwater Monitoring Coalition Model Monitoring Technical Committee, 2004. Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California. Technical Report #419. August 2004.

(f) Known or suspected cause(s) of existing downstream erosion or habitat impact, including flow, soil, slope, and vegetation conditions, as well as upstream land uses and contributing new and existing development.

d. WET WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three wet weather monitoring events at each long-term receiving water monitoring station. At least one wet weather monitoring event must be conducted during the first wet weather event of the wet season (October 1 – April 30), and at least one wet weather monitoring event during a wet weather event that occurs after February 1.

(1) Wet Weather Receiving Water Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each long-term receiving water monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event;

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(d) Presence and assessment of trash in and around station.

(2) Wet Weather Receiving Water Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

(3) Wet Weather Receiving Water Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) Constituents listed in Table D-3.

(4) <u>Wet Weather Receiving Water Toxicity Monitoring</u>

For each wet weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for chronic aquatic toxicity in accordance with Provisions D.1.c.(4)(a)-(f).

e. OTHER RECEIVING WATER MONITORING REQUIREMENTS

(1) Regional Monitoring

The Copermittees must participate in the following regional receiving waters monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring; and

(b) Southern California Bight Regional Monitoring and

(c) Unified Beach Water Quality Monitoring and Assessment Program. The Orange County Copermittees shall participate in and, together with South Orange County Wastewater Authority and Orange County Health Care Agency, shall share responsibility for implementation of a unified regional beach water quality monitoring and assessment program in south Orange County, as set forth in the October 2014 report, *Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County* , issued pursuant to CWC section 13383 and subject to future revision in the San Diego Water Board December 5, 2014 Letter Directive.

(2) Sediment Quality Monitoring

The Copermittees must perform sediment monitoring to assess compliance with sediment quality receiving water limits applicable to MS4 discharges to enclosed bays and estuaries. The monitoring may be performed either by individual or multiple Copermittees to assess compliance with receiving water limits, or through participation in a water body monitoring coalition. A Sediment Monitoring Plan which satisfies the requirements of the State Water Board's Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part 1 Sediment Quality (Sediment Control Plan) must be submitted as part of the monitoring and assessment program in the Water Quality Improvement Plan.

(a) The Sediment Monitoring Plan design must include the following:

(i) The elements required under Section VII.D (Receiving Water Limits Monitoring Frequency) and Section VII.E (Sediment Monitoring) of the Sediment Control Plan;

(ii) A Quality Assurance Project Plan (QAPP) describing the project objectives and organization, functional activities, and quality assurance/quality control protocols for the water and sediment monitoring; and

(iii) A schedule for completion of all sample collection and analysis activities and submission of Sediment Monitoring Reports.

(b) The Copermittees must implement the Sediment Monitoring Plan in accordance with the schedule contained in the Sediment Monitoring Plan, unless otherwise directed in writing by the San Diego Water Board Executive Officer.

(c) The Copermittees must incorporate a Sediment Monitoring Report as part of the Water Quality Improvement Plan Annual Report in accordance with the schedule contained in the Sediment Monitoring Plan, unless otherwise directed in writing by the San Diego Water Board Executive Officer. The Sediment Monitoring Report must contain the following information:

(i) Analysis: An evaluation, interpretation and tabulation of the water and sediment monitoring data, including interpretations and conclusions as to whether applicable Receiving Water Limitations in this Order have been attained at each sample station;

(ii) Sample Location Map: The locations, type, and number of samples must be identified and shown on a site map; and

(iii) California Environmental Data Exchange Network: A statement certifying that the monitoring data and results have been uploaded into the California Environmental Data Exchange Network (CEDEN).

(d) Based on the Sediment Monitoring Report conclusions the San Diego Water Board may require a human health risk assessment to determine if the human health objective contained in Receiving Water Limitations in Provision A.2.a.(3)(b)(ii) has been attained at each sample station. In conducting a risk assessment, the Copermittees must consider any applicable and relevant information, including California Environmental Protection Agency's (Cal/EPA) Office of Environmental Health Hazard Assessment (OEHHA) policies for fish consumption and risk assessment, Cal/EPA's Department of Toxic Substances Control (DTSC) Risk Assessment, and USEPA Human Health Risk Assessment policies.

(3) <u>ASBS Monitoring</u>

For Watershed Management Areas with ASBS, the Copermittees must implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

f. ALTERNATIVE WATERSHED MONITORING REQUIREMENTS

The San Diego Water Board may direct the Copermittees to participate in an effort to develop alternative watershed monitoring with other regulated entities, other interested parties, and the San Diego Water Board to refine, coordinate, and implement regional monitoring and assessment programs to determine the status and trends of water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams.

2. MS4 Outfall Discharge Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the discharges from the MS4 outfalls in each Watershed Management Area during dry weather and wet weather. Following San Diego Water Board acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct MS4 outfall discharge monitoring during implementation of the Water Quality Improvement Plan to assess the effectiveness of their jurisdictional runoff management programs toward effectively prohibiting non-storm water discharges into the MS4 and reducing pollutants in storm water discharges from their MS4s to the MEP. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following MS4 outfall monitoring procedures:

a. TRANSITIONAL MS4 OUTFALL DISCHARGE MONITORING

Until the monitoring requirements and schedules of Provisions D.2.b-c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following MS4 outfall discharge monitoring in the Watershed Management Area:

(1) <u>MS4 Outfall Discharge Monitoring Station Inventory</u>

Each Copermittee must identify all major MS4 outfalls that discharge directly to receiving waters within its jurisdiction and geo-locate those outfalls on a map of the MS4 pursuant to Provision E.2.b.(1). This information must be compiled into a MS4 outfall discharge monitoring station inventory, and must include the following information:

(a) Latitude and longitude of MS4 outfall point of discharge;

(b) Watershed Management Area;

(c) Hydrologic subarea;

(d) Outlet size;

(e) Accessibility (i.e. safety and without disturbance of critical habitat);

(f) Approximate drainage area; and

(g) Classification of whether the MS4 outfall is known to have persistent dry weather flows, transient dry weather flows, no dry weather flows, or unknown dry weather flows.

(2) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Until the monitoring requirements and schedules of Provision D.2.b are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, each Copermittee must perform dry weather MS4 outfall field screening monitoring to identify non-storm water and illicit discharges within its jurisdiction in accordance with Provision E.2.c, to determine which discharges are transient flows and which are persistent flows, and prioritize the dry weather MS4 discharges that will be investigated and eliminated in accordance with Provision E.2.d.

(a) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Frequency

Each Copermittee must field screen the MS4 outfalls in its inventory developed pursuant to Provision D.2.a.(1) as follows:

(i) For Copermittees with less than 125 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 80 percent of the outfalls must be visually inspected two times per year during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv).

(ii) For Copermittees with 125 major MS4 outfalls or more, but less than or equal to 500 that discharge to receiving waters within a Watershed Management Area, all the outfalls must be visually inspected at least annually during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv).

(iii) For Copermittees with more than 500 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 500 outfalls must be visually inspected at least annually during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv). Copermittees with more than 500 major MS4 outfalls within a Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;

[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(iv) For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major MS4 outfalls within its jurisdiction, at least 500 major MS4 outfalls within its inventory must be visually inspected at least annually during dry weather conditions. Copermittees with more than 500 major MS4 outfalls in more than one Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(v) Inspections of major MS4 outfalls conducted in response to public reports and staff or contractor reports and notifications may count toward the required visual inspections of MS4 outfall discharge monitoring stations.

(b) Transitional Dry Weather MS4 Outfall Discharge Field Screening Visual Observations

(i) An antecedent dry period of at least 72 hours following any storm event producing measurable rainfall greater than 0.1 inch is required prior to conducting field screening visual observations during a field screening monitoring event.

(ii) During the field screening monitoring event, each Copermittee must record visual observations consistent with Table D-5 at each MS4 outfall discharge monitoring station inspected.

Table D-5. Field Screening Visual Observations for MS4 Outfall Discharge Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) - Flow source(s) suspected or identified from non-storm water source investigation - Flow source(s) eliminated during non-storm water source identification • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) - Known or suspected source(s) of pooled or ponded water • Station description (i.e. deposits or stains, vegetation condition, structural condition, observable biology) • Presence and assessment of trash in and around station • Evidence or signs of illicit connections or illegal dumping

(iii) Each Copermittee must implement the requirements of Provisions E.2.d.(2)(c)-(e) based on the field observations required pursuant to Provision D.2.a.(2)(b)(ii).

(iv) Each Copermittee must evaluate field observations together with existing information available from prior reports, inspections and monitoring results to determine whether any observed flowing, pooled, or ponded waters are likely to be transient or persistent flow.[19]

(c) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Records

Based upon the results of the transitional dry weather MS4 outfall discharge field screening monitoring conducted pursuant to Provisions D.2.a.(2)(a)-(b), each Copermittee must update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow.

(3) <u>Transitional Wet Weather MS4 Outfall Discharge Monitoring</u>

Until the monitoring requirements and schedules of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the

[19] Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(a) Transitional Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees must select wet weather MS4 outfall discharge monitoring stations from the inventories developed pursuant to Provision D.2.a.(1) for each Watershed Management Area as follows:

(i) At least five wet weather MS4 outfall discharge monitoring stations that are representative of storm water discharges from areas consisting primarily of residential, commercial, industrial, and typical mixed-use land uses present within the Watershed Management Area;

(ii) At least one wet weather MS4 outfall discharge monitoring station for each Copermittee within the Watershed Management Area; and

(iii) The County of San Diego may select at least two (2) wet weather MS4 outfall discharge monitoring stations for the portion of the Santa Margarita River Watershed Management Area within its jurisdiction to be monitored during the transitional period until the Riverside County Copermittees are notified of coverage under this Order. After the Riverside County Copermittees are notified of coverage under this Order, the Copermittees in the Watershed Management Area must select wet weather MS4 outfall discharge monitoring stations consistent with the requirements above.

(b) Transitional Wet Weather MS4 Outfall Discharge Monitoring Frequency

Each wet weather MS4 outfall discharge monitoring station selected pursuant to Provision D.2.a.(3)(a) must be monitored once during the wet season (October 1 – April 30). The wet weather monitoring events must be selected to be representative of the range of hydrological conditions experienced in the region. At least 10 percent of samples must be conducted during the first wet weather event of the wet season, to include at least one such sample in each Watershed Management Area..

(c) Transitional Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(i) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the

storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(ii) The flow rates and volumes measured or estimated from the MS4 outfall (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(d) Transitional Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(e) Transitional Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, and indicator bacteria;

(iv) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

[a] Time-weighted composites collected over the length of the storm event or the first 24 hour period whichever is shorter, composed of discrete samples, which may be collected through the use of automated equipment, or

[b] Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

[c] If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours;

(v) Only one analysis of the composite of aliquots is required;

(vi) The samples must be analyzed for the following constituents:

[a] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

[b] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and

[c] Constituents listed in Table D-6.

Table D-6. Analytical Monitoring Constituents for Wet Weather MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Nickel • Selenium • Thallium • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(f) Other Transitional Wet Weather MS4 Outfall Discharge Monitoring

The San Diego County Copermittees must continue the wet weather MS4 outfall monitoring program developed under Order No. R9-2007-0001, as approved by the San Diego Water Board, through its planned completion.

b. DRY WEATHER MS4 OUTFALL DISCHARGE MONITORING

Each Copermittee must perform dry weather MS4 outfall monitoring to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. Each Copermittee must conduct the following dry weather MS4 outfall discharge monitoring within its jurisdiction:

(1) Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Each Copermittee must continue to perform the dry weather MS4 outfall discharge field screening monitoring in accordance with the requirements of Provision D.2.a.(2). The Copermittee may adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of persistent flow non-storm water discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of visual inspections performed is equivalent to the number of visual inspections required under Provision D.2.a.(2)(a).

(2) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring

Each Copermittee must perform non-storm water persistent flow MS4 outfall discharge monitoring to determine which persistent non-storm water discharges contain concentrations of pollutants below NALs, and which persistent non-storm water discharges impact receiving water quality during dry weather. Each Copermittee must conduct the following non-storm water persistent flow MS4 outfall discharge monitoring within its jurisdiction:

(a) Prioritization of Non-Storm Water Persistent Flow MS4 Outfalls

Based upon the dry weather MS4 outfall discharge field screening monitoring records developed pursuant to Provision D.2.a.(2)(c), each Copermittee must identify and prioritize the MS4 outfalls with persistent flows based on the highest priority water quality conditions identified in the Water Quality Improvement Plan and any additional criteria developed by the Copermittee, which may include historical data and data from sources other than what the Copermittee collects.

(b) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring Frequency

(i) Based on the prioritization of major MS4 outfalls developed under Provision D.2.b.(2)(a), each Copermittee must identify, at a minimum, the 5 highest priority major MS4 outfalls with non-storm water persistent flows that the Copermittee will monitor within its jurisdiction in each Watershed Management Area. For Responsible Copermittees identified by a TMDL in Attachment E to this Order, if the 5 chosen outfall locations are not sufficient to determine compliance with the TMDL(s), then each Responsible Copermittee must identify additional MS4 outfall monitoring locations within its jurisdiction sufficient to address compliance with the TMDL(s). If a Copermittee has less than 5 major outfalls within a Watershed

Management Area, then the Copermittee must monitor all of its major MS4 outfalls with persistent flows within each Watershed Management Area. The location of the highest priority non-storm water persistent flow MS4 outfall monitoring stations must be identified on the map required pursuant to Provision E.2.b.(1). The map must specify which MS4 outfalls are being monitored for compliance with a TMDL.

(ii) Each of the highest priority non-storm water persistent flow MS4 outfall monitoring stations identified pursuant to Provision D.2.b.(2)(b)(i) must be monitored under dry weather conditions at least semi-annually until one of the following occurs:

[a] The non-storm water discharges have been effectively eliminated (i.e. no flowing, pooled, or ponded water) for three consecutive dry weather monitoring events; or

[b] The source(s) of the persistent flows has been identified as a category of non-storm water discharges that does not require an NPDES permit and does not have to be addressed as an illicit discharge because it was not identified as a source of pollutants (i.e. constituents in non-storm water discharge do not exceed NALs), and the persistent flow can be re-prioritized to a lower priority; or

[c] The constituents in the persistent flow non-storm water discharge do not exceed NALs, and the persistent flow can be re-prioritized to a lower priority; or

[d] The source(s) of the persistent flows has been identified as a non-storm water discharge authorized by a separate NPDES permit.

(iii) Where the criteria under Provision D.2.b.(2)(b)(ii) are not met, but the threat to water quality has been reduced by the Copermittee, the highest priority persistent flow MS4 outfall monitoring stations may be reprioritized accordingly for continued dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1).

(iv) Each Copermittee must document removal or re-prioritization of the highest priority persistent flow MS4 outfall monitoring stations identified under Provision D.2.b.(2)(a) in the Water Quality Improvement Plan Annual Report. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized major MS4 outfall in the Watershed Management Area within its jurisdiction, unless there are no remaining qualifying major MS4 outfalls within the Copermittee's jurisdiction in the Watershed Management Area.

(c) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Observations

During each semi-annual monitoring event, each Copermittee must record field observations consistent with Table D-5 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(d) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Monitoring

During each semi-annual monitoring event, if conditions allow the collection of the data, each Copermittee must monitor and record the parameters in Table D-2 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(e) Non-Storm Water Persistent Flow MS4 Outfall Discharge Analytical Monitoring

During each semi-annual monitoring event in which measurable flow is present, each Copermittee must collect and analyze samples from each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Collect grab or composite samples to be analyzed at a qualified laboratory for the following constituents:

[a] Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,
[b] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,
[c] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,
[d] Applicable NAL constituents, and
[e] Constituents listed in Table D-7. The Copermittees may adjust the list of constituents for the Watershed Management Area if historical data or supporting information can be provided that demonstrates or justifies the analysis of a constituent is not necessary.

Table D-7. Analytical Monitoring Constituents for Persistent Flow MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Total Hardness • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Cadmium • Copper • Lead • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(iv) If the Copermittee identifies and eliminates the source of the persistent flow non-storm water discharge, analysis of the sample is not required.

c. WET WEATHER MS4 OUTFALL DISCHARGE MONITORING

The Copermittees must perform wet weather MS4 outfall monitoring to identify pollutants in storm water discharges from the MS4s, to guide pollutant source identification efforts, and to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order. The Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(1) Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees may adjust the wet weather MS4 outfall discharge monitoring locations in the Watershed Management Area, as needed, to identify pollutants in storm water discharges from MS4s, to guide pollutant source identification efforts, and to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of stations is at least equivalent to the number of stations required under Provision D.2.a.(3)(a). Additional outfall monitoring locations, above the minimum per jurisdiction, may be required to demonstrate compliance with the WQBELs associated with the applicable TMDLs in Attachment E.

(2) Wet Weather MS4 Outfall Discharge Monitoring Frequency

The Copermittees must monitor the wet weather MS4 outfall discharge monitoring stations in the Watershed Management Area at least once (1) per year. The Copermittees may need to increase the frequency of monitoring in order to identify pollutants in storm water discharges from the MS4s causing or contributing to the highest priority water quality conditions, to guide pollutant source identification efforts, or to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order.

(3) Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(4) Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(5) Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites collected over the length of the storm event or the first 24 hour period, whichever is shorter , composed of discrete samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

(iii) If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours.

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) The Copermittees may adjust the analytical monitoring required for the Watershed Management Area, if the Copermittees have historical data or supporting information that can demonstrate or provide justification that the analysis of a constituent is not necessary.

3. Special Studies

a. Within the term of this Order, the Copermittees must initiate the following special studies:

(1) At least two special studies in each Watershed Management Area to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that cause or contribute to highest priority water quality conditions identified in the Water Quality Improvement Plan.

(2) At least one special study for the San Diego Region to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that are impacting receiving waters on a regional basis in the San Diego Region.

(3) One of the two special studies in each Watershed Management Area required pursuant to Provision D.3.a.(1) may be replaced by a special study implemented pursuant to Provision D.3.a.(2).

b. The special studies must, at a minimum, be in conformance with the following criteria:

(1) The special studies must be related to the highest priority water quality conditions identified by the Copermittees in the Watershed Management Area and/or for the entire San Diego Region;

(2) The special studies developed pursuant to Provision D.3.a.(1) must:

(a) Be implemented within the applicable Watershed Management Area, and

(b) Require some form of participation by all the Copermittees within the Watershed Management Area;

(3) The special studies developed pursuant to Provision D.3.a.(2) must:

(a) Be implemented within the San Diego Region, and

(b) Require some form of participation by all Copermittees covered under the requirements of this Order.

(4) The Copermittees are encouraged to partner with environmental groups or third parties knowledgeable of watershed conditions to complete the required special studies.

c. Special studies developed to identify sources of pollutants and/or stressors should be pollutant and/or stressor specific and based on historical monitoring data and monitoring performed pursuant to Provisions D.1 and D.2. Development of source identification special studies should include the following:

(1) A compilation of known information on the specific pollutant and/or stressor, including data on potential sources and movement of the pollutant and/or stressor within the watershed. Data generated by the Copermittees and others, as well as information available from a literature research on the pollutant and/or stressor should be compiled and analyzed as appropriate.

(2) An identification of data gaps, based on the compiled information generated on the specific pollutant and/or stressor identified in Provision D.3.c.(1). Source identification special studies should be developed to fill identified data gaps.

(3) A monitoring plan that will collect and provide data the Copermittees can utilize to do the following:

(a) Quantify the relative loading or impact of a pollutant and/or stressor from a particular source or pollutant generating activity;

(b) Improve understanding of the fate of a pollutant and/or stressor in the environment;

(c) Develop an inventory of known and suspected sources of a pollutant and/or stressor in the Watershed Management Area; and/or

(d) Prioritize known and suspected sources of a pollutant and/or stressor based on relative magnitude in discharges, geographical distribution (i.e., regional or localized), frequency of occurrence in discharges, human health risk, and controllability.

d. Special studies initiated prior to the effective date of this Order that meet the requirements of Provision D.3.b and are implemented during the term of this Order as part of the Water Quality Improvement Plan may be utilized to fulfill the special study requirements of Provision D.3.a. Special studies completed before the effective date of this Order cannot be utilized to fulfill the special study requirements of Provision D.3.a.

e. The Copermittees must submit the monitoring plans for the special studies in the Water Quality Improvement Plans required pursuant to Provision F.1.

f. The Copermittees are encouraged to share the results of the special studies regionally among the Copermittees to provide information useful in improving and adapting the management of non-storm water and storm water runoff through the implementation of the Water Quality Improvement Plans.

4. Assessment Requirements

Each Copermittee must evaluate the data collected pursuant to Provisions D.1, D.2 and D.3, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E, to assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a. Assessments must be performed as described in the following provisions:

a. Receiving Waters Assessments

(1) The Copermittees must assess and report the conditions of the receiving waters in the Watershed Management Area as follows:

(a) Based on data collected pursuant to Provision D.1.a, the assessments under Provision D.4.a.(2) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(b) Based on the data collected pursuant to Provisions D.1.a-e, the assessments required under Provision D.4.a.(2) must be included in the Report of Waste Discharge required pursuant to Provision F.5.b.

(2) The Copermittees must assess the status and trends of receiving water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under dry weather and wet weather conditions. For each of the three types of receiving waters in each Watershed Management Area the Copermittees must:

(a) Determine whether or not the conditions of the receiving waters are meeting the numeric goals established pursuant to Provision B.3.a;

(b) Identify the most critical beneficial uses that must be protected to ensure overall health of the receiving water;

(c) Determine whether or not those critical beneficial uses are being protected;

(d) Identify short-term and/or long-term improvements or degradation of those critical beneficial uses;

(e) Determine whether or not the strategies established in the Water Quality Improvement Plan contribute towards progress in achieving the interim and final numeric goals of the Water Quality Improvement Plan; and

(f) Identify data gaps in the monitoring data necessary to assess Provisions D.4.a.(2)(a)-(e).

b. MS4 OUTFALL DISCHARGES ASSESSMENTS

(1) Non-Storm Water Discharges Reduction Assessments

(a) Each Copermittee must assess and report the progress of its illicit discharge detection and elimination program, required to be implemented pursuant to Provision E.2, toward effectively prohibiting non-storm water and illicit discharges into the MS4 within its jurisdiction as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(2), the assessments under Provision D.4.b.(1)(b) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(ii) Based on the data collected pursuant to Provisions D.2.b, the assessments required under Provision D.4.b.(1)(c) must be included in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

(iii) Based on the data collected pursuant to Provisions D.2.b, the assessment required under Provision D.4.b.(1)(c) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.a.(2), each Copermittee must assess and report the following:

(i) Identify the known and suspected controllable sources (e.g. facilities, areas, land uses, pollutant generating activities) of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area;

(ii) Identify sources of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area that have been reduced or eliminated; and

(iii) Identify modifications to the field screening monitoring locations and frequencies for the MS4 outfalls in its inventory necessary to identify and eliminate sources of persistent flow non-storm water discharges pursuant to Provision D.2.b.

(c) Based on the dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1), each Copermittee must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(1)(b);

(ii) Based on the data collected and applicable NALs in the Water Quality Improvement Plan, rank the MS4 outfalls in the Copermittee's jurisdiction according to potential threat to receiving water quality, and produce a prioritized list of major MS4 outfalls for follow-up action to update the Water Quality Improvement Plan, with the goal of eliminating persistent flow non-storm water discharges and/or pollutant loads in order of the ranked priority list through targeted programmatic actions and source investigations;

(iii) For the highest priority major MS4 outfalls with persistent flows that are in exceedance of NALs, identify the known and suspected sources within the Copermittee's jurisdiction in the Watershed Management Area that may cause or contribute to the NAL exceedances;

(iv) Each Copermittee must analyze the data collected pursuant to Provision D.2.b, and utilize a model or other method, to calculate or estimate the non-storm water volumes and pollutant loads collectively discharged from all the major MS4s outfalls in its jurisdiction identified as having persistent dry weather flows during the monitoring year. These calculations or estimates must be updated annually.

[a] Each Copermittee must calculate or estimate the annual non-storm water volumes and pollutant loads collectively discharged from the Copermittee's major MS4 outfalls to receiving waters within the Copermittee's jurisdiction, with an estimate of the percent contribution from each known source for each MS4 outfall;

[b] Each Copermittee must annually identify and quantify (i.e. volume and pollutant loads) sources of non-storm water not subject to the Copermittee's legal authority that are discharged from the Copermittee's major MS4 outfalls to downstream receiving waters.

(v) Each Copermittee must review the data collected pursuant to Provision D.2.b and findings from the assessments required pursuant to Provision D.4.b.(1)(c)(i)-(iv) at least once during the term of this Order to:

[a] Identify reductions and progress in achieving reductions in non-storm water and illicit discharges to the Copermittee's MS4 in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction, with an estimate, if possible, of the non-storm water volume and/or pollutant load reductions attributable to specific water quality strategies implemented by the Copermittee; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittee in the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction.

(vi) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(1)(c)(i)-(v).

(2) <u>Storm Water Pollutant Discharges Reduction Assessments</u>

(a) The Copermittees must assess and report the progress of the water quality improvement strategies, required to be implemented pursuant to Provisions B and E, toward reducing pollutants in storm water discharges from the MS4s within the Watershed Management Area as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(3), the assessments under Provision D.4.b.(2)(b) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(ii) Based on the data collected pursuant to Provisions D.2.c, the assessments required under Provision D.4.b.(2)(c) must be included in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

(iii) Based on the data collected pursuant to Provisions D.2.c, the assessment required under Provisions D.4.b.(2)(c)-(d) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.a.(3) the Copermittees must assess and report the following:

(i) The Copermittees must analyze the monitoring data collected pursuant to Provision D.2.a.(3), and utilize a watershed model or other method, to calculate or estimate the following for each monitoring year:

[a] The average storm water runoff coefficient for each land use type within the Watershed Management Area;
[b] The volume of storm water and pollutant loads discharged from each of the Copermittee's monitored MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch;
[c] The total flow volume and pollutant loadings discharged from the Copermittee's jurisdiction within the Watershed Management Area over the course of the wet season, extrapolated from the data produced from the monitored MS4 outfalls; and
[d] The percent contribution of storm water volumes and pollutant loads discharged from each land use type within each hydrologic subarea with a major MS4 outfall to receiving waters or within each major MS4 outfall to receiving waters in the Copermittee's jurisdiction within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch.

(ii) Identify modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify pollutants in storm water discharges from the MS4s in the Watershed Management Area pursuant to Provision D.2.c.(1).

(c) Based on the wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.c the Copermittees must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(2)(b);

(ii) Based on the data collected and applicable SALs in the Water Quality Improvement Plan, analyze and compare the monitoring data to the analyses and assumptions used to develop the Water Quality Improvement Plans, including strategies developed pursuant to Provision B.3, and evaluate whether those analyses and assumptions should be updated as a component of the adaptive management efforts pursuant to Provision B.5 for follow-up action to update the Water Quality Improvement Plan;

(iii) The Copermittees must review the data collected pursuant to Provision D.2.c and findings from the assessments required pursuant to Provisions D.4.b.(2)(c)(i)-(ii) at least once during the term of this Order to:

[a] Identify reductions or progress in achieving reductions in pollutant concentrations and/or pollutant loads from different land uses and/or drainage areas discharging from the Copermittees' MS4s in the Watershed Management Area;
[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed

Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters within the Watershed Management Area to the MEP, with an estimate, if possible, of the pollutant load reductions attributable to specific water quality strategies implemented by the Copermittees; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittees in the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters in the Watershed Management Area to the MEP.

(iv) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(iii).

(d) The Copermittees must evaluate all the data collected pursuant to Provision D.2.c, and incorporate new outfall monitoring data into time series plots for each long-term monitoring constituent for the Watershed Management Area, and perform statistical trends analysis on the cumulative long-term wet weather MS4 outfall discharge water quality data set.

c. Special Studies Assessments

The Copermittees must annually evaluate the results and findings from the special studies developed and implemented pursuant to Provision D.3, and assess their relevance to the Copermittees' efforts to characterize receiving water conditions, understand sources of pollutants and/or stressors, and control and reduce the discharges of pollutants from the MS4 outfalls to receiving waters in the Watershed Management Area. The Copermittees must report the results of the special studies assessments applicable to the Watershed Management Area, and identify any necessary modifications or updates to the Water Quality Improvement Plan based on the results in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

d. Integrated Assessment of Water Quality Improvement Plan

As part of the iterative approach and adaptive management process required for the Water Quality Improvement Plan pursuant to Provision B.5, the Copermittees in each Watershed Management Area must integrate the data collected pursuant to Provisions D.1-D.3, the findings from the assessments required pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to assess the effectiveness of, and identify necessary modifications to, the Water Quality Improvement Plan as follows:

(1) The Copermittees must re-evaluate the priority water quality conditions and

numeric goals for the Watershed Management Area, as needed, during the term of this Order pursuant to Provision B.5.a. The re-evaluation and recommendations for modifications to the priority water quality conditions, and/or numeric goals and corresponding schedules may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The priority water quality conditions and numeric goals for the Watershed Management Area must be re-evaluated as follows:

(a) Re-evaluate the receiving water conditions in the Watershed Management Area in accordance with Provision B.2.a;

(b) Re-evaluate the impacts on receiving waters in the Watershed Management Area from MS4 discharges in accordance with Provision B.2.b;

(c) Re-evaluate the identification of MS4 sources of pollutants and/or stressors in accordance with Provision B.2.d;

(d) Identify beneficial uses of the receiving waters that are protected in accordance with Provision D.4.a;

(e) Evaluate the progress toward achieving the interim and final numeric goals for protecting impacted beneficial uses in the receiving waters.

(2) The Copermittees must re-evaluate the water quality improvement strategies for the Watershed Management Area during the term of this Order pursuant to Provision B.5.b. The re-evaluation and recommendations for modifications to the water quality improvement strategies and schedules may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The water quality improvement strategies for the Watershed Management Area must be re-evaluated as follows:

(a) Identify the non-storm water and storm water pollutant loads from the Copermittees' MS4 outfalls in the Watershed Management Area, calculated or estimated pursuant to Provisions D.4.b;

(b) Identify the non-storm water and storm water pollutant load reductions, or other improvements to receiving water or water quality conditions, that are necessary to attain the interim and final numeric goals identified in the Water Quality Improvement Plan for protecting beneficial uses in the receiving waters;

(c) Identify the non-storm water and storm water pollutant load reductions, or other improvements to the quality of MS4 discharges, that are necessary

for the Copermittees to demonstrate that non-storm water and storm water discharges from their MS4s are not causing or contributing to exceedances of receiving water limitations;

(d) Evaluate the progress of the water quality improvement strategies toward achieving the interim and final numeric goals identified in the Water Quality Improvement Plan for protecting beneficial uses in the receiving waters.

(3) The Copermittees must re-evaluate and adapt the water quality monitoring and assessment program for the Watershed Management Area when new information becomes available to improve the monitoring and assessment program pursuant to Provision B.5.c. The re-evaluation and recommendations for modifications to the monitoring and assessment program may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. Modifications to the water quality monitoring and assessment program must be consistent with the requirements of Provision D.1-D.3. The re-evaluation of the water quality monitoring and assessment program for the Watershed Management Area must consider the data gaps identified by the assessments required pursuant to Provisions D.4.a-b, and results of the special studies implemented pursuant to Provision D.4.c.

5. Monitoring Provisions

Each Copermittee must comply with all the monitoring, reporting, and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

E. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS

The purpose of this provision is for each Copermittee to implement a program to control the contribution of pollutants to and the discharges from the MS4 within its jurisdiction. The goal of the jurisdictional runoff management programs is to implement strategies that effectively prohibit non-storm water discharges to the MS4 and reduce the discharge of pollutants in storm water to the MEP. This goal will be accomplished through implementing the jurisdictional runoff management programs in accordance with the strategies identified in the Water Quality Improvement Plans.

Each Copermittee must update its jurisdictional runoff management program document, in accordance with Provision F.2.a, to incorporate all the requirements of Provision E. Until the Copermittee has updated its jurisdictional runoff management program document with the requirements of Provision E, the Copermittee must continue implementing its current jurisdictional runoff management program.

1. Legal Authority Establishment and Enforcement

a. Each Copermittee must establish, maintain, and enforce adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 through statute, ordinance, permit, contract, order, or similar means. This legal authority must, at a minimum, authorize the Copermittee to:

(1) Prohibit and eliminate all illicit discharges and illicit connections to its MS4;

(2) Control the contribution of pollutants in discharges of runoff associated with industrial and construction activity to its MS4 and control the quality of runoff from industrial and construction sites, including industrial and construction sites which have coverage under the statewide General Permit for Discharges of Storm Water Associated with Industrial Activities (Industrial General Permit) or General Permit for Discharges of Storm Water Associated with Construction Activities (Construction General Permit), as well as to those sites which do not;

(3) Control the discharge of spills, dumping, or disposal of materials other than storm water into its MS4;

(4) Control through interagency agreements among Copermittees the contribution of pollutants from one portion of the MS4 to another portion of the MS4;

(5) Control, by coordinating and cooperating with other owners of the MS4 such as Caltrans, the U.S. federal government, or sovereign Native American Tribes through interagency agreements, where possible, the contribution of pollutants from their portion of the MS4 to the portion of the MS4 within the Copermittee's jurisdiction;

(6) Require compliance with conditions in its statutes, ordinances, permits, contracts, orders, or similar means to hold dischargers to its MS4 accountable for their contributions of pollutants and flows;

(7) Require the use of BMPs to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(8) Require documentation on the effectiveness of BMPs implemented to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(9) Utilize enforcement mechanisms to require compliance with its statutes, ordinances, permits, contracts, orders, or similar means; and

(10) Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with its statutes, ordinances, permits, contracts, orders, or similar means and with the requirements of this Order, including the prohibition of illicit discharges and connections to its MS4; the Copermittee must also have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from industrial facilities, including construction sites, discharging into its MS4.

b. With the first Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3), each Copermittee must submit a statement certified by its Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative that the Copermittee has taken the necessary steps to obtain and maintain full legal authority within its jurisdiction to implement and enforce each of the requirements contained in this Order.

2. Illicit Discharge Detection and Elimination

Each Copermittee must implement a program to actively detect and eliminate illicit discharges and improper disposal into the MS4, or otherwise require the discharger to apply for and obtain a separate NPDES permit. The illicit discharge detection and elimination program must be implemented in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include, at a minimum, the following requirements:

a. NON-STORM WATER DISCHARGES

Each Copermittee must address all non-storm water discharges as illicit discharges unless a non-storm water discharge is either identified as a discharge authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to the following requirements:

(1) Discharges of non-storm water to the MS4 from the following categories must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG919001 (Order No. R9-2007-0034, or subsequent order) for discharges to San Diego Bay, or NPDES Permit No. CAG919002 (Order No. R9-2008-0002, or subsequent order) for discharges to surface waters other than San Diego Bay:

(1) Uncontaminated pumped ground water;

(2) Discharges from foundation drains;[20]

(3) Water from crawl space pumps; and

(4) Water from footing drains.[20]

(2) Discharges of non-storm water from water line flushing and water main breaks to the MS4 must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG 679001 (Order No. R9-2010-0003 or subsequent order). This category includes water line flushing and water main break discharges from water purveyors issued a water supply permit by the California Department of Public Health or federal military installations. Discharges from recycled or reclaimed water lines to the MS4 must be addressed as illicit discharges, unless the discharges have coverage under a separate NPDES permit.

(3) Discharges of non-storm water to the MS4 from the following categories must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a source of pollutants to receiving waters:

(a) Diverted stream flows;

(b) Rising ground waters;

(c) Uncontaminated ground water infiltration to MS4s;

(d) Springs;

(e) Flows from riparian habitats and wetlands;

(f) Discharges from potable water sources;

[20] Provision E.2.a.(1) only applies to this category of non-storm water if the system is designed to be located at or below the groundwater table to actively or passively extract groundwater during any part of the year.

(g) Discharges from foundation drains;[21] and

(h) Discharges from footing drains.[21]

(4) Discharges of non-storm water to the MS4 from the following categories must be controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means. Discharges of non-storm water to the MS4 from the following categories not controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means must be addressed by the Copermittee as illicit discharges.

(a) Air conditioning condensation

The discharge of air conditioning condensation should be directed to landscaped areas or other pervious surfaces, or to the sanitary sewer, where feasible.

(b) Individual residential vehicle washing

(i) The discharge of wash water should be directed to landscaped areas or other pervious surfaces where feasible; and

(ii) The minimization of water, washing detergent and other vehicle wash products used for residential vehicle washing, and the implementation of other practices or behaviors that will prevent the discharge of pollutants associated with individual residential vehicle washing from entering the MS4 must be encouraged.

(c) Dechlorinated swimming pool discharges

(i) Residual chlorine, algaecide, filter backwash, or other pollutants from swimming pools must be eliminated prior to discharging to the MS4; and

(ii) The discharge of saline swimming pool water must be directed to the sanitary sewer, landscaped areas, or other pervious surfaces that can accommodate the volume of water, unless the saline swimming pool water can be discharged via a pipe or concrete channel directly to a naturally saline water body (e.g. Pacific Ocean).

(5) Firefighting discharges to the MS4 must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a significant source of pollutants to receiving waters. Firefighting discharges to the MS4 not identified as a significant source of pollutants to receiving waters, must be addressed, at a minimum, as follows:

[21] Provision E.2.a.(3) only applies to this category of non-storm water discharge if the system is designed to be located above the groundwater table at all times of the year, and the system is only expected to discharge non-storm water under unusual circumstances.

(a) Non-emergency firefighting discharges

(i) Building fire suppression system maintenance discharges (e.g. sprinkler line flushing) to the MS4 must be addressed as illicit discharges unless BMPs are implemented to prevent pollutants associated with such discharges to the MS4.

(ii) Non-emergency firefighting discharges (i.e., discharges from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems) must be addressed by a program, to be developed and implemented by the Copermittee, to reduce or eliminate pollutants in such discharges from entering the MS4.

(b) Emergency firefighting discharges

Each Copermittee should develop and encourage implementation of BMPs to reduce or eliminate pollutants in emergency firefighting discharges to the MS4s and receiving waters within its jurisdiction. During emergency situations, priority of efforts should be directed toward life, property, and the environment (in descending order). BMPs should not interfere with immediate emergency response operations or impact public health and safety.

(6) If the Copermittee or San Diego Water Board identifies any category of non-storm water discharges listed under Provisions E.2.a.(1)-(4) as a source of pollutants to receiving waters, the category must be prohibited through ordinance, order, or similar means and addressed as an illicit discharge. Alternatively, the Copermittee may propose controls to be implemented for the category of non-storm water discharges as part of the Water Quality Improvement Plan instead of prohibiting the category of non-storm water discharges, and implement the controls if accepted by the San Diego Water Board as part of the Water Quality Improvement Plan.

(7) Each Copermittee must, where feasible and priorities and resources allow, reduce or eliminate non-storm water discharges listed under Provisions E.2.a.(1)-(4) into its MS4, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit.

b. PREVENT AND DETECT ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to prevent and detect illicit discharges to the MS4:

(1) Each Copermittee must maintain an updated map of its entire MS4 and the corresponding drainage areas. The accuracy of the MS4 map must be confirmed during the field screening required pursuant to Provision E.2.c.

The MS4 map must be included as part of the jurisdictional runoff management program document. Any geographic information system (GIS) layers or files used by the Copermittee to maintain the MS4 map must be made available to the San Diego Water Board upon request. The MS4 map must identify the following:

(a) All segments of the MS4 owned, operated, and maintained by the Copermittee;

(b) All known locations of inlets that discharge and/or collect runoff into the Copermittee's MS4;

(c) All known locations of connections with other MS4s not owned or operated by the Copermittee (e.g. Caltrans MS4s);

(d) All known locations of MS4 outfalls and private outfalls that discharge runoff collected from areas within the Copermittee's jurisdiction;

(e) All segments of receiving waters within the Copermittee's jurisdiction that receive and convey runoff discharged from the Copermittee's MS4 outfalls;

(f) Locations of the MS4 outfalls, identified pursuant to Provision D.2.a.(1), within its jurisdiction; and

(g) Locations of the non-storm water persistent flow MS4 outfall discharge monitoring stations, identified pursuant to Provision D.2.b.(2), within its jurisdiction.

(2) Each Copermittee must use Copermittee personnel and contractors to assist in identifying and reporting illicit discharges and connections during their daily employment activities.

(3) Each Copermittee must promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges to or from the MS4, including the following methods for public reporting:

(a) Operate a public hotline, which can be Copermittee-specific or shared by the Copermittees, and must be capable of receiving reports in both English and Spanish 24 hours per day and seven days per week; and

(b) Designate an e-mail address for receiving electronic reports from the public, which can be Copermittee-specific or shared by the Copermittees, and must be prominently displayed on the Copermittee's webpage and the Regional Clearinghouse required pursuant to Provision F.4.

(4) Each Copermittee must implement practices and procedures (including a notification mechanism) to prevent, respond to, contain, and clean up any spills that may discharge into the MS4 within its jurisdiction from any source. The Copermittee must coordinate, to the extent possible, with spill response teams to prevent entry of spills into the MS4, and prevent contamination of surface water, ground water, and soil. The Copermittee must coordinate spill prevention, containment, and response activities throughout all appropriate Copermittee departments, programs, and agencies.

(5) Each Copermittee must implement practices and procedures to prevent and limit infiltration of seepage from sanitary sewers (including private laterals and failing septic systems) to the MS4.

(6) Each Copermittee must coordinate, when necessary, with upstream Copermittees and/or entities to prevent illicit discharges from upstream sources into the MS4 within its jurisdiction.

c. FIELD SCREENING

Each Copermittee must conduct field screening (i.e. visual observations, field testing, and/or analytical testing) of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4 in accordance with the dry weather MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

d. INVESTIGATE AND ELIMINATE ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to investigate and eliminate illicit discharges to the MS4:

(1) Each Copermittee must prioritize and determine when follow-up investigations will be performed in response to visual observations and/or water quality monitoring data collected during an investigation of a detected non-storm water or illicit discharge to or from the MS4. The criteria for prioritizing investigations must consider the following:

(a) Pollutants identified as causing or contributing to the highest water quality priorities identified in the Water Quality Improvement Plan;

(b) Pollutants identified as causing or contributing, or threatening to cause or contribute to impairments in water bodies on the 303(d) List and/or in environmentally sensitive areas (ESAs), located within its jurisdiction;

(c) Pollutants identified from sources or land uses known to exist within the area, drainage basin, or watershed that discharges to the portion of the MS4 within its jurisdiction included in the investigation;

(d) Pollutants identified as causing or contributing to an exceedance of a NAL in the Water Quality Improvement Plan; and

(e) Pollutants identified as a threat to human health or the environment.

(2) Each Copermittee must implement procedures to investigate and inspect portions of its MS4 that, based on reports or notifications, field screening, or other appropriate information, indicate a reasonable potential of receiving, containing, or discharging pollutants due to illicit discharges, illicit connections, or other sources of non-storm water. The procedures must include the following:

(a) Each Copermittee must develop criteria to:

(i) Assess the validity of each report or notification received; and

(ii) Prioritize the response to each report or notification received.

(b) Each Copermittee must prioritize and respond to each valid report or notification (e.g., public reports, staff or contractor reports and notifications, etc.) of an incident in a timely manner.

(c) In accordance with the requirements of Provision E.2.d.(1), each Copermittee must investigate and seek to identify the source(s) of discharges of non-storm water where flows are observed in and from the MS4 during the field screening required pursuant to Provision D.2.b.(1) as follows:

(i) Obvious illicit discharges must be immediately investigated to identify the source(s) of non-storm water discharges;

(ii) The investigation must include field investigations to identify sources or potential sources for the discharge, unless the source or potential source has already been identified during previous investigations; and

(iii) The investigation may include follow-up field investigations and/or reviewing Copermittee inventories and other land use data to identify potential sources of the discharge.

(d) Each Copermittee must maintain records and a database of the following information:

(i) Location of incident, including hydrologic subarea, portion of MS4 receiving the non-storm water or illicit discharge, and point of discharge or potential discharge from MS4 to receiving water;

(ii) Source of information initiating the investigation (e.g., public reports, staff or contractor reports and notifications, field screening, etc.);

(iii) Date the information used to initiate the investigation was received;

(iv) Date the investigation was initiated;

(v) Dates of follow-up investigations;

(vi) Identified or suspected source of the illicit discharge or connection, if determined;

(vii) Known or suspected related incidents, if any;

(viii) Result of the investigation; and

(ix) If a source cannot be identified and the investigation is not continued, document the response pursuant to the requirements of Provision E.2.d.(4).

(e) Each Copermittee must maintain records and, in accordance with the priorities of the Water Quality Improvement Plan, seek to identify the source(s) of non-storm water discharges from the MS4 where there is evidence of non-storm water having been discharged into or from the MS4 (e.g., pooled water), in accordance with MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

(3) Each Copermittee must initiate the implementation of procedures, in a timely manner, to eliminate all detected and identified illicit discharges and connections within its jurisdiction. The procedures must include the following responses:

(a) Each Copermittee must enforce its legal authority, as required under Provision E.1, to eliminate illicit discharges and connections to the MS4.

(b) If the Copermittee identifies the source as a controllable source of non-storm water or illicit discharge or connection, the Copermittee must implement its Enforcement Response Plan pursuant to Provision E.6 and enforce its legal authority to prohibit and eliminate illicit discharges and connections to its MS4.

(c) If the Copermittee identifies the source of the discharge as a category of non-storm water discharges in Provision E.2.a, and the discharge is in exceedance of NALs in the Water Quality Improvement Plan, then the Copermittee must determine if: (1) this is an isolated incident or set of circumstances that will be addressed through its Enforcement Response Plan pursuant to Provision E.6, or (2) the category of discharge must be addressed through the prohibition of that category of discharge as an illicit discharge pursuant to Provision E.2.a.(6).

(d) If the Copermittee suspects the source of the non-storm water discharge as natural in origin (i.e. non-anthropogenically influenced) and in conveyance into the MS4, then the Copermittee must document and

provide the data and evidence necessary to demonstrate to the San Diego Water Board that it is natural in origin and does not require further investigation.

(e) If the Copermittee is unable to identify and document the source of a recurring non-storm water discharge to or from the MS4, then the Copermittee must address the discharge as an illicit discharge and update its jurisdictional runoff management program to address the common and suspected sources of the non-storm water discharge within its jurisdiction in accordance with the Copermittee's priorities.

(4) Each Copermittee must submit a summary of the non-storm water discharges and illicit discharges and connections investigated and eliminated within its jurisdiction with each Water Quality Improvement Plan Annual Report required under Provision F.3.b.(3) of this Order.

3. Development Planning

Each Copermittee must use their land use and planning authorities to implement a development planning program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. BMP Requirements for All Development Projects

Each Copermittee must prescribe the following BMP requirements during the planning process (i.e. prior to project approval and issuance of local permits) for all development projects (regardless of project type or size), where local permits are issued, including unpaved roads and flood management projects:

(1) General Requirements

(a) Onsite BMPs must be located so as to remove pollutants from runoff prior to its discharge to any receiving waters, and as close to the source as possible;

(b) Structural BMPs must not be constructed within waters of the U.S.

(c) Onsite BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors (e.g. mosquitos, rodents, or flies).

(2) Source Control BMP Requirements

The following source control BMPs must be implemented at all development projects where applicable and feasible:

(a) Prevention of illicit discharges into the MS4;

(b) Storm drain system stenciling or signage;

(c) Protect outdoor material storage areas from rainfall, run-on, runoff, and wind dispersal;

(d) Protect materials stored in outdoor work areas from rainfall, run-on, runoff, and wind dispersal;

(e) Protect trash storage areas from rainfall, run-on, runoff, and wind dispersal; and

(f) Any additional BMPs determined to be necessary by the Copermittee to minimize pollutant generation at each project.

(3) Low Impact Development (LID) BMP Requirements

The following LID BMPs must be implemented at all development projects where applicable and feasible:

(a) Maintenance or restoration of natural storage reservoirs and drainage corridors (including topographic depressions, areas of permeable soils, natural swales, and ephemeral and intermittent streams);[22]

(b) Buffer zones for natural water bodies (where buffer zones are technically infeasible, require project applicant to include other buffers such as trees, access restrictions, etc.);

(c) Conservation of natural areas within the project footprint including existing trees, other vegetation, and soils;

(d) Construction of streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided public safety is not compromised;

(e) Minimization of the impervious footprint of the project;

(f) Minimization of soil compaction to landscaped areas;

(g) Disconnection of impervious surfaces through distributed pervious areas;

[22] Development projects proposing to dredge or fill materials in waters of the U.S. must obtain a CWA Section 401 Water Quality Certification. Projects proposing to dredge or fill waters of the state must obtain waste discharge requirements.

(h) Landscaped or other pervious areas designed and constructed to effectively receive and infiltrate, retain and/or treat runoff from impervious areas, prior to discharging to the MS4;

(i) Small collection strategies located at, or as close as possible to, the source (i.e. the point where storm water initially meets the ground) to minimize the transport of runoff and pollutants to the MS4 and receiving waters;

(j) Use of permeable materials for projects with low traffic areas and appropriate soil conditions;

(k) Landscaping with native or drought tolerant species; and

(l) Harvesting and using precipitation.

b. PRIORITY DEVELOPMENT PROJECTS

Priority Development Projects are land development projects that fall under the planning and building authority of the Copermittee for which the Copermittee must impose specific requirements, in addition to those described in Provision E.3.a, including the implementation of structural BMPs to meet the performance requirements described in Provision E.3.c.

(1) Definition of Priority Development Project

Priority Development Projects include the following:

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(b) Redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site on an existing site of 10,000 square feet or more of impervious surfaces). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(c) New and redevelopment projects that create 5,000 square feet or more of impervious surface (collectively over the entire project site), and support one or more of the following uses:

(i) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812).

(ii) Hillside development projects. This category includes development on any natural slope that is twenty-five percent or greater.

(iii) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce.

(iv) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

(d) New or redevelopment projects that create or replace 2,500 square feet or more of impervious surface (collectively over the entire project site), and discharging directly to an Environmentally Sensitive Area (ESA). "Discharging directly to" includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands).

(e) New development projects that support one or more of the following uses:

(i) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

(ii) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

(f) New or redevelopment projects that result in the disturbance of one or more acres of land and are expected to generate pollutants post construction.

(2) <u>Special Considerations for Redevelopment Projects</u>

The structural BMP performance requirements of Provision E.3.c are applicable to redevelopment Priority Development Projects, as defined in E.3.b.(1), as follows:

(a) Where redevelopment results in the creation or replacement of impervious surface in an amount of less than fifty percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provision E.3.c apply only to the creation or replacement of impervious surface, and not the entire development; or

(b) Where redevelopment results in the creation or replacement of impervious surface in an amount of more than fifty percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provision E.3.c apply to the entire development.

(3) Priority Development Project Exemptions

Each Copermittee has the discretion to exempt the following projects from being defined as Priority Development Projects:

(a) New or retrofit paved sidewalks, bicycle lanes, or trails that meet the following criteria:

(i) Designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas; OR

(ii) Designed and constructed to be hydraulically disconnected from paved streets or roads; OR

(iii) Designed and constructed with permeable pavements or surfaces in accordance with USEPA Green Streets guidance.[23]

(b) Retrofitting or redevelopment of existing paved alleys, streets or roads that are designed and constructed in accordance with the USEPA Green Streets guidance.[24]

c. Priority Development Project Structural BMP Performance Requirements

In addition to the BMP requirements listed for all development projects under Provision E.3.a, Priority Development Projects must also implement structural BMPs that conform to performance requirements described below.

(1) Storm Water Pollutant Control BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite structural BMPs to control pollutants in storm water that may be discharged from a project as follows:

(a) Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite the pollutants contained in the volume of storm water runoff produced from a 24-hour 85th percentile storm event (design capture volume);[25]

[23] See "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).
[24] Ibid.
[25] This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are

(i) If a Copermittee determines that implementing BMPs to retain the full design capture volume onsite for a Priority Development Project is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize biofiltration BMPs. Biofiltration BMPs must be designed to have an appropriate hydraulic loading rate to maximize storm water retention and pollutant removal, as well as to prevent erosion, scour, and channeling within the BMP,[26] and must be sized to:

[a] Treat 1.5 times the design capture volume not reliably retained onsite, OR

[b] Treat the design capture volume not reliably retained onsite with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite.

(ii) If a Copermittee determines that biofiltration is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize flow-thru treatment control BMPs to treat runoff leaving the site, AND mitigate for the design capture volume not reliably retained onsite pursuant to Provision E.3.c.(1)(b). Flow thru treatment control BMPs must be sized and designed to:

[a] Remove pollutants from storm water to the MEP;

[b] Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;

[c] Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Flow-thru treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of flow-thru treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

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encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals.

[26] As part of the Copermittee's update to its BMP Design Manual, pursuant to Provision E.3.d, the Copermittee must provide guidance for hydraulic loading rates and other biofiltration design criteria necessary to maximize storm water retention and pollutant removal.

(b) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1)(a). The Priority Development Project must mitigate for the portion of the pollutant load in the design capture volume not retained onsite if Provision E.3.c.(3) is utilized. If a Priority Development Project is allowed to utilize alternative compliance, flow-thru treatment control BMPs must be implemented to treat the portion of the design capture volume that is not reliably retained onsite. Flow-thru treatment control BMPs must be sized and designed in accordance with Provisions E.3.c.(1)(a)(ii)[a]-[c].

(2) Hydromodification Management BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite BMPs to manage hydromodification that may be caused by storm water runoff discharged from a project as follows:

(a) Post-project runoff conditions (flow rates and durations) must not exceed pre-development runoff conditions by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat downstream of Priority Development Projects).

(i) In evaluating the range of flows that results in increased potential for erosion of natural (non-hardened) channels, the lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks.

(ii) The Copermittees may use monitoring results collected pursuant to Provision D.1.a.(2) to re-define the range of flows resulting in increased potential for erosion, or degraded instream habitat conditions, as warranted by the data.

(b) Each Priority Development Project must avoid critical sediment yield areas known to the Copermittee or identified by the optional Watershed Management Area Analysis pursuant to Provision B.3.b.(4), or implement measures that allow critical coarse sediment to be discharged to receiving waters, such that there is no net impact to the receiving water.

(c) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the performance requirements of Provision E.3.c.(2)(a). The Priority Development Project must mitigate for the post-project runoff conditions not fully managed onsite if Provision E.3.c.(3) is utilized.

(d) Exemptions

Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provisions E.3.c.(2) where the project discharges storm water runoff to:

(i) Existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;

(ii) Conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; or

(iii) An area identified by the Copermittees as appropriate for an exemption by the optional Watershed Management Area Analysis incorporated into the Water Quality Improvement Plan pursuant to Provision B.3.b.(4).

(e) Interim Timeframe Exemptions

Until the Copermittees have updated their BMP Design Manual in accordance with Provision F.2.b with the requirements of Provision E, the Copermittees have the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provision E.3.c.(2) where the project discharges storm water runoff directly to:

(i) An engineered channel conveyance system with a capacity to convey peak flows generated by the 10-year storm event all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; and

(ii) Large river reaches with a drainage area larger than 100 square miles and a 100-year flow capacity in excess of 20,000 cubic feet per second, provided that properly sized energy dissipation is included at all Priority Development Project discharge points.

(3) <u>Alternative Compliance Program to Onsite Structural BMP Implementation</u>

At the discretion of each Copermittee, Priority Development Projects may be allowed to participate in an alternative compliance program in lieu of implementing the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a), provided that the Water Quality Improvement Plan includes the optional Watershed Management Area Analysis described in Provision B.3.b.(4), and Water Quality Equivalency

calculations have been accepted by the San Diego Water Board's Executive Officer pursuant to Provision E.3.c.(3)(a). The alternative compliance program is available to a Priority Development Project only if the Priority Development Project applicant enters into a voluntary agreement with the Copermittee authorizing this arrangement. In addition to the voluntary agreement, relief from implementing structural BMPs onsite may be authorized by the Copermittee under the following conditions:

(a) Water Quality Equivalency

Copermittees must submit Water Quality Equivalency calculations for acceptance by the San Diego Water Board's Executive Officer prior to administering an alternative compliance program in order to establish a regional and technical basis for determining the water quality benefits associated with alternative compliance projects. Accepted Water Quality Equivalency calculations must be incorporated as part of any Copermittee's alternative compliance program necessary for evaluating Watershed Management Area Analysis candidate projects, project applicant-proposed alternative compliance projects, alternative compliance in lieu fee structures, and alternative compliance water quality credit systems as described in Provisions E.3.c.(3)(b)-(e).

(b) Watershed Management Area Analysis Candidate Projects

The Priority Development Project applicant agrees to fund, contribute funds to, or implement a candidate project identified by the Copermittees in the Watershed Management Area Analysis included in the Water Quality Improvement Plan, pursuant to Provisions B.3.b.(4) subject to the following conditions:

(i) The Copermittee must determine that implementation of the candidate project will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a) onsite;

(ii) If the Priority Development Project applicant chooses to fully or partially fund a candidate project, then the in-lieu fee structure described in Provision E.3.c.(3)(c) must be followed;

(iii) If the Priority Development Project applicant chooses to fully or partially fund a candidate project, then the Copermittee must ensure that the funds to be obtained from the Priority Development Project applicant are sufficient to mitigate for impacts caused by not fully implementing structural BMPs onsite, pursuant to the performance requirements described in Provisions E.3.c.(1) and E.3.c.(2)(a);

(iv) If the Priority Development Project applicant chooses to implement a candidate project, then the Copermittee must ensure that pollutant

control and/or hydromodification management within the candidate project are sufficient to mitigate for impacts caused by not implementing structural BMPs fully onsite, pursuant to the performance requirements described in Provisions E.3.c.(1) and E.3.c.(2)(a);

(v) The voluntary agreement to fund, partially fund, or implement a candidate project must include reliable sources of funding for operation and maintenance of the candidate project;

(vi) Design of the candidate project must be conducted under an appropriately qualified engineer, geologist, architect, landscape architect, or other professional, licenses where applicable, and competent and proficient in the fields pertinent to the candidate project design;

(vii) The candidate project must be constructed as soon as possible, but no later than 4 years after the certificate of occupancy is granted for the first Priority Development Project that contributed funds toward the construction of the candidate project, unless a longer period of time is authorized by the San Diego Water Board Executive Officer; and

(viii) If the candidate project is constructed after the Priority Development Project is constructed, the Copermittee must require temporal mitigation for pollutant loads and altered flows that are discharged from the Priority Development Project.

(c) Project Applicant Proposed Alternative Compliance Projects

The Copermittee may allow a Priority Development Project applicant to propose and fund, contribute funds to, or implement an alternative compliance project not identified by the Watershed Management Area Analysis included in the Water Quality Improvement Plan pursuant to Provisions B.3.b.(4). This option is allowed provided the Copermittee determines that implementation of the alternative compliance project will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a) onsite, and is subject to the requirements described in Provisions E.3.c.(3)(a)(ii)-(viii).

(d) Alternative Compliance In-Lieu Fee Structure

If a Copermittee chooses to allow a Priority Development Project applicant to fund, or partially fund a candidate project or an alternative compliance project, then the Copermittee must develop and implement an in-lieu fee structure. This may be developed individually or with other Copermittees and/or entities, as a means for designing, developing, constructing, operating and maintaining offsite alternative compliance projects. The in-

lieu fee must be transferred to the Copermittee (for public projects) or an escrow account (for private projects) prior to the construction of the Priority Development Project.

(e) Alternative Compliance Water Quality Credit System Option

The Copermittee may develop and implement an alternative compliance water quality credit system option, individually or with other Copermittees and/or entities, provided that such a credit system clearly exhibits that it will not allow discharges from Priority Development Projects to cause or contribute to a net impact over and above the impact caused by projects meeting the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a). Any credit system that a Copermittee chooses to implement must be submitted to the San Diego Water Board Executive Officer for review and acceptance as part of the Water Quality Improvement Plan.

(4) Long-Term Structural BMP Maintenance

Each Copermittee must require the project applicant to submit proof of the mechanism under which ongoing long-term maintenance of all structural BMPs will be conducted.

(5) Infiltration and Groundwater Protection

(a) Structural BMPs designed to primarily function as large, centralized infiltration devices (such as large infiltration trenches and infiltration basins) must not cause or contribute to an exceedance of an applicable groundwater quality objective. At a minimum, such infiltration BMPs must be in conformance with the design criteria listed below, unless the development project applicant demonstrates to the Copermittee that one or more of the specific design criteria listed below are not necessary to protect groundwater quality. The design criteria listed below do not apply to small infiltration systems dispersed throughout a development project.

(i) Runoff must undergo pretreatment such as sedimentation or filtration prior to infiltration;

(ii) Pollution prevention and source control BMPs must be implemented at a level appropriate to protect groundwater quality at sites where infiltration BMPs are to be used;

(iii) Infiltration BMPs must be adequately maintained to remove pollutants in storm water to the MEP;

(iv) The vertical distance from the base of any infiltration BMP to the seasonal high groundwater mark must be at least 10 feet. Where groundwater basins do not support beneficial uses, this vertical

distance criteria may be reduced, provided groundwater quality is maintained;

(v) The soil through which infiltration is to occur must have physical and chemical characteristics (e.g., appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses;

(vi) Infiltration BMPs must not be used for areas of industrial or light industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee, unless source control BMPs to prevent exposure of high threat activities are implemented, or runoff from such activities is first treated or filtered to remove pollutants prior to infiltration; and

(vii) Infiltration BMPs must be located a minimum of 100 feet horizontally from any water supply wells.

(b) The Copermittee may develop, individually or with other Copermittees, alternative mandatory design criteria to that listed above for infiltration BMPs which are designed to primarily function as centralized infiltration devices. Before implementing the alternative design criteria in the development planning process the Copermitee(s) must:

(i) Notify the San Diego Water Board of the intent to implement the alternative design criteria submitted; and

(ii) Comply with any conditions set by the San Diego Water Board.

d. BMP DESIGN MANUAL UPDATE

Each Copermittee must update its BMP Design Manual[27] pursuant to Provision F.2.b. Until the Copermittee has updated its BMP Design Manual with the requirements of Provisions E.3.a-c, the Copermittee must continue implementing its current BMP Design Manual. Unless directed otherwise by the San Diego Water Board, the Copermittee must implement the BMP Design Manual within 180 days of completing the update. The update of the BMP Design Manual must include the following:

(1) Updated procedures to determine the nature and extent of storm water requirements applicable to a potential development or redevelopment projects. These procedures must inform project applicants of the storm water management requirements applicable to their project including, but not limited to, general requirements for all development projects, structural BMP design procedures and requirements, hydromodification management requirements,

[27] The BMP Design Manual was formerly known as the Standard Storm Water Mitigation Plan under Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016.

requirements specific to phased projects, and procedures specific to private developments and public improvement projects;

(2) Updated procedures to identify pollutants and conditions of concern for selecting the most appropriate structural BMPs that consider, at a minimum, the following:

(a) Receiving water quality (including pollutants for which receiving waters are listed as impaired under the CWA section 303(d) List);

(b) Pollutants, stressors, and/or receiving water conditions that cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(c) Land use type of the project and pollutants associated with that land use type; and

(d) Pollutants expected to be present onsite.

(3) Updated procedures for designing structural BMPs, including any updated performance requirements to be consistent with the requirements of Provision E.3.c for all structural BMPs listed in the BMP Design Manual;

(4) Long-term maintenance criteria for each structural BMP listed in the BMP Design Manual; and

(5) Alternative compliance criteria, in accordance with the requirements under Provision E.3.c.(3), if the Copermittee elects to allow Priority Development Projects within its jurisdiction to utilize alternative compliance.

e. PRIORITY DEVELOPMENT PROJECT BMP IMPLEMENTATION AND OVERSIGHT

Each Copermittee must implement a program that requires and confirms structural BMPs on all Priority Development Projects are designed, constructed, and maintained to remove pollutants in storm water to the MEP.

(1) <u>Structural BMP Approval and Verification Process</u>

(a) Each Copermittee must require and confirm that for all Priority Development Project applications that have not received prior lawful approval by the Copermittee by the effective date of the BMP Design Manual pursuant to Provision E.3.d, the requirements of Provision E.3 must be implemented. For project applications that have received prior lawful approval before the effective date of the BMP Design Manual pursuant to Provision E.3.d, the Copermittee may allow previous land development requirements to apply.

(b) Each Copermittee must identify the roles and responsibilities of its various municipal departments in implementing the structural BMP requirements, including each stage of a project from application review and approval through BMP maintenance and inspections.

(c) Each Copermittee must require and confirm that appropriate easements and ownerships are properly recorded in public records and the information is conveyed to all appropriate parties when there is a change in project or site ownership.

(d) Each Copermittee must require and confirm that prior to occupancy and/or intended use of any portion of the Priority Development Project, each structural BMP is inspected to verify that it has been constructed and is operating in compliance with all of its specifications, plans, permits, ordinances, and the requirements of this Order.

(2) Priority Development Project Inventory and Prioritization

(a) Each Copermittee must develop, maintain, and update at least annually, a watershed-based database to track and inventory all Priority Development Projects and associated structural BMPs within its jurisdiction. Inventories must be accurate and complete beginning from December 2002 for the San Diego County Copermittees, February 2003 for the Orange County Copermittees, and July 2005 for the Riverside County Copermittees. The use of an automated database system, such as GIS, is highly recommended. The database must include, at a minimum, the following information:

(i) Priority Development Project location (address and hydrologic subarea);

(ii) Descriptions of structural BMP type(s);

(iii) Date(s) of construction;

(iv) Party responsible for structural BMP maintenance;

(v) Dates and findings of structural BMP maintenance verifications; and

(vi) Corrective actions and/or resolutions, when applicable.

(b) Each Copermittee must prioritize the Priority Development Projects with structural BMPs within its jurisdiction. The designation of Priority Development Projects as high priority must consider the following:

(i) The highest water quality priorities identified in the Water Quality Improvement Plan;

(ii) Receiving water quality;

(iii) Number and sizes of structural BMPs;

(iv) Recommended maintenance frequency of structural BMPs;

(v) Likelihood of operation and maintenance issues of structural BMPs;

(vi) Land use and expected pollutants generated; and

(vii) Compliance record.

(3) Structural BMP Maintenance Verifications and Inspections

Each Copermittee is required to verify that structural BMPs on each Priority Development Project are adequately maintained, and continue to operate effectively to remove pollutants in storm water to the MEP through inspections, self-certifications, surveys, or other equally effective approaches.

(a) All (100 percent) of the structural BMPs at Priority Development Projects that are designated as high priority must be inspected directly by the Copermittee annually prior to each rainy season;

(b) For verifications performed through a means other than direct Copermittee inspection, adequate documentation must be required by the Copermittee to provide assurance that the required maintenance of structural BMPs at each Priority Development Project has been completed; and

(c) Appropriate follow-up measures (including re-inspections, enforcement, etc.) must be conducted to ensure that structural BMPs at each Priority Development Project continue to reduce pollutants in storm water to the MEP as originally designed.

f. Development Project Enforcement

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all development projects, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

4. Construction Management

Each Copermittee must implement a construction management program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. Project Approval Process

Prior to issuance of any local permit(s) that allows the commencement of construction projects that involve ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff, each Copermittee must:

(1) Require a pollution control plan, construction BMP plan, and/or an erosion and sediment control plan, to be submitted by the project applicant to the Copermittee;

(2) Confirm the pollution control plan, construction BMP plan, and/or erosion and sediment control plan, complies with the local grading ordinance, other applicable local ordinances, and the requirements of this Order;

(3) Confirm the pollution control, construction BMP, and/or erosion and sediment control plan, includes seasonally appropriate and effective BMPs and management measures described in Provision E.4.c, as applicable to the project; and

(4) Verify that the project applicant has obtained coverage under the statewide Construction General Permit (Order 2009-0009-DWQ or subsequent Order), if applicable.

b. CONSTRUCTION SITE INVENTORY AND TRACKING

(1) Each Copermittee must maintain and update, at least quarterly, a watershed-based inventory of all construction projects issued a local permit that allows ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff. The use of an automated database system, such as GIS, is highly recommended. The inventory must include:

(a) Relevant contact information for each site (e.g., name, address, phone, and email for the owner and contractor);

(b) The basic site information including location (address and hydrologic subarea), Waste Discharge Identification (WDID) number (if applicable), size of the site, and approximate area of disturbance;

(c) Whether or not the site is considered a high threat to water quality, as defined in Provision E.4.b.(2) below;

(d) The project start and completion dates;

(e) The required inspection frequency, as defined in the Copermittee's jurisdictional runoff management program document;

(f) The date the Copermittee accepted or approved the pollution control plan, construction BMP plan, and/or erosion and sediment control plan; and

(g) Whether or not there are ongoing enforcement actions administered to the site.

(2) Each Copermittee must identify all construction sites within its jurisdiction that represent a high threat to downstream surface water quality. The designation of construction sites as high threat to water quality must consider the following:

(a) Sites located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Sites located within the same hydrologic subarea and tributary to a water body segment listed as impaired for sediment on the CWA section 303(d) List;

(c) Sites located within, directly adjacent to, or discharging directly to a receiving water within an ESA; and

(d) Other sites determined by the Copermittees or the San Diego Water Board as a high threat to water quality.

c. Construction Site BMP Implementation

Each Copermittee must implement, or require the implementation of effective BMPs to reduce discharges of pollutants in storm water from construction sites to the MEP, and effectively prohibit non-storm water discharges from construction sites into the MS4. These BMPs must be site specific, seasonally appropriate, and construction phase appropriate. BMPs must be implemented at each construction site year round. Dry season BMP implementation must plan for and address unseasonal rain events that may occur during the dry season (May 1 through September 30). Copermittees must implement, or require the implementation of, BMPs in the following categories:

(1) Project Planning;

(2) Good Site Management “Housekeeping”, including waste management;

(3) Non-storm Water Management;

(4) Erosion Control;

(5) Sediment Control;

(6) Run-on and Run-off Control; and

(7) Active/Passive Sediment Treatment Systems, where applicable.

d. CONSTRUCTION SITE INSPECTIONS

Each Copermittee must conduct construction site inspections to require and confirm compliance with its local permits and applicable local ordinances, and the requirements of this Order. Priority for site inspections must consider threat to water quality pursuant to Provision E.4.b as well as the nature of the construction activity, topography, and the characteristics of soils and receiving water quality.

(1) Inspection Frequency

(a) Each Copermittee must conduct inspections at all inventoried sites, including high threat to water quality sites, at an appropriate frequency for each phase of construction to confirm the site reduces the discharge of pollutants in storm water from construction sites to the MEP, and effectively prohibits non-storm water discharges from entering the MS4.

(b) Each Copermittee must establish appropriate inspection frequencies for high threat to water quality sites, and all other sites, for each phase of construction. Inspection frequencies appropriate for addressing the highest water quality priorities identified in the Water Quality Improvement Plan, and for complying with the requirements of this Order must be identified in each Copermittee's jurisdictional runoff management program document.

(c) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e., re-inspection, enforcement) necessary to require and confirm site compliance with its local permits and applicable local ordinances, and the requirements of this Order.

(2) Inspection Content

Inspections of construction sites by the Copermittee must include, at a minimum:

(a) Verification of coverage under the Construction General Permit (Notice of Intent (NOI) and/or WDID number) during initial inspections, when applicable;

(b) Assessment of compliance with its local permits and applicable local ordinances related to pollution prevention, including the implementation and maintenance of applicable BMPs;

(c) Assessment of BMP adequacy and effectiveness;

(d) Visual observations of actual non-storm water discharges;

(e) Visual observations of actual or potential discharge of sediment and/or

construction related materials from the site;

(f) Visual observations of actual or potential illicit connections; and

(g) If any violations are found and BMP corrections are needed, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried construction sites. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Site name, location (address and hydrologic subarea), and WDID number (if applicable);

(b) Inspection date;

(c) Approximate amount of rainfall since last inspection;

(d) Description of problems observed with BMPs and indication of need for BMP addition/repair/replacement and any scheduled re-inspection, and date of re-inspection;

(e) Descriptions of any other specific inspection comments which must, at a minimum, include rationales for longer compliance time;

(f) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(g) Resolution of problems noted and date problems fixed.

e. CONSTRUCTION SITE ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried construction sites, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

5. Existing Development Management

Each Copermittee must implement an existing development management program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. EXISTING DEVELOPMENT INVENTORY AND TRACKING

Each Copermittee must maintain, and update at least annually, a watershed-based inventory of the existing development within its jurisdiction that may discharge a pollutant load to and from the MS4. The use of an automated database system, such as GIS, is highly recommended. The inventory must, at a minimum, include:

(1) Name, location (hydrological subarea and address, if applicable) of the following types of existing development with its jurisdiction:

(a) Commercial facilities or areas;

(b) Industrial facilities;

(c) Municipal facilities, including:

(i) MS4 and related structures;[28]
(ii) Roads, streets, and highways;
(iii) Parking facilities;
(iv) Municipal airfields;
(v) Parks and recreation facilities;
(vi) Flood management facilities, flood control devices and structures;
(vii) Operating or closed municipal landfills;
(viii) Publicly owned treatment works (including water and wastewater treatment plants) and sanitary sewer collection systems;
(ix) Corporate yards, including maintenance and storage yards for materials, waste, equipment, and vehicles;
(x) Hazardous waste collection facilities;
(xi) Other treatment, storage or disposal facilities for municipal waste; and
(xii) Other municipal facilities that the Copermittee determines may contribute a significant pollutant load to the MS4.

[28] The inventory may refer to the MS4 map required to be maintained pursuant to Provision E.2.b.(1).

(d) Residential areas, which may be designated by one or more of the following:

(i) Residential management area;

(ii) Drainage basin or area;

(iii) Land use (e.g., single family, multi-family, rural);

(iv) Neighborhood;

(v) Common Interest Area;

(vi) Home Owner Association;

(vii) Mobile home park; and/or

(viii) Other designations accepted by the San Diego Water Board Executive Officer.

(2) A description of the facility or area, including the following information:

(a) Classification as commercial, industrial, municipal, or residential;

(b) Status of facility or area as active or inactive;

(c) Identification if a business is a mobile business;

(d) SIC Code or NAICS Code, if applicable;

(e) Industrial General Permit NOI and/or WDID number, if applicable;

(f) Identification if a residential area is or includes a Common Interest Area / Home Owner Association, or mobile home park;

(g) Identification of pollutants generated and potentially generated by the facility or area;

(h) Whether the facility or area is adjacent to an ESA;

(i) Whether the facility or area is tributary to and within the same hydrologic subarea as a water body segment listed as impaired on the CWA section 303(d) List and generates pollutants for which the water body segment is impaired; and

(3) An annually updated map showing the location of inventoried existing development, watershed boundaries, and water bodies.

b. EXISTING DEVELOPMENT BMP IMPLEMENTATION AND MAINTENANCE

Each Copermittee must designate a minimum set of BMPs required for all inventoried existing development, including special event venues. The designated minimum BMPs must be specific to facility or area types and pollutant generating activities, as appropriate.

(1) Commercial, Industrial, and Municipal Facilities and Areas

(a) Pollution Prevention

Each Copermittee must require the use of pollution prevention methods by the commercial, industrial, and municipal facilities and areas in its inventoried existing development to address the priorities and strategies in the Water Quality Improvement Plan.

(b) BMP Implementation

Each Copermittee must require the implementation of designated BMPs at commercial facilities and areas, industrial facilities, and implement designated BMPs at municipal facilities in its inventoried existing development.

(c) BMP Operation and Maintenance

(i) Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development.

(ii) Each Copermittee must implement a schedule of operation and maintenance activities for its MS4 and related structures (including but not limited to catch basins, storm drain inlets, detention basins, etc.), and verify proper operation of all its municipal structural treatment controls designed to reduce pollutants (including floatables) in storm water discharges to or from its MS4s and related drainage structures. Operation and maintenance activities may include, but is not limited to, the following:

[a] Inspections of the MS4 and related structures;
[b] Cleaning of the MS4 and related structures; and
[c] Proper disposal of materials removed from cleaning of the MS4 and related structures.

(iii) Each Copermittee must implement a schedule of operation and maintenance for public streets, unpaved roads, paved roads, and paved highways within its jurisdiction to minimize pollutants that can be discharged in storm water.

(iv) Each Copermittee must implement controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers. Copermittees that operate both a municipal sanitary sewer system and a MS4 must implement controls and measures to prevent and eliminate seeping sewage from infiltrating the MS4. Copermittees that do not operate both a municipal sanitary sewer system and a MS4 must coordinate with sewering agencies to keep themselves informed of relevant and appropriate maintenance activities and sanitary sewage projects in their jurisdiction that may cause or contribute to seepage of sewage into the MS4.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must require the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from commercial facilities and areas and industrial facilities, and implement BMPs at municipal facilities in its inventoried existing development. Such BMPs must include, as appropriate, educational activities, permits, certifications and other measures for applicators and distributors.

(2) <u>Residential Areas</u>

(a) Pollution Prevention

Each Copermittee must promote and encourage the use of pollution prevention methods, where appropriate, by the residential areas in its inventoried existing development.

(b) BMP Implementation

Each Copermittee must promote and encourage the implementation of designated BMPs at residential areas in its inventoried existing development.

(c) BMP Operation and Maintenance

Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at residential areas in its inventoried existing development.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must promote and encourage the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the

application, storage, and disposal of pesticides, herbicides and fertilizers from residential areas in its inventoried existing development.

c. Existing Development Inspections

Each Copermittee must conduct inspections of inventoried existing development to ensure compliance with applicable local ordinances and permits, and the requirements of this Order.

(1) Inspection Frequency

(a) Each Copermittee must establish appropriate inspection frequencies for inventoried existing development in accordance with the following requirements:

(i) At a minimum, inventoried existing development must be inspected once every five years utilizing one or more of the following methods:

[a] Drive-by inspections by Copermittee municipal and contract staff;
[b] Onsite inspections by Copermittee municipal and contract staff; and/or
[c] Visual inspections of publicly accessible inventoried facilities or areas by volunteer monitoring or patrol programs that have been trained by the Copermittee;

(ii) The frequency of inspections must be appropriate to confirm that BMPs are being implemented to reduce the discharge of pollutants in storm water from the MS4 to the MEP and effectively prohibit non-storm water discharges to the MS4;

(iii) The frequency of inspections must be based on the potential for a facility or area to discharge non-storm water and pollutants in storm water, and should reflect the priorities set forth in the Water Quality Improvement Plan;

(iv) Each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development;[29] and

(v) Inventoried existing development must be inspected by the Copermittee, as needed, in response to valid public complaints.

(b) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e. education and outreach, re-inspection, enforcement)

[29] If any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspection may count toward the total annual inspection requirement. This requirement excludes linear municipal facilities (i.e., MS4 linear channels, sanitary sewer collection systems, streets, roads and highways).

necessary to require and confirm compliance with its applicable local ordinances and permits and the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

(2) Inspection Content

(a) Inspections of existing development must include, at a minimum:

(i) Visual inspections for the presence of actual non-storm water discharges;

(ii) Visual inspections for the presence of actual or potential discharge of pollutants;

(iii) Visual inspections for the presence of actual or potential illicit connections; and

(iv) Verification that the description of the facility or area in the inventory, required pursuant to Provision E.5.a.(2), has not changed.

(b) Onsite inspections of existing development by the Copermittee must include, at a minimum:

(i) Assessment of compliance with its applicable local ordinances and permits related to non-storm water and storm water discharges and runoff;

(ii) Assessment of the implementation of the designated BMPs;

(iii) Verification of coverage under the Industrial General Permit, when applicable; and

(iv) If any problems or violations are found, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried existing development. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Name and location of the facility or area (address and hydrologic subarea) consistent with the inventory name and location, pursuant to Provision E.5.a.(1);

(b) Inspection and re-inspection date(s);

(c) Inspection method(s) (i.e. drive-by, onsite);

(d) Observations and findings from the inspection(s);

(e) For onsite inspections of existing development by Copermittee municipal or contract staff, the records must also include, as applicable:

(i) Description of any problems or violations found during the inspection(s);

(ii) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(iii) The date problems or violations were resolved.

d. EXISTING DEVELOPMENT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried existing development, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

e. RETROFITTING AND REHABILITATING AREAS OF EXISTING DEVELOPMENT

(1) Retrofitting Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to retrofit areas of existing development within its jurisdiction to address identified sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify areas of existing development as candidates for retrofitting, focusing on areas where retrofitting will address pollutants and/or stressors that contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for retrofitting projects may be utilized to reduce pollutants that may be discharged in storm water from areas of existing development, and/or address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of retrofitting projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting projects; and

(e) Where retrofitting projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional retrofitting projects (i.e. projects that can receive and/or treat storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment) adjacent to and/or downstream of the areas of existing development.

(2) Stream, Channel and/or Habitat Rehabilitation in Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to rehabilitate streams, channels, and/or habitats in areas of existing development within its jurisdiction to address the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify streams, channels, and/or habitats in areas of existing development as candidates for rehabilitation, focusing on areas where stream, channel, and/or habitat rehabilitation projects will address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for stream, channel, and/or habitat rehabilitation projects may be utilized to address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters, rehabilitate channelized or hydromodified streams, restore wetland and riparian habitat, restore watershed functions, and/or restore beneficial uses of receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of stream, channel, and/or habitat rehabilitation projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance stream, channel, and/or habitat rehabilitation projects; and

(e) Where stream, channel, and/or habitat rehabilitation projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional stream, channel, and/or habitat rehabilitation projects (i.e. projects that can receive storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment).

6. Enforcement Response Plans

Each Copermittee must develop and implement an Enforcement Response Plan as part of its jurisdictional runoff management program document. The Enforcement Response Plan must describe the applicable approaches and options to enforce its legal authority established pursuant to Provision E.1, as necessary, to achieve compliance with the requirements of this Order. The Enforcement Response Plan must be in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include the following:

a. Enforcement Response Plan Components

The Enforcement Response Plan must include the following individual components:

(1) Illicit Discharge Detection and Elimination Enforcement Component;

(2) Development Planning Enforcement Component;

(3) Construction Management Enforcement Component; and

(4) Existing Development Enforcement Component.

b. Enforcement Response Approaches and Options

Each component of the Enforcement Response Plan must describe the enforcement response approaches that the Copermittee will implement to compel compliance with its statutes, ordinances, permits, contracts, orders, or similar means, and the requirements of this Order. The description must include the protocols for implementing progressively stricter enforcement responses. The enforcement response approaches must include appropriate sanctions to compel compliance, including, at a minimum, the following tools or their equivalent:

(1) Verbal and written notices of violation;

(2) Cleanup requirements;

(3) Fines;

(4) Bonding requirements;

(5) Administrative and criminal penalties;

(6) Liens;

(7) Stop work orders; and

(8) Permit and occupancy denials.

c. CORRECTION OF VIOLATIONS

(1) Violations must be corrected in a timely manner with the goal of correcting the violations within 30 calendar days after the violations are discovered, or prior to the next predicted rain event, whichever is sooner.

(2) If more than 30 calendar days are required to achieve compliance, then a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

d. ESCALATED ENFORCEMENT

(1) The Enforcement Response Plan must include a definition of "escalated enforcement." Escalated enforcement must include any enforcement scenario where a violation or other non-compliance is determined to cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan. Escalated enforcement may be defined differently for development planning, construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas.

(2) Where the Copermittee determines escalated enforcement is not required, a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

(3) Escalated enforcement actions must continue to increase in severity, as necessary, to compel compliance as soon as possible.

e. REPORTING OF NON-COMPLIANT SITES

(1) Each Copermittee must notify the San Diego Water Board in writing within five (5) calendar days of issuing escalated enforcement (as defined in the Copermittee's Enforcement Response Plan) to a construction site that poses a significant threat to water quality as a result of violations or other non-compliance with its permits and applicable local ordinances, and the

requirements of this Order. Written notification may be provided electronically by email to the appropriate San Diego Water Board staff.

(2) Each Copermittee must notify the San Diego Water Board of any persons required to obtain coverage under the statewide Industrial General Permit and Construction General Permit and failing to do so, within five (5) calendar days from the time the Copermittee become aware of the circumstances. Written notification may be provided electronically by email to R9_Nonfilers@waterboards.ca.gov.

7. Public Education and Participation

Each Copermittee must implement, individually or with other Copermittees, a public education and participation program in accordance with the strategies identified in the Water Quality Improvement Plan to promote and encourage the development of programs, management practices, and behaviors that reduce the discharge of pollutants in storm water to the MEP, prevent controllable non-storm water discharges from entering the MS4, and protect water quality standards in receiving waters. The public education and participation program must be implemented in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include, at a minimum, the following requirements:

a. PUBLIC EDUCATION

The public education program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) Educational activities, public information activities, and other appropriate outreach activities intended to reduce pollutants associated with the application of pesticides, herbicides and fertilizer and other pollutants of concern in storm water discharges to and from its MS4 to the MEP, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed to address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(2) Educational activities, public information activities, and other appropriate outreach activities to facilitate the proper management and disposal of used oil and toxic materials; and

(3) Appropriate education and training measures for specific target audiences, such as construction site operators, residents, underserved target audiences and school-aged children, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed, based on high risk behaviors and pollutants of concern.

b. PUBLIC PARTICIPATION

The public participation program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) A process for members of the public to participate in updating the highest priority water quality conditions, numeric goals, and water quality improvement strategies in the Water Quality Improvement Plan;

(2) Opportunities for members of the public to participate in providing the Copermittee recommendations for improving the effectiveness of the water quality improvement strategies implemented within its jurisdiction; and

(3) Opportunities for members of the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or protection of the quality of receiving waters.

8. Fiscal Analysis

a. Each Copermittee must secure the resources necessary to meet all the requirements of this Order.

b. Each Copermittee must conduct an annual fiscal analysis of its jurisdictional runoff management program in its entirety. The fiscal analysis must include the following:

(1) Identification of the various categories of expenditures necessary to implement the requirements of this Order, including a description of the specific capital, operation and maintenance, and other expenditure items to be accounted for in each category of expenditures;

(2) The staff resources needed and allocated to meet the requirements of this Order, including any development, implementation, and enforcement activities required;

(3) The estimated expenditures for Provisions E.8.b.(1) and E.8.b.(2) for the current fiscal year; and

(4) The source(s) of funds that are proposed to meet the necessary expenditures described in Provisions E.8.b.(1) and E.8.b.(2), including legal restrictions on the use of such funds, for the current fiscal year and next fiscal year.

c. Each Copermittee must submit a summary of the annual fiscal analysis with each Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3).

d. Each Copermittee must provide the documentation used to develop the summary of the annual fiscal analysis upon request by the San Diego Water Board.

F. REPORTING

The purpose of this provision is to determine and document compliance with the requirements set forth in this Order. The goal of reporting is to communicate to the San Diego Water Board and the people of the State of California the implementation status of each jurisdictional runoff management program and compliance with the requirements of this Order. This goal is to be accomplished through the submittal of specific deliverables to the San Diego Water Board by the Copermittees.

1. Water Quality Improvement Plans

The Copermittees for each Watershed Management Area must develop and submit the Water Quality Improvement Plan in accordance with the following requirements:

a. WATER QUALITY IMPROVEMENT PLAN DEVELOPMENT

Each Water Quality Improvement Plan must be developed in accordance with the following process:

(1) Public Participation Process

The Copermittees must implement a public participation process to solicit data, information, and recommendations to be utilized in the development of the Water Quality Improvement Plan. The public participation process must include the following:

(a) The Copermittees must develop a publicly available and noticed schedule of the opportunities for the public to participate and provide comments during the development of the Water Quality Improvement Plan. The schedule may be adjusted as necessary by the Copermittees, provided the public is provided timely notification of the changes to the schedule.

(b) The Copermittees must form a Water Quality Improvement Consultation Panel to provide recommendations during the development of the Water Quality Improvement Plan. The Water Quality Improvement Consultation Panel must consist of at least the following members:

(i) A representative of the San Diego Water Board;

(ii) A representative of the environmental community familiar with the water quality conditions of concern of the receiving waters in the Watershed Management Area, preferably from an environmental interest group associated with a water body within the Watershed Management Area; and

(iii) A representative of the development community familiar with the opportunities and constraints for implementing structural BMPs, retrofitting projects, and stream, channel or habitat rehabilitation

projects in the Watershed Management Area, preferably with relevant engineering, hydrology, and/or geomorphology experience in the Watershed Management Area.

(c) The Copermittees must coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public time and opportunity to participate during the development of the Water Quality Improvement Plans.

(2) Priority Water Quality Conditions

(a) The Copermittees must solicit data, information and recommendations from the public to be utilized in the development and identification of the priority water quality conditions and potential water quality improvement strategies for the Watershed Management Area.

(b) The Copermittees must review the priority water quality conditions the Copermittees plan on including in the Water Quality Improvement Plan with the Water Quality Improvement Consultation Panel to receive recommendations or concurrence.

(c) The Copermittees must consider revisions to the priority water quality conditions based on recommendations from the Water Quality Improvement Consultation Panel.

(d) The Copermittees must include all the potential water quality improvement strategies identified by the public and the Water Quality Improvement Consultation Panel with the submittal of the priority water quality conditions to the San Diego Water Board.

(e) The Copermittees must submit the Water Quality Improvement Plan requirements of Provision B.2 to the San Diego Water Board as early as 6 months and no later than 12 months after the commencement of coverage under this Order. Upon receipt, the San Diego Water Board will issue a public notice and release the proposed priority water quality conditions and potential water quality improvement strategies for public review and comment for a minimum of 30 days.

(f) The Copermittees must consider revisions to the priority water quality conditions and potential water quality improvement strategies developed pursuant to Provision B.2 based on public comments received by the close of the comment period.

(3) Water Quality Improvement Goals, Strategies and Schedules

(a) The Copermittees must solicit recommendations from the public on potential numeric goals for the highest priority water quality conditions identified for the Watershed Management Area, and recommendations on the strategies that should be implemented to achieve the potential numeric goals.

(b) The Copermittees must consult with the Water Quality Improvement Consultation Panel and consider revisions to the following items based on the Panel's recommendations:

(i) The numeric goals and schedules the Copermittees propose to include in the Water Quality Improvement Plan;

(ii) The water quality improvement strategies and schedules the Copermittees propose to implement in the Watershed Management Area and include in the Water Quality Improvement Plan; and

(iii) If the Copermittees choose to implement Provision B.3.b.(4), the results of the Watershed Management Area Analysis the Copermittees proposed to incorporate into the Water Quality Improvement Plan.

(c) The Copermittees must submit the Water Quality Improvement Plan requirements of Provision B.3 to the San Diego Water Board as early as 9 months and no later than 18 months after the commencement of coverage under this Order. Upon receipt, the San Diego Water Board will issue a public notice and release the proposed water quality improvement goals, strategies and schedules for public review and comment for a minimum of 30 days.

(d) The Copermittees must consider revisions to the water quality improvement goals, strategies and schedules developed pursuant to Provision B.3 based on public comments received by the close of the comment period.

b. WATER QUALITY IMPROVEMENT PLAN SUBMITTAL AND IMPLEMENTATION

(1) Within 24 months after the commencement of coverage under this Order, the Copermittees for each Watershed Management Area must submit a complete Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order to the San Diego Water Board. The San Diego Water Board will issue a public notice and release the Water Quality Improvement Plan for public review and comment for a minimum of 30 days.

(2) The Copermittees must consider revisions to the Water Quality Improvement Plan based on written comments received by the close of the public comment period.

(3) The Copermittees must promptly submit any revisions to the Water Quality Improvement Plan to the San Diego Water Board no later than 60 days after the close of the public comment period.

(4) If issues concerning the Water Quality Improvement Plan are resolved informally through discussions among the Copermittees, the San Diego Water Board and interested parties, the San Diego Water Board Executive Officer may provide written notification of acceptance to the Copermittees that the Water Quality Improvement Plan meets the requirements of Provision B. However, if the Executive Officer determines that significant issues with the Water Quality Improvement Plan remain, the matter will be scheduled for San Diego Water Board consideration at a public meeting.

(5) The Copermittees must commence with implementation of the Water Quality Improvement Plan, in accordance with the water quality improvement strategies and schedules therein, upon written notification of acceptance with the Water Quality Improvement Plan by the San Diego Water Board Executive Officer.

(6) During implementation of the Water Quality Improvement Plan the Copermittees must correct any deficiencies in the Plan identified by the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report following a request by the Board to do so.

(7) The Water Quality Improvement Plan must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of receiving notification of acceptance with the Water Quality Improvement Plan by the San Diego Water Board Executive Officer.

2. Updates

a. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATES

Each Copermittee must update its jurisdictional runoff management program document in accordance with the following requirements:

(1) Each Copermittee is encouraged to seek public and key stakeholder participation and comments, as early and often as possible during the process of developing updates to its jurisdictional runoff management program document;

(2) Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E concurrent with the submittal of the Water Quality Improvement Plan. Each Copermittee must correct any deficiencies in the jurisdictional runoff management program document based on comments received from the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report;

(3) Each Copermittee must submit updates to its jurisdictional runoff management program, with the supporting rationale for the modifications, either in the Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b;

(4) The Copermittee must revise proposed modifications to its jurisdictional runoff management program as directed by the San Diego Water Board Executive Officer; and

(5) Updated jurisdictional runoff management program documents must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of submitting the Water Quality Improvement Plan Annual Report.

b. BMP DESIGN MANUAL UPDATES

Each Copermittee must update its BMP Design Manual in accordance with the following requirements:

(1) Each Copermittee must update its BMP Design Manual to incorporate the requirements of Provisions E.3.a-d concurrent with the submittal of the Water Quality Improvement Plan. Each Copermittee must correct any deficiencies in the BMP Design Manual based on comments received from the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report;

(2) Subsequent updates to the BMP Design Manual must be consistent with the requirements of Provisions E.3.a-d and must be submitted as part of the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b; and

(3) Updated BMP Design Manuals must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of completing the update.

c. WATER QUALITY IMPROVEMENT PLAN UPDATES

(1) The Water Quality Improvement Plans must be updated in accordance with the following process:

(a) The Copermittees must develop and implement a public participation process to obtain data, information and recommendations for updating the Water Quality Improvement Plan. The public participation process must provide for a publicly available and noticed schedule of opportunities for the public to participate and provide comments during the development of updates to the Water Quality Improvement Plan;

(b) The Copermittees must consult with the Water Quality Improvement Consultation Panel on proposed updates of the Water Quality Improvement Plan, and consider the Water Quality Improvement Consultation Panel's recommendations in finalizing the proposed updates;

(c) The Copermittees for each Watershed Management Area must submit 1) proposed updates to the Water Quality Improvement Plan and supporting rationale, and 2) recommendations received from the public and the Water Quality Improvement Consultation Panel and the rationale for the requested updates, either in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The updates submitted will be deemed accepted for inclusion in the Water Quality Improvement Plan ninety (90) days after submission unless otherwise directed in writing by the San Diego Water Board Executive Officer;

(d) The Copermittees must revise the requested updates as directed by the San Diego Water Board Executive Officer; and

(e) Updated Water Quality Improvement Plans must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance of the requested updates by the San Diego Water Board.

(2) No later than six months following Office of Administrative Law and USEPA approval of any TMDL Basin Plan amendment with wasteload allocations (WLAs) assigned to the Copermittees during the term of this Order, the Copermittees must initiate an update to the applicable Water Quality Improvement Plans in accordance with Provision F.1 or Provision F.2.c.(1) to incorporate the requirements of the TMDL WLAs.

3. Progress Reporting

a. Progress Report Presentations

The Copermittees for each Watershed Management Area must periodically appear before the San Diego Water Board, as requested by the Board, to provide progress reports on the implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs.

b. Annual Reports

(1) Transitional Jurisdictional Runoff Management Program Annual Reports

(a) Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) no later than October 31 of each year for each jurisdictional runoff management program reporting period (i.e. July 1 to June 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted.

(b) Each Copermittee must submit the information on the Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) specific to the area within its jurisdiction in each Watershed Management Area.

(c) In addition to submitting the Jurisdictional Runoff Management Program Annual Report Form during the transitional reporting period, each Copermittee may continue to utilize and submit the jurisdictional runoff management program annual reporting format of its previous NPDES permit until the first Water Quality Improvement Plan Annual Report is required to be submitted.

(2) Transitional Monitoring and Assessment Program Annual Reports

The Copermittees for each Watershed Management Area must submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted under this Order. The Transitional Monitoring and Assessment Program Annual Reports must include:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1.a and D.2.a, summarized and presented in tabular and graphical form; and

(b) The findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

(3) Water Quality Improvement Plan Annual Reports

The Copermittees for each Watershed Management Area must submit a Water Quality Improvement Plan Annual Report for each reporting period no later than January 31 of the following year. The annual reporting period consists of two different periods: 1) July 1 to June 30 of the following year for the jurisdictional runoff management programs, 2) October 1 to September 30 of the following year for the monitoring and assessment programs. The Water Quality Improvement Plan Annual Reports must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Each Annual Report must include the following:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, summarized and presented in tabular and graphical form;

(b) The progress of the special studies required pursuant to Provision D.3, and the findings, interpretations and conclusions of a special study, or each phase of a special study, upon its completion;

(c) The findings, interpretations and conclusions from the assessments required pursuant to Provision D.4;

(d) The progress of implementing the Water Quality Improvement Plan, including, but not limited to, the following:

(i) The progress toward achieving the interim and final numeric goals for the highest water quality priorities for the Watershed Management Area;

(ii) The water quality improvement strategies that were implemented and/or no longer implemented by each of the Copermittees during the reporting period and previous reporting periods;

(iii) The water quality improvement strategies planned for implementation during the next reporting period;

(iv) Proposed modifications to the water quality improvement strategies, the public comments received and the supporting rationale for the proposed modifications;

(v) Previous modifications or updates incorporated into the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document and implemented by the Copermittees in the Watershed Management Area; and

(vi) Proposed modifications or updates to the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document;

(e) A completed Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) for each Copermittee in the Watershed Management Area, certified by a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative; and

(f) Each Copermittee must provide any data or documentation utilized in developing the Water Quality Improvement Plan Annual Report upon request by the San Diego Water Board. Any Copermittee monitoring data utilized in developing the Water Quality Improvement Plan Annual Report must be uploaded to the California Environmental Data Exchange Network (CEDEN).[30] Any Copermittee monitoring and assessment data utilized in developing the Water Quality Improvement Plan Annual Report must be available for access on the Regional Clearinghouse required pursuant to Provision F.4.

C. REGIONAL MONITORING AND ASSESSMENT REPORT

(1) The Copermittees must submit a Regional Monitoring and Assessment Report no later than 180 days prior to the expiration date of this Order. The Regional Monitoring and Assessment Report may be submitted as part of the Report of Waste Discharge required pursuant to Provision F.5.b. In preparing the report the Copermittees must consider the receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, and the findings, interpretations, and conclusions from the assessments required pursuant to Provision D.4. Based on these considerations the report must assess the following:

(a) The beneficial uses of the receiving waters within the San Diego Region that are supported and not adversely affected by the Copermittees' MS4 discharges;

(b) The beneficial uses of the receiving waters within the San Diego Region that are adversely impacted by the Copermittees' MS4 discharges;

(c) The progress toward protecting the beneficial uses in the receiving waters within the San Diego Region from the Copermittees' discharges; and

[30] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

(d) Pollutants or conditions of emerging concern that may impact beneficial uses in the receiving waters within the San Diego Region.

(2) The Regional Monitoring and Assessment Report must include recommendations for improving the implementation and assessment of the Water Quality Improvement Plans and jurisdictional runoff management programs.

(3) Each Copermittee must provide any data or documentation utilized in developing the Regional Monitoring and Assessment Report upon request by the San Diego Water Board. Any Copermittee monitoring and assessment data utilized in developing the Regional Monitoring and Assessment Report must be available for access on the Regional Clearinghouse required pursuant to Provision F.4.

4. Regional Clearinghouse

The Copermittees must develop, update, and maintain an internet-based Regional Clearinghouse that is made available to the public no later than 18 months after the effective date of this Order.[31]

a. The Copermittees, through the Regional Clearinghouse, must make the following documents and data available for access, and organized by Watershed Management Area. The documents and data may be linked to other internet-based data portals and databases where the original documents are stored:

(1) Water Quality Improvement Plan for the Watershed Management Area, and all updated versions with date of update;

(2) Annual Reports for the Watershed Management Area;

(3) Jurisdictional Runoff Management Program document for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(4) BMP Design Manual for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(5) Reports from special studies (e.g. source identification, BMP effectiveness assessment) conducted in the Watershed Management Area;

[31] The Copermittees may develop, update and maintain the clearinghouse(s) of other Copermittees or agencies.

(6) Monitoring data collected pursuant to Provision D for each Watershed Management Area must be uploaded to CEDEN,[32] with links to the uploaded data; and

(7) Available GIS data, layers, and/or shapefiles used to develop the maps generated and maintained by the Copermittees for the Water Quality Improvement Plans, Annual Reports, and jurisdictional runoff management program documents.

b. The Copermittees, through the Regional Clearinghouse, must make the following information and documents available for access:

(1) Contact information (point of contact, phone number, email address, and mailing address) for each Copermittee;

(2) Public hotline number for reporting non-storm water and illicit discharges for each Copermittee;

(3) Email address for reporting non-storm water and illicit discharges for each Copermittee;

(4) Link to each Copermittee's website, if available, where the public may find additional information about the Copermittee's storm water management program and for requesting records for the implementation of its program;

(5) Information about opportunities for the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or protection of the quality of receiving waters; and

(6) Reports from regional monitoring programs in which the Copermittees participate (e.g. Southern California Monitoring Coalition, Southern California Coastal Water Research Project Bight Monitoring);

(7) Regional Monitoring and Assessment Reports; and

(8) Any other information, data, and documents the Copermittees determine as appropriate for making available to the public.

[32] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

5. Report of Waste Discharge

a. The Riverside County Copermittees are required to submit a complete Report of Waste Discharge pursuant to the requirements of their current Order. The San Diego Water Board will review and consider the Report of Waste Discharge to determine whether modification to this Order, pursuant to the requirements of Provision H, will be required prior to the Riverside County Copermittees obtaining coverage under this Order. The current Order for Riverside County Copermittees is rescinded upon the date of effective coverage under this Order except for enforcement purposes.

b. The Copermittees subject to the requirements of this Order must submit to the San Diego Water Board a complete Report of Waste Discharge as an application for the re-issuance of this Order and NPDES permit. The Report of Waste Discharge must be submitted no later than 180 days in advance of the expiration date of this Order. The Report of Waste Discharge must contain the following minimum information:

(1) Names and addresses of the Copermittees;

(2) Names and titles of the primary contacts of the Copermittees;

(3) Proposed changes to the Copermittees' Water Quality Improvement Plans and the supporting justification;

(4) Proposed changes to the Copermittees' jurisdictional runoff management programs and the supporting justification;

(5) Any other information necessary for the re-issuance of this Order;

(6) Any information to be included as part of the Report of Waste Discharge pursuant to the requirements of this Order; and

(7) Any other information required by federal regulations for NPDES permit reissuance.

6. Application for Early Coverage

a. The Riverside County Copermittees may apply for early coverage under this Order by submitting a Report of Waste Discharge Form 200, with a written request for early coverage under this Order.

b. The San Diego Water Board will review the application for early coverage. A notification of coverage under this Order will be issued to the Copermittees in the respective county by the San Diego Water Board upon completion of the early coverage application requirements. The effective coverage date will be specified in the notification of coverage. The Copermittees in the respective county are authorized to have MS4 discharges pursuant to the requirements of this Order starting on the effective coverage date specified in the notification of coverage. The existing Order for the respective county is rescinded upon the effective coverage date specified in the notification of coverage except for enforcement purposes.

7. Reporting Provisions

Each Copermittee must comply with all the reporting and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

G. PRINCIPAL WATERSHED COPERMITTEE RESPONSIBILITIES

1. The Copermittees within each Watershed Management Area must designate a Principal Watershed Copermittee and notify the San Diego Water Board of the name of the Principal Watershed Copermittee. An individual Copermittee should not be designated a Principal Watershed Copermittee for more than two Watershed Management Areas. The notification may be submitted with the Water Quality Improvement Plan required pursuant to Provision F.1 of this Order.

2. The Principal Watershed Copermittee is responsible for, at a minimum, the following:

a. Serving as liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues, and when necessary and appropriate, representing the Copermittees in the Watershed Management Area before the San Diego Water Board;

b. Facilitating the development of the Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order;

c. Coordinating the submittal of the deliverables required by Provisions F.1, F.2, F.3.a, and F.3.b of this Order; and

d. Coordinating and developing, with the other Principal Watershed Copermittees, the requirements of Provisions F.3.c, F.4, and F.5.b of this Order.

3. The Principal Watershed Copermittee is not responsible for ensuring that the other Copermittees within the Watershed Management Area are in compliance with the requirements of this Order. Each Copermittee within the Watershed Management Area is responsible for complying with the requirements of this Order.

H. MODIFICATION OF ORDER

1. Modifications of the Order may be initiated by the San Diego Water Board or by the Copermittees. Requests by Copermittees must be made to the San Diego Water Board.

2. Minor modifications to the Order may be made by the San Diego Water Board where the proposed modification complies with all the prohibitions and limitations, and other requirements of this Order.

3. This Order may also be re-opened and modified, revoked and, reissued or terminated in accordance with the provisions of 40 CFR 122.44, 122.62 to 122.64, and 124.5. Causes for taking such actions include, but are not limited to, failure to comply with any condition of this Order and permit, and endangerment to human health or the environment resulting from the permitted activity.

4. This Order may be re-opened for modification for cause including but not limited to the following:

a. The State Water Board determines that revisions are warranted, and the San Diego Water Board concurs that revisions are necessary to those provisions of the Order addressing compliance with water quality standards in the receiving water and/or those provisions of the Order establishing an iterative process for implementation of management practices to assure compliance with water quality standards in the receiving water;

b. An application for early coverage under this Order is received pursuant to Provision F.6;

c. Any of the TMDLs in Attachment E to this Order are amended in the Basin Plan by San Diego Water Board, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA;

d. The Basin Plan is amended by the San Diego Water Board to incorporate a new TMDL, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA; or

e. Updating or revising the monitoring and reporting requirements is determined to be necessary, at the discretion of the San Diego Water Board. Such modification(s) may include, but is (are) not limited to, revision(s) to: (i) implement recommendations from Southern California Coastal Water Research Project (SCCWRP), (ii) develop, refine, implement, and/or coordinate a regional monitoring program, (iii) develop and implement improved monitoring and assessment programs in keeping with San Diego Water Board Resolution No. R9-2012-0069, Resolution in Support of a Regional Monitoring Framework, and/or (iv) add provisions to require the Copermittees to evaluate and provide information on cost and values of the monitoring and reporting program.

5. The San Diego Water Board, after opportunity for public comment and a public hearing, will re-open and consider modifications to this Order when the Riverside County Copermittees submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders.

I. STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

Each Copermittee must comply with all the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

ATTACHMENT A

DISCHARGE PROHIBITIONS AND SPECIAL PROTECTIONS

1. Basin Plan Waste Discharge Prohibitions

California Water Code Section 13243 provides that a Regional Water Board, in a water quality control plan, may specify certain conditions or areas where the discharge of waste or certain types of waste is not permitted. The following waste discharge prohibitions in the Water Quality Control Plan for the San Diego Basin (Basin Plan) are applicable to any person, as defined by Section 13050(c) of the California Water Code, who is a citizen, domiciliary, or political agency or entity of California whose activities in California could affect the quality of waters of the state within the boundaries of the San Diego Region.

1. The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in California Water Code Section 13050, is prohibited.

2. The discharge of waste to land, except as authorized by waste discharge requirements or the terms described in California Water Code Section 13264 is prohibited.

3. The discharge of pollutants or dredged or fill material to waters of the United States except as authorized by a National Pollutant Discharge Elimination System (NPDES) permit or a dredged or fill material permit (subject to the exemption described in California Water Code Section 13376) is prohibited.

4. Discharges of recycled water to lakes or reservoirs used for municipal water supply or to inland surface water tributaries thereto are prohibited, unless this San Diego Water Board issues a NPDES permit authorizing such a discharge; the proposed discharge has been approved by the State Department of Health Services (DHS) and the operating agency of the impacted reservoir; and the discharger has an approved fail-safe long-term disposal alternative.

5. The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the San Diego Water Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

6. The discharge of waste in a manner causing flow, ponding, or surfacing on lands not owned or under the control of the discharger is prohibited, unless the discharge is authorized by the San Diego Water Board.

7. The dumping, deposition, or discharge of waste directly into waters of the state, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the San Diego Water Board.

8. Any discharge to a storm water conveyance system that is not composed entirely of "*storm water*" is prohibited unless authorized by the San Diego Water Board. [The federal regulations, 40 CFR 122.26(b)(13), define storm water as storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from firefighting activities.] [§122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

9. The unauthorized discharge of treated or untreated sewage to waters of the state or to a storm water conveyance system is prohibited.

10. The discharge of industrial wastes to conventional septic tank/subsurface disposal systems, except as authorized by the terms described in California Water Code Section 13264, is prohibited.

11. The discharge of radioactive wastes amenable to alternative methods of disposal into the waters of the state is prohibited.

12. The discharge of any radiological, chemical, or biological warfare agent into waters of the state is prohibited.

13. The discharge of waste into a natural or excavated site below historic water levels is prohibited unless the discharge is authorized by the San Diego Water Board.

14. The discharge of sand, silt, clay, or other earthen materials from any activity, including land grading and construction, in quantities which cause deleterious bottom deposits, turbidity or discoloration in waters of the state or which unreasonably affect, or threaten to affect, beneficial uses of such waters is prohibited.

15. The discharge of treated or untreated sewage from vessels to Mission Bay, Oceanside Harbor, Dana Point Harbor, or other small boat harbors is prohibited.

16. The discharge of untreated sewage from vessels to San Diego Bay is prohibited.

17. The discharge of treated sewage from vessels to portions of San Diego Bay that are less than 30 feet deep at mean lower low water (MLLW) is prohibited.

18. The discharge of treated sewage from vessels, which do not have a properly functioning US Coast Guard certified Type I or Type II marine sanitation device, to portions of San Diego Bay that are greater than 30 feet deep at mean lower low water (MLLW) is prohibited.

2. Attachment B to State Water Board Resolution 2012-0012, as amended by State Water Board Resolution No. 2012-0031.

Special Protections for Areas of Special Biological Significance (ASBS), Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges

I. PROVISIONS FOR POINT SOURCE DISCHARGES OF STORM WATER AND NONPOINT SOURCE WASTE DISCHARGES

The following terms, prohibitions, and special conditions (hereafter collectively referred to as special conditions) are established as limitations on point source storm water and nonpoint source discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in Areas of Special Biological Significance (ASBS), as required for State Water Quality Protection Areas pursuant to California Public Resources Code Sections 36700(f) and 36710(f). These Special Protections are adopted by the State Water Board as part of the California Ocean Plan (Ocean Plan) General Exception.

The special conditions are organized by category of discharge. The State Water Resources Control Board (State Water Board) and Regional Water Quality Control Boards (Regional Water Boards) will determine categories and the means of regulation for those categories [e.g., Point Source Storm Water National Pollutant Discharge Elimination System (NPDES) or Nonpoint Source].

A. PERMITTED POINT SOURCE DISCHARGES OF STORM WATER

1. General Provisions for Permitted Point Source Discharges of Storm Water

   a. Existing storm water discharges into an ASBS are allowed only under the following conditions:

      (1) The discharges are authorized by an NPDES permit issued by the State Water Board or Regional Water Board;

      (2) The discharges comply with all of the applicable terms, prohibitions, and special conditions contained in these Special Protections; and

      (3) The discharges:

         (i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

         (ii) Are designed to prevent soil erosion;

         (iii) Occur only during wet weather;

         (iv) Are composed of only storm water runoff.

   b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

   c. The discharge of trash is prohibited.

d. Only discharges from existing storm water outfalls are allowed. Any proposed or new storm water runoff discharge shall be routed to existing storm water discharge outfalls and shall not result in any new contribution of waste to an ASBS (i.e., no additional pollutant loading). "Existing storm water outfalls" are those that were constructed or under construction prior to January 1, 2005. "New contribution of waste" is defined as any addition of waste beyond what would have occurred as of January 1, 2005. A change to an existing storm water outfall, in terms of re-location or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges are prohibited except as provided below:

(1) The term "non-storm water discharges" means any waste discharges from a municipal separate storm sewer system (MS4) or other NPDES permitted storm drain system to an ASBS that are not composed entirely of storm water.

(2) (i) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability or occur naturally:

(a) Discharges associated with emergency fire fighting operations.

(b) Foundation and footing drains.

(c) Water from crawl space or basement pumps.

(d) Hillside dewatering.

(e) Naturally occurring groundwater seepage via a storm drain.

(f) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(ii) An NPDES permitting authority may authorize non-storm water discharges to an MS4 with a direct discharge to an ASBS only to the extent the NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

2. Compliance Plans for Inclusion in Storm Water Management Plans (SWMP) and Storm Water Pollution Prevention Plans (SWPPP).

The discharger shall specifically address the prohibition of non-storm water runoff and the requirement to maintain natural water quality for storm water discharges to an ASBS in an ASBS Compliance Plan to be included in its SWMP or a SWPPP, as appropriate to permit type. If a statewide permit includes a SWMP, then the discharger shall prepare a stand-alone compliance plan for ASBS discharges. The ASBS Compliance Plan is subject to approval by the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (for permits issued by Regional Water Boards).

a. The Compliance Plan shall include a map of surface drainage of storm water runoff, showing areas of sheet runoff, prioritize discharges, and describe any structural Best Management Practices (BMPs) already employed and/or BMPs to be employed in the future. Priority discharges are those that pose the greatest water quality threat and which are identified to require installation of structural BMPs. The map shall also show the storm water conveyances in relation to other features such as service areas, sewage conveyances and treatment facilities, landslides, areas prone to erosion, and waste and hazardous material storage areas, if applicable. The SWMP or SWPPP shall also include a procedure for updating the map and plan when changes are made to the storm water conveyance facilities.

b. The ASBS Compliance Plan shall describe the measures by which all non-authorized non-storm water runoff (e.g., dry weather flows) has been eliminated, how these measures will be maintained over time, and how these measures are monitored and documented.

c. For Municipal Separate Storm Sewer System (MS4s), the ASBS Compliance Plan shall require minimum inspection frequencies as follows:

(1) The minimum inspection frequency for construction sites shall be weekly during rainy season;

(2) The minimum inspection frequency for industrial facilities shall be monthly during the rainy season;

(3) The minimum inspection frequency for commercial facilities (e.g., restaurants) shall be twice during the rainy season; and

(4) Storm water outfall drains equal to or greater than 18 inches (457 mm) in diameter or width shall be inspected once prior to the beginning of the rainy season and once during the rainy season and maintained to remove trash and other anthropogenic debris.

d. The ASBS Compliance Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff, that are necessary to comply with these special conditions, will be achieved through BMPs. Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that such installation would pose a threat to health or safety. BMPs to control storm water runoff discharges (at the end-of-pipe) during a design storm shall be designed to achieve on average the following target levels:

(1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

(2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges.

The baseline for these determinations is the effective date of the Exception, except for those structural BMPs installed between January 1, 2005 and adoption of these

Special Protections, and the reductions must be achieved and documented within six (6) years of the effective date.

e. The ASBS Compliance Plan shall address erosion control and the prevention of anthropogenic sedimentation in ASBS. The natural habitat conditions in the ASBS shall not be altered as a result of anthropogenic sedimentation.

f. The ASBS Compliance Plan shall describe the non-structural BMPs currently employed and planned in the future (including those for construction activities), and include an implementation schedule. The ASBS Compliance Plan shall include non-structural BMPs that address public education and outreach. Education and outreach efforts must adequately inform the public that direct discharges of pollutants from private property not entering an MS4 are prohibited. The ASBS Compliance Plan shall also describe the structural BMPs, including any low impact development (LID) measures, currently employed and planned for higher threat discharges and include an implementation schedule. To control storm water runoff discharges (at the end-of-pipe) during a design storm, permittees must first consider, and use where feasible, LID practices to infiltrate, use, or evapotranspirate storm water runoff on-site, if LID practices would be the most effective at reducing pollutants from entering the ASBS.

g. The BMPs and implementation schedule shall be designed to ensure that natural water quality conditions in the receiving water are achieved and maintained by either reducing flows from impervious surfaces or reducing pollutant loading, or some combination thereof.

h. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents in storm water runoff that alter natural ocean water quality and the sources of these constituents.

(2) The report shall describe BMPs that are currently being implemented, BMPs that are identified in the SWMP or SWPPP for future implementation, and any additional BMPs that may be added to the SWMP or SWPPP to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the BMPs.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits), the discharger shall revise its ASBS Compliance Plan to incorporate any new or modified BMPs that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised SWMP or SWPPP, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural ocean water quality conditions due to the same constituent.

(5) The requirements of this section are in addition to the terms, prohibitions, and conditions contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within eighteen (18) months from the effective date of the Exception, the discharger shall submit a draft written ASBS Compliance Plan to the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that describes its strategy to comply with these special conditions, including the requirement to maintain natural water quality in the affected ASBS. The ASBS Compliance Plan shall include a description of appropriate non-structural controls and a time schedule to implement structural controls (implementation schedule) to comply with these special conditions for inclusion in the discharger's SWMP or SWPPP, as appropriate to permit type. The final ASBS Compliance Plan, including a description and final schedule for structural controls based on the results of runoff and receiving water monitoring, must be submitted within thirty (30) months from the effective date of the Exception.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these special conditions shall be implemented.

d. Within six (6) years of the effective date of the Exception, any structural controls identified in the ASBS Compliance Plan that are necessary to comply with these special conditions shall be operational.

e. Within six (6) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water, pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data, and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. for municipalities, a demonstration of significant hardship to discharger ratepayers, by showing the relationship of storm water fees to annual household income for residents within the discharger's jurisdictional area, and the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or

2. for other governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

B. NONPOINT SOURCE DISCHARGES

1. General Provisions for Nonpoint Sources

a. Existing nonpoint source waste discharges are allowed into an ASBS only under the following conditions:

(1) The discharges are authorized under waste discharge requirements, a conditional waiver of waste discharge requirements, or a conditional prohibition issued by the State Water Board or a Regional Water Board.

(2) The discharges are in compliance with the applicable terms, prohibitions, and special conditions contained in these Special Protections.

(3) The discharges:

(i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

(ii) Are designed to prevent soil erosion;

(iii) Occur only during wet weather;

(iv) Are composed of only storm water runoff.

b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

c. The discharge of trash is prohibited.

d. Only existing nonpoint source waste discharges are allowed. "Existing nonpoint source waste discharges" are discharges that were ongoing prior to January 1, 2005. "New nonpoint source discharges" are defined as those that commenced on or after January 1, 2005. A change to an existing nonpoint source discharge, in terms of relocation or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges from nonpoint sources (those not subject to an NPDES Permit) are prohibited except as provided below:

(1) The term "non-storm water discharges" means any waste discharges that are not composed entirely of storm water.

(2) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability, or occur naturally:

(i) Discharges associated with emergency fire fighting operations.

(ii) Foundation and footing drains.

(iii) Water from crawl space or basement pumps.

(iv) Hillside dewatering.

(v) Naturally occurring groundwater seepage via a storm drain.

(vi) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

f. At the San Clemente Island ASBS, discharges incidental to military training and research, development, test, and evaluation operations are allowed. Discharges incidental to underwater demolition and other in-water explosions are not allowed in the two military closure areas in the vicinity of Wilson Cove and Castle Rock. Discharges must not result in a violation of the water quality objectives, including the protection of the marine aquatic life beneficial use, anywhere in the ASBS.

g. At the San Nicolas Island and Begg Rock ASBS, discharges incidental to military research, development, testing, and evaluation of, and training with, guided missile and other weapons systems, fleet training exercises, small-scale amphibious warfare training, and special warfare training are allowed. Discharges incidental to underwater demolition and other in-water explosions are not allowed. Discharges must not result in a violation of the water quality objectives, including the protection of the marine aquatic life beneficial use, anywhere in the ASBS.

h. All other nonpoint source discharges not specifically authorized above are prohibited.

2. Planning and Reporting

a. The nonpoint source discharger shall develop an ASBS Pollution Prevention Plan, including an implementation schedule, to address storm water runoff and any other nonpoint source discharges from its facilities. The ASBS Pollution Prevention Plan must be equivalent in contents to an ASBS Compliance Plan as described in I (A)(2) in this document. The ASBS Pollution Prevention Plan is subject to approval by the Executive Director of the State Water Board (statewide waivers or waste discharge requirements) or Executive

Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements).

b. The ASBS Pollution Prevention Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff that are necessary to comply with these special conditions, will be achieved through Management Measures and associated Management Practices (Management Measures/Practices). Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director or Regional Water Board Executive Officer that such installation would pose a threat to health or safety. Management Measures to control storm water runoff during a design storm shall achieve on average the following target levels:

(1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

(2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges.

The baseline for these determinations is the effective date of the Exception, except for those structural BMPs installed between January 1, 2005 and adoption of these Special Protections, and the reductions must be achieved and documented within six (6) years of the effective date.

c. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff or other nonpoint source pollution is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and the Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents that alter natural water quality and the sources of these constituents.

(2) The report shall describe Management Measures/Practices that are currently being implemented, Management Measures/Practices that are identified in the ASBS Pollution Prevention Plan for future implementation, and any additional Management Measures/Practices that may be added to the Pollution Prevention Plan to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the Management Measures/Practices.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements), the discharger shall revise its ASBS Pollution Prevention Plan to incorporate any new or modified Management Measures/Practices that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised ASBS Pollution Prevention Plan, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural water quality conditions due to the same constituent.

(5) The requirements of this section are in addition to the terms, prohibitions, and conditions contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within eighteen (18) months from the effective date of the Exception, the discharger~~s~~ shall submit a draft written ASBS Pollution Prevention Plan to the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) that describes its strategy to comply with these special conditions, including the requirement to maintain natural ocean water quality in the affected ASBS. The Pollution Prevention Plan shall include a description of appropriate non-structural controls and a time schedule to implement structural controls to comply with these special conditions for inclusion in the discharger's Pollution Prevention Plan. The final ASBS Pollution Prevention Plan, including a description and final schedule for structural controls based on the results of runoff and receiving water monitoring, must be submitted within thirty (30) months from the effective date of the Exception.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these Special Protections shall be implemented.

d. Within six (6) years of the effective date of the Exception, any structural controls identified in the ASBS Pollution Prevention Plan that are necessary to comply with these special conditions shall be operational.

e. Within six (6) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in (d.) or (e.). The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures

taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. a demonstration that the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or

2. for governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

II. ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES

In addition to the provisions in Section I (A) or I (B), respectively, a discharger with parks and recreation facilities shall comply with the following:

A. The discharger shall include a section in an ASBS Compliance Plan (for NPDES dischargers) or an ASBS Pollution Prevention Plan (for nonpoint source dischargers) to address storm water runoff from parks and recreation facilities.

1. The plan shall identify all pollutant sources, including sediment sources, which may result in waste entering storm water runoff. Pollutant sources include, but are not limited to, roadside rest areas and vistas, picnic areas, campgrounds, trash receptacles, maintenance facilities, park personnel housing, portable toilets, leach fields, fuel tanks, roads, piers, and boat launch facilities.

2. The plan shall describe BMPs or Management Measures/Practices that will be implemented to control soil erosion (both temporary and permanent erosion controls) and reduce or eliminate pollutants in storm water runoff in order to achieve and maintain natural water quality conditions in the affected ASBS. The plan shall include BMPs or Management Measures/Practices to ensure that trails and culverts are maintained to prevent erosion and minimize waste discharges to ASBS.

3. The plan shall include BMPs or Management Measures/Practices to prevent the discharge of pesticides or other chemicals, including agricultural chemicals, in storm water runoff to the affected ASBS.

4. The plan shall include BMPs or Management Measures/Practices that address public education and outreach. The goal of these BMPs or Management Measures/Practices is to ensure that the public is adequately informed that waste discharges to the affected ASBS are prohibited or limited by special conditions in these Special Protections. The BMPs or Management Measures/Practices shall include signage at camping, picnicking, beach and roadside parking areas, and visitor centers, or other appropriate measures, which notify the public of any applicable requirements of these Special Protections and identify the ASBS boundaries.

5. The plan shall include BMPs or Management Measures/Practices that address the prohibition against the discharge of trash to ASBS. The BMPs or Management Measures/Practices shall include measures to ensure that adequate trash receptacles are available for public use at visitor facilities, including parking areas, and that the receptacles are adequately maintained to prevent trash discharges into the ASBS. Appropriate measures include covering trash receptacles to prevent trash from being wind blown and periodically emptying the receptacles to prevent overflows.

6. The plan shall include BMPs or Management Measures/Practices to address runoff from parking areas and other developed features to ensure that the runoff does not alter natural water quality in the affected ASBS. BMPs or Management Measures/Practices shall include measures to reduce pollutant loading in runoff to the ASBS through installation of natural area buffers (LID), treatment, or other appropriate measures.

B. Maintenance and repair of park and recreation facilities must not result in waste discharges to the ASBS. The practice of road oiling must be minimized or eliminated, and must not result in waste discharges to the ASBS.

III. ADDITIONAL REQUIREMENTS – WATERFRONT AND MARINE OPERATIONS

In addition to the provisions in Section I (A) or I (B), respectively, a discharger with waterfront and marine operations shall comply with the following:

A. For discharges related to waterfront and marine operations, the discharger shall develop a Waterfront and Marine Operations Management Plan (Waterfront Plan). This plan shall contain appropriate Management Measures/Practices to address nonpoint source pollutant discharges to the affected ASBS.

1. The Waterfront Plan shall contain appropriate Management Measures/Practices for any waste discharges associated with the operation and maintenance of vessels, moorings, piers, launch ramps, and cleaning stations in order to ensure that beneficial uses are protected and natural water quality is maintained in the affected ASBS.

2. For discharges from marinas and recreational boating activities, the Waterfront Plan shall include appropriate Management Measures, described in The Plan for California's Nonpoint Source Pollution Control Program, for marinas and recreational boating, or equivalent practices, to ensure that nonpoint source pollutant discharges do not alter natural water quality in the affected ASBS.

3. The Waterfront Plan shall include Management Practices to address public education and outreach to ensure that the public is adequately informed that waste discharges to the affected ASBS are prohibited or limited by special conditions in these Special Protections. The management practices shall include appropriate signage, or similar measures, to inform the public of the ASBS restrictions and to identify the ASBS boundaries.

4. The Waterfront Plan shall include Management Practices to address the prohibition against trash discharges to ASBS. The Management Practices shall include the provision of adequate trash receptacles for marine recreation areas, including parking areas, launch ramps, and docks. The plan shall also include appropriate Management Practices to ensure that the receptacles are adequately maintained and secured in order to prevent trash discharges into the ASBS. Appropriate Management Practices

include covering the trash receptacles to prevent trash from being windblown, staking or securing the trash receptacles so they don't tip over, and periodically emptying the receptacles to prevent overflow.

5. The discharger shall submit its Waterfront Plan to the by the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) within six months of the effective date of these special conditions. The Waterfront Plan is subject to approval by the State Water Board Executive Director or the Regional Water Board Executive Officer, as appropriate. The plan must be fully implemented within 18 months of the effective date of the Exception.

B. The discharge of chlorine, soaps, petroleum, other chemical contaminants, trash, fish offal, or human sewage to ASBS is prohibited. Sinks and fish cleaning stations are point source discharges of wastes and are prohibited from discharging into ASBS. Anthropogenic accumulations of discarded fouling organisms on the sea floor must be minimized.

C. Limited-term activities, such as the repair, renovation, or maintenance of waterfront facilities, including, but not limited to, piers, docks, moorings, and breakwaters, are authorized only in accordance with Chapter III.E.2 of the Ocean Plan.

D. If the discharger anticipates that the discharger will fail to fully implement the approved Waterfront Plan within the 18 month deadline, the discharger shall submit a technical report as soon as practicable to the State Water Board Executive Director or the Regional Water Board Executive Officer, as appropriate. The technical report shall contain reasons for failing to meet the deadline and propose a revised schedule to fully implement the plan.

E. The State Water Board or the Regional Water Board may, for good cause, authorize additional time to comply with the Waterfront Plan. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in Section III.A.5. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality. The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. a demonstration of significant hardship by showing that the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate.

2. for governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

IV. MONITORING REQUIREMENTS

Monitoring is mandatory for all dischargers to assure compliance with the Ocean Plan. Monitoring requirements include both: (A) core discharge monitoring, and (B) ocean receiving water monitoring. The State and Regional Water Boards must approve sampling site locations and any adjustments to the monitoring programs. All ocean receiving water and reference area monitoring must be comparable with the Water Boards' Surface Water Ambient Monitoring Program (SWAMP).

Safety concerns: Sample locations and sampling periods must be determined considering safety issues. Sampling may be postponed upon notification to the State and Regional Water Boards if hazardous conditions prevail.

Analytical Chemistry Methods: All constituents must be analyzed using the lowest minimum detection limits comparable to the Ocean Plan water quality objectives. For metal analysis, all samples, including storm water effluent, reference samples, and ocean receiving water samples, must be analyzed by the approved analytical method with the lowest minimum detection limits (currently Inductively Coupled Plasma/Mass Spectrometry) described in the Ocean Plan.

A. CORE DISCHARGE MONITORING PROGRAM

1. General sampling requirements for timing and storm size:

   Runoff must be collected during a storm event that is greater than 0.1 inch and generates runoff, and at least 72 hours from the previously measurable storm event. Runoff samples shall be collected during the same storm and at approximately the same time when post-storm receiving water is sampled, and analyzed for the same constituents as receiving water and reference site samples (see section IV B) as described below.

2. Runoff flow measurements

   a. For municipal/industrial storm water outfalls in existence as of December 31, 2007, 18 inches (457mm) or greater in diameter/width (including multiple outfall pipes in combination having a width of 18 inches, runoff flows must be measured or calculated, using a method acceptable to and approved by the State and Regional Water Boards.

   b. This will be reported annually for each precipitation season to the State and Regional Water Boards.

3. Runoff samples – storm events

   a. For outfalls equal to or greater than 18 inches (0.46m) in diameter or width:

      (1) samples of storm water runoff shall be collected during the same storm as receiving water samples and analyzed for oil and grease, total suspended solids,

and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

(2) samples of storm water runoff shall be collected and analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

(3) If an applicant has no outfall greater than 36 inches, then storm water runoff from the applicant's largest outfall shall be further collected during the same storm as receiving water samples and analyzed for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates).

b. For outfalls equal to or greater than 36 inches (0.91m) in diameter or width:

(1) samples of storm water runoff shall be collected during the same storm as receiving water samples and analyzed for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

(2) samples of storm water runoff shall be further collected during the same storm as receiving water samples and analyzed for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates); and

(3) samples of storm water runoff shall be collected and analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

c. For an applicant not participating in a regional monitoring program [see below in Section IV (B)] in addition to (a.) and (b.) above, a minimum of the two largest outfalls or 20 percent of the larger outfalls, whichever is greater, shall be sampled (flow weighted composite samples) at least three times annually during wet weather (storm event) and analyzed for all Ocean Plan Table A constituents, Table B constituents for marine aquatic life protection (except for toxicity, only chronic toxicity for three species shall be required), DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, and Ocean Plan indicator bacteria. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one (the largest) such discharge shall be sampled annually in each Region.

4. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may reduce or suspend core monitoring once the storm runoff is fully characterized. This determination may be made at any point after the discharge is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

B. Ocean Receiving Water and Reference Area Monitoring Program

In addition to performing the Core Discharge Monitoring Program in Section II.A above, all applicants having authorized discharges must perform ocean receiving water monitoring. In order to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS, dischargers may choose either (1) an individual monitoring program, or (2) participation in a regional integrated monitoring program.

1. Individual Monitoring Program: The requirements listed below are for those dischargers who elect to perform an individual monitoring program to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within the affected ASBS. In addition to Core Discharge Monitoring, the following additional monitoring requirements shall be met:

   a. Three times annually, during wet weather (storm events), the receiving water at the point of discharge from the outfalls described in section (IV)(A)(3)(c) above shall be sampled and analyzed for Ocean Plan Table A constituents, Table B constituents for marine aquatic life, DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, salinity, chronic toxicity (three species), and Ocean Plan indicator bacteria.

      The sample location for the ocean receiving water shall be in the surf zone at the point of discharges; this must be at the same location where storm water runoff is sampled. Receiving water shall be sampled prior to (pre-storm) and during (or immediately after) the same storm (post storm). Post storm sampling shall be during the same storm and at approximately the same time as when the runoff is sampled. Reference water quality shall also be sampled three times annually and analyzed for the same constituents pre-storm and post-storm, during the same storm seasons when receiving water is sampled. Reference stations will be determined by the State Water Board's Division of Water Quality and the applicable Regional Water Board(s).

   b. Sediment sampling shall occur at least three times during every five (5) year period. The subtidal sediment (sand or finer, if present) at the discharge shall be sampled and analyzed for Ocean Plan Table B constituents for marine aquatic life, DDT, PCBs, PAHs, pyrethroids, and OP pesticides. For sediment toxicity testing, only an acute toxicity test using the amphipod *Eohaustorius estuarius* must be performed.

   c. A quantitative survey of intertidal benthic marine life shall be performed at the discharge and at a reference site. The survey shall be performed at least once every five (5) year period. The survey design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The results of the survey shall be completed and submitted to the State Water Board and Regional Water Board at least six months prior to the end of the permit cycle.

   d. Once during each five (5) year period, a bioaccumulation study shall be conducted to determine the concentrations of metals and synthetic organic pollutants at representative discharge sites and at representative reference sites. The study design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The bioaccumulation study may include California mussels (*Mytilus californianus*) and/or sand crabs (*Emerita analoga* or *Blepharipoda occidentalis*). Based

on the study results, the Regional Water Board and the State Water Board's Division of Water Quality, may adjust the study design in subsequent permits, or add or modify additional test organisms (such as shore crabs or fish), or modify the study design appropriate for the area and best available sensitive measures of contaminant exposure.

e. Marine Debris: Representative quantitative observations for trash by type and source shall be performed along the coast of the ASBS within the influence of the discharger's outfalls. The design, including locations and frequency, of the marine debris observations is subject to approval by the Regional Water Board and State Water Board's Division of Water Quality.

f. The monitoring requirements of the Individual Monitoring Program in this section are minimum requirements. After a minimum of one (1) year of continuous water quality monitoring of the discharges and ocean receiving waters, the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may require additional monitoring, or adjust, reduce or suspend receiving water and reference station monitoring. This determination may be made at any point after the discharge and receiving water is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

2. Regional Integrated Monitoring Program: Dischargers may elect to participate in a regional integrated monitoring program, in lieu of an individual monitoring program, to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS. This regional approach shall characterize natural water quality, pre- and post-storm, in ocean reference areas near the mouths of identified open space watersheds and the effects of the discharges on natural water quality (physical, chemical, and toxicity) in the ASBS receiving waters, and should include benthic marine aquatic life and bioaccumulation components. The design of the ASBS stratum of a regional integrated monitoring program may deviate from the otherwise prescribed individual monitoring approach (in Section IV.B.1) if approved by the State Water Board's Division of Water Quality and the Regional Water Boards.

a. Ocean reference areas shall be located at the drainages of flowing watersheds with minimal development (in no instance more than 10% development), and shall not be located in CWA Section 303(d) listed waterbodies or have tributaries that are 303(d) listed. Reference areas shall be free of wastewater discharges and anthropogenic non- storm water runoff. A minimum of low threat storm runoff discharges (e.g. stream highway overpasses and campgrounds) may be allowed on a case-by-case basis. Reference areas shall be located in the same region as the ASBS receiving water monitoring occurs. The reference areas for each Region are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean reference water samples must be collected from each station, each from a separate storm during the same storm season that receiving water is sampled. A minimum of one reference location shall be sampled for each ASBS receiving water site sampled per responsible party. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

b. ASBS ocean receiving water must be sampled in the surf zone at the location where the runoff makes contact with ocean water (i.e. at "point zero"). Ocean receiving water

stations must be representative of worst-case discharge conditions (i.e. co-located at a large drain greater than 36 inches, or if drains greater than 36 inches are not present in the ASBS then the largest drain greater than18 inches.) Ocean receiving water stations are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean receiving water samples must be collected during each storm season from each station, each from a separate storm. A minimum of one receiving water location shall be sampled in each ASBS per responsible party in that ASBS. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

c. Reference and receiving water sampling shall commence during the first full storm season following the adoption of these special conditions, and post-storm samples shall be collected during the same storm event when storm water runoff is sampled. Sampling shall occur in a minimum of two storm seasons. For those ASBS dischargers that have already participated in the Southern California Bight 2008 ASBS regional monitoring effort, sampling may be limited to only one storm season.

d. Receiving water and reference samples shall be analyzed for the same constituents as storm water runoff samples. At a minimum, constituents to be sampled and analyzed in reference and discharge receiving waters must include oil and grease, total suspended solids, Ocean Plan Table B metals for protection of marine life, Ocean Plan PAHs, pyrethroids, OP pesticides, ammonia, nitrate, phosphates, and critical life stage chronic toxicity for three species. In addition, within the range of the southern sea otter, indicator bacteria or some other measure of fecal contamination shall be analyzed.

3. Waterfront and Marine Operations: In addition to the above requirements for ocean receiving water monitoring, additional monitoring must be performed for marinas and boat launch and pier facilities:

a. For all marina or mooring field operators, in mooring fields with 10 or more occupied moorings, the ocean receiving water must be sampled for Ocean Plan indicator bacteria, residual chlorine, copper, zinc, grease and oil, methylene blue active substances (MBAS), and ammonia nitrogen.

(1) For mooring field operators opting for an individual monitoring program (Section IV.B.1 above), this sampling must occur weekly (on the weekend) from May through October.

(2) For mooring field operators opting to participate in a regional integrated monitoring program (Section IV.B.2 above), this sampling must occur monthly from May through October on a high use weekend in each month. The Water Boards may allow a reduction in the frequency of sampling, through the regional monitoring program, after the first year of monitoring.

b. For all mooring field operators, the subtidal sediment (sand or finer, if present) within mooring fields and below piers shall be sampled and analyzed for Ocean Plan Table B metals (for marine aquatic life beneficial use), acute toxicity, PAHs, and tributyltin. For sediment toxicity testing, only an acute toxicity test using the amphipod *Eohaustorius*

estuarius must be performed. This sampling shall occur at least three times during a five (5) year period. For mooring field operators opting to participate in a regional integrated monitoring program, the Water Boards may allow a reduction in the frequency of sampling after the first sampling effort's results are assessed.

Glossary

At the point of discharge(s) – Means in the surf zone immediately where runoff from an outfall meets the ocean water (a.k.a., at point zero).

Areas of Special Biological Significance (ASBS) – Those areas designated by the State Water Board as ocean areas requiring protection of species or biological communities to the extent that alteration of natural water quality is undesirable. All Areas of Special Biological Significance are also classified as a subset of State Water Quality Protection Areas.

Design storm – For purposes of these Special Protections, a design storm is defined as the volume of runoff produced from one inch of precipitation per day or, if this definition is inconsistent with the discharger's applicable storm water permit, then the design storm shall be the definition included in the discharger's applicable storm water permit.

Development – Relevant to reference monitoring sites, means urban, industrial, agricultural, grazing, mining, and timber harvesting land uses.

Higher threat discharges - Permitted storm drains discharging equal to or greater than 18 inches, industrial storm drains, agricultural runoff discharged through an MS4, discharges associated with waterfront and marina operations (e.g., piers, launch ramps, mooring fields, and associated vessel support activities, except for passive discharges defined below), and direct discharges associated with commercial or industrial activities to ASBS.

Low Impact Development (LID) – A sustainable practice that benefits water supply and contributes to water quality protection. Unlike traditional storm water management, which entails collecting and conveying storm water runoff through storm drains, pipes, or other conveyances to a centralized storm water facility, LID focuses on using site design and storm water management to maintain the site's pre-development runoff rates and volumes. The goal of LID is to mimic a site's predevelopment hydrology by using design techniques that infiltrate, filter, store, evaporate, and detain runoff close to the source of rainfall.

Marine Operations – Marinas or mooring fields that contain slips or mooring locations for 10 or more vessels.

Management Measure (MM) - Economically achievable measures for the control of the addition of pollutants from various classes of nonpoint sources of pollution, which reflect the greatest degree of pollutant reduction achievable through the application of the best available nonpoint pollution control practices, technologies, processes, siting criteria, operating methods, or other alternatives. For example, in the "marinas and recreational boating" land- use category specified in the Plan for California's Nonpoint Source Pollution Control Program (NPS Program Plan) (SWRCB, 1999), "boat cleaning and maintenance" is considered a MM or the source of a specific class or type of NPS pollution.

Management Practice (MP) - The practices (e.g., structural, non-structural, operational, or other alternatives) that can be used either individually or in combination to address a

specific MM class or classes of NPS pollution. For example, for the "boat cleaning and maintenance" MM, specific MPs can include, but are not limited to, methods for the selection of environmentally sensitive hull paints or methods for cleaning/removal of hull copper anti- fouling paints.

Municipal Separate Storm Sewer System (MS4) – A municipally-owned storm sewer system regulated under the Phase I or Phase II storm water program implemented in compliance with Clean Water Act section 402(p). Note that an MS4 program's boundaries are not necessarily congruent with the permittee's political boundaries.

Natural Ocean Water Quality - The water quality (based on selected physical, chemical and biological characteristics) that is required to sustain marine ecosystems, and which is without apparent human influence, *i.e.*, an absence of significant amounts of: (a) man-made constituents (*e.g.,* DDT); (b) other chemical (*e.g.,* trace metals), physical (temperature/thermal pollution, sediment burial), and biological (*e.g.*, bacteria) constituents at concentrations that have been elevated due to man's activities above those resulting from the naturally occurring processes that affect the area in question; and (c) non-indigenous biota (*e.g.,* invasive algal bloom species) that have been introduced either deliberately or accidentally by man. Discharges "*shall not alter natural ocean water quality*" as determined by a comparison to the range of constituent concentrations in reference areas agreed upon via the regional monitoring program(s). If monitoring information indicates that *natural ocean water quality* is not maintained, but there is sufficient evidence that a discharge is not contributing to the alteration of natural water quality, then the Regional Water Board may make that determination. In this case, sufficient information must include runoff sample data that has equal or lower concentrations for the range of constituents at the applicable reference area(s).

Nonpoint source – Nonpoint pollution sources generally are sources that do not meet the definition of a point source. Nonpoint source pollution typically results from land runoff, precipitation, atmospheric deposition, agricultural drainage, marine/boating operations or hydrologic modification. Nonpoint sources, for purposes of these Special Protections, include discharges that are not required to be regulated under an NPDES permit.

Non-storm water discharge – Any runoff that is not the result of a precipitation event. This is often referred to as "dry weather flow."

Non-structural control – A Best Management Practice that involves operational, maintenance, regulatory (e.g., ordinances) or educational activities designed to reduce or eliminate pollutants in runoff, and that are not structural controls (i.e. there are no physical structures involved).

Physical impossibility - Means any act of God, war, fire, earthquake, windstorm, flood or natural catastrophe; unexpected and unintended accidents not caused by discharger or its employees' negligence; civil disturbance, vandalism, sabotage or terrorism; restrain by court order or public authority or agency; or action or non-action by, or inability to obtain the necessary authorizations or approvals from any governmental agency other than the permittee.

Representative sites and monitoring procedures – Are to be proposed by the discharger, with appropriate rationale, and subject to approval by Water Board staff.

Sheet-flow – Runoff that flows across land surfaces at a shallow depth relative to the cross- sectional width of the flow. These types of flow may or may not enter a storm drain system before discharge to receiving waters.

Storm Season – Also referred to as rainy season, means the months of the year from the onset of rainfall during autumn until the cessation of rainfall in the spring.

Structural control – A Best Management Practice that involves the installation of engineering solutions to the physical treatment or infiltration of runoff.

Surf Zone - The surf zone is defined as the submerged area between the breaking waves and the shoreline at any one time.

Surface Water Ambient Monitoring Program (SWAMP) comparable – Means that the monitoring program must 1) meet or exceed 2008 SWAMP Quality Assurance Program Management Plan (QAPP) Measurement Quality Objectives, or 2) have a Quality Assurance Project Plan that has been approved by SWAMP; in addition data must be formatted to match the database requirements of the SWAMP Information Management System. Adherence to the measurement quality objectives in the Southern California Bight 2008 ASBS Regional Monitoring Program QAPP and data base management comprises being SWAMP comparable.

Waterfront Operations - Piers, launch ramps, and cleaning stations in the water or on the adjacent shoreline.

Attachment 1
Special Protections Sections I(A)(3)(e) and I(B)(3)(e)
Flowchart to Deteremine Compliance with natural Water Quality

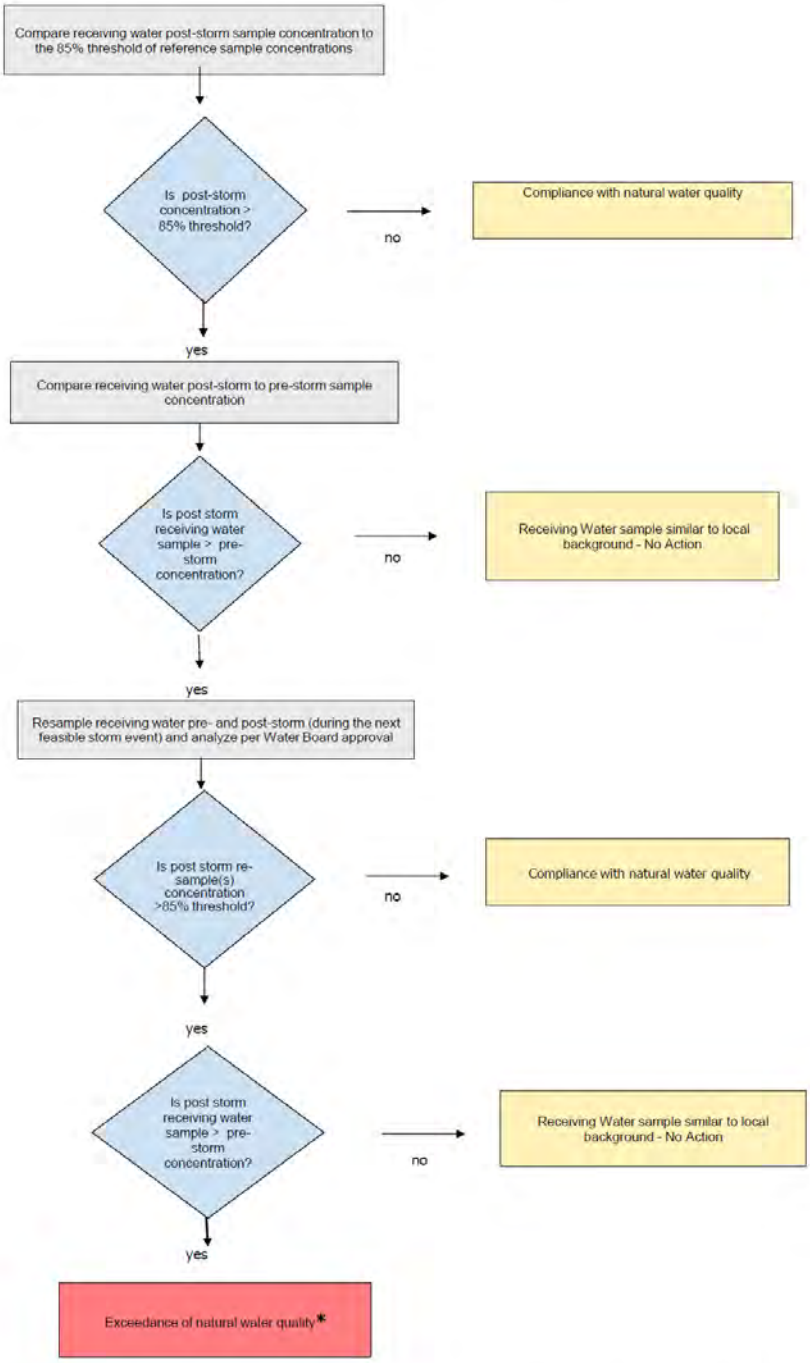

*** When an exceedance of natural water quality occurs, the discharger must comply with section I.A.2.h (for permitted storm water) or section I.B.2.c (for nonpoint sources). Note, when sampling data is available, end-of-pipe effluent concentrations will be considered by the Water Boards in making this determination.**

ATTACHMENT B

STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

1. Standard Permit Provisions

Code of Federal Regulations Title 40 Section 122.41 (40 CFR 122.41) includes conditions, or provisions, that apply to all National Pollutant Discharge Elimination System (NPDES) permits. Additional provisions applicable to NPDES permits are in 40 CFR 122.42. All applicable provisions in 40 CFR 122.41 and 40 CFR 122.42 must be incorporated into this Order and NPDES permit. The applicable 40 CFR 122.41 and 40 CFR 122.42 provisions are as follows:

a. DUTY TO COMPLY [40 CFR 122.41(a)]

The Copermittee must comply with all of the provisions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

(1) The Copermittee must comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement. [40 CFR 122.41(a)(1)]

(2) The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to a civil penalty not to exceed $25,000 per day for each violation. The CWA provides that any person who *negligently* violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than 2 years, or both. Any person who *knowingly* violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both. Any person who knowingly violates Section 301, 302, 303, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, and who knows at that time that he thereby places another person in imminent danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of

not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.
[40 CFR 122.41(a)(2)]

(3) Any person may be assessed an administrative penalty by the San Diego Regional Water Quality Control Board (San Diego Water Board), State Water Resources Control Board (State Water Board), or United States Environmental Protection Agency (USEPA) for violating Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.
[40 CFR 122.41(a)(3)]

b. DUTY TO REAPPLY [40 CFR 122.41(b)]

If a Copermittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Copermittee must apply for and obtain a new permit.

c. NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE [40 CFR 122.41(c)]

It shall not be a defense for a Copermittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

d. DUTY TO MITIGATE [40 CFR 122.41(d)]

The Copermittee must take all reasonable steps to minimize or prevent any discharge or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

e. PROPER OPERATION AND MAINTENANCE [40 CFR 122.41(e)]

The Copermittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Copermittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by a Copermittee only when the operation is necessary to achieve compliance with the conditions of this permit.

f. PERMIT ACTIONS [40 CFR 122.41(f)]

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Copermittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

g. PROPERTY RIGHTS [40 CFR 122.41(g)]

This permit does not convey any property rights of any sort, or any exclusive privilege.

h. DUTY TO PROVIDE INFORMATION [40 CFR 122.41(h)]

The Copermittee must furnish to the San Diego Water Board, State Water Board, or USEPA within a reasonable time, any information which the San Diego Water Board, State Water Board, or USPEA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Copermittee must also furnish to the San Diego Water Board, State Water Board, or USPEA upon request, copies of records required to be kept by this permit.

i. INSPECTION AND ENTRY [40 CFR 122.41(i)]

The Copermittee must allow the San Diego Water Board, State Water Board, USEPA, and/or their authorized representative (including an authorized contractor acting as their representative), upon presentation of credentials and other documents as may be required by law, to:

(1) Enter upon the Copermittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit; [40 CFR 122.41(i)(1)]

(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit; [40 CFR 122.41(i)(2)]

(3) Inspect and photograph at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; [40 CFR 122.41(i)(3)] and

(4) Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location. [40 CFR 122.41(i)(4)]

j. MONITORING AND RECORDS [40 CFR 122.41(j)]

(1) Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity. [40 CFR 122.41(j)(1)]

(2) Except for records of monitoring information required by this permit related to the Copermittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five (5) years (or longer as required by 40 CFR Part 503), the

Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time. [40 CFR 122.41(j)(2)]

(3) Records for monitoring information must include: [40 CFR 122.41(j)(3)]

(a) The date, exact place, and time of sampling or measurements; [40 CFR 122.41(j)(3)(i)]
(b) The individual(s) who performed the sampling or measurements; [40 CFR 122.41(j)(3)(ii)]
(c) The date(s) analyses were performed; [40 CFR 122.41(j)(3)(iii)]
(d) The individual(s) who performed the analyses; [40 CFR 122.41(j)(3)(iv)]
(e) The analytical techniques or methods used; [40 CFR 122.41(j)(3)(v)] and
(f) The results of such analyses. [40 CFR 122.41(j)(3)(vi)]

(4) Monitoring must be conducted according to test procedures under 40 CFR Part 136 unless another method is required under 40 CFR Subchapters N or O. [40 CFR 122.41(j)(4)]

In the case of pollutants for which there are no approved methods under 40 CFR Part 136 or otherwise required under 40 CFR Subchapters N and O, monitoring must be conducted according to a test procedure specified in the permit for such pollutants. [40 CFR 122.44(i)(1)(iv)]

(5) The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. [40 CFR 122.41(j)(5)]

k. SIGNATORY REQUIREMENT [40 CFR 122.41(k)]

(1) All applications, reports, or information submitted to the San Diego Water Board, State Water Board, or USEPA must be signed and certified. (See 40 CFR 122.22) [40 CFR 122.41(k)(1)]

(a) *For a municipality, State, Federal, or other public agency.* [All applications must be signed] by either a principal executive officer or ranking elected official. [40 CFR 122.22(a)(3)]

(b) All reports required by permits, and other information requested by the San Diego Water Board, State Water Board, or USEPA must be signed by a person described in paragraph (a) of this section, or by a duly authorized representative of that person. A person is a duly authorized representative only if: [40 CFR 122.22(b)]

(i) The authorization is made in writing by a person described in paragraph (a) of this section; [40 CFR 122.22(b)(1)]

(ii) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company, (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) [40 CFR 122.22(b)(2)] and,

(iii) The written authorization is submitted to the San Diego Water Board and State Water Board. [40 CFR 122.22(b)(3)]

(c) *Changes to authorization.* If an authorization under paragraph (b) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (b) of this section must be submitted to the San Diego Water Board prior to or together with any reports, information, or applications to be signed by an authorized representative. [40 CFR 122.22(c)]

(d) *Certification.* Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." [40 CFR 122.22(d)]

(2) The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both. [40 CFR 122.41(k)(2)]

I. REPORTING REQUIREMENTS [40 CFR 122.41(l)]

(1) *Planned changes.* The Copermittee must give notice to the San Diego Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when: [40 CFR 122.41(l)(1)]

(a) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); [40 CFR 122.41(l)(1)(i)] or

(b) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which

are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1). [40 CFR 122.41(l)(1)(ii)]

(c) The alteration or addition results in a significant change in the Copermittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. [40 CFR 122.41(l)(1)(iii)]

(2) *Anticipated noncompliance*. The Copermittee must give advance notice to the San Diego Water Board or State Water Board of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements. [40 CFR 122.41(l)(2)]

(3) *Transfers*. This permit is not transferable to any person except after notice to the San Diego Water Board. The San Diego Water Board may require modification or revocation and reissuance of the permit to change the name of the Copermittee and incorporate such other requirements as may be necessary under the CWA. [40 CFR 122.41(l)(3)]

(4) *Monitoring reports.* Monitoring results must be reported at the intervals specified elsewhere in this permit. [40 CFR 122.41(l)(4)]

(a) Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the San Diego Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices. [40 CFR 122.41(l)(4)(i)]

(b) If the Copermittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or another method required for an industry-specific waste stream under 40 CFR Subchapters N or O, the results of this monitoring must be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the San Diego Water Board or State Water Board. [40 CFR 122.41(l)(4)(ii)]

(c) Calculations for all limitations which require averaging of measurements must utilize an arithmetic mean unless otherwise specified in the permit. [40 CFR 122.41(l)(4)(iii)]

(5) *Compliance schedules*. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date. [40 CFR 122.41(l)(5)]

(6) *Twenty-four hour reporting.*

(a) The Copermittee must report any noncompliance that may endanger health or the environment. Any information must be provided orally within 24 hours from the time the Copermittee becomes aware of the circumstances. A written submission must also be provided within five (5) days of the time the Copermittee becomes aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6)(i)]

(b) The following must be included as information which must be reported within 24 hours under this paragraph: [40 CFR 122.41(l)(6)(ii)]

(i) Any unanticipated bypass that exceeds any effluent limitation in the permit (See 40 CFR 122.41(g)). [40 CFR 122.41(l)(6)(ii)(A)]
(ii) Any upset which exceeds any effluent limitation in the permit. [40 CFR 122.41(l)(6)(ii)(B)] and,
(iii) Violation of a maximum daily discharge limitation for any of the pollutants listed by the San Diego Water Board in the permit to be reported within 24 hours. (See 40 CFR 122.44(g)) [40 CFR 122.41(l)(6)(ii)(C)]

(c) The San Diego Water Board may waive the above-required written report on a case-by-case basis if the oral report has been received within 24 hours. [40 CFR 122.41(l)(6)(iii)]

(7) *Other noncompliance.* The Copermittee must report all instances of noncompliance not reported in accordance with the standard provisions required under 40 CFR 122.41(l)(4), (5), and (6), at the time monitoring reports are submitted. The reports must contain the information listed in the standard provisions required under 40 CFR 122.41(l)(6). [40 CFR 122.41(l)(7))]

(8) *Other information.* When the Copermittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the San Diego Water Board, State Water Board, or USEPA, the Copermittee must promptly submit such facts or information. [40 CFR 122.41(l)(8)]

m. BYPASS [40 CFR 122.41(m)]

(1) *Definitions.*

(a) "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. [40 CFR 122.41(m)(1)(i)] or

(b) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be

expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
[40 CFR 122.41(m)(1)(ii)]

(2) *Bypass not exceeding limitations*. The Copermittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the standard provisions required under 40 CFR 122.41(m)(3) and (4).
[40 CFR 122.41(m)(2)]

(3) *Notice.*

(a) *Anticipated bypass*. If the Copermittee knows in advance of the need for a bypass, it must submit a notice, if possible at least ten days before the date of the bypass. [40 CFR 122.41(m)(3)(i)] or

(b) *Unanticipated bypass*. The Copermittee must submit notice of an unanticipated bypass in accordance with the standard provisions required under 40 CFR 122.41(l)(6) (24-hour notice).
[40 CFR 122.41(m)(3)(ii)]

(4) *Prohibition of Bypass.*

(a) Bypass is prohibited, and the San Diego Water Board may take enforcement action against a Copermittee for bypass, unless:
[40 CFR 122.41(m)(4)(i)]

(i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; [40 CFR 122.41(m)(4)(i)(A)]
(ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance;
[40 CFR 122.41(m)(4)(i)(B)] and,
(iii) The Copermittee submitted notice in accordance with the standard provisions required under 40 CFR 122.41(m)(3).
[40 CFR 122.41(m)(4)(i)(C)]

(b) The San Diego Water Board may approve an anticipated bypass, after considering its adverse effects, if the San Diego Water Board determines that it will meet the three conditions listed above.
[40 CFR 122.41(m)(4)(ii)]

n. UPSET [40 CFR 122.41(n)]

(1) *Definition.* "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Copermittee. An upset does not

include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. [40 CFR 122.41(n)(1)]

(2) *Effect of an upset*. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the standard provisions required under 40 CFR 122.41(n)(3) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. [40 CFR 122.41(n)(2)]

(3) *Conditions necessary for a demonstration of upset*. A Copermittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that: [40 CFR 122.41(n)(3)]

(a) An upset occurred and that the Copermittee can identify the cause(s) of the upset; [40 CFR 122.41(n)(3)(i)]
(b) The permitted facility was at the time being properly operated; [40 CFR 122.41(n)(3)(ii)] and
(c) The Copermittee submitted notice of the upset in accordance with the standard provisions required under 40 CFR 122.41(l)(6)(ii)(B) (24-hour notice). [40 CFR 122.41(n)(3)(iii)]
(d) The Copermittee complied with any remedial measures pursuant to the standard provisions required under 40 CFR 122.41(d). [40 CFR 122.41(n)(3)(iii)]

(4) *Burden of proof*. In any enforcement proceeding, the Copermittee seeking to establish the occurrence of an upset has the burden of proof. [40 CFR 122.41(n)(4)]

o. STANDARD PERMIT PROVISIONS FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS [40 CFR 122.42(c)]

The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the San Diego Water Board or State Water Board under 40 CFR 122.26(a)(1)(v) must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report must include:

(1) The status of implementing the components of the storm water management program that are established as permit conditions; [40 CFR 122.42(c)(1)]

(2) Proposed changes to the storm water management programs that are established as permit conditions. Such proposed changes must be consistent with 40 CFR 122.26(d)(2)(iii); [40 CFR 122.42(c)(2)] and

(3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under 40 CFR 122.26(d)(2)(iv) and (v); [40 CFR 122.42(c)(3)]

(4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; [40 CFR 122.42(c)(4)]

(5) Annual expenditures and budget for year following each annual report; [40 CFR 122.42(c)(5)]

(6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; [40 CFR 122.42(c)(6)]

(7) Identification of water quality improvements or degradation. [40 CFR 122.42(c)(7)]

p. STANDARD PERMIT PROVISIONS FOR STORM WATER DISCHARGES [40 CFR 122.42(d)]

The initial permits for discharges composed entirely of storm water issued pursuant to 40 CFR 122.26(e)(7) must require compliance with the conditions of the permit as expeditiously as practicable, but in no event later than three years after the date of issuance of the permit.

2. General Provisions

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. The general provisions applicable to this Order and NPDES permit are as follows:

a. DISCHARGE OF WASTE IS A PRIVILEGE

No discharge of waste into the waters of the State, whether or not such discharge is made pursuant to waste discharge requirements, shall create a vested right to continue such discharge. All discharges of waste into waters of the State are privileges, not rights. [CWC Section 13263(g)]

b. DURATION OF ORDER AND NPDES PERMIT

(1) *Effective date*. This Order supersedes Order No. R9-2007-0001 for the San Diego County Copermittees listed in Table 2.a and became effective on June 27, 2013 for those Copermittees. This Order as amended by Order R9-2015-0001supersedes Order No. R9-2009-0002 and becomes effective April 1, 2015, following the date Order No. R9-2015-0001 is adopted. This Order supersedes Order No. R9-2010-0016 upon further amendment or earlier notice of coverage.

(2) *Expiration*. This Order and NPDES permit expires five years after its effective date. [40 CFR 122.46(a)]

(3) *Continuation of expired order*. After this Order and NPDES permit expires, the terms and conditions of this Order and NPDES permit are automatically continued pending issuance of a new permit if all requirements of the federal NPDES regulations on the continuation of expired permits (40 CFR 122.6) are complied with.

c. AVAILABILITY

A copy of this Order must be kept at a readily accessible location and must be available to on-site personnel at all times.

d. CONFIDENTIALITY OF INFORMATION

Except as provided for in 40 CFR 122.7, no information or documents submitted in accordance with or in application for this Order will be considered confidential, and all such information and documents shall be available for review by the public at the San Diego Water Board office.

Claims of confidentiality for the following information will be denied:
[40 CFR 122.7(b)]

(1) The name and address of any permit applicant or Copermittee; [40 CFR 122.7(b)(1)] and

(2) Permit applications and attachments, permits, and effluent data. [40 CFR 122.7(b)(2)]

e. EFFLUENT LIMITATIONS

(1) *Interim effluent limitations*. The Copermittee must comply with any interim effluent limitations as established by addendum, enforcement action, or revised waste discharge requirements which have been, or may be, adopted by the San Diego Water Board.

(2) *Other effluent limitations and standards*. If any applicable toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant and that standard or prohibition is more stringent than any limitation on the pollutant in the permit, the San Diego Water Board shall institute proceedings under these regulations to modify or revoke and reissue the permit to conform to the toxic effluent standard or prohibition. [40 CFR 122.44(b)(1)]

f. DUTY TO MINIMIZE OR CORRECT ADVERSE IMPACTS

The Copermittee must take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this Order, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the noncompliance.

g. PERMIT ACTIONS

The filing of a request by the Copermittee for modification, revocation and reissuance, or termination of this Order, or a notification of planned change in or anticipated noncompliance with this Order does not stay any condition of this Order. (See 40 CFR 122.41(f)) In addition, the following provisions apply to this Order:

(1) Upon application by any affected person, or on its own motion, the San Diego Water

Board may review and revise the requirements in this Order. All requirements must be reviewed periodically. [CWC Section 13263(e)]

(2) This Order may be terminated or modified for cause, including, but not limited to, all of the following: [CWC Section 13381]

(a) Violation of any condition contained in the requirements of this Order. [CWC Section 13381(a)]

(b) Obtaining the requirements in this Order by misrepresentation, or failure to disclose fully all relevant facts. [CWC Section 13381(b)]

(c) A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge. [CWC Section 13381(c)]

(3) When this Order is transferred to a new owner or operator, such requirements as may be necessary under the CWC may be incorporated into this Order.

h. NPDES PERMITTED NON-STORM WATER DISCHARGES

The San Diego Water Board has, in prior years, issued a limited number of individual NPDES permits for non-storm water discharges to MS4s. The San Diego Water Board or State Water Board may in the future, upon prior notice to the Copermittee(s), issue an NPDES permit for any non-storm water discharge (or class of non-storm water discharges) to an MS4.

i. MONITORING

In addition to the standard provisions required under 40 CFR 122.41(j) and (l)(4), the following general monitoring provisions apply to this Order:

(1) Where procedures are not otherwise specified in Order, sampling, analysis and quality assurance/quality control must be conducted in accordance with the Quality Assurance Management Plan (QAMP) for the State of California's Surface Water Ambient Monitoring Program (SWAMP), adopted by the State Water Resources Control Board (State Water Board).

(2) Pursuant to 40 CFR 122.41(j)(2) and CWC Section 13383(a), each Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five (5) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time.

(3) All chemical, bacteriological, and toxicity analyses must be conducted at a laboratory certified for such analyses by the California Department of Public Health or a laboratory approved by the San Diego Water Board.

(4) For priority toxic pollutants that are identified in the California Toxics Rule (CTR) (65

Fed. Reg. 31682), the Copermittees must instruct their laboratories to establish calibration standards that are equivalent to or lower than the Minimum Levels (MLs) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP). If a Copermittee can demonstrate that a particular ML is not attainable, in accordance with procedures set forth in 40 CFR Part 136, the lowest quantifiable concentration of the lowest calibration standard analyzed by a specific analytical procedure (assuming that all the method specified sample weights, volumes, and processing steps have been followed) may be used instead of the ML listed in Appendix 4 of the SIP. The Copermittee must submit documentation from the laboratory to the San Diego Water Board for approval prior to raising the ML for any priority toxic pollutant.

j. ENFORCEMENT

(1) The San Diego Water Board is authorized to enforce the terms of this Order under several provisions of the CWC, including, but not limited to, CWC Sections 13385, 13386, and 13387.

(2) Nothing in this Order shall be construed to protect the Copermittee from its liabilities under federal, state, or local laws.

(3) The CWC provides for civil and criminal penalties comparable to, and in some cases greater than, those provided for under the CWA.

(4) Except as provided in the standard conditions required under 40 CFR 122.41(m) and (n), nothing in this Order shall be construed to relieve the Copermittee from civil or criminal penalties for noncompliance.

(5) Nothing in this Order shall be construed to preclude the institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties to which the Copermittee is or may be subject to under Section 311 of the CWA.

(6) Nothing in this Order shall be construed to preclude institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authoring preserved by Section 510 of the CWA.

k. SEVERABILITY

The provisions of this Order are severable, and if any provision of this Order, or the application of any provisions of this Order to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this Order shall not be affected thereby.

l. APPLICATIONS

Any application submitted by a Copermittee for reissuance or modification of this Order must satisfy all applicable requirements specified in federal regulations as well as any additional requirements for submittal of a Report of Waste Discharge specified in the CWC and the California Code of Regulations.

m. IMPLEMENTATION

All plans, reports and subsequent amendments submitted in compliance with this Order must be implemented immediately (or as otherwise specified). All submittals by Copermittees must be adequate to implement the requirements of this Order.

n. REPORT SUBMITTALS

(1) All report submittals must include an executive summary, introduction, conclusion, recommendations, and signed certified statement.

(2) Each Copermittee must submit a signed certified statement covering its responsibilities for each applicable submittal.

(3) The Principal Watershed Copermittee(s) must submit a signed certified statement covering its responsibilities for each applicable submittal and the sections of the submittals for which it is responsible.

(4) Unless otherwise directed, the Copermittees must submit one hard copy and one electronic copy of each report required under this Order to the San Diego Water Board, and one electronic copy to the USEPA.

(5) The Copermittees must submit reports and provide notifications as required by this Order to the following:

EXECUTIVE OFFICER
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
2375 NORTHSIDE DRIVE, SUITE 100
SAN DIEGO CA 92108
Telephone: (619) 516-1990 Fax: (619) 516-1994

EUGENE BROMLEY
US ENVIRONMENTAL PROTECTION AGENCY
REGION IX
PERMITS ISSUANCE SECTION (W-5-1)
75 HAWTHORNE STREET
SAN FRANCISCO CA 94105

ATTACHMENT C

ACRONYMS AND ABBREVIATIONS

AMAL	Average Monthly Action Level
ASBS	Area(s) of Special Biological Significance
BMP	Best Management Practice
Basin Plan	Water Quality Control Plan for the San Diego Basin
CEQA	California Environmental Quality Act
CCR	California Code of Regulations
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWC	California Water Code
CZARA	Coastal Zone Act Reauthorization Amendments of 1990
ESAs	Environmentally Sensitive Areas
GIS	Geographic Information System
IBI	Index of Biological Integrity
LID	Low Impact Development
MDAL	Maximum Daily Action Level
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
NAL	Non-Storm Water Action Level
NAICS	North American Industry Classification System
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
ROWD	Report of Waste Discharge (application for NPDES reissuance)
SAL	Storm Water Action Level
San Diego Water Board	California Regional Water Quality Control Board, San Diego Region
SIC	Standard Industrial Classification Code
State Water Board	State Water Resources Control Board
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
WDID	Waste Discharge Identification Number
WLA	Waste Load Allocation
WQBEL	Water Quality Based Effluent Limitation

DEFINITIONS

Active/Passive Sediment Treatment - Using mechanical, electrical or chemical means to flocculate or coagulate suspended sediment for removal from runoff from construction sites prior to discharge.

Anthropogenic Litter – Trash generated from human activities, not including sediment.

Average Monthly Action Level – The highest allowable average of daily discharges over a calendar month.

Beneficial Uses - The uses of water necessary for the survival or wellbeing of man, plants, and wildlife. These uses of water serve to promote tangible and intangible economic, social, and environmental goals. "Beneficial Uses" of the waters of the State that may be protected include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. Existing beneficial uses are uses that were attained in the surface or ground water on or after November 28, 1975; and potential beneficial uses are uses that would probably develop in future years through the implementation of various control measures. "Beneficial Uses" are equivalent to "Designated Uses" under federal law. [California Water Code Section 13050(f)].

Best Management Practices (BMPs) - Defined in 40 CFR 122.2 as schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Bioassessment - The use of biological community information to evaluate the biological integrity of a water body and its watershed. With respect to aquatic ecosystems, bioassessment is the collection and analysis of samples of the benthic macroinvertebrate community together with physical/habitat quality measurements associated with the sampling site and the watershed to evaluate the biological condition (i.e. biotic integrity) of a water body.

Biofiltration - Practices that use vegetation and amended soils to detain and treat runoff from impervious areas. Treatment is through filtration, infiltration, adsorption, ion exchange, and biological uptake of pollutants.

Biological Integrity - Defined in Karr J.R. and D.R. Dudley. 1981. Ecological perspective on water quality goals. *Environmental Management* 5:55-68 as: "A balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitat of the region." Also referred to as ecosystem health.

BMP Design Manual – A plan developed to eliminate, reduce, or mitigate the impacts of runoff from development projects, including Priority Development Projects.

Chronic Toxicity – A measurement of sublethal effect (e.g. reduced growth, reproduction) to experimental test organisms exposed to an effluent or receiving waters compared to that of the control organisms.

Clean Water Act Section 303(d) Water Body - An impaired water body in which water quality does not meet applicable water quality standards and/or is not expected to meet water quality standards, even after the application of technology based pollution controls required by the CWA. The discharge of runoff to these water bodies by the Copermittees is significant because these discharges can cause or contribute to violations of applicable water quality standards.

Construction Site – Any project, including projects requiring coverage under the Construction General Permit, that involves soil disturbing activities including, but not limited to, clearing, grading, disturbances to ground such as stockpiling, and excavation.

Contamination - As defined in the Porter-Cologne Water Quality Control Act, contamination is "an impairment of the quality of waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste whether or not waters of the State are affected."

Copermittee – A permittee to a NPDES permit that is only responsible for permit conditions relating to the discharge for which it is operator [40 CFR 122.26(b)(1)]. For the purposes of this Order, a Copermittee is one of the individual permittees identified in Tables 1a-1c of this Order.

Copermittees – All of the individual Copermittees, collectively.

Critical Channel Flow (Qc) – The channel flow that produces the critical shear stress that initiates bed movement or that erodes the toe of channel banks. When measuring Qc, it should be based on the weakest boundary material – either bed or bank.

Daily Discharge – Defined as either: (1) the total mass of the constituent discharged over the calendar day or any 24 hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g. concentration.)

The Daily Discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day, or other 24 hour period other than a day), or by the arithmetic mean of analytical results from one or more grab samples taken over the course of a day.

Development Projects - Construction, rehabilitation, redevelopment, or reconstruction of any public or private projects.

Dry Season –May 1 to September 30.

Dry Weather – Weather is considered dry if the preceding 72 hours has been without measurable precipitation (>0.1 inch).

Enclosed Bays – Enclosed bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost bay works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays do not include inland surface waters or ocean waters.

Erosion – When land is diminished or worn away due to wind, water, or glacial ice. Often the eroded debris (silt or sediment) becomes a pollutant via storm water runoff. Erosion occurs naturally but can be intensified by land clearing activities such as farming, development, road building, and timber harvesting.

Environmentally Sensitive Areas (ESAs) - Areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; areas designated as preserves or their equivalent under the Natural Communities Conservation Program within the Cities and County of Orange; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.

Estuaries – Waters, including coastal lagoons, located at the mouth of streams that serve as areas of mixing fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and ocean water. Estuaries do not include inland surface waters or ocean waters.

Existing Development – Any area that has been developed and exists for municipal, commercial, industrial, or residential purposes, uses, or activities. May include areas that are not actively used for its originally developed purpose, but may be re-purposed or redeveloped for another use or activity.

Flow Duration – The long-term period of time that flows occur above a threshold that causes significant sediment transport and may cause excessive erosion damage to creeks and streams (not a single storm event duration). The simplest way to visualize this is to consider a histogram of pre- and post-project flows using long-term records of hourly data. To maintain pre-development flow duration means that the total number of hours (counts) within each range of flows in a flow-duration histogram cannot increase between the pre- and post-development condition. Flow duration within the range of geomorphologically significant flows is important for managing erosion.

Grading - The cutting and/or filling of the land surface to a desired slope or elevation.

Groundwater – Subsurface water that occurs beneath the water table in soils and geologic formations that are fully saturated.

Hazardous Material – Any substance that poses a threat to human health or the environment due to its toxicity, corrosiveness, ignitability, explosive nature or chemical reactivity. These also include materials named by the USEPA in 40 CFR 116 to be reported if a designated quantity of the material is spilled into the waters of the U.S. or emitted into the environment.

Hazardous Waste - Hazardous waste is defined as “any waste which, under Section 600 of Title 22 of this code, is required to be managed according to Chapter 30 of Division 4.5 of Title 22 of this code” [CCR Title 22, Division 4.5, Chapter 11, Article 1].

Household Hazardous Waste – Paints, cleaning products, and other hazardous wastes generated during home improvement or maintenance activities.

Hydromodification – The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

Illicit Connection – Any man-made conveyance or drainage system through which a non-storm water discharge to the storm water drainage system occurs or may occur. Any connection to the MS4 that conveys an illicit discharge.

Illicit Discharge - Any discharge to the MS4 that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from firefighting activities [40 CFR 122.26(b)(2)].

Inactive Areas – Areas of construction activity that are not active and those that have been active and are not scheduled to be re-disturbed for at least 14 days.

Infiltration – In the context of low impact development, infiltration is defined as the percolation of water into the ground. Infiltration is often expressed as a rate (inches per hour), which is determined through an infiltration test. In the context of non-storm water, infiltration is water other than wastewater that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow [40 CFR 35.2005(20)].

Inland Surface Waters – Includes all surface waters of the State that do not include the ocean, enclosed bays, or estuaries.

Jurisdictional Runoff Management Program Document – A written description of the specific jurisdictional runoff management measures and programs that each Copermittee will implement to comply with this Order and ensure that storm water pollutant discharges in runoff are reduced to the MEP and do not cause or contribute to a violation of water quality standards.

Low Impact Development (LID) – A storm water management and land development strategy that emphasizes conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions.

Low Impact Development Best Management Practices (LID BMPs) – LID BMPs include schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States through storm water management and land development strategies that emphasize conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions. LID BMPs include retention practices that do not allow runoff, such as infiltration, rain water harvesting and reuse, and evapotranspiration. LID BMPs also include flow-through practices such as biofiltration that may have some discharge of storm water following pollutant reduction.

Major Outfall – As defined in the Code of Federal Regulations, a major outfall is a MS4 outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (i.e. discharge from a single conveyance other than a circular pipe which is associated with a drainage area of more than 50 acres); or, for MS4s that receive storm water from lands zoned for industrial activity (based on comprehensive zoning plans or equivalent), a MS4 outfall that discharges from a single pipe with an inside diameter of 12 inches or more or from its equivalent (i.e. discharge from other than a circular pipe associated with a drainage area of 2 acres or more).

Maximum Daily Action Level (MDAL) –The highest allowable daily discharge of a pollutant, over a calendar day (or 24 hour period). For pollutants with action levels expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with action levels expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

Maximum Extent Practicable (MEP) – The technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) for storm water that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) in combination with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than BAT. A definition for MEP is not provided either in the statute or in the regulations. Instead the definition of MEP is dynamic and will be defined by the following process over time: municipalities propose their definition of MEP by way of their runoff management programs. Their total collective and individual activities conducted pursuant to the runoff management programs becomes their proposal for MEP as it applies both to their overall effort, as well as to specific activities (e.g., MEP for street sweeping, or MEP for MS4 maintenance). In the absence of a proposal acceptable to the San Diego Water Board, the San Diego Water Board defines MEP.

In a memo dated February 11, 1993, entitled "Definition of Maximum Extent Practicable," Elizabeth Jennings, Senior Staff Counsel, SWRCB addressed the achievement of the MEP standard as follows:

> "*To achieve the MEP standard, municipalities must employ whatever Best Management Practices (BMPs) are technically feasible (i.e., are likely to be effective) and are not cost prohibitive. The major emphasis is on technical feasibility. Reducing pollutants to the MEP means choosing effective BMPs, and rejecting applicable BMPs only where other effective BMPs will serve the same purpose, or the BMPs would not be technically feasible, or the cost would be prohibitive. In selecting BMPs to achieve the MEP standard, the following factors may be useful to consider:*
>
> *a. Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?*
> *b. Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?*
> *c. Public Acceptance: Does the BMP have public support?*
> *d. Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?*
> *e. Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc.?*

The final determination regarding whether a municipality has reduced pollutants to the maximum extent practicable can only be made by the Regional or State Water Boards, and not by the municipal discharger. If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit derived, it would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs that would address a pollutant source, or to pick a BMP based solely on cost, which would be clearly less effective. In selecting BMPs the municipality must make a serious attempt to comply and practical solutions may not be lightly rejected. In any case, the burden would be on the municipal discharger to show compliance with its permit. After selecting a menu of BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented."

Monitoring Year – October 1 to September 30

Municipal Separate Storm Sewer System (MS4) – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designated or used for collecting or conveying storm water; (iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.26.

National Pollutant Discharge Elimination System (NPDES) - The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the CWA.

Non-Storm Water - All discharges to and from a MS4 that do not originate from precipitation events (i.e., all discharges from a MS4 other than storm water). Non-storm water includes illicit discharges and NPDES permitted discharges.

Nuisance - As defined in the Porter-Cologne Water Quality Control Act, a nuisance is "anything which meets all of the following requirements: 1) Is injurious to health, or is indecent, or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. 2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. 3) Occurs during, or as a result of, the treatment or disposal of wastes."

Ocean Waters – The territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the State Board's California Ocean Plan.

Order – Unless otherwise specified, refers to this Order, Order No. R9-2013-0001 (NPDES No. CAS0109266)

Outfall - Outfall means a point source as defined by 40 CFR 122.2 at the point where a municipal separate storm sewer discharges to waters of the US and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels or other conveyances which connect segments of the same stream or other waters of the US and are used to convey waters of the US.

Persistent Flow - Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

Person - A person is defined as an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof [40 CFR 122.2].

Point Source - Any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, landfill leachate collection systems, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

Pollutant - Any agent that may cause or contribute to the degradation of water quality such that a condition of pollution or contamination is created or aggravated.

Pollution - As defined in the Porter-Cologne Water Quality Control Act, pollution is "the alteration of the quality of the waters of the State by waste, to a degree which unreasonably affects either of the following: 1) The waters for beneficial uses; or 2) Facilities that serve these beneficial uses." Pollution may include contamination.

Pollution Prevention - Pollution prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control BMPs, treatment control BMPs, or disposal.

Pre-Development Runoff Conditions – Approximate flow rates and durations that exist or existed onsite before land development occurs. For new development projects, this equates to runoff conditions immediately before project construction. For redevelopment projects, this equates to runoff conditions from the project footprint assuming infiltration characteristics of the underlying soil, and existing grade. Runoff coefficients of concrete or asphalt must not be used. A redevelopment Priority Development Project must use available information pertaining to existing underlying soil type and onsite existing grade to estimate pre-development runoff conditions.

Priority Development Projects - New development and redevelopment projects defined under Provision E.3.b of Order No. R9-2013-0001.

Rainy Season (aka Wet Season) –October 1 to April 30

Receiving Waters – Waters of the United States.

Receiving Water Limitations - Waste discharge requirements issued by the San Diego Water Board typically include both: (1) "Effluent Limitations" (or "Discharge Limitations") that specify the technology-based or water-quality-based effluent limitations; and (2) "Receiving Water Limitations" that specify the water quality objectives in the Basin Plan as well as any other limitations necessary to attain those objectives. In summary, the "Receiving Water Limitations" provision is the provision used to implement the requirements of CWA section 402(p)(3)(B).

Redevelopment - The creation and/or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include trenching and resurfacing associated with utility work; resurfacing existing roadways; new sidewalk construction, pedestrian ramps, or bike lane on existing roads; and routine replacement of damaged pavement, such as pothole repair.

Regional Clearinghouse – A central location for the collection and distribution of information developed and maintained by the Copermittees including, but not limited to, plans, reports, manuals, data, contact information, and/or links to such documents and information.

Rehabilitation - Remedial measures or activities for the purpose of improving or restoring the beneficial uses of streams, channels or river systems. Techniques may vary from in-stream restoration techniques to off-line storm water management practices installed in the system corridor or upland areas, or a combination of in-stream and out of stream techniques. Rehabilitation techniques may include, but are not limited to the following: riparian zone restoration, constructed wetlands, channel modifications that improve habitat and stability, and daylighting of drainage systems.

Reporting Period – The period of information that is reported in the Water Quality Improvement Plan Annual Report. The reporting period consists of two components: 1) July 1 to June 30, consistent with the fiscal year, for the implementation of the jurisdictional runoff management programs, and 2) October 1 to September 30, consistent with the monitoring year for the monitoring and assessment programs. Together, these two time periods constitute the reporting year for the Water Quality Improvement Plan Annual Report due January 31 following the end of the monitoring year.

Retain – Keep or hold in a particular place, condition, or position without discharge to surface waters.

Retrofitting – Storm water management practice put into place after development has occurred in watersheds where the practices previously did not exist or are ineffective. Retrofitting of developed areas is intended to improve water quality, protect downstream channels, reduce flooding, or meet other specific objectives. Retrofitting developed areas may include, but is not limited to replacing roofs with green roofs, disconnecting downspouts or impervious surfaces to drain to pervious surfaces, replacing impervious surfaces with pervious surfaces, installing rain barrels, installing rain gardens, and trash area enclosures.

Runoff - All flows in a storm water conveyance system that consists of the following components: (1) storm water (wet weather flows) and (2) non-storm water including dry weather flows.

San Diego Water Board – As used in this document the term "San Diego Water Board" is synonymous with the term "Regional Board" as defined in Water Code section 13050(b) and is intended to refer to the California Regional Water Quality Control Board for the San Diego Region as specified in Water Code Section 13200.

Sediment - Soil, sand, and minerals washed from land into water. Sediment resulting from anthropogenic sources (i.e. human induced land disturbance activities) is considered a pollutant. This Order regulates only the discharges of sediment from anthropogenic sources and does not regulate naturally occurring sources of sediment. Sediment can destroy fish-nesting areas, clog animal habitats, and cloud waters so that sunlight does not reach aquatic plants.

Source Control BMP – Land use or site planning practices, or structural or nonstructural measures that aim to prevent runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between pollutants and runoff.

Storm Water – Per 40 CFR 122.26(b)(13), means storm water runoff, snowmelt runoff and surface runoff and drainage. Surface runoff and drainage pertains to runoff and drainage resulting from precipitation events.

Structural BMPs - A subset of BMPs which detains, retains, filters, removes, or prevents the release of pollutants to surface waters from development projects in perpetuity, after construction of a project is completed.

Test of Significant Toxicity (TST) - A statistical approach used to analyze toxicity test data. The TST incorporates a restated null hypothesis, Welch's t-test, and biological effect thresholds for chronic and acute toxicity.

Total Maximum Daily Load (TMDL) - The maximum amount of a pollutant that can be discharged into a water body from all sources (point and non-point) and still maintain water quality standards. Under CWA section 303(d), TMDLs must be developed for all water bodies that do not meet water quality standards after application of technology-based controls.

Toxicity - Adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies. The water quality objectives for toxicity provided in the Basin Plan, state in part…"All waters shall be free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life….The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge."

Toxicity Identification Evaluation (TIE) - A set of procedures for identifying the specific chemical(s) responsible for toxicity. These procedures are performed in three phases (characterization, identification, and confirmation) using aquatic organism toxicity tests.

Toxicity Reduction Evaluation (TRE) - A study conducted in a step-wise process designed to identify the causative agents of effluent or ambient toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in toxicity. The first steps of the TRE consist of the collection of data relevant to the toxicity, including additional toxicity testing, and an evaluation of facility operations and maintenance practices, and best management practices. A Toxicity Identification Evaluation (TIE) may be required as

part of the TRE, if appropriate.

Treatment Control BMP – Any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media absorption or any other physical, biological, or chemical process.

Unpaved Road – Any long, narrow stretch without pavement used for traveling by motor passenger vehicles between two or more points. Unpaved roads are generally constructed of dirt, gravel, aggregate or macadam and may be improved or unimproved.

Waste - As defined in CWC Section 13050(d), "waste includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal."

Article 2 of CCR Title 23, Chapter 15 (Chapter 15) contains a waste classification system that applies to solid and semi-solid waste, which cannot be discharged directly or indirectly to water of the state and which therefore must be discharged to land for treatment, storage, or disposal in accordance with Chapter 15. There are four classifications of waste (listed in order of highest to lowest threat to water quality): hazardous waste, designated waste, non-hazardous solid waste, and inert waste.

Water Quality Objective - Numerical or narrative limits on constituents or characteristics of water designated to protect designated beneficial uses of the water. [California Water Code Section 13050 (h)]. California's water quality objectives are established by the State and Regional Water Boards in the Water Quality Control Plans. Numeric or narrative limits for pollutants or characteristics of water designed to protect the beneficial uses of the water. In other words, a water quality objective is the maximum concentration of a pollutant that can exist in a receiving water and still generally ensure that the beneficial uses of the receiving water remain protected (i.e., not impaired). Since water quality objectives are designed specifically to protect the beneficial uses, when the objectives are violated the beneficial uses are, by definition, no longer protected and become impaired. This is a fundamental concept under the Porter Cologne Act. Equally fundamental is Porter Cologne's definition of pollution. A condition of pollution exists when the water quality needed to support designated beneficial uses has become unreasonably affected or impaired; in other words, when the water quality objectives have been violated. These underlying definitions (regarding beneficial use protection) are the reason why all waste discharge requirements implementing the federal NPDES regulations require compliance with water quality objectives. (Water quality objectives are also called water quality criteria in the CWA.)

Water Quality Standards - Water quality standards, as defined in Clean Water Act section 303(c) consist of the beneficial uses (e.g., swimming, fishing, municipal drinking water supply, etc.,) of a water body and criteria (referred to as water quality objectives in the California Water Code) necessary to protect those uses. Under the Water Code, the water boards establish beneficial uses and water quality objectives in water quality control or basin plans. Together with an anti-degradation policy, these beneficial uses and water quality objectives serve as water quality standards under the Clean Water Act. In Clean Water Act parlance, state beneficial uses are called "designated uses" and state water quality objectives are called "criteria." Throughout this Order, the relevant term is used depending on the statutory scheme.

Waters of the State - Any water, surface or underground, including saline waters within the boundaries of the State [CWC section 13050 (e)]. The definition of the Waters of the State is broader than that for the Waters of the United States in that all water in the State is considered to be a Waters of the State regardless of circumstances or condition.

Waters of the United States - As defined in the 40 CFR 122.2, the Waters of the U.S. are defined as: "(a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate "wetlands;" (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters otherwise defined as waters of the United States under this definition: (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial seas; and (g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA."

Watershed - That geographical area which drains to a specified point on a water course, usually a confluence of streams or rivers (also known as drainage area, catchment, or river basin).

Wet Season (aka Rainy Season) – October 1 to April 30

Wet Weather – Weather is considered wet up to 72 hours after a storm event of 0.1 inches and greater, unless otherwise defined by another regulatory mechanism (e.g. a TMDL).

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM

ATTACHMENT D

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM

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JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

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I. COPERMITTEE INFORMATION			
Copermittee Name:			
Copermittee Primary Contact Name:			
Copermittee Primary Contact Information: Address: City:	County:	State:	Zip:
Telephone:	Fax:	Email:	

II. LEGAL AUTHORITY		
Has the Copermittee established adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 that complies with Order No. R9-2013-0001?	YES NO	☐ ☐
A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority?	YES NO	☐ ☐

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE		
Was an update of the jurisdictional runoff management program document required or recommended by the San Diego Water Board?	YES NO	☐ ☐
If YES to the question above, did the Copermittee update its jurisdictional runoff management program document and make it available on the Regional Clearinghouse?	YES NO	☐ ☐

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM		
Has the Copermittee implemented a program to actively detect and eliminate illicit discharges and connections to its MS4 that complies with Order No. R9-2013-0001?	YES NO	☐ ☐

Number of non-storm water discharges reported by the public	
Number of non-storm water discharges detected by Copermittee staff or contractors	
Number of non-storm water discharges investigated by the Copermittee	
Number of sources of non-storm water discharges identified	
Number of non-storm water discharges eliminated	
Number of sources of illicit discharges or connections identified	
Number of illicit discharges or connections eliminated	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

V. DEVELOPMENT PLANNING PROGRAM		
Has the Copermittee implemented a development planning program that complies with Order No. R9-2013-0001?	YES NO	☐ ☐
Was an update to the BMP Design Manual required or recommended by the San Diego Water Board?	YES NO	☐ ☐
If YES to the question above, did the Copermittee update its BMP Design Manual and make it available on the Regional Clearinghouse?	YES NO	☐ ☐

Number of proposed development projects in review	
Number of Priority Development Projects in review	
Number of Priority Development Projects approved	
Number of approved Priority Development Projects exempt from any BMP requirements	
Number of approved Priority Development Projects allowed alternative compliance	
Number of Priority Development Projects granted occupancy	

Number of completed Priority Development Projects in inventory	
Number of high priority Priority Development Project structural BMP inspections	
Number of Priority Development Project structural BMP violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM
ANNUAL REPORT FORM
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VI. CONSTRUCTION MANAGEMENT PROGRAM

Has the Copermittee implemented a construction management program that complies with Order No. R9-2013-0001?	YES ☐ NO ☐
Number of construction sites in inventory	
Number of active construction sites in inventory	
Number of inactive construction sites in inventory	
Number of construction sites closed/completed during reporting period	
Number of construction site inspections	
Number of construction site violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

Has the Copermittee implemented an existing development management program that complies with Order No. R9-2013-0001?	YES ☐ NO ☐

	Municipal	Commercial	Industrial	Residential
Number of facilities or areas in inventory				
Number of existing development inspections				
Number of follow-up inspections				
Number of violations				
Number of enforcement actions issued				
Number of escalated enforcement actions issued				

VIII. PUBLIC EDUCATION AND PARTICIPATION

Has the Copermittee implemented a public education program component that complies with Order No. R9-2013-0001?	YES ☐ NO ☐
Has the Copermittee implemented a public participation program component that complies with Order No. R9-2013-0001?	YES ☐ NO ☐

IX. FISCAL ANALYSIS

Has the Copermittee attached to this form a summary of its fiscal analysis that complies with Order No. R9-2013-0001?	YES ☐ NO ☐

X. CERTIFICATION

I [☐ Principal Executive Officer ☐ Ranking Elected Official ☐ Duly Authorized Representative] certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature	Date
Print Name	Title
Telephone Number	Email

ATTACHMENT E

SPECIFIC PROVISIONS FOR TOTAL MAXIMUM DAILY LOADS APPLICABLE TO ORDER NO. R9-2013-0001

These provisions implement load allocations (LAs) and wasteload allocations (WLAs) of the Total Maximum Daily Loads (TMDLs) established by the San Diego Water Board or USEPA under Clean Water Act section 303(c), applicable to discharges regulated under this Order. The provisions and schedules for implementation of the TMDLs described below must be incorporated into the Water Quality Improvement Plans, required pursuant to Provision B of this Order, for the specified Watershed Management Areas.

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed
2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin
3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed
4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek
5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay
6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)
7. Total Maximum Daily Load for Sediment in Los Peñasquitos Lagoon

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2002-0123

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	August 14, 2002
State Water Board Approval Date:	July 16, 2003
Office of Administrative Law Approval Date:	September 11, 2003
US EPA Approval Date:	November 3, 2003

(3) TMDL Effective Date: September 11, 2003

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final diazinon TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must be in compliance with the final TMDL compliance requirements as of December 31, 2010.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations:

Table 1.1
Final Receiving Water Limitations Expressed as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Diazinon	Acute	0.08 µg/L	1 hour
	Chronic	0.05 µg/L	4 days

(b) Final Effluent Limitations

Discharges from the MS4s containing concentrations that do not exceed the following effluent limitations will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 1.b.(2)(a):

Table 1.2
Final Effluent Limitations Expressed as Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation	Averaging Period
Diazinon	Acute	0.072 µg/L	1 hour
	Chronic	0.045 µg/L	4 days

(c) Best Management Practices

The following BMPs for Chollas Creek must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area and implemented by the Responsible Copermittees:

(i) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 1.b.(2)(a) and/or the effluent limitations under Specific Provision 1.b.(2)(b) for Chollas Creek.

(ii) The Responsible Copermittees must implement the Diazinon Toxicity Control Plan and Diazinon Public Outreach/Education Program as described in the report titled, *Technical Report for Total Maximum Daily Load for Diazinon in Chollas Creek Watershed, San Diego County*, dated August 14, 2002, including subsequent modifications, in order to achieve the receiving water limitations under Specific Provision 1.b.(2)(a) and/or the effluent limitations under Specific Provision 1.b.(2)(b).

(iii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 1.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 1.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 1.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 1.b.(2)(c) achieves compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 1.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 1.d, to demonstrate compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The Responsible Copermittees must be in compliance with the final diazinon TMDL compliance requirements as of December 31, 2010.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls for diazinon within the Chollas Creek watershed, and calculate or estimate the annual diazinon loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 1.b.(2)(b), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0019

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	September 22, 2005
Office of Administrative Law Approval Date:	December 2, 2005
US EPA Approval Date:	February 8, 2006

(3) TMDL Effective Date: December 2, 2005

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Shelter Island Yacht Basin

(6) Responsible Copermittee: City of San Diego

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final dissolved copper TMDL compliance requirements for Shelter Island Yacht Basin consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittee must be in compliance with the final TMDL compliance requirements as of December 2, 2005.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations:

Table 2.1
Final Receiving Water Limitations Expressed as Concentrations in Shelter Island Yacht Basin

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Dissolved Copper	Acute	4.8 µg/L x WER*	1 hour
	Chronic	3.1 µg/L x WER*	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 2.b.(3)(a):

Table 2.2
Final Effluent Limitations as Expressed as Annual Loads in MS4 Discharges to Shelter Island Yacht Basin

Constituent	Effluent Limitation
Dissolved Copper	30 kg/yr*

* If the water quality objectives for dissolved copper in Shelter Island Yacht Basin are changed in the future, then the margin of safety (MOS), TMDL and allocations will be recalculated using the *Method for Recalculation of the Total Maximum Daily Load for Dissolved Copper in the Shelter Island Yacht Basin, San Diego Bay* in the Basin Plan (p. 7-14).

(c) Best Management Practices

The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 2.b.(2)(a) and/or the effluent limitations under Specific Provision 2.b.(2)(b) for Shelter Island Yacht Basin. The BMPs must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 2.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 2.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittee develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 2.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a

watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 2.b.(2)(c) achieves compliance with Specific Provisions 2.b.(3)(a), 2.b.(3)(b) and/or 2.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 2.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 2.d, to demonstrate compliance with Specific Provisions 2.b.(3)(a), 2.b.(3)(b) and/or 2.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The Responsible Copermittees must be in compliance with the final dissolved copper TMDL compliance requirements as of December 2, 2005.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

The Responsible Copermittee must monitor the effluent of its MS4 outfalls for dissolved copper, and calculate or estimate the monthly and annual dissolved copper loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.(b)(2)of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0036

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	November 16, 2005
Office of Administrative Law Approval Date:	February 1, 2006
US EPA Approval Date:	March 22, 2006

(3) TMDL Effective Date: February 1, 2006

(4) Watershed Management Area: Santa Margarita River

(5) Water Body: Rainbow Creek

(6) Responsible Copermittee: County of San Diego

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final total nitrogen and total phosphorus TMDL compliance requirements for Rainbow Creek consist of the following

(1) Final TMDL Compliance Date

The Responsible Copermittee must comply with final TMDL compliance requirements by December 31, 2021.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance date under Specific Provision 3.b.(1):

Table 3.1
Final Receiving Water Limitations Expressed as Concentrations in Rainbow Creek

Constituent	Receiving Water Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing concentrations that do not exceed the following effluent limitations by the compliance date under Specific Provision 3.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 3.b.(2)(a):

Table 3.2
Final Effluent Limitations Expressed as Concentrations in MS4 Discharges to Rainbow Creek

Constituent	Effluent Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(ii) Annual pollutant loads from given land uses discharging to and from the MS4s that do not exceed the following annual loads by the compliance date under Specific Provision 3.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 3.b.(2)(a):

Table 3.3
Final Effluent Limitations Expressed as Annual Loads in MS4 Discharges to Rainbow Creek

Land Use	Total N	Total P
Commercial nurseries	116 kg/yr	3 kg/yr
Park	3 kg/yr	0.1 kg/yr
Residential areas	149 kg/yr	12 kg/yr
Urban areas	27 kg/yr	6 kg/yr

(c) Best Management Practices

(i) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 3.b.(2)(a) and/or the effluent limitations under Specific Provision 3.b.(2)(b) for Rainbow Creek.

(ii) The Responsible Copermittee should coordinate any BMPs implemented to address this TMDL with Caltrans and other sources as possible.

(3) <u>Final TMDL Compliance Determination</u>

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 3.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 3.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the final effluent limitations under Specific Provision 3.b.(2)(b)(ii); OR

(e) The Responsible Copermittee develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 3.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Specific Provision 3.b.(2)(c) achieves compliance with Specific Provisions 3.b.(3)(a), 3.b.(3)(b), 3.b.(3)(c) and/or 3.b.(3)(d),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 3.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 3.d, to demonstrate compliance with Specific Provisions 3.b.(3)(a), 3.b.(3)(b), 3.b.(3)(c) and/or 3.b.(3)(d).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim total nitrogen and total phosphorus TMDL compliance requirements for Rainbow Creek consist of the following:

(1) Interim Compliance Dates and WQBELs

The Responsible Copermittee must comply with the interim WQBELs, expressed as annual loads, by December 31 of the interim compliance year given in Table 3.4.

Table 3.4
Interim Water Quality Based Effluent Limitations Expressed as Annual Loads in MS4 Discharges from Specific Land Uses to Rainbow Creek

	Total N Interim Effluent Limitations (kg/yr)			Total P Interim Effluent Limitations (kg/yr)		
	Interim Compliance Date			Interim Compliance Date		
Land Use	**2009**	**2013**	**2017**	**2009**	**2013**	**2017**
Commercial nurseries	390	299	196	20	16	10
Park	5	3	3	0.15	0.10	0.10
Residential areas	507	390	260	99	74	47
Urban areas	40	27	27	9	6	6

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 3.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 3.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the final effluent limitations under Specific Provision 3.b.(2)(b)(ii); OR

(e) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the interim effluent limitations under Specific Provision 3.c.(1); OR

(f) The Responsible Copermittee has submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

d. Specific Monitoring and Assessment Requirements

(1) The Responsible Copermittee must incorporate into the Water Quality Improvement Plan and implement the Sampling and Analysis Plan for Rainbow Creek Nutrient Reduction TMDL Implementation Water Quality Monitoring, dated January 2010.

(2) The results of any monitoring conducted during the reporting period, and assessment of whether the interim and final TMDL compliance requirements have been achieved must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 3.b.(2)(b)(i), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2007-0043

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2007
State Water Board Approval Date:	July 15, 2008
Office of Administrative Law Approval Date:	October 22, 2008
US EPA Approval Date:	December 18, 2008

(3) TMDL Effective Date: October 22, 2008

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final dissolved copper, lead, and zinc TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must comply with the final TMDL compliance requirements by October 22, 2028.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance date under Specific Provision 4.b.(1):

Table 4.1
Final Receiving Water Limitations Expressed as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$(0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$(0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$(0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$(0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations by the compliance date under Specific Provision 4.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 4.b.(2)(a):

Table 4.2
Final Effluent Limitations as Expressed Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(c) Best Management Practices

(i) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 4.b.(2)(a) and/or the effluent limitations under Specific Provision 4.b.(2)(b) for Chollas Creek.

(ii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans and the U.S. Navy as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 4.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 4.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 4.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 4.b.(2)(c) achieves compliance with Specific Provisions 4.b.(3)(a), 4.b.(3)(b) and/or 4.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 4.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 4.d, to demonstrate compliance with Specific Provisions 4.b.(3)(a), 4.b.(3)(b) and/or 4.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim dissolved copper, lead, and zinc TMDL compliance requirements for Chollas Creek consist of the following:

(1) Interim Compliance Date and WQBELs

The Responsible Copermittee must comply with the interim WQBELs, expressed as concentrations, by the interim compliance date given in Table 4.3:

Table 4.3
Interim Water Quality Based Effluent Limitations Expressed as Concentrations in MS4 Discharges to Chollas Creek

Interim Compliance Date	Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
October 22, 2018	Dissolved Copper	Acute	$1.2 \times 90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
	Dissolved Lead	Acute	$1.2 \times 90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
	Dissolved Zinc	Acute	$1.2 \times 90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 4.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 4.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) There are no exceedances of the interim effluent limitations under Specific Provision 4.c.(1) at the Responsible Copermittee's MS4 outfalls; OR

(e) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance date.

d. Specific Monitoring and Assessment Requirements

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*, when it is amended to include monitoring requirements for the Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls discharging to Chollas Creek for dissolved copper, lead, and zinc, and calculate or estimate the monthly and annual dissolved copper, lead, and zinc loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 4.b.(2)(b) or 4.c.(1), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2008-0027

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 11, 2008
State Water Board Approval Date:	June 16, 2009
Office of Administrative Law Approval Date:	September 15, 2009
US EPA Approval Date:	October 26, 2009

(3) TMDL Effective Date: September 15, 2009

(4) Watershed Management Areas: See Table 5.0

(5) Water Bodies: See Table 5.0

(6) Responsible Copermittees: See Table 5.0

Table 5.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County	Dana Point Harbor	Baby Beach	-City of Dana Point -County of Orange
San Diego Bay	San Diego Bay	Shelter Island Shoreline Park	- San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final indicator bacteria TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Final TMDL Compliance Dates

(a) Baby Beach in Dana Point Harbor

The Responsible Copermittees for MS4 discharges to Baby Beach must be in compliance with the final TMDL compliance requirements according to the following compliance dates:

Table 5.1
Compliance Dates to Achieve Final TMDL Compliance Requirements For Baby Beach in Dana Point Harbor

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform	September 15, 2014	September 15, 2009
Fecal Coliform		September 15, 2009
Enterococcus		September 15, 2019

(b) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park must be in compliance with the final TMDL compliance requirements as of December 31, 2012.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance dates under Specific Provision 5.b.(1):

Table 5.2
Final Receiving Water Limitations Expressed as Bacteria Densities in the Water Body

	Receiving Water Limitations	
Constituent	Single Sample Maximum[1,2]	30-Day Geometric Mean[2]
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing indicator bacteria densities that do not exceed the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.3a
Final Effluent Limitations as Expressed as Bacteria Densities in MS4 Discharges to the Water Body

	Effluent Limitations	
Constituent	**Single Sample Maximum[1,2]**	**30-Day Geometric Mean[2]**
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.

(ii) Discharges from the MS4s containing indicator bacteria loads that do not exceed the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.4a
Final Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to the Baby Beach in Dana Point Harbor

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0.86×10^9 MPN/day	$3{,}254 \times 10^9$ MPN/30days
Fecal Coliform	0.17×10^9 MPN/day	112×10^9 MPN/30days
Enterococcus	0.03×10^9 MPN/day	114×10^9 MPN/30days

Table 5.4b
Final Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to the Shelter Island Shoreline Park in San Diego Bay

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0 MPN/day	198×10^9 MPN/30days
Fecal Coliform	0 MPN/day	8×10^9 MPN/30days
Enterococcus	0 MPN/day	26×10^9 MPN/30days

(iii) Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.5a
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to Baby Beach in Dana Point Harbor*

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	90.4%	0%
Fecal Coliform	82.7%	0%
Enterococcus	96.2%	62.2%

Notes:
* The percent load reductions are relative to data collected between 1996-2002. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittees' MS4s must not exceed the loads in Table 5.4a, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the water body.

Table 5.5b
*Final Effluent Limitations Expressed as Percent Load Reductions** in MS4 Discharges to Shelter Island Shoreline Park in San Diego Bay*

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0%	0%
Fecal Coliform	0%	0%
Enterococcus	0%	0%

Notes:
* The percent load reductions are relative to data collected between 1999-2004. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittee's MS4s must not exceed the loads in Table 5.4b, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the water body.

(c) Best Management Practices

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 5.0 must incorporate the Bacteria Load Reduction Plan (BLRP) required to be developed pursuant to Resolution No. R9-2008-0027.

(ii) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 5.b.(2)(a) and/or the effluent limitations under Specific Provision 5.b.(2)(b) for the segments or areas of the water bodies listed in Table 5.0

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.b.(2)(b)(ii); OR

(e) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 5.b.(2)(b)(iii); OR

(f) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(g) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 5.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 5.b.(2)(c) achieves compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 5.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 5.d, to demonstrate compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim indicator bacteria TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Baby Beach in Dana Point Harbor

(a) Interim TMDL Compliance Dates and WQBELs

The Responsible Copermittees for MS4 discharges to Baby Beach must comply with the following interim WQBELs by the interim compliance dates given in Tables 5.6a and/or 5.6b:

Table 5.6a
Interim Water Quality Based Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to Baby Beach in Dana Point Harbor

Constituent	Interim Compliance Dates	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	4.93×10^9 MPN/day	$3{,}254 \times 10^9$ MPN/30days*
Fecal Coliform	September 15, 2012	0.59×10^9 MPN/day	112×10^9 MPN/30days*
Enterococcus	September 15, 2012	0.42×10^9 MPN/day	301×10^9 MPN/30days
	September 15, 2016	0.03×10^9 MPN/day *	207×10^9 MPN/30days

Notes:
* Same as the final effluent limitations in Table 5.4a.

Table 5.6b
Interim Water Quality Based Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to Baby Beach in Dana Point Harbor*

Constituent	Interim Compliance Dates	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	45.2%	0%**
Fecal Coliform	September 15, 2012	41.4%	0%**
Enterococcus	September 15, 2012	48.1%	0%
	September 15, 2016	96.2%**	31.1%

Notes:
* The percent load reductions are relative to data collected between 1996-2002. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittees' MS4s must not exceed the loads in Table 5.6a, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the waterbody.
** Same as the final effluent limitations in Table 5.5a.

(b) Interim Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(i) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(ii) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(iii) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(iv) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.b(2)(b)(ii); OR

(v) The Responsible Copermittees can demonstrate that exceedances of the applicable receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(vi) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the interim effluent limitations under Table 5.6a of Specific Provision 5.c.(1)(a); OR

(vii) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the interim effluent limitations under Table 5.6b of Specific Provision 5.c.(1)(a); OR

(viii) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

(2) <u>Shelter Island Shoreline Park in San Diego Bay</u>

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park must be in compliance with the final indicator bacteria TMDL requirements as of December 31, 2012.

d. Specific Monitoring and Assessment Requirements

(1) Monitoring Stations

Monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[33] If discharges of bacteria from the MS4 exceed the applicable interim or final WQBELs, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(2) Monitoring Procedures

(a) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) The Responsible Copermittees must collect wet weather monitoring samples within the first 24 hours of a storm event[34] of the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(c) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

[33] Commonly referred to as AB 411 monitoring
[34] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs have been achieved.

(b) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 5.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(c) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to correlate elevated bacteria levels with known or suspected sewage spills from wastewater collection systems and treatment plants or boats.

(d) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2010-0001

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date: February 10, 2010
State Water Board Approval Date: December 14, 2010
Office of Administrative Law Approval Date: April 4, 2011
US EPA Approval Date: June 22, 2011

(3) TMDL Effective Date: April 4, 2011

(4) Watershed Management Areas: See Table 6.0

(5) Water Bodies: See Table 6.0

(6) Responsible Copermittees: See Table 6.0

Table 6.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	-City of Laguna Beach -County of Orange -Orange County Flood Control District
		at Heisler Park - North	
	Pacific Ocean Shoreline	at Main Laguna Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Woods -County of Orange -Orange County Flood Control District
		Laguna Beach at Ocean Avenue	
		Laguna Beach at Cleo Street	
		Arch Cove at Bluebird Canyon Road	
		Laguna Beach at Dumond Drive	
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Hills -City of Laguna Niguel -City of Laguna Woods -City of Lake Forest -City of Mission Viejo -County of Orange -Orange County Flood Control District
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	
	Aliso Creek Mouth	at mouth	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	-City of Dana Point -City of Laguna Beach -City of Laguna Niguel -County of Orange -Orange County Flood Control District
		Aliso Beach at Table Rock Drive	
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)	
		at Salt Creek (large outlet)	
		Salt Creek Beach at Salt Creek service road	
		Salt Creek Beach at Strand Road	
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	-City of Dana Point -City of Laguna Hills -City of Laguna Niguel -City of Mission Viejo -City of Rancho Santa Margarita -City of San Juan Capistrano -County of Orange -Orange County Flood Control District
	San Juan Creek	lower 1 mile	
	San Juan Creek Mouth	at mouth	
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	-City of Dana Point -City of San Clemente -County of Orange -Orange County Flood Control District
		Ole Hanson Beach Club Beach at Pico Drain	
		San Clemente City Beach at El Portal Street Stairs	
		San Clemente City Beach at Mariposa Street	
		San Clemente City Beach at Linda Lane	
		San Clemente City Beach at South Linda Lane	
		San Clemente City Beach at Lifeguard Headquarters	
		under San Clemente Municipal Pier	
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	
		San Clemente State Beach at Riviera Beach	
		Can Clemente State Beach at Cypress Shores	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	-City of Oceanside -City of Vista -County of San Diego
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	-City of Carlsbad -City of Encinitas -City of Escondido -City of San Marcos -County of San Diego
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	-City of Del Mar -City of Escondido -City of Poway -City of San Diego -City of Solana Beach -County of San Diego
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	-City of Del Mar -City of Poway -City of San Diego -County of San Diego
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	-City of San Diego
		La Jolla Shores Beach at Caminito del Oro	
		La Jolla Shores Beach at Vallecitos	
		La Jolla Shores Beach at Avenida de la Playa	
		at Casa Beach, Children's Pool	
		South Casa Beach at Coast Boulevard	
		Whispering Sands Beach at Ravina Street	
		Windansea Beach at Vista de la Playa	
		Windansea Beach at Bonair Street	
		Windansea Beach at Playa del Norte	
		Windansea Beach at Palomar Avenue	
		at Tourmaline Surf Park	
		Pacific Beach at Grand Avenue	
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I- Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	-City of El Cajon -City of Santee -County of San Diego
	San Diego River	lower 6 miles	-City of El Cajon -City of La Mesa -City of San Diego -City of Santee -County of San Diego
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	-City of La Mesa -City of Lemon Grove -City of San Diego -County of San Diego - San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final indicator bacteria TMDL compliance requirements for the water bodies listed in Table 6.0 consist of the following:

(1) Final TMDL Compliance Dates

The Responsible Copermittees for MS4 discharges to the water bodies listed in Table 6.0 must be in compliance with the final TMDL compliance requirements according to the following compliance dates:

Table 6.1
Compliance Dates to Achieve Final TMDL Compliance Requirements

Constituent	Dry Weather TMDL Compliance Date	Wet Weather TMDL Compliance Date
Total Coliform	April 4, 2021	April 4, 2031
Fecal Coliform		
Enterococcus		

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance dates under Specific Provision 6.b.(1):

Table 6.2a
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Beaches

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform	10,000	22%	1,000	0%
Fecal Coliform	400	22%	200	0%
Enterococcus	104	22%	35	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan.

Table 6.2b
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Creeks

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Fecal Coliform	400	22%	200	0%
Enterococcus	61 (104)	22%	33	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Basin Plan.
d. A single sample maximum of 104 MPN/100ml for *Enterococcus* may be applied as a receiving water limitation for creeks, instead of 61 MPN/100mL, if one or more of the creeks addressed by these TMDLs (San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek, San Diego River, and/or Chollas Creek) is designated with a "moderately to lightly used area" or less frequent usage frequency in the Basin Plan. Otherwise, the single sample maximum of 61 MPN/100mL for *Enterococcus* must be used to assess compliance with the allowable exceedance frequency.

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing indicator bacteria densities that do not exceed the following effluent limitations by the compliance dates under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a):

Table 6.2c
Final Effluent Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies in MS4 Discharges to the Water Body

Constituent	Concentration-Based Effluent Limitations			
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform[d]	10,000	22%	1,000	0%
Fecal Coliform	400	22%	200	0%
Enterococcus	104[e] / 61[f]	22%	35[e] / 33[f]	0%

Notes:
a. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan for discharges to beaches, and the Basin Plan for discharges to creeks and creek mouths.
d. Total coliform effluent limitations only apply to MS4 outfalls that discharge to the Pacific Ocean Shorelines and creek mouths listed in Table 6.0.
e. This *Enterococcus* effluent limitation applies to MS4 discharges to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
f. This *Enterococcus* effluent limitation applies to MS4 discharges to segments or areas of creeks or creek mouths listed in Table 6.0.

(ii) Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the compliance dates under Specific Provision 6.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a):

Table 6.3
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	*Watershed and Water Bodies*	*Load-Based Effluent Limitations*					
		Dry Weather			*Wet Weather*		
		Total Coliform	*Fecal Coliform*	*Entero-coccus*	*Total Coliform*	*Fecal Coliform*	*Entero-coccus*
South Orange County	San Joaquin Hills HSA (901.11) and Laguna Hills HSA (901.12) - Pacific Ocean Shoreline	91.78%	91.72%	98.28%	46.85%	52.07%	51.26%
	Aliso HSA (901.13) - Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	95.47%	95.58%	99.13%	25.29%	26.62%	27.52% (27.37%)**
	Dana Point HSA (901.14) - Pacific Ocean Shoreline	95.04%	95.03%	98.98%	13.15%	14.86%	15.16%
	Lower San Juan HSA (901.27) - Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	72.96%	74.21%	94.94%	19.21%	12.82%	27.12% (26.90%)**
	San Clemente HA (901.30) - Pacific Ocean Shoreline	94.28%	94.23%	98.83%	23.85%	24.58%	25.26%
San Luis Rey River	San Luis Rey HU (903.00) - Pacific Ocean Shoreline	38.13%	39.09%	87.38%	5.62%	3.12%	11.69%

Table 6.3 (Cont'd)
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watershed and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
Carlsbad	San Marcos HA (904.50) - Pacific Ocean Shoreline	82.82%	82.55%	96.03%	18.47%	18.98%	20.19%
San Dieguito River	San Dieguito HU (905.00) - Pacific Ocean Shoreline	14.39%	20.72%	83.48%	4.29%	1.46%	7.72%
Penasquitos	Miramar Reservoir HA (906.10) - Pacific Ocean Shoreline	96.50%	96.59%	99.42%	1.61%	1.99%	1.93%
Mission Bay	Scripps HA (906.30) - Pacific Ocean Shoreline	96.44%	96.42%	99.25%	16.32%	21.14%	18.82%
	Tecolote HA (906.50) - Tecolote Creek	94.51%	94.59%	98.94%	16.51%	20.47%	18.15% (18.08%)**
San Diego River	Mission San Diego HSA (907.11) and Santee HSA (907.12) - Pacific Ocean Shoreline - Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles)	74.03%	69.44%	93.96%	38.14%	53.22%	42.74% (42.47%)**
San Diego Bay	Chollas HSA (908.22) - Chollas Creek	92.06%	92.15%	98.46%	17.82%	24.84%	21.46% (21.36%)**

Notes:
* The percent load reductions are based on reducing loads compared to pollutant loads from 2001 to 2002.
** The alternative *Enterococcus* percent load reduction was calculated based on a numeric target of 104 MPN/100mL instead of 61 MPN/100mL, protective of the REC-1 "moderately to lightly used area" usage frequency that is protective of freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative pollutant load reductions can be utilized.

(c) Best Management Practices

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 6.0 must incorporate the Comprehensive Load Reduction Plans (CLRPs) required to be developed pursuant to Resolution No. R9-2010-0001.

(ii) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 6.b.(2)(a) and/or the effluent limitations under Specific Provision 6.b.(2)(b) for the segments or areas of the water bodies listed in Table 6.0.

(iii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans, owners/operators of small MS4s, and agricultural dischargers as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(f) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 6.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 6.b.(2)(c) achieves compliance with Specific Provisions 6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), and/or 6.b.(3)(e),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 6.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 6.d, to demonstrate compliance with Specific Provisions 6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), 6.b.(3)(e) and/or 6.b.(3)(f).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim indicator bacteria TMDL compliance requirements for the water bodies listed in Table 6.0 consist of the following:

(1) Interim TMDL Compliance Dates

The Responsible Copermittees must achieve compliance with the interim TMDL compliance requirements, as determined in accordance with Specific Provision 6.c.(3), by the interim compliance dates given in Table 6.4, unless alternative interim compliance dates are accepted by the San Diego Water Board Executive Officer as part of the Water Quality Improvement Plan.

Table 6.4
Interim Compliance Dates to Achieve Interim TMDL Compliance Requirements

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	April 4, 2016	April 4, 2021
		at Heisler Park - North		
	Pacific Ocean Shoreline	at Main Laguna Beach	April 4, 2016	April 4, 2021
		Laguna Beach at Ocean Avenue		
		Laguna Beach at Cleo Street		
		Arch Cove at Bluebird Canyon Road		
		Laguna Beach at Dumond Drive		
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	April 4, 2016	April 4, 2021
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	April 4, 2018	April 4, 2021
	Aliso Creek Mouth	at mouth	April 4, 2018	April 4, 2021
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	April 4, 2016	April 4, 2021
		Aliso Beach at Table Rock Drive		
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)		
		at Salt Creek (large outlet)		
		Salt Creek Beach at Salt Creek service road	April 4, 2017	April 4, 2021
		Salt Creek Beach at Strand Road	April 4, 2017	April 4, 2021

Table 6.4 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates	
			Interim Dry Weather WQBELs	Interim Wet Weather WQBELs
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	April 4, 2016	April 4, 2021
	San Juan Creek	lower 1 mile	April 4, 2018	April 4, 2021
	San Juan Creek Mouth	at mouth	April 4, 2016	April 4, 2021
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	April 4, 2016	April 4, 2021
		Ole Hanson Beach Club Beach at Pico Drain	April 4, 2016	April 4, 2021
		San Clemente City Beach at El Portal Street Stairs	April 4, 2017	April 4, 2021
		San Clemente City Beach at Mariposa Street		
		San Clemente City Beach at Linda Lane	April 4, 2016	April 4, 2021
		San Clemente City Beach at South Linda Lane	April 4, 2018	April 4, 2021
		San Clemente City Beach at Lifeguard Headquarters	April 4, 2017	April 4, 2021
		under San Clemente Municipal Pier		
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	April 4, 2018	April 4, 2021
		San Clemente State Beach at Riviera Beach	April 4, 2016	April 4, 2021
		Can Clemente State Beach at Cypress Shores	April 4, 2017	April 4, 2021
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	April 4, 2017	April 4, 2021
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	April 4, 2016	April 4, 2021
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	April 4, 2016	April 4, 2021

Table 6.4 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates	
			Interim Dry Weather WQBELs	Interim Wet Weather WQBELs
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	April 4, 2016	April 4, 2021
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	April 4, 2016	April 4, 2021
		La Jolla Shores Beach at Caminito del Oro		
		La Jolla Shores Beach at Vallecitos		
		La Jolla Shores Beach at Avenida de la Playa		
		at Casa Beach, Children's Pool		
		South Casa Beach at Coast Boulevard		
		Whispering Sands Beach at Ravina Street		
		Windansea Beach at Vista de la Playa		
		Windansea Beach at Bonair Street		
		Windansea Beach at Playa del Norte		
		Windansea Beach at Palomar Avenue		
		at Tourmaline Surf Park		
		Pacific Beach at Grand Avenue		
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries		
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	April 4, 2018	April 4, 2021
	San Diego River	lower 6 miles		
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach		
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	April 4, 2018	April 4, 2021

(2) Interim Water Quality Based Effluent Limitations

The Responsible Copermittees for discharges to the water bodies in Table 6.0 must comply with the following interim WQBELs by the interim compliance dates given in Specific Provision 6.c.(1):

(a) Interim Receiving Water Limitations

(i) *Interim Dry Weather Receiving Water Limitations*

The Responsible Copermittee must calculate the "existing" exceedance frequencies of the 30-day geometric mean water quality objectives for each of the indicator bacteria by analyzing the available monitoring data collected between January 1, 1996 and December 31, 2002. "Existing" exceedance frequencies may be calculated by water body and/or by Watershed Management Area listed in Table 6.0. Separate "existing" exceedance frequencies must be calculated for beaches and creeks/creek mouths.

The Responsible Copermittees must achieve a 50 percent reduction in the "existing" exceedance frequency of the 30-day geometric mean WQBELs for the water bodies listed in Table 6.0 by the interim compliance dates given in Table 6.4. A 50 percent reduction in the "existing" exceedance frequency is equivalent to half of the "existing" exceedance frequency of the 30-day geometric mean WQBELs.

The "existing" exceedance frequencies and the interim dry weather allowable exceedance frequencies (i.e. interim dry weather receiving water limitations) calculated by the Responsible Copermittees must be included in the Water Quality Improvement Plans for the applicable Watershed Management Areas.

(ii) *Interim Wet Weather Receiving Water Limitations*

The Responsible Copermittees must achieve the interim wet weather receiving water limitations in Table 6.5, expressed as interim wet weather allowable exceedance frequencies, by the interim compliance dates given in Table 6.4.

Table 6.5
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	38%	37%	39%
		at Heisler Park - North			
	Pacific Ocean Shoreline	at Main Laguna Beach			
		Laguna Beach at Ocean Avenue			
		Laguna Beach at Cleo Street			
		Arch Cove at Bluebird Canyon Road			
		Laguna Beach at Dumond Drive			
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	41%	41%	42%
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	41%	41%	42%
	Aliso Creek Mouth	at mouth	41%	41%	42%
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	36%	36%	36%
		Aliso Beach at Table Rock Drive			
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)			
		at Salt Creek (large outlet)			
		Salt Creek Beach at Salt Creek service road			
		Salt Creek Beach at Strand Road			

Table 6.5 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	44%	44%	48%
	San Juan Creek	lower 1 mile	44%	44%	47%
	San Juan Creek Mouth	at mouth	44%	44%	47%
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	35%	35%	36%
		Ole Hanson Beach Club Beach at Pico Drain			
		San Clemente City Beach at El Portal Street Stairs			
		San Clemente City Beach at Mariposa Street			
		San Clemente City Beach at Linda Lane			
		San Clemente City Beach at South Linda Lane			
		San Clemente City Beach at Lifeguard Headquarters			
		under San Clemente Municipal Pier			
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)			
		San Clemente State Beach at Riviera Beach			
		Can Clemente State Beach at Cypress Shores			
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	45%	44%	47%
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	40%	40%	41%
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	33%	33%	36%

Table 6.5 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	26%	26%	26%
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	37%	37%	37%
		La Jolla Shores Beach at Caminito del Oro			
		La Jolla Shores Beach at Vallecitos			
		La Jolla Shores Beach at Avenida de la Playa			
		at Casa Beach, Children's Pool			
		South Casa Beach at Coast Boulevard			
		Whispering Sands Beach at Ravina Street			
		Windansea Beach at Vista de la Playa			
		Windansea Beach at Bonair Street			
		Windansea Beach at Playa del Norte			
		Windansea Beach at Palomar Avenue			
		at Tourmaline Surf Park			
		Pacific Beach at Grand Avenue			
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries	49%	49%	51%
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	46%	43%	49%
	San Diego River	lower 6 miles	46%	43%	49%
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	46%	43%	51%
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	41%	41%	43%

(b) Interim Effluent Limitations

Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the interim compliance dates under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.c.(2)(a):

Table 6.6
Interim Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	*Watersheds and Water Bodies*	*Load-Based Effluent Limitations*					
		Dry Weather			*Wet Weather*		
		Total Coliform	*Fecal Coliform*	*Entero-coccus*	*Total Coliform*	*Fecal Coliform*	*Entero-coccus*
South Orange County	San Joaquin Hills HSA (901.11) and Laguna Hills HSA (901.12) - Pacific Ocean Shoreline	45.89%	45.86%	49.14%	23.43%	26.04%	25.63%
	Aliso HSA (901.13) - Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	47.74%	47.79%	49.57%	12.65%	13.31%	13.76% (13.69%)**
	Dana Point HSA (901.14) - Pacific Ocean Shoreline	47.52%	47.52%	49.49%	6.58%	7.43%	7.58%
	Lower San Juan HSA (901.27) - Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	36.48%	37.11%	47.47%	9.61%	6.41%	13.56% (13.45%)**
	San Clemente HA (901.30) - Pacific Ocean Shoreline	47.14%	47.12%	49.42%	11.93%	12.29%	12.63%
San Luis Rey River	San Luis Rey HU (903.00) - Pacific Ocean Shoreline	19.07%	19.55%	43.69%	2.81%	1.56%	5.85%
Carlsbad	San Marcos HA (904.50) - Pacific Ocean Shoreline	41.41%	41.28%	48.02%	9.24%	9.49%	10.10%

Table 6.6 (Cont'd)
Interim Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watersheds and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
San Dieguito River	San Dieguito HU (905.00) - Pacific Ocean Shoreline	7.20%	10.36%	41.74%	2.15%	0.73%	3.86%
Penasquitos	Miramar Reservoir HA (906.10) - Pacific Ocean Shoreline	48.25%	48.30%	49.71%	0.81%	1.00%	0.97%
Mission Bay	Scripps HA (906.30) - Pacific Ocean Shoreline	48.22%	48.21%	49.63%	8.16%	10.57%	9.41%
	Tecolote HA (906.50) - Tecolote Creek	47.26%	47.30%	49.47%	8.26%	10.24%	9.08% (9.04%)**
San Diego River	Mission San Diego HSA (907.11) and Santee HSA (907.12) - Pacific Ocean Shoreline - Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles)	37.02%	34.72%	46.98%	19.07%	26.61%	21.37% (21.24%)**
San Diego Bay	Chollas HSA (908.22) - Chollas Creek	46.03%	46.08%	49.23%	8.91%	12.42%	10.73% (10.68%)**

Notes:
* The percent load reductions are based on reducing loads compared to pollutant loads from 2001 to 2002.
** The alternative *Enterococcus* percent load reduction was calculated based on a numeric target of 104 MPN/100mL instead of 61 MPN/100mL, protective of the REC-1 "moderately to lightly used area" usage frequency that is protective of freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative pollutant load reductions can be utilized.

(3) <u>Interim TMDL Compliance Determination</u>

Compliance with the interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(f) There are no exceedances of the interim receiving water limitations under Specific Provision 6.c.(2)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(g) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the interim effluent limitations under Specific Provision 6.c.(2)(b); OR

(h) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

d. Specific Monitoring and Assessment Requirements

(1) Monitoring and Assessment Requirements for Beaches

(a) Monitoring Stations

For beaches addressed by the TMDL, monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[35] If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources

[35] Commonly referred to as AB 411 monitoring

causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations at least once within the first 24 hours of the end of a storm event[36] during the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer in exceedance of the allowable exceedance frequencies in the receiving waters.

(iii) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(iv) For Pacific Ocean Shoreline segments or areas listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final

[36] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

WQBELs for the Pacific Ocean Shoreline segments or areas listed in Table 6.0 have been achieved.

(ii) Dry weather exceedance frequencies must be calculated as follows:

[a] 30-day geometric means must be calculated from the results of any dry weather samples collected from the segments or areas for each water body listed in Table 6.0;
[b] The method and number of samples need for calculating the 30-day geometric means must be consistent with the number of samples required by the Ocean Plan;
[c] Where there are multiple segments or areas associated with a water body listed in Table 6.0, the Copermittees may calculate geometric means for each segment or area, or combine the dry weather monitoring data from all the segments or areas to calculate geometric means for the water body;
[d] The exceedance frequency must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the dry season.

(iii) Wet weather exceedance frequencies must be calculated as follows:

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;
[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;
[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria densities reported from each storm event sampled; and
[d] The single sample maximum exceedance frequency must be calculated by dividing the number of wet weather days that exceed the single sample maximum receiving water limitations in Table 6.2 by the total number of wet weather days during the rainy season.
[e] The data collected for dry weather must be used in addition to the data collected for wet weather to calculate the wet weather 30-day geometric means. The exceedance frequency of the wet weather 30-day geometric means must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of

geometric means calculated from samples collected during the wet season.

(iv) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(v) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) Monitoring and Assessment Requirements for Creeks and Creek Mouths

(a) Monitoring Stations

For creeks addressed by the TMDL, monitoring locations should consist of, at a minimum, a location at or near the mouth of the creek (e.g. Mass Loading Station or Mass Emission Station) and one or more locations upstream of the mouth (e.g. Watershed Assessment Station). If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations in accordance with the requirements of Provision D.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations within the first 24 hours of the end of a storm event[37] during the rainy season (i.e. October 1 through April 30).

(iii) Samples collected from receiving water monitoring stations must be analyzed for fecal coliform and *Enterococcus* indicator bacteria.

[37] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(iv) For creeks or creek mouths listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the receiving water monitoring data to assess whether the interim and final receiving water WQBELs for the creeks and creek mouths listed in Table 6.0 have been achieved.

(ii) Dry weather exceedance frequencies must be calculated as follows:

[a] 30-day geometric means must be calculated from the results of any dry weather samples collected from the segment or area for each water body listed in Table 6.0;
[b] The method and number of samples need for calculating the 30-day geometric means must be consistent with the number of samples required by the Basin Plan;
[c] The exceedance frequency must be calculated by dividing the number of 30-day geometric means that exceed the 30-day geometric mean receiving water limitations in Table 6.2 by the total number of 30-day geometric means calculated from samples collected during the dry season.

(iii) Wet weather exceedance frequencies must be calculated as follows:

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;
[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;
[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria densities reported from each of the storm events sampled; and

[d] The exceedance frequency must be calculated by dividing the number of wet weather days that exceed the single sample

maximum receiving water limitations in Table 6.2 by the total number of wet weather days during the rainy season.

[e] The data collected for dry weather must be used in addition to the data collected for wet weather to calculate the wet weather 30-day geometric means. The exceedance frequency of the wet weather 30-day geometric means must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the wet season.

(iv) The Responsible Copermittee must identify and incorporate additional MS4 outfall and receiving water monitoring stations and/or adjust monitoring frequencies to identify sources causing exceedances of the receiving water WQBELs.

(v) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(vi) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

7. Total Maximum Daily Loads for Sediment in Los Peñasquitos Lagoon

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2012-0033

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2012
State Water Board Approval Date:	January 21, 2014
Office of Administrative Law Approval Date:	July 14, 2014
US EPA Approval Date:	October 30, 2014

(3) TMDL Effective Date: July 14, 2014

(4) Watershed Management Area: Los Peñasquitos

(5) Water Body: Los Peñasquitos Lagoon

(6) Responsible Copermittees: County of San Diego, City of San Diego, City of Del Mar, and City of Poway

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final sediment TMDL compliance requirements for Los Peñasquitos Lagoon consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must be in compliance with the final TMDL compliance requirements by December 31, 2034.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not prohibit the sustainable restoration of tidal and non-tidal saltmarsh vegetation of at least 346 acres.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations by the compliance date under Provision 7.b(1) will not cause or contribute to a failure of the receiving water condition specified under Specific Provision 7.b.(2)(a):

Table 7.1
*Final Effluent Limitations as Expressed as Wet Season Loads in MS4 Discharges to Los Peñasquitos Lagoon**

Constituent	Effluent Limitation
Sediment	2,580 tons/wet season

*Final effluent limitations are to be achieved by the following Responsible Parties: County of San Diego, City of San Diego, City of Del Mar, City of Poway, Phase II MS4 permittees, Caltrans, general construction storm water NPDES permittees, and general industrial storm water NPDES permittees.

(c) Best Management Practices

(i) The Water Quality Improvement Plan for the Los Peñasquitos Watershed Management Area must incorporate the Sediment Load Reduction Plan required to be developed pursuant to Resolution No. R9-2012-0033.

(ii) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 7.b.(2)(a) and/or the Copermittee's portion of the effluent limitations under Specific Provision 7.b.(2)(b) for Los Peñasquitos Lagoon.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) Successful restoration of 80 percent of the 1973 acreage of tidal and non-tidal lagoon salt marsh (346 acres); OR

(b) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 7.b.(2)(c)(ii) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 7.b.(2)(c)(ii) or other implementation actions achieve compliance with Specific Provision 7.b.(3)(a),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 7.b.(2)(c)(ii) or other implementation actions, AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 7.d to demonstrate compliance with Specific Provision 7.b.(3)(a).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim sediment TMDL compliance requirements for Los Penasquitos Lagoon consist of the following:

(1) Interim Compliance Dates and WQBELs

The Responsible Copermittees must comply with the interim WQBELs, expressed as wet season loads, by December 31 of the interim compliance year set forth in Table 7.2.

Table 7.2
*Interim Water Quality Based Effluent Limitations Expressed as Wet Season Loads in MS4 Discharges**

Interim Compliance Date	Interim Effluent Limitations (tons/wet season)
December 31, 2019	6,691
December 31, 2023	5,663
December 31, 2027	4,636
December 31, 2029	3,608

*Interim effluent limitations are to be achieved by the following Responsible Parties: County of San Diego, City of San Diego, City of Del Mar, City of Poway, Phase II MS4 permittees, Caltrans, general construction storm water NPDES permittees, and general industrial storm water NPDES permittees.

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) The final receiving water limitation under Specific Provision 7.b.(2)(a) is met; OR

(c) There are no exceedances of the Copermittee's portion of interim effluent limitations under Table 7.2 at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the Copermittee's portion of the interim TMDL compliance requirements described in Attachment A of

Resolution No. R9-2010-0033 will be achieved by the interim compliance date.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) Watershed Monitoring

The Responsible Copermittees must conduct suspended sediment, bed load, and flow monitoring to calculate total sediment loading to the Los Peñasquitos Lagoon for each wet season (October 1 thru April 30) as set forth below:

(a) The Responsible Copermittees must monitor enough storm events throughout the season to quantify sediment loading over each wet season, and

(b) The Responsible Copermittees must monitor at least 3 stations to quantify cumulative sediment loading into Los Peñasquitos Lagoon. Stations must be located within the Los Peñasquitos, Carroll Canyon, and Carmel Creek tributaries prior to discharging into Los Peñasquitos Lagoon.

(2) Lagoon Monitoring

The Responsible Copermittees must monitor Los Peñasquitos Lagoon each Fall for changes in the extent of the vegetation types as set forth below:

(a) The Responsible Copermittees must acquire aerial photos of Los Peñasquitos Lagoon and digitize them at an approximate scale of 1:2,500,

(b) The Responsible Copermittees must appropriately interpret the vegetation and classify the various types as saltmarsh, non-tidal saltmarsh, freshwater marsh, non-tidal saltmarsh –*Lolium perrene* infested, southern willow scrub/mulefat scrub, herbaceous wetland, or upland land cover.

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the monitoring data collected under Specific Provision 7.d(1) and 7.d(2) to assess whether the interim and final WQBELs have been achieved.

(b) For assessing and determining compliance with the final receiving water limitations under Specific Provision 7.b.(2)(a), the Responsible Copermittees must use the data acquired under Specific Provision 7.d.(2) to estimate the acreage of tidal and non-tidal saltmarsh actually restored.

(c) For assessing and determining compliance with the final effluent limitations under Specific Provision 7.b.(2)(b), the Responsible Copermittees must use the data acquired under Specific Provision 7.d.(1) to estimate sediment loading into Los Peñasquitos Lagoon. Sediment loading must be evaluated using a 3-year, weighted rolling average. The first reported average shall be calculated using data collected in the year, 2015-2016, 2016-2017, and 2017-2018 wet seasons.

(d) The monitoring and assessment results must be submitted as part of the Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

ATTACHMENT F

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

FACT SHEET / TECHNICAL REPORT

FOR

ORDER NO. R9-2013-0001
AS AMENDED BY ORDER No. R9-2015-0001
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

May 8, 2013
Amended on February 11, 2015

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I. FACT SHEET FORMAT

This Fact Sheet briefly sets forth the principal facts and the significant factual, legal, methodological, and policy questions that the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) considered in preparing Order No. R9-2013-0001 (Order) as amended by Order No. R9-2015-0001. In accordance with the Code of Federal Regulations (CFR) Title 40 Parts 124.8 and 124.56 (40 CFR 124.8 and 40 CFR 124.56), this Fact Sheet includes, but is not limited to, the following information:

1. Contact information
2. Public process and notification procedures
3. Background of municipal storm water permits
4. Regional MS4 Permit approach
5. Economic considerations
6. Applicable statutes, regulations, plans and policies
7. Discussion of the provisions in the Order

Tentative Order No. R9-2013-0001 was distributed for public review on October 31, 2012. The San Diego Water Board accepted written comments on the Tentative Order until January 11, 2013. A public hearing was subsequently held on April 10 and 11, 2013, that was continued to May 8, 2013 to receive oral comments from interested persons. The San Diego Water Board adopted Order No. R9-2013-0001 on May 8, 2013.

Order No. R9-2015-0001, an Order amending Order No. R9-2013-0001, was distributed for public review on September 19, 2014. Order No. R9-2015-0001 amended the findings and provisions of Order No. R9-2013-0001 to:

a. Enroll the County of Orange, the Orange County Flood Control District and the south Orange County Cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano as Copermittees responsible for compliance with the terms and conditions of Order No. R9-2013-0001, as amended by Order No. R9-2015-0001;

b. Designate the San Diego Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the Cities of Laguna Woods and Laguna Hills and agree to the designation of the Santa Ana Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the City of Lake Forest, subject to the terms of the February 10, 2015 agreement between San Diego Water Board and the Santa Ana Water Board described in Finding 29 of this Order, upon the later effective date of Order No. R9-2015-0001 or Order No. R8-2015-0001 (superseding Order No. R8-2009-0030);

c. Establish interim exceptions to land development requirements for those priority development projects that discharge to engineered channels and large river reaches as described in Provision E.3.c(2)(e) of this Order;

d. Incorporate the amended requirements of the State Water Resources Control Board's (State Water Board) General Exception to require that pollutant reductions be achieved within 6 years for storm water and nonpoint source discharges to ASBS within the Region;

e. Incorporate applicable requirements of the Los Peñasquitos Lagoon Sediment TMDL;

f. Require the Orange County Copermittees to implement the "*Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County*," dated October 2014, made effective in the Monitoring and Reporting Program/Order issued pursuant to California Water Code section 13383 in the December 5, 2014 San Diego Water Board Letter Directive and subject to future revisions by the Executive Officer after appropriate public input;

A public hearing was held on February 11, 2015, to receive oral comments from Copermittees and interested persons. The San Diego Water Board adopted Order No. R9-2015-0001 amending Order No. R9-2013-0001 on February 11, 2015.

The San Diego Water Board files applicable to the issuance of Order No. R9-2013-0001 and amendments thereto are incorporated into the administrative record in support of the findings and requirements of the Order.

II. CONTACT INFORMATION

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The Order and other related documents can be downloaded from the San Diego Water Board website at

http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/oc_stormwater.shtml

The documents referenced in this Fact Sheet and in Order No. R9-2013-0001 and amendments thereto are available for public review at the San Diego Water Board office, located at the address listed above. Public records are available for inspection during regular business hours, from 8:00 am to 5:00 pm Monday through Friday. To schedule an appointment to inspect public records, contact the San Diego Water Board Records Management Officer at 619-516-1990.

COPERMITTEES

Orange County Copermittees

- County of Orange
  - City of Aliso Viejo
  - City of Dana Point
  - City of Laguna Beach
  - City of Laguna Hills
  - City of Laguna Niguel
  - City of Laguna Woods
  - City of Lake Forest *
  - City of Mission Viejo
  - City of Ranch Santa Margarita
  - City of San Clemente
  - City of San Juan Capistrano
  - Orange County Flood Control District

* While not listed in the above table, the City of Lake Forest remains a Copermittee under this Order until the later effective date of this Order or Santa Ana Water Board Tentative Order No. R8-2015-0001. Thereafter, the City of Lake Forest will no longer be considered a Copermittee under this Order because its Phase I MS4 discharges will be regulated by the Santa Ana Water Board pursuant to Water Code section 13328 designation. The requirements of this Order that apply to the City of Lake Forest for the duration of this Order, consistent with the Water Code section 13228 agreement dated February 10, 2015, are described in Finding 29 and Footnote 2 to Table B-1.

Riverside County Copermittees

- County of Riverside
  - City of Murrieta
  - City of Temecula
  - City of Wildomar
  - Riverside County Flood Control and Water Conservation District

San Diego County Copermittees

- County of San Diego
  - City of Carlsbad
  - City of Chula Vista
  - City of Coronado
  - City of Del Mar
  - City of El Cajon
  - City of Encinitas
  - City of Escondido
  - City of Imperial Beach
  - City of La Mesa
  - City of Lemon Grove
  - City of National City
  - City of Oceanside
  - City of Poway
  - City of San Diego
  - City of San Marcos
  - City of Santee
  - City of Solana Beach
  - City of Vista
  - San Diego County Regional Airport Authority
  - San Diego Unified Port District

III. PUBLIC PROCESS AND NOTIFICATION PROCEDURES

The San Diego Water Board followed the schedule listed below for the preparation of Order No. R9-2013-0001:

San Diego County Copermittee Permit Reissuance Process

1. On February 8, 2011, the San Diego Water Board met with the San Diego County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No. R9-2007-0001.

2. Between February and May 2011, the San Diego Water Board met with select San Diego County, Orange County, and Riverside County Copermittees, as well as representatives of the environmental community to discuss concepts and receive recommendations for elements to be incorporated in a Regional Municipal Separate Storm Sewer System Permit (Regional MS4 Permit).

3. On June 27, 2011 the San Diego Water Board received the Report of Waste Discharge from the San Diego County Copermittees for the renewal of their NPDES permit, Order No. R9-2007-0001.

4. On April 9, 2012, the San Diego Water Board released an administrative draft of Tentative Order No. R9-2013-0001 for preliminary informal comments and feedback.

5. On April 25, 2012, the San Diego Water Board held an informal public workshop to present the administrative draft of Tentative Order No. R9-2013-0001 and receive verbal comments.

6. Between June and August 2012, the San Diego Water Board held four (4) focused meetings with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community, and USEPA) to discuss and receive preliminary comments and feedback about specific elements in the administrative draft of Tentative Order No. R9-2013-0001.

7. On September 5, 2012, the San Diego Water Board held an informal public workshop to present the modifications that were expected to be incorporated into the Tentative Order based on the preliminary comments and feedback received during the focused meetings held between June and August 2012.

8. Informal written comments on the administrative draft of Tentative Order No. R9-2013-0001 were accepted until September 14, 2012.

9. On October 12, 2012, the San Diego Water Board released a revised administrative draft of Tentative Order No. R9-2013-0001.

10. On October 24, 2012, the San Diego Water Board held a focused meeting with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community, and USEPA) to discuss modifications incorporated into the administrative draft of Tentative Order No. R9-2013-0001.

11. On October 31, 2012, the San Diego Water Board released Tentative Order No. R9-2013-0001 for formal public review and comment.

12. On November 13, 2012 and December 12, 2012, the San Diego Water Board held a formal public Board workshop to present the public draft of Tentative Order No. R9-2013-0001 and receive verbal comments.

13. Formal written comments on the public draft of Tentative Order No. R9-2013-0001 were accepted until January 11, 2013.

14. A public hearing of Tentative Order No. R9-2013-0001 was conducted on April 10 and 11, 2013, that was continued to May 8, 2013.

Orange County Copermittee Permit Reissuance Process

15. On May 20, 2014 the San Diego Water Board received the Report of Waste Discharge from the Orange County Copermittees for the renewal of their MS4 NPDES permit, Order No. R9-2009-0002.

16. On June 24, 2014, the San Diego Water Board met with the Orange County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No.R9-2009-0002 and the process for enrollment as Copermittees under Regional MS4 Permit Order No. R9-2013-0001.

17. On July 1, 2014, the San Diego Water Board held a public meeting to discuss the Orange County Report of Waste Discharge (RoWD) and receive comments on potential modifications to Order No. R9-2013-0001. Based on comments received from the Orange County Copermittees and other interested persons at this meeting, the San Diego Water Board determined that additional public meetings were not needed prior to release of Tentative Order No. R9-2015-0001, amending Order No. R9-2013-0001 in redlined – strikeout format for public review and comment.

18. On September 19, 2014, the San Diego Water Board released Tentative Order No. R9-2015-0001 for a 60 day public review and comment period.

19. On October 8, 2014, the San Diego Water Board held a formal public workshop at a regular board meeting to receive information and discuss the proposed amendments to Order No. R9-2013-0001 described in Tentative Order No. R9-2015-0001.

20. In accordance with State and federal laws and regulations, the San Diego Water Board notified San Diego County, Orange County and Riverside County Copermittees, and all known interested agencies and persons of its intent to adopt Tentative Order No. R9-2015-0001 and provided them with an opportunity to submit their written comments and recommendations. Written comments and recommendations on Tentative Order No. R9-2015-0001 were accepted until November 19, 2014.

21. The San Diego Water Board held a public workshop on October 8, 2014, and a public hearing on February 11, 2015, and heard and considered all comments pertaining to the adoption of Tentative Order No. R9-2015-0001 on February 11, 2015.

IV. BACKGROUND OF THE SAN DIEGO REGION MUNICIPAL STORM WATER PERMITS

In developed and developing areas, storm water runoff is commonly transported through municipal separate storm sewer systems (MS4s) and discharged into local receiving water bodies. As the storm water runs off and flows over the land or impervious surfaces (e.g., paved streets, parking lots, and building rooftops), it accumulates debris, chemicals, sediment, and other pollutants that can adversely affect receiving water quality if discharged untreated. The United States Environmental Protection Agency (USEPA) recognizes wet weather flows from urban areas as the number one source of estuarine pollution in coastal communities,[1] such as those within the San Diego Region.

The federal Clean Water Act (CWA) was amended in 1987 to address and regulate discharges of storm water associated with industrial activities and from municipal storm sewers. With the amendments, many municipalities throughout the United States were obligated for the first time to obtain National Pollutant Discharge Elimination System (NPDES) permits for discharges of storm water from their MS4s.

In response to the CWA 1987 amendment, as well as the pending federal NPDES regulations which would implement the amendment, the San Diego Water Board issued "early" MS4 permits. The San Diego Water Board adopted and issued Order Nos. 90-38, 90-42, and 90-46 to regulate storm water discharges from the MS4s in Orange County, San Diego County, and Riverside County, respectively, within the San Diego Region on July 16, 1990.

The "early" MS4 permits, or First Term Permits, were issued prior to the November 1990 promulgation of the final federal NPDES storm water regulations. By issuing these First Term Permits before the federal regulations took effect, the San Diego Water Board was able to provide the Copermittees additional flexibility in addressing and managing storm water discharges. The First Term Permits contained the essentials of the 1990 regulations, and required the Copermittees to develop and implement runoff management programs, but provided little specificity about what was required to be included in or actually achieved by those programs.

The flexibility provided in the First Term Permits was generally continued through the Second Term Permits. The combination of the lack of specificity in the First and Second Term Permits, a general lack of meaningful action by the Copermittees and a general lack of corresponding reaction (i.e. enforcement) by the San Diego Water Board during the first ten years of the storm water program, resulted in few substantive steps towards achieving improvements in the quality of receiving waters or storm water discharges from the MS4s.

[1] US EPA. 1999. 40 CFR Parts 9, 122, 123, and 124. National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. 64 FR 68727.

From 2001, the regulatory approach incorporated into Third Term Permits was a significant departure from the regulatory approach of the First and Second Term Permits. The Third Term Permits issued by the San Diego Water Board included more detailed requirements that outlined the minimum level of implementation required for the Copermittees' programs to meet the maximum extent practicable (MEP) standard for storm water. The Third Term Permits included more detail to emphasize and enhance the jurisdictional runoff management programs developed by the Copermittees and introduced requirements for developing and implementing watershed-based programs.

The Third Term Permits also incorporated two precedent setting decisions by the State Water Board. In Order WQ 99-05, the State Water Board established receiving water limitation language to be included in all MS4 permits. The State Water Board's precedential language clarified that municipal storm water permits must include provisions requiring discharges to be controlled to attain water quality standards in receiving waters. Unlike previously adopted versions of the receiving water limitation language in the First and Second Term Permits, the language no longer stated that "*violations of water quality standards are not violations of the municipal storm water permit under certain conditions*." In addition, the receiving water limitation language no longer indicated that the "*implementation of best management practices is the 'functional equivalent' of meeting water quality standards*." State Water Board Order WQ 99-05 specifically requires language in MS4 permits for the Copermittees to comply with water quality standards based discharge prohibitions and receiving water limitations through timely implementation of control measures and other actions to reduce pollutants in discharges. (See State Water Board Order WQ 99-05 (*Environmental Health Coalition*)).

In Order WQ 2000-11, also a precedential decision, the State Water Board addressed design standards for structural post-construction best management practices (BMPs) for new development and significant redevelopment. The State Water Board found that the design standards, which require that runoff generated by 85 percent of storm events from specific development categories be infiltrated or treated, reflect the MEP standard. State Water Board Order WQ 2000-11 also found that the post-construction BMP provisions, or Standard Storm Water Mitigation Plan (SSMP) provisions, constitute MEP for addressing storm water pollutant discharges resulting from specific development categories.

The Third Term San Diego County and Orange County Permits (Order Nos. 2001-01 and R9-2002-0001, respectively) were appealed to the State Water Board. Minor modifications were made by the State Water Board, but the requirements were largely upheld. In State Water Board Order WQ 2001-15, the State Water Board upheld the Third Term San Diego County Permit requirements with certain modifications. The State Water Board removed the prohibition of storm water discharges *into* the MS4 that cause or contribute to exceedances of water quality objectives. The revision allows for treatment of pollutants in storm water runoff after the pollutants have entered the MS4. State Water Board Order WQ 2001-15 otherwise upheld all the other requirements of the permit.

In addition to the modification to the discharge prohibition in Order WQ 2001-15, the State Water Board refined Order WQ 99-05 by making clear that the Copermittees may use an iterative approach to achieving compliance with water quality standards that involves ongoing assessments and revisions. Thus, the language for the discharge prohibitions and receiving water limitations was revised to explicitly require the Copermittees to implement an iterative process of assessments and revisions to comply with the discharge prohibitions and receiving water limitations. The San Diego Water Board retained the authority to enforce receiving water limitations and discharge prohibitions even if the Copermittee is engaged in the iterative process.

The Third Term San Diego County Permit was subsequently challenged in the Superior Court of the State of California and the Court of Appeal, Fourth Appellate District. The Court of Appeal, Fourth Appellate District, found that the approach of the Third Term San Diego County Permit to regulating discharges into the MS4 was appropriate (*Building Industry Ass'n. v. State Water Resources Control Bd., et al.,* 124 Cal.App.4th 866 (2004)). The State of California Supreme Court denied review sought by the Building Industry Association in March 2005.

The Fourth Term Permits, or current MS4 permits, began with the adoption of Order No. R9-2007-0001 issued to the Copermittees of San Diego County in January 2007. Order Nos. R9-2009-0002 and R9-2010-0016 were subsequently issued to the Copermittees of Orange County and Riverside County. The Fourth Term Permits continued to include more detailed requirements to be implemented by each Copermittee's jurisdictional runoff management program. The Fourth Term Permits also include requirements to further emphasize a watershed management approach and for more coordination among jurisdictional runoff management programs. In addition, the Fourth Term Permits included more requirements for assessing the effectiveness of the runoff management programs being implemented by the Copermittees. The intent of the inclusion of additional requirements was to enhance and better define elements of the permit that were expected to be incorporated into the iterative process for managing runoff from each Copermittee's jurisdiction and within the watersheds of the San Diego Region.

The Fourth Term Permits include several new and emerging approaches for managing storm water runoff and discharges. Low impact development (LID) requirements are included for development and significant redevelopment to reduce pollutants in storm water runoff from sites through more natural processes such as infiltration and biofiltration closer to the source, rather than utilizing conventional mechanical end-of-pipe treatment systems. Hydrograph modification (hydromodification) management requirements also are included to mitigate the potential for increased erosion in receiving waters due to increased runoff rates and durations often caused by development and increased impervious surfaces. The Fourth Term Orange County and Riverside County Permits introduced requirements to identify areas of existing development where retrofitting with LID projects would be feasible and could be implemented to reduce storm water runoff and pollutants in storm water discharges.

The Fourth Term Orange County and Riverside County Permits included a clearer distinction between storm water and non-storm water discharges. The term “urban runoff” was completely removed, and a distinction between storm water (wet weather) runoff and non-storm water (dry weather) runoff was emphasized. This clarification was made to prevent any potential misunderstanding that regulation under the MS4 permits is limited only to urbanized areas, and to prevent non-storm water runoff from being managed in the same manner as storm water runoff. The term “urban runoff” is not defined in the Code of Federal Regulations (CFR) or Federal Register (FR) in the regulation of MS4 discharges. According to the CWA 402(p)(3)(B)(ii), MS4 permits must include a requirement to effectively prohibit non-storm water discharges into the MS4s.

Finally, for the Fourth Term Orange County and Riverside County Permits the San Diego Water Board found that non-storm water discharges to the MS4 from over application of irrigation water are sources of pollutants. The San Diego Water Board found that non-storm water discharges resulting from over-irrigation must be prohibited from entering the MS4 in accordance with the requirements of the CWA and pursuant to 40 CFR 122.26(d)(2)(iv)(B)(1).

The requirements of the Fourth Term Permits issued to the Copermittees in each county within the San Diego Region now have substantively the same core requirements such as discharge prohibitions, receiving water limitations, jurisdictional runoff management program components, and monitoring program requirements. There are, however, several inconsistencies that exist among the three Fourth Term Permits which complicate oversight and implementation of the permits by the San Diego Water Board.

The Fourth Term San Diego County Permit expired in January 2012. The Fourth Term Orange County permit expired in December 2014 and the Fourth Term Riverside County Permit will expire in November 2015. Issuing the Fifth Term Permits within five years for three counties under three different permits would require the San Diego Water Board to expend significant time and resources for the issuance of the permits through three separate public proceedings, thereby greatly reducing the time and resources available to oversee implementation and compliance. Multiple permits also create confusion for determining compliance among regulated entities, especially for the land development community.

The San Diego Water Board has acknowledged that issuing a single MS4 permit for all the Copermittees in the San Diego Region can and is expected to result in more consistent implementation, improve communication among agencies within watersheds crossing multiple jurisdictions, and minimize resources spent with each permit renewal process. Within the findings of the Fourth Term Riverside County Permit issued in November 2010, the San Diego Water Board notified the public of its intent to develop and issue a single Regional MS4 Permit.

V. REGIONAL MS4 PERMIT APPROACH

The Fifth Term Permit, or Regional MS4 Permit, shifts the focus of the permit requirements from a minimum level of actions to be implemented by the Copermittees to identifying outcomes to be achieved by those actions. Order No. R9-2013-0001 represents an important paradigm shift in the approach for MS4 permits within the San Diego Region.

Historical Permitting Approach

The First and Second Term Permits were very broad and provided little specificity about what was required to be developed and implemented by the Copermittees. The Third Term Permits began to become more specific about the minimum level of implementation required by the Copermittees. The Fourth Term Permits subsequently increased in specificity. The MS4 permits have progressively become more detailed and focused on specifying the minimum level of actions expected to be implemented by the Copermittees. As detailed and specific as the MS4 permits have become, however, they include very little detail about what the desired outcomes of the required actions are expected to achieve. Compliance with the permit requirements has essentially been tracking numbers of actions and reporting, not tracking progress or actual improvements in the quality of receiving waters or discharges from the MS4s. The result has been an increase in actions being implemented by the Copermittees with little or no ability or expectations to determine whether or not improvements in water quality are being achieved.

The Fourth Term Permits result in significant resource expenditure by the Copermittees to report permit compliance information to the San Diego Water Board in the form of annual jurisdictional runoff management program, watershed program, and monitoring program reports. The San Diego Water Board must then expend much of its limited resources on reviewing more than 50 voluminous reports submitted annually by the Copermittees. The information currently reported by the Copermittees is of limited value when trying to measure progress toward achieving improvements in the quality of receiving waters or discharges from the MS4s. Oversight of the MS4 permits is further complicated by the inconsistencies among the requirements issued to the Orange County, San Diego County, and Riverside County Copermittees under three separate MS4 permits.

Under the Fourth Term Permits, the Copermittees must expend a significant portion of their limited resources collecting data of limited value, and putting together reports to submit that information to the San Diego Water Board. Likewise, the San Diego Water Board must expend most of its limited resources reviewing reports, and developing permits instead of working directly with the Copermittees to identify solutions to problems causing impacts to water quality. This is an unsustainable course that will continue to demand more resources from the Copermittees and the San Diego Water Board, and would continue to result in unknown water quality benefits.

New Permitting Approach

The goal of the Regional MS4 Permit is twofold: 1) bring a consistent set of MS4 permit requirements to all of the Copermittees within the San Diego Region; and, 2) provide an MS4 permit with requirements that will allow the Copermittees to focus their efforts and resources on achieving goals and desired outcomes toward the improvement of water quality rather than completing specific actions.

The overall approach included in the Regional MS4 Permit with respect to the jurisdictional runoff management programs will not differ significantly from the current permits. The general requirements for the jurisdictional runoff management program components and compliance with those requirements will remain and be applied consistently throughout the San Diego Region under the Regional MS4 Permit.

The most significant difference in the new permitting approach is the specific manner of implementation for those jurisdictional runoff management programs. Implementation will be based on decisions made by the Copermittees in accordance with what they have identified as their highest priority water quality conditions. In other words, the Copermittees will have significant control in how to implement the jurisdictional runoff management programs to best utilize their available resources in addressing a specific set of priorities effectively, instead of trying to address all the water quality priorities ineffectively.

The Copermittees are given the responsibility of identifying their highest priority water quality conditions that they intend to address. The Copermittees will develop goals that can be used to measure and demonstrate progress or improvements toward addressing those priorities. In addition to the goals, the Copermittees will provide a schedule for achieving the goals for those highest priorities. The measurement of progress toward achieving the goals for those highest priorities requires a better defined and more focused program of monitoring and assessment than under the Fourth Term Permits.

The monitoring and assessment program must be designed to inform the Copermittees of their progress, and the need for modifications in their jurisdictional runoff management programs and schedules to achieve their goals to improve water quality. The monitoring and assessment program requirements will have a more central role in the Regional MS4 Permit than in earlier permits. The monitoring and assessment requirements must also be designed to enable the Copermittees to focus and direct their efforts in implementing their jurisdictional runoff management programs toward their stated desired outcomes to improve the quality of receiving waters and/or discharges from the MS4s.

By providing an MS4 permit that allows the Copermittees to make more decisions about how to utilize and focus their resources, along with a better defined monitoring and assessment program to inform their water quality management decisions, the Copermittees will have the opportunity to:

1) *Plan strategically*. The Copermittees must have the ability to identify their available resources and develop and implement long term plans that can organize, collect, and use those resources in the most strategically advantageous and efficient manner possible. This ability to develop long term plans will allow the Copermittees to focus and utilize their resources in a more concerted way over the short term and long term to address specific water quality priorities through stated desired outcomes.

2) *Manage adaptively*. The Copermittees must be given the ability to modify their plans as additional information and data are collected from the monitoring and assessment programs. The Copermittees' plans may require modifications to the programs, priorities, goals, strategies, and/or schedules in order for the Copermittees to achieve a stated desired outcome.

3) *Identify synergies*. The Copermittees must be given more flexibility to identify efficiencies within and among their jurisdictional runoff management programs as the strategies are developed and implemented to increase the Copermittees' collective effectiveness. The Copermittees must also be able to identify and utilize resources available from other agencies and entities to further augment and enhance their jurisdictional runoff management programs and/or to collectively work with those other agencies and entities toward achieving a stated desired outcome.

The Regional MS4 Permit requirements will provide the Copermittees the flexibility and responsibility to decide what actions will be necessary to achieve an outcome that is tailored and designed by the Copermittees to improve specific prioritized water quality conditions. The San Diego Water Board expects the approach of the Regional MS4 Permit to give the Copermittees a greater sense of ownership for restoring the quality of receiving waters in the San Diego Region by becoming an integral part of the decision making process in identifying water quality conditions to be addressed, as well as determining the best use of their resources.

VI. ECONOMIC CONSIDERATIONS

Statutory Considerations

California Water Code (CWC) section 13241 requires the San Diego Water Board to consider certain factors, including economic considerations, in the adoption of water quality objectives. CWC section 13263 requires the San Diego Water Board to take into consideration the provisions of CWC section 13241 in adopting waste discharge requirements.

In *City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, the California Supreme Court considered whether Regional Water Boards must comply with CWC section 13241 when issuing waste discharge requirements under CWC section 13263(a) by taking into account the costs a permittee will incur in complying with the permit requirements. The Court concluded that whether it is necessary to consider such cost information "*depends on whether those restrictions meet or exceed the requirements of the federal Clean Water Act.*" (*Id.* at p. 627.) The Court ruled that Regional Water Boards may not consider the factors in CWC section 13241, including economics, to justify imposing pollutant restrictions that are less stringent than applicable federal law requires. (*Id.* At pp. 618, 626-627 ["*[Water Code section 13377 specifies that [] discharge permits issued by California's regional boards must meet the federal standards set by federal law. In effect, section 13377 forbids a regional board's consideration of any economic hardship on the part of the permit holder if doing so would result in the dilution of the requirements set by Congress in the Clean Water Act...Because CWC section 13263 cannot authorize what federal law forbids, it cannot authorize a regional board, when issuing a [] discharge permit, to use compliance costs to justify pollutant restrictions that do not comply with federal clean water standards*."]). However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Regional Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

As discussed in Section VII.F, Unfunded State Mandates, the San Diego Water Board finds that the requirements in this Order are not more stringent than the minimum federal requirements. Among other requirements, federal law requires MS4 permits to include requirements to effectively prohibit non-storm water discharges into the MS4s, in addition to requiring controls to reduce the discharge of pollutants in storm water to the MEP, and other provisions as USEPA or the State determines are appropriate for the control of pollutants in MS4 discharges.

The requirements in this Order may be more specific or detailed than those enumerated in federal regulations under 40 CFR 122.26 or in the USEPA guidance. However, the requirements have been designed to be consistent with and within the federal statutory mandates described in CWA section 402(p)(3)(B)(ii) and (iii) and the related federal regulations and guidance. Consistent with federal law, all of the

conditions in this Order could have been included in a permit adopted by USEPA in the absence of the in lieu authority of California to issue NPDES permits.

Moreover, the inclusion of numeric WQBELs in this Order does not cause this Order to be more stringent than federal law. Federal law authorizes both narrative and numeric effluent limitations to meet state water quality standards. The inclusion of WQBELs as discharge specifications in an NPDES permit in order to achieve compliance with water quality standards is not a more stringent requirement than the inclusion of BMP based permit limitations to achieve water quality standards (State Water Board Order No. WQ 2006-0012 (*Boeing*)). Therefore, consideration of the factors set forth in CWC section 13241 is not required for permit requirements to implement the effective prohibition on the discharge of non-storm water discharges into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determine appropriate to control such pollutants, as those requirements are mandated by federal law.

Included in the provisions of the Order are monitoring and reporting requirements that are designed to demonstrate that the Copermittees are implementing programs to comply with the CWA municipal storm water requirements. CWA section 308(a) and 40 CFR 122.41(h), (j)-(l), 122.44(i) and 122.48 require that all NPDES permits specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s (40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c)) also specify additional monitoring and reporting requirements. In addition to the federal requirements of the CWA, the San Diego Water Board also has the authority in CWC 13383 to establish monitoring, reporting, and recordkeeping requirements that implement federal and state laws and regulations through NPDES permits.

The monitoring and assessment information that will be reported to the San Diego Water Board is necessary to determine if the Copermittees are making progress toward achieving compliance with the discharge prohibitions, receiving water limitations, and effluent limitations under Provision A of the Order. The monitoring and assessment information that will be reported is also expected to be key to the iterative approach and adaptive management process that is required to be implemented by the Copermittees if they cannot meet the discharge prohibitions and receiving water limitations under the present conditions, which is also part of the requirements under Provision A of the Order.

Notwithstanding the above, the San Diego Water Board has considered cost information in issuing this Order, as discussed below. The San Diego Water Board has also considered all of the evidence that has been presented to the San Diego Water Board regarding the CWC section 13241 factors in adopting this Order. The San Diego Water Board finds that the requirements in this Order are reasonably necessary to protect beneficial uses identified in the Basin Plan and the economic information related to costs of compliance and other CWC section 13241 factors are not sufficient to justify failing to protect those beneficial uses. Where appropriate, the

San Diego Water Board has provided or will consider providing the Copermittees with additional time to implement control measures to achieve final WQBELs and/or water quality standards.

Cost Information

Discussions of the financial and economic ramifications of municipal storm water management programs tend to focus on the significant costs incurred by municipalities in developing and implementing the programs. When considering the cost of implementing the programs, however, it is also important to consider the alternative costs that are incurred when programs are not fully implemented, as well as the economic benefits which result from effective program implementation.

The recent financial and economic conditions have amplified the concerns about the costs incurred by the municipalities in developing and implementing their programs. The reduction in resources resulting from the recent financial and economic conditions has been cited by many of the Copermittees as a justification for reducing the requirements that must be met by their programs. While the recent conditions are a cause for concern in the short term, these programs also have an opportunity to identify and implement improvements and efficiencies before the next period of growth and development, resulting in more effective and sustainable programs over the long term.

In addition, it is very difficult to ascertain the true cost of implementation of the Copermittees' management programs because of inconsistencies in reporting by the Copermittees. Reported costs of compliance for the same program element can vary widely from city to city, often by a very wide margin that is not easily explained.[2] Despite these problems, efforts have been made to identify management program costs, which can be helpful in understanding the costs of program implementation.

The San Diego Water Board recognizes that the Copermittees will incur costs in implementing this Order, potentially above and beyond the costs from the Copermittees' prior permits. The San Diego Water Board also recognizes that, due to California's current economic condition, many Copermittees currently have limited staff and resources to implement actions to address its MS4 discharges. Based on the economic considerations below, the San Diego Water Board has provided the Copermittees a significant amount of flexibility to choose how to implement the requirements of the Order.

The Order also allows the Copermittees to customize their plans, programs, and monitoring requirements. In the end, it is up to the Copermittees to determine the effective BMPs and measures necessary to comply with this Order. The Copermittees can choose to implement the least expensive measures that are effective in meeting the requirements of this Order. This Order also does not require the Copermittees to

[2] LARWQCB, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.

fully implement all requirements within a single permit term. Where appropriate, the Board has provided the Copermittees with additional time outside of the permit term to implement control measures to achieve final WQBELs and/or water quality standards.

The San Diego Water Board has considered available cost information associated with compliance with this Order. It is not possible to predict accurately the cost impact of the requirements that involve an unknown level of implementation or that depend on environmental variables that are as yet undefined. Only general conclusions can be drawn from this information.

Estimated Municipal Storm Water Program Implementation Costs

The USEPA, the State Water Board, and the California Regional Water Quality Control Boards (Regional Water Boards) have attempted to evaluate the costs of implementing municipal storm water programs. The assessments have demonstrated that the true costs are difficult to ascertain and reported costs vary widely. In addition, reported fiscal analyses tend to neglect the costs incurred to municipalities when storm water and non-storm water runoff is not effectively managed, which are incurred as a result of pollution, contamination, nuisance, and damage to ecosystems, property, and human health. Nonetheless, they provide a useful context for considering the costs of requirements within Order No. R9-2013-0001.

In 1999, the USEPA reported on multiple studies it conducted to determine the cost of management programs. A study of Phase II municipalities determined that the annual cost of the Phase II program was expected to be $9.16 per household. The USEPA also studied 35 Phase I municipalities, finding costs to be $9.08 per household annually, similar to those anticipated for Phase II municipalities.[3]

The State Water Board commissioned a study by the California State University, Sacramento to assess costs of the Phase I MS4 program. This study includes an assessment of costs incurred by Phase I MS4s throughout the state to implement their programs. Annual cost per household in the study ranged from $18 to $46, with the Fresno-Clovis Metropolitan Area representing the lower end of the range, and the City of Encinitas (in San Diego County) representing the upper end of the range.[4]

A study on Phase I MS4 program costs was also conducted by the California Regional Water Quality Control Board, Los Angeles Region (Los Angeles Water Board), where program costs reported in the municipalities' annual reports were assessed. The Los Angeles Water Board estimated that average per household cost to implement the MS4 program in Los Angeles County was $12.50. [5]

[3] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791-68792.
[4] State Water Board, 2005. NPDES Stormwater Cost Survey. P. ii.
[5] Los Angeles Water Board, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.

It is important to note that reported program costs are not all attributable to solely complying with MS4 permits. Many program components, and their associated costs, existed before any MS4 permits were ever issued. For example, street sweeping and trash collection costs cannot be solely or even principally attributable to MS4 permit compliance, since these practices have long been expected from and implemented by municipalities.

Therefore, true program cost resulting from MS4 permit requirements is some fraction of reported costs. The California State University, Sacramento study found that only 38 percent of program costs are new costs fully attributable to MS4 permits. The remainder of the program costs was either pre-existing or resulted from enhancement of pre-existing programs.[6] In 2000, the County of Orange found that even lower amounts of program costs are solely attributable to MS4 permit compliance, reporting that the amount attributable to implement the County or Orange Drainage Area Management Plan (DAMP), was less than 20 percent of the total budget. The remaining 80 percent was attributable to pre-existing programs.[7] More current data from the County of Orange is not used in this discussion because the County of Orange no longer reports such information.

Estimated Value of Healthy Water Quality

Economic considerations of municipal storm water management programs cannot be limited only to program costs. Evaluation of programs must also consider information on the benefits derived from environmental protection and improvement.[8] Attention is often focused on municipal storm water management program costs, but the programs must also be viewed in terms of their value to the public.

Placing a value on healthy receiving waters is very difficult. Often the value of receiving waters with good water quality manifests in other forms, such as tourism, recreational opportunities, and/or increased property values. When surface water bodies are degraded, thereby degrading the habitat within and adjacent to the water bodies, the public loses the value and benefits associated with being able to use the area in and around the water bodies. Surface waters that are able to support the beneficial uses designated in the Basin Plan can sustain plants and wildlife that can attract visitors and residents, providing aesthetic, recreational, as well as monetary value to the public. At this time, however, there have been no studies for the San Diego Region to quantify the added value that surface waters with healthy water quality can provide.

[6] State Water Board, 2005. NPDES Stormwater Cost Survey. P. 58.
[7] County of Orange, 2000. A NPDES Annual Progress Report. P. 60.
[8] Ribaudo M.O. and D. Heelerstein. 1992, *Estimating Water Quality Benefits: Theoretical and Methodological Issues.* U.S. Department of Agriculture. Technical Bulletin No. 1808.

USEPA has estimated that household willingness to pay for improvements in fresh water quality for fishing and boating is approximately $158-$210.[9] This estimate can be considered conservative, since it does not include important considerations such as marine waters benefits, wildlife benefits, or flood control benefits. Another study conducted by California State University, Sacramento reported that the annual household willingness to pay for statewide clean water is approximately $180.[10]

A study conducted by the University of Southern California and University of California, Los Angeles assessed the costs and benefits of implementing various approaches for achieving compliance with the MS4 permits in the Los Angeles region. The study found that non-structural systems would cost $2.8 billion but provide $5.6 billion in benefit. If structural systems were determined to be needed, the study found that total costs would be $5.7 to $7.4 billion, while benefits could reach $18 billion.[11] Costs are anticipated to be borne over many years, probably at least ten years.

As can be seen, the benefits of the municipal storm water management programs are expected to considerably exceed their costs. Such findings are corroborated by USEPA, which found that the benefits of implementation of its Phase II storm water rule would also outweigh the costs.[12]

[9] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68793.
[10] State Water Board, 2005. NPDES Stormwater Cost Survey. P. iv.
[11] Los Angeles Water Board, 2004. Alternative Approaches to Stormwater Control.
[12] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791.

VII. APPLICABLE STATUTES, REGULATIONS, PLANS AND POLICIES

A. Legal Authorities – Federal Clean Water Act and California Water Code

This Order is issued pursuant to section 402 of the CWA and implementing regulations adopted by the USEPA and chapter 5.5, division 7 of the CWC (commencing with section 13370). This Order serves as an NPDES permit for point source discharges to surface waters. This Order also serves as waste discharge requirements pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

The objective of the CWA is "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*." To carry out this objective, the CWA requires the implementation of permit programs to regulate the discharge of pollutants and dredged or fill material to the navigable waters of the U.S. and to regulate the use and disposal of sewage sludge. CWA section 402 provides the legal authority to issue a permit for the discharge of pollutants to waters of the U.S. under the NPDES. The CWA provides that NPDES permits may be issued by states which are authorized to implement the provisions of that act. California became authorized to implement the NPDES permit program on May 14, 1973.

The Porter-Cologne Water Quality Control Act (Division 7, commencing with CWC section 13000) established the State Water Resources Control Board (State Water Board) and nine Regional Water Quality Control Boards (Regional Water Boards) as the principal state agencies with primary responsibility for the coordination and control of water quality. CWC section 13200(f) established the San Diego Water Board, which has the primary responsibility for the coordination and control of water quality in the San Diego Region, which includes all the basins draining into the Pacific Ocean between the southern boundary of the Santa Ana Region and the California-Mexico boundary. The San Diego Water Board implements the CWA through Chapter 5.5 of the CWC, commencing with section 13370. CWC section 13377 provides the San Diego Water Board the legal authority to issue waste discharge requirements to ensure compliance with all applicable provisions of the CWA and acts amendatory thereof or supplementary, thereto, to implement water quality control plans, or for the protection of beneficial uses, or to prevent nuisance.

CWA section 402(p) requires the USEPA or authorized state to issue NPDES permits for storm water discharges from municipal separate storm sewer systems (MS4s) to waters of the U.S. CWA section 402(p)(3)(B)(ii) requires that NPDES permits for storm water discharges from MS4s "*effectively prohibit non-storm water discharges*" into the MS4s. CWA section 402(p)(3)(B)(iii) requires that NPDES permits for storm water discharges from MS4s to "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable* [MEP], *including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*."

The USEPA published implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]), which prescribe permit application requirements for storm water discharges from MS4s pursuant to CWA 402(p), on November 16, 1990. The USEPA published an Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems, which provided guidance on permit application requirements for regulated MS4s, on May 17, 1996. The federal regulations in 40 CFR 122 and guidance issued by USEPA serve as the foundation for the provisions of Order No. R9-2013-0001. The legal authorities provided by the above statutes and regulations are included as part of the discussions in Section VIII of this Fact Sheet.

B. Legal Authority for the Permit Issued on a Region-wide Basis

CWA section 402(p)(3)(B) provides the San Diego Water Board the legal authority to issue an NPDES permit for the San Diego Region as compared to separate MS4 permits based upon County- and partial County-wide boundaries as they exist within the San Diego Region. CWA section 402(p)(3)(B) states that "*Permits for discharges from municipal storm sewers- (i) may be issued on a system- or jurisdiction-wide basis ....*" The federal regulations in 40 CFR 122.26(a)(1)(v) also state that the San Diego Water Board "*may designate dischargers from municipal separate storm sewers on a system-wide or jurisdiction-wide basis. In making this determination, the [San Diego Water Board] may consider the following factors: (A) the location of the discharge with respect to waters of the United States; (B) the size of the discharge; (C) the quantity and nature of the pollutants discharged to waters of the United States; and (D) other relevant factors*."

More specifically, the federal regulations provide that for large and medium MS4 systems, the San Diego Water Board may issue a regional permit. Specifically, the federal regulation in 40 CFR 122.26(a)(3) provide:

"*(ii) The Director may either issue one system-wide permit covering all discharges from municipal separate storm sewers within a large or medium municipal storm sewer system or issue distinct permits for appropriate categories of discharges within a large or municipal separate storm sewer system including, but not limited to: all discharges owned or operated by the same municipality; located within the same jurisdiction; all discharges within a system that discharge to the same watershed; discharges within a system that are similar in nature; or for individual discharges from municipal separate storm sewers within the system.*

(iii) The operator of a discharge from a municipal separate storm sewer which is part of a large or medium municipal separate storm sewer system must either: (A) Participate in a permit application (to be a permittee or a co-permittee) with one or more other operator of discharges from the large or medium municipal storm sewer system which covers all, or a portion of all, discharges from the municipal separate storm sewer system; (B) Submit a distinct permit application

which only covers discharges from the municipal separate storm sewers for which the operator is responsible; or (C) A regional authority may be responsible for submitting a permit application under the following guidelines....

(iv) One permit application may be submitted for all or a portion of all municipal separate storm sewers within adjacent or interconnected large or medium municipal separate storm sewer systems. The Director may issue one systemwide permit covering all, or a portion of all municipal separate storm sewers in adjacent or interconnected large or medium municipal separate storm sewer systems.

(v) Permits for all or a portion of all discharges from large or medium municipal separate storm sewer systems that are issued on a system-wide, jurisdiction-wide, watershed or other basis may specify different conditions relating to different discharges covered by the permit, including different management programs for different drainage areas which contribute storm water to the system."

Based on these regulations, the San Diego Water Board may issue a region-wide MS4 permit. The regulations also clarify that the permit may include different conditions for separate discharges covered by the permit. This allows the San Diego Water Board to ensure that suitable water quality conditions and provisions are identified for each watershed.

The USEPA's responses to comments in the Final Rule for the above-mentioned regulations also make it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide, permits. In the Final Rule published in the Federal Register and containing the responses to comments, USEPA notes that 40 CFR 122.26(a)(3)(iv) would allow an entire system in a geographical region under the purview of a State agency to be designated under a permit.[13] USEPA also states that many commenters wanted to allow the permitting authority broad discretion to establish system-wide permits, and that EPA believes that paragraphs 40 CFR 122.26 (a)(1)(v) and (a)(3)(ii) allow for such broad discretion.[14]

This Order creates watershed requirements that apply to multiple counties. The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees. Managing storm water on a regional and watershed basis is expected to result in improved water quality, as the Order focuses on monitoring and management practices necessary to improve each watershed rather than political boundaries. A single permit also allows the San Diego Water Board staff to expend fewer resources developing successive multiple permits and allows more resources to be devoted to working cooperatively with all three current groups of Copermittees to ensure implementation of this Order results in improved water quality.

[13] 55 Federal Register 47990-01, 48042
[14] Ibid

C. Federal and California Endangered Species Acts

This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2115.5) or the Federal Endangered Species Act (16 United States Code [USC] sections 1531 to 1544). This Order requires compliance with requirements to protect the beneficial uses of waters of the U.S. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

D. California Environmental Quality Act

The action to adopt an NPDES Permit is exempt from the provisions of Chapter 3 of the California Environmental Quality Act (CEQA) (Public Resources Code section 21100, et seq.) pursuant to CWC section 13389. (*County of Los Angeles v. Cal. Water Boards* (2006) 143 Cal.App.4th 985.)

E. State and Federal Regulations, Plans and Policies

The legal authority provided by the following regulations, plans, and policies are also included as part of the discussions in Section VIII of this Fact Sheet.

<u>Water Quality Control Plan for the San Diego Basin</u>

The CWA requires the San Diego Water Board to establish water quality standards for each water body in its region. Water quality standards include beneficial uses, water quality objectives and criteria that are established at levels sufficient to protect beneficial uses, and an antidegradation policy to prevent degrading of waters. On September 8, 1994, the San Diego Water Board adopted the *Water Quality Control Plan for the San Diego Basin (*Basin Plan). The Basin Plan designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters in the San Diego Region. The San Diego Water Board has amended the Basin Plan on multiple occasions since 1994. In addition, the Basin Plan implements State Water Board Resolution No. 88-63, which established state policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply. Beneficial uses applicable to the surface water bodies that receive discharges from the MS4s within the San Diego Region generally include those listed below:

The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region:

- Municipal and Domestic Supply (MUN)
- Agricultural Supply (AGR)

- Industrial Process Supply (PROC)
- Industrial Service Supply (IND)
- Ground Water Recharge (GWR)
- Contact Water Recreation (REC1)
- Non-contact Water Recreation (REC2)
- Warm Freshwater Habitat (WARM)
- Cold Freshwater Habitat (COLD)
- Wildlife Habitat (WILD)
- Rare, Threatened, or Endangered Species (RARE)
- Freshwater Replenishment (FRSH)
- Hydropower Generation (POW)
- Preservation of Biological Habitats of Special Significance (BIOL)

The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region:

- Navigation (NAV)
- Commercial and Sport Fishing (COMM)
- Estuarine Habitat (EST)
- Marine Habitat (MAR)
- Aquaculture (AQUA)
- Migration of Aquatic Organisms (MIGR)
- Spawning, Reproduction, and/or Early Development (SPWN)
- Shellfish Harvesting (SHELL)

Pursuant to Water Code sections 13263 and 13377, the requirements of this Order implement the Basin Plan.

Water Quality Control Plan for Ocean Waters of California, California Ocean Plan

In 1972, the State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan). The State Water Board adopted the most recent amended Ocean Plan on September 15, 2009. The Office of Administrative Law approved it on March 10, 2010. On October 8, 2010, USEPA approved the 2009 Ocean Plan. The Ocean Plan is applicable, in its entirety, to ocean waters of the State. In order to protect beneficial uses, the Ocean Plan establishes water quality objectives and a program of implementation. Pursuant to Water Code sections 13263 and 13377, the requirements of this Order implement the Ocean Plan. The Ocean Plan identifies the beneficial uses of ocean waters of the State to be protected as summarized below:

- Industrial water supply
- Water contact and non-contact recreation, including aesthetic enjoyment; navigation
- Commercial and sport fishing

- Mariculture
- Preservation and enhancement of designated Areas of Special Biological Significance
- Rare and endangered species
- Marine habitat
- Fish spawning and shellfish harvesting

On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving an exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges. On June 19, 2012, the State Water Board adopted Order No. 2012-0031, amending Order No. 2012-0012 to require pollutant load reductions to be achieved within six years for the ASBS Compliance Plans, section A.2.d(2) and ASBS Pollution Prevention Plans, section B.2.b(2). The State Water Board Resolution No. 2012-0012, as amended requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject terms and conditions of State Water Board Resolution No. 2012-0012, as amended. The Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012, as amended, applicable to these discharges, are incorporated in Attachment A of this Order. Requirements of this Order implement the Ocean Plan.

Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality

On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

Antidegradation Policy

Federal regulations (40 CFR 131.12) require that the state water quality standards include an antidegradation policy consistent with the federal antidegradation policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16 ("Statement of Policy with Respect to Maintaining the Quality of the Waters of the State"). State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law.

The San Diego Water Board's Basin Plan implements and incorporates by reference both the State and federal antidegradation policies. State Water Board Resolution No. 68-16 and 40 CFR 131.12 require the San Diego Water Board to maintain high quality waters of the State until it is demonstrated that any change in quality will be consistent with maximum benefit to the people of the State, will not unreasonably affect beneficial uses, and will not result in water quality less than that described in the San Diego Water Boards' policies. State Water Board Resolution No. 68-16 requires that discharges of waste be regulated to meet best practicable treatment or control to assure that pollution or nuisance will not occur and the highest water quality consistent with the maximum benefit to the people of the State be maintained.

The discharges permitted in this Order are consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Board Resolution No. 68-16. Many of the water bodies within the area covered by this Order are of high quality. The Order requires the Copermittees to meet best practicable treatment or control to meet water quality standards. As required by 40 CFR 122.44(a), the Copermittees must comply with the "maximum extent practicable" technology-based standard set forth in CWA section 402(p) for discharges of pollutants in storm water from the MS4s.

Many of the waters within the area covered by this Order are impaired and listed on the State's CWA Section 303(d) List and the San Diego Water Board has established TMDLs to address the impairments. This Order requires the Copermittees to comply with permit provisions to implement the WLAs set forth in the TMDLs in order to restore the beneficial uses of the impaired water bodies consistent with the assumptions and requirements of the TMDLs. This Order includes requirements to develop and implement storm water management programs, achieve WQBELs, and effectively prohibit non-storm water discharges into the MS4. The issuance of this Order does not authorize an increase in the amount of discharge of waste.

Anti-Backsliding Requirements

CWA sections 402(o) and 303(d)(4) and 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations or conditions may be relaxed. All effluent limitations and other conditions in this Order are at least as stringent as the effluent limitations in the previous permits issued to the San Diego County Copermittees, the Orange County Copermittees and the Riverside County Copermittees.

Clean Water Act Section 303(d) List

CWA section 303(d)(1) requires each State to identify specific water bodies within its boundaries where water quality standards are not being met or are not expected to be

met after implementation of technology-based effluent limitations on point sources. Water bodies that do not meet water quality standards are considered impaired and are placed on the state's "303(d) List." Periodically, USEPA approves the State's 303(d) List.

Most recently, USEPA approved the State's 2010 303(d) List of impaired water bodies on October 11, 2011, which includes certain receiving waters in the San Diego Region. For each listed water body, the state or USEPA is required to establish a TMDL of each pollutant impairing the water quality standards in that water body. A TMDL is a tool for implementing water quality standards and is based on the relationship between pollution sources and in-stream water quality conditions. The TMDL establishes the allowable pollutant loadings for a water body and thereby provides the basis to establish water quality-based controls. These controls should provide the pollution reduction necessary for a water body to meet water quality standards.

A TMDL is the sum of the allowable pollutant loads of a single pollutant from all contributing point sources (the waste load allocations or WLAs) and non-point sources (load allocations of LAs) plus the contribution from background sources and a margin of safety (40 CFR 130.2(i)). MS4 discharges are considered point source discharges. For 303(d)-listed water bodies and pollutants in the San Diego Region, the San Diego Water Board or USEPA develops and adopts TMDLs that specify these requirements.

Since 2002, the San Diego Water Board has established seven (7) TMDLs to remedy water quality impairments in various water bodies within the San Diego Region (see Attachment E to the Order). These TMDLs identify MS4 discharges as a source of pollutants to these water bodies, and, as required, establish WLAs for MS4 discharges to reduce the amount of pollutant discharged to receiving waters. CWA section 402(p)(3)(B)(iii) requires the San Diego Water Board to impose permit conditions, including: "management practices, control techniques and system, design and engineering methods, and *such other provisions as the Administrator or the State determines appropriate for the control of such pollutants."* (Emphasis added.) CWA section 402(a)(1) also requires states to issue permits with conditions necessary to carry out the provisions of the CWA. Federal regulations also require that NDPES permits contain WQBELs consistent with the assumptions and requirements of all available WLAs (40 CFR 122.44(d)(1)(vii)(B)). CWC section 13377 also requires that NPDES permits include limitations necessary to implement water quality control plans. Therefore, this Order includes WQBELs and other provisions to implement the TMDL WLAs assigned to Copermittees regulated by this Order.

<u>Other Regulations, Plans and Policies</u>

This Order implements all other applicable federal regulations and State regulations, plans and policies, including the California Toxics Rule at 40 CFR 131.38 (Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California Rule [California Toxics Rule or CTR]), and State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP).

F. Unfunded State Mandates

Article XIII B, Section 6(a) of the California Constitution provides that whenever "*any state agency mandates a new program or higher level of service on any local government, the state shall provide a subvention of funds to reimburse that local government for the costs of the program or increased level of service*." The requirements of this Order do not constitute state mandates that are subject to a subvention of funds for several reasons, including, but not limited to, the following.

First, the requirements of this Order do not constitute a new program or a higher level of service as compared to the requirements contained in the previous Fourth Term Permits. The overarching requirement to impose controls to reduce the pollutants in discharges from MS4s is dictated by the CWA and is not new to this permit cycle (33 USC section 1342(p)(3)(B)). The inclusion of new and advanced measures as the MS4 programs evolve and mature over time is anticipated under the CWA (55 FR 47990, 48052 (Nov. 16, 1990)), and to the extent requirements in this Order are interpreted as new advanced measures, they do not constitute a new program or higher level of service.

Second, and more broadly, mandates imposed by federal law, rather than by a state agency, are exempt from the requirement that the local agency's expenditures be reimbursed (Cal. Const., art. XIII B, section 9, subd. (b)). This Order implements federally mandated requirements under the CWA and its requirements are therefore not subject to subvention of funds. This includes federal requirements to effectively prohibit non-storm water discharges, to reduce the discharge of pollutants in storm water to the MEP, and to include such other provisions as the Administrator or the State determines appropriate for the control of such pollutants (33 USC section 1342(p)(3)(B)). Federal cases have held these provisions require the development of permits and permit provisions on a case-by-case basis to satisfy federal requirements. (*Natural Resources Defense Council, Inc., v. USEPA* (9th Cir. 1992) 966 F.2d 1292, 1308, fn. 17.)

The authority exercised under this Order is not reserved state authority under the CWA's savings clause (cf. *Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 627-628 [relying on 33 USC section 1370, which allows a state to develop requirements which are not "less stringent" than federal requirements]), but instead is part of a federal mandate to develop pollutant reduction requirements for municipal separate storm sewer systems. To this extent, it is entirely federal authority that forms the legal basis to establish the permit provisions. (See, *City of Rancho Cucamonga v. Regional Water Quality Control Board, Santa Ana Region* (2006) 135 Cal.App.4th 1377, 1389; *Building Industry Ass'n of San Diego Co. v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 882-883.)

The MEP standard is a flexible standard that balances a number of considerations, including technical feasibility, cost, public acceptance, regulatory compliance, and effectiveness. (*Building Ind. Ass'n., supra,* 124 Cal.App.4th at pp. 873-874, 889.) Such considerations change over time with advances in technology and with experience

gained in storm water management (55 FR 47990, 48052 (Nov. 16, 1990)). Accordingly, a determination of whether the conditions contained in this Order exceed the requirements of federal law cannot be based on a point by point comparison of the permit conditions and the minimum control measures that are required "at a minimum" to reduce pollutants to the maximum extent practicable and to protect water quality (40 CFR 122.34). Rather, the appropriate focus is whether the permit conditions, as a whole, exceed the MEP standard.

In recent months, the County of Los Angeles and County of Sacramento Superior Courts have granted writs setting aside decisions of the Commission on State Mandates that held certain requirements in Phase I permits constituted unfunded mandates. In both cases, the courts have found that the correct analysis in determining whether an MS4 permit constituted a state mandate was to evaluate whether the permit as a whole exceeds the MEP standard. (*State of Cal. v. Comm. on State Mandates* (Super. Ct. Sacramento County, 2012, No. 34-2010-80000604), *State of California v. County of Los Angeles* (Super. Ct. Los Angeles County, 2011, No. BS130730.) Both cases are currently pending appeal.

The requirements of the Order, taken as a whole rather than individually, are necessary to reduce the discharge of pollutants to the MEP and to protect water quality. The San Diego Water Board finds that the requirements of the Order are practicable, do not exceed federal law, and thus do not constitute an unfunded mandate. These findings are the expert conclusions of the principal state agency charged with implementing the NPDES program in California (CWC sections 13001, 13370).

It should also be noted that the provisions in this Order to effectively prohibit non-storm water discharges are also mandated by the CWA (33 USC section 1342(p)(3)(B)(ii)). Likewise, the provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state establishes or adopts a TMDL, federal law requires that permits must contain effluent limitations consistent with the assumptions and requirements of any applicable waste load allocation in a TMDL (40 CFR 122.44(d)(1)(vii)(B)).

Third, the local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental dischargers who are issued NPDES permits for storm water discharges. With a few inapplicable exceptions, the CWA regulates the discharge of pollutants from point sources (33 USC section 1342) and the Porter-Cologne Act regulates the discharge of waste (CWC section 13263), both without regard to the source of the pollutant or waste. As a result, the "costs incurred by local agencies" to protect water quality reflect an overarching regulatory scheme that places similar requirements on governmental and non-governmental dischargers. (See *County of Los Angeles v. State of California* (1987) 43 Cal.3d 46, 57-58 [finding comprehensive workers' compensation scheme did not create a cost for local agencies that was subject to state subvention].)

The CWA and the Porter-Cologne Act largely regulate storm water with an even hand, but to the extent there is any relaxation of this even-handed regulation, it is in favor of the local agencies. Generally, the CWA requires point source dischargers, including dischargers of storm water associated with industrial or construction activity, to comply strictly with water quality standards (33 USC section 1311(b)(1)(C); *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159, 1164-1165 [noting that industrial discharges must strictly comply with water quality standards]). As discussed in prior State Water Board decisions, certain provisions of this Order do not require strict compliance with water quality standards (State Water Board Order No. WQ 2001-0015, p. 7). Those provisions of this Order regulate the discharge of waste in municipal storm water under the CWA's MEP standard, not the BAT/BCT standard that applies to other types of discharges. These provisions, therefore, regulate the discharge of waste in municipal storm water more leniently than the discharge of waste from non-governmental sources.

Fourth, the Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)). To the extent that the local agency Copermittees have voluntarily availed themselves of the permit, the program is not a state mandate. (Accord, *County of San Diego v. State of California* (1997) 15 Cal.4th 68, 107-108.)

Fifth, the local agency Copermittees' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under state law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

Finally, even if any of the permit provisions could be considered unfunded mandates, under Government Code section 17556, subdivision (d), a state mandate is not subject to reimbursement if the local agency has the authority to charge a fee. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order, subject to certain voting requirements contained in the California Constitution. (See Cal. Const., Art. XIII D, section 6, subd. (c); see also *Howard Jarvis Taxpayers Ass'n v. City of Salinas* (2002) 98 Cal.App.4th 1351, 1358-1359.) The Fact Sheet demonstrates that numerous activities contribute to the pollutant loading in the MS4. Local agencies can levy service charges, fees, or assessments on these activities, independent of real property ownership. (See, e.g., *Apartment Ass'n of Los Angeles County, Inc., v. City of Los Angeles* (2001(24 Cal.4th 830, 842 [upholding inspection fees associated with renting property].) The authority and ability of a local agency to defray the cost of a program without raising taxes indicates that a program does not entail a cost subject to subvention. (*Clovis Unified School Dist. V. Chiang* (2010) 188 Cal.App.4th 794, 812, citing *Connell v. Sup. Ct.* (1997) 59 Cal.App.4th 382, 401; *County of Fresno v. State of California* (1991) 53 Cal. 3d. 482, 487-488.)

VIII. PROVISIONS

The provisions (i.e. NPDES permit requirements) of the Order are discussed below.

A. Prohibitions and Limitations

Purpose: Provision A includes the prohibitions and limitations requirements that are the foundation of all the subsequent requirements included in the Order. Compliance with the prohibitions and limitations will restore and protect receiving waters from impacts that may be caused by discharges into and from the Copermittees' MS4s and ultimately achieve the objective of the CWA.

In meeting the requirements set forth in the Order, the Copermittees must be cognizant that the prohibitions and limitations exist and will be the standard by which the San Diego Water Board will be measuring the progress and success of their implementation of the NPDES permit requirements.

***Discussion*:** The objective of the CWA is to "*restore and maintain the chemical, physical, and biological integrity of the Nation's waters*." The CWA requires the implementation of NPDES permit programs to regulate discharges of pollutants and dredged or fill material to the navigable waters of the U.S. For discharges into and from MS4s, the CWA requires the NPDES permits to "*effectively prohibit non-stormwater discharges into the storm sewers*" and "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable.*"

Provision A includes limitations, consistent with the requirements of the CWA for discharges from MS4s. Provision A expresses these limitations as discharge prohibitions, receiving water limitations, and effluent limitations. Compliance with the discharge prohibitions and receiving water limitations is also explicitly described, in conformance with precedential State Water Board Orders.

More specific and detailed discussions of the requirements of Provision A are provided below.

Provision A.1 (Discharge Prohibitions) prohibits the discharge of specific types of waste into and/or from the Copermittees' MS4s.

Provision A.1.a restates and reiterates Basin Plan Waste Discharge Prohibition 1, by prohibiting discharges into and from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the

state. The terms pollution,[15] contamination,[16] and nuisance[17] are defined under CWC 13050. Provision A.1.c incorporates all the waste discharge prohibitions of the Basin Plan into the requirements of the Order. The waste discharge prohibitions from the Basin Plan have been reproduced and provided in Attachment A to the Order.

Provision A.1.b requires non-storm water discharges into the MS4s to be effectively prohibited, consistent with the requirements of the CWA for MS4 permits to "*effectively prohibit non-stormwater discharges into the storm sewers*." The effective prohibition is required to be implemented by each Copermittee within its jurisdiction through the illicit discharge detection and elimination requirements under Provision E.2. The prohibition does not apply to NPDES permitted discharges into the Copermittees' MS4s.

The CWA employs the strategy of prohibiting the discharge of any pollutant from a point source into waters of the United States unless the discharger of the pollutant(s) obtains an NPDES permit pursuant to CWA Section 402. The 1987 amendment to the CWA includes provision 402(p) that specifically addresses NPDES permitting requirements for storm water discharges from MS4s. CWA section 402(p) prohibits the discharge of pollutants from specified MS4s to waters of the U.S. except as authorized by an NPDES permit and identifies two substantive standards for MS4 storm water permits. MS4 permits (1) "*shall include a requirement to effectively prohibit nonstormwater discharges into the storm sewers*" and (2) "*shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or State determines appropriate for the control of such pollutants*." (CWA section 402(p)(3)(B)(ii-iii).)

In November 1990, the USEPA published regulations addressing storm water discharges from MS4s (55 FR 47990 and following (Nov. 16, 1990) (Phase I Final Rule)). The regulations establish minimum requirements for MS4 permits, and generally focus on the requirement that MS4s implement programs to reduce the amount of pollutants found in storm water discharges to the MEP. The CWA's municipal storm water MEP standard does not require storm water discharges to strictly meet water quality standards, as is required for other NPDES permitted discharges. Compliance is achieved through an iterative approach of continuous

[15] CWC 13050(l): "(1) 'Pollution' means an alteration of the quality of waters of the state by waste to a degree which unreasonably affects either of the following: (A) The water for beneficial uses. (B) Facilities which serve beneficial uses. (2) 'Pollution' may include "contamination.

[16] CWC 13050(k): "Contamination' means an impairment of the quality of waters of the state by waste to a degree which creates a hazard to public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste, whether or not waters of the state are affected."

[17] CWC 13050(m): "Nuisance' means anything which meets all of the following requirements: (1) Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. (2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. (3) Occurs during, or as a result of, the treatment or disposal of wastes."

implementation of improved BMPs. This distinction reflects Congress's recognition that variability in flow and intensity of storm events render difficult strict compliance with water quality standards by MS4 permittees. In describing the controls that permits must include to reduce pollutants in storm water discharges to the MEP, the statute (CWA section 402(p)(3)(B)(iii)) states that the controls shall include: "*management practices, control techniques and system, design and engineering methods, and such other provisions as the [permit writer] determines appropriate for the control of such pollutants*."

In contrast, non-storm water discharges from the MS4 that are not authorized by separate NPDES permits are subject to requirements under the NPDES program, including discharge prohibitions, technology based effluent limitations and water quality-based effluent limitations (40 CFR 122.44). The regulations also require the Copermittee's program to include an element to detect and remove illicit discharges and improper disposal into the storm sewer (40 CFR 122.26(d)(2)(iv)(B)).

While "non-storm water" is not defined in the CWA or federal regulations, the federal regulations (at 40 CFR 122.26(b)(2)) define "*illicit discharge*" as *"any discharge to a municipal separate storm sewer that is not composed entirely of storm water and that is not covered by an NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer and discharges resulting from fire fighting activities)*." This definition is the most closely applicable definition of "non-storm water" contained in federal law. As stated in the Phase I Final Rule, USEPA added the illicit discharge program requirement to begin implementation of the 'effective prohibition' requirement to detect and control non-storm water discharges to their municipal system.

Thus, federal law mandates that permits issued to MS4s must require management practices that will result in reducing storm water pollutants to the MEP yet at the same time requires that non-storm water discharges be effectively prohibited from entering the MS4. "Effectively" prohibit does not mean that non-storm water discharges are authorized to be discharged into and from the Copermittees' MS4s. The Phase I Final Rule clarifies what "effectively prohibit" means (55 FR 47995):

> "*Section 402(p)(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…<u>Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit</u> (other than the permit for the discharge from the municipal separate storm sewer)*" [Emphasis added].

Consistent with federal law, unless non-storm water discharges to the MS4 are authorized by a separate NPDES permit, non-storm water discharges are appropriately subject to the effective prohibition requirement in the CWA and Regional

Water Boards are not limited by the iterative MEP approach to storm water regulation in crafting appropriate regulations for non-storm water discharges.

The federal regulations (40CFR122.26(d)(2)(i)(B)) require the Copermittees to establish the legal authority which authorizes or enables the Copermittees to prohibit illicit discharges to the MS4s. The federal regulations (40 CFR 122.26(d)(2)(vi)(B)(1)) require the Copermittees to "*implement and enforce an ordinance, order or similar means*" to prevent non-storm water discharges to their MS4s. Thus, the Copermittees are required to "*effectively*" prohibit non-storm water discharges to their MS4s through enforcing their legal authority established under "*ordinance, order or similar means*" and either remove those discharges to their MS4s, or require those discharges to obtain coverage under a separate NPDES permit. More detail about the program that must be implemented to "*effectively*" prohibit non-storm water discharges to the Copermittees' MS4s is provided under the discussion for Provision E.2.

Provision A.1.d was included to be consistent Resolution No. 2012-0012, adopted by the State Water Board on March 20, 2012. Provision A.1.d prohibits discharges from MS4s to Areas of Special Biological Significance (ASBS), except for storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach to the Heisler Park ASBS subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012. The pertinent Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 are provided in Attachment A to the Order.

<u>Provision A.2 (Receiving Water Limitations)</u> specifies the condition of the receiving waters that must be achieved when there are discharges from the Copermittees' MS4s. Receiving water limitations are included in all NPDES permits issued pursuant to the CWA section 402. CWA section 402(p)(3)(B)(iii) authorizes the inclusion of "*such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." This requirement gives USEPA or the State permitting authority, in this case the San Diego Water Board, discretion to determine what permit conditions are necessary to control pollutants.

In its Phase I Final Rule (see 55 FR 47990, 47994 (Nov. 16, 1990)), USEPA elaborated on these requirements, stating that, "*permits for discharges from municipal separate storm sewer systems must require controls to reduce the discharge of pollutants to the maximum extent practicable, and where necessary water quality-based controls*." USEPA reiterated in its Phase II Final Rule (64 FR 68722, 68737), that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL*." CWC section 13377 also requires that NPDES permits include limitations necessary to implement water quality control plans. Both the State Water Board and the San Diego Water Board have previously concluded that discharges from the MS4 contain pollutants that have the reasonable potential to cause or contribute to excursions above water quality

standards. As such, inclusion of receiving water limitations is appropriate to control MS4 discharges.

The inclusion of receiving water limitations is also consistent with the Ninth Circuit Court of Appeals' ruling in *Defenders of Wildlife v. Browner* (191 F.3d 1159, 1166 (1999)) that the permitting authority has discretion regarding the nature and timing of requirements that it includes as MS4 permit conditions to attain water quality standards. The Ninth Circuit Court of Appeals recently explained that, "*[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*" (*Natural Resources Defense Council v. County of Los Angeles* (9th Cir. 2011) 673 F.3d 880, 886 (revd. On other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013)))

The receiving water limitations included in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan or in water quality control plans or policies adopted by the State Water Board, including State Water Board Resolution No. 68-16, or in federal regulations, including but not limited to 40 CFR 131.12 and 131.38. The water quality objectives in the Basin Plan and other State Water Board plans and policies have been approved by USEPA and combined with designated beneficial uses constitute the water quality standards required under federal law.

Provision A.2.a requires that discharges from the Copermittees' MS4s must not cause or contribute to the violation of water quality standards in receiving waters. The water quality standards of the receiving waters must be protected from the impacts that may be caused by the Copermittees' MS4 discharges. Water quality standards applicable to the surface waters in the San Diego Region must be achieved through meeting the technology based standard of MEP through an iterative process of improved management actions. Provision A.2.a is also consistent with State Water Board Order WQ 99-05 precedent-setting language requiring discharges from MS4s to attain receiving water quality standards. The water quality control plans and policies with water quality standards applicable to the waters in the San Diego Region are included under Provision A.2.a.

Provisions A.2.b was included to be consistent with the requirements of State Water Board Resolution No. 2012-0012, adopted on March 20, 2012.

<u>Provision A.3 (Effluent Limitations)</u> specifies the condition of the discharges from the Copermittees' MS4s that must be achieved if and when there are discharges.

Consistent with CWA section 301(b)(1)(A) and 40 CFR 122.44(a), Provision A.3.a includes the technology-based effluent limitations that must be included in the Order.

The technology-based effluent limits, representing the minimum level of control that must be imposed in a permit under CWA section 402, requires that pollutants in discharges of storm water from the Copermittees' MS4s be reduced to the MEP. This provision applies specifically to storm water discharges. Non-storm water discharges must be effectively prohibited, as required under Provision A.1.b. Non-storm water (dry weather) discharges from the MS4 are not considered storm water (wet weather) discharges and therefore are not subject to the MEP standard.

The technology-based MEP standard is an ever-evolving, flexible, and advancing concept. Neither Congress nor USEPA has specifically defined the term "maximum extent practicable." Congress established this flexible MEP standard so that the administrative bodies would have "*the tools to meet the fundamental goals of the Clean Water Act in the context of storm water pollution*." (*Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 884.) As knowledge about controlling storm water runoff and discharges continues to evolve, so does the knowledge which constitutes MEP. Reducing the discharge of pollutants in storm water from the MS4 to the MEP requires the Copermittees to assess each program component and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP.

The San Diego Water Board or the State Water Board ultimately define MEP, and may include requirements that provide specific guidance on what is expected to demonstrate MEP. It is the responsibility of the Copermittees to propose actions that implement BMPs to reduce storm water pollution to the MEP. In other words, the Copermittees' runoff management programs developed and implemented under the Order are the Copermittees' proposals for achieving MEP. Their total collective and individual activities conducted pursuant to their runoff management programs become their proposal for achieving MEP as it applies both to their overall effort, as well as to specific activities. Provisions B through E of the Order provides a minimum framework to guide the Copermittees in achieving the MEP standard for discharges of pollutants in storm water.

Provision A.3.b incorporates any water quality based effluent limitations (WQBELs) applicable to the MS4s established for TMDLs adopted and approved for the San Diego Region and requires the Copermittees to comply with those WQBELs. This is consistent with 40 CFR 122.44(d)(1)(vii)(B), which requires that NPDES permits to incorporate WQBELs "*developed to protect a narrative water quality criterion, a numeric water quality criterion, or both…consistent with the assumptions and requirements of any available wasteload allocation for the discharge...*"

Pursuant to CWA section 303(d), for surface water bodies identified as impaired by one or more pollutants, the San Diego Water Board is required to establish TMDLs "*at a level necessary to implement the applicable water quality standards with seasonal variations and a margin of safety which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality*." The

TMDLs identify sources of the pollutants causing the impairments and assign portions of the TMDL as WLAs to point sources, which include MS4s.

WLAs must be expressed in NPDES permits as WQBELs, which may include one or more numeric components such as numeric effluent limits, and/or receiving water limitations, and/or BMP requirements. Because numeric targets for TMDLs typically include a component that will be protective of water quality standards, a TMDL will likely include one or more numeric receiving water limitations and/or effluent limitations as part of the assumptions or requirements of the TMDL. Any numeric receiving water limitations and/or effluent limitations developed as part of the assumptions or requirements of a TMDL must be incorporated and included as part of WQBELs for the MS4s.

Because the development and approval of new TMDLs, or modification of existing TMDLs, may occur during the term of this Order, the specific provisions of those TMDLs, including effluent limitations applicable to MS4s are provided within Attachment E to the Order. Attachment E will be updated with new TMDLs and modifications to existing TMDLs in a timely manner as they occur.

Provision A.4 (Compliance with Discharge Prohibitions and Receiving Water Limitations) describes the process required to be implemented by the Copermittees if compliance with the discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a are not being achieved under current conditions.

In its Phase II Stormwater Regulations, Final Rule, USEPA states that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL.*"[18] In a series of comment letters on MS4 permits issued by various Regional Water Boards, USEPA has also reiterated that MS4 discharges must meet water quality standards.[19] In addition, the Ninth Circuit Court of Appeals explained in a recent ruling that, *"[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*"[20]

[18] Phase II Stormwater Regulations, Final Rule, 64 Fed. Reg. 68722, 68737.
[19] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.
[20] NRDC v. County of Los Angeles (9th Cir. 2011), 673 F.3d 880, 886 (revd. on other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013))). See also, *Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 884-886, citing *Defenders of Wildlife v. Browning,* (9th Cir. 1999) 191 F.3d 1159.)

Water quality standards for the San Diego Region are established in the Basin Plan. The water quality standards of the Basin Plan are incorporated into this Order as the discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a. The discharge prohibitions and receiving water limitations in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations or prohibitions to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan, water quality control plans or policies adopted by the State Water Board, including Resolution No. 68-16, or federal regulations, including but not limited to, 40 CFR 131.12 and 131.38. The waste discharge prohibitions and water quality objectives in the Basin Plan have been approved by USEPA and combined with the designated beneficial uses constitute the water quality standards required under federal law.

Under federal law (CWA section 402(p)(3)(B)(iii)), an MS4 permit must include "*controls to reduce the discharge of pollutants to the maximum extent practicable...and such other provision as...the State determines appropriate for control of such pollutants*." The State Water Board has previously determined that limitations necessary to meet water quality standards are appropriate for the control of pollutants discharged by MS4s and must be included in MS4 permits. (State Water Board Orders WQ 91-03, 98-01, 99-05, 2001-15; see also *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159.) This Order prohibits discharges that cause or contribute to violations of water quality standards.

The discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a are included in this Order to ensure that discharges from the MS4s do not cause or contribute to exceedances of water quality objectives necessary to protect the beneficial uses of the receiving waters.

Provision A.4 is consistent with the precedent-setting language in State Water Board Order WQ 99-05 required to be included in municipal storm water permits. State Water Board Order WQ 2001-15 refined Order WQ 99-05 by requiring an iterative approach to compliance with water quality standards involving ongoing assessments and revisions, as referred to as the "iterative process." The "iterative process" is a fundamental NPDES requirement for municipal storm water permits to achieve the objectives of the CWA.

The State Water Board and Regional Water Boards have stated that the provisions under Provisions A.1.a, A.1.c, A.2.a, and A.4 are independently applicable, meaning that compliance with one provision does not provide a "safe harbor" where there is non-compliance with another provision (i.e., compliance with the Provision A.4 does not shield a Copermittee who may have violated Provision A.1.a, A.1.c, or A.2.a from an enforcement action). The intent of Provision A.4 is to ensure that the Copermittees have the necessary storm water management programs and controls in place, and that they are modified by the Copermittees in a timely fashion when necessary, so that compliance with Provisions A.1.a, A.1.c, and/or A.2.a is achieved as soon as possible. USEPA expressed the importance of this independent applicability in a series of

comment letters on MS4 permits proposed by various Regional Water Boards. At that time, USEPA expressly objected to certain MS4 permits that included language stating, *"permittees will not be in violation of this [receiving water limitation] provision … [if certain steps are taken to evaluate and improve the effectiveness of the jurisdictional runoff management programs],"* concluding that this phrase would not comply with the CWA.[21]

The Ninth Circuit held in *Natural Resources Defense Council v. County of Los Angeles* (2011) 673 F3d. 880, 886 (revd. on other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013))) that engagement in the iterative process does not provide a safe harbor from liability for violations of permit terms prohibiting exceedances of water quality standards. The Ninth Circuit holding is consistent with the position of the State and Regional Water Boards that exceedances of water quality standards in an MS4 permit constitute violations of permit terms subject to enforcement by the Water Boards or through a citizen suit. While the Water Boards have generally directed dischargers to achieve compliance by improving control measures through the iterative process, the San Diego Water Board retains the discretion to take other appropriate enforcement and the iterative process does not shield dischargers from citizen suits under the CWA.

The requirements of Provision A.4, therefore, are required to be implemented until the water quality standards expressed under Provisions A.1.a, A.1.c, and A.2.a are achieved. The CWA requires MS4 permits to "*require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." The requirements of this Order have been deemed or determined to be "appropriate" to achieve water quality standards in receiving waters.

Part of the "*controls*" required by the Order is the process described in Provision A.4. Provision A.4 includes the process that is ultimately expected to achieve compliance with the requirement that discharges from the MS4 do not cause or contribute to violations of water quality standards in the receiving waters. The implementation of Provision A.4 is required when the Copermittees or the San Diego Water Board have determined that discharges from the MS4 are causing or contributing to violations of water quality standards in the receiving waters.

The Copermittees must effectively prohibit non-storm water discharges into the MS4s, reduce the discharge of pollutants in storm water from the MS4s to the MEP, and ensure that their MS4 discharges do not cause or contribute to violations of water quality standards. If the Copermittees have effectively prohibited non-storm water

[21] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.

discharges and reduced storm water pollutant discharges to the MEP, but their discharges are still causing or contributing to violations of water quality standards, Provision A.4 provides a clear “iterative process” for the Copermittees to follow.

Provision A.4 essentially requires the Copermittees to implement additional BMPs until MS4 discharges no longer cause or contribute to a violation of water quality standards.

In assessing compliance and potential enforcement actions, the San Diego Water Board looks at the Copermittees’ efforts in total to meet the requirements of Provisions A.1.a, A.1.c, A.2.a and Provision A.4. The Copermittees need to demonstrate that they are making improvements to their programs and making progress toward achieving the discharge prohibitions and receiving water limitations in Provisions A.1.a, A.1.c, and A.2.a by implementing the requirements of Provision A.4. The San Diego Water Board would consider these efforts prior to strictly enforcing the requirements of Provisions A.1.a, A.1.c, and A.2.a. Causes of exceedances of the receiving water limitations can often be more difficult to identify and attribute solely to the Copermittees’ MS4s. The intent of the Order is to provide the Copermittees more clarity and flexibility in addressing these exceedances through the iterative approach and adaptive management process until the requirements under Provisions A.1.a, A.1.c, and A.2.a are fully achieved.

An exception to the iterative approach and adaptive management process would be in receiving waters subject to adopted and approved TMDLs. For TMDLs that are incorporated into the Order, there is a specific date for compliance to be achieved, after which the iterative approach and adaptive management process required under Provision A.4 no longer provides the flexibility to achieve compliance. Where compliance dates for a TMDL have passed, compliance with the WQBELs incorporated into the Order established by a TMDL in Attachment E to protect water quality standards is required. Thus, after the interim or final compliance dates for a TMDL have passed, if the discharges from the Copermittees’ MS4s are causing or contributing to a violation of WQBELs, exceedances of WQBELs must be strictly enforced by the San Diego Water Board. In the meantime, however, the Copermittees are in compliance with the interim or final TMDL requirements in Attachment E as long as the interim or final WQBELs are being achieved in accordance with the interim or final compliance dates.

B. Water Quality Improvement Plans

Purpose: Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges to the MS4s and control pollutants in storm water discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the Clean Water Act.

Provision B includes requirements for the Copermittees to develop and implement Water Quality Improvement Plans to ultimately comply with the prohibitions and limitations under Provision A. The Water Quality Improvement Plans will provide the Copermittees a comprehensive program that can achieve the requirements and further the objectives of the CWA. Implementation of the Water Quality Improvement Plans will also improve the quality of the receiving waters in the San Diego Region.

The Water Quality Improvement Plan is the backbone of the Regional MS4 Permit requirements. Provision B provides the guidance, criteria, and minimum expectations and requirements for the elements of the Water Quality Improvement Plan to be developed and implemented by the Copermittees. The Water Quality Improvement Plans will be implemented in the Watershed Management Area by the Copermittees within their jurisdictions through their jurisdictional runoff management programs.

The Water Quality Improvement Plan also incorporates a program to monitor and assess the progress of the Copermittees' jurisdictional runoff management programs toward improving the quality of discharges from the MS4s, as well as tracking improvements to the quality of receiving waters. A process to adapt and improve the effectiveness of the Water Quality Improvement Plans has also been incorporated into the requirements of Provision B to be consistent with the "iterative approach" required to achieve compliance with discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a, pursuant to the requirements of Provision A.4.

The Water Quality Improvement Plans have also been structured to incorporate the requirements of any TMDLs that have been adopted for the San Diego Region. Incorporating the requirements of the TMDLs into the requirements of Provision B allows the Copermittees to develop a single plan, instead of separate plans, to coordinate their non-storm water and storm water runoff management programs. The Water Quality Improvement Plans allow the Copermittees to meet the requirements of this Order, as well as fulfill the requirements of the TMDLs.

As an added benefit, if the Copermittees demonstrate that impaired water bodies within the Watershed Management Area listed on the 303(d) List will be addressed with their Water Quality Improvement Plans in a reasonable period of time, the San Diego Water Board may be able to remove the water bodies from the 303(d) List, which would greatly reduce the need for the San Diego Water Board to develop additional TMDLs that would have to be incorporated into the Order and implemented by the Copermittees.

***Discussion*:** The federal NPDES regulations require the Copermittees to develop a proposed management program (40 CFR 122.26(d)(2)(iv)). The proposed management program must include "*a comprehensive planning process*" and "*where necessary intergovernmental coordination*" for the "*duration of the permit.*" The Water Quality Improvement Plan is the Copermittees' "*comprehensive planning process*" document for the proposed management program that will be implemented within a Watershed Management Area. Implementation of the Water Quality Improvement Plan requires "*intergovernmental coordination*" among the Copermittees for at least the "*duration of the permit*," and likely into and beyond the next iteration of the permit.

Developing Water Quality Improvement Plans based upon watersheds is consistent with federal regulations that support the development of permit conditions, as well as implementation of storm water management programs, at a watershed scale (40 CFR 122.26(a)(3)(ii), 122.26(a)(3)(v), and 122.26(d)(2)(iv)). In 2003, USEPA issued a Watershed-Based NPDES Permitting Policy Statement (USEPA, 2003) that defines watershed-based permitting as an approach that produces NPDES permits that are issued to point sources on a geographic or watershed basis. In this policy statement, USEPA explains that "*[t]he utility of this tool relies heavily on a detailed, integrated, and inclusive watershed planning process*." USEPA identifies a number of important benefits of watershed permitting, including more environmentally effective results, the ability to emphasize measuring the effectiveness of targeted actions on improvements in water quality, reduced cost of improving the quality of the nation's waters and more effective implementation of watershed plans, including TMDLs, among others.

An emphasis on watersheds is appropriate at this stage in the San Diego Region's MS4 program to shift the focus to more targeted, water quality driven planning and implementation. Addressing discharges on a watershed scale focuses on water quality results by emphasizing the receiving waters in the watershed. The conditions of the receiving waters drive management actions, which in turn focus measures to address pollutant contributions from MS4 discharges.

The Water Quality Improvement Plan gives the Copermittees the responsibility of developing a comprehensive plan to coordinate the efforts of their jurisdictional runoff management programs for addressing the problems related to MS4 discharges causing impacts to water quality in the Watershed Management Area. The development of the plan provides the Copermittees the opportunity to provide significant input on how to implement their jurisdictional runoff management programs, and how to best utilize their available resources in addressing a focused set of

priorities that they believe will result in measureable improvements to water quality within the Watershed Management Area.

The Copermittees are encouraged to separate the Watershed Management Area into subwatersheds, as appropriate. This allows the Copermittees to identify priorities applicable to a subset of the Copermittees or specific water bodies or areas within the Watershed Management Area.

Included in the requirements for the elements to be included in the Water Quality Improvement Plan are monitoring and assessment requirements that are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order. In addition to the federal requirements of the CWA section 308(a) and 40 CFR 122.26(d), the San Diego Water Board has the authority to establish monitoring, reporting, and recordkeeping requirements for NPDES permits under CWC 13383.

More specific and detailed discussions of the requirements of Provision B are provided below.

Provision B.1 (Watershed Management Areas) requires the Copermittees to develop a Water Quality Improvement Plan for each of the Watershed Management Areas defined by the San Diego Water Board.

Pursuant to 40 CFR 122.26(d)(2)(iv), proposed management programs "*may impose controls on a…watershed basis…*" The Water Quality Improvement Plan is the Copermittees' proposed management program. A Water Quality Improvement Plan must be developed for each Watershed Management Area identified in the Order.

The Watershed Management Areas are identified in Table B-1. Table B-1 establishes ten (10) Watershed Management Areas, and identifies the Copermittees that are responsible for developing and implementing the Water Quality Improvement Plan for each Watershed Management Area.

The Copermittees from each of the three counties within the San Diego Region are expected to be phased in as their respective NPDES municipal storm water permits expire. Because Order No. R9-2007-0001 expired in January 2012, the San Diego County Copermittees were covered under the Regional MS4 Permit on June 27, 2013, the effective date of the Order. Because Order No. R9-2009-0002 expired in December 2014, the Orange County Copermittees are covered under the Regional MS4 Permit on April 1, 2015, the effective date of Order No. R9-2013-0001 as amended by Order No. R9-2015-0001.

After the San Diego Water Board receives and considers the Report of Waste Discharge required to be submitted by the Riverside County Copermittees pursuant to the requirements of their current permit, and makes any necessary changes to the Order, the Riverside County Copermittees will be covered under the Regional MS4

Permit after Order No. R9-2010-0016 expires in December 2015.

The Riverside County Copermittees also have the option to obtain coverage under the Regional MS4 Permit earlier than their respective permit expiration dates. The process to apply for early coverage is described Provision F.6.

Because the Santa Margarita River Watershed Management Area includes Copermittees from both San Diego County and Riverside County, a footnote to Table B-1 has been included to specify that the requirements of Provision B are not required to be implemented by the County of San Diego until the Riverside County Copermittees have received a notice of coverage under the Order. Until the Riverside County Copermittees are notified of coverage under the Order, the County of San Diego is subject to the prohibitions and limitations under Provision A, responsible for continuing to implement its existing jurisdictional runoff management program, and responsible for implementing the transitional monitoring and assessment requirements of Provision D, the transitional annual reporting requirements of Provision F.3.b, and the TMDL requirements of Attachment E to the Order.

The City of Laguna Woods and Laguna Hills are located partially within the jurisdictions of both the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board) and the San Diego Water Board. Written requests for designation of a single Regional Water Board to regulate matters pertaining to permitting of Phase I MS4 discharges were submitted to the San Diego Water Board and the Santa Ana Water Board by the City of Laguna Woods by letter dated September 8, 2014, and the City of Laguna Hills by letter dated March 12, 2014. The Cities of Laguna Woods and Laguna Hills requested designation of the San Diego Water Board pursuant to CWC section 13228. The Cities of Laguna Woods and Laguna Hills reported that management and implementation of municipal programs to comply with two different Phase I MS4 permits creates a significant administrative and financial burden and inhibits their ability to contribute to greater overall water quality improvements in either Region. In an effort to address these concerns, the San Diego Water Board and the Santa Ana Water Board have entered into an agreement dated February 10, 2015, whereby the San Diego Water Board is designated to regulate Phase I MS4 discharges within the jurisdiction of the Cities of Laguna Woods and Laguna Hills including areas in the Santa Region upon the later effective date of this Order or Tentative Order No. R8-2015-0001. Under the terms of the agreement, each Regional Water Board retains the authority to enforce provisions of the Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee (Water Code section 13228 (b)). Also under the terms of the agreement, any TMDL and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Laguna Woods or Laguna Hills as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement of the applicable TMDL would remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa

Ana Water Boards' San Diego Creek/Newport Bay TMDL and the San Diego Water Boards indicator Bacteria Project I Beaches and Creeks TMDL. In conformance with this agreement, a footnote to Table B-1 has been included to specify coverage under Order No. R9-2013-0001 for those Phase I MS4 discharges within the jurisdictional boundaries of the Cities of Laguna Woods and Laguna Hills within the Santa Ana Region. The footnote specifies that the City of Laguna Woods and Laguna Hills are identified as responsible Copermittees in the San Diego Creek/Newport Bay TMDL in the Santa Ana Region and remain obligated to comply with the San Diego Creek/Newport Bay TMDL pursuant to section XVIII of Tentative Order No. R8-2015-0001 (NPDES No. CAS618030) and any reissuance thereof.

The City of Lake Forest is located partially within the jurisdictions of both the Santa Ana Water Board and the San Diego Water Board. By letters dated January 14, 2013 and April 4, 2014 the City of Lake Forest submitted a written request, pursuant to CWC section 13228, to the San Diego Water Board and the Santa Ana Water Board requesting the Santa Ana Water Board be designated to regulate matters within the City of Lake Forest pertaining to permitting of their Phase I MS4 discharges. The City of Lake Forest reported that management and implementation of municipal programs to comply with two different Phase I MS4 permits creates a significant administrative and financial burden and inhibits their ability to contribute to greater overall water quality improvements in either Region. In an effort to address these concerns, the San Diego Water Board and the Santa Ana Water Board have entered into an agreement dated February 10, 2015, whereby the Santa Ana Water Board is designated to regulate Phase I MS4 discharges within the jurisdiction of the City of Lake Forest within the San Diego Region upon the later date of this Order or Santa Ana Water Board Tentative Order No. R8-2015-0001. Under the terms of the agreement, each Regional Water Board retains the authority to enforce provisions of the Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee (Water Code section 13228 (b)). Also under the terms of the agreement, any TMDL and associated Phase I MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the City of Lake Forest as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement authority for the applicable TMDL would remain with the Regional Water Board which has the jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Boards' San Diego Creek/Newport Bay TMDL and the San Diego Water Boards' indicator Bacteria Project I Beaches and Creeks TMDL. In conformance with this agreement, a footnote to Table B-1 has been included to specify that Phase I MS4 discharges within the jurisdictional boundaries of the City of Lake Forest located within the San Diego Region will be regulated under Santa Ana Water Board Order No. R8-2015-0001 (NPDES No. CAS618030) and any reissuance thereof. The footnote specifies that the City of Lake Forest is an identified responsible Copermittee in the Indicator Bacteria Project I Beaches and Creeks TMDL (Bacteria TMDL) in the San Diego Region and remains obligated to comply with the Bacteria TMDL pursuant to Attachment E of Order No. R9-2013-0001 and any reissuance thereto. The City is

also identified as a responsible Copermittee in the San Diego Creek/Newport Bay TMDL established by the Santa Ana Water Board. The City remains obligated to comply with the San Diego Creek/New Port Bay TMDL pursuant to the Santa Ana Water Board's Phase I MS4 Permit (Tentative Order No. R8-2015-0001 (NPDES No. CAS618030). Under the terms of the agreement, the City of Lake Forest must retain and continue implementation of the over irrigation prohibition in Title 15, Chapter 15, Section 14.030, List (b) of the City Municipal Code throughout its jurisdiction. Also under the terms of the agreement, the City of Lake Forest must actively participate in the development and implementation of the Aliso Creek Watershed Management Area Water Quality Improvement Plan required pursuant to Order No. R9-2013-0001, and any reissuance thereof.

The bases supporting the Cities of Laguna Woods, Laguna Hills, and Lake Forest requests to designate a specific Regional Water Board for regulatory oversight of Phase I MS4 discharges may change under future conditions and circumstances, therefore the San Diego Water Board will periodically review the effectiveness of the agreement during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate the agreement with the Santa Ana Water Board or otherwise modify the agreement subject to the approval of the Santa Ana Water Board.

Provision B.2 (Priority Water Quality Conditions) requires the Copermittees in each Watershed Management Area to identify the highest priority water quality conditions which will be the focus of the Water Quality Improvement Plan implementation.

Provisions B.2.a and B.2.b provide the criteria that must be assessed when characterizing the receiving water quality and potential impacts from MS4 discharges of the receiving waters within the Watershed Management Area. The criteria are based primarily on the requirements in 40 CFR 122.26(d)(1)(iv)(C) and (C)(1)-(9). Characterizing the receiving water quality and identifying the potential impacts caused by MS4 discharges to receiving waters in the Watershed Management Area is necessary to identify the impacts to receiving waters associated with MS4 discharges that are of the most concern to the Copermittees.

Based on the information required to be considered under Provisions B.2.a and B.2.b, Provision B.2.c requires to Copermittees to identify the highest priority water quality conditions related to discharges from the MS4s that will be the primary focus of the Water Quality Improvement Plan in the Watershed Management Area. Addressing and improving these highest priority water quality conditions will become the focus of each Copermittee's jurisdictional runoff management program as the Water Quality Improvement Plan is implemented in the Watershed Management Area. The highest priority water quality conditions are expected to include source of pollutants and/or stressors, and/or receiving water conditions, that the Copermittees consider the highest threats or most likely to have adverse impacts on the physical, chemical, and biological integrity of receiving waters. Addressing these threats and/or adverse impacts should restore the physical, chemical, and biological integrity of receiving

waters, and result in the restoration and protection of the beneficial uses of the receiving waters in the Watershed Management Area.

Provision B.2.d requires the Copermittees to identify known and suspected sources of pollutants and/or stressors contributing to the highest priority water quality conditions. The requirements of Provision B.2.d are based primarily on the requirements in 40 CFR 122.26(d)(1)(iii)(B)(1)-(6). The Copermittees are required to evaluate several factors in the identification of those sources. The Copermittees must consider and evaluate the following: (1) the land uses that may contribute toward impacts to receiving waters, (2) the locations of the Copermittees' MS4s that can convey and discharge runoff and pollutants to receiving waters, (3) other sources that discharge into the Copermittees' MS4s and receiving waters, and (4) other information and data that can help the Copermittees to evaluate the relative importance of or contribution from those sources toward the highest priority water quality conditions. Identifying the known and suspected sources, and their relative contribution toward the highest priority water quality conditions, will help the Copermittees to focus, direct, and prioritize their resources and implementation efforts within their jurisdictions.

Provision B.2.e requires the Copermittees to identify potential strategies that can result in improvements to water quality in MS4 discharges and/or receiving waters within the Watershed Management Area. Potential water quality improvement strategies will not necessarily be implemented by the Copermittees, but provide a "menu" of options that the Copermittees will consider for implementation. The public participation process that will be implemented during the development of the Water Quality Improvement Plan is where the potential water quality improvement strategies will be identified.

<u>Provision B.3 (Water Quality Improvement Goals, Strategies and Schedules)</u> requires the Copermittees in each Watershed Management Area to identify the goals that the Copermittees' jurisdictional runoff management programs will work toward achieving to address and improve the highest priority water quality conditions identified under Provision B.2.c; the strategies that will be implemented by the Copermittees within their jurisdictions and the Watershed Management Area to achieve the goals; and, the schedules for implementing the strategies and achieving the goals. The element of the Water Quality Improvement Plan required under Provision B.3 is where the "*comprehensive planning*" and "*intergovernmental coordination*" [40 CFR 122.26(d)(2)(iv)] of the Copermittees' actions for the proposed management programs within the Watershed Management Area is required to be described.

Provision B.3.a requires the Copermittees to identify interim and final numeric goals, and schedules to achieve those goals as part of the Water Quality Improvement Plans. Provision B.3.a.(1) requires the Copermittees to identify two types of numeric goals to be achieved:

(1) Final numeric goals in the receiving waters and/or MS4 discharges that will result in the protection of the water quality standards of the receiving waters for the highest priority water quality conditions identified by the Copermittees for Provision B.2.c. These final numeric goals are the ultimate goals for the Water Quality Improvement

Plan, and the achievement and maintenance of these final numeric goals will indicate that one or more beneficial uses have been successfully restored and/or protected from MS4 discharges.

(2) Interim numeric goals that can be used by the Copermittees to demonstrate progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges for the highest priority water quality conditions in the Watershed Management Area. Achievement of the interim numeric goals will demonstrate to the San Diego Water Board that the Copermittees' implementation efforts are progressing toward achieving the final numeric goals.

Provision B.3.a.(1) does not specify what the interim and final numeric goals must be based on, but they essentially must be designed to achieve compliance with water quality standards in the receiving waters. To that end, the interim goals must be based on measureable criteria or indicators capable of demonstrating progress toward achieving the numeric goals."

The interim and final numeric goals can be based on the water quality objectives in the Basin Plan. The water quality objectives in the Basin Plan, however, consist of numeric and narrative water quality objectives. Numeric water quality objectives can be directly used as numeric goals. Narrative water quality objectives, on the other hand, will require some interpretation to identify numeric goals. The achievement of multiple numeric goals based on the water quality objectives, used in combination, may be necessary to demonstrate that beneficial uses have been restored and/or protected.

The Copermittees could also propose other numeric goals that are not necessarily water quality objectives from the Basin Plan. For example, the Copermittees could propose a numeric goal that consists of achieving some percent improvement of a measureable indicator, such as acreage of a specific habitat or increase in a specific plant or animal species population. Other examples may include pollutant load reductions, number of impaired waterbodies delisted from the List of Water Quality Impaired Segments, Index of Biological Integrity (IBI) scores, etc.

The Copermittees may choose to develop interim numeric goals based on the final numeric goals they develop, such as incremental steps toward ultimately achieving the final numeric goals. The Copermittees may also choose to develop interim numeric goals that are based on other measureable indicators that can indirectly indicate improvements and progress toward the final numeric goals.

There are no limits to the types of interim numeric goals that could be proposed by the Copermittees, other than the goals must be based on measureable criteria or indicators capable of demonstrating progress toward achieving the numeric goals. Likewise, there are no limits to the types of final numeric goals that could be proposed by the Copermittees, other than the goals must "*restore and protect the water quality standards of the receiving waters.*"

Finally, Provision B.3.a.(2) also requires the Copermittees to develop schedules for measuring progress and achieving the interim and final numeric goals. Several criteria are included for the development of the schedules, but the Copermittees are required to achieve the numeric goals as soon as possible, consistent with federal NPDES regulations (40 CFR 122.47(a)(1)).

The Copermittees are also required to incorporate any compliance schedules for any applicable ASBS or TMDL requirements. Applicable ASBS and TMDL compliance schedules are set forth in Attachment A and Attachment E to the Order, respectively. The information provided by the Copermittees under Provision B.3.a.(2) will be used by the Copermittees and the San Diego Water Board to gauge and track the progress of the Copermittees' efforts in addressing the highest priority water quality conditions identified in the Water Quality Improvement Plan.

Provision B.3.b requires the Copermittees to identify the strategies and schedules to implement those strategies as part of the Water Quality Improvement Plans. Provision B.3.b requires the Copermittees to identify the water quality improvement strategies that will be and may be implemented within the Watershed Management Area to 1) reduce of pollutants in storm water discharged from the MS4 to the MEP, 2) effectively prohibit non-storm water discharges from entering the MS4, 3) protect water quality standards in receiving waters by controlling MS4 discharges so that they do not cause or contribute to exceedances of receiving water limitations, and 4) achieve applicable WQBELs that implement TMDLs. The Copermittees will select the strategies to be implemented based on the likely effectiveness and efficiency of the potential water quality improvement strategies identified under Provision B.2.e to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, and/or achieve the interim and final numeric goals identified under Provision B.3.a.

Provision B.3.b.(1) requires each Copermittee to identify the strategies that will be or may be implemented within its jurisdiction. Each Copermittee is required to describe the strategies it is committed to implementing as part of its jurisdictional runoff management requirements under Provisions E.2 through E.7, and the optional jurisdictional strategies that the Copermittee will implement, as necessary, to achieve the numeric goals.

Each Copermittee is expected to implement the optional jurisdictional strategies identified under Provisions B.3.b.(1)(b) when the jurisdictional strategies it has committed to implement under Provision B.3.b.(1)(a) are not making adequate progress toward the interim and final numeric goals in accordance with the schedules established under Provision B.3.a. Provision B.3.b.(1)(b)(v) requires each Copermittee to describe the circumstances necessary to trigger implementation of the optional jurisdictional strategies, in addition to the requirements of Provisions B.3.b.(1)(a).

The San Diego Water Board recognizes that there may be optional jurisdictional strategies that will likely require funding and/or resources for planning, permitting, procurement of labor and materials, and implementation. Thus, Provision B.3.b.(1)(b)(iv) requires each Copermittee to describe the funding and/or resources that are necessary to implement these optional jurisdictional strategies. This information may provide interested groups and members of the public an understanding of the resources that they could provide or assist in obtaining to implement these optional jurisdictional strategies.

Provision B.3.b.(2) requires the Copermittees in the Watershed Management Area to identify the regional or multi-jurisdictional strategies that may be implemented, as necessary, to achieve the numeric goals. Similar to the requirements of Provision B.3.b.(1)(b), these regional or multi-jurisdictional strategies will likely require funding and/or resources for planning, permitting, procurement of labor and materials, and implementation, and San Diego Water Board recognizes that these strategies may be difficult to implement with only Copermittee resources. Thus, Provision B.3.b.(2)(d) requires the Copermittees to describe the funding and/or resources necessary to implement these optional regional or multi-jurisdictional strategies. This information may provide interested groups and members of the public an understanding of the resources that they could provide or assist in obtaining to implement these optional regional or multi-jurisdictional strategies.

Provision B.3.b.(3) requires the Copermittees to develop and include schedules in the Water Quality Improvement Plan for implementing the water quality improvement strategies identified under Provisions B.3.b.(1) and B.3.b.(2). The schedule for implementing the water quality improvement strategies will be used by the Copermittees and San Diego Water Board to measure and demonstrate the progress of the Copermittees' implementation efforts toward reducing pollutants in storm water discharged from the MS4 to the MEP, and eliminating illicit non-storm water discharges from entering the MS4.

Provision B.3.b.(4) provides the Copermittees in each Watershed Management Area the option of implementing watershed-specific structural BMP requirements for Priority Development Projects. Historically, storm water permits have included very specific performance standards for permanent, structural BMPs. These standards describe the expectation for the capture or treatment of pollutants and control of excessive flow before storm water is discharged from a site. The Copermittees were also allowed to develop waiver programs for Priority Development Projects to avoid implementing the structural BMPs; however, the waiver programs were not necessarily tied into any sort of holistic watershed strategy. The result is that implementation of BMP requirements is largely done on a site-by-site basis. This requires proper design on the part of the Priority Development Project and strict oversight on the part of the Copermittee.

Provision B.3.b.(4) promotes the evaluation of multiple strategies for water quality improvement, in addition to the implementation of permanent structural BMPs, on a watershed-scale versus the site-by-site approach. In a report issued by the Southern

California Coastal Water Research Project (SCCWRP) and several other research institutions, the report emphasized that a successful hydromodification management program will involve watershed analysis as a first step, and that integrating multiple watershed-based strategies is preferable over a site-by-site approach. Indeed, the report states that the watershed analysis "…*should lead to identification of existing opportunities and constraints that can be used to help prioritize areas of greater concern, areas of restoration potential, infrastructure constraints, and pathways for potential cumulative effects*."[22] Provision B.3.b.(4) promotes the findings and recommendations of the report by providing a pathway for Copermittees to develop an integrated approach to their land development programs.

Under Provision B.3.b.(4), the Copermittees in a Watershed Management Area must first perform an analysis by gathering as much information pertaining to the physical characteristics of the Watershed Management Area as possible. This includes, for example, identifying potential areas of coarse sediment supply, present and anticipated future land uses, and locations of physical structures within receiving streams and upland areas that affect the watershed hydrology (such as bridges, culverts, and flood management basins). Once this information is collected, the Copermittees must produce GIS layers (maps) that include this information.

From there, the Copermittees must use the results of the Watershed Management Area Analysis to identify and compile a list of candidate projects that could potentially be used as alternative compliance options for Priority Development Projects. Such projects include, for example, opportunities for stream or riparian area rehabilitation, opportunities for retrofitting existing infrastructure to incorporate storm water retention or treatment, and opportunities for regional BMPs, among others. Once these candidate projects are identified, Copermittees may allow Priority Development Projects to fund, partially fund, or completely implement these candidate projects. The Copermittees must first find that implementing such a candidate project would provide greater overall benefit to the watershed than requiring implementation of the structural BMPs onsite, and also enter into a voluntary agreement with the Priority Development Project that authorizes this arrangement. The Copermittees may use Provision B.3.b.(4) as both 1) a mechanism to reach their stated goals of the Water Quality Improvement Plan by using Priority Development Projects to either fund or implement projects that will provide water quality benefit, and 2) an alternative to requiring strict adherence to the structural BMP design standards.

Additionally, Provision B.3.b.(4) allows the Copermittees to use the results of the Watershed Management Area Analysis to identify areas within the Watershed Management Area where it is appropriate to allow Priority Development Projects to be exempt from the hydromodification management BMP performance requirements. Provision E.3.c.(2) already allows exemptions for Priority Development Projects that discharge to a conveyance channel whose bed and bank are concrete lined from the

[22] 2012. ED Stein, F Federico, DB Booth, BP Bledsoe, C Bowles, Z Rubin, GM Kondolf, A Sengupta. Technical Report 667. Southern California Coastal Water Research Project. Costa Mesa, CA.

point of discharge to an enclosed embayment or the Pacific Ocean. However, there may be cases where further exemptions are warranted. The Copermittees may identify such cases on a watershed basis and include them in the Watershed Management Area Analysis; however, they must provide the supporting rationale to support all claims for exemptions.

Provision B.3.b.(4) provides an innovative pathway for Copermittees to regulate their land development programs by allowing alternative compliance in lieu of implementing structural BMPs on each and every Priority Development Project. This approach facilitates the integration of watershed-scale solutions for improving overall water quality and assisting Copermittees to achieve their stated goals of the Water Quality Improvement Plan. The San Diego Water Board understands, however, that undertaking this approach, which involves extensive planning, could be resource intensive for the Copermittees. Therefore, the Watershed Management Area Analysis is optional and not a requirement. The Copermittees can choose not to perform the watershed planning and mapping exercise described in Provision B.3.b.(4), and instead choose to require strict implementation of the structural BMPs onsite, pursuant to Provision E.3.b.

Provision B.4 (Water Quality Improvement Monitoring and Assessment) requires the Copermittees to develop an integrated monitoring and assessment program to track the progress of the Water Quality Improvement Plan toward meeting the implementation goals and schedules, and improving the water quality of the Watershed Management Area. Provision B.4 is the part of the Water Quality Improvement Plan where the Copermittees describe the monitoring data that will be collected, which is not only necessary to implement the "iterative approach" required by Provision A.4, but inform the adaptive management and "*comprehensive planning process*" that allows the Copermittees to make adjustments and modifications to the Water Quality Improvement Plans and the jurisdictional runoff management programs.

Provision B.4 requires the Copermittees, at a minimum, to include the requirements of Provision D as part of the water quality improvement monitoring and assessment program for the Water Quality Improvement Plan. The Copermittees, however, are not limited to the requirements of Provision D and may include additional monitoring and assessment methods to track progress toward improving water quality in the Watershed Management Area.

In addition to incorporating the requirements of Provision D, the water quality improvement monitoring and assessment program must incorporate any monitoring and assessment requirements specified for any applicable TMDLs included in Attachment E to the Order, and the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 for Watershed Management Areas with ASBS.

The monitoring and assessments required to be incorporated into the Water Quality Improvement Plan are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order.

Provision B.5 (Iterative Approach and Adaptive Management Process) requires the Copermittees to implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a.

Provision B.5 requires the Copermittees in each Watershed Management Area to re-evaluate the highest priority water quality conditions and potential water quality improvement strategies, the water quality improvement goals, strategies and schedules, and the water quality improvement monitoring and assessment program and provide recommendations for modifying those elements to improve the effectiveness of the Water Quality Improvement Plan. The re-evaluation of the Water Quality Improvement Plan is part of the assessment requirements of Provision D.

Provision B.6 (Water Quality Improvement Plan Submittal, Updates, and Implementation) requires to Copermittees to submit, update, and implement the Water Quality Improvement Plans.

The requirements for the process to develop and submit the Water Quality Improvement Plans is described in more detail under the discussion for Provision F.1. The process will include several opportunities for the public to provide input during the development of the Water Quality Improvement Plans. The process for updating the Water Quality Improvement Plans is described in more detail under the discussion for Provision F.3.c. Upon acceptance of the Water Quality Improvement Plan and updates, the Copermittees are required to immediately begin implementing the Water Quality Improvement Plan and subsequent updates.

The Water Quality Improvement Plan is expected to be a dynamic document that will evolve over time. The Water Quality Improvement Plan is also expected to be a long term plan that focuses the Copermittees' efforts and resources on a limited set of priority water quality conditions, with the ultimate goal of protecting all the beneficial uses of the receiving waters within the Watershed Management Area from impacts that may be caused or contributed to by MS4 discharges. As the Copermittees collect data, implement their jurisdictional runoff management programs, and review the results from their water quality improvement monitoring and assessment program, the Water Quality Improvement Plan is expected to be continually reviewed and updated until compliance with Provisions A.1.a, A.1.b, and A.2.a is achieved.

However, in specific cases supported by robust analytical documentation the implementation of the Water Quality Improvement Plans may demonstrate that TMDLs are not necessary for identified impaired water bodies within the Watershed Management Area if the analytical record demonstrates that technology-based effluent limitations required by the CWA, more stringent effluent limitations required by state, local, or federal authority, and/or other pollution control requirements (e.g., best management practices) required by local, state or federal authority are stringent enough to implement applicable

water quality standards within a reasonable period of time.[23]

The San Diego Water Board submits an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. According to USEPA guidance for the Integrated Report,[24] water bodies are placed in one of five categories. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 are placed on the 303(d) List.

Category 4 in the Integrated Report is for water bodies where available data and/or information indicate that at least one beneficial use is not being supported or is threatened, but a TMDL is not needed. [25] Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

Impaired water bodies can be included in Category 4a if a TMDL has been adopted and approved. The TMDLs in Attachment E to the Order implement the requirements of the TMDLs adopted by the San Diego Water Board, and approved by the State Water Board and USEPA. The water bodies in Attachment E will be included in Category 4a in the Integrated Report and removed from the 303(d) List.

Impaired water bodies can be included in Category 4b if there are *acceptable* "pollution control requirements" required by a local, state or federal authority stringent enough to implement applicable water quality standards within a reasonable period of time (e.g., a compliance date is set). When evaluating whether a particular set of pollution controls are "requirements," the USEPA considers a number of factors, including: (1) the authority (local, state, federal) under which the controls are required and will be implemented with respect to sources contributing to the water quality impairment (examples may include: self-executing state or local regulations, permits, and contracts and grant/funding agreements that require implementation of necessary controls), (2) existing commitments made by the sources and completion or soon to be completed implementation of the controls (including an analysis of the amount of actual implementation that has already occurred), (3) the certainty of dedicated funding for the implementation of the controls, and (4) other relevant factors as determined by USEPA depending on case-specific circumstances.[26]

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[23] 40 CFR 130.7(b)(1)
[24] USEPA, 2005. Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act
[25] Ibid
[26] Ibid

Impaired water bodies can be included in Category 4c if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution. Pollution, as defined by the CWA is "the man-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of water."[27] In other cases, pollution does not result from a pollutant and a TMDL is not required. Examples of circumstances where an impaired segment may be placed in Category 4c include segments impaired solely due to lack of adequate flow, stream channelization, or hydromodification. In these situations, there may be water quality management actions that can address the cause(s) of the impairment, but a TMDL may not be required to implement the actions.

The Water Quality Improvement Plans will require the implementation of pollution controls and water quality management actions (i.e. water quality improvement strategies) which can result in the attainment of water quality standards in water bodies impaired by discharges from the Copermittees' MS4s. The Water Quality Improvement Plans also include requirements that are expected to attain water quality standards in a reasonable period of time. The San Diego Water Board considers the Water Quality Improvement Plans to be a commitment by the Copermittees to develop, plan, budget for, and implement pollution controls that will attain water quality standards in receiving waters in a reasonable period of time, or as soon as possible. The results of the Copermittees' efforts in implementing the Water Quality Improvement Plans can be used to re-evaluate the condition of the impaired water bodies during the next update to the 303(d) List.

After the Copermittees submit the Water Quality Improvement Plans and demonstrate that water quality standards are being attained or will be attained in a reasonable period of time, the San Diego Water Board may re-evaluate the water bodies on the 303(d) List. These water bodies on the 303(d) List may be re-evaluated and placed into Category 4b or Category 4c in the Integrated Report. The water bodies placed in Category 4b or Category 4c in the Integrated Report must show a record that the water bodies are attaining water quality standards or supporting the identified beneficial uses, or will attain water quality standards or support identified beneficial uses in a reasonable period of time, in order for the water bodies to be appropriately removed from the 303(d) List.

[27] CWA section 502(19)

C. Action Levels

Purpose: Provision C includes requirements for the Copermittees to identify and include numeric action levels in the Water Quality Improvement Plan to direct and focus the Copermittees' jurisdictional runoff management program implementation efforts for controlling MS4 discharges to receiving waters.

***Discussion*:** Under Provision C, the numeric action levels required are for non-storm water discharges and storm water discharges. The non-storm water action levels (NALs) are applicable to non-storm water discharges from the Copermittees' MS4s, which can occur year-round. The storm water action levels (SALs) are applicable to storm water discharges from the Copermittees' MS4s, which occur during the rainy season defined as the period between October 1 and April 30.

The action levels required by Provision C are based on the action level requirements that were developed and incorporated into Order Nos. R9-2009-0002 and R9-2010-0016, the Orange County and Riverside County MS4 Permits, respectively. The Fact Sheets for these Orders provide detailed discussions about the development of the numeric NALs and SALs included in this Order.

Order Nos. R9-2009-0002 and R9-2010-0016 required the Copermittees to perform prescribed actions if the NALs or SALs are exceeded. The actions required under Order Nos. R9-2009-0002 and R9-2010-0016 generally included conducting additional monitoring and source investigations when a discharge from the MS4 is observed to exceed one or more NALs and/or SALs.

For this Order, however, the action levels of Provision C are to be used by the Copermittees to prioritize the actions to be implemented as part of the Water Quality Improvement Plan. Monitoring data collected by the Copermittees from MS4 outfalls will be compared with the NALs and SALs. Exceedances of the NALs and SALs will not require the Copermittees to immediately identify sources causing exceedances, but will provide some numeric indicator levels that can give the Copermittees a way to measure the relative severity of a pollutant contributing to receiving water quality impacts.

NALs and SALs must be included in the Water Quality Improvement Plans to be used by the Copermittees in directing and focusing their water quality improvement strategies. The Copermittees are expected to utilize the NALs and SALs to help focus their implementation efforts on addressing pollutants that have the most significant potential or observed impacts to receiving waters. The NALs and SALs will be used as part of the MS4 discharges assessments required under Provision D.4.b. The NALs and SALs may also be used by the Copermittees as the numeric goals to be achieved in MS4 discharges and/or receiving waters as the Water Quality Improvement Plans are implemented.

More specific and detailed discussions of the requirements of Provision C are provided below.

Provision C.1 (Non-storm Water Action Levels) requires the Copermittees to incorporate NALs into the Water Quality Improvement Plan for pollutants and/or constituents that are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions identified in the Water Quality Improvement Plan related to non-storm water discharges from the MS4s. NALs generally must be consistent with the water quality objectives found within the Basin Plan.

The NALs have been included to ensure that the Copermittees are implementing and complying with several requirements of the MS4 permit. The federal CWA requires permits for municipal storm sewer systems to "*effectively prohibit non-storm water discharges into the storm sewers*." The federal NPDES regulations, which were promulgated to implement the CWA requirements for discharges from municipal storm sewers, require a program to address illicit discharges, which are non-storm water discharges. Provision A.1.b prohibits "*[n]on-storm water discharges into MS4s*" unless the non-storm water discharge authorized by a separate NPDES permit. The NALs will be used as part of the illicit discharge detection and elimination program required pursuant to Provision E.2, as well as part of the MS4 discharges assessments required pursuant to Provision D.4.b.

Provision A.1.a prohibits non-storm water discharges from the MS4 from "*causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state.*" In addition, pursuant to Provision A.2.a, non-storm water discharges "*must not cause or contribute to the violation of water quality standards in any receiving waters*."

Ideally, the Copermittees' jurisdictional runoff management programs will eliminate all non-storm water discharges entering the MS4s within their jurisdictions. The complete elimination of non-storm water discharges to the Copermittees' MS4s would be in compliance with the CWA requirements for non-storm water discharges, as well as the prohibitions and limitations of Provisions A.1.a and A.2.a.

The federal regulations, however, also refer to several non-storm water discharge categories that must be addressed as illicit discharges if they are found to be a source of pollutants. The federal regulations thus identify some non-storm water discharges that are not required to be addressed as illicit discharges if they are not a source of pollutants (e.g. non-storm water discharges specified in Provisions E.2.a.(1)-(5)). Thus, these regulations imply that some non-storm water discharges into and from the MS4 may occur even if non-storm water discharges are "effectively" prohibited by the Copermittees.

If the source of a non-storm water discharge is identified as a category of non-storm water specified in Provisions E.2.a.(1)-(5), the NALs can be used to determine the category of non-storm water discharges is a source of pollutants. For other non-storm

water discharges not specified in Provisions E.2.a.(1)-(5), the CWA requires those discharges to be "*effectively"* prohibited by removing the discharge to the MS4 through enforcement of the Copermittees' legal authority established under "*ordinance, order or similar means*" to prohibit illicit discharges to the MS4s.

If there are non-storm water discharges that are not required to be addressed as illicit discharges, those discharges must comply, at a minimum, with the discharge prohibitions and receiving water limitations of Provision A. Thus, the non-storm water discharges from the MS4 must be at levels that will not cause or contribute to a condition of pollution, contamination, or nuisance (Provision A.1.a), and must not cause or contribute to a violation of water quality standards in receiving waters (Provision A.2.a) to be consistent with the discharge prohibitions and receiving water limitations of Provisions A.1.a and A.2.a.

Furthermore, the San Diego Region has predominantly intermittent and ephemeral rivers and streams which vary in flow volume and duration at spatial and temporal scales. For most of these river and stream systems, non-storm water discharges from the MS4 are likely to be the most significant or the only source contributing to surface flows present within the receiving water, especially during the dry season.

Therefore, because of the prohibitions and limitations of Provision A.1.a and A.2.a, and the likelihood that non-storm water discharges from the MS4 are the most significant or only source contributing to surface flows present within the receiving water, NALs generally must be consistent with the water quality objectives found within the Basin Plan. Non-storm water discharges that are meeting the NALs would not be expected to cause or contribute to an exceedance of water quality objectives in receiving waters, which would be consistent with the discharge prohibitions and receiving water limitations of Provisions A.1.a and A.2.a.

Exceedances of the NALs would then provide an indication of the relative severity of a pollutant in non-storm water discharges from the MS4 contributing to potential or observed receiving water quality impacts. The relative severity or significance of a pollutant in non-storm water discharges from the MS4 will provide the Copermittees a valuable source of information that can be used to identify priority water quality conditions within a Watershed Management Area and within each Copermittee's jurisdiction.

Tables C-1 through C-4 under Provision C.1.a specify numeric NALs for several parameters or pollutant constituents for non-storm water discharges from the MS4 to several water body types. The NALs for MS4 discharges given under Provision C.1.a are based on the water quality objectives for inland surface waters in the Basin Plan, and the water quality objectives for ocean waters in the Ocean Plan. The NALs for most of the metals were calculated based on the State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP). The NALs provided in Tables C-1

through C-4 must be included in the Water Quality Improvement Plans required to be developed pursuant to Provision B.

Provision C.1.b requires the Copermittees to identify NALs for pollutants and/or constituents, not specified in Provision C.1.a, which are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions of the Watershed Management Area related to non-storm water discharges from the MS4s. The NALs must be based on the water quality objectives in the Basin Plan. The NALs identified under Provision C.1.b must be included in the Water Quality Improvement Plan.

The San Diego Water Board recognizes that some of the NALs required pursuant to Provisions C.1.a and C.1.b may be exceeded more frequently than not. Thus, Provision C.1.c has been included in the Order to provide the Copermittees the option to develop secondary NALs that are set at levels greater than the levels required pursuant to Provisions C.1.a and C.1.b to further refine the prioritization and assessment of water quality improvement strategies for addressing non-storm water discharges to and from the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and from the MS4.

Provision C.2 (Storm Water Action Levels) requires the Copermittees to incorporate SALs into the Water Quality Improvement Plan for pollutants and/or constituents causing or contributing, or may be causing or contributing, to the highest priority water quality conditions identified in the Water Quality Improvement Plan related to storm water discharges from the MS4s.

The SALs have been included to ensure that the Copermittees are implementing and complying with several requirements of the MS4 permit. Provision A.1.a prohibits storm water discharges from the MS4 from "*causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state.*" In addition, pursuant to Provision A.2.a, storm water discharges "*must not cause or contribute to the violation of water quality standards in any receiving waters*."

Provision A.3.a, however, implicitly acknowledges that compliance with Provisions A.1.a and A.2.a cannot be achieved immediately for discharges of storm water from the MS4 by applying the MEP standard. Thus, Provision A.4 requires the Copermittees to implement an iterative approach to demonstrate that MEP is being achieved. This approach is supported by USEPA.

The federal CWA requires permits for municipal storm sewer systems to "*require controls to reduce the discharge of pollutants [in storm water] to the maximum extent practicable*, *including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants.*" MEP is an ever-evolving, flexible, and advancing concept. As knowledge about controlling storm water runoff

and discharges evolves, so does the knowledge which constitutes MEP. Reducing the discharge of storm water pollutants from the MS4 to the MEP requires the Copermittees to assess their jurisdictional runoff management programs and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP. The SALs provide the Copermittees measureable goals that may be used to demonstrate the achievement of MEP for reducing pollutants in storm water discharges from the MS4. The SALs will be used as part of the MS4 discharges assessments required under Provision D.4.a.

In June of 2006, the State Water Board's Blue Ribbon Storm Water Panel released its report titled "*The Feasibility of Numerical Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities*." In the recommendations, the Blue Ribbon panel proposed storm water effluent limitations which are computed using statistical based population approaches. The SALs specified in Table C-5 under Provision C.2.a were developed from a regional subset of nationwide Phase I MS4 data by using USEPA Rain Zone 6 (arid west) data.[28] Additionally, utilization of regional data is appropriate due to the addition of data into the nationwide Phase I MS4 monitoring dataset in February 2008. This additional data increased the number of USEPA Rain Zone 6 samples to more than 400, and included additional monitoring events within Southern California.

Utilizing data from USEPA Rain Zone 6 resulted in SALs which closely reflect the environmental conditions experienced in the San Diego Region. The localized subset of data includes sampling events from multiple Southern California locations including Orange, San Diego, Riverside, Los Angeles, and San Bernardino Counties. The dataset includes samples taken from highly built-out impervious areas and from storm events representative of Southern California conditions.

The SALs for cadmium, copper, lead and zinc require the measurement of hardness and to provide more specificity in the assessment of samples with SALs for total metal concentrations. While USEPA Rain Zone 6 data include a large sample size for concentrations of total metals, the impact the concentration will have on receiving waters will vary with receiving water hardness. Since it is the goal of the SALs, through the iterative process and MEP standard, to have MS4 storm water discharges meet all applicable water quality objectives, the hardness of the receiving water should be used when assessing the total metal concentration of a sample.

Thus, when there is an exceedance of a SAL for a metal, the Copermittee must determine if that exceedance is above the existing applicable water quality objectives based upon the hardness of the receiving water. The water quality objectives Copermittees must use to assess total metal SAL exceedances are the California Toxic Rule (CTR) and USEPA National Recommended Water Quality Criteria for Freshwater Aquatic Life 1 hour maximum concentrations. The 1 hour maximum

[28] Data used to develop SAL were obtained from http://rpitt.eng.ua.edu/Research/ms4/mainms4.shtml

concentration is to be used for comparison since it is expected to most replicate the impacts to waters of the State from the first flush following a precipitation event.

The statistically calculated SALs given in Table C-5 are at levels greater than the water quality objectives in the Basin Plan or Ocean Plan. Because the objective of the CWA is to "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*", meaning eventually pollutants in storm water discharges must be reduced to a level that cannot cause or contribute to an exceedance of water quality objectives in receiving waters, over time the SALs are expected to be reduced to a level that is based on the water quality objectives rather than statistical calculations. The San Diego Water Board will review the SALs as more data for discharges of storm water from the MS4s are collected, and revise them as conditions improve and the MEP standard advances. For the Water Quality Improvement Plans required under this Order, the SALs identified under Provision C.2.a must be included.

Provision C.2.b requires the Copermittees to identify SALs for pollutants and/or constituents, not specified in Provision C.2.a, which are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions of the Watershed Management Area related to storm water discharges from the MS4s. The SALs identified under Provision C.2.b must be included in the Water Quality Improvement Plan.

The San Diego Water Board recognizes that some of the SALs required pursuant to Provisions C.2.a and C.2.b may be exceeded more frequently than not. Thus, Provision C.2.c has been included in the Order to provide the Copermittees the option to develop secondary SALs that are set at levels greater than the levels required pursuant to Provisions C.2.a and C.2.b to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s.

D. Monitoring and Assessment Program Requirements

Purpose: Provision D includes minimum monitoring and assessment requirements that must be developed and implemented by the Copermittees as part of the Water Quality Improvement Plans. Implementation of the monitoring and assessment requirements of Provision D will allow the Copermittees to demonstrate that the requirements of the CWA to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP are being achieved. Implementation of the monitoring and assessment requirements of Provision D will also allow the Copermittees and the San Diego Water Board to track improvements to the water quality in the San Diego Region. The monitoring and assessment program requirements are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order.

***Discussion*:** The San Diego Water Board recognized that changes to the monitoring and assessment requirements of the Fourth Term Permit were necessary to improve the usefulness and usability of monitoring data collected by the Copermittees to support their jurisdictional storm water programs more efficiently and with increased effectiveness. The data collected are needed to better inform the Copermittees' understanding of the physical, chemical, and biological condition of the receiving waters and the quality of the MS4 discharges. The monitoring program needs to provide opportunities for the Copermittees to integrate regional monitoring efforts into municipal storm water monitoring requirements to provide a cost-effective approach to monitoring and avoid duplication of efforts.

The requirements in Provision D were largely recommended by the Copermittees as an outcome of the San Diego Water Boards Focused Meeting process. The monitoring and assessment program requirements now require collection of more specific information necessary for each Copermittee to adapt its jurisdictional runoff management program in such a way that focuses resources on a watershed's highest priority water quality conditions. The monitoring and assessment program will require the Copermittees to collect data that can be utilized to answer both watershed level management questions (e.g. Are the chemical, physical, and biological conditions of a receiving water protective, or likely protective of beneficial uses?), and specific jurisdictional runoff management program activity questions (e.g. Are the water quality improvement strategies of the jurisdictional program effectively eliminating non-storm water discharges to the MS4?).

The monitoring data collected and assessment information that will be reported to the San Diego Water Board are necessary to determine if the Copermittees are complying with the prohibitions and limitations of Provision A. The required monitoring and assessments that must be reported to the San Diego Water Board will be utilized for three purposes:

(1) Inform the Copermittees, San Diego Water Board, and the public on the progress of the Copermittees' efforts to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP;

(2) Inform the Copermittees, San Diego Water Board, and the public on the condition of water bodies receiving discharges from the Copermittees' MS4, and the progress of the Copermittees' water quality improvement implementation efforts toward improving the receiving water quality; and

(3) Inform the Copermittees, the San Diego Water Board, and the public on the effectiveness of the Water Quality Improvement Plan toward achieving (1) and (2).

The monitoring and assessment information reported pursuant to Provision F is also expected to be key to the iterative approach and adaptive management process required under Provision A.4 and implemented through the Water Quality Improvement Plan required under Provision B. As required by Provision A.4, the iterative approach and adaptive management process is required if the Copermittees cannot meet the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c, and/or A.2.a under the present conditions.

Provision D provides the minimum monitoring and assessment requirements that must be included in each Water Quality Improvement Plan to be developed and implemented by the Copermittees. The Copermittees, however, are not limited to the requirements of Provision D and may include additional methods to track progress toward improving water quality in a Watershed Management Area.

More specific and detailed discussions of the requirements of Provision D are provided below.

<u>Provision D.1 (Receiving Water Monitoring Requirements)</u> specifies the minimum receiving water monitoring that the Copermittees must conduct within the Watershed Management Area and include as part of the Water Quality Improvement Plan.

Provision D.1 establishes minimum monitoring requirements that must be conducted by the Copermittees within each Watershed Management Area. Provision D.1 requires the Copermittees to collect and develop the data and information necessary to determine potential impacts to the beneficial uses in the receiving waters due to discharges from the MS4s. The monitoring required under Provision D.1 will also provide the data that will allow the Copermittees to gauge the effectiveness and progress of its Water Quality Improvement Plan implementation efforts toward improving the quality of receiving waters.

The receiving water monitoring requirements of Provision D.1 are focused primarily on monitoring the conditions and response of the receiving waters to the Copermittees'

collective implementation efforts to reduce receiving water impacts that may be caused by the discharges from the MS4s. The preference of the San Diego Water Board is for the Copermittees to spend their resources achieving tangible and observable improvements in receiving water conditions instead of collecting samples and analyzing data that has consistently indicated that receiving water conditions are degraded and require improvement. In general, the ability to measure potential improvements in receiving water conditions due to any actions implemented by the Copermittees as part of the Water Quality Improvement Plan may require several years before a response can be observed. Thus, the frequency of collecting receiving water monitoring data has been kept to a minimum.

During the transitional period between adoption of this Order and San Diego Water Board acceptance of a Water Quality Improvement Plan, the Copermittees must conduct receiving water monitoring in accordance with Provision D.1.a. This approach to collecting receiving water data is different from what was required in the Fourth Term Permits, but one that truly embraces the concept of an integrated, cost-effective, streamlined receiving water monitoring approach.

Provision D.1.a requires Copermittees to continue performing the receiving water monitoring programs required in Order Nos. R-2007-0001, R9-2009-002, and R9-2010-0016; plus participation in: hydromodification management plan monitoring approved by the San Diego Water Board, monitoring plans as part of load reduction plans (either Bacteria Load Reduction Plans or Comprehensive Load Reduction Plans) for TMDLs in Attachment E of the Order, Storm Water Monitoring Coalition Regional Monitoring, Southern California Bight Regional Monitoring, Sediment Quality Monitoring, and ASBS Monitoring as applicable to a Watershed Management Area.

Provision D.1.a also provides an opportunity for the Copermittees to use third party data to meet receiving water monitoring requirements where feasible. Allowing the Copermittees to use the data currently collected through its participation in existing regional receiving water programs and that of third parties provides an efficiency of resources in obtaining the data necessary to inform the Copermittees and the San Diego Water Board about the physical, chemical, and biological conditions of the receiving waters, which can also help to focus the receiving water monitoring during the implementation of the Water Quality Improvement Plan. Once a Water Quality Improvement Plan is developed for a Watershed Management Area in compliance with Provision B of this Order, the transitional period is over and Copermittees are required to conduct receiving water monitoring according to the requirements of Provisions D.1.b-e.

Provision D.1.b requires each Copermittee to identify at least one long term receiving water monitoring station to be representative of receiving water quality within each Watershed Management Area. Long term receiving water monitoring stations can be located at any existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees. The requirements under Provision D.1.b. are

consistent with 40 CFR 122.26(d)(2)(iii)(D), which specifies that a "*monitoring program for representative data collection for the term of the permit*" may include "*instream locations.*" For each Watershed Management Area, at least one long term watershed monitoring station is required to be established and monitored. The Copermittees may choose to establish additional long term monitoring stations where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

Provision D.1.b. requires the Copermittees to locate the long term receiving water monitoring station at one of these existing receiving water monitoring stations to provide the Copermittees an opportunity to experience monitoring cost savings while continuing to collect the necessary data to assess the status and trends of receiving water quality conditions in 1) coastal water, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under both dry weather and wet weather conditions. Ideally these stations will continue to be monitored as part of the receiving water monitoring for each Watershed Management Area to maintain a consistent set of locations and a period of data that can be built upon with the monitoring required under this Order.

The receiving water monitoring requirements are separated into monitoring required during dry weather conditions pursuant to Provision D.1.c, and wet weather conditions pursuant to Provision D.1.d.

At each long term monitoring station the Copermittees must conduct at least three dry weather monitoring events as required pursuant to Provision D.1.c and at least three wet weather monitoring events as required pursuant to Provision D.1.d per permit term. Provisions D.1.c and D.1.d require the Copermittees to monitor priority water quality conditions identified in the Water Quality Improvement Plan, constituents listed as causing impairment of receiving waters in the Watershed Management Area, applicable NALs, toxicity, constituents listed in Tables D-2 and D-3, and constituents for implementation plans (e.g. Bacteria Load Reduction Plans and Comprehensive Load Reduction Plans). Required toxicity monitoring was changed to reflect an updated understanding of the unique challenges associated with sampling storm water for toxicity. Copermittees are required to sample storm water for toxicity during each dry weather and each wet weather event pursuant to Provision D.1.c.(4) and D.1.d.(4). Required toxicity monitoring is now consistent with the State Water Resources Control Board Policy for Toxicity Assessment and Control (Draft June 2012) and recently adopted MS4 permits for Caltrans and Los Angeles Water Board. Receiving water monitoring efforts in this Order have been streamlined to redirect resources to monitoring efforts that better support pollutant reduction solutions with an increasing emphasis on MS4 outfall monitoring, source identification and source abatement activities.

In addition to the receiving water monitoring requirements under Provisions D.1.b-d, Provision D.1.e requires the Copermittees participate in and/or conduct other types of receiving water monitoring. As recommended and requested by the Copermittees, Provision D.1.e.(1) requires the Copermittees to participate in existing regional monitoring, as applicable to each Watershed Management Area. Existing regional

monitoring includes monitoring conducted by the Storm Water Monitoring Coalition and for the Southern California Bight. Participation in and use of monitoring data collected from these existing regional water quality monitoring programs provide the Copermittees a greater opportunity for efficiency in the use of their resources to manage their storm water programs and those controllable discharges under their authority. Provision D.1.e.(1)(c) requires the south Orange County MS4 Copermittees to participate in "unified regional beach water quality monitoring." This monitoring replaces requirements to conduct "core monitoring" of beach water quality, as provided for in Appendix III of the 2012 California Ocean Plan.

Several different public agencies currently conduct routine, ongoing beach water quality monitoring in south Orange County in accordance with several different sets of requirements. The monitoring programs implemented to meet those requirements overlap temporally and spatially. These monitoring programs are partially but not fully integrated. In November 2010, the State Water Board adopted Resolution No. 2010-0053, which directed regional water boards to work with dischargers to modify beach water quality monitoring programs required by regional board-issued permits in order to eliminate redundancies and incorporate beach water quality monitoring required by beach water quality statutes, where appropriate.

In April 2012, the San Diego Water Board requested that its staff review beach water quality monitoring conducted in south Orange County. To assist in responding to that request, staff of the Board convened a workgroup that included representatives of the three public agencies that currently conduct almost all of the routine, ongoing beach water quality monitoring in south Orange County, i.e., South Orange County Wastewater Authority (SOCWA), Orange County Public Works, and Orange County Health Care Agency (OCHCA). The workgroup also included other interested parties, including representatives of the Sierra Club and Surfrider Foundation. In December 2012, the San Diego Water Board adopted Resolution No. R9-2012-0069, which endorsed the San Diego Water Board staff report entitled "A Framework for Monitoring and Assessment in the San Diego Region," dated November 2012.

The unified program is consistent with and will meet or exceed the minimum requirements for beach water quality monitoring and related public notification and reporting established by State law, including the California Ocean Plan. The unified program is consistent with State Water Board Resolution No. 2010-0053. The unified program is also consistent with and will help implement, "A Framework for Monitoring and Assessment in the San Diego Region," which emphasizes the need for question-driven, beneficial use-oriented monitoring and assessment. The primary purpose of the unified program will be to answer the question "Does beach water quality meet standards for the beneficial use of water contact recreation?"

The unified program is intended to be protective; it will help protect the health of swimmers, surfers, and others who use south Orange County beach waters for water contact recreational activities. The unified program is also intended to be reasonable; it will eliminate duplicative monitoring and will include triggers for public notification

and additional sampling at all sampling stations year-round. The unified program is intended to be equitable; responsibility for implementation of the unified program will be shared and the responsible agencies will jointly make arrangements to implement the program and will have the flexibility to jointly make short and/or long term changes in those arrangements.

The San Diego Water Board Executive Officer issued a written directive on December 5, 2014, pursuant to California Water Code section 13383, for SOCWA and the south Orange County MS4 Copermittees to implement the unified program in cooperation with OCHCA. The Executive Officer may make revisions to the unified program, provided that the unified program, as revised, continues to be consistent with and meet the requirements of State law, including the California Ocean Plan, for beach water quality monitoring and related public notification and reporting. Following a thirty day public comment period, and subject to a request for a hearing before the San Diego Water Board, any such revision shall take effect as specified in a written directive issued by the Executive Officer pursuant to California Water Code sections 13383. The program and any Executive Officer issued revisions to the program are subject to California Water Code section 13320 right of review from the date of issuance.

The unified program will supersede the existing routine, ongoing, beach water quality monitoring programs in south Orange County that are conducted in accordance with the existing requirements of the NPDES permits for discharges from the SOCWA ocean outfalls and the south Orange County MS4s. The requirement to participate in "regional monitoring" of beach water quality replaces requirements to conduct "core monitoring" of beach water quality, as provided for in Appendix III of the 2012 California Ocean Plan.

The State Water Resources Control Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part 1 Sediment Quality which became effective August 25, 2009 (Sediment Quality Monitoring Policy). Provision D.1.e.(2) requires any Copermittees with MS4 discharges to an enclosed bay or estuary to monitoring the sediments in the enclosed bay or estuary receiving water in accordance with the sediment quality monitoring procedures as prescribed in the Sediment Quality Monitoring Policy.

The State Water Board adopted Resolution No. 2012-0012 which approved exceptions to the California Ocean Plan for selected discharges into Areas of Special Biological Significance (ASBS), including special protections for beneficial uses. State Board Resolution No. 2012-0012 became effective on March 20, 2012, and Attachment B to the Resolution established limitations on point source storm water discharges to ASBS. Copermittees with MS4s that discharge to an ASBS must monitor its discharge to assure compliance with State Board Resolution No. 2012-0012 as required pursuant to Provision D.1.e.(3).

The San Diego Water Board is currently developing a regional monitoring strategy to assess the conditions of receiving waters in the San Diego Region. The monitoring requirements of Provision D.1 are expected to be incorporated or serve as a foundation of this regional monitoring strategy, but may require some modifications. When the San Diego Water Board develops an alternative regional monitoring strategy, the Copermittees will be required to participate in the development and implementation of the alternative regional monitoring program pursuant to Provision D.1.f.

Provision D.2 (MS4 Outfall Discharge Monitoring Requirements) specifies the minimum MS4 outfall discharge monitoring requirements that the Copermittees must incorporate and implement as part of the Water Quality Improvement Plan.

The dry weather MS4 outfall discharge monitoring requirements are included under Provisions D.2.a.(2) and D.2.b. The dry weather MS4 outfall discharge monitoring requirements are part of the "*program, including a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer*" required by 40 CFR 122.26(d)(2)(iv)(B), which is expected to achieve compliance with the CWA section 402(p)(3)(B)(ii) statutory requirement for municipal storm water permits to require the Copermittees to "*effectively prohibit non-storm water discharges into the storm sewers*." The dry weather MS4 outfall discharge monitoring data collection requirements are based on requirements under 40 CFR 122.26(d)(1)(iv)(D) and 122.26(d)(2)(iv)(B)(3).

The dry weather MS4 outfall discharge monitoring requirements are designed to provide wide spatial and temporal coverage of each jurisdiction to better understand the extent and magnitude of non-storm water discharges to receiving waters, and make a distinction between persistent and transient non-storm water flows. This information is expected to allow each Copermittee to focus its resources on eliminating and controlling the highest priority threats to receiving water quality, as well as integrating other elements of the storm water programs (e.g. complaint call response) and third party data to efficiently and effectively assist in efforts to eliminate non-storm water discharges.

The dry weather MS4 outfall discharge monitoring requirements of Provision D.2.a.(2) and D.2.b are separated into monitoring required before and after the San Diego Water Board accepts the Copermittees' Water Quality Improvement Plan. Outfall monitoring conducted prior to acceptance of the Water Quality Improvement Plan is referred to in the Order as Transitional MS4 Outfall Discharge Monitoring. Provision D.2.a.(2) includes the transitional dry weather MS4 outfall discharge monitoring requirements.

The requirements under Provision D.2.a.(2) are based on the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B), which include the requirements for a monitoring program to identify, detect, and eliminate illicit connections and illegal

discharges to the MS4s. The federal regulations (40 CFR 122.26(d)(1)(iv)(D)) require the monitoring program to include "*a field screening analysis for illicit connections and illegal dumping [that]…[a]t a minimum, include[s] a narrative description, for either each field screening point or major outfall, of visual observations made during dry weather periods.*" The federal regulations (40 CFR 122.26(d)(1)(v)(B)) require the monitoring program to include "*inspection procedures and methods for detecting and preventing illicit discharges, and describe areas where this program has been implemented.*" Furthermore, the monitoring program is required by federal regulations (40 CFR 122.26(d)(2)(iv)(B)) to include "*a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer.*"

Dry weather transitional MS4 outfall discharge monitoring requires each Copermittee to field screen (inspect) its major MS4 outfalls to classify the MS4 outfall locations as having persistent dry weather flows, transient dry weather flows, or no dry weather flows. To account for the variance in size of the 39 jurisdictions covered under this Order, the Copermittees recommended a tiered approach to the number of major MS4 outfalls that must be inspected. Provision D.2.a.(2)(a) provides a tiered approach to the number of major MS4 outfalls that must be visually inspected per jurisdiction as well as a minimum frequency each Copermittee must inspect each major MS4 outfall per year. This tiered approach is based on the total number of major MS4 outfalls within a Copermittees jurisdiction within each Watershed Management Area.

Based on the field screening, each Copermittee is required to make a determination whether any observed flowing, pooled, or ponded waters are transient or persistent flows. Based on this field screening information, other jurisdictional program information, and third party information, each Copermittee is required to prioritize the MS4 outfalls within its jurisdiction for follow up investigation and elimination of the non-storm water discharge, as part of its illicit discharge detection and elimination program required pursuant to Provision E.2. In accordance with the requirements of Provision E.2, each Copermittee is required to immediately investigate obvious illicit discharges (e.g. outfall discharges with unusual color, unusual odor, or high flows).

This approach allows a Copermittee to use all of its resources, as well as leverage resources and information provided by third parties, to effectively eliminate non-storm water discharges from its MS4 outfalls. If the source of the non-storm water discharge cannot be immediately eliminated, the Copermittee uses the persistent flow or transient flow classification along with other programmatic implementation data to prioritize the MS4 outfalls for future investigation. In accordance with the adaptive management approach deployed throughout this Order, Provision D.2.a.(2)(c) requires each Copermittee to update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow. The requirement of Provision D.2.a.(2)(c) assures that each Copermittee is collecting data that can be used to demonstrate compliance with the CWA requirement that each Copermittee must implement a program to "*effectively*

prohibit non-storm water discharges into the [MS4]" and with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

Provision D.2.b describes the dry weather MS4 outfall discharge monitoring required to be incorporated and implemented as part of the Water Quality Improvement Plan. Dry weather MS4 outfall discharge monitoring must be performed by each Copermittee to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. The emphasis of the dry weather MS4 outfall discharge monitoring required pursuant to Provision D.2.b is consistent with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

Provision D.2.b.(1) requires each Copermittee to continue field screening its major MS4 outfalls and identifying those with persistent flows and transient flows, as conducted during the transitional period (i.e. before the Water Quality Improvement Plan was developed). However, each Copermittee now has the flexibility to adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of non-storm water persistent flow discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan. In order to ensure a minimum number of outfalls are inspected, Provision D.2.b.(1) requires the number of visual inspections be equal to the number of visual inspections required in the tiered inspection program pursuant to Provision D.2.a.(2)(a).

Provision D.2.b.(2)(b) requires each Copermittee to monitor a minimum of 5 major MS4 outfalls with persistent flows identified as the highest priorities within a Copermittee's jurisdiction, within each Watershed Management Area. In other words, Copermittees located in more than one Watershed Management Area must identify at least 5 major MS4 outfalls with persistent flows in its jurisdiction in each Watershed Management Area. If a Copermittee is located in more than one Watershed Management Area, and they have less than 5 major MS4 outfalls with persistent flows per jurisdictional area per Watershed Management Area, all of the major MS4 outfalls must be identified as high priority dry weather persistent flow MS4 outfalls. The Copermittees identified as Responsible Copermittees by a TMDL in Attachment E of the Order may need to monitor more than 5 dry weather major MS4 outfall locations to determine compliance with the requirements of the TMDL(s).

Monitoring must occur at the highest priority outfall locations at least semi-annually until the non-storm water discharges have been eliminated for three consecutive dry weather monitoring events; identified to be authorized by a separate NPDES Permit; or reprioritized to a lower priority. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized MS4 major outfall in the Copermittee's jurisdiction within the Watershed Management Area, unless there are no remaining qualifying major MS4 outfalls within the Copermittees jurisdiction. The Copermittees must continually update their dry weather persistent

flow MS4 outfall discharge monitoring locations with the next highest priority non-storm water flow that have yet to be eliminated until all persistent and transient flows are eliminated or its threat reduced.

Non-storm water persistent flow MS4 outfall discharge monitoring data collected during each semi-annual monitoring event, must be collected and analyzed according to the requirements of Provision D.2.b.(2)(b)–(e). These monitoring requirements are consistent with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

The wet weather MS4 outfall discharge monitoring requirements are included under Provisions D.2.a.(3) and D.2.c. The wet weather MS4 outfall discharge monitoring requirements are necessary for the Copermittees to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable, using management practices, control techniques and system, design and engineering methods, and such other provisions which are appropriate*" required by 40CFR 122.26(d)(2)(iv), which is expected to achieve compliance with the CWA section 402(p)(3)(B)(iii) statutory requirement for municipal storm water permits to require "*controls to reduce the discharge of pollutants [in storm water] to the maximum extent practicable*." The wet weather MS4 outfall discharge monitoring data collection requirements are based on requirements under 40 CFR 122.26(d)(2)(iii), 122.26(d)(2)(iii)(A) and 122.26(d)(2)(iii)(A)(1)-(4), and 40 CFR 122.21(g)(7)(i)-(ii).

The wet weather MS4 outfall discharge monitoring requirements of Provision D.2.a.(3) and D.2.c are separated into monitoring required before and after the San Diego Water Board accepts the Copermittees' Water Quality Improvement Plan. Outfall monitoring conducted prior to acceptance of the Water Quality Improvement Plan is referred to in the Order as Transitional MS4 Outfall Discharge Monitoring. Provision D.2.a.(3) includes the transitional wet weather MS4 outfall discharge monitoring requirements.

Until the wet weather MS4 outfall discharge monitoring requirements of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board, the Copermittees must comply with the requirements of transitional wet weather MS4 outfall monitoring requirements pursuant to Provision D.2.a.(3). Provision D.2.a.(3) requires the Copermittees in each Watershed Management Area to sample, at least five of the major MS4 outfalls inventoried pursuant to Provision D.2.a.(1) once per wet season for the monitoring data required to be collected pursuant to Provision D.2.a.(3)(c)-(e). Provision D.2.a.(3) further requires at least one major MS4 outfall monitoring station be located in each Copermittee's jurisdiction within the Watershed Management Area.

At a minimum, the five sampling locations chosen must be representative of storm water discharges from residential, commercial, industrial, and typical mixed-use land uses present within a Watershed Management Area. The San Diego Water Board expects the Copermittees to extrapolate from these data to similar land uses

throughout the Watershed Management Area to better inform the Water Quality Improvement Plan development process by prioritizing drainages for implementation of storm water control efforts required pursuant to Provision E.

Provision D.2.c describes the wet weather MS4 outfall discharge monitoring required to be included and implemented as part of the Water Quality Improvement Plan. Provision D.2.c provides the Copermittees the flexibility to adjust the wet weather MS4 outfall discharge monitoring locations and frequencies in the Watershed Management Area, as needed, to identify sources of pollutants in storm water discharges from MS4s in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan.

Although Provision D.2.c.(1) allows the Copermittees to adaptively manage the wet weather MS4 outfall discharge monitoring locations and frequencies, the provision requires a minimum of at least five wet weather outfall stations to be monitored. Provision D.2.c.(2) further allows the Copermittees to modify the monitoring frequency at each wet weather MS4 outfall station to meet the goals of the Water Quality Improvement Plan as long as the monitoring frequency occurs at least once per year and is at an appropriate frequency to identify sources of pollutants in storm water discharges, guide pollutant source identification efforts, or determine compliance with the requirements of the applicable TMDLs in Attachment E to the Order.

The wet weather MS4 outfall discharge monitoring requirements of Provisions D.2.c.(3) and D.2.c.(4) are the same as the transitional wet weather MS4 outfall discharge monitoring. In contrast, the requirements of Provision D.2.c.(5) are focused on collecting analytical data specific to the highest priority water quality conditions in the Watershed Management Area identified in the Water Quality Improvement Plan. The wet weather MS4 outfall discharge monitoring data collection requirements are consistent with the requirements under 40 CFR 122.26(d)(2)(iii), 122.26(d)(2)(iii)(A) and 122.26(d)(2)(iii)(A)(1)-(4), and 40 CFR 122.21(g)(7)(i)-(ii).

<u>Provision D.3 (Special Studies)</u> requires the Copermittees to develop special studies that will be conducted for each Watershed Management Area and the entire San Diego Region. Data collected pursuant to Provision D.3 is to be used by the Copermittees to improve the effectiveness of the strategies implemented by the jurisdictional runoff management programs toward achieving the numeric goals identified in the Water Quality Improvement Plans and ultimately achieve compliance with the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c, and A.2.a, which is consistent with the requirements of Provision A.4.

Special studies are often necessary to fill data gaps or provide more refined information that allow the Copermittees to better manage the generation or elimination of pollutants and discharges to and from the MS4. In the Fourth Term Permits, the Copermittees have been required to implement special studies as directed by the San Diego Water Board. The special studies required by this Order provide the Copermittees more flexibility to identify and implement special studies that will be most

useful to improving the effectiveness of their jurisdictional runoff management programs.

Provision D.3.a.(1) requires the Copermittees to develop and conduct at least two special studies per Watershed Management Area, to be determined by the Copermittees. One of the two special studies may be accomplished through participation in a Regional Special Study required under Provision D.3.a.(2). The requirements provide the Copermittees great latitude in identifying and developing the special studies. Watershed Management Area special studies are required, at a minimum, to: (a) relate in some way to the highest water quality priorities identified by the Copermittees in the Water Quality Improvement Plan, (b) be conducted within the Watershed Management Area, and (c) include some form of participation (e.g. contribution of funds, personnel services, project management) by all the responsible Copermittees within the Watershed Management Area.

Examples of Watershed Management Area special studies might include, but are not limited to: (1) focused pollutant source identification studies, (2) BMP effectiveness and/or comparison studies, (3) pilot tests for new or emerging pollutant control methods, (4) receiving water pollutant or stressor source identification and/or mitigation studies, or (5) pollutant fate and transport studies. The Watershed Management Area special studies are expected to provide data that can be utilized by the Copermittees to improve the Water Quality Improvement Plan or implementation of the Copermittees' jurisdictional runoff management programs to address the highest priority water quality conditions.

Provision D.3.a.(2) requires the Copermittees to develop at least one special study that will be conducted for the entire San Diego region. The regional special study is expected to provide data that can be utilized by the Copermittees to improve the Water Quality Improvement Plan or implementation of the Copermittees' jurisdictional runoff management programs to identify or address regional water quality concerns and priorities.

An example of a regional special study would be to develop and establish allowable exceedance frequencies of the bacteria water quality objectives for several types of water bodies, during different wet and dry weather conditions the San Diego region. The special study would be related to bacteria, which is a priority for the San Diego region due to the adoption of "*Bacteria TMDL Project I – Beaches and Creeks in the San Diego Region*." The study results could be used to inform the Copermittees and the San Diego Water Board about the indictor bacteria water quality objective exceedance frequencies that occur in natural or reference watersheds.

<u>Provision D.4 (Assessment Requirements)</u> specifies the assessments that the Copermittees are required to perform, based on the monitoring data collected, and will be reported as part of the Annual Report for the Water Quality Improvement Plan implementation. Provision D.4 requires the Copermittees assess the progress of the

water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c, and A.2.a.

Provision D.4 specifies the assessments that Copermittees must perform for each Watershed Management Area to assess the effectiveness of each Copermittee's jurisdictional runoff management program and the Water Quality Improvement Plan. The effectiveness of each Copermittee's jurisdictional runoff management program and Water Quality Improvement Plan is measured through these types of assessments: (a) Receiving Waters Assessments (b) MS4 Outfall Discharges Assessments, (c) Special Studies Assessments, and (d) Integrated Assessment of Water Quality Improvement Plan.

Provision D.4.a requires the Copermittees to assess the status of receiving water conditions annually during the transitional monitoring period (during development of the Water Quality Improvement Plan) and after acceptance of the Water Quality Improvement Plan. The monitoring data collected pursuant to Provision D.1 will be evaluated, among other information, to assess the condition of a Watershed Management Area's streams, coastal waters, enclosed bays, harbors, estuaries, and lagoons. The focus of the receiving waters assessments is to measure progress toward the objective of the CWA to "*restore and maintain the chemical, physical, and biological integrity of the Nation's waters*" as the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program are implemented within a Watershed Management Area. Provision D.4.a is consistent with 40 CFR 122.42(c)(7) which requires the Copermittees to annually report the *"[i]dentification of water quality improvements or degradation."*

Provision D.4.b includes the MS4 outfall discharges assessment requirements. The focus of MS4 outfall discharges assessments is to determine if the Copermittees' are implementing programs that comply with the requirements of the CWA for MS4 permits to "*effectively prohibit non-stormwater discharges into the storm sewers*" and "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable.*" The monitoring data collected pursuant to Provisions D.2 will be evaluated, among other information, to assess the effectiveness of the transitional MS4 outfall field screening monitoring, the implementation of the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program. The MS4 outfall discharge assessments consist of Non-Storm Water Discharges Reduction Assessments and Storm Water Pollutant Discharges Reduction Assessments.

The Non-Storm Water Discharges Reduction Assessments are how each Copermittee will demonstrate that its jurisdictional runoff management program implementation efforts are achieving the CWA requirement to "*effectively prohibit non-stormwater discharges into the storm sewers.*" Provision D.4.b.(1) requires each Copermittee to assess and report on its illicit discharge detection and elimination program required pursuant to Provision E.2 to reduce and effectively prohibit non-storm water and illicit discharges into the MS4 within its jurisdiction. The Non-Storm Water Discharges

Reduction Assessments include specific assessment requirements applicable to each Copermittee.

As each Copermittee collects and analyzes the data collected pursuant to dry weather MS4 outfall discharges monitoring requirements of Provisions D.2.a.(2) and D.2.b, Provision D.4.b.(1) requires each Copermittee to assess the progress, assess the effectiveness of its current actions, and identify modifications necessary to increase the effectiveness of its actions toward reducing and eliminating non-storm water and illicit discharges to its MS4. The findings from these assessments are expected to be utilized by the Copermittee as part of its procedures to prioritize the non-storm water discharges that will be addressed by its Illicit Discharge Detection and Elimination program required pursuant to Provision E.2.

The assessment requirements of Provision D.4.a.(1) are consistent with 40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(3) which require "*procedures…to investigate portions of the separate storm sewer system that, <u>based on the results of the field screen, or other appropriate information</u> [emphasis added], indicate a reasonable potential of contain illicit discharges or other sources of non-storm water*" as part of a "*program…to detect and remove…illicit discharges and improper disposal into the storm sewer.*" The assessment requirements of Provision D.4.a.(1) are also consistent with 40 CFR122.42(c)(1) requires the Copermittees to annually report the "*status of implementing the components of the storm water management program that are established as permit conditions.*"

The Storm Water Pollutant Discharges Reduction Assessment is how the Copermittees in each Watershed Management Area will demonstrate that their jurisdictional runoff management program implementation efforts are achieving the CWA requirement to "*reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable*." Provision D.4.b.(2) requires the Copermittees in each Watershed Management Area to assess and report the progress of the Copermittees' efforts to reduce pollutants in storm water discharges from the MS4s to the MEP. The Storm Water Pollutant Discharges Reduction Assessments include specific assessment requirements during both the transitional monitoring period and after acceptance of the Water Quality Improvement Plan applicable to the Watershed Management Area and each Copermittee.

As the Copermittees collect and analyze the data collected pursuant to wet weather MS4 outfall discharges monitoring requirements of Provisions D.2.a.(3) and D.2.c, Provision D.4.b.(2) requires the Copermittees to assess runoff conditions during the transitional period, and the progress of the Water Quality Improvement Plan strategies toward reducing pollutants in storm water from the MS4 to the MEP. The findings from these assessments are expected to be utilized by the Copermittees to identify any modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify sources of pollutants in storm water discharges from the MS4s, as well as focus, modify, and improve the water quality improvement

strategies implemented by each Copermittee within its jurisdiction to reduce pollutants in storm water discharges to the MEP.

The assessment requirements of Provision D.4.b.(2) are consistent with 40 CFR 122.26(d)(2)(iii)(B) which requires "*[e]stimates of the annual pollutant load of the cumulative discharges to waters of the United States from all identified municipal outfalls…during a storm event…accompanied by a description of the procedures for estimating constituent loads and concentrations, including any modeling, data analysis, and calculation methods.*" The assessment requirements of Provision D.4.a.(2) are consistent with 40 CFR 122.26(d)(2)(v) which requires that each Copermittee assesses the *"estimated reductions in loadings of pollutants from discharges of municipal storm sewer constituents from municipal storm sewer systems expected as the result of the municipal storm water quality management program."* The assessment requirements of Provision D.4.b.(2) are also consistent with 40 CFR122.42(c)(1) requires the Copermittees to annually report the "*status of implementing the components of the storm water management program that are established as permit conditions.*"

Provision D.4.c includes the special studies assessment requirements. Performing special studies are how the Copermittees will address data gaps identified during the development of and updates to the Water Quality Improvement Plan. The relevant findings from the special studies assessments are expected to be incorporated as part of the applicable receiving water assessments, MS4 outfall discharge assessments, and integrated water quality improvement assessments required in Provision D.4.a, D.4.b, and D.4.d, respectively.

The assessment requirements in Provision D.4.d are part of the iterative approach and adaptive management process required by Provision A.4. The Copermittees are required to integrate the data collected pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to re-evaluate the Water Quality Improvement Plan.

The monitoring data collected pursuant to Provisions D.1 and D.2, and the results of the assessment required pursuant to Provisions D.4.a-c, will be used to determine whether the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program are effective, or require modifications or improvements to become more effective to achieve the requirements of the CWA. The assessments required by Provision D.4.d are consistent with 40 CFR 122.42(c)(1) which requires that the Copermittees to report the *"[t]he status of implementing the components of the storm water management program that are established as permit conditions."*

E. Jurisdictional Runoff Management Programs

Purpose: Provision E includes the requirements for the jurisdictional runoff management programs to be implemented by each of the Copermittees. Compliance with the requirements for the jurisdictional runoff management programs will allow the Copermittees to demonstrate that they are implementing programs to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP. The jurisdictional runoff management program document prepared by each Copermittee will also provide the details for implementing the water quality improvement strategies identified in the Water Quality Improvement Plan specifically within its jurisdiction.

***Discussion*:** Implementation of the jurisdictional runoff management program requirements under Provision E is how the Copermittees "*effectively prohibit non-stormwater discharges into the storm sewer,*" and outlines the "*controls to reduce the discharge of pollutants to the maximum extent practicable"* consistent with the federal regulations under 40 CFR 122.26. The jurisdictional runoff management program is part of the "*comprehensive planning process*" that is required pursuant to 40 CFR 122.26(d)(2)(iv). Where the Water Quality Improvement Plan is the "*comprehensive planning process*" on a Watershed Management Area scale, requiring "*intergovernmental coordination,*" the jurisdictional runoff management program document is the "*comprehensive planning process*" on a jurisdictional scale that should be coordinated with the other Copermittees in the Watershed Management Area to achieve the goals of the Water Quality Improvement Plan.

The jurisdictional runoff management program requirements are included to provide each Copermittee criteria that can be used to demonstrate that its storm water management program is implementing the "*comprehensive planning process*" within its jurisdiction to "*effectively prohibit non-stormwater discharges into the storm sewers,*" and to identify and implement the most effective "*controls to reduce the discharge of pollutants to the maximum extent practicable"* in accordance with the performance standards given in the CWA.

Provision E includes the requirements for each of the components that must be included in the Copermittee's jurisdictional runoff management program document that will be implemented by the Copermittee within its jurisdiction. Implementation of the components of each Copermittee's jurisdictional runoff management program must incorporate the water quality improvement strategies identified by each Copermittee in the Water Quality Improvement Plans, described pursuant to Provision B.3.b.(1)(a).

More specific and detailed discussions of the requirements of Provision E are provided below.

Provision E.1 (Legal Authority Establishment and Enforcement) requires each Copermittee to establish and enforce sufficient legal authority to control discharges to the MS4 within its jurisdiction.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system*" and be able to demonstrate that it can "*operate pursuant to legal authority established by statute, ordinance or series of contracts.*" Provision E.1.a describes the minimum legal authorities each Copermittee must establish for itself within its jurisdiction to control discharges to its MS4. The requirements of Provision E.1.a are consistent with the requirements set forth in 40 CFR 122.26(d)(2)(i)(A)-(F).

The certification statement required from each Copermittee by Provision E.1.b is included to provide the San Diego Water Board additional documentation that each Copermittee has established the legal authorities consistent with Provision E.1.a and 40 CFR 122.26(d)(2)(i)(A)-(F), and the Copermittee can "*operate pursuant to legal authority established by statute, ordinance or series of contracts.*"

Provision E.2 (Illicit Discharge Detection and Elimination) requires each Copermittee to implement an illicit discharge detection and elimination program to effectively prohibit non-storm water discharges to the MS4 by actively detecting and eliminating illicit discharges and disposal into its MS4.

Provision E.2 establishes the minimum requirements that each Copermittee must implement within its jurisdiction to effectively prohibit non-storm water discharges from entering its MS4. The federal CWA requires permits for municipal storm sewer systems to "*effectively prohibit non-storm water discharges into the storm sewers*." The federal regulations (40CFR122.26(d)(2)(i)(B)) require each Copermittee to establish the legal authority to prohibit illicit discharges to its MS4s. Under 40 CFR 122.26(d)(2)(iv)(B), each Copermittee must implement a "*program…to detect and remove…illicit discharges and improper disposal into the storm sewer.*" The federal NPDES regulations, under 40 CFR 122.26(b)(2), define illicit discharges as "*any discharge to a municipal separate storm sewer that is not composed entirely of storm water*." Thus, non-storm water discharges are not authorized to enter the MS4 and are considered to be illicit discharges, unless authorized by a separate NPDES permit.

The Phase I Final Rule clarifies that non-storm water discharges through an MS4 are not authorized under the CWA (55 FR 47995):

> "*Today's rule defines the term "illicit discharge" to describe any discharge through a municipal separate storm sewer system that is not composed entirely of storm water and that is not covered by an NPDES permit. Such illicit discharges are not authorized under the Clean Water Act. Section 402(p)(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…Ultimately, such non-storm water discharges through a municipal separate*

storm sewer must either be removed from the system or become subject to an NPDES permit."

The federal NPDES requirements for the program to address illicit discharges must include "*inspections, to implement and enforce an ordinance, orders, or other similar means to prevent illicit discharges to the MS4*." The federal NPDES regulations also reference several categories of "*non-storm water discharges or flows* [which] *shall be addressed where such discharges are identified…as sources of pollutants to waters of the United States*." The Phase I Final Rule (55 FR 48037) further clarified the requirements of 40 CFR 122.26(d)(2)(iv)(B)(1) as follows:

"*EPA is clarifying that section 402(p)(3)(B) of the CWA (which requires permits for municipal separate storm sewers to 'effectively' prohibit non-storm water discharges) does not require permits for municipalities to prohibit certain discharges or flows of nonstorm water to waters of the United States through municipal separate storm sewers in all cases*."

In previous iterations of the municipal storm water permits for the San Diego Region, these categories were simply listed and referred to as categories of non-storm water discharges "not prohibited" unless identified as a source of pollutants. The Copermittees have often referred to these categories as "exempt" discharges. In both cases, however, the language is inconsistent with the federal CWA and NPDES regulations. And, the clarification provided in the Phase I Final Rule does not specifically state that such discharges are "not prohibited" or "exempt" or in any way authorized. The federal NPDES regulations do, however, state that specific categories of non-storm water discharges must be "*addressed*" if identified as "*sources of pollutants to waters of the United States*."

The language of Provision E.2.a has been revised to be fully consistent with the language of the CWA and the requirements of the federal regulations under 40 CFR 122.26(d)(2)(iv)(B)(1). Provision E.2.a requires each Copermittee to address <u>all</u> types of non-storm water discharges into its MS4 as illicit discharges, <u>unless</u> the discharge is authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to Provisions E.2.a.(1) through E.2.a.(5). Only non-NPDES-permitted non-storm water discharges identified as a category of non-storm water discharges under Provisions E.2.a.(1) through E.2.a.(5) <u>and</u> *not identified as a source of pollutants* do not have to be addressed as illicit discharges. Categories of non-storm water discharges that meet the requirements of Provisions E.2.a.(1) through E.2.a.(5) do not have to be addressed by the Copermittee as illicit discharges.

Several of the non-storm water categories listed in 40 CFR 122.26(d)(2)(iv)(B)(1) have not been included in Provisions E.2.a.(1) through E.2.a.(5), including: street wash water, landscape irrigation, irrigation water, and lawn watering. Because these are no longer included within the categories listed under Provisions E.2.a.(1) through E.2.a.(5), the Copermittees must prohibit these types of non-storm water discharges

from entering the MS4. This is consistent with the clarification of 40 CFR 122.26(d)(2)(iv)(B)(1) in the Phase I Final Rule (55 FR 48037), which states:

> "*[T]he Director may include permit conditions that either require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*."

Street wash water is a category of non-storm water discharges that was removed when the Third Term Permits were issued. Street wash water is a source of several pollutants (e.g., metals, oil and grease, petroleum hydrocarbons, chlorinated solvents, sediment) which are generated during the street washing process. The removal of this category requires the Copermittees to prohibit this type of non-storm water discharge from entering the MS4.

The landscape irrigation, irrigation water, and lawn watering categories, collectively referred to hereafter as "over-irrigation" discharges, were removed from the list of non-storm water discharge categories in the Fourth Term Orange County and Riverside County Permits. Non-storm water discharges resulting from over-irrigation have been found to be a source of several types of pollutants (e.g., nutrients, bacteria, pesticides, sediment) in receiving waters. The San Diego Water Board and the Copermittees have identified categories of non-storm water discharges associated with over-irrigation as a source of pollutants and conveyance of pollutants to the MS4 and waters of the United States in the following documents:

- **SmartTimer/Edgescape Evaluation Program (SEEP) Grant Application**

  The State Water Board allocated grant funding to the SEEP project grant application submitted in 2006, which targeted irrigation runoff by retrofitting areas of existing development and documenting the conservation and runoff improvements. The basis of this grant project is that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 is a source and conveyance of pollutants. In addition, the grant application indicated that this alteration of natural flows is impacting the beneficial uses of waters of the state and U.S. Results from the study indicate that that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 *is* a source and conveyance of pollutants. The results of this study can be applied broadly to any area where over-irrigation takes place. The grant application included the following statements:

  > "*Irrigation runoff contributes flow & pollutant loads to creeks and beaches that are 303(d) listed for bacteria indicators.*"
  >
  > "*Regional program managers agree that the reduction and/or elimination of irrigation-related urban flows and associated pollutant loads may be key to successful attainment of water quality and beneficial use goals as outlined in the San Diego Basin Plan and Bacteria TMDL over the long term.*"

"*Elevated dry-weather storm drain flows, composed primarily … of landscape irrigation water wasted as runoff, carry pollutants that impair recreational use and aquatic habitats all along Southern California's urbanized coastline. Storm drain systems carry the wasted water, along with landscape derived pollutants such as bacteria, nutrients and pesticides, to local creeks and the ocean. Given the local Mediterranean climate, excessive perennial dry season stream flows are an unnatural hydrologic pattern, causing species shifts in local riparian communities and warm, unseasonal contaminated freshwater plumes in the near-shore marine environment.*"

- **2006-2007 Orange County Watershed Action Plan Annual Reports**

The Watershed Action Plan Annual Reports for the 2006-2007 reporting period were submitted by the County of Orange, Orange County Flood Control District and Copermittees within the San Juan Creek, Laguna Coastal Streams, Aliso Creek, and Dana Point Coastal Streams Watersheds. San Juan Creek, Laguna Coastal Streams, Aliso Creek and Dana Point Coastal Streams are all currently 303(d) listed as impaired for indicator bacteria within their watersheds and/or in the Pacific Ocean at the discharge points of their watersheds. The Orange County Copermittees, within their Watershed Action Strategy Table for fecal indicator bacteria included the following:

"*Support programs to reduce or eliminate the discharge of anthropogenic dry weather nuisance flow throughout the…watershed. Dry weather flow is the transport medium for bacteria and other 303(d) constituents of concern.*"

Additionally, they state that "*conditions in the MS4 contribute to high seasonal bacteria propagation in-pipe during warm weather. Landscape irrigation is a major contributor to dry weather flow, both as surface runoff due to over-irrigation and overspray onto pavements; and as subsurface seepage that finds its way into the MS4*."

- **Fiscal Year 2008 Carlsbad Watershed Urban Runoff Management Program Annual Report**

The Carlsbad Watershed Urban Runoff Management Program Annual Report for Fiscal Year 2008 was submitted by the Carlsbad Watershed Copermittees (Cities of Carlsbad, Encinitas, Escondido, Oceanside, San Marcos, Solana Beach, and Vista, and the County of San Diego). In the Annual Report, the Carlsbad Watershed Copermittees stated the following:

"The Carlsbad Watershed Management Area (WMA) collective watershed strategy identifies bacteria, sediment, and nutrients as high priority water quality pollutants in the Agua Hedionda (904.3 – bacteria and sediment), Buena Vista (904.2 – bacteria), and San Marcos Creek (904.5 – nutrients) Hydrologic Areas. Bacteria, sediment, and nutrients have been identified as potential discharges from over-irrigation."

- **2007-2008 San Diego Bay Watershed Urban Runoff Management Program Annual Report**

  The San Diego Bay Watershed Urban Runoff Management Program 2007-2008 Annual Report was submitted by the San Diego Bay Watershed Copermittees (Cities of Chula Vista, Coronado, Imperial Beach, La Mesa, Lemon Grove, National City, and San Diego, the County of San Diego, the Port of San Diego, and the San Diego County Airport Authority). In Appendix D of the Annual Report, titled "Likely Sources of Pollutants," the San Diego Bay Watershed Copermittees identified over-irrigation of lawns as a pollutant generating activity from business and/or residential land uses for bacteria, pesticides, and sediment.

- **Copermittee Public Education Materials**

  The Orange County Public Works *Tips for Landscape & Gardening* public education brochure states: "*Fertilizers, pesticides and other chemicals that are left on yards or driveways can be blown or washed into storm drains that flow to the ocean. Overwatering lawns can also send materials into storm drains*."

  The Riverside County Flood Control and Water Conservation District *Landscape and Garden* public education brochure states: *"Soil, yard wastes, over-watering and garden chemicals become part of the urban runoff mix that winds its way through streets, gutters and storm drains before entering lakes, rivers, streams, etc. Urban runoff pollution contaminates water and harms aquatic life!"*

- **Los Peñasquitos Lagoon Sedimentation/Siltation TMDL Technical Report**

  The Los Peñasquitos Lagoon Sedimentation/Siltation TMDL technical report was prepared for the City of San Diego and USEPA in October 2010. The technical report was included as a technical supporting document attached to the Sediment TMDL for Los Peñasquitos Lagoon staff report prepared by the San Diego Water Board, dated June 13, 2012. Under the Source Assessment section, the technical report states the following:

  > "*Dry weather loading is dominated by nuisance flows from urban land use activities such as car washing, sidewalk washing, and lawn over-irrigation, which pick up and transport sediment into receiving waters.*"

These documents confirm that non-storm water discharges associated with over-irrigation are a source of pollutants and should be addressed as illicit discharges to the MS4. Prohibiting non-storm water discharges associated with over-irrigation, however, is not a new requirement for the Copermittees because it is also consistent with and required by the Water Conservation in Landscaping Act (AB 1881, Laird).

The Water Conservation in Landscaping Act required the Department of Water Resources (DWR) to prepare a Model Water Efficient Landscape Ordinance for use by local agencies (e.g. the Copermittees). All local agencies were required to adopt a water efficient landscape ordinance by January 1, 2010. Local agencies could adopt the Water Efficient Landscape Ordinance developed by DWR, or an ordinance considered at least as effective as the Model Ordinance. The Water Efficient Landscape Ordinance includes a requirement that local agencies prohibit runoff from irrigation (§ 493.2):

> "*Local agencies shall prevent water waste resulting from inefficient landscape irrigation by* <u>*prohibiting runoff from leaving the target landscape*</u> *[emphasis added] due to low head drainage, overspray, or other similar conditions where water flows onto adjacent property, non-irrigated areas, walks, roadways, parking lots, or structures. Penalties for violation of these prohibitions shall be established locally*."

Furthermore, non-storm water discharges from over-irrigation not only transport and discharge pollutants to receiving waters, but are also a likely source of the dry weather flows causing changes to habitat within and along the receiving water bodies. Examples of habitat changes from the dry weather flows include perennialization of ephemeral streams, and conversion of saltwater and brackish water marsh habitats to freshwater marsh habitats (e.g. Los Peñasquitos Lagoon). Both of these examples have resulted in the promotion of invasive species in several areas of the San Diego Region.

The removal of the over-irrigation discharges categories does not require the Copermittees to strictly prohibit lawn and landscape irrigation, but does require the prohibition of excessive irrigation water that results in non-storm water discharges to the MS4. Non-storm water discharges to the MS4 from over-irrigation must be addressed as illicit discharges by the Copermittees pursuant to the requirements of Provision E.2.

The remaining non-storm water categories listed in 40 CFR 122.26(d)(2)(iv)(B)(1) are listed under Provisions E.2.a.(1) through E.2.a.(5) and generally fall into four categories: (1) non-storm water discharges subject to existing San Diego Water Board waste discharge requirements and NPDES permits; (2) non-storm water discharges generally not expected to be a source of pollutants to receiving waters; (3) non-storm water discharges likely to contain pollutants requiring some form of control to address the pollutants prior to discharging to the MS4; and (4) non-storm water discharges or flows associated with firefighting.

Provisions E.2.a.(1) and E.2.a.(2) include several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) for which the San Diego Water Board already has developed general waste discharge requirements and NPDES permits to address the discharges. The Copermittees are only required to address these types of non-storm water discharges as illicit discharges if the Copermittees or

the San Diego Water Board identifies these non-storm water discharges not having coverage under the applicable NPDES permit.

Provision E.2.a.(3) includes several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) which are generally not expected to be a source of pollutants to receiving waters, many of which originate from what are typically natural, uncontrollable sources. The Copermittees are only required to address these types of non-storm water discharges as illicit discharges if the Copermittees or the San Diego Water Board identifies these non-storm water discharges as a source of pollutants to receiving waters. Because many of these sources are generally uncontrollable, enforcing a prohibition may not be a possibility for the Copermittees. The Copermittees would be able to address these non-storm water discharges by preventing these non-storm water discharges from entering the MS4. This could potentially be achieved by sealing their MS4 structures so the discharges cannot enter the MS4.

Provision E.2.a.(4) includes several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) that are likely to contain pollutants requiring some form of control to address the pollutants prior to discharging to the MS4. At this time, an outright prohibition of these types of non-storm water discharges does not yet appear to be warranted. Thus, Provision E.2.a.(4) includes several requirements for the Copermittees to control the pollutants from these types of non-storm water discharges. This is consistent with the clarification of the federal regulations in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board has the authority to require the Copermittees to "*control any of these types of discharges where appropriate*."

Unlike non-storm water discharges from over-irrigation, these types of non-storm water discharges are not expected to occur in close proximity to each other or very frequently. Provided these types of non-storm water discharges are controlled as required in Provision E.2.a.(4), the Copermittees would only be required to address these types of non-storm water discharges as illicit discharges if the Copermittee or the San Diego Water Board identifies these non-storm water discharges as a source of pollutants to receiving waters.

Provision E.2.a.(5) includes specific requirements for fire fighting discharges and flows. The requirements for non-storm water discharges and flows associated with fire fighting have been separated into requirements for: a) non-emergency fire fighting discharges and flows, and b) emergency fire fighting discharges and flows.

The San Diego Water Board has found that discharges from building fire suppression system maintenance (e.g. fire sprinklers) contain waste and potentially a significant source of pollutants to receiving waters. As such, the San Diego Water Board is requiring these discharges be addressed as illicit discharges by the Copermittees. Thus, the discharges to the MS4 are to be prohibited via ordinance, order or similar means. For other non-emergency firefighting discharges and flows (i.e. flows from

controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems), the Copermittees are required to develop and implement a program to address pollutants in these non-storm water discharges and flows. This is consistent with the clarification of the federal regulations in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board has the authority to require the Copermittees to "*control any of these types of discharges where appropriate*."

For emergency firefighting discharges and flows, the Phase I Final Rule (55 FR 48037) has clarified the requirements of 40 CFR 122.26(d)(2)(iv)(B)(1) pertaining to emergency firefighting flows and discharges, which states:

> "*In the case of firefighting it is not the intention of these rules to prohibit in any circumstances the protection of life and public or private property through the use of water or other fire retardants that flow into separate storm sewers*."

Thus, the requirements have been made to be consistent with the guidance provided by the Phase I Final Rule. The Order recommends that the Copermittees develop and encourage implementation of BMPs to reduce or eliminate the discharge of pollutants from emergency firefighting flows to the MS4s and receiving waters. The Order does not include any requirements that should be interpreted as requiring the implementation of BMPs for emergency firefighting flows to the MS4s and receiving waters.

The Copermittees are expected to review the dry weather MS4 outfall discharge monitoring data they collect to determine if and when there are non-storm water discharges to or from their MS4s that are a source of pollutants to receiving waters. If the Copermittees identify one of the types of non-storm water discharges listed in Provisions E.2.a.(1) through E.2.a.(4) as a source of pollutants to receiving waters based on the review and evaluation of monitoring data, Provision E.2.a.(6) requires the Copermittees to prohibit those categories of discharges from entering the MS4 through ordinance, order or similar means. In addition, Provision E.2.a.(6) clarifies that the San Diego Water Board may identify categories of non-storm water discharges or flows listed under Provisions E.2.a.(1) through E.2.a.(4) that must be prohibited.

Provision E.2.a.(6) also provides the Copermittees an option to propose controls to be implemented for the category of non-storm water discharges as part of the Water Quality Improvement Plan instead of prohibiting the category of non-storm water discharges. If the Water Quality Improvement Plan is accepted by the San Diego Water Board with the proposed controls, the Copermittees will not be required to prohibit the category of non-storm water discharges to their MS4s as long as the controls are implemented. This is consistent with the clarification of 40 CFR 122.26(d)(2)(iv)(B)(1) in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board may "*require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*."

Finally, Provision E.2.a.(7) has been included in the requirements for non-storm water discharges to clarify that any non-storm water discharges to the Copermittee's MS4, even those identified pursuant to Provisions E.2.a.(1) through E.2.a.(4), must be reduced or eliminated, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit. Provision E.2.a.(7) is consistent with the requirements of CWA section 402(p)(3)(B)(ii) and 40 CFR 122.26(d)(1)(v)(B), as clarified in the Phase I Final Rule (55 FR 47995) that "*[u]ltimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit*." However, the reduction or elimination of those non-storm water discharges are expected to be achieved as feasible, in accordance with the priorities in the Water Quality Improvement Plan and when the resources are available to the Copermittee.

Consistent with 40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(1), each Copermittee must implement a "*program…to prevent illicit discharges to the municipal storm sewer system*" and "*detect…illicit discharges and improper disposal into the storm sewer.*" Provision E.2.b requires each Copermittee to implement measures to prevent and detect illicit discharges and connections to its MS4 as part of its illicit discharge detection and elimination program.

As part of the program to prevent and detect illicit discharges to the MS4, 40 CFR 122.26(d)(2)(iv)(B)(2) requires "*procedures to conduct on-going field screening activities during the life of the permit, including areas or locations that will be evaluated by such field screens*." As part of the procedures, each Copermittee is required to maintain an updated map of its entire MS4 and the corresponding drainage areas within its jurisdiction. Having knowledge about where inlets, access points, connections with other MS4s, and outfalls are located is necessary for each Copermittee to track, identify, and eliminate illicit discharges and connections. Thus, Provision E.2.b.(1) of the Order specifies that the map must include the segments of the storm sewer system owned, operated, and maintained by the Copermittee, and include locations of all known inlets, connections with other MS4s, and outfalls to the Copermittee's MS4. The remaining requirements of Provision E.2.b are consistent with the requirements of 40 CFR 122.26(d)(2)(iv)(B)(3)-(7) related to implementing measures to prevent and detect illicit discharges and connections to the MS4.

Provision E.2.c requires each Copermittee to conduct field screening and monitoring of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4. Field screening is a required element of the program to detect and eliminate illicit discharges and connections to the MS4, pursuant to 40 CFR 122.26(d)(2)(iv)(B)(2). The field screening requirement will be implemented through the dry weather MS4 outfall discharge monitoring required under Provisions D.2.a.(2) and D.2.b.(1).

Provision E.2.d specifies the measures each Copermittee must implement to eliminate illicit discharges and connections to its MS4. Elimination of illicit discharges and connections to the MS4 is consistent with the requirement of 40 CFR

122.26(d)(2)(iv)(B) "*to detect and remove [emphasis added]…illicit discharges and improper disposal into the storm sewer*" and will achieve the CWA requirement for MS4 permits to "*effectively prohibit non-storm water discharges into the storm sewers*."

Generally, each Copermittee is responsible for prioritizing its efforts to eliminate non-storm water and illicit discharges or connections to its MS4 based on field screening and monitoring data, NALs, illicit discharge investigation records, and the known or suspected sources. Sources of non-storm water and illicit discharges or connections must be eliminated by enforcing the legal authority established by each Copermittee pursuant to Provision E.1.

Provision E.3 (Development Planning) requires each Copermittee to use its land use and planning authority to implement a development planning program to control and reduce the discharge of pollutants in storm water from new development and significant redevelopment to the MEP. Proper implementation of the development planning program will also contribute toward effectively prohibiting non-storm water discharges from development projects to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." As part of the management program, 40 CFR 122.26(d)(2)(iv)(A)(2) requires "*planning procedures including a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment*."

Land development generally alters the natural conditions of the land by removing vegetative cover, compacting soil, and/or placement of concrete, asphalt, or other impervious surfaces. These impervious surfaces concentrate urban pollutants (such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not found in high concentrations in the natural environment. Pollutants that accumulate on impervious surfaces are not easily biodegraded nor subject to natural treatment processes.

Impervious surfaces greatly affect the natural hydrology of the land because they do not allow natural infiltration and treatment of storm water runoff to take place. Instead, storm water runoff from impervious surfaces is typically directed through pipes, curbs, gutters, and other hardscape into receiving waters, with little treatment, at significantly increased volumes and accelerated flow rates over what would occur naturally. The increased pollutant loads, storm water volume, discharge rates and velocities, and discharge durations from the MS4 adversely impact stream habitat by causing accelerated, unnatural erosion and scouring within creek bed and banks. Placement of impervious surfaces also encapsulates "good" sediment (such as sand, gravel, rocks and cobbles) that would normally replenish creek beds and banks to help

stabilize them. Collectively, these changes to natural hydrologic processes are termed hydrograph modification, or hydromodification.

Hydromodification, which is caused by both altered storm water flow and altered sediment flow regimes, is largely responsible for degradation of creeks, streams, and associated habitats in the San Diego Region. In an ongoing study by the Stormwater Monitoring Coalition to assess the health of streams throughout Southern California, researchers found that three of the four highest risk stressors to creeks (percent sands and fines present, channel alteration, and riparian disturbance) were related to physical habitat.[29] Researchers studying flood frequencies in Riverside County have found that increases in watershed imperviousness of only 9-22 percent can result in increases in peak flow rates for the two-year storm event of up to 100 percent.[30] Such changes in runoff have significant impacts on channel morphology.

In addition, a technical report issued by the Southern California Coastal Water Research Project (SCCWRP) stated that "*[r]ecent studies indicate that California's intermittent and ephemeral streams are more susceptible to the effects of hydromodification than streams from other parts of the United States. Physical degradation of stream channels in the central and eastern United States can initially be detected when watershed impervious cover approaches 10 percent, although biological effects (which may be more difficult to detect) may occur at lower levels. In contrast, initial response of streams in the semi-arid portions of California appears to occur between 3 and 5 percent impervious cover*."[31] These studies highlight the extent to which impacts originating from impervious surfaces created by land development are responsible for the degradation of creek and stream habitat.

This is consistent with what USEPA has noted, that "*[m]ost stormwater runoff is the result of the man-made hydrologic modifications that normally accompany development. The addition of impervious surfaces, soil compaction, and tree and vegetation removal result in alterations to the movement of water through the environment. As interception, evapotranspiration, and infiltration are reduced and precipitation is converted to overland flow, these modifications affect not only the characteristics of the developed site but also the watershed in which the development is located. Stormwater has been identified as one of the leading sources of pollution for all waterbody types in the United States. Furthermore, the impacts of stormwater pollution are not static; they usually increase with more development and urbanization*."[32]

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[29] Assessing the Health of Southern California Streams, Stormwater Monitoring Coalition, Fact Sheet
[30] Schueler and Holland, 2000. Storm Water Strategies for Arid and Semi-Arid Watersheds (Article 66). The Practice of Watershed Protection.
[31] Stein, E. and Zaleski, S., 2005. Technical Report 475, Managing Runoff to Protect Natural Streams: The Latest Development on Investigation and Management of Hydromodification in California. December 30, 2005.
[32] USEPA, 2007. Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices, December 2007.

Reducing the impact from the increased pollutant loads and flows generated by impervious surfaces within a watershed is essential to protecting and restoring the integrity of the receiving waters. Provision E.3 includes the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment*." The requirements of Provision E.3 will 1) minimize the generation and discharge of pollutants in storm water from the MS4, and 2) minimize the potential of storm water discharges from the MS4 from causing altered flow regimes and excessive downstream erosion in receiving waters.

The requirements of Provision E.3.a include the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment*" applicable to all development projects, regardless of size or purpose of development. In general, all development projects must implement onsite BMPs to remove pollutants from runoff prior to its discharge to any receiving waters, as close to the pollutant generating source as possible, and structural BMPs must not be constructed within waters of the U.S.

Furthermore, the onsite BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors (e.g. mosquitos, rodents, and flies). If not properly designed or maintained, certain BMPs implemented or required by municipalities may create a habitat for vectors. Monitoring studies conducted by the California Department of Public Health (CDPH) have documented that mosquitoes opportunistically breed in structural storm water BMPs, particularly those that hold standing water for over 96 hours. Certain site design features that hold standing water may similarly produce mosquitoes.

Structural BMPs and site design features should incorporate design, construction, and maintenance principles to promote drainage within 96 hours to minimize standing water available to mosquitoes. Nuisances and public health impacts resulting from vector breeding can be prevented with close collaboration and cooperative effort between municipalities and local vector control agencies and the CDPH during the development and implementation of storm water runoff management programs. The CDPH also has issued guidance for BMP implementation that will minimize potential nuisances and public health impacts resulting from vector breeding.[33]

All development projects are required to implement source control BMPs that will minimize the generation of pollutants. Additionally, each development project must implement, where applicable and feasible, low impact development (LID) BMPs to

[33] California Department of Public Health, 2012. Best Management Practices for Mosquito Control in California. (http://www.cdph.ca.gov/HealthInfo/discond/Documents/BMPforMosquitoControl07-12.pdf)

mimic the natural hydrology of the site and retain and/or treat pollutants in storm water runoff prior to discharging to and from the MS4.

The LID Center defines LID as "*a comprehensive land planning and engineering design approach with a goal of maintaining and enhancing the pre-development hydrologic regime of urban and developing watersheds.*"[34] LID designs seek to control storm water at the source, using small-scale integrated site design and management practices to mimic the natural hydrology of a site, retain storm water runoff by minimizing soil compaction and impervious surfaces, and disconnect storm water runoff from conveyances to the storm drain system.

LID BMPs may utilize interception, storage, evaporation, evapotranspiration, infiltration, and filtration processes to retain and/or treat pollutants in storm water before it is discharged from a site. Because of these numerous options, the San Diego Water Board expects that every development project will be able to implement some form of LID BMPs. Examples of LID BMPs include using permeable pavements, rain gardens, rain barrels, grassy swales, soil amendments, and native plants.

Provision E.3.a also includes requirements for all development projects to, where feasible, landscape with native and/or low water use plants to minimize the discharge of non-storm water discharges associated with excessive irrigation, as well as harvest (i.e., storage) and use precipitation to promote the concept of utilizing storm water as a resource.

While all development projects are subject to the requirements of Provision E.3.a, Provision E.3.b identifies Priority Development Projects that exceed given size thresholds and/or fit under specific use categories. Priority Development Projects are required to incorporate specific performance criteria for structural BMPs into the project plan to reduce the generation of pollutants, and address potential impacts from hydromodification.

The Priority Development Project categories are based on the requirements of the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), and do not differ significantly from the Fourth Term Permit for San Diego County. Furthermore, the Priority Development Project categories are consistent with Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), and Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit).

Because of the impact of relatively small increases in watershed impervious surfaces to receiving waters, Provision E.3.b.(1)(c)(iv) has been updated to include large driveways that are 5,000 square feet or more. The San Diego Water Board finds that large driveways can exacerbate altered flow regimes if not properly controlled.

[34] www.lowimpactdevelopment.org

Provision E.3.b.(3) describes projects that are exempt from Priority Development Project status. These include new or retrofit paved sidewalks, bicycle lanes, or trails that are designed and constructed to direct runoff to vegetated areas or be hydraulically disconnected from paved areas. The exemptions have been provided to encourage these types of projects because they provide multiple environmental benefits, such as promoting walking rather than driving, which will in turn improve air quality. Additionally, retrofitting of existing alleys, streets, or roads are exempt from Priority Development Project status if they are constructed using USEPA Green Streets guidance.[35] By doing so, retrofitting of these types of projects is encouraged. The San Diego Water Board recognizes that there are spatial constraints associated with these projects, and implementation of structural BMPs are not always feasible.

For development projects identified as Priority Development Projects, the requirements of Provision E.3.c are the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment.*" Provisions E.3.c.(1)-(3) describe the performance criteria for the structural BMPs that must be implemented for each Priority Development Project defined by Provision E.3.b.

Provision E.3.c.(1) describes the storm water pollutant control BMP requirements that must be implemented by all Priority Development Projects. The purpose of Provision E.3.c.(1) is to reduce pollutants in storm water runoff to the MEP from Priority Development Projects before it is discharged to the MS4. Of all the available treatment processes available, retention of storm water, and therefore capture of the pollutants in the storm water, will achieve 100 percent pollutant removal efficiency for the volume of storm water retained. No other method of treatment can achieve 100 percent pollutant removal efficiency. Thus, retention of as much storm water onsite is the most effective way to reduce pollutants in storm water discharges to, and consequently from the MS4, and controls pollutants in storm water discharges from a site to the MEP.

Under Provision E.3.c.(1)(a), retention of the pollutants in the runoff produced from the 85th percentile storm event ("design capture volume") is the design standard to which Priority Development Projects must comply. Since the 85th percentile storm event has previously been used as the numeric design standard for treatment control BMPs, this same size storm event is used as the numeric design standard for storm water retention. This is the MEP standard recognized by the San Diego Water Board and is consistent with the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), as well as Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and

[35] "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).

Riverside County MS4 Permits, respectively), Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit), and Los Angeles Water Board Order No. R4-2012-0175 (Los Angeles County MS4 Permit).

The 85th percentile storm event is the event that has a precipitation total greater than or equal to 85 percent of all storm events over a given period of record in a specific area or location. For example, to determine what the 85th percentile storm event is in a specific location, all 24 hour storms that have recorded values over a 30 year period would be tabulated and a 85th percentile storm would be determined from this record (i.e. 15 percent of the storms would be greater than the number determined to be the 85th percentile storm). Most jurisdictions in the San Diego Region have already developed isopluvial maps that can provide this type of information. The 85th percentile storm might be determined to be a number such as 1.0 inch, and this would be multiplied by the total area of the project footprint producing runoff to calculate the design capture volume. The Priority Development Project designer would then select a system of BMPs that would retain (i.e. intercept, store, infiltrate, evaporate, or evapotranspire) the pollutants contained in the design capture volume onsite.

Retention BMPs are necessary to capture and retain pollutants generated from a Priority Development Project. In a recent study performed by SCCWRP in the Los Angeles Region, they found "*that the magnitude of constituent load associated with storm water runoff depends, at least in part, on the amount of time available for pollutant build-up on land surfaces. The extended dry period that typically occurs in arid climates such as southern California maximizes the time for constituents to build-up on land surfaces, resulting in proportionally higher concentrations and loads during initial storms of the season*."[36] This implies that the "first flush" of a rainy season and the first storm events after long antecedent dry periods tend to have the highest pollutant loads. Capturing and retaining the pollutant loads of the "first flush" of a rainy season and the first storm events after long antecedent dry periods will reduce a significant portion of the pollutants in storm water discharged to and from the MS4.

The San Diego Water Board, however, acknowledges that in some situations retention of the full design capture volume onsite may not be technically feasible. In this event, the Copermittee may allow the Priority Development Project to use biofiltration BMPs to treat 1.5 times the design capture volume not reliably retained onsite, or biofiltration BMPs with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite.

The 1.5 multiplier is based on the finding in the Ventura County Technical Guidance Manual that biofiltration of 1.5 times the design capture volume not retained onsite will provide approximately the same pollutant removal as retention of the design capture

[36] Stein, E.D., Tiefenthaler, L.L., and Schiff, K.C., 2007. Technical Report 510, Sources, Patterns and Mechanisms of Storm Water Pollutant Loading from Watershed and Land Uses of the Greater Los Angeles Area, California, USA. March 20, 2007.

volume on an annual basis.[37] This standard is consistent with the Los Angeles Water Board's Los Angeles County and Ventura County municipal storm water permits (Order Nos. R4-2012-0175 and R4-2010-0108, respectively). The flow-thru design of 0.75 times the portion of the design capture volume not reliably retained onsite is consistent with the San Diego Water Board's Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively). In either case, the biofiltration BMPs must be designed with an appropriate hydraulic loading rate to maximize storm water retention and pollutant removal, as well as to prevent erosion, scour, and channeling within the BMP. Each Copermittee is required to update its BMP Design Manual to provide guidance for hydraulic loading rates and other biofiltration design criteria necessary to maximize storm water retention and pollutant removal.

The San Diego Water Board further recognizes that, in addition to not being technically feasible, retention of the full design capture storm onsite may be cost prohibitive, or may not provide as much water quality benefit to the Watershed Management Area as would implementing BMPs elsewhere in the watershed. Thus, Provision E.3.c.(1)(b) allows for the use of a combination of onsite retention BMPs, and the implementation of an Alternative Compliance Program described in Provision E.3.c.(3). Provision E.3.c.(3) is discussed in more detail below.

If the full design capture volume is not retained onsite either because biofiltration is not technically feasible, or a Copermittee grants a Priority Development Project permission to utilize the Alternative Compliance Program, then the pollutants in the portion of the design capture volume that are not reliably retained onsite must still be reduced to the MEP. Thus, flow-thru treatment control BMPs are required to be implemented on Priority Development Projects in addition to the retention BMPs. The requirements of Provisions E.3.c.(1)(a)(ii)[a]-[c] include the performance standards for flow-thru treatment control BMPs, consistent with the Fourth Term Permits in the San Diego Region.

Whereas the purpose of the requirements under Provision E.3.c.(1) is to reduce pollutants in storm water runoff to the MEP, the purpose of the requirements under Provision E.3.c.(2) is to maintain or restore more natural hydrologic flow regimes to prevent accelerated, unnatural erosion in downstream receiving waters, also to the MEP standard. Provision E.3.c.(2) describes hydromodification management BMP requirements that must be implemented by all Priority Development Projects.

The performance criteria for the implementation of hydromodification management BMPs on Priority Development Projects are consistent with the requirements in the Fourth Term Permits for Orange and Riverside Counties (Order Nos. R9-2009-0002 and R9-2010-0016, respectively). Modifications to the Orange County and Riverside County Hydromodification Management Plans (HMPs) will likely be minor, or may not

[37] Ventura Countywide Stormwater Management Program. 2011. Ventura Technical Guidance Manual, Manual Update, 2011.

be necessary. The HMP for San Diego County will likely require some minor modifications to incorporate the requirements of Provision E.3.c.(2) and become consistent with the Orange County and Riverside County HMPs. The San Diego Water Board does not, however, expect that it will be necessary for the San Diego County Copermittees to develop a new approach or significantly re-write the San Diego County HMP. This is because the premise of the hydromodification management BMP requirements, which are to control storm water runoff conditions (flow rates and durations) for Copermittee-defined range of flows, is unchanged from all Fourth Term Permits in the San Diego Region.

Provision E.3.c.(2)(a) requires that post-project runoff conditions mimic the *pre-development* runoff conditions, and not the *pre-project* runoff conditions. Fundamentally, the San Diego Water Board believes that using a hydrology baseline that approximates that of an undeveloped, natural watershed is the only way to facilitate the return of more natural hydrological conditions to already built-out watersheds, and ultimately improved stream health. On the other hand, using the *pre-project* hydrology as a baseline for redevelopment projects results in propagating the unnatural hydrology of urbanized areas. Propagating the urbanized flow regime does not support conditions for restoring degraded or channelized stream segments, and would forever sentence such streams to the degraded state. Furthermore, reducing the volume of storm water runoff associated with the urbanized flow regime will also result in reducing the discharge of pollutants into receiving waters, since storm water runoff from impervious surfaces contains untreated pollutants.

The San Diego Water Board understands that approximating the pre-development runoff condition associated with a redevelopment site is not necessarily straightforward because factors such as natural grade and native vegetation for the site cannot be precisely known. Therefore, the San Diego Water Board does not expect project designers to estimate historical conditions associated with redevelopment sites. Rather, the San Diego Water Board expects project designers and the Copermittees to approximate pre-development runoff conditions using the parameters of a *pervious* area rather than an *impervious* area. This means that for redevelopment sites, approximating pre-development runoff conditions equates to using existing onsite grade and assuming the infiltration characteristics of the underlying soil. A redevelopment Priority Development Project must not use runoff coefficients of concrete or asphalt to estimate pre-development runoff conditions. Rather, redevelopment projects must use available information pertaining to existing underlying soil type (such as soil maps published by the National Resource Conservation Service), onsite existing grade, and any other readily available pertinent information to estimate pre-development runoff conditions.

The San Diego Water Board understands, indeed asserts, that the pre-development hydrology of an area in question can only be roughly estimated and cannot be precisely known. However, using the hydrology of a natural condition, even if not precisely known, will provide significant benefit to receiving waters over using the hydrology associated with impervious (developed) surfaces. Therefore in order to

achieve the goals of the Clean Water Act, which are to "*restore and maintain the chemical, physical, and biological integrity of the nation's waters* [emphasis added]," the most appropriate standard to use for hydromodification management is the standard associated with the pre-development condition.

Provision E.3.c.(2)(b) requires Priority Development Projects to avoid known critical sediment yield areas or implement measures that would allow coarse sediment to be discharged to receiving waters, such that the natural sediment supply is unaffected by the project. This is necessary because the availability of coarse sediment supply is as much an issue for causing erosive conditions to receiving streams as are accelerated flows.

The San Diego Water Board recognizes that in some situations implementing the hydromodification management BMP requirements for flow control fully onsite may not be technically feasible, may be cost prohibitive, or may not provide any overall water quality benefits to the Watershed Management Area. Thus, Provision E.3.c.(2)(c) allows for the use of a combination of onsite hydromodification management BMPs for flow control and alternative compliance options described in Provision E.3.c.(3).

Provision E.3.c.(3) allows for alternative compliance in instances where the Copermittee determines that offsite measures will have a greater overall water quality benefit for the Watershed Management Area than if the Priority Development Project were to implement structural BMPs onsite. Consequently, watershed-specific structural BMP requirements are present in this Order in the form of allowable compliance offsite. The Alternative Compliance Program to Onsite Structural BMP Implementation Provision is intended to integrate with the Copermittees' planning efforts in the Water Quality Improvement Plans.

The Alternative Compliance Program is an option for Priority Development Projects where the governing Copermittee has participated in the development of a Watershed Management Area Analysis as part of the Water Quality Improvement Plan (described in Provision B.3.b.(4)). Such an approach is consistent with the latest findings in hydromodification management by the scientific community. In a Technical Report entitled *Hydromodification Assessment and Management in California,*[38] the report states:

> *"An effective [hydromodification] management program will likely include combinations of on-site measures (e.g., low-impact development techniques, flow-control basins), in-stream measures (e.g., stream habitat restoration), floodplain and riparian zone actions, and off-site measures. Off-site measures may include compensatory mitigation measures at upstream locations that are designed to help restore and manage flow and sediment yield in the watershed."*

[38] 2012. ED Stein, F Federico, DB Booth, BP Bledsoe, C Bowles, Z Rubin, GM Kondolf, A Sengupta. Technical Report 667. Southern California Coastal Water Research Project. Costa Mesa, CA.

Consistent with the ideas brought forth in the report, in the Watershed Management Area Analysis of Provision B.3.b.(4), which is optional, the Copermittees will develop watershed maps that include as much detail about factors that affect the hydrology of the watershed as is available. Such factors included identification of areas suitable for infiltration, coarse sediment supply areas, and locating stream channel structures and constrictions. Once these factors are mapped and studied, the Copermittees can identify areas in the watershed where candidate projects may be implemented that are expected to improve water quality in the watershed by providing more opportunity for infiltration, slowing down storm water flows, or attenuation of pollutants naturally via healthy stream habitat. These candidate projects may be in the form of retrofitting existing development, rehabilitating degraded stream segments, identifying regional BMPs, purchasing land to preserve valuable floodplain functions, and any other project(s) that the Copermittees identify.

Under the Alternative Compliance Program, Priority Development Projects may be allowed to fund, partially fund, or implement a candidate project, in lieu of implementing structural BMPs onsite, if they enter into a voluntary agreement with the governing Copermittee permitting this arrangement. Project proponents may also propose an alternative project not previously identified by the Copermittees. In either case, whether a project proponent implements a candidate project identified by the Copermittees or a separate alternative compliance project, the governing Copermittee must determine that implementation of the project will have a greater overall water quality benefit for the Watershed Management Area than fully implementing structural BMPs onsite. Determination of greater overall water quality benefits associated with alternative compliance projects would be accomplished by utilizing Water Quality Equivalency calculations developed pursuant to Provision E.3.c.(3)(a). Water Quality Equivalency calculations are necessary to establish a regional and technical basis for determining water quality benefits associated with alternative compliance projects, which can be consistently used by all Copermittees in the San Diego Region. Finally, if ~~If~~ alternative compliance involves funding or implementing a project that is outside the jurisdiction of the governing Copermittee, then that Copermittee may enter into an inter-agency agreement with the appropriate jurisdiction.

Finally, Provision E.3.c.(2)(d) allows Priority Development Projects to be exempt from the hydromodification management BMP requirements if there is no threat of erosion to downstream receiving waters (i.e. the receiving stream is concrete lined from the point of discharge all the way to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean). If the Copermittees believe that more exemptions are warranted, then they must perform the optional Watershed Management Area Analysis of Provision B.3.b.(4). Additional exemptions other than those specified in this Order may be established on a watershed basis, provided the Copermittees perform the analysis, provide supporting rationale for the exemptions, and complete the Water Quality Improvement Plan approval process pursuant to Provision F.1.

To facilitate the transition to this Order from the Fourth Term Permits for Orange and Riverside County Copermittees, Provision E.3.c.(2)(e) allows two additional temporary

exemptions from hydromodification management BMP implementation. The first temporary exemption allows relief from hydromodification management BMP implementation for Priority Development Projects discharging directly to an engineered channel conveyance system with a capacity to convey peak flows generated by the 10-year storm event all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean. Similar to the exemption allowed for concrete-lined channels, this exemption is premised on the concept that there is little threat of erosion to these types of engineered channel systems.

The second temporary exemption allows relief from hydromodification management BMP implementation for Priority Development Projects discharging directly to large river reaches with drainage areas larger than 100 square miles and a 100-year flow capacity in excess of 20,000 cubic feet per second. If this exemption is claimed, then properly sized energy dissipation is required at all discharge points associated with the Priority Development Project. This exemption is premised on the concept that large river reaches can essentially assimilate the accelerated flow rates associated with individual Priority Development Projects because they are inconsequential compared to the flow rate in the large river reach. Both of these exemptions are included in the Hydromodification Management Plan for San Diego County[39].

These temporary exemptions are allowed as a means to facilitate Orange and Riverside County Copermittees' transition to this Order from the Fourth Term Permits and are not meant to reside as permanent exemptions without additional rigorous technical analyses specific to each County. Therefore, these exemptions will no longer apply once the Copermittees' land development programs are fully updated to reflect the requirements of this Order, i.e., upon implementation of the BMP Design Manual pursuant to Provision F.2.b. If the Copermittees believe that these or other exemptions are warranted in the context of water quality improvement and stream restoration opportunities, then the Copermittees must perform the optional Watershed Management Area Analysis of Provision B.3.b.(4) and provide supporting rationale for the exemptions. The San Diego County Copermittees are also required to perform the optional Watershed Management Area Analysis to provide supporting rationale to justify use of these and other exemptions. Updated BMP Design Manuals including rationale to justify use of exemptions will be reviewed by the San Diego Water Board pursuant to Provision F.2.b.

Provisions E.3.c.(4) and E.3.c.(5) were included under the BMP requirements applicable to all development projects in the Fourth Term Permits for San Diego, Orange, and Riverside Counties (Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016, respectively). In this Order, the long-term BMP maintenance and infiltration and groundwater protection requirements apply to structural BMPs implemented by Priority Development Projects only.

[39] Final Hydromodification Management Plan Prepared for County of San Diego, March 2011

Provision E.3.d requires the Copermittees to update their BMP Design Manual as needed to incorporate the requirements of Provision E.3. The BMP Design Manual is formerly known as the Standard Storm Water Mitigation Plan, or SSMP, and was renamed so that the title has a more accurate description of the document content. The contents of the BMP Design Manual are largely unchanged from the previous Standard Storm Water Mitigation Plans required under the Fourth Term Permits. The BMP Design Manual fulfills the 40 CFR 122.26(d)(2)(iv)(A)(2) requirement that the Copermittee's development planning program includes "*a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment*."

As part of the "*planning procedures,*" 40 CFR 122.26(d)(2)(iv)(A)(2) requires the procedures to "*address controls to reduce pollutants in discharges from municipal separate storm sewers after construction is completed*." The requirements applicable to the implementation and oversight of structural BMPs at Priority Development Projects are provided under Provision E.3.e.

Proper installation of the structural BMPs approved for a Priority Development Project is necessary to ensure that pollutants in storm water discharges will be reduced to the MEP after the project is completed. In addition to the proper installation of structural BMPs, the maintenance of structural BMPs on Priority Development Projects is necessary to ensure that pollutants in storm water discharges will continue to be reduced to the MEP. Provision E.3.e.(1) includes the minimum requirements that each Copermittee must implement to ensure structural BMPs are properly installed and will be properly maintained.

The requirements under Provision E.3.e.(2)-(3) are necessary to demonstrate each Copermittee is implementing a program that complies with Provisions E.3.b-c and E.3.e.(1), and ensure structural BMPs at Priority Development Project will continue to be able to reduce pollutants in storm water discharges to the MEP.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary for any development projects to compel compliance with the requirements of Provision E.3 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.3.f requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

<u>Provision E.4 (Construction Management)</u> requires each Copermittee to implement a construction management program to control and reduce the discharge of pollutants in storm water from construction sites to the MEP. Proper implementation of the construction management program will also contribute toward effectively prohibiting non-storm water discharges from construction sites to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." As part of the management program, 40 CFR 122.26(d)(2)(iv)(D) requires "*a program to implement and maintain structural and non-structural best management practices to reduce pollutants in storm water runoff from construction sites to the municipal storm sewer system.*"

Construction sites can be significant sources of sediment, trash, and other pollutants to receiving waters. Although sediment is naturally occurring in the natural environment, the discharge of sediment under unnatural conditions is problematic to receiving waters. Fine sediment in creeks causes high turbidity that interferes with the functionality of native flora and fauna in local creeks. For example, turbidity interferes with both photosynthesis of water-philic plants, as well as successful foraging and reproduction of benthic macroinvertebrates. Sediment can also make it difficult for fish to breathe because it clogs fish gills. Other pollutants such as heavy metals or pesticides can adhere to sediment and are transported to receiving waters during storm events, where they dissolve in the water column and become bioavailable to aquatic organisms. Sediment is recognized as a major stressor to surface waters and is responsible for the impairment of several lagoons and creeks in the San Diego Region.

Provision E.4 includes requirements that each Copermittee must implement to minimize the discharge of sediment and other pollutants from construction sites to the MS4 within its jurisdiction. The requirements under Provision E.4 are consistent with the Fourth Term Permits for San Diego, Orange, and Riverside Counties. Therefore, Copermittees are expected to implement the requirements seamlessly, with minimal changes to their existing construction management programs. The Copermittees, however, are given more flexibility to run their programs as needed to maximize efficiency, and also to be consistent with the Water Quality Improvement Plan for the Watershed Management Area.

As part of the construction management program, 40 CFR 122.26(d)(2)(iv)(D)(1) requires "*procedures for site planning which incorporate consideration of potential water quality impacts.*" Provision E.4.a describes the minimum elements each Copermittee is required to include as part of the construction site planning and project approval process. The construction site planning and approval process is based primarily on ensuring each project had an adequate site-specific pollution control, construction BMP, and/or erosion and sediment control plan that will be implemented to minimize the discharge of pollutants in storm water to the MEP, and minimize impacts to receiving waters.

The requirements under Provision E.4.b provide the data and information necessary to identify "*priorities for inspecting sites and enforcing control measures*" required

pursuant to 40 CFR 122.26(d)(2)(iv)(D)(3). Under Provision E.4.b, each Copermittee must identify construction sites that are considered a high threat to downstream surface waters. Designation of "high threat to water quality" construction sites will necessitate the Copermittees to develop criteria to identify such sites. Provision E.4.b.(2) describes a list of factors that must be considered when the Copermittee considers threat to water quality. For example, a Copermittee must identify sites as "high threat to water quality" if it is located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions, according to the Water Quality Improvement Plan. This ensures that construction management program implementation is compatible with the Copermittee's identified highest priority water quality conditions.

Pursuant to 40 CFR 122.26(d)(2)(iv)(D)(2) each Copermittee is required describe "*requirements for nonstructural and structural best management practices*" at construction sites. Provision E.4.c includes the types of construction site BMPs that the Copermittees must implement, or require the implementation of, at each construction site to reduce pollutants in storm water discharges to the MEP.

Each Copermittee is expected to require the implementation of appropriate BMPs given specific site conditions, the season and likelihood of rain events, and construction phase (i.e. grading vs. vertical construction). This means that throughout the life of the project construction, the appropriate BMPs will vary, especially if the construction of the project spans multiple wet seasons. As opposed to describing specific minimum BMPs that must be implemented, the Order describes major BMP categories that should be considered for each site.

Each Copermittee is expected to use its 20 years of storm water experience and knowledge to require implementation of appropriate BMPs from the various categories at each construction site within its jurisdiction. For example, the San Diego Water Board expects that each site will be required to implement erosion control and sediment control. The San Diego Water Board also expects each Copermittee to require implementation of active/passive sediment treatment systems at sites where other BMPs have been tried and are known to be inadequate, and discharges of sediment are causing or contributing to water quality impairment downstream. Each Copermittee is granted flexibility in specifying the minimum level of BMP requirements at each site, but the San Diego Water Board expects each site to be capable of controlling pollutants in storm water discharges to the MEP and preventing illicit discharges.

The requirements under Provision E.4.d are necessary to demonstrate that each Copermittee is implementing a program that complies with Provisions E.4.a and E.4.c and ensure BMPs at construction sites will reduce pollutants in storm water discharges to the MEP.

Provision E.4.d does not include minimum required inspection frequencies for construction sites. Each Copermittee must use its experience and knowledge to

specify an appropriate inspection frequency for both high priority and lower priority sites in their jurisdictional runoff management program documents, and in accordance with the Water Quality Improvement Plan. Appropriate inspection frequencies may vary by Copermittee, but the San Diego Water Board expects that the stated frequency will be adequate for each Copermittee to properly oversee the construction sites within its jurisdiction, confirm BMPs are implemented to reduce pollutants in storm water discharges from constructions sites to the MEP, and make needed changes to its program on an ongoing basis as necessary.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary for any development projects to compel compliance with the requirements of Provision E.4 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.4.e requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

<u>Provision E.5 (Existing Development Management)</u> requires each Copermittee to implement an existing development management program to control and reduce the discharge of pollutants in storm water from areas of existing development to the MEP. Proper implementation of the existing development management program will also contribute toward effectively prohibiting non-storm water discharges from areas of existing development to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." Within 40 CFR 122.26(d)(2)(iv)(A) and (C), the management program is required to reduce impacts on receiving waters and reduce pollutants in storm water discharges to the MEP from commercial and residential areas, industrial facilities, and municipal facilities.

Commercial and residential areas, industrial facilities, and municipal facilities must be addressed by each Copermittee with the existing development management program required under Provision E.5. All other areas within each Copermittee's jurisdiction should be either undeveloped open space, or areas that are being developed or under construction. Areas being developed or under construction will be addressed by the Copermittee under the requirements of Provision E.3 (Development Planning) or Provision E.4 (Construction Management).

Areas of existing development typically include impervious surfaces such as sidewalks, driveways, roads, and rooftops, which generate and concentrate pollutants (such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not found in high concentrations in the natural environment. Pollutants that accumulate on impervious surfaces are not easily biodegraded or not subject to

natural treatment processes. When it rains, these pollutants are transported in storm water runoff from these impervious surfaces into receiving waters, resulting in poor water quality and degradation of beneficial uses.

In addition to the generation of pollutants, areas of existing development have generally altered the natural conditions of the land and removed vegetative cover, reduced the perviousness of the surface, and reduced the capacity of storm water that can be intercepted, captured, stored, infiltrated, evaporated, and/or evapotranspired. The alteration of the natural conditions and the impervious surfaces associated with areas of existing development causes water quality problems due to the alteration of natural flow regimes within the watersheds; resulting in hydromodification of channels, streams, and habitats that exist within or adjacent to the areas of existing development.

Thus, storm water discharges from areas of existing development are responsible for poor water quality, degraded habitats, and hydromodified channels throughout the developed portions of the watersheds in the San Diego Region. To improve the health and functionality of the receiving waters in a Watershed Management Area, land use practices and the amount of impervious surfaces in areas of existing development must change to reduce the various impacts caused by hydromodification and pollutants from storm water runoff generated in developed areas. Each Copermittee must be aggressive to address pollutant sources and runoff from areas of existing development to be able to reduce pollutants in storm water discharges from the MS4 to the MEP.

There is some overlap in the requirements under Provision E.5 with the requirements under Provisions E.2 (Illicit Discharge Detection and Elimination), E.3 (Development Planning), and E.4 (Construction Management). Illicit discharges frequently originate from areas of existing development. New development projects, when completed will become some type of residential, commercial, industrial or municipal existing development. Redevelopment projects are, by definition, redeveloping areas of existing development. And, redevelopment projects become construction sites located in areas of existing development. Much of the data and information collected, inspections performed, and enforcement actions taken for the requirements under Provisions E.2 to E.4 may also be utilized by the existing development management program. The requirements under Provision E.5, however, are focused primarily on reducing pollutants generated in areas of existing development that can be transported in storm water runoff and discharged to and from the MS4.

The requirements under Provision E.5 build upon existing program elements being implemented by the Copermittees. Provision E.5 is generally consistent with the existing development requirements of the Fourth Term Permits for Orange and Riverside Counties (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), but modified to provide more flexibility to implement the programs so resources can be better focused toward addressing the highest priority water quality conditions identified in the Water Quality Improvement Plans.

For a Copermittee to properly manage areas of existing development, having knowledge of what development exists within its jurisdiction is essential. Provision E.5.a requires each Copermittee to maintain a watershed-based inventory of all the existing development within its jurisdiction. This requirement is necessary for each Copermittee to implement the requirements of Provision E.5.b-e.

As opposed to just maintaining separate inventories based on the type of site, each Copermittee must maintain a watershed-based inventory that includes all types of existing development within its jurisdiction. By utilizing a watershed-based inventory, the Copermittees within a Watershed Management Area can combine their inventories and review the inventories by watershed in addition to by jurisdiction. Pollutant sources and strategies for abatement can then be evaluated on a watershed level, as opposed to evaluating sources and strategies strictly by type of site.

Provision E.5.a includes the information that must be included in the inventory. Provision E.5.a.(1) specifies what facilities or areas must be included in the inventory. A commercial type of existing development may be identified in the inventory as a facility (e.g. individual building, individual business) or an area (e.g. shopping center, commercial zone). An industrial type of existing development must be identified in the inventory by facility (e.g. individual industrial entity). A municipal type of existing development must be identified in the inventory by facility, with a list of specific municipal facilities that must be included in the inventory. A residential type of existing development must be identified by areas to be designated by the Copermittee. For each of the facilities and areas identified in the Copermittee's inventory developed pursuant to Provision E.5.a.(1), Provision E.5.a.(2) specifies the information that must be included in the description for the facility or area.

Provision E.5.a.(3) requires each Copermittee to maintain an updated map showing the location of inventoried existing development, watershed boundaries, and water bodies. This requirement was included because this information is expected to help the Copermittees in a Watershed Management Area identify and prioritize sources of pollutants and/or stressors in areas of existing development that contribute toward the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Knowledge of the existing development that are likely to be sources of pollutants contributing to the highest priority water quality conditions is expected to be a key element in the Copermittees' development of the water quality improvement strategies that will be included in the Water Quality Improvement Plans. The strategies described in the Water Quality Improvement Plans will direct efforts within the existing development management programs implemented by each Copermittee.

Pursuant to 40 CFR 122.26(d)(2)(iv)(A) each Copermittee is required describe "*structural and source control measures to reduce pollutants*" in storm water runoff discharged from areas of existing development. Provision E.5.b includes the BMP

implementation and maintenance requirements that the each Copermittee must require at areas of existing development to reduce pollutants in storm water discharges to the MEP. The San Diego Water Board, however, recognizes that BMP implementation and maintenance for residential areas will require much more education and encouragement through less authoritative measures than for commercial, industrial and municipal facilities and areas. Thus, the BMP implementation and maintenance requirements have been separated between requirements under Provision E.5.b.(1) for commercial, industrial and municipal facilities and areas, and Provision E.5.b.(2) for residential areas.

Most of the requirements in Provision E.5.b are consistent with the related requirements in the Fourth Term Permits. The level of specificity, however, has been changed to allow each Copermittee the flexibility to implement its program to achieve maximum efficiency, and to perform functions that will address the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Each Copermittee is expected to require the implementation of appropriate BMPs to address the expected pollutants from each facility or area. The Third and Fourth Term Permits described specific minimum BMPs that must be implemented at various sites. This Order, however, requires each Copermittee to designate minimum BMPs themselves and require implementation. Consistent with the Fourth Term Permits, each Copermittee is required to maintain, or require the maintenance of, all BMPs as needed.

The BMP implementation and maintenance requirements include a schedule of operation and maintenance activities for the MS4 and related structures (such as catch basins, storm drain inlets, and detention basins), as well as public streets and roads. Public streets and roads specifically include public unpaved roads. The San Diego Water Board identified, through investigations and complaints, sediment discharges from unpaved roads as a significant source of water quality problems in the San Diego Region. Inspection activities conducted by the San Diego Water Board since the Third Term Permits have found a lack of source control for many unpaved roads within the jurisdiction of the Copermittees.

Unpaved roads are a source of sediment that can be discharged in runoff to receiving waters, especially during storm events. Erosion of unpaved roadways occurs when soil particles are loosened and carried away from the roadway base, ditch, or road bank by water, wind, traffic, or other transport means. Exposed soils, high runoff velocities and volumes, sandy or silty soil types, and poor compaction increase the potential for erosion.

Road construction, culvert installation, and other maintenance activities can disturb the soil and drainage patterns to streams in undeveloped areas, causing excess runoff and thereby erosion and the release of sediment. Poorly designed unpaved roads can act as preferential drainage pathways that carry runoff and sediment into natural streams, impacting water quality. In addition, other public works activities along

unpaved roads have the potential to significantly affect sediment discharge and transport within streams and other waterways, which can degrade the beneficial uses of those waterways.

USEPA also recognizes that discharges from unpaved roads pose a significant potential threat to water quality. USEPA guidance[40] emphasizes the threat of unpaved roads to water quality:

> "*Dirt and gravel roads are a major potential source of these pollutants [sediment] and pollutants that bind to sediment such as oils, nutrients, pesticides, herbicides, and other toxic substances. Many roads have unstable surfaces and bases. Roads act like dams, concentrating flows that accelerate erosion of road materials and roadsides. Both unstable surfaces and accelerated erosion then lead to sediment and dust.*"

There are several guidance documents, developed by the USEPA,[41] the US Forest Service,[42] the University of California,[43] and others, that include design and construction specifications and BMPs that are readily available for implementation by public entities. Implementing design and other source control BMPs for unpaved roads in the region is necessary to reduce and minimize the impacts of sediment discharged during storm events from unpaved roads to the MS4s and receiving waters.

Provision E.5.c describes existing development site inspection frequency, content, and tracking that each Copermittee must incorporate into their existing development management programs. The requirements under Provision E.5.c are necessary to demonstrate each Copermittee is implementing a program that complies with Provision E.5.b and ensure BMPs implemented in areas of existing development will reduce pollutants in storm water discharges to the MEP. Provision E.5.c has been modified to include a minimum of once every 5 years for all inventoried facilities and areas of existing development, utilizing one or more methods of inspection.

In addition to onsite inspections, the methods of inspection have been expanded to include drive-by inspections. Inspections may be performed by the Copermittee's municipal and contract staff, or by volunteer monitoring or patrol programs. Volunteer monitoring or patrol programs are not expected to enforce the Copermittee's ordinances, or to inspect areas or facilities where members of the public are not allowed access. Volunteer monitoring or patrol programs must be trained by the Copermittee, and are only expected to collect visual observations. By utilizing drive-by

[40] USEPA, 2006. Environmentally Sensitive Maintenance for Dirt and Gravel Roads. Gesford and Anderson, USEPA-PA-2005.
[41] Ibid
[42] US Forest Service, 1996. Forest Service Specifications for Construction of Roads & Bridges. EM-7720-100. Revised August 1996.
[43] University of California Division of Agriculture and Natural Resources, 2007. Rural Roads: A Construction and Maintenance Guide of California Landowners. Publication 8262.

inspections and volunteer monitoring or patrol programs, the Copermittees will be able to maximize and efficiently use their resources to identify and address sources of pollutants in areas of existing development.

The municipal and contract staff of each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial, industrial, and municipal facilities and areas in its inventoried existing development pursuant to Provision E.5.c.(1)(a)(iv). An "equivalent" of at least 20 percent means if any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspections may count toward the total annual inspection requirement. Linear municipal facilities (i.e. MS4 linear channels, sanitary sewer collection systems, streets, roads and highways) in the Copermittee's existing development inventory are not subject to the inspection frequency requirement of Provision E.5.c.(1)(a)(iv).

The inspection content specified in Provision E.5.c.(2)(a) includes the information required to be collected during an inspection by any method. The inspection content specified in Provision E.5.c.(2)(b) includes additional information that must be collected when a Copermittee's municipal or contract staff perform an onsite inspection. Provision E.5.c.(3) specifies the information that each Copermittee must maintain in its existing development inspection records.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary to compel compliance with the requirements of Provision E.5 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.5.d requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Provisions E.5.e.(1)-(2) specifically require the Copermittee to identify areas of existing development as candidates for retrofitting, and streams, channels, and/or habitats as candidates for rehabilitation. Provisions E.5.e.(1)-(2) are based on the retrofitting requirements of the Fourth Term Permits for Orange and Riverside Counties, but modified to also include identifying projects to rehabilitate channels within areas of existing development. The requirements have also been modified to be more focused on utilizing these types of projects for addressing the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Interest and opportunity to retrofit areas of existing development and rehabilitate channels located in areas of existing development has been observed in several programs the San Diego Water Board oversees (e.g., CWA Section 401 Water Quality Certification program, supplemental environmental projects, and grant programs). Each jurisdiction has miles and miles of streets that could be retrofitted to become green streets. Reshaping landscaped areas from convex to concave configurations

can detain storm water instead of directing runoff as quickly as possible to the MS4. Retrofit projects could also include simply replacing impervious surfaces with permeable surfaces.

Retrofitting projects do not necessarily have to be expensive. Retrofitting projects could be as simple as redirecting downspouts from roofs to pervious or landscaped areas instead of to hardscaped areas discharging directly to the MS4, providing rain barrels to harvest storm water from downspouts for use at a later time, or planting more trees in areas with little vegetation to provide canopy that can intercept storm water. The San Diego Water Board encourages the Copermittees to identify simple, low-cost retrofitting opportunities that can be easily implemented, in addition to other more expensive retrofitting and channel rehabilitation projects.

Rehabilitation of channels, streams, and/or habitat will require more significant planning and resources to implement. There are, however, also abundant opportunities to rehabilitate channels, streams and/or habitats in or adjacent to areas of existing development. Each Watershed Management Area likely has several creeks and stream reaches that have been undergrounded, artificially hardened, or hydromodified that could be rehabilitated to be more sustainably configured, which would slow down storm water flows and potentially have more assimilative capacity for pollutants while still being supportive of designated beneficial uses.

The San Diego Water Board recognizes that it may be infeasible to implement retrofitting or channel rehabilitation projects within certain areas of a Copermittee's jurisdictions. For such areas, the Copermittee must instead identify, develop, and implement regional retrofitting and channel rehabilitation projects (i.e. projects that can retain and/or treat storm water from one or more areas of existing development) adjacent to and/or downstream of the areas of existing development.

Provisions E.5.e.(1)-(2) do not require the implementation of retrofitting and rehabilitation projects, but do require the Copermittee to develop a program with strategies to facilitate the implementation of these types of projects in areas of existing development. The strategies are expected to include allowing and encouraging Priority Development Projects to implement retrofitting types of projects as a means of compliance with the structural BMP performance criteria requirements of Provisions E.3.c.(1) and E.3.c.(2).

<u>Provision E.6 (Enforcement Response Plans)</u> requires each Copermittee to develop an Enforcement Response Plan as part of its jurisdictional runoff management program document. Proper implementation of the Enforcement Response Plans is necessary to effectively prohibit non-storm water discharges to the MS4, and reduce the discharge of pollutants in storm water from the MS4 to the MEP.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system*" and be able to demonstrate that it can "*operate pursuant to legal*

authority established by statute, ordinance or series of contracts" to control the discharge of non-storm water and pollutants in storm water to and from its MS4. Pursuant to 40 CFR 122.26(d)(2)(i)(E) each Copermittee is specifically required to have the legal authority to "*[r]equire compliance with conditions in ordinances, permits, contracts or order*s."

The requirements under Provision E.6 are necessary to demonstrate that each Copermittee can enforce its legal authority to *"effectively prohibit non-stormwater discharges"* and "*reduce the discharge of pollutants to the maximum extent practicable*" as well as "*[r]equire compliance with conditions in ordinances, permits, contracts or order*."

The Enforcement Response Plan required under Provision E.6 will serve as a reference for the Copermittee and the San Diego Water Board to determine if consistent enforcement actions are being implemented to achieve timely and effective compliance from all public and private entities that are not in compliance with the Copermittee's ordinances, permits, or other requirements. The Enforcement Response Plan must contain clear direction for the Copermittee to take immediate enforcement action, when appropriate and necessary, in their illicit discharge detection and elimination, development planning, construction management, and existing development management programs.

If the entities subject to the Copermittee's legal authority do not implement appropriate corrective actions in a timely manner, or if violations repeat, the Copermittee must take progressively stricter responses to enforce its legal authority and achieve compliance with its ordinances, permits, or other requirements to *"effectively prohibit non-stormwater discharges"* and "*reduce the discharge of pollutants to the maximum extent practicable.*"

<u>Provision E.7 (Public Education and Participation)</u> requires each Copermittee to implement a public education and participation program. Proper implementation of the public education and participation program as part of its jurisdictional runoff management program will contribute toward effectively prohibiting non-storm water discharges to the MS4, and toward the reduction of pollutants in storm water from the MS4 to the MEP.

Provision E.7 establishes the minimum requirements that each Copermittee must implement to engage members of the public as part of its jurisdictional runoff management program. In the Fourth Term Permits, the public education program requirements and the public participation requirements were included as separate jurisdictional runoff management program components. In this Order, the public education requirements have been consolidated with the public participation requirements, as both sets of requirements are related to the engagement of the public by each Copermittee. Engagement of the public is critical for the success of each Copermittee's jurisdictional runoff management program.

The Copermittees have been implementing public education programs for the last 20 years, which are now well established. The specificity of expected public education program elements of the Fourth Term Permits has been removed. For the most part, the public education program requirements in Provision E.7.a have been reduced to a set of requirements that are specifically included in the federal regulations under 40 CFR 122.26(d)(2)(iv)(A)(6), 122.26(d)(2)(B)(6) and 122.26(d)(2)(D)(4), which should already be incorporated into each Copermittee's existing public education program. Each Copermittee is expected to utilize the information and data collected from the monitoring and assessments conducted within the Watershed Management Area, and from its inventories and inspections to best direct its public education program resources toward addressing the highest priority water quality conditions identified within the Water Quality Improvement Plan.

According to 40 CFR 122.26(d)(2)(iv), public participation is required to be included as part of the "*comprehensive planning process*", which includes the development and implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs. The requirements under Provision E.7.b specify the opportunities that the public must be provided to be involved in the "*comprehensive planning process*", as required by to 40 CFR 122.26(d)(2)(iv).

Provision E.8 (Fiscal Analysis) requires each Copermittee to secure the resources and provide an analysis of the resources that will be necessary to implement the requirements of the Order. Adequate fiscal resources are necessary for a jurisdictional runoff management program to effectively prohibit non-storm water discharges to the MS4, and reduce pollutants in storm water from the MS4 to the MEP.

According to 40 CFR 122.26(d)(2)(vi), each Copermittee is responsible for providing "*a fiscal analysis of the necessary capital and operation and maintenance expenditures necessary to accomplish the activities*" required by this Order, including "*a description of the source of funds that are proposed to meet the necessary expenditures, including legal restrictions on the use of such funds.*" The fiscal analysis requirements of Provision E.8 are consistent with 40 CFR 122.26(d)(2)(vi).

The San Diego Water Board has chosen not to require a description of fiscal benefits realized from implementation of the jurisdictional runoff management programs. This is a recommendation from the National Association of Flood and Stormwater Management Agencies.[44] For instance, the fiscal analysis requirements do not address city-wide fiscal benefits of protection (e.g., public health, tourism, property values, economic activity, beneficial uses, etc.), even though many costs currently reported to the San Diego Water Board are for related activities. This type of assessment may help Copermittees improve the allocation of resources and it may help the Copermittees secure adequate funding for the program. Qualitative

[44] National Association of Flood and Stormwater Management Agencies. 2006. *Guidance for Municipal Stormwater Funding.* Prepared under a grant provided by the USEPA.

assessments, however, could be overly subjective and most Copermittees likely lack the ability to provide accurate quantitative assessments. The San Diego Water Board encourages the Copermittees to consider means for conducting assessments of fiscal benefits derived from the programs. Such assessments could be conducted on a regional scale similar to studies of program costs conducted by the State Water Board.[45]

[45] State Water Board, 2005. NPDES Stormwater Cost Survey.

F. Reporting

Purpose: Provision F includes the requirements for the documents and reports that the Copermittees must prepare and provide to the San Diego Water Board. The documents prepared by the Copermittees and provided to the San Diego Water Board and made available to the public will provide the documentation that the Copermittees are complying with the requirements of the Order.

***Discussion*:** Provision F requires the Copermittees to prepare several documents and reports that must be provided to the San Diego Water Board and made available to the public. The reporting requirements have been significantly reduced compared to the Fourth Term Permit reporting requirements. The reduction in reporting requirements was recommended by the San Diego County Copermittees in the Report of Water Discharge submitted in June 2011.

More specific and detailed discussions of the requirements of Provision F are provided below.

Provision F.1 (Water Quality Improvement Plans) requires the Copermittees in each Watershed Management Area to develop and submit a Water Quality Improvement Plan in accordance with the requirements of Provision B.

Of all the requirements of Provision F, the Water Quality Improvement Plans will likely be the documents requiring the most significant effort to develop. The content of the Water Quality Improvement Plans, however, is expected to include content that should already have been developed for the Watershed Plans and several elements that are included in the Monitoring and Reporting Programs required under the Fourth Term Permits.

Because the Water Quality Improvement Plan is part of the "*comprehensive planning process which involves public participation*," Provision F.1 includes requirements to give multiple opportunities to the public to provide input on the content of the plans.

Provision F.1.a.(1) specifies the elements that the Copermittees must include in the public participation process for the development of the Water Quality Improvement Plans. In order for the public to be aware of the opportunities to provide input, Provision F.1.a.(1)(a) requires the Copermittees to develop a publicly available and noticed schedule of the opportunities for the public to participate and provide comments during the development of the Water Quality Improvement Plan. These opportunities are when the public can provide the data, information, and recommendations that the Copermittees can consider during the development of the Water Quality Improvement Plans.

The San Diego Water Board recognizes, however, that the Copermittees cannot be expected to incorporate all the data, information, and recommendations that the public

may provide into the Water Quality Improvement Plans. The Copermittees will have to review the data, information, and recommendations received and make some decisions on what to incorporate into the Water Quality Improvement Plans. Before the Copermittees finalize their decisions, members of the public should be allowed to review the Copermittees' decisions. Thus, Provision F.1.a.(1)(b) requires the Copermittees to form a Water Quality Improvement Consultation Panel (Panel).

The Panel will consist of a member from the environmental community and a member from the development community familiar with the Watershed Management Area. A representative from the San Diego Water Board staff will also be part of the Panel. The Copermittees may choose to include additional members, but the Panel is only required to include three panel members.

The Panel will serve as an additional public participation and input mechanism during the development of the Water Quality Improvement Plans. The knowledge and expertise from these Panel members are expected to provide the Copermittees valuable direction during their decision-making process. The Copermittees will review the content of their planned submittals with the Panel members to receive recommendations. If the Panel provides recommendations, the Copermittees must consider revisions to the Water Quality Improvement Plan submittals.

The San Diego Water Board recognizes that the development of multiple Water Quality Improvement Plans concurrently may limit the ability of the public to review and provide comments to the Copermittees. Thus, Provision F.1.a.(1)(c) requires the Copermittees to coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public time and opportunity to participate during the development of the Water Quality Improvement Plans.

Provision F.1.a.(2) requires the Copermittees to develop and submit the first Water Quality Improvement Plan component, in accordance with the requirements of Provision B.2, which includes the identification of the priority water quality conditions and potential water quality improvement strategies. The public must be provided an opportunity to provide data, information and recommendations to be utilized in the development and identification of the priority water quality conditions and potential water quality improvement strategies for the Watershed Management Area. The Copermittees must consult with the Panel and consider making revisions. The Copermittees may submit the requirements of Provision B.2 as early as 6 months and no later than 12 months after the commencement of coverage under this Order. After the requirements of Provision B.2 are submitted to the San Diego Water Board, the public will be provided another opportunity to provide comments.

Provision F.1.a.(3) requires the Copermittees to develop and submit the second Water Quality Improvement Plan component, in accordance with the requirements of Provision B.3, which includes the identification of the numeric goals for the highest priority water quality conditions identified for the Watershed Management Area, and the strategies that will be implemented to achieve the potential numeric goals. The

Copermittees may also develop the Optional Watershed Management Area Analysis, in accordance with the requirements of Provision B.3.b.(4), as part of this submittal. The public must be provided an opportunity to provide data, information and recommendations to be utilized in the development and identification of the numeric goals and water quality improvement strategies for the Watershed Management Area. The Copermittees must consult with the Panel and consider making revisions. The Copermittees may submit the requirements of Provision B.3 as early as 9 months and no later than 18 months after the commencement of coverage under this Order. After the requirements of Provision B.3 are submitted to the San Diego Water Board, the public will be provided another opportunity to provide comments.

Finally, Provision F.1.b describes the process for the submittal and implementation of the Water Quality Improvement Plans. The complete Water Quality Improvement Plans are required to be submitted by the Copermittees within 24 months after the commencement of coverage under this Order. The San Diego Water Board will provide the public an opportunity to provide comments on each complete Water Quality Improvement Plan.

The San Diego Water Board will review each Water Quality Improvement Plan and the public comments received to determine if the Copermittees have submitted a Water Quality Improvement Plan that meets the requirements of Provision B. If a Water Quality Improvement Plan does not meet the requirements of Provision B, the Copermittees will be considered out of compliance and directed in writing by the San Diego Water Board Executive Officer to correct the deficiencies.

When a Water Quality Improvement Plan meets the requirements of Provision B, the San Diego Water Board will determine whether to hold a public hearing or to limit public input to submittal of written comments before accepting the Water Quality Improvement Plan. Implementation of the Water Quality Improvement Plan must begin within 30 days of acceptance.

The San Diego Water Board expects that any deficiencies in the Water Quality Improvement Plan will be identified either in the public comments or during the review by the San Diego Water Board before implementation begins. In the event any deficiencies are identified after the implementation of the Water Quality Improvement Plan, Provision F.1.b.(7) clarifies that the San Diego Water Board maintains the right to require the Copermittees to correct any deficiencies that may be identified.

<u>Provision F.2 (Updates)</u> requires the Copermittees to update specific documents that the Copermittees will utilize to implement the requirements of this Order.

Each Copermittee is required to continue implementing a jurisdictional runoff management program, as required under Provision E. Implementation of each Copermittee's jurisdictional runoff management program is directed by its jurisdictional runoff management program document. Provision F.2.a requires each Copermittee to update its jurisdictional runoff management program document to be consistent with

the requirements of Provision E concurrent with the submittal of the Water Quality Improvement Plan.

Likewise, each Copermittee must continue to require new development and redevelopment projects to implement BMPs to control pollutants in storm water runoff. The control of pollutants in storm water runoff from development and redevelopment projects within each Copermittee's jurisdiction is guided and directed by its BMP Design Manual, formerly known as a Standard Storm Water Mitigation Plan (SSMP). Provision F.2.b requires each Copermittee to update its BMP Design Manual to be consistent with the requirements of Provision E.3 concurrent with the submittal of the Water Quality Improvement Plan.

In general, the requirements of the Order should not necessitate a complete rewrite of each Copermittee's jurisdictional runoff management program document or BMP Design Manual, as was required by the Third Term Permits. The jurisdictional runoff management program and BMP Design Manual requirements of this Order are not significantly different than the requirements of the Fourth Term Permits. Thus, only sections of the Order which are new or have been significantly changed should warrant revisions to specific sections of the Copermittee's jurisdictional runoff management program document and BMP Design Manual.

Finally, the Water Quality Improvement Plans are expected to require updates as the iterative approach and adaptive management process included in the Water Quality Improvement Plan, as required under Provision B.5, is implemented by the Copermittees. Provision F.2.c.(1) requires the Copermittees to implement a public participation process for the proposed updates, review the proposed updates with the Panel, and submit the updates to the Water Quality Improvement Plan as part of the Annual Reports required under Provision F.3.b.

Also, because TMDLs are likely to be developed, adopted and approved during the term of the Order, Provision F.2.c.(2) has been included to expedite the incorporation of TMDLs into the Copermittees' Water Quality Improvement Plans as part of the update process, potentially before the Order is re-opened to incorporated the requirements of the new TMDLs.

<u>Provision F.3 (Progress Reporting)</u> requires the Copermittees to report on the progress of implementing the Water Quality Improvement Plans.

The requirements of Provision F.3 are to report the progress toward improving water quality that the Copermittees are achieving with the implementation of the Water Quality Improvement Plans and each Copermittee's jurisdictional runoff management program. The Progress Report Presentations required under Provision F.3.a are included to provide the Copermittees an opportunity to communicate directly with the San Diego Water Board and the public. The Progress Report Presentations will also provide the members of the San Diego Water Board and members of the public an opportunity to become more acquainted with the Copermittees and their projects and

programs to address non-storm water and storm water discharges into and from their MS4s.

The Annual Report requirements of Provision F.3.b are a consolidation of several reporting requirements from the Fourth Term Permits, including the Jurisdictional Runoff Management Program Annual Reports, the Watershed Annual Reports, and the Monitoring and Reporting Program Annual Reports. Furthermore, the Annual Report requirements are consistent with the requirements under 40 CFR 122.42(c).

Pursuant to 40 CFR 122.42(c), "*[t]he operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the Director…must submit an annual report*", which must include the following:

(1) *The status of implementing the components of the storm water management program that are established as permit conditions* [40 CFR 122.42(c)(1)];

(2) *Proposed changes to the storm water management programs that are established as permit conditions* [40 CFR 122.42(c)(2)];

(3) *Revisions, if necessary, to the assessment of controls and fiscal analysis* [40 CFR 122.42(c)(3)];

(4) *A summary of data, including monitoring data, that is accumulated throughout the reporting year* [40 CFR 122.42(c)(4)];

(5) *Annual expenditures and budget for year following each annual report* [40 CFR 122.42(c)(5)];

(6) *A summary describing the number and nature of enforcement actions, inspections, and public education programs* [40 CFR 122.42(c)(6)];

(7) *Identification of water quality improvements or degradation* [40 CFR 122.42(c)(7)].

Under the Fourth Term Permits, each Copermittee is responsible for submitting a Jurisdictional Runoff Management Program Annual Report; the Copermittees in each designated watershed are responsible for submitting a Watershed Annual Report; and the Copermittees from each county are responsible for submitting a Monitoring and Reporting Program Annual Report.

There are 39 Copermittees in the San Diego Region, each required to prepare and submit a Jurisdictional Runoff Management Program Annual Report. There are 9 designated watersheds in San Diego County, 6 designated watersheds in Orange County, and 1 designated watershed in Riverside County for a total of 16 designated watersheds, each requiring a Watershed Annual Report. There are 3 sets of Copermittees in 3 counties in the San Diego Region, requiring Copermittees from each county to prepare and submit a Monitoring and Reporting Program Annual Report.

Thus each Copermittee is currently required to prepare, or participate in the preparation of at least 3 annual reports. In addition, the San Diego County Copermittees are required to prepare and submit a Regional Urban Runoff Management Plan Annual Report.

In total, there are 59 annual reports that are prepared by the Copermittees and submitted to the San Diego Water Board for the Fourth Term Permits. The preparation of these annual reports requires significant time and resources from each Copermittee, which could otherwise be expended on actions that could improve water quality within its jurisdiction. In turn, significant time and resources are required from the San Diego Water Board staff to review these reports, which could otherwise be expended on working directly with the Copermittees to improve their implementation efforts toward restoring and protecting water quality.

Until the Water Quality Improvement Plans are developed, there will be a transitional period during which the Copermittees will continue to implement their existing jurisdictional runoff management programs. There will also be a transitional period during which the Copermittees will implement the transitional monitoring and assessment requirements of Provision D. During the transitional period, the Copermittees will submit annual reports pursuant to the requirements of Provisions F.3.b.(1) and F.3.b.(2).

Provision F.3.b.(1) includes the transitional annual reporting requirements for each Copermittee's jurisdictional runoff management program. The reporting of the jurisdictional runoff management program implementation efforts have been reduced to a single 2-page form. Each Copermittee is required to complete and submit a Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D or a revised form accepted by the San Diego Water Board) no later than October 31 of each year for each jurisdictional runoff management program reporting period (i.e. July 1 to June 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted. The Jurisdictional Runoff Management Program Annual Report Form will certify that each Copermittee has implemented its jurisdictional runoff management program in accordance with the requirements of Provision E. Each Copermittee may choose to continue to utilize and submit the jurisdictional runoff management program annual reporting format of its current Order until the first Water Quality Improvement Plan Annual Report is required to be submitted.

Provision F.3.b.(2) includes the transitional annual reporting requirements for the transitional monitoring and assessment program for each Watershed Management Area. The Copermittees in the Watershed Management Area are required to submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted. The Transitional Monitoring and Assessment Program Annual Report is required to include

the transitional period monitoring data collected pursuant to Provisions D.1.a and D.2.a, and the findings from the transitional period findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

Provision F.3.b.(3) includes the Water Quality Improvement Plan Annual Report requirements. Only one Water Quality Improvement Plan Annual Report is required for each of the ten (10) Watershed Management Areas designated under Provision B.1, which is a significant reduction in the number of annual reports required to be prepared and submitted by the Copermittees. The Water Quality Improvement Plan Annual Report will document the Copermittees' efforts to implement the Water Quality Improvement Plan. Each Water Quality Improvement Plan Annual Report will be focused primarily on reporting the analysis of the monitoring data collected pursuant to Provisions D.1-D.3 during the reporting period, and the assessments that are required pursuant to Provision D.4 based on the data. The monitoring data analyses and the assessments that are provided in the Water Quality Improvement Plan Annual Report will be the core of the report. The reporting of the jurisdictional runoff management program implementation efforts have been reduced to a single 2-page form, and will no longer be the primary focus of the reporting requirements as in the Third and Fourth Term Permits.

Each Copermittee will continue to prepare and submit a Jurisdictional Runoff Management Program Annual Report Form as part of the Water Quality Improvement Plan Annual Report to certify that each Copermittee has implemented its jurisdictional runoff management program in accordance with the requirements of Provision E. Instead of reviewing a voluminous report from each Copermittee, as was required under the Third and Fourth Term Permits, the San Diego Water Board will conduct audits of each Copermittee's jurisdictional runoff management program to investigate and confirm the information provided by each Copermittee on its Jurisdictional Runoff Management Program Annual Report Form. The audits will allow the San Diego Water Board to become more familiar with the each Copermittee's jurisdictional runoff management program, and each Copermittee will become more informed about the expectations of the San Diego Water Board.

The reduction in the number and content of the Water Quality Improvement Plan Annual Reports should result in significant time, cost and resource savings for the Copermittees, as well as the San Diego Water Board. Those savings should offset a significant portion of any additional costs that may be incurred to develop the Water Quality Improvement Plans and to implement the monitoring and assessment program requirements of Provision D.

The reporting period for the Water Quality Improvement Plan Annual Reports consists of two periods. Because the jurisdictional runoff management programs are typically budgeted and implemented during a fiscal year, the information provided on the Jurisdictional Runoff Management Program Annual Report Forms will cover the period from July 1 to June 30 of the following year.

The Water Quality Improvement Plan Annual Reports, however, are focused primarily on the monitoring data and the assessments based on the monitoring data. The monitoring data is collected during the monitoring year, which begins October 1 and ends September 30 of the following year. The monitoring year begins after the beginning of the fiscal year and ends after the end of the fiscal year. Therefore, to accommodate and capture the information collected during the fiscal year and the monitoring year, the Annual Report reporting period incorporates both periods.

Finally, Provision F.3.c requires the Copermittees to develop and submit a Regional Monitoring and Assessment Report. The Regional Monitoring and Assessment Report is similar to the Long Term Effectiveness Assessment required under the Fourth Term San Diego County Permit. The Regional Monitoring and Assessment Report is expected to utilize the entire body of data and information collected by the Copermittees during the term of this Order to assess improvements to water quality on a regional scale.

Provision F.4 (Regional Clearinghouse) requires the Copermittees to develop, update, and maintain an internet-based Regional Clearinghouse that can be used to store, disseminate, and share the Copermittees' documents, monitoring data, special studies, and any other data or information.

Most of the documents and data that are generated by the Copermittees can be provided in electronic format, and made available to the San Diego Water Board and the public on the internet. The San Diego Water Board has been gradually transitioning its document submittal requirements to electronic submittals. Provision F.4 has been included to further these efforts.

Provision F.4 has also been included to improve the exchange and availability of information among the Copermittees, as well as between the Copermittees and the San Diego Water Board. Provision F.4 will also make the information generated during the implementation of the Order more accessible to the public.

Provision F.5 (Report of Waste Discharge) requires the Copermittees to submit a Report of Waste Discharge to reapply for renewal of the Order prior to its expiration, in accordance with 40 CFR 122.21(d)(2) and CWC section 13376.

Because the Riverside County Copermittees will not be subject to the requirements of this Order until they are notified of coverage, Provision F.5.a describes the process of submitting a Report of Waste Discharge pursuant to the requirements of their current permit to obtain coverage under this Order.

For the Copermittees subject to the requirements of this Order, Provision F.5.b requires the Copermittees to submit a Report of Waste Discharge 180 days in advance of the expiration of this Order. Provision F.5.b also describes the minimum information to be included in the Report of Waste Discharge, based on USEPA

guidance “Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems,” dated May 17, 1996.

Provision F.6 (Application for Early Coverage) describes the process that would allow the Orange County and/or Riverside County Copermittees to obtain coverage under this Order earlier than the expiration of their current Orders.

If the Riverside County Copermittees choose to obtain coverage under this Order earlier than the expiration of their current Orders, the preparation and submittal of a Report of Waste Discharge, as required by the Fourth Term Permits, will not be necessary. The existing Order for the respective county will be rescinded upon the effective coverage date under this Order, except for enforcement purposes.

G. Principal Watershed Copermittee Responsibilities

Purpose: Provision G includes the requirements for the Principal Watershed Copermittee designated by the Copermittees in each Watershed Management Area.

***Discussion*:** Unlike previous NPDES requirements, there will no longer be a single Principal Copermittee. Provision G.1 requires the Copermittees to designate a Principal Watershed Copermittee for each Watershed Management Area. There are ten (10) Watershed Management Areas in the San Diego Region, as defined in Table B-1 under Provision B.1 of the Order. An individual Copermittee should not be the Principal Watershed Copermittee for more than two (2) Watershed Management Areas. There could be up to ten (10) Principal Water Copermittees designated for the Watershed Management Areas in the San Diego Region.

Provision G.2 describes the minimum responsibilities of each Principal Watershed Copermittee. The primary responsibility of the Principal Watershed Copermittees is to serve as the liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues. Ideally, the Principal Watershed Copermittee can represent the interests of all the Copermittees within a Watershed Management Area during discussions or meetings to facilitate communication with the San Diego Water Board. The Principal Watershed Copermittees are also responsible for facilitating and coordinating the implementation efforts of the Copermittees and submittals of required documents and reports.

The Principal Watershed Copermittee is responsible for facilitating the efforts of the Copermittees within the Watershed Management Area to develop the Water Quality Improvement Plan required under Provision B, and submit it for approval in accordance with Provision F.1. The Principal Watershed Copermittee is also responsible for coordinating the submittal of the document updates, Progress Report Presentations, and Annual Reports required from the Copermittees within each Watershed Management Area under Provisions F.2, F.3.a, and F.3.b. The Principal Watershed Copermittees are responsible for coordinating with each other to develop and submit the Regional Clearinghouse, Regional Monitoring and Assessment Report, and the Report of Waste Discharge required under Provisions F.3.c, F.4, and F.5.

The designated Principal Watershed Copermittee for each Watershed Management Area does not necessarily have to serve as the Principal Watershed Copermittee for the entire term of the Order. If the Copermittees in a Watershed Management Area choose to designate a new Principal Watershed Copermittee, the change may be submitted as part of the Annual Report required under Provision F.3.b, with an update to the Water Quality Improvement Plan in accordance with Provision F.2.c.

Provision G.3 specifies that the Principal Watershed Copermittee is not responsible for ensuring that the other Copermittees within the Watershed Management Area are in compliance with the requirements of this Order

H. Modification of Order

Purpose: Provision H provides the conditions under which modifications to Order No. R9-2013-0001, as amended, may occur.

***Discussion*:** Provision H allows for modifications to Order No. R9-2013-0001, as amended, for bases in addition to modifications (minor and major) allowed under the federal regulations at 40 CFR 122.62 and 122.63.

Modifications to the Order require re-opening the Order (see Water Code section 13223), subject to the requirements of 40 CFR 122.44, 122.62 to 122.64, and 124.5, but only for the specific provisions subject to the modification. Proposed modifications of the Order will be made available for public review, a public notice and comment period, and a public hearing if requested. Comments on the provisions not subject to the proposed modifications are not required to be considered in the San Diego Water Board's responses to comments or during the public hearing.

Provision H.4 was included to specify that the Order will be re-opened for modifications if the State Water Board determines revisions to Provision A are warranted, an application for early coverage under the Order is received pursuant to Provision F.6, the Basin Plan is amended to modify an existing TMDL or incorporate a new TMDL, or the monitoring and assessment program requirements need to be updated or revised.

Provision H.5 was included to specify that the San Diego Water Board will re-open and consider modifications to this Order when the Orange County Copermittees or the Riverside County Copermittees submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders

I. Standard Permit Provisions and General Provisions

Purpose: Provision I incorporates the standard permit provisions required to be included in all NPDES permits, as well as several other general provisions.

***Discussion*:** Provision I refers to Attachment B to the Order. Attachment B expressly incorporates the conditions applicable to all NPDES permits as provided under 40 CFR 122.41(a)-(n), as well as the applicable conditions for MS4s and storm water discharges provided under 40 CFR 122.42(c) and 40 CFR 122.42(d), respectively. Attachment B also includes several general provisions that are typically included in or applicable to waste discharge requirements issued by the San Diego Water Board.

IX. ATTACHMENTS

The attachments to the Order are discussed below. The discussions describe the content of the attachments.

Attachment A – Discharge Prohibitions and Special Protections

Section 1 of Attachment A includes the Waste Discharge Prohibitions from the Basin Plan. They have been provided verbatim in their entirety.

Section 2 of Attachment A includes the "*Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges*" applicable to permitted point source discharges of storm water, adopted under State Water Board Resolution No. 2012-0012, as amended by Resolution No. 2012-0031. The terms, prohibitions, and special conditions (collectively referred to as special conditions) are established as limitations on point source storm water discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in ASBS, as required for State Water Quality Protection Areas pursuant to California Public Resources Code sections 36700(f) and 36710(f). These Special Protections were adopted by the State Water Board as part of the Ocean Plan General Exception.

Attachment B – Standard Permit Provisions and General Provisions

Conditions applicable to all NPDES permits, as required under 40 CFR 122.41, and conditions applicable to MS4s and storm water discharges, as required under 40 CFR 122.42(c) and 122.42(d), respectively are provided in Attachment B to the Order. They have been provided expressly in their entirety.

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. These general provisions are typically included in or applicable to waste discharge requirements issued by the San Diego Water Board. Many of the general provisions were developed by the State Water Board. Where a general provision is derived from statute or regulation, a citation of the statute or regulation section is provided. General provisions that do not provide a citation are included under the authority provided CWC 13377.

Attachment C – Acronyms, Abbreviations and Definitions

The acronyms and abbreviations that are used in the Order are provided in Attachment C. Attachment C also includes definitions that may provide an explanation or description of the meaning or intent of specific terms or phrases included in the Order.

Attachment D – Jurisdictional Runoff Management Program Annual Report Form

An example of the Jurisdictional Runoff Management Program Annual Report Form required to be submitted by each Copermittee as part of the Annual Reports required under Provision F.3.b.(1)(e) is provided as Attachment D to the Order. An electronic version of the form will be available from the San Diego Water Board after the adoption of the Order.

The Jurisdictional Runoff Management Program Annual Report Form includes the minimum information necessary to demonstrate that the Copermittee is implementing and in compliance with the requirements of Provision E, and includes much of the information required to be reported pursuant to 40 CFR 122.42(c).

The information that must be provided on the Jurisdictional Runoff Management Program Annual Report Form is limited to the fiscal year, which begins July 1 and ends June 30 of the following year. The information expected to be provided by the Copermittees in each section of the Jurisdictional Runoff Management Program Annual Report Form is discussed below.

I. COPERMITTEE INFORMATION

The name of the Copermittee (e.g. name of city, county, or special district) and the contact information for the storm water program manager are provided under this section.

II. LEGAL AUTHORITY

The Copermittee must confirm whether or not the legal authorities under Provision E.1.a have been established for itself within its jurisdiction.

The Copermittee must also confirm whether or not a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority, as required under Provision E.1.b. The certification statement required by Provision E.1.b is only required to be submitted with the first Annual Report required under Provision F.3.b.

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

The Copermittee must inform the San Diego Water Board whether or not an update to its jurisdictional runoff management program document was required or recommended by the San Diego Water Board during the reporting period. An update to the jurisdictional runoff management program is required under Provision F.2.a. The San Diego Water Board may recommend modifications to the jurisdictional runoff management program as part of the iterative approach and adaptive management process required under Provision B.5, which may result in an update that is necessary for the Copermittee's jurisdictional runoff management document.

If an update was required or recommended, the Copermittee must confirm whether or not the update was completed and made available on the Regional Clearinghouse within the reporting period. If no update was required or recommended, an answer is not required. If the answer is NO, meaning the required or recommended update was not completed and/or made available on the Regional Clearinghouse, the Copermittee must attach a schedule for the completion of the update and/or posting of the updated document on the Regional Clearinghouse.

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

The Copermittee must confirm whether or not a program was implemented during the fiscal year to actively detect and eliminate illicit discharges and connections in accordance with the requirements under Provision E.2.

In addition to confirming that a program to detect and eliminate illicit discharges was implemented during the reporting period, the Copermittee is also required to report on several items related to the program. The information that must be reported is limited to the fiscal year for the Annual Report.

All non-storm water discharges are considered illicit discharges unless the source is identified as one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5). If a non-storm water discharge is identified as one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5), the discharge is a non-storm water discharge, but not an illicit discharge. If a non-storm water discharge is identified but not in one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5), the discharge is both a non-storm water discharge and an illicit discharge.

V. DEVELOPMENT PLANNING PROGRAM

The Copermittee must confirm whether or not a development planning program was implemented during the fiscal year in accordance with the requirements under Provision E.3.

The Copermittee must also inform the San Diego Water Board whether or not an update to its BMP Design Manual was required or recommended by the San Diego Water Board during the fiscal year. An update to the BMP Design Manual is required under Provision F.2.b. The San Diego Water Board may recommend modifications to the BMP Design Manual, which may result in an update that is necessary for Copermittee's the BMP Design Manual.

If an update was required or recommended, the Copermittee must confirm whether or not the update was completed and made available on the Regional Clearinghouse within the reporting period. If no update was required or recommended, an answer is not required. If the answer is NO, meaning the required or recommended update was not completed and/or made available on the Regional Clearinghouse, the Copermittee must attach a schedule for the completion of the update and/or posting of the updated document on the Regional Clearinghouse.

The Copermittee is also required to report on several items related to the program. For the development and redevelopment projects that are reviewed under the program, the Copermittee must report the total number projects submitted for review during the fiscal year. Of those projects, the Copermittee must report the number that are Priority Development Projects, as defined under Provision E.3.b.(1). The Copermittee must also report the number of Priority Development Projects that were approved and/or granted occupancy during the fiscal year, regardless of when the project was originally submitted for review. Any projects that were approved during the fiscal year and granted any exemptions from the BMP Design Manual requirements and/or allowed to implement alternative compliance options in accordance with Provision E.3.c.(3) must be reported.

Finally, the Copermittee must also report on several items related to its oversight of permanent BMPs on Priority Development Projects within its jurisdiction, as required

under Provision E.3.e. The information that must be reported is limited to the fiscal year for the Annual Report.

VI. CONSTRUCTION MANAGEMENT PROGRAM

The Copermittee must confirm whether or not a construction management program was implemented during the fiscal year in accordance with the requirements under Provision E.4.

The Copermittee is also required to report on several items related to its oversight construction projects within its jurisdiction. The information that must be reported is limited to the fiscal year for the Annual Report.

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

The Copermittee must confirm whether or not an existing development management program was implemented during the fiscal year in accordance with the requirements under Provision E.5.

The Copermittee is also required to report on several items related to its oversight in areas of existing development within its jurisdiction. The information that must be reported is limited to the fiscal year for the Annual Report. The information must also be separated into four categories of existing development: municipal, commercial, industrial, and residential.

VIII. PUBLIC EDUCATION AND PARTICIPATION

The Copermittee must confirm whether or not a public education program component was implemented during the fiscal year in accordance with the requirements under Provision E.7.a.

The Copermittee must also confirm whether or not a public participation program component was implemented during the fiscal year in accordance with the requirements under Provision E.7.b.

IX. FISCAL ANALYSIS

The Copermittee must confirm a summary of its fiscal analysis, conducted in accordance with the requirements under Provision E.8, has been attached to the form.

X. CERTIFICATION

A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative must sign and certify the Jurisdictional Runoff Management Program Annual Report Form. The appropriate box must be checked to indicate the whether a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative is signing the form.

Attachment E – Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2013-0001

Attachment E provides specific provisions for implementing the load allocations (LAs) and wasteload allocations (WLAs) of Total Maximum Daily Loads (TMDLs) adopted by the San Diego Water Board and approved by USEPA in which the Copermittees are identified as responsible for discharges subject to the requirements of the TMDLs. Federal regulations require that NPDES requirements incorporate water quality based effluent limitations (WQBELs) that must be consistent with the requirements and assumptions of any available WLAs,[46] which may be expressed as numeric effluent limitations, when feasible, and/or as a best management practice (BMP) program of expanded or better-tailored BMPs.[47] Where the TMDL includes WLAs that provide numeric pollutant load or pollutant parameter objectives, the WLA has been, where feasible, translated into numeric WQBELs.[48]

For each TMDL in Attachment E, four sections are included:

a. Applicability: This section provides the resolution under which the TMDL Basin Plan amendment was adopted and approved, with the applicable adoption and approval dates. This section also gives the effective date of the TMDL and where the TMDL is applicable (i.e. Watershed Management Area and water body). The Copermittees that are responsible for implementing the specific provisions are also given in this section.

b. Final TMDL Compliance Requirements: For each TMDL, the final TMDL compliance requirements consist of the final TMDL compliance date(s), the final WQBELs, and the final TMDL compliance determination requirements. The final WQBELs are expressed in terms of receiving water limitations, effluent limitations, and/or best management practices (BMPs). The final WQBELs for the TMDLs are incorporated by reference into Provision A of the Order. The final WQBELs become enforceable when the final TMDL compliance dates have passed. Applicable BMPs within the final WQBELs must be incorporated into the Water Quality Improvement Plans. Compliance with the final WQBELs will be determined in accordance with the options provided under the final TMDL compliance determination requirements.

c. Interim TMDL Compliance Requirements: If the final TMDL compliance date has not passed and there are interim TMDL compliance requirements, they are included in this section. If there are interim WQBELs with interim compliance dates, the interim WQBELs become enforceable when the corresponding interim compliance dates have passed. Compliance with the interim WQBELs will be determined in accordance with the options provided under the interim TMDL compliance determination requirements.

d. Specific Monitoring and Assessment Requirements: If there are specific monitoring and assessment requirements that cannot be met with the monitoring and assessment program

[46] 40 CFR 122.44(d)(1)(vii)(B)
[47] 40 CFR 122.44(k)(2) and 40 CFR 122.44(k)(3)
[48] November 26, 2014 Memorandum from the USEPA, Revisions to the November 22, 2002 Memorandum "Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLA""

requirements under Provision D of the Order, the additional requirements are included in this section.

The requirements of the TMDLs are based on and consistent with the assumptions and requirements of any available adopted and approved TMDLs that have been incorporated into the Basin Plan. Modifications to the requirements for the TMDLs in Attachment E cannot be made unless the TMDLs are modified in the Basin Plan.

A modification to any aspect of a TMDL in the Basin Plan requires a Basin Plan amendment. A Basin Plan amendment to modify a TMDL will require the San Diego Water Board to adopt a resolution to amend the Basin Plan, which includes a separate public process. When the San Diego Water Board adopts a Basin Plan amendment, it subsequently requires approval from the State Water Board, the Office of Administrative Law, and the USEPA before it becomes effective.

If and when the TMDLs are a modified in the Basin Plan, the San Diego Water Board will revise the requirements of the Order in accordance with the Basin Plan amendment. When a Basin Plan amendment to modify a TMDL becomes effective, the San Diego Water Board will modify the requirements of the Order pursuant to the requirements of Provision H.4 of the Order as soon as possible.

Walsh, Laurie@Waterboards

From: lyris@swrcb18.waterboards.ca.gov
Sent: Wednesday, March 04, 2015 3:59 PM
To: Walsh, Laurie@Waterboards
Subject: Order R9-2015-0001 An Order Amending Order R9-2013-0001 and Attachments, San Diego Regional MS4 Permit

Water Boards This is a message from the California Regional Water Quality Control Board, San Diego Region (9).

Stakeholders and Interested Persons,

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) is pleased to inform you that the finalized copy of Order No. R9-2015-0001, NPDES No. CAS010266, *An Order Amending Order No. R9-2013-0001, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Amending Order), as adopted by the San Diego Water Board February 11, 2015 is complete and available electronically on the San Diego Water Board website at http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

Order No. R9-2015-0001 identifies specific changes made to Order R9-2013-0001 and Attachments. Specific changes can be seen in a blue underline and red-strikeout text version named Final Amended Order No. R9-2013-0001 (Order Only) and Final Fact Sheet to Amended Order No. R9-2013-0001 (Fact Sheet Only). A conformed copy of Order R9-2013-0001 and Attachments which incorporates all adopted changes is also available on the San Diego Water Board website at http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

Please submit any written correspondence in response to this email to SanDiego@waterboards.ca.gov. Electronic documents must be submitted as a single file, in Portable Document Format (PDF) format, and converted to text searchable format using Optical Character Recognition (OCR). All electronic documents must also include scanned copies of all signature pages; electronic signatures will not be accepted. Electronic documents submitted to the San Diego Water Board must include the following identification numbers in the header or subject line: PIN: CW-786088:lwalsh.

Laurie Walsh, PE
San Diego Water Board

2375 Northside Drive, Suite 100
San Diego, CA 92108
Direct Phone: 619-521-3373
Main Line: 619-516-1990
Fax No. (619) 516-1994
Email: Laurie.Walsh@waterboards.ca.gov

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD
www.waterboards.ca.gov/sandiego/

You are currently subscribed to reg9_riversideco_ms4permit as: Laurie.Walsh@waterboards.ca.gov.

To unsubscribe click here: leave-3786963-517884.fe4ac2551da2875f89bb8791d9bbf856@swrcb18.waterboards.ca.gov

Chiu, Wayne@Waterboards

From: Arias, Christina@Waterboards
Sent: Tuesday, March 03, 2015 1:22 PM
To: Kolb, Ruth (RKolb@sandiego.gov); Stroud, Heather (HStroud@sandiego.gov); Lin, Cindy (Lin.Cindy@epa.gov)
Cc: Chiu, Wayne@Waterboards; Haas, Jeremy@Waterboards; Becker, Eric@Waterboards
Subject: Sediment TMDL proposed revisions
Attachments: 2015-0303 Sed TMDL proposed revisions.docx

Good afternoon ladies and gents,

Thank you for a productive meeting this morning. I'm attaching the proposed changes that we discussed. Hopefully this addresses the City of San Diego's concern with preserving the intent of the basin plan amendment. If I don't hear back from anyone, we will proceed forward with this language during the reissuance of the MS4 permit to the Riverside Copermittees.

Christina Arias, PE
Water Resource Control Engineer
San Diego Regional Water Quality Control Board
Tel. (619) 521-3361

2375 Northside Drive, Suite 100
San Diego, CA 92108

7. Total Maximum Daily Loads for Sediment in Los Peñasquitos Lagoon

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2012-0033

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2012
State Water Board Approval Date:	January 21, 2014
Office of Administrative Law Approval Date:	July 14, 2014
US EPA Approval Date:	October 30, 2014

(3) TMDL Effective Date: July 14, 2014

(4) Watershed Management Area: Los Peñasquitos

(5) Water Body: Los Peñasquitos Lagoon

(6) Responsible Copermittees: County of San Diego, City of San Diego, City of Del Mar, and City of Poway

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final sediment TMDL compliance requirements for Los Peñasquitos Lagoon consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must be in compliance with the final TMDL compliance requirements by December 31, 2034.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not prohibit the sustainable restoration of tidal and non-tidal saltmarsh vegetation of at least 346 acres.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations by the compliance date under Provision 7.b(1) will not cause or contribute to a failure of the receiving water condition specified under Specific Provision 7.b.(2)(a):

Table 7.1
*Final Effluent Limitations as Expressed as Wet Season Loads in MS4 Discharges to Los Peñasquitos Lagoon**

Constituent	Effluent Limitation
Sediment	2,580 tons/wet season

*Final effluent limitations are to be achieved by the following Responsible Parties: County of San Diego, City of San Diego, City of Del Mar, City of Poway, Phase II MS4 permittees, Caltrans, general construction storm water NPDES permittees, and general industrial storm water NPDES permittees.

(c) Best Management Practices

(i) The Water Quality Improvement Plan for the Los Peñasquitos Watershed Management Area must incorporate the Sediment Load Reduction Plan required to be developed pursuant to Resolution No. R9-2012-0033.

(ii) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 7.b.(2)(a) and/or the Copermittee's portion of the effluent limitations under Specific Provision 7.b.(2)(b) for Los Peñasquitos Lagoon.

(3) Final TMDL Compliance Determination

Compliance determination with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) Successful restoration of 80 percent of the 1973 acreage of tidal and non-tidal lagoon salt marsh (346 acres) as described in Attachment A of Resolution No. R9-2010-0033; OR

(b) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 7.b.(2)(c)(ii) and/or other implementation actions to achieve compliance with Specific Provision 7.b.(3)(a) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 7.b.(2)(c)(ii) or other implementation actions to achieve compliance with Specific Provision 7.b.(3)(a),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs

required under Specific Provision 7.b.(2)(c)(ii) or other implementation actions, AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 7.d to demonstrate compliance with Specific Provision 7.b.(3)(a).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim sediment TMDL compliance requirements for Los Penasquitos Lagoon consist of the following:

(1) Interim Compliance Dates and WQBELs

The Responsible Copermittees must comply with the interim WQBELs, expressed as wet season loads, by December 31 of the interim compliance year set forth in Table 7.2.

Table 7.2
*Interim Water Quality Based Effluent Limitations Expressed as Wet Season Loads in MS4 Discharges**

Interim Compliance Date	Interim Effluent Limitations (tons/wet season)
December 31, 2019	6,691
December 31, 2023	5,663
December 31, 2027	4,636
December 31, 2029	3,608

*Interim effluent limitations are to be achieved by the following Responsible Parties: County of San Diego, City of San Diego, City of Del Mar, City of Poway, Phase II MS4 permittees, Caltrans, general construction storm water NPDES permittees, and general industrial storm water NPDES permittees.

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) The final receiving water limitation under Specific Provision 7.b.(2)(a) is met; OR

(c) There are no exceedances of the Copermittee's portion of interim effluent limitations under Table 7.2 at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board,

which provides reasonable assurance that the Copermittee's portion of the interim TMDL compliance requirements described in Attachment A of Resolution No. R9-2010-0033 will be achieved by the interim compliance date.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) Watershed Monitoring

The Responsible Copermittees must conduct suspended sediment, bed load, and flow monitoring to calculate total sediment loading to the Los Peñasquitos Lagoon for each wet season (October 1 thru April 30) as set forth below:

(a) The Responsible Copermittees must monitor enough storm events throughout the season to quantify sediment loading over each wet season, and

(b) The Responsible Copermittees must monitor at least 3 stations to quantify cumulative sediment loading into Los Peñasquitos Lagoon. Stations must be located within the Los Peñasquitos, Carroll Canyon, and Carmel Creek tributaries prior to discharging into Los Peñasquitos Lagoon.

(2) Lagoon Monitoring

The Responsible Copermittees must monitor Los Peñasquitos Lagoon each Fall for changes in the extent of the vegetation types as set forth below:

(a) The Responsible Copermittees must acquire aerial photos of Los Peñasquitos Lagoon and digitize them at an approximate scale of 1:2,500,

(b) The Responsible Copermittees must appropriately interpret the vegetation and classify the various types as saltmarsh, non-tidal saltmarsh, freshwater marsh, non-tidal saltmarsh –*Lolium perrene* infested, southern willow scrub/mulefat scrub, herbaceous wetland, or upland land cover.

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the monitoring data collected under Specific Provision 7.d(1) and 7.d(2) to assess whether the interim and final WQBELs have been achieved.

(b) For assessing and determining compliance with the final receiving water limitations under Specific Provision 7.b.(2)(a), the Responsible Copermittees must use the data acquired under Specific Provision 7.d.(2) to estimate the acreage of tidal and non-tidal saltmarsh actually restored.

(c) For assessing and determining compliance with the final effluent limitations under Specific Provision 7.b.(2)(b), the Responsible Copermittees must use the data acquired under Specific Provision 7.d.(1) to estimate sediment loading into Los Peñasquitos Lagoon. Sediment loading must be evaluated using a 3-year, weighted rolling average. The first reported average shall be calculated using data collected in the year, 2015-2016, 2016-2017, and 2017-2018 wet seasons.

(d) The monitoring and assessment results must be submitted as part of the Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

Chiu, Wayne@Waterboards

From: Lomeli, Eric <erlomeli@rcflood.org>
Sent: Wednesday, March 18, 2015 6:46 AM
To: Chiu, Wayne@Waterboards
Cc: Becker, Eric@Waterboards; Garcia, David
Subject: RE: Pre-Meeting for ROWD

Good Morning Wayne,

That sounds good. April 15th at 9am prior to our TAC meeting we will have the Pre-ROWD meeting. I'll try to see if we can somehow have the meeting during the week of April 6-10 if the Copermittees' schedules become open. I will notify you if anything changes.

The Pre-ROWD and TAC meeting will both be held at the City of Murrieta next month in their DRC conference room. The address is as follows…

1 Town Square
Murrieta, CA 92562

If you should have any questions, please call or email me. Thank you.

Eric R. Lomeli
Associate Engineer
Santa Margarita Watershed MS4 Permit Manager
Riverside County Flood Control and
Water Conservation District
(951) 955-8589
1995 Market Street
Riverside, California 92501
erlomeli@rcflood.org

From: Chiu, Wayne@Waterboards [mailto:Wayne.Chiu@waterboards.ca.gov]
Sent: Friday, March 13, 2015 8:31 AM
To: Lomeli, Eric
Cc: Becker, Eric@Waterboards; Garcia, David
Subject: RE: Pre-Meeting for ROWD

Hi Eric,

Unless you can find a date that works during the week of April 6-10, April 15 before the TAC meeting will work. We can be in Temecula around 9am.

Thanks,
Wayne Chiu, PE
Water Resource Control Engineer
Storm Water Management Unit
California Regional Water Quality Control Board

San Diego Region
2375 Northside Drive, Suite 100
San Diego, CA 92108
Direct Line: (619) 521-3354
Main Line: (619) 516-1990

From: Lomeli, Eric [mailto:erlomeli@rcflood.org]
Sent: Thursday, March 12, 2015 6:36 AM
To: Chiu, Wayne@Waterboards
Cc: Becker, Eric@Waterboards; Garcia, David
Subject: RE: Pre-Meeting for ROWD

Good Morning Wayne,

I'll ask the Co-Permittees to see if they are available during the week of April 6-10. If this doesn't work, I believe we can have the meeting prior to our SMR TAC meeting on April 15th. I'll try to get you an answer by early next week. Thank you.

Eric R. Lomeli
Associate Engineer
Santa Margarita Watershed MS4 Permit Manager
Riverside County Flood Control and
Water Conservation District
(951) 955-8589
1995 Market Street
Riverside, California 92501
erlomeli@rcflood.org

From: Chiu, Wayne@Waterboards [mailto:Wayne.Chiu@waterboards.ca.gov]
Sent: Wednesday, March 11, 2015 5:23 PM
To: Lomeli, Eric
Cc: Becker, Eric@Waterboards; Garcia, David
Subject: RE: Pre-Meeting for ROWD

Hi Eric,

March 31 is Cesar Chavez Day, a holiday for us. So, unfortunately, that's the one day that won't work for us. Assuming no other days during the weeks of March 23-27 and March 30-April 3 work for you, is there anything that will work the following week, April 6-10?

Thanks,
Wayne

From: Lomeli, Eric [erlomeli@rcflood.org]
Sent: Wednesday, March 11, 2015 4:03 PM
To: Chiu, Wayne@Waterboards
Cc: Becker, Eric@Waterboards; Garcia, David
Subject: RE: Pre-Meeting for ROWD

Hi Wayne,

It looks like the only day that all of the Copermittees are available to have the meeting will be on **March 31st (Tuesday) at 9am**. Aldo (City of Temecula) was able to reserve their Great Oaks Conference room for us from 9am to 12pm. If anything changes, please let me know. Thank you.

Eric R. Lomeli
Associate Engineer
Santa Margarita Watershed MS4 Permit Manager
Riverside County Flood Control and
Water Conservation District
(951) 955-8589
1995 Market Street
Riverside, California 92501
erlomeli@rcflood.org

From: Chiu, Wayne@Waterboards [mailto:Wayne.Chiu@waterboards.ca.gov]
Sent: Friday, March 06, 2015 11:47 AM
To: Garcia, David; Lomeli, Eric
Cc: Becker, Eric@Waterboards; Uhley, Jason; Bill Woolsey (wwoolsey@murrieta.org); Aldo Licitra (Aldo.Licitra@cityoftemecula.org); Matt Bennett (mbennett@cityofwildomar.org); Horn, Steven
Subject: Pre-Meeting for ROWD

Hi David and Eric,

We'd like to set up a meeting with the Riverside County Copermittees to discuss your Report of Waste Discharge and start talking about the MS4 permit reissuance process. Can you send me some dates that will work for your group during the weeks of March 23-27 and March 30-April 3? We can meet you in the Riverside County part of the San Diego Region, or you can come to our office.

Thanks,

Wayne Chiu, PE
Water Resource Control Engineer
Storm Water Management Unit
California Regional Water Quality Control Board
San Diego Region
2375 Northside Drive, Suite 100
San Diego, CA 92108
Direct Line: (619) 521-3354
Main Line: (619) 516-1990

Chiu, Wayne@Waterboards

From: lyris@swrcb18.waterboards.ca.gov
Sent: Thursday, April 02, 2015 9:16 AM
To: Chiu, Wayne@Waterboards
Subject: Notice of Public Workshops - Prior Lawful Approval and Alternative Compliance Pathway for Receiving Water Limitations Proposed Amendments to Order No. R9-2013-0001
Attachments: 2015-0402 Notice of PLA-RWL Public Workshops.pdf

Water Boards This is a message from the California Regional Water Quality Control Board, San Diego Region (9).

Stakeholders,

Attached is the San Diego Water Board's Notice of Public Workshops to discuss Prior Lawful Approval and Alternative Compliance Pathway for Receiving Water Limitations Proposed Amendments to Order No. R9-2013-0001.

This Notice and the Regional MS4 Permit is available on the Water Boards webpage at http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

If you have any questions please feel free to give me or Wayne a call or email.

Laurie Walsh, PE
San Diego Water Board

2375 Northside Drive, Suite 100
San Diego, CA 92108
Direct Phone: 619-521-3373
Main Line: 619-516-1990
Fax No. (619) 516-1994
Email: Laurie.Walsh@waterboards.ca.gov

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD
www.waterboards.ca.gov/sandiego/

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California Water Boards

Edmund G. Brown Jr.
Governor

Matthew Rodriquez
Secretary for
Environmental Protection

California Regional Water Quality Control Board, San Diego Region

NOTICE OF PUBLIC WORKSHOPS

Proposed Amendments to Order No. R9-2013-0001, as amended by Order No. R9-2015-0001, to Incorporate a Definition of Prior Lawful Approval for Priority Development Projects and an Alternative Compliance Pathway for Receiving Water Limitations

NOTICE IS HEREBY GIVEN that the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) will hold a series of public workshops to provide an opportunity for discussion and receive comments, information, and input from the public on proposed amendments to Order No. R9-2013-0001, as amended by Order No. R9-2015-0001, NPDES No. CAS0109266, *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Regional MS4 Permit). The workshops will be conducted by a professional facilitator. Two or more San Diego Water Board members may be present at the workshop, but no actions or voting will occur.

Background

On May 8, 2013, the San Diego Water Board adopted Order No. R9-2013-0001, which became effective for the San Diego County Copermittees on June 27, 2013. On February 11, 2015, the San Diego Water Board adopted Order No. R9-2015-0001, which amended Order No. R9-2013-0001, to extend coverage of the Regional MS4 Permit to the Orange County Copermittees and address a variety of other issues. The Regional MS4 Permit became effective for the Orange County Copermittees on April 1, 2015. In May 2015, the San Diego Water Board will begin the process to consider extending coverage of the Regional MS4 Permit to the Riverside County Copermittees.

During the proceedings for Order No. R9-2015-0001, the San Diego Water Board deferred consideration of two concepts proposed as permit amendments. In order to promote transparency and outreach, the Board determined that additional public discussions on those concepts should be scheduled to obtain input and advice from Copermittees and other key stakeholder groups prior to incorporating proposed permit language into a Tentative Order to amend the Regional MS4 Permit. The two proposed amendments would establish 1) a definition of the term “prior lawful approval” for priority development projects, and 2) an alternative compliance pathway that would conditionally allow the Copermittees to be in compliance with the receiving water limitations and related prohibitions in Provisions A.1.a, A.1.c, and A.2.a of the Regional MS4 Permit. Based on these considerations, the San Diego Water Board is scheduling a series of workshops to receive comments and information from the Copermittees and other key stakeholder groups concerning the prior lawful approval and receiving water limitations issues.

Objective of Public Workshops

The objective of the workshops is for the San Diego Water Board to gain a greater understanding of the perspectives that storm water program managers, non-government environmental organizations, and the development/business communities have on the prior lawful approval and receiving water limitations issues. While the professional facilitator may help the group to reach consensus on key issues, it is important to understand that consensus may not be attained at the workshops. The comments and information received during the workshops on these issues will be considered by the San Diego Water Board in finalizing proposed permit language that will be incorporated in a Tentative Order and released for formal public review and comment later this year in the course of the Board’s proceedings to consider extending Regional MS4 Permit coverage to

the Riverside County Copermittees. The San Diego Water Board is seeking comments and information addressing the following questions:

1. **Prior Lawful Approval for Priority Development Projects:** Is there a definition of prior lawful approval that will allow developers, the environmental community, and the Copermittees to clearly understand when a development project should be subject to the Priority Development Project requirements of the Regional MS4 Permit?

2. **Alternative Compliance Pathway for Receiving Water Limitations:** What ambitious, rigorous and transparent alternative compliance path should be required that allows a Copermittee an appropriate period of time to come into compliance with receiving water limitations, as a precondition of a Copermittee being considered in compliance with the receiving water limitations while fully implementing the compliance alternative?

Public Workshops Location
City of Vista Civic Center Complex
Community Room
200 Civic Center Drive
Vista, CA 92008

Stakeholder Participation
Participation at the public workshops will be structured to provide for an appropriate level of participation by key stakeholder groups, while preserving the ability for the meeting facilitator to ensure a collaborative discussion on the issues. Meeting participants will be divided into two groups: a limited group to be seated at the meeting table and an audience group. The total number of participants at the meeting table will be limited to twenty-five (25) persons subdivided into representative stakeholder groups as described in the table below.

Stakeholder Group	Participants at the Table
San Diego County Copermittees	5
Orange County Copermittees	4
Riverside County Copermittees	4
Environmental Community	3
Development/Business Community	3
USEPA	1
San Diego Water Board Permit Team	5

Groups of stakeholders can share their seats at the table and rotate particular topic experts from the audience to the table depending on the topic being discussed. Audience seating will be provided so that interested persons can attend the public workshops. Audience members will be allowed to ask questions and make comments at the end of each topic discussion period.

Public Workshops Schedule
The public workshops are scheduled as follows:

Workshop Date	Topic Discussion Period	Topic
Tuesday, April 28, 2015	9:30 am – 12:00 pm	Prior Lawful Approval for Priority Development Projects
	1:00 pm – 3:30 pm	Alternative Compliance Pathway for Receiving Water Limitations
Friday, May 22, 2015	9:30 am – 12:00 pm	Prior Lawful Approval for Priority Development Projects
	1:00 pm – 3:30 pm	Alternative Compliance Pathway for Receiving Water Limitations
Tuesday, June 30, 2015	9:30 am – 12:00 pm	San Diego Water Board Wrap-up Workshop on Prior Lawful Approval and Receiving Water Limitations

Availability of Draft Permit Language
The Regional MS4 Permit is available on the following webpage:
http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

Draft permit language will be made available for review and used as the starting point for workshop discussions on the prior lawful approval and receiving water limitations issues. The draft permit language will also be posted on the webpage above at least one week prior to the first scheduled workshop.

Electronic Mail List Subscription
The San Diego Water Board has established an electronic mail list specifically for information and notices on the development of a Regional MS4 Permit. The San Diego Water Board will use the email list to notify interested persons of upcoming important events and the availability of on-line documents. Persons interested in receiving future notices and information on this specific project can subscribe to one (1) of the electronic mail lists titled "Orange County MS4 Permit," "Riverside County MS4 Permit," or "San Diego MS4 Permit," located on the San Diego Water Board website at:
http://www.waterboards.ca.gov/resources/email_subscriptions/reg9_subscribe.shtml

Persons who wish to receive hard copy notices of future notices or meetings on the Regional MS4 Storm Water Permit in lieu of electronic notices should submit a request to Mr. Wayne Chiu, Water Resource Control Engineer, 2375 Northside Drive, Suite 100, San Diego, CA 92108.

Directions and Parking
Interstate 15 North or South to Highway 78 West OR Interstate 5 North or South to Highway 78 East to Civic Center Drive exit; go North on Civic Center Drive approximately 1.1 miles to stoplight at Alta Vista Drive; turn right on Alta Vista Drive and right into the Civic Center Complex parking lot; follow signs within Civic Center Complex to the Community Room. Free parking is available at the Civic Center Complex.

Contacts for Additional Information
The San Diego Water Board Regional MS4 Permit Team includes the following staff:

David Barker, P.E. – Supervising Water Resource Control Engineer
Eric Becker, P.E. – Senior Water Resource Control Engineer
Wayne Chiu, P.E. – Water Resource Control Engineer
Laurie Walsh, P.E. – Water Resource Control Engineer
Christina Arias, P.E. – Water Resource Control Engineer

Questions or requests for additional information regarding this notice should be directed to Laurie Walsh at (619) 521-3373 or laurie.walsh@waterboards.ca.gov, or Wayne Chiu at (619) 521-3354 or wayne.chiu@waterboards.ca.gov.

David W. Gibson
Executive Officer
April 2, 2015

027735

SANTA MARGARITA TECHNICAL ADVISORY COMMITTEE MEETING
SIGN-IN SHEET

Meeting of: April 15, 2015

P8142641

NAME	AGENCY	PHONE	FAX	E-MAIL	SIGN-IN
Eric Lomeli	RCFC&WCD	951.955.8589	951.788.9965	Erlomeli@rcflood.org	
David Garcia	RCFC&WCD	951.955.1330	951.788.9965	dhgarcia@rcflood.org	
Art Diaz	RCFC&WCD	951.955.8602	951.788.9965	aadiaz@rcflood.org	
Stuart McKibbin	RCFC&WCD	951.955.1273	951.788.9965	smckibbi@rcflood.org	
Charlene Warren	RCFC&WCD	951.955.4375	951.788.9965	CharleneWarren@rcflood.org	
Scott Bruckner	RCFC&WCD	951.955.0843	951.788.9965	sebruckner@rcflood.org	
Kahlil Amin	RCFC&WCD	951.955.8235	951.788.9965	kaamin@rcflood.org	
Penny Nanney	RCFC&WCD	951.955.1325	951.788.9965	pnanney@rcflood.org	
Robert Vasquez	RCFC&WCD	951.955.8845	951.788.9965	revasquez@rcflood.org	
Julianna Gonzalez	RCFC&WCD	951.955.8064	951.788.9965	Juliannagonzalez@rcflood.org	
Rebekah Guill	RCFC&WCD	951.955.2013	951.788.9965	rguill@rcflood.org	
Darcy Kuenzi	RCFC&WCD	951.955.1688	951.788.9965	Darcyk@rcflood.org	
Mike Phipps	RCFC&WCD	951.955.1263	951.788.9965	Mjphipps@rcflood.org	
Graciela Rivera	RCFC&WCD	951.955.0836		gracielarivera@rcflood.org	
Steve Horn	Riverside Co. Executive Office	951.955.1110	951.955.1105	shorn@rceo.org	
Jeff Johnson	Riverside County Environmental Health			JeffJohnson@rivcocha.org	
John Alfred	Riverside Co. EDA	951.955.4844		jalfred@rivcoeda.org	
Hector Cazares	Riverside Co. EDA	909.955.0166		hcazares@rivcoeda.org	
Adrianna Soares	Riverside Co. Transportation	951.955.8823	951.955.6721	ASoares@rctlma.org	
Claudia Steiding	Riverside Co. Transportation	951.955.1694	951.955.6721	csteiding@rctlma.org	
Ward Maxwell	Riverside Co. Transportation	951.955.6739	951.955.6797	wmaxwell@rctlma.org	

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SANTA MARGARITA TECHNICAL ADVISORY COMMITTEE MEETING
SIGN-IN SHEET

Meeting of: April 15, 2015

P8142641

Tracy Towner	Riverside Co. Code Enforcement	951.955.0295		TTOWNER@rctlma.org	
Hector Viray	Riverside Co. Code Enforcement	951.696.1613		HVIRAY@rctlma.org	
Tim Handel	Riverside Co. Fire Dept.	951.926.3591	951.926.3719	Tim.handel@fire.ca.gov	
Bill Blankenship	BIA – Riverside County	951.781.7310	951.781.0509	BBlankenship@RiversideBIA.org	
William Pan	Caltrans – District 8	951.383.6714	951.383.6230	William.pan@dot.ca.gov	
Kelly Dorsey	CRWQCB – San Diego Region	848.467.2980		kdorsey@waterboards.ca.gov	
Wayne Chiu	CRWQCB – San Diego Region	619.521.3354		Wayne.Chiu@waterboards.ca.gov	Wayne Chi
Eric Becker	CRWQCB – San Diego Region			Eric.becker@waterboards.ca.gov	ESB
John Kemmerer	EPA			Kemmerer.john@epa.gov	
Bill Woolsey	City of Murrieta	951.461.6073	951.698.4509	WWoolsey@murrieta.org	B. Woolsey
Aldo Licitra	City of Temecula	951.308.6387	951.694.6475	Aldo.licitra@cityoftemecula.org	
Dan York	City of Wildomar	951.677.7751	951.698.1463	dyork@cityofwildomar.org	
Matt Bennett	City of Wildomar	951.677.7751 ext 208	951.698.1463	mbennett@cityofwildomar.org	
Jason Farag	City of Wildomar	951.677.7751 ext 219	951.698.1463	jfarag@cityofwildomar.org	
Daniel Apt	RBF Consulting	949.330.4117		dapt@rbf.com	
Jamie Aderhold	J2A Environmental	562.433.6907	562.433.1102	jamie@ciagent.com	
Steve Fuller	Stormwater Center	951.679.4072		SFuller766.aol.com	
Bill Flores	HDR	951.320.7300	951.320.7301	bflores007@msn.com	
Del Ross	EMARCD	800.222.9686		delross@verizon.net	
Daniel Matrisciano	EMARCD	951.506.0283		danishelen@earthlink.net	
Pam Nelson	EMARCD	951.767.2324		Pam.emarcd@yahoo.com	
Vaikko Allen	CONTECH Stormwater	310.260.7953		allenv@contech-cpi.com	
Mark Baker	CONTECH Stormwater	909.797.1367	909.797.5296	Baker, Mark [BakerM@contech-cpi.com]	Mark Baker

027737

SANTA MARGARITA TECHNICAL ADVISORY COMMITTEE MEETING
SIGN-IN SHEET

Meeting of: April 15, 2015

P8142641

Geoff Mok	CONTECH Stormwater	562.733.0733 x407	562.264.0733	gmok@contech-cpi.com	
Jason Pereira	CA Watershed Engineering	714.310.1070	714.475.1595	jpereira@cwecorp.com	
Vik Bapna	CA Watershed Engineering			vbapna@cwecorp.com	
Bob Collacott	URS Corporation	714.648.2726	714.667.7147	Robert_Collacott@urscorp.com	
Nida Saleem	Whitson Contracting Management	858.673.0966	858.487.8355	nsaleem@whitsoncm.com	
Mark A. Grey	BIA	909.396.9993	606.396.1571	mgrey@biasc.org	
Sandy Caldwell	Southstar Engineering	951.581.7661	951.342.3148	scaldwel@southstareng.com	
Jennifer Walker	Watearth	714.640.7486		jwalker@watearth.com	
Roger Turner	Roger Turner & Associates, Inc	951.707.5020	951.684.7507	rwturner@hotmail.com	
Gil Saenz	Inland Empire Dev. Serv	951.845.1003		gilsaenz@msn.com	
Amanda Grey	UCR	951.827.2416	714.323.2052	Amanda.grey@urc.edu	
Hal Schillinger	Oldcastle Stormwater	951.970.0728		hal.schillinger@oldcastle.com	
John Loera	Kristar			John.Loera@oldcastle.com	
~~Will Harris~~	~~Kristar~~	~~909.255.5444~~		~~will.harris@oldcastle.com~~	
Johnny Murad	Huitt-Zollars			jmurad@huitt-zollars.com	
James Ozouf	City of Murrieta	951-461-6075		jozouf@murrieta.org	

Chiu, Wayne@Waterboards

From: lyris@swrcb18.waterboards.ca.gov
Sent: Tuesday, April 21, 2015 9:40 AM
To: Chiu, Wayne@Waterboards
Subject: Revised Notice of Public Workshops on Prior Lawful Approval and Receiving Water Limitation permit language
Attachments: 2015-0420 Revised Notice of PLA-RWL Public Workshops.pdf

Water Boards This is a message from the California Regional Water Quality Control Board, San Diego Region (9).

Greetings Stakeholders,

A change to the date and location of the May workshop was necessary. Therefore, we posted a Revised Public Notice to the San Diego Water Board's website at
http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

For your convenience I also attached the Revised Public Notice to this email.

Laurie Walsh, PE
San Diego Water Board

2375 Northside Drive, Suite 100
San Diego, CA 92108
Direct Phone: 619-521-3373
Main Line: 619-516-1990
Fax No. (619) 516-1994
Email: Laurie.Walsh@waterboards.ca.gov

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD
www.waterboards.ca.gov/sandiego/

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California Water Boards

Edmund G. Brown Jr.
Governor

Matthew Rodriquez
Secretary for
Environmental Protection

California Regional Water Quality Control Board, San Diego Region

REVISED
NOTICE OF PUBLIC WORKSHOPS

Proposed Amendments to Order No. R9-2013-0001, as amended by Order No. R9-2015-0001, to Incorporate a Definition of Prior Lawful Approval for Priority Development Projects and an Alternative Compliance Pathway for Receiving Water Limitations

NOTICE IS HEREBY GIVEN that the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) will hold a series of public workshops to provide an opportunity for discussion and receive comments, information, and input from the public on proposed amendments to Order No. R9-2013-0001, as amended by Order No. R9-2015-0001, NPDES No. CAS0109266, *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Regional MS4 Permit). The workshops will be conducted by a professional facilitator. Two or more San Diego Water Board members may be present at the workshop, but no actions or voting will occur.

Background

On May 8, 2013, the San Diego Water Board adopted Order No. R9-2013-0001, which became effective for the San Diego County Copermittees on June 27, 2013. On February 11, 2015, the San Diego Water Board adopted Order No. R9-2015-0001, which amended Order No. R9-2013-0001, to extend coverage of the Regional MS4 Permit to the Orange County Copermittees and address a variety of other issues. The Regional MS4 Permit became effective for the Orange County Copermittees on April 1, 2015. In May 2015, the San Diego Water Board will begin the process to consider extending coverage of the Regional MS4 Permit to the Riverside County Copermittees.

During the proceedings for Order No. R9-2015-0001, the San Diego Water Board deferred consideration of two concepts proposed as permit amendments. In order to promote transparency and outreach, the Board determined that additional public discussions on those concepts should be scheduled to obtain input and advice from Copermittees and other key stakeholder groups prior to incorporating proposed permit language into a Tentative Order to amend the Regional MS4 Permit. The two proposed amendments would establish 1) a definition of the term “prior lawful approval” for priority development projects, and 2) an alternative compliance pathway that would conditionally allow the Copermittees to be in compliance with the receiving water limitations and related prohibitions in Provisions A.1.a, A.1.c, and A.2.a of the Regional MS4 Permit. Based on these considerations, the San Diego Water Board is scheduling a series of workshops to receive comments and information from the Copermittees and other key stakeholder groups concerning the prior lawful approval and receiving water limitations issues.

Objective of Public Workshops

The objective of the workshops is for the San Diego Water Board to gain a greater understanding of the perspectives that storm water program managers, non-government environmental organizations, and the development/business communities have on the prior lawful approval and receiving water limitations issues. While the professional facilitator may help the group to reach consensus on key issues, it is important to understand that consensus may not be attained at the workshops. The comments and information received during the workshops on these issues will be considered by the San Diego Water Board in finalizing proposed permit language that will be incorporated in a Tentative Order and released for formal public review and comment later this year in the course of the Board’s proceedings to consider extending Regional MS4 Permit coverage to

the Riverside County Copermittees. The San Diego Water Board is seeking comments and information addressing the following questions:

1. **Prior Lawful Approval for Priority Development Projects:** Is there a definition of prior lawful approval that will allow developers, the environmental community, and the Copermittees to clearly understand when a development project should be subject to the Priority Development Project requirements of the Regional MS4 Permit?
2. **Alternative Compliance Pathway for Receiving Water Limitations:** What ambitious, rigorous and transparent alternative compliance path should be required that allows a Copermittee an appropriate period of time to come into compliance with receiving water limitations, as a precondition of a Copermittee being considered in compliance with the receiving water limitations while fully implementing the compliance alternative?

Public Workshops Dates and Locations

April 28, 2015 and June 30, 2015
City of Vista Civic Center Complex
Community Room
200 Civic Center Drive
Vista, CA 92008

May 21, 2015
San Diego Water Board
Board Meeting Room
2375 Northside Drive, Suite 100
San Diego, CA 92108

Stakeholder Participation

Participation at the public workshops will be structured to provide for an appropriate level of participation by key stakeholder groups, while preserving the ability for the meeting facilitator to ensure a collaborative discussion on the issues. Meeting participants will be divided into two groups: a limited group to be seated at the meeting table and an audience group. The total number of participants at the meeting table will be limited to twenty-five (25) persons subdivided into representative stakeholder groups as described in the table below.

Stakeholder Group	Participants at the Table
San Diego County Copermittees	5
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USEPA	1
San Diego Water Board Permit Team	5

Groups of stakeholders can share their seats at the table and rotate particular topic experts from the audience to the table depending on the topic being discussed. Audience seating will be provided so that interested persons can attend the public workshops. Audience members will be allowed to ask questions and make comments at the end of each topic discussion period.

Public Workshops Schedule

The public workshops are scheduled as follows:

Workshop Date	Topic Discussion Period	Topic
Tuesday, April 28, 2015	9:30 am – 12:00 pm	Prior Lawful Approval for Priority Development Projects
	1:00 pm – 3:30 pm	Alternative Compliance Pathway for Receiving Water Limitations
Friday, ~~May 22, 2015~~ May 21, 2015	9:30 am – 12:00 pm	Prior Lawful Approval for Priority Development Projects
	1:00 pm – 3:30 pm	Alternative Compliance Pathway for Receiving Water Limitations
Tuesday, June 30, 2015	9:30 am – 12:00 pm	San Diego Water Board Wrap-up Workshop on Prior Lawful Approval and Receiving Water Limitations

Availability of Draft Permit Language
The Regional MS4 Permit is available on the following webpage:
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http://www.waterboards.ca.gov/resources/email_subscriptions/reg9_subscribe.shtml

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Directions and Parking
City of Vista Civic Center Complex
Interstate 15 North or South to Highway 78 West OR Interstate 5 North or South to Highway 78 East to Civic Center Drive exit; go North on Civic Center Drive approximately 1.1 miles to stoplight at Alta Vista Drive; turn right on Alta Vista Drive and right into the Civic Center Complex parking lot; follow signs within Civic Center Complex to the Community Room. Free parking is available at the Civic Center Complex.

San Diego Water Board, Board Meeting Room
For directions to the San Diego Water Board office, please refer to:
http://www.waterboards.ca.gov/sandiego/about_us/contact_us/
On-site parking is available, and the facility is accessible to persons with disabilities. Two-hour free parking is available on a first-come first-serve basis and long term fee parking is available in an adjacent parking structure. The facility is also accessible via public transit.

Contacts for Additional Information
The San Diego Water Board Regional MS4 Permit Team includes the following staff:

David Barker, P.E. – Supervising Water Resource Control Engineer
Eric Becker, P.E. – Senior Water Resource Control Engineer
Wayne Chiu, P.E. – Water Resource Control Engineer
Laurie Walsh, P.E. – Water Resource Control Engineer
Christina Arias, P.E. – Water Resource Control Engineer

Questions or requests for additional information regarding this notice should be directed to Laurie Walsh at (619) 521-3373 or laurie.walsh@waterboards.ca.gov, or Wayne Chiu at (619) 521-3354 or wayne.chiu@waterboards.ca.gov.

David W. Gibson
Executive Officer
April 2, 2015
Revised April 20, 2015

Chiu, Wayne@Waterboards

From: lyris@swrcb18.waterboards.ca.gov
Sent: Wednesday, April 22, 2015 3:59 PM
To: Chiu, Wayne@Waterboards
Subject: April 28, 2015 San Diego Water Board Workshop on Prior Lawful Approval and Compliance Option to Receiving Water Limitations
Attachments: 2015-0428 PLA RWL Workshop Agenda.pdf

Water Boards This is a message from the California Regional Water Quality Control Board, San Diego Region (9).

Copermittees and Interested Persons,

Attached is an agenda for next Tuesdays April 28, 2015 Workshop on Prior Lawful Approval and Compliance Option to Receiving Water Limitations in the Regional MS4 Permit. This agenda along with baseline language (our starting point for each discussion) for each topic is also posted on our website
http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

We look forward to a robust discussion with all.

Laurie Walsh, PE
San Diego Water Board

2375 Northside Drive, Suite 100
San Diego, CA 92108
Direct Phone: 619-521-3373
Main Line: 619-516-1990
Fax No. (619) 516-1994
Email: Laurie.Walsh@waterboards.ca.gov

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD
www.waterboards.ca.gov/sandiego/

You are currently subscribed to reg9_sandiegoco_ms4permit as: wchiu@waterboards.ca.gov.

To unsubscribe click here: leave-4132120-508208.cee2a373662e566393e62f0af18d11cf@swrcb18.waterboards.ca.gov

PUBLIC WORKSHOP AGENDA

Proposed Amendments to Order No. R9-2013-0001, as amended by Order No. R9-2015-0001, to Incorporate a Definition of Prior Lawful Approval for Priority Development Projects and an Alternative Compliance Pathway for Receiving Water Limitations

Tuesday, April 28, 2015

SESSION 1
9:30 a.m. to 12:00 p.m.
Prior Lawful Approval for Priority Development Projects

QUESTION: Is there a definition of prior lawful approval that will allow developers, the environmental community, and the Copermittees to clearly understand when a development project should be subject to the Priority Development Project requirements of the Regional MS4 Permit?

9:30 a.m. - 9:35 a.m.	Introductions [Table Participants]
9:35 a.m. - 9:50 a.m.	Workshop Procedures and Objectives [Lewis Michaelson, Katz & Associates]
9:50 a.m. - 10:00 a.m.	Background & Proposed Language [Laurie Walsh, San Diego Water Board]
10:00 a.m. - 11:30 a.m.	Discussion [Table Participants]
11:30 a.m. - 12:00 p.m.	Comments & Questions [All]

LUNCH
12:00 p.m. to 1:00 p.m.

SESSION 2
1:00 p.m. to 3:30 p.m.
Alternative Compliance Pathway for Receiving Water Limitations

QUESTION: What ambitious, rigorous and transparent alternative compliance path should be required that allows a Copermittee an appropriate period of time to come into compliance with receiving water limitations, as a precondition of a Copermittee being considered in compliance with the receiving water limitations while fully implementing the compliance alternative?

1:00 p.m. - 1:05 p.m.	Introductions [Table Participants]
1:05 p.m. - 1:20 p.m.	Workshop Procedures and Objectives [Lewis Michaelson, Katz & Associates]
1:20 p.m. - 1:30 p.m.	Background & Proposed Language [Wayne Chiu, San Diego Water Board]
1:30 p.m. - 3:00 p.m.	Discussion [Table Participants]
3:00 p.m. - 3:30 p.m.	Comments & Questions [All]

Chiu, Wayne@Waterboards

From: Woolsey, William <WWoolsey@murrieta.org>
Sent: Thursday, April 30, 2015 1:52 PM
To: Chiu, Wayne@Waterboards; Becker, Eric@Waterboards
Cc: Lomeli, Eric; McKibbin, Stuart
Subject: WQIP for SMR ~ Designation of San Diego Regionsl Water Quality Control Board for MS4 Regulation
Attachments: W_Warren_Amndng_10-0033_WDR_R8-2013-0024.pdf; doc03069520150430111112.pdf

Hello Wayne and Eric,

We discussed in our last SMR TAC meeting about including in the WQIP for Murrieta to be regulated by the San Diego MS4 permit. The email chain below along with the first attachment shows that the SA Water Board is in agreement. A condition of approval for this to happen was for Murrieta to comply with the applicable provisions of the LE/CL TMDL. Please see attached highlighted language on Page 3 of 6, second attachment.

The city is having troubles with current TMDL process and want the flexibility to change the language on page 3 of 6 if, necessary. It is possible that the language stays the same and Murrieta just needs to work out an agreement with the Santa Ana Water Board. We are trying to meet with them the second week of May. It is our goal to discuss the city's concerns about the fairness of this matter and come to an agreeable solution. I'm not certain how this will go and but want to point this out in case an exception is needed in the Regional Permit. Murrieta intends to work with Riverside County Flood Control regarding the language in the WQIP that will address the city's concerns and satisfy the SA Water Board. Please let us know if can think of a better way to handle this.

Respectfully,

BILL WOOLSEY, P.E. / Civil Engineer Associate / wwoolsey@murrieta.org
CITY OF MURRIETA / 1 Town Square (mailing) / 24601 Jefferson Ave (for Map Quest) / Murrieta, CA 92562
(951) 461-6073 Direct / (951) 304-2489 Main / Fax (951) 698-3416 / < the City is Closed on Friday's>

Your feedback is appreciated. If you are interested in filling out a short customer service survey, please visit www.murrieta.org/customerservice

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From: Gaslan, Milasol@Waterboards [mailto:Milasol.Gaslan@waterboards.ca.gov]
Sent: Wednesday, April 29, 2015 10:53 AM
To: Theisen, Ken@Waterboards; Woolsey, William

Cc: Moehling, Bob; Ozouf, James; Smythe, Mark@Waterboards; Smythe, Hope@Waterboards; Roth, Michael@Waterboards; Elliott, Keith@Waterboards
Subject: RE: Designation of San Diego Regionsl Water Quality Control Board for MS4 Regulation

Hello,
The cities of Murrieta and Wildomar will not be identified as co-permittees in the next SAR MS4. We intend to carry the MOA MS4 designation through to the next permit. The current Riverside MS4 permit has been administratively extended which includes the amendment as attached.

Thanks,

Milasol Gaslan, P.E.
Senior Water Resource Control Engineer
Inland Storm Water Section
Santa Ana Regional Water Quality Control Board
3737 Main Street, Suite 500
Riverside, CA 92501
Phone: 951-782-4419
E-Mail: Milasol.Gaslan@waterboards.ca.gov

From: Theisen, Ken@Waterboards
Sent: Wednesday, April 29, 2015 7:01 AM
To: 'Woolsey, William'
Cc: Moehling, Bob; Ozouf, James; Smythe, Mark@Waterboards; Smythe, Hope@Waterboards; Gaslan, Milasol@Waterboards; Roth, Michael@Waterboards; Elliott, Keith@Waterboards
Subject: RE: Designation of San Diego Regionsl Water Quality Control Board for MS4 Regulation

Hi Bill,

I have cc:'d our MS4 staff on this reply. They are in the process of updating the MS4 permit for Riverside and San Bernardino Counties. I am not familiar with how the draft MS4 addresses Murrieta.

If you would like to discuss the issue of the City's compliance with the TMDL for Lake Elsinore and Canyon Lake, I suggest we set up a meeting with my supervisor and the MS4 staff and hash this out.

Ken Theisen
Water Resource Control Engineer
Inland Planning and TMDL Section
Santa Ana Regional Water Quality Control Board
3737 Main St. Suite 500
Riverside, CA 92501
951-320-2028
951-781-6288 Fax
Ken.Theisen@waterboards.ca.gov

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From: Woolsey, William [mailto:WWoolsey@murrieta.org]
Sent: Tuesday, April 28, 2015 5:18 PM
To: Theisen, Ken@Waterboards

Cc: Moehling, Bob; Ozouf, James
Subject: Designation of San Diego Regionsl Water Quality Control Board for MS4 Regulation

Hello Ken,

I do not know if you are the point of contact on this matter but we were told by Eric Becker and Wayne Chiu, San Diego Water Board, that they want this matter reapproved. This matter being continuing Murrieta being regulated by the San Diego MS4 permit only. The San Diego MS4 permit expires on November 10, 2015. Shortly thereafter, the Regional MS4 Permit will become effective. I'm wondering who we must talk too to and what is required from the city for this to happen.

I recall there was one stipulation requiring Murrieta to participate in the Lake Elsinore / Canyon Lake TMDL. However, we want to open discussions on the requirement because some things how come to light since 2010. I believe you were at the last meeting in SAWPA when I expressed my concerns about the TMDL. Can you please direct us to the person whom we must discuss this matter with? Thank you for your help.

Respectfully,

BILL WOOLSEY, P.E. / Civil Engineer Associate / wwoolsey@murrieta.org
CITY OF MURRIETA / 1 Town Square (mailing) / 24601 Jefferson Ave (for Map Quest) / Murrieta, CA 92562
(951) 461-6073 Direct / (951) 304-2489 Main / Fax (951) 698-3416 / < the City is Closed on Friday's>

Your feedback is appreciated. If you are interested in filling out a short customer service survey, please visit
www.murrieta.org/customerservice

CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

Santa Ana Regional Water Quality Control Board

June 11, 2013

Mr. Warren D. Williams, General Manager and Chief Engineer
Riverside County Flood Control and
Water Conservation District
1995 Market Street
Riverside, CA 92501

AMENDMENT OF ORDER R8-2010-0033 - WASTE DISCHARGE REQUIREMENTS FOR AREAWIDE URBAN STORM WATER RUNOFF FOR THE RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT, THE COUNTY OF RIVERSIDE, AND THE INCORPORATED CITIES OF RIVERSIDE COUNTY, ORDER NO. R8-2013-0024, NPDES NO. CAS618033

Dear Mr. Williams:

Enclosed is a certified copy of Order No. R8-2013-0024 amending Order R8-2010-0033, NPDES No. CAS 618033. This amendment is for the limited purpose of:

1. Inclusion of the recently incorporated cities of Eastvale and Jurupa Valley as Permittees.

2. To incorporate changes as per the Designation Agreement dated September 28, 2010 between the San Diego and the Santa Ana Regional Water Quality Control Boards with respect to regulating municipal storm water runoff from the Cities of Menifee, Murrieta and Wildomar.

This order was adopted at a public hearing during the June 7, 2013 Board meeting. Please note that Order No. R8-2010-0033 expires on January 29, 2015 and a Report of Waste Discharge must be filed no later than 180 days in advance of that expiration date.

To view and/or download all information related to this Order, please access our website at

http://www.waterboards.ca.gov/santaana/water_issues/programs/stormwater/riverside_permit.shtml.

If you have any questions, please call Milasol Gaslan at (951) 782-4419, or Keith Elliott at (951) 782-4925.

Sincerely,

Kurt V. Berchtold
Executive Officer
Santa Ana Regional Water Quality Control Board

Enclosures: Adopted Order No. R8-2013-0024

cc/w enclosures to be e-mailed:

Mr. Don Allison, City of Jurupa Valley, Dallison@jurupavalley.org
Mr. Roy F. Stephenson, City of Jurupa Valley, rstephenson@jurupavalley.org
Mr. Joe Indrawan, City of Eastvale, Jindrawan@eastvaleca.gov
Mr. Jonathan Smith, City of Menifee, jsmith@cityofmenifee.us
Ms. Lori Wolfe, City of Menifee, lwolfe@cityofmenifee.us
Mr. Bill Woolsey, City of Murrieta, wwoolsey@murrieta.org
Mr. Dan York, City of Wildomar, dyork@cityofwildomar.org

State of California
California Regional Water Quality Control Board
Santa Ana Region

Order No. R8-2013-0024

Amending Order No. R8-2010-0033, NPDES No. CAS 618033

The California Regional Water Quality Control Board, Santa Ana Region (hereinafter, Regional Board), finds that:

1. On January 29, 2010, the Regional Board adopted Order No. R8-2010-0033, NPDES No. CAS 618033, prescribing Waste Discharge Requirements for Area-wide Urban Storm Water Runoff for the County of Riverside, Riverside County Flood Control and Water Conservation District, and the incorporated cities of Riverside County within the Santa Ana Region. This Order is commonly referred to as the Riverside County Municipal Separate Storm Sewer System (MS4) Permit.

2. Order No. R8-2010-0033 is amended: (1) to add the newly incorporated cities of Eastvale and Jurupa Valley to the list of Permittees; (2) to remove two cities, Murrieta and Wildomar from the list of Permittees; and (3) to add all portions of the City of Menifee under this Order, including those portions that are under the jurisdiction of the San Diego Regional Board.

3. Title 40 of the Code of Federal Regulations, section 122.62, provides that NPDES permits may be modified if new information that was not available at the time of permit issuance becomes available, and that the information would have justified different permit conditions at the time of permit issuance. (40 CFR § 122.62(a)(2)). In this case, the incorporation of the Cities of Eastvale and Jurupa Valley and the designation agreements under Water Code 13228 were not available at the time of adoption of Order No. R8-2010-0033.

4. In accordance with Water Code Section 13389, amending wastewater discharge requirements for this discharge is exempt from those provisions of the California Environmental Quality Act contained in Chapter 3 (commencing with Section 21100), Division 13 of the Public Resources Code.

5. The Board has notified the discharger and other interested agencies and persons of its intent to amend waste discharge requirements for the discharge and has provided them with an opportunity to submit their written views and recommendations.

6. The Board, in a public meeting, heard and considered all comments pertaining to the discharge.

IT IS HERBY ORDERED that Order No. R8-2010-0033 be amended as follows:

1. Order No. R8-2010-0033, page 1 of 117, revise Table 1 to read:

Table 1. Municipal Permittees (Dischargers)

Principal Permittee	Riverside County Flood Control and Water Conservation District (RCFC&WCD)*	
Co–Permittees	1. Beaumont	10. Menifee
	2. Calimesa	11. Moreno Valley
	3. Canyon Lake	12. Norco
	4. Corona	13. Perris
	5. County of Riverside (County)	14. Riverside
	6. Eastvale	15. San Jacinto
	7. Hemet	
	8. Jurupa Valley	
	9. Lake Elsinore	

2. Order No. R8-2010-0033, page 7 of 117, revise Section I.E. as follows:

On February 5, 2008 Wildomar residents voted for cityhood and the city incorporated on July 1, 2008. Menifee residents voted for cityhood on June 3, 2008 and the city incorporated on October 1, 2008. Both cities in letters dated May 5 and May 6, 2009, respectively, have expressed their intent to be a Co-Permittee in this Order and for the purposes of this Order shall be considered as such. Urban Runoff from the cities of Menifee, Murrieta and Wildomar discharges into watersheds within the Santa Ana Regional Board and the San Diego Regional Board jurisdictions.

On July 20, 2010 and July 21, 2010, the Cities of Murrieta and Wildomar, respectively, pursuant to California Water Code section 13228, requested that the Santa Ana Regional Board designate the San Diego Regional Board as the regulating authority for all portions of these cities, regardless of Regional Board jurisdictional boundaries for matters pertaining to MS4 permitting. In addition, on July 22, 2010, the City of Menifee requested that the San Diego Regional Board designate the Santa Ana Regional Board as the regulating authority for all portions of the city, regardless of Regional Board jurisdictional boundaries for matters pertaining to MS4 permitting.

On September 28, 2010, the Executive Officers of the Santa Ana and San Diego Regional Water Quality Control Boards signed Designation Agreements, pursuant to Water Code section 13228(a), providing: (1) the San Diego Regional Board the authority to regulate municipal storm water runoff from the Cities of Murrieta and Wildomar, including those portions of the cities that fall within the Santa Ana Regional Board's geographic jurisdiction; and (2) the Santa Ana Regional Board the authority to regulate municipal storm water runoff from all portions of the City of Menifee, including those portions that are within the San Diego Regional Board's jurisdiction.

In accordance with the San Diego MS4 Permit, Order No. R9-2010-0016, the cities of Murrieta and Wildomar are required to comply with the applicable provisions of the Santa Ana MS4 Permit, Order R8-2010-0033, pertaining to implementation of the nutrient total maximum daily loads pertaining to Lake Elsinore and Canyon Lake. Similarly, Order R8-2010-0033 requires the City of Menifee to comply with any TMDLs and associated MS4 permit requirements issued by the San Diego Regional Board which include the City of Menifee as a responsible party.

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3. Order No. R8-2010-0033, page 16 of 117, revise Table 3 to read:

Table 3a – Receiving Waterbodies and Municipal Dischargers:

		Upper Santa Ana									San Jacinto								
Municipality	**Mill Creek Prado Area**	**Chino Creek, Reach 1A**	**Chino Creek, Reach 1B**	**Temescal Creek**	**San Timoteo Wash**	**Little San Gorgonio**	**Santa Ana River, Reach 3**	**Santa Ana River, Reach 4**	**Cucamonga Creek**	Sunnyslope Channel	**San Jacinto River reaches 1-4**	**Lake Elsinore**	**Canyon Lake**	**Strawberry Creek**	**Lake Hemet**	**Salt Creek**	**Poppet Creek**	**Indian Creek**	**Bautista Creek**
RCFC&WCD				◆	◆	◆	◆	◆	◆		◆	◆	◆	◆	◆	◆	◆	◆	◆
Beaumont					◆	◆	⌘	⌘			◆	⌘		◆					
Calimesa					◆	⌘	⌘	⌘			◆	⌘	◆	◆					
Canyon Lake				⌘			⌘				⌘	⌘	◆						
Corona				◆			⌘												
County of Riverside (County)	◆	◆	◆	◆	◆	◆	◆	◆	◆		◆	◆	◆	◆	◆	◆	◆	◆	◆
Eastvale							⌘		⌘										
Hemet				⌘			⌘				⌘	⌘	⌘			⌘			
Jurupa Valley							◆	◆		◆									
Lake Elsinore				◆			⌘				⌘	◆							
Menifee				⌘			⌘				⌘	⌘	⌘			⌘			
Moreno Valley				⌘			⌘				⌘	⌘	⌘						
Murrieta				⌘			⌘					⌘							
Norco				⌘			◆												
Perris				⌘			⌘				◆	⌘	⌘			⌘			
Riverside				⌘			◆	◆				⌘							
San Jacinto											◆	⌘	⌘						
Wildomar				⌘			⌘					⌘							

◆ Direct Discharge of MS4 to Receiving Water
⌘ Tributary to Receiving Water

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4. Order No. R8-2010-0033, page 49 of 117, revise Section II. to read:

   IT IS HEREBY ORDERED that the Riverside County Flood Control and Water Conservation District, the County of Riverside, and the incorporated cities of Beaumont, Calimesa, Canyon Lake, Corona, Eastvale, Hemet, Jurupa Valley, Lake Elsinore, Menifee, Moreno Valley, Norco, Perris, Riverside, and San Jacinto, in order to meet the provisions contained in Division 7 of the Water Code and regulations adopted thereunder, and the provisions of the CWA, as amended, and the regulations and guidelines adopted there under must comply with the following:

5. Order No. R8-2010-0033, page 116 of 117, revise Section XXI.C. to read:

   Pursuant to Section 13228 of the Water Code, on September 28, 2010 the Santa Ana Regional Board, through a Designation Agreement, authorized the San Diego Regional Board to regulate municipal storm water runoff from all areas of the cities of Murrieta and Wildomar, including those areas that are within the Santa Ana Regional Board's jurisdiction. Similarly, the San Diego Regional Board authorized the Santa Ana Regional Board to regulate municipal storm water runoff from all areas of the City of Menifee, including those areas that are within the jurisdiction of the San Diego Regional Board.

6. Order No. R8-2010-0033, Appendix 4, page 3 of 21, revise definition to read:

   Co-Permittees – County of Riverside and the cities of Beaumont, Calimesa, Canyon Lake, Corona, Eastvale, Hemet, Jurupa Valley, Lake Elsinore, Menifee, Moreno Valley, Norco, Perris, Riverside, and San Jacinto.

7. Order No. R8-2010-0033, Appendix 6 – Fact Sheet, revise Section I.A., page 2 of 57, to read:

   On February 5, 2008 Wildomar residents voted for cityhood and the city incorporated on July 1, 2008. Menifee residents voted for cityhood on June 3, 2008 and the city incorporated on October 1, 2008. On May 6, 2009, the City of Menifee and on May 5, 2009, the City of Wildomar submitted Letters of Intent to be a Co-Permittee in this Order and for the purposes of this Order shall be considered as such. Urban Runoff from the cities of Menifee, Murrieta and Wildomar discharges into watersheds within the Santa Ana Regional Board and the San Diego Regional Board jurisdictions.

   On July 20, 2010 and July 21, 2010, the Cities of Murrieta and Wildomar, respectively, pursuant to California Water Code section 13228, requested that the Santa Ana Regional Board designate the San Diego Regional Board as the regulating authority for all portions of these cities, regardless of Regional Board jurisdictional boundaries for matters pertaining to MS4 permitting. In addition, on July 22, 2010, the City of Menifee requested that the San Diego Regional Board designate the

Santa Ana Regional Board as the regulating authority for all portions of the city, regardless of Regional Board jurisdictional boundaries for matters pertaining to MS4 permitting.

On September 28, 2010, the Executive Officers of the Santa Ana and San Diego Regional Water Quality Control Boards signed Designation Agreements, pursuant to Water Code section 13228(a), providing: (1) the San Diego Regional Board the authority to regulate municipal storm water runoff from the Cities of Murrieta and Wildomar, including those portions of the cities that fall within the Santa Ana Regional Board's geographic jurisdiction; and (2) the Santa Ana Regional Board the authority to regulate municipal storm water runoff from all portions of the City of Menifee, including those portions that are within the San Diego Regional Board's jurisdiction.

In accordance with the San Diego MS4 Permit, Order No. R9-2010-0016, the cities of Murrieta and Wildomar are required to comply with the applicable provisions of the Santa Ana MS4 Permit, Order R8-2010-0033, pertaining to implementation of the nutrient total maximum daily loads pertaining to Lake Elsinore and Canyon Lake. Similarly, Order R8-2010-0033 requires the City of Menifee to comply with any TMDLs and associated MS4 permit requirements issued by the San Diego Regional Board which include the City of Menifee as a responsible party

The cities in the Permit Area, along with the County, are collectively referred to as the Co-Permittees, and collectively, with the Principal Permittee, the Permittees.

8. This amendment shall become effective upon the adoption of this Order.

9. With respect to the changes pertaining to the cities of Murrieta and Wildomar, the amendments are valid only as long the Designation Agreements are valid and effective.

10. All other terms and conditions of Order No. R8-2010-0033 shall remain unchanged.

I, Kurt V. Berchtold, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an order adopted by the California Regional Water Quality Control Board, Santa Ana Region, on June 7, 2013.

Kurt V. Berchtold, Executive Officer

In accordance with the San Diego MS4 Permit, Order No. R9-2010-0016, the cities of Murrieta and Wildomar are required to comply with the applicable provisions of the Santa Ana MS4 Permit, Order R8-2010-0033, pertaining to implementation of the nutrient total maximum daily loads pertaining to Lake Elsinore and Canyon Lake. Similarly, Order R8-2010-0033 requires the City of Menifee to comply with any TMDLs and associated MS4 permit requirements issued by the San Diego Regional Board which include the City of Menifee as a responsible party.

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Chiu, Wayne@Waterboards

From:	Wayne Rosenbaum <swr@envirolawyer.com>
Sent:	Friday, May 01, 2015 11:53 AM
To:	Marco Gonzalez (marco@coastlawgroup.com)
Cc:	Matt O'Malley (matt@sdcoastkeeper.org); Chiu, Wayne@Waterboards; Walsh, Laurie@Waterboards; Becker, Eric@Waterboards; 'Mike McSweeney'
Subject:	Word version of proposed language
Attachments:	2015-04-10Stormwater--Prior Lawful Approval.docx

Marco

Attached please find word version of proposed language as promised. We think this language clarifies for all the parties what was intended by the "Prior Lawful Approval" provision in the 2013 order. It recognizes both common law and statutory vested rights while limiting their application only to projects that have clearly demonstrated that they will comply with the 2010 hydromodification requirements as provided in the 2007 order. In order to understand why we think this proposed language is both protective of the environment and feasible I think it would be good to start by looking at some of the differences between the 2007 and 2013 orders:

Order No. R9-2007-0001 provides as follows: "Updated SUSMP and hydromodification requirements shall apply to all priority projects or phases of priority projects which have not yet begun grading or construction activities at the time any updated SUSMP or hydromodification requirement commences. **If a Copermittee determines that lawful prior approval of a project exists, whereby application of an updated SUSMP or hydromodification requirement to the project is infeasible, the updated SUSMP or hydromodification requirement need not apply to the project.** Where feasible, the Copermittees shall utilize the SUSMP and hydromodification update periods to ensure that projects undergoing approval processes include application of the updated SUSMP and hydromodification requirements in their plans." [Emphasis Added]. Thus while the footnote in the 2007 order did appear to only recognize the common law standard for vesting it also provided an escape valve for projects with a lawful prior approval where application of an updated SUSMP or hydromodification requirement was infeasible. Whether or not this order intended to also recognize statutory vesting is discussed below.

Order NO. R9-2013-0001 does not provide for projects with lawful prior approvals whereby application of provisions E.3.c.1 and E.3.c.2 are infeasible. Instead it appears that the 2013 order intended that alternative compliance would provide the necessary relief. However, the alternative compliance options proposed in the order are not available at this time and are not

likely to be available for some time in the future. Thus, reading the language of the 2013 order as you suggest creates a dilemma for both private developers and public agencies. A few scenarios might help clarify this dilemma.

City A decides to build a desperately needed fire station. Construction will not commence until January 2016. The soils at the site make infiltration impossible plus the proposed fire house is located in a poor urbanized area where infiltration of urban runoff may negatively impact ground water were it to reach the aquifer. The alternative compliance relief valve is not available and will not be available for some time as it requires the City to pass an ordinance and as you know an ordinance is a project under CEQA requiring CEQA review.

Developer B seeks to build a low and middle income housing project on a site that had been a paved parking lot. The entitlement process began in 2007 and the developer has a Development Agreement but final building permits will not be available until January 2016. The project was designed to the 2007 permit standards. Again the soils will not infiltrate thus retention of the 85th percentile storm is infeasible.

In the first case, I believe your reading of the 2013 order would prevent the construction of needed infrastructure. In the second case, your reading would expose the City to an inverse condemnation claim as the project has a statutorily vested right.

I think we both agree that a prior lawful approval can be usurped without triggering a taking under some situations. For example, if a Federal or state law preempts a vested right there is not taking. However, that is not the case here. There is no mandate from US EPA or the Clean Water Act that projects with prior lawful approvals must meet the requirements of provisions E.3.c.1. and E.3.c.2. when it is infeasible for the project to do so. Thus there is no federal preemption. There is no state preemption either. Provision E.3.e.(1)(a) is permissive in nature. "For project applications that have received prior lawful approval before the effective date of the BMP Design Manual is updated pursuant to Provision E.3.d, the Copermittee **<u>may</u>** allow previous land development requirements to apply. [Emphasis Added] Thus the Order does not command the Copermittees to impose the requirements of E.3.d on projects with prior lawful approvals and, in fact, if it were to do so it would likely be deemed an unfunded mandate.

I also think that we agree that a Copermittee may usurp a project's prior lawful approvals using its police powers when it is necessary to do so for reasons of health and safety on a case by case basis. Thus, if a project with a prior lawful approval really does present a threat to water quality even when it implements the standards in the 2007 permit, the Copermittee always has the authority to revoke the prior lawful approval.

In summary, the proposed language is not a "get out of jail free" card as you seem to think. It is intended to clarify the Copermittees land use discretion while helping to achieve water quality objectives by setting out the following limits:

1. Any project that seeks to take advantage of the prior lawful approval provision must demonstrate that the prior lawful approval on which it relies results in full compliance with the immediately prior MS4 Permit or in our case the design standards established in 2010 based on the 2007 order even where the prior lawful approval predates the 2007 order.
2. The 2007 permit standards will only apply to those portions of the project for which the MS4 system if fully constructed within five years of the adoption of the BMP manual. Thus, we are really talking about a relatively short cycle period from 2020 reaching back to the 2010 standards.

Reversion to the 2007 footnote as you suggest would likely only create more confusion and the potential to slow improvements in water quality. This is because, a project with an older prior lawful approval that can demonstrate infeasibility would not even have to achieve the 2010 standard. "**If a Copermittee determines that lawful prior approval of a project exists, whereby application of an updated SUSMP or hydromodification requirement to the project is infeasible, the updated SUSMP or hydromodification requirement need not apply to the project**."

Finally, the proposed language can be viewed as stop gap. If alternative compliance becomes available in the future, it will be much more likely that projects will not require these types of provisions because there will be an option that addresses infeasibility. However until alternative compliance becomes a reality for projects with prior lawful approvals, where achieving the 2013 requirements are infeasible the ability to proceed with the project under the standards set forth in the immediately prior MS4 permit is essential to allow needed infrastructure to proceed and to avoid inverse condemnation claims against Copermittees.

Hope this is helpful

Wayne

I will be out of the office with minimal access to e-mails or phones from May 27th through June 9th. In the event of an emergency please contact my partner Suzanne Varco at svarco@envirolawyer.com (619) 231-5858 or my law clerk Josh Rosenbaum at jrosenb@gmail.com (619) 920-1535

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Proposed Prior Lawful Approval Language

e. Priority Development Project BMP Implementation and Oversight

Each Copermittee must implement a program that requires and confirms structural BMPs on all Priority Development Projects are designed, constructed, and maintained to remove pollutants in stormwater to the MEP.

(1) Structural BMP Approval and Verification Process

(a) Each Copermittee must require and confirm that for all Priority Development Project applications that have not received prior lawful approval by the Copermittee by the effective date of the BMP Design Manual pursuant to Provision E.3.d, the requirements of Provision E.3 must be implemented. For project applications that have received prior lawful approval before the effective date of the BMP Design Manual pursuant to Provision E.3.d, the Copermittee may allow previous land development requirements to apply.

(b) For private development projects, prior lawful approval under this Order is any development approval or construction permit that either:

1) complies with the Priority Development Project requirements of the immediately prior MS4 permits and includes the design of the storm water drainage system for the project in its entirety as accepted by the Copermittee, or

2) in the case of a development agreement, vesting tentative map or common law mechanism established by the State allowing for the vesting of rights, the rights vested shall be deemed to include the right to proceed under the Priority Development Project requirements of the immediately prior MS4 permits.

For public projects, approval means that the design of the storm water drainage system for the project in its entirety complies with the Priority Development Project requirements of the immediately prior MS4 permits and has been stamped by the City or County Engineer or engineer of record for the project. For public projects completed on a design build or similar basis where project design is completed after construction contract award, the project may be designed in conformance with the Priority Development Project requirements of the immediately prior MS4 permits if the contract is awarded before the effective date of the BMP Design Manual.

For any applicable portion(s) of a public or private project, approvals may be extended to any subsequent discretionary or ministerial approvals necessary to implement the initial project approval with the following conditions:

(i) All grading permits and other discretionary approvals, or equivalent discretionary approvals for public projects, must be issued within 5 years of the effective date of the BMP Design Manual pursuant to Provision E.3.d. Subsequent permits may be issued beyond 5 years after the effective date of the BMP Design Manual, provided that the backbone storm water drainage system that services or connects to the project, which is the subject of any subsequent permits, has already been constructed ~~and any remaining Structural BMP's have been installed in substantial conformity with the initial approval~~; and

(ii) BMP installation under subsequent approvals must remain in substantial conformity with the design of the storm water drainage system included in the initial approval.

Chiu, Wayne@Waterboards

From: Wayne Rosenbaum <swr@envirolawyer.com>
Sent: Wednesday, May 06, 2015 11:57 AM
To: Walsh, Laurie@Waterboards
Cc: Becker, Eric@Waterboards; Chiu, Wayne@Waterboards; Arias, Christina@Waterboards; 'Mike McSweeney'
Subject: Vested Rights Primer
Attachments: 2015-05-06Vested Rights.docx

Laurie,

Attached please find a primer on vested rights that I thought might be helpful for our discussions this afternoon. I am working from home and my printer is a bit wonky. Could I impose on you to print copies for the meeting.

Wayne

I will be out of the office with minimal access to e-mails or phones from May 27th through June 9th. In the event of an emergency please contact my partner Suzanne Varco at svarco@envirolawyer.com (619) 231-5858 or my law clerk Josh Rosenbaum at jrosenb@gmail.com (619) 920-1535

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Vested Rights, Preemption, and the Subdivision Map Act.

What constitutes a vested right?

The concept of vesting is intended to reflect an equitable balance between the reasonable expectations of the developer and the ability of the land use agency to use its police powers to protect health and safety. In California the right to proceed with a project based on prior approvals vests under three conditions. These are: common law rights (also known as Avco rights), vesting tentative maps, and development agreements.

Common law rights

In *Avco Community Developer's v. South Coast Regional Commission* (1976) the California Supreme Court decided that a final map or a parcel map does not, standing alone, create a vested right. However, as with most court decisions there are exceptions to the rule.

- Where there are additional permits associated with construction and work has occurred the right to proceed vests.
- Where a final map has issued and the Department of Real estate has issued a public report the project has a vested right to proceed.
- Where the developer has changed its position and invested money in the project based on assurances by the land use agency, the agency is estopped from changing the rules, thus the project is vested.

Each of these situations if fact specific and requires the subjective interpretation by the land use agency. However, as long as the application of common law rights by the agency is not arbitrary, capricious or in derogation of law, the courts will generally uphold the agency's conclusions.

Vesting Tentative Maps

In response to the vagaries created by the Avco decision, in 1984 the California Legislature enacted Government Code 66498.1 et seq establishing a new form of tentative maps for subdivisions – the vesting tentative map. The approval of a vesting tentative map expressly confers a vested right to proceed with a development in substantial compliance with the ordinances, policies and standards in effect at the time the application for the approval of the vesting tentative map is deemed complete. Thus, a project with a vesting tentative map whose application was deemed complete prior to 2007 or even 2001 has the right to proceed with that project under the rules and regulations applicable at the time the application was deemed

complete and may not be required to implement any hydromodification or water quality requirements set out in later MS4 permits as adopted by the land use agency through its ordinances.

There are three general exceptions to this bar that are discussed herein. Where the land use agency later determines that to allow the project to proceed would result in health or safety impacts (note environmental impacts are not included) it may use its police power to override the provisions of the VTM. Where the land use agency imposes additional water quality or hydromodification requirements without a finding of health or safety impacts it may do so through an eminent domain action to compensate the developer for any additional costs or lost revenues resulting from the action. Finally, where the land use agency's authority has been preempted by state or federal law, state or federal law can supersede the rights and obligations of the developer and the respective land use agency.

Development Agreements

Development Agreements are adopted by ordinance between a developer and a land use agency establishing the conditions under which a particular development may occur. The local government freezes the regulations applicable to the site for an agreed upon period (frequently up to twenty years or more) to allow the project to both prepare approval of plans and to proceed with the project. See Government Code section 65864 et seq.

As with the vesting tentative map the conferred rights can be superseded by a finding of health or safety endangerment or an eminent domain action by which the land use agency would reimburse the developer for the cost of complying with later enacted requirements or a finding that the provisions of the local ordinance are preempted by state or federal law. However, as with vesting tentative maps, the developer may otherwise proceed under the requirements established in the DA even if those requirements are twenty or more years out of date.

When are vested rights preempted by superseding federal or state law?

As discussed above, vested rights can be preempted by state or federal law. However, as demonstrated below, that is not the case here.

Federal Preemption

Occasionally, Congress is sufficiently concerned about federal supremacy in an area that it expressly spells out its preemptive intent on the face of the federal law. This is called "express preemption"; and given the historical respect for state property law in general, and state water law in particular, it will not often occur in the water law arena. In legislating the Clean Water Act, Congress utilized the "cooperative federalism" model of regulation, and invited the States to take over certain programs. For example, as in the situation of MS4 permits, the majority of

§402 (33 U.S.C. §1342) NPDES permit systems have been assumed by the State. This is a far cry from the typical express preemption scenario where the state role is entirely displaced.

In addition to "express preemption", however, there are two different kinds of "implied preemption" analysis. These are the "field preemption" and the "conflict preemption" models.

In "field preemption" cases, the facts involve either a detailed and "pervasive" federal statutory and regulatory scheme; or a "dominant" federal interest; or both. In such cases, the palpable assertion of (or need for) unimpeded federal control leads the courts to attribute to Congress an intent to "occupy the field", leaving no room for state law. This is not the case with NPDES permits as discussed above. Realistically, the only area in water law where "field preemption" appears to have any role is the area of hydroelectric power generation.

At last we come to "conflict" preemption. "Conflict" analysis is really a two-step process. First, one must ascertain with fair precision what the relevant federal and state laws dictate. This may be an arduous process in itself, entailing an odyssey through reams of statutes; tomes on the rules of statutory construction; and a deluge of legislative history. Then, as a second step, the courts compare the federal and state law, and set aside those aspects of the state law that directly conflict with the federal law, as well as those that "frustrate" the accomplishment of the objectives of Congress. The field is not "occupied"; state laws that are consistent with federal programs are welcome.

Conflict preemption cases are necessarily decided on a case by case basis; one decision will not likely serve as very persuasive authority in another case involving different federal or state laws. However, I have not found any federal mandate that would require an MS4 permit to address the issues raised by the prior lawful approval provision in this or any other MS4 permit. Thus, there does not appear to be a basis for conflict preemption.

State Preemption.

The same legal doctrines that apply to federal preemption of state statutes and regulations also apply to state preemption of local ordinances. With one additional nuance in California.

Under Dillon's Rule, California's legislature has stipulated local governments are administrative arms of the states and can be ordered to carry out state programs or policies generally referred to as mandates. However, the California Constitution provides that whenever the Legislature or any state agency mandates a new program or higher level of service on a local government, the state shall reimburse the local government for the costs of that program or increased level of service. Here, where the imposition of a strict mandate on local agencies to impose new development requirements on vested projects represents a new program or higher level of

service for which the local agencies must be reimbursed; particularly if the imposition requires the local land use agency to utilize it eminent domain powers to rescind a vested right.

Moreover, the state remains liable for making reimbursements even when events render a mandate determination inappropriate or obsolete. There is no current mechanism for reducing or eliminating mandates when there is a change in law or when the cost for implementing a mandate decreases over time. For example, sometimes federal mandates are imposed subsequent to a state mandate relating to the identical program. Under the current structure, there is no mechanism to retire the state mandate. Even assuming that federal preemption existed in this case, which it does not, by incorporating a strict mandate into the MS4 permit which requires land use agencies to withdraw vested rights, the state would still be liable for the resulting costs to the jurisdictions.

It would certainly be possible for the RWQCB to adopt language that eviscerates vested rights. However, the logical consequence would be a finding of an unfunded mandate whereby the state would be required to reimburse the land use agencies for the cost of imposing such a requirement on both public and private projects.

The Solution

Given the legal analysis above, we believe that the language proposed by the Coalition in consultation with the Copermittees fairly addresses the legal concerns raised by a reversion to the “footnote” in the 2007 permit. The proposed language:

- Addresses the ambiguities that result in common law vesting.
- Provides a clear pathway by which land use agencies can use their police powers to avoid the results older vesting tentative maps and development agreements.
- Provides the necessary safeguards and protections to all parties regarding the ability to complete a project based on the regulations in place at the time the project was approved.
- Shields the State from having to reimburse the land use agencies for unfunded mandates.

Chiu, Wayne@Waterboards

From: Marco Gonzalez <marco@coastlawgroup.com>
Sent: Thursday, May 07, 2015 4:00 PM
To: Wayne Rosenbaum
Cc: Matt O'Malley (matt@sdcoastkeeper.org); Chiu, Wayne@Waterboards; Walsh, Laurie@Waterboards; Becker, Eric@Waterboards; 'Mike McSweeney'; Livia Borak; Marco Gonzalez
Subject: RE: Word version of proposed language

Hey Wayne:

As was noted at the workshop, at this point in the process we do not believe it makes sense to develop a definition of PLA or to create a policy-driven solution (in a vacuum) without some better data on the likely implication of a relaxed definition. Therefore, before we propose alternate language, we believe either of the following options should first occur:

(a) The Co-Permittees should be required to provide a database for each of their jurisdictions identifying the projects that might take advantage of the new definition and process for addressing Prior Lawful Approvals; or

(b) General notice should be provided (via newspaper and Co-Permittee websites) to property owners and project applicants that if they believe their project warrants consideration for having achieved a Prior Lawful Approval, they have a limited time (30-60 days) to come forward and make their cases. Once we have that database and arguments, we can more appropriately discern the common circumstances that might warrant application of the 2007/10 standards notwithstanding lack of a grading permit (Avco vested right). So, for instance, based on the timing, number, size, location, and other factors of those projects seeking certification of their PLAs, we might be able to say that all projects with x,y,z conditions or circumstances probably warrant use of the old standards (based on infeasibility, equity, estoppel, proximity to sensitive resources, etc.). This is akin to the methodology used by the County of San Diego when it considered amending its recently approved General Plan in 2012; it considered pleas from more than 137 disgruntled individual property owners at a workshop, after which it agreed to evaluate a limited number of requests for relief from the new zoning constraints. See: http://www.sandiegocounty.gov/pds/gpupdate/docs/BOS_Jun2012/July_25_PSR_GPA_BL.pdf

However, we'd like to make clear that simple economic infeasibility will never be a sufficient reason to allow use of the older standards, as it is well established that lack of funds is typically not a defense to compliance with the Clean Water Act.

-Marco

COAST LAW GROUP LLP

MARCO A. GONZALEZ
Managing Partner

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From: Wayne Rosenbaum [mailto:swr@envirolawyer.com]
Sent: Friday, May 01, 2015 11:53 AM
To: Marco Gonzalez
Cc: Matt O'Malley (matt@sdcoastkeeper.org); Chiu, Wayne@Waterboards; Walsh, Laurie@Waterboards; Becker, Eric@Waterboards; 'Mike McSweeney'
Subject: Word version of proposed language

Marco

Attached please find word version of proposed language as promised. We think this language clarifies for all the parties what was intended by the "Prior Lawful Approval" provision in the 2013 order. It recognizes both common law and statutory vested rights while limiting their application only to projects that have clearly demonstrated that they will comply with the 2010 hydromodification requirements as provided in the 2007 order. In order to understand why we think this proposed language is both protective of the environment and feasible I think it would be good to start by looking at some of the differences between the 2007 and 2013 orders:

Order No. R9-2007-0001 provides as follows: "Updated SUSMP and hydromodification requirements shall apply to all priority projects or phases of priority projects which have not yet begun grading or construction activities at the time any updated SUSMP or hydromodification requirement commences. **If a Copermittee determines that lawful prior approval of a project exists, whereby application of an updated SUSMP or hydromodification requirement to the project is infeasible, the updated SUSMP or hydromodification requirement need not apply to the project.** Where feasible, the Copermittees shall utilize the SUSMP and hydromodification update periods to ensure that projects undergoing approval processes include application of the updated SUSMP and hydromodification requirements in their plans." [Emphasis Added]. Thus while the footnote in the 2007 order did appear to only recognize the common law standard for vesting it also provided an escape valve for projects with a lawful prior approval where application of an updated SUSMP or hydromodification requirement was infeasible. Whether or not this order intended to also recognize statutory vesting is discussed below.

Order NO. R9-2013-0001 does not provide for projects with lawful prior approvals whereby application of provisions E.3.c.1 and E.3.c.2 are infeasible. Instead it appears that the 2013 order intended that alternative compliance would provide the necessary relief. However, the alternative compliance options proposed in the order are not available at this time and are not likely to be available for some time in the future. Thus, reading the language of the 2013 order

as you suggest creates a dilemma for both private developers and public agencies. A few scenarios might help clarify this dilemma.

City A decides to build a desperately needed fire station. Construction will not commence until January 2016. The soils at the site make infiltration impossible plus the proposed fire house is located in a poor urbanized area where infiltration of urban runoff may negatively impact ground water were it to reach the aquifer. The alternative compliance relief valve is not available and will not be available for some time as it requires the City to pass an ordinance and as you know an ordinance is a project under CEQA requiring CEQA review.

Developer B seeks to build a low and middle income housing project on a site that had been a paved parking lot. The entitlement process began in 2007 and the developer has a Development Agreement but final building permits will not be available until January 2016. The project was designed to the 2007 permit standards. Again the soils will not infiltrate thus retention of the 85th percentile storm is infeasible.

In the first case, I believe your reading of the 2013 order would prevent the construction of needed infrastructure. In the second case, your reading would expose the City to an inverse condemnation claim as the project has a statutorily vested right.

I think we both agree that a prior lawful approval can be usurped without triggering a taking under some situations. For example, if a Federal or state law preempts a vested right there is not taking. However, that is not the case here. There is no mandate from US EPA or the Clean Water Act that projects with prior lawful approvals must meet the requirements of provisions E.3.c.1. and E.3.c.2. when it is infeasible for the project to do so. Thus there is no federal preemption. There is no state preemption either. Provision E.3.e.(1)(a) is permissive in nature. "For project applications that have received prior lawful approval before the effective date of the BMP Design Manual is updated pursuant to Provision E.3.d, the Copermittee **may** allow previous land development requirements to apply. [Emphasis Added] Thus the Order does not command the Copermittees to impose the requirements of E.3.d on projects with prior lawful approvals and, in fact, if it were to do so it would likely be deemed an unfunded mandate.

I also think that we agree that a Copermittee may usurp a project's prior lawful approvals using its police powers when it is necessary to do so for reasons of health and safety on a case by case basis. Thus, if a project with a prior lawful approval really does present a threat to water quality even when it implements the standards in the 2007 permit, the Copermittee always has the authority to revoke the prior lawful approval.

In summary, the proposed language is not a "get out of jail free" card as you seem to think. It is intended to clarify the Copermittees land use discretion while helping to achieve water quality objectives by setting out the following limits:

1. Any project that seeks to take advantage of the prior lawful approval provision must demonstrate that the prior lawful approval on which it relies results in full compliance with the immediately prior MS4 Permit or in our case the design standards established in 2010 based on the 2007 order even where the prior lawful approval predates the 2007 order.
2. The 2007 permit standards will only apply to those portions of the project for which the MS4 system if fully constructed within five years of the adoption of the BMP manual. Thus, we are really talking about a relatively short cycle period from 2020 reaching back to the 2010 standards.

Reversion to the 2007 footnote as you suggest would likely only create more confusion and the potential to slow improvements in water quality. This is because, a project with an older prior lawful approval that can demonstrate infeasibility would not even have to achieve the 2010 standard. "**If a Copermittee determines that lawful prior approval of a project exists, whereby application of an updated SUSMP or hydromodification requirement to the project is infeasible, the updated SUSMP or hydromodification requirement need not apply to the project**."

Finally, the proposed language can be viewed as stop gap. If alternative compliance becomes available in the future, it will be much more likely that projects will not require these types of provisions because there will be an option that addresses infeasibility. However until alternative compliance becomes a reality for projects with prior lawful approvals, where achieving the 2013 requirements are infeasible the ability to proceed with the project under the standards set forth in the immediately prior MS4 permit is essential to allow needed infrastructure to proceed and to avoid inverse condemnation claims against Copermittees.

Hope this is helpful

Wayne

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CITY OF MURRIETA

June 22, 2015

Mr. Kurt Berchtold
Executive Officer
California Regional Water Quality
Control Board - Santa Ana Region
3737 Main Street, Suite 500
Riverside, CA 92501-3339

Mr. David W. Gibson
Executive Officer
California Regional Water Quality
Control Board – San Diego Region
2375 Northside Drive, Suite 100
San Diego, CA 92108

Dear Messrs. Berchtold and Gibson:

Re: Request for Designating the San Diego Regional Board as Regulating Discharges from MS4 owned by the City of Murrieta

The City of Murrieta is located within southwestern Riverside County, and covers an area of approximately 33.6 square miles. While the city is located primarily within the Santa Margarita Watershed and therefore is under the jurisdiction of the San Diego Regional Board, approximately 0.58 square miles (or 1.7%) of the city extends into the Santa Ana Watershed which is under the jurisdiction of the Santa Ana Regional Board. Attached for your reference is a map of the city, overlaid with the jurisdictional boundary between the two Regional Boards. Because of this situation, the city is subject to two Municipal Separate Storm Sewer System (MS4) Permits issued by the respective Regional Boards.

Pursuant to discussions with staff at both Regional Boards and consistent with California Water Code section 13228, the City of Murrieta hereby requests that the Santa Ana Regional Board designate the San Diego Regional Board for regulation of all portions of the city, regardless of Regional Board jurisdictional boundaries, for matters pertaining to MS4 permitting.

The remainder of this letter contains a discussion of the basis for this request; a description of the understood limitations of this designation; a description of the additional portion of the city that, pursuant to this designation, would be regulated by the San Diego Regional Board, and any other associated requests.

1 Town Square • Murrieta, California 92562
phone: 951.304.CITY (2489) • fax: 951.698.4509 • web: murrieta.org

Mr. Kurt Berchtold
Santa Ana Regional Water Quality Control Board
Mr. David W. Gibson
San Diego Regional Water Quality Control Board
Re: Request for Area Exchange

Basis for the request

The City is currently a named permittee on order R8-2010-0033 issued by the Santa Ana Regional Board (Santa Ana Permit), and order R9-2010-0016 with the San Diego Regional Board (San Diego Permit) – both of which are currently up for renewal. While having the same goal of reducing the discharge of pollutants from the MS4 system, these two orders include requirements that accomplish that goal in different ways. As a result, programs designed to be in compliance with the Santa Ana Permit are similar, but necessarily different than programs designed for compliance with the San Diego Permit. When this situation is applied within a single city, such as the City of Murrieta, having two differing programs creates significant confusion among both city staff and the public, which can lead to inefficient and inconsistent implementation of the programs and less effective protection of water quality. Additionally, and no less significant, there is a duplicative administrative and financial burden that is inherent in complying with two MS4 permits: two sets of programs have to be developed; staff have to be trained to two sets of requirements, and at differing frequencies; business inspections must inspect for and track different information, at differing frequencies; two sets of annual reports have to be created, with each report being required to include different information; etc.

The purpose of the City's request is to reduce the aforementioned complexity to allow for the more effective and focused utilization of the City's resources to the benefit of water quality.

Understood Limitations

This request by the City of Murrieta is made with the understanding that:

- For the purposes of MS4 permitting only, the San Diego Regional Board would regulate the entirety of the City of Murrieta. As a result, the City of Murrieta would be subject to a single MS4 permit, which would be issued by the San Diego Regional Board.
- Enforcement of any provisions of the MS4 permit issued to the City of Murrieta would be performed by the San Diego Regional Board.
- Any TMDLs and associated MS4 permit requirements issued by the Santa Ana Regional Board, which include the City of Murrieta as a responsible party, will be incorporated into the MS4 permit issued by the San Diego Regional Board by reference, including reference to any associated provisions, findings or elements of the fact sheet.
- Enforcement of any TMDL will remain with the Regional Board that has jurisdiction over the targeted impaired water body.
- Other Waste Discharge Requirements, or other Orders issued or enforced by the San Diego Regional Board would remain wholly under the jurisdiction of the San Diego Regional Board.

Mr. Kurt Berchtold
Santa Ana Regional Water Quality Control Board
Mr. David W. Gibson
San Diego Regional Water Quality Control Board
Re: Request for Area Exchange

Description of the area of the City subject to the designation:

Some facts about the City of Murrieta and the portion within the jurisdiction of the Santa Ana Regional Board are described below. Also enclosed with this letter is a map of the City with the subject area highlighted.

- Total Area of the city = 33.6 square miles
- Area within the Santa Ana Region Watershed = 0.58 square miles (or 375 acres)
- Percent of City in the Santa Ana Region Watershed = 1.7%

In conclusion, the requested designation of regulatory authority to the San Diego Regional Board will not only reduce the complexity and administrative burden upon the City of Murrieta, but will allow the City to better focus and effectively utilize their available resources to the best benefit to water quality in both regions.

If you have any questions regarding this request, please contact Robert K. Moehling at 951-304-2489.

Very truly yours,

Robert K. Moehling
City Engineer
CITY OF MURRIETA

Attachments:

Map of the City of Murrieta

cc:

Bill Woolsey, City of Murrieta
James Ozouf, City of Murrieta
Stuart McKibbin, Riverside County Flood Control
Scott Bruckner, Riverside County Flood Control

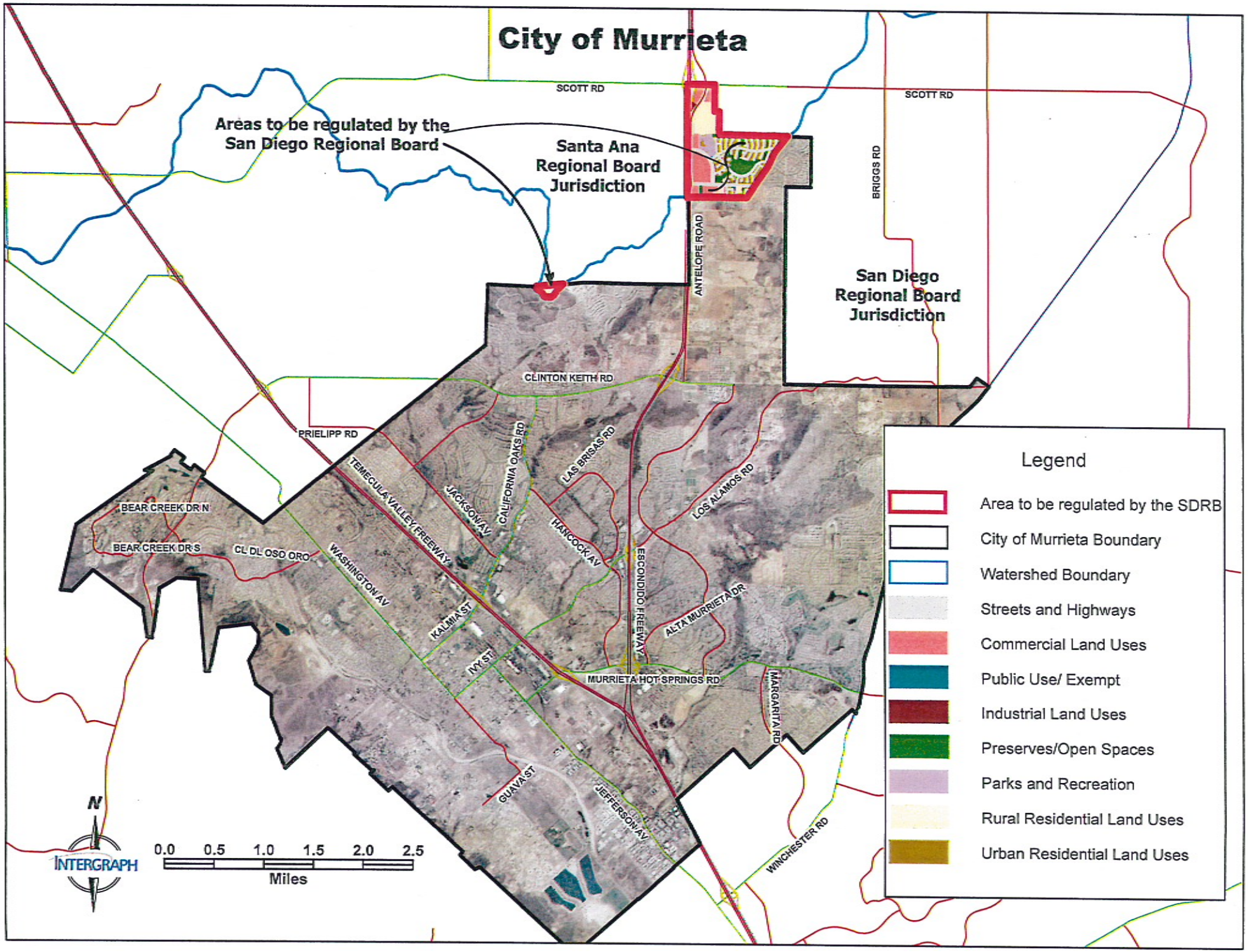
City of Murrieta
Areas to be regulated by the San Diego Regional Board
Santa Ana Regional Board Jurisdiction
San Diego Regional Board Jurisdiction
SCOTT RD
SCOTT RD
BRIGGS RD
ANTELOPE ROAD
CLINTON KEITH RD
PRIELIPP RD
TEMECULA VALLEY FREEWAY
JACKSON AV
CALIFORNIA OAKS RD
LAS BRISAS RD
HANCOCK AV
LOS ALAMOS RD
ESCONDIDO FREEWAY
ALTA MURRIETA DR
MURRIETA HOT SPRINGS RD
MARGARITA RD
BEAR CREEK DR N
BEAR CREEK DR S
CL DL OSO ORO
WASHINGTON AV
KALMIA ST
IVY ST
GUAVA ST
JEFFERSON AV
WINCHESTER RD
Legend
Area to be regulated by the SDRB
City of Murrieta Boundary
Watershed Boundary
Streets and Highways
Commercial Land Uses
Public Use/ Exempt
Industrial Land Uses
Preserves/Open Spaces
Parks and Recreation
Rural Residential Land Uses
Urban Residential Land Uses
N
INTERGRAPH
0.0 0.5 1.0 1.5 2.0 2.5
Miles

027775

027776

Ben Benoit, Mayor
Bridgette Moore, Mayor Pro Tem
Timothy Walker, Council Member
Bob Cashman, Council Member
Marsha Swanson, Council Member

23873 Clinton Keith Rd, Suite 201
Wildomar, CA 92595
951/677-7751 Phone
951/698-1463 Fax
www.CityofWildomar.org

June 23, 2015

Mr. Kurt Berchtold
Executive Officer
California Regional Water Quality
Control Board - Santa Ana Region
3737 Main Street, Suite 500
Riverside, CA 92501-3339

Mr. David W. Gibson
Executive Officer
California Regional Water Quality
Control Board – San Diego Region
2375 Northside Drive, Suite 100
San Diego, CA 92108

Re: Request for Designating the San Diego Regional Board as Regulating Discharges from MS4 owned by the City of Wildomar

Dear Messrs. Berchtold and Gibson:

The City of Wildomar is located within southwestern Riverside County, and covers an area of approximately 24 square miles. While the city is located primarily within the Santa Margarita Watershed and therefore is under the jurisdiction of the San Diego Regional Board, approximately 5,000 acres (or 33%) of the city extends into the Santa Ana Watershed which is under the jurisdiction of the Santa Ana Regional Board. Attached for your reference is a map of the city, overlaid with the jurisdictional boundary between the two Regional Boards. Because of this situation, the city is subject to two Municipal Separate Storm Sewer System (MS4) Permits issued by the respective Regional Boards.

Pursuant to discussions with staff at both Regional Boards and consistent with California Water Code section 13228, the City of Wildomar hereby requests that the Santa Ana Regional Board designate the San Diego Regional Board for regulation of all portions of the city, regardless of Regional Board jurisdictional boundaries, for matters pertaining to MS4 permitting.

The remainder of this letter contains a discussion of the basis for this request; a description of the understood limitations of this designation; a description of the additional portion of the city that, pursuant to this designation, would be regulated by the San Diego Regional Board, and any other associated requests.

Basis for the request

The City is currently a named permittee on order R8-2010-0033 issued by the Santa Ana Regional Board (Santa Ana Permit) and order R9-2010-0016 with the San Diego Regional Board (San Diego Permit) – both of which are currently up for renewal. While having the same goal of reducing the discharge of pollutants from the MS4 system, these two orders include requirements that accomplish that goal in different ways. As a result, programs designed to be in compliance with the Santa Ana Permit are similar, but necessarily different than programs designed for compliance with the San Diego Permit. When this situation is applied within a single city, such as the City of Wildomar, having two differing programs creates significant confusion among both city staff and the public, which can lead to inefficient and inconsistent implementation of the programs and less effective protection of water quality. Additionally, and no less significant, there is a duplicative administrative and financial burden that is inherent in complying with two MS4 permits: two sets of programs have to be developed; staff have to be trained to two sets of requirements, and at differing frequencies; business inspections must inspect for and track different information, at differing frequencies; two sets of annual reports have to be created, with each report being required to include different information; etc.

The purpose of the City's request is to reduce the aforementioned complexity to allow for the more effective and focused utilization of the City's resources to the benefit of water quality.

Understood Limitations

This request by the City of Wildomar is made with the understanding that:

- For the purposes of MS4 permitting only, the San Diego Regional Board would regulate the entirety of the City of Wildomar. As a result, the City of Wildomar would be subject to a single MS4 permit, which would be issued by the San Diego Regional Board.
- Enforcement of any provisions of the MS4 permit issued to the City of Wildomar would be performed by the San Diego Regional Board.
- Any TMDLs and associated MS4 permit requirements issued by the Santa Ana Regional Board, which include the City of Wildomar as a responsible party, will be incorporated into the MS4 permit issued by the San Diego Regional Board by reference, including reference to any associated provisions, findings or elements of the fact sheet.
- Enforcement of any TMDL will remain with the Regional Board that has jurisdiction over the targeted impaired water body.
- Other Waste Discharge Requirements, or other Orders issued or enforced by the Santa Ana Regional Board would remain wholly under the jurisdiction of the Santa Ana Regional Board.

Description of the area of the City subject to the designation:

Some facts about the City of Wildomar and the portion within the jurisdiction of the Santa Ana Regional Board are described below. Also enclosed with this letter is a map of the City with the subject area highlighted.

- Total Area of the city = 24 square miles
- Area within the Santa Ana Region Watershed = 7.8 square miles
- Percent of City in the Santa Ana Region Watershed = 33%

In conclusion, the requested designation of regulatory authority to the San Diego Regional Board will not only reduce the complexity and administrative burden upon the City of Wildomar, but will allow the City to better focus and effectively utilize their available resources to the best benefit to water quality in both regions.

If you have any questions regarding this request, please contact Matt Bennett at 951.677.7751 x208.

Very truly yours,

Daniel A. York
Assistant City Manager
Public Works Director/City Engineer
City of Wildomar

Attachments:

Map of the City of Wildomar

ec: Matt Bennett, City of Wildomar
Scott Bruckner, Riverside County Flood Control
Stuart McKibbin, Riverside County Flood Control
Wayne Chiu, California Regional Water Quality Control Board San Diego Region

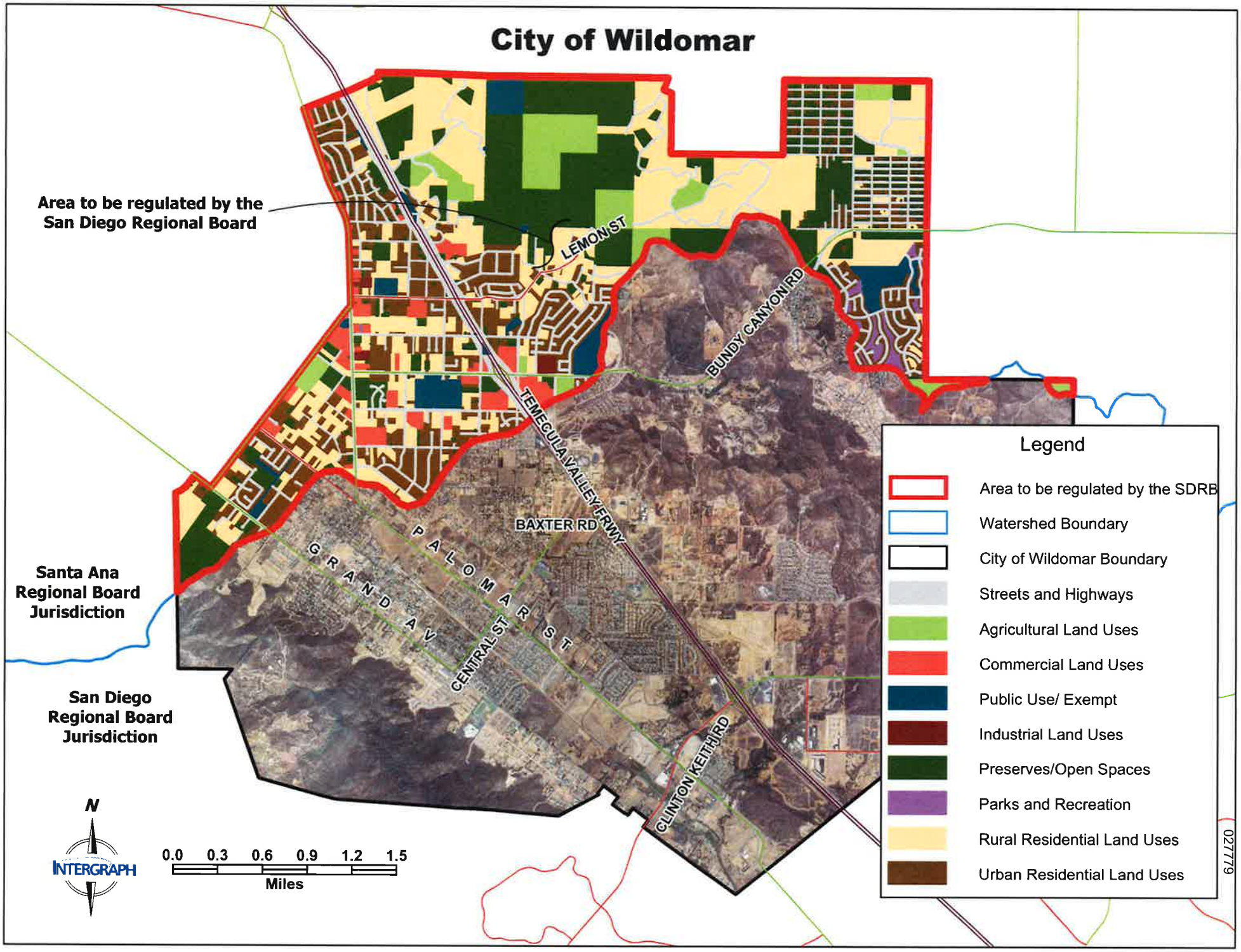
City of Wildomar
Area to be regulated by the San Diego Regional Board
Santa Ana Regional Board Jurisdiction
San Diego Regional Board Jurisdiction
LEMON ST
BUNDY CANYON RD
TEMECULA VALLEY FRWY
BAXTER RD
PALOMAR ST
GRAND AV
CENTRAL ST
CLINTON KEITH RD
N
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0.0 0.3 0.6 0.9 1.2 1.5
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Area to be regulated by the SDRB
Watershed Boundary
City of Wildomar Boundary
Streets and Highways
Agricultural Land Uses
Commercial Land Uses
Public Use/ Exempt
Industrial Land Uses
Preserves/Open Spaces
Parks and Recreation
Rural Residential Land Uses
Urban Residential Land Uses
027779

Chiu, Wayne@Waterboards

From: lyris@swrcb18.waterboards.ca.gov
Sent: Tuesday, June 23, 2015 3:30 PM
To: Chiu, Wayne@Waterboards
Subject: June 30, 2015 Public Workshop on Prior Lawful Approval and Alternative Compliance Pathway
Attachments: 2015-0630 PLA RWL Wrap-up Workshop Agenda.pdf; 2015-0623 Second Revised Draft RWL Compliance Pathway.pdf; 2015-0623 Second Revised Draft PLA.pdf

This is a message from the California Regional Water Quality Control Board, San Diego Region (9).

Greetings,

Please find attached the agenda for the June 30, 2015 Public Workshop to be held at the City of Vista Civic Center Complex, Community Room, 200 Civic Center Drive, Vista, CA 92084. The workshop begins at 9:30 a.m.

As a result of the information and comments received during the April 28, 2015 and May 21, 2015 Public Workshops and additional meetings with various stakeholders, and proposed revisions provided by various stakeholders, the San Diego Water Board made additional revisions to the draft language for the Definition of Prior Lawful Approval for Priority Development Projects and the Alternative Compliance Pathway for Receiving Water Limitations. The revised language (also attached to this email), proposed revised language provided by various stakeholders, as well as notes summarizing the May 21, 2015 Public Workshop are available on the San Diego Water Board's website at: http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

As part of the proceedings to amend the Regional MS4 Permit (Order No. R9-2013-0001, as amended by Order No. R9-2015-0001) to extend coverage to the Riverside County Copermittees, the draft language is expected to be included into the proposed amendments to the Regional MS4 Permit. At the workshop, the Regional MS4 Permit Team will present the significant changes made to the draft language for the Definition of Prior Lawful Approval for Priority Development Projects and the Alternative Compliance Pathway for Receiving Water Limitations. The Regional MS4 Permit Team will also take comments and answer questions on the draft language at the workshop.

We look forward to seeing you at the workshop.

Wayne Chiu, PE
Water Resource Control Engineer
Storm Water Management
San Diego Water Board

You are currently subscribed to reg9_riversideco_ms4permit as: wchiu@waterboards.ca.gov.

To unsubscribe click here: leave-4774870-508207.5107fc8553449efc6c06984e788d7ab2@swrcb18.waterboards.ca.gov

Draft Definition of Prior Lawful Approval for Priority Development Projects
Revised June 23, 2015

Revise Provision E.3.e.(1)(a) as follows:

e. **PRIORITY DEVELOPMENT PROJECT BMP IMPLEMENTATION AND OVERSIGHT**

Each Copermittee must implement a program that requires and confirms structural BMPs on all Priority Development Projects are designed, constructed, and maintained to remove pollutants in storm water to the MEP.

(1) Structural BMP Approval and Verification Process

(a) Each Copermittee must require and confirm that all Priority Development Projects implement the requirements of Provision E.3, except that the Copermittee may allow previous land development requirements to apply to a Priority Development Project if ~~all of~~ the ~~following~~ conditions of Provision E.3.e.(1)(a)(i) or Provision E.3.e.(1)(a)(ii) are met:

(i) The Copermittee has, prior to the effective date of the BMP Design Manual required to be developed pursuant to Provision E.3.d:~~,~~

[a] ~~a~~Approved[1] a design that incorporates the storm water drainage system for the Priority Development Project in its entirety, including all applicable structural pollutant treatment control and hydromodification management BMPs consistent with the previous applicable MS4 permit requirements;[2] AND

[b] Issued a private project permit or approval, or functional equivalent for public projects, that authorizes the Priority Development Project applicant to commence construction activities based on a design that incorporates the storm water drainage system approved in conformance with Provision E.3.e.(1)(a)(i)[a], AND

[c] Confirmed that there have been construction activities on the Priority Development Project site within the 365 days prior to the effective date of the BMP Design Manual, *OR* the Copermittee confirms that construction activities have commenced on the Priority Development Project site within the 180 days after the effective date of the BMP Design Manual, where construction activities are undertaken in reliance on the permit or approval, or functional equivalent for public projects, issued by the Copermittee in conformance with Provision E.3.e.(1)(a)(i)[b].

[d] All subsequent private project permits or approvals, or functional equivalent for public projects, that are needed to implement the

[1] For public projects, a design stamped by the City or County Engineer, or engineer of record for the project is considered an approved design.
[2] Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016 for San Diego County, Orange County, and Riverside County Copermittees, respectively

design initially approved in conformance with Provision E.3.e.(1)(a)(i)[a], must be issued within 5 years of the effective date of the BMP Design Manual. The storm water drainage system for the Priority Development Project in its entirety, including all applicable structural pollutant treatment control and hydromodification management BMPs must remain in substantial conformity with the design initially approved in conformance with Provision E.3.e.(1)(a)(i)[a].

(ii) The Copermittee does not have the land use authority or legal authority to require a Priority Development Project to implement the full requirements of Provision E.3. ~~has, prior to the effective date of the BMP Design Manual required to be developed pursuant to Provision E.3.d, issued a building permit, or functional equivalent, that authorizes the Priority Development Project applicant to commence construction activities, based on a design that incorporates the approved storm water drainage system for the Priority Development Project in its entirety; AND~~

~~(iii) The Copermittee confirms that there have been construction activities on the Priority Development Project site within the 365 days prior to the effective date of the BMP Design Manual required to be developed pursuant to Provision E.3.d, *OR* the Copermittee confirms that construction activities will commence on the Priority Development Project site within the 180 days after the effective date of the BMP Design Manual required to be developed pursuant to Provision E.3.d, where construction activities are undertaken in reliance on the building permit, or functional equivalent, issued by the Copermittee in conformance with Provision E.3.e.(1)(a)(ii).~~

Draft Alternative Compliance Pathway for Receiving Water Limitations
Revised June 23, 2015

Insert the following as Provision B.3.c:

c. ~~DISCHARGE~~ PROHIBITIONS AND ~~RECEIVING WATER~~ LIMITATIONS COMPLIANCE OPTION

Each Copermittee has the option to utilize the implementation of the Water Quality Improvement Plan to demonstrate compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, ~~and~~ A.2.a, and A.3.b within a Watershed Management Area subject to~~. A Copermittee will be deemed to be in compliance with Provisions A.1.a, A.1.c and A.2.a within a Watershed Management Area when~~ the following conditions ~~are met~~:

(1) A Copermittee is eligible to be deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2.a, and A.3.b within a Watershed Management Area when ~~T~~the Water Quality Improvement Plan for a Watershed Management Area ~~must~~ incorporates the following:

(a) Numeric goals, water quality improvement strategies, and schedules developed pursuant to Provisions B.3.a and B.3.b that include the following:

(i) Interim and final WQBELs established by the TMDLs in Attachment E to this Order applicable to the Copermittee's jurisdiction within the Watershed Management Area; AND ~~and~~

(ii) Interim and final numeric goals for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 applicable to the Copermittee's jurisdiction within the Watershed Management Area; AND

(iii) Interim and final ~~N~~numeric goals applicable to the Copermittee's MS4 discharges within the Watershed Management Area expressed as numeric concentration-based or load-based goals for all ~~other~~ pollutants and conditions listed on the Clean Water Act Section 303(d) List of Water Quality Impaired Segments[1] for the receiving waters in the Watershed Management Area that do not have a TMDL ~~developed and~~ incorporated into Attachment E to this Order; AND/OR ~~and~~

(iv) Interim and final ~~N~~numeric goals for pollutants and conditions identified as receiving water priorities in the Water Quality Improvement Plan ~~for receiving waters~~ that will result in chemical, physical, and~~/or~~ biological conditions protective of the beneficial uses of the receiving waters impacted by the Copermittee's MS4 discharges ~~that will be protective of the beneficial uses~~ within the Watershed Management Area ~~under the Copermittee's jurisdiction.~~; AND

[1] 2010 and subsequent 303(d) Lists

(v) The Copermittee has the option to include interim and final numeric goals applicable to the Copermittee's MS4 discharges and/or receiving waters within the Watershed Management Area for any pollutants or conditions in addition to those described in Provisions B.3.c.(1)(a)(i)-(iv); AND

(vi) Schedules for achieving each final numeric goal that reflect a realistic assessment of the shortest practicable time needed for achievement; AND

(vii) For each final numeric goal developed pursuant to Provisions B.3.a and B.3.c.(1)(a)(i)-(v), at least one annual milestone[2] and date for its achievement must be included within each Water Quality Improvement Plan Annual Report reporting period until the final numeric goal is achieved.

(b) An analysis ~~utilizing a watershed model or other watershed analytical tools~~ that meets the following conditions:

(i) The analysis, with clearly stated assumptions included in the analysis, must quantitatively demonstrate that the implementation of the water quality improvement strategies required under Provision B.3.b will achieve the final numeric goals within the ~~established~~ schedules ~~required to be~~ developed pursuant to Provisions B.3.a and B.3.c.(1)(a).

(ii) The development of the analysis must include a public participation process which allows the public to review and provide comments on the analysis methodology utilized and the assumptions included in the analysis. Public comments and responses must be included as part of the analysis documentation included in the Water Quality Improvement Plan.

(iii) The analysis may be performed by an individual Copermittee ~~only for its jurisdiction within the Watershed Management Area,~~ or jointly by two or more ~~of any of the~~ Copermittees choosing to utilize this compliance option for their jurisdictions within the ~~same~~ Watershed Management Area.

(iv) The analysis must be updated as part of the iterative approach and adaptive management process required under Provisions B.5.a-b.

(c) Specific monitoring and assessments ~~included in the monitoring and assessment program~~ required pursuant to Provision B.4.a that will be performed by the Copermittee capable of ~~to:~~ 1) demonstrating~~e~~ ~~that~~ whether the implementation of the water quality improvement strategies ~~within its jurisdiction~~ are making progress toward achieving the numeric goals in

[2] Annual milestones for each final numeric goal must build upon previous milestones and lead to the achievement of the final numeric goal. The annual milestones may consist of water quality improvement strategy implementation phases, interim numeric goals, and other acceptable metrics.

accordance with the established schedules developed pursuant to Provisions B.3.a and B.3.c.(1)(a), and 2) determining~~e~~ whether interim and final numeric goals have been achieved. The specific monitoring and assessments must be updated as part of the iterative approach and adaptive management process required under Provision B.5.c.

(d) Documentation showing that the numeric goals, schedules, and annual milestones proposed pursuant to Provision B.3.c.(1)(a), the analysis performed pursuant to Provision B.3.c.(1)(b), and the specific monitoring and assessments proposed pursuant to Provision B.3.c.(1)(c) have been reviewed by the Water Quality Improvement Consultation Panel (see Provision F.1.a.(1)(b)) ~~for any recommendations~~. Updates must be reviewed by the Water Quality Improvement Consultation Panel for any recommendations.

(2) Each Copermittee that voluntarily completes the requirements of Provision B.3.c.(1) is ~~chooses to utilize this option will, for the pollutant/water body combinations included in the analysis performed pursuant to Provision B.3.c.(1)(b), be~~ deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, ~~and~~ A.2.a, and A.3.b for the pollutants and conditions for which numeric goals are developed when the Water Quality Improvement Plan, incorporating the requirements of Provision B.3.c.(1), is accepted by the San Diego Water Board pursuant to Provision F.1.b or F.2.c. The Copermittee is considered to be in compliance during the term of this Order as long as:

~~(3) The Copermittee will, for the pollutant/water body combinations included in the analysis performed pursuant to Provision B.3.c.(1)(b), remain in compliance with Provisions A.1.a, A.1.c and A.2.a during the term of this Order as long as:~~

~~(a) The results of the analysis performed pursuant to Provision B.3.c.(1)(b) is accepted by the San Diego Water Board Executive Officer as part of the Water Quality Improvement Plan and as part of subsequent updates to the Water Quality Improvement Plan; AND~~

~~(b)~~(a) The Copermittee ~~continues to~~ is implementing the water quality improvement strategies within its jurisdiction developed pursuant to Provision B.3.b.(1) and in ~~accordance~~ compliance with the schedules for implementing the strategies established pursuant to Provisions B.3.b.(3)(a) and B.3.c.(1)(a)(vii); AND

~~(c)~~(b) The Copermittee ~~continues to~~ is performing the monitoring and assessments ~~specified in the Water Quality Improvement Plan,~~ developed ~~and implemented~~ pursuant to Provision B.3.c.(1)(c)~~, to demonstrate its progress toward achieving the numeric goals applicable to its MS4 discharges in accordance with the interim and final dates for achieving the numeric goals established pursuant to Provision B.3.a.(2)~~; AND

~~(d)~~(c) The Copermittee's assessments in the Water Quality Improvement Plan Annual Report submitted pursuant to Provision F.3.b.(3) support a conclusion that: 1) the Copermittee is in compliance with the annual milestones and dates for achievement developed pursuant to Provision B.3.c.(1)(a)(vii), OR 2) the Copermittee has provided acceptable rationale and recommends appropriate modifications to the interim numeric goals, and/or water quality improvement strategies, and/or schedules to improve the rate of progress toward achieving the final numeric goals developed pursuant to Provisions B.3.a and B.3.c.(1)(a)(i)-(vi); AND

(d) Any proposed modifications to the numeric goals, schedules, and/or annual milestones are accepted by the San Diego Water Board as part of subsequent updates to the Water Quality Improvement Plan pursuant to Provision F.2.c;[3] AND

(e) The Copermittee ~~continues to~~ is implementing the requirements of Provision A.4.a.

[3] A request for proposed changes to the Water Quality Improvement Plan does not stay any permit condition.

PUBLIC WORKSHOP AGENDA

Proposed Amendments to
Order No. R9-2013-0001, as amended by Order No. R9-2015-0001,
to Incorporate
a Definition of Prior Lawful Approval for Priority Development Projects and
an Alternative Compliance Pathway for Receiving Water Limitations

Tuesday, June 30, 2015
9:30 a.m. – 12:00 p.m.

Location: City of Vista Civic Center Complex, Community Room, 200 Civic Center Drive, Vista, CA 92084

1. Introductions (Lewis Michaelson)

2. Prior Lawful Approval Draft Permit Language

   QUESTION: Is there a definition of prior lawful approval that will allow developers, the environmental community, and the Copermittees to clearly understand when a development project should be subject to the Priority Development Project requirements of the Regional MS4 Permit?

   a. Review of Significant Language Changes (Christina Arias)

   b. Comments and Questions

3. Alternative Compliance Pathway for Receiving Water Limitations Draft Permit Language

   QUESTION: What ambitious, rigorous and transparent alternative compliance path should be required that allows a Copermittee an appropriate period of time to come into compliance with receiving water limitations, as a precondition of a Copermittee being considered in compliance with the receiving water limitations while fully implementing the compliance alternative?

   a. Review of Significant Language Changes (Wayne Chiu)

   b. Comments and Questions

4. Next Steps (Laurie Walsh)

Permit Team
David Barker, Branch Supervisor- David.Barker@waterboards.ca.gov
Laurie Walsh, Senior Water Resource Control Engineer- Laurie.Walsh@waterboards.ca.gov
Wayne Chiu, Water Resource Control Engineer- Wayne.Chiu@waterboards.ca.gov
Christina Arias, Water Resource Control Engineer- Christina.Arias@waterboards.ca.gov
Eric Becker, Senior Water Resource Control Engineer- Eric.Becker@waterboards.ca.gov

ELECTRONIC MAIL LIST SUBSCRIPTION
The San Diego Water Board has established an electronic mail list specifically for information and notices on the development of a Regional MS4 Storm Water Permit. The San Diego Water Board will use the email list to notify interested persons of upcoming important events and the availability of on-line documents. Persons interested in receiving future notices and information on this specific project can subscribe to one (1) of the electronic mail lists titled “Orange County MS4 Permit, “ Riverside County MS4 Permit, or “San Diego MS4 Permit ”, located on the San Diego Water Board website at:
http://www.waterboards.ca.gov/resources/email_subscriptions/reg9_subscribe.shtml

027789

Scott A. Mann
Mayor

John V. Denver
Mayor Pro Tem

Wallace W. Edgerton
Councilmember

Greg August
Councilmember

Matthew Liesemeyer
Councilmember

29714 Haun Road
Menifee, CA 92586
Phone 951.672.6777
Fax 951.676.3843
www.cityofmenifee.us

June 25, 2015

Mr. Kurt Berchtold

Executive Officer

California Regional Water Quality

Control Board - Santa Ana Region

3737 Main Street, Suite 500

Riverside, CA 92501-3339

2015 JUN 29 AM 8 59
SAN DIEGO REGIONAL
WATER QUALITY
CONTROL BOARD

Mr. David W. Gibson

Executive Officer

California Regional Water Quality

Control Board – San Diego Region

2375 Northside Drive, Suite 100

San Diego, CA 92108

Dear Messrs. Berchtold and Gibson:

Re: Request for Designating the Santa Ana Regional Board as Regulating Discharges from MS4 owned by the City of Menifee

The City of Menifee is located within southwestern Riverside County, and covers an area of approximately 47 square miles. While the city is located primarily within the Santa Ana Watershed and therefore is under the jurisdiction of the Santa Ana Regional Board, approximately 737acres (or 2.5%) of the city extends into the Santa Margarita Watershed which is under the jurisdiction of the San Diego Regional Board. Attached for your reference is a map of the city, overlaid with the jurisdictional boundary between the two Regional Boards. Because of this situation, the city is subject to two Municipal Separate Storm Sewer System (MS4) Permits issued by the respective Regional Boards.

DH# 1981457 6/29/15
Doc Scanned On:
B. Davila Time: 4:14

Pursuant to discussions with staff at both Regional Boards and consistent with California Water Code section 13228, the City of Menifee hereby requests that the San Diego Regional Board designate the Santa Ana Regional Board for regulation of all portions of the city, regardless of Regional Board jurisdictional boundaries, for matters pertaining to MS4 permitting.

The remainder of this letter contains a discussion of the basis for this request; a description of the understood limitations of this designation; a description of the additional portion of the city that, pursuant to this designation, would be regulated by the Santa Ana Regional Board, and any other associated requests.

Basis for the request

The City is currently a named permittee on order R8-2010-0033 issued by the Santa Ana Regional Board (Santa Ana Permit), and order R9-2010-0016 with the San Diego Regional Board (San Diego Permit) - which is currently up for renewal. While having the same goal of reducing the discharge of pollutants from the MS4 system, these two orders include requirements that accomplish that goal in different ways. As a result, programs designed to be in compliance with the Santa Ana Permit are similar, but necessarily different than programs designed for compliance with the San Diego Permit. When this situation is applied within a single city, such as the City of Menifee, having two differing programs creates significant confusion among both city staff and the public, which can lead to inefficient and inconsistent implementation of the programs and less effective protection of water quality. Additionally, and no less significant, there is a duplicative administrative and financial burden that is inherent in complying with two MS4 permits: two sets of programs have to be developed; staff have to be trained to two sets of requirements, and at differing frequencies; business inspections must inspect for and track different information, at differing frequencies; two sets of annual reports have to be created, with each report being required to include different information; etc.

The purpose of the City's request is to reduce the aforementioned complexity to allow for the more effective and focused utilization of the City's resources to the benefit of water quality.

Understood Limitations

This request by the City of Menifee is made with the understanding that:

- For the purposes of MS4 permitting only, the Santa Ana Regional Board would regulate the entirety of the City of Menifee. As a result, the City of Menifee would be subject to a single MS4 permit, which would be issued by the Santa Ana Regional Board.
- Enforcement of any provisions of the MS4 permit issued to the City of Menifee would be performed by the Santa Ana Regional Board.
- Any TMDLs and associated MS4 permit requirements issued by the San Diego Regional Board, which include the City of Menifee as a responsible party, will be incorporated into the MS4 permit issued by the Santa Ana Regional Board by reference, including reference to any associated provisions, findings or elements of the fact sheet.
- Enforcement of any TMDL will remain with the Regional Board that has jurisdiction over the targeted impaired water body.
- Other Waste Discharge Requirements, or other Orders issued or enforced by the San Diego Regional Board would remain wholly under the jurisdiction of the San Diego Regional Board.

Description of the area of the City subject to the designation:

Some facts about the City of Menifee and the portion within the jurisdiction of the San Diego Regional Board are described below. Also enclosed with this letter is a map of the City with the subject area highlighted.

- Total Area of the city = 47 square miles
- Area within the Santa Margarita Region Watershed = 1.15 square miles
- Percent of City in the Santa Margarita Region Watershed = 2.5%

Other Requests:

Understanding that the requested designation applies to the MS4 permit requirements, the Santa Ana Permit incorporates a simplified process in section XIV.G.1. for applying for coverage under the General Construction Permit (Order 2009-0009-DWQ) for municipal projects. This process includes submission of the NOI or Permit Registration Documents (PRDs) directly to the Executive Officer, and waived application fees. To avoid unnecessary confusion among staff, and potential for inadvertent non-compliance, the City of Menifee specifically requests that this portion of the MS4 permit would be applicable within the entire City, including those portions of the city within the jurisdiction of the San Diego Regional Board.

In conclusion, the requested designation of regulatory authority to the Santa Ana Regional Board will not only reduce the complexity and administrative burden upon the City of Menifee, but will allow the City to better focus and effectively utilize their available resources to the best benefit to water quality in both regions.

If you have any questions regarding this request, please contact Nino Abad at 951.672.6777.

Very truly yours,

JONTHAN G SMITH, PE
PUBLIC WORKS DIRECTOR
CITY OF MENIFEE

Attachments:

Map of the City of Menifee

ec:

Nino Abad, City of Menifee

Stuart McKibbin, Riverside County Flood Control

Julianna Gonzalez, Riverside County Flood Control

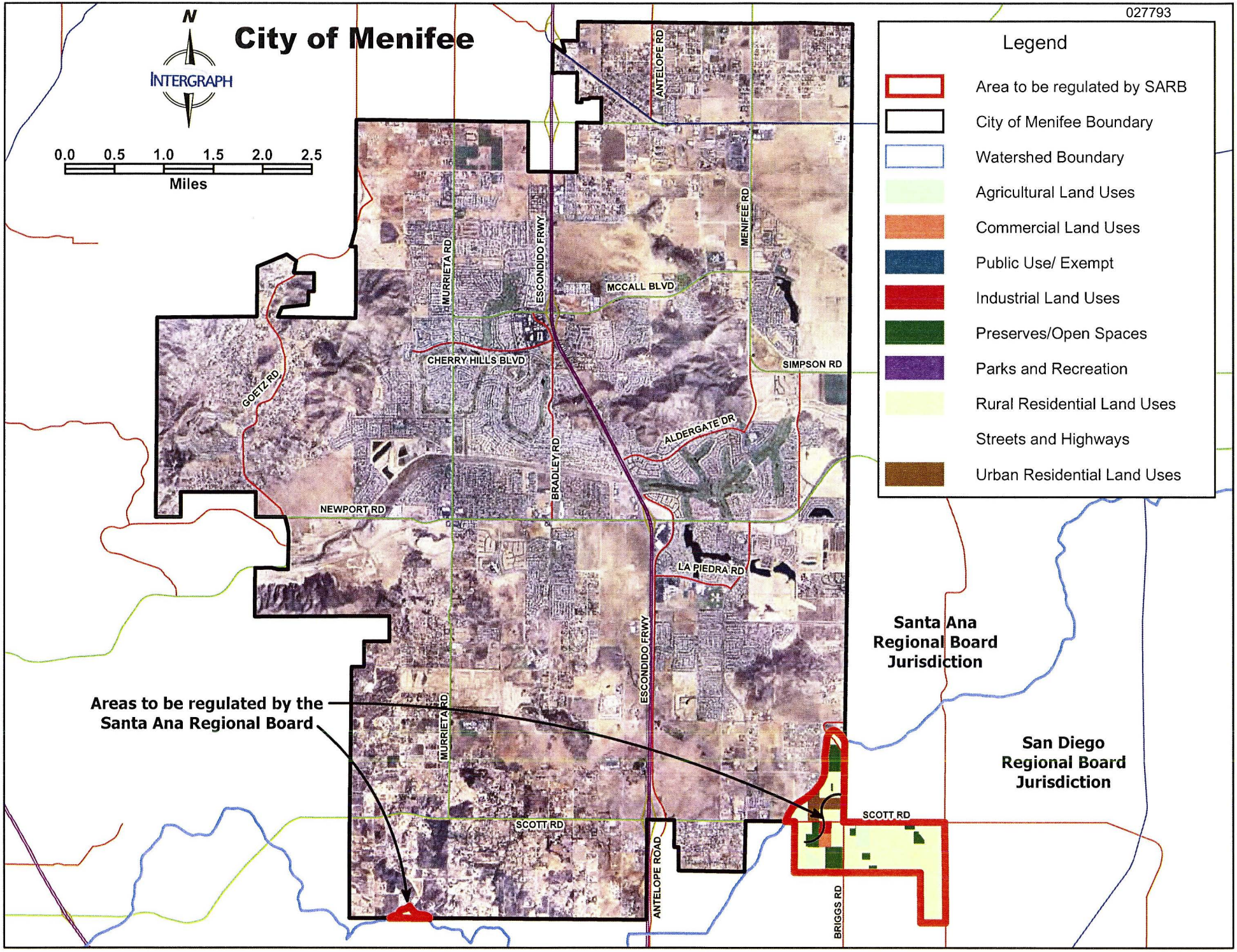
027793
City of Menifee
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INTERGRAPH
0.0 0.5 1.0 1.5 2.0 2.5
Miles
Legend
Area to be regulated by SARB
City of Menifee Boundary
Watershed Boundary
Agricultural Land Uses
Commercial Land Uses
Public Use/ Exempt
Industrial Land Uses
Preserves/Open Spaces
Parks and Recreation
Rural Residential Land Uses
Streets and Highways
Urban Residential Land Uses
ANTELOPE RD
MENIFEE RD
MURRIETA RD
ESCONDIDO FRWY
MCCALL BLVD
CHERRY HILLS BLVD
SIMPSON RD
GOETZ RD
ALDERGATE DR
BRADLEY RD
NEWPORT RD
LA PIEDRA RD
Santa Ana Regional Board Jurisdiction
San Diego Regional Board Jurisdiction
Areas to be regulated by the Santa Ana Regional Board
SCOTT RD
ANTELOPE ROAD
BRIGGS RD

Chiu, Wayne@Waterboards

From: Matt O'Malley <matt@sdcoastkeeper.org>
Sent: Friday, July 10, 2015 1:58 PM
To: Chiu, Wayne@Waterboards; Arias, Christina@Waterboards; Walsh, Laurie@Waterboards
Cc: Livia Borak; Marco Gonzalez
Subject: Coastkeeper comments on PLA draft language

Hello Wayne and Christina,

I wanted to briefly follow up after the final PLA presentation meeting to relay comments, which are based on a question I asked during the PLA presentation.

Under e.(1)(a)(ii), the language allows exceptions where the Copermittee "does not have the land use authority or legal authority to require a Priority Development Project to implement the full requirements of Provision E.3."

I think this section is not only redundant, but could possibly be used to excuse implementing portions of E.3. where the Copermittees actually have some land use and legal authority. I'll briefly explain below.

As far as redundancy, section E.3. already states "Each Copermittee must use their land use and planning authorities to implement a development planning program in accordance with the strategies in the WQIP...and includes, at a minimum..." This section already assumes they will only exercise authority when and where they have it, and requires it in those instances. This just makes sense.

The issue I have is where the draft language mentions the authority "to implement the *full* requirements of E.3." There might be, in some instances, a situation where the Copermittee has land use or legal authority to implement *some* portion of E.3. but not "the full requirements". The draft language as stated, in the hands of a decent lawyer, could be argued to excuse them from having to implement *any* part of E.3. because they lack the authority to implement "the full requirements" of E.3.

I realize you said you would not be amenable to making significant changes to this language, but I'm writing to request that section (ii) be removed since it is redundant and potentially problematic from a water quality standpoint.

Please call me if this is unclear or you'd like to discuss in more detail.

Thanks,

Matt

--
Matt O'Malley
Waterkeeper, Legal & Policy Director
matt@sdcoastkeeper.org
(o) 619-758-7743 x119
(c) 619-241-1894

San Diego Coastkeeper®

www.sdcoastkeeper.org

@SDWaterkeeper
@sd_coastkeeper

LEGAL PRIVILEGE AND CONFIDENTIALITY NOTICE: This e-mail is intended only for the individual(s) or entity(s) named within the message. This e-mail might contain legally privileged and confidential information. If you properly received this e-mail as a client or retained expert, please hold it in confidence to protect the attorney-client or work product privileges. Should the intended recipient forward or disclose this message to another person or party, that action could constitute a waiver of the attorney-client privilege. If the reader of this message is not the intended recipient, or the agent responsible to deliver it to the intended recipient, you are hereby notified that any review, dissemination, distribution or copying of this communication is prohibited by the sender and to do so might constitute a violation of the Electronic Communications Privacy Act, 18 U.S.C. section 2510-2521. If this communication was received in error we apologize for the intrusion. Please notify us by reply e-mail and delete the original message without reading same. Nothing in this e-mail message shall, in and of itself, create an attorney-client relationship with the sender.

Chiu, Wayne@Waterboards

From: Chiu, Wayne@Waterboards
Sent: Friday, July 31, 2015 10:44 AM
To: 'Barbara Tipton'; 'Boushra Salem' (bsalem@chulavistaca.gov); Brown, Clement (CMBrown@sandiego.gov); Cecilia Padres-Tipton (ctipton@cityofsanteeca.gov); Cheryl Filar (cfilar@cityofvista.com); Chris Helmer (chelmer@cityofib.org); Elaine Lukey (Elaine.Lukey@carlsbadca.gov); Erik Steenblock (esteenblock@encinitasca.gov); Godby, Kim (kgodby@coronado.ca.us); Helen M. Davies (hdavies@ci.escondido.ca.us); Jaime Campos (jcampos@ci.el-cajon.ca.us); 'James Wood'; 'JoAnn Weber'; Joe Kuhn (jkuhn@ci.la-mesa.ca.us); Karen Holman (kholman@portofsandiego.org); Kolb, Ruth (RKolb@sandiego.gov); Malik Tamimi (mtamimi@lemongrove.ca.gov); Mikhail Ogawa (mikhail@mogawaeng.com); Mo Lahsaie (mlahsaie@ci.oceanside.ca.us); Reed Thornberry (rthornberry@san-marcos.net); Richard Gilb (rgilb@san.org); Steven Strapac (SStrapac@poway.org); Taryn Dunbar (tdunbar@cosb.org); Boon, Richard (Richard.Boon@ocpw.ocgov.com); Chris Crompton (chris.crompton@ocpw.ocgov.com); Christopher Macon (cmacon@lagunawoodscity.org); Greg Yi (greg.yi@rdmd.ocgov.com); 'Hossein Ajideh'; Humza Javed (hjaved@ci.laguna-hills.ca.us); Joe Ames (JAmes@cityofmissionviejo.org); Lisa Zawaski (lzawaski@danapoint.org); Mary Vondrak (vondrakM@san-clemente.org); Moy Yahya (myahya@cityofalisoviejo.com); Nancy Palmer (NPalmer@cityoflagunaniguel.org); Rae Beimer (RBeimer@cityofrsm.org); Slaven, Devin (dslaven@lakeforestca.gov); Tracy Ingebrigtsen (tingebrigtsen@lagunabeachcity.net); Aldo Licitra (Aldo.Licitra@cityoftemecula.org); Bill Woolsey (wwoolsey@murrieta.org); Bruckner, Scott (sebruckner@rcflood.org); Horn, Steven (Shorn@rceo.org); Matt Bennett (mbennett@cityofwildomar.org); 'Bill Paznokas'; 'Carol Roberts'; 'Cindy Lin'; 'Dave Smith'; 'Deborah Lee'; 'Robert Smith'
Cc: Walsh, Laurie@Waterboards; Arias, Christina@Waterboards
Subject: NOTICE OF OPPORTUNITY TO COMMENT AND PUBIC HEARING: Amendments to Regional MS4 Permit
Attachments: 2015-0731 Final Tent Order Cover Letter.pdf; 2015-0731 Final Public Cmt_Hearing Notice.pdf

Good morning Copermittees of the San Diego Region,

Please see the attached Cover Letter and Notice of Opportunity to Comment and Public Hearing for Tentative Order No. R9-2015-0100, *An Order Amending Order No. R9-2013-0001, NPDES No. CAS010266, as Amended by Order No. R9-2015-0001* (Tentative Order). The Tentative Order and proposed changes to the Regional MS4 Permit are available to download on the following webpage:
http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

The San Diego Water Board is accepting written comments on the Tentative Order and proposed changes to the Regional MS4 Permit. **Written comments must be received no later than 5 p.m. on Monday, September 14, 2015**.

The San Diego Water Board is scheduled to hold a public hearing to consider adoption of the Tentative Order. The public hearing to consider the Tentative Order will be held at the San Diego Water Board meeting at the following date and location:

November 18, 2015, beginning at 9 a.m.
San Diego Water Board Room
2375 Northside Drive, San Diego, CA 92108

Please see the attachments for further detail and contact me with any questions.

Thank you,

Wayne Chiu, PE
Water Resource Control Engineer
Storm Water Management Unit
California Regional Water Quality Control Board
San Diego Region
2375 Northside Drive, Suite 100
San Diego, CA 92108
Direct Line: (619) 521-3354
Main Line: (619) 516-1990

California Water Boards

Edmund G. Brown Jr.
Governor

Matthew Rodriquez
Secretary for Environmental Protection

California Regional Water Quality Control Board, San Diego Region

July 31, 2015

Sent via E-mail

San Diego County Copermittees
Orange County Copermittees
Riverside County Copermittees

In reply refer to / attn:
Place ID: 786088:WChiu

Subject: Notice of Opportunity to Comment and Public Hearing
Tentative Order No. R9-2015-0100, An Order Amending Order No. R9-2013-0001, Regional Municipal Separate Storm Sewer (MS4) Permit for the San Diego Region

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) is releasing for public review and comment Tentative Order No. R9-2015-0100 (Tentative Order) amending Order No. R9-2013-0001, as amended by Order No. R9-2015-0001 (Regional MS4 Permit). The San Diego Water Board is scheduled to hold a public hearing to consider adoption of the Tentative Order during the Board meeting scheduled for November 18, 2015. The deadline for submission of written comments on the Tentative Order and other details regarding the public hearing is contained in the enclosed Notice of Opportunity to Comment and Public Hearing.

The Tentative Order and Notice of Opportunity to Comment and Public Hearing is available on the San Diego Water Board's website at http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml.

Interested persons may also receive a copy of the Tentative Order and its attachments by contacting Wayne Chiu at (619) 521-3354, or by email at Wayne.Chiu@waterboards.ca.gov or by visiting the San Diego Water Board's office at 2375 Northside Drive, Suite 100, San Diego, California 92108, weekdays between 8:00 a.m. and 5:00 p.m., telephone (619) 516-1990.

The Tentative Order proposes to amend the Regional MS4 Permit in response to the Riverside County Copermittees' Report of Waste Discharge (RoWD) submitted by letter dated May 8, 2015, and designate the Riverside County Copermittees as MS4 dischargers responsible for compliance with the terms and the conditions of the Permit. The Tentative Order also proposes to amend the Regional MS4 Permit to address a variety of other issues including 1) incorporation of an option to utilize the Water Quality Improvement Plan to demonstrate compliance with receiving water prohibitions and limitations, 2) clarification of land development requirements describing when a development project should be subject to the Priority Development Project (PDP) requirements, 3) amendment to the requirements for updating the BMP Design Manual as a result of corrections to the priority development project definitions, 4) clarification of requirements for non-storm water discharges covered by the Statewide NPDES Permit for Drinking Water Systems and the San Diego Water Board's General Waste Discharge Requirements for Groundwater Extraction Discharges to Surface Waters, and 5) clarification of the Indicator Bacteria, Project I - Beaches and Creeks and Los Penasquitos Lagoon Sediment Total Maximum Daily Load requirements to increase consistency with the Basin Plan Amendment. If

adopted, the Tentative Order will supersede the Riverside County Copermittees' current Fourth Term MS4 Permit, Order No. R9-2010-0016.

The Tentative Order amends the Regional MS4 Permit and its Fact Sheet (Attachment F of the Permit) as described in Attachments 1 and 2 of the Tentative Order. Changes to the Regional MS4 Permit and its Fact Sheet based upon the Tentative Order are displayed in blue-underline for added text and red-strikeout for deleted text in the attachments to the Tentative Order.

Interested persons desiring to receive future public notices regarding the Tentative Order, proceedings to consider its adoption and potential future modifications to the Regional MS4 Permit can subscribe to one of the electronic e-mail service lists titled "Orange County MS4 Permit," "Riverside County MS4 Permit," or "San Diego MS4 Permit" located on the San Diego Water Board website: http://www.waterboards.ca.gov/resources/email_subscriptions/reg9_subscribe.shtml.

In the subject line of any response, please include the requested "In reply refer to:" information located in the header of this letter. If you have any questions or comments, please contact Wayne Chiu by phone at (619) 521-3354, or by e-mail at Wayne.Chiu@waterboards.ca.gov.

Respectfully,

for David Barker, P.E.
Supervising Engineer
San Diego Regional Water Quality Control Board

DTB:bb:law

Enclosure: Notice of Opportunity to Comment and Public Hearing

cc (via email):

San Diego County Copermittees
Orange County Copermittees
Riverside County Copermittees
Natural Resource Agencies
San Diego County MS4 Permit E-mail Service List
Riverside County MS4 Permit E-mail Service List
Orange County MS4 Permit E-mail Service List
San Diego Water Board Agenda E-mail Service List

Tech Staff Info & Use	
Tentative Order No.	R9-2015-0100
NPDES No.	CAS0109266
Place ID	786088

San Diego County Copermittees

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CALIFORNIA Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

NOTICE OF OPPORTUNITY TO COMMENT AND PUBLIC HEARING

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) is scheduled to hold a public hearing to consider adoption of Tentative Order No. R9-2015-0100 (Tentative Order). The Tentative Order proposes to amend the National Pollutant Discharge Elimination System (NPDES) Permit for *Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region, Order No. R9-2013-0001, as amended by Order No. R9-2015-0001 (Regional MS4 Permit).* Notice is hereby given that the San Diego Water Board will accept written comments on the Tentative Order and proposed changes to the Regional MS4 Permit in accordance with title 40 Code of Federal Regulations (CFR) section 124.10 and Water Code section 13167.5. Notice is also given that the San Diego Water Board will consider adoption of the Tentative Order at a public hearing on November 18, 2015.

The Tentative Order and attachments thereto, are available on the San Diego Water Board website at:
http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

The Tentative Order proposes to amend the Regional MS4 Permit to address a variety of issues including coverage for Copermittees in Riverside County consisting of the County of Riverside, the Riverside County Cities of Murrieta, Temecula, and Wildomar, and the Riverside County Flood Control and Water Conservation District and incorporation of limited permit provisions applicable to the City of Menifiee. If adopted, the Tentative Order will supersede the Riverside County Copermittees' current Fourth Term MS4 Permit, Order No. R9-2010-0016.

All written comments pertaining to the terms and conditions of the Tentative Order to be considered by the San Diego Water Board at the November 18, 2015 public hearing must be received no later than **5:00 p.m. on Monday September 14, 2015**. Written comments must be sent to the San Diego Water Board's office at 2375 Northside Drive, Suite 100, San Diego, CA 92108, faxed to (619) 516-1994, or e-mailed to sandiego@waterboards.ca.gov Attn: Wayne Chiu. Please indicate in the subject line of all written comments "Comment - Tentative Order No. R9-2015-0100, Place ID:786088WChiu." The early submission of written comments on the Tentative Order is encouraged.

The San Diego Water Board will prepare written responses to significant comments that are timely received. Consistent with State Water Resources Control Board regulations that apply to this proceeding, written comments received after 5:00 p.m. on Monday, September 14, 2015 will not be accepted and will not be incorporated into the administrative record if doing so would prejudice any party.

The public hearing on this matter will be held during the San Diego Water Board meeting scheduled for **November 18, 2015 in the Board Room of the San Diego Water Board Office, located at 2375 Northside Drive, San Diego, CA 92108**. The item will be heard during the meeting that starts at 9:00 a.m. The meeting notice and agenda, which will indicate any changes in the meeting location and may provide other specific information concerning this hearing, will be posted at least two weeks prior to the meeting date at http://www.waterboards.ca.gov/sandiego/board_info/agendas/.

Oral testimony at the public hearing will be allowed. The scope of oral testimony at the public hearing will be strictly limited to summarizing the previously submitted written comments, comments on revisions to the Tentative Order made in response to comments, and making policy statements. Oral testimony will be limited in time by the Board Chair.

The procedures governing San Diego Water Board meetings may be found at title 23, California Code of Regulations, section 647, et seq. and are available upon request. The hearing facilities will be accessible to persons with disabilities. The meeting notice and agenda for this meeting will provide contact information for persons requesting special accommodations.

Information related to this matter, including revisions made to the Tentative Order in response to written comments timely submitted, as well as the San Diego Water Board's responses to written comments timely submitted, will be available at the San Diego Water Board's office and the San Diego Water Board's storm water web page in advance of the public hearing. A separate notice will be sent announcing the availability of the revised Tentative Order and the responses to comments upon website posting of the documents.

Please contact Wayne Chiu at (619) 521-3354 or by email at Wayne.Chiu@waterboards.ca.gov for information regarding the above listed proposed permit action. Please bring the foregoing to the attention of any person known to you who would be interested in this matter.

DAVID W. GIBSON
Executive Officer
July 31, 2015

Chiu, Wayne@Waterboards

From: lyris@swrcb18.waterboards.ca.gov
Sent: Friday, July 31, 2015 11:50 AM
To: Chiu, Wayne@Waterboards
Subject: NOTICE OF OPPORTUNITY TO COMMENT AND PUBIC HEARING: Amendments to Regional MS4 Permit
Attachments: 2015-0731_Public_Notice.pdf

Water Boards This is a message from the California Regional Water Quality Control Board, San Diego Region (9).

Dear Interested Persons:

Please see the attached Notice of Opportunity to Comment and Public Hearing for Tentative Order No. R9-2015-0100, *An Order Amending Order No. R9-2013-0001, NPDES No. CAS010266, as Amended by Order No. R9-2015-0001* (Tentative Order). The Tentative Order and proposed changes to the Regional MS4 Permit are available to download on the following webpage:
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San Diego Water Board Room
2375 Northside Drive, San Diego, CA 92108

Please see the attachments for further detail and contact me with any questions.

Thank you,
Wayne Chiu, PE
Water Resource Control Engineer
Storm Water Management Unit
California Regional Water Quality Control Board
San Diego Region
2375 Northside Drive, Suite 100
San Diego, CA 92108
Direct Line: (619) 521-3354
Main Line: (619) 516-1990

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CALIFORNIA Water Boards

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ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

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The Tentative Order proposes to amend the Regional MS4 Permit to address a variety of issues including coverage for Copermittees in Riverside County consisting of the County of Riverside, the Riverside County Cities of Murrieta, Temecula, and Wildomar, and the Riverside County Flood Control and Water Conservation District and incorporation of limited permit provisions applicable to the City of Menifiee. If adopted, the Tentative Order will supersede the Riverside County Copermittees' current Fourth Term MS4 Permit, Order No. R9-2010-0016.

All written comments pertaining to the terms and conditions of the Tentative Order to be considered by the San Diego Water Board at the November 18, 2015 public hearing must be received no later than **5:00 p.m. on Monday September 14, 2015**. Written comments must be sent to the San Diego Water Board's office at 2375 Northside Drive, Suite 100, San Diego, CA 92108, faxed to (619) 516-1994, or e-mailed to sandiego@waterboards.ca.gov Attn: Wayne Chiu. Please indicate in the subject line of all written comments "Comment - Tentative Order No. R9-2015-0100, Place ID:786088WChiu." The early submission of written comments on the Tentative Order is encouraged.

The San Diego Water Board will prepare written responses to significant comments that are timely received. Consistent with State Water Resources Control Board regulations that apply to this proceeding, written comments received after 5:00 p.m. on Monday, September 14, 2015 will not be accepted and will not be incorporated into the administrative record if doing so would prejudice any party.

The public hearing on this matter will be held during the San Diego Water Board meeting scheduled for **November 18, 2015 in the Board Room of the San Diego Water Board Office, located at 2375 Northside Drive, San Diego, CA 92108**. The item will be heard during the meeting that starts at 9:00 a.m. The meeting notice and agenda, which will indicate any changes in the meeting location and may provide other specific information concerning this hearing, will be posted at least two weeks prior to the meeting date at http://www.waterboards.ca.gov/sandiego/board_info/agendas/.

Oral testimony at the public hearing will be allowed. The scope of oral testimony at the public hearing will be strictly limited to summarizing the previously submitted written comments, comments on revisions to the Tentative Order made in response to comments, and making policy statements. Oral testimony will be limited in time by the Board Chair.

The procedures governing San Diego Water Board meetings may be found at title 23, California Code of Regulations, section 647, et seq. and are available upon request. The hearing facilities will be accessible to persons with disabilities. The meeting notice and agenda for this meeting will provide contact information for persons requesting special accommodations.

Information related to this matter, including revisions made to the Tentative Order in response to written comments timely submitted, as well as the San Diego Water Board's responses to written comments timely submitted, will be available at the San Diego Water Board's office and the San Diego Water Board's storm water web page in advance of the public hearing. A separate notice will be sent announcing the availability of the revised Tentative Order and the responses to comments upon website posting of the documents.

Please contact Wayne Chiu at (619) 521-3354 or by email at Wayne.Chiu@waterboards.ca.gov for information regarding the above listed proposed permit action. Please bring the foregoing to the attention of any person known to you who would be interested in this matter.

DAVID W. GIBSON
Executive Officer
July 31, 2015

CALIFORNIA Water Boards

EDMUND G. BROWN JR. GOVERNOR

MATTHEW RODRIQUEZ SECRETARY FOR ENVIRONMENTAL PROTECTION

San Diego Regional Water Quality Control Board

October 26, 2015

Via Email Only

In reply refer to / attn:
Place ID 786088:WChiu

Mr. Robert K. Moehling
City Engineer
City of Murrieta
1 Town Square
Murrieta, CA 92562

Mr. Jonathan G. Smith
Public Works Director
City of Menifee
29714 Haun Road
Menifee, CA 92586

Mr. Daniel A. York
Public Works Director/City Engineer
City of Wildomar
23873 Clinton Keith Road, Suite 201
Wildomar, CA 92595

Subject: Regional Water Board Designation for Regulating Municipal Separate Storm Sewer System Discharges in the Cities of Murrieta, Wildomar, and Menifee in Riverside County

Messrs. Moehling, York, and Smith:

This is in response to your separately submitted requests seeking designation of a single Regional Water Board to regulate matters pertaining to Phase I municipal separate storm sewer system (MS4) discharges in the Cities of Murrieta, Wildomar, and Menifee (jointly referred to herein as Cities). The requests were consolidated for review and this letter is being issued in response to all three requests.

As provided in Water Code section 13228(a), this letter constitutes the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) agreement (Agreement) to the Regional Water Board designations specified below.

1. Except as otherwise provided in this Agreement, the Santa Ana Regional Water Quality Control Board (Santa Ana Water Board) is designated to regulate the entire jurisdictional area of the City of Menifee under the Santa Ana Water Board's *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for the Riverside County Flood Control and Water Conservation District, the County of Riverside, and the Incorporated Cities of Riverside within the Santa Ana Region* (Order No. R8-2010-0033, NPDES No. CAS618033, as it may be amended or reissued) (Santa Ana Phase I MS4 Permit), including those areas of the City located within the San Diego Water Board's geographic jurisdiction; *and*

2. Except as otherwise provided in this Agreement, the San Diego Water Board is designated to regulate the entire jurisdictional areas of the City of Murrieta and the City of Wildomar

under the San Diego Water Board's *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds Within the San Diego Region* (Order No. R9-2013-0001, as amended by Order Nos. R9-2015-0001 and R9-2015-0100, NPDES No. CAS0109266, as it may be further amended or reissued) (San Diego Phase I MS4 Permit), including those areas of each City located within the Santa Ana Water Board's geographic jurisdiction.

This Agreement is based upon the written request submitted by each City, factual considerations and other conditions as summarized below. To the extent of any inconsistencies between the terms of this Agreement and the permit provisions implementing the Agreement, the permit provisions shall prevail.

Regional Water Board Designation Request
Written requests for designation of a single Regional Water Board to regulate matters pertaining to permitting of Phase I MS4 discharges were submitted to the San Diego Water Board by the City of Murrieta by letter dated June 22, 2015 (attached hereto as Exhibit 1), the City of Wildomar by letter dated June 23, 2015 (attached hereto as Exhibit 2), and the City of Menifee by letter dated June 25, 2015 (attached hereto as Exhibit 3). The City of Murrieta and the City of Wildomar requested designation of the San Diego Water Board, and the City of Menifee requested designation of the Santa Ana Water Board. Water Code section 13228 specifies the circumstances that allow, and the process for, designation of a single Regional Water Board as the sole regulatory entity for any matter which may be submitted to more than one Regional Water Board.

Factual Considerations
The Cities each lay partially within the geographic jurisdictional boundaries of the San Diego Water Board and the Santa Ana Water Board. Phase I MS4 discharges in the Cities of Murrieta and Wildomar, including areas within the Santa Ana Region, are currently regulated by the San Diego Water Board under Order No. R9-2010-0016. Phase I MS4 discharges in the City of Menifee, including areas within the San Diego Region, are currently regulated by the Santa Ana Water Board under Order No. R8-2010-0033.

The Santa Ana Water Board and San Diego Water Board establish generally consistent requirements for MS4 dischargers. However due to the unique nature of watersheds and water quality issues in the San Diego Region and Santa Ana Region, MS4 permit requirements between the two Regional Water Boards may also vary to address region specific pollutant discharges and watershed conditions. The Cities report that requiring management and implementation of municipal programs to comply with two different MS4 permits would create a significant administrative and financial burden that would not contribute to greater overall water quality improvements with the respective City.

The San Diego Water Board is scheduled to hold a public hearing on November 18, 2015 to consider adoption of Tentative Order No. R9-2015-0100, *An Order Amending Order No. R9-2013-0001 as amended by Order No. R9-2015-0001, NPDES No. CAS0109266, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Tentative Order). The Tentative Order proposes to amend the San Diego Phase I MS4 Permit for a variety of reasons including incorporation of the Riverside County Flood Control and Water Conservation District, the County of Riverside, and the Cities of Murrieta, Temecula, and Wildomar as MS4 dischargers responsible for compliance

with the terms and the conditions of the San Diego Phase I MS4 Permit. The Tentative Order also proposes limited permit provisions addressing Regional Water Board designation to consolidate regulation of the Cities of Murrieta, Wildomar, and Menifee pursuant to Water Code section 13228, in accordance with the terms of this Agreement.

The Santa Ana Water Board is currently in the process of reissuing the Santa Ana Phase I MS4 Permit. The Santa Ana Water Board has not yet released a draft of the Santa Ana Phase I MS4 Permit for public comment, and expects to hold a hearing to consider adoption of the Santa Ana Phase I MS4 Permit in 2016.

San Diego Water Board Conditions for Regional Water Board Designation

This Agreement is conditional upon the following:

1. **Effective Date.** The effective date of this agreement is the effective date of the amended San Diego Phase I MS4 Permit, currently scheduled for a public hearing on November 18, 2015. Phase I MS4 discharges in the Cities of Murrieta and Wildomar, including areas within the Santa Ana Region, will be regulated by the San Diego Water Board under Order No. R9-2013-0001, as amended by Order Nos. R9-2015-0001 and R9-2015-0100 (as it may be amended or reissued) upon the effective date of the amended San Diego Phase I MS4 Permit, except for the regulation of provisions related to the implementation of any applicable Total Maximum Daily Load (TMDL) as provided below. Phase I MS4 discharges in the City of Menifee, including areas within the San Diego Region, are regulated by the Santa Ana Water Board under Order No. R8-2010-0033 (as it may be amended or reissued) and will continue to be regulated by the Santa Ana Water Board upon the effective date of the amended San Diego Phase I MS4 Permit, except for the regulation of provisions related to the implementation of any applicable Total Maximum Daily Load (TMDL) as provided below.

2. **Applicability of Designation.** Except as otherwise provided herein, this Agreement enables each City to be regulated under a single Phase I MS4 Permit.

3. **Conformance with Written Request.** Upon the effective date of this Agreement, each City shall implement the water quality protection measures described in its written request for designation and attached as Exhibits 1, 2 and 3 hereto and as reflected in the San Diego and Santa Ana Phase I MS4 Permits. These water quality protection measures are incorporated by reference into this Agreement as if fully stated herein. The conditions of this Agreement shall supersede any conflicting provisions in the Cities' written requests.

4. **Enforcement Authority.** Each Regional Water Board reserves its right to take any enforcement action against a City, as authorized by law, for any violations of the terms and conditions of the applicable Phase I MS4 Permit which affects that Regional Water Board pursuant to Water Code section 13228(b). Responsibility for undertaking enforcement to compel compliance with permit conditions will generally be assumed by the Regional Water Board that issued the Phase I MS4 Permit.

5. **Total Maximum Daily Load Requirements for the City of Murrieta or the City of Wildomar.** The Santa Ana Water Board shall continue to regulate the Cities of Wildomar and Murrieta under the Santa Ana Phase I MS4 Permit for the limited purpose of implementing any applicable TMDL. The Cities of Murrieta and Wildomar are expected to continue to participate in the Lake Elsinore and Canyon Lake TMDL Task Force and

continue to implement the approved Comprehensive Nutrient Reduction Plan (Resolution No. R8-2013-0044). The Cities of Murrieta and Wildomar shall also be required to comply with any provisions related to TMDL-implementation contained in the San Diego Phase I MS4 Permit.

6. **Total Maximum Daily Load Requirements for the City of Menifee.** Any TMDL and associated Phase I MS4 permit requirements issued by the San Diego Water Board and applicable to the City of Menifee will be incorporated into the appropriate Phase I MS4 permit by reference and remain applicable. The San Diego Water Board shall continue to regulate the City of Menifee under the San Diego Phase I MS4 Permit for the limited purpose of implementing any applicable TMDL. The City of Menifee shall also be required to comply with any provisions related to TMDL-implementation contained in the Santa Ana Phase I MS4 Permit.

7. **Construction Site Storm Water Program.** Construction sites in the Cities regulated under the statewide *General Permit for Construction Discharges of Storm Water Associated with Construction Activities,* Order No. 2009-0009-DWQ and any subsequent reissuance (Construction General Storm Water Permit) will continue to be subject to regulation by the San Diego Water Board or the Santa Ana Water Board as determined by the geographical jurisdictional area of each Regional Water Board. The Santa Ana Water Board will notify the San Diego Water Board of any incidents of noncompliance discovered during inspections of construction sites within its geographic jurisdictional boundary that discharge into an MS4 owned or operated by the City of Murrieta or the City of Wildomar. The San Diego Water Board will notify the Santa Ana Water Board of any incidents of noncompliance discovered during inspections of construction sites within its geographic jurisdictional boundary that discharge into an MS4 owned or operated by the City of Menifee.

8. **Industrial Site Storm Water Program.** Industrial sites in the Cities subject to regulation under the statewide *General Permit for Storm Water Discharges Associated with Industrial Activities,* Order No. 2014-0057-DWQ and any subsequent reissuance (Industrial General Storm Water Permit) will continue to be subject to regulation by the San Diego Water Board or the Santa Ana Water Board as determined by the geographical jurisdictional area of each Regional Water Board. The Santa Ana Water Board will notify the San Diego Water Board of any incidents of noncompliance discovered during inspections of industrial sites within its geographic jurisdictional boundary that discharge into an MS4 owned or operated by the City of Murrieta or the City of Wildomar. The San Diego Water Board will notify the Santa Ana Water Board of any incidents of noncompliance discovered during inspections of industrial sites within its geographic jurisdictional boundary that discharge into an MS4 owned or operated by the City of Menifee.

9. **Municipal Construction Projects.** For all municipal construction projects, including those projects located within the jurisdictional area of the Santa Ana Water Board, the City of Murrieta and the City of Wildomar will submit Permit Registration Documents (PRDs) in the form of a Notice of Intent (NOI) with appropriate fees in accordance with the manner prescribed in the statewide Construction General Storm Water Permit. For all municipal construction projects, including those projects located within the jurisdictional area of the San Diego Water Board, the City of Menifee will use the process established by the Santa Ana Water Board for obtaining coverage under the Construction General Storm Water Permit.

10. **Water Quality Improvement Plan.** The San Diego Phase I MS4 Permit requires responsible agencies within designated Watershed Management Areas to develop and implement a Water Quality Improvement Plan. The Water Quality Improvement Plan is a comprehensive watershed plan that identifies priority water quality conditions, water quality improvement goals, pollutant control strategies, and implementation schedules to achieve the goals. The requirements of TMDLs adopted by the San Diego Water Board have been incorporated into the requirements of the Water Quality Improvement Plan allowing the City of Menifee and the other responsible agencies within the Santa Margarita River Watershed Management Area to develop a single plan to coordinate their non-storm water and storm water runoff management programs. The City of Menifee is required to participate in the development and implementation of the Water Quality Improvement Plan for the Santa Margarita River Watershed Management Area.

11. **Citizen Complaints.** Citizen complaints received regarding discharges from municipal, construction, industrial, and commercial sites to MS4s within the jurisdiction of the City of Murrieta or the City of Wildomar will be referred to the San Diego Water Board for review. Citizen complaints received regarding discharges from municipal, construction, industrial, and commercial sites to MS4s within the City of Menifee will be referred to the Santa Ana Water Board for review.

12. **Annual Reports.** Annual Reports prepared by each City pursuant to its Phase I MS4 Permit requirements shall be a single report encompassing the entire geographic jurisdictional area of the City, using the format prescribed in the applicable Phase I MS4 Permit. The Annual Reports shall be submitted to the Regional Water Board that issued the applicable Phase I MS4 NPDES Permit.

13. **Periodic Review of Agreement.** The basis supporting the Cities of Murrieta, Wildomar, and Menifee's requests to designate a single Regional Water Board for regulatory oversight may change under future conditions and circumstances. Therefore the San Diego Water Board will periodically review the effectiveness of this Agreement during each Phase I MS4 Permit reissuance. Based on this periodic review the San Diego Water Board may terminate the Agreement with the Santa Ana Water Board or otherwise modify the Agreement subject to the approval of the Santa Ana Water Board.

Please send any written correspondence in response to this letter to SanDiego@waterboards.ca.gov. These electronic documents must be submitted as a single file, in Portable Document Format (PDF) format, and converted to text searchable format using Optical Character Recognition (OCR). All electronic documents must also include scanned copies of all signature pages; electronic signatures will not be accepted. Electronic documents submitted to the San Diego Water Board must include the following identification numbers in the header or subject line **Place ID 786088:WChiu**.

For questions or comments, please contact Wayne Chiu by phone at (619) 521-3354 or by email at Wayne.Chiu@waterboards.ca.gov.

Respectfully,

DAVID W. GIBSON
Executive Officer

DWG:dtb:cgh:law:wc

Enclosures: Exhibit 1: City of Murrieta, June 22, 2015 Written Request
Exhibit 2: City of Wildomar, June 23, 2015 Written Request
Exhibit 3: City of Menifee, June 25, 2015 Written Request

cc: Kurt Berchtold, Executive Officer, Santa Ana Water Board

Tech Staff Info & Use	
Tentative Order No.	R9-2015-0100 (amending R9-2013-0001)
NPDES No.	CAS0109266
CIWQS PIN	CW-768088 (Regional MS4 Permit) CW-749045 (Riverside County Copermittees) CW-214653 (Murrieta) CW-762396 (Wildomar) CW-792120 (Menifee)

Exhibit 1

City of Murrieta
June 22, 2015 Written Request

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CITY OF MURRIETA

June 22, 2015

Mr. Kurt Berchtold
Executive Officer
California Regional Water Quality
Control Board - Santa Ana Region
3737 Main Street, Suite 500
Riverside, CA 92501-3339

Mr. David W. Gibson
Executive Officer
California Regional Water Quality
Control Board – San Diego Region
2375 Northside Drive, Suite 100
San Diego, CA 92108

Dear Messrs. Berchtold and Gibson:

Re: Request for Designating the San Diego Regional Board as Regulating Discharges from MS4 owned by the City of Murrieta

The City of Murrieta is located within southwestern Riverside County, and covers an area of approximately 33.6 square miles. While the city is located primarily within the Santa Margarita Watershed and therefore is under the jurisdiction of the San Diego Regional Board, approximately 0.58 square miles (or 1.7%) of the city extends into the Santa Ana Watershed which is under the jurisdiction of the Santa Ana Regional Board. Attached for your reference is a map of the city, overlaid with the jurisdictional boundary between the two Regional Boards. Because of this situation, the city is subject to two Municipal Separate Storm Sewer System (MS4) Permits issued by the respective Regional Boards.

Pursuant to discussions with staff at both Regional Boards and consistent with California Water Code section 13228, the City of Murrieta hereby requests that the Santa Ana Regional Board designate the San Diego Regional Board for regulation of all portions of the city, regardless of Regional Board jurisdictional boundaries, for matters pertaining to MS4 permitting.

The remainder of this letter contains a discussion of the basis for this request; a description of the understood limitations of this designation; a description of the additional portion of the city that, pursuant to this designation, would be regulated by the San Diego Regional Board, and any other associated requests.

1 Town Square • Murrieta, California 92562
phone: 951.304.CITY (2489) • fax: 951.698.4509 • web: murrieta.org

Mr. Kurt Berchtold
Santa Ana Regional Water Quality Control Board
Mr. David W. Gibson
San Diego Regional Water Quality Control Board
Re: Request for Area Exchange

Basis for the request

The City is currently a named permittee on order R8-2010-0033 issued by the Santa Ana Regional Board (Santa Ana Permit), and order R9-2010-0016 with the San Diego Regional Board (San Diego Permit) – both of which are currently up for renewal. While having the same goal of reducing the discharge of pollutants from the MS4 system, these two orders include requirements that accomplish that goal in different ways. As a result, programs designed to be in compliance with the Santa Ana Permit are similar, but necessarily different than programs designed for compliance with the San Diego Permit. When this situation is applied within a single city, such as the City of Murrieta, having two differing programs creates significant confusion among both city staff and the public, which can lead to inefficient and inconsistent implementation of the programs and less effective protection of water quality. Additionally, and no less significant, there is a duplicative administrative and financial burden that is inherent in complying with two MS4 permits: two sets of programs have to be developed; staff have to be trained to two sets of requirements, and at differing frequencies; business inspections must inspect for and track different information, at differing frequencies; two sets of annual reports have to be created, with each report being required to include different information; etc.

The purpose of the City's request is to reduce the aforementioned complexity to allow for the more effective and focused utilization of the City's resources to the benefit of water quality.

Understood Limitations

This request by the City of Murrieta is made with the understanding that:

- For the purposes of MS4 permitting only, the San Diego Regional Board would regulate the entirety of the City of Murrieta. As a result, the City of Murrieta would be subject to a single MS4 permit, which would be issued by the San Diego Regional Board.
- Enforcement of any provisions of the MS4 permit issued to the City of Murrieta would be performed by the San Diego Regional Board.
- Any TMDLs and associated MS4 permit requirements issued by the Santa Ana Regional Board, which include the City of Murrieta as a responsible party, will be incorporated into the MS4 permit issued by the San Diego Regional Board by reference, including reference to any associated provisions, findings or elements of the fact sheet.
- Enforcement of any TMDL will remain with the Regional Board that has jurisdiction over the targeted impaired water body.
- Other Waste Discharge Requirements, or other Orders issued or enforced by the San Diego Regional Board would remain wholly under the jurisdiction of the San Diego Regional Board.

Mr. Kurt Berchtold
Santa Ana Regional Water Quality Control Board
Mr. David W. Gibson
San Diego Regional Water Quality Control Board
Re: Request for Area Exchange

Description of the area of the City subject to the designation:

Some facts about the City of Murrieta and the portion within the jurisdiction of the Santa Ana Regional Board are described below. Also enclosed with this letter is a map of the City with the subject area highlighted.

- Total Area of the city = 33.6 square miles
- Area within the Santa Ana Region Watershed = 0.58 square miles (or 375 acres)
- Percent of City in the Santa Ana Region Watershed = 1.7%

In conclusion, the requested designation of regulatory authority to the San Diego Regional Board will not only reduce the complexity and administrative burden upon the City of Murrieta, but will allow the City to better focus and effectively utilize their available resources to the best benefit to water quality in both regions.

If you have any questions regarding this request, please contact Robert K. Moehling at 951-304-2489.

Very truly yours,

Robert K. Moehling
City Engineer
CITY OF MURRIETA

Attachments:

Map of the City of Murrieta

cc:

Bill Woolsey, City of Murrieta
James Ozouf, City of Murrieta
Stuart McKibbin, Riverside County Flood Control
Scott Bruckner, Riverside County Flood Control

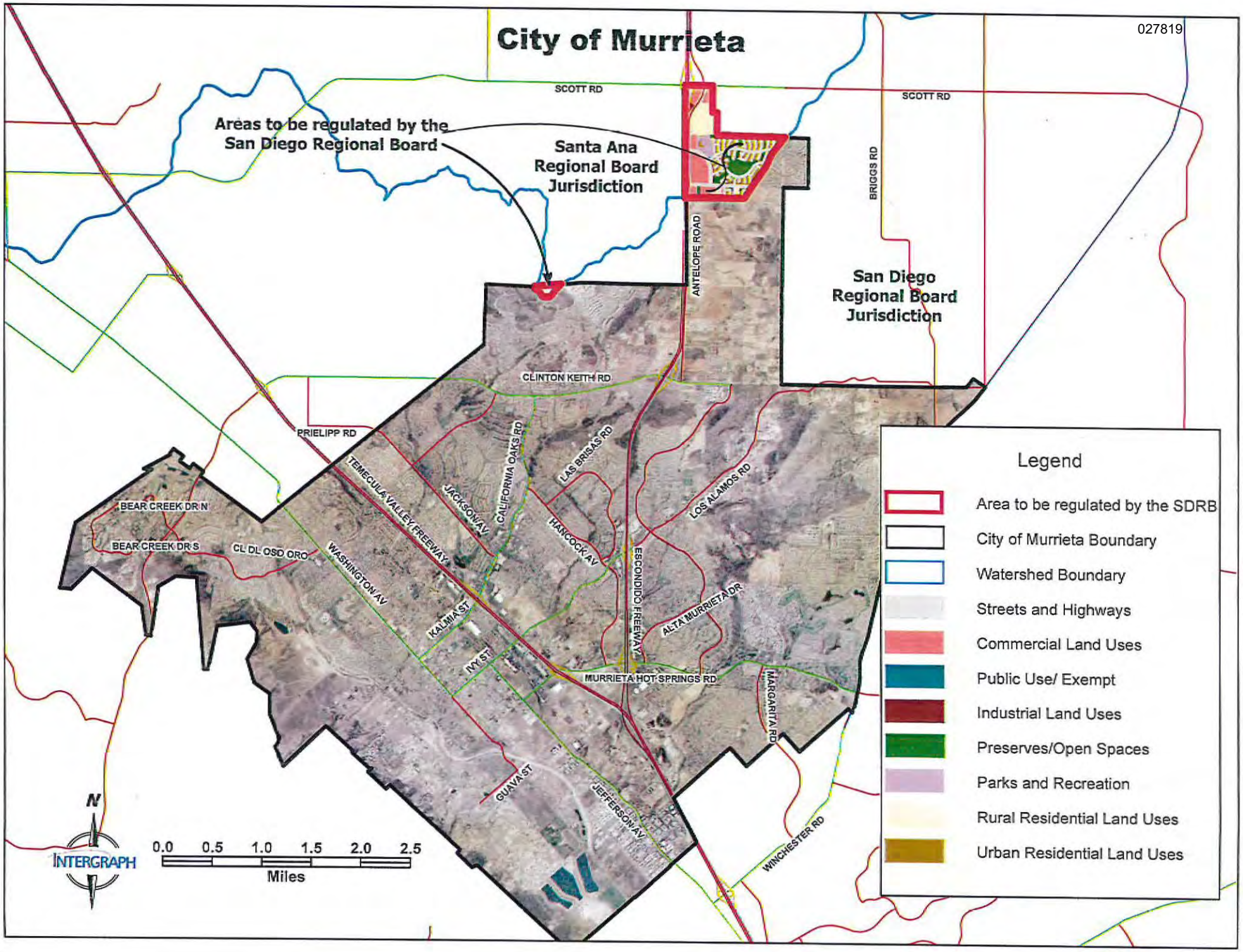
City of Murrieta
Areas to be regulated by the San Diego Regional Board
Santa Ana Regional Board Jurisdiction
San Diego Regional Board Jurisdiction
SCOTT RD
SCOTT RD
BRIGGS RD
ANTELOPE ROAD
CLINTON KEITH RD
PRIELIPP RD
TEMECULA VALLEY FREEWAY
JACKSON AV
CALIFORNIA OAKS RD
LAS BRISAS RD
HANCOCK AV
ESCONDIDO FREEWAY
LOS ALAMOS RD
ALTA MURRIETA DR
MURRIETA HOT SPRINGS RD
MARGARITA RD
WINCHESTER RD
JEFFERSON AV
GUAVA ST
IVY ST
KALMIA ST
WASHINGTON AV
CL DL OSO ORO
BEAR CREEK DR N
BEAR CREEK DR S
Legend
Area to be regulated by the SDRB
City of Murrieta Boundary
Watershed Boundary
Streets and Highways
Commercial Land Uses
Public Use/ Exempt
Industrial Land Uses
Preserves/Open Spaces
Parks and Recreation
Rural Residential Land Uses
Urban Residential Land Uses
N
INTERGRAPH
0.0 0.5 1.0 1.5 2.0 2.5
Miles

Exhibit 2

City of Wildomar
June 23, 2015 Written Request

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Ben Benoit, Mayor
Bridgette Moore, Mayor Pro Tem
Timothy Walker, Council Member
Bob Cashman, Council Member
Marsha Swanson, Council Member

23873 Clinton Keith Rd, Suite 201
Wildomar, CA 92595
951/677-7751 Phone
951/698-1463 Fax
www.CityofWildomar.org

June 23, 2015

Mr. Kurt Berchtold
Executive Officer
California Regional Water Quality
Control Board - Santa Ana Region
3737 Main Street, Suite 500
Riverside, CA 92501-3339

Mr. David W. Gibson
Executive Officer
California Regional Water Quality
Control Board – San Diego Region
2375 Northside Drive, Suite 100
San Diego, CA 92108

Re: Request for Designating the San Diego Regional Board as Regulating Discharges from MS4 owned by the City of Wildomar

Dear Messrs. Berchtold and Gibson:

The City of Wildomar is located within southwestern Riverside County, and covers an area of approximately 24 square miles. While the city is located primarily within the Santa Margarita Watershed and therefore is under the jurisdiction of the San Diego Regional Board, approximately 5,000 acres (or 33%) of the city extends into the Santa Ana Watershed which is under the jurisdiction of the Santa Ana Regional Board. Attached for your reference is a map of the city, overlaid with the jurisdictional boundary between the two Regional Boards. Because of this situation, the city is subject to two Municipal Separate Storm Sewer System (MS4) Permits issued by the respective Regional Boards.

Pursuant to discussions with staff at both Regional Boards and consistent with California Water Code section 13228, the City of Wildomar hereby requests that the Santa Ana Regional Board designate the San Diego Regional Board for regulation of all portions of the city, regardless of Regional Board jurisdictional boundaries, for matters pertaining to MS4 permitting.

The remainder of this letter contains a discussion of the basis for this request; a description of the understood limitations of this designation; a description of the additional portion of the city that, pursuant to this designation, would be regulated by the San Diego Regional Board, and any other associated requests.

Basis for the request

The City is currently a named permittee on order R8-2010-0033 issued by the Santa Ana Regional Board (Santa Ana Permit) and order R9-2010-0016 with the San Diego Regional Board (San Diego Permit) – both of which are currently up for renewal. While having the same goal of reducing the discharge of pollutants from the MS4 system, these two orders include requirements that accomplish that goal in different ways. As a result, programs designed to be in compliance with the Santa Ana Permit are similar, but necessarily different than programs designed for compliance with the San Diego Permit. When this situation is applied within a single city, such as the City of Wildomar, having two differing programs creates significant confusion among both city staff and the public, which can lead to inefficient and inconsistent implementation of the programs and less effective protection of water quality. Additionally, and no less significant, there is a duplicative administrative and financial burden that is inherent in complying with two MS4 permits: two sets of programs have to be developed; staff have to be trained to two sets of requirements, and at differing frequencies; business inspections must inspect for and track different information, at differing frequencies; two sets of annual reports have to be created, with each report being required to include different information; etc.

The purpose of the City's request is to reduce the aforementioned complexity to allow for the more effective and focused utilization of the City's resources to the benefit of water quality.

Understood Limitations

This request by the City of Wildomar is made with the understanding that:

- For the purposes of MS4 permitting only, the San Diego Regional Board would regulate the entirety of the City of Wildomar. As a result, the City of Wildomar would be subject to a single MS4 permit, which would be issued by the San Diego Regional Board.
- Enforcement of any provisions of the MS4 permit issued to the City of Wildomar would be performed by the San Diego Regional Board.
- Any TMDLs and associated MS4 permit requirements issued by the Santa Ana Regional Board, which include the City of Wildomar as a responsible party, will be incorporated into the MS4 permit issued by the San Diego Regional Board by reference, including reference to any associated provisions, findings or elements of the fact sheet.
- Enforcement of any TMDL will remain with the Regional Board that has jurisdiction over the targeted impaired water body.
- Other Waste Discharge Requirements, or other Orders issued or enforced by the Santa Ana Regional Board would remain wholly under the jurisdiction of the Santa Ana Regional Board.

Description of the area of the City subject to the designation:

Some facts about the City of Wildomar and the portion within the jurisdiction of the Santa Ana Regional Board are described below. Also enclosed with this letter is a map of the City with the subject area highlighted.

- Total Area of the city = 24 square miles
- Area within the Santa Ana Region Watershed = 7.8 square miles
- Percent of City in the Santa Ana Region Watershed = 33%

In conclusion, the requested designation of regulatory authority to the San Diego Regional Board will not only reduce the complexity and administrative burden upon the City of Wildomar, but will allow the City to better focus and effectively utilize their available resources to the best benefit to water quality in both regions.

If you have any questions regarding this request, please contact Matt Bennett at 951.677.7751 x208.

Very truly yours,

Daniel A. York
Assistant City Manager
Public Works Director/City Engineer
City of Wildomar

Attachments:

Map of the City of Wildomar

ec: Matt Bennett, City of Wildomar
Scott Bruckner, Riverside County Flood Control
Stuart McKibbin, Riverside County Flood Control
Wayne Chiu, California Regional Water Quality Control Board San Diego Region

City of Wildomar

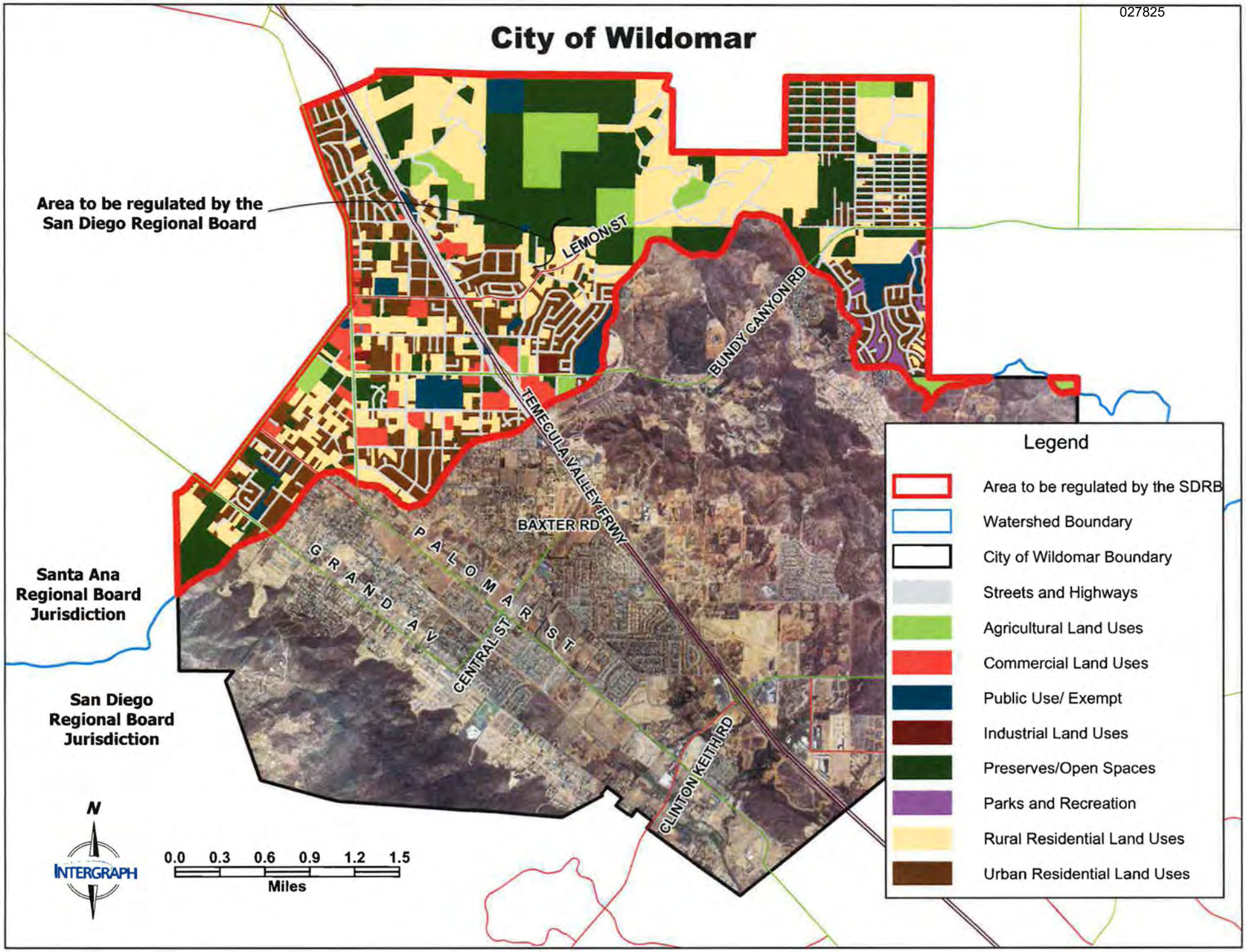

Exhibit 3

City of Menifee

June 25, 2015 Written Request

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027828

Scott A. Mann
Mayor

John V. Denver
Mayor Pro Tem

Wallace W. Edgerton
Councilmember

Greg August
Councilmember

Matthew Liesemeyer
Councilmember

29714 Haun Road
Menifee, CA 92586
Phone 951.672.6777
Fax 951.676.3843
www.cityofmenifee.us

June 25, 2015

Mr. Kurt Berchtold

Executive Officer

California Regional Water Quality

Control Board - Santa Ana Region

3737 Main Street, Suite 500

Riverside, CA 92501-3339

Mr. David W. Gibson

Executive Officer

California Regional Water Quality

Control Board – San Diego Region

2375 Northside Drive, Suite 100

San Diego, CA 92108

Dear Messrs. Berchtold and Gibson:

Re: Request for Designating the Santa Ana Regional Board as Regulating Discharges from MS4 owned by the City of Menifee

The City of Menifee is located within southwestern Riverside County, and covers an area of approximately 47 square miles. While the city is located primarily within the Santa Ana Watershed and therefore is under the jurisdiction of the Santa Ana Regional Board, approximately 737acres (or 2.5%) of the city extends into the Santa Margarita Watershed which is under the jurisdiction of the San Diego Regional Board. Attached for your reference is a map of the city, overlaid with the jurisdictional boundary between the two Regional Boards. Because of this situation, the city is subject to two Municipal Separate Storm Sewer System (MS4) Permits issued by the respective Regional Boards.

DH# 1981457 6/27/15
Doc Scanned On:
B. Davila Time: 4:14

Pursuant to discussions with staff at both Regional Boards and consistent with California Water Code section 13228, the City of Menifee hereby requests that the San Diego Regional Board designate the Santa Ana Regional Board for regulation of all portions of the city, regardless of Regional Board jurisdictional boundaries, for matters pertaining to MS4 permitting.

The remainder of this letter contains a discussion of the basis for this request; a description of the understood limitations of this designation; a description of the additional portion of the city that, pursuant to this designation, would be regulated by the Santa Ana Regional Board, and any other associated requests.

Basis for the request

The City is currently a named permittee on order R8-2010-0033 issued by the Santa Ana Regional Board (Santa Ana Permit), and order R9-2010-0016 with the San Diego Regional Board (San Diego Permit) - which is currently up for renewal. While having the same goal of reducing the discharge of pollutants from the MS4 system, these two orders include requirements that accomplish that goal in different ways. As a result, programs designed to be in compliance with the Santa Ana Permit are similar, but necessarily different than programs designed for compliance with the San Diego Permit. When this situation is applied within a single city, such as the City of Menifee, having two differing programs creates significant confusion among both city staff and the public, which can lead to inefficient and inconsistent implementation of the programs and less effective protection of water quality. Additionally, and no less significant, there is a duplicative administrative and financial burden that is inherent in complying with two MS4 permits: two sets of programs have to be developed; staff have to be trained to two sets of requirements, and at differing frequencies; business inspections must inspect for and track different information, at differing frequencies; two sets of annual reports have to be created, with each report being required to include different information; etc.

The purpose of the City's request is to reduce the aforementioned complexity to allow for the more effective and focused utilization of the City's resources to the benefit of water quality.

Understood Limitations

This request by the City of Menifee is made with the understanding that:

- For the purposes of MS4 permitting only, the Santa Ana Regional Board would regulate the entirety of the City of Menifee. As a result, the City of Menifee would be subject to a single MS4 permit, which would be issued by the Santa Ana Regional Board.
- Enforcement of any provisions of the MS4 permit issued to the City of Menifee would be performed by the Santa Ana Regional Board.
- Any TMDLs and associated MS4 permit requirements issued by the San Diego Regional Board, which include the City of Menifee as a responsible party, will be incorporated into the MS4 permit issued by the Santa Ana Regional Board by reference, including reference to any associated provisions, findings or elements of the fact sheet.
- Enforcement of any TMDL will remain with the Regional Board that has jurisdiction over the targeted impaired water body.
- Other Waste Discharge Requirements, or other Orders issued or enforced by the San Diego Regional Board would remain wholly under the jurisdiction of the San Diego Regional Board.

Description of the area of the City subject to the designation:

Some facts about the City of Menifee and the portion within the jurisdiction of the San Diego Regional Board are described below. Also enclosed with this letter is a map of the City with the subject area highlighted.

- Total Area of the city = 47 square miles
- Area within the Santa Margarita Region Watershed = 1.15 square miles
- Percent of City in the Santa Margarita Region Watershed = 2.5%

Other Requests:

Understanding that the requested designation applies to the MS4 permit requirements, the Santa Ana Permit incorporates a simplified process in section XIV.G.1. for applying for coverage under the General Construction Permit (Order 2009-0009-DWQ) for municipal projects. This process includes submission of the NOI or Permit Registration Documents (PRDs) directly to the Executive Officer, and waived application fees. To avoid unnecessary confusion among staff, and potential for inadvertent non-compliance, the City of Menifee specifically requests that this portion of the MS4 permit would be applicable within the entire City, including those portions of the city within the jurisdiction of the San Diego Regional Board.

In conclusion, the requested designation of regulatory authority to the Santa Ana Regional Board will not only reduce the complexity and administrative burden upon the City of Menifee, but will allow the City to better focus and effectively utilize their available resources to the best benefit to water quality in both regions.

If you have any questions regarding this request, please contact Nino Abad at 951.672.6777.

Very truly yours,

JONTHAN G SMITH, PE
PUBLIC WORKS DIRECTOR
CITY OF MENIFEE

Attachments:

Map of the City of Menifee

ec:

Nino Abad, City of Menifee

Stuart McKibbin, Riverside County Flood Control

Julianna Gonzalez, Riverside County Flood Control

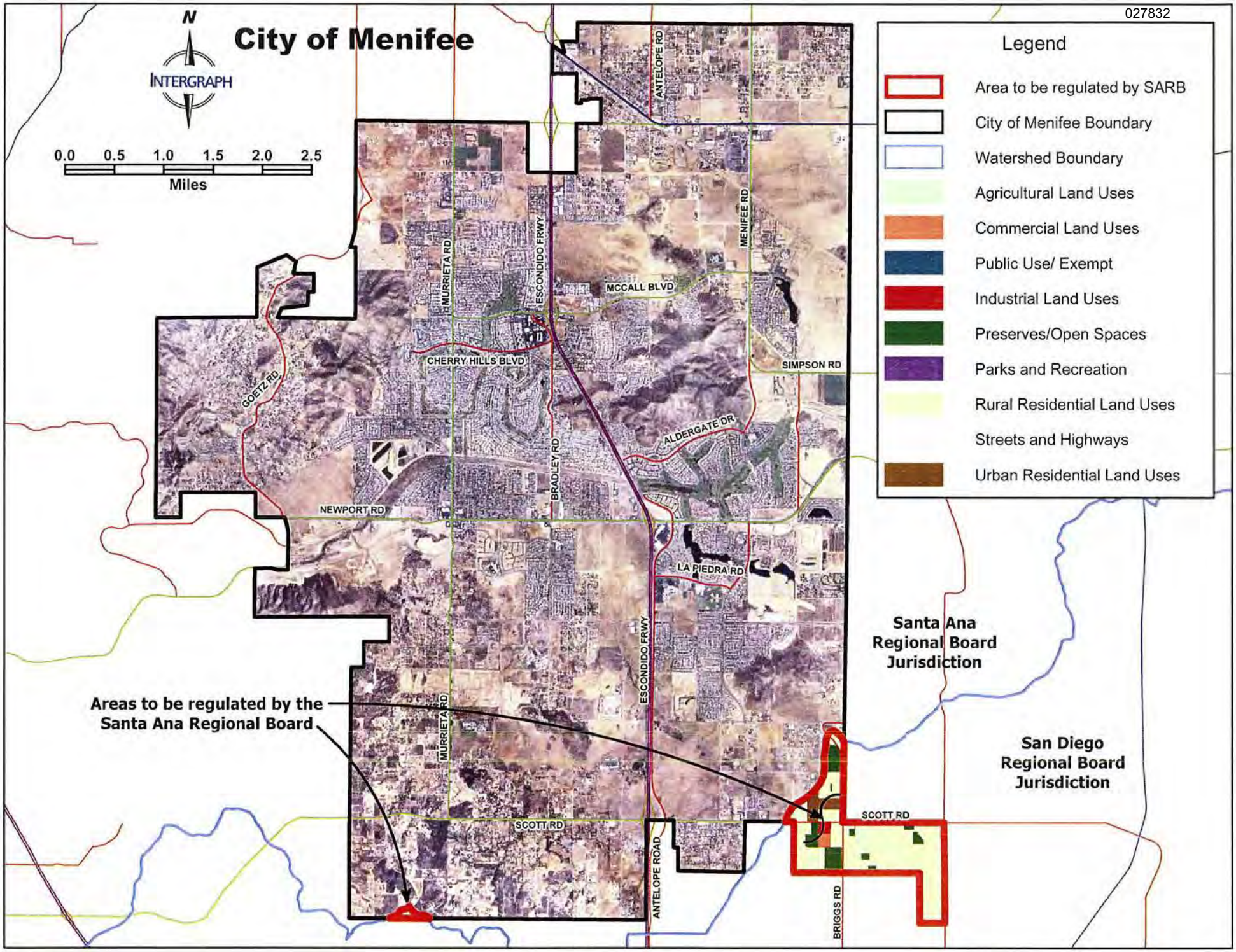
City of Menifee
N
INTERGRAPH
0.0 0.5 1.0 1.5 2.0 2.5
Miles
Legend
Area to be regulated by SARB
City of Menifee Boundary
Watershed Boundary
Agricultural Land Uses
Commercial Land Uses
Public Use/ Exempt
Industrial Land Uses
Preserves/Open Spaces
Parks and Recreation
Rural Residential Land Uses
Streets and Highways
Urban Residential Land Uses
ANTELOPE RD
MENIFEE RD
MURRIETA RD
ESCONDIDO FRWY
MCCALL BLVD
CHERRY HILLS BLVD
SIMPSON RD
GOETZ RD
ALDERGATE DR
BRADLEY RD
NEWPORT RD
LA PIEDRA RD
Santa Ana Regional Board Jurisdiction
San Diego Regional Board Jurisdiction
Areas to be regulated by the Santa Ana Regional Board
SCOTT RD
ANTELOPE ROAD
BRIGGS RD

Chiu, Wayne@Waterboards

From: lyris@swrcb18.waterboards.ca.gov
Sent: Thursday, November 05, 2015 8:54 AM
To: Chiu, Wayne@Waterboards
Subject: Response to Comments for Tentative Order No. R9-2015-0100 now posted

Water Boards This is a message from the California Regional Water Quality Control Board, San Diego Region (9).

Dear MS4 Permit Stakeholders,

The Responses to Comments and an Errata Sheet for Tentative Order No. R9-2015-0100, *An Order Amending Order No. R9-2013-0001, NPDES No. CAS010266*, *as amended by Order No. R9-2015-0001, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Tentative Order) are now available on the Regional Board's website at http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/rsd_stormwater.shtml.

The Public Hearing on Tentative Order No. R9-2015-0100 will be held during the San Diego Water Board meeting scheduled for November 18, 2015, beginning at 9 am. The meeting will take place at the San Diego Water Board's Hearing Room at 2375 Northside Dr., Suite 100, San Diego, 92108.

For questions pertaining to the Tentative Order or the upcoming Board meeting, please contact me or Wayne Chiu at Wayne.Chiu@waterboards.ca.gov or 619.521.3354.

Christina Arias, PE
Water Resource Control Engineer
San Diego Regional Water Quality Control Board
2375 Northside Drive, Suite 100
San Diego, CA 92108
Tel. (619) 521-3361
Christina.Arias@waterboards.ca.gov

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www.waterboards.ca.gov

You are currently subscribed to reg9_orangeco_ms4permit as: wchiu@waterboards.ca.gov.

To unsubscribe click here: leave-5655100-508206.5e12452d2cea9a5676faf89bcbc2cb99@swrcb18.waterboards.ca.gov

Chiu, Wayne@Waterboards

From: lyris@swrcb18.waterboards.ca.gov
Sent: Tuesday, November 10, 2015 4:16 PM
To: Chiu, Wayne@Waterboards
Subject: REVISED Responses to Comments and Errata Sheet posted on website

Water Boards This is a message from the California Regional Water Quality Control Board, San Diego Region (9).

Dear MS4 Permit Stakeholders,

The San Diego Water Board has posted **Revised** Responses to Comments, and a **Revised** Errata Sheet, in preparation of the Public Hearing on Tentative Order No. R9-2015-0100. The revised documents are available here: http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/rsd_stormwater.shtml.

The Public Hearing on the Tentative Order is scheduled for Wednesday, November 18, 2015, beginning at 9 am at the San Diego Water Board's Hearing Room. Please contact me with any questions or concerns.

Christina Arias, PE
Water Resource Control Engineer
San Diego Regional Water Quality Control Board
2375 Northside Drive, Suite 100
San Diego, CA 92108
Tel. (619) 521-3361
Christina.Arias@waterboards.ca.gov

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www.waterboards.ca.gov

You are currently subscribed to reg9_orangeco_ms4permit as: wchiu@waterboards.ca.gov.

To unsubscribe click here: leave-5658589-508206.5e12452d2cea9a5676faf89bcbc2cb99@swrcb18.waterboards.ca.gov

Chiu, Wayne@Waterboards

From: Walsh, Laurie@Waterboards
Sent: Friday, November 13, 2015 9:16 AM
To: Matt O'Malley (matt@sdcoastkeeper.org); Joann Weber; Baron, Ryan [COCO] (ryan.baron@coco.ocgov.com); McKibbin, Stuart (SMCKIBBI@rcflood.org) (SMCKIBBI@rcflood.org); Richard Boon; Lisa Zawaski; Mike McSweeney (MMcSweeney@biasandiego.org); Julia Chunn (julia@surfridersd.org)
Cc: Chiu, Wayne@Waterboards; Arias, Christina@Waterboards; Ryan, Erica@Waterboards; Barker, David@Waterboards; Hagan, Catherine@Waterboards; Nunez, Adriana@Waterboards; Smith, James@Waterboards; Gibson, David@Waterboards; Barbra Tipton; Boushra Salem; Cecilia Padres-Tipton; Cheryl Filar; Chris Helmer; Erik Steenblock ; Helen Davies; James Wood Jr (James.Wood@carlsbadca.gov); Jamie Campos; Joe Juhn; Karen Holman; Kim Godby; Kleis, Andrew (AKleis@sandiego.gov); Lukey, Elaine; Malik Tamimi (mtamimi@lemongrove.ca.gov); Mikhail Ogawa; Mo Lahsaiezadeh; Richard Gilb; RThornberry@san-marcos.net; Ruth Kolb; Steven Strapac; Taryn Dunbar; Brad Fowler; Chris Crompton; Christopher Macon ; Devin Slaven ; Grant Sharp; Greg Yi; Humza Javed; Ames, Joe@MISSIONVIEJO@DOT; Keith Van Der Maaten; Mary Vondrak; MaryAnne Skorpanich; Moy Yahya; Nancy Palmer; Rae Beimer; Tom Bonigut; Tracy Ingebrigtsen; Bill Woolsey; Bob Moehling; David Garcia; Eric Lomeli; James Ozouf; Jason Uhley; Licitra, Aldo; Matt Bennett; Scott Bruckner; Steve Horn
Subject: Speaker Schedule and Time Allocations - San Diego Water Board November 18, 2015 Public Hearing on Agenda Item No. 11 Proposed Amendment to Regional MS4 Permit

Copermittees, Stakeholders, and other Interested Persons,

In response to requests for time allocations to present testimony to the San Diego Water Board during its November 18, 2015 public hearing on Agenda Item No. 11 , Tentative Order No. R9-2015-0100, *An Order to amend Order R9-2013-0001, as amended by Order No. R9-2015-0001, NPDES No. CAS0109266, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region,* the amounts of time and anticipated order of speakers is as follows:

1. San Diego Water Board Staff Presentation – 25 minutes
2. Elected Officials – No earlier than 10 a.m., but will be heard as soon as possible after Board staff presentation – 3 minutes per speaker
3. Riverside Co. CoPermittees – 15 minutes
4. Orange Co. CoPermittees – 30 minutes
5. San Diego Co. CoPermittees – 30 minutes
6. Building Industrial Association – 15 minutes
7. Coastkeeper/Coastal Environmental Rights Foundation – 30 minutes
8. Interested persons: 3 minutes each

The Board Chair retains discretion to modify the time allocations including to grant a speaker(s) more time upon request at the hearing.

***Laurie Walsh,* PE**

Senior Water Resource Control Engineer
Storm Water Management
San Diego Water Board

2375 Northside Drive, Suite 100
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Direct Phone: (619) 521-3373
Main Line: (619) 516-1990
Fax No. (619) 516-1994
Email: Laurie.Walsh@waterboards.ca.gov

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD
www.waterboards.ca.gov/sandiego/

Chiu, Wayne@Waterboards

From: Chiu, Wayne@Waterboards
Sent: Wednesday, November 25, 2015 1:03 PM
To: Aldo Licitra (Aldo.Licitra@cityoftemecula.org); Bill Woolsey (wwoolsey@murrieta.org); Bruckner, Scott (sebruckner@rcflood.org); Horn, Steven (Shorn@rceo.org); Matt Bennett (mbennett@cityofwildomar.org); Boon, Richard (Richard.Boon@ocpw.ocgov.com); Chris Crompton (chris.crompton@ocpw.ocgov.com); Christopher Macon (cmacon@lagunawoodscity.org); Greg Yi (greg.yi@rdmd.ocgov.com); 'Hossein Ajideh'; Humza Javed (hjaved@ci.laguna-hills.ca.us); Joe Ames (JAmes@cityofmissionviejo.org); Lisa Zawaski (lzawaski@danapoint.org); Mary Vondrak (vondrakM@san-clemente.org); Moy Yahya (myahya@cityofalisoviejo.com); Nancy Palmer (NPalmer@cityoflagunaniguel.org); Rae Beimer (RBeimer@cityofrsm.org); Slaven, Devin (dslaven@lakeforestca.gov); Tracy Ingebrigtsen (tingebrigtsen@lagunabeachcity.net); 'Boushra Salem' (bsalem@chulavistaca.gov); Brown, Clement (CMBrown@sandiego.gov); Cecilia Padres-Tipton (ctipton@cityofsanteeca.gov); Cheryl Filar (cfilar@cityofvista.com); Chris Helmer; Dan Goldberg; Elaine Lukey (Elaine.Lukey@carlsbadca.gov); Erik Steenblock (esteenblock@encinitasca.gov); Godby, Kim (kgodby@coronado.ca.us); Helen M. Davies (hdavies@ci.escondido.ca.us); Jaime Campos (jcampos@ci.el-cajon.ca.us); 'James Wood'; 'JoAnn Weber'; Joe Kuhn (jkuhn@ci.la-mesa.ca.us); John Quenzer (jquenzer@dmaxinc.com); Karen Holman (kholman@portofsandiego.org); Kolb, Ruth (RKolb@sandiego.gov); Kuma Muthusamy; Malik Tamimi (mtamimi@lemongrove.ca.gov); Mikhail Ogawa (mikhail@mogawaeng.com); Mo Lahsaie (mlahsaie@ci.oceanside.ca.us); Reed Thornberry (rthornberry@san-marcos.net); Richard Gilb (rgilb@san.org); Ron Borromeo; Steven Strapac (SStrapac@poway.org)
Cc: Walsh, Laurie@Waterboards; Barker, David@Waterboards; Arias, Christina@Waterboards; Ryan, Erica@Waterboards; 'Bill Paznokas'; 'Carol Roberts'; 'Cindy Lin'; 'Dave Smith'; 'Deborah Lee'; 'Robert Smith'
Subject: Transmittal of Order No. R9-2015-0100 and Conformed Order No. R9-2013-0001
Attachments: 2015-1125 Transmittal Letter Order No. R9-2015-0100.pdf; 2015-1118 Adopted Order No. R9-2015-0100_withAttachments.pdf; 2015-1118 Conformed Order No. R9-2013-0001 COMPLETE.pdf

San Diego Region Municipal Storm Water Copermittees:

Please find attached the transmittal letter and a copy of Order No. R9-2015-0100 and the attachments adopted by the San Diego Water Board on November 18, 2015. The attachments to Order No. R9-2015-0100 show the amendments to the Regional MS4 Permit in blue underline and red strikeout text. A conformed copy of the Regional MS4 Permit (including attachments) incorporating the amendments adopted pursuant to Order No. R9-2015-0001 is also attached.

These documents are available on the San Diego Water Board website at:
http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/rsd_stormwater.shtml

The San Diego Water Board Storm Water webpage has also been updated with the amended Regional MS4 Permit:
http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

Please contact me with any questions.

Happy holidays,

Wayne Chiu, PE
Water Resource Control Engineer
Storm Water Management Unit
California Regional Water Quality Control Board
San Diego Region
2375 Northside Drive, Suite 100
San Diego, CA 92108
Direct Line: (619) 521-3354
Main Line: (619) 516-1990

California Water Boards

Edmund G. Brown Jr., Governor

Matthew Rodriquez, Secretary for Environmental Protection

California Regional Water Quality Control Board, San Diego Region

November 25, 2015

Sent via E-mail

Riverside County Copermittees
Orange County Copermittees
San Diego County Copermittees

In reply refer to / attn:
Place ID: 786088:WChiu

Subject: Order No. R9-2015-0100, An Order Amending Order No. R9-2013-0001, NPDES No. CAS0109266, as Amended by Order No. R9-2015-0001, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) is pleased to transmit to you the finalized copy of Order No. R9-2015-0100, *An Order Amending Order No. R9-2013-0001, NPDES No. 0109266, as Amended by Order No. R9-2015-0001, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Amending Order), as adopted by the San Diego Water Board November 18, 2015. The Amending Order identifies specific changes made to Order No. R9-2013-0001 and Attachments in blue underline and red strikeout text. Also enclosed is a conformed copy of Order No. R9-2013-0001 and Attachments which incorporates all adopted changes.

An electronic copy of both the Amending Order and a conformed copy of Order R9-2013-0001 and Attachments are available from the San Diego Water Board website at: http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml
If a Copermittee or other interested person would like to receive a hard copy of either the Amending Order or a conformed copy of Order No. R9-2013-0001 with Attachments, please contact Wayne Chiu at (619) 521-3354 or Wayne.Chiu@waterboards.ca.gov or visit the San Diego Water Board's office at 2375 Northside Drive, Suite 100, San Diego, California 92108, weekdays between 8:00 a.m. and 5:00 p.m.

Please submit any written correspondence in response to this letter to SanDiego@waterboards.ca.gov. Electronic documents must be submitted as a single file, in Portable Document Format (PDF) format, and converted to text searchable format using Optical Character Recognition (OCR). All electronic documents must also include scanned copies of all signature pages; electronic signatures will not be accepted. Electronic documents submitted to the San Diego Water Board must include the following identification numbers in the header or subject line: **PIN: CW-786088:WChiu.**

Respectfully,

David T. Barker P.E.
Supervising Water Resource Control Engineer

DTB: law:wc

Enclosures: Order No. R9-2015-0100 with Attachments
Conformed Copy of Order No. R9-2013-0001 with Attachments

cc:

Distribution list via email:
(see attached address list)

San Diego County MS4 Permit E-mail Service List
Orange County MS4 Permit E-mail Service List
Riverside County MS4 Permit E-mail Service List
Natural Resources Agencies

Tech Staff Info & Use	
Order No.	R9-2015-0100
NPDES No.	CAS0109266
Place ID	786088

San Diego County Copermittees

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CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

2375 Northside Drive, Suite 100, San Diego, CA 92108
Phone (619) 516-1990 Fax (619) 516-1994
http://www.waterboards.ca.gov/sandiego

ORDER NO. R9-2015-0100

AN ORDER AMENDING ORDER NO. R9-2013-0001, NPDES NO. CAS010266, AS AMENDED BY ORDER NO. R9-2015-0001 NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The California Regional Water Quality Control Board, San Diego Region (hereinafter San Diego Water Board), finds that:

ENROLLMENT OF RIVERSIDE COUNTY COPERMITTEES

1. **Enrollment Process.** On May 8, 2013, the San Diego Water Board adopted Order No. R9-2013-0001, NPDES No. CAS019266, *National Pollutant Discharge Elimination System Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Order No. R9-2013-0001, or Regional MS4 Permit). Provision F.5 of that Order (as amended by Order No. R9-2015-0001) outlines a process to designate (enroll) the County of Riverside, the Riverside County Cities of Murrieta, Temecula, and Wildomar, and the Riverside County Flood Control and Water Conservation District as Copermittees under Order No. R9-2013-0001, responsible for compliance with the terms and the conditions of the Regional MS4 Permit. Provision F.5 provides that prior to such enrollment, the San Diego Water Board must first review and consider a Report of Waste Discharge (ROWD) submitted by the Riverside County Copermittees under their current MS4 Permit, Order No. R9-2010-0016, to determine whether the Copermittees should be enrolled under Order No. R9-2013-0001, and what changes to Order No. R9-2013-0001 proposed in the ROWD are appropriate.

2. **Report of Waste Discharge.** By letter dated May 8, 2015, the Riverside County Copermittees jointly submitted a ROWD in application for the reissuance of waste discharge requirements, pursuant to the requirements of section K.2.c of Order No. R9-2010-0016. The San Diego Water Board reviewed the ROWD and determined it is complete.

3. **Riverside County Copermittees Enrollment.** After consideration of the Riverside County Copermitees' ROWD and changes needed to Order No. R9-2013-0001, the San Diego Water Board determined that the County of Riverside, the Cities of Murrieta, Temecula, and Wildomar, and the Riverside County Flood Control and Water Conservation District should be enrolled as Copermittees under Order No. R9-2013-0001 and be responsible for compliance with the terms and the conditions of the Regional MS4 Permit. Enrolling the Riverside County Copermittees into Order No. R9-2013-0001 will provide regulatory consistency in the implementation of MS4 permit requirements throughout the San Diego Region, improve communication and coordination among Copermittees within watersheds crossing multiple jurisdictions, and maximize efficiency and economy of resources for the San Diego Water Board achieved through the redirection of staff permitting resources to better advance the storm water program. Enrollment of the Cities of Murrieta and Wildomar is subject to a California Water Code section 13228 agreement as set forth in the findings of this Order.

DESIGNATION OF A REGIONAL WATER BOARD

4. **Regional Water Board Designation.** The Cities of Menifee, Murrieta, and Wildomar are located partially within the jurisdictions of both the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board) and the San Diego Water Board. California Water Code section 13228 provides a way to streamline the regulation of entities whose jurisdictions straddle the border of two or more Regional Water Boards.

   As allowed by California Water Code section 13228, during the proceedings for Order No. R9-2010-0016, the Fourth Term Riverside County MS4 Permit, written requests for designation of a single Regional Water Board to regulate matters pertaining to Phase I MS4 discharges were submitted to the San Diego Water Board and Santa Ana Water Board by the City of Murrieta by letter dated July 20, 2010, the City of Wildomar by letter dated July 21, 2010, and the City of Menifee by letter dated July 22, 2010. The Cities of Murrieta and Wildomar requested designation of the San Diego Water Board, and the City of Menifee requested designation of the Santa Ana Water Board.

   As authorized by California Water Code section 13228 and pursuant to written agreements dated September 28, 2010 between the San Diego Water Board and the Santa Ana Water Board, the San Diego Water Board is designated under Order No. R9-2010-0016 to regulate Phase I MS4s within the entire jurisdictional area of the Cities of Murrieta and Wildomar, including those areas of each City located within the Santa Ana Water Board's geographic jurisdiction. The Santa Ana Water Board is designated under Order No. R8-2010-0033 to regulate the Phase I MS4s within the entire jurisdictional area of the City of Menifee, including those areas of the City located within the San Diego Water Board's geographic jurisdiction. Written requests to continue these Regional Water Board designations were submitted to the San Diego Water Board and Santa Ana Water Board by the City of Murrieta by

letter dated June 22, 2015, the City of Wildomar by letter dated June 23, 2015, and the City of Menifee by letter dated June 25, 2015.

5. **Factual Considerations.** The Santa Ana Water Board and San Diego Water Board establish generally consistent requirements for MS4 discharges to meet the technology-based standard of reducing pollutants in the discharge to the maximum extent practicable (MEP), a related iterative process to ensure MS4 discharges meet receiving water quality standards, and for non-storm water discharges to be effectively prohibited from entering the MS4. However due to the unique nature of watersheds and water quality issues in the San Diego Region and Santa Ana Region, MS4 permit requirements between the two Regional Water Boards may also vary to address region specific pollutant discharges and watershed conditions. The Cities of Menifee, Murrieta, and Wildomar report that management and implementation of municipal programs to comply with two different MS4 permits creates a significant administrative and financial burden that is not contributing to greater overall water quality improvements in either region.

6. **Regional Water Board Agreement.** The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated October 26, 2015 to:

   a. Continue designation of the San Diego Water Board to regulate Phase I MS4 discharges within the entire jurisdictional area of the Cities of Murrieta and Wildomar, including those areas of each City located within the Santa Ana Region upon the effective date of Order R9-2015-0100, *and*

   b. Continue designation of the San Ana Water Board to regulate Phase I MS4 discharges within the entire jurisdictional area of the City of Menifee, including those areas of the City located within the San Diego Region, under Order No. R8-2010-0033 (NPDES No. CAS618030) as it may be amended or reissued upon the effective date of Order No. R9-2015-0100.

7. **Periodic Review of Regional Water Board Agreement.** The basis supporting the Cities of Menifee, Murrieta, and Wildomar requests to designate a specific Regional Water Board for regulatory oversight of MS4 discharges may change under future conditions and circumstances. Therefore the San Diego Water Board and Santa Ana Water Board will periodically review the effectiveness of the agreement during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate the agreement with the Santa Ana Water Board or otherwise modify the agreement subject to the approval of the Santa Ana Water Board.

AMENDMENTS TO ORDER NO. R9-2013-0001

8. **Effect of this Order.** Order No. R9-2013-0001 is not being reopened for any other purpose than the amendments contained herein. Except as contradicted or superseded by the findings and directives set forth in this Order, all of the previous findings and directives of Order No. R9-2013-0001 (as amended by Order No. R9-2015-0001) shall remain in full force and effect.

9. **Enroll Riverside County Copermittees.** This Order amends Order No. R9-2013-0001 to incorporate the County of Riverside, the Riverside County Cities of Murrieta, Temecula, and Wildomar, and the Riverside County Flood Control and Water Conservation District as Copermittees responsible for compliance with the terms and the conditions of Order No. R9-2013-0001, as amended by Order No. R9-2015-0001 and this Order.

10. **Alternative Compliance Pathway for Prohibitions and Limitations.** The San Diego County, Orange County, and Riverside County Copermittees have asserted that the prohibitions and limitations under Provision A of Order No. R9-2013-0001 may result in many years of noncompliance because years of technical efforts may ultimately be required to achieve compliance with the prohibitions and limitations, especially for wet weather discharges.

    The San Diego Water Board considered the incorporation of an alternative pathway to compliance during the adoption proceedings for Order No. R9-2013-0001 in May 2013, but chose not to include it at that time. During the proceedings for Order No. R9-2015-0001, amending Order No. R9-2013-0001 to extend coverage of the Regional MS4 Permit to the Orange County Copermittees and as reflected in Order No. R9-2015-0001, the San Diego Water Board committed to considering the incorporation of a well-defined, transparent, and finite alternative pathway to compliance in Order No. R9-2013-0001 during the MS4 permit reissuance proceedings for the Riverside County Copermittees.

    On June 16, 2015, the State Water Resources Control Board (State Water Board) adopted Order WQ 2015-0075, *In the Matter of Review of Order No. R4-2012-0175, NPDES Permit No. CAS004001, Waste Discharge Requirements for Municipal Separate Storm Sewer System (MS4) Discharges within the Coastal Watersheds of Los Angeles County, Except Those Discharges Originating from the City of Long Beach MS4,* which directs all Regional Water Boards to consider a watershed-based planning and implementation approach to compliance with receiving water limitations when issuing Phase I MS4 permits going forward. Consistent with the principles set forth in Order WQ 2015-0075, this Order amends Order No. R9-2013-0001 to incorporate an alternative compliance pathway that allows a Copermittee to utilize the watershed-based Water Quality Improvement Plan to be deemed in compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2.a, and A.3.b which are included in the prohibitions and limitations under Provision A of the Regional MS4 Permit.

    This Order amends the Fact Sheet of Order No. R9-2013-0001, Attachment F, section VII.E, Antidegradation Policy, to provide an expanded analysis consistent with the principles set forth in State Water Board Order WQ 2015-0075, demonstrating why the incorporation of an alternative compliance pathway for prohibitions and limitations in Order No. R9-2013-0001 complies with federal and state antidegradation policies. This Order also amends the Fact Sheet of Order No. R9-2013-0001, Attachment F, section VII.E, Anti-Backsliding Requirements, with an expanded analysis consistent with State Water Board Order WQ 2015-0075 demonstrating that the anti-backsliding requirements of the Clean Water Act and the

federal regulations do not foreclose the incorporation of an alternative compliance pathway into Order No. R9-2013-0001.

11. **Update to Non-Storm Water Discharges.** Since Order No. R9-2013-0001 was adopted, the State Water Board adopted Order 2014-0194-DWQ (*Statewide National Pollutant Discharge Elimination System (NPDES) Permit for Drinking Water System Discharges to Waters of the United States*) and the San Diego Water Board adopted Order No. R9-2015-0013 (*General Waste Discharge Requirements for Groundwater Extraction Discharges to Surface Waters within the San Diego Region*). These orders are NPDES permits regulating non-storm water discharges that may be discharged to the Copermittees' MS4s. This Order amends Order No. R9-2013-0001 to incorporate State Water Board Order 2014-0194-DWQ and San Diego Water Board Order No. R9-2015-0013 into the requirements for addressing non-storm water discharges.

12. **Priority Development Project Definition Consistency.** The Fact Sheet of the Regional MS4 Permit as modified by Order No. R9-2015-0001, describes on Page F-98 the San Diego Water Board's intent that the Priority Development Project categories in Provision E.3.b.(1) be consistent with the categories in the Riverside County MS4 Permit (Order No. R9-2010-0016) and the Orange County MS4 Permit (Order No. R9-2009-0002). The San Diego Water Board's intention reflected in the Fact Sheet was not explicitly incorporated in some of the Priority Development Project categories described in Provision E.3.b.(1) and this Order amends the provision with clarifying language to better describe these categories consistent with the Fact Sheet. The Order also has been amended to include the requirements for updating the BMP Design Manual as a result of the corrections to the Priority Development Project categories in Provision E.3.b.(1).

13. **Definition of Prior Lawful Approval.** During the proceedings for Order No. R9-2015-0001, amending Order No. R9-2013-0001 to extend coverage of the Regional MS4 Permit to the Orange County Copermittees, the land development community asserted that the lack of a definition for the term "prior lawful approval" in the Regional MS4 Permit had created significant uncertainty for the San Diego County Copermittees, the land development community, and the general public about when the development planning requirements are applicable. The San Diego Water Board committed to considering the incorporation of additional guidance for prior lawful approval in Order No. R9-2013-0001 during the MS4 permit reissuance proceedings for the Riverside County Copermittees. This Order amends Order No. R9-2013-0001 to incorporate additional clarification describing when the structural BMP performance requirements are applicable to Priority Development Projects.

14. **Los Peñasquitos Lagoon Sediment TMDL.** During the proceedings for Order No. R9-2015-0001, amending Order No. R9-2013-0001 to extend coverage of the Regional MS4 Permit to the Orange County Copermittees, the San Diego County Copermittees responsible for implementing the TMDLs for Sediment in Los Peñasquitos Lagoon requested several minor revisions to make the TMDL requirements consistent with the Basin Plan amendment adopted by the San Diego

Water Board. This Order amends Attachment E to Order No. R9-2013-0001 to incorporate minor revisions to the Los Peñasquitos Lagoon Sediment TMDL to make the requirements consistent with the adopted Basin Plan amendment.

15. **Compliance Dates for TMDLs Beaches and Creeks Indicator Bacteria TMDLs.** A review of the interim and final compliance dates for the Revised TMDLs for Indicator Bacteria, Project I – Beaches and Creeks (Beaches and Creeks Indicator Bacteria TMDLs) in the San Diego Region in Attachment E to the Order revealed an inconsistency with the adopted Basin Plan amendment. This Order amends Attachment E to Order No. R9-2013-0001 to incorporate minor revisions to the Beaches and Creeks Indicator Bacteria TMDLs to make the requirements consistent with the adopted Basin Plan amendment.

16. **Removal of Application for Early Coverage Provisions.** Order No. R9-2013-0001, as amended by Order No. R9-2015-0001 included several provisions that allowed the Riverside County Copermittees to apply for early coverage under the Regional MS4 Permit prior to the expiration of Order No. R9-2010-0016. These provisions are no longer necessary once the Riverside County Copermittees are covered by the requirements of the Regional MS4 Permit with the adoption of this Order. This Order amends Order No. R9-2013-0001 to remove provisions related to applying for early coverage under the Regional MS4 Permit.

ADMINISTRATIVE FINDINGS

17. **California Environmental Quality Act**. This action is exempt from the requirement of preparation of environmental documents under the California Environmental Quality Act [Public Resources Code, Division 13, Chapter 3, Section 21000 et seq.] in accordance with California Water Code section 13389.

18. **Public Notice.** In accordance with State and federal laws and regulations, the San Diego Water Board has notified San Diego County, Orange County and Riverside County Copermittees, and all known interested agencies and persons of its intent to adopt this Order and has provided them with an opportunity to submit their written comments.

19. **Public Hearing.** The San Diego Water Board held a public hearing on November 18, 2015 and heard and considered all comments pertaining to the adoption of this Order.

20. **Notification.** Any person aggrieved by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with California Water Code section 13320 and California Code of Regulations, title 23, sections 2050 et seq. The State Water Board must receive the petition by 5:00 p.m., 30 days after the adoption date of this Order. Copies of the law and regulations applicable to filing petitions may be found on the Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

THEREFORE, IT IS HEREBY ORDERED,

1. This Order amends Order No. R9-2013-0001 and Fact Sheet as amended by Order No. R9-2015-0001 (Regional MS4 Permit and Fact Sheet). The revisions to the Regional MS4 Permit and Fact Sheet are shown Attachments 1 and 2 to this Order. Added text to the Regional MS4 Permit and Fact Sheet is displayed in blue-underline text and deleted text is displayed as red-strikeout text.

2. The amended Regional MS4 Permit and Fact Sheet included as Attachments 1 and 2 to this Order shall become effective on January 7, 2016.

3. The amended Regional MS4 Permit and Fact Sheet included as Attachments 1 and 2 to this Order shall supersede Order No. R9-2010-0016 for the Riverside County Copermittees except for enforcement purposes.

4. San Diego Water Board staff is directed to prepare and post a conformed copy of the Regional MS4 Permit and Fact Sheet, as amended by this Order, incorporating the revisions made by this Order.

I, David W. Gibson, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on November 18, 2015.

David W. Gibson
Executive Officer

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

ORDER NO. R9-2013-0001,
AS AMENDED BY ORDER NOS. R9-2015-0001 AND R9-2015-0100
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The San Diego County Copermittees in Table 1a are subject to waste discharge requirements set forth in this Order.

Table 1a. San Diego County Copermittees

City of Carlsbad	City of Oceanside
City of Chula Vista	City of Poway
City of Coronado	City of San Diego
City of Del Mar	City of San Marcos
City of El Cajon	City of Santee
City of Encinitas	City of Solana Beach
City of Escondido	City of Vista
City of Imperial Beach	County of San Diego
City of La Mesa	San Diego County Regional Airport Authority
City of Lemon Grove	San Diego Unified Port District
City of National City	

The Orange County Copermittees in Table 1b are subject to waste discharge requirements set forth in this Order.

Table 1b. Orange County Copermittees[1]

City of Aliso Viejo	City of Rancho Santa Margarita
City of Dana Point	City of San Clemente
City of Laguna Beach	City of San Juan Capistrano
City of Laguna Hills	City of Laguna Woods
City of Laguna Niguel	County of Orange
City of Mission Viejo	Orange County Flood Control District

~~After the San Diego Water Board receives and considers the Riverside County Copermittees' Report of Waste Discharge and makes any necessary changes to this Order, t~~The Riverside County Copermittees in Table 1c ~~will become~~ are subject to waste

[1] While not listed in Table 1b., the City of Lake Forest remains a Copermittee under this Order until the later effective date of this Order or the effective date of Santa Ana Water Board Tentative Order No. R8-2015-0001. Thereafter, the City of Lake Forest will no longer be considered a Copermittee under this Order because its Phase I MS4 discharges will be regulated by the Santa Ana Water Board pursuant to Water Code section 13228 designation. The requirements of this Order that apply to the City of Lake Forest for the duration of this Order, however, are described in Finding 29 and Footnote 2 to Table B-1.

discharge requirements set forth in this Order ~~after expiration of Order No.R9-2010-0016, NPDES No. CAS0108766 on or after November 10, 2015~~.

Table 1c. Riverside County Copermittees

City of Murrieta	County of Riverside
City of Temecula	Riverside County Flood Control and Water Conservation District
City of Wildomar	

~~The Riverside County Copermittees may become subject to the requirements of this Order at a date earlier than the expiration date of their current Order subject to the conditions described in Provision F.6 of this Order if the Riverside County Copermittees receive notification of coverage from the San Diego Water Board.~~

The term Copermittee in this Order refers to any San Diego County, Orange County, or Riverside County Copermittee covered under this Order, unless specified otherwise.

This Order provides permit coverage for the Copermittee discharges described in Table 2.

Table 2. Discharge Locations and Receiving Waters

Discharge Points	Locations throughout San Diego Region
Discharge Description	Municipal Separate Storm Sewer System (MS4) Discharges
Receiving Waters	Inland Surface Waters, Enclosed Bays and Estuaries, and Coastal Ocean Waters of the San Diego Region

Table 3. Administrative Information

This Order was adopted by the San Diego Water Board on:	**May 8, 2013**
Order No. R9-2013-0001 became effective on:	**June 27, 2013**
This Order as amended by R9-2015-0001 became effective on:	**April 1, 2015**
This Order as amended by R9-2015-0100 became effective on:	**January 7, 2016**
This Order will expire on:	**June 27, 2018**
The Copermittees must file a Report of Waste Discharge in accordance with Title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than 180 days in advance of the Order expiration date.	

I, David W. Gibson, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on May 8, 2013, as amended by adoption of Order No. R9-2015-0001 on February 11, 2015, and as amended by adoption of Order No. R9-2015-0100 on November 18, 2015.

TENTATIVE

David W. Gibson
Executive Officer

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ATTACHMENTS

Attachment A: Discharge Prohibitions and Special Protections A-1
Attachment B: Standard Permit Provisions and General Provisions B-1
Attachment C: Acronyms, Abbreviations and Definitions C-1
Attachment D: Jurisdictional Runoff Management Program Annual Report Form D-1
Attachment E: Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2013-0001, as amended by Order Nos. R9-2015-0001 and R9-2015-0100 ..... E-1
Attachment F: Fact Sheet / Technical Report for Order No. R9-2013-0001 as amended by Order Nos. R9-2015-0001 and R9-2015-0100 ..... F-1

I. FINDINGS

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), finds that:

JURISDICTION

1. **MS4 Ownership or Operation.** Each of the Copermittees owns or operates an MS4, through which it discharges storm water and non-storm water into waters of the U.S. within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the U.S.

2. **Legal and Regulatory Authority.** This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]) adopted by the United States Environmental Protection Agency (USEPA), and chapter 5.5, division 7 of the California Water Code (CWC) (commencing with section 13370). This Order serves as an NPDES permit for discharges from MS4s to surface waters. This Order also serves as waste discharge requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

   The San Diego Water Board has the legal authority to issue a regional MS4 permit pursuant to its authority under CWA section 402(p)(3)(B) and 40 CFR 122.26(a)(1)(v). The USEPA also made it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide permits (55 Federal Register [FR] 47990, 48039-48042). The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees and San Diego Water Board.

   The federal regulations make it clear that the Copermittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators (40 CFR 122.26(a)(3)(vi)). This Order does not require the Copermittees to manage storm water outside of their jurisdictional boundaries, but rather to work collectively to improve storm water management within watersheds.

3. **CWA NPDES Permit Conditions.** Pursuant to CWA section 402(p)(3)(B), NPDES permits for storm water discharges from MS4s must include requirements to effectively prohibit non-storm water discharges into MS4s, and require controls to reduce the discharge of pollutants in storm water to the maximum extent practicable (MEP), and to require other provisions as the San Diego Water Board determines are appropriate to control such pollutants. This Order prescribes conditions to assure compliance with the CWA requirements for owners and operators of MS4s to effectively prohibit non-storm water discharges into the MS4s, and require controls to reduce the discharge of pollutants in storm water from the MS4s to the MEP.

4. **CWA and CWC Monitoring Requirements.** CWA section 308(a) and 40 CFR 122.41(h),(j)-(l) and 122.48 require that NPDES permits must specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s also specify additional monitoring and reporting requirements in 40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c). CWC section 13383 authorizes the San Diego Water Board to establish monitoring, inspection, entry, reporting and recordkeeping requirements. This Order establishes monitoring and reporting requirements to implement federal and State requirements. This Order also includes requirements for the Orange County Copermittees to participate in, and together with South Orange County Wastewater Authority and Orange County Health Care Agency, share responsibility for implementing the unified approach to beach water quality monitoring and assessment program set forth in the October 2014 report, *Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County*, issued pursuant to CWC section 13383 in the San Diego Water Board December 5, 2014 Letter Directive.

5. **Total Maximum Daily Loads.** CWA section 303(d)(1)(A) requires that "[e]ach state shall identify those waters within its boundaries for which the effluent limitations are not stringent enough to implement any water quality standard applicable to such waters." The CWA also requires states to establish a priority ranking of impaired water bodies known as Water Quality Limited Segments and to establish Total Maximum Daily Loads (TMDLs) for such waters. This priority list of impaired water bodies is called the Clean Water Act Section 303(d) List of Water Quality Limited Segments, commonly referred to as the 303(d) List. The CWA requires the 303(d) List to be updated every two years.

   TMDLs are numerical calculations of the maximum amount of a pollutant that a water body can assimilate and still meet water quality standards. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point sources (waste load allocations or WLAs) and non-point sources (load allocations or LAs), background contribution, plus a margin of safety. Discharges from MS4s are point source discharges. The federal regulations (40 CFR 122.44(d)(1)(vii)(B)) require that NPDES permits incorporate water quality based effluent limitations (WQBELs) developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, consistent with the assumptions and requirements of any available WLA for the discharge. Requirements of this Order implement the TMDLs established by the San Diego Water Board or USEPA as of the date this Order was amended in 2015. This Order establishes WQBELs consistent with the assumptions and requirements of all available TMDL WLAs assigned to discharges from the Copermittees' MS4s.

6. **Non-Storm Water Discharges.** Pursuant to CWA section 402(p)(3)(B)(ii), this Order requires each Copermittee to effectively prohibit discharges of non-storm water into its MS4. Nevertheless, non-storm water discharges into and from the

MS4s continue to be reported to the San Diego Water Board by the Copermittees and other persons. Monitoring conducted by the Copermittees, as well as the 303(d) List, have identified dry weather, non-storm water discharges from the MS4s as a source of pollutants causing or contributing to receiving water quality impairments in the San Diego Region. The federal regulations (40 CFR 122.26(d)(2)(iv)(B)(1)) require the Copermittees to have a program to prevent illicit discharges to the MS4. The federal regulations, however, allow for specific categories of non-storm water discharges or flows to be addressed as illicit discharges only where such discharges are identified as sources of pollutants to waters of the U.S.

7. **In-Stream Treatment Systems.** Pursuant to federal regulations (40 CFR 131.10(a)), in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S. Authorizing the construction of a runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to accepting waste assimilation as an appropriate use for that water body. Runoff treatment must occur prior to the discharge of runoff into receiving waters. Treatment control best management practices (BMPs) must not be constructed in waters of the U.S. Construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body.

DISCHARGE CHARACTERISTICS AND RUNOFF MANAGEMENT

8. **Point Source Discharges of Pollutants.** Discharges from the MS4s contain waste, as defined in the CWC, and pollutants that adversely affect the quality of the waters of the state. A discharge from an MS4 is a “discharge of pollutants from a point source” into waters of the U.S. as defined in the CWA. Storm water and non-storm water discharges from the MS4s contain pollutants that cause or threaten to cause a violation of surface water quality standards, as outlined in the Water Quality Control Plan for the San Diego Basin (Basin Plan). Storm water and non-storm water discharges from the MS4s are subject to the conditions and requirements established in the Basin Plan for point source discharges.

9. **Potential Beneficial Use Impairment.** The discharge of pollutants and/or increased flows from MS4s may cause or threaten to cause the concentration of pollutants to exceed applicable receiving water quality objectives and impair or threaten to impair designated beneficial uses resulting in a condition of pollution, contamination, or nuisance.

10. **Pollutants Generated by Land Development.** Land development has created and continues to create new sources of non-storm water discharges and pollutants in storm water discharges as human population density increases. This brings higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash. Pollutants from these sources are dumped or washed off the surface by non-storm water or storm water flows into

and from the MS4s. When development converts natural vegetated pervious ground cover to impervious surfaces such as paved highways, streets, rooftops, and parking lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving a developed area without BMPs that can maintain pre-development runoff conditions will contain greater pollutant loads and have significantly greater runoff volume, velocity, and peak flow rate than pre-development runoff conditions from the same area.

11. **Runoff Discharges to Receiving Waters.** The MS4s discharge runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within the eleven hydrologic units comprising the San Diego Region. Historic and current development makes use of natural drainage patterns and features as conveyances for runoff. Rivers, streams and creeks in developed areas used in this manner are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and receiving water. Numerous receiving water bodies and water body segments have been designated as impaired by the San Diego Water Board pursuant to CWA section 303(d).

12. **Pollutants in Runoff.** The most common pollutants in runoff discharged from the MS4s include total suspended solids, sediment, pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., cadmium, copper, lead, and zinc), petroleum products and polynuclear aromatic hydrocarbons, synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus), oxygen-demanding substances (e.g., decaying vegetation, animal waste), detergents, and trash. As operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not prohibit or otherwise control. These discharges may cause or contribute to a condition of pollution or a violation of water quality standards.

13. **Human Health and Aquatic Life Impairment.** Pollutants in runoff discharged from the MS4s can threaten and adversely affect human health and aquatic organisms. Adverse responses of organisms to chemicals or physical agents in runoff range from physiological responses such as impaired reproduction or growth anomalies to mortality. Increased volume, velocity, rate, and duration of storm water runoff greatly accelerate the erosion of downstream natural channels. This alters stream channels and habitats and can adversely affect aquatic and terrestrial organisms.

14. **Water Quality Effects.** The Copermittees' water quality monitoring data submitted to date documents persistent exceedances of Basin Plan water quality objectives for runoff-related pollutants at various watershed monitoring stations. Persistent toxicity has also been observed at several watershed monitoring stations. In addition, bioassessment data indicate that the majority of the monitored receiving waters have

Poor to Very Poor Index of Biological Integrity (IBI) ratings. These findings indicate that runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in the San Diego Region. Non-storm water discharges from the MS4s have been shown to contribute significant levels of pollutants and flow in arid, developed Southern California watersheds, and contribute significantly to exceedances of applicable receiving water quality objectives.

15. **Non-Storm Water and Storm Water Discharges.** Non-storm water discharges from the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard of CWA section 402(p)(3)(B)(iii), which is explicitly for "Municipal … *Stormwater Discharges* (emphasis added)" from the MS4s. Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s must be effectively prohibited.

16. **Best Management Practices.** Waste and pollutants which are deposited and accumulate in MS4 drainage structures will be discharged from these structures to waters of the U.S. unless they are removed. These discharges may cause or contribute to, or threaten to cause or contribute to, a condition of pollution in receiving waters. For this reason, pollutants in storm water discharges from the MS4s can be and must be effectively reduced in runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Pollution prevention is the reduction or elimination of pollutant generation at its source and is the best "first line of defense." Source control BMPs (both structural and non-structural) minimize the contact between pollutants and runoff, therefore keeping pollutants onsite and out of receiving waters. Treatment control BMPs remove pollutants that have been mobilized by storm water or non-storm water flows.

17. **BMP Implementation.** Runoff needs to be addressed during the three major phases of development (planning, construction, and use) in order to reduce the discharge of storm water pollutants to the MEP, effectively prohibit non-storm water discharges, and protect receiving waters. Development which is not guided by water quality planning policies and principles can result in increased pollutant load discharges, flow rates, and flow durations which can negatively affect receiving water beneficial uses. Construction sites without adequate BMP implementation result in sediment runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. Existing development can generate substantial pollutant loads which are discharged in runoff to receiving waters. Retrofitting areas of existing development with storm water pollutant control and hydromodification management BMPs is necessary to address storm water discharges from existing development that may cause or contribute to a condition of pollution or a violation of water quality standards.

18. **Water Quality Improvements.** Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit

non-storm water discharges to the MS4s and control pollutants in storm water discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the CWA.

19. **Long Term Planning and Implementation.** Federal regulations require municipal storm water permits to expire 5 years from adoption, after which the permit must be renewed and reissued. The San Diego Water Board recognizes that the degradation of water quality and impacts to beneficial uses of the waters in the San Diego Region occurred over several decades. The San Diego Water Board further recognizes that a decade or more may be necessary to realize demonstrable improvement to the quality of waters in the San Diego Region. This Order includes a long term planning and implementation approach that will require more than a single permit term to complete.

WATER QUALITY STANDARDS

20. **Basin Plan.** The San Diego Water Board adopted the Water Quality Control Plan for the San Diego Basin (Basin Plan) on September 8, 1994, that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for receiving waters addressed through the plan. The Basin Plan was subsequently approved by the State Water Resources Control Board (State Water Board) on December 13, 1994. Subsequent revisions to the Basin Plan have also been adopted by the San Diego Water Board and approved by the State Water Board. Requirements of this Order implement the Basin Plan.

    The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Process Supply (PROC), Industrial Service Supply (IND), Ground Water Recharge (GWR), Contact Water Recreation (REC1), Non-contact Water Recreation (REC2), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Freshwater Replenishment (FRSH), Hydropower Generation (POW), and Preservation of Biological Habitats of Special Significance (BIOL). The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region: Navigation (NAV), Commercial and Sport Fishing (COMM), Estuarine Habitat (EST), Marine Habitat (MAR), Aquaculture (AQUA), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN), and Shellfish Harvesting (SHELL).

21. **Ocean Plan.** The State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, and 2005. The State Water Board adopted the latest amendment on ~~April 21, 2005~~ October 16, 2012 and it became effective on ~~February 14, 2006~~ August 19, 2013. The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean. Requirements of this Order implement the Ocean Plan.

    The Ocean Plan identifies the following beneficial uses of ocean waters of the state to be protected: Industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture; preservation and enhancement of designated Areas of Special Biological Significance; rare and endangered species; marine habitat; fish spawning and shellfish harvesting.

22. **Sediment Quality Control Plan**. On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes: 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

23. **National Toxics Rule and California Toxics Rule.** USEPA adopted the National Toxics Rule (NTR) on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the NTR applied in California. On May 18, 2000, USEPA adopted the California Toxics Rule (CTR). The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants.

24. **Antidegradation Policy.** This Order is in conformance with the federal Antidegradation Policy described in 40 CFR 131.12, and State Water Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality Waters in California*. Federal regulations at 40 CFR 131.12 require that the State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. State Water Board Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies. The Fact Sheet of this Order contains additional discussion about antidegradation.

25. **Anti-Backsliding Requirements.** Section 402(o)(2) of the CWA and federal regulations at 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations may be relaxed. All effluent limitations in this Order are at least as stringent as effluent limitations in the previous permits. The Fact Sheet of this Order contains additional discussion about anti-backsliding.

CONSIDERATIONS UNDER FEDERAL AND STATE LAW

26. **Coastal Zone Act Reauthorization Amendments.** Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states with approved coastal zone management programs to address non-point source pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point source pollution: agriculture, silviculture, urban, marinas, and hydromodification. This Order addresses the management measures required for the urban category, with the exception of septic systems. The runoff management programs developed pursuant to this Order fulfills the need for coastal cities to develop a runoff non-point source plan identified in the Non-Point Source Program Strategy and Implementation Plan. The San Diego Water Board addresses septic systems through the administration of other programs.

27. **Endangered Species Act.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 USC sections 1531 to 1544). This Order requires compliance with receiving water limits, and other requirements to protect the beneficial uses of waters of the State. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

28. **Report of Waste Discharge Process.** The waste discharge requirements set forth in this Order are based upon the Report of Waste Discharge submitted by the San Diego County Copermittees prior to the expiration of Order No. R9-2007-0001 (NPDES No. CAS0109266), ~~and~~ the Report of Waste Discharge submitted by the Orange County Copermittees prior to the expiration of Order No. R9-2009-0002 (CAS0108740), and the Report of Waste Discharge submitted by the Riverside County Copermittees prior to the expiration of Order No. R9-2010-0016 (CAS0108766). ~~The Riverside County Copermittees are not immediately covered by the waste discharge requirements in this Order. The San Diego Water Board understands that each municipality is unique although the Counties share watersheds and/or geographical boundaries. The Order will continue to use the Report of Waste Discharge process prior to initially making Riverside County Copermittees subject to the requirements of this Order.~~

The federal regulations (40 CFR 122.21(d)(2)) and CWC section 13376 impose a duty on the Copermittees to reapply for continued coverage through submittal of a Report of Waste Discharge no later than 180 days prior to expiration of a currently effective permit. The expiration date of this Order as shown in Table 3, and requirement to file a Report of Waste Discharge no later than 180 days prior to the expiration date of the Order, applies jointly to the San Diego County, Orange County, and Riverside County Copermittees. ~~This requirement is set forth in the Riverside County Copermittees' currently effective permit at ProvisionK.2.c. The Riverside County MS4 Permit, Order No. R9-2010-0016 (NPDES No. CAS0108766) expires on November 10, 2015.~~

~~Unless the Riverside County Copermittees apply for and receive early coverage under this Order, the Riverside County Copermittees' permit will be superseded by this Order upon expiration of their permit, subject to any necessary revisions to the requirements of this Order made after the San Diego Water Board considers their Report of Waste Discharge through the public process provided in 40 CFR Part 124.~~

29. Regional Water Board Designation. The Cities of Laguna Hills, Laguna Woods, ~~and~~ Lake Forest, Menifee, Murrieta, and Wildomar are located partially within the jurisdictions of the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board) and the San Diego Water Board and their discharges are subject to regulation by both Regional Water Boards. CWC section 13228 provides a way to streamline the regulation of entities whose jurisdictions straddle the border of two or more Regions. CWC section 13228 is implemented in this Order at the request of these six cities and to ease the regulatory burden of municipalities that lie in both the San Diego Water Board's and the adjacent Santa Ana Water Board's jurisdiction. MS4 discharges from these municipalities are regulated by the San Diego Water Board and Santa Ana Water Board as follows:

a. Pursuant to CWC section 13228, the Cities of Laguna Hills, Laguna Woods, and Lake Forest submitted written requests that one Regional Water Board be designated to regulate Phase I MS4 discharges for each of the Cities. The Santa Ana Water Board and the San Diego Water Board have entered into an agreement dated February 10, 2015, whereby the Cities of Laguna Woods and Laguna Hills are largely regulated by the San Diego Water Board under this Order, including those portions of the Cities of Laguna Woods and Laguna Hills not within the San Diego Water Board's jurisdiction, upon the effective date of this Order or Santa Ana Water Board Order No. R8-2015-0001, whichever is later. Similarly, the City of Lake Forest, including those portions of the City of Lake Forest within the San Diego Water Board's jurisdiction, is largely regulated by the Santa Ana Water Board under Order No. R8-2015-0001 (NPDES No. CAS618030) upon the later effective date of this Order or Order No. R8-2015-0001. The agreement provides that the City of Lake Forest is required to retain, and continue implementation of, its over-irrigation discharge prohibition in Title 15, Chapter 14.030, List (b) of the City Municipal Code for regulating storm water quality throughout its jurisdiction. The agreement also requires the City of Lake Forest to actively participate during development and implementation of the Aliso

Creek Watershed Management Area Water Quality Improvement Plan required pursuant to this Order. Each Regional Water Board retains the authority to enforce provisions of its Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee under the terms of the agreement (Water Code section 13228 (b)). Under the terms of the agreement, any TMDL and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Laguna Woods, Laguna Hills or Lake Forest as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement of the applicable TMDL will remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's San Diego Creek/Newport Bay TMDL and the San Diego Water Board's Indicator Bacteria Project I Beaches and Creeks TMDL. The San Diego Water Board will periodically review the effectiveness of the agreement during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate the agreement with Santa Ana Water Board or otherwise modify the agreement subject to the approval of the Santa Ana Water Board.

b. Pursuant to CWC section 13228, the Cities of Murrieta, Wildomar, and Menifee submitted written requests that one Regional Water Board be designated to regulate Phase I MS4 discharges for each of the Cities. The Santa Ana Water Board and the San Diego Water Board have entered into an agreement dated October 26, 2015, whereby the Cities of Murrieta and Wildomar are largely regulated by the San Diego Water Board under this Order, including those portions of the Cities of Murrieta and Wildomar not within the San Diego Water Board's jurisdiction, upon the effective date of this Order. Similarly, the City of Menifee is largely regulated by the Santa Ana Water Board under Order No. R8-2010-0033 as it may be amended or reissued, including those portions of the City of Menifee within the San Diego Water Board's jurisdiction, upon the effective date of this Order. The agreement also requires the City of Menifee to actively participate during development and implementation of the Santa Margarita River Watershed Management Area Water Quality Improvement Plan required pursuant to this Order. Each Regional Water Board retains the authority to enforce provisions of its Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee under the terms of the agreement (Water Code section 13228 (b)). Under the terms of the agreement, any TMDL and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Menifee, Murrieta, or Wildomar as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement of the applicable TMDL will remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's Lake Elsinore/Canyon Lake Nutrient

TMDLs. The San Diego Water Board will periodically review the effectiveness of the agreement during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate the agreement with Santa Ana Water Board or otherwise modify the agreement subject to the approval of the Santa Ana Water Board.

30. **Integrated Report and Clean Water Act Section 303(d) List.** The San Diego Water Board and State Water Board submit an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. USEPA issued its *Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act* on July 29, 2005, which advocates the use of a five category approach for classifying the attainment status of water quality standards for water bodies in the Integrated Report. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 in the Integrated Report are placed on the 303(d) List.

    Water bodies with available data and/or information that indicate at least one beneficial use is not being supported or is threatened, but a TMDL is not required, are included in Category 4 in the Integrated Report. Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

    Implementation of the requirements of this Order may allow the San Diego Water Board to include surface waters impaired by discharges from the Copermittees' MS4s in Category 4 in the Integrated Report for consideration during the next 303(d) List submittal by the State to USEPA.

31. **Economic Considerations.** The California Supreme Court has ruled that although CWC section 13263 requires the State and Regional Water Boards (collectively Water Boards) to consider factors set forth in CWC section 13241 when issuing an NPDES permit, the Water Board may not consider the factors to justify imposing pollutant restrictions that are less stringent than the applicable federal regulations require. (*City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 618, 626-627.) However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

    As noted in the following finding, the San Diego Water Board finds that the requirements in this Order are not more stringent than the minimum federal

requirements. Therefore, a CWC section 13241 analysis is not required for permit requirements that implement the effective prohibition on the discharge of non-storm water into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determined appropriate to control such pollutants, as those requirements are mandated by federal law. Notwithstanding the above, the San Diego Water Board has developed an economic analysis of the requirements in this Order. The economic analysis is provided in the Fact Sheet.

32. **Unfunded Mandates.** This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following:

    a. This Order implements federally mandated requirements under CWA section 402 (33 USC section 1342(p)(3)(B)).

    b. The local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental and new dischargers who are issued NPDES permits for storm water and non-storm water discharges.

    c. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order.

    d. The Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)) and in lieu of numeric restrictions on their MS4 discharges (i.e. effluent limitations).

    e. The local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under State law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

    f. The provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state develops a TMDL, federal law requires that permits must contain water quality based effluent limitations consistent with the assumptions and requirements of any applicable wasteload allocation (40 CFR 122.44(d)(1)(vii)(B)).

    See the Fact Sheet for further discussion of unfunded mandates.

33. **California Environmental Quality Act.** The issuance of waste discharge requirements and an NPDES permit for the discharge of runoff from MS4s to waters of the U.S. is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 et seq.) in accordance with CWC section 13389.

STATE WATER BOARD DECISIONS

34. **Compliance with Prohibitions and Limitations.** The receiving water limitation language specified in this Order is consistent with language recommended by the USEPA and established in State Water Board Order WQ 99-05, *Own Motion Review of the Petition of Environmental Health Coalition to Review Waste Discharge Requirements Order No. 96-03, NPDES Permit No. CAS0108740*, adopted by the State Water Board on June 17, 1999. The receiving water limitation language in this Order requires storm water discharges from MS4s to not cause or contribute to a violation of water quality standards, which is to be achieved through an iterative approach requiring the implementation of improved and better-tailored BMPs over time. Implementation of the iterative approach to comply with receiving water limitations based on applicable water quality standards is necessary to ensure that storm water discharges from the MS4 will not ultimately cause or contribute to violations of water quality standards and will not create conditions of pollution, contamination, or nuisance.

The San Diego, Orange County, and Riverside County Copermittees have asserted that the prohibitions and limitations may result in many years of noncompliance because years of technical efforts may ultimately be required to achieve compliance with the prohibitions and limitations, especially for wet weather discharges. To address this concern, this Order includes an option that allows a Copermittee to be deemed in compliance with the prohibitions and limitations where more than one permit term may be necessary to achieve full compliance with the prohibitions and limitations. One or more Copermittees within a Watershed Management Area can choose to implement this option.

An alternative compliance pathway option has been included in this Order consistent with the approach described in Order WQ 2015-0075, *In the Matter of Review of Order No. R4-2012-0175, NPDES Permit No. CAS004001, Waste Discharge Requirements for Municipal Separate Storm Sewer System (MS4) Discharges within the Coastal Watersheds of Los Angeles County, Except Those Discharges Originating from the City of Long Beach MS4*, adopted by the State Water Board on June 16, 2015. State Water Board Order WQ 2015-0075 directs the Regional Water Boards to consider a watershed-based planning and implementation approach to compliance with receiving water limitations when issuing Phase I MS4 permits going forward. Order WQ 2015-0075 included seven principles that the Regional Water Boards are expected to follow when incorporating an alternative compliance pathway into an MS4 permit. The Fact Sheet discusses the incorporation of the seven principles stipulated in State Water Board Order WQ 2015-0075 into the alternative compliance pathway option in this Order.

35. **Special Conditions for Areas of Special Biological Significance.** On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving a general exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and

NPDES permitted municipal storm water discharges (General Exception). On June 19, 2012, the State Water Board adopted Order No. 2012-0031, amending the General Exception to require pollutant reductions to be achieved within six years in accordance with ASBS Compliance Plans and ASBS Pollution Prevention Plans. The General Exception requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject to the terms and conditions of the General Exception as amended. The Special Protections contained in Attachment B to the General Exception as amended are applicable to these discharges, and are hereby incorporated into Attachment A of this Order.

ADMINISTRATIVE FINDINGS

36. **Executive Officer Delegation of Authority.** The San Diego Water Board by prior resolution has delegated all matters that may legally be delegated to its Executive Officer to act on its behalf pursuant to CWC section 13223. Therefore, the Executive Officer is authorized to act on the San Diego Water Board's behalf on any matter within this Order unless such delegation is unlawful under CWC section 13223 or this Order explicitly states otherwise.

37. **Standard Provisions.** Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR 122.42, are provided in Attachment B to this Order.

38. **Fact Sheet.** The Fact Sheet for this Order contains background information, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of this Order. The Fact Sheet is hereby incorporated into this Order and constitutes part of the Findings of this Order.

39. **Public Notice.** In accordance with State and federal laws and regulations, the San Diego Water Board notified the Copermittees, and interested agencies and persons of its intent to prescribe waste discharge requirements for the control of discharges into and from the MS4s to waters of the U.S. and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet.

40. **Public Hearings.** The San Diego Water Board held a public hearing on April 10 and 11, 2013, that was continued to May 8, 2013 and heard and considered all comments pertaining to the terms and conditions of this Order. The San Diego Water Board also held a public workshop on October 8, 2015, and a public hearing

on February 11, 2015, and heard and considered all comments pertaining to the amendment of this Order through Order No. R9-2015-0001. The San Diego Water Board also held a public hearing on November 18, 2015, and heard and considered all comments pertaining to the amendment of this Order through Order No. R9-2015-0100. Details of these public hearings are provided in the Fact Sheet.

41. **Effective Date.** This Order serves as an NPDES permit pursuant to CWA section 402 or amendments thereto, and as to the San Diego County Copermittees listed in Table ~~2.~~1a~~.~~, became effective fifty (50) days after the date of its adoption, and as to the Orange County Copermittees listed in Table ~~2.~~1b~~.~~, ~~becomes~~ became effective on April 1, 2015, after Order No. R9-2015-0001 was ~~is~~ adopted, and as to the Riverside County Copermittees listed in Table 1c, became effective on January 7, 2016, after Order No. R9-2015-0100 was adopted, provided that the Regional Administrator, USEPA, Region IX, does not object to this Order.

42. **Review by the State Water Board.** Any person aggrieved by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with CWC section 13320 and California Code of Regulations, title 23, sections 2050, and following. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date of this Order, except that if the thirtieth day following the date of this Order falls on a Saturday, Sunday or State holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

THEREFORE, IT IS HEREBY ORDERED that the Copermittees, in order to meet the provisions contained in division 7 of the CWC (commencing with section 13000) and regulations adopted thereunder, and the provisions of the CWA and regulations adopted thereunder, must each comply with the requirements of this Order. This action in no way prevents the San Diego Water Board from taking enforcement action for past violations of the previous Order applicable to the Copermittees. If any part of this Order is subject to a temporary stay of enforcement, unless otherwise specified, the Copermittees must comply with the analogous portions of the previous Order, which will remain in effect for all purposes during the pendency of the stay.

II. PROVISIONS

A. PROHIBITIONS AND LIMITATIONS

The purpose of this provision is to describe the conditions under which storm water and non-storm water discharges into and from MS4s are prohibited or limited. The goal of the prohibitions and limitations is to protect the water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through the implementation of water quality improvement strategies and runoff management programs that effectively prohibit non-storm water discharges into the Copermittees' MS4s, and reduce pollutants in storm water discharges from the Copermittees' MS4s to the MEP.

1. Discharge Prohibitions

a. Discharges from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the state are prohibited.

b. Non-storm water discharges into MS4s are to be effectively prohibited, through the implementation of Provision E.2, unless such discharges are authorized by a separate NPDES permit.

c. Discharges from MS4s are subject to all waste discharge prohibitions in the Basin Plan, included in Attachment A to this Order.

d. Storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012, as amended by State Water Board Resolution No. 2012-0031, applicable to these discharges, included in Attachment A to this Order. All other discharges from the Copermittees' MS4s to ASBS are prohibited.

2. Receiving Water Limitations

a. Discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters, including but not limited to all applicable provisions contained in:

(1) The San Diego Water Board's Basin Plan, including beneficial uses, water quality objectives, and implementation plans;

(2) State Water Board plans for water quality control including the following:

(a) Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries (Thermal Plan), and

(b) The Ocean Plan, including beneficial uses, water quality objectives, and implementation plans;

(3) State Water Board policies for water and sediment quality control including the following:

(a) Water Quality Control Policy for the Enclosed Bays and Estuaries of California,

(b) Sediment Quality Control Plan which includes the following narrative objectives for bays and estuaries:

(i) Pollutants in sediments shall not be present in quantities that, alone or in combination, are toxic to benthic communities, and

(ii) Pollutants shall not be present in sediments at levels that will bioaccumulate in aquatic life to levels that are harmful to human health,

(c) The Statement of Policy with Respect to Maintaining High Quality of Waters in California;[2]

(4) Priority pollutant criteria promulgated by the USEPA through the following:

(a) National Toxics Rule (NTR)[3] (promulgated on December 22, 1992 and amended on May 4, 1995), and

(b) California Toxics Rule (CTR).[4,5]

b. Discharges from MS4s composed of storm water runoff must not alter natural ocean water quality in an ASBS.

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[2] State Water Board Resolution No. 68-16
[3] 40 CFR 131.36
[4] 65 Federal Register 31682-31719 (May 18, 2000), adding Section 131.38 to 40 CFR
[5] If a water quality objective and a CTR criterion are in effect for the same priority pollutant, the more stringent of the two applies.

3. Effluent Limitations

a. Technology Based Effluent Limitations

Pollutants in storm water discharges from MS4s must be reduced to the MEP.[6]

b. Water Quality Based Effluent Limitations

Each Copermittee must comply with applicable WQBELs established for the TMDLs in Attachment E to this Order, pursuant to the applicable TMDL compliance schedules.

4. Compliance with Discharge Prohibitions and Receiving Water Limitations

Each Copermittee must achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order through timely implementation of control measures and other actions as specified in Provisions B and E of this Order, including any modifications. The Water Quality Improvement Plans required under Provision B must be designed and adapted to ultimately achieve compliance with Provisions A.1.a, A.1.c and A.2.a.

a. If exceedance(s) of water quality standards persist in receiving waters notwithstanding implementation of this Order, the Copermittees must comply with the following procedures:

(1) For exceedance(s) of a water quality standard in the process of being addressed by the Water Quality Improvement Plan, the Copermittee(s) must implement the Water Quality Improvement Plan as accepted by the San Diego Water Board, and update the Water Quality Improvement Plan, as necessary, pursuant to Provision F.2.c;

(2) Upon a determination by either the Copermittees or the San Diego Water Board that discharges from the MS4 are causing or contributing to a new exceedance of an applicable water quality standard not addressed by the Water Quality Improvement Plan, the Copermittees must submit the following updates to the Water Quality Improvement Plan pursuant to Provision F.2.c or as part of the Water Quality Improvement Plan Annual Report required under Provision F.3.b, unless the San Diego Water Board directs an earlier submittal:

(a) The water quality improvement strategies being implemented that are effective and will continue to be implemented,

[6] This does not apply to MS4 discharges which receive subsequent treatment to reduce pollutants in storm water discharges to the MEP prior to entering receiving waters (e.g., low flow diversions to the sanitary sewer). Runoff treatment must occur prior to the discharge of runoff into receiving waters per Finding 7.

(b) Water quality improvement strategies (i.e. BMPs, retrofitting projects, stream and/or habitat rehabilitation projects, adjustments to jurisdictional runoff management programs, etc.) that will be implemented to reduce or eliminate any pollutants or conditions that are causing or contributing to the exceedance of water quality standards,

(c) Updates to the schedule for implementation of the existing and additional water quality improvement strategies, and

(d) Updates to the monitoring and assessment program to track progress toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a of this Order;

(3) The San Diego Water Board may require the incorporation of additional modifications to the Water Quality Improvement Plan required under Provision B. The applicable Copermittees must submit any modifications to the update to the Water Quality Improvement Plan within 90 days of notification that additional modifications are required by the San Diego Water Board, or as otherwise directed;

(4) Within 90 days of the San Diego Water Board determination that the modifications to the Water Quality Improvement Plan required under Provision A.4.a.(3) meet the requirements of this Order, the applicable Copermittees must revise the jurisdictional runoff management program documents to incorporate the modified water quality improvement strategies that have been and will be implemented, the implementation schedule, and any additional monitoring required; and

(5) Each Copermittee must implement the updated Water Quality Improvement Plan.

b. The procedure set forth above to achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order do not have to be repeated for continuing or recurring exceedances of the same water quality standard(s) following implementation of scheduled actions unless directed to do otherwise by the San Diego Water Board.

c. Nothing in Provisions A.4.a and A.4.b prevents the San Diego Water Board from enforcing any provision of this Order while the applicable Copermittees prepare and implement the above update to the Water Quality Improvement Plan and jurisdictional runoff management programs.

B. WATER QUALITY IMPROVEMENT PLANS

The purpose of this provision is to develop Water Quality Improvement Plans that guide the Copermittees' jurisdictional runoff management programs towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plans is to further the Clean Water Act's objective to protect, preserve, enhance, and restore the water quality and designated beneficial uses of waters of the state. This goal will be accomplished through an adaptive planning and management process that identifies the highest priority water quality conditions within a watershed and implements strategies through the jurisdictional runoff management programs to achieve improvements in the quality of discharges from the MS4s and receiving waters.

1. Watershed Management Areas

The Copermittees must develop a Water Quality Improvement Plan for each of the Watershed Management Areas in Table B-1. A total of ten Water Quality Improvement Plans must be developed for the San Diego Region.

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
San Juan (901.00)	South Orange County	- Aliso Creek - San Juan Creek - San Mateo Creek - Pacific Ocean - Heisler Park ASBS	- City of Aliso Viejo - City of Dana Point - City of Laguna Beach - City of Laguna Hills[1] - City of Laguna Niguel - City of Laguna Woods[1] - City of Lake Forest[2] - City of Mission Viejo - City of Rancho Santa Margarita - City of San Clemente - City of San Juan Capistrano - County of Orange - Orange County Flood Control District
Santa Margarita (902.00)	Santa Margarita River	- Murrieta Creek - Temecula Creek - Santa Margarita River - Santa Margarita Lagoon - Pacific Ocean	- City of Menifee[3] - City of Murrieta[~~3~~4] - City of Temecula[~~3~~] - City of Wildomar[~~3~~4] - County of Riverside[~~3~~] - County of San Diego[4] - Riverside County Flood Control and Water Conservation District[~~3~~]
San Luis Rey (903.00)	San Luis Rey River	- San Luis Rey River - San Luis Rey Estuary - Pacific Ocean	- City of Oceanside - City of Vista - County of San Diego

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
Carlsbad (904.00)	Carlsbad	- Loma Alta Slough - Buena Vista Lagoon - Agua Hedionda Lagoon - Batiquitos Lagoon - San Elijo Lagoon - Pacific Ocean	- City of Carlsbad - City of Encinitas - City of Escondido - City of Oceanside - City of San Marcos - City of Solana Beach - City of Vista - County of San Diego
San Dieguito (905.00)	San Dieguito River	- San Dieguito River - San Dieguito Lagoon - Pacific Ocean	- City of Del Mar - City of Escondido - City of Poway - City of San Diego - City of Solana Beach - County of San Diego
Penasquitos (906.00)	Penasquitos	- Los Penasquitos Lagoon - Pacific Ocean	- City of Del Mar - City of Poway - City of San Diego - County of San Diego
	Mission Bay	- Mission Bay - Pacific Ocean - San Diego Marine Life Refuge ASBS	- City of San Diego
San Diego (907.00)	San Diego River	- San Diego River - Pacific Ocean	- City of El Cajon - City of La Mesa - City of San Diego - City of Santee - County of San Diego
Pueblo San Diego (908.00) Sweetwater (909.00) Otay (910.00)	San Diego Bay	- Sweetwater River - Otay River - San Diego Bay - Pacific Ocean	- City of Chula Vista - City of Coronado - City of Imperial Beach - City of La Mesa - City of Lemon Grove - City of National City - City of San Diego - County of San Diego - San Diego County Regional Airport Authority - San Diego Unified Port District
Tijuana (911.00)	Tijuana River	- Tijuana River - Tijuana Estuary - Pacific Ocean	- City of Imperial Beach - City of San Diego - County of San Diego

Notes:

1. By agreement dated February 10, 2015, pursuant to Water Code section 13228, the Phase I MS4 discharges within the jurisdiction of the City of Laguna Hills and the City of Laguna Woods located in the Santa Ana Region are regulated by San Diego Water Board Order No. R9-2013-0001 as amended by Order No. R9-2015-0001, upon the later effective date of Order No. R9-2015-0001 or Santa Ana Water Board Tentative Order No. R8-2015-0001. The City of Laguna Hills and Laguna Woods must also comply with the requirements of the San Diego Creek/Newport Bay TMDL in section XVIII of Santa Ana Water Board Order No. R8-2015-0001.
2. By agreement dated February 10, 2015, pursuant to Water Code section 13228, Phase I MS4 discharges within the City of Lake Forest located within the San Diego Water Board Region are regulated by the Santa Ana Water Board Order No. R8-2015-0001 (NPDES No. CAS618030) upon the later effective date of this Order or Santa Ana Water Board Tentative Order No. R8-2015-0001. In accordance with the terms of the agreement between the San Diego Water Board and the Santa Ana Water Board, the City of Lake Forest must implement the requirements of the Bacteria TMDL in Attachment E of this Order, participate in preparation and implementation of the Water Quality Improvement Plan for the Aliso Creek Watershed Management Area as described in Provision B of this Order and continue implementation of its over-irrigation discharge prohibition in its City Ordinance, Title 15, Chapter 15, section 14.030, List (b).
3. By agreement dated October 26, 2015, pursuant to Water Code section 13228, Phase I MS4 discharges within the City of Menifee located within the San Diego Water Board Region are regulated by the Santa Ana Water Board Order No. R8-2010-0033 as it may be amended or reissued (NPDES No. CAS618033) upon the later effective date of this Order. In accordance with the terms of the agreement between the San Diego Water Board and the Santa Ana Water Board, the City of Menifee must participate in preparation and implementation of the Water Quality Improvement Plan for the Santa Margarita River Watershed Management Area as described in Provision B of this Order.~~The Riverside County Copermittees will be covered under this Order after expiration of Order No. R9-2010-0016 or earlier if the Riverside County Copermittees meet the conditions in Provision F.6, upon further amendment of this Order.~~
4. By agreement dated October 26, 2015, pursuant to Water Code section 13228, the Phase I MS4 discharges within the jurisdiction of the City of Murrieta and the City of Wildomar located in the Santa Ana Region are regulated by San Diego Water Board Order No. R9-2013-0001 as amended by Orders No. R9-2015-0001 and R9-2015-0100. The City of Murrieta and City of Wildomar must also comply with the requirements of the Lake Elsinore/Canyon Lake Nutrient TMDLs in section VI.D.2 of Santa Ana Water Board Order No. R8-2010-0033, or corresponding section as it may be amended or reissued.~~The County of San Diego is not required to implement the requirements of Provision B for its jurisdiction within the Santa Margarita River Watershed Management Area~~

~~until the Riverside County Copermittees have been notified of coverage under this Order. The County of San Diego is required to implement the requirements of Provisions D, F.3.b, and Attachment E until the Riverside County Copermittees have been notified of coverage under this Order.~~

2. Priority Water Quality Conditions

The Copermittees must identify the water quality priorities within each Watershed Management Area that will be addressed by the Water Quality Improvement Plan. Where appropriate, Watershed Management Areas may be separated into subwatersheds to focus water quality prioritization and jurisdictional runoff management program implementation efforts by receiving water.

a. Assessment of Receiving Water Conditions

The Copermittees must consider the following, at a minimum, to identify water quality priorities based on impacts of MS4 discharges on receiving water beneficial uses:

(1) Receiving waters listed as impaired on the CWA Section 303(d) List of Water Quality Limited Segments (303(d) List);

(2) TMDLs adopted and under development by the San Diego Water Board;

(3) Receiving waters recognized as sensitive or highly valued by the Copermittees, including estuaries designated under the National Estuary Program under CWA section 320, marine protected areas, wetlands defined by the State or U.S. Fish and Wildlife Service's National Wetlands Inventory as wetlands, waters having the Preservation of Biological Habitats of Special Significance (BIOL) beneficial use designation, and receiving waters identified as ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(4) The receiving water limitations of Provision A.2;

(5) Known historical versus current physical, chemical, and biological water quality conditions;

(6) Available, relevant, and appropriately collected and analyzed physical, chemical, and biological receiving water monitoring data, including, but not limited to, data describing:

(a) Chemical constituents,

(b) Water quality parameters (i.e. pH, temperature, conductivity, etc.),

(c) Toxicity Identification Evaluations for both receiving water column and sediment,

(d) Trash impacts,

(e) Bioassessments, and

(f) Physical habitat;

(7) Available evidence of erosional impacts in receiving waters due to accelerated flows (i.e. hydromodification);

(8) Available evidence of adverse impacts to the chemical, physical, and biological integrity of receiving waters; and

(9) The potential improvements in the overall condition of the Watershed Management Area that can be achieved.

b. ASSESSMENT OF IMPACTS FROM MS4 DISCHARGES

The Copermittees must consider the following, at a minimum, to identify the potential impacts to receiving waters that may be caused or contributed to by discharges from the Copermittees' MS4s:

(1) The discharge prohibitions of Provision A.1 and effluent limitations of Provision A.3; and

(2) Available, relevant, and appropriately collected and analyzed storm water and non-storm water monitoring data from the Copermittees' MS4 outfalls;

(3) Locations of each Copermittee's MS4 outfalls that discharge to receiving waters;

(4) Locations of MS4 outfalls that are known to persistently discharge non-storm water to receiving waters likely causing or contributing to impacts on receiving water beneficial uses;

(5) Locations of MS4 outfalls that are known to discharge pollutants in storm water causing or contributing to impacts on receiving water beneficial uses; and

(6) The potential improvements in the quality of discharges from the MS4 that can be achieved.

c. IDENTIFICATION OF PRIORITY WATER QUALITY CONDITIONS

(1) The Copermittees must use the information gathered for Provisions B.2.a and B.2.b to develop a list of priority water quality conditions as pollutants, stressors and/or receiving water conditions that are the highest threat to receiving water quality or that most adversely affect the quality of receiving waters. The list must include the following information for each priority water quality condition:

(a) The beneficial use(s) associated with the priority water quality condition;

(b) The geographic extent of the priority water quality condition within the Watershed Management Area, if known;

(c) The temporal extent of the priority water quality condition (e.g., dry weather and/or wet weather);

(d) The Copermittees with MS4s discharges that may cause or contribute to the priority water quality condition; and

(e) An assessment of the adequacy of and data gaps in the monitoring data to characterize the conditions causing or contributing to the priority water quality condition, including a consideration of spatial and temporal variation.

(2) The Copermittees must identify the highest priority water quality conditions to be addressed by the Water Quality Improvement Plan, and provide a rationale for selecting a subset of the water quality conditions identified pursuant to Provision B.2.c.(1) as the highest priorities.

d. IDENTIFICATION OF MS4 SOURCES OF POLLUTANTS AND/OR STRESSORS

The Copermittees must identify and prioritize known and suspected sources of storm water and non-storm water pollutants and/or other stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c. The identification of known and suspected sources of pollutants and/or stressors that cause or contribute to the highest priority water quality conditions as identified for Provision B.2.c must consider the following:

(1) Pollutant generating facilities, areas, and/or activities within the Watershed Management Area, including:

(a) Each Copermittee's inventory of construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas,

(b) Publicly owned parks and/or recreational areas,

(c) Open space areas,

(d) All currently operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste, and

(e) Areas not within the Copermittees' jurisdictions (e.g., Phase II MS4s, tribal lands, state lands, federal lands) that are known or suspected to be discharging to the Copermittees' MS4s;

(2) Locations of the Copermittees' MS4s, including the following:

(a) All MS4 outfalls that discharge to receiving waters, and

(b) Locations of major structural controls for storm water and non-storm water (e.g., retention basins, detention basins, major infiltration devices, etc.);

(3) Other known and suspected sources of non-storm water or pollutants in storm water discharges to receiving waters within the Watershed Management Area, including the following:

(a) Other MS4 outfalls (e.g., Phase II Municipal and Caltrans),

(b) Other NPDES permitted discharges,

(c) Any other discharges that may be considered point sources (e.g., private outfalls), and

(d) Any other discharges that may be considered non-point sources (e.g., agriculture, wildlife or other natural sources);

(4) Review of available data, including but not limited to:

(a) Findings from the Copermittees' illicit discharge detection and elimination programs,

(b) Findings from the Copermittees' MS4 outfall discharge monitoring,

(c) Findings from the Copermittees' receiving water monitoring,

(d) Findings from the Copermittees' MS4 outfall discharge and receiving water assessments, and

(e) Other available, relevant, and appropriately collected data, information, or studies related to pollutant sources and/or stressors that contribute to the highest priority water quality conditions as identified for Provision B.2.c.

(5) The adequacy of the available data to identify and prioritize sources and/or stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c.

e. IDENTIFICATION OF POTENTIAL WATER QUALITY IMPROVEMENT STRATEGIES

The Copermittees must evaluate the findings identified under Provisions B.2.a-d, and identify potential strategies that can result in improvements to water quality in MS4 discharges and/or receiving waters within the Watershed Management Area. Potential water quality improvement strategies that may be implemented within the Watershed Management Area must include the following:

(1) Structural BMPs, non-structural BMPs, incentives, or programs that can potentially be implemented to address the highest priority water quality conditions identified under Provision B.2.c, or MS4 sources of pollutants or stressors identified under Provision B.2.d,

(2) Retrofitting projects in areas of existing development within the Watershed Management Area that can potentially be implemented to reduce MS4 sources of pollutants or stressors identified under Provision B.2.d causing or contributing to the highest priority water quality conditions identified under Provision B.2.c, and

(3) Stream, channel, and/or habitat rehabilitation projects within the Watershed Management Area that can potentially be implemented to protect and/or improve conditions in receiving waters from MS4 pollutants and/or stressors identified under Provision B.2.d causing or contributing to the highest priority water quality conditions identified under Provision B.2.c.

3. Water Quality Improvement Goals, Strategies and Schedules

The Copermittees must identify and develop specific water quality improvement goals and strategies to address the highest priority water quality conditions identified within a Watershed Management Area. The water quality improvement goals and strategies must address the highest priority water quality conditions by effectively prohibiting non-storm water discharges to the MS4, reducing pollutants in storm water discharges from the MS4 to the MEP, and protecting the water quality standards of receiving waters.

a. WATER QUALITY IMPROVEMENT GOALS AND SCHEDULES

(1) Numeric Goals

The Copermittees must develop and incorporate numeric goals[7] into the

[7] Interim and final numeric goals may take a variety of forms such as TMDL established WQBELs, action levels, pollutant concentration, load reductions, number of impaired water bodies delisted from the List of Water Quality Impaired Segments, Index of Biotic Integrity (IBI) scores, or other appropriate metrics. Interim and final numeric goals are not necessarily limited to one criterion or indicator, but may include multiple criteria and/or indicators. Except for TMDL established WQBELs, interim and final numeric goals and corresponding schedules may be revised through the adaptive management process under Provision B.5.

Water Quality Improvement Plan. Numeric goals must be used to support Water Quality Improvement Plan implementation and measure reasonable progress towards addressing the highest priority water quality conditions identified under Provision B.2.c. The Copermittees must establish and incorporate the following numeric goals in the Water Quality Improvement Plan:

(a) Final numeric goals must be based on measureable criteria or indicators capable of demonstrating one or more of the following:

(i) Discharges from the Copermittees' MS4s will not cause or contribute to exceedances of water quality standards in receiving waters, AND/OR

(ii) The conditions of receiving waters and associated habitat are protected from MS4 discharges, AND/OR

(iii) Beneficial uses of receiving waters are protected from MS4 discharges and will be supported.

(b) Interim numeric goals must be based on measureable criteria or indicators capable of demonstrating reasonable incremental progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges as follows:

(i) One or more interim numeric goals may be established to demonstrate progress toward achieving each final numeric goal,

(ii) For each final numeric goal, at least one interim numeric goal must be expressed as a reasonable increment toward achievement of the final numeric goal,

(iii) For each final numeric goal, reasonable interim numeric goals must be established to be accomplished during each 5 year period between the acceptance of the Water Quality Improvement Plan and the achievement of the final numeric goals.

(2) <u>Schedules for Achieving Numeric Goals</u>

The Copermittees must develop and incorporate schedules for achieving the numeric goals into the Water Quality Improvement Plan. The schedules must demonstrate reasonable progress toward achieving the final numeric goals required for Provision B.3.a.(1). The Copermittees must incorporate the schedules for achieving the numeric goals into the Water Quality Improvement Plan based on the following considerations:

(a) Final dates for achieving all final numeric goals must be established considering the following:

(i) Final compliance dates for any applicable TMDLs in Attachment E to this Order;

(ii) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(iii) Achievement of the final numeric goals for the highest water quality priorities must be as soon as possible;

(iv) Final dates for achieving the final numeric goals must reflect a realistic assessment of the shortest practicable time required based on the temporal and spatial extent and factors associated with the highest priority water quality conditions identified under Provision B.2.c, and taking into account the time reasonably required to implement the water quality improvement strategies required pursuant to Provision B.3.b.

(b) Interim dates for achieving all interim numeric goals must be established considering the following:

(i) Interim compliance dates for any applicable TMDLs in Attachment E to this Order;

(ii) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(iii) Interim dates for achieving the interim numeric goals must reflect a realistic assessment of the shortest practicable time reasonably required, taking into account the time needed to implement new or significantly expanded programs and securing financing, if necessary; and

(iv) For each final numeric goal, at least one interim numeric goal must be established that the Copermittees will work toward achieving within the term of this Order.

b. WATER QUALITY IMPROVEMENT STRATEGIES AND SCHEDULES

Based on the likely effectiveness and efficiency of the potential water quality improvement strategies identified under Provision B.2.e to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a, the Copermittees must identify the strategies that will be implemented in each Watershed Management Area as follows:

(1) Jurisdictional Strategies

(a) Each Copermittee in the Watershed Management Area must identify the strategies that will be implemented within its jurisdiction as part of its jurisdictional runoff management program requirements under Provisions E.2 through E.7, including descriptions of the following:

(i) For each of the inventories developed for its jurisdiction, as required under Provisions D.2.a.(1), E.3.e.(2), E.4.b, and E.5.a, each Copermittee must identify the known and suspected areas or sources causing or contributing to the highest priority water quality conditions in the Watershed Management Area that the Copermittee will focus on in its efforts to effectively prohibit non-storm water discharges to its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, and achieve the interim and final numeric goals identified under Provision B.3.a;

(ii) BMPs that each Copermittee will implement, or require to be implemented, as applicable, for those areas or sources within its jurisdiction;

(iii) Education programs that each Copermittee will implement, as applicable, for those areas or sources within its jurisdiction;

(iv) Frequencies that each Copermittee will conduct inspections on those areas or sources within its jurisdiction;

(v) Incentive and enforcement programs that each Copermittee will implement, as applicable, for those areas or sources within its jurisdiction; and

(vi) Any other BMPs, incentives, or programs that each Copermittee will implement for those areas or sources within its jurisdiction.

(b) Identify the optional jurisdictional strategies that each Copermittee will implement within its jurisdiction, as necessary, to effectively prohibit non-storm water discharges to its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. Descriptions of the optional jurisdictional strategies must include:

(i) BMPs, incentives, or programs that may be implemented by the Copermittee within its jurisdiction in addition to the requirements of Provisions B.3.b.(1)(a);

(ii) Incentives or programs that may be implemented by the Copermittee to encourage or implement projects to retrofit areas of existing development within its jurisdiction;

(iii) Incentives or programs that may be implemented by the Copermittee to encourage or implement projects that will rehabilitate the conditions of channels or habitats within its jurisdiction;

(iv) The funds and/or resources that must be secured by the Copermittee to implement the optional strategies described for Provisions B.3.b.(1)(b)(i)-(iii) within its jurisdiction; and

(v) The circumstances necessary to trigger implementation of the optional jurisdictional strategies, in addition to the requirements of Provision B.3.b.(1)(a), to achieve the interim and final numeric goals within the schedules established under Provision B.3.a.

(c) Identify the strategies that will be implemented by the Copermittee in coordination with or with the cooperation of other agencies (e.g. Caltrans, water districts, school districts) and/or entities (e.g. non-governmental organizations) within its jurisdiction.

(2) Watershed Management Area Strategies

The Copermittees must identify the optional regional or multi-jurisdictional strategies that will be implemented in the Watershed Management Area, as necessary, to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. Descriptions of the optional regional or multi-jurisdictional strategies must include:

(a) Regional or multi-jurisdictional BMPs, incentives, or programs that may be implemented by the Copermittees in the Watershed Management Area;

(b) Incentives or programs that may be implemented by the Copermittees in the Watershed Management Area to encourage or implement regional or multi-jurisdictional projects to retrofit areas of existing development;

(c) Incentives or programs that may be implemented by the Copermittees to encourage or implement regional or multi-jurisdictional projects that will rehabilitate the conditions of channels, streams, or habitats within the Watershed Management Area;

(d) The funds and/or resources that must be secured by the Copermittees to implement the optional strategies described for Provisions B.3.b.(2)(a)-(c) within the Watershed Management Area; and

(e) The circumstances necessary to trigger implementation of the optional regional or multi-jurisdictional strategies to achieve the interim and final numeric goals within the schedules established under Provision B.3.a.

(3) Schedules for Implementing Strategies

The Copermittees must develop reasonable schedules for implementing the water quality improvement strategies identified under Provisions B.3.b.(1) and B.3.b.(2) to achieve the interim and final numeric goals identified and schedules established under Provision B.3.a. The Copermittees must incorporate the schedules to implement the water quality improvement strategies into the Water Quality Improvement Plan as follows:

(a) Each Copermittee must develop schedules for the jurisdictional strategies identified pursuant to Provisions B.3.b.(1)(a)-(b). Each schedule must specify:

(i) If each jurisdictional strategy identified pursuant to Provision B.3.b.(1)(a) will or will not be initiated upon acceptance of the Water Quality Improvement Plan;

(ii) For each jurisdictional strategy identified pursuant to Provision B.3.b.(1)(a) that will not be initiated upon acceptance of the Water Quality Improvement Plan, the shortest practicable time in which each jurisdictional strategy will be initiated after acceptance of the Water Quality Improvement Plan;

(iii) For each optional jurisdictional strategy identified pursuant to Provision B.3.b.(1)(b), a realistic assessment of the shortest practicable time required to:

[a] Secure the resources needed to fund the optional jurisdictional strategy, and
[b] Procure the resources, materials, labor, and applicable permits necessary to initiate implementation of the optional jurisdictional strategy;

(iv) If each jurisdictional strategy identified pursuant to Provisions B.3.b.(1)(a)-(b) is expected to be continuously implemented (e.g. inspections) or completed within a schedule (e.g. construction of structural BMP); and

(v) If a jurisdictional strategy identified pursuant to Provisions B.3.b.(1)(a)-(b) is expected to be completed within a schedule, the anticipated time to complete based on a realistic assessment of the shortest practicable time required.

(b) The Copermittees in the Watershed Management Area must develop schedules for the regional or multi-jurisdictional strategies identified pursuant to Provision B.3.b.(2). Each schedule must specify:

(i) A realistic assessment of the shortest practicable time to:

[a] Secure the resources needed to fund the optional regional or multi-jurisdictional strategy, and
[b] Procure the resources, materials, labor, and permits necessary to initiate the implementation of the optional regional or multi-jurisdictional strategy;

(ii) If each regional or multi-jurisdictional strategy identified pursuant to Provision B.3.b.(2) is expected to be continuously implemented (e.g. inspections) or completed within a schedule (e.g. construction of structural BMP); and

(iii) If a regional or multi-jurisdictional strategy and/or activity identified pursuant to Provisions B.3.b.(2) is expected to be completed within a schedule, the anticipated time to complete based on a realistic assessment of the shortest practicable time required.

(4) Optional Watershed Management Area Analysis

(a) For each Watershed Management Area, the Copermittees have the option to perform a Watershed Management Area Analysis for the purpose of developing watershed-specific requirements for structural BMP implementation, as described in Provision E.3.c.(3). The Watershed Management Area Analysis must include GIS layers (maps) as output. The analysis must include the following information, to the extent it is available, in order to characterize the Watershed Management Areas:

(i) A description of dominant hydrologic processes, such as areas where infiltration or overland flow likely dominates;

(ii) A description of existing streams in the watershed, including bed material and composition, and if they are perennial or ephemeral;

(iii) Current and anticipated future land uses;

(iv) Potential coarse sediment yield areas; and

(v) Locations of existing flood control structures and channel structures, such as stream armoring, constrictions, grade control structures, and hydromodification or flood management basins.

(b) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify and compile a list of candidate projects that could potentially be used as

alternative compliance options for Priority Development Projects, to be implemented in lieu of onsite structural BMP performance requirements described in Provisions E.3.c.(1) and E.3.c.(2)(a). Specifically, the Copermittees must identify opportunities to be included in the list of candidate projects in each Watershed Management Area, such as:

(i) Stream or riparian area rehabilitation;

(ii) Retrofitting existing infrastructure to incorporate storm water retention or treatment;

(iii) Regional BMPs;

(iv) Groundwater recharge projects;

(v) Water supply augmentation projects; and

(vi) Land purchases to preserve floodplain functions.

(c) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify areas within the Watershed Management Area where it is appropriate to allow Priority Development Projects to be exempt from the hydromodification management BMP performance requirements described in Provision E.3.c.(2), including supporting rationale.

c. Prohibitions and Limitations Compliance Option

Each Copermittee has the option to utilize the implementation of the Water Quality Improvement Plan to demonstrate compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b within a Watershed Management Area subject to the following conditions:

(1) A Copermittee is eligible to be deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b within a Watershed Management Area when the Water Quality Improvement Plan for a Watershed Management Area incorporates the following:

(a) Numeric goals, water quality improvement strategies, and schedules developed pursuant to Provisions B.3.a and B.3.b that include the following:

(i) Interim and final WQBELs established by the TMDLs in Attachment E to this Order applicable to the Copermittee's jurisdiction within the Watershed Management Area; AND

(ii) Interim and final numeric goals for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012

(included as Attachment A to this Order) applicable to the Copermittee's jurisdiction within the Watershed Management Area; AND

(iii) Interim and final numeric goals applicable to the Copermittee's MS4 discharges within the Watershed Management Area expressed as numeric concentration-based or load-based goals for all pollutants and conditions listed on the Clean Water Act Section 303(d) List of Water Quality Impaired Segments[8] for the receiving waters in the Watershed Management Area that do not have a TMDL incorporated into Attachment E to this Order; AND/OR

(iv) Interim and final numeric goals for pollutants and conditions identified as receiving water priorities in the Water Quality Improvement Plan that will result in chemical, physical, and biological conditions protective of the beneficial uses of the receiving waters impacted by the Copermittee's MS4 discharges within the Watershed Management Area; AND

(v) The Copermittee has the option to include interim and final numeric goals applicable to the Copermittee's MS4 discharges and/or receiving waters within the Watershed Management Area for any pollutants or conditions in addition to those described in Provisions B.3.c.(1)(a)(i)-(iv); AND

(vi) Schedules for achieving each final numeric goal that reflect a realistic assessment of the shortest practicable time needed for achievement; AND

(vii) For each final numeric goal developed pursuant to Provisions B.3.a and B.3.c.(1)(a)(i)-(v), annual milestones[9] and the dates for their achievement must be included within each of the next five (5) Water Quality Improvement Plan Annual Report reporting periods, or until the final numeric goal is achieved. Annual milestones and the dates for their achievement for the 5 Water Quality Improvement Plan Annual Report reporting periods of the next permit term, or until the final numeric goal is achieved, must be provided as part of the Report of Waste Discharge required pursuant to Provision F.5.

(b) An analysis that meets all of the following conditions:

(i) The analysis, with clearly stated assumptions included in the analysis, must quantitatively demonstrate that the implementation of

[8] 2010 and subsequent 303(d) Lists
[9] Annual milestones for each final numeric goal must be clearly and directly linked to, or demonstrate progress is being made toward the achievement of the final numeric goal. The annual milestones may consist of water quality improvement strategy implementation phases, interim numeric goals, and other acceptable metrics. The annual milestones may address multiple numeric goals and/or multiple water bodies, as applicable and appropriate.

the water quality improvement strategies required under Provision B.3.b will achieve the final numeric goals within the schedules developed pursuant to Provisions B.3.a and B.3.c.(1)(a).

(ii) The development of the analysis must include a public participation process which allows the public to review and provide comments on the analysis methodology utilized and the assumptions included in the analysis. Public comments and responses must be included as part of the analysis documentation included in the Water Quality Improvement Plan.

(iii) The analysis may be performed by an individual Copermittee or jointly by two or more Copermittees choosing to utilize this compliance option for their jurisdictions within the Watershed Management Area.

(iv) The analysis must be updated as part of the iterative approach and adaptive management process required under Provisions B.5.a-b.

(c) Specific monitoring and assessments required pursuant to Provision B.4.a that will be performed by the Copermittee capable of 1) demonstrating whether the implementation of the water quality improvement strategies are making progress toward achieving the numeric goals in accordance with the established schedules developed pursuant to Provisions B.3.a and B.3.c.(1)(a), and 2) determining whether interim and final numeric goals have been achieved. The specific monitoring and assessments must be updated as part of the iterative approach and adaptive management process required under Provision B.5.c.

(d) Documentation showing that the numeric goals, schedules, and annual milestones proposed pursuant to Provision B.3.c.(1)(a), the analysis performed pursuant to Provision B.3.c.(1)(b), and the specific monitoring and assessments proposed pursuant to Provision B.3.c.(1)(c) have been reviewed by the Water Quality Improvement Consultation Panel (see Provision F.1.a.(1)(b)). Updates must be reviewed by the Water Quality Improvement Consultation Panel for any recommendations.

(2) Each Copermittee that voluntarily completes the requirements of Provision B.3.c.(1) is deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b for the pollutants and conditions for which numeric goals are developed when the Water Quality Improvement Plan, incorporating the requirements of Provision B.3.c.(1), is accepted by the San Diego Water Board pursuant to Provision F.1.b or F.2.c. The Copermittee is deemed in compliance during the term of this Order as long as:

(a) The Copermittee is implementing the water quality improvement strategies within its jurisdiction developed pursuant to Provision B.3.b.(1) and in

compliance with the schedules for implementing the strategies established pursuant to Provisions B.3.b.(3)(a) and B.3.c.(1)(a)(vii); AND

(b) The Copermittee is performing the monitoring and assessments developed pursuant to Provision B.3.c.(1)(c); AND

(c) The Copermittee's assessments in the Water Quality Improvement Plan Annual Report submitted pursuant to Provision F.3.b.(3) support a conclusion that: 1) the Copermittee is in compliance with the annual milestones and dates for achievement developed pursuant to Provision B.3.c.(1)(a)(vii), OR 2) the Copermittee has provided acceptable rationale and recommends appropriate modifications to the interim numeric goals, and/or water quality improvement strategies, and/or schedules to improve the rate of progress toward achieving the final numeric goals developed pursuant to Provisions B.3.a and B.3.c.(1)(a)(i)-(vi); AND

(d) Any proposed modifications to the numeric goals, strategies, schedules, and/or annual milestones are accepted by the San Diego Water Board as part of subsequent updates to the Water Quality Improvement Plan pursuant to Provision F.2.c;[10] AND

(e) The Copermittee is implementing the requirements of Provision A.4.a.

4. Water Quality Improvement Monitoring and Assessment Program

a. The Copermittees in each Watershed Management Area must develop and incorporate an integrated monitoring and assessment program into the Water Quality Improvement Plan that assesses: 1) the progress toward achieving the numeric goals and schedules, 2) the progress toward addressing the highest priority water quality conditions for each Watershed Management Area, and 3) each Copermittee's overall efforts to implement the Water Quality Improvement Plan.

b. The monitoring and assessment program must incorporate the monitoring and assessment requirements of Provision D, which may allow the Copermittees to modify the program to be consistent with and focus on the highest priority water quality conditions for each Watershed Management Area.

c. For Watershed Management Areas with applicable TMDLs, the monitoring and assessment program must incorporate the specific monitoring and assessment requirements of Attachment E.

[10] A request for proposed changes to the Water Quality Improvement Plan does not stay any permit condition.

d. For Watershed Management Areas with any ASBS, the water quality monitoring and assessment program must incorporate the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

5. Iterative Approach and Adaptive Management Process

The Copermittees in each Watershed Management Area must implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a, and must include the following:

a. RE-EVALUATION OF PRIORITY WATER QUALITY CONDITIONS

The priority water quality conditions and potential water quality improvement strategies included in the Water Quality Improvement Plan pursuant to Provisions B.2.c and B.2.e may be re-evaluated by the Copermittees as needed during the term of this Order as part of the Water Quality Improvement Plan Annual Report. Re-evaluation and recommendations for modifications to the priority water quality conditions and potential water quality improvement strategies must be provided in the Report of Waste Discharge, and must consider the following:

(1) Achieving the outcome of improved water quality in MS4 discharges and receiving waters through implementation of the water quality improvement strategies identified in the Water Quality Improvement Plan;

(2) New information developed when the requirements of Provisions B.2.a-c have been re-evaluated;

(3) Spatial and temporal accuracy of monitoring data collected to inform prioritization of water quality conditions and implementation strategies to address the highest priority water quality conditions;

(4) Availability of new information and data from sources other than the jurisdictional runoff management programs within the Watershed Management Area that informs the effectiveness of the actions implemented by the Copermittees;

(5) San Diego Water Board recommendations; and

(6) Recommendations for modifications solicited through a public participation process.

b. ADAPTATION OF GOALS, STRATEGIES AND SCHEDULES

The water quality improvement goals, strategies and schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.3, must be re-evaluated and adapted as new information becomes available to result in more effective and efficient measures to address the highest priority water quality conditions identified pursuant to Provision B.2.c. Re-evaluation of and modifications to the water quality improvement goals, strategies and schedules must be provided in the Water Quality Improvement Plan Annual Report, and must consider the following:

(1) Modifications to the priority water quality conditions based on Provision B.5.a;

(2) Progress toward achieving interim and final numeric goals in receiving waters and MS4 discharges for the highest priority water quality conditions in the Watershed Management Area,

(3) Progress toward achieving outcomes according to established schedules;

(4) New policies or regulations that may affect identified numeric goals;

(5) Measurable or demonstrable reductions of non-storm water discharges to and from each Copermittee's MS4;

(6) Measurable or demonstrable reductions of pollutants in storm water discharges from each Copermittee's MS4 to the MEP;

(7) New information developed when the requirements of Provisions B.2.b and B.2.d have been re-evaluated;

(8) Efficiency in implementing the Water Quality Improvement Plan;

(9) San Diego Water Board recommendations; and

(10) Recommendations for modifications solicited through a public participation process.

c. ADAPTATION OF MONITORING AND ASSESSMENT PROGRAM

The water quality improvement monitoring and assessment program, included in the Water Quality Improvement Plan pursuant to Provision B.4, must be re-evaluated and adapted when new information becomes available. Re-evaluation and recommendations for modifications to the monitoring and assessment program, pursuant to the requirements of Provision D, may be provided in the Water Quality Improvement Plan Annual Report, but must be provided in the Report of Waste Discharge.

d. ADAPTATION OF PROHIBITIONS AND LIMITATIONS COMPLIANCE OPTION

If a Copermittee has implemented the Prohibitions and Limitations Compliance Option allowed to be included in the Water Quality Improvement Plan pursuant to Provision B.3.c, the Copermittee must re-evaluate and adapt the numeric goals, water quality improvement strategies, schedules, and annual milestones required under Provision B.3.c.(1) when significant new information becomes available, or with the Report of Waste Discharge required pursuant to Provision F.5. Significant changes in the numeric goals, water quality improvement strategies, schedules, or annual milestones requires an update to the analysis required under Provision B.3.c.(2).

6. Water Quality Improvement Plan Submittal, Updates, and Implementation

a. The Copermittees must submit and commence implementation of the Water Quality Improvement Plans in accordance with the requirements of Provision F.1.

b. The Copermittees must submit proposed updates to the Water Quality Improvement Plan for acceptance by the San Diego Water Board Executive Officer in accordance with the requirements of Provision F.2.c.

C. ACTION LEVELS

The purpose of this provision is for the Copermittees to incorporate numeric action levels in the Water Quality Improvement Plans. The goal of the action levels is to guide Water Quality Improvement Plan implementation efforts and measure progress towards the protection of water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through monitoring and assessing the quality of the MS4 discharges during the implementation of the Water Quality Improvement Plans.

1. Non-Storm Water Action Levels[11]

The Copermittees must develop and incorporate numeric non-storm water action levels (NALs) into the Water Quality Improvement Plan to: 1) support the development and prioritization of water quality improvement strategies for effectively prohibiting non-storm water discharges to the MS4s, 2) assess the effectiveness of the water quality improvement strategies toward addressing MS4 non-storm water discharges, required pursuant to Provision D.4.b.(1), and 3) support the detection and elimination of non-storm water and illicit discharges to the MS4, required pursuant to Provision E.2.[12]

a. The following NALs must be incorporated:

(1) Non-Storm Water Discharges from MS4s to Ocean Surf Zone

Table C-1. Non-Storm Water Action Levels for Discharges from MS4s to Ocean Surf Zone

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Total Coliform	MPN/100 ml	1,000	-	10,000/1,000[1]	OP
Fecal Coliform	MPN/100 ml	200[2]	-	400	OP
Enterococci	MPN/100 ml	35	-	104[3]	OP

Abbreviations/Acronyms
AMAL – average monthly action level
MDAL – maximum daily action level
OP – Ocean Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Total coliform density NAL is 1,000 MPN/100 ml when the fecal/total coliform ratio exceeds 0.1.
2. Fecal coliform density NAL is 200 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas."

[11] NALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, unless the NAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed.
[12] The Copermittees may utilize NALs or other benchmarks currently established by the Copermittees as interim NALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

(2) Non-Storm Water Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Table C-2. Non-Storm Water Action Levels for Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Turbidity	NTU	75	-	225	OP
pH	Units	Within limit of 6.0 to 9.0 at all times			OP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	35	-	104[3]	BP
Priority Pollutants	µg/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
OP – Ocean Plan water quality objective
NTU – Nephelometric Turbidity Units
µg/L – micrograms per liter
MDAL – maximum daily action level
BP – Basin Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas" and is not applicable to water bodies that are not designated with the water contact recreation (REC-1) beneficial use.

Table C-3. Non-Storm Water Action Levels for Priority Pollutants

Parameter	Units	Freshwater (CTR)		Saltwater (CTR)	
		MDAL	AMAL	MDAL	AMAL
Cadmium	µg/L	**	**	16	8
Copper	µg/L	*	*	5.8	2.9
Chromium III	µg/L	**	**	-	-
Chromium VI	µg/L	16	8.1	83	41
Lead	µg/L	*	*	14	2.9
Nickel	µg/L	**	**	14	6.8
Silver	µg/L	*	*	2.2	1.1
Zinc	µg/L	*	*	95	47

Abbreviations/Acronyms:
CTR – California Toxic Rule
AMAL – average monthly action level
µg/L – micrograms per liter
MDAL – maximum daily action level

Notes:
* Action levels developed on a case-by-case basis (see below)
** Action levels developed on a case-by-case basis (see below), but calculated criteria are not to exceed Maximum Contaminant Levels (MCLs) under the California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64431

The Cadmium, Copper, Chromium (III), Lead, Nickel, Silver and Zinc NALs for MS4 discharges to freshwater receiving waters will be developed on a case-by-case basis based on site-specific water quality data (receiving water hardness). For these priority pollutants, refer to 40 CFR 131.38(b)(2).

(3) Non-Storm Water Discharges from MS4s to Inland Surface Waters

Table C-4. Non-Storm Water Action Levels for Discharges from MS4s to Inland Surface Waters

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Dissolved Oxygen	mg/L	Not less than 5.0 in WARM waters and not less than 6.0 in COLD waters			BP
Turbidity	NTU	-	20	See MDAL	BP
pH	Units	Within limit of 6.5 to 8.5 at all times			BP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	33	-	61[3]	BP
Total Nitrogen	mg/L	-	1.0	See MDAL	BP
Total Phosphorus	mg/L	-	0.1	See MDAL	BP
MBAS	mg/L	-	0.5	See MDAL	BP
Iron	mg/L	-	0.3	See MDAL	BP
Manganese	mg/L	-	0.05	See MDAL	BP
Priority Pollutants	µg/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
BP – Basin Plan water quality objective
COLD – cold freshwater habitat beneficial use
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
MDAL – maximum daily action level
WARM – warm freshwater habitat beneficial use
MBAS – Methylene Blue Active Substances
MPN/100 ml – most probable number per 100 milliliters
µg/L – micrograms per liter

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for freshwater "designated beach areas" and is not applicable to water bodies that are not designated with the water contact recreation (REC-1) beneficial use.

b. If not identified in Provision C.1.a, NALs must be identified, developed and incorporated in the Water Quality Improvement Plan for any pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in receiving waters associated with the highest priority water quality conditions related to non-storm water discharges from the MS4s. NALs must be based on:

(1) Applicable water quality standards which may be dependent upon site-specific or receiving water-specific conditions or assumptions to be identified by the Copermittees; or

(2) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the NALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary NALs specific to the Watershed Management Area at levels greater than the NALs required by Provisions C.1.a and C.1.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for effectively prohibiting non-storm water discharges to the MS4s, as well as the detection and

elimination of non-storm water and illicit discharges to and from the MS4. The secondary NALs may be developed using an approach acceptable to the San Diego Water Board.

d. Dry weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.b may be utilized to develop or revise NALs based on watershed-specific data, subject to San Diego Water Board Executive Officer approval.

2. Storm Water Action Levels[13]

The Copermittees must develop and incorporate numeric storm water action levels (SALs) in the Water Quality Improvement Plans to: 1) support the development and prioritization of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s, and 2) assess the effectiveness of the water quality improvement strategies toward reducing pollutants in storm water discharges, required pursuant to Provision D.4.b.(2).[14]

a. The following SALs for discharges of storm water from the MS4 must be incorporated:

Table C-5. Storm Water Action Levels for Discharges from MS4s to Receiving Waters

Parameter	Units	Action Level
Turbidity	NTU	126
Nitrate & Nitrite (Total)	mg/L	2.6
Phosphorus (Total P)	mg/L	1.46
Cadmium (Total Cd)*	µg/L	3.0
Copper (Total Cu)*	µg/L	127
Lead (Total Pb)*	µg/L	250
Zinc (Total Zn)*	µg/L	976

Abbreviations/Acronyms:
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
µg/L – micrograms per liter

Notes:
* The sampling must include a measure of receiving water hardness at each MS4 outfall. If a total metal concentration exceeds the corresponding metals SAL in Table C-5, that concentration must be compared to the California Toxics Rule criteria and the USEPA 1-hour maximum concentration for the detected level of receiving water hardness associated with that sample. If it is determined that the sample's total metal concentration for that specific metal exceeds that SAL, but does not exceed the applicable USEPA 1-hour maximum concentration criterion for the measured level of hardness, then the sample result will not be considered above the SAL for that measurement.

[13] SALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, unless the SAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed.

[14] The Copermittees may utilize SALs or other benchmarks currently established by the Copermittees as interim SALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

b. If not identified in Provision C.2.a, SALs must be identified, developed and incorporated in the Water Quality Improvement Plan for pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in receiving waters associated with the highest priority water quality conditions related to storm water discharges from the MS4s. SALs must be based on:

(1) Federal and State water quality guidance and/or water quality standards; and

(2) Site-specific or receiving water-specific conditions; or

(3) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the SALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary SALs specific to the Watershed Management Area at levels greater than the SALs required by Provisions C.2.a and C.2.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s. The secondary SALs may be developed based on the approaches recommended by the State Water Board's Storm Water Panel[15] or using an approach acceptable to the San Diego Water Board.

d. Wet weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.c may be used to develop or revise SALs based upon watershed-specific data, subject to San Diego Water Board Executive Officer approval.

[15] Storm Water Panel Recommendations to the California State Water Resources Control Board: The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities (June 2006)

D. MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS

The purpose of this provision is for the Copermittees to monitor and assess the impact on the conditions of receiving waters caused by discharges from the Copermittees' MS4s under wet weather and dry weather conditions. The goal of the monitoring and assessment program is to inform the Copermittees about the nexus between the health of receiving waters and the water quality condition of the discharges from their MS4s. This goal will be accomplished through monitoring and assessing the conditions of the receiving waters, discharges from the MS4s, pollutant sources and/or stressors, and effectiveness of the water quality improvement strategies implemented as part of the Water Quality Improvement Plans.

1. Receiving Water Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the condition of the receiving waters in each Watershed Management Area during dry weather and wet weather. Following San Diego Water Board acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct long-term receiving water monitoring during implementation of the Water Quality Improvement Plan to assess the long term trends and determine if conditions in receiving waters are improving. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following receiving water monitoring procedures:

a. TRANSITIONAL RECEIVING WATER MONITORING

Until the monitoring requirements and schedules of Provisions D.1.b-e are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following receiving water monitoring in the Watershed Management Area:

(1) Continue the receiving water monitoring programs required in Order Nos. R9-2007-0001 (Monitoring and Reporting Program No. R9-2007-0001 Sections II.A.1-A.5), R9-2009-0002, and R9-2010-0016, unless the Executive Officer provides conditional approval for Copermittees to proceed with implementation of the proposed monitoring and assessment program developed in accordance with Provision B.4;

(2) Continue the monitoring in the Hydromodification Management Plans approved by the San Diego Water Board;

(3) Participate in the following regional receiving water monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring,

(b) Southern California Bight Regional Monitoring, and

(c) Sediment Quality Monitoring;

(4) Implement the monitoring programs developed as part of any implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) for the TMDLs in Attachment E to this Order; and

(5) For Watershed Management Areas with ASBS, implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

b. LONG-TERM RECEIVING WATER MONITORING STATIONS

The Copermittees must select at least one long-term receiving water monitoring station from among the existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees to be representative of the receiving water quality in the Watershed Management Area. Additional long-term receiving water monitoring stations must be selected where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

c. DRY WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three dry weather monitoring events at each of the long-term receiving water monitoring stations. At least one monitoring event must be conducted during the dry season (May 1 – September 30) and at least one monitoring event must be conducted during a dry weather period during the wet season (October 1 – April 30), after the first wet weather event of the season, with an antecedent dry period of at least 72 hours following a storm event producing measureable rainfall of greater than 0.1 inch.

(1) Dry Weather Receiving Water Field Observations

For each dry weather monitoring event, the Copermittees must record field observations consistent with Table D-1 at each long-term receiving water monitoring station.

Table D-1. Field Observations for Receiving Water Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) • Station description (i.e. deposits or stains, vegetation condition, structural condition, and observable biology) • Presence and assessment of trash in and around station

(2) Dry Weather Receiving Water Field Monitoring

For each dry weather monitoring event, if conditions allow the collection of the data, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

Table D-2. Field Monitoring Parameters for Receiving Water Monitoring Stations

Parameters
• pH • Temperature • Specific conductivity • Dissolved oxygen • Turbidity

(3) Dry Weather Receiving Water Analytical Monitoring

For each dry weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable NAL constituents, and

(v) Constituents listed in Table D-3.

Table D-3. Analytical Monitoring Constituents for Receiving Water Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Pesticides	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Mercury • Nickel • Selenium • Thallium • Zinc	• Organophosphate Pesticides • Pyrethroid Pesticides	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(4) Dry Weather Receiving Water Toxicity Monitoring

For each dry weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for aquatic toxicity in accordance with Table D-4. When the State Water Board's Policy for Toxicity Assessment and Control (Toxicity Policy) is approved and in effect, the San Diego Water Board Executive Officer may direct the Copermittees to replace current toxicity program elements with standardized procedures in the Toxicity Policy.

Table D-4. Dry Weather Chronic[1] Toxicity Testing for Receiving Water Monitoring Stations

Organism	Units	Test	USEPA Protocol
Freshwater			
Pimephales promelas (Fathead Minnow)	Pass / Fail	Larval Survival and Growth	EPA-821-R-02-013
Ceriodaphnia dubia (*Daphnid*)	Pass / Fail	Survival and Production	EPA-821-R-02-013
Selenastrum capricornutum (Green Algae)	Pass / Fail	Growth	EPA-821-R-02-013
Marine and Estuarine			
Strongylocentrotus purpuratus *(Purple Sea Urchin)*	Pass / Fail	Embryo-Larval Development	EPA-600-R-95-136

Notes:
1. Chronic toxicity testing is not required at receiving water monitoring stations located at mass loading stations if the channel flows are diverted year-round during dry weather conditions to the sanitary sewer for treatment.

(a) Freshwater Test Species and Methods: If samples are collected in receiving waters with salinity less than 1 ppt, the Copermittees must follow the methods for chronic toxicity tests as established in 40 CFR 136.3 using a single-concentration test design for routine monitoring, or a five-concentration test design for additional toxicity testing if the limitation is exceeded. The Copermittees must estimate the critical life stage chronic toxicity on undiluted samples in accordance with species and short term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms (EPA-821-R-02-013; Table IA, 40 CFR 136). Additional test species may be used by the Copermittees if approved by the San Diego Water Board Executive Officer. The Copermittees must conduct:

(i) A static renewal toxicity test with the fathead minnow, *Pimephales promelas* (Larval Survival and Growth Test Method 1000.0);

(ii) A static renewal toxicity test with the daphnid, *Ceriodaphnia dubia* (Survival and Reproduction Test Method 1002.0); and

(iii) A static renewal toxicity test with the green alga, *Selenastrum capricornutum* (also named *Raphidocelis subcapitata*) (Growth Test Method 1003.0).

(b) Marine and Estuarine Test Species and Methods: If samples are collected in receiving waters with salinity greater or equal to 1 ppt, the Copermittees must follow the methods for chronic toxicity tests as established in 40 CFR 136.3 using a single-concentration test design for routine monitoring, or a five-concentration test design for additional toxicity testing if the limitation is exceeded. The Copermittees must conduct the following critical life state chronic toxicity tests on undiluted samples in accordance with species and short term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms (EPA-600-R-95-136; 1995). Artificial sea salts must be used to increase sample salinity. The Copermittees must conduct a static non-renewal toxicity test with the purple sea urchin, *Strongylocentrotus purpuratus* (Embryo-larval Development Test Method). Additional species may be used by the Copermittees if approved by the San Diego Water Board Executive Officer.

(c) Holding Times: All toxicity tests must be conducted as soon as possible following sample collection. The 36-hour sample holding time for test initiation shall be targeted. However, no more than 72 hours shall elapse before the conclusion of sample collection and test initiation.

(d) Test Species Sensitivity Screening: To determine the most sensitive test species for freshwater, the Copermittees must screen 2 wet weather and 2 dry weather toxicity tests with a vertebrate, an invertebrate, and a plant species. After this screening period, subsequent monitoring must be conducted using the most sensitive test species. Alternatively, if a sensitive test species has already been determined, or if there is prior knowledge of potential toxicant(s) and a test species is sensitive to such toxicant(s), then monitoring must be conducted using only that test species. Sensitive test species determinations must also consider the most sensitive test species used for proximal receiving water monitoring. Rescreening must occur once each permit term.

(e) Chronic toxicity test biological endpoint data must be analyzed using the Test of Significant Toxicity t-test approach specified in *National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document* (USEPA, Office of Wastewater Management, Washington, D.C., EPA-833-R-10-003, 2010). For this monitoring program, the critical chronic instream waste concentration (IWC) is set at 100 percent receiving water (i.e. no dilution) for receiving water samples. A 100 percent receiving water and a control must be tested.

(f) Toxicity Identification Evaluation (TIE) / Toxicity Reduction Evaluation (TRE): If chronic toxicity is detected in receiving waters, the Copermittees must discuss the need for conducting a TIE/TRE in the assessments

required under Provision D.4.a.(2), and develop a plan for implementing the TIE/TRE to be incorporated in the Water Quality Improvement Plan.

(5) Dry Weather Receiving Water Bioassessment Monitoring

Bioassessment monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must conduct bioassessment monitoring during at least one dry weather monitoring event at each long-term receiving water monitoring station as follows:

(a) The following bioassessment samples and measurements must be collected:

(i) Macroinvertebrate samples must be collected in accordance with the "Reachwide Benthos (Multihabitat) Procedure" in the most current Surface Water Ambient Monitoring Program (SWAMP) Bioassessment Standard Operating Procedures (SOP), and amendments, as applicable;[16]

(ii) The "Full" suite of physical habitat characterization measurements must be collected in accordance with the most current SWAMP Bioassessment SOP, and as summarized in the SWAMP Stream Habitat Characterization Form – Full Version;[17] and

(iii) Freshwater algae samples must be collected in accordance with the SWAMP Standard Operating Procedures for Collecting Algae Samples.[18] Analysis of samples must include algal taxonomic composition (diatoms and soft algae) and algal biomass.

(b) The bioassessment samples, measurements, and appropriate water chemistry data must be used to calculate the following:

(i) An Index of Biological Integrity (IBI) for macroinvertebrates for each monitoring station where bioassessment monitoring was conducted, based on the most current calculation method;[19] and

[16] Ode, P.R.. 2007. Standard operating procedures for collecting macroinvertebrate samples and associated physical and chemical data for ambient bioassessments in California. California State Water Resources Control Board Surface Water Ambient Monitoring Program (SWAMP) Bioassessment SOP 001. http://www.swrcb.ca.gov/water_issues/programs/swamp/tools.shtml#monitoring

[17] Available at: http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/reports/fieldforms_fullversion052908.pdf

[18] Fetscher et al. 2009. Standard Operating Procedures for Collecting Stream Algae Samples and Associated Physical Habitat and Chemical Data for Ambient Bioassessments in California.

[19] The most current calculation method at the time the Order was adopted is outlined in "A Quantitative Tool for Assessing the Integrity of Southern California Coastal Streams" (Ode, et al. 2005. Environmental Management. Vol. 35, No. 1, pp. 1-13). If an updated or new calculation method is developed, either both

(ii) An IBI for algae for each monitoring station where bioassessment monitoring was conducted, when a calculation method is developed.[20]

(c) In lieu of the requirements of Provision D.1.c.(5)(a), the Copermittees may conduct the bioassessment monitoring in accordance with the "Triad" assessment approach[21] to calculate the IBIs required for Provision D.1.c.(5)(b). The Copermittees must conduct sampling, analysis, and reporting of specified in-stream biological and habitat data according to the protocols specified in the SCCWRP Technical Report No. 539, or subsequent protocols, if developed.

(6) Dry Weather Receiving Water Hydromodification Monitoring

In addition to the hydromodification monitoring conducted as part of the Copermittees' Hydromodification Management Plans, hydromodification monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must collect the following hydromodification monitoring observations and measurements within an appropriate domain of analysis during at least one dry weather monitoring event for each long-term receiving water monitoring station:

(a) Channel conditions, including:

(i) Channel dimensions,

(ii) Hydrologic and geomorphic conditions, and

(iii) Presence and condition of vegetation and habitat;

(b) Location of discharge points;

(c) Habitat integrity;

(d) Photo documentation of existing erosion and habitat impacts, with location (i.e. latitude and longitude coordinates) where photos were taken;

(e) Measurement or estimate of dimensions of any existing channel bed or bank eroded areas, including length, width, and depth of any incisions; and

(i.e. current and updated/new) methods must be used, or historical IBIs must be recalculated with the updated or new calculation method.

[20] When a calculation method is developed, IBIs must be calculated for all available and appropriate historical data.

[21] Stormwater Monitoring Coalition Model Monitoring Technical Committee, 2004. Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California. Technical Report #419. August 2004.

(f) Known or suspected cause(s) of existing downstream erosion or habitat impact, including flow, soil, slope, and vegetation conditions, as well as upstream land uses and contributing new and existing development.

d. WET WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three wet weather monitoring events at each long-term receiving water monitoring station. At least one wet weather monitoring event must be conducted during the first wet weather event of the wet season (October 1 – April 30), and at least one wet weather monitoring event during a wet weather event that occurs after February 1.

(1) Wet Weather Receiving Water Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each long-term receiving water monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event;

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(d) Presence and assessment of trash in and around station.

(2) Wet Weather Receiving Water Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

(3) Wet Weather Receiving Water Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) Constituents listed in Table D-3.

(4) Wet Weather Receiving Water Toxicity Monitoring

For each wet weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for chronic aquatic toxicity in accordance with Provisions D.1.c.(4)(a)-(f).

e. OTHER RECEIVING WATER MONITORING REQUIREMENTS

(1) Regional Monitoring

The Copermittees must participate in the following regional receiving waters monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring; and

(b) Southern California Bight Regional Monitoring and

(c) Unified Beach Water Quality Monitoring and Assessment Program. The Orange County Copermittees shall participate in and, together with South Orange County Wastewater Authority and Orange County Health Care Agency, shall share responsibility for implementation of a unified regional beach water quality monitoring and assessment program in south Orange County, as set forth in the October 2014 report, *Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County* , issued pursuant to CWC section 13383 and subject to future revision in the San Diego Water Board December 5, 2014 Letter Directive.

(2) Sediment Quality Monitoring

The Copermittees must perform sediment monitoring to assess compliance with sediment quality receiving water limits applicable to MS4 discharges to enclosed bays and estuaries. The monitoring may be performed either by individual or multiple Copermittees to assess compliance with receiving water limits, or through participation in a water body monitoring coalition. A Sediment Monitoring Plan which satisfies the requirements of the State Water Board's Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part 1 Sediment Quality (Sediment Control Plan) must be submitted as part of the monitoring and assessment program in the Water Quality Improvement Plan.

(a) The Sediment Monitoring Plan design must include the following:

(i) The elements required under Section VII.D (Receiving Water Limits Monitoring Frequency) and Section VII.E (Sediment Monitoring) of the Sediment Control Plan;

(ii) A Quality Assurance Project Plan (QAPP) describing the project objectives and organization, functional activities, and quality assurance/quality control protocols for the water and sediment monitoring; and

(iii) A schedule for completion of all sample collection and analysis activities and submission of Sediment Monitoring Reports.

(b) The Copermittees must implement the Sediment Monitoring Plan in accordance with the schedule contained in the Sediment Monitoring Plan, unless otherwise directed in writing by the San Diego Water Board Executive Officer.

(c) The Copermittees must incorporate a Sediment Monitoring Report as part of the Water Quality Improvement Plan Annual Report in accordance with the schedule contained in the Sediment Monitoring Plan, unless otherwise directed in writing by the San Diego Water Board Executive Officer. The Sediment Monitoring Report must contain the following information:

(i) Analysis: An evaluation, interpretation and tabulation of the water and sediment monitoring data, including interpretations and conclusions as to whether applicable Receiving Water Limitations in this Order have been attained at each sample station;

(ii) Sample Location Map: The locations, type, and number of samples must be identified and shown on a site map; and

(iii) California Environmental Data Exchange Network: A statement certifying that the monitoring data and results have been uploaded into the California Environmental Data Exchange Network (CEDEN).

(d) Based on the Sediment Monitoring Report conclusions the San Diego Water Board may require a human health risk assessment to determine if the human health objective contained in Receiving Water Limitations in Provision A.2.a.(3)(b)(ii) has been attained at each sample station. In conducting a risk assessment, the Copermittees must consider any applicable and relevant information, including California Environmental Protection Agency's (Cal/EPA) Office of Environmental Health Hazard Assessment (OEHHA) policies for fish consumption and risk assessment, Cal/EPA's Department of Toxic Substances Control (DTSC) Risk Assessment, and USEPA Human Health Risk Assessment policies.

(3) ASBS Monitoring

For Watershed Management Areas with ASBS, the Copermittees must implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

f. ALTERNATIVE WATERSHED MONITORING REQUIREMENTS

The San Diego Water Board may direct the Copermittees to participate in an effort to develop alternative watershed monitoring with other regulated entities, other interested parties, and the San Diego Water Board to refine, coordinate, and implement regional monitoring and assessment programs to determine the status and trends of water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams.

2. MS4 Outfall Discharge Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the discharges from the MS4 outfalls in each Watershed Management Area during dry weather and wet weather. Following San Diego Water Board acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct MS4 outfall discharge monitoring during implementation of the Water Quality Improvement Plan to assess the effectiveness of their jurisdictional runoff management programs toward effectively prohibiting non-storm water discharges into the MS4 and reducing pollutants in storm water discharges from their MS4s to the MEP. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following MS4 outfall monitoring procedures:

a. TRANSITIONAL MS4 OUTFALL DISCHARGE MONITORING

Until the monitoring requirements and schedules of Provisions D.2.b-c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following MS4 outfall discharge monitoring in the Watershed Management Area:

(1) MS4 Outfall Discharge Monitoring Station Inventory

Each Copermittee must identify all major MS4 outfalls that discharge directly to receiving waters within its jurisdiction and geo-locate those outfalls on a map of the MS4 pursuant to Provision E.2.b.(1). This information must be compiled into a MS4 outfall discharge monitoring station inventory, and must include the following information:

(a) Latitude and longitude of MS4 outfall point of discharge;

(b) Watershed Management Area;

(c) Hydrologic subarea;

(d) Outlet size;

(e) Accessibility (i.e. safety and without disturbance of critical habitat);

(f) Approximate drainage area; and

(g) Classification of whether the MS4 outfall is known to have persistent dry weather flows, transient dry weather flows, no dry weather flows, or unknown dry weather flows.

(2) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Until the monitoring requirements and schedules of Provision D.2.b are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, each Copermittee must perform dry weather MS4 outfall field screening monitoring to identify non-storm water and illicit discharges within its jurisdiction in accordance with Provision E.2.c, to determine which discharges are transient flows and which are persistent flows, and prioritize the dry weather MS4 discharges that will be investigated and eliminated in accordance with Provision E.2.d.

(a) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Frequency

Each Copermittee must field screen the MS4 outfalls in its inventory developed pursuant to Provision D.2.a.(1) as follows:

(i) For Copermittees with less than 125 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 80 percent of the outfalls must be visually inspected two times per year during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv).

(ii) For Copermittees with 125 major MS4 outfalls or more, but less than or equal to 500 that discharge to receiving waters within a Watershed Management Area, all the outfalls must be visually inspected at least annually during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv).

(iii) For Copermittees with more than 500 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 500 outfalls must be visually inspected at least annually during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv). Copermittees with more than 500 major MS4 outfalls within a Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;

[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(iv) For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major MS4 outfalls within its jurisdiction, at least 500 major MS4 outfalls within its inventory must be visually inspected at least annually during dry weather conditions. Copermittees with more than 500 major MS4 outfalls in more than one Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(v) Inspections of major MS4 outfalls conducted in response to public reports and staff or contractor reports and notifications may count toward the required visual inspections of MS4 outfall discharge monitoring stations.

(b) Transitional Dry Weather MS4 Outfall Discharge Field Screening Visual Observations

(i) An antecedent dry period of at least 72 hours following any storm event producing measurable rainfall greater than 0.1 inch is required prior to conducting field screening visual observations during a field screening monitoring event.

(ii) During the field screening monitoring event, each Copermittee must record visual observations consistent with Table D-5 at each MS4 outfall discharge monitoring station inspected.

Table D-5. Field Screening Visual Observations for MS4 Outfall Discharge Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) - Flow source(s) suspected or identified from non-storm water source investigation - Flow source(s) eliminated during non-storm water source identification • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) - Known or suspected source(s) of pooled or ponded water • Station description (i.e. deposits or stains, vegetation condition, structural condition, observable biology) • Presence and assessment of trash in and around station • Evidence or signs of illicit connections or illegal dumping

(iii) Each Copermittee must implement the requirements of Provisions E.2.d.(2)(c)-(e) based on the field observations required pursuant to Provision D.2.a.(2)(b)(ii).

(iv) Each Copermittee must evaluate field observations together with existing information available from prior reports, inspections and monitoring results to determine whether any observed flowing, pooled, or ponded waters are likely to be transient or persistent flow.[22]

(c) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Records

Based upon the results of the transitional dry weather MS4 outfall discharge field screening monitoring conducted pursuant to Provisions D.2.a.(2)(a)-(b), each Copermittee must update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow.

(3) Transitional Wet Weather MS4 Outfall Discharge Monitoring

Until the monitoring requirements and schedules of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the

[22] Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(a) Transitional Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees must select wet weather MS4 outfall discharge monitoring stations from the inventories developed pursuant to Provision D.2.a.(1) for each Watershed Management Area as follows:

(i) At least five wet weather MS4 outfall discharge monitoring stations that are representative of storm water discharges from areas consisting primarily of residential, commercial, industrial, and typical mixed-use land uses present within the Watershed Management Area;

(ii) At least one wet weather MS4 outfall discharge monitoring station for each Copermittee within the Watershed Management Area; and

(iii) The County of San Diego may select at least two (2) wet weather MS4 outfall discharge monitoring stations for the portion of the Santa Margarita River Watershed Management Area within its jurisdiction to be monitored during the transitional period until the Riverside County Copermittees are notified of coverage under this Order. After the Riverside County Copermittees are notified of coverage under this Order, the Copermittees in the Watershed Management Area must select wet weather MS4 outfall discharge monitoring stations consistent with the requirements above.

(b) Transitional Wet Weather MS4 Outfall Discharge Monitoring Frequency

Each wet weather MS4 outfall discharge monitoring station selected pursuant to Provision D.2.a.(3)(a) must be monitored once during the wet season (October 1 – April 30). The wet weather monitoring events must be selected to be representative of the range of hydrological conditions experienced in the region. At least 10 percent of samples must be conducted during the first wet weather event of the wet season, to include at least one such sample in each Watershed Management Area..

(c) Transitional Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(i) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(ii) The flow rates and volumes measured or estimated from the MS4 outfall (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(d) Transitional Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(e) Transitional Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, and indicator bacteria;

(iv) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

[a] Time-weighted composites collected over the length of the storm event or the first 24 hour period whichever is shorter, composed of discrete samples, which may be collected through the use of automated equipment, or

[b] Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

[c] If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during

the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours;

(v) Only one analysis of the composite of aliquots is required;

(vi) The samples must be analyzed for the following constituents:

[a] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

[b] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and

[c] Constituents listed in Table D-6.

Table D-6. Analytical Monitoring Constituents for Wet Weather MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Nickel • Selenium • Thallium • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(f) Other Transitional Wet Weather MS4 Outfall Discharge Monitoring

The San Diego County Copermittees must continue the wet weather MS4 outfall monitoring program developed under Order No. R9-2007-0001, as approved by the San Diego Water Board, through its planned completion.

b. Dry Weather MS4 Outfall Discharge Monitoring

Each Copermittee must perform dry weather MS4 outfall monitoring to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision

E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. Each Copermittee must conduct the following dry weather MS4 outfall discharge monitoring within its jurisdiction:

(1) Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Each Copermittee must continue to perform the dry weather MS4 outfall discharge field screening monitoring in accordance with the requirements of Provision D.2.a.(2). The Copermittee may adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of persistent flow non-storm water discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of visual inspections performed is equivalent to the number of visual inspections required under Provision D.2.a.(2)(a).

(2) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring

Each Copermittee must perform non-storm water persistent flow MS4 outfall discharge monitoring to determine which persistent non-storm water discharges contain concentrations of pollutants below NALs, and which persistent non-storm water discharges impact receiving water quality during dry weather. Each Copermittee must conduct the following non-storm water persistent flow MS4 outfall discharge monitoring within its jurisdiction:

(a) Prioritization of Non-Storm Water Persistent Flow MS4 Outfalls

Based upon the dry weather MS4 outfall discharge field screening monitoring records developed pursuant to Provision D.2.a.(2)(c), each Copermittee must identify and prioritize the MS4 outfalls with persistent flows based on the highest priority water quality conditions identified in the Water Quality Improvement Plan and any additional criteria developed by the Copermittee, which may include historical data and data from sources other than what the Copermittee collects.

(b) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring Frequency

(i) Based on the prioritization of major MS4 outfalls developed under Provision D.2.b.(2)(a), each Copermittee must identify, at a minimum, the 5 highest priority major MS4 outfalls with non-storm water persistent flows that the Copermittee will monitor within its jurisdiction in each Watershed Management Area. For Responsible Copermittees identified by a TMDL in Attachment E to this Order, if the 5 chosen outfall locations are not sufficient to determine compliance with the TMDL(s), then each Responsible Copermittee

must identify additional MS4 outfall monitoring locations within its jurisdiction sufficient to address compliance with the TMDL(s). If a Copermittee has less than 5 major outfalls within a Watershed Management Area, then the Copermittee must monitor all of its major MS4 outfalls with persistent flows within each Watershed Management Area. The location of the highest priority non-storm water persistent flow MS4 outfall monitoring stations must be identified on the map required pursuant to Provision E.2.b.(1). The map must specify which MS4 outfalls are being monitored for compliance with a TMDL.

(ii) Each of the highest priority non-storm water persistent flow MS4 outfall monitoring stations identified pursuant to Provision D.2.b.(2)(b)(i) must be monitored under dry weather conditions at least semi-annually until one of the following occurs:

[a] The non-storm water discharges have been effectively eliminated (i.e. no flowing, pooled, or ponded water) for three consecutive dry weather monitoring events; or

[b] The source(s) of the persistent flows has been identified as a category of non-storm water discharges that does not require an NPDES permit and does not have to be addressed as an illicit discharge because it was not identified as a source of pollutants (i.e. constituents in non-storm water discharge do not exceed NALs), and the persistent flow can be re-prioritized to a lower priority; or

[c] The constituents in the persistent flow non-storm water discharge do not exceed NALs, and the persistent flow can be re-prioritized to a lower priority; or

[d] The source(s) of the persistent flows has been identified as a non-storm water discharge authorized by a separate NPDES permit.

(iii) Where the criteria under Provision D.2.b.(2)(b)(ii) are not met, but the threat to water quality has been reduced by the Copermittee, the highest priority persistent flow MS4 outfall monitoring stations may be reprioritized accordingly for continued dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1).

(iv) Each Copermittee must document removal or re-prioritization of the highest priority persistent flow MS4 outfall monitoring stations identified under Provision D.2.b.(2)(a) in the Water Quality Improvement Plan Annual Report. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized major MS4 outfall in the Watershed Management Area within its jurisdiction, unless there are no remaining qualifying major MS4 outfalls within the Copermittee's jurisdiction in the Watershed Management Area.

(c) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Observations

During each semi-annual monitoring event, each Copermittee must record field observations consistent with Table D-5 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(d) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Monitoring

During each semi-annual monitoring event, if conditions allow the collection of the data, each Copermittee must monitor and record the parameters in Table D-2 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(e) Non-Storm Water Persistent Flow MS4 Outfall Discharge Analytical Monitoring

During each semi-annual monitoring event in which measurable flow is present, each Copermittee must collect and analyze samples from each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Collect grab or composite samples to be analyzed at a qualified laboratory for the following constituents:

[a] Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,
[b] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,
[c] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,
[d] Applicable NAL constituents, and
[e] Constituents listed in Table D-7. The Copermittees may adjust the list of constituents for the Watershed Management Area if historical data or supporting information can be provided that demonstrates or justifies the analysis of a constituent is not necessary.

Table D-7. Analytical Monitoring Constituents for Persistent Flow MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Total Hardness • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Cadmium • Copper • Lead • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(iv) If the Copermittee identifies and eliminates the source of the persistent flow non-storm water discharge, analysis of the sample is not required.

c. WET WEATHER MS4 OUTFALL DISCHARGE MONITORING

The Copermittees must perform wet weather MS4 outfall monitoring to identify pollutants in storm water discharges from the MS4s, to guide pollutant source identification efforts, and to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order. The Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(1) Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees may adjust the wet weather MS4 outfall discharge monitoring locations in the Watershed Management Area, as needed, to identify pollutants in storm water discharges from MS4s, to guide pollutant source identification efforts, and to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of stations is at least equivalent to the number of stations required under Provision D.2.a.(3)(a). Additional outfall monitoring locations, above the minimum per jurisdiction, may be required to demonstrate compliance with the WQBELs associated with the applicable TMDLs in Attachment E.

(2) Wet Weather MS4 Outfall Discharge Monitoring Frequency

The Copermittees must monitor the wet weather MS4 outfall discharge monitoring stations in the Watershed Management Area at least once (1) per year. The Copermittees may need to increase the frequency of monitoring in order to identify pollutants in storm water discharges from the MS4s causing or contributing to the highest priority water quality conditions, to guide pollutant source identification efforts, or to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order.

(3) Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(4) Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(5) Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites collected over the length of the storm event or the first 24 hour period, whichever is shorter , composed of discrete samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

(iii) If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours.

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) The Copermittees may adjust the analytical monitoring required for the Watershed Management Area, if the Copermittees have historical data or supporting information that can demonstrate or provide justification that the analysis of a constituent is not necessary.

3. Special Studies

a. Within the term of this Order, the Copermittees must initiate the following special studies:

(1) At least two special studies in each Watershed Management Area to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that cause or contribute to highest priority water quality conditions identified in the Water Quality Improvement Plan.

(2) At least one special study for the San Diego Region to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that are impacting receiving waters on a regional basis in the San Diego Region.

(3) One of the two special studies in each Watershed Management Area required pursuant to Provision D.3.a.(1) may be replaced by a special study implemented pursuant to Provision D.3.a.(2).

b. The special studies must, at a minimum, be in conformance with the following criteria:

(1) The special studies must be related to the highest priority water quality conditions identified by the Copermittees in the Watershed Management Area and/or for the entire San Diego Region;

(2) The special studies developed pursuant to Provision D.3.a.(1) must:

(a) Be implemented within the applicable Watershed Management Area, and

(b) Require some form of participation by all the Copermittees within the Watershed Management Area;

(3) The special studies developed pursuant to Provision D.3.a.(2) must:

(a) Be implemented within the San Diego Region, and

(b) Require some form of participation by all Copermittees covered under the requirements of this Order.

(4) The Copermittees are encouraged to partner with environmental groups or third parties knowledgeable of watershed conditions to complete the required special studies.

c. Special studies developed to identify sources of pollutants and/or stressors should be pollutant and/or stressor specific and based on historical monitoring data and monitoring performed pursuant to Provisions D.1 and D.2. Development of source identification special studies should include the following:

(1) A compilation of known information on the specific pollutant and/or stressor, including data on potential sources and movement of the pollutant and/or stressor within the watershed. Data generated by the Copermittees and others, as well as information available from a literature research on the pollutant and/or stressor should be compiled and analyzed as appropriate.

(2) An identification of data gaps, based on the compiled information generated on the specific pollutant and/or stressor identified in Provision D.3.c.(1). Source identification special studies should be developed to fill identified data gaps.

(3) A monitoring plan that will collect and provide data the Copermittees can utilize to do the following:

(a) Quantify the relative loading or impact of a pollutant and/or stressor from a particular source or pollutant generating activity;

(b) Improve understanding of the fate of a pollutant and/or stressor in the environment;

(c) Develop an inventory of known and suspected sources of a pollutant and/or stressor in the Watershed Management Area; and/or

(d) Prioritize known and suspected sources of a pollutant and/or stressor based on relative magnitude in discharges, geographical distribution (i.e., regional or localized), frequency of occurrence in discharges, human health risk, and controllability.

d. Special studies initiated prior to the effective date of this Order that meet the requirements of Provision D.3.b and are implemented during the term of this Order as part of the Water Quality Improvement Plan may be utilized to fulfill the special study requirements of Provision D.3.a. Special studies completed before the effective date of this Order cannot be utilized to fulfill the special study requirements of Provision D.3.a.

e. The Copermittees must submit the monitoring plans for the special studies in the Water Quality Improvement Plans required pursuant to Provision F.1.

f. The Copermittees are encouraged to share the results of the special studies regionally among the Copermittees to provide information useful in improving and adapting the management of non-storm water and storm water runoff through the implementation of the Water Quality Improvement Plans.

4. Assessment Requirements

Each Copermittee must evaluate the data collected pursuant to Provisions D.1, D.2 and D.3, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E, to assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a. Assessments must be performed as described in the following provisions:

a. Receiving Waters Assessments

(1) The Copermittees must assess and report the conditions of the receiving waters in the Watershed Management Area as follows:

(a) Based on data collected pursuant to Provision D.1.a, the assessments under Provision D.4.a.(2) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(b) Based on the data collected pursuant to Provisions D.1.a-e, the assessments required under Provision D.4.a.(2) must be included in the Report of Waste Discharge required pursuant to Provision F.5.b.

(2) The Copermittees must assess the status and trends of receiving water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under dry weather and wet weather conditions. For each of the three types of receiving waters in each Watershed Management Area the Copermittees must:

(a) Determine whether or not the conditions of the receiving waters are meeting the numeric goals established pursuant to Provision B.3.a;

(b) Identify the most critical beneficial uses that must be protected to ensure overall health of the receiving water;

(c) Determine whether or not those critical beneficial uses are being protected;

(d) Identify short-term and/or long-term improvements or degradation of those critical beneficial uses;

(e) Determine whether or not the strategies established in the Water Quality Improvement Plan contribute towards progress in achieving the interim and final numeric goals of the Water Quality Improvement Plan; and

(f) Identify data gaps in the monitoring data necessary to assess Provisions D.4.a.(2)(a)-(e).

b. MS4 OUTFALL DISCHARGES ASSESSMENTS

(1) Non-Storm Water Discharges Reduction Assessments

(a) Each Copermittee must assess and report the progress of its illicit discharge detection and elimination program, required to be implemented pursuant to Provision E.2, toward effectively prohibiting non-storm water and illicit discharges into the MS4 within its jurisdiction as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(2), the assessments under Provision D.4.b.(1)(b) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(ii) Based on the data collected pursuant to Provisions D.2.b, the assessments required under Provision D.4.b.(1)(c) must be included in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

(iii) Based on the data collected pursuant to Provisions D.2.b, the assessment required under Provision D.4.b.(1)(c) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.a.(2), each Copermittee must assess and report the following:

(i) Identify the known and suspected controllable sources (e.g. facilities, areas, land uses, pollutant generating activities) of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area;

(ii) Identify sources of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area that have been reduced or eliminated; and

(iii) Identify modifications to the field screening monitoring locations and frequencies for the MS4 outfalls in its inventory necessary to identify and eliminate sources of persistent flow non-storm water discharges pursuant to Provision D.2.b.

(c) Based on the dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1), each Copermittee must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(1)(b);

(ii) Based on the data collected and applicable NALs in the Water Quality Improvement Plan, rank the MS4 outfalls in the Copermittee's jurisdiction according to potential threat to receiving water quality, and produce a prioritized list of major MS4 outfalls for follow-up action to update the Water Quality Improvement Plan, with the goal of eliminating persistent flow non-storm water discharges and/or pollutant loads in order of the ranked priority list through targeted programmatic actions and source investigations;

(iii) For the highest priority major MS4 outfalls with persistent flows that are in exceedance of NALs, identify the known and suspected sources within the Copermittee's jurisdiction in the Watershed Management Area that may cause or contribute to the NAL exceedances;

(iv) Each Copermittee must analyze the data collected pursuant to Provision D.2.b, and utilize a model or other method, to calculate or estimate the non-storm water volumes and pollutant loads collectively discharged from all the major MS4s outfalls in its jurisdiction identified as having persistent dry weather flows during the monitoring year. These calculations or estimates must be updated annually.

[a] Each Copermittee must calculate or estimate the annual non-storm water volumes and pollutant loads collectively discharged from the Copermittee's major MS4 outfalls to receiving waters within the Copermittee's jurisdiction, with an estimate of the percent contribution from each known source for each MS4 outfall;

[b] Each Copermittee must annually identify and quantify (i.e. volume and pollutant loads) sources of non-storm water not subject to the Copermittee's legal authority that are discharged from the Copermittee's major MS4 outfalls to downstream receiving waters.

(v) Each Copermittee must review the data collected pursuant to Provision D.2.b and findings from the assessments required pursuant to Provision D.4.b.(1)(c)(i)-(iv) at least once during the term of this Order to:

[a] Identify reductions and progress in achieving reductions in non-storm water and illicit discharges to the Copermittee's MS4 in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction, with an estimate, if possible, of the non-storm water volume and/or pollutant load reductions attributable to specific water quality strategies implemented by the Copermittee; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittee in the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction.

(vi) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(1)(c)(i)-(v).

(2) Storm Water Pollutant Discharges Reduction Assessments

(a) The Copermittees must assess and report the progress of the water quality improvement strategies, required to be implemented pursuant to Provisions B and E, toward reducing pollutants in storm water discharges from the MS4s within the Watershed Management Area as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(3), the assessments under Provision D.4.b.(2)(b) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(ii) Based on the data collected pursuant to Provisions D.2.c, the assessments required under Provision D.4.b.(2)(c) must be included in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

(iii) Based on the data collected pursuant to Provisions D.2.c, the assessment required under Provisions D.4.b.(2)(c)-(d) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.a.(3) the Copermittees must assess and report the following:

(i) The Copermittees must analyze the monitoring data collected pursuant to Provision D.2.a.(3), and utilize a watershed model or other method, to calculate or estimate the following for each monitoring year:

[a] The average storm water runoff coefficient for each land use type within the Watershed Management Area;
[b] The volume of storm water and pollutant loads discharged from each of the Copermittee's monitored MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch;
[c] The total flow volume and pollutant loadings discharged from the Copermittee's jurisdiction within the Watershed Management Area over the course of the wet season, extrapolated from the data produced from the monitored MS4 outfalls; and
[d] The percent contribution of storm water volumes and pollutant loads discharged from each land use type within each hydrologic subarea with a major MS4 outfall to receiving waters or within each major MS4 outfall to receiving waters in the Copermittee's jurisdiction within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch.

(ii) Identify modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify pollutants in storm water discharges from the MS4s in the Watershed Management Area pursuant to Provision D.2.c.(1).

(c) Based on the wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.c the Copermittees must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(2)(b);

(ii) Based on the data collected and applicable SALs in the Water Quality Improvement Plan, analyze and compare the monitoring data to the analyses and assumptions used to develop the Water Quality Improvement Plans, including strategies developed pursuant to Provision B.3, and evaluate whether those analyses and assumptions should be updated as a component of the adaptive management efforts pursuant to Provision B.5 for follow-up action to update the Water Quality Improvement Plan;

(iii) The Copermittees must review the data collected pursuant to Provision D.2.c and findings from the assessments required pursuant to Provisions D.4.b.(2)(c)(i)-(ii) at least once during the term of this Order to:

[a] Identify reductions or progress in achieving reductions in pollutant concentrations and/or pollutant loads from different land uses and/or drainage areas discharging from the Copermittees' MS4s in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters within the Watershed Management Area to the MEP, with an estimate, if possible, of the pollutant load reductions attributable to specific water quality strategies implemented by the Copermittees; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittees in the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters in the Watershed Management Area to the MEP.

(iv) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(iii).

(d) The Copermittees must evaluate all the data collected pursuant to Provision D.2.c, and incorporate new outfall monitoring data into time series plots for each long-term monitoring constituent for the Watershed Management Area, and perform statistical trends analysis on the cumulative long-term wet weather MS4 outfall discharge water quality data set.

c. Special Studies Assessments

The Copermittees must annually evaluate the results and findings from the special studies developed and implemented pursuant to Provision D.3, and assess their relevance to the Copermittees' efforts to characterize receiving water conditions, understand sources of pollutants and/or stressors, and control and reduce the discharges of pollutants from the MS4 outfalls to receiving waters in the Watershed Management Area. The Copermittees must report the results of the special studies assessments applicable to the Watershed Management Area, and identify any necessary modifications or updates to the Water Quality Improvement Plan based on the results in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

d. Integrated Assessment of Water Quality Improvement Plan

As part of the iterative approach and adaptive management process required for the Water Quality Improvement Plan pursuant to Provision B.5, the Copermittees in each Watershed Management Area must integrate the data collected pursuant to Provisions D.1-D.3, the findings from the assessments required pursuant to

Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to assess the effectiveness of, and identify necessary modifications to, the Water Quality Improvement Plan as follows:

(1) The Copermittees must re-evaluate the priority water quality conditions and numeric goals for the Watershed Management Area, as needed, during the term of this Order pursuant to Provision B.5.a. The re-evaluation and recommendations for modifications to the priority water quality conditions, and/or numeric goals and corresponding schedules may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The priority water quality conditions and numeric goals for the Watershed Management Area must be re-evaluated as follows:

(a) Re-evaluate the receiving water conditions in the Watershed Management Area in accordance with Provision B.2.a;

(b) Re-evaluate the impacts on receiving waters in the Watershed Management Area from MS4 discharges in accordance with Provision B.2.b;

(c) Re-evaluate the identification of MS4 sources of pollutants and/or stressors in accordance with Provision B.2.d;

(d) Identify beneficial uses of the receiving waters that are protected in accordance with Provision D.4.a;

(e) Evaluate the progress toward achieving the interim and final numeric goals for protecting impacted beneficial uses in the receiving waters.

(2) The Copermittees must re-evaluate the water quality improvement strategies for the Watershed Management Area during the term of this Order pursuant to Provision B.5.b. The re-evaluation and recommendations for modifications to the water quality improvement strategies and schedules may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The water quality improvement strategies for the Watershed Management Area must be re-evaluated as follows:

(a) Identify the non-storm water and storm water pollutant loads from the Copermittees' MS4 outfalls in the Watershed Management Area, calculated or estimated pursuant to Provisions D.4.b;

(b) Identify the non-storm water and storm water pollutant load reductions, or other improvements to receiving water or water quality conditions, that are necessary to attain the interim and final numeric goals identified in the Water Quality Improvement Plan for protecting beneficial uses in the receiving waters;

(c) Identify the non-storm water and storm water pollutant load reductions, or other improvements to the quality of MS4 discharges, that are necessary for the Copermittees to demonstrate that non-storm water and storm water discharges from their MS4s are not causing or contributing to exceedances of receiving water limitations;

(d) Evaluate the progress of the water quality improvement strategies toward achieving the interim and final numeric goals identified in the Water Quality Improvement Plan for protecting beneficial uses in the receiving waters.

(3) The Copermittees must re-evaluate and adapt the water quality monitoring and assessment program for the Watershed Management Area when new information becomes available to improve the monitoring and assessment program pursuant to Provision B.5.c. The re-evaluation and recommendations for modifications to the monitoring and assessment program may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. Modifications to the water quality monitoring and assessment program must be consistent with the requirements of Provision D.1-D.3. The re-evaluation of the water quality monitoring and assessment program for the Watershed Management Area must consider the data gaps identified by the assessments required pursuant to Provisions D.4.a-b, and results of the special studies implemented pursuant to Provision D.4.c.

5. Monitoring Provisions

Each Copermittee must comply with all the monitoring, reporting, and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

E. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS

The purpose of this provision is for each Copermittee to implement a program to control the contribution of pollutants to and the discharges from the MS4 within its jurisdiction. The goal of the jurisdictional runoff management programs is to implement strategies that effectively prohibit non-storm water discharges to the MS4 and reduce the discharge of pollutants in storm water to the MEP. This goal will be accomplished through implementing the jurisdictional runoff management programs in accordance with the strategies identified in the Water Quality Improvement Plans.

Each Copermittee must update its jurisdictional runoff management program document, in accordance with Provision F.2.a, to incorporate all the requirements of Provision E. Until the Copermittee has updated its jurisdictional runoff management program document with the requirements of Provision E, the Copermittee must continue implementing its current jurisdictional runoff management program.

1. Legal Authority Establishment and Enforcement

a. Each Copermittee must establish, maintain, and enforce adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 through statute, ordinance, permit, contract, order, or similar means. This legal authority must, at a minimum, authorize the Copermittee to:

(1) Prohibit and eliminate all illicit discharges and illicit connections to its MS4;

(2) Control the contribution of pollutants in discharges of runoff associated with industrial and construction activity to its MS4 and control the quality of runoff from industrial and construction sites, including industrial and construction sites which have coverage under the statewide General Permit for Discharges of Storm Water Associated with Industrial Activities (Industrial General Permit) or General Permit for Discharges of Storm Water Associated with Construction Activities (Construction General Permit), as well as to those sites which do not;

(3) Control the discharge of spills, dumping, or disposal of materials other than storm water into its MS4;

(4) Control through interagency agreements among Copermittees the contribution of pollutants from one portion of the MS4 to another portion of the MS4;

(5) Control, by coordinating and cooperating with other owners of the MS4 such as Caltrans, the U.S. federal government, or sovereign Native American Tribes through interagency agreements, where possible, the contribution of pollutants from their portion of the MS4 to the portion of the MS4 within the Copermittee's jurisdiction;

(6) Require compliance with conditions in its statutes, ordinances, permits, contracts, orders, or similar means to hold dischargers to its MS4 accountable for their contributions of pollutants and flows;

(7) Require the use of BMPs to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(8) Require documentation on the effectiveness of BMPs implemented to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(9) Utilize enforcement mechanisms to require compliance with its statutes, ordinances, permits, contracts, orders, or similar means; and

(10) Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with its statutes, ordinances, permits, contracts, orders, or similar means and with the requirements of this Order, including the prohibition of illicit discharges and connections to its MS4; the Copermittee must also have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from industrial facilities, including construction sites, discharging into its MS4.

b. With the first Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3), each Copermittee must submit a statement certified by its Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative that the Copermittee has taken the necessary steps to obtain and maintain full legal authority within its jurisdiction to implement and enforce each of the requirements contained in this Order.

2. Illicit Discharge Detection and Elimination

Each Copermittee must implement a program to actively detect and eliminate illicit discharges and improper disposal into the MS4, or otherwise require the discharger to apply for and obtain a separate NPDES permit. The illicit discharge detection and elimination program must be implemented in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include, at a minimum, the following requirements:

a. Non-Storm Water Discharges

Each Copermittee must address all non-storm water discharges as illicit discharges unless a non-storm water discharge is either identified as a discharge authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to the following requirements:

(1) Discharges of non-storm water to the MS4 from the following categories must be addressed as illicit discharges unless the discharge has coverage or meets the exception criteria under NPDES Permit No. CAG919003~~1 (Order No. R9-2007-0034, or subsequent order) for discharges to San Diego Bay, or NPDES Permit No. CAG919002~~ (Order No. R9-2015-0013 ~~2008-0002~~, ~~or subsequent order~~ as it may be amended or reissued) for discharges to surface waters within the San Diego Region ~~other than San Diego Bay~~:

(1) Uncontaminated pumped ground water;

(2) Discharges from foundation drains;[23]

(3) Water from crawl space pumps; and

(4) Water from footing drains.[20]

(2) Discharges of non-storm water from water line flushing and water main breaks to the MS4 must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG679001 (Order No. R9-2010-0003, ~~or subsequent order~~ as it may be amended or reissued) or NPDES General Permit No. CAG140001 (Order 2014-0194-DWQ, as it may be amended or reissued). This category includes water line flushing and water main break discharges from water purveyors issued a water supply permit by the California Department of Public Health or federal military installations. Discharges from recycled or reclaimed water lines to the MS4 must be addressed as illicit discharges, unless the discharges have coverage under a separate NPDES permit.

(3) Discharges of non-storm water to the MS4 from the following categories must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a source of pollutants to receiving waters:

(a) Diverted stream flows;

(b) Rising ground waters;

(c) Uncontaminated ground water infiltration to MS4s;

(d) Springs;

(e) Flows from riparian habitats and wetlands;

[23] Provision E.2.a.(1) only applies to this category of non-storm water if the system is designed to be located at or below the groundwater table to actively or passively extract groundwater during any part of the year.

(f) Discharges from potable water sources;

(g) Discharges from foundation drains;[24] and

(h) Discharges from footing drains.[21]

(4) Discharges of non-storm water to the MS4 from the following categories must be controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means. Discharges of non-storm water to the MS4 from the following categories not controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means must be addressed by the Copermittee as illicit discharges.

(a) Air conditioning condensation

The discharge of air conditioning condensation should be directed to landscaped areas or other pervious surfaces, or to the sanitary sewer, where feasible.

(b) Individual residential vehicle washing

(i) The discharge of wash water should be directed to landscaped areas or other pervious surfaces where feasible; and

(ii) The minimization of water, washing detergent and other vehicle wash products used for residential vehicle washing, and the implementation of other practices or behaviors that will prevent the discharge of pollutants associated with individual residential vehicle washing from entering the MS4 must be encouraged.

(c) Dechlorinated swimming pool discharges

(i) Residual chlorine, algaecide, filter backwash, or other pollutants from swimming pools must be eliminated prior to discharging to the MS4; and

(ii) The discharge of saline swimming pool water must be directed to the sanitary sewer, landscaped areas, or other pervious surfaces that can accommodate the volume of water, unless the saline swimming pool water can be discharged via a pipe or concrete channel directly to a naturally saline water body (e.g. Pacific Ocean).

(5) Firefighting discharges to the MS4 must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board

[24] Provision E.2.a.(3) only applies to this category of non-storm water discharge if the system is designed to be located above the groundwater table at all times of the year, and the system is only expected to discharge non-storm water under unusual circumstances.

identifies the discharge as a significant source of pollutants to receiving waters. Firefighting discharges to the MS4 not identified as a significant source of pollutants to receiving waters, must be addressed, at a minimum, as follows:

(a) Non-emergency firefighting discharges

(i) Building fire suppression system maintenance discharges (e.g. sprinkler line flushing) to the MS4 must be addressed as illicit discharges unless BMPs are implemented to prevent pollutants associated with such discharges to the MS4.

(ii) Non-emergency firefighting discharges (i.e., discharges from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems) must be addressed by a program, to be developed and implemented by the Copermittee, to reduce or eliminate pollutants in such discharges from entering the MS4.

(b) Emergency firefighting discharges

Each Copermittee should develop and encourage implementation of BMPs to reduce or eliminate pollutants in emergency firefighting discharges to the MS4s and receiving waters within its jurisdiction. During emergency situations, priority of efforts should be directed toward life, property, and the environment (in descending order). BMPs should not interfere with immediate emergency response operations or impact public health and safety.

(6) If the Copermittee or San Diego Water Board identifies any category of non-storm water discharges listed under Provisions E.2.a.(1)-(4) as a source of pollutants to receiving waters, the category must be prohibited through ordinance, order, or similar means and addressed as an illicit discharge. Alternatively, the Copermittee may propose controls to be implemented for the category of non-storm water discharges as part of the Water Quality Improvement Plan instead of prohibiting the category of non-storm water discharges, and implement the controls if accepted by the San Diego Water Board as part of the Water Quality Improvement Plan.

(7) Each Copermittee must, where feasible and priorities and resources allow, reduce or eliminate non-storm water discharges listed under Provisions E.2.a.(1)-(4) into its MS4, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit.

b. PREVENT AND DETECT ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to prevent and detect illicit discharges to the MS4:

(1) Each Copermittee must maintain an updated map of its entire MS4 and the corresponding drainage areas. The accuracy of the MS4 map must be confirmed during the field screening required pursuant to Provision E.2.c. The MS4 map must be included as part of the jurisdictional runoff management program document. Any geographic information system (GIS) layers or files used by the Copermittee to maintain the MS4 map must be made available to the San Diego Water Board upon request. The MS4 map must identify the following:

(a) All segments of the MS4 owned, operated, and maintained by the Copermittee;

(b) All known locations of inlets that discharge and/or collect runoff into the Copermittee's MS4;

(c) All known locations of connections with other MS4s not owned or operated by the Copermittee (e.g. Caltrans MS4s);

(d) All known locations of MS4 outfalls and private outfalls that discharge runoff collected from areas within the Copermittee's jurisdiction;

(e) All segments of receiving waters within the Copermittee's jurisdiction that receive and convey runoff discharged from the Copermittee's MS4 outfalls;

(f) Locations of the MS4 outfalls, identified pursuant to Provision D.2.a.(1), within its jurisdiction; and

(g) Locations of the non-storm water persistent flow MS4 outfall discharge monitoring stations, identified pursuant to Provision D.2.b.(2), within its jurisdiction.

(2) Each Copermittee must use Copermittee personnel and contractors to assist in identifying and reporting illicit discharges and connections during their daily employment activities.

(3) Each Copermittee must promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges to or from the MS4, including the following methods for public reporting:

(a) Operate a public hotline, which can be Copermittee-specific or shared by the Copermittees, and must be capable of receiving reports in both English and Spanish 24 hours per day and seven days per week; and

(b) Designate an e-mail address for receiving electronic reports from the public, which can be Copermittee-specific or shared by the Copermittees, and must be prominently displayed on the Copermittee's webpage and the Regional Clearinghouse required pursuant to Provision F.4.

(4) Each Copermittee must implement practices and procedures (including a notification mechanism) to prevent, respond to, contain, and clean up any spills that may discharge into the MS4 within its jurisdiction from any source. The Copermittee must coordinate, to the extent possible, with spill response teams to prevent entry of spills into the MS4, and prevent contamination of surface water, ground water, and soil. The Copermittee must coordinate spill prevention, containment, and response activities throughout all appropriate Copermittee departments, programs, and agencies.

(5) Each Copermittee must implement practices and procedures to prevent and limit infiltration of seepage from sanitary sewers (including private laterals and failing septic systems) to the MS4.

(6) Each Copermittee must coordinate, when necessary, with upstream Copermittees and/or entities to prevent illicit discharges from upstream sources into the MS4 within its jurisdiction.

c. Field Screening

Each Copermittee must conduct field screening (i.e. visual observations, field testing, and/or analytical testing) of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4 in accordance with the dry weather MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

d. Investigate and Eliminate Illicit Discharges And Connections

Each Copermittee must include the following measures within its program to investigate and eliminate illicit discharges to the MS4:

(1) Each Copermittee must prioritize and determine when follow-up investigations will be performed in response to visual observations and/or water quality monitoring data collected during an investigation of a detected non-storm water or illicit discharge to or from the MS4. The criteria for prioritizing investigations must consider the following:

(a) Pollutants identified as causing or contributing to the highest water quality priorities identified in the Water Quality Improvement Plan;

(b) Pollutants identified as causing or contributing, or threatening to cause or contribute to impairments in water bodies on the 303(d) List and/or in environmentally sensitive areas (ESAs), located within its jurisdiction;

(c) Pollutants identified from sources or land uses known to exist within the area, drainage basin, or watershed that discharges to the portion of the MS4 within its jurisdiction included in the investigation;

(d) Pollutants identified as causing or contributing to an exceedance of a NAL in the Water Quality Improvement Plan; and

(e) Pollutants identified as a threat to human health or the environment.

(2) Each Copermittee must implement procedures to investigate and inspect portions of its MS4 that, based on reports or notifications, field screening, or other appropriate information, indicate a reasonable potential of receiving, containing, or discharging pollutants due to illicit discharges, illicit connections, or other sources of non-storm water. The procedures must include the following:

(a) Each Copermittee must develop criteria to:

(i) Assess the validity of each report or notification received; and

(ii) Prioritize the response to each report or notification received.

(b) Each Copermittee must prioritize and respond to each valid report or notification (e.g., public reports, staff or contractor reports and notifications, etc.) of an incident in a timely manner.

(c) In accordance with the requirements of Provision E.2.d.(1), each Copermittee must investigate and seek to identify the source(s) of discharges of non-storm water where flows are observed in and from the MS4 during the field screening required pursuant to Provision D.2.b.(1) as follows:

(i) Obvious illicit discharges must be immediately investigated to identify the source(s) of non-storm water discharges;

(ii) The investigation must include field investigations to identify sources or potential sources for the discharge, unless the source or potential source has already been identified during previous investigations; and

(iii) The investigation may include follow-up field investigations and/or reviewing Copermittee inventories and other land use data to identify potential sources of the discharge.

(d) Each Copermittee must maintain records and a database of the following information:

(i) Location of incident, including hydrologic subarea, portion of MS4 receiving the non-storm water or illicit discharge, and point of discharge or potential discharge from MS4 to receiving water;

(ii) Source of information initiating the investigation (e.g., public reports, staff or contractor reports and notifications, field screening, etc.);

(iii) Date the information used to initiate the investigation was received;

(iv) Date the investigation was initiated;

(v) Dates of follow-up investigations;

(vi) Identified or suspected source of the illicit discharge or connection, if determined;

(vii) Known or suspected related incidents, if any;

(viii) Result of the investigation; and

(ix) If a source cannot be identified and the investigation is not continued, document the response pursuant to the requirements of Provision E.2.d.(4).

(e) Each Copermittee must maintain records and, in accordance with the priorities of the Water Quality Improvement Plan, seek to identify the source(s) of non-storm water discharges from the MS4 where there is evidence of non-storm water having been discharged into or from the MS4 (e.g., pooled water), in accordance with MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

(3) Each Copermittee must initiate the implementation of procedures, in a timely manner, to eliminate all detected and identified illicit discharges and connections within its jurisdiction. The procedures must include the following responses:

(a) Each Copermittee must enforce its legal authority, as required under Provision E.1, to eliminate illicit discharges and connections to the MS4.

(b) If the Copermittee identifies the source as a controllable source of non-storm water or illicit discharge or connection, the Copermittee must implement its Enforcement Response Plan pursuant to Provision E.6 and enforce its legal authority to prohibit and eliminate illicit discharges and connections to its MS4.

(c) If the Copermittee identifies the source of the discharge as a category of non-storm water discharges in Provision E.2.a, and the discharge is in exceedance of NALs in the Water Quality Improvement Plan, then the Copermittee must determine if: (1) this is an isolated incident or set of

circumstances that will be addressed through its Enforcement Response Plan pursuant to Provision E.6, or (2) the category of discharge must be addressed through the prohibition of that category of discharge as an illicit discharge pursuant to Provision E.2.a.(6).

(d) If the Copermittee suspects the source of the non-storm water discharge as natural in origin (i.e. non-anthropogenically influenced) and in conveyance into the MS4, then the Copermittee must document and provide the data and evidence necessary to demonstrate to the San Diego Water Board that it is natural in origin and does not require further investigation.

(e) If the Copermittee is unable to identify and document the source of a recurring non-storm water discharge to or from the MS4, then the Copermittee must address the discharge as an illicit discharge and update its jurisdictional runoff management program to address the common and suspected sources of the non-storm water discharge within its jurisdiction in accordance with the Copermittee's priorities.

(4) Each Copermittee must submit a summary of the non-storm water discharges and illicit discharges and connections investigated and eliminated within its jurisdiction with each Water Quality Improvement Plan Annual Report required under Provision F.3.b.(3) of this Order.

3. Development Planning

Each Copermittee must use their land use and planning authorities to implement a development planning program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. BMP Requirements for All Development Projects

Each Copermittee must prescribe the following BMP requirements during the planning process (i.e. prior to project approval and issuance of local permits) for all development projects (regardless of project type or size), where local permits are issued, including unpaved roads and flood management projects:

(1) General Requirements

(a) Onsite BMPs must be located so as to remove pollutants from runoff prior to its discharge to any receiving waters, and as close to the source as possible;

(b) Structural BMPs must not be constructed within waters of the U.S.

(c) Onsite BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors (e.g. mosquitos, rodents, or flies).

(2) Source Control BMP Requirements

The following source control BMPs must be implemented at all development projects where applicable and feasible:

(a) Prevention of illicit discharges into the MS4;

(b) Storm drain system stenciling or signage;

(c) Protect outdoor material storage areas from rainfall, run-on, runoff, and wind dispersal;

(d) Protect materials stored in outdoor work areas from rainfall, run-on, runoff, and wind dispersal;

(e) Protect trash storage areas from rainfall, run-on, runoff, and wind dispersal; and

(f) Any additional BMPs determined to be necessary by the Copermittee to minimize pollutant generation at each project.

(3) Low Impact Development (LID) BMP Requirements

The following LID BMPs must be implemented at all development projects where applicable and feasible:

(a) Maintenance or restoration of natural storage reservoirs and drainage corridors (including topographic depressions, areas of permeable soils, natural swales, and ephemeral and intermittent streams);[25]

(b) Buffer zones for natural water bodies (where buffer zones are technically infeasible, require project applicant to include other buffers such as trees, access restrictions, etc.);

(c) Conservation of natural areas within the project footprint including existing trees, other vegetation, and soils;

(d) Construction of streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided public safety is not compromised;

[25] Development projects proposing to dredge or fill materials in waters of the U.S. must obtain a CWA Section 401 Water Quality Certification. Projects proposing to dredge or fill waters of the state must obtain waste discharge requirements.

(e) Minimization of the impervious footprint of the project;

(f) Minimization of soil compaction to landscaped areas;

(g) Disconnection of impervious surfaces through distributed pervious areas;

(h) Landscaped or other pervious areas designed and constructed to effectively receive and infiltrate, retain and/or treat runoff from impervious areas, prior to discharging to the MS4;

(i) Small collection strategies located at, or as close as possible to, the source (i.e. the point where storm water initially meets the ground) to minimize the transport of runoff and pollutants to the MS4 and receiving waters;

(j) Use of permeable materials for projects with low traffic areas and appropriate soil conditions;

(k) Landscaping with native or drought tolerant species; and

(l) Harvesting and using precipitation.

b. PRIORITY DEVELOPMENT PROJECTS

Priority Development Projects are land development projects that fall under the planning and building authority of the Copermittee for which the Copermittee must impose specific requirements, in addition to those described in Provision E.3.a, including the implementation of structural BMPs to meet the performance requirements described in Provision E.3.c.

(1) Definition of Priority Development Project

Priority Development Projects include the following:

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(b) Redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site on an existing site of 10,000 square feet or more of impervious surfaces). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(c) New and redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site), and support one or more of the following uses:

(i) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812).

(ii) Hillside development projects. This category includes development on any natural slope that is twenty-five percent or greater.

(iii) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce.

(iv) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

(d) New or redevelopment projects that create and/or replace 2,500 square feet or more of impervious surface (collectively over the entire project site), and discharging directly to an Environmentally Sensitive Area (ESA). "Discharging directly to" includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands).

(e) New development projects, or redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface, that support one or more of the following uses:

(i) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

(ii) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

(f) New or redevelopment projects that result in the disturbance of one or more acres of land and are expected to generate pollutants post construction.

(2) Special Considerations for Redevelopment Projects

The structural BMP performance requirements of Provision E.3.c are applicable to redevelopment Priority Development Projects, as defined in E.3.b.(1), as follows:

(a) Where redevelopment results in the creation or replacement of impervious surface in an amount of less than fifty percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provision E.3.c apply only to the creation or replacement of impervious surface, and not the entire development; or

(b) Where redevelopment results in the creation or replacement of impervious surface in an amount of more than fifty percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provision E.3.c apply to the entire development.

(3) Priority Development Project Exemptions

Each Copermittee has the discretion to exempt the following projects from being defined as Priority Development Projects:

(a) New or retrofit paved sidewalks, bicycle lanes, or trails that meet the following criteria:

(i) Designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas; OR

(ii) Designed and constructed to be hydraulically disconnected from paved streets or roads; OR

(iii) Designed and constructed with permeable pavements or surfaces in accordance with USEPA Green Streets guidance.[26]

(b) Retrofitting or redevelopment of existing paved alleys, streets or roads that are designed and constructed in accordance with the USEPA Green Streets guidance.[27]

c. Priority Development Project Structural BMP Performance Requirements

In addition to the BMP requirements listed for all development projects under Provision E.3.a, Priority Development Projects must also implement structural BMPs that conform to performance requirements described below.

[26] See "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).
[27] Ibid.

(1) Storm Water Pollutant Control BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite structural BMPs to control pollutants in storm water that may be discharged from a project as follows:

(a) Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite the pollutants contained in the volume of storm water runoff produced from a 24-hour 85th percentile storm event (design capture volume);[28]

(i) If a Copermittee determines that implementing BMPs to retain the full design capture volume onsite for a Priority Development Project is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize biofiltration BMPs. Biofiltration BMPs must be designed to have an appropriate hydraulic loading rate to maximize storm water retention and pollutant removal, as well as to prevent erosion, scour, and channeling within the BMP,[29] and must be sized to:

[a] Treat 1.5 times the design capture volume not reliably retained onsite, OR

[b] Treat the design capture volume not reliably retained onsite with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite.

(ii) If a Copermittee determines that biofiltration is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize flow-thru treatment control BMPs to treat runoff leaving the site, AND mitigate for the design capture volume not reliably retained onsite pursuant to Provision E.3.c.(1)(b). Flow thru treatment control BMPs must be sized and designed to:

[28] This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals.

[29] As part of the Copermittee's update to its BMP Design Manual, pursuant to Provision E.3.d, the Copermittee must provide guidance for hydraulic loading rates and other biofiltration design criteria necessary to maximize storm water retention and pollutant removal.

[a] Remove pollutants from storm water to the MEP;
[b] Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;
[c] Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Flow-thru treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of flow-thru treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

(b) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1)(a). The Priority Development Project must mitigate for the portion of the pollutant load in the design capture volume not retained onsite if Provision E.3.c.(3) is utilized. If a Priority Development Project is allowed to utilize alternative compliance, flow-thru treatment control BMPs must be implemented to treat the portion of the design capture volume that is not reliably retained onsite. Flow-thru treatment control BMPs must be sized and designed in accordance with Provisions E.3.c.(1)(a)(ii)[a]-[c].

(2) Hydromodification Management BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite BMPs to manage hydromodification that may be caused by storm water runoff discharged from a project as follows:

(a) Post-project runoff conditions (flow rates and durations) must not exceed pre-development runoff conditions by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat downstream of Priority Development Projects).

(i) In evaluating the range of flows that results in increased potential for erosion of natural (non-hardened) channels, the lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks.

(ii) The Copermittees may use monitoring results collected pursuant to Provision D.1.a.(2) to re-define the range of flows resulting in

increased potential for erosion, or degraded instream habitat conditions, as warranted by the data.

(b) Each Priority Development Project must avoid critical sediment yield areas known to the Copermittee or identified by the optional Watershed Management Area Analysis pursuant to Provision B.3.b.(4), or implement measures that allow critical coarse sediment to be discharged to receiving waters, such that there is no net impact to the receiving water.

(c) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the performance requirements of Provision E.3.c.(2)(a). The Priority Development Project must mitigate for the post-project runoff conditions not fully managed onsite if Provision E.3.c.(3) is utilized.

(d) Exemptions

Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provisions E.3.c.(2) where the project discharges storm water runoff to:

(i) Existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;

(ii) Conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; or

(iii) An area identified by the Copermittees as appropriate for an exemption by the optional Watershed Management Area Analysis incorporated into the Water Quality Improvement Plan pursuant to Provision B.3.b.(4).

(e) Interim Timeframe Exemptions

Until the Copermittees have updated their BMP Design Manual in accordance with Provision F.2.b with the requirements of Provision E, the Copermittees have the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provision E.3.c.(2) where the project discharges storm water runoff directly to:

(i) An engineered channel conveyance system with a capacity to convey peak flows generated by the 10-year storm event all the way from the

point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; and

(ii) Large river reaches with a drainage area larger than 100 square miles and a 100-year flow capacity in excess of 20,000 cubic feet per second, provided that properly sized energy dissipation is included at all Priority Development Project discharge points.

(3) Alternative Compliance Program to Onsite Structural BMP Implementation

At the discretion of each Copermittee, Priority Development Projects may be allowed to participate in an alternative compliance program in lieu of implementing the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a), provided that the Water Quality Improvement Plan includes the optional Watershed Management Area Analysis described in Provision B.3.b.(4), and Water Quality Equivalency calculations have been accepted by the San Diego Water Board's Executive Officer pursuant to Provision E.3.c.(3)(a). The alternative compliance program is available to a Priority Development Project only if the Priority Development Project applicant enters into a voluntary agreement with the Copermittee authorizing this arrangement. In addition to the voluntary agreement, relief from implementing structural BMPs onsite may be authorized by the Copermittee under the following conditions:

(a) Water Quality Equivalency

Copermittees must submit Water Quality Equivalency calculations for acceptance by the San Diego Water Board's Executive Officer prior to administering an alternative compliance program in order to establish a regional and technical basis for determining the water quality benefits associated with alternative compliance projects. Accepted Water Quality Equivalency calculations must be incorporated as part of any Copermittee's alternative compliance program necessary for evaluating Watershed Management Area Analysis candidate projects, project applicant-proposed alternative compliance projects, alternative compliance in lieu fee structures, and alternative compliance water quality credit systems as described in Provisions E.3.c.(3)(b)-(e).

(b) Watershed Management Area Analysis Candidate Projects

The Priority Development Project applicant agrees to fund, contribute funds to, or implement a candidate project identified by the Copermittees in the Watershed Management Area Analysis included in the Water Quality Improvement Plan, pursuant to Provisions B.3.b.(4) subject to the following conditions:

(i) The Copermittee must determine that implementation of the candidate project will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a) onsite;

(ii) If the Priority Development Project applicant chooses to fully or partially fund a candidate project, then the in-lieu fee structure described in Provision E.3.c.(3)(c) must be followed;

(iii) If the Priority Development Project applicant chooses to fully or partially fund a candidate project, then the Copermittee must ensure that the funds to be obtained from the Priority Development Project applicant are sufficient to mitigate for impacts caused by not fully implementing structural BMPs onsite, pursuant to the performance requirements described in Provisions E.3.c.(1) and E.3.c.(2)(a);

(iv) If the Priority Development Project applicant chooses to implement a candidate project, then the Copermittee must ensure that pollutant control and/or hydromodification management within the candidate project are sufficient to mitigate for impacts caused by not implementing structural BMPs fully onsite, pursuant to the performance requirements described in Provisions E.3.c.(1) and E.3.c.(2)(a);

(v) The voluntary agreement to fund, partially fund, or implement a candidate project must include reliable sources of funding for operation and maintenance of the candidate project;

(vi) Design of the candidate project must be conducted under an appropriately qualified engineer, geologist, architect, landscape architect, or other professional, licenses where applicable, and competent and proficient in the fields pertinent to the candidate project design;

(vii) The candidate project must be constructed as soon as possible, but no later than 4 years after the certificate of occupancy is granted for the first Priority Development Project that contributed funds toward the construction of the candidate project, unless a longer period of time is authorized by the San Diego Water Board Executive Officer; and

(viii) If the candidate project is constructed after the Priority Development Project is constructed, the Copermittee must require temporal mitigation for pollutant loads and altered flows that are discharged from the Priority Development Project.

(c) Project Applicant Proposed Alternative Compliance Projects

The Copermittee may allow a Priority Development Project applicant to propose and fund, contribute funds to, or implement an alternative compliance project not identified by the Watershed Management Area Analysis included in the Water Quality Improvement Plan pursuant to Provisions B.3.b.(4). This option is allowed provided the Copermittee determines that implementation of the alternative compliance project will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a) onsite, and is subject to the requirements described in Provisions E.3.c.(3)(a)(ii)-(viii).

(d) Alternative Compliance In-Lieu Fee Structure

If a Copermittee chooses to allow a Priority Development Project applicant to fund, or partially fund a candidate project or an alternative compliance project, then the Copermittee must develop and implement an in-lieu fee structure. This may be developed individually or with other Copermittees and/or entities, as a means for designing, developing, constructing, operating and maintaining offsite alternative compliance projects. The in-lieu fee must be transferred to the Copermittee (for public projects) or an escrow account (for private projects) prior to the construction of the Priority Development Project.

(e) Alternative Compliance Water Quality Credit System Option

The Copermittee may develop and implement an alternative compliance water quality credit system option, individually or with other Copermittees and/or entities, provided that such a credit system clearly exhibits that it will not allow discharges from Priority Development Projects to cause or contribute to a net impact over and above the impact caused by projects meeting the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a). Any credit system that a Copermittee chooses to implement must be submitted to the San Diego Water Board Executive Officer for review and acceptance as part of the Water Quality Improvement Plan.

(4) Long-Term Structural BMP Maintenance

Each Copermittee must require the project applicant to submit proof of the mechanism under which ongoing long-term maintenance of all structural BMPs will be conducted.

(5) Infiltration and Groundwater Protection

(a) Structural BMPs designed to primarily function as large, centralized infiltration devices (such as large infiltration trenches and infiltration basins) must not cause or contribute to an exceedance of an applicable groundwater quality objective. At a minimum, such infiltration BMPs must be in conformance with the design criteria listed below, unless the development project applicant demonstrates to the Copermittee that one or more of the specific design criteria listed below are not necessary to protect groundwater quality. The design criteria listed below do not apply to small infiltration systems dispersed throughout a development project.

(i) Runoff must undergo pretreatment such as sedimentation or filtration prior to infiltration;

(ii) Pollution prevention and source control BMPs must be implemented at a level appropriate to protect groundwater quality at sites where infiltration BMPs are to be used;

(iii) Infiltration BMPs must be adequately maintained to remove pollutants in storm water to the MEP;

(iv) The vertical distance from the base of any infiltration BMP to the seasonal high groundwater mark must be at least 10 feet. Where groundwater basins do not support beneficial uses, this vertical distance criteria may be reduced, provided groundwater quality is maintained;

(v) The soil through which infiltration is to occur must have physical and chemical characteristics (e.g., appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses;

(vi) Infiltration BMPs must not be used for areas of industrial or light industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee, unless source control BMPs to prevent exposure of high threat activities are implemented, or runoff from such activities is first treated or filtered to remove pollutants prior to infiltration; and

(vii) Infiltration BMPs must be located a minimum of 100 feet horizontally from any water supply wells.

(b) The Copermittee may develop, individually or with other Copermittees, alternative mandatory design criteria to that listed above for infiltration BMPs which are designed to primarily function as centralized infiltration devices. Before implementing the alternative design criteria in the development planning process the Copermitee(s) must:

(i) Notify the San Diego Water Board of the intent to implement the alternative design criteria submitted; and

(ii) Comply with any conditions set by the San Diego Water Board.

d. BMP DESIGN MANUAL UPDATE

Each Copermittee must update its BMP Design Manual[30] pursuant to Provision F.2.b. Until the Copermittee has updated its BMP Design Manual pursuant to Provision F.2.b.(1) ~~with the requirements of Provisions E.3.a-c~~, the Copermittee must continue implementing its current BMP Design Manual. ~~Unless directed otherwise by the San Diego Water Board, t~~The Copermittee must implement the updated BMP Design Manual within 180 days following completion of ~~completing~~ the update pursuant to Provision F.2.b.(1), unless directed otherwise by the San Diego Water Board Executive Officer. The date the BMP Design Manual is implemented is the "effective date" of the BMP Design Manual. The update of the BMP Design Manual required pursuant to Provision F.2.b.(1) must include the following:

(1) Updated procedures to determine the nature and extent of storm water requirements applicable to a potential development or redevelopment projects. These procedures must inform project applicants of the storm water management requirements applicable to their project including, but not limited to, general requirements for all development projects, structural BMP design procedures and requirements, hydromodification management requirements, requirements specific to phased projects, and procedures specific to private developments and public improvement projects;

(2) Updated procedures to identify pollutants and conditions of concern for selecting the most appropriate structural BMPs that consider, at a minimum, the following:

(a) Receiving water quality (including pollutants for which receiving waters are listed as impaired under the CWA section 303(d) List);

(b) Pollutants, stressors, and/or receiving water conditions that cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(c) Land use type of the project and pollutants associated with that land use type; and

(d) Pollutants expected to be present onsite.

(3) Updated procedures for designing structural BMPs, including any updated

[30] The BMP Design Manual was formerly known as the Standard Storm Water Mitigation Plan under Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016.

performance requirements to be consistent with the requirements of Provision E.3.c for all structural BMPs listed in the BMP Design Manual;

(4) Long-term maintenance criteria for each structural BMP listed in the BMP Design Manual; and

(5) Alternative compliance criteria, in accordance with the requirements under Provision E.3.c.(3), if the Copermittee elects to allow Priority Development Projects within its jurisdiction to utilize alternative compliance.

e. PRIORITY DEVELOPMENT PROJECT BMP IMPLEMENTATION AND OVERSIGHT

Each Copermittee must implement a program that requires and confirms structural BMPs on all Priority Development Projects are designed, constructed, and maintained to remove pollutants in storm water to the MEP.

(1) Structural BMP Approval and Verification Process

(a) Each Copermittee must require and confirm that ~~for~~ all Priority Development Projects ~~applications that have not received prior lawful approval by the Copermittee by the effective date of the BMP Design Manual pursuant to Provision E.3.d,~~ implement the requirements of Provision E.3, ~~must be implemented. For project applications that have received prior lawful approval before the effective date of the BMP Design Manual pursuant to Provision E.3.d, the Copermittee may allow previous land development requirements to apply.~~ except that the Copermittee may allow previous land development requirements to apply to a Priority Development Project if the conditions of Provision E.3.e.(1)(a)(i) or Provision E.3.e.(1)(a)(ii) are met:

(i) The Copermittee has, prior to the effective date of the BMP Design Manual required to be developed pursuant to Provision E.3.d:

[a] Approved[31] a design that incorporates the storm water drainage system for the Priority Development Project in its entirety, including all applicable structural pollutant treatment control and hydromodification management BMPs consistent with the previous applicable MS4 permit requirements;[32] AND

[b] Issued a private project permit or approval, or functional equivalent for public projects, that authorizes the Priority Development Project applicant to commence construction activities based on a design that incorporates the storm water

[31] For public projects, a design stamped by the City or County Engineer, or engineer of record for the project is considered an approved design.

[32] Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016 for San Diego County, Orange County, and Riverside County Copermittees, respectively

drainage system approved in conformance with Provision E.3.e.(1)(a)(i)[a]; AND

[c] Confirmed that there have been construction activities on the Priority Development Project site within the 365 days prior to the effective date of the BMP Design Manual, *OR* the Copermittee confirms that construction activities have commenced on the Priority Development Project site within the 180 days after the effective date of the BMP Design Manual, where construction activities are undertaken in reliance on the permit or approval, or functional equivalent for public projects, issued by the Copermittee in conformance with Provision E.3.e.(1)(a)(i)[b]; AND

[d] Issued all subsequent private project permits or approvals, or functional equivalent for public projects, that are needed to implement the design initially approved in conformance with Provision E.3.e.(1)(a)(i)[a] within 5 years of the effective date of the BMP Design Manual. The storm water drainage system for the Priority Development Project in its entirety, including all applicable structural pollutant treatment control and hydromodification management BMPs must remain in substantial conformity with the design initially approved in conformance with Provision E.3.e.(1)(a)(i)[a].

(ii) The Copermittee demonstrates it lacks the land use authority or legal authority to require a Priority Development Project to implement the requirements of Provision E.3.

(b) Each Copermittee must identify the roles and responsibilities of its various municipal departments in implementing the structural BMP requirements, including each stage of a project from application review and approval through BMP maintenance and inspections.

(c) Each Copermittee must require and confirm that appropriate easements and ownerships are properly recorded in public records and the information is conveyed to all appropriate parties when there is a change in project or site ownership.

(d) Each Copermittee must require and confirm that prior to occupancy and/or intended use of any portion of the Priority Development Project, each structural BMP is inspected to verify that it has been constructed and is operating in compliance with all of its specifications, plans, permits, ordinances, and the requirements of this Order.

(2) Priority Development Project Inventory and Prioritization

(a) Each Copermittee must develop, maintain, and update at least annually, a watershed-based database to track and inventory all Priority Development

Projects and associated structural BMPs within its jurisdiction. Inventories must be accurate and complete beginning from December 2002 for the San Diego County Copermittees, February 2003 for the Orange County Copermittees, and July 2005 for the Riverside County Copermittees. The use of an automated database system, such as GIS, is highly recommended. The database must include, at a minimum, the following information:

(i) Priority Development Project location (address and hydrologic subarea);

(ii) Descriptions of structural BMP type(s);

(iii) Date(s) of construction;

(iv) Party responsible for structural BMP maintenance;

(v) Dates and findings of structural BMP maintenance verifications; and

(vi) Corrective actions and/or resolutions, when applicable.

(b) Each Copermittee must prioritize the Priority Development Projects with structural BMPs within its jurisdiction. The designation of Priority Development Projects as high priority must consider the following:

(i) The highest water quality priorities identified in the Water Quality Improvement Plan;

(ii) Receiving water quality;

(iii) Number and sizes of structural BMPs;

(iv) Recommended maintenance frequency of structural BMPs;

(v) Likelihood of operation and maintenance issues of structural BMPs;

(vi) Land use and expected pollutants generated; and

(vii) Compliance record.

(3) Structural BMP Maintenance Verifications and Inspections

Each Copermittee is required to verify that structural BMPs on each Priority Development Project are adequately maintained, and continue to operate effectively to remove pollutants in storm water to the MEP through inspections, self-certifications, surveys, or other equally effective approaches.

(a) All (100 percent) of the structural BMPs at Priority Development Projects that are designated as high priority must be inspected directly by the Copermittee annually prior to each rainy season;

(b) For verifications performed through a means other than direct Copermittee inspection, adequate documentation must be required by the Copermittee

to provide assurance that the required maintenance of structural BMPs at each Priority Development Project has been completed; and

(c) Appropriate follow-up measures (including re-inspections, enforcement, etc.) must be conducted to ensure that structural BMPs at each Priority Development Project continue to reduce pollutants in storm water to the MEP as originally designed.

f. DEVELOPMENT PROJECT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all development projects, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

4. Construction Management

Each Copermittee must implement a construction management program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. PROJECT APPROVAL PROCESS

Prior to issuance of any local permit(s) that allows the commencement of construction projects that involve ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff, each Copermittee must:

(1) Require a pollution control plan, construction BMP plan, and/or an erosion and sediment control plan, to be submitted by the project applicant to the Copermittee;

(2) Confirm the pollution control plan, construction BMP plan, and/or erosion and sediment control plan, complies with the local grading ordinance, other applicable local ordinances, and the requirements of this Order;

(3) Confirm the pollution control, construction BMP, and/or erosion and sediment control plan, includes seasonally appropriate and effective BMPs and management measures described in Provision E.4.c, as applicable to the project; and

(4) Verify that the project applicant has obtained coverage under the statewide Construction General Permit (Order 2009-0009-DWQ or subsequent Order), if applicable.

b. Construction Site Inventory and Tracking

(1) Each Copermittee must maintain and update, at least quarterly, a watershed-based inventory of all construction projects issued a local permit that allows ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff. The use of an automated database system, such as GIS, is highly recommended. The inventory must include:

(a) Relevant contact information for each site (e.g., name, address, phone, and email for the owner and contractor);

(b) The basic site information including location (address and hydrologic subarea), Waste Discharge Identification (WDID) number (if applicable), size of the site, and approximate area of disturbance;

(c) Whether or not the site is considered a high threat to water quality, as defined in Provision E.4.b.(2) below;

(d) The project start and completion dates;

(e) The required inspection frequency, as defined in the Copermittee's jurisdictional runoff management program document;

(f) The date the Copermittee accepted or approved the pollution control plan, construction BMP plan, and/or erosion and sediment control plan; and

(g) Whether or not there are ongoing enforcement actions administered to the site.

(2) Each Copermittee must identify all construction sites within its jurisdiction that represent a high threat to downstream surface water quality. The designation of construction sites as high threat to water quality must consider the following:

(a) Sites located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Sites located within the same hydrologic subarea and tributary to a water body segment listed as impaired for sediment on the CWA section 303(d) List;

(c) Sites located within, directly adjacent to, or discharging directly to a receiving water within an ESA; and

(d) Other sites determined by the Copermittees or the San Diego Water Board as a high threat to water quality.

c. CONSTRUCTION SITE BMP IMPLEMENTATION

Each Copermittee must implement, or require the implementation of effective BMPs to reduce discharges of pollutants in storm water from construction sites to the MEP, and effectively prohibit non-storm water discharges from construction sites into the MS4. These BMPs must be site specific, seasonally appropriate, and construction phase appropriate. BMPs must be implemented at each construction site year round. Dry season BMP implementation must plan for and address unseasonal rain events that may occur during the dry season (May 1 through September 30). Copermittees must implement, or require the implementation of, BMPs in the following categories:

(1) Project Planning;

(2) Good Site Management "Housekeeping", including waste management;

(3) Non-storm Water Management;

(4) Erosion Control;

(5) Sediment Control;

(6) Run-on and Run-off Control; and

(7) Active/Passive Sediment Treatment Systems, where applicable.

d. CONSTRUCTION SITE INSPECTIONS

Each Copermittee must conduct construction site inspections to require and confirm compliance with its local permits and applicable local ordinances, and the requirements of this Order. Priority for site inspections must consider threat to water quality pursuant to Provision E.4.b as well as the nature of the construction activity, topography, and the characteristics of soils and receiving water quality.

(1) Inspection Frequency

(a) Each Copermittee must conduct inspections at all inventoried sites, including high threat to water quality sites, at an appropriate frequency for each phase of construction to confirm the site reduces the discharge of pollutants in storm water from construction sites to the MEP, and effectively prohibits non-storm water discharges from entering the MS4.

(b) Each Copermittee must establish appropriate inspection frequencies for high threat to water quality sites, and all other sites, for each phase of construction. Inspection frequencies appropriate for addressing the

highest water quality priorities identified in the Water Quality Improvement Plan, and for complying with the requirements of this Order must be identified in each Copermittee's jurisdictional runoff management program document.

(c) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e., re-inspection, enforcement) necessary to require and confirm site compliance with its local permits and applicable local ordinances, and the requirements of this Order.

(2) Inspection Content

Inspections of construction sites by the Copermittee must include, at a minimum:

(a) Verification of coverage under the Construction General Permit (Notice of Intent (NOI) and/or WDID number) during initial inspections, when applicable;

(b) Assessment of compliance with its local permits and applicable local ordinances related to pollution prevention, including the implementation and maintenance of applicable BMPs;

(c) Assessment of BMP adequacy and effectiveness;

(d) Visual observations of actual non-storm water discharges;

(e) Visual observations of actual or potential discharge of sediment and/or construction related materials from the site;

(f) Visual observations of actual or potential illicit connections; and

(g) If any violations are found and BMP corrections are needed, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried construction sites. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Site name, location (address and hydrologic subarea), and WDID number (if applicable);

(b) Inspection date;

(c) Approximate amount of rainfall since last inspection;

(d) Description of problems observed with BMPs and indication of need for BMP addition/repair/replacement and any scheduled re-inspection, and date of re-inspection;

(e) Descriptions of any other specific inspection comments which must, at a minimum, include rationales for longer compliance time;

(f) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(g) Resolution of problems noted and date problems fixed.

e. CONSTRUCTION SITE ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried construction sites, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

5. Existing Development Management

Each Copermittee must implement an existing development management program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. EXISTING DEVELOPMENT INVENTORY AND TRACKING

Each Copermittee must maintain, and update at least annually, a watershed-based inventory of the existing development within its jurisdiction that may discharge a pollutant load to and from the MS4. The use of an automated database system, such as GIS, is highly recommended. The inventory must, at a minimum, include:

(1) Name, location (hydrological subarea and address, if applicable) of the following types of existing development with its jurisdiction:

(a) Commercial facilities or areas;

(b) Industrial facilities;

(c) Municipal facilities, including:

(i) MS4 and related structures;[33]

(ii) Roads, streets, and highways;

(iii) Parking facilities;

(iv) Municipal airfields;

(v) Parks and recreation facilities;

(vi) Flood management facilities, flood control devices and structures;

(vii) Operating or closed municipal landfills;

(viii) Publicly owned treatment works (including water and wastewater treatment plants) and sanitary sewer collection systems;

(ix) Corporate yards, including maintenance and storage yards for materials, waste, equipment, and vehicles;

(x) Hazardous waste collection facilities;

(xi) Other treatment, storage or disposal facilities for municipal waste; and

(xii) Other municipal facilities that the Copermittee determines may contribute a significant pollutant load to the MS4.

(d) Residential areas, which may be designated by one or more of the following:

(i) Residential management area;

(ii) Drainage basin or area;

(iii) Land use (e.g., single family, multi-family, rural);

(iv) Neighborhood;

(v) Common Interest Area;

(vi) Home Owner Association;

(vii) Mobile home park; and/or

(viii) Other designations accepted by the San Diego Water Board Executive Officer.

(2) A description of the facility or area, including the following information:

(a) Classification as commercial, industrial, municipal, or residential;

[33] The inventory may refer to the MS4 map required to be maintained pursuant to Provision E.2.b.(1).

(b) Status of facility or area as active or inactive;

(c) Identification if a business is a mobile business;

(d) SIC Code or NAICS Code, if applicable;

(e) Industrial General Permit NOI and/or WDID number, if applicable;

(f) Identification if a residential area is or includes a Common Interest Area / Home Owner Association, or mobile home park;

(g) Identification of pollutants generated and potentially generated by the facility or area;

(h) Whether the facility or area is adjacent to an ESA;

(i) Whether the facility or area is tributary to and within the same hydrologic subarea as a water body segment listed as impaired on the CWA section 303(d) List and generates pollutants for which the water body segment is impaired; and

(3) An annually updated map showing the location of inventoried existing development, watershed boundaries, and water bodies.

b. EXISTING DEVELOPMENT BMP IMPLEMENTATION AND MAINTENANCE

Each Copermittee must designate a minimum set of BMPs required for all inventoried existing development, including special event venues. The designated minimum BMPs must be specific to facility or area types and pollutant generating activities, as appropriate.

(1) Commercial, Industrial, and Municipal Facilities and Areas

(a) Pollution Prevention

Each Copermittee must require the use of pollution prevention methods by the commercial, industrial, and municipal facilities and areas in its inventoried existing development to address the priorities and strategies in the Water Quality Improvement Plan.

(b) BMP Implementation

Each Copermittee must require the implementation of designated BMPs at commercial facilities and areas, industrial facilities, and implement designated BMPs at municipal facilities in its inventoried existing development.

(c) BMP Operation and Maintenance

(i) Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development.

(ii) Each Copermittee must implement a schedule of operation and maintenance activities for its MS4 and related structures (including but not limited to catch basins, storm drain inlets, detention basins, etc.), and verify proper operation of all its municipal structural treatment controls designed to reduce pollutants (including floatables) in storm water discharges to or from its MS4s and related drainage structures. Operation and maintenance activities may include, but is not limited to, the following:

[a] Inspections of the MS4 and related structures;
[b] Cleaning of the MS4 and related structures; and
[c] Proper disposal of materials removed from cleaning of the MS4 and related structures.

(iii) Each Copermittee must implement a schedule of operation and maintenance for public streets, unpaved roads, paved roads, and paved highways within its jurisdiction to minimize pollutants that can be discharged in storm water.

(iv) Each Copermittee must implement controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers. Copermittees that operate both a municipal sanitary sewer system and a MS4 must implement controls and measures to prevent and eliminate seeping sewage from infiltrating the MS4. Copermittees that do not operate both a municipal sanitary sewer system and a MS4 must coordinate with sewering agencies to keep themselves informed of relevant and appropriate maintenance activities and sanitary sewage projects in their jurisdiction that may cause or contribute to seepage of sewage into the MS4.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must require the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from commercial facilities and areas and industrial facilities, and implement BMPs at municipal facilities in its inventoried existing development. Such BMPs must include, as appropriate, educational activities, permits, certifications and other measures for applicators and distributors.

(2) Residential Areas

(a) Pollution Prevention

Each Copermittee must promote and encourage the use of pollution prevention methods, where appropriate, by the residential areas in its inventoried existing development.

(b) BMP Implementation

Each Copermittee must promote and encourage the implementation of designated BMPs at residential areas in its inventoried existing development.

(c) BMP Operation and Maintenance

Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at residential areas in its inventoried existing development.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must promote and encourage the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from residential areas in its inventoried existing development.

c. EXISTING DEVELOPMENT INSPECTIONS

Each Copermittee must conduct inspections of inventoried existing development to ensure compliance with applicable local ordinances and permits, and the requirements of this Order.

(1) Inspection Frequency

(a) Each Copermittee must establish appropriate inspection frequencies for inventoried existing development in accordance with the following requirements:

(i) At a minimum, inventoried existing development must be inspected once every five years utilizing one or more of the following methods:

[a] Drive-by inspections by Copermittee municipal and contract staff;

[b] Onsite inspections by Copermittee municipal and contract staff; and/or

[c] Visual inspections of publicly accessible inventoried facilities or areas by volunteer monitoring or patrol programs that have been trained by the Copermittee;

(ii) The frequency of inspections must be appropriate to confirm that BMPs are being implemented to reduce the discharge of pollutants in storm water from the MS4 to the MEP and effectively prohibit non-storm water discharges to the MS4;

(iii) The frequency of inspections must be based on the potential for a facility or area to discharge non-storm water and pollutants in storm water, and should reflect the priorities set forth in the Water Quality Improvement Plan;

(iv) Each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development;[34] and

(v) Inventoried existing development must be inspected by the Copermittee, as needed, in response to valid public complaints.

(b) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e. education and outreach, re-inspection, enforcement) necessary to require and confirm compliance with its applicable local ordinances and permits and the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

(2) <u>Inspection Content</u>

(a) Inspections of existing development must include, at a minimum:

(i) Visual inspections for the presence of actual non-storm water discharges;

(ii) Visual inspections for the presence of actual or potential discharge of pollutants;

(iii) Visual inspections for the presence of actual or potential illicit connections; and

(iv) Verification that the description of the facility or area in the inventory, required pursuant to Provision E.5.a.(2), has not changed.

[34] If any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspection may count toward the total annual inspection requirement. This requirement excludes linear municipal facilities (i.e., MS4 linear channels, sanitary sewer collection systems, streets, roads and highways).

(b) Onsite inspections of existing development by the Copermittee must include, at a minimum:

(i) Assessment of compliance with its applicable local ordinances and permits related to non-storm water and storm water discharges and runoff;

(ii) Assessment of the implementation of the designated BMPs;

(iii) Verification of coverage under the Industrial General Permit, when applicable; and

(iv) If any problems or violations are found, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried existing development. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Name and location of the facility or area (address and hydrologic subarea) consistent with the inventory name and location, pursuant to Provision E.5.a.(1);

(b) Inspection and re-inspection date(s);

(c) Inspection method(s) (i.e. drive-by, onsite);

(d) Observations and findings from the inspection(s);

(e) For onsite inspections of existing development by Copermittee municipal or contract staff, the records must also include, as applicable:

(i) Description of any problems or violations found during the inspection(s);

(ii) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(iii) The date problems or violations were resolved.

d. EXISTING DEVELOPMENT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried existing development, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

e. RETROFITTING AND REHABILITATING AREAS OF EXISTING DEVELOPMENT

(1) Retrofitting Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to retrofit areas of existing development within its jurisdiction to address identified sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify areas of existing development as candidates for retrofitting, focusing on areas where retrofitting will address pollutants and/or stressors that contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for retrofitting projects may be utilized to reduce pollutants that may be discharged in storm water from areas of existing development, and/or address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of retrofitting projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting projects; and

(e) Where retrofitting projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional retrofitting projects (i.e. projects that can receive and/or treat storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment) adjacent to and/or downstream of the areas of existing development.

(2) Stream, Channel and/or Habitat Rehabilitation in Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to rehabilitate streams, channels, and/or habitats in areas of existing development within its jurisdiction to address the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify streams, channels, and/or habitats in areas of existing development as candidates for rehabilitation, focusing on areas where stream, channel, and/or habitat rehabilitation projects will address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for stream, channel, and/or habitat rehabilitation projects may be utilized to address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters, rehabilitate channelized or hydromodified streams, restore wetland and riparian habitat, restore watershed functions, and/or restore beneficial uses of receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of stream, channel, and/or habitat rehabilitation projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance stream, channel, and/or habitat rehabilitation projects; and

(e) Where stream, channel, and/or habitat rehabilitation projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional stream, channel, and/or habitat rehabilitation projects (i.e. projects that can receive storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment).

6. Enforcement Response Plans

Each Copermittee must develop and implement an Enforcement Response Plan as part of its jurisdictional runoff management program document. The Enforcement Response Plan must describe the applicable approaches and options to enforce its legal authority established pursuant to Provision E.1, as necessary, to achieve compliance with the requirements of this Order. The Enforcement Response Plan must be in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include the following:

a. Enforcement Response Plan Components

The Enforcement Response Plan must include the following individual components:

(1) Illicit Discharge Detection and Elimination Enforcement Component;

(2) Development Planning Enforcement Component;

(3) Construction Management Enforcement Component; and

(4) Existing Development Enforcement Component.

b. Enforcement Response Approaches and Options

Each component of the Enforcement Response Plan must describe the enforcement response approaches that the Copermittee will implement to compel compliance with its statutes, ordinances, permits, contracts, orders, or similar means, and the requirements of this Order. The description must include the protocols for implementing progressively stricter enforcement responses. The enforcement response approaches must include appropriate sanctions to compel compliance, including, at a minimum, the following tools or their equivalent:

(1) Verbal and written notices of violation;

(2) Cleanup requirements;

(3) Fines;

(4) Bonding requirements;

(5) Administrative and criminal penalties;

(6) Liens;

(7) Stop work orders; and

(8) Permit and occupancy denials.

c. Correction of Violations

(1) Violations must be corrected in a timely manner with the goal of correcting the violations within 30 calendar days after the violations are discovered, or prior to the next predicted rain event, whichever is sooner.

(2) If more than 30 calendar days are required to achieve compliance, then a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

d. Escalated Enforcement

(1) The Enforcement Response Plan must include a definition of "escalated enforcement." Escalated enforcement must include any enforcement scenario where a violation or other non-compliance is determined to cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan. Escalated enforcement may be defined differently for development planning, construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas.

(2) Where the Copermittee determines escalated enforcement is not required, a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

(3) Escalated enforcement actions must continue to increase in severity, as necessary, to compel compliance as soon as possible.

e. Reporting of Non-Compliant Sites

(1) Each Copermittee must notify the San Diego Water Board in writing within five (5) calendar days of issuing escalated enforcement (as defined in the Copermittee's Enforcement Response Plan) to a construction site that poses a significant threat to water quality as a result of violations or other non-compliance with its permits and applicable local ordinances, and the requirements of this Order. Written notification may be provided electronically by email to the appropriate San Diego Water Board staff.

(2) Each Copermittee must notify the San Diego Water Board of any persons required to obtain coverage under the statewide Industrial General Permit and Construction General Permit and failing to do so, within five (5) calendar days from the time the Copermittee become aware of the circumstances. Written notification may be provided electronically by email to RB9_Nonfilers@waterboards.ca.gov.

7. Public Education and Participation

Each Copermittee must implement, individually or with other Copermittees, a public education and participation program in accordance with the strategies identified in the Water Quality Improvement Plan to promote and encourage the development of programs, management practices, and behaviors that reduce the discharge of pollutants in storm water to the MEP, prevent controllable non-storm water discharges from entering the MS4, and protect water quality standards in receiving waters. The public education and participation program must be implemented in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include, at a minimum, the following requirements:

a. PUBLIC EDUCATION

The public education program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) Educational activities, public information activities, and other appropriate outreach activities intended to reduce pollutants associated with the application of pesticides, herbicides and fertilizer and other pollutants of concern in storm water discharges to and from its MS4 to the MEP, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed to address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(2) Educational activities, public information activities, and other appropriate outreach activities to facilitate the proper management and disposal of used oil and toxic materials; and

(3) Appropriate education and training measures for specific target audiences, such as construction site operators, residents, underserved target audiences and school-aged children, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed, based on high risk behaviors and pollutants of concern.

b. PUBLIC PARTICIPATION

The public participation program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) A process for members of the public to participate in updating the highest priority water quality conditions, numeric goals, and water quality improvement strategies in the Water Quality Improvement Plan;

(2) Opportunities for members of the public to participate in providing the Copermittee recommendations for improving the effectiveness of the water quality improvement strategies implemented within its jurisdiction; and

(3) Opportunities for members of the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or protection of the quality of receiving waters.

8. Fiscal Analysis

a. Each Copermittee must secure the resources necessary to meet all the requirements of this Order.

b. Each Copermittee must conduct an annual fiscal analysis of its jurisdictional runoff management program in its entirety. The fiscal analysis must include the following:

(1) Identification of the various categories of expenditures necessary to implement the requirements of this Order, including a description of the specific capital, operation and maintenance, and other expenditure items to be accounted for in each category of expenditures;

(2) The staff resources needed and allocated to meet the requirements of this Order, including any development, implementation, and enforcement activities required;

(3) The estimated expenditures for Provisions E.8.b.(1) and E.8.b.(2) for the current fiscal year; and

(4) The source(s) of funds that are proposed to meet the necessary expenditures described in Provisions E.8.b.(1) and E.8.b.(2), including legal restrictions on the use of such funds, for the current fiscal year and next fiscal year.

c. Each Copermittee must submit a summary of the annual fiscal analysis with each Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3).

d. Each Copermittee must provide the documentation used to develop the summary of the annual fiscal analysis upon request by the San Diego Water Board.

F. REPORTING

The purpose of this provision is to determine and document compliance with the requirements set forth in this Order. The goal of reporting is to communicate to the San Diego Water Board and the people of the State of California the implementation status of each jurisdictional runoff management program and compliance with the requirements of this Order. This goal is to be accomplished through the submittal of specific deliverables to the San Diego Water Board by the Copermittees.

1. Water Quality Improvement Plans

The Copermittees for each Watershed Management Area must develop and submit the Water Quality Improvement Plan in accordance with the following requirements:

a. WATER QUALITY IMPROVEMENT PLAN DEVELOPMENT

Each Water Quality Improvement Plan must be developed in accordance with the following process:

(1) Public Participation Process

The Copermittees must implement a public participation process to solicit data, information, and recommendations to be utilized in the development of the Water Quality Improvement Plan. The public participation process must include the following:

(a) The Copermittees must develop a publicly available and noticed schedule of the opportunities for the public to participate and provide comments during the development of the Water Quality Improvement Plan. The schedule may be adjusted as necessary by the Copermittees, provided the public is provided timely notification of the changes to the schedule.

(b) The Copermittees must form a Water Quality Improvement Consultation Panel to provide recommendations during the development of the Water Quality Improvement Plan. The Water Quality Improvement Consultation Panel must consist of at least the following members:

(i) A representative of the San Diego Water Board;

(ii) A representative of the environmental community familiar with the water quality conditions of concern of the receiving waters in the Watershed Management Area, preferably from an environmental interest group associated with a water body within the Watershed Management Area; and

(iii) A representative of the development community familiar with the opportunities and constraints for implementing structural BMPs,

retrofitting projects, and stream, channel or habitat rehabilitation projects in the Watershed Management Area, preferably with relevant engineering, hydrology, and/or geomorphology experience in the Watershed Management Area.

(c) The Copermittees must coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public time and opportunity to participate during the development of the Water Quality Improvement Plans.

(2) Priority Water Quality Conditions

(a) The Copermittees must solicit data, information and recommendations from the public to be utilized in the development and identification of the priority water quality conditions and potential water quality improvement strategies for the Watershed Management Area.

(b) The Copermittees must review the priority water quality conditions the Copermittees plan on including in the Water Quality Improvement Plan with the Water Quality Improvement Consultation Panel to receive recommendations or concurrence.

(c) The Copermittees must consider revisions to the priority water quality conditions based on recommendations from the Water Quality Improvement Consultation Panel.

(d) The Copermittees must include all the potential water quality improvement strategies identified by the public and the Water Quality Improvement Consultation Panel with the submittal of the priority water quality conditions to the San Diego Water Board.

(e) The Copermittees must submit the Water Quality Improvement Plan requirements of Provision B.2 to the San Diego Water Board as early as 6 months and no later than 12 months after the commencement of coverage under this Order. Upon receipt, the San Diego Water Board will issue a public notice and release the proposed priority water quality conditions and potential water quality improvement strategies for public review and comment for a minimum of 30 days.

(f) The Copermittees must consider revisions to the priority water quality conditions and potential water quality improvement strategies developed pursuant to Provision B.2 based on public comments received by the close of the comment period.

(3) Water Quality Improvement Goals, Strategies and Schedules

(a) The Copermittees must solicit recommendations from the public on potential numeric goals for the highest priority water quality conditions identified for the Watershed Management Area, and recommendations on the strategies that should be implemented to achieve the potential numeric goals.

(b) The Copermittees must consult with the Water Quality Improvement Consultation Panel and consider revisions to the following items based on the Panel's recommendations:

(i) The numeric goals and schedules the Copermittees propose to include in the Water Quality Improvement Plan;

(ii) The water quality improvement strategies and schedules the Copermittees propose to implement in the Watershed Management Area and include in the Water Quality Improvement Plan; and

(iii) If the Copermittees choose to implement Provision B.3.b.(4), the results of the Watershed Management Area Analysis the Copermittees proposed to incorporate into the Water Quality Improvement Plan.

(c) The Copermittees must submit the Water Quality Improvement Plan requirements of Provision B.3 to the San Diego Water Board as early as 9 months and no later than 18 months after the commencement of coverage under this Order. Upon receipt, the San Diego Water Board will issue a public notice and release the proposed water quality improvement goals, strategies and schedules for public review and comment for a minimum of 30 days.

(d) The Copermittees must consider revisions to the water quality improvement goals, strategies and schedules developed pursuant to Provision B.3 based on public comments received by the close of the comment period.

b. WATER QUALITY IMPROVEMENT PLAN SUBMITTAL AND IMPLEMENTATION

(1) Within 24 months after the commencement of coverage under this Order, the Copermittees for each Watershed Management Area must submit a complete Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order to the San Diego Water Board. The San Diego Water Board will issue a public notice and release the Water Quality Improvement Plan for public review and comment for a minimum of 30 days.

(2) The Copermittees must consider revisions to the Water Quality Improvement Plan based on written comments received by the close of the public comment period.

(3) The Copermittees must promptly submit any revisions to the Water Quality Improvement Plan to the San Diego Water Board no later than 60 days after the close of the public comment period.

(4) If issues concerning the Water Quality Improvement Plan are resolved informally through discussions among the Copermittees, the San Diego Water Board and interested parties, the San Diego Water Board Executive Officer may provide written notification of acceptance to the Copermittees that the Water Quality Improvement Plan meets the requirements of Provision B. However, if the Executive Officer determines that significant issues with the Water Quality Improvement Plan remain, the matter will be scheduled for San Diego Water Board consideration at a public meeting.

(5) The Copermittees must commence with implementation of the Water Quality Improvement Plan, in accordance with the water quality improvement strategies and schedules therein, upon written notification of acceptance with the Water Quality Improvement Plan by the San Diego Water Board Executive Officer.

(6) During implementation of the Water Quality Improvement Plan the Copermittees must correct any deficiencies in the Plan identified by the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report following a request by the Board to do so.

(7) The Water Quality Improvement Plan must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of receiving notification of acceptance with the Water Quality Improvement Plan by the San Diego Water Board Executive Officer.

2. Updates

a. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATES

Each Copermittee must update its jurisdictional runoff management program document in accordance with the following requirements:

(1) Each Copermittee is encouraged to seek public and key stakeholder participation and comments, as early and often as possible during the process of developing updates to its jurisdictional runoff management program document;

(2) Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E concurrent with the submittal of the Water Quality Improvement Plan. Each Copermittee must correct any deficiencies in the jurisdictional runoff management program document based on comments received from the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report;

(3) Each Copermittee must submit updates to its jurisdictional runoff management program, with the supporting rationale for the modifications, either in the Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b;

(4) The Copermittee must revise proposed modifications to its jurisdictional runoff management program as directed by the San Diego Water Board Executive Officer; and

(5) Updated jurisdictional runoff management program documents must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of submitting the Water Quality Improvement Plan Annual Report.

b. BMP DESIGN MANUAL UPDATES

Each Copermittee must update its BMP Design Manual in accordance with the following requirements:

(1) Each Copermittee must update its BMP Design Manual to incorporate the requirements of Provisions E.3.a-d concurrent with the submittal of the Water Quality Improvement Plan. Each Copermittee must correct any deficiencies in the BMP Design Manual based on comments received from the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report;

(2) ~~Subsequent~~ Any future updates to the BMP Design Manual made after its update pursuant to Provision F.2.b.(1) is completed must be consistent with the requirements of Provisions E.3.a-d and must be submitted as part of the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b; and

(3) ~~Updated~~ BMP Design Manuals must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of completing the update.

(4) If the San Diego Water Board amends Provisions E.3.a-d during the permit term but after the Copermittee has completed the update pursuant to

Provision F.2.b.(1), the Copermittee must revise its BMP Design Manual to incorporate the amended Provision E.3.a-d requirements as soon as possible but not later than 90 days after the date the San Diego Water Board adopts the amendments to Provisions E.3.a-d, unless otherwise directed by the San Diego Water Board Executive Officer. Under these circumstances, the effective date of the BMP Design Manual is no later than 90 days after the date the San Diego Water Board adopts the amendments to Provisions E.3.a-d, unless otherwise directed by the San Diego Water Board Executive Officer.

c. Water Quality Improvement Plan Updates

(1) The Water Quality Improvement Plans must be updated in accordance with the following process:

(a) The Copermittees must develop and implement a public participation process to obtain data, information and recommendations for updating the Water Quality Improvement Plan. The public participation process must provide for a publicly available and noticed schedule of opportunities for the public to participate and provide comments during the development of updates to the Water Quality Improvement Plan;

(b) The Copermittees must consult with the Water Quality Improvement Consultation Panel on proposed updates of the Water Quality Improvement Plan, and consider the Water Quality Improvement Consultation Panel's recommendations in finalizing the proposed updates;

(c) The Copermittees for each Watershed Management Area must submit 1) proposed updates to the Water Quality Improvement Plan and supporting rationale, and 2) recommendations received from the public and the Water Quality Improvement Consultation Panel and the rationale for the requested updates, either in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The updates submitted will be deemed accepted for inclusion in the Water Quality Improvement Plan ninety (90) days after submission unless otherwise directed in writing by the San Diego Water Board Executive Officer;

(d) The Copermittees must revise the requested updates as directed by the San Diego Water Board Executive Officer; and

(e) Updated Water Quality Improvement Plans must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance of the requested updates by the San Diego Water Board.

(2) No later than six months following Office of Administrative Law and USEPA approval of any TMDL Basin Plan amendment with wasteload allocations (WLAs) assigned to the Copermittees during the term of this Order, the Copermittees must initiate an update to the applicable Water Quality Improvement Plans in accordance with Provision F.1 or Provision F.2.c.(1) to incorporate the requirements of the TMDL WLAs.

3. Progress Reporting

a. Progress Report Presentations

The Copermittees for each Watershed Management Area must periodically appear before the San Diego Water Board, as requested by the Board, to provide progress reports on the implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs.

b. Annual Reports

(1) Transitional Jurisdictional Runoff Management Program Annual Reports

(a) Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) no later than October 31 of each year for each jurisdictional runoff management program reporting period (i.e. July 1 to June 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted.

(b) Each Copermittee must submit the information on the Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) specific to the area within its jurisdiction in each Watershed Management Area.

(c) In addition to submitting the Jurisdictional Runoff Management Program Annual Report Form during the transitional reporting period, each Copermittee may continue to utilize and submit the jurisdictional runoff management program annual reporting format of its previous NPDES permit until the first Water Quality Improvement Plan Annual Report is required to be submitted.

(2) Transitional Monitoring and Assessment Program Annual Reports

The Copermittees for each Watershed Management Area must submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment

program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted under this Order. The Transitional Monitoring and Assessment Program Annual Reports must include:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1.a and D.2.a, summarized and presented in tabular and graphical form; and

(b) The findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

(3) Water Quality Improvement Plan Annual Reports

The Copermittees for each Watershed Management Area must submit a Water Quality Improvement Plan Annual Report for each reporting period no later than January 31 of the following year. The annual reporting period consists of two different periods: 1) July 1 to June 30 of the following year for the jurisdictional runoff management programs, 2) October 1 to September 30 of the following year for the monitoring and assessment programs. The Water Quality Improvement Plan Annual Reports must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Each Annual Report must include the following:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, summarized and presented in tabular and graphical form;

(b) The progress of the special studies required pursuant to Provision D.3, and the findings, interpretations and conclusions of a special study, or each phase of a special study, upon its completion;

(c) The findings, interpretations and conclusions from the assessments required pursuant to Provision D.4;

(d) The progress of implementing the Water Quality Improvement Plan, including, but not limited to, the following:

(i) The progress toward achieving the interim and final numeric goals for the highest water quality priorities for the Watershed Management Area;

(ii) The water quality improvement strategies that were implemented and/or no longer implemented by each of the Copermittees during the reporting period and previous reporting periods;

(iii) The water quality improvement strategies planned for implementation during the next reporting period;

(iv) Proposed modifications to the water quality improvement strategies, the public comments received and the supporting rationale for the proposed modifications;

(v) Previous modifications or updates incorporated into the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document and implemented by the Copermittees in the Watershed Management Area; and

(vi) Proposed modifications or updates to the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document;

(e) A completed Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) for each Copermittee in the Watershed Management Area, certified by a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative; and

(f) Each Copermittee must provide any data or documentation utilized in developing the Water Quality Improvement Plan Annual Report upon request by the San Diego Water Board. Any Copermittee monitoring data utilized in developing the Water Quality Improvement Plan Annual Report must be uploaded to the California Environmental Data Exchange Network (CEDEN).[35] Any Copermittee monitoring and assessment data utilized in developing the Water Quality Improvement Plan Annual Report must be available for access on the Regional Clearinghouse required pursuant to Provision F.4.

c. Regional Monitoring and Assessment Report

(1) The Copermittees must submit a Regional Monitoring and Assessment Report no later than 180 days prior to the expiration date of this Order. The Regional Monitoring and Assessment Report may be submitted as part of the Report of Waste Discharge required pursuant to Provision F.5.b. In preparing the report the Copermittees must consider the receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, and the findings, interpretations, and conclusions from the assessments required pursuant to Provision D.4. Based on these considerations the report must assess the following:

[35] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

(a) The beneficial uses of the receiving waters within the San Diego Region that are supported and not adversely affected by the Copermittees' MS4 discharges;

(b) The beneficial uses of the receiving waters within the San Diego Region that are adversely impacted by the Copermittees' MS4 discharges;

(c) The progress toward protecting the beneficial uses in the receiving waters within the San Diego Region from the Copermittees' discharges; and

(d) Pollutants or conditions of emerging concern that may impact beneficial uses in the receiving waters within the San Diego Region.

(2) The Regional Monitoring and Assessment Report must include recommendations for improving the implementation and assessment of the Water Quality Improvement Plans and jurisdictional runoff management programs.

(3) Each Copermittee must provide any data or documentation utilized in developing the Regional Monitoring and Assessment Report upon request by the San Diego Water Board. Any Copermittee monitoring and assessment data utilized in developing the Regional Monitoring and Assessment Report must be available for access on the Regional Clearinghouse required pursuant to Provision F.4.

4. Regional Clearinghouse

The Copermittees must develop, update, and maintain an internet-based Regional Clearinghouse that is made available to the public no later than 18 months after the effective date of this Order.[36]

a. The Copermittees, through the Regional Clearinghouse, must make the following documents and data available for access, and organized by Watershed Management Area. The documents and data may be linked to other internet-based data portals and databases where the original documents are stored:

(1) Water Quality Improvement Plan for the Watershed Management Area, and all updated versions with date of update;

(2) Annual Reports for the Watershed Management Area;

(3) Jurisdictional Runoff Management Program document for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

[36] The Copermittees may develop, update and maintain the clearinghouse(s) of other Copermittees or agencies.

(4) BMP Design Manual for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(5) Reports from special studies (e.g. source identification, BMP effectiveness assessment) conducted in the Watershed Management Area;

(6) Monitoring data collected pursuant to Provision D for each Watershed Management Area must be uploaded to CEDEN,[37] with links to the uploaded data; and

(7) Available GIS data, layers, and/or shapefiles used to develop the maps generated and maintained by the Copermittees for the Water Quality Improvement Plans, Annual Reports, and jurisdictional runoff management program documents.

b. The Copermittees, through the Regional Clearinghouse, must make the following information and documents available for access:

(1) Contact information (point of contact, phone number, email address, and mailing address) for each Copermittee;

(2) Public hotline number for reporting non-storm water and illicit discharges for each Copermittee;

(3) Email address for reporting non-storm water and illicit discharges for each Copermittee;

(4) Link to each Copermittee's website, if available, where the public may find additional information about the Copermittee's storm water management program and for requesting records for the implementation of its program;

(5) Information about opportunities for the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or protection of the quality of receiving waters; and

(6) Reports from regional monitoring programs in which the Copermittees participate (e.g. Southern California Monitoring Coalition, Southern California Coastal Water Research Project Bight Monitoring);

(7) Regional Monitoring and Assessment Reports; and

(8) Any other information, data, and documents the Copermittees determine as appropriate for making available to the public.

[37] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

5. Report of Waste Discharge

~~a. The Riverside County Copermittees are required to submit a complete Report of Waste Discharge pursuant to the requirements of their current Order. The San Diego Water Board will review and consider the Report of Waste Discharge to determine whether modification to this Order, pursuant to the requirements of Provision H, will be required prior to the Riverside County Copermittees obtaining coverage under this Order. The current Order for Riverside County Copermittees is rescinded upon the date of effective coverage under this Order except for enforcement purposes.~~

~~b.~~
The Copermittees subject to the requirements of this Order must submit to the San Diego Water Board a complete Report of Waste Discharge as an application for the re-issuance of this Order and NPDES permit. The Report of Waste Discharge must be submitted no later than 180 days in advance of the expiration date of this Order. The Report of Waste Discharge must contain the following minimum information:

~~(1)~~
a. Names and addresses of the Copermittees;
~~(2)~~
b. Names and titles of the primary contacts of the Copermittees;
~~(3)~~
c. Proposed changes to the Copermittees' Water Quality Improvement Plans and the supporting justification;
~~(4)~~
d. Proposed changes to the Copermittees' jurisdictional runoff management programs and the supporting justification;
~~(5)~~
e. Any other information necessary for the re-issuance of this Order;
~~(6)~~
f. Any information to be included as part of the Report of Waste Discharge pursuant to the requirements of this Order; and
~~(7)~~
g. Any other information required by federal regulations for NPDES permit reissuance.

~~6. Application for Early Coverage~~

~~a. The Riverside County Copermittees may apply for early coverage under this Order by submitting a Report of Waste Discharge Form 200, with a written request for early coverage under this Order.~~

~~b. The San Diego Water Board will review the application for early coverage. A notification of coverage under this Order will be issued to the Copermittees in the respective county by the San Diego Water Board upon completion of the early coverage application requirements. The effective coverage date will be specified~~

~~in the notification of coverage. The Copermittees in the respective county are authorized to have MS4 discharges pursuant to the requirements of this Order starting on the effective coverage date specified in the notification of coverage. The existing Order for the respective county is rescinded upon the effective coverage date specified in the notification of coverage except for enforcement purposes.~~

~~7.~~

6. Reporting Provisions

Each Copermittee must comply with all the reporting and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

G. PRINCIPAL WATERSHED COPERMITTEE RESPONSIBILITIES

1. The Copermittees within each Watershed Management Area must designate a Principal Watershed Copermittee and notify the San Diego Water Board of the name of the Principal Watershed Copermittee. An individual Copermittee should not be designated a Principal Watershed Copermittee for more than two Watershed Management Areas. The notification may be submitted with the Water Quality Improvement Plan required pursuant to Provision F.1 of this Order.

2. The Principal Watershed Copermittee is responsible for, at a minimum, the following:

a. Serving as liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues, and when necessary and appropriate, representing the Copermittees in the Watershed Management Area before the San Diego Water Board;

b. Facilitating the development of the Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order;

c. Coordinating the submittal of the deliverables required by Provisions F.1, F.2, F.3.a, and F.3.b of this Order; and

d. Coordinating and developing, with the other Principal Watershed Copermittees, the requirements of Provisions F.3.c, F.4, and F.5.b of this Order.

3. The Principal Watershed Copermittee is not responsible for ensuring that the other Copermittees within the Watershed Management Area are in compliance with the requirements of this Order. Each Copermittee within the Watershed Management Area is responsible for complying with the requirements of this Order.

H. MODIFICATION OF ORDER

1. Modifications of the Order may be initiated by the San Diego Water Board or by the Copermittees. Requests by Copermittees must be made to the San Diego Water Board.

2. Minor modifications to the Order may be made by the San Diego Water Board where the proposed modification complies with all the prohibitions and limitations, and other requirements of this Order.

3. This Order may also be re-opened and modified, revoked and, reissued or terminated in accordance with the provisions of 40 CFR 122.44, 122.62 to 122.64, and 124.5. Causes for taking such actions include, but are not limited to, failure to comply with any condition of this Order and permit, and endangerment to human health or the environment resulting from the permitted activity.

4. This Order may be re-opened for modification for cause including but not limited to the following:

   ~~a. The State Water Board determines that revisions are warranted, and the San Diego Water Board concurs that revisions are necessary to those provisions of the Order addressing compliance with water quality standards in the receiving water and/or those provisions of the Order establishing an iterative process for implementation of management practices to assure compliance with water quality standards in the receiving water;~~

   ~~b. An application for early coverage under this Order is received pursuant to Provision F.6;~~

   ~~c.~~

   a. Any of the TMDLs in Attachment E to this Order are amended in the Basin Plan by San Diego Water Board, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA;

   ~~d.~~

   b. The Basin Plan is amended by the San Diego Water Board to incorporate a new TMDL, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA; or

   ~~e.~~

   c. Updating or revising the monitoring and reporting requirements is determined to be necessary, at the discretion of the San Diego Water Board. Such modification(s) may include, but is (are) not limited to, revision(s) to: (i) implement recommendations from Southern California Coastal Water Research Project (SCCWRP), (ii) develop, refine, implement, and/or coordinate a regional monitoring program, (iii) develop and implement improved monitoring and assessment programs in keeping with San Diego Water Board Resolution No. R9-2012-0069, Resolution in Support of a Regional Monitoring Framework, and/or (iv) add provisions to require the Copermittees to evaluate and provide information on cost and values of the monitoring and reporting program.

~~**5.** The San Diego Water Board, after opportunity for public comment and a public hearing, will re-open and consider modifications to this Order when the Riverside County Copermittees submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders.~~

I. STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

Each Copermittee must comply with all the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

ATTACHMENT A

DISCHARGE PROHIBITIONS AND SPECIAL PROTECTIONS

1. Basin Plan Waste Discharge Prohibitions

California Water Code Section 13243 provides that a Regional Water Board, in a water quality control plan, may specify certain conditions or areas where the discharge of waste or certain types of waste is not permitted. The following waste discharge prohibitions in the Water Quality Control Plan for the San Diego Basin (Basin Plan) are applicable to any person, as defined by Section 13050(c) of the California Water Code, who is a citizen, domiciliary, or political agency or entity of California whose activities in California could affect the quality of waters of the state within the boundaries of the San Diego Region.

1. The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in California Water Code Section 13050, is prohibited.

2. The discharge of waste to land, except as authorized by waste discharge requirements or the terms described in California Water Code Section 13264 is prohibited.

3. The discharge of pollutants or dredged or fill material to waters of the United States except as authorized by a National Pollutant Discharge Elimination System (NPDES) permit or a dredged or fill material permit (subject to the exemption described in California Water Code Section 13376) is prohibited.

4. Discharges of recycled water to lakes or reservoirs used for municipal water supply or to inland surface water tributaries thereto are prohibited, unless this San Diego Water Board issues a NPDES permit authorizing such a discharge; the proposed discharge has been approved by the State Department of Health Services (DHS) and the operating agency of the impacted reservoir; and the discharger has an approved fail-safe long-term disposal alternative.

5. The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the San Diego Water Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

6. The discharge of waste in a manner causing flow, ponding, or surfacing on lands not owned or under the control of the discharger is prohibited, unless the discharge is authorized by the San Diego Water Board.

7. The dumping, deposition, or discharge of waste directly into waters of the state, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the San Diego Water Board.

8. Any discharge to a storm water conveyance system that is not composed entirely of "*storm water*" is prohibited unless authorized by the San Diego Water Board. [The federal regulations, 40 CFR 122.26(b)(13), define storm water as storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from firefighting activities.] [§122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

9. The unauthorized discharge of treated or untreated sewage to waters of the state or to a storm water conveyance system is prohibited.

10. The discharge of industrial wastes to conventional septic tank/subsurface disposal systems, except as authorized by the terms described in California Water Code Section 13264, is prohibited.

11. The discharge of radioactive wastes amenable to alternative methods of disposal into the waters of the state is prohibited.

12. The discharge of any radiological, chemical, or biological warfare agent into waters of the state is prohibited.

13. The discharge of waste into a natural or excavated site below historic water levels is prohibited unless the discharge is authorized by the San Diego Water Board.

14. The discharge of sand, silt, clay, or other earthen materials from any activity, including land grading and construction, in quantities which cause deleterious bottom deposits, turbidity or discoloration in waters of the state or which unreasonably affect, or threaten to affect, beneficial uses of such waters is prohibited.

15. The discharge of treated or untreated sewage from vessels to Mission Bay, Oceanside Harbor, Dana Point Harbor, or other small boat harbors is prohibited.

16. The discharge of untreated sewage from vessels to San Diego Bay is prohibited.

17. The discharge of treated sewage from vessels to portions of San Diego Bay that are less than 30 feet deep at mean lower low water (MLLW) is prohibited.

18. The discharge of treated sewage from vessels, which do not have a properly functioning US Coast Guard certified Type I or Type II marine sanitation device, to portions of San Diego Bay that are greater than 30 feet deep at mean lower low water (MLLW) is prohibited.

2. Attachment B to State Water Board Resolution 2012-0012, as amended by State Water Board Resolution No. 2012-0031.

Special Protections for Areas of Special Biological Significance (ASBS), Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges

I. PROVISIONS FOR POINT SOURCE DISCHARGES OF STORM WATER AND NONPOINT SOURCE WASTE DISCHARGES

The following terms, prohibitions, and special conditions (hereafter collectively referred to as special conditions) are established as limitations on point source storm water and nonpoint source discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in Areas of Special Biological Significance (ASBS), as required for State Water Quality Protection Areas pursuant to California Public Resources Code Sections 36700(f) and 36710(f). These Special Protections are adopted by the State Water Board as part of the California Ocean Plan (Ocean Plan) General Exception.

The special conditions are organized by category of discharge. The State Water Resources Control Board (State Water Board) and Regional Water Quality Control Boards (Regional Water Boards) will determine categories and the means of regulation for those categories [e.g., Point Source Storm Water National Pollutant Discharge Elimination System (NPDES) or Nonpoint Source].

A. PERMITTED POINT SOURCE DISCHARGES OF STORM WATER

1. General Provisions for Permitted Point Source Discharges of Storm Water

   a. Existing storm water discharges into an ASBS are allowed only under the following conditions:

      (1) The discharges are authorized by an NPDES permit issued by the State Water Board or Regional Water Board;

      (2) The discharges comply with all of the applicable terms, prohibitions, and special conditions contained in these Special Protections; and

      (3) The discharges:

         (i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

         (ii) Are designed to prevent soil erosion;

         (iii) Occur only during wet weather;

         (iv) Are composed of only storm water runoff.

   b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

c. The discharge of trash is prohibited.

d. Only discharges from existing storm water outfalls are allowed. Any proposed or new storm water runoff discharge shall be routed to existing storm water discharge outfalls and shall not result in any new contribution of waste to an ASBS (i.e., no additional pollutant loading). "Existing storm water outfalls" are those that were constructed or under construction prior to January 1, 2005. "New contribution of waste" is defined as any addition of waste beyond what would have occurred as of January 1, 2005. A change to an existing storm water outfall, in terms of re-location or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges are prohibited except as provided below:

(1) The term "non-storm water discharges" means any waste discharges from a municipal separate storm sewer system (MS4) or other NPDES permitted storm drain system to an ASBS that are not composed entirely of storm water.

(2) (i) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability or occur naturally:

(a) Discharges associated with emergency fire fighting operations.

(b) Foundation and footing drains.

(c) Water from crawl space or basement pumps.

(d) Hillside dewatering.

(e) Naturally occurring groundwater seepage via a storm drain.

(f) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(ii) An NPDES permitting authority may authorize non-storm water discharges to an MS4 with a direct discharge to an ASBS only to the extent the NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

2. Compliance Plans for Inclusion in Storm Water Management Plans (SWMP) and Storm Water Pollution Prevention Plans (SWPPP).

The discharger shall specifically address the prohibition of non-storm water runoff and the requirement to maintain natural water quality for storm water discharges to an ASBS in an ASBS Compliance Plan to be included in its SWMP or a SWPPP, as appropriate to permit type. If a statewide permit includes a SWMP, then the discharger shall prepare a stand-alone compliance plan for ASBS discharges. The ASBS Compliance Plan is subject to approval by

the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (for permits issued by Regional Water Boards).

a. The Compliance Plan shall include a map of surface drainage of storm water runoff, showing areas of sheet runoff, prioritize discharges, and describe any structural Best Management Practices (BMPs) already employed and/or BMPs to be employed in the future. Priority discharges are those that pose the greatest water quality threat and which are identified to require installation of structural BMPs. The map shall also show the storm water conveyances in relation to other features such as service areas, sewage conveyances and treatment facilities, landslides, areas prone to erosion, and waste and hazardous material storage areas, if applicable. The SWMP or SWPPP shall also include a procedure for updating the map and plan when changes are made to the storm water conveyance facilities.

b. The ASBS Compliance Plan shall describe the measures by which all non-authorized non-storm water runoff (e.g., dry weather flows) has been eliminated, how these measures will be maintained over time, and how these measures are monitored and documented.

c. For Municipal Separate Storm Sewer System (MS4s), the ASBS Compliance Plan shall require minimum inspection frequencies as follows:

(1) The minimum inspection frequency for construction sites shall be weekly during rainy season;

(2) The minimum inspection frequency for industrial facilities shall be monthly during the rainy season;

(3) The minimum inspection frequency for commercial facilities (e.g., restaurants) shall be twice during the rainy season; and

(4) Storm water outfall drains equal to or greater than 18 inches (457 mm) in diameter or width shall be inspected once prior to the beginning of the rainy season and once during the rainy season and maintained to remove trash and other anthropogenic debris.

d. The ASBS Compliance Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff, that are necessary to comply with these special conditions, will be achieved through BMPs. Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that such installation would pose a threat to health or safety. BMPs to control storm water runoff discharges (at the end-of-pipe) during a design storm shall be designed to achieve on average the following target levels:

(1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

(2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges.

The baseline for these determinations is the effective date of the Exception, except for those structural BMPs installed between January 1, 2005 and adoption of these Special Protections, and the reductions must be achieved and documented within six (6) years of the effective date.

e. The ASBS Compliance Plan shall address erosion control and the prevention of anthropogenic sedimentation in ASBS. The natural habitat conditions in the ASBS shall not be altered as a result of anthropogenic sedimentation.

f. The ASBS Compliance Plan shall describe the non-structural BMPs currently employed and planned in the future (including those for construction activities), and include an implementation schedule. The ASBS Compliance Plan shall include non-structural BMPs that address public education and outreach. Education and outreach efforts must adequately inform the public that direct discharges of pollutants from private property not entering an MS4 are prohibited. The ASBS Compliance Plan shall also describe the structural BMPs, including any low impact development (LID) measures, currently employed and planned for higher threat discharges and include an implementation schedule. To control storm water runoff discharges (at the end-of-pipe) during a design storm, permittees must first consider, and use where feasible, LID practices to infiltrate, use, or evapotranspirate storm water runoff on-site, if LID practices would be the most effective at reducing pollutants from entering the ASBS.

g. The BMPs and implementation schedule shall be designed to ensure that natural water quality conditions in the receiving water are achieved and maintained by either reducing flows from impervious surfaces or reducing pollutant loading, or some combination thereof.

h. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents in storm water runoff that alter natural ocean water quality and the sources of these constituents.

(2) The report shall describe BMPs that are currently being implemented, BMPs that are identified in the SWMP or SWPPP for future implementation, and any additional BMPs that may be added to the SWMP or SWPPP to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the BMPs.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits), the discharger shall revise its ASBS Compliance Plan to incorporate any new or modified BMPs that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised SWMP or SWPPP, the discharger does not have to repeat

the same procedure for continuing or recurring exceedances of natural ocean water quality conditions due to the same constituent.

(5) The requirements of this section are in addition to the terms, prohibitions, and conditions contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within eighteen (18) months from the effective date of the Exception, the discharger shall submit a draft written ASBS Compliance Plan to the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that describes its strategy to comply with these special conditions, including the requirement to maintain natural water quality in the affected ASBS. The ASBS Compliance Plan shall include a description of appropriate non-structural controls and a time schedule to implement structural controls (implementation schedule) to comply with these special conditions for inclusion in the discharger's SWMP or SWPPP, as appropriate to permit type. The final ASBS Compliance Plan, including a description and final schedule for structural controls based on the results of runoff and receiving water monitoring, must be submitted within thirty (30) months from the effective date of the Exception.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these special conditions shall be implemented.

d. Within six (6) years of the effective date of the Exception, any structural controls identified in the ASBS Compliance Plan that are necessary to comply with these special conditions shall be operational.

e. Within six (6) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water, pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data, and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in

compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. for municipalities, a demonstration of significant hardship to discharger ratepayers, by showing the relationship of storm water fees to annual household income for residents within the discharger's jurisdictional area, and the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or

2. for other governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

B. NONPOINT SOURCE DISCHARGES

1. General Provisions for Nonpoint Sources

a. Existing nonpoint source waste discharges are allowed into an ASBS only under the following conditions:

(1) The discharges are authorized under waste discharge requirements, a conditional waiver of waste discharge requirements, or a conditional prohibition issued by the State Water Board or a Regional Water Board.

(2) The discharges are in compliance with the applicable terms, prohibitions, and special conditions contained in these Special Protections.

(3) The discharges:

(i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

(ii) Are designed to prevent soil erosion;

(iii) Occur only during wet weather;

(iv) Are composed of only storm water runoff.

b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

c. The discharge of trash is prohibited.

d. Only existing nonpoint source waste discharges are allowed. "Existing nonpoint source waste discharges" are discharges that were ongoing prior to January 1, 2005. "New nonpoint source discharges" are defined as those that commenced on or after January 1, 2005. A change to an existing nonpoint source discharge, in terms of relocation or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges from nonpoint sources (those not subject to an NPDES Permit) are prohibited except as provided below:

(1) The term "non-storm water discharges" means any waste discharges that are not composed entirely of storm water.

(2) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability, or occur naturally:

(i) Discharges associated with emergency fire fighting operations.

(ii) Foundation and footing drains.

(iii) Water from crawl space or basement pumps.

(iv) Hillside dewatering.

(v) Naturally occurring groundwater seepage via a storm drain.

(vi) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

f. At the San Clemente Island ASBS, discharges incidental to military training and research, development, test, and evaluation operations are allowed. Discharges incidental to underwater demolition and other in-water explosions are not allowed in the two military closure areas in the vicinity of Wilson Cove and Castle Rock. Discharges must not result in a violation of the water quality objectives, including the protection of the marine aquatic life beneficial use, anywhere in the ASBS.

g. At the San Nicolas Island and Begg Rock ASBS, discharges incidental to military research, development, testing, and evaluation of, and training with, guided missile and other weapons systems, fleet training exercises, small-scale amphibious warfare training, and special warfare training are allowed. Discharges incidental to underwater demolition and other in-water explosions are not allowed. Discharges must not result in a violation of the water quality objectives, including the protection of the marine aquatic life beneficial use, anywhere in the ASBS.

h. All other nonpoint source discharges not specifically authorized above are prohibited.

2. Planning and Reporting

a. The nonpoint source discharger shall develop an ASBS Pollution Prevention Plan, including an implementation schedule, to address storm water runoff and any other nonpoint source discharges from its facilities. The ASBS Pollution Prevention Plan must be equivalent in contents to an ASBS Compliance Plan as described in I (A)(2) in this document. The ASBS Pollution Prevention Plan is subject to approval by the Executive Director of the State Water Board (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements).

b. The ASBS Pollution Prevention Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff that are necessary to comply with these special conditions, will be achieved through Management Measures and associated Management Practices (Management Measures/Practices). Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director or Regional Water Board Executive Officer that such installation would pose a threat to health or safety. Management Measures to control storm water runoff during a design storm shall achieve on average the following target levels:

(1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

(2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges.

The baseline for these determinations is the effective date of the Exception, except for those structural BMPs installed between January 1, 2005 and adoption of these Special Protections, and the reductions must be achieved and documented within six (6) years of the effective date.

c. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff or other nonpoint source pollution is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and the Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents that alter natural water quality and the sources of these constituents.

(2) The report shall describe Management Measures/Practices that are currently being implemented, Management Measures/Practices that are identified in the ASBS Pollution Prevention Plan for future implementation, and any additional Management Measures/Practices that may be added to the Pollution Prevention Plan to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the Management Measures/Practices.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge

requirements), the discharger shall revise its ASBS Pollution Prevention Plan to incorporate any new or modified Management Measures/Practices that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised ASBS Pollution Prevention Plan, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural water quality conditions due to the same constituent.

(5) The requirements of this section are in addition to the terms, prohibitions, and conditions contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within eighteen (18) months from the effective date of the Exception, the discharger~~s~~ shall submit a draft written ASBS Pollution Prevention Plan to the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) that describes its strategy to comply with these special conditions, including the requirement to maintain natural ocean water quality in the affected ASBS. The Pollution Prevention Plan shall include a description of appropriate non-structural controls and a time schedule to implement structural controls to comply with these special conditions for inclusion in the discharger's Pollution Prevention Plan. The final ASBS Pollution Prevention Plan, including a description and final schedule for structural controls based on the results of runoff and receiving water monitoring, must be submitted within thirty (30) months from the effective date of the Exception.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these Special Protections shall be implemented.

d. Within six (6) years of the effective date of the Exception, any structural controls identified in the ASBS Pollution Prevention Plan that are necessary to comply with these special conditions shall be operational.

e. Within six (6) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) may only authorize additional time to comply

with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in (d.) or (e.). The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. a demonstration that the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or

2. for governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

II. ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES

In addition to the provisions in Section I (A) or I (B), respectively, a discharger with parks and recreation facilities shall comply with the following:

A. The discharger shall include a section in an ASBS Compliance Plan (for NPDES dischargers) or an ASBS Pollution Prevention Plan (for nonpoint source dischargers) to address storm water runoff from parks and recreation facilities.

1. The plan shall identify all pollutant sources, including sediment sources, which may result in waste entering storm water runoff. Pollutant sources include, but are not limited to, roadside rest areas and vistas, picnic areas, campgrounds, trash receptacles, maintenance facilities, park personnel housing, portable toilets, leach fields, fuel tanks, roads, piers, and boat launch facilities.

2. The plan shall describe BMPs or Management Measures/Practices that will be implemented to control soil erosion (both temporary and permanent erosion controls) and reduce or eliminate pollutants in storm water runoff in order to achieve and maintain natural water quality conditions in the affected ASBS. The plan shall include BMPs or Management Measures/Practices to ensure that trails and culverts are maintained to prevent erosion and minimize waste discharges to ASBS.

3. The plan shall include BMPs or Management Measures/Practices to prevent the discharge of pesticides or other chemicals, including agricultural chemicals, in storm water runoff to the affected ASBS.

4. The plan shall include BMPs or Management Measures/Practices that address public education and outreach. The goal of these BMPs or Management Measures/Practices is to ensure that the public is adequately informed that waste discharges to the affected ASBS are prohibited or limited by special conditions in these Special Protections. The BMPs or Management Measures/Practices shall include signage at camping, picnicking, beach and roadside parking areas, and visitor centers, or other appropriate measures, which notify the public of any applicable requirements of these Special Protections and identify the ASBS boundaries.

5. The plan shall include BMPs or Management Measures/Practices that address the prohibition against the discharge of trash to ASBS. The BMPs or Management Measures/Practices shall include measures to ensure that adequate trash receptacles are available for public use at visitor facilities, including parking areas, and that the receptacles are adequately maintained to prevent trash discharges into the ASBS. Appropriate measures include covering trash receptacles to prevent trash from being wind blown and periodically emptying the receptacles to prevent overflows.

6. The plan shall include BMPs or Management Measures/Practices to address runoff from parking areas and other developed features to ensure that the runoff does not alter natural water quality in the affected ASBS. BMPs or Management Measures/Practices shall include measures to reduce pollutant loading in runoff to the ASBS through installation of natural area buffers (LID), treatment, or other appropriate measures.

B. Maintenance and repair of park and recreation facilities must not result in waste discharges to the ASBS. The practice of road oiling must be minimized or eliminated, and must not result in waste discharges to the ASBS.

III. ADDITIONAL REQUIREMENTS – WATERFRONT AND MARINE OPERATIONS

In addition to the provisions in Section I (A) or I (B), respectively, a discharger with waterfront and marine operations shall comply with the following:

A. For discharges related to waterfront and marine operations, the discharger shall develop a Waterfront and Marine Operations Management Plan (Waterfront Plan). This plan shall contain appropriate Management Measures/Practices to address nonpoint source pollutant discharges to the affected ASBS.

1. The Waterfront Plan shall contain appropriate Management Measures/Practices for any waste discharges associated with the operation and maintenance of vessels, moorings, piers, launch ramps, and cleaning stations in order to ensure that beneficial uses are protected and natural water quality is maintained in the affected ASBS.

2. For discharges from marinas and recreational boating activities, the Waterfront Plan shall include appropriate Management Measures, described in The Plan for California's Nonpoint Source Pollution Control Program, for marinas and recreational boating, or equivalent practices, to ensure that nonpoint source pollutant discharges do not alter natural water quality in the affected ASBS.

3. The Waterfront Plan shall include Management Practices to address public education and outreach to ensure that the public is adequately informed that waste discharges to the affected ASBS are prohibited or limited by special conditions in these Special Protections. The management practices shall include appropriate signage, or similar measures, to inform the public of the ASBS restrictions and to identify the ASBS boundaries.

4. The Waterfront Plan shall include Management Practices to address the prohibition against trash discharges to ASBS. The Management Practices shall include the provision of adequate trash receptacles for marine recreation areas, including parking areas, launch ramps, and docks. The plan shall also include appropriate Management Practices to ensure that the receptacles are adequately maintained and secured in order to prevent trash discharges into the ASBS. Appropriate Management Practices include covering the trash receptacles to prevent trash from being windblown, staking or securing the trash receptacles so they don't tip over, and periodically emptying the receptacles to prevent overflow.

5. The discharger shall submit its Waterfront Plan to the by the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) within six months of the effective date of these special conditions. The Waterfront Plan is subject to approval by the State Water Board Executive Director or the Regional Water Board Executive Officer, as appropriate. The plan must be fully implemented within 18 months of the effective date of the Exception.

B. The discharge of chlorine, soaps, petroleum, other chemical contaminants, trash, fish offal, or human sewage to ASBS is prohibited. Sinks and fish cleaning stations are point source discharges of wastes and are prohibited from discharging into ASBS. Anthropogenic accumulations of discarded fouling organisms on the sea floor must be minimized.

C. Limited-term activities, such as the repair, renovation, or maintenance of waterfront facilities, including, but not limited to, piers, docks, moorings, and breakwaters, are authorized only in accordance with Chapter III.E.2 of the Ocean Plan.

D. If the discharger anticipates that the discharger will fail to fully implement the approved Waterfront Plan within the 18 month deadline, the discharger shall submit a technical report as soon as practicable to the State Water Board Executive Director or the Regional Water Board Executive Officer, as appropriate. The technical report shall contain reasons for failing to meet the deadline and propose a revised schedule to fully implement the plan.

E. The State Water Board or the Regional Water Board may, for good cause, authorize additional time to comply with the Waterfront Plan. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in Section III.A.5. The notice shall

describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality. The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. a demonstration of significant hardship by showing that the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate.

2. for governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

IV. MONITORING REQUIREMENTS

Monitoring is mandatory for all dischargers to assure compliance with the Ocean Plan. Monitoring requirements include both: (A) core discharge monitoring, and (B) ocean receiving water monitoring. The State and Regional Water Boards must approve sampling site locations and any adjustments to the monitoring programs. All ocean receiving water and reference area monitoring must be comparable with the Water Boards' Surface Water Ambient Monitoring Program (SWAMP).

Safety concerns: Sample locations and sampling periods must be determined considering safety issues. Sampling may be postponed upon notification to the State and Regional Water Boards if hazardous conditions prevail.

Analytical Chemistry Methods: All constituents must be analyzed using the lowest minimum detection limits comparable to the Ocean Plan water quality objectives. For metal analysis, all samples, including storm water effluent, reference samples, and ocean receiving water samples, must be analyzed by the approved analytical method with the lowest minimum detection limits (currently Inductively Coupled Plasma/Mass Spectrometry) described in the Ocean Plan.

A. CORE DISCHARGE MONITORING PROGRAM

1. General sampling requirements for timing and storm size:

   Runoff must be collected during a storm event that is greater than 0.1 inch and generates runoff, and at least 72 hours from the previously measurable storm event. Runoff samples shall be collected during the same storm and at approximately the same time when post-storm receiving water is sampled, and analyzed for the same constituents as receiving water and reference site samples (see section IV B) as described below.

2. Runoff flow measurements

   a. For municipal/industrial storm water outfalls in existence as of December 31, 2007,

18 inches (457mm) or greater in diameter/width (including multiple outfall pipes in combination having a width of 18 inches, runoff flows must be measured or calculated, using a method acceptable to and approved by the State and Regional Water Boards.

b. This will be reported annually for each precipitation season to the State and Regional Water Boards.

3. Runoff samples – storm events

a. For outfalls equal to or greater than 18 inches (0.46m) in diameter or width:

(1) samples of storm water runoff shall be collected during the same storm as receiving water samples and analyzed for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

(2) samples of storm water runoff shall be collected and analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

(3) If an applicant has no outfall greater than 36 inches, then storm water runoff from the applicant's largest outfall shall be further collected during the same storm as receiving water samples and analyzed for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates).

b. For outfalls equal to or greater than 36 inches (0.91m) in diameter or width:

(1) samples of storm water runoff shall be collected during the same storm as receiving water samples and analyzed for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

(2) samples of storm water runoff shall be further collected during the same storm as receiving water samples and analyzed for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates); and

(3) samples of storm water runoff shall be collected and analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

c. For an applicant not participating in a regional monitoring program [see below in Section IV (B)] in addition to (a.) and (b.) above, a minimum of the two largest outfalls or 20 percent of the larger outfalls, whichever is greater, shall be sampled (flow weighted composite samples) at least three times annually during wet weather (storm event) and analyzed for all Ocean Plan Table A constituents, Table B constituents for marine

aquatic life protection (except for toxicity, only chronic toxicity for three species shall be required), DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, and Ocean Plan indicator bacteria. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one (the largest) such discharge shall be sampled annually in each Region.

4. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may reduce or suspend core monitoring once the storm runoff is fully characterized. This determination may be made at any point after the discharge is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

B. Ocean Receiving Water and Reference Area Monitoring Program

In addition to performing the Core Discharge Monitoring Program in Section II.A above, all applicants having authorized discharges must perform ocean receiving water monitoring. In order to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS, dischargers may choose either (1) an individual monitoring program, or (2) participation in a regional integrated monitoring program.

1. Individual Monitoring Program: The requirements listed below are for those dischargers who elect to perform an individual monitoring program to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within the affected ASBS. In addition to Core Discharge Monitoring, the following additional monitoring requirements shall be met:

   a. Three times annually, during wet weather (storm events), the receiving water at the point of discharge from the outfalls described in section (IV)(A)(3)(c) above shall be sampled and analyzed for Ocean Plan Table A constituents, Table B constituents for marine aquatic life, DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, salinity, chronic toxicity (three species), and Ocean Plan indicator bacteria.

      The sample location for the ocean receiving water shall be in the surf zone at the point of discharges; this must be at the same location where storm water runoff is sampled. Receiving water shall be sampled prior to (pre-storm) and during (or immediately after) the same storm (post storm). Post storm sampling shall be during the same storm and at approximately the same time as when the runoff is sampled. Reference water quality shall also be sampled three times annually and analyzed for the same constituents pre-storm and post-storm, during the same storm seasons when receiving water is sampled. Reference stations will be determined by the State Water Board's Division of Water Quality and the applicable Regional Water Board(s).

   b. Sediment sampling shall occur at least three times during every five (5) year period. The subtidal sediment (sand or finer, if present) at the discharge shall be sampled and analyzed for Ocean Plan Table B constituents for marine aquatic life, DDT, PCBs, PAHs, pyrethroids, and OP pesticides. For sediment toxicity testing, only an acute toxicity test using the amphipod *Eohaustorius estuarius* must be performed.

c. A quantitative survey of intertidal benthic marine life shall be performed at the discharge and at a reference site. The survey shall be performed at least once every five (5) year period. The survey design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The results of the survey shall be completed and submitted to the State Water Board and Regional Water Board at least six months prior to the end of the permit cycle.

d. Once during each five (5) year period, a bioaccumulation study shall be conducted to determine the concentrations of metals and synthetic organic pollutants at representative discharge sites and at representative reference sites. The study design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The bioaccumulation study may include California mussels (*Mytilus californianus*) and/or sand crabs (*Emerita analoga* or *Blepharipoda occidentalis*). Based on the study results, the Regional Water Board and the State Water Board's Division of Water Quality, may adjust the study design in subsequent permits, or add or modify additional test organisms (such as shore crabs or fish), or modify the study design appropriate for the area and best available sensitive measures of contaminant exposure.

e. Marine Debris: Representative quantitative observations for trash by type and source shall be performed along the coast of the ASBS within the influence of the discharger's outfalls. The design, including locations and frequency, of the marine debris observations is subject to approval by the Regional Water Board and State Water Board's Division of Water Quality.

f. The monitoring requirements of the Individual Monitoring Program in this section are minimum requirements. After a minimum of one (1) year of continuous water quality monitoring of the discharges and ocean receiving waters, the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may require additional monitoring, or adjust, reduce or suspend receiving water and reference station monitoring. This determination may be made at any point after the discharge and receiving water is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

2. Regional Integrated Monitoring Program: Dischargers may elect to participate in a regional integrated monitoring program, in lieu of an individual monitoring program, to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS. This regional approach shall characterize natural water quality, pre- and post-storm, in ocean reference areas near the mouths of identified open space watersheds and the effects of the discharges on natural water quality (physical, chemical, and toxicity) in the ASBS receiving waters, and should include benthic marine aquatic life and bioaccumulation components. The design of the ASBS stratum of a regional integrated monitoring program may deviate from the otherwise prescribed individual monitoring approach (in Section IV.B.1) if approved by the State Water Board's Division of Water Quality and the Regional Water Boards.

a. Ocean reference areas shall be located at the drainages of flowing watersheds with minimal development (in no instance more than 10% development), and shall not be located in CWA Section 303(d) listed waterbodies or have tributaries that are 303(d) listed. Reference areas shall be free of wastewater discharges and anthropogenic non- storm water runoff. A minimum of low threat storm runoff discharges (e.g.

stream highway overpasses and campgrounds) may be allowed on a case-by-case basis. Reference areas shall be located in the same region as the ASBS receiving water monitoring occurs. The reference areas for each Region are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean reference water samples must be collected from each station, each from a separate storm during the same storm season that receiving water is sampled. A minimum of one reference location shall be sampled for each ASBS receiving water site sampled per responsible party. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

b. ASBS ocean receiving water must be sampled in the surf zone at the location where the runoff makes contact with ocean water (i.e. at "point zero"). Ocean receiving water stations must be representative of worst-case discharge conditions (i.e. co-located at a large drain greater than 36 inches, or if drains greater than 36 inches are not present in the ASBS then the largest drain greater than18 inches.) Ocean receiving water stations are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean receiving water samples must be collected during each storm season from each station, each from a separate storm. A minimum of one receiving water location shall be sampled in each ASBS per responsible party in that ASBS. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

c. Reference and receiving water sampling shall commence during the first full storm season following the adoption of these special conditions, and post-storm samples shall be collected during the same storm event when storm water runoff is sampled. Sampling shall occur in a minimum of two storm seasons. For those ASBS dischargers that have already participated in the Southern California Bight 2008 ASBS regional monitoring effort, sampling may be limited to only one storm season.

d. Receiving water and reference samples shall be analyzed for the same constituents as storm water runoff samples. At a minimum, constituents to be sampled and analyzed in reference and discharge receiving waters must include oil and grease, total suspended solids, Ocean Plan Table B metals for protection of marine life, Ocean Plan PAHs, pyrethroids, OP pesticides, ammonia, nitrate, phosphates, and critical life stage chronic toxicity for three species. In addition, within the range of the southern sea otter, indicator bacteria or some other measure of fecal contamination shall be analyzed.

3. Waterfront and Marine Operations: In addition to the above requirements for ocean receiving water monitoring, additional monitoring must be performed for marinas and boat launch and pier facilities:

a. For all marina or mooring field operators, in mooring fields with 10 or more occupied moorings, the ocean receiving water must be sampled for Ocean Plan indicator bacteria, residual chlorine, copper, zinc, grease and oil, methylene blue active substances (MBAS), and ammonia nitrogen.

(1) For mooring field operators opting for an individual monitoring program (Section IV.B.1 above), this sampling must occur weekly (on the weekend) from May through October.

(2) For mooring field operators opting to participate in a regional integrated monitoring program (Section IV.B.2 above), this sampling must occur monthly from May through October on a high use weekend in each month. The Water Boards may allow a reduction in the frequency of sampling, through the regional monitoring program, after the first year of monitoring.

b. For all mooring field operators, the subtidal sediment (sand or finer, if present) within mooring fields and below piers shall be sampled and analyzed for Ocean Plan Table B metals (for marine aquatic life beneficial use), acute toxicity, PAHs, and tributyltin. For sediment toxicity testing, only an acute toxicity test using the amphipod *Eohaustorius estuarius* must be performed. This sampling shall occur at least three times during a five (5) year period. For mooring field operators opting to participate in a regional integrated monitoring program, the Water Boards may allow a reduction in the frequency of sampling after the first sampling effort's results are assessed.

Glossary

At the point of discharge(s) – Means in the surf zone immediately where runoff from an outfall meets the ocean water (a.k.a., at point zero).

Areas of Special Biological Significance (ASBS) – Those areas designated by the State Water Board as ocean areas requiring protection of species or biological communities to the extent that alteration of natural water quality is undesirable. All Areas of Special Biological Significance are also classified as a subset of State Water Quality Protection Areas.

Design storm – For purposes of these Special Protections, a design storm is defined as the volume of runoff produced from one inch of precipitation per day or, if this definition is inconsistent with the discharger's applicable storm water permit, then the design storm shall be the definition included in the discharger's applicable storm water permit.

Development – Relevant to reference monitoring sites, means urban, industrial, agricultural, grazing, mining, and timber harvesting land uses.

Higher threat discharges - Permitted storm drains discharging equal to or greater than 18 inches, industrial storm drains, agricultural runoff discharged through an MS4, discharges associated with waterfront and marina operations (e.g., piers, launch ramps, mooring fields, and associated vessel support activities, except for passive discharges defined below), and direct discharges associated with commercial or industrial activities to ASBS.

Low Impact Development (LID) – A sustainable practice that benefits water supply and contributes to water quality protection. Unlike traditional storm water management, which entails collecting and conveying storm water runoff through storm drains, pipes, or other conveyances to a centralized storm water facility, LID focuses on using site design and storm water management to maintain the site's pre-development runoff rates and volumes. The goal of LID is to mimic a site's predevelopment hydrology by using design techniques that infiltrate, filter, store, evaporate, and detain runoff close to the source of rainfall.

Marine Operations – Marinas or mooring fields that contain slips or mooring locations for 10 or more vessels.

Management Measure (MM) - Economically achievable measures for the control of the addition of pollutants from various classes of nonpoint sources of pollution, which reflect the greatest degree of pollutant reduction achievable through the application of the best available nonpoint pollution control practices, technologies, processes, siting criteria, operating methods, or other alternatives. For example, in the "marinas and recreational boating" land- use category specified in the Plan for California's Nonpoint Source Pollution Control Program (NPS Program Plan) (SWRCB, 1999), "boat cleaning and maintenance" is considered a MM or the source of a specific class or type of NPS pollution.

Management Practice (MP) - The practices (e.g., structural, non-structural, operational, or other alternatives) that can be used either individually or in combination to address a specific MM class or classes of NPS pollution. For example, for the "boat cleaning and maintenance" MM, specific MPs can include, but are not limited to, methods for the selection of environmentally sensitive hull paints or methods for cleaning/removal of hull copper anti- fouling paints.

Municipal Separate Storm Sewer System (MS4) – A municipally-owned storm sewer system regulated under the Phase I or Phase II storm water program implemented in compliance with Clean Water Act section 402(p). Note that an MS4 program's boundaries are not necessarily congruent with the permittee's political boundaries.

Natural Ocean Water Quality - The water quality (based on selected physical, chemical and biological characteristics) that is required to sustain marine ecosystems, and which is without apparent human influence, *i.e.*, an absence of significant amounts of: (a) man-made constituents (*e.g.,* DDT); (b) other chemical (*e.g.,* trace metals), physical (temperature/thermal pollution, sediment burial), and biological (*e.g.*, bacteria) constituents at concentrations that have been elevated due to man's activities above those resulting from the naturally occurring processes that affect the area in question; and (c) non-indigenous biota (*e.g.,* invasive algal bloom species) that have been introduced either deliberately or accidentally by man. Discharges "*shall not alter natural ocean water quality*" as determined by a comparison to the range of constituent concentrations in reference areas agreed upon via the regional monitoring program(s). If monitoring information indicates that *natural ocean water quality* is not maintained, but there is sufficient evidence that a discharge is not contributing to the alteration of natural water quality, then the Regional Water Board may make that determination. In this case, sufficient information must include runoff sample data that has equal or lower concentrations for the range of constituents at the applicable reference area(s).

Nonpoint source – Nonpoint pollution sources generally are sources that do not meet the definition of a point source. Nonpoint source pollution typically results from land runoff, precipitation, atmospheric deposition, agricultural drainage, marine/boating operations or hydrologic modification. Nonpoint sources, for purposes of these Special Protections, include discharges that are not required to be regulated under an NPDES permit.

Non-storm water discharge – Any runoff that is not the result of a precipitation event. This is often referred to as "dry weather flow."

Non-structural control – A Best Management Practice that involves operational, maintenance, regulatory (e.g., ordinances) or educational activities designed to reduce or eliminate pollutants in runoff, and that are not structural controls (i.e. there are no physical structures involved).

Physical impossibility - Means any act of God, war, fire, earthquake, windstorm, flood or natural catastrophe; unexpected and unintended accidents not caused by discharger or its employees' negligence; civil disturbance, vandalism, sabotage or terrorism; restrain by court order or public authority or agency; or action or non-action by, or inability to

obtain the necessary authorizations or approvals from any governmental agency other than the permittee.

Representative sites and monitoring procedures – Are to be proposed by the discharger, with appropriate rationale, and subject to approval by Water Board staff.

Sheet-flow – Runoff that flows across land surfaces at a shallow depth relative to the cross- sectional width of the flow. These types of flow may or may not enter a storm drain system before discharge to receiving waters.

Storm Season – Also referred to as rainy season, means the months of the year from the onset of rainfall during autumn until the cessation of rainfall in the spring.

Structural control – A Best Management Practice that involves the installation of engineering solutions to the physical treatment or infiltration of runoff.

Surf Zone - The surf zone is defined as the submerged area between the breaking waves and the shoreline at any one time.

Surface Water Ambient Monitoring Program (SWAMP) comparable – Means that the monitoring program must 1) meet or exceed 2008 SWAMP Quality Assurance Program Management Plan (QAPP) Measurement Quality Objectives, or 2) have a Quality Assurance Project Plan that has been approved by SWAMP; in addition data must be formatted to match the database requirements of the SWAMP Information Management System. Adherence to the measurement quality objectives in the Southern California Bight 2008 ASBS Regional Monitoring Program QAPP and data base management comprises being SWAMP comparable.

Waterfront Operations - Piers, launch ramps, and cleaning stations in the water or on the adjacent shoreline.

Attachment 1
Special Protections Sections I(A)(3)(e) and I(B)(3)(e)
Flowchart to Determine Compliance with natural Water Quality

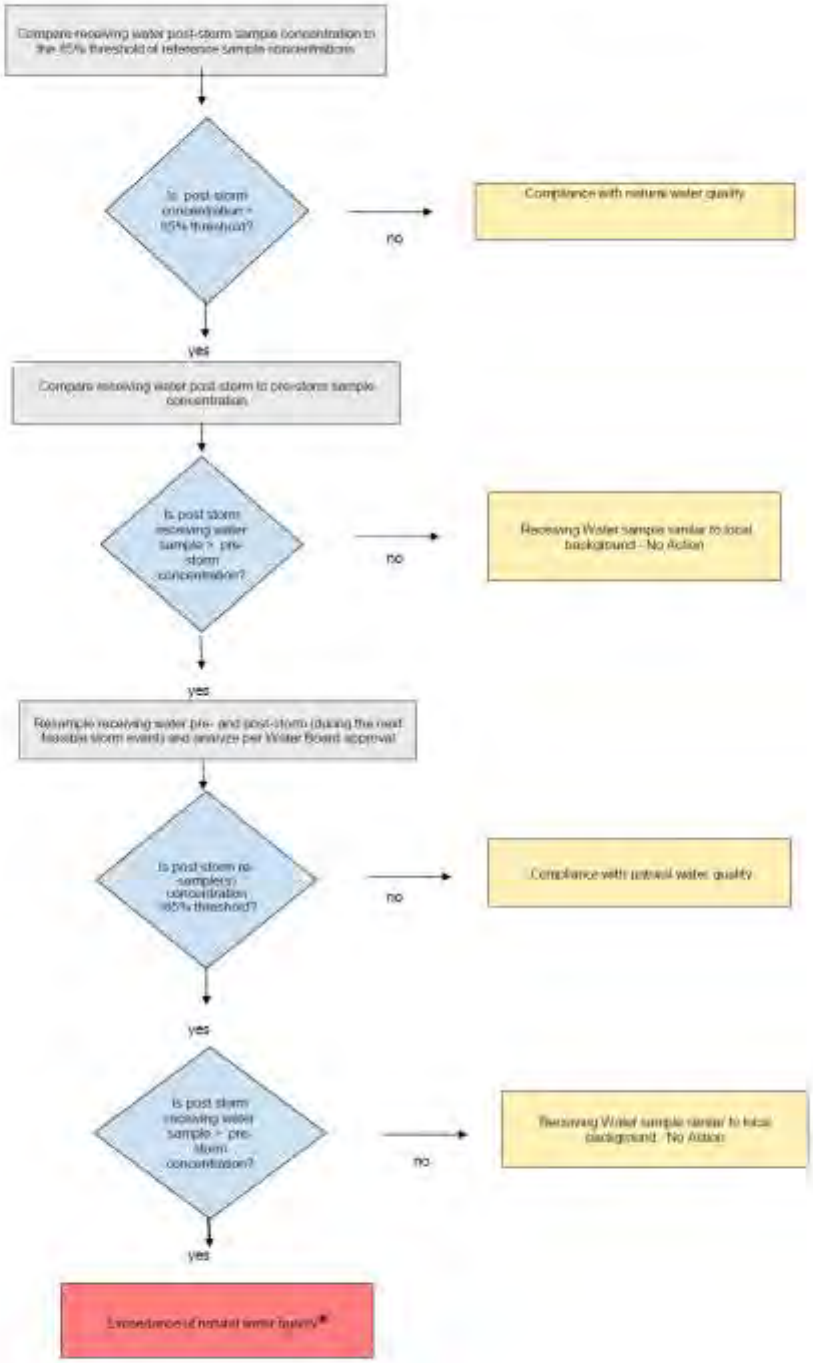

* When an exceedance of natural water quality occurs, the discharger must comply with section I.A.2.h (for permitted storm water) or section I.B.2.c (for nonpoint sources). Note, when sampling data is available, end-of-pipe effluent concentrations will be considered by the Water Boards in making this determination.

ATTACHMENT B

STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

1. Standard Permit Provisions

Code of Federal Regulations Title 40 Section 122.41 (40 CFR 122.41) includes conditions, or provisions, that apply to all National Pollutant Discharge Elimination System (NPDES) permits. Additional provisions applicable to NPDES permits are in 40 CFR 122.42. All applicable provisions in 40 CFR 122.41 and 40 CFR 122.42 must be incorporated into this Order and NPDES permit. The applicable 40 CFR 122.41 and 40 CFR 122.42 provisions are as follows:

a. DUTY TO COMPLY [40 CFR 122.41(a)]

The Copermittee must comply with all of the provisions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

(1) The Copermittee must comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement. [40 CFR 122.41(a)(1)]

(2) The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to a civil penalty not to exceed $25,000 per day for each violation. The CWA provides that any person who *negligently* violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than 2 years, or both. Any person who *knowingly* violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both. Any person who knowingly violates Section 301, 302, 303, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, and who knows at that time that he thereby places another person in imminent

danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.
[40 CFR 122.41(a)(2)]

(3) Any person may be assessed an administrative penalty by the San Diego Regional Water Quality Control Board (San Diego Water Board), State Water Resources Control Board (State Water Board), or United States Environmental Protection Agency (USEPA) for violating Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.
[40 CFR 122.41(a)(3)]

b. DUTY TO REAPPLY [40 CFR 122.41(b)]

If a Copermittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Copermittee must apply for and obtain a new permit.

c. NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE [40 CFR 122.41(c)]

It shall not be a defense for a Copermittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

d. DUTY TO MITIGATE [40 CFR 122.41(d)]

The Copermittee must take all reasonable steps to minimize or prevent any discharge or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

e. PROPER OPERATION AND MAINTENANCE [40 CFR 122.41(e)]

The Copermittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Copermittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by a Copermittee only when the operation is necessary to achieve compliance with the conditions of this permit.

f. PERMIT ACTIONS [40 CFR 122.41(f)]

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Copermittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

g. PROPERTY RIGHTS [40 CFR 122.41(g)]

This permit does not convey any property rights of any sort, or any exclusive privilege.

h. DUTY TO PROVIDE INFORMATION [40 CFR 122.41(h)]

The Copermittee must furnish to the San Diego Water Board, State Water Board, or USEPA within a reasonable time, any information which the San Diego Water Board, State Water Board, or USPEA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Copermittee must also furnish to the San Diego Water Board, State Water Board, or USPEA upon request, copies of records required to be kept by this permit.

i. INSPECTION AND ENTRY [40 CFR 122.41(i)]

The Copermittee must allow the San Diego Water Board, State Water Board, USEPA, and/or their authorized representative (including an authorized contractor acting as their representative), upon presentation of credentials and other documents as may be required by law, to:

(1) Enter upon the Copermittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit; [40 CFR 122.41(i)(1)]

(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit; [40 CFR 122.41(i)(2)]

(3) Inspect and photograph at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; [40 CFR 122.41(i)(3)] and

(4) Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location. [40 CFR 122.41(i)(4)]

j. MONITORING AND RECORDS [40 CFR 122.41(j)]

(1) Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity. [40 CFR 122.41(j)(1)]

(2) Except for records of monitoring information required by this permit related to the Copermittee's sewage sludge use and disposal activities, which shall be retained for

a period of at least five (5) years (or longer as required by 40 CFR Part 503), the Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time. [40 CFR 122.41(j)(2)]

(3) Records for monitoring information must include: [40 CFR 122.41(j)(3)]

(a) The date, exact place, and time of sampling or measurements; [40 CFR 122.41(j)(3)(i)]
(b) The individual(s) who performed the sampling or measurements; [40 CFR 122.41(j)(3)(ii)]
(c) The date(s) analyses were performed; [40 CFR 122.41(j)(3)(iii)]
(d) The individual(s) who performed the analyses; [40 CFR 122.41(j)(3)(iv)]
(e) The analytical techniques or methods used; [40 CFR 122.41(j)(3)(v)] and
(f) The results of such analyses. [40 CFR 122.41(j)(3)(vi)]

(4) Monitoring must be conducted according to test procedures under 40 CFR Part 136 unless another method is required under 40 CFR Subchapters N or O. [40 CFR 122.41(j)(4)]

In the case of pollutants for which there are no approved methods under 40 CFR Part 136 or otherwise required under 40 CFR Subchapters N and O, monitoring must be conducted according to a test procedure specified in the permit for such pollutants. [40 CFR 122.44(i)(1)(iv)]

(5) The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. [40 CFR 122.41(j)(5)]

k. SIGNATORY REQUIREMENT [40 CFR 122.41(k)]

(1) All applications, reports, or information submitted to the San Diego Water Board, State Water Board, or USEPA must be signed and certified. (See 40 CFR 122.22) [40 CFR 122.41(k)(1)]

(a) *For a municipality, State, Federal, or other public agency.* [All applications must be signed] by either a principal executive officer or ranking elected official. [40 CFR 122.22(a)(3)]

(b) All reports required by permits, and other information requested by the San Diego Water Board, State Water Board, or USEPA must be signed by a person described in paragraph (a) of this section, or by a duly authorized

representative of that person. A person is a duly authorized representative only if: [40 CFR 122.22(b)]

(i) The authorization is made in writing by a person described in paragraph (a) of this section; [40 CFR 122.22(b)(1)]

(ii) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company, (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) [40 CFR 122.22(b)(2)] and,

(iii) The written authorization is submitted to the San Diego Water Board and State Water Board. [40 CFR 122.22(b)(3)]

(c) *Changes to authorization.* If an authorization under paragraph (b) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (b) of this section must be submitted to the San Diego Water Board prior to or together with any reports, information, or applications to be signed by an authorized representative. [40 CFR 122.22(c)]

(d) *Certification.* Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." [40 CFR 122.22(d)]

(2) The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both. [40 CFR 122.41(k)(2)]

I. REPORTING REQUIREMENTS [40 CFR 122.41(l)]

(1) *Planned changes.* The Copermittee must give notice to the San Diego Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when: [40 CFR 122.41(l)(1)]

(a) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); [40 CFR 122.41(l)(1)(i)] or

(b) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1). [40 CFR 122.41(l)(1)(ii)]

(c) The alteration or addition results in a significant change in the Copermittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. [40 CFR 122.41(l)(1)(iii)]

(2) *Anticipated noncompliance*. The Copermittee must give advance notice to the San Diego Water Board or State Water Board of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements. [40 CFR 122.41(l)(2)]

(3) *Transfers*. This permit is not transferable to any person except after notice to the San Diego Water Board. The San Diego Water Board may require modification or revocation and reissuance of the permit to change the name of the Copermittee and incorporate such other requirements as may be necessary under the CWA. [40 CFR 122.41(l)(3)]

(4) *Monitoring reports.* Monitoring results must be reported at the intervals specified elsewhere in this permit. [40 CFR 122.41(l)(4)]

(a) Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the San Diego Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices. [40 CFR 122.41(l)(4)(i)]

(b) If the Copermittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or another method required for an industry-specific waste stream under 40 CFR Subchapters N or O, the results of this monitoring must be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the San Diego Water Board or State Water Board. [40 CFR 122.41(l)(4)(ii)]

(c) Calculations for all limitations which require averaging of measurements must utilize an arithmetic mean unless otherwise specified in the permit. [40 CFR 122.41(l)(4)(iii)]

(5) *Compliance schedules*. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date. [40 CFR 122.41(l)(5)]

(6) *Twenty-four hour reporting.*

(a) The Copermittee must report any noncompliance that may endanger health or the environment. Any information must be provided orally within 24 hours from the time the Copermittee becomes aware of the circumstances. A written submission must also be provided within five (5) days of the time the Copermittee becomes aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6)(i)]

(b) The following must be included as information which must be reported within 24 hours under this paragraph: [40 CFR 122.41(l)(6)(ii)]

(i) Any unanticipated bypass that exceeds any effluent limitation in the permit (See 40 CFR 122.41(g)). [40 CFR 122.41(l)(6)(ii)(A)]
(ii) Any upset which exceeds any effluent limitation in the permit. [40 CFR 122.41(l)(6)(ii)(B)] and,
(iii) Violation of a maximum daily discharge limitation for any of the pollutants listed by the San Diego Water Board in the permit to be reported within 24 hours. (See 40 CFR 122.44(g)) [40 CFR 122.41(l)(6)(ii)(C)]

(c) The San Diego Water Board may waive the above-required written report on a case-by-case basis if the oral report has been received within 24 hours. [40 CFR 122.41(l)(6)(iii)]

(7) *Other noncompliance.* The Copermittee must report all instances of noncompliance not reported in accordance with the standard provisions required under 40 CFR 122.41(l)(4), (5), and (6), at the time monitoring reports are submitted. The reports must contain the information listed in the standard provisions required under 40 CFR 122.41(l)(6). [40 CFR 122.41(l)(7))]

(8) *Other information.* When the Copermittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the San Diego Water Board, State Water Board, or USEPA, the Copermittee must promptly submit such facts or information. [40 CFR 122.41(l)(8)]

m. BYPASS [40 CFR 122.41(m)]

(1) *Definitions.*

(a) "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. [40 CFR 122.41(m)(1)(i)] or

(b) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or

substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
[40 CFR 122.41(m)(1)(ii)]

(2) *Bypass not exceeding limitations*. The Copermittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the standard provisions required under 40 CFR 122.41(m)(3) and (4).
[40 CFR 122.41(m)(2)]

(3) *Notice.*

(a) *Anticipated bypass*. If the Copermittee knows in advance of the need for a bypass, it must submit a notice, if possible at least ten days before the date of the bypass. [40 CFR 122.41(m)(3)(i)] or

(b) *Unanticipated bypass*. The Copermittee must submit notice of an unanticipated bypass in accordance with the standard provisions required under 40 CFR 122.41(l)(6) (24-hour notice).
[40 CFR 122.41(m)(3)(ii)]

(4) *Prohibition of Bypass.*

(a) Bypass is prohibited, and the San Diego Water Board may take enforcement action against a Copermittee for bypass, unless:
[40 CFR 122.41(m)(4)(i)]

(i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; [40 CFR 122.41(m)(4)(i)(A)]
(ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance;
[40 CFR 122.41(m)(4)(i)(B)] and,
(iii) The Copermittee submitted notice in accordance with the standard provisions required under 40 CFR 122.41(m)(3).
[40 CFR 122.41(m)(4)(i)(C)]

(b) The San Diego Water Board may approve an anticipated bypass, after considering its adverse effects, if the San Diego Water Board determines that it will meet the three conditions listed above.
[40 CFR 122.41(m)(4)(ii)]

n. UPSET [40 CFR 122.41(n)]

(1) *Definition.* "Upset" means an exceptional incident in which there is unintentional and

temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Copermittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. [40 CFR 122.41(n)(1)]

(2) *Effect of an upset*. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the standard provisions required under 40 CFR 122.41(n)(3) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. [40 CFR 122.41(n)(2)]

(3) *Conditions necessary for a demonstration of upset*. A Copermittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that: [40 CFR 122.41(n)(3)]

(a) An upset occurred and that the Copermittee can identify the cause(s) of the upset; [40 CFR 122.41(n)(3)(i)]
(b) The permitted facility was at the time being properly operated; [40 CFR 122.41(n)(3)(ii)] and
(c) The Copermittee submitted notice of the upset in accordance with the standard provisions required under 40 CFR 122.41(l)(6)(ii)(B) (24-hour notice). [40 CFR 122.41(n)(3)(iii)]
(d) The Copermittee complied with any remedial measures pursuant to the standard provisions required under 40 CFR 122.41(d). [40 CFR 122.41(n)(3)(iii)]

(4) *Burden of proof*. In any enforcement proceeding, the Copermittee seeking to establish the occurrence of an upset has the burden of proof. [40 CFR 122.41(n)(4)]

o. STANDARD PERMIT PROVISIONS FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS [40 CFR 122.42(c)]

The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the San Diego Water Board or State Water Board under 40 CFR 122.26(a)(1)(v) must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report must include:

(1) The status of implementing the components of the storm water management program that are established as permit conditions; [40 CFR 122.42(c)(1)]

(2) Proposed changes to the storm water management programs that are established as permit conditions. Such proposed changes must be consistent with 40 CFR 122.26(d)(2)(iii); [40 CFR 122.42(c)(2)] and

(3) Revisions, if necessary, to the assessment of controls and the fiscal analysis

reported in the permit application under 40 CFR 122.26(d)(2)(iv) and (v); [40 CFR 122.42(c)(3)]

(4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; [40 CFR 122.42(c)(4)]

(5) Annual expenditures and budget for year following each annual report; [40 CFR 122.42(c)(5)]

(6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; [40 CFR 122.42(c)(6)]

(7) Identification of water quality improvements or degradation. [40 CFR 122.42(c)(7)]

p. STANDARD PERMIT PROVISIONS FOR STORM WATER DISCHARGES [40 CFR 122.42(d)]

The initial permits for discharges composed entirely of storm water issued pursuant to 40 CFR 122.26(e)(7) must require compliance with the conditions of the permit as expeditiously as practicable, but in no event later than three years after the date of issuance of the permit.

2. General Provisions

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. The general provisions applicable to this Order and NPDES permit are as follows:

a. DISCHARGE OF WASTE IS A PRIVILEGE

No discharge of waste into the waters of the State, whether or not such discharge is made pursuant to waste discharge requirements, shall create a vested right to continue such discharge. All discharges of waste into waters of the State are privileges, not rights. [CWC Section 13263(g)]

b. DURATION OF ORDER AND NPDES PERMIT

(1) *Effective date*. This Order supersedes Order No. R9-2007-0001 for the San Diego County Copermittees listed in Table ~~2.~~1a and became effective on June 27, 2013~~ for those Copermittees~~. This Order as amended by Order R9-2015-0001 supersedes Order No. R9-2009-0002 for the Orange County Copermittees listed in Table 1b and its amendments through Order No. R9-2015-0001 ~~becomes~~ became effective April 1, 2015~~, following the date Order No. R9-2015-0001 is adopted~~. This Order as amended by Order Nos. R9-2015-0001 and R9-2015-0100 supersedes Order No. R9-2010-0016 for the Riverside County Copermittees listed in Table 1c and its amendments through Order No. R9-2015-0100 became effective January 7, 2016. ~~upon further amendment or earlier notice of coverage.~~

(2) *Expiration*. This Order and NPDES permit expires five years after June 27, 2013, its initial effective date. [40 CFR 122.46(a)]

(3) *Continuation of expired order*. After this Order and NPDES permit expires, the terms and conditions of this Order and NPDES permit are automatically continued pending issuance of a new permit if all requirements of the federal NPDES regulations on the continuation of expired permits (40 CFR 122.6) are complied with.

c. AVAILABILITY

A copy of this Order must be kept at a readily accessible location and must be available to on-site personnel at all times.

d. CONFIDENTIALITY OF INFORMATION

Except as provided for in 40 CFR 122.7, no information or documents submitted in accordance with or in application for this Order will be considered confidential, and all such information and documents shall be available for review by the public at the San Diego Water Board office.

Claims of confidentiality for the following information will be denied:
[40 CFR 122.7(b)]

(1) The name and address of any permit applicant or Copermittee; [40 CFR 122.7(b)(1)] and

(2) Permit applications and attachments, permits, and effluent data. [40 CFR 122.7(b)(2)]

e. EFFLUENT LIMITATIONS

(1) *Interim effluent limitations*. The Copermittee must comply with any interim effluent limitations as established by addendum, enforcement action, or revised waste discharge requirements which have been, or may be, adopted by the San Diego Water Board.

(2) *Other effluent limitations and standards*. If any applicable toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant and that standard or prohibition is more stringent than any limitation on the pollutant in the permit, the San Diego Water Board shall institute proceedings under these regulations to modify or revoke and reissue the permit to conform to the toxic effluent standard or prohibition. [40 CFR 122.44(b)(1)]

f. DUTY TO MINIMIZE OR CORRECT ADVERSE IMPACTS

The Copermittee must take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this Order, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the noncompliance.

g. PERMIT ACTIONS

The filing of a request by the Copermittee for modification, revocation and reissuance, or termination of this Order, or a notification of planned change in or anticipated noncompliance with this Order does not stay any condition of this Order. (See 40 CFR 122.41(f)) In addition, the following provisions apply to this Order:

(1) Upon application by any affected person, or on its own motion, the San Diego Water Board may review and revise the requirements in this Order. All requirements must be reviewed periodically. [CWC Section 13263(e)]

(2) This Order may be terminated or modified for cause, including, but not limited to, all of the following: [CWC Section 13381]

(a) Violation of any condition contained in the requirements of this Order. [CWC Section 13381(a)]

(b) Obtaining the requirements in this Order by misrepresentation, or failure to disclose fully all relevant facts. [CWC Section 13381(b)]

(c) A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge. [CWC Section 13381(c)]

(3) When this Order is transferred to a new owner or operator, such requirements as may be necessary under the CWC may be incorporated into this Order.

h. NPDES PERMITTED NON-STORM WATER DISCHARGES

The San Diego Water Board has, in prior years, issued a limited number of individual NPDES permits for non-storm water discharges to MS4s. The San Diego Water Board or State Water Board may in the future, upon prior notice to the Copermittee(s), issue an NPDES permit for any non-storm water discharge (or class of non-storm water discharges) to an MS4.

i. MONITORING

In addition to the standard provisions required under 40 CFR 122.41(j) and (l)(4), the following general monitoring provisions apply to this Order:

(1) Where procedures are not otherwise specified in Order, sampling, analysis and quality assurance/quality control must be conducted in accordance with the Quality Assurance Management Plan (QAMP) for the State of California's Surface Water Ambient Monitoring Program (SWAMP), adopted by the State Water Resources Control Board (State Water Board).

(2) Pursuant to 40 CFR 122.41(j)(2) and CWC Section 13383(a), each Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring

instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five (5) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time.

(3) All chemical, bacteriological, and toxicity analyses must be conducted at a laboratory certified for such analyses by the California Department of Public Health or a laboratory approved by the San Diego Water Board.

(4) For priority toxic pollutants that are identified in the California Toxics Rule (CTR) (65 Fed. Reg. 31682), the Copermittees must instruct their laboratories to establish calibration standards that are equivalent to or lower than the Minimum Levels (MLs) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP). If a Copermittee can demonstrate that a particular ML is not attainable, in accordance with procedures set forth in 40 CFR Part 136, the lowest quantifiable concentration of the lowest calibration standard analyzed by a specific analytical procedure (assuming that all the method specified sample weights, volumes, and processing steps have been followed) may be used instead of the ML listed in Appendix 4 of the SIP. The Copermittee must submit documentation from the laboratory to the San Diego Water Board for approval prior to raising the ML for any priority toxic pollutant.

j. ENFORCEMENT

(1) The San Diego Water Board is authorized to enforce the terms of this Order under several provisions of the CWC, including, but not limited to, CWC Sections 13385, 13386, and 13387.

(2) Nothing in this Order shall be construed to protect the Copermittee from its liabilities under federal, state, or local laws.

(3) The CWC provides for civil and criminal penalties comparable to, and in some cases greater than, those provided for under the CWA.

(4) Except as provided in the standard conditions required under 40 CFR 122.41(m) and (n), nothing in this Order shall be construed to relieve the Copermittee from civil or criminal penalties for noncompliance.

(5) Nothing in this Order shall be construed to preclude the institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties to which the Copermittee is or may be subject to under Section 311 of the CWA.

(6) Nothing in this Order shall be construed to preclude institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authoring preserved by Section 510 of the CWA.

k. SEVERABILITY

The provisions of this Order are severable, and if any provision of this Order, or the application of any provisions of this Order to any circumstance, is held invalid, the

application of such provision to other circumstances and the remainder of this Order shall not be affected thereby.

l. APPLICATIONS

Any application submitted by a Copermittee for reissuance or modification of this Order must satisfy all applicable requirements specified in federal regulations as well as any additional requirements for submittal of a Report of Waste Discharge specified in the CWC and the California Code of Regulations.

m. IMPLEMENTATION

All plans, reports and subsequent amendments submitted in compliance with this Order must be implemented immediately (or as otherwise specified). All submittals by Copermittees must be adequate to implement the requirements of this Order.

n. REPORT SUBMITTALS

(1) All report submittals must include an executive summary, introduction, conclusion, recommendations, and signed certified statement.

(2) Each Copermittee must submit a signed certified statement covering its responsibilities for each applicable submittal.

(3) The Principal Watershed Copermittee(s) must submit a signed certified statement covering its responsibilities for each applicable submittal and the sections of the submittals for which it is responsible.

(4) Unless otherwise directed, the Copermittees must submit ~~one hard copy and~~ one electronic copy of each report required under this Order to the San Diego Water Board at SanDiego@waterboards.ca.gov~~, and one electronic copy to the USEPA~~.

(5) When hard copies are requested or required, ~~T~~the Copermittees must submit reports and provide notifications as required by this Order to ~~the following~~:

EXECUTIVE OFFICER
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
2375 NORTHSIDE DRIVE, SUITE 100
SAN DIEGO CA 92108
Telephone: (619) 516-1990 Fax: (619) 516-1994

~~EUGENE BROMLEY~~
~~US ENVIRONMENTAL PROTECTION AGENCY~~
~~REGION IX~~
~~PERMITS ISSUANCE SECTION (W-5-1)~~
~~75 HAWTHORNE STREET~~
~~SAN FRANCISCO CA 94105~~

ATTACHMENT C

ACRONYMS AND ABBREVIATIONS

AMAL	Average Monthly Action Level
ASBS	Area(s) of Special Biological Significance
BMP	Best Management Practice
Basin Plan	Water Quality Control Plan for the San Diego Basin
CEQA	California Environmental Quality Act
CCR	California Code of Regulations
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWC	California Water Code
CZARA	Coastal Zone Act Reauthorization Amendments of 1990
ESAs	Environmentally Sensitive Areas
GIS	Geographic Information System
IBI	Index of Biological Integrity
LID	Low Impact Development
MDAL	Maximum Daily Action Level
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
NAL	Non-Storm Water Action Level
NAICS	North American Industry Classification System
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
ROWD	Report of Waste Discharge (application for NPDES reissuance)
SAL	Storm Water Action Level
San Diego Water Board	California Regional Water Quality Control Board, San Diego Region
SIC	Standard Industrial Classification Code
State Water Board	State Water Resources Control Board
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
WDID	Waste Discharge Identification Number
WLA	Waste Load Allocation
WQBEL	Water Quality Based Effluent Limitation

DEFINITIONS

Active/Passive Sediment Treatment - Using mechanical, electrical or chemical means to flocculate or coagulate suspended sediment for removal from runoff from construction sites prior to discharge.

Anthropogenic Litter – Trash generated from human activities, not including sediment.

Average Monthly Action Level – The highest allowable average of daily discharges over a calendar month.

Beneficial Uses - The uses of water necessary for the survival or wellbeing of man, plants, and wildlife. These uses of water serve to promote tangible and intangible economic, social, and environmental goals. "Beneficial Uses" of the waters of the State that may be protected include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. Existing beneficial uses are uses that were attained in the surface or ground water on or after November 28, 1975; and potential beneficial uses are uses that would probably develop in future years through the implementation of various control measures. "Beneficial Uses" are equivalent to "Designated Uses" under federal law. [California Water Code Section 13050(f)].

Best Management Practices (BMPs) - Defined in 40 CFR 122.2 as schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Bioassessment - The use of biological community information to evaluate the biological integrity of a water body and its watershed. With respect to aquatic ecosystems, bioassessment is the collection and analysis of samples of the benthic macroinvertebrate community together with physical/habitat quality measurements associated with the sampling site and the watershed to evaluate the biological condition (i.e. biotic integrity) of a water body.

Biofiltration - Practices that use vegetation and amended soils to detain and treat runoff from impervious areas. Treatment is through filtration, infiltration, adsorption, ion exchange, and biological uptake of pollutants.

Biological Integrity - Defined in Karr J.R. and D.R. Dudley. 1981. Ecological perspective on water quality goals. *Environmental Management* 5:55-68 as: "A balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitat of the region." Also referred to as ecosystem health.

BMP Design Manual – A plan developed to eliminate, reduce, or mitigate the impacts of runoff from development projects, including Priority Development Projects.

Chronic Toxicity – A measurement of sublethal effect (e.g. reduced growth, reproduction) to experimental test organisms exposed to an effluent or receiving waters compared to that of the control organisms.

Clean Water Act Section 303(d) Water Body - An impaired water body in which water quality does not meet applicable water quality standards and/or is not expected to meet water quality standards, even after the application of technology based pollution controls required by the CWA. The discharge of runoff to these water bodies by the Copermittees is significant because these discharges can cause or contribute to violations of applicable water quality standards.

Construction Activities – Actions implemented during construction of development or redevelopment projects during the Preliminary Task (including rough grading and/or disking, clearing and grubbing operations, or any soil disturbance prior to mass grading), Grading or Land Development (including topography and slope reconfiguration, alluvium removals, canyon cleanouts, rock undercuts, keyway excavations, land form grading, and stockpiling of select material for capping operations), Streets and Utility Installation (including excavation and street paving, lot grading, curbs, gutters and sidewalks, public utilities, public water facilities including fire hydrants, public sanitary sewer systems, storm sewer systems and/or other drainage improvements), or Vertical Construction (including the build out of structures from foundations to roofing, including rough landscaping).

Construction Site – Any project, including projects requiring coverage under the Construction General Permit, that involves soil disturbing activities including, but not limited to, clearing, grading, disturbances to ground such as stockpiling, and excavation.

Contamination - As defined in the Porter-Cologne Water Quality Control Act, contamination is "an impairment of the quality of waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste whether or not waters of the State are affected."

Copermittee – A permittee to a NPDES permit that is only responsible for permit conditions relating to the discharge for which it is operator [40 CFR 122.26(b)(1)]. For the purposes of this Order, a Copermittee is one of the individual permittees identified in Tables 1a-1c of this Order.

Copermittees – All of the individual Copermittees, collectively.

Critical Channel Flow (Qc) – The channel flow that produces the critical shear stress that initiates bed movement or that erodes the toe of channel banks. When measuring Qc, it should be based on the weakest boundary material – either bed or bank.

Daily Discharge – Defined as either: (1) the total mass of the constituent discharged over the calendar day or any 24 hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g. concentration.)

The Daily Discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day, or other 24 hour period other than a day), or by the arithmetic mean of analytical results from one or more grab samples taken over the course of a day.

Development Projects - Construction, rehabilitation, redevelopment, or reconstruction of any public or private projects.

Dry Season –May 1 to September 30.

Dry Weather – Weather is considered dry if the preceding 72 hours has been without measurable precipitation (>0.1 inch).

Enclosed Bays – Enclosed bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost bay works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays do not include inland surface waters or ocean waters.

Erosion – When land is diminished or worn away due to wind, water, or glacial ice. Often the eroded debris (silt or sediment) becomes a pollutant via storm water runoff. Erosion occurs naturally but can be intensified by land clearing activities such as farming, development, road building, and timber harvesting.

Environmentally Sensitive Areas (ESAs) - Areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; areas designated as preserves or their equivalent under the Natural Communities Conservation Program within the Cities and County of Orange; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.

Estuaries – Waters, including coastal lagoons, located at the mouth of streams that serve as areas of mixing fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and ocean water. Estuaries do not include inland surface waters or ocean waters.

Existing Development – Any area that has been developed and exists for municipal, commercial, industrial, or residential purposes, uses, or activities. May include areas that are not actively used for its originally developed purpose, but may be re-purposed or redeveloped for another use or activity.

Flow Duration – The long-term period of time that flows occur above a threshold that causes significant sediment transport and may cause excessive erosion damage to creeks and streams (not a single storm event duration). The simplest way to visualize this is to consider a histogram of pre- and post-project flows using long-term records of hourly data. To maintain pre-development flow duration means that the total number of hours (counts) within each range of flows in a flow-duration histogram cannot increase between the pre- and post-development condition. Flow duration within the range of geomorphologically significant flows is important for managing erosion.

Grading - The cutting and/or filling of the land surface to a desired slope or elevation.

Groundwater – Subsurface water that occurs beneath the water table in soils and geologic formations that are fully saturated.

Hazardous Material – Any substance that poses a threat to human health or the environment due to its toxicity, corrosiveness, ignitability, explosive nature or chemical reactivity. These also include materials named by the USEPA in 40 CFR 116 to be reported if a designated quantity of the material is spilled into the waters of the U.S. or emitted into the environment.

Hazardous Waste - Hazardous waste is defined as "any waste which, under Section 600 of Title 22 of this code, is required to be managed according to Chapter 30 of Division 4.5 of Title 22 of this code" [CCR Title 22, Division 4.5, Chapter 11, Article 1].

Household Hazardous Waste – Paints, cleaning products, and other hazardous wastes generated during home improvement or maintenance activities.

Hydromodification – The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

Illicit Connection – Any man-made conveyance or drainage system through which a non-storm water discharge to the storm water drainage system occurs or may occur. Any connection to the MS4 that conveys an illicit discharge.

Illicit Discharge - Any discharge to the MS4 that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from firefighting activities [40 CFR 122.26(b)(2)].

Inactive Areas – Areas of construction activity that are not active and those that have been active and are not scheduled to be re-disturbed for at least 14 days.

Infiltration – In the context of low impact development, infiltration is defined as the percolation of water into the ground. Infiltration is often expressed as a rate (inches per hour), which is determined through an infiltration test. In the context of non-storm water, infiltration is water other than wastewater that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow [40 CFR 35.2005(20)].

Inland Surface Waters – Includes all surface waters of the State that do not include the ocean, enclosed bays, or estuaries.

Jurisdictional Runoff Management Program Document – A written description of the specific jurisdictional runoff management measures and programs that each Copermittee will implement to comply with this Order and ensure that storm water pollutant discharges in runoff are reduced to the MEP and do not cause or contribute to a violation of water quality standards.

Low Impact Development (LID) – A storm water management and land development strategy that emphasizes conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions.

Low Impact Development Best Management Practices (LID BMPs) – LID BMPs include schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States through storm water management and land development strategies that emphasize conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions. LID BMPs include retention practices that do not allow runoff, such as infiltration, rain water harvesting and reuse, and evapotranspiration. LID BMPs also include flow-through practices such as biofiltration that may have some discharge of storm water following pollutant reduction.

Major Outfall – As defined in the Code of Federal Regulations, a major outfall is a MS4 outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (i.e. discharge from a single conveyance other than a circular pipe which is associated with a drainage area of more than 50 acres); or, for MS4s that receive storm water from lands zoned for industrial activity (based on comprehensive zoning plans or equivalent), a MS4 outfall that discharges from a single pipe with an inside diameter of 12 inches or more or from its equivalent (i.e. discharge from other than a circular pipe associated with a drainage area of 2 acres or more).

Maximum Daily Action Level (MDAL) –The highest allowable daily discharge of a pollutant, over a calendar day (or 24 hour period). For pollutants with action levels expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with action levels expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

Maximum Extent Practicable (MEP) – The technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) for storm water that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) in combination with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than BAT. A definition for MEP is not provided either in the statute or in the regulations. Instead the definition of MEP is dynamic and will be defined by the following process over time: municipalities propose their definition of MEP by way of their runoff management programs. Their total collective and individual activities conducted pursuant to the runoff management programs becomes their proposal for MEP as it applies both to their overall effort, as well as to specific activities (e.g., MEP for street sweeping, or MEP for MS4 maintenance). In the absence of a proposal acceptable to the San Diego Water Board, the San Diego Water Board defines MEP.

In a memo dated February 11, 1993, entitled "Definition of Maximum Extent Practicable," Elizabeth Jennings, Senior Staff Counsel, SWRCB addressed the achievement of the MEP standard as follows:

"*To achieve the MEP standard, municipalities must employ whatever Best Management Practices (BMPs) are technically feasible (i.e., are likely to be effective) and are not cost prohibitive. The major emphasis is on technical feasibility. Reducing pollutants to the MEP means choosing effective BMPs, and rejecting applicable BMPs only where other effective BMPs will serve the same purpose, or the BMPs would not be technically feasible, or the cost would be prohibitive. In selecting BMPs to achieve the MEP standard, the following factors may be useful to consider:*

a. Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?
b. Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?
c. Public Acceptance: Does the BMP have public support?
d. Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?
e. Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc.?

The final determination regarding whether a municipality has reduced pollutants to the maximum extent practicable can only be made by the Regional or State Water Boards, and not by the municipal discharger. If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit derived, it would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs that would address a pollutant source, or to pick a BMP based solely on cost, which would be clearly less effective. In selecting BMPs the municipality must make a serious attempt to comply and practical solutions may not be lightly rejected. In any case, the burden would be on the municipal discharger to show compliance with its permit. After selecting a menu of BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented."

Monitoring Year – October 1 to September 30

Municipal Separate Storm Sewer System (MS4) – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designated or used for collecting or conveying storm water; (iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.26.

National Pollutant Discharge Elimination System (NPDES) - The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the CWA.

Non-Storm Water - All discharges to and from a MS4 that do not originate from precipitation events (i.e., all discharges from a MS4 other than storm water). Non-storm water includes illicit discharges and NPDES permitted discharges.

Nuisance - As defined in the Porter-Cologne Water Quality Control Act, a nuisance is "anything which meets all of the following requirements: 1) Is injurious to health, or is indecent, or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. 2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. 3) Occurs during, or as a result of, the treatment or disposal of wastes."

Ocean Waters – The territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the State Board's California Ocean Plan.

Order – Unless otherwise specified, refers to this Order, Order No. R9-2013-0001 (NPDES No. CAS0109266)

Outfall - Outfall means a point source as defined by 40 CFR 122.2 at the point where a municipal separate storm sewer discharges to waters of the US and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels or other conveyances which connect segments of the same stream or other waters of the US and are used to convey waters of the US.

Persistent Flow - Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

Person - A person is defined as an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof [40 CFR 122.2].

Point Source - Any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, landfill leachate collection systems, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

Pollutant - Any agent that may cause or contribute to the degradation of water quality such that a condition of pollution or contamination is created or aggravated.

Pollution - As defined in the Porter-Cologne Water Quality Control Act, pollution is "the alteration of the quality of the waters of the State by waste, to a degree which unreasonably affects either of the following: 1) The waters for beneficial uses; or 2) Facilities that serve these beneficial uses." Pollution may include contamination.

Pollution Prevention - Pollution prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control BMPs, treatment control BMPs, or disposal.

Pre-Development Runoff Conditions – Approximate flow rates and durations that exist or existed onsite before land development occurs. For new development projects, this equates to runoff conditions immediately before project construction. For redevelopment projects, this equates to runoff conditions from the project footprint assuming infiltration characteristics of the underlying soil, and existing grade. Runoff coefficients of concrete or asphalt must not be used. A redevelopment Priority Development Project must use available information pertaining to existing underlying soil type and onsite existing grade to estimate pre-development runoff conditions.

Priority Development Projects - New development and redevelopment projects defined under Provision E.3.b of Order No. R9-2013-0001, as amended by Order Nos. R9-2015-0001 and R9-2015-0100.

Rainy Season (aka Wet Season) –October 1 to April 30

Receiving Waters – Waters of the United States.

Receiving Water Limitations - Waste discharge requirements issued by the San Diego Water Board typically include both: (1) "Effluent Limitations" (or "Discharge Limitations") that specify the technology-based or water-quality-based effluent limitations; and (2) "Receiving Water Limitations" that specify the water quality objectives in the Basin Plan as well as any other limitations necessary to attain those objectives. In summary, the "Receiving Water Limitations" provision is the provision used to implement the requirements of CWA section 402(p)(3)(B).

Redevelopment - The creation and/or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure~~, and creation or addition of impervious surfaces~~. Replacement of impervious surfaces includes any activity ~~that is not part of a routine maintenance activity~~ where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include routine maintenance activities, such as trenching and resurfacing associated with utility work; pavement grinding; resurfacing existing roadways,~~;~~ ~~new~~ sidewalks~~ construction~~, pedestrian ramps, or bike lanes on existing roads; and routine replacement of damaged pavement, such as pothole repair.

Regional Clearinghouse – A central location for the collection and distribution of information developed and maintained by the Copermittees including, but not limited to, plans, reports, manuals, data, contact information, and/or links to such documents and information.

Rehabilitation - Remedial measures or activities for the purpose of improving or restoring the beneficial uses of streams, channels or river systems. Techniques may vary from in-stream restoration techniques to off-line storm water management practices installed in the system corridor or upland areas, or a combination of in-stream and out of stream techniques. Rehabilitation techniques may include, but are not limited to the following: riparian zone restoration, constructed wetlands, channel modifications that improve habitat and stability, and daylighting of drainage systems.

Reporting Period – The period of information that is reported in the Water Quality Improvement Plan Annual Report. The reporting period consists of two components: 1) July 1 to June 30, consistent with the fiscal year, for the implementation of the jurisdictional runoff management programs, and 2) October 1 to September 30, consistent with the monitoring year for the monitoring and assessment programs. Together, these two time periods constitute the reporting year for the Water Quality Improvement Plan Annual Report due January 31 following the end of the monitoring year.

Retain – Keep or hold in a particular place, condition, or position without discharge to surface waters.

Retrofitting – Storm water management practice put into place after development has occurred in watersheds where the practices previously did not exist or are ineffective. Retrofitting of developed areas is intended to improve water quality, protect downstream channels, reduce flooding, or meet other specific objectives. Retrofitting developed areas may include, but is not limited to replacing roofs with green roofs, disconnecting downspouts or impervious surfaces to drain to pervious surfaces, replacing impervious surfaces with pervious surfaces, installing rain barrels, installing rain gardens, and trash area enclosures.

Runoff - All flows in a storm water conveyance system that consists of the following components: (1) storm water (wet weather flows) and (2) non-storm water including dry weather flows.

San Diego Water Board – As used in this document the term "San Diego Water Board" is synonymous with the term "Regional Board" as defined in Water Code section 13050(b) and is intended to refer to the California Regional Water Quality Control Board for the San Diego Region as specified in Water Code Section 13200.

Sediment - Soil, sand, and minerals washed from land into water. Sediment resulting from anthropogenic sources (i.e. human induced land disturbance activities) is considered a pollutant. This Order regulates only the discharges of sediment from anthropogenic sources and does not regulate naturally occurring sources of sediment. Sediment can destroy fish-nesting areas, clog animal habitats, and cloud waters so that sunlight does not reach aquatic plants.

Source Control BMP – Land use or site planning practices, or structural or nonstructural measures that aim to prevent runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between pollutants and runoff.

Storm Water – Per 40 CFR 122.26(b)(13), means storm water runoff, snowmelt runoff and surface runoff and drainage. Surface runoff and drainage pertains to runoff and drainage resulting from precipitation events.

Structural BMPs - A subset of BMPs which detains, retains, filters, removes, or prevents the release of pollutants to surface waters from development projects in perpetuity, after construction of a project is completed.

Test of Significant Toxicity (TST) - A statistical approach used to analyze toxicity test data. The TST incorporates a restated null hypothesis, Welch's t-test, and biological effect thresholds for chronic and acute toxicity.

Total Maximum Daily Load (TMDL) - The maximum amount of a pollutant that can be discharged into a water body from all sources (point and non-point) and still maintain water quality standards. Under CWA section 303(d), TMDLs must be developed for all water bodies that do not meet water quality standards after application of technology-based controls.

Toxicity - Adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies. The water quality objectives for toxicity provided in the Basin Plan, state in part…"All waters shall be

free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life….The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge."

Toxicity Identification Evaluation (TIE) - A set of procedures for identifying the specific chemical(s) responsible for toxicity. These procedures are performed in three phases (characterization, identification, and confirmation) using aquatic organism toxicity tests.

Toxicity Reduction Evaluation (TRE) - A study conducted in a step-wise process designed to identify the causative agents of effluent or ambient toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in toxicity. The first steps of the TRE consist of the collection of data relevant to the toxicity, including additional toxicity testing, and an evaluation of facility operations and maintenance practices, and best management practices. A Toxicity Identification Evaluation (TIE) may be required as part of the TRE, if appropriate.

Treatment Control BMP – Any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media absorption or any other physical, biological, or chemical process.

Unpaved Road – Any long, narrow stretch without pavement used for traveling by motor passenger vehicles between two or more points. Unpaved roads are generally constructed of dirt, gravel, aggregate or macadam and may be improved or unimproved.

Waste - As defined in CWC Section 13050(d), "waste includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal."

Article 2 of CCR Title 23, Chapter 15 (Chapter 15) contains a waste classification system that applies to solid and semi-solid waste, which cannot be discharged directly or indirectly to water of the state and which therefore must be discharged to land for treatment, storage, or disposal in accordance with Chapter 15. There are four classifications of waste (listed in order of highest to lowest threat to water quality): hazardous waste, designated waste, non-hazardous solid waste, and inert waste.

Water Quality Objective - Numerical or narrative limits on constituents or characteristics of water designated to protect designated beneficial uses of the water. [California Water Code Section 13050 (h)]. California's water quality objectives are established by the State and Regional Water Boards in the Water Quality Control Plans. Numeric or narrative limits for pollutants or characteristics of water designed to protect the beneficial uses of the water. In other words, a water quality objective is the maximum concentration of a pollutant that can exist in a receiving water and still generally ensure that the beneficial uses of the receiving water remain protected (i.e., not impaired). Since water quality objectives are designed specifically to protect the beneficial uses, when the objectives are violated the beneficial uses are, by definition, no longer protected and become impaired. This is a fundamental concept under the Porter Cologne Act. Equally fundamental is Porter Cologne's definition of pollution. A condition of pollution exists when the water quality needed to support designated beneficial uses has

become unreasonably affected or impaired; in other words, when the water quality objectives have been violated. These underlying definitions (regarding beneficial use protection) are the reason why all waste discharge requirements implementing the federal NPDES regulations require compliance with water quality objectives. (Water quality objectives are also called water quality criteria in the CWA.)

Water Quality Standards - Water quality standards, as defined in Clean Water Act section 303(c) consist of the beneficial uses (e.g., swimming, fishing, municipal drinking water supply, etc.,) of a water body and criteria (referred to as water quality objectives in the California Water Code) necessary to protect those uses. Under the Water Code, the water boards establish beneficial uses and water quality objectives in water quality control or basin plans. Together with an anti-degradation policy, these beneficial uses and water quality objectives serve as water quality standards under the Clean Water Act. In Clean Water Act parlance, state beneficial uses are called "designated uses" and state water quality objectives are called "criteria." Throughout this Order, the relevant term is used depending on the statutory scheme.

Waters of the State - Any water, surface or underground, including saline waters within the boundaries of the State [CWC section 13050 (e)]. The definition of the Waters of the State is broader than that for the Waters of the United States in that all water in the State is considered to be a Waters of the State regardless of circumstances or condition.

Waters of the United States - As defined in the 40 CFR 122.2, the Waters of the U.S. are defined as: "(a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate "wetlands;" (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters otherwise defined as waters of the United States under this definition: (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial seas; and (g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA."

Watershed - That geographical area which drains to a specified point on a water course, usually a confluence of streams or rivers (also known as drainage area, catchment, or river basin).

Wet Season (aka Rainy Season) – October 1 to April 30

Wet Weather – Weather is considered wet up to 72 hours after a storm event of 0.1 inches and greater, unless otherwise defined by another regulatory mechanism (e.g. a TMDL).

ATTACHMENT D

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

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JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

FY _____

I. COPERMITTEE INFORMATION

Copermittee Name:

Copermittee Primary Contact Name:

Copermittee Primary Contact Information:
Address:
City: County: State: Zip:
Telephone: Fax: Email:

II. LEGAL AUTHORITY

Has the Copermittee established adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐
A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority?	**YES**	☐
	NO	☐

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

Was an update of the jurisdictional runoff management program document required or recommended by the San Diego Water Board?	**YES**	☐
	NO	☐
If YES to the question above, did the Copermittee update its jurisdictional runoff management program document and make it available on the Regional Clearinghouse?	**YES**	☐
	NO	☐

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

Has the Copermittee implemented a program to actively detect and eliminate illicit discharges and connections to its MS4 that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

Number of non-storm water discharges reported by the public	
Number of non-storm water discharges detected by Copermittee staff or contractors	
Number of non-storm water discharges investigated by the Copermittee	
Number of sources of non-storm water discharges identified	
Number of non-storm water discharges eliminated	
Number of sources of illicit discharges or connections identified	
Number of illicit discharges or connections eliminated	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

V. DEVELOPMENT PLANNING PROGRAM

Has the Copermittee implemented a development planning program that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐
Was an update to the BMP Design Manual required or recommended by the San Diego Water Board?	**YES**	☐
	NO	☐
If YES to the question above, did the Copermittee update its BMP Design Manual and make it available on the Regional Clearinghouse?	**YES**	☐
	NO	☐

Number of proposed development projects in review	
Number of Priority Development Projects in review	
Number of Priority Development Projects approved	
Number of approved Priority Development Projects exempt from any BMP requirements	
Number of approved Priority Development Projects allowed alternative compliance	
Number of Priority Development Projects granted occupancy	

Number of completed Priority Development Projects in inventory	
Number of high priority Priority Development Project structural BMP inspections	
Number of Priority Development Project structural BMP violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

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VI. CONSTRUCTION MANAGEMENT PROGRAM

Has the Copermittee implemented a construction management program that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

Number of construction sites in inventory	
Number of active construction sites in inventory	
Number of inactive construction sites in inventory	
Number of construction sites closed/completed during reporting period	
Number of construction site inspections	
Number of construction site violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

Has the Copermittee implemented an existing development management program that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

	Municipal	Commercial	Industrial	Residential
Number of facilities or areas in inventory				
Number of existing development inspections				
Number of follow-up inspections				
Number of violations				
Number of enforcement actions issued				
Number of escalated enforcement actions issued				

VIII. PUBLIC EDUCATION AND PARTICIPATION

Has the Copermittee implemented a public education program component that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐
Has the Copermittee implemented a public participation program component that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

IX. FISCAL ANALYSIS

Has the Copermittee attached to this form a summary of its fiscal analysis that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

X. CERTIFICATION

I [☐ Principal Executive Officer ☐ Ranking Elected Official ☐ Duly Authorized Representative] certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature	Date
Print Name	Title
Telephone Number	Email

ATTACHMENT E

SPECIFIC PROVISIONS FOR TOTAL MAXIMUM DAILY LOADS APPLICABLE TO ORDER NO. R9-2013-0001, AS AMENDED BY ORDER NOS. R9-2015-0001 AND R9-2015-0100

These provisions implement load allocations (LAs) and wasteload allocations (WLAs) of the Total Maximum Daily Loads (TMDLs) established by the San Diego Water Board or USEPA under Clean Water Act section 303(c), applicable to discharges regulated under this Order. The provisions and schedules for implementation of the TMDLs described below must be incorporated into the Water Quality Improvement Plans, required pursuant to Provision B of this Order, for the specified Watershed Management Areas.

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed
2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin
3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed
4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek
5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay
6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)
7. Total Maximum Daily Load for Sediment in Los Peñasquitos Lagoon

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2002-0123

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	August 14, 2002
State Water Board Approval Date:	July 16, 2003
Office of Administrative Law Approval Date:	September 11, 2003
US EPA Approval Date:	November 3, 2003

(3) TMDL Effective Date: September 11, 2003

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final diazinon TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must be in compliance with the final TMDL compliance requirements as of December 31, 2010.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations:

Table 1.1
Final Receiving Water Limitations Expressed as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Diazinon	Acute	0.08 µg/L	1 hour
	Chronic	0.05 µg/L	4 days

(b) Final Effluent Limitations

Discharges from the MS4s containing concentrations that do not exceed the following effluent limitations will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 1.b.(2)(a):

Table 1.2
Final Effluent Limitations Expressed as Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation	Averaging Period
Diazinon	Acute	0.072 µg/L	1 hour
	Chronic	0.045 µg/L	4 days

(c) Best Management Practices

The following BMPs for Chollas Creek must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area and implemented by the Responsible Copermittees:

(i) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 1.b.(2)(a) and/or the effluent limitations under Specific Provision 1.b.(2)(b) for Chollas Creek.

(ii) The Responsible Copermittees must implement the Diazinon Toxicity Control Plan and Diazinon Public Outreach/Education Program as described in the report titled, *Technical Report for Total Maximum Daily Load for Diazinon in Chollas Creek Watershed, San Diego County*, dated August 14, 2002, including subsequent modifications, in order to achieve the receiving water limitations under Specific Provision 1.b.(2)(a) and/or the effluent limitations under Specific Provision 1.b.(2)(b).

(iii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 1.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 1.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 1.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 1.b.(2)(c) achieves compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 1.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 1.d, to demonstrate compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The Responsible Copermittees must be in compliance with the final diazinon TMDL compliance requirements as of December 31, 2010.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls for diazinon within the Chollas Creek watershed, and calculate or estimate the annual diazinon loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment

Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 1.b.(2)(b), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0019

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	September 22, 2005
Office of Administrative Law Approval Date:	December 2, 2005
US EPA Approval Date:	February 8, 2006

(3) TMDL Effective Date: December 2, 2005

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Shelter Island Yacht Basin

(6) Responsible Copermittee: City of San Diego

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final dissolved copper TMDL compliance requirements for Shelter Island Yacht Basin consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittee must be in compliance with the final TMDL compliance requirements as of December 2, 2005.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations:

Table 2.1
Final Receiving Water Limitations Expressed as Concentrations in Shelter Island Yacht Basin

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Dissolved Copper	Acute	4.8 µg/L x WER*	1 hour
	Chronic	3.1 µg/L x WER*	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 2.b.(2)(a):

Table 2.2
Final Effluent Limitations as Expressed as Annual Loads in MS4 Discharges to Shelter Island Yacht Basin

Constituent	Effluent Limitation
Dissolved Copper	30 kg/yr*

* If the water quality objectives for dissolved copper in Shelter Island Yacht Basin are changed in the future, then the margin of safety (MOS), TMDL and allocations will be recalculated using the *Method for Recalculation of the Total Maximum Daily Load for Dissolved Copper in the Shelter Island Yacht Basin, San Diego Bay* in the Basin Plan (p. 7-14).

(c) Best Management Practices

The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 2.b.(2)(a) and/or the effluent limitations under Specific Provision 2.b.(2)(b) for Shelter Island Yacht Basin. The BMPs must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 2.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 2.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittee develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 2.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 2.b.(2)(c) achieves compliance with Specific Provisions 2.b.(3)(a), 2.b.(3)(b) and/or 2.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 2.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 2.d, to demonstrate compliance with Specific Provisions 2.b.(3)(a), 2.b.(3)(b) and/or 2.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The Responsible Copermittees must be in compliance with the final dissolved copper TMDL compliance requirements as of December 2, 2005.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

The Responsible Copermittee must monitor the effluent of its MS4 outfalls for dissolved copper, and calculate or estimate the monthly and annual dissolved copper loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.(b)(2)of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0036

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	November 16, 2005
Office of Administrative Law Approval Date:	February 1, 2006
US EPA Approval Date:	March 22, 2006

(3) TMDL Effective Date: February 1, 2006

(4) Watershed Management Area: Santa Margarita River

(5) Water Body: Rainbow Creek

(6) Responsible Copermittee: County of San Diego

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final total nitrogen and total phosphorus TMDL compliance requirements for Rainbow Creek consist of the following

(1) Final TMDL Compliance Date

The Responsible Copermittee must comply with final TMDL compliance requirements by December 31, 2021.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance date under Specific Provision 3.b.(1):

Table 3.1
Final Receiving Water Limitations Expressed as Concentrations in Rainbow Creek

Constituent	Receiving Water Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing concentrations that do not exceed the following effluent limitations by the compliance date under Specific Provision 3.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 3.b.(2)(a):

Table 3.2
Final Effluent Limitations Expressed as Concentrations in MS4 Discharges to Rainbow Creek

Constituent	Effluent Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(ii) Annual pollutant loads from given land uses discharging to and from the MS4s that do not exceed the following annual loads by the compliance date under Specific Provision 3.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 3.b.(2)(a):

Table 3.3
Final Effluent Limitations Expressed as Annual Loads in MS4 Discharges to Rainbow Creek

Land Use	Total N	Total P
Commercial nurseries	116 kg/yr	3 kg/yr
Park	3 kg/yr	0.1 kg/yr
Residential areas	149 kg/yr	12 kg/yr
Urban areas	27 kg/yr	6 kg/yr

(c) Best Management Practices

(i) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 3.b.(2)(a) and/or the effluent limitations under Specific Provision 3.b.(2)(b) for Rainbow Creek.

(ii) The Responsible Copermittee should coordinate any BMPs implemented to address this TMDL with Caltrans and other sources as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under

Specific Provision 3.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 3.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the final effluent limitations under Specific Provision 3.b.(2)(b)(ii); OR

(e) The Responsible Copermittee develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 3.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Specific Provision 3.b.(2)(c) achieves compliance with Specific Provisions 3.b.(3)(a), 3.b.(3)(b), 3.b.(3)(c) and/or 3.b.(3)(d),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 3.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 3.d, to demonstrate compliance with Specific Provisions 3.b.(3)(a), 3.b.(3)(b), 3.b.(3)(c) and/or 3.b.(3)(d).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim total nitrogen and total phosphorus TMDL compliance requirements for Rainbow Creek consist of the following:

(1) Interim Compliance Dates and WQBELs

The Responsible Copermittee must comply with the interim WQBELs, expressed as annual loads, by December 31 of the interim compliance year given in Table 3.4.

Table 3.4
Interim Water Quality Based Effluent Limitations Expressed as Annual Loads in MS4 Discharges from Specific Land Uses to Rainbow Creek

	Total N Interim Effluent Limitations (kg/yr)			Total P Interim Effluent Limitations (kg/yr)		
	Interim Compliance Date			Interim Compliance Date		
Land Use	**2009**	**2013**	**2017**	**2009**	**2013**	**2017**
Commercial nurseries	390	299	196	20	16	10
Park	5	3	3	0.15	0.10	0.10
Residential areas	507	390	260	99	74	47
Urban areas	40	27	27	9	6	6

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 3.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 3.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the final effluent limitations under Specific Provision 3.b.(2)(b)(ii); OR

(e) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the interim effluent limitations under Specific Provision 3.c.(1); OR

(f) The Responsible Copermittee has submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

d. Specific Monitoring and Assessment Requirements

(1) The Responsible Copermittee must incorporate into the Water Quality Improvement Plan and implement the Sampling and Analysis Plan for Rainbow Creek Nutrient Reduction TMDL Implementation Water Quality Monitoring, dated January 2010.

(2) The results of any monitoring conducted during the reporting period, and assessment of whether the interim and final TMDL compliance requirements have been achieved must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 3.b.(2)(b)(i), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2007-0043

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2007
State Water Board Approval Date:	July 15, 2008
Office of Administrative Law Approval Date:	October 22, 2008
US EPA Approval Date:	December 18, 2008

(3) TMDL Effective Date: October 22, 2008

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final dissolved copper, lead, and zinc TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must comply with the final TMDL compliance requirements by October 22, 2028.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance date under Specific Provision 4.b.(1):

Table 4.1
Final Receiving Water Limitations Expressed as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$(0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$(0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$(0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$(0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations by the compliance date under Specific Provision 4.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 4.b.(2)(a):

Table 4.2
Final Effluent Limitations as Expressed Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(c) Best Management Practices

(i) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 4.b.(2)(a) and/or the effluent limitations under Specific Provision 4.b.(2)(b) for Chollas Creek.

(ii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans and the U.S. Navy as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 4.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 4.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 4.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 4.b.(2)(c) achieves compliance with Specific Provisions 4.b.(3)(a), 4.b.(3)(b) and/or 4.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 4.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 4.d, to demonstrate compliance with Specific Provisions 4.b.(3)(a), 4.b.(3)(b) and/or 4.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim dissolved copper, lead, and zinc TMDL compliance requirements for Chollas Creek consist of the following:

(1) Interim Compliance Date and WQBELs

The Responsible Copermittee must comply with the interim WQBELs, expressed as concentrations, by the interim compliance date given in Table 4.3:

Table 4.3
Interim Water Quality Based Effluent Limitations Expressed as Concentrations in MS4 Discharges to Chollas Creek

Interim Compliance Date	Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
October 22, 2018	Dissolved Copper	Acute	$1.2 \times 90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
	Dissolved Lead	Acute	$1.2 \times 90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
	Dissolved Zinc	Acute	$1.2 \times 90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 4.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 4.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) There are no exceedances of the interim effluent limitations under Specific

Provision 4.c.(1) at the Responsible Copermittee's MS4 outfalls; OR

(e) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance date.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*, when it is amended to include monitoring requirements for the Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls discharging to Chollas Creek for dissolved copper, lead, and zinc, and calculate or estimate the monthly and annual dissolved copper, lead, and zinc loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 4.b.(2)(b) or 4.c.(1), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2008-0027

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 11, 2008
State Water Board Approval Date:	June 16, 2009
Office of Administrative Law Approval Date:	September 15, 2009
US EPA Approval Date:	October 26, 2009

(3) TMDL Effective Date: September 15, 2009

(4) Watershed Management Areas: See Table 5.0

(5) Water Bodies: See Table 5.0

(6) Responsible Copermittees: See Table 5.0

Table 5.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County	Dana Point Harbor	Baby Beach	-City of Dana Point -County of Orange
San Diego Bay	San Diego Bay	Shelter Island Shoreline Park	- San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final indicator bacteria TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Final TMDL Compliance Dates

(a) Baby Beach in Dana Point Harbor

The Responsible Copermittees for MS4 discharges to Baby Beach must be in compliance with the final TMDL compliance requirements according to the following compliance dates:

Table 5.1
Compliance Dates to Achieve Final TMDL Compliance Requirements For Baby Beach in Dana Point Harbor

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform	September 15, 2014	September 15, 2009
Fecal Coliform		September 15, 2009
Enterococcus		September 15, 2019

(b) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park must be in compliance with the final TMDL compliance requirements as of December 31, 2012.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance dates under Specific Provision 5.b.(1):

Table 5.2
Final Receiving Water Limitations Expressed as Bacteria Densities in the Water Body

	Receiving Water Limitations	
Constituent	Single Sample Maximum[1,2]	30-Day Geometric Mean[2]
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing indicator bacteria densities that do not exceed the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.3a
Final Effluent Limitations as Expressed as Bacteria Densities in MS4 Discharges to the Water Body

	Effluent Limitations	
Constituent	**Single Sample Maximum[1,2]**	**30-Day Geometric Mean[2]**
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.

(ii) Discharges from the MS4s containing indicator bacteria loads that do not exceed the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.4a
Final Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to the Baby Beach in Dana Point Harbor

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0.86×10^9 MPN/day	$3{,}254 \times 10^9$ MPN/30days
Fecal Coliform	0.17×10^9 MPN/day	112×10^9 MPN/30days
Enterococcus	0.03×10^9 MPN/day	114×10^9 MPN/30days

Table 5.4b
Final Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to the Shelter Island Shoreline Park in San Diego Bay

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0 MPN/day	198×10^9 MPN/30days
Fecal Coliform	0 MPN/day	8×10^9 MPN/30days
Enterococcus	0 MPN/day	26×10^9 MPN/30days

(iii) Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.5a
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to Baby Beach in Dana Point Harbor*

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	90.4%	0%
Fecal Coliform	82.7%	0%
Enterococcus	96.2%	62.2%

Notes:
* The percent load reductions are relative to data collected between 1996-2002. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittees' MS4s must not exceed the loads in Table 5.4a, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the water body.

Table 5.5b
*Final Effluent Limitations Expressed as Percent Load Reductions** in MS4 Discharges to Shelter Island Shoreline Park in San Diego Bay*

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0%	0%
Fecal Coliform	0%	0%
Enterococcus	0%	0%

Notes:
* The percent load reductions are relative to data collected between 1999-2004. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittee's MS4s must not exceed the loads in Table 5.4b, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the water body.

(c) Best Management Practices

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 5.0 must incorporate the Bacteria Load Reduction Plan (BLRP) required to be developed pursuant to Resolution No. R9-2008-0027.

(ii) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 5.b.(2)(a) and/or the effluent limitations under Specific Provision 5.b.(2)(b) for the segments or areas of the water bodies listed in Table 5.0

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.b.(2)(b)(ii); OR

(e) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 5.b.(2)(b)(iii); OR

(f) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(g) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 5.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 5.b.(2)(c) achieves compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 5.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 5.d, to demonstrate compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim indicator bacteria TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Baby Beach in Dana Point Harbor

(a) Interim TMDL Compliance Dates and WQBELs

The Responsible Copermittees for MS4 discharges to Baby Beach must comply with the following interim WQBELs by the interim compliance dates given in Tables 5.6a and/or 5.6b:

Table 5.6a
Interim Water Quality Based Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to Baby Beach in Dana Point Harbor

Constituent	Interim Compliance Dates	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	4.93×10^9 MPN/day	$3{,}254 \times 10^9$ MPN/30days*
Fecal Coliform	September 15, 2012	0.59×10^9 MPN/day	112×10^9 MPN/30days*
Enterococcus	September 15, 2012	0.42×10^9 MPN/day	301×10^9 MPN/30days
	September 15, 2016	0.03×10^9 MPN/day *	207×10^9 MPN/30days

Notes:
* Same as the final effluent limitations in Table 5.4a.

Table 5.6b
Interim Water Quality Based Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to Baby Beach in Dana Point Harbor*

Constituent	Interim Compliance Dates	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	45.2%	0%**
Fecal Coliform	September 15, 2012	41.4%	0%**
Enterococcus	September 15, 2012	48.1%	0%
	September 15, 2016	96.2%**	31.1%

Notes:
* The percent load reductions are relative to data collected between 1996-2002. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittees' MS4s must not exceed the loads in Table 5.6a, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the waterbody.
** Same as the final effluent limitations in Table 5.5a.

(b) Interim Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(i) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(ii) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(iii) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(iv) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.b(2)(b)(ii); OR

(v) The Responsible Copermittees can demonstrate that exceedances of the applicable receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(vi) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the interim effluent limitations under Table 5.6a of Specific Provision 5.c.(1)(a); OR

(vii) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the interim effluent limitations under Table 5.6b of Specific Provision 5.c.(1)(a); OR

(viii) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

(2) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park must be in compliance with the final indicator bacteria TMDL requirements as of December 31, 2012.

d. Specific Monitoring and Assessment Requirements

(1) Monitoring Stations

Monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[38] If discharges of bacteria from the MS4 exceed the applicable interim or final WQBELs, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(2) Monitoring Procedures

(a) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) The Responsible Copermittees must collect wet weather monitoring samples within the first 24 hours of a storm event[39] of the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(c) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

[38] Commonly referred to as AB 411 monitoring

[39] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs have been achieved.

(b) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 5.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(c) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to correlate elevated bacteria levels with known or suspected sewage spills from wastewater collection systems and treatment plants or boats.

(d) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2010-0001

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 10, 2010
State Water Board Approval Date:	December 14, 2010
Office of Administrative Law Approval Date:	April 4, 2011
US EPA Approval Date:	June 22, 2011

(3) TMDL Effective Date: April 4, 2011

(4) Watershed Management Areas: See Table 6.0

(5) Water Bodies: See Table 6.0

(6) Responsible Copermittees: See Table 6.0

Table 6.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	-City of Laguna Beach -County of Orange -Orange County Flood Control District
		at Heisler Park - North	
	Pacific Ocean Shoreline	at Main Laguna Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Woods -County of Orange -Orange County Flood Control District
		Laguna Beach at Ocean Avenue	
		Laguna Beach at Cleo Street	
		Arch Cove at Bluebird Canyon Road	
		Laguna Beach at Dumond Drive	
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Hills -City of Laguna Niguel -City of Laguna Woods -City of Lake Forest -City of Mission Viejo -County of Orange -Orange County Flood Control District
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	
	Aliso Creek Mouth	at mouth	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	-City of Dana Point -City of Laguna Beach -City of Laguna Niguel -County of Orange -Orange County Flood Control District
		Aliso Beach at Table Rock Drive	
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)	
		at Salt Creek (large outlet)	
		Salt Creek Beach at Salt Creek service road	
		Salt Creek Beach at Strand Road	
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	-City of Dana Point -City of Laguna Hills -City of Laguna Niguel -City of Mission Viejo -City of Rancho Santa Margarita -City of San Juan Capistrano -County of Orange -Orange County Flood Control District
	San Juan Creek	lower 1 mile	
	San Juan Creek Mouth	at mouth	
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	-City of Dana Point -City of San Clemente -County of Orange -Orange County Flood Control District
		Ole Hanson Beach Club Beach at Pico Drain	
		San Clemente City Beach at El Portal Street Stairs	
		San Clemente City Beach at Mariposa Street	
		San Clemente City Beach at Linda Lane	
		San Clemente City Beach at South Linda Lane	
		San Clemente City Beach at Lifeguard Headquarters	
		under San Clemente Municipal Pier	
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	
		San Clemente State Beach at Riviera Beach	
		Can Clemente State Beach at Cypress Shores	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	-City of Oceanside -City of Vista -County of San Diego
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	-City of Carlsbad -City of Encinitas -City of Escondido -City of San Marcos -County of San Diego
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	-City of Del Mar -City of Escondido -City of Poway -City of San Diego -City of Solana Beach -County of San Diego
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	-City of Del Mar -City of Poway -City of San Diego -County of San Diego
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	-City of San Diego
		La Jolla Shores Beach at Caminito del Oro	
		La Jolla Shores Beach at Vallecitos	
		La Jolla Shores Beach at Avenida de la Playa	
		at Casa Beach, Children's Pool	
		South Casa Beach at Coast Boulevard	
		Whispering Sands Beach at Ravina Street	
		Windansea Beach at Vista de la Playa	
		Windansea Beach at Bonair Street	
		Windansea Beach at Playa del Norte	
		Windansea Beach at Palomar Avenue	
		at Tourmaline Surf Park	
		Pacific Beach at Grand Avenue	
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I- Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	-City of El Cajon -City of Santee -County of San Diego
	San Diego River	lower 6 miles	-City of El Cajon -City of La Mesa -City of San Diego -City of Santee -County of San Diego
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	-City of La Mesa -City of Lemon Grove -City of San Diego -County of San Diego - San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final indicator bacteria TMDL compliance requirements for the water bodies listed in Table 6.0 consist of the following:

(1) Final TMDL Compliance Dates

The Responsible Copermittees for MS4 discharges to the water bodies listed in Table 6.0 must be in compliance with the final TMDL compliance requirements according to the following compliance dates:

Table 6.1
Compliance Dates to Achieve Final TMDL Compliance Requirements

Constituent	Dry Weather TMDL Compliance Date	Wet Weather TMDL Compliance Date*
Total Coliform	April 4, 2021	April 4, 2031 (April 4, 2021)
Fecal Coliform		
Enterococcus		

* The Wet Weather TMDL Compliance Date in parenthesis applies if the applicable Water Quality Improvement Plan does not include load reduction programs for other constituents (e.g. metals, pesticides, trash, nutrients, sediment, etc.) together with bacteria load reduction requirements of these TMDLs.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance dates under Specific Provision 6.b.(1):

Table 6.2a
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Beaches

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform	10,000	22%	1,000	0%
Fecal Coliform	400	22%	200	0%
Enterococcus	104	22%	35	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan.

Table 6.2b
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Creeks

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Fecal Coliform	400	22%	200	0%
Enterococcus	61 (104)	22%	33	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Basin Plan.
d. A single sample maximum of 104 MPN/100ml for *Enterococcus* may be applied as a receiving water limitation for creeks, instead of 61 MPN/100mL, if one or more of the creeks addressed by these TMDLs (San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek, San Diego River, and/or Chollas Creek) is designated with a "moderately to lightly used area" or less frequent usage frequency in the Basin Plan. Otherwise, the single sample maximum of 61 MPN/100mL for *Enterococcus* must be used to assess compliance with the allowable exceedance frequency.

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing indicator bacteria densities that do not exceed the following effluent limitations by the compliance dates under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a):

Table 6.2c
Final Effluent Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies in MS4 Discharges to the Water Body

Constituent	Concentration-Based Effluent Limitations			
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform[d]	10,000	22%	1,000	0%
Fecal Coliform	400	22%	200	0%
Enterococcus	104[e] / 61[f]	22%	35[e] / 33[f]	0%

Notes:
a. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan for discharges to beaches, and the Basin Plan for discharges to creeks and creek mouths.
d. Total coliform effluent limitations only apply to MS4 outfalls that discharge to the Pacific Ocean Shorelines and creek mouths listed in Table 6.0.
e. This *Enterococcus* effluent limitation applies to MS4 discharges to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
f. This *Enterococcus* effluent limitation applies to MS4 discharges to segments or areas of creeks or creek mouths listed in Table 6.0.

(ii) Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the compliance dates under Specific Provision 6.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a):

Table 6.3
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watershed and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
South Orange County	**San Joaquin Hills HSA** (901.11) and **Laguna Hills HSA** (901.12) - Pacific Ocean Shoreline	91.78%	91.72%	98.28%	46.85%	52.07%	51.26%
	Aliso HSA (901.13) - Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	95.47%	95.58%	99.13%	25.29%	26.62%	27.52% (27.37%)**
	Dana Point HSA (901.14) - Pacific Ocean Shoreline	95.04%	95.03%	98.98%	13.15%	14.86%	15.16%
	Lower San Juan HSA (901.27) - Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	72.96%	74.21%	94.94%	19.21%	12.82%	27.12% (26.90%)**
	San Clemente HA (901.30) - Pacific Ocean Shoreline	94.28%	94.23%	98.83%	23.85%	24.58%	25.26%
San Luis Rey River	**San Luis Rey HU** (903.00) - Pacific Ocean Shoreline	38.13%	39.09%	87.38%	5.62%	3.12%	11.69%

Table 6.3 (Cont'd)
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watershed and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
Carlsbad	**San Marcos HA** (904.50) - Pacific Ocean Shoreline	82.82%	82.55%	96.03%	18.47%	18.98%	20.19%
San Dieguito River	**San Dieguito HU** (905.00) - Pacific Ocean Shoreline	14.39%	20.72%	83.48%	4.29%	1.46%	7.72%
Penasquitos	**Miramar Reservoir HA** (906.10) - Pacific Ocean Shoreline	96.50%	96.59%	99.42%	1.61%	1.99%	1.93%
Mission Bay	**Scripps HA** (906.30) - Pacific Ocean Shoreline	96.44%	96.42%	99.25%	16.32%	21.14%	18.82%
	Tecolote HA (906.50) - Tecolote Creek	94.51%	94.59%	98.94%	16.51%	20.47%	18.15% (18.08%)**
San Diego River	**Mission San Diego HSA** (907.11) and **Santee HSA** (907.12) - Pacific Ocean Shoreline - Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles)	74.03%	69.44%	93.96%	38.14%	53.22%	42.74% (42.47%)**
San Diego Bay	**Chollas HSA** (908.22) - Chollas Creek	92.06%	92.15%	98.46%	17.82%	24.84%	21.46% (21.36%)**

Notes:
* The percent load reductions are based on reducing loads compared to pollutant loads from 2001 to 2002.
** The alternative *Enterococcus* percent load reduction was calculated based on a numeric target of 104 MPN/100mL instead of 61 MPN/100mL, protective of the REC-1 "moderately to lightly used area" usage frequency that is protective of freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative pollutant load reductions can be utilized.

(c) Best Management Practices

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 6.0 must incorporate the Bacteria Load Reduction Plans (BLRPs) or Comprehensive Load Reduction Plans (CLRPs) required to be developed pursuant to Resolution No. R9-2010-0001.

(ii) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 6.b.(2)(a) and/or the effluent limitations under Specific Provision 6.b.(2)(b) for the segments or areas of the water bodies listed in Table 6.0.

(iii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans, owners/operators of small MS4s, and agricultural dischargers as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(f) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 6.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 6.b.(2)(c) achieves compliance with Specific Provisions 6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), and/or 6.b.(3)(e),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 6.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 6.d, to demonstrate compliance with Specific Provisions 6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), 6.b.(3)(e) and/or 6.b.(3)(f).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim indicator bacteria TMDL compliance requirements for the water bodies listed in Table 6.0 consist of the following:

(1) Interim TMDL Compliance Dates

The Responsible Copermittees must achieve compliance with the interim TMDL compliance requirements, as determined in accordance with Specific Provision 6.c.(3), by the interim compliance dates given in Table 6.4, unless alternative interim compliance dates are accepted by the San Diego Water Board Executive Officer as part of the Water Quality Improvement Plan.

Table 6.4
Interim Compliance Dates to Achieve Interim TMDL Compliance Requirements

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs*
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	April 4, 2016	April 4, 2021 (April 4, 2016)
		at Heisler Park - North		
	Pacific Ocean Shoreline	at Main Laguna Beach	April 4, 2016	April 4, 2021 (April 4, 2016)
		Laguna Beach at Ocean Avenue		
		Laguna Beach at Cleo Street		
		Arch Cove at Bluebird Canyon Road		
		Laguna Beach at Dumond Drive		
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	April 4, 2016	April 4, 2021 (April 4, 2016)
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	April 4, 2018	April 4, 2021 (April 4, 2018)
	Aliso Creek Mouth	at mouth	April 4, 2018	April 4, 2021 (April 4, 2018)
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	April 4, 2016	April 4, 2021 (April 4, 2016)
		Aliso Beach at Table Rock Drive		
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)		
		at Salt Creek (large outlet)		
		Salt Creek Beach at Salt Creek service road	April 4, 2017	April 4, 2021 (April 4, 2017)
		Salt Creek Beach at Strand Road	April 4, 2017	April 4, 2021 (April 4, 2017)

Table 6.4 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs*
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	April 4, 2016	April 4, 2021 (April 4, 2016)
	San Juan Creek	lower 1 mile	April 4, 2018	April 4, 2021 (April 4, 2018)
	San Juan Creek Mouth	at mouth	April 4, 2016	April 4, 2021 (April 4, 2016)
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	April 4, 2016	April 4, 2021 (April 4, 2016)
		Ole Hanson Beach Club Beach at Pico Drain	April 4, 2016	April 4, 2021 (April 4, 2016)
		San Clemente City Beach at El Portal Street Stairs	April 4, 2017	April 4, 2021 (April 4, 2017)
		San Clemente City Beach at Mariposa Street		
		San Clemente City Beach at Linda Lane	April 4, 2016	April 4, 2021 (April 4, 2016)
		San Clemente City Beach at South Linda Lane	April 4, 2018	April 4, 2021 (April 4, 2018)
		San Clemente City Beach at Lifeguard Headquarters	April 4, 2017	April 4, 2021 (April 4, 2017)
		under San Clemente Municipal Pier		
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	April 4, 2018	April 4, 2021 (April 4, 2018)
		San Clemente State Beach at Riviera Beach	April 4, 2016	April 4, 2021 (April 4, 2016)
		Can Clemente State Beach at Cypress Shores	April 4, 2017	April 4, 2021 (April 4, 2017)
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	April 4, 2017	April 4, 2021 (April 4, 2017)
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	April 4, 2016	April 4, 2021 (April 4, 2016)
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	April 4, 2016	April 4, 2021 (April 4, 2016)

Table 6.4 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs*
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	April 4, 2016	April 4, 2021 (April 4, 2016)
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	April 4, 2016	April 4, 2021 (April 4, 2016)
		La Jolla Shores Beach at Caminito del Oro		
		La Jolla Shores Beach at Vallecitos		
		La Jolla Shores Beach at Avenida de la Playa		
		at Casa Beach, Children's Pool		
		South Casa Beach at Coast Boulevard		
		Whispering Sands Beach at Ravina Street		
		Windansea Beach at Vista de la Playa		
		Windansea Beach at Bonair Street		
		Windansea Beach at Playa del Norte		
		Windansea Beach at Palomar Avenue		
		at Tourmaline Surf Park		
		Pacific Beach at Grand Avenue		
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries		
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	April 4, 2018	April 4, 2021 (April 4, 2018)
	San Diego River	lower 6 miles		
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach		
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	April 4, 2018	April 4, 2021 (April 4, 2018)

* The Interim Compliance Dates to achieve the Interim Wet Weather WQBELs in parenthesis apply if the applicable Water Quality Improvement Plan does not include load reduction programs for other constituents (e.g. metals, pesticides, trash, nutrients, sediment, etc.) together with bacteria load reduction requirements of these TMDLs.

(2) Interim Water Quality Based Effluent Limitations

The Responsible Copermittees for discharges to the water bodies in Table 6.0 must comply with the following interim WQBELs by the interim compliance dates given in Specific Provision 6.c.(1):

(a) Interim Receiving Water Limitations

(i) *Interim Dry Weather Receiving Water Limitations*

The Responsible Copermittee must calculate the "existing" exceedance frequencies of the 30-day geometric mean water quality objectives for each of the indicator bacteria by analyzing the available monitoring data collected between January 1, 1996 and December 31, 2002. "Existing" exceedance frequencies may be calculated by water body and/or by Watershed Management Area listed in Table 6.0. Separate "existing" exceedance frequencies must be calculated for beaches and creeks/creek mouths.

The Responsible Copermittees must achieve a 50 percent reduction in the "existing" exceedance frequency of the 30-day geometric mean WQBELs for the water bodies listed in Table 6.0 by the interim compliance dates given in Table 6.4. A 50 percent reduction in the "existing" exceedance frequency is equivalent to half of the "existing" exceedance frequency of the 30-day geometric mean WQBELs.

The "existing" exceedance frequencies and the interim dry weather allowable exceedance frequencies (i.e. interim dry weather receiving water limitations) calculated by the Responsible Copermittees must be included in the Water Quality Improvement Plans for the applicable Watershed Management Areas.

(ii) *Interim Wet Weather Receiving Water Limitations*

The Responsible Copermittees must achieve the interim wet weather receiving water limitations in Table 6.5, expressed as interim wet weather allowable exceedance frequencies, by the interim compliance dates given in Table 6.4.

Table 6.5
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	38%	37%	39%
		at Heisler Park - North			
	Pacific Ocean Shoreline	at Main Laguna Beach			
		Laguna Beach at Ocean Avenue			
		Laguna Beach at Cleo Street			
		Arch Cove at Bluebird Canyon Road			
		Laguna Beach at Dumond Drive			
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	41%	41%	42%
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	41%	41%	42%
	Aliso Creek Mouth	at mouth	41%	41%	42%
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	36%	36%	36%
		Aliso Beach at Table Rock Drive			
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)			
		at Salt Creek (large outlet)			
		Salt Creek Beach at Salt Creek service road			
		Salt Creek Beach at Strand Road			

Table 6.5 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	44%	44%	48%
	San Juan Creek	lower 1 mile	44%	44%	47%
	San Juan Creek Mouth	at mouth	44%	44%	47%
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	35%	35%	36%
		Ole Hanson Beach Club Beach at Pico Drain			
		San Clemente City Beach at El Portal Street Stairs			
		San Clemente City Beach at Mariposa Street			
		San Clemente City Beach at Linda Lane			
		San Clemente City Beach at South Linda Lane			
		San Clemente City Beach at Lifeguard Headquarters			
		under San Clemente Municipal Pier			
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)			
		San Clemente State Beach at Riviera Beach			
		Can Clemente State Beach at Cypress Shores			
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	45%	44%	47%
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	40%	40%	41%
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	33%	33%	36%

Table 6.5 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	26%	26%	26%
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	37%	37%	37%
		La Jolla Shores Beach at Caminito del Oro			
		La Jolla Shores Beach at Vallecitos			
		La Jolla Shores Beach at Avenida de la Playa			
		at Casa Beach, Children's Pool			
		South Casa Beach at Coast Boulevard			
		Whispering Sands Beach at Ravina Street			
		Windansea Beach at Vista de la Playa			
		Windansea Beach at Bonair Street			
		Windansea Beach at Playa del Norte			
		Windansea Beach at Palomar Avenue			
		at Tourmaline Surf Park			
		Pacific Beach at Grand Avenue			
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries	49%	49%	51%
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	46%	43%	49%
	San Diego River	lower 6 miles	46%	43%	49%
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	46%	43%	51%
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	41%	41%	43%

(b) Interim Effluent Limitations

Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the interim compliance dates under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.c.(2)(a):

Table 6.6
Interim Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watersheds and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
South Orange County	**San Joaquin Hills HSA** (901.11) and **Laguna Hills HSA** (901.12) - Pacific Ocean Shoreline	45.89%	45.86%	49.14%	23.43%	26.04%	25.63%
	Aliso HSA (901.13) - Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	47.74%	47.79%	49.57%	12.65%	13.31%	13.76% (13.69%)**
	Dana Point HSA (901.14) - Pacific Ocean Shoreline	47.52%	47.52%	49.49%	6.58%	7.43%	7.58%
	Lower San Juan HSA (901.27) - Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	36.48%	37.11%	47.47%	9.61%	6.41%	13.56% (13.45%)**
	San Clemente HA (901.30) - Pacific Ocean Shoreline	47.14%	47.12%	49.42%	11.93%	12.29%	12.63%
San Luis Rey River	**San Luis Rey HU** (903.00) - Pacific Ocean Shoreline	19.07%	19.55%	43.69%	2.81%	1.56%	5.85%
Carlsbad	**San Marcos HA** (904.50) - Pacific Ocean Shoreline	41.41%	41.28%	48.02%	9.24%	9.49%	10.10%

Table 6.6 (Cont'd)
Interim Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watersheds and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
San Dieguito River	**San Dieguito HU** (905.00) - Pacific Ocean Shoreline	7.20%	10.36%	41.74%	2.15%	0.73%	3.86%
Penasquitos	**Miramar Reservoir HA** (906.10) - Pacific Ocean Shoreline	48.25%	48.30%	49.71%	0.81%	1.00%	0.97%
Mission Bay	**Scripps HA** (906.30) - Pacific Ocean Shoreline	48.22%	48.21%	49.63%	8.16%	10.57%	9.41%
	Tecolote HA (906.50) - Tecolote Creek	47.26%	47.30%	49.47%	8.26%	10.24%	9.08% (9.04%)**
San Diego River	**Mission San Diego HSA** (907.11) and **Santee HSA** (907.12) - Pacific Ocean Shoreline - Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles)	37.02%	34.72%	46.98%	19.07%	26.61%	21.37% (21.24%)**
San Diego Bay	**Chollas HSA** (908.22) - Chollas Creek	46.03%	46.08%	49.23%	8.91%	12.42%	10.73% (10.68%)**

Notes:
* The percent load reductions are based on reducing loads compared to pollutant loads from 2001 to 2002.
** The alternative *Enterococcus* percent load reduction was calculated based on a numeric target of 104 MPN/100mL instead of 61 MPN/100mL, protective of the REC-1 "moderately to lightly used area" usage frequency that is protective of freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative pollutant load reductions can be utilized.

(3) Interim TMDL Compliance Determination

Compliance with the interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(f) There are no exceedances of the interim receiving water limitations under Specific Provision 6.c.(2)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(g) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the interim effluent limitations under Specific Provision 6.c.(2)(b); OR

(h) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

d. Specific Monitoring and Assessment Requirements

(1) Monitoring and Assessment Requirements for Beaches

(a) Monitoring Stations

For beaches addressed by the TMDL, monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[40] If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source

[40] Commonly referred to as AB 411 monitoring

identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations at least once within the first 24 hours of the end of a storm event[41] during the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer in exceedance of the allowable exceedance frequencies in the receiving waters.

(iii) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(iv) For Pacific Ocean Shoreline segments or areas listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the dry weather and

[41] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

wet weather monitoring data to assess whether the interim and final WQBELs for the Pacific Ocean Shoreline segments or areas listed in Table 6.0 have been achieved.

(ii) Dry weather exceedance frequencies must be calculated as follows:

[a] 30-day geometric means must be calculated from the results of any dry weather samples collected from the segments or areas for each water body listed in Table 6.0;
[b] The method and number of samples need for calculating the 30-day geometric means must be consistent with the number of samples required by the Ocean Plan;
[c] Where there are multiple segments or areas associated with a water body listed in Table 6.0, the Copermittees may calculate geometric means for each segment or area, or combine the dry weather monitoring data from all the segments or areas to calculate geometric means for the water body;
[d] The exceedance frequency must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the dry season.

(iii) Wet weather exceedance frequencies must be calculated as follows:

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;
[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;
[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria densities reported from each storm event sampled; and
[d] The single sample maximum exceedance frequency must be calculated by dividing the number of wet weather days that exceed the single sample maximum receiving water limitations in Table 6.2 by the total number of wet weather days during the rainy season.
[e] The data collected for dry weather must be used in addition to the data collected for wet weather to calculate the wet weather 30-day geometric means. The exceedance frequency of the wet weather 30-day geometric means must be calculated by dividing the number of geometric means that exceed the geometric mean

receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the wet season.

(iv) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(v) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) Monitoring and Assessment Requirements for Creeks and Creek Mouths

(a) Monitoring Stations

For creeks addressed by the TMDL, monitoring locations should consist of, at a minimum, a location at or near the mouth of the creek (e.g. Mass Loading Station or Mass Emission Station) and one or more locations upstream of the mouth (e.g. Watershed Assessment Station). If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations in accordance with the requirements of Provision D.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations within the first 24 hours of the end of a storm event[42] during the rainy season (i.e. October 1 through April 30).

[42] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(iii) Samples collected from receiving water monitoring stations must be analyzed for fecal coliform and *Enterococcus* indicator bacteria.

(iv) For creeks or creek mouths listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the receiving water monitoring data to assess whether the interim and final receiving water WQBELs for the creeks and creek mouths listed in Table 6.0 have been achieved.

(ii) Dry weather exceedance frequencies must be calculated as follows:

[a] 30-day geometric means must be calculated from the results of any dry weather samples collected from the segment or area for each water body listed in Table 6.0;
[b] The method and number of samples need for calculating the 30-day geometric means must be consistent with the number of samples required by the Basin Plan;
[c] The exceedance frequency must be calculated by dividing the number of 30-day geometric means that exceed the 30-day geometric mean receiving water limitations in Table 6.2 by the total number of 30-day geometric means calculated from samples collected during the dry season.

(iii) Wet weather exceedance frequencies must be calculated as follows:

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;
[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;
[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria densities reported from each of the storm events sampled; and

[d] The exceedance frequency must be calculated by dividing the number of wet weather days that exceed the single sample maximum receiving water limitations in Table 6.2 by the total number of wet weather days during the rainy season.

[e] The data collected for dry weather must be used in addition to the data collected for wet weather to calculate the wet weather 30-day geometric means. The exceedance frequency of the wet weather 30-day geometric means must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the wet season.

(iv) The Responsible Copermittee must identify and incorporate additional MS4 outfall and receiving water monitoring stations and/or adjust monitoring frequencies to identify sources causing exceedances of the receiving water WQBELs.

(v) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(vi) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

7. Total Maximum Daily Loads for Sediment in Los Peñasquitos Lagoon

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2012-0033

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2012
State Water Board Approval Date:	January 21, 2014
Office of Administrative Law Approval Date:	July 14, 2014
US EPA Approval Date:	October 30, 2014

(3) TMDL Effective Date: July 14, 2014

(4) Watershed Management Area: ~~Los~~ Peñasquitos

(5) Water Body: Los Peñasquitos Lagoon

(6) Responsible Copermittees: County of San Diego, City of San Diego, City of Del Mar, and City of Poway

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final sediment TMDL compliance requirements for Los Peñasquitos Lagoon consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must be in compliance with the final TMDL compliance requirements by December 31, 2034.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not prohibit the sustainable restoration of tidal and non-tidal saltmarsh vegetation of at least 346 acres.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations by the compliance date under Provision 7.b(1) will not cause or contribute to a failure of the receiving water condition specified under Specific Provision 7.b.(2)(a):

Table 7.1
*Final Effluent Limitations as Expressed as Wet Season Loads in MS4 Discharges to Los Peñasquitos Lagoon**

Constituent	Effluent Limitation
Sediment	2,580 tons/wet season

* Final effluent limitations are to be achieved by the following Responsible Parties: County of San Diego, City of San Diego, City of Del Mar, City of Poway, Phase II MS4 permittees, Caltrans, general construction storm water NPDES permittees, and general industrial storm water NPDES permittees.

(c) Best Management Practices

(i) The Water Quality Improvement Plan for the Los Peñasquitos Watershed Management Area must incorporate the Sediment Load Reduction Plan required to be developed pursuant to Resolution No. R9-2012-0033.

(ii) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 7.b.(2)(a) and/or the Copermittee's portion of the effluent limitations under Specific Provision 7.b.(2)(b) for Los Peñasquitos Lagoon.

(3) Final TMDL Compliance Determination

Compliance determination with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) Successful restoration of 80 percent of the 1973 acreage of tidal and non-tidal lagoon salt marsh (346 acres) as described in Attachment A of Resolution No. R9-2010-0033; OR

(b) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 7.b.(2)(c)(ii) and/or other implementation actions to achieve compliance with Specific Provision 7.b.(3)(a) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 7.b.(2)(c)(ii) or other implementation actions to achieve compliance with Specific Provision 7.b.(3)(a),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 7.b.(2)(c)(ii) or other implementation actions, AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 7.d to demonstrate compliance with Specific Provision 7.b.(3)(a).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim sediment TMDL compliance requirements for Los Penasquitos Lagoon consist of the following:

(1) Interim Compliance Dates and WQBELs

The Responsible Copermittees must comply with the interim WQBELs, expressed as wet season loads, by December 31 of the interim compliance year set forth in Table 7.2.

Table 7.2
*Interim Water Quality Based Effluent Limitations Expressed as Wet Season Loads in MS4 Discharges**

Interim Compliance Date	Interim Effluent Limitations (tons/wet season)
December 31, 2019	6,691
December 31, 2023	5,663
December 31, 2027	4,636
December 31, 2029	3,608

* Interim effluent limitations are to be achieved by the following Responsible Parties: County of San Diego, City of San Diego, City of Del Mar, City of Poway, Phase II MS4 permittees, Caltrans, general construction storm water NPDES permittees, and general industrial storm water NPDES permittees.

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) The final receiving water limitation under Specific Provision 7.b.(2)(a) is met; OR

(c) There are no exceedances of the Copermittee's portion of interim effluent limitations under Table 7.2 at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the Copermittee's portion of the interim TMDL compliance requirements described in Attachment A of Resolution No. R9-2010-0033 will be achieved by the interim compliance date.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) Watershed Monitoring

The Responsible Copermittees must conduct suspended sediment, bed load, and flow monitoring to calculate total sediment loading to the Los Peñasquitos Lagoon for each wet season (October 1 thru April 30) as set forth below:

(a) The Responsible Copermittees must monitor enough storm events throughout the season to quantify sediment loading over each wet season, and

(b) The Responsible Copermittees must monitor at least 3 stations to quantify cumulative sediment loading into Los Peñasquitos Lagoon. Stations must be located within the Los Peñasquitos, Carroll Canyon, and Carmel Creek tributaries prior to discharging into Los Peñasquitos Lagoon.

(2) Lagoon Monitoring

The Responsible Copermittees must monitor Los Peñasquitos Lagoon each Fall for changes in the extent of the vegetation types as set forth below:

(a) The Responsible Copermittees must acquire aerial photos of Los Peñasquitos Lagoon and digitize them at an approximate scale of 1:2,500,

(b) The Responsible Copermittees must appropriately interpret the vegetation and classify the various types as saltmarsh, non-tidal saltmarsh, freshwater marsh, non-tidal saltmarsh –*Lolium perrene* infested, southern willow scrub/mulefat scrub, herbaceous wetland, or upland land cover.

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the monitoring data collected under Specific Provision 7.d(1) and 7.d(2) to assess whether the interim and final WQBELs have been achieved.

(b) For assessing and determining compliance with the final receiving water limitations under Specific Provision 7.b.(2)(a), the Responsible

Copermittees must use the data acquired under Specific Provision 7.d.(2) to estimate the acreage of tidal and non-tidal saltmarsh actually restored.

(c) For assessing and determining compliance with the final effluent limitations under Specific Provision 7.b.(2)(b), the Responsible Copermittees must use the data acquired under Specific Provision 7.d.(1) to estimate sediment loading into Los Peñasquitos Lagoon. Sediment loading must be evaluated using a 3-year, weighted rolling average. The first reported average shall be calculated using data collected in the year, 2015-2016, 2016-2017, and 2017-2018 wet seasons.

(d) The monitoring and assessment results must be submitted as part of the Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

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ATTACHMENT F

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

FACT SHEET / TECHNICAL REPORT

FOR

ORDER NO. R9-2013-0001
AS AMENDED BY ORDER NOS. R9-2015-0001 AND R9-2015-0100
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

May 8, 2013
Amended ~~on~~ February 11, 2015
and November 18, 2015

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I. FACT SHEET FORMAT

This Fact Sheet briefly sets forth the principal facts and the significant factual, legal, methodological, and policy questions that the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) considered in preparing Order No. R9-2013-0001 (Order), as amended by Order Nos. R9-2015-0001 and R9-2015-0100. In accordance with the Code of Federal Regulations (CFR) Title 40 Parts 124.8 and 124.56 (40 CFR 124.8 and 40 CFR 124.56), this Fact Sheet includes, but is not limited to, the following information:

1. Contact information
2. Public process and notification procedures
3. Background of municipal storm water permits
4. Regional MS4 Permit approach
5. Economic considerations
6. Applicable statutes, regulations, plans and policies
7. Discussion of the provisions in the Order

Tentative Order No. R9-2013-0001 was distributed for public review on October 31, 2012. The San Diego Water Board accepted written comments on ~~the~~ Tentative Order No. R9-2013-0001 until January 11, 2013. A public hearing was subsequently held on April 10 and 11, 2013, that was continued to May 8, 2013 to receive oral comments from interested persons. The San Diego Water Board adopted Order No. R9-2013-0001 on May 8, 2013.

Tentative Order No. R9-2015-0001, an Order amending Order No. R9-2013-0001, was distributed for public review on September 19, 2014. The San Diego Water Board accepted written comments on Tentative Order No. R9-2015-0001 until November 19, 2014. A public hearing was held on February 11, 2015, to receive oral comments from Copermittees and interested persons. The San Diego Water Board adopted Order No. R9-2015-0001 amending Order No. R9-2013-0001 on February 11, 2015. Order No. R9-2015-0001 amended the findings and provisions of Order No. R9-2013-0001 to:

a. Enroll the County of Orange, the Orange County Flood Control District and the south Orange County Cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano as Copermittees responsible for compliance with the terms and conditions of Order No. R9-2013-0001, as amended by Order No. R9-2015-0001;

b. Designate the San Diego Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the Cities of Laguna Woods and Laguna Hills and agree to the designation of the Santa Ana Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the City of Lake Forest, subject to the

terms of the February 10, 2015 agreement between San Diego Water Board and the Santa Ana Water Board described in Finding 29 of this Order, upon the later effective date of Order No. R9-2015-0001 or Order No. R8-2015-0001 (superseding Order No. R8-2009-0030);

c. Establish interim exceptions to land development requirements for those priority development projects that discharge to engineered channels and large river reaches as described in Provision E.3.c.(2)(e) of this Order;

d. Incorporate the amended requirements of the State Water Resources Control Board's (State Water Board) General Exception to require that pollutant reductions be achieved within 6 years for storm water and nonpoint source discharges to ASBS within the Region;

e. Incorporate applicable requirements of the Los Peñasquitos Lagoon Sediment TMDL; and

f. Require the Orange County Copermittees to implement the "*Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County*," dated October 2014, made effective in the Monitoring and Reporting Program/Order issued pursuant to California Water Code section 13383 in the December 5, 2014 San Diego Water Board Letter Directive and subject to future revisions by the Executive Officer after appropriate public input.

~~A public hearing was held on February 11, 2015, to receive oral comments from Copermittees and interested persons. The San Diego Water Board adopted Order No. R9-2015-0001 amending Order No. R9-2013-0001 on February 11, 2015.~~

Tentative Order No. R9-2015-0100, an Order amending Order No. R9-2013-0001 as amended by Order No. R9-2015-0001, was distributed for public review on July 31, 2015. The San Diego Water Board accepted written comments on Tentative Order No. R9-2015-0100 until September 14, 2015. A public hearing was held on November 18, 2015, to receive oral comments from Copermittees and interested persons. The San Diego Water Board adopted Order No. R9-2015-0100 amending Order No. R9-2013-0001 as amended by Order No. R9-2015-0001, on November 18, 2015. Order No. R9-2015-0100 amended the findings and provisions of Order No. R9-2013-0001 as amended by Order No. R9-2015-0001 to:

a. Enroll the County of Riverside, the Cities of Murrieta, Temecula, and Wildomar, and the Riverside County Flood Control and Water Conservation District as Copermittees responsible for compliance with the terms and conditions of Order No. R9-2013-0001, as amended by Order Nos. R9-2015-0001 and R9-2015-0100;

b. Continue designation of the San Diego Water Board to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Murrieta and Wildomar, including areas within the Santa Ana Region; and, agree to continue designation of the Santa Ana Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the City of Menifee, including areas within the San Diego Region, subject to the terms of the October 26, 2015 agreement between San Diego Water Board and the Santa Ana Water Board described in Finding 29 of this Order;

d. Incorporate Provision B.3.c, which provides an option that allows a Copermittee to utilize the watershed-based Water Quality Improvement Plan to be deemed in compliance with the prohibitions and limitations of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b;

e. Incorporate minor revisions to Provisions E.2.a.(1) and E.2.a.(2) to include San Diego Water Board Order No. R9-2015-0013 and State Water Board Order 2014-0194-DWQ into the requirements for addressing non-storm water discharges to a Copermittee's MS4;

e. Incorporate minor revisions to Provision E.3.b.(1) to correct inconsistencies in the definition of a Priority Development Project as compared to the definitions in Order No. R9-2009-0002 (Fourth Term Orange County MS4 Permit) and Order No. R9-2010-0016 (Fourth Term Riverside County MS4 Permit), and requirements for incorporating the corrected definitions into the BMP Design Manual;

f. Incorporate revisions to Provision E.3.e.(1)(a) to provide additional clarity on when the structural BMP performance requirements of Provision E.3.c are applicable to Priority Development Projects;

e. Incorporate minor revisions to the Revised TMDLs for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region and the TMDLs for Sediment in Los Peñasquitos Lagoon in Attachment E to the Order to make the requirements consistent with the Basin Plan amendments adopted by the San Diego Water Board; and

f. Remove provisions related to allowing the Riverside County Copermittees to apply for early coverage under the Regional MS4 Permit.

The San Diego Water Board files applicable to the issuance of Order No. R9-2013-0001 and amendments thereto are incorporated into the administrative record in support of the findings and requirements of the Order.

II. CONTACT INFORMATION

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The Order and other related documents can be downloaded from the San Diego Water Board website at

http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

The documents referenced in this Fact Sheet and in Order No. R9-2013-0001 and amendments thereto are available for public review at the San Diego Water Board office, located at the address listed above. Public records are available for inspection during regular business hours, from 8:00 am to 5:00 pm Monday through Friday. To schedule an appointment to inspect public records, contact the San Diego Water Board Records Management Officer at 619-516-1990.

COPERMITTEES

Orange County Copermittees

- County of Orange
  - City of Aliso Viejo
  - City of Dana Point
  - City of Laguna Beach
  - City of Laguna Hills
  - City of Laguna Niguel
  - City of Laguna Woods
  - City of Lake Forest *
  - City of Mission Viejo
  - City of Ranch Santa Margarita
  - City of San Clemente
  - City of San Juan Capistrano
  - Orange County Flood Control District

* While not listed in the above table, the City of Lake Forest remains a Copermittee under this Order until the later effective date of this Order or Santa Ana Water Board Tentative Order No. R8-2015-0001. Thereafter, the City of Lake Forest will no longer be considered a Copermittee under this Order because its Phase I MS4 discharges will be regulated by the Santa Ana Water Board pursuant to Water Code section 13328 designation. The requirements of this Order that apply to the City of Lake Forest for the duration of this Order, consistent with the Water Code section 13228 agreement dated February 10, 2015, are described in Finding 29 and Footnote 2 to Table B-1.

Riverside County Copermittees

- County of Riverside
  - City of Menifee**
  - City of Murrieta
  - City of Temecula
  - City of Wildomar
  - Riverside County Flood Control and Water Conservation District

** The City of Menifee is not regulated as a Copermittee under this Order because its Phase I MS4 discharges are regulated by Santa Ana Water Board Order No. R8-2010-0033 as it may be amended or issued pursuant to Water Code section 13228 designation. The requirements of this Order that apply to the City of Menifee for the duration of this Order, consistent with the Water Code section 13228 written agreement dated October 26, 2015, are described in Finding 29 and Footnote 3 to Table B-1.

San Diego County Copermittees

- County of San Diego
  - City of Carlsbad
  - City of Chula Vista
  - City of Coronado
  - City of Del Mar
  - City of El Cajon
  - City of Encinitas
  - City of Escondido
  - City of Imperial Beach
  - City of La Mesa
  - City of Lemon Grove
  - City of National City
  - City of Oceanside
  - City of Poway
  - City of San Diego
  - City of San Marcos
  - City of Santee
  - City of Solana Beach
  - City of Vista
  - San Diego County Regional Airport Authority
  - San Diego Unified Port District

III. PUBLIC PROCESS AND NOTIFICATION PROCEDURES

The San Diego Water Board followed the schedule listed below for the preparation of Order No. R9-2013-0001 and amendments thereto:

San Diego County Copermittee Permit Reissuance Process

1. On February 8, 2011, the San Diego Water Board met with the San Diego County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No. R9-2007-0001.

2. Between February and May 2011, the San Diego Water Board met with select San Diego County, Orange County, and Riverside County Copermittees, as well as representatives of the environmental community to discuss concepts and receive recommendations for elements to be incorporated in a Regional Municipal Separate Storm Sewer System Permit (Regional MS4 Permit).

3. On June 27, 2011 the San Diego Water Board received the Report of Waste Discharge from the San Diego County Copermittees for the renewal of their NPDES permit, Order No. R9-2007-0001.

4. On April 9, 2012, the San Diego Water Board released an administrative draft of Tentative Order No. R9-2013-0001 for preliminary informal comments and feedback.

5. On April 25, 2012, the San Diego Water Board held an informal public workshop to present the administrative draft of Tentative Order No. R9-2013-0001 and receive verbal comments.

6. Between June and August 2012, the San Diego Water Board held four (4) focused meetings with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community, and USEPA) to discuss and receive preliminary comments and feedback about specific elements in the administrative draft of Tentative Order No. R9-2013-0001.

7. On September 5, 2012, the San Diego Water Board held an informal public workshop to present the modifications that were expected to be incorporated into the Tentative Order based on the preliminary comments and feedback received during the focused meetings held between June and August 2012.

8. Informal written comments on the administrative draft of Tentative Order No. R9-2013-0001 were accepted until September 14, 2012.

9. On October 12, 2012, the San Diego Water Board released a revised administrative draft of Tentative Order No. R9-2013-0001.

10. On October 24, 2012, the San Diego Water Board held a focused meeting with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community, and USEPA) to discuss modifications incorporated into the administrative draft of Tentative Order No. R9-2013-0001.

11. On October 31, 2012, the San Diego Water Board released Tentative Order No. R9-2013-0001 for formal public review and comment.

12. On November 13, 2012 and December 12, 2012, the San Diego Water Board held a formal public Board workshop to present the public draft of Tentative Order No. R9-2013-0001 and receive verbal comments.

13. Formal written comments on the public draft of Tentative Order No. R9-2013-0001 were accepted until January 11, 2013.

14. A public hearing of Tentative Order No. R9-2013-0001 was conducted on April 10 and 11, 2013, that was continued to May 8, 2013.

Orange County Copermittee Permit Reissuance Process

15. On May 20, 2014 the San Diego Water Board received the Report of Waste Discharge from the Orange County Copermittees for the renewal of their MS4 NPDES permit, Order No. R9-2009-0002.

16. On June 24, 2014, the San Diego Water Board met with the Orange County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No.R9-2009-0002 and the process for enrollment as Copermittees under Regional MS4 Permit Order No. R9-2013-0001.

17. On July 1, 2014, the San Diego Water Board held a public meeting to discuss the Orange County Report of Waste Discharge and receive comments on potential modifications to Order No. R9-2013-0001. Based on comments received from the Orange County Copermittees and other interested persons at this meeting, the San Diego Water Board determined that additional public meetings were not needed prior to release of Tentative Order No. R9-2015-0001, amending Order No. R9-2013-0001 in redlined – strikeout format for public review and comment.

18. On September 19, 2014, the San Diego Water Board released Tentative Order No. R9-2015-0001 for a 60 day public review and comment period.

19. On October 8, 2014, the San Diego Water Board held a formal public workshop at a regular board meeting to receive information and discuss the proposed amendments to Order No. R9-2013-0001 described in Tentative Order No. R9-2015-0001.

20. In accordance with State and federal laws and regulations, the San Diego Water Board notified San Diego County, Orange County and Riverside County Copermittees, and all known interested agencies and persons of its intent to adopt Tentative Order No. R9-2015-0001 and provided them with an opportunity to submit their written comments and recommendations. Written comments and recommendations on Tentative Order No. R9-2015-0001 were accepted until November 19, 2014.

21. The San Diego Water Board held a public workshop on October 8, 2014, and a public hearing on February 11, 2015, and heard and considered all comments pertaining to the adoption of Tentative Order No. R9-2015-0001 on February 11, 2015.

Riverside County Copermittee Permit Reissuance Process

22. Between April and June 2015, the San Diego Water Board held three (3) public workshops with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community) to discuss and receive comments and feedback about amending Order No. R9-2013-0001 to incorporate a definition of prior lawful approval for Priority Development Projects, and an alternative compliance pathway for prohibitions and limitations in Provision A of the Order. A San Diego Water Board member attended the April and May 2015 public workshops, but no actions or voting took place.

23. On April 15, 2015, the San Diego Water Board met with the Riverside County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No.R9-2010-0016 and the process for enrollment as Copermittees under Order No. R9-2013-0001 (Regional MS4 Permit).

24. On May 8, 2015 the San Diego Water Board received a Report of Waste Discharge from the Riverside County Copermittees for the renewal of their MS4 NPDES permit, Order No. R9-2010-0016.

25. On July 31, 2015, the San Diego Water Board released Tentative Order No. R9-2015-0100 for a formal public review and comment period.

26. Formal written comments on the public draft of Tentative Order No. R9-2015-0100 were accepted until September 14, 2015, a formal public written comment period of 46 days.

27. A public hearing to receive oral comments on Tentative Order No. R9-2015-0100 was conducted on November 18, 2015.

IV. BACKGROUND OF THE SAN DIEGO REGION MUNICIPAL STORM WATER PERMITS

In developed and developing areas, storm water runoff is commonly transported through municipal separate storm sewer systems (MS4s) and discharged into local receiving water bodies. As the storm water runs off and flows over the land or impervious surfaces (e.g., paved streets, parking lots, and building rooftops), it accumulates debris, chemicals, sediment, and other pollutants that can adversely affect receiving water quality if discharged untreated. The United States Environmental Protection Agency (USEPA) recognizes wet weather flows from urban areas as the number one source of estuarine pollution in coastal communities,[1] such as those within the San Diego Region.

The federal Clean Water Act (CWA) was amended in 1987 to address and regulate discharges of storm water associated with industrial activities and from municipal storm sewers. With the amendments, many municipalities throughout the United States were obligated for the first time to obtain National Pollutant Discharge Elimination System (NPDES) permits for discharges of storm water from their MS4s.

In response to the CWA 1987 amendment, as well as the pending federal NPDES regulations which would implement the amendment, the San Diego Water Board issued "early" MS4 permits. The San Diego Water Board adopted and issued Order Nos. 90-38, 90-42, and 90-46 to regulate storm water discharges from the MS4s in Orange County, San Diego County, and Riverside County, respectively, within the San Diego Region on July 16, 1990.

The "early" MS4 permits, or First Term Permits, were issued prior to the November 1990 promulgation of the final federal NPDES storm water regulations. By issuing these First Term Permits before the federal regulations took effect, the San Diego Water Board was able to provide the Copermittees additional flexibility in addressing and managing storm water discharges. The First Term Permits contained the essentials of the 1990 regulations, and required the Copermittees to develop and implement runoff management programs, but provided little specificity about what was required to be included in or actually achieved by those programs.

The flexibility provided in the First Term Permits was generally continued through the Second Term Permits. The combination of the lack of specificity in the First and Second Term Permits, a general lack of meaningful action by the Copermittees and a general lack of corresponding reaction (i.e. enforcement) by the San Diego Water Board during the first ten years of the storm water program, resulted in few substantive steps towards achieving improvements in the quality of receiving waters or storm water discharges from the MS4s.

[1] US EPA. 1999. 40 CFR Parts 9, 122, 123, and 124. National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. 64 FR 68727.

From 2001, the regulatory approach incorporated into Third Term Permits was a significant departure from the regulatory approach of the First and Second Term Permits. The Third Term Permits issued by the San Diego Water Board included more detailed requirements that outlined the minimum level of implementation required for the Copermittees' programs to meet the maximum extent practicable (MEP) standard for storm water. The Third Term Permits included more detail to emphasize and enhance the jurisdictional runoff management programs developed by the Copermittees and introduced requirements for developing and implementing watershed-based programs.

The Third Term Permits also incorporated two precedent setting decisions by the State Water Board. In Order WQ 99-05, the State Water Board established receiving water limitation language to be included in all MS4 permits. The State Water Board's precedential language clarified that municipal storm water permits must include provisions requiring discharges to be controlled to attain water quality standards in receiving waters. Unlike previously adopted versions of the receiving water limitation language in the First and Second Term Permits, the language no longer stated that "*violations of water quality standards are not violations of the municipal storm water permit under certain conditions*." In addition, the receiving water limitation language no longer indicated that the "*implementation of best management practices is the 'functional equivalent' of meeting water quality standards*." State Water Board Order WQ 99-05 specifically requires language in MS4 permits for the Copermittees to comply with water quality standards based discharge prohibitions and receiving water limitations through timely implementation of control measures and other actions to reduce pollutants in discharges. (See State Water Board Order WQ 99-05 (*Environmental Health Coalition*)).

In Order WQ 2000-11, also a precedential decision, the State Water Board addressed design standards for structural post-construction best management practices (BMPs) for new development and significant redevelopment. The State Water Board found that the design standards, which require that runoff generated by 85 percent of storm events from specific development categories be infiltrated or treated, reflect the MEP standard. State Water Board Order WQ 2000-11 also found that the post-construction BMP provisions, or Standard Storm Water Mitigation Plan (SSMP) provisions, constitute MEP for addressing storm water pollutant discharges resulting from specific development categories.

The Third Term San Diego County and Orange County Permits (Order Nos. 2001-01 and R9-2002-0001, respectively) were appealed to the State Water Board. Minor modifications were made by the State Water Board, but the requirements were largely upheld. In State Water Board Order WQ 2001-15, the State Water Board upheld the Third Term San Diego County Permit requirements with certain modifications. The State Water Board removed the prohibition of storm water discharges *into* the MS4 that cause or contribute to exceedances of water quality objectives. The revision allows for treatment of pollutants in storm water runoff after the pollutants have entered the MS4.

State Water Board Order WQ 2001-15 otherwise upheld all the other requirements of the permit.

In addition to the modification to the discharge prohibition in Order WQ 2001-15, the State Water Board refined Order WQ 99-05 by making clear that the Copermittees may use an iterative approach to achieving compliance with water quality standards that involves ongoing assessments and revisions. Thus, the language for the discharge prohibitions and receiving water limitations was revised to explicitly require the Copermittees to implement an iterative process of assessments and revisions to comply with the discharge prohibitions and receiving water limitations. The San Diego Water Board retained the authority to enforce receiving water limitations and discharge prohibitions even if the Copermittee is engaged in the iterative process.

The Third Term San Diego County Permit was subsequently challenged in the Superior Court of the State of California and the Court of Appeal, Fourth Appellate District. The Court of Appeal, Fourth Appellate District, found that the approach of the Third Term San Diego County Permit to regulating discharges into the MS4 was appropriate (*Building Industry Ass'n. v. State Water Resources Control Bd., et al.,* 124 Cal.App.4th 866 (2004)). The State of California Supreme Court denied review sought by the Building Industry Association in March 2005.

The Fourth Term Permits~~, or current MS4 permits,~~ began with the adoption of Order No. R9-2007-0001 issued to the Copermittees of San Diego County in January 2007. Order Nos. R9-2009-0002 and R9-2010-0016 were subsequently issued to the Copermittees of Orange County and Riverside County. The Fourth Term Permits continued to include more detailed requirements to be implemented by each Copermittee's jurisdictional runoff management program. The Fourth Term Permits also included requirements to further emphasize a watershed management approach and for more coordination among jurisdictional runoff management programs. In addition, the Fourth Term Permits included more requirements for assessing the effectiveness of the runoff management programs being implemented by the Copermittees. The intent of the inclusion of additional requirements was to enhance and better define elements of the permit that were expected to be incorporated into the iterative process for managing runoff from each Copermittee's jurisdiction and within the watersheds of the San Diego Region.

The Fourth Term Permits included several new and emerging approaches for managing storm water runoff and discharges. Low impact development (LID) requirements are included for development and significant redevelopment to reduce pollutants in storm water runoff from sites through more natural processes such as infiltration and biofiltration closer to the source, rather than utilizing conventional mechanical end-of-pipe treatment systems. Hydrograph modification (hydromodification) management requirements also are included to mitigate the potential for increased erosion in receiving waters due to increased runoff rates and durations often caused by development and increased impervious surfaces. The Fourth Term Orange County and Riverside County Permits introduced requirements to identify areas of existing

development where retrofitting with LID projects would be feasible and could be implemented to reduce storm water runoff and pollutants in storm water discharges.

The Fourth Term Orange County and Riverside County Permits included a clearer distinction between storm water and non-storm water discharges. The term "urban runoff" was completely removed, and a distinction between storm water (wet weather) runoff and non-storm water (dry weather) runoff was emphasized. This clarification was made to prevent any potential misunderstanding that regulation under the MS4 permits is limited only to urbanized areas, and to prevent non-storm water runoff from being managed in the same manner as storm water runoff. The term "urban runoff" is not defined in the Code of Federal Regulations (CFR) or Federal Register (FR) in the regulation of MS4 discharges. According to the CWA 402(p)(3)(B)(ii), MS4 permits must include a requirement to effectively prohibit non-storm water discharges into the MS4s.

Finally, for the Fourth Term Orange County and Riverside County Permits the San Diego Water Board found that non-storm water discharges to the MS4 from over application of irrigation water are sources of pollutants. The San Diego Water Board found that non-storm water discharges resulting from over-irrigation must be prohibited from entering the MS4 in accordance with the requirements of the CWA and pursuant to 40 CFR 122.26(d)(2)(iv)(B)(1).

The requirements of the Fourth Term Permits issued to the Copermittees in each county within the San Diego Region now have substantively the same core requirements such as discharge prohibitions, receiving water limitations, jurisdictional runoff management program components, and monitoring program requirements. There are, however, several inconsistencies that exist among the three Fourth Term Permits which complicate oversight and implementation of the permits by the San Diego Water Board.

The Fourth Term San Diego County Permit expired in January 2012. The Fourth Term Orange County permit expired in December 2014 and the Fourth Term Riverside County Permit ~~will~~ expired in November 2015. Issuing the Fifth Term Permits within five years for three counties under three different permits would have required the San Diego Water Board to expend significant time and resources for the issuance of the permits through three separate public proceedings, thereby greatly reducing the time and resources available to oversee implementation and compliance. Multiple permits also create confusion for determining compliance among regulated entities, especially for the land development community.

The San Diego Water Board ~~has~~ acknowledged that issuing a single MS4 permit for all the Copermittees in the San Diego Region can and is expected to result in more consistent implementation, improve communication among agencies within watersheds crossing multiple jurisdictions, and minimize resources spent with each permit renewal process. Within the findings of the Fourth Term Riverside County Permit issued in November 2010, the San Diego Water Board notified the public of its intent to develop and issue a single Regional MS4 Permit.

V. REGIONAL MS4 PERMIT APPROACH

The Fifth Term Permit, or Regional MS4 Permit, shifts the focus of the permit requirements from a minimum level of actions to be implemented by the Copermittees to identifying outcomes to be achieved by those actions. Order No. R9-2013-0001 represents an important paradigm shift in the approach for MS4 permits within the San Diego Region.

Historical Permitting Approach

The First and Second Term Permits were very broad and provided little specificity about what was required to be developed and implemented by the Copermittees. The Third Term Permits began to become more specific about the minimum level of implementation required by the Copermittees. The Fourth Term Permits subsequently increased in specificity. The MS4 permits have progressively become more detailed and focused on specifying the minimum level of actions expected to be implemented by the Copermittees. As detailed and specific as the MS4 permits have become, however, they include very little detail about what the desired outcomes of the required actions are expected to achieve. Compliance with the permit requirements has essentially been tracking numbers of actions and reporting, not tracking progress or actual improvements in the quality of receiving waters or discharges from the MS4s. The result has been an increase in actions being implemented by the Copermittees with little or no ability or expectations to determine whether or not improvements in water quality are being achieved.

The Fourth Term Permits result in significant resource expenditure by the Copermittees to report permit compliance information to the San Diego Water Board in the form of annual jurisdictional runoff management program, watershed program, and monitoring program reports. The San Diego Water Board ~~must then~~ was required to expend much of its limited resources on reviewing more than 50 voluminous reports submitted annually by the Copermittees. The information ~~currently~~ reported by the Copermittees ~~is~~ was of limited value when trying to measure progress toward achieving improvements in the quality of receiving waters or discharges from the MS4s. Oversight of the MS4 permits ~~is~~ was further complicated by the inconsistencies among the requirements issued to the Orange County, San Diego County, and Riverside County Copermittees under three separate MS4 permits.

Under the Fourth Term Permits, the Copermittees ~~must~~ were required to expend a significant portion of their limited resources collecting data of limited value, and putting together reports to submit that information to the San Diego Water Board. Likewise, the San Diego Water Board ~~must~~ was required to expend most of its limited resources reviewing reports, and developing permits instead of working directly with the Copermittees to identify solutions to problems causing impacts to water quality. This ~~is~~ was an unsustainable course that ~~will~~ would have continued to demand more

resources from the Copermittees and the San Diego Water Board, and would have continued to result in unknown water quality benefits.

New Permitting Approach

The goal of the Regional MS4 Permit is twofold: 1) bring a consistent set of MS4 permit requirements to all of the Copermittees within the San Diego Region; and, 2) provide an MS4 permit with requirements that will allow the Copermittees to focus their efforts and resources on achieving goals and desired outcomes toward the improvement of water quality rather than completing specific actions.

The overall approach included in the Regional MS4 Permit with respect to the jurisdictional runoff management programs will not differ significantly from the current permits. The general requirements for the jurisdictional runoff management program components and compliance with those requirements will remain and be applied consistently throughout the San Diego Region under the Regional MS4 Permit.

The most significant difference in the new permitting approach is the specific manner of implementation for those jurisdictional runoff management programs. Implementation will be based on decisions made by the Copermittees in accordance with what they have identified as their highest priority water quality conditions. In other words, the Copermittees will have significant control in how to implement the jurisdictional runoff management programs to best utilize their available resources in addressing a specific set of priorities effectively, instead of trying to address all the water quality priorities ineffectively.

The Copermittees are given the responsibility of identifying their highest priority water quality conditions that they intend to address. The Copermittees will develop goals that can be used to measure and demonstrate progress or improvements toward addressing those priorities. In addition to the goals, the Copermittees will provide a schedule for achieving the goals for those highest priorities. The measurement of progress toward achieving the goals for those highest priorities requires a better defined and more focused program of monitoring and assessment than under the Fourth Term Permits.

The monitoring and assessment program must be designed to inform the Copermittees of their progress, and the need for modifications in their jurisdictional runoff management programs and schedules to achieve their goals to improve water quality. The monitoring and assessment program requirements will have a more central role in the Regional MS4 Permit than in earlier permits. The monitoring and assessment requirements must also be designed to enable the Copermittees to focus and direct their efforts in implementing their jurisdictional runoff management programs toward their stated desired outcomes to improve the quality of receiving waters and/or discharges from the MS4s.

By providing an MS4 permit that allows the Copermittees to make more decisions about how to utilize and focus their resources, along with a better defined monitoring and assessment program to inform their water quality management decisions, the Copermittees ~~will~~ have the opportunity to:

1) *Plan strategically*. The Copermittees must have the ability to identify their available resources and develop and implement long term plans that can organize, collect, and use those resources in the most strategically advantageous and efficient manner possible. This ability to develop long term plans will allow the Copermittees to focus and utilize their resources in a more concerted way over the short term and long term to address specific water quality priorities through stated desired outcomes.

2) *Manage adaptively*. The Copermittees must be given the ability to modify their plans as additional information and data are collected from the monitoring and assessment programs. The Copermittees' plans may require modifications to the programs, priorities, goals, strategies, and/or schedules in order for the Copermittees to achieve a stated desired outcome.

3) *Identify synergies*. The Copermittees must be given more flexibility to identify efficiencies within and among their jurisdictional runoff management programs as the strategies are developed and implemented to increase the Copermittees' collective effectiveness. The Copermittees must also be able to identify and utilize resources available from other agencies and entities to further augment and enhance their jurisdictional runoff management programs and/or to collectively work with those other agencies and entities toward achieving a stated desired outcome.

The Regional MS4 Permit requirements ~~will~~ provide the Copermittees the flexibility and responsibility to decide what actions will be necessary to achieve an outcome that is tailored and designed by the Copermittees to improve specific prioritized water quality conditions. The San Diego Water Board expects the approach of the Regional MS4 Permit to give the Copermittees a greater sense of ownership for restoring the quality of receiving waters in the San Diego Region by becoming an integral part of the decision making process in identifying water quality conditions to be addressed, as well as determining the best use of their resources.

VI. ECONOMIC CONSIDERATIONS

Statutory Considerations

California Water Code (CWC) section 13241 requires the San Diego Water Board to consider certain factors, including economic considerations, in the adoption of water quality objectives. CWC section 13263 requires the San Diego Water Board to take into consideration the provisions of CWC section 13241 in adopting waste discharge requirements.

In *City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, the California Supreme Court considered whether Regional Water Boards must comply with CWC section 13241 when issuing waste discharge requirements under CWC section 13263(a) by taking into account the costs a permittee will incur in complying with the permit requirements. The Court concluded that whether it is necessary to consider such cost information "*depends on whether those restrictions meet or exceed the requirements of the federal Clean Water Act.*" (*Id.* at p. 627.) The Court ruled that Regional Water Boards may not consider the factors in CWC section 13241, including economics, to justify imposing pollutant restrictions that are less stringent than applicable federal law requires. (*Id.* At pp. 618, 626-627 ["*[Water Code section 13377 specifies that [ ] discharge permits issued by California's regional boards must meet the federal standards set by federal law. In effect, section 13377 forbids a regional board's consideration of any economic hardship on the part of the permit holder if doing so would result in the dilution of the requirements set by Congress in the Clean Water Act...Because CWC section 13263 cannot authorize what federal law forbids, it cannot authorize a regional board, when issuing a [ ] discharge permit, to use compliance costs to justify pollutant restrictions that do not comply with federal clean water standards*."]). However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Regional Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

As discussed in Section VII.F, Unfunded State Mandates, the San Diego Water Board finds that the requirements in this Order are not more stringent than the minimum federal requirements. Among other requirements, federal law requires MS4 permits to include requirements to effectively prohibit non-storm water discharges into the MS4s, in addition to requiring controls to reduce the discharge of pollutants in storm water to the MEP, and other provisions as USEPA or the State determines are appropriate for the control of pollutants in MS4 discharges.

The requirements in this Order may be more specific or detailed than those enumerated in federal regulations under 40 CFR 122.26 or in the USEPA guidance. However, the requirements have been designed to be consistent with and within the federal statutory mandates described in CWA section 402(p)(3)(B)(ii) and (iii) and the related federal regulations and guidance. Consistent with federal law, all of the

conditions in this Order could have been included in a permit adopted by USEPA in the absence of the in lieu authority of California to issue NPDES permits.

Moreover, the inclusion of numeric WQBELs in this Order does not cause this Order to be more stringent than federal law. Federal law authorizes both narrative and numeric effluent limitations to meet state water quality standards. The inclusion of WQBELs as discharge specifications in an NPDES permit in order to achieve compliance with water quality standards is not a more stringent requirement than the inclusion of BMP based permit limitations to achieve water quality standards (State Water Board Order No. WQ 2006-0012 (*Boeing*)). Therefore, consideration of the factors set forth in CWC section 13241 is not required for permit requirements to implement the effective prohibition on the discharge of non-storm water discharges into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determine appropriate to control such pollutants, as those requirements are mandated by federal law.

Included in the provisions of the Order are monitoring and reporting requirements that are designed to demonstrate that the Copermittees are implementing programs to comply with the CWA municipal storm water requirements. CWA section 308(a) and 40 CFR 122.41(h), (j)-(l), 122.44(i) and 122.48 require that all NPDES permits specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s (40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c)) also specify additional monitoring and reporting requirements. In addition to the federal requirements of the CWA, the San Diego Water Board also has the authority in CWC 13383 to establish monitoring, reporting, and recordkeeping requirements that implement federal and state laws and regulations through NPDES permits.

The monitoring and assessment information that will be reported to the San Diego Water Board is necessary to determine if the Copermittees are making progress toward achieving compliance with the discharge prohibitions, receiving water limitations, and effluent limitations under Provision A of the Order. The monitoring and assessment information that will be reported is also expected to be key to the iterative approach and adaptive management process that is required to be implemented by the Copermittees if they cannot meet the discharge prohibitions and receiving water limitations under the present conditions, which is also part of the requirements under Provision A of the Order.

Notwithstanding the above, the San Diego Water Board has considered cost information in issuing this Order, as discussed below. The San Diego Water Board has also considered all of the evidence that has been presented to the San Diego Water Board regarding the CWC section 13241 factors in adopting this Order. The San Diego Water Board finds that the requirements in this Order are reasonably necessary to protect beneficial uses identified in the Basin Plan and the economic information related to costs of compliance and other CWC section 13241 factors are not sufficient to justify failing to protect those beneficial uses. Where appropriate, the

San Diego Water Board has provided or will consider providing the Copermittees with additional time to implement control measures to achieve final WQBELs and/or water quality standards.

Cost Information

Discussions of the financial and economic ramifications of municipal storm water management programs tend to focus on the significant costs incurred by municipalities in developing and implementing the programs. When considering the cost of implementing the programs, however, it is also important to consider the alternative costs that are incurred when programs are not fully implemented, as well as the economic benefits which result from effective program implementation.

The recent financial and economic conditions have amplified the concerns about the costs incurred by the municipalities in developing and implementing their programs. The reduction in resources resulting from the recent financial and economic conditions has been cited by many of the Copermittees as a justification for reducing the requirements that must be met by their programs. While the recent conditions are a cause for concern in the short term, these programs also have an opportunity to identify and implement improvements and efficiencies before the next period of growth and development, resulting in more effective and sustainable programs over the long term.

In addition, it is very difficult to ascertain the true cost of implementation of the Copermittees' management programs because of inconsistencies in reporting by the Copermittees. Reported costs of compliance for the same program element can vary widely from city to city, often by a very wide margin that is not easily explained.[2] Despite these problems, efforts have been made to identify management program costs, which can be helpful in understanding the costs of program implementation.

The San Diego Water Board recognizes that the Copermittees will incur costs in implementing this Order, potentially above and beyond the costs from the Copermittees' prior permits. The San Diego Water Board also recognizes that, due to California's current economic condition, many Copermittees currently have limited staff and resources to implement actions to address its MS4 discharges. Based on the economic considerations below, the San Diego Water Board has provided the Copermittees a significant amount of flexibility to choose how to implement the requirements of the Order.

The Order also allows the Copermittees to customize their plans, programs, and monitoring requirements. In the end, it is up to the Copermittees to determine the effective BMPs and measures necessary to comply with this Order. The Copermittees can choose to implement the least expensive measures that are effective in meeting

[2] Los Angeles Water Board, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.

the requirements of this Order. This Order also does not require the Copermittees to fully implement all requirements within a single permit term. Where appropriate, the Board has provided the Copermittees with additional time outside of the permit term to implement control measures to achieve final WQBELs and/or water quality standards.

The San Diego Water Board has considered available cost information associated with compliance with this Order. It is not possible to predict accurately the cost impact of the requirements that involve an unknown level of implementation or that depend on environmental variables that are as yet undefined. Only general conclusions can be drawn from this information.

Estimated Municipal Storm Water Program Implementation Costs

The USEPA, the State Water Board, and the California Regional Water Quality Control Boards (Regional Water Boards) have attempted to evaluate the costs of implementing municipal storm water programs. The assessments have demonstrated that the true costs are difficult to ascertain and reported costs vary widely. In addition, reported fiscal analyses tend to neglect the costs incurred to municipalities when storm water and non-storm water runoff is not effectively managed, which are incurred as a result of pollution, contamination, nuisance, and damage to ecosystems, property, and human health. Nonetheless, they provide a useful context for considering the costs of requirements within Order No. R9-2013-0001.

In 1999, the USEPA reported on multiple studies it conducted to determine the cost of management programs. A study of Phase II municipalities determined that the annual cost of the Phase II program was expected to be $9.16 per household. The USEPA also studied 35 Phase I municipalities, finding costs to be $9.08 per household annually, similar to those anticipated for Phase II municipalities.[3]

The State Water Board commissioned a study by the California State University, Sacramento to assess costs of the Phase I MS4 program. This study includes an assessment of costs incurred by Phase I MS4s throughout the state to implement their programs. Annual cost per household in the study ranged from $18 to $46, with the Fresno-Clovis Metropolitan Area representing the lower end of the range, and the City of Encinitas (in San Diego County) representing the upper end of the range.[4]

A study on Phase I MS4 program costs was also conducted by the California Regional Water Quality Control Board, Los Angeles Region (Los Angeles Water Board), where program costs reported in the municipalities' annual reports were assessed. The Los

[3] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791-68792.
[4] State Water Board, 2005. NPDES Stormwater Cost Survey. P. ii.

Angeles Water Board estimated that average per household cost to implement the MS4 program in Los Angeles County was $12.50. [5]

It is important to note that reported program costs are not all attributable to solely complying with MS4 permits. Many program components, and their associated costs, existed before any MS4 permits were ever issued. For example, street sweeping and trash collection costs cannot be solely or even principally attributable to MS4 permit compliance, since these practices have long been expected from and implemented by municipalities.

Therefore, true program cost resulting from MS4 permit requirements is some fraction of reported costs. The California State University, Sacramento study found that only 38 percent of program costs are new costs fully attributable to MS4 permits. The remainder of the program costs was either pre-existing or resulted from enhancement of pre-existing programs.[6] In 2000, the County of Orange found that even lower amounts of program costs are solely attributable to MS4 permit compliance, reporting that the amount attributable to implement the County or Orange Drainage Area Management Plan (DAMP), was less than 20 percent of the total budget. The remaining 80 percent was attributable to pre-existing programs.[7] More current data from the County of Orange is not used in this discussion because the County of Orange no longer reports such information.

Estimated Value of Healthy Water Quality

Economic considerations of municipal storm water management programs cannot be limited only to program costs. Evaluation of programs must also consider information on the benefits derived from environmental protection and improvement.[8] Attention is often focused on municipal storm water management program costs, but the programs must also be viewed in terms of their value to the public.

Placing a value on healthy receiving waters is very difficult. Often the value of receiving waters with good water quality manifests in other forms, such as tourism, recreational opportunities, and/or increased property values. When surface water bodies are degraded, thereby degrading the habitat within and adjacent to the water bodies, the public loses the value and benefits associated with being able to use the area in and around the water bodies. Surface waters that are able to support the beneficial uses designated in the Basin Plan can sustain plants and wildlife that can attract visitors and residents, providing aesthetic, recreational, as well as monetary value to the public. At this time, however, there have been no studies for the San

[5] Los Angeles Water Board, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.
[6] State Water Board, 2005. NPDES Stormwater Cost Survey. P. 58.
[7] County of Orange, 2000. A NPDES Annual Progress Report. P. 60.
[8] Ribaudo M.O. and D. Heelerstein. 1992, *Estimating Water Quality Benefits: Theoretical and Methodological Issues.* U.S. Department of Agriculture. Technical Bulletin No. 1808.

Diego Region to quantify the added value that surface waters with healthy water quality can provide.

USEPA has estimated that household willingness to pay for improvements in fresh water quality for fishing and boating is approximately $158-$210.[9] This estimate can be considered conservative, since it does not include important considerations such as marine waters benefits, wildlife benefits, or flood control benefits. Another study conducted by California State University, Sacramento reported that the annual household willingness to pay for statewide clean water is approximately $180.[10]

A study conducted by the University of Southern California and University of California, Los Angeles assessed the costs and benefits of implementing various approaches for achieving compliance with the MS4 permits in the Los Angeles region. The study found that non-structural systems would cost $2.8 billion but provide $5.6 billion in benefit. If structural systems were determined to be needed, the study found that total costs would be $5.7 to $7.4 billion, while benefits could reach $18 billion.[11] Costs are anticipated to be borne over many years, probably at least ten years.

As can be seen, the benefits of the municipal storm water management programs are expected to considerably exceed their costs. Such findings are corroborated by USEPA, which found that the benefits of implementation of its Phase II storm water rule would also outweigh the costs.[12]

[9] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68793.
[10] State Water Board, 2005. NPDES Stormwater Cost Survey. P. iv.
[11] Los Angeles Water Board, 2004. Alternative Approaches to Stormwater Control.
[12] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791.

VII. APPLICABLE STATUTES, REGULATIONS, PLANS AND POLICIES

A. Legal Authorities – Federal Clean Water Act and California Water Code

This Order is issued pursuant to section 402 of the CWA and implementing regulations adopted by the USEPA and chapter 5.5, division 7 of the CWC (commencing with section 13370). This Order serves as an NPDES permit for point source discharges to surface waters. This Order also serves as waste discharge requirements pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

The objective of the CWA is "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*." To carry out this objective, the CWA requires the implementation of permit programs to regulate the discharge of pollutants and dredged or fill material to the navigable waters of the U.S. and to regulate the use and disposal of sewage sludge. CWA section 402 provides the legal authority to issue a permit for the discharge of pollutants to waters of the U.S. under the NPDES. The CWA provides that NPDES permits may be issued by states which are authorized to implement the provisions of that act. California became authorized to implement the NPDES permit program on May 14, 1973.

The Porter-Cologne Water Quality Control Act (Division 7, commencing with CWC section 13000) established the State Water Resources Control Board (State Water Board) and nine Regional Water Quality Control Boards (Regional Water Boards) as the principal state agencies with primary responsibility for the coordination and control of water quality. CWC section 13200(f) established the San Diego Water Board, which has the primary responsibility for the coordination and control of water quality in the San Diego Region, which includes all the basins draining into the Pacific Ocean between the southern boundary of the Santa Ana Region and the California-Mexico boundary. The San Diego Water Board implements the CWA through Chapter 5.5 of the CWC, commencing with section 13370. CWC section 13377 provides the San Diego Water Board the legal authority to issue waste discharge requirements to ensure compliance with all applicable provisions of the CWA and acts amendatory thereof or supplementary, thereto, to implement water quality control plans, or for the protection of beneficial uses, or to prevent nuisance.

CWA section 402(p) requires the USEPA or authorized state to issue NPDES permits for storm water discharges from MS4s to waters of the U.S. CWA section 402(p)(3)(B)(ii) requires that NPDES permits for storm water discharges from MS4s "*effectively prohibit non-storm water discharges*" into the MS4s. CWA section 402(p)(3)(B)(iii) requires that NPDES permits for storm water discharges from MS4s to "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable* [MEP], *including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*."

The USEPA published implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]), which prescribe permit application requirements for storm water discharges from MS4s pursuant to CWA 402(p), on November 16, 1990. The USEPA published an Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems, which provided guidance on permit application requirements for regulated MS4s, on May 17, 1996. The federal regulations in 40 CFR 122 and guidance issued by USEPA serve as the foundation for the provisions of Order No. R9-2013-0001. The legal authorities provided by the above statutes and regulations are included as part of the discussions in Section VIII of this Fact Sheet.

B. Legal Authority for the Permit Issued on a Region-wide Basis

CWA section 402(p)(3)(B) provides the San Diego Water Board the legal authority to issue an NPDES permit for the San Diego Region as compared to separate MS4 permits based upon County- and partial County-wide boundaries as they existed within the San Diego Region. CWA section 402(p)(3)(B) states that "*Permits for discharges from municipal storm sewers- (i) may be issued on a system- or jurisdiction-wide basis* ...." The federal regulations in 40 CFR 122.26(a)(1)(v) also state that the San Diego Water Board "*may designate dischargers from municipal separate storm sewers on a system-wide or jurisdiction-wide basis. In making this determination, the [San Diego Water Board] may consider the following factors: (A) the location of the discharge with respect to waters of the United States; (B) the size of the discharge; (C) the quantity and nature of the pollutants discharged to waters of the United States; and (D) other relevant factors*."

More specifically, the federal regulations provide that for large and medium MS4 systems, the San Diego Water Board may issue a regional permit. Specifically, the federal regulation in 40 CFR 122.26(a)(3) provide:

"*(ii) The Director may either issue one system-wide permit covering all discharges from municipal separate storm sewers within a large or medium municipal storm sewer system or issue distinct permits for appropriate categories of discharges within a large or municipal separate storm sewer system including, but not limited to: all discharges owned or operated by the same municipality; located within the same jurisdiction; all discharges within a system that discharge to the same watershed; discharges within a system that are similar in nature; or for individual discharges from municipal separate storm sewers within the system.*

(iii) The operator of a discharge from a municipal separate storm sewer which is part of a large or medium municipal separate storm sewer system must either: (A) Participate in a permit application (to be a permittee or a co-permittee) with one or more other operator of discharges from the large or medium municipal storm sewer system which covers all, or a portion of all, discharges from the municipal separate storm sewer system; (B) Submit a distinct permit application which only covers discharges from the municipal separate storm sewers for

which the operator is responsible; or (C) A regional authority may be responsible for submitting a permit application under the following guidelines....

(iv) One permit application may be submitted for all or a portion of all municipal separate storm sewers within adjacent or interconnected large or medium municipal separate storm sewer systems. The Director may issue one systemwide permit covering all, or a portion of all municipal separate storm sewers in adjacent or interconnected large or medium municipal separate storm sewer systems.

(v) Permits for all or a portion of all discharges from large or medium municipal separate storm sewer systems that are issued on a system-wide, jurisdiction-wide, watershed or other basis may specify different conditions relating to different discharges covered by the permit, including different management programs for different drainage areas which contribute storm water to the system."

Based on these regulations, the San Diego Water Board may issue a region-wide MS4 permit. The regulations also clarify that the permit may include different conditions for separate discharges covered by the permit. This allows the San Diego Water Board to ensure that suitable water quality conditions and provisions are identified for each watershed.

The USEPA's responses to comments in the Final Rule for the above-mentioned regulations also make it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide, permits. In the Final Rule published in the Federal Register and containing the responses to comments, USEPA notes that 40 CFR 122.26(a)(3)(iv) would allow an entire system in a geographical region under the purview of a State agency to be designated under a permit.[13] USEPA also states that many commenters wanted to allow the permitting authority broad discretion to establish system-wide permits, and that EPA believes that paragraphs 40 CFR 122.26 (a)(1)(v) and (a)(3)(ii) allow for such broad discretion.[14]

This Order creates watershed requirements that apply to multiple counties. The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees. Managing storm water on a regional and watershed basis is expected to result in improved water quality, as the Order focuses on monitoring and management practices necessary to improve each watershed rather than political boundaries. A single permit also allows the San Diego Water Board staff to expend fewer resources developing successive multiple permits and allows more resources to be devoted to working cooperatively with all three current groups of Copermittees to ensure implementation of this Order results in improved water quality.

[13] 55 Federal Register 47990-01, 48042.
[14] Ibid.

C. Federal and California Endangered Species Acts

This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2115.5) or the Federal Endangered Species Act (16 United States Code [USC] sections 1531 to 1544). This Order requires compliance with requirements to protect the beneficial uses of waters of the U.S. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

D. California Environmental Quality Act

The action to adopt an NPDES Permit is exempt from the provisions of Chapter 3 of the California Environmental Quality Act (CEQA) (Public Resources Code section 21100, et seq.) pursuant to CWC section 13389. (*County of Los Angeles v. Cal. Water Boards* (2006) 143 Cal.App.4th 985.)

E. State and Federal Regulations, Plans and Policies

The legal authority provided by the following regulations, plans, and policies are also included as part of the discussions in Section VIII of this Fact Sheet.

Water Quality Control Plan for the San Diego Basin

The CWA requires the San Diego Water Board to establish water quality standards for each water body in its region. Water quality standards include beneficial uses, water quality objectives and criteria that are established at levels sufficient to protect beneficial uses, and an antidegradation policy to prevent degrading of waters. On September 8, 1994, the San Diego Water Board adopted the *Water Quality Control Plan for the San Diego Basin* (Basin Plan). The Basin Plan designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters in the San Diego Region. The San Diego Water Board has amended the Basin Plan on multiple occasions since 1994. In addition, the Basin Plan implements State Water Board Resolution No. 88-63, which established state policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply. Beneficial uses applicable to the surface water bodies that receive discharges from the MS4s within the San Diego Region generally include those listed below:

The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region:

- Municipal and Domestic Supply (MUN)
- Agricultural Supply (AGR)
- Industrial Process Supply (PROC)

- Industrial Service Supply (IND)
- Ground Water Recharge (GWR)
- Contact Water Recreation (REC1)
- Non-contact Water Recreation (REC2)
- Warm Freshwater Habitat (WARM)
- Cold Freshwater Habitat (COLD)
- Wildlife Habitat (WILD)
- Rare, Threatened, or Endangered Species (RARE)
- Freshwater Replenishment (FRSH)
- Hydropower Generation (POW)
- Preservation of Biological Habitats of Special Significance (BIOL)

The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region:

- Navigation (NAV)
- Commercial and Sport Fishing (COMM)
- Estuarine Habitat (EST)
- Marine Habitat (MAR)
- Aquaculture (AQUA)
- Migration of Aquatic Organisms (MIGR)
- Spawning, Reproduction, and/or Early Development (SPWN)
- Shellfish Harvesting (SHELL)

Pursuant to Water Code sections 13263 and 13377, the requirements of this Order implement the Basin Plan.

Water Quality Control Plan for Ocean Waters of California, California Ocean Plan

In 1972, the State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan). The State Water Board adopted the most recent amended Ocean Plan on October 16, 2012 ~~September 15, 2009~~. The Office of Administrative Law approved it on July 3, 2013 ~~March 10, 2010~~. ~~On October 8, 2010, USEPA approved the 2009 Ocean Plan.~~ The amended Ocean Plan became effective on August 19, 2013. The Ocean Plan is applicable, in its entirety, to ocean waters of the State. In order to protect beneficial uses, the Ocean Plan establishes water quality objectives and a program of implementation. Pursuant to Water Code sections 13263 and 13377, the requirements of this Order implement the Ocean Plan. The Ocean Plan identifies the beneficial uses of ocean waters of the State to be protected as summarized below:

- Industrial water supply
- Water contact and non-contact recreation, including aesthetic enjoyment; navigation

- Commercial and sport fishing
- Mariculture
- Preservation and enhancement of designated Areas of Special Biological Significance
- Rare and endangered species
- Marine habitat
- Fish spawning and shellfish harvesting

On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving an exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges. On June 19, 2012, the State Water Board adopted Order No. 2012-0031, amending Order No. 2012-0012 to require pollutant load reductions to be achieved within six years for the ASBS Compliance Plans, section A.2.d(2) and ASBS Pollution Prevention Plans, section B.2.b(2). The State Water Board Resolution No. 2012-0012, as amended requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject terms and conditions of State Water Board Resolution No. 2012-0012, as amended. The Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012, as amended, applicable to these discharges, are incorporated in Attachment A of this Order. Requirements of this Order implement the Ocean Plan.

Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality

On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

Antidegradation Policy

Federal regulations (40 CFR 131.12) require that the state water quality standards include an antidegradation policy consistent with the federal antidegradation policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16 ("Statement of Policy with Respect to Maintaining the Quality of

the Waters of the State"). State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law.

The San Diego Water Board's Basin Plan implements and incorporates by reference both the State and federal antidegradation policies. State Water Board Resolution No. 68-16 and 40 CFR 131.12 require the San Diego Water Board to maintain high quality waters of the State unless degradation is justified based on specific findings. First, the Board must ensure that "existing instream uses and the level of water quality necessary to protect the existing uses" are maintained and protected. Second, if the baseline quality of a water body for a given constituent exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water, that quality shall be maintained and protected through the requirements of the Order unless the Board makes findings that (1) any lowering of the water quality is necessary to accommodate important economic or social development in the area in which the waters are located; (2) water quality adequate to protect existing uses fully is assured; and (3) the highest statutory and regulatory requirements for all new and existing point sources and all cost-effective and reasonable best management practices for nonpoint source control are achieved. The San Diego Water Board must also comply with any requirements of State Water Board Resolution No. 68-16 beyond those imposed through incorporation of the federal antidegradation policy. In particular, the Board must find that not only present, but also anticipated future uses of water are protected, and must ensure best practicable treatment or control of the discharges. The baseline quality considered in making the appropriate findings is the best quality of the water since 1968, the year of the adoption of Resolution No. 68-16, or a lower level if that lower level was allowed through a permitting action that was consistent with the federal and state antidegradation policies. ~~until it is demonstrated that any change in quality will be consistent with maximum benefit to the people of the State, will not unreasonably affect beneficial uses, and will not result in water quality less than that described in the San Diego Water Boards' policies. State Water Board Resolution No. 68-16 requires that discharges of waste be regulated to meet best practicable treatment or control to assure that pollution or nuisance will not occur and the highest water quality consistent with the maximum benefit to the people of the State be maintained.~~

The discharges permitted in this Order are consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Board Resolution No. 68-16 as set forth below~~.~~: ~~Many of the water bodies within the area covered by this Order are of high quality. The Order requires the Copermittees to meet best practicable treatment or control to meet water quality standards. As required by 40 CFR 122.44(a), the Copermittees must comply with the "maximum extent practicable" technology-based standard set forth in CWA section 402(p) for discharges of pollutants in storm water from the MS4s.~~

1. Many of the waters within the area covered by this Order are impaired for multiple pollutants discharged through MS4s and are not high quality waters with regard to these pollutants. In most cases, there is insufficient data to determine whether these water bodies were impaired as early as 1968, but the limited available data shows

impairment dating back for more than two decades. Many such water bodies are ~~and~~ listed on the State's CWA Section 303(d) List and the San Diego Water Board has established TMDLs to address the impairments. This Order ensures that existing instream (beneficial) water uses and the level of water quality necessary to protect the existing uses is maintained and protected. This Order requires the Copermittees to comply with permit provisions to implement the WLAs set forth in the TMDLs in order to restore the beneficial uses of the impaired water bodies consistent with the assumptions and requirements of the TMDLs. This Order further requires compliance with receiving water limitations to meet water quality standards in the receiving water either by demonstrating compliance pursuant to Provision A and the Copermittees' monitoring and assessment program pursuant to Provision D of this Order, or by implementing Provision B.3.c with a schedule to achieve compliance with receiving water limitations. This Order includes requirements to develop and implement storm water management programs, achieve WQBELs, and effectively prohibit non-storm water discharges into the MS4. The issuance of this Order does not authorize an increase in the amount of discharge of waste.

2. To the extent that water bodies within the area covered by this Order are high quality waters with regard to some constituents, this Order finds as follows:

   a. Allowing limited degradation of high quality water bodies through MS4 discharges is necessary to accommodate important economic or social development in the area and is consistent with the maximum benefit to the people of the state. The discharge of storm water in certain circumstances is to the maximum benefit to the people of the state because it can assist with maintaining instream flows that support beneficial uses, may spur the development of multiple-benefit projects, and may be necessary for flood control, and public safety as well as to accommodate development in the area. The alternative – capturing all storm water from all storm events – would be an enormous opportunity cost that would preclude MS4 permittees from spending substantial funds on other important social needs. The Order ensures that any limited degradation does not affect existing and anticipated future uses of the water and does not result in water quality less than established standards. The Order requires compliance with receiving water limitations that act as a floor to any limited degradation.

   b. The Order requires the highest statutory and regulatory requirements and requires that the Copermittees meet best practicable treatment or control. The Order prohibits all non-storm water discharges, with a few enumerated exceptions, through the MS4 to the receiving waters. As required by 40 CFR section 122.44(a), the Copermittees must comply with the "maximum extent practicable" technology-based standard set forth in CWA section 402(p), and implement extensive minimum control measures in a storm water management program. Recognizing that best practicable treatment or control may evolve over time, the Order includes new and more specific requirements as compared to the prior Phase I MS4 permits for the San Diego County, Orange County and Riverside County Copermittees. The Order incorporates options to implement

Water Quality Improvement Plans that must specify detailed structural and non-structural storm water controls that must be implemented in accordance with an accepted proposed time schedule. The Order contains provisions to encourage, wherever feasible, retention of the storm water from the 85th percentile 24-hour storm event.

Anti-Backsliding Requirements

CWA sections 402(o) and 303(d)(4) and federal regulations at 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations or conditions may be relaxed. ~~All effluent limitations and other conditions in this Order are at least as stringent as the effluent limitations in the previous permits issued to the San Diego County Copermittees, the Orange County Copermittees, and the Riverside County Copermittees.~~ While this Order allows implementation of an alternative compliance pathway option in Provision B.3.c to constitute compliance with receiving water limitations under certain circumstances, the availability of that alternative and the corresponding availability of additional time to come into compliance with receiving water limitations~~,~~ does not violate the anti-backsliding provisions. The receiving water limitations provisions of this Order are imposed under section 402(p)(3)(B) of the Clean Water Act rather than based on best professional judgment, or based on section 301(b)(1)(C) or sections 303(d) or (e), and are accordingly not subject to the anti-backsliding requirements of section 402(o). Although the non-applicability is less clear with respect to the regulatory anti-backsliding provisions in 40 CFR 122.44(l), the regulatory history suggests that USEPA's intent was to establish the anti-backsliding regulations with respect to evolving technology standards for traditional point sources. (See, e.g., 44 Fed.Reg. 32854, 32864 (Jun. 7, 1979)). It is unnecessary, however, to resolve the ultimate applicability of the regulatory anti-backsliding provisions, because the alternative compliance pathway option in Provision B.3.c qualifies for an exception to backsliding as based on new information.

The alternative compliance pathway option in Provision B.3.c of this Order was informed by new information available to the Board from experience and knowledge gained through storm water permitting at the Regional Water Boards in the last ten years. There has been a statewide paradigm shift in storm water management. State Water Board Order WQ 2015-0075 directed all of the Regional Water Boards to consider the Los Angeles Water Board's alternative compliance path to receiving water limitations in all Phase I MS4 permits going forward (State Water Board Order WQ 2015-0075 at page 51), and the Los Angeles Water Board's process of developing over 30 watershed-based TMDLs and implementing several TMDLs since the adoption of the previous permits. In particular, the Los Angeles Water Board recognized the significance of allowing time to plan, design, fund, operate and maintain watershed-based BMPs necessary to attain water quality improvements and additionally recognized the potential for municipal storm water to benefit water supply. Similarly, the San Diego Water Board's experience developing and implementing the Fourth Term MS4 Permits and TMDLs that apply on a region-wide scale (e.g. TMDLs for Indicator

Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region) has resulted in a similar recognition of the need for a watershed-based approach that allows time to plan, design, fund, operate and maintain BMPs to address impaired waters that have been impacted by MS4 discharges. Thus, even if the receiving water limitations are subject to anti-backsliding requirements, they were revised based on new information that would support an exception to the anti-backsliding provisions. (33 U.S.C. § 1342(o)(2)(B)(i); 40 C.F.R. § 122.44(l)(1); 40 C.F.R. §122.44(l)(2)(i)(B)(1)).

Clean Water Act Section 303(d) List

CWA section 303(d)(1) requires each State to identify specific water bodies within its boundaries where water quality standards are not being met or are not expected to be met after implementation of technology-based effluent limitations on point sources. Water bodies that do not meet water quality standards are considered impaired and are placed on the state's "303(d) List." Periodically, USEPA approves the State's 303(d) List.

Most recently, USEPA approved the State's 2010 303(d) List of impaired water bodies on October 11, 2011, which includes certain receiving waters in the San Diego Region. For each listed water body, the state or USEPA is required to establish a TMDL of each pollutant impairing the water quality standards in that water body. A TMDL is a tool for implementing water quality standards and is based on the relationship between pollution sources and in-stream water quality conditions. The TMDL establishes the allowable pollutant loadings for a water body and thereby provides the basis to establish water quality-based controls. These controls should provide the pollution reduction necessary for a water body to meet water quality standards.

A TMDL is the sum of the allowable pollutant loads of a single pollutant from all contributing point sources (the waste load allocations or WLAs) and non-point sources (load allocations of LAs) plus the contribution from background sources and a margin of safety (40 CFR 130.2(i)). MS4 discharges are considered point source discharges. For 303(d)-listed water bodies and pollutants in the San Diego Region, the San Diego Water Board or USEPA develops and adopts TMDLs that specify these requirements.

Since 2002, the San Diego Water Board has established seven (7) TMDLs to remedy water quality impairments in various water bodies within the San Diego Region (see Attachment E to the Order). These TMDLs identify MS4 discharges as a source of pollutants to these water bodies, and, as required, establish WLAs for MS4 discharges to reduce the amount of pollutant discharged to receiving waters. CWA section 402(p)(3)(B)(iii) requires the San Diego Water Board to impose permit conditions, including: "management practices, control techniques and system, design and engineering methods, and *such other provisions as the Administrator or the State determines appropriate for the control of such pollutants."* (Emphasis added.) CWA section 402(a)(1) also requires states to issue permits with conditions necessary to carry out the provisions of the CWA. Federal regulations also require that NDPES permits contain WQBELs consistent with the assumptions and requirements of all available WLAs (40 CFR 122.44(d)(1)(vii)(B)). CWC section 13377 also requires that

NPDES permits include limitations necessary to implement water quality control plans. Therefore, this Order includes WQBELs and other provisions to implement the TMDL WLAs assigned to Copermittees regulated by this Order.

Other Regulations, Plans and Policies

This Order implements all other applicable federal regulations and State regulations, plans and policies, including the California Toxics Rule at 40 CFR 131.38 (Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California Rule [California Toxics Rule or CTR]), and State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP).

F. Unfunded State Mandates

Article XIII B, Section 6(a) of the California Constitution provides that whenever "*any state agency mandates a new program or higher level of service on any local government, the state shall provide a subvention of funds to reimburse that local government for the costs of the program or increased level of service*." The requirements of this Order do not constitute state mandates that are subject to a subvention of funds for several reasons, including, but not limited to, the following.

First, the requirements of this Order do not constitute a new program or a higher level of service as compared to the requirements contained in the previous Fourth Term Permits. The overarching requirement to impose controls to reduce the pollutants in discharges from MS4s is dictated by the CWA and is not new to this permit cycle (33 USC section 1342(p)(3)(B)). The inclusion of new and advanced measures as the MS4 programs evolve and mature over time is anticipated under the CWA (55 FR 47990, 48052 (Nov. 16, 1990)), and to the extent requirements in this Order are interpreted as new advanced measures, they do not constitute a new program or higher level of service.

Second, and more broadly, mandates imposed by federal law, rather than by a state agency, are exempt from the requirement that the local agency's expenditures be reimbursed (Cal. Const., art. XIII B, section 9, subd. (b)). This Order implements federally mandated requirements under the CWA and its requirements are therefore not subject to subvention of funds. This includes federal requirements to effectively prohibit non-storm water discharges, to reduce the discharge of pollutants in storm water to the MEP, and to include such other provisions as the Administrator or the State determines appropriate for the control of such pollutants (33 USC section 1342(p)(3)(B)). Federal cases have held these provisions require the development of permits and permit provisions on a case-by-case basis to satisfy federal requirements. (*Natural Resources Defense Council, Inc., v. USEPA* (9th Cir. 1992) 966 F.2d 1292, 1308, fn. 17.)

The authority exercised under this Order is not reserved state authority under the CWA's savings clause (cf. *Burbank v. State Water Resources Control Bd.* (2005) 35

Cal.4th 613, 627-628 [relying on 33 USC section 1370, which allows a state to develop requirements which are not "less stringent" than federal requirements]), but instead is part of a federal mandate to develop pollutant reduction requirements for municipal separate storm sewer systems. To this extent, it is entirely federal authority that forms the legal basis to establish the permit provisions. (See, *City of Rancho Cucamonga v. Regional Water Quality Control Board, Santa Ana Region* (2006) 135 Cal.App.4th 1377, 1389; *Building Industry Ass'n of San Diego Co. v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 882-883.)

The MEP standard is a flexible standard that balances a number of considerations, including technical feasibility, cost, public acceptance, regulatory compliance, and effectiveness. (*Building Ind. Ass'n., supra,* 124 Cal.App.4th at pp. 873-874, 889.) Such considerations change over time with advances in technology and with experience gained in storm water management (55 FR 47990, 48052 (Nov. 16, 1990)). Accordingly, a determination of whether the conditions contained in this Order exceed the requirements of federal law cannot be based on a point by point comparison of the permit conditions and the minimum control measures that are required "at a minimum" to reduce pollutants to the maximum extent practicable and to protect water quality (40 CFR 122.34). Rather, the appropriate focus is whether the permit conditions, as a whole, exceed the MEP standard.

In recent months, the County of Los Angeles and County of Sacramento Superior Courts have granted writs setting aside decisions of the Commission on State Mandates that held certain requirements in Phase I permits constituted unfunded mandates. In both cases, the courts have found that the correct analysis in determining whether an MS4 permit constituted a state mandate was to evaluate whether the permit as a whole exceeds the MEP standard. (*State of Cal. v. Comm. on State Mandates* (Super. Ct. Sacramento County, 2012, No. 34-2010-80000604), *State of California v. County of Los Angeles* (Super. Ct. Los Angeles County, 2011, No. BS130730.) Both cases are currently pending appeal.

The requirements of the Order, taken as a whole rather than individually, are necessary to reduce the discharge of pollutants to the MEP and to protect water quality. The San Diego Water Board finds that the requirements of the Order are practicable, do not exceed federal law, and thus do not constitute an unfunded mandate. These findings are the expert conclusions of the principal state agency charged with implementing the NPDES program in California (CWC sections 13001, 13370).

It should also be noted that the provisions in this Order to effectively prohibit non-storm water discharges are also mandated by the CWA (33 USC section 1342(p)(3)(B)(ii)). Likewise, the provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state establishes or adopts a TMDL, federal law requires that permits must contain effluent limitations consistent with the assumptions and requirements of any applicable waste load allocation in a TMDL (40 CFR 122.44(d)(1)(vii)(B)).

Third, the local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental dischargers who are issued NPDES permits for storm water discharges. With a few inapplicable exceptions, the CWA regulates the discharge of pollutants from point sources (33 USC section 1342) and the Porter-Cologne Act regulates the discharge of waste (CWC section 13263), both without regard to the source of the pollutant or waste. As a result, the "costs incurred by local agencies" to protect water quality reflect an overarching regulatory scheme that places similar requirements on governmental and non-governmental dischargers. (See *County of Los Angeles v. State of California* (1987) 43 Cal.3d 46, 57-58 [finding comprehensive workers' compensation scheme did not create a cost for local agencies that was subject to state subvention].)

The CWA and the Porter-Cologne Act largely regulate storm water with an even hand, but to the extent there is any relaxation of this even-handed regulation, it is in favor of the local agencies. Generally, the CWA requires point source dischargers, including dischargers of storm water associated with industrial or construction activity, to comply strictly with water quality standards (33 USC section 1311(b)(1)(C); *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159, 1164-1165 [noting that industrial discharges must strictly comply with water quality standards]). As discussed in prior State Water Board decisions, certain provisions of this Order do not require strict compliance with water quality standards (State Water Board Order No. WQ 2001-0015, p. 7). Those provisions of this Order regulate the discharge of waste in municipal storm water under the CWA's MEP standard, not the BAT/BCT standard that applies to other types of discharges. These provisions, therefore, regulate the discharge of waste in municipal storm water more leniently than the discharge of waste from non-governmental sources.

Fourth, the Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)). To the extent that the local agency Copermittees have voluntarily availed themselves of the permit, the program is not a state mandate. (Accord, *County of San Diego v. State of California* (1997) 15 Cal.4th 68, 107-108.)

Fifth, the local agency Copermittees' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under state law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

Finally, even if any of the permit provisions could be considered unfunded mandates, under Government Code section 17556, subdivision (d), a state mandate is not subject to reimbursement if the local agency has the authority to charge a fee. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order, subject to certain voting requirements contained in the California Constitution. (See Cal. Const., Art. XIII D, section 6, subd. (c); see also *Howard Jarvis Taxpayers Ass'n v. City of Salinas* (2002) 98 Cal.App.4th

1351, 1358-1359.) The Fact Sheet demonstrates that numerous activities contribute to the pollutant loading in the MS4. Local agencies can levy service charges, fees, or assessments on these activities, independent of real property ownership. (See, e.g., *Apartment Ass'n of Los Angeles County, Inc., v. City of Los Angeles* (2001(24 Cal.4th 830, 842 [upholding inspection fees associated with renting property].) The authority and ability of a local agency to defray the cost of a program without raising taxes indicates that a program does not entail a cost subject to subvention. (*Clovis Unified School Dist. V. Chiang* (2010) 188 Cal.App.4th 794, 812, citing *Connell v. Sup. Ct.* (1997) 59 Cal.App.4th 382, 401; *County of Fresno v. State of California* (1991) 53 Cal. 3d. 482, 487-488.)

VIII. PROVISIONS

The provisions (i.e. NPDES permit requirements) of the Order are discussed below.

A. Prohibitions and Limitations

Purpose: Provision A includes the prohibitions and limitations requirements that are the foundation of all the subsequent requirements included in the Order. Compliance with the prohibitions and limitations will restore and protect receiving waters from impacts that may be caused by discharges into and from the Copermittees' MS4s and ultimately achieve the objective of the CWA.

In meeting the requirements set forth in the Order, the Copermittees must be cognizant that the prohibitions and limitations exist and will be the standard by which the San Diego Water Board will be measuring the progress and success of their implementation of the NPDES permit requirements.

***Discussion*:** The objective of the CWA is to "*restore and maintain the chemical, physical, and biological integrity of the Nation's waters*." The CWA requires the implementation of NPDES permit programs to regulate discharges of pollutants and dredged or fill material to the navigable waters of the U.S. For discharges into and from MS4s, the CWA requires the NPDES permits to "*effectively prohibit non-stormwater discharges into the storm sewers*" and "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable.*"

Provision A includes limitations, consistent with the requirements of the CWA for discharges from MS4s. Provision A expresses these limitations as discharge prohibitions, receiving water limitations, and effluent limitations. Compliance with the discharge prohibitions and receiving water limitations is also explicitly described, in conformance with precedential State Water Board Orders.

More specific and detailed discussions of the requirements of Provision A are provided below.

Provision A.1 (Discharge Prohibitions) prohibits the discharge of specific types of waste into and/or from the Copermittees' MS4s.

Provision A.1.a restates and reiterates Basin Plan Waste Discharge Prohibition 1, by prohibiting discharges into and from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the

state. The terms pollution,[15] contamination,[16] and nuisance[17] are defined under CWC 13050. Provision A.1.c incorporates all the waste discharge prohibitions of the Basin Plan into the requirements of the Order. The waste discharge prohibitions from the Basin Plan have been reproduced and provided in Attachment A to the Order.

Provision A.1.b requires non-storm water discharges into the MS4s to be effectively prohibited, consistent with the requirements of the CWA for MS4 permits to "*effectively prohibit non-stormwater discharges into the storm sewers*." The effective prohibition is required to be implemented by each Copermittee within its jurisdiction through the illicit discharge detection and elimination requirements under Provision E.2. The prohibition does not apply to NPDES permitted discharges into the Copermittees' MS4s.

The CWA employs the strategy of prohibiting the discharge of any pollutant from a point source into waters of the United States unless the discharger of the pollutant(s) obtains an NPDES permit pursuant to CWA Section 402. The 1987 amendment to the CWA includes provision 402(p) that specifically addresses NPDES permitting requirements for storm water discharges from MS4s. CWA section 402(p) prohibits the discharge of pollutants from specified MS4s to waters of the U.S. except as authorized by an NPDES permit and identifies two substantive standards for MS4 storm water permits. MS4 permits (1) "*shall include a requirement to effectively prohibit non-stormwater discharges into the storm sewers*" and (2) "*shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or State determines appropriate for the control of such pollutants*." (CWA section 402(p)(3)(B)(ii)-(iii).)

In November 1990, the USEPA published regulations addressing storm water discharges from MS4s (55 FR 47990 and following (Nov. 16, 1990) (Phase I Final Rule)). The regulations establish minimum requirements for MS4 permits, and generally focus on the requirement that MS4s implement programs to reduce the amount of pollutants found in storm water discharges to the MEP. The CWA's municipal storm water MEP standard does not require storm water discharges to strictly meet water quality standards, as is required for other NPDES permitted

[15] CWC 13050(l): "(1) 'Pollution' means an alteration of the quality of waters of the state by waste to a degree which unreasonably affects either of the following: (A) The water for beneficial uses. (B) Facilities which serve beneficial uses. (2) 'Pollution' may include 'contamination.'
[16] CWC 13050(k): "Contamination' means an impairment of the quality of waters of the state by waste to a degree which creates a hazard to public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste, whether or not waters of the state are affected."
[17] CWC 13050(m): 'Nuisance' means anything which meets all of the following requirements: (1) Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. (2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. (3) Occurs during, or as a result of, the treatment or disposal of wastes."

discharges. Compliance is achieved through an iterative approach of continuous implementation of improved BMPs. This distinction reflects Congress's recognition that variability in flow and intensity of storm events render difficult strict compliance with water quality standards by MS4 permittees. In describing the controls that permits must include to reduce pollutants in storm water discharges to the MEP, the statute (CWA section 402(p)(3)(B)(iii)) states that the controls shall include: "*management practices, control techniques and system, design and engineering methods, and such other provisions as the [permit writer] determines appropriate for the control of such pollutants*."

In contrast, non-storm water discharges from the MS4 that are not authorized by separate NPDES permits are subject to requirements under the NPDES program, including discharge prohibitions, technology based effluent limitations and water quality-based effluent limitations (40 CFR 122.44). The regulations also require the Copermittee's program to include an element to detect and remove illicit discharges and improper disposal into the storm sewer (40 CFR 122.26(d)(2)(iv)(B)).

While "non-storm water" is not defined in the CWA or federal regulations, the federal regulations (at 40 CFR 122.26(b)(2)) define "*illicit discharge*" as *"any discharge to a municipal separate storm sewer that is not composed entirely of storm water and that is not covered by an NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer and discharges resulting from fire fighting activities)*." This definition is the most closely applicable definition of "non-storm water" contained in federal law. As stated in the Phase I Final Rule, USEPA added the illicit discharge program requirement to begin implementation of the 'effective prohibition' requirement to detect and control non-storm water discharges to their municipal system.

Thus, federal law mandates that permits issued to MS4s must require management practices that will result in reducing storm water pollutants to the MEP yet at the same time requires that non-storm water discharges be effectively prohibited from entering the MS4. "Effectively" prohibit does not mean that non-storm water discharges are authorized to be discharged into and from the Copermittees' MS4s. The Phase I Final Rule clarifies what "effectively prohibit" means (55 FR 47995):

> "*Section 402(p)(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…<u>Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit</u> (other than the permit for the discharge from the municipal separate storm sewer)*" [Emphasis added].

Consistent with federal law, unless non-storm water discharges to the MS4 are authorized by a separate NPDES permit, non-storm water discharges are

appropriately subject to the effective prohibition requirement in the CWA and Regional Water Boards are not limited by the iterative MEP approach to storm water regulation in crafting appropriate regulations for non-storm water discharges.

The federal regulations (40CFR122.26(d)(2)(i)(B)) require the Copermittees to establish the legal authority which authorizes or enables the Copermittees to prohibit illicit discharges to the MS4s. The federal regulations (40 CFR 122.26(d)(2)(vi)(B)(1)) require the Copermittees to "*implement and enforce an ordinance, order or similar means*" to prevent non-storm water discharges to their MS4s. Thus, the Copermittees are required to "*effectively*" prohibit non-storm water discharges to their MS4s through enforcing their legal authority established under "*ordinance, order or similar means*" and either remove those discharges to their MS4s, or require those discharges to obtain coverage under a separate NPDES permit. More detail about the program that must be implemented to "*effectively*" prohibit non-storm water discharges to the Copermittees' MS4s is provided under the discussion for Provision E.2.

Provision A.1.d was included to be consistent with Resolution No. 2012-0012, adopted by the State Water Board on March 20, 2012. Provision A.1.d prohibits discharges from MS4s to Areas of Special Biological Significance (ASBS), except for storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach to the Heisler Park ASBS subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012. The pertinent Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 are provided in Attachment A to the Order.

<u>Provision A.2 (Receiving Water Limitations)</u> specifies the condition of the receiving waters that must be achieved when there are discharges from the Copermittees' MS4s. Receiving water limitations are included in all NPDES permits issued pursuant to the CWA section 402. CWA section 402(p)(3)(B)(iii) authorizes the inclusion of "*such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." This requirement gives USEPA or the State permitting authority, in this case the San Diego Water Board, discretion to determine what permit conditions are necessary to control pollutants.

In its Phase I Final Rule (see 55 FR 47990, 47994 (Nov. 16, 1990)), USEPA elaborated on these requirements, stating that, "*permits for discharges from municipal separate storm sewer systems must require controls to reduce the discharge of pollutants to the maximum extent practicable, and where necessary water quality-based controls*." USEPA reiterated in its Phase II Final Rule (64 FR 68722, 68737), that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL*." CWC section 13377 also requires that NPDES permits include limitations necessary to implement water quality control plans. Both the State Water Board and the San Diego Water Board have previously concluded that discharges from the MS4 contain pollutants that have

the reasonable potential to cause or contribute to excursions above water quality standards. As such, inclusion of receiving water limitations is appropriate to control MS4 discharges.

The inclusion of receiving water limitations is also consistent with the Ninth Circuit Court of Appeals' ruling in *Defenders of Wildlife v. Browner* (191 F.3d 1159, 1166 (1999)) that the permitting authority has discretion regarding the nature and timing of requirements that it includes as MS4 permit conditions to attain water quality standards. The Ninth Circuit Court of Appeals recently explained that, "*[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*" (*Natural Resources Defense Council v. County of Los Angeles* (9th Cir. 2011) 673 F.3d 880, 886 (revd. On other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013)))

The receiving water limitations included in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan or in water quality control plans or policies adopted by the State Water Board, including State Water Board Resolution No. 68-16, or in federal regulations, including but not limited to 40 CFR 131.12 and 131.38. The water quality objectives in the Basin Plan and other State Water Board plans and policies have been approved by USEPA and combined with designated beneficial uses constitute the water quality standards required under federal law.

Provision A.2.a requires that discharges from the Copermittees' MS4s must not cause or contribute to the violation of water quality standards in receiving waters. The water quality standards of the receiving waters must be protected from the impacts that may be caused by the Copermittees' MS4 discharges. Water quality standards applicable to the surface waters in the San Diego Region must be achieved through meeting the technology based standard of MEP through an iterative process of improved management actions. Provision A.2.a is also consistent with State Water Board Order WQ 99-05 precedent-setting language requiring discharges from MS4s to attain receiving water quality standards. The water quality control plans and policies with water quality standards applicable to the waters in the San Diego Region are included under Provision A.2.a.

Provisions A.2.b was included to be consistent with the requirements of State Water Board Resolution No. 2012-0012, adopted on March 20, 2012.

<u>Provision A.3 (Effluent Limitations)</u> specifies the condition of the discharges from the Copermittees' MS4s that must be achieved if and when there are discharges.

Consistent with CWA section 301(b)(1)(A) and 40 CFR 122.44(a), Provision A.3.a includes the technology-based effluent limitations that must be included in the Order. The technology-based effluent limits, representing the minimum level of control that must be imposed in a permit under CWA section 402, requires that pollutants in discharges of storm water from the Copermittees' MS4s be reduced to the MEP. This provision applies specifically to storm water discharges. Non-storm water discharges must be effectively prohibited, as required under Provision A.1.b. Non-storm water (dry weather) discharges from the MS4 are not considered storm water (wet weather) discharges and therefore are not subject to the MEP standard.

The technology-based MEP standard is an ever-evolving, flexible, and advancing concept. Neither Congress nor USEPA has specifically defined the term "maximum extent practicable." Congress established this flexible MEP standard so that the administrative bodies would have "*the tools to meet the fundamental goals of the Clean Water Act in the context of storm water pollution*." (*Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 884.) As knowledge about controlling storm water runoff and discharges continues to evolve, so does the knowledge which constitutes MEP. Reducing the discharge of pollutants in storm water from the MS4 to the MEP requires the Copermittees to assess each program component and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP.

The San Diego Water Board or the State Water Board ultimately define MEP, and may include requirements that provide specific guidance on what is expected to demonstrate MEP. It is the responsibility of the Copermittees to propose actions that implement BMPs to reduce storm water pollution to the MEP. In other words, the Copermittees' runoff management programs developed and implemented under the Order are the Copermittees' proposals for achieving MEP. Their total collective and individual activities conducted pursuant to their runoff management programs become their proposal for achieving MEP as it applies both to their overall effort, as well as to specific activities. Provisions B through E of the Order provides a minimum framework to guide the Copermittees in achieving the MEP standard for discharges of pollutants in storm water.

Provision A.3.b incorporates any water quality based effluent limitations (WQBELs) applicable to the MS4s established for TMDLs adopted and approved for the San Diego Region and requires the Copermittees to comply with those WQBELs. This is consistent with 40 CFR 122.44(d)(1)(vii)(B), which requires that NPDES permits to incorporate WQBELs "*developed to protect a narrative water quality criterion, a numeric water quality criterion, or both…consistent with the assumptions and requirements of any available wasteload allocation for the discharge...*"

Pursuant to CWA section 303(d), for surface water bodies identified as impaired by one or more pollutants, the San Diego Water Board is required to establish TMDLs "*at a level necessary to implement the applicable water quality standards with seasonal variations and a margin of safety which takes into account any lack of knowledge*

concerning the relationship between effluent limitations and water quality." The TMDLs identify sources of the pollutants causing the impairments and assign portions of the TMDL as WLAs to point sources, which include MS4s.

WLAs must be expressed in NPDES permits as WQBELs, which may include one or more numeric components such as numeric effluent limits, and/or receiving water limitations, and/or BMP requirements. Because numeric targets for TMDLs typically include a component that will be protective of water quality standards, a TMDL will likely include one or more numeric receiving water limitations and/or effluent limitations as part of the assumptions or requirements of the TMDL. Any numeric receiving water limitations and/or effluent limitations developed as part of the assumptions or requirements of a TMDL must be incorporated and included as part of WQBELs for the MS4s.

Because the development and approval of new TMDLs, or modification of existing TMDLs, may occur during the term of this Order, the specific provisions of those TMDLs, including effluent limitations applicable to MS4s are provided within Attachment E to the Order. Attachment E will be updated with new TMDLs and modifications to existing TMDLs in a timely manner as they occur.

Provision A.4 (Compliance with Discharge Prohibitions and Receiving Water Limitations) describes the process required to be implemented by the Copermittees if compliance with the discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a are not being achieved under current conditions.

In its Phase II Stormwater Regulations, Final Rule, USEPA states that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL.*"[18] In a series of comment letters on MS4 permits issued by various Regional Water Boards, USEPA has also reiterated that MS4 discharges must meet water quality standards.[19] In addition, the Ninth Circuit Court of Appeals explained in a recent ruling that, *"[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*"[20]

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[18] Phase II Stormwater Regulations, Final Rule, 64 Fed. Reg. 68722, 68737.
[19] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.
[20] NRDC v. County of Los Angeles (9th Cir. 2011), 673 F.3d 880, 886 (revd. on other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013))). See also, *Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 884-886, citing *Defenders of Wildlife v. Browning,* (9th Cir. 1999) 191 F.3d 1159.)

Water quality standards for the San Diego Region are established in the Basin Plan. The water quality standards of the Basin Plan are incorporated into this Order as the discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a. The discharge prohibitions and receiving water limitations in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations or prohibitions to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan, water quality control plans or policies adopted by the State Water Board, including Resolution No. 68-16, or federal regulations, including but not limited to, 40 CFR 131.12 and 131.38. The waste discharge prohibitions and water quality objectives in the Basin Plan have been approved by USEPA and combined with the designated beneficial uses constitute the water quality standards required under federal law.

Under federal law (CWA section 402(p)(3)(B)(iii)), an MS4 permit must include "*controls to reduce the discharge of pollutants to the maximum extent practicable...and such other provision as...the State determines appropriate for control of such pollutants*." The State Water Board has previously determined that limitations necessary to meet water quality standards are appropriate for the control of pollutants discharged by MS4s and must be included in MS4 permits. (State Water Board Orders WQ 91-03, 98-01, 99-05, 2001-15; see also *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159.) This Order prohibits discharges that cause or contribute to violations of water quality standards.

The discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a are included in this Order to ensure that discharges from the MS4s do not cause or contribute to exceedances of water quality objectives necessary to protect the beneficial uses of the receiving waters.

Provision A.4 is consistent with the precedent-setting language in State Water Board Order WQ 99-05 required to be included in municipal storm water permits. State Water Board Order WQ 2001-15 refined Order WQ 99-05 by requiring an iterative approach to compliance with water quality standards involving ongoing assessments and revisions, referred to as the "iterative process." The "iterative process" is a fundamental NPDES requirement for municipal storm water permits to achieve the objectives of the CWA.

The State Water Board and Regional Water Boards have stated that the provisions under Provisions A.1.a, A.1.c, A.2.a, and A.4 are independently applicable, meaning that compliance with one provision does not provide a "safe harbor" where there is non-compliance with another provision (i.e., compliance with the Provision A.4 does not shield a Copermittee who may have violated Provision A.1.a, A.1.c, or A.2.a from an enforcement action). The intent of Provision A.4 is to ensure that the Copermittees have the necessary storm water management programs and controls in place, and that they are modified by the Copermittees in a timely fashion when necessary, so that compliance with Provisions A.1.a, A.1.c, and/or A.2.a is achieved as soon as possible. USEPA expressed the importance of this independent applicability in a series of

comment letters on MS4 permits proposed by various Regional Water Boards. At that time, USEPA expressly objected to certain MS4 permits that included language stating, *"permittees will not be in violation of this [receiving water limitation] provision … [if certain steps are taken to evaluate and improve the effectiveness of the jurisdictional runoff management programs],"* concluding that this phrase would not comply with the CWA.[21]

The Ninth Circuit held in *Natural Resources Defense Council v. County of Los Angeles* (2011) 673 F3d. 880, 886 (revd. on other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013))) that engagement in the iterative process does not provide a safe harbor from liability for violations of permit terms prohibiting exceedances of water quality standards. The Ninth Circuit holding is consistent with the position of the State and Regional Water Boards that exceedances of water quality standards in an MS4 permit constitute violations of permit terms subject to enforcement by the Water Boards or through a citizen suit. While the Water Boards have generally directed dischargers to achieve compliance by improving control measures through the iterative process, the San Diego Water Board retains the discretion to take other appropriate enforcement and the iterative process does not shield dischargers from citizen suits under the CWA.

The requirements of Provision A.4, therefore, are required to be implemented until the water quality standards expressed under Provisions A.1.a, A.1.c, and A.2.a are achieved. The CWA requires MS4 permits to "*require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." The requirements of this Order have been deemed or determined to be "appropriate" to achieve water quality standards in receiving waters.

Part of the "*controls*" required by the Order is the process described in Provision A.4. Provision A.4 includes the process that is ultimately expected to achieve compliance with the requirement that discharges from the MS4 do not cause or contribute to violations of water quality standards in the receiving waters. The implementation of Provision A.4 is required when the Copermittees or the San Diego Water Board have determined that discharges from the MS4 are causing or contributing to violations of water quality standards in the receiving waters.

The Copermittees must effectively prohibit non-storm water discharges into the MS4s, reduce the discharge of pollutants in storm water from the MS4s to the MEP, and ensure that their MS4 discharges do not cause or contribute to violations of water quality standards. If the Copermittees have effectively prohibited non-storm water

[21] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.

discharges and reduced storm water pollutant discharges to the MEP, but their discharges are still causing or contributing to violations of water quality standards, Provision A.4 provides a clear "iterative process" for the Copermittees to follow.

Provision A.4 essentially requires the Copermittees to implement additional BMPs until MS4 discharges no longer cause or contribute to a violation of water quality standards.

In assessing compliance and potential enforcement actions, the San Diego Water Board looks at the Copermittees' efforts in total to meet the requirements of Provisions A.1.a, A.1.c, A.2.a and Provision A.4. The Copermittees need to demonstrate that they are making improvements to their programs and making progress toward achieving the discharge prohibitions and receiving water limitations in Provisions A.1.a, A.1.c, and A.2.a by implementing the requirements of Provision A.4. The San Diego Water Board would consider these efforts prior to strictly enforcing the requirements of Provisions A.1.a, A.1.c, and A.2.a. Causes of exceedances of the receiving water limitations can often be more difficult to identify and attribute solely to the Copermittees' MS4s. The intent of the Order is to provide the Copermittees more clarity and flexibility in addressing these exceedances through the iterative approach and adaptive management process until the requirements under Provisions A.1.a, A.1.c, and A.2.a are fully achieved.

An exception to the iterative approach and adaptive management process would be in receiving waters subject to adopted and approved TMDLs. For TMDLs that are incorporated into the Order, there is a specific date for compliance to be achieved, after which the iterative approach and adaptive management process required under Provision A.4 no longer provides the flexibility to achieve compliance. Where compliance dates for a TMDL have passed, compliance with the WQBELs incorporated into the Order established by a TMDL in Attachment E to protect water quality standards is required. Thus, after the interim or final compliance dates for a TMDL have passed, if the discharges from the Copermittees' MS4s are causing or contributing to a violation of WQBELs, exceedances of WQBELs must be strictly enforced by the San Diego Water Board. In the meantime, however, the Copermittees are in compliance with the interim or final TMDL requirements in Attachment E as long as the interim or final WQBELs are being achieved in accordance with the interim or final compliance dates.

In addition, this Order includes an optional pathway that incorporates the requirements of Provision A.4 and would allow a Copermittee to be deemed in compliance with the requirements under Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b during implementation of a Water Quality Improvement Plan that incorporates specific additional requirements. This alternative compliance pathway and the additional specific requirements are described below under the discussion for Provision B.3.c.

B. Water Quality Improvement Plans

Purpose: Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges to the MS4s and control pollutants in storm water discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the Clean Water Act.

Provision B includes requirements for the Copermittees to develop and implement Water Quality Improvement Plans to ultimately comply with the prohibitions and limitations under Provision A. The Water Quality Improvement Plans will provide the Copermittees a comprehensive program that can achieve the requirements and further the objectives of the CWA. Implementation of the Water Quality Improvement Plans will also improve the quality of the receiving waters in the San Diego Region.

The Water Quality Improvement Plan is the backbone of the Regional MS4 Permit requirements. Provision B provides the guidance, criteria, and minimum expectations and requirements for the elements of the Water Quality Improvement Plan to be developed and implemented by the Copermittees. The Water Quality Improvement Plans will be implemented in the Watershed Management Area by the Copermittees within their jurisdictions through their jurisdictional runoff management programs.

The Water Quality Improvement Plan also incorporates a program to monitor and assess the progress of the Copermittees' jurisdictional runoff management programs toward improving the quality of discharges from the MS4s, as well as tracking improvements to the quality of receiving waters. A process to adapt and improve the effectiveness of the Water Quality Improvement Plans has also been incorporated into the requirements of Provision B to be consistent with the "iterative approach" required to achieve compliance with discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a, pursuant to the requirements of Provision A.4.

The Water Quality Improvement Plans have also been structured to incorporate the requirements of any TMDLs that have been adopted for the San Diego Region. Incorporating the requirements of the TMDLs into the requirements of Provision B allows the Copermittees to develop a single plan, instead of separate plans, to coordinate their non-storm water and storm water runoff management programs. The Water Quality Improvement Plans allow the Copermittees to meet the requirements of this Order, as well as fulfill the requirements of the TMDLs.

As an added benefit, if the Copermittees demonstrate that impaired water bodies within the Watershed Management Area listed on the 303(d) List will be addressed with their Water Quality Improvement Plans in a reasonable period of time, the San Diego Water Board may be able to remove the water bodies from the 303(d) List, which would greatly reduce the need for the San Diego Water Board to develop additional TMDLs that would have to be incorporated into the Order and implemented by the Copermittees.

***Discussion*:** The federal NPDES regulations require the Copermittees to develop a proposed management program (40 CFR 122.26(d)(2)(iv)). The proposed management program must include "*a comprehensive planning process*" and "*where necessary intergovernmental coordination*" for the "*duration of the permit.*" The Water Quality Improvement Plan is the Copermittees' "*comprehensive planning process*" document for the proposed management program that will be implemented within a Watershed Management Area. Implementation of the Water Quality Improvement Plan requires "*intergovernmental coordination*" among the Copermittees for at least the "*duration of the permit*," and likely into and beyond the next iteration of the permit.

Developing Water Quality Improvement Plans based upon watersheds is consistent with federal regulations that support the development of permit conditions, as well as implementation of storm water management programs, at a watershed scale (40 CFR 122.26(a)(3)(ii), 122.26(a)(3)(v), and 122.26(d)(2)(iv)). In 2003, USEPA issued a Watershed-Based NPDES Permitting Policy Statement (USEPA, 2003) that defines watershed-based permitting as an approach that produces NPDES permits that are issued to point sources on a geographic or watershed basis. In this policy statement, USEPA explains that "*[t]he utility of this tool relies heavily on a detailed, integrated, and inclusive watershed planning process*." USEPA identifies a number of important benefits of watershed permitting, including more environmentally effective results, the ability to emphasize measuring the effectiveness of targeted actions on improvements in water quality, reduced cost of improving the quality of the nation's waters and more effective implementation of watershed plans, including TMDLs, among others.

An emphasis on watersheds is appropriate at this stage in the San Diego Region's MS4 program to shift the focus to more targeted, water quality driven planning and implementation. Addressing discharges on a watershed scale focuses on water quality results by emphasizing the receiving waters in the watershed. The conditions of the receiving waters drive management actions, which in turn focus measures to address pollutant contributions from MS4 discharges.

The Water Quality Improvement Plan gives the Copermittees the responsibility of developing a comprehensive plan to coordinate the efforts of their jurisdictional runoff management programs for addressing the problems related to MS4 discharges causing impacts to water quality in the Watershed Management Area. The development of the plan provides the Copermittees the opportunity to provide

significant input on how to implement their jurisdictional runoff management programs, and how to best utilize their available resources in addressing a focused set of priorities that they believe will result in measureable improvements to water quality within the Watershed Management Area.

The Copermittees are encouraged to separate the Watershed Management Area into subwatersheds, as appropriate. This allows the Copermittees to identify priorities applicable to a subset of the Copermittees or specific water bodies or areas within the Watershed Management Area.

Included in the requirements for the elements to be included in the Water Quality Improvement Plan are monitoring and assessment requirements that are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order. In addition to the federal requirements of the CWA section 308(a) and 40 CFR 122.26(d), the San Diego Water Board has the authority to establish monitoring, reporting, and recordkeeping requirements for NPDES permits under CWC 13383.

More specific and detailed discussions of the requirements of Provision B are provided below.

Provision B.1 (Watershed Management Areas) requires the Copermittees to develop a Water Quality Improvement Plan for each of the Watershed Management Areas defined by the San Diego Water Board.

Pursuant to 40 CFR 122.26(d)(2)(iv), proposed management programs "*may impose controls on a…watershed basis…*" The Water Quality Improvement Plan is the Copermittees' proposed management program. A Water Quality Improvement Plan must be developed for each Watershed Management Area identified in the Order.

The Watershed Management Areas are identified in Table B-1. Table B-1 establishes ten (10) Watershed Management Areas, and identifies the Copermittees that are responsible for developing and implementing the Water Quality Improvement Plan for each Watershed Management Area.

The Copermittees from each of the three counties within the San Diego Region ~~are~~ were ~~expected to be~~ phased in as their respective NPDES municipal storm water permits expired. ~~Because~~ Order No. R9-2007-0001 expired in January 2012, and the San Diego County Copermittees ~~were~~ became covered under the Regional MS4 Permit on June 27, 2013, the effective date of the Order. ~~Because~~ Order No. R9-2009-0002 expired in December 2014, and the Orange County Copermittees ~~are~~ became covered under the Regional MS4 Permit on April 1, 2015, the effective date of Order No. R9-2013-0001 as amended by Order No. R9-2015-0001. Order No. R9-2010-0016 expired in November 2015, and the Riverside County Copermittees became covered under the Regional MS4 Permit on January 7, 2016, the effective

date of Order No. R9-2013-0001 as amended by Order No. R9-2015-0100.

~~After the San Diego Water Board receives and considers the Report of Waste Discharge required to be submitted by the Riverside County Copermittees pursuant to the requirements of their current permit, and makes any necessary changes to the Order, the Riverside County Copermittees will be covered under the Regional MS4 Permit after Order No. R9-2010-0016 expires in December 2015.~~

~~The Riverside County Copermittees also have the option to obtain coverage under the Regional MS4 Permit earlier than their respective permit expiration dates. The process to apply for early coverage is described Provision F.6.~~

~~Because the Santa Margarita River Watershed Management Area includes Copermittees from both San Diego County and Riverside County, a footnote to Table B-1 has been included to specify that the requirements of Provision B are not required to be implemented by the County of San Diego until the Riverside County Copermittees have received a notice of coverage under the Order. Until the Riverside County Copermittees are notified of coverage under the Order, the County of San Diego is subject to the prohibitions and limitations under Provision A, responsible for continuing to implement its existing jurisdictional runoff management program, and responsible for implementing the transitional monitoring and assessment requirements of Provision D, the transitional annual reporting requirements of Provision F.3.b, and the TMDL requirements of Attachment E to the Order.~~

The Cities~~y~~ of Laguna Woods, ~~and~~ Laguna Hills, Murrieta, and Wildomar are located partially within the jurisdictions of both the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board) and the San Diego Water Board. Written requests for designation of a single Regional Water Board to regulate matters pertaining to permitting of Phase I MS4 discharges were submitted to the San Diego Water Board and the Santa Ana Water Board by the City of Laguna Woods by letter dated September 8, 2014, ~~and~~ the City of Laguna Hills by letter dated March 12, 2014, the City of Murrieta by letter dated June 22, 2015, and the City of Wildomar by letter dated June 23, 2015. The Cities of Laguna Woods, ~~and~~ Laguna Hills, Murrieta, and Wildomar requested designation of the San Diego Water Board pursuant to CWC section 13228.

The Cities of Laguna Woods, ~~and~~ Laguna Hills, Murrieta, and Wildomar reported that management and implementation of municipal programs to comply with two different Phase I MS4 permits creates a significant administrative and financial burden and inhibits their ability to contribute to greater overall water quality improvements in either Region. In an effort to address these concerns, the San Diego Water Board and the Santa Ana Water Board have entered into ~~an~~ written agreements ~~dated February 10, 2015~~, whereby the San Diego Water Board is designated to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Laguna Woods, ~~and~~ Laguna Hills, Murrieta, and Wildomar including ~~areas~~ the portions of the jurisdictions within the

Santa Ana Region. The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated February 10, 2015 to designate the San Diego Water Board to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Laguna Woods and Laguna Hills, including the portions of the jurisdictions within the Santa Ana Region, upon the later effective date of ~~this~~ Order No. R9-2015-0001 or Santa Ana Water Board Tentative Order No. R8-2015-0001. The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated October 26, 2015 to designate the San Diego Water Board to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Murrieta and Wildomar, including the portions of the jurisdictions within the Santa Ana Region upon the effective date of Order R9-2015-0100.

Under the terms of the agreements, each Regional Water Board retains the authority to enforce provisions of the Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee (Water Code section 13228 (b)). Also under the terms of the agreements, any TMDL and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Laguna Woods, ~~or~~ Laguna Hills, Murrieta, or Wildomar as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement of the applicable TMDL would remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's San Diego Creek/Newport Bay TMDL and Lake Elsinore/Canyon Lake Nutrient TMDLs, and the San Diego Water Board's Indicator Bacteria Project I Beaches and Creeks TMDL.

In conformance with the~~is~~ agreements, ~~a~~ footnotes to Table B-1 ~~has been~~ are included to specify coverage under Order No. R9-2013-0001 for those Phase I MS4 discharges within the jurisdictional boundaries of the Cities of Laguna Woods, ~~and~~ Laguna Hills, Murrieta, and Wildomar within the Santa Ana Region. ~~The f~~Footnote 1 to Table B-1 specifies that the Cities~~y~~ of Laguna Woods and Laguna Hills are identified as responsible Copermittees in the San Diego Creek/Newport Bay TMDL in the Santa Ana Region and remain obligated to comply with the San Diego Creek/Newport Bay TMDL pursuant to section XVIII of Tentative Order No. R8-2015-0001 (NPDES No. CAS618030) and any reissuance thereof. Footnote 4 to Table B-1 specifies that the Cities of Murrieta and Wildomar are identified as responsible Copermittees in the Lake Elsinore/Canyon Lake Nutrient TMDLs in the Santa Ana Region and remain obligated to comply with the Lake Elsinore/Canyon Lake Nutrient TMDLs pursuant to section VI.D.2 of Order No. R8-2010-0033 (NPDES No. CAS618030) or corresponding section as it may be amended or reissued.

The Cities~~y~~ of Lake Forest and Menifee ~~is~~ are located partially within the jurisdictions of both the Santa Ana Water Board and the San Diego Water Board. Written requests for designation of a single Regional Water Board to regulate matters pertaining to

permitting of Phase I MS4 discharges were submitted to the San Diego Water Board and the Santa Ana Water Board by the City of Lake Forest by letters dated January 14, 2013 and April 4, 2014, and the City of Menifee by letter dated June 25, 2015. The Cities of Lake Forest and Menifee requested designation of the San Ana Water Board pursuant to CWC section 13228. ~~By letters dated January 14, 2013 and April 4, 2014 the City of Lake Forest submitted a written request, pursuant to CWC section 13228, to the San Diego Water Board and the Santa Ana Water Board requesting the Santa Ana Water Board be designated to regulate matters within the City of Lake Forest pertaining to permitting of their Phase I MS4 discharges.~~

The Cities~~y~~ of Lake Forest and Menifee reported that management and implementation of municipal programs to comply with two different Phase I MS4 permits creates a significant administrative and financial burden and inhibits their ability to contribute to greater overall water quality improvements in either Region. In an effort to address these concerns, the San Diego Water Board and the Santa Ana Water Board have entered into ~~an~~ written agreements ~~dated February 10, 2015~~, whereby the Santa Ana Water Board is designated to regulate Phase I MS4 discharges within the jurisdictions of the Cities~~y~~ of Lake Forest and Menifee including the portions of the jurisdictions within the San Diego Region. The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated February 10, 2015 to designate the San Ana Water Board to regulate Phase I MS4 discharges within the jurisdiction of the City of Lake Forest, including portions of the jurisdiction within the Santa Diego Region, upon the later date of ~~this~~ Order No. R9-2015-0001 or Santa Ana Water Board Tentative Order No. R8-2015-0001. The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated October 26, 2015 to designate the San Ana Water Board to regulate Phase I MS4 discharges within the jurisdiction of the City of Menifee, including portions of the jurisdiction within the San Diego Region, under Order No. R8-2010-0033 (NPDES No. CAS618030) as it may be amended or reissued upon the effective date of Order No. R9-2015-0100.

Under the terms of the agreements, each Regional Water Board retains the authority to enforce provisions of the Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee (Water Code section 13228 (b)). Also under the terms of the agreements, any TMDL and associated Phase I MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities~~y~~ of Lake Forest or Menifee as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement authority for the applicable TMDL would remain with the Regional Water Board which has the jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's San Diego Creek/Newport Bay TMDL and Lake Elsinore/Canyon Lake Nutrient TMDLs, and the San Diego Water Board's Indicator Bacteria Project I Beaches and Creeks TMDL.

In conformance with the~~is~~ agreements, ~~a f~~Footnote 2 to Table B-1 has been included to specify that Phase I MS4 discharges within the jurisdictional boundaries of the City of Lake Forest located within the San Diego Region will be regulated under Santa Ana Water Board Order No. R8-2015-0001 (NPDES No. CAS618030) and any reissuance thereof. The footnote specifies that the City of Lake Forest is an identified responsible Copermittee in the Indicator Bacteria Project I Beaches and Creeks TMDL (Bacteria TMDL) in the San Diego Region and remains obligated to comply with the Bacteria TMDL pursuant to Attachment E of Order No. R9-2013-0001 and any reissuance thereto. The City of Lake Forest is also identified as a responsible Copermittee in the San Diego Creek/Newport Bay TMDL established by the Santa Ana Water Board. The City remains obligated to comply with the San Diego Creek/New Port Bay TMDL pursuant to the Santa Ana Water Board's Phase I MS4 Permit (Tentative Order No. R8-2015-0001 (NPDES No. CAS618030), as it may be amended or reissued). Under the terms of the agreement, the City of Lake Forest must retain and continue implementation of the over irrigation prohibition in Title 15, Chapter 15, Section 14.030, List (b) of the City Municipal Code throughout its jurisdiction. Also under the terms of the agreement, the City of Lake Forest must actively participate in the development and implementation of the ~~Aliso Creek~~ South Orange County Watershed Management Area Water Quality Improvement Plan required pursuant to Order No. R9-2013-0001, and any reissuance thereof.

Footnote 3 to Table B-1 has been included to specify that Phase I MS4 discharges within the jurisdictional boundaries of the City of Menifee located within the San Diego Region will be regulated under Santa Ana Water Board Order No. R8-2010-0033 (NPDES No. CAS618033) and any reissuance thereof. At this time, the City of Menifee is not identified as a responsible Copermittee for any TMDLs established by the San Diego Water Board. Under the terms of the agreement, the City of Menifee must actively participate in the development and implementation of the Santa Margarita River Watershed Management Area Water Quality Improvement Plan required pursuant to Order No. R9-2013-0001, and any reissuance thereof.

The basis supporting the Cities of Laguna Woods, Laguna Hills, ~~and~~ Lake Forest, Menifee, Murrieta, and Wildomar requests to designate a specific Regional Water Board for regulatory oversight of Phase I MS4 discharges may change under future conditions and circumstances, therefore the San Diego Water Board will periodically review the effectiveness of the agreements during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate ~~the~~ one or both of the agreements with the Santa Ana Water Board or otherwise modify the agreements subject to the approval of the Santa Ana Water Board.

Provision B.2 (Priority Water Quality Conditions) requires the Copermittees in each Watershed Management Area to identify the highest priority water quality conditions which will be the focus of the Water Quality Improvement Plan implementation.

Provisions B.2.a and B.2.b provide the criteria that must be assessed when

characterizing the receiving water quality and potential impacts from MS4 discharges of the receiving waters within the Watershed Management Area. The criteria are based primarily on the requirements in 40 CFR 122.26(d)(1)(iv)(C) and (C)(1)-(9). Characterizing the receiving water quality and identifying the potential impacts caused by MS4 discharges to receiving waters in the Watershed Management Area is necessary to identify the impacts to receiving waters associated with MS4 discharges that are of the most concern to the Copermittees.

Based on the information required to be considered under Provisions B.2.a and B.2.b, Provision B.2.c requires to Copermittees to identify the highest priority water quality conditions related to discharges from the MS4s that will be the primary focus of the Water Quality Improvement Plan in the Watershed Management Area. Addressing and improving these highest priority water quality conditions will become the focus of each Copermittee's jurisdictional runoff management program as the Water Quality Improvement Plan is implemented in the Watershed Management Area. The highest priority water quality conditions are expected to include sources of pollutants and/or stressors, and/or receiving water conditions, that the Copermittees consider the highest threats or most likely to have adverse impacts on the physical, chemical, and biological integrity of receiving waters. Addressing these threats and/or adverse impacts should restore the physical, chemical, and biological integrity of receiving waters, and result in the restoration and protection of the beneficial uses of the receiving waters in the Watershed Management Area.

Provision B.2.d requires the Copermittees to identify known and suspected sources of pollutants and/or stressors contributing to the highest priority water quality conditions. The requirements of Provision B.2.d are based primarily on the requirements in 40 CFR 122.26(d)(1)(iii)(B)(1)-(6). The Copermittees are required to evaluate several factors in the identification of those sources. The Copermittees must consider and evaluate the following: (1) the land uses that may contribute toward impacts to receiving waters, (2) the locations of the Copermittees' MS4s that can convey and discharge runoff and pollutants to receiving waters, (3) other sources that discharge into the Copermittees' MS4s and receiving waters, and (4) other information and data that can help the Copermittees to evaluate the relative importance of or contribution from those sources toward the highest priority water quality conditions. Identifying the known and suspected sources, and their relative contribution toward the highest priority water quality conditions, will help the Copermittees to focus, direct, and prioritize their resources and implementation efforts within their jurisdictions.

Provision B.2.e requires the Copermittees to identify potential strategies that can result in improvements to water quality in MS4 discharges and/or receiving waters within the Watershed Management Area. Potential water quality improvement strategies will not necessarily be implemented by the Copermittees, but provide a "menu" of options that the Copermittees will consider for implementation. The public participation process that will be implemented during the development of the Water Quality Improvement Plan is where the potential water quality improvement strategies will be identified.

Provision B.3 (Water Quality Improvement Goals, Strategies and Schedules) requires the Copermittees in each Watershed Management Area to identify the goals that the Copermittees' jurisdictional runoff management programs will work toward achieving to address and improve the highest priority water quality conditions identified under Provision B.2.c; the strategies that will be implemented by the Copermittees within their jurisdictions and the Watershed Management Area to achieve the goals; and, the schedules for implementing the strategies and achieving the goals. The element of the Water Quality Improvement Plan required under Provision B.3 is where the "*comprehensive planning*" and "*intergovernmental coordination*" [40 CFR 122.26(d)(2)(iv)] of the Copermittees' actions for the proposed management programs within the Watershed Management Area is required to be described.

Provision B.3.a requires the Copermittees to identify interim and final numeric goals, and schedules to achieve those goals as part of the Water Quality Improvement Plans. Provision B.3.a.(1) requires the Copermittees to identify two types of numeric goals to be achieved:

(1) Final numeric goals in the receiving waters and/or MS4 discharges that will result in the protection of the water quality standards of the receiving waters for the highest priority water quality conditions identified by the Copermittees for Provision B.2.c. These final numeric goals are the ultimate goals for the Water Quality Improvement Plan, and the achievement and maintenance of these final numeric goals will indicate that one or more beneficial uses have been successfully restored and/or protected from MS4 discharges.

(2) Interim numeric goals that can be used by the Copermittees to demonstrate progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges for the highest priority water quality conditions in the Watershed Management Area. Achievement of the interim numeric goals will demonstrate to the San Diego Water Board that the Copermittees' implementation efforts are progressing toward achieving the final numeric goals.

Provision B.3.a.(1) does not specify what the interim and final numeric goals must be based on, but they essentially must be designed to achieve compliance with water quality standards in the receiving waters. To that end, the interim goals must be based on measureable criteria or indicators capable of demonstrating progress toward achieving the numeric goals.

The interim and final numeric goals can be based on the water quality objectives in the Basin Plan. The water quality objectives in the Basin Plan, however, consist of numeric and narrative water quality objectives. Numeric water quality objectives can be directly used as numeric goals. Narrative water quality objectives, on the other hand, will require some interpretation to identify numeric goals. The achievement of multiple numeric goals based on the water quality objectives, used in combination,

may be necessary to demonstrate that beneficial uses have been restored and/or protected.

The Copermittees could also propose other numeric goals that are not necessarily water quality objectives from the Basin Plan. For example, the Copermittees could propose a numeric goal that consists of achieving some percent improvement of a measureable indicator, such as acreage of a specific habitat or increase in a specific plant or animal species population. Other examples may include pollutant load reductions, number of impaired waterbodies delisted from the List of Water Quality Impaired Segments, Index of Biological Integrity (IBI) scores, etc.

The Copermittees may choose to develop interim numeric goals based on the final numeric goals they develop, such as incremental steps toward ultimately achieving the final numeric goals. The Copermittees may also choose to develop interim numeric goals that are based on other measureable indicators that can indirectly indicate improvements and progress toward the final numeric goals.

There are no limits to the types of interim numeric goals that could be proposed by the Copermittees, other than the goals must be based on measureable criteria or indicators capable of demonstrating progress toward achieving the numeric goals. Likewise, there are no limits to the types of final numeric goals that could be proposed by the Copermittees, other than the goals must "*restore and protect the water quality standards of the receiving waters.*"

Finally, Provision B.3.a.(2) also requires the Copermittees to develop schedules for measuring progress and achieving the interim and final numeric goals. Several criteria are included for the development of the schedules, but the Copermittees are required to achieve the numeric goals as soon as possible, consistent with federal NPDES regulations (40 CFR 122.47(a)(1)).

The Copermittees are also required to incorporate any compliance schedules for applicable ASBS or TMDL requirements. Applicable ASBS and TMDL compliance schedules are set forth in Attachment A and Attachment E to the Order, respectively. The information provided by the Copermittees under Provision B.3.a.(2) will be used by the Copermittees and the San Diego Water Board to gauge and track the progress of the Copermittees' efforts in addressing the highest priority water quality conditions identified in the Water Quality Improvement Plan.

Provision B.3.b requires the Copermittees to identify the strategies and schedules to implement those strategies as part of the Water Quality Improvement Plans. Provision B.3.b requires the Copermittees to identify the water quality improvement strategies that will be and may be implemented within the Watershed Management Area to 1) reduce pollutants in storm water discharged from the MS4 to the MEP, 2) effectively prohibit non-storm water discharges from entering the MS4, 3) protect water quality standards in receiving waters by controlling MS4 discharges so that they do not cause

or contribute to exceedances of receiving water limitations, and 4) achieve applicable WQBELs that implement TMDLs. The Copermittees will select the strategies to be implemented based on the likely effectiveness and efficiency of the potential water quality improvement strategies identified under Provision B.2.e to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, and/or achieve the interim and final numeric goals identified under Provision B.3.a.

Provision B.3.b.(1) requires each Copermittee to identify the strategies that will be or may be implemented within its jurisdiction. Each Copermittee is required to describe the strategies it is committed to implementing as part of its jurisdictional runoff management requirements under Provisions E.2 through E.7, and the optional jurisdictional strategies that the Copermittee will implement, as necessary, to achieve the numeric goals.

Each Copermittee is expected to implement the optional jurisdictional strategies identified under Provisions B.3.b.(1)(b) when the jurisdictional strategies it has committed to implement under Provision B.3.b.(1)(a) are not making adequate progress toward the interim and final numeric goals in accordance with the schedules established under Provision B.3.a. Provision B.3.b.(1)(b)(v) requires each Copermittee to describe the circumstances necessary to trigger implementation of the optional jurisdictional strategies, in addition to the requirements of Provisions B.3.b.(1)(a).

The San Diego Water Board recognizes that there may be optional jurisdictional strategies that will likely require funding and/or resources for planning, permitting, procurement of labor and materials, and implementation. Thus, Provision B.3.b.(1)(b)(iv) requires each Copermittee to describe the funding and/or resources that are necessary to implement these optional jurisdictional strategies. This information may provide interested groups and members of the public an understanding of the resources that they could provide or assist in obtaining to implement these optional jurisdictional strategies.

Provision B.3.b.(2) requires the Copermittees in the Watershed Management Area to identify the regional or multi-jurisdictional strategies that may be implemented, as necessary, to achieve the numeric goals. Similar to the requirements of Provision B.3.b.(1)(b), these regional or multi-jurisdictional strategies will likely require funding and/or resources for planning, permitting, procurement of labor and materials, and implementation, and San Diego Water Board recognizes that these strategies may be difficult to implement with only Copermittee resources. Thus, Provision B.3.b.(2)(d) requires the Copermittees to describe the funding and/or resources necessary to implement these optional regional or multi-jurisdictional strategies. This information may provide interested groups and members of the public an understanding of the resources that they could provide or assist in obtaining to implement these optional regional or multi-jurisdictional strategies.

Provision B.3.b.(3) requires the Copermittees to develop and include schedules in the Water Quality Improvement Plan for implementing the water quality improvement strategies identified under Provisions B.3.b.(1) and B.3.b.(2). The schedule for implementing the water quality improvement strategies will be used by the Copermittees and San Diego Water Board to measure and demonstrate the progress of the Copermittees' implementation efforts toward reducing pollutants in storm water discharged from the MS4 to the MEP, and eliminating illicit non-storm water discharges from entering the MS4.

Provision B.3.b.(4) provides the Copermittees in each Watershed Management Area the option of implementing watershed-specific structural BMP requirements for Priority Development Projects. Historically, storm water permits have included very specific performance standards for permanent, structural BMPs. These standards describe the expectation for the capture or treatment of pollutants and control of excessive flow before storm water is discharged from a site. The Copermittees were also allowed to develop waiver programs for Priority Development Projects to avoid implementing the structural BMPs; however, the waiver programs were not necessarily tied into any sort of holistic watershed strategy. The result is that implementation of BMP requirements is largely done on a site-by-site basis. This requires proper design on the part of the Priority Development Project and strict oversight on the part of the Copermittee.

Provision B.3.b.(4) promotes the evaluation of multiple strategies for water quality improvement, in addition to the implementation of permanent structural BMPs, on a watershed-scale versus the site-by-site approach. In a report issued by the Southern California Coastal Water Research Project (SCCWRP) and several other research institutions, the report emphasized that a successful hydromodification management program will involve watershed analysis as a first step, and that integrating multiple watershed-based strategies is preferable over a site-by-site approach. Indeed, the report states that the watershed analysis "…*should lead to identification of existing opportunities and constraints that can be used to help prioritize areas of greater concern, areas of restoration potential, infrastructure constraints, and pathways for potential cumulative effects*."[22] Provision B.3.b.(4) promotes the findings and recommendations of the report by providing a pathway for Copermittees to develop an integrated approach to their land development programs.

Under Provision B.3.b.(4), the Copermittees in a Watershed Management Area must first perform an analysis by gathering as much information pertaining to the physical characteristics of the Watershed Management Area as possible. This includes, for example, identifying potential areas of coarse sediment supply, present and anticipated future land uses, and locations of physical structures within receiving streams and upland areas that affect the watershed hydrology (such as bridges,

[22] 2012. ED Stein, F Federico, DB Booth, BP Bledsoe, C Bowles, Z Rubin, GM Kondolf, A Sengupta. Technical Report 667. Southern California Coastal Water Research Project. Costa Mesa, CA.

culverts, and flood management basins). Once this information is collected, the Copermittees must produce GIS layers (maps) that include this information.

From there, the Copermittees must use the results of the Watershed Management Area Analysis to identify and compile a list of candidate projects that could potentially be used as alternative compliance options for Priority Development Projects. Such projects include, for example, opportunities for stream or riparian area rehabilitation, opportunities for retrofitting existing infrastructure to incorporate storm water retention or treatment, and opportunities for regional BMPs, among others. Once these candidate projects are identified, Copermittees may allow Priority Development Projects to fund, partially fund, or completely implement these candidate projects. The Copermittees must first find that implementing such a candidate project would provide greater overall benefit to the watershed than requiring implementation of the structural BMPs onsite, and also enter into a voluntary agreement with the Priority Development Project that authorizes this arrangement. The Copermittees may use Provision B.3.b.(4) as both 1) a mechanism to reach their stated goals of the Water Quality Improvement Plan by using Priority Development Projects to either fund or implement projects that will provide water quality benefit, and 2) an alternative to requiring strict adherence to the structural BMP design standards.

Additionally, Provision B.3.b.(4) allows the Copermittees to use the results of the Watershed Management Area Analysis to identify areas within the Watershed Management Area where it is appropriate to allow Priority Development Projects to be exempt from the hydromodification management BMP performance requirements. Provision E.3.c.(2) already allows exemptions for Priority Development Projects that discharge to a conveyance channel whose bed and bank are concrete lined from the point of discharge to an enclosed embayment or the Pacific Ocean. However, there may be cases where further exemptions are warranted. The Copermittees may identify such cases on a watershed basis and include them in the Watershed Management Area Analysis; however, they must provide the supporting rationale to support all claims for exemptions.

Provision B.3.b.(4) provides an innovative pathway for Copermittees to regulate their land development programs by allowing alternative compliance in lieu of implementing structural BMPs on each and every Priority Development Project. This approach facilitates the integration of watershed-scale solutions for improving overall water quality and assisting Copermittees to achieve their stated goals of the Water Quality Improvement Plan. The San Diego Water Board understands, however, that undertaking this approach, which involves extensive planning, could be resource intensive for the Copermittees. Therefore, the Watershed Management Area Analysis is optional and not a requirement. The Copermittees can choose not to perform the watershed planning and mapping exercise described in Provision B.3.b.(4), and instead choose to require strict implementation of the structural BMPs onsite, pursuant to Provision E.3.c.

Provision B.3.c is included to provide the Copermittees an option that allows the Copermittees to be deemed in compliance with the prohibitions and limitations (receiving water limitations) of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b. One or more Copermittees within a Watershed Management Area can choose to implement this option. This option is only expected to be utilized by a Copermittee that wishes to be deemed in compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b.

The alternative compliance pathway option included in Provision B.3.c is consistent with the approach described in Order WQ 2015-0075, *In the Matter of Review of Order No. R4-2012-0175, NPDES Permit No. CAS004001, Waste Discharge Requirements for Municipal Separate Storm Sewer System (MS4) Discharges within the Coastal Watersheds of Los Angeles County, Except Those Discharges Originating from the City of Long Beach MS4,* adopted by the State Water Board on June 16, 2015. State Water Board Order WQ 2015-0075 directs the Regional Water Boards to consider a watershed-based planning and implementation approach to compliance with receiving water limitations when issuing Phase I MS4 permits going forward. Order WQ 2015-0075 included seven principles that the Regional Water Boards are expected to follow when incorporating an alternative compliance pathway into a MS4 permit. The San Diego Water Board incorporated the seven principles stipulated in State Water Board Order WQ 2015-0075 into the Regional MS4 Permit as follows:

1. Provision A of this Order continues to require compliance with water quality standards in the receiving water and does not deem good faith engagement in the iterative process to constitute compliance with receiving water limitations. Provision A of this Order continues to be consistent with the receiving water limitations provisions from State Water Board Order WQ 99-05.

2. Compliance with Provision B.3.c constitutes compliance with the requirements of the Provision A.3.b, which requires compliance with the WQBELs of the TMDLs in Attachment E to the Order, and is considered compliance with receiving water limitations for those TMDL water body-pollutant combinations.

3. Provision B.3.c is an ambitious, rigorous, and transparent alternative compliance pathway that allows a Copermittee appropriate time to come into compliance with receiving water limitations without being in violation of the receiving water limitations during implementation of the compliance alternative.

4. Provision B.3.c requirements are incorporated into a Water Quality Improvement Plan. Water Quality Improvement Plans are a watershed-based planning and implementation approach, which address multiple contaminants, and incorporate TMDL requirements.

5. The strategies required to be included in the Water Quality Improvement Plans promote and incentivize the use of green infrastructure and requires the implementation of low impact development principles.

6. The strategies required to be included in the Water Quality Improvement Plans encourage multi-benefit regional projects that capture, infiltrate, and reuse storm water and support a local sustainable water supply.

7. The alternative compliance pathway of Provision B.3.c includes rigor and accountability. The Copermittee is required, through a transparent public process, to demonstrate that water quality issues in the watershed have been analyzed and prioritized, and that appropriate solutions are proposed. The Copermittee is also required, through a transparent process, to monitor the results and return to their analysis to verify assumptions and update the solutions. The Copermittee is required to conduct this type of adaptive management on its own initiative without waiting for direction from the San Diego Water Board.

In order for a Copermittee to utilize this option, the Copermittee is required to include three components in the Water Quality Improvement Plan. The first component is a comprehensive set of numeric goals and schedules that will demonstrate the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b will be achieved within a specified period of time. The criteria provided in the Order will require the Copermittee to demonstrate that the discharges from its MS4s will not cause or contribute to exceedances of water quality objectives in the receiving waters, and/or the receiving waters will be adequately protected from adverse impacts attributable to the Copermittee's MS4 discharges. The Copermittee is also required to specify annual milestones to be achieved each year, which adds rigor, accountability, and transparency to the process. The annual milestones may consist of water quality improvement strategy implementation phases, interim numeric goals, and other acceptable metrics, which are expected to build upon previous milestones and lead to the achievement of the final numeric goals.

The second component is an analysis to demonstrate that implementation of the water quality improvement strategies required under Provision B.3.b will achieve the numeric goals within the established schedules required under Provisions B.3.a and B.3.c.(1). Because the development of the analysis may require significant resources, the Order allows the Copermittees in each Watershed Management Area that choose to implement this option to perform the analysis individually, or pool their resources for the analysis collectively.

The analysis must "reasonably" and "quantitatively" demonstrate that the implementation of the water quality improvement strategies can achieve the numeric goals within the established schedules. However, as more data and information are collected during implementation of the Water Quality Improvement Plan to demonstrate progress toward achieving the numeric goals, the numeric goals, water quality improvement strategies and schedules may need to be modified. If the data and information indicate that modification is needed, the Copermittee must also update the analysis. With the exception of numeric goals and schedules associated with

TMDLs from Attachment E to the Order, the modification to the analysis would be allowed as part of the adaptive management process of the Water Quality Improvement Plan. For TMDLs, modification of numeric goals or schedules would likely require an amendment to the Basin Plan and Attachment E to the Order before the analysis and Water Quality Improvement Plan could include such modifications.

Thus, the third component is the key component that allows a Copermittee to demonstrate the implementation of the water quality improvement strategies within its jurisdiction is making progress toward achieving the final numeric goals. Each Copermittee must specify the monitoring and assessments that will be performed to confirm that implementation of the water quality improvement strategies are making progress toward achieving the numeric goals within the established schedules, and whether the interim and final numeric goals have been achieved.

These three components must then be reviewed by the Water Quality Improvement Consultation Panel. The Water Quality Improvement Consultation Panel is required to be formed as part of the public participation process for the development of the Water Quality Improvement Plans. The Water Quality Improvement Consultation Panel is described under Provision F.1.a.(1)(b). Review by the Water Quality Improvement Consultation Panel is included to provide an additional layer of input, support, and accountability for the implementation of this option.

Compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b begins when the Water Quality Improvement Plan, incorporating the requirements of Provision B.3.c.(1), is accepted by the San Diego Water Board. Each Copermittee that chooses to implement and continues to implement this option will be deemed in compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b as long as the Copermittee continues to implement the strategies, monitoring and assessments as incorporated in the Water Quality Improvement Plan in accordance with Provision B.3.c.(1), and the Copermittee reports the achievement of the annual milestones each year, or provides acceptable rationale and recommends appropriate modifications to the interim numeric goals, and/or water quality improvement strategies, and/or schedules to improve the rate of progress toward achieving the final numeric goals. The Copermittee continues to be deemed in compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b during the time the San Diego Water Board reviews the rationale and recommended modifications to the interim numeric goals, and/or water quality improvement strategies, and/or schedules. If and when the San Diego Water Board determines that it does not accept the rationale or recommendations, the Copermittee will be notified they are no longer deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b.

Provision B.4 (Water Quality Improvement Monitoring and Assessment) requires the Copermittees to develop an integrated monitoring and assessment program to track the progress of the Water Quality Improvement Plan toward meeting the implementation goals and schedules, and improving the water quality of the

Watershed Management Area. Provision B.4 is the part of the Water Quality Improvement Plan where the Copermittees describe the monitoring data that will be collected, which is not only necessary to implement the "iterative approach" required by Provision A.4, but inform the adaptive management and "*comprehensive planning process*" that allows the Copermittees to make adjustments and modifications to the Water Quality Improvement Plans and the jurisdictional runoff management programs.

Provision B.4 requires the Copermittees, at a minimum, to include the requirements of Provision D as part of the water quality improvement monitoring and assessment program for the Water Quality Improvement Plan. The Copermittees, however, are not limited to the requirements of Provision D and may include additional monitoring and assessment methods to track progress toward improving water quality in the Watershed Management Area.

In addition to incorporating the requirements of Provision D, the water quality improvement monitoring and assessment program must incorporate any monitoring and assessment requirements specified for any applicable TMDLs included in Attachment E to the Order, and the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 for Watershed Management Areas with ASBS.

The monitoring and assessments required to be incorporated into the Water Quality Improvement Plan are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order.

Provision B.5 (Iterative Approach and Adaptive Management Process) requires the Copermittees to implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a.

Provision B.5 requires the Copermittees in each Watershed Management Area to re-evaluate the highest priority water quality conditions and potential water quality improvement strategies, the water quality improvement goals, strategies and schedules, and the water quality improvement monitoring and assessment program and provide recommendations for modifying those elements to improve the effectiveness of the Water Quality Improvement Plan. The re-evaluation of the Water Quality Improvement Plan is part of the assessment requirements of Provision D.

Provision B.6 (Water Quality Improvement Plan Submittal, Updates, and Implementation) requires to Copermittees to submit, update, and implement the Water Quality Improvement Plans.

The requirements for the process to develop and submit the Water Quality Improvement Plans is described in more detail under the discussion for Provision F.1. The process will include several opportunities for the public to provide input during the

development of the Water Quality Improvement Plans. The process for updating the Water Quality Improvement Plans is described in more detail under the discussion for Provision F.3.c. Upon acceptance of the Water Quality Improvement Plan and updates, the Copermittees are required to immediately begin implementing the Water Quality Improvement Plan and subsequent updates.

The Water Quality Improvement Plan is expected to be a dynamic document that will evolve over time. The Water Quality Improvement Plan is also expected to be a long term plan that focuses the Copermittees' efforts and resources on a limited set of priority water quality conditions, with the ultimate goal of protecting all the beneficial uses of the receiving waters within the Watershed Management Area from impacts that may be caused or contributed to by MS4 discharges. As the Copermittees collect data, implement their jurisdictional runoff management programs, and review the results from their water quality improvement monitoring and assessment program, the Water Quality Improvement Plan is expected to be continually reviewed and updated until compliance with Provisions A.1.a, A.1.b, and A.2.a is achieved.

However, in specific cases supported by robust analytical documentation the implementation of the Water Quality Improvement Plans may demonstrate that TMDLs are not necessary for identified impaired water bodies within the Watershed Management Area if the analytical record demonstrates that technology-based effluent limitations required by the CWA, more stringent effluent limitations required by state, local, or federal authority, and/or other pollution control requirements (e.g., best management practices) required by local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time.[23]

The San Diego Water Board submits an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. According to USEPA guidance for the Integrated Report,[24] water bodies are placed in one of five categories. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 are placed on the 303(d) List.

Category 4 in the Integrated Report is for water bodies where available data and/or information indicate that at least one beneficial use is not being supported or is threatened, but a TMDL is not needed.[25] Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality

[23] 40 CFR 130.7(b)(1)
[24] USEPA, 2005. Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act
[25] Ibid

standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

Impaired water bodies can be included in Category 4a if a TMDL has been adopted and approved. The TMDLs in Attachment E to the Order implement the requirements of the TMDLs adopted by the San Diego Water Board, and approved by the State Water Board and USEPA. The water bodies in Attachment E will be included in Category 4a in the Integrated Report and removed from the 303(d) List.

Impaired water bodies can be included in Category 4b if there are *acceptable* "pollution control requirements" required by a local, state or federal authority stringent enough to implement applicable water quality standards within a reasonable period of time (e.g., a compliance date is set). When evaluating whether a particular set of pollution controls are "requirements," the USEPA considers a number of factors, including: (1) the authority (local, state, federal) under which the controls are required and will be implemented with respect to sources contributing to the water quality impairment (examples may include: self-executing state or local regulations, permits, and contracts and grant/funding agreements that require implementation of necessary controls), (2) existing commitments made by the sources and completion or soon to be completed implementation of the controls (including an analysis of the amount of actual implementation that has already occurred), (3) the certainty of dedicated funding for the implementation of the controls, and (4) other relevant factors as determined by USEPA depending on case-specific circumstances.[26]

Impaired water bodies can be included in Category 4c if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution. Pollution, as defined by the CWA is "the man-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of water."[27] In other cases, pollution does not result from a pollutant and a TMDL is not required. Examples of circumstances where an impaired segment may be placed in Category 4c include segments impaired solely due to lack of adequate flow, stream channelization, or hydromodification. In these situations, there may be water quality management actions that can address the cause(s) of the impairment, but a TMDL may not be required to implement the actions.

The Water Quality Improvement Plans will require the implementation of pollution controls and water quality management actions (i.e. water quality improvement strategies) which can result in the attainment of water quality standards in water bodies impaired by discharges from the Copermittees' MS4s. The Water Quality Improvement Plans also include requirements that are expected to attain water quality standards in a reasonable period of time. The San Diego Water Board considers the Water Quality Improvement Plans to be a commitment by the Copermittees to

[26] Ibid
[27] CWA section 502(19)

develop, plan, budget for, and implement pollution controls that will attain water quality standards in receiving waters in a reasonable period of time, or as soon as possible. The results of the Copermittees' efforts in implementing the Water Quality Improvement Plans can be used to re-evaluate the condition of the impaired water bodies during the next update to the 303(d) List.

After the Copermittees submit the Water Quality Improvement Plans and demonstrate that water quality standards are being attained or will be attained in a reasonable period of time, the San Diego Water Board may re-evaluate the water bodies on the 303(d) List. These water bodies on the 303(d) List may be re-evaluated and placed into Category 4b or Category 4c in the Integrated Report. The water bodies placed in Category 4b or Category 4c in the Integrated Report must show a record that the water bodies are attaining water quality standards or supporting the identified beneficial uses, or will attain water quality standards or support identified beneficial uses in a reasonable period of time, in order for the water bodies to be appropriately removed from the 303(d) List.

C. Action Levels

Purpose: Provision C includes requirements for the Copermittees to identify and include numeric action levels in the Water Quality Improvement Plan to direct and focus the Copermittees' jurisdictional runoff management program implementation efforts for controlling MS4 discharges to receiving waters.

***Discussion*:** Under Provision C, the numeric action levels required are for non-storm water discharges and storm water discharges. The non-storm water action levels (NALs) are applicable to non-storm water discharges from the Copermittees' MS4s, which can occur year-round. The storm water action levels (SALs) are applicable to storm water discharges from the Copermittees' MS4s, which occur during the rainy season defined as the period between October 1 and April 30.

The action levels required by Provision C are based on the action level requirements that were developed and incorporated into Order Nos. R9-2009-0002 and R9-2010-0016, the Orange County and Riverside County MS4 Permits, respectively. The Fact Sheets for these Orders provide detailed discussions about the development of the numeric NALs and SALs included in this Order.

Order Nos. R9-2009-0002 and R9-2010-0016 required the Copermittees to perform prescribed actions if the NALs or SALs are exceeded. The actions required under Order Nos. R9-2009-0002 and R9-2010-0016 generally included conducting additional monitoring and source investigations when a discharge from the MS4 is observed to exceed one or more NALs and/or SALs.

For this Order, however, the action levels of Provision C are to be used by the Copermittees to prioritize the actions to be implemented as part of the Water Quality Improvement Plan. Monitoring data collected by the Copermittees from MS4 outfalls will be compared with the NALs and SALs. Exceedances of the NALs and SALs will not require the Copermittees to immediately identify sources causing exceedances, but will provide some numeric indicator levels that can give the Copermittees a way to measure the relative severity of a pollutant contributing to receiving water quality impacts.

NALs and SALs must be included in the Water Quality Improvement Plans to be used by the Copermittees in directing and focusing their water quality improvement strategies. The Copermittees are expected to utilize the NALs and SALs to help focus their implementation efforts on addressing pollutants that have the most significant potential or observed impacts to receiving waters. The NALs and SALs will be used as part of the MS4 discharges assessments required under Provision D.4.b. The NALs and SALs may also be used by the Copermittees as the numeric goals to be achieved in MS4 discharges and/or receiving waters as the Water Quality Improvement Plans are implemented.

More specific and detailed discussions of the requirements of Provision C are provided below.

Provision C.1 (Non-storm Water Action Levels) requires the Copermittees to incorporate NALs into the Water Quality Improvement Plan for pollutants and/or constituents that are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions identified in the Water Quality Improvement Plan related to non-storm water discharges from the MS4s. NALs generally must be consistent with the water quality objectives found within the Basin Plan.

The NALs have been included to ensure that the Copermittees are implementing and complying with several requirements of the MS4 permit. The federal CWA requires permits for municipal storm sewer systems to "*effectively prohibit non-storm water discharges into the storm sewers*." The federal NPDES regulations, which were promulgated to implement the CWA requirements for discharges from municipal storm sewers, require a program to address illicit discharges, which are non-storm water discharges. Provision A.1.b prohibits "*[n]on-storm water discharges into MS4s*" unless the non-storm water discharge authorized by a separate NPDES permit. The NALs will be used as part of the illicit discharge detection and elimination program required pursuant to Provision E.2, as well as part of the MS4 discharges assessments required pursuant to Provision D.4.b.

Provision A.1.a prohibits non-storm water discharges from the MS4 from "*causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state.*" In addition, pursuant to Provision A.2.a, non-storm water discharges "*must not cause or contribute to the violation of water quality standards in any receiving waters*."

Ideally, the Copermittees' jurisdictional runoff management programs will eliminate all non-storm water discharges entering the MS4s within their jurisdictions. The complete elimination of non-storm water discharges to the Copermittees' MS4s would be in compliance with the CWA requirements for non-storm water discharges, as well as the prohibitions and limitations of Provisions A.1.a and A.2.a.

The federal regulations, however, also refer to several non-storm water discharge categories that must be addressed as illicit discharges if they are found to be a source of pollutants. The federal regulations thus identify some non-storm water discharges that are not required to be addressed as illicit discharges if they are not a source of pollutants (e.g. non-storm water discharges specified in Provisions E.2.a.(1)-(5)). Thus, these regulations imply that some non-storm water discharges into and from the MS4 may occur even if non-storm water discharges are "effectively" prohibited by the Copermittees.

If the source of a non-storm water discharge is identified as a category of non-storm water specified in Provisions E.2.a.(1)-(5), the NALs can be used to determine if the category of non-storm water discharges is a source of pollutants. For other non-storm water discharges not specified in Provisions E.2.a.(1)-(5), the CWA requires those discharges to be "*effectively"* prohibited by removing the discharge to the MS4 through enforcement of the Copermittees' legal authority established under "*ordinance, order or similar means*" to prohibit illicit discharges to the MS4s.

If there are non-storm water discharges that are not required to be addressed as illicit discharges, those discharges must comply, at a minimum, with the discharge prohibitions and receiving water limitations of Provision A. Thus, the non-storm water discharges from the MS4 must be at levels that will not cause or contribute to a condition of pollution, contamination, or nuisance (Provision A.1.a), and must not cause or contribute to a violation of water quality standards in receiving waters (Provision A.2.a) to be consistent with the discharge prohibitions and receiving water limitations of Provisions A.1.a and A.2.a.

Furthermore, the San Diego Region has predominantly intermittent and ephemeral rivers and streams which vary in flow volume and duration at spatial and temporal scales. For most of these river and stream systems, non-storm water discharges from the MS4 are likely to be the most significant or the only source contributing to surface flows present within the receiving water, especially during the dry season.

Therefore, because of the prohibitions and limitations of Provision A.1.a and A.2.a, and the likelihood that non-storm water discharges from the MS4 are the most significant or only source contributing to surface flows present within the receiving water, NALs generally must be consistent with the water quality objectives found within the Basin Plan. Non-storm water discharges that are meeting the NALs would not be expected to cause or contribute to an exceedance of water quality objectives in receiving waters, which would be consistent with the discharge prohibitions and receiving water limitations of Provisions A.1.a and A.2.a.

Exceedances of the NALs would then provide an indication of the relative severity of a pollutant in non-storm water discharges from the MS4 contributing to potential or observed receiving water quality impacts. The relative severity or significance of a pollutant in non-storm water discharges from the MS4 will provide the Copermittees a valuable source of information that can be used to identify priority water quality conditions within a Watershed Management Area and within each Copermittee's jurisdiction.

Tables C-1 through C-4 under Provision C.1.a specify numeric NALs for several parameters or pollutant constituents for non-storm water discharges from the MS4 to several water body types. The NALs for MS4 discharges given under Provision C.1.a are based on the water quality objectives for inland surface waters in the Basin Plan, and the water quality objectives for ocean waters in the Ocean Plan. The NALs for

most of the metals were calculated based on the State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP). The NALs provided in Tables C-1 through C-4 must be included in the Water Quality Improvement Plans required to be developed pursuant to Provision B.

Provision C.1.b requires the Copermittees to identify NALs for pollutants and/or constituents, not specified in Provision C.1.a, which are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions of the Watershed Management Area related to non-storm water discharges from the MS4s. The NALs must be based on the water quality objectives in the Basin Plan. The NALs identified under Provision C.1.b must be included in the Water Quality Improvement Plan.

The San Diego Water Board recognizes that some of the NALs required pursuant to Provisions C.1.a and C.1.b may be exceeded more frequently than not. Thus, Provision C.1.c has been included in the Order to provide the Copermittees the option to develop secondary NALs that are set at levels greater than the levels required pursuant to Provisions C.1.a and C.1.b to further refine the prioritization and assessment of water quality improvement strategies for addressing non-storm water discharges to and from the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and from the MS4.

Provision C.2 (Storm Water Action Levels) requires the Copermittees to incorporate SALs into the Water Quality Improvement Plan for pollutants and/or constituents causing or contributing, or may be causing or contributing, to the highest priority water quality conditions identified in the Water Quality Improvement Plan related to storm water discharges from the MS4s.

The SALs have been included to ensure that the Copermittees are implementing and complying with several requirements of the MS4 permit. Provision A.1.a prohibits storm water discharges from the MS4 from "*causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state.*" In addition, pursuant to Provision A.2.a, storm water discharges "*must not cause or contribute to the violation of water quality standards in any receiving waters*."

Provision A.3.a, however, implicitly acknowledges that compliance with Provisions A.1.a and A.2.a cannot be achieved immediately for discharges of storm water from the MS4 by applying the MEP standard. Thus, Provision A.4 requires the Copermittees to implement an iterative approach to demonstrate that MEP is being achieved. This approach is supported by USEPA.

The federal CWA requires permits for municipal storm sewer systems to "*require controls to reduce the discharge of pollutants [in storm water] to the maximum extent*

practicable, *including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants.*" MEP is an ever-evolving, flexible, and advancing concept. As knowledge about controlling storm water runoff and discharges evolves, so does the knowledge which constitutes MEP. Reducing the discharge of storm water pollutants from the MS4 to the MEP requires the Copermittees to assess their jurisdictional runoff management programs and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP. The SALs provide the Copermittees measureable goals that may be used to demonstrate the achievement of MEP for reducing pollutants in storm water discharges from the MS4. The SALs will be used as part of the MS4 discharges assessments required under Provision D.4.a.

In June of 2006, the State Water Board's Blue Ribbon Storm Water Panel released its report titled "*The Feasibility of Numerical Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities*." In the recommendations, the Blue Ribbon panel proposed storm water effluent limitations which are computed using statistical based population approaches. The SALs specified in Table C-5 under Provision C.2.a were developed from a regional subset of nationwide Phase I MS4 data by using USEPA Rain Zone 6 (arid west) data.[28] Additionally, utilization of regional data is appropriate due to the addition of data into the nationwide Phase I MS4 monitoring dataset in February 2008. This additional data increased the number of USEPA Rain Zone 6 samples to more than 400, and included additional monitoring events within Southern California.

Utilizing data from USEPA Rain Zone 6 resulted in SALs which closely reflect the environmental conditions experienced in the San Diego Region. The localized subset of data includes sampling events from multiple Southern California locations including Orange, San Diego, Riverside, Los Angeles, and San Bernardino Counties. The dataset includes samples taken from highly built-out impervious areas and from storm events representative of Southern California conditions.

The SALs for cadmium, copper, lead and zinc require the measurement of hardness and to provide more specificity in the assessment of samples with SALs for total metal concentrations. While USEPA Rain Zone 6 data include a large sample size for concentrations of total metals, the impact the concentration will have on receiving waters will vary with receiving water hardness. Since it is the goal of the SALs, through the iterative process and MEP standard, to have MS4 storm water discharges meet all applicable water quality objectives, the hardness of the receiving water should be used when assessing the total metal concentration of a sample.

Thus, when there is an exceedance of a SAL for a metal, the Copermittee must determine if that exceedance is above the existing applicable water quality objectives

[28] Data used to develop SAL were obtained from http://rpitt.eng.ua.edu/Research/ms4/mainms4.shtml

based upon the hardness of the receiving water. The water quality objectives Copermittees must use to assess total metal SAL exceedances are the California Toxic Rule (CTR) and USEPA National Recommended Water Quality Criteria for Freshwater Aquatic Life 1 hour maximum concentrations. The 1-hour maximum concentration is to be used for comparison since it is expected to most replicate the impacts to waters of the State from the first flush following a precipitation event.

The statistically calculated SALs given in Table C-5 are at levels greater than the water quality objectives in the Basin Plan or Ocean Plan. Because the objective of the CWA is to "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*", meaning eventually pollutants in storm water discharges must be reduced to a level that cannot cause or contribute to an exceedance of water quality objectives in receiving waters, over time the SALs are expected to be reduced to a level that is based on the water quality objectives rather than statistical calculations. The San Diego Water Board will review the SALs as more data for discharges of storm water from the MS4s are collected, and revise them as conditions improve and the MEP standard advances. For the Water Quality Improvement Plans required under this Order, the SALs identified under Provision C.2.a must be included.

Provision C.2.b requires the Copermittees to identify SALs for pollutants and/or constituents, not specified in Provision C.2.a, which are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions of the Watershed Management Area related to storm water discharges from the MS4s. The SALs identified under Provision C.2.b must be included in the Water Quality Improvement Plan.

The San Diego Water Board recognizes that some of the SALs required pursuant to Provisions C.2.a and C.2.b may be exceeded more frequently than not. Thus, Provision C.2.c has been included in the Order to provide the Copermittees the option to develop secondary SALs that are set at levels greater than the levels required pursuant to Provisions C.2.a and C.2.b to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s.

D. Monitoring and Assessment Program Requirements

Purpose: Provision D includes minimum monitoring and assessment requirements that must be developed and implemented by the Copermittees as part of the Water Quality Improvement Plans. Implementation of the monitoring and assessment requirements of Provision D will allow the Copermittees to demonstrate that the requirements of the CWA to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP are being achieved. Implementation of the monitoring and assessment requirements of Provision D will also allow the Copermittees and the San Diego Water Board to track improvements to the water quality in the San Diego Region. The monitoring and assessment program requirements are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order.

***Discussion*:** The San Diego Water Board recognized that changes to the monitoring and assessment requirements of the Fourth Term Permit were necessary to improve the usefulness and usability of monitoring data collected by the Copermittees to support their jurisdictional storm water programs more efficiently and with increased effectiveness. The data collected are needed to better inform the Copermittees' understanding of the physical, chemical, and biological condition of the receiving waters and the quality of the MS4 discharges. The monitoring program needs to provide opportunities for the Copermittees to integrate regional monitoring efforts into municipal storm water monitoring requirements to provide a cost-effective approach to monitoring and avoid duplication of efforts.

The requirements in Provision D were largely recommended by the Copermittees as an outcome of the San Diego Water Boards Focused Meeting process. The monitoring and assessment program requirements now require collection of more specific information necessary for each Copermittee to adapt its jurisdictional runoff management program in such a way that focuses resources on a watershed's highest priority water quality conditions. The monitoring and assessment program will require the Copermittees to collect data that can be utilized to answer both watershed level management questions (e.g. Are the chemical, physical, and biological conditions of a receiving water protective, or likely protective of beneficial uses?), and specific jurisdictional runoff management program activity questions (e.g. Are the water quality improvement strategies of the jurisdictional program effectively eliminating non-storm water discharges to the MS4?).

The monitoring data collected and assessment information that will be reported to the San Diego Water Board are necessary to determine if the Copermittees are complying with the prohibitions and limitations of Provision A. The required monitoring and assessments that must be reported to the San Diego Water Board will be utilized for three purposes:

(1) Inform the Copermittees, San Diego Water Board, and the public on the progress of the Copermittees' efforts to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP;

(2) Inform the Copermittees, San Diego Water Board, and the public on the condition of water bodies receiving discharges from the Copermittees' MS4, and the progress of the Copermittees' water quality improvement implementation efforts toward improving the receiving water quality; and

(3) Inform the Copermittees, the San Diego Water Board, and the public on the effectiveness of the Water Quality Improvement Plan toward achieving (1) and (2).

The monitoring and assessment information reported pursuant to Provision F is also expected to be key to the iterative approach and adaptive management process required under Provision A.4 and implemented through the Water Quality Improvement Plan required under Provision B. As required by Provision A.4, the iterative approach and adaptive management process is required if the Copermittees cannot meet the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c, and/or A.2.a under the present conditions.

Provision D provides the minimum monitoring and assessment requirements that must be included in each Water Quality Improvement Plan to be developed and implemented by the Copermittees. The Copermittees, however, are not limited to the requirements of Provision D and may include additional methods to track progress toward improving water quality in a Watershed Management Area.

More specific and detailed discussions of the requirements of Provision D are provided below.

Provision D.1 (Receiving Water Monitoring Requirements) specifies the minimum receiving water monitoring that the Copermittees must conduct within the Watershed Management Area and include as part of the Water Quality Improvement Plan.

Provision D.1 establishes minimum monitoring requirements that must be conducted by the Copermittees within each Watershed Management Area. Provision D.1 requires the Copermittees to collect and develop the data and information necessary to determine potential impacts to the beneficial uses in the receiving waters due to discharges from the MS4s. The monitoring required under Provision D.1 will also provide the data that will allow the Copermittees to gauge the effectiveness and progress of its Water Quality Improvement Plan implementation efforts toward improving the quality of receiving waters.

The receiving water monitoring requirements of Provision D.1 are focused primarily on monitoring the conditions and response of the receiving waters to the Copermittees'

collective implementation efforts to reduce receiving water impacts that may be caused by the discharges from the MS4s. The preference of the San Diego Water Board is for the Copermittees to spend their resources achieving tangible and observable improvements in receiving water conditions instead of collecting samples and analyzing data that has consistently indicated that receiving water conditions are degraded and require improvement. In general, the ability to measure potential improvements in receiving water conditions due to any actions implemented by the Copermittees as part of the Water Quality Improvement Plan may require several years before a response can be observed. Thus, the frequency of collecting receiving water monitoring data has been kept to a minimum.

During the transitional period between adoption of this Order and San Diego Water Board acceptance of a Water Quality Improvement Plan, the Copermittees must conduct receiving water monitoring in accordance with Provision D.1.a. This approach to collecting receiving water data is different from what was required in the Fourth Term Permits, but one that truly embraces the concept of an integrated, cost-effective, streamlined receiving water monitoring approach.

Provision D.1.a requires Copermittees to continue performing the receiving water monitoring programs required in Order Nos. R-2007-0001, R9-2009-002, and R9-2010-0016; plus participation in: hydromodification management plan monitoring approved by the San Diego Water Board, monitoring plans as part of load reduction plans (either Bacteria Load Reduction Plans or Comprehensive Load Reduction Plans) for TMDLs in Attachment E of the Order, Storm Water Monitoring Coalition Regional Monitoring, Southern California Bight Regional Monitoring, Sediment Quality Monitoring, and ASBS Monitoring as applicable to a Watershed Management Area.

Provision D.1.a also provides an opportunity for the Copermittees to use third party data to meet receiving water monitoring requirements where feasible. Allowing the Copermittees to use the data currently collected through its participation in existing regional receiving water programs and that of third parties provides an efficiency of resources in obtaining the data necessary to inform the Copermittees and the San Diego Water Board about the physical, chemical, and biological conditions of the receiving waters, which can also help to focus the receiving water monitoring during the implementation of the Water Quality Improvement Plan. Once a Water Quality Improvement Plan is developed for a Watershed Management Area in compliance with Provision B of this Order, the transitional period is over and Copermittees are required to conduct receiving water monitoring according to the requirements of Provisions D.1.b-e.

Provision D.1.b requires each Copermittee to identify at least one long term receiving water monitoring station to be representative of receiving water quality within each Watershed Management Area. Long term receiving water monitoring stations can be located at any existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees. The requirements under Provision D.1.b. are

consistent with 40 CFR 122.26(d)(2)(iii)(D), which specifies that a "*monitoring program for representative data collection for the term of the permit*" may include "*instream locations.*" For each Watershed Management Area, at least one long term watershed monitoring station is required to be established and monitored. The Copermittees may choose to establish additional long term monitoring stations where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

Provision D.1.b. requires the Copermittees to locate the long term receiving water monitoring station at one of these existing receiving water monitoring stations to provide the Copermittees an opportunity to experience monitoring cost savings while continuing to collect the necessary data to assess the status and trends of receiving water quality conditions in 1) coastal water, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under both dry weather and wet weather conditions. Ideally these stations will continue to be monitored as part of the receiving water monitoring for each Watershed Management Area to maintain a consistent set of locations and a period of data that can be built upon with the monitoring required under this Order.

The receiving water monitoring requirements are separated into monitoring required during dry weather conditions pursuant to Provision D.1.c, and wet weather conditions pursuant to Provision D.1.d.

At each long term monitoring station the Copermittees must conduct at least three dry weather monitoring events as required pursuant to Provision D.1.c and at least three wet weather monitoring events as required pursuant to Provision D.1.d per permit term. Provisions D.1.c and D.1.d require the Copermittees to monitor priority water quality conditions identified in the Water Quality Improvement Plan, constituents listed as causing impairment of receiving waters in the Watershed Management Area, applicable NALs, toxicity, constituents listed in Tables D-2 and D-3, and constituents for implementation plans (e.g. Bacteria Load Reduction Plans and Comprehensive Load Reduction Plans). Required toxicity monitoring was changed to reflect an updated understanding of the unique challenges associated with sampling storm water for toxicity. Copermittees are required to sample receiving water for toxicity during each dry weather and each wet weather event pursuant to Provision D.1.c.(4) and D.1.d.(4). Required toxicity monitoring is now consistent with the State Water Resources Control Board Policy for Toxicity Assessment and Control (Draft June 2012) and recently adopted MS4 permits for Caltrans and Los Angeles Water Board. Receiving water monitoring efforts in this Order have been streamlined to redirect resources to monitoring efforts that better support pollutant reduction solutions with an increasing emphasis on MS4 outfall monitoring, source identification, and source abatement activities.

In addition to the receiving water monitoring requirements under Provisions D.1.b-d, Provision D.1.e requires the Copermittees participate in and/or conduct other types of receiving water monitoring. As recommended and requested by the Copermittees, Provision D.1.e.(1) requires the Copermittees to participate in existing regional monitoring, as applicable to each Watershed Management Area. Existing regional

monitoring includes monitoring conducted by the Storm Water Monitoring Coalition and for the Southern California Bight. Participation in and use of monitoring data collected from these existing regional water quality monitoring programs provide the Copermittees a greater opportunity for efficiency in the use of their resources to manage their storm water programs and those controllable discharges under their authority.

Provision D.1.e.(1)(c) requires the south Orange County MS4 Copermittees to participate in "unified regional beach water quality monitoring." This monitoring replaces requirements to conduct "core monitoring" of beach water quality, as provided for in Appendix III of the Ocean Plan.

Several different public agencies currently conduct routine, ongoing beach water quality monitoring in south Orange County in accordance with several different sets of requirements. The monitoring programs implemented to meet those requirements overlap temporally and spatially. These monitoring programs are partially but not fully integrated. In November 2010, the State Water Board adopted Resolution No. 2010-0053, which directed Regional Water Boards to work with dischargers to modify beach water quality monitoring programs required by Regional Water Board-issued permits in order to eliminate redundancies and incorporate beach water quality monitoring required by beach water quality statutes, where appropriate.

In April 2012, the San Diego Water Board requested that its staff review beach water quality monitoring conducted in south Orange County. To assist in responding to that request, staff of the Board convened a workgroup that included representatives of the three public agencies that currently conduct almost all of the routine, ongoing beach water quality monitoring in south Orange County, i.e., South Orange County Wastewater Authority (SOCWA), Orange County Public Works, and Orange County Health Care Agency (OCHCA). The workgroup also included other interested parties, including representatives of the Sierra Club and Surfrider Foundation. In December 2012, the San Diego Water Board adopted Resolution No. R9-2012-0069, which endorsed the San Diego Water Board staff report entitled "A Framework for Monitoring and Assessment in the San Diego Region," dated November 2012.

The unified program is consistent with and will meet or exceed the minimum requirements for beach water quality monitoring and related public notification and reporting established by State law, including the Ocean Plan. The unified program is consistent with State Water Board Resolution No. 2010-0053. The unified program is also consistent with and will help implement, "A Framework for Monitoring and Assessment in the San Diego Region," which emphasizes the need for question-driven, beneficial use-oriented monitoring and assessment. The primary purpose of the unified program will be to answer the question "Does beach water quality meet standards for the beneficial use of water contact recreation?"

The unified program is intended to be protective; it will help protect the health of swimmers, surfers, and others who use south Orange County beach waters for water

contact recreational activities. The unified program is also intended to be reasonable; it will eliminate duplicative monitoring and will include triggers for public notification and additional sampling at all sampling stations year-round. The unified program is intended to be equitable; responsibility for implementation of the unified program will be shared and the responsible agencies will jointly make arrangements to implement the program and will have the flexibility to jointly make short and/or long term changes in those arrangements.

The San Diego Water Board Executive Officer issued a written directive on December 5, 2014, pursuant to California Water Code section 13383, for SOCWA and the south Orange County MS4 Copermittees to implement the unified program in cooperation with OCHCA. The Executive Officer may make revisions to the unified program, provided that the unified program, as revised, continues to be consistent with and meet the requirements of State law, including the Ocean Plan, for beach water quality monitoring and related public notification and reporting. Following a thirty day public comment period, and subject to a request for a hearing before the San Diego Water Board, any such revision shall take effect as specified in a written directive issued by the Executive Officer pursuant to CWC section 13383. The program and any Executive Officer issued revisions to the program are subject to CWC section 13320 right of review from the date of issuance.

The unified program will supersede the existing routine, ongoing, beach water quality monitoring programs in south Orange County that are conducted in accordance with the existing requirements of the NPDES permits for discharges from the SOCWA ocean outfalls and the south Orange County MS4s. The requirement to participate in "regional monitoring" of beach water quality replaces requirements to conduct "core monitoring" of beach water quality, as provided for in Appendix III of the Ocean Plan.

The State Water Resources Control Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part 1 Sediment Quality which became effective August 25, 2009 (Sediment Quality Monitoring Policy). Provision D.1.e.(2) requires any Copermittees with MS4 discharges to an enclosed bay or estuary to monitoring the sediments in the enclosed bay or estuary receiving water in accordance with the sediment quality monitoring procedures as prescribed in the Sediment Quality Monitoring Policy.

The State Water Board adopted Resolution No. 2012-0012 which approved exceptions to the California Ocean Plan for selected discharges into Areas of Special Biological Significance (ASBS), including special protections for beneficial uses. State Board Resolution No. 2012-0012 became effective on March 20, 2012, and Attachment B to the Resolution established limitations on point source storm water discharges to ASBS. Copermittees with MS4s that discharge to an ASBS must monitor its discharge to assure compliance with State Board Resolution No. 2012-0012 as required pursuant to Provision D.1.e.(3).

The San Diego Water Board is developing a regional monitoring strategy to assess the conditions of receiving waters in the San Diego Region. The monitoring requirements of Provision D.1 are expected to be incorporated or serve as a foundation of this regional monitoring strategy, but may require some modifications. When the San Diego Water Board develops an alternative regional monitoring strategy, the Copermittees will be required to participate in the development and implementation of the alternative regional monitoring program pursuant to Provision D.1.f.

Provision D.2 (MS4 Outfall Discharge Monitoring Requirements) specifies the minimum MS4 outfall discharge monitoring requirements that the Copermittees must incorporate and implement as part of the Water Quality Improvement Plan.

The dry weather MS4 outfall discharge monitoring requirements are included under Provisions D.2.a.(2) and D.2.b. The dry weather MS4 outfall discharge monitoring requirements are part of the "*program, including a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer*" required by 40 CFR 122.26(d)(2)(iv)(B), which is expected to achieve compliance with the CWA section 402(p)(3)(B)(ii) statutory requirement for municipal storm water permits to require the Copermittees to "*effectively prohibit non-storm water discharges into the storm sewers*." The dry weather MS4 outfall discharge monitoring data collection requirements are based on requirements under 40 CFR 122.26(d)(1)(iv)(D) and 122.26(d)(2)(iv)(B)(3).

The dry weather MS4 outfall discharge monitoring requirements are designed to provide wide spatial and temporal coverage of each jurisdiction to better understand the extent and magnitude of non-storm water discharges to receiving waters, and make a distinction between persistent and transient non-storm water flows. This information is expected to allow each Copermittee to focus its resources on eliminating and controlling the highest priority threats to receiving water quality, as well as integrating other elements of the storm water programs (e.g. complaint call response) and third party data to efficiently and effectively assist in efforts to eliminate non-storm water discharges.

The dry weather MS4 outfall discharge monitoring requirements of Provision D.2.a.(2) and D.2.b are separated into monitoring required before and after the San Diego Water Board accepts the Copermittees' Water Quality Improvement Plan. Outfall monitoring conducted prior to acceptance of the Water Quality Improvement Plan is referred to in the Order as Transitional MS4 Outfall Discharge Monitoring. Provision D.2.a.(2) includes the transitional dry weather MS4 outfall discharge monitoring requirements.

The requirements under Provision D.2.a.(2) are based on the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B), which include the requirements for a monitoring program to identify, detect, and eliminate illicit connections and illegal discharges to the MS4s. The federal regulations (40 CFR 122.26(d)(1)(iv)(D)) require

the monitoring program to include "*a field screening analysis for illicit connections and illegal dumping [that]…[a]t a minimum, include[s] a narrative description, for either each field screening point or major outfall, of visual observations made during dry weather periods.*" The federal regulations (40 CFR 122.26(d)(1)(v)(B)) require the monitoring program to include "*inspection procedures and methods for detecting and preventing illicit discharges, and describe areas where this program has been implemented.*" Furthermore, the monitoring program is required by federal regulations (40 CFR 122.26(d)(2)(iv)(B)) to include "*a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer.*"

Dry weather transitional MS4 outfall discharge monitoring requires each Copermittee to field screen (inspect) its major MS4 outfalls to classify the MS4 outfall locations as having persistent dry weather flows, transient dry weather flows, or no dry weather flows. To account for the variance in size of the 39 jurisdictions covered under this Order, the Copermittees recommended a tiered approach to the number of major MS4 outfalls that must be inspected. Provision D.2.a.(2)(a) provides a tiered approach to the number of major MS4 outfalls that must be visually inspected per jurisdiction as well as a minimum frequency each Copermittee must inspect each major MS4 outfall per year. This tiered approach is based on the total number of major MS4 outfalls within a Copermittees jurisdiction within each Watershed Management Area.

Based on the field screening, each Copermittee is required to make a determination whether any observed flowing, pooled, or ponded waters are transient or persistent flows. Based on this field screening information, other jurisdictional program information, and third party information, each Copermittee is required to prioritize the MS4 outfalls within its jurisdiction for follow up investigation and elimination of the non-storm water discharge, as part of its illicit discharge detection and elimination program required pursuant to Provision E.2. In accordance with the requirements of Provision E.2, each Copermittee is required to immediately investigate obvious illicit discharges (e.g. outfall discharges with unusual color, unusual odor, or high flows).

This approach allows a Copermittee to use all of its resources, as well as leverage resources and information provided by third parties, to effectively eliminate non-storm water discharges from its MS4 outfalls. If the source of the non-storm water discharge cannot be immediately eliminated, the Copermittee uses the persistent flow or transient flow classification along with other programmatic implementation data to prioritize the MS4 outfalls for future investigation. In accordance with the adaptive management approach deployed throughout this Order, Provision D.2.a.(2)(c) requires each Copermittee to update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow. The requirement of Provision D.2.a.(2)(c) assures that each Copermittee is collecting data that can be used to demonstrate compliance with the CWA requirement that each Copermittee must implement a program to "*effectively*

prohibit non-storm water discharges into the [MS4]" and with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

Provision D.2.b describes the dry weather MS4 outfall discharge monitoring required to be incorporated and implemented as part of the Water Quality Improvement Plan. Dry weather MS4 outfall discharge monitoring must be performed by each Copermittee to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. The emphasis of the dry weather MS4 outfall discharge monitoring required pursuant to Provision D.2.b is consistent with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

Provision D.2.b.(1) requires each Copermittee to continue field screening its major MS4 outfalls and identifying those with persistent flows and transient flows, as conducted during the transitional period (i.e. before the Water Quality Improvement Plan was developed). However, each Copermittee now has the flexibility to adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of non-storm water persistent flow discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan. In order to ensure a minimum number of outfalls are inspected, Provision D.2.b.(1) requires the number of visual inspections be equal to the number of visual inspections required in the tiered inspection program pursuant to Provision D.2.a.(2)(a).

Provision D.2.b.(2)(b) requires each Copermittee to monitor a minimum of 5 major MS4 outfalls with persistent flows identified as the highest priorities within a Copermittee's jurisdiction, within each Watershed Management Area. In other words, Copermittees located in more than one Watershed Management Area must identify at least 5 major MS4 outfalls with persistent flows in its jurisdiction in each Watershed Management Area. If a Copermittee is located in more than one Watershed Management Area, and they have less than 5 major MS4 outfalls with persistent flows per jurisdictional area per Watershed Management Area, all of the major MS4 outfalls must be identified as high priority dry weather persistent flow MS4 outfalls. The Copermittees identified as Responsible Copermittees by a TMDL in Attachment E of the Order may need to monitor more than 5 dry weather major MS4 outfall locations to determine compliance with the requirements of the TMDL(s).

Monitoring must occur at the highest priority outfall locations at least semi-annually until the non-storm water discharges have been eliminated for three consecutive dry weather monitoring events; identified to be authorized by a separate NPDES Permit; or reprioritized to a lower priority. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized MS4 major outfall in the Copermittee's jurisdiction within the Watershed Management Area, unless there are no remaining qualifying major MS4 outfalls within the Copermittees jurisdiction. The Copermittees must continually update their dry weather persistent

flow MS4 outfall discharge monitoring locations with the next highest priority non-storm water flow that have yet to be eliminated until all persistent and transient flows are eliminated or its threat reduced.

Non-storm water persistent flow MS4 outfall discharge monitoring data collected during each semi-annual monitoring event, must be collected and analyzed according to the requirements of Provision D.2.b.(2)(b)-(e). These monitoring requirements are consistent with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

The wet weather MS4 outfall discharge monitoring requirements are included under Provisions D.2.a.(3) and D.2.c. The wet weather MS4 outfall discharge monitoring requirements are necessary for the Copermittees to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable, using management practices, control techniques and system, design and engineering methods, and such other provisions which are appropriate*" required by 40CFR 122.26(d)(2)(iv), which is expected to achieve compliance with the CWA section 402(p)(3)(B)(iii) statutory requirement for municipal storm water permits to require "*controls to reduce the discharge of pollutants [in storm water] to the maximum extent practicable*." The wet weather MS4 outfall discharge monitoring data collection requirements are based on requirements under 40 CFR 122.26(d)(2)(iii), 122.26(d)(2)(iii)(A) and 122.26(d)(2)(iii)(A)(1)-(4), and 40 CFR 122.21(g)(7)(i)-(ii).

The wet weather MS4 outfall discharge monitoring requirements of Provision D.2.a.(3) and D.2.c are separated into monitoring required before and after the San Diego Water Board accepts the Copermittees' Water Quality Improvement Plan. Outfall monitoring conducted prior to acceptance of the Water Quality Improvement Plan is referred to in the Order as Transitional MS4 Outfall Discharge Monitoring. Provision D.2.a.(3) includes the transitional wet weather MS4 outfall discharge monitoring requirements.

Until the wet weather MS4 outfall discharge monitoring requirements of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board, the Copermittees must comply with the requirements of transitional wet weather MS4 outfall monitoring requirements pursuant to Provision D.2.a.(3). Provision D.2.a.(3) requires the Copermittees in each Watershed Management Area to sample, at least five of the major MS4 outfalls inventoried pursuant to Provision D.2.a.(1) once per wet season for the monitoring data required to be collected pursuant to Provision D.2.a.(3)(c)-(e). Provision D.2.a.(3) further requires at least one major MS4 outfall monitoring station be located in each Copermittee's jurisdiction within the Watershed Management Area.

At a minimum, the five sampling locations chosen must be representative of storm water discharges from residential, commercial, industrial, and typical mixed-use land uses present within a Watershed Management Area. The San Diego Water Board expects the Copermittees to extrapolate from these data to similar land uses

throughout the Watershed Management Area to better inform the Water Quality Improvement Plan development process by prioritizing drainages for implementation of storm water control efforts required pursuant to Provision E.

Provision D.2.c describes the wet weather MS4 outfall discharge monitoring required to be included and implemented as part of the Water Quality Improvement Plan. Provision D.2.c provides the Copermittees the flexibility to adjust the wet weather MS4 outfall discharge monitoring locations and frequencies in the Watershed Management Area, as needed, to identify sources of pollutants in storm water discharges from MS4s in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan.

Although Provision D.2.c.(1) allows the Copermittees to adaptively manage the wet weather MS4 outfall discharge monitoring locations and frequencies, the provision requires a minimum of at least five wet weather outfall stations to be monitored. Provision D.2.c.(2) further allows the Copermittees to modify the monitoring frequency at each wet weather MS4 outfall station to meet the goals of the Water Quality Improvement Plan as long as the monitoring frequency occurs at least once per year and is at an appropriate frequency to identify sources of pollutants in storm water discharges, guide pollutant source identification efforts, or determine compliance with the requirements of the applicable TMDLs in Attachment E to the Order.

The wet weather MS4 outfall discharge monitoring requirements of Provisions D.2.c.(3) and D.2.c.(4) are the same as the transitional wet weather MS4 outfall discharge monitoring. In contrast, the requirements of Provision D.2.c.(5) are focused on collecting analytical data specific to the highest priority water quality conditions in the Watershed Management Area identified in the Water Quality Improvement Plan. The wet weather MS4 outfall discharge monitoring data collection requirements are consistent with the requirements under 40 CFR 122.26(d)(2)(iii), 122.26(d)(2)(iii)(A) and 122.26(d)(2)(iii)(A)(1)-(4), and 40 CFR 122.21(g)(7)(i)-(ii).

Provision D.3 (Special Studies) requires the Copermittees to develop special studies that will be conducted for each Watershed Management Area and the entire San Diego Region. Data collected pursuant to Provision D.3 is to be used by the Copermittees to improve the effectiveness of the strategies implemented by the jurisdictional runoff management programs toward achieving the numeric goals identified in the Water Quality Improvement Plans and ultimately achieve compliance with the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c, and A.2.a, which is consistent with the requirements of Provision A.4.

Special studies are often necessary to fill data gaps or provide more refined information that allow the Copermittees to better manage the generation or elimination of pollutants and discharges to and from the MS4. In the Fourth Term Permits, the Copermittees have been required to implement special studies as directed by the San Diego Water Board. The special studies required by this Order provide the Copermittees more flexibility to identify and implement special studies that will be most

useful to improving the effectiveness of their jurisdictional runoff management programs.

Provision D.3.a.(1) requires the Copermittees to develop and conduct at least two special studies per Watershed Management Area, to be determined by the Copermittees. One of the two special studies may be accomplished through participation in a Regional Special Study required under Provision D.3.a.(2). The requirements provide the Copermittees great latitude in identifying and developing the special studies. Watershed Management Area special studies are required, at a minimum, to: (a) relate in some way to the highest water quality priorities identified by the Copermittees in the Water Quality Improvement Plan, (b) be conducted within the Watershed Management Area, and (c) include some form of participation (e.g. contribution of funds, personnel services, project management) by all the responsible Copermittees within the Watershed Management Area.

Examples of Watershed Management Area special studies might include, but are not limited to: (1) focused pollutant source identification studies, (2) BMP effectiveness and/or comparison studies, (3) pilot tests for new or emerging pollutant control methods, (4) receiving water pollutant or stressor source identification and/or mitigation studies, or (5) pollutant fate and transport studies. The Watershed Management Area special studies are expected to provide data that can be utilized by the Copermittees to improve the Water Quality Improvement Plan or implementation of the Copermittees' jurisdictional runoff management programs to address the highest priority water quality conditions.

Provision D.3.a.(2) requires the Copermittees to develop at least one special study that will be conducted for the entire San Diego region. The regional special study is expected to provide data that can be utilized by the Copermittees to improve the Water Quality Improvement Plan or implementation of the Copermittees' jurisdictional runoff management programs to identify or address regional water quality concerns and priorities.

An example of a regional special study would be to develop and establish allowable exceedance frequencies of the bacteria water quality objectives for several types of water bodies, during different wet and dry weather conditions the San Diego region. The special study would be related to bacteria, which is a priority for the San Diego region due to the adoption of "*Bacteria TMDL Project I – Beaches and Creeks in the San Diego Region*." The study results could be used to inform the Copermittees and the San Diego Water Board about the indictor bacteria water quality objective exceedance frequencies that occur in natural or reference watersheds.

<u>Provision D.4 (Assessment Requirements)</u> specifies the assessments that the Copermittees are required to perform, based on the monitoring data collected, and will be reported as part of the Annual Report for the Water Quality Improvement Plan implementation. Provision D.4 requires the Copermittees assess the progress of the

water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c, and A.2.a.

Provision D.4 specifies the assessments that Copermittees must perform for each Watershed Management Area to assess the effectiveness of each Copermittee's jurisdictional runoff management program and the Water Quality Improvement Plan. The effectiveness of each Copermittee's jurisdictional runoff management program and Water Quality Improvement Plan is measured through these types of assessments: (a) Receiving Waters Assessments (b) MS4 Outfall Discharges Assessments, (c) Special Studies Assessments, and (d) Integrated Assessment of Water Quality Improvement Plan.

Provision D.4.a requires the Copermittees to assess the status of receiving water conditions annually during the transitional monitoring period (during development of the Water Quality Improvement Plan) and after acceptance of the Water Quality Improvement Plan. The monitoring data collected pursuant to Provision D.1 will be evaluated, among other information, to assess the condition of a Watershed Management Area's streams, coastal waters, enclosed bays, harbors, estuaries, and lagoons. The focus of the receiving waters assessments is to measure progress toward the objective of the CWA to "*restore and maintain the chemical, physical, and biological integrity of the Nation's waters*" as the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program are implemented within a Watershed Management Area. Provision D.4.a is consistent with 40 CFR 122.42(c)(7) which requires the Copermittees to annually report the *"[i]dentification of water quality improvements or degradation."*

Provision D.4.b includes the MS4 outfall discharges assessment requirements. The focus of MS4 outfall discharges assessments is to determine if the Copermittees' are implementing programs that comply with the requirements of the CWA for MS4 permits to "*effectively prohibit non-stormwater discharges into the storm sewers*" and "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable.*" The monitoring data collected pursuant to Provisions D.2 will be evaluated, among other information, to assess the effectiveness of the transitional MS4 outfall field screening monitoring, the implementation of the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program. The MS4 outfall discharge assessments consist of Non-Storm Water Discharges Reduction Assessments and Storm Water Pollutant Discharges Reduction Assessments.

The Non-Storm Water Discharges Reduction Assessments are how each Copermittee will demonstrate that its jurisdictional runoff management program implementation efforts are achieving the CWA requirement to "*effectively prohibit non-stormwater discharges into the storm sewers.*" Provision D.4.b.(1) requires each Copermittee to assess and report on its illicit discharge detection and elimination program required pursuant to Provision E.2 to reduce and effectively prohibit non-storm water and illicit discharges into the MS4 within its jurisdiction. The Non-Storm Water Discharges

Reduction Assessments include specific assessment requirements applicable to each Copermittee.

As each Copermittee collects and analyzes the data collected pursuant to dry weather MS4 outfall discharges monitoring requirements of Provisions D.2.a.(2) and D.2.b, Provision D.4.b.(1) requires each Copermittee to assess the progress, assess the effectiveness of its current actions, and identify modifications necessary to increase the effectiveness of its actions toward reducing and eliminating non-storm water and illicit discharges to its MS4. The findings from these assessments are expected to be utilized by the Copermittee as part of its procedures to prioritize the non-storm water discharges that will be addressed by its Illicit Discharge Detection and Elimination program required pursuant to Provision E.2.

The assessment requirements of Provision D.4.a.(1) are consistent with 40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(3) which require "*procedures…to investigate portions of the separate storm sewer system that, <u>based on the results of the field screen, or other appropriate information</u> [emphasis added], indicate a reasonable potential of contain illicit discharges or other sources of non-storm water*" as part of a "*program…to detect and remove…illicit discharges and improper disposal into the storm sewer.*" The assessment requirements of Provision D.4.a.(1) are also consistent with 40 CFR122.42(c)(1) requires the Copermittees to annually report the "*status of implementing the components of the storm water management program that are established as permit conditions.*"

The Storm Water Pollutant Discharges Reduction Assessment is how the Copermittees in each Watershed Management Area will demonstrate that their jurisdictional runoff management program implementation efforts are achieving the CWA requirement to "*reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable*." Provision D.4.b.(2) requires the Copermittees in each Watershed Management Area to assess and report the progress of the Copermittees' efforts to reduce pollutants in storm water discharges from the MS4s to the MEP. The Storm Water Pollutant Discharges Reduction Assessments include specific assessment requirements during both the transitional monitoring period and after acceptance of the Water Quality Improvement Plan applicable to the Watershed Management Area and each Copermittee.

As the Copermittees collect and analyze the data collected pursuant to wet weather MS4 outfall discharges monitoring requirements of Provisions D.2.a.(3) and D.2.c, Provision D.4.b.(2) requires the Copermittees to assess runoff conditions during the transitional period, and the progress of the Water Quality Improvement Plan strategies toward reducing pollutants in storm water from the MS4 to the MEP. The findings from these assessments are expected to be utilized by the Copermittees to identify any modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify sources of pollutants in storm water discharges from the MS4s, as well as focus, modify, and improve the water quality improvement

strategies implemented by each Copermittee within its jurisdiction to reduce pollutants in storm water discharges to the MEP.

The assessment requirements of Provision D.4.b.(2) are consistent with 40 CFR 122.26(d)(2)(iii)(B) which requires "*[e]stimates of the annual pollutant load of the cumulative discharges to waters of the United States from all identified municipal outfalls…during a storm event…accompanied by a description of the procedures for estimating constituent loads and concentrations, including any modeling, data analysis, and calculation methods.*" The assessment requirements of Provision D.4.a.(2) are consistent with 40 CFR 122.26(d)(2)(v) which requires that each Copermittee assesses the *"estimated reductions in loadings of pollutants from discharges of municipal storm sewer constituents from municipal storm sewer systems expected as the result of the municipal storm water quality management program."* The assessment requirements of Provision D.4.b.(2) are also consistent with 40 CFR122.42(c)(1) requires the Copermittees to annually report the "*status of implementing the components of the storm water management program that are established as permit conditions.*"

Provision D.4.c includes the special studies assessment requirements. Performing special studies are how the Copermittees will address data gaps identified during the development of and updates to the Water Quality Improvement Plan. The relevant findings from the special studies assessments are expected to be incorporated as part of the applicable receiving water assessments, MS4 outfall discharge assessments, and integrated water quality improvement assessments required in Provision D.4.a, D.4.b, and D.4.d, respectively.

The assessment requirements in Provision D.4.d are part of the iterative approach and adaptive management process required by Provision A.4. The Copermittees are required to integrate the data collected pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to re-evaluate the Water Quality Improvement Plan.

The monitoring data collected pursuant to Provisions D.1 and D.2, and the results of the assessment required pursuant to Provisions D.4.a-c, will be used to determine whether the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program are effective, or require modifications or improvements to become more effective to achieve the requirements of the CWA. The assessments required by Provision D.4.d are consistent with 40 CFR 122.42(c)(1) which requires that the Copermittees to report the *"[t]he status of implementing the components of the storm water management program that are established as permit conditions."*

E. Jurisdictional Runoff Management Programs

Purpose: Provision E includes the requirements for the jurisdictional runoff management programs to be implemented by each of the Copermittees. Compliance with the requirements for the jurisdictional runoff management programs will allow the Copermittees to demonstrate that they are implementing programs to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP. The jurisdictional runoff management program document prepared by each Copermittee will also provide the details for implementing the water quality improvement strategies identified in the Water Quality Improvement Plan specifically within its jurisdiction.

***Discussion*:** Implementation of the jurisdictional runoff management program requirements under Provision E is how the Copermittees "*effectively prohibit non-stormwater discharges into the storm sewer,*" and outlines the "*controls to reduce the discharge of pollutants to the maximum extent practicable"* consistent with the federal regulations under 40 CFR 122.26. The jurisdictional runoff management program is part of the "*comprehensive planning process*" that is required pursuant to 40 CFR 122.26(d)(2)(iv). Where the Water Quality Improvement Plan is the "*comprehensive planning process*" on a Watershed Management Area scale, requiring "*intergovernmental coordination,*" the jurisdictional runoff management program document is the "*comprehensive planning process*" on a jurisdictional scale that should be coordinated with the other Copermittees in the Watershed Management Area to achieve the goals of the Water Quality Improvement Plan.

The jurisdictional runoff management program requirements are included to provide each Copermittee criteria that can be used to demonstrate that its storm water management program is implementing the "*comprehensive planning process*" within its jurisdiction to "*effectively prohibit non-stormwater discharges into the storm sewers,*" and to identify and implement the most effective "*controls to reduce the discharge of pollutants to the maximum extent practicable"* in accordance with the performance standards given in the CWA.

Provision E includes the requirements for each of the components that must be included in the Copermittee's jurisdictional runoff management program document that will be implemented by the Copermittee within its jurisdiction. Implementation of the components of each Copermittee's jurisdictional runoff management program must incorporate the water quality improvement strategies identified by each Copermittee in the Water Quality Improvement Plans, described pursuant to Provision B.3.b.(1)(a).

More specific and detailed discussions of the requirements of Provision E are provided below.

Provision E.1 (Legal Authority Establishment and Enforcement) requires each Copermittee to establish and enforce sufficient legal authority to control discharges to the MS4 within its jurisdiction.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system*" and be able to demonstrate that it can "*operate pursuant to legal authority established by statute, ordinance or series of contracts.*" Provision E.1.a describes the minimum legal authorities each Copermittee must establish for itself within its jurisdiction to control discharges to its MS4. The requirements of Provision E.1.a are consistent with the requirements set forth in 40 CFR 122.26(d)(2)(i)(A)-(F).

The certification statement required from each Copermittee by Provision E.1.b is included to provide the San Diego Water Board additional documentation that each Copermittee has established the legal authorities consistent with Provision E.1.a and 40 CFR 122.26(d)(2)(i)(A)-(F), and the Copermittee can "*operate pursuant to legal authority established by statute, ordinance or series of contracts.*"

Provision E.2 (Illicit Discharge Detection and Elimination) requires each Copermittee to implement an illicit discharge detection and elimination program to effectively prohibit non-storm water discharges to the MS4 by actively detecting and eliminating illicit discharges and disposal into its MS4. If the San Diego Water Board finds that a Copermittee is fully implementing the requirements of Provision E.2, then the Copermittee is deemed in compliance with the effective prohibition of non-storm water discharges to the MS4 required under Provision A.1.b.

Provision E.2 establishes the minimum requirements that each Copermittee must implement within its jurisdiction to effectively prohibit non-storm water discharges from entering its MS4. The federal CWA requires permits for municipal storm sewer systems to "*effectively prohibit non-storm water discharges into the storm sewers*." The federal regulations (40CFR122.26(d)(2)(i)(B)) require each Copermittee to establish the legal authority to prohibit illicit discharges to its MS4s. Under 40 CFR 122.26(d)(2)(iv)(B), each Copermittee must implement a "*program…to detect and remove…illicit discharges and improper disposal into the storm sewer.*" The federal NPDES regulations, under 40 CFR 122.26(b)(2), define illicit discharges as "*any discharge to a municipal separate storm sewer that is not composed entirely of storm water*." Thus, non-storm water discharges are not authorized to enter the MS4 and are considered to be illicit discharges, unless authorized by a separate NPDES permit.

The Phase I Final Rule clarifies that non-storm water discharges through an MS4 are not authorized under the CWA (55 FR 47995):

> "*Today's rule defines the term "illicit discharge" to describe any discharge through a municipal separate storm sewer system that is not composed entirely of storm water and that is not covered by an NPDES permit. Such illicit discharges are not*

> *authorized under the Clean Water Act. Section 402(p)(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit*."

The federal NPDES requirements for the program to address illicit discharges must include "*inspections, to implement and enforce an ordinance, orders, or other similar means to prevent illicit discharges to the MS4*." The federal NPDES regulations also reference several categories of "*non-storm water discharges or flows* [which] *shall be addressed where such discharges are identified…as sources of pollutants to waters of the United States*." The Phase I Final Rule (55 FR 48037) further clarified the requirements of 40 CFR 122.26(d)(2)(iv)(B)(1) as follows:

> "*EPA is clarifying that section 402(p)(3)(B) of the CWA (which requires permits for municipal separate storm sewers to 'effectively' prohibit non-storm water discharges) does not require permits for municipalities to prohibit certain discharges or flows of nonstorm water to waters of the United States through municipal separate storm sewers in all cases*."

In previous iterations of the municipal storm water permits for the San Diego Region, these categories were simply listed and referred to as categories of non-storm water discharges "not prohibited" unless identified as a source of pollutants. The Copermittees have often referred to these categories as "exempt" discharges. In both cases, however, the language is inconsistent with the federal CWA and NPDES regulations. And, the clarification provided in the Phase I Final Rule does not specifically state that such discharges are "not prohibited" or "exempt" or in any way authorized. The federal NPDES regulations do, however, state that specific categories of non-storm water discharges must be "*addressed*" if identified as "*sources of pollutants to waters of the United States*."

The language of Provision E.2.a has been revised to be fully consistent with the language of the CWA and the requirements of the federal regulations under 40 CFR 122.26(d)(2)(iv)(B)(1). Provision E.2.a requires each Copermittee to address <u>all</u> types of non-storm water discharges into its MS4 as illicit discharges, <u>unless</u> the discharge is authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to Provisions E.2.a.(1) through E.2.a.(5). Only non-NPDES-permitted non-storm water discharges identified as a category of non-storm water discharges under Provisions E.2.a.(1) through E.2.a.(5) <u>and</u> *not identified as a source of pollutants* do not have to be addressed as illicit discharges. Categories of non-storm water discharges that meet the requirements of Provisions E.2.a.(1) through E.2.a.(5) do not have to be addressed by the Copermittee as illicit discharges.

Several of the non-storm water categories listed in 40 CFR 122.26(d)(2)(iv)(B)(1) have not been included in Provisions E.2.a.(1) through E.2.a.(5), including: street wash water, landscape irrigation, irrigation water, and lawn watering. Because these are no longer included within the categories listed under Provisions E.2.a.(1) through E.2.a.(5), the Copermittees must prohibit these types of non-storm water discharges from entering the MS4. This is consistent with the clarification of 40 CFR 122.26(d)(2)(iv)(B)(1) in the Phase I Final Rule (55 FR 48037), which states:

> "*[T]he Director may include permit conditions that either require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*."

Street wash water is a category of non-storm water discharges that was removed when the Third Term Permits were issued. Street wash water is a source of several pollutants (e.g., metals, oil and grease, petroleum hydrocarbons, chlorinated solvents, sediment) which are generated during the street washing process. The removal of this category requires the Copermittees to prohibit this type of non-storm water discharge from entering the MS4.

The landscape irrigation, irrigation water, and lawn watering categories, collectively referred to hereafter as "over-irrigation" discharges, were removed from the list of non-storm water discharge categories in the Fourth Term Orange County and Riverside County Permits. Non-storm water discharges resulting from over-irrigation have been found to be a source of several types of pollutants (e.g., nutrients, bacteria, pesticides, sediment) in receiving waters. The San Diego Water Board and the Copermittees have identified categories of non-storm water discharges associated with over-irrigation as a source of pollutants and conveyance of pollutants to the MS4 and waters of the United States in the following documents:

- **SmartTimer/Edgescape Evaluation Program (SEEP) Grant Application**

  The State Water Board allocated grant funding to the SEEP project grant application submitted in 2006, which targeted irrigation runoff by retrofitting areas of existing development and documenting the conservation and runoff improvements. The basis of this grant project is that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 is a source and conveyance of pollutants. In addition, the grant application indicated that this alteration of natural flows is impacting the beneficial uses of waters of the state and U.S. Results from the study indicate that that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 *is* a source and conveyance of pollutants. The results of this study can be applied broadly to any area where over-irrigation takes place. The grant application included the following statements:

  > "*Irrigation runoff contributes flow & pollutant loads to creeks and beaches that are 303(d) listed for bacteria indicators.*"

"*Regional program managers agree that the reduction and/or elimination of irrigation-related urban flows and associated pollutant loads may be key to successful attainment of water quality and beneficial use goals as outlined in the San Diego Basin Plan and Bacteria TMDL over the long term.*"

"*Elevated dry-weather storm drain flows, composed primarily … of landscape irrigation water wasted as runoff, carry pollutants that impair recreational use and aquatic habitats all along Southern California's urbanized coastline. Storm drain systems carry the wasted water, along with landscape derived pollutants such as bacteria, nutrients and pesticides, to local creeks and the ocean. Given the local Mediterranean climate, excessive perennial dry season stream flows are an unnatural hydrologic pattern, causing species shifts in local riparian communities and warm, unseasonal contaminated freshwater plumes in the near-shore marine environment.*"

- **2006-2007 Orange County Watershed Action Plan Annual Reports**

The Watershed Action Plan Annual Reports for the 2006-2007 reporting period were submitted by the County of Orange, Orange County Flood Control District and Copermittees within the San Juan Creek, Laguna Coastal Streams, Aliso Creek, and Dana Point Coastal Streams Watersheds. San Juan Creek, Laguna Coastal Streams, Aliso Creek and Dana Point Coastal Streams are all currently 303(d) listed as impaired for indicator bacteria within their watersheds and/or in the Pacific Ocean at the discharge points of their watersheds. The Orange County Copermittees, within their Watershed Action Strategy Table for fecal indicator bacteria included the following:

"*Support programs to reduce or eliminate the discharge of anthropogenic dry weather nuisance flow throughout the…watershed. Dry weather flow is the transport medium for bacteria and other 303(d) constituents of concern.*"

Additionally, they state that "*conditions in the MS4 contribute to high seasonal bacteria propagation in-pipe during warm weather. Landscape irrigation is a major contributor to dry weather flow, both as surface runoff due to over-irrigation and overspray onto pavements; and as subsurface seepage that finds its way into the MS4.*"

- **Fiscal Year 2008 Carlsbad Watershed Urban Runoff Management Program Annual Report**

The Carlsbad Watershed Urban Runoff Management Program Annual Report for Fiscal Year 2008 was submitted by the Carlsbad Watershed Copermittees (Cities of Carlsbad, Encinitas, Escondido, Oceanside, San Marcos, Solana Beach, and Vista, and the County of San Diego). In the Annual Report, the Carlsbad Watershed Copermittees stated the following:

"The Carlsbad Watershed Management Area (WMA) collective watershed strategy identifies bacteria, sediment, and nutrients as high priority water quality pollutants in the Agua Hedionda (904.3 – bacteria and sediment), Buena Vista (904.2 – bacteria), and San Marcos Creek (904.5 – nutrients) Hydrologic Areas. Bacteria, sediment, and nutrients have been identified as potential discharges from over-irrigation."

- **2007-2008 San Diego Bay Watershed Urban Runoff Management Program Annual Report**

  The San Diego Bay Watershed Urban Runoff Management Program 2007-2008 Annual Report was submitted by the San Diego Bay Watershed Copermittees (Cities of Chula Vista, Coronado, Imperial Beach, La Mesa, Lemon Grove, National City, and San Diego, the County of San Diego, the Port of San Diego, and the San Diego County Airport Authority). In Appendix D of the Annual Report, titled "Likely Sources of Pollutants," the San Diego Bay Watershed Copermittees identified over-irrigation of lawns as a pollutant generating activity from business and/or residential land uses for bacteria, pesticides, and sediment.

- **Copermittee Public Education Materials**

  The Orange County Public Works *Tips for Landscape & Gardening* public education brochure states: "*Fertilizers, pesticides and other chemicals that are left on yards or driveways can be blown or washed into storm drains that flow to the ocean. Overwatering lawns can also send materials into storm drains*."

  The Riverside County Flood Control and Water Conservation District *Landscape and Garden* public education brochure states: *"Soil, yard wastes, over-watering and garden chemicals become part of the urban runoff mix that winds its way through streets, gutters and storm drains before entering lakes, rivers, streams, etc. Urban runoff pollution contaminates water and harms aquatic life!"*

- **Los Peñasquitos Lagoon Sedimentation/Siltation TMDL Technical Report**

  The Los Peñasquitos Lagoon Sedimentation/Siltation TMDL technical report was prepared for the City of San Diego and USEPA in October 2010. The technical report was included as a technical supporting document attached to the Sediment TMDL for Los Peñasquitos Lagoon staff report prepared by the San Diego Water Board, dated June 13, 2012. Under the Source Assessment section, the technical report states the following:

  "*Dry weather loading is dominated by nuisance flows from urban land use activities such as car washing, sidewalk washing, and lawn over-irrigation, which pick up and transport sediment into receiving waters.*"

These documents confirm that non-storm water discharges associated with over-irrigation are a source of pollutants and should be addressed as illicit discharges to the MS4. Prohibiting non-storm water discharges associated with over-irrigation, however, is not a new requirement for the Copermittees because it is also consistent with and required by the Water Conservation in Landscaping Act (AB 1881, Laird).

The Water Conservation in Landscaping Act required the Department of Water Resources (DWR) to prepare a Model Water Efficient Landscape Ordinance for use by local agencies (e.g. the Copermittees). All local agencies were required to adopt a water efficient landscape ordinance by January 1, 2010. Local agencies could adopt the Water Efficient Landscape Ordinance developed by DWR, or an ordinance considered at least as effective as the Model Ordinance. The Water Efficient Landscape Ordinance includes a requirement that local agencies prohibit runoff from irrigation (§ 493.2):

> "*Local agencies shall prevent water waste resulting from inefficient landscape irrigation by <u>prohibiting runoff from leaving the target landscape</u> [emphasis added] due to low head drainage, overspray, or other similar conditions where water flows onto adjacent property, non-irrigated areas, walks, roadways, parking lots, or structures. Penalties for violation of these prohibitions shall be established locally*."

Furthermore, non-storm water discharges from over-irrigation not only transport and discharge pollutants to receiving waters, but are also a likely source of the dry weather flows causing changes to habitat within and along the receiving water bodies. Examples of habitat changes from the dry weather flows include perennialization of ephemeral streams, and conversion of saltwater and brackish water marsh habitats to freshwater marsh habitats (e.g. Los Peñasquitos Lagoon). Both of these examples have resulted in the promotion of invasive species in several areas of the San Diego Region.

The removal of the over-irrigation discharges categories does not require the Copermittees to strictly prohibit lawn and landscape irrigation, but does require the prohibition of excessive irrigation water that results in non-storm water discharges to the MS4. Non-storm water discharges to the MS4 from over-irrigation must be addressed as illicit discharges by the Copermittees pursuant to the requirements of Provision E.2.

The remaining non-storm water categories listed in 40 CFR 122.26(d)(2)(iv)(B)(1) are listed under Provisions E.2.a.(1) through E.2.a.(5) and generally fall into four categories: (1) non-storm water discharges subject to existing San Diego Water Board waste discharge requirements and NPDES permits; (2) non-storm water discharges generally not expected to be a source of pollutants to receiving waters; (3) non-storm water discharges likely to contain pollutants requiring some form of control to address

the pollutants prior to discharging to the MS4; and (4) non-storm water discharges or flows associated with firefighting.

Provisions E.2.a.(1) and E.2.a.(2) include several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) for which the San Diego Water Board already has developed general waste discharge requirements and NPDES permits to address the discharges. The Copermittees are only required to address these types of non-storm water discharges as illicit discharges if the Copermittees or the San Diego Water Board identifies these non-storm water discharges not having coverage under the applicable NPDES permit.

Provision E.2.a.(3) includes several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) which are generally not expected to be a source of pollutants to receiving waters, many of which originate from what are typically natural, uncontrollable sources. The Copermittees are only required to address these types of non-storm water discharges as illicit discharges if the Copermittees or the San Diego Water Board identifies these non-storm water discharges as a source of pollutants to receiving waters. Because many of these sources are generally uncontrollable, enforcing a prohibition may not be a possibility for the Copermittees. The Copermittees would be able to address these non-storm water discharges by preventing these non-storm water discharges from entering the MS4. This could potentially be achieved by sealing their MS4 structures so the discharges cannot enter the MS4.

Provision E.2.a.(4) includes several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) that are likely to contain pollutants requiring some form of control to address the pollutants prior to discharging to the MS4. At this time, an outright prohibition of these types of non-storm water discharges does not yet appear to be warranted. Thus, Provision E.2.a.(4) includes several requirements for the Copermittees to control the pollutants from these types of non-storm water discharges. This is consistent with the clarification of the federal regulations in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board has the authority to require the Copermittees to "*control any of these types of discharges where appropriate*."

Unlike non-storm water discharges from over-irrigation, these types of non-storm water discharges are not expected to occur in close proximity to each other or very frequently. Provided these types of non-storm water discharges are controlled as required in Provision E.2.a.(4), the Copermittees would only be required to address these types of non-storm water discharges as illicit discharges if the Copermittee or the San Diego Water Board identifies these non-storm water discharges as a source of pollutants to receiving waters.

Provision E.2.a.(5) includes specific requirements for fire fighting discharges and flows. The requirements for non-storm water discharges and flows associated with fire

fighting have been separated into requirements for: a) non-emergency fire fighting discharges and flows, and b) emergency fire fighting discharges and flows.

The San Diego Water Board has found that discharges from building fire suppression system maintenance (e.g. fire sprinklers) contain waste and potentially a significant source of pollutants to receiving waters. As such, the San Diego Water Board is requiring these discharges be addressed as illicit discharges by the Copermittees. Thus, the discharges to the MS4 are to be prohibited via ordinance, order or similar means. For other non-emergency firefighting discharges and flows (i.e. flows from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems), the Copermittees are required to develop and implement a program to address pollutants in these non-storm water discharges and flows. This is consistent with the clarification of the federal regulations in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board has the authority to require the Copermittees to "*control any of these types of discharges where appropriate*."

For emergency firefighting discharges and flows, the Phase I Final Rule (55 FR 48037) has clarified the requirements of 40 CFR 122.26(d)(2)(iv)(B)(1) pertaining to emergency firefighting flows and discharges, which states:

> "*In the case of firefighting it is not the intention of these rules to prohibit in any circumstances the protection of life and public or private property through the use of water or other fire retardants that flow into separate storm sewers*."

Thus, the requirements have been made to be consistent with the guidance provided by the Phase I Final Rule. The Order recommends that the Copermittees develop and encourage implementation of BMPs to reduce or eliminate the discharge of pollutants from emergency firefighting flows to the MS4s and receiving waters. The Order does not include any requirements that should be interpreted as requiring the implementation of BMPs for emergency firefighting flows to the MS4s and receiving waters.

The Copermittees are expected to review the dry weather MS4 outfall discharge monitoring data they collect to determine if and when there are non-storm water discharges to or from their MS4s that are a source of pollutants to receiving waters. If the Copermittees identify one of the types of non-storm water discharges listed in Provisions E.2.a.(1) through E.2.a.(4) as a source of pollutants to receiving waters based on the review and evaluation of monitoring data, Provision E.2.a.(6) requires the Copermittees to prohibit those categories of discharges from entering the MS4 through ordinance, order or similar means. In addition, Provision E.2.a.(6) clarifies that the San Diego Water Board may identify categories of non-storm water discharges or flows listed under Provisions E.2.a.(1) through E.2.a.(4) that must be prohibited.

Provision E.2.a.(6) also provides the Copermittees an option to propose controls to be implemented for the category of non-storm water discharges as part of the Water Quality Improvement Plan instead of prohibiting the category of non-storm water discharges. If the Water Quality Improvement Plan is accepted by the San Diego Water Board with the proposed controls, the Copermittees will not be required to prohibit the category of non-storm water discharges to their MS4s as long as the controls are implemented. This is consistent with the clarification of 40 CFR 122.26(d)(2)(iv)(B)(1) in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board may "*require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*."

Finally, Provision E.2.a.(7) has been included in the requirements for non-storm water discharges to clarify that any non-storm water discharges to the Copermittee's MS4, even those identified pursuant to Provisions E.2.a.(1) through E.2.a.(4), must be reduced or eliminated, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit. Provision E.2.a.(7) is consistent with the requirements of CWA section 402(p)(3)(B)(ii) and 40 CFR 122.26(d)(1)(v)(B), as clarified in the Phase I Final Rule (55 FR 47995) that "*[u]ltimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit*." However, the reduction or elimination of those non-storm water discharges are expected to be achieved as feasible, in accordance with the priorities in the Water Quality Improvement Plan and when the resources are available to the Copermittee.

Consistent with 40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(1), each Copermittee must implement a "*program…to prevent illicit discharges to the municipal storm sewer system*" and "*detect…illicit discharges and improper disposal into the storm sewer.*" Provision E.2.b requires each Copermittee to implement measures to prevent and detect illicit discharges and connections to its MS4 as part of its illicit discharge detection and elimination program.

As part of the program to prevent and detect illicit discharges to the MS4, 40 CFR 122.26(d)(2)(iv)(B)(2) requires "*procedures to conduct on-going field screening activities during the life of the permit, including areas or locations that will be evaluated by such field screens*." As part of the procedures, each Copermittee is required to maintain an updated map of its entire MS4 and the corresponding drainage areas within its jurisdiction. Having knowledge about where inlets, access points, connections with other MS4s, and outfalls are located is necessary for each Copermittee to track, identify, and eliminate illicit discharges and connections. Thus, Provision E.2.b.(1) of the Order specifies that the map must include the segments of the storm sewer system owned, operated, and maintained by the Copermittee, and include locations of all known inlets, connections with other MS4s, and outfalls to the Copermittee's MS4. The remaining requirements of Provision E.2.b are consistent with the requirements of 40 CFR 122.26(d)(2)(iv)(B)(3)-(7) related to implementing measures to prevent and detect illicit discharges and connections to the MS4.

Provision E.2.c requires each Copermittee to conduct field screening and monitoring of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4. Field screening is a required element of the program to detect and eliminate illicit discharges and connections to the MS4, pursuant to 40 CFR 122.26(d)(2)(iv)(B)(2). The field screening requirement will be implemented through the dry weather MS4 outfall discharge monitoring required under Provisions D.2.a.(2) and D.2.b.(1).

Provision E.2.d specifies the measures each Copermittee must implement to eliminate illicit discharges and connections to its MS4. Elimination of illicit discharges and connections to the MS4 is consistent with the requirement of 40 CFR 122.26(d)(2)(iv)(B) "*to detect and remove [emphasis added]…illicit discharges and improper disposal into the storm sewer*" and will achieve the CWA requirement for MS4 permits to "*effectively prohibit non-storm water discharges into the storm sewers*."

Generally, each Copermittee is responsible for prioritizing its efforts to eliminate non-storm water and illicit discharges or connections to its MS4 based on field screening and monitoring data, NALs, illicit discharge investigation records, and the known or suspected sources. Sources of non-storm water and illicit discharges or connections must be eliminated by enforcing the legal authority established by each Copermittee pursuant to Provision E.1.

Provision E.3 (Development Planning) requires each Copermittee to use its land use and planning authority to implement a development planning program to control and reduce the discharge of pollutants in storm water from new development and significant redevelopment to the MEP. Proper implementation of the development planning program will also contribute toward effectively prohibiting non-storm water discharges from development projects to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." As part of the management program, 40 CFR 122.26(d)(2)(iv)(A)(2) requires "*planning procedures including a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment*."

Land development generally alters the natural conditions of the land by removing vegetative cover, compacting soil, and/or placement of concrete, asphalt, or other impervious surfaces. These impervious surfaces concentrate urban pollutants (such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not found in high concentrations in the natural environment. Pollutants that

accumulate on impervious surfaces are not easily biodegraded nor subject to natural treatment processes.

Impervious surfaces greatly affect the natural hydrology of the land because they do not allow natural infiltration and treatment of storm water runoff to take place. Instead, storm water runoff from impervious surfaces is typically directed through pipes, curbs, gutters, and other hardscape into receiving waters, with little treatment, at significantly increased volumes and accelerated flow rates over what would occur naturally. The increased pollutant loads, storm water volume, discharge rates and velocities, and discharge durations from the MS4 adversely impact stream habitat by causing accelerated, unnatural erosion and scouring within creek bed and banks. Placement of impervious surfaces also encapsulates "good" sediment (such as sand, gravel, rocks and cobbles) that would normally replenish creek beds and banks to help stabilize them. Collectively, these changes to natural hydrologic processes are termed hydrograph modification, or hydromodification.

Hydromodification, which is caused by both altered storm water flow and altered sediment flow regimes, is largely responsible for degradation of creeks, streams, and associated habitats in the San Diego Region. In an ongoing study by the Stormwater Monitoring Coalition to assess the health of streams throughout Southern California, researchers found that three of the four highest risk stressors to creeks (percent sands and fines present, channel alteration, and riparian disturbance) were related to physical habitat.[29] Researchers studying flood frequencies in Riverside County have found that increases in watershed imperviousness of only 9-22 percent can result in increases in peak flow rates for the two-year storm event of up to 100 percent.[30] Such changes in runoff have significant impacts on channel morphology.

In addition, a technical report issued by the Southern California Coastal Water Research Project (SCCWRP) stated that "*[r]ecent studies indicate that California's intermittent and ephemeral streams are more susceptible to the effects of hydromodification than streams from other parts of the United States. Physical degradation of stream channels in the central and eastern United States can initially be detected when watershed impervious cover approaches 10 percent, although biological effects (which may be more difficult to detect) may occur at lower levels. In contrast, initial response of streams in the semi-arid portions of California appears to occur between 3 and 5 percent impervious cover.*"[31] These studies highlight the extent to which impacts originating from impervious surfaces created by land development are responsible for the degradation of creek and stream habitat.

[29] Assessing the Health of Southern California Streams, Stormwater Monitoring Coalition, Fact Sheet
[30] Schueler and Holland, 2000. Storm Water Strategies for Arid and Semi-Arid Watersheds (Article 66). The Practice of Watershed Protection.
[31] Stein, E. and Zaleski, S., 2005. Technical Report 475, Managing Runoff to Protect Natural Streams: The Latest Development on Investigation and Management of Hydromodification in California. December 30, 2005.

This is consistent with what USEPA has noted, that "*[m]ost stormwater runoff is the result of the man-made hydrologic modifications that normally accompany development. The addition of impervious surfaces, soil compaction, and tree and vegetation removal result in alterations to the movement of water through the environment. As interception, evapotranspiration, and infiltration are reduced and precipitation is converted to overland flow, these modifications affect not only the characteristics of the developed site but also the watershed in which the development is located. Stormwater has been identified as one of the leading sources of pollution for all waterbody types in the United States. Furthermore, the impacts of stormwater pollution are not static; they usually increase with more development and urbanization*."[32]

Reducing the impact from the increased pollutant loads and flows generated by impervious surfaces within a watershed is essential to protecting and restoring the integrity of the receiving waters. Provision E.3 includes the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment*." The requirements of Provision E.3 will 1) minimize the generation and discharge of pollutants in storm water from the MS4, and 2) minimize the potential of storm water discharges from the MS4 from causing altered flow regimes and excessive downstream erosion in receiving waters.

The requirements of Provision E.3.a include the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment*" applicable to all development projects, regardless of size or purpose of development. In general, all development projects must implement onsite BMPs to remove pollutants from runoff prior to its discharge to any receiving waters, as close to the pollutant generating source as possible, and structural BMPs must not be constructed within waters of the U.S.

Furthermore, the onsite BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors (e.g. mosquitos, rodents, and flies). If not properly designed or maintained, certain BMPs implemented or required by municipalities may create a habitat for vectors. Monitoring studies conducted by the California Department of Public Health (CDPH) have documented that mosquitoes opportunistically breed in structural storm water BMPs, particularly those that hold standing water for over 96 hours. Certain site design features that hold standing water may similarly produce mosquitoes.

[32] USEPA, 2007. Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices, December 2007.

Structural BMPs and site design features should incorporate design, construction, and maintenance principles to promote drainage within 96 hours to minimize standing water available to mosquitoes. Nuisances and public health impacts resulting from vector breeding can be prevented with close collaboration and cooperative effort between municipalities and local vector control agencies and the CDPH during the development and implementation of storm water runoff management programs. The CDPH also has issued guidance for BMP implementation that will minimize potential nuisances and public health impacts resulting from vector breeding.[33]

All development projects are required to implement source control BMPs that will minimize the generation of pollutants. Additionally, each development project must implement, where applicable and feasible, low impact development (LID) BMPs to mimic the natural hydrology of the site and retain and/or treat pollutants in storm water runoff prior to discharging to and from the MS4.

The LID Center defines LID as "*a comprehensive land planning and engineering design approach with a goal of maintaining and enhancing the pre-development hydrologic regime of urban and developing watersheds.*"[34] LID designs seek to control storm water at the source, using small-scale integrated site design and management practices to mimic the natural hydrology of a site, retain storm water runoff by minimizing soil compaction and impervious surfaces, and disconnect storm water runoff from conveyances to the storm drain system.

LID BMPs may utilize interception, storage, evaporation, evapotranspiration, infiltration, and filtration processes to retain and/or treat pollutants in storm water before it is discharged from a site. Because of these numerous options, the San Diego Water Board expects that every development project will be able to implement some form of LID BMPs. Examples of LID BMPs include using permeable pavements, rain gardens, rain barrels, grassy swales, soil amendments, and native plants.

Provision E.3.a also includes requirements for all development projects to, where feasible, landscape with native and/or low water use plants to minimize the discharge of non-storm water discharges associated with excessive irrigation, as well as harvest (i.e., storage) and use precipitation to promote the concept of utilizing storm water as a resource.

While all development projects are subject to the requirements of Provision E.3.a, Provision E.3.b identifies Priority Development Projects that exceed given size thresholds and/or fit under specific use categories. Priority Development Projects are required to incorporate specific performance criteria for structural BMPs into the

[33] California Department of Public Health, 2012. Best Management Practices for Mosquito Control in California. (http://www.cdph.ca.gov/HealthInfo/discond/Documents/BMPforMosquitoControl07-12.pdf)
[34] www.lowimpactdevelopment.org

project plan to reduce the generation of pollutants, and address potential impacts from hydromodification.

The Priority Development Project categories are based on the requirements of the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), and do not differ significantly from the Fourth Term Permit for San Diego County. Furthermore, the Priority Development Project categories are consistent with Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), and Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit).

Because of the impact of relatively small increases in watershed impervious surfaces to receiving waters, Provision E.3.b.(1)(c)(iv) has been updated to include large driveways that are 5,000 square feet or more. The San Diego Water Board finds that large driveways can exacerbate altered flow regimes if not properly controlled.

Provision E.3.b.(3) describes projects that are exempt from Priority Development Project status. These include new or retrofit paved sidewalks, bicycle lanes, or trails that are designed and constructed to direct runoff to vegetated areas or be hydraulically disconnected from paved areas. The exemptions have been provided to encourage these types of projects because they provide multiple environmental benefits, such as promoting walking rather than driving, which will in turn improve air quality. Additionally, retrofitting of existing alleys, streets, or roads are exempt from Priority Development Project status if they are constructed using USEPA Green Streets guidance.[35] By doing so, retrofitting of these types of projects is encouraged. The San Diego Water Board recognizes that there are spatial constraints associated with these projects, and implementation of structural BMPs are not always feasible.

For development projects identified as Priority Development Projects, the requirements of Provision E.3.c are the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment.*" Provisions E.3.c.(1)-(3) describe the performance criteria for the structural BMPs that must be implemented for each Priority Development Project defined by Provision E.3.b.

Provision E.3.c.(1) describes the storm water pollutant control BMP requirements that must be implemented by all Priority Development Projects. The purpose of Provision E.3.c.(1) is to reduce pollutants in storm water runoff to the MEP from Priority Development Projects before it is discharged to the MS4. Of all the available treatment processes available, retention of storm water, and therefore capture of the

[35] "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).

pollutants in the storm water, will achieve 100 percent pollutant removal efficiency for the volume of storm water retained. No other method of treatment can achieve 100 percent pollutant removal efficiency. Thus, retention of as much storm water onsite is the most effective way to reduce pollutants in storm water discharges to, and consequently from the MS4, and controls pollutants in storm water discharges from a site to the MEP.

Under Provision E.3.c.(1)(a), retention of the pollutants in the runoff produced from the 85th percentile storm event ("design capture volume") is the design standard to which Priority Development Projects must comply. Since the 85th percentile storm event has previously been used as the numeric design standard for treatment control BMPs, this same size storm event is used as the numeric design standard for storm water retention. This is the MEP standard recognized by the San Diego Water Board and is consistent with the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), as well as Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit), and Los Angeles Water Board Order No. R4-2012-0175 (Los Angeles County MS4 Permit).

The 85th percentile storm event is the event that has a precipitation total greater than or equal to 85 percent of all storm events over a given period of record in a specific area or location. For example, to determine what the 85th percentile storm event is in a specific location, all 24 hour storms that have recorded values over a 30 year period would be tabulated and a 85th percentile storm would be determined from this record (i.e. 15 percent of the storms would be greater than the number determined to be the 85th percentile storm). Most jurisdictions in the San Diego Region have already developed isopluvial maps that can provide this type of information. The 85th percentile storm might be determined to be a number such as 1.0 inch, and this would be multiplied by the total area of the project footprint producing runoff to calculate the design capture volume. The Priority Development Project designer would then select a system of BMPs that would retain (i.e. intercept, store, infiltrate, evaporate, or evapotranspire) the pollutants contained in the design capture volume onsite.

Retention BMPs are necessary to capture and retain pollutants generated from a Priority Development Project. In a recent study performed by SCCWRP in the Los Angeles Region, they found "*that the magnitude of constituent load associated with storm water runoff depends, at least in part, on the amount of time available for pollutant build-up on land surfaces. The extended dry period that typically occurs in arid climates such as southern California maximizes the time for constituents to build-up on land surfaces, resulting in proportionally higher concentrations and loads during*

initial storms of the season."[36] This implies that the "first flush" of a rainy season and the first storm events after long antecedent dry periods tend to have the highest pollutant loads. Capturing and retaining the pollutant loads of the "first flush" of a rainy season and the first storm events after long antecedent dry periods will reduce a significant portion of the pollutants in storm water discharged to and from the MS4.

The San Diego Water Board, however, acknowledges that in some situations retention of the full design capture volume onsite may not be technically feasible. In this event, the Copermittee may allow the Priority Development Project to use biofiltration BMPs to treat 1.5 times the design capture volume not reliably retained onsite, or biofiltration BMPs with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite.

The 1.5 multiplier is based on the finding in the Ventura County Technical Guidance Manual that biofiltration of 1.5 times the design capture volume not retained onsite will provide approximately the same pollutant removal as retention of the design capture volume on an annual basis.[37] This standard is consistent with the Los Angeles Water Board's Los Angeles County and Ventura County municipal storm water permits (Order Nos. R4-2012-0175 and R4-2010-0108, respectively). The flow-thru design of 0.75 times the portion of the design capture volume not reliably retained onsite is consistent with the San Diego Water Board's Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively). In either case, the biofiltration BMPs must be designed with an appropriate hydraulic loading rate to maximize storm water retention and pollutant removal, as well as to prevent erosion, scour, and channeling within the BMP. Each Copermittee is required to update its BMP Design Manual to provide guidance for hydraulic loading rates and other biofiltration design criteria necessary to maximize storm water retention and pollutant removal.

The San Diego Water Board further recognizes that, in addition to not being technically feasible, retention of the full design capture storm onsite may be cost prohibitive, or may not provide as much water quality benefit to the Watershed Management Area as would implementing BMPs elsewhere in the watershed. Thus, Provision E.3.c.(1)(b) allows for the use of a combination of onsite retention BMPs, and the implementation of an Alternative Compliance Program described in Provision E.3.c.(3). Provision E.3.c.(3) is discussed in more detail below.

If the full design capture volume is not retained onsite either because biofiltration is not technically feasible, or a Copermittee grants a Priority Development Project permission

[36] Stein, E.D., Tiefenthaler, L.L., and Schiff, K.C., 2007. Technical Report 510, Sources, Patterns and Mechanisms of Storm Water Pollutant Loading from Watershed and Land Uses of the Greater Los Angeles Area, California, USA. March 20, 2007.
[37] Ventura Countywide Stormwater Management Program. 2011. Ventura Technical Guidance Manual, Manual Update, 2011.

to utilize the Alternative Compliance Program, then the pollutants in the portion of the design capture volume that are not reliably retained onsite must still be reduced to the MEP. Thus, flow-thru treatment control BMPs are required to be implemented on Priority Development Projects in addition to the retention BMPs. The requirements of Provisions E.3.c.(1)(a)(ii)[a]-[c] include the performance standards for flow-thru treatment control BMPs, consistent with the Fourth Term Permits in the San Diego Region.

Whereas the purpose of the requirements under Provision E.3.c.(1) is to reduce pollutants in storm water runoff to the MEP, the purpose of the requirements under Provision E.3.c.(2) is to maintain or restore more natural hydrologic flow regimes to prevent accelerated, unnatural erosion in downstream receiving waters, also to the MEP standard. Provision E.3.c.(2) describes hydromodification management BMP requirements that must be implemented by all Priority Development Projects.

The performance criteria for the implementation of hydromodification management BMPs on Priority Development Projects are consistent with the requirements in the Fourth Term Permits for Orange and Riverside Counties (Order Nos. R9-2009-0002 and R9-2010-0016, respectively). Modifications to the Orange County and Riverside County Hydromodification Management Plans (HMPs) will likely be minor, or may not be necessary. The HMP for San Diego County will likely require some minor modifications to incorporate the requirements of Provision E.3.c.(2) and become consistent with the Orange County and Riverside County HMPs. The San Diego Water Board does not, however, expect that it will be necessary for the San Diego County Copermittees to develop a new approach or significantly re-write the San Diego County HMP. This is because the premise of the hydromodification management BMP requirements, which are to control storm water runoff conditions (flow rates and durations) for Copermittee-defined range of flows, is unchanged from all Fourth Term Permits in the San Diego Region.

Provision E.3.c.(2)(a) requires that post-project runoff conditions mimic the *pre-development* runoff conditions, and not the *pre-project* runoff conditions. Fundamentally, the San Diego Water Board believes that using a hydrology baseline that approximates that of an undeveloped, natural watershed is the only way to facilitate the return of more natural hydrological conditions to already built-out watersheds, and ultimately improved stream health. On the other hand, using the *pre-project* hydrology as a baseline for redevelopment projects results in propagating the unnatural hydrology of urbanized areas. Propagating the urbanized flow regime does not support conditions for restoring degraded or channelized stream segments, and would forever sentence such streams to the degraded state. Furthermore, reducing the volume of storm water runoff associated with the urbanized flow regime will also result in reducing the discharge of pollutants into receiving waters, since storm water runoff from impervious surfaces contains untreated pollutants.

The San Diego Water Board understands that approximating the pre-development runoff condition associated with a redevelopment site is not necessarily straightforward because factors such as natural grade and native vegetation for the site cannot be precisely known. Therefore, the San Diego Water Board does not expect project designers to estimate historical conditions associated with redevelopment sites. Rather, the San Diego Water Board expects project designers and the Copermittees to approximate pre-development runoff conditions using the parameters of a *pervious* area rather than an *impervious* area. This means that for redevelopment sites, approximating pre-development runoff conditions equates to using existing onsite grade and assuming the infiltration characteristics of the underlying soil. A redevelopment Priority Development Project must not use runoff coefficients of concrete or asphalt to estimate pre-development runoff conditions. Rather, redevelopment projects must use available information pertaining to existing underlying soil type (such as soil maps published by the National Resource Conservation Service), onsite existing grade, and any other readily available pertinent information to estimate pre-development runoff conditions.

The San Diego Water Board understands, indeed asserts, that the pre-development hydrology of an area in question can only be roughly estimated and cannot be precisely known. However, using the hydrology of a natural condition, even if not precisely known, will provide significant benefit to receiving waters over using the hydrology associated with impervious (developed) surfaces. Therefore in order to achieve the goals of the Clean Water Act, which are to "*restore and maintain the chemical, physical, and biological integrity of the nation's waters* [emphasis added]," the most appropriate standard to use for hydromodification management is the standard associated with the pre-development condition.

Provision E.3.c.(2)(b) requires Priority Development Projects to avoid known critical sediment yield areas or implement measures that would allow coarse sediment to be discharged to receiving waters, such that the natural sediment supply is unaffected by the project. This is necessary because the availability of coarse sediment supply is as much an issue for causing erosive conditions to receiving streams as are accelerated flows.

The San Diego Water Board recognizes that in some situations implementing the hydromodification management BMP requirements for flow control fully onsite may not be technically feasible, may be cost prohibitive, or may not provide any overall water quality benefits to the Watershed Management Area. Thus, Provision E.3.c.(2)(c) allows for the use of a combination of onsite hydromodification management BMPs for flow control and alternative compliance options described in Provision E.3.c.(3).

Provision E.3.c.(3) allows for alternative compliance in instances where the Copermittee determines that offsite measures will have a greater overall water quality benefit for the Watershed Management Area than if the Priority Development Project were to implement structural BMPs onsite. Consequently, watershed-specific

structural BMP requirements are present in this Order in the form of allowable compliance offsite. The Alternative Compliance Program to Onsite Structural BMP Implementation Provision is intended to integrate with the Copermittees' planning efforts in the Water Quality Improvement Plans.

The Alternative Compliance Program is an option for Priority Development Projects where the governing Copermittee has participated in the development of a Watershed Management Area Analysis as part of the Water Quality Improvement Plan (described in Provision B.3.b.(4)). Such an approach is consistent with the latest findings in hydromodification management by the scientific community. In a Technical Report entitled *Hydromodification Assessment and Management in California,*[38] the report states:

> *"An effective [hydromodification] management program will likely include combinations of on-site measures (e.g., low-impact development techniques, flow-control basins), in-stream measures (e.g., stream habitat restoration), floodplain and riparian zone actions, and off-site measures. Off-site measures may include compensatory mitigation measures at upstream locations that are designed to help restore and manage flow and sediment yield in the watershed."*

Consistent with the ideas brought forth in the report, in the Watershed Management Area Analysis of Provision B.3.b.(4), which is optional, the Copermittees will develop watershed maps that include as much detail about factors that affect the hydrology of the watershed as is available. Such factors included identification of areas suitable for infiltration, coarse sediment supply areas, and locating stream channel structures and constrictions. Once these factors are mapped and studied, the Copermittees can identify areas in the watershed where candidate projects may be implemented that are expected to improve water quality in the watershed by providing more opportunity for infiltration, slowing down storm water flows, or attenuation of pollutants naturally via healthy stream habitat. These candidate projects may be in the form of retrofitting existing development, rehabilitating degraded stream segments, identifying regional BMPs, purchasing land to preserve valuable floodplain functions, and any other project(s) that the Copermittees identify.

Under the Alternative Compliance Program, Priority Development Projects may be allowed to fund, partially fund, or implement a candidate project, in lieu of implementing structural BMPs onsite, if they enter into a voluntary agreement with the governing Copermittee permitting this arrangement. Project proponents may also propose an alternative project not previously identified by the Copermittees. In either case, whether a project proponent implements a candidate project identified by the Copermittees or a separate alternative compliance project, the governing Copermittee must determine that implementation of the project will have a greater overall water

[38] 2012. ED Stein, F Federico, DB Booth, BP Bledsoe, C Bowles, Z Rubin, GM Kondolf, A Sengupta. Technical Report 667. Southern California Coastal Water Research Project. Costa Mesa, CA.

quality benefit for the Watershed Management Area than fully implementing structural BMPs onsite. Determination of greater overall water quality benefits associated with alternative compliance projects would be accomplished by utilizing Water Quality Equivalency calculations developed pursuant to Provision E.3.c.(3)(a). Water Quality Equivalency calculations are necessary to establish a regional and technical basis for determining water quality benefits associated with alternative compliance projects, which can be consistently used by all Copermittees in the San Diego Region. Finally, if ~~I~~f alternative compliance involves funding or implementing a project that is outside the jurisdiction of the governing Copermittee, then that Copermittee may enter into an inter-agency agreement with the appropriate jurisdiction.

Finally, Provision E.3.c.(2)(d) allows Priority Development Projects to be exempt from the hydromodification management BMP requirements if there is no threat of erosion to downstream receiving waters (i.e. the receiving stream is concrete lined from the point of discharge all the way to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean). If the Copermittees believe that more exemptions are warranted, then they must perform the optional Watershed Management Area Analysis of Provision B.3.b.(4). Additional exemptions other than those specified in this Order may be established on a watershed basis, provided the Copermittees perform the analysis, provide supporting rationale for the exemptions, and complete the Water Quality Improvement Plan approval process pursuant to Provision F.1.

To facilitate the transition to this Order from the Fourth Term Permits for Orange and Riverside County Copermittees, Provision E.3.c.(2)(e) allows two additional temporary exemptions from hydromodification management BMP implementation. The first temporary exemption allows relief from hydromodification management BMP implementation for Priority Development Projects discharging directly to an engineered channel conveyance system with a capacity to convey peak flows generated by the 10-year storm event all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean. Similar to the exemption allowed for concrete-lined channels, this exemption is premised on the concept that there is little threat of erosion to these types of engineered channel systems.

The second temporary exemption allows relief from hydromodification management BMP implementation for Priority Development Projects discharging directly to large river reaches with drainage areas larger than 100 square miles and a 100-year flow capacity in excess of 20,000 cubic feet per second. If this exemption is claimed, then properly sized energy dissipation is required at all discharge points associated with the Priority Development Project. This exemption is premised on the concept that large river reaches can essentially assimilate the accelerated flow rates associated with individual Priority Development Projects because they are inconsequential compared

to the flow rate in the large river reach. Both of these exemptions are included in the Hydromodification Management Plan for San Diego County[39].

These temporary exemptions are allowed as a means to facilitate Orange and Riverside County Copermittees' transition to this Order from the Fourth Term Permits and are not meant to reside as permanent exemptions without additional rigorous technical analyses specific to each County. Therefore, these exemptions will no longer apply once the Copermittees' land development programs are fully updated to reflect the requirements of this Order, i.e., upon implementation of the BMP Design Manual pursuant to Provision F.2.b. If the Copermittees believe that these or other exemptions are warranted in the context of water quality improvement and stream restoration opportunities, then the Copermittees must perform the optional Watershed Management Area Analysis of Provision B.3.b.(4) and provide supporting rationale for the exemptions. The San Diego County Copermittees are also required to perform the optional Watershed Management Area Analysis to provide supporting rationale to justify use of these and other exemptions. Updated BMP Design Manuals including rationale to justify use of exemptions will be reviewed by the San Diego Water Board pursuant to Provision F.2.b.

Provisions E.3.c.(4) and E.3.c.(5) were included under the BMP requirements applicable to all development projects in the Fourth Term Permits for San Diego, Orange, and Riverside Counties (Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016, respectively). In this Order, the long-term BMP maintenance and infiltration and groundwater protection requirements apply to structural BMPs implemented by Priority Development Projects only.

Provision E.3.d requires the Copermittees to update their BMP Design Manual as needed to incorporate the requirements of Provision E.3. The BMP Design Manual is formerly known as the Standard Storm Water Mitigation Plan, or SSMP, and was renamed so that the title has a more accurate description of the document content. The contents of the BMP Design Manual are largely unchanged from the previous Standard Storm Water Mitigation Plans required under the Fourth Term Permits. The BMP Design Manual fulfills the 40 CFR 122.26(d)(2)(iv)(A)(2) requirement that the Copermittee's development planning program includes "*a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment*."

As part of the "*planning procedures,*" 40 CFR 122.26(d)(2)(iv)(A)(2) requires the procedures to "*address controls to reduce pollutants in discharges from municipal separate storm sewers after construction is completed*." The requirements applicable to the implementation and oversight of structural BMPs at Priority Development Projects are provided under Provision E.3.e.

[39] Final Hydromodification Management Plan Prepared for County of San Diego, March 2011

Proper installation of the structural BMPs approved for a Priority Development Project is necessary to ensure that pollutants in storm water discharges will be reduced to the MEP after the project is completed. In addition to the proper installation of structural BMPs, the maintenance of structural BMPs on Priority Development Projects is necessary to ensure that pollutants in storm water discharges will continue to be reduced to the MEP. Provision E.3.e.(1) includes the minimum requirements that each Copermittee must implement to ensure structural BMPs are properly installed and will be properly maintained.

Provisions E.3.e.(1)(a)(i)-(ii) have been included to provide additional clarification regarding when a Copermittee may allow land development requirements from earlier MS4 permits to apply to a Priority Development Project. Since the MS4 permits issued from 2001 to the adoption of Order No. R9-2015-0001 amending Order No. R9-2013-0001 (Regional MS4 Permit), a Copermittee could allow development projects with "prior lawful approval" to be "grandfathered" into implementing BMP requirements from previous MS4 permits. The Copermittees were given the discretion to use their land use authority to determine when it was appropriate to allow a development project with prior lawful approval to implement BMP requirements from the previous MS4 permits, and when the most recent BMP requirements should be required to achieve the reduction of pollutants in storm water runoff from development projects to the MEP. However, the San Diego Water Board has found that the Copermittees and the development community frequently disagree about when a development project has prior lawful approval and what is necessary to reduce pollutants in storm water runoff from development projects to the MEP.

Therefore, Provisions E.3.e.(1)(a)(i)-(ii) were included to provide more clarity and certainty for the Copermittees, the land development community, and the general public about when the structural BMP performance standards of earlier MS4 permits may be allowed to be implemented. A Copermittee may allow a Priority Development Project to implement BMP requirements of the previous MS4 permit only if all requirements of Provisions E.3.e.(1)(a)(i)[a]-[d] have been met. Otherwise, the Copermittees must require all Priority Development Projects to incorporate the BMP requirements of Provision E.3 into the project to reduce pollutants in storm water runoff from development projects to the MEP.

Provisions E.3.e.(1)(a)(i)[a]-[d] are dependent upon the effective date of the BMP Design Manual. Unless otherwise directed by the San Diego Water Board, the effective date of the BMP Design Manual is December 24, 2015 for the San Diego County Copermittees, September 28, 2017 for the Orange County Copermittees, and July 5, 2018 for the Riverside County Copermittees.

Alternatively, if the Copermittee can demonstrate a lack of land use authority or legal authority to require a Priority Development Project to implement the requirements of Provision E.3, the Copermittee may allow land development requirements from the

previous MS4 permits to apply. However, under these circumstances the San Diego Water Board expects the Copermittee to utilize its available land use authority or legal authority to require the implementation of as much of Provision E.3 as possible to reduce the discharge of pollutants in storm water from development and redevelopment projects within its jurisdiction to the MEP.

In cases where BMP requirements from the earlier MS4 permits govern the structural BMP design requirements of a Priority Development Project, the San Diego Water Board expects the Copermittees to be able to demonstrate, in a programmatic audit or other means, that a Priority Development Project met all the requirements listed under Provisions E.3.e.(1)(a)(i)[a]-[d], or have evidence that the Copermittee did not have the land use or legal authority to require the implementation of Provision E.3 for a Priority Development Project.

The requirements under Provision E.3.e.(2)-(3) are necessary to demonstrate each Copermittee is implementing a program that complies with Provisions E.3.b-c and E.3.e.(1), and ensure structural BMPs at Priority Development Project will continue to be able to reduce pollutants in storm water discharges to the MEP.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary for any development projects to compel compliance with the requirements of Provision E.3 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.3.f requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Provision E.4 (Construction Management) requires each Copermittee to implement a construction management program to control and reduce the discharge of pollutants in storm water from construction sites to the MEP. Proper implementation of the construction management program will also contribute toward effectively prohibiting non-storm water discharges from construction sites to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." As part of the management program, 40 CFR 122.26(d)(2)(iv)(D) requires "*a program to implement and maintain structural and non-structural best management practices to reduce pollutants in storm water runoff from construction sites to the municipal storm sewer system.*"

Construction sites can be significant sources of sediment, trash, and other pollutants to receiving waters. Although sediment is naturally occurring in the natural

environment, the discharge of sediment under unnatural conditions is problematic to receiving waters. Fine sediment in creeks causes high turbidity that interferes with the functionality of native flora and fauna in local creeks. For example, turbidity interferes with both photosynthesis of water-philic plants, as well as successful foraging and reproduction of benthic macroinvertebrates. Sediment can also make it difficult for fish to breathe because it clogs fish gills. Other pollutants such as heavy metals or pesticides can adhere to sediment and are transported to receiving waters during storm events, where they dissolve in the water column and become bioavailable to aquatic organisms. Sediment is recognized as a major stressor to surface waters and is responsible for the impairment of several lagoons and creeks in the San Diego Region.

Provision E.4 includes requirements that each Copermittee must implement to minimize the discharge of sediment and other pollutants from construction sites to the MS4 within its jurisdiction. The requirements under Provision E.4 are consistent with the Fourth Term Permits for San Diego, Orange, and Riverside Counties. Therefore, Copermittees are expected to implement the requirements seamlessly, with minimal changes to their existing construction management programs. The Copermittees, however, are given more flexibility to run their programs as needed to maximize efficiency, and also to be consistent with the Water Quality Improvement Plan for the Watershed Management Area.

As part of the construction management program, 40 CFR 122.26(d)(2)(iv)(D)(1) requires "*procedures for site planning which incorporate consideration of potential water quality impacts.*" Provision E.4.a describes the minimum elements each Copermittee is required to include as part of the construction site planning and project approval process. The construction site planning and approval process is based primarily on ensuring each project had an adequate site-specific pollution control, construction BMP, and/or erosion and sediment control plan that will be implemented to minimize the discharge of pollutants in storm water to the MEP, and minimize impacts to receiving waters.

The requirements under Provision E.4.b provide the data and information necessary to identify "*priorities for inspecting sites and enforcing control measures*" required pursuant to 40 CFR 122.26(d)(2)(iv)(D)(3). Under Provision E.4.b, each Copermittee must identify construction sites that are considered a high threat to downstream surface waters. Designation of "high threat to water quality" construction sites will necessitate the Copermittees to develop criteria to identify such sites. Provision E.4.b.(2) describes a list of factors that must be considered when the Copermittee considers threat to water quality. For example, a Copermittee must identify sites as "high threat to water quality" if it is located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions, according to the Water Quality Improvement Plan. This ensures that construction management program implementation is compatible with the Copermittee's identified highest priority water quality conditions.

Pursuant to 40 CFR 122.26(d)(2)(iv)(D)(2) each Copermittee is required describe "*requirements for nonstructural and structural best management practices*" at construction sites. Provision E.4.c includes the types of construction site BMPs that the Copermittees must implement, or require the implementation of, at each construction site to reduce pollutants in storm water discharges to the MEP.

Each Copermittee is expected to require the implementation of appropriate BMPs given specific site conditions, the season and likelihood of rain events, and construction phase (i.e. grading vs. vertical construction). This means that throughout the life of the project construction, the appropriate BMPs will vary, especially if the construction of the project spans multiple wet seasons. As opposed to describing specific minimum BMPs that must be implemented, the Order describes major BMP categories that should be considered for each site.

Each Copermittee is expected to use its 20 years of storm water experience and knowledge to require implementation of appropriate BMPs from the various categories at each construction site within its jurisdiction. For example, the San Diego Water Board expects that each site will be required to implement erosion control and sediment control. The San Diego Water Board also expects each Copermittee to require implementation of active/passive sediment treatment systems at sites where other BMPs have been tried and are known to be inadequate, and discharges of sediment are causing or contributing to water quality impairment downstream. Each Copermittee is granted flexibility in specifying the minimum level of BMP requirements at each site, but the San Diego Water Board expects each site to be capable of controlling pollutants in storm water discharges to the MEP and preventing illicit discharges.

The requirements under Provision E.4.d are necessary to demonstrate that each Copermittee is implementing a program that complies with Provisions E.4.a and E.4.c and ensure BMPs at construction sites will reduce pollutants in storm water discharges to the MEP.

Provision E.4.d does not include minimum required inspection frequencies for construction sites. Each Copermittee must use its experience and knowledge to specify an appropriate inspection frequency for both high priority and lower priority sites in their jurisdictional runoff management program documents, and in accordance with the Water Quality Improvement Plan. Appropriate inspection frequencies may vary by Copermittee, but the San Diego Water Board expects that the stated frequency will be adequate for each Copermittee to properly oversee the construction sites within its jurisdiction, confirm BMPs are implemented to reduce pollutants in storm water discharges from constructions sites to the MEP, and make needed changes to its program on an ongoing basis as necessary.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary for any development projects to compel compliance with the requirements of Provision E.4 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.4.e requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Provision E.5 (Existing Development Management) requires each Copermittee to implement an existing development management program to control and reduce the discharge of pollutants in storm water from areas of existing development to the MEP. Proper implementation of the existing development management program will also contribute toward effectively prohibiting non-storm water discharges from areas of existing development to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." Within 40 CFR 122.26(d)(2)(iv)(A) and (C), the management program is required to reduce impacts on receiving waters and reduce pollutants in storm water discharges to the MEP from commercial and residential areas, industrial facilities, and municipal facilities.

Commercial and residential areas, industrial facilities, and municipal facilities must be addressed by each Copermittee with the existing development management program required under Provision E.5. All other areas within each Copermittee's jurisdiction should be either undeveloped open space, or areas that are being developed or under construction. Areas being developed or under construction will be addressed by the Copermittee under the requirements of Provision E.3 (Development Planning) or Provision E.4 (Construction Management).

Areas of existing development typically include impervious surfaces such as sidewalks, driveways, roads, and rooftops, which generate and concentrate pollutants (such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not found in high concentrations in the natural environment. Pollutants that accumulate on impervious surfaces are not easily biodegraded or not subject to natural treatment processes. When it rains, these pollutants are transported in storm water runoff from these impervious surfaces into receiving waters, resulting in poor water quality and degradation of beneficial uses.

In addition to the generation of pollutants, areas of existing development have generally altered the natural conditions of the land and removed vegetative cover, reduced the perviousness of the surface, and reduced the capacity of storm water that can be intercepted, captured, stored, infiltrated, evaporated, and/or evapotranspired.

The alteration of the natural conditions and the impervious surfaces associated with areas of existing development causes water quality problems due to the alteration of natural flow regimes within the watersheds; resulting in hydromodification of channels, streams, and habitats that exist within or adjacent to the areas of existing development.

Thus, storm water discharges from areas of existing development are responsible for poor water quality, degraded habitats, and hydromodified channels throughout the developed portions of the watersheds in the San Diego Region. To improve the health and functionality of the receiving waters in a Watershed Management Area, land use practices and the amount of impervious surfaces in areas of existing development must change to reduce the various impacts caused by hydromodification and pollutants from storm water runoff generated in developed areas. Each Copermittee must be aggressive to address pollutant sources and runoff from areas of existing development to be able to reduce pollutants in storm water discharges from the MS4 to the MEP.

There is some overlap in the requirements under Provision E.5 with the requirements under Provisions E.2 (Illicit Discharge Detection and Elimination), E.3 (Development Planning), and E.4 (Construction Management). Illicit discharges frequently originate from areas of existing development. New development projects, when completed will become some type of residential, commercial, industrial or municipal existing development. Redevelopment projects are, by definition, redeveloping areas of existing development. And, redevelopment projects become construction sites located in areas of existing development. Much of the data and information collected, inspections performed, and enforcement actions taken for the requirements under Provisions E.2 to E.4 may also be utilized by the existing development management program. The requirements under Provision E.5, however, are focused primarily on reducing pollutants generated in areas of existing development that can be transported in storm water runoff and discharged to and from the MS4.

The requirements under Provision E.5 build upon existing program elements being implemented by the Copermittees. Provision E.5 is generally consistent with the existing development requirements of the Fourth Term Permits for Orange and Riverside Counties (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), but modified to provide more flexibility to implement the programs so resources can be better focused toward addressing the highest priority water quality conditions identified in the Water Quality Improvement Plans.

For a Copermittee to properly manage areas of existing development, having knowledge of what development exists within its jurisdiction is essential. Provision E.5.a requires each Copermittee to maintain a watershed-based inventory of all the existing development within its jurisdiction. This requirement is necessary for each Copermittee to implement the requirements of Provision E.5.b-e.

As opposed to just maintaining separate inventories based on the type of site, each Copermittee must maintain a watershed-based inventory that includes all types of existing development within its jurisdiction. By utilizing a watershed-based inventory, the Copermittees within a Watershed Management Area can combine their inventories and review the inventories by watershed in addition to by jurisdiction. Pollutant sources and strategies for abatement can then be evaluated on a watershed level, as opposed to evaluating sources and strategies strictly by type of site.

Provision E.5.a includes the information that must be included in the inventory. Provision E.5.a.(1) specifies what facilities or areas must be included in the inventory. A commercial type of existing development may be identified in the inventory as a facility (e.g. individual building, individual business) or an area (e.g. shopping center, commercial zone). An industrial type of existing development must be identified in the inventory by facility (e.g. individual industrial entity). A municipal type of existing development must be identified in the inventory by facility, with a list of specific municipal facilities that must be included in the inventory. A residential type of existing development must be identified by areas to be designated by the Copermittee. For each of the facilities and areas identified in the Copermittee's inventory developed pursuant to Provision E.5.a.(1), Provision E.5.a.(2) specifies the information that must be included in the description for the facility or area.

Provision E.5.a.(3) requires each Copermittee to maintain an updated map showing the location of inventoried existing development, watershed boundaries, and water bodies. This requirement was included because this information is expected to help the Copermittees in a Watershed Management Area identify and prioritize sources of pollutants and/or stressors in areas of existing development that contribute toward the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Knowledge of the existing development that are likely to be sources of pollutants contributing to the highest priority water quality conditions is expected to be a key element in the Copermittees' development of the water quality improvement strategies that will be included in the Water Quality Improvement Plans. The strategies described in the Water Quality Improvement Plans will direct efforts within the existing development management programs implemented by each Copermittee.

Pursuant to 40 CFR 122.26(d)(2)(iv)(A) each Copermittee is required describe "*structural and source control measures to reduce pollutants*" in storm water runoff discharged from areas of existing development. Provision E.5.b includes the BMP implementation and maintenance requirements that the each Copermittee must require at areas of existing development to reduce pollutants in storm water discharges to the MEP. The San Diego Water Board, however, recognizes that BMP implementation and maintenance for residential areas will require much more education and encouragement through less authoritative measures than for commercial, industrial and municipal facilities and areas. Thus, the BMP

implementation and maintenance requirements have been separated between requirements under Provision E.5.b.(1) for commercial, industrial and municipal facilities and areas, and Provision E.5.b.(2) for residential areas.

Most of the requirements in Provision E.5.b are consistent with the related requirements in the Fourth Term Permits. The level of specificity, however, has been changed to allow each Copermittee the flexibility to implement its program to achieve maximum efficiency, and to perform functions that will address the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Each Copermittee is expected to require the implementation of appropriate BMPs to address the expected pollutants from each facility or area. The Third and Fourth Term Permits described specific minimum BMPs that must be implemented at various sites. This Order, however, requires each Copermittee to designate minimum BMPs themselves and require implementation. Consistent with the Fourth Term Permits, each Copermittee is required to maintain, or require the maintenance of, all BMPs as needed.

The BMP implementation and maintenance requirements include a schedule of operation and maintenance activities for the MS4 and related structures (such as catch basins, storm drain inlets, and detention basins), as well as public streets and roads. Public streets and roads specifically include public unpaved roads. The San Diego Water Board identified, through investigations and complaints, sediment discharges from unpaved roads as a significant source of water quality problems in the San Diego Region. Inspection activities conducted by the San Diego Water Board since the Third Term Permits have found a lack of source control for many unpaved roads within the jurisdiction of the Copermittees.

Unpaved roads are a source of sediment that can be discharged in runoff to receiving waters, especially during storm events. Erosion of unpaved roadways occurs when soil particles are loosened and carried away from the roadway base, ditch, or road bank by water, wind, traffic, or other transport means. Exposed soils, high runoff velocities and volumes, sandy or silty soil types, and poor compaction increase the potential for erosion.

Road construction, culvert installation, and other maintenance activities can disturb the soil and drainage patterns to streams in undeveloped areas, causing excess runoff and thereby erosion and the release of sediment. Poorly designed unpaved roads can act as preferential drainage pathways that carry runoff and sediment into natural streams, impacting water quality. In addition, other public works activities along unpaved roads have the potential to significantly affect sediment discharge and transport within streams and other waterways, which can degrade the beneficial uses of those waterways.

USEPA also recognizes that discharges from unpaved roads pose a significant potential threat to water quality. USEPA guidance[40] emphasizes the threat of unpaved roads to water quality:

> "*Dirt and gravel roads are a major potential source of these pollutants [sediment] and pollutants that bind to sediment such as oils, nutrients, pesticides, herbicides, and other toxic substances. Many roads have unstable surfaces and bases. Roads act like dams, concentrating flows that accelerate erosion of road materials and roadsides. Both unstable surfaces and accelerated erosion then lead to sediment and dust.*"

There are several guidance documents, developed by the USEPA,[41] the US Forest Service,[42] the University of California,[43] and others, that include design and construction specifications and BMPs that are readily available for implementation by public entities. Implementing design and other source control BMPs for unpaved roads in the region is necessary to reduce and minimize the impacts of sediment discharged during storm events from unpaved roads to the MS4s and receiving waters.

Provision E.5.c describes existing development site inspection frequency, content, and tracking that each Copermittee must incorporate into their existing development management programs. The requirements under Provision E.5.c are necessary to demonstrate each Copermittee is implementing a program that complies with Provision E.5.b and ensure BMPs implemented in areas of existing development will reduce pollutants in storm water discharges to the MEP. Provision E.5.c has been modified to include a minimum of once every 5 years for all inventoried facilities and areas of existing development, utilizing one or more methods of inspection.

In addition to onsite inspections, the methods of inspection have been expanded to include drive-by inspections. Inspections may be performed by the Copermittee's municipal and contract staff, or by volunteer monitoring or patrol programs. Volunteer monitoring or patrol programs are not expected to enforce the Copermittee's ordinances, or to inspect areas or facilities where members of the public are not allowed access. Volunteer monitoring or patrol programs must be trained by the Copermittee, and are only expected to collect visual observations. By utilizing drive-by inspections and volunteer monitoring or patrol programs, the Copermittees will be able to maximize and efficiently use their resources to identify and address sources of pollutants in areas of existing development.

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[40] USEPA, 2006. Environmentally Sensitive Maintenance for Dirt and Gravel Roads. Gesford and Anderson, USEPA-PA-2005.
[41] Ibid
[42] US Forest Service, 1996. Forest Service Specifications for Construction of Roads & Bridges. EM-7720-100. Revised August 1996.
[43] University of California Division of Agriculture and Natural Resources, 2007. Rural Roads: A Construction and Maintenance Guide of California Landowners. Publication 8262.

The municipal and contract staff of each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial, industrial, and municipal facilities and areas in its inventoried existing development pursuant to Provision E.5.c.(1)(a)(iv). An "equivalent" of at least 20 percent means if any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspections may count toward the total annual inspection requirement. Linear municipal facilities (i.e. MS4 linear channels, sanitary sewer collection systems, streets, roads and highways) in the Copermittee's existing development inventory are not subject to the inspection frequency requirement of Provision E.5.c.(1)(a)(iv).

The inspection content specified in Provision E.5.c.(2)(a) includes the information required to be collected during an inspection by any method. The inspection content specified in Provision E.5.c.(2)(b) includes additional information that must be collected when a Copermittee's municipal or contract staff perform an onsite inspection. Provision E.5.c.(3) specifies the information that each Copermittee must maintain in its existing development inspection records.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary to compel compliance with the requirements of Provision E.5 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.5.d requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Provisions E.5.e.(1)-(2) specifically require the Copermittee to identify areas of existing development as candidates for retrofitting, and streams, channels, and/or habitats as candidates for rehabilitation. Provisions E.5.e.(1)-(2) are based on the retrofitting requirements of the Fourth Term Permits for Orange and Riverside Counties, but modified to also include identifying projects to rehabilitate channels within areas of existing development. The requirements have also been modified to be more focused on utilizing these types of projects for addressing the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Interest and opportunity to retrofit areas of existing development and rehabilitate channels located in areas of existing development has been observed in several programs the San Diego Water Board oversees (e.g., CWA Section 401 Water Quality Certification program, supplemental environmental projects, and grant programs). Each jurisdiction has miles and miles of streets that could be retrofitted to become green streets. Reshaping landscaped areas from convex to concave configurations can detain storm water instead of directing runoff as quickly as possible to the MS4. Retrofit projects could also include simply replacing impervious surfaces with permeable surfaces.

Retrofitting projects do not necessarily have to be expensive. Retrofitting projects could be as simple as redirecting downspouts from roofs to pervious or landscaped areas instead of to hardscaped areas discharging directly to the MS4, providing rain barrels to harvest storm water from downspouts for use at a later time, or planting more trees in areas with little vegetation to provide canopy that can intercept storm water. The San Diego Water Board encourages the Copermittees to identify simple, low-cost retrofitting opportunities that can be easily implemented, in addition to other more expensive retrofitting and channel rehabilitation projects.

Rehabilitation of channels, streams, and/or habitat will require more significant planning and resources to implement. There are, however, also abundant opportunities to rehabilitate channels, streams and/or habitats in or adjacent to areas of existing development. Each Watershed Management Area likely has several creeks and stream reaches that have been undergrounded, artificially hardened, or hydromodified that could be rehabilitated to be more sustainably configured, which would slow down storm water flows and potentially have more assimilative capacity for pollutants while still being supportive of designated beneficial uses.

The San Diego Water Board recognizes that it may be infeasible to implement retrofitting or channel rehabilitation projects within certain areas of a Copermittee's jurisdictions. For such areas, the Copermittee must instead identify, develop, and implement regional retrofitting and channel rehabilitation projects (i.e. projects that can retain and/or treat storm water from one or more areas of existing development) adjacent to and/or downstream of the areas of existing development.

Provisions E.5.e.(1)-(2) do not require the implementation of retrofitting and rehabilitation projects, but do require the Copermittee to develop a program with strategies to facilitate the implementation of these types of projects in areas of existing development. The strategies are expected to include allowing and encouraging Priority Development Projects to implement retrofitting types of projects as a means of compliance with the structural BMP performance criteria requirements of Provisions E.3.c.(1) and E.3.c.(2).

Provision E.6 (Enforcement Response Plans) requires each Copermittee to develop an Enforcement Response Plan as part of its jurisdictional runoff management program document. Proper implementation of the Enforcement Response Plans is necessary to effectively prohibit non-storm water discharges to the MS4, and reduce the discharge of pollutants in storm water from the MS4 to the MEP.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system*" and be able to demonstrate that it can "*operate pursuant to legal authority established by statute, ordinance or series of contracts*" to control the discharge of non-storm water and pollutants in storm water to and from its MS4. Pursuant to 40 CFR 122.26(d)(2)(i)(E) each Copermittee is specifically required to

have the legal authority to "*[r]equire compliance with conditions in ordinances, permits, contracts or order*s."

The requirements under Provision E.6 are necessary to demonstrate that each Copermittee can enforce its legal authority to *"effectively prohibit non-stormwater discharges"* and "*reduce the discharge of pollutants to the maximum extent practicable*" as well as "*[r]equire compliance with conditions in ordinances, permits, contracts or order*."

The Enforcement Response Plan required under Provision E.6 will serve as a reference for the Copermittee and the San Diego Water Board to determine if consistent enforcement actions are being implemented to achieve timely and effective compliance from all public and private entities that are not in compliance with the Copermittee's ordinances, permits, or other requirements. The Enforcement Response Plan must contain clear direction for the Copermittee to take immediate enforcement action, when appropriate and necessary, in their illicit discharge detection and elimination, development planning, construction management, and existing development management programs.

If the entities subject to the Copermittee's legal authority do not implement appropriate corrective actions in a timely manner, or if violations repeat, the Copermittee must take progressively stricter responses to enforce its legal authority and achieve compliance with its ordinances, permits, or other requirements to *"effectively prohibit non-stormwater discharges"* and "*reduce the discharge of pollutants to the maximum extent practicable.*"

Provision E.7 (Public Education and Participation) requires each Copermittee to implement a public education and participation program. Proper implementation of the public education and participation program as part of its jurisdictional runoff management program will contribute toward effectively prohibiting non-storm water discharges to the MS4, and toward the reduction of pollutants in storm water from the MS4 to the MEP.

Provision E.7 establishes the minimum requirements that each Copermittee must implement to engage members of the public as part of its jurisdictional runoff management program. In the Fourth Term Permits, the public education program requirements and the public participation requirements were included as separate jurisdictional runoff management program components. In this Order, the public education requirements have been consolidated with the public participation requirements, as both sets of requirements are related to the engagement of the public by each Copermittee. Engagement of the public is critical for the success of each Copermittee's jurisdictional runoff management program.

The Copermittees have been implementing public education programs for the last 20 years, which are now well established. The specificity of expected public education program elements of the Fourth Term Permits has been removed. For the most part,

the public education program requirements in Provision E.7.a have been reduced to a set of requirements that are specifically included in the federal regulations under 40 CFR 122.26(d)(2)(iv)(A)(6), 122.26(d)(2)(B)(6) and 122.26(d)(2)(D)(4), which should already be incorporated into each Copermittee's existing public education program. Each Copermittee is expected to utilize the information and data collected from the monitoring and assessments conducted within the Watershed Management Area, and from its inventories and inspections to best direct its public education program resources toward addressing the highest priority water quality conditions identified within the Water Quality Improvement Plan.

According to 40 CFR 122.26(d)(2)(iv), public participation is required to be included as part of the "*comprehensive planning process*", which includes the development and implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs. The requirements under Provision E.7.b specify the opportunities that the public must be provided to be involved in the "*comprehensive planning process*", as required by to 40 CFR 122.26(d)(2)(iv).

Provision E.8 (Fiscal Analysis) requires each Copermittee to secure the resources and provide an analysis of the resources that will be necessary to implement the requirements of the Order. Adequate fiscal resources are necessary for a jurisdictional runoff management program to effectively prohibit non-storm water discharges to the MS4, and reduce pollutants in storm water from the MS4 to the MEP.

According to 40 CFR 122.26(d)(2)(vi), each Copermittee is responsible for providing "*a fiscal analysis of the necessary capital and operation and maintenance expenditures necessary to accomplish the activities*" required by this Order, including "*a description of the source of funds that are proposed to meet the necessary expenditures, including legal restrictions on the use of such funds.*" The fiscal analysis requirements of Provision E.8 are consistent with 40 CFR 122.26(d)(2)(vi).

The San Diego Water Board has chosen not to require a description of fiscal benefits realized from implementation of the jurisdictional runoff management programs. This is a recommendation from the National Association of Flood and Stormwater Management Agencies.[44] For instance, the fiscal analysis requirements do not address city-wide fiscal benefits of protection (e.g., public health, tourism, property values, economic activity, beneficial uses, etc.), even though many costs currently reported to the San Diego Water Board are for related activities. This type of assessment may help Copermittees improve the allocation of resources and it may help the Copermittees secure adequate funding for the program. Qualitative assessments, however, could be overly subjective and most Copermittees likely lack the ability to provide accurate quantitative assessments. The San Diego Water Board encourages the Copermittees to consider means for conducting assessments of fiscal

[44] National Association of Flood and Stormwater Management Agencies. 2006. *Guidance for Municipal Stormwater Funding.* Prepared under a grant provided by the USEPA.

benefits derived from the programs. Such assessments could be conducted on a regional scale similar to studies of program costs conducted by the State Water Board.[45]

[45] State Water Board, 2005. NPDES Stormwater Cost Survey.

F. Reporting

Purpose: Provision F includes the requirements for the documents and reports that the Copermittees must prepare and provide to the San Diego Water Board. The documents prepared by the Copermittees and provided to the San Diego Water Board and made available to the public will provide the documentation that the Copermittees are complying with the requirements of the Order.

***Discussion*:** Provision F requires the Copermittees to prepare several documents and reports that must be provided to the San Diego Water Board and made available to the public. The reporting requirements have been significantly reduced compared to the Fourth Term Permit reporting requirements. The reduction in reporting requirements was recommended by the San Diego County Copermittees in the Report of Water Discharge submitted in June 2011.

More specific and detailed discussions of the requirements of Provision F are provided below.

Provision F.1 (Water Quality Improvement Plans) requires the Copermittees in each Watershed Management Area to develop and submit a Water Quality Improvement Plan in accordance with the requirements of Provision B.

Of all the requirements of Provision F, the Water Quality Improvement Plans will likely be the documents requiring the most significant effort to develop. The content of the Water Quality Improvement Plans, however, is expected to include content that should already have been developed for the Watershed Plans and several elements that are included in the Monitoring and Reporting Programs required under the Fourth Term Permits.

Because the Water Quality Improvement Plan is part of the "*comprehensive planning process which involves public participation*," Provision F.1 includes requirements to give multiple opportunities to the public to provide input on the content of the plans.

Provision F.1.a.(1) specifies the elements that the Copermittees must include in the public participation process for the development of the Water Quality Improvement Plans. In order for the public to be aware of the opportunities to provide input, Provision F.1.a.(1)(a) requires the Copermittees to develop a publicly available and noticed schedule of the opportunities for the public to participate and provide comments during the development of the Water Quality Improvement Plan. These opportunities are when the public can provide the data, information, and recommendations that the Copermittees can consider during the development of the Water Quality Improvement Plans.

The San Diego Water Board recognizes, however, that the Copermittees cannot be expected to incorporate all the data, information, and recommendations that the public may provide into the Water Quality Improvement Plans. The Copermittees will have to review the data, information, and recommendations received and make some decisions on what to incorporate into the Water Quality Improvement Plans. Before the Copermittees finalize their decisions, members of the public should be allowed to review the Copermittees' decisions. Thus, Provision F.1.a.(1)(b) requires the Copermittees to form a Water Quality Improvement Consultation Panel (Panel).

The Panel will consist of a member from the environmental community and a member from the development community familiar with the Watershed Management Area. A representative from the San Diego Water Board staff will also be part of the Panel. The Copermittees may choose to include additional members, but the Panel is only required to include three panel members.

The Panel will serve as an additional public participation and input mechanism during the development of the Water Quality Improvement Plans. The knowledge and expertise from these Panel members are expected to provide the Copermittees valuable direction during their decision-making process. The Copermittees will review the content of their planned submittals with the Panel members to receive recommendations. If the Panel provides recommendations, the Copermittees must consider revisions to the Water Quality Improvement Plan submittals.

The San Diego Water Board recognizes that the development of multiple Water Quality Improvement Plans concurrently may limit the ability of the public to review and provide comments to the Copermittees. Thus, Provision F.1.a.(1)(c) requires the Copermittees to coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public time and opportunity to participate during the development of the Water Quality Improvement Plans.

Provision F.1.a.(2) requires the Copermittees to develop and submit the first Water Quality Improvement Plan component, in accordance with the requirements of Provision B.2, which includes the identification of the priority water quality conditions and potential water quality improvement strategies. The public must be provided an opportunity to provide data, information and recommendations to be utilized in the development and identification of the priority water quality conditions and potential water quality improvement strategies for the Watershed Management Area. The Copermittees must consult with the Panel and consider making revisions. The Copermittees may submit the requirements of Provision B.2 as early as 6 months and no later than 12 months after the commencement of coverage under this Order. After the requirements of Provision B.2 are submitted to the San Diego Water Board, the public will be provided another opportunity to provide comments.

Provision F.1.a.(3) requires the Copermittees to develop and submit the second Water Quality Improvement Plan component, in accordance with the requirements of Provision B.3, which includes the identification of the numeric goals for the highest

priority water quality conditions identified for the Watershed Management Area, and the strategies that will be implemented to achieve the potential numeric goals. The Copermittees may also develop the Optional Watershed Management Area Analysis, in accordance with the requirements of Provision B.3.b.(4), as part of this submittal. The public must be provided an opportunity to provide data, information and recommendations to be utilized in the development and identification of the numeric goals and water quality improvement strategies for the Watershed Management Area. The Copermittees must consult with the Panel and consider making revisions. The Copermittees may submit the requirements of Provision B.3 as early as 9 months and no later than 18 months after the commencement of coverage under this Order. After the requirements of Provision B.3 are submitted to the San Diego Water Board, the public will be provided another opportunity to provide comments.

Finally, Provision F.1.b describes the process for the submittal and implementation of the Water Quality Improvement Plans. The complete Water Quality Improvement Plans are required to be submitted by the Copermittees within 24 months after the commencement of coverage under this Order. The San Diego Water Board will provide the public an opportunity to provide comments on each complete Water Quality Improvement Plan.

The San Diego Water Board will review each Water Quality Improvement Plan and the public comments received to determine if the Copermittees have submitted a Water Quality Improvement Plan that meets the requirements of Provision B. If a Water Quality Improvement Plan does not meet the requirements of Provision B, the Copermittees will be considered out of compliance and directed in writing by the San Diego Water Board Executive Officer to correct the deficiencies.

When a Water Quality Improvement Plan meets the requirements of Provision B, the San Diego Water Board will determine whether to hold a public hearing or to limit public input to submittal of written comments before accepting the Water Quality Improvement Plan. Implementation of the Water Quality Improvement Plan must begin within 30 days of acceptance.

The San Diego Water Board expects that any deficiencies in the Water Quality Improvement Plan will be identified either in the public comments or during the review by the San Diego Water Board before implementation begins. In the event any deficiencies are identified after the implementation of the Water Quality Improvement Plan, Provision F.1.b.(7) clarifies that the San Diego Water Board maintains the right to require the Copermittees to correct any deficiencies that may be identified.

Provision F.2 (Updates) requires the Copermittees to update specific documents that the Copermittees will utilize to implement the requirements of this Order.

Each Copermittee is required to continue implementing a jurisdictional runoff management program, as required under Provision E. Implementation of each Copermittee's jurisdictional runoff management program is directed by its jurisdictional

runoff management program document. Provision F.2.a requires each Copermittee to update its jurisdictional runoff management program document to be consistent with the requirements of Provision E concurrent with the submittal of the Water Quality Improvement Plan.

Likewise, each Copermittee must continue to require new development and redevelopment projects to implement BMPs to control pollutants in storm water runoff. The control of pollutants in storm water runoff from development and redevelopment projects within each Copermittee's jurisdiction is guided and directed by its BMP Design Manual, formerly known as a Standard Storm Water Mitigation Plan (SSMP). Provision F.2.b requires each Copermittee to update its BMP Design Manual to be consistent with the requirements of Provision E.3 concurrent with the submittal of the Water Quality Improvement Plan.

For situations where the San Diego Water Board may amend the requirements of Provisions E.3.a-d after a Copermittee has updated its BMP Design Manual pursuant to Provision F.2.b.(1), Provision F.2.b.(4) gives the Copermittee up to 90 days to incorporate the amended requirements of Provision E.3.a-d into its BMP Design Manual. The San Diego Water Board Executive Officer has discretion to modify the 90-day time period depending on the complexity of the amendments or other information that warrants a change in the 90-day time period.

In general, the requirements of the Order should not necessitate a complete rewrite of each Copermittee's jurisdictional runoff management program document or BMP Design Manual, as was required by the Third Term Permits. The jurisdictional runoff management program and BMP Design Manual requirements of this Order are not significantly different than the requirements of the Fourth Term Permits. Thus, only sections of the Order which are new or have been significantly changed should warrant revisions to specific sections of the Copermittee's jurisdictional runoff management program document and BMP Design Manual.

Finally, the Water Quality Improvement Plans are expected to require updates as the iterative approach and adaptive management process included in the Water Quality Improvement Plan, as required under Provision B.5, is implemented by the Copermittees. Provision F.2.c.(1) requires the Copermittees to implement a public participation process for the proposed updates, review the proposed updates with the Panel, and submit the updates to the Water Quality Improvement Plan as part of the Annual Reports required under Provision F.3.b.

Also, because TMDLs are likely to be developed, adopted and approved during the term of the Order, Provision F.2.c.(2) has been included to expedite the incorporation of TMDLs into the Copermittees' Water Quality Improvement Plans as part of the update process, potentially before the Order is re-opened to incorporated the requirements of the new TMDLs.

Provision F.3 (Progress Reporting) requires the Copermittees to report on the progress of implementing the Water Quality Improvement Plans.

The requirements of Provision F.3 are to report the progress toward improving water quality that the Copermittees are achieving with the implementation of the Water Quality Improvement Plans and each Copermittee's jurisdictional runoff management program. The Progress Report Presentations required under Provision F.3.a are included to provide the Copermittees an opportunity to communicate directly with the San Diego Water Board and the public. The Progress Report Presentations will also provide the members of the San Diego Water Board and members of the public an opportunity to become more acquainted with the Copermittees and their projects and programs to address non-storm water and storm water discharges into and from their MS4s.

The Annual Report requirements of Provision F.3.b are a consolidation of several reporting requirements from the Fourth Term Permits, including the Jurisdictional Runoff Management Program Annual Reports, the Watershed Annual Reports, and the Monitoring and Reporting Program Annual Reports. Furthermore, the Annual Report requirements are consistent with the requirements under 40 CFR 122.42(c).

Pursuant to 40 CFR 122.42(c), "*[t]he operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the Director…must submit an annual report*", which must include the following:

(1) *The status of implementing the components of the storm water management program that are established as permit conditions* [40 CFR 122.42(c)(1)];

(2) *Proposed changes to the storm water management programs that are established as permit conditions* [40 CFR 122.42(c)(2)];

(3) *Revisions, if necessary, to the assessment of controls and fiscal analysis* [40 CFR 122.42(c)(3)];

(4) *A summary of data, including monitoring data, that is accumulated throughout the reporting year* [40 CFR 122.42(c)(4)];

(5) *Annual expenditures and budget for year following each annual report* [40 CFR 122.42(c)(5)];

(6) *A summary describing the number and nature of enforcement actions, inspections, and public education programs* [40 CFR 122.42(c)(6)];

(7) *Identification of water quality improvements or degradation* [40 CFR 122.42(c)(7)].

Under the Fourth Term Permits, each Copermittee is responsible for submitting a Jurisdictional Runoff Management Program Annual Report; the Copermittees in each

designated watershed are responsible for submitting a Watershed Annual Report; and the Copermittees from each county are responsible for submitting a Monitoring and Reporting Program Annual Report.

There are 39 Copermittees in the San Diego Region, each required to prepare and submit a Jurisdictional Runoff Management Program Annual Report. There are 9 designated watersheds in San Diego County, 6 designated watersheds in Orange County, and 1 designated watershed in Riverside County for a total of 16 designated watersheds, each requiring a Watershed Annual Report. There are 3 sets of Copermittees in 3 counties in the San Diego Region, requiring Copermittees from each county to prepare and submit a Monitoring and Reporting Program Annual Report. Thus each Copermittee is currently required to prepare, or participate in the preparation of at least 3 annual reports. In addition, the San Diego County Copermittees are required to prepare and submit a Regional Urban Runoff Management Plan Annual Report.

In total, there are 59 annual reports that are prepared by the Copermittees and submitted to the San Diego Water Board for the Fourth Term Permits. The preparation of these annual reports requires significant time and resources from each Copermittee, which could otherwise be expended on actions that could improve water quality within its jurisdiction. In turn, significant time and resources are required from the San Diego Water Board staff to review these reports, which could otherwise be expended on working directly with the Copermittees to improve their implementation efforts toward restoring and protecting water quality.

Until the Water Quality Improvement Plans are developed, there will be a transitional period during which the Copermittees will continue to implement their existing jurisdictional runoff management programs. There will also be a transitional period during which the Copermittees will implement the transitional monitoring and assessment requirements of Provision D. During the transitional period, the Copermittees will submit annual reports pursuant to the requirements of Provisions F.3.b.(1) and F.3.b.(2).

Provision F.3.b.(1) includes the transitional annual reporting requirements for each Copermittee's jurisdictional runoff management program. The reporting of the jurisdictional runoff management program implementation efforts have been reduced to a single 2-page form. Each Copermittee is required to complete and submit a Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D or a revised form accepted by the San Diego Water Board) no later than October 31 of each year for each jurisdictional runoff management program reporting period (i.e. July 1 to June 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted. The Jurisdictional Runoff Management Program Annual Report Form will certify that each Copermittee has implemented its jurisdictional runoff management program in accordance with the requirements of Provision E. Each Copermittee may choose to continue to utilize and submit the jurisdictional runoff management program annual reporting format of its

current Order until the first Water Quality Improvement Plan Annual Report is required to be submitted.

Provision F.3.b.(2) includes the transitional annual reporting requirements for the transitional monitoring and assessment program for each Watershed Management Area. The Copermittees in the Watershed Management Area are required to submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted. The Transitional Monitoring and Assessment Program Annual Report is required to include the transitional period monitoring data collected pursuant to Provisions D.1.a and D.2.a, and the findings from the transitional period findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

Provision F.3.b.(3) includes the Water Quality Improvement Plan Annual Report requirements. Only one Water Quality Improvement Plan Annual Report is required for each of the ten (10) Watershed Management Areas designated under Provision B.1, which is a significant reduction in the number of annual reports required to be prepared and submitted by the Copermittees. The Water Quality Improvement Plan Annual Report will document the Copermittees' efforts to implement the Water Quality Improvement Plan. Each Water Quality Improvement Plan Annual Report will be focused primarily on reporting the analysis of the monitoring data collected pursuant to Provisions D.1-D.3 during the reporting period, and the assessments that are required pursuant to Provision D.4 based on the data. The monitoring data analyses and the assessments that are provided in the Water Quality Improvement Plan Annual Report will be the core of the report. The reporting of the jurisdictional runoff management program implementation efforts have been reduced to a single 2-page form, and will no longer be the primary focus of the reporting requirements as in the Third and Fourth Term Permits.

Each Copermittee will continue to prepare and submit a Jurisdictional Runoff Management Program Annual Report Form as part of the Water Quality Improvement Plan Annual Report to certify that each Copermittee has implemented its jurisdictional runoff management program in accordance with the requirements of Provision E. Instead of reviewing a voluminous report from each Copermittee, as was required under the Third and Fourth Term Permits, the San Diego Water Board will conduct audits of each Copermittee's jurisdictional runoff management program to investigate and confirm the information provided by each Copermittee on its Jurisdictional Runoff Management Program Annual Report Form. The audits will allow the San Diego Water Board to become more familiar with the each Copermittee's jurisdictional runoff management program, and each Copermittee will become more informed about the expectations of the San Diego Water Board.

The reduction in the number and content of the Water Quality Improvement Plan Annual Reports should result in significant time, cost and resource savings for the

Copermittees, as well as the San Diego Water Board. Those savings should offset a significant portion of any additional costs that may be incurred to develop the Water Quality Improvement Plans and to implement the monitoring and assessment program requirements of Provision D.

The reporting period for the Water Quality Improvement Plan Annual Reports consists of two periods. Because the jurisdictional runoff management programs are typically budgeted and implemented during a fiscal year, the information provided on the Jurisdictional Runoff Management Program Annual Report Forms will cover the period from July 1 to June 30 of the following year.

The Water Quality Improvement Plan Annual Reports, however, are focused primarily on the monitoring data and the assessments based on the monitoring data. The monitoring data is collected during the monitoring year, which begins October 1 and ends September 30 of the following year. The monitoring year begins after the beginning of the fiscal year and ends after the end of the fiscal year. Therefore, to accommodate and capture the information collected during the fiscal year and the monitoring year, the Annual Report reporting period incorporates both periods.

Finally, Provision F.3.c requires the Copermittees to develop and submit a Regional Monitoring and Assessment Report. The Regional Monitoring and Assessment Report is similar to the Long Term Effectiveness Assessment required under the Fourth Term San Diego County Permit. The Regional Monitoring and Assessment Report is expected to utilize the entire body of data and information collected by the Copermittees during the term of this Order to assess improvements to water quality on a regional scale.

Provision F.4 (Regional Clearinghouse) requires the Copermittees to develop, update, and maintain an internet-based Regional Clearinghouse that can be used to store, disseminate, and share the Copermittees' documents, monitoring data, special studies, and any other data or information.

Most of the documents and data that are generated by the Copermittees can be provided in electronic format, and made available to the San Diego Water Board and the public on the internet. The San Diego Water Board has been gradually transitioning its document submittal requirements to electronic submittals. Provision F.4 has been included to further these efforts.

Provision F.4 has also been included to improve the exchange and availability of information among the Copermittees, as well as between the Copermittees and the San Diego Water Board. Provision F.4 will also make the information generated during the implementation of the Order more accessible to the public.

Provision F.5 (Report of Waste Discharge) requires the Copermittees to submit a Report of Waste Discharge to reapply for renewal of the Order prior to its expiration, in accordance with 40 CFR 122.21(d)(2) and CWC section 13376.

~~Because the Riverside County Copermittees will not be subject to the requirements of this Order until they are notified of coverage, Provision F.5.a describes the process of submitting a Report of Waste Discharge pursuant to the requirements of their current permit to obtain coverage under this Order.~~

~~For the Copermittees subject to the requirements of this Order,~~ Provision F.5~~.b~~ requires the Copermittees to submit a Report of Waste Discharge 180 days in advance of the expiration of this Order. Provision F.5~~.b~~ also describes the minimum information to be included in the Report of Waste Discharge, based on USEPA guidance "Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems," dated May 17, 1996.

~~Provision F.6 (Application for Early Coverage) describes the process that would allow the Orange County and/or Riverside County Copermittees to obtain coverage under this Order earlier than the expiration of their current Orders.~~

~~If the Riverside County Copermittees choose to obtain coverage under this Order earlier than the expiration of their current Orders, the preparation and submittal of a Report of Waste Discharge, as required by the Fourth Term Permits, will not be necessary. The existing Order for the respective county will be rescinded upon the effective coverage date under this Order, except for enforcement purposes.~~

G. Principal Watershed Copermittee Responsibilities

Purpose: Provision G includes the requirements for the Principal Watershed Copermittee designated by the Copermittees in each Watershed Management Area.

***Discussion*:** Unlike previous NPDES requirements, there will no longer be a single Principal Copermittee. Provision G.1 requires the Copermittees to designate a Principal Watershed Copermittee for each Watershed Management Area. There are ten (10) Watershed Management Areas in the San Diego Region, as defined in Table B-1 under Provision B.1 of the Order. An individual Copermittee should not be the Principal Watershed Copermittee for more than two (2) Watershed Management Areas. There could be up to ten (10) Principal Water Copermittees designated for the Watershed Management Areas in the San Diego Region.

Provision G.2 describes the minimum responsibilities of each Principal Watershed Copermittee. The primary responsibility of the Principal Watershed Copermittees is to serve as the liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues. Ideally, the Principal Watershed Copermittee can represent the interests of all the Copermittees within a Watershed Management Area during discussions or meetings to facilitate communication with the San Diego Water Board. The Principal Watershed Copermittees are also responsible for facilitating and coordinating the implementation efforts of the Copermittees and submittals of required documents and reports.

The Principal Watershed Copermittee is responsible for facilitating the efforts of the Copermittees within the Watershed Management Area to develop the Water Quality Improvement Plan required under Provision B, and submit it for approval in accordance with Provision F.1. The Principal Watershed Copermittee is also responsible for coordinating the submittal of the document updates, Progress Report Presentations, and Annual Reports required from the Copermittees within each Watershed Management Area under Provisions F.2, F.3.a, and F.3.b. The Principal Watershed Copermittees are responsible for coordinating with each other to develop and submit the Regional Clearinghouse, Regional Monitoring and Assessment Report, and the Report of Waste Discharge required under Provisions F.3.c, F.4, and F.5.

The designated Principal Watershed Copermittee for each Watershed Management Area does not necessarily have to serve as the Principal Watershed Copermittee for the entire term of the Order. If the Copermittees in a Watershed Management Area choose to designate a new Principal Watershed Copermittee, the change may be submitted as part of the Annual Report required under Provision F.3.b, with an update to the Water Quality Improvement Plan in accordance with Provision F.2.c.

Provision G.3 specifies that the Principal Watershed Copermittee is not responsible for ensuring that the other Copermittees within the Watershed Management Area are in compliance with the requirements of this Order

H. Modification of Order

Purpose: Provision H provides the conditions under which modifications to Order No. R9-2013-0001, as amended, may occur.

***Discussion*:** Provision H allows for modifications to Order No. R9-2013-0001, as amended, for bases in addition to modifications (minor and major) allowed under the federal regulations at 40 CFR 122.62 and 122.63.

Modifications to the Order require re-opening the Order (see Water Code section 13223), subject to the requirements of 40 CFR 122.44, 122.62 to 122.64, and 124.5, but only for the specific provisions subject to the modification. Proposed modifications of the Order will be made available for public review, a public notice and comment period, and a public hearing if requested. Comments on the provisions not subject to the proposed modifications are not required to be considered in the San Diego Water Board's responses to comments or during the public hearing.

Provision H.4 was included to specify that the Order will be re-opened for modifications if ~~the State Water Board determines revisions to Provision A are warranted, an application for early coverage under the Order is received pursuant to Provision F.6,~~ the Basin Plan is amended to modify an existing TMDL or incorporate a new TMDL, or the monitoring and assessment program requirements need to be updated or revised.

~~Provision H.5 was included to specify that the San Diego Water Board will re-open and consider modifications to this Order when the Orange County Copermittees or the Riverside County Copermittees submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders~~

I. Standard Permit Provisions and General Provisions

Purpose: Provision I incorporates the standard permit provisions required to be included in all NPDES permits, as well as several other general provisions.

***Discussion*:** Provision I refers to Attachment B to the Order. Attachment B expressly incorporates the conditions applicable to all NPDES permits as provided under 40 CFR 122.41(a)-(n), as well as the applicable conditions for MS4s and storm water discharges provided under 40 CFR 122.42(c) and 40 CFR 122.42(d), respectively. Attachment B also includes several general provisions that are typically included in or applicable to waste discharge requirements issued by the San Diego Water Board.

IX. ATTACHMENTS

The attachments to the Order are discussed below. The discussions describe the content of the attachments.

Attachment A – Discharge Prohibitions and Special Protections

Section 1 of Attachment A includes the Waste Discharge Prohibitions from the Basin Plan. They have been provided verbatim in their entirety.

Section 2 of Attachment A includes the "*Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges*" applicable to permitted point source discharges of storm water, adopted under State Water Board Resolution No. 2012-0012, as amended by Resolution No. 2012-0031. The terms, prohibitions, and special conditions (collectively referred to as special conditions) are established as limitations on point source storm water discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in ASBS, as required for State Water Quality Protection Areas pursuant to California Public Resources Code sections 36700(f) and 36710(f). These Special Protections were adopted by the State Water Board as part of the Ocean Plan General Exception.

Attachment B – Standard Permit Provisions and General Provisions

Conditions applicable to all NPDES permits, as required under 40 CFR 122.41, and conditions applicable to MS4s and storm water discharges, as required under 40 CFR 122.42(c) and 122.42(d), respectively are provided in Attachment B to the Order. They have been provided expressly in their entirety.

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. These general provisions are typically included in or applicable to waste discharge requirements issued by the San Diego Water Board. Many of the general provisions were developed by the State Water Board. Where a general provision is derived from statute or regulation, a citation of the statute or regulation section is provided. General provisions that do not provide a citation are included under the authority provided CWC 13377.

Attachment C – Acronyms, Abbreviations and Definitions

The acronyms and abbreviations that are used in the Order are provided in Attachment C. Attachment C also includes definitions that may provide an explanation or description of the meaning or intent of specific terms or phrases included in the Order.

Attachment D – Jurisdictional Runoff Management Program Annual Report Form

An example of the Jurisdictional Runoff Management Program Annual Report Form required to be submitted by each Copermittee as part of the Annual Reports required under Provision F.3.b.(1)(e) is provided as Attachment D to the Order. An electronic version of the form will be available from the San Diego Water Board after the adoption of the Order.

The Jurisdictional Runoff Management Program Annual Report Form includes the minimum information necessary to demonstrate that the Copermittee is implementing and in compliance with the requirements of Provision E, and includes much of the information required to be reported pursuant to 40 CFR 122.42(c).

The information that must be provided on the Jurisdictional Runoff Management Program Annual Report Form is limited to the fiscal year, which begins July 1 and ends June 30 of the following year. The information expected to be provided by the Copermittees in each section of the Jurisdictional Runoff Management Program Annual Report Form is discussed below.

I. COPERMITTEE INFORMATION

The name of the Copermittee (e.g. name of city, county, or special district) and the contact information for the storm water program manager are provided under this section.

II. LEGAL AUTHORITY

The Copermittee must confirm whether or not the legal authorities under Provision E.1.a have been established for itself within its jurisdiction.

The Copermittee must also confirm whether or not a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority, as required under Provision E.1.b. The certification statement required by Provision E.1.b is only required to be submitted with the first Annual Report required under Provision F.3.b.

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

The Copermittee must inform the San Diego Water Board whether or not an update to its jurisdictional runoff management program document was required or recommended by the San Diego Water Board during the reporting period. An update to the jurisdictional runoff management program is required under Provision F.2.a. The San Diego Water Board may recommend modifications to the jurisdictional runoff management program as part of the iterative approach and adaptive management process required under Provision B.5, which may result in an update that is necessary for the Copermittee's jurisdictional runoff management document.

If an update was required or recommended, the Copermittee must confirm whether or not the update was completed and made available on the Regional Clearinghouse within the reporting period. If no update was required or recommended, an answer is not required. If the answer is NO, meaning the required or recommended update was not completed and/or made available on the Regional Clearinghouse, the Copermittee must attach a

schedule for the completion of the update and/or posting of the updated document on the Regional Clearinghouse.

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

The Copermittee must confirm whether or not a program was implemented during the fiscal year to actively detect and eliminate illicit discharges and connections in accordance with the requirements under Provision E.2.

In addition to confirming that a program to detect and eliminate illicit discharges was implemented during the reporting period, the Copermittee is also required to report on several items related to the program. The information that must be reported is limited to the fiscal year for the Annual Report.

All non-storm water discharges are considered illicit discharges unless the source is identified as one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5). If a non-storm water discharge is identified as one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5), the discharge is a non-storm water discharge, but not an illicit discharge. If a non-storm water discharge is identified but not in one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5), the discharge is both a non-storm water discharge and an illicit discharge.

V. DEVELOPMENT PLANNING PROGRAM

The Copermittee must confirm whether or not a development planning program was implemented during the fiscal year in accordance with the requirements under Provision E.3.

The Copermittee must also inform the San Diego Water Board whether or not an update to its BMP Design Manual was required or recommended by the San Diego Water Board during the fiscal year. An update to the BMP Design Manual is required under Provision F.2.b. The San Diego Water Board may recommend modifications to the BMP Design Manual, which may result in an update that is necessary for Copermittee's the BMP Design Manual.

If an update was required or recommended, the Copermittee must confirm whether or not the update was completed and made available on the Regional Clearinghouse within the reporting period. If no update was required or recommended, an answer is not required. If the answer is NO, meaning the required or recommended update was not completed and/or made available on the Regional Clearinghouse, the Copermittee must attach a schedule for the completion of the update and/or posting of the updated document on the Regional Clearinghouse.

The Copermittee is also required to report on several items related to the program. For the development and redevelopment projects that are reviewed under the program, the Copermittee must report the total number projects submitted for review during the fiscal year. Of those projects, the Copermittee must report the number that are Priority Development Projects, as defined under Provision E.3.b.(1). The Copermittee must also report the number of Priority Development Projects that were approved and/or granted occupancy during the fiscal year, regardless of when the project was originally submitted for review. Any projects that were approved during the fiscal year and granted any

exemptions from the BMP Design Manual requirements and/or allowed to implement alternative compliance options in accordance with Provision E.3.c.(3) must be reported.

Finally, the Copermittee must also report on several items related to its oversight of permanent BMPs on Priority Development Projects within its jurisdiction, as required under Provision E.3.e. The information that must be reported is limited to the fiscal year for the Annual Report.

VI. CONSTRUCTION MANAGEMENT PROGRAM

The Copermittee must confirm whether or not a construction management program was implemented during the fiscal year in accordance with the requirements under Provision E.4.

The Copermittee is also required to report on several items related to its oversight construction projects within its jurisdiction. The information that must be reported is limited to the fiscal year for the Annual Report.

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

The Copermittee must confirm whether or not an existing development management program was implemented during the fiscal year in accordance with the requirements under Provision E.5.

The Copermittee is also required to report on several items related to its oversight in areas of existing development within its jurisdiction. The information that must be reported is limited to the fiscal year for the Annual Report. The information must also be separated into four categories of existing development: municipal, commercial, industrial, and residential.

VIII. PUBLIC EDUCATION AND PARTICIPATION

The Copermittee must confirm whether or not a public education program component was implemented during the fiscal year in accordance with the requirements under Provision E.7.a.

The Copermittee must also confirm whether or not a public participation program component was implemented during the fiscal year in accordance with the requirements under Provision E.7.b.

IX. FISCAL ANALYSIS

The Copermittee must confirm a summary of its fiscal analysis, conducted in accordance with the requirements under Provision E.8, has been attached to the form.

X. CERTIFICATION

A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative must sign and certify the Jurisdictional Runoff Management Program Annual Report Form. The appropriate box must be checked to indicate the whether a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative is signing the form.

Attachment E – Specific Provisions for Total Maximum Daily Loads

Attachment E provides specific provisions for implementing the load allocations (LAs) and wasteload allocations (WLAs) of Total Maximum Daily Loads (TMDLs) adopted by the San Diego Water Board and approved by USEPA in which the Copermittees are identified as responsible for discharges subject to the requirements of the TMDLs. Federal regulations require that NPDES requirements incorporate water quality based effluent limitations (WQBELs) that must be consistent with the requirements and assumptions of any available WLAs,[46] which may be expressed as numeric effluent limitations, when feasible, and/or as a best management practice (BMP) program of expanded or better-tailored BMPs.[47] Where the TMDL includes WLAs that provide numeric pollutant load or pollutant parameter objectives, the WLA has been, where feasible, translated into numeric WQBELs.[48]

For each TMDL in Attachment E, four sections are included:

a. Applicability: This section provides the resolution under which the TMDL Basin Plan amendment was adopted and approved, with the applicable adoption and approval dates. This section also gives the effective date of the TMDL and where the TMDL is applicable (i.e. Watershed Management Area and water body). The Copermittees that are responsible for implementing the specific provisions are also given in this section.

b. Final TMDL Compliance Requirements: For each TMDL, the final TMDL compliance requirements consist of the final TMDL compliance date(s), the final WQBELs, and the final TMDL compliance determination requirements. The final WQBELs are expressed in terms of receiving water limitations, effluent limitations, and/or best management practices (BMPs). The final WQBELs for the TMDLs are incorporated by reference into Provision A of the Order. The final WQBELs become enforceable when the final TMDL compliance dates have passed. Applicable BMPs within the final WQBELs must be incorporated into the Water Quality Improvement Plans. Compliance with the final WQBELs will be determined in accordance with the options provided under the final TMDL compliance determination requirements.

c. Interim TMDL Compliance Requirements: If the final TMDL compliance date has not passed and there are interim TMDL compliance requirements, they are included in this section. If there are interim WQBELs with interim compliance dates, the interim WQBELs become enforceable when the corresponding interim compliance dates have passed. Compliance with the interim WQBELs will be determined in accordance with the options provided under the interim TMDL compliance determination requirements.

d. Specific Monitoring and Assessment Requirements: If there are specific monitoring and assessment requirements that cannot be met with the monitoring and assessment program

[46] 40 CFR 122.44(d)(1)(vii)(B)
[47] 40 CFR 122.44(k)(2) and 40 CFR 122.44(k)(3)
[48] November 26, 2014 Memorandum from the USEPA, Revisions to the November 22, 2002 Memorandum "Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLA""

requirements under Provision D of the Order, the additional requirements are included in this section.

The requirements of the TMDLs are based on and consistent with the assumptions and requirements of any available adopted and approved TMDLs that have been incorporated into the Basin Plan. Modifications to the requirements for the TMDLs in Attachment E cannot be made unless the TMDLs are modified in the Basin Plan.

A modification to any aspect of a TMDL in the Basin Plan requires a Basin Plan amendment. A Basin Plan amendment to modify a TMDL will require the San Diego Water Board to adopt a resolution to amend the Basin Plan, which includes a separate public process. When the San Diego Water Board adopts a Basin Plan amendment, it subsequently requires approval from the State Water Board, the Office of Administrative Law, and the USEPA before it becomes effective.

If and when the TMDLs are a modified in the Basin Plan, the San Diego Water Board will revise the requirements of the Order in accordance with the Basin Plan amendment. When a Basin Plan amendment to modify a TMDL becomes effective, the San Diego Water Board will modify the requirements of the Order pursuant to the requirements of Provision H.4 of the Order as soon as possible.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

ORDER NO. R9-2013-0001,
AS AMENDED BY ORDER NOS. R9-2015-0001 AND R9-2015-0100
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The San Diego County Copermittees in Table 1a are subject to waste discharge requirements set forth in this Order.

Table 1a. San Diego County Copermittees

City of Carlsbad	City of Oceanside
City of Chula Vista	City of Poway
City of Coronado	City of San Diego
City of Del Mar	City of San Marcos
City of El Cajon	City of Santee
City of Encinitas	City of Solana Beach
City of Escondido	City of Vista
City of Imperial Beach	County of San Diego
City of La Mesa	San Diego County Regional Airport Authority
City of Lemon Grove	San Diego Unified Port District
City of National City	

The Orange County Copermittees in Table 1b are subject to waste discharge requirements set forth in this Order.

Table 1b. Orange County Copermittees[1]

City of Aliso Viejo	City of Rancho Santa Margarita
City of Dana Point	City of San Clemente
City of Laguna Beach	City of San Juan Capistrano
City of Laguna Hills	City of Laguna Woods
City of Laguna Niguel	County of Orange
City of Mission Viejo	Orange County Flood Control District

[1] While not listed in Table 1b., the City of Lake Forest remains a Copermittee under this Order until the later effective date of this Order or the effective date of Santa Ana Water Board Tentative Order No. R8-2015-0001. Thereafter, the City of Lake Forest will no longer be considered a Copermittee under this Order because its Phase I MS4 discharges will be regulated by the Santa Ana Water Board pursuant to Water Code section 13228 designation. The requirements of this Order that apply to the City of Lake Forest for the duration of this Order, however, are described in Finding 29 and Footnote 2 to Table B-1.

The Riverside County Copermittees in Table 1c are subject to waste discharge requirements set forth in this Order.

Table 1c. Riverside County Copermittees

City of Murrieta	County of Riverside
City of Temecula	Riverside County Flood Control and Water Conservation District
City of Wildomar	

The term Copermittee in this Order refers to any San Diego County, Orange County, or Riverside County Copermittee covered under this Order, unless specified otherwise.

This Order provides permit coverage for the Copermittee discharges described in Table 2.

Table 2. Discharge Locations and Receiving Waters

Discharge Points	Locations throughout San Diego Region
Discharge Description	Municipal Separate Storm Sewer System (MS4) Discharges
Receiving Waters	Inland Surface Waters, Enclosed Bays and Estuaries, and Coastal Ocean Waters of the San Diego Region

Table 3. Administrative Information

This Order was adopted by the San Diego Water Board on:	**May 8, 2013**
Order No. R9-2013-0001 became effective on:	**June 27, 2013**
This Order as amended by R9-2015-0001 became effective on:	**April 1, 2015**
This Order as amended by R9-2015-0100 became effective on:	**January 7, 2016**
This Order will expire on:	**June 27, 2018**
The Copermittees must file a Report of Waste Discharge in accordance with Title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than 180 days in advance of the Order expiration date.	

I, David W. Gibson, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on May 8, 2013, as amended by adoption of Order No. R9-2015-0001 on February 11, 2015, and as amended by adoption of Order No. R9-2015-0100 on November 18, 2015.

David W. Gibson
Executive Officer

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Attachment B: Standard Permit Provisions and General Provisions B-1
Attachment C: Acronyms, Abbreviations and Definitions C-1
Attachment D: Jurisdictional Runoff Management Program Annual Report Form D-1
Attachment E: Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2013-0001, as amended by Order Nos. R9-2015-0001 and R9-2015-0100 ..... E-1
Attachment F: Fact Sheet / Technical Report for Order No. R9-2013-0001, as amended by Order Nos. R9-2015-0001 and R9-2015-0100 ..... F-1

I. FINDINGS

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), finds that:

JURISDICTION

1. **MS4 Ownership or Operation.** Each of the Copermittees owns or operates an MS4, through which it discharges storm water and non-storm water into waters of the U.S. within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the U.S.

2. **Legal and Regulatory Authority.** This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]) adopted by the United States Environmental Protection Agency (USEPA), and chapter 5.5, division 7 of the California Water Code (CWC) (commencing with section 13370). This Order serves as an NPDES permit for discharges from MS4s to surface waters. This Order also serves as waste discharge requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

   The San Diego Water Board has the legal authority to issue a regional MS4 permit pursuant to its authority under CWA section 402(p)(3)(B) and 40 CFR 122.26(a)(1)(v). The USEPA also made it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide permits (55 Federal Register [FR] 47990, 48039-48042). The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees and San Diego Water Board.

   The federal regulations make it clear that the Copermittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators (40 CFR 122.26(a)(3)(vi)). This Order does not require the Copermittees to manage storm water outside of their jurisdictional boundaries, but rather to work collectively to improve storm water management within watersheds.

3. **CWA NPDES Permit Conditions.** Pursuant to CWA section 402(p)(3)(B), NPDES permits for storm water discharges from MS4s must include requirements to effectively prohibit non-storm water discharges into MS4s, and require controls to reduce the discharge of pollutants in storm water to the maximum extent practicable (MEP), and to require other provisions as the San Diego Water Board determines are appropriate to control such pollutants. This Order prescribes conditions to assure compliance with the CWA requirements for owners and operators of MS4s to effectively prohibit non-storm water discharges into the MS4s, and require controls to reduce the discharge of pollutants in storm water from the MS4s to the MEP.

4. **CWA and CWC Monitoring Requirements.** CWA section 308(a) and 40 CFR 122.41(h),(j)-(l) and 122.48 require that NPDES permits must specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s also specify additional monitoring and reporting requirements in 40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c). CWC section 13383 authorizes the San Diego Water Board to establish monitoring, inspection, entry, reporting and recordkeeping requirements. This Order establishes monitoring and reporting requirements to implement federal and State requirements. This Order also includes requirements for the Orange County Copermittees to participate in, and together with South Orange County Wastewater Authority and Orange County Health Care Agency, share responsibility for implementing the unified approach to beach water quality monitoring and assessment program set forth in the October 2014 report, *Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County*, issued pursuant to CWC section 13383 in the San Diego Water Board December 5, 2014 Letter Directive.

5. **Total Maximum Daily Loads.** CWA section 303(d)(1)(A) requires that "[e]ach state shall identify those waters within its boundaries for which the effluent limitations are not stringent enough to implement any water quality standard applicable to such waters." The CWA also requires states to establish a priority ranking of impaired water bodies known as Water Quality Limited Segments and to establish Total Maximum Daily Loads (TMDLs) for such waters. This priority list of impaired water bodies is called the Clean Water Act Section 303(d) List of Water Quality Limited Segments, commonly referred to as the 303(d) List. The CWA requires the 303(d) List to be updated every two years.

   TMDLs are numerical calculations of the maximum amount of a pollutant that a water body can assimilate and still meet water quality standards. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point sources (waste load allocations or WLAs) and non-point sources (load allocations or LAs), background contribution, plus a margin of safety. Discharges from MS4s are point source discharges. The federal regulations (40 CFR 122.44(d)(1)(vii)(B)) require that NPDES permits incorporate water quality based effluent limitations (WQBELs) developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, consistent with the assumptions and requirements of any available WLA for the discharge. Requirements of this Order implement the TMDLs established by the San Diego Water Board or USEPA as of the date this Order was amended in 2015. This Order establishes WQBELs consistent with the assumptions and requirements of all available TMDL WLAs assigned to discharges from the Copermittees' MS4s.

6. **Non-Storm Water Discharges.** Pursuant to CWA section 402(p)(3)(B)(ii), this Order requires each Copermittee to effectively prohibit discharges of non-storm water into its MS4. Nevertheless, non-storm water discharges into and from the

MS4s continue to be reported to the San Diego Water Board by the Copermittees and other persons. Monitoring conducted by the Copermittees, as well as the 303(d) List, have identified dry weather, non-storm water discharges from the MS4s as a source of pollutants causing or contributing to receiving water quality impairments in the San Diego Region. The federal regulations (40 CFR 122.26(d)(2)(iv)(B)(1)) require the Copermittees to have a program to prevent illicit discharges to the MS4. The federal regulations, however, allow for specific categories of non-storm water discharges or flows to be addressed as illicit discharges only where such discharges are identified as sources of pollutants to waters of the U.S.

7. **In-Stream Treatment Systems.** Pursuant to federal regulations (40 CFR 131.10(a)), in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S. Authorizing the construction of a runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to accepting waste assimilation as an appropriate use for that water body. Runoff treatment must occur prior to the discharge of runoff into receiving waters. Treatment control best management practices (BMPs) must not be constructed in waters of the U.S. Construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body.

DISCHARGE CHARACTERISTICS AND RUNOFF MANAGEMENT

8. **Point Source Discharges of Pollutants.** Discharges from the MS4s contain waste, as defined in the CWC, and pollutants that adversely affect the quality of the waters of the state. A discharge from an MS4 is a “discharge of pollutants from a point source” into waters of the U.S. as defined in the CWA. Storm water and non-storm water discharges from the MS4s contain pollutants that cause or threaten to cause a violation of surface water quality standards, as outlined in the Water Quality Control Plan for the San Diego Basin (Basin Plan). Storm water and non-storm water discharges from the MS4s are subject to the conditions and requirements established in the Basin Plan for point source discharges.

9. **Potential Beneficial Use Impairment.** The discharge of pollutants and/or increased flows from MS4s may cause or threaten to cause the concentration of pollutants to exceed applicable receiving water quality objectives and impair or threaten to impair designated beneficial uses resulting in a condition of pollution, contamination, or nuisance.

10. **Pollutants Generated by Land Development.** Land development has created and continues to create new sources of non-storm water discharges and pollutants in storm water discharges as human population density increases. This brings higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash. Pollutants from these sources are dumped or washed off the surface by non-storm water or storm water flows into

and from the MS4s. When development converts natural vegetated pervious ground cover to impervious surfaces such as paved highways, streets, rooftops, and parking lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving a developed area without BMPs that can maintain pre-development runoff conditions will contain greater pollutant loads and have significantly greater runoff volume, velocity, and peak flow rate than pre-development runoff conditions from the same area.

11. **Runoff Discharges to Receiving Waters.** The MS4s discharge runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within the eleven hydrologic units comprising the San Diego Region. Historic and current development makes use of natural drainage patterns and features as conveyances for runoff. Rivers, streams and creeks in developed areas used in this manner are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and receiving water. Numerous receiving water bodies and water body segments have been designated as impaired by the San Diego Water Board pursuant to CWA section 303(d).

12. **Pollutants in Runoff.** The most common pollutants in runoff discharged from the MS4s include total suspended solids, sediment, pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., cadmium, copper, lead, and zinc), petroleum products and polynuclear aromatic hydrocarbons, synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus), oxygen-demanding substances (e.g., decaying vegetation, animal waste), detergents, and trash. As operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not prohibit or otherwise control. These discharges may cause or contribute to a condition of pollution or a violation of water quality standards.

13. **Human Health and Aquatic Life Impairment.** Pollutants in runoff discharged from the MS4s can threaten and adversely affect human health and aquatic organisms. Adverse responses of organisms to chemicals or physical agents in runoff range from physiological responses such as impaired reproduction or growth anomalies to mortality. Increased volume, velocity, rate, and duration of storm water runoff greatly accelerate the erosion of downstream natural channels. This alters stream channels and habitats and can adversely affect aquatic and terrestrial organisms.

14. **Water Quality Effects.** The Copermittees' water quality monitoring data submitted to date documents persistent exceedances of Basin Plan water quality objectives for runoff-related pollutants at various watershed monitoring stations. Persistent toxicity has also been observed at several watershed monitoring stations. In addition, bioassessment data indicate that the majority of the monitored receiving waters have

Poor to Very Poor Index of Biological Integrity (IBI) ratings. These findings indicate that runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in the San Diego Region. Non-storm water discharges from the MS4s have been shown to contribute significant levels of pollutants and flow in arid, developed Southern California watersheds, and contribute significantly to exceedances of applicable receiving water quality objectives.

15. **Non-Storm Water and Storm Water Discharges.** Non-storm water discharges from the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard of CWA section 402(p)(3)(B)(iii), which is explicitly for "Municipal … *Stormwater Discharges* (emphasis added)" from the MS4s. Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s must be effectively prohibited.

16. **Best Management Practices.** Waste and pollutants which are deposited and accumulate in MS4 drainage structures will be discharged from these structures to waters of the U.S. unless they are removed. These discharges may cause or contribute to, or threaten to cause or contribute to, a condition of pollution in receiving waters. For this reason, pollutants in storm water discharges from the MS4s can be and must be effectively reduced in runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Pollution prevention is the reduction or elimination of pollutant generation at its source and is the best "first line of defense." Source control BMPs (both structural and non-structural) minimize the contact between pollutants and runoff, therefore keeping pollutants onsite and out of receiving waters. Treatment control BMPs remove pollutants that have been mobilized by storm water or non-storm water flows.

17. **BMP Implementation.** Runoff needs to be addressed during the three major phases of development (planning, construction, and use) in order to reduce the discharge of storm water pollutants to the MEP, effectively prohibit non-storm water discharges, and protect receiving waters. Development which is not guided by water quality planning policies and principles can result in increased pollutant load discharges, flow rates, and flow durations which can negatively affect receiving water beneficial uses. Construction sites without adequate BMP implementation result in sediment runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. Existing development can generate substantial pollutant loads which are discharged in runoff to receiving waters. Retrofitting areas of existing development with storm water pollutant control and hydromodification management BMPs is necessary to address storm water discharges from existing development that may cause or contribute to a condition of pollution or a violation of water quality standards.

18. **Water Quality Improvements.** Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges to the MS4s and control pollutants in storm water

discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the CWA.

19. **Long Term Planning and Implementation.** Federal regulations require municipal storm water permits to expire 5 years from adoption, after which the permit must be renewed and reissued. The San Diego Water Board recognizes that the degradation of water quality and impacts to beneficial uses of the waters in the San Diego Region occurred over several decades. The San Diego Water Board further recognizes that a decade or more may be necessary to realize demonstrable improvement to the quality of waters in the San Diego Region. This Order includes a long term planning and implementation approach that will require more than a single permit term to complete.

WATER QUALITY STANDARDS

20. **Basin Plan.** The San Diego Water Board adopted the Water Quality Control Plan for the San Diego Basin (Basin Plan) on September 8, 1994, that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for receiving waters addressed through the plan. The Basin Plan was subsequently approved by the State Water Resources Control Board (State Water Board) on December 13, 1994. Subsequent revisions to the Basin Plan have also been adopted by the San Diego Water Board and approved by the State Water Board. Requirements of this Order implement the Basin Plan.

    The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Process Supply (PROC), Industrial Service Supply (IND), Ground Water Recharge (GWR), Contact Water Recreation (REC1), Non-contact Water Recreation (REC2), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Freshwater Replenishment (FRSH), Hydropower Generation (POW), and Preservation of Biological Habitats of Special Significance (BIOL). The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region: Navigation (NAV), Commercial and Sport Fishing (COMM), Estuarine Habitat (EST), Marine Habitat (MAR), Aquaculture (AQUA), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN), and Shellfish Harvesting (SHELL).

21. **Ocean Plan.** The State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, and 2005. The State Water Board adopted the latest amendment on October 16, 2012 and it became effective on August 19, 2013. The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean. Requirements of this Order implement the Ocean Plan.

    The Ocean Plan identifies the following beneficial uses of ocean waters of the state to be protected: Industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture; preservation and enhancement of designated Areas of Special Biological Significance; rare and endangered species; marine habitat; fish spawning and shellfish harvesting.

22. **Sediment Quality Control Plan**. On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes: 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

23. **National Toxics Rule and California Toxics Rule.** USEPA adopted the National Toxics Rule (NTR) on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the NTR applied in California. On May 18, 2000, USEPA adopted the California Toxics Rule (CTR). The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants.

24. **Antidegradation Policy.** This Order is in conformance with the federal Antidegradation Policy described in 40 CFR 131.12, and State Water Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality Waters in California*. Federal regulations at 40 CFR 131.12 require that the State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. State Water Board Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies. The Fact Sheet of this Order contains additional discussion about antidegradation.

25. **Anti-Backsliding Requirements.** Section 402(o)(2) of the CWA and federal regulations at 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations may be relaxed. All effluent limitations in this Order are at least as stringent as effluent limitations in the previous permits. The Fact Sheet of this Order contains additional discussion about anti-backsliding.

CONSIDERATIONS UNDER FEDERAL AND STATE LAW

26. **Coastal Zone Act Reauthorization Amendments.** Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states with approved coastal zone management programs to address non-point source pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point source pollution: agriculture, silviculture, urban, marinas, and hydromodification. This Order addresses the management measures required for the urban category, with the exception of septic systems. The runoff management programs developed pursuant to this Order fulfills the need for coastal cities to develop a runoff non-point source plan identified in the Non-Point Source Program Strategy and Implementation Plan. The San Diego Water Board addresses septic systems through the administration of other programs.

27. **Endangered Species Act.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 USC sections 1531 to 1544). This Order requires compliance with receiving water limits, and other requirements to protect the beneficial uses of waters of the State. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

28. **Report of Waste Discharge Process.** The waste discharge requirements set forth in this Order are based upon the Report of Waste Discharge submitted by the San Diego County Copermittees prior to the expiration of Order No. R9-2007-0001 (NPDES No. CAS0109266), the Report of Waste Discharge submitted by the Orange County Copermittees prior to the expiration of Order No. R9-2009-0002 (CAS0108740), and the Report of Waste Discharge submitted by the Riverside County Copermittees prior to the expiration of Order No. R9-2010-0016 (CAS0108766).

    The federal regulations (40 CFR 122.21(d)(2)) and CWC section 13376 impose a duty on the Copermittees to reapply for continued coverage through submittal of a Report of Waste Discharge no later than 180 days prior to expiration of a currently effective permit. The expiration date of this Order as shown in Table 3, and requirement to file a Report of Waste Discharge no later than 180 days prior to the

expiration date of the Order, applies jointly to the San Diego County, Orange County, and Riverside County Copermittees.

29. **Regional Water Board Designation.** The Cities of Laguna Hills, Laguna Woods, Lake Forest, Menifee, Murrieta, and Wildomar are located partially within the jurisdictions of the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board) and the San Diego Water Board and their discharges are subject to regulation by both Regional Water Boards. CWC section 13228 provides a way to streamline the regulation of entities whose jurisdictions straddle the border of two or more Regions. CWC section 13228 is implemented in this Order at the request of these six cities and to ease the regulatory burden of municipalities that lie in both the San Diego Water Board's and the adjacent Santa Ana Water Board's jurisdiction. MS4 discharges from these municipalities are regulated by the San Diego Water Board and Santa Ana Water Board as follows:

    a. Pursuant to CWC section 13228, the Cities of Laguna Hills, Laguna Woods, and Lake Forest submitted written requests that one Regional Water Board be designated to regulate Phase I MS4 discharges for each of the Cities. The Santa Ana Water Board and the San Diego Water Board have entered into an agreement dated February 10, 2015, whereby the Cities of Laguna Woods and Laguna Hills are largely regulated by the San Diego Water Board under this Order, including those portions of the Cities of Laguna Woods and Laguna Hills not within the San Diego Water Board's jurisdiction, upon the effective date of this Order or Santa Ana Water Board Order No. R8-2015-0001, whichever is later. Similarly, the City of Lake Forest, including those portions of the City of Lake Forest within the San Diego Water Board's jurisdiction, is largely regulated by the Santa Ana Water Board under Order No. R8-2015-0001 (NPDES No. CAS618030) upon the later effective date of this Order or Order No. R8-2015-0001. The agreement provides that the City of Lake Forest is required to retain, and continue implementation of, its over-irrigation discharge prohibition in Title 15, Chapter 14.030, List (b) of the City Municipal Code for regulating storm water quality throughout its jurisdiction. The agreement also requires the City of Lake Forest to actively participate during development and implementation of the Aliso Creek Watershed Management Area Water Quality Improvement Plan required pursuant to this Order. Each Regional Water Board retains the authority to enforce provisions of its Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee under the terms of the agreement (Water Code section 13228 (b)). Under the terms of the agreement, any TMDL and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Laguna Woods, Laguna Hills or Lake Forest as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement of the applicable TMDL will remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's San

Diego Creek/Newport Bay TMDL and the San Diego Water Board's Indicator Bacteria Project I Beaches and Creeks TMDL. The San Diego Water Board will periodically review the effectiveness of the agreement during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate the agreement with Santa Ana Water Board or otherwise modify the agreement subject to the approval of the Santa Ana Water Board.

b. Pursuant to CWC section 13228, the Cities of Murrieta, Wildomar, and Menifee submitted written requests that one Regional Water Board be designated to regulate Phase I MS4 discharges for each of the Cities. The Santa Ana Water Board and the San Diego Water Board have entered into an agreement dated October 26, 2015, whereby the Cities of Murrieta and Wildomar are largely regulated by the San Diego Water Board under this Order, including those portions of the Cities of Murrieta and Wildomar not within the San Diego Water Board's jurisdiction, upon the effective date of this Order. Similarly, the City of Menifee is largely regulated by the Santa Ana Water Board under Order No. R8-2010-0033 as it may be amended or reissued, including those portions of the City of Menifee within the San Diego Water Board's jurisdiction, upon the effective date of this Order. The agreement also requires the City of Menifee to actively participate during development and implementation of the Santa Margarita River Watershed Management Area Water Quality Improvement Plan required pursuant to this Order. Each Regional Water Board retains the authority to enforce provisions of its Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee under the terms of the agreement (Water Code section 13228 (b)). Under the terms of the agreement, any TMDL and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Menifee, Murrieta, or Wildomar as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement of the applicable TMDL will remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's Lake Elsinore/Canyon Lake Nutrient TMDLs. The San Diego Water Board will periodically review the effectiveness of the agreement during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate the agreement with Santa Ana Water Board or otherwise modify the agreement subject to the approval of the Santa Ana Water Board.

30. Integrated Report and Clean Water Act Section 303(d) List. The San Diego Water Board and State Water Board submit an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. USEPA issued its *Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act* on July 29, 2005, which advocates the use of a five category approach for

classifying the attainment status of water quality standards for water bodies in the Integrated Report. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 in the Integrated Report are placed on the 303(d) List.

Water bodies with available data and/or information that indicate at least one beneficial use is not being supported or is threatened, but a TMDL is not required, are included in Category 4 in the Integrated Report. Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

Implementation of the requirements of this Order may allow the San Diego Water Board to include surface waters impaired by discharges from the Copermittees' MS4s in Category 4 in the Integrated Report for consideration during the next 303(d) List submittal by the State to USEPA.

31. **Economic Considerations.** The California Supreme Court has ruled that although CWC section 13263 requires the State and Regional Water Boards (collectively Water Boards) to consider factors set forth in CWC section 13241 when issuing an NPDES permit, the Water Board may not consider the factors to justify imposing pollutant restrictions that are less stringent than the applicable federal regulations require. (*City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 618, 626-627.) However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

    As noted in the following finding, the San Diego Water Board finds that the requirements in this Order are not more stringent than the minimum federal requirements. Therefore, a CWC section 13241 analysis is not required for permit requirements that implement the effective prohibition on the discharge of non-storm water into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determined appropriate to control such pollutants, as those requirements are mandated by federal law. Notwithstanding the above, the San Diego Water Board has developed an economic analysis of the requirements in this Order. The economic analysis is provided in the Fact Sheet.

32. **Unfunded Mandates.** This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following:

a. This Order implements federally mandated requirements under CWA section 402 (33 USC section 1342(p)(3)(B)).

b. The local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental and new dischargers who are issued NPDES permits for storm water and non-storm water discharges.

c. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order.

d. The Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)) and in lieu of numeric restrictions on their MS4 discharges (i.e. effluent limitations).

e. The local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under State law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

f. The provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state develops a TMDL, federal law requires that permits must contain water quality based effluent limitations consistent with the assumptions and requirements of any applicable wasteload allocation (40 CFR 122.44(d)(1)(vii)(B)).

See the Fact Sheet for further discussion of unfunded mandates.

33. California Environmental Quality Act. The issuance of waste discharge requirements and an NPDES permit for the discharge of runoff from MS4s to waters of the U.S. is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 et seq.) in accordance with CWC section 13389.

STATE WATER BOARD DECISIONS

34. Compliance with Prohibitions and Limitations. The receiving water limitation language specified in this Order is consistent with language recommended by the USEPA and established in State Water Board Order WQ 99-05, *Own Motion Review of the Petition of Environmental Health Coalition to Review Waste Discharge Requirements Order No. 96-03, NPDES Permit No. CAS0108740*, adopted by the State Water Board on June 17, 1999. The receiving water limitation language in this Order requires storm water discharges from MS4s to not cause or contribute to a violation of water quality standards, which is to be achieved through an iterative approach requiring the implementation of improved and better-tailored BMPs over time. Implementation of the iterative approach to comply with receiving water

limitations based on applicable water quality standards is necessary to ensure that storm water discharges from the MS4 will not ultimately cause or contribute to violations of water quality standards and will not create conditions of pollution, contamination, or nuisance.

The San Diego, Orange County, and Riverside County Copermittees have asserted that the prohibitions and limitations may result in many years of noncompliance because years of technical efforts may ultimately be required to achieve compliance with the prohibitions and limitations, especially for wet weather discharges. To address this concern, this Order includes an option that allows a Copermittee to be deemed in compliance with the prohibitions and limitations where more than one permit term may be necessary to achieve full compliance with the prohibitions and limitations. One or more Copermittees within a Watershed Management Area can choose to implement this option.

An alternative compliance pathway option has been included in this Order consistent with the approach described in Order WQ 2015-0075, *In the Matter of Review of Order No. R4-2012-0175, NPDES Permit No. CAS004001, Waste Discharge Requirements for Municipal Separate Storm Sewer System (MS4) Discharges within the Coastal Watersheds of Los Angeles County, Except Those Discharges Originating from the City of Long Beach MS4,* adopted by the State Water Board on June 16, 2015. State Water Board Order WQ 2015-0075 directs the Regional Water Boards to consider a watershed-based planning and implementation approach to compliance with receiving water limitations when issuing Phase I MS4 permits going forward. Order WQ 2015-0075 included seven principles that the Regional Water Boards are expected to follow when incorporating an alternative compliance pathway into an MS4 permit. The Fact Sheet discusses the incorporation of the seven principles stipulated in State Water Board Order WQ 2015-0075 into the alternative compliance pathway option in this Order.

35. **Special Conditions for Areas of Special Biological Significance.** On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving a general exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges (General Exception). On June 19, 2012, the State Water Board adopted Order No. 2012-0031, amending the General Exception to require pollutant reductions to be achieved within six years in accordance with ASBS Compliance Plans and ASBS Pollution Prevention Plans. The General Exception requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject to the terms and conditions of the General Exception as amended. The Special Protections contained in Attachment B to the General Exception as amended are

applicable to these discharges, and are hereby incorporated into Attachment A of this Order.

ADMINISTRATIVE FINDINGS

36. **Executive Officer Delegation of Authority.** The San Diego Water Board by prior resolution has delegated all matters that may legally be delegated to its Executive Officer to act on its behalf pursuant to CWC section 13223. Therefore, the Executive Officer is authorized to act on the San Diego Water Board's behalf on any matter within this Order unless such delegation is unlawful under CWC section 13223 or this Order explicitly states otherwise.

37. **Standard Provisions.** Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR 122.42, are provided in Attachment B to this Order.

38. **Fact Sheet.** The Fact Sheet for this Order contains background information, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of this Order. The Fact Sheet is hereby incorporated into this Order and constitutes part of the Findings of this Order.

39. **Public Notice.** In accordance with State and federal laws and regulations, the San Diego Water Board notified the Copermittees, and interested agencies and persons of its intent to prescribe waste discharge requirements for the control of discharges into and from the MS4s to waters of the U.S. and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet.

40. **Public Hearings.** The San Diego Water Board held a public hearing on April 10 and 11, 2013, that was continued to May 8, 2013 and heard and considered all comments pertaining to the terms and conditions of this Order. The San Diego Water Board also held a public workshop on October 8, 2015, and a public hearing on February 11, 2015, and heard and considered all comments pertaining to the amendment of this Order through Order No. R9-2015-0001. The San Diego Water Board also held a public hearing on November 18, 2015, and heard and considered all comments pertaining to the amendment of this Order through Order No. R9-2015-0100. Details of these public hearings are provided in the Fact Sheet.

41. **Effective Date.** This Order serves as an NPDES permit pursuant to CWA section 402 or amendments thereto, and as to the San Diego County Copermittees listed in Table 1a, became effective fifty (50) days after the date of its adoption, and as to the Orange County Copermittees listed in Table 1b, became effective on April 1, 2015, after Order No. R9-2015-0001 was adopted, and as to the Riverside County Copermittees listed in Table 1c, became effective on January 7, 2016, after Order No. R9-2015-0100 was adopted, provided that the Regional Administrator, USEPA, Region IX, does not object to this Order.

42. **Review by the State Water Board.** Any person aggrieved by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with CWC section 13320 and California Code of Regulations, title 23, sections 2050, and following. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date of this Order, except that if the thirtieth day following the date of this Order falls on a Saturday, Sunday or State holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

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THEREFORE, IT IS HEREBY ORDERED that the Copermittees, in order to meet the provisions contained in division 7 of the CWC (commencing with section 13000) and regulations adopted thereunder, and the provisions of the CWA and regulations adopted thereunder, must each comply with the requirements of this Order. This action in no way prevents the San Diego Water Board from taking enforcement action for past violations of the previous Order applicable to the Copermittees. If any part of this Order is subject to a temporary stay of enforcement, unless otherwise specified, the Copermittees must comply with the analogous portions of the previous Order, which will remain in effect for all purposes during the pendency of the stay.

II. PROVISIONS

A. PROHIBITIONS AND LIMITATIONS

The purpose of this provision is to describe the conditions under which storm water and non-storm water discharges into and from MS4s are prohibited or limited. The goal of the prohibitions and limitations is to protect the water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through the implementation of water quality improvement strategies and runoff management programs that effectively prohibit non-storm water discharges into the Copermittees' MS4s, and reduce pollutants in storm water discharges from the Copermittees' MS4s to the MEP.

1. Discharge Prohibitions

a. Discharges from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the state are prohibited.

b. Non-storm water discharges into MS4s are to be effectively prohibited, through the implementation of Provision E.2, unless such discharges are authorized by a separate NPDES permit.

c. Discharges from MS4s are subject to all waste discharge prohibitions in the Basin Plan, included in Attachment A to this Order.

d. Storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012, as amended by State Water Board Resolution No. 2012-0031, applicable to these discharges, included in Attachment A to this Order. All other discharges from the Copermittees' MS4s to ASBS are prohibited.

2. Receiving Water Limitations

a. Discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters, including but not limited to all applicable provisions contained in:

(1) The San Diego Water Board's Basin Plan, including beneficial uses, water quality objectives, and implementation plans;

(2) State Water Board plans for water quality control including the following:

(a) Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries (Thermal Plan), and

(b) The Ocean Plan, including beneficial uses, water quality objectives, and implementation plans;

(3) State Water Board policies for water and sediment quality control including the following:

(a) Water Quality Control Policy for the Enclosed Bays and Estuaries of California,

(b) Sediment Quality Control Plan which includes the following narrative objectives for bays and estuaries:

(i) Pollutants in sediments shall not be present in quantities that, alone or in combination, are toxic to benthic communities, and

(ii) Pollutants shall not be present in sediments at levels that will bioaccumulate in aquatic life to levels that are harmful to human health,

(c) The Statement of Policy with Respect to Maintaining High Quality of Waters in California;[2]

(4) Priority pollutant criteria promulgated by the USEPA through the following:

(a) National Toxics Rule (NTR)[3] (promulgated on December 22, 1992 and amended on May 4, 1995), and

(b) California Toxics Rule (CTR).[4,5]

b. Discharges from MS4s composed of storm water runoff must not alter natural ocean water quality in an ASBS.

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[2] State Water Board Resolution No. 68-16
[3] 40 CFR 131.36
[4] 65 Federal Register 31682-31719 (May 18, 2000), adding Section 131.38 to 40 CFR
[5] If a water quality objective and a CTR criterion are in effect for the same priority pollutant, the more stringent of the two applies.

3. Effluent Limitations

a. TECHNOLOGY BASED EFFLUENT LIMITATIONS

Pollutants in storm water discharges from MS4s must be reduced to the MEP.[6]

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

Each Copermittee must comply with applicable WQBELs established for the TMDLs in Attachment E to this Order, pursuant to the applicable TMDL compliance schedules.

4. Compliance with Discharge Prohibitions and Receiving Water Limitations

Each Copermittee must achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order through timely implementation of control measures and other actions as specified in Provisions B and E of this Order, including any modifications. The Water Quality Improvement Plans required under Provision B must be designed and adapted to ultimately achieve compliance with Provisions A.1.a, A.1.c and A.2.a.

a. If exceedance(s) of water quality standards persist in receiving waters notwithstanding implementation of this Order, the Copermittees must comply with the following procedures:

(1) For exceedance(s) of a water quality standard in the process of being addressed by the Water Quality Improvement Plan, the Copermittee(s) must implement the Water Quality Improvement Plan as accepted by the San Diego Water Board, and update the Water Quality Improvement Plan, as necessary, pursuant to Provision F.2.c;

(2) Upon a determination by either the Copermittees or the San Diego Water Board that discharges from the MS4 are causing or contributing to a new exceedance of an applicable water quality standard not addressed by the Water Quality Improvement Plan, the Copermittees must submit the following updates to the Water Quality Improvement Plan pursuant to Provision F.2.c or as part of the Water Quality Improvement Plan Annual Report required under Provision F.3.b, unless the San Diego Water Board directs an earlier submittal:

(a) The water quality improvement strategies being implemented that are effective and will continue to be implemented,

[6] This does not apply to MS4 discharges which receive subsequent treatment to reduce pollutants in storm water discharges to the MEP prior to entering receiving waters (e.g., low flow diversions to the sanitary sewer). Runoff treatment must occur prior to the discharge of runoff into receiving waters per Finding 7.

(b) Water quality improvement strategies (i.e. BMPs, retrofitting projects, stream and/or habitat rehabilitation projects, adjustments to jurisdictional runoff management programs, etc.) that will be implemented to reduce or eliminate any pollutants or conditions that are causing or contributing to the exceedance of water quality standards,

(c) Updates to the schedule for implementation of the existing and additional water quality improvement strategies, and

(d) Updates to the monitoring and assessment program to track progress toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a of this Order;

(3) The San Diego Water Board may require the incorporation of additional modifications to the Water Quality Improvement Plan required under Provision B. The applicable Copermittees must submit any modifications to the update to the Water Quality Improvement Plan within 90 days of notification that additional modifications are required by the San Diego Water Board, or as otherwise directed;

(4) Within 90 days of the San Diego Water Board determination that the modifications to the Water Quality Improvement Plan required under Provision A.4.a.(3) meet the requirements of this Order, the applicable Copermittees must revise the jurisdictional runoff management program documents to incorporate the modified water quality improvement strategies that have been and will be implemented, the implementation schedule, and any additional monitoring required; and

(5) Each Copermittee must implement the updated Water Quality Improvement Plan.

b. The procedure set forth above to achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order do not have to be repeated for continuing or recurring exceedances of the same water quality standard(s) following implementation of scheduled actions unless directed to do otherwise by the San Diego Water Board.

c. Nothing in Provisions A.4.a and A.4.b prevents the San Diego Water Board from enforcing any provision of this Order while the applicable Copermittees prepare and implement the above update to the Water Quality Improvement Plan and jurisdictional runoff management programs.

B. WATER QUALITY IMPROVEMENT PLANS

The purpose of this provision is to develop Water Quality Improvement Plans that guide the Copermittees' jurisdictional runoff management programs towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plans is to further the Clean Water Act's objective to protect, preserve, enhance, and restore the water quality and designated beneficial uses of waters of the state. This goal will be accomplished through an adaptive planning and management process that identifies the highest priority water quality conditions within a watershed and implements strategies through the jurisdictional runoff management programs to achieve improvements in the quality of discharges from the MS4s and receiving waters.

1. Watershed Management Areas

The Copermittees must develop a Water Quality Improvement Plan for each of the Watershed Management Areas in Table B-1. A total of ten Water Quality Improvement Plans must be developed for the San Diego Region.

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
San Juan (901.00)	South Orange County	- Aliso Creek - San Juan Creek - San Mateo Creek - Pacific Ocean - Heisler Park ASBS	- City of Aliso Viejo - City of Dana Point - City of Laguna Beach - City of Laguna Hills[1] - City of Laguna Niguel - City of Laguna Woods[1] - City of Lake Forest[2] - City of Mission Viejo - City of Rancho Santa Margarita - City of San Clemente - City of San Juan Capistrano - County of Orange - Orange County Flood Control District
Santa Margarita (902.00)	Santa Margarita River	- Murrieta Creek - Temecula Creek - Santa Margarita River - Santa Margarita Lagoon - Pacific Ocean	- City of Menifee[3] - City of Murrieta[4] - City of Temecula - City of Wildomar[4] - County of Riverside - County of San Diego - Riverside County Flood Control and Water Conservation District
San Luis Rey (903.00)	San Luis Rey River	- San Luis Rey River - San Luis Rey Estuary - Pacific Ocean	- City of Oceanside - City of Vista - County of San Diego

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
Carlsbad (904.00)	Carlsbad	- Loma Alta Slough - Buena Vista Lagoon - Agua Hedionda Lagoon - Batiquitos Lagoon - San Elijo Lagoon - Pacific Ocean	- City of Carlsbad - City of Encinitas - City of Escondido - City of Oceanside - City of San Marcos - City of Solana Beach - City of Vista - County of San Diego
San Dieguito (905.00)	San Dieguito River	- San Dieguito River - San Dieguito Lagoon - Pacific Ocean	- City of Del Mar - City of Escondido - City of Poway - City of San Diego - City of Solana Beach - County of San Diego
Penasquitos (906.00)	Penasquitos	- Los Penasquitos Lagoon - Pacific Ocean	- City of Del Mar - City of Poway - City of San Diego - County of San Diego
	Mission Bay	- Mission Bay - Pacific Ocean - San Diego Marine Life Refuge ASBS	- City of San Diego
San Diego (907.00)	San Diego River	- San Diego River - Pacific Ocean	- City of El Cajon - City of La Mesa - City of San Diego - City of Santee - County of San Diego
Pueblo San Diego (908.00) Sweetwater (909.00) Otay (910.00)	San Diego Bay	- Sweetwater River - Otay River - San Diego Bay - Pacific Ocean	- City of Chula Vista - City of Coronado - City of Imperial Beach - City of La Mesa - City of Lemon Grove - City of National City - City of San Diego - County of San Diego - San Diego County Regional Airport Authority - San Diego Unified Port District
Tijuana (911.00)	Tijuana River	- Tijuana River - Tijuana Estuary - Pacific Ocean	- City of Imperial Beach - City of San Diego - County of San Diego

Notes:

1. By agreement dated February 10, 2015, pursuant to Water Code section 13228, the Phase I MS4 discharges within the jurisdiction of the City of Laguna Hills and the City of Laguna Woods located in the Santa Ana Region are regulated by San Diego Water Board Order No. R9-2013-0001 as amended by Order No. R9-2015-0001, upon the later effective date of Order No. R9-2015-0001 or Santa Ana Water Board Tentative Order No. R8-2015-0001. The City of Laguna Hills and Laguna Woods must also comply with the requirements of the San Diego Creek/Newport Bay TMDL in section XVIII of Santa Ana Water Board Order No. R8-2015-0001.
2. By agreement dated February 10, 2015, pursuant to Water Code section 13228, Phase I MS4 discharges within the City of Lake Forest located within the San Diego Water Board Region are regulated by the Santa Ana Water Board Order No. R8-2015-0001 (NPDES No. CAS618030) upon the later effective date of this Order or Santa Ana Water Board Tentative Order No. R8-2015-0001. In accordance with the terms of the agreement between the San Diego Water Board and the Santa Ana Water Board, the City of Lake Forest must implement the requirements of the Bacteria TMDL in Attachment E of this Order, participate in preparation and implementation of the Water Quality Improvement Plan for the Aliso Creek Watershed Management Area as described in Provision B of this Order and continue implementation of its over-irrigation discharge prohibition in its City Ordinance, Title 15, Chapter 15, section 14.030, List (b).
3. By agreement dated October 26, 2015, pursuant to Water Code section 13228, Phase I MS4 discharges within the City of Menifee located within the San Diego Water Board Region are regulated by the Santa Ana Water Board Order No. R8-2010-0033 as it may be amended or reissued (NPDES No. CAS618033) upon the later effective date of this Order. In accordance with the terms of the agreement between the San Diego Water Board and the Santa Ana Water Board, the City of Menifee must participate in preparation and implementation of the Water Quality Improvement Plan for the Santa Margarita River Watershed Management Area as described in Provision B of this Order.
4. By agreement dated October 26, 2015, pursuant to Water Code section 13228, the Phase I MS4 discharges within the jurisdiction of the City of Murrieta and the City of Wildomar located in the Santa Ana Region are regulated by San Diego Water Board Order No. R9-2013-0001 as amended by Orders No. R9-2015-0001 and R9-2015-0100. The City of Murrieta and City of Wildomar must also comply with the requirements of the Lake Elsinore/Canyon Lake Nutrient TMDLs in section VI.D.2 of Santa Ana Water Board Order No. R8-2010-0033, or corresponding section as it may be amended or reissued.

2. Priority Water Quality Conditions

The Copermittees must identify the water quality priorities within each Watershed Management Area that will be addressed by the Water Quality Improvement Plan. Where appropriate, Watershed Management Areas may be separated into subwatersheds to focus water quality prioritization and jurisdictional runoff management program implementation efforts by receiving water.

a. Assessment of Receiving Water Conditions

The Copermittees must consider the following, at a minimum, to identify water quality priorities based on impacts of MS4 discharges on receiving water beneficial uses:

(1) Receiving waters listed as impaired on the CWA Section 303(d) List of Water Quality Limited Segments (303(d) List);

(2) TMDLs adopted and under development by the San Diego Water Board;

(3) Receiving waters recognized as sensitive or highly valued by the Copermittees, including estuaries designated under the National Estuary Program under CWA section 320, marine protected areas, wetlands defined by the State or U.S. Fish and Wildlife Service's National Wetlands Inventory as wetlands, waters having the Preservation of Biological Habitats of Special Significance (BIOL) beneficial use designation, and receiving waters identified as ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(4) The receiving water limitations of Provision A.2;

(5) Known historical versus current physical, chemical, and biological water quality conditions;

(6) Available, relevant, and appropriately collected and analyzed physical, chemical, and biological receiving water monitoring data, including, but not limited to, data describing:

(a) Chemical constituents,

(b) Water quality parameters (i.e. pH, temperature, conductivity, etc.),

(c) Toxicity Identification Evaluations for both receiving water column and sediment,

(d) Trash impacts,

(e) Bioassessments, and

(f) Physical habitat;

(7) Available evidence of erosional impacts in receiving waters due to accelerated flows (i.e. hydromodification);

(8) Available evidence of adverse impacts to the chemical, physical, and biological integrity of receiving waters; and

(9) The potential improvements in the overall condition of the Watershed Management Area that can be achieved.

b. ASSESSMENT OF IMPACTS FROM MS4 DISCHARGES

The Copermittees must consider the following, at a minimum, to identify the potential impacts to receiving waters that may be caused or contributed to by discharges from the Copermittees' MS4s:

(1) The discharge prohibitions of Provision A.1 and effluent limitations of Provision A.3; and

(2) Available, relevant, and appropriately collected and analyzed storm water and non-storm water monitoring data from the Copermittees' MS4 outfalls;

(3) Locations of each Copermittee's MS4 outfalls that discharge to receiving waters;

(4) Locations of MS4 outfalls that are known to persistently discharge non-storm water to receiving waters likely causing or contributing to impacts on receiving water beneficial uses;

(5) Locations of MS4 outfalls that are known to discharge pollutants in storm water causing or contributing to impacts on receiving water beneficial uses; and

(6) The potential improvements in the quality of discharges from the MS4 that can be achieved.

c. IDENTIFICATION OF PRIORITY WATER QUALITY CONDITIONS

(1) The Copermittees must use the information gathered for Provisions B.2.a and B.2.b to develop a list of priority water quality conditions as pollutants, stressors and/or receiving water conditions that are the highest threat to receiving water quality or that most adversely affect the quality of receiving waters. The list must include the following information for each priority water quality condition:

(a) The beneficial use(s) associated with the priority water quality condition;

(b) The geographic extent of the priority water quality condition within the Watershed Management Area, if known;

(c) The temporal extent of the priority water quality condition (e.g., dry weather and/or wet weather);

(d) The Copermittees with MS4s discharges that may cause or contribute to the priority water quality condition; and

(e) An assessment of the adequacy of and data gaps in the monitoring data to characterize the conditions causing or contributing to the priority water quality condition, including a consideration of spatial and temporal variation.

(2) The Copermittees must identify the highest priority water quality conditions to be addressed by the Water Quality Improvement Plan, and provide a rationale for selecting a subset of the water quality conditions identified pursuant to Provision B.2.c.(1) as the highest priorities.

d. IDENTIFICATION OF MS4 SOURCES OF POLLUTANTS AND/OR STRESSORS

The Copermittees must identify and prioritize known and suspected sources of storm water and non-storm water pollutants and/or other stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c. The identification of known and suspected sources of pollutants and/or stressors that cause or contribute to the highest priority water quality conditions as identified for Provision B.2.c must consider the following:

(1) Pollutant generating facilities, areas, and/or activities within the Watershed Management Area, including:

(a) Each Copermittee's inventory of construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas,

(b) Publicly owned parks and/or recreational areas,

(c) Open space areas,

(d) All currently operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste, and

(e) Areas not within the Copermittees' jurisdictions (e.g., Phase II MS4s, tribal lands, state lands, federal lands) that are known or suspected to be discharging to the Copermittees' MS4s;

(2) Locations of the Copermittees' MS4s, including the following:

(a) All MS4 outfalls that discharge to receiving waters, and

(b) Locations of major structural controls for storm water and non-storm water (e.g., retention basins, detention basins, major infiltration devices, etc.);

(3) Other known and suspected sources of non-storm water or pollutants in storm water discharges to receiving waters within the Watershed Management Area, including the following:

(a) Other MS4 outfalls (e.g., Phase II Municipal and Caltrans),

(b) Other NPDES permitted discharges,

(c) Any other discharges that may be considered point sources (e.g., private outfalls), and

(d) Any other discharges that may be considered non-point sources (e.g., agriculture, wildlife or other natural sources);

(4) Review of available data, including but not limited to:

(a) Findings from the Copermittees' illicit discharge detection and elimination programs,

(b) Findings from the Copermittees' MS4 outfall discharge monitoring,

(c) Findings from the Copermittees' receiving water monitoring,

(d) Findings from the Copermittees' MS4 outfall discharge and receiving water assessments, and

(e) Other available, relevant, and appropriately collected data, information, or studies related to pollutant sources and/or stressors that contribute to the highest priority water quality conditions as identified for Provision B.2.c.

(5) The adequacy of the available data to identify and prioritize sources and/or stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c.

e. IDENTIFICATION OF POTENTIAL WATER QUALITY IMPROVEMENT STRATEGIES

The Copermittees must evaluate the findings identified under Provisions B.2.a-d, and identify potential strategies that can result in improvements to water quality in MS4 discharges and/or receiving waters within the Watershed Management Area. Potential water quality improvement strategies that may be implemented within the Watershed Management Area must include the following:

(1) Structural BMPs, non-structural BMPs, incentives, or programs that can potentially be implemented to address the highest priority water quality conditions identified under Provision B.2.c, or MS4 sources of pollutants or stressors identified under Provision B.2.d,

(2) Retrofitting projects in areas of existing development within the Watershed Management Area that can potentially be implemented to reduce MS4 sources of pollutants or stressors identified under Provision B.2.d causing or contributing to the highest priority water quality conditions identified under Provision B.2.c, and

(3) Stream, channel, and/or habitat rehabilitation projects within the Watershed Management Area that can potentially be implemented to protect and/or improve conditions in receiving waters from MS4 pollutants and/or stressors identified under Provision B.2.d causing or contributing to the highest priority water quality conditions identified under Provision B.2.c.

3. Water Quality Improvement Goals, Strategies and Schedules

The Copermittees must identify and develop specific water quality improvement goals and strategies to address the highest priority water quality conditions identified within a Watershed Management Area. The water quality improvement goals and strategies must address the highest priority water quality conditions by effectively prohibiting non-storm water discharges to the MS4, reducing pollutants in storm water discharges from the MS4 to the MEP, and protecting the water quality standards of receiving waters.

a. WATER QUALITY IMPROVEMENT GOALS AND SCHEDULES

(1) Numeric Goals

The Copermittees must develop and incorporate numeric goals[7] into the Water Quality Improvement Plan. Numeric goals must be used to support

[7] Interim and final numeric goals may take a variety of forms such as TMDL established WQBELs, action levels, pollutant concentration, load reductions, number of impaired water bodies delisted from the List of Water Quality Impaired Segments, Index of Biotic Integrity (IBI) scores, or other appropriate metrics. Interim and final numeric goals are not necessarily limited to one criterion or indicator, but may include multiple criteria and/or indicators. Except for TMDL established WQBELs, interim and final numeric goals and corresponding schedules may be revised through the adaptive management process under Provision B.5.

Water Quality Improvement Plan implementation and measure reasonable progress towards addressing the highest priority water quality conditions identified under Provision B.2.c. The Copermittees must establish and incorporate the following numeric goals in the Water Quality Improvement Plan:

(a) Final numeric goals must be based on measureable criteria or indicators capable of demonstrating one or more of the following:

(i) Discharges from the Copermittees' MS4s will not cause or contribute to exceedances of water quality standards in receiving waters, AND/OR

(ii) The conditions of receiving waters and associated habitat are protected from MS4 discharges, AND/OR

(iii) Beneficial uses of receiving waters are protected from MS4 discharges and will be supported.

(b) Interim numeric goals must be based on measureable criteria or indicators capable of demonstrating reasonable incremental progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges as follows:

(i) One or more interim numeric goals may be established to demonstrate progress toward achieving each final numeric goal,

(ii) For each final numeric goal, at least one interim numeric goal must be expressed as a reasonable increment toward achievement of the final numeric goal,

(iii) For each final numeric goal, reasonable interim numeric goals must be established to be accomplished during each 5 year period between the acceptance of the Water Quality Improvement Plan and the achievement of the final numeric goals.

(2) <u>Schedules for Achieving Numeric Goals</u>

The Copermittees must develop and incorporate schedules for achieving the numeric goals into the Water Quality Improvement Plan. The schedules must demonstrate reasonable progress toward achieving the final numeric goals required for Provision B.3.a.(1). The Copermittees must incorporate the schedules for achieving the numeric goals into the Water Quality Improvement Plan based on the following considerations:

(a) Final dates for achieving all final numeric goals must be established considering the following:

(i) Final compliance dates for any applicable TMDLs in Attachment E to this Order;

(ii) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(iii) Achievement of the final numeric goals for the highest water quality priorities must be as soon as possible;

(iv) Final dates for achieving the final numeric goals must reflect a realistic assessment of the shortest practicable time required based on the temporal and spatial extent and factors associated with the highest priority water quality conditions identified under Provision B.2.c, and taking into account the time reasonably required to implement the water quality improvement strategies required pursuant to Provision B.3.b.

(b) Interim dates for achieving all interim numeric goals must be established considering the following:

(i) Interim compliance dates for any applicable TMDLs in Attachment E to this Order;

(ii) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(iii) Interim dates for achieving the interim numeric goals must reflect a realistic assessment of the shortest practicable time reasonably required, taking into account the time needed to implement new or significantly expanded programs and securing financing, if necessary; and

(iv) For each final numeric goal, at least one interim numeric goal must be established that the Copermittees will work toward achieving within the term of this Order.

b. WATER QUALITY IMPROVEMENT STRATEGIES AND SCHEDULES

Based on the likely effectiveness and efficiency of the potential water quality improvement strategies identified under Provision B.2.e to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a, the Copermittees must identify the strategies that will be implemented in each Watershed Management Area as follows:

(1) Jurisdictional Strategies

(a) Each Copermittee in the Watershed Management Area must identify the strategies that will be implemented within its jurisdiction as part of its jurisdictional runoff management program requirements under Provisions E.2 through E.7, including descriptions of the following:

(i) For each of the inventories developed for its jurisdiction, as required under Provisions D.2.a.(1), E.3.e.(2), E.4.b, and E.5.a, each Copermittee must identify the known and suspected areas or sources causing or contributing to the highest priority water quality conditions in the Watershed Management Area that the Copermittee will focus on in its efforts to effectively prohibit non-storm water discharges to its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, and achieve the interim and final numeric goals identified under Provision B.3.a;

(ii) BMPs that each Copermittee will implement, or require to be implemented, as applicable, for those areas or sources within its jurisdiction;

(iii) Education programs that each Copermittee will implement, as applicable, for those areas or sources within its jurisdiction;

(iv) Frequencies that each Copermittee will conduct inspections on those areas or sources within its jurisdiction;

(v) Incentive and enforcement programs that each Copermittee will implement, as applicable, for those areas or sources within its jurisdiction; and

(vi) Any other BMPs, incentives, or programs that each Copermittee will implement for those areas or sources within its jurisdiction.

(b) Identify the optional jurisdictional strategies that each Copermittee will implement within its jurisdiction, as necessary, to effectively prohibit non-storm water discharges to its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. Descriptions of the optional jurisdictional strategies must include:

(i) BMPs, incentives, or programs that may be implemented by the Copermittee within its jurisdiction in addition to the requirements of Provisions B.3.b.(1)(a);

(ii) Incentives or programs that may be implemented by the Copermittee to encourage or implement projects to retrofit areas of existing development within its jurisdiction;

(iii) Incentives or programs that may be implemented by the Copermittee to encourage or implement projects that will rehabilitate the conditions of channels or habitats within its jurisdiction;

(iv) The funds and/or resources that must be secured by the Copermittee to implement the optional strategies described for Provisions B.3.b.(1)(b)(i)-(iii) within its jurisdiction; and

(v) The circumstances necessary to trigger implementation of the optional jurisdictional strategies, in addition to the requirements of Provision B.3.b.(1)(a), to achieve the interim and final numeric goals within the schedules established under Provision B.3.a.

(c) Identify the strategies that will be implemented by the Copermittee in coordination with or with the cooperation of other agencies (e.g. Caltrans, water districts, school districts) and/or entities (e.g. non-governmental organizations) within its jurisdiction.

(2) Watershed Management Area Strategies

The Copermittees must identify the optional regional or multi-jurisdictional strategies that will be implemented in the Watershed Management Area, as necessary, to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. Descriptions of the optional regional or multi-jurisdictional strategies must include:

(a) Regional or multi-jurisdictional BMPs, incentives, or programs that may be implemented by the Copermittees in the Watershed Management Area;

(b) Incentives or programs that may be implemented by the Copermittees in the Watershed Management Area to encourage or implement regional or multi-jurisdictional projects to retrofit areas of existing development;

(c) Incentives or programs that may be implemented by the Copermittees to encourage or implement regional or multi-jurisdictional projects that will rehabilitate the conditions of channels, streams, or habitats within the Watershed Management Area;

(d) The funds and/or resources that must be secured by the Copermittees to implement the optional strategies described for Provisions B.3.b.(2)(a)-(c) within the Watershed Management Area; and

(e) The circumstances necessary to trigger implementation of the optional regional or multi-jurisdictional strategies to achieve the interim and final numeric goals within the schedules established under Provision B.3.a.

(3) Schedules for Implementing Strategies

The Copermittees must develop reasonable schedules for implementing the water quality improvement strategies identified under Provisions B.3.b.(1) and B.3.b.(2) to achieve the interim and final numeric goals identified and schedules established under Provision B.3.a. The Copermittees must incorporate the schedules to implement the water quality improvement strategies into the Water Quality Improvement Plan as follows:

(a) Each Copermittee must develop schedules for the jurisdictional strategies identified pursuant to Provisions B.3.b.(1)(a)-(b). Each schedule must specify:

(i) If each jurisdictional strategy identified pursuant to Provision B.3.b.(1)(a) will or will not be initiated upon acceptance of the Water Quality Improvement Plan;

(ii) For each jurisdictional strategy identified pursuant to Provision B.3.b.(1)(a) that will not be initiated upon acceptance of the Water Quality Improvement Plan, the shortest practicable time in which each jurisdictional strategy will be initiated after acceptance of the Water Quality Improvement Plan;

(iii) For each optional jurisdictional strategy identified pursuant to Provision B.3.b.(1)(b), a realistic assessment of the shortest practicable time required to:

[a] Secure the resources needed to fund the optional jurisdictional strategy, and
[b] Procure the resources, materials, labor, and applicable permits necessary to initiate implementation of the optional jurisdictional strategy;

(iv) If each jurisdictional strategy identified pursuant to Provisions B.3.b.(1)(a)-(b) is expected to be continuously implemented (e.g. inspections) or completed within a schedule (e.g. construction of structural BMP); and

(v) If a jurisdictional strategy identified pursuant to Provisions B.3.b.(1)(a)-(b) is expected to be completed within a schedule, the anticipated time to complete based on a realistic assessment of the shortest practicable time required.

(b) The Copermittees in the Watershed Management Area must develop schedules for the regional or multi-jurisdictional strategies identified pursuant to Provision B.3.b.(2). Each schedule must specify:

(i) A realistic assessment of the shortest practicable time to:

[a] Secure the resources needed to fund the optional regional or multi-jurisdictional strategy, and
[b] Procure the resources, materials, labor, and permits necessary to initiate the implementation of the optional regional or multi-jurisdictional strategy;

(ii) If each regional or multi-jurisdictional strategy identified pursuant to Provision B.3.b.(2) is expected to be continuously implemented (e.g. inspections) or completed within a schedule (e.g. construction of structural BMP); and

(iii) If a regional or multi-jurisdictional strategy and/or activity identified pursuant to Provisions B.3.b.(2) is expected to be completed within a schedule, the anticipated time to complete based on a realistic assessment of the shortest practicable time required.

(4) <u>Optional Watershed Management Area Analysis</u>

(a) For each Watershed Management Area, the Copermittees have the option to perform a Watershed Management Area Analysis for the purpose of developing watershed-specific requirements for structural BMP implementation, as described in Provision E.3.c.(3). The Watershed Management Area Analysis must include GIS layers (maps) as output. The analysis must include the following information, to the extent it is available, in order to characterize the Watershed Management Areas:

(i) A description of dominant hydrologic processes, such as areas where infiltration or overland flow likely dominates;

(ii) A description of existing streams in the watershed, including bed material and composition, and if they are perennial or ephemeral;

(iii) Current and anticipated future land uses;

(iv) Potential coarse sediment yield areas; and

(v) Locations of existing flood control structures and channel structures, such as stream armoring, constrictions, grade control structures, and hydromodification or flood management basins.

(b) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify and compile a list of candidate projects that could potentially be used as

alternative compliance options for Priority Development Projects, to be implemented in lieu of onsite structural BMP performance requirements described in Provisions E.3.c.(1) and E.3.c.(2)(a). Specifically, the Copermittees must identify opportunities to be included in the list of candidate projects in each Watershed Management Area, such as:

(i) Stream or riparian area rehabilitation;

(ii) Retrofitting existing infrastructure to incorporate storm water retention or treatment;

(iii) Regional BMPs;

(iv) Groundwater recharge projects;

(v) Water supply augmentation projects; and

(vi) Land purchases to preserve floodplain functions.

(c) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify areas within the Watershed Management Area where it is appropriate to allow Priority Development Projects to be exempt from the hydromodification management BMP performance requirements described in Provision E.3.c.(2), including supporting rationale.

c. Prohibitions and Limitations Compliance Option

Each Copermittee has the option to utilize the implementation of the Water Quality Improvement Plan to demonstrate compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b within a Watershed Management Area subject to the following conditions:

(1) A Copermittee is eligible to be deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b within a Watershed Management Area when the Water Quality Improvement Plan for a Watershed Management Area incorporates the following:

(a) Numeric goals, water quality improvement strategies, and schedules developed pursuant to Provisions B.3.a and B.3.b that include the following:

(i) Interim and final WQBELs established by the TMDLs in Attachment E to this Order applicable to the Copermittee's jurisdiction within the Watershed Management Area; AND

(ii) Interim and final numeric goals for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012

(included as Attachment A to this Order) applicable to the Copermittee's jurisdiction within the Watershed Management Area; AND

(iii) Interim and final numeric goals applicable to the Copermittee's MS4 discharges within the Watershed Management Area expressed as numeric concentration-based or load-based goals for all pollutants and conditions listed on the Clean Water Act Section 303(d) List of Water Quality Impaired Segments[8] for the receiving waters in the Watershed Management Area that do not have a TMDL incorporated into Attachment E to this Order; AND/OR

(iv) Interim and final numeric goals for pollutants and conditions identified as receiving water priorities in the Water Quality Improvement Plan that will result in chemical, physical, and biological conditions protective of the beneficial uses of the receiving waters impacted by the Copermittee's MS4 discharges within the Watershed Management Area; AND

(v) The Copermittee has the option to include interim and final numeric goals applicable to the Copermittee's MS4 discharges and/or receiving waters within the Watershed Management Area for any pollutants or conditions in addition to those described in Provisions B.3.c.(1)(a)(i)-(iv); AND

(vi) Schedules for achieving each final numeric goal that reflect a realistic assessment of the shortest practicable time needed for achievement; AND

(vii) For each final numeric goal developed pursuant to Provisions B.3.a and B.3.c.(1)(a)(i)-(v), annual milestones[9] and the dates for their achievement must be included within each of the next five (5) Water Quality Improvement Plan Annual Report reporting periods, or until the final numeric goal is achieved. Annual milestones and the dates for their achievement for the 5 Water Quality Improvement Plan Annual Report reporting periods of the next permit term, or until the final numeric goal is achieved, must be provided as part of the Report of Waste Discharge required pursuant to Provision F.5.

(b) An analysis that meets all of the following conditions:

(i) The analysis, with clearly stated assumptions included in the analysis, must quantitatively demonstrate that the implementation of

[8] 2010 and subsequent 303(d) Lists

[9] Annual milestones for each final numeric goal must be clearly and directly linked to, or demonstrate progress is being made toward the achievement of the final numeric goal. The annual milestones may consist of water quality improvement strategy implementation phases, interim numeric goals, and other acceptable metrics. The annual milestones may address multiple numeric goals and/or multiple water bodies, as applicable and appropriate.

the water quality improvement strategies required under Provision B.3.b will achieve the final numeric goals within the schedules developed pursuant to Provisions B.3.a and B.3.c.(1)(a).

(ii) The development of the analysis must include a public participation process which allows the public to review and provide comments on the analysis methodology utilized and the assumptions included in the analysis. Public comments and responses must be included as part of the analysis documentation included in the Water Quality Improvement Plan.

(iii) The analysis may be performed by an individual Copermittee or jointly by two or more Copermittees choosing to utilize this compliance option for their jurisdictions within the Watershed Management Area.

(iv) The analysis must be updated as part of the iterative approach and adaptive management process required under Provisions B.5.a-b.

(c) Specific monitoring and assessments required pursuant to Provision B.4.a that will be performed by the Copermittee capable of 1) demonstrating whether the implementation of the water quality improvement strategies are making progress toward achieving the numeric goals in accordance with the established schedules developed pursuant to Provisions B.3.a and B.3.c.(1)(a), and 2) determining whether interim and final numeric goals have been achieved. The specific monitoring and assessments must be updated as part of the iterative approach and adaptive management process required under Provision B.5.c.

(d) Documentation showing that the numeric goals, schedules, and annual milestones proposed pursuant to Provision B.3.c.(1)(a), the analysis performed pursuant to Provision B.3.c.(1)(b), and the specific monitoring and assessments proposed pursuant to Provision B.3.c.(1)(c) have been reviewed by the Water Quality Improvement Consultation Panel (see Provision F.1.a.(1)(b)). Updates must be reviewed by the Water Quality Improvement Consultation Panel for any recommendations.

(2) Each Copermittee that voluntarily completes the requirements of Provision B.3.c.(1) is deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b for the pollutants and conditions for which numeric goals are developed when the Water Quality Improvement Plan, incorporating the requirements of Provision B.3.c.(1), is accepted by the San Diego Water Board pursuant to Provision F.1.b or F.2.c. The Copermittee is deemed in compliance during the term of this Order as long as:

(a) The Copermittee is implementing the water quality improvement strategies within its jurisdiction developed pursuant to Provision B.3.b.(1) and in

compliance with the schedules for implementing the strategies established pursuant to Provisions B.3.b.(3)(a) and B.3.c.(1)(a)(vii); AND

(b) The Copermittee is performing the monitoring and assessments developed pursuant to Provision B.3.c.(1)(c); AND

(c) The Copermittee's assessments in the Water Quality Improvement Plan Annual Report submitted pursuant to Provision F.3.b.(3) support a conclusion that: 1) the Copermittee is in compliance with the annual milestones and dates for achievement developed pursuant to Provision B.3.c.(1)(a)(vii), OR 2) the Copermittee has provided acceptable rationale and recommends appropriate modifications to the interim numeric goals, and/or water quality improvement strategies, and/or schedules to improve the rate of progress toward achieving the final numeric goals developed pursuant to Provisions B.3.a and B.3.c.(1)(a)(i)-(vi); AND

(d) Any proposed modifications to the numeric goals, strategies, schedules, and/or annual milestones are accepted by the San Diego Water Board as part of subsequent updates to the Water Quality Improvement Plan pursuant to Provision F.2.c;[10] AND

(e) The Copermittee is implementing the requirements of Provision A.4.a.

4. Water Quality Improvement Monitoring and Assessment Program

a. The Copermittees in each Watershed Management Area must develop and incorporate an integrated monitoring and assessment program into the Water Quality Improvement Plan that assesses: 1) the progress toward achieving the numeric goals and schedules, 2) the progress toward addressing the highest priority water quality conditions for each Watershed Management Area, and 3) each Copermittee's overall efforts to implement the Water Quality Improvement Plan.

b. The monitoring and assessment program must incorporate the monitoring and assessment requirements of Provision D, which may allow the Copermittees to modify the program to be consistent with and focus on the highest priority water quality conditions for each Watershed Management Area.

c. For Watershed Management Areas with applicable TMDLs, the monitoring and assessment program must incorporate the specific monitoring and assessment requirements of Attachment E.

[10] A request for proposed changes to the Water Quality Improvement Plan does not stay any permit condition.

d. For Watershed Management Areas with any ASBS, the water quality monitoring and assessment program must incorporate the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

5. Iterative Approach and Adaptive Management Process

The Copermittees in each Watershed Management Area must implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a, and must include the following:

a. RE-EVALUATION OF PRIORITY WATER QUALITY CONDITIONS

The priority water quality conditions and potential water quality improvement strategies included in the Water Quality Improvement Plan pursuant to Provisions B.2.c and B.2.e may be re-evaluated by the Copermittees as needed during the term of this Order as part of the Water Quality Improvement Plan Annual Report. Re-evaluation and recommendations for modifications to the priority water quality conditions and potential water quality improvement strategies must be provided in the Report of Waste Discharge, and must consider the following:

(1) Achieving the outcome of improved water quality in MS4 discharges and receiving waters through implementation of the water quality improvement strategies identified in the Water Quality Improvement Plan;

(2) New information developed when the requirements of Provisions B.2.a-c have been re-evaluated;

(3) Spatial and temporal accuracy of monitoring data collected to inform prioritization of water quality conditions and implementation strategies to address the highest priority water quality conditions;

(4) Availability of new information and data from sources other than the jurisdictional runoff management programs within the Watershed Management Area that informs the effectiveness of the actions implemented by the Copermittees;

(5) San Diego Water Board recommendations; and

(6) Recommendations for modifications solicited through a public participation process.

b. ADAPTATION OF GOALS, STRATEGIES AND SCHEDULES

The water quality improvement goals, strategies and schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.3, must be re-evaluated and adapted as new information becomes available to result in more effective and efficient measures to address the highest priority water quality conditions identified pursuant to Provision B.2.c. Re-evaluation of and modifications to the water quality improvement goals, strategies and schedules must be provided in the Water Quality Improvement Plan Annual Report, and must consider the following:

(1) Modifications to the priority water quality conditions based on Provision B.5.a;

(2) Progress toward achieving interim and final numeric goals in receiving waters and MS4 discharges for the highest priority water quality conditions in the Watershed Management Area,

(3) Progress toward achieving outcomes according to established schedules;

(4) New policies or regulations that may affect identified numeric goals;

(5) Measurable or demonstrable reductions of non-storm water discharges to and from each Copermittee's MS4;

(6) Measurable or demonstrable reductions of pollutants in storm water discharges from each Copermittee's MS4 to the MEP;

(7) New information developed when the requirements of Provisions B.2.b and B.2.d have been re-evaluated;

(8) Efficiency in implementing the Water Quality Improvement Plan;

(9) San Diego Water Board recommendations; and

(10) Recommendations for modifications solicited through a public participation process.

c. ADAPTATION OF MONITORING AND ASSESSMENT PROGRAM

The water quality improvement monitoring and assessment program, included in the Water Quality Improvement Plan pursuant to Provision B.4, must be re-evaluated and adapted when new information becomes available. Re-evaluation and recommendations for modifications to the monitoring and assessment program, pursuant to the requirements of Provision D, may be provided in the Water Quality Improvement Plan Annual Report, but must be provided in the Report of Waste Discharge.

d. ADAPTATION OF PROHIBITIONS AND LIMITATIONS COMPLIANCE OPTION

If a Copermittee has implemented the Prohibitions and Limitations Compliance Option allowed to be included in the Water Quality Improvement Plan pursuant to Provision B.3.c, the Copermittee must re-evaluate and adapt the numeric goals, water quality improvement strategies, schedules, and annual milestones required under Provision B.3.c.(1) when significant new information becomes available, or with the Report of Waste Discharge required pursuant to Provision F.5. Significant changes in the numeric goals, water quality improvement strategies, schedules, or annual milestones requires an update to the analysis required under Provision B.3.c.(2).

6. Water Quality Improvement Plan Submittal, Updates, and Implementation

a. The Copermittees must submit and commence implementation of the Water Quality Improvement Plans in accordance with the requirements of Provision F.1.

b. The Copermittees must submit proposed updates to the Water Quality Improvement Plan for acceptance by the San Diego Water Board Executive Officer in accordance with the requirements of Provision F.2.c.

C. ACTION LEVELS

The purpose of this provision is for the Copermittees to incorporate numeric action levels in the Water Quality Improvement Plans. The goal of the action levels is to guide Water Quality Improvement Plan implementation efforts and measure progress towards the protection of water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through monitoring and assessing the quality of the MS4 discharges during the implementation of the Water Quality Improvement Plans.

1. Non-Storm Water Action Levels[11]

The Copermittees must develop and incorporate numeric non-storm water action levels (NALs) into the Water Quality Improvement Plan to: 1) support the development and prioritization of water quality improvement strategies for effectively prohibiting non-storm water discharges to the MS4s, 2) assess the effectiveness of the water quality improvement strategies toward addressing MS4 non-storm water discharges, required pursuant to Provision D.4.b.(1), and 3) support the detection and elimination of non-storm water and illicit discharges to the MS4, required pursuant to Provision E.2.[12]

a. The following NALs must be incorporated:

(1) Non-Storm Water Discharges from MS4s to Ocean Surf Zone

Table C-1. Non-Storm Water Action Levels for Discharges from MS4s to Ocean Surf Zone

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Total Coliform	MPN/100 ml	1,000	-	10,000/1,000[1]	OP
Fecal Coliform	MPN/100 ml	200[2]	-	400	OP
Enterococci	MPN/100 ml	35	-	104[3]	OP

Abbreviations/Acronyms
AMAL – average monthly action level
MDAL – maximum daily action level
OP – Ocean Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Total coliform density NAL is 1,000 MPN/100 ml when the fecal/total coliform ratio exceeds 0.1.
2. Fecal coliform density NAL is 200 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas."

[11] NALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, unless the NAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed.
[12] The Copermittees may utilize NALs or other benchmarks currently established by the Copermittees as interim NALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

(2) Non-Storm Water Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Table C-2. Non-Storm Water Action Levels for Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Turbidity	NTU	75	-	225	OP
pH	Units	Within limit of 6.0 to 9.0 at all times			OP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	35	-	104[3]	BP
Priority Pollutants	µg/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
OP – Ocean Plan water quality objective
NTU – Nephelometric Turbidity Units
µg/L – micrograms per liter
MDAL – maximum daily action level
BP – Basin Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas" and is not applicable to water bodies that are not designated with the water contact recreation (REC-1) beneficial use.

Table C-3. Non-Storm Water Action Levels for Priority Pollutants

Parameter	Units	Freshwater (CTR)		Saltwater (CTR)	
		MDAL	AMAL	MDAL	AMAL
Cadmium	µg/L	**	**	16	8
Copper	µg/L	*	*	5.8	2.9
Chromium III	µg/L	**	**	-	-
Chromium VI	µg/L	16	8.1	83	41
Lead	µg/L	*	*	14	2.9
Nickel	µg/L	**	**	14	6.8
Silver	µg/L	*	*	2.2	1.1
Zinc	µg/L	*	*	95	47

Abbreviations/Acronyms:
CTR – California Toxic Rule
AMAL – average monthly action level
µg/L – micrograms per liter
MDAL – maximum daily action level

Notes:
* Action levels developed on a case-by-case basis (see below)
** Action levels developed on a case-by-case basis (see below), but calculated criteria are not to exceed Maximum Contaminant Levels (MCLs) under the California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64431

The Cadmium, Copper, Chromium (III), Lead, Nickel, Silver and Zinc NALs for MS4 discharges to freshwater receiving waters will be developed on a case-by-case basis based on site-specific water quality data (receiving water hardness). For these priority pollutants, refer to 40 CFR 131.38(b)(2).

(3) Non-Storm Water Discharges from MS4s to Inland Surface Waters

Table C-4. Non-Storm Water Action Levels for Discharges from MS4s to Inland Surface Waters

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Dissolved Oxygen	mg/L	Not less than 5.0 in WARM waters and not less than 6.0 in COLD waters			BP
Turbidity	NTU	-	20	See MDAL	BP
pH	Units	Within limit of 6.5 to 8.5 at all times			BP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	33	-	61[3]	BP
Total Nitrogen	mg/L	-	1.0	See MDAL	BP
Total Phosphorus	mg/L	-	0.1	See MDAL	BP
MBAS	mg/L	-	0.5	See MDAL	BP
Iron	mg/L	-	0.3	See MDAL	BP
Manganese	mg/L	-	0.05	See MDAL	BP
Priority Pollutants	µg/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
BP – Basin Plan water quality objective
COLD – cold freshwater habitat beneficial use
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
MDAL – maximum daily action level
WARM – warm freshwater habitat beneficial use
MBAS – Methylene Blue Active Substances
MPN/100 ml – most probable number per 100 milliliters
µg/L – micrograms per liter

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for freshwater "designated beach areas" and is not applicable to water bodies that are not designated with the water contact recreation (REC-1) beneficial use.

b. If not identified in Provision C.1.a, NALs must be identified, developed and incorporated in the Water Quality Improvement Plan for any pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in receiving waters associated with the highest priority water quality conditions related to non-storm water discharges from the MS4s. NALs must be based on:

(1) Applicable water quality standards which may be dependent upon site-specific or receiving water-specific conditions or assumptions to be identified by the Copermittees; or

(2) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the NALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary NALs specific to the Watershed Management Area at levels greater than the NALs required by Provisions C.1.a and C.1.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for effectively prohibiting non-storm water discharges to the MS4s, as well as the detection and

elimination of non-storm water and illicit discharges to and from the MS4. The secondary NALs may be developed using an approach acceptable to the San Diego Water Board.

d. Dry weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.b may be utilized to develop or revise NALs based on watershed-specific data, subject to San Diego Water Board Executive Officer approval.

2. Storm Water Action Levels[13]

The Copermittees must develop and incorporate numeric storm water action levels (SALs) in the Water Quality Improvement Plans to: 1) support the development and prioritization of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s, and 2) assess the effectiveness of the water quality improvement strategies toward reducing pollutants in storm water discharges, required pursuant to Provision D.4.b.(2).[14]

a. The following SALs for discharges of storm water from the MS4 must be incorporated:

Table C-5. Storm Water Action Levels for Discharges from MS4s to Receiving Waters

Parameter	Units	Action Level
Turbidity	NTU	126
Nitrate & Nitrite (Total)	mg/L	2.6
Phosphorus (Total P)	mg/L	1.46
Cadmium (Total Cd)*	µg/L	3.0
Copper (Total Cu)*	µg/L	127
Lead (Total Pb)*	µg/L	250
Zinc (Total Zn)*	µg/L	976

Abbreviations/Acronyms:
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
µg/L – micrograms per liter

Notes:
* The sampling must include a measure of receiving water hardness at each MS4 outfall. If a total metal concentration exceeds the corresponding metals SAL in Table C-5, that concentration must be compared to the California Toxics Rule criteria and the USEPA 1-hour maximum concentration for the detected level of receiving water hardness associated with that sample. If it is determined that the sample's total metal concentration for that specific metal exceeds that SAL, but does not exceed the applicable USEPA 1-hour maximum concentration criterion for the measured level of hardness, then the sample result will not be considered above the SAL for that measurement.

[13] SALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, unless the SAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed.

[14] The Copermittees may utilize SALs or other benchmarks currently established by the Copermittees as interim SALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

b. If not identified in Provision C.2.a, SALs must be identified, developed and incorporated in the Water Quality Improvement Plan for pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in receiving waters associated with the highest priority water quality conditions related to storm water discharges from the MS4s. SALs must be based on:

(1) Federal and State water quality guidance and/or water quality standards; and

(2) Site-specific or receiving water-specific conditions; or

(3) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the SALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary SALs specific to the Watershed Management Area at levels greater than the SALs required by Provisions C.2.a and C.2.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s. The secondary SALs may be developed based on the approaches recommended by the State Water Board's Storm Water Panel[15] or using an approach acceptable to the San Diego Water Board.

d. Wet weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.c may be used to develop or revise SALs based upon watershed-specific data, subject to San Diego Water Board Executive Officer approval.

[15] Storm Water Panel Recommendations to the California State Water Resources Control Board: The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities (June 2006)

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D. MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS

The purpose of this provision is for the Copermittees to monitor and assess the impact on the conditions of receiving waters caused by discharges from the Copermittees' MS4s under wet weather and dry weather conditions. The goal of the monitoring and assessment program is to inform the Copermittees about the nexus between the health of receiving waters and the water quality condition of the discharges from their MS4s. This goal will be accomplished through monitoring and assessing the conditions of the receiving waters, discharges from the MS4s, pollutant sources and/or stressors, and effectiveness of the water quality improvement strategies implemented as part of the Water Quality Improvement Plans.

1. Receiving Water Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the condition of the receiving waters in each Watershed Management Area during dry weather and wet weather. Following San Diego Water Board acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct long-term receiving water monitoring during implementation of the Water Quality Improvement Plan to assess the long term trends and determine if conditions in receiving waters are improving. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following receiving water monitoring procedures:

a. TRANSITIONAL RECEIVING WATER MONITORING

Until the monitoring requirements and schedules of Provisions D.1.b-e are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following receiving water monitoring in the Watershed Management Area:

(1) Continue the receiving water monitoring programs required in Order Nos. R9-2007-0001 (Monitoring and Reporting Program No. R9-2007-0001 Sections II.A.1-A.5), R9-2009-0002, and R9-2010-0016, unless the Executive Officer provides conditional approval for Copermittees to proceed with implementation of the proposed monitoring and assessment program developed in accordance with Provision B.4;

(2) Continue the monitoring in the Hydromodification Management Plans approved by the San Diego Water Board;

(3) Participate in the following regional receiving water monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring,

(b) Southern California Bight Regional Monitoring, and

(c) Sediment Quality Monitoring;

(4) Implement the monitoring programs developed as part of any implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) for the TMDLs in Attachment E to this Order; and

(5) For Watershed Management Areas with ASBS, implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

b. LONG-TERM RECEIVING WATER MONITORING STATIONS

The Copermittees must select at least one long-term receiving water monitoring station from among the existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees to be representative of the receiving water quality in the Watershed Management Area. Additional long-term receiving water monitoring stations must be selected where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

c. DRY WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three dry weather monitoring events at each of the long-term receiving water monitoring stations. At least one monitoring event must be conducted during the dry season (May 1 – September 30) and at least one monitoring event must be conducted during a dry weather period during the wet season (October 1 – April 30), after the first wet weather event of the season, with an antecedent dry period of at least 72 hours following a storm event producing measureable rainfall of greater than 0.1 inch.

(1) <u>Dry Weather Receiving Water Field Observations</u>

For each dry weather monitoring event, the Copermittees must record field observations consistent with Table D-1 at each long-term receiving water monitoring station.

Table D-1. Field Observations for Receiving Water Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) • Station description (i.e. deposits or stains, vegetation condition, structural condition, and observable biology) • Presence and assessment of trash in and around station

(2) Dry Weather Receiving Water Field Monitoring

For each dry weather monitoring event, if conditions allow the collection of the data, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

Table D-2. Field Monitoring Parameters for Receiving Water Monitoring Stations

Parameters
• pH • Temperature • Specific conductivity • Dissolved oxygen • Turbidity

(3) Dry Weather Receiving Water Analytical Monitoring

For each dry weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable NAL constituents, and

(v) Constituents listed in Table D-3.

Table D-3. Analytical Monitoring Constituents for Receiving Water Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Pesticides	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Mercury • Nickel • Selenium • Thallium • Zinc	• Organophosphate Pesticides • Pyrethroid Pesticides	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(4) Dry Weather Receiving Water Toxicity Monitoring

For each dry weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for aquatic toxicity in accordance with Table D-4. When the State Water Board's Policy for Toxicity Assessment and Control (Toxicity Policy) is approved and in effect, the San Diego Water Board Executive Officer may direct the Copermittees to replace current toxicity program elements with standardized procedures in the Toxicity Policy.

Table D-4. Dry Weather Chronic[1] Toxicity Testing for Receiving Water Monitoring Stations

Organism	Units	Test	USEPA Protocol
Freshwater			
Pimephales promelas (Fathead Minnow)	Pass / Fail	Larval Survival and Growth	EPA-821-R-02-013
Ceriodaphnia dubia (*Daphnid*)	Pass / Fail	Survival and Production	EPA-821-R-02-013
Selenastrum capricornutum (Green Algae)	Pass / Fail	Growth	EPA-821-R-02-013
Marine and Estuarine			
Strongylocentrotus purpuratus *(Purple Sea Urchin)*	Pass / Fail	Embryo-Larval Development	EPA-600-R-95-136

Notes:
1. Chronic toxicity testing is not required at receiving water monitoring stations located at mass loading stations if the channel flows are diverted year-round during dry weather conditions to the sanitary sewer for treatment.

(a) Freshwater Test Species and Methods: If samples are collected in receiving waters with salinity less than 1 ppt, the Copermittees must follow the methods for chronic toxicity tests as established in 40 CFR 136.3 using a single-concentration test design for routine monitoring, or a five-concentration test design for additional toxicity testing if the limitation is exceeded. The Copermittees must estimate the critical life stage chronic toxicity on undiluted samples in accordance with species and short term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms (EPA-821-R-02-013; Table IA, 40 CFR 136). Additional test species may be used by the Copermittees if approved by the San Diego Water Board Executive Officer. The Copermittees must conduct:

(i) A static renewal toxicity test with the fathead minnow, *Pimephales promelas* (Larval Survival and Growth Test Method 1000.0);

(ii) A static renewal toxicity test with the daphnid, *Ceriodaphnia dubia* (Survival and Reproduction Test Method 1002.0); and

(iii) A static renewal toxicity test with the green alga, *Selenastrum capricornutum* (also named *Raphidocelis subcapitata*) (Growth Test Method 1003.0).

(b) Marine and Estuarine Test Species and Methods: If samples are collected in receiving waters with salinity greater or equal to 1 ppt, the Copermittees must follow the methods for chronic toxicity tests as established in 40 CFR 136.3 using a single-concentration test design for routine monitoring, or a five-concentration test design for additional toxicity testing if the limitation is exceeded. The Copermittees must conduct the following critical life state chronic toxicity tests on undiluted samples in accordance with species and short term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms (EPA-600-R-95-136; 1995). Artificial sea salts must be used to increase sample salinity. The Copermittees must conduct a static non-renewal toxicity test with the purple sea urchin, *Strongylocentrotus purpuratus* (Embryo-larval Development Test Method). Additional species may be used by the Copermittees if approved by the San Diego Water Board Executive Officer.

(c) Holding Times: All toxicity tests must be conducted as soon as possible following sample collection. The 36-hour sample holding time for test initiation shall be targeted. However, no more than 72 hours shall elapse before the conclusion of sample collection and test initiation.

(d) Test Species Sensitivity Screening: To determine the most sensitive test species for freshwater, the Copermittees must screen 2 wet weather and 2 dry weather toxicity tests with a vertebrate, an invertebrate, and a plant species. After this screening period, subsequent monitoring must be conducted using the most sensitive test species. Alternatively, if a sensitive test species has already been determined, or if there is prior knowledge of potential toxicant(s) and a test species is sensitive to such toxicant(s), then monitoring must be conducted using only that test species. Sensitive test species determinations must also consider the most sensitive test species used for proximal receiving water monitoring. Rescreening must occur once each permit term.

(e) Chronic toxicity test biological endpoint data must be analyzed using the Test of Significant Toxicity t-test approach specified in *National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document* (USEPA, Office of Wastewater Management, Washington, D.C., EPA-833-R-10-003, 2010). For this monitoring program, the critical chronic instream waste concentration (IWC) is set at 100 percent receiving water (i.e. no dilution) for receiving water samples. A 100 percent receiving water and a control must be tested.

(f) Toxicity Identification Evaluation (TIE) / Toxicity Reduction Evaluation (TRE): If chronic toxicity is detected in receiving waters, the Copermittees must discuss the need for conducting a TIE/TRE in the assessments

required under Provision D.4.a.(2), and develop a plan for implementing the TIE/TRE to be incorporated in the Water Quality Improvement Plan.

(5) Dry Weather Receiving Water Bioassessment Monitoring

Bioassessment monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must conduct bioassessment monitoring during at least one dry weather monitoring event at each long-term receiving water monitoring station as follows:

(a) The following bioassessment samples and measurements must be collected:

(i) Macroinvertebrate samples must be collected in accordance with the "Reachwide Benthos (Multihabitat) Procedure" in the most current Surface Water Ambient Monitoring Program (SWAMP) Bioassessment Standard Operating Procedures (SOP), and amendments, as applicable;[16]

(ii) The "Full" suite of physical habitat characterization measurements must be collected in accordance with the most current SWAMP Bioassessment SOP, and as summarized in the SWAMP Stream Habitat Characterization Form – Full Version;[17] and

(iii) Freshwater algae samples must be collected in accordance with the SWAMP Standard Operating Procedures for Collecting Algae Samples.[18] Analysis of samples must include algal taxonomic composition (diatoms and soft algae) and algal biomass.

(b) The bioassessment samples, measurements, and appropriate water chemistry data must be used to calculate the following:

(i) An Index of Biological Integrity (IBI) for macroinvertebrates for each monitoring station where bioassessment monitoring was conducted, based on the most current calculation method;[19] and

[16] Ode, P.R.. 2007. Standard operating procedures for collecting macroinvertebrate samples and associated physical and chemical data for ambient bioassessments in California. California State Water Resources Control Board Surface Water Ambient Monitoring Program (SWAMP) Bioassessment SOP 001. http://www.swrcb.ca.gov/water_issues/programs/swamp/tools.shtml#monitoring
[17] Available at: http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/reports/fieldforms_fullversion052908.pdf
[18] Fetscher et al. 2009. Standard Operating Procedures for Collecting Stream Algae Samples and Associated Physical Habitat and Chemical Data for Ambient Bioassessments in California.
[19] The most current calculation method at the time the Order was adopted is outlined in "A Quantitative Tool for Assessing the Integrity of Southern California Coastal Streams" (Ode, et al. 2005. Environmental Management. Vol. 35, No. 1, pp. 1-13). If an updated or new calculation method is developed, either both

(ii) An IBI for algae for each monitoring station where bioassessment monitoring was conducted, when a calculation method is developed.[20]

(c) In lieu of the requirements of Provision D.1.c.(5)(a), the Copermittees may conduct the bioassessment monitoring in accordance with the "Triad" assessment approach[21] to calculate the IBIs required for Provision D.1.c.(5)(b). The Copermittees must conduct sampling, analysis, and reporting of specified in-stream biological and habitat data according to the protocols specified in the SCCWRP Technical Report No. 539, or subsequent protocols, if developed.

(6) Dry Weather Receiving Water Hydromodification Monitoring

In addition to the hydromodification monitoring conducted as part of the Copermittees' Hydromodification Management Plans, hydromodification monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must collect the following hydromodification monitoring observations and measurements within an appropriate domain of analysis during at least one dry weather monitoring event for each long-term receiving water monitoring station:

(a) Channel conditions, including:

(i) Channel dimensions,

(ii) Hydrologic and geomorphic conditions, and

(iii) Presence and condition of vegetation and habitat;

(b) Location of discharge points;

(c) Habitat integrity;

(d) Photo documentation of existing erosion and habitat impacts, with location (i.e. latitude and longitude coordinates) where photos were taken;

(e) Measurement or estimate of dimensions of any existing channel bed or bank eroded areas, including length, width, and depth of any incisions; and

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(i.e. current and updated/new) methods must be used, or historical IBIs must be recalculated with the updated or new calculation method.

[20] When a calculation method is developed, IBIs must be calculated for all available and appropriate historical data.

[21] Stormwater Monitoring Coalition Model Monitoring Technical Committee, 2004. Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California. Technical Report #419. August 2004.

(f) Known or suspected cause(s) of existing downstream erosion or habitat impact, including flow, soil, slope, and vegetation conditions, as well as upstream land uses and contributing new and existing development.

d. WET WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three wet weather monitoring events at each long-term receiving water monitoring station. At least one wet weather monitoring event must be conducted during the first wet weather event of the wet season (October 1 – April 30), and at least one wet weather monitoring event during a wet weather event that occurs after February 1.

(1) Wet Weather Receiving Water Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each long-term receiving water monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event;

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(d) Presence and assessment of trash in and around station.

(2) Wet Weather Receiving Water Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

(3) Wet Weather Receiving Water Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) Constituents listed in Table D-3.

(4) <u>Wet Weather Receiving Water Toxicity Monitoring</u>

For each wet weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for chronic aquatic toxicity in accordance with Provisions D.1.c.(4)(a)-(f).

e. OTHER RECEIVING WATER MONITORING REQUIREMENTS

(1) Regional Monitoring

The Copermittees must participate in the following regional receiving waters monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring; and

(b) Southern California Bight Regional Monitoring and

(c) Unified Beach Water Quality Monitoring and Assessment Program. The Orange County Copermittees shall participate in and, together with South Orange County Wastewater Authority and Orange County Health Care Agency, shall share responsibility for implementation of a unified regional beach water quality monitoring and assessment program in south Orange County, as set forth in the October 2014 report, *Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County* , issued pursuant to CWC section 13383 and subject to future revision in the San Diego Water Board December 5, 2014 Letter Directive.

(2) Sediment Quality Monitoring

The Copermittees must perform sediment monitoring to assess compliance with sediment quality receiving water limits applicable to MS4 discharges to enclosed bays and estuaries. The monitoring may be performed either by individual or multiple Copermittees to assess compliance with receiving water limits, or through participation in a water body monitoring coalition. A Sediment Monitoring Plan which satisfies the requirements of the State Water Board's Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part 1 Sediment Quality (Sediment Control Plan) must be submitted as part of the monitoring and assessment program in the Water Quality Improvement Plan.

(a) The Sediment Monitoring Plan design must include the following:

(i) The elements required under Section VII.D (Receiving Water Limits Monitoring Frequency) and Section VII.E (Sediment Monitoring) of the Sediment Control Plan;

(ii) A Quality Assurance Project Plan (QAPP) describing the project objectives and organization, functional activities, and quality assurance/quality control protocols for the water and sediment monitoring; and

(iii) A schedule for completion of all sample collection and analysis activities and submission of Sediment Monitoring Reports.

(b) The Copermittees must implement the Sediment Monitoring Plan in accordance with the schedule contained in the Sediment Monitoring Plan, unless otherwise directed in writing by the San Diego Water Board Executive Officer.

(c) The Copermittees must incorporate a Sediment Monitoring Report as part of the Water Quality Improvement Plan Annual Report in accordance with the schedule contained in the Sediment Monitoring Plan, unless otherwise directed in writing by the San Diego Water Board Executive Officer. The Sediment Monitoring Report must contain the following information:

(i) Analysis: An evaluation, interpretation and tabulation of the water and sediment monitoring data, including interpretations and conclusions as to whether applicable Receiving Water Limitations in this Order have been attained at each sample station;

(ii) Sample Location Map: The locations, type, and number of samples must be identified and shown on a site map; and

(iii) California Environmental Data Exchange Network: A statement certifying that the monitoring data and results have been uploaded into the California Environmental Data Exchange Network (CEDEN).

(d) Based on the Sediment Monitoring Report conclusions the San Diego Water Board may require a human health risk assessment to determine if the human health objective contained in Receiving Water Limitations in Provision A.2.a.(3)(b)(ii) has been attained at each sample station. In conducting a risk assessment, the Copermittees must consider any applicable and relevant information, including California Environmental Protection Agency's (Cal/EPA) Office of Environmental Health Hazard Assessment (OEHHA) policies for fish consumption and risk assessment, Cal/EPA's Department of Toxic Substances Control (DTSC) Risk Assessment, and USEPA Human Health Risk Assessment policies.

(3) <u>ASBS Monitoring</u>

For Watershed Management Areas with ASBS, the Copermittees must implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

f. ALTERNATIVE WATERSHED MONITORING REQUIREMENTS

The San Diego Water Board may direct the Copermittees to participate in an effort to develop alternative watershed monitoring with other regulated entities, other interested parties, and the San Diego Water Board to refine, coordinate, and implement regional monitoring and assessment programs to determine the status and trends of water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams.

2. MS4 Outfall Discharge Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the discharges from the MS4 outfalls in each Watershed Management Area during dry weather and wet weather. Following San Diego Water Board acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct MS4 outfall discharge monitoring during implementation of the Water Quality Improvement Plan to assess the effectiveness of their jurisdictional runoff management programs toward effectively prohibiting non-storm water discharges into the MS4 and reducing pollutants in storm water discharges from their MS4s to the MEP. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following MS4 outfall monitoring procedures:

a. TRANSITIONAL MS4 OUTFALL DISCHARGE MONITORING

Until the monitoring requirements and schedules of Provisions D.2.b-c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following MS4 outfall discharge monitoring in the Watershed Management Area:

(1) <u>MS4 Outfall Discharge Monitoring Station Inventory</u>

Each Copermittee must identify all major MS4 outfalls that discharge directly to receiving waters within its jurisdiction and geo-locate those outfalls on a map of the MS4 pursuant to Provision E.2.b.(1). This information must be compiled into a MS4 outfall discharge monitoring station inventory, and must include the following information:

(a) Latitude and longitude of MS4 outfall point of discharge;

(b) Watershed Management Area;

(c) Hydrologic subarea;

(d) Outlet size;

(e) Accessibility (i.e. safety and without disturbance of critical habitat);

(f) Approximate drainage area; and

(g) Classification of whether the MS4 outfall is known to have persistent dry weather flows, transient dry weather flows, no dry weather flows, or unknown dry weather flows.

(2) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Until the monitoring requirements and schedules of Provision D.2.b are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, each Copermittee must perform dry weather MS4 outfall field screening monitoring to identify non-storm water and illicit discharges within its jurisdiction in accordance with Provision E.2.c, to determine which discharges are transient flows and which are persistent flows, and prioritize the dry weather MS4 discharges that will be investigated and eliminated in accordance with Provision E.2.d.

(a) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Frequency

Each Copermittee must field screen the MS4 outfalls in its inventory developed pursuant to Provision D.2.a.(1) as follows:

(i) For Copermittees with less than 125 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 80 percent of the outfalls must be visually inspected two times per year during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv).

(ii) For Copermittees with 125 major MS4 outfalls or more, but less than or equal to 500 that discharge to receiving waters within a Watershed Management Area, all the outfalls must be visually inspected at least annually during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv).

(iii) For Copermittees with more than 500 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 500 outfalls must be visually inspected at least annually during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv). Copermittees with more than 500 major MS4 outfalls within a Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;

[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(iv) For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major MS4 outfalls within its jurisdiction, at least 500 major MS4 outfalls within its inventory must be visually inspected at least annually during dry weather conditions. Copermittees with more than 500 major MS4 outfalls in more than one Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(v) Inspections of major MS4 outfalls conducted in response to public reports and staff or contractor reports and notifications may count toward the required visual inspections of MS4 outfall discharge monitoring stations.

(b) Transitional Dry Weather MS4 Outfall Discharge Field Screening Visual Observations

(i) An antecedent dry period of at least 72 hours following any storm event producing measurable rainfall greater than 0.1 inch is required prior to conducting field screening visual observations during a field screening monitoring event.

(ii) During the field screening monitoring event, each Copermittee must record visual observations consistent with Table D-5 at each MS4 outfall discharge monitoring station inspected.

Table D-5. Field Screening Visual Observations for MS4 Outfall Discharge Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) - Flow source(s) suspected or identified from non-storm water source investigation - Flow source(s) eliminated during non-storm water source identification • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) - Known or suspected source(s) of pooled or ponded water • Station description (i.e. deposits or stains, vegetation condition, structural condition, observable biology) • Presence and assessment of trash in and around station • Evidence or signs of illicit connections or illegal dumping

(iii) Each Copermittee must implement the requirements of Provisions E.2.d.(2)(c)-(e) based on the field observations required pursuant to Provision D.2.a.(2)(b)(ii).

(iv) Each Copermittee must evaluate field observations together with existing information available from prior reports, inspections and monitoring results to determine whether any observed flowing, pooled, or ponded waters are likely to be transient or persistent flow.[22]

(c) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Records

Based upon the results of the transitional dry weather MS4 outfall discharge field screening monitoring conducted pursuant to Provisions D.2.a.(2)(a)-(b), each Copermittee must update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow.

(3) <u>Transitional Wet Weather MS4 Outfall Discharge Monitoring</u>

Until the monitoring requirements and schedules of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the

[22] Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(a) Transitional Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees must select wet weather MS4 outfall discharge monitoring stations from the inventories developed pursuant to Provision D.2.a.(1) for each Watershed Management Area as follows:

(i) At least five wet weather MS4 outfall discharge monitoring stations that are representative of storm water discharges from areas consisting primarily of residential, commercial, industrial, and typical mixed-use land uses present within the Watershed Management Area;

(ii) At least one wet weather MS4 outfall discharge monitoring station for each Copermittee within the Watershed Management Area; and

(iii) The County of San Diego may select at least two (2) wet weather MS4 outfall discharge monitoring stations for the portion of the Santa Margarita River Watershed Management Area within its jurisdiction to be monitored during the transitional period until the Riverside County Copermittees are notified of coverage under this Order. After the Riverside County Copermittees are notified of coverage under this Order, the Copermittees in the Watershed Management Area must select wet weather MS4 outfall discharge monitoring stations consistent with the requirements above.

(b) Transitional Wet Weather MS4 Outfall Discharge Monitoring Frequency

Each wet weather MS4 outfall discharge monitoring station selected pursuant to Provision D.2.a.(3)(a) must be monitored once during the wet season (October 1 – April 30). The wet weather monitoring events must be selected to be representative of the range of hydrological conditions experienced in the region. At least 10 percent of samples must be conducted during the first wet weather event of the wet season, to include at least one such sample in each Watershed Management Area..

(c) Transitional Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(i) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(ii) The flow rates and volumes measured or estimated from the MS4 outfall (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(d) Transitional Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(e) Transitional Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, and indicator bacteria;

(iv) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

[a] Time-weighted composites collected over the length of the storm event or the first 24 hour period whichever is shorter, composed of discrete samples, which may be collected through the use of automated equipment, or

[b] Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

[c] If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during

the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours;

(v) Only one analysis of the composite of aliquots is required;

(vi) The samples must be analyzed for the following constituents:

[a] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

[b] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and

[c] Constituents listed in Table D-6.

Table D-6. Analytical Monitoring Constituents for Wet Weather MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Nickel • Selenium • Thallium • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(f) Other Transitional Wet Weather MS4 Outfall Discharge Monitoring

The San Diego County Copermittees must continue the wet weather MS4 outfall monitoring program developed under Order No. R9-2007-0001, as approved by the San Diego Water Board, through its planned completion.

b. DRY WEATHER MS4 OUTFALL DISCHARGE MONITORING

Each Copermittee must perform dry weather MS4 outfall monitoring to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision

E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. Each Copermittee must conduct the following dry weather MS4 outfall discharge monitoring within its jurisdiction:

(1) Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Each Copermittee must continue to perform the dry weather MS4 outfall discharge field screening monitoring in accordance with the requirements of Provision D.2.a.(2). The Copermittee may adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of persistent flow non-storm water discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of visual inspections performed is equivalent to the number of visual inspections required under Provision D.2.a.(2)(a).

(2) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring

Each Copermittee must perform non-storm water persistent flow MS4 outfall discharge monitoring to determine which persistent non-storm water discharges contain concentrations of pollutants below NALs, and which persistent non-storm water discharges impact receiving water quality during dry weather. Each Copermittee must conduct the following non-storm water persistent flow MS4 outfall discharge monitoring within its jurisdiction:

(a) Prioritization of Non-Storm Water Persistent Flow MS4 Outfalls

Based upon the dry weather MS4 outfall discharge field screening monitoring records developed pursuant to Provision D.2.a.(2)(c), each Copermittee must identify and prioritize the MS4 outfalls with persistent flows based on the highest priority water quality conditions identified in the Water Quality Improvement Plan and any additional criteria developed by the Copermittee, which may include historical data and data from sources other than what the Copermittee collects.

(b) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring Frequency

(i) Based on the prioritization of major MS4 outfalls developed under Provision D.2.b.(2)(a), each Copermittee must identify, at a minimum, the 5 highest priority major MS4 outfalls with non-storm water persistent flows that the Copermittee will monitor within its jurisdiction in each Watershed Management Area. For Responsible Copermittees identified by a TMDL in Attachment E to this Order, if the 5 chosen outfall locations are not sufficient to determine compliance with the TMDL(s), then each Responsible Copermittee

must identify additional MS4 outfall monitoring locations within its jurisdiction sufficient to address compliance with the TMDL(s). If a Copermittee has less than 5 major outfalls within a Watershed Management Area, then the Copermittee must monitor all of its major MS4 outfalls with persistent flows within each Watershed Management Area. The location of the highest priority non-storm water persistent flow MS4 outfall monitoring stations must be identified on the map required pursuant to Provision E.2.b.(1). The map must specify which MS4 outfalls are being monitored for compliance with a TMDL.

(ii) Each of the highest priority non-storm water persistent flow MS4 outfall monitoring stations identified pursuant to Provision D.2.b.(2)(b)(i) must be monitored under dry weather conditions at least semi-annually until one of the following occurs:

[a] The non-storm water discharges have been effectively eliminated (i.e. no flowing, pooled, or ponded water) for three consecutive dry weather monitoring events; or

[b] The source(s) of the persistent flows has been identified as a category of non-storm water discharges that does not require an NPDES permit and does not have to be addressed as an illicit discharge because it was not identified as a source of pollutants (i.e. constituents in non-storm water discharge do not exceed NALs), and the persistent flow can be re-prioritized to a lower priority; or

[c] The constituents in the persistent flow non-storm water discharge do not exceed NALs, and the persistent flow can be re-prioritized to a lower priority; or

[d] The source(s) of the persistent flows has been identified as a non-storm water discharge authorized by a separate NPDES permit.

(iii) Where the criteria under Provision D.2.b.(2)(b)(ii) are not met, but the threat to water quality has been reduced by the Copermittee, the highest priority persistent flow MS4 outfall monitoring stations may be reprioritized accordingly for continued dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1).

(iv) Each Copermittee must document removal or re-prioritization of the highest priority persistent flow MS4 outfall monitoring stations identified under Provision D.2.b.(2)(a) in the Water Quality Improvement Plan Annual Report. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized major MS4 outfall in the Watershed Management Area within its jurisdiction, unless there are no remaining qualifying major MS4 outfalls within the Copermittee's jurisdiction in the Watershed Management Area.

(c) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Observations

During each semi-annual monitoring event, each Copermittee must record field observations consistent with Table D-5 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(d) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Monitoring

During each semi-annual monitoring event, if conditions allow the collection of the data, each Copermittee must monitor and record the parameters in Table D-2 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(e) Non-Storm Water Persistent Flow MS4 Outfall Discharge Analytical Monitoring

During each semi-annual monitoring event in which measurable flow is present, each Copermittee must collect and analyze samples from each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Collect grab or composite samples to be analyzed at a qualified laboratory for the following constituents:

[a] Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,
[b] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,
[c] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,
[d] Applicable NAL constituents, and
[e] Constituents listed in Table D-7. The Copermittees may adjust the list of constituents for the Watershed Management Area if historical data or supporting information can be provided that demonstrates or justifies the analysis of a constituent is not necessary.

Table D-7. Analytical Monitoring Constituents for Persistent Flow MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Total Hardness • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Cadmium • Copper • Lead • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(iv) If the Copermittee identifies and eliminates the source of the persistent flow non-storm water discharge, analysis of the sample is not required.

c. WET WEATHER MS4 OUTFALL DISCHARGE MONITORING

The Copermittees must perform wet weather MS4 outfall monitoring to identify pollutants in storm water discharges from the MS4s, to guide pollutant source identification efforts, and to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order. The Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(1) Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees may adjust the wet weather MS4 outfall discharge monitoring locations in the Watershed Management Area, as needed, to identify pollutants in storm water discharges from MS4s, to guide pollutant source identification efforts, and to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of stations is at least equivalent to the number of stations required under Provision D.2.a.(3)(a). Additional outfall monitoring locations, above the minimum per jurisdiction, may be required to demonstrate compliance with the WQBELs associated with the applicable TMDLs in Attachment E.

(2) Wet Weather MS4 Outfall Discharge Monitoring Frequency

The Copermittees must monitor the wet weather MS4 outfall discharge monitoring stations in the Watershed Management Area at least once (1) per year. The Copermittees may need to increase the frequency of monitoring in order to identify pollutants in storm water discharges from the MS4s causing or contributing to the highest priority water quality conditions, to guide pollutant source identification efforts, or to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order.

(3) Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(4) Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(5) Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites collected over the length of the storm event or the first 24 hour period, whichever is shorter , composed of discrete samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

(iii) If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours.

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) The Copermittees may adjust the analytical monitoring required for the Watershed Management Area, if the Copermittees have historical data or supporting information that can demonstrate or provide justification that the analysis of a constituent is not necessary.

3. Special Studies

a. Within the term of this Order, the Copermittees must initiate the following special studies:

(1) At least two special studies in each Watershed Management Area to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that cause or contribute to highest priority water quality conditions identified in the Water Quality Improvement Plan.

(2) At least one special study for the San Diego Region to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that are impacting receiving waters on a regional basis in the San Diego Region.

(3) One of the two special studies in each Watershed Management Area required pursuant to Provision D.3.a.(1) may be replaced by a special study implemented pursuant to Provision D.3.a.(2).

b. The special studies must, at a minimum, be in conformance with the following criteria:

(1) The special studies must be related to the highest priority water quality conditions identified by the Copermittees in the Watershed Management Area and/or for the entire San Diego Region;

(2) The special studies developed pursuant to Provision D.3.a.(1) must:

(a) Be implemented within the applicable Watershed Management Area, and

(b) Require some form of participation by all the Copermittees within the Watershed Management Area;

(3) The special studies developed pursuant to Provision D.3.a.(2) must:

(a) Be implemented within the San Diego Region, and

(b) Require some form of participation by all Copermittees covered under the requirements of this Order.

(4) The Copermittees are encouraged to partner with environmental groups or third parties knowledgeable of watershed conditions to complete the required special studies.

c. Special studies developed to identify sources of pollutants and/or stressors should be pollutant and/or stressor specific and based on historical monitoring data and monitoring performed pursuant to Provisions D.1 and D.2. Development of source identification special studies should include the following:

(1) A compilation of known information on the specific pollutant and/or stressor, including data on potential sources and movement of the pollutant and/or stressor within the watershed. Data generated by the Copermittees and others, as well as information available from a literature research on the pollutant and/or stressor should be compiled and analyzed as appropriate.

(2) An identification of data gaps, based on the compiled information generated on the specific pollutant and/or stressor identified in Provision D.3.c.(1). Source identification special studies should be developed to fill identified data gaps.

(3) A monitoring plan that will collect and provide data the Copermittees can utilize to do the following:

(a) Quantify the relative loading or impact of a pollutant and/or stressor from a particular source or pollutant generating activity;

(b) Improve understanding of the fate of a pollutant and/or stressor in the environment;

(c) Develop an inventory of known and suspected sources of a pollutant and/or stressor in the Watershed Management Area; and/or

(d) Prioritize known and suspected sources of a pollutant and/or stressor based on relative magnitude in discharges, geographical distribution (i.e., regional or localized), frequency of occurrence in discharges, human health risk, and controllability.

d. Special studies initiated prior to the effective date of this Order that meet the requirements of Provision D.3.b and are implemented during the term of this Order as part of the Water Quality Improvement Plan may be utilized to fulfill the special study requirements of Provision D.3.a. Special studies completed before the effective date of this Order cannot be utilized to fulfill the special study requirements of Provision D.3.a.

e. The Copermittees must submit the monitoring plans for the special studies in the Water Quality Improvement Plans required pursuant to Provision F.1.

f. The Copermittees are encouraged to share the results of the special studies regionally among the Copermittees to provide information useful in improving and adapting the management of non-storm water and storm water runoff through the implementation of the Water Quality Improvement Plans.

4. Assessment Requirements

Each Copermittee must evaluate the data collected pursuant to Provisions D.1, D.2 and D.3, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E, to assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a. Assessments must be performed as described in the following provisions:

a. Receiving Waters Assessments

(1) The Copermittees must assess and report the conditions of the receiving waters in the Watershed Management Area as follows:

(a) Based on data collected pursuant to Provision D.1.a, the assessments under Provision D.4.a.(2) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(b) Based on the data collected pursuant to Provisions D.1.a-e, the assessments required under Provision D.4.a.(2) must be included in the Report of Waste Discharge required pursuant to Provision F.5.b.

(2) The Copermittees must assess the status and trends of receiving water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under dry weather and wet weather conditions. For each of the three types of receiving waters in each Watershed Management Area the Copermittees must:

(a) Determine whether or not the conditions of the receiving waters are meeting the numeric goals established pursuant to Provision B.3.a;

(b) Identify the most critical beneficial uses that must be protected to ensure overall health of the receiving water;

(c) Determine whether or not those critical beneficial uses are being protected;

(d) Identify short-term and/or long-term improvements or degradation of those critical beneficial uses;

(e) Determine whether or not the strategies established in the Water Quality Improvement Plan contribute towards progress in achieving the interim and final numeric goals of the Water Quality Improvement Plan; and

(f) Identify data gaps in the monitoring data necessary to assess Provisions D.4.a.(2)(a)-(e).

b. MS4 OUTFALL DISCHARGES ASSESSMENTS

(1) Non-Storm Water Discharges Reduction Assessments

(a) Each Copermittee must assess and report the progress of its illicit discharge detection and elimination program, required to be implemented pursuant to Provision E.2, toward effectively prohibiting non-storm water and illicit discharges into the MS4 within its jurisdiction as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(2), the assessments under Provision D.4.b.(1)(b) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(ii) Based on the data collected pursuant to Provisions D.2.b, the assessments required under Provision D.4.b.(1)(c) must be included in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

(iii) Based on the data collected pursuant to Provisions D.2.b, the assessment required under Provision D.4.b.(1)(c) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.a.(2), each Copermittee must assess and report the following:

(i) Identify the known and suspected controllable sources (e.g. facilities, areas, land uses, pollutant generating activities) of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area;

(ii) Identify sources of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area that have been reduced or eliminated; and

(iii) Identify modifications to the field screening monitoring locations and frequencies for the MS4 outfalls in its inventory necessary to identify and eliminate sources of persistent flow non-storm water discharges pursuant to Provision D.2.b.

(c) Based on the dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1), each Copermittee must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(1)(b);

(ii) Based on the data collected and applicable NALs in the Water Quality Improvement Plan, rank the MS4 outfalls in the Copermittee's jurisdiction according to potential threat to receiving water quality, and produce a prioritized list of major MS4 outfalls for follow-up action to update the Water Quality Improvement Plan, with the goal of eliminating persistent flow non-storm water discharges and/or pollutant loads in order of the ranked priority list through targeted programmatic actions and source investigations;

(iii) For the highest priority major MS4 outfalls with persistent flows that are in exceedance of NALs, identify the known and suspected sources within the Copermittee's jurisdiction in the Watershed Management Area that may cause or contribute to the NAL exceedances;

(iv) Each Copermittee must analyze the data collected pursuant to Provision D.2.b, and utilize a model or other method, to calculate or estimate the non-storm water volumes and pollutant loads collectively discharged from all the major MS4s outfalls in its jurisdiction identified as having persistent dry weather flows during the monitoring year. These calculations or estimates must be updated annually.

[a] Each Copermittee must calculate or estimate the annual non-storm water volumes and pollutant loads collectively discharged from the Copermittee's major MS4 outfalls to receiving waters within the Copermittee's jurisdiction, with an estimate of the percent contribution from each known source for each MS4 outfall;

[b] Each Copermittee must annually identify and quantify (i.e. volume and pollutant loads) sources of non-storm water not subject to the Copermittee's legal authority that are discharged from the Copermittee's major MS4 outfalls to downstream receiving waters.

(v) Each Copermittee must review the data collected pursuant to Provision D.2.b and findings from the assessments required pursuant to Provision D.4.b.(1)(c)(i)-(iv) at least once during the term of this Order to:

[a] Identify reductions and progress in achieving reductions in non-storm water and illicit discharges to the Copermittee's MS4 in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction, with an estimate, if possible, of the non-storm water volume and/or pollutant load reductions attributable to specific water quality strategies implemented by the Copermittee; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittee in the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction.

(vi) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(1)(c)(i)-(v).

(2) <u>Storm Water Pollutant Discharges Reduction Assessments</u>

(a) The Copermittees must assess and report the progress of the water quality improvement strategies, required to be implemented pursuant to Provisions B and E, toward reducing pollutants in storm water discharges from the MS4s within the Watershed Management Area as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(3), the assessments under Provision D.4.b.(2)(b) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(ii) Based on the data collected pursuant to Provisions D.2.c, the assessments required under Provision D.4.b.(2)(c) must be included in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

(iii) Based on the data collected pursuant to Provisions D.2.c, the assessment required under Provisions D.4.b.(2)(c)-(d) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.a.(3) the Copermittees must assess and report the following:

(i) The Copermittees must analyze the monitoring data collected pursuant to Provision D.2.a.(3), and utilize a watershed model or other method, to calculate or estimate the following for each monitoring year:

[a] The average storm water runoff coefficient for each land use type within the Watershed Management Area;
[b] The volume of storm water and pollutant loads discharged from each of the Copermittee's monitored MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch;
[c] The total flow volume and pollutant loadings discharged from the Copermittee's jurisdiction within the Watershed Management Area over the course of the wet season, extrapolated from the data produced from the monitored MS4 outfalls; and
[d] The percent contribution of storm water volumes and pollutant loads discharged from each land use type within each hydrologic subarea with a major MS4 outfall to receiving waters or within each major MS4 outfall to receiving waters in the Copermittee's jurisdiction within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch.

(ii) Identify modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify pollutants in storm water discharges from the MS4s in the Watershed Management Area pursuant to Provision D.2.c.(1).

(c) Based on the wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.c the Copermittees must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(2)(b);

(ii) Based on the data collected and applicable SALs in the Water Quality Improvement Plan, analyze and compare the monitoring data to the analyses and assumptions used to develop the Water Quality Improvement Plans, including strategies developed pursuant to Provision B.3, and evaluate whether those analyses and assumptions should be updated as a component of the adaptive management efforts pursuant to Provision B.5 for follow-up action to update the Water Quality Improvement Plan;

(iii) The Copermittees must review the data collected pursuant to Provision D.2.c and findings from the assessments required pursuant to Provisions D.4.b.(2)(c)(i)-(ii) at least once during the term of this Order to:

[a] Identify reductions or progress in achieving reductions in pollutant concentrations and/or pollutant loads from different land uses and/or drainage areas discharging from the Copermittees' MS4s in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters within the Watershed Management Area to the MEP, with an estimate, if possible, of the pollutant load reductions attributable to specific water quality strategies implemented by the Copermittees; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittees in the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters in the Watershed Management Area to the MEP.

(iv) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(iii).

(d) The Copermittees must evaluate all the data collected pursuant to Provision D.2.c, and incorporate new outfall monitoring data into time series plots for each long-term monitoring constituent for the Watershed Management Area, and perform statistical trends analysis on the cumulative long-term wet weather MS4 outfall discharge water quality data set.

c. Special Studies Assessments

The Copermittees must annually evaluate the results and findings from the special studies developed and implemented pursuant to Provision D.3, and assess their relevance to the Copermittees' efforts to characterize receiving water conditions, understand sources of pollutants and/or stressors, and control and reduce the discharges of pollutants from the MS4 outfalls to receiving waters in the Watershed Management Area. The Copermittees must report the results of the special studies assessments applicable to the Watershed Management Area, and identify any necessary modifications or updates to the Water Quality Improvement Plan based on the results in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

d. Integrated Assessment of Water Quality Improvement Plan

As part of the iterative approach and adaptive management process required for the Water Quality Improvement Plan pursuant to Provision B.5, the Copermittees in each Watershed Management Area must integrate the data collected pursuant to Provisions D.1-D.3, the findings from the assessments required pursuant to

Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to assess the effectiveness of, and identify necessary modifications to, the Water Quality Improvement Plan as follows:

(1) The Copermittees must re-evaluate the priority water quality conditions and numeric goals for the Watershed Management Area, as needed, during the term of this Order pursuant to Provision B.5.a. The re-evaluation and recommendations for modifications to the priority water quality conditions, and/or numeric goals and corresponding schedules may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The priority water quality conditions and numeric goals for the Watershed Management Area must be re-evaluated as follows:

(a) Re-evaluate the receiving water conditions in the Watershed Management Area in accordance with Provision B.2.a;

(b) Re-evaluate the impacts on receiving waters in the Watershed Management Area from MS4 discharges in accordance with Provision B.2.b;

(c) Re-evaluate the identification of MS4 sources of pollutants and/or stressors in accordance with Provision B.2.d;

(d) Identify beneficial uses of the receiving waters that are protected in accordance with Provision D.4.a;

(e) Evaluate the progress toward achieving the interim and final numeric goals for protecting impacted beneficial uses in the receiving waters.

(2) The Copermittees must re-evaluate the water quality improvement strategies for the Watershed Management Area during the term of this Order pursuant to Provision B.5.b. The re-evaluation and recommendations for modifications to the water quality improvement strategies and schedules may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The water quality improvement strategies for the Watershed Management Area must be re-evaluated as follows:

(a) Identify the non-storm water and storm water pollutant loads from the Copermittees' MS4 outfalls in the Watershed Management Area, calculated or estimated pursuant to Provisions D.4.b;

(b) Identify the non-storm water and storm water pollutant load reductions, or other improvements to receiving water or water quality conditions, that are necessary to attain the interim and final numeric goals identified in the Water Quality Improvement Plan for protecting beneficial uses in the receiving waters;

(c) Identify the non-storm water and storm water pollutant load reductions, or other improvements to the quality of MS4 discharges, that are necessary for the Copermittees to demonstrate that non-storm water and storm water discharges from their MS4s are not causing or contributing to exceedances of receiving water limitations;

(d) Evaluate the progress of the water quality improvement strategies toward achieving the interim and final numeric goals identified in the Water Quality Improvement Plan for protecting beneficial uses in the receiving waters.

(3) The Copermittees must re-evaluate and adapt the water quality monitoring and assessment program for the Watershed Management Area when new information becomes available to improve the monitoring and assessment program pursuant to Provision B.5.c. The re-evaluation and recommendations for modifications to the monitoring and assessment program may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. Modifications to the water quality monitoring and assessment program must be consistent with the requirements of Provision D.1-D.3. The re-evaluation of the water quality monitoring and assessment program for the Watershed Management Area must consider the data gaps identified by the assessments required pursuant to Provisions D.4.a-b, and results of the special studies implemented pursuant to Provision D.4.c.

5. Monitoring Provisions

Each Copermittee must comply with all the monitoring, reporting, and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

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E. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS

The purpose of this provision is for each Copermittee to implement a program to control the contribution of pollutants to and the discharges from the MS4 within its jurisdiction. The goal of the jurisdictional runoff management programs is to implement strategies that effectively prohibit non-storm water discharges to the MS4 and reduce the discharge of pollutants in storm water to the MEP. This goal will be accomplished through implementing the jurisdictional runoff management programs in accordance with the strategies identified in the Water Quality Improvement Plans.

Each Copermittee must update its jurisdictional runoff management program document, in accordance with Provision F.2.a, to incorporate all the requirements of Provision E. Until the Copermittee has updated its jurisdictional runoff management program document with the requirements of Provision E, the Copermittee must continue implementing its current jurisdictional runoff management program.

1. Legal Authority Establishment and Enforcement

a. Each Copermittee must establish, maintain, and enforce adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 through statute, ordinance, permit, contract, order, or similar means. This legal authority must, at a minimum, authorize the Copermittee to:

(1) Prohibit and eliminate all illicit discharges and illicit connections to its MS4;

(2) Control the contribution of pollutants in discharges of runoff associated with industrial and construction activity to its MS4 and control the quality of runoff from industrial and construction sites, including industrial and construction sites which have coverage under the statewide General Permit for Discharges of Storm Water Associated with Industrial Activities (Industrial General Permit) or General Permit for Discharges of Storm Water Associated with Construction Activities (Construction General Permit), as well as to those sites which do not;

(3) Control the discharge of spills, dumping, or disposal of materials other than storm water into its MS4;

(4) Control through interagency agreements among Copermittees the contribution of pollutants from one portion of the MS4 to another portion of the MS4;

(5) Control, by coordinating and cooperating with other owners of the MS4 such as Caltrans, the U.S. federal government, or sovereign Native American Tribes through interagency agreements, where possible, the contribution of pollutants from their portion of the MS4 to the portion of the MS4 within the Copermittee's jurisdiction;

(6) Require compliance with conditions in its statutes, ordinances, permits, contracts, orders, or similar means to hold dischargers to its MS4 accountable for their contributions of pollutants and flows;

(7) Require the use of BMPs to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(8) Require documentation on the effectiveness of BMPs implemented to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(9) Utilize enforcement mechanisms to require compliance with its statutes, ordinances, permits, contracts, orders, or similar means; and

(10) Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with its statutes, ordinances, permits, contracts, orders, or similar means and with the requirements of this Order, including the prohibition of illicit discharges and connections to its MS4; the Copermittee must also have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from industrial facilities, including construction sites, discharging into its MS4.

b. With the first Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3), each Copermittee must submit a statement certified by its Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative that the Copermittee has taken the necessary steps to obtain and maintain full legal authority within its jurisdiction to implement and enforce each of the requirements contained in this Order.

2. Illicit Discharge Detection and Elimination

Each Copermittee must implement a program to actively detect and eliminate illicit discharges and improper disposal into the MS4, or otherwise require the discharger to apply for and obtain a separate NPDES permit. The illicit discharge detection and elimination program must be implemented in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include, at a minimum, the following requirements:

a. Non-Storm Water Discharges

Each Copermittee must address all non-storm water discharges as illicit discharges unless a non-storm water discharge is either identified as a discharge authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to the following requirements:

(1) Discharges of non-storm water to the MS4 from the following categories must be addressed as illicit discharges unless the discharge has coverage or meets the exception criteria under NPDES Permit No. CAG919003(Order No. R9-2015-0013, as it may be amended or reissued) for discharges to surface waters within the San Diego Region:

(1) Uncontaminated pumped ground water;

(2) Discharges from foundation drains;[23]

(3) Water from crawl space pumps; and

(4) Water from footing drains.[20]

(2) Discharges of non-storm water from water line flushing and water main breaks to the MS4 must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG679001 (Order No. R9-2010-0003, as it may be amended or reissued) or NPDES General Permit No. CAG140001 (Order 2014-0194-DWQ, as it may be amended or reissued). This category includes water line flushing and water main break discharges from water purveyors issued a water supply permit by the California Department of Public Health or federal military installations. Discharges from recycled or reclaimed water lines to the MS4 must be addressed as illicit discharges, unless the discharges have coverage under a separate NPDES permit.

(3) Discharges of non-storm water to the MS4 from the following categories must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a source of pollutants to receiving waters:

(a) Diverted stream flows;

(b) Rising ground waters;

(c) Uncontaminated ground water infiltration to MS4s;

(d) Springs;

(e) Flows from riparian habitats and wetlands;

(f) Discharges from potable water sources;

[23] Provision E.2.a.(1) only applies to this category of non-storm water if the system is designed to be located at or below the groundwater table to actively or passively extract groundwater during any part of the year.

(g) Discharges from foundation drains;[24] and

(h) Discharges from footing drains.[21]

(4) Discharges of non-storm water to the MS4 from the following categories must be controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means. Discharges of non-storm water to the MS4 from the following categories not controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means must be addressed by the Copermittee as illicit discharges.

(a) Air conditioning condensation

The discharge of air conditioning condensation should be directed to landscaped areas or other pervious surfaces, or to the sanitary sewer, where feasible.

(b) Individual residential vehicle washing

(i) The discharge of wash water should be directed to landscaped areas or other pervious surfaces where feasible; and

(ii) The minimization of water, washing detergent and other vehicle wash products used for residential vehicle washing, and the implementation of other practices or behaviors that will prevent the discharge of pollutants associated with individual residential vehicle washing from entering the MS4 must be encouraged.

(c) Dechlorinated swimming pool discharges

(i) Residual chlorine, algaecide, filter backwash, or other pollutants from swimming pools must be eliminated prior to discharging to the MS4; and

(ii) The discharge of saline swimming pool water must be directed to the sanitary sewer, landscaped areas, or other pervious surfaces that can accommodate the volume of water, unless the saline swimming pool water can be discharged via a pipe or concrete channel directly to a naturally saline water body (e.g. Pacific Ocean).

(5) Firefighting discharges to the MS4 must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a significant source of pollutants to receiving waters. Firefighting discharges to the MS4 not identified as a significant

[24] Provision E.2.a.(3) only applies to this category of non-storm water discharge if the system is designed to be located above the groundwater table at all times of the year, and the system is only expected to discharge non-storm water under unusual circumstances.

source of pollutants to receiving waters, must be addressed, at a minimum, as follows:

(a) Non-emergency firefighting discharges

(i) Building fire suppression system maintenance discharges (e.g. sprinkler line flushing) to the MS4 must be addressed as illicit discharges unless BMPs are implemented to prevent pollutants associated with such discharges to the MS4.

(ii) Non-emergency firefighting discharges (i.e., discharges from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems) must be addressed by a program, to be developed and implemented by the Copermittee, to reduce or eliminate pollutants in such discharges from entering the MS4.

(b) Emergency firefighting discharges

Each Copermittee should develop and encourage implementation of BMPs to reduce or eliminate pollutants in emergency firefighting discharges to the MS4s and receiving waters within its jurisdiction. During emergency situations, priority of efforts should be directed toward life, property, and the environment (in descending order). BMPs should not interfere with immediate emergency response operations or impact public health and safety.

(6) If the Copermittee or San Diego Water Board identifies any category of non-storm water discharges listed under Provisions E.2.a.(1)-(4) as a source of pollutants to receiving waters, the category must be prohibited through ordinance, order, or similar means and addressed as an illicit discharge. Alternatively, the Copermittee may propose controls to be implemented for the category of non-storm water discharges as part of the Water Quality Improvement Plan instead of prohibiting the category of non-storm water discharges, and implement the controls if accepted by the San Diego Water Board as part of the Water Quality Improvement Plan.

(7) Each Copermittee must, where feasible and priorities and resources allow, reduce or eliminate non-storm water discharges listed under Provisions E.2.a.(1)-(4) into its MS4, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit.

b. PREVENT AND DETECT ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to prevent and detect illicit discharges to the MS4:

(1) Each Copermittee must maintain an updated map of its entire MS4 and the

corresponding drainage areas. The accuracy of the MS4 map must be confirmed during the field screening required pursuant to Provision E.2.c. The MS4 map must be included as part of the jurisdictional runoff management program document. Any geographic information system (GIS) layers or files used by the Copermittee to maintain the MS4 map must be made available to the San Diego Water Board upon request. The MS4 map must identify the following:

(a) All segments of the MS4 owned, operated, and maintained by the Copermittee;

(b) All known locations of inlets that discharge and/or collect runoff into the Copermittee's MS4;

(c) All known locations of connections with other MS4s not owned or operated by the Copermittee (e.g. Caltrans MS4s);

(d) All known locations of MS4 outfalls and private outfalls that discharge runoff collected from areas within the Copermittee's jurisdiction;

(e) All segments of receiving waters within the Copermittee's jurisdiction that receive and convey runoff discharged from the Copermittee's MS4 outfalls;

(f) Locations of the MS4 outfalls, identified pursuant to Provision D.2.a.(1), within its jurisdiction; and

(g) Locations of the non-storm water persistent flow MS4 outfall discharge monitoring stations, identified pursuant to Provision D.2.b.(2), within its jurisdiction.

(2) Each Copermittee must use Copermittee personnel and contractors to assist in identifying and reporting illicit discharges and connections during their daily employment activities.

(3) Each Copermittee must promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges to or from the MS4, including the following methods for public reporting:

(a) Operate a public hotline, which can be Copermittee-specific or shared by the Copermittees, and must be capable of receiving reports in both English and Spanish 24 hours per day and seven days per week; and

(b) Designate an e-mail address for receiving electronic reports from the public, which can be Copermittee-specific or shared by the Copermittees,

and must be prominently displayed on the Copermittee's webpage and the Regional Clearinghouse required pursuant to Provision F.4.

(4) Each Copermittee must implement practices and procedures (including a notification mechanism) to prevent, respond to, contain, and clean up any spills that may discharge into the MS4 within its jurisdiction from any source. The Copermittee must coordinate, to the extent possible, with spill response teams to prevent entry of spills into the MS4, and prevent contamination of surface water, ground water, and soil. The Copermittee must coordinate spill prevention, containment, and response activities throughout all appropriate Copermittee departments, programs, and agencies.

(5) Each Copermittee must implement practices and procedures to prevent and limit infiltration of seepage from sanitary sewers (including private laterals and failing septic systems) to the MS4.

(6) Each Copermittee must coordinate, when necessary, with upstream Copermittees and/or entities to prevent illicit discharges from upstream sources into the MS4 within its jurisdiction.

c. FIELD SCREENING

Each Copermittee must conduct field screening (i.e. visual observations, field testing, and/or analytical testing) of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4 in accordance with the dry weather MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

d. INVESTIGATE AND ELIMINATE ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to investigate and eliminate illicit discharges to the MS4:

(1) Each Copermittee must prioritize and determine when follow-up investigations will be performed in response to visual observations and/or water quality monitoring data collected during an investigation of a detected non-storm water or illicit discharge to or from the MS4. The criteria for prioritizing investigations must consider the following:

(a) Pollutants identified as causing or contributing to the highest water quality priorities identified in the Water Quality Improvement Plan;

(b) Pollutants identified as causing or contributing, or threatening to cause or contribute to impairments in water bodies on the 303(d) List and/or in environmentally sensitive areas (ESAs), located within its jurisdiction;

(c) Pollutants identified from sources or land uses known to exist within the

area, drainage basin, or watershed that discharges to the portion of the MS4 within its jurisdiction included in the investigation;

(d) Pollutants identified as causing or contributing to an exceedance of a NAL in the Water Quality Improvement Plan; and

(e) Pollutants identified as a threat to human health or the environment.

(2) Each Copermittee must implement procedures to investigate and inspect portions of its MS4 that, based on reports or notifications, field screening, or other appropriate information, indicate a reasonable potential of receiving, containing, or discharging pollutants due to illicit discharges, illicit connections, or other sources of non-storm water. The procedures must include the following:

(a) Each Copermittee must develop criteria to:

(i) Assess the validity of each report or notification received; and

(ii) Prioritize the response to each report or notification received.

(b) Each Copermittee must prioritize and respond to each valid report or notification (e.g., public reports, staff or contractor reports and notifications, etc.) of an incident in a timely manner.

(c) In accordance with the requirements of Provision E.2.d.(1), each Copermittee must investigate and seek to identify the source(s) of discharges of non-storm water where flows are observed in and from the MS4 during the field screening required pursuant to Provision D.2.b.(1) as follows:

(i) Obvious illicit discharges must be immediately investigated to identify the source(s) of non-storm water discharges;

(ii) The investigation must include field investigations to identify sources or potential sources for the discharge, unless the source or potential source has already been identified during previous investigations; and

(iii) The investigation may include follow-up field investigations and/or reviewing Copermittee inventories and other land use data to identify potential sources of the discharge.

(d) Each Copermittee must maintain records and a database of the following information:

(i) Location of incident, including hydrologic subarea, portion of MS4

receiving the non-storm water or illicit discharge, and point of discharge or potential discharge from MS4 to receiving water;

(ii) Source of information initiating the investigation (e.g., public reports, staff or contractor reports and notifications, field screening, etc.);

(iii) Date the information used to initiate the investigation was received;

(iv) Date the investigation was initiated;

(v) Dates of follow-up investigations;

(vi) Identified or suspected source of the illicit discharge or connection, if determined;

(vii) Known or suspected related incidents, if any;

(viii) Result of the investigation; and

(ix) If a source cannot be identified and the investigation is not continued, document the response pursuant to the requirements of Provision E.2.d.(4).

(e) Each Copermittee must maintain records and, in accordance with the priorities of the Water Quality Improvement Plan, seek to identify the source(s) of non-storm water discharges from the MS4 where there is evidence of non-storm water having been discharged into or from the MS4 (e.g., pooled water), in accordance with MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

(3) Each Copermittee must initiate the implementation of procedures, in a timely manner, to eliminate all detected and identified illicit discharges and connections within its jurisdiction. The procedures must include the following responses:

(a) Each Copermittee must enforce its legal authority, as required under Provision E.1, to eliminate illicit discharges and connections to the MS4.

(b) If the Copermittee identifies the source as a controllable source of non-storm water or illicit discharge or connection, the Copermittee must implement its Enforcement Response Plan pursuant to Provision E.6 and enforce its legal authority to prohibit and eliminate illicit discharges and connections to its MS4.

(c) If the Copermittee identifies the source of the discharge as a category of non-storm water discharges in Provision E.2.a, and the discharge is in exceedance of NALs in the Water Quality Improvement Plan, then the Copermittee must determine if: (1) this is an isolated incident or set of circumstances that will be addressed through its Enforcement Response Plan pursuant to Provision E.6, or (2) the category of discharge must be

addressed through the prohibition of that category of discharge as an illicit discharge pursuant to Provision E.2.a.(6).

(d) If the Copermittee suspects the source of the non-storm water discharge as natural in origin (i.e. non-anthropogenically influenced) and in conveyance into the MS4, then the Copermittee must document and provide the data and evidence necessary to demonstrate to the San Diego Water Board that it is natural in origin and does not require further investigation.

(e) If the Copermittee is unable to identify and document the source of a recurring non-storm water discharge to or from the MS4, then the Copermittee must address the discharge as an illicit discharge and update its jurisdictional runoff management program to address the common and suspected sources of the non-storm water discharge within its jurisdiction in accordance with the Copermittee's priorities.

(4) Each Copermittee must submit a summary of the non-storm water discharges and illicit discharges and connections investigated and eliminated within its jurisdiction with each Water Quality Improvement Plan Annual Report required under Provision F.3.b.(3) of this Order.

3. Development Planning

Each Copermittee must use their land use and planning authorities to implement a development planning program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. BMP Requirements for All Development Projects

Each Copermittee must prescribe the following BMP requirements during the planning process (i.e. prior to project approval and issuance of local permits) for all development projects (regardless of project type or size), where local permits are issued, including unpaved roads and flood management projects:

(1) <u>General Requirements</u>

(a) Onsite BMPs must be located so as to remove pollutants from runoff prior to its discharge to any receiving waters, and as close to the source as possible;

(b) Structural BMPs must not be constructed within waters of the U.S.

(c) Onsite BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors (e.g.

mosquitos, rodents, or flies).

(2) Source Control BMP Requirements

The following source control BMPs must be implemented at all development projects where applicable and feasible:

(a) Prevention of illicit discharges into the MS4;

(b) Storm drain system stenciling or signage;

(c) Protect outdoor material storage areas from rainfall, run-on, runoff, and wind dispersal;

(d) Protect materials stored in outdoor work areas from rainfall, run-on, runoff, and wind dispersal;

(e) Protect trash storage areas from rainfall, run-on, runoff, and wind dispersal; and

(f) Any additional BMPs determined to be necessary by the Copermittee to minimize pollutant generation at each project.

(3) Low Impact Development (LID) BMP Requirements

The following LID BMPs must be implemented at all development projects where applicable and feasible:

(a) Maintenance or restoration of natural storage reservoirs and drainage corridors (including topographic depressions, areas of permeable soils, natural swales, and ephemeral and intermittent streams);[25]

(b) Buffer zones for natural water bodies (where buffer zones are technically infeasible, require project applicant to include other buffers such as trees, access restrictions, etc.);

(c) Conservation of natural areas within the project footprint including existing trees, other vegetation, and soils;

(d) Construction of streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided public safety is not compromised;

(e) Minimization of the impervious footprint of the project;

[25] Development projects proposing to dredge or fill materials in waters of the U.S. must obtain a CWA Section 401 Water Quality Certification. Projects proposing to dredge or fill waters of the state must obtain waste discharge requirements.

(f) Minimization of soil compaction to landscaped areas;

(g) Disconnection of impervious surfaces through distributed pervious areas;

(h) Landscaped or other pervious areas designed and constructed to effectively receive and infiltrate, retain and/or treat runoff from impervious areas, prior to discharging to the MS4;

(i) Small collection strategies located at, or as close as possible to, the source (i.e. the point where storm water initially meets the ground) to minimize the transport of runoff and pollutants to the MS4 and receiving waters;

(j) Use of permeable materials for projects with low traffic areas and appropriate soil conditions;

(k) Landscaping with native or drought tolerant species; and

(l) Harvesting and using precipitation.

b. PRIORITY DEVELOPMENT PROJECTS

Priority Development Projects are land development projects that fall under the planning and building authority of the Copermittee for which the Copermittee must impose specific requirements, in addition to those described in Provision E.3.a, including the implementation of structural BMPs to meet the performance requirements described in Provision E.3.c.

(1) Definition of Priority Development Project

Priority Development Projects include the following:

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(b) Redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site on an existing site of 10,000 square feet or more of impervious surfaces). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(c) New and redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project

site), and support one or more of the following uses:

(i) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812).

(ii) Hillside development projects. This category includes development on any natural slope that is twenty-five percent or greater.

(iii) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce.

(iv) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

(d) New or redevelopment projects that create and/or replace 2,500 square feet or more of impervious surface (collectively over the entire project site), and discharging directly to an Environmentally Sensitive Area (ESA). "Discharging directly to" includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands).

(e) New development projects, or redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface, that support one or more of the following uses:

(i) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

(ii) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

(f) New or redevelopment projects that result in the disturbance of one or more acres of land and are expected to generate pollutants post construction.

(2) <u>Special Considerations for Redevelopment Projects</u>

The structural BMP performance requirements of Provision E.3.c are applicable to redevelopment Priority Development Projects, as defined in E.3.b.(1), as follows:

(a) Where redevelopment results in the creation or replacement of impervious surface in an amount of less than fifty percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provision E.3.c apply only to the creation or replacement of impervious surface, and not the entire development; or

(b) Where redevelopment results in the creation or replacement of impervious surface in an amount of more than fifty percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provision E.3.c apply to the entire development.

(3) Priority Development Project Exemptions

Each Copermittee has the discretion to exempt the following projects from being defined as Priority Development Projects:

(a) New or retrofit paved sidewalks, bicycle lanes, or trails that meet the following criteria:

(i) Designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas; OR

(ii) Designed and constructed to be hydraulically disconnected from paved streets or roads; OR

(iii) Designed and constructed with permeable pavements or surfaces in accordance with USEPA Green Streets guidance.[26]

(b) Retrofitting or redevelopment of existing paved alleys, streets or roads that are designed and constructed in accordance with the USEPA Green Streets guidance.[27]

c. Priority Development Project Structural BMP Performance Requirements

In addition to the BMP requirements listed for all development projects under Provision E.3.a, Priority Development Projects must also implement structural BMPs that conform to performance requirements described below.

(1) Storm Water Pollutant Control BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite structural BMPs to control pollutants in storm water that may be discharged from a project as follows:

[26] See "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).
[27] Ibid.

(a) Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite the pollutants contained in the volume of storm water runoff produced from a 24-hour 85th percentile storm event (design capture volume);[28]

(i) If a Copermittee determines that implementing BMPs to retain the full design capture volume onsite for a Priority Development Project is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize biofiltration BMPs. Biofiltration BMPs must be designed to have an appropriate hydraulic loading rate to maximize storm water retention and pollutant removal, as well as to prevent erosion, scour, and channeling within the BMP,[29] and must be sized to:

[a] Treat 1.5 times the design capture volume not reliably retained onsite, OR
[b] Treat the design capture volume not reliably retained onsite with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite.

(ii) If a Copermittee determines that biofiltration is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize flow-thru treatment control BMPs to treat runoff leaving the site, AND mitigate for the design capture volume not reliably retained onsite pursuant to Provision E.3.c.(1)(b). Flow thru treatment control BMPs must be sized and designed to:

[a] Remove pollutants from storm water to the MEP;
[b] Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;

[28] This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals.

[29] As part of the Copermittee's update to its BMP Design Manual, pursuant to Provision E.3.d, the Copermittee must provide guidance for hydraulic loading rates and other biofiltration design criteria necessary to maximize storm water retention and pollutant removal.

[c] Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Flow-thru treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of flow-thru treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

(b) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1)(a). The Priority Development Project must mitigate for the portion of the pollutant load in the design capture volume not retained onsite if Provision E.3.c.(3) is utilized. If a Priority Development Project is allowed to utilize alternative compliance, flow-thru treatment control BMPs must be implemented to treat the portion of the design capture volume that is not reliably retained onsite. Flow-thru treatment control BMPs must be sized and designed in accordance with Provisions E.3.c.(1)(a)(ii)[a]-[c].

(2) <u>Hydromodification Management BMP Requirements</u>

Each Copermittee must require each Priority Development Project to implement onsite BMPs to manage hydromodification that may be caused by storm water runoff discharged from a project as follows:

(a) Post-project runoff conditions (flow rates and durations) must not exceed pre-development runoff conditions by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat downstream of Priority Development Projects).

(i) In evaluating the range of flows that results in increased potential for erosion of natural (non-hardened) channels, the lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks.

(ii) The Copermittees may use monitoring results collected pursuant to Provision D.1.a.(2) to re-define the range of flows resulting in increased potential for erosion, or degraded instream habitat conditions, as warranted by the data.

(b) Each Priority Development Project must avoid critical sediment yield areas known to the Copermittee or identified by the optional Watershed Management Area Analysis pursuant to Provision B.3.b.(4), or implement measures that allow critical coarse sediment to be discharged to receiving waters, such that there is no net impact to the receiving water.

(c) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the performance requirements of Provision E.3.c.(2)(a). The Priority Development Project must mitigate for the post-project runoff conditions not fully managed onsite if Provision E.3.c.(3) is utilized.

(d) Exemptions

Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provisions E.3.c.(2) where the project discharges storm water runoff to:

(i) Existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;

(ii) Conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; or

(iii) An area identified by the Copermittees as appropriate for an exemption by the optional Watershed Management Area Analysis incorporated into the Water Quality Improvement Plan pursuant to Provision B.3.b.(4).

(e) Interim Timeframe Exemptions

Until the Copermittees have updated their BMP Design Manual in accordance with Provision F.2.b with the requirements of Provision E, the Copermittees have the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provision E.3.c.(2) where the project discharges storm water runoff directly to:

(i) An engineered channel conveyance system with a capacity to convey peak flows generated by the 10-year storm event all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; and

(ii) Large river reaches with a drainage area larger than 100 square miles and a 100-year flow capacity in excess of 20,000 cubic feet per second, provided that properly sized energy dissipation is included at all Priority Development Project discharge points.

(3) Alternative Compliance Program to Onsite Structural BMP Implementation

At the discretion of each Copermittee, Priority Development Projects may be allowed to participate in an alternative compliance program in lieu of implementing the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a), provided that the Water Quality Improvement Plan includes the optional Watershed Management Area Analysis described in Provision B.3.b.(4), and Water Quality Equivalency calculations have been accepted by the San Diego Water Board's Executive Officer pursuant to Provision E.3.c.(3)(a). The alternative compliance program is available to a Priority Development Project only if the Priority Development Project applicant enters into a voluntary agreement with the Copermittee authorizing this arrangement. In addition to the voluntary agreement, relief from implementing structural BMPs onsite may be authorized by the Copermittee under the following conditions:

(a) Water Quality Equivalency

Copermittees must submit Water Quality Equivalency calculations for acceptance by the San Diego Water Board's Executive Officer prior to administering an alternative compliance program in order to establish a regional and technical basis for determining the water quality benefits associated with alternative compliance projects. Accepted Water Quality Equivalency calculations must be incorporated as part of any Copermittee's alternative compliance program necessary for evaluating Watershed Management Area Analysis candidate projects, project applicant-proposed alternative compliance projects, alternative compliance in lieu fee structures, and alternative compliance water quality credit systems as described in Provisions E.3.c.(3)(b)-(e).

(b) Watershed Management Area Analysis Candidate Projects

The Priority Development Project applicant agrees to fund, contribute funds to, or implement a candidate project identified by the Copermittees in the Watershed Management Area Analysis included in the Water Quality Improvement Plan, pursuant to Provisions B.3.b.(4) subject to the following conditions:

(i) The Copermittee must determine that implementation of the candidate project will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a) onsite;

(ii) If the Priority Development Project applicant chooses to fully or partially fund a candidate project, then the in-lieu fee structure described in Provision E.3.c.(3)(c) must be followed;

(iii) If the Priority Development Project applicant chooses to fully or partially fund a candidate project, then the Copermittee must ensure that the funds to be obtained from the Priority Development Project applicant are sufficient to mitigate for impacts caused by not fully implementing structural BMPs onsite, pursuant to the performance requirements described in Provisions E.3.c.(1) and E.3.c.(2)(a);

(iv) If the Priority Development Project applicant chooses to implement a candidate project, then the Copermittee must ensure that pollutant control and/or hydromodification management within the candidate project are sufficient to mitigate for impacts caused by not implementing structural BMPs fully onsite, pursuant to the performance requirements described in Provisions E.3.c.(1) and E.3.c.(2)(a);

(v) The voluntary agreement to fund, partially fund, or implement a candidate project must include reliable sources of funding for operation and maintenance of the candidate project;

(vi) Design of the candidate project must be conducted under an appropriately qualified engineer, geologist, architect, landscape architect, or other professional, licenses where applicable, and competent and proficient in the fields pertinent to the candidate project design;

(vii) The candidate project must be constructed as soon as possible, but no later than 4 years after the certificate of occupancy is granted for the first Priority Development Project that contributed funds toward the construction of the candidate project, unless a longer period of time is authorized by the San Diego Water Board Executive Officer; and

(viii) If the candidate project is constructed after the Priority Development Project is constructed, the Copermittee must require temporal mitigation for pollutant loads and altered flows that are discharged from the Priority Development Project.

(c) Project Applicant Proposed Alternative Compliance Projects

The Copermittee may allow a Priority Development Project applicant to propose and fund, contribute funds to, or implement an alternative compliance project not identified by the Watershed Management Area Analysis included in the Water Quality Improvement Plan pursuant to Provisions B.3.b.(4). This option is allowed provided the Copermittee determines that implementation of the alternative compliance project will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a) onsite, and is subject to the requirements described in Provisions E.3.c.(3)(a)(ii)-(viii).

(d) Alternative Compliance In-Lieu Fee Structure

If a Copermittee chooses to allow a Priority Development Project applicant to fund, or partially fund a candidate project or an alternative compliance project, then the Copermittee must develop and implement an in-lieu fee structure. This may be developed individually or with other Copermittees and/or entities, as a means for designing, developing, constructing, operating and maintaining offsite alternative compliance projects. The in-lieu fee must be transferred to the Copermittee (for public projects) or an escrow account (for private projects) prior to the construction of the Priority Development Project.

(e) Alternative Compliance Water Quality Credit System Option

The Copermittee may develop and implement an alternative compliance water quality credit system option, individually or with other Copermittees and/or entities, provided that such a credit system clearly exhibits that it will not allow discharges from Priority Development Projects to cause or contribute to a net impact over and above the impact caused by projects meeting the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a). Any credit system that a Copermittee chooses to implement must be submitted to the San Diego Water Board Executive Officer for review and acceptance as part of the Water Quality Improvement Plan.

(4) Long-Term Structural BMP Maintenance

Each Copermittee must require the project applicant to submit proof of the mechanism under which ongoing long-term maintenance of all structural BMPs will be conducted.

(5) Infiltration and Groundwater Protection

(a) Structural BMPs designed to primarily function as large, centralized infiltration devices (such as large infiltration trenches and infiltration basins) must not cause or contribute to an exceedance of an applicable groundwater quality objective. At a minimum, such infiltration BMPs must be in conformance with the design criteria listed below, unless the development project applicant demonstrates to the Copermittee that one or more of the specific design criteria listed below are not necessary to protect groundwater quality. The design criteria listed below do not apply to small infiltration systems dispersed throughout a development project.

(i) Runoff must undergo pretreatment such as sedimentation or filtration prior to infiltration;

(ii) Pollution prevention and source control BMPs must be implemented at a level appropriate to protect groundwater quality at sites where infiltration BMPs are to be used;

(iii) Infiltration BMPs must be adequately maintained to remove pollutants in storm water to the MEP;

(iv) The vertical distance from the base of any infiltration BMP to the seasonal high groundwater mark must be at least 10 feet. Where groundwater basins do not support beneficial uses, this vertical distance criteria may be reduced, provided groundwater quality is maintained;

(v) The soil through which infiltration is to occur must have physical and chemical characteristics (e.g., appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses;

(vi) Infiltration BMPs must not be used for areas of industrial or light industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee, unless source control BMPs to prevent exposure of high threat activities are implemented, or runoff from such activities is first treated or filtered to remove pollutants prior to infiltration; and

(vii) Infiltration BMPs must be located a minimum of 100 feet horizontally from any water supply wells.

(b) The Copermittee may develop, individually or with other Copermittees, alternative mandatory design criteria to that listed above for infiltration BMPs which are designed to primarily function as centralized infiltration devices. Before implementing the alternative design criteria in the development planning process the Copermitee(s) must:

(i) Notify the San Diego Water Board of the intent to implement the alternative design criteria submitted; and

(ii) Comply with any conditions set by the San Diego Water Board.

d. BMP DESIGN MANUAL UPDATE

Each Copermittee must update its BMP Design Manual[30] pursuant to Provision F.2.b. Until the Copermittee has updated its BMP Design Manual pursuant to Provision F.2.b.(1), the Copermittee must continue implementing its current BMP Design Manual. The Copermittee must implement the updated BMP Design Manual within 180 days following completion of the update pursuant to Provision

[30] The BMP Design Manual was formerly known as the Standard Storm Water Mitigation Plan under Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016.

F.2.b.(1), unless directed otherwise by the San Diego Water Board Executive Officer. The date the BMP Design Manual is implemented is the "effective date" of the BMP Design Manual. The update of the BMP Design Manual required pursuant to Provision F.2.b.(1) must include the following:

(1) Updated procedures to determine the nature and extent of storm water requirements applicable to a potential development or redevelopment projects. These procedures must inform project applicants of the storm water management requirements applicable to their project including, but not limited to, general requirements for all development projects, structural BMP design procedures and requirements, hydromodification management requirements, requirements specific to phased projects, and procedures specific to private developments and public improvement projects;

(2) Updated procedures to identify pollutants and conditions of concern for selecting the most appropriate structural BMPs that consider, at a minimum, the following:

(a) Receiving water quality (including pollutants for which receiving waters are listed as impaired under the CWA section 303(d) List);

(b) Pollutants, stressors, and/or receiving water conditions that cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(c) Land use type of the project and pollutants associated with that land use type; and

(d) Pollutants expected to be present onsite.

(3) Updated procedures for designing structural BMPs, including any updated performance requirements to be consistent with the requirements of Provision E.3.c for all structural BMPs listed in the BMP Design Manual;

(4) Long-term maintenance criteria for each structural BMP listed in the BMP Design Manual; and

(5) Alternative compliance criteria, in accordance with the requirements under Provision E.3.c.(3), if the Copermittee elects to allow Priority Development Projects within its jurisdiction to utilize alternative compliance.

e. PRIORITY DEVELOPMENT PROJECT BMP IMPLEMENTATION AND OVERSIGHT

Each Copermittee must implement a program that requires and confirms structural BMPs on all Priority Development Projects are designed, constructed, and maintained to remove pollutants in storm water to the MEP.

(1) Structural BMP Approval and Verification Process

(a) Each Copermittee must require and confirm that all Priority Development Projects implement the requirements of Provision E.3, except that the Copermittee may allow previous land development requirements to apply to a Priority Development Project if the conditions of Provision E.3.e.(1)(a)(i) or Provision E.3.e.(1)(a)(ii) are met:

(i) The Copermittee has, prior to the effective date of the BMP Design Manual required to be developed pursuant to Provision E.3.d:

[a] Approved[31] a design that incorporates the storm water drainage system for the Priority Development Project in its entirety, including all applicable structural pollutant treatment control and hydromodification management BMPs consistent with the previous applicable MS4 permit requirements;[32] AND

[b] Issued a private project permit or approval, or functional equivalent for public projects, that authorizes the Priority Development Project applicant to commence construction activities based on a design that incorporates the storm water drainage system approved in conformance with Provision E.3.e.(1)(a)(i)[a]; AND

[c] Confirmed that there have been construction activities on the Priority Development Project site within the 365 days prior to the effective date of the BMP Design Manual, *OR* the Copermittee confirms that construction activities have commenced on the Priority Development Project site within the 180 days after the effective date of the BMP Design Manual, where construction activities are undertaken in reliance on the permit or approval, or functional equivalent for public projects, issued by the Copermittee in conformance with Provision E.3.e.(1)(a)(i)[b]; AND

[d] Issued all subsequent private project permits or approvals, or functional equivalent for public projects, that are needed to implement the design initially approved in conformance with Provision E.3.e.(1)(a)(i)[a] within 5 years of the effective date of the BMP Design Manual. The storm water drainage system for the Priority Development Project in its entirety, including all applicable structural pollutant treatment control and hydromodification management BMPs must remain in substantial conformity with the design initially approved in conformance with Provision E.3.e.(1)(a)(i)[a].

[31] For public projects, a design stamped by the City or County Engineer, or engineer of record for the project is considered an approved design.
[32] Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016 for San Diego County, Orange County, and Riverside County Copermittees, respectively

(ii) The Copermittee demonstrates it lacks the land use authority or legal authority to require a Priority Development Project to implement the requirements of Provision E.3.

(b) Each Copermittee must identify the roles and responsibilities of its various municipal departments in implementing the structural BMP requirements, including each stage of a project from application review and approval through BMP maintenance and inspections.

(c) Each Copermittee must require and confirm that appropriate easements and ownerships are properly recorded in public records and the information is conveyed to all appropriate parties when there is a change in project or site ownership.

(d) Each Copermittee must require and confirm that prior to occupancy and/or intended use of any portion of the Priority Development Project, each structural BMP is inspected to verify that it has been constructed and is operating in compliance with all of its specifications, plans, permits, ordinances, and the requirements of this Order.

(2) Priority Development Project Inventory and Prioritization

(a) Each Copermittee must develop, maintain, and update at least annually, a watershed-based database to track and inventory all Priority Development Projects and associated structural BMPs within its jurisdiction. Inventories must be accurate and complete beginning from December 2002 for the San Diego County Copermittees, February 2003 for the Orange County Copermittees, and July 2005 for the Riverside County Copermittees. The use of an automated database system, such as GIS, is highly recommended. The database must include, at a minimum, the following information:

(i) Priority Development Project location (address and hydrologic subarea);

(ii) Descriptions of structural BMP type(s);

(iii) Date(s) of construction;

(iv) Party responsible for structural BMP maintenance;

(v) Dates and findings of structural BMP maintenance verifications; and

(vi) Corrective actions and/or resolutions, when applicable.

(b) Each Copermittee must prioritize the Priority Development Projects with structural BMPs within its jurisdiction. The designation of Priority Development Projects as high priority must consider the following:

(i) The highest water quality priorities identified in the Water Quality Improvement Plan;

(ii) Receiving water quality;

(iii) Number and sizes of structural BMPs;

(iv) Recommended maintenance frequency of structural BMPs;

(v) Likelihood of operation and maintenance issues of structural BMPs;

(vi) Land use and expected pollutants generated; and

(vii) Compliance record.

(3) Structural BMP Maintenance Verifications and Inspections

Each Copermittee is required to verify that structural BMPs on each Priority Development Project are adequately maintained, and continue to operate effectively to remove pollutants in storm water to the MEP through inspections, self-certifications, surveys, or other equally effective approaches.

(a) All (100 percent) of the structural BMPs at Priority Development Projects that are designated as high priority must be inspected directly by the Copermittee annually prior to each rainy season;

(b) For verifications performed through a means other than direct Copermittee inspection, adequate documentation must be required by the Copermittee to provide assurance that the required maintenance of structural BMPs at each Priority Development Project has been completed; and

(c) Appropriate follow-up measures (including re-inspections, enforcement, etc.) must be conducted to ensure that structural BMPs at each Priority Development Project continue to reduce pollutants in storm water to the MEP as originally designed.

f. DEVELOPMENT PROJECT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all development projects, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

4. Construction Management

Each Copermittee must implement a construction management program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. Project Approval Process

Prior to issuance of any local permit(s) that allows the commencement of construction projects that involve ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff, each Copermittee must:

(1) Require a pollution control plan, construction BMP plan, and/or an erosion and sediment control plan, to be submitted by the project applicant to the Copermittee;

(2) Confirm the pollution control plan, construction BMP plan, and/or erosion and sediment control plan, complies with the local grading ordinance, other applicable local ordinances, and the requirements of this Order;

(3) Confirm the pollution control, construction BMP, and/or erosion and sediment control plan, includes seasonally appropriate and effective BMPs and management measures described in Provision E.4.c, as applicable to the project; and

(4) Verify that the project applicant has obtained coverage under the statewide Construction General Permit (Order 2009-0009-DWQ or subsequent Order), if applicable.

b. Construction Site Inventory and Tracking

(1) Each Copermittee must maintain and update, at least quarterly, a watershed-based inventory of all construction projects issued a local permit that allows ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff. The use of an automated database system, such as GIS, is highly recommended. The inventory must include:

(a) Relevant contact information for each site (e.g., name, address, phone, and email for the owner and contractor);

(b) The basic site information including location (address and hydrologic subarea), Waste Discharge Identification (WDID) number (if applicable), size of the site, and approximate area of disturbance;

(c) Whether or not the site is considered a high threat to water quality, as defined in Provision E.4.b.(2) below;

(d) The project start and completion dates;

(e) The required inspection frequency, as defined in the Copermittee's jurisdictional runoff management program document;

(f) The date the Copermittee accepted or approved the pollution control plan, construction BMP plan, and/or erosion and sediment control plan; and

(g) Whether or not there are ongoing enforcement actions administered to the site.

(2) Each Copermittee must identify all construction sites within its jurisdiction that represent a high threat to downstream surface water quality. The designation of construction sites as high threat to water quality must consider the following:

(a) Sites located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Sites located within the same hydrologic subarea and tributary to a water body segment listed as impaired for sediment on the CWA section 303(d) List;

(c) Sites located within, directly adjacent to, or discharging directly to a receiving water within an ESA; and

(d) Other sites determined by the Copermittees or the San Diego Water Board as a high threat to water quality.

c. CONSTRUCTION SITE BMP IMPLEMENTATION

Each Copermittee must implement, or require the implementation of effective BMPs to reduce discharges of pollutants in storm water from construction sites to the MEP, and effectively prohibit non-storm water discharges from construction sites into the MS4. These BMPs must be site specific, seasonally appropriate, and construction phase appropriate. BMPs must be implemented at each construction site year round. Dry season BMP implementation must plan for and address unseasonal rain events that may occur during the dry season (May 1 through September 30). Copermittees must implement, or require the implementation of, BMPs in the following categories:

(1) Project Planning;

(2) Good Site Management "Housekeeping", including waste management;

(3) Non-storm Water Management;

(4) Erosion Control;

(5) Sediment Control;

(6) Run-on and Run-off Control; and

(7) Active/Passive Sediment Treatment Systems, where applicable.

d. CONSTRUCTION SITE INSPECTIONS

Each Copermittee must conduct construction site inspections to require and confirm compliance with its local permits and applicable local ordinances, and the requirements of this Order. Priority for site inspections must consider threat to water quality pursuant to Provision E.4.b as well as the nature of the construction activity, topography, and the characteristics of soils and receiving water quality.

(1) Inspection Frequency

(a) Each Copermittee must conduct inspections at all inventoried sites, including high threat to water quality sites, at an appropriate frequency for each phase of construction to confirm the site reduces the discharge of pollutants in storm water from construction sites to the MEP, and effectively prohibits non-storm water discharges from entering the MS4.

(b) Each Copermittee must establish appropriate inspection frequencies for high threat to water quality sites, and all other sites, for each phase of construction. Inspection frequencies appropriate for addressing the highest water quality priorities identified in the Water Quality Improvement Plan, and for complying with the requirements of this Order must be identified in each Copermittee's jurisdictional runoff management program document.

(c) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e., re-inspection, enforcement) necessary to require and confirm site compliance with its local permits and applicable local ordinances, and the requirements of this Order.

(2) Inspection Content

Inspections of construction sites by the Copermittee must include, at a minimum:

(a) Verification of coverage under the Construction General Permit (Notice of Intent (NOI) and/or WDID number) during initial inspections, when applicable;

(b) Assessment of compliance with its local permits and applicable local ordinances related to pollution prevention, including the implementation and maintenance of applicable BMPs;

(c) Assessment of BMP adequacy and effectiveness;

(d) Visual observations of actual non-storm water discharges;

(e) Visual observations of actual or potential discharge of sediment and/or construction related materials from the site;

(f) Visual observations of actual or potential illicit connections; and

(g) If any violations are found and BMP corrections are needed, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried construction sites. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Site name, location (address and hydrologic subarea), and WDID number (if applicable);

(b) Inspection date;

(c) Approximate amount of rainfall since last inspection;

(d) Description of problems observed with BMPs and indication of need for BMP addition/repair/replacement and any scheduled re-inspection, and date of re-inspection;

(e) Descriptions of any other specific inspection comments which must, at a minimum, include rationales for longer compliance time;

(f) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(g) Resolution of problems noted and date problems fixed.

e. CONSTRUCTION SITE ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried construction sites, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

5. Existing Development Management

Each Copermittee must implement an existing development management program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. EXISTING DEVELOPMENT INVENTORY AND TRACKING

Each Copermittee must maintain, and update at least annually, a watershed-based inventory of the existing development within its jurisdiction that may discharge a pollutant load to and from the MS4. The use of an automated database system, such as GIS, is highly recommended. The inventory must, at a minimum, include:

(1) Name, location (hydrological subarea and address, if applicable) of the following types of existing development with its jurisdiction:

(a) Commercial facilities or areas;

(b) Industrial facilities;

(c) Municipal facilities, including:

(i) MS4 and related structures;[33]

(ii) Roads, streets, and highways;

(iii) Parking facilities;

(iv) Municipal airfields;

(v) Parks and recreation facilities;

[33] The inventory may refer to the MS4 map required to be maintained pursuant to Provision E.2.b.(1).

(vi) Flood management facilities, flood control devices and structures;

(vii) Operating or closed municipal landfills;

(viii) Publicly owned treatment works (including water and wastewater treatment plants) and sanitary sewer collection systems;

(ix) Corporate yards, including maintenance and storage yards for materials, waste, equipment, and vehicles;

(x) Hazardous waste collection facilities;

(xi) Other treatment, storage or disposal facilities for municipal waste; and

(xii) Other municipal facilities that the Copermittee determines may contribute a significant pollutant load to the MS4.

(d) Residential areas, which may be designated by one or more of the following:

(i) Residential management area;

(ii) Drainage basin or area;

(iii) Land use (e.g., single family, multi-family, rural);

(iv) Neighborhood;

(v) Common Interest Area;

(vi) Home Owner Association;

(vii) Mobile home park; and/or

(viii) Other designations accepted by the San Diego Water Board Executive Officer.

(2) A description of the facility or area, including the following information:

(a) Classification as commercial, industrial, municipal, or residential;

(b) Status of facility or area as active or inactive;

(c) Identification if a business is a mobile business;

(d) SIC Code or NAICS Code, if applicable;

(e) Industrial General Permit NOI and/or WDID number, if applicable;

(f) Identification if a residential area is or includes a Common Interest Area / Home Owner Association, or mobile home park;

(g) Identification of pollutants generated and potentially generated by the facility or area;

(h) Whether the facility or area is adjacent to an ESA;

(i) Whether the facility or area is tributary to and within the same hydrologic subarea as a water body segment listed as impaired on the CWA section 303(d) List and generates pollutants for which the water body segment is impaired; and

(3) An annually updated map showing the location of inventoried existing development, watershed boundaries, and water bodies.

b. EXISTING DEVELOPMENT BMP IMPLEMENTATION AND MAINTENANCE

Each Copermittee must designate a minimum set of BMPs required for all inventoried existing development, including special event venues. The designated minimum BMPs must be specific to facility or area types and pollutant generating activities, as appropriate.

(1) Commercial, Industrial, and Municipal Facilities and Areas

(a) Pollution Prevention

Each Copermittee must require the use of pollution prevention methods by the commercial, industrial, and municipal facilities and areas in its inventoried existing development to address the priorities and strategies in the Water Quality Improvement Plan.

(b) BMP Implementation

Each Copermittee must require the implementation of designated BMPs at commercial facilities and areas, industrial facilities, and implement designated BMPs at municipal facilities in its inventoried existing development.

(c) BMP Operation and Maintenance

(i) Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development.

(ii) Each Copermittee must implement a schedule of operation and maintenance activities for its MS4 and related structures (including

but not limited to catch basins, storm drain inlets, detention basins, etc.), and verify proper operation of all its municipal structural treatment controls designed to reduce pollutants (including floatables) in storm water discharges to or from its MS4s and related drainage structures. Operation and maintenance activities may include, but is not limited to, the following:

[a] Inspections of the MS4 and related structures;
[b] Cleaning of the MS4 and related structures; and
[c] Proper disposal of materials removed from cleaning of the MS4 and related structures.

(iii) Each Copermittee must implement a schedule of operation and maintenance for public streets, unpaved roads, paved roads, and paved highways within its jurisdiction to minimize pollutants that can be discharged in storm water.

(iv) Each Copermittee must implement controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers. Copermittees that operate both a municipal sanitary sewer system and a MS4 must implement controls and measures to prevent and eliminate seeping sewage from infiltrating the MS4. Copermittees that do not operate both a municipal sanitary sewer system and a MS4 must coordinate with sewering agencies to keep themselves informed of relevant and appropriate maintenance activities and sanitary sewage projects in their jurisdiction that may cause or contribute to seepage of sewage into the MS4.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must require the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from commercial facilities and areas and industrial facilities, and implement BMPs at municipal facilities in its inventoried existing development. Such BMPs must include, as appropriate, educational activities, permits, certifications and other measures for applicators and distributors.

(2) <u>Residential Areas</u>

(a) Pollution Prevention

Each Copermittee must promote and encourage the use of pollution prevention methods, where appropriate, by the residential areas in its inventoried existing development.

(b) BMP Implementation

Each Copermittee must promote and encourage the implementation of designated BMPs at residential areas in its inventoried existing development.

(c) BMP Operation and Maintenance

Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at residential areas in its inventoried existing development.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must promote and encourage the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from residential areas in its inventoried existing development.

c. EXISTING DEVELOPMENT INSPECTIONS

Each Copermittee must conduct inspections of inventoried existing development to ensure compliance with applicable local ordinances and permits, and the requirements of this Order.

(1) Inspection Frequency

(a) Each Copermittee must establish appropriate inspection frequencies for inventoried existing development in accordance with the following requirements:

(i) At a minimum, inventoried existing development must be inspected once every five years utilizing one or more of the following methods:

[a] Drive-by inspections by Copermittee municipal and contract staff;
[b] Onsite inspections by Copermittee municipal and contract staff; and/or
[c] Visual inspections of publicly accessible inventoried facilities or areas by volunteer monitoring or patrol programs that have been trained by the Copermittee;

(ii) The frequency of inspections must be appropriate to confirm that BMPs are being implemented to reduce the discharge of pollutants in storm water from the MS4 to the MEP and effectively prohibit non-storm water discharges to the MS4;

(iii) The frequency of inspections must be based on the potential for a facility or area to discharge non-storm water and pollutants in storm water, and should reflect the priorities set forth in the Water Quality Improvement Plan;

(iv) Each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development;[34] and

(v) Inventoried existing development must be inspected by the Copermittee, as needed, in response to valid public complaints.

(b) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e. education and outreach, re-inspection, enforcement) necessary to require and confirm compliance with its applicable local ordinances and permits and the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

(2) Inspection Content

(a) Inspections of existing development must include, at a minimum:

(i) Visual inspections for the presence of actual non-storm water discharges;

(ii) Visual inspections for the presence of actual or potential discharge of pollutants;

(iii) Visual inspections for the presence of actual or potential illicit connections; and

(iv) Verification that the description of the facility or area in the inventory, required pursuant to Provision E.5.a.(2), has not changed.

(b) Onsite inspections of existing development by the Copermittee must include, at a minimum:

(i) Assessment of compliance with its applicable local ordinances and permits related to non-storm water and storm water discharges and runoff;

(ii) Assessment of the implementation of the designated BMPs;

(iii) Verification of coverage under the Industrial General Permit, when applicable; and

[34] If any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspection may count toward the total annual inspection requirement. This requirement excludes linear municipal facilities (i.e., MS4 linear channels, sanitary sewer collection systems, streets, roads and highways).

(iv) If any problems or violations are found, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried existing development. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Name and location of the facility or area (address and hydrologic subarea) consistent with the inventory name and location, pursuant to Provision E.5.a.(1);

(b) Inspection and re-inspection date(s);

(c) Inspection method(s) (i.e. drive-by, onsite);

(d) Observations and findings from the inspection(s);

(e) For onsite inspections of existing development by Copermittee municipal or contract staff, the records must also include, as applicable:

(i) Description of any problems or violations found during the inspection(s);

(ii) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(iii) The date problems or violations were resolved.

d. EXISTING DEVELOPMENT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried existing development, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

e. RETROFITTING AND REHABILITATING AREAS OF EXISTING DEVELOPMENT

(1) Retrofitting Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to retrofit areas of existing development within its jurisdiction to address identified sources of pollutants and/or stressors that

contribute to the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify areas of existing development as candidates for retrofitting, focusing on areas where retrofitting will address pollutants and/or stressors that contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for retrofitting projects may be utilized to reduce pollutants that may be discharged in storm water from areas of existing development, and/or address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of retrofitting projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting projects; and

(e) Where retrofitting projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional retrofitting projects (i.e. projects that can receive and/or treat storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment) adjacent to and/or downstream of the areas of existing development.

(2) Stream, Channel and/or Habitat Rehabilitation in Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to rehabilitate streams, channels, and/or habitats in areas of existing development within its jurisdiction to address the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify streams, channels, and/or habitats in areas of existing development as candidates for rehabilitation, focusing on areas where stream, channel, and/or habitat rehabilitation projects will address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for stream, channel, and/or habitat rehabilitation projects may be utilized to address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters, rehabilitate channelized or hydromodified streams, restore wetland and riparian habitat, restore watershed functions, and/or restore beneficial uses of receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of stream, channel, and/or habitat rehabilitation projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance stream, channel, and/or habitat rehabilitation projects; and

(e) Where stream, channel, and/or habitat rehabilitation projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional stream, channel, and/or habitat rehabilitation projects (i.e. projects that can receive storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment).

6. Enforcement Response Plans

Each Copermittee must develop and implement an Enforcement Response Plan as part of its jurisdictional runoff management program document. The Enforcement Response Plan must describe the applicable approaches and options to enforce its legal authority established pursuant to Provision E.1, as necessary, to achieve compliance with the requirements of this Order. The Enforcement Response Plan must be in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include the following:

a. Enforcement Response Plan Components

The Enforcement Response Plan must include the following individual components:

(1) Illicit Discharge Detection and Elimination Enforcement Component;

(2) Development Planning Enforcement Component;

(3) Construction Management Enforcement Component; and

(4) Existing Development Enforcement Component.

b. ENFORCEMENT RESPONSE APPROACHES AND OPTIONS

Each component of the Enforcement Response Plan must describe the enforcement response approaches that the Copermittee will implement to compel compliance with its statutes, ordinances, permits, contracts, orders, or similar means, and the requirements of this Order. The description must include the protocols for implementing progressively stricter enforcement responses. The enforcement response approaches must include appropriate sanctions to compel compliance, including, at a minimum, the following tools or their equivalent:

(1) Verbal and written notices of violation;

(2) Cleanup requirements;

(3) Fines;

(4) Bonding requirements;

(5) Administrative and criminal penalties;

(6) Liens;

(7) Stop work orders; and

(8) Permit and occupancy denials.

c. CORRECTION OF VIOLATIONS

(1) Violations must be corrected in a timely manner with the goal of correcting the violations within 30 calendar days after the violations are discovered, or prior to the next predicted rain event, whichever is sooner.

(2) If more than 30 calendar days are required to achieve compliance, then a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

d. ESCALATED ENFORCEMENT

(1) The Enforcement Response Plan must include a definition of “escalated enforcement.” Escalated enforcement must include any enforcement scenario where a violation or other non-compliance is determined to cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan. Escalated enforcement may be defined differently for development planning, construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas.

(2) Where the Copermittee determines escalated enforcement is not required, a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

(3) Escalated enforcement actions must continue to increase in severity, as necessary, to compel compliance as soon as possible.

e. REPORTING OF NON-COMPLIANT SITES

(1) Each Copermittee must notify the San Diego Water Board in writing within five (5) calendar days of issuing escalated enforcement (as defined in the Copermittee's Enforcement Response Plan) to a construction site that poses a significant threat to water quality as a result of violations or other non-compliance with its permits and applicable local ordinances, and the requirements of this Order. Written notification may be provided electronically by email to the appropriate San Diego Water Board staff.

(2) Each Copermittee must notify the San Diego Water Board of any persons required to obtain coverage under the statewide Industrial General Permit and Construction General Permit and failing to do so, within five (5) calendar days from the time the Copermittee become aware of the circumstances. Written notification may be provided electronically by email to RB9_Nonfilers@waterboards.ca.gov.

7. Public Education and Participation

Each Copermittee must implement, individually or with other Copermittees, a public education and participation program in accordance with the strategies identified in the Water Quality Improvement Plan to promote and encourage the development of programs, management practices, and behaviors that reduce the discharge of pollutants in storm water to the MEP, prevent controllable non-storm water discharges from entering the MS4, and protect water quality standards in receiving waters. The public education and participation program must be implemented in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include, at a minimum, the following requirements:

a. PUBLIC EDUCATION

The public education program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) Educational activities, public information activities, and other appropriate outreach activities intended to reduce pollutants associated with the application of pesticides, herbicides and fertilizer and other pollutants of

concern in storm water discharges to and from its MS4 to the MEP, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed to address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(2) Educational activities, public information activities, and other appropriate outreach activities to facilitate the proper management and disposal of used oil and toxic materials; and

(3) Appropriate education and training measures for specific target audiences, such as construction site operators, residents, underserved target audiences and school-aged children, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed, based on high risk behaviors and pollutants of concern.

b. PUBLIC PARTICIPATION

The public participation program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) A process for members of the public to participate in updating the highest priority water quality conditions, numeric goals, and water quality improvement strategies in the Water Quality Improvement Plan;

(2) Opportunities for members of the public to participate in providing the Copermittee recommendations for improving the effectiveness of the water quality improvement strategies implemented within its jurisdiction; and

(3) Opportunities for members of the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or protection of the quality of receiving waters.

8. Fiscal Analysis

a. Each Copermittee must secure the resources necessary to meet all the requirements of this Order.

b. Each Copermittee must conduct an annual fiscal analysis of its jurisdictional runoff management program in its entirety. The fiscal analysis must include the following:

(1) Identification of the various categories of expenditures necessary to implement the requirements of this Order, including a description of the specific capital, operation and maintenance, and other expenditure items to be accounted for in each category of expenditures;

(2) The staff resources needed and allocated to meet the requirements of this Order, including any development, implementation, and enforcement activities required;

(3) The estimated expenditures for Provisions E.8.b.(1) and E.8.b.(2) for the current fiscal year; and

(4) The source(s) of funds that are proposed to meet the necessary expenditures described in Provisions E.8.b.(1) and E.8.b.(2), including legal restrictions on the use of such funds, for the current fiscal year and next fiscal year.

c. Each Copermittee must submit a summary of the annual fiscal analysis with each Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3).

d. Each Copermittee must provide the documentation used to develop the summary of the annual fiscal analysis upon request by the San Diego Water Board.

F. REPORTING

The purpose of this provision is to determine and document compliance with the requirements set forth in this Order. The goal of reporting is to communicate to the San Diego Water Board and the people of the State of California the implementation status of each jurisdictional runoff management program and compliance with the requirements of this Order. This goal is to be accomplished through the submittal of specific deliverables to the San Diego Water Board by the Copermittees.

1. Water Quality Improvement Plans

The Copermittees for each Watershed Management Area must develop and submit the Water Quality Improvement Plan in accordance with the following requirements:

a. WATER QUALITY IMPROVEMENT PLAN DEVELOPMENT

Each Water Quality Improvement Plan must be developed in accordance with the following process:

(1) Public Participation Process

The Copermittees must implement a public participation process to solicit data, information, and recommendations to be utilized in the development of the Water Quality Improvement Plan. The public participation process must include the following:

(a) The Copermittees must develop a publicly available and noticed schedule of the opportunities for the public to participate and provide comments during the development of the Water Quality Improvement Plan. The schedule may be adjusted as necessary by the Copermittees, provided the public is provided timely notification of the changes to the schedule.

(b) The Copermittees must form a Water Quality Improvement Consultation Panel to provide recommendations during the development of the Water Quality Improvement Plan. The Water Quality Improvement Consultation Panel must consist of at least the following members:

(i) A representative of the San Diego Water Board;

(ii) A representative of the environmental community familiar with the water quality conditions of concern of the receiving waters in the Watershed Management Area, preferably from an environmental interest group associated with a water body within the Watershed Management Area; and

(iii) A representative of the development community familiar with the opportunities and constraints for implementing structural BMPs,

retrofitting projects, and stream, channel or habitat rehabilitation projects in the Watershed Management Area, preferably with relevant engineering, hydrology, and/or geomorphology experience in the Watershed Management Area.

(c) The Copermittees must coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public time and opportunity to participate during the development of the Water Quality Improvement Plans.

(2) Priority Water Quality Conditions

(a) The Copermittees must solicit data, information and recommendations from the public to be utilized in the development and identification of the priority water quality conditions and potential water quality improvement strategies for the Watershed Management Area.

(b) The Copermittees must review the priority water quality conditions the Copermittees plan on including in the Water Quality Improvement Plan with the Water Quality Improvement Consultation Panel to receive recommendations or concurrence.

(c) The Copermittees must consider revisions to the priority water quality conditions based on recommendations from the Water Quality Improvement Consultation Panel.

(d) The Copermittees must include all the potential water quality improvement strategies identified by the public and the Water Quality Improvement Consultation Panel with the submittal of the priority water quality conditions to the San Diego Water Board.

(e) The Copermittees must submit the Water Quality Improvement Plan requirements of Provision B.2 to the San Diego Water Board as early as 6 months and no later than 12 months after the commencement of coverage under this Order. Upon receipt, the San Diego Water Board will issue a public notice and release the proposed priority water quality conditions and potential water quality improvement strategies for public review and comment for a minimum of 30 days.

(f) The Copermittees must consider revisions to the priority water quality conditions and potential water quality improvement strategies developed pursuant to Provision B.2 based on public comments received by the close of the comment period.

(3) Water Quality Improvement Goals, Strategies and Schedules

(a) The Copermittees must solicit recommendations from the public on potential numeric goals for the highest priority water quality conditions identified for the Watershed Management Area, and recommendations on the strategies that should be implemented to achieve the potential numeric goals.

(b) The Copermittees must consult with the Water Quality Improvement Consultation Panel and consider revisions to the following items based on the Panel's recommendations:

(i) The numeric goals and schedules the Copermittees propose to include in the Water Quality Improvement Plan;

(ii) The water quality improvement strategies and schedules the Copermittees propose to implement in the Watershed Management Area and include in the Water Quality Improvement Plan; and

(iii) If the Copermittees choose to implement Provision B.3.b.(4), the results of the Watershed Management Area Analysis the Copermittees proposed to incorporate into the Water Quality Improvement Plan.

(c) The Copermittees must submit the Water Quality Improvement Plan requirements of Provision B.3 to the San Diego Water Board as early as 9 months and no later than 18 months after the commencement of coverage under this Order. Upon receipt, the San Diego Water Board will issue a public notice and release the proposed water quality improvement goals, strategies and schedules for public review and comment for a minimum of 30 days.

(d) The Copermittees must consider revisions to the water quality improvement goals, strategies and schedules developed pursuant to Provision B.3 based on public comments received by the close of the comment period.

b. WATER QUALITY IMPROVEMENT PLAN SUBMITTAL AND IMPLEMENTATION

(1) Within 24 months after the commencement of coverage under this Order, the Copermittees for each Watershed Management Area must submit a complete Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order to the San Diego Water Board. The San Diego Water Board will issue a public notice and release the Water Quality Improvement Plan for public review and comment for a minimum of 30 days.

(2) The Copermittees must consider revisions to the Water Quality Improvement Plan based on written comments received by the close of the public comment period.

(3) The Copermittees must promptly submit any revisions to the Water Quality Improvement Plan to the San Diego Water Board no later than 60 days after the close of the public comment period.

(4) If issues concerning the Water Quality Improvement Plan are resolved informally through discussions among the Copermittees, the San Diego Water Board and interested parties, the San Diego Water Board Executive Officer may provide written notification of acceptance to the Copermittees that the Water Quality Improvement Plan meets the requirements of Provision B. However, if the Executive Officer determines that significant issues with the Water Quality Improvement Plan remain, the matter will be scheduled for San Diego Water Board consideration at a public meeting.

(5) The Copermittees must commence with implementation of the Water Quality Improvement Plan, in accordance with the water quality improvement strategies and schedules therein, upon written notification of acceptance with the Water Quality Improvement Plan by the San Diego Water Board Executive Officer.

(6) During implementation of the Water Quality Improvement Plan the Copermittees must correct any deficiencies in the Plan identified by the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report following a request by the Board to do so.

(7) The Water Quality Improvement Plan must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of receiving notification of acceptance with the Water Quality Improvement Plan by the San Diego Water Board Executive Officer.

2. Updates

a. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATES

Each Copermittee must update its jurisdictional runoff management program document in accordance with the following requirements:

(1) Each Copermittee is encouraged to seek public and key stakeholder participation and comments, as early and often as possible during the process of developing updates to its jurisdictional runoff management program document;

(2) Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E concurrent with the submittal of the Water Quality Improvement Plan. Each Copermittee must correct any deficiencies in the jurisdictional runoff management program document based on comments received from the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report;

(3) Each Copermittee must submit updates to its jurisdictional runoff management program, with the supporting rationale for the modifications, either in the Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b;

(4) The Copermittee must revise proposed modifications to its jurisdictional runoff management program as directed by the San Diego Water Board Executive Officer; and

(5) Updated jurisdictional runoff management program documents must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of submitting the Water Quality Improvement Plan Annual Report.

b. BMP DESIGN MANUAL UPDATES

Each Copermittee must update its BMP Design Manual in accordance with the following requirements:

(1) Each Copermittee must update its BMP Design Manual to incorporate the requirements of Provisions E.3.a-d concurrent with the submittal of the Water Quality Improvement Plan. Each Copermittee must correct any deficiencies in the BMP Design Manual based on comments received from the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report;

(2) Any future updates to the BMP Design Manual made after its update pursuant to Provision F.2.b.(1) is completed must be consistent with the requirements of Provisions E.3.a-d and must be submitted as part of the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b; and

(3) BMP Design Manuals must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of completing the update.

(4) If the San Diego Water Board amends Provisions E.3.a-d during the permit term but after the Copermittee has completed the update pursuant to Provision F.2.b.(1), the Copermittee must revise its BMP Design Manual to

incorporate the amended Provision E.3.a-d requirements as soon as possible but not later than 90 days after the date the San Diego Water Board adopts the amendments to Provisions E.3.a-d, unless otherwise directed by the San Diego Water Board Executive Officer. Under these circumstances, the effective date of the BMP Design Manual is no later than 90 days after the date the San Diego Water Board adopts the amendments to Provisions E.3.a-d, unless otherwise directed by the San Diego Water Board Executive Officer.

c. WATER QUALITY IMPROVEMENT PLAN UPDATES

(1) The Water Quality Improvement Plans must be updated in accordance with the following process:

(a) The Copermittees must develop and implement a public participation process to obtain data, information and recommendations for updating the Water Quality Improvement Plan. The public participation process must provide for a publicly available and noticed schedule of opportunities for the public to participate and provide comments during the development of updates to the Water Quality Improvement Plan;

(b) The Copermittees must consult with the Water Quality Improvement Consultation Panel on proposed updates of the Water Quality Improvement Plan, and consider the Water Quality Improvement Consultation Panel's recommendations in finalizing the proposed updates;

(c) The Copermittees for each Watershed Management Area must submit 1) proposed updates to the Water Quality Improvement Plan and supporting rationale, and 2) recommendations received from the public and the Water Quality Improvement Consultation Panel and the rationale for the requested updates, either in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The updates submitted will be deemed accepted for inclusion in the Water Quality Improvement Plan ninety (90) days after submission unless otherwise directed in writing by the San Diego Water Board Executive Officer;

(d) The Copermittees must revise the requested updates as directed by the San Diego Water Board Executive Officer; and

(e) Updated Water Quality Improvement Plans must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance of the requested updates by the San Diego Water Board.

(2) No later than six months following Office of Administrative Law and USEPA approval of any TMDL Basin Plan amendment with wasteload allocations (WLAs) assigned to the Copermittees during the term of this Order, the

Copermittees must initiate an update to the applicable Water Quality Improvement Plans in accordance with Provision F.1 or Provision F.2.c.(1) to incorporate the requirements of the TMDL WLAs.

3. Progress Reporting

a. Progress Report Presentations

The Copermittees for each Watershed Management Area must periodically appear before the San Diego Water Board, as requested by the Board, to provide progress reports on the implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs.

b. Annual Reports

(1) Transitional Jurisdictional Runoff Management Program Annual Reports

(a) Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) no later than October 31 of each year for each jurisdictional runoff management program reporting period (i.e. July 1 to June 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted.

(b) Each Copermittee must submit the information on the Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) specific to the area within its jurisdiction in each Watershed Management Area.

(c) In addition to submitting the Jurisdictional Runoff Management Program Annual Report Form during the transitional reporting period, each Copermittee may continue to utilize and submit the jurisdictional runoff management program annual reporting format of its previous NPDES permit until the first Water Quality Improvement Plan Annual Report is required to be submitted.

(2) Transitional Monitoring and Assessment Program Annual Reports

The Copermittees for each Watershed Management Area must submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted under this Order. The Transitional

Monitoring and Assessment Program Annual Reports must include:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1.a and D.2.a, summarized and presented in tabular and graphical form; and

(b) The findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

(3) Water Quality Improvement Plan Annual Reports

The Copermittees for each Watershed Management Area must submit a Water Quality Improvement Plan Annual Report for each reporting period no later than January 31 of the following year. The annual reporting period consists of two different periods: 1) July 1 to June 30 of the following year for the jurisdictional runoff management programs, 2) October 1 to September 30 of the following year for the monitoring and assessment programs. The Water Quality Improvement Plan Annual Reports must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Each Annual Report must include the following:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, summarized and presented in tabular and graphical form;

(b) The progress of the special studies required pursuant to Provision D.3, and the findings, interpretations and conclusions of a special study, or each phase of a special study, upon its completion;

(c) The findings, interpretations and conclusions from the assessments required pursuant to Provision D.4;

(d) The progress of implementing the Water Quality Improvement Plan, including, but not limited to, the following:

(i) The progress toward achieving the interim and final numeric goals for the highest water quality priorities for the Watershed Management Area;

(ii) The water quality improvement strategies that were implemented and/or no longer implemented by each of the Copermittees during the reporting period and previous reporting periods;

(iii) The water quality improvement strategies planned for implementation during the next reporting period;

(iv) Proposed modifications to the water quality improvement strategies, the public comments received and the supporting rationale for the

proposed modifications;

(v) Previous modifications or updates incorporated into the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document and implemented by the Copermittees in the Watershed Management Area; and

(vi) Proposed modifications or updates to the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document;

(e) A completed Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) for each Copermittee in the Watershed Management Area, certified by a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative; and

(f) Each Copermittee must provide any data or documentation utilized in developing the Water Quality Improvement Plan Annual Report upon request by the San Diego Water Board. Any Copermittee monitoring data utilized in developing the Water Quality Improvement Plan Annual Report must be uploaded to the California Environmental Data Exchange Network (CEDEN).[35] Any Copermittee monitoring and assessment data utilized in developing the Water Quality Improvement Plan Annual Report must be available for access on the Regional Clearinghouse required pursuant to Provision F.4.

c. Regional Monitoring and Assessment Report

(1) The Copermittees must submit a Regional Monitoring and Assessment Report no later than 180 days prior to the expiration date of this Order. The Regional Monitoring and Assessment Report may be submitted as part of the Report of Waste Discharge required pursuant to Provision F.5.b. In preparing the report the Copermittees must consider the receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, and the findings, interpretations, and conclusions from the assessments required pursuant to Provision D.4. Based on these considerations the report must assess the following:

[35] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

(a) The beneficial uses of the receiving waters within the San Diego Region that are supported and not adversely affected by the Copermittees' MS4 discharges;

(b) The beneficial uses of the receiving waters within the San Diego Region that are adversely impacted by the Copermittees' MS4 discharges;

(c) The progress toward protecting the beneficial uses in the receiving waters within the San Diego Region from the Copermittees' discharges; and

(d) Pollutants or conditions of emerging concern that may impact beneficial uses in the receiving waters within the San Diego Region.

(2) The Regional Monitoring and Assessment Report must include recommendations for improving the implementation and assessment of the Water Quality Improvement Plans and jurisdictional runoff management programs.

(3) Each Copermittee must provide any data or documentation utilized in developing the Regional Monitoring and Assessment Report upon request by the San Diego Water Board. Any Copermittee monitoring and assessment data utilized in developing the Regional Monitoring and Assessment Report must be available for access on the Regional Clearinghouse required pursuant to Provision F.4.

4. Regional Clearinghouse

The Copermittees must develop, update, and maintain an internet-based Regional Clearinghouse that is made available to the public no later than 18 months after the effective date of this Order.[36]

a. The Copermittees, through the Regional Clearinghouse, must make the following documents and data available for access, and organized by Watershed Management Area. The documents and data may be linked to other internet-based data portals and databases where the original documents are stored:

(1) Water Quality Improvement Plan for the Watershed Management Area, and all updated versions with date of update;

(2) Annual Reports for the Watershed Management Area;

(3) Jurisdictional Runoff Management Program document for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

[36] The Copermittees may develop, update and maintain the clearinghouse(s) of other Copermittees or agencies.

(4) BMP Design Manual for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(5) Reports from special studies (e.g. source identification, BMP effectiveness assessment) conducted in the Watershed Management Area;

(6) Monitoring data collected pursuant to Provision D for each Watershed Management Area must be uploaded to CEDEN,[37] with links to the uploaded data; and

(7) Available GIS data, layers, and/or shapefiles used to develop the maps generated and maintained by the Copermittees for the Water Quality Improvement Plans, Annual Reports, and jurisdictional runoff management program documents.

b. The Copermittees, through the Regional Clearinghouse, must make the following information and documents available for access:

(1) Contact information (point of contact, phone number, email address, and mailing address) for each Copermittee;

(2) Public hotline number for reporting non-storm water and illicit discharges for each Copermittee;

(3) Email address for reporting non-storm water and illicit discharges for each Copermittee;

(4) Link to each Copermittee's website, if available, where the public may find additional information about the Copermittee's storm water management program and for requesting records for the implementation of its program;

(5) Information about opportunities for the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or protection of the quality of receiving waters; and

(6) Reports from regional monitoring programs in which the Copermittees participate (e.g. Southern California Monitoring Coalition, Southern California Coastal Water Research Project Bight Monitoring);

(7) Regional Monitoring and Assessment Reports; and

(8) Any other information, data, and documents the Copermittees determine as appropriate for making available to the public.

[37] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

5. Report of Waste Discharge

The Copermittees subject to the requirements of this Order must submit to the San Diego Water Board a complete Report of Waste Discharge as an application for the re-issuance of this Order and NPDES permit. The Report of Waste Discharge must be submitted no later than 180 days in advance of the expiration date of this Order. The Report of Waste Discharge must contain the following minimum information:

a. Names and addresses of the Copermittees;

b. Names and titles of the primary contacts of the Copermittees;

c. Proposed changes to the Copermittees' Water Quality Improvement Plans and the supporting justification;

d. Proposed changes to the Copermittees' jurisdictional runoff management programs and the supporting justification;

e. Any other information necessary for the re-issuance of this Order;

f. Any information to be included as part of the Report of Waste Discharge pursuant to the requirements of this Order; and

g. Any other information required by federal regulations for NPDES permit reissuance.

6. Reporting Provisions

Each Copermittee must comply with all the reporting and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

G. PRINCIPAL WATERSHED COPERMITTEE RESPONSIBILITIES

1. The Copermittees within each Watershed Management Area must designate a Principal Watershed Copermittee and notify the San Diego Water Board of the name of the Principal Watershed Copermittee. An individual Copermittee should not be designated a Principal Watershed Copermittee for more than two Watershed Management Areas. The notification may be submitted with the Water Quality Improvement Plan required pursuant to Provision F.1 of this Order.

2. The Principal Watershed Copermittee is responsible for, at a minimum, the following:

a. Serving as liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues, and when necessary and appropriate, representing the Copermittees in the Watershed Management Area before the San Diego Water Board;

b. Facilitating the development of the Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order;

c. Coordinating the submittal of the deliverables required by Provisions F.1, F.2, F.3.a, and F.3.b of this Order; and

d. Coordinating and developing, with the other Principal Watershed Copermittees, the requirements of Provisions F.3.c, F.4, and F.5.b of this Order.

3. The Principal Watershed Copermittee is not responsible for ensuring that the other Copermittees within the Watershed Management Area are in compliance with the requirements of this Order. Each Copermittee within the Watershed Management Area is responsible for complying with the requirements of this Order.

H. MODIFICATION OF ORDER

1. Modifications of the Order may be initiated by the San Diego Water Board or by the Copermittees. Requests by Copermittees must be made to the San Diego Water Board.

2. Minor modifications to the Order may be made by the San Diego Water Board where the proposed modification complies with all the prohibitions and limitations, and other requirements of this Order.

3. This Order may also be re-opened and modified, revoked and, reissued or terminated in accordance with the provisions of 40 CFR 122.44, 122.62 to 122.64, and 124.5. Causes for taking such actions include, but are not limited to, failure to comply with any condition of this Order and permit, and endangerment to human health or the environment resulting from the permitted activity.

4. This Order may be re-opened for modification for cause including but not limited to the following:

a. Any of the TMDLs in Attachment E to this Order are amended in the Basin Plan by San Diego Water Board, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA;

b. The Basin Plan is amended by the San Diego Water Board to incorporate a new TMDL, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA; or

c. Updating or revising the monitoring and reporting requirements is determined to be necessary, at the discretion of the San Diego Water Board. Such modification(s) may include, but is (are) not limited to, revision(s) to: (i) implement recommendations from Southern California Coastal Water Research Project (SCCWRP), (ii) develop, refine, implement, and/or coordinate a regional monitoring program, (iii) develop and implement improved monitoring and assessment programs in keeping with San Diego Water Board Resolution No. R9-2012-0069, Resolution in Support of a Regional Monitoring Framework, and/or (iv) add provisions to require the Copermittees to evaluate and provide information on cost and values of the monitoring and reporting program.

I. STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

Each Copermittee must comply with all the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

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ATTACHMENT A

DISCHARGE PROHIBITIONS AND SPECIAL PROTECTIONS

1. Basin Plan Waste Discharge Prohibitions

California Water Code Section 13243 provides that a Regional Water Board, in a water quality control plan, may specify certain conditions or areas where the discharge of waste or certain types of waste is not permitted. The following waste discharge prohibitions in the Water Quality Control Plan for the San Diego Basin (Basin Plan) are applicable to any person, as defined by Section 13050(c) of the California Water Code, who is a citizen, domiciliary, or political agency or entity of California whose activities in California could affect the quality of waters of the state within the boundaries of the San Diego Region.

1. The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in California Water Code Section 13050, is prohibited.

2. The discharge of waste to land, except as authorized by waste discharge requirements or the terms described in California Water Code Section 13264 is prohibited.

3. The discharge of pollutants or dredged or fill material to waters of the United States except as authorized by a National Pollutant Discharge Elimination System (NPDES) permit or a dredged or fill material permit (subject to the exemption described in California Water Code Section 13376) is prohibited.

4. Discharges of recycled water to lakes or reservoirs used for municipal water supply or to inland surface water tributaries thereto are prohibited, unless this San Diego Water Board issues a NPDES permit authorizing such a discharge; the proposed discharge has been approved by the State Department of Health Services (DHS) and the operating agency of the impacted reservoir; and the discharger has an approved fail-safe long-term disposal alternative.

5. The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the San Diego Water Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

6. The discharge of waste in a manner causing flow, ponding, or surfacing on lands not owned or under the control of the discharger is prohibited, unless the discharge is authorized by the San Diego Water Board.

7. The dumping, deposition, or discharge of waste directly into waters of the state, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the San Diego Water Board.

8. Any discharge to a storm water conveyance system that is not composed entirely of "*storm water*" is prohibited unless authorized by the San Diego Water Board. [The federal regulations, 40 CFR 122.26(b)(13), define storm water as storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from firefighting activities.] [§122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

9. The unauthorized discharge of treated or untreated sewage to waters of the state or to a storm water conveyance system is prohibited.

10. The discharge of industrial wastes to conventional septic tank/subsurface disposal systems, except as authorized by the terms described in California Water Code Section 13264, is prohibited.

11. The discharge of radioactive wastes amenable to alternative methods of disposal into the waters of the state is prohibited.

12. The discharge of any radiological, chemical, or biological warfare agent into waters of the state is prohibited.

13. The discharge of waste into a natural or excavated site below historic water levels is prohibited unless the discharge is authorized by the San Diego Water Board.

14. The discharge of sand, silt, clay, or other earthen materials from any activity, including land grading and construction, in quantities which cause deleterious bottom deposits, turbidity or discoloration in waters of the state or which unreasonably affect, or threaten to affect, beneficial uses of such waters is prohibited.

15. The discharge of treated or untreated sewage from vessels to Mission Bay, Oceanside Harbor, Dana Point Harbor, or other small boat harbors is prohibited.

16. The discharge of untreated sewage from vessels to San Diego Bay is prohibited.

17. The discharge of treated sewage from vessels to portions of San Diego Bay that are less than 30 feet deep at mean lower low water (MLLW) is prohibited.

18. The discharge of treated sewage from vessels, which do not have a properly functioning US Coast Guard certified Type I or Type II marine sanitation device, to portions of San Diego Bay that are greater than 30 feet deep at mean lower low water (MLLW) is prohibited.

2. Attachment B to State Water Board Resolution 2012-0012, as amended by State Water Board Resolution No. 2012-0031.

Special Protections for Areas of Special Biological Significance (ASBS), Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges

I. PROVISIONS FOR POINT SOURCE DISCHARGES OF STORM WATER AND NONPOINT SOURCE WASTE DISCHARGES

The following terms, prohibitions, and special conditions (hereafter collectively referred to as special conditions) are established as limitations on point source storm water and nonpoint source discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in Areas of Special Biological Significance (ASBS), as required for State Water Quality Protection Areas pursuant to California Public Resources Code Sections 36700(f) and 36710(f). These Special Protections are adopted by the State Water Board as part of the California Ocean Plan (Ocean Plan) General Exception.

The special conditions are organized by category of discharge. The State Water Resources Control Board (State Water Board) and Regional Water Quality Control Boards (Regional Water Boards) will determine categories and the means of regulation for those categories [e.g., Point Source Storm Water National Pollutant Discharge Elimination System (NPDES) or Nonpoint Source].

A. PERMITTED POINT SOURCE DISCHARGES OF STORM WATER

1. General Provisions for Permitted Point Source Discharges of Storm Water

   a. Existing storm water discharges into an ASBS are allowed only under the following conditions:

      (1) The discharges are authorized by an NPDES permit issued by the State Water Board or Regional Water Board;

      (2) The discharges comply with all of the applicable terms, prohibitions, and special conditions contained in these Special Protections; and

      (3) The discharges:

         (i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

         (ii) Are designed to prevent soil erosion;

         (iii) Occur only during wet weather;

         (iv) Are composed of only storm water runoff.

   b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

   c. The discharge of trash is prohibited.

d. Only discharges from existing storm water outfalls are allowed. Any proposed or new storm water runoff discharge shall be routed to existing storm water discharge outfalls and shall not result in any new contribution of waste to an ASBS (i.e., no additional pollutant loading). "Existing storm water outfalls" are those that were constructed or under construction prior to January 1, 2005. "New contribution of waste" is defined as any addition of waste beyond what would have occurred as of January 1, 2005. A change to an existing storm water outfall, in terms of re-location or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges are prohibited except as provided below:

(1) The term "non-storm water discharges" means any waste discharges from a municipal separate storm sewer system (MS4) or other NPDES permitted storm drain system to an ASBS that are not composed entirely of storm water.

(2) (i) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability or occur naturally:

(a) Discharges associated with emergency fire fighting operations.

(b) Foundation and footing drains.

(c) Water from crawl space or basement pumps.

(d) Hillside dewatering.

(e) Naturally occurring groundwater seepage via a storm drain.

(f) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(ii) An NPDES permitting authority may authorize non-storm water discharges to an MS4 with a direct discharge to an ASBS only to the extent the NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

2. Compliance Plans for Inclusion in Storm Water Management Plans (SWMP) and Storm Water Pollution Prevention Plans (SWPPP).

The discharger shall specifically address the prohibition of non-storm water runoff and the requirement to maintain natural water quality for storm water discharges to an ASBS in an ASBS Compliance Plan to be included in its SWMP or a SWPPP, as appropriate to permit type. If a statewide permit includes a SWMP, then the discharger shall prepare a stand-alone compliance plan for ASBS discharges. The ASBS Compliance Plan is subject to approval by the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (for permits issued by Regional Water Boards).

a. The Compliance Plan shall include a map of surface drainage of storm water runoff, showing areas of sheet runoff, prioritize discharges, and describe any structural Best Management Practices (BMPs) already employed and/or BMPs to be employed in the future. Priority discharges are those that pose the greatest water quality threat and which are identified to require installation of structural BMPs. The map shall also show the storm water conveyances in relation to other features such as service areas, sewage conveyances and treatment facilities, landslides, areas prone to erosion, and waste and hazardous material storage areas, if applicable. The SWMP or SWPPP shall also include a procedure for updating the map and plan when changes are made to the storm water conveyance facilities.

b. The ASBS Compliance Plan shall describe the measures by which all non-authorized non-storm water runoff (e.g., dry weather flows) has been eliminated, how these measures will be maintained over time, and how these measures are monitored and documented.

c. For Municipal Separate Storm Sewer System (MS4s), the ASBS Compliance Plan shall require minimum inspection frequencies as follows:

(1) The minimum inspection frequency for construction sites shall be weekly during rainy season;

(2) The minimum inspection frequency for industrial facilities shall be monthly during the rainy season;

(3) The minimum inspection frequency for commercial facilities (e.g., restaurants) shall be twice during the rainy season; and

(4) Storm water outfall drains equal to or greater than 18 inches (457 mm) in diameter or width shall be inspected once prior to the beginning of the rainy season and once during the rainy season and maintained to remove trash and other anthropogenic debris.

d. The ASBS Compliance Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff, that are necessary to comply with these special conditions, will be achieved through BMPs. Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that such installation would pose a threat to health or safety. BMPs to control storm water runoff discharges (at the end-of-pipe) during a design storm shall be designed to achieve on average the following target levels:

(1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

(2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges.

The baseline for these determinations is the effective date of the Exception, except for those structural BMPs installed between January 1, 2005 and adoption of these Special Protections, and the reductions must be achieved and documented within six (6) years of the effective date.

e. The ASBS Compliance Plan shall address erosion control and the prevention of anthropogenic sedimentation in ASBS. The natural habitat conditions in the ASBS shall not be altered as a result of anthropogenic sedimentation.

f. The ASBS Compliance Plan shall describe the non-structural BMPs currently employed and planned in the future (including those for construction activities), and include an implementation schedule. The ASBS Compliance Plan shall include non-structural BMPs that address public education and outreach. Education and outreach efforts must adequately inform the public that direct discharges of pollutants from private property not entering an MS4 are prohibited. The ASBS Compliance Plan shall also describe the structural BMPs, including any low impact development (LID) measures, currently employed and planned for higher threat discharges and include an implementation schedule. To control storm water runoff discharges (at the end-of-pipe) during a design storm, permittees must first consider, and use where feasible, LID practices to infiltrate, use, or evapotranspirate storm water runoff on-site, if LID practices would be the most effective at reducing pollutants from entering the ASBS.

g. The BMPs and implementation schedule shall be designed to ensure that natural water quality conditions in the receiving water are achieved and maintained by either reducing flows from impervious surfaces or reducing pollutant loading, or some combination thereof.

h. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents in storm water runoff that alter natural ocean water quality and the sources of these constituents.

(2) The report shall describe BMPs that are currently being implemented, BMPs that are identified in the SWMP or SWPPP for future implementation, and any additional BMPs that may be added to the SWMP or SWPPP to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the BMPs.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits), the discharger shall revise its ASBS Compliance Plan to incorporate any new or modified BMPs that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised SWMP or SWPPP, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural ocean water quality conditions due to the same constituent.

(5) The requirements of this section are in addition to the terms, prohibitions, and conditions contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within eighteen (18) months from the effective date of the Exception, the discharger shall submit a draft written ASBS Compliance Plan to the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that describes its strategy to comply with these special conditions, including the requirement to maintain natural water quality in the affected ASBS. The ASBS Compliance Plan shall include a description of appropriate non-structural controls and a time schedule to implement structural controls (implementation schedule) to comply with these special conditions for inclusion in the discharger's SWMP or SWPPP, as appropriate to permit type. The final ASBS Compliance Plan, including a description and final schedule for structural controls based on the results of runoff and receiving water monitoring, must be submitted within thirty (30) months from the effective date of the Exception.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these special conditions shall be implemented.

d. Within six (6) years of the effective date of the Exception, any structural controls identified in the ASBS Compliance Plan that are necessary to comply with these special conditions shall be operational.

e. Within six (6) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water, pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data, and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by

the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. for municipalities, a demonstration of significant hardship to discharger ratepayers, by showing the relationship of storm water fees to annual household income for residents within the discharger's jurisdictional area, and the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or

2. for other governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

B. NONPOINT SOURCE DISCHARGES

1. General Provisions for Nonpoint Sources

a. Existing nonpoint source waste discharges are allowed into an ASBS only under the following conditions:

(1) The discharges are authorized under waste discharge requirements, a conditional waiver of waste discharge requirements, or a conditional prohibition issued by the State Water Board or a Regional Water Board.

(2) The discharges are in compliance with the applicable terms, prohibitions, and special conditions contained in these Special Protections.

(3) The discharges:

(i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

(ii) Are designed to prevent soil erosion;

(iii) Occur only during wet weather;

(iv) Are composed of only storm water runoff.

b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

c. The discharge of trash is prohibited.

d. Only existing nonpoint source waste discharges are allowed. "Existing nonpoint source waste discharges" are discharges that were ongoing prior to January 1, 2005. "New nonpoint source discharges" are defined as those that commenced on or after January 1,

2005. A change to an existing nonpoint source discharge, in terms of relocation or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges from nonpoint sources (those not subject to an NPDES Permit) are prohibited except as provided below:

(1) The term "non-storm water discharges" means any waste discharges that are not composed entirely of storm water.

(2) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability, or occur naturally:

(i) Discharges associated with emergency fire fighting operations.

(ii) Foundation and footing drains.

(iii) Water from crawl space or basement pumps.

(iv) Hillside dewatering.

(v) Naturally occurring groundwater seepage via a storm drain.

(vi) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

f. At the San Clemente Island ASBS, discharges incidental to military training and research, development, test, and evaluation operations are allowed. Discharges incidental to underwater demolition and other in-water explosions are not allowed in the two military closure areas in the vicinity of Wilson Cove and Castle Rock. Discharges must not result in a violation of the water quality objectives, including the protection of the marine aquatic life beneficial use, anywhere in the ASBS.

g. At the San Nicolas Island and Begg Rock ASBS, discharges incidental to military research, development, testing, and evaluation of, and training with, guided missile and other weapons systems, fleet training exercises, small-scale amphibious warfare training, and special warfare training are allowed. Discharges incidental to underwater demolition and other in-water explosions are not allowed. Discharges must not result in a violation of the water quality objectives, including the protection of the marine aquatic life beneficial use, anywhere in the ASBS.

h. All other nonpoint source discharges not specifically authorized above are prohibited.

2. Planning and Reporting

a. The nonpoint source discharger shall develop an ASBS Pollution Prevention Plan, including an implementation schedule, to address storm water runoff and any other nonpoint source discharges from its facilities. The ASBS Pollution Prevention Plan must be equivalent in contents to an ASBS Compliance Plan as described in I (A)(2) in this document. The ASBS Pollution Prevention Plan is subject to approval by the Executive Director of the State Water Board (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements).

b. The ASBS Pollution Prevention Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff that are necessary to comply with these special conditions, will be achieved through Management Measures and associated Management Practices (Management Measures/Practices). Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director or Regional Water Board Executive Officer that such installation would pose a threat to health or safety. Management Measures to control storm water runoff during a design storm shall achieve on average the following target levels:

(1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

(2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges.

The baseline for these determinations is the effective date of the Exception, except for those structural BMPs installed between January 1, 2005 and adoption of these Special Protections, and the reductions must be achieved and documented within six (6) years of the effective date.

c. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff or other nonpoint source pollution is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and the Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents that alter natural water quality and the sources of these constituents.

(2) The report shall describe Management Measures/Practices that are currently being implemented, Management Measures/Practices that are identified in the ASBS Pollution Prevention Plan for future implementation, and any additional Management Measures/Practices that may be added to the Pollution Prevention Plan to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the Management Measures/Practices.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements), the discharger shall revise its ASBS Pollution Prevention Plan to incorporate any new or modified Management Measures/Practices that have been or

will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised ASBS Pollution Prevention Plan, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural water quality conditions due to the same constituent.

(5) The requirements of this section are in addition to the terms, prohibitions, and conditions contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within eighteen (18) months from the effective date of the Exception, the discharger~~s~~ shall submit a draft written ASBS Pollution Prevention Plan to the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) that describes its strategy to comply with these special conditions, including the requirement to maintain natural ocean water quality in the affected ASBS. The Pollution Prevention Plan shall include a description of appropriate non-structural controls and a time schedule to implement structural controls to comply with these special conditions for inclusion in the discharger's Pollution Prevention Plan. The final ASBS Pollution Prevention Plan, including a description and final schedule for structural controls based on the results of runoff and receiving water monitoring, must be submitted within thirty (30) months from the effective date of the Exception.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these Special Protections shall be implemented.

d. Within six (6) years of the effective date of the Exception, any structural controls identified in the ASBS Pollution Prevention Plan that are necessary to comply with these special conditions shall be operational.

e. Within six (6) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in (d.) or (e.). The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. a demonstration that the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or

2. for governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

II. ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES

In addition to the provisions in Section I (A) or I (B), respectively, a discharger with parks and recreation facilities shall comply with the following:

A. The discharger shall include a section in an ASBS Compliance Plan (for NPDES dischargers) or an ASBS Pollution Prevention Plan (for nonpoint source dischargers) to address storm water runoff from parks and recreation facilities.

1. The plan shall identify all pollutant sources, including sediment sources, which may result in waste entering storm water runoff. Pollutant sources include, but are not limited to, roadside rest areas and vistas, picnic areas, campgrounds, trash receptacles, maintenance facilities, park personnel housing, portable toilets, leach fields, fuel tanks, roads, piers, and boat launch facilities.

2. The plan shall describe BMPs or Management Measures/Practices that will be implemented to control soil erosion (both temporary and permanent erosion controls) and reduce or eliminate pollutants in storm water runoff in order to achieve and maintain natural water quality conditions in the affected ASBS. The plan shall include BMPs or Management Measures/Practices to ensure that trails and culverts are maintained to prevent erosion and minimize waste discharges to ASBS.

3. The plan shall include BMPs or Management Measures/Practices to prevent the discharge of pesticides or other chemicals, including agricultural chemicals, in storm water runoff to the affected ASBS.

4. The plan shall include BMPs or Management Measures/Practices that address public education and outreach. The goal of these BMPs or Management Measures/Practices is to ensure that the public is adequately informed that waste discharges to the affected ASBS are prohibited or limited by special conditions in these Special Protections. The BMPs or Management Measures/Practices shall include signage at camping, picnicking, beach and roadside parking areas, and visitor centers, or other appropriate measures, which notify the public of any applicable requirements of these Special Protections and identify the ASBS boundaries.

5. The plan shall include BMPs or Management Measures/Practices that address the prohibition against the discharge of trash to ASBS. The BMPs or Management Measures/Practices shall include measures to ensure that adequate trash receptacles are available for public use at visitor facilities, including parking areas, and that the receptacles are adequately maintained to prevent trash discharges into the ASBS. Appropriate measures include covering trash receptacles to prevent trash from being wind blown and periodically emptying the receptacles to prevent overflows.

6. The plan shall include BMPs or Management Measures/Practices to address runoff from parking areas and other developed features to ensure that the runoff does not alter natural water quality in the affected ASBS. BMPs or Management Measures/Practices shall include measures to reduce pollutant loading in runoff to the ASBS through installation of natural area buffers (LID), treatment, or other appropriate measures.

B. Maintenance and repair of park and recreation facilities must not result in waste discharges to the ASBS. The practice of road oiling must be minimized or eliminated, and must not result in waste discharges to the ASBS.

III. ADDITIONAL REQUIREMENTS – WATERFRONT AND MARINE OPERATIONS

In addition to the provisions in Section I (A) or I (B), respectively, a discharger with waterfront and marine operations shall comply with the following:

A. For discharges related to waterfront and marine operations, the discharger shall develop a Waterfront and Marine Operations Management Plan (Waterfront Plan). This plan shall contain appropriate Management Measures/Practices to address nonpoint source pollutant discharges to the affected ASBS.

1. The Waterfront Plan shall contain appropriate Management Measures/Practices for any waste discharges associated with the operation and maintenance of vessels, moorings, piers, launch ramps, and cleaning stations in order to ensure that beneficial uses are protected and natural water quality is maintained in the affected ASBS.

2. For discharges from marinas and recreational boating activities, the Waterfront Plan shall include appropriate Management Measures, described in The Plan for California's Nonpoint Source Pollution Control Program, for marinas and recreational boating, or equivalent practices, to ensure that nonpoint source pollutant discharges do not alter natural water quality in the affected ASBS.

3. The Waterfront Plan shall include Management Practices to address public education and outreach to ensure that the public is adequately informed that waste discharges to the affected ASBS are prohibited or limited by special conditions in these Special

Protections. The management practices shall include appropriate signage, or similar measures, to inform the public of the ASBS restrictions and to identify the ASBS boundaries.

4. The Waterfront Plan shall include Management Practices to address the prohibition against trash discharges to ASBS. The Management Practices shall include the provision of adequate trash receptacles for marine recreation areas, including parking areas, launch ramps, and docks. The plan shall also include appropriate Management Practices to ensure that the receptacles are adequately maintained and secured in order to prevent trash discharges into the ASBS. Appropriate Management Practices include covering the trash receptacles to prevent trash from being windblown, staking or securing the trash receptacles so they don't tip over, and periodically emptying the receptacles to prevent overflow.

5. The discharger shall submit its Waterfront Plan to the by the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) within six months of the effective date of these special conditions. The Waterfront Plan is subject to approval by the State Water Board Executive Director or the Regional Water Board Executive Officer, as appropriate. The plan must be fully implemented within 18 months of the effective date of the Exception.

B. The discharge of chlorine, soaps, petroleum, other chemical contaminants, trash, fish offal, or human sewage to ASBS is prohibited. Sinks and fish cleaning stations are point source discharges of wastes and are prohibited from discharging into ASBS. Anthropogenic accumulations of discarded fouling organisms on the sea floor must be minimized.

C. Limited-term activities, such as the repair, renovation, or maintenance of waterfront facilities, including, but not limited to, piers, docks, moorings, and breakwaters, are authorized only in accordance with Chapter III.E.2 of the Ocean Plan.

D. If the discharger anticipates that the discharger will fail to fully implement the approved Waterfront Plan within the 18 month deadline, the discharger shall submit a technical report as soon as practicable to the State Water Board Executive Director or the Regional Water Board Executive Officer, as appropriate. The technical report shall contain reasons for failing to meet the deadline and propose a revised schedule to fully implement the plan.

E. The State Water Board or the Regional Water Board may, for good cause, authorize additional time to comply with the Waterfront Plan. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in Section III.A.5. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the

discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality. The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. a demonstration of significant hardship by showing that the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate.

2. for governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

IV. MONITORING REQUIREMENTS

Monitoring is mandatory for all dischargers to assure compliance with the Ocean Plan. Monitoring requirements include both: (A) core discharge monitoring, and (B) ocean receiving water monitoring. The State and Regional Water Boards must approve sampling site locations and any adjustments to the monitoring programs. All ocean receiving water and reference area monitoring must be comparable with the Water Boards' Surface Water Ambient Monitoring Program (SWAMP).

Safety concerns: Sample locations and sampling periods must be determined considering safety issues. Sampling may be postponed upon notification to the State and Regional Water Boards if hazardous conditions prevail.

Analytical Chemistry Methods: All constituents must be analyzed using the lowest minimum detection limits comparable to the Ocean Plan water quality objectives. For metal analysis, all samples, including storm water effluent, reference samples, and ocean receiving water samples, must be analyzed by the approved analytical method with the lowest minimum detection limits (currently Inductively Coupled Plasma/Mass Spectrometry) described in the Ocean Plan.

A. CORE DISCHARGE MONITORING PROGRAM

1. General sampling requirements for timing and storm size:

   Runoff must be collected during a storm event that is greater than 0.1 inch and generates runoff, and at least 72 hours from the previously measurable storm event. Runoff samples shall be collected during the same storm and at approximately the same time when post-storm receiving water is sampled, and analyzed for the same constituents as receiving water and reference site samples (see section IV B) as described below.

2. Runoff flow measurements

   a. For municipal/industrial storm water outfalls in existence as of December 31, 2007, 18 inches (457mm) or greater in diameter/width (including multiple outfall pipes in combination having a width of 18 inches, runoff flows must be measured or calculated, using a method acceptable to and approved by the State and Regional Water Boards.

b. This will be reported annually for each precipitation season to the State and Regional Water Boards.

3. Runoff samples – storm events

a. For outfalls equal to or greater than 18 inches (0.46m) in diameter or width:

(1) samples of storm water runoff shall be collected during the same storm as receiving water samples and analyzed for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

(2) samples of storm water runoff shall be collected and analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

(3) If an applicant has no outfall greater than 36 inches, then storm water runoff from the applicant's largest outfall shall be further collected during the same storm as receiving water samples and analyzed for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates).

b. For outfalls equal to or greater than 36 inches (0.91m) in diameter or width:

(1) samples of storm water runoff shall be collected during the same storm as receiving water samples and analyzed for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

(2) samples of storm water runoff shall be further collected during the same storm as receiving water samples and analyzed for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates); and

(3) samples of storm water runoff shall be collected and analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

c. For an applicant not participating in a regional monitoring program [see below in Section IV (B)] in addition to (a.) and (b.) above, a minimum of the two largest outfalls or 20 percent of the larger outfalls, whichever is greater, shall be sampled (flow weighted composite samples) at least three times annually during wet weather (storm event) and analyzed for all Ocean Plan Table A constituents, Table B constituents for marine aquatic life protection (except for toxicity, only chronic toxicity for three species shall be required), DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, and Ocean Plan indicator bacteria. For parties discharging to ASBS in

more than one Regional Water Board region, at a minimum, one (the largest) such discharge shall be sampled annually in each Region.

4. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may reduce or suspend core monitoring once the storm runoff is fully characterized. This determination may be made at any point after the discharge is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

B. Ocean Receiving Water and Reference Area Monitoring Program

In addition to performing the Core Discharge Monitoring Program in Section II.A above, all applicants having authorized discharges must perform ocean receiving water monitoring. In order to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS, dischargers may choose either (1) an individual monitoring program, or (2) participation in a regional integrated monitoring program.

1. Individual Monitoring Program: The requirements listed below are for those dischargers who elect to perform an individual monitoring program to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within the affected ASBS. In addition to Core Discharge Monitoring, the following additional monitoring requirements shall be met:

   a. Three times annually, during wet weather (storm events), the receiving water at the point of discharge from the outfalls described in section (IV)(A)(3)(c) above shall be sampled and analyzed for Ocean Plan Table A constituents, Table B constituents for marine aquatic life, DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, salinity, chronic toxicity (three species), and Ocean Plan indicator bacteria.

      The sample location for the ocean receiving water shall be in the surf zone at the point of discharges; this must be at the same location where storm water runoff is sampled. Receiving water shall be sampled prior to (pre-storm) and during (or immediately after) the same storm (post storm). Post storm sampling shall be during the same storm and at approximately the same time as when the runoff is sampled. Reference water quality shall also be sampled three times annually and analyzed for the same constituents pre-storm and post-storm, during the same storm seasons when receiving water is sampled. Reference stations will be determined by the State Water Board's Division of Water Quality and the applicable Regional Water Board(s).

   b. Sediment sampling shall occur at least three times during every five (5) year period. The subtidal sediment (sand or finer, if present) at the discharge shall be sampled and analyzed for Ocean Plan Table B constituents for marine aquatic life, DDT, PCBs, PAHs, pyrethroids, and OP pesticides. For sediment toxicity testing, only an acute toxicity test using the amphipod *Eohaustorius estuarius* must be performed.

   c. A quantitative survey of intertidal benthic marine life shall be performed at the discharge and at a reference site. The survey shall be performed at least once every five (5) year period. The survey design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The results of the survey shall be

completed and submitted to the State Water Board and Regional Water Board at least six months prior to the end of the permit cycle.

d. Once during each five (5) year period, a bioaccumulation study shall be conducted to determine the concentrations of metals and synthetic organic pollutants at representative discharge sites and at representative reference sites. The study design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The bioaccumulation study may include California mussels (*Mytilus californianus*) and/or sand crabs (*Emerita analoga* or *Blepharipoda occidentalis*). Based on the study results, the Regional Water Board and the State Water Board's Division of Water Quality, may adjust the study design in subsequent permits, or add or modify additional test organisms (such as shore crabs or fish), or modify the study design appropriate for the area and best available sensitive measures of contaminant exposure.

e. Marine Debris: Representative quantitative observations for trash by type and source shall be performed along the coast of the ASBS within the influence of the discharger's outfalls. The design, including locations and frequency, of the marine debris observations is subject to approval by the Regional Water Board and State Water Board's Division of Water Quality.

f. The monitoring requirements of the Individual Monitoring Program in this section are minimum requirements. After a minimum of one (1) year of continuous water quality monitoring of the discharges and ocean receiving waters, the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may require additional monitoring, or adjust, reduce or suspend receiving water and reference station monitoring. This determination may be made at any point after the discharge and receiving water is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

2. Regional Integrated Monitoring Program: Dischargers may elect to participate in a regional integrated monitoring program, in lieu of an individual monitoring program, to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS. This regional approach shall characterize natural water quality, pre- and post-storm, in ocean reference areas near the mouths of identified open space watersheds and the effects of the discharges on natural water quality (physical, chemical, and toxicity) in the ASBS receiving waters, and should include benthic marine aquatic life and bioaccumulation components. The design of the ASBS stratum of a regional integrated monitoring program may deviate from the otherwise prescribed individual monitoring approach (in Section IV.B.1) if approved by the State Water Board's Division of Water Quality and the Regional Water Boards.

a. Ocean reference areas shall be located at the drainages of flowing watersheds with minimal development (in no instance more than 10% development), and shall not be located in CWA Section 303(d) listed waterbodies or have tributaries that are 303(d) listed. Reference areas shall be free of wastewater discharges and anthropogenic non- storm water runoff. A minimum of low threat storm runoff discharges (e.g. stream highway overpasses and campgrounds) may be allowed on a case-by-case basis. Reference areas shall be located in the same region as the ASBS receiving water monitoring occurs. The reference areas for each Region are subject to approval by the participants in the regional monitoring program and the State Water

Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean reference water samples must be collected from each station, each from a separate storm during the same storm season that receiving water is sampled. A minimum of one reference location shall be sampled for each ASBS receiving water site sampled per responsible party. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

b. ASBS ocean receiving water must be sampled in the surf zone at the location where the runoff makes contact with ocean water (i.e. at "point zero"). Ocean receiving water stations must be representative of worst-case discharge conditions (i.e. co-located at a large drain greater than 36 inches, or if drains greater than 36 inches are not present in the ASBS then the largest drain greater than18 inches.) Ocean receiving water stations are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean receiving water samples must be collected during each storm season from each station, each from a separate storm. A minimum of one receiving water location shall be sampled in each ASBS per responsible party in that ASBS. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

c. Reference and receiving water sampling shall commence during the first full storm season following the adoption of these special conditions, and post-storm samples shall be collected during the same storm event when storm water runoff is sampled. Sampling shall occur in a minimum of two storm seasons. For those ASBS dischargers that have already participated in the Southern California Bight 2008 ASBS regional monitoring effort, sampling may be limited to only one storm season.

d. Receiving water and reference samples shall be analyzed for the same constituents as storm water runoff samples. At a minimum, constituents to be sampled and analyzed in reference and discharge receiving waters must include oil and grease, total suspended solids, Ocean Plan Table B metals for protection of marine life, Ocean Plan PAHs, pyrethroids, OP pesticides, ammonia, nitrate, phosphates, and critical life stage chronic toxicity for three species. In addition, within the range of the southern sea otter, indicator bacteria or some other measure of fecal contamination shall be analyzed.

3. Waterfront and Marine Operations: In addition to the above requirements for ocean receiving water monitoring, additional monitoring must be performed for marinas and boat launch and pier facilities:

a. For all marina or mooring field operators, in mooring fields with 10 or more occupied moorings, the ocean receiving water must be sampled for Ocean Plan indicator bacteria, residual chlorine, copper, zinc, grease and oil, methylene blue active substances (MBAS), and ammonia nitrogen.

(1) For mooring field operators opting for an individual monitoring program (Section IV.B.1 above), this sampling must occur weekly (on the weekend) from May through October.

(2) For mooring field operators opting to participate in a regional integrated monitoring program (Section IV.B.2 above), this sampling must occur monthly from May through October on a high use weekend in each month. The Water Boards may allow a reduction in the frequency of sampling, through the regional monitoring program, after the first year of monitoring.

b. For all mooring field operators, the subtidal sediment (sand or finer, if present) within mooring fields and below piers shall be sampled and analyzed for Ocean Plan Table B metals (for marine aquatic life beneficial use), acute toxicity, PAHs, and tributyltin. For sediment toxicity testing, only an acute toxicity test using the amphipod *Eohaustorius estuarius* must be performed. This sampling shall occur at least three times during a five (5) year period. For mooring field operators opting to participate in a regional integrated monitoring program, the Water Boards may allow a reduction in the frequency of sampling after the first sampling effort's results are assessed.

Glossary

At the point of discharge(s) – Means in the surf zone immediately where runoff from an outfall meets the ocean water (a.k.a., at point zero).

Areas of Special Biological Significance (ASBS) – Those areas designated by the State Water Board as ocean areas requiring protection of species or biological communities to the extent that alteration of natural water quality is undesirable. All Areas of Special Biological Significance are also classified as a subset of State Water Quality Protection Areas.

Design storm – For purposes of these Special Protections, a design storm is defined as the volume of runoff produced from one inch of precipitation per day or, if this definition is inconsistent with the discharger's applicable storm water permit, then the design storm shall be the definition included in the discharger's applicable storm water permit.

Development – Relevant to reference monitoring sites, means urban, industrial, agricultural, grazing, mining, and timber harvesting land uses.

Higher threat discharges - Permitted storm drains discharging equal to or greater than 18 inches, industrial storm drains, agricultural runoff discharged through an MS4, discharges associated with waterfront and marina operations (e.g., piers, launch ramps, mooring fields, and associated vessel support activities, except for passive discharges defined below), and direct discharges associated with commercial or industrial activities to ASBS.

Low Impact Development (LID) – A sustainable practice that benefits water supply and contributes to water quality protection. Unlike traditional storm water management, which entails collecting and conveying storm water runoff through storm drains, pipes, or other conveyances to a centralized storm water facility, LID focuses on using site design and storm water management to maintain the site's pre-development runoff rates and volumes. The goal of LID is to mimic a site's predevelopment hydrology by using design techniques that infiltrate, filter, store, evaporate, and detain runoff close to the source of rainfall.

Marine Operations – Marinas or mooring fields that contain slips or mooring locations for 10 or more vessels.

Management Measure (MM) - Economically achievable measures for the control of the addition of pollutants from various classes of nonpoint sources of pollution, which reflect the greatest degree of pollutant reduction achievable through the application of the best available nonpoint pollution control practices, technologies, processes, siting criteria, operating methods, or other alternatives. For example, in the "marinas and recreational boating" land- use category specified in the Plan for California's Nonpoint Source Pollution Control Program (NPS Program Plan) (SWRCB, 1999), "boat cleaning and maintenance" is considered a MM or the source of a specific class or type of NPS pollution.

Management Practice (MP) - The practices (e.g., structural, non-structural, operational, or other alternatives) that can be used either individually or in combination to address a specific MM class or classes of NPS pollution. For example, for the "boat cleaning and maintenance" MM, specific MPs can include, but are not limited to, methods for the selection of environmentally sensitive hull paints or methods for cleaning/removal of hull copper anti- fouling paints.

Municipal Separate Storm Sewer System (MS4) – A municipally-owned storm sewer system regulated under the Phase I or Phase II storm water program implemented in compliance with Clean Water Act section 402(p). Note that an MS4 program's boundaries are not necessarily congruent with the permittee's political boundaries.

Natural Ocean Water Quality - The water quality (based on selected physical, chemical and biological characteristics) that is required to sustain marine ecosystems, and which is without apparent human influence, *i.e.*, an absence of significant amounts of: (a) man-made constituents (*e.g.,* DDT); (b) other chemical (*e.g.,* trace metals), physical (temperature/thermal pollution, sediment burial), and biological (*e.g.*, bacteria) constituents at concentrations that have been elevated due to man's activities above those resulting from the naturally occurring processes that affect the area in question; and (c) non-indigenous biota (*e.g.,* invasive algal bloom species) that have been introduced either deliberately or accidentally by man. Discharges "*shall not alter natural ocean water quality*" as determined by a comparison to the range of constituent concentrations in reference areas agreed upon via the regional monitoring program(s). If monitoring information indicates that *natural ocean water quality* is not maintained, but there is sufficient evidence that a discharge is not contributing to the alteration of natural water quality, then the Regional Water Board may make that determination. In this case, sufficient information must include runoff sample data that has equal or lower concentrations for the range of constituents at the applicable reference area(s).

Nonpoint source – Nonpoint pollution sources generally are sources that do not meet the definition of a point source. Nonpoint source pollution typically results from land runoff, precipitation, atmospheric deposition, agricultural drainage, marine/boating operations or hydrologic modification. Nonpoint sources, for purposes of these Special Protections, include discharges that are not required to be regulated under an NPDES permit.

Non-storm water discharge – Any runoff that is not the result of a precipitation event. This is often referred to as "dry weather flow."

Non-structural control – A Best Management Practice that involves operational, maintenance, regulatory (e.g., ordinances) or educational activities designed to reduce or eliminate pollutants in runoff, and that are not structural controls (i.e. there are no physical structures involved).

Physical impossibility - Means any act of God, war, fire, earthquake, windstorm, flood or natural catastrophe; unexpected and unintended accidents not caused by discharger or its employees' negligence; civil disturbance, vandalism, sabotage or terrorism; restrain by court order or public authority or agency; or action or non-action by, or inability to

obtain the necessary authorizations or approvals from any governmental agency other than the permittee.

Representative sites and monitoring procedures – Are to be proposed by the discharger, with appropriate rationale, and subject to approval by Water Board staff.

Sheet-flow – Runoff that flows across land surfaces at a shallow depth relative to the cross- sectional width of the flow. These types of flow may or may not enter a storm drain system before discharge to receiving waters.

Storm Season – Also referred to as rainy season, means the months of the year from the onset of rainfall during autumn until the cessation of rainfall in the spring.

Structural control – A Best Management Practice that involves the installation of engineering solutions to the physical treatment or infiltration of runoff.

Surf Zone - The surf zone is defined as the submerged area between the breaking waves and the shoreline at any one time.

Surface Water Ambient Monitoring Program (SWAMP) comparable – Means that the monitoring program must 1) meet or exceed 2008 SWAMP Quality Assurance Program Management Plan (QAPP) Measurement Quality Objectives, or 2) have a Quality Assurance Project Plan that has been approved by SWAMP; in addition data must be formatted to match the database requirements of the SWAMP Information Management System. Adherence to the measurement quality objectives in the Southern California Bight 2008 ASBS Regional Monitoring Program QAPP and data base management comprises being SWAMP comparable.

Waterfront Operations - Piers, launch ramps, and cleaning stations in the water or on the adjacent shoreline.

Attachment 1
Special Protections Sections I(A)(3)(e) and I(B)(3)(e)
Flowchart to Determine Compliance with natural Water Quality

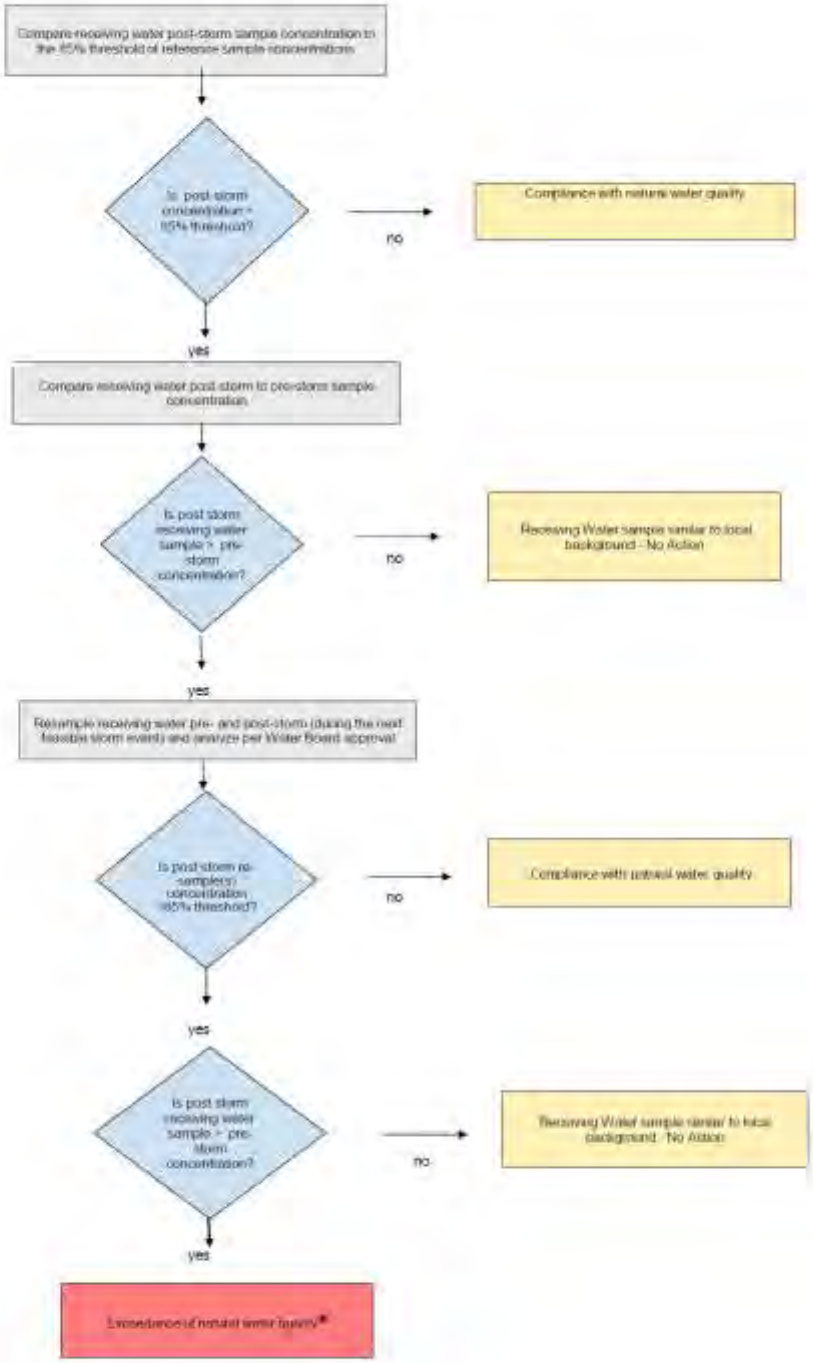

*** When an exceedance of natural water quality occurs, the discharger must comply with section I.A.2.h (for permitted storm water) or section I.B.2.c (for nonpoint sources). Note, when sampling data is available, end-of-pipe effluent concentrations will be considered by the Water Boards in making this determination.**

ATTACHMENT B

STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

1. Standard Permit Provisions

Code of Federal Regulations Title 40 Section 122.41 (40 CFR 122.41) includes conditions, or provisions, that apply to all National Pollutant Discharge Elimination System (NPDES) permits. Additional provisions applicable to NPDES permits are in 40 CFR 122.42. All applicable provisions in 40 CFR 122.41 and 40 CFR 122.42 must be incorporated into this Order and NPDES permit. The applicable 40 CFR 122.41 and 40 CFR 122.42 provisions are as follows:

a. DUTY TO COMPLY [40 CFR 122.41(a)]

The Copermittee must comply with all of the provisions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

(1) The Copermittee must comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement. [40 CFR 122.41(a)(1)]

(2) The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to a civil penalty not to exceed $25,000 per day for each violation. The CWA provides that any person who *negligently* violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than 2 years, or both. Any person who *knowingly* violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both. Any person who knowingly violates Section 301, 302, 303, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, and who knows at that time that he thereby places another person in imminent

danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.
[40 CFR 122.41(a)(2)]

(3) Any person may be assessed an administrative penalty by the San Diego Regional Water Quality Control Board (San Diego Water Board), State Water Resources Control Board (State Water Board), or United States Environmental Protection Agency (USEPA) for violating Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.
[40 CFR 122.41(a)(3)]

b. DUTY TO REAPPLY [40 CFR 122.41(b)]

If a Copermittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Copermittee must apply for and obtain a new permit.

c. NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE [40 CFR 122.41(c)]

It shall not be a defense for a Copermittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

d. DUTY TO MITIGATE [40 CFR 122.41(d)]

The Copermittee must take all reasonable steps to minimize or prevent any discharge or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

e. PROPER OPERATION AND MAINTENANCE [40 CFR 122.41(e)]

The Copermittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Copermittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by a Copermittee only when the operation is necessary to achieve compliance with the conditions of this permit.

f. PERMIT ACTIONS [40 CFR 122.41(f)]

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Copermittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

g. PROPERTY RIGHTS [40 CFR 122.41(g)]

This permit does not convey any property rights of any sort, or any exclusive privilege.

h. DUTY TO PROVIDE INFORMATION [40 CFR 122.41(h)]

The Copermittee must furnish to the San Diego Water Board, State Water Board, or USEPA within a reasonable time, any information which the San Diego Water Board, State Water Board, or USPEA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Copermittee must also furnish to the San Diego Water Board, State Water Board, or USPEA upon request, copies of records required to be kept by this permit.

i. INSPECTION AND ENTRY [40 CFR 122.41(i)]

The Copermittee must allow the San Diego Water Board, State Water Board, USEPA, and/or their authorized representative (including an authorized contractor acting as their representative), upon presentation of credentials and other documents as may be required by law, to:

(1) Enter upon the Copermittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit; [40 CFR 122.41(i)(1)]

(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit; [40 CFR 122.41(i)(2)]

(3) Inspect and photograph at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; [40 CFR 122.41(i)(3)] and

(4) Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location. [40 CFR 122.41(i)(4)]

j. MONITORING AND RECORDS [40 CFR 122.41(j)]

(1) Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity. [40 CFR 122.41(j)(1)]

(2) Except for records of monitoring information required by this permit related to the Copermittee's sewage sludge use and disposal activities, which shall be retained for

a period of at least five (5) years (or longer as required by 40 CFR Part 503), the Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time. [40 CFR 122.41(j)(2)]

(3) Records for monitoring information must include: [40 CFR 122.41(j)(3)]

(a) The date, exact place, and time of sampling or measurements; [40 CFR 122.41(j)(3)(i)]
(b) The individual(s) who performed the sampling or measurements; [40 CFR 122.41(j)(3)(ii)]
(c) The date(s) analyses were performed; [40 CFR 122.41(j)(3)(iii)]
(d) The individual(s) who performed the analyses; [40 CFR 122.41(j)(3)(iv)]
(e) The analytical techniques or methods used; [40 CFR 122.41(j)(3)(v)] and
(f) The results of such analyses. [40 CFR 122.41(j)(3)(vi)]

(4) Monitoring must be conducted according to test procedures under 40 CFR Part 136 unless another method is required under 40 CFR Subchapters N or O. [40 CFR 122.41(j)(4)]

In the case of pollutants for which there are no approved methods under 40 CFR Part 136 or otherwise required under 40 CFR Subchapters N and O, monitoring must be conducted according to a test procedure specified in the permit for such pollutants. [40 CFR 122.44(i)(1)(iv)]

(5) The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. [40 CFR 122.41(j)(5)]

k. SIGNATORY REQUIREMENT [40 CFR 122.41(k)]

(1) All applications, reports, or information submitted to the San Diego Water Board, State Water Board, or USEPA must be signed and certified. (See 40 CFR 122.22) [40 CFR 122.41(k)(1)]

(a) *For a municipality, State, Federal, or other public agency.* [All applications must be signed] by either a principal executive officer or ranking elected official. [40 CFR 122.22(a)(3)]

(b) All reports required by permits, and other information requested by the San Diego Water Board, State Water Board, or USEPA must be signed by a person described in paragraph (a) of this section, or by a duly authorized

representative of that person. A person is a duly authorized representative only if: [40 CFR 122.22(b)]

(i) The authorization is made in writing by a person described in paragraph (a) of this section; [40 CFR 122.22(b)(1)]
(ii) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company, (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) [40 CFR 122.22(b)(2)] and,
(iii) The written authorization is submitted to the San Diego Water Board and State Water Board. [40 CFR 122.22(b)(3)]

(c) *Changes to authorization.* If an authorization under paragraph (b) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (b) of this section must be submitted to the San Diego Water Board prior to or together with any reports, information, or applications to be signed by an authorized representative. [40 CFR 122.22(c)]

(d) *Certification.* Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." [40 CFR 122.22(d)]

(2) The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both. [40 CFR 122.41(k)(2)]

I. REPORTING REQUIREMENTS [40 CFR 122.41(l)]

(1) *Planned changes.* The Copermittee must give notice to the San Diego Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when: [40 CFR 122.41(l)(1)]

(a) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); [40 CFR 122.41(l)(1)(i)] or

(b) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1). [40 CFR 122.41(l)(1)(ii)]

(c) The alteration or addition results in a significant change in the Copermittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. [40 CFR 122.41(l)(1)(iii)]

(2) *Anticipated noncompliance*. The Copermittee must give advance notice to the San Diego Water Board or State Water Board of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements. [40 CFR 122.41(l)(2)]

(3) *Transfers*. This permit is not transferable to any person except after notice to the San Diego Water Board. The San Diego Water Board may require modification or revocation and reissuance of the permit to change the name of the Copermittee and incorporate such other requirements as may be necessary under the CWA. [40 CFR 122.41(l)(3)]

(4) *Monitoring reports.* Monitoring results must be reported at the intervals specified elsewhere in this permit. [40 CFR 122.41(l)(4)]

(a) Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the San Diego Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices. [40 CFR 122.41(l)(4)(i)]

(b) If the Copermittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or another method required for an industry-specific waste stream under 40 CFR Subchapters N or O, the results of this monitoring must be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the San Diego Water Board or State Water Board. [40 CFR 122.41(l)(4)(ii)]

(c) Calculations for all limitations which require averaging of measurements must utilize an arithmetic mean unless otherwise specified in the permit. [40 CFR 122.41(l)(4)(iii)]

(5) *Compliance schedules*. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date. [40 CFR 122.41(l)(5)]

(6) *Twenty-four hour reporting.*

(a) The Copermittee must report any noncompliance that may endanger health or the environment. Any information must be provided orally within 24 hours from the time the Copermittee becomes aware of the circumstances. A written submission must also be provided within five (5) days of the time the Copermittee becomes aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6)(i)]

(b) The following must be included as information which must be reported within 24 hours under this paragraph: [40 CFR 122.41(l)(6)(ii)]

(i) Any unanticipated bypass that exceeds any effluent limitation in the permit (See 40 CFR 122.41(g)). [40 CFR 122.41(l)(6)(ii)(A)]
(ii) Any upset which exceeds any effluent limitation in the permit. [40 CFR 122.41(l)(6)(ii)(B)] and,
(iii) Violation of a maximum daily discharge limitation for any of the pollutants listed by the San Diego Water Board in the permit to be reported within 24 hours. (See 40 CFR 122.44(g)) [40 CFR 122.41(l)(6)(ii)(C)]

(c) The San Diego Water Board may waive the above-required written report on a case-by-case basis if the oral report has been received within 24 hours. [40 CFR 122.41(l)(6)(iii)]

(7) *Other noncompliance.* The Copermittee must report all instances of noncompliance not reported in accordance with the standard provisions required under 40 CFR 122.41(l)(4), (5), and (6), at the time monitoring reports are submitted. The reports must contain the information listed in the standard provisions required under 40 CFR 122.41(l)(6). [40 CFR 122.41(l)(7))]

(8) *Other information.* When the Copermittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the San Diego Water Board, State Water Board, or USEPA, the Copermittee must promptly submit such facts or information. [40 CFR 122.41(l)(8)]

m. BYPASS [40 CFR 122.41(m)]

(1) *Definitions.*

(a) "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. [40 CFR 122.41(m)(1)(i)] or

(b) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or

substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
[40 CFR 122.41(m)(1)(ii)]

(2) *Bypass not exceeding limitations*. The Copermittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the standard provisions required under 40 CFR 122.41(m)(3) and (4).
[40 CFR 122.41(m)(2)]

(3) *Notice.*

(a) *Anticipated bypass*. If the Copermittee knows in advance of the need for a bypass, it must submit a notice, if possible at least ten days before the date of the bypass. [40 CFR 122.41(m)(3)(i)] or

(b) *Unanticipated bypass*. The Copermittee must submit notice of an unanticipated bypass in accordance with the standard provisions required under 40 CFR 122.41(l)(6) (24-hour notice).
[40 CFR 122.41(m)(3)(ii)]

(4) *Prohibition of Bypass.*

(a) Bypass is prohibited, and the San Diego Water Board may take enforcement action against a Copermittee for bypass, unless:
[40 CFR 122.41(m)(4)(i)]

(i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; [40 CFR 122.41(m)(4)(i)(A)]
(ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance;
[40 CFR 122.41(m)(4)(i)(B)] and,
(iii) The Copermittee submitted notice in accordance with the standard provisions required under 40 CFR 122.41(m)(3).
[40 CFR 122.41(m)(4)(i)(C)]

(b) The San Diego Water Board may approve an anticipated bypass, after considering its adverse effects, if the San Diego Water Board determines that it will meet the three conditions listed above.
[40 CFR 122.41(m)(4)(ii)]

n. UPSET [40 CFR 122.41(n)]

(1) *Definition.* "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because

of factors beyond the reasonable control of the Copermittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. [40 CFR 122.41(n)(1)]

(2) *Effect of an upset*. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the standard provisions required under 40 CFR 122.41(n)(3) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. [40 CFR 122.41(n)(2)]

(3) *Conditions necessary for a demonstration of upset*. A Copermittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that: [40 CFR 122.41(n)(3)]

(a) An upset occurred and that the Copermittee can identify the cause(s) of the upset; [40 CFR 122.41(n)(3)(i)]
(b) The permitted facility was at the time being properly operated; [40 CFR 122.41(n)(3)(ii)] and
(c) The Copermittee submitted notice of the upset in accordance with the standard provisions required under 40 CFR 122.41(l)(6)(ii)(B) (24-hour notice). [40 CFR 122.41(n)(3)(iii)]
(d) The Copermittee complied with any remedial measures pursuant to the standard provisions required under 40 CFR 122.41(d). [40 CFR 122.41(n)(3)(iii)]

(4) *Burden of proof*. In any enforcement proceeding, the Copermittee seeking to establish the occurrence of an upset has the burden of proof. [40 CFR 122.41(n)(4)]

o. STANDARD PERMIT PROVISIONS FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS [40 CFR 122.42(c)]

The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the San Diego Water Board or State Water Board under 40 CFR 122.26(a)(1)(v) must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report must include:

(1) The status of implementing the components of the storm water management program that are established as permit conditions; [40 CFR 122.42(c)(1)]

(2) Proposed changes to the storm water management programs that are established as permit conditions. Such proposed changes must be consistent with 40 CFR 122.26(d)(2)(iii); [40 CFR 122.42(c)(2)] and

(3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under 40 CFR 122.26(d)(2)(iv) and (v); [40 CFR 122.42(c)(3)]

(4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; [40 CFR 122.42(c)(4)]

(5) Annual expenditures and budget for year following each annual report; [40 CFR 122.42(c)(5)]

(6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; [40 CFR 122.42(c)(6)]

(7) Identification of water quality improvements or degradation. [40 CFR 122.42(c)(7)]

p. STANDARD PERMIT PROVISIONS FOR STORM WATER DISCHARGES [40 CFR 122.42(d)]

The initial permits for discharges composed entirely of storm water issued pursuant to 40 CFR 122.26(e)(7) must require compliance with the conditions of the permit as expeditiously as practicable, but in no event later than three years after the date of issuance of the permit.

2. General Provisions

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. The general provisions applicable to this Order and NPDES permit are as follows:

a. DISCHARGE OF WASTE IS A PRIVILEGE

No discharge of waste into the waters of the State, whether or not such discharge is made pursuant to waste discharge requirements, shall create a vested right to continue such discharge. All discharges of waste into waters of the State are privileges, not rights. [CWC Section 13263(g)]

b. DURATION OF ORDER AND NPDES PERMIT

(1) *Effective date*. This Order supersedes Order No. R9-2007-0001 for the San Diego County Copermittees listed in Table 1a and became effective on June 27, 2013. This Order as amended by Order R9-2015-0001 supersedes Order No. R9-2009-0002 for the Orange County Copermittees listed in Table 1b and its amendments through Order No. R9-2015-0001 became effective April 1, 2015. This Order as amended by Order Nos. R9-2015-0001 and R9-2015-0100 supersedes Order No. R9-2010-0016 for the Riverside County Copermittees listed in Table 1c and its amendments through Order No. R9-2015-0100 became effective January 7, 2016.

(2) *Expiration*. This Order and NPDES permit expires five years after June 27, 2013, its initial effective date. [40 CFR 122.46(a)]

(3) *Continuation of expired order*. After this Order and NPDES permit expires, the terms and conditions of this Order and NPDES permit are automatically continued pending issuance of a new permit if all requirements of the federal NPDES regulations on the continuation of expired permits (40 CFR 122.6) are complied with.

c. AVAILABILITY

A copy of this Order must be kept at a readily accessible location and must be available to on-site personnel at all times.

d. CONFIDENTIALITY OF INFORMATION

Except as provided for in 40 CFR 122.7, no information or documents submitted in accordance with or in application for this Order will be considered confidential, and all such information and documents shall be available for review by the public at the San Diego Water Board office.

Claims of confidentiality for the following information will be denied: [40 CFR 122.7(b)]

(1) The name and address of any permit applicant or Copermittee; [40 CFR 122.7(b)(1)] and

(2) Permit applications and attachments, permits, and effluent data. [40 CFR 122.7(b)(2)]

e. EFFLUENT LIMITATIONS

(1) *Interim effluent limitations*. The Copermittee must comply with any interim effluent limitations as established by addendum, enforcement action, or revised waste discharge requirements which have been, or may be, adopted by the San Diego Water Board.

(2) *Other effluent limitations and standards*. If any applicable toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant and that standard or prohibition is more stringent than any limitation on the pollutant in the permit, the San Diego Water Board shall institute proceedings under these regulations to modify or revoke and reissue the permit to conform to the toxic effluent standard or prohibition. [40 CFR 122.44(b)(1)]

f. DUTY TO MINIMIZE OR CORRECT ADVERSE IMPACTS

The Copermittee must take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this Order, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the noncompliance.

g. PERMIT ACTIONS

The filing of a request by the Copermittee for modification, revocation and reissuance, or termination of this Order, or a notification of planned change in or anticipated noncompliance with this Order does not stay any condition of this Order. (See 40 CFR 122.41(f)) In addition, the following provisions apply to this Order:

(1) Upon application by any affected person, or on its own motion, the San Diego Water Board may review and revise the requirements in this Order. All requirements must be reviewed periodically. [CWC Section 13263(e)]

(2) This Order may be terminated or modified for cause, including, but not limited to, all of the following: [CWC Section 13381]

(a) Violation of any condition contained in the requirements of this Order. [CWC Section 13381(a)]

(b) Obtaining the requirements in this Order by misrepresentation, or failure to disclose fully all relevant facts. [CWC Section 13381(b)]

(c) A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge. [CWC Section 13381(c)]

(3) When this Order is transferred to a new owner or operator, such requirements as may be necessary under the CWC may be incorporated into this Order.

h. NPDES Permitted Non-Storm Water Discharges

The San Diego Water Board has, in prior years, issued a limited number of individual NPDES permits for non-storm water discharges to MS4s. The San Diego Water Board or State Water Board may in the future, upon prior notice to the Copermittee(s), issue an NPDES permit for any non-storm water discharge (or class of non-storm water discharges) to an MS4.

i. Monitoring

In addition to the standard provisions required under 40 CFR 122.41(j) and (l)(4), the following general monitoring provisions apply to this Order:

(1) Where procedures are not otherwise specified in Order, sampling, analysis and quality assurance/quality control must be conducted in accordance with the Quality Assurance Management Plan (QAMP) for the State of California's Surface Water Ambient Monitoring Program (SWAMP), adopted by the State Water Resources Control Board (State Water Board).

(2) Pursuant to 40 CFR 122.41(j)(2) and CWC Section 13383(a), each Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five (5) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time.

(3) All chemical, bacteriological, and toxicity analyses must be conducted at a laboratory certified for such analyses by the California Department of Public Health or a laboratory approved by the San Diego Water Board.

(4) For priority toxic pollutants that are identified in the California Toxics Rule (CTR) (65 Fed. Reg. 31682), the Copermittees must instruct their laboratories to establish calibration standards that are equivalent to or lower than the Minimum Levels (MLs) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP). If a Copermittee can demonstrate that a particular ML is not attainable, in accordance with procedures set forth in 40 CFR Part 136, the lowest quantifiable concentration of the lowest calibration standard analyzed by a specific analytical procedure (assuming that all the method specified sample weights, volumes, and processing steps have been followed) may be used instead of the ML listed in Appendix 4 of the SIP. The Copermittee must submit documentation from the laboratory to the San Diego Water Board for approval prior to raising the ML for any priority toxic pollutant.

j. ENFORCEMENT

(1) The San Diego Water Board is authorized to enforce the terms of this Order under several provisions of the CWC, including, but not limited to, CWC Sections 13385, 13386, and 13387.

(2) Nothing in this Order shall be construed to protect the Copermittee from its liabilities under federal, state, or local laws.

(3) The CWC provides for civil and criminal penalties comparable to, and in some cases greater than, those provided for under the CWA.

(4) Except as provided in the standard conditions required under 40 CFR 122.41(m) and (n), nothing in this Order shall be construed to relieve the Copermittee from civil or criminal penalties for noncompliance.

(5) Nothing in this Order shall be construed to preclude the institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties to which the Copermittee is or may be subject to under Section 311 of the CWA.

(6) Nothing in this Order shall be construed to preclude institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authoring preserved by Section 510 of the CWA.

k. SEVERABILITY

The provisions of this Order are severable, and if any provision of this Order, or the application of any provisions of this Order to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this Order shall not be affected thereby.

l. APPLICATIONS

Any application submitted by a Copermittee for reissuance or modification of this Order must satisfy all applicable requirements specified in federal regulations as well as any additional requirements for submittal of a Report of Waste Discharge specified in the CWC and the California Code of Regulations.

m. IMPLEMENTATION

All plans, reports and subsequent amendments submitted in compliance with this Order must be implemented immediately (or as otherwise specified). All submittals by Copermittees must be adequate to implement the requirements of this Order.

n. REPORT SUBMITTALS

(1) All report submittals must include an executive summary, introduction, conclusion, recommendations, and signed certified statement.

(2) Each Copermittee must submit a signed certified statement covering its responsibilities for each applicable submittal.

(3) The Principal Watershed Copermittee(s) must submit a signed certified statement covering its responsibilities for each applicable submittal and the sections of the submittals for which it is responsible.

(4) Unless otherwise directed, the Copermittees must submit one electronic copy of each report required under this Order to the San Diego Water Board at SanDiego@waterboards.ca.gov.

(5) When hard copies are requested or required, the Copermittees must submit reports and provide notifications as required by this Order to:

EXECUTIVE OFFICER
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
2375 NORTHSIDE DRIVE, SUITE 100
SAN DIEGO CA 92108
Telephone: (619) 516-1990 Fax: (619) 516-1994

ATTACHMENT C

ACRONYMS AND ABBREVIATIONS

AMAL	Average Monthly Action Level
ASBS	Area(s) of Special Biological Significance
BMP	Best Management Practice
Basin Plan	Water Quality Control Plan for the San Diego Basin
CEQA	California Environmental Quality Act
CCR	California Code of Regulations
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWC	California Water Code
CZARA	Coastal Zone Act Reauthorization Amendments of 1990
ESAs	Environmentally Sensitive Areas
GIS	Geographic Information System
IBI	Index of Biological Integrity
LID	Low Impact Development
MDAL	Maximum Daily Action Level
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
NAL	Non-Storm Water Action Level
NAICS	North American Industry Classification System
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
ROWD	Report of Waste Discharge (application for NPDES reissuance)
SAL	Storm Water Action Level
San Diego Water Board	California Regional Water Quality Control Board, San Diego Region
SIC	Standard Industrial Classification Code
State Water Board	State Water Resources Control Board
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
WDID	Waste Discharge Identification Number
WLA	Waste Load Allocation
WQBEL	Water Quality Based Effluent Limitation

DEFINITIONS

Active/Passive Sediment Treatment - Using mechanical, electrical or chemical means to flocculate or coagulate suspended sediment for removal from runoff from construction sites prior to discharge.

Anthropogenic Litter – Trash generated from human activities, not including sediment.

Average Monthly Action Level – The highest allowable average of daily discharges over a calendar month.

Beneficial Uses - The uses of water necessary for the survival or wellbeing of man, plants, and wildlife. These uses of water serve to promote tangible and intangible economic, social, and environmental goals. "Beneficial Uses" of the waters of the State that may be protected include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. Existing beneficial uses are uses that were attained in the surface or ground water on or after November 28, 1975; and potential beneficial uses are uses that would probably develop in future years through the implementation of various control measures. "Beneficial Uses" are equivalent to "Designated Uses" under federal law. [California Water Code Section 13050(f)].

Best Management Practices (BMPs) - Defined in 40 CFR 122.2 as schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Bioassessment - The use of biological community information to evaluate the biological integrity of a water body and its watershed. With respect to aquatic ecosystems, bioassessment is the collection and analysis of samples of the benthic macroinvertebrate community together with physical/habitat quality measurements associated with the sampling site and the watershed to evaluate the biological condition (i.e. biotic integrity) of a water body.

Biofiltration - Practices that use vegetation and amended soils to detain and treat runoff from impervious areas. Treatment is through filtration, infiltration, adsorption, ion exchange, and biological uptake of pollutants.

Biological Integrity - Defined in Karr J.R. and D.R. Dudley. 1981. Ecological perspective on water quality goals. *Environmental Management* 5:55-68 as: "A balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitat of the region." Also referred to as ecosystem health.

BMP Design Manual – A plan developed to eliminate, reduce, or mitigate the impacts of runoff from development projects, including Priority Development Projects.

Chronic Toxicity – A measurement of sublethal effect (e.g. reduced growth, reproduction) to experimental test organisms exposed to an effluent or receiving waters compared to that of the control organisms.

Clean Water Act Section 303(d) Water Body - An impaired water body in which water quality does not meet applicable water quality standards and/or is not expected to meet water quality standards, even after the application of technology based pollution controls required by the CWA. The discharge of runoff to these water bodies by the Copermittees is significant because these discharges can cause or contribute to violations of applicable water quality standards.

Construction Activities – Actions implemented during construction of development or redevelopment projects during the Preliminary Task (including rough grading and/or disking, clearing and grubbing operations, or any soil disturbance prior to mass grading), Grading or Land Development (including topography and slope reconfiguration, alluvium removals, canyon cleanouts, rock undercuts, keyway excavations, land form grading, and stockpiling of select material for capping operations), Streets and Utility Installation (including excavation and street paving, lot grading, curbs, gutters and sidewalks, public utilities, public water facilities including fire hydrants, public sanitary sewer systems, storm sewer systems and/or other drainage improvements), or Vertical Construction (including the build out of structures from foundations to roofing, including rough landscaping).

Construction Site – Any project, including projects requiring coverage under the Construction General Permit, that involves soil disturbing activities including, but not limited to, clearing, grading, disturbances to ground such as stockpiling, and excavation.

Contamination - As defined in the Porter-Cologne Water Quality Control Act, contamination is "an impairment of the quality of waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste whether or not waters of the State are affected."

Copermittee – A permittee to a NPDES permit that is only responsible for permit conditions relating to the discharge for which it is operator [40 CFR 122.26(b)(1)]. For the purposes of this Order, a Copermittee is one of the individual permittees identified in Tables 1a-1c of this Order.

Copermittees – All of the individual Copermittees, collectively.

Critical Channel Flow (Qc) – The channel flow that produces the critical shear stress that initiates bed movement or that erodes the toe of channel banks. When measuring Qc, it should be based on the weakest boundary material – either bed or bank.

Daily Discharge – Defined as either: (1) the total mass of the constituent discharged over the calendar day or any 24 hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g. concentration.)

The Daily Discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day, or other 24 hour period other than a day), or by the arithmetic mean of analytical results from one or more grab samples taken over the course of a day.

Development Projects - Construction, rehabilitation, redevelopment, or reconstruction of any public or private projects.

Dry Season –May 1 to September 30.

Dry Weather – Weather is considered dry if the preceding 72 hours has been without measurable precipitation (>0.1 inch).

Enclosed Bays – Enclosed bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost bay works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays do not include inland surface waters or ocean waters.

Erosion – When land is diminished or worn away due to wind, water, or glacial ice. Often the eroded debris (silt or sediment) becomes a pollutant via storm water runoff. Erosion occurs naturally but can be intensified by land clearing activities such as farming, development, road building, and timber harvesting.

Environmentally Sensitive Areas (ESAs) - Areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; areas designated as preserves or their equivalent under the Natural Communities Conservation Program within the Cities and County of Orange; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.

Estuaries – Waters, including coastal lagoons, located at the mouth of streams that serve as areas of mixing fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and ocean water. Estuaries do not include inland surface waters or ocean waters.

Existing Development – Any area that has been developed and exists for municipal, commercial, industrial, or residential purposes, uses, or activities. May include areas that are not actively used for its originally developed purpose, but may be re-purposed or redeveloped for another use or activity.

Flow Duration – The long-term period of time that flows occur above a threshold that causes significant sediment transport and may cause excessive erosion damage to creeks and streams (not a single storm event duration). The simplest way to visualize this is to consider a histogram of pre- and post-project flows using long-term records of hourly data. To maintain pre-development flow duration means that the total number of hours (counts) within each range of flows in a flow-duration histogram cannot increase between the pre- and post-development condition. Flow duration within the range of geomorphologically significant flows is important for managing erosion.

Grading - The cutting and/or filling of the land surface to a desired slope or elevation.

Groundwater – Subsurface water that occurs beneath the water table in soils and geologic formations that are fully saturated.

Hazardous Material – Any substance that poses a threat to human health or the environment due to its toxicity, corrosiveness, ignitability, explosive nature or chemical reactivity. These also include materials named by the USEPA in 40 CFR 116 to be reported if a designated quantity of the material is spilled into the waters of the U.S. or emitted into the environment.

Hazardous Waste - Hazardous waste is defined as "any waste which, under Section 600 of Title 22 of this code, is required to be managed according to Chapter 30 of Division 4.5 of Title 22 of this code" [CCR Title 22, Division 4.5, Chapter 11, Article 1].

Household Hazardous Waste – Paints, cleaning products, and other hazardous wastes generated during home improvement or maintenance activities.

Hydromodification – The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

Illicit Connection – Any man-made conveyance or drainage system through which a non-storm water discharge to the storm water drainage system occurs or may occur. Any connection to the MS4 that conveys an illicit discharge.

Illicit Discharge - Any discharge to the MS4 that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from firefighting activities [40 CFR 122.26(b)(2)].

Inactive Areas – Areas of construction activity that are not active and those that have been active and are not scheduled to be re-disturbed for at least 14 days.

Infiltration – In the context of low impact development, infiltration is defined as the percolation of water into the ground. Infiltration is often expressed as a rate (inches per hour), which is determined through an infiltration test. In the context of non-storm water, infiltration is water other than wastewater that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow [40 CFR 35.2005(20)].

Inland Surface Waters – Includes all surface waters of the State that do not include the ocean, enclosed bays, or estuaries.

Jurisdictional Runoff Management Program Document – A written description of the specific jurisdictional runoff management measures and programs that each Copermittee will implement to comply with this Order and ensure that storm water pollutant discharges in runoff are reduced to the MEP and do not cause or contribute to a violation of water quality standards.

Low Impact Development (LID) – A storm water management and land development strategy that emphasizes conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions.

Low Impact Development Best Management Practices (LID BMPs) – LID BMPs include schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States through storm water management and land development strategies that emphasize conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions. LID BMPs include retention practices that do not allow runoff, such as infiltration, rain water harvesting and reuse, and evapotranspiration. LID BMPs also include flow-through practices such as biofiltration that may have some discharge of storm water following pollutant reduction.

Major Outfall – As defined in the Code of Federal Regulations, a major outfall is a MS4 outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (i.e. discharge from a single conveyance other than a circular pipe which is associated with a drainage area of more than 50 acres); or, for MS4s that receive storm water from lands zoned for industrial activity (based on comprehensive zoning plans or equivalent), a MS4 outfall that discharges from a single pipe with an inside diameter of 12 inches or more or from its equivalent (i.e. discharge from other than a circular pipe associated with a drainage area of 2 acres or more).

Maximum Daily Action Level (MDAL) –The highest allowable daily discharge of a pollutant, over a calendar day (or 24 hour period). For pollutants with action levels expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with action levels expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

Maximum Extent Practicable (MEP) – The technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) for storm water that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) in combination with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than BAT. A definition for MEP is not provided either in the statute or in the regulations. Instead the definition of MEP is dynamic and will be defined by the following process over time: municipalities propose their definition of MEP by way of their runoff management programs. Their total collective and individual activities conducted pursuant to the runoff management programs becomes their proposal for MEP as it applies both to their overall effort, as well as to specific activities (e.g., MEP for street sweeping, or MEP for MS4 maintenance). In the absence of a proposal acceptable to the San Diego Water Board, the San Diego Water Board defines MEP.

In a memo dated February 11, 1993, entitled "Definition of Maximum Extent Practicable," Elizabeth Jennings, Senior Staff Counsel, SWRCB addressed the achievement of the MEP standard as follows:

"*To achieve the MEP standard, municipalities must employ whatever Best Management Practices (BMPs) are technically feasible (i.e., are likely to be effective) and are not cost prohibitive. The major emphasis is on technical feasibility. Reducing pollutants to the MEP means choosing effective BMPs, and rejecting applicable BMPs only where other effective BMPs will serve the same purpose, or the BMPs would not be technically feasible, or the cost would be prohibitive. In selecting BMPs to achieve the MEP standard, the following factors may be useful to consider:*

a. *Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?*
b. *Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?*
c. *Public Acceptance: Does the BMP have public support?*
d. *Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?*
e. *Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc.?*

The final determination regarding whether a municipality has reduced pollutants to the maximum extent practicable can only be made by the Regional or State Water Boards, and not by the municipal discharger. If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit derived, it would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs that would address a pollutant source, or to pick a BMP based solely on cost, which would be clearly less effective. In selecting BMPs the municipality must make a serious attempt to comply and practical solutions may not be lightly rejected. In any case, the burden would be on the municipal discharger to show compliance with its permit. After selecting a menu of BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented."

Monitoring Year – October 1 to September 30

Municipal Separate Storm Sewer System (MS4) – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designated or used for collecting or conveying storm water; (iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.26.

National Pollutant Discharge Elimination System (NPDES) - The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the CWA.

Non-Storm Water - All discharges to and from a MS4 that do not originate from precipitation events (i.e., all discharges from a MS4 other than storm water). Non-storm water includes illicit discharges and NPDES permitted discharges.

Nuisance - As defined in the Porter-Cologne Water Quality Control Act, a nuisance is "anything which meets all of the following requirements: 1) Is injurious to health, or is indecent, or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. 2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. 3) Occurs during, or as a result of, the treatment or disposal of wastes."

Ocean Waters – The territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the State Board's California Ocean Plan.

Order – Unless otherwise specified, refers to this Order, Order No. R9-2013-0001 (NPDES No. CAS0109266)

Outfall - Outfall means a point source as defined by 40 CFR 122.2 at the point where a municipal separate storm sewer discharges to waters of the US and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels or other conveyances which connect segments of the same stream or other waters of the US and are used to convey waters of the US.

Persistent Flow - Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

Person - A person is defined as an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof [40 CFR 122.2].

Point Source - Any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, landfill leachate collection systems, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

Pollutant - Any agent that may cause or contribute to the degradation of water quality such that a condition of pollution or contamination is created or aggravated.

Pollution - As defined in the Porter-Cologne Water Quality Control Act, pollution is "the alteration of the quality of the waters of the State by waste, to a degree which unreasonably affects either of the following: 1) The waters for beneficial uses; or 2) Facilities that serve these beneficial uses." Pollution may include contamination.

Pollution Prevention - Pollution prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control BMPs, treatment control BMPs, or disposal.

Pre-Development Runoff Conditions – Approximate flow rates and durations that exist or existed onsite before land development occurs. For new development projects, this equates to runoff conditions immediately before project construction. For redevelopment projects, this equates to runoff conditions from the project footprint assuming infiltration characteristics of the underlying soil, and existing grade. Runoff coefficients of concrete or asphalt must not be used. A redevelopment Priority Development Project must use available information pertaining to existing underlying soil type and onsite existing grade to estimate pre-development runoff conditions.

Priority Development Projects - New development and redevelopment projects defined under Provision E.3.b of Order No. R9-2013-0001, as amended by Order Nos. R9-2015-0001 and R9-2015-0100.

Rainy Season (aka Wet Season) –October 1 to April 30

Receiving Waters – Waters of the United States.

Receiving Water Limitations - Waste discharge requirements issued by the San Diego Water Board typically include both: (1) "Effluent Limitations" (or "Discharge Limitations") that specify the technology-based or water-quality-based effluent limitations; and (2) "Receiving Water Limitations" that specify the water quality objectives in the Basin Plan as well as any other limitations necessary to attain those objectives. In summary, the "Receiving Water Limitations" provision is the provision used to implement the requirements of CWA section 402(p)(3)(B).

Redevelopment - The creation and/or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure. Replacement of impervious surfaces includes any activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include routine maintenance activities, such as trenching and resurfacing associated with utility work; pavement grinding; resurfacing existing roadways, sidewalks, pedestrian ramps, or bike lanes on existing roads; and routine replacement of damaged pavement, such as pothole repair.

Regional Clearinghouse – A central location for the collection and distribution of information developed and maintained by the Copermittees including, but not limited to, plans, reports, manuals, data, contact information, and/or links to such documents and information.

Rehabilitation - Remedial measures or activities for the purpose of improving or restoring the beneficial uses of streams, channels or river systems. Techniques may vary from in-stream restoration techniques to off-line storm water management practices installed in the system corridor or upland areas, or a combination of in-stream and out of stream techniques. Rehabilitation techniques may include, but are not limited to the following: riparian zone restoration, constructed wetlands, channel modifications that improve habitat and stability, and daylighting of drainage systems.

Reporting Period – The period of information that is reported in the Water Quality Improvement Plan Annual Report. The reporting period consists of two components: 1) July 1 to June 30, consistent with the fiscal year, for the implementation of the jurisdictional runoff management programs, and 2) October 1 to September 30, consistent with the monitoring year for the monitoring and assessment programs. Together, these two time periods constitute the reporting year for the Water Quality Improvement Plan Annual Report due January 31 following the end of the monitoring year.

Retain – Keep or hold in a particular place, condition, or position without discharge to surface waters.

Retrofitting – Storm water management practice put into place after development has occurred in watersheds where the practices previously did not exist or are ineffective. Retrofitting of developed areas is intended to improve water quality, protect downstream channels, reduce flooding, or meet other specific objectives. Retrofitting developed areas may include, but is not limited to replacing roofs with green roofs, disconnecting downspouts or impervious surfaces to drain to pervious surfaces, replacing impervious surfaces with pervious surfaces, installing rain barrels, installing rain gardens, and trash area enclosures.

Runoff - All flows in a storm water conveyance system that consists of the following components: (1) storm water (wet weather flows) and (2) non-storm water including dry weather flows.

San Diego Water Board – As used in this document the term "San Diego Water Board" is synonymous with the term "Regional Board" as defined in Water Code section 13050(b) and is intended to refer to the California Regional Water Quality Control Board for the San Diego Region as specified in Water Code Section 13200.

Sediment - Soil, sand, and minerals washed from land into water. Sediment resulting from anthropogenic sources (i.e. human induced land disturbance activities) is considered a pollutant. This Order regulates only the discharges of sediment from anthropogenic sources and does not regulate naturally occurring sources of sediment. Sediment can destroy fish-nesting areas, clog animal habitats, and cloud waters so that sunlight does not reach aquatic plants.

Source Control BMP – Land use or site planning practices, or structural or nonstructural measures that aim to prevent runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between pollutants and runoff.

Storm Water – Per 40 CFR 122.26(b)(13), means storm water runoff, snowmelt runoff and surface runoff and drainage. Surface runoff and drainage pertains to runoff and drainage resulting from precipitation events.

Structural BMPs - A subset of BMPs which detains, retains, filters, removes, or prevents the release of pollutants to surface waters from development projects in perpetuity, after construction of a project is completed.

Test of Significant Toxicity (TST) - A statistical approach used to analyze toxicity test data. The TST incorporates a restated null hypothesis, Welch's t-test, and biological effect thresholds for chronic and acute toxicity.

Total Maximum Daily Load (TMDL) - The maximum amount of a pollutant that can be discharged into a water body from all sources (point and non-point) and still maintain water quality standards. Under CWA section 303(d), TMDLs must be developed for all water bodies that do not meet water quality standards after application of technology-based controls.

Toxicity - Adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies. The water quality objectives for toxicity provided in the Basin Plan, state in part…"All waters shall be

free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life….The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge."

Toxicity Identification Evaluation (TIE) - A set of procedures for identifying the specific chemical(s) responsible for toxicity. These procedures are performed in three phases (characterization, identification, and confirmation) using aquatic organism toxicity tests.

Toxicity Reduction Evaluation (TRE) - A study conducted in a step-wise process designed to identify the causative agents of effluent or ambient toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in toxicity. The first steps of the TRE consist of the collection of data relevant to the toxicity, including additional toxicity testing, and an evaluation of facility operations and maintenance practices, and best management practices. A Toxicity Identification Evaluation (TIE) may be required as part of the TRE, if appropriate.

Treatment Control BMP – Any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media absorption or any other physical, biological, or chemical process.

Unpaved Road – Any long, narrow stretch without pavement used for traveling by motor passenger vehicles between two or more points. Unpaved roads are generally constructed of dirt, gravel, aggregate or macadam and may be improved or unimproved.

Waste - As defined in CWC Section 13050(d), "waste includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal."

Article 2 of CCR Title 23, Chapter 15 (Chapter 15) contains a waste classification system that applies to solid and semi-solid waste, which cannot be discharged directly or indirectly to water of the state and which therefore must be discharged to land for treatment, storage, or disposal in accordance with Chapter 15. There are four classifications of waste (listed in order of highest to lowest threat to water quality): hazardous waste, designated waste, non-hazardous solid waste, and inert waste.

Water Quality Objective - Numerical or narrative limits on constituents or characteristics of water designated to protect designated beneficial uses of the water. [California Water Code Section 13050 (h)]. California's water quality objectives are established by the State and Regional Water Boards in the Water Quality Control Plans. Numeric or narrative limits for pollutants or characteristics of water designed to protect the beneficial uses of the water. In other words, a water quality objective is the maximum concentration of a pollutant that can exist in a receiving water and still generally ensure that the beneficial uses of the receiving water remain protected (i.e., not impaired). Since water quality objectives are designed specifically to protect the beneficial uses, when the objectives are violated the beneficial uses are, by definition, no longer protected and become impaired. This is a fundamental concept under the Porter Cologne Act. Equally fundamental is Porter Cologne's definition of pollution. A condition of pollution exists when the water quality needed to support designated beneficial uses has

become unreasonably affected or impaired; in other words, when the water quality objectives have been violated. These underlying definitions (regarding beneficial use protection) are the reason why all waste discharge requirements implementing the federal NPDES regulations require compliance with water quality objectives. (Water quality objectives are also called water quality criteria in the CWA.)

Water Quality Standards - Water quality standards, as defined in Clean Water Act section 303(c) consist of the beneficial uses (e.g., swimming, fishing, municipal drinking water supply, etc.,) of a water body and criteria (referred to as water quality objectives in the California Water Code) necessary to protect those uses. Under the Water Code, the water boards establish beneficial uses and water quality objectives in water quality control or basin plans. Together with an anti-degradation policy, these beneficial uses and water quality objectives serve as water quality standards under the Clean Water Act. In Clean Water Act parlance, state beneficial uses are called "designated uses" and state water quality objectives are called "criteria." Throughout this Order, the relevant term is used depending on the statutory scheme.

Waters of the State - Any water, surface or underground, including saline waters within the boundaries of the State [CWC section 13050 (e)]. The definition of the Waters of the State is broader than that for the Waters of the United States in that all water in the State is considered to be a Waters of the State regardless of circumstances or condition.

Waters of the United States - As defined in the 40 CFR 122.2, the Waters of the U.S. are defined as: "(a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate "wetlands;" (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters otherwise defined as waters of the United States under this definition: (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial seas; and (g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA."

Watershed - That geographical area which drains to a specified point on a water course, usually a confluence of streams or rivers (also known as drainage area, catchment, or river basin).

Wet Season (aka Rainy Season) – October 1 to April 30

Wet Weather – Weather is considered wet up to 72 hours after a storm event of 0.1 inches and greater, unless otherwise defined by another regulatory mechanism (e.g. a TMDL).

ATTACHMENT D

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

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JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

FY _____

I. COPERMITTEE INFORMATION

Copermittee Name:

Copermittee Primary Contact Name:

Copermittee Primary Contact Information:
Address:
City: County: State: Zip:
Telephone: Fax: Email:

II. LEGAL AUTHORITY

Has the Copermittee established adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐
A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority?	**YES**	☐
	NO	☐

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

Was an update of the jurisdictional runoff management program document required or recommended by the San Diego Water Board?	**YES**	☐
	NO	☐
If YES to the question above, did the Copermittee update its jurisdictional runoff management program document and make it available on the Regional Clearinghouse?	**YES**	☐
	NO	☐

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

Has the Copermittee implemented a program to actively detect and eliminate illicit discharges and connections to its MS4 that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

Number of non-storm water discharges reported by the public	
Number of non-storm water discharges detected by Copermittee staff or contractors	
Number of non-storm water discharges investigated by the Copermittee	
Number of sources of non-storm water discharges identified	
Number of non-storm water discharges eliminated	
Number of sources of illicit discharges or connections identified	
Number of illicit discharges or connections eliminated	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

V. DEVELOPMENT PLANNING PROGRAM

Has the Copermittee implemented a development planning program that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐
Was an update to the BMP Design Manual required or recommended by the San Diego Water Board?	**YES**	☐
	NO	☐
If YES to the question above, did the Copermittee update its BMP Design Manual and make it available on the Regional Clearinghouse?	**YES**	☐
	NO	☐

Number of proposed development projects in review	
Number of Priority Development Projects in review	
Number of Priority Development Projects approved	
Number of approved Priority Development Projects exempt from any BMP requirements	
Number of approved Priority Development Projects allowed alternative compliance	
Number of Priority Development Projects granted occupancy	

Number of completed Priority Development Projects in inventory	
Number of high priority Priority Development Project structural BMP inspections	
Number of Priority Development Project structural BMP violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

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VI. CONSTRUCTION MANAGEMENT PROGRAM

Has the Copermittee implemented a construction management program that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

Number of construction sites in inventory	
Number of active construction sites in inventory	
Number of inactive construction sites in inventory	
Number of construction sites closed/completed during reporting period	
Number of construction site inspections	
Number of construction site violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

Has the Copermittee implemented an existing development management program that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

	Municipal	Commercial	Industrial	Residential
Number of facilities or areas in inventory				
Number of existing development inspections				
Number of follow-up inspections				
Number of violations				
Number of enforcement actions issued				
Number of escalated enforcement actions issued				

VIII. PUBLIC EDUCATION AND PARTICIPATION

Has the Copermittee implemented a public education program component that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐
Has the Copermittee implemented a public participation program component that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

IX. FISCAL ANALYSIS

Has the Copermittee attached to this form a summary of its fiscal analysis that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

X. CERTIFICATION

I [☐ Principal Executive Officer ☐ Ranking Elected Official ☐ Duly Authorized Representative] certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature	Date
Print Name	Title
Telephone Number	Email

ATTACHMENT E

SPECIFIC PROVISIONS FOR TOTAL MAXIMUM DAILY LOADS APPLICABLE TO ORDER NO. R9-2013-0001, AS AMENDED BY ORDER NOS. R9-2015-0001 AND R9-2015-0100

These provisions implement load allocations (LAs) and wasteload allocations (WLAs) of the Total Maximum Daily Loads (TMDLs) established by the San Diego Water Board or USEPA under Clean Water Act section 303(c), applicable to discharges regulated under this Order. The provisions and schedules for implementation of the TMDLs described below must be incorporated into the Water Quality Improvement Plans, required pursuant to Provision B of this Order, for the specified Watershed Management Areas.

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed
2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin
3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed
4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek
5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay
6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)
7. Total Maximum Daily Load for Sediment in Los Peñasquitos Lagoon

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1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2002-0123

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	August 14, 2002
State Water Board Approval Date:	July 16, 2003
Office of Administrative Law Approval Date:	September 11, 2003
US EPA Approval Date:	November 3, 2003

(3) TMDL Effective Date: September 11, 2003

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final diazinon TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must be in compliance with the final TMDL compliance requirements as of December 31, 2010.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations:

Table 1.1
Final Receiving Water Limitations Expressed as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Diazinon	Acute	0.08 µg/L	1 hour
	Chronic	0.05 µg/L	4 days

(b) Final Effluent Limitations

Discharges from the MS4s containing concentrations that do not exceed the following effluent limitations will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 1.b.(2)(a):

Table 1.2
Final Effluent Limitations Expressed as Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation	Averaging Period
Diazinon	Acute	0.072 µg/L	1 hour
	Chronic	0.045 µg/L	4 days

(c) Best Management Practices

The following BMPs for Chollas Creek must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area and implemented by the Responsible Copermittees:

(i) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 1.b.(2)(a) and/or the effluent limitations under Specific Provision 1.b.(2)(b) for Chollas Creek.

(ii) The Responsible Copermittees must implement the Diazinon Toxicity Control Plan and Diazinon Public Outreach/Education Program as described in the report titled, *Technical Report for Total Maximum Daily Load for Diazinon in Chollas Creek Watershed, San Diego County*, dated August 14, 2002, including subsequent modifications, in order to achieve the receiving water limitations under Specific Provision 1.b.(2)(a) and/or the effluent limitations under Specific Provision 1.b.(2)(b).

(iii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 1.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 1.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 1.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 1.b.(2)(c) achieves compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 1.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 1.d, to demonstrate compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The Responsible Copermittees must be in compliance with the final diazinon TMDL compliance requirements as of December 31, 2010.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls for diazinon within the Chollas Creek watershed, and calculate or estimate the annual diazinon loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment

Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 1.b.(2)(b), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0019

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	September 22, 2005
Office of Administrative Law Approval Date:	December 2, 2005
US EPA Approval Date:	February 8, 2006

(3) TMDL Effective Date: December 2, 2005

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Shelter Island Yacht Basin

(6) Responsible Copermittee: City of San Diego

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final dissolved copper TMDL compliance requirements for Shelter Island Yacht Basin consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittee must be in compliance with the final TMDL compliance requirements as of December 2, 2005.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations:

Table 2.1
Final Receiving Water Limitations Expressed as Concentrations in Shelter Island Yacht Basin

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Dissolved Copper	Acute	4.8 µg/L x WER*	1 hour
	Chronic	3.1 µg/L x WER*	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 2.b.(2)(a):

Table 2.2
Final Effluent Limitations as Expressed as Annual Loads in MS4 Discharges to Shelter Island Yacht Basin

Constituent	Effluent Limitation
Dissolved Copper	30 kg/yr*

* If the water quality objectives for dissolved copper in Shelter Island Yacht Basin are changed in the future, then the margin of safety (MOS), TMDL and allocations will be recalculated using the *Method for Recalculation of the Total Maximum Daily Load for Dissolved Copper in the Shelter Island Yacht Basin, San Diego Bay* in the Basin Plan (p. 7-14).

(c) Best Management Practices

The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 2.b.(2)(a) and/or the effluent limitations under Specific Provision 2.b.(2)(b) for Shelter Island Yacht Basin. The BMPs must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 2.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 2.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittee develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 2.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 2.b.(2)(c) achieves compliance with Specific Provisions 2.b.(3)(a), 2.b.(3)(b) and/or 2.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 2.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 2.d, to demonstrate compliance with Specific Provisions 2.b.(3)(a), 2.b.(3)(b) and/or 2.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The Responsible Copermittees must be in compliance with the final dissolved copper TMDL compliance requirements as of December 2, 2005.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

The Responsible Copermittee must monitor the effluent of its MS4 outfalls for dissolved copper, and calculate or estimate the monthly and annual dissolved copper loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.(b)(2)of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0036

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	November 16, 2005
Office of Administrative Law Approval Date:	February 1, 2006
US EPA Approval Date:	March 22, 2006

(3) TMDL Effective Date: February 1, 2006

(4) Watershed Management Area: Santa Margarita River

(5) Water Body: Rainbow Creek

(6) Responsible Copermittee: County of San Diego

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final total nitrogen and total phosphorus TMDL compliance requirements for Rainbow Creek consist of the following

(1) Final TMDL Compliance Date

The Responsible Copermittee must comply with final TMDL compliance requirements by December 31, 2021.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance date under Specific Provision 3.b.(1):

Table 3.1
Final Receiving Water Limitations Expressed as Concentrations in Rainbow Creek

Constituent	Receiving Water Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing concentrations that do not exceed the following effluent limitations by the compliance date under Specific Provision 3.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 3.b.(2)(a):

Table 3.2
Final Effluent Limitations Expressed as Concentrations in MS4 Discharges to Rainbow Creek

Constituent	Effluent Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(ii) Annual pollutant loads from given land uses discharging to and from the MS4s that do not exceed the following annual loads by the compliance date under Specific Provision 3.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 3.b.(2)(a):

Table 3.3
Final Effluent Limitations Expressed as Annual Loads in MS4 Discharges to Rainbow Creek

Land Use	Total N	Total P
Commercial nurseries	116 kg/yr	3 kg/yr
Park	3 kg/yr	0.1 kg/yr
Residential areas	149 kg/yr	12 kg/yr
Urban areas	27 kg/yr	6 kg/yr

(c) Best Management Practices

(i) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 3.b.(2)(a) and/or the effluent limitations under Specific Provision 3.b.(2)(b) for Rainbow Creek.

(ii) The Responsible Copermittee should coordinate any BMPs implemented to address this TMDL with Caltrans and other sources as possible.

(3) <u>Final TMDL Compliance Determination</u>

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 3.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 3.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the final effluent limitations under Specific Provision 3.b.(2)(b)(ii); OR

(e) The Responsible Copermittee develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 3.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Specific Provision 3.b.(2)(c) achieves compliance with Specific Provisions 3.b.(3)(a), 3.b.(3)(b), 3.b.(3)(c) and/or 3.b.(3)(d),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 3.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 3.d, to demonstrate compliance with Specific Provisions 3.b.(3)(a), 3.b.(3)(b), 3.b.(3)(c) and/or 3.b.(3)(d).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim total nitrogen and total phosphorus TMDL compliance requirements for Rainbow Creek consist of the following:

(1) Interim Compliance Dates and WQBELs

The Responsible Copermittee must comply with the interim WQBELs, expressed as annual loads, by December 31 of the interim compliance year given in Table 3.4.

Table 3.4
Interim Water Quality Based Effluent Limitations Expressed as Annual Loads in MS4 Discharges from Specific Land Uses to Rainbow Creek

	Total N Interim Effluent Limitations (kg/yr)			Total P Interim Effluent Limitations (kg/yr)		
	Interim Compliance Date			Interim Compliance Date		
Land Use	**2009**	**2013**	**2017**	**2009**	**2013**	**2017**
Commercial nurseries	390	299	196	20	16	10
Park	5	3	3	0.15	0.10	0.10
Residential areas	507	390	260	99	74	47
Urban areas	40	27	27	9	6	6

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 3.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 3.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the final effluent limitations under Specific Provision 3.b.(2)(b)(ii); OR

(e) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the interim effluent limitations under Specific Provision 3.c.(1); OR

(f) The Responsible Copermittee has submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

d. Specific Monitoring and Assessment Requirements

(1) The Responsible Copermittee must incorporate into the Water Quality Improvement Plan and implement the Sampling and Analysis Plan for Rainbow Creek Nutrient Reduction TMDL Implementation Water Quality Monitoring, dated January 2010.

(2) The results of any monitoring conducted during the reporting period, and assessment of whether the interim and final TMDL compliance requirements have been achieved must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 3.b.(2)(b)(i), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2007-0043

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2007
State Water Board Approval Date:	July 15, 2008
Office of Administrative Law Approval Date:	October 22, 2008
US EPA Approval Date:	December 18, 2008

(3) TMDL Effective Date: October 22, 2008

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final dissolved copper, lead, and zinc TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must comply with the final TMDL compliance requirements by October 22, 2028.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance date under Specific Provision 4.b.(1):

Table 4.1
Final Receiving Water Limitations Expressed as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$(0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$(0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$(0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$(0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations by the compliance date under Specific Provision 4.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 4.b.(2)(a):

Table 4.2
Final Effluent Limitations as Expressed Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(c) Best Management Practices

(i) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 4.b.(2)(a) and/or the effluent limitations under Specific Provision 4.b.(2)(b) for Chollas Creek.

(ii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans and the U.S. Navy as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 4.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 4.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 4.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 4.b.(2)(c) achieves compliance with Specific Provisions 4.b.(3)(a), 4.b.(3)(b) and/or 4.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 4.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 4.d, to demonstrate compliance with Specific Provisions 4.b.(3)(a), 4.b.(3)(b) and/or 4.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim dissolved copper, lead, and zinc TMDL compliance requirements for Chollas Creek consist of the following:

(1) Interim Compliance Date and WQBELs

The Responsible Copermittee must comply with the interim WQBELs, expressed as concentrations, by the interim compliance date given in Table 4.3:

Table 4.3
Interim Water Quality Based Effluent Limitations Expressed as Concentrations in MS4 Discharges to Chollas Creek

Interim Compliance Date	Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
October 22, 2018	Dissolved Copper	Acute	$1.2 \times 90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
	Dissolved Lead	Acute	$1.2 \times 90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
	Dissolved Zinc	Acute	$1.2 \times 90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 4.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 4.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) There are no exceedances of the interim effluent limitations under Specific Provision 4.c.(1) at the Responsible Copermittee's MS4 outfalls; OR

(e) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance date.

d. Specific Monitoring and Assessment Requirements

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*, when it is amended to include monitoring requirements for the Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls discharging to Chollas Creek for dissolved copper, lead, and zinc, and calculate or estimate the monthly and annual dissolved copper, lead, and zinc loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 4.b.(2)(b) or 4.c.(1), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2008-0027

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 11, 2008
State Water Board Approval Date:	June 16, 2009
Office of Administrative Law Approval Date:	September 15, 2009
US EPA Approval Date:	October 26, 2009

(3) TMDL Effective Date: September 15, 2009

(4) Watershed Management Areas: See Table 5.0

(5) Water Bodies: See Table 5.0

(6) Responsible Copermittees: See Table 5.0

Table 5.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County	Dana Point Harbor	Baby Beach	-City of Dana Point -County of Orange
San Diego Bay	San Diego Bay	Shelter Island Shoreline Park	- San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final indicator bacteria TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Final TMDL Compliance Dates

(a) Baby Beach in Dana Point Harbor

The Responsible Copermittees for MS4 discharges to Baby Beach must be in compliance with the final TMDL compliance requirements according to the following compliance dates:

Table 5.1
Compliance Dates to Achieve Final TMDL Compliance Requirements For Baby Beach in Dana Point Harbor

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform	September 15, 2014	September 15, 2009
Fecal Coliform		September 15, 2009
Enterococcus		September 15, 2019

(b) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park must be in compliance with the final TMDL compliance requirements as of December 31, 2012.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance dates under Specific Provision 5.b.(1):

Table 5.2
Final Receiving Water Limitations Expressed as Bacteria Densities in the Water Body

	Receiving Water Limitations	
Constituent	Single Sample Maximum[1,2]	30-Day Geometric Mean[2]
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing indicator bacteria densities that do not exceed the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.3a
Final Effluent Limitations as Expressed as Bacteria Densities in MS4 Discharges to the Water Body

	Effluent Limitations	
Constituent	**Single Sample Maximum[1,2]**	**30-Day Geometric Mean[2]**
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.

(ii) Discharges from the MS4s containing indicator bacteria loads that do not exceed the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.4a
Final Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to the Baby Beach in Dana Point Harbor

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0.86×10^9 MPN/day	$3{,}254 \times 10^9$ MPN/30days
Fecal Coliform	0.17×10^9 MPN/day	112×10^9 MPN/30days
Enterococcus	0.03×10^9 MPN/day	114×10^9 MPN/30days

Table 5.4b
Final Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to the Shelter Island Shoreline Park in San Diego Bay

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0 MPN/day	198×10^9 MPN/30days
Fecal Coliform	0 MPN/day	8×10^9 MPN/30days
Enterococcus	0 MPN/day	26×10^9 MPN/30days

(iii) Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.5a
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to Baby Beach in Dana Point Harbor*

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	90.4%	0%
Fecal Coliform	82.7%	0%
Enterococcus	96.2%	62.2%

Notes:
* The percent load reductions are relative to data collected between 1996-2002. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittees' MS4s must not exceed the loads in Table 5.4a, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the water body.

Table 5.5b
*Final Effluent Limitations Expressed as Percent Load Reductions** in MS4 Discharges to Shelter Island Shoreline Park in San Diego Bay*

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0%	0%
Fecal Coliform	0%	0%
Enterococcus	0%	0%

Notes:
* The percent load reductions are relative to data collected between 1999-2004. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittee's MS4s must not exceed the loads in Table 5.4b, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the water body.

(c) Best Management Practices

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 5.0 must incorporate the Bacteria Load Reduction Plan (BLRP) required to be developed pursuant to Resolution No. R9-2008-0027.

(ii) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 5.b.(2)(a) and/or the effluent limitations under Specific Provision 5.b.(2)(b) for the segments or areas of the water bodies listed in Table 5.0

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.b.(2)(b)(ii); OR

(e) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 5.b.(2)(b)(iii); OR

(f) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(g) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 5.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 5.b.(2)(c) achieves compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 5.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 5.d, to demonstrate compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim indicator bacteria TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Baby Beach in Dana Point Harbor

(a) Interim TMDL Compliance Dates and WQBELs

The Responsible Copermittees for MS4 discharges to Baby Beach must comply with the following interim WQBELs by the interim compliance dates given in Tables 5.6a and/or 5.6b:

Table 5.6a
Interim Water Quality Based Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to Baby Beach in Dana Point Harbor

Constituent	Interim Compliance Dates	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	4.93×10^9 MPN/day	$3{,}254 \times 10^9$ MPN/30days*
Fecal Coliform	September 15, 2012	0.59×10^9 MPN/day	112×10^9 MPN/30days*
Enterococcus	September 15, 2012	0.42×10^9 MPN/day	301×10^9 MPN/30days
	September 15, 2016	0.03×10^9 MPN/day *	207×10^9 MPN/30days

Notes:
* Same as the final effluent limitations in Table 5.4a.

Table 5.6b
Interim Water Quality Based Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to Baby Beach in Dana Point Harbor*

Constituent	Interim Compliance Dates	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	45.2%	0%**
Fecal Coliform	September 15, 2012	41.4%	0%**
Enterococcus	September 15, 2012	48.1%	0%
	September 15, 2016	96.2%**	31.1%

Notes:
* The percent load reductions are relative to data collected between 1996-2002. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittees' MS4s must not exceed the loads in Table 5.6a, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the waterbody.
** Same as the final effluent limitations in Table 5.5a.

(b) Interim Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(i) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(ii) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(iii) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(iv) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.b(2)(b)(ii); OR

(v) The Responsible Copermittees can demonstrate that exceedances of the applicable receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(vi) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the interim effluent limitations under Table 5.6a of Specific Provision 5.c.(1)(a); OR

(vii) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the interim effluent limitations under Table 5.6b of Specific Provision 5.c.(1)(a); OR

(viii) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

(2) <u>Shelter Island Shoreline Park in San Diego Bay</u>

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park must be in compliance with the final indicator bacteria TMDL requirements as of December 31, 2012.

d. Specific Monitoring and Assessment Requirements

(1) Monitoring Stations

Monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[38] If discharges of bacteria from the MS4 exceed the applicable interim or final WQBELs, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(2) Monitoring Procedures

(a) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) The Responsible Copermittees must collect wet weather monitoring samples within the first 24 hours of a storm event[39] of the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(c) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

[38] Commonly referred to as AB 411 monitoring
[39] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs have been achieved.

(b) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 5.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(c) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to correlate elevated bacteria levels with known or suspected sewage spills from wastewater collection systems and treatment plants or boats.

(d) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2010-0001

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date: February 10, 2010
State Water Board Approval Date: December 14, 2010
Office of Administrative Law Approval Date: April 4, 2011
US EPA Approval Date: June 22, 2011

(3) TMDL Effective Date: April 4, 2011

(4) Watershed Management Areas: See Table 6.0

(5) Water Bodies: See Table 6.0

(6) Responsible Copermittees: See Table 6.0

Table 6.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	-City of Laguna Beach -County of Orange -Orange County Flood Control District
		at Heisler Park - North	
	Pacific Ocean Shoreline	at Main Laguna Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Woods -County of Orange -Orange County Flood Control District
		Laguna Beach at Ocean Avenue	
		Laguna Beach at Cleo Street	
		Arch Cove at Bluebird Canyon Road	
		Laguna Beach at Dumond Drive	
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Hills -City of Laguna Niguel -City of Laguna Woods -City of Lake Forest -City of Mission Viejo -County of Orange -Orange County Flood Control District
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	
	Aliso Creek Mouth	at mouth	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	-City of Dana Point -City of Laguna Beach -City of Laguna Niguel -County of Orange -Orange County Flood Control District
		Aliso Beach at Table Rock Drive	
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)	
		at Salt Creek (large outlet)	
		Salt Creek Beach at Salt Creek service road	
		Salt Creek Beach at Strand Road	
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	-City of Dana Point -City of Laguna Hills -City of Laguna Niguel -City of Mission Viejo -City of Rancho Santa Margarita -City of San Juan Capistrano -County of Orange -Orange County Flood Control District
	San Juan Creek	lower 1 mile	
	San Juan Creek Mouth	at mouth	
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	-City of Dana Point -City of San Clemente -County of Orange -Orange County Flood Control District
		Ole Hanson Beach Club Beach at Pico Drain	
		San Clemente City Beach at El Portal Street Stairs	
		San Clemente City Beach at Mariposa Street	
		San Clemente City Beach at Linda Lane	
		San Clemente City Beach at South Linda Lane	
		San Clemente City Beach at Lifeguard Headquarters	
		under San Clemente Municipal Pier	
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	
		San Clemente State Beach at Riviera Beach	
		Can Clemente State Beach at Cypress Shores	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	-City of Oceanside -City of Vista -County of San Diego
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	-City of Carlsbad -City of Encinitas -City of Escondido -City of San Marcos -County of San Diego
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	-City of Del Mar -City of Escondido -City of Poway -City of San Diego -City of Solana Beach -County of San Diego
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	-City of Del Mar -City of Poway -City of San Diego -County of San Diego
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	-City of San Diego
		La Jolla Shores Beach at Caminito del Oro	
		La Jolla Shores Beach at Vallecitos	
		La Jolla Shores Beach at Avenida de la Playa	
		at Casa Beach, Children's Pool	
		South Casa Beach at Coast Boulevard	
		Whispering Sands Beach at Ravina Street	
		Windansea Beach at Vista de la Playa	
		Windansea Beach at Bonair Street	
		Windansea Beach at Playa del Norte	
		Windansea Beach at Palomar Avenue	
		at Tourmaline Surf Park	
		Pacific Beach at Grand Avenue	
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I- Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	-City of El Cajon -City of Santee -County of San Diego
	San Diego River	lower 6 miles	-City of El Cajon -City of La Mesa -City of San Diego -City of Santee -County of San Diego
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	-City of La Mesa -City of Lemon Grove -City of San Diego -County of San Diego - San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final indicator bacteria TMDL compliance requirements for the water bodies listed in Table 6.0 consist of the following:

(1) Final TMDL Compliance Dates

The Responsible Copermittees for MS4 discharges to the water bodies listed in Table 6.0 must be in compliance with the final TMDL compliance requirements according to the following compliance dates:

Table 6.1
Compliance Dates to Achieve Final TMDL Compliance Requirements

Constituent	Dry Weather TMDL Compliance Date	Wet Weather TMDL Compliance Date*
Total Coliform	April 4, 2021	April 4, 2031 (April 4, 2021)
Fecal Coliform		
Enterococcus		

* The Wet Weather TMDL Compliance Date in parenthesis applies if the applicable Water Quality Improvement Plan does not include load reduction programs for other constituents (e.g. metals, pesticides, trash, nutrients, sediment, etc.) together with bacteria load reduction requirements of these TMDLs.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance dates under Specific Provision 6.b.(1):

Table 6.2a
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Beaches

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform	10,000	22%	1,000	0%
Fecal Coliform	400	22%	200	0%
Enterococcus	104	22%	35	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan.

Table 6.2b
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Creeks

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Fecal Coliform	400	22%	200	0%
Enterococcus	61 (104)	22%	33	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Basin Plan.
d. A single sample maximum of 104 MPN/100ml for *Enterococcus* may be applied as a receiving water limitation for creeks, instead of 61 MPN/100mL, if one or more of the creeks addressed by these TMDLs (San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek, San Diego River, and/or Chollas Creek) is designated with a "moderately to lightly used area" or less frequent usage frequency in the Basin Plan. Otherwise, the single sample maximum of 61 MPN/100mL for *Enterococcus* must be used to assess compliance with the allowable exceedance frequency.

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing indicator bacteria densities that do not exceed the following effluent limitations by the compliance dates under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a):

Table 6.2c
Final Effluent Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies in MS4 Discharges to the Water Body

Constituent	Concentration-Based Effluent Limitations			
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform[d]	10,000	22%	1,000	0%
Fecal Coliform	400	22%	200	0%
Enterococcus	104[e] / 61[f]	22%	35[e] / 33[f]	0%

Notes:
a. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan for discharges to beaches, and the Basin Plan for discharges to creeks and creek mouths.
d. Total coliform effluent limitations only apply to MS4 outfalls that discharge to the Pacific Ocean Shorelines and creek mouths listed in Table 6.0.
e. This *Enterococcus* effluent limitation applies to MS4 discharges to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
f. This *Enterococcus* effluent limitation applies to MS4 discharges to segments or areas of creeks or creek mouths listed in Table 6.0.

(ii) Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the compliance dates under Specific Provision 6.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a):

Table 6.3
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watershed and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
South Orange County	**San Joaquin Hills HSA** (901.11) and **Laguna Hills HSA** (901.12) - Pacific Ocean Shoreline	91.78%	91.72%	98.28%	46.85%	52.07%	51.26%
	Aliso HSA (901.13) - Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	95.47%	95.58%	99.13%	25.29%	26.62%	27.52% (27.37%)**
	Dana Point HSA (901.14) - Pacific Ocean Shoreline	95.04%	95.03%	98.98%	13.15%	14.86%	15.16%
	Lower San Juan HSA (901.27) - Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	72.96%	74.21%	94.94%	19.21%	12.82%	27.12% (26.90%)**
	San Clemente HA (901.30) - Pacific Ocean Shoreline	94.28%	94.23%	98.83%	23.85%	24.58%	25.26%
San Luis Rey River	**San Luis Rey HU** (903.00) - Pacific Ocean Shoreline	38.13%	39.09%	87.38%	5.62%	3.12%	11.69%

Table 6.3 (Cont'd)
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watershed and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
Carlsbad	**San Marcos HA** (904.50) - Pacific Ocean Shoreline	82.82%	82.55%	96.03%	18.47%	18.98%	20.19%
San Dieguito River	**San Dieguito HU** (905.00) - Pacific Ocean Shoreline	14.39%	20.72%	83.48%	4.29%	1.46%	7.72%
Penasquitos	**Miramar Reservoir HA** (906.10) - Pacific Ocean Shoreline	96.50%	96.59%	99.42%	1.61%	1.99%	1.93%
Mission Bay	**Scripps HA** (906.30) - Pacific Ocean Shoreline	96.44%	96.42%	99.25%	16.32%	21.14%	18.82%
	Tecolote HA (906.50) - Tecolote Creek	94.51%	94.59%	98.94%	16.51%	20.47%	18.15% (18.08%)**
San Diego River	**Mission San Diego HSA** (907.11) and **Santee HSA** (907.12) - Pacific Ocean Shoreline - Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles)	74.03%	69.44%	93.96%	38.14%	53.22%	42.74% (42.47%)**
San Diego Bay	**Chollas HSA** (908.22) - Chollas Creek	92.06%	92.15%	98.46%	17.82%	24.84%	21.46% (21.36%)**

Notes:
* The percent load reductions are based on reducing loads compared to pollutant loads from 2001 to 2002.
** The alternative *Enterococcus* percent load reduction was calculated based on a numeric target of 104 MPN/100mL instead of 61 MPN/100mL, protective of the REC-1 "moderately to lightly used area" usage frequency that is protective of freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative pollutant load reductions can be utilized.

(c) Best Management Practices

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 6.0 must incorporate the Bacteria Load Reduction Plans (BLRPs) or Comprehensive Load Reduction Plans (CLRPs) required to be developed pursuant to Resolution No. R9-2010-0001.

(ii) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 6.b.(2)(a) and/or the effluent limitations under Specific Provision 6.b.(2)(b) for the segments or areas of the water bodies listed in Table 6.0.

(iii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans, owners/operators of small MS4s, and agricultural dischargers as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(f) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 6.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 6.b.(2)(c) achieves compliance with Specific Provisions 6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), and/or 6.b.(3)(e),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 6.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 6.d, to demonstrate compliance with Specific Provisions 6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), 6.b.(3)(e) and/or 6.b.(3)(f).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim indicator bacteria TMDL compliance requirements for the water bodies listed in Table 6.0 consist of the following:

(1) Interim TMDL Compliance Dates

The Responsible Copermittees must achieve compliance with the interim TMDL compliance requirements, as determined in accordance with Specific Provision 6.c.(3), by the interim compliance dates given in Table 6.4, unless alternative interim compliance dates are accepted by the San Diego Water Board Executive Officer as part of the Water Quality Improvement Plan.

Table 6.4
Interim Compliance Dates to Achieve Interim TMDL Compliance Requirements

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs*
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	April 4, 2016	April 4, 2021 (April 4, 2016)
		at Heisler Park - North		
	Pacific Ocean Shoreline	at Main Laguna Beach	April 4, 2016	April 4, 2021 (April 4, 2016)
		Laguna Beach at Ocean Avenue		
		Laguna Beach at Cleo Street		
		Arch Cove at Bluebird Canyon Road		
		Laguna Beach at Dumond Drive		
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	April 4, 2016	April 4, 2021 (April 4, 2016)
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	April 4, 2018	April 4, 2021 (April 4, 2018)
	Aliso Creek Mouth	at mouth	April 4, 2018	April 4, 2021 (April 4, 2018)
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	April 4, 2016	April 4, 2021 (April 4, 2016)
		Aliso Beach at Table Rock Drive		
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)		
		at Salt Creek (large outlet)		
		Salt Creek Beach at Salt Creek service road	April 4, 2017	April 4, 2021 (April 4, 2017)
		Salt Creek Beach at Strand Road	April 4, 2017	April 4, 2021 (April 4, 2017)

Table 6.4 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs*
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	April 4, 2016	April 4, 2021 (April 4, 2016)
	San Juan Creek	lower 1 mile	April 4, 2018	April 4, 2021 (April 4, 2018)
	San Juan Creek Mouth	at mouth	April 4, 2016	April 4, 2021 (April 4, 2016)
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	April 4, 2016	April 4, 2021 (April 4, 2016)
		Ole Hanson Beach Club Beach at Pico Drain	April 4, 2016	April 4, 2021 (April 4, 2016)
		San Clemente City Beach at El Portal Street Stairs	April 4, 2017	April 4, 2021 (April 4, 2017)
		San Clemente City Beach at Mariposa Street		
		San Clemente City Beach at Linda Lane	April 4, 2016	April 4, 2021 (April 4, 2016)
		San Clemente City Beach at South Linda Lane	April 4, 2018	April 4, 2021 (April 4, 2018)
		San Clemente City Beach at Lifeguard Headquarters	April 4, 2017	April 4, 2021 (April 4, 2017)
		under San Clemente Municipal Pier		
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	April 4, 2018	April 4, 2021 (April 4, 2018)
		San Clemente State Beach at Riviera Beach	April 4, 2016	April 4, 2021 (April 4, 2016)
		Can Clemente State Beach at Cypress Shores	April 4, 2017	April 4, 2021 (April 4, 2017)
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	April 4, 2017	April 4, 2021 (April 4, 2017)
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	April 4, 2016	April 4, 2021 (April 4, 2016)
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	April 4, 2016	April 4, 2021 (April 4, 2016)

Table 6.4 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates	
			Interim Dry Weather WQBELs	Interim Wet Weather WQBELs*
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	April 4, 2016	April 4, 2021 (April 4, 2016)
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	April 4, 2016	April 4, 2021 (April 4, 2016)
		La Jolla Shores Beach at Caminito del Oro		
		La Jolla Shores Beach at Vallecitos		
		La Jolla Shores Beach at Avenida de la Playa		
		at Casa Beach, Children's Pool		
		South Casa Beach at Coast Boulevard		
		Whispering Sands Beach at Ravina Street		
		Windansea Beach at Vista de la Playa		
		Windansea Beach at Bonair Street		
		Windansea Beach at Playa del Norte		
		Windansea Beach at Palomar Avenue		
		at Tourmaline Surf Park		
		Pacific Beach at Grand Avenue		
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries		
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	April 4, 2018	April 4, 2021 (April 4, 2018)
	San Diego River	lower 6 miles		
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach		
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	April 4, 2018	April 4, 2021 (April 4, 2018)

* The Interim Compliance Dates to achieve the Interim Wet Weather WQBELs in parenthesis apply if the applicable Water Quality Improvement Plan does not include load reduction programs for other constituents (e.g. metals, pesticides, trash, nutrients, sediment, etc.) together with bacteria load reduction requirements of these TMDLs.

(2) Interim Water Quality Based Effluent Limitations

The Responsible Copermittees for discharges to the water bodies in Table 6.0 must comply with the following interim WQBELs by the interim compliance dates given in Specific Provision 6.c.(1):

(a) Interim Receiving Water Limitations

(i) *Interim Dry Weather Receiving Water Limitations*

The Responsible Copermittee must calculate the "existing" exceedance frequencies of the 30-day geometric mean water quality objectives for each of the indicator bacteria by analyzing the available monitoring data collected between January 1, 1996 and December 31, 2002. "Existing" exceedance frequencies may be calculated by water body and/or by Watershed Management Area listed in Table 6.0. Separate "existing" exceedance frequencies must be calculated for beaches and creeks/creek mouths.

The Responsible Copermittees must achieve a 50 percent reduction in the "existing" exceedance frequency of the 30-day geometric mean WQBELs for the water bodies listed in Table 6.0 by the interim compliance dates given in Table 6.4. A 50 percent reduction in the "existing" exceedance frequency is equivalent to half of the "existing" exceedance frequency of the 30-day geometric mean WQBELs.

The "existing" exceedance frequencies and the interim dry weather allowable exceedance frequencies (i.e. interim dry weather receiving water limitations) calculated by the Responsible Copermittees must be included in the Water Quality Improvement Plans for the applicable Watershed Management Areas.

(ii) *Interim Wet Weather Receiving Water Limitations*

The Responsible Copermittees must achieve the interim wet weather receiving water limitations in Table 6.5, expressed as interim wet weather allowable exceedance frequencies, by the interim compliance dates given in Table 6.4.

Table 6.5
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	38%	37%	39%
		at Heisler Park - North			
	Pacific Ocean Shoreline	at Main Laguna Beach			
		Laguna Beach at Ocean Avenue			
		Laguna Beach at Cleo Street			
		Arch Cove at Bluebird Canyon Road			
		Laguna Beach at Dumond Drive			
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	41%	41%	42%
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	41%	41%	42%
	Aliso Creek Mouth	at mouth	41%	41%	42%
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	36%	36%	36%
		Aliso Beach at Table Rock Drive			
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)			
		at Salt Creek (large outlet)			
		Salt Creek Beach at Salt Creek service road			
		Salt Creek Beach at Strand Road			

Table 6.5 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	44%	44%	48%
	San Juan Creek	lower 1 mile	44%	44%	47%
	San Juan Creek Mouth	at mouth	44%	44%	47%
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	35%	35%	36%
		Ole Hanson Beach Club Beach at Pico Drain			
		San Clemente City Beach at El Portal Street Stairs			
		San Clemente City Beach at Mariposa Street			
		San Clemente City Beach at Linda Lane			
		San Clemente City Beach at South Linda Lane			
		San Clemente City Beach at Lifeguard Headquarters			
		under San Clemente Municipal Pier			
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)			
		San Clemente State Beach at Riviera Beach			
		Can Clemente State Beach at Cypress Shores			
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	45%	44%	47%
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	40%	40%	41%
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	33%	33%	36%

Table 6.5 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	26%	26%	26%
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	37%	37%	37%
		La Jolla Shores Beach at Caminito del Oro			
		La Jolla Shores Beach at Vallecitos			
		La Jolla Shores Beach at Avenida de la Playa			
		at Casa Beach, Children's Pool			
		South Casa Beach at Coast Boulevard			
		Whispering Sands Beach at Ravina Street			
		Windansea Beach at Vista de la Playa			
		Windansea Beach at Bonair Street			
		Windansea Beach at Playa del Norte			
		Windansea Beach at Palomar Avenue			
		at Tourmaline Surf Park			
		Pacific Beach at Grand Avenue			
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries	49%	49%	51%
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	46%	43%	49%
	San Diego River	lower 6 miles	46%	43%	49%
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	46%	43%	51%
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	41%	41%	43%

(b) Interim Effluent Limitations

Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the interim compliance dates under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.c.(2)(a):

Table 6.6
Interim Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watersheds and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
South Orange County	**San Joaquin Hills HSA** (901.11) and **Laguna Hills HSA** (901.12) - Pacific Ocean Shoreline	45.89%	45.86%	49.14%	23.43%	26.04%	25.63%
	Aliso HSA (901.13) - Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	47.74%	47.79%	49.57%	12.65%	13.31%	13.76% (13.69%)**
	Dana Point HSA (901.14) - Pacific Ocean Shoreline	47.52%	47.52%	49.49%	6.58%	7.43%	7.58%
	Lower San Juan HSA (901.27) - Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	36.48%	37.11%	47.47%	9.61%	6.41%	13.56% (13.45%)**
	San Clemente HA (901.30) - Pacific Ocean Shoreline	47.14%	47.12%	49.42%	11.93%	12.29%	12.63%
San Luis Rey River	**San Luis Rey HU** (903.00) - Pacific Ocean Shoreline	19.07%	19.55%	43.69%	2.81%	1.56%	5.85%
Carlsbad	**San Marcos HA** (904.50) - Pacific Ocean Shoreline	41.41%	41.28%	48.02%	9.24%	9.49%	10.10%

Table 6.6 (Cont'd)
Interim Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watersheds and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
San Dieguito River	**San Dieguito HU** (905.00) - Pacific Ocean Shoreline	7.20%	10.36%	41.74%	2.15%	0.73%	3.86%
Penasquitos	**Miramar Reservoir HA** (906.10) - Pacific Ocean Shoreline	48.25%	48.30%	49.71%	0.81%	1.00%	0.97%
Mission Bay	**Scripps HA** (906.30) - Pacific Ocean Shoreline	48.22%	48.21%	49.63%	8.16%	10.57%	9.41%
	Tecolote HA (906.50) - Tecolote Creek	47.26%	47.30%	49.47%	8.26%	10.24%	9.08% (9.04%)**
San Diego River	**Mission San Diego HSA** (907.11) and **Santee HSA** (907.12) - Pacific Ocean Shoreline - Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles)	37.02%	34.72%	46.98%	19.07%	26.61%	21.37% (21.24%)**
San Diego Bay	**Chollas HSA** (908.22) - Chollas Creek	46.03%	46.08%	49.23%	8.91%	12.42%	10.73% (10.68%)**

Notes:
* The percent load reductions are based on reducing loads compared to pollutant loads from 2001 to 2002.
** The alternative *Enterococcus* percent load reduction was calculated based on a numeric target of 104 MPN/100mL instead of 61 MPN/100mL, protective of the REC-1 "moderately to lightly used area" usage frequency that is protective of freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative pollutant load reductions can be utilized.

(3) Interim TMDL Compliance Determination

Compliance with the interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(f) There are no exceedances of the interim receiving water limitations under Specific Provision 6.c.(2)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(g) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the interim effluent limitations under Specific Provision 6.c.(2)(b); OR

(h) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

d. Specific Monitoring and Assessment Requirements

(1) Monitoring and Assessment Requirements for Beaches

(a) Monitoring Stations

For beaches addressed by the TMDL, monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[40] If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source

[40] Commonly referred to as AB 411 monitoring

identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations at least once within the first 24 hours of the end of a storm event[41] during the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer in exceedance of the allowable exceedance frequencies in the receiving waters.

(iii) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(iv) For Pacific Ocean Shoreline segments or areas listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

[41] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs for the Pacific Ocean Shoreline segments or areas listed in Table 6.0 have been achieved.

(ii) Dry weather exceedance frequencies must be calculated as follows:

[a] 30-day geometric means must be calculated from the results of any dry weather samples collected from the segments or areas for each water body listed in Table 6.0;
[b] The method and number of samples need for calculating the 30-day geometric means must be consistent with the number of samples required by the Ocean Plan;
[c] Where there are multiple segments or areas associated with a water body listed in Table 6.0, the Copermittees may calculate geometric means for each segment or area, or combine the dry weather monitoring data from all the segments or areas to calculate geometric means for the water body;
[d] The exceedance frequency must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the dry season.

(iii) Wet weather exceedance frequencies must be calculated as follows:

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;
[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;
[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria densities reported from each storm event sampled; and
[d] The single sample maximum exceedance frequency must be calculated by dividing the number of wet weather days that exceed the single sample maximum receiving water limitations in Table 6.2 by the total number of wet weather days during the rainy season.
[e] The data collected for dry weather must be used in addition to the data collected for wet weather to calculate the wet weather 30-

day geometric means. The exceedance frequency of the wet weather 30-day geometric means must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the wet season.

(iv) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(v) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) Monitoring and Assessment Requirements for Creeks and Creek Mouths

(a) Monitoring Stations

For creeks addressed by the TMDL, monitoring locations should consist of, at a minimum, a location at or near the mouth of the creek (e.g. Mass Loading Station or Mass Emission Station) and one or more locations upstream of the mouth (e.g. Watershed Assessment Station). If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations in accordance with the requirements of Provision D.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations within the first 24 hours of the end of a storm event[42] during the rainy season (i.e. October 1 through April 30).

[42] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to

(iii) Samples collected from receiving water monitoring stations must be analyzed for fecal coliform and *Enterococcus* indicator bacteria.

(iv) For creeks or creek mouths listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the receiving water monitoring data to assess whether the interim and final receiving water WQBELs for the creeks and creek mouths listed in Table 6.0 have been achieved.

(ii) Dry weather exceedance frequencies must be calculated as follows:

[a] 30-day geometric means must be calculated from the results of any dry weather samples collected from the segment or area for each water body listed in Table 6.0;
[b] The method and number of samples need for calculating the 30-day geometric means must be consistent with the number of samples required by the Basin Plan;
[c] The exceedance frequency must be calculated by dividing the number of 30-day geometric means that exceed the 30-day geometric mean receiving water limitations in Table 6.2 by the total number of 30-day geometric means calculated from samples collected during the dry season.

(iii) Wet weather exceedance frequencies must be calculated as follows:

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;
[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;

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storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria densities reported from each of the storm events sampled; and

[d] The exceedance frequency must be calculated by dividing the number of wet weather days that exceed the single sample maximum receiving water limitations in Table 6.2 by the total number of wet weather days during the rainy season.

[e] The data collected for dry weather must be used in addition to the data collected for wet weather to calculate the wet weather 30-day geometric means. The exceedance frequency of the wet weather 30-day geometric means must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the wet season.

(iv) The Responsible Copermittee must identify and incorporate additional MS4 outfall and receiving water monitoring stations and/or adjust monitoring frequencies to identify sources causing exceedances of the receiving water WQBELs.

(v) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(vi) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

7. Total Maximum Daily Loads for Sediment in Los Peñasquitos Lagoon

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2012-0033

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2012
State Water Board Approval Date:	January 21, 2014
Office of Administrative Law Approval Date:	July 14, 2014
US EPA Approval Date:	October 30, 2014

(3) TMDL Effective Date: July 14, 2014

(4) Watershed Management Area: Peñasquitos

(5) Water Body: Los Peñasquitos Lagoon

(6) Responsible Copermittees: County of San Diego, City of San Diego, City of Del Mar, and City of Poway

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final sediment TMDL compliance requirements for Los Peñasquitos Lagoon consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must be in compliance with the final TMDL compliance requirements by December 31, 2034.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not prohibit the sustainable restoration of tidal and non-tidal saltmarsh vegetation of at least 346 acres.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations by the compliance date under Provision 7.b(1) will not cause or contribute to a failure of the receiving water condition specified under Specific Provision 7.b.(2)(a):

Table 7.1
*Final Effluent Limitations as Expressed as Wet Season Loads in MS4 Discharges to Los Peñasquitos Lagoon**

Constituent	Effluent Limitation
Sediment	2,580 tons/wet season

* Final effluent limitations are to be achieved by the following Responsible Parties: County of San Diego, City of San Diego, City of Del Mar, City of Poway, Phase II MS4 permittees, Caltrans, general construction storm water NPDES permittees, and general industrial storm water NPDES permittees.

(c) Best Management Practices

(i) The Water Quality Improvement Plan for the Los Peñasquitos Watershed Management Area must incorporate the Sediment Load Reduction Plan required to be developed pursuant to Resolution No. R9-2012-0033.

(ii) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 7.b.(2)(a) and/or the Copermittee's portion of the effluent limitations under Specific Provision 7.b.(2)(b) for Los Peñasquitos Lagoon.

(3) Final TMDL Compliance Determination

Compliance determination with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) Successful restoration of 80 percent of the 1973 acreage of tidal and non-tidal lagoon salt marsh (346 acres) as described in Attachment A of Resolution No. R9-2010-0033; OR

(b) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 7.b.(2)(c)(ii) and/or other implementation actions to achieve compliance with Specific Provision 7.b.(3)(a) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 7.b.(2)(c)(ii) or other implementation actions to achieve compliance with Specific Provision 7.b.(3)(a),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 7.b.(2)(c)(ii) or other implementation actions, AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 7.d to demonstrate compliance with Specific Provision 7.b.(3)(a).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim sediment TMDL compliance requirements for Los Penasquitos Lagoon consist of the following:

(1) Interim Compliance Dates and WQBELs

The Responsible Copermittees must comply with the interim WQBELs, expressed as wet season loads, by December 31 of the interim compliance year set forth in Table 7.2.

Table 7.2
*Interim Water Quality Based Effluent Limitations Expressed as Wet Season Loads in MS4 Discharges**

Interim Compliance Date	Interim Effluent Limitations (tons/wet season)
December 31, 2019	6,691
December 31, 2023	5,663
December 31, 2027	4,636
December 31, 2029	3,608

* Interim effluent limitations are to be achieved by the following Responsible Parties: County of San Diego, City of San Diego, City of Del Mar, City of Poway, Phase II MS4 permittees, Caltrans, general construction storm water NPDES permittees, and general industrial storm water NPDES permittees.

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) The final receiving water limitation under Specific Provision 7.b.(2)(a) is met; OR

(c) There are no exceedances of the Copermittee's portion of interim effluent limitations under Table 7.2 at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the Copermittee's portion of the interim TMDL compliance requirements described in Attachment A of Resolution No. R9-2010-0033 will be achieved by the interim compliance date.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) Watershed Monitoring

The Responsible Copermittees must conduct suspended sediment, bed load, and flow monitoring to calculate total sediment loading to the Los Peñasquitos Lagoon for each wet season (October 1 thru April 30) as set forth below:

(a) The Responsible Copermittees must monitor enough storm events throughout the season to quantify sediment loading over each wet season, and

(b) The Responsible Copermittees must monitor at least 3 stations to quantify cumulative sediment loading into Los Peñasquitos Lagoon. Stations must be located within the Los Peñasquitos, Carroll Canyon, and Carmel Creek tributaries prior to discharging into Los Peñasquitos Lagoon.

(2) Lagoon Monitoring

The Responsible Copermittees must monitor Los Peñasquitos Lagoon each Fall for changes in the extent of the vegetation types as set forth below:

(a) The Responsible Copermittees must acquire aerial photos of Los Peñasquitos Lagoon and digitize them at an approximate scale of 1:2,500,

(b) The Responsible Copermittees must appropriately interpret the vegetation and classify the various types as saltmarsh, non-tidal saltmarsh, freshwater marsh, non-tidal saltmarsh –*Lolium perrene* infested, southern willow scrub/mulefat scrub, herbaceous wetland, or upland land cover.

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the monitoring data collected under Specific Provision 7.d(1) and 7.d(2) to assess whether the interim and final WQBELs have been achieved.

(b) For assessing and determining compliance with the final receiving water limitations under Specific Provision 7.b.(2)(a), the Responsible Copermittees must use the data acquired under Specific Provision 7.d.(2) to estimate the acreage of tidal and non-tidal saltmarsh actually restored.

(c) For assessing and determining compliance with the final effluent limitations under Specific Provision 7.b.(2)(b), the Responsible Copermittees must use the data acquired under Specific Provision 7.d.(1) to estimate sediment loading into Los Peñasquitos Lagoon. Sediment loading must be evaluated using a 3-year, weighted rolling average. The first reported average shall be calculated using data collected in the year, 2015-2016, 2016-2017, and 2017-2018 wet seasons.

(d) The monitoring and assessment results must be submitted as part of the Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

ATTACHMENT F

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

FACT SHEET / TECHNICAL REPORT

FOR

ORDER NO. R9-2013-0001
AS AMENDED BY ORDER NOS. R9-2015-0001 AND R9-2015-0100
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

May 8, 2013
Amended February 11, 2015
and November 18, 2015

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I. FACT SHEET FORMAT

This Fact Sheet briefly sets forth the principal facts and the significant factual, legal, methodological, and policy questions that the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) considered in preparing Order No. R9-2013-0001 (Order), as amended by Order Nos. R9-2015-0001 and R9-2015-0100. In accordance with the Code of Federal Regulations (CFR) Title 40 Parts 124.8 and 124.56 (40 CFR 124.8 and 40 CFR 124.56), this Fact Sheet includes, but is not limited to, the following information:

1. Contact information
2. Public process and notification procedures
3. Background of municipal storm water permits
4. Regional MS4 Permit approach
5. Economic considerations
6. Applicable statutes, regulations, plans and policies
7. Discussion of the provisions in the Order

Tentative Order No. R9-2013-0001 was distributed for public review on October 31, 2012. The San Diego Water Board accepted written comments on Tentative Order No. R9-2013-0001 until January 11, 2013. A public hearing was subsequently held on April 10 and 11, 2013, that was continued to May 8, 2013 to receive oral comments from interested persons. The San Diego Water Board adopted Order No. R9-2013-0001 on May 8, 2013.

Tentative Order No. R9-2015-0001, an Order amending Order No. R9-2013-0001, was distributed for public review on September 19, 2014. The San Diego Water Board accepted written comments on Tentative Order No. R9-2015-0001 until November 19, 2014. A public hearing was held on February 11, 2015, to receive oral comments from Copermittees and interested persons. The San Diego Water Board adopted Order No. R9-2015-0001 amending Order No. R9-2013-0001 on February 11, 2015. Order No. R9-2015-0001 amended the findings and provisions of Order No. R9-2013-0001 to:

a. Enroll the County of Orange, the Orange County Flood Control District and the south Orange County Cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano as Copermittees responsible for compliance with the terms and conditions of Order No. R9-2013-0001, as amended by Order No. R9-2015-0001;

b. Designate the San Diego Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the Cities of Laguna Woods and Laguna Hills and agree to the designation of the Santa Ana Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the City of Lake Forest, subject to the

terms of the February 10, 2015 agreement between San Diego Water Board and the Santa Ana Water Board described in Finding 29 of this Order, upon the later effective date of Order No. R9-2015-0001 or Order No. R8-2015-0001 (superseding Order No. R8-2009-0030);

c. Establish interim exceptions to land development requirements for those priority development projects that discharge to engineered channels and large river reaches as described in Provision E.3.c.(2)(e) of this Order;

d. Incorporate the amended requirements of the State Water Resources Control Board's (State Water Board) General Exception to require that pollutant reductions be achieved within 6 years for storm water and nonpoint source discharges to ASBS within the Region;

e. Incorporate applicable requirements of the Los Peñasquitos Lagoon Sediment TMDL; and

f. Require the Orange County Copermittees to implement the "*Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County*," dated October 2014, made effective in the Monitoring and Reporting Program/Order issued pursuant to California Water Code section 13383 in the December 5, 2014 San Diego Water Board Letter Directive and subject to future revisions by the Executive Officer after appropriate public input.

Tentative Order No. R9-2015-0100, an Order amending Order No. R9-2013-0001 as amended by Order No. R9-2015-0001, was distributed for public review on July 31, 2015. The San Diego Water Board accepted written comments on Tentative Order No. R9-2015-0100 until September 14, 2015. A public hearing was held on November 18, 2015, to receive oral comments from Copermittees and interested persons. The San Diego Water Board adopted Order No. R9-2015-0100 amending Order No. R9-2013-0001 as amended by Order No. R9-2015-0001, on November 18, 2015. Order No. R9-2015-0100 amended the findings and provisions of Order No. R9-2013-0001 as amended by Order No. R9-2015-0001 to:

a. Enroll the County of Riverside, the Cities of Murrieta, Temecula, and Wildomar, and the Riverside County Flood Control and Water Conservation District as Copermittees responsible for compliance with the terms and conditions of Order No. R9-2013-0001, as amended by Order Nos. R9-2015-0001 and R9-2015-0100;

b. Continue designation of the San Diego Water Board to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Murrieta and Wildomar, including areas within the Santa Ana Region; and, agree to continue designation of the Santa Ana Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the City of Menifee, including areas within

the San Diego Region, subject to the terms of the October 26, 2015 agreement between San Diego Water Board and the Santa Ana Water Board described in Finding 29 of this Order;

d. Incorporate Provision B.3.c, which provides an option that allows a Copermittee to utilize the watershed-based Water Quality Improvement Plan to be deemed in compliance with the prohibitions and limitations of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b;

e. Incorporate minor revisions to Provisions E.2.a.(1) and E.2.a.(2) to include San Diego Water Board Order No. R9-2015-0013 and State Water Board Order 2014-0194-DWQ into the requirements for addressing non-storm water discharges to a Copermittee's MS4;

e. Incorporate minor revisions to Provision E.3.b.(1) to correct inconsistencies in the definition of a Priority Development Project as compared to the definitions in Order No. R9-2009-0002 (Fourth Term Orange County MS4 Permit) and Order No. R9-2010-0016 (Fourth Term Riverside County MS4 Permit), and requirements for incorporating the corrected definitions into the BMP Design Manual;

f. Incorporate revisions to Provision E.3.e.(1)(a) to provide additional clarity on when the structural BMP performance requirements of Provision E.3.c are applicable to Priority Development Projects;

e. Incorporate minor revisions to the Revised TMDLs for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region and the TMDLs for Sediment in Los Peñasquitos Lagoon in Attachment E to the Order to make the requirements consistent with the Basin Plan amendments adopted by the San Diego Water Board; and

f. Remove provisions related to allowing the Riverside County Copermittees to apply for early coverage under the Regional MS4 Permit.

The San Diego Water Board files applicable to the issuance of Order No. R9-2013-0001 and amendments thereto are incorporated into the administrative record in support of the findings and requirements of the Order.

II. CONTACT INFORMATION

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The Order and other related documents can be downloaded from the San Diego Water Board website at

http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

The documents referenced in this Fact Sheet and in Order No. R9-2013-0001 and amendments thereto are available for public review at the San Diego Water Board office, located at the address listed above. Public records are available for inspection during regular business hours, from 8:00 am to 5:00 pm Monday through Friday. To schedule an appointment to inspect public records, contact the San Diego Water Board Records Management Officer at 619-516-1990.

COPERMITTEES

Orange County Copermittees

- County of Orange
  - City of Aliso Viejo
  - City of Dana Point
  - City of Laguna Beach
  - City of Laguna Hills
  - City of Laguna Niguel
  - City of Laguna Woods
  - City of Lake Forest *
  - City of Mission Viejo
  - City of Ranch Santa Margarita
  - City of San Clemente
  - City of San Juan Capistrano
  - Orange County Flood Control District

* While not listed in the above table, the City of Lake Forest remains a Copermittee under this Order until the later effective date of this Order or Santa Ana Water Board Tentative Order No. R8-2015-0001. Thereafter, the City of Lake Forest will no longer be considered a Copermittee under this Order because its Phase I MS4 discharges will be regulated by the Santa Ana Water Board pursuant to Water Code section 13328 designation. The requirements of this Order that apply to the City of Lake Forest for the duration of this Order, consistent with the Water Code section 13228 agreement dated February 10, 2015, are described in Finding 29 and Footnote 2 to Table B-1.

Riverside County Copermittees

- County of Riverside
  - City of Menifee**
  - City of Murrieta
  - City of Temecula
  - City of Wildomar
  - Riverside County Flood Control and Water Conservation District

** The City of Menifee is not regulated as a Copermittee under this Order because its Phase I MS4 discharges are regulated by Santa Ana Water Board Order No. R8-2010-0033 as it may be amended or issued pursuant to Water Code section 13228 designation. The requirements of this Order that apply to the City of Menifee for the duration of this Order, consistent with the Water Code section 13228 written agreement dated October 26, 2015, are described in Finding 29 and Footnote 3 to Table B-1.

San Diego County Copermittees

- County of San Diego
  - City of Carlsbad
  - City of Chula Vista
  - City of Coronado
  - City of Del Mar
  - City of El Cajon
  - City of Encinitas
  - City of Escondido
  - City of Imperial Beach
  - City of La Mesa
  - City of Lemon Grove
  - City of National City
  - City of Oceanside
  - City of Poway
  - City of San Diego
  - City of San Marcos
  - City of Santee
  - City of Solana Beach
  - City of Vista
  - San Diego County Regional Airport Authority
  - San Diego Unified Port District

III. PUBLIC PROCESS AND NOTIFICATION PROCEDURES

The San Diego Water Board followed the schedule listed below for the preparation of Order No. R9-2013-0001 and amendments thereto:

San Diego County Copermittee Permit Reissuance Process

1. On February 8, 2011, the San Diego Water Board met with the San Diego County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No. R9-2007-0001.

2. Between February and May 2011, the San Diego Water Board met with select San Diego County, Orange County, and Riverside County Copermittees, as well as representatives of the environmental community to discuss concepts and receive recommendations for elements to be incorporated in a Regional Municipal Separate Storm Sewer System Permit (Regional MS4 Permit).

3. On June 27, 2011 the San Diego Water Board received the Report of Waste Discharge from the San Diego County Copermittees for the renewal of their NPDES permit, Order No. R9-2007-0001.

4. On April 9, 2012, the San Diego Water Board released an administrative draft of Tentative Order No. R9-2013-0001 for preliminary informal comments and feedback.

5. On April 25, 2012, the San Diego Water Board held an informal public workshop to present the administrative draft of Tentative Order No. R9-2013-0001 and receive verbal comments.

6. Between June and August 2012, the San Diego Water Board held four (4) focused meetings with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community, and USEPA) to discuss and receive preliminary comments and feedback about specific elements in the administrative draft of Tentative Order No. R9-2013-0001.

7. On September 5, 2012, the San Diego Water Board held an informal public workshop to present the modifications that were expected to be incorporated into the Tentative Order based on the preliminary comments and feedback received during the focused meetings held between June and August 2012.

8. Informal written comments on the administrative draft of Tentative Order No. R9-2013-0001 were accepted until September 14, 2012.

9. On October 12, 2012, the San Diego Water Board released a revised administrative draft of Tentative Order No. R9-2013-0001.

10. On October 24, 2012, the San Diego Water Board held a focused meeting with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community, and USEPA) to discuss modifications incorporated into the administrative draft of Tentative Order No. R9-2013-0001.

11. On October 31, 2012, the San Diego Water Board released Tentative Order No. R9-2013-0001 for formal public review and comment.

12. On November 13, 2012 and December 12, 2012, the San Diego Water Board held a formal public Board workshop to present the public draft of Tentative Order No. R9-2013-0001 and receive verbal comments.

13. Formal written comments on the public draft of Tentative Order No. R9-2013-0001 were accepted until January 11, 2013.

14. A public hearing of Tentative Order No. R9-2013-0001 was conducted on April 10 and 11, 2013, that was continued to May 8, 2013.

Orange County Copermittee Permit Reissuance Process

15. On May 20, 2014 the San Diego Water Board received the Report of Waste Discharge from the Orange County Copermittees for the renewal of their MS4 NPDES permit, Order No. R9-2009-0002.

16. On June 24, 2014, the San Diego Water Board met with the Orange County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No.R9-2009-0002 and the process for enrollment as Copermittees under Regional MS4 Permit Order No. R9-2013-0001.

17. On July 1, 2014, the San Diego Water Board held a public meeting to discuss the Orange County Report of Waste Discharge and receive comments on potential modifications to Order No. R9-2013-0001. Based on comments received from the Orange County Copermittees and other interested persons at this meeting, the San Diego Water Board determined that additional public meetings were not needed prior to release of Tentative Order No. R9-2015-0001, amending Order No. R9-2013-0001 in redlined – strikeout format for public review and comment.

18. On September 19, 2014, the San Diego Water Board released Tentative Order No. R9-2015-0001 for a 60 day public review and comment period.

19. On October 8, 2014, the San Diego Water Board held a formal public workshop at a regular board meeting to receive information and discuss the proposed amendments to Order No. R9-2013-0001 described in Tentative Order No. R9-2015-0001.

20. In accordance with State and federal laws and regulations, the San Diego Water Board notified San Diego County, Orange County and Riverside County Copermittees, and all known interested agencies and persons of its intent to adopt Tentative Order No. R9-2015-0001 and provided them with an opportunity to submit their written comments and recommendations. Written comments and recommendations on Tentative Order No. R9-2015-0001 were accepted until November 19, 2014.

21. The San Diego Water Board held a public workshop on October 8, 2014, and a public hearing on February 11, 2015, and heard and considered all comments pertaining to the adoption of Tentative Order No. R9-2015-0001 on February 11, 2015.

Riverside County Copermittee Permit Reissuance Process

22. Between April and June 2015, the San Diego Water Board held three (3) public workshops with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community) to discuss and receive comments and feedback about amending Order No. R9-2013-0001 to incorporate a definition of prior lawful approval for Priority Development Projects, and an alternative compliance pathway for prohibitions and limitations in Provision A of the Order. A San Diego Water Board member attended the April and May 2015 public workshops, but no actions or voting took place.

23. On April 15, 2015, the San Diego Water Board met with the Riverside County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No.R9-2010-0016 and the process for enrollment as Copermittees under Order No. R9-2013-0001 (Regional MS4 Permit).

24. On May 8, 2015 the San Diego Water Board received a Report of Waste Discharge from the Riverside County Copermittees for the renewal of their MS4 NPDES permit, Order No. R9-2010-0016.

25. On July 31, 2015, the San Diego Water Board released Tentative Order No. R9-2015-0100 for a formal public review and comment period.

26. Formal written comments on the public draft of Tentative Order No. R9-2015-0100 were accepted until September 14, 2015, a formal public written comment period of 46 days.

27. A public hearing to receive oral comments on Tentative Order No. R9-2015-0100 was conducted on November 18, 2015.

IV. BACKGROUND OF THE SAN DIEGO REGION MUNICIPAL STORM WATER PERMITS

In developed and developing areas, storm water runoff is commonly transported through municipal separate storm sewer systems (MS4s) and discharged into local receiving water bodies. As the storm water runs off and flows over the land or impervious surfaces (e.g., paved streets, parking lots, and building rooftops), it accumulates debris, chemicals, sediment, and other pollutants that can adversely affect receiving water quality if discharged untreated. The United States Environmental Protection Agency (USEPA) recognizes wet weather flows from urban areas as the number one source of estuarine pollution in coastal communities,[1] such as those within the San Diego Region.

The federal Clean Water Act (CWA) was amended in 1987 to address and regulate discharges of storm water associated with industrial activities and from municipal storm sewers. With the amendments, many municipalities throughout the United States were obligated for the first time to obtain National Pollutant Discharge Elimination System (NPDES) permits for discharges of storm water from their MS4s.

In response to the CWA 1987 amendment, as well as the pending federal NPDES regulations which would implement the amendment, the San Diego Water Board issued "early" MS4 permits. The San Diego Water Board adopted and issued Order Nos. 90-38, 90-42, and 90-46 to regulate storm water discharges from the MS4s in Orange County, San Diego County, and Riverside County, respectively, within the San Diego Region on July 16, 1990.

The "early" MS4 permits, or First Term Permits, were issued prior to the November 1990 promulgation of the final federal NPDES storm water regulations. By issuing these First Term Permits before the federal regulations took effect, the San Diego Water Board was able to provide the Copermittees additional flexibility in addressing and managing storm water discharges. The First Term Permits contained the essentials of the 1990 regulations, and required the Copermittees to develop and implement runoff management programs, but provided little specificity about what was required to be included in or actually achieved by those programs.

The flexibility provided in the First Term Permits was generally continued through the Second Term Permits. The combination of the lack of specificity in the First and Second Term Permits, a general lack of meaningful action by the Copermittees and a general lack of corresponding reaction (i.e. enforcement) by the San Diego Water Board during the first ten years of the storm water program, resulted in few substantive steps towards achieving improvements in the quality of receiving waters or storm water discharges from the MS4s.

[1] US EPA. 1999. 40 CFR Parts 9, 122, 123, and 124. National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. 64 FR 68727.

From 2001, the regulatory approach incorporated into Third Term Permits was a significant departure from the regulatory approach of the First and Second Term Permits. The Third Term Permits issued by the San Diego Water Board included more detailed requirements that outlined the minimum level of implementation required for the Copermittees' programs to meet the maximum extent practicable (MEP) standard for storm water. The Third Term Permits included more detail to emphasize and enhance the jurisdictional runoff management programs developed by the Copermittees and introduced requirements for developing and implementing watershed-based programs.

The Third Term Permits also incorporated two precedent setting decisions by the State Water Board. In Order WQ 99-05, the State Water Board established receiving water limitation language to be included in all MS4 permits. The State Water Board's precedential language clarified that municipal storm water permits must include provisions requiring discharges to be controlled to attain water quality standards in receiving waters. Unlike previously adopted versions of the receiving water limitation language in the First and Second Term Permits, the language no longer stated that "*violations of water quality standards are not violations of the municipal storm water permit under certain conditions*." In addition, the receiving water limitation language no longer indicated that the "*implementation of best management practices is the 'functional equivalent' of meeting water quality standards*." State Water Board Order WQ 99-05 specifically requires language in MS4 permits for the Copermittees to comply with water quality standards based discharge prohibitions and receiving water limitations through timely implementation of control measures and other actions to reduce pollutants in discharges. (See State Water Board Order WQ 99-05 (*Environmental Health Coalition*)).

In Order WQ 2000-11, also a precedential decision, the State Water Board addressed design standards for structural post-construction best management practices (BMPs) for new development and significant redevelopment. The State Water Board found that the design standards, which require that runoff generated by 85 percent of storm events from specific development categories be infiltrated or treated, reflect the MEP standard. State Water Board Order WQ 2000-11 also found that the post-construction BMP provisions, or Standard Storm Water Mitigation Plan (SSMP) provisions, constitute MEP for addressing storm water pollutant discharges resulting from specific development categories.

The Third Term San Diego County and Orange County Permits (Order Nos. 2001-01 and R9-2002-0001, respectively) were appealed to the State Water Board. Minor modifications were made by the State Water Board, but the requirements were largely upheld. In State Water Board Order WQ 2001-15, the State Water Board upheld the Third Term San Diego County Permit requirements with certain modifications. The State Water Board removed the prohibition of storm water discharges *into* the MS4 that cause or contribute to exceedances of water quality objectives. The revision allows for treatment of pollutants in storm water runoff after the pollutants have entered the MS4.

State Water Board Order WQ 2001-15 otherwise upheld all the other requirements of the permit.

In addition to the modification to the discharge prohibition in Order WQ 2001-15, the State Water Board refined Order WQ 99-05 by making clear that the Copermittees may use an iterative approach to achieving compliance with water quality standards that involves ongoing assessments and revisions. Thus, the language for the discharge prohibitions and receiving water limitations was revised to explicitly require the Copermittees to implement an iterative process of assessments and revisions to comply with the discharge prohibitions and receiving water limitations. The San Diego Water Board retained the authority to enforce receiving water limitations and discharge prohibitions even if the Copermittee is engaged in the iterative process.

The Third Term San Diego County Permit was subsequently challenged in the Superior Court of the State of California and the Court of Appeal, Fourth Appellate District. The Court of Appeal, Fourth Appellate District, found that the approach of the Third Term San Diego County Permit to regulating discharges into the MS4 was appropriate (*Building Industry Ass'n. v. State Water Resources Control Bd., et al.,* 124 Cal.App.4th 866 (2004)). The State of California Supreme Court denied review sought by the Building Industry Association in March 2005.

The Fourth Term Permits began with the adoption of Order No. R9-2007-0001 issued to the Copermittees of San Diego County in January 2007. Order Nos. R9-2009-0002 and R9-2010-0016 were subsequently issued to the Copermittees of Orange County and Riverside County. The Fourth Term Permits continued to include more detailed requirements to be implemented by each Copermittee's jurisdictional runoff management program. The Fourth Term Permits also included requirements to further emphasize a watershed management approach and for more coordination among jurisdictional runoff management programs. In addition, the Fourth Term Permits included more requirements for assessing the effectiveness of the runoff management programs being implemented by the Copermittees. The intent of the inclusion of additional requirements was to enhance and better define elements of the permit that were expected to be incorporated into the iterative process for managing runoff from each Copermittee's jurisdiction and within the watersheds of the San Diego Region.

The Fourth Term Permits included several new and emerging approaches for managing storm water runoff and discharges. Low impact development (LID) requirements are included for development and significant redevelopment to reduce pollutants in storm water runoff from sites through more natural processes such as infiltration and biofiltration closer to the source, rather than utilizing conventional mechanical end-of-pipe treatment systems. Hydrograph modification (hydromodification) management requirements also are included to mitigate the potential for increased erosion in receiving waters due to increased runoff rates and durations often caused by development and increased impervious surfaces. The Fourth Term Orange County and Riverside County Permits introduced requirements to identify areas of existing

development where retrofitting with LID projects would be feasible and could be implemented to reduce storm water runoff and pollutants in storm water discharges.

The Fourth Term Orange County and Riverside County Permits included a clearer distinction between storm water and non-storm water discharges. The term “urban runoff” was completely removed, and a distinction between storm water (wet weather) runoff and non-storm water (dry weather) runoff was emphasized. This clarification was made to prevent any potential misunderstanding that regulation under the MS4 permits is limited only to urbanized areas, and to prevent non-storm water runoff from being managed in the same manner as storm water runoff. The term “urban runoff” is not defined in the Code of Federal Regulations (CFR) or Federal Register (FR) in the regulation of MS4 discharges. According to the CWA 402(p)(3)(B)(ii), MS4 permits must include a requirement to effectively prohibit non-storm water discharges into the MS4s.

Finally, for the Fourth Term Orange County and Riverside County Permits the San Diego Water Board found that non-storm water discharges to the MS4 from over application of irrigation water are sources of pollutants. The San Diego Water Board found that non-storm water discharges resulting from over-irrigation must be prohibited from entering the MS4 in accordance with the requirements of the CWA and pursuant to 40 CFR 122.26(d)(2)(iv)(B)(1).

The requirements of the Fourth Term Permits issued to the Copermittees in each county within the San Diego Region now have substantively the same core requirements such as discharge prohibitions, receiving water limitations, jurisdictional runoff management program components, and monitoring program requirements. There are, however, several inconsistencies that exist among the three Fourth Term Permits which complicate oversight and implementation of the permits by the San Diego Water Board.

The Fourth Term San Diego County Permit expired in January 2012. The Fourth Term Orange County permit expired in December 2014 and the Fourth Term Riverside County Permit expired in November 2015. Issuing the Fifth Term Permits within five years for three counties under three different permits would have required the San Diego Water Board to expend significant time and resources for the issuance of the permits through three separate public proceedings, thereby greatly reducing the time and resources available to oversee implementation and compliance. Multiple permits also create confusion for determining compliance among regulated entities, especially for the land development community.

The San Diego Water Board acknowledged that issuing a single MS4 permit for all the Copermittees in the San Diego Region can and is expected to result in more consistent implementation, improve communication among agencies within watersheds crossing multiple jurisdictions, and minimize resources spent with each permit renewal process. Within the findings of the Fourth Term Riverside County Permit issued in November 2010, the San Diego Water Board notified the public of its intent to develop and issue a single Regional MS4 Permit.

V. REGIONAL MS4 PERMIT APPROACH

The Fifth Term Permit, or Regional MS4 Permit, shifts the focus of the permit requirements from a minimum level of actions to be implemented by the Copermittees to identifying outcomes to be achieved by those actions. Order No. R9-2013-0001 represents an important paradigm shift in the approach for MS4 permits within the San Diego Region.

Historical Permitting Approach

The First and Second Term Permits were very broad and provided little specificity about what was required to be developed and implemented by the Copermittees. The Third Term Permits began to become more specific about the minimum level of implementation required by the Copermittees. The Fourth Term Permits subsequently increased in specificity. The MS4 permits have progressively become more detailed and focused on specifying the minimum level of actions expected to be implemented by the Copermittees. As detailed and specific as the MS4 permits have become, however, they include very little detail about what the desired outcomes of the required actions are expected to achieve. Compliance with the permit requirements has essentially been tracking numbers of actions and reporting, not tracking progress or actual improvements in the quality of receiving waters or discharges from the MS4s. The result has been an increase in actions being implemented by the Copermittees with little or no ability or expectations to determine whether or not improvements in water quality are being achieved.

The Fourth Term Permits result in significant resource expenditure by the Copermittees to report permit compliance information to the San Diego Water Board in the form of annual jurisdictional runoff management program, watershed program, and monitoring program reports. The San Diego Water Board was required to expend much of its limited resources on reviewing more than 50 voluminous reports submitted annually by the Copermittees. The information reported by the Copermittees was of limited value when trying to measure progress toward achieving improvements in the quality of receiving waters or discharges from the MS4s. Oversight of the MS4 permits was further complicated by the inconsistencies among the requirements issued to the Orange County, San Diego County, and Riverside County Copermittees under three separate MS4 permits.

Under the Fourth Term Permits, the Copermittees were required to expend a significant portion of their limited resources collecting data of limited value, and putting together reports to submit that information to the San Diego Water Board. Likewise, the San Diego Water Board was required to expend most of its limited resources reviewing reports, and developing permits instead of working directly with the Copermittees to identify solutions to problems causing impacts to water quality. This was an unsustainable course that would have continued to demand more resources

from the Copermittees and the San Diego Water Board, and would have continued to result in unknown water quality benefits.

New Permitting Approach

The goal of the Regional MS4 Permit is twofold: 1) bring a consistent set of MS4 permit requirements to all of the Copermittees within the San Diego Region; and, 2) provide an MS4 permit with requirements that will allow the Copermittees to focus their efforts and resources on achieving goals and desired outcomes toward the improvement of water quality rather than completing specific actions.

The overall approach included in the Regional MS4 Permit with respect to the jurisdictional runoff management programs will not differ significantly from the current permits. The general requirements for the jurisdictional runoff management program components and compliance with those requirements will remain and be applied consistently throughout the San Diego Region under the Regional MS4 Permit.

The most significant difference in the new permitting approach is the specific manner of implementation for those jurisdictional runoff management programs. Implementation will be based on decisions made by the Copermittees in accordance with what they have identified as their highest priority water quality conditions. In other words, the Copermittees will have significant control in how to implement the jurisdictional runoff management programs to best utilize their available resources in addressing a specific set of priorities effectively, instead of trying to address all the water quality priorities ineffectively.

The Copermittees are given the responsibility of identifying their highest priority water quality conditions that they intend to address. The Copermittees will develop goals that can be used to measure and demonstrate progress or improvements toward addressing those priorities. In addition to the goals, the Copermittees will provide a schedule for achieving the goals for those highest priorities. The measurement of progress toward achieving the goals for those highest priorities requires a better defined and more focused program of monitoring and assessment than under the Fourth Term Permits.

The monitoring and assessment program must be designed to inform the Copermittees of their progress, and the need for modifications in their jurisdictional runoff management programs and schedules to achieve their goals to improve water quality. The monitoring and assessment program requirements will have a more central role in the Regional MS4 Permit than in earlier permits. The monitoring and assessment requirements must also be designed to enable the Copermittees to focus and direct their efforts in implementing their jurisdictional runoff management programs toward their stated desired outcomes to improve the quality of receiving waters and/or discharges from the MS4s.

By providing an MS4 permit that allows the Copermittees to make more decisions about how to utilize and focus their resources, along with a better defined monitoring and assessment program to inform their water quality management decisions, the Copermittees have the opportunity to:

1) *Plan strategically*. The Copermittees must have the ability to identify their available resources and develop and implement long term plans that can organize, collect, and use those resources in the most strategically advantageous and efficient manner possible. This ability to develop long term plans will allow the Copermittees to focus and utilize their resources in a more concerted way over the short term and long term to address specific water quality priorities through stated desired outcomes.

2) *Manage adaptively*. The Copermittees must be given the ability to modify their plans as additional information and data are collected from the monitoring and assessment programs. The Copermittees' plans may require modifications to the programs, priorities, goals, strategies, and/or schedules in order for the Copermittees to achieve a stated desired outcome.

3) *Identify synergies*. The Copermittees must be given more flexibility to identify efficiencies within and among their jurisdictional runoff management programs as the strategies are developed and implemented to increase the Copermittees' collective effectiveness. The Copermittees must also be able to identify and utilize resources available from other agencies and entities to further augment and enhance their jurisdictional runoff management programs and/or to collectively work with those other agencies and entities toward achieving a stated desired outcome.

The Regional MS4 Permit requirements provide the Copermittees the flexibility and responsibility to decide what actions will be necessary to achieve an outcome that is tailored and designed by the Copermittees to improve specific prioritized water quality conditions. The San Diego Water Board expects the approach of the Regional MS4 Permit to give the Copermittees a greater sense of ownership for restoring the quality of receiving waters in the San Diego Region by becoming an integral part of the decision making process in identifying water quality conditions to be addressed, as well as determining the best use of their resources.

VI. ECONOMIC CONSIDERATIONS

Statutory Considerations

California Water Code (CWC) section 13241 requires the San Diego Water Board to consider certain factors, including economic considerations, in the adoption of water quality objectives. CWC section 13263 requires the San Diego Water Board to take into consideration the provisions of CWC section 13241 in adopting waste discharge requirements.

In *City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, the California Supreme Court considered whether Regional Water Boards must comply with CWC section 13241 when issuing waste discharge requirements under CWC section 13263(a) by taking into account the costs a permittee will incur in complying with the permit requirements. The Court concluded that whether it is necessary to consider such cost information "*depends on whether those restrictions meet or exceed the requirements of the federal Clean Water Act.*" (*Id.* at p. 627.) The Court ruled that Regional Water Boards may not consider the factors in CWC section 13241, including economics, to justify imposing pollutant restrictions that are less stringent than applicable federal law requires. (*Id.* At pp. 618, 626-627 ["*[Water Code section 13377 specifies that [ ] discharge permits issued by California's regional boards must meet the federal standards set by federal law. In effect, section 13377 forbids a regional board's consideration of any economic hardship on the part of the permit holder if doing so would result in the dilution of the requirements set by Congress in the Clean Water Act...Because CWC section 13263 cannot authorize what federal law forbids, it cannot authorize a regional board, when issuing a [ ] discharge permit, to use compliance costs to justify pollutant restrictions that do not comply with federal clean water standards*."]). However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Regional Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

As discussed in Section VII.F, Unfunded State Mandates, the San Diego Water Board finds that the requirements in this Order are not more stringent than the minimum federal requirements. Among other requirements, federal law requires MS4 permits to include requirements to effectively prohibit non-storm water discharges into the MS4s, in addition to requiring controls to reduce the discharge of pollutants in storm water to the MEP, and other provisions as USEPA or the State determines are appropriate for the control of pollutants in MS4 discharges.

The requirements in this Order may be more specific or detailed than those enumerated in federal regulations under 40 CFR 122.26 or in the USEPA guidance. However, the requirements have been designed to be consistent with and within the federal statutory mandates described in CWA section 402(p)(3)(B)(ii) and (iii) and the related federal regulations and guidance. Consistent with federal law, all of the

conditions in this Order could have been included in a permit adopted by USEPA in the absence of the in lieu authority of California to issue NPDES permits.

Moreover, the inclusion of numeric WQBELs in this Order does not cause this Order to be more stringent than federal law. Federal law authorizes both narrative and numeric effluent limitations to meet state water quality standards. The inclusion of WQBELs as discharge specifications in an NPDES permit in order to achieve compliance with water quality standards is not a more stringent requirement than the inclusion of BMP based permit limitations to achieve water quality standards (State Water Board Order No. WQ 2006-0012 (*Boeing*)). Therefore, consideration of the factors set forth in CWC section 13241 is not required for permit requirements to implement the effective prohibition on the discharge of non-storm water discharges into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determine appropriate to control such pollutants, as those requirements are mandated by federal law.

Included in the provisions of the Order are monitoring and reporting requirements that are designed to demonstrate that the Copermittees are implementing programs to comply with the CWA municipal storm water requirements. CWA section 308(a) and 40 CFR 122.41(h), (j)-(l), 122.44(i) and 122.48 require that all NPDES permits specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s (40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c)) also specify additional monitoring and reporting requirements. In addition to the federal requirements of the CWA, the San Diego Water Board also has the authority in CWC 13383 to establish monitoring, reporting, and recordkeeping requirements that implement federal and state laws and regulations through NPDES permits.

The monitoring and assessment information that will be reported to the San Diego Water Board is necessary to determine if the Copermittees are making progress toward achieving compliance with the discharge prohibitions, receiving water limitations, and effluent limitations under Provision A of the Order. The monitoring and assessment information that will be reported is also expected to be key to the iterative approach and adaptive management process that is required to be implemented by the Copermittees if they cannot meet the discharge prohibitions and receiving water limitations under the present conditions, which is also part of the requirements under Provision A of the Order.

Notwithstanding the above, the San Diego Water Board has considered cost information in issuing this Order, as discussed below. The San Diego Water Board has also considered all of the evidence that has been presented to the San Diego Water Board regarding the CWC section 13241 factors in adopting this Order. The San Diego Water Board finds that the requirements in this Order are reasonably necessary to protect beneficial uses identified in the Basin Plan and the economic information related to costs of compliance and other CWC section 13241 factors are not sufficient to justify failing to protect those beneficial uses. Where appropriate, the

San Diego Water Board has provided or will consider providing the Copermittees with additional time to implement control measures to achieve final WQBELs and/or water quality standards.

Cost Information

Discussions of the financial and economic ramifications of municipal storm water management programs tend to focus on the significant costs incurred by municipalities in developing and implementing the programs. When considering the cost of implementing the programs, however, it is also important to consider the alternative costs that are incurred when programs are not fully implemented, as well as the economic benefits which result from effective program implementation.

The recent financial and economic conditions have amplified the concerns about the costs incurred by the municipalities in developing and implementing their programs. The reduction in resources resulting from the recent financial and economic conditions has been cited by many of the Copermittees as a justification for reducing the requirements that must be met by their programs. While the recent conditions are a cause for concern in the short term, these programs also have an opportunity to identify and implement improvements and efficiencies before the next period of growth and development, resulting in more effective and sustainable programs over the long term.

In addition, it is very difficult to ascertain the true cost of implementation of the Copermittees' management programs because of inconsistencies in reporting by the Copermittees. Reported costs of compliance for the same program element can vary widely from city to city, often by a very wide margin that is not easily explained.[2] Despite these problems, efforts have been made to identify management program costs, which can be helpful in understanding the costs of program implementation.

The San Diego Water Board recognizes that the Copermittees will incur costs in implementing this Order, potentially above and beyond the costs from the Copermittees' prior permits. The San Diego Water Board also recognizes that, due to California's current economic condition, many Copermittees currently have limited staff and resources to implement actions to address its MS4 discharges. Based on the economic considerations below, the San Diego Water Board has provided the Copermittees a significant amount of flexibility to choose how to implement the requirements of the Order.

The Order also allows the Copermittees to customize their plans, programs, and monitoring requirements. In the end, it is up to the Copermittees to determine the effective BMPs and measures necessary to comply with this Order. The Copermittees can choose to implement the least expensive measures that are effective in meeting

[2] Los Angeles Water Board, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.

the requirements of this Order. This Order also does not require the Copermittees to fully implement all requirements within a single permit term. Where appropriate, the Board has provided the Copermittees with additional time outside of the permit term to implement control measures to achieve final WQBELs and/or water quality standards.

The San Diego Water Board has considered available cost information associated with compliance with this Order. It is not possible to predict accurately the cost impact of the requirements that involve an unknown level of implementation or that depend on environmental variables that are as yet undefined. Only general conclusions can be drawn from this information.

Estimated Municipal Storm Water Program Implementation Costs

The USEPA, the State Water Board, and the California Regional Water Quality Control Boards (Regional Water Boards) have attempted to evaluate the costs of implementing municipal storm water programs. The assessments have demonstrated that the true costs are difficult to ascertain and reported costs vary widely. In addition, reported fiscal analyses tend to neglect the costs incurred to municipalities when storm water and non-storm water runoff is not effectively managed, which are incurred as a result of pollution, contamination, nuisance, and damage to ecosystems, property, and human health. Nonetheless, they provide a useful context for considering the costs of requirements within Order No. R9-2013-0001.

In 1999, the USEPA reported on multiple studies it conducted to determine the cost of management programs. A study of Phase II municipalities determined that the annual cost of the Phase II program was expected to be $9.16 per household. The USEPA also studied 35 Phase I municipalities, finding costs to be $9.08 per household annually, similar to those anticipated for Phase II municipalities.[3]

The State Water Board commissioned a study by the California State University, Sacramento to assess costs of the Phase I MS4 program. This study includes an assessment of costs incurred by Phase I MS4s throughout the state to implement their programs. Annual cost per household in the study ranged from $18 to $46, with the Fresno-Clovis Metropolitan Area representing the lower end of the range, and the City of Encinitas (in San Diego County) representing the upper end of the range.[4]

A study on Phase I MS4 program costs was also conducted by the California Regional Water Quality Control Board, Los Angeles Region (Los Angeles Water Board), where program costs reported in the municipalities' annual reports were assessed. The Los

[3] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791-68792.
[4] State Water Board, 2005. NPDES Stormwater Cost Survey. P. ii.

Angeles Water Board estimated that average per household cost to implement the MS4 program in Los Angeles County was $12.50. [5]

It is important to note that reported program costs are not all attributable to solely complying with MS4 permits. Many program components, and their associated costs, existed before any MS4 permits were ever issued. For example, street sweeping and trash collection costs cannot be solely or even principally attributable to MS4 permit compliance, since these practices have long been expected from and implemented by municipalities.

Therefore, true program cost resulting from MS4 permit requirements is some fraction of reported costs. The California State University, Sacramento study found that only 38 percent of program costs are new costs fully attributable to MS4 permits. The remainder of the program costs was either pre-existing or resulted from enhancement of pre-existing programs.[6] In 2000, the County of Orange found that even lower amounts of program costs are solely attributable to MS4 permit compliance, reporting that the amount attributable to implement the County or Orange Drainage Area Management Plan (DAMP), was less than 20 percent of the total budget. The remaining 80 percent was attributable to pre-existing programs.[7] More current data from the County of Orange is not used in this discussion because the County of Orange no longer reports such information.

Estimated Value of Healthy Water Quality

Economic considerations of municipal storm water management programs cannot be limited only to program costs. Evaluation of programs must also consider information on the benefits derived from environmental protection and improvement.[8] Attention is often focused on municipal storm water management program costs, but the programs must also be viewed in terms of their value to the public.

Placing a value on healthy receiving waters is very difficult. Often the value of receiving waters with good water quality manifests in other forms, such as tourism, recreational opportunities, and/or increased property values. When surface water bodies are degraded, thereby degrading the habitat within and adjacent to the water bodies, the public loses the value and benefits associated with being able to use the area in and around the water bodies. Surface waters that are able to support the beneficial uses designated in the Basin Plan can sustain plants and wildlife that can attract visitors and residents, providing aesthetic, recreational, as well as monetary value to the public. At this time, however, there have been no studies for the San

[5] Los Angeles Water Board, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.
[6] State Water Board, 2005. NPDES Stormwater Cost Survey. P. 58.
[7] County of Orange, 2000. A NPDES Annual Progress Report. P. 60.
[8] Ribaudo M.O. and D. Heelerstein. 1992, *Estimating Water Quality Benefits: Theoretical and Methodological Issues.* U.S. Department of Agriculture. Technical Bulletin No. 1808.

Diego Region to quantify the added value that surface waters with healthy water quality can provide.

USEPA has estimated that household willingness to pay for improvements in fresh water quality for fishing and boating is approximately $158-$210.[9] This estimate can be considered conservative, since it does not include important considerations such as marine waters benefits, wildlife benefits, or flood control benefits. Another study conducted by California State University, Sacramento reported that the annual household willingness to pay for statewide clean water is approximately $180.[10]

A study conducted by the University of Southern California and University of California, Los Angeles assessed the costs and benefits of implementing various approaches for achieving compliance with the MS4 permits in the Los Angeles region. The study found that non-structural systems would cost $2.8 billion but provide $5.6 billion in benefit. If structural systems were determined to be needed, the study found that total costs would be $5.7 to $7.4 billion, while benefits could reach $18 billion.[11] Costs are anticipated to be borne over many years, probably at least ten years.

As can be seen, the benefits of the municipal storm water management programs are expected to considerably exceed their costs. Such findings are corroborated by USEPA, which found that the benefits of implementation of its Phase II storm water rule would also outweigh the costs.[12]

[9] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68793.
[10] State Water Board, 2005. NPDES Stormwater Cost Survey. P. iv.
[11] Los Angeles Water Board, 2004. Alternative Approaches to Stormwater Control.
[12] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791.

VII. APPLICABLE STATUTES, REGULATIONS, PLANS AND POLICIES

A. Legal Authorities – Federal Clean Water Act and California Water Code

This Order is issued pursuant to section 402 of the CWA and implementing regulations adopted by the USEPA and chapter 5.5, division 7 of the CWC (commencing with section 13370). This Order serves as an NPDES permit for point source discharges to surface waters. This Order also serves as waste discharge requirements pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

The objective of the CWA is "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*." To carry out this objective, the CWA requires the implementation of permit programs to regulate the discharge of pollutants and dredged or fill material to the navigable waters of the U.S. and to regulate the use and disposal of sewage sludge. CWA section 402 provides the legal authority to issue a permit for the discharge of pollutants to waters of the U.S. under the NPDES. The CWA provides that NPDES permits may be issued by states which are authorized to implement the provisions of that act. California became authorized to implement the NPDES permit program on May 14, 1973.

The Porter-Cologne Water Quality Control Act (Division 7, commencing with CWC section 13000) established the State Water Resources Control Board (State Water Board) and nine Regional Water Quality Control Boards (Regional Water Boards) as the principal state agencies with primary responsibility for the coordination and control of water quality. CWC section 13200(f) established the San Diego Water Board, which has the primary responsibility for the coordination and control of water quality in the San Diego Region, which includes all the basins draining into the Pacific Ocean between the southern boundary of the Santa Ana Region and the California-Mexico boundary. The San Diego Water Board implements the CWA through Chapter 5.5 of the CWC, commencing with section 13370. CWC section 13377 provides the San Diego Water Board the legal authority to issue waste discharge requirements to ensure compliance with all applicable provisions of the CWA and acts amendatory thereof or supplementary, thereto, to implement water quality control plans, or for the protection of beneficial uses, or to prevent nuisance.

CWA section 402(p) requires the USEPA or authorized state to issue NPDES permits for storm water discharges from MS4s to waters of the U.S. CWA section 402(p)(3)(B)(ii) requires that NPDES permits for storm water discharges from MS4s "*effectively prohibit non-storm water discharges*" into the MS4s. CWA section 402(p)(3)(B)(iii) requires that NPDES permits for storm water discharges from MS4s to "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable* [MEP], *including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*."

The USEPA published implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]), which prescribe permit application requirements for storm water discharges from MS4s pursuant to CWA 402(p), on November 16, 1990. The USEPA published an Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems, which provided guidance on permit application requirements for regulated MS4s, on May 17, 1996. The federal regulations in 40 CFR 122 and guidance issued by USEPA serve as the foundation for the provisions of Order No. R9-2013-0001. The legal authorities provided by the above statutes and regulations are included as part of the discussions in Section VIII of this Fact Sheet.

B. Legal Authority for the Permit Issued on a Region-wide Basis

CWA section 402(p)(3)(B) provides the San Diego Water Board the legal authority to issue an NPDES permit for the San Diego Region as compared to separate MS4 permits based upon County- and partial County-wide boundaries as they existed within the San Diego Region. CWA section 402(p)(3)(B) states that "*Permits for discharges from municipal storm sewers- (i) may be issued on a system- or jurisdiction-wide basis* ...." The federal regulations in 40 CFR 122.26(a)(1)(v) also state that the San Diego Water Board "*may designate dischargers from municipal separate storm sewers on a system-wide or jurisdiction-wide basis. In making this determination, the [San Diego Water Board] may consider the following factors: (A) the location of the discharge with respect to waters of the United States; (B) the size of the discharge; (C) the quantity and nature of the pollutants discharged to waters of the United States; and (D) other relevant factors*."

More specifically, the federal regulations provide that for large and medium MS4 systems, the San Diego Water Board may issue a regional permit. Specifically, the federal regulation in 40 CFR 122.26(a)(3) provide:

"*(ii) The Director may either issue one system-wide permit covering all discharges from municipal separate storm sewers within a large or medium municipal storm sewer system or issue distinct permits for appropriate categories of discharges within a large or municipal separate storm sewer system including, but not limited to: all discharges owned or operated by the same municipality; located within the same jurisdiction; all discharges within a system that discharge to the same watershed; discharges within a system that are similar in nature; or for individual discharges from municipal separate storm sewers within the system.*

(iii) The operator of a discharge from a municipal separate storm sewer which is part of a large or medium municipal separate storm sewer system must either: (A) Participate in a permit application (to be a permittee or a co-permittee) with one or more other operator of discharges from the large or medium municipal storm sewer system which covers all, or a portion of all, discharges from the municipal separate storm sewer system; (B) Submit a distinct permit application which only covers discharges from the municipal separate storm sewers for

which the operator is responsible; or (C) A regional authority may be responsible for submitting a permit application under the following guidelines....

(iv) One permit application may be submitted for all or a portion of all municipal separate storm sewers within adjacent or interconnected large or medium municipal separate storm sewer systems. The Director may issue one systemwide permit covering all, or a portion of all municipal separate storm sewers in adjacent or interconnected large or medium municipal separate storm sewer systems.

(v) Permits for all or a portion of all discharges from large or medium municipal separate storm sewer systems that are issued on a system-wide, jurisdiction-wide, watershed or other basis may specify different conditions relating to different discharges covered by the permit, including different management programs for different drainage areas which contribute storm water to the system."

Based on these regulations, the San Diego Water Board may issue a region-wide MS4 permit. The regulations also clarify that the permit may include different conditions for separate discharges covered by the permit. This allows the San Diego Water Board to ensure that suitable water quality conditions and provisions are identified for each watershed.

The USEPA's responses to comments in the Final Rule for the above-mentioned regulations also make it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide, permits. In the Final Rule published in the Federal Register and containing the responses to comments, USEPA notes that 40 CFR 122.26(a)(3)(iv) would allow an entire system in a geographical region under the purview of a State agency to be designated under a permit.[13] USEPA also states that many commenters wanted to allow the permitting authority broad discretion to establish system-wide permits, and that EPA believes that paragraphs 40 CFR 122.26 (a)(1)(v) and (a)(3)(ii) allow for such broad discretion.[14]

This Order creates watershed requirements that apply to multiple counties. The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees. Managing storm water on a regional and watershed basis is expected to result in improved water quality, as the Order focuses on monitoring and management practices necessary to improve each watershed rather than political boundaries. A single permit also allows the San Diego Water Board staff to expend fewer resources developing successive multiple permits and allows more resources to be devoted to working cooperatively with all three current groups of Copermittees to ensure implementation of this Order results in improved water quality.

[13] 55 Federal Register 47990-01, 48042.
[14] Ibid.

C. Federal and California Endangered Species Acts

This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2115.5) or the Federal Endangered Species Act (16 United States Code [USC] sections 1531 to 1544). This Order requires compliance with requirements to protect the beneficial uses of waters of the U.S. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

D. California Environmental Quality Act

The action to adopt an NPDES Permit is exempt from the provisions of Chapter 3 of the California Environmental Quality Act (CEQA) (Public Resources Code section 21100, et seq.) pursuant to CWC section 13389. (*County of Los Angeles v. Cal. Water Boards* (2006) 143 Cal.App.4th 985.)

E. State and Federal Regulations, Plans and Policies

The legal authority provided by the following regulations, plans, and policies are also included as part of the discussions in Section VIII of this Fact Sheet.

<u>Water Quality Control Plan for the San Diego Basin</u>

The CWA requires the San Diego Water Board to establish water quality standards for each water body in its region. Water quality standards include beneficial uses, water quality objectives and criteria that are established at levels sufficient to protect beneficial uses, and an antidegradation policy to prevent degrading of waters. On September 8, 1994, the San Diego Water Board adopted the *Water Quality Control Plan for the San Diego Basin* (Basin Plan). The Basin Plan designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters in the San Diego Region. The San Diego Water Board has amended the Basin Plan on multiple occasions since 1994. In addition, the Basin Plan implements State Water Board Resolution No. 88-63, which established state policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply. Beneficial uses applicable to the surface water bodies that receive discharges from the MS4s within the San Diego Region generally include those listed below:

The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region:

- Municipal and Domestic Supply (MUN)
- Agricultural Supply (AGR)
- Industrial Process Supply (PROC)

- Industrial Service Supply (IND)
- Ground Water Recharge (GWR)
- Contact Water Recreation (REC1)
- Non-contact Water Recreation (REC2)
- Warm Freshwater Habitat (WARM)
- Cold Freshwater Habitat (COLD)
- Wildlife Habitat (WILD)
- Rare, Threatened, or Endangered Species (RARE)
- Freshwater Replenishment (FRSH)
- Hydropower Generation (POW)
- Preservation of Biological Habitats of Special Significance (BIOL)

The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region:

- Navigation (NAV)
- Commercial and Sport Fishing (COMM)
- Estuarine Habitat (EST)
- Marine Habitat (MAR)
- Aquaculture (AQUA)
- Migration of Aquatic Organisms (MIGR)
- Spawning, Reproduction, and/or Early Development (SPWN)
- Shellfish Harvesting (SHELL)

Pursuant to Water Code sections 13263 and 13377, the requirements of this Order implement the Basin Plan.

Water Quality Control Plan for Ocean Waters of California, California Ocean Plan

In 1972, the State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan). The State Water Board adopted the most recent amended Ocean Plan on October 16, 2012. The Office of Administrative Law approved it on July 3, 2013. The amended Ocean Plan became effective on August 19, 2013. The Ocean Plan is applicable, in its entirety, to ocean waters of the State. In order to protect beneficial uses, the Ocean Plan establishes water quality objectives and a program of implementation. Pursuant to Water Code sections 13263 and 13377, the requirements of this Order implement the Ocean Plan. The Ocean Plan identifies the beneficial uses of ocean waters of the State to be protected as summarized below:

- Industrial water supply
- Water contact and non-contact recreation, including aesthetic enjoyment; navigation
- Commercial and sport fishing

- Mariculture
- Preservation and enhancement of designated Areas of Special Biological Significance
- Rare and endangered species
- Marine habitat
- Fish spawning and shellfish harvesting

On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving an exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges. On June 19, 2012, the State Water Board adopted Order No. 2012-0031, amending Order No. 2012-0012 to require pollutant load reductions to be achieved within six years for the ASBS Compliance Plans, section A.2.d(2) and ASBS Pollution Prevention Plans, section B.2.b(2). The State Water Board Resolution No. 2012-0012, as amended requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject terms and conditions of State Water Board Resolution No. 2012-0012, as amended. The Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012, as amended, applicable to these discharges, are incorporated in Attachment A of this Order. Requirements of this Order implement the Ocean Plan.

Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality

On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

Antidegradation Policy

Federal regulations (40 CFR 131.12) require that the state water quality standards include an antidegradation policy consistent with the federal antidegradation policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16 ("Statement of Policy with Respect to Maintaining the Quality of the Waters of the State"). State Water Board Resolution No. 68-16 incorporates the

federal antidegradation policy where the federal policy applies under federal law.

The San Diego Water Board's Basin Plan implements and incorporates by reference both the State and federal antidegradation policies. State Water Board Resolution No. 68-16 and 40 CFR 131.12 require the San Diego Water Board to maintain high quality waters of the State unless degradation is justified based on specific findings. First, the Board must ensure that "existing instream uses and the level of water quality necessary to protect the existing uses" are maintained and protected. Second, if the baseline quality of a water body for a given constituent exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water, that quality shall be maintained and protected through the requirements of the Order unless the Board makes findings that (1) any lowering of the water quality is necessary to accommodate important economic or social development in the area in which the waters are located; (2) water quality adequate to protect existing uses fully is assured; and (3) the highest statutory and regulatory requirements for all new and existing point sources and all cost-effective and reasonable best management practices for nonpoint source control are achieved. The San Diego Water Board must also comply with any requirements of State Water Board Resolution No. 68-16 beyond those imposed through incorporation of the federal antidegradation policy. In particular, the Board must find that not only present, but also anticipated future uses of water are protected, and must ensure best practicable treatment or control of the discharges. The baseline quality considered in making the appropriate findings is the best quality of the water since 1968, the year of the adoption of Resolution No. 68-16, or a lower level if that lower level was allowed through a permitting action that was consistent with the federal and state antidegradation policies.

The discharges permitted in this Order are consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Board Resolution No. 68-16 as set forth below:

1. Many of the waters within the area covered by this Order are impaired for multiple pollutants discharged through MS4s and are not high quality waters with regard to these pollutants. In most cases, there is insufficient data to determine whether these water bodies were impaired as early as 1968, but the limited available data shows impairment dating back for more than two decades. Many such water bodies are listed on the State's CWA Section 303(d) List and the San Diego Water Board has established TMDLs to address the impairments. This Order ensures that existing instream (beneficial) water uses and the level of water quality necessary to protect the existing uses is maintained and protected. This Order requires the Copermittees to comply with permit provisions to implement the WLAs set forth in the TMDLs in order to restore the beneficial uses of the impaired water bodies consistent with the assumptions and requirements of the TMDLs. This Order further requires compliance with receiving water limitations to meet water quality standards in the receiving water either by demonstrating compliance pursuant to Provision A and the Copermittees' monitoring and assessment program pursuant to Provision D of this Order, or by implementing Provision B.3.c with a schedule to achieve compliance

with receiving water limitations. This Order includes requirements to develop and implement storm water management programs, achieve WQBELs, and effectively prohibit non-storm water discharges into the MS4. The issuance of this Order does not authorize an increase in the amount of discharge of waste.

2. To the extent that water bodies within the area covered by this Order are high quality waters with regard to some constituents, this Order finds as follows:

   a. Allowing limited degradation of high quality water bodies through MS4 discharges is necessary to accommodate important economic or social development in the area and is consistent with the maximum benefit to the people of the state. The discharge of storm water in certain circumstances is to the maximum benefit to the people of the state because it can assist with maintaining instream flows that support beneficial uses, may spur the development of multiple-benefit projects, and may be necessary for flood control, and public safety as well as to accommodate development in the area. The alternative – capturing all storm water from all storm events – would be an enormous opportunity cost that would preclude MS4 permittees from spending substantial funds on other important social needs. The Order ensures that any limited degradation does not affect existing and anticipated future uses of the water and does not result in water quality less than established standards. The Order requires compliance with receiving water limitations that act as a floor to any limited degradation.

   b. The Order requires the highest statutory and regulatory requirements and requires that the Copermittees meet best practicable treatment or control. The Order prohibits all non-storm water discharges, with a few enumerated exceptions, through the MS4 to the receiving waters. As required by 40 CFR section 122.44(a), the Copermittees must comply with the "maximum extent practicable" technology-based standard set forth in CWA section 402(p), and implement extensive minimum control measures in a storm water management program. Recognizing that best practicable treatment or control may evolve over time, the Order includes new and more specific requirements as compared to the prior Phase I MS4 permits for the San Diego County, Orange County and Riverside County Copermittees. The Order incorporates options to implement Water Quality Improvement Plans that must specify detailed structural and non-structural storm water controls that must be implemented in accordance with an accepted proposed time schedule. The Order contains provisions to encourage, wherever feasible, retention of the storm water from the 85th percentile 24-hour storm event.

<u>Anti-Backsliding Requirements</u>

CWA sections 402(o) and 303(d)(4) and federal regulations at 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations or conditions may be relaxed. While this Order

allows implementation of an alternative compliance pathway option in Provision B.3.c to constitute compliance with receiving water limitations under certain circumstances, the availability of that alternative and the corresponding availability of additional time to come into compliance with receiving water limitations does not violate the anti-backsliding provisions. The receiving water limitations provisions of this Order are imposed under section 402(p)(3)(B) of the Clean Water Act rather than based on best professional judgment, or based on section 301(b)(1)(C) or sections 303(d) or (e), and are accordingly not subject to the anti-backsliding requirements of section 402(o). Although the non-applicability is less clear with respect to the regulatory anti-backsliding provisions in 40 CFR 122.44(l), the regulatory history suggests that USEPA's intent was to establish the anti-backsliding regulations with respect to evolving technology standards for traditional point sources. (See, e.g., 44 Fed.Reg. 32854, 32864 (Jun. 7, 1979)). It is unnecessary, however, to resolve the ultimate applicability of the regulatory anti-backsliding provisions, because the alternative compliance pathway option in Provision B.3.c qualifies for an exception to backsliding as based on new information.

The alternative compliance pathway option in Provision B.3.c of this Order was informed by new information available to the Board from experience and knowledge gained through storm water permitting at the Regional Water Boards in the last ten years. There has been a statewide paradigm shift in storm water management. State Water Board Order WQ 2015-0075 directed all of the Regional Water Boards to consider the Los Angeles Water Board's alternative compliance path to receiving water limitations in all Phase I MS4 permits going forward (State Water Board Order WQ 2015-0075 at page 51), and the Los Angeles Water Board's process of developing over 30 watershed-based TMDLs and implementing several TMDLs since the adoption of the previous permits. In particular, the Los Angeles Water Board recognized the significance of allowing time to plan, design, fund, operate and maintain watershed-based BMPs necessary to attain water quality improvements and additionally recognized the potential for municipal storm water to benefit water supply. Similarly, the San Diego Water Board's experience developing and implementing the Fourth Term MS4 Permits and TMDLs that apply on a region-wide scale (e.g. TMDLs for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region) has resulted in a similar recognition of the need for a watershed-based approach that allows time to plan, design, fund, operate and maintain BMPs to address impaired waters that have been impacted by MS4 discharges. Thus, even if the receiving water limitations are subject to anti-backsliding requirements, they were revised based on new information that would support an exception to the anti-backsliding provisions. (33 U.S.C. § 1342(o)(2)(B)(i); 40 C.F.R. § 122.44(l)(1); 40 C.F.R. §122.44(l)(2)(i)(B)(1)).

<u>Clean Water Act Section 303(d) List</u>

CWA section 303(d)(1) requires each State to identify specific water bodies within its boundaries where water quality standards are not being met or are not expected to be met after implementation of technology-based effluent limitations on point sources. Water bodies that do not meet water quality standards are considered impaired and are placed on the state's "303(d) List." Periodically, USEPA approves the State's 303(d) List.

Most recently, USEPA approved the State's 2010 303(d) List of impaired water bodies on October 11, 2011, which includes certain receiving waters in the San Diego Region. For each listed water body, the state or USEPA is required to establish a TMDL of each pollutant impairing the water quality standards in that water body. A TMDL is a tool for implementing water quality standards and is based on the relationship between pollution sources and in-stream water quality conditions. The TMDL establishes the allowable pollutant loadings for a water body and thereby provides the basis to establish water quality-based controls. These controls should provide the pollution reduction necessary for a water body to meet water quality standards.

A TMDL is the sum of the allowable pollutant loads of a single pollutant from all contributing point sources (the waste load allocations or WLAs) and non-point sources (load allocations of LAs) plus the contribution from background sources and a margin of safety (40 CFR 130.2(i)). MS4 discharges are considered point source discharges. For 303(d)-listed water bodies and pollutants in the San Diego Region, the San Diego Water Board or USEPA develops and adopts TMDLs that specify these requirements.

Since 2002, the San Diego Water Board has established seven (7) TMDLs to remedy water quality impairments in various water bodies within the San Diego Region (see Attachment E to the Order). These TMDLs identify MS4 discharges as a source of pollutants to these water bodies, and, as required, establish WLAs for MS4 discharges to reduce the amount of pollutant discharged to receiving waters. CWA section 402(p)(3)(B)(iii) requires the San Diego Water Board to impose permit conditions, including: "management practices, control techniques and system, design and engineering methods, and *such other provisions as the Administrator or the State determines appropriate for the control of such pollutants."* (Emphasis added.) CWA section 402(a)(1) also requires states to issue permits with conditions necessary to carry out the provisions of the CWA. Federal regulations also require that NDPES permits contain WQBELs consistent with the assumptions and requirements of all available WLAs (40 CFR 122.44(d)(1)(vii)(B)). CWC section 13377 also requires that NPDES permits include limitations necessary to implement water quality control plans. Therefore, this Order includes WQBELs and other provisions to implement the TMDL WLAs assigned to Copermittees regulated by this Order.

<u>Other Regulations, Plans and Policies</u>

This Order implements all other applicable federal regulations and State regulations, plans and policies, including the California Toxics Rule at 40 CFR 131.38 (Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California Rule [California Toxics Rule or CTR]), and State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP).

F. Unfunded State Mandates

Article XIII B, Section 6(a) of the California Constitution provides that whenever "*any state agency mandates a new program or higher level of service on any local government, the state shall provide a subvention of funds to reimburse that local government for the costs of the program or increased level of service*." The requirements of this Order do not constitute state mandates that are subject to a subvention of funds for several reasons, including, but not limited to, the following.

First, the requirements of this Order do not constitute a new program or a higher level of service as compared to the requirements contained in the previous Fourth Term Permits. The overarching requirement to impose controls to reduce the pollutants in discharges from MS4s is dictated by the CWA and is not new to this permit cycle (33 USC section 1342(p)(3)(B)). The inclusion of new and advanced measures as the MS4 programs evolve and mature over time is anticipated under the CWA (55 FR 47990, 48052 (Nov. 16, 1990)), and to the extent requirements in this Order are interpreted as new advanced measures, they do not constitute a new program or higher level of service.

Second, and more broadly, mandates imposed by federal law, rather than by a state agency, are exempt from the requirement that the local agency's expenditures be reimbursed (Cal. Const., art. XIII B, section 9, subd. (b)). This Order implements federally mandated requirements under the CWA and its requirements are therefore not subject to subvention of funds. This includes federal requirements to effectively prohibit non-storm water discharges, to reduce the discharge of pollutants in storm water to the MEP, and to include such other provisions as the Administrator or the State determines appropriate for the control of such pollutants (33 USC section 1342(p)(3)(B)). Federal cases have held these provisions require the development of permits and permit provisions on a case-by-case basis to satisfy federal requirements. (*Natural Resources Defense Council, Inc., v. USEPA* (9th Cir. 1992) 966 F.2d 1292, 1308, fn. 17.)

The authority exercised under this Order is not reserved state authority under the CWA's savings clause (cf. *Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 627-628 [relying on 33 USC section 1370, which allows a state to develop requirements which are not "less stringent" than federal requirements]), but instead is part of a federal mandate to develop pollutant reduction requirements for municipal separate storm sewer systems. To this extent, it is entirely federal authority that forms the legal basis to establish the permit provisions. (See, *City of Rancho Cucamonga v. Regional Water Quality Control Board, Santa Ana Region* (2006) 135 Cal.App.4th 1377, 1389; *Building Industry Ass'n of San Diego Co. v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 882-883.)

The MEP standard is a flexible standard that balances a number of considerations, including technical feasibility, cost, public acceptance, regulatory compliance, and effectiveness. (*Building Ind. Ass'n., supra,* 124 Cal.App.4th at pp. 873-874, 889.) Such considerations change over time with advances in technology and with experience

gained in storm water management (55 FR 47990, 48052 (Nov. 16, 1990)). Accordingly, a determination of whether the conditions contained in this Order exceed the requirements of federal law cannot be based on a point by point comparison of the permit conditions and the minimum control measures that are required "at a minimum" to reduce pollutants to the maximum extent practicable and to protect water quality (40 CFR 122.34). Rather, the appropriate focus is whether the permit conditions, as a whole, exceed the MEP standard.

In recent months, the County of Los Angeles and County of Sacramento Superior Courts have granted writs setting aside decisions of the Commission on State Mandates that held certain requirements in Phase I permits constituted unfunded mandates. In both cases, the courts have found that the correct analysis in determining whether an MS4 permit constituted a state mandate was to evaluate whether the permit as a whole exceeds the MEP standard. (*State of Cal. v. Comm. on State Mandates* (Super. Ct. Sacramento County, 2012, No. 34-2010-80000604), *State of California v. County of Los Angeles* (Super. Ct. Los Angeles County, 2011, No. BS130730.) Both cases are currently pending appeal.

The requirements of the Order, taken as a whole rather than individually, are necessary to reduce the discharge of pollutants to the MEP and to protect water quality. The San Diego Water Board finds that the requirements of the Order are practicable, do not exceed federal law, and thus do not constitute an unfunded mandate. These findings are the expert conclusions of the principal state agency charged with implementing the NPDES program in California (CWC sections 13001, 13370).

It should also be noted that the provisions in this Order to effectively prohibit non-storm water discharges are also mandated by the CWA (33 USC section 1342(p)(3)(B)(ii)). Likewise, the provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state establishes or adopts a TMDL, federal law requires that permits must contain effluent limitations consistent with the assumptions and requirements of any applicable waste load allocation in a TMDL (40 CFR 122.44(d)(1)(vii)(B)).

Third, the local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental dischargers who are issued NPDES permits for storm water discharges. With a few inapplicable exceptions, the CWA regulates the discharge of pollutants from point sources (33 USC section 1342) and the Porter-Cologne Act regulates the discharge of waste (CWC section 13263), both without regard to the source of the pollutant or waste. As a result, the "costs incurred by local agencies" to protect water quality reflect an overarching regulatory scheme that places similar requirements on governmental and non-governmental dischargers. (See *County of Los Angeles v. State of California* (1987) 43 Cal.3d 46, 57-58 [finding comprehensive workers' compensation scheme did not create a cost for local agencies that was subject to state subvention].)

The CWA and the Porter-Cologne Act largely regulate storm water with an even hand, but to the extent there is any relaxation of this even-handed regulation, it is in favor of the local agencies. Generally, the CWA requires point source dischargers, including dischargers of storm water associated with industrial or construction activity, to comply strictly with water quality standards (33 USC section 1311(b)(1)(C); *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159, 1164-1165 [noting that industrial discharges must strictly comply with water quality standards]). As discussed in prior State Water Board decisions, certain provisions of this Order do not require strict compliance with water quality standards (State Water Board Order No. WQ 2001-0015, p. 7). Those provisions of this Order regulate the discharge of waste in municipal storm water under the CWA's MEP standard, not the BAT/BCT standard that applies to other types of discharges. These provisions, therefore, regulate the discharge of waste in municipal storm water more leniently than the discharge of waste from non-governmental sources.

Fourth, the Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)). To the extent that the local agency Copermittees have voluntarily availed themselves of the permit, the program is not a state mandate. (Accord, *County of San Diego v. State of California* (1997) 15 Cal.4th 68, 107-108.)

Fifth, the local agency Copermittees' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under state law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

Finally, even if any of the permit provisions could be considered unfunded mandates, under Government Code section 17556, subdivision (d), a state mandate is not subject to reimbursement if the local agency has the authority to charge a fee. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order, subject to certain voting requirements contained in the California Constitution. (See Cal. Const., Art. XIII D, section 6, subd. (c); see also *Howard Jarvis Taxpayers Ass'n v. City of Salinas* (2002) 98 Cal.App.4th 1351, 1358-1359.) The Fact Sheet demonstrates that numerous activities contribute to the pollutant loading in the MS4. Local agencies can levy service charges, fees, or assessments on these activities, independent of real property ownership. (See, e.g., *Apartment Ass'n of Los Angeles County, Inc., v. City of Los Angeles* (2001(24 Cal.4th 830, 842 [upholding inspection fees associated with renting property].) The authority and ability of a local agency to defray the cost of a program without raising taxes indicates that a program does not entail a cost subject to subvention. (*Clovis Unified School Dist. V. Chiang* (2010) 188 Cal.App.4th 794, 812, citing *Connell v. Sup. Ct.* (1997) 59 Cal.App.4th 382, 401; *County of Fresno v. State of California* (1991) 53 Cal. 3d. 482, 487-488.)

VIII. PROVISIONS

The provisions (i.e. NPDES permit requirements) of the Order are discussed below.

A. Prohibitions and Limitations

Purpose: Provision A includes the prohibitions and limitations requirements that are the foundation of all the subsequent requirements included in the Order. Compliance with the prohibitions and limitations will restore and protect receiving waters from impacts that may be caused by discharges into and from the Copermittees' MS4s and ultimately achieve the objective of the CWA.

In meeting the requirements set forth in the Order, the Copermittees must be cognizant that the prohibitions and limitations exist and will be the standard by which the San Diego Water Board will be measuring the progress and success of their implementation of the NPDES permit requirements.

***Discussion*:** The objective of the CWA is to "*restore and maintain the chemical, physical, and biological integrity of the Nation's waters*." The CWA requires the implementation of NPDES permit programs to regulate discharges of pollutants and dredged or fill material to the navigable waters of the U.S. For discharges into and from MS4s, the CWA requires the NPDES permits to "*effectively prohibit non-stormwater discharges into the storm sewers*" and "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable.*"

Provision A includes limitations, consistent with the requirements of the CWA for discharges from MS4s. Provision A expresses these limitations as discharge prohibitions, receiving water limitations, and effluent limitations. Compliance with the discharge prohibitions and receiving water limitations is also explicitly described, in conformance with precedential State Water Board Orders.

More specific and detailed discussions of the requirements of Provision A are provided below.

Provision A.1 (Discharge Prohibitions) prohibits the discharge of specific types of waste into and/or from the Copermittees' MS4s.

Provision A.1.a restates and reiterates Basin Plan Waste Discharge Prohibition 1, by prohibiting discharges into and from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the

state. The terms pollution,[15] contamination,[16] and nuisance[17] are defined under CWC 13050. Provision A.1.c incorporates all the waste discharge prohibitions of the Basin Plan into the requirements of the Order. The waste discharge prohibitions from the Basin Plan have been reproduced and provided in Attachment A to the Order.

Provision A.1.b requires non-storm water discharges into the MS4s to be effectively prohibited, consistent with the requirements of the CWA for MS4 permits to "*effectively prohibit non-stormwater discharges into the storm sewers*." The effective prohibition is required to be implemented by each Copermittee within its jurisdiction through the illicit discharge detection and elimination requirements under Provision E.2. The prohibition does not apply to NPDES permitted discharges into the Copermittees' MS4s.

The CWA employs the strategy of prohibiting the discharge of any pollutant from a point source into waters of the United States unless the discharger of the pollutant(s) obtains an NPDES permit pursuant to CWA Section 402. The 1987 amendment to the CWA includes provision 402(p) that specifically addresses NPDES permitting requirements for storm water discharges from MS4s. CWA section 402(p) prohibits the discharge of pollutants from specified MS4s to waters of the U.S. except as authorized by an NPDES permit and identifies two substantive standards for MS4 storm water permits. MS4 permits (1) "*shall include a requirement to effectively prohibit non-stormwater discharges into the storm sewers*" and (2) "*shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or State determines appropriate for the control of such pollutants*." (CWA section 402(p)(3)(B)(ii)-(iii).)

In November 1990, the USEPA published regulations addressing storm water discharges from MS4s (55 FR 47990 and following (Nov. 16, 1990) (Phase I Final Rule)). The regulations establish minimum requirements for MS4 permits, and generally focus on the requirement that MS4s implement programs to reduce the amount of pollutants found in storm water discharges to the MEP. The CWA's municipal storm water MEP standard does not require storm water discharges to strictly meet water quality standards, as is required for other NPDES permitted

[15] CWC 13050(l): "(1) 'Pollution' means an alteration of the quality of waters of the state by waste to a degree which unreasonably affects either of the following: (A) The water for beneficial uses. (B) Facilities which serve beneficial uses. (2) 'Pollution' may include 'contamination.'

[16] CWC 13050(k): "Contamination' means an impairment of the quality of waters of the state by waste to a degree which creates a hazard to public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste, whether or not waters of the state are affected."

[17] CWC 13050(m): 'Nuisance' means anything which meets all of the following requirements: (1) Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. (2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. (3) Occurs during, or as a result of, the treatment or disposal of wastes."

discharges. Compliance is achieved through an iterative approach of continuous implementation of improved BMPs. This distinction reflects Congress's recognition that variability in flow and intensity of storm events render difficult strict compliance with water quality standards by MS4 permittees. In describing the controls that permits must include to reduce pollutants in storm water discharges to the MEP, the statute (CWA section 402(p)(3)(B)(iii)) states that the controls shall include: "*management practices, control techniques and system, design and engineering methods, and such other provisions as the [permit writer] determines appropriate for the control of such pollutants*."

In contrast, non-storm water discharges from the MS4 that are not authorized by separate NPDES permits are subject to requirements under the NPDES program, including discharge prohibitions, technology based effluent limitations and water quality-based effluent limitations (40 CFR 122.44). The regulations also require the Copermittee's program to include an element to detect and remove illicit discharges and improper disposal into the storm sewer (40 CFR 122.26(d)(2)(iv)(B)).

While "non-storm water" is not defined in the CWA or federal regulations, the federal regulations (at 40 CFR 122.26(b)(2)) define "*illicit discharge*" as *"any discharge to a municipal separate storm sewer that is not composed entirely of storm water and that is not covered by an NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer and discharges resulting from fire fighting activities)*." This definition is the most closely applicable definition of "non-storm water" contained in federal law. As stated in the Phase I Final Rule, USEPA added the illicit discharge program requirement to begin implementation of the 'effective prohibition' requirement to detect and control non-storm water discharges to their municipal system.

Thus, federal law mandates that permits issued to MS4s must require management practices that will result in reducing storm water pollutants to the MEP yet at the same time requires that non-storm water discharges be effectively prohibited from entering the MS4. "Effectively" prohibit does not mean that non-storm water discharges are authorized to be discharged into and from the Copermittees' MS4s. The Phase I Final Rule clarifies what "effectively prohibit" means (55 FR 47995):

> "*Section 402(p)(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…<u>Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit</u> (other than the permit for the discharge from the municipal separate storm sewer)*" [Emphasis added].

Consistent with federal law, unless non-storm water discharges to the MS4 are authorized by a separate NPDES permit, non-storm water discharges are

appropriately subject to the effective prohibition requirement in the CWA and Regional Water Boards are not limited by the iterative MEP approach to storm water regulation in crafting appropriate regulations for non-storm water discharges.

The federal regulations (40CFR122.26(d)(2)(i)(B)) require the Copermittees to establish the legal authority which authorizes or enables the Copermittees to prohibit illicit discharges to the MS4s. The federal regulations (40 CFR 122.26(d)(2)(vi)(B)(1)) require the Copermittees to "*implement and enforce an ordinance, order or similar means*" to prevent non-storm water discharges to their MS4s. Thus, the Copermittees are required to "*effectively*" prohibit non-storm water discharges to their MS4s through enforcing their legal authority established under "*ordinance, order or similar mean*s" and either remove those discharges to their MS4s, or require those discharges to obtain coverage under a separate NPDES permit. More detail about the program that must be implemented to "*effectively*" prohibit non-storm water discharges to the Copermittees' MS4s is provided under the discussion for Provision E.2.

Provision A.1.d was included to be consistent with Resolution No. 2012-0012, adopted by the State Water Board on March 20, 2012. Provision A.1.d prohibits discharges from MS4s to Areas of Special Biological Significance (ASBS), except for storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach to the Heisler Park ASBS subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012. The pertinent Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 are provided in Attachment A to the Order.

<u>Provision A.2 (Receiving Water Limitations)</u> specifies the condition of the receiving waters that must be achieved when there are discharges from the Copermittees' MS4s. Receiving water limitations are included in all NPDES permits issued pursuant to the CWA section 402. CWA section 402(p)(3)(B)(iii) authorizes the inclusion of "*such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." This requirement gives USEPA or the State permitting authority, in this case the San Diego Water Board, discretion to determine what permit conditions are necessary to control pollutants.

In its Phase I Final Rule (see 55 FR 47990, 47994 (Nov. 16, 1990)), USEPA elaborated on these requirements, stating that, "*permits for discharges from municipal separate storm sewer systems must require controls to reduce the discharge of pollutants to the maximum extent practicable, and where necessary water quality-based controls*." USEPA reiterated in its Phase II Final Rule (64 FR 68722, 68737), that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL*." CWC section 13377 also requires that NPDES permits include limitations necessary to implement water quality control plans. Both the State Water Board and the San Diego Water Board have previously concluded that discharges from the MS4 contain pollutants that have

the reasonable potential to cause or contribute to excursions above water quality standards. As such, inclusion of receiving water limitations is appropriate to control MS4 discharges.

The inclusion of receiving water limitations is also consistent with the Ninth Circuit Court of Appeals' ruling in *Defenders of Wildlife v. Browner* (191 F.3d 1159, 1166 (1999)) that the permitting authority has discretion regarding the nature and timing of requirements that it includes as MS4 permit conditions to attain water quality standards. The Ninth Circuit Court of Appeals recently explained that, "*[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*" (*Natural Resources Defense Council v. County of Los Angeles* (9th Cir. 2011) 673 F.3d 880, 886 (revd. On other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013)))

The receiving water limitations included in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan or in water quality control plans or policies adopted by the State Water Board, including State Water Board Resolution No. 68-16, or in federal regulations, including but not limited to 40 CFR 131.12 and 131.38. The water quality objectives in the Basin Plan and other State Water Board plans and policies have been approved by USEPA and combined with designated beneficial uses constitute the water quality standards required under federal law.

Provision A.2.a requires that discharges from the Copermittees' MS4s must not cause or contribute to the violation of water quality standards in receiving waters. The water quality standards of the receiving waters must be protected from the impacts that may be caused by the Copermittees' MS4 discharges. Water quality standards applicable to the surface waters in the San Diego Region must be achieved through meeting the technology based standard of MEP through an iterative process of improved management actions. Provision A.2.a is also consistent with State Water Board Order WQ 99-05 precedent-setting language requiring discharges from MS4s to attain receiving water quality standards. The water quality control plans and policies with water quality standards applicable to the waters in the San Diego Region are included under Provision A.2.a.

Provisions A.2.b was included to be consistent with the requirements of State Water Board Resolution No. 2012-0012, adopted on March 20, 2012.

<u>Provision A.3 (Effluent Limitations)</u> specifies the condition of the discharges from the Copermittees' MS4s that must be achieved if and when there are discharges.

Consistent with CWA section 301(b)(1)(A) and 40 CFR 122.44(a), Provision A.3.a includes the technology-based effluent limitations that must be included in the Order. The technology-based effluent limits, representing the minimum level of control that must be imposed in a permit under CWA section 402, requires that pollutants in discharges of storm water from the Copermittees' MS4s be reduced to the MEP. This provision applies specifically to storm water discharges. Non-storm water discharges must be effectively prohibited, as required under Provision A.1.b. Non-storm water (dry weather) discharges from the MS4 are not considered storm water (wet weather) discharges and therefore are not subject to the MEP standard.

The technology-based MEP standard is an ever-evolving, flexible, and advancing concept. Neither Congress nor USEPA has specifically defined the term "maximum extent practicable." Congress established this flexible MEP standard so that the administrative bodies would have "*the tools to meet the fundamental goals of the Clean Water Act in the context of storm water pollution*." (*Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 884.) As knowledge about controlling storm water runoff and discharges continues to evolve, so does the knowledge which constitutes MEP. Reducing the discharge of pollutants in storm water from the MS4 to the MEP requires the Copermittees to assess each program component and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP.

The San Diego Water Board or the State Water Board ultimately define MEP, and may include requirements that provide specific guidance on what is expected to demonstrate MEP. It is the responsibility of the Copermittees to propose actions that implement BMPs to reduce storm water pollution to the MEP. In other words, the Copermittees' runoff management programs developed and implemented under the Order are the Copermittees' proposals for achieving MEP. Their total collective and individual activities conducted pursuant to their runoff management programs become their proposal for achieving MEP as it applies both to their overall effort, as well as to specific activities. Provisions B through E of the Order provides a minimum framework to guide the Copermittees in achieving the MEP standard for discharges of pollutants in storm water.

Provision A.3.b incorporates any water quality based effluent limitations (WQBELs) applicable to the MS4s established for TMDLs adopted and approved for the San Diego Region and requires the Copermittees to comply with those WQBELs. This is consistent with 40 CFR 122.44(d)(1)(vii)(B), which requires that NPDES permits to incorporate WQBELs "*developed to protect a narrative water quality criterion, a numeric water quality criterion, or both…consistent with the assumptions and requirements of any available wasteload allocation for the discharge...*"

Pursuant to CWA section 303(d), for surface water bodies identified as impaired by one or more pollutants, the San Diego Water Board is required to establish TMDLs "*at a level necessary to implement the applicable water quality standards with seasonal variations and a margin of safety which takes into account any lack of knowledge*

concerning the relationship between effluent limitations and water quality." The TMDLs identify sources of the pollutants causing the impairments and assign portions of the TMDL as WLAs to point sources, which include MS4s.

WLAs must be expressed in NPDES permits as WQBELs, which may include one or more numeric components such as numeric effluent limits, and/or receiving water limitations, and/or BMP requirements. Because numeric targets for TMDLs typically include a component that will be protective of water quality standards, a TMDL will likely include one or more numeric receiving water limitations and/or effluent limitations as part of the assumptions or requirements of the TMDL. Any numeric receiving water limitations and/or effluent limitations developed as part of the assumptions or requirements of a TMDL must be incorporated and included as part of WQBELs for the MS4s.

Because the development and approval of new TMDLs, or modification of existing TMDLs, may occur during the term of this Order, the specific provisions of those TMDLs, including effluent limitations applicable to MS4s are provided within Attachment E to the Order. Attachment E will be updated with new TMDLs and modifications to existing TMDLs in a timely manner as they occur.

Provision A.4 (Compliance with Discharge Prohibitions and Receiving Water Limitations) describes the process required to be implemented by the Copermittees if compliance with the discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a are not being achieved under current conditions.

In its Phase II Stormwater Regulations, Final Rule, USEPA states that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL.*"[18] In a series of comment letters on MS4 permits issued by various Regional Water Boards, USEPA has also reiterated that MS4 discharges must meet water quality standards.[19] In addition, the Ninth Circuit Court of Appeals explained in a recent ruling that, *"[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*"[20]

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[18] Phase II Stormwater Regulations, Final Rule, 64 Fed. Reg. 68722, 68737.
[19] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.
[20] NRDC v. County of Los Angeles (9th Cir. 2011), 673 F.3d 880, 886 (revd. on other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013))). See also, *Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 884-886, citing *Defenders of Wildlife v. Browning,* (9th Cir. 1999) 191 F.3d 1159.)

Water quality standards for the San Diego Region are established in the Basin Plan. The water quality standards of the Basin Plan are incorporated into this Order as the discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a. The discharge prohibitions and receiving water limitations in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations or prohibitions to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan, water quality control plans or policies adopted by the State Water Board, including Resolution No. 68-16, or federal regulations, including but not limited to, 40 CFR 131.12 and 131.38. The waste discharge prohibitions and water quality objectives in the Basin Plan have been approved by USEPA and combined with the designated beneficial uses constitute the water quality standards required under federal law.

Under federal law (CWA section 402(p)(3)(B)(iii)), an MS4 permit must include "*controls to reduce the discharge of pollutants to the maximum extent practicable...and such other provision as...the State determines appropriate for control of such pollutants*." The State Water Board has previously determined that limitations necessary to meet water quality standards are appropriate for the control of pollutants discharged by MS4s and must be included in MS4 permits. (State Water Board Orders WQ 91-03, 98-01, 99-05, 2001-15; see also *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159.) This Order prohibits discharges that cause or contribute to violations of water quality standards.

The discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a are included in this Order to ensure that discharges from the MS4s do not cause or contribute to exceedances of water quality objectives necessary to protect the beneficial uses of the receiving waters.

Provision A.4 is consistent with the precedent-setting language in State Water Board Order WQ 99-05 required to be included in municipal storm water permits. State Water Board Order WQ 2001-15 refined Order WQ 99-05 by requiring an iterative approach to compliance with water quality standards involving ongoing assessments and revisions, referred to as the "iterative process." The "iterative process" is a fundamental NPDES requirement for municipal storm water permits to achieve the objectives of the CWA.

The State Water Board and Regional Water Boards have stated that the provisions under Provisions A.1.a, A.1.c, A.2.a, and A.4 are independently applicable, meaning that compliance with one provision does not provide a "safe harbor" where there is non-compliance with another provision (i.e., compliance with the Provision A.4 does not shield a Copermittee who may have violated Provision A.1.a, A.1.c, or A.2.a from an enforcement action). The intent of Provision A.4 is to ensure that the Copermittees have the necessary storm water management programs and controls in place, and that they are modified by the Copermittees in a timely fashion when necessary, so that compliance with Provisions A.1.a, A.1.c, and/or A.2.a is achieved as soon as possible. USEPA expressed the importance of this independent applicability in a series of

comment letters on MS4 permits proposed by various Regional Water Boards. At that time, USEPA expressly objected to certain MS4 permits that included language stating, *"permittees will not be in violation of this [receiving water limitation] provision … [if certain steps are taken to evaluate and improve the effectiveness of the jurisdictional runoff management programs],"* concluding that this phrase would not comply with the CWA.[21]

The Ninth Circuit held in *Natural Resources Defense Council v. County of Los Angeles* (2011) 673 F3d. 880, 886 (revd. on other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013))) that engagement in the iterative process does not provide a safe harbor from liability for violations of permit terms prohibiting exceedances of water quality standards. The Ninth Circuit holding is consistent with the position of the State and Regional Water Boards that exceedances of water quality standards in an MS4 permit constitute violations of permit terms subject to enforcement by the Water Boards or through a citizen suit. While the Water Boards have generally directed dischargers to achieve compliance by improving control measures through the iterative process, the San Diego Water Board retains the discretion to take other appropriate enforcement and the iterative process does not shield dischargers from citizen suits under the CWA.

The requirements of Provision A.4, therefore, are required to be implemented until the water quality standards expressed under Provisions A.1.a, A.1.c, and A.2.a are achieved. The CWA requires MS4 permits to "*require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." The requirements of this Order have been deemed or determined to be "appropriate" to achieve water quality standards in receiving waters.

Part of the "*controls*" required by the Order is the process described in Provision A.4. Provision A.4 includes the process that is ultimately expected to achieve compliance with the requirement that discharges from the MS4 do not cause or contribute to violations of water quality standards in the receiving waters. The implementation of Provision A.4 is required when the Copermittees or the San Diego Water Board have determined that discharges from the MS4 are causing or contributing to violations of water quality standards in the receiving waters.

The Copermittees must effectively prohibit non-storm water discharges into the MS4s, reduce the discharge of pollutants in storm water from the MS4s to the MEP, and ensure that their MS4 discharges do not cause or contribute to violations of water quality standards. If the Copermittees have effectively prohibited non-storm water

[21] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.

discharges and reduced storm water pollutant discharges to the MEP, but their discharges are still causing or contributing to violations of water quality standards, Provision A.4 provides a clear "iterative process" for the Copermittees to follow.

Provision A.4 essentially requires the Copermittees to implement additional BMPs until MS4 discharges no longer cause or contribute to a violation of water quality standards.

In assessing compliance and potential enforcement actions, the San Diego Water Board looks at the Copermittees' efforts in total to meet the requirements of Provisions A.1.a, A.1.c, A.2.a and Provision A.4. The Copermittees need to demonstrate that they are making improvements to their programs and making progress toward achieving the discharge prohibitions and receiving water limitations in Provisions A.1.a, A.1.c, and A.2.a by implementing the requirements of Provision A.4. The San Diego Water Board would consider these efforts prior to strictly enforcing the requirements of Provisions A.1.a, A.1.c, and A.2.a. Causes of exceedances of the receiving water limitations can often be more difficult to identify and attribute solely to the Copermittees' MS4s. The intent of the Order is to provide the Copermittees more clarity and flexibility in addressing these exceedances through the iterative approach and adaptive management process until the requirements under Provisions A.1.a, A.1.c, and A.2.a are fully achieved.

An exception to the iterative approach and adaptive management process would be in receiving waters subject to adopted and approved TMDLs. For TMDLs that are incorporated into the Order, there is a specific date for compliance to be achieved, after which the iterative approach and adaptive management process required under Provision A.4 no longer provides the flexibility to achieve compliance. Where compliance dates for a TMDL have passed, compliance with the WQBELs incorporated into the Order established by a TMDL in Attachment E to protect water quality standards is required. Thus, after the interim or final compliance dates for a TMDL have passed, if the discharges from the Copermittees' MS4s are causing or contributing to a violation of WQBELs, exceedances of WQBELs must be strictly enforced by the San Diego Water Board. In the meantime, however, the Copermittees are in compliance with the interim or final TMDL requirements in Attachment E as long as the interim or final WQBELs are being achieved in accordance with the interim or final compliance dates.

In addition, this Order includes an optional pathway that incorporates the requirements of Provision A.4 and would allow a Copermittee to be deemed in compliance with the requirements under Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b during implementation of a Water Quality Improvement Plan that incorporates specific additional requirements. This alternative compliance pathway and the additional specific requirements are described below under the discussion for Provision B.3.c.

B. Water Quality Improvement Plans

Purpose: Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges to the MS4s and control pollutants in storm water discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the Clean Water Act.

Provision B includes requirements for the Copermittees to develop and implement Water Quality Improvement Plans to ultimately comply with the prohibitions and limitations under Provision A. The Water Quality Improvement Plans will provide the Copermittees a comprehensive program that can achieve the requirements and further the objectives of the CWA. Implementation of the Water Quality Improvement Plans will also improve the quality of the receiving waters in the San Diego Region.

The Water Quality Improvement Plan is the backbone of the Regional MS4 Permit requirements. Provision B provides the guidance, criteria, and minimum expectations and requirements for the elements of the Water Quality Improvement Plan to be developed and implemented by the Copermittees. The Water Quality Improvement Plans will be implemented in the Watershed Management Area by the Copermittees within their jurisdictions through their jurisdictional runoff management programs.

The Water Quality Improvement Plan also incorporates a program to monitor and assess the progress of the Copermittees' jurisdictional runoff management programs toward improving the quality of discharges from the MS4s, as well as tracking improvements to the quality of receiving waters. A process to adapt and improve the effectiveness of the Water Quality Improvement Plans has also been incorporated into the requirements of Provision B to be consistent with the "iterative approach" required to achieve compliance with discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a, pursuant to the requirements of Provision A.4.

The Water Quality Improvement Plans have also been structured to incorporate the requirements of any TMDLs that have been adopted for the San Diego Region. Incorporating the requirements of the TMDLs into the requirements of Provision B allows the Copermittees to develop a single plan, instead of separate plans, to coordinate their non-storm water and storm water runoff management programs. The Water Quality Improvement Plans allow the Copermittees to meet the requirements of this Order, as well as fulfill the requirements of the TMDLs.

As an added benefit, if the Copermittees demonstrate that impaired water bodies within the Watershed Management Area listed on the 303(d) List will be addressed with their Water Quality Improvement Plans in a reasonable period of time, the San Diego Water Board may be able to remove the water bodies from the 303(d) List, which would greatly reduce the need for the San Diego Water Board to develop additional TMDLs that would have to be incorporated into the Order and implemented by the Copermittees.

***Discussion*:** The federal NPDES regulations require the Copermittees to develop a proposed management program (40 CFR 122.26(d)(2)(iv)). The proposed management program must include "*a comprehensive planning process*" and "*where necessary intergovernmental coordination*" for the "*duration of the permit.*" The Water Quality Improvement Plan is the Copermittees' "*comprehensive planning process*" document for the proposed management program that will be implemented within a Watershed Management Area. Implementation of the Water Quality Improvement Plan requires "*intergovernmental coordination*" among the Copermittees for at least the "*duration of the permit*," and likely into and beyond the next iteration of the permit.

Developing Water Quality Improvement Plans based upon watersheds is consistent with federal regulations that support the development of permit conditions, as well as implementation of storm water management programs, at a watershed scale (40 CFR 122.26(a)(3)(ii), 122.26(a)(3)(v), and 122.26(d)(2)(iv)). In 2003, USEPA issued a Watershed-Based NPDES Permitting Policy Statement (USEPA, 2003) that defines watershed-based permitting as an approach that produces NPDES permits that are issued to point sources on a geographic or watershed basis. In this policy statement, USEPA explains that "*[t]he utility of this tool relies heavily on a detailed, integrated, and inclusive watershed planning process*." USEPA identifies a number of important benefits of watershed permitting, including more environmentally effective results, the ability to emphasize measuring the effectiveness of targeted actions on improvements in water quality, reduced cost of improving the quality of the nation's waters and more effective implementation of watershed plans, including TMDLs, among others.

An emphasis on watersheds is appropriate at this stage in the San Diego Region's MS4 program to shift the focus to more targeted, water quality driven planning and implementation. Addressing discharges on a watershed scale focuses on water quality results by emphasizing the receiving waters in the watershed. The conditions of the receiving waters drive management actions, which in turn focus measures to address pollutant contributions from MS4 discharges.

The Water Quality Improvement Plan gives the Copermittees the responsibility of developing a comprehensive plan to coordinate the efforts of their jurisdictional runoff management programs for addressing the problems related to MS4 discharges causing impacts to water quality in the Watershed Management Area. The development of the plan provides the Copermittees the opportunity to provide

significant input on how to implement their jurisdictional runoff management programs, and how to best utilize their available resources in addressing a focused set of priorities that they believe will result in measureable improvements to water quality within the Watershed Management Area.

The Copermittees are encouraged to separate the Watershed Management Area into subwatersheds, as appropriate. This allows the Copermittees to identify priorities applicable to a subset of the Copermittees or specific water bodies or areas within the Watershed Management Area.

Included in the requirements for the elements to be included in the Water Quality Improvement Plan are monitoring and assessment requirements that are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order. In addition to the federal requirements of the CWA section 308(a) and 40 CFR 122.26(d), the San Diego Water Board has the authority to establish monitoring, reporting, and recordkeeping requirements for NPDES permits under CWC 13383.

More specific and detailed discussions of the requirements of Provision B are provided below.

<u>Provision B.1 (Watershed Management Areas)</u> requires the Copermittees to develop a Water Quality Improvement Plan for each of the Watershed Management Areas defined by the San Diego Water Board.

Pursuant to 40 CFR 122.26(d)(2)(iv), proposed management programs "*may impose controls on a…watershed basis…*" The Water Quality Improvement Plan is the Copermittees' proposed management program. A Water Quality Improvement Plan must be developed for each Watershed Management Area identified in the Order.

The Watershed Management Areas are identified in Table B-1. Table B-1 establishes ten (10) Watershed Management Areas, and identifies the Copermittees that are responsible for developing and implementing the Water Quality Improvement Plan for each Watershed Management Area.

The Copermittees from each of the three counties within the San Diego Region were phased in as their respective NPDES municipal storm water permits expired. Order No. R9-2007-0001 expired in January 2012, and the San Diego County Copermittees became covered under the Regional MS4 Permit on June 27, 2013, the effective date of the Order. Order No. R9-2009-0002 expired in December 2014, and the Orange County Copermittees became covered under the Regional MS4 Permit on April 1, 2015, the effective date of Order No. R9-2013-0001 as amended by Order No. R9-2015-0001. Order No. R9-2010-0016 expired in November 2015, and the Riverside County Copermittees became covered under the Regional MS4 Permit on January 7, 2016, the effective date of Order No. R9-2013-0001 as amended by Order No. R9-2015-0100.

The Cities of Laguna Woods, Laguna Hills, Murrieta, and Wildomar are located partially within the jurisdictions of both the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board) and the San Diego Water Board. Written requests for designation of a single Regional Water Board to regulate matters pertaining to permitting of Phase I MS4 discharges were submitted to the San Diego Water Board and the Santa Ana Water Board by the City of Laguna Woods by letter dated September 8, 2014, the City of Laguna Hills by letter dated March 12, 2014, the City of Murrieta by letter dated June 22, 2015, and the City of Wildomar by letter dated June 23, 2015. The Cities of Laguna Woods, Laguna Hills, Murrieta, and Wildomar requested designation of the San Diego Water Board pursuant to CWC section 13228.

The Cities of Laguna Woods, Laguna Hills, Murrieta, and Wildomar reported that management and implementation of municipal programs to comply with two different Phase I MS4 permits creates a significant administrative and financial burden and inhibits their ability to contribute to greater overall water quality improvements in either Region. In an effort to address these concerns, the San Diego Water Board and the Santa Ana Water Board have entered into written agreements, whereby the San Diego Water Board is designated to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Laguna Woods, Laguna Hills, Murrieta, and Wildomar including the portions of the jurisdictions within the Santa Ana Region. The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated February 10, 2015 to designate the San Diego Water Board to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Laguna Woods and Laguna Hills, including the portions of the jurisdictions within the Santa Ana Region, upon the later effective date of Order No. R9-2015-0001 or Santa Ana Water Board Tentative Order No. R8-2015-0001. The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated October 26, 2015 to designate the San Diego Water Board to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Murrieta and Wildomar, including the portions of the jurisdictions within the Santa Ana Region upon the effective date of Order R9-2015-0100.

Under the terms of the agreements, each Regional Water Board retains the authority to enforce provisions of the Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee (Water Code section 13228 (b)). Also under the terms of the agreements, any TMDL and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Laguna Woods, Laguna Hills, Murrieta, or Wildomar as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement of the applicable TMDL would remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's San Diego Creek/Newport Bay TMDL and Lake Elsinore/Canyon Lake Nutrient TMDLs, and the San Diego Water Board's Indicator Bacteria Project I Beaches and Creeks TMDL.

In conformance with the agreements, footnotes to Table B-1 are included to specify coverage under Order No. R9-2013-0001 for those Phase I MS4 discharges within the jurisdictional boundaries of the Cities of Laguna Woods, Laguna Hills, Murrieta, and Wildomar within the Santa Ana Region. Footnote 1 to Table B-1 specifies that the Cities of Laguna Woods and Laguna Hills are identified as responsible Copermittees in the San Diego Creek/Newport Bay TMDL in the Santa Ana Region and remain obligated to comply with the San Diego Creek/Newport Bay TMDL pursuant to section XVIII of Tentative Order No. R8-2015-0001 (NPDES No. CAS618030) and any reissuance thereof. Footnote 4 to Table B-1 specifies that the Cities of Murrieta and Wildomar are identified as responsible Copermittees in the Lake Elsinore/Canyon Lake Nutrient TMDLs in the Santa Ana Region and remain obligated to comply with the Lake Elsinore/Canyon Lake Nutrient TMDLs pursuant to section VI.D.2 of Order No. R8-2010-0033 (NPDES No. CAS618030) or corresponding section as it may be amended or reissued.

The Cities of Lake Forest and Menifee are located partially within the jurisdictions of both the Santa Ana Water Board and the San Diego Water Board. Written requests for designation of a single Regional Water Board to regulate matters pertaining to permitting of Phase I MS4 discharges were submitted to the San Diego Water Board and the Santa Ana Water Board by the City of Lake Forest by letters dated January 14, 2013 and April 4, 2014, and the City of Menifee by letter dated June 25, 2015. The Cities of Lake Forest and Menifee requested designation of the San Ana Water Board pursuant to CWC section 13228.

The Cities of Lake Forest and Menifee reported that management and implementation of municipal programs to comply with two different Phase I MS4 permits creates a significant administrative and financial burden and inhibits their ability to contribute to greater overall water quality improvements in either Region. In an effort to address these concerns, the San Diego Water Board and the Santa Ana Water Board have entered into written agreements, whereby the Santa Ana Water Board is designated to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Lake Forest and Menifee including the portions of the jurisdictions within the San Diego Region. The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated February 10, 2015 to designate the San Ana Water Board to regulate Phase I MS4 discharges within the jurisdiction of the City of Lake Forest, including portions of the jurisdiction within the Santa Diego Region, upon the later date of Order No. R9-2015-0001 or Santa Ana Water Board Tentative Order No. R8-2015-0001. The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated October 26, 2015 to designate the San Ana Water Board to regulate Phase I MS4 discharges within the jurisdiction of the City of Menifee, including portions of the jurisdiction within the San Diego Region, under Order No. R8-2010-0033 (NPDES No. CAS618030) as it may be amended or reissued upon the effective date of Order No. R9-2015-0100.

Under the terms of the agreements, each Regional Water Board retains the authority to enforce provisions of the Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee (Water Code section 13228 (b)). Also under the terms of the agreements, any TMDL and associated Phase I MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Lake Forest or Menifee as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement authority for the applicable TMDL would remain with the Regional Water Board which has the jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's San Diego Creek/Newport Bay TMDL and Lake Elsinore/Canyon Lake Nutrient TMDLs, and the San Diego Water Board's Indicator Bacteria Project I Beaches and Creeks TMDL.

In conformance with the agreements, Footnote 2 to Table B-1 has been included to specify that Phase I MS4 discharges within the jurisdictional boundaries of the City of Lake Forest located within the San Diego Region will be regulated under Santa Ana Water Board Order No. R8-2015-0001 (NPDES No. CAS618030) and any reissuance thereof. The footnote specifies that the City of Lake Forest is an identified responsible Copermittee in the Indicator Bacteria Project I Beaches and Creeks TMDL (Bacteria TMDL) in the San Diego Region and remains obligated to comply with the Bacteria TMDL pursuant to Attachment E of Order No. R9-2013-0001 and any reissuance thereto. The City of Lake Forest is also identified as a responsible Copermittee in the San Diego Creek/Newport Bay TMDL established by the Santa Ana Water Board. The City remains obligated to comply with the San Diego Creek/New Port Bay TMDL pursuant to the Santa Ana Water Board's Phase I MS4 Permit (Tentative Order No. R8-2015-0001 (NPDES No. CAS618030), as it may be amended or reissued). Under the terms of the agreement, the City of Lake Forest must retain and continue implementation of the over irrigation prohibition in Title 15, Chapter 15, Section 14.030, List (b) of the City Municipal Code throughout its jurisdiction. Also under the terms of the agreement, the City of Lake Forest must actively participate in the development and implementation of the South Orange County Watershed Management Area Water Quality Improvement Plan required pursuant to Order No. R9-2013-0001, and any reissuance thereof.

Footnote 3 to Table B-1 has been included to specify that Phase I MS4 discharges within the jurisdictional boundaries of the City of Menifee located within the San Diego Region will be regulated under Santa Ana Water Board Order No. R8-2010-0033 (NPDES No. CAS618033) and any reissuance thereof. At this time, the City of Menifee is not identified as a responsible Copermittee for any TMDLs established by the San Diego Water Board. Under the terms of the agreement, the City of Menifee must actively participate in the development and implementation of the Santa Margarita River Watershed Management Area Water Quality Improvement Plan required pursuant to Order No. R9-2013-0001, and any reissuance thereof.

The basis supporting the Cities of Laguna Woods, Laguna Hills, Lake Forest, Menifee, Murrieta, and Wildomar requests to designate a specific Regional Water Board for regulatory oversight of Phase I MS4 discharges may change under future conditions and circumstances, therefore the San Diego Water Board will periodically review the effectiveness of the agreements during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate one or both of the agreements with the Santa Ana Water Board or otherwise modify the agreements subject to the approval of the Santa Ana Water Board.

Provision B.2 (Priority Water Quality Conditions) requires the Copermittees in each Watershed Management Area to identify the highest priority water quality conditions which will be the focus of the Water Quality Improvement Plan implementation.

Provisions B.2.a and B.2.b provide the criteria that must be assessed when characterizing the receiving water quality and potential impacts from MS4 discharges of the receiving waters within the Watershed Management Area. The criteria are based primarily on the requirements in 40 CFR 122.26(d)(1)(iv)(C) and (C)(1)-(9). Characterizing the receiving water quality and identifying the potential impacts caused by MS4 discharges to receiving waters in the Watershed Management Area is necessary to identify the impacts to receiving waters associated with MS4 discharges that are of the most concern to the Copermittees.

Based on the information required to be considered under Provisions B.2.a and B.2.b, Provision B.2.c requires to Copermittees to identify the highest priority water quality conditions related to discharges from the MS4s that will be the primary focus of the Water Quality Improvement Plan in the Watershed Management Area. Addressing and improving these highest priority water quality conditions will become the focus of each Copermittee's jurisdictional runoff management program as the Water Quality Improvement Plan is implemented in the Watershed Management Area. The highest priority water quality conditions are expected to include sources of pollutants and/or stressors, and/or receiving water conditions, that the Copermittees consider the highest threats or most likely to have adverse impacts on the physical, chemical, and biological integrity of receiving waters. Addressing these threats and/or adverse impacts should restore the physical, chemical, and biological integrity of receiving waters, and result in the restoration and protection of the beneficial uses of the receiving waters in the Watershed Management Area.

Provision B.2.d requires the Copermittees to identify known and suspected sources of pollutants and/or stressors contributing to the highest priority water quality conditions. The requirements of Provision B.2.d are based primarily on the requirements in 40 CFR 122.26(d)(1)(iii)(B)(1)-(6). The Copermittees are required to evaluate several factors in the identification of those sources. The Copermittees must consider and evaluate the following: (1) the land uses that may contribute toward impacts to receiving waters, (2) the locations of the Copermittees' MS4s that can convey and discharge runoff and pollutants to receiving waters, (3) other sources that discharge

into the Copermittees' MS4s and receiving waters, and (4) other information and data that can help the Copermittees to evaluate the relative importance of or contribution from those sources toward the highest priority water quality conditions. Identifying the known and suspected sources, and their relative contribution toward the highest priority water quality conditions, will help the Copermittees to focus, direct, and prioritize their resources and implementation efforts within their jurisdictions.

Provision B.2.e requires the Copermittees to identify potential strategies that can result in improvements to water quality in MS4 discharges and/or receiving waters within the Watershed Management Area. Potential water quality improvement strategies will not necessarily be implemented by the Copermittees, but provide a "menu" of options that the Copermittees will consider for implementation. The public participation process that will be implemented during the development of the Water Quality Improvement Plan is where the potential water quality improvement strategies will be identified.

Provision B.3 (Water Quality Improvement Goals, Strategies and Schedules) requires the Copermittees in each Watershed Management Area to identify the goals that the Copermittees' jurisdictional runoff management programs will work toward achieving to address and improve the highest priority water quality conditions identified under Provision B.2.c; the strategies that will be implemented by the Copermittees within their jurisdictions and the Watershed Management Area to achieve the goals; and, the schedules for implementing the strategies and achieving the goals. The element of the Water Quality Improvement Plan required under Provision B.3 is where the "*comprehensive planning*" and "*intergovernmental coordination*" [40 CFR 122.26(d)(2)(iv)] of the Copermittees' actions for the proposed management programs within the Watershed Management Area is required to be described.

Provision B.3.a requires the Copermittees to identify interim and final numeric goals, and schedules to achieve those goals as part of the Water Quality Improvement Plans. Provision B.3.a.(1) requires the Copermittees to identify two types of numeric goals to be achieved:

(1) Final numeric goals in the receiving waters and/or MS4 discharges that will result in the protection of the water quality standards of the receiving waters for the highest priority water quality conditions identified by the Copermittees for Provision B.2.c. These final numeric goals are the ultimate goals for the Water Quality Improvement Plan, and the achievement and maintenance of these final numeric goals will indicate that one or more beneficial uses have been successfully restored and/or protected from MS4 discharges.

(2) Interim numeric goals that can be used by the Copermittees to demonstrate progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges for the highest priority water quality conditions in the Watershed Management Area. Achievement of the interim numeric goals will demonstrate to the San Diego Water Board that the Copermittees' implementation efforts are progressing toward achieving the final numeric goals.

Provision B.3.a.(1) does not specify what the interim and final numeric goals must be based on, but they essentially must be designed to achieve compliance with water quality standards in the receiving waters. To that end, the interim goals must be based on measureable criteria or indicators capable of demonstrating progress toward achieving the numeric goals.

The interim and final numeric goals can be based on the water quality objectives in the Basin Plan. The water quality objectives in the Basin Plan, however, consist of numeric and narrative water quality objectives. Numeric water quality objectives can be directly used as numeric goals. Narrative water quality objectives, on the other hand, will require some interpretation to identify numeric goals. The achievement of multiple numeric goals based on the water quality objectives, used in combination, may be necessary to demonstrate that beneficial uses have been restored and/or protected.

The Copermittees could also propose other numeric goals that are not necessarily water quality objectives from the Basin Plan. For example, the Copermittees could propose a numeric goal that consists of achieving some percent improvement of a measureable indicator, such as acreage of a specific habitat or increase in a specific plant or animal species population. Other examples may include pollutant load reductions, number of impaired waterbodies delisted from the List of Water Quality Impaired Segments, Index of Biological Integrity (IBI) scores, etc.

The Copermittees may choose to develop interim numeric goals based on the final numeric goals they develop, such as incremental steps toward ultimately achieving the final numeric goals. The Copermittees may also choose to develop interim numeric goals that are based on other measureable indicators that can indirectly indicate improvements and progress toward the final numeric goals.

There are no limits to the types of interim numeric goals that could be proposed by the Copermittees, other than the goals must be based on measureable criteria or indicators capable of demonstrating progress toward achieving the numeric goals. Likewise, there are no limits to the types of final numeric goals that could be proposed by the Copermittees, other than the goals must "*restore and protect the water quality standards of the receiving waters.*"

Finally, Provision B.3.a.(2) also requires the Copermittees to develop schedules for measuring progress and achieving the interim and final numeric goals. Several criteria are included for the development of the schedules, but the Copermittees are required to achieve the numeric goals as soon as possible, consistent with federal NPDES regulations (40 CFR 122.47(a)(1)).

The Copermittees are also required to incorporate any compliance schedules for applicable ASBS or TMDL requirements. Applicable ASBS and TMDL compliance schedules are set forth in Attachment A and Attachment E to the Order, respectively.

The information provided by the Copermittees under Provision B.3.a.(2) will be used by the Copermittees and the San Diego Water Board to gauge and track the progress of the Copermittees' efforts in addressing the highest priority water quality conditions identified in the Water Quality Improvement Plan.

Provision B.3.b requires the Copermittees to identify the strategies and schedules to implement those strategies as part of the Water Quality Improvement Plans. Provision B.3.b requires the Copermittees to identify the water quality improvement strategies that will be and may be implemented within the Watershed Management Area to 1) reduce pollutants in storm water discharged from the MS4 to the MEP, 2) effectively prohibit non-storm water discharges from entering the MS4, 3) protect water quality standards in receiving waters by controlling MS4 discharges so that they do not cause or contribute to exceedances of receiving water limitations, and 4) achieve applicable WQBELs that implement TMDLs. The Copermittees will select the strategies to be implemented based on the likely effectiveness and efficiency of the potential water quality improvement strategies identified under Provision B.2.e to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, and/or achieve the interim and final numeric goals identified under Provision B.3.a.

Provision B.3.b.(1) requires each Copermittee to identify the strategies that will be or may be implemented within its jurisdiction. Each Copermittee is required to describe the strategies it is committed to implementing as part of its jurisdictional runoff management requirements under Provisions E.2 through E.7, and the optional jurisdictional strategies that the Copermittee will implement, as necessary, to achieve the numeric goals.

Each Copermittee is expected to implement the optional jurisdictional strategies identified under Provisions B.3.b.(1)(b) when the jurisdictional strategies it has committed to implement under Provision B.3.b.(1)(a) are not making adequate progress toward the interim and final numeric goals in accordance with the schedules established under Provision B.3.a. Provision B.3.b.(1)(b)(v) requires each Copermittee to describe the circumstances necessary to trigger implementation of the optional jurisdictional strategies, in addition to the requirements of Provisions B.3.b.(1)(a).

The San Diego Water Board recognizes that there may be optional jurisdictional strategies that will likely require funding and/or resources for planning, permitting, procurement of labor and materials, and implementation. Thus, Provision B.3.b.(1)(b)(iv) requires each Copermittee to describe the funding and/or resources that are necessary to implement these optional jurisdictional strategies. This information may provide interested groups and members of the public an understanding of the resources that they could provide or assist in obtaining to implement these optional jurisdictional strategies.

Provision B.3.b.(2) requires the Copermittees in the Watershed Management Area to identify the regional or multi-jurisdictional strategies that may be implemented, as necessary, to achieve the numeric goals. Similar to the requirements of Provision B.3.b.(1)(b), these regional or multi-jurisdictional strategies will likely require funding and/or resources for planning, permitting, procurement of labor and materials, and implementation, and San Diego Water Board recognizes that these strategies may be difficult to implement with only Copermittee resources. Thus, Provision B.3.b.(2)(d) requires the Copermittees to describe the funding and/or resources necessary to implement these optional regional or multi-jurisdictional strategies. This information may provide interested groups and members of the public an understanding of the resources that they could provide or assist in obtaining to implement these optional regional or multi-jurisdictional strategies.

Provision B.3.b.(3) requires the Copermittees to develop and include schedules in the Water Quality Improvement Plan for implementing the water quality improvement strategies identified under Provisions B.3.b.(1) and B.3.b.(2). The schedule for implementing the water quality improvement strategies will be used by the Copermittees and San Diego Water Board to measure and demonstrate the progress of the Copermittees' implementation efforts toward reducing pollutants in storm water discharged from the MS4 to the MEP, and eliminating illicit non-storm water discharges from entering the MS4.

Provision B.3.b.(4) provides the Copermittees in each Watershed Management Area the option of implementing watershed-specific structural BMP requirements for Priority Development Projects. Historically, storm water permits have included very specific performance standards for permanent, structural BMPs. These standards describe the expectation for the capture or treatment of pollutants and control of excessive flow before storm water is discharged from a site. The Copermittees were also allowed to develop waiver programs for Priority Development Projects to avoid implementing the structural BMPs; however, the waiver programs were not necessarily tied into any sort of holistic watershed strategy. The result is that implementation of BMP requirements is largely done on a site-by-site basis. This requires proper design on the part of the Priority Development Project and strict oversight on the part of the Copermittee.

Provision B.3.b.(4) promotes the evaluation of multiple strategies for water quality improvement, in addition to the implementation of permanent structural BMPs, on a watershed-scale versus the site-by-site approach. In a report issued by the Southern California Coastal Water Research Project (SCCWRP) and several other research institutions, the report emphasized that a successful hydromodification management program will involve watershed analysis as a first step, and that integrating multiple watershed-based strategies is preferable over a site-by-site approach. Indeed, the report states that the watershed analysis "…*should lead to identification of existing opportunities and constraints that can be used to help prioritize areas of greater concern, areas of restoration potential, infrastructure constraints, and pathways for*

potential cumulative effects."[22] Provision B.3.b.(4) promotes the findings and recommendations of the report by providing a pathway for Copermittees to develop an integrated approach to their land development programs.

Under Provision B.3.b.(4), the Copermittees in a Watershed Management Area must first perform an analysis by gathering as much information pertaining to the physical characteristics of the Watershed Management Area as possible. This includes, for example, identifying potential areas of coarse sediment supply, present and anticipated future land uses, and locations of physical structures within receiving streams and upland areas that affect the watershed hydrology (such as bridges, culverts, and flood management basins). Once this information is collected, the Copermittees must produce GIS layers (maps) that include this information.

From there, the Copermittees must use the results of the Watershed Management Area Analysis to identify and compile a list of candidate projects that could potentially be used as alternative compliance options for Priority Development Projects. Such projects include, for example, opportunities for stream or riparian area rehabilitation, opportunities for retrofitting existing infrastructure to incorporate storm water retention or treatment, and opportunities for regional BMPs, among others. Once these candidate projects are identified, Copermittees may allow Priority Development Projects to fund, partially fund, or completely implement these candidate projects. The Copermittees must first find that implementing such a candidate project would provide greater overall benefit to the watershed than requiring implementation of the structural BMPs onsite, and also enter into a voluntary agreement with the Priority Development Project that authorizes this arrangement. The Copermittees may use Provision B.3.b.(4) as both 1) a mechanism to reach their stated goals of the Water Quality Improvement Plan by using Priority Development Projects to either fund or implement projects that will provide water quality benefit, and 2) an alternative to requiring strict adherence to the structural BMP design standards.

Additionally, Provision B.3.b.(4) allows the Copermittees to use the results of the Watershed Management Area Analysis to identify areas within the Watershed Management Area where it is appropriate to allow Priority Development Projects to be exempt from the hydromodification management BMP performance requirements. Provision E.3.c.(2) already allows exemptions for Priority Development Projects that discharge to a conveyance channel whose bed and bank are concrete lined from the point of discharge to an enclosed embayment or the Pacific Ocean. However, there may be cases where further exemptions are warranted. The Copermittees may identify such cases on a watershed basis and include them in the Watershed Management Area Analysis; however, they must provide the supporting rationale to support all claims for exemptions.

[22] 2012. ED Stein, F Federico, DB Booth, BP Bledsoe, C Bowles, Z Rubin, GM Kondolf, A Sengupta. Technical Report 667. Southern California Coastal Water Research Project. Costa Mesa, CA.

Provision B.3.b.(4) provides an innovative pathway for Copermittees to regulate their land development programs by allowing alternative compliance in lieu of implementing structural BMPs on each and every Priority Development Project. This approach facilitates the integration of watershed-scale solutions for improving overall water quality and assisting Copermittees to achieve their stated goals of the Water Quality Improvement Plan. The San Diego Water Board understands, however, that undertaking this approach, which involves extensive planning, could be resource intensive for the Copermittees. Therefore, the Watershed Management Area Analysis is optional and not a requirement. The Copermittees can choose not to perform the watershed planning and mapping exercise described in Provision B.3.b.(4), and instead choose to require strict implementation of the structural BMPs onsite, pursuant to Provision E.3.c.

Provision B.3.c is included to provide the Copermittees an option that allows the Copermittees to be deemed in compliance with the prohibitions and limitations (receiving water limitations) of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b. One or more Copermittees within a Watershed Management Area can choose to implement this option. This option is only expected to be utilized by a Copermittee that wishes to be deemed in compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b.

The alternative compliance pathway option included in Provision B.3.c is consistent with the approach described in Order WQ 2015-0075, *In the Matter of Review of Order No. R4-2012-0175, NPDES Permit No. CAS004001, Waste Discharge Requirements for Municipal Separate Storm Sewer System (MS4) Discharges within the Coastal Watersheds of Los Angeles County, Except Those Discharges Originating from the City of Long Beach MS4,* adopted by the State Water Board on June 16, 2015. State Water Board Order WQ 2015-0075 directs the Regional Water Boards to consider a watershed-based planning and implementation approach to compliance with receiving water limitations when issuing Phase I MS4 permits going forward. Order WQ 2015-0075 included seven principles that the Regional Water Boards are expected to follow when incorporating an alternative compliance pathway into a MS4 permit. The San Diego Water Board incorporated the seven principles stipulated in State Water Board Order WQ 2015-0075 into the Regional MS4 Permit as follows:

1. Provision A of this Order continues to require compliance with water quality standards in the receiving water and does not deem good faith engagement in the iterative process to constitute compliance with receiving water limitations. Provision A of this Order continues to be consistent with the receiving water limitations provisions from State Water Board Order WQ 99-05.

2. Compliance with Provision B.3.c constitutes compliance with the requirements of the Provision A.3.b, which requires compliance with the WQBELs of the TMDLs in Attachment E to the Order, and is considered compliance with receiving water limitations for those TMDL water body-pollutant combinations.

3. Provision B.3.c is an ambitious, rigorous, and transparent alternative compliance pathway that allows a Copermittee appropriate time to come into compliance with receiving water limitations without being in violation of the receiving water limitations during implementation of the compliance alternative.

4. Provision B.3.c requirements are incorporated into a Water Quality Improvement Plan. Water Quality Improvement Plans are a watershed-based planning and implementation approach, which address multiple contaminants, and incorporate TMDL requirements.

5. The strategies required to be included in the Water Quality Improvement Plans promote and incentivize the use of green infrastructure and requires the implementation of low impact development principles.

6. The strategies required to be included in the Water Quality Improvement Plans encourage multi-benefit regional projects that capture, infiltrate, and reuse storm water and support a local sustainable water supply.

7. The alternative compliance pathway of Provision B.3.c includes rigor and accountability. The Copermittee is required, through a transparent public process, to demonstrate that water quality issues in the watershed have been analyzed and prioritized, and that appropriate solutions are proposed. The Copermittee is also required, through a transparent process, to monitor the results and return to their analysis to verify assumptions and update the solutions. The Copermittee is required to conduct this type of adaptive management on its own initiative without waiting for direction from the San Diego Water Board.

In order for a Copermittee to utilize this option, the Copermittee is required to include three components in the Water Quality Improvement Plan. The first component is a comprehensive set of numeric goals and schedules that will demonstrate the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b will be achieved within a specified period of time. The criteria provided in the Order will require the Copermittee to demonstrate that the discharges from its MS4s will not cause or contribute to exceedances of water quality objectives in the receiving waters, and/or the receiving waters will be adequately protected from adverse impacts attributable to the Copermittee's MS4 discharges. The Copermittee is also required to specify annual milestones to be achieved each year, which adds rigor, accountability, and transparency to the process. The annual milestones may consist of water quality improvement strategy implementation phases, interim numeric goals, and other acceptable metrics, which are expected to build upon previous milestones and lead to the achievement of the final numeric goals.

The second component is an analysis to demonstrate that implementation of the water quality improvement strategies required under Provision B.3.b will achieve the numeric goals within the established schedules required under Provisions B.3.a and B.3.c.(1).

Because the development of the analysis may require significant resources, the Order allows the Copermittees in each Watershed Management Area that choose to implement this option to perform the analysis individually, or pool their resources for the analysis collectively.

The analysis must “reasonably” and “quantitatively” demonstrate that the implementation of the water quality improvement strategies can achieve the numeric goals within the established schedules. However, as more data and information are collected during implementation of the Water Quality Improvement Plan to demonstrate progress toward achieving the numeric goals, the numeric goals, water quality improvement strategies and schedules may need to be modified. If the data and information indicate that modification is needed, the Copermittee must also update the analysis. With the exception of numeric goals and schedules associated with TMDLs from Attachment E to the Order, the modification to the analysis would be allowed as part of the adaptive management process of the Water Quality Improvement Plan. For TMDLs, modification of numeric goals or schedules would likely require an amendment to the Basin Plan and Attachment E to the Order before the analysis and Water Quality Improvement Plan could include such modifications.

Thus, the third component is the key component that allows a Copermittee to demonstrate the implementation of the water quality improvement strategies within its jurisdiction is making progress toward achieving the final numeric goals. Each Copermittee must specify the monitoring and assessments that will be performed to confirm that implementation of the water quality improvement strategies are making progress toward achieving the numeric goals within the established schedules, and whether the interim and final numeric goals have been achieved.

These three components must then be reviewed by the Water Quality Improvement Consultation Panel. The Water Quality Improvement Consultation Panel is required to be formed as part of the public participation process for the development of the Water Quality Improvement Plans. The Water Quality Improvement Consultation Panel is described under Provision F.1.a.(1)(b). Review by the Water Quality Improvement Consultation Panel is included to provide an additional layer of input, support, and accountability for the implementation of this option.

Compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b begins when the Water Quality Improvement Plan, incorporating the requirements of Provision B.3.c.(1), is accepted by the San Diego Water Board. Each Copermittee that chooses to implement and continues to implement this option will be deemed in compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b as long as the Copermittee continues to implement the strategies, monitoring and assessments as incorporated in the Water Quality Improvement Plan in accordance with Provision B.3.c.(1), and the Copermittee reports the achievement of the annual milestones each year, or provides acceptable rationale and recommends appropriate modifications to the interim numeric goals, and/or water quality improvement

strategies, and/or schedules to improve the rate of progress toward achieving the final numeric goals. The Copermittee continues to be deemed in compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b during the time the San Diego Water Board reviews the rationale and recommended modifications to the interim numeric goals, and/or water quality improvement strategies, and/or schedules. If and when the San Diego Water Board determines that it does not accept the rationale or recommendations, the Copermittee will be notified they are no longer deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b.

Provision B.4 (Water Quality Improvement Monitoring and Assessment) requires the Copermittees to develop an integrated monitoring and assessment program to track the progress of the Water Quality Improvement Plan toward meeting the implementation goals and schedules, and improving the water quality of the Watershed Management Area. Provision B.4 is the part of the Water Quality Improvement Plan where the Copermittees describe the monitoring data that will be collected, which is not only necessary to implement the "iterative approach" required by Provision A.4, but inform the adaptive management and "*comprehensive planning process*" that allows the Copermittees to make adjustments and modifications to the Water Quality Improvement Plans and the jurisdictional runoff management programs.

Provision B.4 requires the Copermittees, at a minimum, to include the requirements of Provision D as part of the water quality improvement monitoring and assessment program for the Water Quality Improvement Plan. The Copermittees, however, are not limited to the requirements of Provision D and may include additional monitoring and assessment methods to track progress toward improving water quality in the Watershed Management Area.

In addition to incorporating the requirements of Provision D, the water quality improvement monitoring and assessment program must incorporate any monitoring and assessment requirements specified for any applicable TMDLs included in Attachment E to the Order, and the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 for Watershed Management Areas with ASBS.

The monitoring and assessments required to be incorporated into the Water Quality Improvement Plan are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order.

Provision B.5 (Iterative Approach and Adaptive Management Process) requires the Copermittees to implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a.

Provision B.5 requires the Copermittees in each Watershed Management Area to re-evaluate the highest priority water quality conditions and potential water quality

improvement strategies, the water quality improvement goals, strategies and schedules, and the water quality improvement monitoring and assessment program and provide recommendations for modifying those elements to improve the effectiveness of the Water Quality Improvement Plan. The re-evaluation of the Water Quality Improvement Plan is part of the assessment requirements of Provision D.

Provision B.6 (Water Quality Improvement Plan Submittal, Updates, and Implementation) requires to Copermittees to submit, update, and implement the Water Quality Improvement Plans.

The requirements for the process to develop and submit the Water Quality Improvement Plans is described in more detail under the discussion for Provision F.1. The process will include several opportunities for the public to provide input during the development of the Water Quality Improvement Plans. The process for updating the Water Quality Improvement Plans is described in more detail under the discussion for Provision F.3.c. Upon acceptance of the Water Quality Improvement Plan and updates, the Copermittees are required to immediately begin implementing the Water Quality Improvement Plan and subsequent updates.

The Water Quality Improvement Plan is expected to be a dynamic document that will evolve over time. The Water Quality Improvement Plan is also expected to be a long term plan that focuses the Copermittees' efforts and resources on a limited set of priority water quality conditions, with the ultimate goal of protecting all the beneficial uses of the receiving waters within the Watershed Management Area from impacts that may be caused or contributed to by MS4 discharges. As the Copermittees collect data, implement their jurisdictional runoff management programs, and review the results from their water quality improvement monitoring and assessment program, the Water Quality Improvement Plan is expected to be continually reviewed and updated until compliance with Provisions A.1.a, A.1.b, and A.2.a is achieved.

However, in specific cases supported by robust analytical documentation the implementation of the Water Quality Improvement Plans may demonstrate that TMDLs are not necessary for identified impaired water bodies within the Watershed Management Area if the analytical record demonstrates that technology-based effluent limitations required by the CWA, more stringent effluent limitations required by state, local, or federal authority, and/or other pollution control requirements (e.g., best management practices) required by local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time.[23]

The San Diego Water Board submits an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region.

[23] 40 CFR 130.7(b)(1)

According to USEPA guidance for the Integrated Report,[24] water bodies are placed in one of five categories. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 are placed on the 303(d) List.

Category 4 in the Integrated Report is for water bodies where available data and/or information indicate that at least one beneficial use is not being supported or is threatened, but a TMDL is not needed.[25] Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

Impaired water bodies can be included in Category 4a if a TMDL has been adopted and approved. The TMDLs in Attachment E to the Order implement the requirements of the TMDLs adopted by the San Diego Water Board, and approved by the State Water Board and USEPA. The water bodies in Attachment E will be included in Category 4a in the Integrated Report and removed from the 303(d) List.

Impaired water bodies can be included in Category 4b if there are *acceptable* "pollution control requirements" required by a local, state or federal authority stringent enough to implement applicable water quality standards within a reasonable period of time (e.g., a compliance date is set). When evaluating whether a particular set of pollution controls are "requirements," the USEPA considers a number of factors, including: (1) the authority (local, state, federal) under which the controls are required and will be implemented with respect to sources contributing to the water quality impairment (examples may include: self-executing state or local regulations, permits, and contracts and grant/funding agreements that require implementation of necessary controls), (2) existing commitments made by the sources and completion or soon to be completed implementation of the controls (including an analysis of the amount of actual implementation that has already occurred), (3) the certainty of dedicated funding for the implementation of the controls, and (4) other relevant factors as determined by USEPA depending on case-specific circumstances.[26]

Impaired water bodies can be included in Category 4c if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution. Pollution, as defined by the CWA is "the man-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of water."[27] In

[24] USEPA, 2005. Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act
[25] Ibid
[26] Ibid
[27] CWA section 502(19)

other cases, pollution does not result from a pollutant and a TMDL is not required. Examples of circumstances where an impaired segment may be placed in Category 4c include segments impaired solely due to lack of adequate flow, stream channelization, or hydromodification. In these situations, there may be water quality management actions that can address the cause(s) of the impairment, but a TMDL may not be required to implement the actions.

The Water Quality Improvement Plans will require the implementation of pollution controls and water quality management actions (i.e. water quality improvement strategies) which can result in the attainment of water quality standards in water bodies impaired by discharges from the Copermittees' MS4s. The Water Quality Improvement Plans also include requirements that are expected to attain water quality standards in a reasonable period of time. The San Diego Water Board considers the Water Quality Improvement Plans to be a commitment by the Copermittees to develop, plan, budget for, and implement pollution controls that will attain water quality standards in receiving waters in a reasonable period of time, or as soon as possible. The results of the Copermittees' efforts in implementing the Water Quality Improvement Plans can be used to re-evaluate the condition of the impaired water bodies during the next update to the 303(d) List.

After the Copermittees submit the Water Quality Improvement Plans and demonstrate that water quality standards are being attained or will be attained in a reasonable period of time, the San Diego Water Board may re-evaluate the water bodies on the 303(d) List. These water bodies on the 303(d) List may be re-evaluated and placed into Category 4b or Category 4c in the Integrated Report. The water bodies placed in Category 4b or Category 4c in the Integrated Report must show a record that the water bodies are attaining water quality standards or supporting the identified beneficial uses, or will attain water quality standards or support identified beneficial uses in a reasonable period of time, in order for the water bodies to be appropriately removed from the 303(d) List.

C. Action Levels

Purpose: Provision C includes requirements for the Copermittees to identify and include numeric action levels in the Water Quality Improvement Plan to direct and focus the Copermittees' jurisdictional runoff management program implementation efforts for controlling MS4 discharges to receiving waters.

***Discussion*:** Under Provision C, the numeric action levels required are for non-storm water discharges and storm water discharges. The non-storm water action levels (NALs) are applicable to non-storm water discharges from the Copermittees' MS4s, which can occur year-round. The storm water action levels (SALs) are applicable to storm water discharges from the Copermittees' MS4s, which occur during the rainy season defined as the period between October 1 and April 30.

The action levels required by Provision C are based on the action level requirements that were developed and incorporated into Order Nos. R9-2009-0002 and R9-2010-0016, the Orange County and Riverside County MS4 Permits, respectively. The Fact Sheets for these Orders provide detailed discussions about the development of the numeric NALs and SALs included in this Order.

Order Nos. R9-2009-0002 and R9-2010-0016 required the Copermittees to perform prescribed actions if the NALs or SALs are exceeded. The actions required under Order Nos. R9-2009-0002 and R9-2010-0016 generally included conducting additional monitoring and source investigations when a discharge from the MS4 is observed to exceed one or more NALs and/or SALs.

For this Order, however, the action levels of Provision C are to be used by the Copermittees to prioritize the actions to be implemented as part of the Water Quality Improvement Plan. Monitoring data collected by the Copermittees from MS4 outfalls will be compared with the NALs and SALs. Exceedances of the NALs and SALs will not require the Copermittees to immediately identify sources causing exceedances, but will provide some numeric indicator levels that can give the Copermittees a way to measure the relative severity of a pollutant contributing to receiving water quality impacts.

NALs and SALs must be included in the Water Quality Improvement Plans to be used by the Copermittees in directing and focusing their water quality improvement strategies. The Copermittees are expected to utilize the NALs and SALs to help focus their implementation efforts on addressing pollutants that have the most significant potential or observed impacts to receiving waters. The NALs and SALs will be used as part of the MS4 discharges assessments required under Provision D.4.b. The NALs and SALs may also be used by the Copermittees as the numeric goals to be achieved in MS4 discharges and/or receiving waters as the Water Quality Improvement Plans are implemented.

More specific and detailed discussions of the requirements of Provision C are provided below.

Provision C.1 (Non-storm Water Action Levels) requires the Copermittees to incorporate NALs into the Water Quality Improvement Plan for pollutants and/or constituents that are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions identified in the Water Quality Improvement Plan related to non-storm water discharges from the MS4s. NALs generally must be consistent with the water quality objectives found within the Basin Plan.

The NALs have been included to ensure that the Copermittees are implementing and complying with several requirements of the MS4 permit. The federal CWA requires permits for municipal storm sewer systems to "*effectively prohibit non-storm water discharges into the storm sewers*." The federal NPDES regulations, which were promulgated to implement the CWA requirements for discharges from municipal storm sewers, require a program to address illicit discharges, which are non-storm water discharges. Provision A.1.b prohibits "*[n]on-storm water discharges into MS4s*" unless the non-storm water discharge authorized by a separate NPDES permit. The NALs will be used as part of the illicit discharge detection and elimination program required pursuant to Provision E.2, as well as part of the MS4 discharges assessments required pursuant to Provision D.4.b.

Provision A.1.a prohibits non-storm water discharges from the MS4 from "*causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state.*" In addition, pursuant to Provision A.2.a, non-storm water discharges "*must not cause or contribute to the violation of water quality standards in any receiving waters*."

Ideally, the Copermittees' jurisdictional runoff management programs will eliminate all non-storm water discharges entering the MS4s within their jurisdictions. The complete elimination of non-storm water discharges to the Copermittees' MS4s would be in compliance with the CWA requirements for non-storm water discharges, as well as the prohibitions and limitations of Provisions A.1.a and A.2.a.

The federal regulations, however, also refer to several non-storm water discharge categories that must be addressed as illicit discharges if they are found to be a source of pollutants. The federal regulations thus identify some non-storm water discharges that are not required to be addressed as illicit discharges if they are not a source of pollutants (e.g. non-storm water discharges specified in Provisions E.2.a.(1)-(5)). Thus, these regulations imply that some non-storm water discharges into and from the MS4 may occur even if non-storm water discharges are "effectively" prohibited by the Copermittees.

If the source of a non-storm water discharge is identified as a category of non-storm water specified in Provisions E.2.a.(1)-(5), the NALs can be used to determine if the category of non-storm water discharges is a source of pollutants. For other non-storm water discharges not specified in Provisions E.2.a.(1)-(5), the CWA requires those discharges to be "*effectively"* prohibited by removing the discharge to the MS4 through enforcement of the Copermittees' legal authority established under "*ordinance, order or similar mean*s" to prohibit illicit discharges to the MS4s.

If there are non-storm water discharges that are not required to be addressed as illicit discharges, those discharges must comply, at a minimum, with the discharge prohibitions and receiving water limitations of Provision A. Thus, the non-storm water discharges from the MS4 must be at levels that will not cause or contribute to a condition of pollution, contamination, or nuisance (Provision A.1.a), and must not cause or contribute to a violation of water quality standards in receiving waters (Provision A.2.a) to be consistent with the discharge prohibitions and receiving water limitations of Provisions A.1.a and A.2.a.

Furthermore, the San Diego Region has predominantly intermittent and ephemeral rivers and streams which vary in flow volume and duration at spatial and temporal scales. For most of these river and stream systems, non-storm water discharges from the MS4 are likely to be the most significant or the only source contributing to surface flows present within the receiving water, especially during the dry season.

Therefore, because of the prohibitions and limitations of Provision A.1.a and A.2.a, and the likelihood that non-storm water discharges from the MS4 are the most significant or only source contributing to surface flows present within the receiving water, NALs generally must be consistent with the water quality objectives found within the Basin Plan. Non-storm water discharges that are meeting the NALs would not be expected to cause or contribute to an exceedance of water quality objectives in receiving waters, which would be consistent with the discharge prohibitions and receiving water limitations of Provisions A.1.a and A.2.a.

Exceedances of the NALs would then provide an indication of the relative severity of a pollutant in non-storm water discharges from the MS4 contributing to potential or observed receiving water quality impacts. The relative severity or significance of a pollutant in non-storm water discharges from the MS4 will provide the Copermittees a valuable source of information that can be used to identify priority water quality conditions within a Watershed Management Area and within each Copermittee's jurisdiction.

Tables C-1 through C-4 under Provision C.1.a specify numeric NALs for several parameters or pollutant constituents for non-storm water discharges from the MS4 to several water body types. The NALs for MS4 discharges given under Provision C.1.a are based on the water quality objectives for inland surface waters in the Basin Plan, and the water quality objectives for ocean waters in the Ocean Plan. The NALs for

most of the metals were calculated based on the State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP). The NALs provided in Tables C-1 through C-4 must be included in the Water Quality Improvement Plans required to be developed pursuant to Provision B.

Provision C.1.b requires the Copermittees to identify NALs for pollutants and/or constituents, not specified in Provision C.1.a, which are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions of the Watershed Management Area related to non-storm water discharges from the MS4s. The NALs must be based on the water quality objectives in the Basin Plan. The NALs identified under Provision C.1.b must be included in the Water Quality Improvement Plan.

The San Diego Water Board recognizes that some of the NALs required pursuant to Provisions C.1.a and C.1.b may be exceeded more frequently than not. Thus, Provision C.1.c has been included in the Order to provide the Copermittees the option to develop secondary NALs that are set at levels greater than the levels required pursuant to Provisions C.1.a and C.1.b to further refine the prioritization and assessment of water quality improvement strategies for addressing non-storm water discharges to and from the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and from the MS4.

<u>Provision C.2 (Storm Water Action Levels)</u> requires the Copermittees to incorporate SALs into the Water Quality Improvement Plan for pollutants and/or constituents causing or contributing, or may be causing or contributing, to the highest priority water quality conditions identified in the Water Quality Improvement Plan related to storm water discharges from the MS4s.

The SALs have been included to ensure that the Copermittees are implementing and complying with several requirements of the MS4 permit. Provision A.1.a prohibits storm water discharges from the MS4 from "*causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state.*" In addition, pursuant to Provision A.2.a, storm water discharges "*must not cause or contribute to the violation of water quality standards in any receiving waters*."

Provision A.3.a, however, implicitly acknowledges that compliance with Provisions A.1.a and A.2.a cannot be achieved immediately for discharges of storm water from the MS4 by applying the MEP standard. Thus, Provision A.4 requires the Copermittees to implement an iterative approach to demonstrate that MEP is being achieved. This approach is supported by USEPA.

The federal CWA requires permits for municipal storm sewer systems to "*require controls to reduce the discharge of pollutants [in storm water] to the maximum extent practicable*, *including management practices, control techniques and system, design*

and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants." MEP is an ever-evolving, flexible, and advancing concept. As knowledge about controlling storm water runoff and discharges evolves, so does the knowledge which constitutes MEP. Reducing the discharge of storm water pollutants from the MS4 to the MEP requires the Copermittees to assess their jurisdictional runoff management programs and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP. The SALs provide the Copermittees measureable goals that may be used to demonstrate the achievement of MEP for reducing pollutants in storm water discharges from the MS4. The SALs will be used as part of the MS4 discharges assessments required under Provision D.4.a.

In June of 2006, the State Water Board's Blue Ribbon Storm Water Panel released its report titled "*The Feasibility of Numerical Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities*." In the recommendations, the Blue Ribbon panel proposed storm water effluent limitations which are computed using statistical based population approaches. The SALs specified in Table C-5 under Provision C.2.a were developed from a regional subset of nationwide Phase I MS4 data by using USEPA Rain Zone 6 (arid west) data.[28] Additionally, utilization of regional data is appropriate due to the addition of data into the nationwide Phase I MS4 monitoring dataset in February 2008. This additional data increased the number of USEPA Rain Zone 6 samples to more than 400, and included additional monitoring events within Southern California.

Utilizing data from USEPA Rain Zone 6 resulted in SALs which closely reflect the environmental conditions experienced in the San Diego Region. The localized subset of data includes sampling events from multiple Southern California locations including Orange, San Diego, Riverside, Los Angeles, and San Bernardino Counties. The dataset includes samples taken from highly built-out impervious areas and from storm events representative of Southern California conditions.

The SALs for cadmium, copper, lead and zinc require the measurement of hardness and to provide more specificity in the assessment of samples with SALs for total metal concentrations. While USEPA Rain Zone 6 data include a large sample size for concentrations of total metals, the impact the concentration will have on receiving waters will vary with receiving water hardness. Since it is the goal of the SALs, through the iterative process and MEP standard, to have MS4 storm water discharges meet all applicable water quality objectives, the hardness of the receiving water should be used when assessing the total metal concentration of a sample.

Thus, when there is an exceedance of a SAL for a metal, the Copermittee must determine if that exceedance is above the existing applicable water quality objectives based upon the hardness of the receiving water. The water quality objectives

[28] Data used to develop SAL were obtained from http://rpitt.eng.ua.edu/Research/ms4/mainms4.shtml

Copermittees must use to assess total metal SAL exceedances are the California Toxic Rule (CTR) and USEPA National Recommended Water Quality Criteria for Freshwater Aquatic Life 1 hour maximum concentrations. The 1-hour maximum concentration is to be used for comparison since it is expected to most replicate the impacts to waters of the State from the first flush following a precipitation event.

The statistically calculated SALs given in Table C-5 are at levels greater than the water quality objectives in the Basin Plan or Ocean Plan. Because the objective of the CWA is to "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*", meaning eventually pollutants in storm water discharges must be reduced to a level that cannot cause or contribute to an exceedance of water quality objectives in receiving waters, over time the SALs are expected to be reduced to a level that is based on the water quality objectives rather than statistical calculations. The San Diego Water Board will review the SALs as more data for discharges of storm water from the MS4s are collected, and revise them as conditions improve and the MEP standard advances. For the Water Quality Improvement Plans required under this Order, the SALs identified under Provision C.2.a must be included.

Provision C.2.b requires the Copermittees to identify SALs for pollutants and/or constituents, not specified in Provision C.2.a, which are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions of the Watershed Management Area related to storm water discharges from the MS4s. The SALs identified under Provision C.2.b must be included in the Water Quality Improvement Plan.

The San Diego Water Board recognizes that some of the SALs required pursuant to Provisions C.2.a and C.2.b may be exceeded more frequently than not. Thus, Provision C.2.c has been included in the Order to provide the Copermittees the option to develop secondary SALs that are set at levels greater than the levels required pursuant to Provisions C.2.a and C.2.b to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s.

D. Monitoring and Assessment Program Requirements

Purpose: Provision D includes minimum monitoring and assessment requirements that must be developed and implemented by the Copermittees as part of the Water Quality Improvement Plans. Implementation of the monitoring and assessment requirements of Provision D will allow the Copermittees to demonstrate that the requirements of the CWA to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP are being achieved. Implementation of the monitoring and assessment requirements of Provision D will also allow the Copermittees and the San Diego Water Board to track improvements to the water quality in the San Diego Region. The monitoring and assessment program requirements are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order.

***Discussion*:** The San Diego Water Board recognized that changes to the monitoring and assessment requirements of the Fourth Term Permit were necessary to improve the usefulness and usability of monitoring data collected by the Copermittees to support their jurisdictional storm water programs more efficiently and with increased effectiveness. The data collected are needed to better inform the Copermittees' understanding of the physical, chemical, and biological condition of the receiving waters and the quality of the MS4 discharges. The monitoring program needs to provide opportunities for the Copermittees to integrate regional monitoring efforts into municipal storm water monitoring requirements to provide a cost-effective approach to monitoring and avoid duplication of efforts.

The requirements in Provision D were largely recommended by the Copermittees as an outcome of the San Diego Water Boards Focused Meeting process. The monitoring and assessment program requirements now require collection of more specific information necessary for each Copermittee to adapt its jurisdictional runoff management program in such a way that focuses resources on a watershed's highest priority water quality conditions. The monitoring and assessment program will require the Copermittees to collect data that can be utilized to answer both watershed level management questions (e.g. Are the chemical, physical, and biological conditions of a receiving water protective, or likely protective of beneficial uses?), and specific jurisdictional runoff management program activity questions (e.g. Are the water quality improvement strategies of the jurisdictional program effectively eliminating non-storm water discharges to the MS4?).

The monitoring data collected and assessment information that will be reported to the San Diego Water Board are necessary to determine if the Copermittees are complying with the prohibitions and limitations of Provision A. The required monitoring and assessments that must be reported to the San Diego Water Board will be utilized for three purposes:

(1) Inform the Copermittees, San Diego Water Board, and the public on the progress of the Copermittees' efforts to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP;

(2) Inform the Copermittees, San Diego Water Board, and the public on the condition of water bodies receiving discharges from the Copermittees' MS4, and the progress of the Copermittees' water quality improvement implementation efforts toward improving the receiving water quality; and

(3) Inform the Copermittees, the San Diego Water Board, and the public on the effectiveness of the Water Quality Improvement Plan toward achieving (1) and (2).

The monitoring and assessment information reported pursuant to Provision F is also expected to be key to the iterative approach and adaptive management process required under Provision A.4 and implemented through the Water Quality Improvement Plan required under Provision B. As required by Provision A.4, the iterative approach and adaptive management process is required if the Copermittees cannot meet the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c, and/or A.2.a under the present conditions.

Provision D provides the minimum monitoring and assessment requirements that must be included in each Water Quality Improvement Plan to be developed and implemented by the Copermittees. The Copermittees, however, are not limited to the requirements of Provision D and may include additional methods to track progress toward improving water quality in a Watershed Management Area.

More specific and detailed discussions of the requirements of Provision D are provided below.

<u>Provision D.1 (Receiving Water Monitoring Requirements)</u> specifies the minimum receiving water monitoring that the Copermittees must conduct within the Watershed Management Area and include as part of the Water Quality Improvement Plan.

Provision D.1 establishes minimum monitoring requirements that must be conducted by the Copermittees within each Watershed Management Area. Provision D.1 requires the Copermittees to collect and develop the data and information necessary to determine potential impacts to the beneficial uses in the receiving waters due to discharges from the MS4s. The monitoring required under Provision D.1 will also provide the data that will allow the Copermittees to gauge the effectiveness and progress of its Water Quality Improvement Plan implementation efforts toward improving the quality of receiving waters.

The receiving water monitoring requirements of Provision D.1 are focused primarily on monitoring the conditions and response of the receiving waters to the Copermittees'

collective implementation efforts to reduce receiving water impacts that may be caused by the discharges from the MS4s. The preference of the San Diego Water Board is for the Copermittees to spend their resources achieving tangible and observable improvements in receiving water conditions instead of collecting samples and analyzing data that has consistently indicated that receiving water conditions are degraded and require improvement. In general, the ability to measure potential improvements in receiving water conditions due to any actions implemented by the Copermittees as part of the Water Quality Improvement Plan may require several years before a response can be observed. Thus, the frequency of collecting receiving water monitoring data has been kept to a minimum.

During the transitional period between adoption of this Order and San Diego Water Board acceptance of a Water Quality Improvement Plan, the Copermittees must conduct receiving water monitoring in accordance with Provision D.1.a. This approach to collecting receiving water data is different from what was required in the Fourth Term Permits, but one that truly embraces the concept of an integrated, cost-effective, streamlined receiving water monitoring approach.

Provision D.1.a requires Copermittees to continue performing the receiving water monitoring programs required in Order Nos. R-2007-0001, R9-2009-002, and R9-2010-0016; plus participation in: hydromodification management plan monitoring approved by the San Diego Water Board, monitoring plans as part of load reduction plans (either Bacteria Load Reduction Plans or Comprehensive Load Reduction Plans) for TMDLs in Attachment E of the Order, Storm Water Monitoring Coalition Regional Monitoring, Southern California Bight Regional Monitoring, Sediment Quality Monitoring, and ASBS Monitoring as applicable to a Watershed Management Area.

Provision D.1.a also provides an opportunity for the Copermittees to use third party data to meet receiving water monitoring requirements where feasible. Allowing the Copermittees to use the data currently collected through its participation in existing regional receiving water programs and that of third parties provides an efficiency of resources in obtaining the data necessary to inform the Copermittees and the San Diego Water Board about the physical, chemical, and biological conditions of the receiving waters, which can also help to focus the receiving water monitoring during the implementation of the Water Quality Improvement Plan. Once a Water Quality Improvement Plan is developed for a Watershed Management Area in compliance with Provision B of this Order, the transitional period is over and Copermittees are required to conduct receiving water monitoring according to the requirements of Provisions D.1.b-e.

Provision D.1.b requires each Copermittee to identify at least one long term receiving water monitoring station to be representative of receiving water quality within each Watershed Management Area. Long term receiving water monitoring stations can be located at any existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees. The requirements under Provision D.1.b. are

consistent with 40 CFR 122.26(d)(2)(iii)(D), which specifies that a "*monitoring program for representative data collection for the term of the permit*" may include "*instream locations.*" For each Watershed Management Area, at least one long term watershed monitoring station is required to be established and monitored. The Copermittees may choose to establish additional long term monitoring stations where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

Provision D.1.b. requires the Copermittees to locate the long term receiving water monitoring station at one of these existing receiving water monitoring stations to provide the Copermittees an opportunity to experience monitoring cost savings while continuing to collect the necessary data to assess the status and trends of receiving water quality conditions in 1) coastal water, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under both dry weather and wet weather conditions. Ideally these stations will continue to be monitored as part of the receiving water monitoring for each Watershed Management Area to maintain a consistent set of locations and a period of data that can be built upon with the monitoring required under this Order.

The receiving water monitoring requirements are separated into monitoring required during dry weather conditions pursuant to Provision D.1.c, and wet weather conditions pursuant to Provision D.1.d.

At each long term monitoring station the Copermittees must conduct at least three dry weather monitoring events as required pursuant to Provision D.1.c and at least three wet weather monitoring events as required pursuant to Provision D.1.d per permit term. Provisions D.1.c and D.1.d require the Copermittees to monitor priority water quality conditions identified in the Water Quality Improvement Plan, constituents listed as causing impairment of receiving waters in the Watershed Management Area, applicable NALs, toxicity, constituents listed in Tables D-2 and D-3, and constituents for implementation plans (e.g. Bacteria Load Reduction Plans and Comprehensive Load Reduction Plans). Required toxicity monitoring was changed to reflect an updated understanding of the unique challenges associated with sampling storm water for toxicity. Copermittees are required to sample receiving water for toxicity during each dry weather and each wet weather event pursuant to Provision D.1.c.(4) and D.1.d.(4). Required toxicity monitoring is now consistent with the State Water Resources Control Board Policy for Toxicity Assessment and Control (Draft June 2012) and recently adopted MS4 permits for Caltrans and Los Angeles Water Board. Receiving water monitoring efforts in this Order have been streamlined to redirect resources to monitoring efforts that better support pollutant reduction solutions with an increasing emphasis on MS4 outfall monitoring, source identification, and source abatement activities.

In addition to the receiving water monitoring requirements under Provisions D.1.b-d, Provision D.1.e requires the Copermittees participate in and/or conduct other types of receiving water monitoring. As recommended and requested by the Copermittees, Provision D.1.e.(1) requires the Copermittees to participate in existing regional monitoring, as applicable to each Watershed Management Area. Existing regional

monitoring includes monitoring conducted by the Storm Water Monitoring Coalition and for the Southern California Bight. Participation in and use of monitoring data collected from these existing regional water quality monitoring programs provide the Copermittees a greater opportunity for efficiency in the use of their resources to manage their storm water programs and those controllable discharges under their authority.

Provision D.1.e.(1)(c) requires the south Orange County MS4 Copermittees to participate in "unified regional beach water quality monitoring." This monitoring replaces requirements to conduct "core monitoring" of beach water quality, as provided for in Appendix III of the Ocean Plan.

Several different public agencies currently conduct routine, ongoing beach water quality monitoring in south Orange County in accordance with several different sets of requirements. The monitoring programs implemented to meet those requirements overlap temporally and spatially. These monitoring programs are partially but not fully integrated. In November 2010, the State Water Board adopted Resolution No. 2010-0053, which directed Regional Water Boards to work with dischargers to modify beach water quality monitoring programs required by Regional Water Board-issued permits in order to eliminate redundancies and incorporate beach water quality monitoring required by beach water quality statutes, where appropriate.

In April 2012, the San Diego Water Board requested that its staff review beach water quality monitoring conducted in south Orange County. To assist in responding to that request, staff of the Board convened a workgroup that included representatives of the three public agencies that currently conduct almost all of the routine, ongoing beach water quality monitoring in south Orange County, i.e., South Orange County Wastewater Authority (SOCWA), Orange County Public Works, and Orange County Health Care Agency (OCHCA). The workgroup also included other interested parties, including representatives of the Sierra Club and Surfrider Foundation. In December 2012, the San Diego Water Board adopted Resolution No. R9-2012-0069, which endorsed the San Diego Water Board staff report entitled "A Framework for Monitoring and Assessment in the San Diego Region," dated November 2012.

The unified program is consistent with and will meet or exceed the minimum requirements for beach water quality monitoring and related public notification and reporting established by State law, including the Ocean Plan. The unified program is consistent with State Water Board Resolution No. 2010-0053. The unified program is also consistent with and will help implement, "A Framework for Monitoring and Assessment in the San Diego Region," which emphasizes the need for question-driven, beneficial use-oriented monitoring and assessment. The primary purpose of the unified program will be to answer the question "Does beach water quality meet standards for the beneficial use of water contact recreation?"

The unified program is intended to be protective; it will help protect the health of swimmers, surfers, and others who use south Orange County beach waters for water

contact recreational activities. The unified program is also intended to be reasonable; it will eliminate duplicative monitoring and will include triggers for public notification and additional sampling at all sampling stations year-round. The unified program is intended to be equitable; responsibility for implementation of the unified program will be shared and the responsible agencies will jointly make arrangements to implement the program and will have the flexibility to jointly make short and/or long term changes in those arrangements.

The San Diego Water Board Executive Officer issued a written directive on December 5, 2014, pursuant to California Water Code section 13383, for SOCWA and the south Orange County MS4 Copermittees to implement the unified program in cooperation with OCHCA. The Executive Officer may make revisions to the unified program, provided that the unified program, as revised, continues to be consistent with and meet the requirements of State law, including the Ocean Plan, for beach water quality monitoring and related public notification and reporting. Following a thirty day public comment period, and subject to a request for a hearing before the San Diego Water Board, any such revision shall take effect as specified in a written directive issued by the Executive Officer pursuant to CWC section 13383. The program and any Executive Officer issued revisions to the program are subject to CWC section 13320 right of review from the date of issuance.

The unified program will supersede the existing routine, ongoing, beach water quality monitoring programs in south Orange County that are conducted in accordance with the existing requirements of the NPDES permits for discharges from the SOCWA ocean outfalls and the south Orange County MS4s. The requirement to participate in “regional monitoring” of beach water quality replaces requirements to conduct “core monitoring” of beach water quality, as provided for in Appendix III of the Ocean Plan.

The State Water Resources Control Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part 1 Sediment Quality which became effective August 25, 2009 (Sediment Quality Monitoring Policy). Provision D.1.e.(2) requires any Copermittees with MS4 discharges to an enclosed bay or estuary to monitoring the sediments in the enclosed bay or estuary receiving water in accordance with the sediment quality monitoring procedures as prescribed in the Sediment Quality Monitoring Policy.

The State Water Board adopted Resolution No. 2012-0012 which approved exceptions to the California Ocean Plan for selected discharges into Areas of Special Biological Significance (ASBS), including special protections for beneficial uses. State Board Resolution No. 2012-0012 became effective on March 20, 2012, and Attachment B to the Resolution established limitations on point source storm water discharges to ASBS. Copermittees with MS4s that discharge to an ASBS must monitor its discharge to assure compliance with State Board Resolution No. 2012-0012 as required pursuant to Provision D.1.e.(3).

The San Diego Water Board is developing a regional monitoring strategy to assess the conditions of receiving waters in the San Diego Region. The monitoring requirements of Provision D.1 are expected to be incorporated or serve as a foundation of this regional monitoring strategy, but may require some modifications. When the San Diego Water Board develops an alternative regional monitoring strategy, the Copermittees will be required to participate in the development and implementation of the alternative regional monitoring program pursuant to Provision D.1.f.

Provision D.2 (MS4 Outfall Discharge Monitoring Requirements) specifies the minimum MS4 outfall discharge monitoring requirements that the Copermittees must incorporate and implement as part of the Water Quality Improvement Plan.

The dry weather MS4 outfall discharge monitoring requirements are included under Provisions D.2.a.(2) and D.2.b. The dry weather MS4 outfall discharge monitoring requirements are part of the "*program, including a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer*" required by 40 CFR 122.26(d)(2)(iv)(B), which is expected to achieve compliance with the CWA section 402(p)(3)(B)(ii) statutory requirement for municipal storm water permits to require the Copermittees to "*effectively prohibit non-storm water discharges into the storm sewers*." The dry weather MS4 outfall discharge monitoring data collection requirements are based on requirements under 40 CFR 122.26(d)(1)(iv)(D) and 122.26(d)(2)(iv)(B)(3).

The dry weather MS4 outfall discharge monitoring requirements are designed to provide wide spatial and temporal coverage of each jurisdiction to better understand the extent and magnitude of non-storm water discharges to receiving waters, and make a distinction between persistent and transient non-storm water flows. This information is expected to allow each Copermittee to focus its resources on eliminating and controlling the highest priority threats to receiving water quality, as well as integrating other elements of the storm water programs (e.g. complaint call response) and third party data to efficiently and effectively assist in efforts to eliminate non-storm water discharges.

The dry weather MS4 outfall discharge monitoring requirements of Provision D.2.a.(2) and D.2.b are separated into monitoring required before and after the San Diego Water Board accepts the Copermittees' Water Quality Improvement Plan. Outfall monitoring conducted prior to acceptance of the Water Quality Improvement Plan is referred to in the Order as Transitional MS4 Outfall Discharge Monitoring. Provision D.2.a.(2) includes the transitional dry weather MS4 outfall discharge monitoring requirements.

The requirements under Provision D.2.a.(2) are based on the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B), which include the requirements for a monitoring program to identify, detect, and eliminate illicit connections and illegal discharges to the MS4s. The federal regulations (40 CFR 122.26(d)(1)(iv)(D)) require

the monitoring program to include "*a field screening analysis for illicit connections and illegal dumping [that]…[a]t a minimum, include[s] a narrative description, for either each field screening point or major outfall, of visual observations made during dry weather periods.*" The federal regulations (40 CFR 122.26(d)(1)(v)(B)) require the monitoring program to include "*inspection procedures and methods for detecting and preventing illicit discharges, and describe areas where this program has been implemented.*" Furthermore, the monitoring program is required by federal regulations (40 CFR 122.26(d)(2)(iv)(B)) to include "*a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer.*"

Dry weather transitional MS4 outfall discharge monitoring requires each Copermittee to field screen (inspect) its major MS4 outfalls to classify the MS4 outfall locations as having persistent dry weather flows, transient dry weather flows, or no dry weather flows. To account for the variance in size of the 39 jurisdictions covered under this Order, the Copermittees recommended a tiered approach to the number of major MS4 outfalls that must be inspected. Provision D.2.a.(2)(a) provides a tiered approach to the number of major MS4 outfalls that must be visually inspected per jurisdiction as well as a minimum frequency each Copermittee must inspect each major MS4 outfall per year. This tiered approach is based on the total number of major MS4 outfalls within a Copermittees jurisdiction within each Watershed Management Area.

Based on the field screening, each Copermittee is required to make a determination whether any observed flowing, pooled, or ponded waters are transient or persistent flows. Based on this field screening information, other jurisdictional program information, and third party information, each Copermittee is required to prioritize the MS4 outfalls within its jurisdiction for follow up investigation and elimination of the non-storm water discharge, as part of its illicit discharge detection and elimination program required pursuant to Provision E.2. In accordance with the requirements of Provision E.2, each Copermittee is required to immediately investigate obvious illicit discharges (e.g. outfall discharges with unusual color, unusual odor, or high flows).

This approach allows a Copermittee to use all of its resources, as well as leverage resources and information provided by third parties, to effectively eliminate non-storm water discharges from its MS4 outfalls. If the source of the non-storm water discharge cannot be immediately eliminated, the Copermittee uses the persistent flow or transient flow classification along with other programmatic implementation data to prioritize the MS4 outfalls for future investigation. In accordance with the adaptive management approach deployed throughout this Order, Provision D.2.a.(2)(c) requires each Copermittee to update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow. The requirement of Provision D.2.a.(2)(c) assures that each Copermittee is collecting data that can be used to demonstrate compliance with the CWA requirement that each Copermittee must implement a program to "*effectively*

prohibit non-storm water discharges into the [MS4]" and with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

Provision D.2.b describes the dry weather MS4 outfall discharge monitoring required to be incorporated and implemented as part of the Water Quality Improvement Plan. Dry weather MS4 outfall discharge monitoring must be performed by each Copermittee to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. The emphasis of the dry weather MS4 outfall discharge monitoring required pursuant to Provision D.2.b is consistent with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

Provision D.2.b.(1) requires each Copermittee to continue field screening its major MS4 outfalls and identifying those with persistent flows and transient flows, as conducted during the transitional period (i.e. before the Water Quality Improvement Plan was developed). However, each Copermittee now has the flexibility to adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of non-storm water persistent flow discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan. In order to ensure a minimum number of outfalls are inspected, Provision D.2.b.(1) requires the number of visual inspections be equal to the number of visual inspections required in the tiered inspection program pursuant to Provision D.2.a.(2)(a).

Provision D.2.b.(2)(b) requires each Copermittee to monitor a minimum of 5 major MS4 outfalls with persistent flows identified as the highest priorities within a Copermittee's jurisdiction, within each Watershed Management Area. In other words, Copermittees located in more than one Watershed Management Area must identify at least 5 major MS4 outfalls with persistent flows in its jurisdiction in each Watershed Management Area. If a Copermittee is located in more than one Watershed Management Area, and they have less than 5 major MS4 outfalls with persistent flows per jurisdictional area per Watershed Management Area, all of the major MS4 outfalls must be identified as high priority dry weather persistent flow MS4 outfalls. The Copermittees identified as Responsible Copermittees by a TMDL in Attachment E of the Order may need to monitor more than 5 dry weather major MS4 outfall locations to determine compliance with the requirements of the TMDL(s).

Monitoring must occur at the highest priority outfall locations at least semi-annually until the non-storm water discharges have been eliminated for three consecutive dry weather monitoring events; identified to be authorized by a separate NPDES Permit; or reprioritized to a lower priority. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized MS4 major outfall in the Copermittee's jurisdiction within the Watershed Management Area, unless there are no remaining qualifying major MS4 outfalls within the Copermittees jurisdiction. The Copermittees must continually update their dry weather persistent

flow MS4 outfall discharge monitoring locations with the next highest priority non-storm water flow that have yet to be eliminated until all persistent and transient flows are eliminated or its threat reduced.

Non-storm water persistent flow MS4 outfall discharge monitoring data collected during each semi-annual monitoring event, must be collected and analyzed according to the requirements of Provision D.2.b.(2)(b)-(e). These monitoring requirements are consistent with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

The wet weather MS4 outfall discharge monitoring requirements are included under Provisions D.2.a.(3) and D.2.c. The wet weather MS4 outfall discharge monitoring requirements are necessary for the Copermittees to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable, using management practices, control techniques and system, design and engineering methods, and such other provisions which are appropriate*" required by 40CFR 122.26(d)(2)(iv), which is expected to achieve compliance with the CWA section 402(p)(3)(B)(iii) statutory requirement for municipal storm water permits to require "*controls to reduce the discharge of pollutants [in storm water] to the maximum extent practicable*." The wet weather MS4 outfall discharge monitoring data collection requirements are based on requirements under 40 CFR 122.26(d)(2)(iii), 122.26(d)(2)(iii)(A) and 122.26(d)(2)(iii)(A)(1)-(4), and 40 CFR 122.21(g)(7)(i)-(ii).

The wet weather MS4 outfall discharge monitoring requirements of Provision D.2.a.(3) and D.2.c are separated into monitoring required before and after the San Diego Water Board accepts the Copermittees' Water Quality Improvement Plan. Outfall monitoring conducted prior to acceptance of the Water Quality Improvement Plan is referred to in the Order as Transitional MS4 Outfall Discharge Monitoring. Provision D.2.a.(3) includes the transitional wet weather MS4 outfall discharge monitoring requirements.

Until the wet weather MS4 outfall discharge monitoring requirements of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board, the Copermittees must comply with the requirements of transitional wet weather MS4 outfall monitoring requirements pursuant to Provision D.2.a.(3). Provision D.2.a.(3) requires the Copermittees in each Watershed Management Area to sample, at least five of the major MS4 outfalls inventoried pursuant to Provision D.2.a.(1) once per wet season for the monitoring data required to be collected pursuant to Provision D.2.a.(3)(c)-(e). Provision D.2.a.(3) further requires at least one major MS4 outfall monitoring station be located in each Copermittee's jurisdiction within the Watershed Management Area.

At a minimum, the five sampling locations chosen must be representative of storm water discharges from residential, commercial, industrial, and typical mixed-use land uses present within a Watershed Management Area. The San Diego Water Board expects the Copermittees to extrapolate from these data to similar land uses

throughout the Watershed Management Area to better inform the Water Quality Improvement Plan development process by prioritizing drainages for implementation of storm water control efforts required pursuant to Provision E.

Provision D.2.c describes the wet weather MS4 outfall discharge monitoring required to be included and implemented as part of the Water Quality Improvement Plan. Provision D.2.c provides the Copermittees the flexibility to adjust the wet weather MS4 outfall discharge monitoring locations and frequencies in the Watershed Management Area, as needed, to identify sources of pollutants in storm water discharges from MS4s in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan.

Although Provision D.2.c.(1) allows the Copermittees to adaptively manage the wet weather MS4 outfall discharge monitoring locations and frequencies, the provision requires a minimum of at least five wet weather outfall stations to be monitored. Provision D.2.c.(2) further allows the Copermittees to modify the monitoring frequency at each wet weather MS4 outfall station to meet the goals of the Water Quality Improvement Plan as long as the monitoring frequency occurs at least once per year and is at an appropriate frequency to identify sources of pollutants in storm water discharges, guide pollutant source identification efforts, or determine compliance with the requirements of the applicable TMDLs in Attachment E to the Order.

The wet weather MS4 outfall discharge monitoring requirements of Provisions D.2.c.(3) and D.2.c.(4) are the same as the transitional wet weather MS4 outfall discharge monitoring. In contrast, the requirements of Provision D.2.c.(5) are focused on collecting analytical data specific to the highest priority water quality conditions in the Watershed Management Area identified in the Water Quality Improvement Plan. The wet weather MS4 outfall discharge monitoring data collection requirements are consistent with the requirements under 40 CFR 122.26(d)(2)(iii), 122.26(d)(2)(iii)(A) and 122.26(d)(2)(iii)(A)(1)-(4), and 40 CFR 122.21(g)(7)(i)-(ii).

<u>Provision D.3 (Special Studies)</u> requires the Copermittees to develop special studies that will be conducted for each Watershed Management Area and the entire San Diego Region. Data collected pursuant to Provision D.3 is to be used by the Copermittees to improve the effectiveness of the strategies implemented by the jurisdictional runoff management programs toward achieving the numeric goals identified in the Water Quality Improvement Plans and ultimately achieve compliance with the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c, and A.2.a, which is consistent with the requirements of Provision A.4.

Special studies are often necessary to fill data gaps or provide more refined information that allow the Copermittees to better manage the generation or elimination of pollutants and discharges to and from the MS4. In the Fourth Term Permits, the Copermittees have been required to implement special studies as directed by the San Diego Water Board. The special studies required by this Order provide the Copermittees more flexibility to identify and implement special studies that will be most

useful to improving the effectiveness of their jurisdictional runoff management programs.

Provision D.3.a.(1) requires the Copermittees to develop and conduct at least two special studies per Watershed Management Area, to be determined by the Copermittees. One of the two special studies may be accomplished through participation in a Regional Special Study required under Provision D.3.a.(2). The requirements provide the Copermittees great latitude in identifying and developing the special studies. Watershed Management Area special studies are required, at a minimum, to: (a) relate in some way to the highest water quality priorities identified by the Copermittees in the Water Quality Improvement Plan, (b) be conducted within the Watershed Management Area, and (c) include some form of participation (e.g. contribution of funds, personnel services, project management) by all the responsible Copermittees within the Watershed Management Area.

Examples of Watershed Management Area special studies might include, but are not limited to: (1) focused pollutant source identification studies, (2) BMP effectiveness and/or comparison studies, (3) pilot tests for new or emerging pollutant control methods, (4) receiving water pollutant or stressor source identification and/or mitigation studies, or (5) pollutant fate and transport studies. The Watershed Management Area special studies are expected to provide data that can be utilized by the Copermittees to improve the Water Quality Improvement Plan or implementation of the Copermittees' jurisdictional runoff management programs to address the highest priority water quality conditions.

Provision D.3.a.(2) requires the Copermittees to develop at least one special study that will be conducted for the entire San Diego region. The regional special study is expected to provide data that can be utilized by the Copermittees to improve the Water Quality Improvement Plan or implementation of the Copermittees' jurisdictional runoff management programs to identify or address regional water quality concerns and priorities.

An example of a regional special study would be to develop and establish allowable exceedance frequencies of the bacteria water quality objectives for several types of water bodies, during different wet and dry weather conditions the San Diego region. The special study would be related to bacteria, which is a priority for the San Diego region due to the adoption of "*Bacteria TMDL Project I – Beaches and Creeks in the San Diego Region*." The study results could be used to inform the Copermittees and the San Diego Water Board about the indictor bacteria water quality objective exceedance frequencies that occur in natural or reference watersheds.

<u>Provision D.4 (Assessment Requirements)</u> specifies the assessments that the Copermittees are required to perform, based on the monitoring data collected, and will be reported as part of the Annual Report for the Water Quality Improvement Plan implementation. Provision D.4 requires the Copermittees assess the progress of the

water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c, and A.2.a.

Provision D.4 specifies the assessments that Copermittees must perform for each Watershed Management Area to assess the effectiveness of each Copermittee's jurisdictional runoff management program and the Water Quality Improvement Plan. The effectiveness of each Copermittee's jurisdictional runoff management program and Water Quality Improvement Plan is measured through these types of assessments: (a) Receiving Waters Assessments (b) MS4 Outfall Discharges Assessments, (c) Special Studies Assessments, and (d) Integrated Assessment of Water Quality Improvement Plan.

Provision D.4.a requires the Copermittees to assess the status of receiving water conditions annually during the transitional monitoring period (during development of the Water Quality Improvement Plan) and after acceptance of the Water Quality Improvement Plan. The monitoring data collected pursuant to Provision D.1 will be evaluated, among other information, to assess the condition of a Watershed Management Area's streams, coastal waters, enclosed bays, harbors, estuaries, and lagoons. The focus of the receiving waters assessments is to measure progress toward the objective of the CWA to "*restore and maintain the chemical, physical, and biological integrity of the Nation's waters*" as the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program are implemented within a Watershed Management Area. Provision D.4.a is consistent with 40 CFR 122.42(c)(7) which requires the Copermittees to annually report the *"[i]dentification of water quality improvements or degradation."*

Provision D.4.b includes the MS4 outfall discharges assessment requirements. The focus of MS4 outfall discharges assessments is to determine if the Copermittees' are implementing programs that comply with the requirements of the CWA for MS4 permits to "*effectively prohibit non-stormwater discharges into the storm sewers*" and "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable.*" The monitoring data collected pursuant to Provisions D.2 will be evaluated, among other information, to assess the effectiveness of the transitional MS4 outfall field screening monitoring, the implementation of the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program. The MS4 outfall discharge assessments consist of Non-Storm Water Discharges Reduction Assessments and Storm Water Pollutant Discharges Reduction Assessments.

The Non-Storm Water Discharges Reduction Assessments are how each Copermittee will demonstrate that its jurisdictional runoff management program implementation efforts are achieving the CWA requirement to "*effectively prohibit non-stormwater discharges into the storm sewers.*" Provision D.4.b.(1) requires each Copermittee to assess and report on its illicit discharge detection and elimination program required pursuant to Provision E.2 to reduce and effectively prohibit non-storm water and illicit discharges into the MS4 within its jurisdiction. The Non-Storm Water Discharges

Reduction Assessments include specific assessment requirements applicable to each Copermittee.

As each Copermittee collects and analyzes the data collected pursuant to dry weather MS4 outfall discharges monitoring requirements of Provisions D.2.a.(2) and D.2.b, Provision D.4.b.(1) requires each Copermittee to assess the progress, assess the effectiveness of its current actions, and identify modifications necessary to increase the effectiveness of its actions toward reducing and eliminating non-storm water and illicit discharges to its MS4. The findings from these assessments are expected to be utilized by the Copermittee as part of its procedures to prioritize the non-storm water discharges that will be addressed by its Illicit Discharge Detection and Elimination program required pursuant to Provision E.2.

The assessment requirements of Provision D.4.a.(1) are consistent with 40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(3) which require "*procedures…to investigate portions of the separate storm sewer system that, <u>based on the results of the field screen, or other appropriate information</u> [emphasis added], indicate a reasonable potential of contain illicit discharges or other sources of non-storm water*" as part of a "*program…to detect and remove…illicit discharges and improper disposal into the storm sewer.*" The assessment requirements of Provision D.4.a.(1) are also consistent with 40 CFR122.42(c)(1) requires the Copermittees to annually report the "*status of implementing the components of the storm water management program that are established as permit conditions.*"

The Storm Water Pollutant Discharges Reduction Assessment is how the Copermittees in each Watershed Management Area will demonstrate that their jurisdictional runoff management program implementation efforts are achieving the CWA requirement to "*reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable*." Provision D.4.b.(2) requires the Copermittees in each Watershed Management Area to assess and report the progress of the Copermittees' efforts to reduce pollutants in storm water discharges from the MS4s to the MEP. The Storm Water Pollutant Discharges Reduction Assessments include specific assessment requirements during both the transitional monitoring period and after acceptance of the Water Quality Improvement Plan applicable to the Watershed Management Area and each Copermittee.

As the Copermittees collect and analyze the data collected pursuant to wet weather MS4 outfall discharges monitoring requirements of Provisions D.2.a.(3) and D.2.c, Provision D.4.b.(2) requires the Copermittees to assess runoff conditions during the transitional period, and the progress of the Water Quality Improvement Plan strategies toward reducing pollutants in storm water from the MS4 to the MEP. The findings from these assessments are expected to be utilized by the Copermittees to identify any modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify sources of pollutants in storm water discharges from the MS4s, as well as focus, modify, and improve the water quality improvement

strategies implemented by each Copermittee within its jurisdiction to reduce pollutants in storm water discharges to the MEP.

The assessment requirements of Provision D.4.b.(2) are consistent with 40 CFR 122.26(d)(2)(iii)(B) which requires "*[e]stimates of the annual pollutant load of the cumulative discharges to waters of the United States from all identified municipal outfalls…during a storm event…accompanied by a description of the procedures for estimating constituent loads and concentrations, including any modeling, data analysis, and calculation methods.*" The assessment requirements of Provision D.4.a.(2) are consistent with 40 CFR 122.26(d)(2)(v) which requires that each Copermittee assesses the *"estimated reductions in loadings of pollutants from discharges of municipal storm sewer constituents from municipal storm sewer systems expected as the result of the municipal storm water quality management program."* The assessment requirements of Provision D.4.b.(2) are also consistent with 40 CFR122.42(c)(1) requires the Copermittees to annually report the "*status of implementing the components of the storm water management program that are established as permit conditions.*"

Provision D.4.c includes the special studies assessment requirements. Performing special studies are how the Copermittees will address data gaps identified during the development of and updates to the Water Quality Improvement Plan. The relevant findings from the special studies assessments are expected to be incorporated as part of the applicable receiving water assessments, MS4 outfall discharge assessments, and integrated water quality improvement assessments required in Provision D.4.a, D.4.b, and D.4.d, respectively.

The assessment requirements in Provision D.4.d are part of the iterative approach and adaptive management process required by Provision A.4. The Copermittees are required to integrate the data collected pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to re-evaluate the Water Quality Improvement Plan.

The monitoring data collected pursuant to Provisions D.1 and D.2, and the results of the assessment required pursuant to Provisions D.4.a-c, will be used to determine whether the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program are effective, or require modifications or improvements to become more effective to achieve the requirements of the CWA. The assessments required by Provision D.4.d are consistent with 40 CFR 122.42(c)(1) which requires that the Copermittees to report the *"[t]he status of implementing the components of the storm water management program that are established as permit conditions."*

E. Jurisdictional Runoff Management Programs

Purpose: Provision E includes the requirements for the jurisdictional runoff management programs to be implemented by each of the Copermittees. Compliance with the requirements for the jurisdictional runoff management programs will allow the Copermittees to demonstrate that they are implementing programs to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP. The jurisdictional runoff management program document prepared by each Copermittee will also provide the details for implementing the water quality improvement strategies identified in the Water Quality Improvement Plan specifically within its jurisdiction.

***Discussion*:** Implementation of the jurisdictional runoff management program requirements under Provision E is how the Copermittees "*effectively prohibit non-stormwater discharges into the storm sewer,*" and outlines the "*controls to reduce the discharge of pollutants to the maximum extent practicable"* consistent with the federal regulations under 40 CFR 122.26. The jurisdictional runoff management program is part of the "*comprehensive planning process*" that is required pursuant to 40 CFR 122.26(d)(2)(iv). Where the Water Quality Improvement Plan is the "*comprehensive planning process*" on a Watershed Management Area scale, requiring "*intergovernmental coordination,*" the jurisdictional runoff management program document is the "*comprehensive planning process*" on a jurisdictional scale that should be coordinated with the other Copermittees in the Watershed Management Area to achieve the goals of the Water Quality Improvement Plan.

The jurisdictional runoff management program requirements are included to provide each Copermittee criteria that can be used to demonstrate that its storm water management program is implementing the "*comprehensive planning process*" within its jurisdiction to "*effectively prohibit non-stormwater discharges into the storm sewers,*" and to identify and implement the most effective "*controls to reduce the discharge of pollutants to the maximum extent practicable"* in accordance with the performance standards given in the CWA.

Provision E includes the requirements for each of the components that must be included in the Copermittee's jurisdictional runoff management program document that will be implemented by the Copermittee within its jurisdiction. Implementation of the components of each Copermittee's jurisdictional runoff management program must incorporate the water quality improvement strategies identified by each Copermittee in the Water Quality Improvement Plans, described pursuant to Provision B.3.b.(1)(a).

More specific and detailed discussions of the requirements of Provision E are provided below.

Provision E.1 (Legal Authority Establishment and Enforcement) requires each Copermittee to establish and enforce sufficient legal authority to control discharges to the MS4 within its jurisdiction.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system*" and be able to demonstrate that it can "*operate pursuant to legal authority established by statute, ordinance or series of contracts.*" Provision E.1.a describes the minimum legal authorities each Copermittee must establish for itself within its jurisdiction to control discharges to its MS4. The requirements of Provision E.1.a are consistent with the requirements set forth in 40 CFR 122.26(d)(2)(i)(A)-(F).

The certification statement required from each Copermittee by Provision E.1.b is included to provide the San Diego Water Board additional documentation that each Copermittee has established the legal authorities consistent with Provision E.1.a and 40 CFR 122.26(d)(2)(i)(A)-(F), and the Copermittee can "*operate pursuant to legal authority established by statute, ordinance or series of contracts.*"

Provision E.2 (Illicit Discharge Detection and Elimination) requires each Copermittee to implement an illicit discharge detection and elimination program to effectively prohibit non-storm water discharges to the MS4 by actively detecting and eliminating illicit discharges and disposal into its MS4. If the San Diego Water Board finds that a Copermittee is fully implementing the requirements of Provision E.2, then the Copermittee is deemed in compliance with the effective prohibition of non-storm water discharges to the MS4 required under Provision A.1.b.

Provision E.2 establishes the minimum requirements that each Copermittee must implement within its jurisdiction to effectively prohibit non-storm water discharges from entering its MS4. The federal CWA requires permits for municipal storm sewer systems to "*effectively prohibit non-storm water discharges into the storm sewers*." The federal regulations (40CFR122.26(d)(2)(i)(B)) require each Copermittee to establish the legal authority to prohibit illicit discharges to its MS4s. Under 40 CFR 122.26(d)(2)(iv)(B), each Copermittee must implement a "*program…to detect and remove…illicit discharges and improper disposal into the storm sewer.*" The federal NPDES regulations, under 40 CFR 122.26(b)(2), define illicit discharges as "*any discharge to a municipal separate storm sewer that is not composed entirely of storm water*." Thus, non-storm water discharges are not authorized to enter the MS4 and are considered to be illicit discharges, unless authorized by a separate NPDES permit.

The Phase I Final Rule clarifies that non-storm water discharges through an MS4 are not authorized under the CWA (55 FR 47995):

> "*Today's rule defines the term "illicit discharge" to describe any discharge through a municipal separate storm sewer system that is not composed entirely of storm water and that is not covered by an NPDES permit. Such illicit discharges are not*

authorized under the Clean Water Act. Section 402(p)(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit."

The federal NPDES requirements for the program to address illicit discharges must include "*inspections, to implement and enforce an ordinance, orders, or other similar means to prevent illicit discharges to the MS4*." The federal NPDES regulations also reference several categories of "*non-storm water discharges or flows* [which] *shall be addressed where such discharges are identified…as sources of pollutants to waters of the United States*." The Phase I Final Rule (55 FR 48037) further clarified the requirements of 40 CFR 122.26(d)(2)(iv)(B)(1) as follows:

"*EPA is clarifying that section 402(p)(3)(B) of the CWA (which requires permits for municipal separate storm sewers to 'effectively' prohibit non-storm water discharges) does not require permits for municipalities to prohibit certain discharges or flows of nonstorm water to waters of the United States through municipal separate storm sewers in all cases*."

In previous iterations of the municipal storm water permits for the San Diego Region, these categories were simply listed and referred to as categories of non-storm water discharges "not prohibited" unless identified as a source of pollutants. The Copermittees have often referred to these categories as "exempt" discharges. In both cases, however, the language is inconsistent with the federal CWA and NPDES regulations. And, the clarification provided in the Phase I Final Rule does not specifically state that such discharges are "not prohibited" or "exempt" or in any way authorized. The federal NPDES regulations do, however, state that specific categories of non-storm water discharges must be "*addressed*" if identified as "*sources of pollutants to waters of the United States*."

The language of Provision E.2.a has been revised to be fully consistent with the language of the CWA and the requirements of the federal regulations under 40 CFR 122.26(d)(2)(iv)(B)(1). Provision E.2.a requires each Copermittee to address <u>all</u> types of non-storm water discharges into its MS4 as illicit discharges, <u>unless</u> the discharge is authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to Provisions E.2.a.(1) through E.2.a.(5). Only non-NPDES-permitted non-storm water discharges identified as a category of non-storm water discharges under Provisions E.2.a.(1) through E.2.a.(5) <u>and</u> *not identified as a source of pollutants* do not have to be addressed as illicit discharges. Categories of non-storm water discharges that meet the requirements of Provisions E.2.a.(1) through E.2.a.(5) do not have to be addressed by the Copermittee as illicit discharges.

Several of the non-storm water categories listed in 40 CFR 122.26(d)(2)(iv)(B)(1) have not been included in Provisions E.2.a.(1) through E.2.a.(5), including: street wash water, landscape irrigation, irrigation water, and lawn watering. Because these are no longer included within the categories listed under Provisions E.2.a.(1) through E.2.a.(5), the Copermittees must prohibit these types of non-storm water discharges from entering the MS4. This is consistent with the clarification of 40 CFR 122.26(d)(2)(iv)(B)(1) in the Phase I Final Rule (55 FR 48037), which states:

> "*[T]he Director may include permit conditions that either require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*."

Street wash water is a category of non-storm water discharges that was removed when the Third Term Permits were issued. Street wash water is a source of several pollutants (e.g., metals, oil and grease, petroleum hydrocarbons, chlorinated solvents, sediment) which are generated during the street washing process. The removal of this category requires the Copermittees to prohibit this type of non-storm water discharge from entering the MS4.

The landscape irrigation, irrigation water, and lawn watering categories, collectively referred to hereafter as "over-irrigation" discharges, were removed from the list of non-storm water discharge categories in the Fourth Term Orange County and Riverside County Permits. Non-storm water discharges resulting from over-irrigation have been found to be a source of several types of pollutants (e.g., nutrients, bacteria, pesticides, sediment) in receiving waters. The San Diego Water Board and the Copermittees have identified categories of non-storm water discharges associated with over-irrigation as a source of pollutants and conveyance of pollutants to the MS4 and waters of the United States in the following documents:

- **SmartTimer/Edgescape Evaluation Program (SEEP) Grant Application**

  The State Water Board allocated grant funding to the SEEP project grant application submitted in 2006, which targeted irrigation runoff by retrofitting areas of existing development and documenting the conservation and runoff improvements. The basis of this grant project is that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 is a source and conveyance of pollutants. In addition, the grant application indicated that this alteration of natural flows is impacting the beneficial uses of waters of the state and U.S. Results from the study indicate that that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 *is* a source and conveyance of pollutants. The results of this study can be applied broadly to any area where over-irrigation takes place. The grant application included the following statements:

  > "*Irrigation runoff contributes flow & pollutant loads to creeks and beaches that are 303(d) listed for bacteria indicators.*"

"*Regional program managers agree that the reduction and/or elimination of irrigation-related urban flows and associated pollutant loads may be key to successful attainment of water quality and beneficial use goals as outlined in the San Diego Basin Plan and Bacteria TMDL over the long term.*"

"*Elevated dry-weather storm drain flows, composed primarily … of landscape irrigation water wasted as runoff, carry pollutants that impair recreational use and aquatic habitats all along Southern California's urbanized coastline. Storm drain systems carry the wasted water, along with landscape derived pollutants such as bacteria, nutrients and pesticides, to local creeks and the ocean. Given the local Mediterranean climate, excessive perennial dry season stream flows are an unnatural hydrologic pattern, causing species shifts in local riparian communities and warm, unseasonal contaminated freshwater plumes in the near-shore marine environment.*"

- **2006-2007 Orange County Watershed Action Plan Annual Reports**

The Watershed Action Plan Annual Reports for the 2006-2007 reporting period were submitted by the County of Orange, Orange County Flood Control District and Copermittees within the San Juan Creek, Laguna Coastal Streams, Aliso Creek, and Dana Point Coastal Streams Watersheds. San Juan Creek, Laguna Coastal Streams, Aliso Creek and Dana Point Coastal Streams are all currently 303(d) listed as impaired for indicator bacteria within their watersheds and/or in the Pacific Ocean at the discharge points of their watersheds. The Orange County Copermittees, within their Watershed Action Strategy Table for fecal indicator bacteria included the following:

"*Support programs to reduce or eliminate the discharge of anthropogenic dry weather nuisance flow throughout the…watershed. Dry weather flow is the transport medium for bacteria and other 303(d) constituents of concern.*"

Additionally, they state that "*conditions in the MS4 contribute to high seasonal bacteria propagation in-pipe during warm weather. Landscape irrigation is a major contributor to dry weather flow, both as surface runoff due to over-irrigation and overspray onto pavements; and as subsurface seepage that finds its way into the MS4.*"

- **Fiscal Year 2008 Carlsbad Watershed Urban Runoff Management Program Annual Report**

The Carlsbad Watershed Urban Runoff Management Program Annual Report for Fiscal Year 2008 was submitted by the Carlsbad Watershed Copermittees (Cities of Carlsbad, Encinitas, Escondido, Oceanside, San Marcos, Solana Beach, and Vista, and the County of San Diego). In the Annual Report, the Carlsbad Watershed Copermittees stated the following:

"The Carlsbad Watershed Management Area (WMA) collective watershed strategy identifies bacteria, sediment, and nutrients as high priority water quality pollutants in the Agua Hedionda (904.3 – bacteria and sediment), Buena Vista (904.2 – bacteria), and San Marcos Creek (904.5 – nutrients) Hydrologic Areas. Bacteria, sediment, and nutrients have been identified as potential discharges from over-irrigation."

- **2007-2008 San Diego Bay Watershed Urban Runoff Management Program Annual Report**

  The San Diego Bay Watershed Urban Runoff Management Program 2007-2008 Annual Report was submitted by the San Diego Bay Watershed Copermittees (Cities of Chula Vista, Coronado, Imperial Beach, La Mesa, Lemon Grove, National City, and San Diego, the County of San Diego, the Port of San Diego, and the San Diego County Airport Authority). In Appendix D of the Annual Report, titled "Likely Sources of Pollutants," the San Diego Bay Watershed Copermittees identified over-irrigation of lawns as a pollutant generating activity from business and/or residential land uses for bacteria, pesticides, and sediment.

- **Copermittee Public Education Materials**

  The Orange County Public Works *Tips for Landscape & Gardening* public education brochure states: "*Fertilizers, pesticides and other chemicals that are left on yards or driveways can be blown or washed into storm drains that flow to the ocean. Overwatering lawns can also send materials into storm drains*."

  The Riverside County Flood Control and Water Conservation District *Landscape and Garden* public education brochure states: *"Soil, yard wastes, over-watering and garden chemicals become part of the urban runoff mix that winds its way through streets, gutters and storm drains before entering lakes, rivers, streams, etc. Urban runoff pollution contaminates water and harms aquatic life!"*

- **Los Peñasquitos Lagoon Sedimentation/Siltation TMDL Technical Report**

  The Los Peñasquitos Lagoon Sedimentation/Siltation TMDL technical report was prepared for the City of San Diego and USEPA in October 2010. The technical report was included as a technical supporting document attached to the Sediment TMDL for Los Peñasquitos Lagoon staff report prepared by the San Diego Water Board, dated June 13, 2012. Under the Source Assessment section, the technical report states the following:

  "*Dry weather loading is dominated by nuisance flows from urban land use activities such as car washing, sidewalk washing, and lawn over-irrigation, which pick up and transport sediment into receiving waters.*"

These documents confirm that non-storm water discharges associated with over-irrigation are a source of pollutants and should be addressed as illicit discharges to the MS4. Prohibiting non-storm water discharges associated with over-irrigation, however, is not a new requirement for the Copermittees because it is also consistent with and required by the Water Conservation in Landscaping Act (AB 1881, Laird).

The Water Conservation in Landscaping Act required the Department of Water Resources (DWR) to prepare a Model Water Efficient Landscape Ordinance for use by local agencies (e.g. the Copermittees). All local agencies were required to adopt a water efficient landscape ordinance by January 1, 2010. Local agencies could adopt the Water Efficient Landscape Ordinance developed by DWR, or an ordinance considered at least as effective as the Model Ordinance. The Water Efficient Landscape Ordinance includes a requirement that local agencies prohibit runoff from irrigation (§ 493.2):

> "*Local agencies shall prevent water waste resulting from inefficient landscape irrigation by <u>prohibiting runoff from leaving the target landscape</u> [emphasis added] due to low head drainage, overspray, or other similar conditions where water flows onto adjacent property, non-irrigated areas, walks, roadways, parking lots, or structures. Penalties for violation of these prohibitions shall be established locally*."

Furthermore, non-storm water discharges from over-irrigation not only transport and discharge pollutants to receiving waters, but are also a likely source of the dry weather flows causing changes to habitat within and along the receiving water bodies. Examples of habitat changes from the dry weather flows include perennialization of ephemeral streams, and conversion of saltwater and brackish water marsh habitats to freshwater marsh habitats (e.g. Los Peñasquitos Lagoon). Both of these examples have resulted in the promotion of invasive species in several areas of the San Diego Region.

The removal of the over-irrigation discharges categories does not require the Copermittees to strictly prohibit lawn and landscape irrigation, but does require the prohibition of excessive irrigation water that results in non-storm water discharges to the MS4. Non-storm water discharges to the MS4 from over-irrigation must be addressed as illicit discharges by the Copermittees pursuant to the requirements of Provision E.2.

The remaining non-storm water categories listed in 40 CFR 122.26(d)(2)(iv)(B)(1) are listed under Provisions E.2.a.(1) through E.2.a.(5) and generally fall into four categories: (1) non-storm water discharges subject to existing San Diego Water Board waste discharge requirements and NPDES permits; (2) non-storm water discharges generally not expected to be a source of pollutants to receiving waters; (3) non-storm water discharges likely to contain pollutants requiring some form of control to address

the pollutants prior to discharging to the MS4; and (4) non-storm water discharges or flows associated with firefighting.

Provisions E.2.a.(1) and E.2.a.(2) include several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) for which the San Diego Water Board already has developed general waste discharge requirements and NPDES permits to address the discharges. The Copermittees are only required to address these types of non-storm water discharges as illicit discharges if the Copermittees or the San Diego Water Board identifies these non-storm water discharges not having coverage under the applicable NPDES permit.

Provision E.2.a.(3) includes several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) which are generally not expected to be a source of pollutants to receiving waters, many of which originate from what are typically natural, uncontrollable sources. The Copermittees are only required to address these types of non-storm water discharges as illicit discharges if the Copermittees or the San Diego Water Board identifies these non-storm water discharges as a source of pollutants to receiving waters. Because many of these sources are generally uncontrollable, enforcing a prohibition may not be a possibility for the Copermittees. The Copermittees would be able to address these non-storm water discharges by preventing these non-storm water discharges from entering the MS4. This could potentially be achieved by sealing their MS4 structures so the discharges cannot enter the MS4.

Provision E.2.a.(4) includes several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) that are likely to contain pollutants requiring some form of control to address the pollutants prior to discharging to the MS4. At this time, an outright prohibition of these types of non-storm water discharges does not yet appear to be warranted. Thus, Provision E.2.a.(4) includes several requirements for the Copermittees to control the pollutants from these types of non-storm water discharges. This is consistent with the clarification of the federal regulations in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board has the authority to require the Copermittees to "*control any of these types of discharges where appropriate*."

Unlike non-storm water discharges from over-irrigation, these types of non-storm water discharges are not expected to occur in close proximity to each other or very frequently. Provided these types of non-storm water discharges are controlled as required in Provision E.2.a.(4), the Copermittees would only be required to address these types of non-storm water discharges as illicit discharges if the Copermittee or the San Diego Water Board identifies these non-storm water discharges as a source of pollutants to receiving waters.

Provision E.2.a.(5) includes specific requirements for fire fighting discharges and flows. The requirements for non-storm water discharges and flows associated with fire

fighting have been separated into requirements for: a) non-emergency fire fighting discharges and flows, and b) emergency fire fighting discharges and flows.

The San Diego Water Board has found that discharges from building fire suppression system maintenance (e.g. fire sprinklers) contain waste and potentially a significant source of pollutants to receiving waters. As such, the San Diego Water Board is requiring these discharges be addressed as illicit discharges by the Copermittees. Thus, the discharges to the MS4 are to be prohibited via ordinance, order or similar means. For other non-emergency firefighting discharges and flows (i.e. flows from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems), the Copermittees are required to develop and implement a program to address pollutants in these non-storm water discharges and flows. This is consistent with the clarification of the federal regulations in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board has the authority to require the Copermittees to "*control any of these types of discharges where appropriate*."

For emergency firefighting discharges and flows, the Phase I Final Rule (55 FR 48037) has clarified the requirements of 40 CFR 122.26(d)(2)(iv)(B)(1) pertaining to emergency firefighting flows and discharges, which states:

> "*In the case of firefighting it is not the intention of these rules to prohibit in any circumstances the protection of life and public or private property through the use of water or other fire retardants that flow into separate storm sewers*."

Thus, the requirements have been made to be consistent with the guidance provided by the Phase I Final Rule. The Order recommends that the Copermittees develop and encourage implementation of BMPs to reduce or eliminate the discharge of pollutants from emergency firefighting flows to the MS4s and receiving waters. The Order does not include any requirements that should be interpreted as requiring the implementation of BMPs for emergency firefighting flows to the MS4s and receiving waters.

The Copermittees are expected to review the dry weather MS4 outfall discharge monitoring data they collect to determine if and when there are non-storm water discharges to or from their MS4s that are a source of pollutants to receiving waters. If the Copermittees identify one of the types of non-storm water discharges listed in Provisions E.2.a.(1) through E.2.a.(4) as a source of pollutants to receiving waters based on the review and evaluation of monitoring data, Provision E.2.a.(6) requires the Copermittees to prohibit those categories of discharges from entering the MS4 through ordinance, order or similar means. In addition, Provision E.2.a.(6) clarifies that the San Diego Water Board may identify categories of non-storm water discharges or flows listed under Provisions E.2.a.(1) through E.2.a.(4) that must be prohibited.

Provision E.2.a.(6) also provides the Copermittees an option to propose controls to be implemented for the category of non-storm water discharges as part of the Water Quality Improvement Plan instead of prohibiting the category of non-storm water discharges. If the Water Quality Improvement Plan is accepted by the San Diego Water Board with the proposed controls, the Copermittees will not be required to prohibit the category of non-storm water discharges to their MS4s as long as the controls are implemented. This is consistent with the clarification of 40 CFR 122.26(d)(2)(iv)(B)(1) in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board may "*require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*."

Finally, Provision E.2.a.(7) has been included in the requirements for non-storm water discharges to clarify that any non-storm water discharges to the Copermittee's MS4, even those identified pursuant to Provisions E.2.a.(1) through E.2.a.(4), must be reduced or eliminated, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit. Provision E.2.a.(7) is consistent with the requirements of CWA section 402(p)(3)(B)(ii) and 40 CFR 122.26(d)(1)(v)(B), as clarified in the Phase I Final Rule (55 FR 47995) that "*[u]ltimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit*." However, the reduction or elimination of those non-storm water discharges are expected to be achieved as feasible, in accordance with the priorities in the Water Quality Improvement Plan and when the resources are available to the Copermittee.

Consistent with 40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(1), each Copermittee must implement a "*program…to prevent illicit discharges to the municipal storm sewer system*" and "*detect…illicit discharges and improper disposal into the storm sewer.*" Provision E.2.b requires each Copermittee to implement measures to prevent and detect illicit discharges and connections to its MS4 as part of its illicit discharge detection and elimination program.

As part of the program to prevent and detect illicit discharges to the MS4, 40 CFR 122.26(d)(2)(iv)(B)(2) requires "*procedures to conduct on-going field screening activities during the life of the permit, including areas or locations that will be evaluated by such field screens*." As part of the procedures, each Copermittee is required to maintain an updated map of its entire MS4 and the corresponding drainage areas within its jurisdiction. Having knowledge about where inlets, access points, connections with other MS4s, and outfalls are located is necessary for each Copermittee to track, identify, and eliminate illicit discharges and connections. Thus, Provision E.2.b.(1) of the Order specifies that the map must include the segments of the storm sewer system owned, operated, and maintained by the Copermittee, and include locations of all known inlets, connections with other MS4s, and outfalls to the Copermittee's MS4. The remaining requirements of Provision E.2.b are consistent with the requirements of 40 CFR 122.26(d)(2)(iv)(B)(3)-(7) related to implementing measures to prevent and detect illicit discharges and connections to the MS4.

Provision E.2.c requires each Copermittee to conduct field screening and monitoring of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4. Field screening is a required element of the program to detect and eliminate illicit discharges and connections to the MS4, pursuant to 40 CFR 122.26(d)(2)(iv)(B)(2). The field screening requirement will be implemented through the dry weather MS4 outfall discharge monitoring required under Provisions D.2.a.(2) and D.2.b.(1).

Provision E.2.d specifies the measures each Copermittee must implement to eliminate illicit discharges and connections to its MS4. Elimination of illicit discharges and connections to the MS4 is consistent with the requirement of 40 CFR 122.26(d)(2)(iv)(B) "*to detect and <u>remove</u> [emphasis added]…illicit discharges and improper disposal into the storm sewer*" and will achieve the CWA requirement for MS4 permits to "*effectively prohibit non-storm water discharges into the storm sewers*."

Generally, each Copermittee is responsible for prioritizing its efforts to eliminate non-storm water and illicit discharges or connections to its MS4 based on field screening and monitoring data, NALs, illicit discharge investigation records, and the known or suspected sources. Sources of non-storm water and illicit discharges or connections must be eliminated by enforcing the legal authority established by each Copermittee pursuant to Provision E.1.

<u>Provision E.3 (Development Planning)</u> requires each Copermittee to use its land use and planning authority to implement a development planning program to control and reduce the discharge of pollutants in storm water from new development and significant redevelopment to the MEP. Proper implementation of the development planning program will also contribute toward effectively prohibiting non-storm water discharges from development projects to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." As part of the management program, 40 CFR 122.26(d)(2)(iv)(A)(2) requires "*planning procedures including a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment*."

Land development generally alters the natural conditions of the land by removing vegetative cover, compacting soil, and/or placement of concrete, asphalt, or other impervious surfaces. These impervious surfaces concentrate urban pollutants (such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not found in high concentrations in the natural environment. Pollutants that

accumulate on impervious surfaces are not easily biodegraded nor subject to natural treatment processes.

Impervious surfaces greatly affect the natural hydrology of the land because they do not allow natural infiltration and treatment of storm water runoff to take place. Instead, storm water runoff from impervious surfaces is typically directed through pipes, curbs, gutters, and other hardscape into receiving waters, with little treatment, at significantly increased volumes and accelerated flow rates over what would occur naturally. The increased pollutant loads, storm water volume, discharge rates and velocities, and discharge durations from the MS4 adversely impact stream habitat by causing accelerated, unnatural erosion and scouring within creek bed and banks. Placement of impervious surfaces also encapsulates "good" sediment (such as sand, gravel, rocks and cobbles) that would normally replenish creek beds and banks to help stabilize them. Collectively, these changes to natural hydrologic processes are termed hydrograph modification, or hydromodification.

Hydromodification, which is caused by both altered storm water flow and altered sediment flow regimes, is largely responsible for degradation of creeks, streams, and associated habitats in the San Diego Region. In an ongoing study by the Stormwater Monitoring Coalition to assess the health of streams throughout Southern California, researchers found that three of the four highest risk stressors to creeks (percent sands and fines present, channel alteration, and riparian disturbance) were related to physical habitat.[29] Researchers studying flood frequencies in Riverside County have found that increases in watershed imperviousness of only 9-22 percent can result in increases in peak flow rates for the two-year storm event of up to 100 percent.[30] Such changes in runoff have significant impacts on channel morphology.

In addition, a technical report issued by the Southern California Coastal Water Research Project (SCCWRP) stated that "*[r]ecent studies indicate that California's intermittent and ephemeral streams are more susceptible to the effects of hydromodification than streams from other parts of the United States. Physical degradation of stream channels in the central and eastern United States can initially be detected when watershed impervious cover approaches 10 percent, although biological effects (which may be more difficult to detect) may occur at lower levels. In contrast, initial response of streams in the semi-arid portions of California appears to occur between 3 and 5 percent impervious cover*."[31] These studies highlight the extent to which impacts originating from impervious surfaces created by land development are responsible for the degradation of creek and stream habitat.

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[29] Assessing the Health of Southern California Streams, Stormwater Monitoring Coalition, Fact Sheet
[30] Schueler and Holland, 2000. Storm Water Strategies for Arid and Semi-Arid Watersheds (Article 66). The Practice of Watershed Protection.
[31] Stein, E. and Zaleski, S., 2005. Technical Report 475, Managing Runoff to Protect Natural Streams: The Latest Development on Investigation and Management of Hydromodification in California. December 30, 2005.

This is consistent with what USEPA has noted, that "*[m]ost stormwater runoff is the result of the man-made hydrologic modifications that normally accompany development. The addition of impervious surfaces, soil compaction, and tree and vegetation removal result in alterations to the movement of water through the environment. As interception, evapotranspiration, and infiltration are reduced and precipitation is converted to overland flow, these modifications affect not only the characteristics of the developed site but also the watershed in which the development is located. Stormwater has been identified as one of the leading sources of pollution for all waterbody types in the United States. Furthermore, the impacts of stormwater pollution are not static; they usually increase with more development and urbanization*."[32]

Reducing the impact from the increased pollutant loads and flows generated by impervious surfaces within a watershed is essential to protecting and restoring the integrity of the receiving waters. Provision E.3 includes the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment*." The requirements of Provision E.3 will 1) minimize the generation and discharge of pollutants in storm water from the MS4, and 2) minimize the potential of storm water discharges from the MS4 from causing altered flow regimes and excessive downstream erosion in receiving waters.

The requirements of Provision E.3.a include the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment*" applicable to all development projects, regardless of size or purpose of development. In general, all development projects must implement onsite BMPs to remove pollutants from runoff prior to its discharge to any receiving waters, as close to the pollutant generating source as possible, and structural BMPs must not be constructed within waters of the U.S.

Furthermore, the onsite BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors (e.g. mosquitos, rodents, and flies). If not properly designed or maintained, certain BMPs implemented or required by municipalities may create a habitat for vectors. Monitoring studies conducted by the California Department of Public Health (CDPH) have documented that mosquitoes opportunistically breed in structural storm water BMPs, particularly those that hold standing water for over 96 hours. Certain site design features that hold standing water may similarly produce mosquitoes.

[32] USEPA, 2007. Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices, December 2007.

Structural BMPs and site design features should incorporate design, construction, and maintenance principles to promote drainage within 96 hours to minimize standing water available to mosquitoes. Nuisances and public health impacts resulting from vector breeding can be prevented with close collaboration and cooperative effort between municipalities and local vector control agencies and the CDPH during the development and implementation of storm water runoff management programs. The CDPH also has issued guidance for BMP implementation that will minimize potential nuisances and public health impacts resulting from vector breeding.[33]

All development projects are required to implement source control BMPs that will minimize the generation of pollutants. Additionally, each development project must implement, where applicable and feasible, low impact development (LID) BMPs to mimic the natural hydrology of the site and retain and/or treat pollutants in storm water runoff prior to discharging to and from the MS4.

The LID Center defines LID as "*a comprehensive land planning and engineering design approach with a goal of maintaining and enhancing the pre-development hydrologic regime of urban and developing watersheds.*"[34] LID designs seek to control storm water at the source, using small-scale integrated site design and management practices to mimic the natural hydrology of a site, retain storm water runoff by minimizing soil compaction and impervious surfaces, and disconnect storm water runoff from conveyances to the storm drain system.

LID BMPs may utilize interception, storage, evaporation, evapotranspiration, infiltration, and filtration processes to retain and/or treat pollutants in storm water before it is discharged from a site. Because of these numerous options, the San Diego Water Board expects that every development project will be able to implement some form of LID BMPs. Examples of LID BMPs include using permeable pavements, rain gardens, rain barrels, grassy swales, soil amendments, and native plants.

Provision E.3.a also includes requirements for all development projects to, where feasible, landscape with native and/or low water use plants to minimize the discharge of non-storm water discharges associated with excessive irrigation, as well as harvest (i.e., storage) and use precipitation to promote the concept of utilizing storm water as a resource.

While all development projects are subject to the requirements of Provision E.3.a, Provision E.3.b identifies Priority Development Projects that exceed given size thresholds and/or fit under specific use categories. Priority Development Projects are required to incorporate specific performance criteria for structural BMPs into the

[33] California Department of Public Health, 2012. Best Management Practices for Mosquito Control in California. (http://www.cdph.ca.gov/HealthInfo/discond/Documents/BMPforMosquitoControl07-12.pdf)
[34] www.lowimpactdevelopment.org

project plan to reduce the generation of pollutants, and address potential impacts from hydromodification.

The Priority Development Project categories are based on the requirements of the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), and do not differ significantly from the Fourth Term Permit for San Diego County. Furthermore, the Priority Development Project categories are consistent with Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), and Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit).

Because of the impact of relatively small increases in watershed impervious surfaces to receiving waters, Provision E.3.b.(1)(c)(iv) has been updated to include large driveways that are 5,000 square feet or more. The San Diego Water Board finds that large driveways can exacerbate altered flow regimes if not properly controlled.

Provision E.3.b.(3) describes projects that are exempt from Priority Development Project status. These include new or retrofit paved sidewalks, bicycle lanes, or trails that are designed and constructed to direct runoff to vegetated areas or be hydraulically disconnected from paved areas. The exemptions have been provided to encourage these types of projects because they provide multiple environmental benefits, such as promoting walking rather than driving, which will in turn improve air quality. Additionally, retrofitting of existing alleys, streets, or roads are exempt from Priority Development Project status if they are constructed using USEPA Green Streets guidance.[35] By doing so, retrofitting of these types of projects is encouraged. The San Diego Water Board recognizes that there are spatial constraints associated with these projects, and implementation of structural BMPs are not always feasible.

For development projects identified as Priority Development Projects, the requirements of Provision E.3.c are the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment.*" Provisions E.3.c.(1)-(3) describe the performance criteria for the structural BMPs that must be implemented for each Priority Development Project defined by Provision E.3.b.

Provision E.3.c.(1) describes the storm water pollutant control BMP requirements that must be implemented by all Priority Development Projects. The purpose of Provision E.3.c.(1) is to reduce pollutants in storm water runoff to the MEP from Priority Development Projects before it is discharged to the MS4. Of all the available treatment processes available, retention of storm water, and therefore capture of the

[35] "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).

pollutants in the storm water, will achieve 100 percent pollutant removal efficiency for the volume of storm water retained. No other method of treatment can achieve 100 percent pollutant removal efficiency. Thus, retention of as much storm water onsite is the most effective way to reduce pollutants in storm water discharges to, and consequently from the MS4, and controls pollutants in storm water discharges from a site to the MEP.

Under Provision E.3.c.(1)(a), retention of the pollutants in the runoff produced from the 85th percentile storm event ("design capture volume") is the design standard to which Priority Development Projects must comply. Since the 85th percentile storm event has previously been used as the numeric design standard for treatment control BMPs, this same size storm event is used as the numeric design standard for storm water retention. This is the MEP standard recognized by the San Diego Water Board and is consistent with the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), as well as Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit), and Los Angeles Water Board Order No. R4-2012-0175 (Los Angeles County MS4 Permit).

The 85th percentile storm event is the event that has a precipitation total greater than or equal to 85 percent of all storm events over a given period of record in a specific area or location. For example, to determine what the 85th percentile storm event is in a specific location, all 24 hour storms that have recorded values over a 30 year period would be tabulated and a 85th percentile storm would be determined from this record (i.e. 15 percent of the storms would be greater than the number determined to be the 85th percentile storm). Most jurisdictions in the San Diego Region have already developed isopluvial maps that can provide this type of information. The 85th percentile storm might be determined to be a number such as 1.0 inch, and this would be multiplied by the total area of the project footprint producing runoff to calculate the design capture volume. The Priority Development Project designer would then select a system of BMPs that would retain (i.e. intercept, store, infiltrate, evaporate, or evapotranspire) the pollutants contained in the design capture volume onsite.

Retention BMPs are necessary to capture and retain pollutants generated from a Priority Development Project. In a recent study performed by SCCWRP in the Los Angeles Region, they found "*that the magnitude of constituent load associated with storm water runoff depends, at least in part, on the amount of time available for pollutant build-up on land surfaces. The extended dry period that typically occurs in arid climates such as southern California maximizes the time for constituents to build-up on land surfaces, resulting in proportionally higher concentrations and loads during*

initial storms of the season."[36] This implies that the "first flush" of a rainy season and the first storm events after long antecedent dry periods tend to have the highest pollutant loads. Capturing and retaining the pollutant loads of the "first flush" of a rainy season and the first storm events after long antecedent dry periods will reduce a significant portion of the pollutants in storm water discharged to and from the MS4.

The San Diego Water Board, however, acknowledges that in some situations retention of the full design capture volume onsite may not be technically feasible. In this event, the Copermittee may allow the Priority Development Project to use biofiltration BMPs to treat 1.5 times the design capture volume not reliably retained onsite, or biofiltration BMPs with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite.

The 1.5 multiplier is based on the finding in the Ventura County Technical Guidance Manual that biofiltration of 1.5 times the design capture volume not retained onsite will provide approximately the same pollutant removal as retention of the design capture volume on an annual basis.[37] This standard is consistent with the Los Angeles Water Board's Los Angeles County and Ventura County municipal storm water permits (Order Nos. R4-2012-0175 and R4-2010-0108, respectively). The flow-thru design of 0.75 times the portion of the design capture volume not reliably retained onsite is consistent with the San Diego Water Board's Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively). In either case, the biofiltration BMPs must be designed with an appropriate hydraulic loading rate to maximize storm water retention and pollutant removal, as well as to prevent erosion, scour, and channeling within the BMP. Each Copermittee is required to update its BMP Design Manual to provide guidance for hydraulic loading rates and other biofiltration design criteria necessary to maximize storm water retention and pollutant removal.

The San Diego Water Board further recognizes that, in addition to not being technically feasible, retention of the full design capture storm onsite may be cost prohibitive, or may not provide as much water quality benefit to the Watershed Management Area as would implementing BMPs elsewhere in the watershed. Thus, Provision E.3.c.(1)(b) allows for the use of a combination of onsite retention BMPs, and the implementation of an Alternative Compliance Program described in Provision E.3.c.(3). Provision E.3.c.(3) is discussed in more detail below.

If the full design capture volume is not retained onsite either because biofiltration is not technically feasible, or a Copermittee grants a Priority Development Project permission

[36] Stein, E.D., Tiefenthaler, L.L., and Schiff, K.C., 2007. Technical Report 510, Sources, Patterns and Mechanisms of Storm Water Pollutant Loading from Watershed and Land Uses of the Greater Los Angeles Area, California, USA. March 20, 2007.
[37] Ventura Countywide Stormwater Management Program. 2011. Ventura Technical Guidance Manual, Manual Update, 2011.

to utilize the Alternative Compliance Program, then the pollutants in the portion of the design capture volume that are not reliably retained onsite must still be reduced to the MEP. Thus, flow-thru treatment control BMPs are required to be implemented on Priority Development Projects in addition to the retention BMPs. The requirements of Provisions E.3.c.(1)(a)(ii)[a]-[c] include the performance standards for flow-thru treatment control BMPs, consistent with the Fourth Term Permits in the San Diego Region.

Whereas the purpose of the requirements under Provision E.3.c.(1) is to reduce pollutants in storm water runoff to the MEP, the purpose of the requirements under Provision E.3.c.(2) is to maintain or restore more natural hydrologic flow regimes to prevent accelerated, unnatural erosion in downstream receiving waters, also to the MEP standard. Provision E.3.c.(2) describes hydromodification management BMP requirements that must be implemented by all Priority Development Projects.

The performance criteria for the implementation of hydromodification management BMPs on Priority Development Projects are consistent with the requirements in the Fourth Term Permits for Orange and Riverside Counties (Order Nos. R9-2009-0002 and R9-2010-0016, respectively). Modifications to the Orange County and Riverside County Hydromodification Management Plans (HMPs) will likely be minor, or may not be necessary. The HMP for San Diego County will likely require some minor modifications to incorporate the requirements of Provision E.3.c.(2) and become consistent with the Orange County and Riverside County HMPs. The San Diego Water Board does not, however, expect that it will be necessary for the San Diego County Copermittees to develop a new approach or significantly re-write the San Diego County HMP. This is because the premise of the hydromodification management BMP requirements, which are to control storm water runoff conditions (flow rates and durations) for Copermittee-defined range of flows, is unchanged from all Fourth Term Permits in the San Diego Region.

Provision E.3.c.(2)(a) requires that post-project runoff conditions mimic the *pre-development* runoff conditions, and not the *pre-project* runoff conditions. Fundamentally, the San Diego Water Board believes that using a hydrology baseline that approximates that of an undeveloped, natural watershed is the only way to facilitate the return of more natural hydrological conditions to already built-out watersheds, and ultimately improved stream health. On the other hand, using the *pre-project* hydrology as a baseline for redevelopment projects results in propagating the unnatural hydrology of urbanized areas. Propagating the urbanized flow regime does not support conditions for restoring degraded or channelized stream segments, and would forever sentence such streams to the degraded state. Furthermore, reducing the volume of storm water runoff associated with the urbanized flow regime will also result in reducing the discharge of pollutants into receiving waters, since storm water runoff from impervious surfaces contains untreated pollutants.

The San Diego Water Board understands that approximating the pre-development runoff condition associated with a redevelopment site is not necessarily straightforward because factors such as natural grade and native vegetation for the site cannot be precisely known. Therefore, the San Diego Water Board does not expect project designers to estimate historical conditions associated with redevelopment sites. Rather, the San Diego Water Board expects project designers and the Copermittees to approximate pre-development runoff conditions using the parameters of a *pervious* area rather than an *impervious* area. This means that for redevelopment sites, approximating pre-development runoff conditions equates to using existing onsite grade and assuming the infiltration characteristics of the underlying soil. A redevelopment Priority Development Project must not use runoff coefficients of concrete or asphalt to estimate pre-development runoff conditions. Rather, redevelopment projects must use available information pertaining to existing underlying soil type (such as soil maps published by the National Resource Conservation Service), onsite existing grade, and any other readily available pertinent information to estimate pre-development runoff conditions.

The San Diego Water Board understands, indeed asserts, that the pre-development hydrology of an area in question can only be roughly estimated and cannot be precisely known. However, using the hydrology of a natural condition, even if not precisely known, will provide significant benefit to receiving waters over using the hydrology associated with impervious (developed) surfaces. Therefore in order to achieve the goals of the Clean Water Act, which are to "*restore and maintain the chemical, physical, and biological integrity of the nation's waters* [emphasis added]," the most appropriate standard to use for hydromodification management is the standard associated with the pre-development condition.

Provision E.3.c.(2)(b) requires Priority Development Projects to avoid known critical sediment yield areas or implement measures that would allow coarse sediment to be discharged to receiving waters, such that the natural sediment supply is unaffected by the project. This is necessary because the availability of coarse sediment supply is as much an issue for causing erosive conditions to receiving streams as are accelerated flows.

The San Diego Water Board recognizes that in some situations implementing the hydromodification management BMP requirements for flow control fully onsite may not be technically feasible, may be cost prohibitive, or may not provide any overall water quality benefits to the Watershed Management Area. Thus, Provision E.3.c.(2)(c) allows for the use of a combination of onsite hydromodification management BMPs for flow control and alternative compliance options described in Provision E.3.c.(3).

Provision E.3.c.(3) allows for alternative compliance in instances where the Copermittee determines that offsite measures will have a greater overall water quality benefit for the Watershed Management Area than if the Priority Development Project were to implement structural BMPs onsite. Consequently, watershed-specific

structural BMP requirements are present in this Order in the form of allowable compliance offsite. The Alternative Compliance Program to Onsite Structural BMP Implementation Provision is intended to integrate with the Copermittees' planning efforts in the Water Quality Improvement Plans.

The Alternative Compliance Program is an option for Priority Development Projects where the governing Copermittee has participated in the development of a Watershed Management Area Analysis as part of the Water Quality Improvement Plan (described in Provision B.3.b.(4)). Such an approach is consistent with the latest findings in hydromodification management by the scientific community. In a Technical Report entitled *Hydromodification Assessment and Management in California,*[38] the report states:

> *"An effective [hydromodification] management program will likely include combinations of on-site measures (e.g., low-impact development techniques, flow-control basins), in-stream measures (e.g., stream habitat restoration), floodplain and riparian zone actions, and off-site measures. Off-site measures may include compensatory mitigation measures at upstream locations that are designed to help restore and manage flow and sediment yield in the watershed."*

Consistent with the ideas brought forth in the report, in the Watershed Management Area Analysis of Provision B.3.b.(4), which is optional, the Copermittees will develop watershed maps that include as much detail about factors that affect the hydrology of the watershed as is available. Such factors included identification of areas suitable for infiltration, coarse sediment supply areas, and locating stream channel structures and constrictions. Once these factors are mapped and studied, the Copermittees can identify areas in the watershed where candidate projects may be implemented that are expected to improve water quality in the watershed by providing more opportunity for infiltration, slowing down storm water flows, or attenuation of pollutants naturally via healthy stream habitat. These candidate projects may be in the form of retrofitting existing development, rehabilitating degraded stream segments, identifying regional BMPs, purchasing land to preserve valuable floodplain functions, and any other project(s) that the Copermittees identify.

Under the Alternative Compliance Program, Priority Development Projects may be allowed to fund, partially fund, or implement a candidate project, in lieu of implementing structural BMPs onsite, if they enter into a voluntary agreement with the governing Copermittee permitting this arrangement. Project proponents may also propose an alternative project not previously identified by the Copermittees. In either case, whether a project proponent implements a candidate project identified by the Copermittees or a separate alternative compliance project, the governing Copermittee must determine that implementation of the project will have a greater overall water

[38] 2012. ED Stein, F Federico, DB Booth, BP Bledsoe, C Bowles, Z Rubin, GM Kondolf, A Sengupta. Technical Report 667. Southern California Coastal Water Research Project. Costa Mesa, CA.

quality benefit for the Watershed Management Area than fully implementing structural BMPs onsite. Determination of greater overall water quality benefits associated with alternative compliance projects would be accomplished by utilizing Water Quality Equivalency calculations developed pursuant to Provision E.3.c.(3)(a). Water Quality Equivalency calculations are necessary to establish a regional and technical basis for determining water quality benefits associated with alternative compliance projects, which can be consistently used by all Copermittees in the San Diego Region. Finally, if ~~I~~f alternative compliance involves funding or implementing a project that is outside the jurisdiction of the governing Copermittee, then that Copermittee may enter into an inter-agency agreement with the appropriate jurisdiction.

Finally, Provision E.3.c.(2)(d) allows Priority Development Projects to be exempt from the hydromodification management BMP requirements if there is no threat of erosion to downstream receiving waters (i.e. the receiving stream is concrete lined from the point of discharge all the way to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean). If the Copermittees believe that more exemptions are warranted, then they must perform the optional Watershed Management Area Analysis of Provision B.3.b.(4). Additional exemptions other than those specified in this Order may be established on a watershed basis, provided the Copermittees perform the analysis, provide supporting rationale for the exemptions, and complete the Water Quality Improvement Plan approval process pursuant to Provision F.1.

To facilitate the transition to this Order from the Fourth Term Permits for Orange and Riverside County Copermittees, Provision E.3.c.(2)(e) allows two additional temporary exemptions from hydromodification management BMP implementation. The first temporary exemption allows relief from hydromodification management BMP implementation for Priority Development Projects discharging directly to an engineered channel conveyance system with a capacity to convey peak flows generated by the 10-year storm event all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean. Similar to the exemption allowed for concrete-lined channels, this exemption is premised on the concept that there is little threat of erosion to these types of engineered channel systems.

The second temporary exemption allows relief from hydromodification management BMP implementation for Priority Development Projects discharging directly to large river reaches with drainage areas larger than 100 square miles and a 100-year flow capacity in excess of 20,000 cubic feet per second. If this exemption is claimed, then properly sized energy dissipation is required at all discharge points associated with the Priority Development Project. This exemption is premised on the concept that large river reaches can essentially assimilate the accelerated flow rates associated with individual Priority Development Projects because they are inconsequential compared

to the flow rate in the large river reach. Both of these exemptions are included in the Hydromodification Management Plan for San Diego County[39].

These temporary exemptions are allowed as a means to facilitate Orange and Riverside County Copermittees' transition to this Order from the Fourth Term Permits and are not meant to reside as permanent exemptions without additional rigorous technical analyses specific to each County. Therefore, these exemptions will no longer apply once the Copermittees' land development programs are fully updated to reflect the requirements of this Order, i.e., upon implementation of the BMP Design Manual pursuant to Provision F.2.b. If the Copermittees believe that these or other exemptions are warranted in the context of water quality improvement and stream restoration opportunities, then the Copermittees must perform the optional Watershed Management Area Analysis of Provision B.3.b.(4) and provide supporting rationale for the exemptions. The San Diego County Copermittees are also required to perform the optional Watershed Management Area Analysis to provide supporting rationale to justify use of these and other exemptions. Updated BMP Design Manuals including rationale to justify use of exemptions will be reviewed by the San Diego Water Board pursuant to Provision F.2.b.

Provisions E.3.c.(4) and E.3.c.(5) were included under the BMP requirements applicable to all development projects in the Fourth Term Permits for San Diego, Orange, and Riverside Counties (Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016, respectively). In this Order, the long-term BMP maintenance and infiltration and groundwater protection requirements apply to structural BMPs implemented by Priority Development Projects only.

Provision E.3.d requires the Copermittees to update their BMP Design Manual as needed to incorporate the requirements of Provision E.3. The BMP Design Manual is formerly known as the Standard Storm Water Mitigation Plan, or SSMP, and was renamed so that the title has a more accurate description of the document content. The contents of the BMP Design Manual are largely unchanged from the previous Standard Storm Water Mitigation Plans required under the Fourth Term Permits. The BMP Design Manual fulfills the 40 CFR 122.26(d)(2)(iv)(A)(2) requirement that the Copermittee's development planning program includes "*a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment*."

As part of the "*planning procedures,*" 40 CFR 122.26(d)(2)(iv)(A)(2) requires the procedures to "*address controls to reduce pollutants in discharges from municipal separate storm sewers after construction is completed*." The requirements applicable to the implementation and oversight of structural BMPs at Priority Development Projects are provided under Provision E.3.e.

[39] Final Hydromodification Management Plan Prepared for County of San Diego, March 2011

Proper installation of the structural BMPs approved for a Priority Development Project is necessary to ensure that pollutants in storm water discharges will be reduced to the MEP after the project is completed. In addition to the proper installation of structural BMPs, the maintenance of structural BMPs on Priority Development Projects is necessary to ensure that pollutants in storm water discharges will continue to be reduced to the MEP. Provision E.3.e.(1) includes the minimum requirements that each Copermittee must implement to ensure structural BMPs are properly installed and will be properly maintained.

Provisions E.3.e.(1)(a)(i)-(ii) have been included to provide additional clarification regarding when a Copermittee may allow land development requirements from earlier MS4 permits to apply to a Priority Development Project. Since the MS4 permits issued from 2001 to the adoption of Order No. R9-2015-0001 amending Order No. R9-2013-0001 (Regional MS4 Permit), a Copermittee could allow development projects with "prior lawful approval" to be "grandfathered" into implementing BMP requirements from previous MS4 permits. The Copermittees were given the discretion to use their land use authority to determine when it was appropriate to allow a development project with prior lawful approval to implement BMP requirements from the previous MS4 permits, and when the most recent BMP requirements should be required to achieve the reduction of pollutants in storm water runoff from development projects to the MEP. However, the San Diego Water Board has found that the Copermittees and the development community frequently disagree about when a development project has prior lawful approval and what is necessary to reduce pollutants in storm water runoff from development projects to the MEP.

Therefore, Provisions E.3.e.(1)(a)(i)-(ii) were included to provide more clarity and certainty for the Copermittees, the land development community, and the general public about when the structural BMP performance standards of earlier MS4 permits may be allowed to be implemented. A Copermittee may allow a Priority Development Project to implement BMP requirements of the previous MS4 permit only if all requirements of Provisions E.3.e.(1)(a)(i)[a]-[d] have been met. Otherwise, the Copermittees must require all Priority Development Projects to incorporate the BMP requirements of Provision E.3 into the project to reduce pollutants in storm water runoff from development projects to the MEP.

Provisions E.3.e.(1)(a)(i)[a]-[d] are dependent upon the effective date of the BMP Design Manual. Unless otherwise directed by the San Diego Water Board, the effective date of the BMP Design Manual is December 24, 2015 for the San Diego County Copermittees, September 28, 2017 for the Orange County Copermittees, and July 5, 2018 for the Riverside County Copermittees.

Alternatively, if the Copermittee can demonstrate a lack of land use authority or legal authority to require a Priority Development Project to implement the requirements of Provision E.3, the Copermittee may allow land development requirements from the previous MS4 permits to apply. However, under these circumstances the San Diego

Water Board expects the Copermittee to utilize its available land use authority or legal authority to require the implementation of as much of Provision E.3 as possible to reduce the discharge of pollutants in storm water from development and redevelopment projects within its jurisdiction to the MEP.

In cases where BMP requirements from the earlier MS4 permits govern the structural BMP design requirements of a Priority Development Project, the San Diego Water Board expects the Copermittees to be able to demonstrate, in a programmatic audit or other means, that a Priority Development Project met all the requirements listed under Provisions E.3.e.(1)(a)(i)[a]-[d], or have evidence that the Copermittee did not have the land use or legal authority to require the implementation of Provision E.3 for a Priority Development Project.

The requirements under Provision E.3.e.(2)-(3) are necessary to demonstrate each Copermittee is implementing a program that complies with Provisions E.3.b-c and E.3.e.(1), and ensure structural BMPs at Priority Development Project will continue to be able to reduce pollutants in storm water discharges to the MEP.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary for any development projects to compel compliance with the requirements of Provision E.3 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.3.f requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

<u>Provision E.4 (Construction Management)</u> requires each Copermittee to implement a construction management program to control and reduce the discharge of pollutants in storm water from construction sites to the MEP. Proper implementation of the construction management program will also contribute toward effectively prohibiting non-storm water discharges from construction sites to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." As part of the management program, 40 CFR 122.26(d)(2)(iv)(D) requires "*a program to implement and maintain structural and non-structural best management practices to reduce pollutants in storm water runoff from construction sites to the municipal storm sewer system.*"

Construction sites can be significant sources of sediment, trash, and other pollutants to receiving waters. Although sediment is naturally occurring in the natural environment, the discharge of sediment under unnatural conditions is problematic to receiving waters. Fine sediment in creeks causes high turbidity that interferes with the

functionality of native flora and fauna in local creeks. For example, turbidity interferes with both photosynthesis of water-philic plants, as well as successful foraging and reproduction of benthic macroinvertebrates. Sediment can also make it difficult for fish to breathe because it clogs fish gills. Other pollutants such as heavy metals or pesticides can adhere to sediment and are transported to receiving waters during storm events, where they dissolve in the water column and become bioavailable to aquatic organisms. Sediment is recognized as a major stressor to surface waters and is responsible for the impairment of several lagoons and creeks in the San Diego Region.

Provision E.4 includes requirements that each Copermittee must implement to minimize the discharge of sediment and other pollutants from construction sites to the MS4 within its jurisdiction. The requirements under Provision E.4 are consistent with the Fourth Term Permits for San Diego, Orange, and Riverside Counties. Therefore, Copermittees are expected to implement the requirements seamlessly, with minimal changes to their existing construction management programs. The Copermittees, however, are given more flexibility to run their programs as needed to maximize efficiency, and also to be consistent with the Water Quality Improvement Plan for the Watershed Management Area.

As part of the construction management program, 40 CFR 122.26(d)(2)(iv)(D)(1) requires "*procedures for site planning which incorporate consideration of potential water quality impacts.*" Provision E.4.a describes the minimum elements each Copermittee is required to include as part of the construction site planning and project approval process. The construction site planning and approval process is based primarily on ensuring each project had an adequate site-specific pollution control, construction BMP, and/or erosion and sediment control plan that will be implemented to minimize the discharge of pollutants in storm water to the MEP, and minimize impacts to receiving waters.

The requirements under Provision E.4.b provide the data and information necessary to identify "*priorities for inspecting sites and enforcing control measures*" required pursuant to 40 CFR 122.26(d)(2)(iv)(D)(3). Under Provision E.4.b, each Copermittee must identify construction sites that are considered a high threat to downstream surface waters. Designation of "high threat to water quality" construction sites will necessitate the Copermittees to develop criteria to identify such sites. Provision E.4.b.(2) describes a list of factors that must be considered when the Copermittee considers threat to water quality. For example, a Copermittee must identify sites as "high threat to water quality" if it is located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions, according to the Water Quality Improvement Plan. This ensures that construction management program implementation is compatible with the Copermittee's identified highest priority water quality conditions.

Pursuant to 40 CFR 122.26(d)(2)(iv)(D)(2) each Copermittee is required describe "*requirements for nonstructural and structural best management practices*" at

construction sites. Provision E.4.c includes the types of construction site BMPs that the Copermittees must implement, or require the implementation of, at each construction site to reduce pollutants in storm water discharges to the MEP.

Each Copermittee is expected to require the implementation of appropriate BMPs given specific site conditions, the season and likelihood of rain events, and construction phase (i.e. grading vs. vertical construction). This means that throughout the life of the project construction, the appropriate BMPs will vary, especially if the construction of the project spans multiple wet seasons. As opposed to describing specific minimum BMPs that must be implemented, the Order describes major BMP categories that should be considered for each site.

Each Copermittee is expected to use its 20 years of storm water experience and knowledge to require implementation of appropriate BMPs from the various categories at each construction site within its jurisdiction. For example, the San Diego Water Board expects that each site will be required to implement erosion control and sediment control. The San Diego Water Board also expects each Copermittee to require implementation of active/passive sediment treatment systems at sites where other BMPs have been tried and are known to be inadequate, and discharges of sediment are causing or contributing to water quality impairment downstream. Each Copermittee is granted flexibility in specifying the minimum level of BMP requirements at each site, but the San Diego Water Board expects each site to be capable of controlling pollutants in storm water discharges to the MEP and preventing illicit discharges.

The requirements under Provision E.4.d are necessary to demonstrate that each Copermittee is implementing a program that complies with Provisions E.4.a and E.4.c and ensure BMPs at construction sites will reduce pollutants in storm water discharges to the MEP.

Provision E.4.d does not include minimum required inspection frequencies for construction sites. Each Copermittee must use its experience and knowledge to specify an appropriate inspection frequency for both high priority and lower priority sites in their jurisdictional runoff management program documents, and in accordance with the Water Quality Improvement Plan. Appropriate inspection frequencies may vary by Copermittee, but the San Diego Water Board expects that the stated frequency will be adequate for each Copermittee to properly oversee the construction sites within its jurisdiction, confirm BMPs are implemented to reduce pollutants in storm water discharges from constructions sites to the MEP, and make needed changes to its program on an ongoing basis as necessary.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary for any development projects to compel compliance with the requirements of Provision E.4 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to

the MEP, Provision E.4.e requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Provision E.5 (Existing Development Management) requires each Copermittee to implement an existing development management program to control and reduce the discharge of pollutants in storm water from areas of existing development to the MEP. Proper implementation of the existing development management program will also contribute toward effectively prohibiting non-storm water discharges from areas of existing development to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." Within 40 CFR 122.26(d)(2)(iv)(A) and (C), the management program is required to reduce impacts on receiving waters and reduce pollutants in storm water discharges to the MEP from commercial and residential areas, industrial facilities, and municipal facilities.

Commercial and residential areas, industrial facilities, and municipal facilities must be addressed by each Copermittee with the existing development management program required under Provision E.5. All other areas within each Copermittee's jurisdiction should be either undeveloped open space, or areas that are being developed or under construction. Areas being developed or under construction will be addressed by the Copermittee under the requirements of Provision E.3 (Development Planning) or Provision E.4 (Construction Management).

Areas of existing development typically include impervious surfaces such as sidewalks, driveways, roads, and rooftops, which generate and concentrate pollutants (such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not found in high concentrations in the natural environment. Pollutants that accumulate on impervious surfaces are not easily biodegraded or not subject to natural treatment processes. When it rains, these pollutants are transported in storm water runoff from these impervious surfaces into receiving waters, resulting in poor water quality and degradation of beneficial uses.

In addition to the generation of pollutants, areas of existing development have generally altered the natural conditions of the land and removed vegetative cover, reduced the perviousness of the surface, and reduced the capacity of storm water that can be intercepted, captured, stored, infiltrated, evaporated, and/or evapotranspired. The alteration of the natural conditions and the impervious surfaces associated with areas of existing development causes water quality problems due to the alteration of natural flow regimes within the watersheds; resulting in hydromodification of channels, streams, and habitats that exist within or adjacent to the areas of existing development.

Thus, storm water discharges from areas of existing development are responsible for poor water quality, degraded habitats, and hydromodified channels throughout the developed portions of the watersheds in the San Diego Region. To improve the health and functionality of the receiving waters in a Watershed Management Area, land use practices and the amount of impervious surfaces in areas of existing development must change to reduce the various impacts caused by hydromodification and pollutants from storm water runoff generated in developed areas. Each Copermittee must be aggressive to address pollutant sources and runoff from areas of existing development to be able to reduce pollutants in storm water discharges from the MS4 to the MEP.

There is some overlap in the requirements under Provision E.5 with the requirements under Provisions E.2 (Illicit Discharge Detection and Elimination), E.3 (Development Planning), and E.4 (Construction Management). Illicit discharges frequently originate from areas of existing development. New development projects, when completed will become some type of residential, commercial, industrial or municipal existing development. Redevelopment projects are, by definition, redeveloping areas of existing development. And, redevelopment projects become construction sites located in areas of existing development. Much of the data and information collected, inspections performed, and enforcement actions taken for the requirements under Provisions E.2 to E.4 may also be utilized by the existing development management program. The requirements under Provision E.5, however, are focused primarily on reducing pollutants generated in areas of existing development that can be transported in storm water runoff and discharged to and from the MS4.

The requirements under Provision E.5 build upon existing program elements being implemented by the Copermittees. Provision E.5 is generally consistent with the existing development requirements of the Fourth Term Permits for Orange and Riverside Counties (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), but modified to provide more flexibility to implement the programs so resources can be better focused toward addressing the highest priority water quality conditions identified in the Water Quality Improvement Plans.

For a Copermittee to properly manage areas of existing development, having knowledge of what development exists within its jurisdiction is essential. Provision E.5.a requires each Copermittee to maintain a watershed-based inventory of all the existing development within its jurisdiction. This requirement is necessary for each Copermittee to implement the requirements of Provision E.5.b-e.

As opposed to just maintaining separate inventories based on the type of site, each Copermittee must maintain a watershed-based inventory that includes all types of existing development within its jurisdiction. By utilizing a watershed-based inventory, the Copermittees within a Watershed Management Area can combine their inventories and review the inventories by watershed in addition to by jurisdiction. Pollutant

sources and strategies for abatement can then be evaluated on a watershed level, as opposed to evaluating sources and strategies strictly by type of site.

Provision E.5.a includes the information that must be included in the inventory. Provision E.5.a.(1) specifies what facilities or areas must be included in the inventory. A commercial type of existing development may be identified in the inventory as a facility (e.g. individual building, individual business) or an area (e.g. shopping center, commercial zone). An industrial type of existing development must be identified in the inventory by facility (e.g. individual industrial entity). A municipal type of existing development must be identified in the inventory by facility, with a list of specific municipal facilities that must be included in the inventory. A residential type of existing development must be identified by areas to be designated by the Copermittee. For each of the facilities and areas identified in the Copermittee's inventory developed pursuant to Provision E.5.a.(1), Provision E.5.a.(2) specifies the information that must be included in the description for the facility or area.

Provision E.5.a.(3) requires each Copermittee to maintain an updated map showing the location of inventoried existing development, watershed boundaries, and water bodies. This requirement was included because this information is expected to help the Copermittees in a Watershed Management Area identify and prioritize sources of pollutants and/or stressors in areas of existing development that contribute toward the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Knowledge of the existing development that are likely to be sources of pollutants contributing to the highest priority water quality conditions is expected to be a key element in the Copermittees' development of the water quality improvement strategies that will be included in the Water Quality Improvement Plans. The strategies described in the Water Quality Improvement Plans will direct efforts within the existing development management programs implemented by each Copermittee.

Pursuant to 40 CFR 122.26(d)(2)(iv)(A) each Copermittee is required describe "*structural and source control measures to reduce pollutants*" in storm water runoff discharged from areas of existing development. Provision E.5.b includes the BMP implementation and maintenance requirements that the each Copermittee must require at areas of existing development to reduce pollutants in storm water discharges to the MEP. The San Diego Water Board, however, recognizes that BMP implementation and maintenance for residential areas will require much more education and encouragement through less authoritative measures than for commercial, industrial and municipal facilities and areas. Thus, the BMP implementation and maintenance requirements have been separated between requirements under Provision E.5.b.(1) for commercial, industrial and municipal facilities and areas, and Provision E.5.b.(2) for residential areas.

Most of the requirements in Provision E.5.b are consistent with the related requirements in the Fourth Term Permits. The level of specificity, however, has been changed to allow each Copermittee the flexibility to implement its program to achieve maximum efficiency, and to perform functions that will address the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Each Copermittee is expected to require the implementation of appropriate BMPs to address the expected pollutants from each facility or area. The Third and Fourth Term Permits described specific minimum BMPs that must be implemented at various sites. This Order, however, requires each Copermittee to designate minimum BMPs themselves and require implementation. Consistent with the Fourth Term Permits, each Copermittee is required to maintain, or require the maintenance of, all BMPs as needed.

The BMP implementation and maintenance requirements include a schedule of operation and maintenance activities for the MS4 and related structures (such as catch basins, storm drain inlets, and detention basins), as well as public streets and roads. Public streets and roads specifically include public unpaved roads. The San Diego Water Board identified, through investigations and complaints, sediment discharges from unpaved roads as a significant source of water quality problems in the San Diego Region. Inspection activities conducted by the San Diego Water Board since the Third Term Permits have found a lack of source control for many unpaved roads within the jurisdiction of the Copermittees.

Unpaved roads are a source of sediment that can be discharged in runoff to receiving waters, especially during storm events. Erosion of unpaved roadways occurs when soil particles are loosened and carried away from the roadway base, ditch, or road bank by water, wind, traffic, or other transport means. Exposed soils, high runoff velocities and volumes, sandy or silty soil types, and poor compaction increase the potential for erosion.

Road construction, culvert installation, and other maintenance activities can disturb the soil and drainage patterns to streams in undeveloped areas, causing excess runoff and thereby erosion and the release of sediment. Poorly designed unpaved roads can act as preferential drainage pathways that carry runoff and sediment into natural streams, impacting water quality. In addition, other public works activities along unpaved roads have the potential to significantly affect sediment discharge and transport within streams and other waterways, which can degrade the beneficial uses of those waterways.

USEPA also recognizes that discharges from unpaved roads pose a significant potential threat to water quality. USEPA guidance[40] emphasizes the threat of unpaved roads to water quality:

[40] USEPA, 2006. Environmentally Sensitive Maintenance for Dirt and Gravel Roads. Gesford and Anderson, USEPA-PA-2005.

> "*Dirt and gravel roads are a major potential source of these pollutants [sediment] and pollutants that bind to sediment such as oils, nutrients, pesticides, herbicides, and other toxic substances. Many roads have unstable surfaces and bases. Roads act like dams, concentrating flows that accelerate erosion of road materials and roadsides. Both unstable surfaces and accelerated erosion then lead to sediment and dust.*"

There are several guidance documents, developed by the USEPA,[41] the US Forest Service,[42] the University of California,[43] and others, that include design and construction specifications and BMPs that are readily available for implementation by public entities. Implementing design and other source control BMPs for unpaved roads in the region is necessary to reduce and minimize the impacts of sediment discharged during storm events from unpaved roads to the MS4s and receiving waters.

Provision E.5.c describes existing development site inspection frequency, content, and tracking that each Copermittee must incorporate into their existing development management programs. The requirements under Provision E.5.c are necessary to demonstrate each Copermittee is implementing a program that complies with Provision E.5.b and ensure BMPs implemented in areas of existing development will reduce pollutants in storm water discharges to the MEP. Provision E.5.c has been modified to include a minimum of once every 5 years for all inventoried facilities and areas of existing development, utilizing one or more methods of inspection.

In addition to onsite inspections, the methods of inspection have been expanded to include drive-by inspections. Inspections may be performed by the Copermittee's municipal and contract staff, or by volunteer monitoring or patrol programs. Volunteer monitoring or patrol programs are not expected to enforce the Copermittee's ordinances, or to inspect areas or facilities where members of the public are not allowed access. Volunteer monitoring or patrol programs must be trained by the Copermittee, and are only expected to collect visual observations. By utilizing drive-by inspections and volunteer monitoring or patrol programs, the Copermittees will be able to maximize and efficiently use their resources to identify and address sources of pollutants in areas of existing development.

The municipal and contract staff of each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial, industrial, and municipal facilities and areas in its inventoried existing development pursuant to Provision E.5.c.(1)(a)(iv). An "equivalent" of at least 20 percent means if any commercial, industrial, or municipal facilities or areas require multiple onsite

[41] Ibid
[42] US Forest Service, 1996. Forest Service Specifications for Construction of Roads & Bridges. EM-7720-100. Revised August 1996.
[43] University of California Division of Agriculture and Natural Resources, 2007. Rural Roads: A Construction and Maintenance Guide of California Landowners. Publication 8262.

inspections during any given year, those additional inspections may count toward the total annual inspection requirement. Linear municipal facilities (i.e. MS4 linear channels, sanitary sewer collection systems, streets, roads and highways) in the Copermittee's existing development inventory are not subject to the inspection frequency requirement of Provision E.5.c.(1)(a)(iv).

The inspection content specified in Provision E.5.c.(2)(a) includes the information required to be collected during an inspection by any method. The inspection content specified in Provision E.5.c.(2)(b) includes additional information that must be collected when a Copermittee's municipal or contract staff perform an onsite inspection. Provision E.5.c.(3) specifies the information that each Copermittee must maintain in its existing development inspection records.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary to compel compliance with the requirements of Provision E.5 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.5.d requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Provisions E.5.e.(1)-(2) specifically require the Copermittee to identify areas of existing development as candidates for retrofitting, and streams, channels, and/or habitats as candidates for rehabilitation. Provisions E.5.e.(1)-(2) are based on the retrofitting requirements of the Fourth Term Permits for Orange and Riverside Counties, but modified to also include identifying projects to rehabilitate channels within areas of existing development. The requirements have also been modified to be more focused on utilizing these types of projects for addressing the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Interest and opportunity to retrofit areas of existing development and rehabilitate channels located in areas of existing development has been observed in several programs the San Diego Water Board oversees (e.g., CWA Section 401 Water Quality Certification program, supplemental environmental projects, and grant programs). Each jurisdiction has miles and miles of streets that could be retrofitted to become green streets. Reshaping landscaped areas from convex to concave configurations can detain storm water instead of directing runoff as quickly as possible to the MS4. Retrofit projects could also include simply replacing impervious surfaces with permeable surfaces.

Retrofitting projects do not necessarily have to be expensive. Retrofitting projects could be as simple as redirecting downspouts from roofs to pervious or landscaped areas instead of to hardscaped areas discharging directly to the MS4, providing rain barrels to harvest storm water from downspouts for use at a later time, or planting more trees in areas with little vegetation to provide canopy that can intercept storm

water. The San Diego Water Board encourages the Copermittees to identify simple, low-cost retrofitting opportunities that can be easily implemented, in addition to other more expensive retrofitting and channel rehabilitation projects.

Rehabilitation of channels, streams, and/or habitat will require more significant planning and resources to implement. There are, however, also abundant opportunities to rehabilitate channels, streams and/or habitats in or adjacent to areas of existing development. Each Watershed Management Area likely has several creeks and stream reaches that have been undergrounded, artificially hardened, or hydromodified that could be rehabilitated to be more sustainably configured, which would slow down storm water flows and potentially have more assimilative capacity for pollutants while still being supportive of designated beneficial uses.

The San Diego Water Board recognizes that it may be infeasible to implement retrofitting or channel rehabilitation projects within certain areas of a Copermittee's jurisdictions. For such areas, the Copermittee must instead identify, develop, and implement regional retrofitting and channel rehabilitation projects (i.e. projects that can retain and/or treat storm water from one or more areas of existing development) adjacent to and/or downstream of the areas of existing development.

Provisions E.5.e.(1)-(2) do not require the implementation of retrofitting and rehabilitation projects, but do require the Copermittee to develop a program with strategies to facilitate the implementation of these types of projects in areas of existing development. The strategies are expected to include allowing and encouraging Priority Development Projects to implement retrofitting types of projects as a means of compliance with the structural BMP performance criteria requirements of Provisions E.3.c.(1) and E.3.c.(2).

<u>Provision E.6 (Enforcement Response Plans)</u> requires each Copermittee to develop an Enforcement Response Plan as part of its jurisdictional runoff management program document. Proper implementation of the Enforcement Response Plans is necessary to effectively prohibit non-storm water discharges to the MS4, and reduce the discharge of pollutants in storm water from the MS4 to the MEP.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system*" and be able to demonstrate that it can "*operate pursuant to legal authority established by statute, ordinance or series of contracts*" to control the discharge of non-storm water and pollutants in storm water to and from its MS4. Pursuant to 40 CFR 122.26(d)(2)(i)(E) each Copermittee is specifically required to have the legal authority to "*[r]equire compliance with conditions in ordinances, permits, contracts or order*s."

The requirements under Provision E.6 are necessary to demonstrate that each Copermittee can enforce its legal authority to *"effectively prohibit non-stormwater discharges"* and "*reduce the discharge of pollutants to the maximum extent*

practicable" as well as "*[r]equire compliance with conditions in ordinances, permits, contracts or order*."

The Enforcement Response Plan required under Provision E.6 will serve as a reference for the Copermittee and the San Diego Water Board to determine if consistent enforcement actions are being implemented to achieve timely and effective compliance from all public and private entities that are not in compliance with the Copermittee's ordinances, permits, or other requirements. The Enforcement Response Plan must contain clear direction for the Copermittee to take immediate enforcement action, when appropriate and necessary, in their illicit discharge detection and elimination, development planning, construction management, and existing development management programs.

If the entities subject to the Copermittee's legal authority do not implement appropriate corrective actions in a timely manner, or if violations repeat, the Copermittee must take progressively stricter responses to enforce its legal authority and achieve compliance with its ordinances, permits, or other requirements to *"effectively prohibit non-stormwater discharges"* and "*reduce the discharge of pollutants to the maximum extent practicable.*"

<u>Provision E.7 (Public Education and Participation)</u> requires each Copermittee to implement a public education and participation program. Proper implementation of the public education and participation program as part of its jurisdictional runoff management program will contribute toward effectively prohibiting non-storm water discharges to the MS4, and toward the reduction of pollutants in storm water from the MS4 to the MEP.

Provision E.7 establishes the minimum requirements that each Copermittee must implement to engage members of the public as part of its jurisdictional runoff management program. In the Fourth Term Permits, the public education program requirements and the public participation requirements were included as separate jurisdictional runoff management program components. In this Order, the public education requirements have been consolidated with the public participation requirements, as both sets of requirements are related to the engagement of the public by each Copermittee. Engagement of the public is critical for the success of each Copermittee's jurisdictional runoff management program.

The Copermittees have been implementing public education programs for the last 20 years, which are now well established. The specificity of expected public education program elements of the Fourth Term Permits has been removed. For the most part, the public education program requirements in Provision E.7.a have been reduced to a set of requirements that are specifically included in the federal regulations under 40 CFR 122.26(d)(2)(iv)(A)(6), 122.26(d)(2)(B)(6) and 122.26(d)(2)(D)(4), which should already be incorporated into each Copermittee's existing public education program. Each Copermittee is expected to utilize the information and data collected from the monitoring and assessments conducted within the Watershed Management Area, and

from its inventories and inspections to best direct its public education program resources toward addressing the highest priority water quality conditions identified within the Water Quality Improvement Plan.

According to 40 CFR 122.26(d)(2)(iv), public participation is required to be included as part of the "*comprehensive planning process*", which includes the development and implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs. The requirements under Provision E.7.b specify the opportunities that the public must be provided to be involved in the "*comprehensive planning process*", as required by to 40 CFR 122.26(d)(2)(iv).

Provision E.8 (Fiscal Analysis) requires each Copermittee to secure the resources and provide an analysis of the resources that will be necessary to implement the requirements of the Order. Adequate fiscal resources are necessary for a jurisdictional runoff management program to effectively prohibit non-storm water discharges to the MS4, and reduce pollutants in storm water from the MS4 to the MEP.

According to 40 CFR 122.26(d)(2)(vi), each Copermittee is responsible for providing "*a fiscal analysis of the necessary capital and operation and maintenance expenditures necessary to accomplish the activities*" required by this Order, including "*a description of the source of funds that are proposed to meet the necessary expenditures, including legal restrictions on the use of such funds.*" The fiscal analysis requirements of Provision E.8 are consistent with 40 CFR 122.26(d)(2)(vi).

The San Diego Water Board has chosen not to require a description of fiscal benefits realized from implementation of the jurisdictional runoff management programs. This is a recommendation from the National Association of Flood and Stormwater Management Agencies.[44] For instance, the fiscal analysis requirements do not address city-wide fiscal benefits of protection (e.g., public health, tourism, property values, economic activity, beneficial uses, etc.), even though many costs currently reported to the San Diego Water Board are for related activities. This type of assessment may help Copermittees improve the allocation of resources and it may help the Copermittees secure adequate funding for the program. Qualitative assessments, however, could be overly subjective and most Copermittees likely lack the ability to provide accurate quantitative assessments. The San Diego Water Board encourages the Copermittees to consider means for conducting assessments of fiscal benefits derived from the programs. Such assessments could be conducted on a regional scale similar to studies of program costs conducted by the State Water Board.[45]

[44] National Association of Flood and Stormwater Management Agencies. 2006. *Guidance for Municipal Stormwater Funding.* Prepared under a grant provided by the USEPA.
[45] State Water Board, 2005. NPDES Stormwater Cost Survey.

F. Reporting

Purpose: Provision F includes the requirements for the documents and reports that the Copermittees must prepare and provide to the San Diego Water Board. The documents prepared by the Copermittees and provided to the San Diego Water Board and made available to the public will provide the documentation that the Copermittees are complying with the requirements of the Order.

***Discussion*:** Provision F requires the Copermittees to prepare several documents and reports that must be provided to the San Diego Water Board and made available to the public. The reporting requirements have been significantly reduced compared to the Fourth Term Permit reporting requirements. The reduction in reporting requirements was recommended by the San Diego County Copermittees in the Report of Water Discharge submitted in June 2011.

More specific and detailed discussions of the requirements of Provision F are provided below.

Provision F.1 (Water Quality Improvement Plans) requires the Copermittees in each Watershed Management Area to develop and submit a Water Quality Improvement Plan in accordance with the requirements of Provision B.

Of all the requirements of Provision F, the Water Quality Improvement Plans will likely be the documents requiring the most significant effort to develop. The content of the Water Quality Improvement Plans, however, is expected to include content that should already have been developed for the Watershed Plans and several elements that are included in the Monitoring and Reporting Programs required under the Fourth Term Permits.

Because the Water Quality Improvement Plan is part of the "*comprehensive planning process which involves public participation*," Provision F.1 includes requirements to give multiple opportunities to the public to provide input on the content of the plans.

Provision F.1.a.(1) specifies the elements that the Copermittees must include in the public participation process for the development of the Water Quality Improvement Plans. In order for the public to be aware of the opportunities to provide input, Provision F.1.a.(1)(a) requires the Copermittees to develop a publicly available and noticed schedule of the opportunities for the public to participate and provide comments during the development of the Water Quality Improvement Plan. These opportunities are when the public can provide the data, information, and recommendations that the Copermittees can consider during the development of the Water Quality Improvement Plans.

The San Diego Water Board recognizes, however, that the Copermittees cannot be expected to incorporate all the data, information, and recommendations that the public may provide into the Water Quality Improvement Plans. The Copermittees will have to

review the data, information, and recommendations received and make some decisions on what to incorporate into the Water Quality Improvement Plans. Before the Copermittees finalize their decisions, members of the public should be allowed to review the Copermittees' decisions. Thus, Provision F.1.a.(1)(b) requires the Copermittees to form a Water Quality Improvement Consultation Panel (Panel).

The Panel will consist of a member from the environmental community and a member from the development community familiar with the Watershed Management Area. A representative from the San Diego Water Board staff will also be part of the Panel. The Copermittees may choose to include additional members, but the Panel is only required to include three panel members.

The Panel will serve as an additional public participation and input mechanism during the development of the Water Quality Improvement Plans. The knowledge and expertise from these Panel members are expected to provide the Copermittees valuable direction during their decision-making process. The Copermittees will review the content of their planned submittals with the Panel members to receive recommendations. If the Panel provides recommendations, the Copermittees must consider revisions to the Water Quality Improvement Plan submittals.

The San Diego Water Board recognizes that the development of multiple Water Quality Improvement Plans concurrently may limit the ability of the public to review and provide comments to the Copermittees. Thus, Provision F.1.a.(1)(c) requires the Copermittees to coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public time and opportunity to participate during the development of the Water Quality Improvement Plans.

Provision F.1.a.(2) requires the Copermittees to develop and submit the first Water Quality Improvement Plan component, in accordance with the requirements of Provision B.2, which includes the identification of the priority water quality conditions and potential water quality improvement strategies. The public must be provided an opportunity to provide data, information and recommendations to be utilized in the development and identification of the priority water quality conditions and potential water quality improvement strategies for the Watershed Management Area. The Copermittees must consult with the Panel and consider making revisions. The Copermittees may submit the requirements of Provision B.2 as early as 6 months and no later than 12 months after the commencement of coverage under this Order. After the requirements of Provision B.2 are submitted to the San Diego Water Board, the public will be provided another opportunity to provide comments.

Provision F.1.a.(3) requires the Copermittees to develop and submit the second Water Quality Improvement Plan component, in accordance with the requirements of Provision B.3, which includes the identification of the numeric goals for the highest priority water quality conditions identified for the Watershed Management Area, and the strategies that will be implemented to achieve the potential numeric goals. The Copermittees may also develop the Optional Watershed Management Area Analysis, in accordance with the requirements of Provision B.3.b.(4), as part of this submittal.

The public must be provided an opportunity to provide data, information and recommendations to be utilized in the development and identification of the numeric goals and water quality improvement strategies for the Watershed Management Area. The Copermittees must consult with the Panel and consider making revisions. The Copermittees may submit the requirements of Provision B.3 as early as 9 months and no later than 18 months after the commencement of coverage under this Order. After the requirements of Provision B.3 are submitted to the San Diego Water Board, the public will be provided another opportunity to provide comments.

Finally, Provision F.1.b describes the process for the submittal and implementation of the Water Quality Improvement Plans. The complete Water Quality Improvement Plans are required to be submitted by the Copermittees within 24 months after the commencement of coverage under this Order. The San Diego Water Board will provide the public an opportunity to provide comments on each complete Water Quality Improvement Plan.

The San Diego Water Board will review each Water Quality Improvement Plan and the public comments received to determine if the Copermittees have submitted a Water Quality Improvement Plan that meets the requirements of Provision B. If a Water Quality Improvement Plan does not meet the requirements of Provision B, the Copermittees will be considered out of compliance and directed in writing by the San Diego Water Board Executive Officer to correct the deficiencies.

When a Water Quality Improvement Plan meets the requirements of Provision B, the San Diego Water Board will determine whether to hold a public hearing or to limit public input to submittal of written comments before accepting the Water Quality Improvement Plan. Implementation of the Water Quality Improvement Plan must begin within 30 days of acceptance.

The San Diego Water Board expects that any deficiencies in the Water Quality Improvement Plan will be identified either in the public comments or during the review by the San Diego Water Board before implementation begins. In the event any deficiencies are identified after the implementation of the Water Quality Improvement Plan, Provision F.1.b.(7) clarifies that the San Diego Water Board maintains the right to require the Copermittees to correct any deficiencies that may be identified.

<u>Provision F.2 (Updates)</u> requires the Copermittees to update specific documents that the Copermittees will utilize to implement the requirements of this Order.

Each Copermittee is required to continue implementing a jurisdictional runoff management program, as required under Provision E. Implementation of each Copermittee's jurisdictional runoff management program is directed by its jurisdictional runoff management program document. Provision F.2.a requires each Copermittee to update its jurisdictional runoff management program document to be consistent with the requirements of Provision E concurrent with the submittal of the Water Quality Improvement Plan.

Likewise, each Copermittee must continue to require new development and redevelopment projects to implement BMPs to control pollutants in storm water runoff. The control of pollutants in storm water runoff from development and redevelopment projects within each Copermittee's jurisdiction is guided and directed by its BMP Design Manual, formerly known as a Standard Storm Water Mitigation Plan (SSMP). Provision F.2.b requires each Copermittee to update its BMP Design Manual to be consistent with the requirements of Provision E.3 concurrent with the submittal of the Water Quality Improvement Plan.

For situations where the San Diego Water Board may amend the requirements of Provisions E.3.a-d after a Copermittee has updated its BMP Design Manual pursuant to Provision F.2.b.(1), Provision F.2.b.(4) gives the Copermittee up to 90 days to incorporate the amended requirements of Provision E.3.a-d into its BMP Design Manual. The San Diego Water Board Executive Officer has discretion to modify the 90-day time period depending on the complexity of the amendments or other information that warrants a change in the 90-day time period.

In general, the requirements of the Order should not necessitate a complete rewrite of each Copermittee's jurisdictional runoff management program document or BMP Design Manual, as was required by the Third Term Permits. The jurisdictional runoff management program and BMP Design Manual requirements of this Order are not significantly different than the requirements of the Fourth Term Permits. Thus, only sections of the Order which are new or have been significantly changed should warrant revisions to specific sections of the Copermittee's jurisdictional runoff management program document and BMP Design Manual.

Finally, the Water Quality Improvement Plans are expected to require updates as the iterative approach and adaptive management process included in the Water Quality Improvement Plan, as required under Provision B.5, is implemented by the Copermittees. Provision F.2.c.(1) requires the Copermittees to implement a public participation process for the proposed updates, review the proposed updates with the Panel, and submit the updates to the Water Quality Improvement Plan as part of the Annual Reports required under Provision F.3.b.

Also, because TMDLs are likely to be developed, adopted and approved during the term of the Order, Provision F.2.c.(2) has been included to expedite the incorporation of TMDLs into the Copermittees' Water Quality Improvement Plans as part of the update process, potentially before the Order is re-opened to incorporated the requirements of the new TMDLs.

<u>Provision F.3 (Progress Reporting)</u> requires the Copermittees to report on the progress of implementing the Water Quality Improvement Plans.

The requirements of Provision F.3 are to report the progress toward improving water quality that the Copermittees are achieving with the implementation of the Water Quality Improvement Plans and each Copermittee's jurisdictional runoff management program. The Progress Report Presentations required under Provision F.3.a are

included to provide the Copermittees an opportunity to communicate directly with the San Diego Water Board and the public. The Progress Report Presentations will also provide the members of the San Diego Water Board and members of the public an opportunity to become more acquainted with the Copermittees and their projects and programs to address non-storm water and storm water discharges into and from their MS4s.

The Annual Report requirements of Provision F.3.b are a consolidation of several reporting requirements from the Fourth Term Permits, including the Jurisdictional Runoff Management Program Annual Reports, the Watershed Annual Reports, and the Monitoring and Reporting Program Annual Reports. Furthermore, the Annual Report requirements are consistent with the requirements under 40 CFR 122.42(c).

Pursuant to 40 CFR 122.42(c), "*[t]he operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the Director…must submit an annual report*", which must include the following:

(1) *The status of implementing the components of the storm water management program that are established as permit conditions* [40 CFR 122.42(c)(1)];

(2) *Proposed changes to the storm water management programs that are established as permit conditions* [40 CFR 122.42(c)(2)];

(3) *Revisions, if necessary, to the assessment of controls and fiscal analysis* [40 CFR 122.42(c)(3)];

(4) *A summary of data, including monitoring data, that is accumulated throughout the reporting year* [40 CFR 122.42(c)(4)];

(5) *Annual expenditures and budget for year following each annual report* [40 CFR 122.42(c)(5)];

(6) *A summary describing the number and nature of enforcement actions, inspections, and public education programs* [40 CFR 122.42(c)(6)];

(7) *Identification of water quality improvements or degradation* [40 CFR 122.42(c)(7)].

Under the Fourth Term Permits, each Copermittee is responsible for submitting a Jurisdictional Runoff Management Program Annual Report; the Copermittees in each designated watershed are responsible for submitting a Watershed Annual Report; and the Copermittees from each county are responsible for submitting a Monitoring and Reporting Program Annual Report.

There are 39 Copermittees in the San Diego Region, each required to prepare and submit a Jurisdictional Runoff Management Program Annual Report. There are 9 designated watersheds in San Diego County, 6 designated watersheds in Orange County, and 1 designated watershed in Riverside County for a total of 16 designated watersheds, each requiring a Watershed Annual Report. There are 3 sets of

Copermittees in 3 counties in the San Diego Region, requiring Copermittees from each county to prepare and submit a Monitoring and Reporting Program Annual Report. Thus each Copermittee is currently required to prepare, or participate in the preparation of at least 3 annual reports. In addition, the San Diego County Copermittees are required to prepare and submit a Regional Urban Runoff Management Plan Annual Report.

In total, there are 59 annual reports that are prepared by the Copermittees and submitted to the San Diego Water Board for the Fourth Term Permits. The preparation of these annual reports requires significant time and resources from each Copermittee, which could otherwise be expended on actions that could improve water quality within its jurisdiction. In turn, significant time and resources are required from the San Diego Water Board staff to review these reports, which could otherwise be expended on working directly with the Copermittees to improve their implementation efforts toward restoring and protecting water quality.

Until the Water Quality Improvement Plans are developed, there will be a transitional period during which the Copermittees will continue to implement their existing jurisdictional runoff management programs. There will also be a transitional period during which the Copermittees will implement the transitional monitoring and assessment requirements of Provision D. During the transitional period, the Copermittees will submit annual reports pursuant to the requirements of Provisions F.3.b.(1) and F.3.b.(2).

Provision F.3.b.(1) includes the transitional annual reporting requirements for each Copermittee's jurisdictional runoff management program. The reporting of the jurisdictional runoff management program implementation efforts have been reduced to a single 2-page form. Each Copermittee is required to complete and submit a Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D or a revised form accepted by the San Diego Water Board) no later than October 31 of each year for each jurisdictional runoff management program reporting period (i.e. July 1 to June 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted. The Jurisdictional Runoff Management Program Annual Report Form will certify that each Copermittee has implemented its jurisdictional runoff management program in accordance with the requirements of Provision E. Each Copermittee may choose to continue to utilize and submit the jurisdictional runoff management program annual reporting format of its current Order until the first Water Quality Improvement Plan Annual Report is required to be submitted.

Provision F.3.b.(2) includes the transitional annual reporting requirements for the transitional monitoring and assessment program for each Watershed Management Area. The Copermittees in the Watershed Management Area are required to submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water

Quality Improvement Plan Annual Reports are required to be submitted. The Transitional Monitoring and Assessment Program Annual Report is required to include the transitional period monitoring data collected pursuant to Provisions D.1.a and D.2.a, and the findings from the transitional period findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

Provision F.3.b.(3) includes the Water Quality Improvement Plan Annual Report requirements. Only one Water Quality Improvement Plan Annual Report is required for each of the ten (10) Watershed Management Areas designated under Provision B.1, which is a significant reduction in the number of annual reports required to be prepared and submitted by the Copermittees. The Water Quality Improvement Plan Annual Report will document the Copermittees' efforts to implement the Water Quality Improvement Plan. Each Water Quality Improvement Plan Annual Report will be focused primarily on reporting the analysis of the monitoring data collected pursuant to Provisions D.1-D.3 during the reporting period, and the assessments that are required pursuant to Provision D.4 based on the data. The monitoring data analyses and the assessments that are provided in the Water Quality Improvement Plan Annual Report will be the core of the report. The reporting of the jurisdictional runoff management program implementation efforts have been reduced to a single 2-page form, and will no longer be the primary focus of the reporting requirements as in the Third and Fourth Term Permits.

Each Copermittee will continue to prepare and submit a Jurisdictional Runoff Management Program Annual Report Form as part of the Water Quality Improvement Plan Annual Report to certify that each Copermittee has implemented its jurisdictional runoff management program in accordance with the requirements of Provision E. Instead of reviewing a voluminous report from each Copermittee, as was required under the Third and Fourth Term Permits, the San Diego Water Board will conduct audits of each Copermittee's jurisdictional runoff management program to investigate and confirm the information provided by each Copermittee on its Jurisdictional Runoff Management Program Annual Report Form. The audits will allow the San Diego Water Board to become more familiar with the each Copermittee's jurisdictional runoff management program, and each Copermittee will become more informed about the expectations of the San Diego Water Board.

The reduction in the number and content of the Water Quality Improvement Plan Annual Reports should result in significant time, cost and resource savings for the Copermittees, as well as the San Diego Water Board. Those savings should offset a significant portion of any additional costs that may be incurred to develop the Water Quality Improvement Plans and to implement the monitoring and assessment program requirements of Provision D.

The reporting period for the Water Quality Improvement Plan Annual Reports consists of two periods. Because the jurisdictional runoff management programs are typically budgeted and implemented during a fiscal year, the information provided on the

Jurisdictional Runoff Management Program Annual Report Forms will cover the period from July 1 to June 30 of the following year.

The Water Quality Improvement Plan Annual Reports, however, are focused primarily on the monitoring data and the assessments based on the monitoring data. The monitoring data is collected during the monitoring year, which begins October 1 and ends September 30 of the following year. The monitoring year begins after the beginning of the fiscal year and ends after the end of the fiscal year. Therefore, to accommodate and capture the information collected during the fiscal year and the monitoring year, the Annual Report reporting period incorporates both periods.

Finally, Provision F.3.c requires the Copermittees to develop and submit a Regional Monitoring and Assessment Report. The Regional Monitoring and Assessment Report is similar to the Long Term Effectiveness Assessment required under the Fourth Term San Diego County Permit. The Regional Monitoring and Assessment Report is expected to utilize the entire body of data and information collected by the Copermittees during the term of this Order to assess improvements to water quality on a regional scale.

Provision F.4 (Regional Clearinghouse) requires the Copermittees to develop, update, and maintain an internet-based Regional Clearinghouse that can be used to store, disseminate, and share the Copermittees' documents, monitoring data, special studies, and any other data or information.

Most of the documents and data that are generated by the Copermittees can be provided in electronic format, and made available to the San Diego Water Board and the public on the internet. The San Diego Water Board has been gradually transitioning its document submittal requirements to electronic submittals. Provision F.4 has been included to further these efforts.

Provision F.4 has also been included to improve the exchange and availability of information among the Copermittees, as well as between the Copermittees and the San Diego Water Board. Provision F.4 will also make the information generated during the implementation of the Order more accessible to the public.

Provision F.5 (Report of Waste Discharge) requires the Copermittees to submit a Report of Waste Discharge to reapply for renewal of the Order prior to its expiration, in accordance with 40 CFR 122.21(d)(2) and CWC section 13376.

Provision F.5 requires the Copermittees to submit a Report of Waste Discharge 180 days in advance of the expiration of this Order. Provision F.5 also describes the minimum information to be included in the Report of Waste Discharge, based on USEPA guidance "Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems," dated May 17, 1996.

G. Principal Watershed Copermittee Responsibilities

Purpose: Provision G includes the requirements for the Principal Watershed Copermittee designated by the Copermittees in each Watershed Management Area.

***Discussion*:** Unlike previous NPDES requirements, there will no longer be a single Principal Copermittee. Provision G.1 requires the Copermittees to designate a Principal Watershed Copermittee for each Watershed Management Area. There are ten (10) Watershed Management Areas in the San Diego Region, as defined in Table B-1 under Provision B.1 of the Order. An individual Copermittee should not be the Principal Watershed Copermittee for more than two (2) Watershed Management Areas. There could be up to ten (10) Principal Water Copermittees designated for the Watershed Management Areas in the San Diego Region.

Provision G.2 describes the minimum responsibilities of each Principal Watershed Copermittee. The primary responsibility of the Principal Watershed Copermittees is to serve as the liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues. Ideally, the Principal Watershed Copermittee can represent the interests of all the Copermittees within a Watershed Management Area during discussions or meetings to facilitate communication with the San Diego Water Board. The Principal Watershed Copermittees are also responsible for facilitating and coordinating the implementation efforts of the Copermittees and submittals of required documents and reports.

The Principal Watershed Copermittee is responsible for facilitating the efforts of the Copermittees within the Watershed Management Area to develop the Water Quality Improvement Plan required under Provision B, and submit it for approval in accordance with Provision F.1. The Principal Watershed Copermittee is also responsible for coordinating the submittal of the document updates, Progress Report Presentations, and Annual Reports required from the Copermittees within each Watershed Management Area under Provisions F.2, F.3.a, and F.3.b. The Principal Watershed Copermittees are responsible for coordinating with each other to develop and submit the Regional Clearinghouse, Regional Monitoring and Assessment Report, and the Report of Waste Discharge required under Provisions F.3.c, F.4, and F.5.

The designated Principal Watershed Copermittee for each Watershed Management Area does not necessarily have to serve as the Principal Watershed Copermittee for the entire term of the Order. If the Copermittees in a Watershed Management Area choose to designate a new Principal Watershed Copermittee, the change may be submitted as part of the Annual Report required under Provision F.3.b, with an update to the Water Quality Improvement Plan in accordance with Provision F.2.c.

Provision G.3 specifies that the Principal Watershed Copermittee is not responsible for ensuring that the other Copermittees within the Watershed Management Area are in compliance with the requirements of this Order

H. Modification of Order

Purpose: Provision H provides the conditions under which modifications to Order No. R9-2013-0001, as amended, may occur.

***Discussion*:** Provision H allows for modifications to Order No. R9-2013-0001, as amended, for bases in addition to modifications (minor and major) allowed under the federal regulations at 40 CFR 122.62 and 122.63.

Modifications to the Order require re-opening the Order (see Water Code section 13223), subject to the requirements of 40 CFR 122.44, 122.62 to 122.64, and 124.5, but only for the specific provisions subject to the modification. Proposed modifications of the Order will be made available for public review, a public notice and comment period, and a public hearing if requested. Comments on the provisions not subject to the proposed modifications are not required to be considered in the San Diego Water Board's responses to comments or during the public hearing.

Provision H.4 was included to specify that the Order will be re-opened for modifications if the Basin Plan is amended to modify an existing TMDL or incorporate a new TMDL, or the monitoring and assessment program requirements need to be updated or revised.

I. Standard Permit Provisions and General Provisions

Purpose: Provision I incorporates the standard permit provisions required to be included in all NPDES permits, as well as several other general provisions.

***Discussion*:** Provision I refers to Attachment B to the Order. Attachment B expressly incorporates the conditions applicable to all NPDES permits as provided under 40 CFR 122.41(a)-(n), as well as the applicable conditions for MS4s and storm water discharges provided under 40 CFR 122.42(c) and 40 CFR 122.42(d), respectively. Attachment B also includes several general provisions that are typically included in or applicable to waste discharge requirements issued by the San Diego Water Board.

IX. ATTACHMENTS

The attachments to the Order are discussed below. The discussions describe the content of the attachments.

Attachment A – Discharge Prohibitions and Special Protections

Section 1 of Attachment A includes the Waste Discharge Prohibitions from the Basin Plan. They have been provided verbatim in their entirety.

Section 2 of Attachment A includes the "*Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges*" applicable to permitted point source discharges of storm water, adopted under State Water Board Resolution No. 2012-0012, as amended by Resolution No. 2012-0031. The terms, prohibitions, and special conditions (collectively referred to as special conditions) are established as limitations on point source storm water discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in ASBS, as required for State Water Quality Protection Areas pursuant to California Public Resources Code sections 36700(f) and 36710(f). These Special Protections were adopted by the State Water Board as part of the Ocean Plan General Exception.

Attachment B – Standard Permit Provisions and General Provisions

Conditions applicable to all NPDES permits, as required under 40 CFR 122.41, and conditions applicable to MS4s and storm water discharges, as required under 40 CFR 122.42(c) and 122.42(d), respectively are provided in Attachment B to the Order. They have been provided expressly in their entirety.

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. These general provisions are typically included in or applicable to waste discharge requirements issued by the San Diego Water Board. Many of the general provisions were developed by the State Water Board. Where a general provision is derived from statute or regulation, a citation of the statute or regulation section is provided. General provisions that do not provide a citation are included under the authority provided CWC 13377.

Attachment C – Acronyms, Abbreviations and Definitions

The acronyms and abbreviations that are used in the Order are provided in Attachment C. Attachment C also includes definitions that may provide an explanation or description of the meaning or intent of specific terms or phrases included in the Order.

Attachment D – Jurisdictional Runoff Management Program Annual Report Form

An example of the Jurisdictional Runoff Management Program Annual Report Form required to be submitted by each Copermittee as part of the Annual Reports required under Provision F.3.b.(1)(e) is provided as Attachment D to the Order. An electronic version of the form will be available from the San Diego Water Board after the adoption of the Order.

The Jurisdictional Runoff Management Program Annual Report Form includes the minimum information necessary to demonstrate that the Copermittee is implementing and in compliance with the requirements of Provision E, and includes much of the information required to be reported pursuant to 40 CFR 122.42(c).

The information that must be provided on the Jurisdictional Runoff Management Program Annual Report Form is limited to the fiscal year, which begins July 1 and ends June 30 of the following year. The information expected to be provided by the Copermittees in each section of the Jurisdictional Runoff Management Program Annual Report Form is discussed below.

I. COPERMITTEE INFORMATION

The name of the Copermittee (e.g. name of city, county, or special district) and the contact information for the storm water program manager are provided under this section.

II. LEGAL AUTHORITY

The Copermittee must confirm whether or not the legal authorities under Provision E.1.a have been established for itself within its jurisdiction.

The Copermittee must also confirm whether or not a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority, as required under Provision E.1.b. The certification statement required by Provision E.1.b is only required to be submitted with the first Annual Report required under Provision F.3.b.

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

The Copermittee must inform the San Diego Water Board whether or not an update to its jurisdictional runoff management program document was required or recommended by the San Diego Water Board during the reporting period. An update to the jurisdictional runoff management program is required under Provision F.2.a. The San Diego Water Board may recommend modifications to the jurisdictional runoff management program as part of the iterative approach and adaptive management process required under Provision B.5, which may result in an update that is necessary for the Copermittee's jurisdictional runoff management document.

If an update was required or recommended, the Copermittee must confirm whether or not the update was completed and made available on the Regional Clearinghouse within the reporting period. If no update was required or recommended, an answer is not required. If the answer is NO, meaning the required or recommended update was not completed and/or made available on the Regional Clearinghouse, the Copermittee must attach a

schedule for the completion of the update and/or posting of the updated document on the Regional Clearinghouse.

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

The Copermittee must confirm whether or not a program was implemented during the fiscal year to actively detect and eliminate illicit discharges and connections in accordance with the requirements under Provision E.2.

In addition to confirming that a program to detect and eliminate illicit discharges was implemented during the reporting period, the Copermittee is also required to report on several items related to the program. The information that must be reported is limited to the fiscal year for the Annual Report.

All non-storm water discharges are considered illicit discharges unless the source is identified as one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5). If a non-storm water discharge is identified as one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5), the discharge is a non-storm water discharge, but not an illicit discharge. If a non-storm water discharge is identified but not in one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5), the discharge is both a non-storm water discharge and an illicit discharge.

V. DEVELOPMENT PLANNING PROGRAM

The Copermittee must confirm whether or not a development planning program was implemented during the fiscal year in accordance with the requirements under Provision E.3.

The Copermittee must also inform the San Diego Water Board whether or not an update to its BMP Design Manual was required or recommended by the San Diego Water Board during the fiscal year. An update to the BMP Design Manual is required under Provision F.2.b. The San Diego Water Board may recommend modifications to the BMP Design Manual, which may result in an update that is necessary for Copermittee's the BMP Design Manual.

If an update was required or recommended, the Copermittee must confirm whether or not the update was completed and made available on the Regional Clearinghouse within the reporting period. If no update was required or recommended, an answer is not required. If the answer is NO, meaning the required or recommended update was not completed and/or made available on the Regional Clearinghouse, the Copermittee must attach a schedule for the completion of the update and/or posting of the updated document on the Regional Clearinghouse.

The Copermittee is also required to report on several items related to the program. For the development and redevelopment projects that are reviewed under the program, the Copermittee must report the total number projects submitted for review during the fiscal year. Of those projects, the Copermittee must report the number that are Priority Development Projects, as defined under Provision E.3.b.(1). The Copermittee must also report the number of Priority Development Projects that were approved and/or granted occupancy during the fiscal year, regardless of when the project was originally submitted for review. Any projects that were approved during the fiscal year and granted any

exemptions from the BMP Design Manual requirements and/or allowed to implement alternative compliance options in accordance with Provision E.3.c.(3) must be reported.

Finally, the Copermittee must also report on several items related to its oversight of permanent BMPs on Priority Development Projects within its jurisdiction, as required under Provision E.3.e. The information that must be reported is limited to the fiscal year for the Annual Report.

VI. CONSTRUCTION MANAGEMENT PROGRAM

The Copermittee must confirm whether or not a construction management program was implemented during the fiscal year in accordance with the requirements under Provision E.4.

The Copermittee is also required to report on several items related to its oversight construction projects within its jurisdiction. The information that must be reported is limited to the fiscal year for the Annual Report.

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

The Copermittee must confirm whether or not an existing development management program was implemented during the fiscal year in accordance with the requirements under Provision E.5.

The Copermittee is also required to report on several items related to its oversight in areas of existing development within its jurisdiction. The information that must be reported is limited to the fiscal year for the Annual Report. The information must also be separated into four categories of existing development: municipal, commercial, industrial, and residential.

VIII. PUBLIC EDUCATION AND PARTICIPATION

The Copermittee must confirm whether or not a public education program component was implemented during the fiscal year in accordance with the requirements under Provision E.7.a.

The Copermittee must also confirm whether or not a public participation program component was implemented during the fiscal year in accordance with the requirements under Provision E.7.b.

IX. FISCAL ANALYSIS

The Copermittee must confirm a summary of its fiscal analysis, conducted in accordance with the requirements under Provision E.8, has been attached to the form.

X. CERTIFICATION

A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative must sign and certify the Jurisdictional Runoff Management Program Annual Report Form. The appropriate box must be checked to indicate the whether a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative is signing the form.

Attachment E – Specific Provisions for Total Maximum Daily Loads

Attachment E provides specific provisions for implementing the load allocations (LAs) and wasteload allocations (WLAs) of Total Maximum Daily Loads (TMDLs) adopted by the San Diego Water Board and approved by USEPA in which the Copermittees are identified as responsible for discharges subject to the requirements of the TMDLs. Federal regulations require that NPDES requirements incorporate water quality based effluent limitations (WQBELs) that must be consistent with the requirements and assumptions of any available WLAs,[46] which may be expressed as numeric effluent limitations, when feasible, and/or as a best management practice (BMP) program of expanded or better-tailored BMPs.[47] Where the TMDL includes WLAs that provide numeric pollutant load or pollutant parameter objectives, the WLA has been, where feasible, translated into numeric WQBELs.[48]

For each TMDL in Attachment E, four sections are included:

a. Applicability: This section provides the resolution under which the TMDL Basin Plan amendment was adopted and approved, with the applicable adoption and approval dates. This section also gives the effective date of the TMDL and where the TMDL is applicable (i.e. Watershed Management Area and water body). The Copermittees that are responsible for implementing the specific provisions are also given in this section.

b. Final TMDL Compliance Requirements: For each TMDL, the final TMDL compliance requirements consist of the final TMDL compliance date(s), the final WQBELs, and the final TMDL compliance determination requirements. The final WQBELs are expressed in terms of receiving water limitations, effluent limitations, and/or best management practices (BMPs). The final WQBELs for the TMDLs are incorporated by reference into Provision A of the Order. The final WQBELs become enforceable when the final TMDL compliance dates have passed. Applicable BMPs within the final WQBELs must be incorporated into the Water Quality Improvement Plans. Compliance with the final WQBELs will be determined in accordance with the options provided under the final TMDL compliance determination requirements.

c. Interim TMDL Compliance Requirements: If the final TMDL compliance date has not passed and there are interim TMDL compliance requirements, they are included in this section. If there are interim WQBELs with interim compliance dates, the interim WQBELs become enforceable when the corresponding interim compliance dates have passed. Compliance with the interim WQBELs will be determined in accordance with the options provided under the interim TMDL compliance determination requirements.

d. Specific Monitoring and Assessment Requirements: If there are specific monitoring and assessment requirements that cannot be met with the monitoring and assessment program

[46] 40 CFR 122.44(d)(1)(vii)(B)
[47] 40 CFR 122.44(k)(2) and 40 CFR 122.44(k)(3)
[48] November 26, 2014 Memorandum from the USEPA, Revisions to the November 22, 2002 Memorandum "Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLA""

requirements under Provision D of the Order, the additional requirements are included in this section.

The requirements of the TMDLs are based on and consistent with the assumptions and requirements of any available adopted and approved TMDLs that have been incorporated into the Basin Plan. Modifications to the requirements for the TMDLs in Attachment E cannot be made unless the TMDLs are modified in the Basin Plan.

A modification to any aspect of a TMDL in the Basin Plan requires a Basin Plan amendment. A Basin Plan amendment to modify a TMDL will require the San Diego Water Board to adopt a resolution to amend the Basin Plan, which includes a separate public process. When the San Diego Water Board adopts a Basin Plan amendment, it subsequently requires approval from the State Water Board, the Office of Administrative Law, and the USEPA before it becomes effective.

If and when the TMDLs are a modified in the Basin Plan, the San Diego Water Board will revise the requirements of the Order in accordance with the Basin Plan amendment. When a Basin Plan amendment to modify a TMDL becomes effective, the San Diego Water Board will modify the requirements of the Order pursuant to the requirements of Provision H.4 of the Order as soon as possible.

Chiu, Wayne@Waterboards

From: lyris@swrcb18.waterboards.ca.gov
Sent: Wednesday, November 25, 2015 2:42 PM
To: Chiu, Wayne@Waterboards
Subject: Order No. R9-2015-0100 and Conformed Order No. R9-2013-0001
Attachments: 2015-1118 Adopted Order No. R9-2015-0100_withAttachments.pdf; 2015-1118 Conformed Order No. R9-2013-0001 COMPLETE.pdf

Water Boards This is a message from the California Regional Water Quality Control Board, San Diego Region (9).

Municipal Storm Water Interested Persons:

Please find attached a copy of Order No. R9-2015-0100 and the attachments adopted by the San Diego Water Board on November 18, 2015. The attachments to Order No. R9-2015-0100 show the amendments to the Regional MS4 Permit in blue underline and red strikeout text. A conformed copy of the Regional MS4 Permit (including attachments) incorporating the amendments adopted pursuant to Order No. R9-2015-0001 is also attached.

These documents are available on the San Diego Water Board website at:
http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/rsd_stormwater.shtml

The San Diego Water Board Storm Water webpage has also been updated with the amended Regional MS4 Permit:
http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

Please contact me with any questions.
Happy holidays,

Wayne Chiu, PE
Water Resource Control Engineer
Storm Water Management Unit
California Regional Water Quality Control Board
San Diego Region
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San Diego, CA 92108
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You are currently subscribed to reg9_orangeco_ms4permit as: wchiu@waterboards.ca.gov.

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CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

2375 Northside Drive, Suite 100, San Diego, CA 92108
Phone (619) 516-1990 Fax (619) 516-1994
http://www.waterboards.ca.gov/sandiego

ORDER NO. R9-2015-0100

AN ORDER AMENDING ORDER NO. R9-2013-0001, NPDES NO. CAS010266, AS AMENDED BY ORDER NO. R9-2015-0001 NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The California Regional Water Quality Control Board, San Diego Region (hereinafter San Diego Water Board), finds that:

ENROLLMENT OF RIVERSIDE COUNTY COPERMITTEES

1. **Enrollment Process.** On May 8, 2013, the San Diego Water Board adopted Order No. R9-2013-0001, NPDES No. CAS019266, *National Pollutant Discharge Elimination System Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Order No. R9-2013-0001, or Regional MS4 Permit). Provision F.5 of that Order (as amended by Order No. R9-2015-0001) outlines a process to designate (enroll) the County of Riverside, the Riverside County Cities of Murrieta, Temecula, and Wildomar, and the Riverside County Flood Control and Water Conservation District as Copermittees under Order No. R9-2013-0001, responsible for compliance with the terms and the conditions of the Regional MS4 Permit. Provision F.5 provides that prior to such enrollment, the San Diego Water Board must first review and consider a Report of Waste Discharge (ROWD) submitted by the Riverside County Copermittees under their current MS4 Permit, Order No. R9-2010-0016, to determine whether the Copermittees should be enrolled under Order No. R9-2013-0001, and what changes to Order No. R9-2013-0001 proposed in the ROWD are appropriate.

2. **Report of Waste Discharge.** By letter dated May 8, 2015, the Riverside County Copermittees jointly submitted a ROWD in application for the reissuance of waste discharge requirements, pursuant to the requirements of section K.2.c of Order No. R9-2010-0016. The San Diego Water Board reviewed the ROWD and determined it is complete.

3. **Riverside County Copermittees Enrollment.** After consideration of the Riverside County Copermitees' ROWD and changes needed to Order No. R9-2013-0001, the San Diego Water Board determined that the County of Riverside, the Cities of Murrieta, Temecula, and Wildomar, and the Riverside County Flood Control and Water Conservation District should be enrolled as Copermittees under Order No. R9-2013-0001 and be responsible for compliance with the terms and the conditions of the Regional MS4 Permit. Enrolling the Riverside County Copermittees into Order No. R9-2013-0001 will provide regulatory consistency in the implementation of MS4 permit requirements throughout the San Diego Region, improve communication and coordination among Copermittees within watersheds crossing multiple jurisdictions, and maximize efficiency and economy of resources for the San Diego Water Board achieved through the redirection of staff permitting resources to better advance the storm water program. Enrollment of the Cities of Murrieta and Wildomar is subject to a California Water Code section 13228 agreement as set forth in the findings of this Order.

DESIGNATION OF A REGIONAL WATER BOARD

4. **Regional Water Board Designation.** The Cities of Menifee, Murrieta, and Wildomar are located partially within the jurisdictions of both the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board) and the San Diego Water Board. California Water Code section 13228 provides a way to streamline the regulation of entities whose jurisdictions straddle the border of two or more Regional Water Boards.

   As allowed by California Water Code section 13228, during the proceedings for Order No. R9-2010-0016, the Fourth Term Riverside County MS4 Permit, written requests for designation of a single Regional Water Board to regulate matters pertaining to Phase I MS4 discharges were submitted to the San Diego Water Board and Santa Ana Water Board by the City of Murrieta by letter dated July 20, 2010, the City of Wildomar by letter dated July 21, 2010, and the City of Menifee by letter dated July 22, 2010. The Cities of Murrieta and Wildomar requested designation of the San Diego Water Board, and the City of Menifee requested designation of the Santa Ana Water Board.

   As authorized by California Water Code section 13228 and pursuant to written agreements dated September 28, 2010 between the San Diego Water Board and the Santa Ana Water Board, the San Diego Water Board is designated under Order No. R9-2010-0016 to regulate Phase I MS4s within the entire jurisdictional area of the Cities of Murrieta and Wildomar, including those areas of each City located within the Santa Ana Water Board's geographic jurisdiction. The Santa Ana Water Board is designated under Order No. R8-2010-0033 to regulate the Phase I MS4s within the entire jurisdictional area of the City of Menifee, including those areas of the City located within the San Diego Water Board's geographic jurisdiction. Written requests to continue these Regional Water Board designations were submitted to the San Diego Water Board and Santa Ana Water Board by the City of Murrieta by

letter dated June 22, 2015, the City of Wildomar by letter dated June 23, 2015, and the City of Menifee by letter dated June 25, 2015.

5. **Factual Considerations.** The Santa Ana Water Board and San Diego Water Board establish generally consistent requirements for MS4 discharges to meet the technology-based standard of reducing pollutants in the discharge to the maximum extent practicable (MEP), a related iterative process to ensure MS4 discharges meet receiving water quality standards, and for non-storm water discharges to be effectively prohibited from entering the MS4. However due to the unique nature of watersheds and water quality issues in the San Diego Region and Santa Ana Region, MS4 permit requirements between the two Regional Water Boards may also vary to address region specific pollutant discharges and watershed conditions. The Cities of Menifee, Murrieta, and Wildomar report that management and implementation of municipal programs to comply with two different MS4 permits creates a significant administrative and financial burden that is not contributing to greater overall water quality improvements in either region.

6. **Regional Water Board Agreement.** The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated October 26, 2015 to:

   a. Continue designation of the San Diego Water Board to regulate Phase I MS4 discharges within the entire jurisdictional area of the Cities of Murrieta and Wildomar, including those areas of each City located within the Santa Ana Region upon the effective date of Order R9-2015-0100, *and*

   b. Continue designation of the San Ana Water Board to regulate Phase I MS4 discharges within the entire jurisdictional area of the City of Menifee, including those areas of the City located within the San Diego Region, under Order No. R8-2010-0033 (NPDES No. CAS618030) as it may be amended or reissued upon the effective date of Order No. R9-2015-0100.

7. **Periodic Review of Regional Water Board Agreement.** The basis supporting the Cities of Menifee, Murrieta, and Wildomar requests to designate a specific Regional Water Board for regulatory oversight of MS4 discharges may change under future conditions and circumstances. Therefore the San Diego Water Board and Santa Ana Water Board will periodically review the effectiveness of the agreement during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate the agreement with the Santa Ana Water Board or otherwise modify the agreement subject to the approval of the Santa Ana Water Board.

AMENDMENTS TO ORDER NO. R9-2013-0001

8. **Effect of this Order.** Order No. R9-2013-0001 is not being reopened for any other purpose than the amendments contained herein. Except as contradicted or superseded by the findings and directives set forth in this Order, all of the previous findings and directives of Order No. R9-2013-0001 (as amended by Order No. R9-2015-0001) shall remain in full force and effect.

9. **Enroll Riverside County Copermittees.** This Order amends Order No. R9-2013-0001 to incorporate the County of Riverside, the Riverside County Cities of Murrieta, Temecula, and Wildomar, and the Riverside County Flood Control and Water Conservation District as Copermittees responsible for compliance with the terms and the conditions of Order No. R9-2013-0001, as amended by Order No. R9-2015-0001 and this Order.

10. **Alternative Compliance Pathway for Prohibitions and Limitations.** The San Diego County, Orange County, and Riverside County Copermittees have asserted that the prohibitions and limitations under Provision A of Order No. R9-2013-0001 may result in many years of noncompliance because years of technical efforts may ultimately be required to achieve compliance with the prohibitions and limitations, especially for wet weather discharges.

    The San Diego Water Board considered the incorporation of an alternative pathway to compliance during the adoption proceedings for Order No. R9-2013-0001 in May 2013, but chose not to include it at that time. During the proceedings for Order No. R9-2015-0001, amending Order No. R9-2013-0001 to extend coverage of the Regional MS4 Permit to the Orange County Copermittees and as reflected in Order No. R9-2015-0001, the San Diego Water Board committed to considering the incorporation of a well-defined, transparent, and finite alternative pathway to compliance in Order No. R9-2013-0001 during the MS4 permit reissuance proceedings for the Riverside County Copermittees.

    On June 16, 2015, the State Water Resources Control Board (State Water Board) adopted Order WQ 2015-0075, *In the Matter of Review of Order No. R4-2012-0175, NPDES Permit No. CAS004001, Waste Discharge Requirements for Municipal Separate Storm Sewer System (MS4) Discharges within the Coastal Watersheds of Los Angeles County, Except Those Discharges Originating from the City of Long Beach MS4,* which directs all Regional Water Boards to consider a watershed-based planning and implementation approach to compliance with receiving water limitations when issuing Phase I MS4 permits going forward. Consistent with the principles set forth in Order WQ 2015-0075, this Order amends Order No. R9-2013-0001 to incorporate an alternative compliance pathway that allows a Copermittee to utilize the watershed-based Water Quality Improvement Plan to be deemed in compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2.a, and A.3.b which are included in the prohibitions and limitations under Provision A of the Regional MS4 Permit.

    This Order amends the Fact Sheet of Order No. R9-2013-0001, Attachment F, section VII.E, Antidegradation Policy, to provide an expanded analysis consistent with the principles set forth in State Water Board Order WQ 2015-0075, demonstrating why the incorporation of an alternative compliance pathway for prohibitions and limitations in Order No. R9-2013-0001 complies with federal and state antidegradation policies. This Order also amends the Fact Sheet of Order No. R9-2013-0001, Attachment F, section VII.E, Anti-Backsliding Requirements, with an expanded analysis consistent with State Water Board Order WQ 2015-0075 demonstrating that the anti-backsliding requirements of the Clean Water Act and the

federal regulations do not foreclose the incorporation of an alternative compliance pathway into Order No. R9-2013-0001.

11. **Update to Non-Storm Water Discharges.** Since Order No. R9-2013-0001 was adopted, the State Water Board adopted Order 2014-0194-DWQ (*Statewide National Pollutant Discharge Elimination System (NPDES) Permit for Drinking Water System Discharges to Waters of the United States*) and the San Diego Water Board adopted Order No. R9-2015-0013 (*General Waste Discharge Requirements for Groundwater Extraction Discharges to Surface Waters within the San Diego Region*). These orders are NPDES permits regulating non-storm water discharges that may be discharged to the Copermittees' MS4s. This Order amends Order No. R9-2013-0001 to incorporate State Water Board Order 2014-0194-DWQ and San Diego Water Board Order No. R9-2015-0013 into the requirements for addressing non-storm water discharges.

12. **Priority Development Project Definition Consistency.** The Fact Sheet of the Regional MS4 Permit as modified by Order No. R9-2015-0001, describes on Page F-98 the San Diego Water Board's intent that the Priority Development Project categories in Provision E.3.b.(1) be consistent with the categories in the Riverside County MS4 Permit (Order No. R9-2010-0016) and the Orange County MS4 Permit (Order No. R9-2009-0002). The San Diego Water Board's intention reflected in the Fact Sheet was not explicitly incorporated in some of the Priority Development Project categories described in Provision E.3.b.(1) and this Order amends the provision with clarifying language to better describe these categories consistent with the Fact Sheet. The Order also has been amended to include the requirements for updating the BMP Design Manual as a result of the corrections to the Priority Development Project categories in Provision E.3.b.(1).

13. **Definition of Prior Lawful Approval.** During the proceedings for Order No. R9-2015-0001, amending Order No. R9-2013-0001 to extend coverage of the Regional MS4 Permit to the Orange County Copermittees, the land development community asserted that the lack of a definition for the term "prior lawful approval" in the Regional MS4 Permit had created significant uncertainty for the San Diego County Copermittees, the land development community, and the general public about when the development planning requirements are applicable. The San Diego Water Board committed to considering the incorporation of additional guidance for prior lawful approval in Order No. R9-2013-0001 during the MS4 permit reissuance proceedings for the Riverside County Copermittees. This Order amends Order No. R9-2013-0001 to incorporate additional clarification describing when the structural BMP performance requirements are applicable to Priority Development Projects.

14. **Los Peñasquitos Lagoon Sediment TMDL.** During the proceedings for Order No. R9-2015-0001, amending Order No. R9-2013-0001 to extend coverage of the Regional MS4 Permit to the Orange County Copermittees, the San Diego County Copermittees responsible for implementing the TMDLs for Sediment in Los Peñasquitos Lagoon requested several minor revisions to make the TMDL requirements consistent with the Basin Plan amendment adopted by the San Diego

Water Board. This Order amends Attachment E to Order No. R9-2013-0001 to incorporate minor revisions to the Los Peñasquitos Lagoon Sediment TMDL to make the requirements consistent with the adopted Basin Plan amendment.

15. **Compliance Dates for TMDLs Beaches and Creeks Indicator Bacteria TMDLs.** A review of the interim and final compliance dates for the Revised TMDLs for Indicator Bacteria, Project I – Beaches and Creeks (Beaches and Creeks Indicator Bacteria TMDLs) in the San Diego Region in Attachment E to the Order revealed an inconsistency with the adopted Basin Plan amendment. This Order amends Attachment E to Order No. R9-2013-0001 to incorporate minor revisions to the Beaches and Creeks Indicator Bacteria TMDLs to make the requirements consistent with the adopted Basin Plan amendment.

16. **Removal of Application for Early Coverage Provisions.** Order No. R9-2013-0001, as amended by Order No. R9-2015-0001 included several provisions that allowed the Riverside County Copermittees to apply for early coverage under the Regional MS4 Permit prior to the expiration of Order No. R9-2010-0016. These provisions are no longer necessary once the Riverside County Copermittees are covered by the requirements of the Regional MS4 Permit with the adoption of this Order. This Order amends Order No. R9-2013-0001 to remove provisions related to applying for early coverage under the Regional MS4 Permit.

ADMINISTRATIVE FINDINGS

17. **California Environmental Quality Act**. This action is exempt from the requirement of preparation of environmental documents under the California Environmental Quality Act [Public Resources Code, Division 13, Chapter 3, Section 21000 et seq.] in accordance with California Water Code section 13389.

18. **Public Notice.** In accordance with State and federal laws and regulations, the San Diego Water Board has notified San Diego County, Orange County and Riverside County Copermittees, and all known interested agencies and persons of its intent to adopt this Order and has provided them with an opportunity to submit their written comments.

19. **Public Hearing.** The San Diego Water Board held a public hearing on November 18, 2015 and heard and considered all comments pertaining to the adoption of this Order.

20. **Notification.** Any person aggrieved by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with California Water Code section 13320 and California Code of Regulations, title 23, sections 2050 et seq. The State Water Board must receive the petition by 5:00 p.m., 30 days after the adoption date of this Order. Copies of the law and regulations applicable to filing petitions may be found on the Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

THEREFORE, IT IS HEREBY ORDERED,

1. This Order amends Order No. R9-2013-0001 and Fact Sheet as amended by Order No. R9-2015-0001 (Regional MS4 Permit and Fact Sheet). The revisions to the Regional MS4 Permit and Fact Sheet are shown Attachments 1 and 2 to this Order. Added text to the Regional MS4 Permit and Fact Sheet is displayed in blue-underline text and deleted text is displayed as red-strikeout text.

2. The amended Regional MS4 Permit and Fact Sheet included as Attachments 1 and 2 to this Order shall become effective on January 7, 2016.

3. The amended Regional MS4 Permit and Fact Sheet included as Attachments 1 and 2 to this Order shall supersede Order No. R9-2010-0016 for the Riverside County Copermittees except for enforcement purposes.

4. San Diego Water Board staff is directed to prepare and post a conformed copy of the Regional MS4 Permit and Fact Sheet, as amended by this Order, incorporating the revisions made by this Order.

I, David W. Gibson, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on November 18, 2015.

David W. Gibson
Executive Officer

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

ORDER NO. R9-2013-0001,
AS AMENDED BY ORDER NOS. R9-2015-0001 AND R9-2015-0100
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The San Diego County Copermittees in Table 1a are subject to waste discharge requirements set forth in this Order.

Table 1a. San Diego County Copermittees

City of Carlsbad	City of Oceanside
City of Chula Vista	City of Poway
City of Coronado	City of San Diego
City of Del Mar	City of San Marcos
City of El Cajon	City of Santee
City of Encinitas	City of Solana Beach
City of Escondido	City of Vista
City of Imperial Beach	County of San Diego
City of La Mesa	San Diego County Regional Airport Authority
City of Lemon Grove	San Diego Unified Port District
City of National City	

The Orange County Copermittees in Table 1b are subject to waste discharge requirements set forth in this Order.

Table 1b. Orange County Copermittees[1]

City of Aliso Viejo	City of Rancho Santa Margarita
City of Dana Point	City of San Clemente
City of Laguna Beach	City of San Juan Capistrano
City of Laguna Hills	City of Laguna Woods
City of Laguna Niguel	County of Orange
City of Mission Viejo	Orange County Flood Control District

~~After the San Diego Water Board receives and considers the Riverside County Copermittees' Report of Waste Discharge and makes any necessary changes to this Order, t~~The Riverside County Copermittees in Table 1c ~~will become~~ are subject to waste

[1] While not listed in Table 1b., the City of Lake Forest remains a Copermittee under this Order until the later effective date of this Order or the effective date of Santa Ana Water Board Tentative Order No. R8-2015-0001. Thereafter, the City of Lake Forest will no longer be considered a Copermittee under this Order because its Phase I MS4 discharges will be regulated by the Santa Ana Water Board pursuant to Water Code section 13228 designation. The requirements of this Order that apply to the City of Lake Forest for the duration of this Order, however, are described in Finding 29 and Footnote 2 to Table B-1.

discharge requirements set forth in this Order ~~after expiration of Order No.R9-2010-0016, NPDES No. CAS0108766 on or after November 10, 2015~~.

Table 1c. Riverside County Copermittees

City of Murrieta	County of Riverside
City of Temecula	Riverside County Flood Control and Water Conservation District
City of Wildomar	

~~The Riverside County Copermittees may become subject to the requirements of this Order at a date earlier than the expiration date of their current Order subject to the conditions described in Provision F.6 of this Order if the Riverside County Copermittees receive notification of coverage from the San Diego Water Board.~~

The term Copermittee in this Order refers to any San Diego County, Orange County, or Riverside County Copermittee covered under this Order, unless specified otherwise.

This Order provides permit coverage for the Copermittee discharges described in Table 2.

Table 2. Discharge Locations and Receiving Waters

Discharge Points	Locations throughout San Diego Region
Discharge Description	Municipal Separate Storm Sewer System (MS4) Discharges
Receiving Waters	Inland Surface Waters, Enclosed Bays and Estuaries, and Coastal Ocean Waters of the San Diego Region

Table 3. Administrative Information

This Order was adopted by the San Diego Water Board on:	**May 8, 2013**
Order No. R9-2013-0001 became effective on:	**June 27, 2013**
This Order as amended by R9-2015-0001 became effective on:	**April 1, 2015**
This Order as amended by R9-2015-0100 became effective on:	**January 7, 2016**
This Order will expire on:	**June 27, 2018**
The Copermittees must file a Report of Waste Discharge in accordance with Title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than 180 days in advance of the Order expiration date.	

I, David W. Gibson, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on May 8, 2013, as amended by adoption of Order No. R9-2015-0001 on February 11, 2015, and as amended by adoption of Order No. R9-2015-0100 on November 18, 2015.

TENTATIVE

David W. Gibson
Executive Officer

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ATTACHMENTS

Attachment A: Discharge Prohibitions and Special Protections A-1
Attachment B: Standard Permit Provisions and General Provisions B-1
Attachment C: Acronyms, Abbreviations and Definitions C-1
Attachment D: Jurisdictional Runoff Management Program Annual Report Form D-1
Attachment E: Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2013-0001, as amended by Order Nos. R9-2015-0001 and R9-2015-0100 ..... E-1
Attachment F: Fact Sheet / Technical Report for Order No. R9-2013-0001 as amended by Order Nos. R9-2015-0001 and R9-2015-0100 ..... F-1

I. FINDINGS

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), finds that:

JURISDICTION

1. **MS4 Ownership or Operation.** Each of the Copermittees owns or operates an MS4, through which it discharges storm water and non-storm water into waters of the U.S. within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the U.S.

2. **Legal and Regulatory Authority.** This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]) adopted by the United States Environmental Protection Agency (USEPA), and chapter 5.5, division 7 of the California Water Code (CWC) (commencing with section 13370). This Order serves as an NPDES permit for discharges from MS4s to surface waters. This Order also serves as waste discharge requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

   The San Diego Water Board has the legal authority to issue a regional MS4 permit pursuant to its authority under CWA section 402(p)(3)(B) and 40 CFR 122.26(a)(1)(v). The USEPA also made it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide permits (55 Federal Register [FR] 47990, 48039-48042). The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees and San Diego Water Board.

   The federal regulations make it clear that the Copermittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators (40 CFR 122.26(a)(3)(vi)). This Order does not require the Copermittees to manage storm water outside of their jurisdictional boundaries, but rather to work collectively to improve storm water management within watersheds.

3. **CWA NPDES Permit Conditions.** Pursuant to CWA section 402(p)(3)(B), NPDES permits for storm water discharges from MS4s must include requirements to effectively prohibit non-storm water discharges into MS4s, and require controls to reduce the discharge of pollutants in storm water to the maximum extent practicable (MEP), and to require other provisions as the San Diego Water Board determines are appropriate to control such pollutants. This Order prescribes conditions to assure compliance with the CWA requirements for owners and operators of MS4s to effectively prohibit non-storm water discharges into the MS4s, and require controls to reduce the discharge of pollutants in storm water from the MS4s to the MEP.

4. **CWA and CWC Monitoring Requirements.** CWA section 308(a) and 40 CFR 122.41(h),(j)-(l) and 122.48 require that NPDES permits must specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s also specify additional monitoring and reporting requirements in 40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c). CWC section 13383 authorizes the San Diego Water Board to establish monitoring, inspection, entry, reporting and recordkeeping requirements. This Order establishes monitoring and reporting requirements to implement federal and State requirements. This Order also includes requirements for the Orange County Copermittees to participate in, and together with South Orange County Wastewater Authority and Orange County Health Care Agency, share responsibility for implementing the unified approach to beach water quality monitoring and assessment program set forth in the October 2014 report, *Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County*, issued pursuant to CWC section 13383 in the San Diego Water Board December 5, 2014 Letter Directive.

5. **Total Maximum Daily Loads.** CWA section 303(d)(1)(A) requires that "[e]ach state shall identify those waters within its boundaries for which the effluent limitations are not stringent enough to implement any water quality standard applicable to such waters." The CWA also requires states to establish a priority ranking of impaired water bodies known as Water Quality Limited Segments and to establish Total Maximum Daily Loads (TMDLs) for such waters. This priority list of impaired water bodies is called the Clean Water Act Section 303(d) List of Water Quality Limited Segments, commonly referred to as the 303(d) List. The CWA requires the 303(d) List to be updated every two years.

   TMDLs are numerical calculations of the maximum amount of a pollutant that a water body can assimilate and still meet water quality standards. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point sources (waste load allocations or WLAs) and non-point sources (load allocations or LAs), background contribution, plus a margin of safety. Discharges from MS4s are point source discharges. The federal regulations (40 CFR 122.44(d)(1)(vii)(B)) require that NPDES permits incorporate water quality based effluent limitations (WQBELs) developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, consistent with the assumptions and requirements of any available WLA for the discharge. Requirements of this Order implement the TMDLs established by the San Diego Water Board or USEPA as of the date this Order was amended in 2015. This Order establishes WQBELs consistent with the assumptions and requirements of all available TMDL WLAs assigned to discharges from the Copermittees' MS4s.

6. **Non-Storm Water Discharges.** Pursuant to CWA section 402(p)(3)(B)(ii), this Order requires each Copermittee to effectively prohibit discharges of non-storm water into its MS4. Nevertheless, non-storm water discharges into and from the

MS4s continue to be reported to the San Diego Water Board by the Copermittees and other persons. Monitoring conducted by the Copermittees, as well as the 303(d) List, have identified dry weather, non-storm water discharges from the MS4s as a source of pollutants causing or contributing to receiving water quality impairments in the San Diego Region. The federal regulations (40 CFR 122.26(d)(2)(iv)(B)(1)) require the Copermittees to have a program to prevent illicit discharges to the MS4. The federal regulations, however, allow for specific categories of non-storm water discharges or flows to be addressed as illicit discharges only where such discharges are identified as sources of pollutants to waters of the U.S.

7. **In-Stream Treatment Systems.** Pursuant to federal regulations (40 CFR 131.10(a)), in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S. Authorizing the construction of a runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to accepting waste assimilation as an appropriate use for that water body. Runoff treatment must occur prior to the discharge of runoff into receiving waters. Treatment control best management practices (BMPs) must not be constructed in waters of the U.S. Construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body.

DISCHARGE CHARACTERISTICS AND RUNOFF MANAGEMENT

8. **Point Source Discharges of Pollutants.** Discharges from the MS4s contain waste, as defined in the CWC, and pollutants that adversely affect the quality of the waters of the state. A discharge from an MS4 is a “discharge of pollutants from a point source” into waters of the U.S. as defined in the CWA. Storm water and non-storm water discharges from the MS4s contain pollutants that cause or threaten to cause a violation of surface water quality standards, as outlined in the Water Quality Control Plan for the San Diego Basin (Basin Plan). Storm water and non-storm water discharges from the MS4s are subject to the conditions and requirements established in the Basin Plan for point source discharges.

9. **Potential Beneficial Use Impairment.** The discharge of pollutants and/or increased flows from MS4s may cause or threaten to cause the concentration of pollutants to exceed applicable receiving water quality objectives and impair or threaten to impair designated beneficial uses resulting in a condition of pollution, contamination, or nuisance.

10. **Pollutants Generated by Land Development.** Land development has created and continues to create new sources of non-storm water discharges and pollutants in storm water discharges as human population density increases. This brings higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash. Pollutants from these sources are dumped or washed off the surface by non-storm water or storm water flows into

and from the MS4s. When development converts natural vegetated pervious ground cover to impervious surfaces such as paved highways, streets, rooftops, and parking lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving a developed area without BMPs that can maintain pre-development runoff conditions will contain greater pollutant loads and have significantly greater runoff volume, velocity, and peak flow rate than pre-development runoff conditions from the same area.

11. **Runoff Discharges to Receiving Waters.** The MS4s discharge runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within the eleven hydrologic units comprising the San Diego Region. Historic and current development makes use of natural drainage patterns and features as conveyances for runoff. Rivers, streams and creeks in developed areas used in this manner are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and receiving water. Numerous receiving water bodies and water body segments have been designated as impaired by the San Diego Water Board pursuant to CWA section 303(d).

12. **Pollutants in Runoff.** The most common pollutants in runoff discharged from the MS4s include total suspended solids, sediment, pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., cadmium, copper, lead, and zinc), petroleum products and polynuclear aromatic hydrocarbons, synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus), oxygen-demanding substances (e.g., decaying vegetation, animal waste), detergents, and trash. As operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not prohibit or otherwise control. These discharges may cause or contribute to a condition of pollution or a violation of water quality standards.

13. **Human Health and Aquatic Life Impairment.** Pollutants in runoff discharged from the MS4s can threaten and adversely affect human health and aquatic organisms. Adverse responses of organisms to chemicals or physical agents in runoff range from physiological responses such as impaired reproduction or growth anomalies to mortality. Increased volume, velocity, rate, and duration of storm water runoff greatly accelerate the erosion of downstream natural channels. This alters stream channels and habitats and can adversely affect aquatic and terrestrial organisms.

14. **Water Quality Effects.** The Copermittees' water quality monitoring data submitted to date documents persistent exceedances of Basin Plan water quality objectives for runoff-related pollutants at various watershed monitoring stations. Persistent toxicity has also been observed at several watershed monitoring stations. In addition, bioassessment data indicate that the majority of the monitored receiving waters have

Poor to Very Poor Index of Biological Integrity (IBI) ratings. These findings indicate that runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in the San Diego Region. Non-storm water discharges from the MS4s have been shown to contribute significant levels of pollutants and flow in arid, developed Southern California watersheds, and contribute significantly to exceedances of applicable receiving water quality objectives.

15. **Non-Storm Water and Storm Water Discharges.** Non-storm water discharges from the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard of CWA section 402(p)(3)(B)(iii), which is explicitly for "Municipal … *Stormwater Discharges* (emphasis added)" from the MS4s. Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s must be effectively prohibited.

16. **Best Management Practices.** Waste and pollutants which are deposited and accumulate in MS4 drainage structures will be discharged from these structures to waters of the U.S. unless they are removed. These discharges may cause or contribute to, or threaten to cause or contribute to, a condition of pollution in receiving waters. For this reason, pollutants in storm water discharges from the MS4s can be and must be effectively reduced in runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Pollution prevention is the reduction or elimination of pollutant generation at its source and is the best "first line of defense." Source control BMPs (both structural and non-structural) minimize the contact between pollutants and runoff, therefore keeping pollutants onsite and out of receiving waters. Treatment control BMPs remove pollutants that have been mobilized by storm water or non-storm water flows.

17. **BMP Implementation.** Runoff needs to be addressed during the three major phases of development (planning, construction, and use) in order to reduce the discharge of storm water pollutants to the MEP, effectively prohibit non-storm water discharges, and protect receiving waters. Development which is not guided by water quality planning policies and principles can result in increased pollutant load discharges, flow rates, and flow durations which can negatively affect receiving water beneficial uses. Construction sites without adequate BMP implementation result in sediment runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. Existing development can generate substantial pollutant loads which are discharged in runoff to receiving waters. Retrofitting areas of existing development with storm water pollutant control and hydromodification management BMPs is necessary to address storm water discharges from existing development that may cause or contribute to a condition of pollution or a violation of water quality standards.

18. **Water Quality Improvements.** Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit

non-storm water discharges to the MS4s and control pollutants in storm water discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the CWA.

19. **Long Term Planning and Implementation.** Federal regulations require municipal storm water permits to expire 5 years from adoption, after which the permit must be renewed and reissued. The San Diego Water Board recognizes that the degradation of water quality and impacts to beneficial uses of the waters in the San Diego Region occurred over several decades. The San Diego Water Board further recognizes that a decade or more may be necessary to realize demonstrable improvement to the quality of waters in the San Diego Region. This Order includes a long term planning and implementation approach that will require more than a single permit term to complete.

WATER QUALITY STANDARDS

20. **Basin Plan.** The San Diego Water Board adopted the Water Quality Control Plan for the San Diego Basin (Basin Plan) on September 8, 1994, that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for receiving waters addressed through the plan. The Basin Plan was subsequently approved by the State Water Resources Control Board (State Water Board) on December 13, 1994. Subsequent revisions to the Basin Plan have also been adopted by the San Diego Water Board and approved by the State Water Board. Requirements of this Order implement the Basin Plan.

    The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Process Supply (PROC), Industrial Service Supply (IND), Ground Water Recharge (GWR), Contact Water Recreation (REC1), Non-contact Water Recreation (REC2), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Freshwater Replenishment (FRSH), Hydropower Generation (POW), and Preservation of Biological Habitats of Special Significance (BIOL). The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region: Navigation (NAV), Commercial and Sport Fishing (COMM), Estuarine Habitat (EST), Marine Habitat (MAR), Aquaculture (AQUA), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN), and Shellfish Harvesting (SHELL).

21. **Ocean Plan.** The State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, and 2005. The State Water Board adopted the latest amendment on ~~April 21, 2005~~ October 16, 2012 and it became effective on ~~February 14, 2006~~ August 19, 2013. The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean. Requirements of this Order implement the Ocean Plan.

    The Ocean Plan identifies the following beneficial uses of ocean waters of the state to be protected: Industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture; preservation and enhancement of designated Areas of Special Biological Significance; rare and endangered species; marine habitat; fish spawning and shellfish harvesting.

22. **Sediment Quality Control Plan**. On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes: 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

23. **National Toxics Rule and California Toxics Rule.** USEPA adopted the National Toxics Rule (NTR) on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the NTR applied in California. On May 18, 2000, USEPA adopted the California Toxics Rule (CTR). The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants.

24. **Antidegradation Policy.** This Order is in conformance with the federal Antidegradation Policy described in 40 CFR 131.12, and State Water Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality Waters in California*. Federal regulations at 40 CFR 131.12 require that the State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. State Water Board Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies. The Fact Sheet of this Order contains additional discussion about antidegradation.

25. **Anti-Backsliding Requirements.** Section 402(o)(2) of the CWA and federal regulations at 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations may be relaxed. All effluent limitations in this Order are at least as stringent as effluent limitations in the previous permits. The Fact Sheet of this Order contains additional discussion about anti-backsliding.

CONSIDERATIONS UNDER FEDERAL AND STATE LAW

26. **Coastal Zone Act Reauthorization Amendments.** Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states with approved coastal zone management programs to address non-point source pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point source pollution: agriculture, silviculture, urban, marinas, and hydromodification. This Order addresses the management measures required for the urban category, with the exception of septic systems. The runoff management programs developed pursuant to this Order fulfills the need for coastal cities to develop a runoff non-point source plan identified in the Non-Point Source Program Strategy and Implementation Plan. The San Diego Water Board addresses septic systems through the administration of other programs.

27. **Endangered Species Act.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 USC sections 1531 to 1544). This Order requires compliance with receiving water limits, and other requirements to protect the beneficial uses of waters of the State. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

28. **Report of Waste Discharge Process.** The waste discharge requirements set forth in this Order are based upon the Report of Waste Discharge submitted by the San Diego County Copermittees prior to the expiration of Order No. R9-2007-0001 (NPDES No. CAS0109266), ~~and~~ the Report of Waste Discharge submitted by the Orange County Copermittees prior to the expiration of Order No. R9-2009-0002 (CAS0108740), and the Report of Waste Discharge submitted by the Riverside County Copermittees prior to the expiration of Order No. R9-2010-0016 (CAS0108766). ~~The Riverside County Copermittees are not immediately covered by the waste discharge requirements in this Order. The San Diego Water Board understands that each municipality is unique although the Counties share watersheds and/or geographical boundaries. The Order will continue to use the Report of Waste Discharge process prior to initially making Riverside County Copermittees subject to the requirements of this Order.~~

The federal regulations (40 CFR 122.21(d)(2)) and CWC section 13376 impose a duty on the Copermittees to reapply for continued coverage through submittal of a Report of Waste Discharge no later than 180 days prior to expiration of a currently effective permit. The expiration date of this Order as shown in Table 3, and requirement to file a Report of Waste Discharge no later than 180 days prior to the expiration date of the Order, applies jointly to the San Diego County, Orange County, and Riverside County Copermittees. ~~This requirement is set forth in the Riverside County Copermittees' currently effective permit at ProvisionK.2.c. The Riverside County MS4 Permit, Order No. R9-2010-0016 (NPDES No. CAS0108766) expires on November 10, 2015.~~

~~Unless the Riverside County Copermittees apply for and receive early coverage under this Order, the Riverside County Copermittees' permit will be superseded by this Order upon expiration of their permit, subject to any necessary revisions to the requirements of this Order made after the San Diego Water Board considers their Report of Waste Discharge through the public process provided in 40 CFR Part 124.~~

29. Regional Water Board Designation. The Cities of Laguna Hills, Laguna Woods, ~~and~~ Lake Forest, Menifee, Murrieta, and Wildomar are located partially within the jurisdictions of the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board) and the San Diego Water Board and their discharges are subject to regulation by both Regional Water Boards. CWC section 13228 provides a way to streamline the regulation of entities whose jurisdictions straddle the border of two or more Regions. CWC section 13228 is implemented in this Order at the request of these six cities and to ease the regulatory burden of municipalities that lie in both the San Diego Water Board's and the adjacent Santa Ana Water Board's jurisdiction. MS4 discharges from these municipalities are regulated by the San Diego Water Board and Santa Ana Water Board as follows:

a. Pursuant to CWC section 13228, the Cities of Laguna Hills, Laguna Woods, and Lake Forest submitted written requests that one Regional Water Board be designated to regulate Phase I MS4 discharges for each of the Cities. The Santa Ana Water Board and the San Diego Water Board have entered into an agreement dated February 10, 2015, whereby the Cities of Laguna Woods and Laguna Hills are largely regulated by the San Diego Water Board under this Order, including those portions of the Cities of Laguna Woods and Laguna Hills not within the San Diego Water Board's jurisdiction, upon the effective date of this Order or Santa Ana Water Board Order No. R8-2015-0001, whichever is later. Similarly, the City of Lake Forest, including those portions of the City of Lake Forest within the San Diego Water Board's jurisdiction, is largely regulated by the Santa Ana Water Board under Order No. R8-2015-0001 (NPDES No. CAS618030) upon the later effective date of this Order or Order No. R8-2015-0001. The agreement provides that the City of Lake Forest is required to retain, and continue implementation of, its over-irrigation discharge prohibition in Title 15, Chapter 14.030, List (b) of the City Municipal Code for regulating storm water quality throughout its jurisdiction. The agreement also requires the City of Lake Forest to actively participate during development and implementation of the Aliso

Creek Watershed Management Area Water Quality Improvement Plan required pursuant to this Order. Each Regional Water Board retains the authority to enforce provisions of its Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee under the terms of the agreement (Water Code section 13228 (b)). Under the terms of the agreement, any TMDL and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Laguna Woods, Laguna Hills or Lake Forest as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement of the applicable TMDL will remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's San Diego Creek/Newport Bay TMDL and the San Diego Water Board's Indicator Bacteria Project I Beaches and Creeks TMDL. The San Diego Water Board will periodically review the effectiveness of the agreement during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate the agreement with Santa Ana Water Board or otherwise modify the agreement subject to the approval of the Santa Ana Water Board.

b. Pursuant to CWC section 13228, the Cities of Murrieta, Wildomar, and Menifee submitted written requests that one Regional Water Board be designated to regulate Phase I MS4 discharges for each of the Cities. The Santa Ana Water Board and the San Diego Water Board have entered into an agreement dated October 26, 2015, whereby the Cities of Murrieta and Wildomar are largely regulated by the San Diego Water Board under this Order, including those portions of the Cities of Murrieta and Wildomar not within the San Diego Water Board's jurisdiction, upon the effective date of this Order. Similarly, the City of Menifee is largely regulated by the Santa Ana Water Board under Order No. R8-2010-0033 as it may be amended or reissued, including those portions of the City of Menifee within the San Diego Water Board's jurisdiction, upon the effective date of this Order. The agreement also requires the City of Menifee to actively participate during development and implementation of the Santa Margarita River Watershed Management Area Water Quality Improvement Plan required pursuant to this Order. Each Regional Water Board retains the authority to enforce provisions of its Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee under the terms of the agreement (Water Code section 13228 (b)). Under the terms of the agreement, any TMDL and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Menifee, Murrieta, or Wildomar as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement of the applicable TMDL will remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's Lake Elsinore/Canyon Lake Nutrient

TMDLs. The San Diego Water Board will periodically review the effectiveness of the agreement during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate the agreement with Santa Ana Water Board or otherwise modify the agreement subject to the approval of the Santa Ana Water Board.

30. **Integrated Report and Clean Water Act Section 303(d) List.** The San Diego Water Board and State Water Board submit an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. USEPA issued its *Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act* on July 29, 2005, which advocates the use of a five category approach for classifying the attainment status of water quality standards for water bodies in the Integrated Report. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 in the Integrated Report are placed on the 303(d) List.

    Water bodies with available data and/or information that indicate at least one beneficial use is not being supported or is threatened, but a TMDL is not required, are included in Category 4 in the Integrated Report. Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

    Implementation of the requirements of this Order may allow the San Diego Water Board to include surface waters impaired by discharges from the Copermittees' MS4s in Category 4 in the Integrated Report for consideration during the next 303(d) List submittal by the State to USEPA.

31. **Economic Considerations.** The California Supreme Court has ruled that although CWC section 13263 requires the State and Regional Water Boards (collectively Water Boards) to consider factors set forth in CWC section 13241 when issuing an NPDES permit, the Water Board may not consider the factors to justify imposing pollutant restrictions that are less stringent than the applicable federal regulations require. (*City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 618, 626-627.) However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

    As noted in the following finding, the San Diego Water Board finds that the requirements in this Order are not more stringent than the minimum federal

requirements. Therefore, a CWC section 13241 analysis is not required for permit requirements that implement the effective prohibition on the discharge of non-storm water into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determined appropriate to control such pollutants, as those requirements are mandated by federal law. Notwithstanding the above, the San Diego Water Board has developed an economic analysis of the requirements in this Order. The economic analysis is provided in the Fact Sheet.

32. **Unfunded Mandates.** This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following:

    a. This Order implements federally mandated requirements under CWA section 402 (33 USC section 1342(p)(3)(B)).

    b. The local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental and new dischargers who are issued NPDES permits for storm water and non-storm water discharges.

    c. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order.

    d. The Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)) and in lieu of numeric restrictions on their MS4 discharges (i.e. effluent limitations).

    e. The local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under State law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

    f. The provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state develops a TMDL, federal law requires that permits must contain water quality based effluent limitations consistent with the assumptions and requirements of any applicable wasteload allocation (40 CFR 122.44(d)(1)(vii)(B)).

    See the Fact Sheet for further discussion of unfunded mandates.

33. **California Environmental Quality Act.** The issuance of waste discharge requirements and an NPDES permit for the discharge of runoff from MS4s to waters of the U.S. is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 et seq.) in accordance with CWC section 13389.

STATE WATER BOARD DECISIONS

34. **Compliance with Prohibitions and Limitations.** The receiving water limitation language specified in this Order is consistent with language recommended by the USEPA and established in State Water Board Order WQ 99-05, *Own Motion Review of the Petition of Environmental Health Coalition to Review Waste Discharge Requirements Order No. 96-03, NPDES Permit No. CAS0108740*, adopted by the State Water Board on June 17, 1999. The receiving water limitation language in this Order requires storm water discharges from MS4s to not cause or contribute to a violation of water quality standards, which is to be achieved through an iterative approach requiring the implementation of improved and better-tailored BMPs over time. Implementation of the iterative approach to comply with receiving water limitations based on applicable water quality standards is necessary to ensure that storm water discharges from the MS4 will not ultimately cause or contribute to violations of water quality standards and will not create conditions of pollution, contamination, or nuisance.

The San Diego, Orange County, and Riverside County Copermittees have asserted that the prohibitions and limitations may result in many years of noncompliance because years of technical efforts may ultimately be required to achieve compliance with the prohibitions and limitations, especially for wet weather discharges. To address this concern, this Order includes an option that allows a Copermittee to be deemed in compliance with the prohibitions and limitations where more than one permit term may be necessary to achieve full compliance with the prohibitions and limitations. One or more Copermittees within a Watershed Management Area can choose to implement this option.

An alternative compliance pathway option has been included in this Order consistent with the approach described in Order WQ 2015-0075, *In the Matter of Review of Order No. R4-2012-0175, NPDES Permit No. CAS004001, Waste Discharge Requirements for Municipal Separate Storm Sewer System (MS4) Discharges within the Coastal Watersheds of Los Angeles County, Except Those Discharges Originating from the City of Long Beach MS4*, adopted by the State Water Board on June 16, 2015. State Water Board Order WQ 2015-0075 directs the Regional Water Boards to consider a watershed-based planning and implementation approach to compliance with receiving water limitations when issuing Phase I MS4 permits going forward. Order WQ 2015-0075 included seven principles that the Regional Water Boards are expected to follow when incorporating an alternative compliance pathway into an MS4 permit. The Fact Sheet discusses the incorporation of the seven principles stipulated in State Water Board Order WQ 2015-0075 into the alternative compliance pathway option in this Order.

35. **Special Conditions for Areas of Special Biological Significance.** On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving a general exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and

NPDES permitted municipal storm water discharges (General Exception). On June 19, 2012, the State Water Board adopted Order No. 2012-0031, amending the General Exception to require pollutant reductions to be achieved within six years in accordance with ASBS Compliance Plans and ASBS Pollution Prevention Plans. The General Exception requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject to the terms and conditions of the General Exception as amended. The Special Protections contained in Attachment B to the General Exception as amended are applicable to these discharges, and are hereby incorporated into Attachment A of this Order.

ADMINISTRATIVE FINDINGS

36. **Executive Officer Delegation of Authority.** The San Diego Water Board by prior resolution has delegated all matters that may legally be delegated to its Executive Officer to act on its behalf pursuant to CWC section 13223. Therefore, the Executive Officer is authorized to act on the San Diego Water Board's behalf on any matter within this Order unless such delegation is unlawful under CWC section 13223 or this Order explicitly states otherwise.

37. **Standard Provisions.** Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR 122.42, are provided in Attachment B to this Order.

38. **Fact Sheet.** The Fact Sheet for this Order contains background information, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of this Order. The Fact Sheet is hereby incorporated into this Order and constitutes part of the Findings of this Order.

39. **Public Notice.** In accordance with State and federal laws and regulations, the San Diego Water Board notified the Copermittees, and interested agencies and persons of its intent to prescribe waste discharge requirements for the control of discharges into and from the MS4s to waters of the U.S. and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet.

40. **Public Hearings.** The San Diego Water Board held a public hearing on April 10 and 11, 2013, that was continued to May 8, 2013 and heard and considered all comments pertaining to the terms and conditions of this Order. The San Diego Water Board also held a public workshop on October 8, 2015, and a public hearing

on February 11, 2015, and heard and considered all comments pertaining to the amendment of this Order through Order No. R9-2015-0001. The San Diego Water Board also held a public hearing on November 18, 2015, and heard and considered all comments pertaining to the amendment of this Order through Order No. R9-2015-0100. Details of these public hearings are provided in the Fact Sheet.

41. **Effective Date.** This Order serves as an NPDES permit pursuant to CWA section 402 or amendments thereto, and as to the San Diego County Copermittees listed in Table ~~2.~~1a~~.~~, became effective fifty (50) days after the date of its adoption, and as to the Orange County Copermittees listed in Table ~~2.~~1b~~.~~, ~~becomes~~ became effective on April 1, 2015, after Order No. R9-2015-0001 was ~~is~~ adopted, and as to the Riverside County Copermittees listed in Table 1c, became effective on January 7, 2016, after Order No. R9-2015-0100 was adopted, provided that the Regional Administrator, USEPA, Region IX, does not object to this Order.

42. **Review by the State Water Board.** Any person aggrieved by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with CWC section 13320 and California Code of Regulations, title 23, sections 2050, and following. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date of this Order, except that if the thirtieth day following the date of this Order falls on a Saturday, Sunday or State holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

THEREFORE, IT IS HEREBY ORDERED that the Copermittees, in order to meet the provisions contained in division 7 of the CWC (commencing with section 13000) and regulations adopted thereunder, and the provisions of the CWA and regulations adopted thereunder, must each comply with the requirements of this Order. This action in no way prevents the San Diego Water Board from taking enforcement action for past violations of the previous Order applicable to the Copermittees. If any part of this Order is subject to a temporary stay of enforcement, unless otherwise specified, the Copermittees must comply with the analogous portions of the previous Order, which will remain in effect for all purposes during the pendency of the stay.

II. PROVISIONS

A. PROHIBITIONS AND LIMITATIONS

The purpose of this provision is to describe the conditions under which storm water and non-storm water discharges into and from MS4s are prohibited or limited. The goal of the prohibitions and limitations is to protect the water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through the implementation of water quality improvement strategies and runoff management programs that effectively prohibit non-storm water discharges into the Copermittees' MS4s, and reduce pollutants in storm water discharges from the Copermittees' MS4s to the MEP.

1. Discharge Prohibitions

a. Discharges from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the state are prohibited.

b. Non-storm water discharges into MS4s are to be effectively prohibited, through the implementation of Provision E.2, unless such discharges are authorized by a separate NPDES permit.

c. Discharges from MS4s are subject to all waste discharge prohibitions in the Basin Plan, included in Attachment A to this Order.

d. Storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012, as amended by State Water Board Resolution No. 2012-0031, applicable to these discharges, included in Attachment A to this Order. All other discharges from the Copermittees' MS4s to ASBS are prohibited.

2. Receiving Water Limitations

a. Discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters, including but not limited to all applicable provisions contained in:

(1) The San Diego Water Board's Basin Plan, including beneficial uses, water quality objectives, and implementation plans;

(2) State Water Board plans for water quality control including the following:

(a) Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries (Thermal Plan), and

(b) The Ocean Plan, including beneficial uses, water quality objectives, and implementation plans;

(3) State Water Board policies for water and sediment quality control including the following:

(a) Water Quality Control Policy for the Enclosed Bays and Estuaries of California,

(b) Sediment Quality Control Plan which includes the following narrative objectives for bays and estuaries:

(i) Pollutants in sediments shall not be present in quantities that, alone or in combination, are toxic to benthic communities, and

(ii) Pollutants shall not be present in sediments at levels that will bioaccumulate in aquatic life to levels that are harmful to human health,

(c) The Statement of Policy with Respect to Maintaining High Quality of Waters in California;[2]

(4) Priority pollutant criteria promulgated by the USEPA through the following:

(a) National Toxics Rule (NTR)[3] (promulgated on December 22, 1992 and amended on May 4, 1995), and

(b) California Toxics Rule (CTR).[4,5]

b. Discharges from MS4s composed of storm water runoff must not alter natural ocean water quality in an ASBS.

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[2] State Water Board Resolution No. 68-16
[3] 40 CFR 131.36
[4] 65 Federal Register 31682-31719 (May 18, 2000), adding Section 131.38 to 40 CFR
[5] If a water quality objective and a CTR criterion are in effect for the same priority pollutant, the more stringent of the two applies.

3. Effluent Limitations

a. Technology Based Effluent Limitations

Pollutants in storm water discharges from MS4s must be reduced to the MEP.[6]

b. Water Quality Based Effluent Limitations

Each Copermittee must comply with applicable WQBELs established for the TMDLs in Attachment E to this Order, pursuant to the applicable TMDL compliance schedules.

4. Compliance with Discharge Prohibitions and Receiving Water Limitations

Each Copermittee must achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order through timely implementation of control measures and other actions as specified in Provisions B and E of this Order, including any modifications. The Water Quality Improvement Plans required under Provision B must be designed and adapted to ultimately achieve compliance with Provisions A.1.a, A.1.c and A.2.a.

a. If exceedance(s) of water quality standards persist in receiving waters notwithstanding implementation of this Order, the Copermittees must comply with the following procedures:

(1) For exceedance(s) of a water quality standard in the process of being addressed by the Water Quality Improvement Plan, the Copermittee(s) must implement the Water Quality Improvement Plan as accepted by the San Diego Water Board, and update the Water Quality Improvement Plan, as necessary, pursuant to Provision F.2.c;

(2) Upon a determination by either the Copermittees or the San Diego Water Board that discharges from the MS4 are causing or contributing to a new exceedance of an applicable water quality standard not addressed by the Water Quality Improvement Plan, the Copermittees must submit the following updates to the Water Quality Improvement Plan pursuant to Provision F.2.c or as part of the Water Quality Improvement Plan Annual Report required under Provision F.3.b, unless the San Diego Water Board directs an earlier submittal:

(a) The water quality improvement strategies being implemented that are effective and will continue to be implemented,

[6] This does not apply to MS4 discharges which receive subsequent treatment to reduce pollutants in storm water discharges to the MEP prior to entering receiving waters (e.g., low flow diversions to the sanitary sewer). Runoff treatment must occur prior to the discharge of runoff into receiving waters per Finding 7.

(b) Water quality improvement strategies (i.e. BMPs, retrofitting projects, stream and/or habitat rehabilitation projects, adjustments to jurisdictional runoff management programs, etc.) that will be implemented to reduce or eliminate any pollutants or conditions that are causing or contributing to the exceedance of water quality standards,

(c) Updates to the schedule for implementation of the existing and additional water quality improvement strategies, and

(d) Updates to the monitoring and assessment program to track progress toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a of this Order;

(3) The San Diego Water Board may require the incorporation of additional modifications to the Water Quality Improvement Plan required under Provision B. The applicable Copermittees must submit any modifications to the update to the Water Quality Improvement Plan within 90 days of notification that additional modifications are required by the San Diego Water Board, or as otherwise directed;

(4) Within 90 days of the San Diego Water Board determination that the modifications to the Water Quality Improvement Plan required under Provision A.4.a.(3) meet the requirements of this Order, the applicable Copermittees must revise the jurisdictional runoff management program documents to incorporate the modified water quality improvement strategies that have been and will be implemented, the implementation schedule, and any additional monitoring required; and

(5) Each Copermittee must implement the updated Water Quality Improvement Plan.

b. The procedure set forth above to achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order do not have to be repeated for continuing or recurring exceedances of the same water quality standard(s) following implementation of scheduled actions unless directed to do otherwise by the San Diego Water Board.

c. Nothing in Provisions A.4.a and A.4.b prevents the San Diego Water Board from enforcing any provision of this Order while the applicable Copermittees prepare and implement the above update to the Water Quality Improvement Plan and jurisdictional runoff management programs.

B. WATER QUALITY IMPROVEMENT PLANS

The purpose of this provision is to develop Water Quality Improvement Plans that guide the Copermittees' jurisdictional runoff management programs towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plans is to further the Clean Water Act's objective to protect, preserve, enhance, and restore the water quality and designated beneficial uses of waters of the state. This goal will be accomplished through an adaptive planning and management process that identifies the highest priority water quality conditions within a watershed and implements strategies through the jurisdictional runoff management programs to achieve improvements in the quality of discharges from the MS4s and receiving waters.

1. Watershed Management Areas

The Copermittees must develop a Water Quality Improvement Plan for each of the Watershed Management Areas in Table B-1. A total of ten Water Quality Improvement Plans must be developed for the San Diego Region.

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
San Juan (901.00)	South Orange County	- Aliso Creek - San Juan Creek - San Mateo Creek - Pacific Ocean - Heisler Park ASBS	- City of Aliso Viejo - City of Dana Point - City of Laguna Beach - City of Laguna Hills[1] - City of Laguna Niguel - City of Laguna Woods[1] - City of Lake Forest[2] - City of Mission Viejo - City of Rancho Santa Margarita - City of San Clemente - City of San Juan Capistrano - County of Orange - Orange County Flood Control District
Santa Margarita (902.00)	Santa Margarita River	- Murrieta Creek - Temecula Creek - Santa Margarita River - Santa Margarita Lagoon - Pacific Ocean	- City of Menifee[3] - City of Murrieta[~~3~~4] - City of Temecula[~~3~~] - City of Wildomar[~~3~~4] - County of Riverside[~~3~~] - County of San Diego[4] - Riverside County Flood Control and Water Conservation District[~~3~~]
San Luis Rey (903.00)	San Luis Rey River	- San Luis Rey River - San Luis Rey Estuary - Pacific Ocean	- City of Oceanside - City of Vista - County of San Diego

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
Carlsbad (904.00)	Carlsbad	- Loma Alta Slough - Buena Vista Lagoon - Agua Hedionda Lagoon - Batiquitos Lagoon - San Elijo Lagoon - Pacific Ocean	- City of Carlsbad - City of Encinitas - City of Escondido - City of Oceanside - City of San Marcos - City of Solana Beach - City of Vista - County of San Diego
San Dieguito (905.00)	San Dieguito River	- San Dieguito River - San Dieguito Lagoon - Pacific Ocean	- City of Del Mar - City of Escondido - City of Poway - City of San Diego - City of Solana Beach - County of San Diego
Penasquitos (906.00)	Penasquitos	- Los Penasquitos Lagoon - Pacific Ocean	- City of Del Mar - City of Poway - City of San Diego - County of San Diego
	Mission Bay	- Mission Bay - Pacific Ocean - San Diego Marine Life Refuge ASBS	- City of San Diego
San Diego (907.00)	San Diego River	- San Diego River - Pacific Ocean	- City of El Cajon - City of La Mesa - City of San Diego - City of Santee - County of San Diego
Pueblo San Diego (908.00) Sweetwater (909.00) Otay (910.00)	San Diego Bay	- Sweetwater River - Otay River - San Diego Bay - Pacific Ocean	- City of Chula Vista - City of Coronado - City of Imperial Beach - City of La Mesa - City of Lemon Grove - City of National City - City of San Diego - County of San Diego - San Diego County Regional Airport Authority - San Diego Unified Port District
Tijuana (911.00)	Tijuana River	- Tijuana River - Tijuana Estuary - Pacific Ocean	- City of Imperial Beach - City of San Diego - County of San Diego

Notes:

1. By agreement dated February 10, 2015, pursuant to Water Code section 13228, the Phase I MS4 discharges within the jurisdiction of the City of Laguna Hills and the City of Laguna Woods located in the Santa Ana Region are regulated by San Diego Water Board Order No. R9-2013-0001 as amended by Order No. R9-2015-0001, upon the later effective date of Order No. R9-2015-0001 or Santa Ana Water Board Tentative Order No. R8-2015-0001. The City of Laguna Hills and Laguna Woods must also comply with the requirements of the San Diego Creek/Newport Bay TMDL in section XVIII of Santa Ana Water Board Order No. R8-2015-0001.
2. By agreement dated February 10, 2015, pursuant to Water Code section 13228, Phase I MS4 discharges within the City of Lake Forest located within the San Diego Water Board Region are regulated by the Santa Ana Water Board Order No. R8-2015-0001 (NPDES No. CAS618030) upon the later effective date of this Order or Santa Ana Water Board Tentative Order No. R8-2015-0001. In accordance with the terms of the agreement between the San Diego Water Board and the Santa Ana Water Board, the City of Lake Forest must implement the requirements of the Bacteria TMDL in Attachment E of this Order, participate in preparation and implementation of the Water Quality Improvement Plan for the Aliso Creek Watershed Management Area as described in Provision B of this Order and continue implementation of its over-irrigation discharge prohibition in its City Ordinance, Title 15, Chapter 15, section 14.030, List (b).
3. By agreement dated October 26, 2015, pursuant to Water Code section 13228, Phase I MS4 discharges within the City of Menifee located within the San Diego Water Board Region are regulated by the Santa Ana Water Board Order No. R8-2010-0033 as it may be amended or reissued (NPDES No. CAS618033) upon the later effective date of this Order. In accordance with the terms of the agreement between the San Diego Water Board and the Santa Ana Water Board, the City of Menifee must participate in preparation and implementation of the Water Quality Improvement Plan for the Santa Margarita River Watershed Management Area as described in Provision B of this Order.~~The Riverside County Copermittees will be covered under this Order after expiration of Order No. R9-2010-0016 or earlier if the Riverside County Copermittees meet the conditions in Provision F.6, upon further amendment of this Order.~~
4. By agreement dated October 26, 2015, pursuant to Water Code section 13228, the Phase I MS4 discharges within the jurisdiction of the City of Murrieta and the City of Wildomar located in the Santa Ana Region are regulated by San Diego Water Board Order No. R9-2013-0001 as amended by Orders No. R9-2015-0001 and R9-2015-0100. The City of Murrieta and City of Wildomar must also comply with the requirements of the Lake Elsinore/Canyon Lake Nutrient TMDLs in section VI.D.2 of Santa Ana Water Board Order No. R8-2010-0033, or corresponding section as it may be amended or reissued.~~The County of San Diego is not required to implement the requirements of Provision B for its jurisdiction within the Santa Margarita River Watershed Management Area~~

~~until the Riverside County Copermittees have been notified of coverage under this Order. The County of San Diego is required to implement the requirements of Provisions D, F.3.b, and Attachment E until the Riverside County Copermittees have been notified of coverage under this Order.~~

2. Priority Water Quality Conditions

The Copermittees must identify the water quality priorities within each Watershed Management Area that will be addressed by the Water Quality Improvement Plan. Where appropriate, Watershed Management Areas may be separated into subwatersheds to focus water quality prioritization and jurisdictional runoff management program implementation efforts by receiving water.

a. Assessment of Receiving Water Conditions

The Copermittees must consider the following, at a minimum, to identify water quality priorities based on impacts of MS4 discharges on receiving water beneficial uses:

(1) Receiving waters listed as impaired on the CWA Section 303(d) List of Water Quality Limited Segments (303(d) List);

(2) TMDLs adopted and under development by the San Diego Water Board;

(3) Receiving waters recognized as sensitive or highly valued by the Copermittees, including estuaries designated under the National Estuary Program under CWA section 320, marine protected areas, wetlands defined by the State or U.S. Fish and Wildlife Service's National Wetlands Inventory as wetlands, waters having the Preservation of Biological Habitats of Special Significance (BIOL) beneficial use designation, and receiving waters identified as ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(4) The receiving water limitations of Provision A.2;

(5) Known historical versus current physical, chemical, and biological water quality conditions;

(6) Available, relevant, and appropriately collected and analyzed physical, chemical, and biological receiving water monitoring data, including, but not limited to, data describing:

(a) Chemical constituents,

(b) Water quality parameters (i.e. pH, temperature, conductivity, etc.),

(c) Toxicity Identification Evaluations for both receiving water column and sediment,

(d) Trash impacts,

(e) Bioassessments, and

(f) Physical habitat;

(7) Available evidence of erosional impacts in receiving waters due to accelerated flows (i.e. hydromodification);

(8) Available evidence of adverse impacts to the chemical, physical, and biological integrity of receiving waters; and

(9) The potential improvements in the overall condition of the Watershed Management Area that can be achieved.

b. ASSESSMENT OF IMPACTS FROM MS4 DISCHARGES

The Copermittees must consider the following, at a minimum, to identify the potential impacts to receiving waters that may be caused or contributed to by discharges from the Copermittees' MS4s:

(1) The discharge prohibitions of Provision A.1 and effluent limitations of Provision A.3; and

(2) Available, relevant, and appropriately collected and analyzed storm water and non-storm water monitoring data from the Copermittees' MS4 outfalls;

(3) Locations of each Copermittee's MS4 outfalls that discharge to receiving waters;

(4) Locations of MS4 outfalls that are known to persistently discharge non-storm water to receiving waters likely causing or contributing to impacts on receiving water beneficial uses;

(5) Locations of MS4 outfalls that are known to discharge pollutants in storm water causing or contributing to impacts on receiving water beneficial uses; and

(6) The potential improvements in the quality of discharges from the MS4 that can be achieved.

c. IDENTIFICATION OF PRIORITY WATER QUALITY CONDITIONS

(1) The Copermittees must use the information gathered for Provisions B.2.a and B.2.b to develop a list of priority water quality conditions as pollutants, stressors and/or receiving water conditions that are the highest threat to receiving water quality or that most adversely affect the quality of receiving waters. The list must include the following information for each priority water quality condition:

(a) The beneficial use(s) associated with the priority water quality condition;

(b) The geographic extent of the priority water quality condition within the Watershed Management Area, if known;

(c) The temporal extent of the priority water quality condition (e.g., dry weather and/or wet weather);

(d) The Copermittees with MS4s discharges that may cause or contribute to the priority water quality condition; and

(e) An assessment of the adequacy of and data gaps in the monitoring data to characterize the conditions causing or contributing to the priority water quality condition, including a consideration of spatial and temporal variation.

(2) The Copermittees must identify the highest priority water quality conditions to be addressed by the Water Quality Improvement Plan, and provide a rationale for selecting a subset of the water quality conditions identified pursuant to Provision B.2.c.(1) as the highest priorities.

d. IDENTIFICATION OF MS4 SOURCES OF POLLUTANTS AND/OR STRESSORS

The Copermittees must identify and prioritize known and suspected sources of storm water and non-storm water pollutants and/or other stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c. The identification of known and suspected sources of pollutants and/or stressors that cause or contribute to the highest priority water quality conditions as identified for Provision B.2.c must consider the following:

(1) Pollutant generating facilities, areas, and/or activities within the Watershed Management Area, including:

(a) Each Copermittee's inventory of construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas,

(b) Publicly owned parks and/or recreational areas,

(c) Open space areas,

(d) All currently operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste, and

(e) Areas not within the Copermittees' jurisdictions (e.g., Phase II MS4s, tribal lands, state lands, federal lands) that are known or suspected to be discharging to the Copermittees' MS4s;

(2) Locations of the Copermittees' MS4s, including the following:

(a) All MS4 outfalls that discharge to receiving waters, and

(b) Locations of major structural controls for storm water and non-storm water (e.g., retention basins, detention basins, major infiltration devices, etc.);

(3) Other known and suspected sources of non-storm water or pollutants in storm water discharges to receiving waters within the Watershed Management Area, including the following:

(a) Other MS4 outfalls (e.g., Phase II Municipal and Caltrans),

(b) Other NPDES permitted discharges,

(c) Any other discharges that may be considered point sources (e.g., private outfalls), and

(d) Any other discharges that may be considered non-point sources (e.g., agriculture, wildlife or other natural sources);

(4) Review of available data, including but not limited to:

(a) Findings from the Copermittees' illicit discharge detection and elimination programs,

(b) Findings from the Copermittees' MS4 outfall discharge monitoring,

(c) Findings from the Copermittees' receiving water monitoring,

(d) Findings from the Copermittees' MS4 outfall discharge and receiving water assessments, and

(e) Other available, relevant, and appropriately collected data, information, or studies related to pollutant sources and/or stressors that contribute to the highest priority water quality conditions as identified for Provision B.2.c.

(5) The adequacy of the available data to identify and prioritize sources and/or stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c.

e. IDENTIFICATION OF POTENTIAL WATER QUALITY IMPROVEMENT STRATEGIES

The Copermittees must evaluate the findings identified under Provisions B.2.a-d, and identify potential strategies that can result in improvements to water quality in MS4 discharges and/or receiving waters within the Watershed Management Area. Potential water quality improvement strategies that may be implemented within the Watershed Management Area must include the following:

(1) Structural BMPs, non-structural BMPs, incentives, or programs that can potentially be implemented to address the highest priority water quality conditions identified under Provision B.2.c, or MS4 sources of pollutants or stressors identified under Provision B.2.d,

(2) Retrofitting projects in areas of existing development within the Watershed Management Area that can potentially be implemented to reduce MS4 sources of pollutants or stressors identified under Provision B.2.d causing or contributing to the highest priority water quality conditions identified under Provision B.2.c, and

(3) Stream, channel, and/or habitat rehabilitation projects within the Watershed Management Area that can potentially be implemented to protect and/or improve conditions in receiving waters from MS4 pollutants and/or stressors identified under Provision B.2.d causing or contributing to the highest priority water quality conditions identified under Provision B.2.c.

3. Water Quality Improvement Goals, Strategies and Schedules

The Copermittees must identify and develop specific water quality improvement goals and strategies to address the highest priority water quality conditions identified within a Watershed Management Area. The water quality improvement goals and strategies must address the highest priority water quality conditions by effectively prohibiting non-storm water discharges to the MS4, reducing pollutants in storm water discharges from the MS4 to the MEP, and protecting the water quality standards of receiving waters.

a. WATER QUALITY IMPROVEMENT GOALS AND SCHEDULES

(1) Numeric Goals

The Copermittees must develop and incorporate numeric goals[7] into the

[7] Interim and final numeric goals may take a variety of forms such as TMDL established WQBELs, action levels, pollutant concentration, load reductions, number of impaired water bodies delisted from the List of Water Quality Impaired Segments, Index of Biotic Integrity (IBI) scores, or other appropriate metrics. Interim and final numeric goals are not necessarily limited to one criterion or indicator, but may include multiple criteria and/or indicators. Except for TMDL established WQBELs, interim and final numeric goals and corresponding schedules may be revised through the adaptive management process under Provision B.5.

Water Quality Improvement Plan. Numeric goals must be used to support Water Quality Improvement Plan implementation and measure reasonable progress towards addressing the highest priority water quality conditions identified under Provision B.2.c. The Copermittees must establish and incorporate the following numeric goals in the Water Quality Improvement Plan:

(a) Final numeric goals must be based on measureable criteria or indicators capable of demonstrating one or more of the following:

(i) Discharges from the Copermittees' MS4s will not cause or contribute to exceedances of water quality standards in receiving waters, AND/OR

(ii) The conditions of receiving waters and associated habitat are protected from MS4 discharges, AND/OR

(iii) Beneficial uses of receiving waters are protected from MS4 discharges and will be supported.

(b) Interim numeric goals must be based on measureable criteria or indicators capable of demonstrating reasonable incremental progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges as follows:

(i) One or more interim numeric goals may be established to demonstrate progress toward achieving each final numeric goal,

(ii) For each final numeric goal, at least one interim numeric goal must be expressed as a reasonable increment toward achievement of the final numeric goal,

(iii) For each final numeric goal, reasonable interim numeric goals must be established to be accomplished during each 5 year period between the acceptance of the Water Quality Improvement Plan and the achievement of the final numeric goals.

(2) <u>Schedules for Achieving Numeric Goals</u>

The Copermittees must develop and incorporate schedules for achieving the numeric goals into the Water Quality Improvement Plan. The schedules must demonstrate reasonable progress toward achieving the final numeric goals required for Provision B.3.a.(1). The Copermittees must incorporate the schedules for achieving the numeric goals into the Water Quality Improvement Plan based on the following considerations:

(a) Final dates for achieving all final numeric goals must be established considering the following:

(i) Final compliance dates for any applicable TMDLs in Attachment E to this Order;

(ii) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(iii) Achievement of the final numeric goals for the highest water quality priorities must be as soon as possible;

(iv) Final dates for achieving the final numeric goals must reflect a realistic assessment of the shortest practicable time required based on the temporal and spatial extent and factors associated with the highest priority water quality conditions identified under Provision B.2.c, and taking into account the time reasonably required to implement the water quality improvement strategies required pursuant to Provision B.3.b.

(b) Interim dates for achieving all interim numeric goals must be established considering the following:

(i) Interim compliance dates for any applicable TMDLs in Attachment E to this Order;

(ii) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(iii) Interim dates for achieving the interim numeric goals must reflect a realistic assessment of the shortest practicable time reasonably required, taking into account the time needed to implement new or significantly expanded programs and securing financing, if necessary; and

(iv) For each final numeric goal, at least one interim numeric goal must be established that the Copermittees will work toward achieving within the term of this Order.

b. WATER QUALITY IMPROVEMENT STRATEGIES AND SCHEDULES

Based on the likely effectiveness and efficiency of the potential water quality improvement strategies identified under Provision B.2.e to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a, the Copermittees must identify the strategies that will be implemented in each Watershed Management Area as follows:

(1) Jurisdictional Strategies

(a) Each Copermittee in the Watershed Management Area must identify the strategies that will be implemented within its jurisdiction as part of its jurisdictional runoff management program requirements under Provisions E.2 through E.7, including descriptions of the following:

(i) For each of the inventories developed for its jurisdiction, as required under Provisions D.2.a.(1), E.3.e.(2), E.4.b, and E.5.a, each Copermittee must identify the known and suspected areas or sources causing or contributing to the highest priority water quality conditions in the Watershed Management Area that the Copermittee will focus on in its efforts to effectively prohibit non-storm water discharges to its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, and achieve the interim and final numeric goals identified under Provision B.3.a;

(ii) BMPs that each Copermittee will implement, or require to be implemented, as applicable, for those areas or sources within its jurisdiction;

(iii) Education programs that each Copermittee will implement, as applicable, for those areas or sources within its jurisdiction;

(iv) Frequencies that each Copermittee will conduct inspections on those areas or sources within its jurisdiction;

(v) Incentive and enforcement programs that each Copermittee will implement, as applicable, for those areas or sources within its jurisdiction; and

(vi) Any other BMPs, incentives, or programs that each Copermittee will implement for those areas or sources within its jurisdiction.

(b) Identify the optional jurisdictional strategies that each Copermittee will implement within its jurisdiction, as necessary, to effectively prohibit non-storm water discharges to its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. Descriptions of the optional jurisdictional strategies must include:

(i) BMPs, incentives, or programs that may be implemented by the Copermittee within its jurisdiction in addition to the requirements of Provisions B.3.b.(1)(a);

(ii) Incentives or programs that may be implemented by the Copermittee to encourage or implement projects to retrofit areas of existing development within its jurisdiction;

(iii) Incentives or programs that may be implemented by the Copermittee to encourage or implement projects that will rehabilitate the conditions of channels or habitats within its jurisdiction;

(iv) The funds and/or resources that must be secured by the Copermittee to implement the optional strategies described for Provisions B.3.b.(1)(b)(i)-(iii) within its jurisdiction; and

(v) The circumstances necessary to trigger implementation of the optional jurisdictional strategies, in addition to the requirements of Provision B.3.b.(1)(a), to achieve the interim and final numeric goals within the schedules established under Provision B.3.a.

(c) Identify the strategies that will be implemented by the Copermittee in coordination with or with the cooperation of other agencies (e.g. Caltrans, water districts, school districts) and/or entities (e.g. non-governmental organizations) within its jurisdiction.

(2) Watershed Management Area Strategies

The Copermittees must identify the optional regional or multi-jurisdictional strategies that will be implemented in the Watershed Management Area, as necessary, to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. Descriptions of the optional regional or multi-jurisdictional strategies must include:

(a) Regional or multi-jurisdictional BMPs, incentives, or programs that may be implemented by the Copermittees in the Watershed Management Area;

(b) Incentives or programs that may be implemented by the Copermittees in the Watershed Management Area to encourage or implement regional or multi-jurisdictional projects to retrofit areas of existing development;

(c) Incentives or programs that may be implemented by the Copermittees to encourage or implement regional or multi-jurisdictional projects that will rehabilitate the conditions of channels, streams, or habitats within the Watershed Management Area;

(d) The funds and/or resources that must be secured by the Copermittees to implement the optional strategies described for Provisions B.3.b.(2)(a)-(c) within the Watershed Management Area; and

(e) The circumstances necessary to trigger implementation of the optional regional or multi-jurisdictional strategies to achieve the interim and final numeric goals within the schedules established under Provision B.3.a.

(3) Schedules for Implementing Strategies

The Copermittees must develop reasonable schedules for implementing the water quality improvement strategies identified under Provisions B.3.b.(1) and B.3.b.(2) to achieve the interim and final numeric goals identified and schedules established under Provision B.3.a. The Copermittees must incorporate the schedules to implement the water quality improvement strategies into the Water Quality Improvement Plan as follows:

(a) Each Copermittee must develop schedules for the jurisdictional strategies identified pursuant to Provisions B.3.b.(1)(a)-(b). Each schedule must specify:

(i) If each jurisdictional strategy identified pursuant to Provision B.3.b.(1)(a) will or will not be initiated upon acceptance of the Water Quality Improvement Plan;

(ii) For each jurisdictional strategy identified pursuant to Provision B.3.b.(1)(a) that will not be initiated upon acceptance of the Water Quality Improvement Plan, the shortest practicable time in which each jurisdictional strategy will be initiated after acceptance of the Water Quality Improvement Plan;

(iii) For each optional jurisdictional strategy identified pursuant to Provision B.3.b.(1)(b), a realistic assessment of the shortest practicable time required to:

[a] Secure the resources needed to fund the optional jurisdictional strategy, and
[b] Procure the resources, materials, labor, and applicable permits necessary to initiate implementation of the optional jurisdictional strategy;

(iv) If each jurisdictional strategy identified pursuant to Provisions B.3.b.(1)(a)-(b) is expected to be continuously implemented (e.g. inspections) or completed within a schedule (e.g. construction of structural BMP); and

(v) If a jurisdictional strategy identified pursuant to Provisions B.3.b.(1)(a)-(b) is expected to be completed within a schedule, the anticipated time to complete based on a realistic assessment of the shortest practicable time required.

(b) The Copermittees in the Watershed Management Area must develop schedules for the regional or multi-jurisdictional strategies identified pursuant to Provision B.3.b.(2). Each schedule must specify:

(i) A realistic assessment of the shortest practicable time to:

[a] Secure the resources needed to fund the optional regional or multi-jurisdictional strategy, and
[b] Procure the resources, materials, labor, and permits necessary to initiate the implementation of the optional regional or multi-jurisdictional strategy;

(ii) If each regional or multi-jurisdictional strategy identified pursuant to Provision B.3.b.(2) is expected to be continuously implemented (e.g. inspections) or completed within a schedule (e.g. construction of structural BMP); and

(iii) If a regional or multi-jurisdictional strategy and/or activity identified pursuant to Provisions B.3.b.(2) is expected to be completed within a schedule, the anticipated time to complete based on a realistic assessment of the shortest practicable time required.

(4) Optional Watershed Management Area Analysis

(a) For each Watershed Management Area, the Copermittees have the option to perform a Watershed Management Area Analysis for the purpose of developing watershed-specific requirements for structural BMP implementation, as described in Provision E.3.c.(3). The Watershed Management Area Analysis must include GIS layers (maps) as output. The analysis must include the following information, to the extent it is available, in order to characterize the Watershed Management Areas:

(i) A description of dominant hydrologic processes, such as areas where infiltration or overland flow likely dominates;

(ii) A description of existing streams in the watershed, including bed material and composition, and if they are perennial or ephemeral;

(iii) Current and anticipated future land uses;

(iv) Potential coarse sediment yield areas; and

(v) Locations of existing flood control structures and channel structures, such as stream armoring, constrictions, grade control structures, and hydromodification or flood management basins.

(b) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify and compile a list of candidate projects that could potentially be used as

alternative compliance options for Priority Development Projects, to be implemented in lieu of onsite structural BMP performance requirements described in Provisions E.3.c.(1) and E.3.c.(2)(a). Specifically, the Copermittees must identify opportunities to be included in the list of candidate projects in each Watershed Management Area, such as:

(i) Stream or riparian area rehabilitation;

(ii) Retrofitting existing infrastructure to incorporate storm water retention or treatment;

(iii) Regional BMPs;

(iv) Groundwater recharge projects;

(v) Water supply augmentation projects; and

(vi) Land purchases to preserve floodplain functions.

(c) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify areas within the Watershed Management Area where it is appropriate to allow Priority Development Projects to be exempt from the hydromodification management BMP performance requirements described in Provision E.3.c.(2), including supporting rationale.

c. Prohibitions and Limitations Compliance Option

Each Copermittee has the option to utilize the implementation of the Water Quality Improvement Plan to demonstrate compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b within a Watershed Management Area subject to the following conditions:

(1) A Copermittee is eligible to be deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b within a Watershed Management Area when the Water Quality Improvement Plan for a Watershed Management Area incorporates the following:

(a) Numeric goals, water quality improvement strategies, and schedules developed pursuant to Provisions B.3.a and B.3.b that include the following:

(i) Interim and final WQBELs established by the TMDLs in Attachment E to this Order applicable to the Copermittee's jurisdiction within the Watershed Management Area; AND

(ii) Interim and final numeric goals for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012

(included as Attachment A to this Order) applicable to the Copermittee's jurisdiction within the Watershed Management Area; AND

(iii) Interim and final numeric goals applicable to the Copermittee's MS4 discharges within the Watershed Management Area expressed as numeric concentration-based or load-based goals for all pollutants and conditions listed on the Clean Water Act Section 303(d) List of Water Quality Impaired Segments[8] for the receiving waters in the Watershed Management Area that do not have a TMDL incorporated into Attachment E to this Order; AND/OR

(iv) Interim and final numeric goals for pollutants and conditions identified as receiving water priorities in the Water Quality Improvement Plan that will result in chemical, physical, and biological conditions protective of the beneficial uses of the receiving waters impacted by the Copermittee's MS4 discharges within the Watershed Management Area; AND

(v) The Copermittee has the option to include interim and final numeric goals applicable to the Copermittee's MS4 discharges and/or receiving waters within the Watershed Management Area for any pollutants or conditions in addition to those described in Provisions B.3.c.(1)(a)(i)-(iv); AND

(vi) Schedules for achieving each final numeric goal that reflect a realistic assessment of the shortest practicable time needed for achievement; AND

(vii) For each final numeric goal developed pursuant to Provisions B.3.a and B.3.c.(1)(a)(i)-(v), annual milestones[9] and the dates for their achievement must be included within each of the next five (5) Water Quality Improvement Plan Annual Report reporting periods, or until the final numeric goal is achieved. Annual milestones and the dates for their achievement for the 5 Water Quality Improvement Plan Annual Report reporting periods of the next permit term, or until the final numeric goal is achieved, must be provided as part of the Report of Waste Discharge required pursuant to Provision F.5.

(b) An analysis that meets all of the following conditions:

(i) The analysis, with clearly stated assumptions included in the analysis, must quantitatively demonstrate that the implementation of

[8] 2010 and subsequent 303(d) Lists
[9] Annual milestones for each final numeric goal must be clearly and directly linked to, or demonstrate progress is being made toward the achievement of the final numeric goal. The annual milestones may consist of water quality improvement strategy implementation phases, interim numeric goals, and other acceptable metrics. The annual milestones may address multiple numeric goals and/or multiple water bodies, as applicable and appropriate.

the water quality improvement strategies required under Provision B.3.b will achieve the final numeric goals within the schedules developed pursuant to Provisions B.3.a and B.3.c.(1)(a).

(ii) The development of the analysis must include a public participation process which allows the public to review and provide comments on the analysis methodology utilized and the assumptions included in the analysis. Public comments and responses must be included as part of the analysis documentation included in the Water Quality Improvement Plan.

(iii) The analysis may be performed by an individual Copermittee or jointly by two or more Copermittees choosing to utilize this compliance option for their jurisdictions within the Watershed Management Area.

(iv) The analysis must be updated as part of the iterative approach and adaptive management process required under Provisions B.5.a-b.

(c) Specific monitoring and assessments required pursuant to Provision B.4.a that will be performed by the Copermittee capable of 1) demonstrating whether the implementation of the water quality improvement strategies are making progress toward achieving the numeric goals in accordance with the established schedules developed pursuant to Provisions B.3.a and B.3.c.(1)(a), and 2) determining whether interim and final numeric goals have been achieved. The specific monitoring and assessments must be updated as part of the iterative approach and adaptive management process required under Provision B.5.c.

(d) Documentation showing that the numeric goals, schedules, and annual milestones proposed pursuant to Provision B.3.c.(1)(a), the analysis performed pursuant to Provision B.3.c.(1)(b), and the specific monitoring and assessments proposed pursuant to Provision B.3.c.(1)(c) have been reviewed by the Water Quality Improvement Consultation Panel (see Provision F.1.a.(1)(b)). Updates must be reviewed by the Water Quality Improvement Consultation Panel for any recommendations.

(2) Each Copermittee that voluntarily completes the requirements of Provision B.3.c.(1) is deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b for the pollutants and conditions for which numeric goals are developed when the Water Quality Improvement Plan, incorporating the requirements of Provision B.3.c.(1), is accepted by the San Diego Water Board pursuant to Provision F.1.b or F.2.c. The Copermittee is deemed in compliance during the term of this Order as long as:

(a) The Copermittee is implementing the water quality improvement strategies within its jurisdiction developed pursuant to Provision B.3.b.(1) and in

compliance with the schedules for implementing the strategies established pursuant to Provisions B.3.b.(3)(a) and B.3.c.(1)(a)(vii); AND

(b) The Copermittee is performing the monitoring and assessments developed pursuant to Provision B.3.c.(1)(c); AND

(c) The Copermittee's assessments in the Water Quality Improvement Plan Annual Report submitted pursuant to Provision F.3.b.(3) support a conclusion that: 1) the Copermittee is in compliance with the annual milestones and dates for achievement developed pursuant to Provision B.3.c.(1)(a)(vii), OR 2) the Copermittee has provided acceptable rationale and recommends appropriate modifications to the interim numeric goals, and/or water quality improvement strategies, and/or schedules to improve the rate of progress toward achieving the final numeric goals developed pursuant to Provisions B.3.a and B.3.c.(1)(a)(i)-(vi); AND

(d) Any proposed modifications to the numeric goals, strategies, schedules, and/or annual milestones are accepted by the San Diego Water Board as part of subsequent updates to the Water Quality Improvement Plan pursuant to Provision F.2.c;[10] AND

(e) The Copermittee is implementing the requirements of Provision A.4.a.

4. Water Quality Improvement Monitoring and Assessment Program

a. The Copermittees in each Watershed Management Area must develop and incorporate an integrated monitoring and assessment program into the Water Quality Improvement Plan that assesses: 1) the progress toward achieving the numeric goals and schedules, 2) the progress toward addressing the highest priority water quality conditions for each Watershed Management Area, and 3) each Copermittee's overall efforts to implement the Water Quality Improvement Plan.

b. The monitoring and assessment program must incorporate the monitoring and assessment requirements of Provision D, which may allow the Copermittees to modify the program to be consistent with and focus on the highest priority water quality conditions for each Watershed Management Area.

c. For Watershed Management Areas with applicable TMDLs, the monitoring and assessment program must incorporate the specific monitoring and assessment requirements of Attachment E.

[10] A request for proposed changes to the Water Quality Improvement Plan does not stay any permit condition.

d. For Watershed Management Areas with any ASBS, the water quality monitoring and assessment program must incorporate the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

5. Iterative Approach and Adaptive Management Process

The Copermittees in each Watershed Management Area must implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a, and must include the following:

a. RE-EVALUATION OF PRIORITY WATER QUALITY CONDITIONS

The priority water quality conditions and potential water quality improvement strategies included in the Water Quality Improvement Plan pursuant to Provisions B.2.c and B.2.e may be re-evaluated by the Copermittees as needed during the term of this Order as part of the Water Quality Improvement Plan Annual Report. Re-evaluation and recommendations for modifications to the priority water quality conditions and potential water quality improvement strategies must be provided in the Report of Waste Discharge, and must consider the following:

(1) Achieving the outcome of improved water quality in MS4 discharges and receiving waters through implementation of the water quality improvement strategies identified in the Water Quality Improvement Plan;

(2) New information developed when the requirements of Provisions B.2.a-c have been re-evaluated;

(3) Spatial and temporal accuracy of monitoring data collected to inform prioritization of water quality conditions and implementation strategies to address the highest priority water quality conditions;

(4) Availability of new information and data from sources other than the jurisdictional runoff management programs within the Watershed Management Area that informs the effectiveness of the actions implemented by the Copermittees;

(5) San Diego Water Board recommendations; and

(6) Recommendations for modifications solicited through a public participation process.

b. ADAPTATION OF GOALS, STRATEGIES AND SCHEDULES

The water quality improvement goals, strategies and schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.3, must be re-evaluated and adapted as new information becomes available to result in more effective and efficient measures to address the highest priority water quality conditions identified pursuant to Provision B.2.c. Re-evaluation of and modifications to the water quality improvement goals, strategies and schedules must be provided in the Water Quality Improvement Plan Annual Report, and must consider the following:

(1) Modifications to the priority water quality conditions based on Provision B.5.a;

(2) Progress toward achieving interim and final numeric goals in receiving waters and MS4 discharges for the highest priority water quality conditions in the Watershed Management Area,

(3) Progress toward achieving outcomes according to established schedules;

(4) New policies or regulations that may affect identified numeric goals;

(5) Measurable or demonstrable reductions of non-storm water discharges to and from each Copermittee's MS4;

(6) Measurable or demonstrable reductions of pollutants in storm water discharges from each Copermittee's MS4 to the MEP;

(7) New information developed when the requirements of Provisions B.2.b and B.2.d have been re-evaluated;

(8) Efficiency in implementing the Water Quality Improvement Plan;

(9) San Diego Water Board recommendations; and

(10) Recommendations for modifications solicited through a public participation process.

c. ADAPTATION OF MONITORING AND ASSESSMENT PROGRAM

The water quality improvement monitoring and assessment program, included in the Water Quality Improvement Plan pursuant to Provision B.4, must be re-evaluated and adapted when new information becomes available. Re-evaluation and recommendations for modifications to the monitoring and assessment program, pursuant to the requirements of Provision D, may be provided in the Water Quality Improvement Plan Annual Report, but must be provided in the Report of Waste Discharge.

d. ADAPTATION OF PROHIBITIONS AND LIMITATIONS COMPLIANCE OPTION

If a Copermittee has implemented the Prohibitions and Limitations Compliance Option allowed to be included in the Water Quality Improvement Plan pursuant to Provision B.3.c, the Copermittee must re-evaluate and adapt the numeric goals, water quality improvement strategies, schedules, and annual milestones required under Provision B.3.c.(1) when significant new information becomes available, or with the Report of Waste Discharge required pursuant to Provision F.5. Significant changes in the numeric goals, water quality improvement strategies, schedules, or annual milestones requires an update to the analysis required under Provision B.3.c.(2).

6. Water Quality Improvement Plan Submittal, Updates, and Implementation

a. The Copermittees must submit and commence implementation of the Water Quality Improvement Plans in accordance with the requirements of Provision F.1.

b. The Copermittees must submit proposed updates to the Water Quality Improvement Plan for acceptance by the San Diego Water Board Executive Officer in accordance with the requirements of Provision F.2.c.

C. ACTION LEVELS

The purpose of this provision is for the Copermittees to incorporate numeric action levels in the Water Quality Improvement Plans. The goal of the action levels is to guide Water Quality Improvement Plan implementation efforts and measure progress towards the protection of water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through monitoring and assessing the quality of the MS4 discharges during the implementation of the Water Quality Improvement Plans.

1. Non-Storm Water Action Levels[11]

The Copermittees must develop and incorporate numeric non-storm water action levels (NALs) into the Water Quality Improvement Plan to: 1) support the development and prioritization of water quality improvement strategies for effectively prohibiting non-storm water discharges to the MS4s, 2) assess the effectiveness of the water quality improvement strategies toward addressing MS4 non-storm water discharges, required pursuant to Provision D.4.b.(1), and 3) support the detection and elimination of non-storm water and illicit discharges to the MS4, required pursuant to Provision E.2.[12]

a. The following NALs must be incorporated:

(1) Non-Storm Water Discharges from MS4s to Ocean Surf Zone

Table C-1. Non-Storm Water Action Levels for Discharges from MS4s to Ocean Surf Zone

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Total Coliform	MPN/100 ml	1,000	-	10,000/1,000[1]	OP
Fecal Coliform	MPN/100 ml	200[2]	-	400	OP
Enterococci	MPN/100 ml	35	-	104[3]	OP

Abbreviations/Acronyms
AMAL – average monthly action level
MDAL – maximum daily action level
OP – Ocean Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Total coliform density NAL is 1,000 MPN/100 ml when the fecal/total coliform ratio exceeds 0.1.
2. Fecal coliform density NAL is 200 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas."

[11] NALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, unless the NAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed.
[12] The Copermittees may utilize NALs or other benchmarks currently established by the Copermittees as interim NALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

(2) Non-Storm Water Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Table C-2. Non-Storm Water Action Levels for Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Turbidity	NTU	75	-	225	OP
pH	Units	Within limit of 6.0 to 9.0 at all times			OP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	35	-	104[3]	BP
Priority Pollutants	µg/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
OP – Ocean Plan water quality objective
NTU – Nephelometric Turbidity Units
µg/L – micrograms per liter
MDAL – maximum daily action level
BP – Basin Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas" and is not applicable to water bodies that are not designated with the water contact recreation (REC-1) beneficial use.

Table C-3. Non-Storm Water Action Levels for Priority Pollutants

Parameter	Units	Freshwater (CTR)		Saltwater (CTR)	
		MDAL	AMAL	MDAL	AMAL
Cadmium	µg/L	**	**	16	8
Copper	µg/L	*	*	5.8	2.9
Chromium III	µg/L	**	**	-	-
Chromium VI	µg/L	16	8.1	83	41
Lead	µg/L	*	*	14	2.9
Nickel	µg/L	**	**	14	6.8
Silver	µg/L	*	*	2.2	1.1
Zinc	µg/L	*	*	95	47

Abbreviations/Acronyms:
CTR – California Toxic Rule
AMAL – average monthly action level
µg/L – micrograms per liter
MDAL – maximum daily action level

Notes:
* Action levels developed on a case-by-case basis (see below)
** Action levels developed on a case-by-case basis (see below), but calculated criteria are not to exceed Maximum Contaminant Levels (MCLs) under the California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64431

The Cadmium, Copper, Chromium (III), Lead, Nickel, Silver and Zinc NALs for MS4 discharges to freshwater receiving waters will be developed on a case-by-case basis based on site-specific water quality data (receiving water hardness). For these priority pollutants, refer to 40 CFR 131.38(b)(2).

(3) Non-Storm Water Discharges from MS4s to Inland Surface Waters

Table C-4. Non-Storm Water Action Levels for Discharges from MS4s to Inland Surface Waters

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Dissolved Oxygen	mg/L	Not less than 5.0 in WARM waters and not less than 6.0 in COLD waters			BP
Turbidity	NTU	-	20	See MDAL	BP
pH	Units	Within limit of 6.5 to 8.5 at all times			BP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	33	-	61[3]	BP
Total Nitrogen	mg/L	-	1.0	See MDAL	BP
Total Phosphorus	mg/L	-	0.1	See MDAL	BP
MBAS	mg/L	-	0.5	See MDAL	BP
Iron	mg/L	-	0.3	See MDAL	BP
Manganese	mg/L	-	0.05	See MDAL	BP
Priority Pollutants	µg/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
BP – Basin Plan water quality objective
COLD – cold freshwater habitat beneficial use
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
MDAL – maximum daily action level
WARM – warm freshwater habitat beneficial use
MBAS – Methylene Blue Active Substances
MPN/100 ml – most probable number per 100 milliliters
µg/L – micrograms per liter

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for freshwater "designated beach areas" and is not applicable to water bodies that are not designated with the water contact recreation (REC-1) beneficial use.

b. If not identified in Provision C.1.a, NALs must be identified, developed and incorporated in the Water Quality Improvement Plan for any pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in receiving waters associated with the highest priority water quality conditions related to non-storm water discharges from the MS4s. NALs must be based on:

(1) Applicable water quality standards which may be dependent upon site-specific or receiving water-specific conditions or assumptions to be identified by the Copermittees; or

(2) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the NALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary NALs specific to the Watershed Management Area at levels greater than the NALs required by Provisions C.1.a and C.1.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for effectively prohibiting non-storm water discharges to the MS4s, as well as the detection and

elimination of non-storm water and illicit discharges to and from the MS4. The secondary NALs may be developed using an approach acceptable to the San Diego Water Board.

d. Dry weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.b may be utilized to develop or revise NALs based on watershed-specific data, subject to San Diego Water Board Executive Officer approval.

2. Storm Water Action Levels[13]

The Copermittees must develop and incorporate numeric storm water action levels (SALs) in the Water Quality Improvement Plans to: 1) support the development and prioritization of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s, and 2) assess the effectiveness of the water quality improvement strategies toward reducing pollutants in storm water discharges, required pursuant to Provision D.4.b.(2).[14]

a. The following SALs for discharges of storm water from the MS4 must be incorporated:

Table C-5. Storm Water Action Levels for Discharges from MS4s to Receiving Waters

Parameter	Units	Action Level
Turbidity	NTU	126
Nitrate & Nitrite (Total)	mg/L	2.6
Phosphorus (Total P)	mg/L	1.46
Cadmium (Total Cd)*	µg/L	3.0
Copper (Total Cu)*	µg/L	127
Lead (Total Pb)*	µg/L	250
Zinc (Total Zn)*	µg/L	976

Abbreviations/Acronyms:
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
µg/L – micrograms per liter

Notes:
* The sampling must include a measure of receiving water hardness at each MS4 outfall. If a total metal concentration exceeds the corresponding metals SAL in Table C-5, that concentration must be compared to the California Toxics Rule criteria and the USEPA 1-hour maximum concentration for the detected level of receiving water hardness associated with that sample. If it is determined that the sample's total metal concentration for that specific metal exceeds that SAL, but does not exceed the applicable USEPA 1-hour maximum concentration criterion for the measured level of hardness, then the sample result will not be considered above the SAL for that measurement.

[13] SALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, unless the SAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed.

[14] The Copermittees may utilize SALs or other benchmarks currently established by the Copermittees as interim SALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

b. If not identified in Provision C.2.a, SALs must be identified, developed and incorporated in the Water Quality Improvement Plan for pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in receiving waters associated with the highest priority water quality conditions related to storm water discharges from the MS4s. SALs must be based on:

(1) Federal and State water quality guidance and/or water quality standards; and

(2) Site-specific or receiving water-specific conditions; or

(3) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the SALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary SALs specific to the Watershed Management Area at levels greater than the SALs required by Provisions C.2.a and C.2.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s. The secondary SALs may be developed based on the approaches recommended by the State Water Board's Storm Water Panel[15] or using an approach acceptable to the San Diego Water Board.

d. Wet weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.c may be used to develop or revise SALs based upon watershed-specific data, subject to San Diego Water Board Executive Officer approval.

[15] Storm Water Panel Recommendations to the California State Water Resources Control Board: The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities (June 2006)

D. MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS

The purpose of this provision is for the Copermittees to monitor and assess the impact on the conditions of receiving waters caused by discharges from the Copermittees' MS4s under wet weather and dry weather conditions. The goal of the monitoring and assessment program is to inform the Copermittees about the nexus between the health of receiving waters and the water quality condition of the discharges from their MS4s. This goal will be accomplished through monitoring and assessing the conditions of the receiving waters, discharges from the MS4s, pollutant sources and/or stressors, and effectiveness of the water quality improvement strategies implemented as part of the Water Quality Improvement Plans.

1. Receiving Water Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the condition of the receiving waters in each Watershed Management Area during dry weather and wet weather. Following San Diego Water Board acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct long-term receiving water monitoring during implementation of the Water Quality Improvement Plan to assess the long term trends and determine if conditions in receiving waters are improving. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following receiving water monitoring procedures:

a. TRANSITIONAL RECEIVING WATER MONITORING

Until the monitoring requirements and schedules of Provisions D.1.b-e are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following receiving water monitoring in the Watershed Management Area:

(1) Continue the receiving water monitoring programs required in Order Nos. R9-2007-0001 (Monitoring and Reporting Program No. R9-2007-0001 Sections II.A.1-A.5), R9-2009-0002, and R9-2010-0016, unless the Executive Officer provides conditional approval for Copermittees to proceed with implementation of the proposed monitoring and assessment program developed in accordance with Provision B.4;

(2) Continue the monitoring in the Hydromodification Management Plans approved by the San Diego Water Board;

(3) Participate in the following regional receiving water monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring,

(b) Southern California Bight Regional Monitoring, and

(c) Sediment Quality Monitoring;

(4) Implement the monitoring programs developed as part of any implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) for the TMDLs in Attachment E to this Order; and

(5) For Watershed Management Areas with ASBS, implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

b. LONG-TERM RECEIVING WATER MONITORING STATIONS

The Copermittees must select at least one long-term receiving water monitoring station from among the existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees to be representative of the receiving water quality in the Watershed Management Area. Additional long-term receiving water monitoring stations must be selected where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

c. DRY WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three dry weather monitoring events at each of the long-term receiving water monitoring stations. At least one monitoring event must be conducted during the dry season (May 1 – September 30) and at least one monitoring event must be conducted during a dry weather period during the wet season (October 1 – April 30), after the first wet weather event of the season, with an antecedent dry period of at least 72 hours following a storm event producing measureable rainfall of greater than 0.1 inch.

(1) Dry Weather Receiving Water Field Observations

For each dry weather monitoring event, the Copermittees must record field observations consistent with Table D-1 at each long-term receiving water monitoring station.

Table D-1. Field Observations for Receiving Water Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) • Station description (i.e. deposits or stains, vegetation condition, structural condition, and observable biology) • Presence and assessment of trash in and around station

(2) Dry Weather Receiving Water Field Monitoring

For each dry weather monitoring event, if conditions allow the collection of the data, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

Table D-2. Field Monitoring Parameters for Receiving Water Monitoring Stations

Parameters
• pH • Temperature • Specific conductivity • Dissolved oxygen • Turbidity

(3) Dry Weather Receiving Water Analytical Monitoring

For each dry weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable NAL constituents, and

(v) Constituents listed in Table D-3.

Table D-3. Analytical Monitoring Constituents for Receiving Water Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Pesticides	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Mercury • Nickel • Selenium • Thallium • Zinc	• Organophosphate Pesticides • Pyrethroid Pesticides	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(4) Dry Weather Receiving Water Toxicity Monitoring

For each dry weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for aquatic toxicity in accordance with Table D-4. When the State Water Board's Policy for Toxicity Assessment and Control (Toxicity Policy) is approved and in effect, the San Diego Water Board Executive Officer may direct the Copermittees to replace current toxicity program elements with standardized procedures in the Toxicity Policy.

Table D-4. Dry Weather Chronic[1] Toxicity Testing for Receiving Water Monitoring Stations

Organism	Units	Test	USEPA Protocol
Freshwater			
Pimephales promelas (Fathead Minnow)	Pass / Fail	Larval Survival and Growth	EPA-821-R-02-013
Ceriodaphnia dubia (*Daphnid*)	Pass / Fail	Survival and Production	EPA-821-R-02-013
Selenastrum capricornutum (Green Algae)	Pass / Fail	Growth	EPA-821-R-02-013
Marine and Estuarine			
Strongylocentrotus purpuratus *(Purple Sea Urchin)*	Pass / Fail	Embryo-Larval Development	EPA-600-R-95-136

Notes:
1. Chronic toxicity testing is not required at receiving water monitoring stations located at mass loading stations if the channel flows are diverted year-round during dry weather conditions to the sanitary sewer for treatment.

(a) Freshwater Test Species and Methods: If samples are collected in receiving waters with salinity less than 1 ppt, the Copermittees must follow the methods for chronic toxicity tests as established in 40 CFR 136.3 using a single-concentration test design for routine monitoring, or a five-concentration test design for additional toxicity testing if the limitation is exceeded. The Copermittees must estimate the critical life stage chronic toxicity on undiluted samples in accordance with species and short term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms (EPA-821-R-02-013; Table IA, 40 CFR 136). Additional test species may be used by the Copermittees if approved by the San Diego Water Board Executive Officer. The Copermittees must conduct:

(i) A static renewal toxicity test with the fathead minnow, *Pimephales promelas* (Larval Survival and Growth Test Method 1000.0);

(ii) A static renewal toxicity test with the daphnid, *Ceriodaphnia dubia* (Survival and Reproduction Test Method 1002.0); and

(iii) A static renewal toxicity test with the green alga, *Selenastrum capricornutum* (also named *Raphidocelis subcapitata*) (Growth Test Method 1003.0).

(b) Marine and Estuarine Test Species and Methods: If samples are collected in receiving waters with salinity greater or equal to 1 ppt, the Copermittees must follow the methods for chronic toxicity tests as established in 40 CFR 136.3 using a single-concentration test design for routine monitoring, or a five-concentration test design for additional toxicity testing if the limitation is exceeded. The Copermittees must conduct the following critical life state chronic toxicity tests on undiluted samples in accordance with species and short term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms (EPA-600-R-95-136; 1995). Artificial sea salts must be used to increase sample salinity. The Copermittees must conduct a static non-renewal toxicity test with the purple sea urchin, *Strongylocentrotus purpuratus* (Embryo-larval Development Test Method). Additional species may be used by the Copermittees if approved by the San Diego Water Board Executive Officer.

(c) Holding Times: All toxicity tests must be conducted as soon as possible following sample collection. The 36-hour sample holding time for test initiation shall be targeted. However, no more than 72 hours shall elapse before the conclusion of sample collection and test initiation.

(d) Test Species Sensitivity Screening: To determine the most sensitive test species for freshwater, the Copermittees must screen 2 wet weather and 2 dry weather toxicity tests with a vertebrate, an invertebrate, and a plant species. After this screening period, subsequent monitoring must be conducted using the most sensitive test species. Alternatively, if a sensitive test species has already been determined, or if there is prior knowledge of potential toxicant(s) and a test species is sensitive to such toxicant(s), then monitoring must be conducted using only that test species. Sensitive test species determinations must also consider the most sensitive test species used for proximal receiving water monitoring. Rescreening must occur once each permit term.

(e) Chronic toxicity test biological endpoint data must be analyzed using the Test of Significant Toxicity t-test approach specified in *National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document* (USEPA, Office of Wastewater Management, Washington, D.C., EPA-833-R-10-003, 2010). For this monitoring program, the critical chronic instream waste concentration (IWC) is set at 100 percent receiving water (i.e. no dilution) for receiving water samples. A 100 percent receiving water and a control must be tested.

(f) Toxicity Identification Evaluation (TIE) / Toxicity Reduction Evaluation (TRE): If chronic toxicity is detected in receiving waters, the Copermittees must discuss the need for conducting a TIE/TRE in the assessments

required under Provision D.4.a.(2), and develop a plan for implementing the TIE/TRE to be incorporated in the Water Quality Improvement Plan.

(5) Dry Weather Receiving Water Bioassessment Monitoring

Bioassessment monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must conduct bioassessment monitoring during at least one dry weather monitoring event at each long-term receiving water monitoring station as follows:

(a) The following bioassessment samples and measurements must be collected:

(i) Macroinvertebrate samples must be collected in accordance with the "Reachwide Benthos (Multihabitat) Procedure" in the most current Surface Water Ambient Monitoring Program (SWAMP) Bioassessment Standard Operating Procedures (SOP), and amendments, as applicable;[16]

(ii) The "Full" suite of physical habitat characterization measurements must be collected in accordance with the most current SWAMP Bioassessment SOP, and as summarized in the SWAMP Stream Habitat Characterization Form – Full Version;[17] and

(iii) Freshwater algae samples must be collected in accordance with the SWAMP Standard Operating Procedures for Collecting Algae Samples.[18] Analysis of samples must include algal taxonomic composition (diatoms and soft algae) and algal biomass.

(b) The bioassessment samples, measurements, and appropriate water chemistry data must be used to calculate the following:

(i) An Index of Biological Integrity (IBI) for macroinvertebrates for each monitoring station where bioassessment monitoring was conducted, based on the most current calculation method;[19] and

[16] Ode, P.R.. 2007. Standard operating procedures for collecting macroinvertebrate samples and associated physical and chemical data for ambient bioassessments in California. California State Water Resources Control Board Surface Water Ambient Monitoring Program (SWAMP) Bioassessment SOP 001. http://www.swrcb.ca.gov/water_issues/programs/swamp/tools.shtml#monitoring
[17] Available at: http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/reports/fieldforms_fullversion052908.pdf
[18] Fetscher et al. 2009. Standard Operating Procedures for Collecting Stream Algae Samples and Associated Physical Habitat and Chemical Data for Ambient Bioassessments in California.
[19] The most current calculation method at the time the Order was adopted is outlined in "A Quantitative Tool for Assessing the Integrity of Southern California Coastal Streams" (Ode, et al. 2005. Environmental Management. Vol. 35, No. 1, pp. 1-13). If an updated or new calculation method is developed, either both

(ii) An IBI for algae for each monitoring station where bioassessment monitoring was conducted, when a calculation method is developed.[20]

(c) In lieu of the requirements of Provision D.1.c.(5)(a), the Copermittees may conduct the bioassessment monitoring in accordance with the "Triad" assessment approach[21] to calculate the IBIs required for Provision D.1.c.(5)(b). The Copermittees must conduct sampling, analysis, and reporting of specified in-stream biological and habitat data according to the protocols specified in the SCCWRP Technical Report No. 539, or subsequent protocols, if developed.

(6) Dry Weather Receiving Water Hydromodification Monitoring

In addition to the hydromodification monitoring conducted as part of the Copermittees' Hydromodification Management Plans, hydromodification monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must collect the following hydromodification monitoring observations and measurements within an appropriate domain of analysis during at least one dry weather monitoring event for each long-term receiving water monitoring station:

(a) Channel conditions, including:

(i) Channel dimensions,

(ii) Hydrologic and geomorphic conditions, and

(iii) Presence and condition of vegetation and habitat;

(b) Location of discharge points;

(c) Habitat integrity;

(d) Photo documentation of existing erosion and habitat impacts, with location (i.e. latitude and longitude coordinates) where photos were taken;

(e) Measurement or estimate of dimensions of any existing channel bed or bank eroded areas, including length, width, and depth of any incisions; and

(i.e. current and updated/new) methods must be used, or historical IBIs must be recalculated with the updated or new calculation method.

[20] When a calculation method is developed, IBIs must be calculated for all available and appropriate historical data.

[21] Stormwater Monitoring Coalition Model Monitoring Technical Committee, 2004. Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California. Technical Report #419. August 2004.

(f) Known or suspected cause(s) of existing downstream erosion or habitat impact, including flow, soil, slope, and vegetation conditions, as well as upstream land uses and contributing new and existing development.

d. WET WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three wet weather monitoring events at each long-term receiving water monitoring station. At least one wet weather monitoring event must be conducted during the first wet weather event of the wet season (October 1 – April 30), and at least one wet weather monitoring event during a wet weather event that occurs after February 1.

(1) Wet Weather Receiving Water Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each long-term receiving water monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event;

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(d) Presence and assessment of trash in and around station.

(2) Wet Weather Receiving Water Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

(3) Wet Weather Receiving Water Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) Constituents listed in Table D-3.

(4) <u>Wet Weather Receiving Water Toxicity Monitoring</u>

For each wet weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for chronic aquatic toxicity in accordance with Provisions D.1.c.(4)(a)-(f).

e. OTHER RECEIVING WATER MONITORING REQUIREMENTS

(1) Regional Monitoring

The Copermittees must participate in the following regional receiving waters monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring; and

(b) Southern California Bight Regional Monitoring and

(c) Unified Beach Water Quality Monitoring and Assessment Program. The Orange County Copermittees shall participate in and, together with South Orange County Wastewater Authority and Orange County Health Care Agency, shall share responsibility for implementation of a unified regional beach water quality monitoring and assessment program in south Orange County, as set forth in the October 2014 report, *Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County* , issued pursuant to CWC section 13383 and subject to future revision in the San Diego Water Board December 5, 2014 Letter Directive.

(2) Sediment Quality Monitoring

The Copermittees must perform sediment monitoring to assess compliance with sediment quality receiving water limits applicable to MS4 discharges to enclosed bays and estuaries. The monitoring may be performed either by individual or multiple Copermittees to assess compliance with receiving water limits, or through participation in a water body monitoring coalition. A Sediment Monitoring Plan which satisfies the requirements of the State Water Board's Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part 1 Sediment Quality (Sediment Control Plan) must be submitted as part of the monitoring and assessment program in the Water Quality Improvement Plan.

(a) The Sediment Monitoring Plan design must include the following:

(i) The elements required under Section VII.D (Receiving Water Limits Monitoring Frequency) and Section VII.E (Sediment Monitoring) of the Sediment Control Plan;

(ii) A Quality Assurance Project Plan (QAPP) describing the project objectives and organization, functional activities, and quality assurance/quality control protocols for the water and sediment monitoring; and

(iii) A schedule for completion of all sample collection and analysis activities and submission of Sediment Monitoring Reports.

(b) The Copermittees must implement the Sediment Monitoring Plan in accordance with the schedule contained in the Sediment Monitoring Plan, unless otherwise directed in writing by the San Diego Water Board Executive Officer.

(c) The Copermittees must incorporate a Sediment Monitoring Report as part of the Water Quality Improvement Plan Annual Report in accordance with the schedule contained in the Sediment Monitoring Plan, unless otherwise directed in writing by the San Diego Water Board Executive Officer. The Sediment Monitoring Report must contain the following information:

(i) Analysis: An evaluation, interpretation and tabulation of the water and sediment monitoring data, including interpretations and conclusions as to whether applicable Receiving Water Limitations in this Order have been attained at each sample station;

(ii) Sample Location Map: The locations, type, and number of samples must be identified and shown on a site map; and

(iii) California Environmental Data Exchange Network: A statement certifying that the monitoring data and results have been uploaded into the California Environmental Data Exchange Network (CEDEN).

(d) Based on the Sediment Monitoring Report conclusions the San Diego Water Board may require a human health risk assessment to determine if the human health objective contained in Receiving Water Limitations in Provision A.2.a.(3)(b)(ii) has been attained at each sample station. In conducting a risk assessment, the Copermittees must consider any applicable and relevant information, including California Environmental Protection Agency's (Cal/EPA) Office of Environmental Health Hazard Assessment (OEHHA) policies for fish consumption and risk assessment, Cal/EPA's Department of Toxic Substances Control (DTSC) Risk Assessment, and USEPA Human Health Risk Assessment policies.

(3) ASBS Monitoring

For Watershed Management Areas with ASBS, the Copermittees must implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

f. ALTERNATIVE WATERSHED MONITORING REQUIREMENTS

The San Diego Water Board may direct the Copermittees to participate in an effort to develop alternative watershed monitoring with other regulated entities, other interested parties, and the San Diego Water Board to refine, coordinate, and implement regional monitoring and assessment programs to determine the status and trends of water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams.

2. MS4 Outfall Discharge Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the discharges from the MS4 outfalls in each Watershed Management Area during dry weather and wet weather. Following San Diego Water Board acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct MS4 outfall discharge monitoring during implementation of the Water Quality Improvement Plan to assess the effectiveness of their jurisdictional runoff management programs toward effectively prohibiting non-storm water discharges into the MS4 and reducing pollutants in storm water discharges from their MS4s to the MEP. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following MS4 outfall monitoring procedures:

a. TRANSITIONAL MS4 OUTFALL DISCHARGE MONITORING

Until the monitoring requirements and schedules of Provisions D.2.b-c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following MS4 outfall discharge monitoring in the Watershed Management Area:

(1) MS4 Outfall Discharge Monitoring Station Inventory

Each Copermittee must identify all major MS4 outfalls that discharge directly to receiving waters within its jurisdiction and geo-locate those outfalls on a map of the MS4 pursuant to Provision E.2.b.(1). This information must be compiled into a MS4 outfall discharge monitoring station inventory, and must include the following information:

(a) Latitude and longitude of MS4 outfall point of discharge;

(b) Watershed Management Area;

(c) Hydrologic subarea;

(d) Outlet size;

(e) Accessibility (i.e. safety and without disturbance of critical habitat);

(f) Approximate drainage area; and

(g) Classification of whether the MS4 outfall is known to have persistent dry weather flows, transient dry weather flows, no dry weather flows, or unknown dry weather flows.

(2) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Until the monitoring requirements and schedules of Provision D.2.b are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, each Copermittee must perform dry weather MS4 outfall field screening monitoring to identify non-storm water and illicit discharges within its jurisdiction in accordance with Provision E.2.c, to determine which discharges are transient flows and which are persistent flows, and prioritize the dry weather MS4 discharges that will be investigated and eliminated in accordance with Provision E.2.d.

(a) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Frequency

Each Copermittee must field screen the MS4 outfalls in its inventory developed pursuant to Provision D.2.a.(1) as follows:

(i) For Copermittees with less than 125 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 80 percent of the outfalls must be visually inspected two times per year during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv).

(ii) For Copermittees with 125 major MS4 outfalls or more, but less than or equal to 500 that discharge to receiving waters within a Watershed Management Area, all the outfalls must be visually inspected at least annually during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv).

(iii) For Copermittees with more than 500 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 500 outfalls must be visually inspected at least annually during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv). Copermittees with more than 500 major MS4 outfalls within a Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;

[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(iv) For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major MS4 outfalls within its jurisdiction, at least 500 major MS4 outfalls within its inventory must be visually inspected at least annually during dry weather conditions. Copermittees with more than 500 major MS4 outfalls in more than one Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(v) Inspections of major MS4 outfalls conducted in response to public reports and staff or contractor reports and notifications may count toward the required visual inspections of MS4 outfall discharge monitoring stations.

(b) Transitional Dry Weather MS4 Outfall Discharge Field Screening Visual Observations

(i) An antecedent dry period of at least 72 hours following any storm event producing measurable rainfall greater than 0.1 inch is required prior to conducting field screening visual observations during a field screening monitoring event.

(ii) During the field screening monitoring event, each Copermittee must record visual observations consistent with Table D-5 at each MS4 outfall discharge monitoring station inspected.

Table D-5. Field Screening Visual Observations for MS4 Outfall Discharge Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) - Flow source(s) suspected or identified from non-storm water source investigation - Flow source(s) eliminated during non-storm water source identification • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) - Known or suspected source(s) of pooled or ponded water • Station description (i.e. deposits or stains, vegetation condition, structural condition, observable biology) • Presence and assessment of trash in and around station • Evidence or signs of illicit connections or illegal dumping

(iii) Each Copermittee must implement the requirements of Provisions E.2.d.(2)(c)-(e) based on the field observations required pursuant to Provision D.2.a.(2)(b)(ii).

(iv) Each Copermittee must evaluate field observations together with existing information available from prior reports, inspections and monitoring results to determine whether any observed flowing, pooled, or ponded waters are likely to be transient or persistent flow.[22]

(c) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Records

Based upon the results of the transitional dry weather MS4 outfall discharge field screening monitoring conducted pursuant to Provisions D.2.a.(2)(a)-(b), each Copermittee must update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow.

(3) Transitional Wet Weather MS4 Outfall Discharge Monitoring

Until the monitoring requirements and schedules of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the

[22] Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(a) Transitional Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees must select wet weather MS4 outfall discharge monitoring stations from the inventories developed pursuant to Provision D.2.a.(1) for each Watershed Management Area as follows:

(i) At least five wet weather MS4 outfall discharge monitoring stations that are representative of storm water discharges from areas consisting primarily of residential, commercial, industrial, and typical mixed-use land uses present within the Watershed Management Area;

(ii) At least one wet weather MS4 outfall discharge monitoring station for each Copermittee within the Watershed Management Area; and

(iii) The County of San Diego may select at least two (2) wet weather MS4 outfall discharge monitoring stations for the portion of the Santa Margarita River Watershed Management Area within its jurisdiction to be monitored during the transitional period until the Riverside County Copermittees are notified of coverage under this Order. After the Riverside County Copermittees are notified of coverage under this Order, the Copermittees in the Watershed Management Area must select wet weather MS4 outfall discharge monitoring stations consistent with the requirements above.

(b) Transitional Wet Weather MS4 Outfall Discharge Monitoring Frequency

Each wet weather MS4 outfall discharge monitoring station selected pursuant to Provision D.2.a.(3)(a) must be monitored once during the wet season (October 1 – April 30). The wet weather monitoring events must be selected to be representative of the range of hydrological conditions experienced in the region. At least 10 percent of samples must be conducted during the first wet weather event of the wet season, to include at least one such sample in each Watershed Management Area..

(c) Transitional Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(i) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(ii) The flow rates and volumes measured or estimated from the MS4 outfall (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(d) Transitional Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(e) Transitional Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, and indicator bacteria;

(iv) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

[a] Time-weighted composites collected over the length of the storm event or the first 24 hour period whichever is shorter, composed of discrete samples, which may be collected through the use of automated equipment, or

[b] Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

[c] If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during

the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours;

(v) Only one analysis of the composite of aliquots is required;

(vi) The samples must be analyzed for the following constituents:

[a] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

[b] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and

[c] Constituents listed in Table D-6.

Table D-6. Analytical Monitoring Constituents for Wet Weather MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Nickel • Selenium • Thallium • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(f) Other Transitional Wet Weather MS4 Outfall Discharge Monitoring

The San Diego County Copermittees must continue the wet weather MS4 outfall monitoring program developed under Order No. R9-2007-0001, as approved by the San Diego Water Board, through its planned completion.

b. Dry Weather MS4 Outfall Discharge Monitoring

Each Copermittee must perform dry weather MS4 outfall monitoring to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision

E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. Each Copermittee must conduct the following dry weather MS4 outfall discharge monitoring within its jurisdiction:

(1) Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Each Copermittee must continue to perform the dry weather MS4 outfall discharge field screening monitoring in accordance with the requirements of Provision D.2.a.(2). The Copermittee may adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of persistent flow non-storm water discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of visual inspections performed is equivalent to the number of visual inspections required under Provision D.2.a.(2)(a).

(2) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring

Each Copermittee must perform non-storm water persistent flow MS4 outfall discharge monitoring to determine which persistent non-storm water discharges contain concentrations of pollutants below NALs, and which persistent non-storm water discharges impact receiving water quality during dry weather. Each Copermittee must conduct the following non-storm water persistent flow MS4 outfall discharge monitoring within its jurisdiction:

(a) Prioritization of Non-Storm Water Persistent Flow MS4 Outfalls

Based upon the dry weather MS4 outfall discharge field screening monitoring records developed pursuant to Provision D.2.a.(2)(c), each Copermittee must identify and prioritize the MS4 outfalls with persistent flows based on the highest priority water quality conditions identified in the Water Quality Improvement Plan and any additional criteria developed by the Copermittee, which may include historical data and data from sources other than what the Copermittee collects.

(b) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring Frequency

(i) Based on the prioritization of major MS4 outfalls developed under Provision D.2.b.(2)(a), each Copermittee must identify, at a minimum, the 5 highest priority major MS4 outfalls with non-storm water persistent flows that the Copermittee will monitor within its jurisdiction in each Watershed Management Area. For Responsible Copermittees identified by a TMDL in Attachment E to this Order, if the 5 chosen outfall locations are not sufficient to determine compliance with the TMDL(s), then each Responsible Copermittee

must identify additional MS4 outfall monitoring locations within its jurisdiction sufficient to address compliance with the TMDL(s). If a Copermittee has less than 5 major outfalls within a Watershed Management Area, then the Copermittee must monitor all of its major MS4 outfalls with persistent flows within each Watershed Management Area. The location of the highest priority non-storm water persistent flow MS4 outfall monitoring stations must be identified on the map required pursuant to Provision E.2.b.(1). The map must specify which MS4 outfalls are being monitored for compliance with a TMDL.

(ii) Each of the highest priority non-storm water persistent flow MS4 outfall monitoring stations identified pursuant to Provision D.2.b.(2)(b)(i) must be monitored under dry weather conditions at least semi-annually until one of the following occurs:

[a] The non-storm water discharges have been effectively eliminated (i.e. no flowing, pooled, or ponded water) for three consecutive dry weather monitoring events; or

[b] The source(s) of the persistent flows has been identified as a category of non-storm water discharges that does not require an NPDES permit and does not have to be addressed as an illicit discharge because it was not identified as a source of pollutants (i.e. constituents in non-storm water discharge do not exceed NALs), and the persistent flow can be re-prioritized to a lower priority; or

[c] The constituents in the persistent flow non-storm water discharge do not exceed NALs, and the persistent flow can be re-prioritized to a lower priority; or

[d] The source(s) of the persistent flows has been identified as a non-storm water discharge authorized by a separate NPDES permit.

(iii) Where the criteria under Provision D.2.b.(2)(b)(ii) are not met, but the threat to water quality has been reduced by the Copermittee, the highest priority persistent flow MS4 outfall monitoring stations may be reprioritized accordingly for continued dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1).

(iv) Each Copermittee must document removal or re-prioritization of the highest priority persistent flow MS4 outfall monitoring stations identified under Provision D.2.b.(2)(a) in the Water Quality Improvement Plan Annual Report. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized major MS4 outfall in the Watershed Management Area within its jurisdiction, unless there are no remaining qualifying major MS4 outfalls within the Copermittee's jurisdiction in the Watershed Management Area.

(c) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Observations

During each semi-annual monitoring event, each Copermittee must record field observations consistent with Table D-5 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(d) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Monitoring

During each semi-annual monitoring event, if conditions allow the collection of the data, each Copermittee must monitor and record the parameters in Table D-2 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(e) Non-Storm Water Persistent Flow MS4 Outfall Discharge Analytical Monitoring

During each semi-annual monitoring event in which measurable flow is present, each Copermittee must collect and analyze samples from each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Collect grab or composite samples to be analyzed at a qualified laboratory for the following constituents:

[a] Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,
[b] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,
[c] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,
[d] Applicable NAL constituents, and
[e] Constituents listed in Table D-7. The Copermittees may adjust the list of constituents for the Watershed Management Area if historical data or supporting information can be provided that demonstrates or justifies the analysis of a constituent is not necessary.

Table D-7. Analytical Monitoring Constituents for Persistent Flow MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Total Hardness • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Cadmium • Copper • Lead • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(iv) If the Copermittee identifies and eliminates the source of the persistent flow non-storm water discharge, analysis of the sample is not required.

c. WET WEATHER MS4 OUTFALL DISCHARGE MONITORING

The Copermittees must perform wet weather MS4 outfall monitoring to identify pollutants in storm water discharges from the MS4s, to guide pollutant source identification efforts, and to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order. The Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(1) Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees may adjust the wet weather MS4 outfall discharge monitoring locations in the Watershed Management Area, as needed, to identify pollutants in storm water discharges from MS4s, to guide pollutant source identification efforts, and to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of stations is at least equivalent to the number of stations required under Provision D.2.a.(3)(a). Additional outfall monitoring locations, above the minimum per jurisdiction, may be required to demonstrate compliance with the WQBELs associated with the applicable TMDLs in Attachment E.

(2) Wet Weather MS4 Outfall Discharge Monitoring Frequency

The Copermittees must monitor the wet weather MS4 outfall discharge monitoring stations in the Watershed Management Area at least once (1) per year. The Copermittees may need to increase the frequency of monitoring in order to identify pollutants in storm water discharges from the MS4s causing or contributing to the highest priority water quality conditions, to guide pollutant source identification efforts, or to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order.

(3) Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(4) Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(5) Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites collected over the length of the storm event or the first 24 hour period, whichever is shorter , composed of discrete samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

(iii) If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours.

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) The Copermittees may adjust the analytical monitoring required for the Watershed Management Area, if the Copermittees have historical data or supporting information that can demonstrate or provide justification that the analysis of a constituent is not necessary.

3. Special Studies

a. Within the term of this Order, the Copermittees must initiate the following special studies:

(1) At least two special studies in each Watershed Management Area to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that cause or contribute to highest priority water quality conditions identified in the Water Quality Improvement Plan.

(2) At least one special study for the San Diego Region to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that are impacting receiving waters on a regional basis in the San Diego Region.

(3) One of the two special studies in each Watershed Management Area required pursuant to Provision D.3.a.(1) may be replaced by a special study implemented pursuant to Provision D.3.a.(2).

b. The special studies must, at a minimum, be in conformance with the following criteria:

(1) The special studies must be related to the highest priority water quality conditions identified by the Copermittees in the Watershed Management Area and/or for the entire San Diego Region;

(2) The special studies developed pursuant to Provision D.3.a.(1) must:

(a) Be implemented within the applicable Watershed Management Area, and

(b) Require some form of participation by all the Copermittees within the Watershed Management Area;

(3) The special studies developed pursuant to Provision D.3.a.(2) must:

(a) Be implemented within the San Diego Region, and

(b) Require some form of participation by all Copermittees covered under the requirements of this Order.

(4) The Copermittees are encouraged to partner with environmental groups or third parties knowledgeable of watershed conditions to complete the required special studies.

c. Special studies developed to identify sources of pollutants and/or stressors should be pollutant and/or stressor specific and based on historical monitoring data and monitoring performed pursuant to Provisions D.1 and D.2. Development of source identification special studies should include the following:

(1) A compilation of known information on the specific pollutant and/or stressor, including data on potential sources and movement of the pollutant and/or stressor within the watershed. Data generated by the Copermittees and others, as well as information available from a literature research on the pollutant and/or stressor should be compiled and analyzed as appropriate.

(2) An identification of data gaps, based on the compiled information generated on the specific pollutant and/or stressor identified in Provision D.3.c.(1). Source identification special studies should be developed to fill identified data gaps.

(3) A monitoring plan that will collect and provide data the Copermittees can utilize to do the following:

(a) Quantify the relative loading or impact of a pollutant and/or stressor from a particular source or pollutant generating activity;

(b) Improve understanding of the fate of a pollutant and/or stressor in the environment;

(c) Develop an inventory of known and suspected sources of a pollutant and/or stressor in the Watershed Management Area; and/or

(d) Prioritize known and suspected sources of a pollutant and/or stressor based on relative magnitude in discharges, geographical distribution (i.e., regional or localized), frequency of occurrence in discharges, human health risk, and controllability.

d. Special studies initiated prior to the effective date of this Order that meet the requirements of Provision D.3.b and are implemented during the term of this Order as part of the Water Quality Improvement Plan may be utilized to fulfill the special study requirements of Provision D.3.a. Special studies completed before the effective date of this Order cannot be utilized to fulfill the special study requirements of Provision D.3.a.

e. The Copermittees must submit the monitoring plans for the special studies in the Water Quality Improvement Plans required pursuant to Provision F.1.

f. The Copermittees are encouraged to share the results of the special studies regionally among the Copermittees to provide information useful in improving and adapting the management of non-storm water and storm water runoff through the implementation of the Water Quality Improvement Plans.

4. Assessment Requirements

Each Copermittee must evaluate the data collected pursuant to Provisions D.1, D.2 and D.3, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E, to assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a. Assessments must be performed as described in the following provisions:

a. Receiving Waters Assessments

(1) The Copermittees must assess and report the conditions of the receiving waters in the Watershed Management Area as follows:

(a) Based on data collected pursuant to Provision D.1.a, the assessments under Provision D.4.a.(2) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(b) Based on the data collected pursuant to Provisions D.1.a-e, the assessments required under Provision D.4.a.(2) must be included in the Report of Waste Discharge required pursuant to Provision F.5.b.

(2) The Copermittees must assess the status and trends of receiving water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under dry weather and wet weather conditions. For each of the three types of receiving waters in each Watershed Management Area the Copermittees must:

(a) Determine whether or not the conditions of the receiving waters are meeting the numeric goals established pursuant to Provision B.3.a;

(b) Identify the most critical beneficial uses that must be protected to ensure overall health of the receiving water;

(c) Determine whether or not those critical beneficial uses are being protected;

(d) Identify short-term and/or long-term improvements or degradation of those critical beneficial uses;

(e) Determine whether or not the strategies established in the Water Quality Improvement Plan contribute towards progress in achieving the interim and final numeric goals of the Water Quality Improvement Plan; and

(f) Identify data gaps in the monitoring data necessary to assess Provisions D.4.a.(2)(a)-(e).

b. MS4 OUTFALL DISCHARGES ASSESSMENTS

(1) Non-Storm Water Discharges Reduction Assessments

(a) Each Copermittee must assess and report the progress of its illicit discharge detection and elimination program, required to be implemented pursuant to Provision E.2, toward effectively prohibiting non-storm water and illicit discharges into the MS4 within its jurisdiction as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(2), the assessments under Provision D.4.b.(1)(b) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(ii) Based on the data collected pursuant to Provisions D.2.b, the assessments required under Provision D.4.b.(1)(c) must be included in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

(iii) Based on the data collected pursuant to Provisions D.2.b, the assessment required under Provision D.4.b.(1)(c) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.a.(2), each Copermittee must assess and report the following:

(i) Identify the known and suspected controllable sources (e.g. facilities, areas, land uses, pollutant generating activities) of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area;

(ii) Identify sources of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area that have been reduced or eliminated; and

(iii) Identify modifications to the field screening monitoring locations and frequencies for the MS4 outfalls in its inventory necessary to identify and eliminate sources of persistent flow non-storm water discharges pursuant to Provision D.2.b.

(c) Based on the dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1), each Copermittee must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(1)(b);

(ii) Based on the data collected and applicable NALs in the Water Quality Improvement Plan, rank the MS4 outfalls in the Copermittee's jurisdiction according to potential threat to receiving water quality, and produce a prioritized list of major MS4 outfalls for follow-up action to update the Water Quality Improvement Plan, with the goal of eliminating persistent flow non-storm water discharges and/or pollutant loads in order of the ranked priority list through targeted programmatic actions and source investigations;

(iii) For the highest priority major MS4 outfalls with persistent flows that are in exceedance of NALs, identify the known and suspected sources within the Copermittee's jurisdiction in the Watershed Management Area that may cause or contribute to the NAL exceedances;

(iv) Each Copermittee must analyze the data collected pursuant to Provision D.2.b, and utilize a model or other method, to calculate or estimate the non-storm water volumes and pollutant loads collectively discharged from all the major MS4s outfalls in its jurisdiction identified as having persistent dry weather flows during the monitoring year. These calculations or estimates must be updated annually.

[a] Each Copermittee must calculate or estimate the annual non-storm water volumes and pollutant loads collectively discharged from the Copermittee's major MS4 outfalls to receiving waters within the Copermittee's jurisdiction, with an estimate of the percent contribution from each known source for each MS4 outfall;

[b] Each Copermittee must annually identify and quantify (i.e. volume and pollutant loads) sources of non-storm water not subject to the Copermittee's legal authority that are discharged from the Copermittee's major MS4 outfalls to downstream receiving waters.

(v) Each Copermittee must review the data collected pursuant to Provision D.2.b and findings from the assessments required pursuant to Provision D.4.b.(1)(c)(i)-(iv) at least once during the term of this Order to:

[a] Identify reductions and progress in achieving reductions in non-storm water and illicit discharges to the Copermittee's MS4 in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction, with an estimate, if possible, of the non-storm water volume and/or pollutant load reductions attributable to specific water quality strategies implemented by the Copermittee; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittee in the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction.

(vi) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(1)(c)(i)-(v).

(2) Storm Water Pollutant Discharges Reduction Assessments

(a) The Copermittees must assess and report the progress of the water quality improvement strategies, required to be implemented pursuant to Provisions B and E, toward reducing pollutants in storm water discharges from the MS4s within the Watershed Management Area as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(3), the assessments under Provision D.4.b.(2)(b) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(ii) Based on the data collected pursuant to Provisions D.2.c, the assessments required under Provision D.4.b.(2)(c) must be included in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

(iii) Based on the data collected pursuant to Provisions D.2.c, the assessment required under Provisions D.4.b.(2)(c)-(d) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.a.(3) the Copermittees must assess and report the following:

(i) The Copermittees must analyze the monitoring data collected pursuant to Provision D.2.a.(3), and utilize a watershed model or other method, to calculate or estimate the following for each monitoring year:

[a] The average storm water runoff coefficient for each land use type within the Watershed Management Area;
[b] The volume of storm water and pollutant loads discharged from each of the Copermittee's monitored MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch;
[c] The total flow volume and pollutant loadings discharged from the Copermittee's jurisdiction within the Watershed Management Area over the course of the wet season, extrapolated from the data produced from the monitored MS4 outfalls; and
[d] The percent contribution of storm water volumes and pollutant loads discharged from each land use type within each hydrologic subarea with a major MS4 outfall to receiving waters or within each major MS4 outfall to receiving waters in the Copermittee's jurisdiction within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch.

(ii) Identify modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify pollutants in storm water discharges from the MS4s in the Watershed Management Area pursuant to Provision D.2.c.(1).

(c) Based on the wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.c the Copermittees must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(2)(b);

(ii) Based on the data collected and applicable SALs in the Water Quality Improvement Plan, analyze and compare the monitoring data to the analyses and assumptions used to develop the Water Quality Improvement Plans, including strategies developed pursuant to Provision B.3, and evaluate whether those analyses and assumptions should be updated as a component of the adaptive management efforts pursuant to Provision B.5 for follow-up action to update the Water Quality Improvement Plan;

(iii) The Copermittees must review the data collected pursuant to Provision D.2.c and findings from the assessments required pursuant to Provisions D.4.b.(2)(c)(i)-(ii) at least once during the term of this Order to:

[a] Identify reductions or progress in achieving reductions in pollutant concentrations and/or pollutant loads from different land uses and/or drainage areas discharging from the Copermittees' MS4s in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters within the Watershed Management Area to the MEP, with an estimate, if possible, of the pollutant load reductions attributable to specific water quality strategies implemented by the Copermittees; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittees in the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters in the Watershed Management Area to the MEP.

(iv) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(iii).

(d) The Copermittees must evaluate all the data collected pursuant to Provision D.2.c, and incorporate new outfall monitoring data into time series plots for each long-term monitoring constituent for the Watershed Management Area, and perform statistical trends analysis on the cumulative long-term wet weather MS4 outfall discharge water quality data set.

c. Special Studies Assessments

The Copermittees must annually evaluate the results and findings from the special studies developed and implemented pursuant to Provision D.3, and assess their relevance to the Copermittees' efforts to characterize receiving water conditions, understand sources of pollutants and/or stressors, and control and reduce the discharges of pollutants from the MS4 outfalls to receiving waters in the Watershed Management Area. The Copermittees must report the results of the special studies assessments applicable to the Watershed Management Area, and identify any necessary modifications or updates to the Water Quality Improvement Plan based on the results in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

d. Integrated Assessment of Water Quality Improvement Plan

As part of the iterative approach and adaptive management process required for the Water Quality Improvement Plan pursuant to Provision B.5, the Copermittees in each Watershed Management Area must integrate the data collected pursuant to Provisions D.1-D.3, the findings from the assessments required pursuant to

Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to assess the effectiveness of, and identify necessary modifications to, the Water Quality Improvement Plan as follows:

(1) The Copermittees must re-evaluate the priority water quality conditions and numeric goals for the Watershed Management Area, as needed, during the term of this Order pursuant to Provision B.5.a. The re-evaluation and recommendations for modifications to the priority water quality conditions, and/or numeric goals and corresponding schedules may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The priority water quality conditions and numeric goals for the Watershed Management Area must be re-evaluated as follows:

(a) Re-evaluate the receiving water conditions in the Watershed Management Area in accordance with Provision B.2.a;

(b) Re-evaluate the impacts on receiving waters in the Watershed Management Area from MS4 discharges in accordance with Provision B.2.b;

(c) Re-evaluate the identification of MS4 sources of pollutants and/or stressors in accordance with Provision B.2.d;

(d) Identify beneficial uses of the receiving waters that are protected in accordance with Provision D.4.a;

(e) Evaluate the progress toward achieving the interim and final numeric goals for protecting impacted beneficial uses in the receiving waters.

(2) The Copermittees must re-evaluate the water quality improvement strategies for the Watershed Management Area during the term of this Order pursuant to Provision B.5.b. The re-evaluation and recommendations for modifications to the water quality improvement strategies and schedules may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The water quality improvement strategies for the Watershed Management Area must be re-evaluated as follows:

(a) Identify the non-storm water and storm water pollutant loads from the Copermittees' MS4 outfalls in the Watershed Management Area, calculated or estimated pursuant to Provisions D.4.b;

(b) Identify the non-storm water and storm water pollutant load reductions, or other improvements to receiving water or water quality conditions, that are necessary to attain the interim and final numeric goals identified in the Water Quality Improvement Plan for protecting beneficial uses in the receiving waters;

(c) Identify the non-storm water and storm water pollutant load reductions, or other improvements to the quality of MS4 discharges, that are necessary for the Copermittees to demonstrate that non-storm water and storm water discharges from their MS4s are not causing or contributing to exceedances of receiving water limitations;

(d) Evaluate the progress of the water quality improvement strategies toward achieving the interim and final numeric goals identified in the Water Quality Improvement Plan for protecting beneficial uses in the receiving waters.

(3) The Copermittees must re-evaluate and adapt the water quality monitoring and assessment program for the Watershed Management Area when new information becomes available to improve the monitoring and assessment program pursuant to Provision B.5.c. The re-evaluation and recommendations for modifications to the monitoring and assessment program may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. Modifications to the water quality monitoring and assessment program must be consistent with the requirements of Provision D.1-D.3. The re-evaluation of the water quality monitoring and assessment program for the Watershed Management Area must consider the data gaps identified by the assessments required pursuant to Provisions D.4.a-b, and results of the special studies implemented pursuant to Provision D.4.c.

5. Monitoring Provisions

Each Copermittee must comply with all the monitoring, reporting, and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

E. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS

The purpose of this provision is for each Copermittee to implement a program to control the contribution of pollutants to and the discharges from the MS4 within its jurisdiction. The goal of the jurisdictional runoff management programs is to implement strategies that effectively prohibit non-storm water discharges to the MS4 and reduce the discharge of pollutants in storm water to the MEP. This goal will be accomplished through implementing the jurisdictional runoff management programs in accordance with the strategies identified in the Water Quality Improvement Plans.

Each Copermittee must update its jurisdictional runoff management program document, in accordance with Provision F.2.a, to incorporate all the requirements of Provision E. Until the Copermittee has updated its jurisdictional runoff management program document with the requirements of Provision E, the Copermittee must continue implementing its current jurisdictional runoff management program.

1. Legal Authority Establishment and Enforcement

a. Each Copermittee must establish, maintain, and enforce adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 through statute, ordinance, permit, contract, order, or similar means. This legal authority must, at a minimum, authorize the Copermittee to:

(1) Prohibit and eliminate all illicit discharges and illicit connections to its MS4;

(2) Control the contribution of pollutants in discharges of runoff associated with industrial and construction activity to its MS4 and control the quality of runoff from industrial and construction sites, including industrial and construction sites which have coverage under the statewide General Permit for Discharges of Storm Water Associated with Industrial Activities (Industrial General Permit) or General Permit for Discharges of Storm Water Associated with Construction Activities (Construction General Permit), as well as to those sites which do not;

(3) Control the discharge of spills, dumping, or disposal of materials other than storm water into its MS4;

(4) Control through interagency agreements among Copermittees the contribution of pollutants from one portion of the MS4 to another portion of the MS4;

(5) Control, by coordinating and cooperating with other owners of the MS4 such as Caltrans, the U.S. federal government, or sovereign Native American Tribes through interagency agreements, where possible, the contribution of pollutants from their portion of the MS4 to the portion of the MS4 within the Copermittee's jurisdiction;

(6) Require compliance with conditions in its statutes, ordinances, permits, contracts, orders, or similar means to hold dischargers to its MS4 accountable for their contributions of pollutants and flows;

(7) Require the use of BMPs to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(8) Require documentation on the effectiveness of BMPs implemented to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(9) Utilize enforcement mechanisms to require compliance with its statutes, ordinances, permits, contracts, orders, or similar means; and

(10) Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with its statutes, ordinances, permits, contracts, orders, or similar means and with the requirements of this Order, including the prohibition of illicit discharges and connections to its MS4; the Copermittee must also have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from industrial facilities, including construction sites, discharging into its MS4.

b. With the first Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3), each Copermittee must submit a statement certified by its Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative that the Copermittee has taken the necessary steps to obtain and maintain full legal authority within its jurisdiction to implement and enforce each of the requirements contained in this Order.

2. Illicit Discharge Detection and Elimination

Each Copermittee must implement a program to actively detect and eliminate illicit discharges and improper disposal into the MS4, or otherwise require the discharger to apply for and obtain a separate NPDES permit. The illicit discharge detection and elimination program must be implemented in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include, at a minimum, the following requirements:

a. Non-Storm Water Discharges

Each Copermittee must address all non-storm water discharges as illicit discharges unless a non-storm water discharge is either identified as a discharge authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to the following requirements:

(1) Discharges of non-storm water to the MS4 from the following categories must be addressed as illicit discharges unless the discharge has coverage or meets the exception criteria under NPDES Permit No. CAG919003~~1 (Order No. R9-2007-0034, or subsequent order) for discharges to San Diego Bay, or NPDES Permit No. CAG919002~~ (Order No. R9-2015-0013 ~~2008-0002~~, ~~or subsequent order~~ as it may be amended or reissued) for discharges to surface waters within the San Diego Region ~~other than San Diego Bay~~:

(1) Uncontaminated pumped ground water;

(2) Discharges from foundation drains;[23]

(3) Water from crawl space pumps; and

(4) Water from footing drains.[20]

(2) Discharges of non-storm water from water line flushing and water main breaks to the MS4 must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG679001 (Order No. R9-2010-0003, ~~or subsequent order~~ as it may be amended or reissued) or NPDES General Permit No. CAG140001 (Order 2014-0194-DWQ, as it may be amended or reissued). This category includes water line flushing and water main break discharges from water purveyors issued a water supply permit by the California Department of Public Health or federal military installations. Discharges from recycled or reclaimed water lines to the MS4 must be addressed as illicit discharges, unless the discharges have coverage under a separate NPDES permit.

(3) Discharges of non-storm water to the MS4 from the following categories must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a source of pollutants to receiving waters:

(a) Diverted stream flows;

(b) Rising ground waters;

(c) Uncontaminated ground water infiltration to MS4s;

(d) Springs;

(e) Flows from riparian habitats and wetlands;

[23] Provision E.2.a.(1) only applies to this category of non-storm water if the system is designed to be located at or below the groundwater table to actively or passively extract groundwater during any part of the year.

(f) Discharges from potable water sources;

(g) Discharges from foundation drains;[24] and

(h) Discharges from footing drains.[21]

(4) Discharges of non-storm water to the MS4 from the following categories must be controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means. Discharges of non-storm water to the MS4 from the following categories not controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means must be addressed by the Copermittee as illicit discharges.

(a) Air conditioning condensation

The discharge of air conditioning condensation should be directed to landscaped areas or other pervious surfaces, or to the sanitary sewer, where feasible.

(b) Individual residential vehicle washing

(i) The discharge of wash water should be directed to landscaped areas or other pervious surfaces where feasible; and

(ii) The minimization of water, washing detergent and other vehicle wash products used for residential vehicle washing, and the implementation of other practices or behaviors that will prevent the discharge of pollutants associated with individual residential vehicle washing from entering the MS4 must be encouraged.

(c) Dechlorinated swimming pool discharges

(i) Residual chlorine, algaecide, filter backwash, or other pollutants from swimming pools must be eliminated prior to discharging to the MS4; and

(ii) The discharge of saline swimming pool water must be directed to the sanitary sewer, landscaped areas, or other pervious surfaces that can accommodate the volume of water, unless the saline swimming pool water can be discharged via a pipe or concrete channel directly to a naturally saline water body (e.g. Pacific Ocean).

(5) Firefighting discharges to the MS4 must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board

[24] Provision E.2.a.(3) only applies to this category of non-storm water discharge if the system is designed to be located above the groundwater table at all times of the year, and the system is only expected to discharge non-storm water under unusual circumstances.

identifies the discharge as a significant source of pollutants to receiving waters. Firefighting discharges to the MS4 not identified as a significant source of pollutants to receiving waters, must be addressed, at a minimum, as follows:

(a) Non-emergency firefighting discharges

(i) Building fire suppression system maintenance discharges (e.g. sprinkler line flushing) to the MS4 must be addressed as illicit discharges unless BMPs are implemented to prevent pollutants associated with such discharges to the MS4.

(ii) Non-emergency firefighting discharges (i.e., discharges from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems) must be addressed by a program, to be developed and implemented by the Copermittee, to reduce or eliminate pollutants in such discharges from entering the MS4.

(b) Emergency firefighting discharges

Each Copermittee should develop and encourage implementation of BMPs to reduce or eliminate pollutants in emergency firefighting discharges to the MS4s and receiving waters within its jurisdiction. During emergency situations, priority of efforts should be directed toward life, property, and the environment (in descending order). BMPs should not interfere with immediate emergency response operations or impact public health and safety.

(6) If the Copermittee or San Diego Water Board identifies any category of non-storm water discharges listed under Provisions E.2.a.(1)-(4) as a source of pollutants to receiving waters, the category must be prohibited through ordinance, order, or similar means and addressed as an illicit discharge. Alternatively, the Copermittee may propose controls to be implemented for the category of non-storm water discharges as part of the Water Quality Improvement Plan instead of prohibiting the category of non-storm water discharges, and implement the controls if accepted by the San Diego Water Board as part of the Water Quality Improvement Plan.

(7) Each Copermittee must, where feasible and priorities and resources allow, reduce or eliminate non-storm water discharges listed under Provisions E.2.a.(1)-(4) into its MS4, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit.

b. PREVENT AND DETECT ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to prevent and detect illicit discharges to the MS4:

(1) Each Copermittee must maintain an updated map of its entire MS4 and the corresponding drainage areas. The accuracy of the MS4 map must be confirmed during the field screening required pursuant to Provision E.2.c. The MS4 map must be included as part of the jurisdictional runoff management program document. Any geographic information system (GIS) layers or files used by the Copermittee to maintain the MS4 map must be made available to the San Diego Water Board upon request. The MS4 map must identify the following:

(a) All segments of the MS4 owned, operated, and maintained by the Copermittee;

(b) All known locations of inlets that discharge and/or collect runoff into the Copermittee's MS4;

(c) All known locations of connections with other MS4s not owned or operated by the Copermittee (e.g. Caltrans MS4s);

(d) All known locations of MS4 outfalls and private outfalls that discharge runoff collected from areas within the Copermittee's jurisdiction;

(e) All segments of receiving waters within the Copermittee's jurisdiction that receive and convey runoff discharged from the Copermittee's MS4 outfalls;

(f) Locations of the MS4 outfalls, identified pursuant to Provision D.2.a.(1), within its jurisdiction; and

(g) Locations of the non-storm water persistent flow MS4 outfall discharge monitoring stations, identified pursuant to Provision D.2.b.(2), within its jurisdiction.

(2) Each Copermittee must use Copermittee personnel and contractors to assist in identifying and reporting illicit discharges and connections during their daily employment activities.

(3) Each Copermittee must promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges to or from the MS4, including the following methods for public reporting:

(a) Operate a public hotline, which can be Copermittee-specific or shared by the Copermittees, and must be capable of receiving reports in both English and Spanish 24 hours per day and seven days per week; and

(b) Designate an e-mail address for receiving electronic reports from the public, which can be Copermittee-specific or shared by the Copermittees, and must be prominently displayed on the Copermittee's webpage and the Regional Clearinghouse required pursuant to Provision F.4.

(4) Each Copermittee must implement practices and procedures (including a notification mechanism) to prevent, respond to, contain, and clean up any spills that may discharge into the MS4 within its jurisdiction from any source. The Copermittee must coordinate, to the extent possible, with spill response teams to prevent entry of spills into the MS4, and prevent contamination of surface water, ground water, and soil. The Copermittee must coordinate spill prevention, containment, and response activities throughout all appropriate Copermittee departments, programs, and agencies.

(5) Each Copermittee must implement practices and procedures to prevent and limit infiltration of seepage from sanitary sewers (including private laterals and failing septic systems) to the MS4.

(6) Each Copermittee must coordinate, when necessary, with upstream Copermittees and/or entities to prevent illicit discharges from upstream sources into the MS4 within its jurisdiction.

c. FIELD SCREENING

Each Copermittee must conduct field screening (i.e. visual observations, field testing, and/or analytical testing) of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4 in accordance with the dry weather MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

d. INVESTIGATE AND ELIMINATE ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to investigate and eliminate illicit discharges to the MS4:

(1) Each Copermittee must prioritize and determine when follow-up investigations will be performed in response to visual observations and/or water quality monitoring data collected during an investigation of a detected non-storm water or illicit discharge to or from the MS4. The criteria for prioritizing investigations must consider the following:

(a) Pollutants identified as causing or contributing to the highest water quality priorities identified in the Water Quality Improvement Plan;

(b) Pollutants identified as causing or contributing, or threatening to cause or contribute to impairments in water bodies on the 303(d) List and/or in environmentally sensitive areas (ESAs), located within its jurisdiction;

(c) Pollutants identified from sources or land uses known to exist within the area, drainage basin, or watershed that discharges to the portion of the MS4 within its jurisdiction included in the investigation;

(d) Pollutants identified as causing or contributing to an exceedance of a NAL in the Water Quality Improvement Plan; and

(e) Pollutants identified as a threat to human health or the environment.

(2) Each Copermittee must implement procedures to investigate and inspect portions of its MS4 that, based on reports or notifications, field screening, or other appropriate information, indicate a reasonable potential of receiving, containing, or discharging pollutants due to illicit discharges, illicit connections, or other sources of non-storm water. The procedures must include the following:

(a) Each Copermittee must develop criteria to:

(i) Assess the validity of each report or notification received; and

(ii) Prioritize the response to each report or notification received.

(b) Each Copermittee must prioritize and respond to each valid report or notification (e.g., public reports, staff or contractor reports and notifications, etc.) of an incident in a timely manner.

(c) In accordance with the requirements of Provision E.2.d.(1), each Copermittee must investigate and seek to identify the source(s) of discharges of non-storm water where flows are observed in and from the MS4 during the field screening required pursuant to Provision D.2.b.(1) as follows:

(i) Obvious illicit discharges must be immediately investigated to identify the source(s) of non-storm water discharges;

(ii) The investigation must include field investigations to identify sources or potential sources for the discharge, unless the source or potential source has already been identified during previous investigations; and

(iii) The investigation may include follow-up field investigations and/or reviewing Copermittee inventories and other land use data to identify potential sources of the discharge.

(d) Each Copermittee must maintain records and a database of the following information:

(i) Location of incident, including hydrologic subarea, portion of MS4 receiving the non-storm water or illicit discharge, and point of discharge or potential discharge from MS4 to receiving water;

(ii) Source of information initiating the investigation (e.g., public reports, staff or contractor reports and notifications, field screening, etc.);

(iii) Date the information used to initiate the investigation was received;

(iv) Date the investigation was initiated;

(v) Dates of follow-up investigations;

(vi) Identified or suspected source of the illicit discharge or connection, if determined;

(vii) Known or suspected related incidents, if any;

(viii) Result of the investigation; and

(ix) If a source cannot be identified and the investigation is not continued, document the response pursuant to the requirements of Provision E.2.d.(4).

(e) Each Copermittee must maintain records and, in accordance with the priorities of the Water Quality Improvement Plan, seek to identify the source(s) of non-storm water discharges from the MS4 where there is evidence of non-storm water having been discharged into or from the MS4 (e.g., pooled water), in accordance with MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

(3) Each Copermittee must initiate the implementation of procedures, in a timely manner, to eliminate all detected and identified illicit discharges and connections within its jurisdiction. The procedures must include the following responses:

(a) Each Copermittee must enforce its legal authority, as required under Provision E.1, to eliminate illicit discharges and connections to the MS4.

(b) If the Copermittee identifies the source as a controllable source of non-storm water or illicit discharge or connection, the Copermittee must implement its Enforcement Response Plan pursuant to Provision E.6 and enforce its legal authority to prohibit and eliminate illicit discharges and connections to its MS4.

(c) If the Copermittee identifies the source of the discharge as a category of non-storm water discharges in Provision E.2.a, and the discharge is in exceedance of NALs in the Water Quality Improvement Plan, then the Copermittee must determine if: (1) this is an isolated incident or set of

circumstances that will be addressed through its Enforcement Response Plan pursuant to Provision E.6, or (2) the category of discharge must be addressed through the prohibition of that category of discharge as an illicit discharge pursuant to Provision E.2.a.(6).

(d) If the Copermittee suspects the source of the non-storm water discharge as natural in origin (i.e. non-anthropogenically influenced) and in conveyance into the MS4, then the Copermittee must document and provide the data and evidence necessary to demonstrate to the San Diego Water Board that it is natural in origin and does not require further investigation.

(e) If the Copermittee is unable to identify and document the source of a recurring non-storm water discharge to or from the MS4, then the Copermittee must address the discharge as an illicit discharge and update its jurisdictional runoff management program to address the common and suspected sources of the non-storm water discharge within its jurisdiction in accordance with the Copermittee's priorities.

(4) Each Copermittee must submit a summary of the non-storm water discharges and illicit discharges and connections investigated and eliminated within its jurisdiction with each Water Quality Improvement Plan Annual Report required under Provision F.3.b.(3) of this Order.

3. Development Planning

Each Copermittee must use their land use and planning authorities to implement a development planning program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. BMP Requirements for All Development Projects

Each Copermittee must prescribe the following BMP requirements during the planning process (i.e. prior to project approval and issuance of local permits) for all development projects (regardless of project type or size), where local permits are issued, including unpaved roads and flood management projects:

(1) General Requirements

(a) Onsite BMPs must be located so as to remove pollutants from runoff prior to its discharge to any receiving waters, and as close to the source as possible;

(b) Structural BMPs must not be constructed within waters of the U.S.

(c) Onsite BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors (e.g. mosquitos, rodents, or flies).

(2) Source Control BMP Requirements

The following source control BMPs must be implemented at all development projects where applicable and feasible:

(a) Prevention of illicit discharges into the MS4;

(b) Storm drain system stenciling or signage;

(c) Protect outdoor material storage areas from rainfall, run-on, runoff, and wind dispersal;

(d) Protect materials stored in outdoor work areas from rainfall, run-on, runoff, and wind dispersal;

(e) Protect trash storage areas from rainfall, run-on, runoff, and wind dispersal; and

(f) Any additional BMPs determined to be necessary by the Copermittee to minimize pollutant generation at each project.

(3) Low Impact Development (LID) BMP Requirements

The following LID BMPs must be implemented at all development projects where applicable and feasible:

(a) Maintenance or restoration of natural storage reservoirs and drainage corridors (including topographic depressions, areas of permeable soils, natural swales, and ephemeral and intermittent streams);[25]

(b) Buffer zones for natural water bodies (where buffer zones are technically infeasible, require project applicant to include other buffers such as trees, access restrictions, etc.);

(c) Conservation of natural areas within the project footprint including existing trees, other vegetation, and soils;

(d) Construction of streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided public safety is not compromised;

[25] Development projects proposing to dredge or fill materials in waters of the U.S. must obtain a CWA Section 401 Water Quality Certification. Projects proposing to dredge or fill waters of the state must obtain waste discharge requirements.

(e) Minimization of the impervious footprint of the project;

(f) Minimization of soil compaction to landscaped areas;

(g) Disconnection of impervious surfaces through distributed pervious areas;

(h) Landscaped or other pervious areas designed and constructed to effectively receive and infiltrate, retain and/or treat runoff from impervious areas, prior to discharging to the MS4;

(i) Small collection strategies located at, or as close as possible to, the source (i.e. the point where storm water initially meets the ground) to minimize the transport of runoff and pollutants to the MS4 and receiving waters;

(j) Use of permeable materials for projects with low traffic areas and appropriate soil conditions;

(k) Landscaping with native or drought tolerant species; and

(l) Harvesting and using precipitation.

b. PRIORITY DEVELOPMENT PROJECTS

Priority Development Projects are land development projects that fall under the planning and building authority of the Copermittee for which the Copermittee must impose specific requirements, in addition to those described in Provision E.3.a, including the implementation of structural BMPs to meet the performance requirements described in Provision E.3.c.

(1) Definition of Priority Development Project

Priority Development Projects include the following:

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(b) Redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site on an existing site of 10,000 square feet or more of impervious surfaces). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(c) New and redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site), and support one or more of the following uses:

(i) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812).

(ii) Hillside development projects. This category includes development on any natural slope that is twenty-five percent or greater.

(iii) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce.

(iv) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

(d) New or redevelopment projects that create and/or replace 2,500 square feet or more of impervious surface (collectively over the entire project site), and discharging directly to an Environmentally Sensitive Area (ESA). "Discharging directly to" includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands).

(e) New development projects, or redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface, that support one or more of the following uses:

(i) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

(ii) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

(f) New or redevelopment projects that result in the disturbance of one or more acres of land and are expected to generate pollutants post construction.

(2) Special Considerations for Redevelopment Projects

The structural BMP performance requirements of Provision E.3.c are applicable to redevelopment Priority Development Projects, as defined in E.3.b.(1), as follows:

(a) Where redevelopment results in the creation or replacement of impervious surface in an amount of less than fifty percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provision E.3.c apply only to the creation or replacement of impervious surface, and not the entire development; or

(b) Where redevelopment results in the creation or replacement of impervious surface in an amount of more than fifty percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provision E.3.c apply to the entire development.

(3) Priority Development Project Exemptions

Each Copermittee has the discretion to exempt the following projects from being defined as Priority Development Projects:

(a) New or retrofit paved sidewalks, bicycle lanes, or trails that meet the following criteria:

(i) Designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas; OR

(ii) Designed and constructed to be hydraulically disconnected from paved streets or roads; OR

(iii) Designed and constructed with permeable pavements or surfaces in accordance with USEPA Green Streets guidance.[26]

(b) Retrofitting or redevelopment of existing paved alleys, streets or roads that are designed and constructed in accordance with the USEPA Green Streets guidance.[27]

c. Priority Development Project Structural BMP Performance Requirements

In addition to the BMP requirements listed for all development projects under Provision E.3.a, Priority Development Projects must also implement structural BMPs that conform to performance requirements described below.

[26] See "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).
[27] Ibid.

(1) Storm Water Pollutant Control BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite structural BMPs to control pollutants in storm water that may be discharged from a project as follows:

(a) Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite the pollutants contained in the volume of storm water runoff produced from a 24-hour 85th percentile storm event (design capture volume);[28]

(i) If a Copermittee determines that implementing BMPs to retain the full design capture volume onsite for a Priority Development Project is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize biofiltration BMPs. Biofiltration BMPs must be designed to have an appropriate hydraulic loading rate to maximize storm water retention and pollutant removal, as well as to prevent erosion, scour, and channeling within the BMP,[29] and must be sized to:

[a] Treat 1.5 times the design capture volume not reliably retained onsite, OR

[b] Treat the design capture volume not reliably retained onsite with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite.

(ii) If a Copermittee determines that biofiltration is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize flow-thru treatment control BMPs to treat runoff leaving the site, AND mitigate for the design capture volume not reliably retained onsite pursuant to Provision E.3.c.(1)(b). Flow thru treatment control BMPs must be sized and designed to:

[28] This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals.

[29] As part of the Copermittee's update to its BMP Design Manual, pursuant to Provision E.3.d, the Copermittee must provide guidance for hydraulic loading rates and other biofiltration design criteria necessary to maximize storm water retention and pollutant removal.

[a] Remove pollutants from storm water to the MEP;
[b] Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;
[c] Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Flow-thru treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of flow-thru treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

(b) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1)(a). The Priority Development Project must mitigate for the portion of the pollutant load in the design capture volume not retained onsite if Provision E.3.c.(3) is utilized. If a Priority Development Project is allowed to utilize alternative compliance, flow-thru treatment control BMPs must be implemented to treat the portion of the design capture volume that is not reliably retained onsite. Flow-thru treatment control BMPs must be sized and designed in accordance with Provisions E.3.c.(1)(a)(ii)[a]-[c].

(2) Hydromodification Management BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite BMPs to manage hydromodification that may be caused by storm water runoff discharged from a project as follows:

(a) Post-project runoff conditions (flow rates and durations) must not exceed pre-development runoff conditions by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat downstream of Priority Development Projects).

(i) In evaluating the range of flows that results in increased potential for erosion of natural (non-hardened) channels, the lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks.

(ii) The Copermittees may use monitoring results collected pursuant to Provision D.1.a.(2) to re-define the range of flows resulting in

increased potential for erosion, or degraded instream habitat conditions, as warranted by the data.

(b) Each Priority Development Project must avoid critical sediment yield areas known to the Copermittee or identified by the optional Watershed Management Area Analysis pursuant to Provision B.3.b.(4), or implement measures that allow critical coarse sediment to be discharged to receiving waters, such that there is no net impact to the receiving water.

(c) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the performance requirements of Provision E.3.c.(2)(a). The Priority Development Project must mitigate for the post-project runoff conditions not fully managed onsite if Provision E.3.c.(3) is utilized.

(d) Exemptions

Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provisions E.3.c.(2) where the project discharges storm water runoff to:

(i) Existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;

(ii) Conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; or

(iii) An area identified by the Copermittees as appropriate for an exemption by the optional Watershed Management Area Analysis incorporated into the Water Quality Improvement Plan pursuant to Provision B.3.b.(4).

(e) Interim Timeframe Exemptions

Until the Copermittees have updated their BMP Design Manual in accordance with Provision F.2.b with the requirements of Provision E, the Copermittees have the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provision E.3.c.(2) where the project discharges storm water runoff directly to:

(i) An engineered channel conveyance system with a capacity to convey peak flows generated by the 10-year storm event all the way from the

point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; and

(ii) Large river reaches with a drainage area larger than 100 square miles and a 100-year flow capacity in excess of 20,000 cubic feet per second, provided that properly sized energy dissipation is included at all Priority Development Project discharge points.

(3) Alternative Compliance Program to Onsite Structural BMP Implementation

At the discretion of each Copermittee, Priority Development Projects may be allowed to participate in an alternative compliance program in lieu of implementing the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a), provided that the Water Quality Improvement Plan includes the optional Watershed Management Area Analysis described in Provision B.3.b.(4), and Water Quality Equivalency calculations have been accepted by the San Diego Water Board's Executive Officer pursuant to Provision E.3.c.(3)(a). The alternative compliance program is available to a Priority Development Project only if the Priority Development Project applicant enters into a voluntary agreement with the Copermittee authorizing this arrangement. In addition to the voluntary agreement, relief from implementing structural BMPs onsite may be authorized by the Copermittee under the following conditions:

(a) Water Quality Equivalency

Copermittees must submit Water Quality Equivalency calculations for acceptance by the San Diego Water Board's Executive Officer prior to administering an alternative compliance program in order to establish a regional and technical basis for determining the water quality benefits associated with alternative compliance projects. Accepted Water Quality Equivalency calculations must be incorporated as part of any Copermittee's alternative compliance program necessary for evaluating Watershed Management Area Analysis candidate projects, project applicant-proposed alternative compliance projects, alternative compliance in lieu fee structures, and alternative compliance water quality credit systems as described in Provisions E.3.c.(3)(b)-(e).

(b) Watershed Management Area Analysis Candidate Projects

The Priority Development Project applicant agrees to fund, contribute funds to, or implement a candidate project identified by the Copermittees in the Watershed Management Area Analysis included in the Water Quality Improvement Plan, pursuant to Provisions B.3.b.(4) subject to the following conditions:

(i) The Copermittee must determine that implementation of the candidate project will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a) onsite;

(ii) If the Priority Development Project applicant chooses to fully or partially fund a candidate project, then the in-lieu fee structure described in Provision E.3.c.(3)(c) must be followed;

(iii) If the Priority Development Project applicant chooses to fully or partially fund a candidate project, then the Copermittee must ensure that the funds to be obtained from the Priority Development Project applicant are sufficient to mitigate for impacts caused by not fully implementing structural BMPs onsite, pursuant to the performance requirements described in Provisions E.3.c.(1) and E.3.c.(2)(a);

(iv) If the Priority Development Project applicant chooses to implement a candidate project, then the Copermittee must ensure that pollutant control and/or hydromodification management within the candidate project are sufficient to mitigate for impacts caused by not implementing structural BMPs fully onsite, pursuant to the performance requirements described in Provisions E.3.c.(1) and E.3.c.(2)(a);

(v) The voluntary agreement to fund, partially fund, or implement a candidate project must include reliable sources of funding for operation and maintenance of the candidate project;

(vi) Design of the candidate project must be conducted under an appropriately qualified engineer, geologist, architect, landscape architect, or other professional, licenses where applicable, and competent and proficient in the fields pertinent to the candidate project design;

(vii) The candidate project must be constructed as soon as possible, but no later than 4 years after the certificate of occupancy is granted for the first Priority Development Project that contributed funds toward the construction of the candidate project, unless a longer period of time is authorized by the San Diego Water Board Executive Officer; and

(viii) If the candidate project is constructed after the Priority Development Project is constructed, the Copermittee must require temporal mitigation for pollutant loads and altered flows that are discharged from the Priority Development Project.

(c) Project Applicant Proposed Alternative Compliance Projects

The Copermittee may allow a Priority Development Project applicant to propose and fund, contribute funds to, or implement an alternative compliance project not identified by the Watershed Management Area Analysis included in the Water Quality Improvement Plan pursuant to Provisions B.3.b.(4). This option is allowed provided the Copermittee determines that implementation of the alternative compliance project will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a) onsite, and is subject to the requirements described in Provisions E.3.c.(3)(a)(ii)-(viii).

(d) Alternative Compliance In-Lieu Fee Structure

If a Copermittee chooses to allow a Priority Development Project applicant to fund, or partially fund a candidate project or an alternative compliance project, then the Copermittee must develop and implement an in-lieu fee structure. This may be developed individually or with other Copermittees and/or entities, as a means for designing, developing, constructing, operating and maintaining offsite alternative compliance projects. The in-lieu fee must be transferred to the Copermittee (for public projects) or an escrow account (for private projects) prior to the construction of the Priority Development Project.

(e) Alternative Compliance Water Quality Credit System Option

The Copermittee may develop and implement an alternative compliance water quality credit system option, individually or with other Copermittees and/or entities, provided that such a credit system clearly exhibits that it will not allow discharges from Priority Development Projects to cause or contribute to a net impact over and above the impact caused by projects meeting the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a). Any credit system that a Copermittee chooses to implement must be submitted to the San Diego Water Board Executive Officer for review and acceptance as part of the Water Quality Improvement Plan.

(4) Long-Term Structural BMP Maintenance

Each Copermittee must require the project applicant to submit proof of the mechanism under which ongoing long-term maintenance of all structural BMPs will be conducted.

(5) Infiltration and Groundwater Protection

(a) Structural BMPs designed to primarily function as large, centralized infiltration devices (such as large infiltration trenches and infiltration basins) must not cause or contribute to an exceedance of an applicable groundwater quality objective. At a minimum, such infiltration BMPs must be in conformance with the design criteria listed below, unless the development project applicant demonstrates to the Copermittee that one or more of the specific design criteria listed below are not necessary to protect groundwater quality. The design criteria listed below do not apply to small infiltration systems dispersed throughout a development project.

(i) Runoff must undergo pretreatment such as sedimentation or filtration prior to infiltration;

(ii) Pollution prevention and source control BMPs must be implemented at a level appropriate to protect groundwater quality at sites where infiltration BMPs are to be used;

(iii) Infiltration BMPs must be adequately maintained to remove pollutants in storm water to the MEP;

(iv) The vertical distance from the base of any infiltration BMP to the seasonal high groundwater mark must be at least 10 feet. Where groundwater basins do not support beneficial uses, this vertical distance criteria may be reduced, provided groundwater quality is maintained;

(v) The soil through which infiltration is to occur must have physical and chemical characteristics (e.g., appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses;

(vi) Infiltration BMPs must not be used for areas of industrial or light industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee, unless source control BMPs to prevent exposure of high threat activities are implemented, or runoff from such activities is first treated or filtered to remove pollutants prior to infiltration; and

(vii) Infiltration BMPs must be located a minimum of 100 feet horizontally from any water supply wells.

(b) The Copermittee may develop, individually or with other Copermittees, alternative mandatory design criteria to that listed above for infiltration BMPs which are designed to primarily function as centralized infiltration devices. Before implementing the alternative design criteria in the development planning process the Copermitee(s) must:

(i) Notify the San Diego Water Board of the intent to implement the alternative design criteria submitted; and

(ii) Comply with any conditions set by the San Diego Water Board.

d. BMP DESIGN MANUAL UPDATE

Each Copermittee must update its BMP Design Manual[30] pursuant to Provision F.2.b. Until the Copermittee has updated its BMP Design Manual pursuant to Provision F.2.b.(1) ~~with the requirements of Provisions E.3.a-c~~, the Copermittee must continue implementing its current BMP Design Manual. ~~Unless directed otherwise by the San Diego Water Board, t~~The Copermittee must implement the updated BMP Design Manual within 180 days following completion of ~~completing~~ the update pursuant to Provision F.2.b.(1), unless directed otherwise by the San Diego Water Board Executive Officer. The date the BMP Design Manual is implemented is the "effective date" of the BMP Design Manual. The update of the BMP Design Manual required pursuant to Provision F.2.b.(1) must include the following:

(1) Updated procedures to determine the nature and extent of storm water requirements applicable to a potential development or redevelopment projects. These procedures must inform project applicants of the storm water management requirements applicable to their project including, but not limited to, general requirements for all development projects, structural BMP design procedures and requirements, hydromodification management requirements, requirements specific to phased projects, and procedures specific to private developments and public improvement projects;

(2) Updated procedures to identify pollutants and conditions of concern for selecting the most appropriate structural BMPs that consider, at a minimum, the following:

(a) Receiving water quality (including pollutants for which receiving waters are listed as impaired under the CWA section 303(d) List);

(b) Pollutants, stressors, and/or receiving water conditions that cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(c) Land use type of the project and pollutants associated with that land use type; and

(d) Pollutants expected to be present onsite.

(3) Updated procedures for designing structural BMPs, including any updated

[30] The BMP Design Manual was formerly known as the Standard Storm Water Mitigation Plan under Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016.

performance requirements to be consistent with the requirements of Provision E.3.c for all structural BMPs listed in the BMP Design Manual;

(4) Long-term maintenance criteria for each structural BMP listed in the BMP Design Manual; and

(5) Alternative compliance criteria, in accordance with the requirements under Provision E.3.c.(3), if the Copermittee elects to allow Priority Development Projects within its jurisdiction to utilize alternative compliance.

e. PRIORITY DEVELOPMENT PROJECT BMP IMPLEMENTATION AND OVERSIGHT

Each Copermittee must implement a program that requires and confirms structural BMPs on all Priority Development Projects are designed, constructed, and maintained to remove pollutants in storm water to the MEP.

(1) Structural BMP Approval and Verification Process

(a) Each Copermittee must require and confirm that ~~for~~ all Priority Development Projects ~~applications that have not received prior lawful approval by the Copermittee by the effective date of the BMP Design Manual pursuant to Provision E.3.d,~~ implement the requirements of Provision E.3, ~~must be implemented. For project applications that have received prior lawful approval before the effective date of the BMP Design Manual pursuant to Provision E.3.d, the Copermittee may allow previous land development requirements to apply.~~ except that the Copermittee may allow previous land development requirements to apply to a Priority Development Project if the conditions of Provision E.3.e.(1)(a)(i) or Provision E.3.e.(1)(a)(ii) are met:

(i) The Copermittee has, prior to the effective date of the BMP Design Manual required to be developed pursuant to Provision E.3.d:

[a] Approved[31] a design that incorporates the storm water drainage system for the Priority Development Project in its entirety, including all applicable structural pollutant treatment control and hydromodification management BMPs consistent with the previous applicable MS4 permit requirements;[32] AND

[b] Issued a private project permit or approval, or functional equivalent for public projects, that authorizes the Priority Development Project applicant to commence construction activities based on a design that incorporates the storm water

[31] For public projects, a design stamped by the City or County Engineer, or engineer of record for the project is considered an approved design.

[32] Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016 for San Diego County, Orange County, and Riverside County Copermittees, respectively

drainage system approved in conformance with Provision E.3.e.(1)(a)(i)[a]; AND

[c] Confirmed that there have been construction activities on the Priority Development Project site within the 365 days prior to the effective date of the BMP Design Manual, *OR* the Copermittee confirms that construction activities have commenced on the Priority Development Project site within the 180 days after the effective date of the BMP Design Manual, where construction activities are undertaken in reliance on the permit or approval, or functional equivalent for public projects, issued by the Copermittee in conformance with Provision E.3.e.(1)(a)(i)[b]; AND

[d] Issued all subsequent private project permits or approvals, or functional equivalent for public projects, that are needed to implement the design initially approved in conformance with Provision E.3.e.(1)(a)(i)[a] within 5 years of the effective date of the BMP Design Manual. The storm water drainage system for the Priority Development Project in its entirety, including all applicable structural pollutant treatment control and hydromodification management BMPs must remain in substantial conformity with the design initially approved in conformance with Provision E.3.e.(1)(a)(i)[a].

(ii) The Copermittee demonstrates it lacks the land use authority or legal authority to require a Priority Development Project to implement the requirements of Provision E.3.

(b) Each Copermittee must identify the roles and responsibilities of its various municipal departments in implementing the structural BMP requirements, including each stage of a project from application review and approval through BMP maintenance and inspections.

(c) Each Copermittee must require and confirm that appropriate easements and ownerships are properly recorded in public records and the information is conveyed to all appropriate parties when there is a change in project or site ownership.

(d) Each Copermittee must require and confirm that prior to occupancy and/or intended use of any portion of the Priority Development Project, each structural BMP is inspected to verify that it has been constructed and is operating in compliance with all of its specifications, plans, permits, ordinances, and the requirements of this Order.

(2) Priority Development Project Inventory and Prioritization

(a) Each Copermittee must develop, maintain, and update at least annually, a watershed-based database to track and inventory all Priority Development

Projects and associated structural BMPs within its jurisdiction. Inventories must be accurate and complete beginning from December 2002 for the San Diego County Copermittees, February 2003 for the Orange County Copermittees, and July 2005 for the Riverside County Copermittees. The use of an automated database system, such as GIS, is highly recommended. The database must include, at a minimum, the following information:

(i) Priority Development Project location (address and hydrologic subarea);

(ii) Descriptions of structural BMP type(s);

(iii) Date(s) of construction;

(iv) Party responsible for structural BMP maintenance;

(v) Dates and findings of structural BMP maintenance verifications; and

(vi) Corrective actions and/or resolutions, when applicable.

(b) Each Copermittee must prioritize the Priority Development Projects with structural BMPs within its jurisdiction. The designation of Priority Development Projects as high priority must consider the following:

(i) The highest water quality priorities identified in the Water Quality Improvement Plan;

(ii) Receiving water quality;

(iii) Number and sizes of structural BMPs;

(iv) Recommended maintenance frequency of structural BMPs;

(v) Likelihood of operation and maintenance issues of structural BMPs;

(vi) Land use and expected pollutants generated; and

(vii) Compliance record.

(3) Structural BMP Maintenance Verifications and Inspections

Each Copermittee is required to verify that structural BMPs on each Priority Development Project are adequately maintained, and continue to operate effectively to remove pollutants in storm water to the MEP through inspections, self-certifications, surveys, or other equally effective approaches.

(a) All (100 percent) of the structural BMPs at Priority Development Projects that are designated as high priority must be inspected directly by the Copermittee annually prior to each rainy season;

(b) For verifications performed through a means other than direct Copermittee inspection, adequate documentation must be required by the Copermittee

to provide assurance that the required maintenance of structural BMPs at each Priority Development Project has been completed; and

(c) Appropriate follow-up measures (including re-inspections, enforcement, etc.) must be conducted to ensure that structural BMPs at each Priority Development Project continue to reduce pollutants in storm water to the MEP as originally designed.

f. DEVELOPMENT PROJECT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all development projects, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

4. Construction Management

Each Copermittee must implement a construction management program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. PROJECT APPROVAL PROCESS

Prior to issuance of any local permit(s) that allows the commencement of construction projects that involve ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff, each Copermittee must:

(1) Require a pollution control plan, construction BMP plan, and/or an erosion and sediment control plan, to be submitted by the project applicant to the Copermittee;

(2) Confirm the pollution control plan, construction BMP plan, and/or erosion and sediment control plan, complies with the local grading ordinance, other applicable local ordinances, and the requirements of this Order;

(3) Confirm the pollution control, construction BMP, and/or erosion and sediment control plan, includes seasonally appropriate and effective BMPs and management measures described in Provision E.4.c, as applicable to the project; and

(4) Verify that the project applicant has obtained coverage under the statewide Construction General Permit (Order 2009-0009-DWQ or subsequent Order), if applicable.

b. Construction Site Inventory and Tracking

(1) Each Copermittee must maintain and update, at least quarterly, a watershed-based inventory of all construction projects issued a local permit that allows ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff. The use of an automated database system, such as GIS, is highly recommended. The inventory must include:

(a) Relevant contact information for each site (e.g., name, address, phone, and email for the owner and contractor);

(b) The basic site information including location (address and hydrologic subarea), Waste Discharge Identification (WDID) number (if applicable), size of the site, and approximate area of disturbance;

(c) Whether or not the site is considered a high threat to water quality, as defined in Provision E.4.b.(2) below;

(d) The project start and completion dates;

(e) The required inspection frequency, as defined in the Copermittee's jurisdictional runoff management program document;

(f) The date the Copermittee accepted or approved the pollution control plan, construction BMP plan, and/or erosion and sediment control plan; and

(g) Whether or not there are ongoing enforcement actions administered to the site.

(2) Each Copermittee must identify all construction sites within its jurisdiction that represent a high threat to downstream surface water quality. The designation of construction sites as high threat to water quality must consider the following:

(a) Sites located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Sites located within the same hydrologic subarea and tributary to a water body segment listed as impaired for sediment on the CWA section 303(d) List;

(c) Sites located within, directly adjacent to, or discharging directly to a receiving water within an ESA; and

(d) Other sites determined by the Copermittees or the San Diego Water Board as a high threat to water quality.

c. CONSTRUCTION SITE BMP IMPLEMENTATION

Each Copermittee must implement, or require the implementation of effective BMPs to reduce discharges of pollutants in storm water from construction sites to the MEP, and effectively prohibit non-storm water discharges from construction sites into the MS4. These BMPs must be site specific, seasonally appropriate, and construction phase appropriate. BMPs must be implemented at each construction site year round. Dry season BMP implementation must plan for and address unseasonal rain events that may occur during the dry season (May 1 through September 30). Copermittees must implement, or require the implementation of, BMPs in the following categories:

(1) Project Planning;

(2) Good Site Management "Housekeeping", including waste management;

(3) Non-storm Water Management;

(4) Erosion Control;

(5) Sediment Control;

(6) Run-on and Run-off Control; and

(7) Active/Passive Sediment Treatment Systems, where applicable.

d. CONSTRUCTION SITE INSPECTIONS

Each Copermittee must conduct construction site inspections to require and confirm compliance with its local permits and applicable local ordinances, and the requirements of this Order. Priority for site inspections must consider threat to water quality pursuant to Provision E.4.b as well as the nature of the construction activity, topography, and the characteristics of soils and receiving water quality.

(1) Inspection Frequency

(a) Each Copermittee must conduct inspections at all inventoried sites, including high threat to water quality sites, at an appropriate frequency for each phase of construction to confirm the site reduces the discharge of pollutants in storm water from construction sites to the MEP, and effectively prohibits non-storm water discharges from entering the MS4.

(b) Each Copermittee must establish appropriate inspection frequencies for high threat to water quality sites, and all other sites, for each phase of construction. Inspection frequencies appropriate for addressing the

highest water quality priorities identified in the Water Quality Improvement Plan, and for complying with the requirements of this Order must be identified in each Copermittee's jurisdictional runoff management program document.

(c) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e., re-inspection, enforcement) necessary to require and confirm site compliance with its local permits and applicable local ordinances, and the requirements of this Order.

(2) Inspection Content

Inspections of construction sites by the Copermittee must include, at a minimum:

(a) Verification of coverage under the Construction General Permit (Notice of Intent (NOI) and/or WDID number) during initial inspections, when applicable;

(b) Assessment of compliance with its local permits and applicable local ordinances related to pollution prevention, including the implementation and maintenance of applicable BMPs;

(c) Assessment of BMP adequacy and effectiveness;

(d) Visual observations of actual non-storm water discharges;

(e) Visual observations of actual or potential discharge of sediment and/or construction related materials from the site;

(f) Visual observations of actual or potential illicit connections; and

(g) If any violations are found and BMP corrections are needed, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried construction sites. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Site name, location (address and hydrologic subarea), and WDID number (if applicable);

(b) Inspection date;

(c) Approximate amount of rainfall since last inspection;

(d) Description of problems observed with BMPs and indication of need for BMP addition/repair/replacement and any scheduled re-inspection, and date of re-inspection;

(e) Descriptions of any other specific inspection comments which must, at a minimum, include rationales for longer compliance time;

(f) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(g) Resolution of problems noted and date problems fixed.

e. CONSTRUCTION SITE ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried construction sites, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

5. Existing Development Management

Each Copermittee must implement an existing development management program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. EXISTING DEVELOPMENT INVENTORY AND TRACKING

Each Copermittee must maintain, and update at least annually, a watershed-based inventory of the existing development within its jurisdiction that may discharge a pollutant load to and from the MS4. The use of an automated database system, such as GIS, is highly recommended. The inventory must, at a minimum, include:

(1) Name, location (hydrological subarea and address, if applicable) of the following types of existing development with its jurisdiction:

(a) Commercial facilities or areas;

(b) Industrial facilities;

(c) Municipal facilities, including:

(i) MS4 and related structures;[33]

(ii) Roads, streets, and highways;

(iii) Parking facilities;

(iv) Municipal airfields;

(v) Parks and recreation facilities;

(vi) Flood management facilities, flood control devices and structures;

(vii) Operating or closed municipal landfills;

(viii) Publicly owned treatment works (including water and wastewater treatment plants) and sanitary sewer collection systems;

(ix) Corporate yards, including maintenance and storage yards for materials, waste, equipment, and vehicles;

(x) Hazardous waste collection facilities;

(xi) Other treatment, storage or disposal facilities for municipal waste; and

(xii) Other municipal facilities that the Copermittee determines may contribute a significant pollutant load to the MS4.

(d) Residential areas, which may be designated by one or more of the following:

(i) Residential management area;

(ii) Drainage basin or area;

(iii) Land use (e.g., single family, multi-family, rural);

(iv) Neighborhood;

(v) Common Interest Area;

(vi) Home Owner Association;

(vii) Mobile home park; and/or

(viii) Other designations accepted by the San Diego Water Board Executive Officer.

(2) A description of the facility or area, including the following information:

(a) Classification as commercial, industrial, municipal, or residential;

[33] The inventory may refer to the MS4 map required to be maintained pursuant to Provision E.2.b.(1).

(b) Status of facility or area as active or inactive;

(c) Identification if a business is a mobile business;

(d) SIC Code or NAICS Code, if applicable;

(e) Industrial General Permit NOI and/or WDID number, if applicable;

(f) Identification if a residential area is or includes a Common Interest Area / Home Owner Association, or mobile home park;

(g) Identification of pollutants generated and potentially generated by the facility or area;

(h) Whether the facility or area is adjacent to an ESA;

(i) Whether the facility or area is tributary to and within the same hydrologic subarea as a water body segment listed as impaired on the CWA section 303(d) List and generates pollutants for which the water body segment is impaired; and

(3) An annually updated map showing the location of inventoried existing development, watershed boundaries, and water bodies.

b. EXISTING DEVELOPMENT BMP IMPLEMENTATION AND MAINTENANCE

Each Copermittee must designate a minimum set of BMPs required for all inventoried existing development, including special event venues. The designated minimum BMPs must be specific to facility or area types and pollutant generating activities, as appropriate.

(1) Commercial, Industrial, and Municipal Facilities and Areas

(a) Pollution Prevention

Each Copermittee must require the use of pollution prevention methods by the commercial, industrial, and municipal facilities and areas in its inventoried existing development to address the priorities and strategies in the Water Quality Improvement Plan.

(b) BMP Implementation

Each Copermittee must require the implementation of designated BMPs at commercial facilities and areas, industrial facilities, and implement designated BMPs at municipal facilities in its inventoried existing development.

(c) BMP Operation and Maintenance

(i) Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development.

(ii) Each Copermittee must implement a schedule of operation and maintenance activities for its MS4 and related structures (including but not limited to catch basins, storm drain inlets, detention basins, etc.), and verify proper operation of all its municipal structural treatment controls designed to reduce pollutants (including floatables) in storm water discharges to or from its MS4s and related drainage structures. Operation and maintenance activities may include, but is not limited to, the following:

[a] Inspections of the MS4 and related structures;
[b] Cleaning of the MS4 and related structures; and
[c] Proper disposal of materials removed from cleaning of the MS4 and related structures.

(iii) Each Copermittee must implement a schedule of operation and maintenance for public streets, unpaved roads, paved roads, and paved highways within its jurisdiction to minimize pollutants that can be discharged in storm water.

(iv) Each Copermittee must implement controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers. Copermittees that operate both a municipal sanitary sewer system and a MS4 must implement controls and measures to prevent and eliminate seeping sewage from infiltrating the MS4. Copermittees that do not operate both a municipal sanitary sewer system and a MS4 must coordinate with sewering agencies to keep themselves informed of relevant and appropriate maintenance activities and sanitary sewage projects in their jurisdiction that may cause or contribute to seepage of sewage into the MS4.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must require the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from commercial facilities and areas and industrial facilities, and implement BMPs at municipal facilities in its inventoried existing development. Such BMPs must include, as appropriate, educational activities, permits, certifications and other measures for applicators and distributors.

(2) Residential Areas

(a) Pollution Prevention

Each Copermittee must promote and encourage the use of pollution prevention methods, where appropriate, by the residential areas in its inventoried existing development.

(b) BMP Implementation

Each Copermittee must promote and encourage the implementation of designated BMPs at residential areas in its inventoried existing development.

(c) BMP Operation and Maintenance

Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at residential areas in its inventoried existing development.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must promote and encourage the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from residential areas in its inventoried existing development.

c. EXISTING DEVELOPMENT INSPECTIONS

Each Copermittee must conduct inspections of inventoried existing development to ensure compliance with applicable local ordinances and permits, and the requirements of this Order.

(1) Inspection Frequency

(a) Each Copermittee must establish appropriate inspection frequencies for inventoried existing development in accordance with the following requirements:

(i) At a minimum, inventoried existing development must be inspected once every five years utilizing one or more of the following methods:

[a] Drive-by inspections by Copermittee municipal and contract staff;

[b] Onsite inspections by Copermittee municipal and contract staff; and/or

[c] Visual inspections of publicly accessible inventoried facilities or areas by volunteer monitoring or patrol programs that have been trained by the Copermittee;

(ii) The frequency of inspections must be appropriate to confirm that BMPs are being implemented to reduce the discharge of pollutants in storm water from the MS4 to the MEP and effectively prohibit non-storm water discharges to the MS4;

(iii) The frequency of inspections must be based on the potential for a facility or area to discharge non-storm water and pollutants in storm water, and should reflect the priorities set forth in the Water Quality Improvement Plan;

(iv) Each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development;[34] and

(v) Inventoried existing development must be inspected by the Copermittee, as needed, in response to valid public complaints.

(b) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e. education and outreach, re-inspection, enforcement) necessary to require and confirm compliance with its applicable local ordinances and permits and the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

(2) <u>Inspection Content</u>

(a) Inspections of existing development must include, at a minimum:

(i) Visual inspections for the presence of actual non-storm water discharges;

(ii) Visual inspections for the presence of actual or potential discharge of pollutants;

(iii) Visual inspections for the presence of actual or potential illicit connections; and

(iv) Verification that the description of the facility or area in the inventory, required pursuant to Provision E.5.a.(2), has not changed.

[34] If any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspection may count toward the total annual inspection requirement. This requirement excludes linear municipal facilities (i.e., MS4 linear channels, sanitary sewer collection systems, streets, roads and highways).

(b) Onsite inspections of existing development by the Copermittee must include, at a minimum:

(i) Assessment of compliance with its applicable local ordinances and permits related to non-storm water and storm water discharges and runoff;

(ii) Assessment of the implementation of the designated BMPs;

(iii) Verification of coverage under the Industrial General Permit, when applicable; and

(iv) If any problems or violations are found, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried existing development. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Name and location of the facility or area (address and hydrologic subarea) consistent with the inventory name and location, pursuant to Provision E.5.a.(1);

(b) Inspection and re-inspection date(s);

(c) Inspection method(s) (i.e. drive-by, onsite);

(d) Observations and findings from the inspection(s);

(e) For onsite inspections of existing development by Copermittee municipal or contract staff, the records must also include, as applicable:

(i) Description of any problems or violations found during the inspection(s);

(ii) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(iii) The date problems or violations were resolved.

d. EXISTING DEVELOPMENT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried existing development, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

e. RETROFITTING AND REHABILITATING AREAS OF EXISTING DEVELOPMENT

(1) Retrofitting Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to retrofit areas of existing development within its jurisdiction to address identified sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify areas of existing development as candidates for retrofitting, focusing on areas where retrofitting will address pollutants and/or stressors that contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for retrofitting projects may be utilized to reduce pollutants that may be discharged in storm water from areas of existing development, and/or address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of retrofitting projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting projects; and

(e) Where retrofitting projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional retrofitting projects (i.e. projects that can receive and/or treat storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment) adjacent to and/or downstream of the areas of existing development.

(2) Stream, Channel and/or Habitat Rehabilitation in Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to rehabilitate streams, channels, and/or habitats in areas of existing development within its jurisdiction to address the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify streams, channels, and/or habitats in areas of existing development as candidates for rehabilitation, focusing on areas where stream, channel, and/or habitat rehabilitation projects will address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for stream, channel, and/or habitat rehabilitation projects may be utilized to address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters, rehabilitate channelized or hydromodified streams, restore wetland and riparian habitat, restore watershed functions, and/or restore beneficial uses of receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of stream, channel, and/or habitat rehabilitation projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance stream, channel, and/or habitat rehabilitation projects; and

(e) Where stream, channel, and/or habitat rehabilitation projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional stream, channel, and/or habitat rehabilitation projects (i.e. projects that can receive storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment).

6. Enforcement Response Plans

Each Copermittee must develop and implement an Enforcement Response Plan as part of its jurisdictional runoff management program document. The Enforcement Response Plan must describe the applicable approaches and options to enforce its legal authority established pursuant to Provision E.1, as necessary, to achieve compliance with the requirements of this Order. The Enforcement Response Plan must be in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include the following:

a. Enforcement Response Plan Components

The Enforcement Response Plan must include the following individual components:

(1) Illicit Discharge Detection and Elimination Enforcement Component;

(2) Development Planning Enforcement Component;

(3) Construction Management Enforcement Component; and

(4) Existing Development Enforcement Component.

b. Enforcement Response Approaches and Options

Each component of the Enforcement Response Plan must describe the enforcement response approaches that the Copermittee will implement to compel compliance with its statutes, ordinances, permits, contracts, orders, or similar means, and the requirements of this Order. The description must include the protocols for implementing progressively stricter enforcement responses. The enforcement response approaches must include appropriate sanctions to compel compliance, including, at a minimum, the following tools or their equivalent:

(1) Verbal and written notices of violation;

(2) Cleanup requirements;

(3) Fines;

(4) Bonding requirements;

(5) Administrative and criminal penalties;

(6) Liens;

(7) Stop work orders; and

(8) Permit and occupancy denials.

c. Correction of Violations

(1) Violations must be corrected in a timely manner with the goal of correcting the violations within 30 calendar days after the violations are discovered, or prior to the next predicted rain event, whichever is sooner.

(2) If more than 30 calendar days are required to achieve compliance, then a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

d. Escalated Enforcement

(1) The Enforcement Response Plan must include a definition of "escalated enforcement." Escalated enforcement must include any enforcement scenario where a violation or other non-compliance is determined to cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan. Escalated enforcement may be defined differently for development planning, construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas.

(2) Where the Copermittee determines escalated enforcement is not required, a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

(3) Escalated enforcement actions must continue to increase in severity, as necessary, to compel compliance as soon as possible.

e. Reporting of Non-Compliant Sites

(1) Each Copermittee must notify the San Diego Water Board in writing within five (5) calendar days of issuing escalated enforcement (as defined in the Copermittee's Enforcement Response Plan) to a construction site that poses a significant threat to water quality as a result of violations or other non-compliance with its permits and applicable local ordinances, and the requirements of this Order. Written notification may be provided electronically by email to the appropriate San Diego Water Board staff.

(2) Each Copermittee must notify the San Diego Water Board of any persons required to obtain coverage under the statewide Industrial General Permit and Construction General Permit and failing to do so, within five (5) calendar days from the time the Copermittee become aware of the circumstances. Written notification may be provided electronically by email to RB9_Nonfilers@waterboards.ca.gov.

7. Public Education and Participation

Each Copermittee must implement, individually or with other Copermittees, a public education and participation program in accordance with the strategies identified in the Water Quality Improvement Plan to promote and encourage the development of programs, management practices, and behaviors that reduce the discharge of pollutants in storm water to the MEP, prevent controllable non-storm water discharges from entering the MS4, and protect water quality standards in receiving waters. The public education and participation program must be implemented in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include, at a minimum, the following requirements:

a. PUBLIC EDUCATION

The public education program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) Educational activities, public information activities, and other appropriate outreach activities intended to reduce pollutants associated with the application of pesticides, herbicides and fertilizer and other pollutants of concern in storm water discharges to and from its MS4 to the MEP, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed to address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(2) Educational activities, public information activities, and other appropriate outreach activities to facilitate the proper management and disposal of used oil and toxic materials; and

(3) Appropriate education and training measures for specific target audiences, such as construction site operators, residents, underserved target audiences and school-aged children, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed, based on high risk behaviors and pollutants of concern.

b. PUBLIC PARTICIPATION

The public participation program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) A process for members of the public to participate in updating the highest priority water quality conditions, numeric goals, and water quality improvement strategies in the Water Quality Improvement Plan;

(2) Opportunities for members of the public to participate in providing the Copermittee recommendations for improving the effectiveness of the water quality improvement strategies implemented within its jurisdiction; and

(3) Opportunities for members of the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or protection of the quality of receiving waters.

8. Fiscal Analysis

a. Each Copermittee must secure the resources necessary to meet all the requirements of this Order.

b. Each Copermittee must conduct an annual fiscal analysis of its jurisdictional runoff management program in its entirety. The fiscal analysis must include the following:

(1) Identification of the various categories of expenditures necessary to implement the requirements of this Order, including a description of the specific capital, operation and maintenance, and other expenditure items to be accounted for in each category of expenditures;

(2) The staff resources needed and allocated to meet the requirements of this Order, including any development, implementation, and enforcement activities required;

(3) The estimated expenditures for Provisions E.8.b.(1) and E.8.b.(2) for the current fiscal year; and

(4) The source(s) of funds that are proposed to meet the necessary expenditures described in Provisions E.8.b.(1) and E.8.b.(2), including legal restrictions on the use of such funds, for the current fiscal year and next fiscal year.

c. Each Copermittee must submit a summary of the annual fiscal analysis with each Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3).

d. Each Copermittee must provide the documentation used to develop the summary of the annual fiscal analysis upon request by the San Diego Water Board.

F. REPORTING

The purpose of this provision is to determine and document compliance with the requirements set forth in this Order. The goal of reporting is to communicate to the San Diego Water Board and the people of the State of California the implementation status of each jurisdictional runoff management program and compliance with the requirements of this Order. This goal is to be accomplished through the submittal of specific deliverables to the San Diego Water Board by the Copermittees.

1. Water Quality Improvement Plans

The Copermittees for each Watershed Management Area must develop and submit the Water Quality Improvement Plan in accordance with the following requirements:

a. WATER QUALITY IMPROVEMENT PLAN DEVELOPMENT

Each Water Quality Improvement Plan must be developed in accordance with the following process:

(1) Public Participation Process

The Copermittees must implement a public participation process to solicit data, information, and recommendations to be utilized in the development of the Water Quality Improvement Plan. The public participation process must include the following:

(a) The Copermittees must develop a publicly available and noticed schedule of the opportunities for the public to participate and provide comments during the development of the Water Quality Improvement Plan. The schedule may be adjusted as necessary by the Copermittees, provided the public is provided timely notification of the changes to the schedule.

(b) The Copermittees must form a Water Quality Improvement Consultation Panel to provide recommendations during the development of the Water Quality Improvement Plan. The Water Quality Improvement Consultation Panel must consist of at least the following members:

(i) A representative of the San Diego Water Board;

(ii) A representative of the environmental community familiar with the water quality conditions of concern of the receiving waters in the Watershed Management Area, preferably from an environmental interest group associated with a water body within the Watershed Management Area; and

(iii) A representative of the development community familiar with the opportunities and constraints for implementing structural BMPs,

retrofitting projects, and stream, channel or habitat rehabilitation projects in the Watershed Management Area, preferably with relevant engineering, hydrology, and/or geomorphology experience in the Watershed Management Area.

(c) The Copermittees must coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public time and opportunity to participate during the development of the Water Quality Improvement Plans.

(2) Priority Water Quality Conditions

(a) The Copermittees must solicit data, information and recommendations from the public to be utilized in the development and identification of the priority water quality conditions and potential water quality improvement strategies for the Watershed Management Area.

(b) The Copermittees must review the priority water quality conditions the Copermittees plan on including in the Water Quality Improvement Plan with the Water Quality Improvement Consultation Panel to receive recommendations or concurrence.

(c) The Copermittees must consider revisions to the priority water quality conditions based on recommendations from the Water Quality Improvement Consultation Panel.

(d) The Copermittees must include all the potential water quality improvement strategies identified by the public and the Water Quality Improvement Consultation Panel with the submittal of the priority water quality conditions to the San Diego Water Board.

(e) The Copermittees must submit the Water Quality Improvement Plan requirements of Provision B.2 to the San Diego Water Board as early as 6 months and no later than 12 months after the commencement of coverage under this Order. Upon receipt, the San Diego Water Board will issue a public notice and release the proposed priority water quality conditions and potential water quality improvement strategies for public review and comment for a minimum of 30 days.

(f) The Copermittees must consider revisions to the priority water quality conditions and potential water quality improvement strategies developed pursuant to Provision B.2 based on public comments received by the close of the comment period.

(3) Water Quality Improvement Goals, Strategies and Schedules

(a) The Copermittees must solicit recommendations from the public on potential numeric goals for the highest priority water quality conditions identified for the Watershed Management Area, and recommendations on the strategies that should be implemented to achieve the potential numeric goals.

(b) The Copermittees must consult with the Water Quality Improvement Consultation Panel and consider revisions to the following items based on the Panel's recommendations:

(i) The numeric goals and schedules the Copermittees propose to include in the Water Quality Improvement Plan;

(ii) The water quality improvement strategies and schedules the Copermittees propose to implement in the Watershed Management Area and include in the Water Quality Improvement Plan; and

(iii) If the Copermittees choose to implement Provision B.3.b.(4), the results of the Watershed Management Area Analysis the Copermittees proposed to incorporate into the Water Quality Improvement Plan.

(c) The Copermittees must submit the Water Quality Improvement Plan requirements of Provision B.3 to the San Diego Water Board as early as 9 months and no later than 18 months after the commencement of coverage under this Order. Upon receipt, the San Diego Water Board will issue a public notice and release the proposed water quality improvement goals, strategies and schedules for public review and comment for a minimum of 30 days.

(d) The Copermittees must consider revisions to the water quality improvement goals, strategies and schedules developed pursuant to Provision B.3 based on public comments received by the close of the comment period.

b. WATER QUALITY IMPROVEMENT PLAN SUBMITTAL AND IMPLEMENTATION

(1) Within 24 months after the commencement of coverage under this Order, the Copermittees for each Watershed Management Area must submit a complete Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order to the San Diego Water Board. The San Diego Water Board will issue a public notice and release the Water Quality Improvement Plan for public review and comment for a minimum of 30 days.

(2) The Copermittees must consider revisions to the Water Quality Improvement Plan based on written comments received by the close of the public comment period.

(3) The Copermittees must promptly submit any revisions to the Water Quality Improvement Plan to the San Diego Water Board no later than 60 days after the close of the public comment period.

(4) If issues concerning the Water Quality Improvement Plan are resolved informally through discussions among the Copermittees, the San Diego Water Board and interested parties, the San Diego Water Board Executive Officer may provide written notification of acceptance to the Copermittees that the Water Quality Improvement Plan meets the requirements of Provision B. However, if the Executive Officer determines that significant issues with the Water Quality Improvement Plan remain, the matter will be scheduled for San Diego Water Board consideration at a public meeting.

(5) The Copermittees must commence with implementation of the Water Quality Improvement Plan, in accordance with the water quality improvement strategies and schedules therein, upon written notification of acceptance with the Water Quality Improvement Plan by the San Diego Water Board Executive Officer.

(6) During implementation of the Water Quality Improvement Plan the Copermittees must correct any deficiencies in the Plan identified by the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report following a request by the Board to do so.

(7) The Water Quality Improvement Plan must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of receiving notification of acceptance with the Water Quality Improvement Plan by the San Diego Water Board Executive Officer.

2. Updates

a. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATES

Each Copermittee must update its jurisdictional runoff management program document in accordance with the following requirements:

(1) Each Copermittee is encouraged to seek public and key stakeholder participation and comments, as early and often as possible during the process of developing updates to its jurisdictional runoff management program document;

(2) Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E concurrent with the submittal of the Water Quality Improvement Plan. Each Copermittee must correct any deficiencies in the jurisdictional runoff management program document based on comments received from the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report;

(3) Each Copermittee must submit updates to its jurisdictional runoff management program, with the supporting rationale for the modifications, either in the Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b;

(4) The Copermittee must revise proposed modifications to its jurisdictional runoff management program as directed by the San Diego Water Board Executive Officer; and

(5) Updated jurisdictional runoff management program documents must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of submitting the Water Quality Improvement Plan Annual Report.

b. BMP DESIGN MANUAL UPDATES

Each Copermittee must update its BMP Design Manual in accordance with the following requirements:

(1) Each Copermittee must update its BMP Design Manual to incorporate the requirements of Provisions E.3.a-d concurrent with the submittal of the Water Quality Improvement Plan. Each Copermittee must correct any deficiencies in the BMP Design Manual based on comments received from the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report;

(2) ~~Subsequent~~ Any future updates to the BMP Design Manual made after its update pursuant to Provision F.2.b.(1) is completed must be consistent with the requirements of Provisions E.3.a-d and must be submitted as part of the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b; and

(3) ~~Updated~~ BMP Design Manuals must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of completing the update.

(4) If the San Diego Water Board amends Provisions E.3.a-d during the permit term but after the Copermittee has completed the update pursuant to

Provision F.2.b.(1), the Copermittee must revise its BMP Design Manual to incorporate the amended Provision E.3.a-d requirements as soon as possible but not later than 90 days after the date the San Diego Water Board adopts the amendments to Provisions E.3.a-d, unless otherwise directed by the San Diego Water Board Executive Officer. Under these circumstances, the effective date of the BMP Design Manual is no later than 90 days after the date the San Diego Water Board adopts the amendments to Provisions E.3.a-d, unless otherwise directed by the San Diego Water Board Executive Officer.

c. Water Quality Improvement Plan Updates

(1) The Water Quality Improvement Plans must be updated in accordance with the following process:

(a) The Copermittees must develop and implement a public participation process to obtain data, information and recommendations for updating the Water Quality Improvement Plan. The public participation process must provide for a publicly available and noticed schedule of opportunities for the public to participate and provide comments during the development of updates to the Water Quality Improvement Plan;

(b) The Copermittees must consult with the Water Quality Improvement Consultation Panel on proposed updates of the Water Quality Improvement Plan, and consider the Water Quality Improvement Consultation Panel's recommendations in finalizing the proposed updates;

(c) The Copermittees for each Watershed Management Area must submit 1) proposed updates to the Water Quality Improvement Plan and supporting rationale, and 2) recommendations received from the public and the Water Quality Improvement Consultation Panel and the rationale for the requested updates, either in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The updates submitted will be deemed accepted for inclusion in the Water Quality Improvement Plan ninety (90) days after submission unless otherwise directed in writing by the San Diego Water Board Executive Officer;

(d) The Copermittees must revise the requested updates as directed by the San Diego Water Board Executive Officer; and

(e) Updated Water Quality Improvement Plans must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance of the requested updates by the San Diego Water Board.

(2) No later than six months following Office of Administrative Law and USEPA approval of any TMDL Basin Plan amendment with wasteload allocations (WLAs) assigned to the Copermittees during the term of this Order, the Copermittees must initiate an update to the applicable Water Quality Improvement Plans in accordance with Provision F.1 or Provision F.2.c.(1) to incorporate the requirements of the TMDL WLAs.

3. Progress Reporting

a. Progress Report Presentations

The Copermittees for each Watershed Management Area must periodically appear before the San Diego Water Board, as requested by the Board, to provide progress reports on the implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs.

b. Annual Reports

(1) Transitional Jurisdictional Runoff Management Program Annual Reports

(a) Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) no later than October 31 of each year for each jurisdictional runoff management program reporting period (i.e. July 1 to June 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted.

(b) Each Copermittee must submit the information on the Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) specific to the area within its jurisdiction in each Watershed Management Area.

(c) In addition to submitting the Jurisdictional Runoff Management Program Annual Report Form during the transitional reporting period, each Copermittee may continue to utilize and submit the jurisdictional runoff management program annual reporting format of its previous NPDES permit until the first Water Quality Improvement Plan Annual Report is required to be submitted.

(2) Transitional Monitoring and Assessment Program Annual Reports

The Copermittees for each Watershed Management Area must submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment

program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted under this Order. The Transitional Monitoring and Assessment Program Annual Reports must include:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1.a and D.2.a, summarized and presented in tabular and graphical form; and

(b) The findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

(3) Water Quality Improvement Plan Annual Reports

The Copermittees for each Watershed Management Area must submit a Water Quality Improvement Plan Annual Report for each reporting period no later than January 31 of the following year. The annual reporting period consists of two different periods: 1) July 1 to June 30 of the following year for the jurisdictional runoff management programs, 2) October 1 to September 30 of the following year for the monitoring and assessment programs. The Water Quality Improvement Plan Annual Reports must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Each Annual Report must include the following:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, summarized and presented in tabular and graphical form;

(b) The progress of the special studies required pursuant to Provision D.3, and the findings, interpretations and conclusions of a special study, or each phase of a special study, upon its completion;

(c) The findings, interpretations and conclusions from the assessments required pursuant to Provision D.4;

(d) The progress of implementing the Water Quality Improvement Plan, including, but not limited to, the following:

(i) The progress toward achieving the interim and final numeric goals for the highest water quality priorities for the Watershed Management Area;

(ii) The water quality improvement strategies that were implemented and/or no longer implemented by each of the Copermittees during the reporting period and previous reporting periods;

(iii) The water quality improvement strategies planned for implementation during the next reporting period;

(iv) Proposed modifications to the water quality improvement strategies, the public comments received and the supporting rationale for the proposed modifications;

(v) Previous modifications or updates incorporated into the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document and implemented by the Copermittees in the Watershed Management Area; and

(vi) Proposed modifications or updates to the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document;

(e) A completed Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) for each Copermittee in the Watershed Management Area, certified by a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative; and

(f) Each Copermittee must provide any data or documentation utilized in developing the Water Quality Improvement Plan Annual Report upon request by the San Diego Water Board. Any Copermittee monitoring data utilized in developing the Water Quality Improvement Plan Annual Report must be uploaded to the California Environmental Data Exchange Network (CEDEN).[35] Any Copermittee monitoring and assessment data utilized in developing the Water Quality Improvement Plan Annual Report must be available for access on the Regional Clearinghouse required pursuant to Provision F.4.

c. Regional Monitoring and Assessment Report

(1) The Copermittees must submit a Regional Monitoring and Assessment Report no later than 180 days prior to the expiration date of this Order. The Regional Monitoring and Assessment Report may be submitted as part of the Report of Waste Discharge required pursuant to Provision F.5.b. In preparing the report the Copermittees must consider the receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, and the findings, interpretations, and conclusions from the assessments required pursuant to Provision D.4. Based on these considerations the report must assess the following:

[35] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

(a) The beneficial uses of the receiving waters within the San Diego Region that are supported and not adversely affected by the Copermittees' MS4 discharges;

(b) The beneficial uses of the receiving waters within the San Diego Region that are adversely impacted by the Copermittees' MS4 discharges;

(c) The progress toward protecting the beneficial uses in the receiving waters within the San Diego Region from the Copermittees' discharges; and

(d) Pollutants or conditions of emerging concern that may impact beneficial uses in the receiving waters within the San Diego Region.

(2) The Regional Monitoring and Assessment Report must include recommendations for improving the implementation and assessment of the Water Quality Improvement Plans and jurisdictional runoff management programs.

(3) Each Copermittee must provide any data or documentation utilized in developing the Regional Monitoring and Assessment Report upon request by the San Diego Water Board. Any Copermittee monitoring and assessment data utilized in developing the Regional Monitoring and Assessment Report must be available for access on the Regional Clearinghouse required pursuant to Provision F.4.

4. Regional Clearinghouse

The Copermittees must develop, update, and maintain an internet-based Regional Clearinghouse that is made available to the public no later than 18 months after the effective date of this Order.[36]

a. The Copermittees, through the Regional Clearinghouse, must make the following documents and data available for access, and organized by Watershed Management Area. The documents and data may be linked to other internet-based data portals and databases where the original documents are stored:

(1) Water Quality Improvement Plan for the Watershed Management Area, and all updated versions with date of update;

(2) Annual Reports for the Watershed Management Area;

(3) Jurisdictional Runoff Management Program document for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

[36] The Copermittees may develop, update and maintain the clearinghouse(s) of other Copermittees or agencies.

(4) BMP Design Manual for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(5) Reports from special studies (e.g. source identification, BMP effectiveness assessment) conducted in the Watershed Management Area;

(6) Monitoring data collected pursuant to Provision D for each Watershed Management Area must be uploaded to CEDEN,[37] with links to the uploaded data; and

(7) Available GIS data, layers, and/or shapefiles used to develop the maps generated and maintained by the Copermittees for the Water Quality Improvement Plans, Annual Reports, and jurisdictional runoff management program documents.

b. The Copermittees, through the Regional Clearinghouse, must make the following information and documents available for access:

(1) Contact information (point of contact, phone number, email address, and mailing address) for each Copermittee;

(2) Public hotline number for reporting non-storm water and illicit discharges for each Copermittee;

(3) Email address for reporting non-storm water and illicit discharges for each Copermittee;

(4) Link to each Copermittee's website, if available, where the public may find additional information about the Copermittee's storm water management program and for requesting records for the implementation of its program;

(5) Information about opportunities for the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or protection of the quality of receiving waters; and

(6) Reports from regional monitoring programs in which the Copermittees participate (e.g. Southern California Monitoring Coalition, Southern California Coastal Water Research Project Bight Monitoring);

(7) Regional Monitoring and Assessment Reports; and

(8) Any other information, data, and documents the Copermittees determine as appropriate for making available to the public.

[37] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

5. Report of Waste Discharge

~~a. The Riverside County Copermittees are required to submit a complete Report of Waste Discharge pursuant to the requirements of their current Order. The San Diego Water Board will review and consider the Report of Waste Discharge to determine whether modification to this Order, pursuant to the requirements of Provision H, will be required prior to the Riverside County Copermittees obtaining coverage under this Order. The current Order for Riverside County Copermittees is rescinded upon the date of effective coverage under this Order except for enforcement purposes.~~

~~b.~~
The Copermittees subject to the requirements of this Order must submit to the San Diego Water Board a complete Report of Waste Discharge as an application for the re-issuance of this Order and NPDES permit. The Report of Waste Discharge must be submitted no later than 180 days in advance of the expiration date of this Order. The Report of Waste Discharge must contain the following minimum information:

~~(1)~~
a. Names and addresses of the Copermittees;
~~(2)~~
b. Names and titles of the primary contacts of the Copermittees;
~~(3)~~
c. Proposed changes to the Copermittees' Water Quality Improvement Plans and the supporting justification;
~~(4)~~
d. Proposed changes to the Copermittees' jurisdictional runoff management programs and the supporting justification;
~~(5)~~
e. Any other information necessary for the re-issuance of this Order;
~~(6)~~
f. Any information to be included as part of the Report of Waste Discharge pursuant to the requirements of this Order; and
~~(7)~~
g. Any other information required by federal regulations for NPDES permit reissuance.

~~6. Application for Early Coverage~~

~~a. The Riverside County Copermittees may apply for early coverage under this Order by submitting a Report of Waste Discharge Form 200, with a written request for early coverage under this Order.~~

~~b. The San Diego Water Board will review the application for early coverage. A notification of coverage under this Order will be issued to the Copermittees in the respective county by the San Diego Water Board upon completion of the early coverage application requirements. The effective coverage date will be specified~~

~~in the notification of coverage. The Copermittees in the respective county are authorized to have MS4 discharges pursuant to the requirements of this Order starting on the effective coverage date specified in the notification of coverage. The existing Order for the respective county is rescinded upon the effective coverage date specified in the notification of coverage except for enforcement purposes.~~

~~7.~~

6. Reporting Provisions

Each Copermittee must comply with all the reporting and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

G. PRINCIPAL WATERSHED COPERMITTEE RESPONSIBILITIES

1. The Copermittees within each Watershed Management Area must designate a Principal Watershed Copermittee and notify the San Diego Water Board of the name of the Principal Watershed Copermittee. An individual Copermittee should not be designated a Principal Watershed Copermittee for more than two Watershed Management Areas. The notification may be submitted with the Water Quality Improvement Plan required pursuant to Provision F.1 of this Order.

2. The Principal Watershed Copermittee is responsible for, at a minimum, the following:

a. Serving as liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues, and when necessary and appropriate, representing the Copermittees in the Watershed Management Area before the San Diego Water Board;

b. Facilitating the development of the Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order;

c. Coordinating the submittal of the deliverables required by Provisions F.1, F.2, F.3.a, and F.3.b of this Order; and

d. Coordinating and developing, with the other Principal Watershed Copermittees, the requirements of Provisions F.3.c, F.4, and F.5.b of this Order.

3. The Principal Watershed Copermittee is not responsible for ensuring that the other Copermittees within the Watershed Management Area are in compliance with the requirements of this Order. Each Copermittee within the Watershed Management Area is responsible for complying with the requirements of this Order.

H. MODIFICATION OF ORDER

1. Modifications of the Order may be initiated by the San Diego Water Board or by the Copermittees. Requests by Copermittees must be made to the San Diego Water Board.

2. Minor modifications to the Order may be made by the San Diego Water Board where the proposed modification complies with all the prohibitions and limitations, and other requirements of this Order.

3. This Order may also be re-opened and modified, revoked and, reissued or terminated in accordance with the provisions of 40 CFR 122.44, 122.62 to 122.64, and 124.5. Causes for taking such actions include, but are not limited to, failure to comply with any condition of this Order and permit, and endangerment to human health or the environment resulting from the permitted activity.

4. This Order may be re-opened for modification for cause including but not limited to the following:

   ~~a. The State Water Board determines that revisions are warranted, and the San Diego Water Board concurs that revisions are necessary to those provisions of the Order addressing compliance with water quality standards in the receiving water and/or those provisions of the Order establishing an iterative process for implementation of management practices to assure compliance with water quality standards in the receiving water;~~

   ~~b. An application for early coverage under this Order is received pursuant to Provision F.6;~~

   ~~c.~~

   a. Any of the TMDLs in Attachment E to this Order are amended in the Basin Plan by San Diego Water Board, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA;

   ~~d.~~

   b. The Basin Plan is amended by the San Diego Water Board to incorporate a new TMDL, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA; or

   ~~e.~~

   c. Updating or revising the monitoring and reporting requirements is determined to be necessary, at the discretion of the San Diego Water Board. Such modification(s) may include, but is (are) not limited to, revision(s) to: (i) implement recommendations from Southern California Coastal Water Research Project (SCCWRP), (ii) develop, refine, implement, and/or coordinate a regional monitoring program, (iii) develop and implement improved monitoring and assessment programs in keeping with San Diego Water Board Resolution No. R9-2012-0069, Resolution in Support of a Regional Monitoring Framework, and/or (iv) add provisions to require the Copermittees to evaluate and provide information on cost and values of the monitoring and reporting program.

~~**5.** The San Diego Water Board, after opportunity for public comment and a public hearing, will re-open and consider modifications to this Order when the Riverside County Copermittees submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders.~~

I. STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

Each Copermittee must comply with all the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

ATTACHMENT A

DISCHARGE PROHIBITIONS AND SPECIAL PROTECTIONS

1. Basin Plan Waste Discharge Prohibitions

California Water Code Section 13243 provides that a Regional Water Board, in a water quality control plan, may specify certain conditions or areas where the discharge of waste or certain types of waste is not permitted. The following waste discharge prohibitions in the Water Quality Control Plan for the San Diego Basin (Basin Plan) are applicable to any person, as defined by Section 13050(c) of the California Water Code, who is a citizen, domiciliary, or political agency or entity of California whose activities in California could affect the quality of waters of the state within the boundaries of the San Diego Region.

1. The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in California Water Code Section 13050, is prohibited.

2. The discharge of waste to land, except as authorized by waste discharge requirements or the terms described in California Water Code Section 13264 is prohibited.

3. The discharge of pollutants or dredged or fill material to waters of the United States except as authorized by a National Pollutant Discharge Elimination System (NPDES) permit or a dredged or fill material permit (subject to the exemption described in California Water Code Section 13376) is prohibited.

4. Discharges of recycled water to lakes or reservoirs used for municipal water supply or to inland surface water tributaries thereto are prohibited, unless this San Diego Water Board issues a NPDES permit authorizing such a discharge; the proposed discharge has been approved by the State Department of Health Services (DHS) and the operating agency of the impacted reservoir; and the discharger has an approved fail-safe long-term disposal alternative.

5. The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the San Diego Water Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

6. The discharge of waste in a manner causing flow, ponding, or surfacing on lands not owned or under the control of the discharger is prohibited, unless the discharge is authorized by the San Diego Water Board.

7. The dumping, deposition, or discharge of waste directly into waters of the state, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the San Diego Water Board.

8. Any discharge to a storm water conveyance system that is not composed entirely of "*storm water*" is prohibited unless authorized by the San Diego Water Board. [The federal regulations, 40 CFR 122.26(b)(13), define storm water as storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from firefighting activities.] [§122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

9. The unauthorized discharge of treated or untreated sewage to waters of the state or to a storm water conveyance system is prohibited.

10. The discharge of industrial wastes to conventional septic tank/subsurface disposal systems, except as authorized by the terms described in California Water Code Section 13264, is prohibited.

11. The discharge of radioactive wastes amenable to alternative methods of disposal into the waters of the state is prohibited.

12. The discharge of any radiological, chemical, or biological warfare agent into waters of the state is prohibited.

13. The discharge of waste into a natural or excavated site below historic water levels is prohibited unless the discharge is authorized by the San Diego Water Board.

14. The discharge of sand, silt, clay, or other earthen materials from any activity, including land grading and construction, in quantities which cause deleterious bottom deposits, turbidity or discoloration in waters of the state or which unreasonably affect, or threaten to affect, beneficial uses of such waters is prohibited.

15. The discharge of treated or untreated sewage from vessels to Mission Bay, Oceanside Harbor, Dana Point Harbor, or other small boat harbors is prohibited.

16. The discharge of untreated sewage from vessels to San Diego Bay is prohibited.

17. The discharge of treated sewage from vessels to portions of San Diego Bay that are less than 30 feet deep at mean lower low water (MLLW) is prohibited.

18. The discharge of treated sewage from vessels, which do not have a properly functioning US Coast Guard certified Type I or Type II marine sanitation device, to portions of San Diego Bay that are greater than 30 feet deep at mean lower low water (MLLW) is prohibited.

2. Attachment B to State Water Board Resolution 2012-0012, as amended by State Water Board Resolution No. 2012-0031.

Special Protections for Areas of Special Biological Significance (ASBS), Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges

I. PROVISIONS FOR POINT SOURCE DISCHARGES OF STORM WATER AND NONPOINT SOURCE WASTE DISCHARGES

The following terms, prohibitions, and special conditions (hereafter collectively referred to as special conditions) are established as limitations on point source storm water and nonpoint source discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in Areas of Special Biological Significance (ASBS), as required for State Water Quality Protection Areas pursuant to California Public Resources Code Sections 36700(f) and 36710(f). These Special Protections are adopted by the State Water Board as part of the California Ocean Plan (Ocean Plan) General Exception.

The special conditions are organized by category of discharge. The State Water Resources Control Board (State Water Board) and Regional Water Quality Control Boards (Regional Water Boards) will determine categories and the means of regulation for those categories [e.g., Point Source Storm Water National Pollutant Discharge Elimination System (NPDES) or Nonpoint Source].

A. PERMITTED POINT SOURCE DISCHARGES OF STORM WATER

1. General Provisions for Permitted Point Source Discharges of Storm Water

   a. Existing storm water discharges into an ASBS are allowed only under the following conditions:

      (1) The discharges are authorized by an NPDES permit issued by the State Water Board or Regional Water Board;

      (2) The discharges comply with all of the applicable terms, prohibitions, and special conditions contained in these Special Protections; and

      (3) The discharges:

         (i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

         (ii) Are designed to prevent soil erosion;

         (iii) Occur only during wet weather;

         (iv) Are composed of only storm water runoff.

   b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

c. The discharge of trash is prohibited.

d. Only discharges from existing storm water outfalls are allowed. Any proposed or new storm water runoff discharge shall be routed to existing storm water discharge outfalls and shall not result in any new contribution of waste to an ASBS (i.e., no additional pollutant loading). "Existing storm water outfalls" are those that were constructed or under construction prior to January 1, 2005. "New contribution of waste" is defined as any addition of waste beyond what would have occurred as of January 1, 2005. A change to an existing storm water outfall, in terms of re-location or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges are prohibited except as provided below:

(1) The term "non-storm water discharges" means any waste discharges from a municipal separate storm sewer system (MS4) or other NPDES permitted storm drain system to an ASBS that are not composed entirely of storm water.

(2) (i) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability or occur naturally:

(a) Discharges associated with emergency fire fighting operations.

(b) Foundation and footing drains.

(c) Water from crawl space or basement pumps.

(d) Hillside dewatering.

(e) Naturally occurring groundwater seepage via a storm drain.

(f) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(ii) An NPDES permitting authority may authorize non-storm water discharges to an MS4 with a direct discharge to an ASBS only to the extent the NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

2. Compliance Plans for Inclusion in Storm Water Management Plans (SWMP) and Storm Water Pollution Prevention Plans (SWPPP).

The discharger shall specifically address the prohibition of non-storm water runoff and the requirement to maintain natural water quality for storm water discharges to an ASBS in an ASBS Compliance Plan to be included in its SWMP or a SWPPP, as appropriate to permit type. If a statewide permit includes a SWMP, then the discharger shall prepare a stand-alone compliance plan for ASBS discharges. The ASBS Compliance Plan is subject to approval by

the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (for permits issued by Regional Water Boards).

a. The Compliance Plan shall include a map of surface drainage of storm water runoff, showing areas of sheet runoff, prioritize discharges, and describe any structural Best Management Practices (BMPs) already employed and/or BMPs to be employed in the future. Priority discharges are those that pose the greatest water quality threat and which are identified to require installation of structural BMPs. The map shall also show the storm water conveyances in relation to other features such as service areas, sewage conveyances and treatment facilities, landslides, areas prone to erosion, and waste and hazardous material storage areas, if applicable. The SWMP or SWPPP shall also include a procedure for updating the map and plan when changes are made to the storm water conveyance facilities.

b. The ASBS Compliance Plan shall describe the measures by which all non-authorized non-storm water runoff (e.g., dry weather flows) has been eliminated, how these measures will be maintained over time, and how these measures are monitored and documented.

c. For Municipal Separate Storm Sewer System (MS4s), the ASBS Compliance Plan shall require minimum inspection frequencies as follows:

(1) The minimum inspection frequency for construction sites shall be weekly during rainy season;

(2) The minimum inspection frequency for industrial facilities shall be monthly during the rainy season;

(3) The minimum inspection frequency for commercial facilities (e.g., restaurants) shall be twice during the rainy season; and

(4) Storm water outfall drains equal to or greater than 18 inches (457 mm) in diameter or width shall be inspected once prior to the beginning of the rainy season and once during the rainy season and maintained to remove trash and other anthropogenic debris.

d. The ASBS Compliance Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff, that are necessary to comply with these special conditions, will be achieved through BMPs. Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that such installation would pose a threat to health or safety. BMPs to control storm water runoff discharges (at the end-of-pipe) during a design storm shall be designed to achieve on average the following target levels:

(1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

(2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges.

The baseline for these determinations is the effective date of the Exception, except for those structural BMPs installed between January 1, 2005 and adoption of these Special Protections, and the reductions must be achieved and documented within six (6) years of the effective date.

e. The ASBS Compliance Plan shall address erosion control and the prevention of anthropogenic sedimentation in ASBS. The natural habitat conditions in the ASBS shall not be altered as a result of anthropogenic sedimentation.

f. The ASBS Compliance Plan shall describe the non-structural BMPs currently employed and planned in the future (including those for construction activities), and include an implementation schedule. The ASBS Compliance Plan shall include non-structural BMPs that address public education and outreach. Education and outreach efforts must adequately inform the public that direct discharges of pollutants from private property not entering an MS4 are prohibited. The ASBS Compliance Plan shall also describe the structural BMPs, including any low impact development (LID) measures, currently employed and planned for higher threat discharges and include an implementation schedule. To control storm water runoff discharges (at the end-of-pipe) during a design storm, permittees must first consider, and use where feasible, LID practices to infiltrate, use, or evapotranspirate storm water runoff on-site, if LID practices would be the most effective at reducing pollutants from entering the ASBS.

g. The BMPs and implementation schedule shall be designed to ensure that natural water quality conditions in the receiving water are achieved and maintained by either reducing flows from impervious surfaces or reducing pollutant loading, or some combination thereof.

h. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents in storm water runoff that alter natural ocean water quality and the sources of these constituents.

(2) The report shall describe BMPs that are currently being implemented, BMPs that are identified in the SWMP or SWPPP for future implementation, and any additional BMPs that may be added to the SWMP or SWPPP to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the BMPs.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits), the discharger shall revise its ASBS Compliance Plan to incorporate any new or modified BMPs that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised SWMP or SWPPP, the discharger does not have to repeat

the same procedure for continuing or recurring exceedances of natural ocean water quality conditions due to the same constituent.

(5) The requirements of this section are in addition to the terms, prohibitions, and conditions contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within eighteen (18) months from the effective date of the Exception, the discharger shall submit a draft written ASBS Compliance Plan to the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that describes its strategy to comply with these special conditions, including the requirement to maintain natural water quality in the affected ASBS. The ASBS Compliance Plan shall include a description of appropriate non-structural controls and a time schedule to implement structural controls (implementation schedule) to comply with these special conditions for inclusion in the discharger's SWMP or SWPPP, as appropriate to permit type. The final ASBS Compliance Plan, including a description and final schedule for structural controls based on the results of runoff and receiving water monitoring, must be submitted within thirty (30) months from the effective date of the Exception.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these special conditions shall be implemented.

d. Within six (6) years of the effective date of the Exception, any structural controls identified in the ASBS Compliance Plan that are necessary to comply with these special conditions shall be operational.

e. Within six (6) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water, pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data, and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in

compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. for municipalities, a demonstration of significant hardship to discharger ratepayers, by showing the relationship of storm water fees to annual household income for residents within the discharger's jurisdictional area, and the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or

2. for other governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

B. NONPOINT SOURCE DISCHARGES

1. General Provisions for Nonpoint Sources

a. Existing nonpoint source waste discharges are allowed into an ASBS only under the following conditions:

(1) The discharges are authorized under waste discharge requirements, a conditional waiver of waste discharge requirements, or a conditional prohibition issued by the State Water Board or a Regional Water Board.

(2) The discharges are in compliance with the applicable terms, prohibitions, and special conditions contained in these Special Protections.

(3) The discharges:

(i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

(ii) Are designed to prevent soil erosion;

(iii) Occur only during wet weather;

(iv) Are composed of only storm water runoff.

b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

c. The discharge of trash is prohibited.

d. Only existing nonpoint source waste discharges are allowed. "Existing nonpoint source waste discharges" are discharges that were ongoing prior to January 1, 2005. "New nonpoint source discharges" are defined as those that commenced on or after January 1, 2005. A change to an existing nonpoint source discharge, in terms of relocation or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges from nonpoint sources (those not subject to an NPDES Permit) are prohibited except as provided below:

(1) The term "non-storm water discharges" means any waste discharges that are not composed entirely of storm water.

(2) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability, or occur naturally:

(i) Discharges associated with emergency fire fighting operations.

(ii) Foundation and footing drains.

(iii) Water from crawl space or basement pumps.

(iv) Hillside dewatering.

(v) Naturally occurring groundwater seepage via a storm drain.

(vi) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

f. At the San Clemente Island ASBS, discharges incidental to military training and research, development, test, and evaluation operations are allowed. Discharges incidental to underwater demolition and other in-water explosions are not allowed in the two military closure areas in the vicinity of Wilson Cove and Castle Rock. Discharges must not result in a violation of the water quality objectives, including the protection of the marine aquatic life beneficial use, anywhere in the ASBS.

g. At the San Nicolas Island and Begg Rock ASBS, discharges incidental to military research, development, testing, and evaluation of, and training with, guided missile and other weapons systems, fleet training exercises, small-scale amphibious warfare training, and special warfare training are allowed. Discharges incidental to underwater demolition and other in-water explosions are not allowed. Discharges must not result in a violation of the water quality objectives, including the protection of the marine aquatic life beneficial use, anywhere in the ASBS.

h. All other nonpoint source discharges not specifically authorized above are prohibited.

2. Planning and Reporting

a. The nonpoint source discharger shall develop an ASBS Pollution Prevention Plan, including an implementation schedule, to address storm water runoff and any other nonpoint source discharges from its facilities. The ASBS Pollution Prevention Plan must be equivalent in contents to an ASBS Compliance Plan as described in I (A)(2) in this document. The ASBS Pollution Prevention Plan is subject to approval by the Executive Director of the State Water Board (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements).

b. The ASBS Pollution Prevention Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff that are necessary to comply with these special conditions, will be achieved through Management Measures and associated Management Practices (Management Measures/Practices). Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director or Regional Water Board Executive Officer that such installation would pose a threat to health or safety. Management Measures to control storm water runoff during a design storm shall achieve on average the following target levels:

(1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

(2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges.

The baseline for these determinations is the effective date of the Exception, except for those structural BMPs installed between January 1, 2005 and adoption of these Special Protections, and the reductions must be achieved and documented within six (6) years of the effective date.

c. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff or other nonpoint source pollution is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and the Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents that alter natural water quality and the sources of these constituents.

(2) The report shall describe Management Measures/Practices that are currently being implemented, Management Measures/Practices that are identified in the ASBS Pollution Prevention Plan for future implementation, and any additional Management Measures/Practices that may be added to the Pollution Prevention Plan to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the Management Measures/Practices.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge

requirements), the discharger shall revise its ASBS Pollution Prevention Plan to incorporate any new or modified Management Measures/Practices that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised ASBS Pollution Prevention Plan, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural water quality conditions due to the same constituent.

(5) The requirements of this section are in addition to the terms, prohibitions, and conditions contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within eighteen (18) months from the effective date of the Exception, the discharger~~s~~ shall submit a draft written ASBS Pollution Prevention Plan to the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) that describes its strategy to comply with these special conditions, including the requirement to maintain natural ocean water quality in the affected ASBS. The Pollution Prevention Plan shall include a description of appropriate non-structural controls and a time schedule to implement structural controls to comply with these special conditions for inclusion in the discharger's Pollution Prevention Plan. The final ASBS Pollution Prevention Plan, including a description and final schedule for structural controls based on the results of runoff and receiving water monitoring, must be submitted within thirty (30) months from the effective date of the Exception.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these Special Protections shall be implemented.

d. Within six (6) years of the effective date of the Exception, any structural controls identified in the ASBS Pollution Prevention Plan that are necessary to comply with these special conditions shall be operational.

e. Within six (6) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) may only authorize additional time to comply

with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in (d.) or (e.). The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. a demonstration that the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or

2. for governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

II. ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES

In addition to the provisions in Section I (A) or I (B), respectively, a discharger with parks and recreation facilities shall comply with the following:

A. The discharger shall include a section in an ASBS Compliance Plan (for NPDES dischargers) or an ASBS Pollution Prevention Plan (for nonpoint source dischargers) to address storm water runoff from parks and recreation facilities.

1. The plan shall identify all pollutant sources, including sediment sources, which may result in waste entering storm water runoff. Pollutant sources include, but are not limited to, roadside rest areas and vistas, picnic areas, campgrounds, trash receptacles, maintenance facilities, park personnel housing, portable toilets, leach fields, fuel tanks, roads, piers, and boat launch facilities.

2. The plan shall describe BMPs or Management Measures/Practices that will be implemented to control soil erosion (both temporary and permanent erosion controls) and reduce or eliminate pollutants in storm water runoff in order to achieve and maintain natural water quality conditions in the affected ASBS. The plan shall include BMPs or Management Measures/Practices to ensure that trails and culverts are maintained to prevent erosion and minimize waste discharges to ASBS.

3. The plan shall include BMPs or Management Measures/Practices to prevent the discharge of pesticides or other chemicals, including agricultural chemicals, in storm water runoff to the affected ASBS.

4. The plan shall include BMPs or Management Measures/Practices that address public education and outreach. The goal of these BMPs or Management Measures/Practices is to ensure that the public is adequately informed that waste discharges to the affected ASBS are prohibited or limited by special conditions in these Special Protections. The BMPs or Management Measures/Practices shall include signage at camping, picnicking, beach and roadside parking areas, and visitor centers, or other appropriate measures, which notify the public of any applicable requirements of these Special Protections and identify the ASBS boundaries.

5. The plan shall include BMPs or Management Measures/Practices that address the prohibition against the discharge of trash to ASBS. The BMPs or Management Measures/Practices shall include measures to ensure that adequate trash receptacles are available for public use at visitor facilities, including parking areas, and that the receptacles are adequately maintained to prevent trash discharges into the ASBS. Appropriate measures include covering trash receptacles to prevent trash from being wind blown and periodically emptying the receptacles to prevent overflows.

6. The plan shall include BMPs or Management Measures/Practices to address runoff from parking areas and other developed features to ensure that the runoff does not alter natural water quality in the affected ASBS. BMPs or Management Measures/Practices shall include measures to reduce pollutant loading in runoff to the ASBS through installation of natural area buffers (LID), treatment, or other appropriate measures.

B. Maintenance and repair of park and recreation facilities must not result in waste discharges to the ASBS. The practice of road oiling must be minimized or eliminated, and must not result in waste discharges to the ASBS.

III. ADDITIONAL REQUIREMENTS – WATERFRONT AND MARINE OPERATIONS

In addition to the provisions in Section I (A) or I (B), respectively, a discharger with waterfront and marine operations shall comply with the following:

A. For discharges related to waterfront and marine operations, the discharger shall develop a Waterfront and Marine Operations Management Plan (Waterfront Plan). This plan shall contain appropriate Management Measures/Practices to address nonpoint source pollutant discharges to the affected ASBS.

1. The Waterfront Plan shall contain appropriate Management Measures/Practices for any waste discharges associated with the operation and maintenance of vessels, moorings, piers, launch ramps, and cleaning stations in order to ensure that beneficial uses are protected and natural water quality is maintained in the affected ASBS.

2. For discharges from marinas and recreational boating activities, the Waterfront Plan shall include appropriate Management Measures, described in The Plan for California's Nonpoint Source Pollution Control Program, for marinas and recreational boating, or equivalent practices, to ensure that nonpoint source pollutant discharges do not alter natural water quality in the affected ASBS.

3. The Waterfront Plan shall include Management Practices to address public education and outreach to ensure that the public is adequately informed that waste discharges to the affected ASBS are prohibited or limited by special conditions in these Special Protections. The management practices shall include appropriate signage, or similar measures, to inform the public of the ASBS restrictions and to identify the ASBS boundaries.

4. The Waterfront Plan shall include Management Practices to address the prohibition against trash discharges to ASBS. The Management Practices shall include the provision of adequate trash receptacles for marine recreation areas, including parking areas, launch ramps, and docks. The plan shall also include appropriate Management Practices to ensure that the receptacles are adequately maintained and secured in order to prevent trash discharges into the ASBS. Appropriate Management Practices include covering the trash receptacles to prevent trash from being windblown, staking or securing the trash receptacles so they don't tip over, and periodically emptying the receptacles to prevent overflow.

5. The discharger shall submit its Waterfront Plan to the by the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) within six months of the effective date of these special conditions. The Waterfront Plan is subject to approval by the State Water Board Executive Director or the Regional Water Board Executive Officer, as appropriate. The plan must be fully implemented within 18 months of the effective date of the Exception.

B. The discharge of chlorine, soaps, petroleum, other chemical contaminants, trash, fish offal, or human sewage to ASBS is prohibited. Sinks and fish cleaning stations are point source discharges of wastes and are prohibited from discharging into ASBS. Anthropogenic accumulations of discarded fouling organisms on the sea floor must be minimized.

C. Limited-term activities, such as the repair, renovation, or maintenance of waterfront facilities, including, but not limited to, piers, docks, moorings, and breakwaters, are authorized only in accordance with Chapter III.E.2 of the Ocean Plan.

D. If the discharger anticipates that the discharger will fail to fully implement the approved Waterfront Plan within the 18 month deadline, the discharger shall submit a technical report as soon as practicable to the State Water Board Executive Director or the Regional Water Board Executive Officer, as appropriate. The technical report shall contain reasons for failing to meet the deadline and propose a revised schedule to fully implement the plan.

E. The State Water Board or the Regional Water Board may, for good cause, authorize additional time to comply with the Waterfront Plan. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in Section III.A.5. The notice shall

describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality. The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. a demonstration of significant hardship by showing that the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate.

2. for governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

IV. MONITORING REQUIREMENTS

Monitoring is mandatory for all dischargers to assure compliance with the Ocean Plan. Monitoring requirements include both: (A) core discharge monitoring, and (B) ocean receiving water monitoring. The State and Regional Water Boards must approve sampling site locations and any adjustments to the monitoring programs. All ocean receiving water and reference area monitoring must be comparable with the Water Boards' Surface Water Ambient Monitoring Program (SWAMP).

Safety concerns: Sample locations and sampling periods must be determined considering safety issues. Sampling may be postponed upon notification to the State and Regional Water Boards if hazardous conditions prevail.

Analytical Chemistry Methods: All constituents must be analyzed using the lowest minimum detection limits comparable to the Ocean Plan water quality objectives. For metal analysis, all samples, including storm water effluent, reference samples, and ocean receiving water samples, must be analyzed by the approved analytical method with the lowest minimum detection limits (currently Inductively Coupled Plasma/Mass Spectrometry) described in the Ocean Plan.

A. CORE DISCHARGE MONITORING PROGRAM

1. General sampling requirements for timing and storm size:

   Runoff must be collected during a storm event that is greater than 0.1 inch and generates runoff, and at least 72 hours from the previously measurable storm event. Runoff samples shall be collected during the same storm and at approximately the same time when post-storm receiving water is sampled, and analyzed for the same constituents as receiving water and reference site samples (see section IV B) as described below.

2. Runoff flow measurements

   a. For municipal/industrial storm water outfalls in existence as of December 31, 2007,

18 inches (457mm) or greater in diameter/width (including multiple outfall pipes in combination having a width of 18 inches, runoff flows must be measured or calculated, using a method acceptable to and approved by the State and Regional Water Boards.

b. This will be reported annually for each precipitation season to the State and Regional Water Boards.

3. Runoff samples – storm events

a. For outfalls equal to or greater than 18 inches (0.46m) in diameter or width:

(1) samples of storm water runoff shall be collected during the same storm as receiving water samples and analyzed for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

(2) samples of storm water runoff shall be collected and analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

(3) If an applicant has no outfall greater than 36 inches, then storm water runoff from the applicant's largest outfall shall be further collected during the same storm as receiving water samples and analyzed for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates).

b. For outfalls equal to or greater than 36 inches (0.91m) in diameter or width:

(1) samples of storm water runoff shall be collected during the same storm as receiving water samples and analyzed for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

(2) samples of storm water runoff shall be further collected during the same storm as receiving water samples and analyzed for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates); and

(3) samples of storm water runoff shall be collected and analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

c. For an applicant not participating in a regional monitoring program [see below in Section IV (B)] in addition to (a.) and (b.) above, a minimum of the two largest outfalls or 20 percent of the larger outfalls, whichever is greater, shall be sampled (flow weighted composite samples) at least three times annually during wet weather (storm event) and analyzed for all Ocean Plan Table A constituents, Table B constituents for marine

aquatic life protection (except for toxicity, only chronic toxicity for three species shall be required), DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, and Ocean Plan indicator bacteria. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one (the largest) such discharge shall be sampled annually in each Region.

4. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may reduce or suspend core monitoring once the storm runoff is fully characterized. This determination may be made at any point after the discharge is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

B. Ocean Receiving Water and Reference Area Monitoring Program

In addition to performing the Core Discharge Monitoring Program in Section II.A above, all applicants having authorized discharges must perform ocean receiving water monitoring. In order to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS, dischargers may choose either (1) an individual monitoring program, or (2) participation in a regional integrated monitoring program.

1. Individual Monitoring Program: The requirements listed below are for those dischargers who elect to perform an individual monitoring program to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within the affected ASBS. In addition to Core Discharge Monitoring, the following additional monitoring requirements shall be met:

   a. Three times annually, during wet weather (storm events), the receiving water at the point of discharge from the outfalls described in section (IV)(A)(3)(c) above shall be sampled and analyzed for Ocean Plan Table A constituents, Table B constituents for marine aquatic life, DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, salinity, chronic toxicity (three species), and Ocean Plan indicator bacteria.

      The sample location for the ocean receiving water shall be in the surf zone at the point of discharges; this must be at the same location where storm water runoff is sampled. Receiving water shall be sampled prior to (pre-storm) and during (or immediately after) the same storm (post storm). Post storm sampling shall be during the same storm and at approximately the same time as when the runoff is sampled. Reference water quality shall also be sampled three times annually and analyzed for the same constituents pre-storm and post-storm, during the same storm seasons when receiving water is sampled. Reference stations will be determined by the State Water Board's Division of Water Quality and the applicable Regional Water Board(s).

   b. Sediment sampling shall occur at least three times during every five (5) year period. The subtidal sediment (sand or finer, if present) at the discharge shall be sampled and analyzed for Ocean Plan Table B constituents for marine aquatic life, DDT, PCBs, PAHs, pyrethroids, and OP pesticides. For sediment toxicity testing, only an acute toxicity test using the amphipod *Eohaustorius estuarius* must be performed.

c. A quantitative survey of intertidal benthic marine life shall be performed at the discharge and at a reference site. The survey shall be performed at least once every five (5) year period. The survey design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The results of the survey shall be completed and submitted to the State Water Board and Regional Water Board at least six months prior to the end of the permit cycle.

d. Once during each five (5) year period, a bioaccumulation study shall be conducted to determine the concentrations of metals and synthetic organic pollutants at representative discharge sites and at representative reference sites. The study design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The bioaccumulation study may include California mussels (*Mytilus californianus*) and/or sand crabs (*Emerita analoga* or *Blepharipoda occidentalis*). Based on the study results, the Regional Water Board and the State Water Board's Division of Water Quality, may adjust the study design in subsequent permits, or add or modify additional test organisms (such as shore crabs or fish), or modify the study design appropriate for the area and best available sensitive measures of contaminant exposure.

e. Marine Debris: Representative quantitative observations for trash by type and source shall be performed along the coast of the ASBS within the influence of the discharger's outfalls. The design, including locations and frequency, of the marine debris observations is subject to approval by the Regional Water Board and State Water Board's Division of Water Quality.

f. The monitoring requirements of the Individual Monitoring Program in this section are minimum requirements. After a minimum of one (1) year of continuous water quality monitoring of the discharges and ocean receiving waters, the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may require additional monitoring, or adjust, reduce or suspend receiving water and reference station monitoring. This determination may be made at any point after the discharge and receiving water is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

2. Regional Integrated Monitoring Program: Dischargers may elect to participate in a regional integrated monitoring program, in lieu of an individual monitoring program, to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS. This regional approach shall characterize natural water quality, pre- and post-storm, in ocean reference areas near the mouths of identified open space watersheds and the effects of the discharges on natural water quality (physical, chemical, and toxicity) in the ASBS receiving waters, and should include benthic marine aquatic life and bioaccumulation components. The design of the ASBS stratum of a regional integrated monitoring program may deviate from the otherwise prescribed individual monitoring approach (in Section IV.B.1) if approved by the State Water Board's Division of Water Quality and the Regional Water Boards.

a. Ocean reference areas shall be located at the drainages of flowing watersheds with minimal development (in no instance more than 10% development), and shall not be located in CWA Section 303(d) listed waterbodies or have tributaries that are 303(d) listed. Reference areas shall be free of wastewater discharges and anthropogenic non- storm water runoff. A minimum of low threat storm runoff discharges (e.g.

stream highway overpasses and campgrounds) may be allowed on a case-by-case basis. Reference areas shall be located in the same region as the ASBS receiving water monitoring occurs. The reference areas for each Region are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean reference water samples must be collected from each station, each from a separate storm during the same storm season that receiving water is sampled. A minimum of one reference location shall be sampled for each ASBS receiving water site sampled per responsible party. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

b. ASBS ocean receiving water must be sampled in the surf zone at the location where the runoff makes contact with ocean water (i.e. at "point zero"). Ocean receiving water stations must be representative of worst-case discharge conditions (i.e. co-located at a large drain greater than 36 inches, or if drains greater than 36 inches are not present in the ASBS then the largest drain greater than18 inches.) Ocean receiving water stations are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean receiving water samples must be collected during each storm season from each station, each from a separate storm. A minimum of one receiving water location shall be sampled in each ASBS per responsible party in that ASBS. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

c. Reference and receiving water sampling shall commence during the first full storm season following the adoption of these special conditions, and post-storm samples shall be collected during the same storm event when storm water runoff is sampled. Sampling shall occur in a minimum of two storm seasons. For those ASBS dischargers that have already participated in the Southern California Bight 2008 ASBS regional monitoring effort, sampling may be limited to only one storm season.

d. Receiving water and reference samples shall be analyzed for the same constituents as storm water runoff samples. At a minimum, constituents to be sampled and analyzed in reference and discharge receiving waters must include oil and grease, total suspended solids, Ocean Plan Table B metals for protection of marine life, Ocean Plan PAHs, pyrethroids, OP pesticides, ammonia, nitrate, phosphates, and critical life stage chronic toxicity for three species. In addition, within the range of the southern sea otter, indicator bacteria or some other measure of fecal contamination shall be analyzed.

3. Waterfront and Marine Operations: In addition to the above requirements for ocean receiving water monitoring, additional monitoring must be performed for marinas and boat launch and pier facilities:

a. For all marina or mooring field operators, in mooring fields with 10 or more occupied moorings, the ocean receiving water must be sampled for Ocean Plan indicator bacteria, residual chlorine, copper, zinc, grease and oil, methylene blue active substances (MBAS), and ammonia nitrogen.

(1) For mooring field operators opting for an individual monitoring program (Section IV.B.1 above), this sampling must occur weekly (on the weekend) from May through October.

(2) For mooring field operators opting to participate in a regional integrated monitoring program (Section IV.B.2 above), this sampling must occur monthly from May through October on a high use weekend in each month. The Water Boards may allow a reduction in the frequency of sampling, through the regional monitoring program, after the first year of monitoring.

b. For all mooring field operators, the subtidal sediment (sand or finer, if present) within mooring fields and below piers shall be sampled and analyzed for Ocean Plan Table B metals (for marine aquatic life beneficial use), acute toxicity, PAHs, and tributyltin. For sediment toxicity testing, only an acute toxicity test using the amphipod *Eohaustorius estuarius* must be performed. This sampling shall occur at least three times during a five (5) year period. For mooring field operators opting to participate in a regional integrated monitoring program, the Water Boards may allow a reduction in the frequency of sampling after the first sampling effort's results are assessed.

Glossary

At the point of discharge(s) – Means in the surf zone immediately where runoff from an outfall meets the ocean water (a.k.a., at point zero).

Areas of Special Biological Significance (ASBS) – Those areas designated by the State Water Board as ocean areas requiring protection of species or biological communities to the extent that alteration of natural water quality is undesirable. All Areas of Special Biological Significance are also classified as a subset of State Water Quality Protection Areas.

Design storm – For purposes of these Special Protections, a design storm is defined as the volume of runoff produced from one inch of precipitation per day or, if this definition is inconsistent with the discharger's applicable storm water permit, then the design storm shall be the definition included in the discharger's applicable storm water permit.

Development – Relevant to reference monitoring sites, means urban, industrial, agricultural, grazing, mining, and timber harvesting land uses.

Higher threat discharges - Permitted storm drains discharging equal to or greater than 18 inches, industrial storm drains, agricultural runoff discharged through an MS4, discharges associated with waterfront and marina operations (e.g., piers, launch ramps, mooring fields, and associated vessel support activities, except for passive discharges defined below), and direct discharges associated with commercial or industrial activities to ASBS.

Low Impact Development (LID) – A sustainable practice that benefits water supply and contributes to water quality protection. Unlike traditional storm water management, which entails collecting and conveying storm water runoff through storm drains, pipes, or other conveyances to a centralized storm water facility, LID focuses on using site design and storm water management to maintain the site's pre-development runoff rates and volumes. The goal of LID is to mimic a site's predevelopment hydrology by using design techniques that infiltrate, filter, store, evaporate, and detain runoff close to the source of rainfall.

Marine Operations – Marinas or mooring fields that contain slips or mooring locations for 10 or more vessels.

Management Measure (MM) - Economically achievable measures for the control of the addition of pollutants from various classes of nonpoint sources of pollution, which reflect the greatest degree of pollutant reduction achievable through the application of the best available nonpoint pollution control practices, technologies, processes, siting criteria, operating methods, or other alternatives. For example, in the "marinas and recreational boating" land- use category specified in the Plan for California's Nonpoint Source Pollution Control Program (NPS Program Plan) (SWRCB, 1999), "boat cleaning and maintenance" is considered a MM or the source of a specific class or type of NPS pollution.

Management Practice (MP) - The practices (e.g., structural, non-structural, operational, or other alternatives) that can be used either individually or in combination to address a specific MM class or classes of NPS pollution. For example, for the "boat cleaning and maintenance" MM, specific MPs can include, but are not limited to, methods for the selection of environmentally sensitive hull paints or methods for cleaning/removal of hull copper anti- fouling paints.

Municipal Separate Storm Sewer System (MS4) – A municipally-owned storm sewer system regulated under the Phase I or Phase II storm water program implemented in compliance with Clean Water Act section 402(p). Note that an MS4 program's boundaries are not necessarily congruent with the permittee's political boundaries.

Natural Ocean Water Quality - The water quality (based on selected physical, chemical and biological characteristics) that is required to sustain marine ecosystems, and which is without apparent human influence, *i.e.*, an absence of significant amounts of: (a) man-made constituents (*e.g.,* DDT); (b) other chemical (*e.g.,* trace metals), physical (temperature/thermal pollution, sediment burial), and biological (*e.g.*, bacteria) constituents at concentrations that have been elevated due to man's activities above those resulting from the naturally occurring processes that affect the area in question; and (c) non-indigenous biota (*e.g.,* invasive algal bloom species) that have been introduced either deliberately or accidentally by man. Discharges "*shall not alter natural ocean water quality*" as determined by a comparison to the range of constituent concentrations in reference areas agreed upon via the regional monitoring program(s). If monitoring information indicates that *natural ocean water quality* is not maintained, but there is sufficient evidence that a discharge is not contributing to the alteration of natural water quality, then the Regional Water Board may make that determination. In this case, sufficient information must include runoff sample data that has equal or lower concentrations for the range of constituents at the applicable reference area(s).

Nonpoint source – Nonpoint pollution sources generally are sources that do not meet the definition of a point source. Nonpoint source pollution typically results from land runoff, precipitation, atmospheric deposition, agricultural drainage, marine/boating operations or hydrologic modification. Nonpoint sources, for purposes of these Special Protections, include discharges that are not required to be regulated under an NPDES permit.

Non-storm water discharge – Any runoff that is not the result of a precipitation event. This is often referred to as "dry weather flow."

Non-structural control – A Best Management Practice that involves operational, maintenance, regulatory (e.g., ordinances) or educational activities designed to reduce or eliminate pollutants in runoff, and that are not structural controls (i.e. there are no physical structures involved).

Physical impossibility - Means any act of God, war, fire, earthquake, windstorm, flood or natural catastrophe; unexpected and unintended accidents not caused by discharger or its employees' negligence; civil disturbance, vandalism, sabotage or terrorism; restrain by court order or public authority or agency; or action or non-action by, or inability to

obtain the necessary authorizations or approvals from any governmental agency other than the permittee.

Representative sites and monitoring procedures – Are to be proposed by the discharger, with appropriate rationale, and subject to approval by Water Board staff.

Sheet-flow – Runoff that flows across land surfaces at a shallow depth relative to the cross- sectional width of the flow. These types of flow may or may not enter a storm drain system before discharge to receiving waters.

Storm Season – Also referred to as rainy season, means the months of the year from the onset of rainfall during autumn until the cessation of rainfall in the spring.

Structural control – A Best Management Practice that involves the installation of engineering solutions to the physical treatment or infiltration of runoff.

Surf Zone - The surf zone is defined as the submerged area between the breaking waves and the shoreline at any one time.

Surface Water Ambient Monitoring Program (SWAMP) comparable – Means that the monitoring program must 1) meet or exceed 2008 SWAMP Quality Assurance Program Management Plan (QAPP) Measurement Quality Objectives, or 2) have a Quality Assurance Project Plan that has been approved by SWAMP; in addition data must be formatted to match the database requirements of the SWAMP Information Management System. Adherence to the measurement quality objectives in the Southern California Bight 2008 ASBS Regional Monitoring Program QAPP and data base management comprises being SWAMP comparable.

Waterfront Operations - Piers, launch ramps, and cleaning stations in the water or on the adjacent shoreline.

Attachment 1
Special Protections Sections I(A)(3)(e) and I(B)(3)(e)
Flowchart to Determine Compliance with natural Water Quality

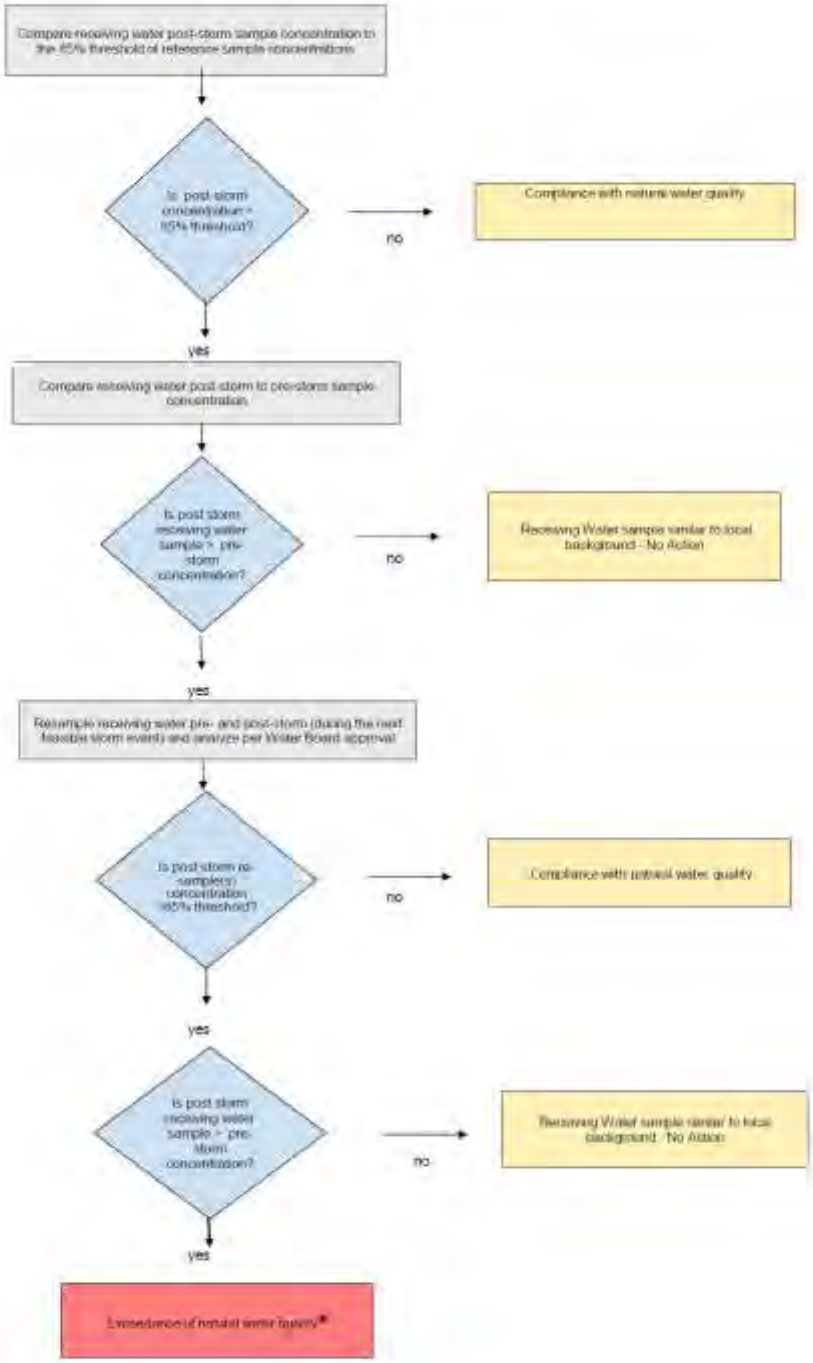

* When an exceedance of natural water quality occurs, the discharger must comply with section I.A.2.h (for permitted storm water) or section I.B.2.c (for nonpoint sources). Note, when sampling data is available, end-of-pipe effluent concentrations will be considered by the Water Boards in making this determination.

ATTACHMENT B

STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

1. Standard Permit Provisions

Code of Federal Regulations Title 40 Section 122.41 (40 CFR 122.41) includes conditions, or provisions, that apply to all National Pollutant Discharge Elimination System (NPDES) permits. Additional provisions applicable to NPDES permits are in 40 CFR 122.42. All applicable provisions in 40 CFR 122.41 and 40 CFR 122.42 must be incorporated into this Order and NPDES permit. The applicable 40 CFR 122.41 and 40 CFR 122.42 provisions are as follows:

a. DUTY TO COMPLY [40 CFR 122.41(a)]

The Copermittee must comply with all of the provisions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

(1) The Copermittee must comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement. [40 CFR 122.41(a)(1)]

(2) The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to a civil penalty not to exceed $25,000 per day for each violation. The CWA provides that any person who *negligently* violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than 2 years, or both. Any person who *knowingly* violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both. Any person who knowingly violates Section 301, 302, 303, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, and who knows at that time that he thereby places another person in imminent

danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.
[40 CFR 122.41(a)(2)]

(3) Any person may be assessed an administrative penalty by the San Diego Regional Water Quality Control Board (San Diego Water Board), State Water Resources Control Board (State Water Board), or United States Environmental Protection Agency (USEPA) for violating Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.
[40 CFR 122.41(a)(3)]

b. DUTY TO REAPPLY [40 CFR 122.41(b)]

If a Copermittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Copermittee must apply for and obtain a new permit.

c. NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE [40 CFR 122.41(c)]

It shall not be a defense for a Copermittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

d. DUTY TO MITIGATE [40 CFR 122.41(d)]

The Copermittee must take all reasonable steps to minimize or prevent any discharge or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

e. PROPER OPERATION AND MAINTENANCE [40 CFR 122.41(e)]

The Copermittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Copermittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by a Copermittee only when the operation is necessary to achieve compliance with the conditions of this permit.

f. PERMIT ACTIONS [40 CFR 122.41(f)]

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Copermittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

g. PROPERTY RIGHTS [40 CFR 122.41(g)]

This permit does not convey any property rights of any sort, or any exclusive privilege.

h. DUTY TO PROVIDE INFORMATION [40 CFR 122.41(h)]

The Copermittee must furnish to the San Diego Water Board, State Water Board, or USEPA within a reasonable time, any information which the San Diego Water Board, State Water Board, or USPEA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Copermittee must also furnish to the San Diego Water Board, State Water Board, or USPEA upon request, copies of records required to be kept by this permit.

i. INSPECTION AND ENTRY [40 CFR 122.41(i)]

The Copermittee must allow the San Diego Water Board, State Water Board, USEPA, and/or their authorized representative (including an authorized contractor acting as their representative), upon presentation of credentials and other documents as may be required by law, to:

(1) Enter upon the Copermittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit; [40 CFR 122.41(i)(1)]

(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit; [40 CFR 122.41(i)(2)]

(3) Inspect and photograph at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; [40 CFR 122.41(i)(3)] and

(4) Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location. [40 CFR 122.41(i)(4)]

j. MONITORING AND RECORDS [40 CFR 122.41(j)]

(1) Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity. [40 CFR 122.41(j)(1)]

(2) Except for records of monitoring information required by this permit related to the Copermittee's sewage sludge use and disposal activities, which shall be retained for

a period of at least five (5) years (or longer as required by 40 CFR Part 503), the Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time. [40 CFR 122.41(j)(2)]

(3) Records for monitoring information must include: [40 CFR 122.41(j)(3)]

(a) The date, exact place, and time of sampling or measurements; [40 CFR 122.41(j)(3)(i)]
(b) The individual(s) who performed the sampling or measurements; [40 CFR 122.41(j)(3)(ii)]
(c) The date(s) analyses were performed; [40 CFR 122.41(j)(3)(iii)]
(d) The individual(s) who performed the analyses; [40 CFR 122.41(j)(3)(iv)]
(e) The analytical techniques or methods used; [40 CFR 122.41(j)(3)(v)] and
(f) The results of such analyses. [40 CFR 122.41(j)(3)(vi)]

(4) Monitoring must be conducted according to test procedures under 40 CFR Part 136 unless another method is required under 40 CFR Subchapters N or O. [40 CFR 122.41(j)(4)]

In the case of pollutants for which there are no approved methods under 40 CFR Part 136 or otherwise required under 40 CFR Subchapters N and O, monitoring must be conducted according to a test procedure specified in the permit for such pollutants. [40 CFR 122.44(i)(1)(iv)]

(5) The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. [40 CFR 122.41(j)(5)]

k. SIGNATORY REQUIREMENT [40 CFR 122.41(k)]

(1) All applications, reports, or information submitted to the San Diego Water Board, State Water Board, or USEPA must be signed and certified. (See 40 CFR 122.22) [40 CFR 122.41(k)(1)]

(a) *For a municipality, State, Federal, or other public agency.* [All applications must be signed] by either a principal executive officer or ranking elected official. [40 CFR 122.22(a)(3)]

(b) All reports required by permits, and other information requested by the San Diego Water Board, State Water Board, or USEPA must be signed by a person described in paragraph (a) of this section, or by a duly authorized

representative of that person. A person is a duly authorized representative only if: [40 CFR 122.22(b)]

(i) The authorization is made in writing by a person described in paragraph (a) of this section; [40 CFR 122.22(b)(1)]

(ii) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company, (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) [40 CFR 122.22(b)(2)] and,

(iii) The written authorization is submitted to the San Diego Water Board and State Water Board. [40 CFR 122.22(b)(3)]

(c) *Changes to authorization.* If an authorization under paragraph (b) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (b) of this section must be submitted to the San Diego Water Board prior to or together with any reports, information, or applications to be signed by an authorized representative. [40 CFR 122.22(c)]

(d) *Certification.* Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." [40 CFR 122.22(d)]

(2) The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both. [40 CFR 122.41(k)(2)]

I. REPORTING REQUIREMENTS [40 CFR 122.41(l)]

(1) *Planned changes.* The Copermittee must give notice to the San Diego Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when: [40 CFR 122.41(l)(1)]

(a) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); [40 CFR 122.41(l)(1)(i)] or

(b) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1). [40 CFR 122.41(l)(1)(ii)]

(c) The alteration or addition results in a significant change in the Copermittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. [40 CFR 122.41(l)(1)(iii)]

(2) *Anticipated noncompliance*. The Copermittee must give advance notice to the San Diego Water Board or State Water Board of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements. [40 CFR 122.41(l)(2)]

(3) *Transfers*. This permit is not transferable to any person except after notice to the San Diego Water Board. The San Diego Water Board may require modification or revocation and reissuance of the permit to change the name of the Copermittee and incorporate such other requirements as may be necessary under the CWA. [40 CFR 122.41(l)(3)]

(4) *Monitoring reports.* Monitoring results must be reported at the intervals specified elsewhere in this permit. [40 CFR 122.41(l)(4)]

(a) Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the San Diego Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices. [40 CFR 122.41(l)(4)(i)]

(b) If the Copermittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or another method required for an industry-specific waste stream under 40 CFR Subchapters N or O, the results of this monitoring must be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the San Diego Water Board or State Water Board. [40 CFR 122.41(l)(4)(ii)]

(c) Calculations for all limitations which require averaging of measurements must utilize an arithmetic mean unless otherwise specified in the permit. [40 CFR 122.41(l)(4)(iii)]

(5) *Compliance schedules*. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date. [40 CFR 122.41(l)(5)]

(6) *Twenty-four hour reporting.*

(a) The Copermittee must report any noncompliance that may endanger health or the environment. Any information must be provided orally within 24 hours from the time the Copermittee becomes aware of the circumstances. A written submission must also be provided within five (5) days of the time the Copermittee becomes aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6)(i)]

(b) The following must be included as information which must be reported within 24 hours under this paragraph: [40 CFR 122.41(l)(6)(ii)]

(i) Any unanticipated bypass that exceeds any effluent limitation in the permit (See 40 CFR 122.41(g)). [40 CFR 122.41(l)(6)(ii)(A)]
(ii) Any upset which exceeds any effluent limitation in the permit. [40 CFR 122.41(l)(6)(ii)(B)] and,
(iii) Violation of a maximum daily discharge limitation for any of the pollutants listed by the San Diego Water Board in the permit to be reported within 24 hours. (See 40 CFR 122.44(g)) [40 CFR 122.41(l)(6)(ii)(C)]

(c) The San Diego Water Board may waive the above-required written report on a case-by-case basis if the oral report has been received within 24 hours. [40 CFR 122.41(l)(6)(iii)]

(7) *Other noncompliance.* The Copermittee must report all instances of noncompliance not reported in accordance with the standard provisions required under 40 CFR 122.41(l)(4), (5), and (6), at the time monitoring reports are submitted. The reports must contain the information listed in the standard provisions required under 40 CFR 122.41(l)(6). [40 CFR 122.41(l)(7))]

(8) *Other information.* When the Copermittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the San Diego Water Board, State Water Board, or USEPA, the Copermittee must promptly submit such facts or information. [40 CFR 122.41(l)(8)]

m. BYPASS [40 CFR 122.41(m)]

(1) *Definitions.*

(a) "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. [40 CFR 122.41(m)(1)(i)] or

(b) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or

substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
[40 CFR 122.41(m)(1)(ii)]

(2) *Bypass not exceeding limitations*. The Copermittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the standard provisions required under 40 CFR 122.41(m)(3) and (4).
[40 CFR 122.41(m)(2)]

(3) *Notice.*

(a) *Anticipated bypass*. If the Copermittee knows in advance of the need for a bypass, it must submit a notice, if possible at least ten days before the date of the bypass. [40 CFR 122.41(m)(3)(i)] or

(b) *Unanticipated bypass*. The Copermittee must submit notice of an unanticipated bypass in accordance with the standard provisions required under 40 CFR 122.41(l)(6) (24-hour notice).
[40 CFR 122.41(m)(3)(ii)]

(4) *Prohibition of Bypass.*

(a) Bypass is prohibited, and the San Diego Water Board may take enforcement action against a Copermittee for bypass, unless:
[40 CFR 122.41(m)(4)(i)]

(i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; [40 CFR 122.41(m)(4)(i)(A)]
(ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance;
[40 CFR 122.41(m)(4)(i)(B)] and,
(iii) The Copermittee submitted notice in accordance with the standard provisions required under 40 CFR 122.41(m)(3).
[40 CFR 122.41(m)(4)(i)(C)]

(b) The San Diego Water Board may approve an anticipated bypass, after considering its adverse effects, if the San Diego Water Board determines that it will meet the three conditions listed above.
[40 CFR 122.41(m)(4)(ii)]

n. UPSET [40 CFR 122.41(n)]

(1) *Definition.* "Upset" means an exceptional incident in which there is unintentional and

temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Copermittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. [40 CFR 122.41(n)(1)]

(2) *Effect of an upset*. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the standard provisions required under 40 CFR 122.41(n)(3) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. [40 CFR 122.41(n)(2)]

(3) *Conditions necessary for a demonstration of upset*. A Copermittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that: [40 CFR 122.41(n)(3)]

(a) An upset occurred and that the Copermittee can identify the cause(s) of the upset; [40 CFR 122.41(n)(3)(i)]
(b) The permitted facility was at the time being properly operated; [40 CFR 122.41(n)(3)(ii)] and
(c) The Copermittee submitted notice of the upset in accordance with the standard provisions required under 40 CFR 122.41(l)(6)(ii)(B) (24-hour notice). [40 CFR 122.41(n)(3)(iii)]
(d) The Copermittee complied with any remedial measures pursuant to the standard provisions required under 40 CFR 122.41(d). [40 CFR 122.41(n)(3)(iii)]

(4) *Burden of proof*. In any enforcement proceeding, the Copermittee seeking to establish the occurrence of an upset has the burden of proof. [40 CFR 122.41(n)(4)]

o. STANDARD PERMIT PROVISIONS FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS [40 CFR 122.42(c)]

The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the San Diego Water Board or State Water Board under 40 CFR 122.26(a)(1)(v) must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report must include:

(1) The status of implementing the components of the storm water management program that are established as permit conditions; [40 CFR 122.42(c)(1)]

(2) Proposed changes to the storm water management programs that are established as permit conditions. Such proposed changes must be consistent with 40 CFR 122.26(d)(2)(iii); [40 CFR 122.42(c)(2)] and

(3) Revisions, if necessary, to the assessment of controls and the fiscal analysis

reported in the permit application under 40 CFR 122.26(d)(2)(iv) and (v); [40 CFR 122.42(c)(3)]

(4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; [40 CFR 122.42(c)(4)]

(5) Annual expenditures and budget for year following each annual report; [40 CFR 122.42(c)(5)]

(6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; [40 CFR 122.42(c)(6)]

(7) Identification of water quality improvements or degradation. [40 CFR 122.42(c)(7)]

p. STANDARD PERMIT PROVISIONS FOR STORM WATER DISCHARGES [40 CFR 122.42(d)]

The initial permits for discharges composed entirely of storm water issued pursuant to 40 CFR 122.26(e)(7) must require compliance with the conditions of the permit as expeditiously as practicable, but in no event later than three years after the date of issuance of the permit.

2. General Provisions

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. The general provisions applicable to this Order and NPDES permit are as follows:

a. DISCHARGE OF WASTE IS A PRIVILEGE

No discharge of waste into the waters of the State, whether or not such discharge is made pursuant to waste discharge requirements, shall create a vested right to continue such discharge. All discharges of waste into waters of the State are privileges, not rights. [CWC Section 13263(g)]

b. DURATION OF ORDER AND NPDES PERMIT

(1) *Effective date*. This Order supersedes Order No. R9-2007-0001 for the San Diego County Copermittees listed in Table ~~2.~~1a and became effective on June 27, 2013~~ for those Copermittees~~. This Order as amended by Order R9-2015-0001 supersedes Order No. R9-2009-0002 for the Orange County Copermittees listed in Table 1b and its amendments through Order No. R9-2015-0001 ~~becomes~~ became effective April 1, 2015~~, following the date Order No. R9-2015-0001 is adopted~~. This Order as amended by Order Nos. R9-2015-0001 and R9-2015-0100 supersedes Order No. R9-2010-0016 for the Riverside County Copermittees listed in Table 1c and its amendments through Order No. R9-2015-0100 became effective January 7, 2016. ~~upon further amendment or earlier notice of coverage.~~

(2) *Expiration*. This Order and NPDES permit expires five years after June 27, 2013, its initial effective date. [40 CFR 122.46(a)]

(3) *Continuation of expired order*. After this Order and NPDES permit expires, the terms and conditions of this Order and NPDES permit are automatically continued pending issuance of a new permit if all requirements of the federal NPDES regulations on the continuation of expired permits (40 CFR 122.6) are complied with.

c. AVAILABILITY

A copy of this Order must be kept at a readily accessible location and must be available to on-site personnel at all times.

d. CONFIDENTIALITY OF INFORMATION

Except as provided for in 40 CFR 122.7, no information or documents submitted in accordance with or in application for this Order will be considered confidential, and all such information and documents shall be available for review by the public at the San Diego Water Board office.

Claims of confidentiality for the following information will be denied:
[40 CFR 122.7(b)]

(1) The name and address of any permit applicant or Copermittee; [40 CFR 122.7(b)(1)] and

(2) Permit applications and attachments, permits, and effluent data. [40 CFR 122.7(b)(2)]

e. EFFLUENT LIMITATIONS

(1) *Interim effluent limitations*. The Copermittee must comply with any interim effluent limitations as established by addendum, enforcement action, or revised waste discharge requirements which have been, or may be, adopted by the San Diego Water Board.

(2) *Other effluent limitations and standards*. If any applicable toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant and that standard or prohibition is more stringent than any limitation on the pollutant in the permit, the San Diego Water Board shall institute proceedings under these regulations to modify or revoke and reissue the permit to conform to the toxic effluent standard or prohibition. [40 CFR 122.44(b)(1)]

f. DUTY TO MINIMIZE OR CORRECT ADVERSE IMPACTS

The Copermittee must take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this Order, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the noncompliance.

g. PERMIT ACTIONS

The filing of a request by the Copermittee for modification, revocation and reissuance, or termination of this Order, or a notification of planned change in or anticipated noncompliance with this Order does not stay any condition of this Order. (See 40 CFR 122.41(f)) In addition, the following provisions apply to this Order:

(1) Upon application by any affected person, or on its own motion, the San Diego Water Board may review and revise the requirements in this Order. All requirements must be reviewed periodically. [CWC Section 13263(e)]

(2) This Order may be terminated or modified for cause, including, but not limited to, all of the following: [CWC Section 13381]

(a) Violation of any condition contained in the requirements of this Order. [CWC Section 13381(a)]

(b) Obtaining the requirements in this Order by misrepresentation, or failure to disclose fully all relevant facts. [CWC Section 13381(b)]

(c) A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge. [CWC Section 13381(c)]

(3) When this Order is transferred to a new owner or operator, such requirements as may be necessary under the CWC may be incorporated into this Order.

h. NPDES PERMITTED NON-STORM WATER DISCHARGES

The San Diego Water Board has, in prior years, issued a limited number of individual NPDES permits for non-storm water discharges to MS4s. The San Diego Water Board or State Water Board may in the future, upon prior notice to the Copermittee(s), issue an NPDES permit for any non-storm water discharge (or class of non-storm water discharges) to an MS4.

i. MONITORING

In addition to the standard provisions required under 40 CFR 122.41(j) and (l)(4), the following general monitoring provisions apply to this Order:

(1) Where procedures are not otherwise specified in Order, sampling, analysis and quality assurance/quality control must be conducted in accordance with the Quality Assurance Management Plan (QAMP) for the State of California's Surface Water Ambient Monitoring Program (SWAMP), adopted by the State Water Resources Control Board (State Water Board).

(2) Pursuant to 40 CFR 122.41(j)(2) and CWC Section 13383(a), each Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring

instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five (5) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time.

(3) All chemical, bacteriological, and toxicity analyses must be conducted at a laboratory certified for such analyses by the California Department of Public Health or a laboratory approved by the San Diego Water Board.

(4) For priority toxic pollutants that are identified in the California Toxics Rule (CTR) (65 Fed. Reg. 31682), the Copermittees must instruct their laboratories to establish calibration standards that are equivalent to or lower than the Minimum Levels (MLs) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP). If a Copermittee can demonstrate that a particular ML is not attainable, in accordance with procedures set forth in 40 CFR Part 136, the lowest quantifiable concentration of the lowest calibration standard analyzed by a specific analytical procedure (assuming that all the method specified sample weights, volumes, and processing steps have been followed) may be used instead of the ML listed in Appendix 4 of the SIP. The Copermittee must submit documentation from the laboratory to the San Diego Water Board for approval prior to raising the ML for any priority toxic pollutant.

j. ENFORCEMENT

(1) The San Diego Water Board is authorized to enforce the terms of this Order under several provisions of the CWC, including, but not limited to, CWC Sections 13385, 13386, and 13387.

(2) Nothing in this Order shall be construed to protect the Copermittee from its liabilities under federal, state, or local laws.

(3) The CWC provides for civil and criminal penalties comparable to, and in some cases greater than, those provided for under the CWA.

(4) Except as provided in the standard conditions required under 40 CFR 122.41(m) and (n), nothing in this Order shall be construed to relieve the Copermittee from civil or criminal penalties for noncompliance.

(5) Nothing in this Order shall be construed to preclude the institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties to which the Copermittee is or may be subject to under Section 311 of the CWA.

(6) Nothing in this Order shall be construed to preclude institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authoring preserved by Section 510 of the CWA.

k. SEVERABILITY

The provisions of this Order are severable, and if any provision of this Order, or the application of any provisions of this Order to any circumstance, is held invalid, the

application of such provision to other circumstances and the remainder of this Order shall not be affected thereby.

l. APPLICATIONS

Any application submitted by a Copermittee for reissuance or modification of this Order must satisfy all applicable requirements specified in federal regulations as well as any additional requirements for submittal of a Report of Waste Discharge specified in the CWC and the California Code of Regulations.

m. IMPLEMENTATION

All plans, reports and subsequent amendments submitted in compliance with this Order must be implemented immediately (or as otherwise specified). All submittals by Copermittees must be adequate to implement the requirements of this Order.

n. REPORT SUBMITTALS

(1) All report submittals must include an executive summary, introduction, conclusion, recommendations, and signed certified statement.

(2) Each Copermittee must submit a signed certified statement covering its responsibilities for each applicable submittal.

(3) The Principal Watershed Copermittee(s) must submit a signed certified statement covering its responsibilities for each applicable submittal and the sections of the submittals for which it is responsible.

(4) Unless otherwise directed, the Copermittees must submit ~~one hard copy and~~ one electronic copy of each report required under this Order to the San Diego Water Board at SanDiego@waterboards.ca.gov~~, and one electronic copy to the USEPA~~.

(5) When hard copies are requested or required, ~~T~~the Copermittees must submit reports and provide notifications as required by this Order to ~~the following~~:

EXECUTIVE OFFICER
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
2375 NORTHSIDE DRIVE, SUITE 100
SAN DIEGO CA 92108
Telephone: (619) 516-1990 Fax: (619) 516-1994

~~EUGENE BROMLEY~~
~~US ENVIRONMENTAL PROTECTION AGENCY~~
~~REGION IX~~
~~PERMITS ISSUANCE SECTION (W-5-1)~~
~~75 HAWTHORNE STREET~~
~~SAN FRANCISCO CA 94105~~

ATTACHMENT C

ACRONYMS AND ABBREVIATIONS

AMAL	Average Monthly Action Level
ASBS	Area(s) of Special Biological Significance
BMP	Best Management Practice
Basin Plan	Water Quality Control Plan for the San Diego Basin
CEQA	California Environmental Quality Act
CCR	California Code of Regulations
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWC	California Water Code
CZARA	Coastal Zone Act Reauthorization Amendments of 1990
ESAs	Environmentally Sensitive Areas
GIS	Geographic Information System
IBI	Index of Biological Integrity
LID	Low Impact Development
MDAL	Maximum Daily Action Level
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
NAL	Non-Storm Water Action Level
NAICS	North American Industry Classification System
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
ROWD	Report of Waste Discharge (application for NPDES reissuance)
SAL	Storm Water Action Level
San Diego Water Board	California Regional Water Quality Control Board, San Diego Region
SIC	Standard Industrial Classification Code
State Water Board	State Water Resources Control Board
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
WDID	Waste Discharge Identification Number
WLA	Waste Load Allocation
WQBEL	Water Quality Based Effluent Limitation

DEFINITIONS

Active/Passive Sediment Treatment - Using mechanical, electrical or chemical means to flocculate or coagulate suspended sediment for removal from runoff from construction sites prior to discharge.

Anthropogenic Litter – Trash generated from human activities, not including sediment.

Average Monthly Action Level – The highest allowable average of daily discharges over a calendar month.

Beneficial Uses - The uses of water necessary for the survival or wellbeing of man, plants, and wildlife. These uses of water serve to promote tangible and intangible economic, social, and environmental goals. "Beneficial Uses" of the waters of the State that may be protected include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. Existing beneficial uses are uses that were attained in the surface or ground water on or after November 28, 1975; and potential beneficial uses are uses that would probably develop in future years through the implementation of various control measures. "Beneficial Uses" are equivalent to "Designated Uses" under federal law. [California Water Code Section 13050(f)].

Best Management Practices (BMPs) - Defined in 40 CFR 122.2 as schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Bioassessment - The use of biological community information to evaluate the biological integrity of a water body and its watershed. With respect to aquatic ecosystems, bioassessment is the collection and analysis of samples of the benthic macroinvertebrate community together with physical/habitat quality measurements associated with the sampling site and the watershed to evaluate the biological condition (i.e. biotic integrity) of a water body.

Biofiltration - Practices that use vegetation and amended soils to detain and treat runoff from impervious areas. Treatment is through filtration, infiltration, adsorption, ion exchange, and biological uptake of pollutants.

Biological Integrity - Defined in Karr J.R. and D.R. Dudley. 1981. Ecological perspective on water quality goals. *Environmental Management* 5:55-68 as: "A balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitat of the region." Also referred to as ecosystem health.

BMP Design Manual – A plan developed to eliminate, reduce, or mitigate the impacts of runoff from development projects, including Priority Development Projects.

Chronic Toxicity – A measurement of sublethal effect (e.g. reduced growth, reproduction) to experimental test organisms exposed to an effluent or receiving waters compared to that of the control organisms.

Clean Water Act Section 303(d) Water Body - An impaired water body in which water quality does not meet applicable water quality standards and/or is not expected to meet water quality standards, even after the application of technology based pollution controls required by the CWA. The discharge of runoff to these water bodies by the Copermittees is significant because these discharges can cause or contribute to violations of applicable water quality standards.

Construction Activities – Actions implemented during construction of development or redevelopment projects during the Preliminary Task (including rough grading and/or disking, clearing and grubbing operations, or any soil disturbance prior to mass grading), Grading or Land Development (including topography and slope reconfiguration, alluvium removals, canyon cleanouts, rock undercuts, keyway excavations, land form grading, and stockpiling of select material for capping operations), Streets and Utility Installation (including excavation and street paving, lot grading, curbs, gutters and sidewalks, public utilities, public water facilities including fire hydrants, public sanitary sewer systems, storm sewer systems and/or other drainage improvements), or Vertical Construction (including the build out of structures from foundations to roofing, including rough landscaping).

Construction Site – Any project, including projects requiring coverage under the Construction General Permit, that involves soil disturbing activities including, but not limited to, clearing, grading, disturbances to ground such as stockpiling, and excavation.

Contamination - As defined in the Porter-Cologne Water Quality Control Act, contamination is "an impairment of the quality of waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste whether or not waters of the State are affected."

Copermittee – A permittee to a NPDES permit that is only responsible for permit conditions relating to the discharge for which it is operator [40 CFR 122.26(b)(1)]. For the purposes of this Order, a Copermittee is one of the individual permittees identified in Tables 1a-1c of this Order.

Copermittees – All of the individual Copermittees, collectively.

Critical Channel Flow (Qc) – The channel flow that produces the critical shear stress that initiates bed movement or that erodes the toe of channel banks. When measuring Qc, it should be based on the weakest boundary material – either bed or bank.

Daily Discharge – Defined as either: (1) the total mass of the constituent discharged over the calendar day or any 24 hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g. concentration.)

The Daily Discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day, or other 24 hour period other than a day), or by the arithmetic mean of analytical results from one or more grab samples taken over the course of a day.

Development Projects - Construction, rehabilitation, redevelopment, or reconstruction of any public or private projects.

Dry Season –May 1 to September 30.

Dry Weather – Weather is considered dry if the preceding 72 hours has been without measurable precipitation (>0.1 inch).

Enclosed Bays – Enclosed bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost bay works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays do not include inland surface waters or ocean waters.

Erosion – When land is diminished or worn away due to wind, water, or glacial ice. Often the eroded debris (silt or sediment) becomes a pollutant via storm water runoff. Erosion occurs naturally but can be intensified by land clearing activities such as farming, development, road building, and timber harvesting.

Environmentally Sensitive Areas (ESAs) - Areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; areas designated as preserves or their equivalent under the Natural Communities Conservation Program within the Cities and County of Orange; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.

Estuaries – Waters, including coastal lagoons, located at the mouth of streams that serve as areas of mixing fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and ocean water. Estuaries do not include inland surface waters or ocean waters.

Existing Development – Any area that has been developed and exists for municipal, commercial, industrial, or residential purposes, uses, or activities. May include areas that are not actively used for its originally developed purpose, but may be re-purposed or redeveloped for another use or activity.

Flow Duration – The long-term period of time that flows occur above a threshold that causes significant sediment transport and may cause excessive erosion damage to creeks and streams (not a single storm event duration). The simplest way to visualize this is to consider a histogram of pre- and post-project flows using long-term records of hourly data. To maintain pre-development flow duration means that the total number of hours (counts) within each range of flows in a flow-duration histogram cannot increase between the pre- and post-development condition. Flow duration within the range of geomorphologically significant flows is important for managing erosion.

Grading - The cutting and/or filling of the land surface to a desired slope or elevation.

Groundwater – Subsurface water that occurs beneath the water table in soils and geologic formations that are fully saturated.

Hazardous Material – Any substance that poses a threat to human health or the environment due to its toxicity, corrosiveness, ignitability, explosive nature or chemical reactivity. These also include materials named by the USEPA in 40 CFR 116 to be reported if a designated quantity of the material is spilled into the waters of the U.S. or emitted into the environment.

Hazardous Waste - Hazardous waste is defined as "any waste which, under Section 600 of Title 22 of this code, is required to be managed according to Chapter 30 of Division 4.5 of Title 22 of this code" [CCR Title 22, Division 4.5, Chapter 11, Article 1].

Household Hazardous Waste – Paints, cleaning products, and other hazardous wastes generated during home improvement or maintenance activities.

Hydromodification – The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

Illicit Connection – Any man-made conveyance or drainage system through which a non-storm water discharge to the storm water drainage system occurs or may occur. Any connection to the MS4 that conveys an illicit discharge.

Illicit Discharge - Any discharge to the MS4 that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from firefighting activities [40 CFR 122.26(b)(2)].

Inactive Areas – Areas of construction activity that are not active and those that have been active and are not scheduled to be re-disturbed for at least 14 days.

Infiltration – In the context of low impact development, infiltration is defined as the percolation of water into the ground. Infiltration is often expressed as a rate (inches per hour), which is determined through an infiltration test. In the context of non-storm water, infiltration is water other than wastewater that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow [40 CFR 35.2005(20)].

Inland Surface Waters – Includes all surface waters of the State that do not include the ocean, enclosed bays, or estuaries.

Jurisdictional Runoff Management Program Document – A written description of the specific jurisdictional runoff management measures and programs that each Copermittee will implement to comply with this Order and ensure that storm water pollutant discharges in runoff are reduced to the MEP and do not cause or contribute to a violation of water quality standards.

Low Impact Development (LID) – A storm water management and land development strategy that emphasizes conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions.

Low Impact Development Best Management Practices (LID BMPs) – LID BMPs include schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States through storm water management and land development strategies that emphasize conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions. LID BMPs include retention practices that do not allow runoff, such as infiltration, rain water harvesting and reuse, and evapotranspiration. LID BMPs also include flow-through practices such as biofiltration that may have some discharge of storm water following pollutant reduction.

Major Outfall – As defined in the Code of Federal Regulations, a major outfall is a MS4 outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (i.e. discharge from a single conveyance other than a circular pipe which is associated with a drainage area of more than 50 acres); or, for MS4s that receive storm water from lands zoned for industrial activity (based on comprehensive zoning plans or equivalent), a MS4 outfall that discharges from a single pipe with an inside diameter of 12 inches or more or from its equivalent (i.e. discharge from other than a circular pipe associated with a drainage area of 2 acres or more).

Maximum Daily Action Level (MDAL) –The highest allowable daily discharge of a pollutant, over a calendar day (or 24 hour period). For pollutants with action levels expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with action levels expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

Maximum Extent Practicable (MEP) – The technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) for storm water that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) in combination with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than BAT. A definition for MEP is not provided either in the statute or in the regulations. Instead the definition of MEP is dynamic and will be defined by the following process over time: municipalities propose their definition of MEP by way of their runoff management programs. Their total collective and individual activities conducted pursuant to the runoff management programs becomes their proposal for MEP as it applies both to their overall effort, as well as to specific activities (e.g., MEP for street sweeping, or MEP for MS4 maintenance). In the absence of a proposal acceptable to the San Diego Water Board, the San Diego Water Board defines MEP.

In a memo dated February 11, 1993, entitled "Definition of Maximum Extent Practicable," Elizabeth Jennings, Senior Staff Counsel, SWRCB addressed the achievement of the MEP standard as follows:

"*To achieve the MEP standard, municipalities must employ whatever Best Management Practices (BMPs) are technically feasible (i.e., are likely to be effective) and are not cost prohibitive. The major emphasis is on technical feasibility. Reducing pollutants to the MEP means choosing effective BMPs, and rejecting applicable BMPs only where other effective BMPs will serve the same purpose, or the BMPs would not be technically feasible, or the cost would be prohibitive. In selecting BMPs to achieve the MEP standard, the following factors may be useful to consider:*

a. *Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?*
b. *Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?*
c. *Public Acceptance: Does the BMP have public support?*
d. *Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?*
e. *Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc.?*

The final determination regarding whether a municipality has reduced pollutants to the maximum extent practicable can only be made by the Regional or State Water Boards, and not by the municipal discharger. If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit derived, it would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs that would address a pollutant source, or to pick a BMP based solely on cost, which would be clearly less effective. In selecting BMPs the municipality must make a serious attempt to comply and practical solutions may not be lightly rejected. In any case, the burden would be on the municipal discharger to show compliance with its permit. After selecting a menu of BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented."

Monitoring Year – October 1 to September 30

Municipal Separate Storm Sewer System (MS4) – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designated or used for collecting or conveying storm water; (iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.26.

National Pollutant Discharge Elimination System (NPDES) - The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the CWA.

Non-Storm Water - All discharges to and from a MS4 that do not originate from precipitation events (i.e., all discharges from a MS4 other than storm water). Non-storm water includes illicit discharges and NPDES permitted discharges.

Nuisance - As defined in the Porter-Cologne Water Quality Control Act, a nuisance is "anything which meets all of the following requirements: 1) Is injurious to health, or is indecent, or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. 2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. 3) Occurs during, or as a result of, the treatment or disposal of wastes."

Ocean Waters – The territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the State Board's California Ocean Plan.

Order – Unless otherwise specified, refers to this Order, Order No. R9-2013-0001 (NPDES No. CAS0109266)

Outfall - Outfall means a point source as defined by 40 CFR 122.2 at the point where a municipal separate storm sewer discharges to waters of the US and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels or other conveyances which connect segments of the same stream or other waters of the US and are used to convey waters of the US.

Persistent Flow - Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

Person - A person is defined as an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof [40 CFR 122.2].

Point Source - Any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, landfill leachate collection systems, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

Pollutant - Any agent that may cause or contribute to the degradation of water quality such that a condition of pollution or contamination is created or aggravated.

Pollution - As defined in the Porter-Cologne Water Quality Control Act, pollution is "the alteration of the quality of the waters of the State by waste, to a degree which unreasonably affects either of the following: 1) The waters for beneficial uses; or 2) Facilities that serve these beneficial uses." Pollution may include contamination.

Pollution Prevention - Pollution prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control BMPs, treatment control BMPs, or disposal.

Pre-Development Runoff Conditions – Approximate flow rates and durations that exist or existed onsite before land development occurs. For new development projects, this equates to runoff conditions immediately before project construction. For redevelopment projects, this equates to runoff conditions from the project footprint assuming infiltration characteristics of the underlying soil, and existing grade. Runoff coefficients of concrete or asphalt must not be used. A redevelopment Priority Development Project must use available information pertaining to existing underlying soil type and onsite existing grade to estimate pre-development runoff conditions.

Priority Development Projects - New development and redevelopment projects defined under Provision E.3.b of Order No. R9-2013-0001, as amended by Order Nos. R9-2015-0001 and R9-2015-0100.

Rainy Season (aka Wet Season) –October 1 to April 30

Receiving Waters – Waters of the United States.

Receiving Water Limitations - Waste discharge requirements issued by the San Diego Water Board typically include both: (1) "Effluent Limitations" (or "Discharge Limitations") that specify the technology-based or water-quality-based effluent limitations; and (2) "Receiving Water Limitations" that specify the water quality objectives in the Basin Plan as well as any other limitations necessary to attain those objectives. In summary, the "Receiving Water Limitations" provision is the provision used to implement the requirements of CWA section 402(p)(3)(B).

Redevelopment - The creation and/or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure~~, and creation or addition of impervious surfaces~~. Replacement of impervious surfaces includes any activity ~~that is not part of a routine maintenance activity~~ where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include routine maintenance activities, such as trenching and resurfacing associated with utility work; pavement grinding; resurfacing existing roadways,~~;~~ ~~new~~ sidewalks ~~construction~~, pedestrian ramps, or bike lanes on existing roads; and routine replacement of damaged pavement, such as pothole repair.

Regional Clearinghouse – A central location for the collection and distribution of information developed and maintained by the Copermittees including, but not limited to, plans, reports, manuals, data, contact information, and/or links to such documents and information.

Rehabilitation - Remedial measures or activities for the purpose of improving or restoring the beneficial uses of streams, channels or river systems. Techniques may vary from in-stream restoration techniques to off-line storm water management practices installed in the system corridor or upland areas, or a combination of in-stream and out of stream techniques. Rehabilitation techniques may include, but are not limited to the following: riparian zone restoration, constructed wetlands, channel modifications that improve habitat and stability, and daylighting of drainage systems.

Reporting Period – The period of information that is reported in the Water Quality Improvement Plan Annual Report. The reporting period consists of two components: 1) July 1 to June 30, consistent with the fiscal year, for the implementation of the jurisdictional runoff management programs, and 2) October 1 to September 30, consistent with the monitoring year for the monitoring and assessment programs. Together, these two time periods constitute the reporting year for the Water Quality Improvement Plan Annual Report due January 31 following the end of the monitoring year.

Retain – Keep or hold in a particular place, condition, or position without discharge to surface waters.

Retrofitting – Storm water management practice put into place after development has occurred in watersheds where the practices previously did not exist or are ineffective. Retrofitting of developed areas is intended to improve water quality, protect downstream channels, reduce flooding, or meet other specific objectives. Retrofitting developed areas may include, but is not limited to replacing roofs with green roofs, disconnecting downspouts or impervious surfaces to drain to pervious surfaces, replacing impervious surfaces with pervious surfaces, installing rain barrels, installing rain gardens, and trash area enclosures.

Runoff - All flows in a storm water conveyance system that consists of the following components: (1) storm water (wet weather flows) and (2) non-storm water including dry weather flows.

San Diego Water Board – As used in this document the term "San Diego Water Board" is synonymous with the term "Regional Board" as defined in Water Code section 13050(b) and is intended to refer to the California Regional Water Quality Control Board for the San Diego Region as specified in Water Code Section 13200.

Sediment - Soil, sand, and minerals washed from land into water. Sediment resulting from anthropogenic sources (i.e. human induced land disturbance activities) is considered a pollutant. This Order regulates only the discharges of sediment from anthropogenic sources and does not regulate naturally occurring sources of sediment. Sediment can destroy fish-nesting areas, clog animal habitats, and cloud waters so that sunlight does not reach aquatic plants.

Source Control BMP – Land use or site planning practices, or structural or nonstructural measures that aim to prevent runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between pollutants and runoff.

Storm Water – Per 40 CFR 122.26(b)(13), means storm water runoff, snowmelt runoff and surface runoff and drainage. Surface runoff and drainage pertains to runoff and drainage resulting from precipitation events.

Structural BMPs - A subset of BMPs which detains, retains, filters, removes, or prevents the release of pollutants to surface waters from development projects in perpetuity, after construction of a project is completed.

Test of Significant Toxicity (TST) - A statistical approach used to analyze toxicity test data. The TST incorporates a restated null hypothesis, Welch's t-test, and biological effect thresholds for chronic and acute toxicity.

Total Maximum Daily Load (TMDL) - The maximum amount of a pollutant that can be discharged into a water body from all sources (point and non-point) and still maintain water quality standards. Under CWA section 303(d), TMDLs must be developed for all water bodies that do not meet water quality standards after application of technology-based controls.

Toxicity - Adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies. The water quality objectives for toxicity provided in the Basin Plan, state in part…"All waters shall be

free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life….The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge."

Toxicity Identification Evaluation (TIE) - A set of procedures for identifying the specific chemical(s) responsible for toxicity. These procedures are performed in three phases (characterization, identification, and confirmation) using aquatic organism toxicity tests.

Toxicity Reduction Evaluation (TRE) - A study conducted in a step-wise process designed to identify the causative agents of effluent or ambient toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in toxicity. The first steps of the TRE consist of the collection of data relevant to the toxicity, including additional toxicity testing, and an evaluation of facility operations and maintenance practices, and best management practices. A Toxicity Identification Evaluation (TIE) may be required as part of the TRE, if appropriate.

Treatment Control BMP – Any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media absorption or any other physical, biological, or chemical process.

Unpaved Road – Any long, narrow stretch without pavement used for traveling by motor passenger vehicles between two or more points. Unpaved roads are generally constructed of dirt, gravel, aggregate or macadam and may be improved or unimproved.

Waste - As defined in CWC Section 13050(d), "waste includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal."

Article 2 of CCR Title 23, Chapter 15 (Chapter 15) contains a waste classification system that applies to solid and semi-solid waste, which cannot be discharged directly or indirectly to water of the state and which therefore must be discharged to land for treatment, storage, or disposal in accordance with Chapter 15. There are four classifications of waste (listed in order of highest to lowest threat to water quality): hazardous waste, designated waste, non-hazardous solid waste, and inert waste.

Water Quality Objective - Numerical or narrative limits on constituents or characteristics of water designated to protect designated beneficial uses of the water. [California Water Code Section 13050 (h)]. California's water quality objectives are established by the State and Regional Water Boards in the Water Quality Control Plans. Numeric or narrative limits for pollutants or characteristics of water designed to protect the beneficial uses of the water. In other words, a water quality objective is the maximum concentration of a pollutant that can exist in a receiving water and still generally ensure that the beneficial uses of the receiving water remain protected (i.e., not impaired). Since water quality objectives are designed specifically to protect the beneficial uses, when the objectives are violated the beneficial uses are, by definition, no longer protected and become impaired. This is a fundamental concept under the Porter Cologne Act. Equally fundamental is Porter Cologne's definition of pollution. A condition of pollution exists when the water quality needed to support designated beneficial uses has

become unreasonably affected or impaired; in other words, when the water quality objectives have been violated. These underlying definitions (regarding beneficial use protection) are the reason why all waste discharge requirements implementing the federal NPDES regulations require compliance with water quality objectives. (Water quality objectives are also called water quality criteria in the CWA.)

Water Quality Standards - Water quality standards, as defined in Clean Water Act section 303(c) consist of the beneficial uses (e.g., swimming, fishing, municipal drinking water supply, etc.,) of a water body and criteria (referred to as water quality objectives in the California Water Code) necessary to protect those uses. Under the Water Code, the water boards establish beneficial uses and water quality objectives in water quality control or basin plans. Together with an anti-degradation policy, these beneficial uses and water quality objectives serve as water quality standards under the Clean Water Act. In Clean Water Act parlance, state beneficial uses are called "designated uses" and state water quality objectives are called "criteria." Throughout this Order, the relevant term is used depending on the statutory scheme.

Waters of the State - Any water, surface or underground, including saline waters within the boundaries of the State [CWC section 13050 (e)]. The definition of the Waters of the State is broader than that for the Waters of the United States in that all water in the State is considered to be a Waters of the State regardless of circumstances or condition.

Waters of the United States - As defined in the 40 CFR 122.2, the Waters of the U.S. are defined as: "(a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate "wetlands;" (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters otherwise defined as waters of the United States under this definition: (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial seas; and (g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA."

Watershed - That geographical area which drains to a specified point on a water course, usually a confluence of streams or rivers (also known as drainage area, catchment, or river basin).

Wet Season (aka Rainy Season) – October 1 to April 30

Wet Weather – Weather is considered wet up to 72 hours after a storm event of 0.1 inches and greater, unless otherwise defined by another regulatory mechanism (e.g. a TMDL).

ATTACHMENT D

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

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JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

FY _____

I. COPERMITTEE INFORMATION

Copermittee Name:

Copermittee Primary Contact Name:

Copermittee Primary Contact Information:
Address:
City: County: State: Zip:
Telephone: Fax: Email:

II. LEGAL AUTHORITY

Has the Copermittee established adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐
A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority?	**YES**	☐
	NO	☐

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

Was an update of the jurisdictional runoff management program document required or recommended by the San Diego Water Board?	**YES**	☐
	NO	☐
If YES to the question above, did the Copermittee update its jurisdictional runoff management program document and make it available on the Regional Clearinghouse?	**YES**	☐
	NO	☐

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

Has the Copermittee implemented a program to actively detect and eliminate illicit discharges and connections to its MS4 that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

Number of non-storm water discharges reported by the public	
Number of non-storm water discharges detected by Copermittee staff or contractors	
Number of non-storm water discharges investigated by the Copermittee	
Number of sources of non-storm water discharges identified	
Number of non-storm water discharges eliminated	
Number of sources of illicit discharges or connections identified	
Number of illicit discharges or connections eliminated	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

V. DEVELOPMENT PLANNING PROGRAM

Has the Copermittee implemented a development planning program that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐
Was an update to the BMP Design Manual required or recommended by the San Diego Water Board?	**YES**	☐
	NO	☐
If YES to the question above, did the Copermittee update its BMP Design Manual and make it available on the Regional Clearinghouse?	**YES**	☐
	NO	☐

Number of proposed development projects in review	
Number of Priority Development Projects in review	
Number of Priority Development Projects approved	
Number of approved Priority Development Projects exempt from any BMP requirements	
Number of approved Priority Development Projects allowed alternative compliance	
Number of Priority Development Projects granted occupancy	

Number of completed Priority Development Projects in inventory	
Number of high priority Priority Development Project structural BMP inspections	
Number of Priority Development Project structural BMP violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

FY _____

VI. CONSTRUCTION MANAGEMENT PROGRAM

Has the Copermittee implemented a construction management program that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

Number of construction sites in inventory	
Number of active construction sites in inventory	
Number of inactive construction sites in inventory	
Number of construction sites closed/completed during reporting period	
Number of construction site inspections	
Number of construction site violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

Has the Copermittee implemented an existing development management program that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

	Municipal	Commercial	Industrial	Residential
Number of facilities or areas in inventory				
Number of existing development inspections				
Number of follow-up inspections				
Number of violations				
Number of enforcement actions issued				
Number of escalated enforcement actions issued				

VIII. PUBLIC EDUCATION AND PARTICIPATION

Has the Copermittee implemented a public education program component that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐
Has the Copermittee implemented a public participation program component that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

IX. FISCAL ANALYSIS

Has the Copermittee attached to this form a summary of its fiscal analysis that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

X. CERTIFICATION

I [☐ Principal Executive Officer ☐ Ranking Elected Official ☐ Duly Authorized Representative] certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature	Date
Print Name	Title
Telephone Number	Email

ATTACHMENT E

SPECIFIC PROVISIONS FOR TOTAL MAXIMUM DAILY LOADS APPLICABLE TO ORDER NO. R9-2013-0001, AS AMENDED BY ORDER NOS. R9-2015-0001 AND R9-2015-0100

These provisions implement load allocations (LAs) and wasteload allocations (WLAs) of the Total Maximum Daily Loads (TMDLs) established by the San Diego Water Board or USEPA under Clean Water Act section 303(c), applicable to discharges regulated under this Order. The provisions and schedules for implementation of the TMDLs described below must be incorporated into the Water Quality Improvement Plans, required pursuant to Provision B of this Order, for the specified Watershed Management Areas.

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed
2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin
3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed
4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek
5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay
6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)
7. Total Maximum Daily Load for Sediment in Los Peñasquitos Lagoon

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2002-0123

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	August 14, 2002
State Water Board Approval Date:	July 16, 2003
Office of Administrative Law Approval Date:	September 11, 2003
US EPA Approval Date:	November 3, 2003

(3) TMDL Effective Date: September 11, 2003

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final diazinon TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must be in compliance with the final TMDL compliance requirements as of December 31, 2010.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations:

Table 1.1
Final Receiving Water Limitations Expressed as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Diazinon	Acute	0.08 µg/L	1 hour
	Chronic	0.05 µg/L	4 days

(b) Final Effluent Limitations

Discharges from the MS4s containing concentrations that do not exceed the following effluent limitations will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 1.b.(2)(a):

Table 1.2
Final Effluent Limitations Expressed as Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation	Averaging Period
Diazinon	Acute	0.072 µg/L	1 hour
	Chronic	0.045 µg/L	4 days

(c) Best Management Practices

The following BMPs for Chollas Creek must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area and implemented by the Responsible Copermittees:

(i) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 1.b.(2)(a) and/or the effluent limitations under Specific Provision 1.b.(2)(b) for Chollas Creek.

(ii) The Responsible Copermittees must implement the Diazinon Toxicity Control Plan and Diazinon Public Outreach/Education Program as described in the report titled, *Technical Report for Total Maximum Daily Load for Diazinon in Chollas Creek Watershed, San Diego County*, dated August 14, 2002, including subsequent modifications, in order to achieve the receiving water limitations under Specific Provision 1.b.(2)(a) and/or the effluent limitations under Specific Provision 1.b.(2)(b).

(iii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 1.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 1.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 1.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 1.b.(2)(c) achieves compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 1.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 1.d, to demonstrate compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The Responsible Copermittees must be in compliance with the final diazinon TMDL compliance requirements as of December 31, 2010.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls for diazinon within the Chollas Creek watershed, and calculate or estimate the annual diazinon loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment

Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 1.b.(2)(b), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0019

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	September 22, 2005
Office of Administrative Law Approval Date:	December 2, 2005
US EPA Approval Date:	February 8, 2006

(3) TMDL Effective Date: December 2, 2005

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Shelter Island Yacht Basin

(6) Responsible Copermittee: City of San Diego

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final dissolved copper TMDL compliance requirements for Shelter Island Yacht Basin consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittee must be in compliance with the final TMDL compliance requirements as of December 2, 2005.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations:

Table 2.1
Final Receiving Water Limitations Expressed as Concentrations in Shelter Island Yacht Basin

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Dissolved Copper	Acute	4.8 µg/L x WER*	1 hour
	Chronic	3.1 µg/L x WER*	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 2.b.(2)(a):

Table 2.2
Final Effluent Limitations as Expressed as Annual Loads in MS4 Discharges to Shelter Island Yacht Basin

Constituent	Effluent Limitation
Dissolved Copper	30 kg/yr*

* If the water quality objectives for dissolved copper in Shelter Island Yacht Basin are changed in the future, then the margin of safety (MOS), TMDL and allocations will be recalculated using the *Method for Recalculation of the Total Maximum Daily Load for Dissolved Copper in the Shelter Island Yacht Basin, San Diego Bay* in the Basin Plan (p. 7-14).

(c) Best Management Practices

The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 2.b.(2)(a) and/or the effluent limitations under Specific Provision 2.b.(2)(b) for Shelter Island Yacht Basin. The BMPs must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 2.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 2.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittee develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 2.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 2.b.(2)(c) achieves compliance with Specific Provisions 2.b.(3)(a), 2.b.(3)(b) and/or 2.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 2.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 2.d, to demonstrate compliance with Specific Provisions 2.b.(3)(a), 2.b.(3)(b) and/or 2.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The Responsible Copermittees must be in compliance with the final dissolved copper TMDL compliance requirements as of December 2, 2005.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

The Responsible Copermittee must monitor the effluent of its MS4 outfalls for dissolved copper, and calculate or estimate the monthly and annual dissolved copper loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.(b)(2)of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0036

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	November 16, 2005
Office of Administrative Law Approval Date:	February 1, 2006
US EPA Approval Date:	March 22, 2006

(3) TMDL Effective Date: February 1, 2006

(4) Watershed Management Area: Santa Margarita River

(5) Water Body: Rainbow Creek

(6) Responsible Copermittee: County of San Diego

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final total nitrogen and total phosphorus TMDL compliance requirements for Rainbow Creek consist of the following

(1) Final TMDL Compliance Date

The Responsible Copermittee must comply with final TMDL compliance requirements by December 31, 2021.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance date under Specific Provision 3.b.(1):

Table 3.1
Final Receiving Water Limitations Expressed as Concentrations in Rainbow Creek

Constituent	Receiving Water Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing concentrations that do not exceed the following effluent limitations by the compliance date under Specific Provision 3.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 3.b.(2)(a):

Table 3.2
Final Effluent Limitations Expressed as Concentrations in MS4 Discharges to Rainbow Creek

Constituent	Effluent Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(ii) Annual pollutant loads from given land uses discharging to and from the MS4s that do not exceed the following annual loads by the compliance date under Specific Provision 3.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 3.b.(2)(a):

Table 3.3
Final Effluent Limitations Expressed as Annual Loads in MS4 Discharges to Rainbow Creek

Land Use	Total N	Total P
Commercial nurseries	116 kg/yr	3 kg/yr
Park	3 kg/yr	0.1 kg/yr
Residential areas	149 kg/yr	12 kg/yr
Urban areas	27 kg/yr	6 kg/yr

(c) Best Management Practices

(i) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 3.b.(2)(a) and/or the effluent limitations under Specific Provision 3.b.(2)(b) for Rainbow Creek.

(ii) The Responsible Copermittee should coordinate any BMPs implemented to address this TMDL with Caltrans and other sources as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under

Specific Provision 3.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 3.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the final effluent limitations under Specific Provision 3.b.(2)(b)(ii); OR

(e) The Responsible Copermittee develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 3.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Specific Provision 3.b.(2)(c) achieves compliance with Specific Provisions 3.b.(3)(a), 3.b.(3)(b), 3.b.(3)(c) and/or 3.b.(3)(d),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 3.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 3.d, to demonstrate compliance with Specific Provisions 3.b.(3)(a), 3.b.(3)(b), 3.b.(3)(c) and/or 3.b.(3)(d).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim total nitrogen and total phosphorus TMDL compliance requirements for Rainbow Creek consist of the following:

(1) Interim Compliance Dates and WQBELs

The Responsible Copermittee must comply with the interim WQBELs, expressed as annual loads, by December 31 of the interim compliance year given in Table 3.4.

Table 3.4
Interim Water Quality Based Effluent Limitations Expressed as Annual Loads in MS4 Discharges from Specific Land Uses to Rainbow Creek

	Total N Interim Effluent Limitations (kg/yr)			Total P Interim Effluent Limitations (kg/yr)		
	Interim Compliance Date			Interim Compliance Date		
Land Use	**2009**	**2013**	**2017**	**2009**	**2013**	**2017**
Commercial nurseries	390	299	196	20	16	10
Park	5	3	3	0.15	0.10	0.10
Residential areas	507	390	260	99	74	47
Urban areas	40	27	27	9	6	6

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 3.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 3.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the final effluent limitations under Specific Provision 3.b.(2)(b)(ii); OR

(e) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the interim effluent limitations under Specific Provision 3.c.(1); OR

(f) The Responsible Copermittee has submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

d. Specific Monitoring and Assessment Requirements

(1) The Responsible Copermittee must incorporate into the Water Quality Improvement Plan and implement the Sampling and Analysis Plan for Rainbow Creek Nutrient Reduction TMDL Implementation Water Quality Monitoring, dated January 2010.

(2) The results of any monitoring conducted during the reporting period, and assessment of whether the interim and final TMDL compliance requirements have been achieved must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 3.b.(2)(b)(i), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2007-0043

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2007
State Water Board Approval Date:	July 15, 2008
Office of Administrative Law Approval Date:	October 22, 2008
US EPA Approval Date:	December 18, 2008

(3) TMDL Effective Date: October 22, 2008

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final dissolved copper, lead, and zinc TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must comply with the final TMDL compliance requirements by October 22, 2028.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance date under Specific Provision 4.b.(1):

Table 4.1
Final Receiving Water Limitations Expressed as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$(0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$(0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$(0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$(0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations by the compliance date under Specific Provision 4.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 4.b.(2)(a):

Table 4.2
Final Effluent Limitations as Expressed Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(c) Best Management Practices

(i) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 4.b.(2)(a) and/or the effluent limitations under Specific Provision 4.b.(2)(b) for Chollas Creek.

(ii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans and the U.S. Navy as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 4.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 4.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 4.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 4.b.(2)(c) achieves compliance with Specific Provisions 4.b.(3)(a), 4.b.(3)(b) and/or 4.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 4.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 4.d, to demonstrate compliance with Specific Provisions 4.b.(3)(a), 4.b.(3)(b) and/or 4.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim dissolved copper, lead, and zinc TMDL compliance requirements for Chollas Creek consist of the following:

(1) Interim Compliance Date and WQBELs

The Responsible Copermittee must comply with the interim WQBELs, expressed as concentrations, by the interim compliance date given in Table 4.3:

Table 4.3
Interim Water Quality Based Effluent Limitations Expressed as Concentrations in MS4 Discharges to Chollas Creek

Interim Compliance Date	Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
October 22, 2018	Dissolved Copper	Acute	$1.2 \times 90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
	Dissolved Lead	Acute	$1.2 \times 90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
	Dissolved Zinc	Acute	$1.2 \times 90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 4.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 4.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) There are no exceedances of the interim effluent limitations under Specific

Provision 4.c.(1) at the Responsible Copermittee's MS4 outfalls; OR

(e) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance date.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*, when it is amended to include monitoring requirements for the Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls discharging to Chollas Creek for dissolved copper, lead, and zinc, and calculate or estimate the monthly and annual dissolved copper, lead, and zinc loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 4.b.(2)(b) or 4.c.(1), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2008-0027

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 11, 2008
State Water Board Approval Date:	June 16, 2009
Office of Administrative Law Approval Date:	September 15, 2009
US EPA Approval Date:	October 26, 2009

(3) TMDL Effective Date: September 15, 2009

(4) Watershed Management Areas: See Table 5.0

(5) Water Bodies: See Table 5.0

(6) Responsible Copermittees: See Table 5.0

Table 5.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County	Dana Point Harbor	Baby Beach	-City of Dana Point -County of Orange
San Diego Bay	San Diego Bay	Shelter Island Shoreline Park	- San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final indicator bacteria TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Final TMDL Compliance Dates

(a) Baby Beach in Dana Point Harbor

The Responsible Copermittees for MS4 discharges to Baby Beach must be in compliance with the final TMDL compliance requirements according to the following compliance dates:

Table 5.1
Compliance Dates to Achieve Final TMDL Compliance Requirements For Baby Beach in Dana Point Harbor

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform	September 15, 2014	September 15, 2009
Fecal Coliform		September 15, 2009
Enterococcus		September 15, 2019

(b) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park must be in compliance with the final TMDL compliance requirements as of December 31, 2012.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance dates under Specific Provision 5.b.(1):

Table 5.2
Final Receiving Water Limitations Expressed as Bacteria Densities in the Water Body

	Receiving Water Limitations	
Constituent	Single Sample Maximum[1,2]	30-Day Geometric Mean[2]
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing indicator bacteria densities that do not exceed the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.3a
Final Effluent Limitations as Expressed as Bacteria Densities in MS4 Discharges to the Water Body

	Effluent Limitations	
Constituent	**Single Sample Maximum[1,2]**	**30-Day Geometric Mean[2]**
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.

(ii) Discharges from the MS4s containing indicator bacteria loads that do not exceed the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.4a
Final Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to the Baby Beach in Dana Point Harbor

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0.86×10^9 MPN/day	$3{,}254 \times 10^9$ MPN/30days
Fecal Coliform	0.17×10^9 MPN/day	112×10^9 MPN/30days
Enterococcus	0.03×10^9 MPN/day	114×10^9 MPN/30days

Table 5.4b
Final Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to the Shelter Island Shoreline Park in San Diego Bay

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0 MPN/day	198×10^9 MPN/30days
Fecal Coliform	0 MPN/day	8×10^9 MPN/30days
Enterococcus	0 MPN/day	26×10^9 MPN/30days

(iii) Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.5a
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to Baby Beach in Dana Point Harbor*

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	90.4%	0%
Fecal Coliform	82.7%	0%
Enterococcus	96.2%	62.2%

Notes:
* The percent load reductions are relative to data collected between 1996-2002. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittees' MS4s must not exceed the loads in Table 5.4a, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the water body.

Table 5.5b
*Final Effluent Limitations Expressed as Percent Load Reductions** in MS4 Discharges to Shelter Island Shoreline Park in San Diego Bay*

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0%	0%
Fecal Coliform	0%	0%
Enterococcus	0%	0%

Notes:
* The percent load reductions are relative to data collected between 1999-2004. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittee's MS4s must not exceed the loads in Table 5.4b, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the water body.

(c) Best Management Practices

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 5.0 must incorporate the Bacteria Load Reduction Plan (BLRP) required to be developed pursuant to Resolution No. R9-2008-0027.

(ii) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 5.b.(2)(a) and/or the effluent limitations under Specific Provision 5.b.(2)(b) for the segments or areas of the water bodies listed in Table 5.0

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.b.(2)(b)(ii); OR

(e) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 5.b.(2)(b)(iii); OR

(f) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(g) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 5.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 5.b.(2)(c) achieves compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 5.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 5.d, to demonstrate compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim indicator bacteria TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Baby Beach in Dana Point Harbor

(a) Interim TMDL Compliance Dates and WQBELs

The Responsible Copermittees for MS4 discharges to Baby Beach must comply with the following interim WQBELs by the interim compliance dates given in Tables 5.6a and/or 5.6b:

Table 5.6a
Interim Water Quality Based Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to Baby Beach in Dana Point Harbor

Constituent	Interim Compliance Dates	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	4.93×10^9 MPN/day	$3{,}254 \times 10^9$ MPN/30days*
Fecal Coliform	September 15, 2012	0.59×10^9 MPN/day	112×10^9 MPN/30days*
Enterococcus	September 15, 2012	0.42×10^9 MPN/day	301×10^9 MPN/30days
	September 15, 2016	0.03×10^9 MPN/day *	207×10^9 MPN/30days

Notes:
* Same as the final effluent limitations in Table 5.4a.

Table 5.6b
Interim Water Quality Based Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to Baby Beach in Dana Point Harbor*

Constituent	Interim Compliance Dates	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	45.2%	0%**
Fecal Coliform	September 15, 2012	41.4%	0%**
Enterococcus	September 15, 2012	48.1%	0%
	September 15, 2016	96.2%**	31.1%

Notes:
* The percent load reductions are relative to data collected between 1996-2002. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittees' MS4s must not exceed the loads in Table 5.6a, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the waterbody.
** Same as the final effluent limitations in Table 5.5a.

(b) Interim Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(i) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(ii) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(iii) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(iv) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.b(2)(b)(ii); OR

(v) The Responsible Copermittees can demonstrate that exceedances of the applicable receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(vi) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the interim effluent limitations under Table 5.6a of Specific Provision 5.c.(1)(a); OR

(vii) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the interim effluent limitations under Table 5.6b of Specific Provision 5.c.(1)(a); OR

(viii) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

(2) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park must be in compliance with the final indicator bacteria TMDL requirements as of December 31, 2012.

d. Specific Monitoring and Assessment Requirements

(1) Monitoring Stations

Monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[38] If discharges of bacteria from the MS4 exceed the applicable interim or final WQBELs, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(2) Monitoring Procedures

(a) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) The Responsible Copermittees must collect wet weather monitoring samples within the first 24 hours of a storm event[39] of the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(c) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

[38] Commonly referred to as AB 411 monitoring

[39] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs have been achieved.

(b) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 5.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(c) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to correlate elevated bacteria levels with known or suspected sewage spills from wastewater collection systems and treatment plants or boats.

(d) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2010-0001

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 10, 2010
State Water Board Approval Date:	December 14, 2010
Office of Administrative Law Approval Date:	April 4, 2011
US EPA Approval Date:	June 22, 2011

(3) TMDL Effective Date: April 4, 2011

(4) Watershed Management Areas: See Table 6.0

(5) Water Bodies: See Table 6.0

(6) Responsible Copermittees: See Table 6.0

Table 6.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	-City of Laguna Beach -County of Orange -Orange County Flood Control District
		at Heisler Park - North	
	Pacific Ocean Shoreline	at Main Laguna Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Woods -County of Orange -Orange County Flood Control District
		Laguna Beach at Ocean Avenue	
		Laguna Beach at Cleo Street	
		Arch Cove at Bluebird Canyon Road	
		Laguna Beach at Dumond Drive	
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Hills -City of Laguna Niguel -City of Laguna Woods -City of Lake Forest -City of Mission Viejo -County of Orange -Orange County Flood Control District
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	
	Aliso Creek Mouth	at mouth	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	-City of Dana Point -City of Laguna Beach -City of Laguna Niguel -County of Orange -Orange County Flood Control District
		Aliso Beach at Table Rock Drive	
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)	
		at Salt Creek (large outlet)	
		Salt Creek Beach at Salt Creek service road	
		Salt Creek Beach at Strand Road	
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	-City of Dana Point -City of Laguna Hills -City of Laguna Niguel -City of Mission Viejo -City of Rancho Santa Margarita -City of San Juan Capistrano -County of Orange -Orange County Flood Control District
	San Juan Creek	lower 1 mile	
	San Juan Creek Mouth	at mouth	
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	-City of Dana Point -City of San Clemente -County of Orange -Orange County Flood Control District
		Ole Hanson Beach Club Beach at Pico Drain	
		San Clemente City Beach at El Portal Street Stairs	
		San Clemente City Beach at Mariposa Street	
		San Clemente City Beach at Linda Lane	
		San Clemente City Beach at South Linda Lane	
		San Clemente City Beach at Lifeguard Headquarters	
		under San Clemente Municipal Pier	
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	
		San Clemente State Beach at Riviera Beach	
		Can Clemente State Beach at Cypress Shores	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	-City of Oceanside -City of Vista -County of San Diego
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	-City of Carlsbad -City of Encinitas -City of Escondido -City of San Marcos -County of San Diego
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	-City of Del Mar -City of Escondido -City of Poway -City of San Diego -City of Solana Beach -County of San Diego
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	-City of Del Mar -City of Poway -City of San Diego -County of San Diego
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	-City of San Diego
		La Jolla Shores Beach at Caminito del Oro	
		La Jolla Shores Beach at Vallecitos	
		La Jolla Shores Beach at Avenida de la Playa	
		at Casa Beach, Children's Pool	
		South Casa Beach at Coast Boulevard	
		Whispering Sands Beach at Ravina Street	
		Windansea Beach at Vista de la Playa	
		Windansea Beach at Bonair Street	
		Windansea Beach at Playa del Norte	
		Windansea Beach at Palomar Avenue	
		at Tourmaline Surf Park	
		Pacific Beach at Grand Avenue	
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I- Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	-City of El Cajon -City of Santee -County of San Diego
	San Diego River	lower 6 miles	-City of El Cajon -City of La Mesa -City of San Diego -City of Santee -County of San Diego
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	-City of La Mesa -City of Lemon Grove -City of San Diego -County of San Diego - San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final indicator bacteria TMDL compliance requirements for the water bodies listed in Table 6.0 consist of the following:

(1) Final TMDL Compliance Dates

The Responsible Copermittees for MS4 discharges to the water bodies listed in Table 6.0 must be in compliance with the final TMDL compliance requirements according to the following compliance dates:

Table 6.1
Compliance Dates to Achieve Final TMDL Compliance Requirements

Constituent	Dry Weather TMDL Compliance Date	Wet Weather TMDL Compliance Date*
Total Coliform	April 4, 2021	April 4, 2031 (April 4, 2021)
Fecal Coliform		
Enterococcus		

* The Wet Weather TMDL Compliance Date in parenthesis applies if the applicable Water Quality Improvement Plan does not include load reduction programs for other constituents (e.g. metals, pesticides, trash, nutrients, sediment, etc.) together with bacteria load reduction requirements of these TMDLs.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance dates under Specific Provision 6.b.(1):

Table 6.2a
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Beaches

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform	10,000	22%	1,000	0%
Fecal Coliform	400	22%	200	0%
Enterococcus	104	22%	35	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan.

Table 6.2b
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Creeks

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Fecal Coliform	400	22%	200	0%
Enterococcus	61 (104)	22%	33	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Basin Plan.
d. A single sample maximum of 104 MPN/100ml for *Enterococcus* may be applied as a receiving water limitation for creeks, instead of 61 MPN/100mL, if one or more of the creeks addressed by these TMDLs (San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek, San Diego River, and/or Chollas Creek) is designated with a "moderately to lightly used area" or less frequent usage frequency in the Basin Plan. Otherwise, the single sample maximum of 61 MPN/100mL for *Enterococcus* must be used to assess compliance with the allowable exceedance frequency.

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing indicator bacteria densities that do not exceed the following effluent limitations by the compliance dates under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a):

Table 6.2c
Final Effluent Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies in MS4 Discharges to the Water Body

Constituent	Concentration-Based Effluent Limitations			
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform[d]	10,000	22%	1,000	0%
Fecal Coliform	400	22%	200	0%
Enterococcus	104[e] / 61[f]	22%	35[e] / 33[f]	0%

Notes:
a. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan for discharges to beaches, and the Basin Plan for discharges to creeks and creek mouths.
d. Total coliform effluent limitations only apply to MS4 outfalls that discharge to the Pacific Ocean Shorelines and creek mouths listed in Table 6.0.
e. This *Enterococcus* effluent limitation applies to MS4 discharges to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
f. This *Enterococcus* effluent limitation applies to MS4 discharges to segments or areas of creeks or creek mouths listed in Table 6.0.

(ii) Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the compliance dates under Specific Provision 6.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a):

Table 6.3
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watershed and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
South Orange County	**San Joaquin Hills HSA** (901.11) and **Laguna Hills HSA** (901.12) - Pacific Ocean Shoreline	91.78%	91.72%	98.28%	46.85%	52.07%	51.26%
	Aliso HSA (901.13) - Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	95.47%	95.58%	99.13%	25.29%	26.62%	27.52% (27.37%)**
	Dana Point HSA (901.14) - Pacific Ocean Shoreline	95.04%	95.03%	98.98%	13.15%	14.86%	15.16%
	Lower San Juan HSA (901.27) - Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	72.96%	74.21%	94.94%	19.21%	12.82%	27.12% (26.90%)**
	San Clemente HA (901.30) - Pacific Ocean Shoreline	94.28%	94.23%	98.83%	23.85%	24.58%	25.26%
San Luis Rey River	**San Luis Rey HU** (903.00) - Pacific Ocean Shoreline	38.13%	39.09%	87.38%	5.62%	3.12%	11.69%

Table 6.3 (Cont'd)
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watershed and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
Carlsbad	**San Marcos HA** (904.50) - Pacific Ocean Shoreline	82.82%	82.55%	96.03%	18.47%	18.98%	20.19%
San Dieguito River	**San Dieguito HU** (905.00) - Pacific Ocean Shoreline	14.39%	20.72%	83.48%	4.29%	1.46%	7.72%
Penasquitos	**Miramar Reservoir HA** (906.10) - Pacific Ocean Shoreline	96.50%	96.59%	99.42%	1.61%	1.99%	1.93%
Mission Bay	**Scripps HA** (906.30) - Pacific Ocean Shoreline	96.44%	96.42%	99.25%	16.32%	21.14%	18.82%
	Tecolote HA (906.50) - Tecolote Creek	94.51%	94.59%	98.94%	16.51%	20.47%	18.15% (18.08%)**
San Diego River	**Mission San Diego HSA** (907.11) and **Santee HSA** (907.12) - Pacific Ocean Shoreline - Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles)	74.03%	69.44%	93.96%	38.14%	53.22%	42.74% (42.47%)**
San Diego Bay	**Chollas HSA** (908.22) - Chollas Creek	92.06%	92.15%	98.46%	17.82%	24.84%	21.46% (21.36%)**

Notes:
* The percent load reductions are based on reducing loads compared to pollutant loads from 2001 to 2002.
** The alternative *Enterococcus* percent load reduction was calculated based on a numeric target of 104 MPN/100mL instead of 61 MPN/100mL, protective of the REC-1 "moderately to lightly used area" usage frequency that is protective of freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative pollutant load reductions can be utilized.

(c) Best Management Practices

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 6.0 must incorporate the Bacteria Load Reduction Plans (BLRPs) or Comprehensive Load Reduction Plans (CLRPs) required to be developed pursuant to Resolution No. R9-2010-0001.

(ii) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 6.b.(2)(a) and/or the effluent limitations under Specific Provision 6.b.(2)(b) for the segments or areas of the water bodies listed in Table 6.0.

(iii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans, owners/operators of small MS4s, and agricultural dischargers as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(f) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 6.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 6.b.(2)(c) achieves compliance with Specific Provisions 6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), and/or 6.b.(3)(e),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 6.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 6.d, to demonstrate compliance with Specific Provisions 6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), 6.b.(3)(e) and/or 6.b.(3)(f).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim indicator bacteria TMDL compliance requirements for the water bodies listed in Table 6.0 consist of the following:

(1) Interim TMDL Compliance Dates

The Responsible Copermittees must achieve compliance with the interim TMDL compliance requirements, as determined in accordance with Specific Provision 6.c.(3), by the interim compliance dates given in Table 6.4, unless alternative interim compliance dates are accepted by the San Diego Water Board Executive Officer as part of the Water Quality Improvement Plan.

Table 6.4
Interim Compliance Dates to Achieve Interim TMDL Compliance Requirements

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs*
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	April 4, 2016	April 4, 2021 (April 4, 2016)
		at Heisler Park - North		
	Pacific Ocean Shoreline	at Main Laguna Beach	April 4, 2016	April 4, 2021 (April 4, 2016)
		Laguna Beach at Ocean Avenue		
		Laguna Beach at Cleo Street		
		Arch Cove at Bluebird Canyon Road		
		Laguna Beach at Dumond Drive		
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	April 4, 2016	April 4, 2021 (April 4, 2016)
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	April 4, 2018	April 4, 2021 (April 4, 2018)
	Aliso Creek Mouth	at mouth	April 4, 2018	April 4, 2021 (April 4, 2018)
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	April 4, 2016	April 4, 2021 (April 4, 2016)
		Aliso Beach at Table Rock Drive		
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)		
		at Salt Creek (large outlet)		
		Salt Creek Beach at Salt Creek service road	April 4, 2017	April 4, 2021 (April 4, 2017)
		Salt Creek Beach at Strand Road	April 4, 2017	April 4, 2021 (April 4, 2017)

Table 6.4 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs*
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	April 4, 2016	April 4, 2021 (April 4, 2016)
	San Juan Creek	lower 1 mile	April 4, 2018	April 4, 2021 (April 4, 2018)
	San Juan Creek Mouth	at mouth	April 4, 2016	April 4, 2021 (April 4, 2016)
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	April 4, 2016	April 4, 2021 (April 4, 2016)
		Ole Hanson Beach Club Beach at Pico Drain	April 4, 2016	April 4, 2021 (April 4, 2016)
		San Clemente City Beach at El Portal Street Stairs	April 4, 2017	April 4, 2021 (April 4, 2017)
		San Clemente City Beach at Mariposa Street		
		San Clemente City Beach at Linda Lane	April 4, 2016	April 4, 2021 (April 4, 2016)
		San Clemente City Beach at South Linda Lane	April 4, 2018	April 4, 2021 (April 4, 2018)
		San Clemente City Beach at Lifeguard Headquarters	April 4, 2017	April 4, 2021 (April 4, 2017)
		under San Clemente Municipal Pier		
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	April 4, 2018	April 4, 2021 (April 4, 2018)
		San Clemente State Beach at Riviera Beach	April 4, 2016	April 4, 2021 (April 4, 2016)
		Can Clemente State Beach at Cypress Shores	April 4, 2017	April 4, 2021 (April 4, 2017)
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	April 4, 2017	April 4, 2021 (April 4, 2017)
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	April 4, 2016	April 4, 2021 (April 4, 2016)
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	April 4, 2016	April 4, 2021 (April 4, 2016)

Table 6.4 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs*
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	April 4, 2016	April 4, 2021 (April 4, 2016)
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	April 4, 2016	April 4, 2021 (April 4, 2016)
		La Jolla Shores Beach at Caminito del Oro		
		La Jolla Shores Beach at Vallecitos		
		La Jolla Shores Beach at Avenida de la Playa		
		at Casa Beach, Children's Pool		
		South Casa Beach at Coast Boulevard		
		Whispering Sands Beach at Ravina Street		
		Windansea Beach at Vista de la Playa		
		Windansea Beach at Bonair Street		
		Windansea Beach at Playa del Norte		
		Windansea Beach at Palomar Avenue		
		at Tourmaline Surf Park		
		Pacific Beach at Grand Avenue		
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries		
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	April 4, 2018	April 4, 2021 (April 4, 2018)
	San Diego River	lower 6 miles		
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach		
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	April 4, 2018	April 4, 2021 (April 4, 2018)

* The Interim Compliance Dates to achieve the Interim Wet Weather WQBELs in parenthesis apply if the applicable Water Quality Improvement Plan does not include load reduction programs for other constituents (e.g. metals, pesticides, trash, nutrients, sediment, etc.) together with bacteria load reduction requirements of these TMDLs.

(2) Interim Water Quality Based Effluent Limitations

The Responsible Copermittees for discharges to the water bodies in Table 6.0 must comply with the following interim WQBELs by the interim compliance dates given in Specific Provision 6.c.(1):

(a) Interim Receiving Water Limitations

(i) *Interim Dry Weather Receiving Water Limitations*

The Responsible Copermittee must calculate the "existing" exceedance frequencies of the 30-day geometric mean water quality objectives for each of the indicator bacteria by analyzing the available monitoring data collected between January 1, 1996 and December 31, 2002. "Existing" exceedance frequencies may be calculated by water body and/or by Watershed Management Area listed in Table 6.0. Separate "existing" exceedance frequencies must be calculated for beaches and creeks/creek mouths.

The Responsible Copermittees must achieve a 50 percent reduction in the "existing" exceedance frequency of the 30-day geometric mean WQBELs for the water bodies listed in Table 6.0 by the interim compliance dates given in Table 6.4. A 50 percent reduction in the "existing" exceedance frequency is equivalent to half of the "existing" exceedance frequency of the 30-day geometric mean WQBELs.

The "existing" exceedance frequencies and the interim dry weather allowable exceedance frequencies (i.e. interim dry weather receiving water limitations) calculated by the Responsible Copermittees must be included in the Water Quality Improvement Plans for the applicable Watershed Management Areas.

(ii) *Interim Wet Weather Receiving Water Limitations*

The Responsible Copermittees must achieve the interim wet weather receiving water limitations in Table 6.5, expressed as interim wet weather allowable exceedance frequencies, by the interim compliance dates given in Table 6.4.

Table 6.5
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	38%	37%	39%
		at Heisler Park - North			
	Pacific Ocean Shoreline	at Main Laguna Beach			
		Laguna Beach at Ocean Avenue			
		Laguna Beach at Cleo Street			
		Arch Cove at Bluebird Canyon Road			
		Laguna Beach at Dumond Drive			
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	41%	41%	42%
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	41%	41%	42%
	Aliso Creek Mouth	at mouth	41%	41%	42%
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	36%	36%	36%
		Aliso Beach at Table Rock Drive			
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)			
		at Salt Creek (large outlet)			
		Salt Creek Beach at Salt Creek service road			
		Salt Creek Beach at Strand Road			

Table 6.5 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	44%	44%	48%
	San Juan Creek	lower 1 mile	44%	44%	47%
	San Juan Creek Mouth	at mouth	44%	44%	47%
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	35%	35%	36%
		Ole Hanson Beach Club Beach at Pico Drain			
		San Clemente City Beach at El Portal Street Stairs			
		San Clemente City Beach at Mariposa Street			
		San Clemente City Beach at Linda Lane			
		San Clemente City Beach at South Linda Lane			
		San Clemente City Beach at Lifeguard Headquarters			
		under San Clemente Municipal Pier			
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)			
		San Clemente State Beach at Riviera Beach			
		Can Clemente State Beach at Cypress Shores			
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	45%	44%	47%
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	40%	40%	41%
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	33%	33%	36%

Table 6.5 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	26%	26%	26%
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	37%	37%	37%
		La Jolla Shores Beach at Caminito del Oro			
		La Jolla Shores Beach at Vallecitos			
		La Jolla Shores Beach at Avenida de la Playa			
		at Casa Beach, Children's Pool			
		South Casa Beach at Coast Boulevard			
		Whispering Sands Beach at Ravina Street			
		Windansea Beach at Vista de la Playa			
		Windansea Beach at Bonair Street			
		Windansea Beach at Playa del Norte			
		Windansea Beach at Palomar Avenue			
		at Tourmaline Surf Park			
		Pacific Beach at Grand Avenue			
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries	49%	49%	51%
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	46%	43%	49%
	San Diego River	lower 6 miles	46%	43%	49%
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	46%	43%	51%
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	41%	41%	43%

(b) Interim Effluent Limitations

Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the interim compliance dates under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.c.(2)(a):

Table 6.6
Interim Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watersheds and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
South Orange County	**San Joaquin Hills HSA** (901.11) and **Laguna Hills HSA** (901.12) - Pacific Ocean Shoreline	45.89%	45.86%	49.14%	23.43%	26.04%	25.63%
	Aliso HSA (901.13) - Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	47.74%	47.79%	49.57%	12.65%	13.31%	13.76% (13.69%)**
	Dana Point HSA (901.14) - Pacific Ocean Shoreline	47.52%	47.52%	49.49%	6.58%	7.43%	7.58%
	Lower San Juan HSA (901.27) - Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	36.48%	37.11%	47.47%	9.61%	6.41%	13.56% (13.45%)**
	San Clemente HA (901.30) - Pacific Ocean Shoreline	47.14%	47.12%	49.42%	11.93%	12.29%	12.63%
San Luis Rey River	**San Luis Rey HU** (903.00) - Pacific Ocean Shoreline	19.07%	19.55%	43.69%	2.81%	1.56%	5.85%
Carlsbad	**San Marcos HA** (904.50) - Pacific Ocean Shoreline	41.41%	41.28%	48.02%	9.24%	9.49%	10.10%

Table 6.6 (Cont'd)
Interim Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watersheds and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
San Dieguito River	**San Dieguito HU** (905.00) - Pacific Ocean Shoreline	7.20%	10.36%	41.74%	2.15%	0.73%	3.86%
Penasquitos	**Miramar Reservoir HA** (906.10) - Pacific Ocean Shoreline	48.25%	48.30%	49.71%	0.81%	1.00%	0.97%
Mission Bay	**Scripps HA** (906.30) - Pacific Ocean Shoreline	48.22%	48.21%	49.63%	8.16%	10.57%	9.41%
	Tecolote HA (906.50) - Tecolote Creek	47.26%	47.30%	49.47%	8.26%	10.24%	9.08% (9.04%)**
San Diego River	**Mission San Diego HSA** (907.11) and **Santee HSA** (907.12) - Pacific Ocean Shoreline - Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles)	37.02%	34.72%	46.98%	19.07%	26.61%	21.37% (21.24%)**
San Diego Bay	**Chollas HSA** (908.22) - Chollas Creek	46.03%	46.08%	49.23%	8.91%	12.42%	10.73% (10.68%)**

Notes:
* The percent load reductions are based on reducing loads compared to pollutant loads from 2001 to 2002.
** The alternative *Enterococcus* percent load reduction was calculated based on a numeric target of 104 MPN/100mL instead of 61 MPN/100mL, protective of the REC-1 "moderately to lightly used area" usage frequency that is protective of freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative pollutant load reductions can be utilized.

(3) Interim TMDL Compliance Determination

Compliance with the interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(f) There are no exceedances of the interim receiving water limitations under Specific Provision 6.c.(2)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(g) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the interim effluent limitations under Specific Provision 6.c.(2)(b); OR

(h) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

d. Specific Monitoring and Assessment Requirements

(1) Monitoring and Assessment Requirements for Beaches

(a) Monitoring Stations

For beaches addressed by the TMDL, monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[40] If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source

[40] Commonly referred to as AB 411 monitoring

identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations at least once within the first 24 hours of the end of a storm event[41] during the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer in exceedance of the allowable exceedance frequencies in the receiving waters.

(iii) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(iv) For Pacific Ocean Shoreline segments or areas listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the dry weather and

[41] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

wet weather monitoring data to assess whether the interim and final WQBELs for the Pacific Ocean Shoreline segments or areas listed in Table 6.0 have been achieved.

(ii) Dry weather exceedance frequencies must be calculated as follows:

[a] 30-day geometric means must be calculated from the results of any dry weather samples collected from the segments or areas for each water body listed in Table 6.0;
[b] The method and number of samples need for calculating the 30-day geometric means must be consistent with the number of samples required by the Ocean Plan;
[c] Where there are multiple segments or areas associated with a water body listed in Table 6.0, the Copermittees may calculate geometric means for each segment or area, or combine the dry weather monitoring data from all the segments or areas to calculate geometric means for the water body;
[d] The exceedance frequency must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the dry season.

(iii) Wet weather exceedance frequencies must be calculated as follows:

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;
[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;
[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria densities reported from each storm event sampled; and
[d] The single sample maximum exceedance frequency must be calculated by dividing the number of wet weather days that exceed the single sample maximum receiving water limitations in Table 6.2 by the total number of wet weather days during the rainy season.
[e] The data collected for dry weather must be used in addition to the data collected for wet weather to calculate the wet weather 30-day geometric means. The exceedance frequency of the wet weather 30-day geometric means must be calculated by dividing the number of geometric means that exceed the geometric mean

receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the wet season.

(iv) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(v) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) Monitoring and Assessment Requirements for Creeks and Creek Mouths

(a) Monitoring Stations

For creeks addressed by the TMDL, monitoring locations should consist of, at a minimum, a location at or near the mouth of the creek (e.g. Mass Loading Station or Mass Emission Station) and one or more locations upstream of the mouth (e.g. Watershed Assessment Station). If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations in accordance with the requirements of Provision D.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations within the first 24 hours of the end of a storm event[42] during the rainy season (i.e. October 1 through April 30).

[42] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(iii) Samples collected from receiving water monitoring stations must be analyzed for fecal coliform and *Enterococcus* indicator bacteria.

(iv) For creeks or creek mouths listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the receiving water monitoring data to assess whether the interim and final receiving water WQBELs for the creeks and creek mouths listed in Table 6.0 have been achieved.

(ii) Dry weather exceedance frequencies must be calculated as follows:

[a] 30-day geometric means must be calculated from the results of any dry weather samples collected from the segment or area for each water body listed in Table 6.0;
[b] The method and number of samples need for calculating the 30-day geometric means must be consistent with the number of samples required by the Basin Plan;
[c] The exceedance frequency must be calculated by dividing the number of 30-day geometric means that exceed the 30-day geometric mean receiving water limitations in Table 6.2 by the total number of 30-day geometric means calculated from samples collected during the dry season.

(iii) Wet weather exceedance frequencies must be calculated as follows:

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;
[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;
[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria densities reported from each of the storm events sampled; and

[d] The exceedance frequency must be calculated by dividing the number of wet weather days that exceed the single sample maximum receiving water limitations in Table 6.2 by the total number of wet weather days during the rainy season.

[e] The data collected for dry weather must be used in addition to the data collected for wet weather to calculate the wet weather 30-day geometric means. The exceedance frequency of the wet weather 30-day geometric means must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the wet season.

(iv) The Responsible Copermittee must identify and incorporate additional MS4 outfall and receiving water monitoring stations and/or adjust monitoring frequencies to identify sources causing exceedances of the receiving water WQBELs.

(v) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(vi) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

7. Total Maximum Daily Loads for Sediment in Los Peñasquitos Lagoon

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2012-0033

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2012
State Water Board Approval Date:	January 21, 2014
Office of Administrative Law Approval Date:	July 14, 2014
US EPA Approval Date:	October 30, 2014

(3) TMDL Effective Date: July 14, 2014

(4) Watershed Management Area: ~~Los~~ Peñasquitos

(5) Water Body: Los Peñasquitos Lagoon

(6) Responsible Copermittees: County of San Diego, City of San Diego, City of Del Mar, and City of Poway

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final sediment TMDL compliance requirements for Los Peñasquitos Lagoon consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must be in compliance with the final TMDL compliance requirements by December 31, 2034.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not prohibit the sustainable restoration of tidal and non-tidal saltmarsh vegetation of at least 346 acres.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations by the compliance date under Provision 7.b(1) will not cause or contribute to a failure of the receiving water condition specified under Specific Provision 7.b.(2)(a):

Table 7.1
*Final Effluent Limitations as Expressed as Wet Season Loads in MS4 Discharges to Los Peñasquitos Lagoon**

Constituent	Effluent Limitation
Sediment	2,580 tons/wet season

* Final effluent limitations are to be achieved by the following Responsible Parties: County of San Diego, City of San Diego, City of Del Mar, City of Poway, Phase II MS4 permittees, Caltrans, general construction storm water NPDES permittees, and general industrial storm water NPDES permittees.

(c) Best Management Practices

(i) The Water Quality Improvement Plan for the Los Peñasquitos Watershed Management Area must incorporate the Sediment Load Reduction Plan required to be developed pursuant to Resolution No. R9-2012-0033.

(ii) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 7.b.(2)(a) and/or the Copermittee's portion of the effluent limitations under Specific Provision 7.b.(2)(b) for Los Peñasquitos Lagoon.

(3) Final TMDL Compliance Determination

Compliance determination with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) Successful restoration of 80 percent of the 1973 acreage of tidal and non-tidal lagoon salt marsh (346 acres) as described in Attachment A of Resolution No. R9-2010-0033; OR

(b) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 7.b.(2)(c)(ii) and/or other implementation actions to achieve compliance with Specific Provision 7.b.(3)(a) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 7.b.(2)(c)(ii) or other implementation actions to achieve compliance with Specific Provision 7.b.(3)(a),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 7.b.(2)(c)(ii) or other implementation actions, AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 7.d to demonstrate compliance with Specific Provision 7.b.(3)(a).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim sediment TMDL compliance requirements for Los Penasquitos Lagoon consist of the following:

(1) Interim Compliance Dates and WQBELs

The Responsible Copermittees must comply with the interim WQBELs, expressed as wet season loads, by December 31 of the interim compliance year set forth in Table 7.2.

Table 7.2
*Interim Water Quality Based Effluent Limitations Expressed as Wet Season Loads in MS4 Discharges**

Interim Compliance Date	Interim Effluent Limitations (tons/wet season)
December 31, 2019	6,691
December 31, 2023	5,663
December 31, 2027	4,636
December 31, 2029	3,608

* Interim effluent limitations are to be achieved by the following Responsible Parties: County of San Diego, City of San Diego, City of Del Mar, City of Poway, Phase II MS4 permittees, Caltrans, general construction storm water NPDES permittees, and general industrial storm water NPDES permittees.

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) The final receiving water limitation under Specific Provision 7.b.(2)(a) is met; OR

(c) There are no exceedances of the Copermittee's portion of interim effluent limitations under Table 7.2 at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the Copermittee's portion of the interim TMDL compliance requirements described in Attachment A of Resolution No. R9-2010-0033 will be achieved by the interim compliance date.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) Watershed Monitoring

The Responsible Copermittees must conduct suspended sediment, bed load, and flow monitoring to calculate total sediment loading to the Los Peñasquitos Lagoon for each wet season (October 1 thru April 30) as set forth below:

(a) The Responsible Copermittees must monitor enough storm events throughout the season to quantify sediment loading over each wet season, and

(b) The Responsible Copermittees must monitor at least 3 stations to quantify cumulative sediment loading into Los Peñasquitos Lagoon. Stations must be located within the Los Peñasquitos, Carroll Canyon, and Carmel Creek tributaries prior to discharging into Los Peñasquitos Lagoon.

(2) Lagoon Monitoring

The Responsible Copermittees must monitor Los Peñasquitos Lagoon each Fall for changes in the extent of the vegetation types as set forth below:

(a) The Responsible Copermittees must acquire aerial photos of Los Peñasquitos Lagoon and digitize them at an approximate scale of 1:2,500,

(b) The Responsible Copermittees must appropriately interpret the vegetation and classify the various types as saltmarsh, non-tidal saltmarsh, freshwater marsh, non-tidal saltmarsh –*Lolium perrene* infested, southern willow scrub/mulefat scrub, herbaceous wetland, or upland land cover.

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the monitoring data collected under Specific Provision 7.d(1) and 7.d(2) to assess whether the interim and final WQBELs have been achieved.

(b) For assessing and determining compliance with the final receiving water limitations under Specific Provision 7.b.(2)(a), the Responsible

Copermittees must use the data acquired under Specific Provision 7.d.(2) to estimate the acreage of tidal and non-tidal saltmarsh actually restored.

(c) For assessing and determining compliance with the final effluent limitations under Specific Provision 7.b.(2)(b), the Responsible Copermittees must use the data acquired under Specific Provision 7.d.(1) to estimate sediment loading into Los Peñasquitos Lagoon. Sediment loading must be evaluated using a 3-year, weighted rolling average. The first reported average shall be calculated using data collected in the year, 2015-2016, 2016-2017, and 2017-2018 wet seasons.

(d) The monitoring and assessment results must be submitted as part of the Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

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ATTACHMENT F

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

FACT SHEET / TECHNICAL REPORT

FOR

ORDER NO. R9-2013-0001
AS AMENDED BY ORDER NOS. R9-2015-0001 AND R9-2015-0100
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

May 8, 2013
Amended ~~on~~ February 11, 2015
and November 18, 2015

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I. FACT SHEET FORMAT

This Fact Sheet briefly sets forth the principal facts and the significant factual, legal, methodological, and policy questions that the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) considered in preparing Order No. R9-2013-0001 (Order), as amended by Order Nos. R9-2015-0001 and R9-2015-0100. In accordance with the Code of Federal Regulations (CFR) Title 40 Parts 124.8 and 124.56 (40 CFR 124.8 and 40 CFR 124.56), this Fact Sheet includes, but is not limited to, the following information:

1. Contact information
2. Public process and notification procedures
3. Background of municipal storm water permits
4. Regional MS4 Permit approach
5. Economic considerations
6. Applicable statutes, regulations, plans and policies
7. Discussion of the provisions in the Order

Tentative Order No. R9-2013-0001 was distributed for public review on October 31, 2012. The San Diego Water Board accepted written comments on ~~the~~ Tentative Order No. R9-2013-0001 until January 11, 2013. A public hearing was subsequently held on April 10 and 11, 2013, that was continued to May 8, 2013 to receive oral comments from interested persons. The San Diego Water Board adopted Order No. R9-2013-0001 on May 8, 2013.

Tentative Order No. R9-2015-0001, an Order amending Order No. R9-2013-0001, was distributed for public review on September 19, 2014. The San Diego Water Board accepted written comments on Tentative Order No. R9-2015-0001 until November 19, 2014. A public hearing was held on February 11, 2015, to receive oral comments from Copermittees and interested persons. The San Diego Water Board adopted Order No. R9-2015-0001 amending Order No. R9-2013-0001 on February 11, 2015. Order No. R9-2015-0001 amended the findings and provisions of Order No. R9-2013-0001 to:

a. Enroll the County of Orange, the Orange County Flood Control District and the south Orange County Cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano as Copermittees responsible for compliance with the terms and conditions of Order No. R9-2013-0001, as amended by Order No. R9-2015-0001;

b. Designate the San Diego Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the Cities of Laguna Woods and Laguna Hills and agree to the designation of the Santa Ana Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the City of Lake Forest, subject to the

terms of the February 10, 2015 agreement between San Diego Water Board and the Santa Ana Water Board described in Finding 29 of this Order, upon the later effective date of Order No. R9-2015-0001 or Order No. R8-2015-0001 (superseding Order No. R8-2009-0030);

c. Establish interim exceptions to land development requirements for those priority development projects that discharge to engineered channels and large river reaches as described in Provision E.3.c.(2)(e) of this Order;

d. Incorporate the amended requirements of the State Water Resources Control Board's (State Water Board) General Exception to require that pollutant reductions be achieved within 6 years for storm water and nonpoint source discharges to ASBS within the Region;

e. Incorporate applicable requirements of the Los Peñasquitos Lagoon Sediment TMDL; and

f. Require the Orange County Copermittees to implement the "*Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County*," dated October 2014, made effective in the Monitoring and Reporting Program/Order issued pursuant to California Water Code section 13383 in the December 5, 2014 San Diego Water Board Letter Directive and subject to future revisions by the Executive Officer after appropriate public input.

~~A public hearing was held on February 11, 2015, to receive oral comments from Copermittees and interested persons. The San Diego Water Board adopted Order No. R9-2015-0001 amending Order No. R9-2013-0001 on February 11, 2015.~~

Tentative Order No. R9-2015-0100, an Order amending Order No. R9-2013-0001 as amended by Order No. R9-2015-0001, was distributed for public review on July 31, 2015. The San Diego Water Board accepted written comments on Tentative Order No. R9-2015-0100 until September 14, 2015. A public hearing was held on November 18, 2015, to receive oral comments from Copermittees and interested persons. The San Diego Water Board adopted Order No. R9-2015-0100 amending Order No. R9-2013-0001 as amended by Order No. R9-2015-0001, on November 18, 2015. Order No. R9-2015-0100 amended the findings and provisions of Order No. R9-2013-0001 as amended by Order No. R9-2015-0001 to:

a. Enroll the County of Riverside, the Cities of Murrieta, Temecula, and Wildomar, and the Riverside County Flood Control and Water Conservation District as Copermittees responsible for compliance with the terms and conditions of Order No. R9-2013-0001, as amended by Order Nos. R9-2015-0001 and R9-2015-0100;

b. Continue designation of the San Diego Water Board to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Murrieta and Wildomar, including areas within the Santa Ana Region; and, agree to continue designation of the Santa Ana Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the City of Menifee, including areas within the San Diego Region, subject to the terms of the October 26, 2015 agreement between San Diego Water Board and the Santa Ana Water Board described in Finding 29 of this Order;

d. Incorporate Provision B.3.c, which provides an option that allows a Copermittee to utilize the watershed-based Water Quality Improvement Plan to be deemed in compliance with the prohibitions and limitations of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b;

e. Incorporate minor revisions to Provisions E.2.a.(1) and E.2.a.(2) to include San Diego Water Board Order No. R9-2015-0013 and State Water Board Order 2014-0194-DWQ into the requirements for addressing non-storm water discharges to a Copermittee's MS4;

e. Incorporate minor revisions to Provision E.3.b.(1) to correct inconsistencies in the definition of a Priority Development Project as compared to the definitions in Order No. R9-2009-0002 (Fourth Term Orange County MS4 Permit) and Order No. R9-2010-0016 (Fourth Term Riverside County MS4 Permit), and requirements for incorporating the corrected definitions into the BMP Design Manual;

f. Incorporate revisions to Provision E.3.e.(1)(a) to provide additional clarity on when the structural BMP performance requirements of Provision E.3.c are applicable to Priority Development Projects;

e. Incorporate minor revisions to the Revised TMDLs for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region and the TMDLs for Sediment in Los Peñasquitos Lagoon in Attachment E to the Order to make the requirements consistent with the Basin Plan amendments adopted by the San Diego Water Board; and

f. Remove provisions related to allowing the Riverside County Copermittees to apply for early coverage under the Regional MS4 Permit.

The San Diego Water Board files applicable to the issuance of Order No. R9-2013-0001 and amendments thereto are incorporated into the administrative record in support of the findings and requirements of the Order.

II. CONTACT INFORMATION

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The Order and other related documents can be downloaded from the San Diego Water Board website at

http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

The documents referenced in this Fact Sheet and in Order No. R9-2013-0001 and amendments thereto are available for public review at the San Diego Water Board office, located at the address listed above. Public records are available for inspection during regular business hours, from 8:00 am to 5:00 pm Monday through Friday. To schedule an appointment to inspect public records, contact the San Diego Water Board Records Management Officer at 619-516-1990.

COPERMITTEES

Orange County Copermittees

- County of Orange
  - City of Aliso Viejo
  - City of Dana Point
  - City of Laguna Beach
  - City of Laguna Hills
  - City of Laguna Niguel
  - City of Laguna Woods
  - City of Lake Forest *
  - City of Mission Viejo
  - City of Ranch Santa Margarita
  - City of San Clemente
  - City of San Juan Capistrano
  - Orange County Flood Control District

* While not listed in the above table, the City of Lake Forest remains a Copermittee under this Order until the later effective date of this Order or Santa Ana Water Board Tentative Order No. R8-2015-0001. Thereafter, the City of Lake Forest will no longer be considered a Copermittee under this Order because its Phase I MS4 discharges will be regulated by the Santa Ana Water Board pursuant to Water Code section 13328 designation. The requirements of this Order that apply to the City of Lake Forest for the duration of this Order, consistent with the Water Code section 13228 agreement dated February 10, 2015, are described in Finding 29 and Footnote 2 to Table B-1.

Riverside County Copermittees

- County of Riverside
  - City of Menifee**
  - City of Murrieta
  - City of Temecula
  - City of Wildomar
  - Riverside County Flood Control and Water Conservation District

** The City of Menifee is not regulated as a Copermittee under this Order because its Phase I MS4 discharges are regulated by Santa Ana Water Board Order No. R8-2010-0033 as it may be amended or issued pursuant to Water Code section 13228 designation. The requirements of this Order that apply to the City of Menifee for the duration of this Order, consistent with the Water Code section 13228 written agreement dated October 26, 2015, are described in Finding 29 and Footnote 3 to Table B-1.

San Diego County Copermittees

- County of San Diego
  - City of Carlsbad
  - City of Chula Vista
  - City of Coronado
  - City of Del Mar
  - City of El Cajon
  - City of Encinitas
  - City of Escondido
  - City of Imperial Beach
  - City of La Mesa
  - City of Lemon Grove
  - City of National City
  - City of Oceanside
  - City of Poway
  - City of San Diego
  - City of San Marcos
  - City of Santee
  - City of Solana Beach
  - City of Vista
  - San Diego County Regional Airport Authority
  - San Diego Unified Port District

III. PUBLIC PROCESS AND NOTIFICATION PROCEDURES

The San Diego Water Board followed the schedule listed below for the preparation of Order No. R9-2013-0001 and amendments thereto:

San Diego County Copermittee Permit Reissuance Process

1. On February 8, 2011, the San Diego Water Board met with the San Diego County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No. R9-2007-0001.

2. Between February and May 2011, the San Diego Water Board met with select San Diego County, Orange County, and Riverside County Copermittees, as well as representatives of the environmental community to discuss concepts and receive recommendations for elements to be incorporated in a Regional Municipal Separate Storm Sewer System Permit (Regional MS4 Permit).

3. On June 27, 2011 the San Diego Water Board received the Report of Waste Discharge from the San Diego County Copermittees for the renewal of their NPDES permit, Order No. R9-2007-0001.

4. On April 9, 2012, the San Diego Water Board released an administrative draft of Tentative Order No. R9-2013-0001 for preliminary informal comments and feedback.

5. On April 25, 2012, the San Diego Water Board held an informal public workshop to present the administrative draft of Tentative Order No. R9-2013-0001 and receive verbal comments.

6. Between June and August 2012, the San Diego Water Board held four (4) focused meetings with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community, and USEPA) to discuss and receive preliminary comments and feedback about specific elements in the administrative draft of Tentative Order No. R9-2013-0001.

7. On September 5, 2012, the San Diego Water Board held an informal public workshop to present the modifications that were expected to be incorporated into the Tentative Order based on the preliminary comments and feedback received during the focused meetings held between June and August 2012.

8. Informal written comments on the administrative draft of Tentative Order No. R9-2013-0001 were accepted until September 14, 2012.

9. On October 12, 2012, the San Diego Water Board released a revised administrative draft of Tentative Order No. R9-2013-0001.

10. On October 24, 2012, the San Diego Water Board held a focused meeting with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community, and USEPA) to discuss modifications incorporated into the administrative draft of Tentative Order No. R9-2013-0001.

11. On October 31, 2012, the San Diego Water Board released Tentative Order No. R9-2013-0001 for formal public review and comment.

12. On November 13, 2012 and December 12, 2012, the San Diego Water Board held a formal public Board workshop to present the public draft of Tentative Order No. R9-2013-0001 and receive verbal comments.

13. Formal written comments on the public draft of Tentative Order No. R9-2013-0001 were accepted until January 11, 2013.

14. A public hearing of Tentative Order No. R9-2013-0001 was conducted on April 10 and 11, 2013, that was continued to May 8, 2013.

Orange County Copermittee Permit Reissuance Process

15. On May 20, 2014 the San Diego Water Board received the Report of Waste Discharge from the Orange County Copermittees for the renewal of their MS4 NPDES permit, Order No. R9-2009-0002.

16. On June 24, 2014, the San Diego Water Board met with the Orange County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No.R9-2009-0002 and the process for enrollment as Copermittees under Regional MS4 Permit Order No. R9-2013-0001.

17. On July 1, 2014, the San Diego Water Board held a public meeting to discuss the Orange County Report of Waste Discharge and receive comments on potential modifications to Order No. R9-2013-0001. Based on comments received from the Orange County Copermittees and other interested persons at this meeting, the San Diego Water Board determined that additional public meetings were not needed prior to release of Tentative Order No. R9-2015-0001, amending Order No. R9-2013-0001 in redlined – strikeout format for public review and comment.

18. On September 19, 2014, the San Diego Water Board released Tentative Order No. R9-2015-0001 for a 60 day public review and comment period.

19. On October 8, 2014, the San Diego Water Board held a formal public workshop at a regular board meeting to receive information and discuss the proposed amendments to Order No. R9-2013-0001 described in Tentative Order No. R9-2015-0001.

20. In accordance with State and federal laws and regulations, the San Diego Water Board notified San Diego County, Orange County and Riverside County Copermittees, and all known interested agencies and persons of its intent to adopt Tentative Order No. R9-2015-0001 and provided them with an opportunity to submit their written comments and recommendations. Written comments and recommendations on Tentative Order No. R9-2015-0001 were accepted until November 19, 2014.

21. The San Diego Water Board held a public workshop on October 8, 2014, and a public hearing on February 11, 2015, and heard and considered all comments pertaining to the adoption of Tentative Order No. R9-2015-0001 on February 11, 2015.

Riverside County Copermittee Permit Reissuance Process

22. Between April and June 2015, the San Diego Water Board held three (3) public workshops with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community) to discuss and receive comments and feedback about amending Order No. R9-2013-0001 to incorporate a definition of prior lawful approval for Priority Development Projects, and an alternative compliance pathway for prohibitions and limitations in Provision A of the Order. A San Diego Water Board member attended the April and May 2015 public workshops, but no actions or voting took place.

23. On April 15, 2015, the San Diego Water Board met with the Riverside County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No.R9-2010-0016 and the process for enrollment as Copermittees under Order No. R9-2013-0001 (Regional MS4 Permit).

24. On May 8, 2015 the San Diego Water Board received a Report of Waste Discharge from the Riverside County Copermittees for the renewal of their MS4 NPDES permit, Order No. R9-2010-0016.

25. On July 31, 2015, the San Diego Water Board released Tentative Order No. R9-2015-0100 for a formal public review and comment period.

26. Formal written comments on the public draft of Tentative Order No. R9-2015-0100 were accepted until September 14, 2015, a formal public written comment period of 46 days.

27. A public hearing to receive oral comments on Tentative Order No. R9-2015-0100 was conducted on November 18, 2015.

IV. BACKGROUND OF THE SAN DIEGO REGION MUNICIPAL STORM WATER PERMITS

In developed and developing areas, storm water runoff is commonly transported through municipal separate storm sewer systems (MS4s) and discharged into local receiving water bodies. As the storm water runs off and flows over the land or impervious surfaces (e.g., paved streets, parking lots, and building rooftops), it accumulates debris, chemicals, sediment, and other pollutants that can adversely affect receiving water quality if discharged untreated. The United States Environmental Protection Agency (USEPA) recognizes wet weather flows from urban areas as the number one source of estuarine pollution in coastal communities,[1] such as those within the San Diego Region.

The federal Clean Water Act (CWA) was amended in 1987 to address and regulate discharges of storm water associated with industrial activities and from municipal storm sewers. With the amendments, many municipalities throughout the United States were obligated for the first time to obtain National Pollutant Discharge Elimination System (NPDES) permits for discharges of storm water from their MS4s.

In response to the CWA 1987 amendment, as well as the pending federal NPDES regulations which would implement the amendment, the San Diego Water Board issued "early" MS4 permits. The San Diego Water Board adopted and issued Order Nos. 90-38, 90-42, and 90-46 to regulate storm water discharges from the MS4s in Orange County, San Diego County, and Riverside County, respectively, within the San Diego Region on July 16, 1990.

The "early" MS4 permits, or First Term Permits, were issued prior to the November 1990 promulgation of the final federal NPDES storm water regulations. By issuing these First Term Permits before the federal regulations took effect, the San Diego Water Board was able to provide the Copermittees additional flexibility in addressing and managing storm water discharges. The First Term Permits contained the essentials of the 1990 regulations, and required the Copermittees to develop and implement runoff management programs, but provided little specificity about what was required to be included in or actually achieved by those programs.

The flexibility provided in the First Term Permits was generally continued through the Second Term Permits. The combination of the lack of specificity in the First and Second Term Permits, a general lack of meaningful action by the Copermittees and a general lack of corresponding reaction (i.e. enforcement) by the San Diego Water Board during the first ten years of the storm water program, resulted in few substantive steps towards achieving improvements in the quality of receiving waters or storm water discharges from the MS4s.

[1] US EPA. 1999. 40 CFR Parts 9, 122, 123, and 124. National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. 64 FR 68727.

From 2001, the regulatory approach incorporated into Third Term Permits was a significant departure from the regulatory approach of the First and Second Term Permits. The Third Term Permits issued by the San Diego Water Board included more detailed requirements that outlined the minimum level of implementation required for the Copermittees' programs to meet the maximum extent practicable (MEP) standard for storm water. The Third Term Permits included more detail to emphasize and enhance the jurisdictional runoff management programs developed by the Copermittees and introduced requirements for developing and implementing watershed-based programs.

The Third Term Permits also incorporated two precedent setting decisions by the State Water Board. In Order WQ 99-05, the State Water Board established receiving water limitation language to be included in all MS4 permits. The State Water Board's precedential language clarified that municipal storm water permits must include provisions requiring discharges to be controlled to attain water quality standards in receiving waters. Unlike previously adopted versions of the receiving water limitation language in the First and Second Term Permits, the language no longer stated that "*violations of water quality standards are not violations of the municipal storm water permit under certain conditions*." In addition, the receiving water limitation language no longer indicated that the "*implementation of best management practices is the 'functional equivalent' of meeting water quality standards*." State Water Board Order WQ 99-05 specifically requires language in MS4 permits for the Copermittees to comply with water quality standards based discharge prohibitions and receiving water limitations through timely implementation of control measures and other actions to reduce pollutants in discharges. (See State Water Board Order WQ 99-05 (*Environmental Health Coalition*)).

In Order WQ 2000-11, also a precedential decision, the State Water Board addressed design standards for structural post-construction best management practices (BMPs) for new development and significant redevelopment. The State Water Board found that the design standards, which require that runoff generated by 85 percent of storm events from specific development categories be infiltrated or treated, reflect the MEP standard. State Water Board Order WQ 2000-11 also found that the post-construction BMP provisions, or Standard Storm Water Mitigation Plan (SSMP) provisions, constitute MEP for addressing storm water pollutant discharges resulting from specific development categories.

The Third Term San Diego County and Orange County Permits (Order Nos. 2001-01 and R9-2002-0001, respectively) were appealed to the State Water Board. Minor modifications were made by the State Water Board, but the requirements were largely upheld. In State Water Board Order WQ 2001-15, the State Water Board upheld the Third Term San Diego County Permit requirements with certain modifications. The State Water Board removed the prohibition of storm water discharges *into* the MS4 that cause or contribute to exceedances of water quality objectives. The revision allows for treatment of pollutants in storm water runoff after the pollutants have entered the MS4.

State Water Board Order WQ 2001-15 otherwise upheld all the other requirements of the permit.

In addition to the modification to the discharge prohibition in Order WQ 2001-15, the State Water Board refined Order WQ 99-05 by making clear that the Copermittees may use an iterative approach to achieving compliance with water quality standards that involves ongoing assessments and revisions. Thus, the language for the discharge prohibitions and receiving water limitations was revised to explicitly require the Copermittees to implement an iterative process of assessments and revisions to comply with the discharge prohibitions and receiving water limitations. The San Diego Water Board retained the authority to enforce receiving water limitations and discharge prohibitions even if the Copermittee is engaged in the iterative process.

The Third Term San Diego County Permit was subsequently challenged in the Superior Court of the State of California and the Court of Appeal, Fourth Appellate District. The Court of Appeal, Fourth Appellate District, found that the approach of the Third Term San Diego County Permit to regulating discharges into the MS4 was appropriate (*Building Industry Ass'n. v. State Water Resources Control Bd., et al.,* 124 Cal.App.4th 866 (2004)). The State of California Supreme Court denied review sought by the Building Industry Association in March 2005.

The Fourth Term Permits~~, or current MS4 permits,~~ began with the adoption of Order No. R9-2007-0001 issued to the Copermittees of San Diego County in January 2007. Order Nos. R9-2009-0002 and R9-2010-0016 were subsequently issued to the Copermittees of Orange County and Riverside County. The Fourth Term Permits continued to include more detailed requirements to be implemented by each Copermittee's jurisdictional runoff management program. The Fourth Term Permits also included requirements to further emphasize a watershed management approach and for more coordination among jurisdictional runoff management programs. In addition, the Fourth Term Permits included more requirements for assessing the effectiveness of the runoff management programs being implemented by the Copermittees. The intent of the inclusion of additional requirements was to enhance and better define elements of the permit that were expected to be incorporated into the iterative process for managing runoff from each Copermittee's jurisdiction and within the watersheds of the San Diego Region.

The Fourth Term Permits included several new and emerging approaches for managing storm water runoff and discharges. Low impact development (LID) requirements are included for development and significant redevelopment to reduce pollutants in storm water runoff from sites through more natural processes such as infiltration and biofiltration closer to the source, rather than utilizing conventional mechanical end-of-pipe treatment systems. Hydrograph modification (hydromodification) management requirements also are included to mitigate the potential for increased erosion in receiving waters due to increased runoff rates and durations often caused by development and increased impervious surfaces. The Fourth Term Orange County and Riverside County Permits introduced requirements to identify areas of existing

development where retrofitting with LID projects would be feasible and could be implemented to reduce storm water runoff and pollutants in storm water discharges.

The Fourth Term Orange County and Riverside County Permits included a clearer distinction between storm water and non-storm water discharges. The term "urban runoff" was completely removed, and a distinction between storm water (wet weather) runoff and non-storm water (dry weather) runoff was emphasized. This clarification was made to prevent any potential misunderstanding that regulation under the MS4 permits is limited only to urbanized areas, and to prevent non-storm water runoff from being managed in the same manner as storm water runoff. The term "urban runoff" is not defined in the Code of Federal Regulations (CFR) or Federal Register (FR) in the regulation of MS4 discharges. According to the CWA 402(p)(3)(B)(ii), MS4 permits must include a requirement to effectively prohibit non-storm water discharges into the MS4s.

Finally, for the Fourth Term Orange County and Riverside County Permits the San Diego Water Board found that non-storm water discharges to the MS4 from over application of irrigation water are sources of pollutants. The San Diego Water Board found that non-storm water discharges resulting from over-irrigation must be prohibited from entering the MS4 in accordance with the requirements of the CWA and pursuant to 40 CFR 122.26(d)(2)(iv)(B)(1).

The requirements of the Fourth Term Permits issued to the Copermittees in each county within the San Diego Region now have substantively the same core requirements such as discharge prohibitions, receiving water limitations, jurisdictional runoff management program components, and monitoring program requirements. There are, however, several inconsistencies that exist among the three Fourth Term Permits which complicate oversight and implementation of the permits by the San Diego Water Board.

The Fourth Term San Diego County Permit expired in January 2012. The Fourth Term Orange County permit expired in December 2014 and the Fourth Term Riverside County Permit ~~will~~ expired in November 2015. Issuing the Fifth Term Permits within five years for three counties under three different permits would have required the San Diego Water Board to expend significant time and resources for the issuance of the permits through three separate public proceedings, thereby greatly reducing the time and resources available to oversee implementation and compliance. Multiple permits also create confusion for determining compliance among regulated entities, especially for the land development community.

The San Diego Water Board ~~has~~ acknowledged that issuing a single MS4 permit for all the Copermittees in the San Diego Region can and is expected to result in more consistent implementation, improve communication among agencies within watersheds crossing multiple jurisdictions, and minimize resources spent with each permit renewal process. Within the findings of the Fourth Term Riverside County Permit issued in November 2010, the San Diego Water Board notified the public of its intent to develop and issue a single Regional MS4 Permit.

V. REGIONAL MS4 PERMIT APPROACH

The Fifth Term Permit, or Regional MS4 Permit, shifts the focus of the permit requirements from a minimum level of actions to be implemented by the Copermittees to identifying outcomes to be achieved by those actions. Order No. R9-2013-0001 represents an important paradigm shift in the approach for MS4 permits within the San Diego Region.

Historical Permitting Approach

The First and Second Term Permits were very broad and provided little specificity about what was required to be developed and implemented by the Copermittees. The Third Term Permits began to become more specific about the minimum level of implementation required by the Copermittees. The Fourth Term Permits subsequently increased in specificity. The MS4 permits have progressively become more detailed and focused on specifying the minimum level of actions expected to be implemented by the Copermittees. As detailed and specific as the MS4 permits have become, however, they include very little detail about what the desired outcomes of the required actions are expected to achieve. Compliance with the permit requirements has essentially been tracking numbers of actions and reporting, not tracking progress or actual improvements in the quality of receiving waters or discharges from the MS4s. The result has been an increase in actions being implemented by the Copermittees with little or no ability or expectations to determine whether or not improvements in water quality are being achieved.

The Fourth Term Permits result in significant resource expenditure by the Copermittees to report permit compliance information to the San Diego Water Board in the form of annual jurisdictional runoff management program, watershed program, and monitoring program reports. The San Diego Water Board ~~must then~~ was required to expend much of its limited resources on reviewing more than 50 voluminous reports submitted annually by the Copermittees. The information ~~currently~~ reported by the Copermittees ~~is~~ was of limited value when trying to measure progress toward achieving improvements in the quality of receiving waters or discharges from the MS4s. Oversight of the MS4 permits ~~is~~ was further complicated by the inconsistencies among the requirements issued to the Orange County, San Diego County, and Riverside County Copermittees under three separate MS4 permits.

Under the Fourth Term Permits, the Copermittees ~~must~~ were required to expend a significant portion of their limited resources collecting data of limited value, and putting together reports to submit that information to the San Diego Water Board. Likewise, the San Diego Water Board ~~must~~ was required to expend most of its limited resources reviewing reports, and developing permits instead of working directly with the Copermittees to identify solutions to problems causing impacts to water quality. This ~~is~~ was an unsustainable course that ~~will~~ would have continued to demand more

resources from the Copermittees and the San Diego Water Board, and would have continued to result in unknown water quality benefits.

New Permitting Approach

The goal of the Regional MS4 Permit is twofold: 1) bring a consistent set of MS4 permit requirements to all of the Copermittees within the San Diego Region; and, 2) provide an MS4 permit with requirements that will allow the Copermittees to focus their efforts and resources on achieving goals and desired outcomes toward the improvement of water quality rather than completing specific actions.

The overall approach included in the Regional MS4 Permit with respect to the jurisdictional runoff management programs will not differ significantly from the current permits. The general requirements for the jurisdictional runoff management program components and compliance with those requirements will remain and be applied consistently throughout the San Diego Region under the Regional MS4 Permit.

The most significant difference in the new permitting approach is the specific manner of implementation for those jurisdictional runoff management programs. Implementation will be based on decisions made by the Copermittees in accordance with what they have identified as their highest priority water quality conditions. In other words, the Copermittees will have significant control in how to implement the jurisdictional runoff management programs to best utilize their available resources in addressing a specific set of priorities effectively, instead of trying to address all the water quality priorities ineffectively.

The Copermittees are given the responsibility of identifying their highest priority water quality conditions that they intend to address. The Copermittees will develop goals that can be used to measure and demonstrate progress or improvements toward addressing those priorities. In addition to the goals, the Copermittees will provide a schedule for achieving the goals for those highest priorities. The measurement of progress toward achieving the goals for those highest priorities requires a better defined and more focused program of monitoring and assessment than under the Fourth Term Permits.

The monitoring and assessment program must be designed to inform the Copermittees of their progress, and the need for modifications in their jurisdictional runoff management programs and schedules to achieve their goals to improve water quality. The monitoring and assessment program requirements will have a more central role in the Regional MS4 Permit than in earlier permits. The monitoring and assessment requirements must also be designed to enable the Copermittees to focus and direct their efforts in implementing their jurisdictional runoff management programs toward their stated desired outcomes to improve the quality of receiving waters and/or discharges from the MS4s.

By providing an MS4 permit that allows the Copermittees to make more decisions about how to utilize and focus their resources, along with a better defined monitoring and assessment program to inform their water quality management decisions, the Copermittees ~~will~~ have the opportunity to:

1) *Plan strategically*. The Copermittees must have the ability to identify their available resources and develop and implement long term plans that can organize, collect, and use those resources in the most strategically advantageous and efficient manner possible. This ability to develop long term plans will allow the Copermittees to focus and utilize their resources in a more concerted way over the short term and long term to address specific water quality priorities through stated desired outcomes.

2) *Manage adaptively*. The Copermittees must be given the ability to modify their plans as additional information and data are collected from the monitoring and assessment programs. The Copermittees' plans may require modifications to the programs, priorities, goals, strategies, and/or schedules in order for the Copermittees to achieve a stated desired outcome.

3) *Identify synergies*. The Copermittees must be given more flexibility to identify efficiencies within and among their jurisdictional runoff management programs as the strategies are developed and implemented to increase the Copermittees' collective effectiveness. The Copermittees must also be able to identify and utilize resources available from other agencies and entities to further augment and enhance their jurisdictional runoff management programs and/or to collectively work with those other agencies and entities toward achieving a stated desired outcome.

The Regional MS4 Permit requirements ~~will~~ provide the Copermittees the flexibility and responsibility to decide what actions will be necessary to achieve an outcome that is tailored and designed by the Copermittees to improve specific prioritized water quality conditions. The San Diego Water Board expects the approach of the Regional MS4 Permit to give the Copermittees a greater sense of ownership for restoring the quality of receiving waters in the San Diego Region by becoming an integral part of the decision making process in identifying water quality conditions to be addressed, as well as determining the best use of their resources.

VI. ECONOMIC CONSIDERATIONS

Statutory Considerations

California Water Code (CWC) section 13241 requires the San Diego Water Board to consider certain factors, including economic considerations, in the adoption of water quality objectives. CWC section 13263 requires the San Diego Water Board to take into consideration the provisions of CWC section 13241 in adopting waste discharge requirements.

In *City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, the California Supreme Court considered whether Regional Water Boards must comply with CWC section 13241 when issuing waste discharge requirements under CWC section 13263(a) by taking into account the costs a permittee will incur in complying with the permit requirements. The Court concluded that whether it is necessary to consider such cost information "*depends on whether those restrictions meet or exceed the requirements of the federal Clean Water Act.*" (*Id.* at p. 627.) The Court ruled that Regional Water Boards may not consider the factors in CWC section 13241, including economics, to justify imposing pollutant restrictions that are less stringent than applicable federal law requires. (*Id.* At pp. 618, 626-627 ["*[Water Code section 13377 specifies that [ ] discharge permits issued by California's regional boards must meet the federal standards set by federal law. In effect, section 13377 forbids a regional board's consideration of any economic hardship on the part of the permit holder if doing so would result in the dilution of the requirements set by Congress in the Clean Water Act...Because CWC section 13263 cannot authorize what federal law forbids, it cannot authorize a regional board, when issuing a [ ] discharge permit, to use compliance costs to justify pollutant restrictions that do not comply with federal clean water standards*."]). However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Regional Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

As discussed in Section VII.F, Unfunded State Mandates, the San Diego Water Board finds that the requirements in this Order are not more stringent than the minimum federal requirements. Among other requirements, federal law requires MS4 permits to include requirements to effectively prohibit non-storm water discharges into the MS4s, in addition to requiring controls to reduce the discharge of pollutants in storm water to the MEP, and other provisions as USEPA or the State determines are appropriate for the control of pollutants in MS4 discharges.

The requirements in this Order may be more specific or detailed than those enumerated in federal regulations under 40 CFR 122.26 or in the USEPA guidance. However, the requirements have been designed to be consistent with and within the federal statutory mandates described in CWA section 402(p)(3)(B)(ii) and (iii) and the related federal regulations and guidance. Consistent with federal law, all of the

conditions in this Order could have been included in a permit adopted by USEPA in the absence of the in lieu authority of California to issue NPDES permits.

Moreover, the inclusion of numeric WQBELs in this Order does not cause this Order to be more stringent than federal law. Federal law authorizes both narrative and numeric effluent limitations to meet state water quality standards. The inclusion of WQBELs as discharge specifications in an NPDES permit in order to achieve compliance with water quality standards is not a more stringent requirement than the inclusion of BMP based permit limitations to achieve water quality standards (State Water Board Order No. WQ 2006-0012 (*Boeing*)). Therefore, consideration of the factors set forth in CWC section 13241 is not required for permit requirements to implement the effective prohibition on the discharge of non-storm water discharges into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determine appropriate to control such pollutants, as those requirements are mandated by federal law.

Included in the provisions of the Order are monitoring and reporting requirements that are designed to demonstrate that the Copermittees are implementing programs to comply with the CWA municipal storm water requirements. CWA section 308(a) and 40 CFR 122.41(h), (j)-(l), 122.44(i) and 122.48 require that all NPDES permits specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s (40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c)) also specify additional monitoring and reporting requirements. In addition to the federal requirements of the CWA, the San Diego Water Board also has the authority in CWC 13383 to establish monitoring, reporting, and recordkeeping requirements that implement federal and state laws and regulations through NPDES permits.

The monitoring and assessment information that will be reported to the San Diego Water Board is necessary to determine if the Copermittees are making progress toward achieving compliance with the discharge prohibitions, receiving water limitations, and effluent limitations under Provision A of the Order. The monitoring and assessment information that will be reported is also expected to be key to the iterative approach and adaptive management process that is required to be implemented by the Copermittees if they cannot meet the discharge prohibitions and receiving water limitations under the present conditions, which is also part of the requirements under Provision A of the Order.

Notwithstanding the above, the San Diego Water Board has considered cost information in issuing this Order, as discussed below. The San Diego Water Board has also considered all of the evidence that has been presented to the San Diego Water Board regarding the CWC section 13241 factors in adopting this Order. The San Diego Water Board finds that the requirements in this Order are reasonably necessary to protect beneficial uses identified in the Basin Plan and the economic information related to costs of compliance and other CWC section 13241 factors are not sufficient to justify failing to protect those beneficial uses. Where appropriate, the

San Diego Water Board has provided or will consider providing the Copermittees with additional time to implement control measures to achieve final WQBELs and/or water quality standards.

Cost Information

Discussions of the financial and economic ramifications of municipal storm water management programs tend to focus on the significant costs incurred by municipalities in developing and implementing the programs. When considering the cost of implementing the programs, however, it is also important to consider the alternative costs that are incurred when programs are not fully implemented, as well as the economic benefits which result from effective program implementation.

The recent financial and economic conditions have amplified the concerns about the costs incurred by the municipalities in developing and implementing their programs. The reduction in resources resulting from the recent financial and economic conditions has been cited by many of the Copermittees as a justification for reducing the requirements that must be met by their programs. While the recent conditions are a cause for concern in the short term, these programs also have an opportunity to identify and implement improvements and efficiencies before the next period of growth and development, resulting in more effective and sustainable programs over the long term.

In addition, it is very difficult to ascertain the true cost of implementation of the Copermittees' management programs because of inconsistencies in reporting by the Copermittees. Reported costs of compliance for the same program element can vary widely from city to city, often by a very wide margin that is not easily explained.[2] Despite these problems, efforts have been made to identify management program costs, which can be helpful in understanding the costs of program implementation.

The San Diego Water Board recognizes that the Copermittees will incur costs in implementing this Order, potentially above and beyond the costs from the Copermittees' prior permits. The San Diego Water Board also recognizes that, due to California's current economic condition, many Copermittees currently have limited staff and resources to implement actions to address its MS4 discharges. Based on the economic considerations below, the San Diego Water Board has provided the Copermittees a significant amount of flexibility to choose how to implement the requirements of the Order.

The Order also allows the Copermittees to customize their plans, programs, and monitoring requirements. In the end, it is up to the Copermittees to determine the effective BMPs and measures necessary to comply with this Order. The Copermittees can choose to implement the least expensive measures that are effective in meeting

[2] Los Angeles Water Board, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.

the requirements of this Order. This Order also does not require the Copermittees to fully implement all requirements within a single permit term. Where appropriate, the Board has provided the Copermittees with additional time outside of the permit term to implement control measures to achieve final WQBELs and/or water quality standards.

The San Diego Water Board has considered available cost information associated with compliance with this Order. It is not possible to predict accurately the cost impact of the requirements that involve an unknown level of implementation or that depend on environmental variables that are as yet undefined. Only general conclusions can be drawn from this information.

Estimated Municipal Storm Water Program Implementation Costs

The USEPA, the State Water Board, and the California Regional Water Quality Control Boards (Regional Water Boards) have attempted to evaluate the costs of implementing municipal storm water programs. The assessments have demonstrated that the true costs are difficult to ascertain and reported costs vary widely. In addition, reported fiscal analyses tend to neglect the costs incurred to municipalities when storm water and non-storm water runoff is not effectively managed, which are incurred as a result of pollution, contamination, nuisance, and damage to ecosystems, property, and human health. Nonetheless, they provide a useful context for considering the costs of requirements within Order No. R9-2013-0001.

In 1999, the USEPA reported on multiple studies it conducted to determine the cost of management programs. A study of Phase II municipalities determined that the annual cost of the Phase II program was expected to be $9.16 per household. The USEPA also studied 35 Phase I municipalities, finding costs to be $9.08 per household annually, similar to those anticipated for Phase II municipalities.[3]

The State Water Board commissioned a study by the California State University, Sacramento to assess costs of the Phase I MS4 program. This study includes an assessment of costs incurred by Phase I MS4s throughout the state to implement their programs. Annual cost per household in the study ranged from $18 to $46, with the Fresno-Clovis Metropolitan Area representing the lower end of the range, and the City of Encinitas (in San Diego County) representing the upper end of the range.[4]

A study on Phase I MS4 program costs was also conducted by the California Regional Water Quality Control Board, Los Angeles Region (Los Angeles Water Board), where program costs reported in the municipalities' annual reports were assessed. The Los

[3] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791-68792.
[4] State Water Board, 2005. NPDES Stormwater Cost Survey. P. ii.

Angeles Water Board estimated that average per household cost to implement the MS4 program in Los Angeles County was $12.50. [5]

It is important to note that reported program costs are not all attributable to solely complying with MS4 permits. Many program components, and their associated costs, existed before any MS4 permits were ever issued. For example, street sweeping and trash collection costs cannot be solely or even principally attributable to MS4 permit compliance, since these practices have long been expected from and implemented by municipalities.

Therefore, true program cost resulting from MS4 permit requirements is some fraction of reported costs. The California State University, Sacramento study found that only 38 percent of program costs are new costs fully attributable to MS4 permits. The remainder of the program costs was either pre-existing or resulted from enhancement of pre-existing programs.[6] In 2000, the County of Orange found that even lower amounts of program costs are solely attributable to MS4 permit compliance, reporting that the amount attributable to implement the County or Orange Drainage Area Management Plan (DAMP), was less than 20 percent of the total budget. The remaining 80 percent was attributable to pre-existing programs.[7] More current data from the County of Orange is not used in this discussion because the County of Orange no longer reports such information.

Estimated Value of Healthy Water Quality

Economic considerations of municipal storm water management programs cannot be limited only to program costs. Evaluation of programs must also consider information on the benefits derived from environmental protection and improvement.[8] Attention is often focused on municipal storm water management program costs, but the programs must also be viewed in terms of their value to the public.

Placing a value on healthy receiving waters is very difficult. Often the value of receiving waters with good water quality manifests in other forms, such as tourism, recreational opportunities, and/or increased property values. When surface water bodies are degraded, thereby degrading the habitat within and adjacent to the water bodies, the public loses the value and benefits associated with being able to use the area in and around the water bodies. Surface waters that are able to support the beneficial uses designated in the Basin Plan can sustain plants and wildlife that can attract visitors and residents, providing aesthetic, recreational, as well as monetary value to the public. At this time, however, there have been no studies for the San

[5] Los Angeles Water Board, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.
[6] State Water Board, 2005. NPDES Stormwater Cost Survey. P. 58.
[7] County of Orange, 2000. A NPDES Annual Progress Report. P. 60.
[8] Ribaudo M.O. and D. Heelerstein. 1992, *Estimating Water Quality Benefits: Theoretical and Methodological Issues.* U.S. Department of Agriculture. Technical Bulletin No. 1808.

Diego Region to quantify the added value that surface waters with healthy water quality can provide.

USEPA has estimated that household willingness to pay for improvements in fresh water quality for fishing and boating is approximately $158-$210.[9] This estimate can be considered conservative, since it does not include important considerations such as marine waters benefits, wildlife benefits, or flood control benefits. Another study conducted by California State University, Sacramento reported that the annual household willingness to pay for statewide clean water is approximately $180.[10]

A study conducted by the University of Southern California and University of California, Los Angeles assessed the costs and benefits of implementing various approaches for achieving compliance with the MS4 permits in the Los Angeles region. The study found that non-structural systems would cost $2.8 billion but provide $5.6 billion in benefit. If structural systems were determined to be needed, the study found that total costs would be $5.7 to $7.4 billion, while benefits could reach $18 billion.[11] Costs are anticipated to be borne over many years, probably at least ten years.

As can be seen, the benefits of the municipal storm water management programs are expected to considerably exceed their costs. Such findings are corroborated by USEPA, which found that the benefits of implementation of its Phase II storm water rule would also outweigh the costs.[12]

[9] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68793.
[10] State Water Board, 2005. NPDES Stormwater Cost Survey. P. iv.
[11] Los Angeles Water Board, 2004. Alternative Approaches to Stormwater Control.
[12] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791.

VII. APPLICABLE STATUTES, REGULATIONS, PLANS AND POLICIES

A. Legal Authorities – Federal Clean Water Act and California Water Code

This Order is issued pursuant to section 402 of the CWA and implementing regulations adopted by the USEPA and chapter 5.5, division 7 of the CWC (commencing with section 13370). This Order serves as an NPDES permit for point source discharges to surface waters. This Order also serves as waste discharge requirements pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

The objective of the CWA is "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*." To carry out this objective, the CWA requires the implementation of permit programs to regulate the discharge of pollutants and dredged or fill material to the navigable waters of the U.S. and to regulate the use and disposal of sewage sludge. CWA section 402 provides the legal authority to issue a permit for the discharge of pollutants to waters of the U.S. under the NPDES. The CWA provides that NPDES permits may be issued by states which are authorized to implement the provisions of that act. California became authorized to implement the NPDES permit program on May 14, 1973.

The Porter-Cologne Water Quality Control Act (Division 7, commencing with CWC section 13000) established the State Water Resources Control Board (State Water Board) and nine Regional Water Quality Control Boards (Regional Water Boards) as the principal state agencies with primary responsibility for the coordination and control of water quality. CWC section 13200(f) established the San Diego Water Board, which has the primary responsibility for the coordination and control of water quality in the San Diego Region, which includes all the basins draining into the Pacific Ocean between the southern boundary of the Santa Ana Region and the California-Mexico boundary. The San Diego Water Board implements the CWA through Chapter 5.5 of the CWC, commencing with section 13370. CWC section 13377 provides the San Diego Water Board the legal authority to issue waste discharge requirements to ensure compliance with all applicable provisions of the CWA and acts amendatory thereof or supplementary, thereto, to implement water quality control plans, or for the protection of beneficial uses, or to prevent nuisance.

CWA section 402(p) requires the USEPA or authorized state to issue NPDES permits for storm water discharges from MS4s to waters of the U.S. CWA section 402(p)(3)(B)(ii) requires that NPDES permits for storm water discharges from MS4s "*effectively prohibit non-storm water discharges*" into the MS4s. CWA section 402(p)(3)(B)(iii) requires that NPDES permits for storm water discharges from MS4s to "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable* [MEP], *including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*."

The USEPA published implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]), which prescribe permit application requirements for storm water discharges from MS4s pursuant to CWA 402(p), on November 16, 1990. The USEPA published an Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems, which provided guidance on permit application requirements for regulated MS4s, on May 17, 1996. The federal regulations in 40 CFR 122 and guidance issued by USEPA serve as the foundation for the provisions of Order No. R9-2013-0001. The legal authorities provided by the above statutes and regulations are included as part of the discussions in Section VIII of this Fact Sheet.

B. Legal Authority for the Permit Issued on a Region-wide Basis

CWA section 402(p)(3)(B) provides the San Diego Water Board the legal authority to issue an NPDES permit for the San Diego Region as compared to separate MS4 permits based upon County- and partial County-wide boundaries as they existed within the San Diego Region. CWA section 402(p)(3)(B) states that "*Permits for discharges from municipal storm sewers- (i) may be issued on a system- or jurisdiction-wide basis* ...." The federal regulations in 40 CFR 122.26(a)(1)(v) also state that the San Diego Water Board "*may designate dischargers from municipal separate storm sewers on a system-wide or jurisdiction-wide basis. In making this determination, the [San Diego Water Board] may consider the following factors: (A) the location of the discharge with respect to waters of the United States; (B) the size of the discharge; (C) the quantity and nature of the pollutants discharged to waters of the United States; and (D) other relevant factors*."

More specifically, the federal regulations provide that for large and medium MS4 systems, the San Diego Water Board may issue a regional permit. Specifically, the federal regulation in 40 CFR 122.26(a)(3) provide:

"*(ii) The Director may either issue one system-wide permit covering all discharges from municipal separate storm sewers within a large or medium municipal storm sewer system or issue distinct permits for appropriate categories of discharges within a large or municipal separate storm sewer system including, but not limited to: all discharges owned or operated by the same municipality; located within the same jurisdiction; all discharges within a system that discharge to the same watershed; discharges within a system that are similar in nature; or for individual discharges from municipal separate storm sewers within the system.*

(iii) The operator of a discharge from a municipal separate storm sewer which is part of a large or medium municipal separate storm sewer system must either: (A) Participate in a permit application (to be a permittee or a co-permittee) with one or more other operator of discharges from the large or medium municipal storm sewer system which covers all, or a portion of all, discharges from the municipal separate storm sewer system; (B) Submit a distinct permit application which only covers discharges from the municipal separate storm sewers for

which the operator is responsible; or (C) A regional authority may be responsible for submitting a permit application under the following guidelines....

(iv) One permit application may be submitted for all or a portion of all municipal separate storm sewers within adjacent or interconnected large or medium municipal separate storm sewer systems. The Director may issue one systemwide permit covering all, or a portion of all municipal separate storm sewers in adjacent or interconnected large or medium municipal separate storm sewer systems.

(v) Permits for all or a portion of all discharges from large or medium municipal separate storm sewer systems that are issued on a system-wide, jurisdiction-wide, watershed or other basis may specify different conditions relating to different discharges covered by the permit, including different management programs for different drainage areas which contribute storm water to the system."

Based on these regulations, the San Diego Water Board may issue a region-wide MS4 permit. The regulations also clarify that the permit may include different conditions for separate discharges covered by the permit. This allows the San Diego Water Board to ensure that suitable water quality conditions and provisions are identified for each watershed.

The USEPA's responses to comments in the Final Rule for the above-mentioned regulations also make it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide, permits. In the Final Rule published in the Federal Register and containing the responses to comments, USEPA notes that 40 CFR 122.26(a)(3)(iv) would allow an entire system in a geographical region under the purview of a State agency to be designated under a permit.[13] USEPA also states that many commenters wanted to allow the permitting authority broad discretion to establish system-wide permits, and that EPA believes that paragraphs 40 CFR 122.26 (a)(1)(v) and (a)(3)(ii) allow for such broad discretion.[14]

This Order creates watershed requirements that apply to multiple counties. The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees. Managing storm water on a regional and watershed basis is expected to result in improved water quality, as the Order focuses on monitoring and management practices necessary to improve each watershed rather than political boundaries. A single permit also allows the San Diego Water Board staff to expend fewer resources developing successive multiple permits and allows more resources to be devoted to working cooperatively with all three current groups of Copermittees to ensure implementation of this Order results in improved water quality.

[13] 55 Federal Register 47990-01, 48042.
[14] Ibid.

C. Federal and California Endangered Species Acts

This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2115.5) or the Federal Endangered Species Act (16 United States Code [USC] sections 1531 to 1544). This Order requires compliance with requirements to protect the beneficial uses of waters of the U.S. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

D. California Environmental Quality Act

The action to adopt an NPDES Permit is exempt from the provisions of Chapter 3 of the California Environmental Quality Act (CEQA) (Public Resources Code section 21100, et seq.) pursuant to CWC section 13389. (*County of Los Angeles v. Cal. Water Boards* (2006) 143 Cal.App.4th 985.)

E. State and Federal Regulations, Plans and Policies

The legal authority provided by the following regulations, plans, and policies are also included as part of the discussions in Section VIII of this Fact Sheet.

Water Quality Control Plan for the San Diego Basin

The CWA requires the San Diego Water Board to establish water quality standards for each water body in its region. Water quality standards include beneficial uses, water quality objectives and criteria that are established at levels sufficient to protect beneficial uses, and an antidegradation policy to prevent degrading of waters. On September 8, 1994, the San Diego Water Board adopted the *Water Quality Control Plan for the San Diego Basin* (Basin Plan). The Basin Plan designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters in the San Diego Region. The San Diego Water Board has amended the Basin Plan on multiple occasions since 1994. In addition, the Basin Plan implements State Water Board Resolution No. 88-63, which established state policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply. Beneficial uses applicable to the surface water bodies that receive discharges from the MS4s within the San Diego Region generally include those listed below:

The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region:

- Municipal and Domestic Supply (MUN)
- Agricultural Supply (AGR)
- Industrial Process Supply (PROC)

- Industrial Service Supply (IND)
- Ground Water Recharge (GWR)
- Contact Water Recreation (REC1)
- Non-contact Water Recreation (REC2)
- Warm Freshwater Habitat (WARM)
- Cold Freshwater Habitat (COLD)
- Wildlife Habitat (WILD)
- Rare, Threatened, or Endangered Species (RARE)
- Freshwater Replenishment (FRSH)
- Hydropower Generation (POW)
- Preservation of Biological Habitats of Special Significance (BIOL)

The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region:

- Navigation (NAV)
- Commercial and Sport Fishing (COMM)
- Estuarine Habitat (EST)
- Marine Habitat (MAR)
- Aquaculture (AQUA)
- Migration of Aquatic Organisms (MIGR)
- Spawning, Reproduction, and/or Early Development (SPWN)
- Shellfish Harvesting (SHELL)

Pursuant to Water Code sections 13263 and 13377, the requirements of this Order implement the Basin Plan.

Water Quality Control Plan for Ocean Waters of California, California Ocean Plan

In 1972, the State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan). The State Water Board adopted the most recent amended Ocean Plan on October 16, 2012 ~~September 15, 2009~~. The Office of Administrative Law approved it on July 3, 2013 ~~March 10, 2010~~. ~~On October 8, 2010, USEPA approved the 2009 Ocean Plan.~~ The amended Ocean Plan became effective on August 19, 2013. The Ocean Plan is applicable, in its entirety, to ocean waters of the State. In order to protect beneficial uses, the Ocean Plan establishes water quality objectives and a program of implementation. Pursuant to Water Code sections 13263 and 13377, the requirements of this Order implement the Ocean Plan. The Ocean Plan identifies the beneficial uses of ocean waters of the State to be protected as summarized below:

- Industrial water supply
- Water contact and non-contact recreation, including aesthetic enjoyment; navigation

- Commercial and sport fishing
- Mariculture
- Preservation and enhancement of designated Areas of Special Biological Significance
- Rare and endangered species
- Marine habitat
- Fish spawning and shellfish harvesting

On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving an exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges. On June 19, 2012, the State Water Board adopted Order No. 2012-0031, amending Order No. 2012-0012 to require pollutant load reductions to be achieved within six years for the ASBS Compliance Plans, section A.2.d(2) and ASBS Pollution Prevention Plans, section B.2.b(2). The State Water Board Resolution No. 2012-0012, as amended requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject terms and conditions of State Water Board Resolution No. 2012-0012, as amended. The Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012, as amended, applicable to these discharges, are incorporated in Attachment A of this Order. Requirements of this Order implement the Ocean Plan.

Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality

On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

Antidegradation Policy

Federal regulations (40 CFR 131.12) require that the state water quality standards include an antidegradation policy consistent with the federal antidegradation policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16 ("Statement of Policy with Respect to Maintaining the Quality of

the Waters of the State"). State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law.

The San Diego Water Board's Basin Plan implements and incorporates by reference both the State and federal antidegradation policies. State Water Board Resolution No. 68-16 and 40 CFR 131.12 require the San Diego Water Board to maintain high quality waters of the State unless degradation is justified based on specific findings. First, the Board must ensure that "existing instream uses and the level of water quality necessary to protect the existing uses" are maintained and protected. Second, if the baseline quality of a water body for a given constituent exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water, that quality shall be maintained and protected through the requirements of the Order unless the Board makes findings that (1) any lowering of the water quality is necessary to accommodate important economic or social development in the area in which the waters are located; (2) water quality adequate to protect existing uses fully is assured; and (3) the highest statutory and regulatory requirements for all new and existing point sources and all cost-effective and reasonable best management practices for nonpoint source control are achieved. The San Diego Water Board must also comply with any requirements of State Water Board Resolution No. 68-16 beyond those imposed through incorporation of the federal antidegradation policy. In particular, the Board must find that not only present, but also anticipated future uses of water are protected, and must ensure best practicable treatment or control of the discharges. The baseline quality considered in making the appropriate findings is the best quality of the water since 1968, the year of the adoption of Resolution No. 68-16, or a lower level if that lower level was allowed through a permitting action that was consistent with the federal and state antidegradation policies. ~~until it is demonstrated that any change in quality will be consistent with maximum benefit to the people of the State, will not unreasonably affect beneficial uses, and will not result in water quality less than that described in the San Diego Water Boards' policies. State Water Board Resolution No. 68-16 requires that discharges of waste be regulated to meet best practicable treatment or control to assure that pollution or nuisance will not occur and the highest water quality consistent with the maximum benefit to the people of the State be maintained.~~

The discharges permitted in this Order are consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Board Resolution No. 68-16 as set forth below~~.~~: ~~Many of the water bodies within the area covered by this Order are of high quality. The Order requires the Copermittees to meet best practicable treatment or control to meet water quality standards. As required by 40 CFR 122.44(a), the Copermittees must comply with the "maximum extent practicable" technology-based standard set forth in CWA section 402(p) for discharges of pollutants in storm water from the MS4s.~~

1. Many of the waters within the area covered by this Order are impaired for multiple pollutants discharged through MS4s and are not high quality waters with regard to these pollutants. In most cases, there is insufficient data to determine whether these water bodies were impaired as early as 1968, but the limited available data shows

impairment dating back for more than two decades. Many such water bodies are ~~and~~ listed on the State's CWA Section 303(d) List and the San Diego Water Board has established TMDLs to address the impairments. This Order ensures that existing instream (beneficial) water uses and the level of water quality necessary to protect the existing uses is maintained and protected. This Order requires the Copermittees to comply with permit provisions to implement the WLAs set forth in the TMDLs in order to restore the beneficial uses of the impaired water bodies consistent with the assumptions and requirements of the TMDLs. This Order further requires compliance with receiving water limitations to meet water quality standards in the receiving water either by demonstrating compliance pursuant to Provision A and the Copermittees' monitoring and assessment program pursuant to Provision D of this Order, or by implementing Provision B.3.c with a schedule to achieve compliance with receiving water limitations. This Order includes requirements to develop and implement storm water management programs, achieve WQBELs, and effectively prohibit non-storm water discharges into the MS4. The issuance of this Order does not authorize an increase in the amount of discharge of waste.

2. To the extent that water bodies within the area covered by this Order are high quality waters with regard to some constituents, this Order finds as follows:

   a. Allowing limited degradation of high quality water bodies through MS4 discharges is necessary to accommodate important economic or social development in the area and is consistent with the maximum benefit to the people of the state. The discharge of storm water in certain circumstances is to the maximum benefit to the people of the state because it can assist with maintaining instream flows that support beneficial uses, may spur the development of multiple-benefit projects, and may be necessary for flood control, and public safety as well as to accommodate development in the area. The alternative – capturing all storm water from all storm events – would be an enormous opportunity cost that would preclude MS4 permittees from spending substantial funds on other important social needs. The Order ensures that any limited degradation does not affect existing and anticipated future uses of the water and does not result in water quality less than established standards. The Order requires compliance with receiving water limitations that act as a floor to any limited degradation.

   b. The Order requires the highest statutory and regulatory requirements and requires that the Copermittees meet best practicable treatment or control. The Order prohibits all non-storm water discharges, with a few enumerated exceptions, through the MS4 to the receiving waters. As required by 40 CFR section 122.44(a), the Copermittees must comply with the "maximum extent practicable" technology-based standard set forth in CWA section 402(p), and implement extensive minimum control measures in a storm water management program. Recognizing that best practicable treatment or control may evolve over time, the Order includes new and more specific requirements as compared to the prior Phase I MS4 permits for the San Diego County, Orange County and Riverside County Copermittees. The Order incorporates options to implement

Water Quality Improvement Plans that must specify detailed structural and non-structural storm water controls that must be implemented in accordance with an accepted proposed time schedule. The Order contains provisions to encourage, wherever feasible, retention of the storm water from the 85th percentile 24-hour storm event.

Anti-Backsliding Requirements

CWA sections 402(o) and 303(d)(4) and federal regulations at 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations or conditions may be relaxed. ~~All effluent limitations and other conditions in this Order are at least as stringent as the effluent limitations in the previous permits issued to the San Diego County Copermittees, the Orange County Copermittees, and the Riverside County Copermittees.~~ While this Order allows implementation of an alternative compliance pathway option in Provision B.3.c to constitute compliance with receiving water limitations under certain circumstances, the availability of that alternative and the corresponding availability of additional time to come into compliance with receiving water limitations~~,~~ does not violate the anti-backsliding provisions. The receiving water limitations provisions of this Order are imposed under section 402(p)(3)(B) of the Clean Water Act rather than based on best professional judgment, or based on section 301(b)(1)(C) or sections 303(d) or (e), and are accordingly not subject to the anti-backsliding requirements of section 402(o). Although the non-applicability is less clear with respect to the regulatory anti-backsliding provisions in 40 CFR 122.44(l), the regulatory history suggests that USEPA's intent was to establish the anti-backsliding regulations with respect to evolving technology standards for traditional point sources. (See, e.g., 44 Fed.Reg. 32854, 32864 (Jun. 7, 1979)). It is unnecessary, however, to resolve the ultimate applicability of the regulatory anti-backsliding provisions, because the alternative compliance pathway option in Provision B.3.c qualifies for an exception to backsliding as based on new information.

The alternative compliance pathway option in Provision B.3.c of this Order was informed by new information available to the Board from experience and knowledge gained through storm water permitting at the Regional Water Boards in the last ten years. There has been a statewide paradigm shift in storm water management. State Water Board Order WQ 2015-0075 directed all of the Regional Water Boards to consider the Los Angeles Water Board's alternative compliance path to receiving water limitations in all Phase I MS4 permits going forward (State Water Board Order WQ 2015-0075 at page 51), and the Los Angeles Water Board's process of developing over 30 watershed-based TMDLs and implementing several TMDLs since the adoption of the previous permits. In particular, the Los Angeles Water Board recognized the significance of allowing time to plan, design, fund, operate and maintain watershed-based BMPs necessary to attain water quality improvements and additionally recognized the potential for municipal storm water to benefit water supply. Similarly, the San Diego Water Board's experience developing and implementing the Fourth Term MS4 Permits and TMDLs that apply on a region-wide scale (e.g. TMDLs for Indicator

Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region) has resulted in a similar recognition of the need for a watershed-based approach that allows time to plan, design, fund, operate and maintain BMPs to address impaired waters that have been impacted by MS4 discharges. Thus, even if the receiving water limitations are subject to anti-backsliding requirements, they were revised based on new information that would support an exception to the anti-backsliding provisions. (33 U.S.C. § 1342(o)(2)(B)(i); 40 C.F.R. § 122.44(l)(1); 40 C.F.R. §122.44(l)(2)(i)(B)(1)).

Clean Water Act Section 303(d) List

CWA section 303(d)(1) requires each State to identify specific water bodies within its boundaries where water quality standards are not being met or are not expected to be met after implementation of technology-based effluent limitations on point sources. Water bodies that do not meet water quality standards are considered impaired and are placed on the state's "303(d) List." Periodically, USEPA approves the State's 303(d) List.

Most recently, USEPA approved the State's 2010 303(d) List of impaired water bodies on October 11, 2011, which includes certain receiving waters in the San Diego Region. For each listed water body, the state or USEPA is required to establish a TMDL of each pollutant impairing the water quality standards in that water body. A TMDL is a tool for implementing water quality standards and is based on the relationship between pollution sources and in-stream water quality conditions. The TMDL establishes the allowable pollutant loadings for a water body and thereby provides the basis to establish water quality-based controls. These controls should provide the pollution reduction necessary for a water body to meet water quality standards.

A TMDL is the sum of the allowable pollutant loads of a single pollutant from all contributing point sources (the waste load allocations or WLAs) and non-point sources (load allocations of LAs) plus the contribution from background sources and a margin of safety (40 CFR 130.2(i)). MS4 discharges are considered point source discharges. For 303(d)-listed water bodies and pollutants in the San Diego Region, the San Diego Water Board or USEPA develops and adopts TMDLs that specify these requirements.

Since 2002, the San Diego Water Board has established seven (7) TMDLs to remedy water quality impairments in various water bodies within the San Diego Region (see Attachment E to the Order). These TMDLs identify MS4 discharges as a source of pollutants to these water bodies, and, as required, establish WLAs for MS4 discharges to reduce the amount of pollutant discharged to receiving waters. CWA section 402(p)(3)(B)(iii) requires the San Diego Water Board to impose permit conditions, including: "management practices, control techniques and system, design and engineering methods, and *such other provisions as the Administrator or the State determines appropriate for the control of such pollutants."* (Emphasis added.) CWA section 402(a)(1) also requires states to issue permits with conditions necessary to carry out the provisions of the CWA. Federal regulations also require that NDPES permits contain WQBELs consistent with the assumptions and requirements of all available WLAs (40 CFR 122.44(d)(1)(vii)(B)). CWC section 13377 also requires that

NPDES permits include limitations necessary to implement water quality control plans. Therefore, this Order includes WQBELs and other provisions to implement the TMDL WLAs assigned to Copermittees regulated by this Order.

Other Regulations, Plans and Policies

This Order implements all other applicable federal regulations and State regulations, plans and policies, including the California Toxics Rule at 40 CFR 131.38 (Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California Rule [California Toxics Rule or CTR]), and State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP).

F. Unfunded State Mandates

Article XIII B, Section 6(a) of the California Constitution provides that whenever "*any state agency mandates a new program or higher level of service on any local government, the state shall provide a subvention of funds to reimburse that local government for the costs of the program or increased level of service*." The requirements of this Order do not constitute state mandates that are subject to a subvention of funds for several reasons, including, but not limited to, the following.

First, the requirements of this Order do not constitute a new program or a higher level of service as compared to the requirements contained in the previous Fourth Term Permits. The overarching requirement to impose controls to reduce the pollutants in discharges from MS4s is dictated by the CWA and is not new to this permit cycle (33 USC section 1342(p)(3)(B)). The inclusion of new and advanced measures as the MS4 programs evolve and mature over time is anticipated under the CWA (55 FR 47990, 48052 (Nov. 16, 1990)), and to the extent requirements in this Order are interpreted as new advanced measures, they do not constitute a new program or higher level of service.

Second, and more broadly, mandates imposed by federal law, rather than by a state agency, are exempt from the requirement that the local agency's expenditures be reimbursed (Cal. Const., art. XIII B, section 9, subd. (b)). This Order implements federally mandated requirements under the CWA and its requirements are therefore not subject to subvention of funds. This includes federal requirements to effectively prohibit non-storm water discharges, to reduce the discharge of pollutants in storm water to the MEP, and to include such other provisions as the Administrator or the State determines appropriate for the control of such pollutants (33 USC section 1342(p)(3)(B)). Federal cases have held these provisions require the development of permits and permit provisions on a case-by-case basis to satisfy federal requirements. (*Natural Resources Defense Council, Inc., v. USEPA* (9th Cir. 1992) 966 F.2d 1292, 1308, fn. 17.)

The authority exercised under this Order is not reserved state authority under the CWA's savings clause (cf. *Burbank v. State Water Resources Control Bd.* (2005) 35

Cal.4th 613, 627-628 [relying on 33 USC section 1370, which allows a state to develop requirements which are not "less stringent" than federal requirements]), but instead is part of a federal mandate to develop pollutant reduction requirements for municipal separate storm sewer systems. To this extent, it is entirely federal authority that forms the legal basis to establish the permit provisions. (See, *City of Rancho Cucamonga v. Regional Water Quality Control Board, Santa Ana Region* (2006) 135 Cal.App.4th 1377, 1389; *Building Industry Ass'n of San Diego Co. v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 882-883.)

The MEP standard is a flexible standard that balances a number of considerations, including technical feasibility, cost, public acceptance, regulatory compliance, and effectiveness. (*Building Ind. Ass'n., supra,* 124 Cal.App.4th at pp. 873-874, 889.) Such considerations change over time with advances in technology and with experience gained in storm water management (55 FR 47990, 48052 (Nov. 16, 1990)). Accordingly, a determination of whether the conditions contained in this Order exceed the requirements of federal law cannot be based on a point by point comparison of the permit conditions and the minimum control measures that are required "at a minimum" to reduce pollutants to the maximum extent practicable and to protect water quality (40 CFR 122.34). Rather, the appropriate focus is whether the permit conditions, as a whole, exceed the MEP standard.

In recent months, the County of Los Angeles and County of Sacramento Superior Courts have granted writs setting aside decisions of the Commission on State Mandates that held certain requirements in Phase I permits constituted unfunded mandates. In both cases, the courts have found that the correct analysis in determining whether an MS4 permit constituted a state mandate was to evaluate whether the permit as a whole exceeds the MEP standard. (*State of Cal. v. Comm. on State Mandates* (Super. Ct. Sacramento County, 2012, No. 34-2010-80000604), *State of California v. County of Los Angeles* (Super. Ct. Los Angeles County, 2011, No. BS130730.) Both cases are currently pending appeal.

The requirements of the Order, taken as a whole rather than individually, are necessary to reduce the discharge of pollutants to the MEP and to protect water quality. The San Diego Water Board finds that the requirements of the Order are practicable, do not exceed federal law, and thus do not constitute an unfunded mandate. These findings are the expert conclusions of the principal state agency charged with implementing the NPDES program in California (CWC sections 13001, 13370).

It should also be noted that the provisions in this Order to effectively prohibit non-storm water discharges are also mandated by the CWA (33 USC section 1342(p)(3)(B)(ii)). Likewise, the provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state establishes or adopts a TMDL, federal law requires that permits must contain effluent limitations consistent with the assumptions and requirements of any applicable waste load allocation in a TMDL (40 CFR 122.44(d)(1)(vii)(B)).

Third, the local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental dischargers who are issued NPDES permits for storm water discharges. With a few inapplicable exceptions, the CWA regulates the discharge of pollutants from point sources (33 USC section 1342) and the Porter-Cologne Act regulates the discharge of waste (CWC section 13263), both without regard to the source of the pollutant or waste. As a result, the "costs incurred by local agencies" to protect water quality reflect an overarching regulatory scheme that places similar requirements on governmental and non-governmental dischargers. (See *County of Los Angeles v. State of California* (1987) 43 Cal.3d 46, 57-58 [finding comprehensive workers' compensation scheme did not create a cost for local agencies that was subject to state subvention].)

The CWA and the Porter-Cologne Act largely regulate storm water with an even hand, but to the extent there is any relaxation of this even-handed regulation, it is in favor of the local agencies. Generally, the CWA requires point source dischargers, including dischargers of storm water associated with industrial or construction activity, to comply strictly with water quality standards (33 USC section 1311(b)(1)(C); *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159, 1164-1165 [noting that industrial discharges must strictly comply with water quality standards]). As discussed in prior State Water Board decisions, certain provisions of this Order do not require strict compliance with water quality standards (State Water Board Order No. WQ 2001-0015, p. 7). Those provisions of this Order regulate the discharge of waste in municipal storm water under the CWA's MEP standard, not the BAT/BCT standard that applies to other types of discharges. These provisions, therefore, regulate the discharge of waste in municipal storm water more leniently than the discharge of waste from non-governmental sources.

Fourth, the Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)). To the extent that the local agency Copermittees have voluntarily availed themselves of the permit, the program is not a state mandate. (Accord, *County of San Diego v. State of California* (1997) 15 Cal.4th 68, 107-108.)

Fifth, the local agency Copermittees' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under state law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

Finally, even if any of the permit provisions could be considered unfunded mandates, under Government Code section 17556, subdivision (d), a state mandate is not subject to reimbursement if the local agency has the authority to charge a fee. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order, subject to certain voting requirements contained in the California Constitution. (See Cal. Const., Art. XIII D, section 6, subd. (c); see also *Howard Jarvis Taxpayers Ass'n v. City of Salinas* (2002) 98 Cal.App.4th

1351, 1358-1359.) The Fact Sheet demonstrates that numerous activities contribute to the pollutant loading in the MS4. Local agencies can levy service charges, fees, or assessments on these activities, independent of real property ownership. (See, e.g., *Apartment Ass'n of Los Angeles County, Inc., v. City of Los Angeles* (2001(24 Cal.4th 830, 842 [upholding inspection fees associated with renting property].) The authority and ability of a local agency to defray the cost of a program without raising taxes indicates that a program does not entail a cost subject to subvention. (*Clovis Unified School Dist. V. Chiang* (2010) 188 Cal.App.4th 794, 812, citing *Connell v. Sup. Ct.* (1997) 59 Cal.App.4th 382, 401; *County of Fresno v. State of California* (1991) 53 Cal. 3d. 482, 487-488.)

VIII. PROVISIONS

The provisions (i.e. NPDES permit requirements) of the Order are discussed below.

A. Prohibitions and Limitations

Purpose: Provision A includes the prohibitions and limitations requirements that are the foundation of all the subsequent requirements included in the Order. Compliance with the prohibitions and limitations will restore and protect receiving waters from impacts that may be caused by discharges into and from the Copermittees' MS4s and ultimately achieve the objective of the CWA.

In meeting the requirements set forth in the Order, the Copermittees must be cognizant that the prohibitions and limitations exist and will be the standard by which the San Diego Water Board will be measuring the progress and success of their implementation of the NPDES permit requirements.

***Discussion*:** The objective of the CWA is to "*restore and maintain the chemical, physical, and biological integrity of the Nation's waters*." The CWA requires the implementation of NPDES permit programs to regulate discharges of pollutants and dredged or fill material to the navigable waters of the U.S. For discharges into and from MS4s, the CWA requires the NPDES permits to "*effectively prohibit non-stormwater discharges into the storm sewers*" and "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable.*"

Provision A includes limitations, consistent with the requirements of the CWA for discharges from MS4s. Provision A expresses these limitations as discharge prohibitions, receiving water limitations, and effluent limitations. Compliance with the discharge prohibitions and receiving water limitations is also explicitly described, in conformance with precedential State Water Board Orders.

More specific and detailed discussions of the requirements of Provision A are provided below.

Provision A.1 (Discharge Prohibitions) prohibits the discharge of specific types of waste into and/or from the Copermittees' MS4s.

Provision A.1.a restates and reiterates Basin Plan Waste Discharge Prohibition 1, by prohibiting discharges into and from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the

state. The terms pollution,[15] contamination,[16] and nuisance[17] are defined under CWC 13050. Provision A.1.c incorporates all the waste discharge prohibitions of the Basin Plan into the requirements of the Order. The waste discharge prohibitions from the Basin Plan have been reproduced and provided in Attachment A to the Order.

Provision A.1.b requires non-storm water discharges into the MS4s to be effectively prohibited, consistent with the requirements of the CWA for MS4 permits to "*effectively prohibit non-stormwater discharges into the storm sewers*." The effective prohibition is required to be implemented by each Copermittee within its jurisdiction through the illicit discharge detection and elimination requirements under Provision E.2. The prohibition does not apply to NPDES permitted discharges into the Copermittees' MS4s.

The CWA employs the strategy of prohibiting the discharge of any pollutant from a point source into waters of the United States unless the discharger of the pollutant(s) obtains an NPDES permit pursuant to CWA Section 402. The 1987 amendment to the CWA includes provision 402(p) that specifically addresses NPDES permitting requirements for storm water discharges from MS4s. CWA section 402(p) prohibits the discharge of pollutants from specified MS4s to waters of the U.S. except as authorized by an NPDES permit and identifies two substantive standards for MS4 storm water permits. MS4 permits (1) "*shall include a requirement to effectively prohibit non-stormwater discharges into the storm sewers*" and (2) "*shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or State determines appropriate for the control of such pollutants*." (CWA section 402(p)(3)(B)(ii)-(iii).)

In November 1990, the USEPA published regulations addressing storm water discharges from MS4s (55 FR 47990 and following (Nov. 16, 1990) (Phase I Final Rule)). The regulations establish minimum requirements for MS4 permits, and generally focus on the requirement that MS4s implement programs to reduce the amount of pollutants found in storm water discharges to the MEP. The CWA's municipal storm water MEP standard does not require storm water discharges to strictly meet water quality standards, as is required for other NPDES permitted

[15] CWC 13050(l): "(1) 'Pollution' means an alteration of the quality of waters of the state by waste to a degree which unreasonably affects either of the following: (A) The water for beneficial uses. (B) Facilities which serve beneficial uses. (2) 'Pollution' may include 'contamination.'

[16] CWC 13050(k): "Contamination' means an impairment of the quality of waters of the state by waste to a degree which creates a hazard to public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste, whether or not waters of the state are affected."

[17] CWC 13050(m): 'Nuisance' means anything which meets all of the following requirements: (1) Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. (2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. (3) Occurs during, or as a result of, the treatment or disposal of wastes."

discharges. Compliance is achieved through an iterative approach of continuous implementation of improved BMPs. This distinction reflects Congress's recognition that variability in flow and intensity of storm events render difficult strict compliance with water quality standards by MS4 permittees. In describing the controls that permits must include to reduce pollutants in storm water discharges to the MEP, the statute (CWA section 402(p)(3)(B)(iii)) states that the controls shall include: "*management practices, control techniques and system, design and engineering methods, and such other provisions as the [permit writer] determines appropriate for the control of such pollutants*."

In contrast, non-storm water discharges from the MS4 that are not authorized by separate NPDES permits are subject to requirements under the NPDES program, including discharge prohibitions, technology based effluent limitations and water quality-based effluent limitations (40 CFR 122.44). The regulations also require the Copermittee's program to include an element to detect and remove illicit discharges and improper disposal into the storm sewer (40 CFR 122.26(d)(2)(iv)(B)).

While "non-storm water" is not defined in the CWA or federal regulations, the federal regulations (at 40 CFR 122.26(b)(2)) define "*illicit discharge*" as *"any discharge to a municipal separate storm sewer that is not composed entirely of storm water and that is not covered by an NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer and discharges resulting from fire fighting activities)*." This definition is the most closely applicable definition of "non-storm water" contained in federal law. As stated in the Phase I Final Rule, USEPA added the illicit discharge program requirement to begin implementation of the 'effective prohibition' requirement to detect and control non-storm water discharges to their municipal system.

Thus, federal law mandates that permits issued to MS4s must require management practices that will result in reducing storm water pollutants to the MEP yet at the same time requires that non-storm water discharges be effectively prohibited from entering the MS4. "Effectively" prohibit does not mean that non-storm water discharges are authorized to be discharged into and from the Copermittees' MS4s. The Phase I Final Rule clarifies what "effectively prohibit" means (55 FR 47995):

> "*Section 402(p)(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…<u>Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit</u> (other than the permit for the discharge from the municipal separate storm sewer)*" [Emphasis added].

Consistent with federal law, unless non-storm water discharges to the MS4 are authorized by a separate NPDES permit, non-storm water discharges are

appropriately subject to the effective prohibition requirement in the CWA and Regional Water Boards are not limited by the iterative MEP approach to storm water regulation in crafting appropriate regulations for non-storm water discharges.

The federal regulations (40CFR122.26(d)(2)(i)(B)) require the Copermittees to establish the legal authority which authorizes or enables the Copermittees to prohibit illicit discharges to the MS4s. The federal regulations (40 CFR 122.26(d)(2)(vi)(B)(1)) require the Copermittees to "*implement and enforce an ordinance, order or similar means*" to prevent non-storm water discharges to their MS4s. Thus, the Copermittees are required to "*effectively*" prohibit non-storm water discharges to their MS4s through enforcing their legal authority established under "*ordinance, order or similar means*" and either remove those discharges to their MS4s, or require those discharges to obtain coverage under a separate NPDES permit. More detail about the program that must be implemented to "*effectively*" prohibit non-storm water discharges to the Copermittees' MS4s is provided under the discussion for Provision E.2.

Provision A.1.d was included to be consistent with Resolution No. 2012-0012, adopted by the State Water Board on March 20, 2012. Provision A.1.d prohibits discharges from MS4s to Areas of Special Biological Significance (ASBS), except for storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach to the Heisler Park ASBS subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012. The pertinent Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 are provided in Attachment A to the Order.

<u>Provision A.2 (Receiving Water Limitations)</u> specifies the condition of the receiving waters that must be achieved when there are discharges from the Copermittees' MS4s. Receiving water limitations are included in all NPDES permits issued pursuant to the CWA section 402. CWA section 402(p)(3)(B)(iii) authorizes the inclusion of "*such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." This requirement gives USEPA or the State permitting authority, in this case the San Diego Water Board, discretion to determine what permit conditions are necessary to control pollutants.

In its Phase I Final Rule (see 55 FR 47990, 47994 (Nov. 16, 1990)), USEPA elaborated on these requirements, stating that, "*permits for discharges from municipal separate storm sewer systems must require controls to reduce the discharge of pollutants to the maximum extent practicable, and where necessary water quality-based controls*." USEPA reiterated in its Phase II Final Rule (64 FR 68722, 68737), that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL*." CWC section 13377 also requires that NPDES permits include limitations necessary to implement water quality control plans. Both the State Water Board and the San Diego Water Board have previously concluded that discharges from the MS4 contain pollutants that have

the reasonable potential to cause or contribute to excursions above water quality standards. As such, inclusion of receiving water limitations is appropriate to control MS4 discharges.

The inclusion of receiving water limitations is also consistent with the Ninth Circuit Court of Appeals' ruling in *Defenders of Wildlife v. Browner* (191 F.3d 1159, 1166 (1999)) that the permitting authority has discretion regarding the nature and timing of requirements that it includes as MS4 permit conditions to attain water quality standards. The Ninth Circuit Court of Appeals recently explained that, "*[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*" (*Natural Resources Defense Council v. County of Los Angeles* (9th Cir. 2011) 673 F.3d 880, 886 (revd. On other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013)))

The receiving water limitations included in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan or in water quality control plans or policies adopted by the State Water Board, including State Water Board Resolution No. 68-16, or in federal regulations, including but not limited to 40 CFR 131.12 and 131.38. The water quality objectives in the Basin Plan and other State Water Board plans and policies have been approved by USEPA and combined with designated beneficial uses constitute the water quality standards required under federal law.

Provision A.2.a requires that discharges from the Copermittees' MS4s must not cause or contribute to the violation of water quality standards in receiving waters. The water quality standards of the receiving waters must be protected from the impacts that may be caused by the Copermittees' MS4 discharges. Water quality standards applicable to the surface waters in the San Diego Region must be achieved through meeting the technology based standard of MEP through an iterative process of improved management actions. Provision A.2.a is also consistent with State Water Board Order WQ 99-05 precedent-setting language requiring discharges from MS4s to attain receiving water quality standards. The water quality control plans and policies with water quality standards applicable to the waters in the San Diego Region are included under Provision A.2.a.

Provisions A.2.b was included to be consistent with the requirements of State Water Board Resolution No. 2012-0012, adopted on March 20, 2012.

Provision A.3 (Effluent Limitations) specifies the condition of the discharges from the Copermittees' MS4s that must be achieved if and when there are discharges.

Consistent with CWA section 301(b)(1)(A) and 40 CFR 122.44(a), Provision A.3.a includes the technology-based effluent limitations that must be included in the Order. The technology-based effluent limits, representing the minimum level of control that must be imposed in a permit under CWA section 402, requires that pollutants in discharges of storm water from the Copermittees' MS4s be reduced to the MEP. This provision applies specifically to storm water discharges. Non-storm water discharges must be effectively prohibited, as required under Provision A.1.b. Non-storm water (dry weather) discharges from the MS4 are not considered storm water (wet weather) discharges and therefore are not subject to the MEP standard.

The technology-based MEP standard is an ever-evolving, flexible, and advancing concept. Neither Congress nor USEPA has specifically defined the term "maximum extent practicable." Congress established this flexible MEP standard so that the administrative bodies would have "*the tools to meet the fundamental goals of the Clean Water Act in the context of storm water pollution*." (*Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 884.) As knowledge about controlling storm water runoff and discharges continues to evolve, so does the knowledge which constitutes MEP. Reducing the discharge of pollutants in storm water from the MS4 to the MEP requires the Copermittees to assess each program component and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP.

The San Diego Water Board or the State Water Board ultimately define MEP, and may include requirements that provide specific guidance on what is expected to demonstrate MEP. It is the responsibility of the Copermittees to propose actions that implement BMPs to reduce storm water pollution to the MEP. In other words, the Copermittees' runoff management programs developed and implemented under the Order are the Copermittees' proposals for achieving MEP. Their total collective and individual activities conducted pursuant to their runoff management programs become their proposal for achieving MEP as it applies both to their overall effort, as well as to specific activities. Provisions B through E of the Order provides a minimum framework to guide the Copermittees in achieving the MEP standard for discharges of pollutants in storm water.

Provision A.3.b incorporates any water quality based effluent limitations (WQBELs) applicable to the MS4s established for TMDLs adopted and approved for the San Diego Region and requires the Copermittees to comply with those WQBELs. This is consistent with 40 CFR 122.44(d)(1)(vii)(B), which requires that NPDES permits to incorporate WQBELs "*developed to protect a narrative water quality criterion, a numeric water quality criterion, or both…consistent with the assumptions and requirements of any available wasteload allocation for the discharge...*"

Pursuant to CWA section 303(d), for surface water bodies identified as impaired by one or more pollutants, the San Diego Water Board is required to establish TMDLs "*at a level necessary to implement the applicable water quality standards with seasonal variations and a margin of safety which takes into account any lack of knowledge*

concerning the relationship between effluent limitations and water quality." The TMDLs identify sources of the pollutants causing the impairments and assign portions of the TMDL as WLAs to point sources, which include MS4s.

WLAs must be expressed in NPDES permits as WQBELs, which may include one or more numeric components such as numeric effluent limits, and/or receiving water limitations, and/or BMP requirements. Because numeric targets for TMDLs typically include a component that will be protective of water quality standards, a TMDL will likely include one or more numeric receiving water limitations and/or effluent limitations as part of the assumptions or requirements of the TMDL. Any numeric receiving water limitations and/or effluent limitations developed as part of the assumptions or requirements of a TMDL must be incorporated and included as part of WQBELs for the MS4s.

Because the development and approval of new TMDLs, or modification of existing TMDLs, may occur during the term of this Order, the specific provisions of those TMDLs, including effluent limitations applicable to MS4s are provided within Attachment E to the Order. Attachment E will be updated with new TMDLs and modifications to existing TMDLs in a timely manner as they occur.

Provision A.4 (Compliance with Discharge Prohibitions and Receiving Water Limitations) describes the process required to be implemented by the Copermittees if compliance with the discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a are not being achieved under current conditions.

In its Phase II Stormwater Regulations, Final Rule, USEPA states that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL.*"[18] In a series of comment letters on MS4 permits issued by various Regional Water Boards, USEPA has also reiterated that MS4 discharges must meet water quality standards.[19] In addition, the Ninth Circuit Court of Appeals explained in a recent ruling that, *"[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*"[20]

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[18] Phase II Stormwater Regulations, Final Rule, 64 Fed. Reg. 68722, 68737.

[19] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.

[20] NRDC v. County of Los Angeles (9th Cir. 2011), 673 F.3d 880, 886 (revd. on other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013))). See also, *Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 884-886, citing *Defenders of Wildlife v. Browning,* (9th Cir. 1999) 191 F.3d 1159.)

Water quality standards for the San Diego Region are established in the Basin Plan. The water quality standards of the Basin Plan are incorporated into this Order as the discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a. The discharge prohibitions and receiving water limitations in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations or prohibitions to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan, water quality control plans or policies adopted by the State Water Board, including Resolution No. 68-16, or federal regulations, including but not limited to, 40 CFR 131.12 and 131.38. The waste discharge prohibitions and water quality objectives in the Basin Plan have been approved by USEPA and combined with the designated beneficial uses constitute the water quality standards required under federal law.

Under federal law (CWA section 402(p)(3)(B)(iii)), an MS4 permit must include "*controls to reduce the discharge of pollutants to the maximum extent practicable...and such other provision as...the State determines appropriate for control of such pollutants*." The State Water Board has previously determined that limitations necessary to meet water quality standards are appropriate for the control of pollutants discharged by MS4s and must be included in MS4 permits. (State Water Board Orders WQ 91-03, 98-01, 99-05, 2001-15; see also *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159.) This Order prohibits discharges that cause or contribute to violations of water quality standards.

The discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a are included in this Order to ensure that discharges from the MS4s do not cause or contribute to exceedances of water quality objectives necessary to protect the beneficial uses of the receiving waters.

Provision A.4 is consistent with the precedent-setting language in State Water Board Order WQ 99-05 required to be included in municipal storm water permits. State Water Board Order WQ 2001-15 refined Order WQ 99-05 by requiring an iterative approach to compliance with water quality standards involving ongoing assessments and revisions, referred to as the "iterative process." The "iterative process" is a fundamental NPDES requirement for municipal storm water permits to achieve the objectives of the CWA.

The State Water Board and Regional Water Boards have stated that the provisions under Provisions A.1.a, A.1.c, A.2.a, and A.4 are independently applicable, meaning that compliance with one provision does not provide a "safe harbor" where there is non-compliance with another provision (i.e., compliance with the Provision A.4 does not shield a Copermittee who may have violated Provision A.1.a, A.1.c, or A.2.a from an enforcement action). The intent of Provision A.4 is to ensure that the Copermittees have the necessary storm water management programs and controls in place, and that they are modified by the Copermittees in a timely fashion when necessary, so that compliance with Provisions A.1.a, A.1.c, and/or A.2.a is achieved as soon as possible. USEPA expressed the importance of this independent applicability in a series of

comment letters on MS4 permits proposed by various Regional Water Boards. At that time, USEPA expressly objected to certain MS4 permits that included language stating, *"permittees will not be in violation of this [receiving water limitation] provision … [if certain steps are taken to evaluate and improve the effectiveness of the jurisdictional runoff management programs],"* concluding that this phrase would not comply with the CWA.[21]

The Ninth Circuit held in *Natural Resources Defense Council v. County of Los Angeles* (2011) 673 F3d. 880, 886 (revd. on other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013))) that engagement in the iterative process does not provide a safe harbor from liability for violations of permit terms prohibiting exceedances of water quality standards. The Ninth Circuit holding is consistent with the position of the State and Regional Water Boards that exceedances of water quality standards in an MS4 permit constitute violations of permit terms subject to enforcement by the Water Boards or through a citizen suit. While the Water Boards have generally directed dischargers to achieve compliance by improving control measures through the iterative process, the San Diego Water Board retains the discretion to take other appropriate enforcement and the iterative process does not shield dischargers from citizen suits under the CWA.

The requirements of Provision A.4, therefore, are required to be implemented until the water quality standards expressed under Provisions A.1.a, A.1.c, and A.2.a are achieved. The CWA requires MS4 permits to "*require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." The requirements of this Order have been deemed or determined to be "appropriate" to achieve water quality standards in receiving waters.

Part of the "*controls*" required by the Order is the process described in Provision A.4. Provision A.4 includes the process that is ultimately expected to achieve compliance with the requirement that discharges from the MS4 do not cause or contribute to violations of water quality standards in the receiving waters. The implementation of Provision A.4 is required when the Copermittees or the San Diego Water Board have determined that discharges from the MS4 are causing or contributing to violations of water quality standards in the receiving waters.

The Copermittees must effectively prohibit non-storm water discharges into the MS4s, reduce the discharge of pollutants in storm water from the MS4s to the MEP, and ensure that their MS4 discharges do not cause or contribute to violations of water quality standards. If the Copermittees have effectively prohibited non-storm water

[21] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.

discharges and reduced storm water pollutant discharges to the MEP, but their discharges are still causing or contributing to violations of water quality standards, Provision A.4 provides a clear "iterative process" for the Copermittees to follow.

Provision A.4 essentially requires the Copermittees to implement additional BMPs until MS4 discharges no longer cause or contribute to a violation of water quality standards.

In assessing compliance and potential enforcement actions, the San Diego Water Board looks at the Copermittees' efforts in total to meet the requirements of Provisions A.1.a, A.1.c, A.2.a and Provision A.4. The Copermittees need to demonstrate that they are making improvements to their programs and making progress toward achieving the discharge prohibitions and receiving water limitations in Provisions A.1.a, A.1.c, and A.2.a by implementing the requirements of Provision A.4. The San Diego Water Board would consider these efforts prior to strictly enforcing the requirements of Provisions A.1.a, A.1.c, and A.2.a. Causes of exceedances of the receiving water limitations can often be more difficult to identify and attribute solely to the Copermittees' MS4s. The intent of the Order is to provide the Copermittees more clarity and flexibility in addressing these exceedances through the iterative approach and adaptive management process until the requirements under Provisions A.1.a, A.1.c, and A.2.a are fully achieved.

An exception to the iterative approach and adaptive management process would be in receiving waters subject to adopted and approved TMDLs. For TMDLs that are incorporated into the Order, there is a specific date for compliance to be achieved, after which the iterative approach and adaptive management process required under Provision A.4 no longer provides the flexibility to achieve compliance. Where compliance dates for a TMDL have passed, compliance with the WQBELs incorporated into the Order established by a TMDL in Attachment E to protect water quality standards is required. Thus, after the interim or final compliance dates for a TMDL have passed, if the discharges from the Copermittees' MS4s are causing or contributing to a violation of WQBELs, exceedances of WQBELs must be strictly enforced by the San Diego Water Board. In the meantime, however, the Copermittees are in compliance with the interim or final TMDL requirements in Attachment E as long as the interim or final WQBELs are being achieved in accordance with the interim or final compliance dates.

In addition, this Order includes an optional pathway that incorporates the requirements of Provision A.4 and would allow a Copermittee to be deemed in compliance with the requirements under Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b during implementation of a Water Quality Improvement Plan that incorporates specific additional requirements. This alternative compliance pathway and the additional specific requirements are described below under the discussion for Provision B.3.c.

B. Water Quality Improvement Plans

Purpose: Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges to the MS4s and control pollutants in storm water discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the Clean Water Act.

Provision B includes requirements for the Copermittees to develop and implement Water Quality Improvement Plans to ultimately comply with the prohibitions and limitations under Provision A. The Water Quality Improvement Plans will provide the Copermittees a comprehensive program that can achieve the requirements and further the objectives of the CWA. Implementation of the Water Quality Improvement Plans will also improve the quality of the receiving waters in the San Diego Region.

The Water Quality Improvement Plan is the backbone of the Regional MS4 Permit requirements. Provision B provides the guidance, criteria, and minimum expectations and requirements for the elements of the Water Quality Improvement Plan to be developed and implemented by the Copermittees. The Water Quality Improvement Plans will be implemented in the Watershed Management Area by the Copermittees within their jurisdictions through their jurisdictional runoff management programs.

The Water Quality Improvement Plan also incorporates a program to monitor and assess the progress of the Copermittees' jurisdictional runoff management programs toward improving the quality of discharges from the MS4s, as well as tracking improvements to the quality of receiving waters. A process to adapt and improve the effectiveness of the Water Quality Improvement Plans has also been incorporated into the requirements of Provision B to be consistent with the "iterative approach" required to achieve compliance with discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a, pursuant to the requirements of Provision A.4.

The Water Quality Improvement Plans have also been structured to incorporate the requirements of any TMDLs that have been adopted for the San Diego Region. Incorporating the requirements of the TMDLs into the requirements of Provision B allows the Copermittees to develop a single plan, instead of separate plans, to coordinate their non-storm water and storm water runoff management programs. The Water Quality Improvement Plans allow the Copermittees to meet the requirements of this Order, as well as fulfill the requirements of the TMDLs.

As an added benefit, if the Copermittees demonstrate that impaired water bodies within the Watershed Management Area listed on the 303(d) List will be addressed with their Water Quality Improvement Plans in a reasonable period of time, the San Diego Water Board may be able to remove the water bodies from the 303(d) List, which would greatly reduce the need for the San Diego Water Board to develop additional TMDLs that would have to be incorporated into the Order and implemented by the Copermittees.

***Discussion*:** The federal NPDES regulations require the Copermittees to develop a proposed management program (40 CFR 122.26(d)(2)(iv)). The proposed management program must include "*a comprehensive planning process*" and "*where necessary intergovernmental coordination*" for the "*duration of the permit.*" The Water Quality Improvement Plan is the Copermittees' "*comprehensive planning process*" document for the proposed management program that will be implemented within a Watershed Management Area. Implementation of the Water Quality Improvement Plan requires "*intergovernmental coordination*" among the Copermittees for at least the "*duration of the permit*," and likely into and beyond the next iteration of the permit.

Developing Water Quality Improvement Plans based upon watersheds is consistent with federal regulations that support the development of permit conditions, as well as implementation of storm water management programs, at a watershed scale (40 CFR 122.26(a)(3)(ii), 122.26(a)(3)(v), and 122.26(d)(2)(iv)). In 2003, USEPA issued a Watershed-Based NPDES Permitting Policy Statement (USEPA, 2003) that defines watershed-based permitting as an approach that produces NPDES permits that are issued to point sources on a geographic or watershed basis. In this policy statement, USEPA explains that "*[t]he utility of this tool relies heavily on a detailed, integrated, and inclusive watershed planning process*." USEPA identifies a number of important benefits of watershed permitting, including more environmentally effective results, the ability to emphasize measuring the effectiveness of targeted actions on improvements in water quality, reduced cost of improving the quality of the nation's waters and more effective implementation of watershed plans, including TMDLs, among others.

An emphasis on watersheds is appropriate at this stage in the San Diego Region's MS4 program to shift the focus to more targeted, water quality driven planning and implementation. Addressing discharges on a watershed scale focuses on water quality results by emphasizing the receiving waters in the watershed. The conditions of the receiving waters drive management actions, which in turn focus measures to address pollutant contributions from MS4 discharges.

The Water Quality Improvement Plan gives the Copermittees the responsibility of developing a comprehensive plan to coordinate the efforts of their jurisdictional runoff management programs for addressing the problems related to MS4 discharges causing impacts to water quality in the Watershed Management Area. The development of the plan provides the Copermittees the opportunity to provide

significant input on how to implement their jurisdictional runoff management programs, and how to best utilize their available resources in addressing a focused set of priorities that they believe will result in measureable improvements to water quality within the Watershed Management Area.

The Copermittees are encouraged to separate the Watershed Management Area into subwatersheds, as appropriate. This allows the Copermittees to identify priorities applicable to a subset of the Copermittees or specific water bodies or areas within the Watershed Management Area.

Included in the requirements for the elements to be included in the Water Quality Improvement Plan are monitoring and assessment requirements that are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order. In addition to the federal requirements of the CWA section 308(a) and 40 CFR 122.26(d), the San Diego Water Board has the authority to establish monitoring, reporting, and recordkeeping requirements for NPDES permits under CWC 13383.

More specific and detailed discussions of the requirements of Provision B are provided below.

Provision B.1 (Watershed Management Areas) requires the Copermittees to develop a Water Quality Improvement Plan for each of the Watershed Management Areas defined by the San Diego Water Board.

Pursuant to 40 CFR 122.26(d)(2)(iv), proposed management programs "*may impose controls on a…watershed basis…*" The Water Quality Improvement Plan is the Copermittees' proposed management program. A Water Quality Improvement Plan must be developed for each Watershed Management Area identified in the Order.

The Watershed Management Areas are identified in Table B-1. Table B-1 establishes ten (10) Watershed Management Areas, and identifies the Copermittees that are responsible for developing and implementing the Water Quality Improvement Plan for each Watershed Management Area.

The Copermittees from each of the three counties within the San Diego Region ~~are~~ were ~~expected to be~~ phased in as their respective NPDES municipal storm water permits expired. ~~Because~~ Order No. R9-2007-0001 expired in January 2012, and the San Diego County Copermittees ~~were~~ became covered under the Regional MS4 Permit on June 27, 2013, the effective date of the Order. ~~Because~~ Order No. R9-2009-0002 expired in December 2014, and the Orange County Copermittees ~~are~~ became covered under the Regional MS4 Permit on April 1, 2015, the effective date of Order No. R9-2013-0001 as amended by Order No. R9-2015-0001. Order No. R9-2010-0016 expired in November 2015, and the Riverside County Copermittees became covered under the Regional MS4 Permit on January 7, 2016, the effective

date of Order No. R9-2013-0001 as amended by Order No. R9-2015-0100.

~~After the San Diego Water Board receives and considers the Report of Waste Discharge required to be submitted by the Riverside County Copermittees pursuant to the requirements of their current permit, and makes any necessary changes to the Order, the Riverside County Copermittees will be covered under the Regional MS4 Permit after Order No. R9-2010-0016 expires in December 2015.~~

~~The Riverside County Copermittees also have the option to obtain coverage under the Regional MS4 Permit earlier than their respective permit expiration dates. The process to apply for early coverage is described Provision F.6.~~

~~Because the Santa Margarita River Watershed Management Area includes Copermittees from both San Diego County and Riverside County, a footnote to Table B-1 has been included to specify that the requirements of Provision B are not required to be implemented by the County of San Diego until the Riverside County Copermittees have received a notice of coverage under the Order. Until the Riverside County Copermittees are notified of coverage under the Order, the County of San Diego is subject to the prohibitions and limitations under Provision A, responsible for continuing to implement its existing jurisdictional runoff management program, and responsible for implementing the transitional monitoring and assessment requirements of Provision D, the transitional annual reporting requirements of Provision F.3.b, and the TMDL requirements of Attachment E to the Order.~~

The Cities~~y~~ of Laguna Woods, ~~and~~ Laguna Hills, Murrieta, and Wildomar are located partially within the jurisdictions of both the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board) and the San Diego Water Board. Written requests for designation of a single Regional Water Board to regulate matters pertaining to permitting of Phase I MS4 discharges were submitted to the San Diego Water Board and the Santa Ana Water Board by the City of Laguna Woods by letter dated September 8, 2014, ~~and~~ the City of Laguna Hills by letter dated March 12, 2014, the City of Murrieta by letter dated June 22, 2015, and the City of Wildomar by letter dated June 23, 2015. The Cities of Laguna Woods, ~~and~~ Laguna Hills, Murrieta, and Wildomar requested designation of the San Diego Water Board pursuant to CWC section 13228.

The Cities of Laguna Woods, ~~and~~ Laguna Hills, Murrieta, and Wildomar reported that management and implementation of municipal programs to comply with two different Phase I MS4 permits creates a significant administrative and financial burden and inhibits their ability to contribute to greater overall water quality improvements in either Region. In an effort to address these concerns, the San Diego Water Board and the Santa Ana Water Board have entered into ~~an~~ written agreements ~~dated February 10, 2015~~, whereby the San Diego Water Board is designated to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Laguna Woods, ~~and~~ Laguna Hills, Murrieta, and Wildomar including ~~areas~~ the portions of the jurisdictions within the

Santa Ana Region. The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated February 10, 2015 to designate the San Diego Water Board to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Laguna Woods and Laguna Hills, including the portions of the jurisdictions within the Santa Ana Region, upon the later effective date of ~~this~~ Order No. R9-2015-0001 or Santa Ana Water Board Tentative Order No. R8-2015-0001. The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated October 26, 2015 to designate the San Diego Water Board to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Murrieta and Wildomar, including the portions of the jurisdictions within the Santa Ana Region upon the effective date of Order R9-2015-0100.

Under the terms of the agreements, each Regional Water Board retains the authority to enforce provisions of the Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee (Water Code section 13228 (b)). Also under the terms of the agreements, any TMDL and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Laguna Woods, ~~or~~ Laguna Hills, Murrieta, or Wildomar as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement of the applicable TMDL would remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's San Diego Creek/Newport Bay TMDL and Lake Elsinore/Canyon Lake Nutrient TMDLs, and the San Diego Water Board's Indicator Bacteria Project I Beaches and Creeks TMDL.

In conformance with the~~is~~ agreements, ~~a~~ footnotes to Table B-1 ~~has been~~ are included to specify coverage under Order No. R9-2013-0001 for those Phase I MS4 discharges within the jurisdictional boundaries of the Cities of Laguna Woods, ~~and~~ Laguna Hills, Murrieta, and Wildomar within the Santa Ana Region. ~~The f~~Footnote 1 to Table B-1 specifies that the Cities~~y~~ of Laguna Woods and Laguna Hills are identified as responsible Copermittees in the San Diego Creek/Newport Bay TMDL in the Santa Ana Region and remain obligated to comply with the San Diego Creek/Newport Bay TMDL pursuant to section XVIII of Tentative Order No. R8-2015-0001 (NPDES No. CAS618030) and any reissuance thereof. Footnote 4 to Table B-1 specifies that the Cities of Murrieta and Wildomar are identified as responsible Copermittees in the Lake Elsinore/Canyon Lake Nutrient TMDLs in the Santa Ana Region and remain obligated to comply with the Lake Elsinore/Canyon Lake Nutrient TMDLs pursuant to section VI.D.2 of Order No. R8-2010-0033 (NPDES No. CAS618030) or corresponding section as it may be amended or reissued.

The Cities~~y~~ of Lake Forest and Menifee ~~is~~ are located partially within the jurisdictions of both the Santa Ana Water Board and the San Diego Water Board. Written requests for designation of a single Regional Water Board to regulate matters pertaining to

permitting of Phase I MS4 discharges were submitted to the San Diego Water Board and the Santa Ana Water Board by the City of Lake Forest by letters dated January 14, 2013 and April 4, 2014, and the City of Menifee by letter dated June 25, 2015. The Cities of Lake Forest and Menifee requested designation of the San Ana Water Board pursuant to CWC section 13228. ~~By letters dated January 14, 2013 and April 4, 2014 the City of Lake Forest submitted a written request, pursuant to CWC section 13228, to the San Diego Water Board and the Santa Ana Water Board requesting the Santa Ana Water Board be designated to regulate matters within the City of Lake Forest pertaining to permitting of their Phase I MS4 discharges.~~

The Cities~~y~~ of Lake Forest and Menifee reported that management and implementation of municipal programs to comply with two different Phase I MS4 permits creates a significant administrative and financial burden and inhibits their ability to contribute to greater overall water quality improvements in either Region. In an effort to address these concerns, the San Diego Water Board and the Santa Ana Water Board have entered into ~~an~~ written agreements ~~dated February 10, 2015~~, whereby the Santa Ana Water Board is designated to regulate Phase I MS4 discharges within the jurisdictions of the Cities~~y~~ of Lake Forest and Menifee including the portions of the jurisdictions within the San Diego Region. The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated February 10, 2015 to designate the San Ana Water Board to regulate Phase I MS4 discharges within the jurisdiction of the City of Lake Forest, including portions of the jurisdiction within the Santa Diego Region, upon the later date of ~~this~~ Order No. R9-2015-0001 or Santa Ana Water Board Tentative Order No. R8-2015-0001. The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated October 26, 2015 to designate the San Ana Water Board to regulate Phase I MS4 discharges within the jurisdiction of the City of Menifee, including portions of the jurisdiction within the San Diego Region, under Order No. R8-2010-0033 (NPDES No. CAS618030) as it may be amended or reissued upon the effective date of Order No. R9-2015-0100.

Under the terms of the agreements, each Regional Water Board retains the authority to enforce provisions of the Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee (Water Code section 13228 (b)). Also under the terms of the agreements, any TMDL and associated Phase I MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities~~y~~ of Lake Forest or Menifee as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement authority for the applicable TMDL would remain with the Regional Water Board which has the jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's San Diego Creek/Newport Bay TMDL and Lake Elsinore/Canyon Lake Nutrient TMDLs, and the San Diego Water Board's Indicator Bacteria Project I Beaches and Creeks TMDL.

In conformance with the~~is~~ agreements, ~~a f~~Footnote 2 to Table B-1 has been included to specify that Phase I MS4 discharges within the jurisdictional boundaries of the City of Lake Forest located within the San Diego Region will be regulated under Santa Ana Water Board Order No. R8-2015-0001 (NPDES No. CAS618030) and any reissuance thereof. The footnote specifies that the City of Lake Forest is an identified responsible Copermittee in the Indicator Bacteria Project I Beaches and Creeks TMDL (Bacteria TMDL) in the San Diego Region and remains obligated to comply with the Bacteria TMDL pursuant to Attachment E of Order No. R9-2013-0001 and any reissuance thereto. The City of Lake Forest is also identified as a responsible Copermittee in the San Diego Creek/Newport Bay TMDL established by the Santa Ana Water Board. The City remains obligated to comply with the San Diego Creek/New Port Bay TMDL pursuant to the Santa Ana Water Board's Phase I MS4 Permit (Tentative Order No. R8-2015-0001 (NPDES No. CAS618030), as it may be amended or reissued). Under the terms of the agreement, the City of Lake Forest must retain and continue implementation of the over irrigation prohibition in Title 15, Chapter 15, Section 14.030, List (b) of the City Municipal Code throughout its jurisdiction. Also under the terms of the agreement, the City of Lake Forest must actively participate in the development and implementation of the ~~Aliso Creek~~ South Orange County Watershed Management Area Water Quality Improvement Plan required pursuant to Order No. R9-2013-0001, and any reissuance thereof.

Footnote 3 to Table B-1 has been included to specify that Phase I MS4 discharges within the jurisdictional boundaries of the City of Menifee located within the San Diego Region will be regulated under Santa Ana Water Board Order No. R8-2010-0033 (NPDES No. CAS618033) and any reissuance thereof. At this time, the City of Menifee is not identified as a responsible Copermittee for any TMDLs established by the San Diego Water Board. Under the terms of the agreement, the City of Menifee must actively participate in the development and implementation of the Santa Margarita River Watershed Management Area Water Quality Improvement Plan required pursuant to Order No. R9-2013-0001, and any reissuance thereof.

The basis supporting the Cities of Laguna Woods, Laguna Hills, ~~and~~ Lake Forest, Menifee, Murrieta, and Wildomar requests to designate a specific Regional Water Board for regulatory oversight of Phase I MS4 discharges may change under future conditions and circumstances, therefore the San Diego Water Board will periodically review the effectiveness of the agreements during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate ~~the~~ one or both of the agreements with the Santa Ana Water Board or otherwise modify the agreements subject to the approval of the Santa Ana Water Board.

Provision B.2 (Priority Water Quality Conditions) requires the Copermittees in each Watershed Management Area to identify the highest priority water quality conditions which will be the focus of the Water Quality Improvement Plan implementation.

Provisions B.2.a and B.2.b provide the criteria that must be assessed when

characterizing the receiving water quality and potential impacts from MS4 discharges of the receiving waters within the Watershed Management Area. The criteria are based primarily on the requirements in 40 CFR 122.26(d)(1)(iv)(C) and (C)(1)-(9). Characterizing the receiving water quality and identifying the potential impacts caused by MS4 discharges to receiving waters in the Watershed Management Area is necessary to identify the impacts to receiving waters associated with MS4 discharges that are of the most concern to the Copermittees.

Based on the information required to be considered under Provisions B.2.a and B.2.b, Provision B.2.c requires to Copermittees to identify the highest priority water quality conditions related to discharges from the MS4s that will be the primary focus of the Water Quality Improvement Plan in the Watershed Management Area. Addressing and improving these highest priority water quality conditions will become the focus of each Copermittee's jurisdictional runoff management program as the Water Quality Improvement Plan is implemented in the Watershed Management Area. The highest priority water quality conditions are expected to include sources of pollutants and/or stressors, and/or receiving water conditions, that the Copermittees consider the highest threats or most likely to have adverse impacts on the physical, chemical, and biological integrity of receiving waters. Addressing these threats and/or adverse impacts should restore the physical, chemical, and biological integrity of receiving waters, and result in the restoration and protection of the beneficial uses of the receiving waters in the Watershed Management Area.

Provision B.2.d requires the Copermittees to identify known and suspected sources of pollutants and/or stressors contributing to the highest priority water quality conditions. The requirements of Provision B.2.d are based primarily on the requirements in 40 CFR 122.26(d)(1)(iii)(B)(1)-(6). The Copermittees are required to evaluate several factors in the identification of those sources. The Copermittees must consider and evaluate the following: (1) the land uses that may contribute toward impacts to receiving waters, (2) the locations of the Copermittees' MS4s that can convey and discharge runoff and pollutants to receiving waters, (3) other sources that discharge into the Copermittees' MS4s and receiving waters, and (4) other information and data that can help the Copermittees to evaluate the relative importance of or contribution from those sources toward the highest priority water quality conditions. Identifying the known and suspected sources, and their relative contribution toward the highest priority water quality conditions, will help the Copermittees to focus, direct, and prioritize their resources and implementation efforts within their jurisdictions.

Provision B.2.e requires the Copermittees to identify potential strategies that can result in improvements to water quality in MS4 discharges and/or receiving waters within the Watershed Management Area. Potential water quality improvement strategies will not necessarily be implemented by the Copermittees, but provide a "menu" of options that the Copermittees will consider for implementation. The public participation process that will be implemented during the development of the Water Quality Improvement Plan is where the potential water quality improvement strategies will be identified.

Provision B.3 (Water Quality Improvement Goals, Strategies and Schedules) requires the Copermittees in each Watershed Management Area to identify the goals that the Copermittees' jurisdictional runoff management programs will work toward achieving to address and improve the highest priority water quality conditions identified under Provision B.2.c; the strategies that will be implemented by the Copermittees within their jurisdictions and the Watershed Management Area to achieve the goals; and, the schedules for implementing the strategies and achieving the goals. The element of the Water Quality Improvement Plan required under Provision B.3 is where the "*comprehensive planning*" and "*intergovernmental coordination*" [40 CFR 122.26(d)(2)(iv)] of the Copermittees' actions for the proposed management programs within the Watershed Management Area is required to be described.

Provision B.3.a requires the Copermittees to identify interim and final numeric goals, and schedules to achieve those goals as part of the Water Quality Improvement Plans. Provision B.3.a.(1) requires the Copermittees to identify two types of numeric goals to be achieved:

(1) Final numeric goals in the receiving waters and/or MS4 discharges that will result in the protection of the water quality standards of the receiving waters for the highest priority water quality conditions identified by the Copermittees for Provision B.2.c. These final numeric goals are the ultimate goals for the Water Quality Improvement Plan, and the achievement and maintenance of these final numeric goals will indicate that one or more beneficial uses have been successfully restored and/or protected from MS4 discharges.

(2) Interim numeric goals that can be used by the Copermittees to demonstrate progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges for the highest priority water quality conditions in the Watershed Management Area. Achievement of the interim numeric goals will demonstrate to the San Diego Water Board that the Copermittees' implementation efforts are progressing toward achieving the final numeric goals.

Provision B.3.a.(1) does not specify what the interim and final numeric goals must be based on, but they essentially must be designed to achieve compliance with water quality standards in the receiving waters. To that end, the interim goals must be based on measureable criteria or indicators capable of demonstrating progress toward achieving the numeric goals.

The interim and final numeric goals can be based on the water quality objectives in the Basin Plan. The water quality objectives in the Basin Plan, however, consist of numeric and narrative water quality objectives. Numeric water quality objectives can be directly used as numeric goals. Narrative water quality objectives, on the other hand, will require some interpretation to identify numeric goals. The achievement of multiple numeric goals based on the water quality objectives, used in combination,

may be necessary to demonstrate that beneficial uses have been restored and/or protected.

The Copermittees could also propose other numeric goals that are not necessarily water quality objectives from the Basin Plan. For example, the Copermittees could propose a numeric goal that consists of achieving some percent improvement of a measureable indicator, such as acreage of a specific habitat or increase in a specific plant or animal species population. Other examples may include pollutant load reductions, number of impaired waterbodies delisted from the List of Water Quality Impaired Segments, Index of Biological Integrity (IBI) scores, etc.

The Copermittees may choose to develop interim numeric goals based on the final numeric goals they develop, such as incremental steps toward ultimately achieving the final numeric goals. The Copermittees may also choose to develop interim numeric goals that are based on other measureable indicators that can indirectly indicate improvements and progress toward the final numeric goals.

There are no limits to the types of interim numeric goals that could be proposed by the Copermittees, other than the goals must be based on measureable criteria or indicators capable of demonstrating progress toward achieving the numeric goals. Likewise, there are no limits to the types of final numeric goals that could be proposed by the Copermittees, other than the goals must "*restore and protect the water quality standards of the receiving waters.*"

Finally, Provision B.3.a.(2) also requires the Copermittees to develop schedules for measuring progress and achieving the interim and final numeric goals. Several criteria are included for the development of the schedules, but the Copermittees are required to achieve the numeric goals as soon as possible, consistent with federal NPDES regulations (40 CFR 122.47(a)(1)).

The Copermittees are also required to incorporate any compliance schedules for applicable ASBS or TMDL requirements. Applicable ASBS and TMDL compliance schedules are set forth in Attachment A and Attachment E to the Order, respectively. The information provided by the Copermittees under Provision B.3.a.(2) will be used by the Copermittees and the San Diego Water Board to gauge and track the progress of the Copermittees' efforts in addressing the highest priority water quality conditions identified in the Water Quality Improvement Plan.

Provision B.3.b requires the Copermittees to identify the strategies and schedules to implement those strategies as part of the Water Quality Improvement Plans. Provision B.3.b requires the Copermittees to identify the water quality improvement strategies that will be and may be implemented within the Watershed Management Area to 1) reduce pollutants in storm water discharged from the MS4 to the MEP, 2) effectively prohibit non-storm water discharges from entering the MS4, 3) protect water quality standards in receiving waters by controlling MS4 discharges so that they do not cause

or contribute to exceedances of receiving water limitations, and 4) achieve applicable WQBELs that implement TMDLs. The Copermittees will select the strategies to be implemented based on the likely effectiveness and efficiency of the potential water quality improvement strategies identified under Provision B.2.e to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, and/or achieve the interim and final numeric goals identified under Provision B.3.a.

Provision B.3.b.(1) requires each Copermittee to identify the strategies that will be or may be implemented within its jurisdiction. Each Copermittee is required to describe the strategies it is committed to implementing as part of its jurisdictional runoff management requirements under Provisions E.2 through E.7, and the optional jurisdictional strategies that the Copermittee will implement, as necessary, to achieve the numeric goals.

Each Copermittee is expected to implement the optional jurisdictional strategies identified under Provisions B.3.b.(1)(b) when the jurisdictional strategies it has committed to implement under Provision B.3.b.(1)(a) are not making adequate progress toward the interim and final numeric goals in accordance with the schedules established under Provision B.3.a. Provision B.3.b.(1)(b)(v) requires each Copermittee to describe the circumstances necessary to trigger implementation of the optional jurisdictional strategies, in addition to the requirements of Provisions B.3.b.(1)(a).

The San Diego Water Board recognizes that there may be optional jurisdictional strategies that will likely require funding and/or resources for planning, permitting, procurement of labor and materials, and implementation. Thus, Provision B.3.b.(1)(b)(iv) requires each Copermittee to describe the funding and/or resources that are necessary to implement these optional jurisdictional strategies. This information may provide interested groups and members of the public an understanding of the resources that they could provide or assist in obtaining to implement these optional jurisdictional strategies.

Provision B.3.b.(2) requires the Copermittees in the Watershed Management Area to identify the regional or multi-jurisdictional strategies that may be implemented, as necessary, to achieve the numeric goals. Similar to the requirements of Provision B.3.b.(1)(b), these regional or multi-jurisdictional strategies will likely require funding and/or resources for planning, permitting, procurement of labor and materials, and implementation, and San Diego Water Board recognizes that these strategies may be difficult to implement with only Copermittee resources. Thus, Provision B.3.b.(2)(d) requires the Copermittees to describe the funding and/or resources necessary to implement these optional regional or multi-jurisdictional strategies. This information may provide interested groups and members of the public an understanding of the resources that they could provide or assist in obtaining to implement these optional regional or multi-jurisdictional strategies.

Provision B.3.b.(3) requires the Copermittees to develop and include schedules in the Water Quality Improvement Plan for implementing the water quality improvement strategies identified under Provisions B.3.b.(1) and B.3.b.(2). The schedule for implementing the water quality improvement strategies will be used by the Copermittees and San Diego Water Board to measure and demonstrate the progress of the Copermittees' implementation efforts toward reducing pollutants in storm water discharged from the MS4 to the MEP, and eliminating illicit non-storm water discharges from entering the MS4.

Provision B.3.b.(4) provides the Copermittees in each Watershed Management Area the option of implementing watershed-specific structural BMP requirements for Priority Development Projects. Historically, storm water permits have included very specific performance standards for permanent, structural BMPs. These standards describe the expectation for the capture or treatment of pollutants and control of excessive flow before storm water is discharged from a site. The Copermittees were also allowed to develop waiver programs for Priority Development Projects to avoid implementing the structural BMPs; however, the waiver programs were not necessarily tied into any sort of holistic watershed strategy. The result is that implementation of BMP requirements is largely done on a site-by-site basis. This requires proper design on the part of the Priority Development Project and strict oversight on the part of the Copermittee.

Provision B.3.b.(4) promotes the evaluation of multiple strategies for water quality improvement, in addition to the implementation of permanent structural BMPs, on a watershed-scale versus the site-by-site approach. In a report issued by the Southern California Coastal Water Research Project (SCCWRP) and several other research institutions, the report emphasized that a successful hydromodification management program will involve watershed analysis as a first step, and that integrating multiple watershed-based strategies is preferable over a site-by-site approach. Indeed, the report states that the watershed analysis "…*should lead to identification of existing opportunities and constraints that can be used to help prioritize areas of greater concern, areas of restoration potential, infrastructure constraints, and pathways for potential cumulative effects*."[22] Provision B.3.b.(4) promotes the findings and recommendations of the report by providing a pathway for Copermittees to develop an integrated approach to their land development programs.

Under Provision B.3.b.(4), the Copermittees in a Watershed Management Area must first perform an analysis by gathering as much information pertaining to the physical characteristics of the Watershed Management Area as possible. This includes, for example, identifying potential areas of coarse sediment supply, present and anticipated future land uses, and locations of physical structures within receiving streams and upland areas that affect the watershed hydrology (such as bridges,

[22] 2012. ED Stein, F Federico, DB Booth, BP Bledsoe, C Bowles, Z Rubin, GM Kondolf, A Sengupta. Technical Report 667. Southern California Coastal Water Research Project. Costa Mesa, CA.

culverts, and flood management basins). Once this information is collected, the Copermittees must produce GIS layers (maps) that include this information.

From there, the Copermittees must use the results of the Watershed Management Area Analysis to identify and compile a list of candidate projects that could potentially be used as alternative compliance options for Priority Development Projects. Such projects include, for example, opportunities for stream or riparian area rehabilitation, opportunities for retrofitting existing infrastructure to incorporate storm water retention or treatment, and opportunities for regional BMPs, among others. Once these candidate projects are identified, Copermittees may allow Priority Development Projects to fund, partially fund, or completely implement these candidate projects. The Copermittees must first find that implementing such a candidate project would provide greater overall benefit to the watershed than requiring implementation of the structural BMPs onsite, and also enter into a voluntary agreement with the Priority Development Project that authorizes this arrangement. The Copermittees may use Provision B.3.b.(4) as both 1) a mechanism to reach their stated goals of the Water Quality Improvement Plan by using Priority Development Projects to either fund or implement projects that will provide water quality benefit, and 2) an alternative to requiring strict adherence to the structural BMP design standards.

Additionally, Provision B.3.b.(4) allows the Copermittees to use the results of the Watershed Management Area Analysis to identify areas within the Watershed Management Area where it is appropriate to allow Priority Development Projects to be exempt from the hydromodification management BMP performance requirements. Provision E.3.c.(2) already allows exemptions for Priority Development Projects that discharge to a conveyance channel whose bed and bank are concrete lined from the point of discharge to an enclosed embayment or the Pacific Ocean. However, there may be cases where further exemptions are warranted. The Copermittees may identify such cases on a watershed basis and include them in the Watershed Management Area Analysis; however, they must provide the supporting rationale to support all claims for exemptions.

Provision B.3.b.(4) provides an innovative pathway for Copermittees to regulate their land development programs by allowing alternative compliance in lieu of implementing structural BMPs on each and every Priority Development Project. This approach facilitates the integration of watershed-scale solutions for improving overall water quality and assisting Copermittees to achieve their stated goals of the Water Quality Improvement Plan. The San Diego Water Board understands, however, that undertaking this approach, which involves extensive planning, could be resource intensive for the Copermittees. Therefore, the Watershed Management Area Analysis is optional and not a requirement. The Copermittees can choose not to perform the watershed planning and mapping exercise described in Provision B.3.b.(4), and instead choose to require strict implementation of the structural BMPs onsite, pursuant to Provision E.3.c.

Provision B.3.c is included to provide the Copermittees an option that allows the Copermittees to be deemed in compliance with the prohibitions and limitations (receiving water limitations) of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b. One or more Copermittees within a Watershed Management Area can choose to implement this option. This option is only expected to be utilized by a Copermittee that wishes to be deemed in compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b.

The alternative compliance pathway option included in Provision B.3.c is consistent with the approach described in Order WQ 2015-0075, *In the Matter of Review of Order No. R4-2012-0175, NPDES Permit No. CAS004001, Waste Discharge Requirements for Municipal Separate Storm Sewer System (MS4) Discharges within the Coastal Watersheds of Los Angeles County, Except Those Discharges Originating from the City of Long Beach MS4,* adopted by the State Water Board on June 16, 2015. State Water Board Order WQ 2015-0075 directs the Regional Water Boards to consider a watershed-based planning and implementation approach to compliance with receiving water limitations when issuing Phase I MS4 permits going forward. Order WQ 2015-0075 included seven principles that the Regional Water Boards are expected to follow when incorporating an alternative compliance pathway into a MS4 permit. The San Diego Water Board incorporated the seven principles stipulated in State Water Board Order WQ 2015-0075 into the Regional MS4 Permit as follows:

1. Provision A of this Order continues to require compliance with water quality standards in the receiving water and does not deem good faith engagement in the iterative process to constitute compliance with receiving water limitations. Provision A of this Order continues to be consistent with the receiving water limitations provisions from State Water Board Order WQ 99-05.

2. Compliance with Provision B.3.c constitutes compliance with the requirements of the Provision A.3.b, which requires compliance with the WQBELs of the TMDLs in Attachment E to the Order, and is considered compliance with receiving water limitations for those TMDL water body-pollutant combinations.

3. Provision B.3.c is an ambitious, rigorous, and transparent alternative compliance pathway that allows a Copermittee appropriate time to come into compliance with receiving water limitations without being in violation of the receiving water limitations during implementation of the compliance alternative.

4. Provision B.3.c requirements are incorporated into a Water Quality Improvement Plan. Water Quality Improvement Plans are a watershed-based planning and implementation approach, which address multiple contaminants, and incorporate TMDL requirements.

5. The strategies required to be included in the Water Quality Improvement Plans promote and incentivize the use of green infrastructure and requires the implementation of low impact development principles.

6. The strategies required to be included in the Water Quality Improvement Plans encourage multi-benefit regional projects that capture, infiltrate, and reuse storm water and support a local sustainable water supply.

7. The alternative compliance pathway of Provision B.3.c includes rigor and accountability. The Copermittee is required, through a transparent public process, to demonstrate that water quality issues in the watershed have been analyzed and prioritized, and that appropriate solutions are proposed. The Copermittee is also required, through a transparent process, to monitor the results and return to their analysis to verify assumptions and update the solutions. The Copermittee is required to conduct this type of adaptive management on its own initiative without waiting for direction from the San Diego Water Board.

In order for a Copermittee to utilize this option, the Copermittee is required to include three components in the Water Quality Improvement Plan. The first component is a comprehensive set of numeric goals and schedules that will demonstrate the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b will be achieved within a specified period of time. The criteria provided in the Order will require the Copermittee to demonstrate that the discharges from its MS4s will not cause or contribute to exceedances of water quality objectives in the receiving waters, and/or the receiving waters will be adequately protected from adverse impacts attributable to the Copermittee's MS4 discharges. The Copermittee is also required to specify annual milestones to be achieved each year, which adds rigor, accountability, and transparency to the process. The annual milestones may consist of water quality improvement strategy implementation phases, interim numeric goals, and other acceptable metrics, which are expected to build upon previous milestones and lead to the achievement of the final numeric goals.

The second component is an analysis to demonstrate that implementation of the water quality improvement strategies required under Provision B.3.b will achieve the numeric goals within the established schedules required under Provisions B.3.a and B.3.c.(1). Because the development of the analysis may require significant resources, the Order allows the Copermittees in each Watershed Management Area that choose to implement this option to perform the analysis individually, or pool their resources for the analysis collectively.

The analysis must "reasonably" and "quantitatively" demonstrate that the implementation of the water quality improvement strategies can achieve the numeric goals within the established schedules. However, as more data and information are collected during implementation of the Water Quality Improvement Plan to demonstrate progress toward achieving the numeric goals, the numeric goals, water quality improvement strategies and schedules may need to be modified. If the data and information indicate that modification is needed, the Copermittee must also update the analysis. With the exception of numeric goals and schedules associated with

TMDLs from Attachment E to the Order, the modification to the analysis would be allowed as part of the adaptive management process of the Water Quality Improvement Plan. For TMDLs, modification of numeric goals or schedules would likely require an amendment to the Basin Plan and Attachment E to the Order before the analysis and Water Quality Improvement Plan could include such modifications.

Thus, the third component is the key component that allows a Copermittee to demonstrate the implementation of the water quality improvement strategies within its jurisdiction is making progress toward achieving the final numeric goals. Each Copermittee must specify the monitoring and assessments that will be performed to confirm that implementation of the water quality improvement strategies are making progress toward achieving the numeric goals within the established schedules, and whether the interim and final numeric goals have been achieved.

These three components must then be reviewed by the Water Quality Improvement Consultation Panel. The Water Quality Improvement Consultation Panel is required to be formed as part of the public participation process for the development of the Water Quality Improvement Plans. The Water Quality Improvement Consultation Panel is described under Provision F.1.a.(1)(b). Review by the Water Quality Improvement Consultation Panel is included to provide an additional layer of input, support, and accountability for the implementation of this option.

Compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b begins when the Water Quality Improvement Plan, incorporating the requirements of Provision B.3.c.(1), is accepted by the San Diego Water Board. Each Copermittee that chooses to implement and continues to implement this option will be deemed in compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b as long as the Copermittee continues to implement the strategies, monitoring and assessments as incorporated in the Water Quality Improvement Plan in accordance with Provision B.3.c.(1), and the Copermittee reports the achievement of the annual milestones each year, or provides acceptable rationale and recommends appropriate modifications to the interim numeric goals, and/or water quality improvement strategies, and/or schedules to improve the rate of progress toward achieving the final numeric goals. The Copermittee continues to be deemed in compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b during the time the San Diego Water Board reviews the rationale and recommended modifications to the interim numeric goals, and/or water quality improvement strategies, and/or schedules. If and when the San Diego Water Board determines that it does not accept the rationale or recommendations, the Copermittee will be notified they are no longer deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b.

Provision B.4 (Water Quality Improvement Monitoring and Assessment) requires the Copermittees to develop an integrated monitoring and assessment program to track the progress of the Water Quality Improvement Plan toward meeting the implementation goals and schedules, and improving the water quality of the

Watershed Management Area. Provision B.4 is the part of the Water Quality Improvement Plan where the Copermittees describe the monitoring data that will be collected, which is not only necessary to implement the "iterative approach" required by Provision A.4, but inform the adaptive management and "*comprehensive planning process*" that allows the Copermittees to make adjustments and modifications to the Water Quality Improvement Plans and the jurisdictional runoff management programs.

Provision B.4 requires the Copermittees, at a minimum, to include the requirements of Provision D as part of the water quality improvement monitoring and assessment program for the Water Quality Improvement Plan. The Copermittees, however, are not limited to the requirements of Provision D and may include additional monitoring and assessment methods to track progress toward improving water quality in the Watershed Management Area.

In addition to incorporating the requirements of Provision D, the water quality improvement monitoring and assessment program must incorporate any monitoring and assessment requirements specified for any applicable TMDLs included in Attachment E to the Order, and the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 for Watershed Management Areas with ASBS.

The monitoring and assessments required to be incorporated into the Water Quality Improvement Plan are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order.

Provision B.5 (Iterative Approach and Adaptive Management Process) requires the Copermittees to implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a.

Provision B.5 requires the Copermittees in each Watershed Management Area to re-evaluate the highest priority water quality conditions and potential water quality improvement strategies, the water quality improvement goals, strategies and schedules, and the water quality improvement monitoring and assessment program and provide recommendations for modifying those elements to improve the effectiveness of the Water Quality Improvement Plan. The re-evaluation of the Water Quality Improvement Plan is part of the assessment requirements of Provision D.

Provision B.6 (Water Quality Improvement Plan Submittal, Updates, and Implementation) requires to Copermittees to submit, update, and implement the Water Quality Improvement Plans.

The requirements for the process to develop and submit the Water Quality Improvement Plans is described in more detail under the discussion for Provision F.1. The process will include several opportunities for the public to provide input during the

development of the Water Quality Improvement Plans. The process for updating the Water Quality Improvement Plans is described in more detail under the discussion for Provision F.3.c. Upon acceptance of the Water Quality Improvement Plan and updates, the Copermittees are required to immediately begin implementing the Water Quality Improvement Plan and subsequent updates.

The Water Quality Improvement Plan is expected to be a dynamic document that will evolve over time. The Water Quality Improvement Plan is also expected to be a long term plan that focuses the Copermittees' efforts and resources on a limited set of priority water quality conditions, with the ultimate goal of protecting all the beneficial uses of the receiving waters within the Watershed Management Area from impacts that may be caused or contributed to by MS4 discharges. As the Copermittees collect data, implement their jurisdictional runoff management programs, and review the results from their water quality improvement monitoring and assessment program, the Water Quality Improvement Plan is expected to be continually reviewed and updated until compliance with Provisions A.1.a, A.1.b, and A.2.a is achieved.

However, in specific cases supported by robust analytical documentation the implementation of the Water Quality Improvement Plans may demonstrate that TMDLs are not necessary for identified impaired water bodies within the Watershed Management Area if the analytical record demonstrates that technology-based effluent limitations required by the CWA, more stringent effluent limitations required by state, local, or federal authority, and/or other pollution control requirements (e.g., best management practices) required by local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time.[23]

The San Diego Water Board submits an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. According to USEPA guidance for the Integrated Report,[24] water bodies are placed in one of five categories. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 are placed on the 303(d) List.

Category 4 in the Integrated Report is for water bodies where available data and/or information indicate that at least one beneficial use is not being supported or is threatened, but a TMDL is not needed.[25] Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality

[23] 40 CFR 130.7(b)(1)
[24] USEPA, 2005. Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act
[25] Ibid

standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

Impaired water bodies can be included in Category 4a if a TMDL has been adopted and approved. The TMDLs in Attachment E to the Order implement the requirements of the TMDLs adopted by the San Diego Water Board, and approved by the State Water Board and USEPA. The water bodies in Attachment E will be included in Category 4a in the Integrated Report and removed from the 303(d) List.

Impaired water bodies can be included in Category 4b if there are *acceptable* "pollution control requirements" required by a local, state or federal authority stringent enough to implement applicable water quality standards within a reasonable period of time (e.g., a compliance date is set). When evaluating whether a particular set of pollution controls are "requirements," the USEPA considers a number of factors, including: (1) the authority (local, state, federal) under which the controls are required and will be implemented with respect to sources contributing to the water quality impairment (examples may include: self-executing state or local regulations, permits, and contracts and grant/funding agreements that require implementation of necessary controls), (2) existing commitments made by the sources and completion or soon to be completed implementation of the controls (including an analysis of the amount of actual implementation that has already occurred), (3) the certainty of dedicated funding for the implementation of the controls, and (4) other relevant factors as determined by USEPA depending on case-specific circumstances.[26]

Impaired water bodies can be included in Category 4c if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution. Pollution, as defined by the CWA is "the man-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of water."[27] In other cases, pollution does not result from a pollutant and a TMDL is not required. Examples of circumstances where an impaired segment may be placed in Category 4c include segments impaired solely due to lack of adequate flow, stream channelization, or hydromodification. In these situations, there may be water quality management actions that can address the cause(s) of the impairment, but a TMDL may not be required to implement the actions.

The Water Quality Improvement Plans will require the implementation of pollution controls and water quality management actions (i.e. water quality improvement strategies) which can result in the attainment of water quality standards in water bodies impaired by discharges from the Copermittees' MS4s. The Water Quality Improvement Plans also include requirements that are expected to attain water quality standards in a reasonable period of time. The San Diego Water Board considers the Water Quality Improvement Plans to be a commitment by the Copermittees to

[26] Ibid
[27] CWA section 502(19)

develop, plan, budget for, and implement pollution controls that will attain water quality standards in receiving waters in a reasonable period of time, or as soon as possible. The results of the Copermittees' efforts in implementing the Water Quality Improvement Plans can be used to re-evaluate the condition of the impaired water bodies during the next update to the 303(d) List.

After the Copermittees submit the Water Quality Improvement Plans and demonstrate that water quality standards are being attained or will be attained in a reasonable period of time, the San Diego Water Board may re-evaluate the water bodies on the 303(d) List. These water bodies on the 303(d) List may be re-evaluated and placed into Category 4b or Category 4c in the Integrated Report. The water bodies placed in Category 4b or Category 4c in the Integrated Report must show a record that the water bodies are attaining water quality standards or supporting the identified beneficial uses, or will attain water quality standards or support identified beneficial uses in a reasonable period of time, in order for the water bodies to be appropriately removed from the 303(d) List.

C. Action Levels

Purpose: Provision C includes requirements for the Copermittees to identify and include numeric action levels in the Water Quality Improvement Plan to direct and focus the Copermittees' jurisdictional runoff management program implementation efforts for controlling MS4 discharges to receiving waters.

***Discussion*:** Under Provision C, the numeric action levels required are for non-storm water discharges and storm water discharges. The non-storm water action levels (NALs) are applicable to non-storm water discharges from the Copermittees' MS4s, which can occur year-round. The storm water action levels (SALs) are applicable to storm water discharges from the Copermittees' MS4s, which occur during the rainy season defined as the period between October 1 and April 30.

The action levels required by Provision C are based on the action level requirements that were developed and incorporated into Order Nos. R9-2009-0002 and R9-2010-0016, the Orange County and Riverside County MS4 Permits, respectively. The Fact Sheets for these Orders provide detailed discussions about the development of the numeric NALs and SALs included in this Order.

Order Nos. R9-2009-0002 and R9-2010-0016 required the Copermittees to perform prescribed actions if the NALs or SALs are exceeded. The actions required under Order Nos. R9-2009-0002 and R9-2010-0016 generally included conducting additional monitoring and source investigations when a discharge from the MS4 is observed to exceed one or more NALs and/or SALs.

For this Order, however, the action levels of Provision C are to be used by the Copermittees to prioritize the actions to be implemented as part of the Water Quality Improvement Plan. Monitoring data collected by the Copermittees from MS4 outfalls will be compared with the NALs and SALs. Exceedances of the NALs and SALs will not require the Copermittees to immediately identify sources causing exceedances, but will provide some numeric indicator levels that can give the Copermittees a way to measure the relative severity of a pollutant contributing to receiving water quality impacts.

NALs and SALs must be included in the Water Quality Improvement Plans to be used by the Copermittees in directing and focusing their water quality improvement strategies. The Copermittees are expected to utilize the NALs and SALs to help focus their implementation efforts on addressing pollutants that have the most significant potential or observed impacts to receiving waters. The NALs and SALs will be used as part of the MS4 discharges assessments required under Provision D.4.b. The NALs and SALs may also be used by the Copermittees as the numeric goals to be achieved in MS4 discharges and/or receiving waters as the Water Quality Improvement Plans are implemented.

More specific and detailed discussions of the requirements of Provision C are provided below.

Provision C.1 (Non-storm Water Action Levels) requires the Copermittees to incorporate NALs into the Water Quality Improvement Plan for pollutants and/or constituents that are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions identified in the Water Quality Improvement Plan related to non-storm water discharges from the MS4s. NALs generally must be consistent with the water quality objectives found within the Basin Plan.

The NALs have been included to ensure that the Copermittees are implementing and complying with several requirements of the MS4 permit. The federal CWA requires permits for municipal storm sewer systems to "*effectively prohibit non-storm water discharges into the storm sewers*." The federal NPDES regulations, which were promulgated to implement the CWA requirements for discharges from municipal storm sewers, require a program to address illicit discharges, which are non-storm water discharges. Provision A.1.b prohibits "*[n]on-storm water discharges into MS4s*" unless the non-storm water discharge authorized by a separate NPDES permit. The NALs will be used as part of the illicit discharge detection and elimination program required pursuant to Provision E.2, as well as part of the MS4 discharges assessments required pursuant to Provision D.4.b.

Provision A.1.a prohibits non-storm water discharges from the MS4 from "*causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state.*" In addition, pursuant to Provision A.2.a, non-storm water discharges "*must not cause or contribute to the violation of water quality standards in any receiving waters*."

Ideally, the Copermittees' jurisdictional runoff management programs will eliminate all non-storm water discharges entering the MS4s within their jurisdictions. The complete elimination of non-storm water discharges to the Copermittees' MS4s would be in compliance with the CWA requirements for non-storm water discharges, as well as the prohibitions and limitations of Provisions A.1.a and A.2.a.

The federal regulations, however, also refer to several non-storm water discharge categories that must be addressed as illicit discharges if they are found to be a source of pollutants. The federal regulations thus identify some non-storm water discharges that are not required to be addressed as illicit discharges if they are not a source of pollutants (e.g. non-storm water discharges specified in Provisions E.2.a.(1)-(5)). Thus, these regulations imply that some non-storm water discharges into and from the MS4 may occur even if non-storm water discharges are "effectively" prohibited by the Copermittees.

If the source of a non-storm water discharge is identified as a category of non-storm water specified in Provisions E.2.a.(1)-(5), the NALs can be used to determine if the category of non-storm water discharges is a source of pollutants. For other non-storm water discharges not specified in Provisions E.2.a.(1)-(5), the CWA requires those discharges to be "*effectively"* prohibited by removing the discharge to the MS4 through enforcement of the Copermittees' legal authority established under "*ordinance, order or similar means*" to prohibit illicit discharges to the MS4s.

If there are non-storm water discharges that are not required to be addressed as illicit discharges, those discharges must comply, at a minimum, with the discharge prohibitions and receiving water limitations of Provision A. Thus, the non-storm water discharges from the MS4 must be at levels that will not cause or contribute to a condition of pollution, contamination, or nuisance (Provision A.1.a), and must not cause or contribute to a violation of water quality standards in receiving waters (Provision A.2.a) to be consistent with the discharge prohibitions and receiving water limitations of Provisions A.1.a and A.2.a.

Furthermore, the San Diego Region has predominantly intermittent and ephemeral rivers and streams which vary in flow volume and duration at spatial and temporal scales. For most of these river and stream systems, non-storm water discharges from the MS4 are likely to be the most significant or the only source contributing to surface flows present within the receiving water, especially during the dry season.

Therefore, because of the prohibitions and limitations of Provision A.1.a and A.2.a, and the likelihood that non-storm water discharges from the MS4 are the most significant or only source contributing to surface flows present within the receiving water, NALs generally must be consistent with the water quality objectives found within the Basin Plan. Non-storm water discharges that are meeting the NALs would not be expected to cause or contribute to an exceedance of water quality objectives in receiving waters, which would be consistent with the discharge prohibitions and receiving water limitations of Provisions A.1.a and A.2.a.

Exceedances of the NALs would then provide an indication of the relative severity of a pollutant in non-storm water discharges from the MS4 contributing to potential or observed receiving water quality impacts. The relative severity or significance of a pollutant in non-storm water discharges from the MS4 will provide the Copermittees a valuable source of information that can be used to identify priority water quality conditions within a Watershed Management Area and within each Copermittee's jurisdiction.

Tables C-1 through C-4 under Provision C.1.a specify numeric NALs for several parameters or pollutant constituents for non-storm water discharges from the MS4 to several water body types. The NALs for MS4 discharges given under Provision C.1.a are based on the water quality objectives for inland surface waters in the Basin Plan, and the water quality objectives for ocean waters in the Ocean Plan. The NALs for

most of the metals were calculated based on the State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP). The NALs provided in Tables C-1 through C-4 must be included in the Water Quality Improvement Plans required to be developed pursuant to Provision B.

Provision C.1.b requires the Copermittees to identify NALs for pollutants and/or constituents, not specified in Provision C.1.a, which are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions of the Watershed Management Area related to non-storm water discharges from the MS4s. The NALs must be based on the water quality objectives in the Basin Plan. The NALs identified under Provision C.1.b must be included in the Water Quality Improvement Plan.

The San Diego Water Board recognizes that some of the NALs required pursuant to Provisions C.1.a and C.1.b may be exceeded more frequently than not. Thus, Provision C.1.c has been included in the Order to provide the Copermittees the option to develop secondary NALs that are set at levels greater than the levels required pursuant to Provisions C.1.a and C.1.b to further refine the prioritization and assessment of water quality improvement strategies for addressing non-storm water discharges to and from the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and from the MS4.

Provision C.2 (Storm Water Action Levels) requires the Copermittees to incorporate SALs into the Water Quality Improvement Plan for pollutants and/or constituents causing or contributing, or may be causing or contributing, to the highest priority water quality conditions identified in the Water Quality Improvement Plan related to storm water discharges from the MS4s.

The SALs have been included to ensure that the Copermittees are implementing and complying with several requirements of the MS4 permit. Provision A.1.a prohibits storm water discharges from the MS4 from "*causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state.*" In addition, pursuant to Provision A.2.a, storm water discharges "*must not cause or contribute to the violation of water quality standards in any receiving waters*."

Provision A.3.a, however, implicitly acknowledges that compliance with Provisions A.1.a and A.2.a cannot be achieved immediately for discharges of storm water from the MS4 by applying the MEP standard. Thus, Provision A.4 requires the Copermittees to implement an iterative approach to demonstrate that MEP is being achieved. This approach is supported by USEPA.

The federal CWA requires permits for municipal storm sewer systems to "*require controls to reduce the discharge of pollutants [in storm water] to the maximum extent*

practicable, *including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants.*" MEP is an ever-evolving, flexible, and advancing concept. As knowledge about controlling storm water runoff and discharges evolves, so does the knowledge which constitutes MEP. Reducing the discharge of storm water pollutants from the MS4 to the MEP requires the Copermittees to assess their jurisdictional runoff management programs and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP. The SALs provide the Copermittees measureable goals that may be used to demonstrate the achievement of MEP for reducing pollutants in storm water discharges from the MS4. The SALs will be used as part of the MS4 discharges assessments required under Provision D.4.a.

In June of 2006, the State Water Board's Blue Ribbon Storm Water Panel released its report titled "*The Feasibility of Numerical Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities*." In the recommendations, the Blue Ribbon panel proposed storm water effluent limitations which are computed using statistical based population approaches. The SALs specified in Table C-5 under Provision C.2.a were developed from a regional subset of nationwide Phase I MS4 data by using USEPA Rain Zone 6 (arid west) data.[28] Additionally, utilization of regional data is appropriate due to the addition of data into the nationwide Phase I MS4 monitoring dataset in February 2008. This additional data increased the number of USEPA Rain Zone 6 samples to more than 400, and included additional monitoring events within Southern California.

Utilizing data from USEPA Rain Zone 6 resulted in SALs which closely reflect the environmental conditions experienced in the San Diego Region. The localized subset of data includes sampling events from multiple Southern California locations including Orange, San Diego, Riverside, Los Angeles, and San Bernardino Counties. The dataset includes samples taken from highly built-out impervious areas and from storm events representative of Southern California conditions.

The SALs for cadmium, copper, lead and zinc require the measurement of hardness and to provide more specificity in the assessment of samples with SALs for total metal concentrations. While USEPA Rain Zone 6 data include a large sample size for concentrations of total metals, the impact the concentration will have on receiving waters will vary with receiving water hardness. Since it is the goal of the SALs, through the iterative process and MEP standard, to have MS4 storm water discharges meet all applicable water quality objectives, the hardness of the receiving water should be used when assessing the total metal concentration of a sample.

Thus, when there is an exceedance of a SAL for a metal, the Copermittee must determine if that exceedance is above the existing applicable water quality objectives

[28] Data used to develop SAL were obtained from http://rpitt.eng.ua.edu/Research/ms4/mainms4.shtml

based upon the hardness of the receiving water. The water quality objectives Copermittees must use to assess total metal SAL exceedances are the California Toxic Rule (CTR) and USEPA National Recommended Water Quality Criteria for Freshwater Aquatic Life 1 hour maximum concentrations. The 1-hour maximum concentration is to be used for comparison since it is expected to most replicate the impacts to waters of the State from the first flush following a precipitation event.

The statistically calculated SALs given in Table C-5 are at levels greater than the water quality objectives in the Basin Plan or Ocean Plan. Because the objective of the CWA is to "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*", meaning eventually pollutants in storm water discharges must be reduced to a level that cannot cause or contribute to an exceedance of water quality objectives in receiving waters, over time the SALs are expected to be reduced to a level that is based on the water quality objectives rather than statistical calculations. The San Diego Water Board will review the SALs as more data for discharges of storm water from the MS4s are collected, and revise them as conditions improve and the MEP standard advances. For the Water Quality Improvement Plans required under this Order, the SALs identified under Provision C.2.a must be included.

Provision C.2.b requires the Copermittees to identify SALs for pollutants and/or constituents, not specified in Provision C.2.a, which are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions of the Watershed Management Area related to storm water discharges from the MS4s. The SALs identified under Provision C.2.b must be included in the Water Quality Improvement Plan.

The San Diego Water Board recognizes that some of the SALs required pursuant to Provisions C.2.a and C.2.b may be exceeded more frequently than not. Thus, Provision C.2.c has been included in the Order to provide the Copermittees the option to develop secondary SALs that are set at levels greater than the levels required pursuant to Provisions C.2.a and C.2.b to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s.

D. Monitoring and Assessment Program Requirements

Purpose: Provision D includes minimum monitoring and assessment requirements that must be developed and implemented by the Copermittees as part of the Water Quality Improvement Plans. Implementation of the monitoring and assessment requirements of Provision D will allow the Copermittees to demonstrate that the requirements of the CWA to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP are being achieved. Implementation of the monitoring and assessment requirements of Provision D will also allow the Copermittees and the San Diego Water Board to track improvements to the water quality in the San Diego Region. The monitoring and assessment program requirements are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order.

***Discussion*:** The San Diego Water Board recognized that changes to the monitoring and assessment requirements of the Fourth Term Permit were necessary to improve the usefulness and usability of monitoring data collected by the Copermittees to support their jurisdictional storm water programs more efficiently and with increased effectiveness. The data collected are needed to better inform the Copermittees' understanding of the physical, chemical, and biological condition of the receiving waters and the quality of the MS4 discharges. The monitoring program needs to provide opportunities for the Copermittees to integrate regional monitoring efforts into municipal storm water monitoring requirements to provide a cost-effective approach to monitoring and avoid duplication of efforts.

The requirements in Provision D were largely recommended by the Copermittees as an outcome of the San Diego Water Boards Focused Meeting process. The monitoring and assessment program requirements now require collection of more specific information necessary for each Copermittee to adapt its jurisdictional runoff management program in such a way that focuses resources on a watershed's highest priority water quality conditions. The monitoring and assessment program will require the Copermittees to collect data that can be utilized to answer both watershed level management questions (e.g. Are the chemical, physical, and biological conditions of a receiving water protective, or likely protective of beneficial uses?), and specific jurisdictional runoff management program activity questions (e.g. Are the water quality improvement strategies of the jurisdictional program effectively eliminating non-storm water discharges to the MS4?).

The monitoring data collected and assessment information that will be reported to the San Diego Water Board are necessary to determine if the Copermittees are complying with the prohibitions and limitations of Provision A. The required monitoring and assessments that must be reported to the San Diego Water Board will be utilized for three purposes:

(1) Inform the Copermittees, San Diego Water Board, and the public on the progress of the Copermittees' efforts to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP;

(2) Inform the Copermittees, San Diego Water Board, and the public on the condition of water bodies receiving discharges from the Copermittees' MS4, and the progress of the Copermittees' water quality improvement implementation efforts toward improving the receiving water quality; and

(3) Inform the Copermittees, the San Diego Water Board, and the public on the effectiveness of the Water Quality Improvement Plan toward achieving (1) and (2).

The monitoring and assessment information reported pursuant to Provision F is also expected to be key to the iterative approach and adaptive management process required under Provision A.4 and implemented through the Water Quality Improvement Plan required under Provision B. As required by Provision A.4, the iterative approach and adaptive management process is required if the Copermittees cannot meet the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c, and/or A.2.a under the present conditions.

Provision D provides the minimum monitoring and assessment requirements that must be included in each Water Quality Improvement Plan to be developed and implemented by the Copermittees. The Copermittees, however, are not limited to the requirements of Provision D and may include additional methods to track progress toward improving water quality in a Watershed Management Area.

More specific and detailed discussions of the requirements of Provision D are provided below.

Provision D.1 (Receiving Water Monitoring Requirements) specifies the minimum receiving water monitoring that the Copermittees must conduct within the Watershed Management Area and include as part of the Water Quality Improvement Plan.

Provision D.1 establishes minimum monitoring requirements that must be conducted by the Copermittees within each Watershed Management Area. Provision D.1 requires the Copermittees to collect and develop the data and information necessary to determine potential impacts to the beneficial uses in the receiving waters due to discharges from the MS4s. The monitoring required under Provision D.1 will also provide the data that will allow the Copermittees to gauge the effectiveness and progress of its Water Quality Improvement Plan implementation efforts toward improving the quality of receiving waters.

The receiving water monitoring requirements of Provision D.1 are focused primarily on monitoring the conditions and response of the receiving waters to the Copermittees'

collective implementation efforts to reduce receiving water impacts that may be caused by the discharges from the MS4s. The preference of the San Diego Water Board is for the Copermittees to spend their resources achieving tangible and observable improvements in receiving water conditions instead of collecting samples and analyzing data that has consistently indicated that receiving water conditions are degraded and require improvement. In general, the ability to measure potential improvements in receiving water conditions due to any actions implemented by the Copermittees as part of the Water Quality Improvement Plan may require several years before a response can be observed. Thus, the frequency of collecting receiving water monitoring data has been kept to a minimum.

During the transitional period between adoption of this Order and San Diego Water Board acceptance of a Water Quality Improvement Plan, the Copermittees must conduct receiving water monitoring in accordance with Provision D.1.a. This approach to collecting receiving water data is different from what was required in the Fourth Term Permits, but one that truly embraces the concept of an integrated, cost-effective, streamlined receiving water monitoring approach.

Provision D.1.a requires Copermittees to continue performing the receiving water monitoring programs required in Order Nos. R-2007-0001, R9-2009-002, and R9-2010-0016; plus participation in: hydromodification management plan monitoring approved by the San Diego Water Board, monitoring plans as part of load reduction plans (either Bacteria Load Reduction Plans or Comprehensive Load Reduction Plans) for TMDLs in Attachment E of the Order, Storm Water Monitoring Coalition Regional Monitoring, Southern California Bight Regional Monitoring, Sediment Quality Monitoring, and ASBS Monitoring as applicable to a Watershed Management Area.

Provision D.1.a also provides an opportunity for the Copermittees to use third party data to meet receiving water monitoring requirements where feasible. Allowing the Copermittees to use the data currently collected through its participation in existing regional receiving water programs and that of third parties provides an efficiency of resources in obtaining the data necessary to inform the Copermittees and the San Diego Water Board about the physical, chemical, and biological conditions of the receiving waters, which can also help to focus the receiving water monitoring during the implementation of the Water Quality Improvement Plan. Once a Water Quality Improvement Plan is developed for a Watershed Management Area in compliance with Provision B of this Order, the transitional period is over and Copermittees are required to conduct receiving water monitoring according to the requirements of Provisions D.1.b-e.

Provision D.1.b requires each Copermittee to identify at least one long term receiving water monitoring station to be representative of receiving water quality within each Watershed Management Area. Long term receiving water monitoring stations can be located at any existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees. The requirements under Provision D.1.b. are

consistent with 40 CFR 122.26(d)(2)(iii)(D), which specifies that a "*monitoring program for representative data collection for the term of the permit*" may include "*instream locations.*" For each Watershed Management Area, at least one long term watershed monitoring station is required to be established and monitored. The Copermittees may choose to establish additional long term monitoring stations where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

Provision D.1.b. requires the Copermittees to locate the long term receiving water monitoring station at one of these existing receiving water monitoring stations to provide the Copermittees an opportunity to experience monitoring cost savings while continuing to collect the necessary data to assess the status and trends of receiving water quality conditions in 1) coastal water, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under both dry weather and wet weather conditions. Ideally these stations will continue to be monitored as part of the receiving water monitoring for each Watershed Management Area to maintain a consistent set of locations and a period of data that can be built upon with the monitoring required under this Order.

The receiving water monitoring requirements are separated into monitoring required during dry weather conditions pursuant to Provision D.1.c, and wet weather conditions pursuant to Provision D.1.d.

At each long term monitoring station the Copermittees must conduct at least three dry weather monitoring events as required pursuant to Provision D.1.c and at least three wet weather monitoring events as required pursuant to Provision D.1.d per permit term. Provisions D.1.c and D.1.d require the Copermittees to monitor priority water quality conditions identified in the Water Quality Improvement Plan, constituents listed as causing impairment of receiving waters in the Watershed Management Area, applicable NALs, toxicity, constituents listed in Tables D-2 and D-3, and constituents for implementation plans (e.g. Bacteria Load Reduction Plans and Comprehensive Load Reduction Plans). Required toxicity monitoring was changed to reflect an updated understanding of the unique challenges associated with sampling storm water for toxicity. Copermittees are required to sample receiving water for toxicity during each dry weather and each wet weather event pursuant to Provision D.1.c.(4) and D.1.d.(4). Required toxicity monitoring is now consistent with the State Water Resources Control Board Policy for Toxicity Assessment and Control (Draft June 2012) and recently adopted MS4 permits for Caltrans and Los Angeles Water Board. Receiving water monitoring efforts in this Order have been streamlined to redirect resources to monitoring efforts that better support pollutant reduction solutions with an increasing emphasis on MS4 outfall monitoring, source identification, and source abatement activities.

In addition to the receiving water monitoring requirements under Provisions D.1.b-d, Provision D.1.e requires the Copermittees participate in and/or conduct other types of receiving water monitoring. As recommended and requested by the Copermittees, Provision D.1.e.(1) requires the Copermittees to participate in existing regional monitoring, as applicable to each Watershed Management Area. Existing regional

monitoring includes monitoring conducted by the Storm Water Monitoring Coalition and for the Southern California Bight. Participation in and use of monitoring data collected from these existing regional water quality monitoring programs provide the Copermittees a greater opportunity for efficiency in the use of their resources to manage their storm water programs and those controllable discharges under their authority.

Provision D.1.e.(1)(c) requires the south Orange County MS4 Copermittees to participate in "unified regional beach water quality monitoring." This monitoring replaces requirements to conduct "core monitoring" of beach water quality, as provided for in Appendix III of the Ocean Plan.

Several different public agencies currently conduct routine, ongoing beach water quality monitoring in south Orange County in accordance with several different sets of requirements. The monitoring programs implemented to meet those requirements overlap temporally and spatially. These monitoring programs are partially but not fully integrated. In November 2010, the State Water Board adopted Resolution No. 2010-0053, which directed Regional Water Boards to work with dischargers to modify beach water quality monitoring programs required by Regional Water Board-issued permits in order to eliminate redundancies and incorporate beach water quality monitoring required by beach water quality statutes, where appropriate.

In April 2012, the San Diego Water Board requested that its staff review beach water quality monitoring conducted in south Orange County. To assist in responding to that request, staff of the Board convened a workgroup that included representatives of the three public agencies that currently conduct almost all of the routine, ongoing beach water quality monitoring in south Orange County, i.e., South Orange County Wastewater Authority (SOCWA), Orange County Public Works, and Orange County Health Care Agency (OCHCA). The workgroup also included other interested parties, including representatives of the Sierra Club and Surfrider Foundation. In December 2012, the San Diego Water Board adopted Resolution No. R9-2012-0069, which endorsed the San Diego Water Board staff report entitled "A Framework for Monitoring and Assessment in the San Diego Region," dated November 2012.

The unified program is consistent with and will meet or exceed the minimum requirements for beach water quality monitoring and related public notification and reporting established by State law, including the Ocean Plan. The unified program is consistent with State Water Board Resolution No. 2010-0053. The unified program is also consistent with and will help implement, "A Framework for Monitoring and Assessment in the San Diego Region," which emphasizes the need for question-driven, beneficial use-oriented monitoring and assessment. The primary purpose of the unified program will be to answer the question "Does beach water quality meet standards for the beneficial use of water contact recreation?"

The unified program is intended to be protective; it will help protect the health of swimmers, surfers, and others who use south Orange County beach waters for water

contact recreational activities. The unified program is also intended to be reasonable; it will eliminate duplicative monitoring and will include triggers for public notification and additional sampling at all sampling stations year-round. The unified program is intended to be equitable; responsibility for implementation of the unified program will be shared and the responsible agencies will jointly make arrangements to implement the program and will have the flexibility to jointly make short and/or long term changes in those arrangements.

The San Diego Water Board Executive Officer issued a written directive on December 5, 2014, pursuant to California Water Code section 13383, for SOCWA and the south Orange County MS4 Copermittees to implement the unified program in cooperation with OCHCA. The Executive Officer may make revisions to the unified program, provided that the unified program, as revised, continues to be consistent with and meet the requirements of State law, including the Ocean Plan, for beach water quality monitoring and related public notification and reporting. Following a thirty day public comment period, and subject to a request for a hearing before the San Diego Water Board, any such revision shall take effect as specified in a written directive issued by the Executive Officer pursuant to CWC section 13383. The program and any Executive Officer issued revisions to the program are subject to CWC section 13320 right of review from the date of issuance.

The unified program will supersede the existing routine, ongoing, beach water quality monitoring programs in south Orange County that are conducted in accordance with the existing requirements of the NPDES permits for discharges from the SOCWA ocean outfalls and the south Orange County MS4s. The requirement to participate in "regional monitoring" of beach water quality replaces requirements to conduct "core monitoring" of beach water quality, as provided for in Appendix III of the Ocean Plan.

The State Water Resources Control Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part 1 Sediment Quality which became effective August 25, 2009 (Sediment Quality Monitoring Policy). Provision D.1.e.(2) requires any Copermittees with MS4 discharges to an enclosed bay or estuary to monitoring the sediments in the enclosed bay or estuary receiving water in accordance with the sediment quality monitoring procedures as prescribed in the Sediment Quality Monitoring Policy.

The State Water Board adopted Resolution No. 2012-0012 which approved exceptions to the California Ocean Plan for selected discharges into Areas of Special Biological Significance (ASBS), including special protections for beneficial uses. State Board Resolution No. 2012-0012 became effective on March 20, 2012, and Attachment B to the Resolution established limitations on point source storm water discharges to ASBS. Copermittees with MS4s that discharge to an ASBS must monitor its discharge to assure compliance with State Board Resolution No. 2012-0012 as required pursuant to Provision D.1.e.(3).

The San Diego Water Board is developing a regional monitoring strategy to assess the conditions of receiving waters in the San Diego Region. The monitoring requirements of Provision D.1 are expected to be incorporated or serve as a foundation of this regional monitoring strategy, but may require some modifications. When the San Diego Water Board develops an alternative regional monitoring strategy, the Copermittees will be required to participate in the development and implementation of the alternative regional monitoring program pursuant to Provision D.1.f.

Provision D.2 (MS4 Outfall Discharge Monitoring Requirements) specifies the minimum MS4 outfall discharge monitoring requirements that the Copermittees must incorporate and implement as part of the Water Quality Improvement Plan.

The dry weather MS4 outfall discharge monitoring requirements are included under Provisions D.2.a.(2) and D.2.b. The dry weather MS4 outfall discharge monitoring requirements are part of the "*program, including a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer*" required by 40 CFR 122.26(d)(2)(iv)(B), which is expected to achieve compliance with the CWA section 402(p)(3)(B)(ii) statutory requirement for municipal storm water permits to require the Copermittees to "*effectively prohibit non-storm water discharges into the storm sewers*." The dry weather MS4 outfall discharge monitoring data collection requirements are based on requirements under 40 CFR 122.26(d)(1)(iv)(D) and 122.26(d)(2)(iv)(B)(3).

The dry weather MS4 outfall discharge monitoring requirements are designed to provide wide spatial and temporal coverage of each jurisdiction to better understand the extent and magnitude of non-storm water discharges to receiving waters, and make a distinction between persistent and transient non-storm water flows. This information is expected to allow each Copermittee to focus its resources on eliminating and controlling the highest priority threats to receiving water quality, as well as integrating other elements of the storm water programs (e.g. complaint call response) and third party data to efficiently and effectively assist in efforts to eliminate non-storm water discharges.

The dry weather MS4 outfall discharge monitoring requirements of Provision D.2.a.(2) and D.2.b are separated into monitoring required before and after the San Diego Water Board accepts the Copermittees' Water Quality Improvement Plan. Outfall monitoring conducted prior to acceptance of the Water Quality Improvement Plan is referred to in the Order as Transitional MS4 Outfall Discharge Monitoring. Provision D.2.a.(2) includes the transitional dry weather MS4 outfall discharge monitoring requirements.

The requirements under Provision D.2.a.(2) are based on the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B), which include the requirements for a monitoring program to identify, detect, and eliminate illicit connections and illegal discharges to the MS4s. The federal regulations (40 CFR 122.26(d)(1)(iv)(D)) require

the monitoring program to include "*a field screening analysis for illicit connections and illegal dumping [that]…[a]t a minimum, include[s] a narrative description, for either each field screening point or major outfall, of visual observations made during dry weather periods.*" The federal regulations (40 CFR 122.26(d)(1)(v)(B)) require the monitoring program to include "*inspection procedures and methods for detecting and preventing illicit discharges, and describe areas where this program has been implemented.*" Furthermore, the monitoring program is required by federal regulations (40 CFR 122.26(d)(2)(iv)(B)) to include "*a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer.*"

Dry weather transitional MS4 outfall discharge monitoring requires each Copermittee to field screen (inspect) its major MS4 outfalls to classify the MS4 outfall locations as having persistent dry weather flows, transient dry weather flows, or no dry weather flows. To account for the variance in size of the 39 jurisdictions covered under this Order, the Copermittees recommended a tiered approach to the number of major MS4 outfalls that must be inspected. Provision D.2.a.(2)(a) provides a tiered approach to the number of major MS4 outfalls that must be visually inspected per jurisdiction as well as a minimum frequency each Copermittee must inspect each major MS4 outfall per year. This tiered approach is based on the total number of major MS4 outfalls within a Copermittees jurisdiction within each Watershed Management Area.

Based on the field screening, each Copermittee is required to make a determination whether any observed flowing, pooled, or ponded waters are transient or persistent flows. Based on this field screening information, other jurisdictional program information, and third party information, each Copermittee is required to prioritize the MS4 outfalls within its jurisdiction for follow up investigation and elimination of the non-storm water discharge, as part of its illicit discharge detection and elimination program required pursuant to Provision E.2. In accordance with the requirements of Provision E.2, each Copermittee is required to immediately investigate obvious illicit discharges (e.g. outfall discharges with unusual color, unusual odor, or high flows).

This approach allows a Copermittee to use all of its resources, as well as leverage resources and information provided by third parties, to effectively eliminate non-storm water discharges from its MS4 outfalls. If the source of the non-storm water discharge cannot be immediately eliminated, the Copermittee uses the persistent flow or transient flow classification along with other programmatic implementation data to prioritize the MS4 outfalls for future investigation. In accordance with the adaptive management approach deployed throughout this Order, Provision D.2.a.(2)(c) requires each Copermittee to update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow. The requirement of Provision D.2.a.(2)(c) assures that each Copermittee is collecting data that can be used to demonstrate compliance with the CWA requirement that each Copermittee must implement a program to "*effectively*

prohibit non-storm water discharges into the [MS4]" and with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

Provision D.2.b describes the dry weather MS4 outfall discharge monitoring required to be incorporated and implemented as part of the Water Quality Improvement Plan. Dry weather MS4 outfall discharge monitoring must be performed by each Copermittee to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. The emphasis of the dry weather MS4 outfall discharge monitoring required pursuant to Provision D.2.b is consistent with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

Provision D.2.b.(1) requires each Copermittee to continue field screening its major MS4 outfalls and identifying those with persistent flows and transient flows, as conducted during the transitional period (i.e. before the Water Quality Improvement Plan was developed). However, each Copermittee now has the flexibility to adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of non-storm water persistent flow discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan. In order to ensure a minimum number of outfalls are inspected, Provision D.2.b.(1) requires the number of visual inspections be equal to the number of visual inspections required in the tiered inspection program pursuant to Provision D.2.a.(2)(a).

Provision D.2.b.(2)(b) requires each Copermittee to monitor a minimum of 5 major MS4 outfalls with persistent flows identified as the highest priorities within a Copermittee's jurisdiction, within each Watershed Management Area. In other words, Copermittees located in more than one Watershed Management Area must identify at least 5 major MS4 outfalls with persistent flows in its jurisdiction in each Watershed Management Area. If a Copermittee is located in more than one Watershed Management Area, and they have less than 5 major MS4 outfalls with persistent flows per jurisdictional area per Watershed Management Area, all of the major MS4 outfalls must be identified as high priority dry weather persistent flow MS4 outfalls. The Copermittees identified as Responsible Copermittees by a TMDL in Attachment E of the Order may need to monitor more than 5 dry weather major MS4 outfall locations to determine compliance with the requirements of the TMDL(s).

Monitoring must occur at the highest priority outfall locations at least semi-annually until the non-storm water discharges have been eliminated for three consecutive dry weather monitoring events; identified to be authorized by a separate NPDES Permit; or reprioritized to a lower priority. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized MS4 major outfall in the Copermittee's jurisdiction within the Watershed Management Area, unless there are no remaining qualifying major MS4 outfalls within the Copermittees jurisdiction. The Copermittees must continually update their dry weather persistent

flow MS4 outfall discharge monitoring locations with the next highest priority non-storm water flow that have yet to be eliminated until all persistent and transient flows are eliminated or its threat reduced.

Non-storm water persistent flow MS4 outfall discharge monitoring data collected during each semi-annual monitoring event, must be collected and analyzed according to the requirements of Provision D.2.b.(2)(b)-(e). These monitoring requirements are consistent with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

The wet weather MS4 outfall discharge monitoring requirements are included under Provisions D.2.a.(3) and D.2.c. The wet weather MS4 outfall discharge monitoring requirements are necessary for the Copermittees to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable, using management practices, control techniques and system, design and engineering methods, and such other provisions which are appropriate*" required by 40CFR 122.26(d)(2)(iv), which is expected to achieve compliance with the CWA section 402(p)(3)(B)(iii) statutory requirement for municipal storm water permits to require "*controls to reduce the discharge of pollutants [in storm water] to the maximum extent practicable*." The wet weather MS4 outfall discharge monitoring data collection requirements are based on requirements under 40 CFR 122.26(d)(2)(iii), 122.26(d)(2)(iii)(A) and 122.26(d)(2)(iii)(A)(1)-(4), and 40 CFR 122.21(g)(7)(i)-(ii).

The wet weather MS4 outfall discharge monitoring requirements of Provision D.2.a.(3) and D.2.c are separated into monitoring required before and after the San Diego Water Board accepts the Copermittees' Water Quality Improvement Plan. Outfall monitoring conducted prior to acceptance of the Water Quality Improvement Plan is referred to in the Order as Transitional MS4 Outfall Discharge Monitoring. Provision D.2.a.(3) includes the transitional wet weather MS4 outfall discharge monitoring requirements.

Until the wet weather MS4 outfall discharge monitoring requirements of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board, the Copermittees must comply with the requirements of transitional wet weather MS4 outfall monitoring requirements pursuant to Provision D.2.a.(3). Provision D.2.a.(3) requires the Copermittees in each Watershed Management Area to sample, at least five of the major MS4 outfalls inventoried pursuant to Provision D.2.a.(1) once per wet season for the monitoring data required to be collected pursuant to Provision D.2.a.(3)(c)-(e). Provision D.2.a.(3) further requires at least one major MS4 outfall monitoring station be located in each Copermittee's jurisdiction within the Watershed Management Area.

At a minimum, the five sampling locations chosen must be representative of storm water discharges from residential, commercial, industrial, and typical mixed-use land uses present within a Watershed Management Area. The San Diego Water Board expects the Copermittees to extrapolate from these data to similar land uses

throughout the Watershed Management Area to better inform the Water Quality Improvement Plan development process by prioritizing drainages for implementation of storm water control efforts required pursuant to Provision E.

Provision D.2.c describes the wet weather MS4 outfall discharge monitoring required to be included and implemented as part of the Water Quality Improvement Plan. Provision D.2.c provides the Copermittees the flexibility to adjust the wet weather MS4 outfall discharge monitoring locations and frequencies in the Watershed Management Area, as needed, to identify sources of pollutants in storm water discharges from MS4s in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan.

Although Provision D.2.c.(1) allows the Copermittees to adaptively manage the wet weather MS4 outfall discharge monitoring locations and frequencies, the provision requires a minimum of at least five wet weather outfall stations to be monitored. Provision D.2.c.(2) further allows the Copermittees to modify the monitoring frequency at each wet weather MS4 outfall station to meet the goals of the Water Quality Improvement Plan as long as the monitoring frequency occurs at least once per year and is at an appropriate frequency to identify sources of pollutants in storm water discharges, guide pollutant source identification efforts, or determine compliance with the requirements of the applicable TMDLs in Attachment E to the Order.

The wet weather MS4 outfall discharge monitoring requirements of Provisions D.2.c.(3) and D.2.c.(4) are the same as the transitional wet weather MS4 outfall discharge monitoring. In contrast, the requirements of Provision D.2.c.(5) are focused on collecting analytical data specific to the highest priority water quality conditions in the Watershed Management Area identified in the Water Quality Improvement Plan. The wet weather MS4 outfall discharge monitoring data collection requirements are consistent with the requirements under 40 CFR 122.26(d)(2)(iii), 122.26(d)(2)(iii)(A) and 122.26(d)(2)(iii)(A)(1)-(4), and 40 CFR 122.21(g)(7)(i)-(ii).

Provision D.3 (Special Studies) requires the Copermittees to develop special studies that will be conducted for each Watershed Management Area and the entire San Diego Region. Data collected pursuant to Provision D.3 is to be used by the Copermittees to improve the effectiveness of the strategies implemented by the jurisdictional runoff management programs toward achieving the numeric goals identified in the Water Quality Improvement Plans and ultimately achieve compliance with the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c, and A.2.a, which is consistent with the requirements of Provision A.4.

Special studies are often necessary to fill data gaps or provide more refined information that allow the Copermittees to better manage the generation or elimination of pollutants and discharges to and from the MS4. In the Fourth Term Permits, the Copermittees have been required to implement special studies as directed by the San Diego Water Board. The special studies required by this Order provide the Copermittees more flexibility to identify and implement special studies that will be most

useful to improving the effectiveness of their jurisdictional runoff management programs.

Provision D.3.a.(1) requires the Copermittees to develop and conduct at least two special studies per Watershed Management Area, to be determined by the Copermittees. One of the two special studies may be accomplished through participation in a Regional Special Study required under Provision D.3.a.(2). The requirements provide the Copermittees great latitude in identifying and developing the special studies. Watershed Management Area special studies are required, at a minimum, to: (a) relate in some way to the highest water quality priorities identified by the Copermittees in the Water Quality Improvement Plan, (b) be conducted within the Watershed Management Area, and (c) include some form of participation (e.g. contribution of funds, personnel services, project management) by all the responsible Copermittees within the Watershed Management Area.

Examples of Watershed Management Area special studies might include, but are not limited to: (1) focused pollutant source identification studies, (2) BMP effectiveness and/or comparison studies, (3) pilot tests for new or emerging pollutant control methods, (4) receiving water pollutant or stressor source identification and/or mitigation studies, or (5) pollutant fate and transport studies. The Watershed Management Area special studies are expected to provide data that can be utilized by the Copermittees to improve the Water Quality Improvement Plan or implementation of the Copermittees' jurisdictional runoff management programs to address the highest priority water quality conditions.

Provision D.3.a.(2) requires the Copermittees to develop at least one special study that will be conducted for the entire San Diego region. The regional special study is expected to provide data that can be utilized by the Copermittees to improve the Water Quality Improvement Plan or implementation of the Copermittees' jurisdictional runoff management programs to identify or address regional water quality concerns and priorities.

An example of a regional special study would be to develop and establish allowable exceedance frequencies of the bacteria water quality objectives for several types of water bodies, during different wet and dry weather conditions the San Diego region. The special study would be related to bacteria, which is a priority for the San Diego region due to the adoption of "*Bacteria TMDL Project I – Beaches and Creeks in the San Diego Region*." The study results could be used to inform the Copermittees and the San Diego Water Board about the indictor bacteria water quality objective exceedance frequencies that occur in natural or reference watersheds.

<u>Provision D.4 (Assessment Requirements)</u> specifies the assessments that the Copermittees are required to perform, based on the monitoring data collected, and will be reported as part of the Annual Report for the Water Quality Improvement Plan implementation. Provision D.4 requires the Copermittees assess the progress of the

water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c, and A.2.a.

Provision D.4 specifies the assessments that Copermittees must perform for each Watershed Management Area to assess the effectiveness of each Copermittee's jurisdictional runoff management program and the Water Quality Improvement Plan. The effectiveness of each Copermittee's jurisdictional runoff management program and Water Quality Improvement Plan is measured through these types of assessments: (a) Receiving Waters Assessments (b) MS4 Outfall Discharges Assessments, (c) Special Studies Assessments, and (d) Integrated Assessment of Water Quality Improvement Plan.

Provision D.4.a requires the Copermittees to assess the status of receiving water conditions annually during the transitional monitoring period (during development of the Water Quality Improvement Plan) and after acceptance of the Water Quality Improvement Plan. The monitoring data collected pursuant to Provision D.1 will be evaluated, among other information, to assess the condition of a Watershed Management Area's streams, coastal waters, enclosed bays, harbors, estuaries, and lagoons. The focus of the receiving waters assessments is to measure progress toward the objective of the CWA to "*restore and maintain the chemical, physical, and biological integrity of the Nation's waters*" as the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program are implemented within a Watershed Management Area. Provision D.4.a is consistent with 40 CFR 122.42(c)(7) which requires the Copermittees to annually report the *"[i]dentification of water quality improvements or degradation."*

Provision D.4.b includes the MS4 outfall discharges assessment requirements. The focus of MS4 outfall discharges assessments is to determine if the Copermittees' are implementing programs that comply with the requirements of the CWA for MS4 permits to "*effectively prohibit non-stormwater discharges into the storm sewers*" and "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable.*" The monitoring data collected pursuant to Provisions D.2 will be evaluated, among other information, to assess the effectiveness of the transitional MS4 outfall field screening monitoring, the implementation of the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program. The MS4 outfall discharge assessments consist of Non-Storm Water Discharges Reduction Assessments and Storm Water Pollutant Discharges Reduction Assessments.

The Non-Storm Water Discharges Reduction Assessments are how each Copermittee will demonstrate that its jurisdictional runoff management program implementation efforts are achieving the CWA requirement to "*effectively prohibit non-stormwater discharges into the storm sewers.*" Provision D.4.b.(1) requires each Copermittee to assess and report on its illicit discharge detection and elimination program required pursuant to Provision E.2 to reduce and effectively prohibit non-storm water and illicit discharges into the MS4 within its jurisdiction. The Non-Storm Water Discharges

Reduction Assessments include specific assessment requirements applicable to each Copermittee.

As each Copermittee collects and analyzes the data collected pursuant to dry weather MS4 outfall discharges monitoring requirements of Provisions D.2.a.(2) and D.2.b, Provision D.4.b.(1) requires each Copermittee to assess the progress, assess the effectiveness of its current actions, and identify modifications necessary to increase the effectiveness of its actions toward reducing and eliminating non-storm water and illicit discharges to its MS4. The findings from these assessments are expected to be utilized by the Copermittee as part of its procedures to prioritize the non-storm water discharges that will be addressed by its Illicit Discharge Detection and Elimination program required pursuant to Provision E.2.

The assessment requirements of Provision D.4.a.(1) are consistent with 40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(3) which require "*procedures…to investigate portions of the separate storm sewer system that, <u>based on the results of the field screen, or other appropriate information</u> [emphasis added], indicate a reasonable potential of contain illicit discharges or other sources of non-storm water*" as part of a "*program…to detect and remove…illicit discharges and improper disposal into the storm sewer.*" The assessment requirements of Provision D.4.a.(1) are also consistent with 40 CFR122.42(c)(1) requires the Copermittees to annually report the "*status of implementing the components of the storm water management program that are established as permit conditions.*"

The Storm Water Pollutant Discharges Reduction Assessment is how the Copermittees in each Watershed Management Area will demonstrate that their jurisdictional runoff management program implementation efforts are achieving the CWA requirement to "*reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable*." Provision D.4.b.(2) requires the Copermittees in each Watershed Management Area to assess and report the progress of the Copermittees' efforts to reduce pollutants in storm water discharges from the MS4s to the MEP. The Storm Water Pollutant Discharges Reduction Assessments include specific assessment requirements during both the transitional monitoring period and after acceptance of the Water Quality Improvement Plan applicable to the Watershed Management Area and each Copermittee.

As the Copermittees collect and analyze the data collected pursuant to wet weather MS4 outfall discharges monitoring requirements of Provisions D.2.a.(3) and D.2.c, Provision D.4.b.(2) requires the Copermittees to assess runoff conditions during the transitional period, and the progress of the Water Quality Improvement Plan strategies toward reducing pollutants in storm water from the MS4 to the MEP. The findings from these assessments are expected to be utilized by the Copermittees to identify any modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify sources of pollutants in storm water discharges from the MS4s, as well as focus, modify, and improve the water quality improvement

strategies implemented by each Copermittee within its jurisdiction to reduce pollutants in storm water discharges to the MEP.

The assessment requirements of Provision D.4.b.(2) are consistent with 40 CFR 122.26(d)(2)(iii)(B) which requires "*[e]stimates of the annual pollutant load of the cumulative discharges to waters of the United States from all identified municipal outfalls…during a storm event…accompanied by a description of the procedures for estimating constituent loads and concentrations, including any modeling, data analysis, and calculation methods.*" The assessment requirements of Provision D.4.a.(2) are consistent with 40 CFR 122.26(d)(2)(v) which requires that each Copermittee assesses the *"estimated reductions in loadings of pollutants from discharges of municipal storm sewer constituents from municipal storm sewer systems expected as the result of the municipal storm water quality management program."* The assessment requirements of Provision D.4.b.(2) are also consistent with 40 CFR122.42(c)(1) requires the Copermittees to annually report the "*status of implementing the components of the storm water management program that are established as permit conditions.*"

Provision D.4.c includes the special studies assessment requirements. Performing special studies are how the Copermittees will address data gaps identified during the development of and updates to the Water Quality Improvement Plan. The relevant findings from the special studies assessments are expected to be incorporated as part of the applicable receiving water assessments, MS4 outfall discharge assessments, and integrated water quality improvement assessments required in Provision D.4.a, D.4.b, and D.4.d, respectively.

The assessment requirements in Provision D.4.d are part of the iterative approach and adaptive management process required by Provision A.4. The Copermittees are required to integrate the data collected pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to re-evaluate the Water Quality Improvement Plan.

The monitoring data collected pursuant to Provisions D.1 and D.2, and the results of the assessment required pursuant to Provisions D.4.a-c, will be used to determine whether the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program are effective, or require modifications or improvements to become more effective to achieve the requirements of the CWA. The assessments required by Provision D.4.d are consistent with 40 CFR 122.42(c)(1) which requires that the Copermittees to report the *"[t]he status of implementing the components of the storm water management program that are established as permit conditions."*

E. Jurisdictional Runoff Management Programs

Purpose: Provision E includes the requirements for the jurisdictional runoff management programs to be implemented by each of the Copermittees. Compliance with the requirements for the jurisdictional runoff management programs will allow the Copermittees to demonstrate that they are implementing programs to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP. The jurisdictional runoff management program document prepared by each Copermittee will also provide the details for implementing the water quality improvement strategies identified in the Water Quality Improvement Plan specifically within its jurisdiction.

***Discussion*:** Implementation of the jurisdictional runoff management program requirements under Provision E is how the Copermittees "*effectively prohibit non-stormwater discharges into the storm sewer,*" and outlines the "*controls to reduce the discharge of pollutants to the maximum extent practicable"* consistent with the federal regulations under 40 CFR 122.26. The jurisdictional runoff management program is part of the "*comprehensive planning process*" that is required pursuant to 40 CFR 122.26(d)(2)(iv). Where the Water Quality Improvement Plan is the "*comprehensive planning process*" on a Watershed Management Area scale, requiring "*intergovernmental coordination,*" the jurisdictional runoff management program document is the "*comprehensive planning process*" on a jurisdictional scale that should be coordinated with the other Copermittees in the Watershed Management Area to achieve the goals of the Water Quality Improvement Plan.

The jurisdictional runoff management program requirements are included to provide each Copermittee criteria that can be used to demonstrate that its storm water management program is implementing the "*comprehensive planning process*" within its jurisdiction to "*effectively prohibit non-stormwater discharges into the storm sewers,*" and to identify and implement the most effective "*controls to reduce the discharge of pollutants to the maximum extent practicable"* in accordance with the performance standards given in the CWA.

Provision E includes the requirements for each of the components that must be included in the Copermittee's jurisdictional runoff management program document that will be implemented by the Copermittee within its jurisdiction. Implementation of the components of each Copermittee's jurisdictional runoff management program must incorporate the water quality improvement strategies identified by each Copermittee in the Water Quality Improvement Plans, described pursuant to Provision B.3.b.(1)(a).

More specific and detailed discussions of the requirements of Provision E are provided below.

Provision E.1 (Legal Authority Establishment and Enforcement) requires each Copermittee to establish and enforce sufficient legal authority to control discharges to the MS4 within its jurisdiction.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system*" and be able to demonstrate that it can "*operate pursuant to legal authority established by statute, ordinance or series of contracts.*" Provision E.1.a describes the minimum legal authorities each Copermittee must establish for itself within its jurisdiction to control discharges to its MS4. The requirements of Provision E.1.a are consistent with the requirements set forth in 40 CFR 122.26(d)(2)(i)(A)-(F).

The certification statement required from each Copermittee by Provision E.1.b is included to provide the San Diego Water Board additional documentation that each Copermittee has established the legal authorities consistent with Provision E.1.a and 40 CFR 122.26(d)(2)(i)(A)-(F), and the Copermittee can "*operate pursuant to legal authority established by statute, ordinance or series of contracts.*"

Provision E.2 (Illicit Discharge Detection and Elimination) requires each Copermittee to implement an illicit discharge detection and elimination program to effectively prohibit non-storm water discharges to the MS4 by actively detecting and eliminating illicit discharges and disposal into its MS4. If the San Diego Water Board finds that a Copermittee is fully implementing the requirements of Provision E.2, then the Copermittee is deemed in compliance with the effective prohibition of non-storm water discharges to the MS4 required under Provision A.1.b.

Provision E.2 establishes the minimum requirements that each Copermittee must implement within its jurisdiction to effectively prohibit non-storm water discharges from entering its MS4. The federal CWA requires permits for municipal storm sewer systems to "*effectively prohibit non-storm water discharges into the storm sewers*." The federal regulations (40CFR122.26(d)(2)(i)(B)) require each Copermittee to establish the legal authority to prohibit illicit discharges to its MS4s. Under 40 CFR 122.26(d)(2)(iv)(B), each Copermittee must implement a "*program…to detect and remove…illicit discharges and improper disposal into the storm sewer.*" The federal NPDES regulations, under 40 CFR 122.26(b)(2), define illicit discharges as "*any discharge to a municipal separate storm sewer that is not composed entirely of storm water*." Thus, non-storm water discharges are not authorized to enter the MS4 and are considered to be illicit discharges, unless authorized by a separate NPDES permit.

The Phase I Final Rule clarifies that non-storm water discharges through an MS4 are not authorized under the CWA (55 FR 47995):

> "*Today's rule defines the term "illicit discharge" to describe any discharge through a municipal separate storm sewer system that is not composed entirely of storm water and that is not covered by an NPDES permit. Such illicit discharges are not*

> *authorized under the Clean Water Act. Section 402(p)(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit*."

The federal NPDES requirements for the program to address illicit discharges must include "*inspections, to implement and enforce an ordinance, orders, or other similar means to prevent illicit discharges to the MS4*." The federal NPDES regulations also reference several categories of "*non-storm water discharges or flows* [which] *shall be addressed where such discharges are identified…as sources of pollutants to waters of the United States*." The Phase I Final Rule (55 FR 48037) further clarified the requirements of 40 CFR 122.26(d)(2)(iv)(B)(1) as follows:

> "*EPA is clarifying that section 402(p)(3)(B) of the CWA (which requires permits for municipal separate storm sewers to 'effectively' prohibit non-storm water discharges) does not require permits for municipalities to prohibit certain discharges or flows of nonstorm water to waters of the United States through municipal separate storm sewers in all cases*."

In previous iterations of the municipal storm water permits for the San Diego Region, these categories were simply listed and referred to as categories of non-storm water discharges "not prohibited" unless identified as a source of pollutants. The Copermittees have often referred to these categories as "exempt" discharges. In both cases, however, the language is inconsistent with the federal CWA and NPDES regulations. And, the clarification provided in the Phase I Final Rule does not specifically state that such discharges are "not prohibited" or "exempt" or in any way authorized. The federal NPDES regulations do, however, state that specific categories of non-storm water discharges must be "*addressed*" if identified as "*sources of pollutants to waters of the United States*."

The language of Provision E.2.a has been revised to be fully consistent with the language of the CWA and the requirements of the federal regulations under 40 CFR 122.26(d)(2)(iv)(B)(1). Provision E.2.a requires each Copermittee to address <u>all</u> types of non-storm water discharges into its MS4 as illicit discharges, <u>unless</u> the discharge is authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to Provisions E.2.a.(1) through E.2.a.(5). Only non-NPDES-permitted non-storm water discharges identified as a category of non-storm water discharges under Provisions E.2.a.(1) through E.2.a.(5) <u>and</u> *not identified as a source of pollutants* do not have to be addressed as illicit discharges. Categories of non-storm water discharges that meet the requirements of Provisions E.2.a.(1) through E.2.a.(5) do not have to be addressed by the Copermittee as illicit discharges.

Several of the non-storm water categories listed in 40 CFR 122.26(d)(2)(iv)(B)(1) have not been included in Provisions E.2.a.(1) through E.2.a.(5), including: street wash water, landscape irrigation, irrigation water, and lawn watering. Because these are no longer included within the categories listed under Provisions E.2.a.(1) through E.2.a.(5), the Copermittees must prohibit these types of non-storm water discharges from entering the MS4. This is consistent with the clarification of 40 CFR 122.26(d)(2)(iv)(B)(1) in the Phase I Final Rule (55 FR 48037), which states:

> "*[T]he Director may include permit conditions that either require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*."

Street wash water is a category of non-storm water discharges that was removed when the Third Term Permits were issued. Street wash water is a source of several pollutants (e.g., metals, oil and grease, petroleum hydrocarbons, chlorinated solvents, sediment) which are generated during the street washing process. The removal of this category requires the Copermittees to prohibit this type of non-storm water discharge from entering the MS4.

The landscape irrigation, irrigation water, and lawn watering categories, collectively referred to hereafter as "over-irrigation" discharges, were removed from the list of non-storm water discharge categories in the Fourth Term Orange County and Riverside County Permits. Non-storm water discharges resulting from over-irrigation have been found to be a source of several types of pollutants (e.g., nutrients, bacteria, pesticides, sediment) in receiving waters. The San Diego Water Board and the Copermittees have identified categories of non-storm water discharges associated with over-irrigation as a source of pollutants and conveyance of pollutants to the MS4 and waters of the United States in the following documents:

- **SmartTimer/Edgescape Evaluation Program (SEEP) Grant Application**

  The State Water Board allocated grant funding to the SEEP project grant application submitted in 2006, which targeted irrigation runoff by retrofitting areas of existing development and documenting the conservation and runoff improvements. The basis of this grant project is that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 is a source and conveyance of pollutants. In addition, the grant application indicated that this alteration of natural flows is impacting the beneficial uses of waters of the state and U.S. Results from the study indicate that that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 *is* a source and conveyance of pollutants. The results of this study can be applied broadly to any area where over-irrigation takes place. The grant application included the following statements:

  > "*Irrigation runoff contributes flow & pollutant loads to creeks and beaches that are 303(d) listed for bacteria indicators.*"

"*Regional program managers agree that the reduction and/or elimination of irrigation-related urban flows and associated pollutant loads may be key to successful attainment of water quality and beneficial use goals as outlined in the San Diego Basin Plan and Bacteria TMDL over the long term.*"

"*Elevated dry-weather storm drain flows, composed primarily … of landscape irrigation water wasted as runoff, carry pollutants that impair recreational use and aquatic habitats all along Southern California's urbanized coastline. Storm drain systems carry the wasted water, along with landscape derived pollutants such as bacteria, nutrients and pesticides, to local creeks and the ocean. Given the local Mediterranean climate, excessive perennial dry season stream flows are an unnatural hydrologic pattern, causing species shifts in local riparian communities and warm, unseasonal contaminated freshwater plumes in the near-shore marine environment.*"

- **2006-2007 Orange County Watershed Action Plan Annual Reports**

The Watershed Action Plan Annual Reports for the 2006-2007 reporting period were submitted by the County of Orange, Orange County Flood Control District and Copermittees within the San Juan Creek, Laguna Coastal Streams, Aliso Creek, and Dana Point Coastal Streams Watersheds. San Juan Creek, Laguna Coastal Streams, Aliso Creek and Dana Point Coastal Streams are all currently 303(d) listed as impaired for indicator bacteria within their watersheds and/or in the Pacific Ocean at the discharge points of their watersheds. The Orange County Copermittees, within their Watershed Action Strategy Table for fecal indicator bacteria included the following:

"*Support programs to reduce or eliminate the discharge of anthropogenic dry weather nuisance flow throughout the…watershed. Dry weather flow is the transport medium for bacteria and other 303(d) constituents of concern.*"

Additionally, they state that "*conditions in the MS4 contribute to high seasonal bacteria propagation in-pipe during warm weather. Landscape irrigation is a major contributor to dry weather flow, both as surface runoff due to over-irrigation and overspray onto pavements; and as subsurface seepage that finds its way into the MS4.*"

- **Fiscal Year 2008 Carlsbad Watershed Urban Runoff Management Program Annual Report**

The Carlsbad Watershed Urban Runoff Management Program Annual Report for Fiscal Year 2008 was submitted by the Carlsbad Watershed Copermittees (Cities of Carlsbad, Encinitas, Escondido, Oceanside, San Marcos, Solana Beach, and Vista, and the County of San Diego). In the Annual Report, the Carlsbad Watershed Copermittees stated the following:

"The Carlsbad Watershed Management Area (WMA) collective watershed strategy identifies bacteria, sediment, and nutrients as high priority water quality pollutants in the Agua Hedionda (904.3 – bacteria and sediment), Buena Vista (904.2 – bacteria), and San Marcos Creek (904.5 – nutrients) Hydrologic Areas. Bacteria, sediment, and nutrients have been identified as potential discharges from over-irrigation."

- **2007-2008 San Diego Bay Watershed Urban Runoff Management Program Annual Report**

  The San Diego Bay Watershed Urban Runoff Management Program 2007-2008 Annual Report was submitted by the San Diego Bay Watershed Copermittees (Cities of Chula Vista, Coronado, Imperial Beach, La Mesa, Lemon Grove, National City, and San Diego, the County of San Diego, the Port of San Diego, and the San Diego County Airport Authority). In Appendix D of the Annual Report, titled "Likely Sources of Pollutants," the San Diego Bay Watershed Copermittees identified over-irrigation of lawns as a pollutant generating activity from business and/or residential land uses for bacteria, pesticides, and sediment.

- **Copermittee Public Education Materials**

  The Orange County Public Works *Tips for Landscape & Gardening* public education brochure states: "*Fertilizers, pesticides and other chemicals that are left on yards or driveways can be blown or washed into storm drains that flow to the ocean. Overwatering lawns can also send materials into storm drains*."

  The Riverside County Flood Control and Water Conservation District *Landscape and Garden* public education brochure states: *"Soil, yard wastes, over-watering and garden chemicals become part of the urban runoff mix that winds its way through streets, gutters and storm drains before entering lakes, rivers, streams, etc. Urban runoff pollution contaminates water and harms aquatic life!"*

- **Los Peñasquitos Lagoon Sedimentation/Siltation TMDL Technical Report**

  The Los Peñasquitos Lagoon Sedimentation/Siltation TMDL technical report was prepared for the City of San Diego and USEPA in October 2010. The technical report was included as a technical supporting document attached to the Sediment TMDL for Los Peñasquitos Lagoon staff report prepared by the San Diego Water Board, dated June 13, 2012. Under the Source Assessment section, the technical report states the following:

  "*Dry weather loading is dominated by nuisance flows from urban land use activities such as car washing, sidewalk washing, and lawn over-irrigation, which pick up and transport sediment into receiving waters.*"

These documents confirm that non-storm water discharges associated with over-irrigation are a source of pollutants and should be addressed as illicit discharges to the MS4. Prohibiting non-storm water discharges associated with over-irrigation, however, is not a new requirement for the Copermittees because it is also consistent with and required by the Water Conservation in Landscaping Act (AB 1881, Laird).

The Water Conservation in Landscaping Act required the Department of Water Resources (DWR) to prepare a Model Water Efficient Landscape Ordinance for use by local agencies (e.g. the Copermittees). All local agencies were required to adopt a water efficient landscape ordinance by January 1, 2010. Local agencies could adopt the Water Efficient Landscape Ordinance developed by DWR, or an ordinance considered at least as effective as the Model Ordinance. The Water Efficient Landscape Ordinance includes a requirement that local agencies prohibit runoff from irrigation (§ 493.2):

> "*Local agencies shall prevent water waste resulting from inefficient landscape irrigation by <u>prohibiting runoff from leaving the target landscape</u> [emphasis added] due to low head drainage, overspray, or other similar conditions where water flows onto adjacent property, non-irrigated areas, walks, roadways, parking lots, or structures. Penalties for violation of these prohibitions shall be established locally*."

Furthermore, non-storm water discharges from over-irrigation not only transport and discharge pollutants to receiving waters, but are also a likely source of the dry weather flows causing changes to habitat within and along the receiving water bodies. Examples of habitat changes from the dry weather flows include perennialization of ephemeral streams, and conversion of saltwater and brackish water marsh habitats to freshwater marsh habitats (e.g. Los Peñasquitos Lagoon). Both of these examples have resulted in the promotion of invasive species in several areas of the San Diego Region.

The removal of the over-irrigation discharges categories does not require the Copermittees to strictly prohibit lawn and landscape irrigation, but does require the prohibition of excessive irrigation water that results in non-storm water discharges to the MS4. Non-storm water discharges to the MS4 from over-irrigation must be addressed as illicit discharges by the Copermittees pursuant to the requirements of Provision E.2.

The remaining non-storm water categories listed in 40 CFR 122.26(d)(2)(iv)(B)(1) are listed under Provisions E.2.a.(1) through E.2.a.(5) and generally fall into four categories: (1) non-storm water discharges subject to existing San Diego Water Board waste discharge requirements and NPDES permits; (2) non-storm water discharges generally not expected to be a source of pollutants to receiving waters; (3) non-storm water discharges likely to contain pollutants requiring some form of control to address

the pollutants prior to discharging to the MS4; and (4) non-storm water discharges or flows associated with firefighting.

Provisions E.2.a.(1) and E.2.a.(2) include several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) for which the San Diego Water Board already has developed general waste discharge requirements and NPDES permits to address the discharges. The Copermittees are only required to address these types of non-storm water discharges as illicit discharges if the Copermittees or the San Diego Water Board identifies these non-storm water discharges not having coverage under the applicable NPDES permit.

Provision E.2.a.(3) includes several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) which are generally not expected to be a source of pollutants to receiving waters, many of which originate from what are typically natural, uncontrollable sources. The Copermittees are only required to address these types of non-storm water discharges as illicit discharges if the Copermittees or the San Diego Water Board identifies these non-storm water discharges as a source of pollutants to receiving waters. Because many of these sources are generally uncontrollable, enforcing a prohibition may not be a possibility for the Copermittees. The Copermittees would be able to address these non-storm water discharges by preventing these non-storm water discharges from entering the MS4. This could potentially be achieved by sealing their MS4 structures so the discharges cannot enter the MS4.

Provision E.2.a.(4) includes several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) that are likely to contain pollutants requiring some form of control to address the pollutants prior to discharging to the MS4. At this time, an outright prohibition of these types of non-storm water discharges does not yet appear to be warranted. Thus, Provision E.2.a.(4) includes several requirements for the Copermittees to control the pollutants from these types of non-storm water discharges. This is consistent with the clarification of the federal regulations in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board has the authority to require the Copermittees to "*control any of these types of discharges where appropriate*."

Unlike non-storm water discharges from over-irrigation, these types of non-storm water discharges are not expected to occur in close proximity to each other or very frequently. Provided these types of non-storm water discharges are controlled as required in Provision E.2.a.(4), the Copermittees would only be required to address these types of non-storm water discharges as illicit discharges if the Copermittee or the San Diego Water Board identifies these non-storm water discharges as a source of pollutants to receiving waters.

Provision E.2.a.(5) includes specific requirements for fire fighting discharges and flows. The requirements for non-storm water discharges and flows associated with fire

fighting have been separated into requirements for: a) non-emergency fire fighting discharges and flows, and b) emergency fire fighting discharges and flows.

The San Diego Water Board has found that discharges from building fire suppression system maintenance (e.g. fire sprinklers) contain waste and potentially a significant source of pollutants to receiving waters. As such, the San Diego Water Board is requiring these discharges be addressed as illicit discharges by the Copermittees. Thus, the discharges to the MS4 are to be prohibited via ordinance, order or similar means. For other non-emergency firefighting discharges and flows (i.e. flows from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems), the Copermittees are required to develop and implement a program to address pollutants in these non-storm water discharges and flows. This is consistent with the clarification of the federal regulations in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board has the authority to require the Copermittees to "*control any of these types of discharges where appropriate*."

For emergency firefighting discharges and flows, the Phase I Final Rule (55 FR 48037) has clarified the requirements of 40 CFR 122.26(d)(2)(iv)(B)(1) pertaining to emergency firefighting flows and discharges, which states:

> "*In the case of firefighting it is not the intention of these rules to prohibit in any circumstances the protection of life and public or private property through the use of water or other fire retardants that flow into separate storm sewers*."

Thus, the requirements have been made to be consistent with the guidance provided by the Phase I Final Rule. The Order recommends that the Copermittees develop and encourage implementation of BMPs to reduce or eliminate the discharge of pollutants from emergency firefighting flows to the MS4s and receiving waters. The Order does not include any requirements that should be interpreted as requiring the implementation of BMPs for emergency firefighting flows to the MS4s and receiving waters.

The Copermittees are expected to review the dry weather MS4 outfall discharge monitoring data they collect to determine if and when there are non-storm water discharges to or from their MS4s that are a source of pollutants to receiving waters. If the Copermittees identify one of the types of non-storm water discharges listed in Provisions E.2.a.(1) through E.2.a.(4) as a source of pollutants to receiving waters based on the review and evaluation of monitoring data, Provision E.2.a.(6) requires the Copermittees to prohibit those categories of discharges from entering the MS4 through ordinance, order or similar means. In addition, Provision E.2.a.(6) clarifies that the San Diego Water Board may identify categories of non-storm water discharges or flows listed under Provisions E.2.a.(1) through E.2.a.(4) that must be prohibited.

Provision E.2.a.(6) also provides the Copermittees an option to propose controls to be implemented for the category of non-storm water discharges as part of the Water Quality Improvement Plan instead of prohibiting the category of non-storm water discharges. If the Water Quality Improvement Plan is accepted by the San Diego Water Board with the proposed controls, the Copermittees will not be required to prohibit the category of non-storm water discharges to their MS4s as long as the controls are implemented. This is consistent with the clarification of 40 CFR 122.26(d)(2)(iv)(B)(1) in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board may "*require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*."

Finally, Provision E.2.a.(7) has been included in the requirements for non-storm water discharges to clarify that any non-storm water discharges to the Copermittee's MS4, even those identified pursuant to Provisions E.2.a.(1) through E.2.a.(4), must be reduced or eliminated, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit. Provision E.2.a.(7) is consistent with the requirements of CWA section 402(p)(3)(B)(ii) and 40 CFR 122.26(d)(1)(v)(B), as clarified in the Phase I Final Rule (55 FR 47995) that "*[u]ltimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit*." However, the reduction or elimination of those non-storm water discharges are expected to be achieved as feasible, in accordance with the priorities in the Water Quality Improvement Plan and when the resources are available to the Copermittee.

Consistent with 40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(1), each Copermittee must implement a "*program…to prevent illicit discharges to the municipal storm sewer system*" and "*detect…illicit discharges and improper disposal into the storm sewer.*" Provision E.2.b requires each Copermittee to implement measures to prevent and detect illicit discharges and connections to its MS4 as part of its illicit discharge detection and elimination program.

As part of the program to prevent and detect illicit discharges to the MS4, 40 CFR 122.26(d)(2)(iv)(B)(2) requires "*procedures to conduct on-going field screening activities during the life of the permit, including areas or locations that will be evaluated by such field screens*." As part of the procedures, each Copermittee is required to maintain an updated map of its entire MS4 and the corresponding drainage areas within its jurisdiction. Having knowledge about where inlets, access points, connections with other MS4s, and outfalls are located is necessary for each Copermittee to track, identify, and eliminate illicit discharges and connections. Thus, Provision E.2.b.(1) of the Order specifies that the map must include the segments of the storm sewer system owned, operated, and maintained by the Copermittee, and include locations of all known inlets, connections with other MS4s, and outfalls to the Copermittee's MS4. The remaining requirements of Provision E.2.b are consistent with the requirements of 40 CFR 122.26(d)(2)(iv)(B)(3)-(7) related to implementing measures to prevent and detect illicit discharges and connections to the MS4.

Provision E.2.c requires each Copermittee to conduct field screening and monitoring of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4. Field screening is a required element of the program to detect and eliminate illicit discharges and connections to the MS4, pursuant to 40 CFR 122.26(d)(2)(iv)(B)(2). The field screening requirement will be implemented through the dry weather MS4 outfall discharge monitoring required under Provisions D.2.a.(2) and D.2.b.(1).

Provision E.2.d specifies the measures each Copermittee must implement to eliminate illicit discharges and connections to its MS4. Elimination of illicit discharges and connections to the MS4 is consistent with the requirement of 40 CFR 122.26(d)(2)(iv)(B) "*to detect and remove [emphasis added]…illicit discharges and improper disposal into the storm sewer*" and will achieve the CWA requirement for MS4 permits to "*effectively prohibit non-storm water discharges into the storm sewers*."

Generally, each Copermittee is responsible for prioritizing its efforts to eliminate non-storm water and illicit discharges or connections to its MS4 based on field screening and monitoring data, NALs, illicit discharge investigation records, and the known or suspected sources. Sources of non-storm water and illicit discharges or connections must be eliminated by enforcing the legal authority established by each Copermittee pursuant to Provision E.1.

Provision E.3 (Development Planning) requires each Copermittee to use its land use and planning authority to implement a development planning program to control and reduce the discharge of pollutants in storm water from new development and significant redevelopment to the MEP. Proper implementation of the development planning program will also contribute toward effectively prohibiting non-storm water discharges from development projects to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." As part of the management program, 40 CFR 122.26(d)(2)(iv)(A)(2) requires "*planning procedures including a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment*."

Land development generally alters the natural conditions of the land by removing vegetative cover, compacting soil, and/or placement of concrete, asphalt, or other impervious surfaces. These impervious surfaces concentrate urban pollutants (such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not found in high concentrations in the natural environment. Pollutants that

accumulate on impervious surfaces are not easily biodegraded nor subject to natural treatment processes.

Impervious surfaces greatly affect the natural hydrology of the land because they do not allow natural infiltration and treatment of storm water runoff to take place. Instead, storm water runoff from impervious surfaces is typically directed through pipes, curbs, gutters, and other hardscape into receiving waters, with little treatment, at significantly increased volumes and accelerated flow rates over what would occur naturally. The increased pollutant loads, storm water volume, discharge rates and velocities, and discharge durations from the MS4 adversely impact stream habitat by causing accelerated, unnatural erosion and scouring within creek bed and banks. Placement of impervious surfaces also encapsulates "good" sediment (such as sand, gravel, rocks and cobbles) that would normally replenish creek beds and banks to help stabilize them. Collectively, these changes to natural hydrologic processes are termed hydrograph modification, or hydromodification.

Hydromodification, which is caused by both altered storm water flow and altered sediment flow regimes, is largely responsible for degradation of creeks, streams, and associated habitats in the San Diego Region. In an ongoing study by the Stormwater Monitoring Coalition to assess the health of streams throughout Southern California, researchers found that three of the four highest risk stressors to creeks (percent sands and fines present, channel alteration, and riparian disturbance) were related to physical habitat.[29] Researchers studying flood frequencies in Riverside County have found that increases in watershed imperviousness of only 9-22 percent can result in increases in peak flow rates for the two-year storm event of up to 100 percent.[30] Such changes in runoff have significant impacts on channel morphology.

In addition, a technical report issued by the Southern California Coastal Water Research Project (SCCWRP) stated that "*[r]ecent studies indicate that California's intermittent and ephemeral streams are more susceptible to the effects of hydromodification than streams from other parts of the United States. Physical degradation of stream channels in the central and eastern United States can initially be detected when watershed impervious cover approaches 10 percent, although biological effects (which may be more difficult to detect) may occur at lower levels. In contrast, initial response of streams in the semi-arid portions of California appears to occur between 3 and 5 percent impervious cover.*"[31] These studies highlight the extent to which impacts originating from impervious surfaces created by land development are responsible for the degradation of creek and stream habitat.

[29] Assessing the Health of Southern California Streams, Stormwater Monitoring Coalition, Fact Sheet
[30] Schueler and Holland, 2000. Storm Water Strategies for Arid and Semi-Arid Watersheds (Article 66). The Practice of Watershed Protection.
[31] Stein, E. and Zaleski, S., 2005. Technical Report 475, Managing Runoff to Protect Natural Streams: The Latest Development on Investigation and Management of Hydromodification in California. December 30, 2005.

This is consistent with what USEPA has noted, that "*[m]ost stormwater runoff is the result of the man-made hydrologic modifications that normally accompany development. The addition of impervious surfaces, soil compaction, and tree and vegetation removal result in alterations to the movement of water through the environment. As interception, evapotranspiration, and infiltration are reduced and precipitation is converted to overland flow, these modifications affect not only the characteristics of the developed site but also the watershed in which the development is located. Stormwater has been identified as one of the leading sources of pollution for all waterbody types in the United States. Furthermore, the impacts of stormwater pollution are not static; they usually increase with more development and urbanization*."[32]

Reducing the impact from the increased pollutant loads and flows generated by impervious surfaces within a watershed is essential to protecting and restoring the integrity of the receiving waters. Provision E.3 includes the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment*." The requirements of Provision E.3 will 1) minimize the generation and discharge of pollutants in storm water from the MS4, and 2) minimize the potential of storm water discharges from the MS4 from causing altered flow regimes and excessive downstream erosion in receiving waters.

The requirements of Provision E.3.a include the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment*" applicable to all development projects, regardless of size or purpose of development. In general, all development projects must implement onsite BMPs to remove pollutants from runoff prior to its discharge to any receiving waters, as close to the pollutant generating source as possible, and structural BMPs must not be constructed within waters of the U.S.

Furthermore, the onsite BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors (e.g. mosquitos, rodents, and flies). If not properly designed or maintained, certain BMPs implemented or required by municipalities may create a habitat for vectors. Monitoring studies conducted by the California Department of Public Health (CDPH) have documented that mosquitoes opportunistically breed in structural storm water BMPs, particularly those that hold standing water for over 96 hours. Certain site design features that hold standing water may similarly produce mosquitoes.

[32] USEPA, 2007. Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices, December 2007.

Structural BMPs and site design features should incorporate design, construction, and maintenance principles to promote drainage within 96 hours to minimize standing water available to mosquitoes. Nuisances and public health impacts resulting from vector breeding can be prevented with close collaboration and cooperative effort between municipalities and local vector control agencies and the CDPH during the development and implementation of storm water runoff management programs. The CDPH also has issued guidance for BMP implementation that will minimize potential nuisances and public health impacts resulting from vector breeding.[33]

All development projects are required to implement source control BMPs that will minimize the generation of pollutants. Additionally, each development project must implement, where applicable and feasible, low impact development (LID) BMPs to mimic the natural hydrology of the site and retain and/or treat pollutants in storm water runoff prior to discharging to and from the MS4.

The LID Center defines LID as "*a comprehensive land planning and engineering design approach with a goal of maintaining and enhancing the pre-development hydrologic regime of urban and developing watersheds.*"[34] LID designs seek to control storm water at the source, using small-scale integrated site design and management practices to mimic the natural hydrology of a site, retain storm water runoff by minimizing soil compaction and impervious surfaces, and disconnect storm water runoff from conveyances to the storm drain system.

LID BMPs may utilize interception, storage, evaporation, evapotranspiration, infiltration, and filtration processes to retain and/or treat pollutants in storm water before it is discharged from a site. Because of these numerous options, the San Diego Water Board expects that every development project will be able to implement some form of LID BMPs. Examples of LID BMPs include using permeable pavements, rain gardens, rain barrels, grassy swales, soil amendments, and native plants.

Provision E.3.a also includes requirements for all development projects to, where feasible, landscape with native and/or low water use plants to minimize the discharge of non-storm water discharges associated with excessive irrigation, as well as harvest (i.e., storage) and use precipitation to promote the concept of utilizing storm water as a resource.

While all development projects are subject to the requirements of Provision E.3.a, Provision E.3.b identifies Priority Development Projects that exceed given size thresholds and/or fit under specific use categories. Priority Development Projects are required to incorporate specific performance criteria for structural BMPs into the

[33] California Department of Public Health, 2012. Best Management Practices for Mosquito Control in California. (http://www.cdph.ca.gov/HealthInfo/discond/Documents/BMPforMosquitoControl07-12.pdf)
[34] www.lowimpactdevelopment.org

project plan to reduce the generation of pollutants, and address potential impacts from hydromodification.

The Priority Development Project categories are based on the requirements of the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), and do not differ significantly from the Fourth Term Permit for San Diego County. Furthermore, the Priority Development Project categories are consistent with Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), and Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit).

Because of the impact of relatively small increases in watershed impervious surfaces to receiving waters, Provision E.3.b.(1)(c)(iv) has been updated to include large driveways that are 5,000 square feet or more. The San Diego Water Board finds that large driveways can exacerbate altered flow regimes if not properly controlled.

Provision E.3.b.(3) describes projects that are exempt from Priority Development Project status. These include new or retrofit paved sidewalks, bicycle lanes, or trails that are designed and constructed to direct runoff to vegetated areas or be hydraulically disconnected from paved areas. The exemptions have been provided to encourage these types of projects because they provide multiple environmental benefits, such as promoting walking rather than driving, which will in turn improve air quality. Additionally, retrofitting of existing alleys, streets, or roads are exempt from Priority Development Project status if they are constructed using USEPA Green Streets guidance.[35] By doing so, retrofitting of these types of projects is encouraged. The San Diego Water Board recognizes that there are spatial constraints associated with these projects, and implementation of structural BMPs are not always feasible.

For development projects identified as Priority Development Projects, the requirements of Provision E.3.c are the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment.*" Provisions E.3.c.(1)-(3) describe the performance criteria for the structural BMPs that must be implemented for each Priority Development Project defined by Provision E.3.b.

Provision E.3.c.(1) describes the storm water pollutant control BMP requirements that must be implemented by all Priority Development Projects. The purpose of Provision E.3.c.(1) is to reduce pollutants in storm water runoff to the MEP from Priority Development Projects before it is discharged to the MS4. Of all the available treatment processes available, retention of storm water, and therefore capture of the

[35] "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).

pollutants in the storm water, will achieve 100 percent pollutant removal efficiency for the volume of storm water retained. No other method of treatment can achieve 100 percent pollutant removal efficiency. Thus, retention of as much storm water onsite is the most effective way to reduce pollutants in storm water discharges to, and consequently from the MS4, and controls pollutants in storm water discharges from a site to the MEP.

Under Provision E.3.c.(1)(a), retention of the pollutants in the runoff produced from the 85th percentile storm event ("design capture volume") is the design standard to which Priority Development Projects must comply. Since the 85th percentile storm event has previously been used as the numeric design standard for treatment control BMPs, this same size storm event is used as the numeric design standard for storm water retention. This is the MEP standard recognized by the San Diego Water Board and is consistent with the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), as well as Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit), and Los Angeles Water Board Order No. R4-2012-0175 (Los Angeles County MS4 Permit).

The 85th percentile storm event is the event that has a precipitation total greater than or equal to 85 percent of all storm events over a given period of record in a specific area or location. For example, to determine what the 85th percentile storm event is in a specific location, all 24 hour storms that have recorded values over a 30 year period would be tabulated and a 85th percentile storm would be determined from this record (i.e. 15 percent of the storms would be greater than the number determined to be the 85th percentile storm). Most jurisdictions in the San Diego Region have already developed isopluvial maps that can provide this type of information. The 85th percentile storm might be determined to be a number such as 1.0 inch, and this would be multiplied by the total area of the project footprint producing runoff to calculate the design capture volume. The Priority Development Project designer would then select a system of BMPs that would retain (i.e. intercept, store, infiltrate, evaporate, or evapotranspire) the pollutants contained in the design capture volume onsite.

Retention BMPs are necessary to capture and retain pollutants generated from a Priority Development Project. In a recent study performed by SCCWRP in the Los Angeles Region, they found "*that the magnitude of constituent load associated with storm water runoff depends, at least in part, on the amount of time available for pollutant build-up on land surfaces. The extended dry period that typically occurs in arid climates such as southern California maximizes the time for constituents to build-up on land surfaces, resulting in proportionally higher concentrations and loads during*

initial storms of the season."[36] This implies that the "first flush" of a rainy season and the first storm events after long antecedent dry periods tend to have the highest pollutant loads. Capturing and retaining the pollutant loads of the "first flush" of a rainy season and the first storm events after long antecedent dry periods will reduce a significant portion of the pollutants in storm water discharged to and from the MS4.

The San Diego Water Board, however, acknowledges that in some situations retention of the full design capture volume onsite may not be technically feasible. In this event, the Copermittee may allow the Priority Development Project to use biofiltration BMPs to treat 1.5 times the design capture volume not reliably retained onsite, or biofiltration BMPs with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite.

The 1.5 multiplier is based on the finding in the Ventura County Technical Guidance Manual that biofiltration of 1.5 times the design capture volume not retained onsite will provide approximately the same pollutant removal as retention of the design capture volume on an annual basis.[37] This standard is consistent with the Los Angeles Water Board's Los Angeles County and Ventura County municipal storm water permits (Order Nos. R4-2012-0175 and R4-2010-0108, respectively). The flow-thru design of 0.75 times the portion of the design capture volume not reliably retained onsite is consistent with the San Diego Water Board's Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively). In either case, the biofiltration BMPs must be designed with an appropriate hydraulic loading rate to maximize storm water retention and pollutant removal, as well as to prevent erosion, scour, and channeling within the BMP. Each Copermittee is required to update its BMP Design Manual to provide guidance for hydraulic loading rates and other biofiltration design criteria necessary to maximize storm water retention and pollutant removal.

The San Diego Water Board further recognizes that, in addition to not being technically feasible, retention of the full design capture storm onsite may be cost prohibitive, or may not provide as much water quality benefit to the Watershed Management Area as would implementing BMPs elsewhere in the watershed. Thus, Provision E.3.c.(1)(b) allows for the use of a combination of onsite retention BMPs, and the implementation of an Alternative Compliance Program described in Provision E.3.c.(3). Provision E.3.c.(3) is discussed in more detail below.

If the full design capture volume is not retained onsite either because biofiltration is not technically feasible, or a Copermittee grants a Priority Development Project permission

[36] Stein, E.D., Tiefenthaler, L.L., and Schiff, K.C., 2007. Technical Report 510, Sources, Patterns and Mechanisms of Storm Water Pollutant Loading from Watershed and Land Uses of the Greater Los Angeles Area, California, USA. March 20, 2007.
[37] Ventura Countywide Stormwater Management Program. 2011. Ventura Technical Guidance Manual, Manual Update, 2011.

to utilize the Alternative Compliance Program, then the pollutants in the portion of the design capture volume that are not reliably retained onsite must still be reduced to the MEP. Thus, flow-thru treatment control BMPs are required to be implemented on Priority Development Projects in addition to the retention BMPs. The requirements of Provisions E.3.c.(1)(a)(ii)[a]-[c] include the performance standards for flow-thru treatment control BMPs, consistent with the Fourth Term Permits in the San Diego Region.

Whereas the purpose of the requirements under Provision E.3.c.(1) is to reduce pollutants in storm water runoff to the MEP, the purpose of the requirements under Provision E.3.c.(2) is to maintain or restore more natural hydrologic flow regimes to prevent accelerated, unnatural erosion in downstream receiving waters, also to the MEP standard. Provision E.3.c.(2) describes hydromodification management BMP requirements that must be implemented by all Priority Development Projects.

The performance criteria for the implementation of hydromodification management BMPs on Priority Development Projects are consistent with the requirements in the Fourth Term Permits for Orange and Riverside Counties (Order Nos. R9-2009-0002 and R9-2010-0016, respectively). Modifications to the Orange County and Riverside County Hydromodification Management Plans (HMPs) will likely be minor, or may not be necessary. The HMP for San Diego County will likely require some minor modifications to incorporate the requirements of Provision E.3.c.(2) and become consistent with the Orange County and Riverside County HMPs. The San Diego Water Board does not, however, expect that it will be necessary for the San Diego County Copermittees to develop a new approach or significantly re-write the San Diego County HMP. This is because the premise of the hydromodification management BMP requirements, which are to control storm water runoff conditions (flow rates and durations) for Copermittee-defined range of flows, is unchanged from all Fourth Term Permits in the San Diego Region.

Provision E.3.c.(2)(a) requires that post-project runoff conditions mimic the *pre-development* runoff conditions, and not the *pre-project* runoff conditions. Fundamentally, the San Diego Water Board believes that using a hydrology baseline that approximates that of an undeveloped, natural watershed is the only way to facilitate the return of more natural hydrological conditions to already built-out watersheds, and ultimately improved stream health. On the other hand, using the *pre-project* hydrology as a baseline for redevelopment projects results in propagating the unnatural hydrology of urbanized areas. Propagating the urbanized flow regime does not support conditions for restoring degraded or channelized stream segments, and would forever sentence such streams to the degraded state. Furthermore, reducing the volume of storm water runoff associated with the urbanized flow regime will also result in reducing the discharge of pollutants into receiving waters, since storm water runoff from impervious surfaces contains untreated pollutants.

The San Diego Water Board understands that approximating the pre-development runoff condition associated with a redevelopment site is not necessarily straightforward because factors such as natural grade and native vegetation for the site cannot be precisely known. Therefore, the San Diego Water Board does not expect project designers to estimate historical conditions associated with redevelopment sites. Rather, the San Diego Water Board expects project designers and the Copermittees to approximate pre-development runoff conditions using the parameters of a *pervious* area rather than an *impervious* area. This means that for redevelopment sites, approximating pre-development runoff conditions equates to using existing onsite grade and assuming the infiltration characteristics of the underlying soil. A redevelopment Priority Development Project must not use runoff coefficients of concrete or asphalt to estimate pre-development runoff conditions. Rather, redevelopment projects must use available information pertaining to existing underlying soil type (such as soil maps published by the National Resource Conservation Service), onsite existing grade, and any other readily available pertinent information to estimate pre-development runoff conditions.

The San Diego Water Board understands, indeed asserts, that the pre-development hydrology of an area in question can only be roughly estimated and cannot be precisely known. However, using the hydrology of a natural condition, even if not precisely known, will provide significant benefit to receiving waters over using the hydrology associated with impervious (developed) surfaces. Therefore in order to achieve the goals of the Clean Water Act, which are to "*restore and maintain the chemical, physical, and biological integrity of the nation's waters* [emphasis added]," the most appropriate standard to use for hydromodification management is the standard associated with the pre-development condition.

Provision E.3.c.(2)(b) requires Priority Development Projects to avoid known critical sediment yield areas or implement measures that would allow coarse sediment to be discharged to receiving waters, such that the natural sediment supply is unaffected by the project. This is necessary because the availability of coarse sediment supply is as much an issue for causing erosive conditions to receiving streams as are accelerated flows.

The San Diego Water Board recognizes that in some situations implementing the hydromodification management BMP requirements for flow control fully onsite may not be technically feasible, may be cost prohibitive, or may not provide any overall water quality benefits to the Watershed Management Area. Thus, Provision E.3.c.(2)(c) allows for the use of a combination of onsite hydromodification management BMPs for flow control and alternative compliance options described in Provision E.3.c.(3).

Provision E.3.c.(3) allows for alternative compliance in instances where the Copermittee determines that offsite measures will have a greater overall water quality benefit for the Watershed Management Area than if the Priority Development Project were to implement structural BMPs onsite. Consequently, watershed-specific

structural BMP requirements are present in this Order in the form of allowable compliance offsite. The Alternative Compliance Program to Onsite Structural BMP Implementation Provision is intended to integrate with the Copermittees' planning efforts in the Water Quality Improvement Plans.

The Alternative Compliance Program is an option for Priority Development Projects where the governing Copermittee has participated in the development of a Watershed Management Area Analysis as part of the Water Quality Improvement Plan (described in Provision B.3.b.(4)). Such an approach is consistent with the latest findings in hydromodification management by the scientific community. In a Technical Report entitled *Hydromodification Assessment and Management in California,*[38] the report states:

> *"An effective [hydromodification] management program will likely include combinations of on-site measures (e.g., low-impact development techniques, flow-control basins), in-stream measures (e.g., stream habitat restoration), floodplain and riparian zone actions, and off-site measures. Off-site measures may include compensatory mitigation measures at upstream locations that are designed to help restore and manage flow and sediment yield in the watershed."*

Consistent with the ideas brought forth in the report, in the Watershed Management Area Analysis of Provision B.3.b.(4), which is optional, the Copermittees will develop watershed maps that include as much detail about factors that affect the hydrology of the watershed as is available. Such factors included identification of areas suitable for infiltration, coarse sediment supply areas, and locating stream channel structures and constrictions. Once these factors are mapped and studied, the Copermittees can identify areas in the watershed where candidate projects may be implemented that are expected to improve water quality in the watershed by providing more opportunity for infiltration, slowing down storm water flows, or attenuation of pollutants naturally via healthy stream habitat. These candidate projects may be in the form of retrofitting existing development, rehabilitating degraded stream segments, identifying regional BMPs, purchasing land to preserve valuable floodplain functions, and any other project(s) that the Copermittees identify.

Under the Alternative Compliance Program, Priority Development Projects may be allowed to fund, partially fund, or implement a candidate project, in lieu of implementing structural BMPs onsite, if they enter into a voluntary agreement with the governing Copermittee permitting this arrangement. Project proponents may also propose an alternative project not previously identified by the Copermittees. In either case, whether a project proponent implements a candidate project identified by the Copermittees or a separate alternative compliance project, the governing Copermittee must determine that implementation of the project will have a greater overall water

[38] 2012. ED Stein, F Federico, DB Booth, BP Bledsoe, C Bowles, Z Rubin, GM Kondolf, A Sengupta. Technical Report 667. Southern California Coastal Water Research Project. Costa Mesa, CA.

quality benefit for the Watershed Management Area than fully implementing structural BMPs onsite. Determination of greater overall water quality benefits associated with alternative compliance projects would be accomplished by utilizing Water Quality Equivalency calculations developed pursuant to Provision E.3.c.(3)(a). Water Quality Equivalency calculations are necessary to establish a regional and technical basis for determining water quality benefits associated with alternative compliance projects, which can be consistently used by all Copermittees in the San Diego Region. Finally, if ~~I~~f alternative compliance involves funding or implementing a project that is outside the jurisdiction of the governing Copermittee, then that Copermittee may enter into an inter-agency agreement with the appropriate jurisdiction.

Finally, Provision E.3.c.(2)(d) allows Priority Development Projects to be exempt from the hydromodification management BMP requirements if there is no threat of erosion to downstream receiving waters (i.e. the receiving stream is concrete lined from the point of discharge all the way to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean). If the Copermittees believe that more exemptions are warranted, then they must perform the optional Watershed Management Area Analysis of Provision B.3.b.(4). Additional exemptions other than those specified in this Order may be established on a watershed basis, provided the Copermittees perform the analysis, provide supporting rationale for the exemptions, and complete the Water Quality Improvement Plan approval process pursuant to Provision F.1.

To facilitate the transition to this Order from the Fourth Term Permits for Orange and Riverside County Copermittees, Provision E.3.c.(2)(e) allows two additional temporary exemptions from hydromodification management BMP implementation. The first temporary exemption allows relief from hydromodification management BMP implementation for Priority Development Projects discharging directly to an engineered channel conveyance system with a capacity to convey peak flows generated by the 10-year storm event all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean. Similar to the exemption allowed for concrete-lined channels, this exemption is premised on the concept that there is little threat of erosion to these types of engineered channel systems.

The second temporary exemption allows relief from hydromodification management BMP implementation for Priority Development Projects discharging directly to large river reaches with drainage areas larger than 100 square miles and a 100-year flow capacity in excess of 20,000 cubic feet per second. If this exemption is claimed, then properly sized energy dissipation is required at all discharge points associated with the Priority Development Project. This exemption is premised on the concept that large river reaches can essentially assimilate the accelerated flow rates associated with individual Priority Development Projects because they are inconsequential compared

to the flow rate in the large river reach. Both of these exemptions are included in the Hydromodification Management Plan for San Diego County[39].

These temporary exemptions are allowed as a means to facilitate Orange and Riverside County Copermittees' transition to this Order from the Fourth Term Permits and are not meant to reside as permanent exemptions without additional rigorous technical analyses specific to each County. Therefore, these exemptions will no longer apply once the Copermittees' land development programs are fully updated to reflect the requirements of this Order, i.e., upon implementation of the BMP Design Manual pursuant to Provision F.2.b. If the Copermittees believe that these or other exemptions are warranted in the context of water quality improvement and stream restoration opportunities, then the Copermittees must perform the optional Watershed Management Area Analysis of Provision B.3.b.(4) and provide supporting rationale for the exemptions. The San Diego County Copermittees are also required to perform the optional Watershed Management Area Analysis to provide supporting rationale to justify use of these and other exemptions. Updated BMP Design Manuals including rationale to justify use of exemptions will be reviewed by the San Diego Water Board pursuant to Provision F.2.b.

Provisions E.3.c.(4) and E.3.c.(5) were included under the BMP requirements applicable to all development projects in the Fourth Term Permits for San Diego, Orange, and Riverside Counties (Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016, respectively). In this Order, the long-term BMP maintenance and infiltration and groundwater protection requirements apply to structural BMPs implemented by Priority Development Projects only.

Provision E.3.d requires the Copermittees to update their BMP Design Manual as needed to incorporate the requirements of Provision E.3. The BMP Design Manual is formerly known as the Standard Storm Water Mitigation Plan, or SSMP, and was renamed so that the title has a more accurate description of the document content. The contents of the BMP Design Manual are largely unchanged from the previous Standard Storm Water Mitigation Plans required under the Fourth Term Permits. The BMP Design Manual fulfills the 40 CFR 122.26(d)(2)(iv)(A)(2) requirement that the Copermittee's development planning program includes "*a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment*."

As part of the "*planning procedures,*" 40 CFR 122.26(d)(2)(iv)(A)(2) requires the procedures to "*address controls to reduce pollutants in discharges from municipal separate storm sewers after construction is completed*." The requirements applicable to the implementation and oversight of structural BMPs at Priority Development Projects are provided under Provision E.3.e.

[39] Final Hydromodification Management Plan Prepared for County of San Diego, March 2011

Proper installation of the structural BMPs approved for a Priority Development Project is necessary to ensure that pollutants in storm water discharges will be reduced to the MEP after the project is completed. In addition to the proper installation of structural BMPs, the maintenance of structural BMPs on Priority Development Projects is necessary to ensure that pollutants in storm water discharges will continue to be reduced to the MEP. Provision E.3.e.(1) includes the minimum requirements that each Copermittee must implement to ensure structural BMPs are properly installed and will be properly maintained.

Provisions E.3.e.(1)(a)(i)-(ii) have been included to provide additional clarification regarding when a Copermittee may allow land development requirements from earlier MS4 permits to apply to a Priority Development Project. Since the MS4 permits issued from 2001 to the adoption of Order No. R9-2015-0001 amending Order No. R9-2013-0001 (Regional MS4 Permit), a Copermittee could allow development projects with "prior lawful approval" to be "grandfathered" into implementing BMP requirements from previous MS4 permits. The Copermittees were given the discretion to use their land use authority to determine when it was appropriate to allow a development project with prior lawful approval to implement BMP requirements from the previous MS4 permits, and when the most recent BMP requirements should be required to achieve the reduction of pollutants in storm water runoff from development projects to the MEP. However, the San Diego Water Board has found that the Copermittees and the development community frequently disagree about when a development project has prior lawful approval and what is necessary to reduce pollutants in storm water runoff from development projects to the MEP.

Therefore, Provisions E.3.e.(1)(a)(i)-(ii) were included to provide more clarity and certainty for the Copermittees, the land development community, and the general public about when the structural BMP performance standards of earlier MS4 permits may be allowed to be implemented. A Copermittee may allow a Priority Development Project to implement BMP requirements of the previous MS4 permit only if all requirements of Provisions E.3.e.(1)(a)(i)[a]-[d] have been met. Otherwise, the Copermittees must require all Priority Development Projects to incorporate the BMP requirements of Provision E.3 into the project to reduce pollutants in storm water runoff from development projects to the MEP.

Provisions E.3.e.(1)(a)(i)[a]-[d] are dependent upon the effective date of the BMP Design Manual. Unless otherwise directed by the San Diego Water Board, the effective date of the BMP Design Manual is December 24, 2015 for the San Diego County Copermittees, September 28, 2017 for the Orange County Copermittees, and July 5, 2018 for the Riverside County Copermittees.

Alternatively, if the Copermittee can demonstrate a lack of land use authority or legal authority to require a Priority Development Project to implement the requirements of Provision E.3, the Copermittee may allow land development requirements from the

previous MS4 permits to apply. However, under these circumstances the San Diego Water Board expects the Copermittee to utilize its available land use authority or legal authority to require the implementation of as much of Provision E.3 as possible to reduce the discharge of pollutants in storm water from development and redevelopment projects within its jurisdiction to the MEP.

In cases where BMP requirements from the earlier MS4 permits govern the structural BMP design requirements of a Priority Development Project, the San Diego Water Board expects the Copermittees to be able to demonstrate, in a programmatic audit or other means, that a Priority Development Project met all the requirements listed under Provisions E.3.e.(1)(a)(i)[a]-[d], or have evidence that the Copermittee did not have the land use or legal authority to require the implementation of Provision E.3 for a Priority Development Project.

The requirements under Provision E.3.e.(2)-(3) are necessary to demonstrate each Copermittee is implementing a program that complies with Provisions E.3.b-c and E.3.e.(1), and ensure structural BMPs at Priority Development Project will continue to be able to reduce pollutants in storm water discharges to the MEP.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary for any development projects to compel compliance with the requirements of Provision E.3 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.3.f requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Provision E.4 (Construction Management) requires each Copermittee to implement a construction management program to control and reduce the discharge of pollutants in storm water from construction sites to the MEP. Proper implementation of the construction management program will also contribute toward effectively prohibiting non-storm water discharges from construction sites to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." As part of the management program, 40 CFR 122.26(d)(2)(iv)(D) requires "*a program to implement and maintain structural and non-structural best management practices to reduce pollutants in storm water runoff from construction sites to the municipal storm sewer system.*"

Construction sites can be significant sources of sediment, trash, and other pollutants to receiving waters. Although sediment is naturally occurring in the natural

environment, the discharge of sediment under unnatural conditions is problematic to receiving waters. Fine sediment in creeks causes high turbidity that interferes with the functionality of native flora and fauna in local creeks. For example, turbidity interferes with both photosynthesis of water-philic plants, as well as successful foraging and reproduction of benthic macroinvertebrates. Sediment can also make it difficult for fish to breathe because it clogs fish gills. Other pollutants such as heavy metals or pesticides can adhere to sediment and are transported to receiving waters during storm events, where they dissolve in the water column and become bioavailable to aquatic organisms. Sediment is recognized as a major stressor to surface waters and is responsible for the impairment of several lagoons and creeks in the San Diego Region.

Provision E.4 includes requirements that each Copermittee must implement to minimize the discharge of sediment and other pollutants from construction sites to the MS4 within its jurisdiction. The requirements under Provision E.4 are consistent with the Fourth Term Permits for San Diego, Orange, and Riverside Counties. Therefore, Copermittees are expected to implement the requirements seamlessly, with minimal changes to their existing construction management programs. The Copermittees, however, are given more flexibility to run their programs as needed to maximize efficiency, and also to be consistent with the Water Quality Improvement Plan for the Watershed Management Area.

As part of the construction management program, 40 CFR 122.26(d)(2)(iv)(D)(1) requires "*procedures for site planning which incorporate consideration of potential water quality impacts.*" Provision E.4.a describes the minimum elements each Copermittee is required to include as part of the construction site planning and project approval process. The construction site planning and approval process is based primarily on ensuring each project had an adequate site-specific pollution control, construction BMP, and/or erosion and sediment control plan that will be implemented to minimize the discharge of pollutants in storm water to the MEP, and minimize impacts to receiving waters.

The requirements under Provision E.4.b provide the data and information necessary to identify "*priorities for inspecting sites and enforcing control measures*" required pursuant to 40 CFR 122.26(d)(2)(iv)(D)(3). Under Provision E.4.b, each Copermittee must identify construction sites that are considered a high threat to downstream surface waters. Designation of "high threat to water quality" construction sites will necessitate the Copermittees to develop criteria to identify such sites. Provision E.4.b.(2) describes a list of factors that must be considered when the Copermittee considers threat to water quality. For example, a Copermittee must identify sites as "high threat to water quality" if it is located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions, according to the Water Quality Improvement Plan. This ensures that construction management program implementation is compatible with the Copermittee's identified highest priority water quality conditions.

Pursuant to 40 CFR 122.26(d)(2)(iv)(D)(2) each Copermittee is required describe "*requirements for nonstructural and structural best management practices*" at construction sites. Provision E.4.c includes the types of construction site BMPs that the Copermittees must implement, or require the implementation of, at each construction site to reduce pollutants in storm water discharges to the MEP.

Each Copermittee is expected to require the implementation of appropriate BMPs given specific site conditions, the season and likelihood of rain events, and construction phase (i.e. grading vs. vertical construction). This means that throughout the life of the project construction, the appropriate BMPs will vary, especially if the construction of the project spans multiple wet seasons. As opposed to describing specific minimum BMPs that must be implemented, the Order describes major BMP categories that should be considered for each site.

Each Copermittee is expected to use its 20 years of storm water experience and knowledge to require implementation of appropriate BMPs from the various categories at each construction site within its jurisdiction. For example, the San Diego Water Board expects that each site will be required to implement erosion control and sediment control. The San Diego Water Board also expects each Copermittee to require implementation of active/passive sediment treatment systems at sites where other BMPs have been tried and are known to be inadequate, and discharges of sediment are causing or contributing to water quality impairment downstream. Each Copermittee is granted flexibility in specifying the minimum level of BMP requirements at each site, but the San Diego Water Board expects each site to be capable of controlling pollutants in storm water discharges to the MEP and preventing illicit discharges.

The requirements under Provision E.4.d are necessary to demonstrate that each Copermittee is implementing a program that complies with Provisions E.4.a and E.4.c and ensure BMPs at construction sites will reduce pollutants in storm water discharges to the MEP.

Provision E.4.d does not include minimum required inspection frequencies for construction sites. Each Copermittee must use its experience and knowledge to specify an appropriate inspection frequency for both high priority and lower priority sites in their jurisdictional runoff management program documents, and in accordance with the Water Quality Improvement Plan. Appropriate inspection frequencies may vary by Copermittee, but the San Diego Water Board expects that the stated frequency will be adequate for each Copermittee to properly oversee the construction sites within its jurisdiction, confirm BMPs are implemented to reduce pollutants in storm water discharges from constructions sites to the MEP, and make needed changes to its program on an ongoing basis as necessary.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary for any development projects to compel compliance with the requirements of Provision E.4 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.4.e requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Provision E.5 (Existing Development Management) requires each Copermittee to implement an existing development management program to control and reduce the discharge of pollutants in storm water from areas of existing development to the MEP. Proper implementation of the existing development management program will also contribute toward effectively prohibiting non-storm water discharges from areas of existing development to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." Within 40 CFR 122.26(d)(2)(iv)(A) and (C), the management program is required to reduce impacts on receiving waters and reduce pollutants in storm water discharges to the MEP from commercial and residential areas, industrial facilities, and municipal facilities.

Commercial and residential areas, industrial facilities, and municipal facilities must be addressed by each Copermittee with the existing development management program required under Provision E.5. All other areas within each Copermittee's jurisdiction should be either undeveloped open space, or areas that are being developed or under construction. Areas being developed or under construction will be addressed by the Copermittee under the requirements of Provision E.3 (Development Planning) or Provision E.4 (Construction Management).

Areas of existing development typically include impervious surfaces such as sidewalks, driveways, roads, and rooftops, which generate and concentrate pollutants (such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not found in high concentrations in the natural environment. Pollutants that accumulate on impervious surfaces are not easily biodegraded or not subject to natural treatment processes. When it rains, these pollutants are transported in storm water runoff from these impervious surfaces into receiving waters, resulting in poor water quality and degradation of beneficial uses.

In addition to the generation of pollutants, areas of existing development have generally altered the natural conditions of the land and removed vegetative cover, reduced the perviousness of the surface, and reduced the capacity of storm water that can be intercepted, captured, stored, infiltrated, evaporated, and/or evapotranspired.

The alteration of the natural conditions and the impervious surfaces associated with areas of existing development causes water quality problems due to the alteration of natural flow regimes within the watersheds; resulting in hydromodification of channels, streams, and habitats that exist within or adjacent to the areas of existing development.

Thus, storm water discharges from areas of existing development are responsible for poor water quality, degraded habitats, and hydromodified channels throughout the developed portions of the watersheds in the San Diego Region. To improve the health and functionality of the receiving waters in a Watershed Management Area, land use practices and the amount of impervious surfaces in areas of existing development must change to reduce the various impacts caused by hydromodification and pollutants from storm water runoff generated in developed areas. Each Copermittee must be aggressive to address pollutant sources and runoff from areas of existing development to be able to reduce pollutants in storm water discharges from the MS4 to the MEP.

There is some overlap in the requirements under Provision E.5 with the requirements under Provisions E.2 (Illicit Discharge Detection and Elimination), E.3 (Development Planning), and E.4 (Construction Management). Illicit discharges frequently originate from areas of existing development. New development projects, when completed will become some type of residential, commercial, industrial or municipal existing development. Redevelopment projects are, by definition, redeveloping areas of existing development. And, redevelopment projects become construction sites located in areas of existing development. Much of the data and information collected, inspections performed, and enforcement actions taken for the requirements under Provisions E.2 to E.4 may also be utilized by the existing development management program. The requirements under Provision E.5, however, are focused primarily on reducing pollutants generated in areas of existing development that can be transported in storm water runoff and discharged to and from the MS4.

The requirements under Provision E.5 build upon existing program elements being implemented by the Copermittees. Provision E.5 is generally consistent with the existing development requirements of the Fourth Term Permits for Orange and Riverside Counties (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), but modified to provide more flexibility to implement the programs so resources can be better focused toward addressing the highest priority water quality conditions identified in the Water Quality Improvement Plans.

For a Copermittee to properly manage areas of existing development, having knowledge of what development exists within its jurisdiction is essential. Provision E.5.a requires each Copermittee to maintain a watershed-based inventory of all the existing development within its jurisdiction. This requirement is necessary for each Copermittee to implement the requirements of Provision E.5.b-e.

As opposed to just maintaining separate inventories based on the type of site, each Copermittee must maintain a watershed-based inventory that includes all types of existing development within its jurisdiction. By utilizing a watershed-based inventory, the Copermittees within a Watershed Management Area can combine their inventories and review the inventories by watershed in addition to by jurisdiction. Pollutant sources and strategies for abatement can then be evaluated on a watershed level, as opposed to evaluating sources and strategies strictly by type of site.

Provision E.5.a includes the information that must be included in the inventory. Provision E.5.a.(1) specifies what facilities or areas must be included in the inventory. A commercial type of existing development may be identified in the inventory as a facility (e.g. individual building, individual business) or an area (e.g. shopping center, commercial zone). An industrial type of existing development must be identified in the inventory by facility (e.g. individual industrial entity). A municipal type of existing development must be identified in the inventory by facility, with a list of specific municipal facilities that must be included in the inventory. A residential type of existing development must be identified by areas to be designated by the Copermittee. For each of the facilities and areas identified in the Copermittee's inventory developed pursuant to Provision E.5.a.(1), Provision E.5.a.(2) specifies the information that must be included in the description for the facility or area.

Provision E.5.a.(3) requires each Copermittee to maintain an updated map showing the location of inventoried existing development, watershed boundaries, and water bodies. This requirement was included because this information is expected to help the Copermittees in a Watershed Management Area identify and prioritize sources of pollutants and/or stressors in areas of existing development that contribute toward the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Knowledge of the existing development that are likely to be sources of pollutants contributing to the highest priority water quality conditions is expected to be a key element in the Copermittees' development of the water quality improvement strategies that will be included in the Water Quality Improvement Plans. The strategies described in the Water Quality Improvement Plans will direct efforts within the existing development management programs implemented by each Copermittee.

Pursuant to 40 CFR 122.26(d)(2)(iv)(A) each Copermittee is required describe "*structural and source control measures to reduce pollutants*" in storm water runoff discharged from areas of existing development. Provision E.5.b includes the BMP implementation and maintenance requirements that the each Copermittee must require at areas of existing development to reduce pollutants in storm water discharges to the MEP. The San Diego Water Board, however, recognizes that BMP implementation and maintenance for residential areas will require much more education and encouragement through less authoritative measures than for commercial, industrial and municipal facilities and areas. Thus, the BMP

implementation and maintenance requirements have been separated between requirements under Provision E.5.b.(1) for commercial, industrial and municipal facilities and areas, and Provision E.5.b.(2) for residential areas.

Most of the requirements in Provision E.5.b are consistent with the related requirements in the Fourth Term Permits. The level of specificity, however, has been changed to allow each Copermittee the flexibility to implement its program to achieve maximum efficiency, and to perform functions that will address the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Each Copermittee is expected to require the implementation of appropriate BMPs to address the expected pollutants from each facility or area. The Third and Fourth Term Permits described specific minimum BMPs that must be implemented at various sites. This Order, however, requires each Copermittee to designate minimum BMPs themselves and require implementation. Consistent with the Fourth Term Permits, each Copermittee is required to maintain, or require the maintenance of, all BMPs as needed.

The BMP implementation and maintenance requirements include a schedule of operation and maintenance activities for the MS4 and related structures (such as catch basins, storm drain inlets, and detention basins), as well as public streets and roads. Public streets and roads specifically include public unpaved roads. The San Diego Water Board identified, through investigations and complaints, sediment discharges from unpaved roads as a significant source of water quality problems in the San Diego Region. Inspection activities conducted by the San Diego Water Board since the Third Term Permits have found a lack of source control for many unpaved roads within the jurisdiction of the Copermittees.

Unpaved roads are a source of sediment that can be discharged in runoff to receiving waters, especially during storm events. Erosion of unpaved roadways occurs when soil particles are loosened and carried away from the roadway base, ditch, or road bank by water, wind, traffic, or other transport means. Exposed soils, high runoff velocities and volumes, sandy or silty soil types, and poor compaction increase the potential for erosion.

Road construction, culvert installation, and other maintenance activities can disturb the soil and drainage patterns to streams in undeveloped areas, causing excess runoff and thereby erosion and the release of sediment. Poorly designed unpaved roads can act as preferential drainage pathways that carry runoff and sediment into natural streams, impacting water quality. In addition, other public works activities along unpaved roads have the potential to significantly affect sediment discharge and transport within streams and other waterways, which can degrade the beneficial uses of those waterways.

USEPA also recognizes that discharges from unpaved roads pose a significant potential threat to water quality. USEPA guidance[40] emphasizes the threat of unpaved roads to water quality:

> "*Dirt and gravel roads are a major potential source of these pollutants [sediment] and pollutants that bind to sediment such as oils, nutrients, pesticides, herbicides, and other toxic substances. Many roads have unstable surfaces and bases. Roads act like dams, concentrating flows that accelerate erosion of road materials and roadsides. Both unstable surfaces and accelerated erosion then lead to sediment and dust.*"

There are several guidance documents, developed by the USEPA,[41] the US Forest Service,[42] the University of California,[43] and others, that include design and construction specifications and BMPs that are readily available for implementation by public entities. Implementing design and other source control BMPs for unpaved roads in the region is necessary to reduce and minimize the impacts of sediment discharged during storm events from unpaved roads to the MS4s and receiving waters.

Provision E.5.c describes existing development site inspection frequency, content, and tracking that each Copermittee must incorporate into their existing development management programs. The requirements under Provision E.5.c are necessary to demonstrate each Copermittee is implementing a program that complies with Provision E.5.b and ensure BMPs implemented in areas of existing development will reduce pollutants in storm water discharges to the MEP. Provision E.5.c has been modified to include a minimum of once every 5 years for all inventoried facilities and areas of existing development, utilizing one or more methods of inspection.

In addition to onsite inspections, the methods of inspection have been expanded to include drive-by inspections. Inspections may be performed by the Copermittee's municipal and contract staff, or by volunteer monitoring or patrol programs. Volunteer monitoring or patrol programs are not expected to enforce the Copermittee's ordinances, or to inspect areas or facilities where members of the public are not allowed access. Volunteer monitoring or patrol programs must be trained by the Copermittee, and are only expected to collect visual observations. By utilizing drive-by inspections and volunteer monitoring or patrol programs, the Copermittees will be able to maximize and efficiently use their resources to identify and address sources of pollutants in areas of existing development.

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[40] USEPA, 2006. Environmentally Sensitive Maintenance for Dirt and Gravel Roads. Gesford and Anderson, USEPA-PA-2005.
[41] Ibid
[42] US Forest Service, 1996. Forest Service Specifications for Construction of Roads & Bridges. EM-7720-100. Revised August 1996.
[43] University of California Division of Agriculture and Natural Resources, 2007. Rural Roads: A Construction and Maintenance Guide of California Landowners. Publication 8262.

The municipal and contract staff of each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial, industrial, and municipal facilities and areas in its inventoried existing development pursuant to Provision E.5.c.(1)(a)(iv). An "equivalent" of at least 20 percent means if any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspections may count toward the total annual inspection requirement. Linear municipal facilities (i.e. MS4 linear channels, sanitary sewer collection systems, streets, roads and highways) in the Copermittee's existing development inventory are not subject to the inspection frequency requirement of Provision E.5.c.(1)(a)(iv).

The inspection content specified in Provision E.5.c.(2)(a) includes the information required to be collected during an inspection by any method. The inspection content specified in Provision E.5.c.(2)(b) includes additional information that must be collected when a Copermittee's municipal or contract staff perform an onsite inspection. Provision E.5.c.(3) specifies the information that each Copermittee must maintain in its existing development inspection records.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary to compel compliance with the requirements of Provision E.5 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.5.d requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Provisions E.5.e.(1)-(2) specifically require the Copermittee to identify areas of existing development as candidates for retrofitting, and streams, channels, and/or habitats as candidates for rehabilitation. Provisions E.5.e.(1)-(2) are based on the retrofitting requirements of the Fourth Term Permits for Orange and Riverside Counties, but modified to also include identifying projects to rehabilitate channels within areas of existing development. The requirements have also been modified to be more focused on utilizing these types of projects for addressing the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Interest and opportunity to retrofit areas of existing development and rehabilitate channels located in areas of existing development has been observed in several programs the San Diego Water Board oversees (e.g., CWA Section 401 Water Quality Certification program, supplemental environmental projects, and grant programs). Each jurisdiction has miles and miles of streets that could be retrofitted to become green streets. Reshaping landscaped areas from convex to concave configurations can detain storm water instead of directing runoff as quickly as possible to the MS4. Retrofit projects could also include simply replacing impervious surfaces with permeable surfaces.

Retrofitting projects do not necessarily have to be expensive. Retrofitting projects could be as simple as redirecting downspouts from roofs to pervious or landscaped areas instead of to hardscaped areas discharging directly to the MS4, providing rain barrels to harvest storm water from downspouts for use at a later time, or planting more trees in areas with little vegetation to provide canopy that can intercept storm water. The San Diego Water Board encourages the Copermittees to identify simple, low-cost retrofitting opportunities that can be easily implemented, in addition to other more expensive retrofitting and channel rehabilitation projects.

Rehabilitation of channels, streams, and/or habitat will require more significant planning and resources to implement. There are, however, also abundant opportunities to rehabilitate channels, streams and/or habitats in or adjacent to areas of existing development. Each Watershed Management Area likely has several creeks and stream reaches that have been undergrounded, artificially hardened, or hydromodified that could be rehabilitated to be more sustainably configured, which would slow down storm water flows and potentially have more assimilative capacity for pollutants while still being supportive of designated beneficial uses.

The San Diego Water Board recognizes that it may be infeasible to implement retrofitting or channel rehabilitation projects within certain areas of a Copermittee's jurisdictions. For such areas, the Copermittee must instead identify, develop, and implement regional retrofitting and channel rehabilitation projects (i.e. projects that can retain and/or treat storm water from one or more areas of existing development) adjacent to and/or downstream of the areas of existing development.

Provisions E.5.e.(1)-(2) do not require the implementation of retrofitting and rehabilitation projects, but do require the Copermittee to develop a program with strategies to facilitate the implementation of these types of projects in areas of existing development. The strategies are expected to include allowing and encouraging Priority Development Projects to implement retrofitting types of projects as a means of compliance with the structural BMP performance criteria requirements of Provisions E.3.c.(1) and E.3.c.(2).

Provision E.6 (Enforcement Response Plans) requires each Copermittee to develop an Enforcement Response Plan as part of its jurisdictional runoff management program document. Proper implementation of the Enforcement Response Plans is necessary to effectively prohibit non-storm water discharges to the MS4, and reduce the discharge of pollutants in storm water from the MS4 to the MEP.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system*" and be able to demonstrate that it can "*operate pursuant to legal authority established by statute, ordinance or series of contracts*" to control the discharge of non-storm water and pollutants in storm water to and from its MS4. Pursuant to 40 CFR 122.26(d)(2)(i)(E) each Copermittee is specifically required to

have the legal authority to "*[r]equire compliance with conditions in ordinances, permits, contracts or order*s."

The requirements under Provision E.6 are necessary to demonstrate that each Copermittee can enforce its legal authority to *"effectively prohibit non-stormwater discharges"* and "*reduce the discharge of pollutants to the maximum extent practicable*" as well as "*[r]equire compliance with conditions in ordinances, permits, contracts or order*."

The Enforcement Response Plan required under Provision E.6 will serve as a reference for the Copermittee and the San Diego Water Board to determine if consistent enforcement actions are being implemented to achieve timely and effective compliance from all public and private entities that are not in compliance with the Copermittee's ordinances, permits, or other requirements. The Enforcement Response Plan must contain clear direction for the Copermittee to take immediate enforcement action, when appropriate and necessary, in their illicit discharge detection and elimination, development planning, construction management, and existing development management programs.

If the entities subject to the Copermittee's legal authority do not implement appropriate corrective actions in a timely manner, or if violations repeat, the Copermittee must take progressively stricter responses to enforce its legal authority and achieve compliance with its ordinances, permits, or other requirements to *"effectively prohibit non-stormwater discharges"* and "*reduce the discharge of pollutants to the maximum extent practicable.*"

Provision E.7 (Public Education and Participation) requires each Copermittee to implement a public education and participation program. Proper implementation of the public education and participation program as part of its jurisdictional runoff management program will contribute toward effectively prohibiting non-storm water discharges to the MS4, and toward the reduction of pollutants in storm water from the MS4 to the MEP.

Provision E.7 establishes the minimum requirements that each Copermittee must implement to engage members of the public as part of its jurisdictional runoff management program. In the Fourth Term Permits, the public education program requirements and the public participation requirements were included as separate jurisdictional runoff management program components. In this Order, the public education requirements have been consolidated with the public participation requirements, as both sets of requirements are related to the engagement of the public by each Copermittee. Engagement of the public is critical for the success of each Copermittee's jurisdictional runoff management program.

The Copermittees have been implementing public education programs for the last 20 years, which are now well established. The specificity of expected public education program elements of the Fourth Term Permits has been removed. For the most part,

the public education program requirements in Provision E.7.a have been reduced to a set of requirements that are specifically included in the federal regulations under 40 CFR 122.26(d)(2)(iv)(A)(6), 122.26(d)(2)(B)(6) and 122.26(d)(2)(D)(4), which should already be incorporated into each Copermittee's existing public education program. Each Copermittee is expected to utilize the information and data collected from the monitoring and assessments conducted within the Watershed Management Area, and from its inventories and inspections to best direct its public education program resources toward addressing the highest priority water quality conditions identified within the Water Quality Improvement Plan.

According to 40 CFR 122.26(d)(2)(iv), public participation is required to be included as part of the "*comprehensive planning process*", which includes the development and implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs. The requirements under Provision E.7.b specify the opportunities that the public must be provided to be involved in the "*comprehensive planning process*", as required by to 40 CFR 122.26(d)(2)(iv).

Provision E.8 (Fiscal Analysis) requires each Copermittee to secure the resources and provide an analysis of the resources that will be necessary to implement the requirements of the Order. Adequate fiscal resources are necessary for a jurisdictional runoff management program to effectively prohibit non-storm water discharges to the MS4, and reduce pollutants in storm water from the MS4 to the MEP.

According to 40 CFR 122.26(d)(2)(vi), each Copermittee is responsible for providing "*a fiscal analysis of the necessary capital and operation and maintenance expenditures necessary to accomplish the activities*" required by this Order, including "*a description of the source of funds that are proposed to meet the necessary expenditures, including legal restrictions on the use of such funds.*" The fiscal analysis requirements of Provision E.8 are consistent with 40 CFR 122.26(d)(2)(vi).

The San Diego Water Board has chosen not to require a description of fiscal benefits realized from implementation of the jurisdictional runoff management programs. This is a recommendation from the National Association of Flood and Stormwater Management Agencies.[44] For instance, the fiscal analysis requirements do not address city-wide fiscal benefits of protection (e.g., public health, tourism, property values, economic activity, beneficial uses, etc.), even though many costs currently reported to the San Diego Water Board are for related activities. This type of assessment may help Copermittees improve the allocation of resources and it may help the Copermittees secure adequate funding for the program. Qualitative assessments, however, could be overly subjective and most Copermittees likely lack the ability to provide accurate quantitative assessments. The San Diego Water Board encourages the Copermittees to consider means for conducting assessments of fiscal

[44] National Association of Flood and Stormwater Management Agencies. 2006. *Guidance for Municipal Stormwater Funding.* Prepared under a grant provided by the USEPA.

benefits derived from the programs. Such assessments could be conducted on a regional scale similar to studies of program costs conducted by the State Water Board.[45]

[45] State Water Board, 2005. NPDES Stormwater Cost Survey.

F. Reporting

Purpose: Provision F includes the requirements for the documents and reports that the Copermittees must prepare and provide to the San Diego Water Board. The documents prepared by the Copermittees and provided to the San Diego Water Board and made available to the public will provide the documentation that the Copermittees are complying with the requirements of the Order.

***Discussion*:** Provision F requires the Copermittees to prepare several documents and reports that must be provided to the San Diego Water Board and made available to the public. The reporting requirements have been significantly reduced compared to the Fourth Term Permit reporting requirements. The reduction in reporting requirements was recommended by the San Diego County Copermittees in the Report of Water Discharge submitted in June 2011.

More specific and detailed discussions of the requirements of Provision F are provided below.

Provision F.1 (Water Quality Improvement Plans) requires the Copermittees in each Watershed Management Area to develop and submit a Water Quality Improvement Plan in accordance with the requirements of Provision B.

Of all the requirements of Provision F, the Water Quality Improvement Plans will likely be the documents requiring the most significant effort to develop. The content of the Water Quality Improvement Plans, however, is expected to include content that should already have been developed for the Watershed Plans and several elements that are included in the Monitoring and Reporting Programs required under the Fourth Term Permits.

Because the Water Quality Improvement Plan is part of the "*comprehensive planning process which involves public participation*," Provision F.1 includes requirements to give multiple opportunities to the public to provide input on the content of the plans.

Provision F.1.a.(1) specifies the elements that the Copermittees must include in the public participation process for the development of the Water Quality Improvement Plans. In order for the public to be aware of the opportunities to provide input, Provision F.1.a.(1)(a) requires the Copermittees to develop a publicly available and noticed schedule of the opportunities for the public to participate and provide comments during the development of the Water Quality Improvement Plan. These opportunities are when the public can provide the data, information, and recommendations that the Copermittees can consider during the development of the Water Quality Improvement Plans.

The San Diego Water Board recognizes, however, that the Copermittees cannot be expected to incorporate all the data, information, and recommendations that the public may provide into the Water Quality Improvement Plans. The Copermittees will have to review the data, information, and recommendations received and make some decisions on what to incorporate into the Water Quality Improvement Plans. Before the Copermittees finalize their decisions, members of the public should be allowed to review the Copermittees' decisions. Thus, Provision F.1.a.(1)(b) requires the Copermittees to form a Water Quality Improvement Consultation Panel (Panel).

The Panel will consist of a member from the environmental community and a member from the development community familiar with the Watershed Management Area. A representative from the San Diego Water Board staff will also be part of the Panel. The Copermittees may choose to include additional members, but the Panel is only required to include three panel members.

The Panel will serve as an additional public participation and input mechanism during the development of the Water Quality Improvement Plans. The knowledge and expertise from these Panel members are expected to provide the Copermittees valuable direction during their decision-making process. The Copermittees will review the content of their planned submittals with the Panel members to receive recommendations. If the Panel provides recommendations, the Copermittees must consider revisions to the Water Quality Improvement Plan submittals.

The San Diego Water Board recognizes that the development of multiple Water Quality Improvement Plans concurrently may limit the ability of the public to review and provide comments to the Copermittees. Thus, Provision F.1.a.(1)(c) requires the Copermittees to coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public time and opportunity to participate during the development of the Water Quality Improvement Plans.

Provision F.1.a.(2) requires the Copermittees to develop and submit the first Water Quality Improvement Plan component, in accordance with the requirements of Provision B.2, which includes the identification of the priority water quality conditions and potential water quality improvement strategies. The public must be provided an opportunity to provide data, information and recommendations to be utilized in the development and identification of the priority water quality conditions and potential water quality improvement strategies for the Watershed Management Area. The Copermittees must consult with the Panel and consider making revisions. The Copermittees may submit the requirements of Provision B.2 as early as 6 months and no later than 12 months after the commencement of coverage under this Order. After the requirements of Provision B.2 are submitted to the San Diego Water Board, the public will be provided another opportunity to provide comments.

Provision F.1.a.(3) requires the Copermittees to develop and submit the second Water Quality Improvement Plan component, in accordance with the requirements of Provision B.3, which includes the identification of the numeric goals for the highest

priority water quality conditions identified for the Watershed Management Area, and the strategies that will be implemented to achieve the potential numeric goals. The Copermittees may also develop the Optional Watershed Management Area Analysis, in accordance with the requirements of Provision B.3.b.(4), as part of this submittal. The public must be provided an opportunity to provide data, information and recommendations to be utilized in the development and identification of the numeric goals and water quality improvement strategies for the Watershed Management Area. The Copermittees must consult with the Panel and consider making revisions. The Copermittees may submit the requirements of Provision B.3 as early as 9 months and no later than 18 months after the commencement of coverage under this Order. After the requirements of Provision B.3 are submitted to the San Diego Water Board, the public will be provided another opportunity to provide comments.

Finally, Provision F.1.b describes the process for the submittal and implementation of the Water Quality Improvement Plans. The complete Water Quality Improvement Plans are required to be submitted by the Copermittees within 24 months after the commencement of coverage under this Order. The San Diego Water Board will provide the public an opportunity to provide comments on each complete Water Quality Improvement Plan.

The San Diego Water Board will review each Water Quality Improvement Plan and the public comments received to determine if the Copermittees have submitted a Water Quality Improvement Plan that meets the requirements of Provision B. If a Water Quality Improvement Plan does not meet the requirements of Provision B, the Copermittees will be considered out of compliance and directed in writing by the San Diego Water Board Executive Officer to correct the deficiencies.

When a Water Quality Improvement Plan meets the requirements of Provision B, the San Diego Water Board will determine whether to hold a public hearing or to limit public input to submittal of written comments before accepting the Water Quality Improvement Plan. Implementation of the Water Quality Improvement Plan must begin within 30 days of acceptance.

The San Diego Water Board expects that any deficiencies in the Water Quality Improvement Plan will be identified either in the public comments or during the review by the San Diego Water Board before implementation begins. In the event any deficiencies are identified after the implementation of the Water Quality Improvement Plan, Provision F.1.b.(7) clarifies that the San Diego Water Board maintains the right to require the Copermittees to correct any deficiencies that may be identified.

Provision F.2 (Updates) requires the Copermittees to update specific documents that the Copermittees will utilize to implement the requirements of this Order.

Each Copermittee is required to continue implementing a jurisdictional runoff management program, as required under Provision E. Implementation of each Copermittee's jurisdictional runoff management program is directed by its jurisdictional

runoff management program document. Provision F.2.a requires each Copermittee to update its jurisdictional runoff management program document to be consistent with the requirements of Provision E concurrent with the submittal of the Water Quality Improvement Plan.

Likewise, each Copermittee must continue to require new development and redevelopment projects to implement BMPs to control pollutants in storm water runoff. The control of pollutants in storm water runoff from development and redevelopment projects within each Copermittee's jurisdiction is guided and directed by its BMP Design Manual, formerly known as a Standard Storm Water Mitigation Plan (SSMP). Provision F.2.b requires each Copermittee to update its BMP Design Manual to be consistent with the requirements of Provision E.3 concurrent with the submittal of the Water Quality Improvement Plan.

For situations where the San Diego Water Board may amend the requirements of Provisions E.3.a-d after a Copermittee has updated its BMP Design Manual pursuant to Provision F.2.b.(1), Provision F.2.b.(4) gives the Copermittee up to 90 days to incorporate the amended requirements of Provision E.3.a-d into its BMP Design Manual. The San Diego Water Board Executive Officer has discretion to modify the 90-day time period depending on the complexity of the amendments or other information that warrants a change in the 90-day time period.

In general, the requirements of the Order should not necessitate a complete rewrite of each Copermittee's jurisdictional runoff management program document or BMP Design Manual, as was required by the Third Term Permits. The jurisdictional runoff management program and BMP Design Manual requirements of this Order are not significantly different than the requirements of the Fourth Term Permits. Thus, only sections of the Order which are new or have been significantly changed should warrant revisions to specific sections of the Copermittee's jurisdictional runoff management program document and BMP Design Manual.

Finally, the Water Quality Improvement Plans are expected to require updates as the iterative approach and adaptive management process included in the Water Quality Improvement Plan, as required under Provision B.5, is implemented by the Copermittees. Provision F.2.c.(1) requires the Copermittees to implement a public participation process for the proposed updates, review the proposed updates with the Panel, and submit the updates to the Water Quality Improvement Plan as part of the Annual Reports required under Provision F.3.b.

Also, because TMDLs are likely to be developed, adopted and approved during the term of the Order, Provision F.2.c.(2) has been included to expedite the incorporation of TMDLs into the Copermittees' Water Quality Improvement Plans as part of the update process, potentially before the Order is re-opened to incorporated the requirements of the new TMDLs.

Provision F.3 (Progress Reporting) requires the Copermittees to report on the progress of implementing the Water Quality Improvement Plans.

The requirements of Provision F.3 are to report the progress toward improving water quality that the Copermittees are achieving with the implementation of the Water Quality Improvement Plans and each Copermittee's jurisdictional runoff management program. The Progress Report Presentations required under Provision F.3.a are included to provide the Copermittees an opportunity to communicate directly with the San Diego Water Board and the public. The Progress Report Presentations will also provide the members of the San Diego Water Board and members of the public an opportunity to become more acquainted with the Copermittees and their projects and programs to address non-storm water and storm water discharges into and from their MS4s.

The Annual Report requirements of Provision F.3.b are a consolidation of several reporting requirements from the Fourth Term Permits, including the Jurisdictional Runoff Management Program Annual Reports, the Watershed Annual Reports, and the Monitoring and Reporting Program Annual Reports. Furthermore, the Annual Report requirements are consistent with the requirements under 40 CFR 122.42(c).

Pursuant to 40 CFR 122.42(c), "*[t]he operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the Director…must submit an annual report*", which must include the following:

(1) *The status of implementing the components of the storm water management program that are established as permit conditions* [40 CFR 122.42(c)(1)];

(2) *Proposed changes to the storm water management programs that are established as permit conditions* [40 CFR 122.42(c)(2)];

(3) *Revisions, if necessary, to the assessment of controls and fiscal analysis* [40 CFR 122.42(c)(3)];

(4) *A summary of data, including monitoring data, that is accumulated throughout the reporting year* [40 CFR 122.42(c)(4)];

(5) *Annual expenditures and budget for year following each annual report* [40 CFR 122.42(c)(5)];

(6) *A summary describing the number and nature of enforcement actions, inspections, and public education programs* [40 CFR 122.42(c)(6)];

(7) *Identification of water quality improvements or degradation* [40 CFR 122.42(c)(7)].

Under the Fourth Term Permits, each Copermittee is responsible for submitting a Jurisdictional Runoff Management Program Annual Report; the Copermittees in each

designated watershed are responsible for submitting a Watershed Annual Report; and the Copermittees from each county are responsible for submitting a Monitoring and Reporting Program Annual Report.

There are 39 Copermittees in the San Diego Region, each required to prepare and submit a Jurisdictional Runoff Management Program Annual Report. There are 9 designated watersheds in San Diego County, 6 designated watersheds in Orange County, and 1 designated watershed in Riverside County for a total of 16 designated watersheds, each requiring a Watershed Annual Report. There are 3 sets of Copermittees in 3 counties in the San Diego Region, requiring Copermittees from each county to prepare and submit a Monitoring and Reporting Program Annual Report. Thus each Copermittee is currently required to prepare, or participate in the preparation of at least 3 annual reports. In addition, the San Diego County Copermittees are required to prepare and submit a Regional Urban Runoff Management Plan Annual Report.

In total, there are 59 annual reports that are prepared by the Copermittees and submitted to the San Diego Water Board for the Fourth Term Permits. The preparation of these annual reports requires significant time and resources from each Copermittee, which could otherwise be expended on actions that could improve water quality within its jurisdiction. In turn, significant time and resources are required from the San Diego Water Board staff to review these reports, which could otherwise be expended on working directly with the Copermittees to improve their implementation efforts toward restoring and protecting water quality.

Until the Water Quality Improvement Plans are developed, there will be a transitional period during which the Copermittees will continue to implement their existing jurisdictional runoff management programs. There will also be a transitional period during which the Copermittees will implement the transitional monitoring and assessment requirements of Provision D. During the transitional period, the Copermittees will submit annual reports pursuant to the requirements of Provisions F.3.b.(1) and F.3.b.(2).

Provision F.3.b.(1) includes the transitional annual reporting requirements for each Copermittee's jurisdictional runoff management program. The reporting of the jurisdictional runoff management program implementation efforts have been reduced to a single 2-page form. Each Copermittee is required to complete and submit a Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D or a revised form accepted by the San Diego Water Board) no later than October 31 of each year for each jurisdictional runoff management program reporting period (i.e. July 1 to June 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted. The Jurisdictional Runoff Management Program Annual Report Form will certify that each Copermittee has implemented its jurisdictional runoff management program in accordance with the requirements of Provision E. Each Copermittee may choose to continue to utilize and submit the jurisdictional runoff management program annual reporting format of its

current Order until the first Water Quality Improvement Plan Annual Report is required to be submitted.

Provision F.3.b.(2) includes the transitional annual reporting requirements for the transitional monitoring and assessment program for each Watershed Management Area. The Copermittees in the Watershed Management Area are required to submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted. The Transitional Monitoring and Assessment Program Annual Report is required to include the transitional period monitoring data collected pursuant to Provisions D.1.a and D.2.a, and the findings from the transitional period findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

Provision F.3.b.(3) includes the Water Quality Improvement Plan Annual Report requirements. Only one Water Quality Improvement Plan Annual Report is required for each of the ten (10) Watershed Management Areas designated under Provision B.1, which is a significant reduction in the number of annual reports required to be prepared and submitted by the Copermittees. The Water Quality Improvement Plan Annual Report will document the Copermittees' efforts to implement the Water Quality Improvement Plan. Each Water Quality Improvement Plan Annual Report will be focused primarily on reporting the analysis of the monitoring data collected pursuant to Provisions D.1-D.3 during the reporting period, and the assessments that are required pursuant to Provision D.4 based on the data. The monitoring data analyses and the assessments that are provided in the Water Quality Improvement Plan Annual Report will be the core of the report. The reporting of the jurisdictional runoff management program implementation efforts have been reduced to a single 2-page form, and will no longer be the primary focus of the reporting requirements as in the Third and Fourth Term Permits.

Each Copermittee will continue to prepare and submit a Jurisdictional Runoff Management Program Annual Report Form as part of the Water Quality Improvement Plan Annual Report to certify that each Copermittee has implemented its jurisdictional runoff management program in accordance with the requirements of Provision E. Instead of reviewing a voluminous report from each Copermittee, as was required under the Third and Fourth Term Permits, the San Diego Water Board will conduct audits of each Copermittee's jurisdictional runoff management program to investigate and confirm the information provided by each Copermittee on its Jurisdictional Runoff Management Program Annual Report Form. The audits will allow the San Diego Water Board to become more familiar with the each Copermittee's jurisdictional runoff management program, and each Copermittee will become more informed about the expectations of the San Diego Water Board.

The reduction in the number and content of the Water Quality Improvement Plan Annual Reports should result in significant time, cost and resource savings for the

Copermittees, as well as the San Diego Water Board. Those savings should offset a significant portion of any additional costs that may be incurred to develop the Water Quality Improvement Plans and to implement the monitoring and assessment program requirements of Provision D.

The reporting period for the Water Quality Improvement Plan Annual Reports consists of two periods. Because the jurisdictional runoff management programs are typically budgeted and implemented during a fiscal year, the information provided on the Jurisdictional Runoff Management Program Annual Report Forms will cover the period from July 1 to June 30 of the following year.

The Water Quality Improvement Plan Annual Reports, however, are focused primarily on the monitoring data and the assessments based on the monitoring data. The monitoring data is collected during the monitoring year, which begins October 1 and ends September 30 of the following year. The monitoring year begins after the beginning of the fiscal year and ends after the end of the fiscal year. Therefore, to accommodate and capture the information collected during the fiscal year and the monitoring year, the Annual Report reporting period incorporates both periods.

Finally, Provision F.3.c requires the Copermittees to develop and submit a Regional Monitoring and Assessment Report. The Regional Monitoring and Assessment Report is similar to the Long Term Effectiveness Assessment required under the Fourth Term San Diego County Permit. The Regional Monitoring and Assessment Report is expected to utilize the entire body of data and information collected by the Copermittees during the term of this Order to assess improvements to water quality on a regional scale.

Provision F.4 (Regional Clearinghouse) requires the Copermittees to develop, update, and maintain an internet-based Regional Clearinghouse that can be used to store, disseminate, and share the Copermittees' documents, monitoring data, special studies, and any other data or information.

Most of the documents and data that are generated by the Copermittees can be provided in electronic format, and made available to the San Diego Water Board and the public on the internet. The San Diego Water Board has been gradually transitioning its document submittal requirements to electronic submittals. Provision F.4 has been included to further these efforts.

Provision F.4 has also been included to improve the exchange and availability of information among the Copermittees, as well as between the Copermittees and the San Diego Water Board. Provision F.4 will also make the information generated during the implementation of the Order more accessible to the public.

Provision F.5 (Report of Waste Discharge) requires the Copermittees to submit a Report of Waste Discharge to reapply for renewal of the Order prior to its expiration, in accordance with 40 CFR 122.21(d)(2) and CWC section 13376.

~~Because the Riverside County Copermittees will not be subject to the requirements of this Order until they are notified of coverage, Provision F.5.a describes the process of submitting a Report of Waste Discharge pursuant to the requirements of their current permit to obtain coverage under this Order.~~

~~For the Copermittees subject to the requirements of this Order,~~ Provision F.5~~.b~~ requires the Copermittees to submit a Report of Waste Discharge 180 days in advance of the expiration of this Order. Provision F.5~~.b~~ also describes the minimum information to be included in the Report of Waste Discharge, based on USEPA guidance "Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems," dated May 17, 1996.

~~Provision F.6 (Application for Early Coverage) describes the process that would allow the Orange County and/or Riverside County Copermittees to obtain coverage under this Order earlier than the expiration of their current Orders.~~

~~If the Riverside County Copermittees choose to obtain coverage under this Order earlier than the expiration of their current Orders, the preparation and submittal of a Report of Waste Discharge, as required by the Fourth Term Permits, will not be necessary. The existing Order for the respective county will be rescinded upon the effective coverage date under this Order, except for enforcement purposes.~~

G. Principal Watershed Copermittee Responsibilities

Purpose: Provision G includes the requirements for the Principal Watershed Copermittee designated by the Copermittees in each Watershed Management Area.

***Discussion*:** Unlike previous NPDES requirements, there will no longer be a single Principal Copermittee. Provision G.1 requires the Copermittees to designate a Principal Watershed Copermittee for each Watershed Management Area. There are ten (10) Watershed Management Areas in the San Diego Region, as defined in Table B-1 under Provision B.1 of the Order. An individual Copermittee should not be the Principal Watershed Copermittee for more than two (2) Watershed Management Areas. There could be up to ten (10) Principal Water Copermittees designated for the Watershed Management Areas in the San Diego Region.

Provision G.2 describes the minimum responsibilities of each Principal Watershed Copermittee. The primary responsibility of the Principal Watershed Copermittees is to serve as the liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues. Ideally, the Principal Watershed Copermittee can represent the interests of all the Copermittees within a Watershed Management Area during discussions or meetings to facilitate communication with the San Diego Water Board. The Principal Watershed Copermittees are also responsible for facilitating and coordinating the implementation efforts of the Copermittees and submittals of required documents and reports.

The Principal Watershed Copermittee is responsible for facilitating the efforts of the Copermittees within the Watershed Management Area to develop the Water Quality Improvement Plan required under Provision B, and submit it for approval in accordance with Provision F.1. The Principal Watershed Copermittee is also responsible for coordinating the submittal of the document updates, Progress Report Presentations, and Annual Reports required from the Copermittees within each Watershed Management Area under Provisions F.2, F.3.a, and F.3.b. The Principal Watershed Copermittees are responsible for coordinating with each other to develop and submit the Regional Clearinghouse, Regional Monitoring and Assessment Report, and the Report of Waste Discharge required under Provisions F.3.c, F.4, and F.5.

The designated Principal Watershed Copermittee for each Watershed Management Area does not necessarily have to serve as the Principal Watershed Copermittee for the entire term of the Order. If the Copermittees in a Watershed Management Area choose to designate a new Principal Watershed Copermittee, the change may be submitted as part of the Annual Report required under Provision F.3.b, with an update to the Water Quality Improvement Plan in accordance with Provision F.2.c.

Provision G.3 specifies that the Principal Watershed Copermittee is not responsible for ensuring that the other Copermittees within the Watershed Management Area are in compliance with the requirements of this Order

H. Modification of Order

Purpose: Provision H provides the conditions under which modifications to Order No. R9-2013-0001, as amended, may occur.

***Discussion*:** Provision H allows for modifications to Order No. R9-2013-0001, as amended, for bases in addition to modifications (minor and major) allowed under the federal regulations at 40 CFR 122.62 and 122.63.

Modifications to the Order require re-opening the Order (see Water Code section 13223), subject to the requirements of 40 CFR 122.44, 122.62 to 122.64, and 124.5, but only for the specific provisions subject to the modification. Proposed modifications of the Order will be made available for public review, a public notice and comment period, and a public hearing if requested. Comments on the provisions not subject to the proposed modifications are not required to be considered in the San Diego Water Board's responses to comments or during the public hearing.

Provision H.4 was included to specify that the Order will be re-opened for modifications if ~~the State Water Board determines revisions to Provision A are warranted, an application for early coverage under the Order is received pursuant to Provision F.6,~~ the Basin Plan is amended to modify an existing TMDL or incorporate a new TMDL, or the monitoring and assessment program requirements need to be updated or revised.

~~Provision H.5 was included to specify that the San Diego Water Board will re-open and consider modifications to this Order when the Orange County Copermittees or the Riverside County Copermittees submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders~~

I. Standard Permit Provisions and General Provisions

Purpose: Provision I incorporates the standard permit provisions required to be included in all NPDES permits, as well as several other general provisions.

***Discussion*:** Provision I refers to Attachment B to the Order. Attachment B expressly incorporates the conditions applicable to all NPDES permits as provided under 40 CFR 122.41(a)-(n), as well as the applicable conditions for MS4s and storm water discharges provided under 40 CFR 122.42(c) and 40 CFR 122.42(d), respectively. Attachment B also includes several general provisions that are typically included in or applicable to waste discharge requirements issued by the San Diego Water Board.

IX. ATTACHMENTS

The attachments to the Order are discussed below. The discussions describe the content of the attachments.

Attachment A – Discharge Prohibitions and Special Protections

Section 1 of Attachment A includes the Waste Discharge Prohibitions from the Basin Plan. They have been provided verbatim in their entirety.

Section 2 of Attachment A includes the "*Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges*" applicable to permitted point source discharges of storm water, adopted under State Water Board Resolution No. 2012-0012, as amended by Resolution No. 2012-0031. The terms, prohibitions, and special conditions (collectively referred to as special conditions) are established as limitations on point source storm water discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in ASBS, as required for State Water Quality Protection Areas pursuant to California Public Resources Code sections 36700(f) and 36710(f). These Special Protections were adopted by the State Water Board as part of the Ocean Plan General Exception.

Attachment B – Standard Permit Provisions and General Provisions

Conditions applicable to all NPDES permits, as required under 40 CFR 122.41, and conditions applicable to MS4s and storm water discharges, as required under 40 CFR 122.42(c) and 122.42(d), respectively are provided in Attachment B to the Order. They have been provided expressly in their entirety.

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. These general provisions are typically included in or applicable to waste discharge requirements issued by the San Diego Water Board. Many of the general provisions were developed by the State Water Board. Where a general provision is derived from statute or regulation, a citation of the statute or regulation section is provided. General provisions that do not provide a citation are included under the authority provided CWC 13377.

Attachment C – Acronyms, Abbreviations and Definitions

The acronyms and abbreviations that are used in the Order are provided in Attachment C. Attachment C also includes definitions that may provide an explanation or description of the meaning or intent of specific terms or phrases included in the Order.

Attachment D – Jurisdictional Runoff Management Program Annual Report Form

An example of the Jurisdictional Runoff Management Program Annual Report Form required to be submitted by each Copermittee as part of the Annual Reports required under Provision F.3.b.(1)(e) is provided as Attachment D to the Order. An electronic version of the form will be available from the San Diego Water Board after the adoption of the Order.

The Jurisdictional Runoff Management Program Annual Report Form includes the minimum information necessary to demonstrate that the Copermittee is implementing and in compliance with the requirements of Provision E, and includes much of the information required to be reported pursuant to 40 CFR 122.42(c).

The information that must be provided on the Jurisdictional Runoff Management Program Annual Report Form is limited to the fiscal year, which begins July 1 and ends June 30 of the following year. The information expected to be provided by the Copermittees in each section of the Jurisdictional Runoff Management Program Annual Report Form is discussed below.

I. COPERMITTEE INFORMATION

The name of the Copermittee (e.g. name of city, county, or special district) and the contact information for the storm water program manager are provided under this section.

II. LEGAL AUTHORITY

The Copermittee must confirm whether or not the legal authorities under Provision E.1.a have been established for itself within its jurisdiction.

The Copermittee must also confirm whether or not a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority, as required under Provision E.1.b. The certification statement required by Provision E.1.b is only required to be submitted with the first Annual Report required under Provision F.3.b.

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

The Copermittee must inform the San Diego Water Board whether or not an update to its jurisdictional runoff management program document was required or recommended by the San Diego Water Board during the reporting period. An update to the jurisdictional runoff management program is required under Provision F.2.a. The San Diego Water Board may recommend modifications to the jurisdictional runoff management program as part of the iterative approach and adaptive management process required under Provision B.5, which may result in an update that is necessary for the Copermittee's jurisdictional runoff management document.

If an update was required or recommended, the Copermittee must confirm whether or not the update was completed and made available on the Regional Clearinghouse within the reporting period. If no update was required or recommended, an answer is not required. If the answer is NO, meaning the required or recommended update was not completed and/or made available on the Regional Clearinghouse, the Copermittee must attach a

schedule for the completion of the update and/or posting of the updated document on the Regional Clearinghouse.

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

The Copermittee must confirm whether or not a program was implemented during the fiscal year to actively detect and eliminate illicit discharges and connections in accordance with the requirements under Provision E.2.

In addition to confirming that a program to detect and eliminate illicit discharges was implemented during the reporting period, the Copermittee is also required to report on several items related to the program. The information that must be reported is limited to the fiscal year for the Annual Report.

All non-storm water discharges are considered illicit discharges unless the source is identified as one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5). If a non-storm water discharge is identified as one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5), the discharge is a non-storm water discharge, but not an illicit discharge. If a non-storm water discharge is identified but not in one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5), the discharge is both a non-storm water discharge and an illicit discharge.

V. DEVELOPMENT PLANNING PROGRAM

The Copermittee must confirm whether or not a development planning program was implemented during the fiscal year in accordance with the requirements under Provision E.3.

The Copermittee must also inform the San Diego Water Board whether or not an update to its BMP Design Manual was required or recommended by the San Diego Water Board during the fiscal year. An update to the BMP Design Manual is required under Provision F.2.b. The San Diego Water Board may recommend modifications to the BMP Design Manual, which may result in an update that is necessary for Copermittee's the BMP Design Manual.

If an update was required or recommended, the Copermittee must confirm whether or not the update was completed and made available on the Regional Clearinghouse within the reporting period. If no update was required or recommended, an answer is not required. If the answer is NO, meaning the required or recommended update was not completed and/or made available on the Regional Clearinghouse, the Copermittee must attach a schedule for the completion of the update and/or posting of the updated document on the Regional Clearinghouse.

The Copermittee is also required to report on several items related to the program. For the development and redevelopment projects that are reviewed under the program, the Copermittee must report the total number projects submitted for review during the fiscal year. Of those projects, the Copermittee must report the number that are Priority Development Projects, as defined under Provision E.3.b.(1). The Copermittee must also report the number of Priority Development Projects that were approved and/or granted occupancy during the fiscal year, regardless of when the project was originally submitted for review. Any projects that were approved during the fiscal year and granted any

exemptions from the BMP Design Manual requirements and/or allowed to implement alternative compliance options in accordance with Provision E.3.c.(3) must be reported.

Finally, the Copermittee must also report on several items related to its oversight of permanent BMPs on Priority Development Projects within its jurisdiction, as required under Provision E.3.e. The information that must be reported is limited to the fiscal year for the Annual Report.

VI. CONSTRUCTION MANAGEMENT PROGRAM

The Copermittee must confirm whether or not a construction management program was implemented during the fiscal year in accordance with the requirements under Provision E.4.

The Copermittee is also required to report on several items related to its oversight construction projects within its jurisdiction. The information that must be reported is limited to the fiscal year for the Annual Report.

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

The Copermittee must confirm whether or not an existing development management program was implemented during the fiscal year in accordance with the requirements under Provision E.5.

The Copermittee is also required to report on several items related to its oversight in areas of existing development within its jurisdiction. The information that must be reported is limited to the fiscal year for the Annual Report. The information must also be separated into four categories of existing development: municipal, commercial, industrial, and residential.

VIII. PUBLIC EDUCATION AND PARTICIPATION

The Copermittee must confirm whether or not a public education program component was implemented during the fiscal year in accordance with the requirements under Provision E.7.a.

The Copermittee must also confirm whether or not a public participation program component was implemented during the fiscal year in accordance with the requirements under Provision E.7.b.

IX. FISCAL ANALYSIS

The Copermittee must confirm a summary of its fiscal analysis, conducted in accordance with the requirements under Provision E.8, has been attached to the form.

X. CERTIFICATION

A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative must sign and certify the Jurisdictional Runoff Management Program Annual Report Form. The appropriate box must be checked to indicate the whether a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative is signing the form.

Attachment E – Specific Provisions for Total Maximum Daily Loads

Attachment E provides specific provisions for implementing the load allocations (LAs) and wasteload allocations (WLAs) of Total Maximum Daily Loads (TMDLs) adopted by the San Diego Water Board and approved by USEPA in which the Copermittees are identified as responsible for discharges subject to the requirements of the TMDLs. Federal regulations require that NPDES requirements incorporate water quality based effluent limitations (WQBELs) that must be consistent with the requirements and assumptions of any available WLAs,[46] which may be expressed as numeric effluent limitations, when feasible, and/or as a best management practice (BMP) program of expanded or better-tailored BMPs.[47] Where the TMDL includes WLAs that provide numeric pollutant load or pollutant parameter objectives, the WLA has been, where feasible, translated into numeric WQBELs.[48]

For each TMDL in Attachment E, four sections are included:

a. Applicability: This section provides the resolution under which the TMDL Basin Plan amendment was adopted and approved, with the applicable adoption and approval dates. This section also gives the effective date of the TMDL and where the TMDL is applicable (i.e. Watershed Management Area and water body). The Copermittees that are responsible for implementing the specific provisions are also given in this section.

b. Final TMDL Compliance Requirements: For each TMDL, the final TMDL compliance requirements consist of the final TMDL compliance date(s), the final WQBELs, and the final TMDL compliance determination requirements. The final WQBELs are expressed in terms of receiving water limitations, effluent limitations, and/or best management practices (BMPs). The final WQBELs for the TMDLs are incorporated by reference into Provision A of the Order. The final WQBELs become enforceable when the final TMDL compliance dates have passed. Applicable BMPs within the final WQBELs must be incorporated into the Water Quality Improvement Plans. Compliance with the final WQBELs will be determined in accordance with the options provided under the final TMDL compliance determination requirements.

c. Interim TMDL Compliance Requirements: If the final TMDL compliance date has not passed and there are interim TMDL compliance requirements, they are included in this section. If there are interim WQBELs with interim compliance dates, the interim WQBELs become enforceable when the corresponding interim compliance dates have passed. Compliance with the interim WQBELs will be determined in accordance with the options provided under the interim TMDL compliance determination requirements.

d. Specific Monitoring and Assessment Requirements: If there are specific monitoring and assessment requirements that cannot be met with the monitoring and assessment program

[46] 40 CFR 122.44(d)(1)(vii)(B)
[47] 40 CFR 122.44(k)(2) and 40 CFR 122.44(k)(3)
[48] November 26, 2014 Memorandum from the USEPA, Revisions to the November 22, 2002 Memorandum "Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLA""

requirements under Provision D of the Order, the additional requirements are included in this section.

The requirements of the TMDLs are based on and consistent with the assumptions and requirements of any available adopted and approved TMDLs that have been incorporated into the Basin Plan. Modifications to the requirements for the TMDLs in Attachment E cannot be made unless the TMDLs are modified in the Basin Plan.

A modification to any aspect of a TMDL in the Basin Plan requires a Basin Plan amendment. A Basin Plan amendment to modify a TMDL will require the San Diego Water Board to adopt a resolution to amend the Basin Plan, which includes a separate public process. When the San Diego Water Board adopts a Basin Plan amendment, it subsequently requires approval from the State Water Board, the Office of Administrative Law, and the USEPA before it becomes effective.

If and when the TMDLs are a modified in the Basin Plan, the San Diego Water Board will revise the requirements of the Order in accordance with the Basin Plan amendment. When a Basin Plan amendment to modify a TMDL becomes effective, the San Diego Water Board will modify the requirements of the Order pursuant to the requirements of Provision H.4 of the Order as soon as possible.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

ORDER NO. R9-2013-0001,
AS AMENDED BY ORDER NOS. R9-2015-0001 AND R9-2015-0100
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The San Diego County Copermittees in Table 1a are subject to waste discharge requirements set forth in this Order.

Table 1a. San Diego County Copermittees

City of Carlsbad	City of Oceanside
City of Chula Vista	City of Poway
City of Coronado	City of San Diego
City of Del Mar	City of San Marcos
City of El Cajon	City of Santee
City of Encinitas	City of Solana Beach
City of Escondido	City of Vista
City of Imperial Beach	County of San Diego
City of La Mesa	San Diego County Regional Airport Authority
City of Lemon Grove	San Diego Unified Port District
City of National City	

The Orange County Copermittees in Table 1b are subject to waste discharge requirements set forth in this Order.

Table 1b. Orange County Copermittees[1]

City of Aliso Viejo	City of Rancho Santa Margarita
City of Dana Point	City of San Clemente
City of Laguna Beach	City of San Juan Capistrano
City of Laguna Hills	City of Laguna Woods
City of Laguna Niguel	County of Orange
City of Mission Viejo	Orange County Flood Control District

[1] While not listed in Table 1b., the City of Lake Forest remains a Copermittee under this Order until the later effective date of this Order or the effective date of Santa Ana Water Board Tentative Order No. R8-2015-0001. Thereafter, the City of Lake Forest will no longer be considered a Copermittee under this Order because its Phase I MS4 discharges will be regulated by the Santa Ana Water Board pursuant to Water Code section 13228 designation. The requirements of this Order that apply to the City of Lake Forest for the duration of this Order, however, are described in Finding 29 and Footnote 2 to Table B-1.

The Riverside County Copermittees in Table 1c are subject to waste discharge requirements set forth in this Order.

Table 1c. Riverside County Copermittees

City of Murrieta	County of Riverside
City of Temecula	Riverside County Flood Control and Water Conservation District
City of Wildomar	

The term Copermittee in this Order refers to any San Diego County, Orange County, or Riverside County Copermittee covered under this Order, unless specified otherwise.

This Order provides permit coverage for the Copermittee discharges described in Table 2.

Table 2. Discharge Locations and Receiving Waters

Discharge Points	Locations throughout San Diego Region
Discharge Description	Municipal Separate Storm Sewer System (MS4) Discharges
Receiving Waters	Inland Surface Waters, Enclosed Bays and Estuaries, and Coastal Ocean Waters of the San Diego Region

Table 3. Administrative Information

This Order was adopted by the San Diego Water Board on:	**May 8, 2013**
Order No. R9-2013-0001 became effective on:	**June 27, 2013**
This Order as amended by R9-2015-0001 became effective on:	**April 1, 2015**
This Order as amended by R9-2015-0100 became effective on:	**January 7, 2016**
This Order will expire on:	**June 27, 2018**
The Copermittees must file a Report of Waste Discharge in accordance with Title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than 180 days in advance of the Order expiration date.	

I, David W. Gibson, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on May 8, 2013, as amended by adoption of Order No. R9-2015-0001 on February 11, 2015, and as amended by adoption of Order No. R9-2015-0100 on November 18, 2015.

David W. Gibson
Executive Officer

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Attachment A: Discharge Prohibitions and Special Protections A-1
Attachment B: Standard Permit Provisions and General Provisions B-1
Attachment C: Acronyms, Abbreviations and Definitions C-1
Attachment D: Jurisdictional Runoff Management Program Annual Report Form D-1
Attachment E: Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2013-0001, as amended by Order Nos. R9-2015-0001 and R9-2015-0100 ..... E-1
Attachment F: Fact Sheet / Technical Report for Order No. R9-2013-0001, as amended by Order Nos. R9-2015-0001 and R9-2015-0100 ..... F-1

I. FINDINGS

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), finds that:

JURISDICTION

1. **MS4 Ownership or Operation.** Each of the Copermittees owns or operates an MS4, through which it discharges storm water and non-storm water into waters of the U.S. within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the U.S.

2. **Legal and Regulatory Authority.** This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]) adopted by the United States Environmental Protection Agency (USEPA), and chapter 5.5, division 7 of the California Water Code (CWC) (commencing with section 13370). This Order serves as an NPDES permit for discharges from MS4s to surface waters. This Order also serves as waste discharge requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

   The San Diego Water Board has the legal authority to issue a regional MS4 permit pursuant to its authority under CWA section 402(p)(3)(B) and 40 CFR 122.26(a)(1)(v). The USEPA also made it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide permits (55 Federal Register [FR] 47990, 48039-48042). The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees and San Diego Water Board.

   The federal regulations make it clear that the Copermittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators (40 CFR 122.26(a)(3)(vi)). This Order does not require the Copermittees to manage storm water outside of their jurisdictional boundaries, but rather to work collectively to improve storm water management within watersheds.

3. **CWA NPDES Permit Conditions.** Pursuant to CWA section 402(p)(3)(B), NPDES permits for storm water discharges from MS4s must include requirements to effectively prohibit non-storm water discharges into MS4s, and require controls to reduce the discharge of pollutants in storm water to the maximum extent practicable (MEP), and to require other provisions as the San Diego Water Board determines are appropriate to control such pollutants. This Order prescribes conditions to assure compliance with the CWA requirements for owners and operators of MS4s to effectively prohibit non-storm water discharges into the MS4s, and require controls to reduce the discharge of pollutants in storm water from the MS4s to the MEP.

4. **CWA and CWC Monitoring Requirements.** CWA section 308(a) and 40 CFR 122.41(h),(j)-(l) and 122.48 require that NPDES permits must specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s also specify additional monitoring and reporting requirements in 40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c). CWC section 13383 authorizes the San Diego Water Board to establish monitoring, inspection, entry, reporting and recordkeeping requirements. This Order establishes monitoring and reporting requirements to implement federal and State requirements. This Order also includes requirements for the Orange County Copermittees to participate in, and together with South Orange County Wastewater Authority and Orange County Health Care Agency, share responsibility for implementing the unified approach to beach water quality monitoring and assessment program set forth in the October 2014 report, *Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County*, issued pursuant to CWC section 13383 in the San Diego Water Board December 5, 2014 Letter Directive.

5. **Total Maximum Daily Loads.** CWA section 303(d)(1)(A) requires that "[e]ach state shall identify those waters within its boundaries for which the effluent limitations are not stringent enough to implement any water quality standard applicable to such waters." The CWA also requires states to establish a priority ranking of impaired water bodies known as Water Quality Limited Segments and to establish Total Maximum Daily Loads (TMDLs) for such waters. This priority list of impaired water bodies is called the Clean Water Act Section 303(d) List of Water Quality Limited Segments, commonly referred to as the 303(d) List. The CWA requires the 303(d) List to be updated every two years.

   TMDLs are numerical calculations of the maximum amount of a pollutant that a water body can assimilate and still meet water quality standards. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point sources (waste load allocations or WLAs) and non-point sources (load allocations or LAs), background contribution, plus a margin of safety. Discharges from MS4s are point source discharges. The federal regulations (40 CFR 122.44(d)(1)(vii)(B)) require that NPDES permits incorporate water quality based effluent limitations (WQBELs) developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, consistent with the assumptions and requirements of any available WLA for the discharge. Requirements of this Order implement the TMDLs established by the San Diego Water Board or USEPA as of the date this Order was amended in 2015. This Order establishes WQBELs consistent with the assumptions and requirements of all available TMDL WLAs assigned to discharges from the Copermittees' MS4s.

6. **Non-Storm Water Discharges.** Pursuant to CWA section 402(p)(3)(B)(ii), this Order requires each Copermittee to effectively prohibit discharges of non-storm water into its MS4. Nevertheless, non-storm water discharges into and from the

MS4s continue to be reported to the San Diego Water Board by the Copermittees and other persons. Monitoring conducted by the Copermittees, as well as the 303(d) List, have identified dry weather, non-storm water discharges from the MS4s as a source of pollutants causing or contributing to receiving water quality impairments in the San Diego Region. The federal regulations (40 CFR 122.26(d)(2)(iv)(B)(1)) require the Copermittees to have a program to prevent illicit discharges to the MS4. The federal regulations, however, allow for specific categories of non-storm water discharges or flows to be addressed as illicit discharges only where such discharges are identified as sources of pollutants to waters of the U.S.

7. **In-Stream Treatment Systems.** Pursuant to federal regulations (40 CFR 131.10(a)), in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S. Authorizing the construction of a runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to accepting waste assimilation as an appropriate use for that water body. Runoff treatment must occur prior to the discharge of runoff into receiving waters. Treatment control best management practices (BMPs) must not be constructed in waters of the U.S. Construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body.

DISCHARGE CHARACTERISTICS AND RUNOFF MANAGEMENT

8. **Point Source Discharges of Pollutants.** Discharges from the MS4s contain waste, as defined in the CWC, and pollutants that adversely affect the quality of the waters of the state. A discharge from an MS4 is a “discharge of pollutants from a point source” into waters of the U.S. as defined in the CWA. Storm water and non-storm water discharges from the MS4s contain pollutants that cause or threaten to cause a violation of surface water quality standards, as outlined in the Water Quality Control Plan for the San Diego Basin (Basin Plan). Storm water and non-storm water discharges from the MS4s are subject to the conditions and requirements established in the Basin Plan for point source discharges.

9. **Potential Beneficial Use Impairment.** The discharge of pollutants and/or increased flows from MS4s may cause or threaten to cause the concentration of pollutants to exceed applicable receiving water quality objectives and impair or threaten to impair designated beneficial uses resulting in a condition of pollution, contamination, or nuisance.

10. **Pollutants Generated by Land Development.** Land development has created and continues to create new sources of non-storm water discharges and pollutants in storm water discharges as human population density increases. This brings higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash. Pollutants from these sources are dumped or washed off the surface by non-storm water or storm water flows into

and from the MS4s. When development converts natural vegetated pervious ground cover to impervious surfaces such as paved highways, streets, rooftops, and parking lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving a developed area without BMPs that can maintain pre-development runoff conditions will contain greater pollutant loads and have significantly greater runoff volume, velocity, and peak flow rate than pre-development runoff conditions from the same area.

11. **Runoff Discharges to Receiving Waters.** The MS4s discharge runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within the eleven hydrologic units comprising the San Diego Region. Historic and current development makes use of natural drainage patterns and features as conveyances for runoff. Rivers, streams and creeks in developed areas used in this manner are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and receiving water. Numerous receiving water bodies and water body segments have been designated as impaired by the San Diego Water Board pursuant to CWA section 303(d).

12. **Pollutants in Runoff.** The most common pollutants in runoff discharged from the MS4s include total suspended solids, sediment, pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., cadmium, copper, lead, and zinc), petroleum products and polynuclear aromatic hydrocarbons, synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus), oxygen-demanding substances (e.g., decaying vegetation, animal waste), detergents, and trash. As operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not prohibit or otherwise control. These discharges may cause or contribute to a condition of pollution or a violation of water quality standards.

13. **Human Health and Aquatic Life Impairment.** Pollutants in runoff discharged from the MS4s can threaten and adversely affect human health and aquatic organisms. Adverse responses of organisms to chemicals or physical agents in runoff range from physiological responses such as impaired reproduction or growth anomalies to mortality. Increased volume, velocity, rate, and duration of storm water runoff greatly accelerate the erosion of downstream natural channels. This alters stream channels and habitats and can adversely affect aquatic and terrestrial organisms.

14. **Water Quality Effects.** The Copermittees' water quality monitoring data submitted to date documents persistent exceedances of Basin Plan water quality objectives for runoff-related pollutants at various watershed monitoring stations. Persistent toxicity has also been observed at several watershed monitoring stations. In addition, bioassessment data indicate that the majority of the monitored receiving waters have

Poor to Very Poor Index of Biological Integrity (IBI) ratings. These findings indicate that runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in the San Diego Region. Non-storm water discharges from the MS4s have been shown to contribute significant levels of pollutants and flow in arid, developed Southern California watersheds, and contribute significantly to exceedances of applicable receiving water quality objectives.

15. **Non-Storm Water and Storm Water Discharges.** Non-storm water discharges from the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard of CWA section 402(p)(3)(B)(iii), which is explicitly for "Municipal … *Stormwater Discharges* (emphasis added)" from the MS4s. Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s must be effectively prohibited.

16. **Best Management Practices.** Waste and pollutants which are deposited and accumulate in MS4 drainage structures will be discharged from these structures to waters of the U.S. unless they are removed. These discharges may cause or contribute to, or threaten to cause or contribute to, a condition of pollution in receiving waters. For this reason, pollutants in storm water discharges from the MS4s can be and must be effectively reduced in runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Pollution prevention is the reduction or elimination of pollutant generation at its source and is the best "first line of defense." Source control BMPs (both structural and non-structural) minimize the contact between pollutants and runoff, therefore keeping pollutants onsite and out of receiving waters. Treatment control BMPs remove pollutants that have been mobilized by storm water or non-storm water flows.

17. **BMP Implementation.** Runoff needs to be addressed during the three major phases of development (planning, construction, and use) in order to reduce the discharge of storm water pollutants to the MEP, effectively prohibit non-storm water discharges, and protect receiving waters. Development which is not guided by water quality planning policies and principles can result in increased pollutant load discharges, flow rates, and flow durations which can negatively affect receiving water beneficial uses. Construction sites without adequate BMP implementation result in sediment runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. Existing development can generate substantial pollutant loads which are discharged in runoff to receiving waters. Retrofitting areas of existing development with storm water pollutant control and hydromodification management BMPs is necessary to address storm water discharges from existing development that may cause or contribute to a condition of pollution or a violation of water quality standards.

18. **Water Quality Improvements.** Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges to the MS4s and control pollutants in storm water

discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the CWA.

19. **Long Term Planning and Implementation.** Federal regulations require municipal storm water permits to expire 5 years from adoption, after which the permit must be renewed and reissued. The San Diego Water Board recognizes that the degradation of water quality and impacts to beneficial uses of the waters in the San Diego Region occurred over several decades. The San Diego Water Board further recognizes that a decade or more may be necessary to realize demonstrable improvement to the quality of waters in the San Diego Region. This Order includes a long term planning and implementation approach that will require more than a single permit term to complete.

WATER QUALITY STANDARDS

20. **Basin Plan.** The San Diego Water Board adopted the Water Quality Control Plan for the San Diego Basin (Basin Plan) on September 8, 1994, that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for receiving waters addressed through the plan. The Basin Plan was subsequently approved by the State Water Resources Control Board (State Water Board) on December 13, 1994. Subsequent revisions to the Basin Plan have also been adopted by the San Diego Water Board and approved by the State Water Board. Requirements of this Order implement the Basin Plan.

    The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Process Supply (PROC), Industrial Service Supply (IND), Ground Water Recharge (GWR), Contact Water Recreation (REC1), Non-contact Water Recreation (REC2), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Freshwater Replenishment (FRSH), Hydropower Generation (POW), and Preservation of Biological Habitats of Special Significance (BIOL). The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region: Navigation (NAV), Commercial and Sport Fishing (COMM), Estuarine Habitat (EST), Marine Habitat (MAR), Aquaculture (AQUA), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN), and Shellfish Harvesting (SHELL).

21. **Ocean Plan.** The State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, and 2005. The State Water Board adopted the latest amendment on October 16, 2012 and it became effective on August 19, 2013. The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean. Requirements of this Order implement the Ocean Plan.

    The Ocean Plan identifies the following beneficial uses of ocean waters of the state to be protected: Industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture; preservation and enhancement of designated Areas of Special Biological Significance; rare and endangered species; marine habitat; fish spawning and shellfish harvesting.

22. **Sediment Quality Control Plan**. On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes: 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

23. **National Toxics Rule and California Toxics Rule.** USEPA adopted the National Toxics Rule (NTR) on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the NTR applied in California. On May 18, 2000, USEPA adopted the California Toxics Rule (CTR). The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants.

24. **Antidegradation Policy.** This Order is in conformance with the federal Antidegradation Policy described in 40 CFR 131.12, and State Water Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality Waters in California*. Federal regulations at 40 CFR 131.12 require that the State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. State Water Board Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies. The Fact Sheet of this Order contains additional discussion about antidegradation.

25. **Anti-Backsliding Requirements.** Section 402(o)(2) of the CWA and federal regulations at 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations may be relaxed. All effluent limitations in this Order are at least as stringent as effluent limitations in the previous permits. The Fact Sheet of this Order contains additional discussion about anti-backsliding.

CONSIDERATIONS UNDER FEDERAL AND STATE LAW

26. **Coastal Zone Act Reauthorization Amendments.** Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states with approved coastal zone management programs to address non-point source pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point source pollution: agriculture, silviculture, urban, marinas, and hydromodification. This Order addresses the management measures required for the urban category, with the exception of septic systems. The runoff management programs developed pursuant to this Order fulfills the need for coastal cities to develop a runoff non-point source plan identified in the Non-Point Source Program Strategy and Implementation Plan. The San Diego Water Board addresses septic systems through the administration of other programs.

27. **Endangered Species Act.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 USC sections 1531 to 1544). This Order requires compliance with receiving water limits, and other requirements to protect the beneficial uses of waters of the State. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

28. **Report of Waste Discharge Process.** The waste discharge requirements set forth in this Order are based upon the Report of Waste Discharge submitted by the San Diego County Copermittees prior to the expiration of Order No. R9-2007-0001 (NPDES No. CAS0109266), the Report of Waste Discharge submitted by the Orange County Copermittees prior to the expiration of Order No. R9-2009-0002 (CAS0108740), and the Report of Waste Discharge submitted by the Riverside County Copermittees prior to the expiration of Order No. R9-2010-0016 (CAS0108766).

    The federal regulations (40 CFR 122.21(d)(2)) and CWC section 13376 impose a duty on the Copermittees to reapply for continued coverage through submittal of a Report of Waste Discharge no later than 180 days prior to expiration of a currently effective permit. The expiration date of this Order as shown in Table 3, and requirement to file a Report of Waste Discharge no later than 180 days prior to the

expiration date of the Order, applies jointly to the San Diego County, Orange County, and Riverside County Copermittees.

29. **Regional Water Board Designation.** The Cities of Laguna Hills, Laguna Woods, Lake Forest, Menifee, Murrieta, and Wildomar are located partially within the jurisdictions of the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board) and the San Diego Water Board and their discharges are subject to regulation by both Regional Water Boards. CWC section 13228 provides a way to streamline the regulation of entities whose jurisdictions straddle the border of two or more Regions. CWC section 13228 is implemented in this Order at the request of these six cities and to ease the regulatory burden of municipalities that lie in both the San Diego Water Board's and the adjacent Santa Ana Water Board's jurisdiction. MS4 discharges from these municipalities are regulated by the San Diego Water Board and Santa Ana Water Board as follows:

    a. Pursuant to CWC section 13228, the Cities of Laguna Hills, Laguna Woods, and Lake Forest submitted written requests that one Regional Water Board be designated to regulate Phase I MS4 discharges for each of the Cities. The Santa Ana Water Board and the San Diego Water Board have entered into an agreement dated February 10, 2015, whereby the Cities of Laguna Woods and Laguna Hills are largely regulated by the San Diego Water Board under this Order, including those portions of the Cities of Laguna Woods and Laguna Hills not within the San Diego Water Board's jurisdiction, upon the effective date of this Order or Santa Ana Water Board Order No. R8-2015-0001, whichever is later. Similarly, the City of Lake Forest, including those portions of the City of Lake Forest within the San Diego Water Board's jurisdiction, is largely regulated by the Santa Ana Water Board under Order No. R8-2015-0001 (NPDES No. CAS618030) upon the later effective date of this Order or Order No. R8-2015-0001. The agreement provides that the City of Lake Forest is required to retain, and continue implementation of, its over-irrigation discharge prohibition in Title 15, Chapter 14.030, List (b) of the City Municipal Code for regulating storm water quality throughout its jurisdiction. The agreement also requires the City of Lake Forest to actively participate during development and implementation of the Aliso Creek Watershed Management Area Water Quality Improvement Plan required pursuant to this Order. Each Regional Water Board retains the authority to enforce provisions of its Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee under the terms of the agreement (Water Code section 13228 (b)). Under the terms of the agreement, any TMDL and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Laguna Woods, Laguna Hills or Lake Forest as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement of the applicable TMDL will remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's San

Diego Creek/Newport Bay TMDL and the San Diego Water Board's Indicator Bacteria Project I Beaches and Creeks TMDL. The San Diego Water Board will periodically review the effectiveness of the agreement during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate the agreement with Santa Ana Water Board or otherwise modify the agreement subject to the approval of the Santa Ana Water Board.

b. Pursuant to CWC section 13228, the Cities of Murrieta, Wildomar, and Menifee submitted written requests that one Regional Water Board be designated to regulate Phase I MS4 discharges for each of the Cities. The Santa Ana Water Board and the San Diego Water Board have entered into an agreement dated October 26, 2015, whereby the Cities of Murrieta and Wildomar are largely regulated by the San Diego Water Board under this Order, including those portions of the Cities of Murrieta and Wildomar not within the San Diego Water Board's jurisdiction, upon the effective date of this Order. Similarly, the City of Menifee is largely regulated by the Santa Ana Water Board under Order No. R8-2010-0033 as it may be amended or reissued, including those portions of the City of Menifee within the San Diego Water Board's jurisdiction, upon the effective date of this Order. The agreement also requires the City of Menifee to actively participate during development and implementation of the Santa Margarita River Watershed Management Area Water Quality Improvement Plan required pursuant to this Order. Each Regional Water Board retains the authority to enforce provisions of its Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee under the terms of the agreement (Water Code section 13228 (b)). Under the terms of the agreement, any TMDL and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Menifee, Murrieta, or Wildomar as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement of the applicable TMDL will remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's Lake Elsinore/Canyon Lake Nutrient TMDLs. The San Diego Water Board will periodically review the effectiveness of the agreement during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate the agreement with Santa Ana Water Board or otherwise modify the agreement subject to the approval of the Santa Ana Water Board.

30. Integrated Report and Clean Water Act Section 303(d) List. The San Diego Water Board and State Water Board submit an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. USEPA issued its *Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act* on July 29, 2005, which advocates the use of a five category approach for

classifying the attainment status of water quality standards for water bodies in the Integrated Report. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 in the Integrated Report are placed on the 303(d) List.

Water bodies with available data and/or information that indicate at least one beneficial use is not being supported or is threatened, but a TMDL is not required, are included in Category 4 in the Integrated Report. Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

Implementation of the requirements of this Order may allow the San Diego Water Board to include surface waters impaired by discharges from the Copermittees' MS4s in Category 4 in the Integrated Report for consideration during the next 303(d) List submittal by the State to USEPA.

31. **Economic Considerations.** The California Supreme Court has ruled that although CWC section 13263 requires the State and Regional Water Boards (collectively Water Boards) to consider factors set forth in CWC section 13241 when issuing an NPDES permit, the Water Board may not consider the factors to justify imposing pollutant restrictions that are less stringent than the applicable federal regulations require. (*City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 618, 626-627.) However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

    As noted in the following finding, the San Diego Water Board finds that the requirements in this Order are not more stringent than the minimum federal requirements. Therefore, a CWC section 13241 analysis is not required for permit requirements that implement the effective prohibition on the discharge of non-storm water into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determined appropriate to control such pollutants, as those requirements are mandated by federal law. Notwithstanding the above, the San Diego Water Board has developed an economic analysis of the requirements in this Order. The economic analysis is provided in the Fact Sheet.

32. **Unfunded Mandates.** This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following:

a. This Order implements federally mandated requirements under CWA section 402 (33 USC section 1342(p)(3)(B)).

b. The local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental and new dischargers who are issued NPDES permits for storm water and non-storm water discharges.

c. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order.

d. The Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)) and in lieu of numeric restrictions on their MS4 discharges (i.e. effluent limitations).

e. The local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under State law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

f. The provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state develops a TMDL, federal law requires that permits must contain water quality based effluent limitations consistent with the assumptions and requirements of any applicable wasteload allocation (40 CFR 122.44(d)(1)(vii)(B)).

See the Fact Sheet for further discussion of unfunded mandates.

33. California Environmental Quality Act. The issuance of waste discharge requirements and an NPDES permit for the discharge of runoff from MS4s to waters of the U.S. is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 et seq.) in accordance with CWC section 13389.

STATE WATER BOARD DECISIONS

34. Compliance with Prohibitions and Limitations. The receiving water limitation language specified in this Order is consistent with language recommended by the USEPA and established in State Water Board Order WQ 99-05, *Own Motion Review of the Petition of Environmental Health Coalition to Review Waste Discharge Requirements Order No. 96-03, NPDES Permit No. CAS0108740*, adopted by the State Water Board on June 17, 1999. The receiving water limitation language in this Order requires storm water discharges from MS4s to not cause or contribute to a violation of water quality standards, which is to be achieved through an iterative approach requiring the implementation of improved and better-tailored BMPs over time. Implementation of the iterative approach to comply with receiving water

limitations based on applicable water quality standards is necessary to ensure that storm water discharges from the MS4 will not ultimately cause or contribute to violations of water quality standards and will not create conditions of pollution, contamination, or nuisance.

The San Diego, Orange County, and Riverside County Copermittees have asserted that the prohibitions and limitations may result in many years of noncompliance because years of technical efforts may ultimately be required to achieve compliance with the prohibitions and limitations, especially for wet weather discharges. To address this concern, this Order includes an option that allows a Copermittee to be deemed in compliance with the prohibitions and limitations where more than one permit term may be necessary to achieve full compliance with the prohibitions and limitations. One or more Copermittees within a Watershed Management Area can choose to implement this option.

An alternative compliance pathway option has been included in this Order consistent with the approach described in Order WQ 2015-0075, *In the Matter of Review of Order No. R4-2012-0175, NPDES Permit No. CAS004001, Waste Discharge Requirements for Municipal Separate Storm Sewer System (MS4) Discharges within the Coastal Watersheds of Los Angeles County, Except Those Discharges Originating from the City of Long Beach MS4,* adopted by the State Water Board on June 16, 2015. State Water Board Order WQ 2015-0075 directs the Regional Water Boards to consider a watershed-based planning and implementation approach to compliance with receiving water limitations when issuing Phase I MS4 permits going forward. Order WQ 2015-0075 included seven principles that the Regional Water Boards are expected to follow when incorporating an alternative compliance pathway into an MS4 permit. The Fact Sheet discusses the incorporation of the seven principles stipulated in State Water Board Order WQ 2015-0075 into the alternative compliance pathway option in this Order.

35. **Special Conditions for Areas of Special Biological Significance.** On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving a general exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges (General Exception). On June 19, 2012, the State Water Board adopted Order No. 2012-0031, amending the General Exception to require pollutant reductions to be achieved within six years in accordance with ASBS Compliance Plans and ASBS Pollution Prevention Plans. The General Exception requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject to the terms and conditions of the General Exception as amended. The Special Protections contained in Attachment B to the General Exception as amended are

applicable to these discharges, and are hereby incorporated into Attachment A of this Order.

ADMINISTRATIVE FINDINGS

36. **Executive Officer Delegation of Authority.** The San Diego Water Board by prior resolution has delegated all matters that may legally be delegated to its Executive Officer to act on its behalf pursuant to CWC section 13223. Therefore, the Executive Officer is authorized to act on the San Diego Water Board's behalf on any matter within this Order unless such delegation is unlawful under CWC section 13223 or this Order explicitly states otherwise.

37. **Standard Provisions.** Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR 122.42, are provided in Attachment B to this Order.

38. **Fact Sheet.** The Fact Sheet for this Order contains background information, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of this Order. The Fact Sheet is hereby incorporated into this Order and constitutes part of the Findings of this Order.

39. **Public Notice.** In accordance with State and federal laws and regulations, the San Diego Water Board notified the Copermittees, and interested agencies and persons of its intent to prescribe waste discharge requirements for the control of discharges into and from the MS4s to waters of the U.S. and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet.

40. **Public Hearings.** The San Diego Water Board held a public hearing on April 10 and 11, 2013, that was continued to May 8, 2013 and heard and considered all comments pertaining to the terms and conditions of this Order. The San Diego Water Board also held a public workshop on October 8, 2015, and a public hearing on February 11, 2015, and heard and considered all comments pertaining to the amendment of this Order through Order No. R9-2015-0001. The San Diego Water Board also held a public hearing on November 18, 2015, and heard and considered all comments pertaining to the amendment of this Order through Order No. R9-2015-0100. Details of these public hearings are provided in the Fact Sheet.

41. **Effective Date.** This Order serves as an NPDES permit pursuant to CWA section 402 or amendments thereto, and as to the San Diego County Copermittees listed in Table 1a, became effective fifty (50) days after the date of its adoption, and as to the Orange County Copermittees listed in Table 1b, became effective on April 1, 2015, after Order No. R9-2015-0001 was adopted, and as to the Riverside County Copermittees listed in Table 1c, became effective on January 7, 2016, after Order No. R9-2015-0100 was adopted, provided that the Regional Administrator, USEPA, Region IX, does not object to this Order.

42. **Review by the State Water Board.** Any person aggrieved by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with CWC section 13320 and California Code of Regulations, title 23, sections 2050, and following. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date of this Order, except that if the thirtieth day following the date of this Order falls on a Saturday, Sunday or State holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

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THEREFORE, IT IS HEREBY ORDERED that the Copermittees, in order to meet the provisions contained in division 7 of the CWC (commencing with section 13000) and regulations adopted thereunder, and the provisions of the CWA and regulations adopted thereunder, must each comply with the requirements of this Order. This action in no way prevents the San Diego Water Board from taking enforcement action for past violations of the previous Order applicable to the Copermittees. If any part of this Order is subject to a temporary stay of enforcement, unless otherwise specified, the Copermittees must comply with the analogous portions of the previous Order, which will remain in effect for all purposes during the pendency of the stay.

II. PROVISIONS

A. PROHIBITIONS AND LIMITATIONS

The purpose of this provision is to describe the conditions under which storm water and non-storm water discharges into and from MS4s are prohibited or limited. The goal of the prohibitions and limitations is to protect the water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through the implementation of water quality improvement strategies and runoff management programs that effectively prohibit non-storm water discharges into the Copermittees' MS4s, and reduce pollutants in storm water discharges from the Copermittees' MS4s to the MEP.

1. Discharge Prohibitions

a. Discharges from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the state are prohibited.

b. Non-storm water discharges into MS4s are to be effectively prohibited, through the implementation of Provision E.2, unless such discharges are authorized by a separate NPDES permit.

c. Discharges from MS4s are subject to all waste discharge prohibitions in the Basin Plan, included in Attachment A to this Order.

d. Storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012, as amended by State Water Board Resolution No. 2012-0031, applicable to these discharges, included in Attachment A to this Order. All other discharges from the Copermittees' MS4s to ASBS are prohibited.

2. Receiving Water Limitations

a. Discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters, including but not limited to all applicable provisions contained in:

(1) The San Diego Water Board's Basin Plan, including beneficial uses, water quality objectives, and implementation plans;

(2) State Water Board plans for water quality control including the following:

(a) Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries (Thermal Plan), and

(b) The Ocean Plan, including beneficial uses, water quality objectives, and implementation plans;

(3) State Water Board policies for water and sediment quality control including the following:

(a) Water Quality Control Policy for the Enclosed Bays and Estuaries of California,

(b) Sediment Quality Control Plan which includes the following narrative objectives for bays and estuaries:

(i) Pollutants in sediments shall not be present in quantities that, alone or in combination, are toxic to benthic communities, and

(ii) Pollutants shall not be present in sediments at levels that will bioaccumulate in aquatic life to levels that are harmful to human health,

(c) The Statement of Policy with Respect to Maintaining High Quality of Waters in California;[2]

(4) Priority pollutant criteria promulgated by the USEPA through the following:

(a) National Toxics Rule (NTR)[3] (promulgated on December 22, 1992 and amended on May 4, 1995), and

(b) California Toxics Rule (CTR).[4,5]

b. Discharges from MS4s composed of storm water runoff must not alter natural ocean water quality in an ASBS.

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[2] State Water Board Resolution No. 68-16
[3] 40 CFR 131.36
[4] 65 Federal Register 31682-31719 (May 18, 2000), adding Section 131.38 to 40 CFR
[5] If a water quality objective and a CTR criterion are in effect for the same priority pollutant, the more stringent of the two applies.

3. Effluent Limitations

a. TECHNOLOGY BASED EFFLUENT LIMITATIONS

Pollutants in storm water discharges from MS4s must be reduced to the MEP.[6]

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

Each Copermittee must comply with applicable WQBELs established for the TMDLs in Attachment E to this Order, pursuant to the applicable TMDL compliance schedules.

4. Compliance with Discharge Prohibitions and Receiving Water Limitations

Each Copermittee must achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order through timely implementation of control measures and other actions as specified in Provisions B and E of this Order, including any modifications. The Water Quality Improvement Plans required under Provision B must be designed and adapted to ultimately achieve compliance with Provisions A.1.a, A.1.c and A.2.a.

a. If exceedance(s) of water quality standards persist in receiving waters notwithstanding implementation of this Order, the Copermittees must comply with the following procedures:

(1) For exceedance(s) of a water quality standard in the process of being addressed by the Water Quality Improvement Plan, the Copermittee(s) must implement the Water Quality Improvement Plan as accepted by the San Diego Water Board, and update the Water Quality Improvement Plan, as necessary, pursuant to Provision F.2.c;

(2) Upon a determination by either the Copermittees or the San Diego Water Board that discharges from the MS4 are causing or contributing to a new exceedance of an applicable water quality standard not addressed by the Water Quality Improvement Plan, the Copermittees must submit the following updates to the Water Quality Improvement Plan pursuant to Provision F.2.c or as part of the Water Quality Improvement Plan Annual Report required under Provision F.3.b, unless the San Diego Water Board directs an earlier submittal:

(a) The water quality improvement strategies being implemented that are effective and will continue to be implemented,

[6] This does not apply to MS4 discharges which receive subsequent treatment to reduce pollutants in storm water discharges to the MEP prior to entering receiving waters (e.g., low flow diversions to the sanitary sewer). Runoff treatment must occur prior to the discharge of runoff into receiving waters per Finding 7.

(b) Water quality improvement strategies (i.e. BMPs, retrofitting projects, stream and/or habitat rehabilitation projects, adjustments to jurisdictional runoff management programs, etc.) that will be implemented to reduce or eliminate any pollutants or conditions that are causing or contributing to the exceedance of water quality standards,

(c) Updates to the schedule for implementation of the existing and additional water quality improvement strategies, and

(d) Updates to the monitoring and assessment program to track progress toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a of this Order;

(3) The San Diego Water Board may require the incorporation of additional modifications to the Water Quality Improvement Plan required under Provision B. The applicable Copermittees must submit any modifications to the update to the Water Quality Improvement Plan within 90 days of notification that additional modifications are required by the San Diego Water Board, or as otherwise directed;

(4) Within 90 days of the San Diego Water Board determination that the modifications to the Water Quality Improvement Plan required under Provision A.4.a.(3) meet the requirements of this Order, the applicable Copermittees must revise the jurisdictional runoff management program documents to incorporate the modified water quality improvement strategies that have been and will be implemented, the implementation schedule, and any additional monitoring required; and

(5) Each Copermittee must implement the updated Water Quality Improvement Plan.

b. The procedure set forth above to achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order do not have to be repeated for continuing or recurring exceedances of the same water quality standard(s) following implementation of scheduled actions unless directed to do otherwise by the San Diego Water Board.

c. Nothing in Provisions A.4.a and A.4.b prevents the San Diego Water Board from enforcing any provision of this Order while the applicable Copermittees prepare and implement the above update to the Water Quality Improvement Plan and jurisdictional runoff management programs.

B. WATER QUALITY IMPROVEMENT PLANS

The purpose of this provision is to develop Water Quality Improvement Plans that guide the Copermittees' jurisdictional runoff management programs towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plans is to further the Clean Water Act's objective to protect, preserve, enhance, and restore the water quality and designated beneficial uses of waters of the state. This goal will be accomplished through an adaptive planning and management process that identifies the highest priority water quality conditions within a watershed and implements strategies through the jurisdictional runoff management programs to achieve improvements in the quality of discharges from the MS4s and receiving waters.

1. Watershed Management Areas

The Copermittees must develop a Water Quality Improvement Plan for each of the Watershed Management Areas in Table B-1. A total of ten Water Quality Improvement Plans must be developed for the San Diego Region.

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
San Juan (901.00)	South Orange County	- Aliso Creek - San Juan Creek - San Mateo Creek - Pacific Ocean - Heisler Park ASBS	- City of Aliso Viejo - City of Dana Point - City of Laguna Beach - City of Laguna Hills[1] - City of Laguna Niguel - City of Laguna Woods[1] - City of Lake Forest[2] - City of Mission Viejo - City of Rancho Santa Margarita - City of San Clemente - City of San Juan Capistrano - County of Orange - Orange County Flood Control District
Santa Margarita (902.00)	Santa Margarita River	- Murrieta Creek - Temecula Creek - Santa Margarita River - Santa Margarita Lagoon - Pacific Ocean	- City of Menifee[3] - City of Murrieta[4] - City of Temecula - City of Wildomar[4] - County of Riverside - County of San Diego - Riverside County Flood Control and Water Conservation District
San Luis Rey (903.00)	San Luis Rey River	- San Luis Rey River - San Luis Rey Estuary - Pacific Ocean	- City of Oceanside - City of Vista - County of San Diego

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
Carlsbad (904.00)	Carlsbad	- Loma Alta Slough - Buena Vista Lagoon - Agua Hedionda Lagoon - Batiquitos Lagoon - San Elijo Lagoon - Pacific Ocean	- City of Carlsbad - City of Encinitas - City of Escondido - City of Oceanside - City of San Marcos - City of Solana Beach - City of Vista - County of San Diego
San Dieguito (905.00)	San Dieguito River	- San Dieguito River - San Dieguito Lagoon - Pacific Ocean	- City of Del Mar - City of Escondido - City of Poway - City of San Diego - City of Solana Beach - County of San Diego
Penasquitos (906.00)	Penasquitos	- Los Penasquitos Lagoon - Pacific Ocean	- City of Del Mar - City of Poway - City of San Diego - County of San Diego
	Mission Bay	- Mission Bay - Pacific Ocean - San Diego Marine Life Refuge ASBS	- City of San Diego
San Diego (907.00)	San Diego River	- San Diego River - Pacific Ocean	- City of El Cajon - City of La Mesa - City of San Diego - City of Santee - County of San Diego
Pueblo San Diego (908.00) Sweetwater (909.00) Otay (910.00)	San Diego Bay	- Sweetwater River - Otay River - San Diego Bay - Pacific Ocean	- City of Chula Vista - City of Coronado - City of Imperial Beach - City of La Mesa - City of Lemon Grove - City of National City - City of San Diego - County of San Diego - San Diego County Regional Airport Authority - San Diego Unified Port District
Tijuana (911.00)	Tijuana River	- Tijuana River - Tijuana Estuary - Pacific Ocean	- City of Imperial Beach - City of San Diego - County of San Diego

Notes:

1. By agreement dated February 10, 2015, pursuant to Water Code section 13228, the Phase I MS4 discharges within the jurisdiction of the City of Laguna Hills and the City of Laguna Woods located in the Santa Ana Region are regulated by San Diego Water Board Order No. R9-2013-0001 as amended by Order No. R9-2015-0001, upon the later effective date of Order No. R9-2015-0001 or Santa Ana Water Board Tentative Order No. R8-2015-0001. The City of Laguna Hills and Laguna Woods must also comply with the requirements of the San Diego Creek/Newport Bay TMDL in section XVIII of Santa Ana Water Board Order No. R8-2015-0001.
2. By agreement dated February 10, 2015, pursuant to Water Code section 13228, Phase I MS4 discharges within the City of Lake Forest located within the San Diego Water Board Region are regulated by the Santa Ana Water Board Order No. R8-2015-0001 (NPDES No. CAS618030) upon the later effective date of this Order or Santa Ana Water Board Tentative Order No. R8-2015-0001. In accordance with the terms of the agreement between the San Diego Water Board and the Santa Ana Water Board, the City of Lake Forest must implement the requirements of the Bacteria TMDL in Attachment E of this Order, participate in preparation and implementation of the Water Quality Improvement Plan for the Aliso Creek Watershed Management Area as described in Provision B of this Order and continue implementation of its over-irrigation discharge prohibition in its City Ordinance, Title 15, Chapter 15, section 14.030, List (b).
3. By agreement dated October 26, 2015, pursuant to Water Code section 13228, Phase I MS4 discharges within the City of Menifee located within the San Diego Water Board Region are regulated by the Santa Ana Water Board Order No. R8-2010-0033 as it may be amended or reissued (NPDES No. CAS618033) upon the later effective date of this Order. In accordance with the terms of the agreement between the San Diego Water Board and the Santa Ana Water Board, the City of Menifee must participate in preparation and implementation of the Water Quality Improvement Plan for the Santa Margarita River Watershed Management Area as described in Provision B of this Order.
4. By agreement dated October 26, 2015, pursuant to Water Code section 13228, the Phase I MS4 discharges within the jurisdiction of the City of Murrieta and the City of Wildomar located in the Santa Ana Region are regulated by San Diego Water Board Order No. R9-2013-0001 as amended by Orders No. R9-2015-0001 and R9-2015-0100. The City of Murrieta and City of Wildomar must also comply with the requirements of the Lake Elsinore/Canyon Lake Nutrient TMDLs in section VI.D.2 of Santa Ana Water Board Order No. R8-2010-0033, or corresponding section as it may be amended or reissued.

2. Priority Water Quality Conditions

The Copermittees must identify the water quality priorities within each Watershed Management Area that will be addressed by the Water Quality Improvement Plan. Where appropriate, Watershed Management Areas may be separated into subwatersheds to focus water quality prioritization and jurisdictional runoff management program implementation efforts by receiving water.

a. Assessment of Receiving Water Conditions

The Copermittees must consider the following, at a minimum, to identify water quality priorities based on impacts of MS4 discharges on receiving water beneficial uses:

(1) Receiving waters listed as impaired on the CWA Section 303(d) List of Water Quality Limited Segments (303(d) List);

(2) TMDLs adopted and under development by the San Diego Water Board;

(3) Receiving waters recognized as sensitive or highly valued by the Copermittees, including estuaries designated under the National Estuary Program under CWA section 320, marine protected areas, wetlands defined by the State or U.S. Fish and Wildlife Service's National Wetlands Inventory as wetlands, waters having the Preservation of Biological Habitats of Special Significance (BIOL) beneficial use designation, and receiving waters identified as ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(4) The receiving water limitations of Provision A.2;

(5) Known historical versus current physical, chemical, and biological water quality conditions;

(6) Available, relevant, and appropriately collected and analyzed physical, chemical, and biological receiving water monitoring data, including, but not limited to, data describing:

(a) Chemical constituents,

(b) Water quality parameters (i.e. pH, temperature, conductivity, etc.),

(c) Toxicity Identification Evaluations for both receiving water column and sediment,

(d) Trash impacts,

(e) Bioassessments, and

(f) Physical habitat;

(7) Available evidence of erosional impacts in receiving waters due to accelerated flows (i.e. hydromodification);

(8) Available evidence of adverse impacts to the chemical, physical, and biological integrity of receiving waters; and

(9) The potential improvements in the overall condition of the Watershed Management Area that can be achieved.

b. ASSESSMENT OF IMPACTS FROM MS4 DISCHARGES

The Copermittees must consider the following, at a minimum, to identify the potential impacts to receiving waters that may be caused or contributed to by discharges from the Copermittees' MS4s:

(1) The discharge prohibitions of Provision A.1 and effluent limitations of Provision A.3; and

(2) Available, relevant, and appropriately collected and analyzed storm water and non-storm water monitoring data from the Copermittees' MS4 outfalls;

(3) Locations of each Copermittee's MS4 outfalls that discharge to receiving waters;

(4) Locations of MS4 outfalls that are known to persistently discharge non-storm water to receiving waters likely causing or contributing to impacts on receiving water beneficial uses;

(5) Locations of MS4 outfalls that are known to discharge pollutants in storm water causing or contributing to impacts on receiving water beneficial uses; and

(6) The potential improvements in the quality of discharges from the MS4 that can be achieved.

c. IDENTIFICATION OF PRIORITY WATER QUALITY CONDITIONS

(1) The Copermittees must use the information gathered for Provisions B.2.a and B.2.b to develop a list of priority water quality conditions as pollutants, stressors and/or receiving water conditions that are the highest threat to receiving water quality or that most adversely affect the quality of receiving waters. The list must include the following information for each priority water quality condition:

(a) The beneficial use(s) associated with the priority water quality condition;

(b) The geographic extent of the priority water quality condition within the Watershed Management Area, if known;

(c) The temporal extent of the priority water quality condition (e.g., dry weather and/or wet weather);

(d) The Copermittees with MS4s discharges that may cause or contribute to the priority water quality condition; and

(e) An assessment of the adequacy of and data gaps in the monitoring data to characterize the conditions causing or contributing to the priority water quality condition, including a consideration of spatial and temporal variation.

(2) The Copermittees must identify the highest priority water quality conditions to be addressed by the Water Quality Improvement Plan, and provide a rationale for selecting a subset of the water quality conditions identified pursuant to Provision B.2.c.(1) as the highest priorities.

d. IDENTIFICATION OF MS4 SOURCES OF POLLUTANTS AND/OR STRESSORS

The Copermittees must identify and prioritize known and suspected sources of storm water and non-storm water pollutants and/or other stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c. The identification of known and suspected sources of pollutants and/or stressors that cause or contribute to the highest priority water quality conditions as identified for Provision B.2.c must consider the following:

(1) Pollutant generating facilities, areas, and/or activities within the Watershed Management Area, including:

(a) Each Copermittee's inventory of construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas,

(b) Publicly owned parks and/or recreational areas,

(c) Open space areas,

(d) All currently operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste, and

(e) Areas not within the Copermittees' jurisdictions (e.g., Phase II MS4s, tribal lands, state lands, federal lands) that are known or suspected to be discharging to the Copermittees' MS4s;

(2) Locations of the Copermittees' MS4s, including the following:

(a) All MS4 outfalls that discharge to receiving waters, and

(b) Locations of major structural controls for storm water and non-storm water (e.g., retention basins, detention basins, major infiltration devices, etc.);

(3) Other known and suspected sources of non-storm water or pollutants in storm water discharges to receiving waters within the Watershed Management Area, including the following:

(a) Other MS4 outfalls (e.g., Phase II Municipal and Caltrans),

(b) Other NPDES permitted discharges,

(c) Any other discharges that may be considered point sources (e.g., private outfalls), and

(d) Any other discharges that may be considered non-point sources (e.g., agriculture, wildlife or other natural sources);

(4) Review of available data, including but not limited to:

(a) Findings from the Copermittees' illicit discharge detection and elimination programs,

(b) Findings from the Copermittees' MS4 outfall discharge monitoring,

(c) Findings from the Copermittees' receiving water monitoring,

(d) Findings from the Copermittees' MS4 outfall discharge and receiving water assessments, and

(e) Other available, relevant, and appropriately collected data, information, or studies related to pollutant sources and/or stressors that contribute to the highest priority water quality conditions as identified for Provision B.2.c.

(5) The adequacy of the available data to identify and prioritize sources and/or stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c.

e. IDENTIFICATION OF POTENTIAL WATER QUALITY IMPROVEMENT STRATEGIES

The Copermittees must evaluate the findings identified under Provisions B.2.a-d, and identify potential strategies that can result in improvements to water quality in MS4 discharges and/or receiving waters within the Watershed Management Area. Potential water quality improvement strategies that may be implemented within the Watershed Management Area must include the following:

(1) Structural BMPs, non-structural BMPs, incentives, or programs that can potentially be implemented to address the highest priority water quality conditions identified under Provision B.2.c, or MS4 sources of pollutants or stressors identified under Provision B.2.d,

(2) Retrofitting projects in areas of existing development within the Watershed Management Area that can potentially be implemented to reduce MS4 sources of pollutants or stressors identified under Provision B.2.d causing or contributing to the highest priority water quality conditions identified under Provision B.2.c, and

(3) Stream, channel, and/or habitat rehabilitation projects within the Watershed Management Area that can potentially be implemented to protect and/or improve conditions in receiving waters from MS4 pollutants and/or stressors identified under Provision B.2.d causing or contributing to the highest priority water quality conditions identified under Provision B.2.c.

3. Water Quality Improvement Goals, Strategies and Schedules

The Copermittees must identify and develop specific water quality improvement goals and strategies to address the highest priority water quality conditions identified within a Watershed Management Area. The water quality improvement goals and strategies must address the highest priority water quality conditions by effectively prohibiting non-storm water discharges to the MS4, reducing pollutants in storm water discharges from the MS4 to the MEP, and protecting the water quality standards of receiving waters.

a. WATER QUALITY IMPROVEMENT GOALS AND SCHEDULES

(1) Numeric Goals

The Copermittees must develop and incorporate numeric goals[7] into the Water Quality Improvement Plan. Numeric goals must be used to support

[7] Interim and final numeric goals may take a variety of forms such as TMDL established WQBELs, action levels, pollutant concentration, load reductions, number of impaired water bodies delisted from the List of Water Quality Impaired Segments, Index of Biotic Integrity (IBI) scores, or other appropriate metrics. Interim and final numeric goals are not necessarily limited to one criterion or indicator, but may include multiple criteria and/or indicators. Except for TMDL established WQBELs, interim and final numeric goals and corresponding schedules may be revised through the adaptive management process under Provision B.5.

Water Quality Improvement Plan implementation and measure reasonable progress towards addressing the highest priority water quality conditions identified under Provision B.2.c. The Copermittees must establish and incorporate the following numeric goals in the Water Quality Improvement Plan:

(a) Final numeric goals must be based on measureable criteria or indicators capable of demonstrating one or more of the following:

(i) Discharges from the Copermittees' MS4s will not cause or contribute to exceedances of water quality standards in receiving waters, AND/OR

(ii) The conditions of receiving waters and associated habitat are protected from MS4 discharges, AND/OR

(iii) Beneficial uses of receiving waters are protected from MS4 discharges and will be supported.

(b) Interim numeric goals must be based on measureable criteria or indicators capable of demonstrating reasonable incremental progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges as follows:

(i) One or more interim numeric goals may be established to demonstrate progress toward achieving each final numeric goal,

(ii) For each final numeric goal, at least one interim numeric goal must be expressed as a reasonable increment toward achievement of the final numeric goal,

(iii) For each final numeric goal, reasonable interim numeric goals must be established to be accomplished during each 5 year period between the acceptance of the Water Quality Improvement Plan and the achievement of the final numeric goals.

(2) <u>Schedules for Achieving Numeric Goals</u>

The Copermittees must develop and incorporate schedules for achieving the numeric goals into the Water Quality Improvement Plan. The schedules must demonstrate reasonable progress toward achieving the final numeric goals required for Provision B.3.a.(1). The Copermittees must incorporate the schedules for achieving the numeric goals into the Water Quality Improvement Plan based on the following considerations:

(a) Final dates for achieving all final numeric goals must be established considering the following:

(i) Final compliance dates for any applicable TMDLs in Attachment E to this Order;

(ii) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(iii) Achievement of the final numeric goals for the highest water quality priorities must be as soon as possible;

(iv) Final dates for achieving the final numeric goals must reflect a realistic assessment of the shortest practicable time required based on the temporal and spatial extent and factors associated with the highest priority water quality conditions identified under Provision B.2.c, and taking into account the time reasonably required to implement the water quality improvement strategies required pursuant to Provision B.3.b.

(b) Interim dates for achieving all interim numeric goals must be established considering the following:

(i) Interim compliance dates for any applicable TMDLs in Attachment E to this Order;

(ii) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A);

(iii) Interim dates for achieving the interim numeric goals must reflect a realistic assessment of the shortest practicable time reasonably required, taking into account the time needed to implement new or significantly expanded programs and securing financing, if necessary; and

(iv) For each final numeric goal, at least one interim numeric goal must be established that the Copermittees will work toward achieving within the term of this Order.

b. WATER QUALITY IMPROVEMENT STRATEGIES AND SCHEDULES

Based on the likely effectiveness and efficiency of the potential water quality improvement strategies identified under Provision B.2.e to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a, the Copermittees must identify the strategies that will be implemented in each Watershed Management Area as follows:

(1) Jurisdictional Strategies

(a) Each Copermittee in the Watershed Management Area must identify the strategies that will be implemented within its jurisdiction as part of its jurisdictional runoff management program requirements under Provisions E.2 through E.7, including descriptions of the following:

(i) For each of the inventories developed for its jurisdiction, as required under Provisions D.2.a.(1), E.3.e.(2), E.4.b, and E.5.a, each Copermittee must identify the known and suspected areas or sources causing or contributing to the highest priority water quality conditions in the Watershed Management Area that the Copermittee will focus on in its efforts to effectively prohibit non-storm water discharges to its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, and achieve the interim and final numeric goals identified under Provision B.3.a;

(ii) BMPs that each Copermittee will implement, or require to be implemented, as applicable, for those areas or sources within its jurisdiction;

(iii) Education programs that each Copermittee will implement, as applicable, for those areas or sources within its jurisdiction;

(iv) Frequencies that each Copermittee will conduct inspections on those areas or sources within its jurisdiction;

(v) Incentive and enforcement programs that each Copermittee will implement, as applicable, for those areas or sources within its jurisdiction; and

(vi) Any other BMPs, incentives, or programs that each Copermittee will implement for those areas or sources within its jurisdiction.

(b) Identify the optional jurisdictional strategies that each Copermittee will implement within its jurisdiction, as necessary, to effectively prohibit non-storm water discharges to its MS4, reduce pollutants in storm water discharges from its MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. Descriptions of the optional jurisdictional strategies must include:

(i) BMPs, incentives, or programs that may be implemented by the Copermittee within its jurisdiction in addition to the requirements of Provisions B.3.b.(1)(a);

(ii) Incentives or programs that may be implemented by the Copermittee to encourage or implement projects to retrofit areas of existing development within its jurisdiction;

(iii) Incentives or programs that may be implemented by the Copermittee to encourage or implement projects that will rehabilitate the conditions of channels or habitats within its jurisdiction;

(iv) The funds and/or resources that must be secured by the Copermittee to implement the optional strategies described for Provisions B.3.b.(1)(b)(i)-(iii) within its jurisdiction; and

(v) The circumstances necessary to trigger implementation of the optional jurisdictional strategies, in addition to the requirements of Provision B.3.b.(1)(a), to achieve the interim and final numeric goals within the schedules established under Provision B.3.a.

(c) Identify the strategies that will be implemented by the Copermittee in coordination with or with the cooperation of other agencies (e.g. Caltrans, water districts, school districts) and/or entities (e.g. non-governmental organizations) within its jurisdiction.

(2) Watershed Management Area Strategies

The Copermittees must identify the optional regional or multi-jurisdictional strategies that will be implemented in the Watershed Management Area, as necessary, to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, protect the beneficial uses of receiving waters from MS4 discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a. Descriptions of the optional regional or multi-jurisdictional strategies must include:

(a) Regional or multi-jurisdictional BMPs, incentives, or programs that may be implemented by the Copermittees in the Watershed Management Area;

(b) Incentives or programs that may be implemented by the Copermittees in the Watershed Management Area to encourage or implement regional or multi-jurisdictional projects to retrofit areas of existing development;

(c) Incentives or programs that may be implemented by the Copermittees to encourage or implement regional or multi-jurisdictional projects that will rehabilitate the conditions of channels, streams, or habitats within the Watershed Management Area;

(d) The funds and/or resources that must be secured by the Copermittees to implement the optional strategies described for Provisions B.3.b.(2)(a)-(c) within the Watershed Management Area; and

(e) The circumstances necessary to trigger implementation of the optional regional or multi-jurisdictional strategies to achieve the interim and final numeric goals within the schedules established under Provision B.3.a.

(3) Schedules for Implementing Strategies

The Copermittees must develop reasonable schedules for implementing the water quality improvement strategies identified under Provisions B.3.b.(1) and B.3.b.(2) to achieve the interim and final numeric goals identified and schedules established under Provision B.3.a. The Copermittees must incorporate the schedules to implement the water quality improvement strategies into the Water Quality Improvement Plan as follows:

(a) Each Copermittee must develop schedules for the jurisdictional strategies identified pursuant to Provisions B.3.b.(1)(a)-(b). Each schedule must specify:

(i) If each jurisdictional strategy identified pursuant to Provision B.3.b.(1)(a) will or will not be initiated upon acceptance of the Water Quality Improvement Plan;

(ii) For each jurisdictional strategy identified pursuant to Provision B.3.b.(1)(a) that will not be initiated upon acceptance of the Water Quality Improvement Plan, the shortest practicable time in which each jurisdictional strategy will be initiated after acceptance of the Water Quality Improvement Plan;

(iii) For each optional jurisdictional strategy identified pursuant to Provision B.3.b.(1)(b), a realistic assessment of the shortest practicable time required to:

[a] Secure the resources needed to fund the optional jurisdictional strategy, and
[b] Procure the resources, materials, labor, and applicable permits necessary to initiate implementation of the optional jurisdictional strategy;

(iv) If each jurisdictional strategy identified pursuant to Provisions B.3.b.(1)(a)-(b) is expected to be continuously implemented (e.g. inspections) or completed within a schedule (e.g. construction of structural BMP); and

(v) If a jurisdictional strategy identified pursuant to Provisions B.3.b.(1)(a)-(b) is expected to be completed within a schedule, the anticipated time to complete based on a realistic assessment of the shortest practicable time required.

(b) The Copermittees in the Watershed Management Area must develop schedules for the regional or multi-jurisdictional strategies identified pursuant to Provision B.3.b.(2). Each schedule must specify:

(i) A realistic assessment of the shortest practicable time to:

[a] Secure the resources needed to fund the optional regional or multi-jurisdictional strategy, and
[b] Procure the resources, materials, labor, and permits necessary to initiate the implementation of the optional regional or multi-jurisdictional strategy;

(ii) If each regional or multi-jurisdictional strategy identified pursuant to Provision B.3.b.(2) is expected to be continuously implemented (e.g. inspections) or completed within a schedule (e.g. construction of structural BMP); and

(iii) If a regional or multi-jurisdictional strategy and/or activity identified pursuant to Provisions B.3.b.(2) is expected to be completed within a schedule, the anticipated time to complete based on a realistic assessment of the shortest practicable time required.

(4) <u>Optional Watershed Management Area Analysis</u>

(a) For each Watershed Management Area, the Copermittees have the option to perform a Watershed Management Area Analysis for the purpose of developing watershed-specific requirements for structural BMP implementation, as described in Provision E.3.c.(3). The Watershed Management Area Analysis must include GIS layers (maps) as output. The analysis must include the following information, to the extent it is available, in order to characterize the Watershed Management Areas:

(i) A description of dominant hydrologic processes, such as areas where infiltration or overland flow likely dominates;

(ii) A description of existing streams in the watershed, including bed material and composition, and if they are perennial or ephemeral;

(iii) Current and anticipated future land uses;

(iv) Potential coarse sediment yield areas; and

(v) Locations of existing flood control structures and channel structures, such as stream armoring, constrictions, grade control structures, and hydromodification or flood management basins.

(b) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify and compile a list of candidate projects that could potentially be used as

alternative compliance options for Priority Development Projects, to be implemented in lieu of onsite structural BMP performance requirements described in Provisions E.3.c.(1) and E.3.c.(2)(a). Specifically, the Copermittees must identify opportunities to be included in the list of candidate projects in each Watershed Management Area, such as:

(i) Stream or riparian area rehabilitation;

(ii) Retrofitting existing infrastructure to incorporate storm water retention or treatment;

(iii) Regional BMPs;

(iv) Groundwater recharge projects;

(v) Water supply augmentation projects; and

(vi) Land purchases to preserve floodplain functions.

(c) The Copermittees must use the results of the Watershed Management Area Analysis performed pursuant to Provision B.3.b.(4)(a) to identify areas within the Watershed Management Area where it is appropriate to allow Priority Development Projects to be exempt from the hydromodification management BMP performance requirements described in Provision E.3.c.(2), including supporting rationale.

c. Prohibitions and Limitations Compliance Option

Each Copermittee has the option to utilize the implementation of the Water Quality Improvement Plan to demonstrate compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b within a Watershed Management Area subject to the following conditions:

(1) A Copermittee is eligible to be deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b within a Watershed Management Area when the Water Quality Improvement Plan for a Watershed Management Area incorporates the following:

(a) Numeric goals, water quality improvement strategies, and schedules developed pursuant to Provisions B.3.a and B.3.b that include the following:

(i) Interim and final WQBELs established by the TMDLs in Attachment E to this Order applicable to the Copermittee's jurisdiction within the Watershed Management Area; AND

(ii) Interim and final numeric goals for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012

(included as Attachment A to this Order) applicable to the Copermittee's jurisdiction within the Watershed Management Area; AND

(iii) Interim and final numeric goals applicable to the Copermittee's MS4 discharges within the Watershed Management Area expressed as numeric concentration-based or load-based goals for all pollutants and conditions listed on the Clean Water Act Section 303(d) List of Water Quality Impaired Segments[8] for the receiving waters in the Watershed Management Area that do not have a TMDL incorporated into Attachment E to this Order; AND/OR

(iv) Interim and final numeric goals for pollutants and conditions identified as receiving water priorities in the Water Quality Improvement Plan that will result in chemical, physical, and biological conditions protective of the beneficial uses of the receiving waters impacted by the Copermittee's MS4 discharges within the Watershed Management Area; AND

(v) The Copermittee has the option to include interim and final numeric goals applicable to the Copermittee's MS4 discharges and/or receiving waters within the Watershed Management Area for any pollutants or conditions in addition to those described in Provisions B.3.c.(1)(a)(i)-(iv); AND

(vi) Schedules for achieving each final numeric goal that reflect a realistic assessment of the shortest practicable time needed for achievement; AND

(vii) For each final numeric goal developed pursuant to Provisions B.3.a and B.3.c.(1)(a)(i)-(v), annual milestones[9] and the dates for their achievement must be included within each of the next five (5) Water Quality Improvement Plan Annual Report reporting periods, or until the final numeric goal is achieved. Annual milestones and the dates for their achievement for the 5 Water Quality Improvement Plan Annual Report reporting periods of the next permit term, or until the final numeric goal is achieved, must be provided as part of the Report of Waste Discharge required pursuant to Provision F.5.

(b) An analysis that meets all of the following conditions:

(i) The analysis, with clearly stated assumptions included in the analysis, must quantitatively demonstrate that the implementation of

[8] 2010 and subsequent 303(d) Lists

[9] Annual milestones for each final numeric goal must be clearly and directly linked to, or demonstrate progress is being made toward the achievement of the final numeric goal. The annual milestones may consist of water quality improvement strategy implementation phases, interim numeric goals, and other acceptable metrics. The annual milestones may address multiple numeric goals and/or multiple water bodies, as applicable and appropriate.

the water quality improvement strategies required under Provision B.3.b will achieve the final numeric goals within the schedules developed pursuant to Provisions B.3.a and B.3.c.(1)(a).

(ii) The development of the analysis must include a public participation process which allows the public to review and provide comments on the analysis methodology utilized and the assumptions included in the analysis. Public comments and responses must be included as part of the analysis documentation included in the Water Quality Improvement Plan.

(iii) The analysis may be performed by an individual Copermittee or jointly by two or more Copermittees choosing to utilize this compliance option for their jurisdictions within the Watershed Management Area.

(iv) The analysis must be updated as part of the iterative approach and adaptive management process required under Provisions B.5.a-b.

(c) Specific monitoring and assessments required pursuant to Provision B.4.a that will be performed by the Copermittee capable of 1) demonstrating whether the implementation of the water quality improvement strategies are making progress toward achieving the numeric goals in accordance with the established schedules developed pursuant to Provisions B.3.a and B.3.c.(1)(a), and 2) determining whether interim and final numeric goals have been achieved. The specific monitoring and assessments must be updated as part of the iterative approach and adaptive management process required under Provision B.5.c.

(d) Documentation showing that the numeric goals, schedules, and annual milestones proposed pursuant to Provision B.3.c.(1)(a), the analysis performed pursuant to Provision B.3.c.(1)(b), and the specific monitoring and assessments proposed pursuant to Provision B.3.c.(1)(c) have been reviewed by the Water Quality Improvement Consultation Panel (see Provision F.1.a.(1)(b)). Updates must be reviewed by the Water Quality Improvement Consultation Panel for any recommendations.

(2) Each Copermittee that voluntarily completes the requirements of Provision B.3.c.(1) is deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b for the pollutants and conditions for which numeric goals are developed when the Water Quality Improvement Plan, incorporating the requirements of Provision B.3.c.(1), is accepted by the San Diego Water Board pursuant to Provision F.1.b or F.2.c. The Copermittee is deemed in compliance during the term of this Order as long as:

(a) The Copermittee is implementing the water quality improvement strategies within its jurisdiction developed pursuant to Provision B.3.b.(1) and in

compliance with the schedules for implementing the strategies established pursuant to Provisions B.3.b.(3)(a) and B.3.c.(1)(a)(vii); AND

(b) The Copermittee is performing the monitoring and assessments developed pursuant to Provision B.3.c.(1)(c); AND

(c) The Copermittee's assessments in the Water Quality Improvement Plan Annual Report submitted pursuant to Provision F.3.b.(3) support a conclusion that: 1) the Copermittee is in compliance with the annual milestones and dates for achievement developed pursuant to Provision B.3.c.(1)(a)(vii), OR 2) the Copermittee has provided acceptable rationale and recommends appropriate modifications to the interim numeric goals, and/or water quality improvement strategies, and/or schedules to improve the rate of progress toward achieving the final numeric goals developed pursuant to Provisions B.3.a and B.3.c.(1)(a)(i)-(vi); AND

(d) Any proposed modifications to the numeric goals, strategies, schedules, and/or annual milestones are accepted by the San Diego Water Board as part of subsequent updates to the Water Quality Improvement Plan pursuant to Provision F.2.c;[10] AND

(e) The Copermittee is implementing the requirements of Provision A.4.a.

4. Water Quality Improvement Monitoring and Assessment Program

a. The Copermittees in each Watershed Management Area must develop and incorporate an integrated monitoring and assessment program into the Water Quality Improvement Plan that assesses: 1) the progress toward achieving the numeric goals and schedules, 2) the progress toward addressing the highest priority water quality conditions for each Watershed Management Area, and 3) each Copermittee's overall efforts to implement the Water Quality Improvement Plan.

b. The monitoring and assessment program must incorporate the monitoring and assessment requirements of Provision D, which may allow the Copermittees to modify the program to be consistent with and focus on the highest priority water quality conditions for each Watershed Management Area.

c. For Watershed Management Areas with applicable TMDLs, the monitoring and assessment program must incorporate the specific monitoring and assessment requirements of Attachment E.

[10] A request for proposed changes to the Water Quality Improvement Plan does not stay any permit condition.

d. For Watershed Management Areas with any ASBS, the water quality monitoring and assessment program must incorporate the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

5. Iterative Approach and Adaptive Management Process

The Copermittees in each Watershed Management Area must implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a, and must include the following:

a. RE-EVALUATION OF PRIORITY WATER QUALITY CONDITIONS

The priority water quality conditions and potential water quality improvement strategies included in the Water Quality Improvement Plan pursuant to Provisions B.2.c and B.2.e may be re-evaluated by the Copermittees as needed during the term of this Order as part of the Water Quality Improvement Plan Annual Report. Re-evaluation and recommendations for modifications to the priority water quality conditions and potential water quality improvement strategies must be provided in the Report of Waste Discharge, and must consider the following:

(1) Achieving the outcome of improved water quality in MS4 discharges and receiving waters through implementation of the water quality improvement strategies identified in the Water Quality Improvement Plan;

(2) New information developed when the requirements of Provisions B.2.a-c have been re-evaluated;

(3) Spatial and temporal accuracy of monitoring data collected to inform prioritization of water quality conditions and implementation strategies to address the highest priority water quality conditions;

(4) Availability of new information and data from sources other than the jurisdictional runoff management programs within the Watershed Management Area that informs the effectiveness of the actions implemented by the Copermittees;

(5) San Diego Water Board recommendations; and

(6) Recommendations for modifications solicited through a public participation process.

b. ADAPTATION OF GOALS, STRATEGIES AND SCHEDULES

The water quality improvement goals, strategies and schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.3, must be re-evaluated and adapted as new information becomes available to result in more effective and efficient measures to address the highest priority water quality conditions identified pursuant to Provision B.2.c. Re-evaluation of and modifications to the water quality improvement goals, strategies and schedules must be provided in the Water Quality Improvement Plan Annual Report, and must consider the following:

(1) Modifications to the priority water quality conditions based on Provision B.5.a;

(2) Progress toward achieving interim and final numeric goals in receiving waters and MS4 discharges for the highest priority water quality conditions in the Watershed Management Area,

(3) Progress toward achieving outcomes according to established schedules;

(4) New policies or regulations that may affect identified numeric goals;

(5) Measurable or demonstrable reductions of non-storm water discharges to and from each Copermittee's MS4;

(6) Measurable or demonstrable reductions of pollutants in storm water discharges from each Copermittee's MS4 to the MEP;

(7) New information developed when the requirements of Provisions B.2.b and B.2.d have been re-evaluated;

(8) Efficiency in implementing the Water Quality Improvement Plan;

(9) San Diego Water Board recommendations; and

(10) Recommendations for modifications solicited through a public participation process.

c. ADAPTATION OF MONITORING AND ASSESSMENT PROGRAM

The water quality improvement monitoring and assessment program, included in the Water Quality Improvement Plan pursuant to Provision B.4, must be re-evaluated and adapted when new information becomes available. Re-evaluation and recommendations for modifications to the monitoring and assessment program, pursuant to the requirements of Provision D, may be provided in the Water Quality Improvement Plan Annual Report, but must be provided in the Report of Waste Discharge.

d. ADAPTATION OF PROHIBITIONS AND LIMITATIONS COMPLIANCE OPTION

If a Copermittee has implemented the Prohibitions and Limitations Compliance Option allowed to be included in the Water Quality Improvement Plan pursuant to Provision B.3.c, the Copermittee must re-evaluate and adapt the numeric goals, water quality improvement strategies, schedules, and annual milestones required under Provision B.3.c.(1) when significant new information becomes available, or with the Report of Waste Discharge required pursuant to Provision F.5. Significant changes in the numeric goals, water quality improvement strategies, schedules, or annual milestones requires an update to the analysis required under Provision B.3.c.(2).

6. Water Quality Improvement Plan Submittal, Updates, and Implementation

a. The Copermittees must submit and commence implementation of the Water Quality Improvement Plans in accordance with the requirements of Provision F.1.

b. The Copermittees must submit proposed updates to the Water Quality Improvement Plan for acceptance by the San Diego Water Board Executive Officer in accordance with the requirements of Provision F.2.c.

C. ACTION LEVELS

The purpose of this provision is for the Copermittees to incorporate numeric action levels in the Water Quality Improvement Plans. The goal of the action levels is to guide Water Quality Improvement Plan implementation efforts and measure progress towards the protection of water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through monitoring and assessing the quality of the MS4 discharges during the implementation of the Water Quality Improvement Plans.

1. Non-Storm Water Action Levels[11]

The Copermittees must develop and incorporate numeric non-storm water action levels (NALs) into the Water Quality Improvement Plan to: 1) support the development and prioritization of water quality improvement strategies for effectively prohibiting non-storm water discharges to the MS4s, 2) assess the effectiveness of the water quality improvement strategies toward addressing MS4 non-storm water discharges, required pursuant to Provision D.4.b.(1), and 3) support the detection and elimination of non-storm water and illicit discharges to the MS4, required pursuant to Provision E.2.[12]

a. The following NALs must be incorporated:

(1) Non-Storm Water Discharges from MS4s to Ocean Surf Zone

Table C-1. Non-Storm Water Action Levels for Discharges from MS4s to Ocean Surf Zone

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Total Coliform	MPN/100 ml	1,000	-	10,000/1,000[1]	OP
Fecal Coliform	MPN/100 ml	200[2]	-	400	OP
Enterococci	MPN/100 ml	35	-	104[3]	OP

Abbreviations/Acronyms
AMAL – average monthly action level
MDAL – maximum daily action level
OP – Ocean Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Total coliform density NAL is 1,000 MPN/100 ml when the fecal/total coliform ratio exceeds 0.1.
2. Fecal coliform density NAL is 200 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas."

[11] NALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, unless the NAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed.
[12] The Copermittees may utilize NALs or other benchmarks currently established by the Copermittees as interim NALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

(2) Non-Storm Water Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Table C-2. Non-Storm Water Action Levels for Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Turbidity	NTU	75	-	225	OP
pH	Units	Within limit of 6.0 to 9.0 at all times			OP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	35	-	104[3]	BP
Priority Pollutants	µg/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
OP – Ocean Plan water quality objective
NTU – Nephelometric Turbidity Units
µg/L – micrograms per liter
MDAL – maximum daily action level
BP – Basin Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas" and is not applicable to water bodies that are not designated with the water contact recreation (REC-1) beneficial use.

Table C-3. Non-Storm Water Action Levels for Priority Pollutants

Parameter	Units	Freshwater (CTR)		Saltwater (CTR)	
		MDAL	AMAL	MDAL	AMAL
Cadmium	µg/L	**	**	16	8
Copper	µg/L	*	*	5.8	2.9
Chromium III	µg/L	**	**	-	-
Chromium VI	µg/L	16	8.1	83	41
Lead	µg/L	*	*	14	2.9
Nickel	µg/L	**	**	14	6.8
Silver	µg/L	*	*	2.2	1.1
Zinc	µg/L	*	*	95	47

Abbreviations/Acronyms:
CTR – California Toxic Rule
AMAL – average monthly action level
µg/L – micrograms per liter
MDAL – maximum daily action level

Notes:
* Action levels developed on a case-by-case basis (see below)
** Action levels developed on a case-by-case basis (see below), but calculated criteria are not to exceed Maximum Contaminant Levels (MCLs) under the California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64431

The Cadmium, Copper, Chromium (III), Lead, Nickel, Silver and Zinc NALs for MS4 discharges to freshwater receiving waters will be developed on a case-by-case basis based on site-specific water quality data (receiving water hardness). For these priority pollutants, refer to 40 CFR 131.38(b)(2).

(3) Non-Storm Water Discharges from MS4s to Inland Surface Waters

Table C-4. Non-Storm Water Action Levels for Discharges from MS4s to Inland Surface Waters

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Dissolved Oxygen	mg/L	Not less than 5.0 in WARM waters and not less than 6.0 in COLD waters			BP
Turbidity	NTU	-	20	See MDAL	BP
pH	Units	Within limit of 6.5 to 8.5 at all times			BP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	33	-	61[3]	BP
Total Nitrogen	mg/L	-	1.0	See MDAL	BP
Total Phosphorus	mg/L	-	0.1	See MDAL	BP
MBAS	mg/L	-	0.5	See MDAL	BP
Iron	mg/L	-	0.3	See MDAL	BP
Manganese	mg/L	-	0.05	See MDAL	BP
Priority Pollutants	µg/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
BP – Basin Plan water quality objective
COLD – cold freshwater habitat beneficial use
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
MDAL – maximum daily action level
WARM – warm freshwater habitat beneficial use
MBAS – Methylene Blue Active Substances
MPN/100 ml – most probable number per 100 milliliters
µg/L – micrograms per liter

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for freshwater "designated beach areas" and is not applicable to water bodies that are not designated with the water contact recreation (REC-1) beneficial use.

b. If not identified in Provision C.1.a, NALs must be identified, developed and incorporated in the Water Quality Improvement Plan for any pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in receiving waters associated with the highest priority water quality conditions related to non-storm water discharges from the MS4s. NALs must be based on:

(1) Applicable water quality standards which may be dependent upon site-specific or receiving water-specific conditions or assumptions to be identified by the Copermittees; or

(2) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the NALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary NALs specific to the Watershed Management Area at levels greater than the NALs required by Provisions C.1.a and C.1.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for effectively prohibiting non-storm water discharges to the MS4s, as well as the detection and

elimination of non-storm water and illicit discharges to and from the MS4. The secondary NALs may be developed using an approach acceptable to the San Diego Water Board.

d. Dry weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.b may be utilized to develop or revise NALs based on watershed-specific data, subject to San Diego Water Board Executive Officer approval.

2. Storm Water Action Levels[13]

The Copermittees must develop and incorporate numeric storm water action levels (SALs) in the Water Quality Improvement Plans to: 1) support the development and prioritization of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s, and 2) assess the effectiveness of the water quality improvement strategies toward reducing pollutants in storm water discharges, required pursuant to Provision D.4.b.(2).[14]

a. The following SALs for discharges of storm water from the MS4 must be incorporated:

Table C-5. Storm Water Action Levels for Discharges from MS4s to Receiving Waters

Parameter	Units	Action Level
Turbidity	NTU	126
Nitrate & Nitrite (Total)	mg/L	2.6
Phosphorus (Total P)	mg/L	1.46
Cadmium (Total Cd)*	µg/L	3.0
Copper (Total Cu)*	µg/L	127
Lead (Total Pb)*	µg/L	250
Zinc (Total Zn)*	µg/L	976

Abbreviations/Acronyms:
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
µg/L – micrograms per liter

Notes:
* The sampling must include a measure of receiving water hardness at each MS4 outfall. If a total metal concentration exceeds the corresponding metals SAL in Table C-5, that concentration must be compared to the California Toxics Rule criteria and the USEPA 1-hour maximum concentration for the detected level of receiving water hardness associated with that sample. If it is determined that the sample's total metal concentration for that specific metal exceeds that SAL, but does not exceed the applicable USEPA 1-hour maximum concentration criterion for the measured level of hardness, then the sample result will not be considered above the SAL for that measurement.

[13] SALs incorporated into the Water Quality Improvement Plans are not considered by the San Diego Water Board to be enforceable effluent limitations, unless the SAL is based on a WQBEL expressed as an interim or final effluent limitation for a TMDL in Attachment E and the interim or final compliance date has passed.

[14] The Copermittees may utilize SALs or other benchmarks currently established by the Copermittees as interim SALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

b. If not identified in Provision C.2.a, SALs must be identified, developed and incorporated in the Water Quality Improvement Plan for pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in receiving waters associated with the highest priority water quality conditions related to storm water discharges from the MS4s. SALs must be based on:

(1) Federal and State water quality guidance and/or water quality standards; and

(2) Site-specific or receiving water-specific conditions; or

(3) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. For the SALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary SALs specific to the Watershed Management Area at levels greater than the SALs required by Provisions C.2.a and C.2.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s. The secondary SALs may be developed based on the approaches recommended by the State Water Board's Storm Water Panel[15] or using an approach acceptable to the San Diego Water Board.

d. Wet weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.c may be used to develop or revise SALs based upon watershed-specific data, subject to San Diego Water Board Executive Officer approval.

[15] Storm Water Panel Recommendations to the California State Water Resources Control Board: The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities (June 2006)

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D. MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS

The purpose of this provision is for the Copermittees to monitor and assess the impact on the conditions of receiving waters caused by discharges from the Copermittees' MS4s under wet weather and dry weather conditions. The goal of the monitoring and assessment program is to inform the Copermittees about the nexus between the health of receiving waters and the water quality condition of the discharges from their MS4s. This goal will be accomplished through monitoring and assessing the conditions of the receiving waters, discharges from the MS4s, pollutant sources and/or stressors, and effectiveness of the water quality improvement strategies implemented as part of the Water Quality Improvement Plans.

1. Receiving Water Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the condition of the receiving waters in each Watershed Management Area during dry weather and wet weather. Following San Diego Water Board acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct long-term receiving water monitoring during implementation of the Water Quality Improvement Plan to assess the long term trends and determine if conditions in receiving waters are improving. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following receiving water monitoring procedures:

a. TRANSITIONAL RECEIVING WATER MONITORING

Until the monitoring requirements and schedules of Provisions D.1.b-e are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following receiving water monitoring in the Watershed Management Area:

(1) Continue the receiving water monitoring programs required in Order Nos. R9-2007-0001 (Monitoring and Reporting Program No. R9-2007-0001 Sections II.A.1-A.5), R9-2009-0002, and R9-2010-0016, unless the Executive Officer provides conditional approval for Copermittees to proceed with implementation of the proposed monitoring and assessment program developed in accordance with Provision B.4;

(2) Continue the monitoring in the Hydromodification Management Plans approved by the San Diego Water Board;

(3) Participate in the following regional receiving water monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring,

(b) Southern California Bight Regional Monitoring, and

(c) Sediment Quality Monitoring;

(4) Implement the monitoring programs developed as part of any implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) for the TMDLs in Attachment E to this Order; and

(5) For Watershed Management Areas with ASBS, implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

b. LONG-TERM RECEIVING WATER MONITORING STATIONS

The Copermittees must select at least one long-term receiving water monitoring station from among the existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees to be representative of the receiving water quality in the Watershed Management Area. Additional long-term receiving water monitoring stations must be selected where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

c. DRY WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three dry weather monitoring events at each of the long-term receiving water monitoring stations. At least one monitoring event must be conducted during the dry season (May 1 – September 30) and at least one monitoring event must be conducted during a dry weather period during the wet season (October 1 – April 30), after the first wet weather event of the season, with an antecedent dry period of at least 72 hours following a storm event producing measureable rainfall of greater than 0.1 inch.

(1) <u>Dry Weather Receiving Water Field Observations</u>

For each dry weather monitoring event, the Copermittees must record field observations consistent with Table D-1 at each long-term receiving water monitoring station.

Table D-1. Field Observations for Receiving Water Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) • Station description (i.e. deposits or stains, vegetation condition, structural condition, and observable biology) • Presence and assessment of trash in and around station

(2) Dry Weather Receiving Water Field Monitoring

For each dry weather monitoring event, if conditions allow the collection of the data, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

Table D-2. Field Monitoring Parameters for Receiving Water Monitoring Stations

Parameters
• pH • Temperature • Specific conductivity • Dissolved oxygen • Turbidity

(3) Dry Weather Receiving Water Analytical Monitoring

For each dry weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable NAL constituents, and

(v) Constituents listed in Table D-3.

Table D-3. Analytical Monitoring Constituents for Receiving Water Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Pesticides	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Mercury • Nickel • Selenium • Thallium • Zinc	• Organophosphate Pesticides • Pyrethroid Pesticides	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(4) Dry Weather Receiving Water Toxicity Monitoring

For each dry weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for aquatic toxicity in accordance with Table D-4. When the State Water Board's Policy for Toxicity Assessment and Control (Toxicity Policy) is approved and in effect, the San Diego Water Board Executive Officer may direct the Copermittees to replace current toxicity program elements with standardized procedures in the Toxicity Policy.

Table D-4. Dry Weather Chronic[1] Toxicity Testing for Receiving Water Monitoring Stations

Organism	Units	Test	USEPA Protocol
Freshwater			
Pimephales promelas (Fathead Minnow)	Pass / Fail	Larval Survival and Growth	EPA-821-R-02-013
Ceriodaphnia dubia (*Daphnid*)	Pass / Fail	Survival and Production	EPA-821-R-02-013
Selenastrum capricornutum (Green Algae)	Pass / Fail	Growth	EPA-821-R-02-013
Marine and Estuarine			
Strongylocentrotus purpuratus *(Purple Sea Urchin)*	Pass / Fail	Embryo-Larval Development	EPA-600-R-95-136

Notes:
1. Chronic toxicity testing is not required at receiving water monitoring stations located at mass loading stations if the channel flows are diverted year-round during dry weather conditions to the sanitary sewer for treatment.

(a) Freshwater Test Species and Methods: If samples are collected in receiving waters with salinity less than 1 ppt, the Copermittees must follow the methods for chronic toxicity tests as established in 40 CFR 136.3 using a single-concentration test design for routine monitoring, or a five-concentration test design for additional toxicity testing if the limitation is exceeded. The Copermittees must estimate the critical life stage chronic toxicity on undiluted samples in accordance with species and short term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms (EPA-821-R-02-013; Table IA, 40 CFR 136). Additional test species may be used by the Copermittees if approved by the San Diego Water Board Executive Officer. The Copermittees must conduct:

(i) A static renewal toxicity test with the fathead minnow, *Pimephales promelas* (Larval Survival and Growth Test Method 1000.0);

(ii) A static renewal toxicity test with the daphnid, *Ceriodaphnia dubia* (Survival and Reproduction Test Method 1002.0); and

(iii) A static renewal toxicity test with the green alga, *Selenastrum capricornutum* (also named *Raphidocelis subcapitata*) (Growth Test Method 1003.0).

(b) Marine and Estuarine Test Species and Methods: If samples are collected in receiving waters with salinity greater or equal to 1 ppt, the Copermittees must follow the methods for chronic toxicity tests as established in 40 CFR 136.3 using a single-concentration test design for routine monitoring, or a five-concentration test design for additional toxicity testing if the limitation is exceeded. The Copermittees must conduct the following critical life state chronic toxicity tests on undiluted samples in accordance with species and short term test methods in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms (EPA-600-R-95-136; 1995). Artificial sea salts must be used to increase sample salinity. The Copermittees must conduct a static non-renewal toxicity test with the purple sea urchin, *Strongylocentrotus purpuratus* (Embryo-larval Development Test Method). Additional species may be used by the Copermittees if approved by the San Diego Water Board Executive Officer.

(c) Holding Times: All toxicity tests must be conducted as soon as possible following sample collection. The 36-hour sample holding time for test initiation shall be targeted. However, no more than 72 hours shall elapse before the conclusion of sample collection and test initiation.

(d) Test Species Sensitivity Screening: To determine the most sensitive test species for freshwater, the Copermittees must screen 2 wet weather and 2 dry weather toxicity tests with a vertebrate, an invertebrate, and a plant species. After this screening period, subsequent monitoring must be conducted using the most sensitive test species. Alternatively, if a sensitive test species has already been determined, or if there is prior knowledge of potential toxicant(s) and a test species is sensitive to such toxicant(s), then monitoring must be conducted using only that test species. Sensitive test species determinations must also consider the most sensitive test species used for proximal receiving water monitoring. Rescreening must occur once each permit term.

(e) Chronic toxicity test biological endpoint data must be analyzed using the Test of Significant Toxicity t-test approach specified in *National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document* (USEPA, Office of Wastewater Management, Washington, D.C., EPA-833-R-10-003, 2010). For this monitoring program, the critical chronic instream waste concentration (IWC) is set at 100 percent receiving water (i.e. no dilution) for receiving water samples. A 100 percent receiving water and a control must be tested.

(f) Toxicity Identification Evaluation (TIE) / Toxicity Reduction Evaluation (TRE): If chronic toxicity is detected in receiving waters, the Copermittees must discuss the need for conducting a TIE/TRE in the assessments

required under Provision D.4.a.(2), and develop a plan for implementing the TIE/TRE to be incorporated in the Water Quality Improvement Plan.

(5) Dry Weather Receiving Water Bioassessment Monitoring

Bioassessment monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must conduct bioassessment monitoring during at least one dry weather monitoring event at each long-term receiving water monitoring station as follows:

(a) The following bioassessment samples and measurements must be collected:

(i) Macroinvertebrate samples must be collected in accordance with the "Reachwide Benthos (Multihabitat) Procedure" in the most current Surface Water Ambient Monitoring Program (SWAMP) Bioassessment Standard Operating Procedures (SOP), and amendments, as applicable;[16]

(ii) The "Full" suite of physical habitat characterization measurements must be collected in accordance with the most current SWAMP Bioassessment SOP, and as summarized in the SWAMP Stream Habitat Characterization Form – Full Version;[17] and

(iii) Freshwater algae samples must be collected in accordance with the SWAMP Standard Operating Procedures for Collecting Algae Samples.[18] Analysis of samples must include algal taxonomic composition (diatoms and soft algae) and algal biomass.

(b) The bioassessment samples, measurements, and appropriate water chemistry data must be used to calculate the following:

(i) An Index of Biological Integrity (IBI) for macroinvertebrates for each monitoring station where bioassessment monitoring was conducted, based on the most current calculation method;[19] and

[16] Ode, P.R.. 2007. Standard operating procedures for collecting macroinvertebrate samples and associated physical and chemical data for ambient bioassessments in California. California State Water Resources Control Board Surface Water Ambient Monitoring Program (SWAMP) Bioassessment SOP 001. http://www.swrcb.ca.gov/water_issues/programs/swamp/tools.shtml#monitoring
[17] Available at: http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/reports/fieldforms_fullversion052908.pdf
[18] Fetscher et al. 2009. Standard Operating Procedures for Collecting Stream Algae Samples and Associated Physical Habitat and Chemical Data for Ambient Bioassessments in California.
[19] The most current calculation method at the time the Order was adopted is outlined in "A Quantitative Tool for Assessing the Integrity of Southern California Coastal Streams" (Ode, et al. 2005. Environmental Management. Vol. 35, No. 1, pp. 1-13). If an updated or new calculation method is developed, either both

(ii) An IBI for algae for each monitoring station where bioassessment monitoring was conducted, when a calculation method is developed.[20]

(c) In lieu of the requirements of Provision D.1.c.(5)(a), the Copermittees may conduct the bioassessment monitoring in accordance with the "Triad" assessment approach[21] to calculate the IBIs required for Provision D.1.c.(5)(b). The Copermittees must conduct sampling, analysis, and reporting of specified in-stream biological and habitat data according to the protocols specified in the SCCWRP Technical Report No. 539, or subsequent protocols, if developed.

(6) Dry Weather Receiving Water Hydromodification Monitoring

In addition to the hydromodification monitoring conducted as part of the Copermittees' Hydromodification Management Plans, hydromodification monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must collect the following hydromodification monitoring observations and measurements within an appropriate domain of analysis during at least one dry weather monitoring event for each long-term receiving water monitoring station:

(a) Channel conditions, including:

(i) Channel dimensions,

(ii) Hydrologic and geomorphic conditions, and

(iii) Presence and condition of vegetation and habitat;

(b) Location of discharge points;

(c) Habitat integrity;

(d) Photo documentation of existing erosion and habitat impacts, with location (i.e. latitude and longitude coordinates) where photos were taken;

(e) Measurement or estimate of dimensions of any existing channel bed or bank eroded areas, including length, width, and depth of any incisions; and

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(i.e. current and updated/new) methods must be used, or historical IBIs must be recalculated with the updated or new calculation method.

[20] When a calculation method is developed, IBIs must be calculated for all available and appropriate historical data.

[21] Stormwater Monitoring Coalition Model Monitoring Technical Committee, 2004. Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California. Technical Report #419. August 2004.

(f) Known or suspected cause(s) of existing downstream erosion or habitat impact, including flow, soil, slope, and vegetation conditions, as well as upstream land uses and contributing new and existing development.

d. WET WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three wet weather monitoring events at each long-term receiving water monitoring station. At least one wet weather monitoring event must be conducted during the first wet weather event of the wet season (October 1 – April 30), and at least one wet weather monitoring event during a wet weather event that occurs after February 1.

(1) Wet Weather Receiving Water Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each long-term receiving water monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event;

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(d) Presence and assessment of trash in and around station.

(2) Wet Weather Receiving Water Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

(3) Wet Weather Receiving Water Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) Constituents listed in Table D-3.

(4) <u>Wet Weather Receiving Water Toxicity Monitoring</u>

For each wet weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for chronic aquatic toxicity in accordance with Provisions D.1.c.(4)(a)-(f).

e. OTHER RECEIVING WATER MONITORING REQUIREMENTS

(1) Regional Monitoring

The Copermittees must participate in the following regional receiving waters monitoring programs, as applicable to the Watershed Management Area:

(a) Storm Water Monitoring Coalition Regional Monitoring; and

(b) Southern California Bight Regional Monitoring and

(c) Unified Beach Water Quality Monitoring and Assessment Program. The Orange County Copermittees shall participate in and, together with South Orange County Wastewater Authority and Orange County Health Care Agency, shall share responsibility for implementation of a unified regional beach water quality monitoring and assessment program in south Orange County, as set forth in the October 2014 report, *Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County* , issued pursuant to CWC section 13383 and subject to future revision in the San Diego Water Board December 5, 2014 Letter Directive.

(2) Sediment Quality Monitoring

The Copermittees must perform sediment monitoring to assess compliance with sediment quality receiving water limits applicable to MS4 discharges to enclosed bays and estuaries. The monitoring may be performed either by individual or multiple Copermittees to assess compliance with receiving water limits, or through participation in a water body monitoring coalition. A Sediment Monitoring Plan which satisfies the requirements of the State Water Board's Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part 1 Sediment Quality (Sediment Control Plan) must be submitted as part of the monitoring and assessment program in the Water Quality Improvement Plan.

(a) The Sediment Monitoring Plan design must include the following:

(i) The elements required under Section VII.D (Receiving Water Limits Monitoring Frequency) and Section VII.E (Sediment Monitoring) of the Sediment Control Plan;

(ii) A Quality Assurance Project Plan (QAPP) describing the project objectives and organization, functional activities, and quality assurance/quality control protocols for the water and sediment monitoring; and

(iii) A schedule for completion of all sample collection and analysis activities and submission of Sediment Monitoring Reports.

(b) The Copermittees must implement the Sediment Monitoring Plan in accordance with the schedule contained in the Sediment Monitoring Plan, unless otherwise directed in writing by the San Diego Water Board Executive Officer.

(c) The Copermittees must incorporate a Sediment Monitoring Report as part of the Water Quality Improvement Plan Annual Report in accordance with the schedule contained in the Sediment Monitoring Plan, unless otherwise directed in writing by the San Diego Water Board Executive Officer. The Sediment Monitoring Report must contain the following information:

(i) Analysis: An evaluation, interpretation and tabulation of the water and sediment monitoring data, including interpretations and conclusions as to whether applicable Receiving Water Limitations in this Order have been attained at each sample station;

(ii) Sample Location Map: The locations, type, and number of samples must be identified and shown on a site map; and

(iii) California Environmental Data Exchange Network: A statement certifying that the monitoring data and results have been uploaded into the California Environmental Data Exchange Network (CEDEN).

(d) Based on the Sediment Monitoring Report conclusions the San Diego Water Board may require a human health risk assessment to determine if the human health objective contained in Receiving Water Limitations in Provision A.2.a.(3)(b)(ii) has been attained at each sample station. In conducting a risk assessment, the Copermittees must consider any applicable and relevant information, including California Environmental Protection Agency's (Cal/EPA) Office of Environmental Health Hazard Assessment (OEHHA) policies for fish consumption and risk assessment, Cal/EPA's Department of Toxic Substances Control (DTSC) Risk Assessment, and USEPA Human Health Risk Assessment policies.

(3) <u>ASBS Monitoring</u>

For Watershed Management Areas with ASBS, the Copermittees must implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

f. ALTERNATIVE WATERSHED MONITORING REQUIREMENTS

The San Diego Water Board may direct the Copermittees to participate in an effort to develop alternative watershed monitoring with other regulated entities, other interested parties, and the San Diego Water Board to refine, coordinate, and implement regional monitoring and assessment programs to determine the status and trends of water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams.

2. MS4 Outfall Discharge Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the discharges from the MS4 outfalls in each Watershed Management Area during dry weather and wet weather. Following San Diego Water Board acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct MS4 outfall discharge monitoring during implementation of the Water Quality Improvement Plan to assess the effectiveness of their jurisdictional runoff management programs toward effectively prohibiting non-storm water discharges into the MS4 and reducing pollutants in storm water discharges from their MS4s to the MEP. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following MS4 outfall monitoring procedures:

a. TRANSITIONAL MS4 OUTFALL DISCHARGE MONITORING

Until the monitoring requirements and schedules of Provisions D.2.b-c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following MS4 outfall discharge monitoring in the Watershed Management Area:

(1) <u>MS4 Outfall Discharge Monitoring Station Inventory</u>

Each Copermittee must identify all major MS4 outfalls that discharge directly to receiving waters within its jurisdiction and geo-locate those outfalls on a map of the MS4 pursuant to Provision E.2.b.(1). This information must be compiled into a MS4 outfall discharge monitoring station inventory, and must include the following information:

(a) Latitude and longitude of MS4 outfall point of discharge;

(b) Watershed Management Area;

(c) Hydrologic subarea;

(d) Outlet size;

(e) Accessibility (i.e. safety and without disturbance of critical habitat);

(f) Approximate drainage area; and

(g) Classification of whether the MS4 outfall is known to have persistent dry weather flows, transient dry weather flows, no dry weather flows, or unknown dry weather flows.

(2) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Until the monitoring requirements and schedules of Provision D.2.b are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1.b, each Copermittee must perform dry weather MS4 outfall field screening monitoring to identify non-storm water and illicit discharges within its jurisdiction in accordance with Provision E.2.c, to determine which discharges are transient flows and which are persistent flows, and prioritize the dry weather MS4 discharges that will be investigated and eliminated in accordance with Provision E.2.d.

(a) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Frequency

Each Copermittee must field screen the MS4 outfalls in its inventory developed pursuant to Provision D.2.a.(1) as follows:

(i) For Copermittees with less than 125 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 80 percent of the outfalls must be visually inspected two times per year during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv).

(ii) For Copermittees with 125 major MS4 outfalls or more, but less than or equal to 500 that discharge to receiving waters within a Watershed Management Area, all the outfalls must be visually inspected at least annually during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv).

(iii) For Copermittees with more than 500 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 500 outfalls must be visually inspected at least annually during dry weather conditions. For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major outfalls, see Provision D.2.a.(2)(a)(iv). Copermittees with more than 500 major MS4 outfalls within a Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;

[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(iv) For any Copermittee with portions of its jurisdiction in more than one Watershed Management Area and more than 500 major MS4 outfalls within its jurisdiction, at least 500 major MS4 outfalls within its inventory must be visually inspected at least annually during dry weather conditions. Copermittees with more than 500 major MS4 outfalls in more than one Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(v) Inspections of major MS4 outfalls conducted in response to public reports and staff or contractor reports and notifications may count toward the required visual inspections of MS4 outfall discharge monitoring stations.

(b) Transitional Dry Weather MS4 Outfall Discharge Field Screening Visual Observations

(i) An antecedent dry period of at least 72 hours following any storm event producing measurable rainfall greater than 0.1 inch is required prior to conducting field screening visual observations during a field screening monitoring event.

(ii) During the field screening monitoring event, each Copermittee must record visual observations consistent with Table D-5 at each MS4 outfall discharge monitoring station inspected.

Table D-5. Field Screening Visual Observations for MS4 Outfall Discharge Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) - Flow source(s) suspected or identified from non-storm water source investigation - Flow source(s) eliminated during non-storm water source identification • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) - Known or suspected source(s) of pooled or ponded water • Station description (i.e. deposits or stains, vegetation condition, structural condition, observable biology) • Presence and assessment of trash in and around station • Evidence or signs of illicit connections or illegal dumping

(iii) Each Copermittee must implement the requirements of Provisions E.2.d.(2)(c)-(e) based on the field observations required pursuant to Provision D.2.a.(2)(b)(ii).

(iv) Each Copermittee must evaluate field observations together with existing information available from prior reports, inspections and monitoring results to determine whether any observed flowing, pooled, or ponded waters are likely to be transient or persistent flow.[22]

(c) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Records

Based upon the results of the transitional dry weather MS4 outfall discharge field screening monitoring conducted pursuant to Provisions D.2.a.(2)(a)-(b), each Copermittee must update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow.

(3) <u>Transitional Wet Weather MS4 Outfall Discharge Monitoring</u>

Until the monitoring requirements and schedules of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the

[22] Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

San Diego Water Board pursuant to Provision F.1.b, the Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(a) Transitional Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees must select wet weather MS4 outfall discharge monitoring stations from the inventories developed pursuant to Provision D.2.a.(1) for each Watershed Management Area as follows:

(i) At least five wet weather MS4 outfall discharge monitoring stations that are representative of storm water discharges from areas consisting primarily of residential, commercial, industrial, and typical mixed-use land uses present within the Watershed Management Area;

(ii) At least one wet weather MS4 outfall discharge monitoring station for each Copermittee within the Watershed Management Area; and

(iii) The County of San Diego may select at least two (2) wet weather MS4 outfall discharge monitoring stations for the portion of the Santa Margarita River Watershed Management Area within its jurisdiction to be monitored during the transitional period until the Riverside County Copermittees are notified of coverage under this Order. After the Riverside County Copermittees are notified of coverage under this Order, the Copermittees in the Watershed Management Area must select wet weather MS4 outfall discharge monitoring stations consistent with the requirements above.

(b) Transitional Wet Weather MS4 Outfall Discharge Monitoring Frequency

Each wet weather MS4 outfall discharge monitoring station selected pursuant to Provision D.2.a.(3)(a) must be monitored once during the wet season (October 1 – April 30). The wet weather monitoring events must be selected to be representative of the range of hydrological conditions experienced in the region. At least 10 percent of samples must be conducted during the first wet weather event of the wet season, to include at least one such sample in each Watershed Management Area..

(c) Transitional Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(i) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(ii) The flow rates and volumes measured or estimated from the MS4 outfall (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(d) Transitional Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(e) Transitional Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, and indicator bacteria;

(iv) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

[a] Time-weighted composites collected over the length of the storm event or the first 24 hour period whichever is shorter, composed of discrete samples, which may be collected through the use of automated equipment, or

[b] Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

[c] If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during

the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours;

(v) Only one analysis of the composite of aliquots is required;

(vi) The samples must be analyzed for the following constituents:

[a] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

[b] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and

[c] Constituents listed in Table D-6.

Table D-6. Analytical Monitoring Constituents for Wet Weather MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Nickel • Selenium • Thallium • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(f) Other Transitional Wet Weather MS4 Outfall Discharge Monitoring

The San Diego County Copermittees must continue the wet weather MS4 outfall monitoring program developed under Order No. R9-2007-0001, as approved by the San Diego Water Board, through its planned completion.

b. DRY WEATHER MS4 OUTFALL DISCHARGE MONITORING

Each Copermittee must perform dry weather MS4 outfall monitoring to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision

E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. Each Copermittee must conduct the following dry weather MS4 outfall discharge monitoring within its jurisdiction:

(1) Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Each Copermittee must continue to perform the dry weather MS4 outfall discharge field screening monitoring in accordance with the requirements of Provision D.2.a.(2). The Copermittee may adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of persistent flow non-storm water discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of visual inspections performed is equivalent to the number of visual inspections required under Provision D.2.a.(2)(a).

(2) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring

Each Copermittee must perform non-storm water persistent flow MS4 outfall discharge monitoring to determine which persistent non-storm water discharges contain concentrations of pollutants below NALs, and which persistent non-storm water discharges impact receiving water quality during dry weather. Each Copermittee must conduct the following non-storm water persistent flow MS4 outfall discharge monitoring within its jurisdiction:

(a) Prioritization of Non-Storm Water Persistent Flow MS4 Outfalls

Based upon the dry weather MS4 outfall discharge field screening monitoring records developed pursuant to Provision D.2.a.(2)(c), each Copermittee must identify and prioritize the MS4 outfalls with persistent flows based on the highest priority water quality conditions identified in the Water Quality Improvement Plan and any additional criteria developed by the Copermittee, which may include historical data and data from sources other than what the Copermittee collects.

(b) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring Frequency

(i) Based on the prioritization of major MS4 outfalls developed under Provision D.2.b.(2)(a), each Copermittee must identify, at a minimum, the 5 highest priority major MS4 outfalls with non-storm water persistent flows that the Copermittee will monitor within its jurisdiction in each Watershed Management Area. For Responsible Copermittees identified by a TMDL in Attachment E to this Order, if the 5 chosen outfall locations are not sufficient to determine compliance with the TMDL(s), then each Responsible Copermittee

must identify additional MS4 outfall monitoring locations within its jurisdiction sufficient to address compliance with the TMDL(s). If a Copermittee has less than 5 major outfalls within a Watershed Management Area, then the Copermittee must monitor all of its major MS4 outfalls with persistent flows within each Watershed Management Area. The location of the highest priority non-storm water persistent flow MS4 outfall monitoring stations must be identified on the map required pursuant to Provision E.2.b.(1). The map must specify which MS4 outfalls are being monitored for compliance with a TMDL.

(ii) Each of the highest priority non-storm water persistent flow MS4 outfall monitoring stations identified pursuant to Provision D.2.b.(2)(b)(i) must be monitored under dry weather conditions at least semi-annually until one of the following occurs:

[a] The non-storm water discharges have been effectively eliminated (i.e. no flowing, pooled, or ponded water) for three consecutive dry weather monitoring events; or

[b] The source(s) of the persistent flows has been identified as a category of non-storm water discharges that does not require an NPDES permit and does not have to be addressed as an illicit discharge because it was not identified as a source of pollutants (i.e. constituents in non-storm water discharge do not exceed NALs), and the persistent flow can be re-prioritized to a lower priority; or

[c] The constituents in the persistent flow non-storm water discharge do not exceed NALs, and the persistent flow can be re-prioritized to a lower priority; or

[d] The source(s) of the persistent flows has been identified as a non-storm water discharge authorized by a separate NPDES permit.

(iii) Where the criteria under Provision D.2.b.(2)(b)(ii) are not met, but the threat to water quality has been reduced by the Copermittee, the highest priority persistent flow MS4 outfall monitoring stations may be reprioritized accordingly for continued dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1).

(iv) Each Copermittee must document removal or re-prioritization of the highest priority persistent flow MS4 outfall monitoring stations identified under Provision D.2.b.(2)(a) in the Water Quality Improvement Plan Annual Report. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized major MS4 outfall in the Watershed Management Area within its jurisdiction, unless there are no remaining qualifying major MS4 outfalls within the Copermittee's jurisdiction in the Watershed Management Area.

(c) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Observations

During each semi-annual monitoring event, each Copermittee must record field observations consistent with Table D-5 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(d) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Monitoring

During each semi-annual monitoring event, if conditions allow the collection of the data, each Copermittee must monitor and record the parameters in Table D-2 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(e) Non-Storm Water Persistent Flow MS4 Outfall Discharge Analytical Monitoring

During each semi-annual monitoring event in which measurable flow is present, each Copermittee must collect and analyze samples from each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Collect grab or composite samples to be analyzed at a qualified laboratory for the following constituents:

[a] Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,
[b] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,
[c] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,
[d] Applicable NAL constituents, and
[e] Constituents listed in Table D-7. The Copermittees may adjust the list of constituents for the Watershed Management Area if historical data or supporting information can be provided that demonstrates or justifies the analysis of a constituent is not necessary.

Table D-7. Analytical Monitoring Constituents for Persistent Flow MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Total Hardness • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Cadmium • Copper • Lead • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(iv) If the Copermittee identifies and eliminates the source of the persistent flow non-storm water discharge, analysis of the sample is not required.

c. WET WEATHER MS4 OUTFALL DISCHARGE MONITORING

The Copermittees must perform wet weather MS4 outfall monitoring to identify pollutants in storm water discharges from the MS4s, to guide pollutant source identification efforts, and to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order. The Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(1) Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees may adjust the wet weather MS4 outfall discharge monitoring locations in the Watershed Management Area, as needed, to identify pollutants in storm water discharges from MS4s, to guide pollutant source identification efforts, and to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of stations is at least equivalent to the number of stations required under Provision D.2.a.(3)(a). Additional outfall monitoring locations, above the minimum per jurisdiction, may be required to demonstrate compliance with the WQBELs associated with the applicable TMDLs in Attachment E.

(2) Wet Weather MS4 Outfall Discharge Monitoring Frequency

The Copermittees must monitor the wet weather MS4 outfall discharge monitoring stations in the Watershed Management Area at least once (1) per year. The Copermittees may need to increase the frequency of monitoring in order to identify pollutants in storm water discharges from the MS4s causing or contributing to the highest priority water quality conditions, to guide pollutant source identification efforts, or to determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E to this Order.

(3) Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(4) Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(5) Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites collected over the length of the storm event or the first 24 hour period, whichever is shorter , composed of discrete samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

(iii) If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours.

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) The Copermittees may adjust the analytical monitoring required for the Watershed Management Area, if the Copermittees have historical data or supporting information that can demonstrate or provide justification that the analysis of a constituent is not necessary.

3. Special Studies

a. Within the term of this Order, the Copermittees must initiate the following special studies:

(1) At least two special studies in each Watershed Management Area to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that cause or contribute to highest priority water quality conditions identified in the Water Quality Improvement Plan.

(2) At least one special study for the San Diego Region to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that are impacting receiving waters on a regional basis in the San Diego Region.

(3) One of the two special studies in each Watershed Management Area required pursuant to Provision D.3.a.(1) may be replaced by a special study implemented pursuant to Provision D.3.a.(2).

b. The special studies must, at a minimum, be in conformance with the following criteria:

(1) The special studies must be related to the highest priority water quality conditions identified by the Copermittees in the Watershed Management Area and/or for the entire San Diego Region;

(2) The special studies developed pursuant to Provision D.3.a.(1) must:

(a) Be implemented within the applicable Watershed Management Area, and

(b) Require some form of participation by all the Copermittees within the Watershed Management Area;

(3) The special studies developed pursuant to Provision D.3.a.(2) must:

(a) Be implemented within the San Diego Region, and

(b) Require some form of participation by all Copermittees covered under the requirements of this Order.

(4) The Copermittees are encouraged to partner with environmental groups or third parties knowledgeable of watershed conditions to complete the required special studies.

c. Special studies developed to identify sources of pollutants and/or stressors should be pollutant and/or stressor specific and based on historical monitoring data and monitoring performed pursuant to Provisions D.1 and D.2. Development of source identification special studies should include the following:

(1) A compilation of known information on the specific pollutant and/or stressor, including data on potential sources and movement of the pollutant and/or stressor within the watershed. Data generated by the Copermittees and others, as well as information available from a literature research on the pollutant and/or stressor should be compiled and analyzed as appropriate.

(2) An identification of data gaps, based on the compiled information generated on the specific pollutant and/or stressor identified in Provision D.3.c.(1). Source identification special studies should be developed to fill identified data gaps.

(3) A monitoring plan that will collect and provide data the Copermittees can utilize to do the following:

(a) Quantify the relative loading or impact of a pollutant and/or stressor from a particular source or pollutant generating activity;

(b) Improve understanding of the fate of a pollutant and/or stressor in the environment;

(c) Develop an inventory of known and suspected sources of a pollutant and/or stressor in the Watershed Management Area; and/or

(d) Prioritize known and suspected sources of a pollutant and/or stressor based on relative magnitude in discharges, geographical distribution (i.e., regional or localized), frequency of occurrence in discharges, human health risk, and controllability.

d. Special studies initiated prior to the effective date of this Order that meet the requirements of Provision D.3.b and are implemented during the term of this Order as part of the Water Quality Improvement Plan may be utilized to fulfill the special study requirements of Provision D.3.a. Special studies completed before the effective date of this Order cannot be utilized to fulfill the special study requirements of Provision D.3.a.

e. The Copermittees must submit the monitoring plans for the special studies in the Water Quality Improvement Plans required pursuant to Provision F.1.

f. The Copermittees are encouraged to share the results of the special studies regionally among the Copermittees to provide information useful in improving and adapting the management of non-storm water and storm water runoff through the implementation of the Water Quality Improvement Plans.

4. Assessment Requirements

Each Copermittee must evaluate the data collected pursuant to Provisions D.1, D.2 and D.3, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E, to assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a. Assessments must be performed as described in the following provisions:

a. Receiving Waters Assessments

(1) The Copermittees must assess and report the conditions of the receiving waters in the Watershed Management Area as follows:

(a) Based on data collected pursuant to Provision D.1.a, the assessments under Provision D.4.a.(2) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(b) Based on the data collected pursuant to Provisions D.1.a-e, the assessments required under Provision D.4.a.(2) must be included in the Report of Waste Discharge required pursuant to Provision F.5.b.

(2) The Copermittees must assess the status and trends of receiving water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under dry weather and wet weather conditions. For each of the three types of receiving waters in each Watershed Management Area the Copermittees must:

(a) Determine whether or not the conditions of the receiving waters are meeting the numeric goals established pursuant to Provision B.3.a;

(b) Identify the most critical beneficial uses that must be protected to ensure overall health of the receiving water;

(c) Determine whether or not those critical beneficial uses are being protected;

(d) Identify short-term and/or long-term improvements or degradation of those critical beneficial uses;

(e) Determine whether or not the strategies established in the Water Quality Improvement Plan contribute towards progress in achieving the interim and final numeric goals of the Water Quality Improvement Plan; and

(f) Identify data gaps in the monitoring data necessary to assess Provisions D.4.a.(2)(a)-(e).

b. MS4 OUTFALL DISCHARGES ASSESSMENTS

(1) Non-Storm Water Discharges Reduction Assessments

(a) Each Copermittee must assess and report the progress of its illicit discharge detection and elimination program, required to be implemented pursuant to Provision E.2, toward effectively prohibiting non-storm water and illicit discharges into the MS4 within its jurisdiction as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(2), the assessments under Provision D.4.b.(1)(b) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(ii) Based on the data collected pursuant to Provisions D.2.b, the assessments required under Provision D.4.b.(1)(c) must be included in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

(iii) Based on the data collected pursuant to Provisions D.2.b, the assessment required under Provision D.4.b.(1)(c) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.a.(2), each Copermittee must assess and report the following:

(i) Identify the known and suspected controllable sources (e.g. facilities, areas, land uses, pollutant generating activities) of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area;

(ii) Identify sources of transient and persistent flows within the Copermittee's jurisdiction in the Watershed Management Area that have been reduced or eliminated; and

(iii) Identify modifications to the field screening monitoring locations and frequencies for the MS4 outfalls in its inventory necessary to identify and eliminate sources of persistent flow non-storm water discharges pursuant to Provision D.2.b.

(c) Based on the dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1), each Copermittee must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(1)(b);

(ii) Based on the data collected and applicable NALs in the Water Quality Improvement Plan, rank the MS4 outfalls in the Copermittee's jurisdiction according to potential threat to receiving water quality, and produce a prioritized list of major MS4 outfalls for follow-up action to update the Water Quality Improvement Plan, with the goal of eliminating persistent flow non-storm water discharges and/or pollutant loads in order of the ranked priority list through targeted programmatic actions and source investigations;

(iii) For the highest priority major MS4 outfalls with persistent flows that are in exceedance of NALs, identify the known and suspected sources within the Copermittee's jurisdiction in the Watershed Management Area that may cause or contribute to the NAL exceedances;

(iv) Each Copermittee must analyze the data collected pursuant to Provision D.2.b, and utilize a model or other method, to calculate or estimate the non-storm water volumes and pollutant loads collectively discharged from all the major MS4s outfalls in its jurisdiction identified as having persistent dry weather flows during the monitoring year. These calculations or estimates must be updated annually.

[a] Each Copermittee must calculate or estimate the annual non-storm water volumes and pollutant loads collectively discharged from the Copermittee's major MS4 outfalls to receiving waters within the Copermittee's jurisdiction, with an estimate of the percent contribution from each known source for each MS4 outfall;

[b] Each Copermittee must annually identify and quantify (i.e. volume and pollutant loads) sources of non-storm water not subject to the Copermittee's legal authority that are discharged from the Copermittee's major MS4 outfalls to downstream receiving waters.

(v) Each Copermittee must review the data collected pursuant to Provision D.2.b and findings from the assessments required pursuant to Provision D.4.b.(1)(c)(i)-(iv) at least once during the term of this Order to:

[a] Identify reductions and progress in achieving reductions in non-storm water and illicit discharges to the Copermittee's MS4 in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction, with an estimate, if possible, of the non-storm water volume and/or pollutant load reductions attributable to specific water quality strategies implemented by the Copermittee; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittee in the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction.

(vi) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(1)(c)(i)-(v).

(2) <u>Storm Water Pollutant Discharges Reduction Assessments</u>

(a) The Copermittees must assess and report the progress of the water quality improvement strategies, required to be implemented pursuant to Provisions B and E, toward reducing pollutants in storm water discharges from the MS4s within the Watershed Management Area as follows:

(i) Based on data collected pursuant to Provisions D.2.a.(3), the assessments under Provision D.4.b.(2)(b) must be included in the Transitional Monitoring and Assessment Program Annual Reports required pursuant to Provision F.3.b.(2).

(ii) Based on the data collected pursuant to Provisions D.2.c, the assessments required under Provision D.4.b.(2)(c) must be included in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

(iii) Based on the data collected pursuant to Provisions D.2.c, the assessment required under Provisions D.4.b.(2)(c)-(d) must be included in the Report of Waste Discharge required pursuant to F.5.b.

(b) Based on the transitional wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.a.(3) the Copermittees must assess and report the following:

(i) The Copermittees must analyze the monitoring data collected pursuant to Provision D.2.a.(3), and utilize a watershed model or other method, to calculate or estimate the following for each monitoring year:

[a] The average storm water runoff coefficient for each land use type within the Watershed Management Area;
[b] The volume of storm water and pollutant loads discharged from each of the Copermittee's monitored MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch;
[c] The total flow volume and pollutant loadings discharged from the Copermittee's jurisdiction within the Watershed Management Area over the course of the wet season, extrapolated from the data produced from the monitored MS4 outfalls; and
[d] The percent contribution of storm water volumes and pollutant loads discharged from each land use type within each hydrologic subarea with a major MS4 outfall to receiving waters or within each major MS4 outfall to receiving waters in the Copermittee's jurisdiction within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch.

(ii) Identify modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify pollutants in storm water discharges from the MS4s in the Watershed Management Area pursuant to Provision D.2.c.(1).

(c) Based on the wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.c the Copermittees must assess and report the following:

(i) The assessments required pursuant to Provision D.4.b.(2)(b);

(ii) Based on the data collected and applicable SALs in the Water Quality Improvement Plan, analyze and compare the monitoring data to the analyses and assumptions used to develop the Water Quality Improvement Plans, including strategies developed pursuant to Provision B.3, and evaluate whether those analyses and assumptions should be updated as a component of the adaptive management efforts pursuant to Provision B.5 for follow-up action to update the Water Quality Improvement Plan;

(iii) The Copermittees must review the data collected pursuant to Provision D.2.c and findings from the assessments required pursuant to Provisions D.4.b.(2)(c)(i)-(ii) at least once during the term of this Order to:

[a] Identify reductions or progress in achieving reductions in pollutant concentrations and/or pollutant loads from different land uses and/or drainage areas discharging from the Copermittees' MS4s in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters within the Watershed Management Area to the MEP, with an estimate, if possible, of the pollutant load reductions attributable to specific water quality strategies implemented by the Copermittees; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittees in the Watershed Management Area toward reducing pollutants in storm water discharges from the MS4s to receiving waters in the Watershed Management Area to the MEP.

(iv) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(iii).

(d) The Copermittees must evaluate all the data collected pursuant to Provision D.2.c, and incorporate new outfall monitoring data into time series plots for each long-term monitoring constituent for the Watershed Management Area, and perform statistical trends analysis on the cumulative long-term wet weather MS4 outfall discharge water quality data set.

c. Special Studies Assessments

The Copermittees must annually evaluate the results and findings from the special studies developed and implemented pursuant to Provision D.3, and assess their relevance to the Copermittees' efforts to characterize receiving water conditions, understand sources of pollutants and/or stressors, and control and reduce the discharges of pollutants from the MS4 outfalls to receiving waters in the Watershed Management Area. The Copermittees must report the results of the special studies assessments applicable to the Watershed Management Area, and identify any necessary modifications or updates to the Water Quality Improvement Plan based on the results in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3).

d. Integrated Assessment of Water Quality Improvement Plan

As part of the iterative approach and adaptive management process required for the Water Quality Improvement Plan pursuant to Provision B.5, the Copermittees in each Watershed Management Area must integrate the data collected pursuant to Provisions D.1-D.3, the findings from the assessments required pursuant to

Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to assess the effectiveness of, and identify necessary modifications to, the Water Quality Improvement Plan as follows:

(1) The Copermittees must re-evaluate the priority water quality conditions and numeric goals for the Watershed Management Area, as needed, during the term of this Order pursuant to Provision B.5.a. The re-evaluation and recommendations for modifications to the priority water quality conditions, and/or numeric goals and corresponding schedules may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The priority water quality conditions and numeric goals for the Watershed Management Area must be re-evaluated as follows:

(a) Re-evaluate the receiving water conditions in the Watershed Management Area in accordance with Provision B.2.a;

(b) Re-evaluate the impacts on receiving waters in the Watershed Management Area from MS4 discharges in accordance with Provision B.2.b;

(c) Re-evaluate the identification of MS4 sources of pollutants and/or stressors in accordance with Provision B.2.d;

(d) Identify beneficial uses of the receiving waters that are protected in accordance with Provision D.4.a;

(e) Evaluate the progress toward achieving the interim and final numeric goals for protecting impacted beneficial uses in the receiving waters.

(2) The Copermittees must re-evaluate the water quality improvement strategies for the Watershed Management Area during the term of this Order pursuant to Provision B.5.b. The re-evaluation and recommendations for modifications to the water quality improvement strategies and schedules may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. The water quality improvement strategies for the Watershed Management Area must be re-evaluated as follows:

(a) Identify the non-storm water and storm water pollutant loads from the Copermittees' MS4 outfalls in the Watershed Management Area, calculated or estimated pursuant to Provisions D.4.b;

(b) Identify the non-storm water and storm water pollutant load reductions, or other improvements to receiving water or water quality conditions, that are necessary to attain the interim and final numeric goals identified in the Water Quality Improvement Plan for protecting beneficial uses in the receiving waters;

(c) Identify the non-storm water and storm water pollutant load reductions, or other improvements to the quality of MS4 discharges, that are necessary for the Copermittees to demonstrate that non-storm water and storm water discharges from their MS4s are not causing or contributing to exceedances of receiving water limitations;

(d) Evaluate the progress of the water quality improvement strategies toward achieving the interim and final numeric goals identified in the Water Quality Improvement Plan for protecting beneficial uses in the receiving waters.

(3) The Copermittees must re-evaluate and adapt the water quality monitoring and assessment program for the Watershed Management Area when new information becomes available to improve the monitoring and assessment program pursuant to Provision B.5.c. The re-evaluation and recommendations for modifications to the monitoring and assessment program may be provided in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), but must at least be provided in the Report of Waste Discharge pursuant to Provision F.5.b. Modifications to the water quality monitoring and assessment program must be consistent with the requirements of Provision D.1-D.3. The re-evaluation of the water quality monitoring and assessment program for the Watershed Management Area must consider the data gaps identified by the assessments required pursuant to Provisions D.4.a-b, and results of the special studies implemented pursuant to Provision D.4.c.

5. Monitoring Provisions

Each Copermittee must comply with all the monitoring, reporting, and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

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E. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS

The purpose of this provision is for each Copermittee to implement a program to control the contribution of pollutants to and the discharges from the MS4 within its jurisdiction. The goal of the jurisdictional runoff management programs is to implement strategies that effectively prohibit non-storm water discharges to the MS4 and reduce the discharge of pollutants in storm water to the MEP. This goal will be accomplished through implementing the jurisdictional runoff management programs in accordance with the strategies identified in the Water Quality Improvement Plans.

Each Copermittee must update its jurisdictional runoff management program document, in accordance with Provision F.2.a, to incorporate all the requirements of Provision E. Until the Copermittee has updated its jurisdictional runoff management program document with the requirements of Provision E, the Copermittee must continue implementing its current jurisdictional runoff management program.

1. Legal Authority Establishment and Enforcement

a. Each Copermittee must establish, maintain, and enforce adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 through statute, ordinance, permit, contract, order, or similar means. This legal authority must, at a minimum, authorize the Copermittee to:

(1) Prohibit and eliminate all illicit discharges and illicit connections to its MS4;

(2) Control the contribution of pollutants in discharges of runoff associated with industrial and construction activity to its MS4 and control the quality of runoff from industrial and construction sites, including industrial and construction sites which have coverage under the statewide General Permit for Discharges of Storm Water Associated with Industrial Activities (Industrial General Permit) or General Permit for Discharges of Storm Water Associated with Construction Activities (Construction General Permit), as well as to those sites which do not;

(3) Control the discharge of spills, dumping, or disposal of materials other than storm water into its MS4;

(4) Control through interagency agreements among Copermittees the contribution of pollutants from one portion of the MS4 to another portion of the MS4;

(5) Control, by coordinating and cooperating with other owners of the MS4 such as Caltrans, the U.S. federal government, or sovereign Native American Tribes through interagency agreements, where possible, the contribution of pollutants from their portion of the MS4 to the portion of the MS4 within the Copermittee's jurisdiction;

(6) Require compliance with conditions in its statutes, ordinances, permits, contracts, orders, or similar means to hold dischargers to its MS4 accountable for their contributions of pollutants and flows;

(7) Require the use of BMPs to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(8) Require documentation on the effectiveness of BMPs implemented to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;

(9) Utilize enforcement mechanisms to require compliance with its statutes, ordinances, permits, contracts, orders, or similar means; and

(10) Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with its statutes, ordinances, permits, contracts, orders, or similar means and with the requirements of this Order, including the prohibition of illicit discharges and connections to its MS4; the Copermittee must also have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from industrial facilities, including construction sites, discharging into its MS4.

b. With the first Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3), each Copermittee must submit a statement certified by its Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative that the Copermittee has taken the necessary steps to obtain and maintain full legal authority within its jurisdiction to implement and enforce each of the requirements contained in this Order.

2. Illicit Discharge Detection and Elimination

Each Copermittee must implement a program to actively detect and eliminate illicit discharges and improper disposal into the MS4, or otherwise require the discharger to apply for and obtain a separate NPDES permit. The illicit discharge detection and elimination program must be implemented in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include, at a minimum, the following requirements:

a. NON-STORM WATER DISCHARGES

Each Copermittee must address all non-storm water discharges as illicit discharges unless a non-storm water discharge is either identified as a discharge authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to the following requirements:

(1) Discharges of non-storm water to the MS4 from the following categories must be addressed as illicit discharges unless the discharge has coverage or meets the exception criteria under NPDES Permit No. CAG919003(Order No. R9-2015-0013, as it may be amended or reissued) for discharges to surface waters within the San Diego Region:

(1) Uncontaminated pumped ground water;

(2) Discharges from foundation drains;[23]

(3) Water from crawl space pumps; and

(4) Water from footing drains.[20]

(2) Discharges of non-storm water from water line flushing and water main breaks to the MS4 must be addressed as illicit discharges unless the discharge has coverage under NPDES Permit No. CAG679001 (Order No. R9-2010-0003, as it may be amended or reissued) or NPDES General Permit No. CAG140001 (Order 2014-0194-DWQ, as it may be amended or reissued). This category includes water line flushing and water main break discharges from water purveyors issued a water supply permit by the California Department of Public Health or federal military installations. Discharges from recycled or reclaimed water lines to the MS4 must be addressed as illicit discharges, unless the discharges have coverage under a separate NPDES permit.

(3) Discharges of non-storm water to the MS4 from the following categories must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a source of pollutants to receiving waters:

(a) Diverted stream flows;

(b) Rising ground waters;

(c) Uncontaminated ground water infiltration to MS4s;

(d) Springs;

(e) Flows from riparian habitats and wetlands;

(f) Discharges from potable water sources;

[23] Provision E.2.a.(1) only applies to this category of non-storm water if the system is designed to be located at or below the groundwater table to actively or passively extract groundwater during any part of the year.

(g) Discharges from foundation drains;[24] and

(h) Discharges from footing drains.[21]

(4) Discharges of non-storm water to the MS4 from the following categories must be controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means. Discharges of non-storm water to the MS4 from the following categories not controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means must be addressed by the Copermittee as illicit discharges.

(a) Air conditioning condensation

The discharge of air conditioning condensation should be directed to landscaped areas or other pervious surfaces, or to the sanitary sewer, where feasible.

(b) Individual residential vehicle washing

(i) The discharge of wash water should be directed to landscaped areas or other pervious surfaces where feasible; and

(ii) The minimization of water, washing detergent and other vehicle wash products used for residential vehicle washing, and the implementation of other practices or behaviors that will prevent the discharge of pollutants associated with individual residential vehicle washing from entering the MS4 must be encouraged.

(c) Dechlorinated swimming pool discharges

(i) Residual chlorine, algaecide, filter backwash, or other pollutants from swimming pools must be eliminated prior to discharging to the MS4; and

(ii) The discharge of saline swimming pool water must be directed to the sanitary sewer, landscaped areas, or other pervious surfaces that can accommodate the volume of water, unless the saline swimming pool water can be discharged via a pipe or concrete channel directly to a naturally saline water body (e.g. Pacific Ocean).

(5) Firefighting discharges to the MS4 must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a significant source of pollutants to receiving waters. Firefighting discharges to the MS4 not identified as a significant

[24] Provision E.2.a.(3) only applies to this category of non-storm water discharge if the system is designed to be located above the groundwater table at all times of the year, and the system is only expected to discharge non-storm water under unusual circumstances.

source of pollutants to receiving waters, must be addressed, at a minimum, as follows:

(a) Non-emergency firefighting discharges

(i) Building fire suppression system maintenance discharges (e.g. sprinkler line flushing) to the MS4 must be addressed as illicit discharges unless BMPs are implemented to prevent pollutants associated with such discharges to the MS4.

(ii) Non-emergency firefighting discharges (i.e., discharges from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems) must be addressed by a program, to be developed and implemented by the Copermittee, to reduce or eliminate pollutants in such discharges from entering the MS4.

(b) Emergency firefighting discharges

Each Copermittee should develop and encourage implementation of BMPs to reduce or eliminate pollutants in emergency firefighting discharges to the MS4s and receiving waters within its jurisdiction. During emergency situations, priority of efforts should be directed toward life, property, and the environment (in descending order). BMPs should not interfere with immediate emergency response operations or impact public health and safety.

(6) If the Copermittee or San Diego Water Board identifies any category of non-storm water discharges listed under Provisions E.2.a.(1)-(4) as a source of pollutants to receiving waters, the category must be prohibited through ordinance, order, or similar means and addressed as an illicit discharge. Alternatively, the Copermittee may propose controls to be implemented for the category of non-storm water discharges as part of the Water Quality Improvement Plan instead of prohibiting the category of non-storm water discharges, and implement the controls if accepted by the San Diego Water Board as part of the Water Quality Improvement Plan.

(7) Each Copermittee must, where feasible and priorities and resources allow, reduce or eliminate non-storm water discharges listed under Provisions E.2.a.(1)-(4) into its MS4, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit.

b. PREVENT AND DETECT ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to prevent and detect illicit discharges to the MS4:

(1) Each Copermittee must maintain an updated map of its entire MS4 and the

corresponding drainage areas. The accuracy of the MS4 map must be confirmed during the field screening required pursuant to Provision E.2.c. The MS4 map must be included as part of the jurisdictional runoff management program document. Any geographic information system (GIS) layers or files used by the Copermittee to maintain the MS4 map must be made available to the San Diego Water Board upon request. The MS4 map must identify the following:

(a) All segments of the MS4 owned, operated, and maintained by the Copermittee;

(b) All known locations of inlets that discharge and/or collect runoff into the Copermittee's MS4;

(c) All known locations of connections with other MS4s not owned or operated by the Copermittee (e.g. Caltrans MS4s);

(d) All known locations of MS4 outfalls and private outfalls that discharge runoff collected from areas within the Copermittee's jurisdiction;

(e) All segments of receiving waters within the Copermittee's jurisdiction that receive and convey runoff discharged from the Copermittee's MS4 outfalls;

(f) Locations of the MS4 outfalls, identified pursuant to Provision D.2.a.(1), within its jurisdiction; and

(g) Locations of the non-storm water persistent flow MS4 outfall discharge monitoring stations, identified pursuant to Provision D.2.b.(2), within its jurisdiction.

(2) Each Copermittee must use Copermittee personnel and contractors to assist in identifying and reporting illicit discharges and connections during their daily employment activities.

(3) Each Copermittee must promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges to or from the MS4, including the following methods for public reporting:

(a) Operate a public hotline, which can be Copermittee-specific or shared by the Copermittees, and must be capable of receiving reports in both English and Spanish 24 hours per day and seven days per week; and

(b) Designate an e-mail address for receiving electronic reports from the public, which can be Copermittee-specific or shared by the Copermittees,

and must be prominently displayed on the Copermittee's webpage and the Regional Clearinghouse required pursuant to Provision F.4.

(4) Each Copermittee must implement practices and procedures (including a notification mechanism) to prevent, respond to, contain, and clean up any spills that may discharge into the MS4 within its jurisdiction from any source. The Copermittee must coordinate, to the extent possible, with spill response teams to prevent entry of spills into the MS4, and prevent contamination of surface water, ground water, and soil. The Copermittee must coordinate spill prevention, containment, and response activities throughout all appropriate Copermittee departments, programs, and agencies.

(5) Each Copermittee must implement practices and procedures to prevent and limit infiltration of seepage from sanitary sewers (including private laterals and failing septic systems) to the MS4.

(6) Each Copermittee must coordinate, when necessary, with upstream Copermittees and/or entities to prevent illicit discharges from upstream sources into the MS4 within its jurisdiction.

c. FIELD SCREENING

Each Copermittee must conduct field screening (i.e. visual observations, field testing, and/or analytical testing) of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4 in accordance with the dry weather MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

d. INVESTIGATE AND ELIMINATE ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to investigate and eliminate illicit discharges to the MS4:

(1) Each Copermittee must prioritize and determine when follow-up investigations will be performed in response to visual observations and/or water quality monitoring data collected during an investigation of a detected non-storm water or illicit discharge to or from the MS4. The criteria for prioritizing investigations must consider the following:

(a) Pollutants identified as causing or contributing to the highest water quality priorities identified in the Water Quality Improvement Plan;

(b) Pollutants identified as causing or contributing, or threatening to cause or contribute to impairments in water bodies on the 303(d) List and/or in environmentally sensitive areas (ESAs), located within its jurisdiction;

(c) Pollutants identified from sources or land uses known to exist within the

area, drainage basin, or watershed that discharges to the portion of the MS4 within its jurisdiction included in the investigation;

(d) Pollutants identified as causing or contributing to an exceedance of a NAL in the Water Quality Improvement Plan; and

(e) Pollutants identified as a threat to human health or the environment.

(2) Each Copermittee must implement procedures to investigate and inspect portions of its MS4 that, based on reports or notifications, field screening, or other appropriate information, indicate a reasonable potential of receiving, containing, or discharging pollutants due to illicit discharges, illicit connections, or other sources of non-storm water. The procedures must include the following:

(a) Each Copermittee must develop criteria to:

(i) Assess the validity of each report or notification received; and

(ii) Prioritize the response to each report or notification received.

(b) Each Copermittee must prioritize and respond to each valid report or notification (e.g., public reports, staff or contractor reports and notifications, etc.) of an incident in a timely manner.

(c) In accordance with the requirements of Provision E.2.d.(1), each Copermittee must investigate and seek to identify the source(s) of discharges of non-storm water where flows are observed in and from the MS4 during the field screening required pursuant to Provision D.2.b.(1) as follows:

(i) Obvious illicit discharges must be immediately investigated to identify the source(s) of non-storm water discharges;

(ii) The investigation must include field investigations to identify sources or potential sources for the discharge, unless the source or potential source has already been identified during previous investigations; and

(iii) The investigation may include follow-up field investigations and/or reviewing Copermittee inventories and other land use data to identify potential sources of the discharge.

(d) Each Copermittee must maintain records and a database of the following information:

(i) Location of incident, including hydrologic subarea, portion of MS4

receiving the non-storm water or illicit discharge, and point of discharge or potential discharge from MS4 to receiving water;

(ii) Source of information initiating the investigation (e.g., public reports, staff or contractor reports and notifications, field screening, etc.);

(iii) Date the information used to initiate the investigation was received;

(iv) Date the investigation was initiated;

(v) Dates of follow-up investigations;

(vi) Identified or suspected source of the illicit discharge or connection, if determined;

(vii) Known or suspected related incidents, if any;

(viii) Result of the investigation; and

(ix) If a source cannot be identified and the investigation is not continued, document the response pursuant to the requirements of Provision E.2.d.(4).

(e) Each Copermittee must maintain records and, in accordance with the priorities of the Water Quality Improvement Plan, seek to identify the source(s) of non-storm water discharges from the MS4 where there is evidence of non-storm water having been discharged into or from the MS4 (e.g., pooled water), in accordance with MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

(3) Each Copermittee must initiate the implementation of procedures, in a timely manner, to eliminate all detected and identified illicit discharges and connections within its jurisdiction. The procedures must include the following responses:

(a) Each Copermittee must enforce its legal authority, as required under Provision E.1, to eliminate illicit discharges and connections to the MS4.

(b) If the Copermittee identifies the source as a controllable source of non-storm water or illicit discharge or connection, the Copermittee must implement its Enforcement Response Plan pursuant to Provision E.6 and enforce its legal authority to prohibit and eliminate illicit discharges and connections to its MS4.

(c) If the Copermittee identifies the source of the discharge as a category of non-storm water discharges in Provision E.2.a, and the discharge is in exceedance of NALs in the Water Quality Improvement Plan, then the Copermittee must determine if: (1) this is an isolated incident or set of circumstances that will be addressed through its Enforcement Response Plan pursuant to Provision E.6, or (2) the category of discharge must be

addressed through the prohibition of that category of discharge as an illicit discharge pursuant to Provision E.2.a.(6).

(d) If the Copermittee suspects the source of the non-storm water discharge as natural in origin (i.e. non-anthropogenically influenced) and in conveyance into the MS4, then the Copermittee must document and provide the data and evidence necessary to demonstrate to the San Diego Water Board that it is natural in origin and does not require further investigation.

(e) If the Copermittee is unable to identify and document the source of a recurring non-storm water discharge to or from the MS4, then the Copermittee must address the discharge as an illicit discharge and update its jurisdictional runoff management program to address the common and suspected sources of the non-storm water discharge within its jurisdiction in accordance with the Copermittee's priorities.

(4) Each Copermittee must submit a summary of the non-storm water discharges and illicit discharges and connections investigated and eliminated within its jurisdiction with each Water Quality Improvement Plan Annual Report required under Provision F.3.b.(3) of this Order.

3. Development Planning

Each Copermittee must use their land use and planning authorities to implement a development planning program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. BMP Requirements for All Development Projects

Each Copermittee must prescribe the following BMP requirements during the planning process (i.e. prior to project approval and issuance of local permits) for all development projects (regardless of project type or size), where local permits are issued, including unpaved roads and flood management projects:

(1) <u>General Requirements</u>

(a) Onsite BMPs must be located so as to remove pollutants from runoff prior to its discharge to any receiving waters, and as close to the source as possible;

(b) Structural BMPs must not be constructed within waters of the U.S.

(c) Onsite BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors (e.g.

mosquitos, rodents, or flies).

(2) Source Control BMP Requirements

The following source control BMPs must be implemented at all development projects where applicable and feasible:

(a) Prevention of illicit discharges into the MS4;

(b) Storm drain system stenciling or signage;

(c) Protect outdoor material storage areas from rainfall, run-on, runoff, and wind dispersal;

(d) Protect materials stored in outdoor work areas from rainfall, run-on, runoff, and wind dispersal;

(e) Protect trash storage areas from rainfall, run-on, runoff, and wind dispersal; and

(f) Any additional BMPs determined to be necessary by the Copermittee to minimize pollutant generation at each project.

(3) Low Impact Development (LID) BMP Requirements

The following LID BMPs must be implemented at all development projects where applicable and feasible:

(a) Maintenance or restoration of natural storage reservoirs and drainage corridors (including topographic depressions, areas of permeable soils, natural swales, and ephemeral and intermittent streams);[25]

(b) Buffer zones for natural water bodies (where buffer zones are technically infeasible, require project applicant to include other buffers such as trees, access restrictions, etc.);

(c) Conservation of natural areas within the project footprint including existing trees, other vegetation, and soils;

(d) Construction of streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided public safety is not compromised;

(e) Minimization of the impervious footprint of the project;

[25] Development projects proposing to dredge or fill materials in waters of the U.S. must obtain a CWA Section 401 Water Quality Certification. Projects proposing to dredge or fill waters of the state must obtain waste discharge requirements.

(f) Minimization of soil compaction to landscaped areas;

(g) Disconnection of impervious surfaces through distributed pervious areas;

(h) Landscaped or other pervious areas designed and constructed to effectively receive and infiltrate, retain and/or treat runoff from impervious areas, prior to discharging to the MS4;

(i) Small collection strategies located at, or as close as possible to, the source (i.e. the point where storm water initially meets the ground) to minimize the transport of runoff and pollutants to the MS4 and receiving waters;

(j) Use of permeable materials for projects with low traffic areas and appropriate soil conditions;

(k) Landscaping with native or drought tolerant species; and

(l) Harvesting and using precipitation.

b. PRIORITY DEVELOPMENT PROJECTS

Priority Development Projects are land development projects that fall under the planning and building authority of the Copermittee for which the Copermittee must impose specific requirements, in addition to those described in Provision E.3.a, including the implementation of structural BMPs to meet the performance requirements described in Provision E.3.c.

(1) Definition of Priority Development Project

Priority Development Projects include the following:

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(b) Redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site on an existing site of 10,000 square feet or more of impervious surfaces). This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.

(c) New and redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project

site), and support one or more of the following uses:

(i) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812).

(ii) Hillside development projects. This category includes development on any natural slope that is twenty-five percent or greater.

(iii) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce.

(iv) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

(d) New or redevelopment projects that create and/or replace 2,500 square feet or more of impervious surface (collectively over the entire project site), and discharging directly to an Environmentally Sensitive Area (ESA). "Discharging directly to" includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands).

(e) New development projects, or redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface, that support one or more of the following uses:

(i) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

(ii) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

(f) New or redevelopment projects that result in the disturbance of one or more acres of land and are expected to generate pollutants post construction.

(2) <u>Special Considerations for Redevelopment Projects</u>

The structural BMP performance requirements of Provision E.3.c are applicable to redevelopment Priority Development Projects, as defined in E.3.b.(1), as follows:

(a) Where redevelopment results in the creation or replacement of impervious surface in an amount of less than fifty percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provision E.3.c apply only to the creation or replacement of impervious surface, and not the entire development; or

(b) Where redevelopment results in the creation or replacement of impervious surface in an amount of more than fifty percent of the surface area of the previously existing development, then the structural BMP performance requirements of Provision E.3.c apply to the entire development.

(3) Priority Development Project Exemptions

Each Copermittee has the discretion to exempt the following projects from being defined as Priority Development Projects:

(a) New or retrofit paved sidewalks, bicycle lanes, or trails that meet the following criteria:

(i) Designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas; OR

(ii) Designed and constructed to be hydraulically disconnected from paved streets or roads; OR

(iii) Designed and constructed with permeable pavements or surfaces in accordance with USEPA Green Streets guidance.[26]

(b) Retrofitting or redevelopment of existing paved alleys, streets or roads that are designed and constructed in accordance with the USEPA Green Streets guidance.[27]

c. Priority Development Project Structural BMP Performance Requirements

In addition to the BMP requirements listed for all development projects under Provision E.3.a, Priority Development Projects must also implement structural BMPs that conform to performance requirements described below.

(1) Storm Water Pollutant Control BMP Requirements

Each Copermittee must require each Priority Development Project to implement onsite structural BMPs to control pollutants in storm water that may be discharged from a project as follows:

[26] See "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).
[27] Ibid.

(a) Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite the pollutants contained in the volume of storm water runoff produced from a 24-hour 85th percentile storm event (design capture volume);[28]

(i) If a Copermittee determines that implementing BMPs to retain the full design capture volume onsite for a Priority Development Project is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize biofiltration BMPs. Biofiltration BMPs must be designed to have an appropriate hydraulic loading rate to maximize storm water retention and pollutant removal, as well as to prevent erosion, scour, and channeling within the BMP,[29] and must be sized to:

[a] Treat 1.5 times the design capture volume not reliably retained onsite, OR
[b] Treat the design capture volume not reliably retained onsite with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite.

(ii) If a Copermittee determines that biofiltration is not technically feasible, then the Copermittee may allow the Priority Development Project to utilize flow-thru treatment control BMPs to treat runoff leaving the site, AND mitigate for the design capture volume not reliably retained onsite pursuant to Provision E.3.c.(1)(b). Flow thru treatment control BMPs must be sized and designed to:

[a] Remove pollutants from storm water to the MEP;
[b] Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;

[28] This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals.

[29] As part of the Copermittee's update to its BMP Design Manual, pursuant to Provision E.3.d, the Copermittee must provide guidance for hydraulic loading rates and other biofiltration design criteria necessary to maximize storm water retention and pollutant removal.

[c] Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Flow-thru treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of flow-thru treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

(b) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1)(a). The Priority Development Project must mitigate for the portion of the pollutant load in the design capture volume not retained onsite if Provision E.3.c.(3) is utilized. If a Priority Development Project is allowed to utilize alternative compliance, flow-thru treatment control BMPs must be implemented to treat the portion of the design capture volume that is not reliably retained onsite. Flow-thru treatment control BMPs must be sized and designed in accordance with Provisions E.3.c.(1)(a)(ii)[a]-[c].

(2) <u>Hydromodification Management BMP Requirements</u>

Each Copermittee must require each Priority Development Project to implement onsite BMPs to manage hydromodification that may be caused by storm water runoff discharged from a project as follows:

(a) Post-project runoff conditions (flow rates and durations) must not exceed pre-development runoff conditions by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat downstream of Priority Development Projects).

(i) In evaluating the range of flows that results in increased potential for erosion of natural (non-hardened) channels, the lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks.

(ii) The Copermittees may use monitoring results collected pursuant to Provision D.1.a.(2) to re-define the range of flows resulting in increased potential for erosion, or degraded instream habitat conditions, as warranted by the data.

(b) Each Priority Development Project must avoid critical sediment yield areas known to the Copermittee or identified by the optional Watershed Management Area Analysis pursuant to Provision B.3.b.(4), or implement measures that allow critical coarse sediment to be discharged to receiving waters, such that there is no net impact to the receiving water.

(c) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of complying with the performance requirements of Provision E.3.c.(2)(a). The Priority Development Project must mitigate for the post-project runoff conditions not fully managed onsite if Provision E.3.c.(3) is utilized.

(d) Exemptions

Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provisions E.3.c.(2) where the project discharges storm water runoff to:

(i) Existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;

(ii) Conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; or

(iii) An area identified by the Copermittees as appropriate for an exemption by the optional Watershed Management Area Analysis incorporated into the Water Quality Improvement Plan pursuant to Provision B.3.b.(4).

(e) Interim Timeframe Exemptions

Until the Copermittees have updated their BMP Design Manual in accordance with Provision F.2.b with the requirements of Provision E, the Copermittees have the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provision E.3.c.(2) where the project discharges storm water runoff directly to:

(i) An engineered channel conveyance system with a capacity to convey peak flows generated by the 10-year storm event all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean; and

(ii) Large river reaches with a drainage area larger than 100 square miles and a 100-year flow capacity in excess of 20,000 cubic feet per second, provided that properly sized energy dissipation is included at all Priority Development Project discharge points.

(3) Alternative Compliance Program to Onsite Structural BMP Implementation

At the discretion of each Copermittee, Priority Development Projects may be allowed to participate in an alternative compliance program in lieu of implementing the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a), provided that the Water Quality Improvement Plan includes the optional Watershed Management Area Analysis described in Provision B.3.b.(4), and Water Quality Equivalency calculations have been accepted by the San Diego Water Board's Executive Officer pursuant to Provision E.3.c.(3)(a). The alternative compliance program is available to a Priority Development Project only if the Priority Development Project applicant enters into a voluntary agreement with the Copermittee authorizing this arrangement. In addition to the voluntary agreement, relief from implementing structural BMPs onsite may be authorized by the Copermittee under the following conditions:

(a) Water Quality Equivalency

Copermittees must submit Water Quality Equivalency calculations for acceptance by the San Diego Water Board's Executive Officer prior to administering an alternative compliance program in order to establish a regional and technical basis for determining the water quality benefits associated with alternative compliance projects. Accepted Water Quality Equivalency calculations must be incorporated as part of any Copermittee's alternative compliance program necessary for evaluating Watershed Management Area Analysis candidate projects, project applicant-proposed alternative compliance projects, alternative compliance in lieu fee structures, and alternative compliance water quality credit systems as described in Provisions E.3.c.(3)(b)-(e).

(b) Watershed Management Area Analysis Candidate Projects

The Priority Development Project applicant agrees to fund, contribute funds to, or implement a candidate project identified by the Copermittees in the Watershed Management Area Analysis included in the Water Quality Improvement Plan, pursuant to Provisions B.3.b.(4) subject to the following conditions:

(i) The Copermittee must determine that implementation of the candidate project will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a) onsite;

(ii) If the Priority Development Project applicant chooses to fully or partially fund a candidate project, then the in-lieu fee structure described in Provision E.3.c.(3)(c) must be followed;

(iii) If the Priority Development Project applicant chooses to fully or partially fund a candidate project, then the Copermittee must ensure that the funds to be obtained from the Priority Development Project applicant are sufficient to mitigate for impacts caused by not fully implementing structural BMPs onsite, pursuant to the performance requirements described in Provisions E.3.c.(1) and E.3.c.(2)(a);

(iv) If the Priority Development Project applicant chooses to implement a candidate project, then the Copermittee must ensure that pollutant control and/or hydromodification management within the candidate project are sufficient to mitigate for impacts caused by not implementing structural BMPs fully onsite, pursuant to the performance requirements described in Provisions E.3.c.(1) and E.3.c.(2)(a);

(v) The voluntary agreement to fund, partially fund, or implement a candidate project must include reliable sources of funding for operation and maintenance of the candidate project;

(vi) Design of the candidate project must be conducted under an appropriately qualified engineer, geologist, architect, landscape architect, or other professional, licenses where applicable, and competent and proficient in the fields pertinent to the candidate project design;

(vii) The candidate project must be constructed as soon as possible, but no later than 4 years after the certificate of occupancy is granted for the first Priority Development Project that contributed funds toward the construction of the candidate project, unless a longer period of time is authorized by the San Diego Water Board Executive Officer; and

(viii) If the candidate project is constructed after the Priority Development Project is constructed, the Copermittee must require temporal mitigation for pollutant loads and altered flows that are discharged from the Priority Development Project.

(c) Project Applicant Proposed Alternative Compliance Projects

The Copermittee may allow a Priority Development Project applicant to propose and fund, contribute funds to, or implement an alternative compliance project not identified by the Watershed Management Area Analysis included in the Water Quality Improvement Plan pursuant to Provisions B.3.b.(4). This option is allowed provided the Copermittee determines that implementation of the alternative compliance project will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a) onsite, and is subject to the requirements described in Provisions E.3.c.(3)(a)(ii)-(viii).

(d) Alternative Compliance In-Lieu Fee Structure

If a Copermittee chooses to allow a Priority Development Project applicant to fund, or partially fund a candidate project or an alternative compliance project, then the Copermittee must develop and implement an in-lieu fee structure. This may be developed individually or with other Copermittees and/or entities, as a means for designing, developing, constructing, operating and maintaining offsite alternative compliance projects. The in-lieu fee must be transferred to the Copermittee (for public projects) or an escrow account (for private projects) prior to the construction of the Priority Development Project.

(e) Alternative Compliance Water Quality Credit System Option

The Copermittee may develop and implement an alternative compliance water quality credit system option, individually or with other Copermittees and/or entities, provided that such a credit system clearly exhibits that it will not allow discharges from Priority Development Projects to cause or contribute to a net impact over and above the impact caused by projects meeting the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2)(a). Any credit system that a Copermittee chooses to implement must be submitted to the San Diego Water Board Executive Officer for review and acceptance as part of the Water Quality Improvement Plan.

(4) Long-Term Structural BMP Maintenance

Each Copermittee must require the project applicant to submit proof of the mechanism under which ongoing long-term maintenance of all structural BMPs will be conducted.

(5) Infiltration and Groundwater Protection

(a) Structural BMPs designed to primarily function as large, centralized infiltration devices (such as large infiltration trenches and infiltration basins) must not cause or contribute to an exceedance of an applicable groundwater quality objective. At a minimum, such infiltration BMPs must be in conformance with the design criteria listed below, unless the development project applicant demonstrates to the Copermittee that one or more of the specific design criteria listed below are not necessary to protect groundwater quality. The design criteria listed below do not apply to small infiltration systems dispersed throughout a development project.

(i) Runoff must undergo pretreatment such as sedimentation or filtration prior to infiltration;

(ii) Pollution prevention and source control BMPs must be implemented at a level appropriate to protect groundwater quality at sites where infiltration BMPs are to be used;

(iii) Infiltration BMPs must be adequately maintained to remove pollutants in storm water to the MEP;

(iv) The vertical distance from the base of any infiltration BMP to the seasonal high groundwater mark must be at least 10 feet. Where groundwater basins do not support beneficial uses, this vertical distance criteria may be reduced, provided groundwater quality is maintained;

(v) The soil through which infiltration is to occur must have physical and chemical characteristics (e.g., appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses;

(vi) Infiltration BMPs must not be used for areas of industrial or light industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee, unless source control BMPs to prevent exposure of high threat activities are implemented, or runoff from such activities is first treated or filtered to remove pollutants prior to infiltration; and

(vii) Infiltration BMPs must be located a minimum of 100 feet horizontally from any water supply wells.

(b) The Copermittee may develop, individually or with other Copermittees, alternative mandatory design criteria to that listed above for infiltration BMPs which are designed to primarily function as centralized infiltration devices. Before implementing the alternative design criteria in the development planning process the Copermitee(s) must:

(i) Notify the San Diego Water Board of the intent to implement the alternative design criteria submitted; and

(ii) Comply with any conditions set by the San Diego Water Board.

d. BMP DESIGN MANUAL UPDATE

Each Copermittee must update its BMP Design Manual[30] pursuant to Provision F.2.b. Until the Copermittee has updated its BMP Design Manual pursuant to Provision F.2.b.(1), the Copermittee must continue implementing its current BMP Design Manual. The Copermittee must implement the updated BMP Design Manual within 180 days following completion of the update pursuant to Provision

[30] The BMP Design Manual was formerly known as the Standard Storm Water Mitigation Plan under Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016.

F.2.b.(1), unless directed otherwise by the San Diego Water Board Executive Officer. The date the BMP Design Manual is implemented is the "effective date" of the BMP Design Manual. The update of the BMP Design Manual required pursuant to Provision F.2.b.(1) must include the following:

(1) Updated procedures to determine the nature and extent of storm water requirements applicable to a potential development or redevelopment projects. These procedures must inform project applicants of the storm water management requirements applicable to their project including, but not limited to, general requirements for all development projects, structural BMP design procedures and requirements, hydromodification management requirements, requirements specific to phased projects, and procedures specific to private developments and public improvement projects;

(2) Updated procedures to identify pollutants and conditions of concern for selecting the most appropriate structural BMPs that consider, at a minimum, the following:

(a) Receiving water quality (including pollutants for which receiving waters are listed as impaired under the CWA section 303(d) List);

(b) Pollutants, stressors, and/or receiving water conditions that cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(c) Land use type of the project and pollutants associated with that land use type; and

(d) Pollutants expected to be present onsite.

(3) Updated procedures for designing structural BMPs, including any updated performance requirements to be consistent with the requirements of Provision E.3.c for all structural BMPs listed in the BMP Design Manual;

(4) Long-term maintenance criteria for each structural BMP listed in the BMP Design Manual; and

(5) Alternative compliance criteria, in accordance with the requirements under Provision E.3.c.(3), if the Copermittee elects to allow Priority Development Projects within its jurisdiction to utilize alternative compliance.

e. PRIORITY DEVELOPMENT PROJECT BMP IMPLEMENTATION AND OVERSIGHT

Each Copermittee must implement a program that requires and confirms structural BMPs on all Priority Development Projects are designed, constructed, and maintained to remove pollutants in storm water to the MEP.

(1) Structural BMP Approval and Verification Process

(a) Each Copermittee must require and confirm that all Priority Development Projects implement the requirements of Provision E.3, except that the Copermittee may allow previous land development requirements to apply to a Priority Development Project if the conditions of Provision E.3.e.(1)(a)(i) or Provision E.3.e.(1)(a)(ii) are met:

(i) The Copermittee has, prior to the effective date of the BMP Design Manual required to be developed pursuant to Provision E.3.d:

[a] Approved[31] a design that incorporates the storm water drainage system for the Priority Development Project in its entirety, including all applicable structural pollutant treatment control and hydromodification management BMPs consistent with the previous applicable MS4 permit requirements;[32] AND

[b] Issued a private project permit or approval, or functional equivalent for public projects, that authorizes the Priority Development Project applicant to commence construction activities based on a design that incorporates the storm water drainage system approved in conformance with Provision E.3.e.(1)(a)(i)[a]; AND

[c] Confirmed that there have been construction activities on the Priority Development Project site within the 365 days prior to the effective date of the BMP Design Manual, *OR* the Copermittee confirms that construction activities have commenced on the Priority Development Project site within the 180 days after the effective date of the BMP Design Manual, where construction activities are undertaken in reliance on the permit or approval, or functional equivalent for public projects, issued by the Copermittee in conformance with Provision E.3.e.(1)(a)(i)[b]; AND

[d] Issued all subsequent private project permits or approvals, or functional equivalent for public projects, that are needed to implement the design initially approved in conformance with Provision E.3.e.(1)(a)(i)[a] within 5 years of the effective date of the BMP Design Manual. The storm water drainage system for the Priority Development Project in its entirety, including all applicable structural pollutant treatment control and hydromodification management BMPs must remain in substantial conformity with the design initially approved in conformance with Provision E.3.e.(1)(a)(i)[a].

[31] For public projects, a design stamped by the City or County Engineer, or engineer of record for the project is considered an approved design.
[32] Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016 for San Diego County, Orange County, and Riverside County Copermittees, respectively

(ii) The Copermittee demonstrates it lacks the land use authority or legal authority to require a Priority Development Project to implement the requirements of Provision E.3.

(b) Each Copermittee must identify the roles and responsibilities of its various municipal departments in implementing the structural BMP requirements, including each stage of a project from application review and approval through BMP maintenance and inspections.

(c) Each Copermittee must require and confirm that appropriate easements and ownerships are properly recorded in public records and the information is conveyed to all appropriate parties when there is a change in project or site ownership.

(d) Each Copermittee must require and confirm that prior to occupancy and/or intended use of any portion of the Priority Development Project, each structural BMP is inspected to verify that it has been constructed and is operating in compliance with all of its specifications, plans, permits, ordinances, and the requirements of this Order.

(2) Priority Development Project Inventory and Prioritization

(a) Each Copermittee must develop, maintain, and update at least annually, a watershed-based database to track and inventory all Priority Development Projects and associated structural BMPs within its jurisdiction. Inventories must be accurate and complete beginning from December 2002 for the San Diego County Copermittees, February 2003 for the Orange County Copermittees, and July 2005 for the Riverside County Copermittees. The use of an automated database system, such as GIS, is highly recommended. The database must include, at a minimum, the following information:

(i) Priority Development Project location (address and hydrologic subarea);

(ii) Descriptions of structural BMP type(s);

(iii) Date(s) of construction;

(iv) Party responsible for structural BMP maintenance;

(v) Dates and findings of structural BMP maintenance verifications; and

(vi) Corrective actions and/or resolutions, when applicable.

(b) Each Copermittee must prioritize the Priority Development Projects with structural BMPs within its jurisdiction. The designation of Priority Development Projects as high priority must consider the following:

(i) The highest water quality priorities identified in the Water Quality Improvement Plan;

(ii) Receiving water quality;

(iii) Number and sizes of structural BMPs;

(iv) Recommended maintenance frequency of structural BMPs;

(v) Likelihood of operation and maintenance issues of structural BMPs;

(vi) Land use and expected pollutants generated; and

(vii) Compliance record.

(3) Structural BMP Maintenance Verifications and Inspections

Each Copermittee is required to verify that structural BMPs on each Priority Development Project are adequately maintained, and continue to operate effectively to remove pollutants in storm water to the MEP through inspections, self-certifications, surveys, or other equally effective approaches.

(a) All (100 percent) of the structural BMPs at Priority Development Projects that are designated as high priority must be inspected directly by the Copermittee annually prior to each rainy season;

(b) For verifications performed through a means other than direct Copermittee inspection, adequate documentation must be required by the Copermittee to provide assurance that the required maintenance of structural BMPs at each Priority Development Project has been completed; and

(c) Appropriate follow-up measures (including re-inspections, enforcement, etc.) must be conducted to ensure that structural BMPs at each Priority Development Project continue to reduce pollutants in storm water to the MEP as originally designed.

f. DEVELOPMENT PROJECT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all development projects, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

4. Construction Management

Each Copermittee must implement a construction management program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. Project Approval Process

Prior to issuance of any local permit(s) that allows the commencement of construction projects that involve ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff, each Copermittee must:

(1) Require a pollution control plan, construction BMP plan, and/or an erosion and sediment control plan, to be submitted by the project applicant to the Copermittee;

(2) Confirm the pollution control plan, construction BMP plan, and/or erosion and sediment control plan, complies with the local grading ordinance, other applicable local ordinances, and the requirements of this Order;

(3) Confirm the pollution control, construction BMP, and/or erosion and sediment control plan, includes seasonally appropriate and effective BMPs and management measures described in Provision E.4.c, as applicable to the project; and

(4) Verify that the project applicant has obtained coverage under the statewide Construction General Permit (Order 2009-0009-DWQ or subsequent Order), if applicable.

b. Construction Site Inventory and Tracking

(1) Each Copermittee must maintain and update, at least quarterly, a watershed-based inventory of all construction projects issued a local permit that allows ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff. The use of an automated database system, such as GIS, is highly recommended. The inventory must include:

(a) Relevant contact information for each site (e.g., name, address, phone, and email for the owner and contractor);

(b) The basic site information including location (address and hydrologic subarea), Waste Discharge Identification (WDID) number (if applicable), size of the site, and approximate area of disturbance;

(c) Whether or not the site is considered a high threat to water quality, as defined in Provision E.4.b.(2) below;

(d) The project start and completion dates;

(e) The required inspection frequency, as defined in the Copermittee's jurisdictional runoff management program document;

(f) The date the Copermittee accepted or approved the pollution control plan, construction BMP plan, and/or erosion and sediment control plan; and

(g) Whether or not there are ongoing enforcement actions administered to the site.

(2) Each Copermittee must identify all construction sites within its jurisdiction that represent a high threat to downstream surface water quality. The designation of construction sites as high threat to water quality must consider the following:

(a) Sites located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Sites located within the same hydrologic subarea and tributary to a water body segment listed as impaired for sediment on the CWA section 303(d) List;

(c) Sites located within, directly adjacent to, or discharging directly to a receiving water within an ESA; and

(d) Other sites determined by the Copermittees or the San Diego Water Board as a high threat to water quality.

c. CONSTRUCTION SITE BMP IMPLEMENTATION

Each Copermittee must implement, or require the implementation of effective BMPs to reduce discharges of pollutants in storm water from construction sites to the MEP, and effectively prohibit non-storm water discharges from construction sites into the MS4. These BMPs must be site specific, seasonally appropriate, and construction phase appropriate. BMPs must be implemented at each construction site year round. Dry season BMP implementation must plan for and address unseasonal rain events that may occur during the dry season (May 1 through September 30). Copermittees must implement, or require the implementation of, BMPs in the following categories:

(1) Project Planning;

(2) Good Site Management "Housekeeping", including waste management;

(3) Non-storm Water Management;

(4) Erosion Control;

(5) Sediment Control;

(6) Run-on and Run-off Control; and

(7) Active/Passive Sediment Treatment Systems, where applicable.

d. CONSTRUCTION SITE INSPECTIONS

Each Copermittee must conduct construction site inspections to require and confirm compliance with its local permits and applicable local ordinances, and the requirements of this Order. Priority for site inspections must consider threat to water quality pursuant to Provision E.4.b as well as the nature of the construction activity, topography, and the characteristics of soils and receiving water quality.

(1) Inspection Frequency

(a) Each Copermittee must conduct inspections at all inventoried sites, including high threat to water quality sites, at an appropriate frequency for each phase of construction to confirm the site reduces the discharge of pollutants in storm water from construction sites to the MEP, and effectively prohibits non-storm water discharges from entering the MS4.

(b) Each Copermittee must establish appropriate inspection frequencies for high threat to water quality sites, and all other sites, for each phase of construction. Inspection frequencies appropriate for addressing the highest water quality priorities identified in the Water Quality Improvement Plan, and for complying with the requirements of this Order must be identified in each Copermittee's jurisdictional runoff management program document.

(c) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e., re-inspection, enforcement) necessary to require and confirm site compliance with its local permits and applicable local ordinances, and the requirements of this Order.

(2) Inspection Content

Inspections of construction sites by the Copermittee must include, at a minimum:

(a) Verification of coverage under the Construction General Permit (Notice of Intent (NOI) and/or WDID number) during initial inspections, when applicable;

(b) Assessment of compliance with its local permits and applicable local ordinances related to pollution prevention, including the implementation and maintenance of applicable BMPs;

(c) Assessment of BMP adequacy and effectiveness;

(d) Visual observations of actual non-storm water discharges;

(e) Visual observations of actual or potential discharge of sediment and/or construction related materials from the site;

(f) Visual observations of actual or potential illicit connections; and

(g) If any violations are found and BMP corrections are needed, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried construction sites. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Site name, location (address and hydrologic subarea), and WDID number (if applicable);

(b) Inspection date;

(c) Approximate amount of rainfall since last inspection;

(d) Description of problems observed with BMPs and indication of need for BMP addition/repair/replacement and any scheduled re-inspection, and date of re-inspection;

(e) Descriptions of any other specific inspection comments which must, at a minimum, include rationales for longer compliance time;

(f) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(g) Resolution of problems noted and date problems fixed.

e. CONSTRUCTION SITE ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried construction sites, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

5. Existing Development Management

Each Copermittee must implement an existing development management program in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and includes, at a minimum, the following requirements:

a. EXISTING DEVELOPMENT INVENTORY AND TRACKING

Each Copermittee must maintain, and update at least annually, a watershed-based inventory of the existing development within its jurisdiction that may discharge a pollutant load to and from the MS4. The use of an automated database system, such as GIS, is highly recommended. The inventory must, at a minimum, include:

(1) Name, location (hydrological subarea and address, if applicable) of the following types of existing development with its jurisdiction:

(a) Commercial facilities or areas;

(b) Industrial facilities;

(c) Municipal facilities, including:

(i) MS4 and related structures;[33]

(ii) Roads, streets, and highways;

(iii) Parking facilities;

(iv) Municipal airfields;

(v) Parks and recreation facilities;

[33] The inventory may refer to the MS4 map required to be maintained pursuant to Provision E.2.b.(1).

(vi) Flood management facilities, flood control devices and structures;

(vii) Operating or closed municipal landfills;

(viii) Publicly owned treatment works (including water and wastewater treatment plants) and sanitary sewer collection systems;

(ix) Corporate yards, including maintenance and storage yards for materials, waste, equipment, and vehicles;

(x) Hazardous waste collection facilities;

(xi) Other treatment, storage or disposal facilities for municipal waste; and

(xii) Other municipal facilities that the Copermittee determines may contribute a significant pollutant load to the MS4.

(d) Residential areas, which may be designated by one or more of the following:

(i) Residential management area;

(ii) Drainage basin or area;

(iii) Land use (e.g., single family, multi-family, rural);

(iv) Neighborhood;

(v) Common Interest Area;

(vi) Home Owner Association;

(vii) Mobile home park; and/or

(viii) Other designations accepted by the San Diego Water Board Executive Officer.

(2) A description of the facility or area, including the following information:

(a) Classification as commercial, industrial, municipal, or residential;

(b) Status of facility or area as active or inactive;

(c) Identification if a business is a mobile business;

(d) SIC Code or NAICS Code, if applicable;

(e) Industrial General Permit NOI and/or WDID number, if applicable;

(f) Identification if a residential area is or includes a Common Interest Area / Home Owner Association, or mobile home park;

(g) Identification of pollutants generated and potentially generated by the facility or area;

(h) Whether the facility or area is adjacent to an ESA;

(i) Whether the facility or area is tributary to and within the same hydrologic subarea as a water body segment listed as impaired on the CWA section 303(d) List and generates pollutants for which the water body segment is impaired; and

(3) An annually updated map showing the location of inventoried existing development, watershed boundaries, and water bodies.

b. EXISTING DEVELOPMENT BMP IMPLEMENTATION AND MAINTENANCE

Each Copermittee must designate a minimum set of BMPs required for all inventoried existing development, including special event venues. The designated minimum BMPs must be specific to facility or area types and pollutant generating activities, as appropriate.

(1) Commercial, Industrial, and Municipal Facilities and Areas

(a) Pollution Prevention

Each Copermittee must require the use of pollution prevention methods by the commercial, industrial, and municipal facilities and areas in its inventoried existing development to address the priorities and strategies in the Water Quality Improvement Plan.

(b) BMP Implementation

Each Copermittee must require the implementation of designated BMPs at commercial facilities and areas, industrial facilities, and implement designated BMPs at municipal facilities in its inventoried existing development.

(c) BMP Operation and Maintenance

(i) Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development.

(ii) Each Copermittee must implement a schedule of operation and maintenance activities for its MS4 and related structures (including

but not limited to catch basins, storm drain inlets, detention basins, etc.), and verify proper operation of all its municipal structural treatment controls designed to reduce pollutants (including floatables) in storm water discharges to or from its MS4s and related drainage structures. Operation and maintenance activities may include, but is not limited to, the following:

[a] Inspections of the MS4 and related structures;
[b] Cleaning of the MS4 and related structures; and
[c] Proper disposal of materials removed from cleaning of the MS4 and related structures.

(iii) Each Copermittee must implement a schedule of operation and maintenance for public streets, unpaved roads, paved roads, and paved highways within its jurisdiction to minimize pollutants that can be discharged in storm water.

(iv) Each Copermittee must implement controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers. Copermittees that operate both a municipal sanitary sewer system and a MS4 must implement controls and measures to prevent and eliminate seeping sewage from infiltrating the MS4. Copermittees that do not operate both a municipal sanitary sewer system and a MS4 must coordinate with sewering agencies to keep themselves informed of relevant and appropriate maintenance activities and sanitary sewage projects in their jurisdiction that may cause or contribute to seepage of sewage into the MS4.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must require the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from commercial facilities and areas and industrial facilities, and implement BMPs at municipal facilities in its inventoried existing development. Such BMPs must include, as appropriate, educational activities, permits, certifications and other measures for applicators and distributors.

(2) <u>Residential Areas</u>

(a) Pollution Prevention

Each Copermittee must promote and encourage the use of pollution prevention methods, where appropriate, by the residential areas in its inventoried existing development.

(b) BMP Implementation

Each Copermittee must promote and encourage the implementation of designated BMPs at residential areas in its inventoried existing development.

(c) BMP Operation and Maintenance

Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at residential areas in its inventoried existing development.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must promote and encourage the implementation of BMPs to reduce pollutants in storm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from residential areas in its inventoried existing development.

c. EXISTING DEVELOPMENT INSPECTIONS

Each Copermittee must conduct inspections of inventoried existing development to ensure compliance with applicable local ordinances and permits, and the requirements of this Order.

(1) Inspection Frequency

(a) Each Copermittee must establish appropriate inspection frequencies for inventoried existing development in accordance with the following requirements:

(i) At a minimum, inventoried existing development must be inspected once every five years utilizing one or more of the following methods:

[a] Drive-by inspections by Copermittee municipal and contract staff;
[b] Onsite inspections by Copermittee municipal and contract staff; and/or
[c] Visual inspections of publicly accessible inventoried facilities or areas by volunteer monitoring or patrol programs that have been trained by the Copermittee;

(ii) The frequency of inspections must be appropriate to confirm that BMPs are being implemented to reduce the discharge of pollutants in storm water from the MS4 to the MEP and effectively prohibit non-storm water discharges to the MS4;

(iii) The frequency of inspections must be based on the potential for a facility or area to discharge non-storm water and pollutants in storm water, and should reflect the priorities set forth in the Water Quality Improvement Plan;

(iv) Each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development;[34] and

(v) Inventoried existing development must be inspected by the Copermittee, as needed, in response to valid public complaints.

(b) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e. education and outreach, re-inspection, enforcement) necessary to require and confirm compliance with its applicable local ordinances and permits and the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

(2) Inspection Content

(a) Inspections of existing development must include, at a minimum:

(i) Visual inspections for the presence of actual non-storm water discharges;

(ii) Visual inspections for the presence of actual or potential discharge of pollutants;

(iii) Visual inspections for the presence of actual or potential illicit connections; and

(iv) Verification that the description of the facility or area in the inventory, required pursuant to Provision E.5.a.(2), has not changed.

(b) Onsite inspections of existing development by the Copermittee must include, at a minimum:

(i) Assessment of compliance with its applicable local ordinances and permits related to non-storm water and storm water discharges and runoff;

(ii) Assessment of the implementation of the designated BMPs;

(iii) Verification of coverage under the Industrial General Permit, when applicable; and

[34] If any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspection may count toward the total annual inspection requirement. This requirement excludes linear municipal facilities (i.e., MS4 linear channels, sanitary sewer collection systems, streets, roads and highways).

(iv) If any problems or violations are found, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried existing development. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Name and location of the facility or area (address and hydrologic subarea) consistent with the inventory name and location, pursuant to Provision E.5.a.(1);

(b) Inspection and re-inspection date(s);

(c) Inspection method(s) (i.e. drive-by, onsite);

(d) Observations and findings from the inspection(s);

(e) For onsite inspections of existing development by Copermittee municipal or contract staff, the records must also include, as applicable:

(i) Description of any problems or violations found during the inspection(s);

(ii) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(iii) The date problems or violations were resolved.

d. EXISTING DEVELOPMENT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried existing development, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

e. RETROFITTING AND REHABILITATING AREAS OF EXISTING DEVELOPMENT

(1) Retrofitting Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to retrofit areas of existing development within its jurisdiction to address identified sources of pollutants and/or stressors that

contribute to the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify areas of existing development as candidates for retrofitting, focusing on areas where retrofitting will address pollutants and/or stressors that contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for retrofitting projects may be utilized to reduce pollutants that may be discharged in storm water from areas of existing development, and/or address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of retrofitting projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting projects; and

(e) Where retrofitting projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional retrofitting projects (i.e. projects that can receive and/or treat storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment) adjacent to and/or downstream of the areas of existing development.

(2) Stream, Channel and/or Habitat Rehabilitation in Areas of Existing Development

Each Copermittee must describe in its jurisdictional runoff management program document, a program to rehabilitate streams, channels, and/or habitats in areas of existing development within its jurisdiction to address the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must identify streams, channels, and/or habitats in areas of existing development as candidates for rehabilitation, focusing on areas where stream, channel, and/or habitat rehabilitation projects will address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for stream, channel, and/or habitat rehabilitation projects may be utilized to address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters, rehabilitate channelized or hydromodified streams, restore wetland and riparian habitat, restore watershed functions, and/or restore beneficial uses of receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of stream, channel, and/or habitat rehabilitation projects in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance stream, channel, and/or habitat rehabilitation projects; and

(e) Where stream, channel, and/or habitat rehabilitation projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional stream, channel, and/or habitat rehabilitation projects (i.e. projects that can receive storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment).

6. Enforcement Response Plans

Each Copermittee must develop and implement an Enforcement Response Plan as part of its jurisdictional runoff management program document. The Enforcement Response Plan must describe the applicable approaches and options to enforce its legal authority established pursuant to Provision E.1, as necessary, to achieve compliance with the requirements of this Order. The Enforcement Response Plan must be in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include the following:

a. Enforcement Response Plan Components

The Enforcement Response Plan must include the following individual components:

(1) Illicit Discharge Detection and Elimination Enforcement Component;

(2) Development Planning Enforcement Component;

(3) Construction Management Enforcement Component; and

(4) Existing Development Enforcement Component.

b. ENFORCEMENT RESPONSE APPROACHES AND OPTIONS

Each component of the Enforcement Response Plan must describe the enforcement response approaches that the Copermittee will implement to compel compliance with its statutes, ordinances, permits, contracts, orders, or similar means, and the requirements of this Order. The description must include the protocols for implementing progressively stricter enforcement responses. The enforcement response approaches must include appropriate sanctions to compel compliance, including, at a minimum, the following tools or their equivalent:

(1) Verbal and written notices of violation;

(2) Cleanup requirements;

(3) Fines;

(4) Bonding requirements;

(5) Administrative and criminal penalties;

(6) Liens;

(7) Stop work orders; and

(8) Permit and occupancy denials.

c. CORRECTION OF VIOLATIONS

(1) Violations must be corrected in a timely manner with the goal of correcting the violations within 30 calendar days after the violations are discovered, or prior to the next predicted rain event, whichever is sooner.

(2) If more than 30 calendar days are required to achieve compliance, then a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

d. ESCALATED ENFORCEMENT

(1) The Enforcement Response Plan must include a definition of “escalated enforcement.” Escalated enforcement must include any enforcement scenario where a violation or other non-compliance is determined to cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan. Escalated enforcement may be defined differently for development planning, construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas.

(2) Where the Copermittee determines escalated enforcement is not required, a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

(3) Escalated enforcement actions must continue to increase in severity, as necessary, to compel compliance as soon as possible.

e. REPORTING OF NON-COMPLIANT SITES

(1) Each Copermittee must notify the San Diego Water Board in writing within five (5) calendar days of issuing escalated enforcement (as defined in the Copermittee's Enforcement Response Plan) to a construction site that poses a significant threat to water quality as a result of violations or other non-compliance with its permits and applicable local ordinances, and the requirements of this Order. Written notification may be provided electronically by email to the appropriate San Diego Water Board staff.

(2) Each Copermittee must notify the San Diego Water Board of any persons required to obtain coverage under the statewide Industrial General Permit and Construction General Permit and failing to do so, within five (5) calendar days from the time the Copermittee become aware of the circumstances. Written notification may be provided electronically by email to RB9_Nonfilers@waterboards.ca.gov.

7. Public Education and Participation

Each Copermittee must implement, individually or with other Copermittees, a public education and participation program in accordance with the strategies identified in the Water Quality Improvement Plan to promote and encourage the development of programs, management practices, and behaviors that reduce the discharge of pollutants in storm water to the MEP, prevent controllable non-storm water discharges from entering the MS4, and protect water quality standards in receiving waters. The public education and participation program must be implemented in accordance with the strategies in the Water Quality Improvement Plan described pursuant to Provision B.3.b.(1) and include, at a minimum, the following requirements:

a. PUBLIC EDUCATION

The public education program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) Educational activities, public information activities, and other appropriate outreach activities intended to reduce pollutants associated with the application of pesticides, herbicides and fertilizer and other pollutants of

concern in storm water discharges to and from its MS4 to the MEP, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed to address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(2) Educational activities, public information activities, and other appropriate outreach activities to facilitate the proper management and disposal of used oil and toxic materials; and

(3) Appropriate education and training measures for specific target audiences, such as construction site operators, residents, underserved target audiences and school-aged children, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed, based on high risk behaviors and pollutants of concern.

b. PUBLIC PARTICIPATION

The public participation program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) A process for members of the public to participate in updating the highest priority water quality conditions, numeric goals, and water quality improvement strategies in the Water Quality Improvement Plan;

(2) Opportunities for members of the public to participate in providing the Copermittee recommendations for improving the effectiveness of the water quality improvement strategies implemented within its jurisdiction; and

(3) Opportunities for members of the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or protection of the quality of receiving waters.

8. Fiscal Analysis

a. Each Copermittee must secure the resources necessary to meet all the requirements of this Order.

b. Each Copermittee must conduct an annual fiscal analysis of its jurisdictional runoff management program in its entirety. The fiscal analysis must include the following:

(1) Identification of the various categories of expenditures necessary to implement the requirements of this Order, including a description of the specific capital, operation and maintenance, and other expenditure items to be accounted for in each category of expenditures;

(2) The staff resources needed and allocated to meet the requirements of this Order, including any development, implementation, and enforcement activities required;

(3) The estimated expenditures for Provisions E.8.b.(1) and E.8.b.(2) for the current fiscal year; and

(4) The source(s) of funds that are proposed to meet the necessary expenditures described in Provisions E.8.b.(1) and E.8.b.(2), including legal restrictions on the use of such funds, for the current fiscal year and next fiscal year.

c. Each Copermittee must submit a summary of the annual fiscal analysis with each Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3).

d. Each Copermittee must provide the documentation used to develop the summary of the annual fiscal analysis upon request by the San Diego Water Board.

F. REPORTING

The purpose of this provision is to determine and document compliance with the requirements set forth in this Order. The goal of reporting is to communicate to the San Diego Water Board and the people of the State of California the implementation status of each jurisdictional runoff management program and compliance with the requirements of this Order. This goal is to be accomplished through the submittal of specific deliverables to the San Diego Water Board by the Copermittees.

1. Water Quality Improvement Plans

The Copermittees for each Watershed Management Area must develop and submit the Water Quality Improvement Plan in accordance with the following requirements:

a. WATER QUALITY IMPROVEMENT PLAN DEVELOPMENT

Each Water Quality Improvement Plan must be developed in accordance with the following process:

(1) Public Participation Process

The Copermittees must implement a public participation process to solicit data, information, and recommendations to be utilized in the development of the Water Quality Improvement Plan. The public participation process must include the following:

(a) The Copermittees must develop a publicly available and noticed schedule of the opportunities for the public to participate and provide comments during the development of the Water Quality Improvement Plan. The schedule may be adjusted as necessary by the Copermittees, provided the public is provided timely notification of the changes to the schedule.

(b) The Copermittees must form a Water Quality Improvement Consultation Panel to provide recommendations during the development of the Water Quality Improvement Plan. The Water Quality Improvement Consultation Panel must consist of at least the following members:

(i) A representative of the San Diego Water Board;

(ii) A representative of the environmental community familiar with the water quality conditions of concern of the receiving waters in the Watershed Management Area, preferably from an environmental interest group associated with a water body within the Watershed Management Area; and

(iii) A representative of the development community familiar with the opportunities and constraints for implementing structural BMPs,

retrofitting projects, and stream, channel or habitat rehabilitation projects in the Watershed Management Area, preferably with relevant engineering, hydrology, and/or geomorphology experience in the Watershed Management Area.

(c) The Copermittees must coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public time and opportunity to participate during the development of the Water Quality Improvement Plans.

(2) Priority Water Quality Conditions

(a) The Copermittees must solicit data, information and recommendations from the public to be utilized in the development and identification of the priority water quality conditions and potential water quality improvement strategies for the Watershed Management Area.

(b) The Copermittees must review the priority water quality conditions the Copermittees plan on including in the Water Quality Improvement Plan with the Water Quality Improvement Consultation Panel to receive recommendations or concurrence.

(c) The Copermittees must consider revisions to the priority water quality conditions based on recommendations from the Water Quality Improvement Consultation Panel.

(d) The Copermittees must include all the potential water quality improvement strategies identified by the public and the Water Quality Improvement Consultation Panel with the submittal of the priority water quality conditions to the San Diego Water Board.

(e) The Copermittees must submit the Water Quality Improvement Plan requirements of Provision B.2 to the San Diego Water Board as early as 6 months and no later than 12 months after the commencement of coverage under this Order. Upon receipt, the San Diego Water Board will issue a public notice and release the proposed priority water quality conditions and potential water quality improvement strategies for public review and comment for a minimum of 30 days.

(f) The Copermittees must consider revisions to the priority water quality conditions and potential water quality improvement strategies developed pursuant to Provision B.2 based on public comments received by the close of the comment period.

(3) Water Quality Improvement Goals, Strategies and Schedules

(a) The Copermittees must solicit recommendations from the public on potential numeric goals for the highest priority water quality conditions identified for the Watershed Management Area, and recommendations on the strategies that should be implemented to achieve the potential numeric goals.

(b) The Copermittees must consult with the Water Quality Improvement Consultation Panel and consider revisions to the following items based on the Panel's recommendations:

(i) The numeric goals and schedules the Copermittees propose to include in the Water Quality Improvement Plan;

(ii) The water quality improvement strategies and schedules the Copermittees propose to implement in the Watershed Management Area and include in the Water Quality Improvement Plan; and

(iii) If the Copermittees choose to implement Provision B.3.b.(4), the results of the Watershed Management Area Analysis the Copermittees proposed to incorporate into the Water Quality Improvement Plan.

(c) The Copermittees must submit the Water Quality Improvement Plan requirements of Provision B.3 to the San Diego Water Board as early as 9 months and no later than 18 months after the commencement of coverage under this Order. Upon receipt, the San Diego Water Board will issue a public notice and release the proposed water quality improvement goals, strategies and schedules for public review and comment for a minimum of 30 days.

(d) The Copermittees must consider revisions to the water quality improvement goals, strategies and schedules developed pursuant to Provision B.3 based on public comments received by the close of the comment period.

b. WATER QUALITY IMPROVEMENT PLAN SUBMITTAL AND IMPLEMENTATION

(1) Within 24 months after the commencement of coverage under this Order, the Copermittees for each Watershed Management Area must submit a complete Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order to the San Diego Water Board. The San Diego Water Board will issue a public notice and release the Water Quality Improvement Plan for public review and comment for a minimum of 30 days.

(2) The Copermittees must consider revisions to the Water Quality Improvement Plan based on written comments received by the close of the public comment period.

(3) The Copermittees must promptly submit any revisions to the Water Quality Improvement Plan to the San Diego Water Board no later than 60 days after the close of the public comment period.

(4) If issues concerning the Water Quality Improvement Plan are resolved informally through discussions among the Copermittees, the San Diego Water Board and interested parties, the San Diego Water Board Executive Officer may provide written notification of acceptance to the Copermittees that the Water Quality Improvement Plan meets the requirements of Provision B. However, if the Executive Officer determines that significant issues with the Water Quality Improvement Plan remain, the matter will be scheduled for San Diego Water Board consideration at a public meeting.

(5) The Copermittees must commence with implementation of the Water Quality Improvement Plan, in accordance with the water quality improvement strategies and schedules therein, upon written notification of acceptance with the Water Quality Improvement Plan by the San Diego Water Board Executive Officer.

(6) During implementation of the Water Quality Improvement Plan the Copermittees must correct any deficiencies in the Plan identified by the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report following a request by the Board to do so.

(7) The Water Quality Improvement Plan must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of receiving notification of acceptance with the Water Quality Improvement Plan by the San Diego Water Board Executive Officer.

2. Updates

a. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATES

Each Copermittee must update its jurisdictional runoff management program document in accordance with the following requirements:

(1) Each Copermittee is encouraged to seek public and key stakeholder participation and comments, as early and often as possible during the process of developing updates to its jurisdictional runoff management program document;

(2) Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E concurrent with the submittal of the Water Quality Improvement Plan. Each Copermittee must correct any deficiencies in the jurisdictional runoff management program document based on comments received from the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report;

(3) Each Copermittee must submit updates to its jurisdictional runoff management program, with the supporting rationale for the modifications, either in the Water Quality Improvement Plan Annual Report required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b;

(4) The Copermittee must revise proposed modifications to its jurisdictional runoff management program as directed by the San Diego Water Board Executive Officer; and

(5) Updated jurisdictional runoff management program documents must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of submitting the Water Quality Improvement Plan Annual Report.

b. BMP DESIGN MANUAL UPDATES

Each Copermittee must update its BMP Design Manual in accordance with the following requirements:

(1) Each Copermittee must update its BMP Design Manual to incorporate the requirements of Provisions E.3.a-d concurrent with the submittal of the Water Quality Improvement Plan. Each Copermittee must correct any deficiencies in the BMP Design Manual based on comments received from the San Diego Water Board in the updates submitted with the Water Quality Improvement Plan Annual Report;

(2) Any future updates to the BMP Design Manual made after its update pursuant to Provision F.2.b.(1) is completed must be consistent with the requirements of Provisions E.3.a-d and must be submitted as part of the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b; and

(3) BMP Design Manuals must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of completing the update.

(4) If the San Diego Water Board amends Provisions E.3.a-d during the permit term but after the Copermittee has completed the update pursuant to Provision F.2.b.(1), the Copermittee must revise its BMP Design Manual to

incorporate the amended Provision E.3.a-d requirements as soon as possible but not later than 90 days after the date the San Diego Water Board adopts the amendments to Provisions E.3.a-d, unless otherwise directed by the San Diego Water Board Executive Officer. Under these circumstances, the effective date of the BMP Design Manual is no later than 90 days after the date the San Diego Water Board adopts the amendments to Provisions E.3.a-d, unless otherwise directed by the San Diego Water Board Executive Officer.

c. WATER QUALITY IMPROVEMENT PLAN UPDATES

(1) The Water Quality Improvement Plans must be updated in accordance with the following process:

(a) The Copermittees must develop and implement a public participation process to obtain data, information and recommendations for updating the Water Quality Improvement Plan. The public participation process must provide for a publicly available and noticed schedule of opportunities for the public to participate and provide comments during the development of updates to the Water Quality Improvement Plan;

(b) The Copermittees must consult with the Water Quality Improvement Consultation Panel on proposed updates of the Water Quality Improvement Plan, and consider the Water Quality Improvement Consultation Panel's recommendations in finalizing the proposed updates;

(c) The Copermittees for each Watershed Management Area must submit 1) proposed updates to the Water Quality Improvement Plan and supporting rationale, and 2) recommendations received from the public and the Water Quality Improvement Consultation Panel and the rationale for the requested updates, either in the Water Quality Improvement Plan Annual Reports required pursuant to Provision F.3.b.(3), or as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The updates submitted will be deemed accepted for inclusion in the Water Quality Improvement Plan ninety (90) days after submission unless otherwise directed in writing by the San Diego Water Board Executive Officer;

(d) The Copermittees must revise the requested updates as directed by the San Diego Water Board Executive Officer; and

(e) Updated Water Quality Improvement Plans must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance of the requested updates by the San Diego Water Board.

(2) No later than six months following Office of Administrative Law and USEPA approval of any TMDL Basin Plan amendment with wasteload allocations (WLAs) assigned to the Copermittees during the term of this Order, the

Copermittees must initiate an update to the applicable Water Quality Improvement Plans in accordance with Provision F.1 or Provision F.2.c.(1) to incorporate the requirements of the TMDL WLAs.

3. Progress Reporting

a. PROGRESS REPORT PRESENTATIONS

The Copermittees for each Watershed Management Area must periodically appear before the San Diego Water Board, as requested by the Board, to provide progress reports on the implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs.

b. ANNUAL REPORTS

(1) Transitional Jurisdictional Runoff Management Program Annual Reports

(a) Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) no later than October 31 of each year for each jurisdictional runoff management program reporting period (i.e. July 1 to June 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted.

(b) Each Copermittee must submit the information on the Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) specific to the area within its jurisdiction in each Watershed Management Area.

(c) In addition to submitting the Jurisdictional Runoff Management Program Annual Report Form during the transitional reporting period, each Copermittee may continue to utilize and submit the jurisdictional runoff management program annual reporting format of its previous NPDES permit until the first Water Quality Improvement Plan Annual Report is required to be submitted.

(2) Transitional Monitoring and Assessment Program Annual Reports

The Copermittees for each Watershed Management Area must submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted under this Order. The Transitional

Monitoring and Assessment Program Annual Reports must include:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1.a and D.2.a, summarized and presented in tabular and graphical form; and

(b) The findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

(3) Water Quality Improvement Plan Annual Reports

The Copermittees for each Watershed Management Area must submit a Water Quality Improvement Plan Annual Report for each reporting period no later than January 31 of the following year. The annual reporting period consists of two different periods: 1) July 1 to June 30 of the following year for the jurisdictional runoff management programs, 2) October 1 to September 30 of the following year for the monitoring and assessment programs. The Water Quality Improvement Plan Annual Reports must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Each Annual Report must include the following:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, summarized and presented in tabular and graphical form;

(b) The progress of the special studies required pursuant to Provision D.3, and the findings, interpretations and conclusions of a special study, or each phase of a special study, upon its completion;

(c) The findings, interpretations and conclusions from the assessments required pursuant to Provision D.4;

(d) The progress of implementing the Water Quality Improvement Plan, including, but not limited to, the following:

(i) The progress toward achieving the interim and final numeric goals for the highest water quality priorities for the Watershed Management Area;

(ii) The water quality improvement strategies that were implemented and/or no longer implemented by each of the Copermittees during the reporting period and previous reporting periods;

(iii) The water quality improvement strategies planned for implementation during the next reporting period;

(iv) Proposed modifications to the water quality improvement strategies, the public comments received and the supporting rationale for the

proposed modifications;

(v) Previous modifications or updates incorporated into the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document and implemented by the Copermittees in the Watershed Management Area; and

(vi) Proposed modifications or updates to the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document;

(e) A completed Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D to this Order or a revised form accepted by the San Diego Water Board) for each Copermittee in the Watershed Management Area, certified by a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative; and

(f) Each Copermittee must provide any data or documentation utilized in developing the Water Quality Improvement Plan Annual Report upon request by the San Diego Water Board. Any Copermittee monitoring data utilized in developing the Water Quality Improvement Plan Annual Report must be uploaded to the California Environmental Data Exchange Network (CEDEN).[35] Any Copermittee monitoring and assessment data utilized in developing the Water Quality Improvement Plan Annual Report must be available for access on the Regional Clearinghouse required pursuant to Provision F.4.

c. Regional Monitoring and Assessment Report

(1) The Copermittees must submit a Regional Monitoring and Assessment Report no later than 180 days prior to the expiration date of this Order. The Regional Monitoring and Assessment Report may be submitted as part of the Report of Waste Discharge required pursuant to Provision F.5.b. In preparing the report the Copermittees must consider the receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, and the findings, interpretations, and conclusions from the assessments required pursuant to Provision D.4. Based on these considerations the report must assess the following:

[35] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

(a) The beneficial uses of the receiving waters within the San Diego Region that are supported and not adversely affected by the Copermittees' MS4 discharges;

(b) The beneficial uses of the receiving waters within the San Diego Region that are adversely impacted by the Copermittees' MS4 discharges;

(c) The progress toward protecting the beneficial uses in the receiving waters within the San Diego Region from the Copermittees' discharges; and

(d) Pollutants or conditions of emerging concern that may impact beneficial uses in the receiving waters within the San Diego Region.

(2) The Regional Monitoring and Assessment Report must include recommendations for improving the implementation and assessment of the Water Quality Improvement Plans and jurisdictional runoff management programs.

(3) Each Copermittee must provide any data or documentation utilized in developing the Regional Monitoring and Assessment Report upon request by the San Diego Water Board. Any Copermittee monitoring and assessment data utilized in developing the Regional Monitoring and Assessment Report must be available for access on the Regional Clearinghouse required pursuant to Provision F.4.

4. Regional Clearinghouse

The Copermittees must develop, update, and maintain an internet-based Regional Clearinghouse that is made available to the public no later than 18 months after the effective date of this Order.[36]

a. The Copermittees, through the Regional Clearinghouse, must make the following documents and data available for access, and organized by Watershed Management Area. The documents and data may be linked to other internet-based data portals and databases where the original documents are stored:

(1) Water Quality Improvement Plan for the Watershed Management Area, and all updated versions with date of update;

(2) Annual Reports for the Watershed Management Area;

(3) Jurisdictional Runoff Management Program document for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

[36] The Copermittees may develop, update and maintain the clearinghouse(s) of other Copermittees or agencies.

(4) BMP Design Manual for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(5) Reports from special studies (e.g. source identification, BMP effectiveness assessment) conducted in the Watershed Management Area;

(6) Monitoring data collected pursuant to Provision D for each Watershed Management Area must be uploaded to CEDEN,[37] with links to the uploaded data; and

(7) Available GIS data, layers, and/or shapefiles used to develop the maps generated and maintained by the Copermittees for the Water Quality Improvement Plans, Annual Reports, and jurisdictional runoff management program documents.

b. The Copermittees, through the Regional Clearinghouse, must make the following information and documents available for access:

(1) Contact information (point of contact, phone number, email address, and mailing address) for each Copermittee;

(2) Public hotline number for reporting non-storm water and illicit discharges for each Copermittee;

(3) Email address for reporting non-storm water and illicit discharges for each Copermittee;

(4) Link to each Copermittee's website, if available, where the public may find additional information about the Copermittee's storm water management program and for requesting records for the implementation of its program;

(5) Information about opportunities for the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in storm water discharges from the MS4, and/or protection of the quality of receiving waters; and

(6) Reports from regional monitoring programs in which the Copermittees participate (e.g. Southern California Monitoring Coalition, Southern California Coastal Water Research Project Bight Monitoring);

(7) Regional Monitoring and Assessment Reports; and

(8) Any other information, data, and documents the Copermittees determine as appropriate for making available to the public.

[37] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

5. Report of Waste Discharge

The Copermittees subject to the requirements of this Order must submit to the San Diego Water Board a complete Report of Waste Discharge as an application for the re-issuance of this Order and NPDES permit. The Report of Waste Discharge must be submitted no later than 180 days in advance of the expiration date of this Order. The Report of Waste Discharge must contain the following minimum information:

a. Names and addresses of the Copermittees;

b. Names and titles of the primary contacts of the Copermittees;

c. Proposed changes to the Copermittees' Water Quality Improvement Plans and the supporting justification;

d. Proposed changes to the Copermittees' jurisdictional runoff management programs and the supporting justification;

e. Any other information necessary for the re-issuance of this Order;

f. Any information to be included as part of the Report of Waste Discharge pursuant to the requirements of this Order; and

g. Any other information required by federal regulations for NPDES permit reissuance.

6. Reporting Provisions

Each Copermittee must comply with all the reporting and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

G. PRINCIPAL WATERSHED COPERMITTEE RESPONSIBILITIES

1. The Copermittees within each Watershed Management Area must designate a Principal Watershed Copermittee and notify the San Diego Water Board of the name of the Principal Watershed Copermittee. An individual Copermittee should not be designated a Principal Watershed Copermittee for more than two Watershed Management Areas. The notification may be submitted with the Water Quality Improvement Plan required pursuant to Provision F.1 of this Order.

2. The Principal Watershed Copermittee is responsible for, at a minimum, the following:

a. Serving as liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues, and when necessary and appropriate, representing the Copermittees in the Watershed Management Area before the San Diego Water Board;

b. Facilitating the development of the Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order;

c. Coordinating the submittal of the deliverables required by Provisions F.1, F.2, F.3.a, and F.3.b of this Order; and

d. Coordinating and developing, with the other Principal Watershed Copermittees, the requirements of Provisions F.3.c, F.4, and F.5.b of this Order.

3. The Principal Watershed Copermittee is not responsible for ensuring that the other Copermittees within the Watershed Management Area are in compliance with the requirements of this Order. Each Copermittee within the Watershed Management Area is responsible for complying with the requirements of this Order.

H. MODIFICATION OF ORDER

1. Modifications of the Order may be initiated by the San Diego Water Board or by the Copermittees. Requests by Copermittees must be made to the San Diego Water Board.

2. Minor modifications to the Order may be made by the San Diego Water Board where the proposed modification complies with all the prohibitions and limitations, and other requirements of this Order.

3. This Order may also be re-opened and modified, revoked and, reissued or terminated in accordance with the provisions of 40 CFR 122.44, 122.62 to 122.64, and 124.5. Causes for taking such actions include, but are not limited to, failure to comply with any condition of this Order and permit, and endangerment to human health or the environment resulting from the permitted activity.

4. This Order may be re-opened for modification for cause including but not limited to the following:

a. Any of the TMDLs in Attachment E to this Order are amended in the Basin Plan by San Diego Water Board, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA;

b. The Basin Plan is amended by the San Diego Water Board to incorporate a new TMDL, and the amendment is approved by the State Water Board, Office of Administrative Law, and the USEPA; or

c. Updating or revising the monitoring and reporting requirements is determined to be necessary, at the discretion of the San Diego Water Board. Such modification(s) may include, but is (are) not limited to, revision(s) to: (i) implement recommendations from Southern California Coastal Water Research Project (SCCWRP), (ii) develop, refine, implement, and/or coordinate a regional monitoring program, (iii) develop and implement improved monitoring and assessment programs in keeping with San Diego Water Board Resolution No. R9-2012-0069, Resolution in Support of a Regional Monitoring Framework, and/or (iv) add provisions to require the Copermittees to evaluate and provide information on cost and values of the monitoring and reporting program.

I. STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

Each Copermittee must comply with all the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

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ATTACHMENT A

DISCHARGE PROHIBITIONS AND SPECIAL PROTECTIONS

1. Basin Plan Waste Discharge Prohibitions

California Water Code Section 13243 provides that a Regional Water Board, in a water quality control plan, may specify certain conditions or areas where the discharge of waste or certain types of waste is not permitted. The following waste discharge prohibitions in the Water Quality Control Plan for the San Diego Basin (Basin Plan) are applicable to any person, as defined by Section 13050(c) of the California Water Code, who is a citizen, domiciliary, or political agency or entity of California whose activities in California could affect the quality of waters of the state within the boundaries of the San Diego Region.

1. The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in California Water Code Section 13050, is prohibited.

2. The discharge of waste to land, except as authorized by waste discharge requirements or the terms described in California Water Code Section 13264 is prohibited.

3. The discharge of pollutants or dredged or fill material to waters of the United States except as authorized by a National Pollutant Discharge Elimination System (NPDES) permit or a dredged or fill material permit (subject to the exemption described in California Water Code Section 13376) is prohibited.

4. Discharges of recycled water to lakes or reservoirs used for municipal water supply or to inland surface water tributaries thereto are prohibited, unless this San Diego Water Board issues a NPDES permit authorizing such a discharge; the proposed discharge has been approved by the State Department of Health Services (DHS) and the operating agency of the impacted reservoir; and the discharger has an approved fail-safe long-term disposal alternative.

5. The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the San Diego Water Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

6. The discharge of waste in a manner causing flow, ponding, or surfacing on lands not owned or under the control of the discharger is prohibited, unless the discharge is authorized by the San Diego Water Board.

7. The dumping, deposition, or discharge of waste directly into waters of the state, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the San Diego Water Board.

8. Any discharge to a storm water conveyance system that is not composed entirely of "*storm water*" is prohibited unless authorized by the San Diego Water Board. [The federal regulations, 40 CFR 122.26(b)(13), define storm water as storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from firefighting activities.] [§122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

9. The unauthorized discharge of treated or untreated sewage to waters of the state or to a storm water conveyance system is prohibited.

10. The discharge of industrial wastes to conventional septic tank/subsurface disposal systems, except as authorized by the terms described in California Water Code Section 13264, is prohibited.

11. The discharge of radioactive wastes amenable to alternative methods of disposal into the waters of the state is prohibited.

12. The discharge of any radiological, chemical, or biological warfare agent into waters of the state is prohibited.

13. The discharge of waste into a natural or excavated site below historic water levels is prohibited unless the discharge is authorized by the San Diego Water Board.

14. The discharge of sand, silt, clay, or other earthen materials from any activity, including land grading and construction, in quantities which cause deleterious bottom deposits, turbidity or discoloration in waters of the state or which unreasonably affect, or threaten to affect, beneficial uses of such waters is prohibited.

15. The discharge of treated or untreated sewage from vessels to Mission Bay, Oceanside Harbor, Dana Point Harbor, or other small boat harbors is prohibited.

16. The discharge of untreated sewage from vessels to San Diego Bay is prohibited.

17. The discharge of treated sewage from vessels to portions of San Diego Bay that are less than 30 feet deep at mean lower low water (MLLW) is prohibited.

18. The discharge of treated sewage from vessels, which do not have a properly functioning US Coast Guard certified Type I or Type II marine sanitation device, to portions of San Diego Bay that are greater than 30 feet deep at mean lower low water (MLLW) is prohibited.

2. Attachment B to State Water Board Resolution 2012-0012, as amended by State Water Board Resolution No. 2012-0031.

Special Protections for Areas of Special Biological Significance (ASBS), Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges

I. PROVISIONS FOR POINT SOURCE DISCHARGES OF STORM WATER AND NONPOINT SOURCE WASTE DISCHARGES

The following terms, prohibitions, and special conditions (hereafter collectively referred to as special conditions) are established as limitations on point source storm water and nonpoint source discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in Areas of Special Biological Significance (ASBS), as required for State Water Quality Protection Areas pursuant to California Public Resources Code Sections 36700(f) and 36710(f). These Special Protections are adopted by the State Water Board as part of the California Ocean Plan (Ocean Plan) General Exception.

The special conditions are organized by category of discharge. The State Water Resources Control Board (State Water Board) and Regional Water Quality Control Boards (Regional Water Boards) will determine categories and the means of regulation for those categories [e.g., Point Source Storm Water National Pollutant Discharge Elimination System (NPDES) or Nonpoint Source].

A. PERMITTED POINT SOURCE DISCHARGES OF STORM WATER

1. General Provisions for Permitted Point Source Discharges of Storm Water

   a. Existing storm water discharges into an ASBS are allowed only under the following conditions:

      (1) The discharges are authorized by an NPDES permit issued by the State Water Board or Regional Water Board;

      (2) The discharges comply with all of the applicable terms, prohibitions, and special conditions contained in these Special Protections; and

      (3) The discharges:

         (i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

         (ii) Are designed to prevent soil erosion;

         (iii) Occur only during wet weather;

         (iv) Are composed of only storm water runoff.

   b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

   c. The discharge of trash is prohibited.

d. Only discharges from existing storm water outfalls are allowed. Any proposed or new storm water runoff discharge shall be routed to existing storm water discharge outfalls and shall not result in any new contribution of waste to an ASBS (i.e., no additional pollutant loading). "Existing storm water outfalls" are those that were constructed or under construction prior to January 1, 2005. "New contribution of waste" is defined as any addition of waste beyond what would have occurred as of January 1, 2005. A change to an existing storm water outfall, in terms of re-location or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges are prohibited except as provided below:

(1) The term "non-storm water discharges" means any waste discharges from a municipal separate storm sewer system (MS4) or other NPDES permitted storm drain system to an ASBS that are not composed entirely of storm water.

(2) (i) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability or occur naturally:

(a) Discharges associated with emergency fire fighting operations.

(b) Foundation and footing drains.

(c) Water from crawl space or basement pumps.

(d) Hillside dewatering.

(e) Naturally occurring groundwater seepage via a storm drain.

(f) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(ii) An NPDES permitting authority may authorize non-storm water discharges to an MS4 with a direct discharge to an ASBS only to the extent the NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

2. Compliance Plans for Inclusion in Storm Water Management Plans (SWMP) and Storm Water Pollution Prevention Plans (SWPPP).

The discharger shall specifically address the prohibition of non-storm water runoff and the requirement to maintain natural water quality for storm water discharges to an ASBS in an ASBS Compliance Plan to be included in its SWMP or a SWPPP, as appropriate to permit type. If a statewide permit includes a SWMP, then the discharger shall prepare a stand-alone compliance plan for ASBS discharges. The ASBS Compliance Plan is subject to approval by the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (for permits issued by Regional Water Boards).

a. The Compliance Plan shall include a map of surface drainage of storm water runoff, showing areas of sheet runoff, prioritize discharges, and describe any structural Best Management Practices (BMPs) already employed and/or BMPs to be employed in the future. Priority discharges are those that pose the greatest water quality threat and which are identified to require installation of structural BMPs. The map shall also show the storm water conveyances in relation to other features such as service areas, sewage conveyances and treatment facilities, landslides, areas prone to erosion, and waste and hazardous material storage areas, if applicable. The SWMP or SWPPP shall also include a procedure for updating the map and plan when changes are made to the storm water conveyance facilities.

b. The ASBS Compliance Plan shall describe the measures by which all non-authorized non-storm water runoff (e.g., dry weather flows) has been eliminated, how these measures will be maintained over time, and how these measures are monitored and documented.

c. For Municipal Separate Storm Sewer System (MS4s), the ASBS Compliance Plan shall require minimum inspection frequencies as follows:

(1) The minimum inspection frequency for construction sites shall be weekly during rainy season;

(2) The minimum inspection frequency for industrial facilities shall be monthly during the rainy season;

(3) The minimum inspection frequency for commercial facilities (e.g., restaurants) shall be twice during the rainy season; and

(4) Storm water outfall drains equal to or greater than 18 inches (457 mm) in diameter or width shall be inspected once prior to the beginning of the rainy season and once during the rainy season and maintained to remove trash and other anthropogenic debris.

d. The ASBS Compliance Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff, that are necessary to comply with these special conditions, will be achieved through BMPs. Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that such installation would pose a threat to health or safety. BMPs to control storm water runoff discharges (at the end-of-pipe) during a design storm shall be designed to achieve on average the following target levels:

(1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

(2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges.

The baseline for these determinations is the effective date of the Exception, except for those structural BMPs installed between January 1, 2005 and adoption of these Special Protections, and the reductions must be achieved and documented within six (6) years of the effective date.

e. The ASBS Compliance Plan shall address erosion control and the prevention of anthropogenic sedimentation in ASBS. The natural habitat conditions in the ASBS shall not be altered as a result of anthropogenic sedimentation.

f. The ASBS Compliance Plan shall describe the non-structural BMPs currently employed and planned in the future (including those for construction activities), and include an implementation schedule. The ASBS Compliance Plan shall include non-structural BMPs that address public education and outreach. Education and outreach efforts must adequately inform the public that direct discharges of pollutants from private property not entering an MS4 are prohibited. The ASBS Compliance Plan shall also describe the structural BMPs, including any low impact development (LID) measures, currently employed and planned for higher threat discharges and include an implementation schedule. To control storm water runoff discharges (at the end-of-pipe) during a design storm, permittees must first consider, and use where feasible, LID practices to infiltrate, use, or evapotranspirate storm water runoff on-site, if LID practices would be the most effective at reducing pollutants from entering the ASBS.

g. The BMPs and implementation schedule shall be designed to ensure that natural water quality conditions in the receiving water are achieved and maintained by either reducing flows from impervious surfaces or reducing pollutant loading, or some combination thereof.

h. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents in storm water runoff that alter natural ocean water quality and the sources of these constituents.

(2) The report shall describe BMPs that are currently being implemented, BMPs that are identified in the SWMP or SWPPP for future implementation, and any additional BMPs that may be added to the SWMP or SWPPP to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the BMPs.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits), the discharger shall revise its ASBS Compliance Plan to incorporate any new or modified BMPs that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised SWMP or SWPPP, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural ocean water quality conditions due to the same constituent.

(5) The requirements of this section are in addition to the terms, prohibitions, and conditions contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within eighteen (18) months from the effective date of the Exception, the discharger shall submit a draft written ASBS Compliance Plan to the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that describes its strategy to comply with these special conditions, including the requirement to maintain natural water quality in the affected ASBS. The ASBS Compliance Plan shall include a description of appropriate non-structural controls and a time schedule to implement structural controls (implementation schedule) to comply with these special conditions for inclusion in the discharger's SWMP or SWPPP, as appropriate to permit type. The final ASBS Compliance Plan, including a description and final schedule for structural controls based on the results of runoff and receiving water monitoring, must be submitted within thirty (30) months from the effective date of the Exception.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these special conditions shall be implemented.

d. Within six (6) years of the effective date of the Exception, any structural controls identified in the ASBS Compliance Plan that are necessary to comply with these special conditions shall be operational.

e. Within six (6) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water, pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data, and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by

the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. for municipalities, a demonstration of significant hardship to discharger ratepayers, by showing the relationship of storm water fees to annual household income for residents within the discharger's jurisdictional area, and the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or

2. for other governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

B. NONPOINT SOURCE DISCHARGES

1. General Provisions for Nonpoint Sources

a. Existing nonpoint source waste discharges are allowed into an ASBS only under the following conditions:

(1) The discharges are authorized under waste discharge requirements, a conditional waiver of waste discharge requirements, or a conditional prohibition issued by the State Water Board or a Regional Water Board.

(2) The discharges are in compliance with the applicable terms, prohibitions, and special conditions contained in these Special Protections.

(3) The discharges:

(i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

(ii) Are designed to prevent soil erosion;

(iii) Occur only during wet weather;

(iv) Are composed of only storm water runoff.

b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

c. The discharge of trash is prohibited.

d. Only existing nonpoint source waste discharges are allowed. "Existing nonpoint source waste discharges" are discharges that were ongoing prior to January 1, 2005. "New nonpoint source discharges" are defined as those that commenced on or after January 1,

2005. A change to an existing nonpoint source discharge, in terms of relocation or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges from nonpoint sources (those not subject to an NPDES Permit) are prohibited except as provided below:

(1) The term "non-storm water discharges" means any waste discharges that are not composed entirely of storm water.

(2) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability, or occur naturally:

(i) Discharges associated with emergency fire fighting operations.

(ii) Foundation and footing drains.

(iii) Water from crawl space or basement pumps.

(iv) Hillside dewatering.

(v) Naturally occurring groundwater seepage via a storm drain.

(vi) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

f. At the San Clemente Island ASBS, discharges incidental to military training and research, development, test, and evaluation operations are allowed. Discharges incidental to underwater demolition and other in-water explosions are not allowed in the two military closure areas in the vicinity of Wilson Cove and Castle Rock. Discharges must not result in a violation of the water quality objectives, including the protection of the marine aquatic life beneficial use, anywhere in the ASBS.

g. At the San Nicolas Island and Begg Rock ASBS, discharges incidental to military research, development, testing, and evaluation of, and training with, guided missile and other weapons systems, fleet training exercises, small-scale amphibious warfare training, and special warfare training are allowed. Discharges incidental to underwater demolition and other in-water explosions are not allowed. Discharges must not result in a violation of the water quality objectives, including the protection of the marine aquatic life beneficial use, anywhere in the ASBS.

h. All other nonpoint source discharges not specifically authorized above are prohibited.

2. Planning and Reporting

a. The nonpoint source discharger shall develop an ASBS Pollution Prevention Plan, including an implementation schedule, to address storm water runoff and any other nonpoint source discharges from its facilities. The ASBS Pollution Prevention Plan must be equivalent in contents to an ASBS Compliance Plan as described in I (A)(2) in this document. The ASBS Pollution Prevention Plan is subject to approval by the Executive Director of the State Water Board (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements).

b. The ASBS Pollution Prevention Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff that are necessary to comply with these special conditions, will be achieved through Management Measures and associated Management Practices (Management Measures/Practices). Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director or Regional Water Board Executive Officer that such installation would pose a threat to health or safety. Management Measures to control storm water runoff during a design storm shall achieve on average the following target levels:

(1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

(2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges.

The baseline for these determinations is the effective date of the Exception, except for those structural BMPs installed between January 1, 2005 and adoption of these Special Protections, and the reductions must be achieved and documented within six (6) years of the effective date.

c. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff or other nonpoint source pollution is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and the Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents that alter natural water quality and the sources of these constituents.

(2) The report shall describe Management Measures/Practices that are currently being implemented, Management Measures/Practices that are identified in the ASBS Pollution Prevention Plan for future implementation, and any additional Management Measures/Practices that may be added to the Pollution Prevention Plan to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the Management Measures/Practices.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements), the discharger shall revise its ASBS Pollution Prevention Plan to incorporate any new or modified Management Measures/Practices that have been or

will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised ASBS Pollution Prevention Plan, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural water quality conditions due to the same constituent.

(5) The requirements of this section are in addition to the terms, prohibitions, and conditions contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within eighteen (18) months from the effective date of the Exception, the discharger~~s~~ shall submit a draft written ASBS Pollution Prevention Plan to the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) that describes its strategy to comply with these special conditions, including the requirement to maintain natural ocean water quality in the affected ASBS. The Pollution Prevention Plan shall include a description of appropriate non-structural controls and a time schedule to implement structural controls to comply with these special conditions for inclusion in the discharger's Pollution Prevention Plan. The final ASBS Pollution Prevention Plan, including a description and final schedule for structural controls based on the results of runoff and receiving water monitoring, must be submitted within thirty (30) months from the effective date of the Exception.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these Special Protections shall be implemented.

d. Within six (6) years of the effective date of the Exception, any structural controls identified in the ASBS Pollution Prevention Plan that are necessary to comply with these special conditions shall be operational.

e. Within six (6) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in (d.) or (e.). The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. a demonstration that the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or

2. for governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

II. ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES

In addition to the provisions in Section I (A) or I (B), respectively, a discharger with parks and recreation facilities shall comply with the following:

A. The discharger shall include a section in an ASBS Compliance Plan (for NPDES dischargers) or an ASBS Pollution Prevention Plan (for nonpoint source dischargers) to address storm water runoff from parks and recreation facilities.

1. The plan shall identify all pollutant sources, including sediment sources, which may result in waste entering storm water runoff. Pollutant sources include, but are not limited to, roadside rest areas and vistas, picnic areas, campgrounds, trash receptacles, maintenance facilities, park personnel housing, portable toilets, leach fields, fuel tanks, roads, piers, and boat launch facilities.

2. The plan shall describe BMPs or Management Measures/Practices that will be implemented to control soil erosion (both temporary and permanent erosion controls) and reduce or eliminate pollutants in storm water runoff in order to achieve and maintain natural water quality conditions in the affected ASBS. The plan shall include BMPs or Management Measures/Practices to ensure that trails and culverts are maintained to prevent erosion and minimize waste discharges to ASBS.

3. The plan shall include BMPs or Management Measures/Practices to prevent the discharge of pesticides or other chemicals, including agricultural chemicals, in storm water runoff to the affected ASBS.

4. The plan shall include BMPs or Management Measures/Practices that address public education and outreach. The goal of these BMPs or Management Measures/Practices is to ensure that the public is adequately informed that waste discharges to the affected ASBS are prohibited or limited by special conditions in these Special Protections. The BMPs or Management Measures/Practices shall include signage at camping, picnicking, beach and roadside parking areas, and visitor centers, or other appropriate measures, which notify the public of any applicable requirements of these Special Protections and identify the ASBS boundaries.

5. The plan shall include BMPs or Management Measures/Practices that address the prohibition against the discharge of trash to ASBS. The BMPs or Management Measures/Practices shall include measures to ensure that adequate trash receptacles are available for public use at visitor facilities, including parking areas, and that the receptacles are adequately maintained to prevent trash discharges into the ASBS. Appropriate measures include covering trash receptacles to prevent trash from being wind blown and periodically emptying the receptacles to prevent overflows.

6. The plan shall include BMPs or Management Measures/Practices to address runoff from parking areas and other developed features to ensure that the runoff does not alter natural water quality in the affected ASBS. BMPs or Management Measures/Practices shall include measures to reduce pollutant loading in runoff to the ASBS through installation of natural area buffers (LID), treatment, or other appropriate measures.

B. Maintenance and repair of park and recreation facilities must not result in waste discharges to the ASBS. The practice of road oiling must be minimized or eliminated, and must not result in waste discharges to the ASBS.

III. ADDITIONAL REQUIREMENTS – WATERFRONT AND MARINE OPERATIONS

In addition to the provisions in Section I (A) or I (B), respectively, a discharger with waterfront and marine operations shall comply with the following:

A. For discharges related to waterfront and marine operations, the discharger shall develop a Waterfront and Marine Operations Management Plan (Waterfront Plan). This plan shall contain appropriate Management Measures/Practices to address nonpoint source pollutant discharges to the affected ASBS.

1. The Waterfront Plan shall contain appropriate Management Measures/Practices for any waste discharges associated with the operation and maintenance of vessels, moorings, piers, launch ramps, and cleaning stations in order to ensure that beneficial uses are protected and natural water quality is maintained in the affected ASBS.

2. For discharges from marinas and recreational boating activities, the Waterfront Plan shall include appropriate Management Measures, described in The Plan for California's Nonpoint Source Pollution Control Program, for marinas and recreational boating, or equivalent practices, to ensure that nonpoint source pollutant discharges do not alter natural water quality in the affected ASBS.

3. The Waterfront Plan shall include Management Practices to address public education and outreach to ensure that the public is adequately informed that waste discharges to the affected ASBS are prohibited or limited by special conditions in these Special

Protections. The management practices shall include appropriate signage, or similar measures, to inform the public of the ASBS restrictions and to identify the ASBS boundaries.

4. The Waterfront Plan shall include Management Practices to address the prohibition against trash discharges to ASBS. The Management Practices shall include the provision of adequate trash receptacles for marine recreation areas, including parking areas, launch ramps, and docks. The plan shall also include appropriate Management Practices to ensure that the receptacles are adequately maintained and secured in order to prevent trash discharges into the ASBS. Appropriate Management Practices include covering the trash receptacles to prevent trash from being windblown, staking or securing the trash receptacles so they don't tip over, and periodically emptying the receptacles to prevent overflow.

5. The discharger shall submit its Waterfront Plan to the by the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) within six months of the effective date of these special conditions. The Waterfront Plan is subject to approval by the State Water Board Executive Director or the Regional Water Board Executive Officer, as appropriate. The plan must be fully implemented within 18 months of the effective date of the Exception.

B. The discharge of chlorine, soaps, petroleum, other chemical contaminants, trash, fish offal, or human sewage to ASBS is prohibited. Sinks and fish cleaning stations are point source discharges of wastes and are prohibited from discharging into ASBS. Anthropogenic accumulations of discarded fouling organisms on the sea floor must be minimized.

C. Limited-term activities, such as the repair, renovation, or maintenance of waterfront facilities, including, but not limited to, piers, docks, moorings, and breakwaters, are authorized only in accordance with Chapter III.E.2 of the Ocean Plan.

D. If the discharger anticipates that the discharger will fail to fully implement the approved Waterfront Plan within the 18 month deadline, the discharger shall submit a technical report as soon as practicable to the State Water Board Executive Director or the Regional Water Board Executive Officer, as appropriate. The technical report shall contain reasons for failing to meet the deadline and propose a revised schedule to fully implement the plan.

E. The State Water Board or the Regional Water Board may, for good cause, authorize additional time to comply with the Waterfront Plan. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in Section III.A.5. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the

discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality. The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. a demonstration of significant hardship by showing that the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate.

2. for governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

IV. MONITORING REQUIREMENTS

Monitoring is mandatory for all dischargers to assure compliance with the Ocean Plan. Monitoring requirements include both: (A) core discharge monitoring, and (B) ocean receiving water monitoring. The State and Regional Water Boards must approve sampling site locations and any adjustments to the monitoring programs. All ocean receiving water and reference area monitoring must be comparable with the Water Boards' Surface Water Ambient Monitoring Program (SWAMP).

Safety concerns: Sample locations and sampling periods must be determined considering safety issues. Sampling may be postponed upon notification to the State and Regional Water Boards if hazardous conditions prevail.

Analytical Chemistry Methods: All constituents must be analyzed using the lowest minimum detection limits comparable to the Ocean Plan water quality objectives. For metal analysis, all samples, including storm water effluent, reference samples, and ocean receiving water samples, must be analyzed by the approved analytical method with the lowest minimum detection limits (currently Inductively Coupled Plasma/Mass Spectrometry) described in the Ocean Plan.

A. CORE DISCHARGE MONITORING PROGRAM

1. General sampling requirements for timing and storm size:

   Runoff must be collected during a storm event that is greater than 0.1 inch and generates runoff, and at least 72 hours from the previously measurable storm event. Runoff samples shall be collected during the same storm and at approximately the same time when post-storm receiving water is sampled, and analyzed for the same constituents as receiving water and reference site samples (see section IV B) as described below.

2. Runoff flow measurements

   a. For municipal/industrial storm water outfalls in existence as of December 31, 2007, 18 inches (457mm) or greater in diameter/width (including multiple outfall pipes in combination having a width of 18 inches, runoff flows must be measured or calculated, using a method acceptable to and approved by the State and Regional Water Boards.

b. This will be reported annually for each precipitation season to the State and Regional Water Boards.

3. Runoff samples – storm events

a. For outfalls equal to or greater than 18 inches (0.46m) in diameter or width:

(1) samples of storm water runoff shall be collected during the same storm as receiving water samples and analyzed for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

(2) samples of storm water runoff shall be collected and analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

(3) If an applicant has no outfall greater than 36 inches, then storm water runoff from the applicant's largest outfall shall be further collected during the same storm as receiving water samples and analyzed for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates).

b. For outfalls equal to or greater than 36 inches (0.91m) in diameter or width:

(1) samples of storm water runoff shall be collected during the same storm as receiving water samples and analyzed for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

(2) samples of storm water runoff shall be further collected during the same storm as receiving water samples and analyzed for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates); and

(3) samples of storm water runoff shall be collected and analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

c. For an applicant not participating in a regional monitoring program [see below in Section IV (B)] in addition to (a.) and (b.) above, a minimum of the two largest outfalls or 20 percent of the larger outfalls, whichever is greater, shall be sampled (flow weighted composite samples) at least three times annually during wet weather (storm event) and analyzed for all Ocean Plan Table A constituents, Table B constituents for marine aquatic life protection (except for toxicity, only chronic toxicity for three species shall be required), DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, and Ocean Plan indicator bacteria. For parties discharging to ASBS in

more than one Regional Water Board region, at a minimum, one (the largest) such discharge shall be sampled annually in each Region.

4. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may reduce or suspend core monitoring once the storm runoff is fully characterized. This determination may be made at any point after the discharge is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

B. Ocean Receiving Water and Reference Area Monitoring Program

In addition to performing the Core Discharge Monitoring Program in Section II.A above, all applicants having authorized discharges must perform ocean receiving water monitoring. In order to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS, dischargers may choose either (1) an individual monitoring program, or (2) participation in a regional integrated monitoring program.

1. Individual Monitoring Program: The requirements listed below are for those dischargers who elect to perform an individual monitoring program to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within the affected ASBS. In addition to Core Discharge Monitoring, the following additional monitoring requirements shall be met:

   a. Three times annually, during wet weather (storm events), the receiving water at the point of discharge from the outfalls described in section (IV)(A)(3)(c) above shall be sampled and analyzed for Ocean Plan Table A constituents, Table B constituents for marine aquatic life, DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, salinity, chronic toxicity (three species), and Ocean Plan indicator bacteria.

      The sample location for the ocean receiving water shall be in the surf zone at the point of discharges; this must be at the same location where storm water runoff is sampled. Receiving water shall be sampled prior to (pre-storm) and during (or immediately after) the same storm (post storm). Post storm sampling shall be during the same storm and at approximately the same time as when the runoff is sampled. Reference water quality shall also be sampled three times annually and analyzed for the same constituents pre-storm and post-storm, during the same storm seasons when receiving water is sampled. Reference stations will be determined by the State Water Board's Division of Water Quality and the applicable Regional Water Board(s).

   b. Sediment sampling shall occur at least three times during every five (5) year period. The subtidal sediment (sand or finer, if present) at the discharge shall be sampled and analyzed for Ocean Plan Table B constituents for marine aquatic life, DDT, PCBs, PAHs, pyrethroids, and OP pesticides. For sediment toxicity testing, only an acute toxicity test using the amphipod *Eohaustorius estuarius* must be performed.

   c. A quantitative survey of intertidal benthic marine life shall be performed at the discharge and at a reference site. The survey shall be performed at least once every five (5) year period. The survey design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The results of the survey shall be

completed and submitted to the State Water Board and Regional Water Board at least six months prior to the end of the permit cycle.

d. Once during each five (5) year period, a bioaccumulation study shall be conducted to determine the concentrations of metals and synthetic organic pollutants at representative discharge sites and at representative reference sites. The study design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The bioaccumulation study may include California mussels (*Mytilus californianus*) and/or sand crabs (*Emerita analoga* or *Blepharipoda occidentalis*). Based on the study results, the Regional Water Board and the State Water Board's Division of Water Quality, may adjust the study design in subsequent permits, or add or modify additional test organisms (such as shore crabs or fish), or modify the study design appropriate for the area and best available sensitive measures of contaminant exposure.

e. Marine Debris: Representative quantitative observations for trash by type and source shall be performed along the coast of the ASBS within the influence of the discharger's outfalls. The design, including locations and frequency, of the marine debris observations is subject to approval by the Regional Water Board and State Water Board's Division of Water Quality.

f. The monitoring requirements of the Individual Monitoring Program in this section are minimum requirements. After a minimum of one (1) year of continuous water quality monitoring of the discharges and ocean receiving waters, the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may require additional monitoring, or adjust, reduce or suspend receiving water and reference station monitoring. This determination may be made at any point after the discharge and receiving water is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

2. Regional Integrated Monitoring Program: Dischargers may elect to participate in a regional integrated monitoring program, in lieu of an individual monitoring program, to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS. This regional approach shall characterize natural water quality, pre- and post-storm, in ocean reference areas near the mouths of identified open space watersheds and the effects of the discharges on natural water quality (physical, chemical, and toxicity) in the ASBS receiving waters, and should include benthic marine aquatic life and bioaccumulation components. The design of the ASBS stratum of a regional integrated monitoring program may deviate from the otherwise prescribed individual monitoring approach (in Section IV.B.1) if approved by the State Water Board's Division of Water Quality and the Regional Water Boards.

a. Ocean reference areas shall be located at the drainages of flowing watersheds with minimal development (in no instance more than 10% development), and shall not be located in CWA Section 303(d) listed waterbodies or have tributaries that are 303(d) listed. Reference areas shall be free of wastewater discharges and anthropogenic non- storm water runoff. A minimum of low threat storm runoff discharges (e.g. stream highway overpasses and campgrounds) may be allowed on a case-by-case basis. Reference areas shall be located in the same region as the ASBS receiving water monitoring occurs. The reference areas for each Region are subject to approval by the participants in the regional monitoring program and the State Water

Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean reference water samples must be collected from each station, each from a separate storm during the same storm season that receiving water is sampled. A minimum of one reference location shall be sampled for each ASBS receiving water site sampled per responsible party. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

b. ASBS ocean receiving water must be sampled in the surf zone at the location where the runoff makes contact with ocean water (i.e. at "point zero"). Ocean receiving water stations must be representative of worst-case discharge conditions (i.e. co-located at a large drain greater than 36 inches, or if drains greater than 36 inches are not present in the ASBS then the largest drain greater than18 inches.) Ocean receiving water stations are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean receiving water samples must be collected during each storm season from each station, each from a separate storm. A minimum of one receiving water location shall be sampled in each ASBS per responsible party in that ASBS. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

c. Reference and receiving water sampling shall commence during the first full storm season following the adoption of these special conditions, and post-storm samples shall be collected during the same storm event when storm water runoff is sampled. Sampling shall occur in a minimum of two storm seasons. For those ASBS dischargers that have already participated in the Southern California Bight 2008 ASBS regional monitoring effort, sampling may be limited to only one storm season.

d. Receiving water and reference samples shall be analyzed for the same constituents as storm water runoff samples. At a minimum, constituents to be sampled and analyzed in reference and discharge receiving waters must include oil and grease, total suspended solids, Ocean Plan Table B metals for protection of marine life, Ocean Plan PAHs, pyrethroids, OP pesticides, ammonia, nitrate, phosphates, and critical life stage chronic toxicity for three species. In addition, within the range of the southern sea otter, indicator bacteria or some other measure of fecal contamination shall be analyzed.

3. Waterfront and Marine Operations: In addition to the above requirements for ocean receiving water monitoring, additional monitoring must be performed for marinas and boat launch and pier facilities:

a. For all marina or mooring field operators, in mooring fields with 10 or more occupied moorings, the ocean receiving water must be sampled for Ocean Plan indicator bacteria, residual chlorine, copper, zinc, grease and oil, methylene blue active substances (MBAS), and ammonia nitrogen.

(1) For mooring field operators opting for an individual monitoring program (Section IV.B.1 above), this sampling must occur weekly (on the weekend) from May through October.

(2) For mooring field operators opting to participate in a regional integrated monitoring program (Section IV.B.2 above), this sampling must occur monthly from May through October on a high use weekend in each month. The Water Boards may allow a reduction in the frequency of sampling, through the regional monitoring program, after the first year of monitoring.

b. For all mooring field operators, the subtidal sediment (sand or finer, if present) within mooring fields and below piers shall be sampled and analyzed for Ocean Plan Table B metals (for marine aquatic life beneficial use), acute toxicity, PAHs, and tributyltin. For sediment toxicity testing, only an acute toxicity test using the amphipod *Eohaustorius estuarius* must be performed. This sampling shall occur at least three times during a five (5) year period. For mooring field operators opting to participate in a regional integrated monitoring program, the Water Boards may allow a reduction in the frequency of sampling after the first sampling effort's results are assessed.

Glossary

At the point of discharge(s) – Means in the surf zone immediately where runoff from an outfall meets the ocean water (a.k.a., at point zero).

Areas of Special Biological Significance (ASBS) – Those areas designated by the State Water Board as ocean areas requiring protection of species or biological communities to the extent that alteration of natural water quality is undesirable. All Areas of Special Biological Significance are also classified as a subset of State Water Quality Protection Areas.

Design storm – For purposes of these Special Protections, a design storm is defined as the volume of runoff produced from one inch of precipitation per day or, if this definition is inconsistent with the discharger's applicable storm water permit, then the design storm shall be the definition included in the discharger's applicable storm water permit.

Development – Relevant to reference monitoring sites, means urban, industrial, agricultural, grazing, mining, and timber harvesting land uses.

Higher threat discharges - Permitted storm drains discharging equal to or greater than 18 inches, industrial storm drains, agricultural runoff discharged through an MS4, discharges associated with waterfront and marina operations (e.g., piers, launch ramps, mooring fields, and associated vessel support activities, except for passive discharges defined below), and direct discharges associated with commercial or industrial activities to ASBS.

Low Impact Development (LID) – A sustainable practice that benefits water supply and contributes to water quality protection. Unlike traditional storm water management, which entails collecting and conveying storm water runoff through storm drains, pipes, or other conveyances to a centralized storm water facility, LID focuses on using site design and storm water management to maintain the site's pre-development runoff rates and volumes. The goal of LID is to mimic a site's predevelopment hydrology by using design techniques that infiltrate, filter, store, evaporate, and detain runoff close to the source of rainfall.

Marine Operations – Marinas or mooring fields that contain slips or mooring locations for 10 or more vessels.

Management Measure (MM) - Economically achievable measures for the control of the addition of pollutants from various classes of nonpoint sources of pollution, which reflect the greatest degree of pollutant reduction achievable through the application of the best available nonpoint pollution control practices, technologies, processes, siting criteria, operating methods, or other alternatives. For example, in the "marinas and recreational boating" land- use category specified in the Plan for California's Nonpoint Source Pollution Control Program (NPS Program Plan) (SWRCB, 1999), "boat cleaning and maintenance" is considered a MM or the source of a specific class or type of NPS pollution.

Management Practice (MP) - The practices (e.g., structural, non-structural, operational, or other alternatives) that can be used either individually or in combination to address a specific MM class or classes of NPS pollution. For example, for the "boat cleaning and maintenance" MM, specific MPs can include, but are not limited to, methods for the selection of environmentally sensitive hull paints or methods for cleaning/removal of hull copper anti- fouling paints.

Municipal Separate Storm Sewer System (MS4) – A municipally-owned storm sewer system regulated under the Phase I or Phase II storm water program implemented in compliance with Clean Water Act section 402(p). Note that an MS4 program's boundaries are not necessarily congruent with the permittee's political boundaries.

Natural Ocean Water Quality - The water quality (based on selected physical, chemical and biological characteristics) that is required to sustain marine ecosystems, and which is without apparent human influence, *i.e.*, an absence of significant amounts of: (a) man-made constituents (*e.g.,* DDT); (b) other chemical (*e.g.,* trace metals), physical (temperature/thermal pollution, sediment burial), and biological (*e.g.*, bacteria) constituents at concentrations that have been elevated due to man's activities above those resulting from the naturally occurring processes that affect the area in question; and (c) non-indigenous biota (*e.g.,* invasive algal bloom species) that have been introduced either deliberately or accidentally by man. Discharges "*shall not alter natural ocean water quality*" as determined by a comparison to the range of constituent concentrations in reference areas agreed upon via the regional monitoring program(s). If monitoring information indicates that *natural ocean water quality* is not maintained, but there is sufficient evidence that a discharge is not contributing to the alteration of natural water quality, then the Regional Water Board may make that determination. In this case, sufficient information must include runoff sample data that has equal or lower concentrations for the range of constituents at the applicable reference area(s).

Nonpoint source – Nonpoint pollution sources generally are sources that do not meet the definition of a point source. Nonpoint source pollution typically results from land runoff, precipitation, atmospheric deposition, agricultural drainage, marine/boating operations or hydrologic modification. Nonpoint sources, for purposes of these Special Protections, include discharges that are not required to be regulated under an NPDES permit.

Non-storm water discharge – Any runoff that is not the result of a precipitation event. This is often referred to as "dry weather flow."

Non-structural control – A Best Management Practice that involves operational, maintenance, regulatory (e.g., ordinances) or educational activities designed to reduce or eliminate pollutants in runoff, and that are not structural controls (i.e. there are no physical structures involved).

Physical impossibility - Means any act of God, war, fire, earthquake, windstorm, flood or natural catastrophe; unexpected and unintended accidents not caused by discharger or its employees' negligence; civil disturbance, vandalism, sabotage or terrorism; restrain by court order or public authority or agency; or action or non-action by, or inability to

obtain the necessary authorizations or approvals from any governmental agency other than the permittee.

Representative sites and monitoring procedures – Are to be proposed by the discharger, with appropriate rationale, and subject to approval by Water Board staff.

Sheet-flow – Runoff that flows across land surfaces at a shallow depth relative to the cross- sectional width of the flow. These types of flow may or may not enter a storm drain system before discharge to receiving waters.

Storm Season – Also referred to as rainy season, means the months of the year from the onset of rainfall during autumn until the cessation of rainfall in the spring.

Structural control – A Best Management Practice that involves the installation of engineering solutions to the physical treatment or infiltration of runoff.

Surf Zone - The surf zone is defined as the submerged area between the breaking waves and the shoreline at any one time.

Surface Water Ambient Monitoring Program (SWAMP) comparable – Means that the monitoring program must 1) meet or exceed 2008 SWAMP Quality Assurance Program Management Plan (QAPP) Measurement Quality Objectives, or 2) have a Quality Assurance Project Plan that has been approved by SWAMP; in addition data must be formatted to match the database requirements of the SWAMP Information Management System. Adherence to the measurement quality objectives in the Southern California Bight 2008 ASBS Regional Monitoring Program QAPP and data base management comprises being SWAMP comparable.

Waterfront Operations - Piers, launch ramps, and cleaning stations in the water or on the adjacent shoreline.

Attachment 1
Special Protections Sections I(A)(3)(e) and I(B)(3)(e)
Flowchart to Determine Compliance with natural Water Quality

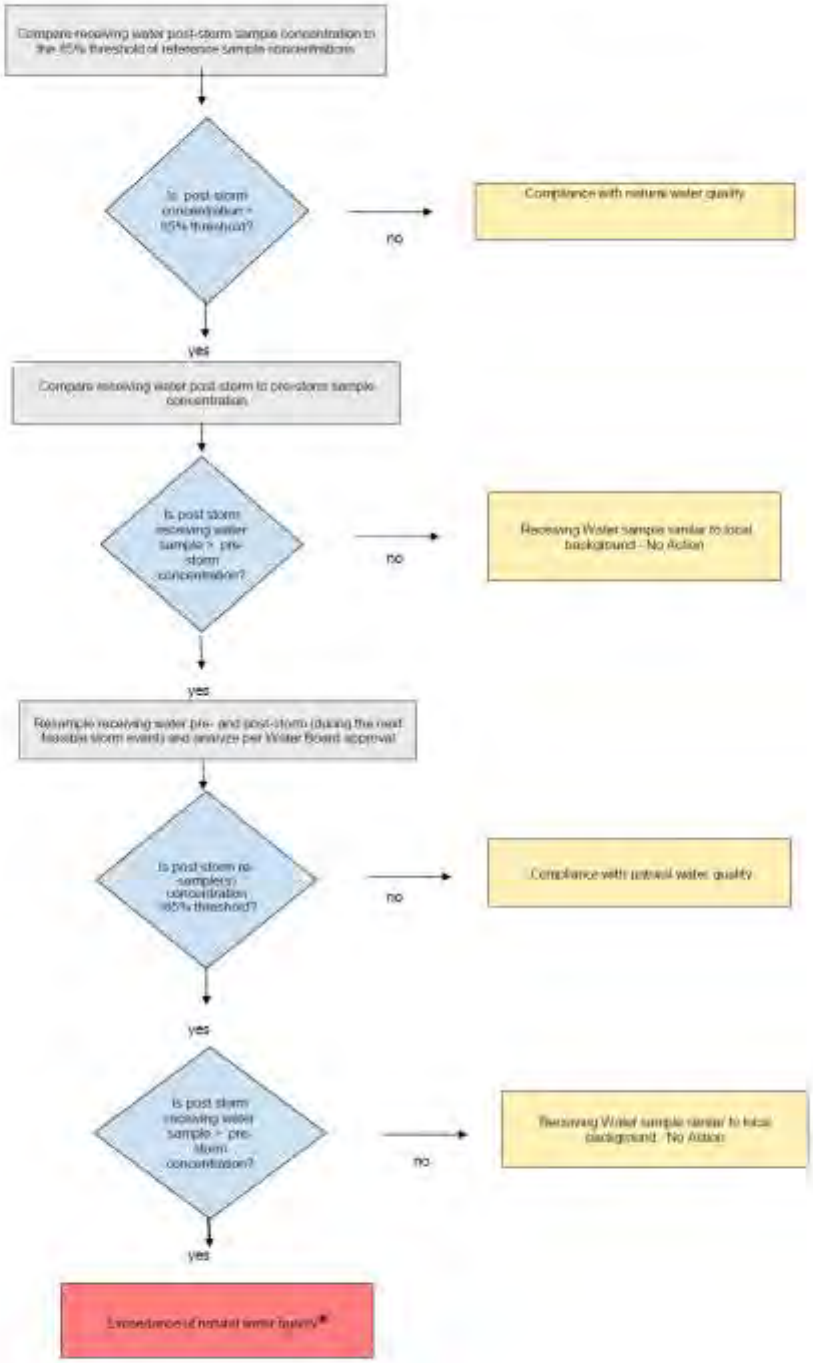

*** When an exceedance of natural water quality occurs, the discharger must comply with section I.A.2.h (for permitted storm water) or section I.B.2.c (for nonpoint sources). Note, when sampling data is available, end-of-pipe effluent concentrations will be considered by the Water Boards in making this determination.**

ATTACHMENT B

STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

1. Standard Permit Provisions

Code of Federal Regulations Title 40 Section 122.41 (40 CFR 122.41) includes conditions, or provisions, that apply to all National Pollutant Discharge Elimination System (NPDES) permits. Additional provisions applicable to NPDES permits are in 40 CFR 122.42. All applicable provisions in 40 CFR 122.41 and 40 CFR 122.42 must be incorporated into this Order and NPDES permit. The applicable 40 CFR 122.41 and 40 CFR 122.42 provisions are as follows:

a. DUTY TO COMPLY [40 CFR 122.41(a)]

The Copermittee must comply with all of the provisions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

(1) The Copermittee must comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement. [40 CFR 122.41(a)(1)]

(2) The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to a civil penalty not to exceed $25,000 per day for each violation. The CWA provides that any person who *negligently* violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than 2 years, or both. Any person who *knowingly* violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both. Any person who knowingly violates Section 301, 302, 303, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, and who knows at that time that he thereby places another person in imminent

danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.
[40 CFR 122.41(a)(2)]

(3) Any person may be assessed an administrative penalty by the San Diego Regional Water Quality Control Board (San Diego Water Board), State Water Resources Control Board (State Water Board), or United States Environmental Protection Agency (USEPA) for violating Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.
[40 CFR 122.41(a)(3)]

b. DUTY TO REAPPLY [40 CFR 122.41(b)]

If a Copermittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Copermittee must apply for and obtain a new permit.

c. NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE [40 CFR 122.41(c)]

It shall not be a defense for a Copermittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

d. DUTY TO MITIGATE [40 CFR 122.41(d)]

The Copermittee must take all reasonable steps to minimize or prevent any discharge or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

e. PROPER OPERATION AND MAINTENANCE [40 CFR 122.41(e)]

The Copermittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Copermittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by a Copermittee only when the operation is necessary to achieve compliance with the conditions of this permit.

f. PERMIT ACTIONS [40 CFR 122.41(f)]

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Copermittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

g. PROPERTY RIGHTS [40 CFR 122.41(g)]

This permit does not convey any property rights of any sort, or any exclusive privilege.

h. DUTY TO PROVIDE INFORMATION [40 CFR 122.41(h)]

The Copermittee must furnish to the San Diego Water Board, State Water Board, or USEPA within a reasonable time, any information which the San Diego Water Board, State Water Board, or USPEA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Copermittee must also furnish to the San Diego Water Board, State Water Board, or USPEA upon request, copies of records required to be kept by this permit.

i. INSPECTION AND ENTRY [40 CFR 122.41(i)]

The Copermittee must allow the San Diego Water Board, State Water Board, USEPA, and/or their authorized representative (including an authorized contractor acting as their representative), upon presentation of credentials and other documents as may be required by law, to:

(1) Enter upon the Copermittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit; [40 CFR 122.41(i)(1)]

(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit; [40 CFR 122.41(i)(2)]

(3) Inspect and photograph at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; [40 CFR 122.41(i)(3)] and

(4) Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location. [40 CFR 122.41(i)(4)]

j. MONITORING AND RECORDS [40 CFR 122.41(j)]

(1) Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity. [40 CFR 122.41(j)(1)]

(2) Except for records of monitoring information required by this permit related to the Copermittee's sewage sludge use and disposal activities, which shall be retained for

a period of at least five (5) years (or longer as required by 40 CFR Part 503), the Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time. [40 CFR 122.41(j)(2)]

(3) Records for monitoring information must include: [40 CFR 122.41(j)(3)]

(a) The date, exact place, and time of sampling or measurements; [40 CFR 122.41(j)(3)(i)]
(b) The individual(s) who performed the sampling or measurements; [40 CFR 122.41(j)(3)(ii)]
(c) The date(s) analyses were performed; [40 CFR 122.41(j)(3)(iii)]
(d) The individual(s) who performed the analyses; [40 CFR 122.41(j)(3)(iv)]
(e) The analytical techniques or methods used; [40 CFR 122.41(j)(3)(v)] and
(f) The results of such analyses. [40 CFR 122.41(j)(3)(vi)]

(4) Monitoring must be conducted according to test procedures under 40 CFR Part 136 unless another method is required under 40 CFR Subchapters N or O. [40 CFR 122.41(j)(4)]

In the case of pollutants for which there are no approved methods under 40 CFR Part 136 or otherwise required under 40 CFR Subchapters N and O, monitoring must be conducted according to a test procedure specified in the permit for such pollutants. [40 CFR 122.44(i)(1)(iv)]

(5) The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. [40 CFR 122.41(j)(5)]

k. SIGNATORY REQUIREMENT [40 CFR 122.41(k)]

(1) All applications, reports, or information submitted to the San Diego Water Board, State Water Board, or USEPA must be signed and certified. (See 40 CFR 122.22) [40 CFR 122.41(k)(1)]

(a) *For a municipality, State, Federal, or other public agency.* [All applications must be signed] by either a principal executive officer or ranking elected official. [40 CFR 122.22(a)(3)]

(b) All reports required by permits, and other information requested by the San Diego Water Board, State Water Board, or USEPA must be signed by a person described in paragraph (a) of this section, or by a duly authorized

representative of that person. A person is a duly authorized representative only if: [40 CFR 122.22(b)]

(i) The authorization is made in writing by a person described in paragraph (a) of this section; [40 CFR 122.22(b)(1)]
(ii) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company, (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) [40 CFR 122.22(b)(2)] and,
(iii) The written authorization is submitted to the San Diego Water Board and State Water Board. [40 CFR 122.22(b)(3)]

(c) *Changes to authorization.* If an authorization under paragraph (b) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (b) of this section must be submitted to the San Diego Water Board prior to or together with any reports, information, or applications to be signed by an authorized representative. [40 CFR 122.22(c)]

(d) *Certification.* Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." [40 CFR 122.22(d)]

(2) The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both. [40 CFR 122.41(k)(2)]

I. REPORTING REQUIREMENTS [40 CFR 122.41(l)]

(1) *Planned changes.* The Copermittee must give notice to the San Diego Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when: [40 CFR 122.41(l)(1)]

(a) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); [40 CFR 122.41(l)(1)(i)] or

(b) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1). [40 CFR 122.41(l)(1)(ii)]

(c) The alteration or addition results in a significant change in the Copermittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. [40 CFR 122.41(l)(1)(iii)]

(2) *Anticipated noncompliance*. The Copermittee must give advance notice to the San Diego Water Board or State Water Board of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements. [40 CFR 122.41(l)(2)]

(3) *Transfers*. This permit is not transferable to any person except after notice to the San Diego Water Board. The San Diego Water Board may require modification or revocation and reissuance of the permit to change the name of the Copermittee and incorporate such other requirements as may be necessary under the CWA. [40 CFR 122.41(l)(3)]

(4) *Monitoring reports.* Monitoring results must be reported at the intervals specified elsewhere in this permit. [40 CFR 122.41(l)(4)]

(a) Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the San Diego Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices. [40 CFR 122.41(l)(4)(i)]

(b) If the Copermittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or another method required for an industry-specific waste stream under 40 CFR Subchapters N or O, the results of this monitoring must be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the San Diego Water Board or State Water Board. [40 CFR 122.41(l)(4)(ii)]

(c) Calculations for all limitations which require averaging of measurements must utilize an arithmetic mean unless otherwise specified in the permit. [40 CFR 122.41(l)(4)(iii)]

(5) *Compliance schedules*. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date. [40 CFR 122.41(l)(5)]

(6) *Twenty-four hour reporting.*

(a) The Copermittee must report any noncompliance that may endanger health or the environment. Any information must be provided orally within 24 hours from the time the Copermittee becomes aware of the circumstances. A written submission must also be provided within five (5) days of the time the Copermittee becomes aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6)(i)]

(b) The following must be included as information which must be reported within 24 hours under this paragraph: [40 CFR 122.41(l)(6)(ii)]

(i) Any unanticipated bypass that exceeds any effluent limitation in the permit (See 40 CFR 122.41(g)). [40 CFR 122.41(l)(6)(ii)(A)]
(ii) Any upset which exceeds any effluent limitation in the permit. [40 CFR 122.41(l)(6)(ii)(B)] and,
(iii) Violation of a maximum daily discharge limitation for any of the pollutants listed by the San Diego Water Board in the permit to be reported within 24 hours. (See 40 CFR 122.44(g)) [40 CFR 122.41(l)(6)(ii)(C)]

(c) The San Diego Water Board may waive the above-required written report on a case-by-case basis if the oral report has been received within 24 hours. [40 CFR 122.41(l)(6)(iii)]

(7) *Other noncompliance.* The Copermittee must report all instances of noncompliance not reported in accordance with the standard provisions required under 40 CFR 122.41(l)(4), (5), and (6), at the time monitoring reports are submitted. The reports must contain the information listed in the standard provisions required under 40 CFR 122.41(l)(6). [40 CFR 122.41(l)(7))]

(8) *Other information.* When the Copermittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the San Diego Water Board, State Water Board, or USEPA, the Copermittee must promptly submit such facts or information. [40 CFR 122.41(l)(8)]

m. BYPASS [40 CFR 122.41(m)]

(1) *Definitions.*

(a) "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. [40 CFR 122.41(m)(1)(i)] or

(b) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or

substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
[40 CFR 122.41(m)(1)(ii)]

(2) *Bypass not exceeding limitations*. The Copermittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the standard provisions required under 40 CFR 122.41(m)(3) and (4).
[40 CFR 122.41(m)(2)]

(3) *Notice.*

(a) *Anticipated bypass*. If the Copermittee knows in advance of the need for a bypass, it must submit a notice, if possible at least ten days before the date of the bypass. [40 CFR 122.41(m)(3)(i)] or

(b) *Unanticipated bypass*. The Copermittee must submit notice of an unanticipated bypass in accordance with the standard provisions required under 40 CFR 122.41(l)(6) (24-hour notice).
[40 CFR 122.41(m)(3)(ii)]

(4) *Prohibition of Bypass.*

(a) Bypass is prohibited, and the San Diego Water Board may take enforcement action against a Copermittee for bypass, unless:
[40 CFR 122.41(m)(4)(i)]

(i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; [40 CFR 122.41(m)(4)(i)(A)]
(ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance;
[40 CFR 122.41(m)(4)(i)(B)] and,
(iii) The Copermittee submitted notice in accordance with the standard provisions required under 40 CFR 122.41(m)(3).
[40 CFR 122.41(m)(4)(i)(C)]

(b) The San Diego Water Board may approve an anticipated bypass, after considering its adverse effects, if the San Diego Water Board determines that it will meet the three conditions listed above.
[40 CFR 122.41(m)(4)(ii)]

n. UPSET [40 CFR 122.41(n)]

(1) *Definition.* "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because

of factors beyond the reasonable control of the Copermittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. [40 CFR 122.41(n)(1)]

(2) *Effect of an upset*. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the standard provisions required under 40 CFR 122.41(n)(3) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. [40 CFR 122.41(n)(2)]

(3) *Conditions necessary for a demonstration of upset*. A Copermittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that: [40 CFR 122.41(n)(3)]

(a) An upset occurred and that the Copermittee can identify the cause(s) of the upset; [40 CFR 122.41(n)(3)(i)]
(b) The permitted facility was at the time being properly operated; [40 CFR 122.41(n)(3)(ii)] and
(c) The Copermittee submitted notice of the upset in accordance with the standard provisions required under 40 CFR 122.41(l)(6)(ii)(B) (24-hour notice). [40 CFR 122.41(n)(3)(iii)]
(d) The Copermittee complied with any remedial measures pursuant to the standard provisions required under 40 CFR 122.41(d). [40 CFR 122.41(n)(3)(iii)]

(4) *Burden of proof*. In any enforcement proceeding, the Copermittee seeking to establish the occurrence of an upset has the burden of proof. [40 CFR 122.41(n)(4)]

o. STANDARD PERMIT PROVISIONS FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS [40 CFR 122.42(c)]

The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the San Diego Water Board or State Water Board under 40 CFR 122.26(a)(1)(v) must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report must include:

(1) The status of implementing the components of the storm water management program that are established as permit conditions; [40 CFR 122.42(c)(1)]

(2) Proposed changes to the storm water management programs that are established as permit conditions. Such proposed changes must be consistent with 40 CFR 122.26(d)(2)(iii); [40 CFR 122.42(c)(2)] and

(3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under 40 CFR 122.26(d)(2)(iv) and (v); [40 CFR 122.42(c)(3)]

(4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; [40 CFR 122.42(c)(4)]

(5) Annual expenditures and budget for year following each annual report; [40 CFR 122.42(c)(5)]

(6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; [40 CFR 122.42(c)(6)]

(7) Identification of water quality improvements or degradation. [40 CFR 122.42(c)(7)]

p. STANDARD PERMIT PROVISIONS FOR STORM WATER DISCHARGES [40 CFR 122.42(d)]

The initial permits for discharges composed entirely of storm water issued pursuant to 40 CFR 122.26(e)(7) must require compliance with the conditions of the permit as expeditiously as practicable, but in no event later than three years after the date of issuance of the permit.

2. General Provisions

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. The general provisions applicable to this Order and NPDES permit are as follows:

a. DISCHARGE OF WASTE IS A PRIVILEGE

No discharge of waste into the waters of the State, whether or not such discharge is made pursuant to waste discharge requirements, shall create a vested right to continue such discharge. All discharges of waste into waters of the State are privileges, not rights. [CWC Section 13263(g)]

b. DURATION OF ORDER AND NPDES PERMIT

(1) *Effective date*. This Order supersedes Order No. R9-2007-0001 for the San Diego County Copermittees listed in Table 1a and became effective on June 27, 2013. This Order as amended by Order R9-2015-0001 supersedes Order No. R9-2009-0002 for the Orange County Copermittees listed in Table 1b and its amendments through Order No. R9-2015-0001 became effective April 1, 2015. This Order as amended by Order Nos. R9-2015-0001 and R9-2015-0100 supersedes Order No. R9-2010-0016 for the Riverside County Copermittees listed in Table 1c and its amendments through Order No. R9-2015-0100 became effective January 7, 2016.

(2) *Expiration*. This Order and NPDES permit expires five years after June 27, 2013, its initial effective date. [40 CFR 122.46(a)]

(3) *Continuation of expired order*. After this Order and NPDES permit expires, the terms and conditions of this Order and NPDES permit are automatically continued pending issuance of a new permit if all requirements of the federal NPDES regulations on the continuation of expired permits (40 CFR 122.6) are complied with.

c. AVAILABILITY

A copy of this Order must be kept at a readily accessible location and must be available to on-site personnel at all times.

d. CONFIDENTIALITY OF INFORMATION

Except as provided for in 40 CFR 122.7, no information or documents submitted in accordance with or in application for this Order will be considered confidential, and all such information and documents shall be available for review by the public at the San Diego Water Board office.

Claims of confidentiality for the following information will be denied: [40 CFR 122.7(b)]

(1) The name and address of any permit applicant or Copermittee; [40 CFR 122.7(b)(1)] and

(2) Permit applications and attachments, permits, and effluent data. [40 CFR 122.7(b)(2)]

e. EFFLUENT LIMITATIONS

(1) *Interim effluent limitations*. The Copermittee must comply with any interim effluent limitations as established by addendum, enforcement action, or revised waste discharge requirements which have been, or may be, adopted by the San Diego Water Board.

(2) *Other effluent limitations and standards*. If any applicable toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant and that standard or prohibition is more stringent than any limitation on the pollutant in the permit, the San Diego Water Board shall institute proceedings under these regulations to modify or revoke and reissue the permit to conform to the toxic effluent standard or prohibition. [40 CFR 122.44(b)(1)]

f. DUTY TO MINIMIZE OR CORRECT ADVERSE IMPACTS

The Copermittee must take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this Order, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the noncompliance.

g. PERMIT ACTIONS

The filing of a request by the Copermittee for modification, revocation and reissuance, or termination of this Order, or a notification of planned change in or anticipated noncompliance with this Order does not stay any condition of this Order. (See 40 CFR 122.41(f)) In addition, the following provisions apply to this Order:

(1) Upon application by any affected person, or on its own motion, the San Diego Water Board may review and revise the requirements in this Order. All requirements must be reviewed periodically. [CWC Section 13263(e)]

(2) This Order may be terminated or modified for cause, including, but not limited to, all of the following: [CWC Section 13381]

(a) Violation of any condition contained in the requirements of this Order. [CWC Section 13381(a)]

(b) Obtaining the requirements in this Order by misrepresentation, or failure to disclose fully all relevant facts. [CWC Section 13381(b)]

(c) A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge. [CWC Section 13381(c)]

(3) When this Order is transferred to a new owner or operator, such requirements as may be necessary under the CWC may be incorporated into this Order.

h. NPDES Permitted Non-Storm Water Discharges

The San Diego Water Board has, in prior years, issued a limited number of individual NPDES permits for non-storm water discharges to MS4s. The San Diego Water Board or State Water Board may in the future, upon prior notice to the Copermittee(s), issue an NPDES permit for any non-storm water discharge (or class of non-storm water discharges) to an MS4.

i. Monitoring

In addition to the standard provisions required under 40 CFR 122.41(j) and (l)(4), the following general monitoring provisions apply to this Order:

(1) Where procedures are not otherwise specified in Order, sampling, analysis and quality assurance/quality control must be conducted in accordance with the Quality Assurance Management Plan (QAMP) for the State of California's Surface Water Ambient Monitoring Program (SWAMP), adopted by the State Water Resources Control Board (State Water Board).

(2) Pursuant to 40 CFR 122.41(j)(2) and CWC Section 13383(a), each Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five (5) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time.

(3) All chemical, bacteriological, and toxicity analyses must be conducted at a laboratory certified for such analyses by the California Department of Public Health or a laboratory approved by the San Diego Water Board.

(4) For priority toxic pollutants that are identified in the California Toxics Rule (CTR) (65 Fed. Reg. 31682), the Copermittees must instruct their laboratories to establish calibration standards that are equivalent to or lower than the Minimum Levels (MLs) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP). If a Copermittee can demonstrate that a particular ML is not attainable, in accordance with procedures set forth in 40 CFR Part 136, the lowest quantifiable concentration of the lowest calibration standard analyzed by a specific analytical procedure (assuming that all the method specified sample weights, volumes, and processing steps have been followed) may be used instead of the ML listed in Appendix 4 of the SIP. The Copermittee must submit documentation from the laboratory to the San Diego Water Board for approval prior to raising the ML for any priority toxic pollutant.

j. ENFORCEMENT

(1) The San Diego Water Board is authorized to enforce the terms of this Order under several provisions of the CWC, including, but not limited to, CWC Sections 13385, 13386, and 13387.

(2) Nothing in this Order shall be construed to protect the Copermittee from its liabilities under federal, state, or local laws.

(3) The CWC provides for civil and criminal penalties comparable to, and in some cases greater than, those provided for under the CWA.

(4) Except as provided in the standard conditions required under 40 CFR 122.41(m) and (n), nothing in this Order shall be construed to relieve the Copermittee from civil or criminal penalties for noncompliance.

(5) Nothing in this Order shall be construed to preclude the institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties to which the Copermittee is or may be subject to under Section 311 of the CWA.

(6) Nothing in this Order shall be construed to preclude institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authoring preserved by Section 510 of the CWA.

k. SEVERABILITY

The provisions of this Order are severable, and if any provision of this Order, or the application of any provisions of this Order to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this Order shall not be affected thereby.

l. APPLICATIONS

Any application submitted by a Copermittee for reissuance or modification of this Order must satisfy all applicable requirements specified in federal regulations as well as any additional requirements for submittal of a Report of Waste Discharge specified in the CWC and the California Code of Regulations.

m. IMPLEMENTATION

All plans, reports and subsequent amendments submitted in compliance with this Order must be implemented immediately (or as otherwise specified). All submittals by Copermittees must be adequate to implement the requirements of this Order.

n. REPORT SUBMITTALS

(1) All report submittals must include an executive summary, introduction, conclusion, recommendations, and signed certified statement.

(2) Each Copermittee must submit a signed certified statement covering its responsibilities for each applicable submittal.

(3) The Principal Watershed Copermittee(s) must submit a signed certified statement covering its responsibilities for each applicable submittal and the sections of the submittals for which it is responsible.

(4) Unless otherwise directed, the Copermittees must submit one electronic copy of each report required under this Order to the San Diego Water Board at SanDiego@waterboards.ca.gov.

(5) When hard copies are requested or required, the Copermittees must submit reports and provide notifications as required by this Order to:

EXECUTIVE OFFICER
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
2375 NORTHSIDE DRIVE, SUITE 100
SAN DIEGO CA 92108
Telephone: (619) 516-1990 Fax: (619) 516-1994

ATTACHMENT C

ACRONYMS AND ABBREVIATIONS

AMAL	Average Monthly Action Level
ASBS	Area(s) of Special Biological Significance
BMP	Best Management Practice
Basin Plan	Water Quality Control Plan for the San Diego Basin
CEQA	California Environmental Quality Act
CCR	California Code of Regulations
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWC	California Water Code
CZARA	Coastal Zone Act Reauthorization Amendments of 1990
ESAs	Environmentally Sensitive Areas
GIS	Geographic Information System
IBI	Index of Biological Integrity
LID	Low Impact Development
MDAL	Maximum Daily Action Level
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
NAL	Non-Storm Water Action Level
NAICS	North American Industry Classification System
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
ROWD	Report of Waste Discharge (application for NPDES reissuance)
SAL	Storm Water Action Level
San Diego Water Board	California Regional Water Quality Control Board, San Diego Region
SIC	Standard Industrial Classification Code
State Water Board	State Water Resources Control Board
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
WDID	Waste Discharge Identification Number
WLA	Waste Load Allocation
WQBEL	Water Quality Based Effluent Limitation

DEFINITIONS

Active/Passive Sediment Treatment - Using mechanical, electrical or chemical means to flocculate or coagulate suspended sediment for removal from runoff from construction sites prior to discharge.

Anthropogenic Litter – Trash generated from human activities, not including sediment.

Average Monthly Action Level – The highest allowable average of daily discharges over a calendar month.

Beneficial Uses - The uses of water necessary for the survival or wellbeing of man, plants, and wildlife. These uses of water serve to promote tangible and intangible economic, social, and environmental goals. "Beneficial Uses" of the waters of the State that may be protected include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. Existing beneficial uses are uses that were attained in the surface or ground water on or after November 28, 1975; and potential beneficial uses are uses that would probably develop in future years through the implementation of various control measures. "Beneficial Uses" are equivalent to "Designated Uses" under federal law. [California Water Code Section 13050(f)].

Best Management Practices (BMPs) - Defined in 40 CFR 122.2 as schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Bioassessment - The use of biological community information to evaluate the biological integrity of a water body and its watershed. With respect to aquatic ecosystems, bioassessment is the collection and analysis of samples of the benthic macroinvertebrate community together with physical/habitat quality measurements associated with the sampling site and the watershed to evaluate the biological condition (i.e. biotic integrity) of a water body.

Biofiltration - Practices that use vegetation and amended soils to detain and treat runoff from impervious areas. Treatment is through filtration, infiltration, adsorption, ion exchange, and biological uptake of pollutants.

Biological Integrity - Defined in Karr J.R. and D.R. Dudley. 1981. Ecological perspective on water quality goals. *Environmental Management* 5:55-68 as: "A balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitat of the region." Also referred to as ecosystem health.

BMP Design Manual – A plan developed to eliminate, reduce, or mitigate the impacts of runoff from development projects, including Priority Development Projects.

Chronic Toxicity – A measurement of sublethal effect (e.g. reduced growth, reproduction) to experimental test organisms exposed to an effluent or receiving waters compared to that of the control organisms.

Clean Water Act Section 303(d) Water Body - An impaired water body in which water quality does not meet applicable water quality standards and/or is not expected to meet water quality standards, even after the application of technology based pollution controls required by the CWA. The discharge of runoff to these water bodies by the Copermittees is significant because these discharges can cause or contribute to violations of applicable water quality standards.

Construction Activities – Actions implemented during construction of development or redevelopment projects during the Preliminary Task (including rough grading and/or disking, clearing and grubbing operations, or any soil disturbance prior to mass grading), Grading or Land Development (including topography and slope reconfiguration, alluvium removals, canyon cleanouts, rock undercuts, keyway excavations, land form grading, and stockpiling of select material for capping operations), Streets and Utility Installation (including excavation and street paving, lot grading, curbs, gutters and sidewalks, public utilities, public water facilities including fire hydrants, public sanitary sewer systems, storm sewer systems and/or other drainage improvements), or Vertical Construction (including the build out of structures from foundations to roofing, including rough landscaping).

Construction Site – Any project, including projects requiring coverage under the Construction General Permit, that involves soil disturbing activities including, but not limited to, clearing, grading, disturbances to ground such as stockpiling, and excavation.

Contamination - As defined in the Porter-Cologne Water Quality Control Act, contamination is "an impairment of the quality of waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste whether or not waters of the State are affected."

Copermittee – A permittee to a NPDES permit that is only responsible for permit conditions relating to the discharge for which it is operator [40 CFR 122.26(b)(1)]. For the purposes of this Order, a Copermittee is one of the individual permittees identified in Tables 1a-1c of this Order.

Copermittees – All of the individual Copermittees, collectively.

Critical Channel Flow (Qc) – The channel flow that produces the critical shear stress that initiates bed movement or that erodes the toe of channel banks. When measuring Qc, it should be based on the weakest boundary material – either bed or bank.

Daily Discharge – Defined as either: (1) the total mass of the constituent discharged over the calendar day or any 24 hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g. concentration.)

The Daily Discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day, or other 24 hour period other than a day), or by the arithmetic mean of analytical results from one or more grab samples taken over the course of a day.

Development Projects - Construction, rehabilitation, redevelopment, or reconstruction of any public or private projects.

Dry Season –May 1 to September 30.

Dry Weather – Weather is considered dry if the preceding 72 hours has been without measurable precipitation (>0.1 inch).

Enclosed Bays – Enclosed bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost bay works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays do not include inland surface waters or ocean waters.

Erosion – When land is diminished or worn away due to wind, water, or glacial ice. Often the eroded debris (silt or sediment) becomes a pollutant via storm water runoff. Erosion occurs naturally but can be intensified by land clearing activities such as farming, development, road building, and timber harvesting.

Environmentally Sensitive Areas (ESAs) - Areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; areas designated as preserves or their equivalent under the Natural Communities Conservation Program within the Cities and County of Orange; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.

Estuaries – Waters, including coastal lagoons, located at the mouth of streams that serve as areas of mixing fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and ocean water. Estuaries do not include inland surface waters or ocean waters.

Existing Development – Any area that has been developed and exists for municipal, commercial, industrial, or residential purposes, uses, or activities. May include areas that are not actively used for its originally developed purpose, but may be re-purposed or redeveloped for another use or activity.

Flow Duration – The long-term period of time that flows occur above a threshold that causes significant sediment transport and may cause excessive erosion damage to creeks and streams (not a single storm event duration). The simplest way to visualize this is to consider a histogram of pre- and post-project flows using long-term records of hourly data. To maintain pre-development flow duration means that the total number of hours (counts) within each range of flows in a flow-duration histogram cannot increase between the pre- and post-development condition. Flow duration within the range of geomorphologically significant flows is important for managing erosion.

Grading - The cutting and/or filling of the land surface to a desired slope or elevation.

Groundwater – Subsurface water that occurs beneath the water table in soils and geologic formations that are fully saturated.

Hazardous Material – Any substance that poses a threat to human health or the environment due to its toxicity, corrosiveness, ignitability, explosive nature or chemical reactivity. These also include materials named by the USEPA in 40 CFR 116 to be reported if a designated quantity of the material is spilled into the waters of the U.S. or emitted into the environment.

Hazardous Waste - Hazardous waste is defined as "any waste which, under Section 600 of Title 22 of this code, is required to be managed according to Chapter 30 of Division 4.5 of Title 22 of this code" [CCR Title 22, Division 4.5, Chapter 11, Article 1].

Household Hazardous Waste – Paints, cleaning products, and other hazardous wastes generated during home improvement or maintenance activities.

Hydromodification – The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

Illicit Connection – Any man-made conveyance or drainage system through which a non-storm water discharge to the storm water drainage system occurs or may occur. Any connection to the MS4 that conveys an illicit discharge.

Illicit Discharge - Any discharge to the MS4 that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from firefighting activities [40 CFR 122.26(b)(2)].

Inactive Areas – Areas of construction activity that are not active and those that have been active and are not scheduled to be re-disturbed for at least 14 days.

Infiltration – In the context of low impact development, infiltration is defined as the percolation of water into the ground. Infiltration is often expressed as a rate (inches per hour), which is determined through an infiltration test. In the context of non-storm water, infiltration is water other than wastewater that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow [40 CFR 35.2005(20)].

Inland Surface Waters – Includes all surface waters of the State that do not include the ocean, enclosed bays, or estuaries.

Jurisdictional Runoff Management Program Document – A written description of the specific jurisdictional runoff management measures and programs that each Copermittee will implement to comply with this Order and ensure that storm water pollutant discharges in runoff are reduced to the MEP and do not cause or contribute to a violation of water quality standards.

Low Impact Development (LID) – A storm water management and land development strategy that emphasizes conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions.

Low Impact Development Best Management Practices (LID BMPs) – LID BMPs include schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States through storm water management and land development strategies that emphasize conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions. LID BMPs include retention practices that do not allow runoff, such as infiltration, rain water harvesting and reuse, and evapotranspiration. LID BMPs also include flow-through practices such as biofiltration that may have some discharge of storm water following pollutant reduction.

Major Outfall – As defined in the Code of Federal Regulations, a major outfall is a MS4 outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (i.e. discharge from a single conveyance other than a circular pipe which is associated with a drainage area of more than 50 acres); or, for MS4s that receive storm water from lands zoned for industrial activity (based on comprehensive zoning plans or equivalent), a MS4 outfall that discharges from a single pipe with an inside diameter of 12 inches or more or from its equivalent (i.e. discharge from other than a circular pipe associated with a drainage area of 2 acres or more).

Maximum Daily Action Level (MDAL) –The highest allowable daily discharge of a pollutant, over a calendar day (or 24 hour period). For pollutants with action levels expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with action levels expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

Maximum Extent Practicable (MEP) – The technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) for storm water that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) in combination with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than BAT. A definition for MEP is not provided either in the statute or in the regulations. Instead the definition of MEP is dynamic and will be defined by the following process over time: municipalities propose their definition of MEP by way of their runoff management programs. Their total collective and individual activities conducted pursuant to the runoff management programs becomes their proposal for MEP as it applies both to their overall effort, as well as to specific activities (e.g., MEP for street sweeping, or MEP for MS4 maintenance). In the absence of a proposal acceptable to the San Diego Water Board, the San Diego Water Board defines MEP.

In a memo dated February 11, 1993, entitled "Definition of Maximum Extent Practicable," Elizabeth Jennings, Senior Staff Counsel, SWRCB addressed the achievement of the MEP standard as follows:

"*To achieve the MEP standard, municipalities must employ whatever Best Management Practices (BMPs) are technically feasible (i.e., are likely to be effective) and are not cost prohibitive. The major emphasis is on technical feasibility. Reducing pollutants to the MEP means choosing effective BMPs, and rejecting applicable BMPs only where other effective BMPs will serve the same purpose, or the BMPs would not be technically feasible, or the cost would be prohibitive. In selecting BMPs to achieve the MEP standard, the following factors may be useful to consider:*

a. *Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?*
b. *Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?*
c. *Public Acceptance: Does the BMP have public support?*
d. *Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?*
e. *Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc.?*

The final determination regarding whether a municipality has reduced pollutants to the maximum extent practicable can only be made by the Regional or State Water Boards, and not by the municipal discharger. If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit derived, it would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs that would address a pollutant source, or to pick a BMP based solely on cost, which would be clearly less effective. In selecting BMPs the municipality must make a serious attempt to comply and practical solutions may not be lightly rejected. In any case, the burden would be on the municipal discharger to show compliance with its permit. After selecting a menu of BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented."

Monitoring Year – October 1 to September 30

Municipal Separate Storm Sewer System (MS4) – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designated or used for collecting or conveying storm water; (iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.26.

National Pollutant Discharge Elimination System (NPDES) - The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the CWA.

Non-Storm Water - All discharges to and from a MS4 that do not originate from precipitation events (i.e., all discharges from a MS4 other than storm water). Non-storm water includes illicit discharges and NPDES permitted discharges.

Nuisance - As defined in the Porter-Cologne Water Quality Control Act, a nuisance is "anything which meets all of the following requirements: 1) Is injurious to health, or is indecent, or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. 2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. 3) Occurs during, or as a result of, the treatment or disposal of wastes."

Ocean Waters – The territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the State Board's California Ocean Plan.

Order – Unless otherwise specified, refers to this Order, Order No. R9-2013-0001 (NPDES No. CAS0109266)

Outfall - Outfall means a point source as defined by 40 CFR 122.2 at the point where a municipal separate storm sewer discharges to waters of the US and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels or other conveyances which connect segments of the same stream or other waters of the US and are used to convey waters of the US.

Persistent Flow - Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

Person - A person is defined as an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof [40 CFR 122.2].

Point Source - Any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, landfill leachate collection systems, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

Pollutant - Any agent that may cause or contribute to the degradation of water quality such that a condition of pollution or contamination is created or aggravated.

Pollution - As defined in the Porter-Cologne Water Quality Control Act, pollution is "the alteration of the quality of the waters of the State by waste, to a degree which unreasonably affects either of the following: 1) The waters for beneficial uses; or 2) Facilities that serve these beneficial uses." Pollution may include contamination.

Pollution Prevention - Pollution prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control BMPs, treatment control BMPs, or disposal.

Pre-Development Runoff Conditions – Approximate flow rates and durations that exist or existed onsite before land development occurs. For new development projects, this equates to runoff conditions immediately before project construction. For redevelopment projects, this equates to runoff conditions from the project footprint assuming infiltration characteristics of the underlying soil, and existing grade. Runoff coefficients of concrete or asphalt must not be used. A redevelopment Priority Development Project must use available information pertaining to existing underlying soil type and onsite existing grade to estimate pre-development runoff conditions.

Priority Development Projects - New development and redevelopment projects defined under Provision E.3.b of Order No. R9-2013-0001, as amended by Order Nos. R9-2015-0001 and R9-2015-0100.

Rainy Season (aka Wet Season) –October 1 to April 30

Receiving Waters – Waters of the United States.

Receiving Water Limitations - Waste discharge requirements issued by the San Diego Water Board typically include both: (1) "Effluent Limitations" (or "Discharge Limitations") that specify the technology-based or water-quality-based effluent limitations; and (2) "Receiving Water Limitations" that specify the water quality objectives in the Basin Plan as well as any other limitations necessary to attain those objectives. In summary, the "Receiving Water Limitations" provision is the provision used to implement the requirements of CWA section 402(p)(3)(B).

Redevelopment - The creation and/or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure. Replacement of impervious surfaces includes any activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include routine maintenance activities, such as trenching and resurfacing associated with utility work; pavement grinding; resurfacing existing roadways, sidewalks, pedestrian ramps, or bike lanes on existing roads; and routine replacement of damaged pavement, such as pothole repair.

Regional Clearinghouse – A central location for the collection and distribution of information developed and maintained by the Copermittees including, but not limited to, plans, reports, manuals, data, contact information, and/or links to such documents and information.

Rehabilitation - Remedial measures or activities for the purpose of improving or restoring the beneficial uses of streams, channels or river systems. Techniques may vary from in-stream restoration techniques to off-line storm water management practices installed in the system corridor or upland areas, or a combination of in-stream and out of stream techniques. Rehabilitation techniques may include, but are not limited to the following: riparian zone restoration, constructed wetlands, channel modifications that improve habitat and stability, and daylighting of drainage systems.

Reporting Period – The period of information that is reported in the Water Quality Improvement Plan Annual Report. The reporting period consists of two components: 1) July 1 to June 30, consistent with the fiscal year, for the implementation of the jurisdictional runoff management programs, and 2) October 1 to September 30, consistent with the monitoring year for the monitoring and assessment programs. Together, these two time periods constitute the reporting year for the Water Quality Improvement Plan Annual Report due January 31 following the end of the monitoring year.

Retain – Keep or hold in a particular place, condition, or position without discharge to surface waters.

Retrofitting – Storm water management practice put into place after development has occurred in watersheds where the practices previously did not exist or are ineffective. Retrofitting of developed areas is intended to improve water quality, protect downstream channels, reduce flooding, or meet other specific objectives. Retrofitting developed areas may include, but is not limited to replacing roofs with green roofs, disconnecting downspouts or impervious surfaces to drain to pervious surfaces, replacing impervious surfaces with pervious surfaces, installing rain barrels, installing rain gardens, and trash area enclosures.

Runoff - All flows in a storm water conveyance system that consists of the following components: (1) storm water (wet weather flows) and (2) non-storm water including dry weather flows.

San Diego Water Board – As used in this document the term "San Diego Water Board" is synonymous with the term "Regional Board" as defined in Water Code section 13050(b) and is intended to refer to the California Regional Water Quality Control Board for the San Diego Region as specified in Water Code Section 13200.

Sediment - Soil, sand, and minerals washed from land into water. Sediment resulting from anthropogenic sources (i.e. human induced land disturbance activities) is considered a pollutant. This Order regulates only the discharges of sediment from anthropogenic sources and does not regulate naturally occurring sources of sediment. Sediment can destroy fish-nesting areas, clog animal habitats, and cloud waters so that sunlight does not reach aquatic plants.

Source Control BMP – Land use or site planning practices, or structural or nonstructural measures that aim to prevent runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between pollutants and runoff.

Storm Water – Per 40 CFR 122.26(b)(13), means storm water runoff, snowmelt runoff and surface runoff and drainage. Surface runoff and drainage pertains to runoff and drainage resulting from precipitation events.

Structural BMPs - A subset of BMPs which detains, retains, filters, removes, or prevents the release of pollutants to surface waters from development projects in perpetuity, after construction of a project is completed.

Test of Significant Toxicity (TST) - A statistical approach used to analyze toxicity test data. The TST incorporates a restated null hypothesis, Welch's t-test, and biological effect thresholds for chronic and acute toxicity.

Total Maximum Daily Load (TMDL) - The maximum amount of a pollutant that can be discharged into a water body from all sources (point and non-point) and still maintain water quality standards. Under CWA section 303(d), TMDLs must be developed for all water bodies that do not meet water quality standards after application of technology-based controls.

Toxicity - Adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies. The water quality objectives for toxicity provided in the Basin Plan, state in part…"All waters shall be

free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life….The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge."

Toxicity Identification Evaluation (TIE) - A set of procedures for identifying the specific chemical(s) responsible for toxicity. These procedures are performed in three phases (characterization, identification, and confirmation) using aquatic organism toxicity tests.

Toxicity Reduction Evaluation (TRE) - A study conducted in a step-wise process designed to identify the causative agents of effluent or ambient toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in toxicity. The first steps of the TRE consist of the collection of data relevant to the toxicity, including additional toxicity testing, and an evaluation of facility operations and maintenance practices, and best management practices. A Toxicity Identification Evaluation (TIE) may be required as part of the TRE, if appropriate.

Treatment Control BMP – Any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media absorption or any other physical, biological, or chemical process.

Unpaved Road – Any long, narrow stretch without pavement used for traveling by motor passenger vehicles between two or more points. Unpaved roads are generally constructed of dirt, gravel, aggregate or macadam and may be improved or unimproved.

Waste - As defined in CWC Section 13050(d), "waste includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal."

Article 2 of CCR Title 23, Chapter 15 (Chapter 15) contains a waste classification system that applies to solid and semi-solid waste, which cannot be discharged directly or indirectly to water of the state and which therefore must be discharged to land for treatment, storage, or disposal in accordance with Chapter 15. There are four classifications of waste (listed in order of highest to lowest threat to water quality): hazardous waste, designated waste, non-hazardous solid waste, and inert waste.

Water Quality Objective - Numerical or narrative limits on constituents or characteristics of water designated to protect designated beneficial uses of the water. [California Water Code Section 13050 (h)]. California's water quality objectives are established by the State and Regional Water Boards in the Water Quality Control Plans. Numeric or narrative limits for pollutants or characteristics of water designed to protect the beneficial uses of the water. In other words, a water quality objective is the maximum concentration of a pollutant that can exist in a receiving water and still generally ensure that the beneficial uses of the receiving water remain protected (i.e., not impaired). Since water quality objectives are designed specifically to protect the beneficial uses, when the objectives are violated the beneficial uses are, by definition, no longer protected and become impaired. This is a fundamental concept under the Porter Cologne Act. Equally fundamental is Porter Cologne's definition of pollution. A condition of pollution exists when the water quality needed to support designated beneficial uses has

become unreasonably affected or impaired; in other words, when the water quality objectives have been violated. These underlying definitions (regarding beneficial use protection) are the reason why all waste discharge requirements implementing the federal NPDES regulations require compliance with water quality objectives. (Water quality objectives are also called water quality criteria in the CWA.)

Water Quality Standards - Water quality standards, as defined in Clean Water Act section 303(c) consist of the beneficial uses (e.g., swimming, fishing, municipal drinking water supply, etc.,) of a water body and criteria (referred to as water quality objectives in the California Water Code) necessary to protect those uses. Under the Water Code, the water boards establish beneficial uses and water quality objectives in water quality control or basin plans. Together with an anti-degradation policy, these beneficial uses and water quality objectives serve as water quality standards under the Clean Water Act. In Clean Water Act parlance, state beneficial uses are called "designated uses" and state water quality objectives are called "criteria." Throughout this Order, the relevant term is used depending on the statutory scheme.

Waters of the State - Any water, surface or underground, including saline waters within the boundaries of the State [CWC section 13050 (e)]. The definition of the Waters of the State is broader than that for the Waters of the United States in that all water in the State is considered to be a Waters of the State regardless of circumstances or condition.

Waters of the United States - As defined in the 40 CFR 122.2, the Waters of the U.S. are defined as: "(a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate "wetlands;" (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters otherwise defined as waters of the United States under this definition: (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial seas; and (g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA."

Watershed - That geographical area which drains to a specified point on a water course, usually a confluence of streams or rivers (also known as drainage area, catchment, or river basin).

Wet Season (aka Rainy Season) – October 1 to April 30

Wet Weather – Weather is considered wet up to 72 hours after a storm event of 0.1 inches and greater, unless otherwise defined by another regulatory mechanism (e.g. a TMDL).

ATTACHMENT D

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

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JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

FY _____

I. COPERMITTEE INFORMATION

Copermittee Name:

Copermittee Primary Contact Name:

Copermittee Primary Contact Information:
Address:
City: County: State: Zip:
Telephone: Fax: Email:

II. LEGAL AUTHORITY

Has the Copermittee established adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐
A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority?	**YES**	☐
	NO	☐

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

Was an update of the jurisdictional runoff management program document required or recommended by the San Diego Water Board?	**YES**	☐
	NO	☐
If YES to the question above, did the Copermittee update its jurisdictional runoff management program document and make it available on the Regional Clearinghouse?	**YES**	☐
	NO	☐

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

Has the Copermittee implemented a program to actively detect and eliminate illicit discharges and connections to its MS4 that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

Number of non-storm water discharges reported by the public	
Number of non-storm water discharges detected by Copermittee staff or contractors	
Number of non-storm water discharges investigated by the Copermittee	
Number of sources of non-storm water discharges identified	
Number of non-storm water discharges eliminated	
Number of sources of illicit discharges or connections identified	
Number of illicit discharges or connections eliminated	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

V. DEVELOPMENT PLANNING PROGRAM

Has the Copermittee implemented a development planning program that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐
Was an update to the BMP Design Manual required or recommended by the San Diego Water Board?	**YES**	☐
	NO	☐
If YES to the question above, did the Copermittee update its BMP Design Manual and make it available on the Regional Clearinghouse?	**YES**	☐
	NO	☐

Number of proposed development projects in review	
Number of Priority Development Projects in review	
Number of Priority Development Projects approved	
Number of approved Priority Development Projects exempt from any BMP requirements	
Number of approved Priority Development Projects allowed alternative compliance	
Number of Priority Development Projects granted occupancy	

Number of completed Priority Development Projects in inventory	
Number of high priority Priority Development Project structural BMP inspections	
Number of Priority Development Project structural BMP violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM ANNUAL REPORT FORM

FY _____

VI. CONSTRUCTION MANAGEMENT PROGRAM

Has the Copermittee implemented a construction management program that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

Number of construction sites in inventory	
Number of active construction sites in inventory	
Number of inactive construction sites in inventory	
Number of construction sites closed/completed during reporting period	
Number of construction site inspections	
Number of construction site violations	
Number of enforcement actions issued	
Number of escalated enforcement actions issued	

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

Has the Copermittee implemented an existing development management program that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

	Municipal	Commercial	Industrial	Residential
Number of facilities or areas in inventory				
Number of existing development inspections				
Number of follow-up inspections				
Number of violations				
Number of enforcement actions issued				
Number of escalated enforcement actions issued				

VIII. PUBLIC EDUCATION AND PARTICIPATION

Has the Copermittee implemented a public education program component that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐
Has the Copermittee implemented a public participation program component that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

IX. FISCAL ANALYSIS

Has the Copermittee attached to this form a summary of its fiscal analysis that complies with Order No. R9-2013-0001?	**YES**	☐
	NO	☐

X. CERTIFICATION

I [☐ Principal Executive Officer ☐ Ranking Elected Official ☐ Duly Authorized Representative] certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature	Date
Print Name	Title
Telephone Number	Email

ATTACHMENT E

SPECIFIC PROVISIONS FOR TOTAL MAXIMUM DAILY LOADS APPLICABLE TO ORDER NO. R9-2013-0001, AS AMENDED BY ORDER NOS. R9-2015-0001 AND R9-2015-0100

These provisions implement load allocations (LAs) and wasteload allocations (WLAs) of the Total Maximum Daily Loads (TMDLs) established by the San Diego Water Board or USEPA under Clean Water Act section 303(c), applicable to discharges regulated under this Order. The provisions and schedules for implementation of the TMDLs described below must be incorporated into the Water Quality Improvement Plans, required pursuant to Provision B of this Order, for the specified Watershed Management Areas.

1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed
2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin
3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed
4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek
5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay
6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)
7. Total Maximum Daily Load for Sediment in Los Peñasquitos Lagoon

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1. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2002-0123

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	August 14, 2002
State Water Board Approval Date:	July 16, 2003
Office of Administrative Law Approval Date:	September 11, 2003
US EPA Approval Date:	November 3, 2003

(3) TMDL Effective Date: September 11, 2003

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final diazinon TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must be in compliance with the final TMDL compliance requirements as of December 31, 2010.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations:

Table 1.1
Final Receiving Water Limitations Expressed as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Diazinon	Acute	0.08 µg/L	1 hour
	Chronic	0.05 µg/L	4 days

(b) Final Effluent Limitations

Discharges from the MS4s containing concentrations that do not exceed the following effluent limitations will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 1.b.(2)(a):

Table 1.2
Final Effluent Limitations Expressed as Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation	Averaging Period
Diazinon	Acute	0.072 µg/L	1 hour
	Chronic	0.045 µg/L	4 days

(c) Best Management Practices

The following BMPs for Chollas Creek must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area and implemented by the Responsible Copermittees:

(i) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 1.b.(2)(a) and/or the effluent limitations under Specific Provision 1.b.(2)(b) for Chollas Creek.

(ii) The Responsible Copermittees must implement the Diazinon Toxicity Control Plan and Diazinon Public Outreach/Education Program as described in the report titled, *Technical Report for Total Maximum Daily Load for Diazinon in Chollas Creek Watershed, San Diego County*, dated August 14, 2002, including subsequent modifications, in order to achieve the receiving water limitations under Specific Provision 1.b.(2)(a) and/or the effluent limitations under Specific Provision 1.b.(2)(b).

(iii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 1.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 1.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 1.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 1.b.(2)(c) achieves compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 1.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 1.d, to demonstrate compliance with Specific Provisions 1.b.(3)(a), 1.b.(3)(b) and/or 1.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The Responsible Copermittees must be in compliance with the final diazinon TMDL compliance requirements as of December 31, 2010.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls for diazinon within the Chollas Creek watershed, and calculate or estimate the annual diazinon loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment

Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 1.b.(2)(b), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

2. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0019

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	September 22, 2005
Office of Administrative Law Approval Date:	December 2, 2005
US EPA Approval Date:	February 8, 2006

(3) TMDL Effective Date: December 2, 2005

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Shelter Island Yacht Basin

(6) Responsible Copermittee: City of San Diego

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final dissolved copper TMDL compliance requirements for Shelter Island Yacht Basin consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittee must be in compliance with the final TMDL compliance requirements as of December 2, 2005.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations:

Table 2.1
Final Receiving Water Limitations Expressed as Concentrations in Shelter Island Yacht Basin

Constituent	Exposure Duration	Receiving Water Limitation	Averaging Period
Dissolved Copper	Acute	4.8 µg/L x WER*	1 hour
	Chronic	3.1 µg/L x WER*	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 2.b.(2)(a):

Table 2.2
Final Effluent Limitations as Expressed as Annual Loads in MS4 Discharges to Shelter Island Yacht Basin

Constituent	Effluent Limitation
Dissolved Copper	30 kg/yr*

* If the water quality objectives for dissolved copper in Shelter Island Yacht Basin are changed in the future, then the margin of safety (MOS), TMDL and allocations will be recalculated using the *Method for Recalculation of the Total Maximum Daily Load for Dissolved Copper in the Shelter Island Yacht Basin, San Diego Bay* in the Basin Plan (p. 7-14).

(c) Best Management Practices

The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 2.b.(2)(a) and/or the effluent limitations under Specific Provision 2.b.(2)(b) for Shelter Island Yacht Basin. The BMPs must be incorporated into the Water Quality Improvement Plan for the San Diego Bay Watershed Management Area.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 2.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 2.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittee develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 2.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 2.b.(2)(c) achieves compliance with Specific Provisions 2.b.(3)(a), 2.b.(3)(b) and/or 2.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 2.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 2.d, to demonstrate compliance with Specific Provisions 2.b.(3)(a), 2.b.(3)(b) and/or 2.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The Responsible Copermittees must be in compliance with the final dissolved copper TMDL compliance requirements as of December 2, 2005.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

The Responsible Copermittee must monitor the effluent of its MS4 outfalls for dissolved copper, and calculate or estimate the monthly and annual dissolved copper loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.(b)(2)of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

3. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2005-0036

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	November 16, 2005
Office of Administrative Law Approval Date:	February 1, 2006
US EPA Approval Date:	March 22, 2006

(3) TMDL Effective Date: February 1, 2006

(4) Watershed Management Area: Santa Margarita River

(5) Water Body: Rainbow Creek

(6) Responsible Copermittee: County of San Diego

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final total nitrogen and total phosphorus TMDL compliance requirements for Rainbow Creek consist of the following

(1) Final TMDL Compliance Date

The Responsible Copermittee must comply with final TMDL compliance requirements by December 31, 2021.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance date under Specific Provision 3.b.(1):

Table 3.1
Final Receiving Water Limitations Expressed as Concentrations in Rainbow Creek

Constituent	Receiving Water Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing concentrations that do not exceed the following effluent limitations by the compliance date under Specific Provision 3.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 3.b.(2)(a):

Table 3.2
Final Effluent Limitations Expressed as Concentrations in MS4 Discharges to Rainbow Creek

Constituent	Effluent Limitation
Nitrate (as N)	10 mg/L
Total Nitrogen	1 mg/L
Total Phosphorus	0.1 mg/L

(ii) Annual pollutant loads from given land uses discharging to and from the MS4s that do not exceed the following annual loads by the compliance date under Specific Provision 3.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 3.b.(2)(a):

Table 3.3
Final Effluent Limitations Expressed as Annual Loads in MS4 Discharges to Rainbow Creek

Land Use	Total N	Total P
Commercial nurseries	116 kg/yr	3 kg/yr
Park	3 kg/yr	0.1 kg/yr
Residential areas	149 kg/yr	12 kg/yr
Urban areas	27 kg/yr	6 kg/yr

(c) Best Management Practices

(i) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 3.b.(2)(a) and/or the effluent limitations under Specific Provision 3.b.(2)(b) for Rainbow Creek.

(ii) The Responsible Copermittee should coordinate any BMPs implemented to address this TMDL with Caltrans and other sources as possible.

(3) <u>Final TMDL Compliance Determination</u>

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 3.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 3.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the final effluent limitations under Specific Provision 3.b.(2)(b)(ii); OR

(e) The Responsible Copermittee develops and implements the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 3.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Specific Provision 3.b.(2)(c) achieves compliance with Specific Provisions 3.b.(3)(a), 3.b.(3)(b), 3.b.(3)(c) and/or 3.b.(3)(d),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 3.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 3.d, to demonstrate compliance with Specific Provisions 3.b.(3)(a), 3.b.(3)(b), 3.b.(3)(c) and/or 3.b.(3)(d).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim total nitrogen and total phosphorus TMDL compliance requirements for Rainbow Creek consist of the following:

(1) Interim Compliance Dates and WQBELs

The Responsible Copermittee must comply with the interim WQBELs, expressed as annual loads, by December 31 of the interim compliance year given in Table 3.4.

Table 3.4
Interim Water Quality Based Effluent Limitations Expressed as Annual Loads in MS4 Discharges from Specific Land Uses to Rainbow Creek

	Total N Interim Effluent Limitations (kg/yr)			Total P Interim Effluent Limitations (kg/yr)		
	Interim Compliance Date			Interim Compliance Date		
Land Use	**2009**	**2013**	**2017**	**2009**	**2013**	**2017**
Commercial nurseries	390	299	196	20	16	10
Park	5	3	3	0.15	0.10	0.10
Residential areas	507	390	260	99	74	47
Urban areas	40	27	27	9	6	6

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 3.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 3.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the final effluent limitations under Specific Provision 3.b.(2)(b)(ii); OR

(e) The annual pollutant loads from given land uses discharging to and from the MS4s do not exceed the interim effluent limitations under Specific Provision 3.c.(1); OR

(f) The Responsible Copermittee has submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

d. Specific Monitoring and Assessment Requirements

(1) The Responsible Copermittee must incorporate into the Water Quality Improvement Plan and implement the Sampling and Analysis Plan for Rainbow Creek Nutrient Reduction TMDL Implementation Water Quality Monitoring, dated January 2010.

(2) The results of any monitoring conducted during the reporting period, and assessment of whether the interim and final TMDL compliance requirements have been achieved must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 3.b.(2)(b)(i), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

4. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2007-0043

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2007
State Water Board Approval Date:	July 15, 2008
Office of Administrative Law Approval Date:	October 22, 2008
US EPA Approval Date:	December 18, 2008

(3) TMDL Effective Date: October 22, 2008

(4) Watershed Management Area: San Diego Bay

(5) Water Body: Chollas Creek

(6) Responsible Copermittees: City of La Mesa, City of Lemon Grove, City of San Diego, County of San Diego, San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final dissolved copper, lead, and zinc TMDL compliance requirements for Chollas Creek consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must comply with the final TMDL compliance requirements by October 22, 2028.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance date under Specific Provision 4.b.(1):

Table 4.1
Final Receiving Water Limitations Expressed as Concentrations in Chollas Creek

Constituent	Exposure Duration	Receiving Water Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$(0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$(0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$(0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$(0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations by the compliance date under Specific Provision 4.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 4.b.(2)(a):

Table 4.2
Final Effluent Limitations as Expressed Concentrations in MS4 Discharges to Chollas Creek

Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
Dissolved Copper	Acute	$90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
Dissolved Lead	Acute	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
Dissolved Zinc	Acute	$90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
	Chronic	$90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(c) Best Management Practices

(i) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 4.b.(2)(a) and/or the effluent limitations under Specific Provision 4.b.(2)(b) for Chollas Creek.

(ii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans and the U.S. Navy as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 4.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 4.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 4.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 4.b.(2)(c) achieves compliance with Specific Provisions 4.b.(3)(a), 4.b.(3)(b) and/or 4.b.(3)(c),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 4.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 4.d, to demonstrate compliance with Specific Provisions 4.b.(3)(a), 4.b.(3)(b) and/or 4.b.(3)(c).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim dissolved copper, lead, and zinc TMDL compliance requirements for Chollas Creek consist of the following:

(1) Interim Compliance Date and WQBELs

The Responsible Copermittee must comply with the interim WQBELs, expressed as concentrations, by the interim compliance date given in Table 4.3:

Table 4.3
Interim Water Quality Based Effluent Limitations Expressed as Concentrations in MS4 Discharges to Chollas Creek

Interim Compliance Date	Constituent	Exposure Duration	Effluent Limitation (µg/L)	Averaging Period
October 22, 2018	Dissolved Copper	Acute	$1.2 \times 90\% \times (0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times (0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}^*$	4 days
	Dissolved Lead	Acute	$1.2 \times 90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times [1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}^*$	4 days
	Dissolved Zinc	Acute	$1.2 \times 90\% \times (0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	1 hour
		Chronic	$1.2 \times 90\% \times (0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}^*$	4 days

Notes:
* The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance date, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the applicable receiving water limitations under Specific Provision 4.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 4.b.(2)(b) at the Responsible Copermittee's MS4 outfalls; OR

(d) There are no exceedances of the interim effluent limitations under Specific Provision 4.c.(1) at the Responsible Copermittee's MS4 outfalls; OR

(e) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance date.

d. Specific Monitoring and Assessment Requirements

(1) The Responsible Copermittees must implement the monitoring and assessment requirements issued under Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed*, when it is amended to include monitoring requirements for the Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek. The monitoring reports required under Investigation Order No. R9-2004-0277 must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) The Responsible Copermittees must monitor the effluent of the MS4 outfalls discharging to Chollas Creek for dissolved copper, lead, and zinc, and calculate or estimate the monthly and annual dissolved copper, lead, and zinc loads, in accordance with the requirements of Provisions D.2, D.4.b.(1), and D.4.b.(2) of this Order. The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(3) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 4.b.(2)(b) or 4.c.(1), dry and wet weather discharge concentrations may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

5. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2008-0027

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 11, 2008
State Water Board Approval Date:	June 16, 2009
Office of Administrative Law Approval Date:	September 15, 2009
US EPA Approval Date:	October 26, 2009

(3) TMDL Effective Date: September 15, 2009

(4) Watershed Management Areas: See Table 5.0

(5) Water Bodies: See Table 5.0

(6) Responsible Copermittees: See Table 5.0

Table 5.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

Watershed Management Area	Water Body	Segment or Area	Responsible Copermittees
South Orange County	Dana Point Harbor	Baby Beach	-City of Dana Point -County of Orange
San Diego Bay	San Diego Bay	Shelter Island Shoreline Park	- San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final indicator bacteria TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Final TMDL Compliance Dates

(a) Baby Beach in Dana Point Harbor

The Responsible Copermittees for MS4 discharges to Baby Beach must be in compliance with the final TMDL compliance requirements according to the following compliance dates:

Table 5.1
Compliance Dates to Achieve Final TMDL Compliance Requirements For Baby Beach in Dana Point Harbor

Constituent	Dry Weather WLA Compliance Date	Wet Weather WLA Compliance Date
Total Coliform	September 15, 2014	September 15, 2009
Fecal Coliform		September 15, 2009
Enterococcus		September 15, 2019

(b) Shelter Island Shoreline Park in San Diego Bay

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park must be in compliance with the final TMDL compliance requirements as of December 31, 2012.

(2) Final Water Quality Based Effluent Water Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance dates under Specific Provision 5.b.(1):

Table 5.2
Final Receiving Water Limitations Expressed as Bacteria Densities in the Water Body

	Receiving Water Limitations	
Constituent	Single Sample Maximum[1,2]	30-Day Geometric Mean[2]
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing indicator bacteria densities that do not exceed the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.3a
Final Effluent Limitations as Expressed as Bacteria Densities in MS4 Discharges to the Water Body

	Effluent Limitations	
Constituent	**Single Sample Maximum[1,2]**	**30-Day Geometric Mean[2]**
Total Coliform	10,000 MPN/100mL	1,000 MPN/100mL
Fecal Coliform	400 MPN/100mL	200 MPN/100mL
Enterococcus	104 MPN/100mL	35 MPN/100mL

Notes:
1. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
2. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.

(ii) Discharges from the MS4s containing indicator bacteria loads that do not exceed the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.4a
Final Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to the Baby Beach in Dana Point Harbor

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0.86×10^9 MPN/day	$3{,}254 \times 10^9$ MPN/30days
Fecal Coliform	0.17×10^9 MPN/day	112×10^9 MPN/30days
Enterococcus	0.03×10^9 MPN/day	114×10^9 MPN/30days

Table 5.4b
Final Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to the Shelter Island Shoreline Park in San Diego Bay

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0 MPN/day	198×10^9 MPN/30days
Fecal Coliform	0 MPN/day	8×10^9 MPN/30days
Enterococcus	0 MPN/day	26×10^9 MPN/30days

(iii) Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the compliance dates under Specific Provision 5.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 5.b.(2)(a):

Table 5.5a
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to Baby Beach in Dana Point Harbor*

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	90.4%	0%
Fecal Coliform	82.7%	0%
Enterococcus	96.2%	62.2%

Notes:
* The percent load reductions are relative to data collected between 1996-2002. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittees' MS4s must not exceed the loads in Table 5.4a, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the water body.

Table 5.5b
*Final Effluent Limitations Expressed as Percent Load Reductions** in MS4 Discharges to Shelter Island Shoreline Park in San Diego Bay*

Constituent	Dry Weather Final Effluent Limitation	Wet Weather Final Effluent Limitation
Total Coliform	0%	0%
Fecal Coliform	0%	0%
Enterococcus	0%	0%

Notes:
* The percent load reductions are relative to data collected between 1999-2004. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittee's MS4s must not exceed the loads in Table 5.4b, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the water body.

(c) Best Management Practices

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 5.0 must incorporate the Bacteria Load Reduction Plan (BLRP) required to be developed pursuant to Resolution No. R9-2008-0027.

(ii) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 5.b.(2)(a) and/or the effluent limitations under Specific Provision 5.b.(2)(b) for the segments or areas of the water bodies listed in Table 5.0

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.b.(2)(b)(ii); OR

(e) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 5.b.(2)(b)(iii); OR

(f) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(g) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 5.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 5.b.(2)(c) achieves compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 5.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 5.d, to demonstrate compliance with Specific Provisions 5.b.(3)(a), 5.b.(3)(b), 5.b.(3)(c), 5.b.(3)(d), 5.b.(3)(e) and/or 5.b.(3)(f).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim indicator bacteria TMDL compliance requirements for segments or areas of the water bodies listed in Table 5.0 consist of the following:

(1) Baby Beach in Dana Point Harbor

(a) Interim TMDL Compliance Dates and WQBELs

The Responsible Copermittees for MS4 discharges to Baby Beach must comply with the following interim WQBELs by the interim compliance dates given in Tables 5.6a and/or 5.6b:

Table 5.6a
Interim Water Quality Based Effluent Limitations Expressed as Bacteria Loads in MS4 Discharges to Baby Beach in Dana Point Harbor

Constituent	Interim Compliance Dates	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	4.93×10^9 MPN/day	$3{,}254 \times 10^9$ MPN/30days*
Fecal Coliform	September 15, 2012	0.59×10^9 MPN/day	112×10^9 MPN/30days*
Enterococcus	September 15, 2012	0.42×10^9 MPN/day	301×10^9 MPN/30days
	September 15, 2016	0.03×10^9 MPN/day *	207×10^9 MPN/30days

Notes:
* Same as the final effluent limitations in Table 5.4a.

Table 5.6b
Interim Water Quality Based Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to Baby Beach in Dana Point Harbor*

Constituent	Interim Compliance Dates	Dry Weather Interim Effluent Limitation	Wet Weather Interim Effluent Limitation
Total Coliform	September 15, 2012	45.2%	0%**
Fecal Coliform	September 15, 2012	41.4%	0%**
Enterococcus	September 15, 2012	48.1%	0%
	September 15, 2016	96.2%**	31.1%

Notes:
* The percent load reductions are relative to data collected between 1996-2002. For pollutant load reductions of 0%, pollutant loads discharged from the Responsible Copermittees' MS4s must not exceed the loads in Table 5.6a, unless an updated model or analysis, accepted by the San Diego Water Board, identifies a different allowable pollutant load that can be discharged from the Responsible Copermittee's MS4s to the waterbody.
** Same as the final effluent limitations in Table 5.5a.

(b) Interim Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(i) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(ii) There are no exceedances of the final receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(iii) There are no exceedances of the final effluent limitations under Specific Provision 5.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(iv) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the final effluent limitations under Specific Provision 5.b(2)(b)(ii); OR

(v) The Responsible Copermittees can demonstrate that exceedances of the applicable receiving water limitations under Specific Provision 5.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(vi) The pollutant loads discharging from the Responsible Copermittees' MS4 outfalls do not exceed the interim effluent limitations under Table 5.6a of Specific Provision 5.c.(1)(a); OR

(vii) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the interim effluent limitations under Table 5.6b of Specific Provision 5.c.(1)(a); OR

(viii) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

(2) <u>Shelter Island Shoreline Park in San Diego Bay</u>

The Responsible Copermittee for MS4 discharges to Shelter Island Shoreline Park must be in compliance with the final indicator bacteria TMDL requirements as of December 31, 2012.

d. Specific Monitoring and Assessment Requirements

(1) Monitoring Stations

Monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[38] If discharges of bacteria from the MS4 exceed the applicable interim or final WQBELs, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(2) Monitoring Procedures

(a) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) The Responsible Copermittees must collect wet weather monitoring samples within the first 24 hours of a storm event[39] of the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(c) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

[38] Commonly referred to as AB 411 monitoring
[39] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs have been achieved.

(b) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 5.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(c) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to correlate elevated bacteria levels with known or suspected sewage spills from wastewater collection systems and treatment plants or boats.

(d) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

6. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2010-0001

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date: February 10, 2010
State Water Board Approval Date: December 14, 2010
Office of Administrative Law Approval Date: April 4, 2011
US EPA Approval Date: June 22, 2011

(3) TMDL Effective Date: April 4, 2011

(4) Watershed Management Areas: See Table 6.0

(5) Water Bodies: See Table 6.0

(6) Responsible Copermittees: See Table 6.0

Table 6.0
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	-City of Laguna Beach -County of Orange -Orange County Flood Control District
		at Heisler Park - North	
	Pacific Ocean Shoreline	at Main Laguna Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Woods -County of Orange -Orange County Flood Control District
		Laguna Beach at Ocean Avenue	
		Laguna Beach at Cleo Street	
		Arch Cove at Bluebird Canyon Road	
		Laguna Beach at Dumond Drive	
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	-City of Aliso Viejo -City of Laguna Beach -City of Laguna Hills -City of Laguna Niguel -City of Laguna Woods -City of Lake Forest -City of Mission Viejo -County of Orange -Orange County Flood Control District
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	
	Aliso Creek Mouth	at mouth	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	-City of Dana Point -City of Laguna Beach -City of Laguna Niguel -County of Orange -Orange County Flood Control District
		Aliso Beach at Table Rock Drive	
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)	
		at Salt Creek (large outlet)	
		Salt Creek Beach at Salt Creek service road	
		Salt Creek Beach at Strand Road	
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	-City of Dana Point -City of Laguna Hills -City of Laguna Niguel -City of Mission Viejo -City of Rancho Santa Margarita -City of San Juan Capistrano -County of Orange -Orange County Flood Control District
	San Juan Creek	lower 1 mile	
	San Juan Creek Mouth	at mouth	
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	-City of Dana Point -City of San Clemente -County of Orange -Orange County Flood Control District
		Ole Hanson Beach Club Beach at Pico Drain	
		San Clemente City Beach at El Portal Street Stairs	
		San Clemente City Beach at Mariposa Street	
		San Clemente City Beach at Linda Lane	
		San Clemente City Beach at South Linda Lane	
		San Clemente City Beach at Lifeguard Headquarters	
		under San Clemente Municipal Pier	
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	
		San Clemente State Beach at Riviera Beach	
		Can Clemente State Beach at Cypress Shores	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	-City of Oceanside -City of Vista -County of San Diego
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	-City of Carlsbad -City of Encinitas -City of Escondido -City of San Marcos -County of San Diego
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	-City of Del Mar -City of Escondido -City of Poway -City of San Diego -City of Solana Beach -County of San Diego
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	-City of Del Mar -City of Poway -City of San Diego -County of San Diego
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	-City of San Diego
		La Jolla Shores Beach at Caminito del Oro	
		La Jolla Shores Beach at Vallecitos	
		La Jolla Shores Beach at Avenida de la Playa	
		at Casa Beach, Children's Pool	
		South Casa Beach at Coast Boulevard	
		Whispering Sands Beach at Ravina Street	
		Windansea Beach at Vista de la Playa	
		Windansea Beach at Bonair Street	
		Windansea Beach at Playa del Norte	
		Windansea Beach at Palomar Avenue	
		at Tourmaline Surf Park	
		Pacific Beach at Grand Avenue	
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries	

Table 6.0 (Cont'd)
Applicability of Total Maximum Daily Loads for Indicator Bacteria
Project I- Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area	Responsible Copermittees
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	-City of El Cajon -City of Santee -County of San Diego
	San Diego River	lower 6 miles	-City of El Cajon -City of La Mesa -City of San Diego -City of Santee -County of San Diego
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	-City of La Mesa -City of Lemon Grove -City of San Diego -County of San Diego - San Diego Unified Port District

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final indicator bacteria TMDL compliance requirements for the water bodies listed in Table 6.0 consist of the following:

(1) Final TMDL Compliance Dates

The Responsible Copermittees for MS4 discharges to the water bodies listed in Table 6.0 must be in compliance with the final TMDL compliance requirements according to the following compliance dates:

Table 6.1
Compliance Dates to Achieve Final TMDL Compliance Requirements

Constituent	Dry Weather TMDL Compliance Date	Wet Weather TMDL Compliance Date*
Total Coliform	April 4, 2021	April 4, 2031 (April 4, 2021)
Fecal Coliform		
Enterococcus		

* The Wet Weather TMDL Compliance Date in parenthesis applies if the applicable Water Quality Improvement Plan does not include load reduction programs for other constituents (e.g. metals, pesticides, trash, nutrients, sediment, etc.) together with bacteria load reduction requirements of these TMDLs.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not cause or contribute to the exceedance of the following receiving water limitations by the compliance dates under Specific Provision 6.b.(1):

Table 6.2a
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Beaches

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform	10,000	22%	1,000	0%
Fecal Coliform	400	22%	200	0%
Enterococcus	104	22%	35	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan.

Table 6.2b
Final Receiving Water Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies for Creeks

Constituent	Wet Weather Days		Dry Weather Days	
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Fecal Coliform	400	22%	200	0%
Enterococcus	61 (104)	22%	33	0%

Notes:
a. During wet weather days, only the single sample maximum receiving water limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean receiving water limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Basin Plan.
d. A single sample maximum of 104 MPN/100ml for *Enterococcus* may be applied as a receiving water limitation for creeks, instead of 61 MPN/100mL, if one or more of the creeks addressed by these TMDLs (San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek, San Diego River, and/or Chollas Creek) is designated with a "moderately to lightly used area" or less frequent usage frequency in the Basin Plan. Otherwise, the single sample maximum of 61 MPN/100mL for *Enterococcus* must be used to assess compliance with the allowable exceedance frequency.

(b) Final Effluent Limitations

(i) Discharges from the MS4s containing indicator bacteria densities that do not exceed the following effluent limitations by the compliance dates under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a):

Table 6.2c
Final Effluent Limitations Expressed as Bacteria Densities and Allowable Exceedance Frequencies in MS4 Discharges to the Water Body

Constituent	Concentration-Based Effluent Limitations			
	Single Sample Maximum[a,b] (MPN/100mL)	Single Sample Maximum Allowable Exceedance Frequency[c]	30-Day Geometric Mean[b] (MPN/100mL)	30-Day Geometric Mean Allowable Exceedance Frequency
Total Coliform[d]	10,000	22%	1,000	0%
Fecal Coliform	400	22%	200	0%
Enterococcus	104[e] / 61[f]	22%	35[e] / 33[f]	0%

Notes:
a. During wet weather days, only the single sample maximum effluent limitations are required to be achieved.
b. During dry weather days, the single sample maximum and 30-day geometric mean effluent limitations are required to be achieved.
c. The 22% single sample maximum allowable exceedance frequency only applies to wet weather days. For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan for discharges to beaches, and the Basin Plan for discharges to creeks and creek mouths.
d. Total coliform effluent limitations only apply to MS4 outfalls that discharge to the Pacific Ocean Shorelines and creek mouths listed in Table 6.0.
e. This *Enterococcus* effluent limitation applies to MS4 discharges to segments of areas of Pacific Ocean Shoreline listed in Table 6.0.
f. This *Enterococcus* effluent limitation applies to MS4 discharges to segments or areas of creeks or creek mouths listed in Table 6.0.

(ii) Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the compliance dates under Specific Provision 6.b.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.b.(2)(a):

Table 6.3
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watershed and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
South Orange County	**San Joaquin Hills HSA** (901.11) and **Laguna Hills HSA** (901.12) - Pacific Ocean Shoreline	91.78%	91.72%	98.28%	46.85%	52.07%	51.26%
	Aliso HSA (901.13) - Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	95.47%	95.58%	99.13%	25.29%	26.62%	27.52% (27.37%)**
	Dana Point HSA (901.14) - Pacific Ocean Shoreline	95.04%	95.03%	98.98%	13.15%	14.86%	15.16%
	Lower San Juan HSA (901.27) - Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	72.96%	74.21%	94.94%	19.21%	12.82%	27.12% (26.90%)**
	San Clemente HA (901.30) - Pacific Ocean Shoreline	94.28%	94.23%	98.83%	23.85%	24.58%	25.26%
San Luis Rey River	**San Luis Rey HU** (903.00) - Pacific Ocean Shoreline	38.13%	39.09%	87.38%	5.62%	3.12%	11.69%

Table 6.3 (Cont'd)
Final Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watershed and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
Carlsbad	**San Marcos HA** (904.50) - Pacific Ocean Shoreline	82.82%	82.55%	96.03%	18.47%	18.98%	20.19%
San Dieguito River	**San Dieguito HU** (905.00) - Pacific Ocean Shoreline	14.39%	20.72%	83.48%	4.29%	1.46%	7.72%
Penasquitos	**Miramar Reservoir HA** (906.10) - Pacific Ocean Shoreline	96.50%	96.59%	99.42%	1.61%	1.99%	1.93%
Mission Bay	**Scripps HA** (906.30) - Pacific Ocean Shoreline	96.44%	96.42%	99.25%	16.32%	21.14%	18.82%
	Tecolote HA (906.50) - Tecolote Creek	94.51%	94.59%	98.94%	16.51%	20.47%	18.15% (18.08%)**
San Diego River	**Mission San Diego HSA** (907.11) and **Santee HSA** (907.12) - Pacific Ocean Shoreline - Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles)	74.03%	69.44%	93.96%	38.14%	53.22%	42.74% (42.47%)**
San Diego Bay	**Chollas HSA** (908.22) - Chollas Creek	92.06%	92.15%	98.46%	17.82%	24.84%	21.46% (21.36%)**

Notes:
* The percent load reductions are based on reducing loads compared to pollutant loads from 2001 to 2002.
** The alternative *Enterococcus* percent load reduction was calculated based on a numeric target of 104 MPN/100mL instead of 61 MPN/100mL, protective of the REC-1 "moderately to lightly used area" usage frequency that is protective of freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative pollutant load reductions can be utilized.

(c) Best Management Practices

(i) The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 6.0 must incorporate the Bacteria Load Reduction Plans (BLRPs) or Comprehensive Load Reduction Plans (CLRPs) required to be developed pursuant to Resolution No. R9-2010-0001.

(ii) The Responsible Copermittee must implement BMPs to achieve the receiving water limitations under Specific Provision 6.b.(2)(a) and/or the effluent limitations under Specific Provision 6.b.(2)(b) for the segments or areas of the water bodies listed in Table 6.0.

(iii) The Responsible Copermittees should coordinate any BMPs implemented to address this TMDL with Caltrans, owners/operators of small MS4s, and agricultural dischargers as possible.

(3) Final TMDL Compliance Determination

Compliance with the final WQBELs, on or after the final TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(f) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 6.b.(2)(c) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 6.b.(2)(c) achieves compliance with Specific Provisions 6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), and/or 6.b.(3)(e),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 6.b.(2)(c), AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 6.d, to demonstrate compliance with Specific Provisions 6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), 6.b.(3)(e) and/or 6.b.(3)(f).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim indicator bacteria TMDL compliance requirements for the water bodies listed in Table 6.0 consist of the following:

(1) Interim TMDL Compliance Dates

The Responsible Copermittees must achieve compliance with the interim TMDL compliance requirements, as determined in accordance with Specific Provision 6.c.(3), by the interim compliance dates given in Table 6.4, unless alternative interim compliance dates are accepted by the San Diego Water Board Executive Officer as part of the Water Quality Improvement Plan.

Table 6.4
Interim Compliance Dates to Achieve Interim TMDL Compliance Requirements

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs*
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	April 4, 2016	April 4, 2021 (April 4, 2016)
		at Heisler Park - North		
	Pacific Ocean Shoreline	at Main Laguna Beach	April 4, 2016	April 4, 2021 (April 4, 2016)
		Laguna Beach at Ocean Avenue		
		Laguna Beach at Cleo Street		
		Arch Cove at Bluebird Canyon Road		
		Laguna Beach at Dumond Drive		
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	April 4, 2016	April 4, 2021 (April 4, 2016)
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	April 4, 2018	April 4, 2021 (April 4, 2018)
	Aliso Creek Mouth	at mouth	April 4, 2018	April 4, 2021 (April 4, 2018)
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	April 4, 2016	April 4, 2021 (April 4, 2016)
		Aliso Beach at Table Rock Drive		
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)		
		at Salt Creek (large outlet)		
		Salt Creek Beach at Salt Creek service road	April 4, 2017	April 4, 2021 (April 4, 2017)
		Salt Creek Beach at Strand Road	April 4, 2017	April 4, 2021 (April 4, 2017)

Table 6.4 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates: Interim Dry Weather WQBELs	Interim Compliance Dates: Interim Wet Weather WQBELs*
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	April 4, 2016	April 4, 2021 (April 4, 2016)
	San Juan Creek	lower 1 mile	April 4, 2018	April 4, 2021 (April 4, 2018)
	San Juan Creek Mouth	at mouth	April 4, 2016	April 4, 2021 (April 4, 2016)
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	April 4, 2016	April 4, 2021 (April 4, 2016)
		Ole Hanson Beach Club Beach at Pico Drain	April 4, 2016	April 4, 2021 (April 4, 2016)
		San Clemente City Beach at El Portal Street Stairs	April 4, 2017	April 4, 2021 (April 4, 2017)
		San Clemente City Beach at Mariposa Street		
		San Clemente City Beach at Linda Lane	April 4, 2016	April 4, 2021 (April 4, 2016)
		San Clemente City Beach at South Linda Lane	April 4, 2018	April 4, 2021 (April 4, 2018)
		San Clemente City Beach at Lifeguard Headquarters	April 4, 2017	April 4, 2021 (April 4, 2017)
		under San Clemente Municipal Pier		
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	April 4, 2018	April 4, 2021 (April 4, 2018)
		San Clemente State Beach at Riviera Beach	April 4, 2016	April 4, 2021 (April 4, 2016)
		Can Clemente State Beach at Cypress Shores	April 4, 2017	April 4, 2021 (April 4, 2017)
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	April 4, 2017	April 4, 2021 (April 4, 2017)
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	April 4, 2016	April 4, 2021 (April 4, 2016)
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	April 4, 2016	April 4, 2021 (April 4, 2016)

Table 6.4 (Cont'd)
Interim Compliance Dates to Achieve Interim WQBELs

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Compliance Dates	
			Interim Dry Weather WQBELs	Interim Wet Weather WQBELs*
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	April 4, 2016	April 4, 2021 (April 4, 2016)
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	April 4, 2016	April 4, 2021 (April 4, 2016)
		La Jolla Shores Beach at Caminito del Oro		
		La Jolla Shores Beach at Vallecitos		
		La Jolla Shores Beach at Avenida de la Playa		
		at Casa Beach, Children's Pool		
		South Casa Beach at Coast Boulevard		
		Whispering Sands Beach at Ravina Street		
		Windansea Beach at Vista de la Playa		
		Windansea Beach at Bonair Street		
		Windansea Beach at Playa del Norte		
		Windansea Beach at Palomar Avenue		
		at Tourmaline Surf Park		
		Pacific Beach at Grand Avenue		
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries		
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	April 4, 2018	April 4, 2021 (April 4, 2018)
	San Diego River	lower 6 miles		
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach		
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	April 4, 2018	April 4, 2021 (April 4, 2018)

* The Interim Compliance Dates to achieve the Interim Wet Weather WQBELs in parenthesis apply if the applicable Water Quality Improvement Plan does not include load reduction programs for other constituents (e.g. metals, pesticides, trash, nutrients, sediment, etc.) together with bacteria load reduction requirements of these TMDLs.

(2) Interim Water Quality Based Effluent Limitations

The Responsible Copermittees for discharges to the water bodies in Table 6.0 must comply with the following interim WQBELs by the interim compliance dates given in Specific Provision 6.c.(1):

(a) Interim Receiving Water Limitations

(i) *Interim Dry Weather Receiving Water Limitations*

The Responsible Copermittee must calculate the "existing" exceedance frequencies of the 30-day geometric mean water quality objectives for each of the indicator bacteria by analyzing the available monitoring data collected between January 1, 1996 and December 31, 2002. "Existing" exceedance frequencies may be calculated by water body and/or by Watershed Management Area listed in Table 6.0. Separate "existing" exceedance frequencies must be calculated for beaches and creeks/creek mouths.

The Responsible Copermittees must achieve a 50 percent reduction in the "existing" exceedance frequency of the 30-day geometric mean WQBELs for the water bodies listed in Table 6.0 by the interim compliance dates given in Table 6.4. A 50 percent reduction in the "existing" exceedance frequency is equivalent to half of the "existing" exceedance frequency of the 30-day geometric mean WQBELs.

The "existing" exceedance frequencies and the interim dry weather allowable exceedance frequencies (i.e. interim dry weather receiving water limitations) calculated by the Responsible Copermittees must be included in the Water Quality Improvement Plans for the applicable Watershed Management Areas.

(ii) *Interim Wet Weather Receiving Water Limitations*

The Responsible Copermittees must achieve the interim wet weather receiving water limitations in Table 6.5, expressed as interim wet weather allowable exceedance frequencies, by the interim compliance dates given in Table 6.4.

Table 6.5
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County San Joaquin Hills HSA (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way	38%	37%	39%
		at Heisler Park - North			
	Pacific Ocean Shoreline	at Main Laguna Beach			
		Laguna Beach at Ocean Avenue			
		Laguna Beach at Cleo Street			
		Arch Cove at Bluebird Canyon Road			
		Laguna Beach at Dumond Drive			
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach	41%	41%	42%
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek	41%	41%	42%
	Aliso Creek Mouth	at mouth	41%	41%	42%
South Orange County Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	36%	36%	36%
		Aliso Beach at Table Rock Drive			
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)			
		at Salt Creek (large outlet)			
		Salt Creek Beach at Salt Creek service road			
		Salt Creek Beach at Strand Road			

Table 6.5 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek	44%	44%	48%
	San Juan Creek	lower 1 mile	44%	44%	47%
	San Juan Creek Mouth	at mouth	44%	44%	47%
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach	35%	35%	36%
		Ole Hanson Beach Club Beach at Pico Drain			
		San Clemente City Beach at El Portal Street Stairs			
		San Clemente City Beach at Mariposa Street			
		San Clemente City Beach at Linda Lane			
		San Clemente City Beach at South Linda Lane			
		San Clemente City Beach at Lifeguard Headquarters			
		under San Clemente Municipal Pier			
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)			
		San Clemente State Beach at Riviera Beach			
		Can Clemente State Beach at Cypress Shores			
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth	45%	44%	47%
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	40%	40%	41%
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth	33%	33%	36%

Table 6.5 (Cont'd)
Interim Wet Weather Receiving Water Limitations Expressed as Interim Wet Weather Allowable Exceedance Frequencies

Watershed Management Area and Watershed	Water Body	Segment or Area	Interim Wet Weather Allowable Exceedance Frequencies		
			Total Coliform	Fecal Coliform	*Entero-coccus*
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	26%	26%	26%
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	37%	37%	37%
		La Jolla Shores Beach at Caminito del Oro			
		La Jolla Shores Beach at Vallecitos			
		La Jolla Shores Beach at Avenida de la Playa			
		at Casa Beach, Children's Pool			
		South Casa Beach at Coast Boulevard			
		Whispering Sands Beach at Ravina Street			
		Windansea Beach at Vista de la Playa			
		Windansea Beach at Bonair Street			
		Windansea Beach at Playa del Norte			
		Windansea Beach at Palomar Avenue			
		at Tourmaline Surf Park			
		Pacific Beach at Grand Avenue			
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries	49%	49%	51%
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile	46%	43%	49%
	San Diego River	lower 6 miles	46%	43%	49%
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach	46%	43%	51%
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles	41%	41%	43%

(b) Interim Effluent Limitations

Indicator bacteria percent load reductions from the Responsible Copermittees' MS4s that are greater than or equal to the following effluent limitations by the interim compliance dates under Specific Provision 6.c.(1) will not cause or contribute to exceedances of the receiving water limitations under Specific Provision 6.c.(2)(a):

Table 6.6
Interim Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watersheds and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
South Orange County	**San Joaquin Hills HSA** (901.11) and **Laguna Hills HSA** (901.12) - Pacific Ocean Shoreline	45.89%	45.86%	49.14%	23.43%	26.04%	25.63%
	Aliso HSA (901.13) - Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	47.74%	47.79%	49.57%	12.65%	13.31%	13.76% (13.69%)**
	Dana Point HSA (901.14) - Pacific Ocean Shoreline	47.52%	47.52%	49.49%	6.58%	7.43%	7.58%
	Lower San Juan HSA (901.27) - Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	36.48%	37.11%	47.47%	9.61%	6.41%	13.56% (13.45%)**
	San Clemente HA (901.30) - Pacific Ocean Shoreline	47.14%	47.12%	49.42%	11.93%	12.29%	12.63%
San Luis Rey River	**San Luis Rey HU** (903.00) - Pacific Ocean Shoreline	19.07%	19.55%	43.69%	2.81%	1.56%	5.85%
Carlsbad	**San Marcos HA** (904.50) - Pacific Ocean Shoreline	41.41%	41.28%	48.02%	9.24%	9.49%	10.10%

Table 6.6 (Cont'd)
Interim Effluent Limitations Expressed as Percent Load Reductions in MS4 Discharges to the Water Body*

Watershed Management Areas	Watersheds and Water Bodies	Load-Based Effluent Limitations					
		Dry Weather			Wet Weather		
		Total Coliform	Fecal Coliform	Entero-coccus	Total Coliform	Fecal Coliform	Entero-coccus
San Dieguito River	**San Dieguito HU** (905.00) - Pacific Ocean Shoreline	7.20%	10.36%	41.74%	2.15%	0.73%	3.86%
Penasquitos	**Miramar Reservoir HA** (906.10) - Pacific Ocean Shoreline	48.25%	48.30%	49.71%	0.81%	1.00%	0.97%
Mission Bay	**Scripps HA** (906.30) - Pacific Ocean Shoreline	48.22%	48.21%	49.63%	8.16%	10.57%	9.41%
	Tecolote HA (906.50) - Tecolote Creek	47.26%	47.30%	49.47%	8.26%	10.24%	9.08% (9.04%)**
San Diego River	**Mission San Diego HSA** (907.11) and **Santee HSA** (907.12) - Pacific Ocean Shoreline - Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles)	37.02%	34.72%	46.98%	19.07%	26.61%	21.37% (21.24%)**
San Diego Bay	**Chollas HSA** (908.22) - Chollas Creek	46.03%	46.08%	49.23%	8.91%	12.42%	10.73% (10.68%)**

Notes:
* The percent load reductions are based on reducing loads compared to pollutant loads from 2001 to 2002.
** The alternative *Enterococcus* percent load reduction was calculated based on a numeric target of 104 MPN/100mL instead of 61 MPN/100mL, protective of the REC-1 "moderately to lightly used area" usage frequency that is protective of freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative pollutant load reductions can be utilized.

(3) <u>Interim TMDL Compliance Determination</u>

Compliance with the interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) There are no exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water at, or downstream of the Responsible Copermittee's MS4 outfalls; OR

(c) There are no exceedances of the final effluent limitations under Specific Provision 6.b.(2)(b)(i) at the Responsible Copermittee's MS4 outfalls; OR

(d) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the final effluent limitations under Specific Provision 6.b.(2)(b)(ii); OR

(e) The Responsible Copermittees can demonstrate that exceedances of the final receiving water limitations under Specific Provision 6.b.(2)(a) in the receiving water are due to loads from natural sources, AND pollutant loads from the Copermittees' MS4s are not causing or contributing to the exceedances; OR

(f) There are no exceedances of the interim receiving water limitations under Specific Provision 6.c.(2)(a) in the receiving water at, or downstream of the Responsible Copermittees' MS4 outfalls; OR

(g) The pollutant load reductions for discharges from the Responsible Copermittees' MS4 outfalls are greater than or equal to the interim effluent limitations under Specific Provision 6.c.(2)(b); OR

(h) The Responsible Copermittees have submitted and are fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the interim TMDL compliance requirements will be achieved by the interim compliance dates.

d. Specific Monitoring and Assessment Requirements

(1) Monitoring and Assessment Requirements for Beaches

(a) Monitoring Stations

For beaches addressed by the TMDL, monitoring locations should consist of, at a minimum, the same locations used to collect data required pursuant to Order Nos. R9-2007-0001 and R9-2009-0002, and beach monitoring for Health and Safety Code section 115880.[40] If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source

[40] Commonly referred to as AB 411 monitoring

identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified anthropogenic sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations at least monthly. Dry weather samples collected from additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations at least once within the first 24 hours of the end of a storm event[41] during the rainy season (i.e. October 1 through April 30). Wet weather samples collected from receiving water stations and any additional monitoring stations established to identify sources must be collected at an appropriate frequency to demonstrate bacteria loads from the identified sources have been addressed and are no longer in exceedance of the allowable exceedance frequencies in the receiving waters.

(iii) Samples must be analyzed for total coliform, fecal coliform, and *Enterococcus* indicator bacteria.

(iv) For Pacific Ocean Shoreline segments or areas listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

[41] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the dry weather and wet weather monitoring data to assess whether the interim and final WQBELs for the Pacific Ocean Shoreline segments or areas listed in Table 6.0 have been achieved.

(ii) Dry weather exceedance frequencies must be calculated as follows:

[a] 30-day geometric means must be calculated from the results of any dry weather samples collected from the segments or areas for each water body listed in Table 6.0;
[b] The method and number of samples need for calculating the 30-day geometric means must be consistent with the number of samples required by the Ocean Plan;
[c] Where there are multiple segments or areas associated with a water body listed in Table 6.0, the Copermittees may calculate geometric means for each segment or area, or combine the dry weather monitoring data from all the segments or areas to calculate geometric means for the water body;
[d] The exceedance frequency must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the dry season.

(iii) Wet weather exceedance frequencies must be calculated as follows:

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;
[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;
[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria densities reported from each storm event sampled; and
[d] The single sample maximum exceedance frequency must be calculated by dividing the number of wet weather days that exceed the single sample maximum receiving water limitations in Table 6.2 by the total number of wet weather days during the rainy season.
[e] The data collected for dry weather must be used in addition to the data collected for wet weather to calculate the wet weather 30-

day geometric means. The exceedance frequency of the wet weather 30-day geometric means must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the wet season.

(iv) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(v) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

(2) Monitoring and Assessment Requirements for Creeks and Creek Mouths

(a) Monitoring Stations

For creeks addressed by the TMDL, monitoring locations should consist of, at a minimum, a location at or near the mouth of the creek (e.g. Mass Loading Station or Mass Emission Station) and one or more locations upstream of the mouth (e.g. Watershed Assessment Station). If exceedances of the applicable interim or final receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations must also be used to demonstrate that the bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

(b) Monitoring Procedures

(i) The Responsible Copermittees must collect dry weather monitoring samples from the receiving water monitoring stations in accordance with the requirements of Provision D.

(ii) The Responsible Copermittees must collect wet weather monitoring samples from the receiving water monitoring stations within the first 24 hours of the end of a storm event[42] during the rainy season (i.e. October 1 through April 30).

[42] Wet weather days are defined by the TMDL as storm events of 0.2 inches or greater and the following 72 hours. The Responsible Copermittees may choose to limit their wet weather sampling requirements to

(iii) Samples collected from receiving water monitoring stations must be analyzed for fecal coliform and *Enterococcus* indicator bacteria.

(iv) For creeks or creek mouths listed in Table 6.0 that have been de-listed from the Clean Water Act Section 303(d) List, the Responsible Copermittees may propose alternative monitoring procedures to demonstrate that the water bodies continue to remain in compliance with water quality standards under wet weather and dry weather conditions. The alternative monitoring procedures must be submitted as a part of the Water Quality Improvement Plans or any updates required under Provisions F.1 and F.2.c of the Order.

(c) Assessment and Reporting Requirements

(i) The Responsible Copermittees must analyze the receiving water monitoring data to assess whether the interim and final receiving water WQBELs for the creeks and creek mouths listed in Table 6.0 have been achieved.

(ii) Dry weather exceedance frequencies must be calculated as follows:

[a] 30-day geometric means must be calculated from the results of any dry weather samples collected from the segment or area for each water body listed in Table 6.0;
[b] The method and number of samples need for calculating the 30-day geometric means must be consistent with the number of samples required by the Basin Plan;
[c] The exceedance frequency must be calculated by dividing the number of 30-day geometric means that exceed the 30-day geometric mean receiving water limitations in Table 6.2 by the total number of 30-day geometric means calculated from samples collected during the dry season.

(iii) Wet weather exceedance frequencies must be calculated as follows:

[a] If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event must be assumed to be equal to the results from the one sample collected;
[b] If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all wet weather days of the storm event not sampled must be assumed to be equal to the highest bacteria density result reported from the samples collected;

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storm events of 0.2 inches or greater, or also include storm events of 0.1 inches or greater as defined by the federal regulations [40CFR122.26(d)(2)(iii)(A)(2)].

[c] If there are any storm events not sampled, the bacteria density for every wet weather day of those storm events must be assumed to be equal to the average of the highest bacteria densities reported from each of the storm events sampled; and

[d] The exceedance frequency must be calculated by dividing the number of wet weather days that exceed the single sample maximum receiving water limitations in Table 6.2 by the total number of wet weather days during the rainy season.

[e] The data collected for dry weather must be used in addition to the data collected for wet weather to calculate the wet weather 30-day geometric means. The exceedance frequency of the wet weather 30-day geometric means must be calculated by dividing the number of geometric means that exceed the geometric mean receiving water limitations in Table 6.2 by the total number of geometric means calculated from samples collected during the wet season.

(iv) The Responsible Copermittee must identify and incorporate additional MS4 outfall and receiving water monitoring stations and/or adjust monitoring frequencies to identify sources causing exceedances of the receiving water WQBELs.

(v) For assessing and determining compliance with the concentration-based effluent limitations under Specific Provision 6.b.(2)(b)(i), dry and wet weather discharge bacteria densities may be calculated based on a flow-weighted average across all major MS4 outfalls along a water body segment or within a jurisdiction if samples are collected within a similar time period.

(vi) The monitoring and assessment results must be submitted as part of the Transitional Monitoring and Assessment Program and Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

7. Total Maximum Daily Loads for Sediment in Los Peñasquitos Lagoon

a. APPLICABILITY

(1) TMDL Basin Plan Amendment: Resolution No. R9-2012-0033

(2) TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2012
State Water Board Approval Date:	January 21, 2014
Office of Administrative Law Approval Date:	July 14, 2014
US EPA Approval Date:	October 30, 2014

(3) TMDL Effective Date: July 14, 2014

(4) Watershed Management Area: Peñasquitos

(5) Water Body: Los Peñasquitos Lagoon

(6) Responsible Copermittees: County of San Diego, City of San Diego, City of Del Mar, and City of Poway

b. FINAL TMDL COMPLIANCE REQUIREMENTS

The final sediment TMDL compliance requirements for Los Peñasquitos Lagoon consist of the following:

(1) Final TMDL Compliance Date

The Responsible Copermittees must be in compliance with the final TMDL compliance requirements by December 31, 2034.

(2) Final Water Quality Based Effluent Limitations

(a) Final Receiving Water Limitations

Discharges from the MS4s must not prohibit the sustainable restoration of tidal and non-tidal saltmarsh vegetation of at least 346 acres.

(b) Final Effluent Limitations

Discharges from the MS4s containing pollutant loads that do not exceed the following effluent limitations by the compliance date under Provision 7.b(1) will not cause or contribute to a failure of the receiving water condition specified under Specific Provision 7.b.(2)(a):

Table 7.1
*Final Effluent Limitations as Expressed as Wet Season Loads in MS4 Discharges to Los Peñasquitos Lagoon**

Constituent	Effluent Limitation
Sediment	2,580 tons/wet season

* Final effluent limitations are to be achieved by the following Responsible Parties: County of San Diego, City of San Diego, City of Del Mar, City of Poway, Phase II MS4 permittees, Caltrans, general construction storm water NPDES permittees, and general industrial storm water NPDES permittees.

(c) Best Management Practices

(i) The Water Quality Improvement Plan for the Los Peñasquitos Watershed Management Area must incorporate the Sediment Load Reduction Plan required to be developed pursuant to Resolution No. R9-2012-0033.

(ii) The Responsible Copermittees must implement BMPs to achieve the receiving water limitations under Specific Provision 7.b.(2)(a) and/or the Copermittee's portion of the effluent limitations under Specific Provision 7.b.(2)(b) for Los Peñasquitos Lagoon.

(3) Final TMDL Compliance Determination

Compliance determination with the final WQBELs, on or after the final TMDL compliance date, may be demonstrated via one of the following methods:

(a) Successful restoration of 80 percent of the 1973 acreage of tidal and non-tidal lagoon salt marsh (346 acres) as described in Attachment A of Resolution No. R9-2010-0033; OR

(b) The Responsible Copermittees develop and implement the Water Quality Improvement Plan as follows:

(i) Incorporate the BMPs required under Specific Provision 7.b.(2)(c)(ii) and/or other implementation actions to achieve compliance with Specific Provision 7.b.(3)(a) as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs required under Provision 7.b.(2)(c)(ii) or other implementation actions to achieve compliance with Specific Provision 7.b.(3)(a),

(iii) The results of the analysis must be accepted by the San Diego Water Board as part of the Water Quality Improvement Plan,

(iv) The Responsible Copermittees continue to implement the BMPs required under Specific Provision 7.b.(2)(c)(ii) or other implementation actions, AND

(v) The Responsible Copermittees continue to perform the specific monitoring and assessments specified in Specific Provision 7.d to demonstrate compliance with Specific Provision 7.b.(3)(a).

c. INTERIM TMDL COMPLIANCE REQUIREMENTS

The interim sediment TMDL compliance requirements for Los Penasquitos Lagoon consist of the following:

(1) Interim Compliance Dates and WQBELs

The Responsible Copermittees must comply with the interim WQBELs, expressed as wet season loads, by December 31 of the interim compliance year set forth in Table 7.2.

Table 7.2
*Interim Water Quality Based Effluent Limitations Expressed as Wet Season Loads in MS4 Discharges**

Interim Compliance Date	Interim Effluent Limitations (tons/wet season)
December 31, 2019	6,691
December 31, 2023	5,663
December 31, 2027	4,636
December 31, 2029	3,608

* Interim effluent limitations are to be achieved by the following Responsible Parties: County of San Diego, City of San Diego, City of Del Mar, City of Poway, Phase II MS4 permittees, Caltrans, general construction storm water NPDES permittees, and general industrial storm water NPDES permittees.

(2) Interim TMDL Compliance Determination

Compliance with interim WQBELs, on or after the interim TMDL compliance dates, may be demonstrated via one of the following methods:

(a) There is no direct or indirect discharge from the Responsible Copermittee's MS4s to the receiving water; OR

(b) The final receiving water limitation under Specific Provision 7.b.(2)(a) is met; OR

(c) There are no exceedances of the Copermittee's portion of interim effluent limitations under Table 7.2 at the Responsible Copermittee's MS4 outfalls; OR

(d) The Responsible Copermittees have submitted and is fully implementing a Water Quality Improvement Plan, accepted by the San Diego Water Board, which provides reasonable assurance that the Copermittee's portion of the interim TMDL compliance requirements described in Attachment A of Resolution No. R9-2010-0033 will be achieved by the interim compliance date.

d. SPECIFIC MONITORING AND ASSESSMENT REQUIREMENTS

(1) Watershed Monitoring

The Responsible Copermittees must conduct suspended sediment, bed load, and flow monitoring to calculate total sediment loading to the Los Peñasquitos Lagoon for each wet season (October 1 thru April 30) as set forth below:

(a) The Responsible Copermittees must monitor enough storm events throughout the season to quantify sediment loading over each wet season, and

(b) The Responsible Copermittees must monitor at least 3 stations to quantify cumulative sediment loading into Los Peñasquitos Lagoon. Stations must be located within the Los Peñasquitos, Carroll Canyon, and Carmel Creek tributaries prior to discharging into Los Peñasquitos Lagoon.

(2) Lagoon Monitoring

The Responsible Copermittees must monitor Los Peñasquitos Lagoon each Fall for changes in the extent of the vegetation types as set forth below:

(a) The Responsible Copermittees must acquire aerial photos of Los Peñasquitos Lagoon and digitize them at an approximate scale of 1:2,500,

(b) The Responsible Copermittees must appropriately interpret the vegetation and classify the various types as saltmarsh, non-tidal saltmarsh, freshwater marsh, non-tidal saltmarsh –*Lolium perrene* infested, southern willow scrub/mulefat scrub, herbaceous wetland, or upland land cover.

(3) Assessment and Reporting Requirements

(a) The Responsible Copermittees must analyze the monitoring data collected under Specific Provision 7.d(1) and 7.d(2) to assess whether the interim and final WQBELs have been achieved.

(b) For assessing and determining compliance with the final receiving water limitations under Specific Provision 7.b.(2)(a), the Responsible Copermittees must use the data acquired under Specific Provision 7.d.(2) to estimate the acreage of tidal and non-tidal saltmarsh actually restored.

(c) For assessing and determining compliance with the final effluent limitations under Specific Provision 7.b.(2)(b), the Responsible Copermittees must use the data acquired under Specific Provision 7.d.(1) to estimate sediment loading into Los Peñasquitos Lagoon. Sediment loading must be evaluated using a 3-year, weighted rolling average. The first reported average shall be calculated using data collected in the year, 2015-2016, 2016-2017, and 2017-2018 wet seasons.

(d) The monitoring and assessment results must be submitted as part of the Water Quality Improvement Plan Annual Reports required under Provision F.3.b of this Order.

ATTACHMENT F

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

FACT SHEET / TECHNICAL REPORT

FOR

ORDER NO. R9-2013-0001
AS AMENDED BY ORDER NOS. R9-2015-0001 AND R9-2015-0100
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

May 8, 2013
Amended February 11, 2015
and November 18, 2015

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I. FACT SHEET FORMAT

This Fact Sheet briefly sets forth the principal facts and the significant factual, legal, methodological, and policy questions that the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) considered in preparing Order No. R9-2013-0001 (Order), as amended by Order Nos. R9-2015-0001 and R9-2015-0100. In accordance with the Code of Federal Regulations (CFR) Title 40 Parts 124.8 and 124.56 (40 CFR 124.8 and 40 CFR 124.56), this Fact Sheet includes, but is not limited to, the following information:

1. Contact information
2. Public process and notification procedures
3. Background of municipal storm water permits
4. Regional MS4 Permit approach
5. Economic considerations
6. Applicable statutes, regulations, plans and policies
7. Discussion of the provisions in the Order

Tentative Order No. R9-2013-0001 was distributed for public review on October 31, 2012. The San Diego Water Board accepted written comments on Tentative Order No. R9-2013-0001 until January 11, 2013. A public hearing was subsequently held on April 10 and 11, 2013, that was continued to May 8, 2013 to receive oral comments from interested persons. The San Diego Water Board adopted Order No. R9-2013-0001 on May 8, 2013.

Tentative Order No. R9-2015-0001, an Order amending Order No. R9-2013-0001, was distributed for public review on September 19, 2014. The San Diego Water Board accepted written comments on Tentative Order No. R9-2015-0001 until November 19, 2014. A public hearing was held on February 11, 2015, to receive oral comments from Copermittees and interested persons. The San Diego Water Board adopted Order No. R9-2015-0001 amending Order No. R9-2013-0001 on February 11, 2015. Order No. R9-2015-0001 amended the findings and provisions of Order No. R9-2013-0001 to:

a. Enroll the County of Orange, the Orange County Flood Control District and the south Orange County Cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano as Copermittees responsible for compliance with the terms and conditions of Order No. R9-2013-0001, as amended by Order No. R9-2015-0001;

b. Designate the San Diego Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the Cities of Laguna Woods and Laguna Hills and agree to the designation of the Santa Ana Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the City of Lake Forest, subject to the

terms of the February 10, 2015 agreement between San Diego Water Board and the Santa Ana Water Board described in Finding 29 of this Order, upon the later effective date of Order No. R9-2015-0001 or Order No. R8-2015-0001 (superseding Order No. R8-2009-0030);

c. Establish interim exceptions to land development requirements for those priority development projects that discharge to engineered channels and large river reaches as described in Provision E.3.c.(2)(e) of this Order;

d. Incorporate the amended requirements of the State Water Resources Control Board's (State Water Board) General Exception to require that pollutant reductions be achieved within 6 years for storm water and nonpoint source discharges to ASBS within the Region;

e. Incorporate applicable requirements of the Los Peñasquitos Lagoon Sediment TMDL; and

f. Require the Orange County Copermittees to implement the "*Workgroup Recommendation for a Unified Beach Water Quality Monitoring and Assessment Program in South Orange County*," dated October 2014, made effective in the Monitoring and Reporting Program/Order issued pursuant to California Water Code section 13383 in the December 5, 2014 San Diego Water Board Letter Directive and subject to future revisions by the Executive Officer after appropriate public input.

Tentative Order No. R9-2015-0100, an Order amending Order No. R9-2013-0001 as amended by Order No. R9-2015-0001, was distributed for public review on July 31, 2015. The San Diego Water Board accepted written comments on Tentative Order No. R9-2015-0100 until September 14, 2015. A public hearing was held on November 18, 2015, to receive oral comments from Copermittees and interested persons. The San Diego Water Board adopted Order No. R9-2015-0100 amending Order No. R9-2013-0001 as amended by Order No. R9-2015-0001, on November 18, 2015. Order No. R9-2015-0100 amended the findings and provisions of Order No. R9-2013-0001 as amended by Order No. R9-2015-0001 to:

a. Enroll the County of Riverside, the Cities of Murrieta, Temecula, and Wildomar, and the Riverside County Flood Control and Water Conservation District as Copermittees responsible for compliance with the terms and conditions of Order No. R9-2013-0001, as amended by Order Nos. R9-2015-0001 and R9-2015-0100;

b. Continue designation of the San Diego Water Board to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Murrieta and Wildomar, including areas within the Santa Ana Region; and, agree to continue designation of the Santa Ana Water Board to regulate all Phase I MS4 discharges within the jurisdiction of the City of Menifee, including areas within

the San Diego Region, subject to the terms of the October 26, 2015 agreement between San Diego Water Board and the Santa Ana Water Board described in Finding 29 of this Order;

d. Incorporate Provision B.3.c, which provides an option that allows a Copermittee to utilize the watershed-based Water Quality Improvement Plan to be deemed in compliance with the prohibitions and limitations of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b;

e. Incorporate minor revisions to Provisions E.2.a.(1) and E.2.a.(2) to include San Diego Water Board Order No. R9-2015-0013 and State Water Board Order 2014-0194-DWQ into the requirements for addressing non-storm water discharges to a Copermittee's MS4;

e. Incorporate minor revisions to Provision E.3.b.(1) to correct inconsistencies in the definition of a Priority Development Project as compared to the definitions in Order No. R9-2009-0002 (Fourth Term Orange County MS4 Permit) and Order No. R9-2010-0016 (Fourth Term Riverside County MS4 Permit), and requirements for incorporating the corrected definitions into the BMP Design Manual;

f. Incorporate revisions to Provision E.3.e.(1)(a) to provide additional clarity on when the structural BMP performance requirements of Provision E.3.c are applicable to Priority Development Projects;

e. Incorporate minor revisions to the Revised TMDLs for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region and the TMDLs for Sediment in Los Peñasquitos Lagoon in Attachment E to the Order to make the requirements consistent with the Basin Plan amendments adopted by the San Diego Water Board; and

f. Remove provisions related to allowing the Riverside County Copermittees to apply for early coverage under the Regional MS4 Permit.

The San Diego Water Board files applicable to the issuance of Order No. R9-2013-0001 and amendments thereto are incorporated into the administrative record in support of the findings and requirements of the Order.

II. CONTACT INFORMATION

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The Order and other related documents can be downloaded from the San Diego Water Board website at

http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/index.shtml

The documents referenced in this Fact Sheet and in Order No. R9-2013-0001 and amendments thereto are available for public review at the San Diego Water Board office, located at the address listed above. Public records are available for inspection during regular business hours, from 8:00 am to 5:00 pm Monday through Friday. To schedule an appointment to inspect public records, contact the San Diego Water Board Records Management Officer at 619-516-1990.

COPERMITTEES

Orange County Copermittees

- County of Orange
  - City of Aliso Viejo
  - City of Dana Point
  - City of Laguna Beach
  - City of Laguna Hills
  - City of Laguna Niguel
  - City of Laguna Woods
  - City of Lake Forest *
  - City of Mission Viejo
  - City of Ranch Santa Margarita
  - City of San Clemente
  - City of San Juan Capistrano
  - Orange County Flood Control District

* While not listed in the above table, the City of Lake Forest remains a Copermittee under this Order until the later effective date of this Order or Santa Ana Water Board Tentative Order No. R8-2015-0001. Thereafter, the City of Lake Forest will no longer be considered a Copermittee under this Order because its Phase I MS4 discharges will be regulated by the Santa Ana Water Board pursuant to Water Code section 13328 designation. The requirements of this Order that apply to the City of Lake Forest for the duration of this Order, consistent with the Water Code section 13228 agreement dated February 10, 2015, are described in Finding 29 and Footnote 2 to Table B-1.

Riverside County Copermittees

- County of Riverside
  - City of Menifee**
  - City of Murrieta
  - City of Temecula
  - City of Wildomar
  - Riverside County Flood Control and Water Conservation District

** The City of Menifee is not regulated as a Copermittee under this Order because its Phase I MS4 discharges are regulated by Santa Ana Water Board Order No. R8-2010-0033 as it may be amended or issued pursuant to Water Code section 13228 designation. The requirements of this Order that apply to the City of Menifee for the duration of this Order, consistent with the Water Code section 13228 written agreement dated October 26, 2015, are described in Finding 29 and Footnote 3 to Table B-1.

San Diego County Copermittees

- County of San Diego
  - City of Carlsbad
  - City of Chula Vista
  - City of Coronado
  - City of Del Mar
  - City of El Cajon
  - City of Encinitas
  - City of Escondido
  - City of Imperial Beach
  - City of La Mesa
  - City of Lemon Grove
  - City of National City
  - City of Oceanside
  - City of Poway
  - City of San Diego
  - City of San Marcos
  - City of Santee
  - City of Solana Beach
  - City of Vista
  - San Diego County Regional Airport Authority
  - San Diego Unified Port District

III. PUBLIC PROCESS AND NOTIFICATION PROCEDURES

The San Diego Water Board followed the schedule listed below for the preparation of Order No. R9-2013-0001 and amendments thereto:

San Diego County Copermittee Permit Reissuance Process

1. On February 8, 2011, the San Diego Water Board met with the San Diego County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No. R9-2007-0001.

2. Between February and May 2011, the San Diego Water Board met with select San Diego County, Orange County, and Riverside County Copermittees, as well as representatives of the environmental community to discuss concepts and receive recommendations for elements to be incorporated in a Regional Municipal Separate Storm Sewer System Permit (Regional MS4 Permit).

3. On June 27, 2011 the San Diego Water Board received the Report of Waste Discharge from the San Diego County Copermittees for the renewal of their NPDES permit, Order No. R9-2007-0001.

4. On April 9, 2012, the San Diego Water Board released an administrative draft of Tentative Order No. R9-2013-0001 for preliminary informal comments and feedback.

5. On April 25, 2012, the San Diego Water Board held an informal public workshop to present the administrative draft of Tentative Order No. R9-2013-0001 and receive verbal comments.

6. Between June and August 2012, the San Diego Water Board held four (4) focused meetings with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community, and USEPA) to discuss and receive preliminary comments and feedback about specific elements in the administrative draft of Tentative Order No. R9-2013-0001.

7. On September 5, 2012, the San Diego Water Board held an informal public workshop to present the modifications that were expected to be incorporated into the Tentative Order based on the preliminary comments and feedback received during the focused meetings held between June and August 2012.

8. Informal written comments on the administrative draft of Tentative Order No. R9-2013-0001 were accepted until September 14, 2012.

9. On October 12, 2012, the San Diego Water Board released a revised administrative draft of Tentative Order No. R9-2013-0001.

10. On October 24, 2012, the San Diego Water Board held a focused meeting with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community, and USEPA) to discuss modifications incorporated into the administrative draft of Tentative Order No. R9-2013-0001.

11. On October 31, 2012, the San Diego Water Board released Tentative Order No. R9-2013-0001 for formal public review and comment.

12. On November 13, 2012 and December 12, 2012, the San Diego Water Board held a formal public Board workshop to present the public draft of Tentative Order No. R9-2013-0001 and receive verbal comments.

13. Formal written comments on the public draft of Tentative Order No. R9-2013-0001 were accepted until January 11, 2013.

14. A public hearing of Tentative Order No. R9-2013-0001 was conducted on April 10 and 11, 2013, that was continued to May 8, 2013.

Orange County Copermittee Permit Reissuance Process

15. On May 20, 2014 the San Diego Water Board received the Report of Waste Discharge from the Orange County Copermittees for the renewal of their MS4 NPDES permit, Order No. R9-2009-0002.

16. On June 24, 2014, the San Diego Water Board met with the Orange County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No.R9-2009-0002 and the process for enrollment as Copermittees under Regional MS4 Permit Order No. R9-2013-0001.

17. On July 1, 2014, the San Diego Water Board held a public meeting to discuss the Orange County Report of Waste Discharge and receive comments on potential modifications to Order No. R9-2013-0001. Based on comments received from the Orange County Copermittees and other interested persons at this meeting, the San Diego Water Board determined that additional public meetings were not needed prior to release of Tentative Order No. R9-2015-0001, amending Order No. R9-2013-0001 in redlined – strikeout format for public review and comment.

18. On September 19, 2014, the San Diego Water Board released Tentative Order No. R9-2015-0001 for a 60 day public review and comment period.

19. On October 8, 2014, the San Diego Water Board held a formal public workshop at a regular board meeting to receive information and discuss the proposed amendments to Order No. R9-2013-0001 described in Tentative Order No. R9-2015-0001.

20. In accordance with State and federal laws and regulations, the San Diego Water Board notified San Diego County, Orange County and Riverside County Copermittees, and all known interested agencies and persons of its intent to adopt Tentative Order No. R9-2015-0001 and provided them with an opportunity to submit their written comments and recommendations. Written comments and recommendations on Tentative Order No. R9-2015-0001 were accepted until November 19, 2014.

21. The San Diego Water Board held a public workshop on October 8, 2014, and a public hearing on February 11, 2015, and heard and considered all comments pertaining to the adoption of Tentative Order No. R9-2015-0001 on February 11, 2015.

Riverside County Copermittee Permit Reissuance Process

22. Between April and June 2015, the San Diego Water Board held three (3) public workshops with representatives of the principal stakeholders (the Copermittees, the environmental community, the development/business community) to discuss and receive comments and feedback about amending Order No. R9-2013-0001 to incorporate a definition of prior lawful approval for Priority Development Projects, and an alternative compliance pathway for prohibitions and limitations in Provision A of the Order. A San Diego Water Board member attended the April and May 2015 public workshops, but no actions or voting took place.

23. On April 15, 2015, the San Diego Water Board met with the Riverside County Copermittees to discuss the Report of Waste Discharge required pursuant to Order No.R9-2010-0016 and the process for enrollment as Copermittees under Order No. R9-2013-0001 (Regional MS4 Permit).

24. On May 8, 2015 the San Diego Water Board received a Report of Waste Discharge from the Riverside County Copermittees for the renewal of their MS4 NPDES permit, Order No. R9-2010-0016.

25. On July 31, 2015, the San Diego Water Board released Tentative Order No. R9-2015-0100 for a formal public review and comment period.

26. Formal written comments on the public draft of Tentative Order No. R9-2015-0100 were accepted until September 14, 2015, a formal public written comment period of 46 days.

27. A public hearing to receive oral comments on Tentative Order No. R9-2015-0100 was conducted on November 18, 2015.

IV. BACKGROUND OF THE SAN DIEGO REGION MUNICIPAL STORM WATER PERMITS

In developed and developing areas, storm water runoff is commonly transported through municipal separate storm sewer systems (MS4s) and discharged into local receiving water bodies. As the storm water runs off and flows over the land or impervious surfaces (e.g., paved streets, parking lots, and building rooftops), it accumulates debris, chemicals, sediment, and other pollutants that can adversely affect receiving water quality if discharged untreated. The United States Environmental Protection Agency (USEPA) recognizes wet weather flows from urban areas as the number one source of estuarine pollution in coastal communities,[1] such as those within the San Diego Region.

The federal Clean Water Act (CWA) was amended in 1987 to address and regulate discharges of storm water associated with industrial activities and from municipal storm sewers. With the amendments, many municipalities throughout the United States were obligated for the first time to obtain National Pollutant Discharge Elimination System (NPDES) permits for discharges of storm water from their MS4s.

In response to the CWA 1987 amendment, as well as the pending federal NPDES regulations which would implement the amendment, the San Diego Water Board issued "early" MS4 permits. The San Diego Water Board adopted and issued Order Nos. 90-38, 90-42, and 90-46 to regulate storm water discharges from the MS4s in Orange County, San Diego County, and Riverside County, respectively, within the San Diego Region on July 16, 1990.

The "early" MS4 permits, or First Term Permits, were issued prior to the November 1990 promulgation of the final federal NPDES storm water regulations. By issuing these First Term Permits before the federal regulations took effect, the San Diego Water Board was able to provide the Copermittees additional flexibility in addressing and managing storm water discharges. The First Term Permits contained the essentials of the 1990 regulations, and required the Copermittees to develop and implement runoff management programs, but provided little specificity about what was required to be included in or actually achieved by those programs.

The flexibility provided in the First Term Permits was generally continued through the Second Term Permits. The combination of the lack of specificity in the First and Second Term Permits, a general lack of meaningful action by the Copermittees and a general lack of corresponding reaction (i.e. enforcement) by the San Diego Water Board during the first ten years of the storm water program, resulted in few substantive steps towards achieving improvements in the quality of receiving waters or storm water discharges from the MS4s.

[1] US EPA. 1999. 40 CFR Parts 9, 122, 123, and 124. National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. 64 FR 68727.

From 2001, the regulatory approach incorporated into Third Term Permits was a significant departure from the regulatory approach of the First and Second Term Permits. The Third Term Permits issued by the San Diego Water Board included more detailed requirements that outlined the minimum level of implementation required for the Copermittees' programs to meet the maximum extent practicable (MEP) standard for storm water. The Third Term Permits included more detail to emphasize and enhance the jurisdictional runoff management programs developed by the Copermittees and introduced requirements for developing and implementing watershed-based programs.

The Third Term Permits also incorporated two precedent setting decisions by the State Water Board. In Order WQ 99-05, the State Water Board established receiving water limitation language to be included in all MS4 permits. The State Water Board's precedential language clarified that municipal storm water permits must include provisions requiring discharges to be controlled to attain water quality standards in receiving waters. Unlike previously adopted versions of the receiving water limitation language in the First and Second Term Permits, the language no longer stated that "*violations of water quality standards are not violations of the municipal storm water permit under certain conditions*." In addition, the receiving water limitation language no longer indicated that the "*implementation of best management practices is the 'functional equivalent' of meeting water quality standards*." State Water Board Order WQ 99-05 specifically requires language in MS4 permits for the Copermittees to comply with water quality standards based discharge prohibitions and receiving water limitations through timely implementation of control measures and other actions to reduce pollutants in discharges. (See State Water Board Order WQ 99-05 (*Environmental Health Coalition*)).

In Order WQ 2000-11, also a precedential decision, the State Water Board addressed design standards for structural post-construction best management practices (BMPs) for new development and significant redevelopment. The State Water Board found that the design standards, which require that runoff generated by 85 percent of storm events from specific development categories be infiltrated or treated, reflect the MEP standard. State Water Board Order WQ 2000-11 also found that the post-construction BMP provisions, or Standard Storm Water Mitigation Plan (SSMP) provisions, constitute MEP for addressing storm water pollutant discharges resulting from specific development categories.

The Third Term San Diego County and Orange County Permits (Order Nos. 2001-01 and R9-2002-0001, respectively) were appealed to the State Water Board. Minor modifications were made by the State Water Board, but the requirements were largely upheld. In State Water Board Order WQ 2001-15, the State Water Board upheld the Third Term San Diego County Permit requirements with certain modifications. The State Water Board removed the prohibition of storm water discharges *into* the MS4 that cause or contribute to exceedances of water quality objectives. The revision allows for treatment of pollutants in storm water runoff after the pollutants have entered the MS4.

State Water Board Order WQ 2001-15 otherwise upheld all the other requirements of the permit.

In addition to the modification to the discharge prohibition in Order WQ 2001-15, the State Water Board refined Order WQ 99-05 by making clear that the Copermittees may use an iterative approach to achieving compliance with water quality standards that involves ongoing assessments and revisions. Thus, the language for the discharge prohibitions and receiving water limitations was revised to explicitly require the Copermittees to implement an iterative process of assessments and revisions to comply with the discharge prohibitions and receiving water limitations. The San Diego Water Board retained the authority to enforce receiving water limitations and discharge prohibitions even if the Copermittee is engaged in the iterative process.

The Third Term San Diego County Permit was subsequently challenged in the Superior Court of the State of California and the Court of Appeal, Fourth Appellate District. The Court of Appeal, Fourth Appellate District, found that the approach of the Third Term San Diego County Permit to regulating discharges into the MS4 was appropriate (*Building Industry Ass'n. v. State Water Resources Control Bd., et al.,* 124 Cal.App.4th 866 (2004)). The State of California Supreme Court denied review sought by the Building Industry Association in March 2005.

The Fourth Term Permits began with the adoption of Order No. R9-2007-0001 issued to the Copermittees of San Diego County in January 2007. Order Nos. R9-2009-0002 and R9-2010-0016 were subsequently issued to the Copermittees of Orange County and Riverside County. The Fourth Term Permits continued to include more detailed requirements to be implemented by each Copermittee's jurisdictional runoff management program. The Fourth Term Permits also included requirements to further emphasize a watershed management approach and for more coordination among jurisdictional runoff management programs. In addition, the Fourth Term Permits included more requirements for assessing the effectiveness of the runoff management programs being implemented by the Copermittees. The intent of the inclusion of additional requirements was to enhance and better define elements of the permit that were expected to be incorporated into the iterative process for managing runoff from each Copermittee's jurisdiction and within the watersheds of the San Diego Region.

The Fourth Term Permits included several new and emerging approaches for managing storm water runoff and discharges. Low impact development (LID) requirements are included for development and significant redevelopment to reduce pollutants in storm water runoff from sites through more natural processes such as infiltration and biofiltration closer to the source, rather than utilizing conventional mechanical end-of-pipe treatment systems. Hydrograph modification (hydromodification) management requirements also are included to mitigate the potential for increased erosion in receiving waters due to increased runoff rates and durations often caused by development and increased impervious surfaces. The Fourth Term Orange County and Riverside County Permits introduced requirements to identify areas of existing

development where retrofitting with LID projects would be feasible and could be implemented to reduce storm water runoff and pollutants in storm water discharges.

The Fourth Term Orange County and Riverside County Permits included a clearer distinction between storm water and non-storm water discharges. The term “urban runoff” was completely removed, and a distinction between storm water (wet weather) runoff and non-storm water (dry weather) runoff was emphasized. This clarification was made to prevent any potential misunderstanding that regulation under the MS4 permits is limited only to urbanized areas, and to prevent non-storm water runoff from being managed in the same manner as storm water runoff. The term “urban runoff” is not defined in the Code of Federal Regulations (CFR) or Federal Register (FR) in the regulation of MS4 discharges. According to the CWA 402(p)(3)(B)(ii), MS4 permits must include a requirement to effectively prohibit non-storm water discharges into the MS4s.

Finally, for the Fourth Term Orange County and Riverside County Permits the San Diego Water Board found that non-storm water discharges to the MS4 from over application of irrigation water are sources of pollutants. The San Diego Water Board found that non-storm water discharges resulting from over-irrigation must be prohibited from entering the MS4 in accordance with the requirements of the CWA and pursuant to 40 CFR 122.26(d)(2)(iv)(B)(1).

The requirements of the Fourth Term Permits issued to the Copermittees in each county within the San Diego Region now have substantively the same core requirements such as discharge prohibitions, receiving water limitations, jurisdictional runoff management program components, and monitoring program requirements. There are, however, several inconsistencies that exist among the three Fourth Term Permits which complicate oversight and implementation of the permits by the San Diego Water Board.

The Fourth Term San Diego County Permit expired in January 2012. The Fourth Term Orange County permit expired in December 2014 and the Fourth Term Riverside County Permit expired in November 2015. Issuing the Fifth Term Permits within five years for three counties under three different permits would have required the San Diego Water Board to expend significant time and resources for the issuance of the permits through three separate public proceedings, thereby greatly reducing the time and resources available to oversee implementation and compliance. Multiple permits also create confusion for determining compliance among regulated entities, especially for the land development community.

The San Diego Water Board acknowledged that issuing a single MS4 permit for all the Copermittees in the San Diego Region can and is expected to result in more consistent implementation, improve communication among agencies within watersheds crossing multiple jurisdictions, and minimize resources spent with each permit renewal process. Within the findings of the Fourth Term Riverside County Permit issued in November 2010, the San Diego Water Board notified the public of its intent to develop and issue a single Regional MS4 Permit.

V. REGIONAL MS4 PERMIT APPROACH

The Fifth Term Permit, or Regional MS4 Permit, shifts the focus of the permit requirements from a minimum level of actions to be implemented by the Copermittees to identifying outcomes to be achieved by those actions. Order No. R9-2013-0001 represents an important paradigm shift in the approach for MS4 permits within the San Diego Region.

Historical Permitting Approach

The First and Second Term Permits were very broad and provided little specificity about what was required to be developed and implemented by the Copermittees. The Third Term Permits began to become more specific about the minimum level of implementation required by the Copermittees. The Fourth Term Permits subsequently increased in specificity. The MS4 permits have progressively become more detailed and focused on specifying the minimum level of actions expected to be implemented by the Copermittees. As detailed and specific as the MS4 permits have become, however, they include very little detail about what the desired outcomes of the required actions are expected to achieve. Compliance with the permit requirements has essentially been tracking numbers of actions and reporting, not tracking progress or actual improvements in the quality of receiving waters or discharges from the MS4s. The result has been an increase in actions being implemented by the Copermittees with little or no ability or expectations to determine whether or not improvements in water quality are being achieved.

The Fourth Term Permits result in significant resource expenditure by the Copermittees to report permit compliance information to the San Diego Water Board in the form of annual jurisdictional runoff management program, watershed program, and monitoring program reports. The San Diego Water Board was required to expend much of its limited resources on reviewing more than 50 voluminous reports submitted annually by the Copermittees. The information reported by the Copermittees was of limited value when trying to measure progress toward achieving improvements in the quality of receiving waters or discharges from the MS4s. Oversight of the MS4 permits was further complicated by the inconsistencies among the requirements issued to the Orange County, San Diego County, and Riverside County Copermittees under three separate MS4 permits.

Under the Fourth Term Permits, the Copermittees were required to expend a significant portion of their limited resources collecting data of limited value, and putting together reports to submit that information to the San Diego Water Board. Likewise, the San Diego Water Board was required to expend most of its limited resources reviewing reports, and developing permits instead of working directly with the Copermittees to identify solutions to problems causing impacts to water quality. This was an unsustainable course that would have continued to demand more resources

from the Copermittees and the San Diego Water Board, and would have continued to result in unknown water quality benefits.

New Permitting Approach

The goal of the Regional MS4 Permit is twofold: 1) bring a consistent set of MS4 permit requirements to all of the Copermittees within the San Diego Region; and, 2) provide an MS4 permit with requirements that will allow the Copermittees to focus their efforts and resources on achieving goals and desired outcomes toward the improvement of water quality rather than completing specific actions.

The overall approach included in the Regional MS4 Permit with respect to the jurisdictional runoff management programs will not differ significantly from the current permits. The general requirements for the jurisdictional runoff management program components and compliance with those requirements will remain and be applied consistently throughout the San Diego Region under the Regional MS4 Permit.

The most significant difference in the new permitting approach is the specific manner of implementation for those jurisdictional runoff management programs. Implementation will be based on decisions made by the Copermittees in accordance with what they have identified as their highest priority water quality conditions. In other words, the Copermittees will have significant control in how to implement the jurisdictional runoff management programs to best utilize their available resources in addressing a specific set of priorities effectively, instead of trying to address all the water quality priorities ineffectively.

The Copermittees are given the responsibility of identifying their highest priority water quality conditions that they intend to address. The Copermittees will develop goals that can be used to measure and demonstrate progress or improvements toward addressing those priorities. In addition to the goals, the Copermittees will provide a schedule for achieving the goals for those highest priorities. The measurement of progress toward achieving the goals for those highest priorities requires a better defined and more focused program of monitoring and assessment than under the Fourth Term Permits.

The monitoring and assessment program must be designed to inform the Copermittees of their progress, and the need for modifications in their jurisdictional runoff management programs and schedules to achieve their goals to improve water quality. The monitoring and assessment program requirements will have a more central role in the Regional MS4 Permit than in earlier permits. The monitoring and assessment requirements must also be designed to enable the Copermittees to focus and direct their efforts in implementing their jurisdictional runoff management programs toward their stated desired outcomes to improve the quality of receiving waters and/or discharges from the MS4s.

By providing an MS4 permit that allows the Copermittees to make more decisions about how to utilize and focus their resources, along with a better defined monitoring and assessment program to inform their water quality management decisions, the Copermittees have the opportunity to:

1) *Plan strategically*. The Copermittees must have the ability to identify their available resources and develop and implement long term plans that can organize, collect, and use those resources in the most strategically advantageous and efficient manner possible. This ability to develop long term plans will allow the Copermittees to focus and utilize their resources in a more concerted way over the short term and long term to address specific water quality priorities through stated desired outcomes.

2) *Manage adaptively*. The Copermittees must be given the ability to modify their plans as additional information and data are collected from the monitoring and assessment programs. The Copermittees' plans may require modifications to the programs, priorities, goals, strategies, and/or schedules in order for the Copermittees to achieve a stated desired outcome.

3) *Identify synergies*. The Copermittees must be given more flexibility to identify efficiencies within and among their jurisdictional runoff management programs as the strategies are developed and implemented to increase the Copermittees' collective effectiveness. The Copermittees must also be able to identify and utilize resources available from other agencies and entities to further augment and enhance their jurisdictional runoff management programs and/or to collectively work with those other agencies and entities toward achieving a stated desired outcome.

The Regional MS4 Permit requirements provide the Copermittees the flexibility and responsibility to decide what actions will be necessary to achieve an outcome that is tailored and designed by the Copermittees to improve specific prioritized water quality conditions. The San Diego Water Board expects the approach of the Regional MS4 Permit to give the Copermittees a greater sense of ownership for restoring the quality of receiving waters in the San Diego Region by becoming an integral part of the decision making process in identifying water quality conditions to be addressed, as well as determining the best use of their resources.

VI. ECONOMIC CONSIDERATIONS

Statutory Considerations

California Water Code (CWC) section 13241 requires the San Diego Water Board to consider certain factors, including economic considerations, in the adoption of water quality objectives. CWC section 13263 requires the San Diego Water Board to take into consideration the provisions of CWC section 13241 in adopting waste discharge requirements.

In *City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, the California Supreme Court considered whether Regional Water Boards must comply with CWC section 13241 when issuing waste discharge requirements under CWC section 13263(a) by taking into account the costs a permittee will incur in complying with the permit requirements. The Court concluded that whether it is necessary to consider such cost information "*depends on whether those restrictions meet or exceed the requirements of the federal Clean Water Act.*" (*Id.* at p. 627.) The Court ruled that Regional Water Boards may not consider the factors in CWC section 13241, including economics, to justify imposing pollutant restrictions that are less stringent than applicable federal law requires. (*Id.* At pp. 618, 626-627 ["*[Water Code section 13377 specifies that [ ] discharge permits issued by California's regional boards must meet the federal standards set by federal law. In effect, section 13377 forbids a regional board's consideration of any economic hardship on the part of the permit holder if doing so would result in the dilution of the requirements set by Congress in the Clean Water Act...Because CWC section 13263 cannot authorize what federal law forbids, it cannot authorize a regional board, when issuing a [ ] discharge permit, to use compliance costs to justify pollutant restrictions that do not comply with federal clean water standards*."]). However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Regional Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

As discussed in Section VII.F, Unfunded State Mandates, the San Diego Water Board finds that the requirements in this Order are not more stringent than the minimum federal requirements. Among other requirements, federal law requires MS4 permits to include requirements to effectively prohibit non-storm water discharges into the MS4s, in addition to requiring controls to reduce the discharge of pollutants in storm water to the MEP, and other provisions as USEPA or the State determines are appropriate for the control of pollutants in MS4 discharges.

The requirements in this Order may be more specific or detailed than those enumerated in federal regulations under 40 CFR 122.26 or in the USEPA guidance. However, the requirements have been designed to be consistent with and within the federal statutory mandates described in CWA section 402(p)(3)(B)(ii) and (iii) and the related federal regulations and guidance. Consistent with federal law, all of the

conditions in this Order could have been included in a permit adopted by USEPA in the absence of the in lieu authority of California to issue NPDES permits.

Moreover, the inclusion of numeric WQBELs in this Order does not cause this Order to be more stringent than federal law. Federal law authorizes both narrative and numeric effluent limitations to meet state water quality standards. The inclusion of WQBELs as discharge specifications in an NPDES permit in order to achieve compliance with water quality standards is not a more stringent requirement than the inclusion of BMP based permit limitations to achieve water quality standards (State Water Board Order No. WQ 2006-0012 (*Boeing*)). Therefore, consideration of the factors set forth in CWC section 13241 is not required for permit requirements to implement the effective prohibition on the discharge of non-storm water discharges into the MS4 or for controls to reduce the discharge of pollutants in storm water to the MEP, or other provisions that the San Diego Water Board has determine appropriate to control such pollutants, as those requirements are mandated by federal law.

Included in the provisions of the Order are monitoring and reporting requirements that are designed to demonstrate that the Copermittees are implementing programs to comply with the CWA municipal storm water requirements. CWA section 308(a) and 40 CFR 122.41(h), (j)-(l), 122.44(i) and 122.48 require that all NPDES permits specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s (40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c)) also specify additional monitoring and reporting requirements. In addition to the federal requirements of the CWA, the San Diego Water Board also has the authority in CWC 13383 to establish monitoring, reporting, and recordkeeping requirements that implement federal and state laws and regulations through NPDES permits.

The monitoring and assessment information that will be reported to the San Diego Water Board is necessary to determine if the Copermittees are making progress toward achieving compliance with the discharge prohibitions, receiving water limitations, and effluent limitations under Provision A of the Order. The monitoring and assessment information that will be reported is also expected to be key to the iterative approach and adaptive management process that is required to be implemented by the Copermittees if they cannot meet the discharge prohibitions and receiving water limitations under the present conditions, which is also part of the requirements under Provision A of the Order.

Notwithstanding the above, the San Diego Water Board has considered cost information in issuing this Order, as discussed below. The San Diego Water Board has also considered all of the evidence that has been presented to the San Diego Water Board regarding the CWC section 13241 factors in adopting this Order. The San Diego Water Board finds that the requirements in this Order are reasonably necessary to protect beneficial uses identified in the Basin Plan and the economic information related to costs of compliance and other CWC section 13241 factors are not sufficient to justify failing to protect those beneficial uses. Where appropriate, the

San Diego Water Board has provided or will consider providing the Copermittees with additional time to implement control measures to achieve final WQBELs and/or water quality standards.

Cost Information

Discussions of the financial and economic ramifications of municipal storm water management programs tend to focus on the significant costs incurred by municipalities in developing and implementing the programs. When considering the cost of implementing the programs, however, it is also important to consider the alternative costs that are incurred when programs are not fully implemented, as well as the economic benefits which result from effective program implementation.

The recent financial and economic conditions have amplified the concerns about the costs incurred by the municipalities in developing and implementing their programs. The reduction in resources resulting from the recent financial and economic conditions has been cited by many of the Copermittees as a justification for reducing the requirements that must be met by their programs. While the recent conditions are a cause for concern in the short term, these programs also have an opportunity to identify and implement improvements and efficiencies before the next period of growth and development, resulting in more effective and sustainable programs over the long term.

In addition, it is very difficult to ascertain the true cost of implementation of the Copermittees' management programs because of inconsistencies in reporting by the Copermittees. Reported costs of compliance for the same program element can vary widely from city to city, often by a very wide margin that is not easily explained.[2] Despite these problems, efforts have been made to identify management program costs, which can be helpful in understanding the costs of program implementation.

The San Diego Water Board recognizes that the Copermittees will incur costs in implementing this Order, potentially above and beyond the costs from the Copermittees' prior permits. The San Diego Water Board also recognizes that, due to California's current economic condition, many Copermittees currently have limited staff and resources to implement actions to address its MS4 discharges. Based on the economic considerations below, the San Diego Water Board has provided the Copermittees a significant amount of flexibility to choose how to implement the requirements of the Order.

The Order also allows the Copermittees to customize their plans, programs, and monitoring requirements. In the end, it is up to the Copermittees to determine the effective BMPs and measures necessary to comply with this Order. The Copermittees can choose to implement the least expensive measures that are effective in meeting

[2] Los Angeles Water Board, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.

the requirements of this Order. This Order also does not require the Copermittees to fully implement all requirements within a single permit term. Where appropriate, the Board has provided the Copermittees with additional time outside of the permit term to implement control measures to achieve final WQBELs and/or water quality standards.

The San Diego Water Board has considered available cost information associated with compliance with this Order. It is not possible to predict accurately the cost impact of the requirements that involve an unknown level of implementation or that depend on environmental variables that are as yet undefined. Only general conclusions can be drawn from this information.

Estimated Municipal Storm Water Program Implementation Costs

The USEPA, the State Water Board, and the California Regional Water Quality Control Boards (Regional Water Boards) have attempted to evaluate the costs of implementing municipal storm water programs. The assessments have demonstrated that the true costs are difficult to ascertain and reported costs vary widely. In addition, reported fiscal analyses tend to neglect the costs incurred to municipalities when storm water and non-storm water runoff is not effectively managed, which are incurred as a result of pollution, contamination, nuisance, and damage to ecosystems, property, and human health. Nonetheless, they provide a useful context for considering the costs of requirements within Order No. R9-2013-0001.

In 1999, the USEPA reported on multiple studies it conducted to determine the cost of management programs. A study of Phase II municipalities determined that the annual cost of the Phase II program was expected to be $9.16 per household. The USEPA also studied 35 Phase I municipalities, finding costs to be $9.08 per household annually, similar to those anticipated for Phase II municipalities.[3]

The State Water Board commissioned a study by the California State University, Sacramento to assess costs of the Phase I MS4 program. This study includes an assessment of costs incurred by Phase I MS4s throughout the state to implement their programs. Annual cost per household in the study ranged from $18 to $46, with the Fresno-Clovis Metropolitan Area representing the lower end of the range, and the City of Encinitas (in San Diego County) representing the upper end of the range.[4]

A study on Phase I MS4 program costs was also conducted by the California Regional Water Quality Control Board, Los Angeles Region (Los Angeles Water Board), where program costs reported in the municipalities' annual reports were assessed. The Los

[3] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791-68792.
[4] State Water Board, 2005. NPDES Stormwater Cost Survey. P. ii.

Angeles Water Board estimated that average per household cost to implement the MS4 program in Los Angeles County was $12.50. [5]

It is important to note that reported program costs are not all attributable to solely complying with MS4 permits. Many program components, and their associated costs, existed before any MS4 permits were ever issued. For example, street sweeping and trash collection costs cannot be solely or even principally attributable to MS4 permit compliance, since these practices have long been expected from and implemented by municipalities.

Therefore, true program cost resulting from MS4 permit requirements is some fraction of reported costs. The California State University, Sacramento study found that only 38 percent of program costs are new costs fully attributable to MS4 permits. The remainder of the program costs was either pre-existing or resulted from enhancement of pre-existing programs.[6] In 2000, the County of Orange found that even lower amounts of program costs are solely attributable to MS4 permit compliance, reporting that the amount attributable to implement the County or Orange Drainage Area Management Plan (DAMP), was less than 20 percent of the total budget. The remaining 80 percent was attributable to pre-existing programs.[7] More current data from the County of Orange is not used in this discussion because the County of Orange no longer reports such information.

Estimated Value of Healthy Water Quality

Economic considerations of municipal storm water management programs cannot be limited only to program costs. Evaluation of programs must also consider information on the benefits derived from environmental protection and improvement.[8] Attention is often focused on municipal storm water management program costs, but the programs must also be viewed in terms of their value to the public.

Placing a value on healthy receiving waters is very difficult. Often the value of receiving waters with good water quality manifests in other forms, such as tourism, recreational opportunities, and/or increased property values. When surface water bodies are degraded, thereby degrading the habitat within and adjacent to the water bodies, the public loses the value and benefits associated with being able to use the area in and around the water bodies. Surface waters that are able to support the beneficial uses designated in the Basin Plan can sustain plants and wildlife that can attract visitors and residents, providing aesthetic, recreational, as well as monetary value to the public. At this time, however, there have been no studies for the San

[5] Los Angeles Water Board, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.
[6] State Water Board, 2005. NPDES Stormwater Cost Survey. P. 58.
[7] County of Orange, 2000. A NPDES Annual Progress Report. P. 60.
[8] Ribaudo M.O. and D. Heelerstein. 1992, *Estimating Water Quality Benefits: Theoretical and Methodological Issues.* U.S. Department of Agriculture. Technical Bulletin No. 1808.

Diego Region to quantify the added value that surface waters with healthy water quality can provide.

USEPA has estimated that household willingness to pay for improvements in fresh water quality for fishing and boating is approximately $158-$210.[9] This estimate can be considered conservative, since it does not include important considerations such as marine waters benefits, wildlife benefits, or flood control benefits. Another study conducted by California State University, Sacramento reported that the annual household willingness to pay for statewide clean water is approximately $180.[10]

A study conducted by the University of Southern California and University of California, Los Angeles assessed the costs and benefits of implementing various approaches for achieving compliance with the MS4 permits in the Los Angeles region. The study found that non-structural systems would cost $2.8 billion but provide $5.6 billion in benefit. If structural systems were determined to be needed, the study found that total costs would be $5.7 to $7.4 billion, while benefits could reach $18 billion.[11] Costs are anticipated to be borne over many years, probably at least ten years.

As can be seen, the benefits of the municipal storm water management programs are expected to considerably exceed their costs. Such findings are corroborated by USEPA, which found that the benefits of implementation of its Phase II storm water rule would also outweigh the costs.[12]

[9] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68793.
[10] State Water Board, 2005. NPDES Stormwater Cost Survey. P. iv.
[11] Los Angeles Water Board, 2004. Alternative Approaches to Stormwater Control.
[12] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791.

VII. APPLICABLE STATUTES, REGULATIONS, PLANS AND POLICIES

A. Legal Authorities – Federal Clean Water Act and California Water Code

This Order is issued pursuant to section 402 of the CWA and implementing regulations adopted by the USEPA and chapter 5.5, division 7 of the CWC (commencing with section 13370). This Order serves as an NPDES permit for point source discharges to surface waters. This Order also serves as waste discharge requirements pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

The objective of the CWA is "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*." To carry out this objective, the CWA requires the implementation of permit programs to regulate the discharge of pollutants and dredged or fill material to the navigable waters of the U.S. and to regulate the use and disposal of sewage sludge. CWA section 402 provides the legal authority to issue a permit for the discharge of pollutants to waters of the U.S. under the NPDES. The CWA provides that NPDES permits may be issued by states which are authorized to implement the provisions of that act. California became authorized to implement the NPDES permit program on May 14, 1973.

The Porter-Cologne Water Quality Control Act (Division 7, commencing with CWC section 13000) established the State Water Resources Control Board (State Water Board) and nine Regional Water Quality Control Boards (Regional Water Boards) as the principal state agencies with primary responsibility for the coordination and control of water quality. CWC section 13200(f) established the San Diego Water Board, which has the primary responsibility for the coordination and control of water quality in the San Diego Region, which includes all the basins draining into the Pacific Ocean between the southern boundary of the Santa Ana Region and the California-Mexico boundary. The San Diego Water Board implements the CWA through Chapter 5.5 of the CWC, commencing with section 13370. CWC section 13377 provides the San Diego Water Board the legal authority to issue waste discharge requirements to ensure compliance with all applicable provisions of the CWA and acts amendatory thereof or supplementary, thereto, to implement water quality control plans, or for the protection of beneficial uses, or to prevent nuisance.

CWA section 402(p) requires the USEPA or authorized state to issue NPDES permits for storm water discharges from MS4s to waters of the U.S. CWA section 402(p)(3)(B)(ii) requires that NPDES permits for storm water discharges from MS4s "*effectively prohibit non-storm water discharges*" into the MS4s. CWA section 402(p)(3)(B)(iii) requires that NPDES permits for storm water discharges from MS4s to "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable* [MEP], *including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*."

The USEPA published implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]), which prescribe permit application requirements for storm water discharges from MS4s pursuant to CWA 402(p), on November 16, 1990. The USEPA published an Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems, which provided guidance on permit application requirements for regulated MS4s, on May 17, 1996. The federal regulations in 40 CFR 122 and guidance issued by USEPA serve as the foundation for the provisions of Order No. R9-2013-0001. The legal authorities provided by the above statutes and regulations are included as part of the discussions in Section VIII of this Fact Sheet.

B. Legal Authority for the Permit Issued on a Region-wide Basis

CWA section 402(p)(3)(B) provides the San Diego Water Board the legal authority to issue an NPDES permit for the San Diego Region as compared to separate MS4 permits based upon County- and partial County-wide boundaries as they existed within the San Diego Region. CWA section 402(p)(3)(B) states that "*Permits for discharges from municipal storm sewers- (i) may be issued on a system- or jurisdiction-wide basis* ...." The federal regulations in 40 CFR 122.26(a)(1)(v) also state that the San Diego Water Board "*may designate dischargers from municipal separate storm sewers on a system-wide or jurisdiction-wide basis. In making this determination, the [San Diego Water Board] may consider the following factors: (A) the location of the discharge with respect to waters of the United States; (B) the size of the discharge; (C) the quantity and nature of the pollutants discharged to waters of the United States; and (D) other relevant factors*."

More specifically, the federal regulations provide that for large and medium MS4 systems, the San Diego Water Board may issue a regional permit. Specifically, the federal regulation in 40 CFR 122.26(a)(3) provide:

"*(ii) The Director may either issue one system-wide permit covering all discharges from municipal separate storm sewers within a large or medium municipal storm sewer system or issue distinct permits for appropriate categories of discharges within a large or municipal separate storm sewer system including, but not limited to: all discharges owned or operated by the same municipality; located within the same jurisdiction; all discharges within a system that discharge to the same watershed; discharges within a system that are similar in nature; or for individual discharges from municipal separate storm sewers within the system.*

(iii) The operator of a discharge from a municipal separate storm sewer which is part of a large or medium municipal separate storm sewer system must either: (A) Participate in a permit application (to be a permittee or a co-permittee) with one or more other operator of discharges from the large or medium municipal storm sewer system which covers all, or a portion of all, discharges from the municipal separate storm sewer system; (B) Submit a distinct permit application which only covers discharges from the municipal separate storm sewers for

which the operator is responsible; or (C) A regional authority may be responsible for submitting a permit application under the following guidelines....

(iv) One permit application may be submitted for all or a portion of all municipal separate storm sewers within adjacent or interconnected large or medium municipal separate storm sewer systems. The Director may issue one systemwide permit covering all, or a portion of all municipal separate storm sewers in adjacent or interconnected large or medium municipal separate storm sewer systems.

(v) Permits for all or a portion of all discharges from large or medium municipal separate storm sewer systems that are issued on a system-wide, jurisdiction-wide, watershed or other basis may specify different conditions relating to different discharges covered by the permit, including different management programs for different drainage areas which contribute storm water to the system."

Based on these regulations, the San Diego Water Board may issue a region-wide MS4 permit. The regulations also clarify that the permit may include different conditions for separate discharges covered by the permit. This allows the San Diego Water Board to ensure that suitable water quality conditions and provisions are identified for each watershed.

The USEPA's responses to comments in the Final Rule for the above-mentioned regulations also make it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide, permits. In the Final Rule published in the Federal Register and containing the responses to comments, USEPA notes that 40 CFR 122.26(a)(3)(iv) would allow an entire system in a geographical region under the purview of a State agency to be designated under a permit.[13] USEPA also states that many commenters wanted to allow the permitting authority broad discretion to establish system-wide permits, and that EPA believes that paragraphs 40 CFR 122.26 (a)(1)(v) and (a)(3)(ii) allow for such broad discretion.[14]

This Order creates watershed requirements that apply to multiple counties. The regional nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Copermittees. Managing storm water on a regional and watershed basis is expected to result in improved water quality, as the Order focuses on monitoring and management practices necessary to improve each watershed rather than political boundaries. A single permit also allows the San Diego Water Board staff to expend fewer resources developing successive multiple permits and allows more resources to be devoted to working cooperatively with all three current groups of Copermittees to ensure implementation of this Order results in improved water quality.

[13] 55 Federal Register 47990-01, 48042.
[14] Ibid.

C. Federal and California Endangered Species Acts

This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2115.5) or the Federal Endangered Species Act (16 United States Code [USC] sections 1531 to 1544). This Order requires compliance with requirements to protect the beneficial uses of waters of the U.S. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

D. California Environmental Quality Act

The action to adopt an NPDES Permit is exempt from the provisions of Chapter 3 of the California Environmental Quality Act (CEQA) (Public Resources Code section 21100, et seq.) pursuant to CWC section 13389. (*County of Los Angeles v. Cal. Water Boards* (2006) 143 Cal.App.4th 985.)

E. State and Federal Regulations, Plans and Policies

The legal authority provided by the following regulations, plans, and policies are also included as part of the discussions in Section VIII of this Fact Sheet.

<u>Water Quality Control Plan for the San Diego Basin</u>

The CWA requires the San Diego Water Board to establish water quality standards for each water body in its region. Water quality standards include beneficial uses, water quality objectives and criteria that are established at levels sufficient to protect beneficial uses, and an antidegradation policy to prevent degrading of waters. On September 8, 1994, the San Diego Water Board adopted the *Water Quality Control Plan for the San Diego Basin* (Basin Plan). The Basin Plan designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters in the San Diego Region. The San Diego Water Board has amended the Basin Plan on multiple occasions since 1994. In addition, the Basin Plan implements State Water Board Resolution No. 88-63, which established state policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply. Beneficial uses applicable to the surface water bodies that receive discharges from the MS4s within the San Diego Region generally include those listed below:

The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region:

- Municipal and Domestic Supply (MUN)
- Agricultural Supply (AGR)
- Industrial Process Supply (PROC)

- Industrial Service Supply (IND)
- Ground Water Recharge (GWR)
- Contact Water Recreation (REC1)
- Non-contact Water Recreation (REC2)
- Warm Freshwater Habitat (WARM)
- Cold Freshwater Habitat (COLD)
- Wildlife Habitat (WILD)
- Rare, Threatened, or Endangered Species (RARE)
- Freshwater Replenishment (FRSH)
- Hydropower Generation (POW)
- Preservation of Biological Habitats of Special Significance (BIOL)

The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region:

- Navigation (NAV)
- Commercial and Sport Fishing (COMM)
- Estuarine Habitat (EST)
- Marine Habitat (MAR)
- Aquaculture (AQUA)
- Migration of Aquatic Organisms (MIGR)
- Spawning, Reproduction, and/or Early Development (SPWN)
- Shellfish Harvesting (SHELL)

Pursuant to Water Code sections 13263 and 13377, the requirements of this Order implement the Basin Plan.

Water Quality Control Plan for Ocean Waters of California, California Ocean Plan

In 1972, the State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan). The State Water Board adopted the most recent amended Ocean Plan on October 16, 2012. The Office of Administrative Law approved it on July 3, 2013. The amended Ocean Plan became effective on August 19, 2013. The Ocean Plan is applicable, in its entirety, to ocean waters of the State. In order to protect beneficial uses, the Ocean Plan establishes water quality objectives and a program of implementation. Pursuant to Water Code sections 13263 and 13377, the requirements of this Order implement the Ocean Plan. The Ocean Plan identifies the beneficial uses of ocean waters of the State to be protected as summarized below:

- Industrial water supply
- Water contact and non-contact recreation, including aesthetic enjoyment; navigation
- Commercial and sport fishing

- Mariculture
- Preservation and enhancement of designated Areas of Special Biological Significance
- Rare and endangered species
- Marine habitat
- Fish spawning and shellfish harvesting

On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving an exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges. On June 19, 2012, the State Water Board adopted Order No. 2012-0031, amending Order No. 2012-0012 to require pollutant load reductions to be achieved within six years for the ASBS Compliance Plans, section A.2.d(2) and ASBS Pollution Prevention Plans, section B.2.b(2). The State Water Board Resolution No. 2012-0012, as amended requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject terms and conditions of State Water Board Resolution No. 2012-0012, as amended. The Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012, as amended, applicable to these discharges, are incorporated in Attachment A of this Order. Requirements of this Order implement the Ocean Plan.

Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality

On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

Antidegradation Policy

Federal regulations (40 CFR 131.12) require that the state water quality standards include an antidegradation policy consistent with the federal antidegradation policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16 ("Statement of Policy with Respect to Maintaining the Quality of the Waters of the State"). State Water Board Resolution No. 68-16 incorporates the

federal antidegradation policy where the federal policy applies under federal law.

The San Diego Water Board's Basin Plan implements and incorporates by reference both the State and federal antidegradation policies. State Water Board Resolution No. 68-16 and 40 CFR 131.12 require the San Diego Water Board to maintain high quality waters of the State unless degradation is justified based on specific findings. First, the Board must ensure that "existing instream uses and the level of water quality necessary to protect the existing uses" are maintained and protected. Second, if the baseline quality of a water body for a given constituent exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water, that quality shall be maintained and protected through the requirements of the Order unless the Board makes findings that (1) any lowering of the water quality is necessary to accommodate important economic or social development in the area in which the waters are located; (2) water quality adequate to protect existing uses fully is assured; and (3) the highest statutory and regulatory requirements for all new and existing point sources and all cost-effective and reasonable best management practices for nonpoint source control are achieved. The San Diego Water Board must also comply with any requirements of State Water Board Resolution No. 68-16 beyond those imposed through incorporation of the federal antidegradation policy. In particular, the Board must find that not only present, but also anticipated future uses of water are protected, and must ensure best practicable treatment or control of the discharges. The baseline quality considered in making the appropriate findings is the best quality of the water since 1968, the year of the adoption of Resolution No. 68-16, or a lower level if that lower level was allowed through a permitting action that was consistent with the federal and state antidegradation policies.

The discharges permitted in this Order are consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Board Resolution No. 68-16 as set forth below:

1. Many of the waters within the area covered by this Order are impaired for multiple pollutants discharged through MS4s and are not high quality waters with regard to these pollutants. In most cases, there is insufficient data to determine whether these water bodies were impaired as early as 1968, but the limited available data shows impairment dating back for more than two decades. Many such water bodies are listed on the State's CWA Section 303(d) List and the San Diego Water Board has established TMDLs to address the impairments. This Order ensures that existing instream (beneficial) water uses and the level of water quality necessary to protect the existing uses is maintained and protected. This Order requires the Copermittees to comply with permit provisions to implement the WLAs set forth in the TMDLs in order to restore the beneficial uses of the impaired water bodies consistent with the assumptions and requirements of the TMDLs. This Order further requires compliance with receiving water limitations to meet water quality standards in the receiving water either by demonstrating compliance pursuant to Provision A and the Copermittees' monitoring and assessment program pursuant to Provision D of this Order, or by implementing Provision B.3.c with a schedule to achieve compliance

with receiving water limitations. This Order includes requirements to develop and implement storm water management programs, achieve WQBELs, and effectively prohibit non-storm water discharges into the MS4. The issuance of this Order does not authorize an increase in the amount of discharge of waste.

2. To the extent that water bodies within the area covered by this Order are high quality waters with regard to some constituents, this Order finds as follows:

   a. Allowing limited degradation of high quality water bodies through MS4 discharges is necessary to accommodate important economic or social development in the area and is consistent with the maximum benefit to the people of the state. The discharge of storm water in certain circumstances is to the maximum benefit to the people of the state because it can assist with maintaining instream flows that support beneficial uses, may spur the development of multiple-benefit projects, and may be necessary for flood control, and public safety as well as to accommodate development in the area. The alternative – capturing all storm water from all storm events – would be an enormous opportunity cost that would preclude MS4 permittees from spending substantial funds on other important social needs. The Order ensures that any limited degradation does not affect existing and anticipated future uses of the water and does not result in water quality less than established standards. The Order requires compliance with receiving water limitations that act as a floor to any limited degradation.

   b. The Order requires the highest statutory and regulatory requirements and requires that the Copermittees meet best practicable treatment or control. The Order prohibits all non-storm water discharges, with a few enumerated exceptions, through the MS4 to the receiving waters. As required by 40 CFR section 122.44(a), the Copermittees must comply with the "maximum extent practicable" technology-based standard set forth in CWA section 402(p), and implement extensive minimum control measures in a storm water management program. Recognizing that best practicable treatment or control may evolve over time, the Order includes new and more specific requirements as compared to the prior Phase I MS4 permits for the San Diego County, Orange County and Riverside County Copermittees. The Order incorporates options to implement Water Quality Improvement Plans that must specify detailed structural and non-structural storm water controls that must be implemented in accordance with an accepted proposed time schedule. The Order contains provisions to encourage, wherever feasible, retention of the storm water from the 85th percentile 24-hour storm event.

<u>Anti-Backsliding Requirements</u>

CWA sections 402(o) and 303(d)(4) and federal regulations at 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations or conditions may be relaxed. While this Order

allows implementation of an alternative compliance pathway option in Provision B.3.c to constitute compliance with receiving water limitations under certain circumstances, the availability of that alternative and the corresponding availability of additional time to come into compliance with receiving water limitations does not violate the anti-backsliding provisions. The receiving water limitations provisions of this Order are imposed under section 402(p)(3)(B) of the Clean Water Act rather than based on best professional judgment, or based on section 301(b)(1)(C) or sections 303(d) or (e), and are accordingly not subject to the anti-backsliding requirements of section 402(o). Although the non-applicability is less clear with respect to the regulatory anti-backsliding provisions in 40 CFR 122.44(l), the regulatory history suggests that USEPA's intent was to establish the anti-backsliding regulations with respect to evolving technology standards for traditional point sources. (See, e.g., 44 Fed.Reg. 32854, 32864 (Jun. 7, 1979)). It is unnecessary, however, to resolve the ultimate applicability of the regulatory anti-backsliding provisions, because the alternative compliance pathway option in Provision B.3.c qualifies for an exception to backsliding as based on new information.

The alternative compliance pathway option in Provision B.3.c of this Order was informed by new information available to the Board from experience and knowledge gained through storm water permitting at the Regional Water Boards in the last ten years. There has been a statewide paradigm shift in storm water management. State Water Board Order WQ 2015-0075 directed all of the Regional Water Boards to consider the Los Angeles Water Board's alternative compliance path to receiving water limitations in all Phase I MS4 permits going forward (State Water Board Order WQ 2015-0075 at page 51), and the Los Angeles Water Board's process of developing over 30 watershed-based TMDLs and implementing several TMDLs since the adoption of the previous permits. In particular, the Los Angeles Water Board recognized the significance of allowing time to plan, design, fund, operate and maintain watershed-based BMPs necessary to attain water quality improvements and additionally recognized the potential for municipal storm water to benefit water supply. Similarly, the San Diego Water Board's experience developing and implementing the Fourth Term MS4 Permits and TMDLs that apply on a region-wide scale (e.g. TMDLs for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region) has resulted in a similar recognition of the need for a watershed-based approach that allows time to plan, design, fund, operate and maintain BMPs to address impaired waters that have been impacted by MS4 discharges. Thus, even if the receiving water limitations are subject to anti-backsliding requirements, they were revised based on new information that would support an exception to the anti-backsliding provisions. (33 U.S.C. § 1342(o)(2)(B)(i); 40 C.F.R. § 122.44(l)(1); 40 C.F.R. §122.44(l)(2)(i)(B)(1)).

<u>Clean Water Act Section 303(d) List</u>

CWA section 303(d)(1) requires each State to identify specific water bodies within its boundaries where water quality standards are not being met or are not expected to be met after implementation of technology-based effluent limitations on point sources. Water bodies that do not meet water quality standards are considered impaired and are placed on the state's "303(d) List." Periodically, USEPA approves the State's 303(d) List.

Most recently, USEPA approved the State's 2010 303(d) List of impaired water bodies on October 11, 2011, which includes certain receiving waters in the San Diego Region. For each listed water body, the state or USEPA is required to establish a TMDL of each pollutant impairing the water quality standards in that water body. A TMDL is a tool for implementing water quality standards and is based on the relationship between pollution sources and in-stream water quality conditions. The TMDL establishes the allowable pollutant loadings for a water body and thereby provides the basis to establish water quality-based controls. These controls should provide the pollution reduction necessary for a water body to meet water quality standards.

A TMDL is the sum of the allowable pollutant loads of a single pollutant from all contributing point sources (the waste load allocations or WLAs) and non-point sources (load allocations of LAs) plus the contribution from background sources and a margin of safety (40 CFR 130.2(i)). MS4 discharges are considered point source discharges. For 303(d)-listed water bodies and pollutants in the San Diego Region, the San Diego Water Board or USEPA develops and adopts TMDLs that specify these requirements.

Since 2002, the San Diego Water Board has established seven (7) TMDLs to remedy water quality impairments in various water bodies within the San Diego Region (see Attachment E to the Order). These TMDLs identify MS4 discharges as a source of pollutants to these water bodies, and, as required, establish WLAs for MS4 discharges to reduce the amount of pollutant discharged to receiving waters. CWA section 402(p)(3)(B)(iii) requires the San Diego Water Board to impose permit conditions, including: "management practices, control techniques and system, design and engineering methods, and *such other provisions as the Administrator or the State determines appropriate for the control of such pollutants."* (Emphasis added.) CWA section 402(a)(1) also requires states to issue permits with conditions necessary to carry out the provisions of the CWA. Federal regulations also require that NDPES permits contain WQBELs consistent with the assumptions and requirements of all available WLAs (40 CFR 122.44(d)(1)(vii)(B)). CWC section 13377 also requires that NPDES permits include limitations necessary to implement water quality control plans. Therefore, this Order includes WQBELs and other provisions to implement the TMDL WLAs assigned to Copermittees regulated by this Order.

<u>Other Regulations, Plans and Policies</u>

This Order implements all other applicable federal regulations and State regulations, plans and policies, including the California Toxics Rule at 40 CFR 131.38 (Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California Rule [California Toxics Rule or CTR]), and State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP).

F. Unfunded State Mandates

Article XIII B, Section 6(a) of the California Constitution provides that whenever "*any state agency mandates a new program or higher level of service on any local government, the state shall provide a subvention of funds to reimburse that local government for the costs of the program or increased level of service*." The requirements of this Order do not constitute state mandates that are subject to a subvention of funds for several reasons, including, but not limited to, the following.

First, the requirements of this Order do not constitute a new program or a higher level of service as compared to the requirements contained in the previous Fourth Term Permits. The overarching requirement to impose controls to reduce the pollutants in discharges from MS4s is dictated by the CWA and is not new to this permit cycle (33 USC section 1342(p)(3)(B)). The inclusion of new and advanced measures as the MS4 programs evolve and mature over time is anticipated under the CWA (55 FR 47990, 48052 (Nov. 16, 1990)), and to the extent requirements in this Order are interpreted as new advanced measures, they do not constitute a new program or higher level of service.

Second, and more broadly, mandates imposed by federal law, rather than by a state agency, are exempt from the requirement that the local agency's expenditures be reimbursed (Cal. Const., art. XIII B, section 9, subd. (b)). This Order implements federally mandated requirements under the CWA and its requirements are therefore not subject to subvention of funds. This includes federal requirements to effectively prohibit non-storm water discharges, to reduce the discharge of pollutants in storm water to the MEP, and to include such other provisions as the Administrator or the State determines appropriate for the control of such pollutants (33 USC section 1342(p)(3)(B)). Federal cases have held these provisions require the development of permits and permit provisions on a case-by-case basis to satisfy federal requirements. (*Natural Resources Defense Council, Inc., v. USEPA* (9th Cir. 1992) 966 F.2d 1292, 1308, fn. 17.)

The authority exercised under this Order is not reserved state authority under the CWA's savings clause (cf. *Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 627-628 [relying on 33 USC section 1370, which allows a state to develop requirements which are not "less stringent" than federal requirements]), but instead is part of a federal mandate to develop pollutant reduction requirements for municipal separate storm sewer systems. To this extent, it is entirely federal authority that forms the legal basis to establish the permit provisions. (See, *City of Rancho Cucamonga v. Regional Water Quality Control Board, Santa Ana Region* (2006) 135 Cal.App.4th 1377, 1389; *Building Industry Ass'n of San Diego Co. v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 882-883.)

The MEP standard is a flexible standard that balances a number of considerations, including technical feasibility, cost, public acceptance, regulatory compliance, and effectiveness. (*Building Ind. Ass'n., supra,* 124 Cal.App.4th at pp. 873-874, 889.) Such considerations change over time with advances in technology and with experience

gained in storm water management (55 FR 47990, 48052 (Nov. 16, 1990)). Accordingly, a determination of whether the conditions contained in this Order exceed the requirements of federal law cannot be based on a point by point comparison of the permit conditions and the minimum control measures that are required "at a minimum" to reduce pollutants to the maximum extent practicable and to protect water quality (40 CFR 122.34). Rather, the appropriate focus is whether the permit conditions, as a whole, exceed the MEP standard.

In recent months, the County of Los Angeles and County of Sacramento Superior Courts have granted writs setting aside decisions of the Commission on State Mandates that held certain requirements in Phase I permits constituted unfunded mandates. In both cases, the courts have found that the correct analysis in determining whether an MS4 permit constituted a state mandate was to evaluate whether the permit as a whole exceeds the MEP standard. (*State of Cal. v. Comm. on State Mandates* (Super. Ct. Sacramento County, 2012, No. 34-2010-80000604), *State of California v. County of Los Angeles* (Super. Ct. Los Angeles County, 2011, No. BS130730.) Both cases are currently pending appeal.

The requirements of the Order, taken as a whole rather than individually, are necessary to reduce the discharge of pollutants to the MEP and to protect water quality. The San Diego Water Board finds that the requirements of the Order are practicable, do not exceed federal law, and thus do not constitute an unfunded mandate. These findings are the expert conclusions of the principal state agency charged with implementing the NPDES program in California (CWC sections 13001, 13370).

It should also be noted that the provisions in this Order to effectively prohibit non-storm water discharges are also mandated by the CWA (33 USC section 1342(p)(3)(B)(ii)). Likewise, the provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state establishes or adopts a TMDL, federal law requires that permits must contain effluent limitations consistent with the assumptions and requirements of any applicable waste load allocation in a TMDL (40 CFR 122.44(d)(1)(vii)(B)).

Third, the local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental dischargers who are issued NPDES permits for storm water discharges. With a few inapplicable exceptions, the CWA regulates the discharge of pollutants from point sources (33 USC section 1342) and the Porter-Cologne Act regulates the discharge of waste (CWC section 13263), both without regard to the source of the pollutant or waste. As a result, the "costs incurred by local agencies" to protect water quality reflect an overarching regulatory scheme that places similar requirements on governmental and non-governmental dischargers. (See *County of Los Angeles v. State of California* (1987) 43 Cal.3d 46, 57-58 [finding comprehensive workers' compensation scheme did not create a cost for local agencies that was subject to state subvention].)

The CWA and the Porter-Cologne Act largely regulate storm water with an even hand, but to the extent there is any relaxation of this even-handed regulation, it is in favor of the local agencies. Generally, the CWA requires point source dischargers, including dischargers of storm water associated with industrial or construction activity, to comply strictly with water quality standards (33 USC section 1311(b)(1)(C); *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159, 1164-1165 [noting that industrial discharges must strictly comply with water quality standards]). As discussed in prior State Water Board decisions, certain provisions of this Order do not require strict compliance with water quality standards (State Water Board Order No. WQ 2001-0015, p. 7). Those provisions of this Order regulate the discharge of waste in municipal storm water under the CWA's MEP standard, not the BAT/BCT standard that applies to other types of discharges. These provisions, therefore, regulate the discharge of waste in municipal storm water more leniently than the discharge of waste from non-governmental sources.

Fourth, the Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)). To the extent that the local agency Copermittees have voluntarily availed themselves of the permit, the program is not a state mandate. (Accord, *County of San Diego v. State of California* (1997) 15 Cal.4th 68, 107-108.)

Fifth, the local agency Copermittees' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under state law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

Finally, even if any of the permit provisions could be considered unfunded mandates, under Government Code section 17556, subdivision (d), a state mandate is not subject to reimbursement if the local agency has the authority to charge a fee. The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order, subject to certain voting requirements contained in the California Constitution. (See Cal. Const., Art. XIII D, section 6, subd. (c); see also *Howard Jarvis Taxpayers Ass'n v. City of Salinas* (2002) 98 Cal.App.4th 1351, 1358-1359.) The Fact Sheet demonstrates that numerous activities contribute to the pollutant loading in the MS4. Local agencies can levy service charges, fees, or assessments on these activities, independent of real property ownership. (See, e.g., *Apartment Ass'n of Los Angeles County, Inc., v. City of Los Angeles* (2001(24 Cal.4th 830, 842 [upholding inspection fees associated with renting property].) The authority and ability of a local agency to defray the cost of a program without raising taxes indicates that a program does not entail a cost subject to subvention. (*Clovis Unified School Dist. V. Chiang* (2010) 188 Cal.App.4th 794, 812, citing *Connell v. Sup. Ct.* (1997) 59 Cal.App.4th 382, 401; *County of Fresno v. State of California* (1991) 53 Cal. 3d. 482, 487-488.)

VIII. PROVISIONS

The provisions (i.e. NPDES permit requirements) of the Order are discussed below.

A. Prohibitions and Limitations

Purpose: Provision A includes the prohibitions and limitations requirements that are the foundation of all the subsequent requirements included in the Order. Compliance with the prohibitions and limitations will restore and protect receiving waters from impacts that may be caused by discharges into and from the Copermittees' MS4s and ultimately achieve the objective of the CWA.

In meeting the requirements set forth in the Order, the Copermittees must be cognizant that the prohibitions and limitations exist and will be the standard by which the San Diego Water Board will be measuring the progress and success of their implementation of the NPDES permit requirements.

***Discussion*:** The objective of the CWA is to "*restore and maintain the chemical, physical, and biological integrity of the Nation's waters*." The CWA requires the implementation of NPDES permit programs to regulate discharges of pollutants and dredged or fill material to the navigable waters of the U.S. For discharges into and from MS4s, the CWA requires the NPDES permits to "*effectively prohibit non-stormwater discharges into the storm sewers*" and "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable.*"

Provision A includes limitations, consistent with the requirements of the CWA for discharges from MS4s. Provision A expresses these limitations as discharge prohibitions, receiving water limitations, and effluent limitations. Compliance with the discharge prohibitions and receiving water limitations is also explicitly described, in conformance with precedential State Water Board Orders.

More specific and detailed discussions of the requirements of Provision A are provided below.

Provision A.1 (Discharge Prohibitions) prohibits the discharge of specific types of waste into and/or from the Copermittees' MS4s.

Provision A.1.a restates and reiterates Basin Plan Waste Discharge Prohibition 1, by prohibiting discharges into and from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the

state. The terms pollution,[15] contamination,[16] and nuisance[17] are defined under CWC 13050. Provision A.1.c incorporates all the waste discharge prohibitions of the Basin Plan into the requirements of the Order. The waste discharge prohibitions from the Basin Plan have been reproduced and provided in Attachment A to the Order.

Provision A.1.b requires non-storm water discharges into the MS4s to be effectively prohibited, consistent with the requirements of the CWA for MS4 permits to "*effectively prohibit non-stormwater discharges into the storm sewers*." The effective prohibition is required to be implemented by each Copermittee within its jurisdiction through the illicit discharge detection and elimination requirements under Provision E.2. The prohibition does not apply to NPDES permitted discharges into the Copermittees' MS4s.

The CWA employs the strategy of prohibiting the discharge of any pollutant from a point source into waters of the United States unless the discharger of the pollutant(s) obtains an NPDES permit pursuant to CWA Section 402. The 1987 amendment to the CWA includes provision 402(p) that specifically addresses NPDES permitting requirements for storm water discharges from MS4s. CWA section 402(p) prohibits the discharge of pollutants from specified MS4s to waters of the U.S. except as authorized by an NPDES permit and identifies two substantive standards for MS4 storm water permits. MS4 permits (1) "*shall include a requirement to effectively prohibit non-stormwater discharges into the storm sewers*" and (2) "*shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or State determines appropriate for the control of such pollutants*." (CWA section 402(p)(3)(B)(ii)-(iii).)

In November 1990, the USEPA published regulations addressing storm water discharges from MS4s (55 FR 47990 and following (Nov. 16, 1990) (Phase I Final Rule)). The regulations establish minimum requirements for MS4 permits, and generally focus on the requirement that MS4s implement programs to reduce the amount of pollutants found in storm water discharges to the MEP. The CWA's municipal storm water MEP standard does not require storm water discharges to strictly meet water quality standards, as is required for other NPDES permitted

[15] CWC 13050(l): "(1) 'Pollution' means an alteration of the quality of waters of the state by waste to a degree which unreasonably affects either of the following: (A) The water for beneficial uses. (B) Facilities which serve beneficial uses. (2) 'Pollution' may include 'contamination.'

[16] CWC 13050(k): "Contamination' means an impairment of the quality of waters of the state by waste to a degree which creates a hazard to public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste, whether or not waters of the state are affected."

[17] CWC 13050(m): 'Nuisance' means anything which meets all of the following requirements: (1) Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. (2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. (3) Occurs during, or as a result of, the treatment or disposal of wastes."

discharges. Compliance is achieved through an iterative approach of continuous implementation of improved BMPs. This distinction reflects Congress's recognition that variability in flow and intensity of storm events render difficult strict compliance with water quality standards by MS4 permittees. In describing the controls that permits must include to reduce pollutants in storm water discharges to the MEP, the statute (CWA section 402(p)(3)(B)(iii)) states that the controls shall include: "*management practices, control techniques and system, design and engineering methods, and such other provisions as the [permit writer] determines appropriate for the control of such pollutants*."

In contrast, non-storm water discharges from the MS4 that are not authorized by separate NPDES permits are subject to requirements under the NPDES program, including discharge prohibitions, technology based effluent limitations and water quality-based effluent limitations (40 CFR 122.44). The regulations also require the Copermittee's program to include an element to detect and remove illicit discharges and improper disposal into the storm sewer (40 CFR 122.26(d)(2)(iv)(B)).

While "non-storm water" is not defined in the CWA or federal regulations, the federal regulations (at 40 CFR 122.26(b)(2)) define "*illicit discharge*" as *"any discharge to a municipal separate storm sewer that is not composed entirely of storm water and that is not covered by an NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer and discharges resulting from fire fighting activities)*." This definition is the most closely applicable definition of "non-storm water" contained in federal law. As stated in the Phase I Final Rule, USEPA added the illicit discharge program requirement to begin implementation of the 'effective prohibition' requirement to detect and control non-storm water discharges to their municipal system.

Thus, federal law mandates that permits issued to MS4s must require management practices that will result in reducing storm water pollutants to the MEP yet at the same time requires that non-storm water discharges be effectively prohibited from entering the MS4. "Effectively" prohibit does not mean that non-storm water discharges are authorized to be discharged into and from the Copermittees' MS4s. The Phase I Final Rule clarifies what "effectively prohibit" means (55 FR 47995):

> "*Section 402(p)(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…<u>Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit</u> (other than the permit for the discharge from the municipal separate storm sewer)*" [Emphasis added].

Consistent with federal law, unless non-storm water discharges to the MS4 are authorized by a separate NPDES permit, non-storm water discharges are

appropriately subject to the effective prohibition requirement in the CWA and Regional Water Boards are not limited by the iterative MEP approach to storm water regulation in crafting appropriate regulations for non-storm water discharges.

The federal regulations (40CFR122.26(d)(2)(i)(B)) require the Copermittees to establish the legal authority which authorizes or enables the Copermittees to prohibit illicit discharges to the MS4s. The federal regulations (40 CFR 122.26(d)(2)(vi)(B)(1)) require the Copermittees to "*implement and enforce an ordinance, order or similar means*" to prevent non-storm water discharges to their MS4s. Thus, the Copermittees are required to "*effectively*" prohibit non-storm water discharges to their MS4s through enforcing their legal authority established under "*ordinance, order or similar mean*s" and either remove those discharges to their MS4s, or require those discharges to obtain coverage under a separate NPDES permit. More detail about the program that must be implemented to "*effectively*" prohibit non-storm water discharges to the Copermittees' MS4s is provided under the discussion for Provision E.2.

Provision A.1.d was included to be consistent with Resolution No. 2012-0012, adopted by the State Water Board on March 20, 2012. Provision A.1.d prohibits discharges from MS4s to Areas of Special Biological Significance (ASBS), except for storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach to the Heisler Park ASBS subject to the Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012. The pertinent Special Protections contained in Attachment B to State Water Board Resolution No. 2012-0012 are provided in Attachment A to the Order.

<u>Provision A.2 (Receiving Water Limitations)</u> specifies the condition of the receiving waters that must be achieved when there are discharges from the Copermittees' MS4s. Receiving water limitations are included in all NPDES permits issued pursuant to the CWA section 402. CWA section 402(p)(3)(B)(iii) authorizes the inclusion of "*such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." This requirement gives USEPA or the State permitting authority, in this case the San Diego Water Board, discretion to determine what permit conditions are necessary to control pollutants.

In its Phase I Final Rule (see 55 FR 47990, 47994 (Nov. 16, 1990)), USEPA elaborated on these requirements, stating that, "*permits for discharges from municipal separate storm sewer systems must require controls to reduce the discharge of pollutants to the maximum extent practicable, and where necessary water quality-based controls*." USEPA reiterated in its Phase II Final Rule (64 FR 68722, 68737), that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL*." CWC section 13377 also requires that NPDES permits include limitations necessary to implement water quality control plans. Both the State Water Board and the San Diego Water Board have previously concluded that discharges from the MS4 contain pollutants that have

the reasonable potential to cause or contribute to excursions above water quality standards. As such, inclusion of receiving water limitations is appropriate to control MS4 discharges.

The inclusion of receiving water limitations is also consistent with the Ninth Circuit Court of Appeals' ruling in *Defenders of Wildlife v. Browner* (191 F.3d 1159, 1166 (1999)) that the permitting authority has discretion regarding the nature and timing of requirements that it includes as MS4 permit conditions to attain water quality standards. The Ninth Circuit Court of Appeals recently explained that, "*[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*" (*Natural Resources Defense Council v. County of Los Angeles* (9th Cir. 2011) 673 F.3d 880, 886 (revd. On other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013)))

The receiving water limitations included in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan or in water quality control plans or policies adopted by the State Water Board, including State Water Board Resolution No. 68-16, or in federal regulations, including but not limited to 40 CFR 131.12 and 131.38. The water quality objectives in the Basin Plan and other State Water Board plans and policies have been approved by USEPA and combined with designated beneficial uses constitute the water quality standards required under federal law.

Provision A.2.a requires that discharges from the Copermittees' MS4s must not cause or contribute to the violation of water quality standards in receiving waters. The water quality standards of the receiving waters must be protected from the impacts that may be caused by the Copermittees' MS4 discharges. Water quality standards applicable to the surface waters in the San Diego Region must be achieved through meeting the technology based standard of MEP through an iterative process of improved management actions. Provision A.2.a is also consistent with State Water Board Order WQ 99-05 precedent-setting language requiring discharges from MS4s to attain receiving water quality standards. The water quality control plans and policies with water quality standards applicable to the waters in the San Diego Region are included under Provision A.2.a.

Provisions A.2.b was included to be consistent with the requirements of State Water Board Resolution No. 2012-0012, adopted on March 20, 2012.

<u>Provision A.3 (Effluent Limitations)</u> specifies the condition of the discharges from the Copermittees' MS4s that must be achieved if and when there are discharges.

Consistent with CWA section 301(b)(1)(A) and 40 CFR 122.44(a), Provision A.3.a includes the technology-based effluent limitations that must be included in the Order. The technology-based effluent limits, representing the minimum level of control that must be imposed in a permit under CWA section 402, requires that pollutants in discharges of storm water from the Copermittees' MS4s be reduced to the MEP. This provision applies specifically to storm water discharges. Non-storm water discharges must be effectively prohibited, as required under Provision A.1.b. Non-storm water (dry weather) discharges from the MS4 are not considered storm water (wet weather) discharges and therefore are not subject to the MEP standard.

The technology-based MEP standard is an ever-evolving, flexible, and advancing concept. Neither Congress nor USEPA has specifically defined the term "maximum extent practicable." Congress established this flexible MEP standard so that the administrative bodies would have "*the tools to meet the fundamental goals of the Clean Water Act in the context of storm water pollution*." (*Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 884.) As knowledge about controlling storm water runoff and discharges continues to evolve, so does the knowledge which constitutes MEP. Reducing the discharge of pollutants in storm water from the MS4 to the MEP requires the Copermittees to assess each program component and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP.

The San Diego Water Board or the State Water Board ultimately define MEP, and may include requirements that provide specific guidance on what is expected to demonstrate MEP. It is the responsibility of the Copermittees to propose actions that implement BMPs to reduce storm water pollution to the MEP. In other words, the Copermittees' runoff management programs developed and implemented under the Order are the Copermittees' proposals for achieving MEP. Their total collective and individual activities conducted pursuant to their runoff management programs become their proposal for achieving MEP as it applies both to their overall effort, as well as to specific activities. Provisions B through E of the Order provides a minimum framework to guide the Copermittees in achieving the MEP standard for discharges of pollutants in storm water.

Provision A.3.b incorporates any water quality based effluent limitations (WQBELs) applicable to the MS4s established for TMDLs adopted and approved for the San Diego Region and requires the Copermittees to comply with those WQBELs. This is consistent with 40 CFR 122.44(d)(1)(vii)(B), which requires that NPDES permits to incorporate WQBELs "*developed to protect a narrative water quality criterion, a numeric water quality criterion, or both…consistent with the assumptions and requirements of any available wasteload allocation for the discharge...*"

Pursuant to CWA section 303(d), for surface water bodies identified as impaired by one or more pollutants, the San Diego Water Board is required to establish TMDLs "*at a level necessary to implement the applicable water quality standards with seasonal variations and a margin of safety which takes into account any lack of knowledge*

concerning the relationship between effluent limitations and water quality." The TMDLs identify sources of the pollutants causing the impairments and assign portions of the TMDL as WLAs to point sources, which include MS4s.

WLAs must be expressed in NPDES permits as WQBELs, which may include one or more numeric components such as numeric effluent limits, and/or receiving water limitations, and/or BMP requirements. Because numeric targets for TMDLs typically include a component that will be protective of water quality standards, a TMDL will likely include one or more numeric receiving water limitations and/or effluent limitations as part of the assumptions or requirements of the TMDL. Any numeric receiving water limitations and/or effluent limitations developed as part of the assumptions or requirements of a TMDL must be incorporated and included as part of WQBELs for the MS4s.

Because the development and approval of new TMDLs, or modification of existing TMDLs, may occur during the term of this Order, the specific provisions of those TMDLs, including effluent limitations applicable to MS4s are provided within Attachment E to the Order. Attachment E will be updated with new TMDLs and modifications to existing TMDLs in a timely manner as they occur.

Provision A.4 (Compliance with Discharge Prohibitions and Receiving Water Limitations) describes the process required to be implemented by the Copermittees if compliance with the discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a are not being achieved under current conditions.

In its Phase II Stormwater Regulations, Final Rule, USEPA states that MS4 "*permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL.*"[18] In a series of comment letters on MS4 permits issued by various Regional Water Boards, USEPA has also reiterated that MS4 discharges must meet water quality standards.[19] In addition, the Ninth Circuit Court of Appeals explained in a recent ruling that, *"[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels.*"[20]

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[18] Phase II Stormwater Regulations, Final Rule, 64 Fed. Reg. 68722, 68737.
[19] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.
[20] NRDC v. County of Los Angeles (9th Cir. 2011), 673 F.3d 880, 886 (revd. on other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013))). See also, *Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 884-886, citing *Defenders of Wildlife v. Browning,* (9th Cir. 1999) 191 F.3d 1159.)

Water quality standards for the San Diego Region are established in the Basin Plan. The water quality standards of the Basin Plan are incorporated into this Order as the discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a. The discharge prohibitions and receiving water limitations in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations or prohibitions to implement the applicable water quality objectives or criteria, for receiving waters as contained in the Basin Plan, water quality control plans or policies adopted by the State Water Board, including Resolution No. 68-16, or federal regulations, including but not limited to, 40 CFR 131.12 and 131.38. The waste discharge prohibitions and water quality objectives in the Basin Plan have been approved by USEPA and combined with the designated beneficial uses constitute the water quality standards required under federal law.

Under federal law (CWA section 402(p)(3)(B)(iii)), an MS4 permit must include "*controls to reduce the discharge of pollutants to the maximum extent practicable...and such other provision as...the State determines appropriate for control of such pollutants*." The State Water Board has previously determined that limitations necessary to meet water quality standards are appropriate for the control of pollutants discharged by MS4s and must be included in MS4 permits. (State Water Board Orders WQ 91-03, 98-01, 99-05, 2001-15; see also *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159.) This Order prohibits discharges that cause or contribute to violations of water quality standards.

The discharge prohibitions under Provisions A.1.a and A.1.c and receiving water limitations under Provision A.2.a are included in this Order to ensure that discharges from the MS4s do not cause or contribute to exceedances of water quality objectives necessary to protect the beneficial uses of the receiving waters.

Provision A.4 is consistent with the precedent-setting language in State Water Board Order WQ 99-05 required to be included in municipal storm water permits. State Water Board Order WQ 2001-15 refined Order WQ 99-05 by requiring an iterative approach to compliance with water quality standards involving ongoing assessments and revisions, referred to as the "iterative process." The "iterative process" is a fundamental NPDES requirement for municipal storm water permits to achieve the objectives of the CWA.

The State Water Board and Regional Water Boards have stated that the provisions under Provisions A.1.a, A.1.c, A.2.a, and A.4 are independently applicable, meaning that compliance with one provision does not provide a "safe harbor" where there is non-compliance with another provision (i.e., compliance with the Provision A.4 does not shield a Copermittee who may have violated Provision A.1.a, A.1.c, or A.2.a from an enforcement action). The intent of Provision A.4 is to ensure that the Copermittees have the necessary storm water management programs and controls in place, and that they are modified by the Copermittees in a timely fashion when necessary, so that compliance with Provisions A.1.a, A.1.c, and/or A.2.a is achieved as soon as possible. USEPA expressed the importance of this independent applicability in a series of

comment letters on MS4 permits proposed by various Regional Water Boards. At that time, USEPA expressly objected to certain MS4 permits that included language stating, *"permittees will not be in violation of this [receiving water limitation] provision … [if certain steps are taken to evaluate and improve the effectiveness of the jurisdictional runoff management programs],"* concluding that this phrase would not comply with the CWA.[21]

The Ninth Circuit held in *Natural Resources Defense Council v. County of Los Angeles* (2011) 673 F3d. 880, 886 (revd. on other grounds and remanded by *Los Angeles County Flood Control District v. Natural Resources Defense Council* (133 S.Ct. 710 (2013))) that engagement in the iterative process does not provide a safe harbor from liability for violations of permit terms prohibiting exceedances of water quality standards. The Ninth Circuit holding is consistent with the position of the State and Regional Water Boards that exceedances of water quality standards in an MS4 permit constitute violations of permit terms subject to enforcement by the Water Boards or through a citizen suit. While the Water Boards have generally directed dischargers to achieve compliance by improving control measures through the iterative process, the San Diego Water Board retains the discretion to take other appropriate enforcement and the iterative process does not shield dischargers from citizen suits under the CWA.

The requirements of Provision A.4, therefore, are required to be implemented until the water quality standards expressed under Provisions A.1.a, A.1.c, and A.2.a are achieved. The CWA requires MS4 permits to "*require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants*." The requirements of this Order have been deemed or determined to be "appropriate" to achieve water quality standards in receiving waters.

Part of the "*controls*" required by the Order is the process described in Provision A.4. Provision A.4 includes the process that is ultimately expected to achieve compliance with the requirement that discharges from the MS4 do not cause or contribute to violations of water quality standards in the receiving waters. The implementation of Provision A.4 is required when the Copermittees or the San Diego Water Board have determined that discharges from the MS4 are causing or contributing to violations of water quality standards in the receiving waters.

The Copermittees must effectively prohibit non-storm water discharges into the MS4s, reduce the discharge of pollutants in storm water from the MS4s to the MEP, and ensure that their MS4 discharges do not cause or contribute to violations of water quality standards. If the Copermittees have effectively prohibited non-storm water

[21] Letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.

discharges and reduced storm water pollutant discharges to the MEP, but their discharges are still causing or contributing to violations of water quality standards, Provision A.4 provides a clear "iterative process" for the Copermittees to follow.

Provision A.4 essentially requires the Copermittees to implement additional BMPs until MS4 discharges no longer cause or contribute to a violation of water quality standards.

In assessing compliance and potential enforcement actions, the San Diego Water Board looks at the Copermittees' efforts in total to meet the requirements of Provisions A.1.a, A.1.c, A.2.a and Provision A.4. The Copermittees need to demonstrate that they are making improvements to their programs and making progress toward achieving the discharge prohibitions and receiving water limitations in Provisions A.1.a, A.1.c, and A.2.a by implementing the requirements of Provision A.4. The San Diego Water Board would consider these efforts prior to strictly enforcing the requirements of Provisions A.1.a, A.1.c, and A.2.a. Causes of exceedances of the receiving water limitations can often be more difficult to identify and attribute solely to the Copermittees' MS4s. The intent of the Order is to provide the Copermittees more clarity and flexibility in addressing these exceedances through the iterative approach and adaptive management process until the requirements under Provisions A.1.a, A.1.c, and A.2.a are fully achieved.

An exception to the iterative approach and adaptive management process would be in receiving waters subject to adopted and approved TMDLs. For TMDLs that are incorporated into the Order, there is a specific date for compliance to be achieved, after which the iterative approach and adaptive management process required under Provision A.4 no longer provides the flexibility to achieve compliance. Where compliance dates for a TMDL have passed, compliance with the WQBELs incorporated into the Order established by a TMDL in Attachment E to protect water quality standards is required. Thus, after the interim or final compliance dates for a TMDL have passed, if the discharges from the Copermittees' MS4s are causing or contributing to a violation of WQBELs, exceedances of WQBELs must be strictly enforced by the San Diego Water Board. In the meantime, however, the Copermittees are in compliance with the interim or final TMDL requirements in Attachment E as long as the interim or final WQBELs are being achieved in accordance with the interim or final compliance dates.

In addition, this Order includes an optional pathway that incorporates the requirements of Provision A.4 and would allow a Copermittee to be deemed in compliance with the requirements under Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b during implementation of a Water Quality Improvement Plan that incorporates specific additional requirements. This alternative compliance pathway and the additional specific requirements are described below under the discussion for Provision B.3.c.

B. Water Quality Improvement Plans

Purpose: Since 1990, the Copermittees have been developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges to the MS4s and control pollutants in storm water discharges from the MS4s to receiving waters. As a result, several water body / pollutant combinations have been de-listed from the CWA Section 303(d) List, beach closures have been significantly reduced, and public awareness of water quality issues has increased. The Copermittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the Clean Water Act.

Provision B includes requirements for the Copermittees to develop and implement Water Quality Improvement Plans to ultimately comply with the prohibitions and limitations under Provision A. The Water Quality Improvement Plans will provide the Copermittees a comprehensive program that can achieve the requirements and further the objectives of the CWA. Implementation of the Water Quality Improvement Plans will also improve the quality of the receiving waters in the San Diego Region.

The Water Quality Improvement Plan is the backbone of the Regional MS4 Permit requirements. Provision B provides the guidance, criteria, and minimum expectations and requirements for the elements of the Water Quality Improvement Plan to be developed and implemented by the Copermittees. The Water Quality Improvement Plans will be implemented in the Watershed Management Area by the Copermittees within their jurisdictions through their jurisdictional runoff management programs.

The Water Quality Improvement Plan also incorporates a program to monitor and assess the progress of the Copermittees' jurisdictional runoff management programs toward improving the quality of discharges from the MS4s, as well as tracking improvements to the quality of receiving waters. A process to adapt and improve the effectiveness of the Water Quality Improvement Plans has also been incorporated into the requirements of Provision B to be consistent with the "iterative approach" required to achieve compliance with discharge prohibitions of Provisions A.1.a and A.1.c and receiving water limitations of Provision A.2.a, pursuant to the requirements of Provision A.4.

The Water Quality Improvement Plans have also been structured to incorporate the requirements of any TMDLs that have been adopted for the San Diego Region. Incorporating the requirements of the TMDLs into the requirements of Provision B allows the Copermittees to develop a single plan, instead of separate plans, to coordinate their non-storm water and storm water runoff management programs. The Water Quality Improvement Plans allow the Copermittees to meet the requirements of this Order, as well as fulfill the requirements of the TMDLs.

As an added benefit, if the Copermittees demonstrate that impaired water bodies within the Watershed Management Area listed on the 303(d) List will be addressed with their Water Quality Improvement Plans in a reasonable period of time, the San Diego Water Board may be able to remove the water bodies from the 303(d) List, which would greatly reduce the need for the San Diego Water Board to develop additional TMDLs that would have to be incorporated into the Order and implemented by the Copermittees.

***Discussion*:** The federal NPDES regulations require the Copermittees to develop a proposed management program (40 CFR 122.26(d)(2)(iv)). The proposed management program must include "*a comprehensive planning process*" and "*where necessary intergovernmental coordination*" for the "*duration of the permit.*" The Water Quality Improvement Plan is the Copermittees' "*comprehensive planning process*" document for the proposed management program that will be implemented within a Watershed Management Area. Implementation of the Water Quality Improvement Plan requires "*intergovernmental coordination*" among the Copermittees for at least the "*duration of the permit*," and likely into and beyond the next iteration of the permit.

Developing Water Quality Improvement Plans based upon watersheds is consistent with federal regulations that support the development of permit conditions, as well as implementation of storm water management programs, at a watershed scale (40 CFR 122.26(a)(3)(ii), 122.26(a)(3)(v), and 122.26(d)(2)(iv)). In 2003, USEPA issued a Watershed-Based NPDES Permitting Policy Statement (USEPA, 2003) that defines watershed-based permitting as an approach that produces NPDES permits that are issued to point sources on a geographic or watershed basis. In this policy statement, USEPA explains that "*[t]he utility of this tool relies heavily on a detailed, integrated, and inclusive watershed planning process*." USEPA identifies a number of important benefits of watershed permitting, including more environmentally effective results, the ability to emphasize measuring the effectiveness of targeted actions on improvements in water quality, reduced cost of improving the quality of the nation's waters and more effective implementation of watershed plans, including TMDLs, among others.

An emphasis on watersheds is appropriate at this stage in the San Diego Region's MS4 program to shift the focus to more targeted, water quality driven planning and implementation. Addressing discharges on a watershed scale focuses on water quality results by emphasizing the receiving waters in the watershed. The conditions of the receiving waters drive management actions, which in turn focus measures to address pollutant contributions from MS4 discharges.

The Water Quality Improvement Plan gives the Copermittees the responsibility of developing a comprehensive plan to coordinate the efforts of their jurisdictional runoff management programs for addressing the problems related to MS4 discharges causing impacts to water quality in the Watershed Management Area. The development of the plan provides the Copermittees the opportunity to provide

significant input on how to implement their jurisdictional runoff management programs, and how to best utilize their available resources in addressing a focused set of priorities that they believe will result in measureable improvements to water quality within the Watershed Management Area.

The Copermittees are encouraged to separate the Watershed Management Area into subwatersheds, as appropriate. This allows the Copermittees to identify priorities applicable to a subset of the Copermittees or specific water bodies or areas within the Watershed Management Area.

Included in the requirements for the elements to be included in the Water Quality Improvement Plan are monitoring and assessment requirements that are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order. In addition to the federal requirements of the CWA section 308(a) and 40 CFR 122.26(d), the San Diego Water Board has the authority to establish monitoring, reporting, and recordkeeping requirements for NPDES permits under CWC 13383.

More specific and detailed discussions of the requirements of Provision B are provided below.

Provision B.1 (Watershed Management Areas) requires the Copermittees to develop a Water Quality Improvement Plan for each of the Watershed Management Areas defined by the San Diego Water Board.

Pursuant to 40 CFR 122.26(d)(2)(iv), proposed management programs "*may impose controls on a…watershed basis…*" The Water Quality Improvement Plan is the Copermittees' proposed management program. A Water Quality Improvement Plan must be developed for each Watershed Management Area identified in the Order.

The Watershed Management Areas are identified in Table B-1. Table B-1 establishes ten (10) Watershed Management Areas, and identifies the Copermittees that are responsible for developing and implementing the Water Quality Improvement Plan for each Watershed Management Area.

The Copermittees from each of the three counties within the San Diego Region were phased in as their respective NPDES municipal storm water permits expired. Order No. R9-2007-0001 expired in January 2012, and the San Diego County Copermittees became covered under the Regional MS4 Permit on June 27, 2013, the effective date of the Order. Order No. R9-2009-0002 expired in December 2014, and the Orange County Copermittees became covered under the Regional MS4 Permit on April 1, 2015, the effective date of Order No. R9-2013-0001 as amended by Order No. R9-2015-0001. Order No. R9-2010-0016 expired in November 2015, and the Riverside County Copermittees became covered under the Regional MS4 Permit on January 7, 2016, the effective date of Order No. R9-2013-0001 as amended by Order No. R9-2015-0100.

The Cities of Laguna Woods, Laguna Hills, Murrieta, and Wildomar are located partially within the jurisdictions of both the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board) and the San Diego Water Board. Written requests for designation of a single Regional Water Board to regulate matters pertaining to permitting of Phase I MS4 discharges were submitted to the San Diego Water Board and the Santa Ana Water Board by the City of Laguna Woods by letter dated September 8, 2014, the City of Laguna Hills by letter dated March 12, 2014, the City of Murrieta by letter dated June 22, 2015, and the City of Wildomar by letter dated June 23, 2015. The Cities of Laguna Woods, Laguna Hills, Murrieta, and Wildomar requested designation of the San Diego Water Board pursuant to CWC section 13228.

The Cities of Laguna Woods, Laguna Hills, Murrieta, and Wildomar reported that management and implementation of municipal programs to comply with two different Phase I MS4 permits creates a significant administrative and financial burden and inhibits their ability to contribute to greater overall water quality improvements in either Region. In an effort to address these concerns, the San Diego Water Board and the Santa Ana Water Board have entered into written agreements, whereby the San Diego Water Board is designated to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Laguna Woods, Laguna Hills, Murrieta, and Wildomar including the portions of the jurisdictions within the Santa Ana Region. The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated February 10, 2015 to designate the San Diego Water Board to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Laguna Woods and Laguna Hills, including the portions of the jurisdictions within the Santa Ana Region, upon the later effective date of Order No. R9-2015-0001 or Santa Ana Water Board Tentative Order No. R8-2015-0001. The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated October 26, 2015 to designate the San Diego Water Board to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Murrieta and Wildomar, including the portions of the jurisdictions within the Santa Ana Region upon the effective date of Order R9-2015-0100.

Under the terms of the agreements, each Regional Water Board retains the authority to enforce provisions of the Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee (Water Code section 13228 (b)). Also under the terms of the agreements, any TMDL and associated MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Laguna Woods, Laguna Hills, Murrieta, or Wildomar as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement of the applicable TMDL would remain with the Regional Water Board which has jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's San Diego Creek/Newport Bay TMDL and Lake Elsinore/Canyon Lake Nutrient TMDLs, and the San Diego Water Board's Indicator Bacteria Project I Beaches and Creeks TMDL.

In conformance with the agreements, footnotes to Table B-1 are included to specify coverage under Order No. R9-2013-0001 for those Phase I MS4 discharges within the jurisdictional boundaries of the Cities of Laguna Woods, Laguna Hills, Murrieta, and Wildomar within the Santa Ana Region. Footnote 1 to Table B-1 specifies that the Cities of Laguna Woods and Laguna Hills are identified as responsible Copermittees in the San Diego Creek/Newport Bay TMDL in the Santa Ana Region and remain obligated to comply with the San Diego Creek/Newport Bay TMDL pursuant to section XVIII of Tentative Order No. R8-2015-0001 (NPDES No. CAS618030) and any reissuance thereof. Footnote 4 to Table B-1 specifies that the Cities of Murrieta and Wildomar are identified as responsible Copermittees in the Lake Elsinore/Canyon Lake Nutrient TMDLs in the Santa Ana Region and remain obligated to comply with the Lake Elsinore/Canyon Lake Nutrient TMDLs pursuant to section VI.D.2 of Order No. R8-2010-0033 (NPDES No. CAS618030) or corresponding section as it may be amended or reissued.

The Cities of Lake Forest and Menifee are located partially within the jurisdictions of both the Santa Ana Water Board and the San Diego Water Board. Written requests for designation of a single Regional Water Board to regulate matters pertaining to permitting of Phase I MS4 discharges were submitted to the San Diego Water Board and the Santa Ana Water Board by the City of Lake Forest by letters dated January 14, 2013 and April 4, 2014, and the City of Menifee by letter dated June 25, 2015. The Cities of Lake Forest and Menifee requested designation of the San Ana Water Board pursuant to CWC section 13228.

The Cities of Lake Forest and Menifee reported that management and implementation of municipal programs to comply with two different Phase I MS4 permits creates a significant administrative and financial burden and inhibits their ability to contribute to greater overall water quality improvements in either Region. In an effort to address these concerns, the San Diego Water Board and the Santa Ana Water Board have entered into written agreements, whereby the Santa Ana Water Board is designated to regulate Phase I MS4 discharges within the jurisdictions of the Cities of Lake Forest and Menifee including the portions of the jurisdictions within the San Diego Region. The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated February 10, 2015 to designate the San Ana Water Board to regulate Phase I MS4 discharges within the jurisdiction of the City of Lake Forest, including portions of the jurisdiction within the Santa Diego Region, upon the later date of Order No. R9-2015-0001 or Santa Ana Water Board Tentative Order No. R8-2015-0001. The San Diego Water Board and the Santa Ana Water Board entered into an agreement dated October 26, 2015 to designate the San Ana Water Board to regulate Phase I MS4 discharges within the jurisdiction of the City of Menifee, including portions of the jurisdiction within the San Diego Region, under Order No. R8-2010-0033 (NPDES No. CAS618030) as it may be amended or reissued upon the effective date of Order No. R9-2015-0100.

Under the terms of the agreements, each Regional Water Board retains the authority to enforce provisions of the Phase I MS4 permits issued to each city but compliance will be determined based upon the Phase I MS4 permit in which a particular city is regulated as a Copermittee (Water Code section 13228 (b)). Also under the terms of the agreements, any TMDL and associated Phase I MS4 permit requirements issued by the San Diego Water Board or the Santa Ana Water Board which include the Cities of Lake Forest or Menifee as a responsible party, will be incorporated into the appropriate Phase I MS4 permit by reference. Enforcement authority for the applicable TMDL would remain with the Regional Water Board which has the jurisdiction over the targeted impaired water body. Applicable TMDLs subject to the terms of the agreement include, but are not limited to, the Santa Ana Water Board's San Diego Creek/Newport Bay TMDL and Lake Elsinore/Canyon Lake Nutrient TMDLs, and the San Diego Water Board's Indicator Bacteria Project I Beaches and Creeks TMDL.

In conformance with the agreements, Footnote 2 to Table B-1 has been included to specify that Phase I MS4 discharges within the jurisdictional boundaries of the City of Lake Forest located within the San Diego Region will be regulated under Santa Ana Water Board Order No. R8-2015-0001 (NPDES No. CAS618030) and any reissuance thereof. The footnote specifies that the City of Lake Forest is an identified responsible Copermittee in the Indicator Bacteria Project I Beaches and Creeks TMDL (Bacteria TMDL) in the San Diego Region and remains obligated to comply with the Bacteria TMDL pursuant to Attachment E of Order No. R9-2013-0001 and any reissuance thereto. The City of Lake Forest is also identified as a responsible Copermittee in the San Diego Creek/Newport Bay TMDL established by the Santa Ana Water Board. The City remains obligated to comply with the San Diego Creek/New Port Bay TMDL pursuant to the Santa Ana Water Board's Phase I MS4 Permit (Tentative Order No. R8-2015-0001 (NPDES No. CAS618030), as it may be amended or reissued). Under the terms of the agreement, the City of Lake Forest must retain and continue implementation of the over irrigation prohibition in Title 15, Chapter 15, Section 14.030, List (b) of the City Municipal Code throughout its jurisdiction. Also under the terms of the agreement, the City of Lake Forest must actively participate in the development and implementation of the South Orange County Watershed Management Area Water Quality Improvement Plan required pursuant to Order No. R9-2013-0001, and any reissuance thereof.

Footnote 3 to Table B-1 has been included to specify that Phase I MS4 discharges within the jurisdictional boundaries of the City of Menifee located within the San Diego Region will be regulated under Santa Ana Water Board Order No. R8-2010-0033 (NPDES No. CAS618033) and any reissuance thereof. At this time, the City of Menifee is not identified as a responsible Copermittee for any TMDLs established by the San Diego Water Board. Under the terms of the agreement, the City of Menifee must actively participate in the development and implementation of the Santa Margarita River Watershed Management Area Water Quality Improvement Plan required pursuant to Order No. R9-2013-0001, and any reissuance thereof.

The basis supporting the Cities of Laguna Woods, Laguna Hills, Lake Forest, Menifee, Murrieta, and Wildomar requests to designate a specific Regional Water Board for regulatory oversight of Phase I MS4 discharges may change under future conditions and circumstances, therefore the San Diego Water Board will periodically review the effectiveness of the agreements during each MS4 permit reissuance. Based on this periodic review the San Diego Water Board may terminate one or both of the agreements with the Santa Ana Water Board or otherwise modify the agreements subject to the approval of the Santa Ana Water Board.

Provision B.2 (Priority Water Quality Conditions) requires the Copermittees in each Watershed Management Area to identify the highest priority water quality conditions which will be the focus of the Water Quality Improvement Plan implementation.

Provisions B.2.a and B.2.b provide the criteria that must be assessed when characterizing the receiving water quality and potential impacts from MS4 discharges of the receiving waters within the Watershed Management Area. The criteria are based primarily on the requirements in 40 CFR 122.26(d)(1)(iv)(C) and (C)(1)-(9). Characterizing the receiving water quality and identifying the potential impacts caused by MS4 discharges to receiving waters in the Watershed Management Area is necessary to identify the impacts to receiving waters associated with MS4 discharges that are of the most concern to the Copermittees.

Based on the information required to be considered under Provisions B.2.a and B.2.b, Provision B.2.c requires to Copermittees to identify the highest priority water quality conditions related to discharges from the MS4s that will be the primary focus of the Water Quality Improvement Plan in the Watershed Management Area. Addressing and improving these highest priority water quality conditions will become the focus of each Copermittee's jurisdictional runoff management program as the Water Quality Improvement Plan is implemented in the Watershed Management Area. The highest priority water quality conditions are expected to include sources of pollutants and/or stressors, and/or receiving water conditions, that the Copermittees consider the highest threats or most likely to have adverse impacts on the physical, chemical, and biological integrity of receiving waters. Addressing these threats and/or adverse impacts should restore the physical, chemical, and biological integrity of receiving waters, and result in the restoration and protection of the beneficial uses of the receiving waters in the Watershed Management Area.

Provision B.2.d requires the Copermittees to identify known and suspected sources of pollutants and/or stressors contributing to the highest priority water quality conditions. The requirements of Provision B.2.d are based primarily on the requirements in 40 CFR 122.26(d)(1)(iii)(B)(1)-(6). The Copermittees are required to evaluate several factors in the identification of those sources. The Copermittees must consider and evaluate the following: (1) the land uses that may contribute toward impacts to receiving waters, (2) the locations of the Copermittees' MS4s that can convey and discharge runoff and pollutants to receiving waters, (3) other sources that discharge

into the Copermittees' MS4s and receiving waters, and (4) other information and data that can help the Copermittees to evaluate the relative importance of or contribution from those sources toward the highest priority water quality conditions. Identifying the known and suspected sources, and their relative contribution toward the highest priority water quality conditions, will help the Copermittees to focus, direct, and prioritize their resources and implementation efforts within their jurisdictions.

Provision B.2.e requires the Copermittees to identify potential strategies that can result in improvements to water quality in MS4 discharges and/or receiving waters within the Watershed Management Area. Potential water quality improvement strategies will not necessarily be implemented by the Copermittees, but provide a "menu" of options that the Copermittees will consider for implementation. The public participation process that will be implemented during the development of the Water Quality Improvement Plan is where the potential water quality improvement strategies will be identified.

Provision B.3 (Water Quality Improvement Goals, Strategies and Schedules) requires the Copermittees in each Watershed Management Area to identify the goals that the Copermittees' jurisdictional runoff management programs will work toward achieving to address and improve the highest priority water quality conditions identified under Provision B.2.c; the strategies that will be implemented by the Copermittees within their jurisdictions and the Watershed Management Area to achieve the goals; and, the schedules for implementing the strategies and achieving the goals. The element of the Water Quality Improvement Plan required under Provision B.3 is where the "*comprehensive planning*" and "*intergovernmental coordination*" [40 CFR 122.26(d)(2)(iv)] of the Copermittees' actions for the proposed management programs within the Watershed Management Area is required to be described.

Provision B.3.a requires the Copermittees to identify interim and final numeric goals, and schedules to achieve those goals as part of the Water Quality Improvement Plans. Provision B.3.a.(1) requires the Copermittees to identify two types of numeric goals to be achieved:

(1) Final numeric goals in the receiving waters and/or MS4 discharges that will result in the protection of the water quality standards of the receiving waters for the highest priority water quality conditions identified by the Copermittees for Provision B.2.c. These final numeric goals are the ultimate goals for the Water Quality Improvement Plan, and the achievement and maintenance of these final numeric goals will indicate that one or more beneficial uses have been successfully restored and/or protected from MS4 discharges.

(2) Interim numeric goals that can be used by the Copermittees to demonstrate progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges for the highest priority water quality conditions in the Watershed Management Area. Achievement of the interim numeric goals will demonstrate to the San Diego Water Board that the Copermittees' implementation efforts are progressing toward achieving the final numeric goals.

Provision B.3.a.(1) does not specify what the interim and final numeric goals must be based on, but they essentially must be designed to achieve compliance with water quality standards in the receiving waters. To that end, the interim goals must be based on measureable criteria or indicators capable of demonstrating progress toward achieving the numeric goals.

The interim and final numeric goals can be based on the water quality objectives in the Basin Plan. The water quality objectives in the Basin Plan, however, consist of numeric and narrative water quality objectives. Numeric water quality objectives can be directly used as numeric goals. Narrative water quality objectives, on the other hand, will require some interpretation to identify numeric goals. The achievement of multiple numeric goals based on the water quality objectives, used in combination, may be necessary to demonstrate that beneficial uses have been restored and/or protected.

The Copermittees could also propose other numeric goals that are not necessarily water quality objectives from the Basin Plan. For example, the Copermittees could propose a numeric goal that consists of achieving some percent improvement of a measureable indicator, such as acreage of a specific habitat or increase in a specific plant or animal species population. Other examples may include pollutant load reductions, number of impaired waterbodies delisted from the List of Water Quality Impaired Segments, Index of Biological Integrity (IBI) scores, etc.

The Copermittees may choose to develop interim numeric goals based on the final numeric goals they develop, such as incremental steps toward ultimately achieving the final numeric goals. The Copermittees may also choose to develop interim numeric goals that are based on other measureable indicators that can indirectly indicate improvements and progress toward the final numeric goals.

There are no limits to the types of interim numeric goals that could be proposed by the Copermittees, other than the goals must be based on measureable criteria or indicators capable of demonstrating progress toward achieving the numeric goals. Likewise, there are no limits to the types of final numeric goals that could be proposed by the Copermittees, other than the goals must "*restore and protect the water quality standards of the receiving waters.*"

Finally, Provision B.3.a.(2) also requires the Copermittees to develop schedules for measuring progress and achieving the interim and final numeric goals. Several criteria are included for the development of the schedules, but the Copermittees are required to achieve the numeric goals as soon as possible, consistent with federal NPDES regulations (40 CFR 122.47(a)(1)).

The Copermittees are also required to incorporate any compliance schedules for applicable ASBS or TMDL requirements. Applicable ASBS and TMDL compliance schedules are set forth in Attachment A and Attachment E to the Order, respectively.

The information provided by the Copermittees under Provision B.3.a.(2) will be used by the Copermittees and the San Diego Water Board to gauge and track the progress of the Copermittees' efforts in addressing the highest priority water quality conditions identified in the Water Quality Improvement Plan.

Provision B.3.b requires the Copermittees to identify the strategies and schedules to implement those strategies as part of the Water Quality Improvement Plans. Provision B.3.b requires the Copermittees to identify the water quality improvement strategies that will be and may be implemented within the Watershed Management Area to 1) reduce pollutants in storm water discharged from the MS4 to the MEP, 2) effectively prohibit non-storm water discharges from entering the MS4, 3) protect water quality standards in receiving waters by controlling MS4 discharges so that they do not cause or contribute to exceedances of receiving water limitations, and 4) achieve applicable WQBELs that implement TMDLs. The Copermittees will select the strategies to be implemented based on the likely effectiveness and efficiency of the potential water quality improvement strategies identified under Provision B.2.e to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, and/or achieve the interim and final numeric goals identified under Provision B.3.a.

Provision B.3.b.(1) requires each Copermittee to identify the strategies that will be or may be implemented within its jurisdiction. Each Copermittee is required to describe the strategies it is committed to implementing as part of its jurisdictional runoff management requirements under Provisions E.2 through E.7, and the optional jurisdictional strategies that the Copermittee will implement, as necessary, to achieve the numeric goals.

Each Copermittee is expected to implement the optional jurisdictional strategies identified under Provisions B.3.b.(1)(b) when the jurisdictional strategies it has committed to implement under Provision B.3.b.(1)(a) are not making adequate progress toward the interim and final numeric goals in accordance with the schedules established under Provision B.3.a. Provision B.3.b.(1)(b)(v) requires each Copermittee to describe the circumstances necessary to trigger implementation of the optional jurisdictional strategies, in addition to the requirements of Provisions B.3.b.(1)(a).

The San Diego Water Board recognizes that there may be optional jurisdictional strategies that will likely require funding and/or resources for planning, permitting, procurement of labor and materials, and implementation. Thus, Provision B.3.b.(1)(b)(iv) requires each Copermittee to describe the funding and/or resources that are necessary to implement these optional jurisdictional strategies. This information may provide interested groups and members of the public an understanding of the resources that they could provide or assist in obtaining to implement these optional jurisdictional strategies.

Provision B.3.b.(2) requires the Copermittees in the Watershed Management Area to identify the regional or multi-jurisdictional strategies that may be implemented, as necessary, to achieve the numeric goals. Similar to the requirements of Provision B.3.b.(1)(b), these regional or multi-jurisdictional strategies will likely require funding and/or resources for planning, permitting, procurement of labor and materials, and implementation, and San Diego Water Board recognizes that these strategies may be difficult to implement with only Copermittee resources. Thus, Provision B.3.b.(2)(d) requires the Copermittees to describe the funding and/or resources necessary to implement these optional regional or multi-jurisdictional strategies. This information may provide interested groups and members of the public an understanding of the resources that they could provide or assist in obtaining to implement these optional regional or multi-jurisdictional strategies.

Provision B.3.b.(3) requires the Copermittees to develop and include schedules in the Water Quality Improvement Plan for implementing the water quality improvement strategies identified under Provisions B.3.b.(1) and B.3.b.(2). The schedule for implementing the water quality improvement strategies will be used by the Copermittees and San Diego Water Board to measure and demonstrate the progress of the Copermittees' implementation efforts toward reducing pollutants in storm water discharged from the MS4 to the MEP, and eliminating illicit non-storm water discharges from entering the MS4.

Provision B.3.b.(4) provides the Copermittees in each Watershed Management Area the option of implementing watershed-specific structural BMP requirements for Priority Development Projects. Historically, storm water permits have included very specific performance standards for permanent, structural BMPs. These standards describe the expectation for the capture or treatment of pollutants and control of excessive flow before storm water is discharged from a site. The Copermittees were also allowed to develop waiver programs for Priority Development Projects to avoid implementing the structural BMPs; however, the waiver programs were not necessarily tied into any sort of holistic watershed strategy. The result is that implementation of BMP requirements is largely done on a site-by-site basis. This requires proper design on the part of the Priority Development Project and strict oversight on the part of the Copermittee.

Provision B.3.b.(4) promotes the evaluation of multiple strategies for water quality improvement, in addition to the implementation of permanent structural BMPs, on a watershed-scale versus the site-by-site approach. In a report issued by the Southern California Coastal Water Research Project (SCCWRP) and several other research institutions, the report emphasized that a successful hydromodification management program will involve watershed analysis as a first step, and that integrating multiple watershed-based strategies is preferable over a site-by-site approach. Indeed, the report states that the watershed analysis "…*should lead to identification of existing opportunities and constraints that can be used to help prioritize areas of greater concern, areas of restoration potential, infrastructure constraints, and pathways for*

potential cumulative effects."[22] Provision B.3.b.(4) promotes the findings and recommendations of the report by providing a pathway for Copermittees to develop an integrated approach to their land development programs.

Under Provision B.3.b.(4), the Copermittees in a Watershed Management Area must first perform an analysis by gathering as much information pertaining to the physical characteristics of the Watershed Management Area as possible. This includes, for example, identifying potential areas of coarse sediment supply, present and anticipated future land uses, and locations of physical structures within receiving streams and upland areas that affect the watershed hydrology (such as bridges, culverts, and flood management basins). Once this information is collected, the Copermittees must produce GIS layers (maps) that include this information.

From there, the Copermittees must use the results of the Watershed Management Area Analysis to identify and compile a list of candidate projects that could potentially be used as alternative compliance options for Priority Development Projects. Such projects include, for example, opportunities for stream or riparian area rehabilitation, opportunities for retrofitting existing infrastructure to incorporate storm water retention or treatment, and opportunities for regional BMPs, among others. Once these candidate projects are identified, Copermittees may allow Priority Development Projects to fund, partially fund, or completely implement these candidate projects. The Copermittees must first find that implementing such a candidate project would provide greater overall benefit to the watershed than requiring implementation of the structural BMPs onsite, and also enter into a voluntary agreement with the Priority Development Project that authorizes this arrangement. The Copermittees may use Provision B.3.b.(4) as both 1) a mechanism to reach their stated goals of the Water Quality Improvement Plan by using Priority Development Projects to either fund or implement projects that will provide water quality benefit, and 2) an alternative to requiring strict adherence to the structural BMP design standards.

Additionally, Provision B.3.b.(4) allows the Copermittees to use the results of the Watershed Management Area Analysis to identify areas within the Watershed Management Area where it is appropriate to allow Priority Development Projects to be exempt from the hydromodification management BMP performance requirements. Provision E.3.c.(2) already allows exemptions for Priority Development Projects that discharge to a conveyance channel whose bed and bank are concrete lined from the point of discharge to an enclosed embayment or the Pacific Ocean. However, there may be cases where further exemptions are warranted. The Copermittees may identify such cases on a watershed basis and include them in the Watershed Management Area Analysis; however, they must provide the supporting rationale to support all claims for exemptions.

[22] 2012. ED Stein, F Federico, DB Booth, BP Bledsoe, C Bowles, Z Rubin, GM Kondolf, A Sengupta. Technical Report 667. Southern California Coastal Water Research Project. Costa Mesa, CA.

Provision B.3.b.(4) provides an innovative pathway for Copermittees to regulate their land development programs by allowing alternative compliance in lieu of implementing structural BMPs on each and every Priority Development Project. This approach facilitates the integration of watershed-scale solutions for improving overall water quality and assisting Copermittees to achieve their stated goals of the Water Quality Improvement Plan. The San Diego Water Board understands, however, that undertaking this approach, which involves extensive planning, could be resource intensive for the Copermittees. Therefore, the Watershed Management Area Analysis is optional and not a requirement. The Copermittees can choose not to perform the watershed planning and mapping exercise described in Provision B.3.b.(4), and instead choose to require strict implementation of the structural BMPs onsite, pursuant to Provision E.3.c.

Provision B.3.c is included to provide the Copermittees an option that allows the Copermittees to be deemed in compliance with the prohibitions and limitations (receiving water limitations) of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b. One or more Copermittees within a Watershed Management Area can choose to implement this option. This option is only expected to be utilized by a Copermittee that wishes to be deemed in compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b.

The alternative compliance pathway option included in Provision B.3.c is consistent with the approach described in Order WQ 2015-0075, *In the Matter of Review of Order No. R4-2012-0175, NPDES Permit No. CAS004001, Waste Discharge Requirements for Municipal Separate Storm Sewer System (MS4) Discharges within the Coastal Watersheds of Los Angeles County, Except Those Discharges Originating from the City of Long Beach MS4,* adopted by the State Water Board on June 16, 2015. State Water Board Order WQ 2015-0075 directs the Regional Water Boards to consider a watershed-based planning and implementation approach to compliance with receiving water limitations when issuing Phase I MS4 permits going forward. Order WQ 2015-0075 included seven principles that the Regional Water Boards are expected to follow when incorporating an alternative compliance pathway into a MS4 permit. The San Diego Water Board incorporated the seven principles stipulated in State Water Board Order WQ 2015-0075 into the Regional MS4 Permit as follows:

1. Provision A of this Order continues to require compliance with water quality standards in the receiving water and does not deem good faith engagement in the iterative process to constitute compliance with receiving water limitations. Provision A of this Order continues to be consistent with the receiving water limitations provisions from State Water Board Order WQ 99-05.

2. Compliance with Provision B.3.c constitutes compliance with the requirements of the Provision A.3.b, which requires compliance with the WQBELs of the TMDLs in Attachment E to the Order, and is considered compliance with receiving water limitations for those TMDL water body-pollutant combinations.

3. Provision B.3.c is an ambitious, rigorous, and transparent alternative compliance pathway that allows a Copermittee appropriate time to come into compliance with receiving water limitations without being in violation of the receiving water limitations during implementation of the compliance alternative.

4. Provision B.3.c requirements are incorporated into a Water Quality Improvement Plan. Water Quality Improvement Plans are a watershed-based planning and implementation approach, which address multiple contaminants, and incorporate TMDL requirements.

5. The strategies required to be included in the Water Quality Improvement Plans promote and incentivize the use of green infrastructure and requires the implementation of low impact development principles.

6. The strategies required to be included in the Water Quality Improvement Plans encourage multi-benefit regional projects that capture, infiltrate, and reuse storm water and support a local sustainable water supply.

7. The alternative compliance pathway of Provision B.3.c includes rigor and accountability. The Copermittee is required, through a transparent public process, to demonstrate that water quality issues in the watershed have been analyzed and prioritized, and that appropriate solutions are proposed. The Copermittee is also required, through a transparent process, to monitor the results and return to their analysis to verify assumptions and update the solutions. The Copermittee is required to conduct this type of adaptive management on its own initiative without waiting for direction from the San Diego Water Board.

In order for a Copermittee to utilize this option, the Copermittee is required to include three components in the Water Quality Improvement Plan. The first component is a comprehensive set of numeric goals and schedules that will demonstrate the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b will be achieved within a specified period of time. The criteria provided in the Order will require the Copermittee to demonstrate that the discharges from its MS4s will not cause or contribute to exceedances of water quality objectives in the receiving waters, and/or the receiving waters will be adequately protected from adverse impacts attributable to the Copermittee's MS4 discharges. The Copermittee is also required to specify annual milestones to be achieved each year, which adds rigor, accountability, and transparency to the process. The annual milestones may consist of water quality improvement strategy implementation phases, interim numeric goals, and other acceptable metrics, which are expected to build upon previous milestones and lead to the achievement of the final numeric goals.

The second component is an analysis to demonstrate that implementation of the water quality improvement strategies required under Provision B.3.b will achieve the numeric goals within the established schedules required under Provisions B.3.a and B.3.c.(1).

Because the development of the analysis may require significant resources, the Order allows the Copermittees in each Watershed Management Area that choose to implement this option to perform the analysis individually, or pool their resources for the analysis collectively.

The analysis must “reasonably” and “quantitatively” demonstrate that the implementation of the water quality improvement strategies can achieve the numeric goals within the established schedules. However, as more data and information are collected during implementation of the Water Quality Improvement Plan to demonstrate progress toward achieving the numeric goals, the numeric goals, water quality improvement strategies and schedules may need to be modified. If the data and information indicate that modification is needed, the Copermittee must also update the analysis. With the exception of numeric goals and schedules associated with TMDLs from Attachment E to the Order, the modification to the analysis would be allowed as part of the adaptive management process of the Water Quality Improvement Plan. For TMDLs, modification of numeric goals or schedules would likely require an amendment to the Basin Plan and Attachment E to the Order before the analysis and Water Quality Improvement Plan could include such modifications.

Thus, the third component is the key component that allows a Copermittee to demonstrate the implementation of the water quality improvement strategies within its jurisdiction is making progress toward achieving the final numeric goals. Each Copermittee must specify the monitoring and assessments that will be performed to confirm that implementation of the water quality improvement strategies are making progress toward achieving the numeric goals within the established schedules, and whether the interim and final numeric goals have been achieved.

These three components must then be reviewed by the Water Quality Improvement Consultation Panel. The Water Quality Improvement Consultation Panel is required to be formed as part of the public participation process for the development of the Water Quality Improvement Plans. The Water Quality Improvement Consultation Panel is described under Provision F.1.a.(1)(b). Review by the Water Quality Improvement Consultation Panel is included to provide an additional layer of input, support, and accountability for the implementation of this option.

Compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b begins when the Water Quality Improvement Plan, incorporating the requirements of Provision B.3.c.(1), is accepted by the San Diego Water Board. Each Copermittee that chooses to implement and continues to implement this option will be deemed in compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b as long as the Copermittee continues to implement the strategies, monitoring and assessments as incorporated in the Water Quality Improvement Plan in accordance with Provision B.3.c.(1), and the Copermittee reports the achievement of the annual milestones each year, or provides acceptable rationale and recommends appropriate modifications to the interim numeric goals, and/or water quality improvement

strategies, and/or schedules to improve the rate of progress toward achieving the final numeric goals. The Copermittee continues to be deemed in compliance with the requirements of Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b during the time the San Diego Water Board reviews the rationale and recommended modifications to the interim numeric goals, and/or water quality improvement strategies, and/or schedules. If and when the San Diego Water Board determines that it does not accept the rationale or recommendations, the Copermittee will be notified they are no longer deemed in compliance with Provisions A.1.a, A.1.c, A.1.d, A.2, and A.3.b.

Provision B.4 (Water Quality Improvement Monitoring and Assessment) requires the Copermittees to develop an integrated monitoring and assessment program to track the progress of the Water Quality Improvement Plan toward meeting the implementation goals and schedules, and improving the water quality of the Watershed Management Area. Provision B.4 is the part of the Water Quality Improvement Plan where the Copermittees describe the monitoring data that will be collected, which is not only necessary to implement the "iterative approach" required by Provision A.4, but inform the adaptive management and "*comprehensive planning process*" that allows the Copermittees to make adjustments and modifications to the Water Quality Improvement Plans and the jurisdictional runoff management programs.

Provision B.4 requires the Copermittees, at a minimum, to include the requirements of Provision D as part of the water quality improvement monitoring and assessment program for the Water Quality Improvement Plan. The Copermittees, however, are not limited to the requirements of Provision D and may include additional monitoring and assessment methods to track progress toward improving water quality in the Watershed Management Area.

In addition to incorporating the requirements of Provision D, the water quality improvement monitoring and assessment program must incorporate any monitoring and assessment requirements specified for any applicable TMDLs included in Attachment E to the Order, and the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 for Watershed Management Areas with ASBS.

The monitoring and assessments required to be incorporated into the Water Quality Improvement Plan are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order.

Provision B.5 (Iterative Approach and Adaptive Management Process) requires the Copermittees to implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management programs to become more effective toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a.

Provision B.5 requires the Copermittees in each Watershed Management Area to re-evaluate the highest priority water quality conditions and potential water quality

improvement strategies, the water quality improvement goals, strategies and schedules, and the water quality improvement monitoring and assessment program and provide recommendations for modifying those elements to improve the effectiveness of the Water Quality Improvement Plan. The re-evaluation of the Water Quality Improvement Plan is part of the assessment requirements of Provision D.

Provision B.6 (Water Quality Improvement Plan Submittal, Updates, and Implementation) requires to Copermittees to submit, update, and implement the Water Quality Improvement Plans.

The requirements for the process to develop and submit the Water Quality Improvement Plans is described in more detail under the discussion for Provision F.1. The process will include several opportunities for the public to provide input during the development of the Water Quality Improvement Plans. The process for updating the Water Quality Improvement Plans is described in more detail under the discussion for Provision F.3.c. Upon acceptance of the Water Quality Improvement Plan and updates, the Copermittees are required to immediately begin implementing the Water Quality Improvement Plan and subsequent updates.

The Water Quality Improvement Plan is expected to be a dynamic document that will evolve over time. The Water Quality Improvement Plan is also expected to be a long term plan that focuses the Copermittees' efforts and resources on a limited set of priority water quality conditions, with the ultimate goal of protecting all the beneficial uses of the receiving waters within the Watershed Management Area from impacts that may be caused or contributed to by MS4 discharges. As the Copermittees collect data, implement their jurisdictional runoff management programs, and review the results from their water quality improvement monitoring and assessment program, the Water Quality Improvement Plan is expected to be continually reviewed and updated until compliance with Provisions A.1.a, A.1.b, and A.2.a is achieved.

However, in specific cases supported by robust analytical documentation the implementation of the Water Quality Improvement Plans may demonstrate that TMDLs are not necessary for identified impaired water bodies within the Watershed Management Area if the analytical record demonstrates that technology-based effluent limitations required by the CWA, more stringent effluent limitations required by state, local, or federal authority, and/or other pollution control requirements (e.g., best management practices) required by local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time.[23]

The San Diego Water Board submits an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region.

[23] 40 CFR 130.7(b)(1)

According to USEPA guidance for the Integrated Report,[24] water bodies are placed in one of five categories. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 are placed on the 303(d) List.

Category 4 in the Integrated Report is for water bodies where available data and/or information indicate that at least one beneficial use is not being supported or is threatened, but a TMDL is not needed.[25] Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

Impaired water bodies can be included in Category 4a if a TMDL has been adopted and approved. The TMDLs in Attachment E to the Order implement the requirements of the TMDLs adopted by the San Diego Water Board, and approved by the State Water Board and USEPA. The water bodies in Attachment E will be included in Category 4a in the Integrated Report and removed from the 303(d) List.

Impaired water bodies can be included in Category 4b if there are *acceptable* "pollution control requirements" required by a local, state or federal authority stringent enough to implement applicable water quality standards within a reasonable period of time (e.g., a compliance date is set). When evaluating whether a particular set of pollution controls are "requirements," the USEPA considers a number of factors, including: (1) the authority (local, state, federal) under which the controls are required and will be implemented with respect to sources contributing to the water quality impairment (examples may include: self-executing state or local regulations, permits, and contracts and grant/funding agreements that require implementation of necessary controls), (2) existing commitments made by the sources and completion or soon to be completed implementation of the controls (including an analysis of the amount of actual implementation that has already occurred), (3) the certainty of dedicated funding for the implementation of the controls, and (4) other relevant factors as determined by USEPA depending on case-specific circumstances.[26]

Impaired water bodies can be included in Category 4c if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution. Pollution, as defined by the CWA is "the man-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of water."[27] In

[24] USEPA, 2005. Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act
[25] Ibid
[26] Ibid
[27] CWA section 502(19)

other cases, pollution does not result from a pollutant and a TMDL is not required. Examples of circumstances where an impaired segment may be placed in Category 4c include segments impaired solely due to lack of adequate flow, stream channelization, or hydromodification. In these situations, there may be water quality management actions that can address the cause(s) of the impairment, but a TMDL may not be required to implement the actions.

The Water Quality Improvement Plans will require the implementation of pollution controls and water quality management actions (i.e. water quality improvement strategies) which can result in the attainment of water quality standards in water bodies impaired by discharges from the Copermittees' MS4s. The Water Quality Improvement Plans also include requirements that are expected to attain water quality standards in a reasonable period of time. The San Diego Water Board considers the Water Quality Improvement Plans to be a commitment by the Copermittees to develop, plan, budget for, and implement pollution controls that will attain water quality standards in receiving waters in a reasonable period of time, or as soon as possible. The results of the Copermittees' efforts in implementing the Water Quality Improvement Plans can be used to re-evaluate the condition of the impaired water bodies during the next update to the 303(d) List.

After the Copermittees submit the Water Quality Improvement Plans and demonstrate that water quality standards are being attained or will be attained in a reasonable period of time, the San Diego Water Board may re-evaluate the water bodies on the 303(d) List. These water bodies on the 303(d) List may be re-evaluated and placed into Category 4b or Category 4c in the Integrated Report. The water bodies placed in Category 4b or Category 4c in the Integrated Report must show a record that the water bodies are attaining water quality standards or supporting the identified beneficial uses, or will attain water quality standards or support identified beneficial uses in a reasonable period of time, in order for the water bodies to be appropriately removed from the 303(d) List.

C. Action Levels

Purpose: Provision C includes requirements for the Copermittees to identify and include numeric action levels in the Water Quality Improvement Plan to direct and focus the Copermittees' jurisdictional runoff management program implementation efforts for controlling MS4 discharges to receiving waters.

***Discussion*:** Under Provision C, the numeric action levels required are for non-storm water discharges and storm water discharges. The non-storm water action levels (NALs) are applicable to non-storm water discharges from the Copermittees' MS4s, which can occur year-round. The storm water action levels (SALs) are applicable to storm water discharges from the Copermittees' MS4s, which occur during the rainy season defined as the period between October 1 and April 30.

The action levels required by Provision C are based on the action level requirements that were developed and incorporated into Order Nos. R9-2009-0002 and R9-2010-0016, the Orange County and Riverside County MS4 Permits, respectively. The Fact Sheets for these Orders provide detailed discussions about the development of the numeric NALs and SALs included in this Order.

Order Nos. R9-2009-0002 and R9-2010-0016 required the Copermittees to perform prescribed actions if the NALs or SALs are exceeded. The actions required under Order Nos. R9-2009-0002 and R9-2010-0016 generally included conducting additional monitoring and source investigations when a discharge from the MS4 is observed to exceed one or more NALs and/or SALs.

For this Order, however, the action levels of Provision C are to be used by the Copermittees to prioritize the actions to be implemented as part of the Water Quality Improvement Plan. Monitoring data collected by the Copermittees from MS4 outfalls will be compared with the NALs and SALs. Exceedances of the NALs and SALs will not require the Copermittees to immediately identify sources causing exceedances, but will provide some numeric indicator levels that can give the Copermittees a way to measure the relative severity of a pollutant contributing to receiving water quality impacts.

NALs and SALs must be included in the Water Quality Improvement Plans to be used by the Copermittees in directing and focusing their water quality improvement strategies. The Copermittees are expected to utilize the NALs and SALs to help focus their implementation efforts on addressing pollutants that have the most significant potential or observed impacts to receiving waters. The NALs and SALs will be used as part of the MS4 discharges assessments required under Provision D.4.b. The NALs and SALs may also be used by the Copermittees as the numeric goals to be achieved in MS4 discharges and/or receiving waters as the Water Quality Improvement Plans are implemented.

More specific and detailed discussions of the requirements of Provision C are provided below.

Provision C.1 (Non-storm Water Action Levels) requires the Copermittees to incorporate NALs into the Water Quality Improvement Plan for pollutants and/or constituents that are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions identified in the Water Quality Improvement Plan related to non-storm water discharges from the MS4s. NALs generally must be consistent with the water quality objectives found within the Basin Plan.

The NALs have been included to ensure that the Copermittees are implementing and complying with several requirements of the MS4 permit. The federal CWA requires permits for municipal storm sewer systems to "*effectively prohibit non-storm water discharges into the storm sewers*." The federal NPDES regulations, which were promulgated to implement the CWA requirements for discharges from municipal storm sewers, require a program to address illicit discharges, which are non-storm water discharges. Provision A.1.b prohibits "*[n]on-storm water discharges into MS4s*" unless the non-storm water discharge authorized by a separate NPDES permit. The NALs will be used as part of the illicit discharge detection and elimination program required pursuant to Provision E.2, as well as part of the MS4 discharges assessments required pursuant to Provision D.4.b.

Provision A.1.a prohibits non-storm water discharges from the MS4 from "*causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state.*" In addition, pursuant to Provision A.2.a, non-storm water discharges "*must not cause or contribute to the violation of water quality standards in any receiving waters*."

Ideally, the Copermittees' jurisdictional runoff management programs will eliminate all non-storm water discharges entering the MS4s within their jurisdictions. The complete elimination of non-storm water discharges to the Copermittees' MS4s would be in compliance with the CWA requirements for non-storm water discharges, as well as the prohibitions and limitations of Provisions A.1.a and A.2.a.

The federal regulations, however, also refer to several non-storm water discharge categories that must be addressed as illicit discharges if they are found to be a source of pollutants. The federal regulations thus identify some non-storm water discharges that are not required to be addressed as illicit discharges if they are not a source of pollutants (e.g. non-storm water discharges specified in Provisions E.2.a.(1)-(5)). Thus, these regulations imply that some non-storm water discharges into and from the MS4 may occur even if non-storm water discharges are "effectively" prohibited by the Copermittees.

If the source of a non-storm water discharge is identified as a category of non-storm water specified in Provisions E.2.a.(1)-(5), the NALs can be used to determine if the category of non-storm water discharges is a source of pollutants. For other non-storm water discharges not specified in Provisions E.2.a.(1)-(5), the CWA requires those discharges to be "*effectively"* prohibited by removing the discharge to the MS4 through enforcement of the Copermittees' legal authority established under "*ordinance, order or similar mean*s" to prohibit illicit discharges to the MS4s.

If there are non-storm water discharges that are not required to be addressed as illicit discharges, those discharges must comply, at a minimum, with the discharge prohibitions and receiving water limitations of Provision A. Thus, the non-storm water discharges from the MS4 must be at levels that will not cause or contribute to a condition of pollution, contamination, or nuisance (Provision A.1.a), and must not cause or contribute to a violation of water quality standards in receiving waters (Provision A.2.a) to be consistent with the discharge prohibitions and receiving water limitations of Provisions A.1.a and A.2.a.

Furthermore, the San Diego Region has predominantly intermittent and ephemeral rivers and streams which vary in flow volume and duration at spatial and temporal scales. For most of these river and stream systems, non-storm water discharges from the MS4 are likely to be the most significant or the only source contributing to surface flows present within the receiving water, especially during the dry season.

Therefore, because of the prohibitions and limitations of Provision A.1.a and A.2.a, and the likelihood that non-storm water discharges from the MS4 are the most significant or only source contributing to surface flows present within the receiving water, NALs generally must be consistent with the water quality objectives found within the Basin Plan. Non-storm water discharges that are meeting the NALs would not be expected to cause or contribute to an exceedance of water quality objectives in receiving waters, which would be consistent with the discharge prohibitions and receiving water limitations of Provisions A.1.a and A.2.a.

Exceedances of the NALs would then provide an indication of the relative severity of a pollutant in non-storm water discharges from the MS4 contributing to potential or observed receiving water quality impacts. The relative severity or significance of a pollutant in non-storm water discharges from the MS4 will provide the Copermittees a valuable source of information that can be used to identify priority water quality conditions within a Watershed Management Area and within each Copermittee's jurisdiction.

Tables C-1 through C-4 under Provision C.1.a specify numeric NALs for several parameters or pollutant constituents for non-storm water discharges from the MS4 to several water body types. The NALs for MS4 discharges given under Provision C.1.a are based on the water quality objectives for inland surface waters in the Basin Plan, and the water quality objectives for ocean waters in the Ocean Plan. The NALs for

most of the metals were calculated based on the State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP). The NALs provided in Tables C-1 through C-4 must be included in the Water Quality Improvement Plans required to be developed pursuant to Provision B.

Provision C.1.b requires the Copermittees to identify NALs for pollutants and/or constituents, not specified in Provision C.1.a, which are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions of the Watershed Management Area related to non-storm water discharges from the MS4s. The NALs must be based on the water quality objectives in the Basin Plan. The NALs identified under Provision C.1.b must be included in the Water Quality Improvement Plan.

The San Diego Water Board recognizes that some of the NALs required pursuant to Provisions C.1.a and C.1.b may be exceeded more frequently than not. Thus, Provision C.1.c has been included in the Order to provide the Copermittees the option to develop secondary NALs that are set at levels greater than the levels required pursuant to Provisions C.1.a and C.1.b to further refine the prioritization and assessment of water quality improvement strategies for addressing non-storm water discharges to and from the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and from the MS4.

<u>Provision C.2 (Storm Water Action Levels)</u> requires the Copermittees to incorporate SALs into the Water Quality Improvement Plan for pollutants and/or constituents causing or contributing, or may be causing or contributing, to the highest priority water quality conditions identified in the Water Quality Improvement Plan related to storm water discharges from the MS4s.

The SALs have been included to ensure that the Copermittees are implementing and complying with several requirements of the MS4 permit. Provision A.1.a prohibits storm water discharges from the MS4 from "*causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state.*" In addition, pursuant to Provision A.2.a, storm water discharges "*must not cause or contribute to the violation of water quality standards in any receiving waters*."

Provision A.3.a, however, implicitly acknowledges that compliance with Provisions A.1.a and A.2.a cannot be achieved immediately for discharges of storm water from the MS4 by applying the MEP standard. Thus, Provision A.4 requires the Copermittees to implement an iterative approach to demonstrate that MEP is being achieved. This approach is supported by USEPA.

The federal CWA requires permits for municipal storm sewer systems to "*require controls to reduce the discharge of pollutants [in storm water] to the maximum extent practicable*, *including management practices, control techniques and system, design*

and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants." MEP is an ever-evolving, flexible, and advancing concept. As knowledge about controlling storm water runoff and discharges evolves, so does the knowledge which constitutes MEP. Reducing the discharge of storm water pollutants from the MS4 to the MEP requires the Copermittees to assess their jurisdictional runoff management programs and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP. The SALs provide the Copermittees measureable goals that may be used to demonstrate the achievement of MEP for reducing pollutants in storm water discharges from the MS4. The SALs will be used as part of the MS4 discharges assessments required under Provision D.4.a.

In June of 2006, the State Water Board's Blue Ribbon Storm Water Panel released its report titled "*The Feasibility of Numerical Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities*." In the recommendations, the Blue Ribbon panel proposed storm water effluent limitations which are computed using statistical based population approaches. The SALs specified in Table C-5 under Provision C.2.a were developed from a regional subset of nationwide Phase I MS4 data by using USEPA Rain Zone 6 (arid west) data.[28] Additionally, utilization of regional data is appropriate due to the addition of data into the nationwide Phase I MS4 monitoring dataset in February 2008. This additional data increased the number of USEPA Rain Zone 6 samples to more than 400, and included additional monitoring events within Southern California.

Utilizing data from USEPA Rain Zone 6 resulted in SALs which closely reflect the environmental conditions experienced in the San Diego Region. The localized subset of data includes sampling events from multiple Southern California locations including Orange, San Diego, Riverside, Los Angeles, and San Bernardino Counties. The dataset includes samples taken from highly built-out impervious areas and from storm events representative of Southern California conditions.

The SALs for cadmium, copper, lead and zinc require the measurement of hardness and to provide more specificity in the assessment of samples with SALs for total metal concentrations. While USEPA Rain Zone 6 data include a large sample size for concentrations of total metals, the impact the concentration will have on receiving waters will vary with receiving water hardness. Since it is the goal of the SALs, through the iterative process and MEP standard, to have MS4 storm water discharges meet all applicable water quality objectives, the hardness of the receiving water should be used when assessing the total metal concentration of a sample.

Thus, when there is an exceedance of a SAL for a metal, the Copermittee must determine if that exceedance is above the existing applicable water quality objectives based upon the hardness of the receiving water. The water quality objectives

[28] Data used to develop SAL were obtained from http://rpitt.eng.ua.edu/Research/ms4/mainms4.shtml

Copermittees must use to assess total metal SAL exceedances are the California Toxic Rule (CTR) and USEPA National Recommended Water Quality Criteria for Freshwater Aquatic Life 1 hour maximum concentrations. The 1-hour maximum concentration is to be used for comparison since it is expected to most replicate the impacts to waters of the State from the first flush following a precipitation event.

The statistically calculated SALs given in Table C-5 are at levels greater than the water quality objectives in the Basin Plan or Ocean Plan. Because the objective of the CWA is to "*to restore and maintain the chemical, physical, and biological integrity of the Nation's waters*", meaning eventually pollutants in storm water discharges must be reduced to a level that cannot cause or contribute to an exceedance of water quality objectives in receiving waters, over time the SALs are expected to be reduced to a level that is based on the water quality objectives rather than statistical calculations. The San Diego Water Board will review the SALs as more data for discharges of storm water from the MS4s are collected, and revise them as conditions improve and the MEP standard advances. For the Water Quality Improvement Plans required under this Order, the SALs identified under Provision C.2.a must be included.

Provision C.2.b requires the Copermittees to identify SALs for pollutants and/or constituents, not specified in Provision C.2.a, which are causing or contributing, or may be causing or contributing, to the highest priority water quality conditions of the Watershed Management Area related to storm water discharges from the MS4s. The SALs identified under Provision C.2.b must be included in the Water Quality Improvement Plan.

The San Diego Water Board recognizes that some of the SALs required pursuant to Provisions C.2.a and C.2.b may be exceeded more frequently than not. Thus, Provision C.2.c has been included in the Order to provide the Copermittees the option to develop secondary SALs that are set at levels greater than the levels required pursuant to Provisions C.2.a and C.2.b to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s.

D. Monitoring and Assessment Program Requirements

Purpose: Provision D includes minimum monitoring and assessment requirements that must be developed and implemented by the Copermittees as part of the Water Quality Improvement Plans. Implementation of the monitoring and assessment requirements of Provision D will allow the Copermittees to demonstrate that the requirements of the CWA to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP are being achieved. Implementation of the monitoring and assessment requirements of Provision D will also allow the Copermittees and the San Diego Water Board to track improvements to the water quality in the San Diego Region. The monitoring and assessment program requirements are necessary to implement, as well as ensure the Copermittees are in compliance with, the requirements of the Order.

***Discussion*:** The San Diego Water Board recognized that changes to the monitoring and assessment requirements of the Fourth Term Permit were necessary to improve the usefulness and usability of monitoring data collected by the Copermittees to support their jurisdictional storm water programs more efficiently and with increased effectiveness. The data collected are needed to better inform the Copermittees' understanding of the physical, chemical, and biological condition of the receiving waters and the quality of the MS4 discharges. The monitoring program needs to provide opportunities for the Copermittees to integrate regional monitoring efforts into municipal storm water monitoring requirements to provide a cost-effective approach to monitoring and avoid duplication of efforts.

The requirements in Provision D were largely recommended by the Copermittees as an outcome of the San Diego Water Boards Focused Meeting process. The monitoring and assessment program requirements now require collection of more specific information necessary for each Copermittee to adapt its jurisdictional runoff management program in such a way that focuses resources on a watershed's highest priority water quality conditions. The monitoring and assessment program will require the Copermittees to collect data that can be utilized to answer both watershed level management questions (e.g. Are the chemical, physical, and biological conditions of a receiving water protective, or likely protective of beneficial uses?), and specific jurisdictional runoff management program activity questions (e.g. Are the water quality improvement strategies of the jurisdictional program effectively eliminating non-storm water discharges to the MS4?).

The monitoring data collected and assessment information that will be reported to the San Diego Water Board are necessary to determine if the Copermittees are complying with the prohibitions and limitations of Provision A. The required monitoring and assessments that must be reported to the San Diego Water Board will be utilized for three purposes:

(1) Inform the Copermittees, San Diego Water Board, and the public on the progress of the Copermittees' efforts to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP;

(2) Inform the Copermittees, San Diego Water Board, and the public on the condition of water bodies receiving discharges from the Copermittees' MS4, and the progress of the Copermittees' water quality improvement implementation efforts toward improving the receiving water quality; and

(3) Inform the Copermittees, the San Diego Water Board, and the public on the effectiveness of the Water Quality Improvement Plan toward achieving (1) and (2).

The monitoring and assessment information reported pursuant to Provision F is also expected to be key to the iterative approach and adaptive management process required under Provision A.4 and implemented through the Water Quality Improvement Plan required under Provision B. As required by Provision A.4, the iterative approach and adaptive management process is required if the Copermittees cannot meet the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c, and/or A.2.a under the present conditions.

Provision D provides the minimum monitoring and assessment requirements that must be included in each Water Quality Improvement Plan to be developed and implemented by the Copermittees. The Copermittees, however, are not limited to the requirements of Provision D and may include additional methods to track progress toward improving water quality in a Watershed Management Area.

More specific and detailed discussions of the requirements of Provision D are provided below.

<u>Provision D.1 (Receiving Water Monitoring Requirements)</u> specifies the minimum receiving water monitoring that the Copermittees must conduct within the Watershed Management Area and include as part of the Water Quality Improvement Plan.

Provision D.1 establishes minimum monitoring requirements that must be conducted by the Copermittees within each Watershed Management Area. Provision D.1 requires the Copermittees to collect and develop the data and information necessary to determine potential impacts to the beneficial uses in the receiving waters due to discharges from the MS4s. The monitoring required under Provision D.1 will also provide the data that will allow the Copermittees to gauge the effectiveness and progress of its Water Quality Improvement Plan implementation efforts toward improving the quality of receiving waters.

The receiving water monitoring requirements of Provision D.1 are focused primarily on monitoring the conditions and response of the receiving waters to the Copermittees'

collective implementation efforts to reduce receiving water impacts that may be caused by the discharges from the MS4s. The preference of the San Diego Water Board is for the Copermittees to spend their resources achieving tangible and observable improvements in receiving water conditions instead of collecting samples and analyzing data that has consistently indicated that receiving water conditions are degraded and require improvement. In general, the ability to measure potential improvements in receiving water conditions due to any actions implemented by the Copermittees as part of the Water Quality Improvement Plan may require several years before a response can be observed. Thus, the frequency of collecting receiving water monitoring data has been kept to a minimum.

During the transitional period between adoption of this Order and San Diego Water Board acceptance of a Water Quality Improvement Plan, the Copermittees must conduct receiving water monitoring in accordance with Provision D.1.a. This approach to collecting receiving water data is different from what was required in the Fourth Term Permits, but one that truly embraces the concept of an integrated, cost-effective, streamlined receiving water monitoring approach.

Provision D.1.a requires Copermittees to continue performing the receiving water monitoring programs required in Order Nos. R-2007-0001, R9-2009-002, and R9-2010-0016; plus participation in: hydromodification management plan monitoring approved by the San Diego Water Board, monitoring plans as part of load reduction plans (either Bacteria Load Reduction Plans or Comprehensive Load Reduction Plans) for TMDLs in Attachment E of the Order, Storm Water Monitoring Coalition Regional Monitoring, Southern California Bight Regional Monitoring, Sediment Quality Monitoring, and ASBS Monitoring as applicable to a Watershed Management Area.

Provision D.1.a also provides an opportunity for the Copermittees to use third party data to meet receiving water monitoring requirements where feasible. Allowing the Copermittees to use the data currently collected through its participation in existing regional receiving water programs and that of third parties provides an efficiency of resources in obtaining the data necessary to inform the Copermittees and the San Diego Water Board about the physical, chemical, and biological conditions of the receiving waters, which can also help to focus the receiving water monitoring during the implementation of the Water Quality Improvement Plan. Once a Water Quality Improvement Plan is developed for a Watershed Management Area in compliance with Provision B of this Order, the transitional period is over and Copermittees are required to conduct receiving water monitoring according to the requirements of Provisions D.1.b-e.

Provision D.1.b requires each Copermittee to identify at least one long term receiving water monitoring station to be representative of receiving water quality within each Watershed Management Area. Long term receiving water monitoring stations can be located at any existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees. The requirements under Provision D.1.b. are

consistent with 40 CFR 122.26(d)(2)(iii)(D), which specifies that a "*monitoring program for representative data collection for the term of the permit*" may include "*instream locations.*" For each Watershed Management Area, at least one long term watershed monitoring station is required to be established and monitored. The Copermittees may choose to establish additional long term monitoring stations where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

Provision D.1.b. requires the Copermittees to locate the long term receiving water monitoring station at one of these existing receiving water monitoring stations to provide the Copermittees an opportunity to experience monitoring cost savings while continuing to collect the necessary data to assess the status and trends of receiving water quality conditions in 1) coastal water, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under both dry weather and wet weather conditions. Ideally these stations will continue to be monitored as part of the receiving water monitoring for each Watershed Management Area to maintain a consistent set of locations and a period of data that can be built upon with the monitoring required under this Order.

The receiving water monitoring requirements are separated into monitoring required during dry weather conditions pursuant to Provision D.1.c, and wet weather conditions pursuant to Provision D.1.d.

At each long term monitoring station the Copermittees must conduct at least three dry weather monitoring events as required pursuant to Provision D.1.c and at least three wet weather monitoring events as required pursuant to Provision D.1.d per permit term. Provisions D.1.c and D.1.d require the Copermittees to monitor priority water quality conditions identified in the Water Quality Improvement Plan, constituents listed as causing impairment of receiving waters in the Watershed Management Area, applicable NALs, toxicity, constituents listed in Tables D-2 and D-3, and constituents for implementation plans (e.g. Bacteria Load Reduction Plans and Comprehensive Load Reduction Plans). Required toxicity monitoring was changed to reflect an updated understanding of the unique challenges associated with sampling storm water for toxicity. Copermittees are required to sample receiving water for toxicity during each dry weather and each wet weather event pursuant to Provision D.1.c.(4) and D.1.d.(4). Required toxicity monitoring is now consistent with the State Water Resources Control Board Policy for Toxicity Assessment and Control (Draft June 2012) and recently adopted MS4 permits for Caltrans and Los Angeles Water Board. Receiving water monitoring efforts in this Order have been streamlined to redirect resources to monitoring efforts that better support pollutant reduction solutions with an increasing emphasis on MS4 outfall monitoring, source identification, and source abatement activities.

In addition to the receiving water monitoring requirements under Provisions D.1.b-d, Provision D.1.e requires the Copermittees participate in and/or conduct other types of receiving water monitoring. As recommended and requested by the Copermittees, Provision D.1.e.(1) requires the Copermittees to participate in existing regional monitoring, as applicable to each Watershed Management Area. Existing regional

monitoring includes monitoring conducted by the Storm Water Monitoring Coalition and for the Southern California Bight. Participation in and use of monitoring data collected from these existing regional water quality monitoring programs provide the Copermittees a greater opportunity for efficiency in the use of their resources to manage their storm water programs and those controllable discharges under their authority.

Provision D.1.e.(1)(c) requires the south Orange County MS4 Copermittees to participate in "unified regional beach water quality monitoring." This monitoring replaces requirements to conduct "core monitoring" of beach water quality, as provided for in Appendix III of the Ocean Plan.

Several different public agencies currently conduct routine, ongoing beach water quality monitoring in south Orange County in accordance with several different sets of requirements. The monitoring programs implemented to meet those requirements overlap temporally and spatially. These monitoring programs are partially but not fully integrated. In November 2010, the State Water Board adopted Resolution No. 2010-0053, which directed Regional Water Boards to work with dischargers to modify beach water quality monitoring programs required by Regional Water Board-issued permits in order to eliminate redundancies and incorporate beach water quality monitoring required by beach water quality statutes, where appropriate.

In April 2012, the San Diego Water Board requested that its staff review beach water quality monitoring conducted in south Orange County. To assist in responding to that request, staff of the Board convened a workgroup that included representatives of the three public agencies that currently conduct almost all of the routine, ongoing beach water quality monitoring in south Orange County, i.e., South Orange County Wastewater Authority (SOCWA), Orange County Public Works, and Orange County Health Care Agency (OCHCA). The workgroup also included other interested parties, including representatives of the Sierra Club and Surfrider Foundation. In December 2012, the San Diego Water Board adopted Resolution No. R9-2012-0069, which endorsed the San Diego Water Board staff report entitled "A Framework for Monitoring and Assessment in the San Diego Region," dated November 2012.

The unified program is consistent with and will meet or exceed the minimum requirements for beach water quality monitoring and related public notification and reporting established by State law, including the Ocean Plan. The unified program is consistent with State Water Board Resolution No. 2010-0053. The unified program is also consistent with and will help implement, "A Framework for Monitoring and Assessment in the San Diego Region," which emphasizes the need for question-driven, beneficial use-oriented monitoring and assessment. The primary purpose of the unified program will be to answer the question "Does beach water quality meet standards for the beneficial use of water contact recreation?"

The unified program is intended to be protective; it will help protect the health of swimmers, surfers, and others who use south Orange County beach waters for water

contact recreational activities. The unified program is also intended to be reasonable; it will eliminate duplicative monitoring and will include triggers for public notification and additional sampling at all sampling stations year-round. The unified program is intended to be equitable; responsibility for implementation of the unified program will be shared and the responsible agencies will jointly make arrangements to implement the program and will have the flexibility to jointly make short and/or long term changes in those arrangements.

The San Diego Water Board Executive Officer issued a written directive on December 5, 2014, pursuant to California Water Code section 13383, for SOCWA and the south Orange County MS4 Copermittees to implement the unified program in cooperation with OCHCA. The Executive Officer may make revisions to the unified program, provided that the unified program, as revised, continues to be consistent with and meet the requirements of State law, including the Ocean Plan, for beach water quality monitoring and related public notification and reporting. Following a thirty day public comment period, and subject to a request for a hearing before the San Diego Water Board, any such revision shall take effect as specified in a written directive issued by the Executive Officer pursuant to CWC section 13383. The program and any Executive Officer issued revisions to the program are subject to CWC section 13320 right of review from the date of issuance.

The unified program will supersede the existing routine, ongoing, beach water quality monitoring programs in south Orange County that are conducted in accordance with the existing requirements of the NPDES permits for discharges from the SOCWA ocean outfalls and the south Orange County MS4s. The requirement to participate in "regional monitoring" of beach water quality replaces requirements to conduct "core monitoring" of beach water quality, as provided for in Appendix III of the Ocean Plan.

The State Water Resources Control Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part 1 Sediment Quality which became effective August 25, 2009 (Sediment Quality Monitoring Policy). Provision D.1.e.(2) requires any Copermittees with MS4 discharges to an enclosed bay or estuary to monitoring the sediments in the enclosed bay or estuary receiving water in accordance with the sediment quality monitoring procedures as prescribed in the Sediment Quality Monitoring Policy.

The State Water Board adopted Resolution No. 2012-0012 which approved exceptions to the California Ocean Plan for selected discharges into Areas of Special Biological Significance (ASBS), including special protections for beneficial uses. State Board Resolution No. 2012-0012 became effective on March 20, 2012, and Attachment B to the Resolution established limitations on point source storm water discharges to ASBS. Copermittees with MS4s that discharge to an ASBS must monitor its discharge to assure compliance with State Board Resolution No. 2012-0012 as required pursuant to Provision D.1.e.(3).

The San Diego Water Board is developing a regional monitoring strategy to assess the conditions of receiving waters in the San Diego Region. The monitoring requirements of Provision D.1 are expected to be incorporated or serve as a foundation of this regional monitoring strategy, but may require some modifications. When the San Diego Water Board develops an alternative regional monitoring strategy, the Copermittees will be required to participate in the development and implementation of the alternative regional monitoring program pursuant to Provision D.1.f.

Provision D.2 (MS4 Outfall Discharge Monitoring Requirements) specifies the minimum MS4 outfall discharge monitoring requirements that the Copermittees must incorporate and implement as part of the Water Quality Improvement Plan.

The dry weather MS4 outfall discharge monitoring requirements are included under Provisions D.2.a.(2) and D.2.b. The dry weather MS4 outfall discharge monitoring requirements are part of the "*program, including a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer*" required by 40 CFR 122.26(d)(2)(iv)(B), which is expected to achieve compliance with the CWA section 402(p)(3)(B)(ii) statutory requirement for municipal storm water permits to require the Copermittees to "*effectively prohibit non-storm water discharges into the storm sewers*." The dry weather MS4 outfall discharge monitoring data collection requirements are based on requirements under 40 CFR 122.26(d)(1)(iv)(D) and 122.26(d)(2)(iv)(B)(3).

The dry weather MS4 outfall discharge monitoring requirements are designed to provide wide spatial and temporal coverage of each jurisdiction to better understand the extent and magnitude of non-storm water discharges to receiving waters, and make a distinction between persistent and transient non-storm water flows. This information is expected to allow each Copermittee to focus its resources on eliminating and controlling the highest priority threats to receiving water quality, as well as integrating other elements of the storm water programs (e.g. complaint call response) and third party data to efficiently and effectively assist in efforts to eliminate non-storm water discharges.

The dry weather MS4 outfall discharge monitoring requirements of Provision D.2.a.(2) and D.2.b are separated into monitoring required before and after the San Diego Water Board accepts the Copermittees' Water Quality Improvement Plan. Outfall monitoring conducted prior to acceptance of the Water Quality Improvement Plan is referred to in the Order as Transitional MS4 Outfall Discharge Monitoring. Provision D.2.a.(2) includes the transitional dry weather MS4 outfall discharge monitoring requirements.

The requirements under Provision D.2.a.(2) are based on the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B), which include the requirements for a monitoring program to identify, detect, and eliminate illicit connections and illegal discharges to the MS4s. The federal regulations (40 CFR 122.26(d)(1)(iv)(D)) require

the monitoring program to include "*a field screening analysis for illicit connections and illegal dumping [that]…[a]t a minimum, include[s] a narrative description, for either each field screening point or major outfall, of visual observations made during dry weather periods.*" The federal regulations (40 CFR 122.26(d)(1)(v)(B)) require the monitoring program to include "*inspection procedures and methods for detecting and preventing illicit discharges, and describe areas where this program has been implemented.*" Furthermore, the monitoring program is required by federal regulations (40 CFR 122.26(d)(2)(iv)(B)) to include "*a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer.*"

Dry weather transitional MS4 outfall discharge monitoring requires each Copermittee to field screen (inspect) its major MS4 outfalls to classify the MS4 outfall locations as having persistent dry weather flows, transient dry weather flows, or no dry weather flows. To account for the variance in size of the 39 jurisdictions covered under this Order, the Copermittees recommended a tiered approach to the number of major MS4 outfalls that must be inspected. Provision D.2.a.(2)(a) provides a tiered approach to the number of major MS4 outfalls that must be visually inspected per jurisdiction as well as a minimum frequency each Copermittee must inspect each major MS4 outfall per year. This tiered approach is based on the total number of major MS4 outfalls within a Copermittees jurisdiction within each Watershed Management Area.

Based on the field screening, each Copermittee is required to make a determination whether any observed flowing, pooled, or ponded waters are transient or persistent flows. Based on this field screening information, other jurisdictional program information, and third party information, each Copermittee is required to prioritize the MS4 outfalls within its jurisdiction for follow up investigation and elimination of the non-storm water discharge, as part of its illicit discharge detection and elimination program required pursuant to Provision E.2. In accordance with the requirements of Provision E.2, each Copermittee is required to immediately investigate obvious illicit discharges (e.g. outfall discharges with unusual color, unusual odor, or high flows).

This approach allows a Copermittee to use all of its resources, as well as leverage resources and information provided by third parties, to effectively eliminate non-storm water discharges from its MS4 outfalls. If the source of the non-storm water discharge cannot be immediately eliminated, the Copermittee uses the persistent flow or transient flow classification along with other programmatic implementation data to prioritize the MS4 outfalls for future investigation. In accordance with the adaptive management approach deployed throughout this Order, Provision D.2.a.(2)(c) requires each Copermittee to update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow. The requirement of Provision D.2.a.(2)(c) assures that each Copermittee is collecting data that can be used to demonstrate compliance with the CWA requirement that each Copermittee must implement a program to "*effectively*

prohibit non-storm water discharges into the [MS4]" and with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

Provision D.2.b describes the dry weather MS4 outfall discharge monitoring required to be incorporated and implemented as part of the Water Quality Improvement Plan. Dry weather MS4 outfall discharge monitoring must be performed by each Copermittee to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. The emphasis of the dry weather MS4 outfall discharge monitoring required pursuant to Provision D.2.b is consistent with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

Provision D.2.b.(1) requires each Copermittee to continue field screening its major MS4 outfalls and identifying those with persistent flows and transient flows, as conducted during the transitional period (i.e. before the Water Quality Improvement Plan was developed). However, each Copermittee now has the flexibility to adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of non-storm water persistent flow discharges in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan. In order to ensure a minimum number of outfalls are inspected, Provision D.2.b.(1) requires the number of visual inspections be equal to the number of visual inspections required in the tiered inspection program pursuant to Provision D.2.a.(2)(a).

Provision D.2.b.(2)(b) requires each Copermittee to monitor a minimum of 5 major MS4 outfalls with persistent flows identified as the highest priorities within a Copermittee's jurisdiction, within each Watershed Management Area. In other words, Copermittees located in more than one Watershed Management Area must identify at least 5 major MS4 outfalls with persistent flows in its jurisdiction in each Watershed Management Area. If a Copermittee is located in more than one Watershed Management Area, and they have less than 5 major MS4 outfalls with persistent flows per jurisdictional area per Watershed Management Area, all of the major MS4 outfalls must be identified as high priority dry weather persistent flow MS4 outfalls. The Copermittees identified as Responsible Copermittees by a TMDL in Attachment E of the Order may need to monitor more than 5 dry weather major MS4 outfall locations to determine compliance with the requirements of the TMDL(s).

Monitoring must occur at the highest priority outfall locations at least semi-annually until the non-storm water discharges have been eliminated for three consecutive dry weather monitoring events; identified to be authorized by a separate NPDES Permit; or reprioritized to a lower priority. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized MS4 major outfall in the Copermittee's jurisdiction within the Watershed Management Area, unless there are no remaining qualifying major MS4 outfalls within the Copermittees jurisdiction. The Copermittees must continually update their dry weather persistent

flow MS4 outfall discharge monitoring locations with the next highest priority non-storm water flow that have yet to be eliminated until all persistent and transient flows are eliminated or its threat reduced.

Non-storm water persistent flow MS4 outfall discharge monitoring data collected during each semi-annual monitoring event, must be collected and analyzed according to the requirements of Provision D.2.b.(2)(b)-(e). These monitoring requirements are consistent with the requirements under 40 CFR 122.26(d)(1)(iv)(D), (d)(1)(v)(B) and (d)(2)(iv)(B).

The wet weather MS4 outfall discharge monitoring requirements are included under Provisions D.2.a.(3) and D.2.c. The wet weather MS4 outfall discharge monitoring requirements are necessary for the Copermittees to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable, using management practices, control techniques and system, design and engineering methods, and such other provisions which are appropriate*" required by 40CFR 122.26(d)(2)(iv), which is expected to achieve compliance with the CWA section 402(p)(3)(B)(iii) statutory requirement for municipal storm water permits to require "*controls to reduce the discharge of pollutants [in storm water] to the maximum extent practicable*." The wet weather MS4 outfall discharge monitoring data collection requirements are based on requirements under 40 CFR 122.26(d)(2)(iii), 122.26(d)(2)(iii)(A) and 122.26(d)(2)(iii)(A)(1)-(4), and 40 CFR 122.21(g)(7)(i)-(ii).

The wet weather MS4 outfall discharge monitoring requirements of Provision D.2.a.(3) and D.2.c are separated into monitoring required before and after the San Diego Water Board accepts the Copermittees' Water Quality Improvement Plan. Outfall monitoring conducted prior to acceptance of the Water Quality Improvement Plan is referred to in the Order as Transitional MS4 Outfall Discharge Monitoring. Provision D.2.a.(3) includes the transitional wet weather MS4 outfall discharge monitoring requirements.

Until the wet weather MS4 outfall discharge monitoring requirements of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board, the Copermittees must comply with the requirements of transitional wet weather MS4 outfall monitoring requirements pursuant to Provision D.2.a.(3). Provision D.2.a.(3) requires the Copermittees in each Watershed Management Area to sample, at least five of the major MS4 outfalls inventoried pursuant to Provision D.2.a.(1) once per wet season for the monitoring data required to be collected pursuant to Provision D.2.a.(3)(c)-(e). Provision D.2.a.(3) further requires at least one major MS4 outfall monitoring station be located in each Copermittee's jurisdiction within the Watershed Management Area.

At a minimum, the five sampling locations chosen must be representative of storm water discharges from residential, commercial, industrial, and typical mixed-use land uses present within a Watershed Management Area. The San Diego Water Board expects the Copermittees to extrapolate from these data to similar land uses

throughout the Watershed Management Area to better inform the Water Quality Improvement Plan development process by prioritizing drainages for implementation of storm water control efforts required pursuant to Provision E.

Provision D.2.c describes the wet weather MS4 outfall discharge monitoring required to be included and implemented as part of the Water Quality Improvement Plan. Provision D.2.c provides the Copermittees the flexibility to adjust the wet weather MS4 outfall discharge monitoring locations and frequencies in the Watershed Management Area, as needed, to identify sources of pollutants in storm water discharges from MS4s in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan.

Although Provision D.2.c.(1) allows the Copermittees to adaptively manage the wet weather MS4 outfall discharge monitoring locations and frequencies, the provision requires a minimum of at least five wet weather outfall stations to be monitored. Provision D.2.c.(2) further allows the Copermittees to modify the monitoring frequency at each wet weather MS4 outfall station to meet the goals of the Water Quality Improvement Plan as long as the monitoring frequency occurs at least once per year and is at an appropriate frequency to identify sources of pollutants in storm water discharges, guide pollutant source identification efforts, or determine compliance with the requirements of the applicable TMDLs in Attachment E to the Order.

The wet weather MS4 outfall discharge monitoring requirements of Provisions D.2.c.(3) and D.2.c.(4) are the same as the transitional wet weather MS4 outfall discharge monitoring. In contrast, the requirements of Provision D.2.c.(5) are focused on collecting analytical data specific to the highest priority water quality conditions in the Watershed Management Area identified in the Water Quality Improvement Plan. The wet weather MS4 outfall discharge monitoring data collection requirements are consistent with the requirements under 40 CFR 122.26(d)(2)(iii), 122.26(d)(2)(iii)(A) and 122.26(d)(2)(iii)(A)(1)-(4), and 40 CFR 122.21(g)(7)(i)-(ii).

<u>Provision D.3 (Special Studies)</u> requires the Copermittees to develop special studies that will be conducted for each Watershed Management Area and the entire San Diego Region. Data collected pursuant to Provision D.3 is to be used by the Copermittees to improve the effectiveness of the strategies implemented by the jurisdictional runoff management programs toward achieving the numeric goals identified in the Water Quality Improvement Plans and ultimately achieve compliance with the discharge prohibitions and receiving water limitations of Provisions A.1.a, A.1.c, and A.2.a, which is consistent with the requirements of Provision A.4.

Special studies are often necessary to fill data gaps or provide more refined information that allow the Copermittees to better manage the generation or elimination of pollutants and discharges to and from the MS4. In the Fourth Term Permits, the Copermittees have been required to implement special studies as directed by the San Diego Water Board. The special studies required by this Order provide the Copermittees more flexibility to identify and implement special studies that will be most

useful to improving the effectiveness of their jurisdictional runoff management programs.

Provision D.3.a.(1) requires the Copermittees to develop and conduct at least two special studies per Watershed Management Area, to be determined by the Copermittees. One of the two special studies may be accomplished through participation in a Regional Special Study required under Provision D.3.a.(2). The requirements provide the Copermittees great latitude in identifying and developing the special studies. Watershed Management Area special studies are required, at a minimum, to: (a) relate in some way to the highest water quality priorities identified by the Copermittees in the Water Quality Improvement Plan, (b) be conducted within the Watershed Management Area, and (c) include some form of participation (e.g. contribution of funds, personnel services, project management) by all the responsible Copermittees within the Watershed Management Area.

Examples of Watershed Management Area special studies might include, but are not limited to: (1) focused pollutant source identification studies, (2) BMP effectiveness and/or comparison studies, (3) pilot tests for new or emerging pollutant control methods, (4) receiving water pollutant or stressor source identification and/or mitigation studies, or (5) pollutant fate and transport studies. The Watershed Management Area special studies are expected to provide data that can be utilized by the Copermittees to improve the Water Quality Improvement Plan or implementation of the Copermittees' jurisdictional runoff management programs to address the highest priority water quality conditions.

Provision D.3.a.(2) requires the Copermittees to develop at least one special study that will be conducted for the entire San Diego region. The regional special study is expected to provide data that can be utilized by the Copermittees to improve the Water Quality Improvement Plan or implementation of the Copermittees' jurisdictional runoff management programs to identify or address regional water quality concerns and priorities.

An example of a regional special study would be to develop and establish allowable exceedance frequencies of the bacteria water quality objectives for several types of water bodies, during different wet and dry weather conditions the San Diego region. The special study would be related to bacteria, which is a priority for the San Diego region due to the adoption of "*Bacteria TMDL Project I – Beaches and Creeks in the San Diego Region*." The study results could be used to inform the Copermittees and the San Diego Water Board about the indictor bacteria water quality objective exceedance frequencies that occur in natural or reference watersheds.

<u>Provision D.4 (Assessment Requirements)</u> specifies the assessments that the Copermittees are required to perform, based on the monitoring data collected, and will be reported as part of the Annual Report for the Water Quality Improvement Plan implementation. Provision D.4 requires the Copermittees assess the progress of the

water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c, and A.2.a.

Provision D.4 specifies the assessments that Copermittees must perform for each Watershed Management Area to assess the effectiveness of each Copermittee's jurisdictional runoff management program and the Water Quality Improvement Plan. The effectiveness of each Copermittee's jurisdictional runoff management program and Water Quality Improvement Plan is measured through these types of assessments: (a) Receiving Waters Assessments (b) MS4 Outfall Discharges Assessments, (c) Special Studies Assessments, and (d) Integrated Assessment of Water Quality Improvement Plan.

Provision D.4.a requires the Copermittees to assess the status of receiving water conditions annually during the transitional monitoring period (during development of the Water Quality Improvement Plan) and after acceptance of the Water Quality Improvement Plan. The monitoring data collected pursuant to Provision D.1 will be evaluated, among other information, to assess the condition of a Watershed Management Area's streams, coastal waters, enclosed bays, harbors, estuaries, and lagoons. The focus of the receiving waters assessments is to measure progress toward the objective of the CWA to "*restore and maintain the chemical, physical, and biological integrity of the Nation's waters*" as the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program are implemented within a Watershed Management Area. Provision D.4.a is consistent with 40 CFR 122.42(c)(7) which requires the Copermittees to annually report the *"[i]dentification of water quality improvements or degradation."*

Provision D.4.b includes the MS4 outfall discharges assessment requirements. The focus of MS4 outfall discharges assessments is to determine if the Copermittees' are implementing programs that comply with the requirements of the CWA for MS4 permits to "*effectively prohibit non-stormwater discharges into the storm sewers*" and "*require controls to reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable.*" The monitoring data collected pursuant to Provisions D.2 will be evaluated, among other information, to assess the effectiveness of the transitional MS4 outfall field screening monitoring, the implementation of the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program. The MS4 outfall discharge assessments consist of Non-Storm Water Discharges Reduction Assessments and Storm Water Pollutant Discharges Reduction Assessments.

The Non-Storm Water Discharges Reduction Assessments are how each Copermittee will demonstrate that its jurisdictional runoff management program implementation efforts are achieving the CWA requirement to "*effectively prohibit non-stormwater discharges into the storm sewers.*" Provision D.4.b.(1) requires each Copermittee to assess and report on its illicit discharge detection and elimination program required pursuant to Provision E.2 to reduce and effectively prohibit non-storm water and illicit discharges into the MS4 within its jurisdiction. The Non-Storm Water Discharges

Reduction Assessments include specific assessment requirements applicable to each Copermittee.

As each Copermittee collects and analyzes the data collected pursuant to dry weather MS4 outfall discharges monitoring requirements of Provisions D.2.a.(2) and D.2.b, Provision D.4.b.(1) requires each Copermittee to assess the progress, assess the effectiveness of its current actions, and identify modifications necessary to increase the effectiveness of its actions toward reducing and eliminating non-storm water and illicit discharges to its MS4. The findings from these assessments are expected to be utilized by the Copermittee as part of its procedures to prioritize the non-storm water discharges that will be addressed by its Illicit Discharge Detection and Elimination program required pursuant to Provision E.2.

The assessment requirements of Provision D.4.a.(1) are consistent with 40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(3) which require "*procedures…to investigate portions of the separate storm sewer system that, <u>based on the results of the field screen, or other appropriate information</u> [emphasis added], indicate a reasonable potential of contain illicit discharges or other sources of non-storm water*" as part of a "*program…to detect and remove…illicit discharges and improper disposal into the storm sewer.*" The assessment requirements of Provision D.4.a.(1) are also consistent with 40 CFR122.42(c)(1) requires the Copermittees to annually report the "*status of implementing the components of the storm water management program that are established as permit conditions.*"

The Storm Water Pollutant Discharges Reduction Assessment is how the Copermittees in each Watershed Management Area will demonstrate that their jurisdictional runoff management program implementation efforts are achieving the CWA requirement to "*reduce the discharge of pollutants* [in storm water] *to the maximum extent practicable*." Provision D.4.b.(2) requires the Copermittees in each Watershed Management Area to assess and report the progress of the Copermittees' efforts to reduce pollutants in storm water discharges from the MS4s to the MEP. The Storm Water Pollutant Discharges Reduction Assessments include specific assessment requirements during both the transitional monitoring period and after acceptance of the Water Quality Improvement Plan applicable to the Watershed Management Area and each Copermittee.

As the Copermittees collect and analyze the data collected pursuant to wet weather MS4 outfall discharges monitoring requirements of Provisions D.2.a.(3) and D.2.c, Provision D.4.b.(2) requires the Copermittees to assess runoff conditions during the transitional period, and the progress of the Water Quality Improvement Plan strategies toward reducing pollutants in storm water from the MS4 to the MEP. The findings from these assessments are expected to be utilized by the Copermittees to identify any modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify sources of pollutants in storm water discharges from the MS4s, as well as focus, modify, and improve the water quality improvement

strategies implemented by each Copermittee within its jurisdiction to reduce pollutants in storm water discharges to the MEP.

The assessment requirements of Provision D.4.b.(2) are consistent with 40 CFR 122.26(d)(2)(iii)(B) which requires "*[e]stimates of the annual pollutant load of the cumulative discharges to waters of the United States from all identified municipal outfalls…during a storm event…accompanied by a description of the procedures for estimating constituent loads and concentrations, including any modeling, data analysis, and calculation methods.*" The assessment requirements of Provision D.4.a.(2) are consistent with 40 CFR 122.26(d)(2)(v) which requires that each Copermittee assesses the *"estimated reductions in loadings of pollutants from discharges of municipal storm sewer constituents from municipal storm sewer systems expected as the result of the municipal storm water quality management program."* The assessment requirements of Provision D.4.b.(2) are also consistent with 40 CFR122.42(c)(1) requires the Copermittees to annually report the "*status of implementing the components of the storm water management program that are established as permit conditions.*"

Provision D.4.c includes the special studies assessment requirements. Performing special studies are how the Copermittees will address data gaps identified during the development of and updates to the Water Quality Improvement Plan. The relevant findings from the special studies assessments are expected to be incorporated as part of the applicable receiving water assessments, MS4 outfall discharge assessments, and integrated water quality improvement assessments required in Provision D.4.a, D.4.b, and D.4.d, respectively.

The assessment requirements in Provision D.4.d are part of the iterative approach and adaptive management process required by Provision A.4. The Copermittees are required to integrate the data collected pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to re-evaluate the Water Quality Improvement Plan.

The monitoring data collected pursuant to Provisions D.1 and D.2, and the results of the assessment required pursuant to Provisions D.4.a-c, will be used to determine whether the Water Quality Improvement Plan and each Copermittee's jurisdictional runoff management program are effective, or require modifications or improvements to become more effective to achieve the requirements of the CWA. The assessments required by Provision D.4.d are consistent with 40 CFR 122.42(c)(1) which requires that the Copermittees to report the *"[t]he status of implementing the components of the storm water management program that are established as permit conditions."*

E. Jurisdictional Runoff Management Programs

Purpose: Provision E includes the requirements for the jurisdictional runoff management programs to be implemented by each of the Copermittees. Compliance with the requirements for the jurisdictional runoff management programs will allow the Copermittees to demonstrate that they are implementing programs to effectively prohibit non-storm water discharges to the MS4 and reduce pollutants in storm water discharges from the MS4 to the MEP. The jurisdictional runoff management program document prepared by each Copermittee will also provide the details for implementing the water quality improvement strategies identified in the Water Quality Improvement Plan specifically within its jurisdiction.

***Discussion*:** Implementation of the jurisdictional runoff management program requirements under Provision E is how the Copermittees "*effectively prohibit non-stormwater discharges into the storm sewer,*" and outlines the "*controls to reduce the discharge of pollutants to the maximum extent practicable"* consistent with the federal regulations under 40 CFR 122.26. The jurisdictional runoff management program is part of the "*comprehensive planning process*" that is required pursuant to 40 CFR 122.26(d)(2)(iv). Where the Water Quality Improvement Plan is the "*comprehensive planning process*" on a Watershed Management Area scale, requiring "*intergovernmental coordination,*" the jurisdictional runoff management program document is the "*comprehensive planning process*" on a jurisdictional scale that should be coordinated with the other Copermittees in the Watershed Management Area to achieve the goals of the Water Quality Improvement Plan.

The jurisdictional runoff management program requirements are included to provide each Copermittee criteria that can be used to demonstrate that its storm water management program is implementing the "*comprehensive planning process*" within its jurisdiction to "*effectively prohibit non-stormwater discharges into the storm sewers,*" and to identify and implement the most effective "*controls to reduce the discharge of pollutants to the maximum extent practicable"* in accordance with the performance standards given in the CWA.

Provision E includes the requirements for each of the components that must be included in the Copermittee's jurisdictional runoff management program document that will be implemented by the Copermittee within its jurisdiction. Implementation of the components of each Copermittee's jurisdictional runoff management program must incorporate the water quality improvement strategies identified by each Copermittee in the Water Quality Improvement Plans, described pursuant to Provision B.3.b.(1)(a).

More specific and detailed discussions of the requirements of Provision E are provided below.

Provision E.1 (Legal Authority Establishment and Enforcement) requires each Copermittee to establish and enforce sufficient legal authority to control discharges to the MS4 within its jurisdiction.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system*" and be able to demonstrate that it can "*operate pursuant to legal authority established by statute, ordinance or series of contracts.*" Provision E.1.a describes the minimum legal authorities each Copermittee must establish for itself within its jurisdiction to control discharges to its MS4. The requirements of Provision E.1.a are consistent with the requirements set forth in 40 CFR 122.26(d)(2)(i)(A)-(F).

The certification statement required from each Copermittee by Provision E.1.b is included to provide the San Diego Water Board additional documentation that each Copermittee has established the legal authorities consistent with Provision E.1.a and 40 CFR 122.26(d)(2)(i)(A)-(F), and the Copermittee can "*operate pursuant to legal authority established by statute, ordinance or series of contracts.*"

Provision E.2 (Illicit Discharge Detection and Elimination) requires each Copermittee to implement an illicit discharge detection and elimination program to effectively prohibit non-storm water discharges to the MS4 by actively detecting and eliminating illicit discharges and disposal into its MS4. If the San Diego Water Board finds that a Copermittee is fully implementing the requirements of Provision E.2, then the Copermittee is deemed in compliance with the effective prohibition of non-storm water discharges to the MS4 required under Provision A.1.b.

Provision E.2 establishes the minimum requirements that each Copermittee must implement within its jurisdiction to effectively prohibit non-storm water discharges from entering its MS4. The federal CWA requires permits for municipal storm sewer systems to "*effectively prohibit non-storm water discharges into the storm sewers*." The federal regulations (40CFR122.26(d)(2)(i)(B)) require each Copermittee to establish the legal authority to prohibit illicit discharges to its MS4s. Under 40 CFR 122.26(d)(2)(iv)(B), each Copermittee must implement a "*program…to detect and remove…illicit discharges and improper disposal into the storm sewer.*" The federal NPDES regulations, under 40 CFR 122.26(b)(2), define illicit discharges as "*any discharge to a municipal separate storm sewer that is not composed entirely of storm water*." Thus, non-storm water discharges are not authorized to enter the MS4 and are considered to be illicit discharges, unless authorized by a separate NPDES permit.

The Phase I Final Rule clarifies that non-storm water discharges through an MS4 are not authorized under the CWA (55 FR 47995):

> "*Today's rule defines the term "illicit discharge" to describe any discharge through a municipal separate storm sewer system that is not composed entirely of storm water and that is not covered by an NPDES permit. Such illicit discharges are not*

authorized under the Clean Water Act. Section 402(p)(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit."

The federal NPDES requirements for the program to address illicit discharges must include "*inspections, to implement and enforce an ordinance, orders, or other similar means to prevent illicit discharges to the MS4*." The federal NPDES regulations also reference several categories of "*non-storm water discharges or flows* [which] *shall be addressed where such discharges are identified…as sources of pollutants to waters of the United States*." The Phase I Final Rule (55 FR 48037) further clarified the requirements of 40 CFR 122.26(d)(2)(iv)(B)(1) as follows:

"*EPA is clarifying that section 402(p)(3)(B) of the CWA (which requires permits for municipal separate storm sewers to 'effectively' prohibit non-storm water discharges) does not require permits for municipalities to prohibit certain discharges or flows of nonstorm water to waters of the United States through municipal separate storm sewers in all cases*."

In previous iterations of the municipal storm water permits for the San Diego Region, these categories were simply listed and referred to as categories of non-storm water discharges "not prohibited" unless identified as a source of pollutants. The Copermittees have often referred to these categories as "exempt" discharges. In both cases, however, the language is inconsistent with the federal CWA and NPDES regulations. And, the clarification provided in the Phase I Final Rule does not specifically state that such discharges are "not prohibited" or "exempt" or in any way authorized. The federal NPDES regulations do, however, state that specific categories of non-storm water discharges must be "*addressed*" if identified as "*sources of pollutants to waters of the United States*."

The language of Provision E.2.a has been revised to be fully consistent with the language of the CWA and the requirements of the federal regulations under 40 CFR 122.26(d)(2)(iv)(B)(1). Provision E.2.a requires each Copermittee to address <u>all</u> types of non-storm water discharges into its MS4 as illicit discharges, <u>unless</u> the discharge is authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed pursuant to Provisions E.2.a.(1) through E.2.a.(5). Only non-NPDES-permitted non-storm water discharges identified as a category of non-storm water discharges under Provisions E.2.a.(1) through E.2.a.(5) <u>and</u> *not identified as a source of pollutants* do not have to be addressed as illicit discharges. Categories of non-storm water discharges that meet the requirements of Provisions E.2.a.(1) through E.2.a.(5) do not have to be addressed by the Copermittee as illicit discharges.

Several of the non-storm water categories listed in 40 CFR 122.26(d)(2)(iv)(B)(1) have not been included in Provisions E.2.a.(1) through E.2.a.(5), including: street wash water, landscape irrigation, irrigation water, and lawn watering. Because these are no longer included within the categories listed under Provisions E.2.a.(1) through E.2.a.(5), the Copermittees must prohibit these types of non-storm water discharges from entering the MS4. This is consistent with the clarification of 40 CFR 122.26(d)(2)(iv)(B)(1) in the Phase I Final Rule (55 FR 48037), which states:

> "*[T]he Director may include permit conditions that either require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*."

Street wash water is a category of non-storm water discharges that was removed when the Third Term Permits were issued. Street wash water is a source of several pollutants (e.g., metals, oil and grease, petroleum hydrocarbons, chlorinated solvents, sediment) which are generated during the street washing process. The removal of this category requires the Copermittees to prohibit this type of non-storm water discharge from entering the MS4.

The landscape irrigation, irrigation water, and lawn watering categories, collectively referred to hereafter as "over-irrigation" discharges, were removed from the list of non-storm water discharge categories in the Fourth Term Orange County and Riverside County Permits. Non-storm water discharges resulting from over-irrigation have been found to be a source of several types of pollutants (e.g., nutrients, bacteria, pesticides, sediment) in receiving waters. The San Diego Water Board and the Copermittees have identified categories of non-storm water discharges associated with over-irrigation as a source of pollutants and conveyance of pollutants to the MS4 and waters of the United States in the following documents:

- **SmartTimer/Edgescape Evaluation Program (SEEP) Grant Application**

  The State Water Board allocated grant funding to the SEEP project grant application submitted in 2006, which targeted irrigation runoff by retrofitting areas of existing development and documenting the conservation and runoff improvements. The basis of this grant project is that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 is a source and conveyance of pollutants. In addition, the grant application indicated that this alteration of natural flows is impacting the beneficial uses of waters of the state and U.S. Results from the study indicate that that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 *is* a source and conveyance of pollutants. The results of this study can be applied broadly to any area where over-irrigation takes place. The grant application included the following statements:

  > "*Irrigation runoff contributes flow & pollutant loads to creeks and beaches that are 303(d) listed for bacteria indicators.*"

"*Regional program managers agree that the reduction and/or elimination of irrigation-related urban flows and associated pollutant loads may be key to successful attainment of water quality and beneficial use goals as outlined in the San Diego Basin Plan and Bacteria TMDL over the long term.*"

"*Elevated dry-weather storm drain flows, composed primarily … of landscape irrigation water wasted as runoff, carry pollutants that impair recreational use and aquatic habitats all along Southern California's urbanized coastline. Storm drain systems carry the wasted water, along with landscape derived pollutants such as bacteria, nutrients and pesticides, to local creeks and the ocean. Given the local Mediterranean climate, excessive perennial dry season stream flows are an unnatural hydrologic pattern, causing species shifts in local riparian communities and warm, unseasonal contaminated freshwater plumes in the near-shore marine environment.*"

- **2006-2007 Orange County Watershed Action Plan Annual Reports**

The Watershed Action Plan Annual Reports for the 2006-2007 reporting period were submitted by the County of Orange, Orange County Flood Control District and Copermittees within the San Juan Creek, Laguna Coastal Streams, Aliso Creek, and Dana Point Coastal Streams Watersheds. San Juan Creek, Laguna Coastal Streams, Aliso Creek and Dana Point Coastal Streams are all currently 303(d) listed as impaired for indicator bacteria within their watersheds and/or in the Pacific Ocean at the discharge points of their watersheds. The Orange County Copermittees, within their Watershed Action Strategy Table for fecal indicator bacteria included the following:

"*Support programs to reduce or eliminate the discharge of anthropogenic dry weather nuisance flow throughout the…watershed. Dry weather flow is the transport medium for bacteria and other 303(d) constituents of concern.*"

Additionally, they state that "*conditions in the MS4 contribute to high seasonal bacteria propagation in-pipe during warm weather. Landscape irrigation is a major contributor to dry weather flow, both as surface runoff due to over-irrigation and overspray onto pavements; and as subsurface seepage that finds its way into the MS4.*"

- **Fiscal Year 2008 Carlsbad Watershed Urban Runoff Management Program Annual Report**

The Carlsbad Watershed Urban Runoff Management Program Annual Report for Fiscal Year 2008 was submitted by the Carlsbad Watershed Copermittees (Cities of Carlsbad, Encinitas, Escondido, Oceanside, San Marcos, Solana Beach, and Vista, and the County of San Diego). In the Annual Report, the Carlsbad Watershed Copermittees stated the following:

"The Carlsbad Watershed Management Area (WMA) collective watershed strategy identifies bacteria, sediment, and nutrients as high priority water quality pollutants in the Agua Hedionda (904.3 – bacteria and sediment), Buena Vista (904.2 – bacteria), and San Marcos Creek (904.5 – nutrients) Hydrologic Areas. Bacteria, sediment, and nutrients have been identified as potential discharges from over-irrigation."

- **2007-2008 San Diego Bay Watershed Urban Runoff Management Program Annual Report**

  The San Diego Bay Watershed Urban Runoff Management Program 2007-2008 Annual Report was submitted by the San Diego Bay Watershed Copermittees (Cities of Chula Vista, Coronado, Imperial Beach, La Mesa, Lemon Grove, National City, and San Diego, the County of San Diego, the Port of San Diego, and the San Diego County Airport Authority). In Appendix D of the Annual Report, titled "Likely Sources of Pollutants," the San Diego Bay Watershed Copermittees identified over-irrigation of lawns as a pollutant generating activity from business and/or residential land uses for bacteria, pesticides, and sediment.

- **Copermittee Public Education Materials**

  The Orange County Public Works *Tips for Landscape & Gardening* public education brochure states: "*Fertilizers, pesticides and other chemicals that are left on yards or driveways can be blown or washed into storm drains that flow to the ocean. Overwatering lawns can also send materials into storm drains*."

  The Riverside County Flood Control and Water Conservation District *Landscape and Garden* public education brochure states: *"Soil, yard wastes, over-watering and garden chemicals become part of the urban runoff mix that winds its way through streets, gutters and storm drains before entering lakes, rivers, streams, etc. Urban runoff pollution contaminates water and harms aquatic life!"*

- **Los Peñasquitos Lagoon Sedimentation/Siltation TMDL Technical Report**

  The Los Peñasquitos Lagoon Sedimentation/Siltation TMDL technical report was prepared for the City of San Diego and USEPA in October 2010. The technical report was included as a technical supporting document attached to the Sediment TMDL for Los Peñasquitos Lagoon staff report prepared by the San Diego Water Board, dated June 13, 2012. Under the Source Assessment section, the technical report states the following:

  "*Dry weather loading is dominated by nuisance flows from urban land use activities such as car washing, sidewalk washing, and lawn over-irrigation, which pick up and transport sediment into receiving waters.*"

These documents confirm that non-storm water discharges associated with over-irrigation are a source of pollutants and should be addressed as illicit discharges to the MS4. Prohibiting non-storm water discharges associated with over-irrigation, however, is not a new requirement for the Copermittees because it is also consistent with and required by the Water Conservation in Landscaping Act (AB 1881, Laird).

The Water Conservation in Landscaping Act required the Department of Water Resources (DWR) to prepare a Model Water Efficient Landscape Ordinance for use by local agencies (e.g. the Copermittees). All local agencies were required to adopt a water efficient landscape ordinance by January 1, 2010. Local agencies could adopt the Water Efficient Landscape Ordinance developed by DWR, or an ordinance considered at least as effective as the Model Ordinance. The Water Efficient Landscape Ordinance includes a requirement that local agencies prohibit runoff from irrigation (§ 493.2):

> "*Local agencies shall prevent water waste resulting from inefficient landscape irrigation by <u>prohibiting runoff from leaving the target landscape</u> [emphasis added] due to low head drainage, overspray, or other similar conditions where water flows onto adjacent property, non-irrigated areas, walks, roadways, parking lots, or structures. Penalties for violation of these prohibitions shall be established locally*."

Furthermore, non-storm water discharges from over-irrigation not only transport and discharge pollutants to receiving waters, but are also a likely source of the dry weather flows causing changes to habitat within and along the receiving water bodies. Examples of habitat changes from the dry weather flows include perennialization of ephemeral streams, and conversion of saltwater and brackish water marsh habitats to freshwater marsh habitats (e.g. Los Peñasquitos Lagoon). Both of these examples have resulted in the promotion of invasive species in several areas of the San Diego Region.

The removal of the over-irrigation discharges categories does not require the Copermittees to strictly prohibit lawn and landscape irrigation, but does require the prohibition of excessive irrigation water that results in non-storm water discharges to the MS4. Non-storm water discharges to the MS4 from over-irrigation must be addressed as illicit discharges by the Copermittees pursuant to the requirements of Provision E.2.

The remaining non-storm water categories listed in 40 CFR 122.26(d)(2)(iv)(B)(1) are listed under Provisions E.2.a.(1) through E.2.a.(5) and generally fall into four categories: (1) non-storm water discharges subject to existing San Diego Water Board waste discharge requirements and NPDES permits; (2) non-storm water discharges generally not expected to be a source of pollutants to receiving waters; (3) non-storm water discharges likely to contain pollutants requiring some form of control to address

the pollutants prior to discharging to the MS4; and (4) non-storm water discharges or flows associated with firefighting.

Provisions E.2.a.(1) and E.2.a.(2) include several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) for which the San Diego Water Board already has developed general waste discharge requirements and NPDES permits to address the discharges. The Copermittees are only required to address these types of non-storm water discharges as illicit discharges if the Copermittees or the San Diego Water Board identifies these non-storm water discharges not having coverage under the applicable NPDES permit.

Provision E.2.a.(3) includes several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) which are generally not expected to be a source of pollutants to receiving waters, many of which originate from what are typically natural, uncontrollable sources. The Copermittees are only required to address these types of non-storm water discharges as illicit discharges if the Copermittees or the San Diego Water Board identifies these non-storm water discharges as a source of pollutants to receiving waters. Because many of these sources are generally uncontrollable, enforcing a prohibition may not be a possibility for the Copermittees. The Copermittees would be able to address these non-storm water discharges by preventing these non-storm water discharges from entering the MS4. This could potentially be achieved by sealing their MS4 structures so the discharges cannot enter the MS4.

Provision E.2.a.(4) includes several categories of non-storm water discharges listed in 40 CFR 122.26(d)(2)(iv)(B)(1) that are likely to contain pollutants requiring some form of control to address the pollutants prior to discharging to the MS4. At this time, an outright prohibition of these types of non-storm water discharges does not yet appear to be warranted. Thus, Provision E.2.a.(4) includes several requirements for the Copermittees to control the pollutants from these types of non-storm water discharges. This is consistent with the clarification of the federal regulations in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board has the authority to require the Copermittees to "*control any of these types of discharges where appropriate*."

Unlike non-storm water discharges from over-irrigation, these types of non-storm water discharges are not expected to occur in close proximity to each other or very frequently. Provided these types of non-storm water discharges are controlled as required in Provision E.2.a.(4), the Copermittees would only be required to address these types of non-storm water discharges as illicit discharges if the Copermittee or the San Diego Water Board identifies these non-storm water discharges as a source of pollutants to receiving waters.

Provision E.2.a.(5) includes specific requirements for fire fighting discharges and flows. The requirements for non-storm water discharges and flows associated with fire

fighting have been separated into requirements for: a) non-emergency fire fighting discharges and flows, and b) emergency fire fighting discharges and flows.

The San Diego Water Board has found that discharges from building fire suppression system maintenance (e.g. fire sprinklers) contain waste and potentially a significant source of pollutants to receiving waters. As such, the San Diego Water Board is requiring these discharges be addressed as illicit discharges by the Copermittees. Thus, the discharges to the MS4 are to be prohibited via ordinance, order or similar means. For other non-emergency firefighting discharges and flows (i.e. flows from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems), the Copermittees are required to develop and implement a program to address pollutants in these non-storm water discharges and flows. This is consistent with the clarification of the federal regulations in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board has the authority to require the Copermittees to "*control any of these types of discharges where appropriate*."

For emergency firefighting discharges and flows, the Phase I Final Rule (55 FR 48037) has clarified the requirements of 40 CFR 122.26(d)(2)(iv)(B)(1) pertaining to emergency firefighting flows and discharges, which states:

> "*In the case of firefighting it is not the intention of these rules to prohibit in any circumstances the protection of life and public or private property through the use of water or other fire retardants that flow into separate storm sewers*."

Thus, the requirements have been made to be consistent with the guidance provided by the Phase I Final Rule. The Order recommends that the Copermittees develop and encourage implementation of BMPs to reduce or eliminate the discharge of pollutants from emergency firefighting flows to the MS4s and receiving waters. The Order does not include any requirements that should be interpreted as requiring the implementation of BMPs for emergency firefighting flows to the MS4s and receiving waters.

The Copermittees are expected to review the dry weather MS4 outfall discharge monitoring data they collect to determine if and when there are non-storm water discharges to or from their MS4s that are a source of pollutants to receiving waters. If the Copermittees identify one of the types of non-storm water discharges listed in Provisions E.2.a.(1) through E.2.a.(4) as a source of pollutants to receiving waters based on the review and evaluation of monitoring data, Provision E.2.a.(6) requires the Copermittees to prohibit those categories of discharges from entering the MS4 through ordinance, order or similar means. In addition, Provision E.2.a.(6) clarifies that the San Diego Water Board may identify categories of non-storm water discharges or flows listed under Provisions E.2.a.(1) through E.2.a.(4) that must be prohibited.

Provision E.2.a.(6) also provides the Copermittees an option to propose controls to be implemented for the category of non-storm water discharges as part of the Water Quality Improvement Plan instead of prohibiting the category of non-storm water discharges. If the Water Quality Improvement Plan is accepted by the San Diego Water Board with the proposed controls, the Copermittees will not be required to prohibit the category of non-storm water discharges to their MS4s as long as the controls are implemented. This is consistent with the clarification of 40 CFR 122.26(d)(2)(iv)(B)(1) in the Phase I Final Rule (55 FR 48037), which states the San Diego Water Board may "*require municipalities to prohibit or otherwise control any of these types of discharges where appropriate*."

Finally, Provision E.2.a.(7) has been included in the requirements for non-storm water discharges to clarify that any non-storm water discharges to the Copermittee's MS4, even those identified pursuant to Provisions E.2.a.(1) through E.2.a.(4), must be reduced or eliminated, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit. Provision E.2.a.(7) is consistent with the requirements of CWA section 402(p)(3)(B)(ii) and 40 CFR 122.26(d)(1)(v)(B), as clarified in the Phase I Final Rule (55 FR 47995) that "*[u]ltimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit*." However, the reduction or elimination of those non-storm water discharges are expected to be achieved as feasible, in accordance with the priorities in the Water Quality Improvement Plan and when the resources are available to the Copermittee.

Consistent with 40 CFR 122.26(d)(2)(iv)(B) and 122.26(d)(2)(iv)(B)(1), each Copermittee must implement a "*program…to prevent illicit discharges to the municipal storm sewer system*" and "*detect…illicit discharges and improper disposal into the storm sewer.*" Provision E.2.b requires each Copermittee to implement measures to prevent and detect illicit discharges and connections to its MS4 as part of its illicit discharge detection and elimination program.

As part of the program to prevent and detect illicit discharges to the MS4, 40 CFR 122.26(d)(2)(iv)(B)(2) requires "*procedures to conduct on-going field screening activities during the life of the permit, including areas or locations that will be evaluated by such field screens*." As part of the procedures, each Copermittee is required to maintain an updated map of its entire MS4 and the corresponding drainage areas within its jurisdiction. Having knowledge about where inlets, access points, connections with other MS4s, and outfalls are located is necessary for each Copermittee to track, identify, and eliminate illicit discharges and connections. Thus, Provision E.2.b.(1) of the Order specifies that the map must include the segments of the storm sewer system owned, operated, and maintained by the Copermittee, and include locations of all known inlets, connections with other MS4s, and outfalls to the Copermittee's MS4. The remaining requirements of Provision E.2.b are consistent with the requirements of 40 CFR 122.26(d)(2)(iv)(B)(3)-(7) related to implementing measures to prevent and detect illicit discharges and connections to the MS4.

Provision E.2.c requires each Copermittee to conduct field screening and monitoring of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4. Field screening is a required element of the program to detect and eliminate illicit discharges and connections to the MS4, pursuant to 40 CFR 122.26(d)(2)(iv)(B)(2). The field screening requirement will be implemented through the dry weather MS4 outfall discharge monitoring required under Provisions D.2.a.(2) and D.2.b.(1).

Provision E.2.d specifies the measures each Copermittee must implement to eliminate illicit discharges and connections to its MS4. Elimination of illicit discharges and connections to the MS4 is consistent with the requirement of 40 CFR 122.26(d)(2)(iv)(B) "*to detect and <u>remove</u> [emphasis added]…illicit discharges and improper disposal into the storm sewer*" and will achieve the CWA requirement for MS4 permits to "*effectively prohibit non-storm water discharges into the storm sewers*."

Generally, each Copermittee is responsible for prioritizing its efforts to eliminate non-storm water and illicit discharges or connections to its MS4 based on field screening and monitoring data, NALs, illicit discharge investigation records, and the known or suspected sources. Sources of non-storm water and illicit discharges or connections must be eliminated by enforcing the legal authority established by each Copermittee pursuant to Provision E.1.

<u>Provision E.3 (Development Planning)</u> requires each Copermittee to use its land use and planning authority to implement a development planning program to control and reduce the discharge of pollutants in storm water from new development and significant redevelopment to the MEP. Proper implementation of the development planning program will also contribute toward effectively prohibiting non-storm water discharges from development projects to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." As part of the management program, 40 CFR 122.26(d)(2)(iv)(A)(2) requires "*planning procedures including a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment*."

Land development generally alters the natural conditions of the land by removing vegetative cover, compacting soil, and/or placement of concrete, asphalt, or other impervious surfaces. These impervious surfaces concentrate urban pollutants (such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not found in high concentrations in the natural environment. Pollutants that

accumulate on impervious surfaces are not easily biodegraded nor subject to natural treatment processes.

Impervious surfaces greatly affect the natural hydrology of the land because they do not allow natural infiltration and treatment of storm water runoff to take place. Instead, storm water runoff from impervious surfaces is typically directed through pipes, curbs, gutters, and other hardscape into receiving waters, with little treatment, at significantly increased volumes and accelerated flow rates over what would occur naturally. The increased pollutant loads, storm water volume, discharge rates and velocities, and discharge durations from the MS4 adversely impact stream habitat by causing accelerated, unnatural erosion and scouring within creek bed and banks. Placement of impervious surfaces also encapsulates "good" sediment (such as sand, gravel, rocks and cobbles) that would normally replenish creek beds and banks to help stabilize them. Collectively, these changes to natural hydrologic processes are termed hydrograph modification, or hydromodification.

Hydromodification, which is caused by both altered storm water flow and altered sediment flow regimes, is largely responsible for degradation of creeks, streams, and associated habitats in the San Diego Region. In an ongoing study by the Stormwater Monitoring Coalition to assess the health of streams throughout Southern California, researchers found that three of the four highest risk stressors to creeks (percent sands and fines present, channel alteration, and riparian disturbance) were related to physical habitat.[29] Researchers studying flood frequencies in Riverside County have found that increases in watershed imperviousness of only 9-22 percent can result in increases in peak flow rates for the two-year storm event of up to 100 percent.[30] Such changes in runoff have significant impacts on channel morphology.

In addition, a technical report issued by the Southern California Coastal Water Research Project (SCCWRP) stated that "*[r]ecent studies indicate that California's intermittent and ephemeral streams are more susceptible to the effects of hydromodification than streams from other parts of the United States. Physical degradation of stream channels in the central and eastern United States can initially be detected when watershed impervious cover approaches 10 percent, although biological effects (which may be more difficult to detect) may occur at lower levels. In contrast, initial response of streams in the semi-arid portions of California appears to occur between 3 and 5 percent impervious cover*."[31] These studies highlight the extent to which impacts originating from impervious surfaces created by land development are responsible for the degradation of creek and stream habitat.

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[29] Assessing the Health of Southern California Streams, Stormwater Monitoring Coalition, Fact Sheet
[30] Schueler and Holland, 2000. Storm Water Strategies for Arid and Semi-Arid Watersheds (Article 66). The Practice of Watershed Protection.
[31] Stein, E. and Zaleski, S., 2005. Technical Report 475, Managing Runoff to Protect Natural Streams: The Latest Development on Investigation and Management of Hydromodification in California. December 30, 2005.

This is consistent with what USEPA has noted, that "*[m]ost stormwater runoff is the result of the man-made hydrologic modifications that normally accompany development. The addition of impervious surfaces, soil compaction, and tree and vegetation removal result in alterations to the movement of water through the environment. As interception, evapotranspiration, and infiltration are reduced and precipitation is converted to overland flow, these modifications affect not only the characteristics of the developed site but also the watershed in which the development is located. Stormwater has been identified as one of the leading sources of pollution for all waterbody types in the United States. Furthermore, the impacts of stormwater pollution are not static; they usually increase with more development and urbanization*."[32]

Reducing the impact from the increased pollutant loads and flows generated by impervious surfaces within a watershed is essential to protecting and restoring the integrity of the receiving waters. Provision E.3 includes the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment*." The requirements of Provision E.3 will 1) minimize the generation and discharge of pollutants in storm water from the MS4, and 2) minimize the potential of storm water discharges from the MS4 from causing altered flow regimes and excessive downstream erosion in receiving waters.

The requirements of Provision E.3.a include the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment*" applicable to all development projects, regardless of size or purpose of development. In general, all development projects must implement onsite BMPs to remove pollutants from runoff prior to its discharge to any receiving waters, as close to the pollutant generating source as possible, and structural BMPs must not be constructed within waters of the U.S.

Furthermore, the onsite BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors (e.g. mosquitos, rodents, and flies). If not properly designed or maintained, certain BMPs implemented or required by municipalities may create a habitat for vectors. Monitoring studies conducted by the California Department of Public Health (CDPH) have documented that mosquitoes opportunistically breed in structural storm water BMPs, particularly those that hold standing water for over 96 hours. Certain site design features that hold standing water may similarly produce mosquitoes.

[32] USEPA, 2007. Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices, December 2007.

Structural BMPs and site design features should incorporate design, construction, and maintenance principles to promote drainage within 96 hours to minimize standing water available to mosquitoes. Nuisances and public health impacts resulting from vector breeding can be prevented with close collaboration and cooperative effort between municipalities and local vector control agencies and the CDPH during the development and implementation of storm water runoff management programs. The CDPH also has issued guidance for BMP implementation that will minimize potential nuisances and public health impacts resulting from vector breeding.[33]

All development projects are required to implement source control BMPs that will minimize the generation of pollutants. Additionally, each development project must implement, where applicable and feasible, low impact development (LID) BMPs to mimic the natural hydrology of the site and retain and/or treat pollutants in storm water runoff prior to discharging to and from the MS4.

The LID Center defines LID as "*a comprehensive land planning and engineering design approach with a goal of maintaining and enhancing the pre-development hydrologic regime of urban and developing watersheds.*"[34] LID designs seek to control storm water at the source, using small-scale integrated site design and management practices to mimic the natural hydrology of a site, retain storm water runoff by minimizing soil compaction and impervious surfaces, and disconnect storm water runoff from conveyances to the storm drain system.

LID BMPs may utilize interception, storage, evaporation, evapotranspiration, infiltration, and filtration processes to retain and/or treat pollutants in storm water before it is discharged from a site. Because of these numerous options, the San Diego Water Board expects that every development project will be able to implement some form of LID BMPs. Examples of LID BMPs include using permeable pavements, rain gardens, rain barrels, grassy swales, soil amendments, and native plants.

Provision E.3.a also includes requirements for all development projects to, where feasible, landscape with native and/or low water use plants to minimize the discharge of non-storm water discharges associated with excessive irrigation, as well as harvest (i.e., storage) and use precipitation to promote the concept of utilizing storm water as a resource.

While all development projects are subject to the requirements of Provision E.3.a, Provision E.3.b identifies Priority Development Projects that exceed given size thresholds and/or fit under specific use categories. Priority Development Projects are required to incorporate specific performance criteria for structural BMPs into the

[33] California Department of Public Health, 2012. Best Management Practices for Mosquito Control in California. (http://www.cdph.ca.gov/HealthInfo/discond/Documents/BMPforMosquitoControl07-12.pdf)
[34] www.lowimpactdevelopment.org

project plan to reduce the generation of pollutants, and address potential impacts from hydromodification.

The Priority Development Project categories are based on the requirements of the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), and do not differ significantly from the Fourth Term Permit for San Diego County. Furthermore, the Priority Development Project categories are consistent with Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), and Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit).

Because of the impact of relatively small increases in watershed impervious surfaces to receiving waters, Provision E.3.b.(1)(c)(iv) has been updated to include large driveways that are 5,000 square feet or more. The San Diego Water Board finds that large driveways can exacerbate altered flow regimes if not properly controlled.

Provision E.3.b.(3) describes projects that are exempt from Priority Development Project status. These include new or retrofit paved sidewalks, bicycle lanes, or trails that are designed and constructed to direct runoff to vegetated areas or be hydraulically disconnected from paved areas. The exemptions have been provided to encourage these types of projects because they provide multiple environmental benefits, such as promoting walking rather than driving, which will in turn improve air quality. Additionally, retrofitting of existing alleys, streets, or roads are exempt from Priority Development Project status if they are constructed using USEPA Green Streets guidance.[35] By doing so, retrofitting of these types of projects is encouraged. The San Diego Water Board recognizes that there are spatial constraints associated with these projects, and implementation of structural BMPs are not always feasible.

For development projects identified as Priority Development Projects, the requirements of Provision E.3.c are the minimum "*management practices, control techniques and system, design and engineering methods, and other such provisions where applicable"* to be included in the "*planning procedures…to reduce the discharge of pollutants…from areas of new development and significant redevelopment.*" Provisions E.3.c.(1)-(3) describe the performance criteria for the structural BMPs that must be implemented for each Priority Development Project defined by Provision E.3.b.

Provision E.3.c.(1) describes the storm water pollutant control BMP requirements that must be implemented by all Priority Development Projects. The purpose of Provision E.3.c.(1) is to reduce pollutants in storm water runoff to the MEP from Priority Development Projects before it is discharged to the MS4. Of all the available treatment processes available, retention of storm water, and therefore capture of the

[35] "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).

pollutants in the storm water, will achieve 100 percent pollutant removal efficiency for the volume of storm water retained. No other method of treatment can achieve 100 percent pollutant removal efficiency. Thus, retention of as much storm water onsite is the most effective way to reduce pollutants in storm water discharges to, and consequently from the MS4, and controls pollutants in storm water discharges from a site to the MEP.

Under Provision E.3.c.(1)(a), retention of the pollutants in the runoff produced from the 85th percentile storm event ("design capture volume") is the design standard to which Priority Development Projects must comply. Since the 85th percentile storm event has previously been used as the numeric design standard for treatment control BMPs, this same size storm event is used as the numeric design standard for storm water retention. This is the MEP standard recognized by the San Diego Water Board and is consistent with the Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), as well as Santa Ana Water Board Order Nos. R8-2009-0030 and R8-2010-0033 (Orange County and Riverside County MS4 Permits, respectively), Los Angeles Water Board Order No. R4-2010-0108 (Ventura County MS4 Permit), and Los Angeles Water Board Order No. R4-2012-0175 (Los Angeles County MS4 Permit).

The 85th percentile storm event is the event that has a precipitation total greater than or equal to 85 percent of all storm events over a given period of record in a specific area or location. For example, to determine what the 85th percentile storm event is in a specific location, all 24 hour storms that have recorded values over a 30 year period would be tabulated and a 85th percentile storm would be determined from this record (i.e. 15 percent of the storms would be greater than the number determined to be the 85th percentile storm). Most jurisdictions in the San Diego Region have already developed isopluvial maps that can provide this type of information. The 85th percentile storm might be determined to be a number such as 1.0 inch, and this would be multiplied by the total area of the project footprint producing runoff to calculate the design capture volume. The Priority Development Project designer would then select a system of BMPs that would retain (i.e. intercept, store, infiltrate, evaporate, or evapotranspire) the pollutants contained in the design capture volume onsite.

Retention BMPs are necessary to capture and retain pollutants generated from a Priority Development Project. In a recent study performed by SCCWRP in the Los Angeles Region, they found "*that the magnitude of constituent load associated with storm water runoff depends, at least in part, on the amount of time available for pollutant build-up on land surfaces. The extended dry period that typically occurs in arid climates such as southern California maximizes the time for constituents to build-up on land surfaces, resulting in proportionally higher concentrations and loads during*

initial storms of the season."[36] This implies that the "first flush" of a rainy season and the first storm events after long antecedent dry periods tend to have the highest pollutant loads. Capturing and retaining the pollutant loads of the "first flush" of a rainy season and the first storm events after long antecedent dry periods will reduce a significant portion of the pollutants in storm water discharged to and from the MS4.

The San Diego Water Board, however, acknowledges that in some situations retention of the full design capture volume onsite may not be technically feasible. In this event, the Copermittee may allow the Priority Development Project to use biofiltration BMPs to treat 1.5 times the design capture volume not reliably retained onsite, or biofiltration BMPs with a flow-thru design that has a total volume, including pore spaces and pre-filter detention volume, sized to hold at least 0.75 times the portion of the design capture volume not reliably retained onsite.

The 1.5 multiplier is based on the finding in the Ventura County Technical Guidance Manual that biofiltration of 1.5 times the design capture volume not retained onsite will provide approximately the same pollutant removal as retention of the design capture volume on an annual basis.[37] This standard is consistent with the Los Angeles Water Board's Los Angeles County and Ventura County municipal storm water permits (Order Nos. R4-2012-0175 and R4-2010-0108, respectively). The flow-thru design of 0.75 times the portion of the design capture volume not reliably retained onsite is consistent with the San Diego Water Board's Fourth Term Permits for Orange County and Riverside County (Order Nos. R9-2009-0002 and R9-2010-0016, respectively). In either case, the biofiltration BMPs must be designed with an appropriate hydraulic loading rate to maximize storm water retention and pollutant removal, as well as to prevent erosion, scour, and channeling within the BMP. Each Copermittee is required to update its BMP Design Manual to provide guidance for hydraulic loading rates and other biofiltration design criteria necessary to maximize storm water retention and pollutant removal.

The San Diego Water Board further recognizes that, in addition to not being technically feasible, retention of the full design capture storm onsite may be cost prohibitive, or may not provide as much water quality benefit to the Watershed Management Area as would implementing BMPs elsewhere in the watershed. Thus, Provision E.3.c.(1)(b) allows for the use of a combination of onsite retention BMPs, and the implementation of an Alternative Compliance Program described in Provision E.3.c.(3). Provision E.3.c.(3) is discussed in more detail below.

If the full design capture volume is not retained onsite either because biofiltration is not technically feasible, or a Copermittee grants a Priority Development Project permission

[36] Stein, E.D., Tiefenthaler, L.L., and Schiff, K.C., 2007. Technical Report 510, Sources, Patterns and Mechanisms of Storm Water Pollutant Loading from Watershed and Land Uses of the Greater Los Angeles Area, California, USA. March 20, 2007.
[37] Ventura Countywide Stormwater Management Program. 2011. Ventura Technical Guidance Manual, Manual Update, 2011.

to utilize the Alternative Compliance Program, then the pollutants in the portion of the design capture volume that are not reliably retained onsite must still be reduced to the MEP. Thus, flow-thru treatment control BMPs are required to be implemented on Priority Development Projects in addition to the retention BMPs. The requirements of Provisions E.3.c.(1)(a)(ii)[a]-[c] include the performance standards for flow-thru treatment control BMPs, consistent with the Fourth Term Permits in the San Diego Region.

Whereas the purpose of the requirements under Provision E.3.c.(1) is to reduce pollutants in storm water runoff to the MEP, the purpose of the requirements under Provision E.3.c.(2) is to maintain or restore more natural hydrologic flow regimes to prevent accelerated, unnatural erosion in downstream receiving waters, also to the MEP standard. Provision E.3.c.(2) describes hydromodification management BMP requirements that must be implemented by all Priority Development Projects.

The performance criteria for the implementation of hydromodification management BMPs on Priority Development Projects are consistent with the requirements in the Fourth Term Permits for Orange and Riverside Counties (Order Nos. R9-2009-0002 and R9-2010-0016, respectively). Modifications to the Orange County and Riverside County Hydromodification Management Plans (HMPs) will likely be minor, or may not be necessary. The HMP for San Diego County will likely require some minor modifications to incorporate the requirements of Provision E.3.c.(2) and become consistent with the Orange County and Riverside County HMPs. The San Diego Water Board does not, however, expect that it will be necessary for the San Diego County Copermittees to develop a new approach or significantly re-write the San Diego County HMP. This is because the premise of the hydromodification management BMP requirements, which are to control storm water runoff conditions (flow rates and durations) for Copermittee-defined range of flows, is unchanged from all Fourth Term Permits in the San Diego Region.

Provision E.3.c.(2)(a) requires that post-project runoff conditions mimic the *pre-development* runoff conditions, and not the *pre-project* runoff conditions. Fundamentally, the San Diego Water Board believes that using a hydrology baseline that approximates that of an undeveloped, natural watershed is the only way to facilitate the return of more natural hydrological conditions to already built-out watersheds, and ultimately improved stream health. On the other hand, using the *pre-project* hydrology as a baseline for redevelopment projects results in propagating the unnatural hydrology of urbanized areas. Propagating the urbanized flow regime does not support conditions for restoring degraded or channelized stream segments, and would forever sentence such streams to the degraded state. Furthermore, reducing the volume of storm water runoff associated with the urbanized flow regime will also result in reducing the discharge of pollutants into receiving waters, since storm water runoff from impervious surfaces contains untreated pollutants.

The San Diego Water Board understands that approximating the pre-development runoff condition associated with a redevelopment site is not necessarily straightforward because factors such as natural grade and native vegetation for the site cannot be precisely known. Therefore, the San Diego Water Board does not expect project designers to estimate historical conditions associated with redevelopment sites. Rather, the San Diego Water Board expects project designers and the Copermittees to approximate pre-development runoff conditions using the parameters of a *pervious* area rather than an *impervious* area. This means that for redevelopment sites, approximating pre-development runoff conditions equates to using existing onsite grade and assuming the infiltration characteristics of the underlying soil. A redevelopment Priority Development Project must not use runoff coefficients of concrete or asphalt to estimate pre-development runoff conditions. Rather, redevelopment projects must use available information pertaining to existing underlying soil type (such as soil maps published by the National Resource Conservation Service), onsite existing grade, and any other readily available pertinent information to estimate pre-development runoff conditions.

The San Diego Water Board understands, indeed asserts, that the pre-development hydrology of an area in question can only be roughly estimated and cannot be precisely known. However, using the hydrology of a natural condition, even if not precisely known, will provide significant benefit to receiving waters over using the hydrology associated with impervious (developed) surfaces. Therefore in order to achieve the goals of the Clean Water Act, which are to "*restore and maintain the chemical, physical, and biological integrity of the nation's waters* [emphasis added]," the most appropriate standard to use for hydromodification management is the standard associated with the pre-development condition.

Provision E.3.c.(2)(b) requires Priority Development Projects to avoid known critical sediment yield areas or implement measures that would allow coarse sediment to be discharged to receiving waters, such that the natural sediment supply is unaffected by the project. This is necessary because the availability of coarse sediment supply is as much an issue for causing erosive conditions to receiving streams as are accelerated flows.

The San Diego Water Board recognizes that in some situations implementing the hydromodification management BMP requirements for flow control fully onsite may not be technically feasible, may be cost prohibitive, or may not provide any overall water quality benefits to the Watershed Management Area. Thus, Provision E.3.c.(2)(c) allows for the use of a combination of onsite hydromodification management BMPs for flow control and alternative compliance options described in Provision E.3.c.(3).

Provision E.3.c.(3) allows for alternative compliance in instances where the Copermittee determines that offsite measures will have a greater overall water quality benefit for the Watershed Management Area than if the Priority Development Project were to implement structural BMPs onsite. Consequently, watershed-specific

structural BMP requirements are present in this Order in the form of allowable compliance offsite. The Alternative Compliance Program to Onsite Structural BMP Implementation Provision is intended to integrate with the Copermittees' planning efforts in the Water Quality Improvement Plans.

The Alternative Compliance Program is an option for Priority Development Projects where the governing Copermittee has participated in the development of a Watershed Management Area Analysis as part of the Water Quality Improvement Plan (described in Provision B.3.b.(4)). Such an approach is consistent with the latest findings in hydromodification management by the scientific community. In a Technical Report entitled *Hydromodification Assessment and Management in California,*[38] the report states:

> *"An effective [hydromodification] management program will likely include combinations of on-site measures (e.g., low-impact development techniques, flow-control basins), in-stream measures (e.g., stream habitat restoration), floodplain and riparian zone actions, and off-site measures. Off-site measures may include compensatory mitigation measures at upstream locations that are designed to help restore and manage flow and sediment yield in the watershed."*

Consistent with the ideas brought forth in the report, in the Watershed Management Area Analysis of Provision B.3.b.(4), which is optional, the Copermittees will develop watershed maps that include as much detail about factors that affect the hydrology of the watershed as is available. Such factors included identification of areas suitable for infiltration, coarse sediment supply areas, and locating stream channel structures and constrictions. Once these factors are mapped and studied, the Copermittees can identify areas in the watershed where candidate projects may be implemented that are expected to improve water quality in the watershed by providing more opportunity for infiltration, slowing down storm water flows, or attenuation of pollutants naturally via healthy stream habitat. These candidate projects may be in the form of retrofitting existing development, rehabilitating degraded stream segments, identifying regional BMPs, purchasing land to preserve valuable floodplain functions, and any other project(s) that the Copermittees identify.

Under the Alternative Compliance Program, Priority Development Projects may be allowed to fund, partially fund, or implement a candidate project, in lieu of implementing structural BMPs onsite, if they enter into a voluntary agreement with the governing Copermittee permitting this arrangement. Project proponents may also propose an alternative project not previously identified by the Copermittees. In either case, whether a project proponent implements a candidate project identified by the Copermittees or a separate alternative compliance project, the governing Copermittee must determine that implementation of the project will have a greater overall water

[38] 2012. ED Stein, F Federico, DB Booth, BP Bledsoe, C Bowles, Z Rubin, GM Kondolf, A Sengupta. Technical Report 667. Southern California Coastal Water Research Project. Costa Mesa, CA.

quality benefit for the Watershed Management Area than fully implementing structural BMPs onsite. Determination of greater overall water quality benefits associated with alternative compliance projects would be accomplished by utilizing Water Quality Equivalency calculations developed pursuant to Provision E.3.c.(3)(a). Water Quality Equivalency calculations are necessary to establish a regional and technical basis for determining water quality benefits associated with alternative compliance projects, which can be consistently used by all Copermittees in the San Diego Region. Finally, if ~~I~~f alternative compliance involves funding or implementing a project that is outside the jurisdiction of the governing Copermittee, then that Copermittee may enter into an inter-agency agreement with the appropriate jurisdiction.

Finally, Provision E.3.c.(2)(d) allows Priority Development Projects to be exempt from the hydromodification management BMP requirements if there is no threat of erosion to downstream receiving waters (i.e. the receiving stream is concrete lined from the point of discharge all the way to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean). If the Copermittees believe that more exemptions are warranted, then they must perform the optional Watershed Management Area Analysis of Provision B.3.b.(4). Additional exemptions other than those specified in this Order may be established on a watershed basis, provided the Copermittees perform the analysis, provide supporting rationale for the exemptions, and complete the Water Quality Improvement Plan approval process pursuant to Provision F.1.

To facilitate the transition to this Order from the Fourth Term Permits for Orange and Riverside County Copermittees, Provision E.3.c.(2)(e) allows two additional temporary exemptions from hydromodification management BMP implementation. The first temporary exemption allows relief from hydromodification management BMP implementation for Priority Development Projects discharging directly to an engineered channel conveyance system with a capacity to convey peak flows generated by the 10-year storm event all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean. Similar to the exemption allowed for concrete-lined channels, this exemption is premised on the concept that there is little threat of erosion to these types of engineered channel systems.

The second temporary exemption allows relief from hydromodification management BMP implementation for Priority Development Projects discharging directly to large river reaches with drainage areas larger than 100 square miles and a 100-year flow capacity in excess of 20,000 cubic feet per second. If this exemption is claimed, then properly sized energy dissipation is required at all discharge points associated with the Priority Development Project. This exemption is premised on the concept that large river reaches can essentially assimilate the accelerated flow rates associated with individual Priority Development Projects because they are inconsequential compared

to the flow rate in the large river reach. Both of these exemptions are included in the Hydromodification Management Plan for San Diego County[39].

These temporary exemptions are allowed as a means to facilitate Orange and Riverside County Copermittees' transition to this Order from the Fourth Term Permits and are not meant to reside as permanent exemptions without additional rigorous technical analyses specific to each County. Therefore, these exemptions will no longer apply once the Copermittees' land development programs are fully updated to reflect the requirements of this Order, i.e., upon implementation of the BMP Design Manual pursuant to Provision F.2.b. If the Copermittees believe that these or other exemptions are warranted in the context of water quality improvement and stream restoration opportunities, then the Copermittees must perform the optional Watershed Management Area Analysis of Provision B.3.b.(4) and provide supporting rationale for the exemptions. The San Diego County Copermittees are also required to perform the optional Watershed Management Area Analysis to provide supporting rationale to justify use of these and other exemptions. Updated BMP Design Manuals including rationale to justify use of exemptions will be reviewed by the San Diego Water Board pursuant to Provision F.2.b.

Provisions E.3.c.(4) and E.3.c.(5) were included under the BMP requirements applicable to all development projects in the Fourth Term Permits for San Diego, Orange, and Riverside Counties (Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016, respectively). In this Order, the long-term BMP maintenance and infiltration and groundwater protection requirements apply to structural BMPs implemented by Priority Development Projects only.

Provision E.3.d requires the Copermittees to update their BMP Design Manual as needed to incorporate the requirements of Provision E.3. The BMP Design Manual is formerly known as the Standard Storm Water Mitigation Plan, or SSMP, and was renamed so that the title has a more accurate description of the document content. The contents of the BMP Design Manual are largely unchanged from the previous Standard Storm Water Mitigation Plans required under the Fourth Term Permits. The BMP Design Manual fulfills the 40 CFR 122.26(d)(2)(iv)(A)(2) requirement that the Copermittee's development planning program includes "*a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal storm sewers which receive discharges from areas of new development and significant redevelopment*."

As part of the "*planning procedures,*" 40 CFR 122.26(d)(2)(iv)(A)(2) requires the procedures to "*address controls to reduce pollutants in discharges from municipal separate storm sewers after construction is completed*." The requirements applicable to the implementation and oversight of structural BMPs at Priority Development Projects are provided under Provision E.3.e.

[39] Final Hydromodification Management Plan Prepared for County of San Diego, March 2011

Proper installation of the structural BMPs approved for a Priority Development Project is necessary to ensure that pollutants in storm water discharges will be reduced to the MEP after the project is completed. In addition to the proper installation of structural BMPs, the maintenance of structural BMPs on Priority Development Projects is necessary to ensure that pollutants in storm water discharges will continue to be reduced to the MEP. Provision E.3.e.(1) includes the minimum requirements that each Copermittee must implement to ensure structural BMPs are properly installed and will be properly maintained.

Provisions E.3.e.(1)(a)(i)-(ii) have been included to provide additional clarification regarding when a Copermittee may allow land development requirements from earlier MS4 permits to apply to a Priority Development Project. Since the MS4 permits issued from 2001 to the adoption of Order No. R9-2015-0001 amending Order No. R9-2013-0001 (Regional MS4 Permit), a Copermittee could allow development projects with "prior lawful approval" to be "grandfathered" into implementing BMP requirements from previous MS4 permits. The Copermittees were given the discretion to use their land use authority to determine when it was appropriate to allow a development project with prior lawful approval to implement BMP requirements from the previous MS4 permits, and when the most recent BMP requirements should be required to achieve the reduction of pollutants in storm water runoff from development projects to the MEP. However, the San Diego Water Board has found that the Copermittees and the development community frequently disagree about when a development project has prior lawful approval and what is necessary to reduce pollutants in storm water runoff from development projects to the MEP.

Therefore, Provisions E.3.e.(1)(a)(i)-(ii) were included to provide more clarity and certainty for the Copermittees, the land development community, and the general public about when the structural BMP performance standards of earlier MS4 permits may be allowed to be implemented. A Copermittee may allow a Priority Development Project to implement BMP requirements of the previous MS4 permit only if all requirements of Provisions E.3.e.(1)(a)(i)[a]-[d] have been met. Otherwise, the Copermittees must require all Priority Development Projects to incorporate the BMP requirements of Provision E.3 into the project to reduce pollutants in storm water runoff from development projects to the MEP.

Provisions E.3.e.(1)(a)(i)[a]-[d] are dependent upon the effective date of the BMP Design Manual. Unless otherwise directed by the San Diego Water Board, the effective date of the BMP Design Manual is December 24, 2015 for the San Diego County Copermittees, September 28, 2017 for the Orange County Copermittees, and July 5, 2018 for the Riverside County Copermittees.

Alternatively, if the Copermittee can demonstrate a lack of land use authority or legal authority to require a Priority Development Project to implement the requirements of Provision E.3, the Copermittee may allow land development requirements from the previous MS4 permits to apply. However, under these circumstances the San Diego

Water Board expects the Copermittee to utilize its available land use authority or legal authority to require the implementation of as much of Provision E.3 as possible to reduce the discharge of pollutants in storm water from development and redevelopment projects within its jurisdiction to the MEP.

In cases where BMP requirements from the earlier MS4 permits govern the structural BMP design requirements of a Priority Development Project, the San Diego Water Board expects the Copermittees to be able to demonstrate, in a programmatic audit or other means, that a Priority Development Project met all the requirements listed under Provisions E.3.e.(1)(a)(i)[a]-[d], or have evidence that the Copermittee did not have the land use or legal authority to require the implementation of Provision E.3 for a Priority Development Project.

The requirements under Provision E.3.e.(2)-(3) are necessary to demonstrate each Copermittee is implementing a program that complies with Provisions E.3.b-c and E.3.e.(1), and ensure structural BMPs at Priority Development Project will continue to be able to reduce pollutants in storm water discharges to the MEP.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary for any development projects to compel compliance with the requirements of Provision E.3 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.3.f requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

<u>Provision E.4 (Construction Management)</u> requires each Copermittee to implement a construction management program to control and reduce the discharge of pollutants in storm water from construction sites to the MEP. Proper implementation of the construction management program will also contribute toward effectively prohibiting non-storm water discharges from construction sites to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." As part of the management program, 40 CFR 122.26(d)(2)(iv)(D) requires "*a program to implement and maintain structural and non-structural best management practices to reduce pollutants in storm water runoff from construction sites to the municipal storm sewer system.*"

Construction sites can be significant sources of sediment, trash, and other pollutants to receiving waters. Although sediment is naturally occurring in the natural environment, the discharge of sediment under unnatural conditions is problematic to receiving waters. Fine sediment in creeks causes high turbidity that interferes with the

functionality of native flora and fauna in local creeks. For example, turbidity interferes with both photosynthesis of water-philic plants, as well as successful foraging and reproduction of benthic macroinvertebrates. Sediment can also make it difficult for fish to breathe because it clogs fish gills. Other pollutants such as heavy metals or pesticides can adhere to sediment and are transported to receiving waters during storm events, where they dissolve in the water column and become bioavailable to aquatic organisms. Sediment is recognized as a major stressor to surface waters and is responsible for the impairment of several lagoons and creeks in the San Diego Region.

Provision E.4 includes requirements that each Copermittee must implement to minimize the discharge of sediment and other pollutants from construction sites to the MS4 within its jurisdiction. The requirements under Provision E.4 are consistent with the Fourth Term Permits for San Diego, Orange, and Riverside Counties. Therefore, Copermittees are expected to implement the requirements seamlessly, with minimal changes to their existing construction management programs. The Copermittees, however, are given more flexibility to run their programs as needed to maximize efficiency, and also to be consistent with the Water Quality Improvement Plan for the Watershed Management Area.

As part of the construction management program, 40 CFR 122.26(d)(2)(iv)(D)(1) requires "*procedures for site planning which incorporate consideration of potential water quality impacts.*" Provision E.4.a describes the minimum elements each Copermittee is required to include as part of the construction site planning and project approval process. The construction site planning and approval process is based primarily on ensuring each project had an adequate site-specific pollution control, construction BMP, and/or erosion and sediment control plan that will be implemented to minimize the discharge of pollutants in storm water to the MEP, and minimize impacts to receiving waters.

The requirements under Provision E.4.b provide the data and information necessary to identify "*priorities for inspecting sites and enforcing control measures*" required pursuant to 40 CFR 122.26(d)(2)(iv)(D)(3). Under Provision E.4.b, each Copermittee must identify construction sites that are considered a high threat to downstream surface waters. Designation of "high threat to water quality" construction sites will necessitate the Copermittees to develop criteria to identify such sites. Provision E.4.b.(2) describes a list of factors that must be considered when the Copermittee considers threat to water quality. For example, a Copermittee must identify sites as "high threat to water quality" if it is located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions, according to the Water Quality Improvement Plan. This ensures that construction management program implementation is compatible with the Copermittee's identified highest priority water quality conditions.

Pursuant to 40 CFR 122.26(d)(2)(iv)(D)(2) each Copermittee is required describe "*requirements for nonstructural and structural best management practices*" at

construction sites. Provision E.4.c includes the types of construction site BMPs that the Copermittees must implement, or require the implementation of, at each construction site to reduce pollutants in storm water discharges to the MEP.

Each Copermittee is expected to require the implementation of appropriate BMPs given specific site conditions, the season and likelihood of rain events, and construction phase (i.e. grading vs. vertical construction). This means that throughout the life of the project construction, the appropriate BMPs will vary, especially if the construction of the project spans multiple wet seasons. As opposed to describing specific minimum BMPs that must be implemented, the Order describes major BMP categories that should be considered for each site.

Each Copermittee is expected to use its 20 years of storm water experience and knowledge to require implementation of appropriate BMPs from the various categories at each construction site within its jurisdiction. For example, the San Diego Water Board expects that each site will be required to implement erosion control and sediment control. The San Diego Water Board also expects each Copermittee to require implementation of active/passive sediment treatment systems at sites where other BMPs have been tried and are known to be inadequate, and discharges of sediment are causing or contributing to water quality impairment downstream. Each Copermittee is granted flexibility in specifying the minimum level of BMP requirements at each site, but the San Diego Water Board expects each site to be capable of controlling pollutants in storm water discharges to the MEP and preventing illicit discharges.

The requirements under Provision E.4.d are necessary to demonstrate that each Copermittee is implementing a program that complies with Provisions E.4.a and E.4.c and ensure BMPs at construction sites will reduce pollutants in storm water discharges to the MEP.

Provision E.4.d does not include minimum required inspection frequencies for construction sites. Each Copermittee must use its experience and knowledge to specify an appropriate inspection frequency for both high priority and lower priority sites in their jurisdictional runoff management program documents, and in accordance with the Water Quality Improvement Plan. Appropriate inspection frequencies may vary by Copermittee, but the San Diego Water Board expects that the stated frequency will be adequate for each Copermittee to properly oversee the construction sites within its jurisdiction, confirm BMPs are implemented to reduce pollutants in storm water discharges from constructions sites to the MEP, and make needed changes to its program on an ongoing basis as necessary.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary for any development projects to compel compliance with the requirements of Provision E.4 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to

the MEP, Provision E.4.e requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Provision E.5 (Existing Development Management) requires each Copermittee to implement an existing development management program to control and reduce the discharge of pollutants in storm water from areas of existing development to the MEP. Proper implementation of the existing development management program will also contribute toward effectively prohibiting non-storm water discharges from areas of existing development to the MS4.

Pursuant to 40 CFR 122.26(d)(2)(iv), each Copermittee is required to implement a "*management program…to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and other such provisions where applicable*." Within 40 CFR 122.26(d)(2)(iv)(A) and (C), the management program is required to reduce impacts on receiving waters and reduce pollutants in storm water discharges to the MEP from commercial and residential areas, industrial facilities, and municipal facilities.

Commercial and residential areas, industrial facilities, and municipal facilities must be addressed by each Copermittee with the existing development management program required under Provision E.5. All other areas within each Copermittee's jurisdiction should be either undeveloped open space, or areas that are being developed or under construction. Areas being developed or under construction will be addressed by the Copermittee under the requirements of Provision E.3 (Development Planning) or Provision E.4 (Construction Management).

Areas of existing development typically include impervious surfaces such as sidewalks, driveways, roads, and rooftops, which generate and concentrate pollutants (such as pesticides, petroleum hydrocarbons, heavy metals, and pathogens) that are otherwise not found in high concentrations in the natural environment. Pollutants that accumulate on impervious surfaces are not easily biodegraded or not subject to natural treatment processes. When it rains, these pollutants are transported in storm water runoff from these impervious surfaces into receiving waters, resulting in poor water quality and degradation of beneficial uses.

In addition to the generation of pollutants, areas of existing development have generally altered the natural conditions of the land and removed vegetative cover, reduced the perviousness of the surface, and reduced the capacity of storm water that can be intercepted, captured, stored, infiltrated, evaporated, and/or evapotranspired. The alteration of the natural conditions and the impervious surfaces associated with areas of existing development causes water quality problems due to the alteration of natural flow regimes within the watersheds; resulting in hydromodification of channels, streams, and habitats that exist within or adjacent to the areas of existing development.

Thus, storm water discharges from areas of existing development are responsible for poor water quality, degraded habitats, and hydromodified channels throughout the developed portions of the watersheds in the San Diego Region. To improve the health and functionality of the receiving waters in a Watershed Management Area, land use practices and the amount of impervious surfaces in areas of existing development must change to reduce the various impacts caused by hydromodification and pollutants from storm water runoff generated in developed areas. Each Copermittee must be aggressive to address pollutant sources and runoff from areas of existing development to be able to reduce pollutants in storm water discharges from the MS4 to the MEP.

There is some overlap in the requirements under Provision E.5 with the requirements under Provisions E.2 (Illicit Discharge Detection and Elimination), E.3 (Development Planning), and E.4 (Construction Management). Illicit discharges frequently originate from areas of existing development. New development projects, when completed will become some type of residential, commercial, industrial or municipal existing development. Redevelopment projects are, by definition, redeveloping areas of existing development. And, redevelopment projects become construction sites located in areas of existing development. Much of the data and information collected, inspections performed, and enforcement actions taken for the requirements under Provisions E.2 to E.4 may also be utilized by the existing development management program. The requirements under Provision E.5, however, are focused primarily on reducing pollutants generated in areas of existing development that can be transported in storm water runoff and discharged to and from the MS4.

The requirements under Provision E.5 build upon existing program elements being implemented by the Copermittees. Provision E.5 is generally consistent with the existing development requirements of the Fourth Term Permits for Orange and Riverside Counties (Order Nos. R9-2009-0002 and R9-2010-0016, respectively), but modified to provide more flexibility to implement the programs so resources can be better focused toward addressing the highest priority water quality conditions identified in the Water Quality Improvement Plans.

For a Copermittee to properly manage areas of existing development, having knowledge of what development exists within its jurisdiction is essential. Provision E.5.a requires each Copermittee to maintain a watershed-based inventory of all the existing development within its jurisdiction. This requirement is necessary for each Copermittee to implement the requirements of Provision E.5.b-e.

As opposed to just maintaining separate inventories based on the type of site, each Copermittee must maintain a watershed-based inventory that includes all types of existing development within its jurisdiction. By utilizing a watershed-based inventory, the Copermittees within a Watershed Management Area can combine their inventories and review the inventories by watershed in addition to by jurisdiction. Pollutant

sources and strategies for abatement can then be evaluated on a watershed level, as opposed to evaluating sources and strategies strictly by type of site.

Provision E.5.a includes the information that must be included in the inventory. Provision E.5.a.(1) specifies what facilities or areas must be included in the inventory. A commercial type of existing development may be identified in the inventory as a facility (e.g. individual building, individual business) or an area (e.g. shopping center, commercial zone). An industrial type of existing development must be identified in the inventory by facility (e.g. individual industrial entity). A municipal type of existing development must be identified in the inventory by facility, with a list of specific municipal facilities that must be included in the inventory. A residential type of existing development must be identified by areas to be designated by the Copermittee. For each of the facilities and areas identified in the Copermittee's inventory developed pursuant to Provision E.5.a.(1), Provision E.5.a.(2) specifies the information that must be included in the description for the facility or area.

Provision E.5.a.(3) requires each Copermittee to maintain an updated map showing the location of inventoried existing development, watershed boundaries, and water bodies. This requirement was included because this information is expected to help the Copermittees in a Watershed Management Area identify and prioritize sources of pollutants and/or stressors in areas of existing development that contribute toward the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Knowledge of the existing development that are likely to be sources of pollutants contributing to the highest priority water quality conditions is expected to be a key element in the Copermittees' development of the water quality improvement strategies that will be included in the Water Quality Improvement Plans. The strategies described in the Water Quality Improvement Plans will direct efforts within the existing development management programs implemented by each Copermittee.

Pursuant to 40 CFR 122.26(d)(2)(iv)(A) each Copermittee is required describe "*structural and source control measures to reduce pollutants*" in storm water runoff discharged from areas of existing development. Provision E.5.b includes the BMP implementation and maintenance requirements that the each Copermittee must require at areas of existing development to reduce pollutants in storm water discharges to the MEP. The San Diego Water Board, however, recognizes that BMP implementation and maintenance for residential areas will require much more education and encouragement through less authoritative measures than for commercial, industrial and municipal facilities and areas. Thus, the BMP implementation and maintenance requirements have been separated between requirements under Provision E.5.b.(1) for commercial, industrial and municipal facilities and areas, and Provision E.5.b.(2) for residential areas.

Most of the requirements in Provision E.5.b are consistent with the related requirements in the Fourth Term Permits. The level of specificity, however, has been changed to allow each Copermittee the flexibility to implement its program to achieve maximum efficiency, and to perform functions that will address the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Each Copermittee is expected to require the implementation of appropriate BMPs to address the expected pollutants from each facility or area. The Third and Fourth Term Permits described specific minimum BMPs that must be implemented at various sites. This Order, however, requires each Copermittee to designate minimum BMPs themselves and require implementation. Consistent with the Fourth Term Permits, each Copermittee is required to maintain, or require the maintenance of, all BMPs as needed.

The BMP implementation and maintenance requirements include a schedule of operation and maintenance activities for the MS4 and related structures (such as catch basins, storm drain inlets, and detention basins), as well as public streets and roads. Public streets and roads specifically include public unpaved roads. The San Diego Water Board identified, through investigations and complaints, sediment discharges from unpaved roads as a significant source of water quality problems in the San Diego Region. Inspection activities conducted by the San Diego Water Board since the Third Term Permits have found a lack of source control for many unpaved roads within the jurisdiction of the Copermittees.

Unpaved roads are a source of sediment that can be discharged in runoff to receiving waters, especially during storm events. Erosion of unpaved roadways occurs when soil particles are loosened and carried away from the roadway base, ditch, or road bank by water, wind, traffic, or other transport means. Exposed soils, high runoff velocities and volumes, sandy or silty soil types, and poor compaction increase the potential for erosion.

Road construction, culvert installation, and other maintenance activities can disturb the soil and drainage patterns to streams in undeveloped areas, causing excess runoff and thereby erosion and the release of sediment. Poorly designed unpaved roads can act as preferential drainage pathways that carry runoff and sediment into natural streams, impacting water quality. In addition, other public works activities along unpaved roads have the potential to significantly affect sediment discharge and transport within streams and other waterways, which can degrade the beneficial uses of those waterways.

USEPA also recognizes that discharges from unpaved roads pose a significant potential threat to water quality. USEPA guidance[40] emphasizes the threat of unpaved roads to water quality:

[40] USEPA, 2006. Environmentally Sensitive Maintenance for Dirt and Gravel Roads. Gesford and Anderson, USEPA-PA-2005.

> "*Dirt and gravel roads are a major potential source of these pollutants [sediment] and pollutants that bind to sediment such as oils, nutrients, pesticides, herbicides, and other toxic substances. Many roads have unstable surfaces and bases. Roads act like dams, concentrating flows that accelerate erosion of road materials and roadsides. Both unstable surfaces and accelerated erosion then lead to sediment and dust.*"

There are several guidance documents, developed by the USEPA,[41] the US Forest Service,[42] the University of California,[43] and others, that include design and construction specifications and BMPs that are readily available for implementation by public entities. Implementing design and other source control BMPs for unpaved roads in the region is necessary to reduce and minimize the impacts of sediment discharged during storm events from unpaved roads to the MS4s and receiving waters.

Provision E.5.c describes existing development site inspection frequency, content, and tracking that each Copermittee must incorporate into their existing development management programs. The requirements under Provision E.5.c are necessary to demonstrate each Copermittee is implementing a program that complies with Provision E.5.b and ensure BMPs implemented in areas of existing development will reduce pollutants in storm water discharges to the MEP. Provision E.5.c has been modified to include a minimum of once every 5 years for all inventoried facilities and areas of existing development, utilizing one or more methods of inspection.

In addition to onsite inspections, the methods of inspection have been expanded to include drive-by inspections. Inspections may be performed by the Copermittee's municipal and contract staff, or by volunteer monitoring or patrol programs. Volunteer monitoring or patrol programs are not expected to enforce the Copermittee's ordinances, or to inspect areas or facilities where members of the public are not allowed access. Volunteer monitoring or patrol programs must be trained by the Copermittee, and are only expected to collect visual observations. By utilizing drive-by inspections and volunteer monitoring or patrol programs, the Copermittees will be able to maximize and efficiently use their resources to identify and address sources of pollutants in areas of existing development.

The municipal and contract staff of each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial, industrial, and municipal facilities and areas in its inventoried existing development pursuant to Provision E.5.c.(1)(a)(iv). An "equivalent" of at least 20 percent means if any commercial, industrial, or municipal facilities or areas require multiple onsite

[41] Ibid
[42] US Forest Service, 1996. Forest Service Specifications for Construction of Roads & Bridges. EM-7720-100. Revised August 1996.
[43] University of California Division of Agriculture and Natural Resources, 2007. Rural Roads: A Construction and Maintenance Guide of California Landowners. Publication 8262.

inspections during any given year, those additional inspections may count toward the total annual inspection requirement. Linear municipal facilities (i.e. MS4 linear channels, sanitary sewer collection systems, streets, roads and highways) in the Copermittee's existing development inventory are not subject to the inspection frequency requirement of Provision E.5.c.(1)(a)(iv).

The inspection content specified in Provision E.5.c.(2)(a) includes the information required to be collected during an inspection by any method. The inspection content specified in Provision E.5.c.(2)(b) includes additional information that must be collected when a Copermittee's municipal or contract staff perform an onsite inspection. Provision E.5.c.(3) specifies the information that each Copermittee must maintain in its existing development inspection records.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system.*" Where enforcement is necessary to compel compliance with the requirements of Provision E.5 and ensure the pollutants in storm water discharges from the MS4 are reduced and continue to be reduced to the MEP, Provision E.5.d requires each Copermittee to enforce its legal authority established pursuant to Provision E.1, and in accordance with its Enforcement Response Plan required to be developed pursuant to Provision E.6.

Provisions E.5.e.(1)-(2) specifically require the Copermittee to identify areas of existing development as candidates for retrofitting, and streams, channels, and/or habitats as candidates for rehabilitation. Provisions E.5.e.(1)-(2) are based on the retrofitting requirements of the Fourth Term Permits for Orange and Riverside Counties, but modified to also include identifying projects to rehabilitate channels within areas of existing development. The requirements have also been modified to be more focused on utilizing these types of projects for addressing the highest priority water quality conditions identified in the Water Quality Improvement Plans.

Interest and opportunity to retrofit areas of existing development and rehabilitate channels located in areas of existing development has been observed in several programs the San Diego Water Board oversees (e.g., CWA Section 401 Water Quality Certification program, supplemental environmental projects, and grant programs). Each jurisdiction has miles and miles of streets that could be retrofitted to become green streets. Reshaping landscaped areas from convex to concave configurations can detain storm water instead of directing runoff as quickly as possible to the MS4. Retrofit projects could also include simply replacing impervious surfaces with permeable surfaces.

Retrofitting projects do not necessarily have to be expensive. Retrofitting projects could be as simple as redirecting downspouts from roofs to pervious or landscaped areas instead of to hardscaped areas discharging directly to the MS4, providing rain barrels to harvest storm water from downspouts for use at a later time, or planting more trees in areas with little vegetation to provide canopy that can intercept storm

water. The San Diego Water Board encourages the Copermittees to identify simple, low-cost retrofitting opportunities that can be easily implemented, in addition to other more expensive retrofitting and channel rehabilitation projects.

Rehabilitation of channels, streams, and/or habitat will require more significant planning and resources to implement. There are, however, also abundant opportunities to rehabilitate channels, streams and/or habitats in or adjacent to areas of existing development. Each Watershed Management Area likely has several creeks and stream reaches that have been undergrounded, artificially hardened, or hydromodified that could be rehabilitated to be more sustainably configured, which would slow down storm water flows and potentially have more assimilative capacity for pollutants while still being supportive of designated beneficial uses.

The San Diego Water Board recognizes that it may be infeasible to implement retrofitting or channel rehabilitation projects within certain areas of a Copermittee's jurisdictions. For such areas, the Copermittee must instead identify, develop, and implement regional retrofitting and channel rehabilitation projects (i.e. projects that can retain and/or treat storm water from one or more areas of existing development) adjacent to and/or downstream of the areas of existing development.

Provisions E.5.e.(1)-(2) do not require the implementation of retrofitting and rehabilitation projects, but do require the Copermittee to develop a program with strategies to facilitate the implementation of these types of projects in areas of existing development. The strategies are expected to include allowing and encouraging Priority Development Projects to implement retrofitting types of projects as a means of compliance with the structural BMP performance criteria requirements of Provisions E.3.c.(1) and E.3.c.(2).

<u>Provision E.6 (Enforcement Response Plans)</u> requires each Copermittee to develop an Enforcement Response Plan as part of its jurisdictional runoff management program document. Proper implementation of the Enforcement Response Plans is necessary to effectively prohibit non-storm water discharges to the MS4, and reduce the discharge of pollutants in storm water from the MS4 to the MEP.

Pursuant to 40 CFR 122.26(d)(1)(ii) and 40 CFR 122.26(d)(2)(i), each Copermittee must have sufficient "*legal authority to control discharges to the municipal separate storm sewer system*" and be able to demonstrate that it can "*operate pursuant to legal authority established by statute, ordinance or series of contracts*" to control the discharge of non-storm water and pollutants in storm water to and from its MS4. Pursuant to 40 CFR 122.26(d)(2)(i)(E) each Copermittee is specifically required to have the legal authority to "*[r]equire compliance with conditions in ordinances, permits, contracts or order*s."

The requirements under Provision E.6 are necessary to demonstrate that each Copermittee can enforce its legal authority to *"effectively prohibit non-stormwater discharges"* and "*reduce the discharge of pollutants to the maximum extent*

practicable" as well as "*[r]equire compliance with conditions in ordinances, permits, contracts or order*."

The Enforcement Response Plan required under Provision E.6 will serve as a reference for the Copermittee and the San Diego Water Board to determine if consistent enforcement actions are being implemented to achieve timely and effective compliance from all public and private entities that are not in compliance with the Copermittee's ordinances, permits, or other requirements. The Enforcement Response Plan must contain clear direction for the Copermittee to take immediate enforcement action, when appropriate and necessary, in their illicit discharge detection and elimination, development planning, construction management, and existing development management programs.

If the entities subject to the Copermittee's legal authority do not implement appropriate corrective actions in a timely manner, or if violations repeat, the Copermittee must take progressively stricter responses to enforce its legal authority and achieve compliance with its ordinances, permits, or other requirements to *"effectively prohibit non-stormwater discharges"* and "*reduce the discharge of pollutants to the maximum extent practicable.*"

<u>Provision E.7 (Public Education and Participation)</u> requires each Copermittee to implement a public education and participation program. Proper implementation of the public education and participation program as part of its jurisdictional runoff management program will contribute toward effectively prohibiting non-storm water discharges to the MS4, and toward the reduction of pollutants in storm water from the MS4 to the MEP.

Provision E.7 establishes the minimum requirements that each Copermittee must implement to engage members of the public as part of its jurisdictional runoff management program. In the Fourth Term Permits, the public education program requirements and the public participation requirements were included as separate jurisdictional runoff management program components. In this Order, the public education requirements have been consolidated with the public participation requirements, as both sets of requirements are related to the engagement of the public by each Copermittee. Engagement of the public is critical for the success of each Copermittee's jurisdictional runoff management program.

The Copermittees have been implementing public education programs for the last 20 years, which are now well established. The specificity of expected public education program elements of the Fourth Term Permits has been removed. For the most part, the public education program requirements in Provision E.7.a have been reduced to a set of requirements that are specifically included in the federal regulations under 40 CFR 122.26(d)(2)(iv)(A)(6), 122.26(d)(2)(B)(6) and 122.26(d)(2)(D)(4), which should already be incorporated into each Copermittee's existing public education program. Each Copermittee is expected to utilize the information and data collected from the monitoring and assessments conducted within the Watershed Management Area, and

from its inventories and inspections to best direct its public education program resources toward addressing the highest priority water quality conditions identified within the Water Quality Improvement Plan.

According to 40 CFR 122.26(d)(2)(iv), public participation is required to be included as part of the "*comprehensive planning process*", which includes the development and implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs. The requirements under Provision E.7.b specify the opportunities that the public must be provided to be involved in the "*comprehensive planning process*", as required by to 40 CFR 122.26(d)(2)(iv).

Provision E.8 (Fiscal Analysis) requires each Copermittee to secure the resources and provide an analysis of the resources that will be necessary to implement the requirements of the Order. Adequate fiscal resources are necessary for a jurisdictional runoff management program to effectively prohibit non-storm water discharges to the MS4, and reduce pollutants in storm water from the MS4 to the MEP.

According to 40 CFR 122.26(d)(2)(vi), each Copermittee is responsible for providing "*a fiscal analysis of the necessary capital and operation and maintenance expenditures necessary to accomplish the activities*" required by this Order, including "*a description of the source of funds that are proposed to meet the necessary expenditures, including legal restrictions on the use of such funds.*" The fiscal analysis requirements of Provision E.8 are consistent with 40 CFR 122.26(d)(2)(vi).

The San Diego Water Board has chosen not to require a description of fiscal benefits realized from implementation of the jurisdictional runoff management programs. This is a recommendation from the National Association of Flood and Stormwater Management Agencies.[44] For instance, the fiscal analysis requirements do not address city-wide fiscal benefits of protection (e.g., public health, tourism, property values, economic activity, beneficial uses, etc.), even though many costs currently reported to the San Diego Water Board are for related activities. This type of assessment may help Copermittees improve the allocation of resources and it may help the Copermittees secure adequate funding for the program. Qualitative assessments, however, could be overly subjective and most Copermittees likely lack the ability to provide accurate quantitative assessments. The San Diego Water Board encourages the Copermittees to consider means for conducting assessments of fiscal benefits derived from the programs. Such assessments could be conducted on a regional scale similar to studies of program costs conducted by the State Water Board.[45]

[44] National Association of Flood and Stormwater Management Agencies. 2006. *Guidance for Municipal Stormwater Funding.* Prepared under a grant provided by the USEPA.
[45] State Water Board, 2005. NPDES Stormwater Cost Survey.

F. Reporting

Purpose: Provision F includes the requirements for the documents and reports that the Copermittees must prepare and provide to the San Diego Water Board. The documents prepared by the Copermittees and provided to the San Diego Water Board and made available to the public will provide the documentation that the Copermittees are complying with the requirements of the Order.

***Discussion*:** Provision F requires the Copermittees to prepare several documents and reports that must be provided to the San Diego Water Board and made available to the public. The reporting requirements have been significantly reduced compared to the Fourth Term Permit reporting requirements. The reduction in reporting requirements was recommended by the San Diego County Copermittees in the Report of Water Discharge submitted in June 2011.

More specific and detailed discussions of the requirements of Provision F are provided below.

Provision F.1 (Water Quality Improvement Plans) requires the Copermittees in each Watershed Management Area to develop and submit a Water Quality Improvement Plan in accordance with the requirements of Provision B.

Of all the requirements of Provision F, the Water Quality Improvement Plans will likely be the documents requiring the most significant effort to develop. The content of the Water Quality Improvement Plans, however, is expected to include content that should already have been developed for the Watershed Plans and several elements that are included in the Monitoring and Reporting Programs required under the Fourth Term Permits.

Because the Water Quality Improvement Plan is part of the "*comprehensive planning process which involves public participation*," Provision F.1 includes requirements to give multiple opportunities to the public to provide input on the content of the plans.

Provision F.1.a.(1) specifies the elements that the Copermittees must include in the public participation process for the development of the Water Quality Improvement Plans. In order for the public to be aware of the opportunities to provide input, Provision F.1.a.(1)(a) requires the Copermittees to develop a publicly available and noticed schedule of the opportunities for the public to participate and provide comments during the development of the Water Quality Improvement Plan. These opportunities are when the public can provide the data, information, and recommendations that the Copermittees can consider during the development of the Water Quality Improvement Plans.

The San Diego Water Board recognizes, however, that the Copermittees cannot be expected to incorporate all the data, information, and recommendations that the public may provide into the Water Quality Improvement Plans. The Copermittees will have to

review the data, information, and recommendations received and make some decisions on what to incorporate into the Water Quality Improvement Plans. Before the Copermittees finalize their decisions, members of the public should be allowed to review the Copermittees' decisions. Thus, Provision F.1.a.(1)(b) requires the Copermittees to form a Water Quality Improvement Consultation Panel (Panel).

The Panel will consist of a member from the environmental community and a member from the development community familiar with the Watershed Management Area. A representative from the San Diego Water Board staff will also be part of the Panel. The Copermittees may choose to include additional members, but the Panel is only required to include three panel members.

The Panel will serve as an additional public participation and input mechanism during the development of the Water Quality Improvement Plans. The knowledge and expertise from these Panel members are expected to provide the Copermittees valuable direction during their decision-making process. The Copermittees will review the content of their planned submittals with the Panel members to receive recommendations. If the Panel provides recommendations, the Copermittees must consider revisions to the Water Quality Improvement Plan submittals.

The San Diego Water Board recognizes that the development of multiple Water Quality Improvement Plans concurrently may limit the ability of the public to review and provide comments to the Copermittees. Thus, Provision F.1.a.(1)(c) requires the Copermittees to coordinate the schedules for the public participation process among the Watershed Management Areas to provide the public time and opportunity to participate during the development of the Water Quality Improvement Plans.

Provision F.1.a.(2) requires the Copermittees to develop and submit the first Water Quality Improvement Plan component, in accordance with the requirements of Provision B.2, which includes the identification of the priority water quality conditions and potential water quality improvement strategies. The public must be provided an opportunity to provide data, information and recommendations to be utilized in the development and identification of the priority water quality conditions and potential water quality improvement strategies for the Watershed Management Area. The Copermittees must consult with the Panel and consider making revisions. The Copermittees may submit the requirements of Provision B.2 as early as 6 months and no later than 12 months after the commencement of coverage under this Order. After the requirements of Provision B.2 are submitted to the San Diego Water Board, the public will be provided another opportunity to provide comments.

Provision F.1.a.(3) requires the Copermittees to develop and submit the second Water Quality Improvement Plan component, in accordance with the requirements of Provision B.3, which includes the identification of the numeric goals for the highest priority water quality conditions identified for the Watershed Management Area, and the strategies that will be implemented to achieve the potential numeric goals. The Copermittees may also develop the Optional Watershed Management Area Analysis, in accordance with the requirements of Provision B.3.b.(4), as part of this submittal.

The public must be provided an opportunity to provide data, information and recommendations to be utilized in the development and identification of the numeric goals and water quality improvement strategies for the Watershed Management Area. The Copermittees must consult with the Panel and consider making revisions. The Copermittees may submit the requirements of Provision B.3 as early as 9 months and no later than 18 months after the commencement of coverage under this Order. After the requirements of Provision B.3 are submitted to the San Diego Water Board, the public will be provided another opportunity to provide comments.

Finally, Provision F.1.b describes the process for the submittal and implementation of the Water Quality Improvement Plans. The complete Water Quality Improvement Plans are required to be submitted by the Copermittees within 24 months after the commencement of coverage under this Order. The San Diego Water Board will provide the public an opportunity to provide comments on each complete Water Quality Improvement Plan.

The San Diego Water Board will review each Water Quality Improvement Plan and the public comments received to determine if the Copermittees have submitted a Water Quality Improvement Plan that meets the requirements of Provision B. If a Water Quality Improvement Plan does not meet the requirements of Provision B, the Copermittees will be considered out of compliance and directed in writing by the San Diego Water Board Executive Officer to correct the deficiencies.

When a Water Quality Improvement Plan meets the requirements of Provision B, the San Diego Water Board will determine whether to hold a public hearing or to limit public input to submittal of written comments before accepting the Water Quality Improvement Plan. Implementation of the Water Quality Improvement Plan must begin within 30 days of acceptance.

The San Diego Water Board expects that any deficiencies in the Water Quality Improvement Plan will be identified either in the public comments or during the review by the San Diego Water Board before implementation begins. In the event any deficiencies are identified after the implementation of the Water Quality Improvement Plan, Provision F.1.b.(7) clarifies that the San Diego Water Board maintains the right to require the Copermittees to correct any deficiencies that may be identified.

<u>Provision F.2 (Updates)</u> requires the Copermittees to update specific documents that the Copermittees will utilize to implement the requirements of this Order.

Each Copermittee is required to continue implementing a jurisdictional runoff management program, as required under Provision E. Implementation of each Copermittee's jurisdictional runoff management program is directed by its jurisdictional runoff management program document. Provision F.2.a requires each Copermittee to update its jurisdictional runoff management program document to be consistent with the requirements of Provision E concurrent with the submittal of the Water Quality Improvement Plan.

Likewise, each Copermittee must continue to require new development and redevelopment projects to implement BMPs to control pollutants in storm water runoff. The control of pollutants in storm water runoff from development and redevelopment projects within each Copermittee's jurisdiction is guided and directed by its BMP Design Manual, formerly known as a Standard Storm Water Mitigation Plan (SSMP). Provision F.2.b requires each Copermittee to update its BMP Design Manual to be consistent with the requirements of Provision E.3 concurrent with the submittal of the Water Quality Improvement Plan.

For situations where the San Diego Water Board may amend the requirements of Provisions E.3.a-d after a Copermittee has updated its BMP Design Manual pursuant to Provision F.2.b.(1), Provision F.2.b.(4) gives the Copermittee up to 90 days to incorporate the amended requirements of Provision E.3.a-d into its BMP Design Manual. The San Diego Water Board Executive Officer has discretion to modify the 90-day time period depending on the complexity of the amendments or other information that warrants a change in the 90-day time period.

In general, the requirements of the Order should not necessitate a complete rewrite of each Copermittee's jurisdictional runoff management program document or BMP Design Manual, as was required by the Third Term Permits. The jurisdictional runoff management program and BMP Design Manual requirements of this Order are not significantly different than the requirements of the Fourth Term Permits. Thus, only sections of the Order which are new or have been significantly changed should warrant revisions to specific sections of the Copermittee's jurisdictional runoff management program document and BMP Design Manual.

Finally, the Water Quality Improvement Plans are expected to require updates as the iterative approach and adaptive management process included in the Water Quality Improvement Plan, as required under Provision B.5, is implemented by the Copermittees. Provision F.2.c.(1) requires the Copermittees to implement a public participation process for the proposed updates, review the proposed updates with the Panel, and submit the updates to the Water Quality Improvement Plan as part of the Annual Reports required under Provision F.3.b.

Also, because TMDLs are likely to be developed, adopted and approved during the term of the Order, Provision F.2.c.(2) has been included to expedite the incorporation of TMDLs into the Copermittees' Water Quality Improvement Plans as part of the update process, potentially before the Order is re-opened to incorporated the requirements of the new TMDLs.

<u>Provision F.3 (Progress Reporting)</u> requires the Copermittees to report on the progress of implementing the Water Quality Improvement Plans.

The requirements of Provision F.3 are to report the progress toward improving water quality that the Copermittees are achieving with the implementation of the Water Quality Improvement Plans and each Copermittee's jurisdictional runoff management program. The Progress Report Presentations required under Provision F.3.a are

included to provide the Copermittees an opportunity to communicate directly with the San Diego Water Board and the public. The Progress Report Presentations will also provide the members of the San Diego Water Board and members of the public an opportunity to become more acquainted with the Copermittees and their projects and programs to address non-storm water and storm water discharges into and from their MS4s.

The Annual Report requirements of Provision F.3.b are a consolidation of several reporting requirements from the Fourth Term Permits, including the Jurisdictional Runoff Management Program Annual Reports, the Watershed Annual Reports, and the Monitoring and Reporting Program Annual Reports. Furthermore, the Annual Report requirements are consistent with the requirements under 40 CFR 122.42(c).

Pursuant to 40 CFR 122.42(c), "*[t]he operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the Director…must submit an annual report*", which must include the following:

(1) *The status of implementing the components of the storm water management program that are established as permit conditions* [40 CFR 122.42(c)(1)];

(2) *Proposed changes to the storm water management programs that are established as permit conditions* [40 CFR 122.42(c)(2)];

(3) *Revisions, if necessary, to the assessment of controls and fiscal analysis* [40 CFR 122.42(c)(3)];

(4) *A summary of data, including monitoring data, that is accumulated throughout the reporting year* [40 CFR 122.42(c)(4)];

(5) *Annual expenditures and budget for year following each annual report* [40 CFR 122.42(c)(5)];

(6) *A summary describing the number and nature of enforcement actions, inspections, and public education programs* [40 CFR 122.42(c)(6)];

(7) *Identification of water quality improvements or degradation* [40 CFR 122.42(c)(7)].

Under the Fourth Term Permits, each Copermittee is responsible for submitting a Jurisdictional Runoff Management Program Annual Report; the Copermittees in each designated watershed are responsible for submitting a Watershed Annual Report; and the Copermittees from each county are responsible for submitting a Monitoring and Reporting Program Annual Report.

There are 39 Copermittees in the San Diego Region, each required to prepare and submit a Jurisdictional Runoff Management Program Annual Report. There are 9 designated watersheds in San Diego County, 6 designated watersheds in Orange County, and 1 designated watershed in Riverside County for a total of 16 designated watersheds, each requiring a Watershed Annual Report. There are 3 sets of

Copermittees in 3 counties in the San Diego Region, requiring Copermittees from each county to prepare and submit a Monitoring and Reporting Program Annual Report. Thus each Copermittee is currently required to prepare, or participate in the preparation of at least 3 annual reports. In addition, the San Diego County Copermittees are required to prepare and submit a Regional Urban Runoff Management Plan Annual Report.

In total, there are 59 annual reports that are prepared by the Copermittees and submitted to the San Diego Water Board for the Fourth Term Permits. The preparation of these annual reports requires significant time and resources from each Copermittee, which could otherwise be expended on actions that could improve water quality within its jurisdiction. In turn, significant time and resources are required from the San Diego Water Board staff to review these reports, which could otherwise be expended on working directly with the Copermittees to improve their implementation efforts toward restoring and protecting water quality.

Until the Water Quality Improvement Plans are developed, there will be a transitional period during which the Copermittees will continue to implement their existing jurisdictional runoff management programs. There will also be a transitional period during which the Copermittees will implement the transitional monitoring and assessment requirements of Provision D. During the transitional period, the Copermittees will submit annual reports pursuant to the requirements of Provisions F.3.b.(1) and F.3.b.(2).

Provision F.3.b.(1) includes the transitional annual reporting requirements for each Copermittee's jurisdictional runoff management program. The reporting of the jurisdictional runoff management program implementation efforts have been reduced to a single 2-page form. Each Copermittee is required to complete and submit a Jurisdictional Runoff Management Program Annual Report Form (contained in Attachment D or a revised form accepted by the San Diego Water Board) no later than October 31 of each year for each jurisdictional runoff management program reporting period (i.e. July 1 to June 30) during the transitional period, until the first Water Quality Improvement Plan Annual Reports are required to be submitted. The Jurisdictional Runoff Management Program Annual Report Form will certify that each Copermittee has implemented its jurisdictional runoff management program in accordance with the requirements of Provision E. Each Copermittee may choose to continue to utilize and submit the jurisdictional runoff management program annual reporting format of its current Order until the first Water Quality Improvement Plan Annual Report is required to be submitted.

Provision F.3.b.(2) includes the transitional annual reporting requirements for the transitional monitoring and assessment program for each Watershed Management Area. The Copermittees in the Watershed Management Area are required to submit a Transitional Monitoring and Assessment Program Annual Report no later than January 31 for each complete transitional monitoring and assessment program reporting period (i.e. October 1 to September 30) during the transitional period, until the first Water

Quality Improvement Plan Annual Reports are required to be submitted. The Transitional Monitoring and Assessment Program Annual Report is required to include the transitional period monitoring data collected pursuant to Provisions D.1.a and D.2.a, and the findings from the transitional period findings from the assessments required pursuant to Provisions D.4.a.(1)(a), D.4.b.(1)(a)(i), D.4.b.(2)(a)(i).

Provision F.3.b.(3) includes the Water Quality Improvement Plan Annual Report requirements. Only one Water Quality Improvement Plan Annual Report is required for each of the ten (10) Watershed Management Areas designated under Provision B.1, which is a significant reduction in the number of annual reports required to be prepared and submitted by the Copermittees. The Water Quality Improvement Plan Annual Report will document the Copermittees' efforts to implement the Water Quality Improvement Plan. Each Water Quality Improvement Plan Annual Report will be focused primarily on reporting the analysis of the monitoring data collected pursuant to Provisions D.1-D.3 during the reporting period, and the assessments that are required pursuant to Provision D.4 based on the data. The monitoring data analyses and the assessments that are provided in the Water Quality Improvement Plan Annual Report will be the core of the report. The reporting of the jurisdictional runoff management program implementation efforts have been reduced to a single 2-page form, and will no longer be the primary focus of the reporting requirements as in the Third and Fourth Term Permits.

Each Copermittee will continue to prepare and submit a Jurisdictional Runoff Management Program Annual Report Form as part of the Water Quality Improvement Plan Annual Report to certify that each Copermittee has implemented its jurisdictional runoff management program in accordance with the requirements of Provision E. Instead of reviewing a voluminous report from each Copermittee, as was required under the Third and Fourth Term Permits, the San Diego Water Board will conduct audits of each Copermittee's jurisdictional runoff management program to investigate and confirm the information provided by each Copermittee on its Jurisdictional Runoff Management Program Annual Report Form. The audits will allow the San Diego Water Board to become more familiar with the each Copermittee's jurisdictional runoff management program, and each Copermittee will become more informed about the expectations of the San Diego Water Board.

The reduction in the number and content of the Water Quality Improvement Plan Annual Reports should result in significant time, cost and resource savings for the Copermittees, as well as the San Diego Water Board. Those savings should offset a significant portion of any additional costs that may be incurred to develop the Water Quality Improvement Plans and to implement the monitoring and assessment program requirements of Provision D.

The reporting period for the Water Quality Improvement Plan Annual Reports consists of two periods. Because the jurisdictional runoff management programs are typically budgeted and implemented during a fiscal year, the information provided on the

Jurisdictional Runoff Management Program Annual Report Forms will cover the period from July 1 to June 30 of the following year.

The Water Quality Improvement Plan Annual Reports, however, are focused primarily on the monitoring data and the assessments based on the monitoring data. The monitoring data is collected during the monitoring year, which begins October 1 and ends September 30 of the following year. The monitoring year begins after the beginning of the fiscal year and ends after the end of the fiscal year. Therefore, to accommodate and capture the information collected during the fiscal year and the monitoring year, the Annual Report reporting period incorporates both periods.

Finally, Provision F.3.c requires the Copermittees to develop and submit a Regional Monitoring and Assessment Report. The Regional Monitoring and Assessment Report is similar to the Long Term Effectiveness Assessment required under the Fourth Term San Diego County Permit. The Regional Monitoring and Assessment Report is expected to utilize the entire body of data and information collected by the Copermittees during the term of this Order to assess improvements to water quality on a regional scale.

Provision F.4 (Regional Clearinghouse) requires the Copermittees to develop, update, and maintain an internet-based Regional Clearinghouse that can be used to store, disseminate, and share the Copermittees' documents, monitoring data, special studies, and any other data or information.

Most of the documents and data that are generated by the Copermittees can be provided in electronic format, and made available to the San Diego Water Board and the public on the internet. The San Diego Water Board has been gradually transitioning its document submittal requirements to electronic submittals. Provision F.4 has been included to further these efforts.

Provision F.4 has also been included to improve the exchange and availability of information among the Copermittees, as well as between the Copermittees and the San Diego Water Board. Provision F.4 will also make the information generated during the implementation of the Order more accessible to the public.

Provision F.5 (Report of Waste Discharge) requires the Copermittees to submit a Report of Waste Discharge to reapply for renewal of the Order prior to its expiration, in accordance with 40 CFR 122.21(d)(2) and CWC section 13376.

Provision F.5 requires the Copermittees to submit a Report of Waste Discharge 180 days in advance of the expiration of this Order. Provision F.5 also describes the minimum information to be included in the Report of Waste Discharge, based on USEPA guidance "Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems," dated May 17, 1996.

G. Principal Watershed Copermittee Responsibilities

Purpose: Provision G includes the requirements for the Principal Watershed Copermittee designated by the Copermittees in each Watershed Management Area.

***Discussion*:** Unlike previous NPDES requirements, there will no longer be a single Principal Copermittee. Provision G.1 requires the Copermittees to designate a Principal Watershed Copermittee for each Watershed Management Area. There are ten (10) Watershed Management Areas in the San Diego Region, as defined in Table B-1 under Provision B.1 of the Order. An individual Copermittee should not be the Principal Watershed Copermittee for more than two (2) Watershed Management Areas. There could be up to ten (10) Principal Water Copermittees designated for the Watershed Management Areas in the San Diego Region.

Provision G.2 describes the minimum responsibilities of each Principal Watershed Copermittee. The primary responsibility of the Principal Watershed Copermittees is to serve as the liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues. Ideally, the Principal Watershed Copermittee can represent the interests of all the Copermittees within a Watershed Management Area during discussions or meetings to facilitate communication with the San Diego Water Board. The Principal Watershed Copermittees are also responsible for facilitating and coordinating the implementation efforts of the Copermittees and submittals of required documents and reports.

The Principal Watershed Copermittee is responsible for facilitating the efforts of the Copermittees within the Watershed Management Area to develop the Water Quality Improvement Plan required under Provision B, and submit it for approval in accordance with Provision F.1. The Principal Watershed Copermittee is also responsible for coordinating the submittal of the document updates, Progress Report Presentations, and Annual Reports required from the Copermittees within each Watershed Management Area under Provisions F.2, F.3.a, and F.3.b. The Principal Watershed Copermittees are responsible for coordinating with each other to develop and submit the Regional Clearinghouse, Regional Monitoring and Assessment Report, and the Report of Waste Discharge required under Provisions F.3.c, F.4, and F.5.

The designated Principal Watershed Copermittee for each Watershed Management Area does not necessarily have to serve as the Principal Watershed Copermittee for the entire term of the Order. If the Copermittees in a Watershed Management Area choose to designate a new Principal Watershed Copermittee, the change may be submitted as part of the Annual Report required under Provision F.3.b, with an update to the Water Quality Improvement Plan in accordance with Provision F.2.c.

Provision G.3 specifies that the Principal Watershed Copermittee is not responsible for ensuring that the other Copermittees within the Watershed Management Area are in compliance with the requirements of this Order

H. Modification of Order

Purpose: Provision H provides the conditions under which modifications to Order No. R9-2013-0001, as amended, may occur.

***Discussion*:** Provision H allows for modifications to Order No. R9-2013-0001, as amended, for bases in addition to modifications (minor and major) allowed under the federal regulations at 40 CFR 122.62 and 122.63.

Modifications to the Order require re-opening the Order (see Water Code section 13223), subject to the requirements of 40 CFR 122.44, 122.62 to 122.64, and 124.5, but only for the specific provisions subject to the modification. Proposed modifications of the Order will be made available for public review, a public notice and comment period, and a public hearing if requested. Comments on the provisions not subject to the proposed modifications are not required to be considered in the San Diego Water Board's responses to comments or during the public hearing.

Provision H.4 was included to specify that the Order will be re-opened for modifications if the Basin Plan is amended to modify an existing TMDL or incorporate a new TMDL, or the monitoring and assessment program requirements need to be updated or revised.

I. Standard Permit Provisions and General Provisions

Purpose: Provision I incorporates the standard permit provisions required to be included in all NPDES permits, as well as several other general provisions.

***Discussion*:** Provision I refers to Attachment B to the Order. Attachment B expressly incorporates the conditions applicable to all NPDES permits as provided under 40 CFR 122.41(a)-(n), as well as the applicable conditions for MS4s and storm water discharges provided under 40 CFR 122.42(c) and 40 CFR 122.42(d), respectively. Attachment B also includes several general provisions that are typically included in or applicable to waste discharge requirements issued by the San Diego Water Board.

IX. ATTACHMENTS

The attachments to the Order are discussed below. The discussions describe the content of the attachments.

Attachment A – Discharge Prohibitions and Special Protections

Section 1 of Attachment A includes the Waste Discharge Prohibitions from the Basin Plan. They have been provided verbatim in their entirety.

Section 2 of Attachment A includes the "*Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges*" applicable to permitted point source discharges of storm water, adopted under State Water Board Resolution No. 2012-0012, as amended by Resolution No. 2012-0031. The terms, prohibitions, and special conditions (collectively referred to as special conditions) are established as limitations on point source storm water discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in ASBS, as required for State Water Quality Protection Areas pursuant to California Public Resources Code sections 36700(f) and 36710(f). These Special Protections were adopted by the State Water Board as part of the Ocean Plan General Exception.

Attachment B – Standard Permit Provisions and General Provisions

Conditions applicable to all NPDES permits, as required under 40 CFR 122.41, and conditions applicable to MS4s and storm water discharges, as required under 40 CFR 122.42(c) and 122.42(d), respectively are provided in Attachment B to the Order. They have been provided expressly in their entirety.

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. These general provisions are typically included in or applicable to waste discharge requirements issued by the San Diego Water Board. Many of the general provisions were developed by the State Water Board. Where a general provision is derived from statute or regulation, a citation of the statute or regulation section is provided. General provisions that do not provide a citation are included under the authority provided CWC 13377.

Attachment C – Acronyms, Abbreviations and Definitions

The acronyms and abbreviations that are used in the Order are provided in Attachment C. Attachment C also includes definitions that may provide an explanation or description of the meaning or intent of specific terms or phrases included in the Order.

Attachment D – Jurisdictional Runoff Management Program Annual Report Form

An example of the Jurisdictional Runoff Management Program Annual Report Form required to be submitted by each Copermittee as part of the Annual Reports required under Provision F.3.b.(1)(e) is provided as Attachment D to the Order. An electronic version of the form will be available from the San Diego Water Board after the adoption of the Order.

The Jurisdictional Runoff Management Program Annual Report Form includes the minimum information necessary to demonstrate that the Copermittee is implementing and in compliance with the requirements of Provision E, and includes much of the information required to be reported pursuant to 40 CFR 122.42(c).

The information that must be provided on the Jurisdictional Runoff Management Program Annual Report Form is limited to the fiscal year, which begins July 1 and ends June 30 of the following year. The information expected to be provided by the Copermittees in each section of the Jurisdictional Runoff Management Program Annual Report Form is discussed below.

I. COPERMITTEE INFORMATION

The name of the Copermittee (e.g. name of city, county, or special district) and the contact information for the storm water program manager are provided under this section.

II. LEGAL AUTHORITY

The Copermittee must confirm whether or not the legal authorities under Provision E.1.a have been established for itself within its jurisdiction.

The Copermittee must also confirm whether or not a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative has certified that the Copermittee obtained and maintains adequate legal authority, as required under Provision E.1.b. The certification statement required by Provision E.1.b is only required to be submitted with the first Annual Report required under Provision F.3.b.

III. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM DOCUMENT UPDATE

The Copermittee must inform the San Diego Water Board whether or not an update to its jurisdictional runoff management program document was required or recommended by the San Diego Water Board during the reporting period. An update to the jurisdictional runoff management program is required under Provision F.2.a. The San Diego Water Board may recommend modifications to the jurisdictional runoff management program as part of the iterative approach and adaptive management process required under Provision B.5, which may result in an update that is necessary for the Copermittee's jurisdictional runoff management document.

If an update was required or recommended, the Copermittee must confirm whether or not the update was completed and made available on the Regional Clearinghouse within the reporting period. If no update was required or recommended, an answer is not required. If the answer is NO, meaning the required or recommended update was not completed and/or made available on the Regional Clearinghouse, the Copermittee must attach a

schedule for the completion of the update and/or posting of the updated document on the Regional Clearinghouse.

IV. ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

The Copermittee must confirm whether or not a program was implemented during the fiscal year to actively detect and eliminate illicit discharges and connections in accordance with the requirements under Provision E.2.

In addition to confirming that a program to detect and eliminate illicit discharges was implemented during the reporting period, the Copermittee is also required to report on several items related to the program. The information that must be reported is limited to the fiscal year for the Annual Report.

All non-storm water discharges are considered illicit discharges unless the source is identified as one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5). If a non-storm water discharge is identified as one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5), the discharge is a non-storm water discharge, but not an illicit discharge. If a non-storm water discharge is identified but not in one of the categories on non-storm water discharges under Provisions E.2.a.(1)-(5), the discharge is both a non-storm water discharge and an illicit discharge.

V. DEVELOPMENT PLANNING PROGRAM

The Copermittee must confirm whether or not a development planning program was implemented during the fiscal year in accordance with the requirements under Provision E.3.

The Copermittee must also inform the San Diego Water Board whether or not an update to its BMP Design Manual was required or recommended by the San Diego Water Board during the fiscal year. An update to the BMP Design Manual is required under Provision F.2.b. The San Diego Water Board may recommend modifications to the BMP Design Manual, which may result in an update that is necessary for Copermittee's the BMP Design Manual.

If an update was required or recommended, the Copermittee must confirm whether or not the update was completed and made available on the Regional Clearinghouse within the reporting period. If no update was required or recommended, an answer is not required. If the answer is NO, meaning the required or recommended update was not completed and/or made available on the Regional Clearinghouse, the Copermittee must attach a schedule for the completion of the update and/or posting of the updated document on the Regional Clearinghouse.

The Copermittee is also required to report on several items related to the program. For the development and redevelopment projects that are reviewed under the program, the Copermittee must report the total number projects submitted for review during the fiscal year. Of those projects, the Copermittee must report the number that are Priority Development Projects, as defined under Provision E.3.b.(1). The Copermittee must also report the number of Priority Development Projects that were approved and/or granted occupancy during the fiscal year, regardless of when the project was originally submitted for review. Any projects that were approved during the fiscal year and granted any

exemptions from the BMP Design Manual requirements and/or allowed to implement alternative compliance options in accordance with Provision E.3.c.(3) must be reported.

Finally, the Copermittee must also report on several items related to its oversight of permanent BMPs on Priority Development Projects within its jurisdiction, as required under Provision E.3.e. The information that must be reported is limited to the fiscal year for the Annual Report.

VI. CONSTRUCTION MANAGEMENT PROGRAM

The Copermittee must confirm whether or not a construction management program was implemented during the fiscal year in accordance with the requirements under Provision E.4.

The Copermittee is also required to report on several items related to its oversight construction projects within its jurisdiction. The information that must be reported is limited to the fiscal year for the Annual Report.

VII. EXISTING DEVELOPMENT MANAGEMENT PROGRAM

The Copermittee must confirm whether or not an existing development management program was implemented during the fiscal year in accordance with the requirements under Provision E.5.

The Copermittee is also required to report on several items related to its oversight in areas of existing development within its jurisdiction. The information that must be reported is limited to the fiscal year for the Annual Report. The information must also be separated into four categories of existing development: municipal, commercial, industrial, and residential.

VIII. PUBLIC EDUCATION AND PARTICIPATION

The Copermittee must confirm whether or not a public education program component was implemented during the fiscal year in accordance with the requirements under Provision E.7.a.

The Copermittee must also confirm whether or not a public participation program component was implemented during the fiscal year in accordance with the requirements under Provision E.7.b.

IX. FISCAL ANALYSIS

The Copermittee must confirm a summary of its fiscal analysis, conducted in accordance with the requirements under Provision E.8, has been attached to the form.

X. CERTIFICATION

A Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative must sign and certify the Jurisdictional Runoff Management Program Annual Report Form. The appropriate box must be checked to indicate the whether a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative is signing the form.

Attachment E – Specific Provisions for Total Maximum Daily Loads

Attachment E provides specific provisions for implementing the load allocations (LAs) and wasteload allocations (WLAs) of Total Maximum Daily Loads (TMDLs) adopted by the San Diego Water Board and approved by USEPA in which the Copermittees are identified as responsible for discharges subject to the requirements of the TMDLs. Federal regulations require that NPDES requirements incorporate water quality based effluent limitations (WQBELs) that must be consistent with the requirements and assumptions of any available WLAs,[46] which may be expressed as numeric effluent limitations, when feasible, and/or as a best management practice (BMP) program of expanded or better-tailored BMPs.[47] Where the TMDL includes WLAs that provide numeric pollutant load or pollutant parameter objectives, the WLA has been, where feasible, translated into numeric WQBELs.[48]

For each TMDL in Attachment E, four sections are included:

a. Applicability: This section provides the resolution under which the TMDL Basin Plan amendment was adopted and approved, with the applicable adoption and approval dates. This section also gives the effective date of the TMDL and where the TMDL is applicable (i.e. Watershed Management Area and water body). The Copermittees that are responsible for implementing the specific provisions are also given in this section.

b. Final TMDL Compliance Requirements: For each TMDL, the final TMDL compliance requirements consist of the final TMDL compliance date(s), the final WQBELs, and the final TMDL compliance determination requirements. The final WQBELs are expressed in terms of receiving water limitations, effluent limitations, and/or best management practices (BMPs). The final WQBELs for the TMDLs are incorporated by reference into Provision A of the Order. The final WQBELs become enforceable when the final TMDL compliance dates have passed. Applicable BMPs within the final WQBELs must be incorporated into the Water Quality Improvement Plans. Compliance with the final WQBELs will be determined in accordance with the options provided under the final TMDL compliance determination requirements.

c. Interim TMDL Compliance Requirements: If the final TMDL compliance date has not passed and there are interim TMDL compliance requirements, they are included in this section. If there are interim WQBELs with interim compliance dates, the interim WQBELs become enforceable when the corresponding interim compliance dates have passed. Compliance with the interim WQBELs will be determined in accordance with the options provided under the interim TMDL compliance determination requirements.

d. Specific Monitoring and Assessment Requirements: If there are specific monitoring and assessment requirements that cannot be met with the monitoring and assessment program

[46] 40 CFR 122.44(d)(1)(vii)(B)
[47] 40 CFR 122.44(k)(2) and 40 CFR 122.44(k)(3)
[48] November 26, 2014 Memorandum from the USEPA, Revisions to the November 22, 2002 Memorandum "Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLA""

requirements under Provision D of the Order, the additional requirements are included in this section.

The requirements of the TMDLs are based on and consistent with the assumptions and requirements of any available adopted and approved TMDLs that have been incorporated into the Basin Plan. Modifications to the requirements for the TMDLs in Attachment E cannot be made unless the TMDLs are modified in the Basin Plan.

A modification to any aspect of a TMDL in the Basin Plan requires a Basin Plan amendment. A Basin Plan amendment to modify a TMDL will require the San Diego Water Board to adopt a resolution to amend the Basin Plan, which includes a separate public process. When the San Diego Water Board adopts a Basin Plan amendment, it subsequently requires approval from the State Water Board, the Office of Administrative Law, and the USEPA before it becomes effective.

If and when the TMDLs are a modified in the Basin Plan, the San Diego Water Board will revise the requirements of the Order in accordance with the Basin Plan amendment. When a Basin Plan amendment to modify a TMDL becomes effective, the San Diego Water Board will modify the requirements of the Order pursuant to the requirements of Provision H.4 of the Order as soon as possible.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
ORDER NO. R9-2007-0001
NPDES NO. CAS0108758
WASTE DISCHARGE REQUIREMENTS
FOR DISCHARGES OF URBAN RUNOFF FROM
THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s)
DRAINING THE WATERSHEDS OF THE COUNTY OF SAN DIEGO,
THE INCORPORATED CITIES OF SAN DIEGO COUNTY,
THE SAN DIEGO UNIFIED PORT DISTRICT,
AND THE SAN DIEGO COUNTY REGIONAL AIRPORT AUTHORITY

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Attachment A – Basin Plan Prohibitions
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RECEIVING WATERS AND URBAN RUNOFF MONITORING AND REPORTING PROGRAM NO. R9-2007-0001

The California Regional Water Quality Control Board, San Diego Region (hereinafter Regional Board), finds that:

A. BASIS FOR THE ORDER

1. This Order is based on the federal Clean Water Act (CWA), the Porter-Cologne Water Quality Control Act (Division 7 of the Water Code, commencing with Section 13000), applicable state and federal regulations, all applicable provisions of statewide Water Quality Control Plans and Policies adopted by the State Water Resources Control Board (SWRCB), the Water Quality Control Plan for the San Diego Basin adopted by the Regional Board, the California Toxics Rule, and the California Toxics Rule Implementation Plan.

2. This Order renews National Pollutant Discharge Elimination System (NPDES) Permit No. CAS0108758, which was first issued on July 16, 1990 (Order No. 90-42), and then renewed on February 21, 2001 (Order No. 2001-01). On August 25, 2005, in accordance with Order No. 2001-01, the County of San Diego, as the Principal Permittee, submitted a Report of Waste Discharge (ROWD) for renewal of their MS4 Permit.

B. REGULATED PARTIES

1. Each of the persons in Table 1 below, hereinafter called Copermittees or dischargers, owns or operates a municipal separate storm sewer system (MS4), through which it discharges urban runoff into waters of the United States within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the United States.

Table 1. Municipal Copermittees

1.	City of Carlsbad	12.	City of Oceanside
2.	City of Chula Vista	13.	City of Poway
3.	City of Coronado	14.	City of San Diego
4.	City of Del Mar	15.	City of San Marcos
5.	City of El Cajon	16.	City of Santee
6.	City of Encinitas	17.	City of Solana Beach
7.	City of Escondido	18.	City of Vista
8.	City of Imperial Beach	19.	County of San Diego
9.	City of La Mesa	20.	San Diego Unified Port District
10.	City of Lemon Grove	21.	San Diego County Regional Airport Authority
11.	City of National City		

C. DISCHARGE CHARACTERISTICS

1. Urban runoff contains waste, as defined in the California Water Code (CWC), and pollutants that adversely affect the quality of the waters of the State. The discharge of urban runoff from an MS4 is a "discharge of pollutants from a point source" into waters of the U.S. as defined in the CWA.

2. The most common categories of pollutants in urban runoff include total suspended solids, sediment (due to anthropogenic activities); pathogens (e.g., bacteria, viruses, protozoa);

heavy metals (e.g., copper, lead, zinc and cadmium); petroleum products and polynuclear aromatic hydrocarbons; synthetic organics (e.g., pesticides, herbicides, and PCBs); nutrients (e.g., nitrogen and phosphorus fertilizers), oxygen-demanding substances (decaying vegetation, animal waste), and trash.

3. The discharge of pollutants and/or increased flows from MS4s may cause or threaten to cause the concentration of pollutants to exceed applicable receiving water quality objectives and impair or threaten to impair designated beneficial uses resulting in a condition of pollution (i.e., unreasonable impairment of water quality for designated beneficial uses), contamination, or nuisance.

4. Pollutants in urban runoff can threaten human health. Human illnesses have been clearly linked to recreating near storm drains flowing to coastal waters. Also, urban runoff pollutants in receiving waters can bioaccumulate in the tissues of invertebrates and fish, which may be eventually consumed by humans.

5. Urban runoff discharges from MS4s often contain pollutants that cause toxicity to aquatic organisms (i.e., adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies). Toxic pollutants impact the overall quality of aquatic systems and beneficial uses of receiving waters.

6. The Copermittees discharge urban runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within ten of the eleven hydrologic units (watersheds) comprising the San Diego Region as shown in Table 2 below. Some of the receiving water bodies have been designated as impaired by the Regional Board and the United States Environmental Protection Agency (USEPA) in 2002 pursuant to CWA section 303(d). Also shown below are the watershed management areas (WMAs) as defined in the Regional Board report, Watershed Management Approach, January 2002.

Table 2. Common Watersheds and CWA Section 303(d) Impaired Waters

REGIONAL BOARD WATERSHED MANAGEMENT AREA (WMA)	HYDROLOGIC UNIT(S)	MAJOR SURFACE WATER BODIES	303(d) POLLUTANT(S) OF CONCERN OR WATER QUALITY EFFECT[1]	COPERMITTEES
Santa Margarita River	Santa Margarita (902.00)	Santa Margarita River and Estuary, Pacific Ocean	1. Eutrophic 2. Nitrogen 3. Phosphorus 4. Total Dissolved Solids	1. County of San Diego
San Luis Rey River	San Luis Rey (903.00)	San Luis Rey River and Estuary, Pacific Ocean	1. Bacterial Indicators 2. Eutrophic 3. Chloride 4. Total Dissolved Solids	1. City of Escondido 2. City of Oceanside 3. City of Vista 4. County of San Diego
Carlsbad	Carlsbad (904.00)	Batiquitos Lagoon San Elijo Lagoon Agua Hedionda Lagoon Buena Vista Lagoon And Tributary Streams Pacific Ocean	1. Bacterial Indicators 2. Eutrophic 3. Sedimentation/Siltation 4. Nutrients 5. Total Dissolved Solids	1. City of Carlsbad 2. City of Encinitas 3. City of Escondido 4. City of Oceanside 5. City of San Marcos 6. City of Solana Beach 7. City of Vista 8. County of San Diego

[1] The listed 303(d) pollutant(s) of concern do not necessarily reflect impairment of the entire corresponding WMA or all corresponding major surface water bodies. The specific impaired portions of each WMA are listed in the State Water Resources Control Board's 2002 Section 303(d) List of Water Quality Limited Segments.

REGIONAL BOARD WATERSHED MANAGEMENT AREA (WMA)	HYDROLOGIC UNIT(S)	MAJOR SURFACE WATER BODIES	303(d) POLLUTANT(S) OF CONCERN OR WATER QUALITY EFFECT[1]	COPERMITTEES
San Dieguito River	San Dieguito (905.00)	San Dieguito River and Estuary, Pacific Ocean	1. Bacterial Indicators 2. Sulfate 3. Color 4. Nitrogen 5. Phosphorus 6. Total Dissolved Solids	1. City of Del Mar 2. City of Escondido 3. City of Poway 4. City of San Diego 5. City of Solana Beach 6. County of San Diego
Mission Bay	Peñasquitos (906.00)	Los Peñasquitos Lagoon Mission Bay, Pacific Ocean	1. Bacterial Indicators 2. Metals 3. Eutrophic 4. Sedimentation/Siltation 5. Toxicity	1. City of Del Mar 2. City of Poway 3. City of San Diego 4. County of San Diego
San Diego River	San Diego (907.00)	San Diego River, Pacific Ocean	1. Bacterial Indicators 2. Eutrophic 3. pH 4. Total Dissolved Solids 5. Oxygen (Dissolved)	1. City of El Cajon 2. City of La Mesa 3. City of Poway 4. City of San Diego 5. City of Santee 6. County of San Diego
San Diego Bay	Pueblo San Diego (908.00) Sweetwater (909.00) Otay (910.00)	San Diego Bay Sweetwater River Otay River Pacific Ocean	1. Bacterial Indicators 2. Metals 3. Sediment Toxicity 4. Benthic Community Degradation 5. Diazinon 6. Chlordane 7. Lindane 8. PAHs 9. PCBs	1. City of Chula Vista 2. City of Coronado 3. City of Imperial Beach 4. City of La Mesa 5. City of Lemon Grove 6. City of National City 7. City of San Diego 8. County of San Diego 9. San Diego Unified Port District 10.San Diego County Regional Airport Authority
Tijuana River	Tijuana (911.00)	Tijuana River and Estuary Pacific Ocean	1. Bacterial Indicators 2. Low Dissolved Oxygen 3. Metals 4. Eutrophic 5. Pesticides 6. Synthetic Organics 7. Trace Elements 8. Trash 9. Solids	1. City of Imperial Beach 2. City of San Diego 3. County of San Diego

7. The Copermittees' water quality monitoring data submitted to date documents persistent exceedances of Basin Plan water quality objectives for various urban runoff-related pollutants (diazinon, fecal coliform bacteria, total suspended solids, turbidity, metals, etc.) at various watershed monitoring stations. At some monitoring stations, such as Agua Hedionda, statistically significant upward trends in pollutant concentrations have been observed. Persistent toxicity has also been observed at some watershed monitoring stations. In addition, bioassessment data indicates that the majority of watersheds have Poor to Very Poor Index of Biotic Integrity ratings. In sum, the above findings indicate that urban runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in San Diego County.

8. When natural vegetated pervious ground cover is converted to impervious surfaces such as paved highways, streets, rooftops, and parking lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving a developed urban area is significantly greater in runoff volume, velocity, and peak flow rate than pre-development runoff from the same area. Runoff durations can also increase as a result of flood control and other efforts to control peak flow rates. Increased volume, velocity, rate, and duration of runoff greatly accelerate the erosion of downstream natural channels. Significant declines in the biological integrity and physical habitat of streams and other receiving waters have been found to occur

with as little as a 10% conversion from natural to impervious surfaces. The increased runoff characteristics from new development must be controlled to protect against increased erosion of channel beds and banks, sediment pollutant generation, or other impacts to beneficial uses and stream habitat due to increased erosive force.

9. Urban development creates new pollution sources as human population density increases and brings with it proportionately higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, trash, etc. which can either be washed or directly dumped into the MS4. As a result, the runoff leaving the developed urban area is significantly greater in pollutant load than the pre-development runoff from the same area. These increased pollutant loads must be controlled to protect downstream receiving water quality.

10. Development and urbanization especially threaten environmentally sensitive areas (ESAs), such as water bodies designated as supporting a RARE beneficial use (supporting rare, threatened or endangered species) and CWA 303(d) impaired water bodies. Such areas have a much lower capacity to withstand pollutant shocks than might be acceptable in the general circumstance. In essence, development that is ordinarily insignificant in its impact on the environment may become significant in a particular sensitive environment. Therefore, additional control to reduce pollutants from new and existing development may be necessary for areas adjacent to or discharging directly to an ESA.

11. Although dependent on several factors, the risks typically associated with properly managed infiltration of runoff (especially from residential land use areas) are not significant. The risks associated with infiltration can be managed by many techniques, including (1) designing landscape drainage features that promote infiltration of runoff, but do not "inject" runoff (injection bypasses the natural processes of filtering and transformation that occur in the soil); (2) taking reasonable steps to prevent the illegal disposal of wastes; (3) protecting footings and foundations; and (4) ensuring that each drainage feature is adequately maintained in perpetuity.

D. URBAN RUNOFF MANAGEMENT PROGRAMS

1. General

a. This Order specifies requirements necessary for the Copermittees to reduce the discharge of pollutants in urban runoff to the maximum extent practicable (MEP). However, since MEP is a dynamic performance standard which evolves over time as urban runoff management knowledge increases, the Copermittees' urban runoff management programs must continually be assessed and modified to incorporate improved programs, control measures, best management practices (BMPs), etc. in order to achieve the evolving MEP standard. Absent evidence to the contrary, this continual assessment, revision, and improvement of urban runoff management program implementation is expected to ultimately achieve compliance with water quality standards.

b. Although the Copermittees have generally been implementing the jurisdictional urban runoff management programs required pursuant to Order No. 2001-01 since February 21, 2002, urban runoff discharges continue to cause or contribute to violations of water quality standards. This Order contains new or modified requirements that are necessary to improve Copermittees' efforts to reduce the discharge of pollutants in urban runoff to the MEP and achieve water quality

standards. Some of the new or modified requirements, such as the expanded Watershed Urban Runoff Management Program section, are designed to specifically address these high priority water quality problems. Other new or modified requirements address program deficiencies that have been noted during audits, report reviews, and other Regional Board compliance assessment activities.

c. Updated Jurisdictional Urban Runoff Management Plans (JURMPs) and Watershed Urban Runoff Management Plans (WURMPs), and a new Regional Urban Runoff Management Plan (RURMP), which describe the Copermittees' urban runoff management programs in their entirety, are needed to guide the Copermittees' urban runoff management efforts and aid the Copermittees in tracking urban runoff management program implementation. It is practicable for the Copermittees to update the JURMPs and WURMPs, and create the RURMP, within one year, since significant efforts to develop these programs have already occurred.

d. Pollutants can be effectively reduced in urban runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Pollution prevention is the reduction or elimination of pollutant generation at its source and is the best "first line of defense". Source control BMPs (both structural and non-structural) minimize the contact between pollutants and flows (e.g., rerouting run-on around pollutant sources or keeping pollutants on-site and out of receiving waters). Treatment control BMPs remove pollutants from urban runoff.

e. Urban runoff needs to be addressed during the three major phases of development (planning, construction, and use) in order to reduce the discharge of pollutants to the MEP and protect receiving waters. Development which is not guided by water quality planning policies and principles can unnecessarily result in increased pollutant load discharges, flow rates, and flow durations which can impact receiving water beneficial uses. Construction sites without adequate BMP implementation result in sediment runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. Existing development generates substantial pollutant loads which are discharged in urban runoff to receiving waters.

f. Annual reporting requirements included in this Order are necessary to meet federal requirements and to evaluate the effectiveness and compliance of the Copermittees' programs.

2. Development Planning

a. The Standard Urban Storm Water Mitigation Plan (SUSMP) requirements contained in this Order are consistent with Order WQ-2000-11 adopted by the SWRCB on October 5, 2000. In the precedential order, the SWRCB found that the design standards, which essentially require that urban runoff generated by 85 percent of storm events from specific development categories be infiltrated or treated, reflect the MEP standard. The order also found that the SUSMP requirements are appropriately applied to the majority of the Priority Development Project categories contained in Section D.1 of this Order. The SWRCB also gave Regional Water Quality Control Boards the discretion to include additional categories and locations, such as retail gasoline outlets (RGOs), in future SUSMPs.

b. Controlling urban runoff pollution by using a combination of onsite source control and Low Impact Development (LID) BMPs augmented with treatment control BMPs before the runoff enters the MS4 is important for the following reasons: (1) Many end-of-pipe BMPs (such as diversion to the sanitary sewer) are typically ineffective during significant storm events. Whereas, onsite source control BMPs can be applied during all runoff conditions; (2) End-of-pipe BMPs are often incapable of capturing and treating the wide range of pollutants which can be generated on a sub-watershed scale; (3) End-of-pipe BMPs are more effective when used as polishing BMPs, rather than the sole BMP to be implemented; (4) End-of-pipe BMPs do not protect the quality or beneficial uses of receiving waters between the source and the BMP; and (5) Offsite end-of-pipe BMPs do not aid in the effort to educate the public regarding sources of pollution and their prevention.

c. Use of LID BMPs at new development projects can be an effective means for minimizing the impact of urban runoff discharges from the development projects on receiving waters. LID BMPs help preserve and restore the natural hydrologic cycle of the site, allowing for filtration and infiltration which can greatly reduce the volume, peak flow rate, velocity, and pollutant loads of urban runoff.

d. Retail Gasoline Outlets (RGOs) are significant sources of pollutants in urban runoff. RGOs are points of convergence for motor vehicles for automotive related services such as repair, refueling, tire inflation, and radiator fill-up and consequently produce significantly higher loadings of hydrocarbons and trace metals (including copper and zinc) than other urban areas. To meet MEP, LID, source control, and treatment control BMPs are needed at RGOs that meet the following criteria: (a) 5,000 square feet or more, or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day. These are appropriate thresholds since vehicular development size and volume of traffic are good indicators of potential impacts of urban runoff from RGOs on receiving waters.

e. Sites of heavy industry are significant sources of pollutants in urban runoff. Pollutant concentrations and loads in runoff from industrial sites are similar or exceed pollutant concentrations and loads in runoff from other land uses, such as commercial or residential land uses. As with other land uses, LID, source control, and treatment control BMPs are needed at sites of heavy industry in order to meet the MEP standard. These BMPs are necessary where the site of heavy industry is larger than one acre. The one acre threshold is appropriate, since it is consistent with requirements in the Phase II NPDES storm water regulations.

f. If not properly designed or maintained, certain BMPs implemented or required by municipalities for urban runoff management may create a habitat for vectors (e.g. mosquitoes and rodents). However, proper BMP design and maintenance can prevent the creation of vector habitat. Nuisances and public health impacts resulting from vector breeding can be prevented with close collaboration and cooperative effort between municipalities and local vector control agencies and the State Department of Health Services during the development and implementation of urban runoff management programs.

3. Construction and Existing Development

a. In accordance with federal NPDES regulations and to ensure the most effective oversight of industrial and construction site discharges, discharges of runoff from

industrial and construction sites are subject to dual (state and local) storm water regulation. Under this dual system, the Regional Board is responsible for enforcing the General Construction Activities Storm Water Permit, SWRCB Order 99-08 DWQ, NPDES No. CAS000002 (General Construction Permit) and the General Industrial Activities Storm Water Permit, SWRCB Order 97-03 DWQ, NPDES No. CAS000001 (General Industrial Permit), and each municipal Copermittee is responsible for enforcing its local permits, plans, and ordinances, which may require the implementation of additional BMPs than required under the statewide general permits.

b. Identification of sources of pollutants in urban runoff (such as municipal areas and activities, industrial and commercial sites/sources, construction sites, and residential areas), development and implementation of BMPs to address those sources, and updating ordinances and approval processes are necessary for the Copermittees to ensure that discharges of pollutants into and from its MS4 are reduced to the MEP. Inspections and other compliance verification methods are needed to ensure minimum BMPs are implemented. Inspections are especially important at high risk areas for pollutant discharges.

c. Historic and current development makes use of natural drainage patterns and features as conveyances for urban runoff. Urban streams used in this manner are part of the municipalities MS4 regardless of whether they are natural, man-made, or partially modified features. In these cases, the urban stream is both an MS4 and a receiving water.

d. As operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not prohibit or control. These discharges may cause or contribute to a condition of contamination or a violation of water quality standards.

e. Waste and pollutants which are deposited and accumulate in MS4 drainage structures will be discharged from these structures to waters of the U.S. unless they are removed or treated. These discharges may cause or contribute to, or threaten to cause or contribute to, a condition of pollution in receiving waters. For this reason, pollutant discharges into MS4s must be reduced to the MEP unless treatment within the MS4 occurs.

f. Enforcement of local urban runoff related ordinances, permits, and plans is an essential component of every urban runoff management program and is specifically required in the federal storm water regulations and this Order. Each Copermittee is individually responsible for adoption and enforcement of ordinances and/or policies, implementation of identified control measures/BMPs needed to prevent or reduce pollutants in storm water runoff, and for the allocation of funds for the capital, operation and maintenance, administrative, and enforcement expenditures necessary to implement and enforce such control measures/BMPs under its jurisdiction.

g. Education is an important aspect of every effective urban runoff management program and the basis for changes in behavior at a societal level. Education of municipal planning, inspection, and maintenance department staffs is especially critical to ensure that in-house staffs understand how their activities impact water

quality, how to accomplish their jobs while protecting water quality, and their specific roles and responsibilities for compliance with this Order. Public education, designed to target various urban land users and other audiences, is also essential to inform the public of how individual actions impact receiving water quality and how these impacts can be minimized.

h. Public participation during the development of urban runoff management programs is necessary to ensure that all stakeholder interests and a variety of creative solutions are considered.

4. Watershed and Regional Urban Runoff Management

a. Since urban runoff does not recognize political boundaries, watershed-based urban runoff management can greatly enhance the protection of receiving waters within a watershed. Such management provides a means to focus on the most important water quality problems in each watershed. By focusing on the most important water quality problems, watershed efforts can maximize protection of beneficial use in an efficient manner. Effective watershed-based urban runoff management actively reduces pollutant discharges and abates pollutant sources causing or contributing to watershed water quality problems; watershed-based urban runoff management that does not actively reduce pollutant discharges and abate pollutant sources causing or contributing to watershed water quality problems can necessitate implementation of the iterative process outlined in section A.3 of the Order. Watershed management of urban runoff does not require Copermittees to expend resources outside of their jurisdictions. Watershed management requires the Copermittees within a watershed to develop a watershed-based management strategy, which can then be implemented on a jurisdictional basis.

b. Some urban runoff issues, such as residential education, can be effectively addressed on a regional basis. Regional approaches to urban runoff management can improve program consistency and promote sharing of resources, which can result in implementation of more efficient programs.

c. Both regionally and on a watershed basis, it is important for the Copermittees to coordinate their water quality protection and land use planning activities to achieve the greatest protection of receiving water bodies. Copermittee coordination with other watershed stakeholders, especially Caltrans, the Department of Defense, and Native American Tribes, is also important. Establishment of a management structure, within which the Copermittees subject to this Order will fund and coordinate those aspects of their joint obligations, will help promote implementation of urban runoff management programs on a watershed and regional basis in a most cost effective manner.

E. STATUTE AND REGULATORY CONSIDERATIONS

1. The Receiving Water Limitations (RWL) language specified in this Order is consistent with language recommended by the USEPA and established in SWRCB Water Quality Order 99-05, adopted by the SWRCB on June 17, 1999. The RWL in this Order require compliance with water quality standards, which is to be achieved through an iterative approach requiring the implementation of improved and better-tailored BMPs over time. Compliance with receiving water limits based on applicable water quality standards is necessary to ensure that MS4 discharges will not cause or contribute to violations of water quality standards and the

creation of conditions of pollution.

2. The Water Quality Control Plan for the San Diego Basin (Basin Plan), identifies the following beneficial uses for surface waters in San Diego County: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Process Supply (PROC), Industrial Service Supply (IND), Ground Water Recharge (GWR), Contact Water Recreation (REC1) Non-contact Water Recreation (REC2), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Freshwater Replenishment (FRSH), Hydropower Generation (POW), and Preservation of Biological Habitats of Special Significance (BIOL). The following additional beneficial uses are identified for coastal waters of San Diego County: Navigation (NAV), Commercial and Sport Fishing (COMM), Estuarine Habitat (EST), Marine Habitat (MAR), Aquaculture (AQUA), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN), and Shellfish Harvesting (SHELL).

3. This Order is in conformance with SWRCB Resolution No. 68-16 and the federal Antidegradation Policy described in 40 CFR 131.12.

4. Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states with approved coastal zone management programs to address non-point pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point pollution: agriculture, silviculture, urban, marinas, and hydromodification. This NPDES permit addresses the management measures required for the urban category, with the exception of septic systems. The adoption and implementation of this NPDES permit relieves the Permittee from developing a non-point source plan, for the urban category, under CZARA. The Regional Board addresses septic systems through the administration of other programs.

5. Section 303(d)(1)(A) of the CWA requires that "Each state shall identify those waters within its boundaries for which the effluent limitations…are not stringent enough to implement any water quality standard (WQS) applicable to such waters." The CWA also requires states to establish a priority ranking of impaired waterbodies known as Water Quality Limited Segments and to establish Total Maximum Daily Loads (TMDLs) for such waters. This priority list of impaired waterbodies is called the Section 303(d) List. The current Section 303(d) List was approved by the SWRCB on February 4, 2003 and on July 25, 2003 by USEPA.

6. This Order fulfills a component of the TMDL Implementation Plan adopted by this Regional Board on August 14, 2002 for diazinon in Chollas Creek by establishing Water Quality Based Effluent Limits (WQBELs) for the Cities of San Diego, Lemon Grove, and La Mesa, the County of San Diego, and the San Diego Unified Port District; and by requiring: 1) legal authority, 2) implementation of a diazinon toxicity control plan and a diazinon public outreach/ education program, 3) achievement of the Compliance Schedule, and 4) a monitoring program. The establishment of WQBELs expressed as iterative BMPs to achieve the Waste Load Allocation (WLA) compliance schedule is appropriate and is expected to be sufficient to achieve the WLAs specified in the TMDL.

7. This Order fulfills a component of the TMDL Implementation Plan adopted by this Regional Board on February 9, 2005 for dissolved copper in Shelter Island Yacht Basin (SIYB) by establishing WQBELs expressed as BMPs to achieve the WLA of 30 kg copper / year for the City of San Diego and the San Diego Unified Port District. The establishment of WQBELs expressed as BMPs is appropriate and is expected to be sufficient to achieve the WLA

specified in the TMDL.

8. This Order establishes WQBELs and conditions consistent with the requirements and assumptions of the WLAs in the TMDLs as required by 40 CFR 122.44(d)(1)(vii)(B).

9. Requirements in this Order that are more explicit than the federal storm water regulations in 40 CFR 122.26 are prescribed in accordance with the CWA section 402(p)(3)(B)(iii) and are necessary to meet the MEP standard.

10. Urban runoff treatment and/or mitigation must occur prior to the discharge of urban runoff into a receiving water. Federal regulations at 40 CFR 131.10(a) state that in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S. Authorizing the construction of an urban runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to accepting waste assimilation as an appropriate use for that water body. Furthermore, the construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body. This is consistent with USEPA guidance to avoid locating structural controls in natural wetlands.

11. The issuance of waste discharge requirements and an NPDES permit for the discharge of urban runoff from MS4s to waters of the U.S. is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 et seq.) in accordance with the CWC section 13389.

F. PUBLIC PROCESS

1. The Regional Board has notified the Copermittees, all known interested parties, and the public of its intent to consider adoption of an Order prescribing waste discharge requirements that would serve to renew an NPDES permit for the existing discharge of urban runoff.

2. The Regional Board has, at public meetings on (date), held public hearings and heard and considered all comments pertaining to the terms and conditions of this Order.

IT IS HEREBY ORDERED that the Copermittees, in order to meet the provisions contained in Division 7 of the California Water Code (CWC) and regulations adopted thereunder, and the provisions of the Clean Water Act (CWA) and regulations adopted thereunder, shall each comply with the following:

A. PROHIBITIONS AND RECEIVING WATER LIMITATIONS

1. Discharges into and from municipal separate storm sewer systems (MS4s) in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state are prohibited.

2. Discharges from MS4s containing pollutants which have not been reduced to the maximum extent practicable (MEP) are prohibited.[2]

[2] This prohibition does not apply to MS4 discharges which receive subsequent treatment to reduce pollutants to the MEP prior to entering receiving waters (e.g., low flow diversions to the sanitary sewer).

3. Discharges from MS4s that cause or contribute to the violation of water quality standards (designated beneficial uses and water quality objectives developed to protect beneficial uses) are prohibited.

   a. Each Copermittee shall comply with section A.3 and section A.4 as it applies to Prohibition 5 in Attachment A of this Order through timely implementation of control measures and other actions to reduce pollutants in urban runoff discharges in accordance with the Jurisdictional Urban Runoff Management Program and other requirements of this Order including any modifications. The Jurisdictional Urban Runoff Management Program shall be designed to achieve compliance with section A.3 and section A.4 as it applies to Prohibition 5 in Attachment A of this Order. If exceedance(s) of water quality standards persist notwithstanding implementation of the Jurisdictional Urban Runoff Management Program and other requirements of this Order, the Copermittee shall assure compliance with section A.3 and section A.4 as it applies to Prohibition 5 in Attachment A of this Order by complying with the following procedure:

      (1) Upon a determination by either the Copermittee or the Regional Board that MS4 discharges are causing or contributing to an exceedance of an applicable water quality standard, the Copermittee shall promptly notify and thereafter submit a report to the Regional Board that describes best management practices (BMPs) that are currently being implemented and additional BMPs that will be implemented to prevent or reduce any pollutants that are causing or contributing to the exceedance of water quality standards. The report may be incorporated in the annual update to the Jurisdictional Urban Runoff Management Program unless the Regional Board directs an earlier submittal. The report shall include an implementation schedule. The Regional Board may require modifications to the report;

      (2) Submit any modifications to the report required by the Regional Board within 30 days of notification;

      (3) Within 30 days following approval of the report described above by the Regional Board, the Copermittee shall revise its Jurisdictional Urban Runoff Management Program and monitoring program to incorporate the approved modified BMPs that have been and will be implemented, the implementation schedule, and any additional monitoring required;

      (4) Implement the revised Jurisdictional Urban Runoff Management Program and monitoring program in accordance with the approved schedule.

   b. So long as the Copermittee has complied with the procedures set forth above and is implementing the revised Jurisdictional Urban Runoff Management Program, the Copermittee does not have to repeat the same procedure for continuing or recurring exceedances of the same receiving water limitations unless directed by the Regional Board to do so.

   c. Nothing in section A.3 shall prevent the Regional Board from enforcing any provision of this Order while the Copermittee prepares and implements the above report.

4. In addition to the above prohibitions, discharges from MS4s are subject to all Basin Plan prohibitions cited in Attachment A to this Order.

B. NON-STORM WATER DISCHARGES

1. Each Copermittee shall effectively prohibit all types of non-storm water discharges into its MS4 unless such discharges are either authorized by a separate National Pollutant Discharge Elimination System (NPDES) permit; or not prohibited in accordance with sections B.2 and B.3 below.

2. The following categories of non-storm water discharges are not prohibited unless a Copermittee or the Regional Board identifies the discharge category as a significant source of pollutants to waters of the U.S. For such a discharge category, the Copermittee shall either prohibit the discharge category or develop and implement appropriate control measures to reduce the discharge of pollutants to the MEP and report to the Regional Board pursuant to section J.

   a. Diverted stream flows;
   b. Rising ground waters;
   c. Uncontaminated ground water infiltration [as defined at 40 CFR 35.2005(20)] to MS4s;
   d. Uncontaminated pumped ground water;
   e. Foundation drains;
   f. Springs;
   g. Water from crawl space pumps;
   h. Footing drains;
   i. Air conditioning condensation;
   j. Flows from riparian habitats and wetlands;
   k. Water line flushing;
   l. Landscape irrigation;
   m. Discharges from potable water sources not subject to NPDES Permit No. CAG679001, other than water main breaks;
   n. Irrigation water;
   o. Lawn watering;
   p. Individual residential car washing; and
   q. Dechlorinated swimming pool discharges.

3. Emergency fire fighting flows (i.e., flows necessary for the protection of life or property) do not require BMPs and need not be prohibited. As part of the Jurisdictional Urban Runoff Management Plan (JURMP), each Copermittee shall develop and implement a program to reduce pollutants from non-emergency fire fighting flows (i.e., flows from controlled or practice blazes and maintenance activities) identified by the Copermittee to be significant sources of pollutants to waters of the United States.

4. Each Copermittee shall examine all dry weather field screening and analytical monitoring results collected in accordance with section D.4 of this Order and Receiving Waters Monitoring and Reporting Program No. R9-2007-0001 to identify water quality problems which may be the result of any non-prohibited discharge category(ies) identified above in section B.2. Follow-up investigations shall be conducted as necessary to identify and control any non-prohibited discharge category(ies) listed above.

C. LEGAL AUTHORITY

1. Each Copermittee shall establish, maintain, and enforce adequate legal authority to control pollutant discharges into and from its MS4 through ordinance, statute, permit, contract or similar means. This legal authority must, at a minimum, authorize the Copermittee to:

   a. Control the contribution of pollutants in discharges of runoff associated with industrial and construction activity to its MS4 and control the quality of runoff from industrial and construction sites. This requirement applies both to industrial and construction sites which have coverage under the statewide general industrial or construction storm water permits, as well as to those sites which do not. Grading ordinances shall be upgraded and enforced as necessary to comply with this Order.

   b. Prohibit all identified illicit discharges not otherwise allowed pursuant to section B.2 including but not limited to:

      (1) Sewage;
      (2) Discharges of wash water resulting from the hosing or cleaning of gas stations, auto repair garages, or other types of automotive services facilities;
      (3) Discharges resulting from the cleaning, repair, or maintenance of any type of equipment, machinery, or facility including motor vehicles, cement-related equipment, and port-a-potty servicing, etc.;
      (4) Discharges of wash water from mobile operations such as mobile automobile washing, steam cleaning, power washing, and carpet cleaning, etc.;
      (5) Discharges of wash water from the cleaning or hosing of impervious surfaces in municipal, industrial, commercial, and residential areas including parking lots, streets, sidewalks, driveways, patios, plazas, work yards and outdoor eating or drinking areas, etc.;
      (6) Discharges of runoff from material storage areas containing chemicals, fuels, grease, oil, or other hazardous materials;
      (7) Discharges of pool or fountain water containing chlorine, biocides, or other chemicals; discharges of pool or fountain filter backwash water;
      (8) Discharges of sediment, pet waste, vegetation clippings, or other landscape or construction-related wastes; and
      (9) Discharges of food-related wastes (e.g., grease, fish processing, and restaurant kitchen mat and trash bin wash water, etc.).

   c. Prohibit and eliminate illicit connections to the MS4;

   d. Control the discharge of spills, dumping, or disposal of materials other than storm water to its MS4;

   e. Require compliance with conditions in Copermittee ordinances, permits, contracts or orders (i.e., hold dischargers to its MS4 accountable for their contributions of pollutants and flows);

   f. Utilize enforcement mechanisms to require compliance with Copermittee storm water ordinances, permits, contracts, or orders;

   g. Control the contribution of pollutants from one portion of the shared MS4 to another portion of the MS4 through interagency agreements among Copermittees. Control of

the contribution of pollutants from one portion of the shared MS4 to another portion of the MS4 through interagency agreements with other owners of the MS4 such as Caltrans, the Department of Defense, or Native American Tribes is encouraged;

h. Carry out all inspections, surveillance, and monitoring necessary to determine compliance and noncompliance with local ordinances and permits and with this Order, including the prohibition on illicit discharges to the MS4. This means the Copermittee must have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from industrial facilities discharging into its MS4, including construction sites;

i. Require the use of BMPs to prevent or reduce the discharge of pollutants into MS4s to the MEP; and

j. Require documentation on the effectiveness of BMPs implemented to reduce the discharge of pollutants to the MS4 to the MEP.

2. Each Permittee shall include as part of its JURMP a statement certified by its chief legal counsel that the Copermittee has taken the necessary steps to obtain and maintain full legal authority to implement and enforce each of the requirements contained in 40 CFR 122.26(d)(2)(i)(A-F) and this Order. This statement shall include:

a. Identification of all departments within the jurisdiction that conduct urban runoff related activities, and their roles and responsibilities under this Order. Include an up to date organizational chart specifying these departments and key personnel.

b. Citation of urban runoff related ordinances and the reasons they are enforceable;

c. Identification of the local administrative and legal procedures available to mandate compliance with urban runoff related ordinances and therefore with the conditions of this Order;

d. A description of how urban runoff related ordinances are implemented and appealed; and

e. Description of whether the municipality can issue administrative orders and injunctions or if it must go through the court system for enforcement actions.

D. JURISDICTIONAL URBAN RUNOFF MANAGEMENT PROGRAM

Each Copermittee shall implement all requirements of section D of this Order no later than 365 days after adoption of the Order, unless otherwise specified in this Order. Prior to 365 days after adoption of the Order, each Copermittee shall at a minimum implement its Jurisdictional URMP document, as the document was developed and amended to comply with the requirements of Order No. 2001-01.

Each Copermittee shall develop and implement an updated Jurisdictional Urban Runoff Management Program for its jurisdiction. Each updated Jurisdictional Urban Runoff Management Program shall meet the requirements of section D of this Order, reduce the discharge of pollutants from the MS4 to the MEP, and prevent urban runoff discharges from the MS4 from causing or contributing to a violation of water quality standards.

1. Development Planning Component

Each Copermittee shall implement a program which meets the requirements of this section and (1) reduces Development Project discharges of pollutants from the MS4 to the MEP, (2) prevents Development Project discharges from the MS4 from causing or contributing to a violation of water quality standards, and (3) manages increases in runoff discharge rates and durations from Development Projects that are likely to cause increased erosion of stream beds and banks, silt pollutant generation, or other impacts to beneficial uses and stream habitat due to increased erosive force.

a. GENERAL PLAN

Each Copermittee shall revise as needed its General Plan or equivalent plan (e.g., Comprehensive, Master, or Community Plan) for the purpose of providing effective water quality and watershed protection principles and policies that direct land-use decisions and require implementation of consistent water quality protection measures for Development Projects.

b. ENVIRONMENTAL REVIEW PROCESS

Each Copermittee shall revise as needed their current environmental review processes to accurately evaluate water quality impacts and cumulative impacts and identify appropriate measures to avoid, minimize and mitigate those impacts for all Development Projects.

c. APPROVAL PROCESS CRITERIA AND REQUIREMENTS FOR ALL DEVELOPMENT PROJECTS

For all proposed Development Projects, each Copermittee during the planning process and prior to project approval and issuance of local permits shall prescribe the necessary requirements so that Development Project discharges of pollutants from the MS4 will be reduced to the MEP, will not cause or contribute to a violation of water quality standards, and will comply with Copermittee's ordinances, permits, plans, and requirements, and with this Order. The requirements shall include, but not be limited to, implementation by the project proponent of the following:

(1) Source control BMPs that reduce storm water pollutants of concern in urban runoff, including storm drain system stenciling and signage, properly designed outdoor material storage areas, properly designed trash storage areas, and implementation of efficient irrigation systems;
(2) LID BMPs where feasible which maximize infiltration, provide retention, slow runoff, minimize impervious footprint, direct runoff from impervious areas into landscaping, and construct impervious surfaces to minimum widths necessary;
(3) Buffer zones for natural water bodies, where feasible. Where buffer zones are infeasible, require project proponent to implement other buffers such as trees, access restrictions, etc., where feasible;
(4) Measures necessary so that grading or other construction activities meet the provisions specified in section D.2 of this Order; and
(5) Submittal of proof of a mechanism under which ongoing long-term maintenance of all structural post-construction BMPs will be conducted.

d. STANDARD URBAN STORM WATER MITIGATION PLANS (SUSMPS) – APPROVAL PROCESS CRITERIA AND REQUIREMENTS FOR PRIORITY DEVELOPMENT PROJECTS

Each Copermittee shall implement an updated local SUSMP which meets the requirements of section D.1.d of this Order and (1) reduces Priority Development Project discharges of pollutants from the MS4 to the MEP, (2) prevents Priority Development Project runoff discharges from the MS4 from causing or contributing to a violation of water quality standards, and (3) manages increases in runoff discharge rates and durations from Priority Development Projects that are likely to cause increased erosion of stream beds and banks, silt pollutant generation, or other impacts to beneficial uses and stream habitat due to increased erosive force.[3]

(1) Definition of Priority Development Project

(a) Priority Development Projects are: a) all new Development Projects that fall under the project categories or locations listed in section D.1.d.(2), and b) those redevelopment projects that create, add or replace at least 5,000 square feet of impervious surfaces on an already developed site that falls under the project categories or locations listed in section D.1.d.(2). Where redevelopment results in an increase of less than fifty percent of the impervious surfaces of a previously existing development, and the existing development was not subject to SUSMP requirements, the numeric sizing criteria discussed in section D.1.d.(6)(c) applies only to the addition, and not to the entire development. Where redevelopment results in an increase of more than fifty percent of the impervious surfaces of a previously existing development, the numeric sizing criteria applies to the entire development. Where a new Development Project feature, such as a parking lot, falls into a Priority Development Project Category, the entire project footprint is subject to SUSMP requirements.

(b) In addition to the Priority Development Project Categories identified in section D.1.d.(2), within three years of adoption of this Order Priority Development Projects shall also include all other pollutant generating Development Projects that result in the disturbance of one acre or more of land.[4] As an alternative to this one acre threshold, the Copermittees may collectively identify a different threshold, provided the Copermittees' threshold is at least as inclusive of Development Projects as the one acre threshold.

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[3] Updated SUSMP and hydromodification requirements shall apply to all priority projects or phases of priority projects which have not yet begun grading or construction activities at the time any updated SUSMP or hydromodification requirement commences. If a Copermittee determines that lawful prior approval of a project exists, whereby application of an updated SUSMP or hydromodification requirement to the project is infeasible, the updated SUSMP or hydromodification requirement need not apply to the project. Where feasible, the Copermittees shall utilize the SUSMP and hydromodification update periods to ensure that projects undergoing approval processes include application of the updated SUSMP and hydromodification requirements in their plans.

[4] Pollutant generating Development Projects are those projects that generate pollutants at levels greater than background levels.

(2) Priority Development Project Categories

(a) Housing subdivisions of 10 or more dwelling units. This category includes single-family homes, multi-family homes, condominiums, and apartments.
(b) Commercial developments greater than one acre. This category is defined as any development on private land that is not for heavy industrial or residential uses where the land area for development is greater than one acre. The category includes, but is not limited to: hospitals; laboratories and other medical facilities; educational institutions; recreational facilities; municipal facilities; commercial nurseries; multi-apartment buildings; car wash facilities; mini-malls and other business complexes; shopping malls; hotels; office buildings; public warehouses; automotive dealerships; airfields; and other light industrial facilities.
(c) Developments of heavy industry greater than one acre. This category includes, but is not limited to, manufacturing plants, food processing plants, metal working facilities, printing plants, and fleet storage areas (bus, truck, etc.).
(d) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.
(e) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812), where the land area for development is greater than 5,000 square feet. Restaurants where land development is less than 5,000 square feet shall meet all SUSMP requirements except for structural treatment BMP and numeric sizing criteria requirement D.1.d.(6)(c) and hydromodification requirement D.1.g.
(f) All hillside development greater than 5,000 square feet. This category is defined as any development which creates 5,000 square feet of impervious surface which is located in an area with known erosive soil conditions, where the development will grade on any natural slope that is twenty-five percent or greater.
(g) Environmentally Sensitive Areas (ESAs). All development located within or directly adjacent to or discharging directly to an ESA (where discharges from the development or redevelopment will enter receiving waters within the ESA), which either creates 2,500 square feet of impervious surface on a proposed project site or increases the area of imperviousness of a proposed project site to 10% or more of its naturally occurring condition. "Directly adjacent" means situated within 200 feet of the ESA. "Discharging directly to" means outflow from a drainage conveyance system that is composed entirely of flows from the subject development or redevelopment site, and not commingled with flows from adjacent lands.
(h) Parking lots 5,000 square feet or more or with 15 or more parking spaces and potentially exposed to urban runoff. Parking lot is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce.
(i) Street, roads, highways, and freeways. This category includes any paved surface that is 5,000 square feet or greater used for the transportation of automobiles, trucks, motorcycles, and other vehicles.
(j) Retail Gasoline Outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average

Daily Traffic (ADT) of 100 or more vehicles per day.

(3) Pollutants of Concern

As part of its local SUSMP, each Copermittee shall develop and implement a procedure for pollutants of concern to be identified for each Priority Development Project. The procedure shall address, at a minimum: (1) Receiving water quality (including pollutants for which receiving waters are listed as impaired under CWA section 303(d)); (2) Land use type of the Development Project and pollutants associated with that land use type; and (3) Pollutants expected to be present on site.

(4) Low Impact Development (LID) BMP Requirements

Each Copermittee shall require each Priority Development Project to implement LID BMPs which will collectively minimize directly connected impervious areas and promote infiltration at Priority Development Projects:

(a) The following LID site design BMPs shall be implemented at all Priority Development Projects as required below:

i. For Priority Development Projects with landscaped or other pervious areas, drain a portion of impervious areas (rooftops, parking lots, sidewalks, walkways, patios, etc) into pervious areas prior to discharge to the MS4. The amount of runoff from impervious areas that is to drain to pervious areas shall correspond with the total capacity of the project's pervious areas to infiltrate or treat runoff, taking into consideration the pervious areas' soil conditions, slope, and other pertinent factors.
ii. For Priority Development Projects with landscaped or other pervious areas, properly design and construct the pervious areas to effectively receive and infiltrate or treat runoff from impervious areas, taking into consideration the pervious areas' soil conditions, slope, and other pertinent factors.
iii. For Priority Development Projects with low traffic areas and appropriate soil conditions, construct a portion of walkways, trails, overflow parking lots, alleys, or other low-traffic areas with permeable surfaces, such as pervious concrete, porous asphalt, unit pavers, and granular materials.

(b) The following LID BMPs listed below shall be implemented at all Priority Development Projects where applicable and feasible.

i. Conserve natural areas, including existing trees, other vegetation, and soils.
ii. Construct streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided that public safety and a walkable environment for pedestrians are not compromised.
iii. Minimize the impervious footprint of the project.
iv. Minimize soil compaction.
v. Minimize disturbances to natural drainages (e.g., natural swales, topographic depressions, etc.)

(5) Source Control BMP Requirements

Each Copermittee shall require each Priority Development Project to implement source control BMPs. The source control BMPs to be required shall:

(a) Minimize storm water pollutants of concern in urban runoff.
(b) Include storm drain system stenciling or signage.
(c) Include properly designed outdoor material storage areas.
(d) Include properly designed trash storage areas.
(e) Include efficient irrigation systems.
(f) Include water quality requirements applicable to individual priority project categories.

(6) Treatment Control BMP Requirements[5]

Each Copermittee shall require each Priority Development Project to implement treatment control BMPs which meet the following treatment control BMP requirements:

(a) Treatment control BMPs for all Priority Development Projects shall mitigate (infiltrate, filter, or treat) the required volume or flow of runoff (identified in section D.1.d.(6)(c)) from all developed portions of the project, including landscaped areas.

(b) All treatment control BMPs shall be located so as to infiltrate, filter, or treat the required runoff volume or flow prior to its discharge to any waters of the U.S. Multiple Priority Development Projects may use shared treatment control BMPs as long as construction of any shared treatment control BMP is completed prior to the use or occupation of any Priority Development Project from which the treatment control BMP will receive runoff.

(c) All treatment control BMPs for a single Priority Development Project shall collectively be sized to comply with the following numeric sizing criteria:

i. Volume-based treatment control BMPs shall be designed to mitigate (infiltrate, filter, or treat) the volume of runoff produced from a 24-hour 85th percentile storm event, as determined from the County of San Diego's 85th Percentile Precipitation Isopluvial Map; or

ii. Flow-based treatment control BMPs shall be designed to mitigate (infiltrate, filter, or treat) either: a) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event; or b) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two.

[5] LID BMPs that are correctly designed to effectively infiltrate, filter, or treat runoff can be considered treatment control BMPs.

(d) All treatment control BMPs for Priority Development Projects shall, at a minimum:

i. Be ranked with a high or medium pollutant removal efficiency for the project's most significant pollutants of concern, as the pollutant removal efficiencies are identified in the Copermittees' Model SUSMP and the most current updates thereto. Treatment control BMPs with a low removal efficiency ranking shall only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.
ii. Be correctly sized and designed so as to remove pollutants to the MEP.
iii. Target removal of pollutants of concern from urban runoff.
iv. Be implemented close to pollutant sources (where shared BMPs are not proposed), and prior to discharging into waters of the U.S.
v. Not be constructed within a receiving water.
vi. Include proof of a mechanism, to be provided by the project proponent or Copermittee, under which ongoing long-term maintenance will be conducted.

(7) Update of SUSMP BMP Requirements

The Copermittees shall collectively review and update the BMP requirements that are listed in their local SUSMPs. At a minimum, the update shall include removal of obsolete or ineffective BMPs, addition of LID and source control BMP requirements that meet or exceed the requirements of sections D.1.d.(4) and D.1.d.(5), and addition of LID BMPs that can be used for treatment, such as bioretention cells, bioretention swales, etc. The update shall also add appropriate LID BMPs to any tables or discussions in the local SUSMPs addressing pollutant removal efficiencies of treatment control BMPs. In addition, the update shall include review, and revision where necessary, of treatment control BMP pollutant removal efficiencies.

(8) Update of SUSMPs to Incorporate LID and Other BMP Requirements

(a) In addition to the implementation of the BMP requirements of sections D.1.d.(4-7) within one year of adoption of this Order, the Copermittees shall also develop and submit an updated Model SUSMP that defines minimum LID and other BMP requirements to be incorporated into the Copermittees' local SUSMPs for application to Priority Development Projects. The purpose of the updated Model SUSMP shall be to establish minimum standards to maximize the use of LID practices and principles in local Copermittee programs as a means of reducing stormwater runoff. It shall meet the following minimum requirements:

i. Establishment of LID BMP requirements that meet or exceed the minimum requirements listed in section D.1.d.(4) above.
ii. Establishment of source control BMP requirements that meet or exceed the minimum requirements listed in section D.1.d.(5) above.
iii. Establishment of treatment control BMP requirements that meet or exceed the minimum requirements listed in section D.1.d.(6) above.

iv. Establishment of siting, design, and maintenance criteria for each LID and treatment control BMP listed in the Model SUSMP, so that implemented LID and treatment control BMPs are constructed correctly and are effective at pollutant removal and/or runoff control. LID techniques, such as soil amendments, shall be incorporated into the criteria for appropriate treatment control BMPs.

v. Establishment of criteria to aid in determining Priority Development Project conditions where implementation of each LID BMP listed in section D.1.d.(4)(b) is applicable and feasible.

vi. Establishment of a requirement for Priority Development Projects with low traffic areas and appropriate or amendable soil conditions to construct a portion of walkways, trails, overflow parking lots, alleys, or other low-traffic areas with permeable surfaces, such a pervious concrete, porous asphalt, unit pavers, and granular materials.

vii. Establishment of restrictions on infiltration of runoff from Priority Development Project categories or Priority Development Project areas that generate high levels of pollutants, if necessary.

(b) The updated Model SUSMP shall be submitted within 18 months of adoption of this Order. If, within 60 days of submittal of the updated Model SUSMP, the Copermittees have not received in writing from the Regional Board either (1) a finding of adequacy of the updated Model SUSMP or (2) a modified schedule for its review and revision, the updated Model SUSMP shall be deemed adequate, and the Copermittees shall implement its provisions in accordance with section D.1.d.(8)(c) below.

(c) Within 365 days of Regional Board acceptance of the updated Model SUSMP, each Copermittee shall update its local SUSMP to implement the requirements established pursuant to section D.1.d.(8)(a). In addition to the requirements of section D.1.d.(8)(a), each Copermittee's updated local SUSMP shall include the following:

i. A requirement that each Priority Development Project use the criteria established pursuant to section D.1.d.(8)(a)v to demonstrate applicability and feasibility, or lack thereof, of implementation of the LID BMPs listed in section D.1.d.(4)(b).

ii. A review process which verifies that all BMPs to be implemented will meet the designated siting, design, and maintenance criteria, and that each Priority Development Project is in compliance with all applicable SUSMP requirements.

(9) <u>Implementation Process</u>

As part of its local SUSMP, each Copermittee shall implement a process to verify compliance with SUSMP requirements. The process shall identify at what point in the planning process Priority Development Projects will be required to meet SUSMP requirements. The process shall also include identification of the roles and responsibilities of various municipal departments in implementing the SUSMP requirements, as well as any other measures necessary for the implementation of SUSMP requirements.

(10) Downstream Erosion

As part of its local SUSMP, each Copermittee shall develop and apply criteria to Priority Development Projects so that runoff discharge rates, durations, and velocities from Priority Development Projects are controlled to maintain or reduce downstream erosion conditions and protect stream habitat. Upon adoption of the Hydromodification Management Plan (HMP) by the Regional Board (section D.1.g), individual Copermittee criteria for control of downstream erosion shall be superseded by criteria identified in the HMP.

(11) Waiver Provision

(a) A Copermittee may provide for a project to be waived from the requirement of meeting numeric sizing criteria (sections D.1.d.(6)(c) or D.1.d.(8)(a)iii) if infeasibility can be established. A waiver of infeasibility shall only be granted by a Copermittee when all available BMPs have been considered and rejected as infeasible. Copermittees shall notify the Regional Board within 5 days of each waiver issued and shall include the following information in the notification:

i. Name of the person granting each waiver;
ii. Name of developer receiving the waiver;
iii. Site location;
iv. Reason for waiver; and
v. Description of BMPs required.

(b) The Copermittees may collectively or individually develop a program to require project proponents who have received waivers to transfer the savings in cost, as determined by the Copermittee(s), to a storm water mitigation fund. This program may be implemented by all Copermittees that issue waivers. Funds may be used on projects to improve urban runoff quality within the watershed of the waived project. The waiver mitigation program should, at a minimum, identify:

i. The entity or entities that will manage the storm water mitigation fund (i.e., assume full responsibility for);
ii. The range and types of acceptable projects for which mitigation funds may be expended;
iii. The entity or entities that will assume full responsibility for each mitigation project including its successful completion; and
iv. How the dollar amount of fund contributions will be determined.

(12) Infiltration and Groundwater Protection

To protect groundwater quality, each Copermittee shall apply restrictions to the use of treatment control BMPs that are designed to primarily function as centralized infiltration devices (such as large infiltration trenches and infiltration basins). Such restrictions shall be designed so that the use of such infiltration treatment control BMPs shall not cause or contribute to an exceedance of groundwater quality objectives. At a minimum, each treatment control BMP designed to primarily function as a centralized infiltration device shall meet the restrictions below, unless it is demonstrated that a restriction is not necessary to

protect groundwater quality. The Copermittees may collectively or individually develop alternative restrictions on the use of treatment control BMPs which are designed to primarily function as centralized infiltration devices. Alternative restrictions developed by the Copermittees can partially or wholly replace the restrictions listed below. The restrictions are not intended to be applied to small infiltration systems dispersed throughout a development project.

(a) Urban runoff shall undergo pretreatment such as sedimentation or filtration prior to infiltration;
(b) All dry weather flows containing significant pollutant loads shall be diverted from infiltration devices;
(c) Pollution prevention and source control BMPs shall be implemented at a level appropriate to protect groundwater quality at sites where infiltration treatment control BMPs are to be used;
(d) Infiltration treatment control BMPs shall be adequately maintained so that they remove pollutants to the MEP;
(e) The vertical distance from the base of any infiltration treatment control BMP to the seasonal high groundwater mark shall be at least 10 feet. Where groundwater basins do not support beneficial uses, this vertical distance criteria may be reduced, provided groundwater quality is maintained;
(f) The soil through which infiltration is to occur shall have physical and chemical characteristics (such as appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of urban runoff for the protection of groundwater beneficial uses;
(g) Infiltration treatment control BMPs shall not be used for areas of industrial or light industrial activity; areas subject to high vehicular traffic (25,000 or greater average daily traffic on main roadway or 15,000 or more average daily traffic on any intersecting roadway); automotive repair shops; car washes; fleet storage areas (bus, truck, etc.); nurseries[6]; and other high threat to water quality land uses and activities as designated by each Permittee; and
(h) Infiltration treatment control BMPs shall be located a minimum of 100 feet horizontally from any water supply wells.

e. TREATMENT CONTROL BMP MAINTENANCE TRACKING

(1) Each Copermittee shall develop and utilize a watershed-based database to track and inventory approved treatment control BMPs and treatment control BMP maintenance within its jurisdiction. At a minimum, the database shall include information on treatment control BMP type, location, watershed, date of construction, party responsible for maintenance, maintenance certifications or verifications, inspections, inspection findings, and corrective actions.

(2) Each Copermittee shall develop and implement a program to verify that approved treatment control BMPs are operating effectively and have been adequately maintained. At a minimum, the program shall include the following:

(a) An annual inventory of all approved treatment control BMPs within the Copermittee's jurisdiction. The inventory shall also include all treatment control BMPs approved during the previous permit cycle.

[6] Except with regard to treated nursery runoff or clean storm water runoff.

(b) The prioritization of all projects with approved treatment control BMPs into high, medium, and low priority categories. At a minimum, projects with drainage insert treatment control BMPs shall be designated as at least a medium priority. Prioritization of other projects with treatment control BMPs shall include consideration of treatment control BMP size, recommended maintenance frequency, likelihood of operational and maintenance issues, location, receiving water quality, and other pertinent factors.

(c) 100% of projects with treatment control BMPs that are high priority shall be inspected by the Copermittee annually. 50% of projects with drainage insert treatment control BMPs shall be inspected by the Copermittee annually. Treatment control BMPs that are low priority shall be inspected as needed. All inspections shall verify effective operation and maintenance of the treatment control BMPs, as well as compliance with all ordinances, permits, and this Order. A minimum of 20% of the total number of projects with approved treatment control BMPs, and a maximum of 200% of the average number of projects with treatment control BMPs approved per year, shall be inspected annually.

(d) Requirement of annual verification of effective operation and maintenance of each approved treatment control BMP by the party responsible for the treatment control BMP maintenance.

(3) Operation and maintenance verifications shall be required prior to each rainy season.

(4) Inspections of high priority treatment control BMPs shall be conducted prior to each rainy season.

f. BMP VERIFICATION

Prior to occupancy of each Priority Development Project subject to SUSMP requirements, each Copermittee shall inspect the constructed LID, source control, and treatment control BMPs to verify that they have been constructed in compliance with all specifications, plans, permits, ordinances, and this Order. This initial BMP verification inspection does not constitute an operation and maintenance inspection, as required above in section D.1.e.(2)(c).

g. HYDROMODIFICATION - LIMITATIONS ON INCREASES OF RUNOFF DISCHARGE RATES AND DURATIONS[7]

Each Copermittee shall collaborate with the other Copermittees to develop and implement a Hydromodification Management Plan (HMP) to manage increases in runoff discharge rates and durations from all Priority Development Projects, where such increased rates and durations are likely to cause increased erosion of channel

[7] Updated SUSMP and hydromodification requirements shall apply to all priority projects or phases of priority projects which have not yet begun grading or construction activities at the time any updated SUSMP or hydromodification requirement commences. If a Copermittee determines that lawful prior approval of a project exists, whereby application of an updated SUSMP or hydromodification requirement to the project is infeasible, the updated SUSMP or hydromodification requirement need not apply to the project. Where feasible, the Copermittees shall utilize the SUSMP and hydromodification update periods to ensure that projects undergoing approval processes include application of the updated SUSMP and hydromodification requirements in their plans.

beds and banks, sediment pollutant generation, or other impacts to beneficial uses and stream habitat due to increased erosive force. The HMP, once approved by the Regional Board, shall be incorporated into the local SUSMP and implemented by each Copermittee so that post-project runoff discharge rates and durations shall not exceed estimated pre-project discharge rates and durations where the increased discharge rates and durations will result in increased potential for erosion or other significant adverse impacts to beneficial uses, attributable to changes in the discharge rates and durations.

(1) The HMP shall:

(a) Identify a standard for channel segments which receive urban runoff discharges from Priority Development Projects. The channel standard shall maintain the pre-project erosion and deposition characteristics of channel segments receiving urban runoff discharges from Priority Development Projects as necessary to maintain or improve the channel segments' stability conditions.
(b) Utilize continuous simulation of the entire rainfall record to identify a range of runoff flows[8] for which Priority Development Project post-project runoff flow rates and durations shall not exceed pre-project runoff flow rates and durations, where the increased flow rates and durations will result in increased potential for erosion or other significant adverse impacts to beneficial uses, attributable to changes in the flow rates and durations. The lower boundary of the range of runoff flows identified shall correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks. The identified range of runoff flows may be different for specific watersheds, channels, or channel reaches.
(c) Require Priority Development Projects to implement hydrologic control measures so that Priority Development Projects' post-project runoff flow rates and durations (1) do not exceed pre-project runoff flow rates and durations for the range of runoff flows identified under section D.1.g.(1)(b), where the increased flow rates and durations will result in increased potential for erosion or other significant adverse impacts to beneficial uses, attributable to changes in the flow rates and durations, and (2) do not result in channel conditions which do not meet the channel standard developed under section D.1.g.(1)(a) for channel segments downstream of Priority Development Project discharge points.
(d) Include other performance criteria (numeric or otherwise) for Priority Development Projects as necessary to prevent urban runoff from the projects from increasing erosion of channel beds and banks, silt pollutant generation, or other impacts to beneficial uses and stream habitat due to increased erosive force.
(e) Include a review of pertinent literature.
(f) Include a protocol to evaluate potential hydrograph change impacts to downstream watercourses from Priority Development Projects.
(g) Include a description of how the Copermittees will incorporate the HMP requirements into their local approval processes.

[8] The identified range of runoff flows to be controlled should be expressed in terms of peak flow rates of rainfall events, such as "10% of the pre-project 2-year peak flow up to the pre-project 10-year peak flow."

(h) Include criteria on selection and design of management practices and measures (such as detention, retention, and infiltration) to control flow rates and durations and address potential hydromodification impacts.
(i) Include technical information supporting any standards and criteria proposed.
(j) Include a description of inspections and maintenance to be conducted for management practices and measures to control flow rates and durations and address potential hydromodification impacts.
(k) Include a description of pre- and post-project monitoring and other program evaluations to be conducted to assess the effectiveness of implementation of the HMP.
(l) Include mechanisms for addressing cumulative impacts within a watershed on channel morphology.
(m) Include information on evaluation of channel form and condition, including slope, discharge, vegetation, underlying geology, and other information, as appropriate.

(2) The HMP may include implementation of planning measures (e.g., buffers and restoration activities, including revegetation, use of less-impacting facilities at the point(s) of discharge, etc.) to allow expected changes in stream channel cross sections, vegetation, and discharge rates, velocities, and/or durations without adverse impacts to channel beneficial uses. Such measures shall not include utilization of non-naturally occurring hardscape materials such as concrete, riprap, gabions, etc.

(3) Section D.1.g.(1)(c) does not apply to Development Projects where the project discharges stormwater runoff into channels or storm drains where the pre-existing channel or storm drain conditions result in minimal potential for erosion or other impacts to beneficial uses. Such situations may include discharges into channels that are concrete-lined or significantly hardened (e.g., with rip-rap, sackrete, etc.) downstream to their outfall in bays or the ocean; underground storm drains discharging to bays or the ocean; and construction of projects where the sub-watersheds below the projects' discharge points are highly impervious (e.g., >70%) and the potential for single-project and/or cumulative impacts is minimal. Specific criteria for identification of such situations shall be included as a part of the HMP. However, plans to restore a channel reach may re-introduce the applicability of HMP controls, and would need to be addressed in the HMP.

(4) <u>HMP Reporting</u>

The Copermittees shall collaborate to report on HMP development as required in section J.2.a of this Order.

(5) <u>HMP Implementation</u>

180 days after approval of the HMP by the Regional Board, each Copermittee shall incorporate into its local SUSMP and implement the HMP for all applicable Priority Development Projects. Prior to approval of the HMP by the Regional Board, the early implementation of measures likely to be included in the HMP shall be encouraged by the Copermittees.

(6) Interim Hydromodification Criteria for Projects Disturbing 50 Acres or More

Within 365 days of adoption of this Order, the Copermittees shall collectively identify an interim range of runoff flow rates for which Priority Development Project post-project runoff flow rates and durations shall not exceed pre-project runoff flow rates and durations (Interim Hydromodification Criteria), where the increased discharge flow rates and durations will result in increased potential for erosion or other significant adverse impacts to beneficial uses, attributable to changes in flow rates and durations. Development of the Interim Hydromodification Criteria shall include identification of methods to be used by Priority Development Projects to exhibit compliance with the criteria, including continuous simulation of the entire rainfall record. Starting 365 days after adoption of this Order and until the final Hydromodification Management Plan standard and criteria are implemented, each Copermittee shall require Priority Development Projects disturbing 50 acres or more to implement hydrologic controls to manage post-project runoff flow rates and durations as required by the Interim Hydromodification Criteria. Development Projects disturbing 50 acres or more are exempt from this requirement when:

(a) The project would discharge into channels that are concrete-lined or significantly hardened (e.g., with rip-rap, sackcrete, etc.) downstream to their outfall in bays or the ocean;
(b) The project would discharge into underground storm drains discharging directly to bays or the ocean; or
(c) The project would discharge to a channel where the watershed areas below the project's discharge points are highly impervious (e.g. >70%).

h. ENFORCEMENT OF DEVELOPMENT SITES

Each Copermittee shall enforce its storm water ordinance for all Development Projects and at all development sites as necessary to maintain compliance with this Order. Copermittee ordinances or other regulatory mechanisms shall include appropriate sanctions to achieve compliance. Sanctions shall include the following or their equivalent: Non-monetary penalties, fines, bonding requirements, and/or permit or occupancy denials for non-compliance.

2. Construction Component

Each Copermittee shall implement a construction program which meets the requirements of this section, reduces construction site discharges of pollutants from the MS4 to the MEP, and prevents construction site discharges from the MS4 from causing or contributing to a violation of water quality standards.

a. ORDINANCE UPDATE AND APPROVAL PROCESS

(1) Within 365 days of adoption of this Order, each Copermittee shall review and update its grading ordinances and other ordinances as necessary to achieve full compliance with this Order, including requirements for the implementation of all designated BMPs and other measures.

(2) Prior to approval and issuance of local construction and grading permits, each Copermittee shall:

(a) Require all individual proposed construction sites to implement designated BMPs and other measures so that pollutants discharged from the site will be reduced to the maximum extent practicable and will not cause or contribute to a violation of water quality standards.
(b) Prior to permit issuance, require and review the project proponent's storm water management plan to verify compliance with their grading ordinance, other ordinances, and this Order.
(c) Verify that project proponents subject to California's statewide General NPDES Permit for Storm Water Discharges Associated With Construction Activities, (hereinafter General Construction Permit), have existing coverage under the General Construction Permit.

b. SOURCE IDENTIFICATION

Each Copermittee shall maintain and update monthly a watershed based inventory of all construction sites within its jurisdiction. The use of an automated database system, such as Geographical Information System (GIS) is highly recommended.

c. BMP IMPLEMENTATION

(1) Each Copermittee shall designate a minimum set of BMPs and other measures to be implemented at construction sites. The designated minimum set of BMPs shall include, at a minimum:

(a) General Site Management

i. Pollution prevention, where appropriate.
ii. Development and implementation of a storm water management plan.
iii. Minimization of areas that are cleared and graded to only the portion of the site that is necessary for construction;
iv. Minimization of exposure time of disturbed soil areas;
v. Minimization of grading during the wet season and correlation of grading with seasonal dry weather periods to the extent feasible.
vi. Limitation of grading to a maximum disturbed area as determined by each Copermittee before either temporary or permanent erosion controls are implemented to prevent storm water pollution. The Copermittee has the option of temporarily increasing the size of disturbed soil areas by a set amount beyond the maximum, if the individual site is in compliance with applicable storm water regulations and the site has adequate control practices implemented to prevent storm water pollution.
vii. Temporary stabilization and reseeding of disturbed soil areas as rapidly as feasible;
viii. Preservation of natural hydrologic features where feasible;
ix. Preservation of riparian buffers and corridors where feasible;
x. Maintenance of all BMPs, until removed; and
xi. Retention, reduction, and proper management of all pollutant discharges on site to the MEP standard.

(b) Erosion and Sediment Controls

i. Erosion prevention, to be used as the most important measure for keeping sediment on site during construction, but never as the single method;
ii. Sediment controls, to be used as a supplement to erosion prevention for keeping sediment on-site during construction;
iii. Slope stabilization on all inactive slopes during the rainy season and during rain events in the dry season;
iv. Slope stabilization on all active slopes during rain events regardless of the season; and
v. Permanent revegetation or landscaping as early as feasible.

(2) Each Copermittee shall require implementation of advanced treatment for sediment at construction sites that are determined by the Copermittee to be an exceptional threat to water quality. In evaluating the threat to water quality, the following factors shall be considered by the Copermittee:

(a) Soil erosion potential or soil type;
(b) The site's slopes;
(c) Project size and type;
(d) Sensitivity of receiving water bodies;
(e) Proximity to receiving water bodies;
(f) Non-storm water discharges;
(g) Ineffectiveness of other BMPs; and
(h) Any other relevant factors.

(3) Each Copermittee shall implement, or require the implementation of, the designated minimum BMPs and any additional measures necessary to comply with this Order at each construction site within its jurisdiction year round. However, BMP implementation requirements can vary based on wet and dry seasons. Dry season BMP implementation must plan for and address rain events that may occur during the dry season.

(4) Each Copermittee shall implement, or require implementation of, additional controls for construction sites tributary to CWA section 303(d) water body segments impaired for sediment as necessary to comply with this Order. Each Copermittee shall implement, or require implementation of, additional controls for construction sites within or adjacent to or discharging directly to coastal lagoons or other receiving waters within environmentally sensitive areas (as defined in section Attachment C of this Order) as necessary to comply with this Order.

d. INSPECTION OF CONSTRUCTION SITES

Each Copermittee shall conduct construction site inspections for compliance with its local ordinances (grading, storm water, etc.), permits (construction, grading, etc.), and this Order.

(1) During the wet season, each Copermittee shall inspect at least biweekly (every two weeks), all construction sites within its jurisdiction meeting the following

criteria:

(a) All sites 50 acres or more in size and grading will occur during the wet season;
(b) All sites 1 acre or more, and tributary to a CWA section 303(d) water body segment impaired for sediment or within or directly adjacent to or discharging directly to a receiving water within an ESA; and
(c) Other sites determined by the Copermittees or the Regional Board as a significant threat to water quality. In evaluating threat to water quality, the following factors shall be considered:

i. soil erosion potential;
ii. site slope;
iii. project size and type;
iv. sensitivity of receiving water bodies;
v. proximity to receiving water bodies;
vi. non-storm water discharges;
vii. past record of non-compliance by the operators of the construction site; and
viii. any other relevant factors.

(2) During the wet season, each Copermittee shall inspect at least monthly, all construction sites with one acre or more of soil disturbance not meeting the criteria specified above in section D.2.c.(1).

(3) During the wet season, each Copermittee shall inspect as needed, construction sites less than 1 acre in size.

(4) Each Copermittee shall inspect all construction sites as needed during the dry season.

(5) Based upon site inspection findings, each Copermittee shall implement all follow-up actions (i.e., reinspection, enforcement) necessary to comply with this Order.

(6) Inspections of construction sites shall include, but not be limited to:

(a) Check for coverage under the General Construction Permit (Notice of Intent (NOI) and/or Waste Discharge Identification No.) during initial inspections;
(b) Assessment of compliance with Permittee ordinances and permits related to urban runoff, including the implementation and maintenance of designated minimum BMPs;
(c) Assessment of BMP effectiveness;
(d) Visual observations for non-storm water discharges, potential illicit connections, and potential discharge of pollutants in storm water runoff;
(e) Education and outreach on storm water pollution prevention, as needed; and
(f) Creation of a written or electronic inspection report.

(7) The Copermittees shall track the number of inspections for the inventoried construction sites throughout the reporting period to verify that the sites are inspected at the minimum frequencies required.

e. ENFORCEMENT OF CONSTRUCTION SITES

Each Copermittee shall develop and implement an escalating enforcement process that achieves prompt corrective actions at construction sites for violations of the Copermittee's water quality protection permit requirements and ordinances. This enforcement process shall include authorizing the Copermittee's construction site inspectors to take immediate enforcement actions when appropriate and necessary. The enforcement process shall include appropriate sanctions such as stop work orders, non-monetary penalties, fines, bonding requirements, and/or permit denials for non-compliance.

f. REPORTING OF NON-COMPLIANT SITES

In addition to the notification requirements in section 5(e) of Attachment B, each Copermittee shall notify the Regional Board when the Copermittee issues a stop work order or other high level enforcement to a construction site in their jurisdiction as a result of storm water violations.

3. Existing Development Component

a. MUNICIPAL

Each Copermittee shall implement a municipal program which meets the requirements of this section, reduces municipal discharges of pollutants from the MS4 to the MEP, and prevents municipal discharges from the MS4 from causing or contributing to a violation of water quality standards.

(1) Source Identification

Each Copermittee shall annually update a watershed based inventory of municipal areas and activities. The inventory shall include the name, address (if applicable), and a description of the area/activity, which pollutants are potentially generated by the area/activity, and identification of whether the area/activity is tributary to a CWA section 303(d) water body segment and generates pollutants for which the water body segment is impaired. The use of an automated database system, such as Geographical Information System (GIS) is highly recommended when applicable, but not required.

(2) BMP Implementation

(a) Each Copermittee shall implement pollution prevention methods in its municipal program and shall require their use by appropriate municipal departments and personnel, where appropriate.

(b) Each Copermittee shall designate a minimum set of BMPs for all municipal areas and activities. The designated minimum BMPs for municipal areas and activities shall be area or activity specific as appropriate.

(c) Each Copermittee shall implement, or require the implementation of, the designated minimum BMPs and any additional measures necessary to comply with this Order for each municipal area or activity within its

jurisdiction.

(d) Each Copermittee shall evaluate existing flood control devices to determine if retrofitting the device to provide additional pollutant removal from urban runoff is feasible. When conducting flood control device retrofit projects, each Copermittee shall incorporate permanent pollutant removal measures into the projects, where feasible.

(e) Each Copermittee shall implement, or require implementation of, any additional controls for municipal areas and activities tributary to CWA section 303(d) impaired water body segments (where an area or activity generates pollutants for which the water body segment is impaired) as necessary to comply with this Order. Each Copermittee shall implement, or require implementation of, additional controls for municipal areas and activities within or directly adjacent to or discharging directly to coastal lagoons or other receiving waters within environmentally sensitive areas (as defined in Attachment C of this Order) as necessary to comply with this Order.

(f) Each Copermittee shall implement, or require implementation of, additional controls for special events within their jurisdiction that are expected to generate significant trash and litter. Controls to consider shall include:

i. Temporary screens on catch basins and storm drain inlets;
ii. Temporary fencing to prevent windblown trash from entering adjacent water bodies and MS4 channels;
iii. Proper management of trash and litter;
iv. Catch basin cleaning following the special event and prior to an anticipated rain event;
v. Street sweeping of roads, streets, highways and parking facilities following the special event; and
vi. Other equivalent controls.

(3) <u>Operation and Maintenance of Municipal Separate Storm Sewer System and Structural Controls</u>

(a) Each Copermittee shall implement a schedule of inspection and maintenance activities to verify proper operation of all municipal structural treatment controls designed to reduce pollutant discharges to or from its MS4s and related drainage structures.

(b) Each Copermittee shall implement a schedule of maintenance activities for the MS4 and MS4 facilities (catch basins, storm drain inlets, open channels, etc). The maintenance activities shall, at a minimum, include:

i. Inspection at least once a year between May 1 and September 30 of each year for all MS4 facilities that receive or collect high volumes of trash and debris. All other MS4 facilities shall be inspected at least annually throughout the year.
ii. Following two years of inspections, any MS4 facility that requires inspection and cleaning less than annually may be inspected as needed, but not less that every other year.

iii. Any catch basin or storm drain inlet that has accumulated trash and debris greater than 33% of design capacity shall be cleaned in a timely manner. Any MS4 facility that is designed to be self cleaning shall be cleaned of any accumulated trash and debris immediately. Open channels shall be cleaned of observed anthropogenic litter in a timely manner.
iv. Record keeping of the maintenance and cleaning activities including the overall quantity of waste removed.
v. Proper disposal of waste removed pursuant to applicable laws.
vi. Measures to eliminate waste discharges during MS4 maintenance and cleaning activities.

(4) Management of Pesticides, Herbicides, and Fertilizers

The Copermittees shall implement BMPs to reduce the contribution of pollutants associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from municipal areas and activities to MS4s. Important municipal areas and activities include municipal facilities, public rights-of-way, parks, recreational facilities, golf courses, cemeteries, botanical or zoological gardens and exhibits, landscaped areas, etc.

Such BMPs shall include, at a minimum: (1) educational activities, permits, certifications and other measures for municipal applicators and distributors; (2) integrated pest management measures that rely on non-chemical solutions; (3) the use of native vegetation; (4) schedules for irrigation and chemical application; and (5) the collection and proper disposal of unused pesticides, herbicides, and fertilizers.

(5) Sweeping of Municipal Areas

Each Copermittee shall implement a program to sweep improved (possessing a curb and gutter) municipal roads, streets, highways, and parking facilities. The program shall include the following measures:

(a) Roads, streets, highways, and parking facilities identified as consistently generating the highest volumes of trash and/or debris shall be swept at least two times per month.

(b) Roads, streets, highways, and parking facilities identified as consistently generating moderate volumes of trash and/or debris shall be swept at least monthly.

(c) Roads, streets, highways, and parking facilities identified as generating low volumes of trash and/or debris shall be swept as necessary, but no less than once per year.

(6) Infiltration From Sanitary Sewer to MS4/Provide Preventive Maintenance of Both

Each Copermittee shall implement controls and measures to prevent and eliminate infiltration of seepage from municipal sanitary sewers to MS4s through thorough, routine preventive maintenance of the MS4. Each Copermittee that

operates both a municipal sanitary sewer system and a MS4 shall implement controls and measures to prevent and eliminate infiltration of seepage from the municipal sanitary sewers to the MS4s that shall include overall sanitary sewer and MS4 surveys and thorough, routine preventive maintenance of both.

(7) Inspection of Municipal Areas and Activities

(a) At a minimum, each Copermittee shall inspect the following high priority municipal areas and activities annually:

i. Roads, Streets, Highways, and Parking Facilities.
ii. Flood Management Projects and Flood Control Devices.
iii. Areas and activities tributary to a C WA section 303(d) impaired water body segment, where an area or activity generates pollutants for which the water body segment is impaired. Areas and activities within or adjacent to or discharging directly to coastal lagoons or other receiving waters within environmentally sensitive areas (as defined in Attachment C of this Order).
iv. Municipal Facilities.
[1] Active or closed municipal landfills;
[2] Publicly owned treatment works (including water and wastewater treatment plants) and sanitary sewage collection systems;
[3] Solid waste transfer facilities;
[4] Land application sites;
[5] Corporate yards including maintenance and storage yards for materials, waste, equipment and vehicles; and
[6] Household hazardous waste collection facilities.
v. Municipal airfields.
vi. Parks and recreation facilities.
vii. Special event venues following special events (festivals, sporting events, etc.)
viii. Power washing.
ix. Other municipal areas and activities that the Copermittee determines may contribute a significant pollutant load to the MS4.

(b) Other municipal areas and activities shall be inspected as needed.

(c) Based upon site inspection findings, each Copermittee shall implement all follow-up actions necessary to comply with this Order.

(8) Enforcement of Municipal Areas and Activities

Each Copermittee shall enforce its storm water ordinance for all municipal areas and activities as necessary to maintain compliance with this Order.

b. INDUSTRIAL AND COMMERCIAL

Each Copermittee shall implement an industrial and commercial program which meets the requirements of this section, reduces industrial and commercial discharges of pollutants from the MS4 to the MEP, and prevents industrial and commercial discharges from the MS4 from causing or contributing to a violation of water quality standards.

(1) Source Identification

Each Copermittee shall annually update a watershed-based inventory of all industrial and commercial sites/sources within its jurisdiction (regardless of ownership) that could contribute a significant pollutant load to the MS4. The inventory shall include the following minimum information for each industrial and commercial site/source: name; address; pollutants potentially generated by the site/source (and identification of whether the site/source is tributary to a Clean Water Act section 303(d) water body segment and generates pollutants for which the water body segment is impaired); and a narrative description including SIC codes which best reflects the principal products or services provided by each facility. The use of an automated database system, such as Geographical Information System (GIS) is highly recommended.

At a minimum, the following sites/sources shall be included in the inventory:

(a) Commercial Sites/Sources:

i. Automobile repair, maintenance, fueling, or cleaning;
ii. Airplane repair, maintenance, fueling, or cleaning;
iii. Boat repair, maintenance, fueling, or cleaning;
iv. Equipment repair, maintenance, fueling, or cleaning;
v. Automobile and other vehicle body repair or painting;
vi. Mobile automobile or other vehicle washing;
vii. Automobile (or other vehicle) parking lots and storage facilities;
viii. Retail or wholesale fueling;
ix. Pest control services;
x. Eating or drinking establishments, including food markets;
xi. Mobile carpet, drape or furniture cleaning;
xii. Cement mixing or cutting;
xiii. Masonry;
xiv. Painting and coating;
xv. Botanical or zoological gardens and exhibits;
xvi. Landscaping;
xvii. Nurseries and greenhouses;
xviii. Golf courses, parks and other recreational areas/facilities;
xix. Cemeteries;
xx. Pool and fountain cleaning;
xxi. Marinas;
xxii. Portable sanitary services;
xxiii. Building material retailers and storage;
xxiv. Animal facilities; and
xxv. Power washing services.

(b) Industrial Sites/Sources:

i. Industrial Facilities, as defined at 40 CFR § 122.26(b)(14), including those subject to the General Industrial Permit or other individual NPDES permit;
ii. Operating and closed landfills;
iii. Facilities subject to SARA Title III; and

iv. Hazardous waste treatment, disposal, storage and recovery facilities.

(c) All other commercial or industrial sites/sources tributary to a CWA Section 303(d) impaired water body segment, where the site/source generates pollutants for which the water body segment is impaired. All other commercial or industrial sites/sources within or directly adjacent to or discharging directly to coastal lagoons or other receiving waters within environmentally sensitive areas (as defined in Attachment C of this Order).

(d) All other commercial or industrial sites/sources that the Copermittee determines may contribute a significant pollutant load to the MS4.

(2) BMP Implementation

(a) Each Copermittee shall require the use of pollution prevention methods by industrial and commercial sites/sources, where appropriate.

(b) Each Copermittee shall designate a minimum set of BMPs for all industrial and commercial sites/sources. The designated minimum BMPs shall be specific to facility types and pollutant generating activities, as appropriate.

(c) Within the first three years of implementation of the updated Jurisdictional Urban Runoff Management Program, each Copermittee shall notify the owner/operator of each inventoried industrial and commercial site/source of the BMP requirements applicable to the site/source.

(d) Each Copermittee shall implement, or require the implementation of, the designated minimum BMPs and any additional measures necessary to comply with this Order at each industrial and commercial site/source within its jurisdiction.

(e) Each Copermittee shall implement, or require implementation of, additional controls for industrial and commercial sites/sources tributary to CWA section 303(d) impaired water body segments (where a site/source generates pollutants for which the water body segment is impaired) as necessary to comply with this Order. Each Copermittee shall implement, or require implementation of, additional controls for industrial and commercial sites/sources within or directly adjacent to or discharging directly to coastal lagoons or other receiving waters within environmentally sensitive areas (as defined in Attachment C of this Order) as necessary to comply with this Order.

(3) Inspection of Industrial and Commercial Sites/Sources

(a) Each Copermittee shall conduct industrial and commercial site inspections for compliance with its ordinances, permits, and this Order. Inspections shall include but not be limited to:

i. Review of BMP implementation plans, if the site uses or is required to use such a plan;
ii. Review of facility monitoring data, if the site monitors its runoff;

iii. Check for coverage under the General Industrial Permit (Notice of Intent (NOI) and/or Waste Discharge Identification No.), if applicable;
iv. Assessment of compliance with Copermittee ordinances and permits related to urban runoff;
v. Assessment of BMP implementation, maintenance and effectiveness;
vi. Visual observations for non-storm water discharges, potential illicit connections, and potential discharge of pollutants in storm water runoff; and
vii. Education and training on storm water pollution prevention, as conditions warrant.

(b) At a minimum, 50% of all sites (excluding mobile sources) determined to pose a high threat to water quality shall be inspected in the first year of implementation of the updated Jurisdictional Urban Runoff Management Program, regardless of whether this exceeds the number of inspections required in section D.3.b.(3)(c). This requirement shall increase to 100% of the sites in the second year, and 100% annually thereafter. In any year that the total number of required inspection per section D.3.b.(3)(c) exceeds the number of high threat to water quality sites, all high threat to water quality sites shall be inspected. In evaluating threat to water quality, each Copermittee shall address, at a minimum, the following:

i. Type of activity (SIC code);
ii. Materials used at the facility;
iii. Wastes generated;
iv. Pollutant discharge potential;
v. Non-storm water discharges;
vi. Size of facility;
vii. Proximity to receiving water bodies;
viii. Sensitivity of receiving water bodies;
ix. Whether the facility is subject to the General Industrial Permit or an individual NPDES permit;
x. Whether the facility has filed a No Exposure Certification/Notice of Non-Applicability;
xi. Facility design;
xii. Total area of the site, area of the site where industrial or commercial activities occur, and area of the site exposed to rainfall and runoff;
xiii. The facility's compliance history; and
xiv. Any other relevant factors.

(c) At a minimum, 20% of the sites inventoried as required in section D.3.b.(1) above (excluding mobile sources) shall be inspected in the first year of implementation of the updated Jurisdictional Urban Runoff Management Program. This requirement shall increase to 25% of the sites in the second year, and 25% annually thereafter.

(d) Each Copermittee may develop and implement a third party inspection program for verifying industrial and commercial site/source compliance with its ordinances, permits, and this Order. The third party inspections can satisfy up to 30% of the inspection requirements in section D.3.b(3)(c), with the Copermittee having to fulfill the remaining required inspections. To the extent that third party inspections are conducted to fulfill the requirements of

section D.3.b(3)(c), the Copermittee will be responsible for the inspection of an additional site for every three sites inspected by a third party. The additional inspections may be conducted by the Copermittee or a third party inspector. The Copermittees third party inspection program must include the following:

i. A description of facility types proposed to be inspected by third parties, including SIC codes;
ii. A third party inspector certification program;
iii. The inspection requirements described in section D.3.b.(3)(a);
iv. Inspection form templates for third party inspector use;
v. Photo documentation of potential storm water violations identified during the third party inspection;
vi. An annual Copermittee audit of random, representative sites that were inspected by a third party;
vii. An annual Copermittee audit of random, representative third party inspectors;
viii. Reporting to the Copermittee of identified significant potential violations within 24 hours of the third party inspection;
ix. Reporting to the Copermittee of all inspection findings within one week of the inspection being conducted; and
x. Copermittee follow-up and/or enforcement actions for identified potential storm water violations within 2 business days of the inspection or potential violation report receipt.

(e) Based upon site inspection findings, each Copermittee shall implement all follow-up actions and enforcement necessary to comply with this Order.

(f) To the extent that the Regional Board has conducted an inspection of an industrial site during a particular year, the requirement for the responsible Copermittee to inspect this facility during the same year will be satisfied.

(g) The Copermittees shall track the number of inspections for the inventoried industrial and commercial sites/sources throughout the reporting period to verify that the sites/sources are inspected at the minimum frequencies listed in sections D.3.b.(3)(b) and D.3.b.(3)(c).

(4) <u>Regulation of Mobile Businesses</u>

(a) Each Copermittee shall develop and implement a program to reduce the discharge of pollutants from mobile businesses to the MEP. Each Copermittee shall keep as part of their inventory (section D.3.b.(1) above), a listing of mobile businesses known to operate within its jurisdiction. The program shall include:

i. Development and implementation of minimum standards and BMPs to be required for each of the various types of mobile businesses.
ii. Development and implementation of an enforcement strategy which specifically addresses the unique characteristics of mobile businesses.
iii. Notification of those mobile businesses known to operate within the Copermittee's jurisdiction of the minimum standards and BMP requirements and local ordinances.

iv. Development and implementation of an outreach and education strategy.
v. Inspection of mobile businesses as needed.

(b) If they choose to, the Copermittees may cooperate in developing and implementing their programs for mobile businesses, including sharing of mobile business inventories, BMP requirements, enforcement action information, and education.

(5) Enforcement of Industrial and Commercial Sites/Sources

Each Copermittee shall enforce its storm water ordinance for all industrial and commercial sites/sources as necessary to maintain compliance with this Order. Copermittee ordinances or other regulatory mechanisms shall include appropriate sanctions to achieve compliance. Sanctions shall include the following or their equivalent: Non-monetary penalties, fines, bonding requirements, and/or permit denials for non-compliance.

(6) Reporting of Industrial Non-Filers

As part of each Annual Report, each Copermittee shall report a list of industrial sites, including the name, address, and SIC code, that may require coverage under the General Industrial Permit for which a NOI has not been filed.

c. RESIDENTIAL

Each Copermittee shall implement a residential program which meets the requirements of this section, reduces residential discharges of pollutants from the MS4 to the MEP, and prevents residential discharges from the MS4 from causing or contributing to a violation of water quality standards.

(1) Threat to Water Quality Prioritization

Each Copermittee shall identify high threat to water quality residential areas and activities. At a minimum, these shall include:

(a) Automobile repair, maintenance, washing, and parking;
(b) Home and garden care activities and product use (pesticides, herbicides, and fertilizers);
(c) Disposal of trash, pet waste, green waste, and household hazardous waste (e.g., paints, cleaning products);
(d) Any other residential source that the Copermittee determines may contribute a significant pollutant load to the MS4;
(e) Any residential areas tributary to a CWA section 303(d) impaired water body, where the residence generates pollutants for which the water body is impaired; and
(f) Any residential areas within or directly adjacent to or discharging directly to a coastal lagoon or other receiving waters within an environmentally sensitive area (as defined in Attachment C of this Order).

(2) BMP Implementation

(a) Each Copermittee shall designate minimum BMPs for high threat to water quality residential areas and activities. The designated minimum BMPs for high threat to water quality municipal areas and activities shall be area or activity specific.
(b) Each Copermittee shall encourage the use of pollution prevention methods by residents, where appropriate.
(c) Each Copermittee shall facilitate the proper management and disposal of used oil, toxic materials, and other household hazardous wastes. Such facilitation shall include educational activities, public information activities, and establishment of collection sites operated by the Copermittee or a private entity. Curbside collection of household hazardous wastes is encouraged.
(d) Each Copermittee shall implement, or require implementation of, the designated minimum BMPs and any additional measures necessary to comply with this Order for high threat to water quality residential areas and activities.
(e) Each Copermittee shall implement, or require implementation of, BMPs for residential areas and activities that have not been designated a high threat to water quality, as necessary.
(f) Each Copermittee shall implement, or require implementation of, any additional controls for residential areas and activities tributary to CWA section 303(d) impaired water body segments (where a residential area or activity generates pollutants for which the water body segment is impaired) as necessary to comply with this Order. Each Copermittee shall implement, or require implementation of, additional controls for residential areas within or directly adjacent to or discharging directly to coastal lagoons or other receiving waters within environmentally sensitive areas (as defined in section Attachment C of this Order) as necessary to comply with this Order.

(3) Enforcement of Residential Areas and Activities

Each Copermittee shall enforce its storm water ordinance for all residential areas and activities as necessary to maintain compliance with this Order.

(4) Evaluation of Oversight of Residential Areas and Activities

The Copermittees are encouraged to individually or collectively evaluate their methods used for oversight of residential areas and activities, including assessment of inspections of residential areas and activities. The evaluation should consider various oversight and inspection approaches to identify an effective and appropriate oversight and inspection approach for residential areas and activities.

(5) Regional Residential Education Program

Each Copermittee shall collaborate with the other Copermittees to develop and implement the Regional Residential Education Program required in section F.1 of this Order.

4. Illicit Discharge Detection and Elimination Component

Each Copermittee shall implement an Illicit Discharge Detection and Elimination program which meets the requirements of this section and actively seeks and eliminates illicit discharges and connections.

a. ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee shall implement a program to actively seek and eliminate illicit discharges and connections into its MS4. The program shall include utilization of appropriate municipal personnel to assist in identifying illicit discharges and connections during their daily activities. The program shall address all types of illicit discharges and connections excluding those non-storm water discharges not prohibited by the Copermittee in accordance with section B of this Order.

b. DEVELOP/MAINTAIN MS4 MAP

Each Copermittee shall develop and/or update its labeled map of its entire MS4 and the corresponding drainage areas within its jurisdiction. The use of a GIS is highly recommended. The accuracy of the MS4 map shall be confirmed during dry weather field screening and analytical monitoring and shall be updated at least annually.

c. DRY WEATHER FIELD SCREENING AND ANALYTICAL MONITORING

Each Copermittee shall conduct dry weather field screening and analytical monitoring of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect illicit discharges and connections in accordance with Receiving Waters and Urban Runoff Monitoring and Reporting Program No. R9-2007-0001.

d. INVESTIGATION/INSPECTION AND FOLLOW-UP

(1) Each Copermittee shall investigate and inspect any portion of the MS4 that, based on visual observations, dry weather field screening and analytical monitoring results, or other appropriate information, indicates a reasonable potential for illicit discharges, illicit connections, or other sources of non-storm water (including non-prohibited discharge(s) identified in section B of this Order). Each Copermittee shall develop/update and utilize numeric criteria action levels (or other actions level criteria where appropriate) to determine when follow-up investigations will be performed.

(2) Within two business days of receiving dry weather field screening results that exceed action levels, the Copermittees shall either conduct an investigation to identify the source of the discharge or provide the rationale for why the discharge does not pose a threat to water quality and does not need further investigation. Within two business days, where applicable, of receiving analytical laboratory results that exceed action levels, the Copermittees shall either conduct an investigation to identify the source of the discharge or provide the rationale for why the discharge does not pose a threat to water quality and does not need further investigation. Obvious illicit discharges (i.e. color, odor, or significant exceedances of action levels) shall be investigated immediately.

e. ELIMINATION OF ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee shall take immediate action to eliminate all detected illicit discharges, illicit discharge sources, and illicit connections as soon as possible after detection. Elimination measures may include an escalating series of enforcement actions for those illicit discharges that are not a serious threat to public health or the environment. Illicit discharges that pose a serious threat to the public's health or the environment must be eliminated immediately.

f. ENFORCE ORDINANCES

Each Copermittee shall implement and enforce its ordinances, orders, or other legal authority to prevent illicit discharges and connections to its MS4. Each Copermittee shall also implement and enforce its ordinance, orders, or other legal authority to eliminate detected illicit discharges and connections to it MS4.

g. PREVENT AND RESPOND TO SEWAGE SPILLS (INCLUDING FROM PRIVATE LATERALS AND FAILING SEPTIC SYSTEMS) AND OTHER SPILLS

Each Copermittee shall prevent, respond to, contain and clean up all sewage and other spills that may discharge into its MS4 from any source (including private laterals and failing septic systems). Spill response teams shall prevent entry of spills into the MS4 and contamination of surface water, ground water and soil to the maximum extent practicable. Each Copermittee shall coordinate spill prevention, containment and response activities throughout all appropriate departments, programs and agencies so that maximum water quality protection is available at all times.

Each Copermittee shall develop and implement a mechanism whereby it is notified of all sewage spills from private laterals and failing septic systems into its MS4. Each Copermittee shall prevent, respond to, contain and clean up sewage from any such notification.

h. FACILITATE PUBLIC REPORTING OF ILLICIT DISCHARGES AND CONNECTIONS - PUBLIC HOTLINE

Each Copermittee shall promote, publicize and facilitate public reporting of illicit discharges or water quality impacts associated with discharges into or from MS4s. Each Copermittee shall facilitate public reporting through development and operation of a public hotline. Public hotlines can be Copermittee-specific or shared by Copermittees. All storm water hotlines shall be capable of receiving reports in both English and Spanish 24 hours per day / seven days per week. Copermittees shall respond to and resolve each reported incident in a timely manner. All reported incidents, and how each was resolved, shall be summarized in each Copermittee's individual JURMP Annual Report.

5. Education Component

Each Copermittee shall implement an education program using all media as appropriate to (1) measurably increase the knowledge of the target communities regarding MS4s, impacts of urban runoff on receiving waters, and potential BMP solutions for the target audience; and (2) to measurably change the behavior of target communities and thereby reduce pollutant releases to MS4s and the environment. At a minimum, the education

program shall meet the requirements of this section and address the following target communities:

- Municipal Departments and Personnel
- Construction Site Owners and Developers
- Industrial Owners and Operators
- Commercial Owners and Operators
- Residential Community, General Public, and School Children

a. GENERAL REQUIREMENTS

(1) Each Copermittee shall educate each target community on the following topics where appropriate:

Table 3. Education

Laws, Regulations, Permits, & Requirements	**Best Management Practices**
• Federal, state, and local water quality laws and regulations • Statewide General NPDES Permit for Storm Water Discharges Associated with Industrial Activities (Except Construction). • Statewide General NPDES Permit for Storm Water Discharges Associated with Construction Activities • Regional Board's General NPDES Permit for Ground Water Dewatering • Regional Board's 401 Water Quality Certification Program • Statewide General NPDES Utility Vault Permit • Requirements of local municipal permits and ordinances (e.g., storm water and grading ordinances and permits)	• Pollution prevention and safe alternatives • Good housekeeping (e.g., sweeping impervious surfaces instead of hosing) • Proper waste disposal (e.g., garbage, pet/animal waste, green waste, household hazardous materials, appliances, tires, furniture, vehicles, boat/recreational vehicle waste, catch basin/ MS4 cleanout waste) • Non-storm water disposal alternatives (e.g., all wash waters) • Methods to minimized the impact of land development and construction • Erosion prevention • Methods to reduce the impact of residential and charity car-washing • Preventive Maintenance • Equipment/vehicle maintenance and repair • Spill response, containment, and recovery • Recycling • BMP maintenance
General Urban Runoff Concepts	**Other Topics**
• Impacts of urban runoff on receiving waters • Distinction between MS4s and sanitary sewers • BMP types: facility or activity specific, LID, source control, and treatment control • Short- and long-term water quality impacts associated with urbanization (e.g., land-use decisions, development, construction) • Non-storm water discharge prohibitions • How to conduct a storm water inspections	• Public reporting mechanisms • Water quality awareness for Emergency/ First Responders • Illicit Discharge Detection and Elimination observations and follow-up during daily work activities • Potable water discharges to the MS4 • Dechlorination techniques • Hydrostatic testing • Integrated pest management • Benefits of native vegetation • Water conservation

	• Alternative materials and designs to maintain peak runoff values • Traffic reduction, alternative fuel use

(2) Copermittee educational programs shall emphasize underserved target audiences, high-risk behaviors, and "allowable" behaviors and discharges, including various ethnic and socioeconomic groups and mobile sources.

b. SPECIFIC REQUIREMENTS

(1) Municipal Departments and Personnel Education

(a) Municipal Development Planning – Each Copermittee shall implement an education program so that its planning and development review staffs (and Planning Boards and Elected Officials, if applicable) have an understanding of:

i. Federal, state, and local water quality laws and regulations applicable to Development Projects;
ii. The connection between land use decisions and short and long-term water quality impacts (i.e., impacts from land development and urbanization);
iii. How to integrate LID BMP requirements into the local regulatory program(s) and requirements; and
iv. Methods of minimizing impacts to receiving water quality resulting from development, including:
[1] Storm water management plan development and review;
[2] Methods to control downstream erosion impacts;
[3] Identification of pollutants of concern;
[4] LID BMP techniques;
[5] Source control BMPs; and
[6] Selection of the most effective treatment control BMPs for the pollutants of concern.

(b) Municipal Construction Activities – Each Copermittee shall implement an education program that includes annual training prior to the rainy season so that its construction, building, code enforcement, and grading review staffs, inspectors, and other responsible construction staff have, at a minimum, an understanding of the following topics, as appropriate for the target audience:

i. Federal, state, and local water quality laws and regulations applicable to construction and grading activities.
ii. The connection between construction activities and water quality impacts (i.e., impacts from land development and urbanization and impacts from construction material such as sediment).
iii. Proper implementation of erosion and sediment control and other BMPs to minimize the impacts to receiving water quality resulting from construction activities.
iv. The Copermittee's inspection, plan review, and enforcement policies and procedures to verify consistent application.
v. Current advancements in BMP technologies.

vi. SUSMP Requirements including treatment options, LID BMPs, source control, and applicable tracking mechanisms.

(c) Municipal Industrial/Commercial Activities - Each Copermittee shall train staff responsible for conducting storm water compliance inspections and enforcement of industrial and commercial facilities at least once a year. Training shall cover inspection and enforcement procedures, BMP implementation, and reviewing monitoring data.

(d) Municipal Other Activities – Each Copermittee shall implement an education program so that municipal personnel and contractors performing activities which generate pollutants have an understanding of the activity specific BMPs for each activity to be performed.

(2) New Development and Construction Education

As early in the planning and development process as possible and all through the permitting and construction process, each Copermittee shall implement a program to educate project applicants, developers, contractors, property owners, community planning groups, and other responsible parties. The education program shall provide an understanding of the topics listed in Sections D.5.b.(1)(a) and D.5.b.(1)(b) above, as appropriate for the audience being educated. The education program shall also educate project applicants, developers, contractors, property owners, and other responsible parties on the importance of educating all construction workers in the field about stormwater issues and BMPs though formal or informal training.

(3) Residential, General Public, and School Children Education

Each Copermittee shall collaboratively conduct or participate in development and implementation of a plan to educate residential, general public, and school children target communities. The plan shall evaluate use of mass media, mailers, door hangers, booths at public events, classroom education, field trips, hands-on experiences, or other educational methods.

6. Public Participation Component

Each Copermittee shall incorporate a mechanism for public participation in the updating, development, and implementation of the Jurisdictional Urban Runoff Management Program.

E. WATERSHED URBAN RUNOFF MANAGEMENT PROGRAM

1. Each Copermittee shall implement all requirements of section E of this Order no later than 365 days after adoption of this Order, unless otherwise specified in this Order. Prior to 365 days after adoption of this Order, each Copermittee shall collaborate with the other Copermittees within its Watershed Management Area(s) (WMA) to at a minimum implement its Watershed URMP document, as the document was developed and amended to comply with the requirements of Order No. 2001-01.

2. Each Copermittee shall collaborate with other Copermittees within its WMA(s) as shown in Table 4 below to develop and implement an updated Watershed Urban Runoff

Management Program for each watershed. Each updated Watershed Urban Runoff Management Program shall meet the requirements of section E of this Order, reduce the discharge of pollutants from the MS4 to the MEP, and prevent urban runoff discharges from the MS4 from causing or contributing to a violation of water quality standards. At a minimum, each Watershed Urban Runoff Management Program shall include the elements described below:

a. Lead Watershed Permittee Identification

Watershed Copermittees shall identify the Lead Watershed Permittee for their WMA. In the event that a Lead Watershed Permittee is not selected and identified by the Watershed Copermittees, by default the Copermittee identified in Table 4 as the Lead Watershed Permittee for that WMA shall be responsible for implementing the requirements of the Lead Watershed Permittee in that WMA. The Lead Watershed Copermittees shall serve as liaisons between the Copermittees and Regional Board, where appropriate.

b. Watershed Map

Watershed Copermittees shall develop and periodically update a map of the WMA to facilitate planning, assessment, and collaborative decision-making. As determined appropriate, the map shall include features such as receiving waters (including the Pacific Ocean); Clean Water Act section 303(d) impaired receiving waters; land uses, MS4s; major highways; jurisdictional boundaries; and inventoried commercial, industrial, and municipal sites.

c. Watershed Water Quality Assessment

Watershed Copermittees shall annually assess the water quality of receiving waters in their WMA. This assessment shall use applicable water quality data, reports, and analysis generated in accordance with the requirements of the Receiving Waters Monitoring and Reporting Program, as well as applicable information available from other public and private organizations.

The assessment and analysis shall annually identify the WMA's water quality problems that are partially or fully attributable to MS4 discharges. Identified water quality problems shall include CWA section 303(d) listings, persistent violations of water quality standards, toxicity, impacts to beneficial uses, and other pertinent conditions. From the list of water quality problems, the high priority water quality problems of the WMA shall be identified, which shall include those water quality problems which most significantly exceed or impact water quality standards (water quality objectives and beneficial uses).

The assessment shall include annual identification of the likely sources of the WMA's high priority water quality problems.

d. Watershed-based Land Use Planning

The Watershed Copermittees shall develop, implement, and modify, as necessary, a program for encouraging collaborative, watershed-based, land use planning in their jurisdictional planning departments.

e. Watershed Strategy

Watershed Copermittees shall develop and implement a collective watershed strategy to abate the sources and reduce the discharge of pollutants causing the high priority water quality problems of the WMA. The strategy shall guide Watershed Copermittee selection and implementation of Watershed Activities, so that the Watershed Activities selected and implemented are appropriate for each Watershed Copermittee's contribution to the WMA's high priority water quality problems.

f. Watershed Activities

(1) The Watershed Copermittees shall identify and implement Watershed Activities that address the high priority water quality problems in the WMA. Watershed Activities shall include both Watershed Water Quality Activities and Watershed Education Activities. These activities may be implemented individually or collectively, and may be implemented at the regional, watershed, or jurisdictional level.

(a) Watershed Water Quality Activities are activities other than education that address the high priority water quality problems in the WMA. A Watershed Water Quality Activity implemented on a jurisdictional basis must be organized and implemented to target a watershed's high priority water quality problems or must exceed the baseline jurisdictional requirements of section D of this Order.
(b) Watershed Education Activities are outreach and training activities that address high priority water quality problems in the WMA.

(2) A Watershed Activities List shall be submitted with each updated WURMP and updated annually thereafter. The Watershed Activities List shall include both Watershed Water Quality Activities and Watershed Education Activities, along with a description of how each activity was selected, and how all of the activities on the list will collectively abate sources and reduce pollutant discharges causing the identified high priority water quality problems in the WMA.

(3) Each activity on the Watershed Activities List shall include the following information:

(a) A description of the activity;
(b) A time schedule for implementation of the activity, including key milestones;
(c) An identification of the specific responsibilities of Watershed Copermittees in completing the activity;
(d) A description of how the activity will address the identified high priority water quality problem(s) of the watershed;
(e) A description of how the activity is consistent with the collective watershed strategy;
(f) A description of the expected benefits of implementing the activity; and
(g) A description of how implementation effectiveness will be measured.

(4) Each Watershed Copermittee shall implement identified Watershed Activities pursuant to established schedules. For each Permit year, no less than two Watershed Water Quality Activities and two Watershed Education Activities shall be in an active implementation phase. A Watershed Water Quality Activity

is in an active implementation phase when significant pollutant load reductions, source abatement, or other quantifiable benefits to discharge or receiving water quality can reasonably be established in relation to the watershed's high priority water quality problem(s). Watershed Water Quality Activities that are capital projects are in active implementation for the first year of implementation only. A Watershed Education Activity is in an active implementation phase when changes in attitudes, knowledge, awareness, or behavior can reasonably be established in target audiences.

g. Copermittee Collaboration

Watershed Copermittees shall collaborate to develop and implement the Watershed Urban Runoff Management Programs. Watershed Copermittee collaboration shall include frequent regularly scheduled meetings.

h. Public Participation

Watershed Copermittees shall implement a watershed-specific public participation mechanism within each watershed. The mechanism shall encourage participation from other organizations within the watershed (such as the Department of Defense, Caltrans, lagoon foundations, etc.)

i. WURMP Review and Updates

Each WURMP shall be reviewed annually to identify needed modifications and improvements. Pursuant to the requirements of Section I.2.b of this Order the Watershed Copermittees shall develop and implement a plan and schedule to address the identified modifications and improvements. All updates to the WURMP shall be documented in the Watershed Urban Runoff Management Program Annual Reports. Individual Watershed Copermittees shall also review and modify their jurisdictional activities and JURMPs as necessary so that they are consistent with the requirements of the WURMP.

Table 4. Watershed Management Areas and Watershed Copermittees

RESPONSIBLE WATERSHED COPERMITTEE(S)	WATERSHED MANAGEMENT AREA	HYDROLOGIC UNIT OR AREA	MAJOR RECEIVING WATER BODIES
1. County of San Diego	Santa Margarita River	Santa Margarita HU (902.00)	Santa Margarita River and Estuary, Pacific Ocean
2. City of Oceanside 3. City of Vista 4. County of San Diego	San Luis Rey River	San Luis Rey HU (903.00)	San Luis Rey River and Estuary, Pacific Ocean
1. City of Carlsbad **2. City of Encinitas** 3. City of Escondido 4. City of Oceanside 5. City of San Marcos 6. City of Solana Beach 7. City of Vista 8. County of San Diego	Carlsbad	Carlsbad HU (904.00)	Batiquitos Lagoon San Elijo Lagoon Agua Hedionda Lagoon Buena Vista Lagoon and Tributary Streams Pacific Ocean
1. City of Del Mar 2. **City of Escondido** 3. City of Poway 4. City of San Diego 5. City of Solana Beach 6. County of San Diego	San Dieguito River	San Dieguito HU (905.00)	San Dieguito River and Estuary Pacific Ocean

RESPONSIBLE WATERSHED COPERMITTEE(S)	WATERSHED MANAGEMENT AREA	HYDROLOGIC UNIT OR AREA	MAJOR RECEIVING WATER BODIES
1. City of Del Mar **2. City of Poway** 3. City of San Diego 4. County of San Diego	Peñasquitos	Miramar Reservoir HA (906.10) Poway HA (906.20)	Los Peñasquitos Creek Los Peñasquitos Lagoon Pacific Ocean
1. City of San Diego	Mission Bay	Scripps HA (906.30) Miramar HA(906.40) Tecolote HA (906.50)	Mission Bay Pacific Ocean
1. City of El Cajon 2. City of La Mesa 3. City of San Diego 4. City of Santee 5. County of San Diego	San Diego River	San Diego HU (907.00)	San Diego River Pacific Ocean
1. City of Chula Vista 2. City of Coronado 3. City of Imperial Beach 4. City of La Mesa 5. City of Lemon Grove 6. City of National City 7. City of San Diego 8. County of San Diego **9. San Diego Unified Port District** 10. San Diego County Regional Airport Authority	San Diego Bay	Pueblo San Diego HU (908.00) Sweetwater HU (909.00) Otay HU (910.00)	San Diego Bay Sweetwater River Otay River Pacific Ocean
1. City of Imperial Beach 2. City of San Diego **3. County of San Diego**	Tijuana River	Tijuana (911.00)	Tijuana River and Estuary Pacific Ocean

- The Lead Watershed Permittee for each watershed is highlighted

F. REGIONAL URBAN RUNOFF MANAGEMENT PROGRAM

The Copermittees shall implement all requirements of section F of this Order no later than 365 days after adoption of this Order, unless otherwise specified in this Order.

Each Copermittee shall collaborate with the other Copermittees to develop, implement, and update as necessary a Regional Urban Runoff Management Program. The Regional Urban Runoff Management Program shall meet the requirements of section F of this Order, reduce the discharge of pollutants from the MS4 to the MEP, and prevent urban runoff discharges from the MS4 from causing or contributing to a violation of water quality standards. The Regional Urban Runoff Management Program shall, at a minimum:

1. Develop and implement a Regional Residential Education Program. The program shall include:
   a. Pollutant specific education which focuses educational efforts on bacteria, nutrients, sediment, pesticides, and trash. If a different pollutant is determined to be more critical for the education program, the pollutant can be substituted for one of these pollutants.
   b. Education efforts focused on the specific residential sources of the pollutants listed in section F.1.a.
2. Develop the standardized fiscal analysis method required in section G of this Order.
3. Facilitate the assessment of the effectiveness of jurisdictional, watershed, and regional programs.

As options, the Regional Urban Runoff Management Program may:

1. Develop and implement urban runoff management activities on a regional level, as determined to be necessary by the Copermittees.

2. Develop and implement a strategy to integrate management, implementation, and reporting of jurisdictional, watershed, and regional activities, as determined to be necessary by the Copermittees. Any such integration shall assure compliance with the jurisdictional requirements of section D and the watershed requirements of section E.
3. Facilitate TMDL management and implementation, as determined to be necessary by the Copermittees.
4. Facilitate development of strategies for implementation of activities on a watershed level, as determined to be necessary by the Copermittees.

G. FISCAL ANALYSIS

1. Each Copermittee shall secure the resources necessary to meet all requirements of this Order.

2. As part of the Regional Urban Runoff Management Program, the Copermittees shall collectively develop a standardized method and format for annually conducting and reporting fiscal analyses of their urban runoff management programs in their entirety (including jurisdictional, watershed, and regional activities). This standardized method shall:

   a. Identify the various categories of expenditures attributable to the urban runoff management programs, including a description of the specific items to be accounted for in each category of expenditures.
   b. Identify expenditures that contribute to multiple programs or were in existence prior to implementation of the urban runoff management program.
   c. Identify a metric or metrics to be used to report program component and total program expenditures.

3. Each Copermittee shall conduct an annual fiscal analysis. Starting January 31, 2010, the annual fiscal analysis shall be conducted consistent with the standardized fiscal analysis method included in the January 31, 2009 Regional Urban Runoff Management Program Annual Report. The annual fiscal analysis shall be conducted and reported on as part of each Copermittee's Jurisdictional Urban Runoff Management Program Annual Reports. For convenience, the fiscal analysis included in the Jurisdictional Urban Runoff Management Program Annual Reports shall address the Copermittee's urban runoff management programs in their entirety, including jurisdictional, watershed, and regional activities. The fiscal analysis shall provide the Copermittee's urban runoff management program budget for the current reporting period. The fiscal analysis shall include a description of the source(s) of the funds that are proposed to be used to meet the necessary expenditures, including legal restrictions on the use of such funds.

H. TOTAL MAXIMUM DAILY LOADS

1. Chollas Creek Diazinon TMDL Water Quality Based Effluent Limits (WQBELs)

   a. The Copermittees in the Chollas Creek watershed shall implement BMPs capable of achieving the interim and final diazinon Waste Load Allocation (WLA) concentration in the storm water discharge in Chollas Creek listed in Table 5.

Table 5. Chollas Creek Diazinon Schedule

Calendar Year	Year	Waste Load Allocation	Interim TMDL Numeric Target	% Reduction
2004	1	0.460 µg/L	0.5 µg/L	0
2005	2	0.460 µg/L	0.5 µg/L	0
2006	3	0.460 µg/L	0.5 µg/L	0
2007	4	0.414 µg/L	0.45 µg/L	10
2008	5	0.322 µg/L	0.35 µg/L	20
2009	6	0.184 µg/L	0.20 µg/L	30
2010	7	0.045 µg/L	0.05 µg/L	30

b. The Copermittees in the Chollas Creek watershed shall not cause or contribute to the violation of the Interim TMDL Numeric Targets in Chollas Creek as listed in Table 5. If the Interim TMDL Numeric Target is violated in Chollas Creek in more than one sample in any three consecutive years, the Copermittees shall submit a report that either 1) documents compliance with the WLA through additional sampling of the urban runoff discharge or 2) demonstrates, using modeling or other technical or scientific basis, the effectiveness of additional BMPs that will be implemented to achieve the WLA. The report may be incorporated into the Watershed Urban Runoff Management Program Annual Report unless the Regional Board directs an earlier submittal. The report shall include an implementation schedule.

c. The Copermittees in the Chollas Creek watershed shall implement the Diazinon Toxicity Control Plan and Diazinon Public Outreach/Education Program as described in the report titled, "Technical Report for Total Maximum Daily Load for Diazinon in Chollas Creek Watershed, San Diego County, August 14, 2002," including subsequent modifications, in order to achieve the WLA listed in Table 5.

2. Shelter Island Yacht Basin WQBELs

a. The Copermittees in the Shelter Island Yacht Basin watershed shall implement BMPs to maintain a total annual copper discharge load of less than or equal to 30 kg copper / year.

b. The Copermittees in the Shelter Island Yacht Basin watershed shall implement, at a minimum, the BMPs included in the Copermittees' Jurisdictional Urban Runoff Management Plan, including subsequent modifications, which address the discharge of copper to achieve the annual copper load in Section H.2.a above.

I. PROGRAM EFFECTIVENESS ASSESSMENT

1. Jurisdictional

a. As part of its Jurisdictional Urban Runoff Management Program, each Copermittee shall annually assess the effectiveness of its Jurisdictional Urban Runoff Management Program implementation. At a minimum, the annual effectiveness assessment shall:

(1) Specifically assess the effectiveness of each of the following:

(a) Each significant jurisdictional activity/BMP or type of jurisdictional activity/BMP implemented;
(b) Implementation of each major component of the Jurisdictional Urban Runoff Management Program (Development Planning, Construction, Municipal, Industrial/Commercial, Residential, Illicit Discharge Detection and Elimination, and Education); and
(c) Implementation of the Jurisdictional Urban Runoff Management Program as a whole.

(2) Identify and utilize measurable targeted outcomes, assessment measures, and assessment methods for each of the items listed in section I.1.a.(1) above.

(3) Utilize outcome levels 1-6[9] to assess the effectiveness of each of the items listed in section I.1.a.(1) above, where applicable and feasible.

(4) Utilize monitoring data and analysis from the Receiving Waters Monitoring Program to assess the effectiveness each of the items listed in section I.1.a.(1) above, where applicable and feasible.

(5) Utilize Implementation Assessment, Water Quality Assessment, and Integrated Assessment, where applicable and feasible.[10]

b. Based on the results of the effectiveness assessment, each Copermittee shall annually review its jurisdictional activities or BMPs to identify modifications and improvements needed to maximize Jurisdictional Urban Runoff Management Program effectiveness, as necessary to achieve compliance with section A of this Order. The Copermittees shall develop and implement a plan and schedule to address the identified modifications and improvements. Jurisdictional activities/BMPs that are ineffective or less effective than other comparable jurisdictional activities/BMPs shall be replaced or improved upon by implementation of more effective jurisdictional activities/BMPs. Where monitoring data exhibits persistent water quality problems that are caused or contributed to by MS4 discharges, jurisdictional activities or BMPs applicable to the water quality problems shall be modified and improved to correct the water quality problems.

c. As part of its Jurisdictional Urban Runoff Management Program Annual Reports, each Copermittee shall report on its Jurisdictional Urban Runoff Management Program effectiveness assessment as implemented under each of the requirements of sections I.1.a and I.1.b above.

2. Watershed

a. As part of its Watershed Urban Runoff Management Program, each watershed group of Copermittees (as identified in Table 4) shall annually assess the effectiveness of its Watershed Urban Runoff Management Program implementation. At a minimum, the annual effectiveness assessment shall:

(1) Specifically assess the effectiveness of each of the following:

[9] Effectiveness assessment outcome levels are defined in Attachment C of this Order.
[10] Implementation Assessment, Water Quality Assessment, and Integrated Assessment are defined in Attachment C of this Order.

(a) Each Watershed Water Quality Activity implemented;
(b) Each Watershed Education Activity implemented; and
(c) Implementation of the Watershed Urban Runoff Management Program as a whole.

(2) Identify and utilize measurable targeted outcomes, assessment measures, and assessment methods for each of the items listed in section I.2.a.(1) above.

(3) Utilize outcome levels 1-6 to assess the effectiveness of each of the items listed in sections I.2.a.(1)(a) and I.2.a.(1)(b) above, where applicable and feasible.

(4) Utilize outcome levels 1-4 to assess the effectiveness of implementation of the Watershed Urban Runoff Management Program as a whole, where applicable and feasible.

(5) Utilize outcome levels 5 and 6 to qualitatively assess the effectiveness of implementation of the Watershed Urban Runoff Management Program as a whole, focusing on the high priority water quality problem(s) of the watershed. These assessments shall attempt to exhibit the impact of Watershed Urban Runoff Management Program implementation on the high priority water quality problem(s) within the watershed.

(6) Utilize monitoring data and analysis from the Receiving Waters Monitoring Program to assess the effectiveness each of the items listed in section I.2.a.(1) above, where applicable and feasible.

(7) Utilize Implementation Assessment, Water Quality Assessment, and Integrated Assessment, where applicable and feasible.

b. Based on the results of the effectiveness assessment, the watershed Copermittees shall annually review their Watershed Water Quality Activities, Watershed Education Activities, and other aspects of the Watershed Urban Runoff Management Program to identify modifications and improvements needed to maximize Watershed Urban Runoff Management Program effectiveness, as necessary to achieve compliance with section A of this Order. The Copermittees shall develop and implement a plan and schedule to address the identified modifications and improvements. Watershed Water Quality Activities/Watershed Education Activities that are ineffective or less effective than other comparable Watershed Water Quality Activities/Watershed Education Activities shall be replaced or improved upon by implementation of more effective Watershed Water Quality Activities/Watershed Education Activities. Where monitoring data exhibits persistent water quality problems that are caused or contributed to by MS4 discharges, Watershed Water Quality Activities and Watershed Education Activities applicable to the water quality problems shall be modified and improved to correct the water quality problems.

c. As part of its Watershed Urban Runoff Management Program Annual Reports, each watershed group of Copermittees (as identified in Table 4) shall report on its Watershed Urban Runoff Management Program effectiveness assessment as implemented under each of the requirements of section I.2.a and I.2.b above.

3. Regional

a. As part of the Regional Urban Runoff Management Program, the Copermittees shall annually assess the effectiveness of Regional Urban Runoff Management Program implementation. At a minimum, the annual effectiveness assessment shall:

(1) Specifically assess the effectiveness of each of the following:

(a) Each regional activity/BMP or type of regional activity/BMP implemented, including regional residential education activities; and
(b) The Regional Urban Runoff Management Program as a whole.

(2) Identify and utilize measurable targeted outcomes, assessment measures, and assessment methods for each of the items listed in section I.3.a.(1) above.

(3) Utilize outcome levels 1-6 to assess the effectiveness of each of the items listed in sections I.3.a.(1) above, where applicable and feasible.

(4) Utilize monitoring data and analysis from the Receiving Waters Monitoring Program to assess the effectiveness each of the items listed in section I.3.a.(1) above, where applicable and feasible.

(5) Utilize Implementation Assessment, Water Quality Assessment, and Integrated Assessment, where applicable and feasible.

(6) Include evaluation of whether the Copermittees' jurisdictional, watershed, and regional effectiveness assessments are meeting the following objectives:

(a) Assessment of watershed health and identification of water quality issues and concerns.
(b) Evaluation of the degree to which existing source management priorities are properly targeted to, and effective in addressing, water quality issues and concerns.
(c) Evaluation of the need to address additional pollutant sources not already included in Copermittee programs.
(d) Assessment of progress in implementing Copermittee programs and activities.
(e) Assessment of the effectiveness of Copermittee activities in addressing priority constituents and sources.
(f) Assessment of changes in discharge and receiving water quality.
(g) Assessment of the relationship of program implementation to changes in pollutant loading, discharge quality, and receiving water quality.
(h) Identification of changes necessary to improve Copermittee programs, activities, and effectiveness assessment methods and strategies.

b. Based on the results of the effectiveness assessment, the Copermittees shall annually review their regional activities and other aspects of the Regional Urban Runoff Management Program to identify modifications and improvements needed maximize Regional Urban Runoff Management Program effectiveness, as necessary to achieve compliance with section A of this Order. The Copermittees shall develop and implement a plan and schedule to address the identified modifications and improvements. Regional activities that are ineffective or less effective than other

comparable regional activities shall be replaced or improved upon by implementation of more effective regional activities. Where monitoring data exhibits persistent water quality problems that are caused or contributed to by MS4 discharges, regional activities applicable to the water quality problems shall be modified and improved to correct the water quality problems.

c. Based on the results of the Copermittees' evaluation of their effectiveness assessments, the Copermittees shall modify their effectiveness assessment methods to improve their ability to accurately assess the effectiveness of their urban runoff management programs.

d. As part of its Regional Urban Runoff Management Program Annual Reports, the Copermittees shall report on its Regional Urban Runoff Management Program effectiveness assessment as implemented under each of the requirements of sections I.3.a, I.3.b, and I.3.c above.

4. TMDL BMP Implementation Plan

a. For each TMDL in a watershed, the Copermittees subject to the TMDL within the watershed shall annually assess the effectiveness of its TMDL BMP Implementation Plan or equivalent plan.[11] At a minimum, the annual effectiveness assessment shall:

(1) Specifically assess the effectiveness of each of the following:

(a) Each activity/BMP or type of activity/BMP implemented; and
(b) Implementation of the TMDL BMP Implementation Plan or equivalent plan as a whole.

(2) Identify and utilize measurable targeted outcomes, assessment measures, and assessment methods for each of the items listed in sections I.4.a.(1) above.

(3) Utilize outcome levels 1-6 to assess the effectiveness of each of the items listed in section I.4.a.(1)(a) above, where applicable and feasible.

(4) Utilize outcome levels 1-4 to assess the effectiveness of implementation of the TMDL BMP Implementation Plan or equivalent plan as a whole, where applicable and feasible.

(5) Utilize outcome levels 5 and 6 to qualitatively assess the effectiveness of the TMDL BMP Implementation Plan or equivalent plan as a whole. These assessments shall attempt to exhibit the effects of the TMDL BMP Implementation Plan or equivalent plan on the impairment that is targeted.

b. Based on the results of the effectiveness assessment, the Copermittees subject to the TMDL shall modify their BMPs and other aspects of the TMDL BMP Implementation Plan or equivalent plan in order to maximize TMDL BMP Implementation Plan or equivalent plan effectiveness. BMPs that are ineffective or less effective than other comparable BMPs shall be replaced or improved upon by implementation of more effective BMPs. Where monitoring data exhibits persistent

[11] This requirement applies to those TMDLs where a TMDL BMP Implementation Plan or equivalent plan has been developed and submitted to the Regional Board.

water quality problems that are caused or contributed to by MS4 discharges, BMPs applicable to the water quality problems shall be modified and improved to correct the water quality problems.

c. As part of its Watershed Urban Runoff Management Program Annual Reports, each group of Copermittees subject to a TMDL shall report on any TMDL BMP Implementation Plan or equivalent plan effectiveness assessments as implemented under each of the requirements of sections I.4.a and I.4.b above.

5. Long-term Effectiveness Assessment

a. Each Copermittee shall collaborate with the other Copermittees to develop a Long-term Effectiveness Assessment (LTEA), which shall build on the results of the Copermittees' August 2005 Baseline LTEA. The LTEA shall be submitted by the Principal Permittee to the Regional Board no later than 210 days in advance of the expiration of this Order.

b. The LTEA shall be designed to address each of the objectives listed in section I.3.a.(6) of this Order, and to serve as a basis for the Copermittees' Report of Waste Discharge for the next permit cycle.

c. The LTEA shall address outcome levels 1-6, and shall specifically include an evaluation of program implementation to changes in water quality (outcome levels 5 and 6).

d. The LTEA shall assess the effectiveness of the Receiving Waters Monitoring Program in meeting its objectives and its ability to answer the five core management questions. This shall include assessment of the frequency of monitoring conducted through the use of power analysis and other pertinent statistical methods. The power analysis shall identify the frequency and intensity of sampling needed to identify a 10% reduction in the concentration of constituents causing the high priority water quality problems within each watershed over the next permit term with 80% confidence.

e. The LTEA shall address the jurisdictional, watershed, and regional programs, with an emphasis on watershed assessment.

J. REPORTING

1. Urban Runoff Management Plans

a. JURISDICTIONAL URBAN RUNOFF MANAGEMENT PLANS

(1) Copermittees - The written account of the overall program to be conducted by each Copermittee to meet the jurisdictional requirements of section D of this Order is referred to as the Jurisdictional Urban Runoff Management Plan (JURMP). Each Copermittee shall revise and update its JURMP so that it describes all activities the Copermittee will undertake to implement the requirements of each component of Jurisdictional Urban Runoff Management Program section D of this Order. Each Copermittee shall submit its updated and revised JURMP to the Principal Permittee by the date specified by the Principal

Permittee.

(2) Principal Permittee –The Principal Permittee shall be responsible for collecting and assembling the individual JURMPs which cover the activities conducted by each individual Copermittee. The Principal Permittee shall submit the JURMPs to the Regional Board 365 days after adoption of this Order.

(3) At a minimum, each Copermittee's JURMP shall be updated and revised to contain the following information:

(a) Non-Storm Water Discharges
   i. Identification of non-storm water discharge categories identified as a source of pollutants to waters of the U.S.
   ii. A description of whether non-storm water discharge categories identified under section (a)i above will be prohibited or required to implement appropriate control measures to reduce the discharge of pollutants to the MEP.
   iii. Identification of any control measures to be required and implemented for non-storm water discharge categories identified under section (a)i above.
   iv. A description of a program to reduce pollutants from non-emergency fire fighting flows identified by the Copermittee to be significant sources of pollutants.

(b) Administrative and Legal Procedures
   i. Certified statement by the chief legal counsel that the Copermittee has adequate legal authority to implement and enforce each of the requirements contained in 40 CFR 122.26(d)(2)(i)(A-F) and this Order.
   ii. Identification of all departments within the jurisdiction that conduct urban runoff related activities, and their roles and responsibilities under the Order. Include an up-to-date organizational chart specifying these departments and key personnel.
   iii. Updated urban runoff related ordinances, with explanations of how they are enforceable.
   iv. Identification of the local administrative and legal procedures available to mandate compliance with urban runoff related ordinances and therefore with the conditions of the Order.
   v. Description of how urban runoff related ordinances are implemented and appealed.
   vi. Description of whether the municipality can issue administrative orders and injunctions or if it must go through the court system for enforcement actions.

(c) Development Planning
   i. A description of the water quality and watershed protection principles that have been or will be included in the Copermittee's General Plan, and a time schedule for when modifications are planned, if applicable.
   ii. A description of the Copermittee's current environmental review process and how it addresses impacts to water quality and appropriate mitigation measures. If the Copermittee plans to modify the process during the permit term, a time schedule for modifications shall be included.

iii. A description of the development project approval process and requirements.
iv. An updated SUSMP document that meets the applicable requirements specified in sections D.1.d and D.1.g(6), including a description of LID BMP requirements to be used prior to the Model SUSMP update. The updated SUSMP may be submitted under separate cover as an attachment to the JURMP.
v. A description of the database to be used to track and inventory approved treatment control BMPs and treatment control BMP maintenance.
vi. A completed watershed-based inventory of approved treatment control BMPs.
vii. A description of the program to be implemented to verify approved treatment control BMPs are operating effectively and have been adequately maintained, including information on treatment control BMP inventory, prioritization, inspection, and annual verification.
viii. A description of inspections that will be conducted to verify BMPs have been constructed according to requirements.
ix. A description of collaboration efforts to be conducted to develop the HMP.
x. A description of enforcement mechanisms and how they will be used.

(d) Construction
i. Updated grading and other applicable ordinances.
ii. A description of the construction and grading approval processes.
iii. Updated construction and grading project requirements.
iv. A completed watershed-based inventory of all construction sites.
v. A description of steps that will be taken to maintain and update monthly a watershed-based inventory of all construction sites.
vi. A list and description of the minimum BMPs that will be implemented, or required to be implemented, including pollution prevention.
vii. A description of the maximum disturbed area allowed for grading before either temporary or permanent erosion controls are implemented.
viii. A description of construction site conditions where advanced treatment will be required.
ix. A description of the steps that will be taken to require and verify the implementation of the designated BMPs at all construction sites.
x. A description of planned inspection frequencies.
xi. A description of inspection procedures.
xii. A description of steps that will be taken to track construction site inspections to verify that all construction sites are inspected at the minimum frequencies required.
xiii. A description of available enforcement mechanisms, under what conditions each will be used, and how they will escalate.
xiv. A description of notification procedures for non-compliant sites.

(e) Municipal
i. A completed inventory of all municipal facilities and activities.
ii. A description of which BMPs will be implemented, or required to be implemented, for municipal facilities and activities, including pollution prevention.
iii. A description of which BMPs will be implemented, or required to be implemented, for special events.

iv. A description of steps that will be taken to require and verify the implementation of designated BMPs at municipal facilities and activities.
v. A description of MS4 and MS4 facility inspection and maintenance activities and schedules.
vi. A description of the management strategy and BMPs to be implemented for pesticides, herbicides, and fertilizer use.
vii. A description of street and parking facility sweeping activities and schedules.
viii. A description of controls and measures to be implemented to prevent and eliminate infiltration of seepage from sanitary sewers to MS4s.
ix. A description of inspection frequencies and procedures.
x. A description of enforcement mechanisms and how they will be used.

(f) Industrial and Commercial
i. A completed and prioritized inventory of all industrial and commercial sites/sources that could contribute a significant pollutant load to the MS4.
ii. A list of minimum BMPs that will be implemented, or required to be implemented, for each facility type or pollutant-generating activity, including pollution prevention.
iii. A description of the steps that will be taken to require and verify the implementation of designated BMPs, including notification efforts.
iv. Identification of high priority sites/sources and sites/sources to be inspected during the first year of implementation.
v. A description of the steps taken to identify sites/sources to be inspected during the first year of implementation, including rationale for their selection.
vi. A description of steps that will be taken to identify sites/sources to be inspected in subsequent years.
vii. A description of inspection procedures.
viii. A description of any third party inspection program to be implemented.
ix. A description of the program to be implemented to regulate mobile businesses, including notification of BMP requirements and local ordinances.
x. A description of enforcement mechanisms and how they will be used.
xi. A description of steps that will be taken to identify non-filers and notify the Regional Board of non-filers.

(g) Residential
i. A list of residential areas and activities that have been identified as high priority.
ii. A list of minimum BMPs that will be implemented, or required to be implemented, for high priority residential activities.
iii. A description of which pollution prevention methods will be encouraged for implementation, and the steps that will be taken to encourage implementation.
iv. A description of the steps that will be taken to require and verify the implementation of prescribed BMPs for high priority residential activities.
v. A description of efforts to facilitate proper disposal of used oil and other toxic materials.

vi. A description of efforts to evaluate methods used for oversight of residential areas and activities.
vii. A description of enforcement mechanisms and how they will be used.

(h) Illicit Discharge Detection and Elimination
i. A description of the program to actively seek and eliminate illicit discharges and illicit connections.
ii. An updated MS4 map, including locations of the MS4, dry weather field screening and analytical monitoring sites, and watersheds.
iii. A description of dry weather field screening and analytical monitoring to be conducted (including procedures) which addresses all requirements included in sections B.1-4 of Receiving Waters Monitoring and Reporting Program No. R9-2006-0011.
iv. A description of investigation and inspection procedures to follow up on dry weather monitoring results or other information which indicate potential for illicit discharges and illicit connections.
v. A description of procedures to eliminate detected illicit discharges and illicit connections.
vi. A description of enforcement mechanisms and how they will be used.
vii. A description of the mechanism to receive notification of spills.
viii. A description of measures to prevent, respond to, contain, and clean up all sewage and other spills.
ix. A description of efforts to facilitate public reporting of illicit discharges and connections, including a public hotline.

(i) Education
i. A description of the content, form, and frequency of education efforts for each target community.
ii. A description of steps to be taken to educate underserved target audiences, high-risk behaviors, and "allowable" behaviors and discharges, including various ethnic and socioeconomic groups and mobile sources.
iii. A description of the content, form, and frequency of education efforts targeting municipal staff working on development planning, construction, municipal, industrial/commercial, and other aspects of the Jurisdictional Urban Runoff Management Program.
iv. A description of the content, form, and frequency of education efforts targeting new development and construction target communities.
v. A description of the content, form, and frequency of jurisdictional education efforts for the residential, general public, and school children target communities.

(j) Public Participation
i. A description of the steps that will be taken to include public participation in the development and implementation of each Copermittee's Jurisdictional Urban Runoff Management Program.

(k) Fiscal Analysis
i. A description of the fiscal analysis to be conducted annually, as required by section G of this Order.

(l) Program Effectiveness Assessment

i. A description of steps that will be taken to annually conduct program effectiveness assessments in compliance with section I.1 of the Order.

ii. Identify measurable targeted outcomes, assessment measures, and assessment methods to be used to assess the effectiveness of: (1) Each significant jurisdictional activity or BMP to be implemented; (2) Implementation of each major component of the Jurisdictional Urban Runoff Management Program; and (3) Implementation of the Jurisdictional Urban Runoff Management Program as a whole.

iii. Identify which of the outcome levels 1-6 will be utilized to assess the effectiveness of each of the items listed in sections J.1.a.(3)(l)ii(1-3). Where an outcome level is determined to not be applicable or feasible for an item listed in sections J.1.a.(3)(l)ii(1-3), the Copermittee shall provide a discussion exhibiting inapplicability or infeasibility.

iv. A description of the steps that will be taken to utilize monitoring data to assess the effectiveness of each of the items listed in sections J.1.a.(3)(l)ii(1-3).

v. A description of the steps that will be taken to improve the Copermittee's ability to assess program effectiveness using measurable targeted outcomes, assessment measures, assessment methods, and outcome levels 1-6. Include a time schedule for when improvement will occur.

vi. A description of the steps that will be taken to identify aspects of the Copermittee's Jurisdictional Urban Runoff Management Program that will be changed, based on the results of the effectiveness assessment.

(m) JURMP Modification

i. Identification of the location in the JURMP of any changes made to the JURMP in order to meet the requirements of Order No. R9-2007-0001.

b. WATERSHED URBAN RUNOFF MANAGEMENT PLANS

(1) Copermittees - The written account of the program conducted by each watershed group of Copermittees is referred to as the Watershed Urban Runoff Management Plan (WURMP). The Copermittees within each watershed shall be responsible for updating and revising each WURMP, as specified in Table 4 above. Each WURMP shall be updated and revised to describe all activities the watershed Copermittees will undertake to implement the Watershed Urban Runoff Management Program requirements of section E of this Order.

(2) Lead Watershed Permittee - Each Lead Watershed Permittee shall be responsible for producing its respective WURMP, as well as for coordination and meetings amongst all member watershed Copermittees. Each Lead Watershed Permittee is further responsible for the submittal of the WURMP to the Principal Permittee by the date specified by the Principal Permittee.

(3) Principal Permittee – The Principal Permittee shall assemble and submit the WURMPs to the Regional Board 365 days after adoption of this Order.

(4) Each WURMP shall include:

(a) Identification of the Lead Watershed Permittee for the watershed.
(b) An updated watershed map.

(c) Identification and description of all applicable water quality data, reports, analyses, and other information to be used to assess receiving water quality.
(d) Assessment and analysis of the watershed's water quality data, reports, analyses, and other information, including identification and prioritization of the watershed's water quality problems. Water quality problems and high priority water quality problems shall be identified.
(e) Identification of the likely sources, pollutant discharges, and/or other factors causing the high priority water quality problems within the watershed.
(f) A description of the program to be implemented to encourage collaborative, watershed-based, land-use planning.
(g) A description of the strategy to be used to guide Copermittee implementation of Watershed Water Quality Activities and Watershed Education Activities, including criteria for evaluating and identifying effective activities.
(h) A list of potential Watershed Water Quality Activities, including a description of each activity and its location(s).
(i) Identification and description of the Watershed Water Quality Activities to be implemented by each Copermittee for the first year of implementation, including justification for why the activities were chosen and a description of how the activities are expected to reduce discharged pollutant loads, abate pollutant sources, or result in other quantifiable benefits to discharge or receiving water quality, in relation to the watershed's high priority water quality problem(s). Plans for activity implementation beyond the first year of implementation should also be provided.
(j) A list of potential Watershed Education Activities.
(k) Identification and description of the Watershed Education Activities to be implemented by each Copermittee for the first year of implementation, including justification for why the activities were chosen and a description of how the activities are expected to directly target the sources and discharges of pollutants causing the watershed's high priority water quality problems. Plans for activity implementation beyond the first year of implementation should also be provided.
(l) A description of the public participation mechanisms to be used and the parties anticipated to be involved.
(m) A description of Copermittee collaboration to occur, including a schedule for WURMP meetings.
(n) A description of any TMDL BMP Implementation Plan or equivalent plan to be implemented under section H of this Order.[12]
(o) A detailed description of the effectiveness assessment to be conducted for the WURMP, including a description how each of the requirements in section I.2 of this Order will be met.

c. REGIONAL URBAN RUNOFF MANAGEMENT PLAN

(1) Copermittees - The written account of the regional program to be conducted is referred to as the Regional Urban Runoff Management Plan (RURMP). Each Copermittee shall collaborate with the other Copermittees to develop the RURMP. The RURMP shall describe all activities the Copermittees will undertake to implement the requirements of each component of Regional Urban

[12] For TMDLs not yet approved by the Office of Administrative Law at the time of adoption of this Order, TMDL BMP Implementation Plans shall be submitted separately 365 days following approval of the TMDL.

Runoff Management Program section F of this Order. At a minimum, the RURMP shall contain the following information:

(a) A common activities section that describes the urban runoff management activities to be implemented on a regional level. For regional activities which are to be implemented in compliance with any jurisdictional requirements of section D or watershed requirements of section E, it shall be described how the regional activities achieve compliance with the subject jurisdictional and/or watershed requirements.
(b) A description of steps that will be taken to facilitate assessment of the effectiveness of jurisdictional, watershed, and regional programs.
(c) A description of the regional residential education program to be implemented.
(d) A description of the strategy for development of the standardized fiscal analysis method required by section G of this Order.
(e) A detailed description of the effectiveness assessment to be conducted for the Regional Urban Runoff Management Program, including a description how each of the requirements in section I.3 of this Order will be met.

(2) The Principal Permittee shall be responsible for creating and submitting the RURMP. The Principal Permittee shall submit the RURMP to the Regional Board 365 days after adoption of this Order.

2. Other Required Reports and Plans

a. HYDROMODIFICATION MANAGEMENT PLAN

(1) Copermittees - Each Copermittee shall collaborate with the other Copermittees to develop the HMP. The HMP shall be submitted for approval by the Regional Board.

(2) Principal Permittee - The Principal Permittee shall be responsible for producing and submitting each document according to the schedule below.

(a) Within 180 days of adoption of the Order: Submit a detailed workplan and schedule for completion of the literature review, development of a protocol to identify an appropriate channel standard and limiting range of flow rates, development of guidance materials, and other required information;
(b) Within 18 months of adoption of the Order: Submit progress report on completion of requirements of the HMP;
(c) Within 2 years of adoption of the Order: Submit a draft HMP, including the analysis that identifies the appropriate limiting range of flow rates;
(d) Within 180 days of receiving comments from the Regional Board: Submit the HMP for Regional Board approval.

b. SUSMP UPDATES

Each Copermittee shall collaborate with the other Copermittees to update the Model SUSMP. The Principal Permittee shall be responsible for producing and submitting the updated Model SUSMP in accordance with the requirements of section D.1.d.(8)(b). Each Copermittee shall submit its updated local SUSMP, consistent

with the updated Model SUSMP, in accordance with the requirements of section D.1.d.(8)(c).

c. LONG-TERM EFFECTIVENESS ASSESSMENT

In accordance with section I.5 of this Order, the Principal Permittee shall submit the LTEA to the Regional Board no later than 210 days in advance of the expiration of this Order.

d. REPORT OF WASTE DISCHARGE

The Principal Permittee shall submit to the Regional Board, no later than 210 days in advance of the expiration date of this Order, a Report of Waste Discharge (ROWD) as an application for issuance of new waste discharge requirements. At a minimum, the ROWD shall include the following: (1) Proposed changes to the Copermittees' urban runoff management programs; (2) Proposed changes to monitoring programs; (3) Justification for proposed changes; (4) Name and mailing addresses of the Copermittees; (5) Names and titles of primary contacts of the Copermittees; and (6) Any other information necessary for the reissuance of this Order.

3. Annual Reports

a. JURISDICTIONAL URBAN RUNOFF MANAGEMENT PROGRAM ANNUAL REPORTS

Each Jurisdictional Urban Runoff Management Program Annual Report shall contain a comprehensive description of all activities conducted by the Copermittee to meet all requirements of section D. The reporting period for these annual reports shall be the previous fiscal year. For example, the report submitted September 30, 2008 shall cover the reporting period July 1, 2007 to June 30, 2008.

(1) Copermittees – Each Copermittee shall generate individual Jurisdictional Urban Runoff Management Program Annual Reports which cover implementation of its jurisdictional activities during the past annual reporting period. Each Copermittee shall submit to the Principal Permittee its individual Jurisdictional Urban Runoff Management Program Annual Report by the date specified by the Principal Permittee. Each individual Jurisdictional Urban Runoff Management Program Annual Report shall be a comprehensive description of all activities conducted by the Copermittees to meet all requirements of each component of section D of this Order.

(2) Principal Permittee – The Principal Permittee shall submit Unified Jurisdictional Urban Runoff Management Program Annual Reports to the Regional Board by September 30 of each year, beginning on September 30, 2008. The Unified Jurisdictional Urban Runoff Management Program Annual Report shall contain the twenty-one individual Jurisdictional Urban Runoff Management Program Annual Reports.

The Principal Permittee shall also be responsible for collecting and assembling each Copermittees' individual Jurisdictional Urban Runoff Management Program Annual Report.

(3) At a minimum, each Jurisdictional Urban Runoff Management Program Annual Report shall contain the following information:

(a) Development Planning

i. A description of any amendments to the General Plan, the environmental review process, development project approval processes, or development project requirements.

ii. Confirmation that all development projects were required to undergo the Copermittee's urban runoff approval process and meet the applicable project requirements, including a description of how this information was tracked.

iii. A listing of the development projects to which SUSMP requirements were applied.

iv. Confirmation that all applicable SUSMP BMP requirements were applied to all priority development projects, including a description of how this information was tracked.

v. At least one example of a priority development project that was conditioned to meet SUSMP requirements and a description of the required BMPs.

vi. A listing of the priority development projects which were allowed to implement treatment control BMPs with low removal efficiency rankings, including the feasibility analyses which were conducted to exhibit that more effective BMPs were infeasible.

vii. An updated treatment control BMP inventory.

viii. The number of treatment control BMPs inspected, including a summary of inspection results and findings.

ix. A description of the annual verification of operation and maintenance of treatment control BMPs, including a summary of verification results and findings.

x. Confirmation that BMP verification was conducted for all priority development projects prior to occupancy, including a description of how this information was tracked.

xi. A listing of any projects which received a SUSMP waiver.

xii. A description of implementation of any SUSMP waiver mitigation program.

xiii. A description of Hydromodification Management Plan (HMP) development collaboration and participation.

xiv. A listing of development projects required to meet HMP requirements, including a description of hydrologic control measures implemented.

xv. A listing of priority development projects not required to meet HMP requirements, including a description of why the projects were found to be exempt from the requirements.

xvi. A listing of development projects disturbing 50 acres or more, including information on whether Interim Hydromodification Criteria were met by each of the projects, together with a description of hydrologic control measures implemented for each applicable project.

xvii. The number of violations and enforcement actions (including types) taken for development projects, including information on any necessary follow-up actions taken. The discussion should exhibit that compliance has been achieved, or describe actions that are being taken to achieve compliance.

xviii. A description of notable activities conducted to manage urban runoff from development projects.

(b) Construction

i. Confirmation that all construction sites were required to undergo the Copermittee's construction urban runoff approval process and meet the applicable construction requirements, including a description of how this information was tracked.
ii. Confirmation that a regularly updated construction site inventory was maintained, including a description of how the inventory was managed.
iii. A description of modifications made to the construction and grading ordinances and approval processes.
iv. Confirmation that the designated BMPs were implemented, or required to be implemented, for all construction sites.
v. Confirmation that a maximum disturbed area for grading was applied to all applicable construction sites.
vi. A listing of all construction sites with conditions requiring advanced treatment, together with confirmation that advanced treatment was required at such construction sites.
vii. For each construction site within each priority category (high, medium, and low), identification of the period of time (weeks) the site was active within the rainy season, the number of inspections conducted during the rainy season, and the number of inspections conducted during the dry season, and the total number of inspections conducted for all sites.
viii. A description of the general results of the inspections.
ix. Confirmation that the inspections conducted addressed all the required inspection steps to determine full compliance.
x. The number of violations and enforcement actions (including types) taken for construction sites, including information on any necessary follow-up actions taken. The discussion should exhibit that compliance has been achieved, or describe actions that are being taken to achieve compliance.
xi. A description of notable activities conducted to manage urban runoff from construction sites.

(c) Municipal

i. Any updates to the municipal inventory and prioritization.
ii. Confirmation that the designated BMPs were implemented, or required to be implemented, for municipal areas and activities, as well as special events.
iii. A description of inspections and maintenance conducted for municipal treatment controls.
iv. Identification of the total number of catch basins and inlets, the number of catch basins and inlets inspected, the number of catch basins and inlets found with accumulated waste exceeding cleaning criteria, and the number of catch basins and inlets cleaned.
v. Identification of the total distance (miles) of the MS4, the distance of the MS4 inspected, the distance of the MS4 found with accumulated waste exceeding cleaning criteria, and the distance of the MS4 cleaned.
vi. Identification of the total distance (miles) of open channels, the distance of open channels inspected, the distance of open channels found with anthropogenic litter, and the distance of open channels cleaned.

vii. Amount of waste and litter (tons) removed from catch basins, inlets, the MS4, and open channels, by category.
viii. Identification of any MS4 facility found to require inspection less than annually following two years of inspection, including justification for the finding.
ix. Confirmation that the designated BMPs for pesticides, herbicides, and fertilizers were implemented, or required to be implemented, for municipal areas and activities.
x. Identification of the total distance of curb-miles of improved roads, streets, and highways identified as consistently generating the highest volumes of trash and/or debris, as well as the frequency of sweeping conducted for such roads, streets, and highways.
xi. Identification of the total distance of curb-miles of improved roads, streets, and highways identified as consistently generating moderate volumes of trash and/or debris, as well as the frequency of sweeping conducted for such roads, streets, and highways.
xii. Identification of the total distance of curb-miles of improved roads, streets, and highways identified as consistently generating low volumes of trash and/or debris, as well as the frequency of sweeping conducted for such roads, streets, and highways.
xiii. Identification of the total distance of curb-miles swept.
xiv. Identification of the number of municipal parking lots, the number of municipal parking lots swept, and the frequency of sweeping.
xv. Amount of material (tons) collected from street and parking lot sweeping.
xvi. A description of efforts implemented to prevent and eliminate infiltration from the sanitary sewer to the MS4
xvii. Identification of the number of sites requiring inspections, the number of sites inspected, and the frequency of the inspections.
xviii. A description of the general results of the inspections.
xix. Confirmation that the inspections conducted addressed all the required inspection steps to determine full compliance.
xx. The number of violations and enforcement actions (including types) taken for municipal areas and activities, including information on any necessary follow-up actions taken. The discussion should exhibit that compliance has been achieved, or describe actions that are being taken to achieve compliance.
xxi. A description of notable activities conducted to manage urban runoff from municipal areas and activities.

(d) Industrial and Commercial
i. Any updates to the industrial and commercial inventory.
ii. Confirmation that the designated BMPs were implemented, or required to be implemented, for industrial and commercial sites/sources.
iii. A description of efforts taken to notify owners/operators of industrial and commercial sites/sources of BMP requirements, including mobile businesses.
iv. Identification of the total number of industrial and commercial sites/sources inventoried and the total number inspected.
v. Justification and rationale for why the industrial and commercial sites/sources inspected were chosen for inspection.

vi. Confirmation that all inspections conducted addressed all the required inspection steps to determine full compliance.
vii. Identification of the number of third party inspections conducted.
viii. Identification of efforts conducted to verify third party inspection effectiveness.
ix. A description of efforts implemented to address mobile businesses.
x. The number of violations and enforcement actions (including types) taken for industrial and commercial sites/sources, including information on any necessary follow-up actions taken. The discussion should exhibit that compliance has been achieved, or describe actions that are being taken to achieve compliance.
xi. A description of steps taken to identify non-filers and a list of non-filers (under the General Industrial Permit) identified by the Copermittees.
xii. A description of notable activities conducted to manage urban runoff from industrial and commercial sites/sources.

(e) Residential
i. Identification of the high threat to water quality residential areas and activities that were focused on.
ii. Confirmation that the designated BMPs were implemented, or required to be implemented, for residential areas and activities.
iii. A description of efforts implemented to facilitate proper management and disposal of used oil and other household hazardous materials.
iv. Types and amounts of household hazardous wastes collected, if applicable.
v. A description of any evaluation of methods used for oversight of residential areas and activities, as well as any findings of the evaluation.
vi. The number of violations and enforcement actions (including types) taken for residential areas and activities, including information on any necessary follow-up actions taken. The discussion should exhibit that compliance has been achieved, or describe actions that are being taken to achieve compliance.
vii. A description of collaboration efforts taken to develop and implement the Regional Residential Education Program.
viii. A description of notable activities conducted to manage urban runoff from residential areas and activities.

(f) Illicit Discharge Detection and Elimination
i. Correction of any inaccuracies in either the MS4 map or the Dry Weather Field Screening and Analytical Stations Map.
ii. Reporting of all dry weather field screening and analytical monitoring results. The data should be presented in tabular and graphical form. The reporting shall include station locations, all dry weather field screening and analytical monitoring results, identification of sites where results exceeded action levels, follow-up and elimination activities for potential illicit discharges and connections, the rationale for why follow-up investigations were not conducted at sites where action levels were exceeded, any Copermittee or consultant program recommendations/changes resulting from the monitoring, and documentation that these recommendations/changes have been implemented. Dry weather field screening and analytical monitoring reporting shall comply with all monitoring and standard reporting

requirements in Attachment B of Order No. R9-2007-0001 and Receiving Waters Monitoring and Reporting Program No. R9-2007-0001.

iii. Any dry weather field screening and analytical monitoring consultant reports generated, to be provided as an attachment to the annual report.
iv. A brief description of any other investigations and follow-up activities for illicit discharges and connections.
v. The number and brief description of illicit discharges and connections identified.
vi. The number of illicit discharges and connections eliminated.
vii. Identification and description of all spills to the MS4 and response to the spills.
viii. A description of activities implemented to prevent sewage and other spills from entering the MS4.
ix. A description of the mechanism whereby notification of sewage spills from private laterals and septic systems is received.
x. Number of times the hotline was called, as compared to previous reporting periods, and a summary of the calls.
xi. A description of efforts to publicize and facilitate public reporting of illicit discharges.
xii. The number of violations and enforcement actions (including types) taken for illicit discharges and connections, including information on any necessary follow-up actions taken. The discussion should exhibit that compliance has been achieved, or describe actions that are being taken to achieve compliance.
xiii. A description of notable activities conducted to manage illicit discharges and connections.

(g) Education
i. A description of education efforts conducted for each target community.
ii. A description of how education efforts targeted underserved target audiences, high-risk behaviors, and "allowable" behaviors and discharges.
iii. A description of education efforts conducted for municipal departments and personnel.
iv. A description of education efforts conducted for the new development and construction communities.
v. A description of jurisdictional education efforts conducted for residents, the general public, and school children.

(h) Public Participation
i. A description of public participation efforts conducted.

(i) Program Effectiveness Assessment
i. An assessment of the effectiveness of the Jurisdictional Urban Runoff Management Program which meets all requirements of section I.1 of this Order.

(j) Fiscal Analysis
i. A fiscal analysis of the Copermittee's urban runoff management programs which meets all requirements of section G of this Order.

(k) Special Investigations
i. A description of any special investigations conducted.

(l) Non-Emergency Fire Fighting
i. A description of any efforts conducted to reduce pollutant discharges from non-emergency fire fighting flows.

(m) JURMP Revisions
i. A description of any proposed revisions to the JURMP.

b. WATERSHED URBAN RUNOFF MANAGEMENT PROGRAM ANNUAL REPORTS

(1) Lead Watershed Permittee - Each Lead Watershed Permittee shall generate watershed specific Watershed Urban Runoff Management Program Annual Reports for their respective watershed(s), as they are outlined in Table 4 of Order No. R9-2007-0001. Copermittees within each watershed shall collaborate with the Lead Watershed Permittee to generate the Watershed Urban Runoff Management Program Annual Reports.

(2) Each Watershed Urban Runoff Management Program Annual Report shall be a comprehensive documentation of all activities conducted by the watershed Copermittees during the previous annual reporting period to meet all requirements of section E of Order No. R9-2007-0001. Each Watershed Urban Runoff Management Program Annual Report shall also serve as an update to the WURMP.[13] Each Watershed Urban Runoff Management Program Annual Report shall, at a minimum, contain the following for its reporting period:

(a) A comprehensive description of all activities conducted by the watershed Copermittees to meet all requirements of section E of Order No. R9-2007-0001.

(b) Any updates to the watershed map.

(c) An updated assessment and analysis of the watershed's current and past applicable water quality data, reports, analyses, and other information, including identification of the watershed's water quality problems and high priority water quality problem(s) during the reporting period. The annual report shall clearly state if the watershed's high priority water quality problem(s) changed from the previous reporting period, and provide justification for the change(s).

(d) Identification of the likely sources, pollutant discharges, and/or other factors causing the high priority water quality problems within the watershed. The annual report shall clearly describe any changes to the identified sources, pollutant discharges, and/or other factors that have occurred since the previous reporting period, and provide justification for the changes.

[13] The first annual report to be submitted is not anticipated to be an update to the WURMP, since it will cover the reporting period which begins immediately after WURMP submittal.

(e) An updated list of potential Watershed Water Quality Activities. The annual report shall clearly describe any changes to the list of Watershed Water Quality Activities that have occurred since the previous reporting period, and provide justification for the changes.

(f) Identification and description of the Watershed Water Quality Activities implemented by each Copermittee during the reporting period, including information on the activities' location(s), as well as information exhibiting that the activities in active implementation phase reduced discharged pollutant loads, abated pollutant sources, or resulted in other quantifiable benefits to discharge or receiving water quality, in relation to the watershed's high priority water quality problem(s). The annual report shall clearly describe any changes to Watershed Water Quality Activities implementation that have occurred since the previous reporting period, and provide justification for the changes.

(g) An updated list of potential Watershed Education Activities. The annual report shall clearly describe any changes to the list of Watershed Education Activities that have occurred since the previous reporting period, and provide justification for the changes.

(h) Identification and description of the Watershed Education Activities implemented by each Copermittee for the reporting period, including information exhibiting that the activities directly targeted the sources and discharges of pollutants causing the watershed's high priority water quality problems, and that activities in active implementation phase changed target audience attitudes, knowledge, awareness, or behavior. The annual report shall clearly describe any changes to Watershed Education Activities implementation that have occurred since the previous reporting period, and provide justification for the changes.

(i) A description of the public participation mechanisms used during the reporting period and the parties that were involved.

(j) A description of Copermittee collaboration efforts.

(k) A description of efforts implemented to encourage collaborative, watershed-based, land-use planning.

(l) A description of all TMDL activities implemented (including BMP Implementation Plan or equivalent plan activities) for each approved TMDL in the watershed. The description shall include:

i. Any additional source identification information;
ii. The number, type, location, and other relevant information about BMP implementation, including any expanded or better tailored BMPs necessary to meet the WLAs;
iii. Updates in the BMP implementation prioritization and schedule;
iv. An assessment of the effectiveness of the BMP Implementation Plan, which meets the requirements of section I.4 Order No. R9-2007-0001; and

v. A discussion of the progress to date in meeting the TMDL Numeric Targets and WLAs, which incorporates the results of the effectiveness assessment, compliance monitoring, and an evaluation of additional efforts needed to date.

(m) An assessment of the effectiveness of the WURMP, which meets the requirements of section I.2 of Order No. R9-2007-0001. The effectiveness assessment shall attempt to qualitatively or quantitatively exhibit the impact that implementation of the Watershed Water Quality Activities and the Watershed Education Activities had on the high priority water quality problem(s) within the watershed. This information shall document changes in pollutant load discharges, urban runoff and discharge quality, and receiving water quality, where applicable and feasible.

(3) Principal Permittee – The Unified Watershed Urban Runoff Management Program Annual Report shall contain the nine separate Watershed Urban Runoff Management Program Annual Reports. Each Lead Watershed Copermittee shall submit to the Principal Permittee a Watershed Urban Runoff Management Program Annual Report by the date specified by the Principal Permittee. The Principal Permittee shall assemble and submit the Unified Watershed Urban Runoff Management Program Annual Report to the Regional Board by January 31, 2009 and every January 31 thereafter. The reporting period for these annual reports shall be the previous fiscal year. For example, the report submitted January 31, 2009 shall cover the reporting period July 1, 2007 to June 30, 2008.

c. REGIONAL URBAN RUNOFF MANAGEMENT PROGRAM ANNUAL REPORTS

The Principal Permittee shall generate the Regional Urban Runoff Management Program Annual Reports. All Copermittees shall collaborate with the Principal Permittee to generate the Regional Urban Runoff Management Program Annual Reports. Each Regional Urban Runoff Management Program Annual Report shall be a comprehensive documentation of all regional activities conducted by the Copermittees during the previous annual reporting period to meet all requirements of section F of Order No. R9-2007-0001.

The Principal Permittee shall submit the Regional Urban Runoff Management Program Annual Report to the Regional Board by January 31, 2009 and every January 31 thereafter. The reporting period for these annual reports shall be the previous fiscal year. For example, the report submitted January 31, 2009 shall cover the reporting period July 1, 2007 to June 30, 2008.

Each Regional Urban Runoff Management Program Annual Report shall, at a minimum, contain the following:

(1) A common activities section that describes the urban runoff management activities or BMPs implemented on a regional level, including information on how the activities complied with jurisdictional or watershed requirements, if applicable.
(2) A description of steps taken to facilitate assessment of the effectiveness of jurisdictional, watershed, and regional programs.

(3) A description of the regional residential education activities implemented as part of the regional residential education program.
(4) A description of steps taken to develop and implement the standardized fiscal analysis method.
(5) An assessment of the effectiveness of the Regional Urban Runoff Management Program which meets the requirements of section I.3 of Order No. R9-2007-0001.

4. **Interim Reporting Requirements -** For the July 2006–June 2007 reporting period, Jurisdictional URMP and Watershed URMP Annual Reports shall be submitted on January 31, 2008. Each Jurisdictional URMP and Watershed URMP Annual Report submitted for this reporting period shall at a minimum be comprehensive descriptions of all activities conducted to fully implement the Copermittees' Jurisdictional URMP and Watershed URMP documents, as those documents were developed to comply with the requirements of Order No. 2001-01. The Principal Permittee shall be responsible for submitting these documents in a unified manner, consistent with the unified reporting requirements of Order No. 2001-01.

5. **Annual Report Integration**

a. The Copermittees are encouraged to submit, for Regional Board review and approval, an annual reporting format which integrates the information submitted in the JURMP, WURMP, and RURMP Annual Reports and Monitoring Reports. This document shall be called the "Integrated Annual Report Format." The Integrated Annual Report Format should:

(1) Exhibit compliance with all requirements of JURMP, WURMP, and RURMP sections D, E, and F of Order No. R9-2007-0001.
(2) Report all information required in section J.3 of Order No. R9-2007-0001.
(3) Report all information required in the Monitoring and Reporting program.
(4) Provide consistent and comparable reporting of jurisdictional and watershed information by all Copermittees and watershed groups.
(5) Specifically identify all types of information that will be reported (e.g., amount of debris collected during street sweeping), including reporting criteria for each type of information (e.g., reported in tons).
(6) Describe quality assurance/quality control methods to be used to assess accuracy of jurisdictional and watershed information conveyed.
(7) Describe each Copermittee's reporting responsibilities under the format.
(8) Improve the Copermittees' ability to assess JURMP and WURMP effectiveness in terms of water quality.
(9) Include a separate section for reporting on each Copermittee's activities.
(10) Include a separate section for reporting on each watershed's activities.

b. Upon approval of the Integrated Annual Report Format by the Regional Board, an Integrated Annual Report shall be submitted annually, which may substitute for the JURMP Annual Reports, WURMP Annual Reports, RURMP Annual Report, and/or Monitoring Reports, as approved by the Regional Board. The Principal Permittee shall be responsible for the generation and submittal of the Integrated Annual Reports. Each Copermittee shall be responsible for the information in the Integrated Annual Report pertaining to its jurisdictional, watershed, regional, and monitoring responsibilities. The Integrated Annual Report shall be submitted the first January 31 following approval of the reporting format by the Regional Board, and every January

31 thereafter. The reporting period for Integrated Annual Reports shall be the previous fiscal year. For example, a report submitted January 31, 2010 shall cover the reporting period July 1, 2008 to June 30, 2009.

c. The format and information provided in Integrated Annual Reports shall match and be consistent with the format and information described in the Integrated Annual Report Format.

6. Universal Reporting Requirements

All submittals shall include an executive summary, introduction, conclusion, recommendations, and signed certified statement. Each Copermittee shall submit a signed certified statement covering its responsibilities for each applicable submittal. The Principal Permittee shall submit a signed certified statement covering its responsibilities for each applicable submittal and the sections of the submittals for which it is responsible.

K. MODIFICATION OF PROGRAMS

Modifications of Jurisdictional Urban Runoff Management Programs, Watershed Urban Runoff Management Programs, and/or the Regional Urban Runoff Management Program may be initiated by the Executive Officer or by the Copermittees. Requests by Copermittees shall be made to the Executive Officer, and shall be submitted during the annual review process. Requests for modifications should be incorporated, as appropriate, into the Annual Reports or other deliverables required or allowed under this Order.

1. Minor Modifications – Minor modifications to Jurisdictional Urban Runoff Management Programs, Watershed Urban Runoff Management Programs, and/or the Regional Urban Runoff Management Program may be accepted by the Executive Officer where the Executive Officer finds the proposed modification complies with all discharge prohibitions, receiving water limitations, and other requirements of this Order.

2. Modifications Requiring an Amendment to this Order – Proposed modifications that are not minor shall require amendment of this Order in accordance with this Order's rules, policies, and procedures.

L. ALL COPERMITTEE COLLABORATION

1. Each Copermittee collaborate with all other Copermittees regulated under this Order to address common issues, promote consistency among Jurisdictional Urban Runoff Management Programs and Watershed Urban Runoff Management Programs, and to plan and coordinate activities required under this Order.

   a. Management Structure - All Copermittees shall jointly execute and submit to the Regional Board no later than 180 days after adoption of this Order, a Memorandum of Understanding, Joint Powers Authority, or other instrument of formal agreement which at a minimum:

      (1) Identifies and defines the responsibilities of the Principal Permittee and Lead Watershed Permittees;
      (2) Identifies Copermittees and defines their individual and joint responsibilities, including watershed responsibilities;

(3) Establishes a management structure to promote consistency and develop and implement regional activities;
(4) Establishes standards for conducting meetings, decision-making, and cost-sharing;
(5) Provides guidelines for committee and workgroup structure and responsibilities;
(6) Lays out a process for addressing Copermittee non-compliance with the formal agreement; and
(7) Includes any and all other collaborative arrangements for compliance with this Order.

M. PRINCIPAL PERMITTEE RESPONSIBILITIES

Within 180 days of adoption of this Order, the Copermittees shall designate the Principal Permittee and notify the Regional Board of the name of the Principal Permittee. The Principal Permittee shall, at a minimum:

1. Serve as liaison between the Copermittees and the Regional Board on general permit issues, and when necessary and appropriate, represent the Copermittees before the Regional Board.

2. Coordinate permit activities among the Copermittees and facilitate collaboration on the development and implementation of programs required under this Order.

3. Integrate individual Copermittee documents and reports into single unified documents and reports for submittal to the Regional Board as required under this Order.

4. Produce and submit documents and reports as required by section J of this Order and Receiving Waters and Urban Runoff Monitoring and Reporting Program No. R9-2007-0001.

5. Submit to the Regional Board, within 180 days of adoption of this Order, a formal agreement between the Copermittees which provides a management structure for meeting the requirements of this Order (as described in section L).

6. Coordinate joint development by all of the Copermittees of standardized format(s) for all documents and reports required under this Order (e.g., JURMPs, WURMPs, annual reports, monitoring reports, etc.). The standardized reporting format(s) shall be used by all Copermittees. The Principal Permittee shall submit the standardized format(s) to the Regional Board for review no later than 180 days after adoption of this Order.

N. RECEIVING WATERS MONITORING AND REPORTING PROGRAM

Pursuant to CWC section 13267, the Copermittees shall comply with all the requirements contained in Receiving Waters and Urban Runoff Monitoring and Reporting Program No. R9-2007-0001.

O. STANDARD PROVISIONS, REPORTING REQUIREMENTS, AND NOTIFICATIONS

1. Each Copermittee shall comply with Standard Provisions, Reporting Requirements, and Notifications contained in Attachment B of this Order. This includes 24 hour/5day reporting requirements for any instance of non-compliance with this Order as described

in section 5.e of Attachment B.

2. All plans, reports and subsequent amendments submitted in compliance with this Order shall be implemented immediately (or as otherwise specified). All submittals by Copermittees must be adequate to implement the requirements of this Order.

I, John H. Robertus, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on January 24, 2007.

John H. Robertus
Executive Officer

ATTACHMENT A

BASIN PLAN PROHIBITIONS

California Water Code Section 13243 provides that a Regional Board, in a water quality control plan, may specify certain conditions or areas where the discharge of waste, or certain types of waste is not permitted. The following discharge prohibitions are applicable to any person, as defined by Section 13050(c) of the California Water Code, who is a citizen, domiciliary, or political agency or entity of California whose activities in California could affect the quality of waters of the state within the boundaries of the San Diego Region.

1. The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in California Water Code Section 13050, is prohibited.

2. The discharge of waste to land, except as authorized by waste discharge requirements or the terms described in California Water Code Section 13264 is prohibited.

3. The discharge of pollutants or dredged or fill material to waters of the United States except as authorized by a NPDES permit or a dredged or fill material permit (subject to the exemption described in California Water Code Section 13376) is prohibited.

4. Discharges of recycled water to lakes or reservoirs used for municipal water supply or to inland surface water tributaries thereto are prohibited, unless this Regional Board issues a NPDES permit authorizing such a discharge; the proposed discharge has been approved by the State Department of Health Services and the operating agency of the impacted reservoir; and the discharger has an approved fail-safe long-term disposal alternative.

5. The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the Regional Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

6. The discharge of waste in a manner causing flow, ponding, or surfacing on lands not owned or under the control of the discharger is prohibited, unless the discharge is authorized by the Regional Board.

7. The dumping, deposition, or discharge of waste directly into waters of the state, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the Regional Board.

8. Any discharge to a storm water conveyance system that is not composed entirely of "storm water" is prohibited unless authorized by the Regional Board. [The federal regulations, 40 CFR 122.26(b)(13), define storm water as storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from

fire fighting activities. [§122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

9. The unauthorized discharge of treated or untreated sewage to waters of the state or to a storm water conveyance system is prohibited.

10. The discharge of industrial wastes to conventional septic tank/subsurface disposal systems, except as authorized by the terms described in California Water Code Section 13264, is prohibited.

11. The discharge of radioactive wastes amenable to alternative methods of disposal into the waters of the state is prohibited.

12. The discharge of any radiological, chemical, or biological warfare agent into waters of the state is prohibited.

13. The discharge of waste into a natural or excavated site below historic water levels is prohibited unless the discharge is authorized by the Regional Board.

14. The discharge of sand, silt, clay, or other earthen materials from any activity, including land grading and construction, in quantities which cause deleterious bottom deposits, turbidity or discoloration in waters of the state or which unreasonably affect, or threaten to affect, beneficial uses of such waters is prohibited.

15. The discharge of treated or untreated sewage from vessels to Mission Bay, Oceanside Harbor, Dana Point Harbor, or other small boat harbors is prohibited.

16. The discharge of untreated sewage from vessels to San Diego Bay is prohibited.

17. The discharge of treated sewage from vessels to portions of San Diego Bay that are less than 30 feet deep at mean lower low water (MLLW) is prohibited.

18. The discharge of treated sewage from vessels, which do not have a properly functioning US Coast Guard certified Type I or Type II marine sanitation device, to portions of San Diego Bay that are greater than 30 feet deep at mean lower low water (MLLW) is prohibited.

ATTACHMENT B

STANDARD PROVISIONS, REPORTING REQUIREMENTS, AND NOTIFICATIONS

1. STANDARD PROVISIONS – PERMIT COMPLIANCE [40 CFR 122.41]

(a) *Duty to comply* [40 CFR 122.41(a)].

(1) The Copermittee must comply with all of the conditions of this Order. Any noncompliance constitutes a violation of the Clean Water Act (CWA) and the California Water Code (CWC) and is grounds for enforcement action, for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

(2) The Copermittee shall comply with effluent standards or prohibitions established under section 307(a) of the CWA toxic pollutants and with standards for sewage sludge use or disposal established under section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the Order has not yet been modified to incorporate the requirement.

(b) *Need to halt or reduce activity not a defense* [40 CFR 122.41(c)]. It shall not be a defense for the Copermittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this Order.

(c) *Duty to mitigate* [40 CFR 122.41(d)]. The Copermittee shall take all reasonable steps to minimize or prevent any discharge or prevent any discharge or sludge use or disposal in violation of this Order that has a reasonable likelihood of adversely affecting human health or the environment.

(d) *Proper operation and maintenance* [40 CFR 122.41(e)]. The Copermittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Copermittee to achieve compliance with the conditions of this Order. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by the Copermittee only when necessary to achieve compliance with the conditions of this Order.

(e) *Property rights* [40 CFR 122.41(g)].

(1) This Order does not convey any property rights of any sort or any exclusive privilege.
(2) The issuance of this Order does not authorize any injury to persons or property or invasion of other private rights, or any infringement of State or local law or regulations.

(f) *Inspection and entry* [40 CFR 122.41(i)]. The Copermittee shall allow the Regional Water Quality Control Board, San Diego Region (Regional Board), State Water Resources Control Board (SWRCB), United States Environmental Protection Agency (USEPA), and/or their authorized representatives (including an authorized contractor acting as their representative), upon presentation of credentials and other documents as may be required by law, to:

(1) Enter upon the Copermittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this Order;
(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this Order;
(3) Inspect and photograph, at reasonable times, any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Order; and
(4) Sample or monitor, at reasonable times, for the purpose of assuring Order compliance or as otherwise authorized by the CWA or the CWC, any substances or parameters at any location.

(g) *Bypass* [40 CFR 122.41(m)]

(1) Definitions:

i) "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility.
ii) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities, which causes them to become inoperable, or substantial and permanent loss of natural resources that can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

(2) Bypass not exceeding limitations - The Copermittee may allow any bypass to occur which does not cause exceedances of effluent limitations, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions listed in Standard Provisions – Permit Compliance (g)(3), (g)(4) and (g)(5) below.

(3) Prohibition of Bypass - Bypass is prohibited, and the Regional Board may take enforcement action against a Copermittee for bypass, unless:

i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and
iii) The Copermittee submitted notice as required under Standard Provisions – Permit Compliance (g)(3) above.

(4) Notice

i) Anticipated bypass. If the Copermittee knows in advance of the need for a bypass, it shall submit a notice, if possible at least ten days before the date of the bypass.
ii) Unanticipated bypass. The Copermittee shall submit notice of an unanticipated bypass as required in Standard Provisions 5(e) below (24-hour notice).

(h) *Upset* [40 CFR 122.41(n)] Upset means an exceptional incident in which there is unintentional and temporary noncompliance with technology based effluent limitations because of factors beyond the reasonable control of the Copermittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

(1) Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of Standard Provisions – Permit Compliance (h)(2) below are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

(2) Conditions necessary for a demonstration of upset. A Copermittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

i) An upset occurred and that the Copermittee can identify the cause(s) of the upset;
ii) The permitted facility was at the time being properly operated;
iii) The Copermittee submitted notice of the upset as required in Standard Provisions – Permit Compliance (5)(e)(ii)(B) below (24-hour notice); and
iv) The Copermittee complied with any remedial measures required under Standard Provisions – Permit Compliance 1(c) above.

(3) Burden of Proof. In any enforcement proceeding, the Copermittee seeking to establish the occurrence of an upset has the burden of proof.

2. STANDARD PROVISIONS – PERMIT ACTION

(a) *General* [40 CFR 122.41(f)] This Order may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Copermittee for modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any Order condition.

(b) *Duty to reapply* [40 CFR 122.41(b)]. If the Copermittee wishes to continue an activity regulated by this Order after the expiration date of this Order, the Copermittee must apply for and obtain new permit.

(c) *Transfers*. This Order is not transferable to any person except after notice to the Regional Board. The Regional Board may require modification or revocation and reissuance of the Order to change the name of the Copermittee and incorporate such other requirements as may be necessary under the CWA and the CWC.

3. STANDARD PROVISIONS – MONITORING

(a) Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. [40 CFR Section 122.41 (j) (1)]

(b) Monitoring results must be conducted according to test procedures under 40 CFR Part 136, or in the case of sludge use or disposal, approved under 40 CFR Part 136 unless otherwise

specified in 40 CFR Part 503 unless other test procedures have been specified in this Order [40 CFR Section 122.41(j)(4)][40 CFR Section 122.44(i)(1)(iv)].

4. STANDARD PROVISIONS – RECORDS

(a) Except for records of monitoring information required by this Order related to the Copermittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five years (or longer as required by 40 CFR Part 503), the Copermittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this Order, and records of all data used to complete the application for this Order, for a period of at least three (3) years from the date of the sample, measurement, report or application, This period may be extended by request of the Regional Water Board Executive Officer at any rime [40 CFR Section 122.41(j)(2)].

(b) *Records of monitoring information* [40 CFR 122.41(j) (3)] shall include:

(1) The date, exact place, and time of sampling or measurements;
(2) The individual(s) who performed the sampling or measurements;
(3) The date(s) analyses were performed;
(4) The individual(s) who performed the analyses;
(5) The analytical techniques or methods used; and
(6) The results of such analyses.

(c) *Claims of confidentiality* [40 CFR Section 122.7(b)] of the following information will be denied:

(1) The name and address of any permit applicant or Copermittee; and
(2) Permit applications and attachments, permits and effluent data.

5. STANDARD PROVISIONS – REPORTING

(a) *Duty to provide information* [40 CFR 122.41(h)]. The Copermittee shall furnish to the Regional Board, SWRCB, or USEPA within a reasonable time, any information which the Regional Board, SWRCB, or USPEA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this Order or to determine compliance with this Order. Upon request, the Copermittee shall also furnish to the Regional Board, SWRCB, or USEPA, copies of records required to be kept by this Order.

(b) *Signatory and Certification Requirements* [40 CFR 122.41(k)]

(1) All applications, reports, or information submitted to the Regional Board, SWRCB, or USEPA shall be signed and certified in accordance with Standard Provisions – Reporting 5(b)ii), 5(b)iii), 5(b)iv), and 5(b) (see 40 CFR 122.22)

(2) *Applications* [40 CFR 122.22(a)(3)] All permit applications shall be signed by either a principal executive officer or ranking elected official.

(3) *Reports* [40 CFR 122.22(b)]. All reports required by this Order, and other information requested by the Regional Board, SWRCB, or USEPA shall be signed by a person described in Standard Provisions – Reporting 5(b)(2) above, or by a duly authorized

representative of that person. A person is a duly authorized representative only if:

i) The authorization is made in writing by a person described in Standard Provisions-Reporting 5(b)(2) above;

ii) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.); and,

iii) The written authorization is submitted to the Regional Water Board and State Water Board.

(4) *Changes to authorization* [40 CFR Section 122.22(c)] If an authorization under Standard Provisions – Reporting 5(b)(3)of this reporting requirement is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of Standard Provisions – Reporting 5(b)(3) above must be submitted to the Regional Water Board and State Water Board prior to or together with any reports, information, or applications to be signed by an authorized representative.

(5) *Certification* [40 CFR Section 122.22(d)] Any person signing a document under Standard Provisions – Reporting 5(b)(2), or 5(b)(3) above shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

(c) *Monitoring reports*. [40 CFR 122.41(l)(4)]

(1) Monitoring results shall be reported at the intervals specified in the Receiving Waters and Urban Runoff Monitoring and Reporting Program No. R9-2007-0001.

(2) Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the Regional Board or SWRCB for reporting results of mentoring of sludge use or disposal practices.

(3) If the Copermittee monitors any pollutant more frequently than required by this Order using test procedures approved under 40 CFR Part 136 or, in the case of sludge use or disposal, approved under 40 CFR Part 136 unless otherwise specified in 40 CFR Part 503, or as specified in this Order, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the Regional Board.

(4) Calculations for all limitations, which require averaging of measurements, shall utilize an arithmetic mean unless otherwise specified in this Order.

(d) *Compliance schedules*. [40 CFR Section 122.41(l)(5)] Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this Order shall be submitted no later than 14 days following each schedule date.

(e) *Twenty-four hour reporting* [40 CFR Section 122.41(l)(6)]

(1) The Copermittee shall report any noncompliance that may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the Copermittee becomes aware of the circumstances. A written submission shall also be provided within five (5) days of the time the Copermittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

(2) The following shall be included as information, which must be reported within 24 hours under this paragraph:

i) Any unanticipated bypass that exceeds any effluent limitation in the Order (See 40 CFR 122.41(g)).
ii) Any upset which exceeds any effluent limitation in this Order.

(3) The Regional Board may waive the above-required written report under this provision on a case-by-case basis if the oral report has been received within 24 hours.

(f) *Planned changes*. [40 CFR Section 122.41(l)(1)] The Copermittee shall give notice to the Regional Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required under this provision only when:

(1) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); or

(2) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants, which are not subject to effluent limitations in this Order.

(3) The alteration or addition results in a significant change in the Copermittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing Order, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan.

(g) *Anticipated noncompliance*. [40 CFR Section 122.41(l)(7)] The Copermittee shall give advance notice to the Regional Board or SWRCB of any planned changes in the permitted facility or activity, which may result in noncompliance with Order requirements.

(h) *Other noncompliance* [40 CFR Section 122.41(l) 7)] The Copermittee shall report all instances of noncompliance not reported under Standard Provisions 5(c), 5(d), and 5(e) above, at the time monitoring reports are submitted. The reports shall contain the information listed in Standard Provision – Reporting 5(e) above.

(i) *Other information* [40 CFR Section 122.41(l)(8)] When the Copermittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Regional Board, SWRCB, or USEPA, the Copermittee shall promptly submit such facts or information.

6. STANDARD PROVISIONS – ENFORCEMENT

(a) The Regional Board is authorized to enforce the terms of this permit under several provisions of the CWC, including, but not limited to, Sections 13385, 13386, and 13387.

7. ADDITIONAL STANDARD PROVISIONS

(a) *Municipal separate storm sewer systems* [40 CFR 122.42(c)]. The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the Director under 40 CFR 122.26(a)(1)(v) must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report shall include:

(1) The status of implementing the components of the storm water management program that are established as permit conditions;

(2) Proposed changes to the storm water management programs that are established as permit conditions. Such proposed changes shall be consistent with 40 CFR 122.26(d)(2)(iii); and

(3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under 40 CFR 122.26(d)(2)(iv) and 40 CFR 122.26(d)(2)(v);

(4) A summary of data, including monitoring data, that is accumulated throughout the reporting year;

(5) Annual expenditures and budget for year following each annual report;

(6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; and

(7) Identification of water quality improvements or degradation.

(b) *Storm water discharges* [40 CFR 122.42(d)]. The initial permits for discharges composed entirely of storm water issued pursuant to 40 CFR 122.26(e)(7) shall require compliance with the conditions of the permit as expeditiously as practicable, but in no event later than three years after the date of issuance of the permit.

(c) *Other Effluent Limitations and Standards* [40 CFR 122.44(b)(1)]. If any toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant which is present in the discharge and that standard or prohibition is more stringent than any limitation on the pollutant in this Order, the Regional Board may institute

proceedings under these regulations to modify or revoke and reissue the Order to conform to the toxic effluent standard or prohibition.

(d) *Discharge is a privilege* [CWC section 13263(g)]. No discharge of waste into the waters of the State, whether or not such discharge is made pursuant to waste discharge requirements, shall create a vested right to continue such discharge. All discharges of waste into waters of the State are privileges, not rights.

(e) *Review and revision of Order* [CWC section 13263(e)]. Upon application by any affected person, or on its own motion, the Regional Board may review and revise this permit.

(f) *Termination or modification of Order* [CWC section13381]. This permit may be terminated or modified for causes, including, but not limited to, all of the following:

(1) Violation of any condition contained in this Order;
(2) Obtaining this Order by misrepresentation, or failure to disclose fully all relevant facts.
(3) A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge.

(g) *Transfers*. When this Order is transferred to a new owner or operator, such requirements as may be necessary under the CWC may be incorporated into this Order.

(h) *Conditions not stayed*. The filing of a request by the Copermittee for modification, revocation and reissuance, or termination of this Order, or a notification of planned change in or anticipated noncompliance with this Order does not stay any condition of this Order.

(i) *Availability*. A copy of this Order shall be kept at a readily accessible location and shall be available to on-site personnel at all times.

(j) *Duty to minimize or correct adverse impacts*. The Copermittees shall take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this Order, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the noncompliance.

(k) *Interim Effluent Limitations.* The Copermittee shall comply with any interim effluent limitations as established by addendum, enforcement action, or revised waste discharge requirements which have been, or may be, adopted by this Regional Board.

(l) *Responsibilities, liabilities, legal action, penalties* [CWC sections 13385 and 13387]. The Porter-Cologne Water Quality Control Act provides for civil and criminal penalties comparable to, and in some cases greater than, those provided for under the CWA.

Nothing in this Order shall be construed to protect the Copermittee from its liabilities under federal, state, or local laws.

Except as provided for in 40CFR 122.41(m) and (n), nothing in this Order shall be construed to relieve the Copermittee from civil or criminal penalties for noncompliance.

Nothing in this Order shall be construed to preclude the institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties to which the Copermittee is or may be subject to under Section 311 of the CWA.

Nothing in this Order shall be construed to preclude institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authoring preserved by Section 510 of the CWA.

(m) *Noncompliance*. Any noncompliance with this Order constitutes violation of the CWC and is grounds for denial of an application for modification of the Order (also see 40 CFR 122.41(a).

(n) *Director*. For purposes of this Order, the term "Director" used in parts of 40 CFR incorporated into this Order by reference and/or applicable to this Order shall have the same meaning as the term "Regional Board" used elsewhere in this Order, except that in 40 CFR 122.41(h) and (I), "Director" shall mean "Regional Board, SWRCB, and USEPA."

(o) The Regional Board has, in prior years, issued a limited number of individual NPDES permits for non-storm water discharges to MS4s. The Regional Board or SWRCB may in the future, upon prior notice to the Copermittee(s), issue an NPDES permit for any non-storm water discharge (or class of non-storm water discharges) to a MS4. Copermittees may prohibit any non-storm water discharge (or class of non-storm water discharges) to a MS4 that is authorized under such separate NPDES permits.

(p) *Effective date*. This Order shall become effective on the date of its adoption provided the USEPA has no objection. If the USEPA objects to its issuance, this Order shall not become effective until such objection is withdrawn. This Order supersedes Order No. 2001-01 upon the effective date of this Order.

(q) *Expiration*. This Order expires five years after adoption.

(r) *Continuation of expired order* [23 CCR 2235.4]. After this Order expires, the terms and conditions of this Order are automatically continued pending issuance of a new permit if all requirements of the federal NPDES regulations on the continuation of expired permits (40 CFR 122.6) are complied with.

(s) *Applications*. Any application submitted by a Copermittee for reissuance or modification of this Order shall satisfy all applicable requirements specified in federal regulations as well as any additional requirements for submittal of a Report of Waste Discharge specified in the CWC and the California Code of Regulations.

(t) *Confidentiality*. Except as provided for in 40 CFR 122.7, no information or documents submitted in accordance with or in application for this Order will be considered confidential, and all such information and documents shall be available for review by the public at the Regional Board office.

(u) *Severability*. The provisions of this Order are severable, and if any provision of this Order, or the application of any provisions of this Order to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this Order shall not be affected thereby.

(v) *Report submittal*. The Copermittee shall submit reports and provide notifications as required by this Order to the following:

SOUTHERN WATERSHED PROTECTION UNIT
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
9174 SKY PARK COURT, SUITE 100
SAN DIEGO CA 92123-4340
Telephone: (858) 467-2952 Fax: (858) 571-6972

EUGENE BROMLEY
US ENVIRONMENTAL PROTECTION AGENCY
REGION IX
PERMITS ISSUANCE SECTION (W-5-1)
75 HAWTHORNE STREET
SAN FRANCISCO CA 94105

Unless otherwise directed, the Copermittee shall submit one hard copy for the official record and one electronic copy of each report required under this Order to the Regional Board and one electronic copy to the EPA.

ATTACHMENT C

DEFINITIONS

Advanced Treatment- Using mechanical or chemical means to flocculate and remove suspended sediment from runoff from construction sites prior to discharge.

Anthropogenic Litter – Trash generated from human activities, not including sediment.

Basin Plan – Water Quality Control Plan, San Diego Basin, Region 9, and amendments, developed by the Regional Board.

Beneficial Uses - The uses of water necessary for the survival or well being of man, plants, and wildlife. These uses of water serve to promote tangible and intangible economic, social, and environmental goals. "Beneficial Uses" of the waters of the State that may be protected include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. Existing beneficial uses are uses that were attained in the surface or ground water on or after November 28, 1975; and potential beneficial uses are uses that would probably develop in future years through the implementation of various control measures. "Beneficial Uses" are equivalent to "Designated Uses" under federal law. [California Water Code Section 13050(f)].

Best Management Practices (BMPs) - Defined in 40 CFR 122.2 as schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. In the case of municipal storm water permits, BMPs are typically used in place of numeric effluent limits.

Bioassessment - The use of biological community information to evaluate the biological integrity of a water body and its watershed. With respect to aquatic ecosystems, bioassessment is the collection and analysis of samples of the benthic macroinvertebrate community together with physical/habitat quality measurements associated with the sampling site and the watershed to evaluate the biological condition (i.e. biological integrity) of a water body.

Biocriteria - Under the CWA, numerical values or narrative expressions that define a desired biological condition for a water body that are legally enforceable. The USEPA defines biocriteria as: "numerical values or narrative expressions that describe the reference biological integrity of aquatic communities inhabiting waters of a given designated aquatic life use…(that)…describe the characteristics of water body segments least impaired by human activities."

Biological Integrity - Defined in Karr J.R. and D.R. Dudley. 1981. Ecological perspective on water quality goals. Environmental Management 5:55-68 as: "A balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitat of the region." Also referred to as ecosystem health.

Clean Water Act Section 402(p) [33 USC 1342(p)] - The federal statute requiring municipal and industrial dischargers to obtain NPDES permits for their discharges of storm water.

Clean Water Act Section 303(d) Water Body - An impaired water body in which water quality does not meet applicable water quality standards and/or is not expected to meet water quality standards, even after the application of technology based pollution controls required by the CWA. The discharge of urban runoff to these water bodies by the Copermittees is significant because these discharges can cause or contribute to violations of applicable water quality standards.

Construction Site – Any project, including projects requiring coverage under the General Construction Permit, that involves soil disturbing activities including, but not limited to, clearing, grading, disturbances to ground such as stockpiling, and excavation.

Contamination - As defined in the Porter-Cologne Water Quality Control Act, contamination is "an impairment of the quality of waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste whether or not waters of the State are affected."

Critical Channel Flow (Qc) – The channel flow that produces the critical shear stress that initiates bed movement or that erodes the toe of channel banks. When measuring Qc, it should be based on the weakest boundary material – either bed or bank.

CWA – Federal Clean Water Act

CWC – California Water Code

Development Projects - New development or redevelopment with land disturbing activities; structural development, including construction or installation of a building or structure, the creation of impervious surfaces, public agency projects, and land subdivision.

Dry Season – May 1 through September 30 of each year.

Effectiveness Assessment Outcome Level 1 - Compliance with Activity-based Permit Requirements – Level 1 outcomes are those directly related to the implementation of specific activities prescribed by this Order or established pursuant to it.

Effectiveness Assessment Outcome Level 2 - Changes in Attitudes, Knowledge, and Awareness – Level 2 outcomes are measured as increases in knowledge and awareness among target audiences such as residents, businesses, and municipal employees.

Effectiveness Assessment Outcome Level 3 - Behavioral Change and BMP Implementation – Level 3 outcomes measure the effectiveness of activities in affecting behavioral change and BMP implementation.

Effectiveness Assessment Outcome Level 4 - Load Reductions – Level 4 outcomes measure load reductions which quantify changes in the amounts of pollutants associated with specific sources before and after a BMP or other control measure is employed.

Effectiveness Assessment Outcome Level 5 - Changes in Urban Runoff and Discharge Quality – Level 5 outcomes are measured as changes in one or more specific constituents or stressors in discharges into or from MS4s.

Effectiveness Assessment Outcome Level 6 - Changes in Receiving Water Quality – Level 6 outcomes measure changes to receiving water quality resulting from discharges into and from MS4s, and may be expressed through a variety of means such as compliance with water quality objectives or other regulatory benchmarks, protection of biological integrity, or beneficial use attainment.

Effluent Limitations – Any restriction imposed on quantities, discharge rates, and concentrations of pollutants, which are discharged from point sources into waters of the State. The limitations are designed to ensure that the discharge does not cause water quality objectives to be exceeded in the receiving water and does not adversely affect beneficial uses. Effluent limits are typically numeric (e.g., 10 mg/l), but can also be narrative (e.g., no toxics in toxic amounts).

Erosion – When land is diminished or worn away due to wind, water, or glacial ice. Often the eroded debris (silt or sediment) becomes a pollutant via storm water runoff. Erosion occurs naturally but can be intensified by land clearing activities such as farming, development, road building, and timber harvesting.

Environmentally Sensitive Areas (ESAs) - Areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Resources Control Board (Water Quality Control Plan for the San Diego Basin (1994) and amendments); water bodies designated with the RARE beneficial use by the State Water Resources Control Board (Water Quality Control Plan for the San Diego Basin (1994) and amendments); areas designated as preserves or their equivalent under the Multi Species Conservation Program within the Cities and County of San Diego; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.

Feasibility Analysis – Detailed description of the selection process for the treatment control BMPs for a Priority Development Project, including justification of why one BMP is selected over another. For a Priority Development Project where a treatment control BMP with a low removal efficiency ranking (as identified by the Model SUSMP) is proposed, the analysis shall include a detailed and adequate justification exhibiting the reasons implementation of a treatment control BMP with a higher removal efficiency is infeasible for the Priority Development Project or portion of the Priority Development Project.

Flow Duration – The long-term period of time that flows occur above a threshold that causes significant sediment transport and may cause excessive erosion damage to creeks and streams (not a single storm event duration). The simplest way to visualize this is to consider a histogram of pre- and post-project flows using long-term records of hourly data. To maintain pre-project flow duration means that the total number of hours (counts) within each range of flows in a flow-duration histogram cannot increase between the pre- and post-project condition. Flow duration within the range of geomorphologically significant flows is important for managing erosion.

GIS – Geographic Information System

Grading - The cutting and/or filling of the land surface to a desired slope or elevation.

Hazardous Material – Any substance that poses a threat to human health or the environment due to its toxicity, corrosiveness, ignitability, explosive nature or chemical reactivity. These also include materials named by the USEPA in 40 CFR 116 to be reported if a designated quantity of the material is spilled into the waters of the U.S. or emitted into the environment.

Hazardous Waste - Hazardous waste is defined as "any waste which, under Section 600 of Title 22 of this code, is required to be managed according to Chapter 30 of Division 4.5 of Title 22 of this code" [CCR Title 22, Division 4.5, Chapter 11, Article 1].

Household Hazardous Waste – Paints, cleaning products, and other wastes generated during home improvement or maintenance activities.

Hydromodification – The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, interflow and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

Illicit Connection – Any connection to the MS4 that conveys an illicit discharge.

Illicit Discharge - Any discharge to the MS4 that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from fire fighting activities [40 CFR 122.26(b)(2)].

Implementation Assessment – Assessment conducted to determine the effectiveness of Copermittee programs and activities in achieving measurable targeted outcomes, and in determining whether priority sources of water quality problems are being effectively addressed.

Inactive Slopes – Slopes on which no grading or other soil disturbing activities are conducted for 10 or more days.

Integrated Assessment – Assessment to be conducted to evaluate whether program implementation is properly targeted to and resulting in the protection and improvement of water quality.

Jurisdictional Urban Runoff Management Plan (JURMP) – A written description of the specific jurisdictional urban runoff management measures and programs that each Copermittee will implement to comply with this Order and ensure that pollutant discharges in urban runoff are reduced to the MEP and do not cause or contribute to a violation of water quality standards.

Low Impact Development (LID) – A storm water management and land development strategy that emphasizes conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions.

Maximum Extent Practicable (MEP) – The technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) <u>in combination</u> with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than BAT. A definition for MEP is not provided either in the statute or in the regulations. Instead the definition of MEP is dynamic and will be defined by the following process over time: municipalities propose their definition of MEP by way of their urban runoff management programs. Their total collective and individual activities conducted pursuant to the urban runoff management programs becomes their

proposal for MEP as it applies both to their overall effort, as well as to specific activities (e.g., MEP for street sweeping, or MEP for MS4 maintenance). In the absence of a proposal acceptable to the Regional Board, the Regional Board defines MEP.

In a memo dated February 11, 1993, entitled "Definition of Maximum Extent Practicable," Elizabeth Jennings, Senior Staff Counsel, SWRCB addressed the achievement of the MEP standard as follows:

> "*To achieve the MEP standard, municipalities must employ whatever Best Management Practices (BMPs) are technically feasible (i.e., are likely to be effective) and are not cost prohibitive. The major emphasis is on technical feasibility. Reducing pollutants to the MEP means choosing effective BMPs, and rejecting applicable BMPs only where other effective BMPs will serve the same purpose, or the BMPs would not be technically feasible, or the cost would be prohibitive. In selecting BMPs to achieve the MEP standard, the following factors may be useful to consider:*
>
> *a. Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?*
> *b. Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?*
> *c. Public Acceptance: Does the BMP have public support?*
> *d. Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?*
> *e. Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc?*
>
> *The final determination regarding whether a municipality has reduced pollutants to the maximum extent practicable can only be made by the Regional or State Water Boards, and not by the municipal discharger. If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit derived, it would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs that would address a pollutant source, or to pick a BMP base solely on cost, which would be clearly less effective. In selecting BMPs the municipality must make a serious attempt to comply and practical solutions may not be lightly rejected. In any case, the burden would be on the municipal discharger to show compliance with its permit. After selecting a menu of BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented."*

Municipal Separate Storm Sewer System (MS4) – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to

waters of the United States; (ii) Designated or used for collecting or conveying storm water; (iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.26.

National Pollutant Discharge Elimination System (NPDES) - The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the CWA.

NOI – Notice of Intent

Non-Storm Water - All discharges to and from a MS4 that do not originate from precipitation events (i.e., all discharges from a MS4 other than storm water). Non-storm water includes illicit discharges, non-prohibited discharges, and NPDES permitted discharges.

Nuisance - As defined in the Porter-Cologne Water Quality Control Act a nuisance is "anything which meets all of the following requirements: 1) Is injurious to health, or is indecent, or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. 2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. 3) Occurs during, or as a result of, the treatment or disposal of wastes."

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Person - A person is defined as an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof [40 CFR 122.2].

Point Source - Any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, landfill leachate collection systems, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

Pollutant - Any agent that may cause or contribute to the degradation of water quality such that a condition of pollution or contamination is created or aggravated.

Pollution - As defined in the Porter-Cologne Water Quality Control Act: "the alteration of the quality of the waters of the State by waste, to a degree that unreasonably affects the either of the following: 1) The waters for beneficial uses; or 2) Facilities that serve these beneficial uses." Pollution may include contamination.

Pollutants of Concern – Pollutants for which water bodies are listed as impaired under CWA section 303(d), pollutants associated with the land use type of a development, and/or pollutants commonly associated with urban runoff. Pollutants commonly associated with urban runoff include total suspended solids; sediment; pathogens (e.g., bacteria, viruses, protozoa); heavy metals (e.g., copper, lead, zinc, and cadmium); petroleum products and polynuclear aromatic hydrocarbons; synthetic organics (e.g., pesticides, herbicides, and PCBs); nutrients (e.g., nitrogen and phosphorus fertilizers); oxygen-demanding substances (decaying vegetation, animal waste, and anthropogenic litter).

Pollution Prevention - Pollution prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control BMPs, treatment control BMPs, or disposal.

Post-Construction BMPs - A subset of BMPs including structural and non-structural controls which detain, retain, filter, or educate to prevent the release of pollutants to surface waters during the final functional life of developments.

Pre-Project or Pre-Development Runoff Conditions (Discharge Rates, Durations, Etc.) – Runoff conditions that exist onsite immediately before the planned development activities occur. This definition is not intended to be interpreted as that period before any human-induces land activities occurred. This definition pertains to redevelopment as well as initial development.

Principal Permittee – County of San Diego

Priority Development Projects - New development and redevelopment project categories listed in Section D.1.d(2) of Order No. R9-2007-0001.

Receiving Waters – Waters of the U.S.

Receiving Water Limitations (RWLs) - Waste discharge requirements issued by the Regional Board typically include both: (1) "Effluent Limitations" (or "Discharge Limitations") that specify the technology-based or water-quality-based effluent limitations; and (2) "Receiving Water Limitations" that specify the water quality objectives in the Basin Plan as well as any other limitations necessary to attain those objectives. In summary, the "Receiving Water Limitations" provision is the provision used to implement the requirement of CWA section 301(b)(1)(C) that NPDES permits must include any more stringent limitations necessary to meet water quality standards.

Redevelopment - The creation, addition, and or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include trenching and resurfacing associated with utility work; resurfacing and reconfiguring surface parking lots and existing roadways; new sidewalk construction, pedestrian ramps, or bikelane on existing roads; and routine replacement of damaged pavement, such as pothole repair.

Regional Urban Runoff Management Plan (RURMP) – A written description of the specific regional urban runoff management measures and programs that the Copermittees will collectively implement to comply with this Order and ensure that pollutant discharges in urban runoff are reduced to the MEP and do not cause or contribute to a violation of water quality standards.

Sediment - Soil, sand, and minerals washed from land into water. Sediment resulting from anthropogenic sources (i.e. human induced land disturbance activities) is considered a pollutant. This Order regulates only the discharges of sediment from anthropogenic sources and does not regulate naturally occurring sources of sediment. Sediment can destroy fish-nesting areas, clog animal habitats, and cloud waters so that sunlight does not reach aquatic plants.

Shared Treatment Control BMP - BMPs used by multiple developments to infiltrate, filter, or treat the required volume or flow prior to discharge to a receiving water. This could include, for example, a treatment BMP at the end of an enclosed storm drain that collects runoff from several commercial developments.

Source Control BMP – Land use or site planning practices, or structural or nonstructural measures that aim to prevent urban runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between pollutants and urban runoff.

Storm Water – Per 40 CFR 122.26(b)(13), means storm water runoff, snowmelt runoff and surface runoff and drainage.

Standard Urban Storm Water Mitigation Plan (SUSMP) – A plan developed to mitigate the impacts of urban runoff from Priority Development Projects.

Third Party Inspectors - Industrial and commercial facility inspectors who are not contracted or employed by a regulatory agency or group of regulatory agencies, such as the Regional Board or Copermittees. The third party inspector is not a regular facility employee self-inspecting their own facility. The third party inspector could be a contractor or consultant employed by a facility or group of businesses to conduct inspections.

Total Maximum Daily Load (TMDL) - The maximum amount of a pollutant that can be discharged into a water body from all sources (point and non-point) and still maintain water quality standards. Under CWA section 303(d), TMDLs must be developed for all water bodies that do not meet water quality standards after application of technology-based controls.

Toxicity - Adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies). The water quality objectives for toxicity provided in the Water Quality Control Plan, San Diego Basin, Region 9, (Basin Plan), state in part…"All waters shall be free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life….The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge".

Treatment Control BMP – Any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media absorption or any other physical, biological, or chemical process.

Urban Runoff - All flows in a storm water conveyance system and consists of the following components: (1) storm water (wet weather flows) and (2) non-storm water illicit discharges (dry weather flows).

Waste - As defined in CWC Section 13050(d), "waste includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal."

Article 2 of CCR Title 23, Chapter 15 (Chapter 15) contains a waste classification system that applies to solid and semi-solid waste, which cannot be discharged directly or indirectly to water of the state and which therefore must be discharged to land for treatment, storage, or disposal in accordance with Chapter 15. There are four classifications of waste (listed in order of highest to lowest threat to water quality): hazardous waste, designated waste, non-hazardous solid waste, and inert waste.

Water Quality Assessment – Assessment conducted to evaluate the condition of non-storm water and storm water discharges, and the water bodies which receive these discharges.

Water Quality Objective - Numerical or narrative limits on constituents or characteristics of water designated to protect designated beneficial uses of the water. [California Water Code Section 13050 (h)]. California's water quality objectives are established by the State and Regional Water Boards in the Water Quality Control Plans.

Numeric or narrative limits for pollutants or characteristics of water designed to protect the beneficial uses of the water. In other words, a water quality objective is the maximum concentration of a pollutant that can exist in a receiving water and still generally ensure that the beneficial uses of the receiving water remain protected (i.e., not impaired). Since water quality objectives are designed specifically to protect the beneficial uses, when the objectives are violated the beneficial uses are, by definition, no longer protected and become impaired. This is a fundamental concept under the Porter Cologne Act. Equally fundamental is Porter Cologne's definition of pollution. A condition of pollution exists when the water quality needed to support designated beneficial uses has become unreasonably affected or impaired; in other words, when the water quality objectives have been violated. These underlying definitions (regarding beneficial use protection) are the reason why all waste discharge requirements implementing the federal NPDES regulations require compliance with water quality objectives. (Water quality objectives are also called water quality criteria in the CWA.)

Water Quality Standards - The beneficial uses (e.g., swimming, fishing, municipal drinking water supply, etc.,) of water and the water quality objectives necessary to protect those uses.

Waters of the State - Any water, surface or underground, including saline waters within the boundaries of the State [CWC section 13050 (e)]. The definition of the Waters of the State is broader than that for the Waters of the United States in that all water in the State is considered to be a Waters of the State regardless of circumstances or condition. Under this definition, a MS4 is always considered to be a Waters of the State.

Waters of the United States - As defined in the 40 CFR 122.2, the Waters of the U.S. are defined as: "(a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate "wetlands;" (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters otherwise defined as waters of the United States under this definition: (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial seas; and (g) "Wetlands" adjacent to waters (other

than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA."

Watershed - That geographical area which drains to a specified point on a water course, usually a confluence of streams or rivers (also known as drainage area, catchment, or river basin).

Watershed Urban Runoff Management Plan (WURMP) – A written description of the specific watershed urban runoff management measures and programs that each watershed group of Copermittees will implement to comply with this Order and ensure that pollutant discharges in urban runoff are reduced to the MEP and do not cause or contribute to a violation of water quality standards.

WDRs – Waste Discharge Requirements

Wet Season – October 1 through April 30 of each year.

ATTACHMENT D

SCHEDULED SUBMITTALS SUMMARY

Submittal	Permit Section	Completion Date	Frequency
Submit identification of discharges not to be prohibited and BMPs required for treatment of discharges not prohibited	B.2	365 days after adoption of the Order	One Time
Submit Certified Statement of Adequate Legal Authority	C.2	365 days after adoption of the Order	One Time
Long-Term Effectiveness Assessment	I.5 and J.2.b	210 days prior to Order expiration	One Time
Submit to Principal Permittee(s) individual JURMPs	J.1.a.(1)	Prior to 365 days after adoption of the Order (Principal Permittee specifies date of submittal)	One Time
Principal Permittee submits JURMPs to Regional Board	J.1.a.(2)	365 days after adoption of the Order	One Time
Lead Watershed Permittees submit WURMPs to Principal Permittee	J..1.b.(2)	Prior to 365 days after adoption of the Order (Principal Permittee specifies date of submittal)	One Time
Principal Permittee submits WURMPs to Regional Board	J.1.b.(3)	365 days after adoption of the Order	One Time
Principal Permittee submits RURMP to Regional Board	J.1.c.(2)	365 days after adoption of the Order	One Time
Principal Permittee submits Hydromodification Management Plan workplan	J.2.a.(2)(a)	180 days after adoption of the Order	One Time
Principal Permittee submits Hydromodification Management Plan progress report	J.2.a.(2)(b)	18 months after adoption of the Order	One Time
Principal Permittee submits draft Hydromodification Management Plan	J.2.a.(2)(c)	2 years after adoption of the Order	One Time
Principal Permittee submits final Hydromodification Management Plan	J.2.a.(2)(d)	180 days after receiving comments from Regional Board	One Time
Principal Permittee submits Model SUSMP update	J.2.b	18 months after adoption of the Order	One Time
Copermittees submit local SUSMP updates	J.2.b	365 days after acceptance of updated Model SUSMP	One Time
Principal Permittee submits Report of Waste Discharge and Long-Term Effectiveness Assessment	J.2.c-d	210 days prior to Order expiration	One Time
Principal Permittee submits Notification of Principal Permittee	M	180 days after adoption of the Order	One Time
Principal Permittee submits formal agreement between Copermittees which provides management structure for meeting Order requirements	M.5	180 days after adoption of Order	One Time
Submit to Principal Permittee individual Jurisdictional Urban Runoff Management Program Annual Reports	J.3.a.(1)	Prior to September 30, 2008, and annually thereafter (Principal Permittee specifies date of submittal)	Annually
Principal Permittee submits unified Jurisdictional Urban Runoff Management Program Annual Report to Regional Board	J.3.a.(2)	September 30, 2008, and annually thereafter	Annually
Lead Watershed Permittees submit to Principal Permittee Watershed Urban Runoff Management Program Annual Reports	J.3.b.(3)	Prior to January 31, 2009 and annually thereafter (Principal Permittee specifies date of submittal)	Annually
Principal Permittee submits unified Watershed Urban Runoff Management Program Annual Report to Regional Board	J.3.b.(3)	January 31, 2009 and annually thereafter	Annually
Principal Permittee submits Regional Urban Runoff	J.3.c	January 31, 2009 and	Annually

Submittal	Permit Section	Completion Date	Frequency
Management Program Annual Report to Regional Board		annually thereafter	
Principal Permittee submits description of Receiving Waters Monitoring Program	Monitoring and Reporting Program, III.A.1	September 1, 2007 and annually thereafter	Annually
Principal Permittee submits description of various monitoring program components	Monitoring and Reporting Program, III.A.3	July 1, 2007 and July 1, 2008	Twice
Principal Permittee submits Receiving Waters Monitoring Program Annual Report	Monitoring and Reporting Program, III.A.2	January 31, 2009 and annually thereafter	Annually
Principal Permittee submits interim Receiving Waters Monitoring Program Annual Report	Monitoring and Reporting Program, III.B	January 31, 2007 and January 31, 2008	Twice
Principal Permittee submits unified interim Jurisdictional URMP and Watershed URMP Annual Reports	J.4	January 31, 2007 and January 31, 2008	Twice
Principal Permittee(s) shall submit standardized formats for all reports required under this Order	M.6	180 days after adoption of Order	One Time

RECEIVING WATERS AND URBAN RUNOFF MONITORING AND REPORTING PROGRAM NO. R9-2007-0001

I. PURPOSE

A. This Receiving Waters and Urban Runoff Monitoring and Reporting Program is intended to meet the following goals:

1. Assess compliance with Order No. R9-2007-0001;
2. Measure and improve the effectiveness of the Copermittees' urban runoff management programs;
3. Assess the chemical, physical, and biological impacts to receiving waters resulting from urban runoff discharges;
4. Characterize urban runoff discharges;
5. Identify sources of specific pollutants;
6. Prioritize drainage and sub-drainage areas that need management actions;
7. Detect and eliminate illicit discharges and illicit connections to the MS4; and
8. Assess the overall health of receiving waters.

B. In addition, this Receiving Waters and Urban Runoff Monitoring and Reporting Program is designed to answer the following core management questions:

1. Are conditions in receiving waters protective, or likely to be protective, of beneficial uses?
2. What is the extent and magnitude of the current or potential receiving water problems?
3. What is the relative urban runoff contribution to the receiving water problem(s)?
4. What are the sources of urban runoff that contribute to receiving water problem(s)?
5. Are conditions in receiving waters getting better or worse?

II. MONITORING PROGRAM

A. Receiving Waters Monitoring Program

Each Copermittee shall collaborate with the other Copermittees to develop, conduct, and report on a year round watershed based Receiving Waters Monitoring Program. The monitoring program design, implementation, analysis, assessment, and reporting shall be conducted on a watershed basis for each of the hydrologic units. The monitoring program shall be designed to meet the goals and answer the questions listed in section I above. The monitoring program shall include the following components:

1. MASS LOADING STATION (MLS) MONITORING

   a. The following existing mass loading stations shall continue to be monitored: Santa Margarita River,[1] San Luis Rey River, Agua Hedionda Creek, Escondido Creek, San Dieguito River, Penasquitos, Tecolote Creek, San Diego River,

[1] For the Santa Margarita River mass loading station, if Camp Pendleton will not conduct the required monitoring or prevents access for the Copermittees to conduct the required monitoring, the mass loading station location shall be moved to where the County of San Diego has land-use jurisdiction.

Chollas Creek, Sweetwater River, and Tijuana River. The mass loading stations shall be monitored at the frequency identified in Table 1.

Table 1. Monitoring Rotation and Number of Stations in Watersheds

Watershed Management Area	Watershed	Permit Year 1 2007-2008				Permit Year 2 2008-2009				Permit Year 3 2009-2010				Permit Year 4 2010-2011				Permit Year 5 2011-2012			
		MLS	TWAS	ABLM	BA	MLS	TWAS	ABLM	BA	MLS	TWAS	ABLM	BA	MLS	TWAS	ABLM	BA	MLS	TWAS	ABLM	BA
Santa Margarita	Santa Margarita River	1		Implement refined program based on assessment	4	1	Bight '08					Implement refined program based on assessment		1		Implement refined program based on assessment	4			Implement refined program based on assessment	
San Luis Rey	San Luis Rey River	1	2		3	1								1	2		3				
Carlsbad	Buena Vista Creek		1		1										1		1				
	Agua Hedionda Creek	1	1		2	1								1	1		2				
	Escondido Creek	1	1		2	1								1	1		2				
San Dieguito	San Dieguito River	1	2		3	1								1	2		3				
Penasquitos	Penasquitos	1	2		3	1								1	2		3				
Mission Bay	Rose Creek										1		1						1		1
	Tecolote Creek					1				1	1		2					1	1		2
San Diego River	San Diego River					1				1	3		4					1	3		4
San Diego Bay	Chollas Creek	1			1	1				1			1	1			1	1			1
	Sweetwater River					1				1	1		2					1	1		2
	Otay River										1		1						1		1
Tijuana	Tijuana River					1				1	2		3					1	1		2

b. Each mass loading station to be monitored in a given year shall be monitored twice during wet weather events and twice during dry weather flow events. The exception is the 2008-2009 monitoring year, which shall include monitoring of all mass loading stations for one wet weather flow event only if the Copermittees participate in Bight '08.

c. Each mass loading station shall be monitored for the first wet weather event of the season which meets the USEPA's criteria as described in 40 CFR 122.21(g)(7). Monitoring of the second wet weather event shall be conducted after February 1. Dry weather mass loading monitoring events shall be sampled in September or October prior to the start of the wet weather season and in May or June after the end of the wet weather season. If flows are not evident in September or October, then sampling shall be conducted during non-rain events in the wet weather season.

d. Mass loading sampling and analysis protocols shall be consistent with 40 CFR 122.21(g)(7)(ii) and with the USEPA Storm Water Sampling Guidance Document (EPA 833-B-92-001). If practicable, the protocols for mass loading sampling and analysis should be SWAMP comparable. If the mass loading sampling and analysis are determined to be impracticable with the SWAMP standards, the Copermittees should provide explanation and discussion to this effect in the Receiving Waters and Urban Runoff Monitoring Annual Report. Wet weather samples shall be flow-weighted composites, collected for the duration of the entire runoff event, where practical. Where such monitoring is not practical, such as for large watersheds with significant groundwater recharge flows, composites shall be collected at a minimum during the first 3 hours of flow. Dry weather event samples shall be flow-weighted composites, collected for a time duration adequate to be representative of changes in pollutant concentrations and runoff flows which may occur over a typical 24 hour period. A minimum of 3 sample aliquots, separated by a minimum of 15 minutes, shall be taken for each hour of monitoring, unless the Regional Board Executive Officer approves an alternate protocol. Automatic samplers shall be used to collect samples from mass loading stations. Grab samples shall be taken for temperature, pH, specific conductance, biochemical oxygen demand, oil and grease, total coliform, fecal coliform, and enterococcus.

e. Copermittees shall measure or estimate flow rates and volumes for each mass loading station sampling event in order to determine mass loadings of pollutants. Data from nearby USGS gauging stations may be utilized, or flow rates may be estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), Section 3.2.1.

f. In the event that the required number of events are not sampled during one monitoring year at any given station, the Copermittees shall submit, with the subsequent Receiving Waters Monitoring Annual Report, a written explanation for a lack of sampling data, including streamflow data from the nearest USGS gauging station.

g. The following constituents shall be analyzed for each monitoring event at each station:

Table 2. Analytical Testing for Mass Loading and Temporary Watershed Assessment Stations

Conventionals, Nutrients, Hydrocarbons	**Pesticides**	**Metals (Total and Dissolved)**	**Bacteriological**
Total Dissolved Solids	Diazinon	Antimony	Total Coliform
Total Suspended Solids	Chlorpyrifos	Arsenic	Fecal Coliform
Turbidity	Malathion	Cadmium	Enterococcus
Total Hardness		Chromium	
pH		Copper	
Specific Conductance		Lead	
Temperature		Nickel	
Dissolved Phosphorus		Selenium	
Nitrite		Zinc	
Nitrate			
Total Kjeldahl Nitrogen			
Ammonia			
Biological Oxygen Demand, 5-day			
Chemical Oxygen Demand			
Total Organic Carbon			
Dissolved Organic Carbon			
Methylene Blue Active Substances			
Oil and Grease			

h. In addition to the constituents listed in Table 2 above, monitoring stations in the Chollas Creek watershed shall also analyze samples for polychlorinated biphenyls (PCBs), Chlordane, and polycyclic aromatic hydrocarbons (PAHs) for each monitoring event.

i. The following toxicity testing shall be conducted for each monitoring event at each station as follows:
   (1) 7-day chronic test with the cladoceran *Ceriodaphnia dubia* (USEPA protocol EPA-821-R-02-013).
   (2) Chronic test with the freshwater algae *Selenastrum capricornutum* (USEPA protocol EPA-821-R-02-013).
   (3) Acute survival test with amphipod *Hyalella azteca* (USEPA protocol EPA-821-R-02-012).

j. The presence of acute toxicity shall be determined in accordance with USEPA protocol (EPA-821-R-02-012). The presence of chronic toxicity shall be determined in accordance with USEPA protocol (EPA-821-R-02-013).

k. The Copermittees shall collaborate to develop and implement a program to assess the presence of trash (anthropogenic litter) in receiving waters. The program shall collect and evaluate trash data in conjunction with collection and evaluation of analytical data. This monitoring program shall be implemented within each watershed and shall begin no later than the 2007-2008 monitoring year.

2. TEMPORARY WATERSHED ASSESSMENT STATION (TWAS) MONITORING

a. The minimum number of temporary watershed assessment stations to be monitored in a given monitoring year is identified in Table 1. The number of stations located within each watershed may change from the number identified in Table 1, provided the total number of stations monitored in a given year is not reduced below the minimum number of stations identified in Table 1. The

temporary watershed assessment stations shall be monitored and located according to a systematic plan which:

(1) Ensures that the Copermittees' Receiving Waters Monitoring Program most effectively answers questions 1-5 of section I.B above.
(2) Provides statistically useful information.
(3) Identifies the extent and magnitude of receiving water problems within each watershed.
(4) Provides spatial coverage of each watershed.
(5) Monitors previously un-assessed sub-watershed areas.
(6) Focuses on specific areas of concern and high priority areas.
(7) Provides adequate information to assess the effectiveness of implemented programs and control measures in reducing discharged pollutant loads and improving urban runoff and receiving water quality.

b. For each temporary watershed assessment station identified to be monitored in a given year, the station shall be monitored twice during wet weather events and twice during dry weather flow events.

c. Temporary watershed assessment stations shall be monitored in the same manner as the mass loading stations in accordance with the monitoring protocols and requirements outlined in sections II.A.1.c-k above.

3. BIOASSESSMENT (BA) MONITORING

a. The minimum number of bioassessment stations to be monitored in each watershed in a given monitoring year is identified in Table 1. Bioassessment stations shall include an adequate number of reference stations, with locations of reference stations identified according to protocols outlined in "A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams," by Ode, et al. 2005.[2]

b. Bioassessment stations shall be collocated with both mass loading stations and temporary watershed assessment stations where feasible.

c. Bioassessment stations to be monitored in a given monitoring year shall be monitored in May or June (to represent the influence of wet weather on the communities) and September or October (to represent the influence of dry weather flows on the communities). The timing of monitoring of bioassessment stations shall coincide with dry weather monitoring of mass loading and temporary watershed assessment stations.

d. Monitoring of bioassessment stations shall utilize the targeted riffle composite approach, as specified in the Surface Water Ambient Monitoring Program (SWAMP) Quality Assurance Management Plan (QAMP), as amended.

[2] Ode, et al. 2005. "A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams." Environmental Management. Vol. 35, No. 1, pp. 1-13.

e. Monitoring of bioassessment stations shall incorporate assessment of periphyton in addition to macroinvertebrates, using the USEPA's 1999 Rapid Bioassessment Protocols for Use in Wadeable Streams and Rivers.[3]

f. Bioassessment analysis procedures shall include calculation of the Index of Biotic Integrity (IBI) for benthic macroinvertebrates for all bioassessment stations, as outlined in "A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams," by Ode, et al. 2005.

g. A professional environmental laboratory shall perform all sampling, laboratory, quality assurance, and analytical procedures.

4. FOLLOW-UP ANALYSIS AND ACTIONS

When results from the chemistry, toxicity, and bioassessment monitoring described above indicate urban runoff-induced degradation at a mass loading or temporary watershed assessment station, Copermittees within the watershed shall evaluate the extent and causes of urban runoff pollution in receiving waters and prioritize and implement management actions to eliminate or reduce sources. Toxicity Identification Evaluations (TIEs) shall be conducted to determine the cause of toxicity as outlined in Table 3 below. Other follow-up activities which shall be conducted by the Copermittees are also identified in Table 3. Once the cause of toxicity has been identified by a TIE, the Copermittees shall perform source identification projects as needed and implement the measures necessary to reduce the pollutant discharges and abate the sources causing the toxicity.

Table 3. Triad Approach to Determining Follow-Up Actions

	Chemistry[4]	**Toxicity[5]**	**Bioassessment[6]**	**Action**
1.	Persistent exceedance of water quality objectives (high frequency constituent of concern identified)	Evidence of persistent toxicity	Indications of alteration	Conduct TIE to identify contaminants of concern, based on TIE metric. Address upstream sources as a high priority.
2.	No persistent exceedances of water quality objectives	No evidence of persistent toxicity	No indications of alteration	No action necessary.

[3] USEPA, 1999. Rapid Bioassessment Protocols for Use in Wadeable Streams and Rivers. EPA-841-B-99-002.
[4] Persistent exceedance shall mean exceedances of established water quality objectives, benchmarks, or action levels by a pollutant known to cause toxicity for two wet weather and/or two dry weather samples in a given year.
[5] Toxicity shall mean when the Lowest Observed Effect Concentration (LOEC) (for chronic toxicity tests) or median lethal concentration (LC_{50}) (for acute toxicity tests) for any given species is less than or equal to 100% of the test sample and observed effects are significantly different from the control. Evidence of persistent toxicity shall mean toxicity to a specific test organism in more than 50% of the samples taken for a given location during a given monitoring year. When a monitoring event has the potential to indicate evidence of persistent toxicity (e.g. the third event of four monitoring events), sufficient samples shall be collected in order to conduct any TIEs that may be required. When a sample collected in order to conduct a TIE does not result in mortality or exhibit a toxic effect in at least 50% of the applicable test organisms in the 100% storm water sample, the TIE may be conducted with a sample collected during the next monitoring event.
[6] Indications of alteration shall mean an IBI score of Poor or Very Poor.

	Chemistry[4]	Toxicity[5]	Bioassessment[6]	Action
3.	Persistent exceedance of water quality objectives (high frequency constituent of concern identified)	No evidence of persistent toxicity	No indications of alteration	Address upstream sources as a low priority.
4.	No persistent exceedances of water quality objectives	Evidence of persistent toxicity	No indications of alteration	Conduct TIE to identify contaminants of concern, based on TIE metric. Address upstream sources as medium priority.
5.	No persistent exceedances of water quality objectives	No evidence of persistent toxicity	Indications of alteration	No action necessary to address toxic chemicals. Address potential role of urban runoff in causing physical habitat disturbance.
6.	Persistent exceedance of water quality objective (high frequency constituent of concern identified)	Evidence of persistent toxicity	No indications of alteration	If chemical and toxicity tests indicate persistent degradation, conduct TIE to identify contaminants of concern, based on TIE metric and address upstream source as a medium priority.
7.	No persistent exceedances of water quality objectives	Evidence of persistent toxicity	Indications of alteration	Conduct TIE to identify contaminants of concern, based on TIE metric. Address upstream sources as a high priority. Address potential role of urban runoff causing physical habitat disturbance.
8.	Persistent exceedance of water quality objectives objective (high frequency constituent of concern identified)	No evidence of persistent toxicity	Indications of alteration	Address upstream source as a high priority.

5. AMBIENT BAY AND LAGOON MONITORING (ABLM)

   a. Ambient Bay and Lagoon Monitoring shall be conducted according to the schedule identified in Table 1.

   b. If results of the Ambient Bay and Lagoon Monitoring assessment indicate a general relationship and/or linkage between conditions in bays/lagoons/estuaries with conditions at mass loading stations, then monitoring shall be conducted at the following locations: Santa Margarita River Estuary, Oceanside Harbor, San Luis Rey Estuary, Buena Vista Lagoon, Agua Hedionda Lagoon, Batiquitos Lagoon, San Elijo Lagoon, San Dieguito Lagoon, Los Penasquitos Lagoon, Mission Bay, Sweetwater River Estuary, and Tijuana River Estuary. This monitoring shall be designed to most effectively answer each of questions 1-5 of section I.B above as they pertain to bays/lagoons/estuaries.

c. If results of the Ambient Bay and Lagoon Monitoring assessment do not indicate a relationship and/or linkage between conditions in bays/lagoons/estuaries with conditions at mass loading stations, then monitoring shall be conducted for special investigations of the bays/lagoons/estuaries. These special investigations shall be designed to most effectively answer each of questions 1-5 of section I.B above as they pertain to bays/lagoons/estuaries, with an emphasis on answering question 4.

d. Ambient Bay and Lagoon Monitoring shall utilize the triad approach, analyzing chemistry, toxicity, and benthic infauna data.

e. Ambient Bay and Lagoon Monitoring shall include a water column monitoring component as necessary to supply information needed for the development, implementation, and assessment of Total Maximum Daily Loads (TMDLs).

6. COASTAL STORM DRAIN MONITORING

The Copermittees shall collaborate to develop and implement a coastal storm drain monitoring program. The monitoring program shall include:

a. Identification of coastal storm drains which discharge to coastal waters.

b. Monthly sampling of all flowing coastal storm drains identified in section II.A.6.a for total coliform, fecal coliform, and enterococcus.[7] Where flowing coastal storm drains are discharging to coastal waters, paired samples from the storm drain discharge and coastal water (25 yards down current of the discharge) shall be collected. If flowing coastal storm drains are not discharging to coastal waters, only the storm drain discharge needs to be sampled.

(1) Frequency of sampling of coastal storm drains may be reduced to every other month if the paired coastal storm drain data:

(a) Exhibits three consecutive storm drain samples with all bacterial indicators below the Copermittees' sampling frequency reduction criteria, as the sampling frequency reduction criteria was developed under Order No. 2001-01.
(b) Exhibits that the three consecutive samples discussed in (a) above are paired with receiving water samples that do not exceed Assembly Bill (AB) 411 or Basin Plan standards.
(c) Exhibits that less than 20% of the storm drain samples were above any of the sampling frequency reduction criteria during the previous year.

(2) The Copermittees shall notify the Regional Board of any coastal storm drains eligible for sampling frequency reduction prior to October 1 of each year. Sampling frequency reduction shall not occur prior to Regional Board

[7] Coastal storm drains where sampler safety, habitat impacts from sampling, or inaccessibility are issues need not be sampled. Such coastal storm drains shall be added to the Copermittee's dry weather field screening and analytical monitoring program where feasible.

notification.

(3) Re-sampling shall be implemented within one business day of receipt of analytical results for coastal storm drains where:

(a) Both storm drain and receiving water samples exceed AB 411 or Basin Plan standards for any bacterial indicator.
(b) The storm drain sample exceeds 95th percentile observations of the previous year's data for any bacterial indicator.

(4) If re-sampling conducted under section (3) above exhibits continued exceedances of a AB 411 or Basin Plan standards in either the storm drain or receiving water, investigations of sources of bacterial contamination shall commence within one business day of receipt of analytical results.

(5) Investigations of sources of bacterial contamination shall occur immediately if evidence of abnormally high flows, sewage releases, restaurant discharges, and/or similar evidence is observed during sampling.

(6) Exceedances of public health standards for bacterial indicators shall be reported to the County Department of Environmental Health as soon as possible.

7. PYRETHROIDS MONITORING

The Copermittees shall collaborate to develop and implement a monitoring program to measure and assess the presence of pyrethroids in receiving waters. This monitoring program shall be implemented within each watershed and shall begin no later than the 2007-2008 monitoring year.

B. Urban Runoff Monitoring

Each Copermittee shall collaborate with the other Copermittees to develop, conduct, and report on a year round watershed based Urban Runoff Monitoring Program. The monitoring program design, implementation, analysis, assessment, and reporting shall be conducted on a watershed basis for each of the hydrologic units. The monitoring program shall be designed to meet the goals and answer the questions listed in section I above. The monitoring program shall include the following components

1. MS4 OUTFALL MONITORING

The Copermittees shall collaborate to develop and implement a monitoring program to characterize pollutant discharges from MS4 outfalls in each watershed during wet and dry weather. The program shall include rationale and criteria for selection of outfalls to be monitored. The program shall at a minimum include collection of samples for those pollutants causing or contributing to violations of water quality standards within the watershed. This monitoring program shall be implemented within each watershed and shall begin within the 2007-2008 monitoring year.

2. SOURCE IDENTIFICATION MONITORING

The Copermittees shall collaborate to develop and implement a monitoring program to identify sources of discharges of pollutants causing the priority water quality problems within each watershed. The monitoring program shall include focused monitoring which moves upstream into each watershed as necessary to identify sources. The monitoring program shall use source inventories and "Threat to Water Quality" analysis to guide monitoring efforts. This monitoring program shall be implemented within each watershed and shall begin no later than the 2008-2009 monitoring year.

3. DRY WEATHER FIELD SCREENING AND ANALYTICAL MONITORING

As part of its Jurisdictional Urban Runoff Management Program, each Copermittee shall update as necessary its dry weather field screening and analytical monitoring program to meet or exceed the requirements of this section. Dry weather analytical and field screening monitoring consists of (1) field observations; (2) field screening monitoring; and (3) analytical monitoring at selected stations. The Dry Weather Field Screening and Analytical Monitoring program is not required to be SWAMP comparable. Each Copermittee's program shall be designed to detect and eliminate illicit connections and illegal discharges to the MS4 using frequent, geographically widespread dry weather discharge monitoring and follow-up investigations. Each Copermittee shall conduct the following dry weather field screening and analytical monitoring tasks:

a. Select Dry Weather Field Screening and Analytical Monitoring Stations

Based upon a review of its past Dry Weather Monitoring Program, each Copermittee shall select dry weather field screening and analytical monitoring stations within its jurisdiction. No more than 500 dry weather field screening and analytical monitoring stations (excluding alternate stations) need to be selected by any individual Copermittee for any given year. Stations shall be selected according to one of the following methods:

(1) Stations shall be either major outfalls or other outfall points (or any other point of access such as manholes) randomly located throughout the MS4 by placing a grid over a drainage system map and identifying those cells of the grid which contain a segment of the MS4 or major outfall. This random selection has to use the following guidelines and criteria:

(a) A grid system consisting of perpendicular north-south and east-west lines spaced ¼ mile apart shall be overlayed on a map of the MS4, creating a series of cells;
(b) All cells that contain a segment of the MS4 shall be identified and one dry weather analytical monitoring station shall be selected in each cell.
(c) Each Copermittee shall determine alternate stations to be sampled in place of selected stations that do not have flow.

(2) Stations may be selected non-randomly provided adequate coverage of the entire MS4 system is ensured and that the selection of stations meets,

exceeds, or provides equivalent coverage to the requirements given above. The dry weather analytical and field screening monitoring stations shall be established using the following guidelines and criteria:

(a) Stations should be located downstream of any sources of suspected illegal or illicit activity;
(b) Stations shall be located to the degree practicable at the farthest manhole or other accessible location downstream in the system within each cell;
(c) Hydrological conditions, total drainage area of the site, traffic density, age of the structures or buildings in the area, history of the area, and land use types shall be considered in locating stations;
(d) Each Copermittee shall determine alternate stations to be sampled in place of selected stations that do not have flow.

b. Complete MS4 Map

Each Copermittee shall clearly identify each dry weather field screening and analytical monitoring station on its MS4 Map as either a separate GIS layer or a map overlay hereafter referred to as a Dry Weather Field Screening and Analytical Stations Map. Each Copermittee shall confirm that each drainage area within its jurisdiction contains at least one station.

c. Develop Dry Weather Field Screening and Analytical Monitoring Procedures

Each Copermittee shall develop and/or update written procedures for dry weather field screening and analytical monitoring (for analytical monitoring only, these procedures must be consistent with 40 CFR part 136), including field observations, monitoring, and analyses to be conducted. At a minimum, the procedures must meet the following guidelines and criteria:

(1) Determining Sampling Frequency: Dry weather field screening and analytical monitoring shall be conducted at each identified station at least once between May 1st and September 30th of each year or as often as the Copermittee determines is necessary to comply with the requirements of section D.4 of Order No. R9-2007-0001.

(2) If flow or ponded runoff is observed at a dry weather field screening or analytical monitoring station and there has been at least seventy-two (72) hours of dry weather, make observations and collect at least one (1) grab sample. Record general information such as time since last rain, quantity of last rain, site descriptions (i.e., conveyance type, dominant watershed land uses), flow estimation (i.e., width of water surface, approximate depth of water, approximate flow velocity, flow rate), and visual observations (i.e., odor, color, clarity, floatables, deposits/stains, vegetation condition, structural condition, and biology).

(3) At a minimum, collect samples for analytical laboratory analysis of the following constituents for at least twenty five percent (25%) of the dry weather monitoring stations where water is present:

(a) Total Hardness
(b) Oil and Grease
(c) Diazinon and Chlorpyrifos
(d) Cadmium (Dissolved)
(e) Lead (Dissolved)
(f) Zinc (Dissolved)
(g) Copper (Dissolved)
(h) Enterococcus bacteria[8]
(i) Total Coliform bacteria[8]
(j) Fecal Coliform bacteria[8]

(4) At a minimum, conduct field screening analysis of the following constituents at all dry weather monitoring stations where water is present:

(a) Specific conductance (calculate estimated Total Dissolved Solids).
(b) Turbidity
(c) pH
(d) Reactive Phosphorous
(e) Nitrate Nitrogen
(f) Ammonia Nitrogen
(g) Surfactants (MBAS)

(5) If the station is dry (no flowing or ponded runoff), make and record all applicable observations and select another station from the list of alternate stations for monitoring.

(6) Develop and/or update criteria for dry weather field screening and analytical monitoring results whereby exceedance of the criteria will require follow-up investigations to be conducted to identify and eliminate the source causing the exceedance of the criteria.

(7) Assess the presence of trash in receiving waters and urban runoff at each dry weather field screening or analytical monitoring station. Assessments of trash shall provide information on the spatial extent and amount of trash present, as well as the nature of the types of trash present.

(8) Dry weather field screening and analytical monitoring stations identified to exceed dry weather monitoring criteria for any constituents shall continue to be screened in subsequent years.

(9) Develop and/or update procedures for source identification follow up investigations in the event of exceedance of dry weather field screening and analytical monitoring result criteria. These procedures shall be consistent with procedures required in section D.4.d of Order No. R9-2007-0001.

(10) Develop and/or update procedures to eliminate detected illicit discharges and connections. These procedures shall be consistent with each Copermittees

[8] Colilert and Enterolert may be used as alternative methods with Fecal Coliform determined by calculations.

Illicit Discharge and Elimination component of its Jurisdictional Urban Runoff Management Plan as discussed in section D.4 of Order No. R9-2007-0001.

d. Conduct Dry Weather Field Screening and Analytical Monitoring

The Copermittees shall commence implementation of dry weather field screening and analytical monitoring under the requirements of this Order by May 1, 2008. Each Copermittee shall conduct dry weather analytical and field screening monitoring in accordance with its storm water conveyance system map and dry weather analytical and field screening monitoring procedures as described in section II.B.3 above. If monitoring indicates an illicit connection or illegal discharge, conduct the follow-up investigation and elimination activities as described in submitted dry weather field screening and analytical monitoring procedures and sections D.4.d and D.4.e of Order No. R9-2007-0001. Until the dry weather field screening and analytical monitoring program is implemented under the requirements of this Order, each Copermittee shall continue to implement dry weather field screening and analytical monitoring as it was most recently implemented pursuant to Order No. 2001-01.

C. Regional Monitoring Program

1. The Copermittees shall participate and coordinate with federal, state, and local agencies and other dischargers in development and implementation of a regional watershed monitoring program as directed by the Executive Officer.

2. Bight ’08

a. During the 2008-2009 monitoring year (Permit Year 2), the Copermittees may participate in the Bight ’08 study. The Copermittees shall ensure that such participation results in collection and analysis of data useful in addressing the goals and management questions of the Receiving Waters Monitoring Program. Any participation shall include the contribution of all funds not otherwise spent on full implementation of mass loading station, temporary watershed assessment station, ambient bay and lagoon, and bioassessment monitoring. All other monitoring shall continue during the 2008-2009 monitoring year (Permit Year 2) as required.

b. If the Copermittees do not participate in Bight ’08, mass loading station, temporary watershed assessment station, ambient bay an lagoon, and bioassessment monitoring shall be conducted as follows:

(1) Permit Year 3 (2009-2010) monitoring shall be conducted in Permit Year 2 (2008-2009) (see Table 1).
(2) Permit Year 4 (2010-2011) monitoring shall be conducted in Permit Year 3 (2009-2010) (see Table 1).
(3) Permit Year 5 (2011-2012) monitoring shall be conducted in Permit Year 4 (2010-2011).

(4) Permit Year 1 (2007-2008) monitoring shall be conducted in Permit Year 5 (2011-2012).

c. If the Copermittees partially participate in Bight '08, monitoring shall be conducted as described in section II.C.2.b above, with the exception of any monitoring offset by the contribution of funds to Bight '08.

D. Special Studies

1. TMDL MONITORING

a. All monitoring shall be conducted as required in Investigation Order No. R9-2004-0277 for Chollas Creek.

2. REGIONAL HARBOR MONITORING

a. The Copermittees which discharge to harbors shall participate in the development and implementation of the Regional Harbor Monitoring Program.

3. The Copermittees shall conduct special studies, including any monitoring required for TMDL development and implementation, as directed by the Executive Officer.

E. Monitoring Provisions

All monitoring activities shall meet the following requirements:

1. Where procedures are not otherwise specified in this Receiving Waters Monitoring and Reporting Program (e.g., Dry Weather Field Screening and Analytical Monitoring), sampling, analysis and quality assurance/quality control must be conducted in accordance with the Quality Assurance Management Plan (QAMP) for the State of California's Surface Water Ambient Monitoring Program (SWAMP), adopted by the State Water Resources Control Board (SWRCB).

2. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity [40 CFR 122.41(j)(1)].

3. The Copermittees shall retain records of all monitoring information, including all calibration and maintenance of monitoring instrumentation, copies of all reports required by this Order, and records of all data used to complete the Report of Waste Discharge and application for this Order, for a period of at least five (5) years from the date of the sample, measurement, report, or application. This period may be extended by request of the Regional Board or USEPA at any time and shall be extended during the course of any unresolved litigation regarding this discharge. [40 CFR 122.41(j)(2), CWC section 13383(a)]

4. Records of monitoring information shall include [40 CFR 122.41(j)(3)]:

a. The date, exact place, and time of sampling or measurements;
b. The individual(s) who performed the sampling or measurements;
c. The date(s) analyses were performed;

d. The individual(s) who performed the analyses;
e. The analytical techniques or methods used; and
f. The results of such analyses.

5. All sampling, sample preservation, and analyses must be conducted according to test procedures approved under 40 CFR part 136, unless other test procedures have been specified in this Receiving Waters Monitoring and Reporting Program or approved by the Executive Officer [40 CFR 122.41(j)(4)].

6. The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this Order shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than two years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than four years, or both. [40 CFR 122.41(j)(5)]

7. Calculations for all limitations which require averaging of measurements shall utilize an arithmetic mean unless otherwise specified in this Receiving Waters Monitoring and Reporting Program. [40 CFR 122.41(l)(4)(iii)]

8. All chemical, bacteriological, and toxicity analyses shall be conducted at a laboratory certified for such analyses by the California Department of Health Services or a laboratory approved by the Executive Officer.

9. For priority toxic pollutants that are identified in the California Toxics Rule (CTR) (65 Fed. Reg. 31682), the Copermittees shall instruct its laboratories to establish calibration standards that are equivalent to or lower than the Minimum Levels (MLs) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP). If a Copermittee can demonstrate that a particular ML is not attainable, in accordance with procedures set forth in 40 CFR 136, the lowest quantifiable concentration of the lowest calibration standard analyzed by a specific analytical procedure (assuming that all the method specified sample weights, volumes, and processing steps have been followed) may be used instead of the ML listed in Appendix 4 of the SIP. The Copermittee must submit documentation from the laboratory to the Regional Board for approval prior to raising the ML for any priority toxic pollutant.

10. The Regional Board Executive Officer or the Regional Board may make revisions to this Receiving Waters and Urban Runoff Monitoring and Reporting Program at any time during the term of Order No. R9-2007-0001, and may include a reduction or increase in the number of parameters to be monitored, locations monitored, the frequency of monitoring, or the number and size of samples collected.

11. The Clean Water Act provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than six

months per violation, or by both. [40 CFR 122.41(k)(2)]

12. Monitoring shall be conducted according the USEPA test procedures approved under 40 CFR 136, "Guidelines Establishing Test Procedures for Analysis of Pollutants under the Clean Water Act" as amended, unless other test procedures have been specified in this Receiving Waters and Urban Runoff Monitoring and Reporting Program, in Order No. R9-2007-0001, or by the Executive Officer.

13. If the discharger monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR part 136, unless otherwise specified in the Order, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the reports requested by the Regional Board. [40 CFR 122.41(l)(4)(ii)]

III. REPORTING PROGRAM

A. Monitoring Reporting

1. The Principal Permittee shall submit a description of the Receiving Waters and Urban Runoff Monitoring Program to be implemented for every monitoring year. The submittals shall begin on September 1, 2007, and continue every year thereafter. The submittals shall describe all monitoring to be conducted during the upcoming monitoring year. For example, the September 1, 2007 submittal shall describe the monitoring to be conducted from October 1, 2007 through September 30, 2008.

   If the Copermittees participate in Bight '08, their submittal for the 2008-2009 monitoring year shall describe the monitoring to be conducted for Bight '08 and exhibit how the monitoring will result in collection and analysis of data useful in addressing the goals and management questions of the Receiving Waters and Urban Runoff Monitoring Program.

2. The Principal Permittee shall submit the Receiving Waters and Urban Runoff Monitoring Annual Report to the Regional Board on January 31 of each year, beginning on January 31, 2009. Receiving Waters and Urban Runoff Monitoring Annual Reports shall meet the following requirements:

   a. Annual monitoring reports shall include the data/results, methods of evaluating the data, graphical summaries of the data, and an explanation/discussion of the data for each monitoring program component.

   b. Annual monitoring reports shall include a watershed-based analysis of the findings of each monitoring program component. Each watershed-based analysis shall include:

      (1) Identification and prioritization of water quality problems within each watershed.
      (2) Identification and description of the nature and magnitude of potential sources of the water quality problems within each watershed.
      (3) Exhibition of pollutant load and concentration increases or decreases at each mass loading and temporary watershed assessment station.

(4) Evaluation of pollutant loads and concentrations at mass loading and temporary watershed assessment stations with respect to land use, population, sources, and other characteristics of watersheds using tools such as multiple linear regression, factor analysis, and cluster analysis.
(5) Identification of links between source activities/conditions and observed receiving water impacts.
(6) Identification of recommended future monitoring to identify and address sources of water quality problems.
(7) Results and discussion of any TIE conducted, together with actions that will be implemented to reduce the discharge of pollutants and abate the sources causing the toxicity.

c. Annual monitoring reports shall include a detailed description of all monitoring conducted under Investigation Order No. R9-2004-0277 for Chollas Creek. Annual monitoring reports shall also include all information required by Investigation Order No. R9-2004-0277.

d. Annual monitoring reports shall include discussions for each watershed which answer each of the management questions listed in section I.B of this Receiving Waters Monitoring and Reporting Program.

e. Annual monitoring reports shall identify how each of the goals listed in section I.A of this Receiving Waters Monitoring and Reporting Program has been addressed by the Copermittees' monitoring.

f. Annual monitoring reports shall include identification and analysis of any long-term trends in storm water or receiving water quality. Trend analysis shall use nonparametric approaches, such as the Mann-Kendall test, including exogenous variables in a multiple regression model, and/or using a seasonal nonparametric trend model, where applicable.

g. Annual monitoring reports shall provide an estimation of total pollutant loads (wet weather loads plus dry weather loads) due to urban runoff for each of the watersheds specified in Table 4 of Order No. R9-2007-0001.

h. Annual monitoring reports shall for each monitoring program component listed above, include an assessment of compliance with applicable water quality standards.

i. Annual monitoring reports shall describe monitoring station locations by latitude and longitude coordinates, frequency of sampling, quality assurance/quality control procedures, and sampling and analysis protocols.

j. Annual monitoring reports shall use a standard report format and shall include the following:

(1) A stand alone comprehensive executive summary addressing all sections of the monitoring report;
(2) Comprehensive interpretations and conclusions; and

(3) Recommendations for future actions.

k. All monitoring reports submitted to the Principal Permittee or the Regional Board shall contain the certified perjury statement described in Attachment B of Order No. R9-2007-0001.

l. Annual monitoring reports shall be reviewed prior to submittal to the Regional Board by a committee (consisting of no less than three members). All review comments shall also be submitted to the Regional Board.

m. Annual monitoring reports shall be submitted in both electronic and paper formats.

3. The Principal Permittee shall submit by July 1, 2007 a detailed description of the monitoring programs to be implemented under requirements II.A.1.k, II.A.7, and II.B.3.c.(7) of Receiving Waters and Urban Runoff Monitoring and Reporting Program No. R9-2007-0001. The Principal Permittee shall submit by July 1, 2008, a detailed description of the monitoring programs to be implemented under requirement II.B.1 and II.B.2 of Receiving Waters and Urban Runoff Monitoring and Reporting Program No. R9-2007-0001. The description shall identify and provide the rationale for the constituents monitored, locations of monitoring, frequency of monitoring, and analyses to be conducted with the data generated.

4. By January 31, 2010, the City of San Diego shall submit a report which evaluates the data and assumptions used to estimate the WLA to Shelter Island Yacht Basin of 30 kg Cu/year. The report shall evaluate if any changes have occurred in the watershed which could cause or contribute to a higher copper urban runoff discharge and any actions necessary to address these changes. The report shall be an attachment to the Watershed Urban Runoff Management Program Annual Report for the San Diego Bay watershed.

5. Monitoring programs and reports shall comply with section II.E of Receiving Waters and Urban Runoff Monitoring and Reporting Program No. R9-2007-0001 and Attachment B of Order No. R9-2007-0001.

6. Following completion of an annual cycle of monitoring in October, the Copermittees shall make the monitoring data and results available to the Regional Board at the Regional Board's request.

B. Interim Reporting Requirements

For the October 2005-October 2006 and October 2006-October 2007 monitoring periods, the Principal Permittee shall submit the Receiving Waters Monitoring Annual Reports on January 31, 2007 and January 31, 2008, respectively. The Receiving Waters Monitoring Annual Report shall address the monitoring conducted to comply with the requirements of Order No. 2001-01.

FACT SHEET/TECHNICAL REPORT

FOR

ORDER NO. R9-2007-0001
NPDES NO. CAS0108758

WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES OF URBAN RUNOFF FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS OF THE COUNTY OF SAN DIEGO, THE INCORPORATED CITIES OF SAN DIEGO COUNTY, THE SAN DIEGO UNIFIED PORT DISTRICT, AND THE SAN DIEGO COUNTY REGIONAL AIRPORT AUTHORITY

JANUARY 24, 2007

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Attachment A – Revised Tentative Order No. R9-2006-0011 dated August 30, 2006
Attachment B – Responses to Comments dated August 30, 2006
Attachment C – Revised Tentative Order No. R9-2006-0011 dated December 13, 2006
Attachment D – Responses to Comments II dated December 13, 2006

Attachment E – Revised Tentative Order No. R9-2007-0001 dated January 24, 2007
Attachment F – Responses to Comments III dated January 24, 2007

I. LIST OF ACRONYMS AND ABBREVIATIONS

ADT - Average Daily Traffic
BAT - Best Available Technology
BIA - Building Industry Association of San Diego County
BMP - Best Management Practice
Basin Plan - Water Quality Control Plan for the San Diego Basin
CASQA - California Stormwater Quality Association
CCC - California Coastal Commission
CDFG - California Department of Fish and Game
CEQA - California Environmental Quality Act
CFR - Code of Federal Regulations
Copermittees - County of San Diego, the 18 incorporated cities within the County of San Diego, the San Diego Unified Port District, and the San Diego County Regional Airport Authority
CWA - Clean Water Act
CWC - California Water Code
CZARA - Coastal Zone Act Reauthorization Amendments of 1990
ESAs - Environmentally Sensitive Areas
FR - Federal Register
GIS - Geographic Information System
IC/ID - Illicit Connections and Illicit Discharges
JURMP - Jurisdictional Urban Runoff Management Plan
LARWQCB - Los Angeles Regional Water Quality Control Board
MEP - Maximum Extent Practicable
MRP - Receiving Waters Monitoring and Reporting Program
MS4 - Municipal Separate Storm Sewer System
NOI - Notice of Intent
NPDES - National Pollutant Discharge Elimination System
NRDC - Natural Resources Defense Council
NURP - Nationwide Urban Runoff Program
Regional Board - San Diego Regional Water Quality Control Board
RGOs - Retail Gasoline Outlets
ROWD - San Diego County Copermittees' Report of Waste Discharge
RURMP - Regional Urban Runoff Management Plan
RWLs - Receiving Water Limitations
SANDAG - San Diego Association of Governments
SIC - Standard Industrial Classification Code
SUSMP - Standard Urban Storm Water Mitigation Plan
SWMP - Storm Water Management Plan
SWRCB - State Water Resources Control Board
SWPPP - Storm Water Pollution Prevention Plan
TAC - State Water Resources Control Board Urban Runoff Technical Advisory Committee
TIE - Toxicity Identification Evaluation
TMDL - Total Maximum Daily Load
USEPA - United States Environmental Protection Agency
WDRs - Waste Discharge Requirements
WLAs - Waste Load Allocation
WQC - Water Quality Criteria

WQBELs - Water Quality Based Effluent Limits
WSPA - Western States Petroleum Association
WURMP - Watershed Urban Runoff Management Plan

II. FACT SHEET FORMAT

This Fact Sheet briefly sets forth the principle facts and the significant factual, legal, methodological, and policy questions that the California Regional Water Quality Control Board, San Diego Region (Regional Board) considered in preparing Order No. R9-2007-0001. In accordance with the Code of Federal Regulations (CFR) title 40 parts 124.8 and 124.56, this Fact Sheet includes, but is not limited to, the following information:

- Contact information
- Public process and notification procedures
- Background information
- Permitting approach discussion
- Economic issues discussion
- Legal authority discussion
- Findings discussions
- Directives discussions

The main body of the Fact Sheet (sections IX and X) reflects the findings and requirements of the Order as they were originally proposed in Tentative Order No. R9-2006-0011, dated March 10, 2006. Through the subsequent public participation process, the findings and requirements of the Tentative Order evolved and were modified in response to comments received. These modifications, as well as discussions providing the rationale for the modifications, are provided in the Attachments to the Fact Sheet.

The Regional Board's files applicable to the issuance of Order No. R9-2007-0001 are incorporated into the administrative record in support of the findings and requirements of Order No. R9-2007-0001.

III. CONTACT INFORMATION

Regional Board

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858-627-3988
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The Order and other related documents can be downloaded from the Regional Board website at: http://www.waterboards.ca.gov/sandiego/programs/sd_stormwater.html

All documents referenced in this Fact Sheet and in Order No. R9-2007-0001 are available for public review at the Regional Board office, located at the address listed above. Public records are available for inspection during regular business hours, from 8:00 am to 5:00 pm Monday through

Friday. To schedule an appointment to inspect public records, contact Sylvia Wellnitz at 858-637-5593, or DiAnne Broussard at 858-492-1763.

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City of Chula Vista Khosro Aminpour 1800 Maxwell Road Chula Vista, CA 91911 (619) 397-6111	City of La Mesa Malik Tamimi 8130 Allison Avenue La Mesa, CA 91941 (619) 667-1153	City of Santee Cary Stewart 10601 Magnolia Avenue Santee, CA 92071 (619) 258-4100
City of Coronado Public Services Scott Huth 101 B Avenue Coronado, CA 92118 (619) 522-7312	City of Lemon Grove Cora Long 3232 Main Street Lemon Grove, CA 91945 (619) 825-3800X3925	City Of Solana Beach Danny King 635 South Highway 101 Solana Beach, CA 92075 (858) 720-2477
City of Del Mar Rosanna Lacarra 9275 Sky Park Court, Suite 200 San Diego, CA 92123 (858) 874-1810	City of National City Din Daneshfar 1243 National City Blvd. National City, CA 91950 (619) 336-4387	City of Vista Engineering Linda Isakson 1165 East Taylor Street Vista, Ca 92084 (760) 726-1340

IV. PUBLIC PROCESS AND NOTIFICATION PROCEDURES

The Regional Board followed the schedule listed below for the preparation of Order No. R9-2007-0001:

- In July 2004, the Regional Board issued the San Diego County Municipal Storm Water Permit Reissuance Analysis Summary, which considered various permitting options such as watershed-based permits and identified the Regional Board's preferred permitting approach for this permit cycle. The Regional Board solicited and received public comments on the document.

- From October 2004 to July 2005, the Regional Board met with the County of San Diego, the 18 incorporated cities within the County of San Diego, and the San Diego Unified Port District (hereinafter Copermittees) representatives on six occasions to discuss the Copermittees' Report of Waste Discharge (ROWD) and potential changes to the permit.
- The Regional Board received the ROWD on August 25, 2005.
- On September 14, 2005, the Regional Board held a public workshop to inform Regional Board members of the principal issues facing permit re-issuance and allow interested parties to address the Regional Board on permit issues.
- On December 14, 2005, the Regional Board held a workshop on the requirements for fiscal assurances in municipal separate storm sewer system (MS4) permits in the San Diego Region.
- On March 10, 2006, the Regional Board released the Tentative Order and supporting Fact Sheet, beginning the public comment period.
- On April 26, 2006, the Regional Board held a workshop on the requirements of the Tentative Order.
- On May 24, 2006, the Regional Board held a workshop on the requirements of the Tentative Order.
- On June 21, 2006, the Regional Board held a public hearing on the requirements of the Tentative Order.
- On August 30, 2006, the Regional Board released a revised Tentative Order and supporting Fact Sheet, as well as a Responses to Comments document.
- Until October 30, 2006, the Regional Board accepted written comments on the revised Tentative Order.
- On December 4, 2006, the Regional Board released a second revised Tentative Order and supporting Fact Sheet, as well as a Responses to Comments II document (all dated December 13, 2006). Starting December 15, 2006, the Regional Board accepted comments on revisions made in the second revised Tentative Order.
- On January 15, 2007, the Regional Board released a third revised Tentative Order and supporting Fact Sheet, as well as a Responses to Comments III document (all dated January 24, 2007).
- On January 24, 2007, the Regional Board accepted oral comments on all revisions made to the Tentative Order following the June 21, 2006 public hearing.
- On January 24, 2007, the Regional Board adopted Order No. R9-2007-0001.

V. BACKGROUND

The federal Clean Water Act (CWA) was amended in 1987 to address urban runoff. One requirement of the amendment was that many municipalities throughout the United States were obligated for the first time to obtain National Pollutant Discharge Elimination System (NPDES) permits for discharges of urban runoff from their MS4s. In response to the CWA amendment (and the pending federal NPDES regulations which would implement the amendment), the Regional Board issued a municipal storm water permit, Order No. 90-42, in July 1990 to the Copermittees for their urban runoff discharges.[1]

Five years after adoption, Order No. 90-42 was due for renewal in July 1995, but was administratively extended pursuant to federal law because of limited Regional Board resources. Two formal drafts of the renewal permit were released to the public (in 1995 and 1998

[1] The San Diego County Regional Airport Authority was not added as a Copermittee until 2003, at the time when it separated from the San Diego Unified Port District.

respectively) and substantial written public comments on the drafts were considered by the Regional Board. In addition, the Regional Board convened a working group of Copermittees and stakeholders in 1997 and 1998 to advise the Regional Board on permit renewal issues. Despite the efforts by the public, the stakeholder group, and Regional Board, and in part due to the concurrent issuance and appeal of three other municipal storm water permits, Order No. 90-42 was not reissued by the Regional Board until February 21, 2001 as Order No. 2001-01.

The regulatory approach incorporated into Order No. 2001-01 was a significant departure from the regulatory approach of Order No. 90-42. Where Order No. 90-42 included broad nonspecific requirements in order to provide the Copermittees with the maximum amount of flexibility in implementing their programs, Order No. 2001-01 utilized detailed specific requirements which outlined the minimum level of implementation required for the Copermittees' programs. The shift in permitting approaches from Order No. 90-42 to Order No. 2001-01 resulted from the Regional Board's conclusion that the lack of specificity in Order No. 90-42 resulted in frequently unenforceable permit requirements, which in turn allowed some Copermittees to only make limited progress in implementing their programs.

Partially due to this shift in regulatory approaches, as well as new categories of permit requirements, the adoption process for Order No. 2001-01 generated extensive interest. Over 1,500 public comments were received on the Order, though many were duplicative. In addition, five public workshops were held covering various aspects of the Order. Following this extensive public participation process, the Regional Board adopted Order No. 2001-01 on February 21, 2001.

Subsequently, Order No. 2001-01 was administratively appealed to the State Water Resources Control Board (SWRCB) in March 2001 by the Building Industry Association of San Diego County (BIA) and the Western States Petroleum Association (WSPA). BIA utilized an across-the-board approach to its appeal, challenging a wide range of requirements included in the Order, while WSPA challenged the Order's legality in requiring treatment of runoff from retail gasoline outlets. In Order No. 2001-15, the SWRCB upheld the vast majority of the Order's requirements challenged by BIA, making insignificant alterations for clarification purposes to three of the Order's requirements. The SWRCB ruled in favor of WSPA, however, determining that the Regional Board had not adequately supported its position regarding retail gasoline outlets in the order's findings and fact sheet.

BIA continued its challenge of the Order in the Superior Court of the State of California, San Diego County in 2002. At that time, BIA was joined by several building industry and other groups, as well as the City of Santee and the City of San Marcos. The Court ruled in favor of the Regional Board on all counts, with all requirements of the Order being upheld. In particular, the Court found that the Order's requirements had not been shown to be impracticable or unreasonable, including provisions requiring compliance with receiving water quality standards. The Court also found that the Regional Board is exempt from California Environmental Quality Act (CEQA) review when adopting municipal storm water permits.

Following the Superior Court decision, BIA, several building industry and other groups, and the City of San Marcos appealed to the State of California Court of Appeal, Fourth Appellate District. Again the Order was upheld on all counts, with the court making the primary finding that the Regional Board has the authority to require compliance with state water quality standards in storm water permits. BIA's final appeal was to the State of California Supreme Court, which declined to hear the issue in March 2005.

Since adoption of Order No. 2001-01, and despite the subsequent legal actions, the Copermittees' storm water programs have expanded dramatically. Audits of the Copermittees' programs exhibit that the Copermittees' jurisdictional programs are largely in compliance with the Order. Some of the efforts currently being conducted on a regular basis by the Copermittees, which were not conducted on a widespread basis prior to adoption of Order No. 2001-01, include: construction site storm water inspections, industrial and commercial facility storm water inspections, municipal facility storm water inspections, management of storm water quality from new development, development of best management practice requirements for existing development, and assessment of storm water program effectiveness.

However, when viewed relative to the magnitude of the urban runoff problem, enormous challenges remain, particularly regarding the management of urban runoff on a watershed level. Today, urban runoff continues to be the leading cause of water quality impairment in the San Diego Region. The Copermittees' monitoring data exhibits persistent exceedances of water quality objectives in most watersheds. Many watersheds also have urban runoff conditions that are frequently toxic to aquatic life. Bioassessment data from the watersheds further reflects these conditions, finding that macroinvertebrate communities in creeks have widespread Poor to Very Poor Index of Biotic Integrity ratings. Finally, the now too familiar "health advisory or beach closure" signs, which often result from high levels of bacteria in urban runoff, exhibit the continued threat to public health by urban runoff.

VI. PERMITTING APPROACH (PROGRAM INTEGRATION, FLEXIBILITY, AND DETAIL)

The Order contains an increased emphasis on urban runoff management on a watershed basis. This shift towards increased watershed urban runoff management is consistent with earlier planning efforts conducted by the Regional Board regarding reissuance of Order No. 2001-01.[2] It is also consistent with the Copermittees' ROWD.[3] There are several reasons for this shift in emphasis. First, it has been found that the Copermittees are generally doing an effective job at implementing their jurisdictional programs, while on the other hand, it has been found that the Copermittees' watershed programs need improvement. In addition, an emphasis on watersheds is necessary to shift the focus of the Copermittees from program implementation to water quality results. After over 15 years of Copermittee program implementation, it is critical that the Copermittees link their efforts with positive impacts on water quality. Addressing urban runoff management on a watershed scale focuses on water quality results by emphasizing the receiving waters within the watershed. The conditions of the receiving waters drive management actions, which in turn focus on the water quality problems of the receiving waters in each watershed.

Focusing on watershed implementation does not mean that the Copermittees must expend funds outside of their jurisdictions, however. Rather, the Copermittees within each watershed are expected to collaborate to develop a watershed strategy to address the high priority water quality problems within each watershed. They then have the option of implementing the strategy in the manner they find to be most effective. Each Copermittee can implement the strategy individually within its jurisdiction, or the Copermittees can group together to implement the strategy throughout the watershed as a group.

While the Order includes a new emphasis on addressing urban runoff on a watershed basis, the Order includes recognition of the importance of continued program implementation on

[2] Regional Board, 2004. San Diego County Municipal Storm Water Permit Reissuance Summary. P. 7.
[3] San Diego County Copermittees, 2005. Report of Waste Discharge. P. C-12.

jurisdictional and regional levels. The Order also acknowledges that jurisdictional, watershed, and regional efforts are not always mutually exclusive. For this reason, an attempt has been made to allow for the Copermittees' jurisdictional, watershed, and regional programs to integrate. In the Order, the watershed requirements serve as the mechanism for this program integration. Since jurisdictional and regional activities can also serve watershed purposes, such activities can be integrated into the Copermittees' watershed programs, provided the activities meet certain criteria. In this manner, the Copermittees' activities do not always need to distinguish between jurisdictional, watershed, and regional levels of implementation. Instead, they can be integrated on multiple levels.

Such opportunities for program integration inherently provide flexibility to the Copermittees in implementing their programs. Program integration can be expanded or minimized as the Copermittees see fit. For example, there is flexibility provided in determining the activities to be integrated and implemented in the watershed programs – watershed-based efforts, regional efforts, enhanced jurisdictional efforts, or a mixture of the three. Significant flexibility is also provided throughout other portions of the Order. Copermittees can choose the best management practices (BMPs) to be implemented, or required to be implemented, for development, construction, and existing development areas. Flexibility to determine which industrial or commercial sites are to be inspected is also provided to the Copermittees. Educational approaches are also to be determined by the Copermittees under the Order. Implementation of efforts on a regional basis is largely optional for the Copermittees as well. Significant leeway is also provided to the Copermittees in utilizing methods to assess the effectiveness of their various urban runoff management programs. This flexibility is further extended to the monitoring program requirements, which allow the Copermittees to develop monitoring approaches to several aspects of the monitoring program.

The challenge in drafting the Order is to provide the flexibility described above while ensuring that the Order is still enforceable. To achieve this, the Order frequently prescribes minimum measurable outcomes, while providing the Copermittees with flexibility in the approaches they use to meet those outcomes. Enforceability has been found to be a critical aspect of the Order. For example, the watershed requirements of Order No. 2001-01 were some of the most flexible requirements found in that Order. This lack of specificity in the watershed requirements resulted in disagreement about the adequacy of the Copermittees' watershed compliance efforts. On one hand, the Regional Board considered the Copermittees' watershed efforts to be inadequate because they would not result in a significant reduction in pollutant discharges. On the other hand, the Copermittees contended their watershed programs were adequate and in compliance with Order No. 2001-01, even after being notified by the Regional Board of needed improvements on multiple occasions spanning several years. This situation reflects a common outcome of flexible permit language. Such language can be unclear and unenforceable, and lead to implementation of inadequate programs.

To avoid these types of situations, a balance between flexibility and enforceability has been crafted into the Order. Minimum measurable outcomes are utilized to ensure the Order is enforceable, while the Copermittees are provided flexibility in deciding how they will implement their programs to meet the minimum measurable outcomes.

VII. ECONOMIC ISSUES

Economic discussions of urban runoff management programs tend to focus on costs incurred by municipalities in developing and implementing the programs. Understandably so, since these costs are significant. However, when considering the cost of implementing the urban runoff

programs, it is also important to consider the alternative costs incurred by not fully implementing the programs, as well as the benefits which result from program implementation.

It is very difficult to ascertain the true cost of implementation of the Copermittees' urban runoff management programs because of inconsistencies in reporting by the Copermittees. Reported costs of compliance for the same program element can vary widely from city to city, often by a very wide margin that is not easily explained.[4] Despite these problems, efforts have been made to identify urban runoff management program costs, which can be helpful in understanding the costs of program implementation.

In 1999, United States Environmental Protection Agency (USEPA) reported on multiple studies it conducted to determine the cost of urban runoff management programs. A study of Phase II municipalities determined that the annual cost of the Phase II program was expected to be $9.16 per household. USEPA also studied 35 Phase I municipalities, finding costs to be similar to those anticipated for Phase II municipalities, at $9.08 per household annually.[5] The USEPA cost estimate for Phase I municipalities is valuable because it considers municipalities (including Orange County and cities) that are implementing programs similar to those required in San Diego.

A study on program cost was also conducted by the Los Angeles Regional Water Quality Control Board (LARWQCB), where program costs reported in the municipalities' annual reports were assessed. The LARWQCB estimated that average per household cost to implement the MS4 program in Los Angeles County was $12.50. Since the Los Angeles County permit is very similar to Order No. 2001-01, this estimate is useful in assessing general program costs in San Diego County.

The SWRCB also recently commissioned a study by the California State University, Sacramento to assess costs of the Phase I MS4 program. This study is current and includes an assessment of costs incurred by the City of Encinitas in implementing their program. Annual cost per household in the study ranged from $18-46, with the City of Encinitas representing the upper end of the range.[6] The cost of the City of Encinitas' program is understandable, given the city's coastal location, reliance on tourism, and consent decree with environmental groups regarding its program. For these reasons, as well as the general recognition the City of Encinitas receives for implementing a superior program, the city's program cost can be considered as the high end of the spectrum for Copermittee urban runoff management program costs.

It is important to note that reported program costs are not all attributable to compliance with MS4 permits. Many program components, and their associated costs, existed before any MS4 permits were ever issued. For example, street sweeping and trash collection costs cannot be solely or even principally attributable to MS4 permit compliance, since these practices have long been implemented by municipalities. Therefore, true program cost resulting from MS4 permit requirements is some fraction of reported costs. The California State University, Sacramento study found that only 38% of program costs are new costs fully attributable to MS4 permits. The remainder of the program costs were either pre-existing or resulted from enhancement of pre-exiting programs.[7] The County of Orange found that even lesser amounts of program costs are solely attributable to MS4 permit compliance, reporting that the amount attributable to implement

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[4] LARWQCB, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.
[5] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791-68792.
[6] SWRCB, 2005. NPDES Stormwater Cost Survey. P. ii.
[7] Ibid. P. 58.

the Drainage Area Management Plan, which is similar to the Jurisdictional Urban Runoff Management Program in the San Diego County MS4 permit, is less than 20% of the total budget. The remaining 80% is attributable to pre-existing programs.[8]

It is also important to acknowledge that the vast majority of costs that will be incurred as a result of implementing Order No. R9-2007-0001 are not new. Urban runoff management programs have been in place in San Diego County for over 15 years. Any increase in cost to the Copermittees will be incremental in nature. Moreover, since Order No. R9-2007-0001 "fine tunes" the requirements of Order No. 2001-01, these cost increases are expected to be modest.

Urban runoff management programs cannot be considered in terms of their costs only. The programs must also be viewed in terms of their value to the public. For example, household willingness to pay for improvements in fresh water quality for fishing and boating has been estimated by USEPA to be $158-210.[9] This estimate can be considered conservative, since it does not include important considerations such as marine waters benefits, wildlife benefits, or flood control benefits. The California State University, Sacramento study corroborates USEPA's estimates, reporting annual household willingness to pay for statewide clean water to be $180.[10] When viewed in comparison to household costs of existing urban runoff management programs, these household willingness to pay estimates exhibit that per household costs incurred by Copermittees to implement their urban runoff management programs remain reasonable.

Another important way to consider urban runoff management program costs is to consider the implementation cost in terms of costs incurred by not improving the programs. Urban runoff in southern California has been found to cause illness in people bathing near storm drains.[11] A study of south Huntington Beach and north Newport Beach found that an illness rate of about 0.8% among bathers at those beaches resulted in about $3 million annually in health-related expenses.[12] Extrapolation of such numbers to the wide range of beaches of San Diego County could result in huge expenses to the public.

Urban runoff and its impact on receiving waters also places a cost on tourism. In past years, San Diego was featured in the national press for its water quality problems.[13] Such news can have a negative impact on San Diego tourism, since polluted beaches are generally not attractive to tourists. According to a 1996 San Diego Association of Governments (SANDAG) Memorandum, the California Division of Tourism has estimated that each out-of-state visitor spends $101.00 a day. The memo goes on to state that based on projections from the California Department of Boating and Waterways, nearly $1.2 billion in direct revenue and $1.2 billion in indirect revenue is pumped into the San Diego area economy each year by out-of-state visitors.[14] The experience of Huntington Beach provides an example of the potential economic impact of poor water quality. Approximately 8 miles of Huntington Beach were closed for two months in the middle of summer of 1999, impacting beach visitation and the local economy.

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[8] County of Orange, 2000. A NPDES Annual Progress Report. P. 60. More current data from the County of Orange is not used in this discussion because the County of Orange no longer reports such information.
[9] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68793.
[10] SWRCB, 2005. NPDES Stormwater Cost Survey. P. iv.
[11] Haile, R.W., et al, 1996. An Epidemiological Study of Possible Adverse Health Effects of Swimming in Santa Monica Bay. Santa Monica Bay Restoration Project.
[12] Los Angeles Times, May 2, 2005. Here's What Ocean Germs Cost You: A UC Irvine Study Tallies the Cost of Treatment and Lost Wages for Beachgoers Who Get Sick.
[13] Regional Board, 2001. Fact Sheet/Technical Report for SDRWQCB Order No. 2001-01. P. 8.
[14] San Diego Association of Governments, 1996. Memorandum: California Department of Boating and Waterways: Unpublished Survey Information Regarding Beach Use. Written to the Shoreline Erosion Committee.

Finally, it is important to consider the benefits of urban runoff management programs in conjunction with their costs. A recent study conducted by USC/UCLA assessed the costs and benefits of implementing various approaches for achieving compliance with the MS4 permits in the Los Angeles Region. The study found that non-structural systems would cost $2.8 billion but provide $5.6 billion in benefit. If structural systems were determined to be needed, the study found that total costs would be $5.7 to $7.4 billion, while benefits could reach $18 billion.[15] Costs are anticipated to be borne over many years – probably ten years at least. As can be seen, the benefits of the programs are expected to considerably exceed their costs. Such findings are corroborated by USEPA, which found that the benefits of implementation of its Phase II storm water rule would also outweigh the costs.[16]

Additional discussion of economic issues can be found at section 3 of the Fact Sheet/Technical Report for SDRWQCB Order No. 2001-01, available at:

http://www.waterboards.ca.gov/sandiego/programs/sd_stormwater.html.

VIII. LEGAL AUTHORITY

The following statutes, regulations, and Water Quality Control Plans provide the basis for the requirements of Order No. R9-2007-0001: CWA, California Water Code (CWC), 40 CFR Parts 122, 123, 124 (National Pollutant Discharge Elimination System Permit Application Regulations for Storm Water Discharges, Final Rule), Part II of 40 CFR Parts 9, 122, 123, and 124 (National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule), Water Quality Control Plan – Ocean Waters of California (California Ocean Plan), Water Quality Control Plan for the San Diego Basin (Basin Plan), 40 CFR 131Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule (California Toxics Rule), and the California Toxics Rule Implementation Plan.

The legal authority citations below generally apply to directives in Order No. R9-2007-0001, and provide the Regional Board with ample underlying authority to require each of the directives of Order No. R9-2007-0001. Legal authority citations are also provided with each permit section discussion in section X of this Fact Sheet/Technical Report.

CWA 402(p)(3)(B)(ii) – The CWA requires in section 402(p)(3)(B)(ii) that permits for discharges from municipal storm sewers "shall include a requirement to effectively prohibit non-stormwater discharges into the storm sewers."

CWA 402(p)(3)(B)(iii) – The CWA requires in section 402(p)(3)(B)(iii) that permits for discharges from municipal storm sewers "shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants."

40 CFR 122.26(d)(2)(i)(B,C,E, and F) – Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) provide that each Copermittee's permit application "shall consist of: (i) Adequate legal authority. A demonstration that the applicant can operate pursuant to legal authority established by statute, ordinance or series of contracts which authorizes or enables the

[15] LARWQCB, 2004. Alternative Approaches to Stormwater Control.
[16] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791.

applicant at a minimum to: […] (B) Prohibit through ordinance, order or similar means, illicit discharges to the municipal separate storm sewer; (C) Control through ordinance, order or similar means the discharge to a municipal separate storm sewer of spills, dumping or disposal of materials other than storm water; […] (E) Require compliance with condition in ordinances, permits, contracts or orders; and (F) Carry out all inspection, surveillance and monitoring procedures necessary to determine compliance and noncompliance with permit conditions including the prohibition on illicit discharges to the municipal separate storm sewer."

40 CFR 122.26(d)(2)(iv) – Federal NPDES regulation 40 CFR 122.26(d)(2)(iv) provides that the Copermittee shall develop and implement a proposed management program which "shall include a comprehensive planning process which involves public participation and where necessary intergovernmental coordination, to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and such other provisions which are appropriate. The program shall also include a description of staff and equipment available to implement the program. […] Proposed programs may impose controls on a system wide basis, a watershed basis, a jurisdiction basis, or on individual outfalls. […] Proposed management programs shall describe priorities for implementing controls."

40 CFR 122.26(d)(2)(iv)(A - D) – Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(A - D) require municipalities to implement controls to reduce pollutants in urban runoff from new development and significant redevelopment, construction, and commercial, residential, industrial, and municipal land uses or activities. Control of illicit discharges is also required.

CWC 13377 – CWC section 13377 provides that "Notwithstanding any other provision of this division, the state board or the regional boards shall, as required or authorized by the CWA, as amended, issue waste discharge requirements and dredged or fill material permits which apply and ensure compliance with all applicable provisions of the act and acts amendatory thereof or supplementary, thereto, together with anymore stringent effluent standards or limitation necessary to implement water quality control plans, or for the protection of beneficial uses, or to prevent nuisance."

Order No. R9-2007-0001 is an essential mechanism for achieving the water quality objectives that have been established for protecting the beneficial uses of the water resources in the San Diego Region portion of San Diego County. Federal NPDES regulation 40 CFR 122.44(d)(1) requires MS4 permits to include any requirements necessary to "achieve water quality standards established under CWA section 303, including State narrative criteria for water quality." The term "water quality standards" in this context refers to a water body's beneficial uses and the water quality objectives necessary to protect those beneficial uses, as established in the Basin Plan.

IX. FINDINGS DISCUSSION

The findings of the Order have been modified to reduce repetition in their discussions and address new requirements. Each finding of the Order is provided and discussed below. Additional discussion relative to the findings can be found in section X of the Fact Sheet, which provides discussions of the Order's directives.

A. Basis For The Order

Finding A.1: This Order is based on the federal CWA, the Porter-Cologne Water Quality Control Act (Division 7 of the CWC, commencing with Section 13000), applicable state and federal regulations, all applicable provisions of statewide Water Quality Control Plans and Policies adopted by the SWRCB, the Basin Plan, the California Toxics Rule, and the California Toxics Rule Implementation Plan.

Discussion: In 1987, Congress established CWA Amendments to create requirements for storm water discharges under the NPDES program, which provides for permit systems to regulate the discharge of pollutants. Under the Porter-Cologne Water Quality Control Act, the SWRCB and Regional Water Quality Control Boards (Regional Boards) have primary responsibility for the coordination and control of water quality, including the authority to implement the CWA. Porter-Cologne (section 13240) directs the Regional Boards to set water quality objectives via adoption of Basin Plans that conform to all state policies for water quality control. As a means for achieving those water quality objectives, Porter-Cologne (section 13243) further authorizes the Regional Boards to establish waste discharge requirements (WDRs) to prohibit waste discharges in certain conditions or areas. Since 1990, the Regional Board has issued area-wide MS4 NPDES permits. The Order will renew Order No. 2001-01 to comply with the CWA and attain water quality objectives in the Basin Plan by limiting the contributions of pollutants conveyed by urban runoff. Further discussions of the legal authority associated with the prohibitions and directives of the Order are provided in section VIII this document.

Finding A.2: This Order renews NPDES Permit No. CAS0108758, which was first issued on July 16, 1990 (Order No. 90-42), and then renewed on February 21, 2001 (Order No. 2001-01). On August 25, 2005, in accordance with Order No. 2001-01, the County of San Diego, as the Principal Permittee, submitted a ROWD for renewal of their MS4 Permit.

Discussion: Supporting information discussing the topic of this finding can be found in section V of this document.

B. Regulated Parties

Finding No. B.1: Each of the Copermittees listed in Table 1 of the Order owns or operates a MS4, through which it discharges urban runoff into waters of the United States within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the United States.

Discussion: Section 402 of the CWA prohibits the discharge of any pollutant to waters of the United States from a point source, unless that discharge is authorized by a NPDES permit. Though urban runoff comes from a diffuse source, it is discharged through MS4s, which are point sources under the CWA. Federal NPDES regulation 40 CFR 122.26(a) (iii) and (iv) provide that discharges from MS4s, which service medium or large populations greater than 100,000 or 250,000 respectively, shall be required to obtain a NPDES permit. Federal NPDES regulation 40 CFR 122.26(a)(v) also provides that a NPDES permit is required for "A [storm water] discharge which the Director, or in States with approved NPDES programs, either the Director or the USEPA Regional Administrator, determines to contribute to a violation of a water quality standard or is a significant contributor of pollutants to waters of the United States." Such sources

are then designated into the program. Please see Attachment 1 of the Fact Sheet/Technical Report for Regional Board Order No. 2001-01 for an explanation on NPDES municipal storm water permit coverage for each municipality.[17] The San Diego County Regional Airport Authority, designated a Copermittee in 2003, was previously a part of the San Diego Unified Port District and has an MS4 interrelated to other Copermittee MS4s.

Other small MS4s, such as those serving universities and military installations, also exist within the watersheds of San Diego County. While these MS4s are not subject to this Order, they are subject to the Phase II NPDES storm water regulations. Over time, these MS4s will be designated for coverage under the SWRCB's statewide general storm water permit for small MS4s.

C. Discharge Characteristics

Finding No. C.1: Urban runoff contains waste, as defined in the CWC, and pollutants that adversely affect the quality of waters of the State. The discharge of urban runoff from an MS4 is a "discharge of pollutants from a point source" into waters of the United States as defined in the CWA.

Discussion: Section 13050(d) of the CWC defines "waste" as "sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal." 40 CFR 122.2 defines "point source" as "any discernable, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff." 40 CFR 122.2 defines "discharge of a pollutant" as "Any addition of any pollutant or combination of pollutants to waters of the U.S. from any point source." Also, the justification for control of pollution into waters of the state can be found at CWC section 13260(a)(1). SWRCB Order WQ 2001-15 verifies that urban runoff contains waste.[18]

Finding C.2: The most common categories of pollutants in urban runoff include total suspended solids, sediment (due to anthropogenic activities); pathogens (e.g., bacteria, viruses, protozoa); heavy metals (e.g., copper, lead, zinc and cadmium); petroleum products and polynuclear aromatic hydrocarbons; synthetic organics (e.g., pesticides, herbicides, and PCBs); nutrients (e.g., nitrogen and phosphorus fertilizers), oxygen-demanding substances (decaying vegetation, animal waste), and trash.

Discussion: The National Urban Runoff Program (NURP) study showed that heavy metals, organics, coliform bacteria, nutrients, oxygen demanding substances (e.g., decaying vegetation), and total suspended solids are found at relatively high levels in urban runoff.[19] It also found that MS4 discharges draining residential, commercial, and light industrial areas contain significant loadings of total suspended solids and other pollutants. The Basin Plan goes on to identify urban

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[17] Regional Board, 2001. Fact Sheet/Technical Report for SDRWQCB Order No. 2001-01. Attachment 1.
[18] SWRCB, 2001. Order WQ 2001-15. In the Matter of Petitions of Building Industry Association of San Diego County and Western States Petroleum Association: For Review of Waster Discharge Requirements Order No. 2001-01 for Urban Runoff from San Diego County [NPDES No. CAS0108758] Issued by the Regional Board.
[19] Ibid.

runoff pollutants to include lawn and garden chemicals, household and automotive care products dumped or drained on streets, and sediment that erodes from construction sites.[20] In addition, the SWRCB Urban Runoff Technical Advisory Committee (TAC) finds that urban runoff pollutants include sediments, nutrients, oxygen-demanding substances, heavy metals, petroleum hydrocarbons, pathogenic bacteria, viruses, and pesticides.[21] Runoff that flows over streets, parking lots, construction sites, and industrial, commercial, residential, and municipal areas carries these untreated pollutants through storm drain networks directly to the receiving waters of the San Diego Region.

Finding No. C.3: The discharge of pollutants and/or increased flows from MS4s may cause or threaten to cause the concentration of pollutants to exceed applicable receiving water quality objectives and impair or threaten to impair designated beneficial uses resulting in a condition of pollution (i.e., unreasonable impairment of water quality for designated beneficial uses), contamination, or nuisance.

Discussion: The 1992, 1994, and 1996 National Water Quality Inventory Reports to Congress prepared by USEPA showed a trend of impairment in the nation's waters from contaminated storm water and urban runoff.[22] The 1998 National Water Quality Inventory Report showed that urban runoff discharges affect 11% of rivers, 12% of lakes, and 28% of estuaries. The report states that ocean shoreline impairment due to urban runoff increased from 55% in 1996 to 63% in 1998. The report notes that urban runoff discharges are the leading source of pollution and the main factor in the degradation of surface water quality in California's coastal waters, rivers, and streams. Furthermore, the NURP study found that pollutant levels from illicit discharges were high enough to significantly degrade receiving water quality, and threaten aquatic life, wildlife, and human health.[23]

In addition, the Region's CWA section 303(d) list, which identifies water bodies with impaired beneficial uses within the region, also indicates that the impacts of urban runoff on receiving waters are significant. Many of the impaired water bodies on the 303(d) list are impaired by constituents which have been found at high levels within urban runoff by the regional storm water monitoring program.[24] Examples of constituents frequently responsible for beneficial use impairment include total and fecal coliform, heavy metals, and sediment; these constituents have been found at high levels in urban runoff both regionally and nationwide.[25,26]

Finding No. C.4: Pollutants in urban runoff can threaten human health. Human illnesses have been clearly linked to recreating near storm drains flowing to coastal waters. Also, urban runoff pollutants in receiving waters can bioaccumulate in the tissues of invertebrates and fish, which may be eventually consumed by humans.

Discussion: A landmark study, conducted by the Santa Monica Bay Restoration Project, found that there was an increased occurrence of illness in people that swam in proximity to a flowing

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[20] Regional Board, 1994. Water Quality Control Plan, San Diego Basin, Region 9. San Diego.
[21] SWRCB, 1994. Urban Runoff Technical Advisory Committee Report and Recommendations. Nonpoint Source Management Program.
[22] USEPA, 2000. Quality of Our Nation's Waters: Summary of the National Water Quality Inventory 1998 Report to Congress – USEPA 841-S-00-001; Water Quality Conditions in the United States: Profile from the 1998 National Water Quality Inventory Report to Congress – USEPA 841-F-00-006.
[23] USEPA, 1993. Results of the Nationwide Urban Runoff Program, Volume 1 – Final Report.
[24] County of San Diego, 2005. San Diego County Municipal Copermittees 2004-2005 Urban Runoff Monitoring.
[25] Ibid.
[26] USEPA, 1983. Results of the Nationwide Urban Runoff Program, Volume 1 – Final Report.

storm drain.[27] Furthermore, urban runoff pollutants in receiving waters can bioaccumulate in the tissues of invertebrates and fish, which may eventually be consumed by humans. Pollutants such as heavy metals and pesticides, which are commonly found in urban runoff, have been found to bioaccumulate and biomagnify in long-lived organisms at the higher trophic levels.[28] Since many aquatic species are utilized for human consumption, toxic substances accumulated in species' tissues can pose a significant threat to public health. USEPA supports this finding when it states, "As runoff flows over areas altered by development, it picks up harmful sediment and chemicals such as oil and grease, pesticides, heavy metals, and nutrients (e.g., nitrogen and phosphorus). These pollutants often become suspended in runoff and are carried to receiving waters, such and lakes, ponds, and streams. Once deposited, these pollutants can enter the food chain through small aquatic life, eventually entering the tissues of fish and humans."[29]

Finding No. C.5: Urban runoff discharges from MS4s often contain pollutants that cause toxicity to aquatic organisms (i.e., adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies). Toxic pollutants impact the overall quality of aquatic systems and beneficial uses of receiving waters.

Discussion: The Copermittees' monitoring data exhibits frequent toxic conditions in urban runoff during storm events. For example, persistent toxicity has been observed at the Chollas Creek mass loading station and the Tijuana River mass loading station. The Chollas Creek and Sweetwater River mass loading stations were also identified as potential Toxicity Identification Evaluation (TIE) candidate sites based on toxicity to *Hyalella* and *Selenastrum,* respectively.[30] Moreover, a study of urban runoff samples from Chollas Creek, revealed toxic concentrations of organophospate pesticides and metals.[31] Also, a water quality data assessment conducted in Aliso Creek in Orange County showed that storm events caused varying degrees of mortality to test organisms.[32]

Finding No. C.6: The Copermittees discharge urban runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within ten of the eleven hydrologic units (watersheds) comprising the San Diego Region. Some of the receiving water bodies have been designated as impaired by the Regional Board and the USEPA in 2002 pursuant to CWA section 303(d).

Discussion: This finding identifies the Copermittees responsible for MS4 discharges in each watershed management area. The list is identical to Order No. 2001-01, with the addition of the San Diego County Regional Airport Authority added to the San Diego Bay Watershed Management Area.

The CWA Section 303(d) List of Impaired Waters, 2002 Update has been approved by the Regional Board, SWRCB, and USEPA. This 303(d) list identifies waters that do not meet water quality standards after applying certain required technology-based effluent limits ("impaired" water bodies). As part of this listing process, states are required to prioritize waters/watersheds

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[27] Haile, R.W., et al., 1996. An Epidemiological Study of Possible Adverse Health Effects of Swimming in Santa Monica Bay. Santa Monica Bay Restoration Project.
[28] Abel, P.D, 1996. Water Pollution Biology.
[29] USEPA, 2000. Storm Water Phase II Compliance Assistance Guide. Washington D.C. EPA 833-R-00-002.
[30] Ibid., P. ES-16.
[31] Bay, Steven M., et al., 2001. Characterization of Stormwater Toxicants from an Urban Watershed to Freshwater and Marine Organisms. Southern California Coastal Water Research Project. Annual Report 1999-2000.
[32] Regional Board, 2002. Fact Sheet/Technical Report for Regional Board Order No. R9-2002-0001.

for future development of Total Maximum Daily Loads (TMDLs). The 303(d) Pollutants of Concern or Water Quality Effect in Table 2 of the Order have been summarized from the 2002 303(d) list which can be found in full on our website at:

http://www.waterboards.ca.gov/sandiego/programs/303dlist.html.

Finding No. C.7: The Copermittees' water quality monitoring data submitted to date documents persistent exceedances of Basin Plan water quality objectives for various urban runoff-related pollutants (diazinon, fecal coliform bacteria, total suspended solids, turbidity, metals, etc.) at various watershed monitoring stations. At some monitoring stations, such as Agua Hedionda, statistically significant upward trends in pollutant concentrations have been observed. Persistent toxicity has also been observed at some watershed monitoring stations. In addition, bioassessment data indicates that the majority of watersheds have Poor to Very Poor Index of Biotic Integrity ratings. In sum, the above findings indicate that urban runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in San Diego County.

Discussion: The Copermittees have submitted information indicating persistent wet weather constituents of concern in various waterbodies of fecal coliform, total suspended solids, turbidity, total dissolved solids, diazinon, copper, zinc, toxicity, ammonia, biochemical oxygen demand, chemical oxygen demand, phosphorus, chlorpyrifos, and malathion.[33] The Agua Hedionda mass loading station shows statistically significant trends of increasing chemical oxygen demand, total kjeldahl nitrogen, total phosphorus, total suspended solids, and turbidity.[34] Statistically significant increasing trends have also been observed in Tecolote Creek (arsenic) and Chollas Creek (nitrate and lead).[35] Persistent toxicity has been observed at the Chollas Creek mass loading station and the Tijuana River mass loading station. The Chollas Creek and Sweetwater River mass loading stations were identified as potential Toxicity Identification Evaluation (TIE) candidate sites based on toxicity to *Hyalella* and *Selenastrum,* respectively.[36] However, the toxicity was not consistent among events and relatively slight. Bioassessment data collected during the 2004-2005 year indicates that the majority of the watersheds have Poor to Very Poor Index of Biotic Integrity ratings.[37] The three sites that received Good and Very Good ratings were at reference sites in the Santa Margarita Watershed[38] and San Luis Rey Watershed.[39] In most of these watersheds, there are no other NPDES permits discharging to the creeks. The few NPDES permits in the watersheds are mainly for recycled water which only discharges occasionally during the rainy season. Because the water quality monitoring indicates exceedances of water quality standards and urban runoff is the main source of pollutants in the watersheds, it can be inferred that the urban runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in San Diego County.

Finding No. C.8: When natural vegetated pervious ground cover is converted to impervious surfaces such as paved highways, streets, rooftops, and parking lots, the natural absorption and

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[33] San Diego County Copermittees, 2005. Baseline Long-Term Effectiveness Assessment, San Diego Copermittees Jurisdictional Urban Runoff Management Program, Final Report. P. 2-24, Table 2-5.
[34] Ibid.
[35] Ibid.
[36] County of San Diego, 2005. San Diego County Municipal Copermittees 2004-2005 Urban Runoff Monitoring. P. ES-16.
[37] Ibid., P. ES-4 – ES-19.
[38] Ibid., P. 4-11.
[39] Ibid., P. ES-7.

infiltration abilities of the land are lost. Therefore, runoff leaving a developed urban area is significantly greater in runoff volume, velocity, peak flow rate, and duration than pre-development runoff from the same area. The increased volume, velocity, rate, and duration of runoff greatly accelerate the erosion of downstream natural channels. Significant declines in the biological integrity and physical habitat of streams and other receiving waters have been found to occur with as little as a 10% conversion from natural to impervious surfaces. The increased runoff characteristics from new development must be controlled to protect against increased erosion of channel beds and banks, sediment pollutant generation, or other impacts to beneficial uses and stream habitat due to increased erosive force.

Finding No. C.9: Urban development creates new pollution sources as human population density increases and brings with it proportionately higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, trash, etc. which can either be washed or directly dumped into the MS4. As a result, the runoff leaving the developed urban area is significantly greater in pollutant load than the pre-development runoff from the same area. These increased pollutant loads must be controlled to protect downstream receiving water quality.

Discussion (C.8 and C.9): The Natural Resources Defense Council (NRDC) 1999 Report, "Stormwater Strategies, Community Responses to Runoff Pollution" identifies two main causes of the storm water pollution problem in urban areas. Both causes are directly related to development in urban and urbanizing areas:

1. Increased volume and velocity of surface runoff. There are three types of human-made impervious covers that increase the volume and velocity of runoff: (i) rooftop, (ii) transportation imperviousness, and (iii) non-porous (impervious) surfaces. As these impervious surfaces increase, infiltration will decrease, forcing more water to run off the surface, picking up speed and pollutants.

2. The concentration of pollutants in the runoff. Certain industrial, commercial, residential and construction activities are large contributors of pollutant concentrations in urban runoff. As human population density increases, it brings with it proportionately higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, trash, etc.

As a result of these two causes, runoff leaving developed urban areas is significantly greater in volume, velocity, and pollutant load than pre-development runoff from the same area.

Studies have shown that the level of imperviousness in an area strongly correlates with the quality of nearby receiving waters.[40] One comprehensive study, which looked at numerous areas, variables, and methods, revealed that stream degradation occurs at levels of imperviousness as low as 10 – 20%.[41] Stream degradation is a decline in the biological integrity and physical habitat conditions that are necessary to support natural biological diversity. For instance, few urban streams can support diverse benthic communities with imperviousness greater than or equal to

[40] USEPA, 1999. Part II. 40 CFR Parts 9, 122, 123, and 124. National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. Federal Register.
[41] Ibid.

25%.[42] To provide some perspective, a medium density, single-family home area can be from 25% to 60% impervious (variation due to street and parking design).[43]

To demonstrate the principle of increased volume and velocity of runoff from urbanization, the following figure shows the flow rate of an urban vs. a natural stream. What the figure demonstrates is that urban stream flows have greater peaks and volumes, as well as shorter retention times than natural stream flows. The greater peak flows and volumes result in stream degradation through increased erosion of stream banks and damage to aquatic habitat. The shorter retention times result in less time for sediments and other pollutants to settle before being carried out to the ocean. This sediment, and the associated pollutants it carries, can be a significant cause of water quality degradation.

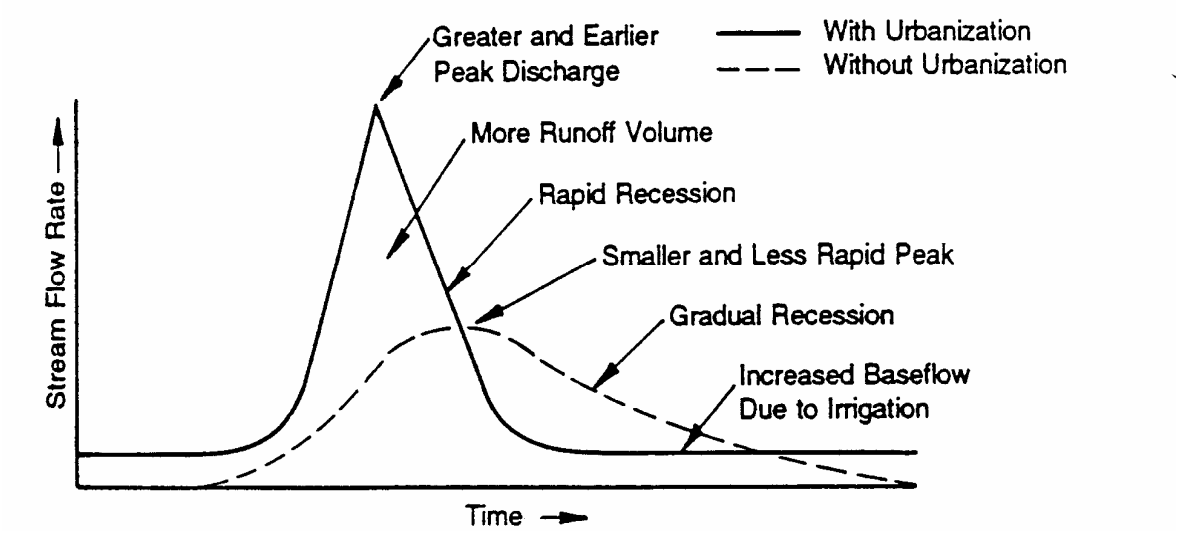

Source: Adapted from Schueler, 1997[44]

Increased volume and velocity of runoff adversely impacts receiving waters and their beneficial uses in many ways. According to the TAC report,[45] increases in population density and imperviousness result in changes to stream hydrology including:

1. Increased peak discharges compared to pre-development levels;
2. Increased volume of storm water runoff with each storm compared to pre-development levels;
3. Decreased travel time to reach receiving water; increased frequency and severity of floods;
4. Reduced stream flow during prolonged periods of dry weather due to reduced levels of infiltration;
5. Increased runoff velocity during storms due to a combination of effects of higher discharge peaks, rapid time of concentration, and smoother hydraulic surfaces from channelization; and

[42] Ibid.
[43] Schueler, T.R., 1994. The Importance of Imperviousness. Watershed Protection Techniques. As cited in 64 Fed. Reg. 68725.
[44] Schueler, T.R., 1987. Controlling Urban Runoff: A Practical Manual for Planning and Designing Urban BMPs. Metropolitan Washington Council of Governments.
[45] SWRCB, 1994. Urban Runoff Technical Advisory Committee Report and Recommendations. Nonpoint Source Management Program.

6. Decreased infiltration and diminished ground water recharge.

Even though the rainfall depths in arid watersheds are lower, watershed development can greatly increase peak discharge rates during rare flood events.[46] A study conducted in arid watersheds around Riverside, CA showed that, over two decades, impervious cover increased from 9% to 22%, which resulted in an increase of more than 100% in the peak flow rate for the two-year storm event. The study also showed that the average annual storm water runoff volume had increased by 115% to 130% over the same time span.[47]

Regarding the impact of urban development on urban runoff pollutant loads, the Regional Board's Basin Plan states:

> Nonpoint source pollution is primarily the result of man's uses of land such as urbanization, roads and highways, vehicles, agriculture, construction, industry, mineral extraction, physical habitat alteration (dredging/filling), hydromodification (diversion, impoundment, channelization), silviculture (logging), and other activities which disturb land.[48] As a result, when rain falls on and drains through urban freeways, industries, construction sites, and neighborhoods it picks up a multitude of pollutants. The pollutants can be dissolved in the runoff and quickly transported by gravity flow through a vast network of concrete channels and underground pipes referred to as storm water conveyance systems. Such systems ultimately discharge the polluted runoff, without treatment, into the nation's creeks, rivers, estuaries, bays, and oceans.[49]

According to the Center for Watershed Protection, the quality of both surface and ground water in urbanizing areas of arid and semi-arid regions of the southwest is strongly shaped by urbanization. Since rain events are so rare, pollutants have more time to build up on impervious surfaces compared to humid regions. Therefore, the pollutant concentrations of storm water runoff from arid watersheds tends to be higher than that of humid watersheds.[50]

Finding No. C.10: Development and urbanization especially threaten environmentally sensitive areas (ESAs), such as water bodies designated as supporting a RARE beneficial use (supporting rare, threatened or endangered species) and CWA 303(d) impaired water bodies. Such areas have a much lower capacity to withstand pollutant shocks than might be acceptable in the general circumstance. In essence, development that is ordinarily insignificant in its impact on the environment may become significant in a particular sensitive environment. Therefore, additional control to reduce pollutants from new and existing development may be necessary for areas adjacent to or discharging directly to an ESA.

Discussion: ESAs are defined in the Order as "Areas that include but are not limited to all CWA Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the Basin Plan ; water bodies designated with the RARE beneficial use by the Basin Plan; areas designated as preserves or their equivalent under the Multi Species Conservation Program within the Cities and County of San Diego; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees." Areas that

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[46] Schueler and Holland, 2000. Storm Water Strategies for Arid and Semi-Arid Watersheds (Article 66). The Practice of Watershed Protection. P. 695-706.
[47] Ibid.
[48] Regional Board, 1994. Water Quality Control Plan for the San Diego Basin. P. 4-66.
[49] Ibid. P. 4-69 - 4-70.
[50] Schueler and Holland, 2000. Storm Water Strategies for Arid and Semi-Arid Watersheds (Article 66). The Practice of Watershed Protection. P. 695-706.

meet this definition are inherently sensitive habitats containing unique, rare, threatened, or endangered species, or are not achieving their designated beneficial uses. As discussed above, urban runoff is known to contain a wide range of pollutants and have demonstrated toxicity to plants and animals. Therefore, it is necessary to apply additional controls for developments within, adjacent to, or directly discharging to ESAs. This need for additional controls is addressed within each component of the Order. USEPA supports the requirement for additional controls, stating "For construction sites that discharge to receiving waters that do not support their designated use or other waters of special concern, additional construction site controls are probably warranted and should be strongly considered."[51] Further support for requiring additional controls to reduce pollutants in discharges to ESAs can be found in *Mitigation of Storm Water Impacts From New Developments in Environmentally Sensitive Areas*, a technical report written by the LARWQCB.[52]

Finding No. C.11: Although dependent on several factors, the risks typically associated with properly managed infiltration of runoff (especially from residential land use areas) are not significant. The risks associated with infiltration can be managed by many techniques, including (1) designing landscape drainage features that promote infiltration of runoff, but do not "inject" runoff (injection bypasses the natural processes of filtering and transformation that occur in the soil); (2) taking reasonable steps to prevent the illegal disposal of wastes; (3) protecting footings and foundations; and (4) ensuring that each drainage feature is adequately maintained in perpetuity.

Discussion: Infiltration is an effective means for managing urban runoff. However, measures must be taken to protect groundwater quality when infiltration of urban runoff is implemented. USEPA supports urban runoff infiltration and provides guidance for protection of groundwater: "With a reasonable degree of site-specific design considerations to compensate for soil characteristics, infiltration may be very effective in controlling both urban runoff quality and quantity problems. This strategy encourages infiltration of urban runoff to replace the natural infiltration capacity lost through urbanization and to use the natural filtering and sorption capacity of soils to remove pollutants; however, the potential for some types of urban runoff to contaminate groundwater through infiltration requires some restrictions."[53] The restrictions placed on urban runoff infiltration in this Order are based on recommendations provided by the USEPA Risk Reduction Engineering Laboratory. The SWRCB found in Order WQ 2000-11 on the appeal of the LARWQCB's Standard Urban Storm Water Mitigation Plan (SUSMP) requirements that the guidance provided in the above referenced document by the USEPA Risk Reduction Engineering Laboratory is sufficient for the protection of groundwater quality from urban runoff infiltration. To further protect groundwater quality, the Order also includes guidance from the LARWQCB,[54] the State of Washington,[55] and the State of Maryland.[56]

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[51] USEPA, 1992. Guidance Manual for the Preparation of Part II of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems. Washington D.C. EPA/833-B-92-002.
[52] LARWQCB, 2001. Mitigation of Storm Water Impacts From New Developments In Environmentally Sensitive Areas.
[53] USEPA, 1994. Potential Groundwater Contamination from Intentional and Nonintentional Stormwater Infiltration. EPA 600 SR-94 051.
[54] LARWQCB, 2000. Standard Urban Storm Water Mitigation Plan for Los Angeles County and Cities in Los Angeles County.
[55] Washington State Department of Ecology, 1999. Draft Stormwater Management in Washington State. Volume V – Runoff Treatment BMPs. Pub. No. 99-15.
[56] Maryland Department of the Environment, 1999. 2000 Maryland Stormwater Design Manual. Volume I.

D. Urban Runoff Management Programs

Finding D.1.a: This Order specifies requirements necessary for the Copermittees to reduce the discharge of pollutants in urban runoff to the maximum extent practicable (MEP). However, since MEP is a dynamic performance standard which evolves over time as urban runoff management knowledge increases, the Copermittees' urban runoff management programs must continually be assessed and modified to incorporate improved programs, control measures, best management practices, etc. Absent evidence to the contrary, this continual assessment, revision, and improvement of urban runoff management program implementation is expected to ultimately achieve compliance with water quality standards.

Discussion: Under CWA section 402(p), municipalities are required to reduce the discharge of pollutants from their MS4s to the maximum extent practicable (MEP). MEP is the critical technology-based performance standard that municipalities must attain. The MEP standard is an ever-evolving, flexible, and advancing concept, which considers technical and economic feasibility. As knowledge about controlling urban runoff continues to evolve, so does that which constitutes MEP. Reducing the discharge of storm water pollutants to the MEP requires Copermittees to assess each program component and revise activities, control measures, best management practices (BMPs), and measurable goals, as necessary to meet MEP.

To achieve the MEP standard, municipalities must employ whatever BMPs are technically feasible (i.e., are likely to be effective) and are not cost prohibitive. The major emphasis is on technical feasibility. Reducing pollutants to the MEP means choosing effective BMPs, and rejecting applicable BMPs only where other effective BMPs will serve the same purpose, or the BMPs would not be technically feasible, or the cost would be prohibitive. In selecting BMPs to achieve the MEP standard, the following factors may be useful to consider:

1. Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?
2. Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?
3. Public Acceptance: Does the BMP have public support?
4. Cost: Will the cost of implementing the BMP have a reasonable relationship to he pollution control benefits to be achieved?
5. Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc?

If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive BMPs, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost is prohibitive, it would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs that would address a pollutant source, or to pick a BMP base solely on cost, which would be clearly less effective. In selecting BMPs the municipality must make a serious attempt to comply and practical solutions may not be lightly rejected. In any case, the burden would be on the municipal discharger to show compliance with its permit. After selecting a menu of BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented.[57]

[57] SWRCB, 1993. Memo Entitled Definition of Maximum Extent Practicable.

A definition of MEP is not provided in either the federal statute or in the federal regulations. The final determination regarding whether a municipality has reduced pollutants to the MEP can only be made by the Regional Board or the SWRCB, and not by the municipal discharger. While the Regional Board or the SWRCB ultimately define MEP, it is the responsibility of the Copermittees to initially propose actions that implement BMPs to reduce pollution to the MEP. In other words, the Copermittees' urban runoff management programs to be developed under the Order are the Copermittees' proposals of MEP. Their total collective and individual activities conducted pursuant to their urban runoff management programs become their proposal for MEP as it applies both to their overall effort, as well as to specific activities. The Order provides a minimum framework to guide the Copermittees in meeting the MEP standard.

It is the Regional Board's responsibility to evaluate the proposed programs and specific BMPs to determine what constitutes MEP, using the above guidance and the court's 1994 decision in NRDC v. California Department of Transportation, Federal District Court, Central District of California. The federal court stated that a Copermittee must evaluate and implement BMPs except where (1) other effective BMPs will achieve greater or substantially similar pollution control benefits; (2) the BMP is not technically feasible; or (3) the cost of BMP implementation greatly outweighs the pollution control benefits. In the absence of a proposal acceptable to the Regional Board, the Regional Board will define MEP by requiring implementation of additional measures by the Copermittees.

The Copermittees' continual evolution in meeting the MEP standard is expected to achieve compliance with water quality standards. USEPA has consistently supported this expectation. In its Interim Permitting Approach for Water Quality-Based Effluent Limitations (WQBELs) in Storm Water Permits, USEPA states "the interim permitting approach uses best management practices (BMPs) in first-round storm water permits, and expanded or better-tailored BMPs in subsequent permits, where necessary, to provide for attainment of water quality standards."[58] USEPA reiterated its position in 1999, when it stated regarding the Phase II municipal storm water regulations that "successive iterations of the mix of BMPs and measurable goals will be driven by the objective of assuring maintenance of water quality standards" and "EPA anticipates that a permit for a regulated small MS4 operator implementing BMPs to satisfy the six minimum control measures will be sufficiently stringent to protect water quality, including water quality standards […]."[59]

Finding D.1.b: Although the Copermittees have generally been implementing the jurisdictional urban runoff management programs required pursuant to Order No. 2001-01 since February 21, 2002, urban runoff discharges continue to cause or contribute to violations of water quality standards. This Order contains new or modified requirements that are necessary to improve Copermittees' efforts to reduce the discharge of pollutants in urban runoff to the MEP and achieve water quality standards. Some of the new or modified requirements, such as the expanded Watershed Urban Runoff Management Program section, are designed to specifically address these high priority water quality problems. Other new or modified requirements address program deficiencies that have been noted during audits, report reviews, and other Regional Board compliance assessment activities.

Discussion: The Copermittees are required to update and expand their urban runoff management programs on jurisdictional, watershed, and regional levels in order to improve their efforts to reduce the contribution of pollutants in urban runoff to the MEP and meet water quality

[58] Federal Register / Vol. 61, No. 166 / August 26, 1996 / P. 43761.
[59] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68753-68754.

standards. Changes to Order No. 2001-01's requirements have been made to help ensure these two standards are achieved by the Copermittees.

The jurisdictional requirements of the Order have been changed based on findings by the Regional Board during typical compliance assurance activities. The Regional Board performed full jurisdictional program audits of 20 of the 21 Copermittees during the Order No. 2001-01 permit term; it also performed detailed audits on 10 of the Copermittees' SUSMP programs. Where the audits found common implementation problems, requirements have been altered to better ensure compliance. In addition, the Regional Board conducted detailed reviews of every jurisdictional annual report submitted by the Copermittees, including provision of specific comments to the Copermittees where improvements were found to be needed. Again, where common reporting issues were found, the Order's requirements have been changed to rectify the issues. Other changes to jurisdictional requirements were based on Regional Board inspection findings or receipt of complaints.[60]

To better focus on attainment of water quality standards, the Order's watershed requirements have been improved. Addressing urban runoff management on a watershed scale focuses on water quality results by emphasizing the receiving waters within the watershed. The conditions of the receiving waters drive management actions, which in turn focus on the water quality problems of the receiving waters each watershed. Improvements to watershed requirements were also made to facilitate better understanding of the requirements between the Regional Board and Copermittees.

Finally, many of the required updates to the Copermittees' programs are based on recommendations found in the Copermittees' ROWD.[61]

Finding D.1.c: Updated Jurisdictional Urban Runoff Management Plans (JURMPs) and Watershed Urban Runoff Management Plans (WURMPs), and a new Regional Urban Runoff Management Plan (RURMP), which describe the Copermittees' urban runoff management programs in their entirety, are needed to guide the Copermittees' urban runoff management efforts and aid the Copermittees in tracking urban runoff management program implementation. It is practicable for the Copermittees to update the JURMPs and WURMPs, and create the RURMP, within one year, since significant efforts to develop these programs have already occurred.

Discussion: While development and submittal of urban runoff management plans are not necessary to ensure compliance of the Copermittees' urban runoff management programs with the Order, the plans do serve as useful correspondence between the Copermittees and the Regional Board. The plans help organize the Copermittees' programs and guide their implementation, while also providing the Regional Board with a means to track Copermittee implementation.

Urban runoff management plans are not necessary for ensuring compliance with the Order because the Order itself contains sufficient detailed requirements to ensure that compliance with discharge prohibitions, receiving water limits, and the narrative standard of MEP are achieved. Implementation by the Copermittees of programs in compliance with the Order's requirements, prohibitions, and receiving water limits is the pertinent compliance standard to be used under the

[60] Audit reports, report reviews, and inspection reports are available for review at the Regional Board office.
[61] All significant changes made to the Order's requirements are described and explained in detail in Fact Sheet section X.

Order, as opposed to assessing compliance by reviewing the Copermittees' implementation of their plans alone.

Rather than being substantive components of the Order itself, the Copermittees' urban runoff management plans are simply descriptions of their urban runoff management programs required under the Order. These plans serve as procedural correspondence which guides program implementation and aids the Copermittees and Regional Board in tracking implementation of the programs. In this manner, the plans are not functional equivalents of the Order. For these reasons, the Copermittees' urban runoff management plans need not be an enforceable part of the Order.

The Copermittees' plans and programs can be updated within one year because much of their plans and programs are already in existence. In fact, many parts of their plans and programs have been in place for 15 years.[62] Moreover, the adoption of Order No. 2001-01 required a larger scale reorganization of the Copermittees' programs than Order No. R9-2007-0001, but also allowed one year for program updates. The Copermittees were able to meet the time schedule required under Order No. 2001-01.

Finding D.1.d: Pollutants can be effectively reduced in urban runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Pollution prevention is the reduction or elimination of pollutant generation at its source and is the best "first line of defense". Source control BMPs (both structural and non-structural) minimize the contact between pollutants and flows (e.g., rerouting run-on around pollutant sources or keeping pollutants on-site and out of receiving waters). Treatment control BMPs remove pollutants from urban runoff.

Discussion: The SWRCB finds in its Order WQ 98-01 that BMPs are effective in reducing pollutants in urban runoff, stating that "implementation of BMPs [is] generally the most appropriate form of effluent limitations when designed to satisfy technology requirements, including reduction of pollutants to the maximum extent practicable." A SWRCB TAC further supports this finding by recommending "that nonpoint source pollution control can be accomplished most effectively by giving priority to [BMPs] in the following order:

1. Pollution Prevention – implementation of practices that use or promote pollution free alternatives;
2. Source Control – implementation of control measures that focus on preventing or minimizing urban runoff from contacting pollution sources;
3. Treatment Control – implementation of practices that require treatment of polluted runoff either onsite or offsite."[63]

Pollution prevention, the reduction or elimination of pollutant generation at its source, is an essential aspect of BMP implementation. By limiting the generation of pollutants by urban activities, less pollutants are available to be washed from urban areas, resulting in reduced pollutant loads in storm water discharges from these areas. In addition, there is no need to control or treat pollutants that are not initially generated. Furthermore, pollution prevention BMPs are

[62] Regional Board, 2000. Comparison Between the Requirements of Tentative Order 2001-01, the Federal NPDES Storm Water Regulations, the Existing San Diego Municipal Storm Water Permit (Order 90-42), and Previous Drafts of the San Diego Municipal Storm Water Permit.
[63] SWRCB, 1994. Urban Runoff Technical Advisory Committee Report and Recommendations. Nonpoint Source Management Program.

generally more cost effective than removal of pollutants by treatment facilities or cleanup of contaminated media.[64]

In the Pollution Prevention Act of 1990, Congress established a national policy that emphasizes pollution prevention over control and treatment. CWC section 13263.3(a) also supports pollution prevention, stating "The Legislature finds and declares that pollution prevention should be the first step in a hierarchy for reducing pollution and managing wastes, and to achieve environmental stewardship for society. The Legislature also finds and declares that pollution prevention is necessary to support the federal goal of zero discharge of pollutants into navigable waters." Finally, the Basin Plan also supports this finding by stating "To eliminate pollutants in storm water, one can either clean it up by removing pollutants or prevent it from becoming polluted in the first place. Because of the overwhelming volume of storm water and the enormous costs associated with pollutant removal, pollution prevention is the only approach that makes sense."[65]

USEPA also supports the utilization of a combination of BMPs to address pollutants in urban runoff. For example, USEPA has found there has been success in addressing illicit discharge related problems through BMP initiatives like storm drain stenciling and recycling programs, including household hazardous waste special collection days.[66] Structural BMP performance data has also been compiled and summarized by USEPA.[67] This data indicates that structural BMPs can be effective in reducing pollutants in urban runoff discharges. The summary provides the performance ranges of various types of structural BMPs for removing suspended solids, nutrients, pathogens, and metals from storm water flows. These pollutants are in general pollutants of concern in storm water in the San Diego Region. For suspended solids, the least effective structural BMP type was found to remove 30-65% of the pollutant load, while the most effective was found to remove 65-100% of the pollutant load. For nutrients, the least effective structural BMP type was found to remove 15-45% of the pollutant load, while the most effective was found to remove 65-100% of the pollutant load. For pathogens, the least effective structural BMP type was found to remove <30% of the pollutant load, while the most effective was found to remove 65-100% of the pollutant load. For metals, the least effective structural BMP type was found to remove 15-45% of the pollutant load, while the most effective was found to remove 65-100% of the pollutant load.

Finding D.1.e: Urban runoff needs to be addressed during the three major phases of development (planning, construction, and use) in order to reduce the discharge of pollutants to the MEP and protect receiving waters. Development which is not guided by water quality planning policies and principles can unnecessarily result in increased pollutant load discharges, flow rates, and flow durations which can impact receiving water beneficial uses. Construction sites without adequate BMP implementation result in sediment runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. Existing development generates substantial pollutant loads which are discharged in urban runoff to receiving waters.

Discussion: MS4 permits are issued to municipalities because of their land use authority. The ultimate responsibility for the pollutant discharges, increased runoff, and inevitable long-term

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[64] Schueler, T.R.., 2000. Center for Watershed Protection. Assessing the Potential for Urban Watershed Restoration, Article 142.
[65] Regional Board, 1994. Water Quality Control Plan, San Diego Basin, Region 9.
[66] USEPA, 1999. 40 CFR Parts 9, 122, 123, and 124 National Pollutant Discharge Elimination System-Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges. 64 FR 68728.
[67] USEPA, 1999. Preliminary Data Summary of Urban Storm Water Best Management Practices. EPA 821-R-99-012.

water quality degradation that results from urbanization lies with local governments. This responsibility is based on the fact that it is the local governments that have authorized the urbanization (i.e., conversion of natural pervious ground cover to impervious urban surfaces) and the land uses that generate the pollutants and runoff. Furthermore, the MS4 through which the pollutants and increased flows are conveyed, and ultimately discharged into natural receiving waters, are owned and operated by the same local governments. In summary, the Copermittees under the Order are responsible for discharges into and out of their MS4s because (1) they own and operate the MS4; and (2) they have the legal authority that authorizes the very development and land uses with generate the pollutants and increased flows in the first place.

For example, since grading cannot commence prior to the issuance of a local grading permit, the Copermittees have a built-in mechanism to ensure that all grading activities are protective of receiving water quality. The Copermittee has the authority to withhold issuance of the grading permit until the project proponent has demonstrated to the satisfaction of the Copermittee that the project will not violate their ordinances or cause the Copermittee to be in violation of its MS4 permit. Since the Copermittee will ultimately be held responsible for any discharges from the grading project by the Regional Board, the Copermittee will want to use its own permitting authority to ensure that whatever measures the Copermittee deems necessary to protect discharges into its MS4 are in fact taken by the project proponent.

The Order holds the local government accountable for this direct link between its land use decisions and water quality degradation. The Order recognizes that each of the three major stages in the urbanization process (development planning, construction, and the use or operational stage) are controlled by and must be authorized by the local government. Accordingly, this permit requires the local government to implement, or require others to implement, appropriate best management practices to reduce pollutant discharges and increased flow during each of the three stages of urbanization.

Including plans for BMP implementation during the design phase of new development and redevelopment offers the most cost effective strategy to reduce urban runoff pollutant loads to surface waters.[68] The Phase II regulations for small municipalities reflect the necessity of addressing urban runoff during the early planning phase. Due to the greater water quality concerns generally experienced by larger municipalities, Phase II requirements for small municipalities are also applicable to larger municipalities such as the Copermittees. The Phase II regulations direct municipalities to develop, implement, and enforce a program to address storm water runoff from new development and redevelopment projects that disturb greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale. The program must ensure that controls are in place that would prevent or minimize water quality impacts. This includes developing and implementing strategies which include a combination of structural and/or non-structural BMPs appropriate to the locality. The program must also ensure the adequate long-term operation and maintenance of BMPs.[69] USEPA expands on the Phase II regulations for urban development when it recommends that Copermittees:

> "Adopt a planning process that identifies the municipality's program goals (e.g., minimize water quality impacts resulting from post-construction runoff from new development and redevelopment), implementation strategies (e.g., adopt a combination of structural and/or non-structural BMPs), operation and maintenance policies and procedures, and enforcement

[68] USEPA, 2000. Storm Water Phase II Compliance Assistance Guide. EPA 833-R-00-002.
[69] USEPA, 1999. 40 CFR Parts 9, 122, 123, and 124 National Pollutant Discharge Elimination System-Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. 64 FR 68845.

> procedures. In developing your program, you should consider assessing existing ordinances, policies, programs and studies that address storm water runoff quality."

Management of urban runoff during the construction phase is also essential. USEPA explains in the preamble to the Phase II regulations that storm water discharges generated during construction activities can cause an array of physical, chemical, and biological water quality impacts. Specifically, the biological, chemical and physical integrity of the waters may become severely compromised due to runoff from construction sites. Fine sediment from construction sites can adversely affect aquatic ecosystems by reducing light penetration, impeding sight-feeding, smothering benthic organisms, abrading gills and other sensitive structures, reducing habitat by clogging interstitial spaces within the streambed, and reducing intergravel dissolved oxygen by reducing the permeability of the bed material. Water quality impairment also results, in part, because a number of pollutants are preferentially absorbed onto mineral or organic particles found in fine sediment. The interconnected process of erosion (detachment of the soil particles), sediment transport, and delivery is the primary pathway for introducing key pollutants, such as nutrients, metals, and organic compounds into aquatic systems.[70]

Finally, urban runoff from existing development must be addressed. The Copermittees' monitoring data exhibits that significant water quality problems exist in receiving waters which receive urban runoff from areas with extensive existing development, such as Chollas Creek.[71] Source identification, BMP requirements, inspections, and enforcement are all important measures which can be implemented to address urban runoff from existing development. USEPA supports inspections and enforcement by municipalities when it states "Effective inspection and enforcement requires […] penalties to deter infractions and intervention by the municipal authority to correct violations. Enforcement mechanisms […] also must be described."[72]

Finding D.1.f: Annual reporting requirements included in this Order are necessary to meet federal requirements and to evaluate the effectiveness and compliance of the Copermittees' programs.

Discussion: The annual reporting requirements are consistent with federal NPDES regulation 40 CFR 122.41, which states:

> "The operator of a large or medium municipal separate storm sewer system of a municipal separate storm sewer system that has been designated by the Director under section 122.26(a)(1)(v) of this part must submit an annual report by the anniversary of the date of the issuance of the permit for such a system. The report shall include: (1) The status of implementing the components of the storm water management program that are established as permit conditions; (2) Proposed changes to the storm water management program that are established as permit condition, Such proposed changes shall be consistent with § 122.26(d)(2)iii) of this part; (3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under § 122.26(d)(2)iv) and (d)(2)(v) of this part; (4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; (5) Annual expenditures and budget for year following each annual report; (6) A summary describing the number and nature of enforcement actions,. Inspections, and

[70] Ibid., 64 FR 68728.
[71] County of San Diego, 2005. San Diego County Municipal Copermittees 2004-2005 Urban Runoff Monitoring. Table 11-7.
[72] USEPA, 1992. Guidance Manual for the Preparation of Part II of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems. EPA 833-B-92-002.

public education programs; and (7) Identification of water quality improvements or degradation."

CWC section 13267 provides that "the regional board may require that any person who has discharged […] shall furnish, under penalty of perjury, technical or monitoring reports which the regional board requires."

The Regional Board must assess the reports to ensure that the Copermittees' programs are adequate to assess and address water quality. The reporting requirements can also be useful tools for the Copermittees to review, update, or revise their programs. Areas or issues which have received insufficient efforts can also be identified and improved upon.

Finding D.2.a: The SUSMP requirements contained in this Order are consistent with Order WQ-2000-11 adopted by the SWRCB on October 5, 2000. In the precedential order, the SWRCB found that the design standards, which essentially require that urban runoff generated by 85 percent of storm events from specific development categories be infiltrated or treated, reflect the MEP standard. The order also found that the SUSMP requirements are appropriately applied to the majority of the Priority Development Project categories contained in Section D.1 of this Order. The SWRCB also gave Regional Water Quality Control Boards the discretion to include additional categories and locations, such as retail gasoline outlets (RGOs), in future SUSMPs.

Discussion: The post-construction requirements and design standards contained in the SUSMP section of Order No. R9-2007-0001 constitute MEP and are consistent SWRCB guidance, court decisions, and Regional Board requirements. The SWRCB and Regional Boards have made several recent decisions in regards to inclusion of SUSMP requirements in MS4 permits. In a precedential decision, SWRCB WQ Order No. 2000-11, the SWRCB found that the SUSMP provisions constitute MEP for addressing pollutant discharges resulting from Priority Development Projects. The provisions of the SUSMP section of the Order are also consistent with those previously issued by the Regional Board for Orange County (Order No. R9-2002-0001) and San Diego County (Order No. 2001-01), as well as requirements in the Los Angeles County MS4 permit (Order No. R4-2001-182). In SWRCB Order WQ 2001-15, the SWRCB reaffirmed that SUSMP requirements constitute MEP. Moreover, the SUSMP requirements of the San Diego County MS4 permit (Order No. 2001-01) were upheld when the California State Supreme Court declined to hear the matter on appeal.

Finding D.2.b: Controlling urban runoff pollution before it enters the MS4 through the use of a combination of onsite source control BMPs augmented with treatment control BMPs is important for the following reasons: (1) Many end-of-pipe BMPs (such as diversion to the sanitary sewer) are typically ineffective during significant storm events. Whereas, onsite source control BMPs can be applied during all runoff conditions; (2) End-of-pipe BMPs are often incapable of capturing and treating the wide range of pollutants which can be generated on a sub-watershed scale; (3) End-of-pipe BMPs are more effective when used as polishing BMPs, rather than the sole BMP to be implemented; (4) End-of-pipe BMPs do not protect the quality or beneficial uses of receiving waters between the source and the BMP; and (5) Offsite end-of-pipe BMPs do not aid in the effort to educate the public regarding sources of pollution and their prevention.

Discussion: Many end-of-pipe BMPs are designed for low flow conditions because their end-of-pipe location prevents them from being designed for large storm events. This results in the end-of-pipe BMPs being overwhelmed, bypassed, or ineffective during larger storm events more frequently than onsite BMPs designed for larger storms. BMPs are also frequently most effective for a particular type of pollutant (such as sediment). Such BMPs may be appropriate for small

sites with a limited suite of pollutants generated; however, end-of-pipe BMPs must typically be able to address a wide range of pollutants generated by a sub-watershed, limiting their effectiveness. Moreover, the location of some end-of-pipe BMPs allow for untreated pollutants to be discharged to and degrade receiving waters prior to their reaching the BMPs. This fails to protect receiving waters, which is the purpose of BMP implementation. Moreover, opportunities to educate the public regarding urban runoff pollution can be lost when end-of-pipe BMPs are located away from pollutant sources and out of sight. Onsite BMPs can lead to a better understanding of urban runoff issues since they demonstrate urban runoff processes.

Finding D.2.c: Use of site design BMPs at new development projects can be an effective means for minimizing the impact of urban runoff discharges from the development projects on receiving waters. Site design BMPs help preserve and restore the natural hydrologic cycle of the site, allowing for filtration and infiltration which can greatly reduce the volume, peak flow rate, velocity, and pollutant loads of urban runoff.

Discussion: The use of site design BMPs helps reduce the amount of impervious area associated with urbanization and allows storm water to infiltrate into the soil. Natural vegetation and soil filters urban runoff and reduces the volume and pollutant loads of storm water. Studies have revealed that the level of imperviousness resulting from urbanization is strongly correlated with the water quality impairment of nearby receiving waters.[73] In many cases the impacts on receiving waters due to changes in hydrology can be more significant than those attributable to the contaminants found in storm water discharges.[74] These impacts include stream bank erosion (increased sediment load and subsequent deposition), benthic habitat degradation, and decreased diversity of macroinvertebrates.

The Order include requirements for developments to include site design BMPs that mimic or replicate the natural hydrologic cycle. Open space designs which maximize pervious surfaces and retention of "natural" drainages have been found to reduce both the costs of development and pollutant export.[75] Moreover, USEPA finds including plans for a "natural" site design and BMP implementation during the design phase of new development and redevelopment offers the most cost effective strategy to reduce pollutant loads to surface waters.[76] In a review of the Copermittees' SUSMP programs, Tetra Tech found that many SUSMP projects were not including this effective BMP in their plans.[77]

Finding D.2.d: RGOs are significant sources of pollutants in urban runoff. RGOs are points of convergence for motor vehicles for automotive related services such as repair, refueling, tire inflation, and radiator fill-up and consequently produce significantly higher loadings of hydrocarbons and trace metals (including copper and zinc) than other urban areas. To meet MEP, source control and treatment control BMPs are needed at RGOs that meet the following criteria: (a) 5,000 square feet or more, or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day. These are appropriate thresholds since vehicular development size and volume of traffic are good indicators of potential impacts of urban runoff from RGOs on receiving waters.

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[73] USEPA, 1999. 40 CFR Parts 9, 122, 123, and 124 National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule.
[74] Ibid.
[75] Center for Watershed Protection, 2000. "The Benefits of Better Site Design in Residential Subdivisions." Watershed Protection Techniques. Vol. 3. No. 2.
[76] USEPA, 1999. 40 CFR Parts 9, 122, 123, and 124 National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule.
[77] Tetra Tech, 2005. San Diego Urban Storm Water Mitigation Plan Program Evaluation Report. Pages 4-5.

Discussion: RGOs are included in the Order as a Priority Development Project category because RGOs are points of confluence for motor vehicles for automotive related services such as repair, refueling, tire inflation, and radiator fill-up. RGOs consequently produce significantly greater loadings of hydrocarbons and trace metals (including copper and zinc) than other urban areas. To meet MEP, source control and structural treatment BMPs are needed at RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a ADT of 100 or more vehicles per day. These are appropriate thresholds since vehicular development size and volume of traffic are good indicators of potential impacts of urban runoff from RGOs on receiving waters.

This finding has been added to satisfy SWRCB WQ Order No. 2000-11's requirements for including RGOs as a Priority Development Category. Order No. 2000-11 acknowledged that a threshold (size, average daily traffic, etc.) appropriate to trigger SUSMP requirements should be developed for RGOs and that specific findings regarding RGOs should be included in MS4 permits to justify the requirement.[78] Additional detail to support the inclusion of RGOs can be found in Fact Sheet Section VIII.F.

Finding D.2.f: If not properly designed or maintained, certain BMPs implemented or required by municipalities for urban runoff management may create a habitat for vectors (e.g. mosquitoes and rodents). However, proper BMP design which avoids standing water can prevent the creation of vector habitat. Nuisances and public health impacts resulting from vector breeding can be prevented with close collaboration and cooperative effort between municipalities, local vector control agencies, and the State Department of Health Services during the development and implementation of urban runoff management programs.

Discussion: The implementation of certain structural BMPs or other urban runoff treatment systems can result in significant vector problems in the form of increased breeding or harborage habitat for mosquitoes, rodents or other potentially disease transmitting organisms. The implementation of BMPs that retain water may provide breeding habitat for a variety of mosquito species, some of which have the potential to transmit diseases such as Western Equine Encephalitis, St. Louis Encephalomyelitis, and malaria. Recent BMP implementation studies by Caltrans[79] in District 7 and District 11 have demonstrated mosquito breeding associated with some types of BMPs. The Caltrans BMP Retrofit Pilot study cited lack of maintenance and improper design as factors contributing to mosquito production. However, a Watershed Protection Techniques article[80] describes management techniques for selecting, designing, and maintaining structural treatment BMPs to minimize mosquito production. State and local urban runoff management programs that include structural BMPs with the potential to retain water have been implemented in Florida and the Chesapeake Bay region without resulting in significant public health threats from mosquitoes or other vectors.[81]

Finding D.3.a: In accordance with federal NPDES regulations, and to ensure the most effective oversight of industrial and construction site discharges, discharges of runoff from industrial and construction sites are subject to dual (state and local) storm water regulation. Under this dual system, the Regional Board is responsible for enforcing the General Construction Activities Storm Water Permit, SWRCB Order 97-03 DWQ, NPDES No. CAS000001 (General Construction Permit) and the General Industrial Activities Storm Water Permit, SWRCB Order

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[78] SWRCB, 2000. Order WQ 2000-11.
[79] Caltrans, 2000. BMP Retrofit Pilot Studies: A Preliminary Assessment of Vector Production.
[80] Watershed Protection Techniques, 1995. Mosquitoes in Constructed Wetlands: A Management Bugaboo? 1(4):203-207.
[81] Shaver, E. and R. Baldwin , 1995. Sand Filter Design for Water Quality Treatment in Herricks, E., Ed. Stormwater Runoff and Receiving Systems: Impact, Monitoring, and Assessment, CRC Lewis Publishers, New York, NY.

99-08 DWQ, NPDES No. CAS000002 (General Industrial Permit), and each municipal Copermittee is responsible for enforcing its local permits, plans, and ordinances, which may require the implementation of additional BMPs than required under the statewide general permits.

Discussion: USEPA finds the control of pollutant discharges from industry and construction so important to receiving water quality that it has established a double system of regulation over industrial and construction sites. This double system of regulation consists of two parallel regulatory systems with the same common objective: to keep pollutants from industrial and construction sites out of the MS4. In this double system of regulation for runoff from industrial and construction sites, local governments must enforce their legal authorities (i.e., local ordinances and permits) while the Regional Board must enforce its legal authority (i.e., statewide general industrial and construction storm water permits). These two regulatory systems are designed to complement and support each other. Municipalities are not required to enforce Regional Board and SWRCB permits; however, they are required to enforce their ordinances and permits. The Federal regulations are clear that municipalities have responsibility to address runoff from industrial and construction sites which enters their MS4s.

Municipalities have this responsibility because they have the authority to issue land use and development permits. Since municipalities are the lead permitting authority for industrial land use and construction activities, they are also the lead for enforcement regarding runoff discharges from these sites. For sites where the municipality is the lead permitting authority, the Regional Board will work with the municipality and provide support where needed. The Regional Board will assist municipalities in enforcement against non-compliant sites after the municipality has exhibited a good faith effort to bring the site into compliance.

According to USEPA, the storm water regulations envision that NPDES permitting authorities and municipal operators will cooperate to develop programs to monitor and control pollutants in storm water discharges from industrial facilities.[82] USEPA discusses the "dual regulation" of construction sites in its Storm Water Phase II Compliance Assistance Guide,[83] which states "Even though all construction sites that disturb more than one acre are covered nationally by an NPDES storm water permit, the construction site runoff control minimum measure […] is needed to induce more localized site regulation and enforcement efforts, and to enable operators […] to more effectively control construction site discharges into their MS4s." While the Storm Water Phase II Compliance Assistance Guide applies to small municipalities, it is applicable to the Copermittees, because they are similar in size and have the potential to discharge similar pollutant types as Phase II municipalities.

Finding D.3.b: Identification of sources of pollutants in urban runoff (such as municipal areas and activities, industrial and commercial sites/sources, construction sites, and residential areas), development and implementation of BMPs to address those sources, and updating ordinances and approval processes are necessary for the Copermittees to ensure that discharges of pollutants into and from its MS4 are reduced to the MEP. Inspections and other compliance verification methods are needed to ensure minimum BMPs are implemented. Inspections are especially important at high risk areas for pollutant discharges.

Discussion: Source identification is necessary to characterize the nature and extent of pollutants in discharges and to develop appropriate BMPs. It is the first step in a targeted approach to urban

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[82] USEPA, 1992. Guidance Manual for the Preparation of Part II of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems. EPA 833-B-92-002.
[83] USEPA, 2000. Storm Water Phase II Compliance Assistance Guide. EPA 833-R-00-002.

runoff management. Source identification helps identify the location of potential sources of pollutants in urban runoff. Pollutants found to be present in receiving waters can then be traced to the sites which frequently generate such pollutants. In this manner an inventories of sources can help in targeting inspections, monitoring, and potential enforcement. This allows for limited inspection, monitoring, and enforcement time to be most effective. USEPA supports source identification as a concept when it recommends construction, municipal, and industrial source identification in guidance and the federal regulations.[84][85]

The development of BMPs for identified sources will help ensure that appropriate, consistent controls are implemented at all types of urban development and areas. Copermittees must reduce the discharge of pollutants in urban runoff to the maximum extent practicable. To achieve this level of pollutant reduction, BMPs must be implemented. Designation of minimum BMPs helps ensure that appropriate BMPs are implemented for various sources. These minimum BMPs also serve as guidance as to the level of water quality protection required. USEPA requires development and implementation of BMPs for construction, municipal, commercial, industrial, and residential sources at 40 CFR 122.26(d)(2)(iv)(A-D).

Updating ordinances and approval processes is necessary in order for the Copermittees to control discharges to their MS4s. USEPA supports updating ordinances and approval processes when it states "A crucial requirement of the NPDES storm water regulation is that a municipality must demonstrate that it has adequate legal authority to control the contribution of pollutants in storm water discharged to its MS4. […] In order to have an effective municipal storm water management program, a municipality must have adequate legal authority to control the contribution of pollutants to the MS4. […] 'Control,' in this context, means not only to require disclosure of information, but also to limit, discourage, or terminate a storm water discharge to the MS4."[86]

Inspections provide a necessary means for the Copermittees to evaluate compliance of pollutant sources with their municipal ordinances and minimum BMP requirements. USEPA supports inspections when it recommends inspections of construction, municipal, and industrial sources.[87] Inspection of high risk sources are especially important because of the ability of frequent inspections to help ensure compliance, thereby reducing the risk associated with such sources. USEPA suggests that inspections can improve compliance when it states "Effective inspection and enforcement requires […] penalties to deter infractions and intervention by the municipal authority to correct violations."[88]

Finding D.3.c: Historic and current development makes use of natural drainage patterns and features as conveyances for urban runoff. Urban streams used in this manner are part of the municipalities MS4 regardless of whether they are natural, man-made, or partially modified features. In these cases, the urban stream is both an MS4 and receiving water.

Discussion: A MS4 is defined in the federal regulations as a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs,

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[84] USEPA, 1992. Guidance Manual for the Preparation of Part II of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems. EPA 833-B-92-002.
[85] 40 CFR 122.26(d)(2)(ii)
[86] USEPA, 1992. Guidance Manual for the Preparation of Part II of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems. EPA 833-B-92-002.
[87] Ibid.
[88] USEPA, 1992. Guidance Manual for the Preparation of Part II of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems. EPA 833-B-92-002.

gutters, ditches, man-made channels, or storm drains), owned or operated by a Copermittee, and designed or used for collecting or conveying urban runoff.[89] Natural drainage patterns and urban streams are frequently used by municipalities to collect and convey urban runoff away from development within their jurisdiction. Therefore, the Regional Board considers natural drainages that are used for conveyances of urban runoff, regardless of whether or not they've been altered by the municipality, as both part of the MS4s and as receiving waters. To clarify, an unaltered natural drainage, which receives runoff from a point source (channeled by a Copermittee to drain an area within their jurisdiction), which then conveys the runoff to an altered natural drainage or a man-made MS4, is both an MS4 and a receiving water.[90]

Finding D.3.d: As operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not prohibit or control. These discharges may cause or contribute to a condition of contamination or a violation of water quality standards.

Discussion: CWA section 402(p) requires operators of MS4s to prohibit non-storm water discharges into their MS4s. This is necessary because pollutants which enter the MS4 generally are conveyed through the MS4 to be eventually discharged into receiving waters. If a municipality does not prohibit non-storm water discharges, it is providing the pathway (its MS4) which enables pollutants to reach receiving waters. Since the municipality's storm water management service can result in pollutant discharges to receiving waters, the municipality must accept responsibility for the water quality consequences resulting from this service. Furthermore, third party discharges can cause a municipality to be out of compliance with its permit. Since pollutants from third parties which enter the MS4 will eventually be discharged from the MS4 to receiving waters, the third party discharges can result in a situation of municipality non-compliance if the discharges lead to an exceedance of water quality standards. For these reasons, each Copermittee must prohibit and/or control discharges from third parties to its MS4. USEPA supports this concept when it states "the operators of regulated small MS4s cannot passively receive and discharge pollutants from third parties" and "the operator of a small MS4 that does not prohibit and/or control discharges into its system essentially accepts 'title' for those discharges. At a minimum, by providing free and open access to the MS4s that convey discharges to the waters of the United States, the municipal storm sewer system enables water quality impairment by third parties."[91]

Finding D.3.e: Waste and pollutants which are deposited and accumulate in the MS4 drainage structures will be discharged from these structures to waters of the U.S. unless they are removed or treated. These discharges may cause or contribute to, or threaten to cause or contribute to, a condition of pollution in receiving waters. For this reason, pollutant discharges into the MS4s must be reduced to the MEP unless treatment within the MS4 occurs.

Discussion: When rain falls and drains urban freeways, industries, construction sites, and neighborhoods it picks up a multitude of pollutants. Gravity flow transports the pollutants to the MS4. Illicit discharges and connections also contribute a significant amount of pollutants to MS4s. MS4s are commonly designed to convey their contents as quickly as possible. Due to the

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[89] USEPA, 2000. EPA Administered Permit Programs: The National Pollutant Discharge Elimination System. Code of Federal Regulations, Vol. 40, Part 122.
[90] Regional Board, 2001. Response in Opposition to Petitions for Review of California Regional Water Quality Control Board San Diego Region Order No. 2001-01 – NPDES Permit No. CAS0108758 (San Diego Municipal Storm Water Permit).
[91] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68765-68766.

resulting typically high flow rates within the concrete conveyance systems of MS4s, pollutants which enter or are deposited in the MS4 and not removed are generally flushed unimpeded through the MS4 to waters of the United States. Since treatment generally does not occur within the MS4, in such cases reduction of pollutants to the MEP must occur prior to discharges entering the MS4.

The importance of this concept is supported by the tons of wastes/pollutants that have been removed from the Copermittees' MS4s as reported in their ROWD.[92] Moreover, these pollutants will be discharged into receiving waters unless an effective MS4 and structural treatment BMP maintenance program is implemented by the Copermittees. The requirement for Copermittees to conduct a MS4 maintenance program is specifically directed in both the Phase I and Phase II storm water regulations. Regarding MS4 cleaning, USEPA states "The removal of sediment, decaying debris, and highly polluted water from catch basins has aesthetic and water quality benefits, including reducing foul odors, reducing suspended solids, and reducing the load of oxygen-demanding substances that reach receiving waters."[93] It goes on to say, "Catch basin cleaning is an efficient and cost-effective method for preventing the transport of sediment and pollutants to receiving water bodies." USEPA also finds that "Lack of maintenance often limits the effectiveness of storm water structural controls such as detention/retention basins and infiltration devices. […] The proposed program should provide for maintenance logs and identify specific maintenance activities for each class of control, such as removing sediment from retention ponds every five years, cleaning catch basins annually, and removing litter from channels twice a year."[94]

Finding D.3.f: Enforcement of local urban runoff related ordinances, permits, and plans is an essential component of every urban runoff management program and is specifically required in the federal storm water regulations and this Order. Each Copermittee is individually responsible for adoption and enforcement of ordinances and/or policies, implementation of identified control measures/BMPs needed to prevent or reduce pollutants in storm water runoff, and for the allocation of funds for the capital, operation and maintenance, administrative, and enforcement expenditures necessary to implement and enforce such control measures/BMPs under its jurisdiction.

Discussion: The Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(A – D) are clear in placing responsibility on municipalities for control of urban runoff from third party activities and land uses to their MS4.[95] In order for municipalities to assume this responsibility, they must implement ordinances, permits, and plans addressing urban runoff from third parties. Assessments for compliance with their ordinances, permits, and plans are essential for a municipality to ensure that third parties are not causing the municipality to be in violation of its municipal storm water permit. When conditions of non-compliance are determined, enforcement is necessary to ensure that violations of municipality ordinances and permits are corrected. When the Copermittees determine a violation of its storm water ordinance, it must pursue correction of the violation. Without enforcement, third parties do not have incentive to correct violations. USEPA supports enforcement by municipalities when it states "Effective inspection and

[92] San Diego County Copermittees, 2005. Report of Waste Discharge. Pages 32-33.
[93] USEPA, 1999. Storm Water O&M Fact Sheet, Catch Basin Cleaning. EPA 832-F-99-011.
[94] USEPA, 1992. Guidance Manual for the Preparation of Part II of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems. EPA 833-B-92-002.
[95] USEPA, 2000. EPA Administered Permit Programs: The National Pollutant Discharge Elimination System. Code of Federal Regulations, Vol. 40, Part 122.

enforcement requires […] penalties to deter infractions and intervention by the municipal authority to correct violations. Enforcement mechanisms […] also must be described."[96]

Finding D.3.g: Education is an important aspect of every effective urban runoff management program and the basis for changes in behavior at a societal level. Education of municipal planning, inspection, and maintenance department staffs is especially critical to ensure that in-house staffs understand how their activities impact water quality, how to accomplish their jobs while protecting water quality, and their specific roles and responsibilities for compliance with this Order. Public education, designed to target various urban land users and other audiences, is also essential to inform the public of how individual actions impact receiving water quality and how these impacts can be minimized.

Discussion: Education is a critical BMP and an important aspect of the urban runoff management programs. USEPA finds that "An informed and knowledgeable community is critical to the success of a storm water management program since it helps ensure the following: Greater support for the program as the public gains a greater understanding of the reasons why it is necessary and important [and] greater compliance with the program as the public becomes aware of the personal responsibilities expected of them and others in the community, including the individual actions they can take to protect or improve the quality of area waters."[97]

Regarding target audiences, USEPA also states "The public education program should use a mix of appropriate local strategies to address the viewpoints and concerns of a variety of audiences and communities, including minority and disadvantaged communities, as well as children."

Finding D.3.h: Public participation during the development of urban runoff management programs is necessary to ensure that all stakeholder interests and a variety of creative solutions are considered.

Discussion: This finding is supported by the Phase II Storm Water Regulations, which state "early and frequent public involvement can shorten implementation schedules and broaden public support for a program." USEPA goes on to explain, "public participation is likely to ensure a more successful storm water program by providing valuable expertise and a conduit to other programs and governments."[98]

Finding D.4.a: Since urban runoff does not recognize political boundaries, watershed-based urban runoff management can greatly enhance the protection of receiving waters within a watershed. Such management provides a means to focus on the most important water quality problems in each watershed. By focusing on the most important water quality problems, watershed efforts can maximize protection of beneficial use in an efficient manner. Watershed management of urban runoff does not require Copermittees to expend resources outside of their jurisdictions. Watershed management requires the Copermittees within a watershed to develop a watershed-based management strategy, which can then be implemented on a jurisdictional basis.

Discussion: In recent years, addressing water quality issues from a watershed perspective has increasingly gained attention. Regarding watershed-based permitting, the USEPA *Watershed-Based NPDES Permitting Policy Statement* issued on Jan. 7, 2004 states the following:

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[96] USEPA, 1992. Guidance Manual for the Preparation of Part II of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems. EPA/833-B-92-002.
[97] USEPA, 2000. Storm Water Phase II Compliance Assistance Guide. EPA 833-R-00-002.
[98] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68755.

> USEPA continues to support a holistic watershed approach to water quality management. The process for developing and issuing NPDES permits on a watershed basis is an important tool in water quality management. USEPA believes that developing and issuing NPDES permits on a watershed basis can benefit all watershed stakeholders, from the NPDES permitting authority to local community members. A watershed-based approach to point source permitting under the NPDES program may serve as one innovative tool for achieving new efficiencies and environmental results. USEPA believes that watershed-based permitting can:
>
> - lead to more environmentally effective results;
> - emphasize measuring the effectiveness of targeted actions on improvements in water quality;
> - provide greater opportunities for trading and other market based approaches;
> - reduce the cost of improving the quality of the nation's waters;
> - foster more effective implementation of watershed plans, including total maximum daily loads (TMDLs); and
> - realize other ancillary benefits beyond those that have been achieved under the CWA (e.g., facilitate program integration including integration of Clean Water Act and Safe Drinking Water Act programs).
>
> Watershed-based permitting is a process that ultimately produces NPDES permits that are issued to point sources on a geographic or watershed basis. In establishing point source controls in a watershed-based permit, the permitting authority may focus on watershed goals, and consider multiple pollutant sources and stressors, including the level of nonpoint source control that is practicable. In general, there are numerous permitting mechanisms that may be used to develop and issue permits within a watershed approach.

This USEPA guidance is in line with SWRCB and Regional Board watershed management goals. For example, the SWRCB's TAC recommends watershed-based water quality protection, stating "Municipal permits should have watershed specific components." The TAC further recommends that "All NPDES permits and Waste Discharge Requirements should be considered for reissuance on a watershed basis."

In addition, the Basin Plan states that "public agencies and private organizations concerned with water resources have come to recognize that a comprehensive evaluation of pollutant contributions on a watershed scale is the only way to realistically assess cumulative impacts and formulate workable strategies to truly protect our water resources. Both water pollution and habitat degradation problems can best be solved by following a basin-wide approach."

In light of USEPA's policy statement and the SWRCB's and Regional Board's watershed management goals, the Regional Board seeks to expand watershed management in the regulation of urban runoff. Watershed-based MS4 permits can provide for more effective receiving water quality protection by focusing on specific water quality problems. The entire watershed for the receiving water can be assessed, allowing for critical areas and practices to be targeted for corrective actions. Known sources of pollutants of concern can be investigated for potential water quality impacts. Problem areas can then be addressed, leading to eventual improvements in receiving water quality. Management of urban runoff on a watershed basis allows for specific water quality problems to be targeted so that efforts result in maximized water quality improvements.[99]

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[99] Regional Board, 2004. San Diego County Municipal Storm Water Permit Reissuance Analysis Summary. P. 1.

Finding D.4.b: Some urban runoff issues, such as residential education, can be effectively addressed on a regional basis. Regional approaches to urban runoff management can improve program consistency and promote sharing of resources, which can result in implementation of more efficient programs.

Discussion: Regional activities are generally directed at developing consistency between watershed and jurisdictional programs (e.g., through standards development), and collaborating on program activities such as education and monitoring to ease implementation and make the most of economies of scale. The Copermittees report having come to an understanding that jurisdictional, watershed, and regional programs cannot be effectively developed and implemented in isolation. In addition, the Copermittees, through WURMP implementation efforts, have learned that many watershed activities can be more effectively implemented (e.g., achieve more water quality benefits) at the regional level due to economies of scale and agree watershed protection should be increasingly emphasized as a focal point of Copermittee efforts under the re-issued Permit.[100]

Finding D.4.c: Both regionally and on a watershed basis, it is important for the Copermittees to coordinate their water quality protection and land use planning activities to achieve the greatest protection of receiving water bodies. Copermittee coordination with other watershed stakeholders, especially Caltrans, the Department of Defense, and Native American Tribes, is also important. Establishment of a management structure, within which the Copermittees subject to this Order will fund and coordinate those aspects of their joint obligations, will help promote implementation of urban runoff management programs on a watershed and regional basis in a most cost effective manner.

Discussion: Conventional planning and zoning can be limited in their ability to protect the environmental quality of creeks, rivers, and other waterbodies. Watershed-based planning is often ignored, despite the fact that receiving waters unite land by collecting runoff from throughout the watershed. Since watersheds unite land, they can be used as an effective basis for planning. Watershed-based planning enables local and regional areas to realize economic, social, and other benefits associated with growth, while conserving the resources needed to sustain such growth, including water quality. This type of planning can involve four steps: (1) Identify the watersheds shared by the participating jurisdictions; (2) Identify, assess, and prioritize the natural, social, and other resources in the watersheds; (3) Prioritize areas for growth, protection, and conservation, based on prioritized resources; and (4) Develop plans and regulations to guide growth and protect resources. Local governments have started with simple, yet effective, steps toward watershed planning, such as adopting a watershed-based planning approach, articulating the basic strategy in their General Plans, and beginning to pursue the basic strategy in collaboration with neighboring local governments who share the watersheds. Examples of new mechanisms created to facilitate watershed-based planning and zoning include the San Francisquito Creek Watershed Coordinated Resource Management Process and the Santa Clara Basin Watershed Management Initiative.[101]

E. Statute and Regulatory Considerations

Finding E.1: The Receiving Water Limitations (RWL) language specified in this Order is consistent with language recommended by USEPA and established in SWRCB Water Quality Order 99-05, adopted by the SWRCB on June 17, 1999. The RWL in this Order require

[100] San Diego County Copermittees, 2005. Report Of Waste Discharge. P. C.14.
[101] BASMAA, 1999. Start at the Source. Forbes Custom Publishing.

compliance with water quality standards through an iterative approach requiring the implementation of improved and better-tailored BMPs over time. Compliance with receiving water limits based on applicable water quality standards is necessary to ensure that MS4 discharges will not cause or contribute to violations of water quality standards and the creation of conditions of pollution.

Discussion: The RWLs in the Order require compliance with water quality standards through an iterative approach for implementing improved and better-tailored BMPs over time. The iterative BMP process requires the implementation of increasingly stringent BMPs until receiving water standards are achieved. This is necessary because implementation of BMPs alone cannot ensure attainment of receiving water quality standards. For example, a BMP that is effective in one situation may not be applicable in another. An iterative process of BMP development, implementation, and assessment is needed to promote consistent compliance with receiving water quality objectives. If assessment of a given BMP confirms that the BMP is ineffective, the iterative process should be restarted, with redevelopment of a new BMP that is anticipated to result in compliance with receiving water quality objectives.

The issue of whether storm water discharges from MS4s must meet water quality standards has been intensely debated in past years. The argument arises because CWA section 402(p) fails to clearly state that municipal dischargers of storm water must meet water quality standards. On the issue of industrial discharges of storm water, the statute clearly indicates that industrial dischargers must meet both (1) the technology-based standard of "best available technology economically achievable (BAT)" and (2) applicable water quality standards. On the issue of municipal discharges however, the statute states that municipal dischargers must meet (1) the technology-based standard of MEP" and (2) "such other provisions that the Administrator or the State determines appropriate for the control of such pollutants." The statute fails, however, to specifically state that municipal dischargers must meet water quality standards.

As a result, the municipal storm water dischargers have argued that they do not have to meet water quality standards; and that they only are required to meet MEP. Environmental interest groups maintain that not only do MS4 discharges have to meet water quality standards, but that MS4 permits must also comply with numeric effluent limitations for the purpose of meeting water quality standards. On the issue of water quality standards, USEPA, the SWRCB, and the Regional Board have consistently maintained that MS4s must indeed comply with water quality standards. On the issue of whether water quality standards must be met by numeric effluent limits, USEPA, the SWRCB (in Orders WQ 91-03 and WQ 91-04), and the Regional Board have maintained that MS4 permits can, at this time, contain narrative requirements for the implementation of BMPs in place of numeric effluent limits.

In addition to relying on USEPA's legal opinion concluding that MS4s must meet MEP and water quality standards, the SWRCB also relied on the CWA's explicit authority for States to require "such other provisions that the Administrator or the State determines appropriate for the control of such pollutants" in addition to the technology-based standard of MEP. To further support its conclusions that MS4 permit dischargers must meet water quality standards, the SWRCB relied on provisions of the CWC that specify that all waste discharge requirements must implement applicable Basin Plans and take into consideration the appropriate water quality objectives for the protection of beneficial uses.

The SWRCB first formally concluded that permits for MS4s must contain effluent limitations based on water quality standards in its Order WQ 91-03. In that Order, the SWRCB also concluded that it was appropriate for Regional Boards to achieve this result by requiring best

management practices, rather than by inserting numeric effluent limitations into MS4 permits. Later, in Order WQ 98-01, the SWRCB prescribed specific precedent setting Receiving Water Limitations language to be included in all future MS4 permits. This language specifically requires that MS4 dischargers meet water quality standards and allows for the use of narrative BMPs (increasing in stringency and implemented in an iterative process) as the mechanism by which water quality standards can be met.

In Order WQ 99-05, the SWRCB modified its receiving water limitations language in Order WQ 98-01 to meet specific objections by USEPA (the modifications resulted in stricter compliance with water quality standards). SWRCB Order WQ 99-05 states:

> "In Order WQ 98-01, the SWRCB ordered that certain receiving water limitation language be included in future municipal storm water permits. Following inclusion of that language in permits issued by the San Francisco Bay and San Diego Regional Boards for Vallejo and Riverside respectively, the USEPA objected to the permits. The USEPA objection was based on the receiving water limitation language. The USEPA has now issued those permits itself and has included receiving water limitation language it deems appropriate.
>
> In light of USEPA's objection to the receiving water limitation language in Order WQ 98-01 and its adoption of alternative language, the SWRCB is revising its instructions regarding receiving water limitation language for municipal storm water permits. It is hereby ordered that Order WQ 98-01 will be amended to remove the receiving water limitation language contained therein and to substitute the USEPA language. Based on the reasons stated here, and as a precedent decision, the following receiving water limitation language shall be included in future municipal storm water permits."

In 1999 case involving MS4 permits issued by USEPA to several Arizona cities (*Defenders of Wildlife v. Browner*, 1999, 197 F. 3d 1035), the United States Court of Appeals for the Ninth Circuit upheld USEPA's requirement for MS4 dischargers to meet water quality standards, but it did so on the basis of USEPA's discretion rather than on the basis of strict compliance with the Clean Water Act. In other words, while holding that the Clean Water Act does not require all MS4 discharges to comply strictly with state water quality standards, the Court also held that USEPA has the authority to determine that ensuring strict compliance with state water quality standards is necessary to control pollutants. On the question of whether MS4 permits must contain numeric effluent limitations, the court upheld USEPA's use of iterative BMPs in place of numeric effluent limits.

On October 14, 1999, the SWRCB issued a legal opinion on the federal appellate decision and provided advice to the Regional Boards on how to proceed in the future. In the memorandum, the SWRCB concludes that the recent Ninth Circuit opinion upholds the discretion of USEPA and the State to (continue to) issue permits to MS4s that require compliance with water quality standards through iterative BMPs. Moreover, the memorandum states that "[…] because most MS4 discharges enter impaired water bodies, there is a real need for permits to include stringent requirements to protect those water bodies. As TMDLs are developed, it is likely that MS4s will have to participate in pollutant load reductions, and the MS4 permits are the most effective vehicles for those reductions." In summary, the SWRCB found that the Regional Boards should continue to include the RWL established in SWRCB Order WQ 99-05 in all future permits.

The issue of the RWLs language was also central to BIA's (and others') appeal of Order No. 2001-01 (Order No. R9-2007-0001 serves as the reissuance of Order No. 2001-01). BIA contended that the MEP standard was a ceiling on what could be required of the Copermittees in implementing their urban runoff management programs, and that Order No. 2001-01's receiving

water limitations requirements exceeded that ceiling. In other words, BIA argued that the Copermittees could not be required to comply with receiving water limitations if they necessitated efforts which went beyond the MEP standard. Again, the courts upheld the Regional Board's discretion to require compliance with water quality standards in municipal storm water permits, without limitation. The Court of Appeal, Fourth Appellate District found that the Regional Board has "the authority to include a permit provision requiring compliance with water quality standards."[102] On further appeal by BIA, the California State Supreme Court declined to hear the matter.

While implementation of the iterative BMP process is a means to achieve compliance with water quality objectives, it does not shield the discharger from enforcement actions for continued non-compliance with water quality standards. Consistent with USEPA guidance,[103] regardless of whether or not an iterative process is being implemented, discharges that cause or contribute to a violation of water quality standards are in violation of Order No. R9-2007-0001.

Finding E.2: The Basin Plan identifies the following beneficial uses for water bodies in the Santa Diego County watersheds: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Process Supply (PROC), Industrial Service Supply (IND), Ground Water Recharge (GWR), Contact Water Recreation (REC1) Non-contact Water Recreation (REC2), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Freshwater Replenishment (FRSH), Hydropower Generation (POW), and Preservation of Biological Habitats of Special Significance (BIOL). The following additional beneficial uses are identified for coastal waters of San Diego County: Navigation (NAV), Commercial and Sport Fishing (COMM), Estuarine Habitat (EST), Marine Habitat (MAR), Aquaculture (AQUA), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN), and Shellfish Harvesting (SHELL).

Discussion: The San Diego County watersheds include all of Carlsbad, San Dieguito, Penasquitos, San Diego, Pueblo, Sweetwater, and Otay watersheds, and portions of Santa Margarita, San Luis Rey, and Tijuana watersheds. Major Rivers include the Santa Margarita River, the San Luis Rey River, San Dieguito River, San Diego River, Sweetwater River, Otay River and the Tijuana River. Major coastal waterbodies include Buena Vista Lagoon, Agua Hedionda Lagoon, Batiquitos Lagoon, San Elijo Lagoon, San Dieguito Lagoon, Los Penasquitos Lagoon, Mission Bay, San Diego Bay, Tijuana River estuary, and the Pacific Ocean. Major inland waterbodies include Lake Henshaw, Lake Wohlford, Lake Hodges, Sutherland Reservoir, Miramar Reservoir, San Vicente Reservoir, El Capitan Reservoir, Cuyamaca Reservoir, Sweetwater Reservoir, Loveland Reservoir, Otay Lakes, Barrett Lake and Morena Reservoir.

The San Diego County watersheds are approximately 2820 square miles and includes unincorporated portions of San Diego County, the Cities of Carlsbad, Chula Vista, Coronado, Del Mar, El Cajon, Encinitas, Escondido, Imperial Beach, La Mesa, Lemon Grove, National City, Oceanside, Poway, San Diego, San Marcos, Santee, Solana Beach, Vista, as well as the San Diego Unified Port District and the San Diego County Regional Airport Authority, portions of the Cleveland National Forests, and the several Indian Reservations. Approximately 2.8 million people reside within the permitted area. Approximately 442 thousand people reside in the unincorporated area while the rest reside within the cities.

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[102] Building Industry Association et al., v. State Water Resources Control Board, et al. 2004.
[103] USEPA, 1998. Jan. 21, 1998 correspondence, "SWRCB/OCC File A-1041 for Orange County," from Alexis Strauss to Walt Petit, and March 17, 1998 correspondence from Alexis Strauss to Walt Petit.

Finding E.3: This Order is in conformance with SWRCB Resolution No. 68-16 and the federal Antidegradation Policy described in 40 CFR 131.12.

Discussion: Urban runoff management programs are required to be designed to reduce pollutants in urban runoff to the maximum extent practicable and achieve compliance with water quality standards. Therefore, implementation of urban runoff management programs, which satisfy the requirements of Order No. R9-2007-0001, will prevent violations of receiving water quality standards. The Basin Plan states that "Water quality objectives must […] conform to US EPA regulations covering antidegradation (40 CFR 131.12) and State Board Resolution 68-16, Statement of Policy with Respect to Maintaining High Quality of Waters in California." As a result, when water quality standards are met through the implementation of urban runoff management programs, USEPA and SWRCB antidegradation policy requirements are also met.

Finding E.4: Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states with approved coastal zone management programs to address non-point pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point pollution: agriculture, silviculture, urban, marinas, and hydromodification. This NPDES permit addresses the management measures required for the urban category, with the exception of septic systems. The adoption and implementation of this NPDES permit relieves the Permittee from developing a non-point source plan, for the urban category, under CZARA. The Regional Board addresses septic systems through the administration of other programs.

Discussion: Coastal states are required to develop programs to protect coastal waters from nonpoint source pollution, as mandated by the federal CZARA. CZARA Section 6217 identifies polluted runoff as a significant factor in coastal water degradation, and requires implementation of management measures and enforceable policies to restore and protect coastal waters. In lieu of developing a separate NPS program for the coastal zone, California's NPS Pollution Control Program was updated in 2000 to address the requirements of both the CWA section 319 and the CZARA section 6217 on a statewide basis. The California Coastal Commission (CCC), the SWRCB, and the nine Regional Water Quality Control Boards are the lead State agencies for upgrading the program, although 20 other State agencies also participate. Pursuant to the CZARA (6217(g) Guidance Document the development of urban runoff management programs pursuant to this NPDES permit fulfills the need for coastal cities to develop an urban runoff non-point source plan identified in the State's Non-point Source Program Strategy and Implementation Plan.[104]

Finding E.5: Section 303(d)(1)(A) of the CWA requires that "Each state shall identify those waters within its boundaries for which the effluent limitations…are not stringent enough to implement any water quality standard (WQS) applicable to such waters." The CWA also requires states to establish a priority ranking of impaired waterbodies known as Water Quality Limited Segments and to establish TMDLs for such waters. This priority list of impaired waterbodies is called the Section 303(d) List. The current Section 303(d) List was approved by the State Water Resources Control Board on February 4, 2003 and on July 25, 2003 by USEPA.

Discussion: Section 303(d) of the federal CWA (CWA, 33 USC 1250, et seq., at 1313(d)), requires States to identify waters that do not meet water quality standards after applying certain required technology-based effluent limits ("impaired" water bodies). States are required to compile this information in a list and submit the list to USEPA for review and approval. This list

[104] SWRCB/CCC, 2000. Nonpoint Source Program Strategy And Implementation Plan, 1998-2013 (PROSIP).

is known as the Section 303(d) list of impaired waters. As part of this listing process, States are required to prioritize waters/watersheds for future development of TMDL. The SWRCB and Regional Boards have ongoing efforts to monitor and assess water quality, to prepare the Section 303(d) list, and to subsequently develop TMDLs. The 2002 California 303(d) List identifies impaired receiving water bodies and their watersheds within the State of California. Urban runoff that is discharged from the Copermittee's MS4s is a leading cause of receiving water quality impairment in the San Diego Region.

Finding E.6: This Order fulfills a component of the TMDL Implementation Plan adopted by this Regional Board on August 14, 2002 for diazinon in Chollas Creek by establishing WQBELs for the Cities of San Diego, Lemon Grove, and La Mesa, the County of San Diego, and the San Diego Unified Port District; and by requiring: 1) legal authority, 2) implementation of a diazinon toxicity control plan and a diazinon public outreach/ education program, 3) achievement of the Compliance Schedule, and 4) a monitoring program. The establishment of WQBELs expressed as iterative BMPs to achieve the WLA compliance schedule is appropriate and is expected to be sufficient to achieve the WLA specified in the TMDL.

Discussion: On August 14, 2002, the Regional Board adopted the TMDL Implementation Plan[105] for diazinon in Chollas Creek by establishing WQBELs for the Cities of San Diego, Lemon Grove, and La Mesa, the County of San Diego, and the San Diego Unified Port District. The adopted Implementation Plan states:

> "The Regional Board will revise existing waste discharge requirements / NPDES permits to incorporate effluent limitations in conformance with the Waste Load Allocations for diazinon as specified above. Modifications to the MS4 Permit can occur when the permit is reopened or during scheduled permit reissuance. Compliance with numeric limitations for diazinon will be required in accordance with a phased schedule of compliance. The compliance schedule will be jointly developed by the Regional Board and the Chollas Creek stakeholders and will be finalized no later than one year following adoption of this TMDL by the Regional Board. The phased compliance schedule will apply only to attainment of numeric limitations for diazinon. All other requirements of this TMDL will be immediately effective upon incorporation into applicable NPDES permits."

On September 30, 2004, the compliance schedule was developed. The Order incorporates the compliance schedule. The TMDL Implementation Plan requires 1) Legal authority, 2) Implementation of a diazinon toxicity control plan and a diazinon public outreach / education program, 3) Achievement of the Compliance Schedule, and 4) Monitoring program. These requirements have been incorporated in the Order. The Implementation Plan states:

> "The municipal Copermittees in the Chollas Creek watershed shall implement the requirements of the MS4 Permit." And
>
> "The Regional Board will use its enforcement authority as necessary to ensure compliance with applicable waste discharge requirements and Basin Plan waste discharge prohibitions."

Finding E.7: This Order fulfills a component of the TMDL Implementation Plan adopted by this Regional Board on February 9, 2005 for dissolved copper in Shelter Island Yacht Basin (SIYB) by establishing WQBELs expressed as BMPs to achieve the WLA of 30 kg copper / year for the

[105] Regional Board, 2002. Basin Plan Amendment, Attachment A to Resolution No. R9-2002-0123, Chollas Creek Diazinon Total Maximum Daily Load. P. 6-8.

City of San Diego and the San Diego Unified Port District. The establishment of WQBELs expressed as BMPs is appropriate and is expected to be sufficient to achieve the WLA specified in the TMDL.

Discussion: On February 9, 2005, the Regional Board adopted the TMDL Implementation Plan[106] for dissolved copper in the SIYB by establishing WQBELs expressed as BMPs to achieve the WLAs for the San Diego Unified Port District and to a much lesser extent the City of San Diego. The TMDL Implementation Plan states:

> "The Regional Board will regulate discharges of copper to SIYB through the issuance of WDRs, Waivers of WDRs (waivers), or adoption of Waste Discharge prohibitions." And
>
> "The Regional Board will amend Order No. 2001-01, "Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm / Sewer Systems" to require that discharges of copper into SIYB waters via the City's municipal separate storm sewer system not exceed a 30 mg/kg wasteload for copper."

The Order is a WDR, therefore the discharge of copper to SIYB is regulated as required in the TMDL Implementation Plan. As stated in Finding A.2, the Order renews Order No. 2001-01, therefore the TMDL Implementation Plan requirements are included in this Order. The establishment of WQBELs expressed as BMPs is appropriate and is expected to be sufficient to achieve the WLAs specified in the TMDL.

Finding E.8: This Order establishes WQBELs and conditions consistent with the requirements and assumptions of the WLAs in the TMDLs as required by 40 CFR 122.44(d)(1)(vii)(B).

Discussion: The establishment of WQBELs expressed as iterative BMPs to achieve the WLA compliance schedule is appropriate and is expected to be sufficient to achieve the WLAs specified in the TMDL.

Finding E.9: Requirements in this Order that are more explicit than the federal storm water regulations in 40 CFR 122.26 are prescribed in accordance with the CWA section 402(p)(3)(iii) and are necessary to meet the MEP standard.

Discussion: The CWA explicitly preserves independent state authority to enact and implement its own standards and requirements, provided that such standards and requirements are at least as stringent as those that would be mandated by the CWA and the federal regulations. For example, as one general overriding principle, CWA section 510 states "nothing in this chapter shall (1) preclude or deny the right of any State or political subdivision thereof or interstate agency to adopt or enforce (A) any standard or limitation respecting discharges of pollutants, or (B) any requirement respecting control or abatement of pollution […]." When relating specifically to storm water, CWA section 402(p)(3)(B)(iii) clearly provides states with wide-ranging discretion, stating that municipal storm water permits "[s]hall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants"

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[106] Regional Board, 2005. Basin Plan Amendment, Attachment A to Resolution No. R9-2005-0019, Amendment to the Water Quality Control Plan for the San Diego Region to Incorporate a Total Maximum Daily Load for Dissolved Copper in Shelter Island Yacht Basin, San Diego Bay. P. 5.

Therefore, where the Order contains requirements more specific than those included in the federal NPDES regulations 40 CFR 122.26(d), it is seeking to meet the above CWA requirements, as well as other particular federal NPDES regulations such as 40 CFR 122.44(d)(1)(i). This federal NPDES regulation requires NPDES permits to include limitations to "control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality." Given the continued impact of urban runoff on receiving waters within the San Diego region, increased specificity in municipal storm water permits is necessary to meet the above CWA and federal regulation requirements.

In a 1992 decision, the U.S. Court of Appeals for the Ninth Circuit (NRDC v. USEPA, 966 F.2d 1292) interpreted the language in Clean Water Act section 402(p)(3)(B)(iii) as providing the State with substantial discretion and authority: "[t]he language in (iii), above, requires the Administrator or the State to design controls. Congress did not mandate a minimum standards approach or specify that USEPA develop minimal performance requirements […] we must defer to USEPA on matters such as this, where USEPA has supplied a reasoned explanation of its choices." The decision in essence holds that USEPA and the States are authorized to require implementation of storm water control programs that, upon "reasoned explanation," accomplish the goals of CWA section 402(p). The Ninth Circuit Court of Appeals further reinforced the State's authority in this area more recently in 1999. In Defenders of Wildlife v. Browner (1999) Case No. 98-71080, the Court cited the language of CWA section 402(p)(3)(B)(iii) and stated "[t]hat provision gives the USEPA discretion to determine what pollution controls are appropriate. As this court stated in NRDC v. USEPA, 'Congress gave the administrator discretion to determine what controls are necessary […].'"

Furthermore, the increased specificity included in the Order is in line with USEPA guidance included in its *Guidance Manual for the Preparation of Part 2 of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems*[107] and its *Interim Permitting Approach for Water Quality-Based Effluent Limitations in Storm Water Permits*.[108] Where the permit is more specific than the federal regulations, it is frequently based on the recommendations of the Guidance Manual. The Interim Permitting Approach also supports increased specificity in storm water permits, recommending that municipal storm water permits use BMPs in first-round storm water permits, and expanded or better-tailored BMPs in subsequent permits, where necessary, to provide for the attainment of water quality standards. In cases where adequate information exists to develop more specific conditions or limitations to meet water quality standards, these conditions or limitations are to be incorporated into storm water permits, as necessary and appropriate." It is important to note that the SWRCB cited USEPA's Interim Permitting Approach as support for its decision which upheld the increased specificity of numeric sizing criteria requirements for post-construction BMPs as appropriate requirements in municipal storm water permits.

Finding E.10: Urban runoff treatment and/or mitigation must occur prior to the discharge of urban runoff into a receiving water. Federal regulations at 40 CFR 131.10(a) state that in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the

[107] USEPA, 1992. Guidance Manual for the Preparation of Part II of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems. EPA 833-B-92-002.
[108] USEPA, 1996. Interim Permitting Approach for Water Quality-Based Effluent Limitations in Storm Water Permits. 61 FR 43761.

U.S. Authorizing the construction of an urban runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to accepting waste assimilation as an appropriate use for that water body. Furthermore, the construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body. This is consistent with USEPA guidance to avoid locating structural controls in natural wetlands.

Discussion: Urban runoff treatment and/or mitigation in accordance with any of the requirements in the Order must occur prior to the discharge of storm water or urban runoff into receiving waters. Allowing polluted runoff to enter receiving waters prior to treatment to the MEP will result in degradation of the water body and potential exceedances of water quality standards, from the discharge point to the point of dissipation, infiltration, or treatment. Furthermore, the construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body. This requirement is supported by federal regulation 40 CFR 131.10(a) and USEPA guidance. According to USEPA,[109] "To the extent possible, municipalities should avoid locating structural controls in natural wetlands. Before considering siting of controls in a natural wetland, the municipality should demonstrate that it is not possible or practicable to construct them in sites that do not contain natural wetlands… Practices should be used that settle solids, regulate flow, and remove contaminants prior to discharging storm water into a wetland."

Finding E.11: Urban runoff is a significant contributor to the creation and persistence of Toxic Hot Spots in San Diego Bay. CWC section 13395 requires regional boards to reevaluate WDRs associated with toxic hot spots. The SWRCB adopted the Consolidated Toxic Hot Spot Cleanup Plan in June 1999. The Plan states: "The reevaluation [of WDRs associated with toxic hot spots] shall consist of (1) an assessment of the WDRs that may influence the creation or further pollution of the known toxic hot spot, (2) an assessment of which WDRs need to be modified to improve environmental conditions at the known toxic hot spot, and (3) a schedule for completion of any WDR modifications deemed appropriate."

Discussion: Toxic hot spots are those areas in enclosed bays, estuaries, or any adjacent waters in the "contiguous zone" or the "ocean", where pollution or contamination affects the interests of the state, and where hazardous substances have accumulated to levels which: 1) may pose a substantial present or potential hazard to aquatic life, wildlife, fisheries, or human health, or 2) may adversely affect the beneficial uses of the bay, estuary, or ocean waters, or 3) exceeds adopted water quality or sediment quality objectives. San Diego Bay contains several toxic hot spots. In a National Oceanic and Atmospheric Administration (NOAA) study which compared EMAP-type sediment toxicity data from various bays, San Diego Bay ranked second with 56 percent of the area of the Bay considered toxic. In addition to chemical and physical impacts, urban runoff often contains pollutants that cause toxicity to aquatic organisms (i.e., adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies). Toxic pollutants impact the overall quality of aquatic systems and beneficial uses of receiving waters. A study of urban runoff samples from Chollas Creek in San Diego County, revealed toxic concentrations of

[109] USEPA, 1992. Guidance Manual for the Preparation of Part II of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems. EPA 833-B-92-002.

organophospate pesticides and metals.[110] In Los Angeles County, storm water samples were found to be toxic to various aquatic organisms in the Los Angeles River, the San Gabriel River, Ballona Creek, and the Santa Monica Bay.[111] Also, a water quality data assessment conducted in Aliso Creek in Orange County showed that storm events caused varying degrees of mortality to test organisms.[112] For these reasons, the Order includes directives to prevent urban runoff from contributing to the further degradation of toxic hot spots.

Finding E.12: The issuance of waste discharge requirements and an NPDES permit for the discharge of urban runoff from MS4s to waters of the U.S. is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 et seq.) in accordance with the CWC section 13389.

Discussion: CWC Section 13389 exempts the adoption of waste discharge requirements (such as NPDES permits) from CEQA requirements: "Neither the state board nor the regional boards shall be required to comply with the provisions of Chapter 3 (commencing with section 21100) of Division 13 of the Public Resources Code prior to the adoption of any waste discharge requirement, except requirements for new sources as defined in the Federal Water Pollution Control Act or acts amendatory thereof or supplementary thereto."

This CEQA exemption was challenged during BIA's (and others') appeal of Order No. 2001-01 (Order No. R9-2007-0001 serves as the reissuance of Order No. 2001-01). BIA contended that the CEQA exemption did not apply to permit requirements where the Regional Board utilized its discretion to craft permit requirements which were more prescriptive than required by federal law. The Court of Appeal, Fourth Appellate District disagreed with this argument, stating "we also reject Building Industry's argument to the extent it contends the statutory CEQA exemption in Water Code section 13389 is inapplicable to a particular NPDES permit provision that is discretionary, rather than mandatory, under the CWA."[113] On further appeal by BIA, the California State Supreme Court declined to hear the matter.

In a recent decision, the Court of Appeal of the State of California, Second Appellate District, upheld the CEQA exemption for municipal storm water NPDES permits (County of Los Angeles, et al. v. California State Water Resources Control Board, et al.).

F. Public Process

Finding F.1: The Regional Board has notified the Copermittees, all known interested parties, and the public of its intent to consider adoption of an Order prescribing waste discharge requirements that would serve to renew an NPDES permit for the existing discharge of urban runoff.

Discussion: Public notification of development of a draft permit is required under Federal regulation 40 CFR 124.10(a)(1)(ii). This regulation states "(a) Scope. (1) The Director shall give public notice that the following actions have occurred: (ii) A draft permit has been prepared

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[110] Bay, et al., 2001. Characterization of Stormwater Toxicants from an Urban Watershed to Freshwater and Marine Organisms. Southern California Coastal Water Research Project. Annual Report 1999-2000.
[111] LARWQCB, 2001. The Role of Municipal Operators In Controlling the Discharge of Pollutants in Storm Water from Industrial/Commercial Facilities: A Case for Inspection Activities in the Large and Medium Municipal Separate Storm Sewer Permits.
[112] Regional Board, 2002. Fact Sheet/Technical Report for Regional Board Order No. R9-2002-0001.
[113] Building Industry Association et al., v. State Water Resources Control Board, et al. 2004.

under Sec. 124.6(d)." Public notifications "shall allow at least 30 days for public comment," as required under Federal regulation 40 CFR 124.10(b)(1).

Finding F.2: The Regional Board has, at public meetings on (date), held public hearings and heard and considered all comments pertaining to the terms and conditions of this Order.

Discussion: Public hearings are required under CWC Section 13378, which states "Waste discharge requirements and dredged or fill material permits shall be adopted only after notice and any necessary hearing." Federal regulation 40 CFR 124.12(a)(1) also requires public hearings for draft permits, stating "The Director shall hold a public hearing whenever he or she finds, on the basis or requests, a significant degree of public interest in a draft permit(s)." Regarding public notice of a public hearing, Federal regulation 40 CFR 124.10(b)(2) states that "Public notice of a public hearing shall be given at least 30 days before the hearing."

X. DIRECTIVES DISCUSSION

This section discusses significant changes which have been made to the requirements of the Order from the requirements which were previously included in Order No. 2001-01. For each section of the Order than has been changed there is a discussion which describes the change that was made and provides the rationale for the change. In addition, comments on the Copermittees' ROWD recommendations, as they pertain to each changed requirement of the Order, are provided.

Requirements of the Order that are not discussed in this section have not been significantly changed from those requirements previously included in Order No. 2001-01. For such requirements, discussions and rationale for the requirements can be found in section VII of the Fact Sheet/Technical Report for Regional Board Order No. 2001-01, dated November 6, 2001. Section VII also provides additional background information for those requirements that have undergone significant change which are described in detail in this report. The Fact Sheet/Technical Report is available for download at:

http://www.waterboards.ca.gov/sandiego/programs/sd_stormwater.html

Legal authority citations are provided for each major section of the Order. These citations apply to all applicable requirements within the section for which they are provided.

A. Prohibitions and Receiving Water Limitations

The following legal authority applies to section A:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: The Regional Board Water Quality Control Plan for the San Diego Basin (Basin Plan) contains the following waste discharge prohibition: "The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination, or nuisance as defined in California Water Code Section 13050, is prohibited."

California Water Code section 13050(l) states "(1) 'Pollution' means an alteration of the quality of waters of the state by waste to a degree which unreasonably affects either of the following: (A) The water for beneficial uses. (B) Facilities which serve beneficial uses. (2) 'Pollution' may include "contamination."

California Water Code section 13050(k) states "'Contamination' means an impairment of the quality of waters of the state by waste to a degree which creates a hazard to public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste, whether or not waters of the state are affected."

California Water Code section 13050(m) states "'Nuisance' means anything which meets all of the following requirements: (1) Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. (2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. (3) Occurs during, or as a result of, the treatment or disposal of wastes."

California Water Code section 13241 requires each regional board to "establish such water quality objectives in water quality control plans as in its judgment will ensure the reasonable protection of beneficial uses and the prevention of nuisance […]."

California Water Code Section 13243 provides that "A regional board, in a water quality control plan or in waste discharge requirements, may specify certain conditions or areas where the discharge of waste, or certain types of waste, will not be permitted."

California Water Code Section 13263(a) provides that waste discharge requirements prescribed by the Regional Board implement the Basin Plan.

Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(A - D) require municipalities to implement controls to reduce pollutants in urban runoff from commercial, residential, industrial, and construction land uses or activities.

Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(A - D) require municipalities to have legal authority to control various discharges to their MS4.

Federal NPDES regulation 40 CFR 122.44(d)(1) requires municipal storm water permits to include any requirements necessary to "[a]cheive water quality standards established under section 303 of the CWA, including State narrative criteria for water quality."

Federal NPDES regulation 40 CFR 122.44(d)(1)(i) requires NPDES permits to include limitations to "control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines are or may be discharged at a level which will cause, have reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality."

Section A of the Order combines two previously distinct requirement sections – Prohibitions and RWLs. These sections have been combined into one section for organization purposes and to reduce redundancy, since both sections address the same issue. In addition, the prohibition specifically addressing post-development runoff has been removed from the Order since it reiterated other more broad prohibitions, making it redundant. These changes have no net effect on the implementation and enforcement of the Order.

B. Non-Storm Water Discharges

The following legal authority applies to section B:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B) requires MS4 operators "to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B)(1) provides that the Copermittees shall prevent all types of illicit discharges into the MS4 except for certain non-storm water discharges.

Section B of the Order has been reworded to simplify and clarify the requirements for addressing non-storm water discharges that are not prohibited. This rewording has no net effect on the implementation and enforcement of the Order.

In their ROWD, the Copermittees recommend expanding the BMP exemption for emergency fire fighting flows so that it would apply to all emergency water flows. However, the Copermittees provide no information regarding what types of urban runoff are considered "emergency water flows." In addition, the level of pollutants in such flows is not discussed. Due to the lack of such information, the requirement regarding emergency fire fighting flows has not been changed.

C. Legal Authority

The following legal authority applies to section C:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(i)(A) provides that the Copermittees shall develop and implement legal authority to "Control through ordinance, order or similar means, the contribution of pollutants to the municipal storm sewer by storm water discharges associated with industrial activity and the quality of storm water discharged from sites of industrial activity."

Federal NPDES regulation 40 CFR 122.26(d)(2)(i)(D) provides that the Copermittees shall develop and implement legal authority to "Control through interagency agreements among coapplicants the contribution of pollutants from one portion of the municipal system to another portion of the municipal system."

Illicit discharge is defined under Federal NPDES regulation 40 CFR 122.26(b)(2) as "any discharge to a municipal separate storm sewer system that is not composed entirely of storm water except discharges pursuant to a NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer) and discharges resulting from fire fighting activities."

Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(A - D) require municipalities to implement controls to reduce pollutants in urban runoff from commercial, residential, industrial, and construction land uses or activities.

Federal NPDES regulation 40 CFR 122.26(d)(1)(ii) requires from the Copermittee "A description of existing legal authority to control discharges to the municipal separate storm sewer system."

Section C.1.j has been added to the Order to ensure that BMPs implemented by third parties are effective. Since the Copermittees cannot passively receive and discharge pollutants from third parties, the Copermittees must ensure discharges of pollutants to the MS4 are reduced to the MEP. In order to achieve this, the Copermittees must be able to ensure that effective BMPs are being implemented by requiring the third parties to document BMP effectiveness. Regarding the Copermittees' ability to require documentation and reporting from third parties, USEPA states "municipalities should provide documentation of their authority to enter, sample, inspect, review, and copy records, etc., as well as demonstrate their authority to require regular reports."[114]

Section C.2.d has been added to the Order to ensure that the Copermittees' enforcement tools are effective enough to ensure compliance with the Order. USEPA supports the need for the adequate Copermittee enforcement when it states that the Copermittees' general counsels "should state that the applicant has the legal authority to apply and enforce the requirements of 40 CFR 122.26(d)(2)(i)(A-F)."[115]

D. Jurisdictional Urban Runoff Management Program

D.1. Development Planning

The following legal authority applies to section D.1:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWA section 402(a), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F), 40 CFR 131.12, and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(2) provides that Copermittees develop and implement a proposed management program which is to include "A description of planning procedures including a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal separate storm sewers which receive discharges from areas of new development and significant redevelopment. Such plan shall address controls to reduce pollutants in discharges from municipal separate storm sewers after construction is completed."

Federal NPDES regulation 40 CFR 122.44(d)(1) requires municipal storm water permits to include any requirements necessary to "[a]cheive water quality standards established under section 303 of the CWA, including State narrative criteria for water quality."

Sections D.1.a and D.1.b (General Plan and Environmental Review Process) require the Copermittees to update and revise their General Plan (or equivalent plan) and environmental review processes to ensure water quality and watershed protection principles are included. The Copermittees are required to detail any changes to the General Plan or environmental review process in their Jurisdictional Urban Runoff Management Program Annual Reports.

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[114] USEPA, 1992. Guidance Manual for the Preparation of Part 2 of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems. EPA 833-B-92-002.
[115] Ibid.

The change made to these sections, which requires updating the General Plan and Environmental Review Process on an as needed basis, is supported by information provided in the Copermittees' ROWD. The ROWD states that all Copermittees have either updated, are in the process of updating, or have assessed their General Plan to ensure the General Plans include the required principles and are in compliance with Order No. 2001-01. The ROWD also states that all the Copermittees have updated their environmental review processes.

Section D.1.c (Approval Process Criteria and Requirements) requires that all development projects (regardless of size) implement BMPs to reduce pollutant discharges to the MEP. Source control and site design BMP requirements were not clearly described in this section of Order No. 2001-01. Additional detail has been added to this section to better describe the source control and site design BMPs needed for implementation. This additional detail is consistent with the requirements of the Model SUSMP. However, only source control and site design BMPs that apply to all types of development projects are required (i.e., properly designed trash storage areas).

In addition, Order No. 2001-01's requirement that applicants must provide evidence of coverage under the General Industrial Permit has been removed. This requirement was difficult to implement since industrial tenants for a development project are usually not known during the planning stage.

Sections D.1.d and D.1.d.(1) (Standard Urban Storm Water Mitigation Plans) require the Copermittees to review and update their local SUSMPs for compliance with the Order. The sections also require all Priority Development Projects falling under certain categories to meet SUSMP requirements. The update is necessary to ensure that the Copermittees' local SUSMPs are consistent with the changes that have been made to the Order's SUSMP requirements. The requirement for the development/adoption of a Model SUSMP has been removed since a model was completed and adopted in 2002.

Section D.1.d.(2) (Priority Development Project Categories) has been changed to simplify and clarify the Priority Development Project categories. The two housing development categories were combined into one category that includes 10 or more housing units. In addition, requirements which specifically apply to restaurants have been combined in this section. The section has been modified to clarify that restaurants with less than 5,000 square feet of development are subject to SUSMP requirements, except for the treatment control BMP and hydromodification control requirements. This is consistent with Order No. 2001-01's approach for applying SUSMP requirements to restaurants.

Section D.1.d.(2)(i) includes Retail Gasoline Outlets (RGOs) as a Priority Development Project category because RGOs are points of confluence for motor vehicles for automotive related services such as repair, refueling, tire inflation, and radiator fill-up. RGOs consequently produce significantly greater pollutant loadings of hydrocarbons and trace metals (including copper and zinc) than other urban areas. To meet MEP, source control and structural treatment BMPs are needed at RGOs that meet the following criteria: (a) 5,000 square feet or more of developed area, or (b) a projected ADT of 100 or more vehicles per day. These are appropriate thresholds since development size and volume of traffic are good indicators of potential impacts of urban runoff from RGOs on receiving waters.

In SWRCB WQ Order No. 2000-11, the SWRCB removed RGOs as a SUSMP category because the SWRCB found that RGOs were already heavily regulated and limited on their ability to construct infiltration devices or perform treatment. Order No. 2000-11 also acknowledged that a

threshold (size, average daily traffic, etc.) appropriate to trigger SUSMP requirements should be developed, and that specific findings regarding RGOs should be included in MS4 permits to justify the requirement.[116] The SWRCB also removed the RGO category from the San Diego County MS4 permit (Order No. 2001-01) because the Regional Board did not specifically address the issues raised in WQ Order No. 2000-11.

As discussed further below, the LARWQCB and the Regional Board have adequately addressed these issues. RGOs have been included as a SUSMP category in the Los Angeles County MS4 permit (Order No. R4-01-182), the statewide general Phase II MS4 permit (WQ Order No. 2003-0005-DWQ), and the Regional Board Southern Riverside County MS4 permit (Order No. R9-2004-001). The SWRCB also addressed the inclusion of RGOs through the appeals of MS4 permits issued by the Los Angeles and San Francisco Bay Area Regional Boards. The SWRCB held a workshop addressing RGOs and identified RGOs as significant sources of pollutants. The SWRCB then dismissed the petitions for removal of RGOs from the SUSMP requirements in the Los Angeles and San Francisco Bay Area MS4 permits.

The following issues regarding RGOs have been addressed:

Heavily Regulated - The heavily regulated distinction does not remove RGOs as significant source of pollutants in urban runoff and therefore should not be a basis for exempting them from SUSMP requirements. Other regulation of RGOs is separate from regulation under the CWA and does not necessarily relate to water quality and urban runoff. Moreover, other municipalities already require that RGOs implement structural BMPs, even though RGOs are regulated under other programs.

Treatment Limitations - Inexpensive and effective structural treatment BMPs which reduce pollutants and control peak flow rates and velocities are available for use at RGOs. Studies have shown that some catch basin inserts can remove hydrocarbons and heavy metals, which are typical pollutants of concern at RGOs. Sand or media filters have also been found to be effective and available for use at RGOs. Cisterns are examples of established BMPs to control flow, but RGOs could also use site design measures such as small weirs, baffles, and redirecting roof runoff to pervious areas.

Safety - No evidence has been provided to indicate that use of these structural BMPs at RGOs will pose a safety risk. In fact, filter BMPs have been installed at RGOs in other municipalities without apparent adverse safety effects. In addition, similar BMPs such as oil/water separators have been used for years by RGOs without safety problems.

Threshold - Studies indicate that runoff from RGOs contains similar pollutants to runoff from commercial parking lots. In precedential WQ Order 2000-11, the SWRCB determined that parking lots with a size threshold of 5,000 square feet or more is an appropriate SUSMP category. Based in part on the similarity of pollutants, the 5,000 square feet size threshold was also included for RGOs in the Order. In addition, other municipalities currently use similar size thresholds for RGOs when requiring design standards to mitigate storm water runoff. To provide additional flexibility for the Copermittees, another threshold of 100 or more motor vehicles ADT has been added to the Order. This threshold is based on requirements used in Washington and Oregon for what are considered “high use” sites. This is an appropriate threshold since vehicular traffic is a good indicator of the amount of pollutants generated at a site.

[116] SWRCB, 2000. Order WQ 2000-11.

The Regional Board followed the SWRCB's direction regarding RGOs by including the above discussion in this Fact Sheet, as well as a specific finding that justifies the regulation of urban runoff from RGOs that meet certain criteria. Considering all of the supporting documentation discussed above, it is appropriate to include RGOs as a Priority Development Project category.

Additional detailed supporting information can be found in the 2001 technical report titled *Retail Gasoline Outlets: New Development Design Standards for Mitigation of Storm Water Impacts* by the LARWQCB and the Regional Board.

Section D.1.d.(4) (Site Design BMP Requirements) requires the Copermittees to place site design requirements on new development within their jurisdictions. The site design BMP options listed in these sections are consistent with the site design BMPs currently required by the Copermittees in the Model SUSMP. However, the Model SUSMP employs an open-ended approach to requirements for site design BMPs, requiring implementation of site design BMPs "where determined applicable and feasible by the Copermittee." Unfortunately, this approach has proven to be ineffective in integrating site design BMPs in project designs. Audits of ten of the Copermittees' SUSMP programs exhibited that "many of the SUSMP plans reviewed for this program evaluation did not adequately address site design."[117] Moreover, the auditor identified site design as one of three principal areas where further program oversight was necessary.[118]

For these reasons, the Order directs the Copermittees to require new development projects to employ at least one site design BMP from each of the two lists of site design BMP options provided in this section of the Order. Two lists of site design BMP options are provided to represent different categories of site design BMPs available for implementation. The first list includes site design BMPs that are less frequently utilized, though they are effective and achievable. The second list includes site design BMPs which are commonly cited in project proponents' SUSMP reports as the site design BMPs that have been incorporated into Priority Development Projects. Implementation of one site design BMP from each list is required to improve site design implementation at Priority Development Projects, while providing a reasonable and achievable minimum measure for site design BMP implementation. Through its process of conditioning development projects under the CWA section 401 Water Quality Certification program, the Regional Board finds that this level of site design BMP implementation is feasible for all projects. This site design BMP requirement will help ensure that site design BMPs are implemented for new development projects. Site design BMPs are a critical component of urban runoff management at new development projects, since the BMPs provide multiple benefits including preservation of hydrologic conditions, reduction of pollutant discharges, cost effectiveness, and green space.

The Order continues to provide the Copermittees with flexibility in implementing site design BMP requirements by providing lists from which site design BMP approaches can be chosen. Moreover, flexibility is inherently included in the site design options listed - each option provides the opportunity for numerous implementation approaches that can be used to achieve compliance.

In its October 29, 2004 letter to the Copermittees, as well as in subsequent meetings, the Regional Board notified Copermittees of the need for improvement in site design BMP implementation at development projects. In addition, at its May 5, 2005 meeting with the Copermittees, the

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[117] Tetra Tech, Inc., 2005. Program Evaluation Report –San Diego Standard Urban Storm Water Mitigation Plan (SUSMP) Evaluation. P. 4.
[118] Tetra Tech, Inc., 2005. Program Evaluation Report –San Diego Standard Urban Storm Water Mitigation Plan (SUSMP) Evaluation. P. 3.

Regional Board suggested that the Copermittees propose specific methods in their ROWD that would improve site design BMP implementation. In response, the Copermittees recommended that the Order "include an option for Copermittees to develop a low-impact design credit program." However, such a requirement would be unenforceable, due to its vague nature. Moreover, if such a credit program were to take years to develop, lack of implementation of site design BMPs would continue unabated. To address this issue, the Order includes minimum requirements for site design BMP implementation, while also providing the Copermittees with their requested option to develop a site design credit program.[119] This provides assurance that site design BMPs will be implemented in a timely manner, while also providing the Copermittees with flexibility for site design credit program development.

The site design BMP options listed do not need to be costly. Some design options, such as concave vegetated surfaces or routing rooftop or walkway runoff to landscaped areas, are cost neutral.[120] Other site design BMPs, such as minimizing parking stall widths or use of efficient irrigation devices, are oftentimes already required. In addition, use of these site design BMPs reduces runoff quantity, allowing for treatment control BMPs on site to be smaller, therefore savings costs. Routing runoff through landscaped areas can also reduce the cost of irrigation.

Section D.1.d.(5) (Source Control BMP Requirements) requires that Priority Development Projects implement minimum source control BMPs. This section has been added to provide more detail and clarify the Order's requirements for source control BMPs. The minimum source control BMPs listed in the section are consistent with the Model SUSMP.

Section D.1.d.(6) (Treatment Control BMP Requirements) clarifies that treatment control BMPs are not required to be designed to treat runoff from preservation areas, or other areas not being disturbed at a priority development project. This is a clarification of the requirements of Order No. 2001-01.

Section D.1.d.(6)(c)(i) ensures that priority development project proponents utilize the most accurate information to determine the volume or flow of runoff which must be treated. Using detailed local rainfall data, the County of San Diego has developed the 85th Percentile Precipitation Isopluvial Map, which exhibits the size of the 85th percentile storm event throughout San Diego County. Since this map uses detailed local rainfall data, it is more accurate for calculating the 85th percentile storm event than other methods which were included in Order No. 2001-01. The other methods found in Order No. 2001-01 were included as options to be used in the event that detailed accurate rainfall data did not exist for various locations within San Diego County. The County of San Diego's development of the 85th Percentile Precipitation Isopluvial Map makes these other less accurate methods superfluous. Therefore, these other methods for calculating the 85th percentile storm event have been removed from the current Order.

Section D.1.d.(6)(d)(i) (Treatment Control BMPs) requires that treatment control BMPs selected for implementation at Priority Development Projects have a removal efficiency rating that is higher than the "low removal efficiency," as presented in the Model SUSMP. The requirement allows exceptions for those projects that, with a feasibility analysis, can justify the use of a treatment control BMP with a low removal efficiency for a Priority Development Project. This requirement is needed because to date, the Copermittees have generally approved low removal efficiency treatment control BMPs without justification or evidence that use of higher efficiency treatment BMPs was considered and found to be infeasible. Specifically, it has been found

[119] See section discussion for section D.1.d.(7) on the site design BMP credit program.
[120] BASMAA, 1999. Start at the Source. P. 149.

during audits of the Copermittees' SUSMP programs that many SUSMP reports do not adequately describe the selection of treatment control BMPs. Moreover, USEPA's contractor Tetra Tech, Inc. recommends that "project proponents should begin with the treatment control that is most effective at removing the pollutants of concern […] and provide justification if that treatment control BMP is not selected."[121]

In the ROWD, the Copermittees acknowledge the need for further attention to the selection and implementation of effective treatment BMPs. They propose to work with the Regional Board to come to a "common understanding" without a fixed permit requirement. However, due to this widespread deficiency regarding treatment control BMP selection in the Copermittees' SUSMP programs, the treatment control BMP feasibility requirement is needed in the Order. The requirement is needed to provide clarification that selection of low efficiency treatment control BMPs over high efficiency BMPs without justification does not meet permit requirements and is not in compliance with the MEP standard.

Section D.1.d.(7) (Site Design BMP Substitution Program) has provisions for the site design BMP credit program which largely mirror components of the program suggested by the Copermittees in their ROWD. In their ROWD, the Copermittees requested the option to develop a site design BMP credit program, under which projects that implement a high level of site design BMPs could receive credit towards compliance with treatment control BMP requirements. The program would provide the opportunity for development projects to avoid partial or full treatment control BMP implementation in exchange for implementation of a high level of site design BMPs. The Regional Board agrees that such a program could be beneficial. As the ROWD notes, the program could achieve equal or greater water quality benefits while also (1) providing greater assurance of adequate operation and maintenance; (2) improved review processes of site design BMP proposals; (3) increased acceptance of site design BMPs; and (4) greater usage of site design BMPs. For this reason, the Regional Board has added to the Order an option for the Copermittees to develop such a program.

In addition to the Copermittees' proposals, the provisions require (1) that runoff originating from pollutant generating exposed impervious areas must be routed through pervious areas prior to entering the MS4, and (2) that development project categories, such as automotive repair shops or streets, roads, highways, or freeways, which have a high potential to generate high levels of pollutants, not be covered under the program. Runoff from pollutant generating impervious areas must be routed through pervious areas in order to ensure that some level of treatment is provided for the protection of water quality. Without such a provision, the program could result in the direct discharge of significant levels of pollutants to the MS4 without treatment. In addition, development projects which frequently generate high levels of pollutants, such as automotive repair shops and streets, roads, highways, and freeways, should not be included in the program due to the need for treatment control BMPs at such development projects. When high levels of pollutants are present at a development project, site design BMPs alone are unlikely to adequately reduce pollutant discharges; treatment BMPs are also needed to polish urban runoff and serve as a last line of defense.

In precedent setting Order No. 2000-11, the State Board determined that implementation of treatment control BMPs is appropriate for development projects falling under the priority development project categories. Therefore, any program which allows development projects to forgo treatment control BMP implementation must include provisions which will achieve similar

[121] Tetra Tech, Inc., 2005. Program Evaluation Report –San Diego Standard Urban Storm Water Mitigation Plan (SUSMP) Evaluation. P. 5.

water quality benefits. To ensure that this is the case for the site design BMP credit program, minimum provisions for the program have been added to the Order. Due to the addition of the minimum provisions in the Order, the program will not need to undergo a lengthy Regional Board approval process at a later date.

Section D. 1.d.(8) (Treatment Control BMP Design Standards) addresses a need for the Copermittees to develop and apply consistent criteria for the design and maintenance of structural treatment BMPs. Correct BMP design is critical to ensure that BMPs are effective and perform as intended. Without design criteria, there is no assurance that this will occur, since there is no standard for design or review. This issue was noted during audits of the Copermittees' SUSMP programs, where it was found that "some SUSMP reports did not clearly describe how treatment control BMPs were designed."[122] Based upon these findings, it was recommended that the Copermittees "require developers to use standard forms to document the design of treatment control BMPs. As an example, Ventura County has developed a BMP manual that includes standard design procedure forms for BMPs. Ventura County's *Technical Guidance Manual for Storm Water Quality Control Measures* is available at http://www.vcstormwater.org/ publications.htm."[123] California Stormwater Quality Association (CASQA) also confirms the necessity of design criteria when it includes such criteria in its New Development and Redevelopment BMP Handbook.[124]

Section D.1.d.(11) (Waiver Provision) allows Copermittees to waive treatment BMPs when all available BMPs have been considered and rejected as infeasible. The requirement also allows the Copermittees to develop a program to require projects that receive waivers, to transfer the cost savings to a fund. The intent of the requirements is to allow Copermittees the necessary flexibility to waive treatment BMPs when it can be established that the implementation of treatment BMPs that meet numeric sizing criteria is not feasible at a given site. This provision also allows Copermittees discretion to transfer the cost savings from such a waiver to a fund for water quality projects within the watershed.

Section D.1.e (Treatment Control BMP Maintenance Tracking) requires steps to be taken by the Copermittees to ensure that approved treatment control BMPs are correctly constructed and maintained, including development of a database. This is critical to ensure that the treatment control BMPs are effective in removing pollutants from urban runoff leaving new development and significant redevelopment projects. Treatment control BMP maintenance has been identified as a critical aspect of addressing urban runoff from new development and significant redevelopment by many prominent urban runoff authorities, including the CASQA which states that "long-term performance of BMPs hinges on ongoing and proper maintenance."[125] USEPA also stresses the importance of BMP maintenance, stating: "Lack of maintenance often limits the effectiveness of storm water structural controls such as detention/retention basins and infiltration devices."[126]

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[122] Tetra Tech, Inc., 2005. Program Evaluation Report –San Diego Standard Urban Storm Water Mitigation Plan (SUSMP) Evaluation. P. 5.
[123] Ibid.
[124] California Stormwater Quality Association, 2003. Stormwater Best Management Practice Handbook – New Development and Redevelopment.
[125] California Stormwater Quality Association, 2003. Stormwater Best Management Practice Handbook – New Development and Redevelopment. P. 6-1.
[126] USEPA, 1992. Guidance Manual for the Preparation of Part II of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems. EPA 833-B-92-002.

This permit section is needed due to findings that treatment control BMPs and treatment control BMP maintenance have predominantly not been tracked by the Copermittees. Following audits of SUSMP implementation of ten Copermittees, each of the Copermittees were recommended to develop a tracking system for treatment control BMPs and treatment control BMP maintenance. It has been found that "source and treatment control BMPs should be tracked in order to assess the number of BMPs installed, for reporting purposes, and to create an inventory for verifying maintenance in the future."[127] Moreover, during the SUSMP audits, two of the ten Copermittees audited were found to have inadequately maintained treatment BMPs within their jurisdiction.[128] Again, it was recommended that Copermittees "should periodically inspect selected SUSMP projects to verify if BMPs are being properly maintained."[129] USEPA also recommends "post-construction inspection and maintenance of BMPs" in the Phase II storm water regulations.[130]

At its May 5, 2005 meeting with the Copermittees, the Regional Board requested that the Copermittees propose a program for addressing treatment control BMP tracking and inspection in their ROWD. In response, the Copermittees' ROWD did not propose a program but instead recommended that the Order include "an option for the Copermittees to develop a Model Program for Permanent BMP Operation and Maintenance Verification."[131] This proposal lacks sufficient detail to be included in the Order, since it would result in an unenforceable permit requirement. As a result, the Order has been crafted to allow the Copermittees to develop their proposed program, but with minimum measurable outcomes to ensure that the program is adequate and effective.

These minimum measurable outcomes largely incorporate suggestions from the Copermittees' ROWD, though some contain more detailed requirements than what was proposed by the Copermittees. In particular, while the Copermittees are free to prioritize most projects with treatment control BMPs, those projects with drainage insert treatment control BMPs must be categorized as at least a medium priority. This will ensure that such projects will be inspected every other year. Tracking of these projects in this manner is necessary because of the frequent maintenance that drainage inserts require, as well as the sensitivity of drainage insert performance to adequate maintenance. Drainage inserts fill relatively rapidly, causing plugging and bypass, rendering them ineffective. For example, CASQA recommends "frequent maintenance, on the order of several times per year."[132]

Another significant measurable outcome requirement is that all projects with treatment control BMPs must be inspected for operation and maintenance at least once during the permit cycle. This is reasonable, since treatment control BMPs are typically recommended to be maintained semi-annually or annually. An activity which needs to be conducted semi-annually or annually should be spot-checked at least once every five years. Twenty percent of the projects within a jurisdiction with approved treatment BMPs are required to be inspected annually in order to ensure that treatment control BMP operation and maintenance oversight is consistent during the permit cycle.

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[127] Tetra Tech, Inc., 2005. Program Evaluation Report –San Diego Standard Urban Storm Water Mitigation Plan (SUSMP) Evaluation. P. 6.
[128] Ibid. P. 25, 38.
[129] Ibid.
[130] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68845.
[131] San Diego County Copermittees, 2005. Report of Waste Discharge. P. D-16.
[132] California Stormwater Quality Association, 2003. Stormwater Best Management Practice Handbook – New Development and Redevelopment. P. M-52.

Section D.1.f (BMP Verification) helps ensure that BMPs constructed at new development sites are consistent with proposed and approved design plans. Correct construction of BMPs is necessary to ensure that the BMPs are effective and that pollutants discharged from new development projects are reduced to the maximum extent practicable and do not cause or contribute to violations of water quality standards. This permit section is needed because it has been found that BMPs frequently are not constructed in the field as they were proposed by applicants and/or approved by Copermittees. Four of the ten Copermittees audited during the SUSMP audits were found to have projects within their jurisdictions with incorrectly constructed BMPs. It was recommended that Copermittees ensure "that the SUSMP BMPs are properly installed in the field. This includes verifying factors such as the location, sizing, and type of BMPs installed."[133] Also recommended is that "Copermittees should ensure that the BMP design details in SUSMP reports are translated to the engineering plan sheets used in the field."[134] In addition, USEPA recommends such practices in the Phase II storm water regulations, promoting "inspections during construction to verify BMPs are built as designed."[135]

Section D.1.g (Hydromodification) addresses the changes in a watershed's runoff characteristics resulting from development, together with associated morphological changes to channels receiving the runoff. These changes are termed hydromodification. As the total area of impervious surfaces increases in previously undeveloped areas, infiltration of rainfall decreases, causing more water to run off the surface at a higher rate. Runoff from developed areas can produce erosive flows in channels under rainfall conditions where previously they did not exist. Moreover, runoff from developed areas increases the duration of time that channels are exposed to erosive flows. The increase in the volume of runoff and the length of time that erosive flows occur ultimately intensify sediment transport, causing changes in sediment transport characteristics and the hydraulic geometry (width, depth, slope) of channels.[136]

These types of changes have been documented in southern California. It has been reported that researchers studying flood frequencies in Riverside County have found that increases in watershed imperviousness of only 9-22% can result in increases in peak flow rates for the two-year storm event of up to 100%.[137] Such changes in runoff have significant impacts on channel morphology. It has recently been found that ephemeral/intermittent channels in southern California appear to be more sensitive to changes in imperviousness than channels in other areas. Morphology of small channels in southern California was found to change with only 2-3% watershed imperviousness, as opposed to 7-10% watershed imperviousness in other parts of the nation.[138]

Stream channels typically respond to increased runoff rates and durations by increasing their cross-sectional area to accommodate the higher flows. This is done through widening of the channel banks, down-cutting of the channel bed, or both. This channel instability results in streambank erosion and habitat degradation, which is a significant impact to beneficial uses. Channel instability causes impacts to beneficial uses through sedimentation, loss of overhead

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[133] Tetra Tech, Inc., 2005. Program Evaluation Report –San Diego Standard Urban Storm Water Mitigation Plan (SUSMP) Evaluation. P. 6.
[134] Ibid.
[135] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68845.
[136] Santa Clara Valley Urban Runoff Pollution Prevention Program, 2005. Hydromodification Management Plan. P. 1-1.
[137] Schueler and Holland, 2000. Storm Water Strategies for Arid and Semi-Arid Watersheds (Article 66). The Practice of Watershed Protection.
[138] Coleman, et. al., 2005. Effect of Increases in Peak Flows and Imperviousness on the Morphology of Southern California Streams. P. iv.

cover, and loss of instream habitat structures, such as the loss of pool and riffle sequences.[139] Numerous studies have exhibited the link between urbanization, poor habitat quality, and impaired beneficial uses such as reduced insect and fish diversity.[140] These findings are also supported by the Copermittees' bioassessment data, which typically exhibits Poor to Very Poor Index of Biotic Integrity ratings for San Diego County channels, even though toxicity is frequently not found to be persistent.[141]

This section of the Order expands the requirements for control of hydromodification caused by changes in runoff resulting from development and urbanization. Expansion of these requirements is needed due to the current lack of a clear standard for controlling hydromodification resulting from development. While the Model SUSMP developed by the Copermittees requires project proponents to control hydromodification, it provides no standard or performance criteria for how this is to be achieved. Without any kind of clear standard or criteria, what must be done to prevent hydromodification is not known by project proponents and plan reviewers. As a result, project proponents do not know what to propose (if anything) and Copermittee review staff do not know what to require. Ultimately, Priority Development Projects implement few measures which can be expected to adequately control hydromodification. In any event, it is clear that Priority Development Projects in San Diego County are not implementing the type of measures which have been identified and required in other parts of California as necessary to prevent hydromodification.

To address this situation, this section of the Order requires the development and implementation of a Hydromodification Management Plan and outlines a process for the development and implementation of a standard and criteria to limit hydromodification of downstream channels. The required process is based on processes currently being developed and/or used in the San Francisco Bay Area and Los Angeles and Ventura Counties.[142] It also corresponds with the planned second phase of the Southern California Stormwater Monitoring Coalition's Hydromodification Control Study, which is expected to develop a regional stream classification system, a numerical model to predict the hydrological changes resulting from development, and to identify effective mitigation strategies.

A detailed example of a process that can be used to develop a standard and criteria for control of hydromodification resulting from new development can be found in the Santa Clara Valley Urban Runoff Pollution Prevention Hydromodification Management Plan.[143] It involves developing ratios of work done on representative channel segments by runoff, where work done to a channel segment under pre-urban conditions is compared to work done under existing conditions. The calculated ratio is called the Erosion Potential (Ep) of the channel segment.[144] The Ep ratios for particular channel segments are then compared to field classified erosion conditions (such as stable/low or medium/high level of erosion). This comparison is used to identify an Ep ratio that has a low risk of resulting in an unstable channel or a channel with a medium/high level of

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[139] Schueler and Holland, 2000. The Importance of Imperviousness (Article 1). The Practice of Watershed Protection.
[140] Ibid.
[141] County of San Diego, 2005. San Diego County Municipal Copermittees 2003-2004 Urban Runoff Monitoring Final Report. By MEC Analytical Systems – Weston Solutions, Inc. Index of Biotic Integrity ratings give an absolute value to the benthic community quality based on the range of reference conditions in the region. The Index of Biotic Integrity ratings can be used to evaluate community conditions over time to monitor the effects of habitat degradation or the success of restoration efforts.
[142] See http://www.cccleanwater.org/construction/nd.php or http://www.scvurppp.org/ under "C.3 Submittals" for examples of a Hydromodification Management Plans.
[143] Santa Clara Valley Urban Runoff Pollution Prevention Program, 2005. Hydromodification Management Plan. P. 3-1 – 3-20.
[144] Ep is discussed in detail in the definitions section of the Permit.

erosion. Generally, an Ep of approximately 1, where work done hydraulically on a channel matches a baseline condition, will have a low risk of causing stream instability.

Once an Ep ratio that will result in stable channels is determined, it is used as a standard upon which to base development of runoff flow rate and duration criteria. Stream channel erosion is caused by increases in runoff flow rates and durations for the small and moderate magnitude runoff flows above the threshold for sediment transport and channel bank erosion.[145] Runoff flow rate and duration criteria identify the range of storms for which flow rates and durations must be controlled to pre-project conditions in order to meet the Ep standard. This involves identifying the critical flow that produces the critical shear stress that initiates bed movement or that erodes the toe of channel banks, and then relating the critical flow to a percentage of the 2-year peak flow, which serves as the lower bound of the range of storm events which must be controlled. The upper bound of the range of storm events is based on the storm event where significant post-project increases in the total work done on the channel do not occur.

Due to the ongoing high level of development in San Diego County, this section of the Order also contains an interim hydromodification standard for large Priority Development Projects. Without an interim hydromodification standard, major Priority Development Projects will be developed without hydromodification controls, resulting in impacts to relatively stable streams with good habitat quality. Examples of areas that can be expected to be developed in the near future include the Otay Valley Hydrologic Area and the Bonsall Hydrologic Subarea.

Priority Development Projects over 50 acres in size are required to meet the interim criteria because large projects have a greater potential to impact streams through hydromodification. Larger projects create more impervious surface, increasing runoff flow rates and durations to a greater extent, resulting in greater potential for hydromodification of receiving channels. The 50 acre size limit was chosen based on high priority status placed on construction sites larger than 50 acres. Applying an interim criteria to projects over 50 acres in size is manageable for Copermittees because of the relative infrequency of development projects larger than 50 acres. Approximately 88% of the construction sites with coverage under the statewide General Construction Storm Water Permit are smaller than 50 acres in size. Moreover, since larger Priority Development Projects typically have greater resources, they have the capability to conduct the necessary analyses and implement measures to maintain the morphology of receiving channels. For example, such analysis (together with proposed implementation of flow rate and duration controls) has been conducted for the Rancho Mission Viejo project in southern Orange County.[146]

The Copermittees' ROWD essentially proposes a continuation of the current process for addressing hydromodification. As with the existing process, it is proposed that the project proponent will somehow demonstrate that the Priority Development Project will not impact downstream erosion or stream habitat. However, as discussed above, without a standard or specific criteria for how this will be done, neither the project proponent or a Copermittee's project review staff will know what needs to be implemented. Without specific standards or criteria, effective measures cannot be expected to be implemented to control hydromodification. For this reason, this section contains requirements that specific standards and criteria to control hydromodification be developed.

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[145] Santa Clara Valley Urban Runoff Pollution Prevention Program, 2005. Hydromodification Management Plan. P. 5-1.
[146] County of Orange, 2004. The Ranch Plan Draft Environmental Impact No. 589. Section 4.5.

Section D.1.h (Enforcement of Development Sites) ensures that the Copermittees will use enforcement to pursue corrections of noted violations at development sites. The section is being added to the Development Planning to complement the requirements for inspections of post-construction BMPs and BMP maintenance. Where ineffective BMP implementation or inadequate BMP maintenance is noted during inspections, Copermittees must take effective enforcement actions that ensure violations are corrected and pollutants are reduced to the maximum extent practicable. USEPA recommends the development of ordinances and the use of enforcement procedures to address post-construction storm water management issues in the Phase II storm water regulations.[147]

D. 2. Construction

The following legal authority applies to section D.2:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D) provides that the proposed management program include "A description of a program to implement and maintain structural and non-structural best management practices to reduce pollutants in storm water runoff from construction sites to the municipal storm sewer system."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D)(1) provides that the proposed management program include "A description of procedures for site planning which incorporate consideration of potential water quality impacts."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D)(2) provides that the proposed management program include "A description of requirements for nonstructural and structural best management practices."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D)(3) provides that the proposed management program include "A description of procedures for identifying priorities for inspecting sites and enforcing control measures which consider the nature of the construction activity, topography, and the characteristics of soils and receiving water quality."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D)(4) provides that the proposed management program include "A description of appropriate educational and training measures for construction site operators."

Federal NPDES regulation 40 CFR 122.26(d)(2)(i)(A) provides that each Copermitee must demonstrate that it can control "through ordinance, permit, contract, order or similar means, the contribution of pollutants to the municipal storm sewer by storm water discharges associated with industrial activity and the quality of storm water discharged from site of industrial activity."

Federal NPDES regulation 40 CFR 122.26(b)(14) provides that "The following categories of facilities are considered to be engaging in 'industrial activity' for the purposes of this subsection: […] (x) Construction activity including cleaning, grading and excavation activities […]."

[147] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68845.

Federal NPDES regulation 40 CFR 122.44(d)(1)(i) requires NPDES permits to include limitations to "control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines are or may be discharged at a level which will cause, have reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality."

Section D.2.a (Ordinance Update and Approval Process) requires each Copermittee to review and update its grading and storm water ordinances as necessary to comply with the MS4 permit. By updating the grading and storm water ordinances, the Copermittees will have the necessary legal authority to require construction sites to implement effective BMPs that will reduce pollutant discharges to the maximum extent practicable. The Order allows the Copermittees 365 days to review and update their ordinances. The 365 days should be more than adequate to allow for the relatively minor changes that might be needed since their ordinances were last updated under Order No. 2001-01.

This section now requires the Copermittees to review project proponents' storm water management plans for compliance with local regulations, policies, and procedures. USEPA recommends that it is often easier and more effective to incorporate storm water quality controls during the site plan review process or earlier.[148] In the Phase I storm water regulations, USEPA states that a primary control technique is good site planning.[149] USEPA goes on to say that the most efficient controls result when a comprehensive storm water management system is in place.[150] To determine if a construction site is in compliance with construction and grading ordinances and permits, USEPA states that the "MS4 operator should review the site plans submitted by the construction site operator before ground is broken."[151] Site plan review aids in compliance and enforcement efforts since it alerts the "MS4 operator early in the process to the planned use or non-use of proper BMPs and provides a way to track new construction activities."[152] During audits of San Diego Copermittee storm water programs, it was found on two separate occasions that site plan and SWPPP review were inadequate and inconsistent.[153]

Section D.2.b (Source Identification) requires the Copermittees to develop and update a watershed based inventory of all construction sites regardless of size or ownership. This section has been modified to require at least monthly updates of construction site inventories to ensure the Copermittees have a more accurate inventory of construction sites within their jurisdiction. A regularly updated inventory of active construction sites will assist the Copermittees in ensuring that all sites are inspected per Order requirements. In the ROWD, the Copermittees provide support for more regular updates by stating "Any inventory…is likely to change significantly within weeks or even days."[154] Reporting of the inventory to the Regional Board would remain on an annual basis in the Jurisdictional Urban Runoff Management Program Annual Report.

Section D.2.c (BMP Implementation) includes modifications to the requirements for each Copermittee to designate and ensure implementation of a set of minimum BMPs at construction sites. These modifications are based on Regional Board findings and experience during implementation of Order No. 2001-01. During audits of the Copermittees' storm water programs,

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[148] USEPA, 1992. Guidance 833-8-92-002. Section 6.3.2.1.
[149] Federal Register / Vol. 55, No. 222 / Friday, November 16, 1990 / Rules and Regulations. P. 48034.
[150] Ibid.
[151] USEPA, 2000. Guidance 833-R-00-002. Section 4.6.2.4, P. 4-30.
[152] Ibid., P. 4-31.
[153] Tetra Tech, Inc., 2002. Program Evaluation Report – San Diego Area Storm Water Programs – El Cajon. P. 15; and Tetra Tech, 2005. Program Evaluation Report – San Diego Area Storm Water Programs – Port of San Diego. P. 15.
[154] San Diego County Copermittees, 2005. Report of Waste Discharge. P. D-23.

BMP implementation at construction sites was found to be second only to education in the number of deficiencies and potential permit violations. Eleven cities had deficiencies or potential permit violations, with the most common being that BMPs were not adequately implemented at construction sites and that the Copermittees' standards were not up to date. Both private and public construction sites were found to have inadequately implemented BMPs.[155] In addition, the only civil liability assessed on a municipality for violations of an MS4 permit under the previous municipal permit, Order No. 2001-01, was based in part on a Copermittee's failure to adequately implement or require implementation of BMPs at a construction site.[156]

This section describes the types of BMPs that are required to be implemented at construction sites. Many of these BMPs are found in Order No. 2001-01.[157] Differences in the BMP requirements from Order No. 2001-01 include: Removal of site priority specific BMP designations; removal of seasonal restrictions on grading; more specificity on slope stabilization; more specificity on phased grading; and the addition of advanced treatment requirements. Since pollution prevention methods are considered a BMP, the pollution prevention requirements have been moved to the BMP implementation section.

Unlike Order No. 2001-01, this Order does not require the Copermittee to designate a set of minimum BMPs for high, medium, and low threat to water quality construction sites. This change was made in recognition of most Copermittees' application of one consistent set of BMPs throughout their jurisdictions.

The Order's requirements for seasonal restrictions on grading have been changed. Seasonal restrictions on grading for storm water are difficult to implement due to the conflict between seasonal grading restrictions and endangered bird's breeding seasons; therefore the seasonal grading restrictions have not been included with the other BMPs in the Order. Found in southern California, the Least Bell's Vireo and the Coastal California Gnatcatcher are listed as federally endangered and threatened, respectively.[158] Permits issued by the California Department of Fish and Game (CDFG) restrict grading during these birds' breeding seasons, which is from April 10 to August 31 for the Least Bell's Vireo[159] and from February 15 to August 31 for the Coastal California Gnatcatcher.[160] Ideally storm water restrictions on grading would be during the wet season from October 1 through April 30.[161] Combined these restrictions would limit construction grading to be during the month of September, which is infeasible. Section D.2.c of the Order still requires "project proponents to minimize grading during the wet season and coincide grading with seasonal dry weather periods to the extent feasible. If grading does occur during the wet season, require project proponent to implement additional BMPs for any rain events which may occur."

Sections D.2.c.(1)(e-f) of the Order require slope stabilization on all active and inactive slopes during rain events regardless of the season, except in areas implementing advanced treatment. Slope stabilization is also required on inactive slopes throughout the rainy season. These

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[155] Tetra Tech, Inc., various. Program Evaluation Reports San Diego Area Storm Water Programs.
[156] Regional Board, 2005. Order No. R9-2005-0237. Administrative Assessment of Civil Liability against JRMC Realty, Inc. and the City of Escondido. P. 3.
[157] Regional Board, 2001. Order No. 2001-01, San Diego County MS4 Permit. P. 22.
[158] State of California, Department of Fish and Game, 2005. State and Federally Listed Endangered and Threatened Animals of California.
[159] United States Department of the Interior, Fish and Wildlife Service, 2001. Least Bell's Vireo Survey Guidelines.
[160] United States Department of the Interior, Fish and Wildlife Service, 1997. Coastal California Gnatcatcher (*Polioptila californica californica)* Presence/Absence Survey Guidelines.
[161] Regional Board, 2001. Order No. 2001-01, San Diego County MS4 Permit. Directive F.2.g.(2).

requirements are needed because un-stabilized slopes at construction sites are significant sources of erosion and sediment discharges during rainstorms. "Steep slopes are the most highly erodible surface of a construction site, and require special attention."[162] USEPA exhibits the importance of slope stabilization when it states that "slope length and steepness are key influences on both the volume and velocity of surface runoff. Long slopes deliver more runoff to the base of slopes and steep slopes increase runoff velocity; both conditions enhance the potential for erosion to occur."[163] In lieu of vegetation preservation or replanting, soil stabilization is the most effective measure in preventing erosion on slopes. Research has shown that effective soil stabilization can reduce sediment discharge concentrations up to six times, as compared to soils without stabilization.[164] In their ROWD,[165] the Copermittees propose that standardized requirements for slope stabilization be developed after Permit adoption, due to the unique differences between the Copermittees' programs and the "need to develop consensus." However, slope stabilization at construction sites is already the consensus among the regulatory community and is found throughout construction BMP manuals and permits. For these reasons, slope stabilization requirements have been added to the Order, while providing sufficient flexibility for each Copermittee's unique storm water program.

Sections D.2.c.(1)(g-j) of the Order provide more specificity regarding phased grading requirements, prescribing that phased grading be implemented utilizing a maximum disturbed area, as determined by the Copermittees. This specificity has been added to the Order because of the importance of phased grading in controlling sediment from leaving construction sites. Phased grading minimizes the disturbed area and the time that the soil is exposed to erosive conditions.[166] USEPA provides guidance stating "construction should be planned to occur in phases in order to minimize the amount of disturbed land exposed at any one time, thus limiting the overall erosion potential of the site."[167] It is important to note that phased grading does not limit the overall development of a project. Moreover, phased grading should not be confused with seasonal restrictions on grading that were addressed above.

The Copermittees are required to designate a maximum disturbed area to be open at any one time. The Order prescribes that construction projects within the Copermittees' jurisdiction are not allowed to expose more soil than the maximum disturbed area, unless authorized to do so in writing by the Copermittee. Prior to the Copermittee's authorization to exceed the maximum disturbed area, the construction site must be in compliance with applicable storm water regulations and have adequate control practices implemented to prevent storm water pollution. The Copermittee's authorization gives the construction industry the flexibility needed to conduct business while continuing to protect water quality. This permit requirement is not unprecedented. The Caltrans construction standard specifications states that no more than 17 acres be exposed unless otherwise approved by their engineer in writing.[168] If needed, local Caltrans districts can

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[162] Schueler, T. and Holland, H., 2000. "Muddy Water In – Muddy Water Out?" The Practice of Watershed Protection. P. 6.
[163] USEPA, 1990. "Sediment and Erosion Control: An Inventory of Current Practices." P. II-1.
[164] Schueler, T. and Holland, H., 2000. "Muddy Water In – Muddy Water Out?" The Practice of Watershed Protection. P. 5.
[165] San Diego County Copermittees, 2005. Report of Waste Discharge. P. D-27.
[166] Schueler, T. and Holland, H., 2000. "Muddy Water In – Muddy Water Out?" The Practice of Watershed Protection. P. 5.
[167] USEPA, 1990. "Sediment and Erosion Control: An Inventory of Current Practices." P. III-1.
[168] State of California, Department of Transportation, 2002. "Standard Specifications for Construction of Local Streets and Roads." Section 7-1.01G; P. 52.

decrease the maximum disturbed soil area to 5 acres during the rainy season.[169] In the Order, the Copermittee determines the maximum disturbed acreage size.

In the ROWD,[170] the Copermittees report that because their programs are unique, more time is needed on phased grading to develop consensus and to further dialogue. They speculate that the phased grading requirements will need consultation with the construction community, California Department of Fish and Game, United States Fish and Wildlife Service, and the Army Corps of Engineers. The Copermittees propose that they develop phased grading requirements after adoption of the Order. However, phased grading was a requirement in Order No. 2001-01.[171] In the five years since the adoption of Order No. 2001-01, the Copermittees did not develop a consensus on phased grading requirements. Even though previously required, the Regional Board inspectors have never observed phased grading implemented within the jurisdictions of the Copermittees. The lack of Copermittee action on phased grading during the past Permit cycles has necessitated the adoption of more specific enforceable requirements on phased grading. Caltrans and its private contractors from the construction community have implemented phased grading on construction projects since 2000 with no issues raised by the construction community or resource agencies. The ability of the Copermittee to increase the size of the maximum disturbed area for a given site will enable the construction site to feasibly grade while maintaining compliance with other environmental permits.

Section D.2.c.(1)(k) of the Order requires the implementation of advanced treatment for sediment at construction sites that the Copermittees or the Regional Board determines to be a significant threat to water quality. In evaluating the threat to water quality, the following factors shall be considered: (1) soil erosion potential; (2) the site's slopes; (3) project size and type; (4) sensitivity of receiving water bodies; (5) proximity to receiving water bodies; (6) non-storm water discharges; and (7) any other relevant factors. Advanced treatment is defined in the Order as "using mechanical or chemical means to flocculate and remove suspended sediment from runoff from construction sites prior to discharge." Advanced treatment consists of a three part treatment train of coagulation, sedimentation, and polishing filtration.

Advanced treatment has been effectively implemented extensively in the other states and in the Central Valley Region of California.[172] In addition, the Regional Board's inspectors have observed advanced treatment being effectively implemented at large sites greater than 100 acres and at small, 5 acre, infill sites. Advanced treatment is often necessary for Copermittees to ensure that discharges from construction sites are not causing or contributing to a violation of water quality standards. For example, the Basin Plan lists the water quality objective for turbidity as 20 NTU for all hydrologic areas and subareas except for the Coronado HA (10.10) and the Tijuana Valley (11.10). For certain construction sites with large slopes and exposed areas, the only technology that is likely to meet 20 NTU is advanced treatment combined with erosion and sediment controls. To ensure the MEP standard and water quality standards are met, the requirement for implementation of advanced treatment at high threat construction sites has been added to the Order, while still providing sufficient flexibility for each Copermittee's unique program.

Sections D.2.c.(1)(l-m) of the Order require the revegetation of a construction site as early as feasible. The Order includes revegetation requirements in the BMP implementation section,

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[169] Caltrans Storm Water Quality Handbooks, 2000. "Construction Site Best Management Practices Manual." Section 2.2.4.1.
[170] San Diego County Copermittees, 2005. Report of Waste Discharge. P. D-27.
[171] Regional Board, 2001. Order No. 2001-01, San Diego County MS4 Permit. Directive F.2.b.(4); P. 22.
[172] SWRCB, 2004. Conference on Advanced Treatment at Construction Sites.

while Order No. 2001-01 required revegetation as part of the grading ordinance update. Implementation of revegetation reduces the threat of polluted storm water discharges from construction sites. For example, it has been found that construction sites should permanently stabilize disturbed soils with vegetation at the conclusion of each phase of construction.[173] A survey of grading and clearing programs found one-third of the programs without a time limit for permanent revegetation, "thereby increasing the chances for soil erosion to occur."[174] USEPA states "the establishment and maintenance of vegetation are the most important factors to minimizing erosion during development."[175] With the construction site being responsible for revegetation, the Copermittee will be more likely to enforce revegetation requirements during oversight of construction site requirements.

Section D.2.c.(2) of the Order requires that dry season BMP implementation must include planning for and addressing rain events that may occur during the dry season. This requirements was added to the Order to emphasize that, although rare, thunderstorms do occur in inland areas of the San Diego Region during the dry season.

Section D.2.d (Inspection of Construction Sites) prescribes a minimum inspection frequency for construction sites. Where Order No. 2001-01 required weekly inspections of high priority sites and monthly inspections of medium and low priority sites during the wet season, this Order prescribes biweekly inspections during the wet season of high priority sites, monthly inspections for medium priority sites, and as needed inspections for low priority sites. High priority sites are identified as all sites greater than 50 acres, or greater than 1 acre and tributary to a CWA Section 303(d) water body impaired for sediment or discharging directly to a ESA. Medium priority sites are all sites causing soil disturbance of one acre or more that are not a high priority. The proposed changes to the Order allow the Copermittees to concentrate more effort on sites that are less than 50 acres, but still have significant disturbed areas. The reduction in inspection frequency for sites greater than 50 acres is justified because the sites have generally improved their erosion and sediment control measures since adoption of Order No. 2001-01. Biweekly inspections of these sites in the future should be sufficient to ensure compliance at these sites.

The Order omits Order No. 2001-01's provision allowing a Copermittee to decrease the inspection frequency for high priority sites if the Copermittee certifies in writing to the Regional Board that they have recorded the site's Waste Discharge Identification Number, reviewed the site's Storm Water Pollution Prevention Plan (SWPPP), assured the site's SWPPP is in compliance, and assured the SWPPP is properly implemented at the site. Under Order No. 2001-01, the Regional Board never received from any of the Copermittees a certification to decrease the inspection frequency at high priority sites. Since the certification process was never used, the language has been deleted from the Order.

In their ROWD,[176] the Copermittees recommend that the use of weather triggered action plans be used in place of minimum inspection frequencies at construction sites during the month of October. The Copermittees' proposal is not to be confused with using weather triggered action plans to implement BMPs; rather the plan would be used during October by Copermittees to conduct inspections. The Order does not include this measure because historical rainfall data shows that San Diego received significant rainfall during October in 2005, 2004, and 2000.[177]

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[173] Schueler, T. and Holland, H., 2000. "Muddy Water In – Muddy Water Out?" The Practice of Watershed Protection. P. 5.
[174] Ibid.; P.11.
[175] USEPA, 1990. "Sediment and Erosion Control: An Inventory of Current Practices", P. II-1
[176] San Diego County Copermittees, 2005. Report of Waste Discharge. P. D-27.
[177] National Weather Service, Surface Observations at Lindbergh field; www.wrh.noaa.gov/sgx/obs/rtp/linber.html

Moreover, based upon Regional Board inspections, construction sites rarely have been found to have fully implemented their SWPPP by October 1 in anticipation of the rainy season. During those years that rainfall does not occur during October, Copermittees' biweekly inspections during October can ensure that construction sites are implementing and preparing for the eventual rains. Like dry weather inspections, these inspections can also identify sources of non-storm water pollution and discharges.

This section also requires the Copermittees to track the number of inspections for each inventoried construction site. This requirement has been added to ensure that the Copermittees can demonstrate that construction sites are inspected at the minimum frequencies.

Section D.2.e (Enforcement of Construction Sites) requires each Copermittee to develop and implement an escalating enforcement process that achieves prompt and effective corrective actions at all construction sites for violations of the Copermittee's requirements and ordinances. Each Copermittee develops their own unique enforcement procedure tailored for their specific jurisdiction. This requirement is similar to Order No. 2001-01, except that enforcement procedures are required to be escalating and enforcement sanctions are required to be implemented in a prompt and effective manner.

Under Order No. 2001-01, inspections conducted by the Regional Board noted deficiencies in the Copermittees' enforcement procedures and implementation. The most common issues found were that enforcement was not firm and appropriate to correct the violation, and that repeat violations did not result in escalated enforcement procedures. Moreover, in the municipal audit reports, deficiencies and potential permit violations were found in Copermittee's enforcement programs.[178] USEPA supports enforcement of ordinances and permits at construction sites stating "Effective inspection and enforcement requires […] penalties to deter infractions and intervention by the municipal authority to correct violations."[179] In addition, USEPA expects permits issued to municipalities to address "weak inspection and enforcement."[180] For these reasons, the enforcement requirements in this section have been modified, while providing sufficient flexibility for each Copermittee's unique storm water program.

In their ROWD, the Copermittees strongly oppose "the revision of Permit requirements for the purpose of standardizing processes that are necessarily unique to individual jurisdictions."[181] However, the Order does not require that Copermittees standardize enforcement procedures to be the same among all the Copermittees, but requires that each Copermittee will consistently implement their unique enforcement procedures at construction sites within their jurisdiction.

The Order requires that inspectors have the authority to conduct immediate enforcement actions when appropriate. Inspectors conducting immediate enforcement will quickly implement corrections to violations, thereby minimizing and preventing threats to water quality. When inspectors are unable to conduct immediate enforcement actions, the threat to water quality continues until an enforcement incentive is issued to correct the violation. In the municipal audits, storm water inspectors for several municipalities were found to lack the necessary

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[178] Tetra Tech, Inc., 2002-05, Program Evaluation Reports – San Diego Area Storm Water Programs – July 23, 2002, Chula Vista P. 11, El Cajon P. 15; April 8, 2003, Oceanside P. 16; December 17, 2003, San Marcos P.20, Vista P.26; June 11, 2004, Poway P. 12, Santee, P. 15; January 31, 2005, Del Mar P.9, Solana Beach, P.12.
[179] USEPA, 1992. Guidance 833-8-92-002. Section 6.3.2.3.
[180] Federal Register / Vol. 55, No. 222 / Friday, November 16, 1990 / Rules and Regulations. P. 48058
[181] San Diego County Copermittees, 2005. Report of Waste Discharge. P. D-28.

enforcement authority.[182] In its Phase II Compliance Assistance Guidance, USEPA says that "Inspections give the MS4 operator an opportunity to provide additional guidance and education, issue warnings, or assess penalties."[183] In order to issue warnings and assess penalties during inspections, inspectors need to have the legal authority to conduct enforcement.

D.3. Existing Development

D.3.a Municipal

The following legal authority applies to section D.3.a:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(1) provides that the proposed management program include "A description of maintenance activities and a maintenance schedule for structural controls to reduce pollutants (including floatables) in discharges from municipal separate storm sewers."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(3) provides that the proposed management program include "A description for operating and maintaining public streets, roads and highways and procedures for reducing the impact on receiving waters of discharges from municipal storm sewer systems, including pollutants discharged as a result of deicing activities."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(4) provides that the proposed management program include "A description of procedures to assure that flood management projects assess the impacts on the water quality of receiving water bodies and that existing structural flood control devices have been evaluated to determine if retrofitting the device to provide additional pollutant removal from storm water is feasible."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(5) provides that the proposed management program include "A description of a program to monitor pollutants in runoff from operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste, which shall identify priorities and procedures for inspections and establishing and implementing control measures for such discharges."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(6) provides that the proposed management program include "A description of a program to reduce to the maximum extent practicable, pollutants in discharges from municipal separate storm sewers associated with the application of pesticides, herbicides, and fertilizer which will include, as appropriate, controls such as educational activities, permits, certifications, and other measures for commercial applicators and distributors, and controls for application in public right-of-ways and at municipal facilities."

Federal NPDES regulation 40 CFR 122.44(d)(1)(i) requires NPDES permits to include limitations to "control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines are or may be discharged at a

[182] Tetra Tech, Inc., 2003-05. Program Evaluation Reports – San Diego Area Storm Water Programs –April 8, 2003, Oceanside P. 16; June 11, 2004, Poway P. 12, Santee, P. 15; January 31, 2005, Solana Beach, P.12.
[183] USEPA, 2000. 833-R-00-002, Storm Water Phase II Compliance Assistance Guide, P.4-31

level which will cause, have reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality."

Section D.3.a.(2) (BMP Implementation) requires the Copermittees to designate minimum BMPs for all municipal areas and activities, regardless of their threat to water quality. The requirement that different types of BMPs be designated for different threat to water quality categories of municipal areas and activities has been removed from the Order to help simplify and clarify the Order's requirements. BMPs required to be implemented at a site can now be based on the sources or activities present at the site. This more closely matches the approach taken by the Copermittees in their JURMPs. Threat to water quality is used to determine inspection frequencies in section D.3.a.(7).

Section D.3.a.(3) (Operation and Maintenance of MS4 and Structural Controls) requires the Copermittees to inspect and remove waste from their MS4s prior to the rainy season. Additional wording has been added to clarify the intent of the requirements. The Copermittees will be required to inspect all storm drain inlets and catch basins. This change will assist the Copermittees in determining which basins/inlets need to be cleaned and at what priority. Removal of trash has been identified by the Copermittees as a priority issue in their long-term effectiveness assessment. To address this issue, wording has been added to require the Copermittees, at a minimum, inspect and remove trash from all their open channels at least once a year.

Section D.3.a.(5) (Sweeping of Municipal Areas) requires the Copermittees to implement a program to sweep all municipal roads, streets, highways, and parking facilities. This section has been added to ensure that the Copermittees are implementing this effective BMP at all appropriate areas. The reporting requirements of the Order have also be modified to ensure that the Copermittees consistently report their sweeping and pollutant removal activities.

Section D.3.a.(6) (Limit Infiltration From Sanitary Sewer to MS4/Provide Preventive Maintenance of Both) requires the Copermittees to implement controls and measures to limit infiltration of seepage from municipal sanitary sewers to MS4s through thorough, routine preventive maintenance of the MS4. In their ROWD, the Copermittees requested this section be removed form the Illicit Discharge Detection and Elimination Component and added to the Municipal Component since it is a municipal activity. We agree and have moved the section to the municipal component of the Order.

Section D.3.a.(7) (Inspection of Municipal Areas and Activities) establishes a minimum set of municipal areas and activities for oversight and inspection by the Copermittees. In their ROWD, the Copermittees stated that some high priority areas on the list are not present in San Diego County. In response to this comment, incinerators, uncontrolled sanitary landfills, sites for disposing and treating sewage sludge, and hazardous waste treatment, disposal, and recovery facilities have been removed as high priority municipal areas. Household hazardous waste collection facilities and parks/recreation facilities have been identified by the Copermittees as municipal areas in their JURMPs and therefore have been added to the high priority list.

D.3.b. Industrial and Commercial

The following legal authority applies to section D.3.b:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(C) provides that the proposed management program include "A description of a program to monitor and control pollutants in storm water discharges to municipal systems from municipal landfills, hazardous waste treatment, disposal and recovery facilities, industrial facilities that are subject to section 313 of title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA), and industrial facilities that the municipal permit applicant determines are contributing a substantial pollutant loading to the municipal storm sewer system."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(C)(1) provides that the Copermittee must "identify priorities and procedures for inspections and establishing and implementing control measures for such discharges."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(C)(2) provides that the proposed management program shall "Describe a monitoring program for storm water discharges associated with the industrial facilities identified in paragraph (d)(2)(iv)(C) of this section, to be implemented during the term of the permit, including the submission of quantitative data on the following constituents: any pollutants limited in effluent guidelines subcategories, where applicable; any pollutant listed in an existing NPDES permit for a facility; oil and grease, COD, pH, BOD5 , TSS, total phosphorus, total Kjeldhal nitrogen, nitrate plus nitrite nitrogen, and any information on discharges required under 40 CFR 122.21(g)(7)(iii) and (iv)."

Federal NPDES regulation 40 CFR 122.26(d)(2)(ii) provides that the Copermittee "Provide an inventory, organized by watershed of the name and address, and a description (such as SIC codes) which best reflects the principal products or services provided by each facility which may discharge, to the municipal separate storm sewer, storm water associated with industrial activity."

Federal NPDES regulation 40 CFR 122.44(d)(1)(i) requires NPDES permits to include limitations to "control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines are or may be discharged at a level which will cause, have reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality."

Federal NPDES regulation 40 CFR 122.26(d)(2)(i)(A) provides that each Copermittee must demonstrate that it can control "through ordinance, permit, contract, order or similar means, the contribution of pollutants to the municipal storm sewer by storm water discharges associated with industrial activity and the quality of storm water discharged from site of industrial activity."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A) provides that the Copermittee develop a proposed management program which includes "A description of structural and source control measures to reduce pollutants from runoff from commercial and residential areas that are discharged from the municipal storm sewer system that are to be implemented during the life of the permit, accompanied with an estimate of the expected reduction of pollutant loads and a proposed schedule for implementing such controls."

Section D.3.b requires the Copermittees to implement an industrial and commercial program to reduce pollutants in runoff from all industrial and commercial sites/sources. The industrial and commercial sections of Order No. 2001-01 have been combined into one section in this Order. This change will streamline and simplify the Order, without negatively impacting water quality. This change is not unprecedented because industrial and commercial facilities are commonly

addressed together. For example, the Southern Riverside County MS4 Permit[184] combined industrial and commercial programs into one section. In addition, in their ROWD,[185] the Copermittees jointly addressed industrial and commercial components. USEPA contractor Tetra Tech also evaluated and reported on the industrial and commercial programs jointly during their program evaluations.[186]

Section D.3.b.(1)(a) (Commercial Sites/Sources) requires that building material retailers and storage, animal facilities, and power washing services be included in the Copermittee's inventory of commercial sites/sources. In their ROWD, the Copermittees state "Two sources that were not identified in the Permit [Order No. 2001-01] as high priorities (animal facilities and pressure washers) were determined to justify close attention due their significant number and their potential to discharge pollutants." The Regional Board agrees with the Copermittees statement in the ROWD; therefore, animal facilities and pressure washers are included in the source identification section. Building material retailers and storage facilities are included because they are potential sources of pollutants to urban runoff. These facilities typically store and vend building materials in the outdoors exposed to storm water without implementing BMPs.

The Order has revised requirements for identifying industrial sites/sources. The revised requirements are identical to those found in the Southern Riverside County MS4 permit.[187] USEPA requires the same identification: "Measures to reduce pollutants in storm water discharges to municipal separate storm sewers from municipal landfills, hazardous waste treatment, disposal and recovery facilities, industrial facilities that are subject to section 313 of title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA)."[188] USEPA "also requires the municipal storm sewer permittee to describe a program to address industrial dischargers that are covered under the municipal storm sewer permit."[189] In order to more closely follow USEPA's guidance, this Order also includes operating and closed landfills, and hazardous waste treatment, disposal, storage and recovery facilities.

The Order continues to require the Copermittees to identify industrial sites and sources subject to the General Industrial Permit or other individual NPDES permit. This requirement is despite the Copermittees' recommendation, "The Permit should be amended to eliminate the requirement to include sites with coverage under the General Industrial Permit, or other permits with storm water requirements, on the list of minimum high priority industrial facilities."[190] USEPA supports the municipalities regulating industrial sites and sources that are already covered by a NPDES permit:

> "Municipal operators of large and medium municipal separate storm sewer systems are responsible for obtaining system-wide or area permits for their system's discharges. These permits are expected to require that controls be placed on storm water discharges associated with industrial activity which discharge through the municipal system. It is anticipated that general or individual permits covering industrial storm water discharges to these municipal

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[184] Regional Board, 2004. Order No. R9-2004-001; Riverside County MS4 Permit. Section H.2; P. 24.
[185] San Diego County Copermittees, 2005. Report of Waste Discharge. Section D.5.1, P. D-37.
[186] Tetra Tech, Inc., 2002-05. Program Evaluation Reports – San Diego Area Storm Water Programs; July 23, 2002; December 13, 2002; December 26, 2002; April 8, 2003; December 17, 2003; June 11, 2004; January 31, 2005.
[187] Regional Board, 2004. Order No. R9-2004-001; Riverside County MS4 Permit. Section H.2.b)(2); P. 25.
[188] Federal Register / Vol. 55, No. 222 / Friday, November 16, 1990 / Rules and Regulations. P. 48056.
[189] Ibid.
[190] San Diego County Copermittees, 2005. Report of Waste Discharge. Section D.5.6, P. D-43

separate storm sewer systems will require industries to comply with the terms of the permit issued to the municipality, as well as other terms specific to the permittee."[191]

And:

"Although today's rule will require industrial discharges through municipal storm sewers to be covered by separate permit, USEPA still believes that municipal operators of large and medium municipal systems have an important role in source identification and the development of pollutant controls for industries that discharge storm water through municipal separate storm sewer systems is appropriate. Under the CWA, large and medium municipalities are responsible for reducing pollutants in discharges from municipal separate storm sewers to the maximum extent practicable. Because storm water from industrial facilities may be a major contributor of pollutants to municipal separate storm sewer systems, municipalities are obligated to develop controls for storm water discharges associated with industrial activity through their system in their storm water management program."[192]

The Order's requirement to inventory those sites subject to the General Industrial Permit is identical to the requirements found in the Southern Riverside County MS4 Permit, Order No. R9-2004-001.[193] USEPA supports the list of industrial facilities in the Order when it states the following:

"The issue of industrial inspections also arose for the Los Angeles County MS4 permit. The State Board, in a memo dated November 9, 2001, from Michael Lauffer of the State board to Dennis Dickerson, Executive Officer of the Los Angeles Regional Board, noted that under Section 402 (p)(3)(B)(iii) of the CWA, the Board has broad authority to require 'such other provisions…as the State determines appropriate…' and that this would provide a basis for requirements that go beyond specific provisions of the EPA regulations. We would agree with the State Board on this matter, and that the Regional Board would have the authority to require inspections of all the industrial facilities listed in the permit [Order], notwithstanding the specific provisions of the EPA regulations."[194]

Section D.3.b.(2) (BMP Implementation) adds a pollution prevention requirement, since pollution prevention methods are considered a BMP. Moving this requirement will streamline the Order, without causing a detrimental effect on water quality.

Section D.3.b.(3) (Inspection of Industrial and Commercial Sites/Sources) includes requirements for inspections of industrial and commercial sites/sources. The Order is similar to the Southern Riverside County MS4 permit[195] in requiring that inspections check for coverage under the General Industrial Permit; assessment of compliance with Copermittee ordinances and permits related to urban runoff; assessment of BMP implementation, maintenance, and effectiveness; visual observations for non-storm water discharges, potential illicit connections, and potential discharge of pollutants in storm water runoff; and education and outreach on storm water pollution prevention. The Order also requires that inspections include review of BMP implementation plans if the site uses or is required to use such a plan, and the review of facility monitoring data if the site monitors its runoff. These changes are necessitated by the results of

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[191] Federal Register / Vol. 55, No. 222 / Friday, November 16, 1990 / Rules and Regulations. P. 48006.
[192] Ibid. P. 48000
[193] Regional Board, 2004. Order No. R9-2004-001; Riverside County MS4 Permit. Section H.2.b)(2); P. 25.
[194] Letter dated March 5, 2004 from Doug Eberhardt, EPA Manager to John Robertus, Executive Officer of Regional Board containing comments on Order No. R9-2004-001.
[195] Regional Board, 2004. Order No. R9-2004-001; Riverside County MS4 Permit. Section H.2.d)(3); P. 26.

storm water program evaluations.[196] It was observed that 12 Copermittees had deficiencies or potential permit violations in their industrial and commercial component. The inspection section received twice as many comments than any other requirement in the industrial/commercial program evaluation reports section. These changes in the Order mimic USEPA's guidance: "Site inspections should include (1) an evaluation of the pollution prevention plan and any other pertinent documents, and (2) an onsite visual inspection of the facility to evaluate the potential for discharges of contaminated storm water from the site and to assess the effectiveness of the pollution prevention plan." [197] In 1999, USEPA "recognized visual inspection as a baseline BMP for over 10 years," and "visual inspections are an effective way to identify a variety of problems. Correcting these problems can improve the water quality of the receiving water." [198]

Section D.3.b.(3)(c) of the Order requires that at a minimum, 40% of the sites inventoried shall be inspected each year, including all sites determined to pose a high threat to water quality. This requirement maintains inspection frequencies and rates while allowing more flexibility for the Copermittees to decide where to conduct inspections. In the ROWD,[199] the Copermittees reported 18,017 industrial and commercial sources. In fiscal year 2002-2003, the Copermittees conducted 10,133 inspections, giving an inspection rate of 56%. In fiscal year 2003-2004, the Copermittees conducted 8,546 inspections giving an inspection rate of 47%. USEPA guidance[200] says, "management programs should address minimum frequency for routine inspections." The USEPA Fact Sheet – Visual Inspection[201] says, "To be effective, inspections must be carried out routinely. This requires a corporate commitment to implementing them."

In their ROWD,[202] the Copermittees recommend, "The Permit should allow revision of mandated inspection requirements in accordance with demonstrated needs." The Copermittees "strongly discourage Permit requirements that seek to establish minimum levels of inspection activity." The Order includes the minimum level of inspection activity because without minimum levels, the Regional Board has no assurance that inspections of commercial and industrial sites will be conducted. Without inspections, the Copermittees would be unable to adequately verify that industrial and commercial sites are in compliance with their local storm water ordinances and regulations. Even though minimum inspection levels have been included, the Order allows enough flexibility to maximize the effectiveness of inspections by concentrating resources on industrial and commercial sites that are higher threats to water quality without neglecting other industrial and commercial sites. Further flexibility is provided in prioritizing inspections, as discussed next.

The Order no longer includes a section titled "Threat to Water Quality Prioritization." Rather, threat to water quality prioritization is incorporated within the inspection section. The Order requires several criteria to determine if a site is a high threat to water quality that needs an annual inspection. This change is identical to the requirements in the Southern Riverside County MS4 permit,[203] except for the addition of a few criteria recommended in the Copermittees' ROWD.[204] The Copermittees recommended criteria that are included in the Order are No Exposure

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[196] Tetra Tech, Inc., 2002-05. Program Evaluation Reports – San Diego Area Storm Water Programs; July 23, 2002; December 13, 2002; December 26, 2002; April 8, 2003; December 17, 2003; June 11, 2004; January 31, 2005.
[197] USEPA, 1992. Guidance 833-8-92-002, section 6.3.3.4 "Inspection and Monitoring".
[198] USEPA, 1999. 832-F-99-046, "Storm Water Management Fact Sheet – Visual Inspection".
[199] San Diego County Copermittees, 2005. Report of Waste Discharge. Section D.5.
[200] USEPA, 1992. Guidance 833-8-92-002, section 6.3.3.4 "Inspection and Monitoring".
[201] USEPA, 1999. 832-F-99-046,, "Storm Water Management Fact Sheet – Visual Inspection".
[202] San Diego County Copermittees, 2005. Report of Waste Discharge. Section D.5.3.
[203] Regional Board, 2004. Order No. R9-2004-001; Riverside County MS4 Permit. Section H.2.d)(1); P. 26.
[204] San Diego County Copermittees, 2005. Report of Waste Discharge. Section D.5.1.

Certification / Notice of Non-Applicability, Compliance History, and Facility Design. "Existing Regulatory Oversight" is already included as a criterion in the Order as "Whether the site is subject to the Statewide Industrial Permit." Self-certification status and Green Business Certification are not included in the Order because these certifications do not ensure that storm water is addressed. In the ROWD,[205] the Copermittees recommend, "The Permit should allow re-prioritization of currently mandated minimum high priority industrial and commercial sources." The Order has been modified to increase flexibility and allow the Copermittees to reprioritize sites as more information is learned about the sites' potential threat to water quality.

In their ROWD[206], the Copermittees recommend, "The Permit should allow and encourage alternatives to current inspection requirements." They suggest utilizing non-inspection methods including self-certification, certified submission of monitoring results demonstrating that benchmarks have been met, third-party inspections, facility- or industry-specific surveys, and/or phone interviews. The proposed alternatives do not provide the same level of compliance oversight as inspections provide; therefore the Order includes such a section not as an alternative to inspections but in addition to inspections. The Order allows the use of these alternatives if they are determined to be necessary by the Copermittee.

Section D.3.b.(4) (Regulation of Mobile Businesses) is a new section. Mobile businesses are service industries that travel to the customer to perform the service rather than the customer traveling to the business to receive the service. Examples of mobile businesses are power washing, mobile vehicle washers, carpet cleaners, port-a-potty servicing, pool and fountain cleaning, mobile pet groomers, and landscapers. These mobile services produce waste streams that could potentially impact water quality if appropriate BMPs are not implemented. Mobile businesses present a unique difficulty in storm water regulation. Due to the transient nature of the business, the regular, effective practice of unannounced inspections is difficult to implement. Also, tracking these mobile businesses is difficult because they are often not permitted or licensed and their services cross Copermittee jurisdictions. The Order takes into account the difficulties in regulating mobile businesses. Only those mobile businesses that are known to operate within their jurisdiction are required to be inventoried and notified. The inventory shall be updated as additional mobile businesses are identified.

The Order requires that mobile businesses shall be inspected as needed. Inspections can be accomplished in response to complaints. Inspections can be scheduled through contacting the business. Impromptu inspections can be conducted if a Copermittee's inspector observes a mobile business operating in the course of the inspector's normal travels throughout their jurisdiction. In their ROWD,[207] the Copermittees recommend, "Copermittees should increase their collaboration on the regulation of mobile businesses". The Order allows but does not require collaboration among the Copermittees. Due to the Copermittee's differences in watersheds, culture, ethnicity, ordinances, regulations, policies and procedures, Copermittee collaboration on regulating mobile businesses is left up to the Copermittees as they see fit.

Section D.3.b.(5) (Enforcement of Industrial and Commercial Sites/Sources) requires that inspectors have authority to conduct immediate enforcement actions when appropriate. Inspectors conducting immediate enforcement will quickly correct violations, thereby minimizing and preventing threats to water quality. When inspectors are unable to conduct immediate enforcement actions, the threat to water quality continues until an enforcement incentive is issued

[205] Ibid. Section D.5.2.
[206] Ibid. Section D.5.4
[207] Ibid. Section D.5.5.

to correct the violation. In the municipal audits, Tetra Tech reported deficiencies where several Copermittees needed to ensure that their storm water inspectors have enforcement authority.[208] In its Phase II Compliance Assistance Guidance, USEPA says that "Inspections give the MS4 operator an opportunity to additional guidance and education, issue warnings, or assess penalties."[209] In order to issue warnings and assess penalties during inspections, inspectors need to have the legal authority to conduct enforcement.

D.3.c. Residential

The following legal authority applies to section D.3.c:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A) provides that the Copermittee develop a proposed management program which includes "A description of structural and source control measures to reduce pollutants from runoff from commercial and residential areas that are discharged from the municipal storm sewer system that are to be implemented during the life of the permit, accompanied with an estimate of the expected reduction of pollutant loads and a proposed schedule for implementing such controls."

Federal NPDES regulation 40 CFR 122.44(d)(1)(i) requires NPDES permits to include limitations to "control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines are or may be discharged at a level which will cause, have reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality."

Section D.3.c.(2)(b) of the Order moves the residential pollution prevention requirements together with the other BMP requirements in order to improve the organization of the Order. This change has no net effect on the implementation and enforcement of the Order.

Section D.3.c.(2)(c) of the Order moves the requirement for proper management of used oil, toxic materials, and other household hazardous wastes to the residential section of the Order, since this requirement generally applies to residents. This change improves the organization of the Order, and has no net effect on its implementation and enforcement.

Section D.3.c.(4) (Regional Residential Education Program) of the Order requires each Copermittee to participate in a Regional Residential Education Program. An education program specifically targeting residential sources is needed due to the fact that residential housing units encompass the largest category of specific sources in San Diego County and have been identified by the Copermittees as a regional priority source. Moreover, the Copermittees recommend in their ROWD that such a program be developed. Section F.7 of the Order, which is referenced in section D.3.c.(4), expands on the Regional Residential Education Program requirements by requiring that the program focus on bacteria, nutrients, sediment, pesticides, and trash. This is appropriate for a regional education program, since the Copermittees have identified these constituents as regional priorities.

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[208] Tetra Tech, Inc., 2002-05. Program Evaluation Reports – San Diego Area Storm Water Programs.
[209] USEPA, 2000. Storm Water Phase II Compliance Assistance Guide. 833-R-00-002. P. 4-31.

D.4. Illicit Discharge Detection and Elimination

The following legal authority applies to section D.4:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(B) provides that the proposed management program "shall be based on a description of a program, including a schedule, to detect and remove (or require the discharger to the municipal storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B)(1) provides that the Copermittee include in its proposed management program "a program, including inspections, to implement and enforce an ordinance, orders or similar means to prevent illicit discharges to the municipal storm sewer system."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B)(2) provides that the Copermittee include in its proposed management program "a description of procedures to conduct on-going field screening activities during the life of the permit, including areas or locations that will be evaluated by such field screens."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B)(3) provides that the Copermittee include in its proposed management program "procedures to be followed to investigate portions of the separate storm sewer system that, based on the results of the field screen, or other appropriate information, indicate a reasonable potential of containing illicit discharges or other sources of non-storm water."

Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(B)(4) provides that the Copermittee include in its proposed management program "a description of procedures to prevent, contain, and respond to spills that may discharge into the municipal separate storm sewer."

Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(B)(5) provides that the Copermittee include in its proposed management program "a description of a program to promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges from municipal separate storm sewers."

Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(B)(6) provides that the Copermittee include in its proposed management program "a description of educational activities, public information activities, and other appropriate activities to facilitate the proper management and disposal of used oil and toxic materials."

Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(B)(7) provides that the Copermittee include in its proposed management program "a description of controls to limit infiltration of seepage from municipal sanitary sewers to municipal separate storm sewer systems where necessary."

Section D.4.a (Illicit Discharges and Connections) requires the Copermittees to implement a program to actively seek and eliminate illicit connections and discharges (IC/ID). Additional wording has been added to this section to clarify and ensure that all appropriate (i.e., field personnel) municipal personnel are utilized in the program to observe and report these illicit discharges and connections.

Section D.4.b (Develop/Maintain MS4 Map) requires the Copermittees to develop or obtain a map of their entire MS4 system and drainages within their jurisdictions. To provide clarification to the Order, this requirement has been moved to the IC/ID component of the Order from the Dry Weather Field Screening and Analytical Monitoring Specifications (Attachment E in previous Order No. 2001-01).

Section D.4.d (Investigation/Inspection and Follow-Up) requires the Copermittees to conduct follow up investigations and inspect portions of the MS4 for illicit discharges and connections, based on dry weather field screening and analytical monitoring results. The section also requires the Copermittees to establish criteria for triggering follow up investigations. Additional language has been added to this section to clarify the minimum level of effort and timeframes for follow up investigations when dry weather action levels (developed by the Copermittees) are exceeded. Timely investigation and follow up when action levels are exceeded is necessary to identify sources of illicit discharges, especially since many of the discharges are transitory. The requirements for a 48-hour minimum response time when action levels are exceeded and for immediate response to obvious illicit discharges is necessary to ensure timely response by the Copermittees.

In its October 29, 2004 letter to the Copermittees, as well as in subsequent meetings, the Regional Board notified Copermittees that standardized procedures were necessary to ensure timely IC/ID investigations. In the ROWD, the Copermittees state that procedures for dry weather programs should not be standardized and that a minimum response timeframe would hamper their efforts to prioritize and respond to IC/IDs. However, the purpose of the dry weather action levels is to help the Copermittees prioritize and investigate the most likely IC/IDs. Sampling locations that exceed these action levels warrant timely investigation/response, and the minimum time frames in the requirements are reasonable. The Copermittees may also determine that the exceedances do not pose a threat to water quality and therefore do not warrant further investigation. The rationale for no further action for dry weather sampling stations that exceed action levels would be reported in the Jurisdictional Urban Runoff Management Program Annual Report.

D.5. Education Component

The following legal authority applies to section D.5:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(6) provides that the proposed management program include “A description of a program to reduce to the maximum extent practicable, pollutants in discharges from municipal separate storm sewers associated with the application of pesticides, herbicides, and fertilizer which will include, as appropriate, controls such as educational activities, permits, certifications, and other measures for commercial applicators and distributors, and controls for application in public right-of-ways and at municipal facilities."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B)(6) provides that the proposed management program include “A description of educational activities, public information activities, and other appropriate activities to facilitate the proper management and disposal of used oil and toxic materials.”

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D)(4) provides that the proposed management program include "A description of appropriate educational and training measures for construction site operators."

Section D.5 includes an introductory paragraph that is the same as in Order No. 2001-01, except for the removal of Quasi-Governmental Agencies/ Districts. The Copermittees' ROWD recommends elimination of the requirement to educate quasi-governmental entities.[210]

Section D.5.a (General Requirements) includes education topics from the existing permit with some minor wording and formatting changes. The Copermittees' ROWD recommends that the Copermittees should focus educational efforts on the most important constituents and not on a list of topics.[211] The Regional Board agrees with the focused efforts, but a list of topics is needed to provide a goal of basic storm water knowledge. The Copermittees can choose how and to what degree to address these topics. Copermittees may decide to focus on some topics and not on others. Some topics may be more important for certain target communities or watersheds.

The Regional Board has incorporated the following recommendation from the Copermittees' ROWD into the permit: "Copermittee educational programs should emphasize underserved target audiences, high-risk behaviors, and "allowable" behaviors and discharges."[212] In conducting audits of the Copermittees' storm water program, Tetra Tech found that several of the Copermittees could improve education of specific target audiences with pollutant-specific educational campaigns, messages, or technical guidance.[213]

Section D.5.b (Specific Requirements) requires the Copermittees to educate their own departments and personnel. The new development and redevelopment as well as the municipal construction education requirements were taken from Order No. 2001-01 with some minor wording changes. Additional clarification was added regarding storm water management plans and SUSMP requirements due to deficiencies found during the SUSMP audits. The Regional Board considers it vital for the Copermittees' planning and development staff, who have a broad authority and influence over new and redevelopment projects, to thoroughly understand storm water management plan development and SUSMP requirements. Municipal construction staff also need a thorough understanding of SUSMP requirements to adequately oversee active construction projects which are implementing SUSMPs.

A new requirement has also been added for education of activity specific BMPs for municipal personnel and contractors performing activities that generate pollutants. Education is required at all levels of municipal staff and contractors. Education is especially important for the staff in the field performing activities which might result in discharges of pollutants if proper BMPs are not used. The CASQA Municipal Handbook states that successful implementation of BMPs is dependent on "Effective training of municipal and contract employees working in both fixed facilities and field programs."[214] This training can be conducted in either a formal or an informal tail-gate format.

Section D.5.b.(2) (New Development and Construction Education) requires the Copermittees to educate all project applicants, developers, contractors, property owners, community planning

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[210] San Diego County Copermittees, 2005. Report of Waste Discharge. P. D-57.
[211] Ibid. P. D-52.
[212] Ibid. P. D-53.
[213] Tetra Tech, Inc., 2002-03. Program Evaluation Reports -- San Diego Area Stormwater Program.
[214] California Stormwater Quality Association, 2003. Stormwater Best Management Practices Handbook, Municipal. P. 5-1

groups, and other responsible parties about stormwater issues and BMPs, including annual training before the rainy season. The first requirement is taken from the existing permit sections on new development and construction, with some minor wording changes and an additional topic at the end to recognize the importance of training for field level construction workers. Different levels of training will be needed for planning groups, owners, developers, contractors, and construction workers, but everyone should get a general education of stormwater requirements. Education of all construction workers can prevent unintentional discharges, such as discharges by workers who are not aware that they are not allowed to wash things down the storm drains. Training for BMP installation workers is imperative because the BMPs will fail if not properly installed and maintained.[215] Training for field level workers can be formal or informal tail-gate format.

Section D.5.b.(3) (Residential, General Public, and School Children Education) requires the Copermittees to collaboratively develop and implement a plan to educate residential, general public, and school children through use of mass media, mailers, door hangers, booths at public events, classroom education, field trips, hands-on experiences, or other educational methods. USEPA supports education of the general community when it states: "An informed and knowledgeable community is critical to the success of a storm water management program since it helps ensure the following:

> Greater support for the program as the public gains a greater understanding of the reasons why it is necessary and important. […]
>
> Greater compliance with the program as the public becomes aware of the personal responsibilities expected of them and others in the community, including the individual actions they can take to protect or improve the quality of area waters."[216]

Regarding target audiences, USEPA also finds that "The public education program should use a mix of appropriate local strategies to address the viewpoints and concerns of a variety of audiences and communities, including minority and disadvantaged communities, as well as children."[217] The SWRCB TAC also supports education of schoolchildren, stating:

> "Target Audiences should include:
>
> 1. Government: Educate government agencies and officials to achieve better communication, consistency, collaboration, and coordination at the federal, state and local levels.
> 2. K-12/Youth Groups: Establish statewide education programs, including curricula, on watershed awareness and nonpoint source pollution problems and solutions, based on a state lead role building upon and coordinating with existing local programs.
> 3. Development Community: Educate the development community, including developers, contractors, architects, and local government planners, engineers, and inspectors, on nonpoint source pollution problems associated with development and redevelopment and construction activities and involve them in problem definitions and solutions.
> 4. Business and Industrial Groups."[218]

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[215] Ibid P.2-6.
[216] USEPA, 2000. Storm Water Phase II Compliance Assistance guide. EPA 833-R-00-002.
[217] Ibid.
[218] SWRCB, 1994. Urban Runoff Technical Advisory Committee Report and Recommendations. Nonpoint Source Management Program.

D.6 Public Participation

The following legal authority applies to section D.6:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

No significant changes have been made to this section of the Order.

E. Watershed Urban Runoff Management Program

The following legal authority applies to section E:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(a)(3)(ii) states: "The Director may […] issue distinct permits for appropriate categories of discharges […] including, but not limited to […] all discharges within a system that discharge to the same watershed […]"

Federal NPDES regulations 40 CFR 122.26(a)(3)(v) states: "Permits for all or a portion of all discharges from large or medium municipal separate storm sewer systems that are issued on a system-wide, jurisdiction-wide, watershed, or other basis may specify different conditions relating to different discharges covered by the permit, including different management programs for different drainage areas [watersheds] which contribute storm water to the system."

Federal NPDES regulation 40 CFR 122.26(a)(5) states: "The Director may issue permits for municipal separate storm sewers that are designated under paragraph (a)91)(v) of this section on a system-wide basis, a jurisdiction-wide basis, watershed basis, or other appropriate basis."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv) states: "Proposed programs may impose controls on a systemwide basis, a watershed basis, a jurisdiction basis, or on individual outfalls."

Section E.2.b of the Order requires the Copermittees to develop a watershed map. The section has been slightly modified from Order No. 2001-01 in that it no longer requires mapping of inventoried construction sites. The reason for this change is the temporary nature of construction sites. The location of construction sites is constantly changing, making the mapping of construction sites not useful.

Section E.2.c of the Order requires identification and description of available water quality data for each watershed. The minimum types of water quality data the Copermittees must consider are listed. For the most part, the listed types of water quality data match the types of data already used by the Copermittees for watershed management. Additional types of monitoring to be considered have been added, such as toxic hot spot and TMDL monitoring, because of their potential to provide useful information during identification and prioritization of watershed water quality problems. The listing of data types is necessary because the Copermittees have previously not used all available watershed water quality data while assessing watershed conditions. For example, in a March 10, 2003 letter, the Regional Board directed the Copermittees to utilize additional available data during WURMP implementation because initial Copermittee data use was limited.

Sections E.2.d and E.2.e of the Order require assessment and analysis of water quality data to prioritize each watershed's water quality problems, together with identification of the sources of the high priority water quality problems. These requirements are essentially the same as the requirements of Order No. 2001-01; they have simply been reorganized to more clearly convey the process required.

Section E.2.f of the Order requires the Copermittees to develop a list of Watershed Water Quality Activities for potential implementation. This requirement developed over time while working with the Copermittees on their WURMP implementation under Order No. 2001-01. In October 2004 letters, the Regional Board recommended the Copermittees develop a list of Watershed Water Quality Activities for potential implementation. Following receipt of the Regional Board letters, the Copermittees created Watershed Water Quality Activity lists. Although the Copermittees' lists needed improvement, the Regional Board found the lists to be useful planning tools that can be evaluated to identify effective and efficient Watershed Water Quality Activities. Because the lists are useful and have become a part of the WURMP implementation process, a requirement for their development has been written into the Order.

The goal of the WURMPs is to abate sources and reduce pollutant discharges causing the high priority water quality problems within a watershed. For this reason, it is required that the Watershed Water Quality Activity list describes how each Watershed Water Quality Activity will meet this goal.

Section E.2.g of the Order requires the Copermittees within a watershed to develop a strategy for implementation of Watershed Water Quality Activities and Watershed Education activities. The requirement for development of an implementation strategy is necessary because it should guide effective implementation of watershed activities. Moreover, it has been found that many of the Copermittees' current Watershed Water Quality Activities have no clear connection to the high priority water quality problems within the watersheds where they are being implemented. For example, when reviewing the 2003-2004 Watershed Urban Runoff Management Program Annual Report for the San Diego River, the Regional Board found that for several of the Watershed Water Quality Activities being implemented, it is "unclear what the connection is between this project and the identified high priority water quality problems in the watershed."[219] Similar findings were also noted during Regional Board review of the 2002-2003 Watershed Urban Runoff Management Program Annual Reports and issuance of corresponding comment letters.

Section E.2.h of the Order requires the Copermittees to evaluate the effectiveness of proposed activities. This will help the Copermittees choose the most effective activities for implementation. Implementation of effective activities is critical to ensure an effective Watershed Urban Runoff Management Program.

Section E.2.i of the Order requires each Copermittee to implement a certain number of Watershed Water Quality Activities annually. In crafting this section of the Order and the Watershed Water Quality Activity definition, the Regional Board sought to obtain a balance between the enforceability of the Order and Copermittee flexibility in implementing the Order.

So that the section is enforceable, it requires each Copermittee to implement a minimum number of Watershed Water Quality Activities which will directly and significantly abate sources and reduce pollutant discharges causing the high priority water quality problems within a watershed.

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[219] Regional Board, 2005. Review of Notices of Violation Issued to the San Diego County Copermittees for Watershed Urban Runoff Management Program Implementation.

This requirement provides measurable outcomes for WURMP implementation. WURMP measurable outcomes are needed in the Order because the Regional Board previously found that Copermittee implementation of Watershed Water Quality Activities was inadequate over the course of several years, despite several Regional Board efforts to precipitate improvement. The Regional Board issued comment letters in March 2003, California Water Code section 13267 information request letters in October 2004, and Notices of Violation in June 2005, all in an attempt to improve the Copermittees' implementation of Watershed Water Quality Activities that would effectively reduce discharges of pollutants causing the watersheds' high priority water quality problems. In addition, in a detailed review of the Copermittees' 2003-2004 Watershed Urban Runoff Management Program Annual Reports, the Regional Board found that for most watersheds, the Copermittees' reported "water quality activities" would not result in any significant reduction of pollutant discharges.[220]

Despite these efforts and findings by the Regional Board, the majority of the Copermittees contended as a group that their WURMP implementation was adequate and that they were in compliance with Order No. 2001-01's WURMP requirements. The Copermittees' position exhibits the lack of clarity and unenforceability of Order No. 2001-01's language regarding implementation of Watershed Water Quality Activities. To rectify this situation and ensure that WURMP implementation actually results in pollutant discharge reductions, a requirement for measurable outcomes has been added to the Order in the form of a minimum number of Watershed Water Quality Activities to be implemented which must reduce the discharge of pollutants and abate pollutant sources.

While section J.1.h specifically requires implementation of a measurable number of Watershed Water Quality Activities, the section and the Watershed Water Quality Activity definition also provide significant flexibility to the Copermittees regarding what constitutes a Watershed Water Quality Activity. The bottom line requirements for Watershed Water Quality Activity is that they reduce pollutant discharges causing high priority water quality problems within a watershed and exceed the baseline jurisdictional requirements. Beyond these bottom line requirements, the Copermittees have ample implementation flexibility. For example, both jurisdictional and regional activities in some circumstances can be considered Watershed Water Quality Activities. The same is true for TMDL activities. In addition, Copermittees can implement Watershed Water Quality Activities within their jurisdictions or outside of their jurisdictions; whichever they prefer. Moreover, Copermittees within a watershed can implement different Watershed Water Quality Activities, provided they are part of the watershed Copermittees' larger watershed strategy.

Details regarding what constitutes a Watershed Water Quality Activity are included in the definition section of the Order. The definition was written to clarify the following points:

- A Watershed Water Quality Activity must abate the sources and/or reduce the discharge of pollutants causing high priority water quality problems in the watershed. Activities that do not specifically abate sources and/or reduce pollutant discharges causing high priority water quality problems in a watershed are not Watershed Water Quality Activities.

- Watershed Water Quality Activities must implement an overall watershed strategy collaboratively developed by the Copermittees within a watershed.

[220] Regional Board, 2005. Supplemental Report for Review of Notices of Violation Issued to the San Diego County Copermittees for Watershed Urban Runoff Management Program Implementation. P. 5-14.

- Jurisdictional activities which exceed the baseline jurisdictional requirements may constitute Watershed Water Quality Activities, if they are more protective of water quality than baseline jurisdictional activities. Such activities must specifically abate sources and/or reduce the discharge of pollutants causing high priority water quality problems within a watershed. The jurisdictional activities must be organized and implemented as part of a larger watershed strategy.

- Specific Watershed Water Quality Activities do not need to be implemented watershed-wide, but all Copermittees within a watershed must implement well-coordinated Watershed Water Quality Activities.

- Watershed Water Quality Activities must be new activities; activities that have been conducted for many years without regard for watershed concerns are not Watershed Water Quality Activities. Moreover, as high priority water quality problems within watersheds continue, efforts to implement new and more effective activities are needed.

- Education, public participation, and planning efforts are not Watershed Water Quality Activities.

- Activities that only consist of monitoring are not Watershed Water Quality Activities. There must also be an element of the monitoring program that directly results in the abatement of sources and/or reduction of pollutant discharges causing high priority water quality problems.

This section of the Order also splits the implementation of Watershed Water Quality Activities into two categories. The first category requires implementation on an annual basis. This helps ensure meaningful and consistent implementation and allows for the use of measurable outcomes. The second category recognizes that not all Watershed Water Quality Activities lend themselves to annual implementation. The Copermittees are provided significant flexibility in taking the steps necessary to implement long-term Watershed Water Quality Activities, since no time frame for implementation is dictated.

Sections E.2.j and E.2.k of the Order require development of a list of potential Watershed Education Activities and implementation of a portion of those activities. Specific implementation of Watershed Education Activities in each jurisdiction within a watershed is being required due to the Regional Board's findings that previous Copermittee reporting often has not exhibited implementation of watershed and pollutant specific education activities. Moreover, the Regional Board has found from the Copermittees' reporting that regional education efforts are not always implemented in all watersheds. These findings have been documented in the Regional Board's Watershed Urban Runoff Management Program Annual Report review letters, which were issued in March 2003 and October 2004.

Implementation of Watershed Education Activities has been split into two categories, in order to represent two types of education pertaining to watershed management of urban runoff. During the previous permit cycle, the Copermittees primarily focused on watershed concept-based education activities. These efforts should proceed, but as high priority water quality problems and impairments within watersheds continue, source and pollutant discharge-based education efforts are also needed. The two categories of Watershed Education Activities provided in the Order ensure that both types of watershed education are conducted.

Section E.2.l of the Order includes minor alterations from Order No. 2001-01 which encourage the Copermittees to seek participation in the WURMP process from other potential interested parties. Increased participation in the WURMP process by interested parties can improve support for WURMP implementation, increasing the probability of implementation of effective programs.

Section E.2.m of the Order requires Copermittee collaboration, including frequent regularly scheduled meetings. The requirement for regularly scheduled meetings has been added based on Regional Board findings that watershed groups which hold regularly scheduled meetings (such as for San Diego Bay) typically produced better programs and work products than watershed groups that went for extended periods of time without scheduled meetings (such as San Dieguito and Los Penasquitos). For example, in their 2002-2003 Annual Reports, the San Dieguito and Los Penasquitos watersheds listed implementation of the same watershed activities, despite the fact that the two watersheds have different high priority water quality problems.

F. Regional Urban Runoff Management Program

The following legal authority applies to section F:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(i)(D) provides that "[The Copermittee must demonstrate that it can control] through interagency agreements among coapplicants the contribution of pollutants from one portion of the municipal system to another portion of the municipal system."

Federal NPDES regulations 40 CFR 122.26(a)(3)(v) states: "Permits for all or a portion of all discharges from large or medium municipal separate storm sewer systems that are issued on a system-wide, jurisdiction-wide, watershed, or other basis may specify different conditions relating to different discharges covered by the permit, including different management programs for different drainage areas [watersheds] which contribute storm water to the system."

Federal NPDES regulation 40 CFR 122.26(a)(5) states: "The Director may issue permits for municipal separate storm sewers that are designated under paragraph (a)91)(v) of this section on a system-wide basis, a jurisdiction-wide basis, watershed basis, or other appropriate basis."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv) states: "Proposed programs may impose controls on a systemwide basis, a watershed basis, a jurisdiction basis, or on individual outfalls."

Section F of the Order requires the Copermittees to develop a Regional Urban Runoff Management Program to facilitate Copermittee implementation of urban runoff management activities on a regional level. The requirement has been included in the Order because of the recognition that some aspects of urban runoff management can be effectively addressed at a regional level. Residential education and implementation of TMDLs covering multiple watersheds are examples of urban runoff issues which can be addressed regionally, since the scope of these issues are not limited to particular jurisdictions or watersheds. Such regional implementation provides opportunities for improved efficiency and utilization of economies of scale.

The Copermittees' ROWD identifies regional urban runoff management as an important aspect of their programs.[221] This requirement for the development of a regional urban runoff management program provides organization and structure for both the Copermittees and Regional Board to track regional efforts. The requirements include continuation of existing regional efforts and identify additional areas for regional implementation. However, significant flexibility has been provided to the Copermittees for new regional requirements. Typically, implementation of such regional requirements is required only where it is determined to be necessary by the Copermittees.

G. Fiscal Analysis

The following legal authority applies to section G:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(vi) provides that "[The Copermittee must submit] for each fiscal year to be covered by the permit, a fiscal analysis of the necessary capital and operation and maintenance expenditures necessary to accomplish the activities of the programs under paragraphs (d)(2)(iii) and (iv) of this section. Such analysis shall include a description of the source of funds that are proposed to meet the necessary expenditures, including legal restrictions on the use of such funds."

Section G has been expanded to achieve better consistency between the Copermittees in reporting budget and expenditure information. The section also requires clarification regarding which expenditures are solely attributable to the urban runoff program, as opposed to those expenditures which are also partially attributable to other programs (such as trash collection and street sweeping). Consistency and clarification of fiscal information are valuable for assessing program effectiveness and adapting programs to help ensure that they are efficient and effective, which is one important purpose of the fiscal analysis.

This section also requires the Copermittees to develop and use a metric for fiscal analysis reporting. This provides standardization of reporting so that figures between Copermittees are comparable, which is one of many types of information which can be used by the Regional Board to better understand Copermittee program implementation. Standardization and comparison of fiscal analysis reporting is supported by the State Board funded NPDES Stormwater Cost Survey, which finds that "standards for reporting costs and stormwater activities are needed to allow accurate cost comparisons to be made between stormwater activities."[222] This document also provides guidance regarding categorization of expenditures for tracking and reporting.

H. Total Maximum Daily Loads

The following legal authority applies to section H:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

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[221] San Diego County Copermittees, 2005. Report of Waste Discharge. P. C-12.
[222] Currier, et al., 2005. NPDES Storm Water Cost Survey Final Report. Prepared for California State Water Resources Control Board by Office of Water Programs, California State University, Sacramento. P. 63.

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.44(d)(1) requires municipal storm water permits to include any requirements necessary to "[a]cheive water quality standards established under section 303 of the CWA, including State narrative criteria for water quality."

Federal NPDES regulation 40 CFR 122.44(d)(1)(i) requires NPDES permits to include limitations to "control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines are or may be discharged at a level which will cause, have reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality."

Section H of the Order incorporates the two TMDLs that have been fully approved and are effective for the Copermittees. These TMDLs are for diazinon in Chollas Creek and for dissolved copper in SIYB.

Where a TMDL has been approved, NPDES permits must contain effluent limitations and conditions consistent with the requirements and assumptions in the TMDL.[223] Effluent limitations are generally expressed in numerical form. However, USEPA recommends that for NPDES-regulated municipal and small construction storm water discharges, effluent limitations should be expressed as best management practices or other similar requirements rather than as numeric effluent limitations.[224] Consistent with USEPA's recommendation, this section implements WQBELs expressed as an iterative BMP approach capable of meeting the WLAs in accordance with the associated compliance schedule. The Order's WQBELs include the numeric WLA as a performance standard and not as an effluent limitation. The WLA can be used to assess if additional BMPs are needed to achieve the TMDL Numeric Target in the waterbody.

Section H.1.a requires the Copermittees to implement BMPs capable of achieving the WLAs for diazinon in the storm drains in accordance with the Compliance Schedule. This requirement is consistent with the USEPA memorandum dated November 22, 2002, which states that NPDES permit conditions must be consistent with the assumptions and requirements of available WLAs.[225]

Section H.1.b requires that the Copermittees not cause or contribute to violations of the Interim TMDL Numeric Targets for diazinon in Chollas Creek. This requirement is necessary to ensure the effectiveness of the BMPs. The BMPs for diazinon control consist primarily of a phase out of the legal uses of diazinon and education and public outreach. Due to the difficulty in measuring the effectiveness of these BMPs directly, an indirect assessment method is necessary in the form of a receiving water limit.

Section H.1.c requires the Copermittees to implement the Diazinon Toxicity Control Plan and Diazinon Public Outreach / Education Program as described in the report titled, *Technical Report for Total Maximum Daily Load for Diazinon in Chollas Creek Watershed, San Diego County*, August 14, 2002, to achieve the WLA. These BMPs are expected to be effective based on the current monitoring in Chollas Creek which shows dramatically decreasing levels of diazinon in the water column.[226]

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[223] 40 CFR 122.44(d)(1)(vii)(B)
[224] USEPA, 2002. Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs. P. 4.
[225] Ibid.
[226] Chollas Creek Copermittees, 2006. Response to Monitoring in Chollas Creek, Investigation Order No. R9-2004-0277, Proposition 13, PRISM Grant Agreement No. 04-17-559-0, San Diego Region, Integrated Pest Management

Compliance with Section H.1.a and c will be assessed with the WURMP annual reports, which will include a description of all TMDL activities implemented in the watershed and an effectiveness assessment of those activities. Compliance with Section H.1.b will be assessed using the monitoring data collected pursuant to the existing Investigation Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the discharge of Diazinon in the Chollas Creek Watershed, San Diego, California* (Investigation Order). This Investigation Order requires water column samples to be collected at two locations and analyzed for diazinon during three storms annually. Water column samples will also be analyzed for total and dissolved copper, lead, and zinc, and hardness. Acute and chronic toxicity tests will be conducted using the water flea for samples from each of these storm events at these two locations. Concentrations of diazinon in sediment at three locations will also be evaluated.

The diazinon water column values obtained from the Investigation Order R9-2004-0277 sampling will be compared with the Interim TMDL Numeric Target adjusted for the time schedule as shown below:

Calendar Year	Year	Waste Load Allocation	Interim TMDL Numeric Target	% Reduction
2004	1	0.460 µg/L	0.5 µg/L	0
2005	2	0.460 µg/L	0.5 µg/L	0
2006	3	0.460 µg/L	0.5 µg/L	0
2007	4	0.414 µg/L	0.45 µg/L	10
2008	5	0.322 µg/L	0.35 µg/L	20
2009	6	0.184 µg/L	0.20 µg/L	30
2010	7	0.045 µg/L	0.05 µg/L	30

Chollas Creek Diazinon TMDL - Background

Chollas Creek was placed on the CWA section 303(d) List of Water Quality Limited Segments (303(d) List) in 1996 for toxicity. The pesticide diazinon was found to be causing the toxicity. The Regional Board has established a TMDL for diazinon to address the toxicity as required by the CWA for water quality limited segments at the August 14, 2002 Regional Board meeting. The State Water Resources Control Board approved the TMDL on July 16, 2003. The Office of Administrative Law approved the TMDL on September 11, 2003. USEPA approved the TMDL on November 3, 2003. Documentation for the Chollas Creek Diazinon TMDL is in the report titled, "Technical Report for Total Maximum Daily Load for Diazinon in Chollas Creek Watershed, San Diego County, August 14, 2002."

The Chollas Creek diazinon TMDL is a concentration based TMDL determined from the CDFG's Water Quality Criteria (WQC) for the protection of freshwater aquatic organisms from diazinon. Using a margin of safety (MOS) of 10%, the TMDL is equal the WLA plus the MOS. The TMDL Numeric Targets and WLA derived from the CDFG WQC are shown in the table below.

(IPM) Education and Outreach Program, 2004-2005 Water and Sediment Quality Monitoring Data Summary for Chollas Creek. P. 48, Figure 4-2.

TMDL Numeric Targets and Waste Load Allocation for Diazinon Acute and Chronic Conditions

Exposure Duration	TMDL Numeric Targets	Margin of Safety	Waste Load and Load Allocations
Acute	0.08 µg/L	0.008 µg/L	0.072 µg/L
Chronic	0.05 µg/L	0.005 µg/L	0.045 µg/L

A compliance schedule for achieving the WLAs was established by the Regional Board Executive Officer on September 30, 2004. This compliance schedule uses an exponential approach to reduction that involves an increasing percent reduction over a 7-year period to meet the objectives. This percent reduction established for WLA in the September 2004 compliance schedule was used to calculate the Interim TMDL Numeric Targets shown in the table below:

Compliance Schedule for Diazinon TMDL Implementation

Calendar Year	Year	Waste Load Allocation	Interim TMDL Numeric Target	% Reduction
2004	1	0.460 µg/L	0.5 µg/L	0
2005	2	0.460 µg/L	0.5 µg/L	0
2006	3	0.460 µg/L	0.5 µg/L	0
2007	4	0.414 µg/L	0.45 µg/L	10
2008	5	0.322 µg/L	0.35 µg/L	20
2009	6	0.184 µg/L	0.20 µg/L	30
2010	7	0.045 µg/L	0.05 µg/L	30

The WLAs shall not be exceeded more than 1 time in any 3-year period. Season and flow conditions will not be a consideration.

Section H.2.a requires the Copermittees in the SIYB watershed to implement BMPs to maintain a total annual copper load of less than or equal to 30 kg copper/year.

Section H.2.b requires the Copermittees in the SIYB watershed to implement, at a minimum, the BMPs contained in the Copermittees' JURMP which address the discharge of copper to achieve the total annual copper load in Section H.2.a above. The WLA was established to maintain the current discharge level of 30 kg copper/year which leads to the conclusion that the current BMPs being implemented in the Copermittees' JURMP will be effective in maintaining this discharge level. Compliance with these requirements will be assessed by re-evaluating the data and assumptions used to estimate the WLA to SIYB of 30 kg copper/year. The Copermittees will be required to evaluate if any changes have occurred in the watershed which could cause or contribute to a higher copper urban runoff discharge and any actions necessary to address these changes. Because the original WLA for municipalities in SIYB was calculated using land use data, drainage area size, event mean concentration and modeling with no actual water quality samples, it is appropriate to use the same or similar method to assess compliance.

SIYB Copper TMDL - Background

SIYB is a popular recreational marina located at the north end of San Diego Bay. It is a semi-enclosed marina that supports a high density of recreational vessels in an area of low tidal flushing. The SIYB watershed is within the City of San Diego. SIYB was placed on the CWA Section 303(d) List of Water Quality Limited Segments (303(d) List) in 1996 due to high concentrations of dissolved copper. The Regional Board has established a TMDL for dissolved copper in SIYB as required by the CWA at the February 9, 2005 Regional Board meeting. The SWRCB approved resolution R9-2005-0019 on September 22, 2005. The Office of Administrative Law approved the TMDL on December 2, 2006 and Resolution R9-2005-0019

has been forwarded to USEPA for final review and approval. Documentation for the SIYB Copper TMDL is included in the report titled, "Total Maximum Daily Load for Dissolved Copper in Shelter Island Yacht Basin, San Diego Bay, Technical Report, February 9, 2005."

The existing dissolved copper load from urban runoff to SIYB was estimated to be roughly 30 kg copper/year or 1% of total loading. Due to the relatively insignificant magnitude of the contribution of dissolved copper from urban runoff, no reductions were assigned to urban runoff and the WLA was assigned the existing 30 kg copper/year. The Basin Plan has been amended to include the following "The Regional Board will amend Order No. 2001-01, *Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm /Sewer Systems* to require that discharges of copper into Shelter Island Yacht Basin waters via the City of San Diego's MS4 not exceed a 30 kg/year wasteload for copper."[227]

The WLA for urban runoff was estimated using land use data, drainage area size, event mean concentration for copper in residential areas. This information and assumptions such as wet weather copper concentrations equal dry weather concentrations were used to estimate the WLA of 30 kg copper/year. Once during the permit cycle, the Copermittees will evaluate the data and assumptions used in estimating the WLA to ensure that nothing has changed which could result in a higher copper discharge.

I. Program Effectiveness Assessment

The following legal authority applies to section I:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(v) provides that the Copermittees must include "Estimated reductions in loadings of pollutants from discharges of municipal storm sewer constituents from municipal storm sewer systems expected as the result of the municipal storm water quality management program. The assessment shall also identify known impacts of storm water controls on ground water." Under Federal NPDES regulation 40 CFR 122.42(c) applicants must provide annual reports on the progress of their storm water management programs.

Section I.1.a of the Order requires the Copermittees to assess the effectiveness of the implementation of their jurisdictional programs and activities. The section requires both specific activities and broader programs to be assessed since the effectiveness of jurisdictional efforts may be evident only when considered at different scales. The effectiveness assessment requirements incorporate the approaches developed by the Copermittees in their October 16, 2003 "Framework for Assessing the Effectiveness of Jurisdictional Urban Runoff Management Programs," including use of "outcome levels" and "major effectiveness assessment elements."

In their ROWD, the Copermittees request that use of particular outcome levels not be required for assessing the effectiveness of specific activities implemented by the Copermittees. Because many of the techniques for using the various outcome levels are still in development, the conditions under which each outcome level must be used is not specified in the Order. However,

[227]Regional Board, 2005. Attachment A to Resolution No. R9-2005-0019, Amendment to the Water Quality Control Plan for the San Diego Region to Incorporate a Total Maximum Daily Load for Dissolved Copper in Shelter Island Yacht Basin, San Diego Bay. P. 5.

during review of the Copermittees' annual reports, the Regional Board has frequently needed to request that the Copermittees improve their effectiveness assessments and utilize the various assessment methods that are available. Moreover, half of the Copermittees audited were found to have inadequate effectiveness assessments which frequently lacked use of measurable goals. For these reasons, the Order contains language requiring the Copermittees to utilize the various outcome levels "where applicable and feasible." This will help ensure that the Copermittees vigorously use outcome levels, while also providing the Copermittees with flexibility to develop techniques to use outcome levels where such techniques do not currently exist.

The Copermittees also request in their ROWD that they not be responsible for assessment of the impact of their jurisdictional programs on pollutant load reductions, urban runoff water quality, and receiving water quality (outcome levels 4-6). This request slights the overall goal of the Copermittees' jurisdictional programs, which is to reduce discharged pollutants loads and improve water quality. A link between the Copermittees' jurisdictional programs and improved urban runoff and receiving water conditions must be made whenever adequate information exists. This can help validate current efforts, which is essential for maintaining program support, while also guiding future efforts.

Assessments of jurisdictional programs on water quality have been conducted by Copermittees in the past and have been useful. For example, the City of Encinitas reports decreasing bacteria levels in commercial areas following increased inspections of commercial facilities. The City also reports similar results in residential areas following increased residential education efforts.[228] Such information provides very useful feedback to the Copermittees, since the results are specific and localized. The results provide direct evidence of program impact which may otherwise be missed by assessments conducted at a watershed level. Program assessment capable of linking jurisdictional programs and water quality improvements is an important tool that can exhibit to program managers, decision makers, and the public that jurisdictional urban runoff management program efforts are worthwhile and should continue. For these reasons, the Order requires the Copermittees to assess the impact of their jurisdictional program on pollutant load reductions and water quality, where applicable and feasible.

Section I.1.b of the Order requires the Copermittees improve jurisdictional activities or BMPs when they are found to be ineffective or when water quality impairments are continuing. This requirement fulfills the purpose of conducting effectiveness assessments – to improve and refine the Copermittees' programs. The requirement is consistent with USEPA's Phase II regulations, which state: "If the permittee determines that its original combination of BMPs are not adequate to achieve the objectives of the municipal program, the MS4 should revise its program to implement BMPs that are adequate […]."[229]

Section I.2.a of the Order requires the Copermittees to assess the effectiveness of the implementation of their watershed programs and activities. The section requires both specific activities and broader programs to be assessed since the effectiveness of watershed efforts may be evident only when considered at different scales. The effectiveness assessment requirements incorporate the approaches developed by the Copermittees in their October 16, 2003 "Framework for Assessing the Effectiveness of Jurisdictional Urban Runoff Management Programs," including use of "outcome levels" and major effectiveness assessment elements.

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[228] City of Encinitas, 2006. Jurisdictional Urban Runoff Management Program Annual Report FY 2004-2005. P. 11-9.
[229] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68762.

As with the jurisdictional assessments discussed for section I.1.a, the Order contains language requiring the Copermittees to utilize outcome levels 1-4 for assessment "where applicable and feasible." This will help ensure that the Copermittees vigorously use the outcome levels, while also providing the Copermittees with flexibility to develop techniques to use outcome levels where such techniques do not currently exist. The section also places particular focus on the Copermittees' utilization of outcome levels 5 and 6, which address urban runoff and receiving water quality. Since the entire thrust of the watershed urban runoff management programs is to improve the high priority water quality problems within the various watersheds, use of outcome levels 5 and 6 is needed to assess the effectiveness of the watershed urban runoff management programs. After 15 years of implementation of the storm water program in San Diego County, impact of the program on water quality must be assessed. Without such assessments, it will not be known whether the watershed urban runoff management programs are achieving their purpose. The Copermittees' receiving waters monitoring program, which is watershed-based, is expected to provide the Copermittees with information to conduct these assessments.

Section I.2.b of the Order includes requirements for modification of watershed activities similar to those for modification of jurisdictional activities discussed in section I.1.b. Please see the section I.1.b discussion for further information.

Section I.3.a of the Order requires the Copermittees to assess the effectiveness of their regional activities and programs in a manner similar to the assessment requirements discussed for section I.1.a and I.2.a. Please see the discussions for these sections for further information. Section I.3.a also requires the Copermittees to evaluate their progress in implementing measures on a regional basis. These evaluations are needed to track the Copermittees' progress towards meeting their goals and objectives for regional urban runoff management.

Section I.4 (TMDL BMP Implementation Plan) requires the Copermittees to assess the effectiveness of their TMDL BMP Implementation Plans or equivalent plans in a manner similar to the assessment of the effectiveness of the watershed urban runoff management programs. This is appropriate, since implementation of TMDL BMP Implementation Plans is similar to implementation of watershed urban runoff management programs.

Section I.5 (Long-Term Effectiveness Assessment) requires the Copermittees to conduct a Long-Term Effectiveness Assessment prior to their submittal of an application for reissuance of the Order. The Long-Term Effectiveness Assessment is necessary to provide support for the Copermittees' proposed changes to their programs in their ROWD. It can also serve as the basis for changes to the Order's requirements. The Copermittees recommend that the Order include a requirement for development of a Long-Term Effectiveness Assessment in their ROWD.[230]

J. Reporting

The following legal authority applies to section J:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.42(c) requires that "The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer system that has been designated by the director under § 122.26(a)(1)(v) of this part

[230] San Diego County Copermittees, 2005. Report of Waste Discharge. P. D-82.

must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report shall include: (1) The status of implementing the components of the storm water management program that are established as permit conditions; (2) Proposed changes to the storm water management program that are established as permit condition. Such proposed changes shall be consistent with § 122.26(d)(2)(iii) of this part; (3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under § 122.26(d)(2)(iv) and (d)(2)(v) of this part; (4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; (5) Annual expenditures and budget for year following each annual report; (6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; (7) Identification of water quality improvements or degradation."

California Water Code section 13267 provides that "the regional board may require than any person who has discharged […] shall furnish, under penalty of perjury, technical or monitoring reports which the regional board requires."

Section J.1 (Jurisdictional Urban Runoff Management Plans) outlines the information to be included in the Copermittees' JURMPs. It utilizes an approach similar to the approach used in Order No. 2001-01. The information to be included in the JURMP is listed in detail in Attachment D. Significant detail is included in the Order regarding what information should be in the JURMPs in order to provide certainty to the Copermittees when they develop and submit their JURMPs. By providing detail for what information should be included in the JURMP, time spent by the Copermittees and Regional Board on JURMP reporting, review, comment, and response is expected to be reduced.

It is important to note that in many cases, the requirements of the Order should not necessitate a complete rewrite of the JURMPs. Only sections of the Order which are new or have been significantly changed should warrant rewriting of JURMP sections. The Regional Board plans to work with the Copermittees and provide guidance regarding where JURMPs must be updated in accordance with the Order. This will help ensure that rewriting, reporting, and review efforts are minimized.

Sections J.2 and J.3 (Watershed and Regional Urban Runoff Management Plans) include requirements for information to be included in the WURMPs and RURMP that are similar in scope to the requirements for information to be included in the JURMPs (section J.1). Please see the discussion for section J.1 for further information.

Section J.4 (Hydromodification Plan) requires various submittals during the development of the HMP. These submittals are necessary to provide both the Copermittees and the Regional Board the opportunity to review progress being made on the HMP. Frequent review of the HMP as it develops is needed due to the complex nature of the issues the HMP will address. The HMP submittal process included in the Order is based on a successful HMP submittal process previously implemented in the San Francisco Bay Area.

The final HMP requires approval by the Regional Board. Final approval by the Regional Board is necessary because the HMP requirements are new and relatively complex. Full vetting of the HMP before the Regional Board will provide all interested parties the opportunity to participate on HMP development and help ensure a workable end product for the interested parties.

Section J.6 (Report of Waste Discharge) requires submittal of a ROWD prior to the expiration of the Order. The section identifies the minimum information to be included in the ROWD, based

on USEPA's May 17, 1996 guidance "Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems."

K. Modifications of Programs

The following legal authority applies to section K:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Section K of the Order provides a process for the Copermittees to modify their urban runoff management programs. This process will be useful so that the Copermittees can continue to refine and improve their programs based on the findings of their annual program effectiveness assessments. The process allows for minor modifications to the Copermittees' programs where the Copermittees can exhibit that the modifications meet or exceed existing legal requirements under the Order. Such a process avoids lengthy and time consuming formal approvals of proposed modifications before the Regional Board, while still ensuring compliance with applicable legal standards and the Order. The Copermittees requested inclusion of a process in the Order to allow for minor modifications to their urban runoff management programs in their ROWD.[231] The process included in the Order is based on a process utilized by the San Francisco Bay Area Regional Water Quality Control Board in their MS4 permit for Alameda County.[232]

L. All Copermittee Collaboration

The following legal authority applies to section L:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(i)(D) provides that "[The Copermittee must demonstrate that it can control] through interagency agreements among coapplicants the contribution of pollutants from one portion of the municipal system to another portion of the municipal system."

No significant changes were made to this section.

M. Principal Permittee Responsibilities

The following legal authority applies to section M:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(a)(3)(iii)(C) provides that "A regional authority may be responsible for submitting a permit application."

Federal NPDES regulation 40 CFR 122.26(d)(2)(i)(D) provides that "[The Copermittee must demonstrate that it can control] through interagency agreements among coapplicants the

[231] San Diego County Copermittees, 2005. Report of Waste Discharge. P. C-10.
[232] San Francisco Bay Area Regional Water Quality Control Board, 2003. Order No. R2-2003-0021. P. 45.

contribution of pollutants from one portion of the municipal system to another portion of the municipal system."

No significant changes were made to this section.

N. Receiving Waters Monitoring and Reporting Program

The following legal authority applies to section N:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Copermittees must conduct a comprehensive monitoring program as required under Federal NPDES regulations 40 CFR 122.26(d)(2)(iii).

See section V of this Fact Sheet/Technical Report for a discussion of changes to the Receiving Waters Monitoring and Reporting Program.

O. Standard Provisions, Reporting Requirements, and Notifications

The following legal authority applies to section O:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Standard provisions, reporting requirements, and notifications are consistent to all NPDES permits and are generally found in Federal NPDES regulation 40 CFR 122.41.

Section O.2 of the Order has been changed to remove the statement that all plans and reports submitted in compliance with the Order are an enforceable part of the Order. This statement has been removed because it is unnecessary. The Order itself contains sufficient detailed requirements to ensure that compliance with discharge prohibitions, receiving water limits, and the narrative standard of MEP are achieved. Implementation by the Copermittees of programs in compliance with the Order's requirements, prohibitions, and receiving water limits is the pertinent compliance standard to be used under the Order, as opposed to assessing compliance by reviewing the Copermittees' implementation of their plans alone.

Rather than being substantive components of the Order itself, the Copermittees' urban runoff management plans are simply descriptions of their urban runoff management programs required under the Order. These plans serve as procedural correspondence which guides program implementation and aids the Copermittees and Regional Board in tracking implementation of the programs. In this manner, the plans are not functional equivalents of the Order. For these reasons, the Copermittees' urban runoff management plans need not be an enforceable part of the Order.

P. Attachment A

The following legal authority applies to Attachment A:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: California Water Code Section 13243 provides that "A regional board, in a water quality control plan or in waste discharge requirements, may specify certain conditions or areas where the discharge of waste, or certain types of waste, will not be permitted."

California Water Code Section 13263(a) provides that waste discharge requirements prescribed by the SDRWQCB implement the Basin Plan.

No significant changes were made to this attachment.

Q. Attachment B

The following legal authority applies to Attachment B:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Standard provisions, reporting requirements, and notifications are consistent to all NPDES permits and are generally found in Federal NPDES regulation 40 CFR 122.41.

Attachment B includes Standard Provisions which have been developed by the SWRCB. These Standard Provisions ensure that NPDES permits are consistent and compatible with USEPA's federal regulations. Some Standard Provisions sections specific to publicly owned sewage treatment works are not included in Attachment B.

R. Attachment C

The following legal authority applies to Attachment C:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Attachment C contains definitions for new terms found in the Order. In addition, definitions for terms previously defined in Order No. 2001-01 Attachment D, but which are not found in the current Order, have been deleted.

S. Attachment D

The following legal authority applies to Attachment D:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: California Water Code section 13267 provides that "the regional board may require than any person who has discharged […] shall furnish, under penalty of perjury, technical or monitoring reports which the regional board requires."

Please see the discussion for section J.1 for further information.

T. Attachment E

The following legal authority applies to Attachment E:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.42(c) requires that "The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer system that has been designated by the director under § 122.26(a)(1)(v) of this part must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report shall include: (1) The status of implementing the components of the storm water management program that are established as permit conditions; (2) Proposed changes to the storm water management program that are established as permit condition. Such proposed changes shall be consistent with § 122.26(d)(2)(iii) of this part; (3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under § 122.26(d)(2)(iv) and (d)(2)(v) of this part; (4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; (5) Annual expenditures and budget for year following each annual report; (6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; (7) Identification of water quality improvements or degradation."

California Water Code section 13267 provides that "the regional board may require than any person who has discharged […] shall furnish, under penalty of perjury, technical or monitoring reports which the regional board requires."

Attachment E to the Order outlines the information to be included in the Copermittees' Jurisdictional Urban Runoff Management Program Annual Reports. Significant detail is included in the attachment regarding what information should be in the annual reports in order to provide certainty to the Copermittees when they develop and submit their annual reports. By providing detail for what information should be included in the annual reports, time spent by the Copermittees and Regional Board to generate, review, and comment on annual reports should be reduced.

U. Attachment F

The following legal authority applies to Attachment F:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.42(c) requires that "The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer system that has been designated by the director under § 122.26(a)(1)(v) of this part must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report shall include: (1) The status of implementing the components of the storm water management program that are established as permit conditions; (2) Proposed changes to the storm water management program that are established as permit condition. Such proposed changes shall be consistent with § 122.26(d)(2)(iii) of this part; (3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under §

122.26(d)(2)(iv) and (d)(2)(v) of this part; (4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; (5) Annual expenditures and budget for year following each annual report; (6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; (7) Identification of water quality improvements or degradation."

California Water Code section 13267 provides that "the regional board may require than any person who has discharged […] shall furnish, under penalty of perjury, technical or monitoring reports which the regional board requires."

Attachment F to the Order provides a table summary of scheduled submittals required by the Order. Unscheduled submittals are no longer added to the table, since there is no proper due date for such submittals. A task summary has not been created for the Order, since the previous task summary was found to be redundant, repeating information found in the submittal summary and elsewhere in the Order.

V. Receiving Waters Monitoring and Urban Runoff Reporting Program

The following legal authority applies to the Receiving Waters Monitoring and Urban Runoff Reporting Program:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Copermittees must conduct a comprehensive monitoring program as required under Federal NPDES regulations 40 CFR 122.26(d)(2)(iii).

Federal NPDES regulation 40 CFR 122.42(c) requires that "The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer system that has been designated by the director under § 122.26(a)(1)(v) of this part must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report shall include: (1) The status of implementing the components of the storm water management program that are established as permit conditions; (2) Proposed changes to the storm water management program that are established as permit condition. Such proposed changes shall be consistent with § 122.26(d)(2)(iii) of this part; (3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under § 122.26(d)(2)(iv) and (d)(2)(v) of this part; (4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; (5) Annual expenditures and budget for year following each annual report; (6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; (7) Identification of water quality improvements or degradation."

California Water Code section 13267 provides that "the regional board may require than any person who has discharged […] shall furnish, under penalty of perjury, technical or monitoring reports which the regional board requires."

1. Purpose

According to USEPA, the benefits of sampling data include, but are not limited to:

1. Providing a means for evaluating the environmental risk of storm water discharges by identifying types and amounts of pollutants present;

2. Determining the relative potential for storm water discharges to contribute to water quality impacts or water quality standard violations;
3. Identifying potential sources of pollutants; and
4. Eliminating or controlling identified sources more specifically through permit conditions.[233]

Equally important, monitoring programs are an essential link in the improvement of urban runoff management efforts. Data collected from monitoring programs can be assessed to determine the effectiveness of management programs and practices, which is vital for the success of the iterative approach used to meet the MEP standard. Specifically, when data indicates that a particular BMP or program component is not effective, improved efforts can be selected and implemented. Also, when water quality data indicate that water quality standards or objectives are being exceeded, particular pollutants, sources, and drainage areas can be identified and targeted for specific urban runoff management efforts.

Considering the benefits described above, the Receiving Waters Monitoring and Reporting Program (MRP) has been designed to determine impacts to receiving water quality and beneficial uses from urban runoff and to use the results to refine the Copermittees' urban runoff management programs for the reduction of pollutant loadings to the MEP. The primary goals of the MRP include:

1. Assess compliance with Order No. R9-2007-0001;
2. Measure and improve the effectiveness of the Copermittees' urban runoff management programs;
3. Assess the chemical, physical, and biological impacts of receiving waters from urban runoff;
4. Characterize urban runoff discharges;
5. Identify sources of specific pollutants;
6. Prioritize drainage and sub-drainage areas that need management actions;
7. Detect and eliminate illicit discharges and illicit connections to the MS4; and
8. Assess the overall health of receiving waters.

Each of the components of the MRP is necessary to meet the objectives listed above. In addition, the MRP has been designed in accordance with the guidance provided by the Southern California Stormwater Monitoring Coalition's Model Monitoring Technical Committee in its August 2004 "Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California." This guidance document was developed in response to Senate Bill 72 (Kuehl), which addressed the standardization of sampling and analysis protocols in municipal stormwater monitoring programs. The technical committee which developed the guidance included representatives from Southern California Regional Water Quality Control Boards (including San Diego), municipal storm water permittees (including the County of San Diego), Heal the Bay, and the Southern California Coastal Water Research Project.

As its title suggests, the guidance essentially developed a model municipal storm water monitoring program for use in Southern California. The model program is structured around five fundamental management questions, outlined below. The MRP is designed as an iterative step towards ensuring that the Copermittees' monitoring program can fully answer each of the five management questions.

[233] USEPA, 1992. NPDES Storm Water Sampling Guidance Document. EPA/833-B-92-001.

1. Are conditions in receiving waters protective, or likely to be protective, of beneficial uses?
2. What is the extent and magnitude of the current or potential receiving water problems?
3. What is the relative urban runoff contribution to the receiving water problem(s)?
4. What are the sources of urban runoff that contribute to receiving water problem(s)?
5. Are conditions in receiving waters getting better or worse?

The justifications for each component of the monitoring program are discussed below.

2. Monitoring Program

Summary of Order No. 2001-01 Monitoring Program and Results

The Copermittees' monitoring under Order No. 2001-01 includes several components: (a) wet weather mass loading station monitoring (including toxicity monitoring); (b) bioassessment monitoring; (c) dry weather field screening and analytical monitoring; (d) coastal storm drain monitoring; and (e) ambient bay and lagoon monitoring. Each of these is briefly summarized below with recent results briefly discussed. The Copermittees' most recent monitoring report is available at:

http://www.projectcleanwater.org/html/wg_monitoring_04-05report.html.

Wet Weather Mass Loading Station Monitoring

The Copermittees' wet weather mass loading station monitoring consists of water quality monitoring during three storm events annually within the main drainage at the base of each major watershed in San Diego County. There are currently 11 wet weather mass loading stations throughout San Diego County, where various constituents of concern, bacterial indicators, and toxicological impacts are measured. Using data collected from the wet weather mass loading stations, persistent wet weather constituents of concern have been identified by the Copermittees in their Baseline Long-Term Effectiveness Assessment document. Persistent wet weather constituents of concern are generally those constituents which have concentrations which persistently exceed water quality objectives. Increasing and decreasing trends in constituent concentrations have also been identified by the Copermittees.

Mass Loading Station Persistent Wet Weather Constituents and Trends[234]

Mass Loading Stations	Persistent Wet Weather Constituents of Concern	Significant Trends Observed
Santa Margarita	Fecal Coliform Total Suspended Solids Turbidity	
San Luis Rey	Total Dissolved Solids	
Agua Hedionda	Fecal Coliform Total Dissolved Solids Total Suspended Solids Turbidity	Increasing chemical oxygen demand Increasing total kjeldahl nitrogen Increasing total phosphorus Increasing total suspended solids Increasing turbidity
Escondido Creek	Fecal Coliform Total Dissolved Solids Turbidity	

[234] San Diego County Copermittees, 2005. Baseline Long-Term Effectiveness Assessment.

San Dieguito River	Total Dissolved Solids	
Penasquitos River	Total Dissolved Solids	
Tecolote Creek	Fecal Coliform Turbidity Diazinon	Increasing arsenic (still below water quality objective) Decreasing total suspended solids Decreasing total zinc
San Diego River	Fecal Coliform	
Chollas Creek	Fecal Coliform Total Suspended Solids Turbidity Diazinon Copper Zinc Toxicity (Ceriodaphnia and Hyalella)	Increasing nitrate Increasing lead Decreasing total suspended solids Decreasing total dissolved solids Decreasing nickel
Sweetwater River	Total Dissolved Solids Fecal Coliform Diazinon	
Tijuana River	Fecal Coliform Ammonia Biochemical Oxygen Demand Chemical Oxygen Demand Total Phosphorus Total Suspended Solids Turbidity Chlorpyrifos Diazinon Malathion Toxicity (Ceriodaphnia)	

Bioassessment Monitoring

Bioassessment monitoring is conducted to provide site-specific information about the health and diversity of freshwater benthic communities within a specific reach of a creek. It consists of collecting samples of the benthic communities during dry weather and conducting a taxonomic identification to measure community abundance and diversity. Benthic community abundance and diversity is then compared to a reference creek to assess benthic community health. Under Order No. 2001-01, the Copermittees are required to conduct bioassessment monitoring on 23 stream reaches. The results from the Copermittees' bioassessment monitoring demonstrate that the beneficial uses of urban streams are being adversely impacted by urban runoff. The San Luis Rey, Carlsbad, San Dieguito, Penasquitos, Mission Bay, San Diego River, San Diego Bay, and Tijuana River watersheds all had Poor to Very Poor Index of Biotic Integrity ratings.[235]

Dry Weather Field Screening and Analytical Monitoring

The Copermittees conduct dry weather field screening and analytical monitoring throughout their jurisdictions at various locations within their MS4s. While a principal purpose of the dry weather field screening and analytical monitoring is to identify illicit discharges and/or connections to the MS4, the data gathered also provides useful information regarding water quality within the Copermittees' MS4s during dry weather conditions. Data from dry weather field screening and

[235] San Diego County Municipal Copermittees, 2005. 2004-2005 Urban Runoff Monitoring Final Report. Executive Summary.

analytical monitoring is often used effectively to identify and abate illicit discharges, but it also indicates high levels of pollutants in the Copermittees' MS4s. The number of exceedances of water quality criteria for various constituents at dry weather field screening and analytical monitoring sites frequently exceeds the number monitoring site visits conducted.[236]

Coastal Storm Drain Monitoring

Coastal storm drain monitoring involves monitoring discharges from coastal storm drains and nearby receiving waters for bacterial indicators. Approximately 59 coastal storm drains are monitored year round on a weekly or monthly basis, depending on the season. For samples collected in receiving waters, total coliform, fecal coliform, and Enterococcus water quality standards were exceeded at a rate of 2.0%, 1.7%, and 4.4% respectively in 2003-2004. Counts of bacterial indicators in samples collected from coastal storm drain discharges greatly exceeded those of samples collected in receiving waters, but were not reported in relation to water quality standards.[237]

Ambient Bay and Lagoon Monitoring

To monitor ambient bay and lagoon conditions, the Copermittees focus on assessing bay and lagoon sediments where contaminants are most likely to be found. Monitoring is conducted in twelve coastal embayments for various constituents, toxicity, and benthic infauna. Most of the embayments monitored were found to contain toxic elements in their sediment. However, this monitoring did occur in embayment areas targeted because of their likelihood to contain contaminated sediment, essentially representing worst-case scenarios.[238]

<u>Mass Loading Station Monitoring</u>

Section II.A.1 of the MRP requires mass loading and toxicity monitoring at monitoring stations located at the bottom of major watersheds within San Diego County. The mass loading monitoring will provide data representing event mean concentrations of pollutants, total pollutant loadings, and toxicity conditions from specific drainage areas. Mass loading monitoring stations are recommended by the Model Monitoring Technical Committee in order to answer management questions 1, 2, and 5.[239] The stations are also expected to contribute towards meeting MRP goals 1, 2, 3, 4, 6, and 8. The mass loading station monitoring included in the MRP is the same as the mass loading station monitoring proposed by the Copermittees in their ROWD.[240]

Sections II.A.1.a and II.A.1.b of the MRP identify the location of the mass loading stations and the frequency of the monitoring to be conducted at the mass loading stations. The locations of the stations are identical to the locations utilized under Order No. 2001-01, and match the locations proposed by the Copermittees in their ROWD.[241] These locations provide substantial coverage of the major watersheds within the San Diego Region portion of San Diego County.

The frequency of monitoring at the mass loading stations has been changed from monitoring each station for three wet weather events every year to monitoring each station for two wet weather

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[236] Ibid. Sections 4-12.
[237] Ibid. Attachment A.
[238] Ibid. Executive Summary.
[239] Model Monitoring Technical Committee, 2004. Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California. Chapter 5.
[240] San Diego County Copermittees, 2005. Report of Waste Discharge. Attachment 3, p. 9.
[241] Ibid. Attachment 3, p. 9.

and two dry weather monitoring events every other year. While this is an overall reduced frequency of monitoring at the mass loading stations, it is replaced by the addition of new monitoring stations to be located in the upper watersheds (called temporary watershed assessment stations). The new information generated from the temporary watershed assessment stations, as well as from new monitoring of dry weather events, offsets the reduced amount of information gathered at mass loading stations resulting from the monitoring of fewer wet weather events.

In their ROWD, the Copermittees statistically compared the Order No. 2001-01 monitoring program with the proposed program in order to determine any loss in the ability to observe trends resulting from the reduced wet weather monitoring frequency. The Copermittees' statistical assessments utilized empirical data from the existing monitoring program and used existing trends to predict or model the future data sets to estimate when water quality objectives would be reached assuming that current trends continue. The Copermittees found that "depending upon the current rate of decrease in observed concentration and variability of constituents, the ability to observe trends will not change significantly with the recommended program."[242] Using an example worst case scenario of a data exhibiting a non-significant downward trend (copper in Tecolote Creek), it was estimated that the frequency of monitoring conducted under Order No. 2001-01 would not exhibit concentrations below the water quality objective with 95% confidence for 18 years. Using the frequency of monitoring included in the MRP, however, it would take 22 years to see the same results - a relatively modest increase. The Copermittees further considered the ability to identify statistically significant differences between watersheds or between years when data from only two wet weather events is collected, as opposed to three events. Again, the Copermittees found that results are similar whether two wet weather events or three are monitored.[243]

While the reduction in the frequency of monitoring of wet weather events will certainly impact the ability to observe statistically significant trends and differences to some extent, the new MRP will advance the understanding of conditions in San Diego County watersheds. Segmenting the watershed and adding new temporary watershed assessment stations will provide additional watershed information relative to magnitude and extent, as well as increased spatial coverage to focus management efforts. Moreover, the MRP provides a more comprehensive temporal view of the watershed with the addition of dry weather monitoring, which will improve the Copermittees' ability to complete the pollutant loading picture.[244]

Sections II.A.1.c-f of the MRP include requirements that standard sampling and analysis protocols are followed by the Copermittees during monitoring. These are generally the same requirements included in Order No. 2001-01.

Section II.A.1.g of the MRP lists the constituents to be monitored at mass loading stations and temporary watershed assessment stations. These constituents have not changed from the constituents monitored under Order No. 2001-01.

Section II.A.1.h of the MRP requires the analysis of several additional constituents at stations in the Chollas Creek watershed. These constituents are required for analysis to assess the contribution of urban runoff to the Toxic Hot Spot at the mouth of Chollas Creek. The requirement for this analysis is consistent with the SWRCB's June 1999 Consolidated Toxic Hot Spot Cleanup Plan.

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[242] Ibid. Attachment 3, p. 14.
[243] San Diego County Copermittees, 2005. Report of Waste Discharge. Attachment 3, Appendix A, p. 2-5.
[244] Ibid. Attachment 3, p. 18.

Sections II.A.1.i-j of the MRP identify the toxicity testing to be implemented and require that standard toxicity testing procedures be followed during the testing. These toxicity testing requirements have not changed for the toxicity testing requirements of Order No. 2001-01.

Temporary Watershed Assessment Station Monitoring

Section II.A.2.a of the MRP identifies the number of temporary watershed assessment stations to be monitored in a given year for each watershed. Temporary watershed assessment stations will serve to segment watersheds, providing information on sub-watersheds which have previously not been monitored extensively. This will aid in the identification of water quality problem areas and help identify sources. Temporary watershed assessment stations are recommended by the Model Monitoring Technical Committee in order to answer management questions 1, 2, 3, and 5.[245] The stations are also expected to contribute towards meeting MRP goals 1, 2, 3, 4, 5, 6, and 8.

The section allows for the number of stations within a watershed to change, as long as the total number of stations monitored is not reduced. The number and watershed location of the stations and the frequency that they are to be monitored matches the Copermittees' proposal in their ROWD.[246] However, the location of the stations within each watershed is critical in terms of determining the monitoring program's effectiveness. If correctly sited, the stations are expected to be very useful in answering the program's management questions and meeting the program's goals. For this reason, the MRP includes requirements to guide where the stations are located. This will help maximize the utility of the stations, while also providing the Copermittees with adequate flexibility to ultimately choose the locations of the stations. The requirements for locating the stations is based on recommendations made by USEPA's contractor Tetra Tech during its review of the Copermittees' monitoring program proposal.[247]

Section II.A.2.b of the MRP identifies the required frequency of monitoring of temporary watershed assessment stations in a given year. The stations will be monitored with the same frequency as the mass loading stations. This frequency was proposed by the Copermittees in their ROWD.[248] The frequency of monitoring is appropriate for the same reasons it is appropriate at the mass loading stations (see the discussion for sections II.A.1.a and II.A.1.b).

Section II.A.2.c of the MRP requires temporary watershed assessment stations to be monitored in the same manner as mass loading stations, in terms of procedures, protocols, analysis, etc.

Bioassessment Monitoring

Section II.A.3 of the MRP requires the Copermittees to conduct bioassessment monitoring. Bioassessment monitoring is a cost-effective tool that measures the effects of water quality over time.[249] It is an important indicator of stream health and impacts from urban runoff. It can detect impacts that chemical and toxicity monitoring cannot. USEPA encourages permitting authorities to consider requiring biological monitoring methods to fully characterize the nature and extent of

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[245] Model Monitoring Technical Committee, 2004. Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California. Chapter 5.
[246] San Diego County Copermittees, 2005. Report of Waste Discharge. Attachment 3, p. 12.
[247] Tetra Tech, Inc., 2006. Review of San Diego County MS4 Monitoring Program. P. 13.
[248] San Diego County Copermittees, 2005. Report of Waste Discharge. Attachment 3, p. 12.
[249] California Department of Fish and Game, 2002. California Regional Water Quality Control Board, San Diego Region 2002 Biological Assessment Report: Results of May 2001 Reference Site Study and Preliminary Index of Biotic Integrity.

impacts from urban runoff.[250] Therefore, the Regional Board commonly requires bioassessment monitoring in MS4 and other types of discharge permits.

Bioassessment is the direct measurement of the biological condition, physical condition, and attainment of beneficial uses of receiving waters (typically using benthic macroinvertebrates, periphyton, and fish). Bioassessment monitoring integrates the effects of both water chemistry and physical habitat impacts (e.g., sedimentation or erosion) of various discharges on the biological community native to the receiving waters. Moreover, bioassessment is a direct measurement of the impact of cumulative, sub-lethal doses of pollutants that may be below reasonable water chemistry detection limits, but that still have biological affects.

Because bioassessment focuses on communities of living organisms as integrators of cumulative impacts resulting from water quality or habitat degradation, it defines the ecological risks resulting from urban runoff. Bioassessment not only identifies that an impact has occurred, but also measures the effect of the impact and tracks recovery when control or restoration measures have been taken. These features make bioassessment a powerful tool to assess compliance, evaluate the effectiveness of BMPs, and to track both short and long-term trends (MRP goals 1,2,3, and 8). Bioassessment can also help answer management questions 1, 2, and 5.

Section II.A.3.a of the MRP specifies the number of bioassessment stations to be monitored and their watershed location. This specification is consistent with Order No. 2001-01's bioassessment requirements and the Copermittees' ROWD.[251] This section also identifies the most current established protocol to be used in identifying bioassessment reference stations. The protocol referenced in the Order is specified because it provides a qualitative and repeatable method for identifying reference sites. Moreover, the protocol is well established, since it has been peer reviewed and published.

Section II.A.3.b of the MRP requires bioassessment stations to be collocated with mass loading and temporary watershed assessment stations. This improves the accuracy of the conclusions of the triad approach for a particular area, since all data will be collected from one location within a watershed, instead of several areas. This approach is recommended by the Copermittees in their ROWD.[252]

Section II.A.3.c of the MRP requires bioassessment monitoring to be conducted in May and October, which is a continuation of the standard practice conducted under Order No. 2001-01. Timing of bioassessment monitoring is also required to coincide with dry weather monitoring at mass loading and temporary watershed assessment stations. This improves the accuracy of the conclusions of the triad approach for particular time periods, since all data will be collected at specific times within a watershed, instead of at different times. This approach is recommended by the Copermittees in their ROWD.[253]

Section II.A.3.d of the MRP requires bioassessment monitoring to utilize the targeted riffle composite approach, which is consistent with the SWRCB's Surface Water Ambient Monitoring Program (SWAMP) Quality Assurance Management Plan (QAMP), as amended. Through SWAMP, various bioassessment methods were evaluated and it was found that the targeted riffle

[250] USEPA, 1999. Rapid Bioassessment Protocols for Use in Wadeable Streams and Rivers. EPA 841-B-99-002. P. 2-5.
[251] San Diego County Copermittees, 2005. Report of Waste Discharge. Attachment 3, p. 12.
[252] Ibid. Attachment 3, p. 10.
[253] Ibid. Attachment 3, p. 10.

composite approach was a particularly efficient method, providing accurate data in a cost efficient manner.

Section II.A.3.e of the MRP requires bioassessment monitoring to include assessment of periphyton (algae). Advantages of bioassessment using periphyton include: (1) they have rapid reproduction rates and very short life cycles, making them valuable indicators of short-term impacts; (2) as primary producers, they are most directly affected by physical and chemical factors; (3) sampling is easy and inexpensive; and (4) algal assemblages are sensitive to some pollutants which may not visibly affect other aquatic assemblages.[254]

Section II.A.3.f of the MRP specifies an approach for calculation of an Index of Biotic Integrity for all bioassessment stations. The specified approach is consistent with USEPA's procedures for developing an Index of Biotic Integrity. The approach is also specified because it is highly repeatable and robust. In addition, the specified approach has previously been utilized by the Copermittees under Order No. 2001-01's requirements.

Section II.A.3.g of the MRP includes a standard requirement for a professional laboratory to perform the bioassessment procedures.

Follow-Up Analysis and Actions

Section II.A.4 of the MRP requires the Copermittees to use the results of the chemistry, toxicity, and bioassessment monitoring to determine if impacts from urban runoff are occurring and when follow-up actions are necessary. The triad approach allows a wide range of measurements to be combined to more efficiently identify pollutants, their sources, and appropriate follow-up actions. Results from the three types of monitoring shall be assessed to evaluate the extent and causes of pollution in receiving waters and to prioritize management actions to eliminate or reduce the sources. The framework provided in Table 3 is to be used to determine conclusions from the data and appropriate follow-up actions. The framework in Table 3 was derived from the Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California.[255] These follow-up actions are expected to primarily help answer management questions 2 and 4, as well as address MRP goals 2, 4, 5, 6 and 7.

When, based on the framework in Table 3, data indicates the presence of toxic pollutants in runoff, the Copermittees are required to conduct a Toxicity Identification Evaluation (TIE). A TIE is a set of procedures used to identify the specific chemical(s) responsible for toxicity to aquatic organisms. When discharges are toxic to a test organism, a TIE must be conducted to confirm potential constituents of concern and rule out others, therefore allowing Copermittees to determine and prioritize appropriate management actions. If a sample is toxic to more than one species, it is necessary to determine the toxicant(s) affecting each species. If the type and source of pollutants can be identified based on the data alone and an analysis of potential sources in the drainage area, a TIE is not necessary.

When a TIE identifies a pollutant associated with urban runoff as a cause of toxicity, it is then necessary to conduct follow-up actions to identify the causative agents of toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in toxicity. Follow-up actions should analyze all potential source(s) causing toxicity,

[254] USEPA, 1999. Rapid Bioassessment Protocols for Use in Wadeable Streams and Rivers. EPA 841-B-99-002. P. 3-3.
[255] Model Monitoring Technical Committee, 2004. Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California. P. 5-61.

potential BMPs to eliminate or reduce the pollutants causing toxicity, and suggested monitoring to demonstrate that toxicity has been removed.

Ambient Bay and Lagoon Monitoring

Sections II.A.5.a-c of the MRP requires to Copermittees to conduct monitoring of the ambient conditions of bays, lagoons, and similar waters. Focused monitoring on these resources is needed because of their uniqueness and the high value of their beneficial uses. Such monitoring is recommended by the Stormwater Monitoring Coalition's Model Monitoring Technical Committee.[256]

The MRP requires the Copermittees to assess the data collected for the bays and lagoons over the last three years and refocus the monitoring program based on the assessment conducted. If links between bay and lagoon conditions and mass loading stations are observed, monitoring is to be conducted in all bays and lagoons in order to gain a better understanding of this relationship. If such a linkage is not observed, special studies shall be conducted specific to the various bays and lagoons and the issues they face. The approach outlined in the MRP for the ambient bay and lagoon monitoring program is based on the proposal found in the Copermittees' ROWD.[257] It is expected to help answer management questions 1, 2, and 5, as well as address MRP goals 1, 2, 3, 6, and 8, with regards to bays and lagoons.

Section II.A.5.d of the MRP requires that ambient bay and lagoon monitoring utilize the triad approach for assessment of data. The triad approach links chemistry, toxicity, and bioassessment data to better identify and understand the causes of impacts to beneficial uses. This approach has previously been used by the Copermittees in their ambient bay and lagoon monitoring.[258]

Section II.A.5.e of the MRP requires monitoring of the water column in bays and lagoons as necessary to supply information needed for TMDLs. This requirement has been added to the MRP to better ensure that storm water and TMDL monitoring complement each other where possible. This is expected to improve the efficiency with which monitoring resources are used. The Copermittees support complementary storm water and TMDL efforts in their ROWD.[259]

Coastal Storm Drain Monitoring

Section II.A.6 of the MRP continues the Copermittees' coastal storm drain monitoring program in the same manner as it was conducted under Order No. 2001-01's receiving waters monitoring program. The coastal storm drain monitoring program outlined in the MRP is consistent with the Copermittees' proposal in their ROWD.[260] Coastal storm drain monitoring is critical because one of the primary impacts to coastal receiving waters is the loss of recreational beneficial uses resulting from high levels of bacteria in urban runoff. The coastal storm drain monitoring program is expected to help answer management questions 1, 2, 3, 4 and 5, as well as address MRP goals 1, 2, 3, 4, 5, 6, 7, and 8.

Sections II.A.6.a and II.A.6.b.(1) of the MRP require the Copermittees to identify all coastal storm drains and sample those that are flowing on a monthly basis. All coastal storm drains are

[256] Ibid. P. 5-38.
[257] San Diego County Copermittees, 2005. Report of Waste Discharge. Attachment 3, p. 10-12.
[258] San Diego County Copermittees, 2005. San Diego County Copermittees 2004-2005 Urban Runoff Monitoring Final Report. P. ES-2.
[259] San Diego County Copermittees, 2005. Report of Waste Discharge. P. D-10.
[260] Ibid. Attachment 4.

required to be part of the program; skipping certain storm drains simply because they are near other storm drains is inappropriate, since each storm drain can have significantly different conditions within its drainage area. One purpose of coastal storm drain monitoring is to identify and abate sources of bacterial contamination. Since the sources of bacterial contamination at a storm drain are generally not known, the potential for a flowing coastal storm drain to be discharging urban runoff with high levels of bacteria cannot be known unless the storm drain is monitored.

The requirement that all coastal storm drains be part of the program is offset by the reduction in sampling frequency to a monthly basis year round, instead of weekly in the summer and monthly in the winter. Moreover, the MRP allows sampling frequency to be further reduced when monitoring results indicate bacteria levels are consistently below an identified criteria. These reductions in sampling frequency are allowed because the Copermittees have found monthly monitoring to typically be representative of storm drain conditions. Also, the Copermittees have identified some storm drains which consistently have low levels of bacteria and do not cause exceedances of standards in receiving waters. Reduction in monitoring frequency provides the Copermittees with more time and resources to investigate problem storm drains, as required in MRP sections II.A.6.b.3-5. The monitoring frequencies in the MRP are recommended by the Copermittees in their ROWD.[261]

Section II.A.6.b.(2) of the MRP requires the Copermittees to notify the Regional Board if they are going to reduce the monitoring frequency of a coastal storm drain. This will allow the Regional Board the opportunity to review the proposed reduction prior to the reduction being enacted by the Copermittee.

Sections II.A.6.b.(3-5) of the MRP identifies when follow-up investigations must be conducted based on results of coastal storm drain monitoring. Criteria to trigger investigations is needed to ensure that problem storm drains are investigated. Without criteria triggering investigations, there is the potential that sources causing high bacteria levels in storms drains and coastal receiving waters could go uninvestigated.

Section II.A.6.b.(6) of the MRP requires the Copermittees to provide notification of exceedances of public health standards so that proper action can be taken by public health agencies.

Toxic Hot Spot Monitoring

Section II.A.7 of the MRP requires the Copermittees to develop and implement a monitoring program for Toxic Hot Spots in San Diego Bay. This requirement is identical to the requirement included in the receiving waters monitoring and reporting program for Order No. 2001-01, and is necessary to ensure the Order is consistent with the SWRCB's June 1999 Consolidated Toxic Hot Spot Cleanup Plan.

Pyrethroids Monitoring

Section II.A.8 of the MRP requires the Copermittees to develop and implement a monitoring program which addresses pyrethroids. A program to monitor pyrethroids is needed because they are the leading insecticides sold to homeowners and have been found at toxic levels in suburban

[261] San Diego County Copermittees, 2005. Report of Waste Discharge. Attachment 4.

stream sediments in California when investigated.[262] Moreover, their use is likely to increase as diazinon use decreases. Monitoring of pyrethroids will help guide efforts to ensure that the gains achieved by the phasing out of diazinon are not nullified by increased use of pyrethroids.

Since a monitoring program for pyrethroids is new, the Copermittees are provided significant leeway in the development and implementation of the program. The Copermittees can utilize the flexibility incorporated into the MRP to develop a program that is workable for them while providing the necessary information. Moreover, the MRP provides the Copermittees with over a year to develop the program.

Trash Monitoring

Section II.A 9 of the MRP requires the Copermittees to develop and implement a monitoring program which addresses trash. A program to monitor trash is needed because trash conditions impacting beneficial uses have frequently been observed within the Copermittees' jurisdictions. For example, the Regional Board directed the Copermittees within the watersheds of Chollas and Paleta Creeks to implement the "iterative process" to address violations of water quality standards due to trash conditions within the creeks.[263] The Regional Board also issued a Notice of Violation to the City of Escondido for trash conditions in Escondido Creek.[264] Moreover, the Copermittees have identified trash as a regional priority.[265]

Since a monitoring program for trash is new, the Copermittees are provided significant leeway in the development and implementation of the program. The Copermittees can utilize the flexibility incorporated into the MRP to develop program that is workable for them while providing the necessary information. Moreover, the MRP provides the Copermittees with over a year to develop the program.

MS4 Discharge Monitoring

Section II.A.10 of the MRP requires the Copermittees to develop and implement a program to monitor and characterize pollutant discharges from MS4 outfalls. After over 15 years of program implementation, most Copermittees have not monitored their MS4 discharges significantly and still do not know the quality of those discharges during various conditions. Such monitoring is critical, since it will provide for prioritization of areas for increased management efforts. It will also provide the Copermittees the ability to better assess and improve their jurisdictional programs and BMPs. For example, the Copermittees' assessment framework calls for assessing changes in load reductions and MS4 discharge quality.[266] Monitoring of MS4 discharges will enable the Copermittees to meet these program assessment goals. Without monitoring of MS4 discharges, it is unclear how these program assessment goals will be met. This type of monitoring is recommended for high priority outfalls by the Stormwater Monitoring Coalitions' Model Monitoring Technical Committee.[267] It is expected to help answer management questions

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[262] Science News Online, 2006. A Little Less Green? Studies Challenge the Benign Image of Pyrethroid Insecticides. www.sciencenews.org/articles/20060204/bob9/asp.
[263] Regional Board, 2001. California Water Code Section 13267 Directives Issued to the City of San Diego, City of La Mesa, City of Lemon Grove, and City of National City.
[264] Regional Board, 2000. Notice of Violation No. 2000-181.
[265] San Diego County Copermittees, 2005. Report of Waste Discharge. P. C-3.
[266] San Diego Municipal Stormwater Copermittees, 2003. A Framework for Assessing the Effectiveness of Jurisdictional Urban Runoff Management Programs. P. 14.
[267] Model Monitoring Technical Committee, 2004. Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California. P. 5-55.

3and 4, which is consistent with Tetra Tech's review of the Copermittees' monitoring proposal, which stated "give substantially more attention of questions 3 and 4."[268] It will also address MRP goals 1, 2, 4, 5, 6, and 7.

Since a monitoring program for MS4 discharges is new, the Copermittees are provided significant leeway in the development and implementation of the program. The Copermittees can utilize the flexibility incorporated into the MRP to develop program that is workable for them while providing the necessary information. Moreover, the MRP provides the Copermittees with over a year to develop the program.

Source Identification Studies

Section II.A.11 of the MRP requires the Copermittees to develop and implement a program to identify sources of discharges of pollutants causing the high priority water quality problems within each watershed. Identification of sources causing high priority water quality problems is a central purpose of urban runoff management programs. Monitoring which enables the Copermittees to identify sources of water quality problems aids the Copermittees in focusing their management efforts and improving their programs. In turn, the Copermittees' programs can abate identified sources, which will improve the quality of urban runoff discharges and receiving waters. This monitoring is needed to address management question 4 (What are the sources to urban runoff that contribute to receiving water problems?). Source identification monitoring is a key component of the Model Monitoring Program, which states "once it has been determined […] that urban runoff is, or is likely to be, a significant source of one or more receiving water problems, then more intensive source identification efforts are called for."[269] Moreover, in its review of the Copermittees' monitoring proposal, Tetra Tech finds that "after some years of assessment monitoring, it is time to look more systematically at determining the relative urban contributions and the sources of urban runoff that contribute to identified receiving water problems."[270]

Since a monitoring program for source identification is mostly new, the Copermittees are provided significant leeway in the development and implementation of the program. The Copermittees can utilize the flexibility incorporated into the MRP to develop program that is workable for them while providing the necessary information. Moreover, the MRP provides the Copermittees with over a year to develop the program.

TMDL Monitoring

Section II.A.12 of the MRP requires the Copermittees to continue to monitor for TMDLs in Chollas Creek as required in the Regional Board's Investigation Order No. R9-2004-0277.

Regional Monitoring Program

Section II.B.1 of the MRP requires the Copermittees to conduct regional monitoring if directed by the Executive Officer. Such investigations may be required under CWC sections 13267 and 13383.

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[268] Tetra Tech Inc., 2006. Review of San Diego County MS4 Monitoring Program. P. 15.
[269] Model Monitoring Technical Committee, 2004. Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California. P. 4-17.
[270] Tetra Tech Inc., 2006. Review of San Diego County MS4 Monitoring Program. P. 15.

Section II.B.2 of the MRP allows the Copermittees to participate in Bight '08. This will provide the Copermittees and Regional Board with insight on the impact of urban runoff on a regional level in the Southern California Bight. Participation in Bight '08 was recommended by the Copermittees in their ROWD.[271] Since participation in Bight '08 is optional for the Copermittees, this section outlines the monitoring which must be conducted if the Copermittees do not participate in the study. The monitoring the Copermittees are to conduct if they do not participate in Bight '08 is consistent with the monitoring they are required to conduct in other years.

Special Studies

Section II.C of the MRP requires the Copermittees to conduct special investigations if directed by the Executive Officer. Such investigations may be required under California Water Code sections 13267 and 13383.

Dry Weather Field Screening and Analytical Monitoring

Section II.D of the MRP requires the Copermittees to conduct dry weather field screening and analytical monitoring. In general, the Order's requirements are the same as the dry weather monitoring requirements of Order No. 2001-01. Significant changes in the requirements are discussed below.

Section II.D.1 of the MRP requires the Copermittees to select dry weather monitoring stations to cover the entire MS4 system, as well as be in compliance with minimum guidelines/criteria. These criteria require a minimum number of stations per square mile. Additional language has been added to provide the Copermittees flexibility in providing equivalent coverage of the MS4 with fewer stations.

In its October 29, 2004 letter to the Copermittees, as well as in subsequent meetings, the Regional Board notified the Copermittees that a process should be developed for determining the minimum number of dry weather sampling stations that should be required in each jurisdiction. The process was needed due to the apparent disparity in the number of sampling stations among the Copermittees. The Copermittees formed a subcommittee to address this issue, but were unable to develop a consensus process. As a result, the Copermittees have requested that a standardized method for determining number of dry monitoring stations not be included in the Order. In response, the Regional Board has relied on Order No. 2001-01's requirements and some additional clarifying language. This continues Order No. 2001-01's process for identifying the number of stations, while allowing the Regional Board to evaluate the adequacy of the each Copermittee's number of dry weather stations.

Order No. 2001-01's requirement for a monitoring map (Task 5) has been moved to the Illicit Discharge Detection and Elimination Component of Order No. R9-2007-0001. This has been done for clarification purposes, since map development is not expressly a monitoring effort.

Section II.D.3 of the MRP requires the Copermittees to collect and analyze dry weather samples using laboratory or field screening methods. Language to has been added to this section to reflect that the Copermittees must collect samples for analytical laboratory analysis for at least 25% of dry weather monitoring stations.

[271] San Diego County Copermittees, 2005. Report of Waste Discharge. Attachment 3, p. 12.

In the ROWD, the Copermittees requested field screening be allowed for surfactants and dissolved copper constituents. The Copermittees also requested that Colilert and Enterolert methods should be allowed for bacteria sampling. The Regional Board agrees with the Copermittees' proposed changes since they will expedite the turnaround time for sampling results for these constituents and assist the Copermittees in their IC/ID investigations. In response the Copermittees' request, surfactants and dissolved copper have been added to the list of field screening constituents. A footnote has also been added allowing for use of Colilert and Enterolert methods for bacteria.

Monitoring Provisions

Section II.E of the MRP includes monitoring provisions which are standard requirements for all municipal storm water permits.

3. Reporting Program

Section III.1 of the MRP discusses submittal of the Jurisdictional Urban Runoff Management Program Annual Reports. The section continues the approach utilized under the requirements of Order No. 2001-01, where Copermittees submit their reports to the Principal Permittee to be unified into one document. The section moves forward the due date for these annual reports from January 31 to September 30. This requires jurisdictional annual reports to be submitted closer to the end of the reporting period they address, which will result in earlier review by the Regional Board. Submittal will also be staggered with submittal of the watershed and regional annual reports, spreading out Regional Board review of annual reports, leading to faster review. Earlier and faster review is useful, because Regional Board comments can be received and responded to quicker by the Copermittees. In this manner, Copermittee programs can be modified and benefit from the jurisdictional annual report review, comment, response process at an earlier date, leading to more effective program over the long-term. In their ROWD, the Copermittees agree that separating due dates for jurisdictional and watershed annual reports would be helpful in spreading out the workload associated with their preparation.[272]

Sections III.2.a and III.2.c of the MRP continues the reporting approach utilized under the requirements of Order No. 2001-01, where Lead Permittees for each watershed submit their annual reports to the Principal Permittee to be unified into one document.

Section III.2.b of the MRP outlines the information to be included in the Copermittees' Watershed Urban Runoff Management Program Annual Reports. Significant detail is included regarding what information should be in the annual reports in order to provide certainty to the Copermittees when they develop and submit their annual reports. By providing detail for what information should be included in the annual reports, time spent by the Copermittees and Regional Board to generate, review, and comment on annual reports should be reduced.

Section III.3 of the MRP outlines the information to be included in the Copermittees' RURMP Annual Reports. Significant detail is included regarding what information should be in the annual reports in order to provide certainty to the Copermittees when they develop and submit their annual reports. By providing detail for what information should be included in the annual reports, time spent by the Copermittees and Regional Board to generate, review, and comment on annual reports should be reduced.

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[272] San Diego County Copermittees, 2005. Report of Waste Discharge. P. D-81.

Section III.4.a of the MRP requires the Copermittees to annually submit a description of the monitoring that will be conducted prior to the start of each monitoring year. This is needed because of the changes the monitoring program frequently undergoes each year. For example, as monitoring programs develop, some monitoring components of the programs are added or dropped. In addition, requirements for conducting monitoring efforts such as TIEs may be applicable. A description of the monitoring to be conducted each year will aid the Regional Board and Copermittees in tracking monitoring activities and compliance with the MRP.

Section III.4.b of the MRP outlines the information to be included in the Copermittees' Receiving Waters Monitoring Annual Reports. The information required to be included in the reports is needed to meet the goals of the MRP and answer the MRP's management questions. The reporting requirements emphasize identifying and assessing the impact of urban runoff on receiving water quality, as well as the impact of the Copermittees' programs on urban runoff quality. Significant detail is included regarding what information should be in the annual reports in order to provide certainty to the Copermittees when they develop and submit their annual reports. By providing detail for what information should be included in the annual reports, time spent by the Copermittees and Regional Board to generate, review, and comment on annual reports should be reduced.

Section III.4.c of the MRP requires the Copermittees to submit a description of the new monitoring programs to be developed under the MRP. Submittal of such a document is necessary in order to identify the monitoring that will be conducted and provide the Regional Board the opportunity to review the monitoring programs.

Section III.4.d of the MRP requires the City of San Diego to report on the Shelter Island Yacht Basin TMDL in order to exhibit that the WLA can be expected to continue to be met. This report is necessary, since MS4 discharge monitoring is not required by the TMDL.

Section III.4.e of the MRP requires that monitoring programs comply with standard provisions, notifications, and reporting requirements.

Section III.4.f of the MRP requires that the Copermittees make data available to the Regional Board during report preparation, if requested. This is a necessary option since monitoring annual reports are not submitted for many months after much of the monitoring data is collected.

Section III.5 of the MRP allows for the Copermittees to develop and submit a reporting format for annual report integration. In their ROWD, the Copermittees requested a requirement that annual reporting ultimately be integrated.[273] Rather than including annual report integration as a requirement in the Order, it is included as an option for the Copermittees to utilize. Annual report integration is left as an option because information addressing what such integration would encompass is largely unknown. Annual reporting is an important tool for the Regional Board for compliance assessment. Where the outcomes regarding compliance assessment are uncertain, it is more appropriate to incorporate such concepts into the Order as options, instead of requirements. However, nothing in the Order prevents the Copermittees from developing an annual report integration format for Regional Board review and approval. To clarify Regional Board expectations for an annual report integration format, minimum standards for the format are provided in the Order.

[273] San Diego County Copermittees, 2005. Report of Waste Discharge. P. D-77.

Section III.6 of the MRP includes universal reporting requirements, which have not changed from the requirements of Order No. 2001-01.

Section III.7 of the MRP clarifies that reporting should continue as it is conducted under Order No. 2001-01 until reporting requirements under Order No. R9-2007-0001 begin.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

ADDENDUM NO. 1 TO ORDER NO. R9-2007-0001
NPDES PERMIT NO. CAS0108758

AN ADDENDUM EXTENDING SELECTED DUE DATES FOR ORDER NO. R9-2007-0001 AS A RESULT OF THE OCTOBER 2007 WILDFIRES IN SAN DIEGO COUNTY

The California Regional Water Quality Control Board, San Diego Region (hereinafter Regional Board) finds that:

1. Regional Board Order No. R9-2007-0001 (NPDES Permit No. CAS0108758), *Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego County, the San Diego Unified Port District, and the San Diego County Regional Airport Authority*, prescribes requirements for the control of pollutant discharges from MS4s within San Diego County.

2. Order No. R9-2007-0001 requires the Copermittees to submit reports and plans on prescribed dates to ensure compliance with the directives of Order No. R9-2007-001.

3. On October 21, 2007, the Governor proclaimed a regional disaster area in the San Diego Region. As of November 13, 2007, wildfires had reportedly burned an estimated 400,000 acres, destroyed or damaged over 3,100 structures, and caused the evacuation of over 500,000 residents in San Diego County.

4. On November 13, 2007, the County of San Diego, on behalf of the San Diego Region Municipal Copermittees, provided the Regional Board with a written request for an extension of due dates for a period of up to eight weeks, for the submittal and implementation of selected deliverables, required by Order No. R9-2007-0001. The Copermittees emergency response to the wildfires has resulted in the reassignment of hundreds of staff whose expertise is needed to submit the deliverables by the prescribed due dates.

5. The Regional Board has notified all known interested parties of its intent to modify Order No. R9-2007-0001 to reflect the extension of due dates for selected required deliverables.

6. The Regional Board in a public hearing heard and considered all comments pertaining to the modification of Order No. R9-2007-0001.

IT IS HEREBY ORDERED THAT

1. Order No. R9-2007-0001 is modified as the following:

   a. Jurisdictional Urban Runoff Management Program, Section D, page 15 – "Each Copermittee shall implement all requirements of section D of this Order no later than ~~365~~ **425** days after adoption of the Order, unless otherwise specified in this Order. Prior to ~~365~~ **425** days after adoption of the Order each Copermittee shall at a minimum implement is Jurisdictional URMP document, as the document was developed and amended to comply with the requirements of Order No. 2001-01."

   b. Construction Component Ordinance Update and Approval Process, Section D.2.a.(1), page 28 – "Within ~~365~~ **425** days of adoption of this Order, each Copermittee shall review and update its grading ordinances and other ordinances as necessary to achieve full compliance with this Order, including requirements for the implementation of all designated BMPs and other measures."

   c. Watershed Urban Runoff Management Program, Section E.1, page 46 – "Each Copermittee shall implement all requirements of section E of this Order no later than ~~365~~ **425** days after adoption of this Order, unless otherwise specified in this Order. Prior to ~~365~~ **425** days after adoption of this Order, each Copermittee shall collaborate with the other Copermittees within its Watershed Management Area(s) (WMA) to at a minimum implement its Watershed URMP document, as the document was developed and amended to comply with the requirements of Order No. 2001-01."

   d. Regional Urban Runoff Management Program, Section F, page 50 – "The Copermittees shall implement all requirements of section F of this Order no later than ~~365~~ **425** days after adoption of this Order, unless otherwise specified in this Order."

   e. Reporting, Urban Runoff Management Plans, Jurisdictional Urban Runoff Management Plans, Section J.1.a.(2), page 58 – "Principal Permittee – The Principal Permittee shall be responsible for collecting and assembling the individual JURMPs which cover the activities conducted by each individual Copermittee. The Principal Permittee shall submit the JURMPs to the Regional Board ~~365~~ **425** days after adoption of this Order."

   f. Reporting, Urban Runoff Management Plans, Watershed Urban Runoff Management Plans, Section J.1.b.(3), page 62 – "Principal Permittee – The Principal Permittee shall assemble and submit the WURMPs to the Regional Board ~~365~~ **425** days after adoption of this Order."

g. Reporting, Urban Runoff Management Plans, Regional Urban Runoff Management Plan, Section J.1.c.(2), page 64 – "The Principal Permittee shall be responsible for creating and submitting the RURMP. The Principal Permittee shall submit the RURMP to the Regional Board ~~365~~ **425** days after adoption of this Order."

I, John H. Robertus, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Addendum adopted by the California Regional Water Quality Control Board, San Diego Region, on December 12, 2007.

JOHN H. ROBERTUS
Executive Officer

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

ADDENDUM NO. 2 TO ORDER NO. R9-2007-0001
NPDES PERMIT NO. CAS0108758

AN ADDENDUM EXTENDING THE DUE DATE FOR THE ILLICIT DISCHARGE DETECTION AND ELIMINATION REPORTING REQUIREMENT AND CHANGING THE BIOASSESSMENT MONITORING PROGRAM FOR ORDER NO. R9-2007-0001

The California Regional Water Quality Control Board, San Diego Region (hereinafter Regional Board) finds that:

1. On January 24, 2007, the Regional Board adopted Order No. R9-2007-0001 (NPDES Permit No. CAS0108758), *Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego County, the San Diego Unified Port District, and the San Diego County Regional Airport Authority (Copermittees)*, which prescribes requirements for the control of pollutant discharges from MS4s within San Diego County.

2. Order No. R9-2007-0001 requires the Copermittees to submit reports and plans on prescribed dates to ensure compliance with the directives of Order No. R9-2007-001. As part of the reporting requirements, the Copermittees must submit Jurisdictional Urban Runoff Management Plan (JURMP) annual reports by September 30th each year. This includes reporting on the Illicit Discharge Detection and Elimination program component.

3. The Illicit Discharge Detection and Elimination program component involves extensive water quality sampling during the dry weather season. The dry weather season is defined as May 1 through September 30th.

4. More time is needed for reporting of the Illicit Discharge Detection and Elimination program component, since the current reporting requirement due date is on the same calendar day as the end of the dry weather season. A delayed reporting requirement for this specific program component is necessary to submit all dry season monitoring and program information together.

5. Order No. R9-2007-0001 requires the Copermittees to conduct bioassessment in May or June and September or October in accordance with the Receiving Waters and Urban Runoff Monitoring and Reporting Program No. R9-2007-0001.

6. Bioassessment in May or June is more effective in San Diego streams since some streams are ephemeral and only have flow during spring after winter storms.

7. The Stormwater Monitoring Coalition of Southern California designed a Storm Water Monitoring Coalition Regional Watershed Monitoring Program (SMC study). The goal of this project is to implement a large-scale, regional bioassessment monitoring program for southern California's coastal streams and rivers. The SMC study will use a probabilistic design (randomly selected sites) that provides an accurate assessment of stream health in southern California. The study is designed for continuous monitoring with samples taken over a five-year cycle.

8. Participation of the Copermitees in the SMC study would enhance their bioassessment monitoring efforts. The Regional Board and the Copermittees have agreed to share the costs of the implementation of the SMC study.

9. The Regional Board has notified all known interested parties of its intent to modify Order No. R9-2007-0001 to reflect the extension of the due date for the Illicit Discharge Detection and Elimination reporting requirement and the change of the bioassessment monitoring program.

10. The Regional Board in a public hearing heard and considered all comments pertaining to the modification of Order No. R9-2007-0001.

11. The modification of Order No. R9-2007-0001, an NPDES permit, is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 et seq.) in accordance with the CWC section 13389.

IT IS HEREBY ORDERED THAT

1. Order No. R9-2007-0001 is modified as follows:

   a. Section J.3.a. JURISDICTIONAL URBAN RUNOFF MANAGEMENT PROGRAM ANNUAL REPORTS. Each Jurisdictional Urban Runoff Management Program Annual Report shall contain a comprehensive description of all activities conducted by the Copermittee to meet all requirements of section D**, with the exception of section D.4**. The reporting period for these annual reports shall be the previous fiscal year. ~~For example, the~~ The report submitted September 30, 2008 shall cover the reporting period July 1, 2007 to June 30, 2008. **For section D.4, the report shall be submitted December 15, 2008, and shall cover the dry weather season May 1, 2008 through September 30, 2008.**

(1) Copermittees—Each Copermittee shall generate individual Jurisdictional Urban Runoff Management Program Annual Reports which cover implementation of its jurisdictional activities during the past annual reporting period. Each Copermittee shall submit to the Principal Permittee its individual Jurisdictional Urban Runoff Management Program Annual Report by the date specified by the Principal Permittee. Each individual Jurisdictional Urban Runoff Management Program Annual Report shall be a comprehensive description of all activities conducted by the Copermittees to meet all requirements of each component of section D, **with the exception of section D.4,** of this order.

(2) Principal Permittee—The Principal Permittee shall submit Unified Jurisdictional Urban Runoff Management Program Annual Reports to the Regional Board by September 30 of each year, beginning on September 30, 2008. **The exception is section D.4, which shall be submitted by December 15 of each year, beginning on December 15, 2008.** The Unified Jurisdictional Urban Runoff Management Program Annual Report shall contain the twenty-one individual Jurisdictional Urban Runoff Management Program Annual Reports.

b. Attachment D, fourth row from bottom:

Principal Permittee submits unified Jurisdictional Urban Runoff Management Program Annual Report to Regional Board**, with the exception of section D.4.**

Add new row:

Principal Permittee submits section D.4 of unified Jurisdictional Urban Runoff Management Program Annual Report.
Permit Section: J.3.a.

Completion Date: December 15, 2008, and annually thereafter
Frequency: Annually

c. Receiving Waters and Urban Runoff Monitoring and Reporting Program No. R9-2007-0001, Section II.A.3.c:

Bioassessment stations to be monitored in a given monitoring year shall be monitored in May or June (to represent the influence of wet weather on the communities) and September or October (to represent the influence of dry weather flows on the communities). **If the Copermittees participate in the Storm Water Monitoring Coalition Regional Watershed Monitoring Program, bioassessment stations only need to be monitored once per year in May or June.** The timing of monitoring of

bioassessment stations shall coincide with dry weather monitoring of mass loading and temporary watershed assessment stations.

d. Receiving Waters and Urban Runoff Monitoring and Reporting Program No. R9-2007-0001, Section II.C.3:

3. Storm Water Monitoring Coalition Regional Watershed Monitoring Program (SMC study) Starting in the monitoring year 2008-2009 (Permit Year 2), the Copermittees may participate in the SMC study. Any participation shall include the contribution of all funds not otherwise spent for the full implementation of the bioassessment monitoring. If the Copermittees do not participate in the SMC study, then the bioassessment monitoring in spring and fall shall be implemented. During Bight '08, the Copermittees are not required to spend funds from the bioassessment monitoring towards the SMC study. During Bight years subsequent to Bight '08, monitoring for the SMC study shall be implemented and shall not be exchanged for Bight monitoring. Data shall be submitted through the SMC's standardized data transfer formats.

I, John H. Robertus, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Addendum adopted by the California Regional Water Quality Control Board, San Diego Region, on September 10, 2008.

JOHN H. ROBERTUS
Executive Officer

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

ADDENDUM NO. 1 TO ORDER NO. R9-2007-0001
NPDES PERMIT NO. CAS0108758

AN ADDENDUM EXTENDING SELECTED DUE DATES FOR ORDER NO. R9-2007-0001 AS A RESULT OF THE OCTOBER 2007 WILDFIRES IN SAN DIEGO COUNTY

The California Regional Water Quality Control Board, San Diego Region (hereinafter Regional Board) finds that:

1. Regional Board Order No. R9-2007-0001 (NPDES Permit No. CAS0108758), *Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego County, the San Diego Unified Port District, and the San Diego County Regional Airport Authority*, prescribes requirements for the control of pollutant discharges from MS4s within San Diego County.

2. Order No. R9-2007-0001 requires the Copermittees to submit reports and plans on prescribed dates to ensure compliance with the directives of Order No. R9-2007-001.

3. On October 21, 2007, the Governor proclaimed a regional disaster area in the San Diego Region. As of November 13, 2007, wildfires had reportedly burned an estimated 400,000 acres, destroyed or damaged over 3,100 structures, and caused the evacuation of over 500,000 residents in San Diego County.

4. On November 13, 2007, the County of San Diego, on behalf of the San Diego Region Municipal Copermittees, provided the Regional Board with a written request for an extension of due dates for a period of up to eight weeks, for the submittal and implementation of selected deliverables, required by Order No. R9-2007-0001. The Copermittees emergency response to the wildfires has resulted in the reassignment of hundreds of staff whose expertise is needed to submit the deliverables by the prescribed due dates.

5. The Regional Board has notified all known interested parties of its intent to modify Order No. R9-2007-0001 to reflect the extension of due dates for selected required deliverables.

6. The Regional Board in a public hearing heard and considered all comments pertaining to the modification of Order No. R9-2007-0001.

IT IS HEREBY ORDERED THAT

1. Order No. R9-2007-0001 is modified as the following:

   a. Jurisdictional Urban Runoff Management Program, Section D, page 15 – "Each Copermittee shall implement all requirements of section D of this Order no later than ~~365~~ **425** days after adoption of the Order, unless otherwise specified in this Order. Prior to ~~365~~ **425** days after adoption of the Order each Copermittee shall at a minimum implement is Jurisdictional URMP document, as the document was developed and amended to comply with the requirements of Order No. 2001-01."

   b. Construction Component Ordinance Update and Approval Process, Section D.2.a.(1), page 28 – "Within ~~365~~ **425** days of adoption of this Order, each Copermittee shall review and update its grading ordinances and other ordinances as necessary to achieve full compliance with this Order, including requirements for the implementation of all designated BMPs and other measures."

   c. Watershed Urban Runoff Management Program, Section E.1, page 46 – "Each Copermittee shall implement all requirements of section E of this Order no later than ~~365~~ **425** days after adoption of this Order, unless otherwise specified in this Order. Prior to ~~365~~ **425** days after adoption of this Order, each Copermittee shall collaborate with the other Copermittees within its Watershed Management Area(s) (WMA) to at a minimum implement its Watershed URMP document, as the document was developed and amended to comply with the requirements of Order No. 2001-01."

   d. Regional Urban Runoff Management Program, Section F, page 50 – "The Copermittees shall implement all requirements of section F of this Order no later than ~~365~~ **425** days after adoption of this Order, unless otherwise specified in this Order."

   e. Reporting, Urban Runoff Management Plans, Jurisdictional Urban Runoff Management Plans, Section J.1.a.(2), page 58 – "Principal Permittee – The Principal Permittee shall be responsible for collecting and assembling the individual JURMPs which cover the activities conducted by each individual Copermittee. The Principal Permittee shall submit the JURMPs to the Regional Board ~~365~~ **425** days after adoption of this Order."

   f. Reporting, Urban Runoff Management Plans, Watershed Urban Runoff Management Plans, Section J.1.b.(3), page 62 – "Principal Permittee – The Principal Permittee shall assemble and submit the WURMPs to the Regional Board ~~365~~ **425** days after adoption of this Order."

g. Reporting, Urban Runoff Management Plans, Regional Urban Runoff Management Plan, Section J.1.c.(2), page 64 – "The Principal Permittee shall be responsible for creating and submitting the RURMP. The Principal Permittee shall submit the RURMP to the Regional Board ~~365~~ **425** days after adoption of this Order."

I, John H. Robertus, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Addendum adopted by the California Regional Water Quality Control Board, San Diego Region, on December 12, 2007.

JOHN H. ROBERTUS
Executive Officer

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

ADDENDUM NO. 2 TO ORDER NO. R9-2007-0001
NPDES PERMIT NO. CAS0108758

AN ADDENDUM EXTENDING THE DUE DATE FOR THE ILLICIT DISCHARGE DETECTION AND ELIMINATION REPORTING REQUIREMENT AND CHANGING THE BIOASSESSMENT MONITORING PROGRAM FOR ORDER NO. R9-2007-0001

The California Regional Water Quality Control Board, San Diego Region (hereinafter Regional Board) finds that:

1. On January 24, 2007, the Regional Board adopted Order No. R9-2007-0001 (NPDES Permit No. CAS0108758), *Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego County, the San Diego Unified Port District, and the San Diego County Regional Airport Authority (Copermittees)*, which prescribes requirements for the control of pollutant discharges from MS4s within San Diego County.

2. Order No. R9-2007-0001 requires the Copermittees to submit reports and plans on prescribed dates to ensure compliance with the directives of Order No. R9-2007-001. As part of the reporting requirements, the Copermittees must submit Jurisdictional Urban Runoff Management Plan (JURMP) annual reports by September 30th each year. This includes reporting on the Illicit Discharge Detection and Elimination program component.

3. The Illicit Discharge Detection and Elimination program component involves extensive water quality sampling during the dry weather season. The dry weather season is defined as May 1 through September 30th.

4. More time is needed for reporting of the Illicit Discharge Detection and Elimination program component, since the current reporting requirement due date is on the same calendar day as the end of the dry weather season. A delayed reporting requirement for this specific program component is necessary to submit all dry season monitoring and program information together.

5. Order No. R9-2007-0001 requires the Copermittees to conduct bioassessment in May or June and September or October in accordance with the Receiving Waters and Urban Runoff Monitoring and Reporting Program No. R9-2007-0001.

6. Bioassessment in May or June is more effective in San Diego streams since some streams are ephemeral and only have flow during spring after winter storms.

7. The Stormwater Monitoring Coalition of Southern California designed a Storm Water Monitoring Coalition Regional Watershed Monitoring Program (SMC study). The goal of this project is to implement a large-scale, regional bioassessment monitoring program for southern California's coastal streams and rivers. The SMC study will use a probabilistic design (randomly selected sites) that provides an accurate assessment of stream health in southern California. The study is designed for continuous monitoring with samples taken over a five-year cycle.

8. Participation of the Copermitees in the SMC study would enhance their bioassessment monitoring efforts. The Regional Board and the Copermittees have agreed to share the costs of the implementation of the SMC study.

9. The Regional Board has notified all known interested parties of its intent to modify Order No. R9-2007-0001 to reflect the extension of the due date for the Illicit Discharge Detection and Elimination reporting requirement and the change of the bioassessment monitoring program.

10. The Regional Board in a public hearing heard and considered all comments pertaining to the modification of Order No. R9-2007-0001.

11. The modification of Order No. R9-2007-0001, an NPDES permit, is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 et seq.) in accordance with the CWC section 13389.

IT IS HEREBY ORDERED THAT

1. Order No. R9-2007-0001 is modified as follows:

   a. Section J.3.a. JURISDICTIONAL URBAN RUNOFF MANAGEMENT PROGRAM ANNUAL REPORTS. Each Jurisdictional Urban Runoff Management Program Annual Report shall contain a comprehensive description of all activities conducted by the Copermittee to meet all requirements of section D**, with the exception of section D.4**. The reporting period for these annual reports shall be the previous fiscal year. ~~For example, the~~ The report submitted September 30, 2008 shall cover the reporting period July 1, 2007 to June 30, 2008. **For section D.4, the report shall be submitted December 15, 2008, and shall cover the dry weather season May 1, 2008 through September 30, 2008.**

(1) Copermittees—Each Copermittee shall generate individual Jurisdictional Urban Runoff Management Program Annual Reports which cover implementation of its jurisdictional activities during the past annual reporting period. Each Copermittee shall submit to the Principal Permittee its individual Jurisdictional Urban Runoff Management Program Annual Report by the date specified by the Principal Permittee. Each individual Jurisdictional Urban Runoff Management Program Annual Report shall be a comprehensive description of all activities conducted by the Copermittees to meet all requirements of each component of section D, **with the exception of section D.4,** of this order.

(2) Principal Permittee—The Principal Permittee shall submit Unified Jurisdictional Urban Runoff Management Program Annual Reports to the Regional Board by September 30 of each year, beginning on September 30, 2008. **The exception is section D.4, which shall be submitted by December 15 of each year, beginning on December 15, 2008.** The Unified Jurisdictional Urban Runoff Management Program Annual Report shall contain the twenty-one individual Jurisdictional Urban Runoff Management Program Annual Reports.

b. Attachment D, fourth row from bottom:

Principal Permittee submits unified Jurisdictional Urban Runoff Management Program Annual Report to Regional Board**, with the exception of section D.4.**

Add new row:

Principal Permittee submits section D.4 of unified Jurisdictional Urban Runoff Management Program Annual Report.
Permit Section: J.3.a.

Completion Date: December 15, 2008, and annually thereafter
Frequency: Annually

c. Receiving Waters and Urban Runoff Monitoring and Reporting Program No. R9-2007-0001, Section II.A.3.c:

Bioassessment stations to be monitored in a given monitoring year shall be monitored in May or June (to represent the influence of wet weather on the communities) and September or October (to represent the influence of dry weather flows on the communities). **If the Copermittees participate in the Storm Water Monitoring Coalition Regional Watershed Monitoring Program, bioassessment stations only need to be monitored once per year in May or June.** The timing of monitoring of

bioassessment stations shall coincide with dry weather monitoring of mass loading and temporary watershed assessment stations.

d. Receiving Waters and Urban Runoff Monitoring and Reporting Program No. R9-2007-0001, Section II.C.3:

3. Storm Water Monitoring Coalition Regional Watershed Monitoring Program (SMC study) Starting in the monitoring year 2008-2009 (Permit Year 2), the Copermittees may participate in the SMC study. Any participation shall include the contribution of all funds not otherwise spent for the full implementation of the bioassessment monitoring. If the Copermittees do not participate in the SMC study, then the bioassessment monitoring in spring and fall shall be implemented. During Bight '08, the Copermittees are not required to spend funds from the bioassessment monitoring towards the SMC study. During Bight years subsequent to Bight '08, monitoring for the SMC study shall be implemented and shall not be exchanged for Bight monitoring. Data shall be submitted through the SMC's standardized data transfer formats.

I, John H. Robertus, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Addendum adopted by the California Regional Water Quality Control Board, San Diego Region, on September 10, 2008.

JOHN H. ROBERTUS
Executive Officer

California Regional Water Quality Control Board
San Diego Region

Waste Discharge Requirements for Discharges of Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watershed of the County of Orange, The Incorporated Cities of Orange County, and The Orange County Flood Control District Within the San Diego Region

Order No. R9-2009-0002
NPDES NO. CAS0108740

December 16, 2009

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
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To request copies of the Orange County Municipal Storm Water Permit, please contact Ben Neill, Water Resources Control Engineer at (858) 467 – 2983, bneill@waterboards.ca.gov

Documents also are available at: http://www.waterboards.ca.gov/sandiego

WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES OF RUNOFF FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHED OF THE COUNTY OF ORANGE, THE INCORPORATED CITIES OF ORANGE COUNTY, AND THE ORANGE COUNTY FLOOD CONTROL DISTRICT WITHIN THE SAN DIEGO REGION

Adopted by the
California Regional Water Quality Control Board
San Diego Region
on December 16, 2009

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
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ARNOLD SCHWARZENEGGER, Governor
LINDA S. ADAMS, Agency Secretary, California Environmental Protection Agency

California Regional Water Quality Control Board
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David King *Vice Chair*	Recreation / Wildlife
Eric Anderson	Irrigated Agriculture
Wayne Rayfield	Water Quality
Grant Destache	Industrial Water Use
George Loveland	Water Supply
Marc Luker	Undesignated (Public)

David W. Gibson, *Executive Officer*
Michael P. McCann, *Assistant Executive Officer*

This permit was prepared under the direction of

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by

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The California Regional Water Quality Control Board, San Diego Region (hereinafter Regional Board), finds that:

A. BASIS FOR THE ORDER

1. This Order is based on the federal Clean Water Act (CWA), the Porter-Cologne Water Quality Control Act (Division 7 of the Water Code, commencing with Section 13000), applicable State and federal regulations, all applicable provisions of statewide Water Quality Control Plans and Policies adopted by the State Water Resources Control Board (State Board), the Water Quality Control Plan for the San Diego Basin adopted by the Regional Board, the California Toxics Rule, and the California Toxics Rule Implementation Plan.

2. This Order reissues National Pollutant Discharge Elimination System (NPDES) Permit No. CAS0108740, which was first adopted by the Regional Board on July 16, 1990 (Order No. 90-38), and then reissued on August 8, 1996 (Order No. 96-03) and February 13, 2002 (Order No. R9-2002-01). On August 21, 2006, in accordance with Order No. R9-2002-01, the County of Orange, as the Principal Copermittee, submitted a Report of Waste Discharge (ROWD) for reissuance of the municipal separate storm sewer system (MS4) Permit.

3. This Order is consistent with the following precedential Orders adopted by the State Water Resources Control Board (State Board) addressing MS4 NPDES Permits: Order 99-05, Order WQ-2000-11, Order WQ 2001-15, Order WQO 2002-0014, and Order WQ-2009-0008 (*SWRCB/OCC FILE A-1780).*

4. The Fact Sheet / Technical Report for the Order No. R9-2009-0002, NPDES No. CAS0108740, Waste Discharge Requirements for Discharges of Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of Orange, the Incorporated Cities of Orange County, and the Orange County Flood Control District Within the San Diego Region includes cited regulatory and legal references and additional explanatory information and data in support of the requirements of this Permit. This information, including any supplements thereto, and any response to comments on the Tentative Orders, is hereby incorporated by reference into these findings.

B. REGULATED PARTIES

1. Each of the persons in Table 1 below, hereinafter called Copermittees or dischargers, owns or operates an MS4, through which it discharges runoff into waters of the United States within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is “interrelated” to a medium or large MS4; or (3) an MS4 which contributes to a

violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the United States (waters of the U.S).

Table 1. Municipal Copermittees

1. City of Aliso Viejo	8. City of Mission Viejo
2. City of Dana Point	9. City of Rancho Santa Margarita
3. City of Laguna Beach	10. City of San Clemente
4. City of Laguna Hills	11. City of San Juan Capistrano
5. City of Laguna Niguel	12. County of Orange
6. City of Laguna Woods	13. Orange County Flood Control District
7. City of Lake Forest	

C. DISCHARGE CHARACTERISTICS

1. Runoff discharged from an MS4 contains waste, as defined in the California Water Code (CWC), and pollutants that adversely affect the quality of the waters of the State. The discharge of runoff from an MS4 is a “discharge of pollutants from a point source” into waters of the U.S. as defined in the CWA.

2. MS4 storm water and non-storm water discharges are likely to contain pollutants that cause or threaten to cause a violation of water quality standards, as outlined in the Regional Board’s Water Quality Control Plan for the San Diego Basin (Basin Plan). Storm water and non-storm water discharges from the MS4 are subject to the conditions and requirements established in the San Diego Basin Plan for point source discharges. These surface water quality standards must be complied with at all times, irrespective of the source and manner of discharge.

3. The most common categories of pollutants in runoff include total suspended solids, sediment, pathogens (e.g., bacteria, viruses, protozoa); heavy metals (e.g., copper, lead, zinc and cadmium); petroleum products and polynuclear aromatic hydrocarbons; synthetic organics (e.g., pesticides, herbicides, and PCBs); nutrients (e.g., nitrogen and phosphorus fertilizers); oxygen-demanding substances (decaying vegetation, animal waste); detergents; and trash.

4. The discharge of pollutants and/or increased flows from MS4s may cause or threaten to cause the concentration of pollutants to exceed applicable receiving water quality objectives and/or impair or threaten to impair designated beneficial uses resulting in a condition of pollution (i.e., unreasonable impairment of water quality for designated beneficial uses), contamination, or nuisance.

5. Pollutants in runoff can threaten and adversely affect human health. Human illnesses have been clearly linked to recreating near storm drains flowing to coastal waters. Also, runoff pollutants in receiving waters can bioaccumulate in the tissues of invertebrates and fish, which may be eventually consumed by humans.

6. Runoff discharges from MS4s often contain pollutants that cause toxicity to aquatic organisms (i.e., adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies). Toxic pollutants impact the overall quality of aquatic systems and beneficial uses of receiving waters.

7. The Copermittees discharge runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within one of the eleven hydrologic units (San Juan Hydrologic Unit) comprising the San Diego Region as shown in Tables 2a and 2b. Some of the receiving water bodies have been designated as impaired by the Regional Board and the United States Environmental Protection Agency (USEPA) in 2006 pursuant to CWA section 303(d). Also shown in the Tables are the watershed management areas (WMAs) as defined in the Regional Board report, Watershed Management Approach, January 2002.

Table 2a. Common Watersheds and CWA Section 303(d) Impaired Waters

Regional Board Watershed Management Area (WMA)	**Hydrologic Area (HA) or Hydrologic Subarea (HSA) of the San Juan Hydrologic Unit**	**Major Receiving Water Bodies**	**303(d) Pollutant(s)/stressor or Water Quality Effect[1]**
Laguna Coastal Streams	Laguna HA, excluding Aliso HSA and Dana Point HSA	Laguna Canyon Creek, Pacific Ocean	Bacterial indicators Sediment toxicity
Aliso Creek	Aliso HSA	Aliso Creek, English Canyon, Pacific Ocean	Toxicity Phosphorus Bacterial indicators Benzo[b]fluoranthene Dieldrin Sediment Toxicity
Dana Point Coastal Streams	Dana Point HSA	Dana Point Harbor, Salt Creek, Pacific Ocean	Bacterial indicators
San Juan Creek	Mission Viejo HA	San Juan Creek, Trabuco Creek, Oso Creek, Canada Gobernadora, Bell Canyon, Verdugo Canyon, Pacific Ocean	Bacterial indicators DDE Chloride Sulfates Total dissolved solids

[1] The listed 303(d) pollutant(s) do not necessarily reflect impairment of the entire corresponding WMA or all corresponding major surface water bodies. The specific impaired portions of each WMA are listed in the State Water Resources Control Board's 2006 Section 303(d) List of Water Quality Limited Segments.

Table 2a. Common Watersheds and CWA Section 303(d) Impaired Waters

Regional Board Watershed Management Area (WMA)	**Hydrologic Area (HA) or Hydrologic Subarea (HSA) of the San Juan Hydrologic Unit**	**Major Receiving Water Bodies**	**303(d) Pollutant(s)/stressor or Water Quality Effect[1]**
San Clemente Coastal Streams	San Clemente HA	Prima Deshecha, Segunda Deshecha, Pacific Ocean	Bacterial indicators Phosphorus Turbidity
San Mateo Creek	San Mateo HA	San Mateo Creek, Christianitos Creek, Pacific Ocean	

Table 2b. Common Watersheds and Municipalities

Municipality	**Laguna Coastal Streams**	**Aliso Creek**	**Dana Point Coastal Streams**	**San Juan Creek**	**San Clemente Coastal Streams**	**San Mateo Creek**
Aliso Viejo	☑	☑				
Dana Point			☑	☑		
Laguna Beach	☑	☑				
Laguna Hills *		☑		☑		
Laguna Niguel		☑	☑	☑		
Laguna Woods *		☑				
Lake Forest *		☑				
Mission Viejo		☑		☑		
Rancho Santa Margarita				☑		
San Clemente					☑	☑
San Juan Capistrano				☑		
County of Orange *	☑	☑	☑	☑	☑	☑
Orange County Flood Control District *	☑	☑	☑	☑	☑	
* Municipality also includes areas within watersheds of the Santa Ana Regional Board that are outside the scope of this Order						

8. Trash is a persistent pollutant which can enter receiving waters from the MS4 resulting in accumulation and transport in receiving waters over time. Trash poses a serious threat to the Beneficial Uses of the receiving waters, including, but not limited to, human health, rare and endangered species, navigation and human recreation.

9. The Copermittees' water quality monitoring data submitted to date documents persistent violations of Basin Plan water quality objectives for various runoff-related pollutants (fecal coliform bacteria, total suspended solids, turbidity, metals, etc.) at

various watershed monitoring stations. Persistent toxicity has also been observed at some watershed monitoring stations. In addition, bioassessment data indicates that the majority of urbanized receiving waters have Poor to Very Poor Index of Biotic Integrity ratings. In sum, the above findings indicate that runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in Orange County.

10. When natural vegetated pervious ground cover is converted to impervious surfaces such as paved highways, streets, rooftops, and parking lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving a developed area is significantly greater in runoff volume, velocity, and peak flow rate than pre-development runoff from the same area. Runoff durations can also increase as a result of flood control and other efforts to control peak flow rates. Increased volume, velocity, rate, and duration of runoff, and decreased natural clean sediment loads, greatly accelerate the erosion of downstream natural channels. Significant declines in the biological integrity and physical habitat of streams and other receiving waters have been found to occur with as little as a 3-5 percent conversion from natural to impervious surfaces. The increased runoff characteristics from new development must be controlled to protect against increased erosion of channel beds and banks, sediment pollutant generation, or other impacts to beneficial uses and stream habitat due to increased erosive force.

11. Development creates new pollution sources as human population density increases and brings with it proportionately higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, trash, etc. which can either be washed or directly dumped into the MS4. As a result, the runoff leaving the developed urban area is significantly greater in pollutant load than the pre-development runoff from the same area. These increased pollutant loads must be controlled to protect downstream receiving water quality.

12. Development and urbanization especially threaten environmentally sensitive areas (ESAs), such as water bodies designated as supporting a RARE beneficial use (supporting rare, threatened or endangered species) and CWA 303(d)-impaired water bodies. Such areas have a much lower capacity to withstand pollutant shocks than might be acceptable in other areas. In essence, development that is ordinarily insignificant in its impact on the environment may become significant in a particularly sensitive environment. Therefore, additional control to reduce storm water pollutants from new and existing development may be necessary for areas adjacent to or discharging directly to an ESA.

13. Although dependent on several factors, the risks typically associated with properly managed infiltration of runoff (especially from residential land use areas) are not significant. The risks associated with infiltration can be managed by many techniques, including (1) designing landscape drainage features that promote infiltration of runoff, but do not “inject” runoff (injection bypasses the natural processes of filtering and transformation that occur in the soil); (2) taking reasonable

steps to prevent the illegal disposal of wastes; (3) protecting footings and foundations; (4) ensuring that each drainage feature is adequately maintained in perpetuity; and (5) pretreatment.

14. Non-storm water (dry weather) discharge from the MS4 is not considered a storm water (wet weather) discharge and therefore is not subject to regulation under the Maximum Extent Practicable (MEP) standard from CWA 402(p)(3)(B)(iii), which is explicitly for "Municipal … *Stormwater Discharges* (emphasis added)" from the MS4. Non-storm water discharges, per CWA 402(p)(3)(B)(ii), are to be effectively prohibited. Such dry weather non-storm water discharges have been shown to contribute significant levels of pollutants and flow in arid, developed Southern California watersheds and are to be effectively prohibited under the Clean Water Act.

15. Non-storm water discharges to the MS4 granted an influent exception [i.e., which are exempt from the effective prohibition requirement set forth in CWA section 402(p)(3)(B)(ii)] under 40 CFR 122. 26 are included within this Order. Any exempted discharges identified by Copermittees as a source of pollutants are subsequently required to be *addressed* (emphasis added) as illicit discharges through prohibition and incorporation into existing IC/ID programs. The Copermittees have identified landscape irrigation, irrigation water and lawn water, previously exempted discharges, as a source of pollutants and conveyance of pollutants to waters of the United States.

D. RUNOFF MANAGEMENT PROGRAMS

1. General

a. This Order specifies requirements necessary for the Copermittees to reduce the discharge of pollutants in storm water runoff to the maximum extent practicable (MEP). However, since MEP is a dynamic performance standard, which evolves over time as runoff management knowledge increases, the Copermittees' runoff management programs must continually be assessed and modified to incorporate improved programs, control measures, best management practices (BMPs), etc. in order to achieve the evolving MEP standard. Absent evidence to the contrary, this continual assessment, revision, and improvement of runoff management program implementation is expected to ultimately achieve compliance with water quality standards in the Region.

b. The Copermittees have generally been implementing the jurisdictional runoff management programs required pursuant to Order No. 2002-01 since February 13, 2003. Prior to that, the Copermittees were regulated by Order No. 96-03 since August 8, 1996. Runoff discharges, however, continue to cause or contribute to violations of water quality standards as evidenced by the Copermittees monitoring results.

c. This Order contains new or modified requirements that are necessary to improve Copermittees' efforts to reduce the discharge of pollutants in storm water runoff to the MEP and achieve water quality standards. Some of the new or modified requirements, such as the revised Watershed Runoff Management Program section, are designed to specifically address high priority water quality problems. Other new or modified requirements address program deficiencies that have been noted during audits, report reviews, and other Regional Board compliance assessment activities.

d. Updated Jurisdictional Runoff Management Plans (JRMPs) and Watershed Runoff Management Plans (WRMPs), which describe the Copermittees' runoff management programs in their entirety, are needed to guide the Copermittees' runoff management efforts and aid the Copermittees in tracking runoff management program implementation. It is practicable for the Copermittees to update the JRMPs and WRMPs within one year, since significant efforts to develop these programs have already occurred.

e. Pollutants can be effectively reduced in storm water runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Pollution prevention is the reduction or elimination of pollutant generation at its source and is the best "first line of defense." Source control BMPs (both structural and non-structural) minimize the contact between pollutants and flows (e.g., rerouting run-on around pollutant sources or keeping pollutants on-site and out of receiving waters). Treatment control BMPs remove pollutants that have been mobilized by wet-weather or dry-weather flows.

f. Runoff needs to be addressed during the three major phases of urban development (planning, construction, and use) in order to reduce the discharge of pollutants from storm water to the MEP, effectively prohibit non-storm water discharges and protect receiving waters. Development which is not guided by water quality planning policies and principles can unnecessarily result in increased pollutant load discharges, flow rates, and flow durations which can negatively impact receiving water beneficial uses. Construction sites without adequate BMP implementation result in sediment runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. Existing development generates substantial pollutant loads which are discharged in runoff to receiving waters.

g. Annual reporting requirements included in this Order are necessary to meet federal requirements and to evaluate the effectiveness and compliance of the Copermittees' programs.

h. This Order establishes Storm Water Action Levels (SALs) for selected pollutants based on USEPA Rain Zone 6 (arid southwest) Phase I MS4 monitoring data for pollutants in storm water. The SALs were computed as the 90th percentile of the data set, utilizing the statistical based population approach, one of three

approaches recommended by the California Water Board's Storm Water Panel in its report, 'The Feasibility of Numerical Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities (June 2006). SALs are identified in Section D of this Order. Copermittees shall implement a timely, comprehensive, cost-effective storm water pollution control program to reduce the discharge of pollutants in storm water from the permitted areas so as not to exceed the SALs. Exceedance of SALs may indicate inadequacy of programmatic measures and BMPs required in this Order.

2. **Development Planning**

a. The Standard Storm Water Mitigation Plan (SSMP) requirements contained in this Order are consistent with Order WQ-2000-11 adopted by the State Water Resources Control Board (State Board) on October 5, 2000. In the precedential order, the State Board found that the design standards, which essentially require that runoff generated by 85 percent of storm events from specific development categories be infiltrated or treated, reflect the MEP standard. The order also found that the SSMP requirements are appropriately applied to the majority of the Priority Development Project categories contained in Section D.1 of this Order. The State Board also gave Regional Water Quality Control Boards the needed discretion to include additional categories and locations, such as retail gasoline outlets (RGOs), in SSMPs.

b. Controlling runoff pollution by using a combination of onsite source control and site design BMPs augmented with treatment control BMPs before the runoff enters the MS4 is important for the following reasons: (1) Many end-of-pipe BMPs (such as diversion to the sanitary sewer) are typically ineffective during significant storm events. Whereas, onsite source control BMPs can be applied during all runoff conditions; (2) End-of-pipe BMPs are often incapable of capturing and treating the wide range of pollutants which can be generated on a sub-watershed scale; (3) End-of-pipe BMPs are more effective when used as polishing BMPs, rather than the sole BMP to be implemented; (4) End-of-pipe BMPs do not protect the quality or beneficial uses of receiving waters between the pollutant source and the BMP; and (5) Offsite end-of-pipe BMPs do not aid in the effort to educate the public regarding sources of pollution and their prevention.

c. Use of Low-Impact Development (LID) site design BMPs at new development, redevelopment and retrofit projects can be an effective means for minimizing the impact of storm water runoff discharges from the development projects on receiving waters. LID is a site design strategy with a goal of maintaining or replicating the pre-development hydrologic regime through the use of design techniques. LID site design BMPs help preserve and restore the natural hydrologic cycle of the site, allowing for filtration and infiltration which can greatly reduce the volume, peak flow rate, velocity, and pollutant loads of storm water runoff. Current runoff management, knowledge, practices and technology have

resulted in the use of LID BMPs as an acceptable means of meeting the storm water MEP standard.

d. Retail Gasoline Outlets (RGOs) are significant sources of pollutants in storm water runoff. RGOs are points of convergence for motor vehicles for automotive related services such as repair, refueling, tire inflation, and radiator fill-up and consequently produce significantly higher loadings of hydrocarbons and trace metals (including copper and zinc) than other developed areas.

e. Industrial sites are significant sources of pollutants in runoff. Pollutant concentrations and loads in runoff from industrial sites are similar or exceed pollutant concentrations and loads in runoff from other land uses, such as commercial or residential land uses. As with other land uses, LID site design, source control, and treatment control BMPs are needed at industrial sites in order to meet the MEP standard. These BMPs are necessary where the industrial site is larger than 10,000 square feet. The 10,000 square feet threshold is appropriate, since it is consistent with requirements in other Phase I NPDES storm water regulations throughout California.

f. If not properly designed or maintained, certain BMPs implemented or required by municipalities for runoff management may create a habitat for vectors (e.g. mosquitoes and rodents). Proper BMP design and maintenance to avoid standing water, however, can prevent the creation of vector habitat. Nuisances and public health impacts resulting from vector breeding can be prevented with close collaboration and cooperative effort between municipalities, the Orange County Vector Control District, and the California Department of Public Health during the development and implementation of runoff management programs.

g. The increased volume, velocity, frequency and discharge duration of storm water runoff from developed areas has the potential to greatly accelerate downstream erosion, impair stream habitat in natural drainages, and negatively impact beneficial uses. Development and urbanization increase pollutant loads in storm water runoff and the volume of storm water runoff. Impervious surfaces can neither absorb water nor remove pollutants and thus lose the purification and infiltration provided by natural vegetated soil. Hydromodification measures for discharges to hardened channels are needed for the future restoration of the hardened channels to their natural state, thereby restoring the chemical, physical, and biological integrity and Beneficial Uses of local receiving waters.

3. **Construction and Existing Development**

a. In accordance with federal NPDES regulations and to ensure the most effective oversight of industrial and construction site discharges, discharges of runoff from industrial and construction sites are subject to dual (State and local) storm water regulation. Under this dual system, each Copermittee is responsible for enforcing its local permits, plans, and ordinances, and the Regional Board is

responsible for enforcing the General Construction Activities Storm Water Permit, State Board Order 99-08 DWQ, NPDES No. CAS000002 (General Construction Permit) and the General Industrial Activities Storm Water Permit, State Board Order 97-03 DWQ, NPDES No. CAS000001 (General Industrial Permit) and any reissuance of these permits. NPDES municipal regulations require that municipalities develop and implement measures to address runoff from industrial and construction activities. Those measures may require the implementation of additional BMPs than are required under the statewide general permits for activities subject to both State and local regulation.

b. Identification of sources of pollutants in runoff (such as municipal areas and activities, industrial and commercial sites/sources, construction sites, and residential areas), development and implementation of BMPs to address those sources, and updating ordinances and approval processes are necessary for the Copermittees to ensure that discharges of pollutants from its MS4 in storm water are reduced to the MEP and that non-storm water discharges are not occurring. Inspections and other compliance verification methods are needed to ensure minimum BMPs are implemented. Inspections are especially important at high risk areas for pollutant discharges.

c. Historic and current development makes use of natural drainage patterns and features as conveyances for runoff. Urban streams used in this manner are part of the municipalities MS4 regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the urban stream is both an MS4 and receiving water.

d. As operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not prohibit or control. These discharges may cause or contribute to a condition of contamination or a violation of water quality standards.

e. Waste and pollutants which are deposited and accumulate in MS4 drainage structures will be discharged from these structures to waters of the U.S. unless they are removed. These discharges may cause or contribute to, or threaten to cause or contribute to, a condition of pollution in receiving waters. For this reason, pollutant discharges from storm water into MS4s must be reduced using a combination of management measures, including source control, and an effective MS4 maintenance program must be implemented by each Copermittee.

f. Enforcement of local runoff related ordinances, permits, and plans is an essential component of every runoff management program and is specifically required in the federal storm water regulations and this Order. Each Copermittee is individually responsible for adoption and enforcement of ordinances and/or policies, implementation of identified control measures/BMPs needed to prevent

or reduce pollutants in storm water runoff, and for the allocation of funds for the capital, operation and maintenance, administrative, and enforcement expenditures necessary to implement and enforce such control measures/BMPs under its jurisdiction. Education is an important aspect of every effective runoff management program and the basis for changes in behavior at a societal level. Education of municipal planning, inspection, and maintenance department staffs is especially critical to ensure that in-house staffs understand how their activities impact water quality, how to accomplish their jobs while protecting water quality, and their specific roles and responsibilities for compliance with this Order. Public education, designed to target various urban land users and other audiences, is also essential to inform the public of how individual actions affect receiving water quality and how adverse effects can be minimized.

g. Public participation during the development of runoff management programs is necessary to ensure that all stakeholder interests and a variety of creative solutions are considered.

h. Retrofitting existing development with storm water treatment controls, including LID, is necessary to address storm water discharges from existing development that may cause or contribute to a condition of pollution or a violation of water quality standards. Although SSMP BMPs are required for redevelopment, the current rate of redevelopment will not address water quality problems in a timely manner. Cooperation with private landowners is necessary to effectively identify, implement and maintain retrofit projects for the preservation, restoration, and enhancement of water quality.

4. **Watershed Runoff Management**

a. Since runoff within a watershed can flow from and through multiple land uses and political jurisdictions, watershed-based runoff management can greatly enhance the protection of receiving waters. Such management provides a means to focus on the most important water quality problems in each watershed. By focusing on the most important water quality problems, watershed efforts can maximize protection of beneficial use in an efficient manner. Effective watershed-based runoff management actively reduces pollutant discharges and abates pollutant sources causing or contributing to watershed water quality problems. Watershed-based runoff management that does not actively reduce pollutant discharges and abate pollutant sources causing or contributing to watershed water quality problems can necessitate implementation of the iterative process outlined in section A.3 of the Tentative Order. Watershed management of runoff does not require Copermittees to expend resources outside of their jurisdictions. Watershed management requires the Copermittees within a watershed to develop a watershed-based management strategy, which can then be implemented on a jurisdictional basis.

b. Some runoff issues, such as general education and training, can be effectively addressed on a regional basis. Regional approaches to runoff management can improve program consistency and promote sharing of resources, which can result in implementation of more efficient programs.

c. It is important for the Copermittees to coordinate their water quality protection and land use planning activities to achieve the greatest protection of receiving water bodies. Copermittee coordination with other watershed stakeholders, especially the State of California Department of Transportation, the United States Department of Defense, and water and sewer districts, is also important.

E. STATUTE AND REGULATORY CONSIDERATIONS

1. The Receiving Water Limitations (RWL) language specified in this Order is consistent with language recommended by the USEPA and established in State Board Water Quality Order 99-05, *Own Motion Review of the Petition of Environmental Health Coalition to Review Waste Discharge Requirements Order No. 96-03, NPDES Permit No. CAS0108740*, adopted by the State Board on June 17, 1999. The RWL in this Order require compliance with water quality standards, which for storm water discharges is to be achieved through an iterative approach requiring the implementation of improved and better-tailored BMPs over time. Compliance with receiving water limits based on applicable water quality standards is necessary to ensure that MS4 discharges will not cause or contribute to violations of water quality standards and the creation of conditions of pollution.

2. The Water Quality Control Plan for the San Diego Basin (Basin Plan), identifies the following beneficial uses for surface waters in Orange County: Municipal and Domestic Supply (MUN)[2], Agricultural Supply (AGR), Industrial Process Supply (PROC), Industrial Service Supply (IND), Ground Water Recharge (GWR), Contact Water Recreation (REC1), Non-contact Water Recreation (REC2), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Freshwater Replenishment (FRSH), Hydropower Generation (POW), and Preservation of Biological Habitats of Special Significance (BIOL). The following additional beneficial uses are identified for coastal waters of Orange County: Navigation (NAV), Commercial and Sport Fishing (COMM), Estuarine Habitat (EST), Marine Habitat (MAR), Aquaculture (AQUA), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN), and Shellfish Harvesting (SHELL).

3. This Order is in conformance with State Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality Waters in California*, and the federal Antidegradation Policy described in 40 CFR 131.12.

[2] Subject to exceptions under the "Sources of Drinking Waters" Policy (Resolution No. 89-33)

4. Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states with approved coastal zone management programs to address non-point pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point pollution: agriculture, silviculture, urban, marinas, and hydromodification. This NPDES permit addresses the management measures required for the urban category, with the exception of septic systems. The adoption and implementation of this NPDES permit relieves the Copermittee from developing a non-point source plan, for the urban category, under CZARA. The Regional Board addresses septic systems through the administration of other programs.

5. Section 303(d)(1)(A) of the CWA requires that "Each state must identify those waters within its boundaries for which the effluent limitations…are not stringent enough to implement any water quality standard (WQS) applicable to such waters." The CWA also requires states to establish a priority ranking of impaired water bodies known as Water Quality Limited Segments and to establish Total Maximum Daily Loads (TMDLs) for such waters. This priority list of impaired water bodies is called the Section 303(d) List. The current Section 303(d) List was approved by the State Board on October 25, 2006. On June 28, 2007 the 2006 303(d) list for California was given final approval by the United States Environmental Protection Agency (USEPA).

6. This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following. First, this Order implements federally mandated requirements under federal Clean Water Act section 402. (33 U.S.C. § 1342(p)(3)(B).) Second, the local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental and new dischargers who are issued NPDES permits for storm water and non-storm water discharges. Third, the local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order. Fourth, the Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in federal Clean Water Act section 301, subdivision (a) (33 U.S.C. § 1311(a)) and in lieu of numeric restrictions on their storm water discharges. Fifth, the local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under State law predates the enactment of Article XIIIB, Section (6) of the California Constitution. Likewise, the provisions of this Order to implement total maximum daily loads (TMDLs) are federal mandates. The federal Clean Water Act requires TMDLs to be developed for water bodies that do not meet federal water quality standards. (33 U.S.C. sec. 1313(d).) Once the U.S. Environmental Protection Agency or a state develops a TMDL, federal law requires that permits must contain effluent limitations consistent with the assumptions of any applicable wasteload allocation. (40 C.F.R. sec. 122.44(d)(1)(vii)(B).)

7. Runoff treatment and/or mitigation must occur prior to the discharge of runoff into receiving waters. Treatment BMPs must not be constructed in waters of the U.S. or State unless the runoff flows are sufficiently pretreated to protect the values and functions of the water body. Federal regulations at 40 CFR 131.10(a) state that in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S. Authorizing the construction of an runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to accepting waste assimilation as an appropriate use for that water body. Furthermore, the construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body. Without federal authorization (e.g., pursuant to Clean Water Act Section 404), waters of the U.S. may not be converted into, or used as, waste treatment or conveyance facilities. Similarly, waste discharge requirements pursuant to California Water Code Section 13260 are required for the conversion or use of waters of the State as waste treatment or conveyance facilities. Diversion from waters of the U.S./State to treatment facilities and subsequent return to waters of the U.S. is allowable, provided that the effluent complies with applicable NPDES requirements.

8. The issuance of waste discharge requirements and an NPDES permit for the discharge of runoff from MS4s to waters of the U.S. is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 et seq.) in accordance with the CWC section 13389.

9. Multiple water bodies in Orange County have been identified as impaired and placed on the 303(d) list. In 2004, Bacteria Impaired Waters TMDL Project II included six bacteria impaired shorelines in Dana Point Harbor and San Diego Bay: Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park, B Street, G Street Pier, Tidelands Park, and Chula Vista Marina in San Diego Bay. Since then, only Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay can be confirmed as still impaired by indicator bacteria. On June 11, 2008 the Regional Board adopted a Basin Plan amendment to incorporate *Bacteria Impaired Waters TMDL Project II for San Diego Bay and Dana Point Harbor Shorelines*. On June 16, 2009, the State Board approved the Basin Plan amendment. This action meets requirements of section 303(d) of the Clean Water Act (CWA). The Basin Plan amendment process is authorized under section 13240 of the Water Code. The State's Office of Administrative Law (OAL) approved the TMDLs on September 15, 2009. The effective date of the TMDLs is the date of OAL approval. USEPA approved the TMDLs on October 26, 2009.

10. Storm water discharges from developed and developing areas in Orange County are significant sources of certain pollutants that cause, may be causing, threatening to cause or contributing to water quality impairment in the waters of Orange County.

Furthermore, as delineated in the CWA section 303(d) list in Table 3, the Regional Board has found that there is a reasonable potential that municipal storm water and non-storm water discharges from MS4s cause or may cause or contribute to an excursion above water quality standards for the following pollutants: Indicator Bacteria, Phosphorous, Toxicity and Turbidity. In accordance with CWA section 303(d), the Regional Board is required to establish Total Maximum Daily Loads (TMDLs) for these pollutants to these waters to eliminate impairment and attain water quality standards. Therefore, certain early pollutant control actions and further pollutant impact assessments by the Copermittees are warranted and required pursuant to this Order.

Table 3. 2006 Section 303(d) Listed Waterbodies in So. Orange County

Waterbody	**Pollutant**
Aliso Creek	Indicator Bacteria, Phosphorus, Toxicity
Aliso Creek Mouth	Indicator Bacteria
Dana Point Harbor	Indicator Bacteria
English Canyon Creek	Benzo[b]fluoranthene, Dieldrin, Sediment Toxicity
Laguna Canyon Channel	Sediment Toxicity
Oso Creek (at Mission Viejo Golf Course)	Chloride, Sulfates, Total Dissolved Solids
Pacific Ocean Shoreline, Aliso HSA	Indicator Bacteria
Pacific Ocean Shoreline, Dana Point HSA	Indicator Bacteria
Pacific Ocean Shoreline, Laguna Beach HSA	Indicator Bacteria
Pacific Ocean Shoreline, Lower San Juan HSA	Indicator Bacteria
Pacific Ocean Shoreline, San Clemente HA	Indicator Bacteria
Pacific Ocean Shoreline, San Joaquin Hills HSA	Indicator Bacteria
Prima Deshecha Creek	Phosphorus, Turbidity
San Juan Creek	DDE, Indicator Bacteria
San Juan Creek (mouth)	Indicator Bacteria
Segunda Deshecha Creek	Phosphorus, Turbidity

11. This Order incorporates only those MS4 Waste Load Allocations (WLAs) developed in TMDLs that have been adopted by the Regional Water Board and have been approved by the State Board, Office of Administrative Law and U.S. EPA. Approved TMDL WLAs are to be addressed using water quality-based effluent limitations (WQBELs) calculated as numeric limitations (either in the receiving waters and/or at the point of MS4 discharge) and/or as BMPs. In most cases, the numeric limitation must be achieved to ensure the adequacy of the BMP program. Waste load

allocations for storm water and non-storm water discharges have been included within this Order only if the TMDL has received all necessary approvals. This Order establishes WQBELs and conditions consistent with the requirements and assumptions of the WLAs in the TMDLs as required by 40 CFR 122.44(d)(1)(vii)(B).

A TMDL is the total amount of a particular pollutant that a water body can receive and still meet Water Quality Standards (WQSs), which are comprised of Water Quality Objectives (WQOs), Beneficial Uses and the States Policy on Maintaining High Quality Waters[3]. The WQOs serve as the primary basis for protecting the associated Beneficial Use. The Numeric Target of a TMDL interprets and applies the numeric and/or narrative WQOs of the WQSs as the basis for the WLAs. This Order addresses TMDLs through Water Quality Based Effluent Limitations (WQBELs) that must be consistent with the assumptions and requirements of the WLA[4]. Federal guidance[5] states that when adequate information exists, storm water permits are to incorporate numeric water quality based effluent limitations. In most cases, the numeric target(s) of a TMDL are a component of the WQBELs. When the numeric target is based on one or more numeric WQOs, the numeric WQOs and underlying assumptions and requirements will be used in the WQBELs as numeric effluent limitations by the end of the TMDL compliance schedule, unless additional information is required. When the numeric target interprets one or more narrative WQOs, the numeric target may assess the efficacy and progress of the BMPs in meeting the WLAs and restoring the Beneficial Uses by the end of the TMDL compliance schedule.

This Order fulfills a component of the TMDL Implementation Plan adopted by this Regional Board on June 11, 2008 for indicator bacteria in Baby Beach by establishing WQBELs expressed as both BMPs to achieve the WLAs and as numeric limitations[6] for the City of Dana Point and the County of Orange. The establishment of WQBELs expressed as BMPs should be sufficient to achieve the WLA specified in the TMDL. The Waste Load Allocations (WLAs) and Numeric Targets are the necessary metrics to ensure that the BMPs achieve appropriate concentrations of bacterial indicators in the receiving waters.

[3] State Water Resources Control Board, Resolution No. 68-16
[4] 40 CFR 122.44(d)(1)(vii)(B)
[5] USEPA, *Interim Permitting Approach for Water Quality-Based Effluent Limitations in Storm Water Permits,* 61 FR 43761, August 26, 1996
[6] The Waste Load Allocations are defined in Resolution No. R9-2008-0027, A Resolution to Adopt an Amendment to the *Water Quality Control Plan for the San Diego Basin (9)* to Incorporate Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay.

12. This Order requires each Copermittee to effectively prohibit all types of unauthorized discharges of non-storm water into its MS4. However, historically pollutants have been identified as present in dry weather non-storm water discharges from the MS4s through 303(d) listings, monitoring conducted by the Copermittees under Order No. R9-2002-0001, and there are others expected to be present in dry weather non-storm water discharges because of the nature of these discharges. This Order includes action levels for pollutants in non-storm water, dry weather, discharges from the MS4 designed to ensure that the requirement to effectively prohibit all types of unauthorized discharges of non-storm water in the MS4 is being complied with. Action levels in the Order are based upon numeric or narrative water quality objectives and criteria as defined in the Basin Plan, the Water Quality Control Plan for Ocean Waters of California (Ocean Plan), and the State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP). An exceedance of an action level requires specified responsive action by the Copermittees. This Order describes what actions the Copermittees must take when an exceedance of an action level is observed. Exceedances of non-storm water action levels do not alone constitute a violation of this Order but could indicate non-compliance with the requirement to effectively prohibit all types of unauthorized non-storm water discharges into the MS4 or other prohibitions established in this Order. Failure to undertake required source investigation and elimination action following an exceedance of 2a non-storm water action level (NAL or action level) is a violation of this Order. The Regional Board recognizes that use of action levels will not necessarily result in detection of all unauthorized sources of non-storm water discharges because there may be some discharges in which pollutants do not exceed established action levels. However, establishing NALs at levels appropriate to protect water quality standards is expected to lead to the identification of significant sources of pollutants in dry weather non-storm water discharges.

13. In addition to federal regulations cited in the Fact Sheet / Technical Report for the Order NO. R9-2009-0002, monitoring and reporting required under Order No. R9-2009-0002 is required pursuant to authority under CWC section 13383.

F. PUBLIC PROCESS

1. The Regional Board has notified the Copermittees, all known interested parties, and the public of its intent to consider adoption of an Order prescribing waste discharge requirements that would serve to renew an NPDES permit for the existing discharge of runoff.

2. The Regional Board has held public hearings on April 11, 2007, February 13, 2008, July 1, 2009, and November 18, 2009 and heard and considered all comments pertaining to the terms and conditions of this Order.

IT IS HEREBY ORDERED that the Copermittees, in order to meet the provisions contained in Division 7 of the California Water Code (CWC) and regulations adopted thereunder, and the provisions of the Clean Water Act (CWA) and regulations adopted thereunder, must each comply with the following:

A. PROHIBITIONS AND RECEIVING WATER LIMITATIONS

1. Discharges into and from municipal separate storm sewer systems (MS4s) in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in waters of the state are prohibited.

2. Storm water discharges from MS4s containing pollutants which have not been reduced to the maximum extent practicable (MEP) are prohibited.[7]

3. Discharges from MS4s that cause or contribute to the violation of water quality standards (designated beneficial uses, water quality objectives developed to protect beneficial uses, and the State policy with respect to maintaining high quality waters) are prohibited.

a. Each Copermittee must comply with section A.3 and section A.4 as it applies to Prohibition 5 in Attachment A of this Order through timely implementation of control measures and other actions to reduce pollutants in storm water discharges in accordance with this Order, including any modifications. If exceedance(s) of water quality standards persist notwithstanding implementation of this Order, the Copermittee must assure compliance with section A.3 and section A.4 as it applies to Prohibition 5 in Attachment A of this Order by complying with the following procedure:

(1) Upon a determination by either the Copermittee or the Regional Board that storm water MS4 discharges are causing or contributing to an exceedance of an applicable water quality standard, the Copermittee must notify the Regional Board within 30 days and thereafter submit a report to the Regional Board that describes best management practices (BMPs) that are currently being implemented and additional BMPs that will be implemented to prevent or reduce any pollutants that are causing or contributing to the exceedance of water quality standards. The report may be incorporated in the Annual Report unless the Regional Board directs an earlier submittal. The report must include an implementation schedule. The Regional Board may require modifications to the report;

[7] This prohibition does not apply to MS4 discharges which receive subsequent treatment to reduce pollutants to the MEP prior to entering receiving waters (e.g., low flow diversions to the sanitary sewer).

(2) Submit any modifications to the report required by the Regional Board within 30 days of notification;

(3) Within 30 days following approval of the report described above by the Regional Board, the Copermittee must revise its Jurisdictional Runoff Management Program and monitoring program to incorporate the approved modified BMPs that have been and will be implemented, the implementation schedule, and any additional monitoring required; and

(4) Implement the revised Jurisdictional Runoff Management Program and monitoring program in accordance with the approved schedule.

b. The Copermittee must repeat the procedure set forth above to comply with the receiving water limitations for continuing or recurring exceedances of the same water quality standard(s) unless directed to do otherwise by the Regional Board Executive Officer.

c. Nothing in section A.3 must prevent the Regional Board from enforcing any provision of this Order while the Copermittee prepares and implements the above report.

4. In addition to the above prohibitions, discharges from MS4s are subject to all Basin Plan prohibitions cited in Attachment A to this Order.

B. NON-STORM WATER DISCHARGES

1. Each Copermittee must effectively prohibit all types of non-storm water discharges into its MS4 unless such discharges are either authorized by a separate National Pollutant Discharge Elimination System (NPDES) permit; or not prohibited in accordance with sections B.2 and B.3 below.

2. The following categories of non-storm water discharges are not prohibited unless a Copermittee or the Regional Board identifies the discharge category as a source of pollutants to waters of the U.S. Where the Copermittee(s) have identified a category as a source of pollutants, the category shall be addressed as an illicit discharge and prohibited through ordinance, order or similar means. The Regional Board may identify categories of discharge that either requires prohibition or other controls. For such a discharge category, the Copermittee, under direction of the Regional Board, must either prohibit the discharge category or develop and implement appropriate control measures to prevent the discharge of pollutants to the MS4 and report to the Regional Board pursuant to Section K.1 and K.3 of this Order.

a. Diverted stream flows;
b. Rising ground waters;
c. Uncontaminated ground water infiltration [as defined at 40 CFR 35.2005(20)] to

MS4s;

d. Uncontaminated pumped ground water[8];
e. Foundation drains[8];
f. Springs;
g. Water from crawl space pumps[8];
h. Footing drains[8];
i. Air conditioning condensation;
j. Flows from riparian habitats and wetlands;
k. Water line flushing[9,10];
l. Discharges from potable water sources not subject to NPDES Permit No. CAG679001, other than water main breaks;
m. Individual residential car washing; and
n. Dechlorinated swimming pool discharges[11].

3. Emergency fire fighting flows (i.e., flows necessary for the protection of life or property) do not require BMPs and need not be prohibited. As part of the Jurisdictional Runoff Management Plan (JRMP), each Copermittee must develop and implement a program to address pollutants from non-emergency fire fighting flows (i.e., flows from controlled or practice blazes and maintenance activities) identified by the Copermittee to be significant sources of pollutants to waters of the United States.

a. Building fire suppression system maintenance discharges (e.g. sprinkler line flushing) contain waste. Therefore, such discharges are to be prohibited by the Copermittees as illicit discharges through ordinance, order, or similar means.

4. Each Copermittee must examine all dry weather effluent analytical monitoring results collected in accordance with section F.4 of this Order and Receiving Waters and MS4 Discharge Monitoring and Reporting Program No. R9-2009-0002 to identify water quality problems which may be the result of any non-prohibited discharge category(ies) identified above in section B.2. Follow-up investigations must be conducted as necessary to identify and control, pursuant to section B.2, any non-prohibited discharge category(ies) listed above.

[8] Requires enrollment under Order R9-2008-002. Discharges into the MS4 require authorization from the owner and operator of the MS4 system.
[9] This exemption does not include fire suppression sprinkler system maintenance and testing discharges. Those discharges may be regulated under Section B.3.
[10] Requires enrollment under Order R9-2002-0020.
[11] Including saline swimming pool discharges directly to a saline water body.

C. NON-STORM WATER DRY WEATHER ACTION LEVELS

1. Each Copermittee, beginning no later than May 1, 2011, shall implement the non-storm water dry weather action level (NAL) monitoring as described in Attachment E of this Order.

2. In response to an exceedance of an NAL, each Copermittee must investigate and identify the source of the exceedance in a timely manner. However, if any Copermittee identifies exceedances of NALs that prevent them from adequately conducting source investigations in a timely manner, then the Copermittees may submit a prioritization plan and timeline that identifies the timeframe and planned actions to investigate and report their findings on all of the exceedances. Following the source investigation and identification, the Copermittees must submit an action report dependant on the source of the pollutant exceedance as follows:

a. If the Copermittee identifies the source of the exceedance as natural (non-anthropogenically influenced) in origin and in conveyance into the MS4; then the Copermittee shall report their findings and documentation of their source investigation to the Regional Board within fourteen days of the source identification.

b. If the Copermittee identifies the source of the exceedance as an illicit discharge or connection, then the Copermittees must eliminate the discharge to their MS4 and report the findings, including any enforcement action(s) taken, and documentation of the source investigation to the Regional Board within fourteen days of the source identification. If the Copermittee is unable to eliminate the source of discharge within fourteen days, then the Copermittee must submit, as part of their action report, their plan and timeframe to eliminate the source of the exceedance. Those dischargers seeking to continue such a discharge must become subject to a separate NPDES permit prior to continuing any such discharge.

c. If the Copermittee identifies the source of the exceedance as an exempted category of non-storm water discharge, then the Copermittees must determine if this is an isolated circumstance or if the category of discharges must be addressed through the prevention or prohibition of that category of discharge as an illicit discharge. The Copermittee must submit their findings in including a description of the steps taken to address the discharge and the category of discharge, to the Regional Board for review with the next subsequent annual report. Such description shall include relevant updates to or new ordinances, orders, or other legal means of addressing the category of discharge. The Copermittees must also submit a summary of their findings with the Report of Waste Discharge.

d. If the Copermittee identifies the source of the exceedance as a non-storm water discharge in violation or potential violation of an existing separate NPDES permit

(e.g. the groundwater dewatering permit), then the Copermittee must report, within three business days, the findings to the Regional Board including all pertinent information regarding the discharger and discharge characteristics.

e. If the Copermittee is unable to identify the source of the exceedance after taking and documenting reasonable steps to do so, then the Copermittee must identify the pollutant as a high priority pollutant of concern in the tributary subwatershed, perform additional focused sampling and update their programs within a year to reflect this priority. The Copermittee's annual report shall include these updates to their programs including, where applicable, updates to their watershed workplans (Section G.2), retrofitting consideration (Section F.3.d) and program effectiveness work plans (Section J.4).

f. The Copermittees or any interested party, may evaluate existing NALs and propose revised NALs for future Board consideration.

3. An exceedance of an NAL does not alone constitute a violation of the provisions of this Order, but an exceedance of an NAL may indicate lack of compliance with the requirement that Copermittees effectively prohibit all types of unauthorized non-storm water discharges into the MS4 or other prohibitions set forth in Sections A and B of this Order. Failure to timely implement required actions specified in this Order following an exceedance of an NAL constitutes a violation of this Order. However, neither compliance with NALs nor compliance with required actions following observed exceedances, excuses any non-compliance with the requirement to effectively prohibit all types of unauthorized non-storm water discharges into the MS4s or any non-compliance with the prohibitions in Sections A and B of this Order. NALs provide an assessment of the effectiveness of the prohibition of non-storm water discharges and of the appropriateness of exempted non-storm water discharges. During any annual reporting period in which one or more exceedances of NALs have been documented the Copermittee must submit with their next scheduled annual report, a report describing whether and how the observed exceedances did or did not result in a discharge form the MS4 that caused, or threatened to cause or contribute to a condition of pollution, contamination, or nuisance in the receiving waters.

4. Monitoring of effluent will occur at the end-of-pipe prior to discharge into the receiving waters, with a focus on Major Outfalls, as defined in 40 CFR 122.26(B 5-6) and Attachment E of this Order. The Copermittees must develop their monitoring plans to sample a representative percentage of major outfalls and identified stations within each hydrologic subarea. At a minimum, outfalls that exceed any NALs once during any year must be monitored in the subsequent year. Any station that does not exceed an NAL for 3 years may be replaced with a different station.

5. Each Copermittee shall monitor for the non-storm water dry weather action levels, which are incorporated into this Order as follows:

a. Action levels for discharges to inland surface waters:

Table 4.a.1: General Constituents

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Fecal Coliform	MPN/ 100 ml	200[A] 400[B]	-		BPO
Enterococci	MPN/ 100 ml	33	-	104[C]	BPO/OP
Turbidity	NTU	-	20		BPO
pH	Units	Within limit of 6.5 to 8.5 at all times			BPO
Dissolved Oxygen	mg/L	Not less than 5.0 in WARM waters and not less than 6.0 in COLD waters			BPO
Total Nitrogen	mg/L	-	1.0	See MDEL	BPO
Total Phosphorus	mg/L	-	0.1	See MDEL	BPO
Methylene Blue Active Substances	mg/L	-	0.5	See MDEL	BPO

A – Based on a minimum of not less than five samples for any 30-day period
B – No more than 10 percent of total samples may exceed 400 per 100 ml during any 30 day period
C – This Value has been set to Ocean Plan Criteria for Designated Beach Areas
BPO – Basin Plan Objective OP – Ocean Plan
MDAL – Maximum Daily Action Level AMAL – Average Monthly Action Level

Table 4.a.2: Priority Pollutants

		Freshwater (CTR)		Saltwater (CTR)	
Parameter	Units	MDAL	AMAL	MDAL	AMAL
Cadmium	ug/L	*	*	16	8
Copper	ug/L	*	*	5.8	2.9
Chromium III	ug/L	*	*	-	-
Chromium VI (hexavalent)	ug/L	16	8.1	83	41
Lead	ug/L	*	*	14	2.9
Nickel	ug/L	*	*	14	6.8
Silver	ug/L	*	*	2.2	1.1
Zinc	ug/L	*	*	95	47

CTR – California Toxic Rule
* - Action Levels developed on a case-by-case basis (see below)

The NALs for Cadmium, Copper, Chromium (III), Lead, Nickel, Silver and Zinc will be developed on a case-by-case basis because the freshwater criteria are based on site-specific water quality data (receiving water hardness). For these priority pollutants, the following equations (40 CFR 131.38.b.2) will be required:

Cadmium (Total Recoverable) = exp(0.7852[ln(hardness)] -2.715)
Chromium III (Total Recoverable) = exp(0.8190[ln(hardness)] + .6848)
Copper (Total Recoverable) = exp(0.8545[ln(hardness)] - 1.702)
Lead (Total Recoverable) = exp(1.273[ln(hardness)] - 4.705)

Nickel (Total Recoverable) = exp(.8460[ln(hardness)] + 0.0584)
Silver (Total Recoverable) = exp(1.72[ln(hardness)] - 6.52)
Zinc (Total Recoverable) = exp(0.8473[ln(hardness)] + 0.884)

b. Action levels for discharges to bays, harbors and lagoons/estuaries:

Table 4.b: General Constituents

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Total Coliform	MPN/100 ml	1,000	-	10,000	BPO
Fecal Coliform	MPN/100 ml	200[A] ,400[B]	-		BPO
Enterococci	MPN/100 ml	35	-	104[C]	BPO
Turbidity	NTU	75	-	225	OP
pH	Units	Within limit of 6.0 to 9.0 at all times			OP
Priority Pollutants	ug/L	See limitations in Table 4.a.2			

A – Based on a minimum of not less than five samples for any 30-day period
B – No more than 10 percent of total samples may exceed 400 per 100 ml during any 30 day period
C – Designated Beach Areas
OP – California Ocean Plan 2005 BPO – Basin Plan Objective
MDAL – Maximum Daily Action Level AMAL – Average Monthly Action Level

c. Action levels for discharges to the surf zone:

Table 4.c: General Constituents

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Total Coliform	MPN/100 ml	1,000	-	10,000 1,000[A]	OP
Fecal Coliform	MPN/100 ml	200[B]	-	400	OP
Enterococci	MPN/100 ml	35	-	104[C]	OP

A – Total coliform density shall not exceed 1,000 per 100 ml when the ratio of fecal/total coliform exceeds 0.1
B – During any 30 day period
C – Designated Beach Areas
OP – California Ocean Plan 2005

D. STORM WATER ACTION LEVELS

1. Beginning Year 3 after Order adoption date, a running average of twenty percent or greater of exceedances of any discharge of storm water from the MS4 to waters of the United States that exceed the Storm Water Action Levels (SALs) for the pollutants listed in Table 5 (below) will require each Copermittee to affirmatively augment and implement all necessary storm water controls and measures to reduce the discharge of the associated class of pollutants(s) to the MEP standard. The Copermittees must utilize the exceedance information when adjusting and executing annual work plans, as required by this Order. Copermittees shall take the magnitude, frequency, and number of constituents exceeding the SAL(s), in addition to receiving water quality data and other information, into consideration when reacting to SAL exceedances in an iterative manner. Failure to appropriately consider and react to SAL exceedances in an iterative manner creates a presumption that the Copermittee(s) have not complied with the MEP standard.

Table 5. Storm Water Action Levels

Pollutant	Action Level
Turbidity (NTU)	126
Nitrate & Nitrite total (mg/L)	2.6
P total (mg/L)	1.46
Cd total (µg/L)	3.0
Cu total (µg/L)	127
Pb total (µg/L)	250
Ni total (µg/L)	54
Zn total (µg/L)	976

2. The end-of-pipe assessment points for the determination of SAL compliance are all major outfalls, as defined in 40 CFR 122.26(b)(5) and (b)(6). The Copermittees must develop their monitoring plans to sample a representative percent of the major outfalls within each hydrologic subarea. At a minimum, outfalls that exceed SALs must be monitored in the subsequent year. Any station that does not exceed an SAL for 3 years may be replaced with a different station. SAL samples must be 24 hour time weighted composites.

3. The absence of SAL exceedances does not relieve the Copermittees from implementing all other required elements of this Permit.

4. This Permit does not regulate natural sources and conveyances of constituents listed in Table 5. To be relieved of the requirements to prioritize pollutant/watershed combinations for BMP updates and to continue monitoring a station, the Copermittee must demonstrate that the likely and expected cause of the SAL exceedance is not anthropogenic in nature.

5. The SALs will be reviewed and updated at the end of every permit cycle. The data collected pursuant to D.2 above can be used to create SALs based upon local data.

It is the goal of the SALs, through the iterative and MEP process, to have outfall storm water discharges meet all applicable water quality standards.

E. LEGAL AUTHORITY

1. Each Copermittee must establish, maintain, and enforce adequate legal authority to control pollutant discharges into and from its MS4 through ordinance, statute, permit, contract or similar means. Nothing herein shall authorize a Co-Permittee or other discharger regulated under the terms of this order to divert, store or otherwise impound water if such action is reasonably anticipated to harm downstream water right holders in the exercise of their water rights. This legal authority must, at a minimum, authorize the Copermittee to:

- **a.** Control the contribution of pollutants in discharges of runoff associated with industrial and construction activity to its MS4 and control the quality of runoff from industrial and construction sites. This requirement applies both to industrial and construction sites which have coverage under the statewide general industrial or construction storm water permits, as well as to those sites which do not. Grading ordinances must be updated and enforced as necessary to comply with this Order;
- **b.** Prohibit all identified illicit discharges not otherwise allowed pursuant to section B.2;
- **c.** Prohibit and eliminate illicit connections to the MS4;
- **d.** Control the discharge of spills, dumping, or disposal of materials other than storm water to its MS4;
- **e.** Require compliance with conditions in Copermittee ordinances, permits, contracts or orders (i.e., hold dischargers to its MS4 accountable for their contributions of pollutants and flows);
- **f.** Utilize enforcement mechanisms to require compliance with Copermittee storm water ordinances, permits, contracts, or orders;
- **g.** Control the contribution of pollutants from one portion of the shared MS4 to another portion of the MS4 through interagency agreements among Copermittees. Control of the contribution of pollutants from one portion of the shared MS4 to another portion of the MS4 through interagency agreements with other owners of the MS4 such as the State of California Department of Transportation, the United States Department of Defense, or Native American Tribes is encouraged;
- **h.** Carry out all inspections, surveillance, and monitoring necessary to determine compliance and noncompliance with local ordinances and permits and with this Order, including the prohibition on illicit discharges to the MS4. This means the Copermittee must have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from industrial facilities discharging into its MS4, including construction sites;
- **i.** Require the use of BMPs to prevent or reduce the discharge of pollutants into MS4s from storm water to the MEP; and

j. Require documentation on the effectiveness of BMPs implemented to reduce the discharge of storm water pollutants to the MS4 to the MEP.

2. Each Copermittee must submit within 365 days of adoption of this Order, a statement certified by its chief legal counsel that the Copermittee has taken the necessary steps to obtain and maintain full legal authority to implement and enforce each of the requirements contained in 40 CFR 122.26(d)(2)(i)(A-F) and this Order except for the updated requirements for low impact development and hydromodification in section F.1. Each Copermittee must submit as part of its updated SSMP, a statement certified by its chief legal counsel that the Copermittee has taken the necessary steps to obtain and maintain full legal authority to implement and enforce the low impact development and hydromodification requirements in section F.1. These statements must include:

a. Identification of all departments within the jurisdiction that conduct runoff related activities, and their roles and responsibilities under this Order. Include an up to date organizational chart specifying these departments and key personnel.
b. Citation of runoff related ordinances and the reasons they are enforceable;
c. Identification of the local administrative and legal procedures available to mandate compliance with runoff related ordinances and therefore with the conditions of this Order;
d. A description of how runoff related ordinances are implemented and appealed; and
e. Description of whether the municipality can issue administrative orders and injunctions or if it must go through the court system for enforcement actions.

F. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM (JRMP)

Each Copermittee must implement all requirements of section F of this Order no later than 365 days after adoption of the Order, unless otherwise specified in this Order. Prior to 365 days after adoption of the Order, each Copermittee must at a minimum implement its Jurisdictional RMP document, as the document was developed and amended to comply with the requirements of Order No. R9-2002-001.
Each Copermittee must develop and implement an updated JRMP for its jurisdiction. Each updated JRMP must meet the requirements of section F of this Order, reduce the discharge of storm water pollutants from the MS4 to the MEP, and prevent runoff discharges from the MS4 from causing or contributing to a violation of water quality standards.

1. DEVELOPMENT PLANNING COMPONENT

Each Copermittee must implement a program which meets the requirements of this section and (1) reduces Development Project discharges of storm water pollutants from the MS4 to the MEP; (2) prevents Development Project discharges from the MS4 from causing or contributing to a violation of water quality standards; (3) prevents illicit discharges into the MS4; and (4) manages increases in runoff discharge rates and durations from Development Projects that are likely to cause increased erosion of stream beds and banks, silt pollutant generation, or other impacts to beneficial uses and stream habitat due to increased erosive force.

a. GENERAL PLAN

Each Copermittee must revise as needed its General Plan or equivalent plan (e.g., Comprehensive, Master, or Community Plan) for the purpose of providing effective water quality and watershed protection principles and policies that direct land-use decisions and require implementation of consistent water quality protection measures for all development and redevelopment projects.

b. ENVIRONMENTAL REVIEW PROCESS

Each Copermittee must revise as needed its current environmental review processes to accurately evaluate water quality impacts and cumulative impacts and identify appropriate measures to avoid, minimize and mitigate those impacts for all Development Projects.

c. APPROVAL PROCESS CRITERIA AND REQUIREMENTS FOR ALL DEVELOPMENT PROJECTS

For all proposed Development Projects, each Copermittee during the planning process, and prior to project approval and issuance of local permits, must prescribe the necessary requirements so that Development Project discharges of storm water pollutants from the MS4 will be reduced to the MEP, will not cause or

contribute to a violation of water quality standards, and will comply with Copermittee's ordinances, permits, plans, and requirements, and with this Order. Performance Criteria: Discharges from each approved development project must be subject to the following management measures:

(1) Source control BMPs that reduce storm water pollutants of concern in runoff, including prevention of illicit discharges into the MS4; prevention of irrigation runoff; storm drain system stenciling or signage; properly designed outdoor material storage areas; properly designed outdoor work areas; and properly designed trash storage areas;

(2) The following LID BMPs listed below shall be implemented at all Development Projects where applicable and feasible.

(a) Conserve natural areas, including existing trees, other vegetation, and soils.
(b) Construct streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided that public safety is not compromised.
(c) Minimize the impervious footprint of the project.
(d) Minimize soil compaction to landscaped areas.
(e) Minimize disturbances to natural drainages (e.g., natural swales, topographic depressions, etc.)
(f) Disconnect impervious surfaces through distributed pervious areas.

(3) Buffer zones for natural water bodies, where feasible. Where buffer zones are infeasible, require project proponent to implement other buffers such as trees, access restrictions, etc;

(4) Measures necessary so that grading or other construction activities meet the provisions specified in section F.2 of this Order; and

(5) Submittal of proof of a mechanism under which ongoing long-term maintenance of all structural post-construction BMPs will be conducted.

(6) Infiltration and Groundwater Protection

To protect groundwater quality, each Copermittee must apply restrictions to the use of treatment control BMPs that are designed to primarily function as centralized infiltration devices (such as large infiltration trenches and infiltration basins). Such restrictions must be designed so that the use of such infiltration treatment control BMPs must not cause or contribute to an exceedance of groundwater quality objectives. At a minimum, each treatment control BMP designed to primarily function as a centralized infiltration device must meet the restrictions below, unless it is demonstrated that a restriction is not necessary to protect groundwater quality. The Copermittees may collectively or individually develop alternative restrictions on the use of

treatment control BMPs which are designed to primarily function as centralized infiltration devices. Alternative restrictions developed by the Copermittees can partially or wholly replace the restrictions listed below. The restrictions are not intended to be applied to small infiltration systems dispersed throughout a development project.

(a) Runoff must undergo pretreatment such as sedimentation or filtration prior to infiltration;

(b) All dry weather flows containing significant pollutant loads must be diverted from infiltration devices and treated through other BMPs;

(c) Pollution prevention and source control BMPs must be implemented at a level appropriate to protect groundwater quality at sites where infiltration treatment control BMPs are to be used;

(d) Infiltration treatment control BMPs must be adequately maintained so that they remove storm water pollutants to the MEP;

(e) The vertical distance from the base of any infiltration treatment control BMP to the seasonal high groundwater mark must be at least 10 feet. Where groundwater basins do not support beneficial uses, this vertical distance criteria may be reduced, provided groundwater quality is maintained;

(f) The soil through which infiltration is to occur must have physical and chemical characteristics (such as appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses;

(g) Infiltration treatment control BMPs must not be used for areas of industrial or light industrial activity; areas subject to high vehicular traffic (25,000 or greater average daily traffic on main roadway or 15,000 or more average daily traffic on any intersecting roadway); automotive repair shops; car washes; fleet storage areas (bus, truck, etc.); nurseries; and other high threat to water quality land uses and activities as designated by each Copermittee unless first treated or filtered to remove pollutants prior to infiltration and a comprehensive site-specific evaluation has been conducted; and

(h) Infiltration treatment control BMPs must be located a minimum of 100 feet horizontally from any water supply wells.

(7) Where feasible, landscaping with native or low water species shall be preferred in areas that drain to the MS4 or to waters of the United States.

d. STANDARD STORM WATER MITIGATION PLANS (SSMPS) – APPROVAL PROCESS CRITERIA AND REQUIREMENTS FOR PRIORITY DEVELOPMENT PROJECTS

Within two years of adoption of this Order, the Copermittees must submit an updated model SSMP, to the Regional Board's Executive Officer for a 30 day public review and comment period. The Regional Board's Executive Officer has the discretion to determine the necessity of a public hearing. Within 180 days of determination that the Model SSMP is in compliance with this Permit's provisions, each Copermittee must update their own local SSMP, and amended ordinances consistent with the model SSMP, and shall submit both (local SSMP and amended ordinances) to the Regional Board. The model SSMP must meet the requirements of section F.1.d of this Order to (1) reduce Priority Development Project discharges of storm water pollutants from the MS4 to the MEP, and (2) prevent Priority Development Project runoff discharges from the MS4 from causing or contributing to a violation of water quality standards.[12]

(1) Definition of Priority Development Project (PDP):

Priority Development Projects are:

(a) All new Development Projects that fall under the project categories or locations listed in section F.1.d.(2), and

(b) Those redevelopment projects that create, add, or replace at least 5,000 square feet of impervious surfaces on an already developed site and the existing development and/or the redevelopment project falls under the project categories or locations listed in section F.1.d.(2). Where redevelopment results in an increase of less than fifty percent of the impervious surfaces of a previously existing development, and the existing development was not subject to SSMP requirements, the numeric sizing criteria discussed in section F.1.d.(6) applies only to the addition or replacement, and not to the entire development. Where redevelopment results in an increase of more than fifty percent of the impervious surfaces of a previously existing development, the numeric sizing criteria applies to

[12] Updated SSMP and hydromodification requirements must apply to all priority projects or phases of priority projects which have not yet begun grading or construction activities at the time any updated SSMP or hydromodification requirement commences. If lawful prior approval of a project exists, whereby application of an updated SSMP or hydromodification requirement to the project is illegal, the updated SSMP or hydromodification requirement need not apply to the project. Updated Development Planning requirements set forth in Sections F.1. (a) through (h) of this Order must apply to all projects or phases of projects, unless, at the time any updated Development Planning requirement commences, the projects or project phases meet any one of the following conditions: (i) the project or phase has begun grading or construction activities; or (ii) a Copermittee determines that lawful prior approval rights for a project or project phase exist, whereby application of the Updated Development Planning requirement to the project is legally infeasible. Where feasible, the Permittees must utilize the SSMP and hydromodification update periods to ensure that projects undergoing approval processes include application of the updated SSMP and hydromodification requirements in their plans.

the entire development.

(c) One acre threshold: In addition to the Priority Development Project Categories identified in section F.1.d.(2), Priority Development Projects must also include all other pollutant-generating Development Projects that result in the disturbance of one acre or more of land within three years of adoption of this Order.[13] As an alternative to this one-acre threshold, the Copermittees may collectively identify a different threshold, provided the Copermittees' threshold is at least as inclusive of Development Projects as the one-acre threshold.

(2) Priority Development Project Categories

Where a new Development Project feature, such as a parking lot, falls into a Priority Development Project Category, the entire project footprint is subject to SSMP requirements.

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site) including commercial, industrial, residential, mixed-use, and public projects. This category includes development projects on public or private land which fall under the planning and building authority of the Copermittees.

(b) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

(c) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812), where the land area for development is greater than 5,000 square feet. Restaurants where land development is less than 5,000 square feet must meet all SSMP requirements except for structural treatment BMP and numeric sizing criteria requirement F.1.d.(6) and hydromodification requirement F.1.h.

(d) All hillside development greater than 5,000 square feet. This category is defined as any development which creates 5,000 square feet of impervious surface which is located in an area with known erosive soil conditions, where the development will grade on any natural slope that is twenty-five percent or greater.

(e) Environmentally Sensitive Areas (ESAs). All development located within or directly adjacent to or discharging directly to an ESA (where discharges

[13] Pollutant generating Development Projects are those projects that generate pollutants at levels greater than natural background levels.

from the development or redevelopment will enter receiving waters within the ESA), which either creates 2,500 square feet of impervious surface on a proposed project site or increases the area of imperviousness of a proposed project site to 10 percent or more of its naturally occurring condition. "Directly adjacent" means situated within 200 feet of the ESA. "Discharging directly to" means outflow from a drainage conveyance system that is composed entirely of flows from the subject development or redevelopment site, and not commingled with flows from adjacent lands.

(f) Parking lots 5,000 square feet or more or with 15 or more parking spaces and potentially exposed to runoff. Parking lot is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce.

(g) Street, roads, highways, and freeways. This category includes any paved surface that is 5,000 square feet or greater used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

(h) Retail Gasoline Outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

(3) Pollutants of Concern

As part of its local SSMP, each Copermittee must implement an updated procedure for identifying pollutants of concern for each Priority Development Project. The procedure must address, at a minimum: (1) Receiving water quality (including pollutants for which receiving waters are listed as impaired under CWA section 303(d)); (2) Land-use type of the Development Project and pollutants associated with that land use type; and (3) Pollutants expected to be present on site.

(4) Low Impact Development BMP Requirements

Each Copermittee must require each Priority Development Project to implement LID BMPs which will collectively minimize directly connected impervious areas, limit loss of existing infiltration capacity, and protect areas that provide important water quality benefits necessary to maintain riparian and aquatic biota, and/or are particularly susceptible to erosion and sediment loss.

(a) The following LID BMPs must be implemented:

(i) Each Copermittee must require LID BMPs or make a finding of infeasibility for each Priority Development Project in accordance with the LID waiver program in Section F.1.d.(8);

(ii) Each Copermittee must incorporate formalized consideration, such as thorough checklists, ordinances, and/or other means, of LID BMPs into the plan review process for Priority Development Projects;

(iii) The review of each Priority Development Project must include an assessment of potential collection of storm water for on-site or off-site reuse opportunities;

(iv) The review of each Priority Development Project must include an assessment of techniques to infiltrate, filter, store, evaporate, or retain runoff close to the source of runoff; and

(v) Within 2 years after adoption of this Order, each Copermittee must review its local codes, policies, and ordinances and identify barriers therein to implementation of LID BMPs. Following the identification of these barriers to LID implementation, where feasible, the Copermittee must take, by the end of the permit cycle, appropriate actions to remove such barriers.

(b) The following LID BMPs must be implemented at all Priority Development Projects where technically feasible as required below:

(i) Maintain or restore natural storage reservoirs and drainage corridors (including depressions, areas of permeable soils, swales, and ephemeral and intermittent streams.

(ii) Projects with landscaped or other pervious areas must, where feasible, drain runoff from impervious areas (rooftops, parking lots, sidewalks, walkways, patios, etc) into pervious areas prior to discharge to the MS4. The amount of runoff from impervious areas that is to drain to pervious areas shall not exceed the total capacity of the project's pervious areas to infiltrate or treat runoff, taking into consideration the pervious areas' geologic and soil conditions, slope, and other pertinent factors.

(iii) Projects with landscaped or other pervious areas must, where feasible, properly design and construct the pervious areas to effectively receive and infiltrate or treat runoff from impervious areas, prior to discharge to the MS4. Soil compaction for these areas shall be minimized. The amount of the impervious areas that are to drain to pervious areas must be based upon the total size, soil conditions, slope, and other pertinent factors.

(iv) Projects with low traffic areas and appropriate soil conditions must construct walkways, trails, overflow parking lots, alleys, or other low-traffic areas with permeable surfaces, such as pervious concrete, porous asphalt, unit pavers, and granular materials.

(c) To protect ground water resources any infiltration LID BMPs must comply with Section F.1.(c)(6).

(d) LID BMPs sizing criteria:

(i) LID BMPs shall be sized and designed to ensure onsite retention without runoff, of the volume of runoff produced from a 24-hour 85th percentile storm event, as determined from the County of Orange's 85th Percentile Precipitation Map[14] ("design capture volume");

(ii) If onsite retention LID BMPs are technically infeasible per section F.1.d.(7)(b), LID biofiltration BMPs may treat any volume that is not retained onsite by the LID BMPs. The LID biofiltration BMPs must be designed for an appropriate surface loading rate to prevent erosion, scour and channeling within the BMP. Due to the flow through design of biofiltration BMPs, the total volume of the BMP, including pore spaces and prefilter detention volume, must be sized to hold at least 0.75 times the design storm volume that is not retained onsite by LID retention BMPs;

(iii) If it is shown to be technically infeasible to treat the remaining volume up to and including the design capture volume using LID BMPs (retention or biofiltration), the project must implement conventional treatment control BMPs in accordance with Section F.1.d.(6) below and must participate in the LID waiver program in Section F.1.d.(7).

(e) All LID BMPs shall be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors, such as mosquitoes, rodents, and flies.

(5) Source Control BMP Requirements

Each Copermittee must require each Priority Development Project to implement source control BMPs. The source control BMPs to be required must:

(a) Prevent illicit discharges into the MS4;
(b) Minimize storm water pollutants of concern in runoff;
(c) Eliminate irrigation runoff;
(d) Include storm drain system stenciling or signage;
(e) Include properly designed outdoor material storage areas;
(f) Include properly designed outdoor work areas;
(g) Include properly designed trash storage areas;
(h) Include water quality requirements applicable to individual priority project categories.

[14] The isopluvial map is available from the County of Orange. The map can also be found as Figure A-1 Exhibit 7.II in the Model WQMP (September 2003), page 5 of 57 at http://www.ocwatersheds.com/documents/2003_DAMP_Exhibit_7_II_Model_WQMP_Attachments.pdf

(6) Treatment Control BMP Requirements[15]

Each Copermittee must require each Priority Development Project to implement treatment control BMPs that meet the following requirements:

(a) All treatment control BMPs for a single Priority Development Project must collectively be sized to comply with the following numeric sizing criteria:

(i) Volume-based treatment control BMPs must be designed to mitigate (infiltrate, filter, or treat) the volume of runoff produced from a 24-hour 85th percentile storm event, as determined from the County of Orange's 85th Percentile Precipitation Isopluvial Map[16]; or

(ii) Flow-based treatment control BMPs must be designed to mitigate (infiltrate, filter, or treat) either: a) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event; or b) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two.

(b) Treatment control BMPs for all Priority Development Projects must mitigate (treat through infiltration, settling, filtration or other unit processes) the required volume or flow of runoff from all developed portions of the project, including landscaped areas.

(c) All treatment control BMPs must be located so as to remove pollutants from runoff prior to its discharge to any waters of the U.S. Multiple Priority Development Projects may use shared treatment control BMPs as long as construction of any shared treatment control BMP is completed prior to the use or occupation of any Priority Development Project from which the treatment control BMP will receive runoff.

(d) All treatment control BMPs for Priority Development Projects must, at a minimum:

(i) Be ranked with high or medium pollutant removal efficiency for the project's most significant pollutants of concern, as the pollutant removal efficiencies are identified in the Copermittees' Model

[15] This section only applies to those PDPs not implementing LID capable of meeting the design storm criteria for the entire site and meeting technical infeasibility eligibility. Low-Impact Development (LID) and other site design BMPs that are correctly designed to effectively remove pollutants from runoff are considered treatment control BMPs.

[16] The isopluvial map is available from the County of Orange. The map can also be found as Figure A-1 Exhibit 7.II in the Model WQMP (September 2003), page 105 of 157 at http://www.ocwatersheds.com/StormWater/PDFs/2003_DAMP/2003_DAMP_Section_7_New_Development_Significant_Redevelopment.pdf.

SSMP. Treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

(ii) Be correctly sized and designed so as to remove storm water pollutants to the MEP.

(e) Target removal of pollutants of concern from runoff.

(f) Be implemented close to pollutant sources, and prior to discharging into waters of the U.S.

(g) Not be constructed within a waters of the U.S. or waters of the State.

(h) Include proof of a mechanism under which ongoing long-term maintenance will be conducted to ensure proper maintenance for the life of the project. The mechanisms may be provided by the project proponent or Copermittee.

(i) Be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors, such as mosquitoes, rodents, and flies.

(7) Low Impact Development (LID) BMP Waiver Program

The Copermittees must develop, collectively or individually, a LID waiver program for incorporation into local SSMPs, which would allow a Priority Development Project to substitute implementation of all or a portion of required LID BMPs in section F.1.d(4) with implementation of treatment control BMPs and a mitigation project, payment into an in-lieu funding program, and/or watershed equivalent BMP(s) consistent with Section F.1.d.(11). The Copermittees shall submit the LID waiver program as part of their updated model SSMP. At a minimum, the program must meet the requirements below:

(a) Prior to implementation, the LID waiver program must clearly exhibit that it will not allow PDPs to result in a net impact (after consideration of any mitigation and in-lieu payments) from pollutant loadings over and above the impact caused by projects meeting LID requirements;

(b) For each PDP participating, a technical feasibility analysis must be included demonstrating that it is technically infeasible to implement LID BMPs that comply with the requirements of Section F.1.(d)(4). The

Copermittee(s) must develop criteria for the technical feasibility analysis including a cost benefit analysis, examination of LID BMPs considered and alternatives chosen. Each PDP participating must demonstrate that LID BMPs were implemented as much as feasible given the site's unique conditions. Analysis must be made of the pollutant loading for each project participating in the LID substitution program. The estimated impacts from not implementing the required LID BMPs in section F.1.d.(4) must be fully mitigated. Technical infeasibility may result from conditions including, but not limited to:

(i) Locations that cannot meet the infiltration and groundwater protection requirements in section F.1.c.(6). Where infiltration is technically infeasible, the project must still examine the feasibility of other onsite retention LID BMPs;
(ii) Smart growth and infill or redevelopment locations where the density and/or nature of the project would create significant difficulty for compliance with the onsite volume retention requirements; and
(iii) Other site, geologic, soil or implementation constraints identified in the Copermittees updated local SSMP document.

(c) The LID waiver program must include mechanisms to verify that each Priority Development Project participating in the program is in compliance with all applicable SSMP requirements;

(d) The LID waiver program must develop and implement a review process verifying that the BMPs to be implemented meet the designated design criteria. The review process must also verify that each Priority Development Project participating in the program is in compliance with all applicable SSMP requirements.

(e) The LID waiver program must include performance standards for treatment control BMPs specified in compliance with section F.1.(d)(6).

(f) Each PDP that participates in the LID waiver program must mitigate for the pollutant loads expected to be discharged due to not implementing the LID BMPs in section F.1.d.(4). Mitigation projects must be implemented within the same hydrologic subarea as the PDP. Mitigation projects outside of the hydrologic subarea but within the same hydrologic unit may be approved provided that the project proponent demonstrates that mitigation projects within the same hydrologic subarea are infeasible and that the mitigation project will address similar beneficial use impacts as expected from the PDPs pollutant load types and amount. Offsite mitigation projects may include green streets projects, existing development retrofit projects, retrofit incentive programs, regional BMPs and stream restoration. Project applicants seeking to utilize these

alternative compliance provisions may propose other offsite mitigation projects, which the Copermittees may approve if they meet the requirements of this subpart.

(g) A Copermittee may choose to implement a pollutant credit system as part of the LID waiver program provided that such a credit system clearly exhibits that it will not allow PDPs to result in a net impact from pollutant loadings over and above the impact caused by projects meeting LID requirements. Any credit system that a Copermittee chooses to implement must be submitted to the Executive Officer for review and approval as part of the waiver program.

(h) The LID waiver program shall include a storm water mitigation fund developed by the Copermittee(s) to be used for water quality improvement projects which may serve in lieu of the PDP's required mitigation in section F.1.d.(8)(e). The LID waiver program's storm water mitigation fund shall, at a minimum, identify;

(i) The entity or entities that will manage the storm water mitigation fund (i.e., assume full responsibility);
(ii) The range and types of acceptable projects for which storm water mitigation funds may be expended;
(iii) The entity or entities that will assume full responsibility for each water quality improvement project, including its successful completion; and
(iv) How the dollar amount of storm water mitigation fund contributions will be determined. In-lieu payments must be proportional to the additional pollutant load discharged by not fully implementing LID.

(i) Each Copermittee must notify the Regional Board in their annual report of each PDP choosing to participate in the LID waiver program. The annual report must include the following information:

(i) Name of the developer of the participating PDP;
(ii) Site location;
(iii) Reason for LID waiver including technical feasibility analysis;
(iv) Description of BMPs implemented;
(v) Total amount deposited, if any, into the storm water mitigation fund described in section F.1.d.(8)(f);
(vi) Water quality improvement project(s) proposed to be funded; and
(vii) Timeframe for implementation of water quality improvement projects.

(8) <u>Site Design and Treatment Control BMP Design Standards</u>

As part of its local SSMP, each Copermittee must develop and require Priority

Development Projects to implement sitting, design, and maintenance criteria for each site design and treatment control BMP listed in its local SSMP to determine feasibility and applicability and so that implemented site design and treatment control BMPs are constructed correctly and are effective at pollutant removal, runoff control, and vector minimization. LID techniques, such as soil amendments, must be incorporated into the criteria for appropriate treatment control BMPs. Development of BMP design worksheets which can be used by project proponents is encouraged.

(9) Implementation Process

As part of its local SSMP, each Copermittee must implement a process to verify compliance with SSMP requirements. The process must identify at what point in the planning process Priority Development Projects will be required to meet SSMP requirements and at a minimum, the Priority Development Project must implement the required post-construction BMPs prior to occupancy and/or the intended use of any portion of that project. The process must also include identification of the roles and responsibilities of various municipal departments in implementing the SSMP requirements, as well as any other measures necessary for the implementation of SSMP requirements.

(10) Treatment BMP Review

(a) The Copermittees must review and update the BMPs that are listed in their local SSMPs as options for treatment control during the third year of implementation of this Order. At a minimum, the update must include removal of obsolete or ineffective BMPs and addition of LID BMPs that can be used for treatment, such as bioretention cells, bioretention swales, etc. The update must also add appropriate LID BMPs to any tables or discussions in the local SSMPs addressing pollutant removal efficiencies of treatment control BMPs. In addition, the update must include review and revision where necessary of treatment control BMP pollutant removal efficiencies.

(b) The update must incorporate findings from BMP effectiveness studies conducted by the Copermittees for projects funded wholly or in part by the State Board or Regional Board.

(c) Each Copermittee must implement a mechanism for annually incorporating findings from local treatment BMP effectiveness studies (e.g., ones conducted by, or on-behalf of, public agencies in Orange County) into SSMP project reviews and permitting

(11) Where a development project, greater than 100 acres in total project size or smaller than 100 acres in size yet part of a larger common plan of

development that is over 100 acres, has been prepared using watershed and/or sub-watershed based water quality, hydrologic, and fluvial geomorphologic planning principles that implement regional LID BMPs in accordance with the sizing and location criteria of this Order and acceptable to the Regional Board, such standards shall govern review of projects with respect to Section F.1 of this Order and shall be deemed to satisfy this Order's requirements for LID site design, buffer zone, infiltration and groundwater protection standards, source control, treatment control, and hydromodification control standards. Regional BMPs must clearly exhibit that they will not result in a net impact from pollutant loadings over and above the impact caused by capture and retention of the design storm. Regional BMPs may be used provided that the BMPs capture and retain the volume of runoff produced from the 24-hour 85th percentile storm event as defined in section F.1.d.(6)(a)(i) and that such controls are located upstream of receiving waters. Any volume that is not retained by the LID BMPs, up to the design capture volume, must be treated using LID biofiltration. Where regional LID implementation has been shown to be technically infeasible (per section F.1.d.7.b) any volume up to and including the design capture volume, not retained by LID BMPs, nor treated by LID biofiltration, must be treated using conventional treatment control BMPs in accordance with Section F.1.d.(6) and participation in the LID waiver program in Section F.1.d.(7).

e. BMP CONSTRUCTION VERIFICATION

Prior to occupancy and/or intended use of any portion of the Priority Development Project subject to SSMP requirements, each Copermittee must inspect the constructed site design, source control, and treatment control BMPs to verify that they have been constructed and are operating in compliance with all specifications, plans, permits, ordinances, and this Order.

f. BMP MAINTENANCE TRACKING

(1) Each Copermittee must develop and maintain a watershed-based database to track and inventory all approved post-construction BMPs and BMP maintenance within its jurisdiction since July 2001. LID BMPs implemented on a lot by lot basis at a single family residential home, such as rainbarrels, are not required to be tracked or inventoried. At a minimum, the database must include information on BMP type, location, watershed, date of construction, party responsible for maintenance, maintenance certifications or verifications, inspections, inspection findings, and corrective actions, including whether the site was referred to the Vector Control District.

(2) Each Copermittee must establish a mechanism not only to track post-construction BMPs, but also to ensure that appropriate easements and ownerships are properly recorded in public records and the information is

conveyed to all appropriate parties when there is a change in project or site ownership.

(3) Each Copermittee must verify that approved post-construction BMPs are operating effectively and have been adequately maintained by implementing the following measures:

(a) An annual inventory of all approved BMPs within the Copermittee's jurisdiction. LID BMPs implemented on a lot by lot basis at a single family residential home, such as rainbarrels, are not required to be tracked or inventoried. The inventory must also include all BMPs approved for Priority Development Projects since July 2001;

(b) The designation of high priority BMPs. High-priority designation must include consideration of BMP size, recommended maintenance frequency, likelihood of operational and maintenance issues, location, receiving water quality, and other pertinent factors;

(c) Verify implementation, operation, and maintenance of BMPs by inspection, self-certification, surveys, or other equally effective approaches with the following conditions:

(i) The implementation, operation, and maintenance of at least 90 percent of approved and inventoried final project public and private SSMPs (a.k.a. WQMPs) must be verified annually. All post-construction BMPs shall be verified within every four year period;
(ii) Operation and maintenance verifications must be required prior to each rainy season;
(iii) All (100 percent) projects with BMPs that are high priority must be inspected by the Copermittee annually prior to each rainy season;
(iv) All (100 percent) public agency projects with BMPs must be inspected by the Copermittee annually;
(v) At least 50 percent of projects with drainage insert treatment control BMPs must be inspected by the Copermittee annually;
(vi) Appropriate follow-up measures (including re-inspections, enforcement, maintenance, etc.) must be conducted to ensure the treatment BMPs continue to reduce storm water pollutants as originally designed;
(vii) All inspections must verify effective operation and maintenance of the treatment control BMPs, as well as compliance with all ordinances, permits, and this Order; and

(viii) Inspections must note observations of vector conditions, such as mosquitoes. Where conditions are identified as contributing to mosquito production, the Copermittee must notify the Orange County Vector Control District.

g. ENFORCEMENT OF DEVELOPMENT SITES

Each Copermittee must enforce its storm water ordinance for all Development Projects and at all development sites as necessary to maintain compliance with this Order. Copermittee ordinances or other regulatory mechanisms must include appropriate sanctions to achieve compliance. Sanctions must include the following or their equivalent: Non-monetary penalties, fines, bonding requirements, and/or permit or occupancy denials for non-compliance.

h. HYDROMODIFICATION – LIMITATIONS ON INCREASES OF RUNOFF DISCHARGE RATES AND DURATIONS[17]

Each Copermittee shall collaborate with the other Copermittees to develop and implement a Hydromodification Management Plan (HMP) to manage increases in runoff discharge rates and durations from all Priority Development Projects. The HMP shall be incorporated into the local SSMP and implemented by each Copermittee so that estimated post-project runoff discharge rates and durations shall not exceed pre-development discharge rates and durations. Where the proposed project is located on an already developed site, the pre-project discharge rate and duration shall be that of the pre-developed, naturally occurring condition. The HMP shall be submitted to the Executive Officer within 2 years of permit adoption. The HMP will be made available for public review and comment and the Executive Officer will determine the need for a public hearing.

(1) The HMP must:

(a) Identify a method for assessing susceptibility of channel segments which receive runoff discharges from Priority Development Projects. The geomorphic stability within the channel shall be assessed. A performance standard shall be created that ensures that the geomorphic stability within the channel not be compromised as a result of receiving runoff discharges from Priority Development Projects.

(b) Utilize continuous simulation of the entire rainfall record (or other analytical method proposed by the Copermittees and deemed acceptable

[17] Updated SSMP and hydromodification requirements shall apply to all priority projects or phases of priority projects which have not yet begun grading or construction activities at the time any updates SSMP or hydromodification requirement commences. If a Copermittee determines that lawful prior approval of a project exists, whereby application of an updated SSMP or hydromodification requirement to the project is legally infeasible, the updated SSMP or hydromodification requirement need not apply to the project. The Copermittees shall utilize the SSMP and hydromodification update periods to ensure that projects undergoing approval processes include application of the updated SSMP and hydromodification requirements in their plans.

by the Regional Board) to identify a range of runoff flows[18] for which priority Development Project post-project runoff flow rates and durations shall not exceed pre-development (naturally occurring) runoff flow rates and durations by more than 10 percent, where the increased flow rates and durations will result in increased potential for erosion or other significant adverse impacts to beneficial uses. In addition, the identified range of runoff flow rates and durations must compensate for the loss of sediment supply due to the development. The lower boundary of the range of runoff flows identified shall correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks. The identified range of runoff flows may be different for specific watersheds, channels, or channel reaches. In the case of an artificially hardened (concrete lined, rip rap, etc.) channel, the lower boundary of the range of runoff flows identified shall correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks of a comparable soft-bottomed channel.

(c) Require Priority Development Projects to implement hydrologic control measures so that Priority Development Projects' post-project runoff flow rates and durations (1) do not exceed pre-project (naturally occurring) runoff flow rates and durations by more than 10 percent for the range of runoff flows identified under section F.1.h.(1)(b), where the increased flow rates and durations will result in increased potential for erosion or other significant adverse impacts to beneficial uses; (2) do not result in channel conditions which do not meet the channel standard developed under section F.1.h.(1)(a) for channel segments downstream of Priority Development Project discharge points; and (3) compensate for the loss of sediment supply due to development.

(d) Include other performance criteria (numeric or otherwise) for Priority Development Projects as necessary to prevent runoff from the projects from increasing and/or continuing unnatural rates of erosion of channel beds and banks, silt pollutants generation, or other impacts to beneficial uses and stream habitat due to increased erosive force.

(e) Include a review of pertinent literature.

(f) Identify areas within the San Juan Hydrologic Unit where historic hydromodification has resulted in a negative impact to benthic macroinvertebrate and benthic periphyton by identifying areas with low or very low Index of Biotic Integrity (IBI) scores.

[18] The identified range of runoff flows to be controlled should be expressed in terms of peak flow rates of rainfall events, such as "10% of the pre-development 2-year runoff event up to the pre-project 10-year runoff event."

(g) Include a protocol to evaluate potential hydrograph change impacts to downstream watercourses from Priority Development Projects. This protocol must include the use of the IBI score as a metric for assessing impacts and improvements to downstream watercourses.

(h) Include a description of how the Copermittees will incorporate the HMP requirements into their local approval processes.

(i) Include criteria on selection and design of management practices and measures (such as detention, retention, and infiltration) to control flow rates and durations and address potential hydromodification impacts.

(j) Include technical information supporting any standards and criteria proposed.

(k) Include a description of inspections and maintenance to be conducted for management practices and measures to control flow rates and durations and address potential hydromodification impacts.

(l) Include a description of pre- and post-project monitoring and other program evaluation, including IBI score, to be conducted to assess the effectiveness of implementation of the HMP.

(m) Include mechanisms for assessing and addressing cumulative impacts within a watershed on channel morphology.

(n) Include information on evaluation of channel form and condition, including slope, discharge, vegetation, underlying geology, and other information, as appropriate.

(2) In addition to the hydrologic control measures that must be implemented per section F.1.h.(1)(c), the HMP must include a suite of management measures to be used on Priority Development Projects to protect and restore downstream beneficial uses and prevent or further prevent adverse physical changes to downstream channels. The measures must be based on a prioritized consideration of the following elements in this order:

(a) Hydrologic control measures;
(b) On-site management controls;
(c) Regional controls located upstream of receiving waters; and
(d) In-stream controls.

Where stream channels are adjacent to, or are to be modified as part of a Priority Development Project, management measures must include buffer zones and setbacks. Under no circumstances will in-stream controls include the use of non-naturally occurring hardscape materials such as concrete,

riprap, gabions, etc. The suite of management measures shall also include stream restoration as a viable option to achieve the channel standard in section F.1.h.(1)(a).

(3) Each individual Copermittee has the discretion to not require Section F.1.h. at Priority Development Projects where the project:

(a) Discharges storm water runoff into underground storm drains discharging directly to bays or the ocean; or
(b) Discharges storm water runoff into conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to ocean waters, enclosed bays, estuaries, or water storage reservoirs and lakes.

(4) HMP Reporting and Implementation

(a) Within 2 years of adoption of the Order, the Copermittees shall submit to the Regional Board a draft HMP that has been reviewed by the public, including the analysis that identifies the appropriate limiting range of flow rates per section F.1.h.(1)(b).

(b) Within 180 days of receiving Regional Board comments on the draft HMP, the Copermittees shall submit a final HMP that addressed the Regional Board's comments.

(c) Within 90 days of receiving a finding of adequacy from the Executive Officer, each Copermittee shall incorporate and implement the HMP for all Priority Development Projects.

(d) Prior to approval of the HMP by the Regional Board, the early implementation measures likely to be included in the HMP shall be encouraged by the Copermittees.

(5) <u>Interim Hydromodification Criteria</u>

Within one year of adoption of this Order, each Copermittee must ensure that all Priority Development Projects are implementing the following criteria by comparing the pre-development (naturally occurring) and post-project flow rates and durations using a continuous simulation hydrologic model such as US EPA's Hydrograph Simulation Program-Fortran (HSPF):

(a) For flow rates from 10 percent of the 2-year storm event to the 5 year storm event, the post-project peak flows shall not exceed pre-development (naturally occurring) peak flows.

(b) For flow rates from the 5 year storm event to the 10 year storm event the post-project peak flows may exceed pre-development (naturally

occurring) flows by up to 10 percent for a 1-year frequency interval.

The interim hydromodification criteria do not apply to Priority Development Projects where the project discharges (1) storm water runoff into underground storm drains discharging directly to bays or the ocean, or (2) storm water runoff into conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to ocean waters, enclosed bays, estuaries, or water storage reservoirs and lakes.

Within one year of adoption of this Order, each Copermittee must submit a signed, certification statement to the Regional Board verifying implementation of the interim hydromodification criteria.

(6) No part of section F.1.h shall alleviate the Copermittees responsibilities for implementing Low Impact Development BMPs as required under section F.1.d.(4).

i. TRAINING AND EDUCATION

(1) Municipal Departments and Personnel Education

Municipal Development Planning: Each Copermittee must implement an education program so that its planning and development review staffs and contractors (and Planning Boards and Elected Officials, if applicable) have an understanding of:

(a) Federal, State, and local water quality laws and regulations applicable to Development Projects;

(b) The connection between land use decisions and short and long-term water quality impacts (i.e., impacts from land development and urbanization); and

(c) Methods of minimizing impacts to receiving water quality resulting from development, including:

(i) Storm water management plan development and review;
(ii) Local sensitive water bodies, including 303(d)-impairments and ESAs;
(iii) Methods to control downstream erosion impacts;
(iv) Identification of pollutants of concern;
(v) Site design BMP techniques;
(vi) Source control BMPs;
(vii) Selection of the most effective treatment control BMPs for the pollutants of concern; and
(viii) Public heath concerns related to storm water management infrastructure.

(2) Project Applicants, Developers, Contractors, Property Owners, and other Responsible Parties

(a) Each Copermittee must implement a New Development / Redevelopment education program using all media as appropriate to:

(i) Measurably increase the knowledge of the target communities regarding MS4s, impacts of runoff on receiving waters, and potential BMP solutions for the target audience; and
(ii) To measurably change the behavior of target communities and thereby reduce pollutant releases to MS4s and the environment.

(b) Each Copermittee must educate each target community on the following topics where appropriate:

(i) The importance of educating all construction workers in the field about storm water issues and BMPs though formal or informal training;
(ii) Federal, State, and local water quality laws and regulations applicable to new development and redevelopment activities;
(iii) Site design, source control, pollution prevention, and treatment BMPs;
(iv) General runoff concepts; and
(v) Other topics of local importance, including local water quality conditions, impaired waterbodies and environmentally sensitive areas.

2. CONSTRUCTION COMPONENT

Each Copermittee must implement a construction program which meets the requirements of this section, prevents illicit discharges into the MS4, implements and maintains structural and non-structural BMPs to reduce pollutants in storm water runoff from construction sites to the MS4, reduces construction site discharges of storm water pollutants from the MS4 to the MEP, and prevents construction site discharges from the MS4 from causing or contributing to a violation of water quality standards.

a. ORDINANCE UPDATE

Within 365 days of adoption of this Order, each Copermittee must review and update its grading ordinances and other ordinances as necessary to achieve full compliance with this Order, including requirements for the implementation of all designated BMPs and other measures.

b. SOURCE IDENTIFICATION

Each Copermittee must maintain an updated watershed based inventory of all construction sites within its jurisdiction. The use of an automated database system, such as Geographical Information Systems (GIS) is required.

c. Site Planning and Project Approval Process

Each Copermittee must incorporate consideration of potential water quality impacts prior to approval and issuance of construction and grading permits.

(1) Each construction and grading permit must require proposed construction sites to implement designated BMPs and other measures so that illicit discharges into the MS4 are prevented and storm water pollutants discharged from the site will be reduced to the maximum extent practicable and will not cause or contribute to a violation of water quality standards.

(2) Prior to permit issuance, the project proponent's runoff management plan (or equivalent construction BMP plan) must be required to comply, and reviewed to verify compliance, with the local grading ordinance, other applicable local ordinances, and this Order.

(3) Prior to permit issuance, each Copermittee must verify that project proponents subject to California's statewide General NPDES Permit for Storm Water Discharges Associated With Construction Activities, (hereinafter General Construction Permit), have existing coverage under the General Construction Permit.

d. BMP Implementation

(1) Designate BMPs: Each Copermittee must designate a minimum set of BMPs and other measures to be implemented at all construction sites. The designated minimum set of BMPs must include:

(a) Management Measures:

(i) Pollution prevention, where appropriate;
(ii) Development and implementation of a site-specific runoff management plan;
(iii) Minimization of areas that are cleared and graded to only the portion of the site that is necessary for construction;
(iv) Minimization of exposure time of disturbed soil areas;
(v) Minimization of grading during the wet season and correlation of grading with seasonal dry weather periods to the extent feasible;
(vi) Limitation of grading to a maximum disturbed area as determined by each Copermittee before either temporary or permanent erosion controls are implemented to prevent storm water pollution. The Copermittee has the option of temporarily increasing the size of

disturbed soil areas by a set amount beyond the maximum, if the individual site is in compliance with applicable storm water regulations and the site has adequate control practices implemented to prevent storm water pollution;

(vii) Temporary stabilization and reseeding of disturbed soil areas as rapidly as feasible;
(viii) Wind erosion controls;
(ix) Tracking controls;
(x) Non-stormwater management measures to prevent illicit discharges and control storm water pollution sources;
(xi) Waste management measures;
(xii) Preservation of natural hydrologic features where feasible;
(xiii) Preservation of riparian buffers and corridors where feasible;
(xiv) Evaluation and maintenance of all BMPs, until removed; and
(xv) Retention, reduction, and proper management of all storm water pollutant discharges on site to the MEP standard.

(b) Erosion and Sediment Controls:

(i) Erosion prevention. Erosion prevention is to be used as the most important measure for keeping sediment on site during construction;
(ii) Sediment controls. Sediment controls are to be used as a supplement to erosion prevention for keeping sediment on-site during construction;
(iii) Slope stabilization must be used on all active slopes during rain events regardless of the season and on all inactive slopes during the rainy season and during rain events in the dry season; and
(iv) Permanent revegetation or landscaping as early as feasible.

(c) Designate enhanced BMPs[19] for 303(d) impairments and ESAs: Each Copermittee must implement, or require implementation of, enhanced measures to address the exceptional threat to water quality posed by all construction sites tributary to CWA section 303(d) water body segments impaired for sediment or turbidity. Each Copermittee must also implement, or require implementation of, enhanced, site-specific measures for construction sites within or adjacent to or discharging directly to coastal lagoons, the ocean, or other receiving waters within environmentally sensitive areas (as defined in Attachment C of this Order).

(i) Active Sediment Treatment (AST): Each Copermittee must require implementation of advanced treatment for sediment at construction

[19] Enhanced BMPs are control actions specifically targeted to the pollutant or condition of concern and of higher quality and effectiveness than the minimum control measures otherwise required. Enhanced in this Order means better, not simply more, BMPs.

sites (or portions thereof) that are determined by the Copermittee to be an exceptional threat to water quality. In evaluating the threat to water quality, the following factors must be considered by the Copermittee:

[a] Soil erosion potential or soil type;
[b] The site's slopes;
[c] Project size and type;
[d] Sensitivity of receiving water bodies;
[e] Proximity to receiving water bodies;
[f] Non-storm water discharges;
[g] Ineffectiveness of other BMPs;
[h] Proximity and sensitivity of aquatic threatened and endangered species of concern;
[i] Known effects of AST chemicals; and
[j] Any other relevant factors.

(d) Implement BMPs: Each Copermittee must implement, or require the implementation of, the designated minimum BMPs and any additional measures necessary to comply with this Order at each construction site within its jurisdiction year round. BMP implementation requirements, however, can vary based on wet and dry seasons. Dry season BMP implementation must plan for and address unseasonal rain events that may occur during the dry season (May 1 through September 30).

e. INSPECTION OF CONSTRUCTION SITES

Each Copermittee must conduct construction site inspections for compliance with its ordinances (grading, storm water, etc.), permits (construction, grading, etc.), and this Order. Priorities for inspecting sites must consider the nature and size of the construction activity, topography, and the characteristics of soils and receiving water quality.

(1) During the wet season, each Copermittee must inspect at least biweekly (every two weeks), all construction sites within its jurisdiction meeting any of the following criteria:

(a) All sites 30 acres or more in size with rough grading or active slopes occurring during the wet season;

(b) All sites one acre or more, and tributary to a CWA section 303(d) water body segment impaired for sediment or within or directly adjacent to, or discharging directly to, the ocean or a receiving water within an ESA; and

(c) Other sites determined by the Copermittees or the Regional Board as a significant threat to water quality. In evaluating threat to water quality, the following factors must be considered: (1) soil erosion potential; (2) site

slope; (3) project size and type; (4) sensitivity of receiving water bodies; (5) proximity to receiving water bodies; (6) non-storm water discharges; (7) past record of non-compliance by the operators of the construction site; and (8) any other relevant factors.

(2) During the wet season, each Copermittee must inspect at least monthly, all construction sites with one acre or more of soil disturbance not meeting the criteria specified above in section F.2.e.(1).

(3) During the wet season, each Copermittee must inspect construction sites less than one acre in size as needed to ensure compliance with its ordinances and this Order.

(4) Each Copermittee must inspect all construction sites as needed during the dry season. Sites meeting the criteria in section F.2.e.(1) must be inspected at least once in August or September each year.

(5) Re-inspections: Based upon site inspection findings, each Copermittee must implement all follow-up actions (i.e., re-inspection, enforcement) necessary to comply with this Order. Reinspection frequencies must be determined by each Copermittee based upon the severity of deficiencies, the nature of the construction activity, and the characteristics of soils and receiving water quality.

(6) Inspections of construction sites must include, but not be limited to:

(a) Check for coverage under the General Construction Permit (Notice of Intent (NOI) and/or Waste Discharge Identification No.) during initial inspections;
(b) Assessment of compliance with Copermittee ordinances and permits related to runoff, including the implementation and maintenance of designated minimum BMPs;
(c) Assessment of BMP effectiveness;
(d) Visual observations for non-storm water discharges, potential illicit connections, and potential discharge of pollutants in storm water runoff;
(e) Education and outreach on storm water pollution prevention, as needed; and
(f) Creation of a written or electronic inspection report.

(7) The Copermittees must track the number of inspections for each inventoried construction site throughout the reporting period to verify that each site is inspected at the minimum frequencies required.

f. ENFORCEMENT OF CONSTRUCTION SITES

(1) Each Copermittee must develop and implement an escalating enforcement

process that achieves prompt corrective actions at construction sites for violations of the Copermittee's water quality protection permit requirements and ordinances. This enforcement process must include authorizing the Copermittee's construction site inspectors to take immediate enforcement actions when appropriate and necessary. The enforcement process must include appropriate sanctions such as stop work orders, non-monetary penalties, fines, bonding requirements, and/or permit denials for non-compliance.

(2) Each Copermittee must be able to respond to complaints received from third-parties and to ensure the Regional Board that corrective actions have been implemented.

g. REPORTING OF NON-COMPLIANT SITES

(1) In addition to the notification requirements in Attachment B, each Copermittee must notify the Regional Board when the Copermittee issues a stop work order or other high level enforcement to a construction site in its jurisdiction as a result of storm water violations.

(2) Each Copermittee shall annually notify the Regional Board, prior to the commencement of the wet season, of all construction sites with alleged violations. Information may be provided as part of the JRMP annual report if submitted prior to the rainy season. Information provided shall include, but not be limited to, the following:

(a) WDID number if enrolled under the General Construction Permit
(b) Site Location, including address
(c) Current violations or suspected violations

h. TRAINING AND EDUCATION

(1) Municipal Staff and Contractors: Requirements for municipal staff and contractors are described in the Municipal Component section of this Order.

(2) Construction Site Owner / Operator Responsibilities:

As early in the planning and development process as possible and all through the permitting and construction process, each Copermittee must implement a program to educate project applicants, developers, contractors, property owners, and other responsible parties. The education program must provide an understanding of the topics listed below, as appropriate for the audience being educated.

(a) The importance of educating all construction workers in the field about storm water issues and BMPs though formal or informal training;

(b) Federal, State, and local water quality laws and regulations applicable to construction and grading activities;
(c) Site design, source control, pollution prevention, and treatment BMPs;
(d) General runoff concepts; and
(e) Other topics of local importance, including local water quality conditions, impaired waterbodies and environmentally sensitive areas.

3. EXISTING DEVELOPMENT COMPONENT

a. MUNICIPAL

Each Copermittee must implement a municipal program which meets the requirements of this section, prevents illicit discharges into the MS4, reduces municipal discharges of storm water pollutants from the MS4 to the MEP, and prevents municipal discharges from the MS4 from causing or contributing to a violation of water quality standards.

(1) Source Identification / Inventory

Each Copermittee must maintain an updated watershed-based inventory of municipal areas and activities. The inventory must include the name, address (if applicable), and a description of the area/activity; which pollutants are potentially generated by the area/activity; whether the area/activity is adjacent to an ESA; and identification of whether the area/activity is tributary to a CWA section 303(d) water body segment and generates pollutants for which the water body segment is impaired. The use of an automated database system, such as Geographical Information Systems (GIS) is required when applicable.

(2) General BMP Implementation

(a) Pollution Prevention: Each Copermittee must implement pollution prevention methods in its municipal program and must require their use by appropriate municipal departments, personnel, and contractors, where appropriate.

(b) Designate Minimum BMPs: Each Copermittee must designate a minimum set of BMPs for all municipal areas and activities. The designated minimum BMPs for municipal areas and activities must be area or activity specific as appropriate. BMPs must be designated for special events that are expected to generate significant trash and litter.

(c) Designate BMPs for ESAs and 303(d) Impairments: Each Copermittee must designate enhanced measures for municipal areas and activities tributary to CWA section 303(d) impaired water body segments when an area or activity generates pollutants for which the water body segment is

impaired. Each Copermittee must also designate additional controls for municipal areas and activities within or directly adjacent to or discharging directly to coastal lagoons, the ocean, or other receiving waters within environmentally sensitive areas (as defined in Attachment C of this Order).

(d) Implement BMPs: Each Copermittee must implement, or require the implementation of, the designated minimum and enhanced BMPs and any additional measures necessary based on its inventory to comply with this Order for each municipal area or activity within its jurisdiction.

(3) BMP Implementation for Management of Pesticides, Herbicides, and Fertilizers

Each Copermittee must implement BMPs to reduce the contribution of storm water pollutants associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from municipal areas and activities to MS4s and receiving waters. Such BMPs must include, at a minimum:

(a) Educational activities, permits, certifications and other measures for municipal applicators and distributors;
(b) Integrated Pest Management (IPM) measures that rely on non-chemical solutions;
(c) The use of native vegetation;
(d) Schedules for irrigation and chemical application; and
(e) The collection and proper disposal of unused pesticides, herbicides, and fertilizers.

(4) BMP implementation for Flood Control Structures

(a) Each Copermittee must implement procedures to assure that flood management projects assess the impacts on the water quality of receiving water bodies.
(b) Each Copermittee must include water quality protection measures, where feasible, when retrofitting existing flood control structural devices.
(c) Each Copermittee must evaluate its existing flood control devices, identify devices causing or contributing to a condition of pollution, identify measures to reduce or eliminate the structure's effect on pollution, and evaluate the feasibility of retrofitting the structural flood control device. The inventory and evaluation must be completed by and submitted to the Regional Board in the 2nd year JRMP Annual Report.

(5) BMP Implementation for Sweeping of Municipal Areas

Where municipal area sweeping is implemented as an MS4 BMP for municipal roads, streets, highways, and parking facilities, each Copermittee must design and implement the program based on the following criteria:

(a) Optimize pickup of trash and debris based on land uses, trash collection schedules, seasonal factors (e.g., special events, tourism, etc.) and inspections of municipal areas/activities.

(6) Operation and Maintenance of Municipal Separate Storm Sewer System (MS4) and Structural Controls

(a) Treatment Controls: Each Copermittee must implement a schedule of inspection and maintenance activities to verify proper operation of all municipal structural treatment controls designed to reduce storm water pollutant discharges to or from its MS4s and related drainage structures.

(b) MS4 and Facilities: Each Copermittee must implement a schedule of maintenance activities for the MS4 and MS4 facilities (catch basins, storm drain inlets, open channels, etc). The maintenance activities must, at a minimum, include:

(i) Inspection and removal of accumulated waste at least once a year between May 1 and September 30 of each year for all MS4 facilities;
(ii) Additional cleaning as necessary between October 1 and April 30 of each year for facilities that receive or collect high volumes of trash and debris;
(iii) Following two years of inspections, any MS4 facility that requires inspection and cleaning less than annually may be inspected as needed, but not less that every other year;
(iv) Open channels must be cleaned of observed anthropogenic litter in a timely manner;
(v) Record keeping of the maintenance and cleaning activities including the overall quantity of waste removed;
(vi) Proper disposal of waste removed pursuant to applicable laws; and
(vii) Measures to eliminate waste discharges during MS4 maintenance and cleaning activities.

(7) Infiltration From Sanitary Sewer to MS4/Provide Preventive Maintenance of Both

(a) Each Copermittee must implement controls and measures to prevent and eliminate infiltration of seepage from municipal sanitary sewers to MS4s through thorough, routine preventive maintenance of the MS4. Each Copermittee that operates both a municipal sanitary sewer system and a MS4 must implement controls and measures to prevent and eliminate infiltration of seepage from the municipal sanitary sewers to the MS4s that must include overall sanitary sewer and MS4 surveys and thorough, routine preventive maintenance of both.

(b) Each Copermittee must implement controls to limit infiltration of seepage from municipal sanitary sewers to municipal separate storm sewer systems where necessary. Such controls must include:

(i) Adequate plan checking for construction and new development,
(ii) Incident response training for municipal employees that identify sanitary sewer spills;
(iii) Code enforcement inspections;
(iv) MS4 maintenance and inspections;
(v) Interagency coordination with sewer agencies; and
(vi) Proper education of municipal staff and contractors conducting field operations on the MS4 or municipal sanitary sewer (if applicable).

(8) Inspection of Municipal Areas and Activities

(a) At a minimum, each Copermittee must inspect the following high priority municipal areas and activities annually:

(i) Roads, Streets, Highways, and Parking Facilities;
(ii) Flood Management Projects and Flood Control Devices;
(iii) Areas and activities tributary to a CWA section 303(d) impaired water body segment, where an area or activity generates pollutants for which the water body segment is impaired.
(iv) Areas and activities within or adjacent to or discharging directly to coastal lagoons, the ocean, or other receiving waters within environmentally sensitive areas (as defined in Attachment C of this Order);
(v) Municipal Facilities:
[a] Active or closed municipal landfills;
[b] Publicly owned treatment works (including water and wastewater treatment plants) and sanitary sewage collection systems;
[c] Solid waste transfer facilities;
[d] Land application sites;
[e] Corporate yards including maintenance and storage yards for materials, waste, equipment and vehicles; and
[f] Household hazardous waste collection facilities.
(vi) Municipal airfields;
(vii) Parks and recreation facilities;
(viii) Special event venues following special events (festivals, sporting events, etc.);
(ix) Power washing; and
(x) Other municipal areas and activities that the Copermittee determines may contribute a significant pollutant load to the MS4.

(b) Other municipal areas and activities must be inspected as needed and in response to water quality data, valid public complaints, and findings from

municipal or contract staff.

(c) Based upon site inspection findings, each Copermittee must implement all follow-up actions necessary to comply with this Order.

(9) Enforcement of Municipal Areas and Activities

Each Copermittee must enforce its storm water ordinance for all municipal areas and activities as necessary to maintain compliance with this Order.

(10) Training and Education

Each Copermittee must ensure that all municipal personnel and contractors that have responsibilities for selecting, implementing, and evaluating BMPs for municipal areas and activities are adequately trained and educated to perform such tasks.

(a) Municipal Departments and Personnel Education

(i) Municipal Construction Activities: Each Copermittee must implement an education program that includes annual training prior to the rainy season so that its construction, building, code enforcement, and grading review staffs, inspectors, and other responsible construction staff have, at a minimum, an understanding of the following topics, as appropriate for the target audience:

[a] Federal, State, and local water quality laws and regulations applicable to construction and grading activities;
[b] The connection between construction activities and water quality impacts (i.e., impacts from land development and urbanization and impacts from construction material such as sediment);
[c] Proper implementation of erosion and sediment control and other BMPs to minimize the impacts to receiving water quality resulting from construction activities;
[d] The Copermittee's inspection, plan review, and enforcement policies and procedures to verify consistent application;
[e] Current advancements in BMP technologies;
[f] SSMP Requirements including treatment options, site design, source control, and applicable tracking mechanisms; and
[g] Other topics of local importance, including local water quality conditions, impaired water bodies, environmentally sensitive areas, and public health and disease vector issues associated with runoff.

(ii) Municipal Industrial/Commercial Activities: Each Copermittee must train staff responsible for conducting storm water compliance inspections and enforcement of industrial and commercial facilities at

least once a year. Training must cover inspection and enforcement procedures, BMP implementation, and review of monitoring data

(iii) Municipal Other Activities: Each Copermittee must implement an education program so that municipal personnel and contractors performing activities which generate pollutants have an understanding of the activity specific BMPs for each activity to be performed.

b. COMMERCIAL / INDUSTRIAL

Each Copermittee must implement a commercial / industrial program that meets the requirements of this section, prevents illicit discharges into the MS4, reduces commercial / industrial discharges of storm water pollutants from the MS4 to the MEP, and prevents commercial / industrial discharges from the MS4 from causing or contributing to a violation of water quality standards.

(1) Source Identification

(a) Each Copermittee must maintain an updated watershed-based inventory of all industrial and commercial sites/sources within its jurisdiction (regardless of ownership) that could contribute a significant pollutant load to the MS4. The inventory must include the following minimum information for each industrial and commercial site/source: name; address; pollutants potentially generated by the site/source; and identification of whether the site/source is tributary to a Clean Water Act section 303(d) water body segment and generates pollutants for which the water body segment is impaired; and a narrative description including SIC codes which best reflects the principal products or services provided by each facility.

At a minimum, the following sites/sources must be included in the inventory:

(i) Commercial Sites/Sources:

[a] Automobile repair, maintenance, fueling, or cleaning;
[b] Airplane repair, maintenance, fueling, or cleaning;
[c] Boat repair, maintenance, fueling, or cleaning;
[d] Equipment repair, maintenance, fueling, or cleaning;
[e] Automobile and other vehicle body repair or painting;
[f] Mobile automobile or other vehicle washing;
[g] Automobile (or other vehicle) parking lots and storage facilities;
[h] Retail or wholesale fueling;
[i] Pest control services;
[j] Eating or drinking establishments, including food markets;

[k] Mobile carpet, drape or furniture cleaning;
[l] Cement mixing or cutting;
[m] Masonry;
[n] Painting and coating;
[o] Botanical or zoological gardens and exhibits;
[p] Landscaping;
[q] Nurseries and greenhouses;
[r] Golf courses, parks and other recreational areas/facilities;
[s] Cemeteries;
[t] Pool and fountain cleaning;
[u] Marinas;
[v] Portable sanitary services;
[w] Building material retailers and storage;
[x] Animal facilities;
[y] Mobile pet services;
[z] Power washing services; and
[aa] Other sites and sources with a history of un-authorized discharges to the MS4.

(ii) Industrial Sites/Sources:

[a] Industrial Facilities, as defined at 40 CFR § 122.26(b)(14), including those subject to the General Industrial Permit or other individual NPDES permit;
[b] Operating and closed landfills;
[c] Facilities subject to SARA Title III; and
[d] Hazardous waste treatment, disposal, storage and recovery facilities.

(iii) ESAs and 303(d) Listed Waterbodies: All other commercial or industrial sites/sources tributary to a CWA Section 303(d) impaired water body segment, where the site/source generates pollutants for which the water body segment is impaired. All other commercial or industrial sites/sources within or directly adjacent to or discharging directly to coastal lagoons, the ocean, or other receiving waters within environmentally sensitive areas (as defined in Attachment C of this Order).

(iv) All other commercial or industrial sites/sources that the Copermittee determines may contribute a significant pollutant load to the MS4.

(2) <u>General BMP Implementation</u>

(a) Pollution Prevention: Each Copermittee must require the use of pollution prevention methods by industrial and commercial sites/sources.

(b) Designate / Update Minimum BMPs: Each Copermittee must designate a minimum set of BMPs for all industrial and commercial sites/sources. Where BMPs have already been designated, each Copermittee must review its existing BMPs for adequacy. The designated minimum BMPs must be specific to facility types and pollutant-generating activities, as appropriate.

(c) Designate Enhanced BMPs for ESAs and 303(d) Impairments: Each Copermittee must designate enhanced measures for industrial and commercial sites/sources tributary to CWA section 303(d) impaired water body segments (where a site/source generates pollutants for which the water body segment is impaired). Each Copermittee must also designate additional controls for industrial and commercial sites/sources within or directly adjacent to or discharging directly to coastal lagoons, the ocean, or other receiving waters within environmentally sensitive areas (as defined in Attachment C of this Order).

(d) Implement BMPs: Each Copermittee must implement, or require the implementation of, the designated minimum and enhanced BMPs and any additional measures necessary based on inspections, incident responses, and water quality data to comply with this Order at each industrial and commercial site/source within its jurisdiction.

(3) <u>BMP Implementation for Mobile Businesses</u>

(a) Each Copermittee must develop and implement a program to reduce the discharge of storm water pollutants from mobile businesses to the MEP and to prohibit non-storm water discharges pursuant to Section B of this Order. Each Copermittee must keep as part of their commercial source inventory a listing of mobile businesses known to operate within its jurisdiction. The program must include:

(i) Development and implementation of minimum standards and BMPs to be required for each of the various types of mobile businesses;
(ii) Development and implementation of an enforcement strategy which specifically addresses the unique characteristics of mobile businesses;
(iii) Notification of those mobile businesses known to operate within the Copermittee's jurisdiction of the minimum standards and BMP requirements and local ordinances;
(iv) Development and implementation of an outreach and education strategy; and
(v) Inspection of mobile businesses as needed to implement the program.

(b) If they choose to, the Copermittees may cooperate in developing and implementing their programs for mobile businesses, including sharing of mobile business inventories, BMP requirements, enforcement action

information, and education.

(4) Inspection of Industrial and Commercial Sites/Sources

Each Copermittee must conduct industrial and commercial site inspections for compliance with its ordinances, permits, and this Order.

(a) Inspection Procedures: Inspections must include but not be limited to:

(i) Review of BMP implementation plans, if the site uses or is required to use such a plan;

(ii) Review of facility monitoring data, if the site monitors its runoff;

(iii) Check for coverage under the General Industrial Permit (Notice of Intent (NOI) and/or Waste Discharge Identification Number), if applicable;

(iv) Assessment of compliance with Copermittee ordinances and permits related to runoff;

(v) Assessment of BMP implementation, maintenance and effectiveness;

(vi) Visual observations for non-storm water discharges, potential illicit connections, and potential discharge of pollutants in storm water runoff; and

(vii) Education and training on storm water pollution prevention, as conditions warrant.

(b) Each Copermittee shall annually notify the Regional Board, prior to the commencement of the wet season, of all Industrial Sites and Industrial Facilities subject to the General Industrial Permit or other individual NPDES permit with alleged violations. Information may be provided as part of the JRMP annual report if submitted prior to the rainy season. Information provided shall include, but not be limited to, the following:

(i) WDID number if enrolled under the General Industrial Permit;
(ii) Site Location, including address;
(iii) Current violations or suspected violations; and
(iv) Past Violation history.

(c) Frequencies: At a minimum, 20 percent of the sites inventoried as required in section F.3.b.(1) above (excluding mobile sources and food facilities) must be inspected each year. Mobile businesses must be

inspected pursuant to the enforcement strategy developed pursuant to section F.3.b.(3). Other inspection frequencies must be based upon findings of the Copermittee's existing program and the following factors:

(i) Type of activity (SIC code);
(ii) Materials used at the facility;
(iii) Wastes generated;
(iv) Pollutant discharge potential;
(v) Non-storm water discharges;
(vi) Size of facility;
(vii) Proximity to receiving water bodies;
(viii) Sensitivity of receiving water bodies;
(ix) Whether the facility is subject to the General Industrial Permit or an individual NPDES permit;
(x) Whether the facility has filed a No Exposure Certification/Notice of Non-Applicability;
(xi) Facility design;
(xii) Total area of the site, area of the site where industrial or commercial activities occur, and area of the site exposed to rainfall and runoff;
(xiii) The facility's compliance history; and
(xiv) Any other relevant factors.

(d) Food Facilities: Each food facility must be inspected annually for compliance with the Copermittee's water quality ordinances and this Order. Each inspection of a food facility must, at a minimum, address the following concerns:

(i) Trash storage and disposal;
(ii) Grease storage and disposal;
(iii) Washwater discharges to the MS4 (e.g., from floor mats, driveways, sidewalks, etc.);
(iv) Identification of outdoor sewer and MS4 connections; and
(v) Education of property managers when grease and/or trash facilities are shared by multiple facilities.

(e) Third-Party Inspections: Each Copermittee may develop and implement a third party inspection program for verifying industrial and commercial site/source compliance with its ordinances, permits, and this Order. To the extent that third party inspections are conducted to fulfill the requirements of this Order, the Copermittee will be responsible for conducting and documenting quality assurance and quality control of the third-party inspections.

(i) Each inspection conducted by a third-party must, at a minimum, result in the following:

[a] Photo documentation of potential storm water violations identified during the third party inspection;
[b] Reporting to the Copermittee of identified significant potential violations, including imminent or observed illegal discharges, within 24 hours of the third party inspection;
[c] Reporting to the Copermittee of all inspection findings within one week of the inspection being conducted; and
[d] Copermittee follow-up and/or enforcement actions for identified potential storm water violations within two business days of the inspection or potential violation report receipt.

(f) Based upon site inspection findings, each Copermittee must implement all follow-up actions and enforcement necessary to comply with this Order.

(g) To the extent that the Regional Board has conducted an inspection of an industrial site during a particular year, the requirement for the responsible Copermittee to inspect this facility during the same year will be satisfied.

(h) The Copermittees must track the number of inspections for the inventoried industrial and commercial sites/sources throughout the reporting period to verify that the sites/sources are inspected at the minimum frequencies listed in this Order.

(5) Enforcement of Industrial and Commercial Sites/Sources

Each Copermittee must enforce its storm water ordinance for all industrial and commercial sites/sources as necessary to maintain compliance with this Order. Copermittee ordinances or other regulatory mechanisms must include appropriate sanctions to achieve compliance. Sanctions must include the following or their equivalent: Non-monetary penalties, fines, bonding requirements, and/or permit denials for non-compliance.

(6) Training and Education for Owners and Operators of Commercial and Industrial Activities

(a) Each Copermittee must implement an education program using all media as appropriate to (1) measurably increase the knowledge of owners and operators of commercial and industrial activities regarding MS4s, impacts of runoff on receiving waters, and potential BMP solutions for the target audience; and (2) to measurably change the behavior of target communities and thereby reduce storm water pollutant releases and eliminate prohibited non-storm water discharges to MS4s and the environment. At a minimum, the education program must meet the requirements of this section and address the following issues:

(i) Laws, regulations, permits, & requirements;

(ii) Best management practices;
(iii) General runoff concepts; and

(iv) Other topics, including public reporting mechanisms, water conservation, low-impact development techniques.

(b) BMP Notification: At least twice during the five-year period of this Order, each Copermittee must notify the owner/operator of each inventoried industrial and commercial site/source of the BMP requirements applicable to the site/source.

C. RESIDENTIAL

Each Copermittee must implement a residential program which meets the requirements of this section, prevents illicit discharges into the MS4, reduces residential discharges of storm water pollutants from the MS4 to the MEP, and prevents residential discharges from the MS4 from causing or contributing to a violation of water quality standards.

(1) Threat to Water Quality Prioritization

Each Copermittee must identify residential areas and activities that pose a high threat to water quality. At a minimum, these must include:

(a) Automobile repair, maintenance, washing, and parking;
(b) Home and garden care activities and product use (pesticides, herbicides, and fertilizers);
(c) Disposal of trash, pet waste, green waste, and household hazardous waste (e.g., paints, cleaning products);
(d) Any other residential source that the Copermittee determines may contribute a significant pollutant load to the MS4;
(e) Any residential areas tributary to a CWA section 303(d) impaired water body, where the residence generates pollutants for which the water body is impaired; and
(f) Any residential areas within or directly adjacent to or discharging directly to a coastal lagoon, the ocean, or other receiving waters within an environmentally sensitive area (as defined in Attachment C of this Order).

(2) BMP Implementation

(a) Pollution Prevention: Each Copermittee must actively encourage the use of pollution prevention methods by residents.

(b) Designate BMPs: Each Copermittee must designate minimum BMPs for high-threat-to-water quality residential areas and activities. The designated minimum BMPs for high-threat-to-water quality residential

areas and activities must be area or activity specific.

(c) Hazardous Waste BMPs: Each Copermittee must facilitate the proper management and disposal of used oil, toxic materials, and other household hazardous wastes. Such facilitation must include educational activities, public information activities, and establishment of collection sites operated by the Copermittee or a private entity. Curbside collection of household hazardous wastes is encouraged.

(d) Implement BMPs: Each Copermittee must implement, or require implementation of, the designated minimum BMPs and any additional measures necessary to comply with Sections A and B of this Order.

(e) Each Copermittee must implement, or require implementation of, BMPs for residential areas and activities that have not been designated a high threat to water quality, as necessary.

(3) Enforcement of Residential Areas and Activities

Each Copermittee must enforce its storm water ordinance for all residential areas and activities as necessary to maintain compliance with this Order.

(4) Evaluation of Oversight of Residential Areas and Activities

Each Copermittee must annually review the effectiveness of efforts to reduce residential discharges of storm water pollutants from the MS4 and eliminate illicit residential discharges into the MS4. The evaluation must consider findings from monitoring data, municipal employee comments, inspections, complaints, and other appropriate sources.

(5) Common Interest Areas (CIA) / Home Owner Association (HOA) Areas

Each Copermittee must implement measures specifically to ensure that runoff within common interest developments, including areas managed by associations, meets the objectives of this section and Order.

(a) BMP Implementation: Each Copermittee must implement management measures based on a review of pertinent factors, including:

(i) Current maintenance duties and procedures used by CIA/HOA maintenance associations within its jurisdiction;
(ii) Whether streets and storm drains are publicly or privately owned within the CIA/HOA;
(iii) Whether the CIA/HOA area has been identified as a high priority residential area;
(iv) Proximity to 303(d)-listed waterbodies, the ocean, environmentally

sensitive areas;
(v) Evaluation of water quality monitoring data;
(vi) Evaluation of existing illegal discharge/illicit connection activities;
(vii) Other activities conducted or authorized by the HOA that may pose a significant risk to inland or coastal receiving waters.

(b) Legal Authority and Enforcement: Within one year of adoption of this Order, each Copermittee must review its Municipal Code to determine the most appropriate method to implement and enforce runoff management measures within CIA/HOA areas.

(6) Residential Education Program

(a) Each Copermittee must implement a Residential Education Program using all media as appropriate to (1) measurably increase the knowledge regarding MS4s, impacts of runoff on receiving waters, and potential BMP solutions for the target audience; and (2) to measurably change the behavior of target communities and thereby reduce storm water and eliminate prohibited non-storm water pollutant releases to MS4s and the environment.

(b) Copermittee educational programs must emphasize underserved target audiences, residents and managers of CIA/HOA areas, high-risk behaviors, and "allowable" behaviors and discharges. At a minimum, the education program must meet the requirements of this section and address the following issues:

(i) Laws, regulations, permits, and requirements;
(ii) Best management practices;
(iii) General runoff concepts;
(iv) Existing water quality, including local water quality conditions, impaired waterbodies and environmentally sensitive areas; and
(v) Other topics, including public reporting mechanisms, water conservation, low-impact development techniques, and public health and disease vector issues associated with runoff.

d. Retrofitting Existing Development

Each Copermittee must develop and implement a retrofitting program which meets the requirements of this section. The goals of the existing development retrofitting program are to reduce impacts from hydromodification, promote LID, support riparian and aquatic habitat restoration, reduce the discharges of storm water pollutants from the MS4 to the MEP, and prevent discharges from the MS4 from causing or contributing to a violation of water quality standards. Where feasible, at the discretion of the Copermittee, the existing development retrofitting program may be coordinated with flood control projects and infrastructure

improvement programs.

(1) Source Identification

The Copermittee must identify and inventory existing developments (i.e. municipal, industrial, commercial, residential) as candidates for retrofitting. Potential retrofitting candidates must include but are not limited to:

(a) Development that contributes pollutants of concern to a TMDL or a ESA;
(b) Receiving waters channelized or otherwise hardened;
(c) Development tributary to receiving waters that are channelized or otherwise hardened;
(d) Developments tributary to receiving waters that are significantly eroded;
(e) Developments tributary to an ASBS or SWQPA; and
(f) Development that causes hydraulic constriction.

(2) Each Copermittee shall evaluate and rank the inventoried existing developments to prioritize retrofitting. Criteria for evaluation must include but is not limited to:

(a) Feasibility;
(b) Cost effectiveness;
(c) Pollutant removal effectiveness;
(d) Impervious area potentially treated;
(e) Maintenance requirements;
(f) Landowner cooperation;
(g) Neighborhood acceptance;
(h) Aesthetic qualities; and
(i) Efficacy at addressing concern.

(3) Each Copermittee must consider the results of the evaluation in prioritizing work plans for the following year. Highly feasible projects expected to benefit water quality should be given a high priority to implement source control and treatment control BMPs. Where feasible, the retrofit projects should be designed in accordance with the SSMP requirements within sections F.1.d.(3) through F.1.d.(8). In addition, the Copermittee shall encourage retrofit projects to implement where feasible the Hydromodification requirements in Section F.1.h.

(4) When requiring retrofitting on existing development, the Copermittees will cooperate with private landowners to encourage retrofitting projects. The Copermittee may consider the following practices in cooperating and encouraging private landowners to retrofit their existing development:

(a) Demonstration retrofit projects;
(b) Retrofits on public land and easements;

(c) Education and outreach;
(d) Subsidies for retrofit projects;
(e) Requiring retrofit projects as mitigation or ordinance compliance;
(f) Public and private partnerships; and
(g) Fees for existing discharges to the MS4.

(5) The completed retrofit BMPs shall be tracked and inspected in accordance with section F.1.f.

(6) Where constraints on retrofitting preclude effective BMP deployment on existing developments at locations critical to protect receiving waters, a Copermittee may propose a regional mitigation project to improve water quality. Such regional projects may include but are not limited to:

(a) Regional water quality treatment BMPs;
(b) Urban creek or wetlands restoration and preservation;
(c) Daylighting and restoring underground creeks;
(d) Localized rainfall storage and reuse to the extent such projects are fully protective of downstream water rights;
(e) Hydromodification project; and
(f) Removal of invasive plant species.

(7) A retrofit project or regional mitigation project may qualify as a Watershed Water Quality Activity provided it meets the requirements in section G. Watershed Runoff Management Program.

4. ILLICIT DISCHARGE DETECTION AND ELIMINATION

Each Copermittee must implement a program which meets the requirements of this section to actively detect and eliminate illicit discharges and disposal into the MS4. The program must address all types of illicit discharges and connections excluding those non-storm water discharges not prohibited by the Copermittee in accordance with section B of this Order.

a. PREVENT AND DETECT ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must implement measures to prevent and detect illicit discharges to the MS4.

(1) Legal Authority: Each Copermittee must retain legal authority to prevent and eliminate illicit discharges and connections to the MS4.

(2) Inspections: Each Copermittee must include use of appropriate municipal personnel and contractors to assist in identifying illicit discharges and connections during their daily activities.

(a) Inspections for illegal discharges and connections must be conducted during routine maintenance of all MS4 facilities.

(b) Municipal staff and contractors conducting non-MS4 field operations must be trained to report suspected illegal discharges and connections to proper municipal staff.

b. MAINTAIN MS4 MAP

Each Copermittee must maintain an updated map of its entire MS4 and the corresponding drainage areas within its jurisdiction. The use of GIS is required. The accuracy of the MS4 map must be confirmed during dry weather field screening and analytical monitoring and must be updated at least annually. The GIS layers of the MS4 map must be submitted with the updated Jurisdictional Runoff Management Plan within 365 days after adoption of this Order.

c. FACILITATE PUBLIC REPORTING OF ILLICIT DISCHARGES AND CONNECTIONS - PUBLIC HOTLINE

Each Copermittee must promote, publicize and facilitate public reporting of illicit discharges or water quality impacts associated with discharges into or from MS4s. Each Copermittee must facilitate public reporting through development and operation of a public hotline. Public hotlines can be Copermittee-specific or shared by Copermittees. All storm water hotlines must be capable of receiving reports in both English and Spanish 24 hours per day and seven days per week.

d. DRY WEATHER FIELD SCREENING AND ANALYTICAL MONITORING

Each Copermittee must conduct dry weather field screening and analytical monitoring of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect illicit discharges and connections in accordance with Receiving Waters and MS4 Discharge Monitoring and Reporting Program No. R9-2009-0002 in Attachment E of this Order.

e. INVESTIGATION / INSPECTION AND FOLLOW-UP

Each Copermittee must implement procedures to investigate and inspect portions of the MS4 that, based on the results of field screening, analytical monitoring, or other appropriate information, indicate a reasonable potential of containing illicit discharges, illicit connections, or other sources of pollutants in non-storm water.

(1) Develop response criteria for data: Each Copermittee must develop, update, and use numeric criteria action levels (or other actions level criteria where appropriate) to determine when follow-up investigations will be performed in response to water quality monitoring. The criteria must include required

non-storm water action levels (see Section C) and a consideration of 303(d)-listed waterbodies and environmentally sensitive areas (ESAs) as defined in Attachment C.

(2) Respond to data: Each Copermittee must investigate portions of the MS4 for which water quality data or conditions indicates a potential illegal discharge or connection.

(a) Obvious illicit discharges (i.e. color, odor, or significant exceedances of action levels) must be investigated immediately.

(b) Field screen data: Within two business days of receiving dry weather field screening results that exceed action levels, the Copermittees must either initiate an investigation to identify the source of the discharge or document the rationale for why the discharge does not pose a threat to water quality and does not need further investigation. This documentation shall be included in the Annual Report.

(c) Analytical data: Within five business days of receiving analytical laboratory results that exceed action levels, the Copermittees must either initiate an investigation to identify the source of the discharge or document the rationale for why the discharge does not pose a threat to water quality and does not need further investigation. This documentation shall be included in the Annual Report.

(3) Respond to notifications: Each Copermittee must respond to and resolve each reported incident (e.g., public hotline, staff notification, etc.) in a timely manner. Criteria may be developed to assess the validity of, and prioritize the response to, each report.

f. Elimination Of Illicit Discharges And Connections

Each Copermittee must take immediate action to initiate steps necessary to eliminate all detected illicit discharges, illicit discharge sources, and illicit connections after detection. Elimination measures may include an escalating series of enforcement actions for those illicit discharges that are not a serious threat to public health or the environment. Illicit discharges that pose a serious threat to the public's health or the environment must be eliminated immediately.

g. Enforce Ordinances

Each Copermittee must implement and enforce its ordinances, orders, or other legal authority to prevent illicit discharges and connections to its MS4 and to eliminate detected illicit discharges and connections to it's MS4.

h. Prevent And Respond To Sewage Spills (Including From Private Laterals And Failing Septic Systems) And Other Spills

(1) Each Copermittee must implement management measures and procedures to prevent, respond to, contain and clean up all sewage (see below) and other spills that may discharge into its MS4 from any source (including private laterals and failing septic systems). Copermittees must coordinate with spill response teams to prevent entry of spills into the MS4 and contamination of surface water, ground water and soil. Each Copermittee must coordinate spill prevention, containment and response activities throughout all appropriate departments, programs and agencies so that maximum water quality protection is available at all times.

(2) Each Copermittee must develop and implement a mechanism whereby it is notified of all sewage spills from private laterals and failing septic systems into its MS4. Each Copermittee must implement management measures and procedures to prevent, respond to, and coordinate a response to contain and clean up sewage from any such notification.

i. Education And Training

Each Copermittee must implement educational activities, public information activities, and other appropriate activities to facilitate the proper management and disposal of used oil and toxic materials.

5. PUBLIC PARTICIPATION COMPONENT

Each Copermittee must incorporate a mechanism for public participation in the updating, development, and implementation of the Jurisdictional Runoff Management Program.

G. WATERSHED RUNOFF MANAGEMENT PROGRAM

1. Lead Watershed Copermittee Identification

Watershed Copermittees shall identify the Lead Watershed Copermittee for their Watershed Management Area (WMA). The Lead Watershed Copermittees shall serve as liaisons between the Permittees and Regional Board, where appropriate.

2. Watershed Water Quality Workplan (Watershed Workplan)

The Watershed Workplan shall describe the Permittees' development and implementation of a collective watershed strategy to assess and prioritize the water quality problems within the watershed's receiving waters, identify and model sources of the highest priority water quality problem(s), develop a watershed-wide BMP implementation strategy to abate highest priority water quality problems, and a monitoring strategy to evaluate BMP effectiveness and changing water quality prioritization in the WMA.

The work plan shall, at a minimum:

a. Characterize the receiving water quality in the WMA. Characterization shall include use of regularly collected water quality data, reports, monitoring and analysis generated in accordance with the requirements of the Receiving Waters Monitoring and Reporting Program, as well as applicable information available from other public and private organizations.

b. Identify the highest priority water quality problem(s), in terms of constituents by location, in the WMA's receiving waters. Identified water quality problem(s) shall, at a minimum, give consideration to; TMDLs, receiving waters listed on the CWA section 303(d) list, waters with persistent violations of water quality standards, toxicity, or impacts to beneficial uses, and other pertinent conditions.

c. Identify the sources of the highest water quality problem(s) within the WMA. Efforts to determine such sources shall include, but not be limited to: use of information from the construction, industrial/commercial, municipal, and residential source identification programs required within the Jurisdictional Runoff Program (JRMP) of this Order; specific actions to model pollutant transport to receiving waters for the sake of identifying the source(s) point(s) of origin; water quality monitoring data collected as part of the Receiving Water Monitoring and Reporting Program required by this Order, and additional focused water quality monitoring to identify specific sources within the watershed.

d. Develop a watershed BMP implementation strategy to attain receiving water quality objectives in the identified highest priority water quality problem(s). The BMP implementation strategy shall include a schedule for implementation of the BMP projects to abate specific receiving water quality problems. BMPs not

contributing to measured pollutant reductions or improvements to water quality must be removed and replaced with alternative BMPs. Identified watershed water quality problems may be the result of jurisdictional discharges that will need to be addressed with BMPs applied in a specific jurisdiction in order to generate a benefit to the watershed.

e. Develop a strategy to model and monitor improvements in receiving water quality directly resulting from implementation of the BMPs described in the Watershed Workplan. The modeling and monitoring strategy shall generate the necessary data to report on the measured pollutant reduction that results from proper BMP implementation. Monitoring shall, at a minimum, be conducted in the receiving water to demonstrate reduction in pollutant concentrations and progression towards attainment of receiving water quality objectives.

f. Establish a schedule for development and implementation of the Watershed strategy outlined in the Workplan. The schedule shall, at a minimum, include forecasted dates of planned actions to address Provisions E.2(a) through E.2(e) and dates for watershed review meetings through the remaining portion of this Permit cycle. Annual watershed workplan review meetings must be open to the public and appropriately publically noticed such that interested parties may come and provide comments on the watershed program.

3. **Watershed Workplan Implementation –** Watershed Copermittee's shall begin implementing the Watershed Workplan within 60-days of acceptance by the Regional Board Executive Officer. If within 30 days of submittal, the Regional Board has not taken an action, the Workplan shall be deemed acceptable.

4. **Copermittee Collaboration** – Watershed Copermittees shall collaborate to develop and implement the Watershed Workplan. Watershed Copermittee collaboration shall include frequent regularly scheduled meetings.

5. **Public Participation –** Watershed Copermittees shall implement a watershed-specific public participation mechanism within each watershed. A required component of the watershed-specific public participation shall be a minimum 30-day public review of the Watershed Workplan prior to submittal for acceptance by the Regional Board Execuive Officer. Opportunity for the public to review and comment on the Watershed Workplan must occur before the workplan is implemented.

6. **Watershed Workplan Review and Updates –** Watershed Copermittees shall review and update the Watershed Workplan annually to identify needed changes to the prioritized water quality problem(s) listed in the workplan. All updates to the Watershed Workplan shall be presented during an Annual Watershed Review Meeting. Annual Watershed Review Meetings shall occur once every calendar year and be conducted by the Watershed Copermittees. Annual Watershed Review Meetings shall be open to the public and adequately noticed. Individual Watershed Copermittees shall also review and modify their jurisdictional programs and JRMP

Annual Reports, as necessary, so that they are consistent with the updated Watershed Workplan.

7. Aliso Creek Watershed Runoff Management Plan (WRMP) Provisions

The following provisions apply to the Aliso Creek WRMP. Requirements in this subsection must supersede requirements prescribed by the Regional Board on October 18, 2005.[20]

a. Each Copermittee within the Aliso Creek Watershed must implement the monitoring and reporting program described in *Aliso Creek 13325 Directive, Revised Monitoring Program Design – Integration with NPDES Program*, December 2004 (Revised Aliso Creek Program).

b. Each Copermittee must provide annual reports by March 1 of each year beginning in 2011 for the preceding annual period of January through December. The annual reports must contain the following information:

(1) Water quality data and assessment from the Revised Aliso Creek Program. Each municipality must implement the monitoring and reporting program described in the Revised Aliso Creek Program. All information submitted in the report must conform to a SWAMP-Compatible Quality Assurance Project Plan[21]. The report must contain an assessment of compliance with applicable water quality standards for each monitoring station. The report must include data in tabular and graphical form, and electronic data must be submitted to the Regional Board.

(2) Program Assessment. A description and assessment of each municipality's program implemented within the high-priority storm drain locations (as identified Revised Aliso Creek Program) to reduce discharges of indicator fecal bacteria/pathogens. Monitoring alone is not sufficient to assess progress of the municipal programs. Municipalities must demonstrate each year that their programs are effective and resulting in a reduction of bacteria sources.

(i) For structural and nonstructural management practices implemented, the assessment must contain a description of the

[20] On October 12, 2005, the Regional Board accepted proposed changes to the bacteria monitoring program that had been conducted since spring 2001 pursuant to an Investigative Order from the Regional Board's executive officer. The October 18, 2005, letter from the Regional Board's executive officer revised the Investigative Order and instituted the new monitoring and reporting requirements.

[21] The State Water Resource Control Board (State Board) has prepared an electronic template for Quality Assurance Project Plans (QAPP) to assist in QAPP development, to provide a common format that will allow for review to be expedited, and to provide information on Surface Water Ambient Monitoring (SWAMP) consistency. Additional information and the template are available on-line at http://www.waterboards.ca.gov/swamp/qapp.html.

practice, capital and maintenance costs, expectations for effectiveness, date implemented, and any observed results.

(ii) For structural and nonstructural management practices evaluated, the assessment must contain a description of the practice(s), conclusions from the evaluation, and whether and when the practice is planned for implementation by the municipality or group of municipalities.

(3) Status Reports. Updates on high-priority storm drain areas. Status reports must be provided by each municipality that discuss the causes of impairment and subsequent management activities implemented within the reporting period in the high priority areas and the planned activities for the next reporting period.

(4) Certification Statement. The technical reports submitted to the Regional Board must include the following certification statement signed by either the principal executive officer, ranking elected official, or duly authorized representative of that person:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person(s) directly responsible for gathering the information, the information is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

c. The annual reports must be submitted until the Regional Board determines they are no longer warranted. If requested by a municipality, the monitoring program may be modified or reduced by the Regional Board. The monitoring program and annual reporting may be modified in response to adopted TMDLs and additional Clean Water Act 303(d) listings for impairment.

d. Municipalities must continue meeting on a quarterly basis to discuss efforts to reduce bacteria in the Aliso Creek watershed.

H. FISCAL ANALYSIS

1. Secure Resources: Each Copermittee must secure the resources necessary to meet all requirements of this Order.

2. Annual Analysis: Each Copermittee must conduct an annual fiscal analysis of the necessary capital and operation and maintenance expenditures necessary to accomplish the activities of the programs required by this Order. The analysis must include estimated expenditures for the reporting period, the preceding period, and the next reporting period.

- **a.** Each analysis must include a description of the source of funds that are proposed to meet the necessary expenditures, including legal restrictions on the use of such funds.
- **b.** Each analysis must include a narrative description of circumstances resulting in a 25 percent or greater annual change for any budget line items.

3. Annual Reporting: Each Copermittee must submit its annual fiscal analysis with the annual JRMP report.

I. TOTAL MAXIMUM DAILY LOADS

The waste load allocations (WLAs) of fully approved and adopted TMDLs are incorporated as Water Quality Based Effluent Limitations on a pollutant by pollutant, watershed by watershed basis. Early TMDL requirements, including monitoring, may be required and inserted into this Order pursuant to Finding E.10

1. Baby Beach Bacterial Indicator TMDL Water Quality Based Effluent Limitations

a. The Copermittees in the Baby Beach watershed shall implement BMPs capable of achieving the interim and final Bacterial Indicator Waste Load Allocations (WLAs) in discharges to Baby Beach as described in Table 6.

Table 6: TMDL Waste Load Reduction Milestones

Action	Date
Meet 50% wasteload reductions	3 years after effective date for dry weather
	7 years after effective date for wet weather
Meet 100% wasteload reductions	5 years after effective date for dry weather
	10 years after effective date for wet weather

b. The Copermittees shall conduct necessary monitoring, as described in Attachment A to Resolution No. R9-2008-0027, and submit annual progress reports as part of their yearly reports.

c. The following WLAs (Table 7) are to be met in Baby Beach receiving water by the end of the year 2019 for wet weather and 2014 for dry weather:

Table 7: Final Bacterial Indicator Waste Load Allocations for Baby Beach

	Waste Load Allocation	
Bacterial Indicator	Dry Weather (Billion MPN / Day)	Wet Weather (Billion MPN / 30 Days)
Total Coliform	0.86	3,254
Fecal Coliform	0.17	112
Enterococcus	0.03	114

MPN: Most Probable Number

d. The Copermittees must meet the following Numeric Targets (Table 8) in Baby Beach receiving waters in order to meet the underlying assumptions of the TMDL. The Numeric Targets are to be met once 100 percent of the WLA reductions have been achieved (see Table 7 above).

Table 8: Final Bacterial Indicator Numeric Targets for Baby Beach

Bacterial Indicator	30-day geo mean (MPN / 100mL)	Single Sample Max (MPN / 100mL)
	Dry Weather only	Dry and Wet Weather
Total Coliform	1,000	10,000
Fecal Coliform	200	400
Enterococcus	35	104

MPN: Most Probable Number

J. PROGRAM EFFECTIVENESS ASSESSMENT AND REPORTING

1. Jurisdictional Program Effectiveness Assessments

a. OBJECTIVES OF EFFECTIVENESS ASSESSMENTS

Beginning with the Annual Report due in 2011, each Copermittee must annually assess the effectiveness of its Jurisdictional Runoff Management Program (JRMP) implementation at meeting the following objectives:

(1) Objective for 303(d) Waterbodies: Reduce storm water pollutant loadings.

(a) Each Copermittee must establish annual assessment measures or methods specifically for reducing discharges of storm water pollutants from its MS4 into each downstream 303(d)-listed water body for which that waterbody is impaired. Assessment measures must be developed for each of the six outcome levels described by CASQA.[22]
(b) Each Copermittee must annually conduct each established assessment measure or method and evaluate the outcome. Each outcome must then be used to assess the effectiveness of implemented management measures toward reducing MS4 discharges of the specific pollutants causing or contributing to conditions of impairment.
(c) The assessment measures must target both water quality outcomes and the results of municipal enforcement activities.

(2) Objective for Environmentally-Sensitive Areas: Prevent storm water MS4 discharges from causing or contributing to conditions of pollution, nuisance, or contamination.

(a) Each Copermittee must establish annual measures or methods specifically for assessing the effectiveness of its management measures for protecting downstream ESAs from adverse effects caused by discharges from its MS4. Assessment measures must be developed for each of the six outcome levels described by CASQA.
(b) Each Copermittee must annually implement each established assessment measure or method and evaluate the outcome. Each outcome must be used to assess the effectiveness of implemented management measures toward reducing MS4 discharges of the specific pollutants causing or contributing to conditions of impairment.
(c) The assessment measures must target both water quality outcomes and the results of municipal enforcement activities.

(3) Objectives for major program component outcomes: Determined by Each

[22] Effectiveness assessment outcome levels as defined by CASQA are defined in Attachment C of this Order. See "*Municipal Stormwater Program Effectiveness Assessment Guidance"* (CASQA, May 2007) for guidance for assessing program activities at the various outcome levels.

Copermittee.

(a) Each Copermittee must annually develop objectives for each program component in Section F and the overall JRMP. The objectives must be established as appropriate in response to program implementation and evaluation of water quality and management practices.
(b) Assessment approaches for program implementation must include a mix of specific activities, general program components, and water quality data.
(c) The assessment measures must target both water quality outcomes and the results of municipal enforcement activities.

(4) Objectives for actions taken to protect receiving water limitations in accordance with this Order.

(a) Each Copermittee must develop and implement an effectiveness assessment strategy for each measure conducted in response to a determination to implement the "iterative" approach to prevent or reduce any storm water pollutants that are causing or contributing to the exceedance of water quality standards as outlined in this Order

b. ASSESSMENT REVIEW

(1) Based on the results of the effectiveness assessments, each Copermittee must annually review its jurisdictional activities and BMPs to identify modifications and improvements needed to maximize JRMP effectiveness, as necessary to achieve compliance with this Order.

(2) Each Copermittee must develop and annually conduct an Integrated Assessment[23] of each effectiveness assessment objective above (Section J.1.a) and the overall JRMP using a combination of outcomes as appropriate to the objectives.[24]

2. Program Modifications

a. Each Copermittee must develop and implement a plan and schedule to address program modifications and improvements identified during annual effectiveness assessments.

b. Jurisdictional activities/BMPs that are ineffective or less effective than other comparable jurisdictional activities/BMPs must be replaced or improved upon by implementation of more effective jurisdictional activities/BMPs. Where monitoring data exhibits persistent water quality problems that are caused or

[23] Integrated assessment is defined in Attachment C. It is the process of evaluating whether program implementation is resulting in the protection or improvement of water quality. Integrated assessment combines assessments of program implementation and water quality.
[24] Not all program components need be addressed at each of the six outcome levels.

contributed to by MS4 discharges, jurisdictional activities or BMPs applicable to the water quality problems must be modified and improved to correct the water quality problems.

3. Effectiveness Assessment and Program Response Reporting

a. Each Copermittee must include a description and summary of its annual and long-term effectiveness assessments within each Annual Report. Beginning with the Annual Report due in 2011, the Program Effectiveness reporting must include:

(1) 303(d) waterbodies: A description and results of the annual assessment measures or methods specifically for reducing discharges of storm water pollutants from its MS4 into each 303(d)-listed waterbody;
(2) ESAs: A description and results of the annual assessment measures or methods specifically for managing discharges of pollutants from its MS4 into each downstream ESA;
(3) Other Program Components: A description of the objectives and corresponding assessment measures and results used to evaluate the effectiveness of each general program component. The results must include findings from both program implementation and water quality assessment where applicable;
(4) Receiving water protection: A description and results of the annual assessment measures or methods employed specifically for actions taken to protect receiving water limitations in accordance with Section A.3 of this Order;
(5) A description of the steps taken to use dry-weather and wet-weather monitoring data to assess the effectiveness of the programs for 303(d) impairments, ESAs, and general program components;
(6) A description of activities conducted in response to investigations of illicit discharge and illicit connection activities, including how each investigation was resolved and the pollutant(s) involved;
(7) Responses to effectiveness assessments: A description of each program modification, made in response to the results of effectiveness assessments conducted pursuant to Section J.1.a, and the basis for determining (pursuant to Section J.2.b.) that each modified activity and/or BMP represents an improvement with respect to reducing the discharge of storm water pollutants from the MS4.
(8) A description of the steps that will be taken to improve the Copermittee's ability to assess program effectiveness using measurable targeted outcomes, assessment measures, assessment methods, and outcome levels 1-6. Include a time schedule for when improvement will occur; and

(9) A description of the steps that will be taken to identify aspects of the Copermittee's Jurisdictional Runoff Management Program that will be changed based on the results of the effectiveness assessment.

4. Work Plan

Each Copermittee must develop a work plan to address their high priority water quality problems in an iterative manner over the life of the permit. The goal of the work plan is to demonstrate a responsive and adaptive approach for the judicious and effective use of available resources to attack the highest priority problems. The work plan shall include, at a minimum, the following:

- **a.** The problems and priorities identified during the assessment;
- **b.** A list of priority pollutants and known or suspected sources;
- **c.** A brief description of the strategy employed to reduce, eliminate or mitigate the negative impacts;
- **d.** A description and schedule for new and/or modified BMPs. The schedule is to include dates for significant milestones;
- **e.** A description of how the selected activities will address an identified high priority problem. This will include a description of the expected effectiveness and benefits of the new and/or modified BMPs;
- **f.** A description of implementation effectiveness metrics;
- **g.** A description of how efficacy results will be used to modify priorities and implementation; and
- **h.** A review of past activities implemented, progress in meeting water quality standards, and planned program adjustments.

The Copermittee shall submit the work plan to the Regional Board within 365 days of adoption of the Order. Annual updates are also required and shall be included with the annual JRMP report. The Regional Board will assess the work plan for compliance with the specific and overall requirements of the Order. To increase effectiveness and efficiencies, Copermittees may combine their implementation efforts and work plans within a hydrologic area or sub area. Each Copermittee, however, maintains individual responsibility for developing and implementing an acceptable work plan.

K. REPORTING

The Copermittees may propose alternate reporting criteria and schedules, as part of their updated JRMP, for the Executive Officer's acceptance. The Copermittees shall submit the updated JRMP within 365 days after adoption of this Order.

1. Runoff Management Plans

a. JURISDICTIONAL RUNOFF MANAGEMENT PLANS

(1) Copermittees: The written account of the overall program to be conducted by each Copermittee to meet the jurisdictional requirements of section F of this Order is referred to as the Jurisdictional Runoff Management Plan (JRMP). Each Copermittee must revise and update its existing JRMP so that it describes all activities the Copermittee will undertake to implement the requirements of this Order. Each Copermittee must submit its updated and revised JRMP to the Regional Board 365 days after adoption of this Order.

(2) At a minimum, each Copermittee's JRMP must be updated and revised to demonstrate compliance with each applicable section of this Order.

b. WATERSHED WORKPLANS

(1) Copermittees: The written account of the program conducted by each watershed group of Copermittees is referred to as the Watershed Workplan. Copermittees within each watershed shall be responsible for updating and revising each Watershed Workplan. Each Watershed Workplan shall be updated and revised to describe any changes in water quality problems or priorities in the WMAs, and any necessary change to actions Copermittees will take to implement jurisdictional or watershed BMPs to address those identified.

(2) Lead Watershed Copermittee: Each Lead Watershed Permittee shall be responsible for coordinating the production of the Watershed Workplan, as well as coordinating Annual Watershed Review Meetings and public participation/public noticing in accordance with the requirements of this Order. The Lead Watershed Permittee shall submit the Watershed Workplan to the Principal.

(3) Principal Copermittee: The Principal Permittee shall assemble and submit the Watershed Workplan to the Regional Board no later than 365 days after adoption of this Order, and shall be prepared to implement the workplan within 60 days of the Regional Board Executive Officer deeming the workplan acceptable.

(4) Each Watershed Workplan shall, at a minimum, include:

(a) Identification of the Lead Watershed Permittee for the watershed.
(b) An updated watershed map.
(c) Identification and description of all applicable water quality data, reports, analyses, and other information to be used to assess receiving water quality.
(d) Assessment and analysis of the watershed's water quality data, reports, analyses, and other information, used during identification and prioritization of the watershed's water quality problems.
(e) A prioritized list of water quality problems within the WMA including rationale explaining the method/logic used to determine prioritization.
(f) Identification of the likely sources, pollutant discharges, and/or other factors causing the high priority water quality problems within the WMA.
(g) A description of the strategy to be used to guide Copermittee implementation of BMPs either jurisdictionally or on a watershed-wide basis to abate the highest water quality problems
(h) A list of criteria used to evaluate BMP effectiveness and how it was applied.
(i) A GIS map of BMPs implemented and BMPs scheduled for implementation.
(j) A description of the public participation mechanisms to be used and the parties anticipated to be involved during the development and implementation of the Watershed Workplan.
(k) A description of Copermittee collaboration to accomplish development of the Watershed Workplan, including a schedule for Watershed meetings.
(l) A description of how TMDLs and 303(d)-listed water bodies were considered during prioritization of watershed water quality problems
(m) A description of the strategy to model and monitor improvement in receiving water quality directly resulting from implementation of the BMPs described in the Watershed Workplan.
(n) A scheduled annual Watershed Workplan Review Meeting once every calendar year. This meeting shall be open to the public.

2. Other Required Reports and Plans

a. SSMP UPDATES

(1) Copermittees must submit their updated model SSMP in accordance with the applicable requirements of section F.1 with the JRMP <u>two years after adoption</u> of this Order.
(2) Within 180 days of determination that the Model SSMP is in compliance with this Permit's provisions, each Copermittee must update their own local SSMP, and amended ordinances consistent with the model SSMP, and shall submit both (local SSMP and amended ordinances) to the Regional Board.
(3) For SSMP-related requirements of Section F.1 with subsequent

implementation due dates, updated SSMPs must be submitted with the JRMP annual report covering the applicable reporting period.

b. REPORT OF WASTE DISCHARGE

The Principal Copermittee must submit to the Regional Board, no later than 210 days in advance of the expiration date of this Order, a Report of Waste Discharge (ROWD) as an application for issuance of new waste discharge requirements. The fourth annual report for this Order may serve as the ROWD, provided it contains the minimum information below.

At a minimum, the ROWD must include the following: (1) Proposed changes to the Copermittees' runoff management programs; (2) Proposed changes to monitoring programs; (3) Justification for proposed changes; (4) Name and mailing addresses of the Copermittees; (5) Names and titles of primary contacts of the Copermittees; and (6) Any other information necessary for the reissuance of this Order.

3. Annual Reports

a. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM (JRMP) ANNUAL REPORTS

(1) Copermittees: Each Copermittee must generate individual JRMP Annual Reports which cover implementation of its jurisdictional activities during the past annual reporting period. Each Annual Report must verify and document compliance with this Order as directed in this section. Each Copermittee must retain records through 2015, available for review, that document compliance with each requirement of this Order. Each Copermittee must submit to the Principal Copermittee its individual JRMP Annual Report by the date specified by the Principal Copermittee. The reporting period for these annual reports must be the previous fiscal year. For example, the report submitted September 30, 2010 must cover the reporting period July 1, 2009 to June 30, 2010.

(2) Principal Copermittee: The Principal Copermittee is responsible for collecting and assembling each Copermittee's individual JRMP Annual Report. The Principal Copermittee must submit Unified JRMP Annual Reports to the Regional Board by September 30 of each year, beginning on September 30, 2011. The Unified JRMP Annual Report must contain the 13 individual JRMP Annual Reports.

(3) Each JRMP Annual Report must contain, at a minimum, the following information:

(a) Information required to be reported annually in Section H (Fiscal Analysis) of this Order;

(b) Information required to be reported annually in Section J (Program Effectiveness) of this Order;
(c) The completed Reporting Checklist found in Attachment D, and
(d) Information for each program component by watershed as described in the following Table 9:

Table 9. Annual Reporting Requirements

Program Component	Reporting Requirement
New Development	1. Updated relevant sections of the General Plan and environmental review process and a description of planned updates within the next annual reporting period, if applicable
	2. Revisions to the local SSMP, including where applicable: (a) Identification and summary of where the SSMP fails to meet the requirements of this Order; (b) Updated procedures for identifying pollutants of concern for each Priority Development Project; (c) Updated treatment BMP ranking matrix; and (d) Updated site design and treatment control BMP design standards;
	3. Verification that site design, source control, and treatment BMPs were required on all applicable Priority Development Projects;
	4. Description of the application of LID and site design BMPs in the planning and approval process;
	5. Description of projects subject to the local waiver provision for numeric sizing of treatment control BMP requirements;
	6. Description and summary of the LID site design BMP substitution program, if applicable;
	7. Description and summary of the process to verify compliance with SSMP requirements;
	8. Updates to the BMPs that are listed in the local SSMP as options for treatment control;
	9. Description of the treatment control maintenance tracking process and verification that the requirements of this Order were met during the reporting period; (a) Updated watershed-based database of approved treatment control BMPs and treatment control BMP maintenance within its jurisdiction, including updates to the list of high-priority treatment BMPs;
	10. Description of the process for identifying and evaluating hydrologic conditions of concern and requiring a suite of management measures within all Priority Development Projects to protect downstream beneficial uses and prevent adverse physical changes to downstream stream channels;
	11. Description of enforcement activities applicable to the new development and redevelopment component and a summary of the effectiveness of those activities;

Program Component	Reporting Requirement
Construction	1. Updated relevant ordinances and description of planned ordinance updates within the next annual reporting period, if applicable;
	2. A description of procedures used for identifying priorities for inspecting sites and enforcing control measures which consider the nature of the construction activity, topography, and the characteristics of soils and receiving water quality;
	3. Designated minimum and enhanced BMPs;
	4. Summary of the inspection program, including the following information: (a) Number and date of inspections conducted at each facility, including the facility address; (b) Number of facilities lacking adequate BMPs; (c) The BMP violations identified during the inspection by facility; (d) Number, date, and types of enforcement actions by facility; (e) Narrative description of inspection findings and follow-up activities for each facility;
Municipal	1. Updated source inventory;
	2. Changes to the designated municipal BMPs;
	3. Descriptions of procedures to assure that flood management projects assess the impacts on the water quality of receiving water bodies;
	4. Summary and assessment of BMPs implemented at retrofitted flood control structures, including: (a) List of projects with BMP retrofits; and (b) List and description of structures retrofitted without BMPs;
	5. Description and assessment of the municipal structural treatment control operations and maintenance activities, including: (a) Number of inspections and types of facilities; and (b) Summary of findings;
	6. Description of the municipal areas/facilities operations and maintenance activities, including: (a) Number and types of facilities maintained; (b) Amount of material removed and how that material was disposed; and (c) List of facilities planned for bi-annual inspections and the justification;
	7. Description of the municipal areas/programs inspection activities, including: (a) Number and date of inspections conducted at each facility; (b) Number of facilities lacking adequate BMPs; (c) The BMP violations identified during the inspection by facility; (d) Number, date and types of enforcement actions by facility; (e) Narrative description of inspection findings and follow-up activities for each facility;

Program Component	Reporting Requirement
	8. Description of activities implemented to address sewage infiltration into the MS4;
Commercial / Industrial	1. Annual inventory of commercial / industrial sources;
	2. Summary of the inspection program, including the following information: (a) Number and date of inspections conducted at each facility including the facility address; (b) Number of facilities lacking adequate BMPs; (c) The BMP violations identified during the inspection by facility; (d) Number, date, and types of enforcement actions by facility; (e) Narrative description of inspection findings and follow-up activities for each facility;
	3. Changes to designated minimum and enhanced BMPs;
	4. A list of industrial sites, including each name, address, and SIC code, that the Copermittee suspects may require coverage under the General Industrial Permit, but has not submitted an NOI;
Residential	1. Updated minimum BMPs required for residential areas and activities;
	2. Quantification and summary of applicable runoff and storm water enforcement actions within residential areas and activities;
	3. Description of efforts to manage runoff and storm water pollution in common interest areas;
Illicit Discharge Detection and Elimination	1. Changes to the legal authority to implement Illicit Discharge Detection and Elimination activities;
	2. Changes to the established investigation procedures;
	3. Public reporting mechanisms, including phone numbers and web pages;
	4. All data and assessments from the Dry Weather Effluent Analytical Monitoring activities;
	5. Response criteria developed for water quality data and notifications;
	6. Summaries of illicit discharges (including spills and water quality data events) and how each significant case was resolved;
	7. A description of instances when field screening and analytical data exceeded action levels, but for which no investigation was conducted;
	8. A description of enforcement actions taken in response to investigations of illicit discharges and a description of the effectiveness of those enforcement measures;
	9. A description of controls to prevent infiltration of seepage from municipal sanitary sewers to municipal separate storm sewer systems;
Work Plan	Priorities, strategy, implementation schedule and effectiveness evaluation;

(4) Each JRMP Annual Report must also include the following information

regarding non-storm water discharges (see Section B.2. of this Order):

(a) Identification of non-storm water discharge categories identified as a source of pollutants to waters of the U.S;
(b) A description of ordinances, orders, or similar means to prohibit non-storm water discharge categories identified under section B.2 above ;
(c) Identification of any control measures to be required and implemented for non-storm water discharge categories identified as needing said controls by the Regional Board; and
(d) A description of a program to address pollutants from non-emergency fire fighting flows identified by the Copermittee to be significant sources of pollutants.

4. Interim Reporting Requirements

For the July 2009-June 2010 reporting period, the Jurisdictional RMP must be submitted on January 31, 2011. Each Jurisdictional RMP Annual Report submitted for this reporting period must, at a minimum, include comprehensive descriptions of all activities conducted to fully implement the Copermittees' Jurisdictional RMP documents, as those documents were developed to comply with the requirements of Order No. 2002-01. The Principal Copermittee must submit these documents in a unified manner, consistent with the unified reporting requirements of Order No. 2002-01.

5. Universal Reporting Requirements

All submittals must include an executive summary, introduction, conclusion, recommendations, and signed certified statement. Each Copermittee must submit a signed certified statement covering its responsibilities for each applicable submittal. The Principal Copermittee must submit a signed certified statement covering its responsibilities for each applicable submittal and the sections of the submittals for which it is responsible.

L. MODIFICATION OF PROGRAMS

Modifications of Jurisdictional Runoff Management Programs and/or Watershed Runoff Management Programs may be initiated by the Executive Officer of the Regional Board or by the Copermittees. Requests by Copermittees must be made to the Executive Officer, and must be submitted during the annual review process. Requests for modifications should be incorporated, as appropriate, into the Annual Reports or other deliverables required or allowed under this Order.

1. Minor Modifications: Minor modifications to Jurisdictional Runoff Management Programs, and/or Watershed Runoff Management Programs, may be accepted by the Executive Officer where the Executive Officer finds the proposed modification complies with all discharge prohibitions, receiving water limitations, and other requirements of this Order.

2. Modifications Requiring an Amendment to this Order: Proposed modifications that are not minor require amendment of this Order in accordance with this Order's rules, policies, and procedures.

M. PRINCIPAL COPERMITTEE RESPONSIBILITIES

Within 180 days of adoption of this Order, the Copermittees must designate the Principal Copermittee and notify the Regional Board of the name of the Principal Copermittee. The Principal Copermittee must, at a minimum:

1. Serve as liaison between the Copermittees and the Regional Board on general permit issues, and when necessary and appropriate, represent the Copermittees before the Regional Board.
2. Coordinate permit activities among the Copermittees and facilitate collaboration on the development and implementation of programs required under this Order.
3. Integrate individual Copermittee documents and reports into single unified documents and reports for submittal to the Regional Board as required under this Order.
4. Produce and submit documents and reports as required by section K of this Order and Receiving Waters and MS4 Discharge Monitoring and Reporting Program No. R9-2009-0002 in Attachment E of this Order.

N. RECEIVING WATERS AND MS4 DISCHARGE MONITORING AND REPORTING PROGRAM

Pursuant to CWC section 13267, the Copermittees must comply with all the requirements contained in Receiving Waters and MS4 Discharge Monitoring and Reporting Program No. R9-2009-0002 in Attachment E of this Order.

O. STANDARD PROVISIONS, REPORTING REQUIREMENTS, AND NOTIFICATIONS

1. Each Copermittee must comply with Standard Provisions, Reporting Requirements, and Notifications contained in Attachment B of this Order. This includes 24 hour/5 day reporting requirements for any instance of non-compliance with this Order as described in section 5.e of Attachment B.

2. All plans, reports and subsequent amendments submitted in compliance with this Order must be implemented immediately (or as otherwise specified). All submittals by Copermittees must be adequate to implement the requirements of this Order.

I, David W. Gibson, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on December 16, 2009.

David W. Gibson
Executive Officer

ATTACHMENT A

BASIN PLAN PROHIBITIONS

California Water Code Section 13243 provides that a Regional Board, in a water quality control plan, may specify certain conditions or areas where the discharge of waste or certain types of waste is not permitted. The following discharge prohibitions are applicable to any person, as defined by Section 13050(c) of the California Water Code, who is a citizen, domiciliary, or political agency or entity of California whose activities in California could affect the quality of waters of the state within the boundaries of the San Diego Region.

1. The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in California Water Code Section 13050, is prohibited.

2. The discharge of waste to land, except as authorized by waste discharge requirements or the terms described in California Water Code Section 13264 is prohibited.

3. The discharge of pollutants or dredged or fill material to waters of the United States except as authorized by a NPDES permit or a dredged or fill material permit (subject to the exemption described in California Water Code Section 13376) is prohibited.

4. Discharges of recycled water to lakes or reservoirs used for municipal water supply or to inland surface water tributaries thereto are prohibited, unless this Regional Board issues a NPDES permit authorizing such a discharge; the proposed discharge has been approved by the State Department of Health Services and the operating agency of the impacted reservoir; and the discharger has an approved fail-safe long-term disposal alternative.

5. The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the Regional Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

6. The discharge of waste in a manner causing flow, ponding, or surfacing on lands not owned or under the control of the discharger is prohibited, unless the discharge is authorized by the Regional Board.

7. The dumping, deposition, or discharge of waste directly into waters of the state, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the Regional Board.

8. Any discharge to a storm water conveyance system that is not composed entirely of "storm water" is prohibited unless authorized by the Regional Board. [The federal regulations, 40 CFR 122.26(b)(13), define storm water as storm water

runoff, snow melt runoff, and surface runoff and drainage. 40 CFR 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from fire fighting activities. [§122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

9. The unauthorized discharge of treated or untreated sewage to waters of the state or to a storm water conveyance system is prohibited.

10. The discharge of industrial wastes to conventional septic tank/subsurface disposal systems, except as authorized by the terms described in California Water Code Section 13264, is prohibited.

11. The discharge of radioactive wastes amenable to alternative methods of disposal into the waters of the state is prohibited.

12. The discharge of any radiological, chemical, or biological warfare agent into waters of the state is prohibited.

13. The discharge of waste into a natural or excavated site below historic water levels is prohibited unless the discharge is authorized by the Regional Board.

14. The discharge of sand, silt, clay, or other earthen materials from any activity, including land grading and construction, in quantities which cause deleterious bottom deposits, turbidity or discoloration in waters of the state or which unreasonably affect, or threaten to affect, beneficial uses of such waters is prohibited.

15. The discharge of treated or untreated sewage from vessels to Mission Bay, Oceanside Harbor, Dana Point Harbor, or other small boat harbors is prohibited.

ATTACHMENT B

STANDARD PROVISIONS, REPORTING REQUIREMENTS, AND NOTIFICATIONS

1. STANDARD PROVISIONS – PERMIT COMPLIANCE [40 CFR 122.41]

(a) *Duty to comply* [40 CFR 122.41(a)].

(1) The Copermittee must comply with all of the conditions of this Order. Any noncompliance constitutes a violation of the Clean Water Act (CWA) and the California Water Code (CWC) and is grounds for enforcement action, for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

(2) The Copermittee shall comply with effluent standards or prohibitions established under section 307(a) of the CWA toxic pollutants and with standards for sewage sludge use or disposal established under section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the Order has not yet been modified to incorporate the requirement.

(b) *Need to halt or reduce activity not a defense* [40 CFR 122.41(c)]. It shall not be a defense for the Copermittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this Order.

(c) *Duty to mitigate* [40 CFR 122.41(d)]. The Copermittee shall take all reasonable steps to minimize or prevent any discharge or prevent any discharge or sludge use or disposal in violation of this Order that has a reasonable likelihood of adversely affecting human health or the environment.

(d) *Proper operation and maintenance* [40 CFR 122.41(e)]. The Copermittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Copermittee to achieve compliance with the conditions of this Order. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by the Copermittee only when necessary to achieve compliance with the conditions of this Order.

(e) *Property rights* [40 CFR 122.41(g)].

(1) This Order does not convey any property rights of any sort or any exclusive privilege.
(2) The issuance of this Order does not authorize any injury to persons or property or invasion of other private rights, or any infringement of State or local law or regulations.

(f) *Inspection and entry* [40 CFR 122.41(i)]. The Copermittee shall allow the Regional Water Quality Control Board, San Diego Region (Regional Board), State Water

Resources Control Board (SWRCB), United States Environmental Protection Agency (USEPA), and/or their authorized representatives (including an authorized contractor acting as their representative), upon presentation of credentials and other documents as may be required by law, to:

(1) Enter upon the Copermittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this Order;
(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this Order;
(3) Inspect and photograph, at reasonable times, any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Order; and
(4) Sample or monitor, at reasonable times, for the purpose of assuring Order compliance or as otherwise authorized by the CWA or the CWC, any substances or parameters at any location.

(g) *Bypass* [40 CFR 122.41(m)]

(1) Definitions:

i) "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility.
ii) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities, which causes them to become inoperable, or substantial and permanent loss of natural resources that can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

(2) Bypass not exceeding limitations - The Copermittee may allow any bypass to occur which does not cause exceedances of effluent limitations, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions listed in Standard Provisions – Permit Compliance (g)(3), (g)(4) and (g)(5) below.

(3) Prohibition of Bypass - Bypass is prohibited, and the Regional Board may take enforcement action against a Copermittee for bypass, unless:

i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and
iii) The Copermittee submitted notice as required under Standard Provisions – Permit Compliance (g)(3) above.

(4) Notice

i) Anticipated bypass. If the Copermittee knows in advance of the need for a bypass, it shall submit a notice, if possible at least ten days before the date of the bypass.
ii) Unanticipated bypass. The Copermittee shall submit notice of an unanticipated bypass as required in Standard Provisions 5(e) below (24-hour notice).

(h) *Upset* [40 CFR 122.41(n)] Upset means an exceptional incident in which there is unintentional and temporary noncompliance with technology based effluent limitations because of factors beyond the reasonable control of the Copermittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

(1) Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of Standard Provisions – Permit Compliance (h)(2) below are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

(2) Conditions necessary for a demonstration of upset. A Copermittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

i) An upset occurred and that the Copermittee can identify the cause(s) of the upset;
ii) The permitted facility was at the time being properly operated;
iii) The Copermittee submitted notice of the upset as required in Standard Provisions – Permit Compliance (5)(e)(ii)(B) below (24-hour notice); and
iv) The Copermittee complied with any remedial measures required under Standard Provisions – Permit Compliance 1(c) above.

(3) Burden of Proof. In any enforcement proceeding, the Copermittee seeking to establish the occurrence of an upset has the burden of proof.

2. STANDARD PROVISIONS – PERMIT ACTION

(a) *General* [40 CFR 122.41(f)] This Order may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Copermittee for modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any Order condition.

(b) *Duty to reapply* [40 CFR 122.41(b)]. If the Copermittee wishes to continue an activity regulated by this Order after the expiration date of this Order, the Copermittee must apply for and obtain new permit.

(c) *Transfers*. This Order is not transferable to any person except after notice to the Regional Board. The Regional Board may require modification or revocation and reissuance of the Order to change the name of the Copermittee and incorporate such other requirements as may be necessary under the CWA and the CWC.

3. STANDARD PROVISIONS – MONITORING

(a) Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. [40 CFR Section 122.41 (j) (1)]

(b) Monitoring results must be conducted according to test procedures under 40 CFR Part 136, or in the case of sludge use or disposal, approved under 40 CFR Part 136 unless otherwise specified in 40 CFR Part 503 unless other test procedures have been specified in this Order [40 CFR Section 122.41(j)(4)][40 CFR Section 122.44(i)(1)(iv)].

4. STANDARD PROVISIONS – RECORDS

(a) Except for records of monitoring information required by this Order related to the Copermittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five years (or longer as required by 40 CFR Part 503), the Copermittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this Order, and records of all data used to complete the application for this Order, for a period of at least three (3) years from the date of the sample, measurement, report or application, This period may be extended by request of the Regional Water Board Executive Officer at any rime [40 CFR Section 122.41(j)(2)].

(b) *Records of monitoring information* [40 CFR 122.41(j) (3)] shall include:

(1) The date, exact place, and time of sampling or measurements;
(2) The individual(s) who performed the sampling or measurements;
(3) The date(s) analyses were performed;
(4) The individual(s) who performed the analyses;
(5) The analytical techniques or methods used; and
(6) The results of such analyses.

(c) *Claims of confidentiality* [40 CFR Section 122.7(b)] of the following information will be denied:

(1) The name and address of any permit applicant or Copermittee; and
(2) Permit applications and attachments, permits and effluent data.

5. STANDARD PROVISIONS – REPORTING

(a) *Duty to provide information* [40 CFR 122.41(h)]. The Copermittee shall furnish to the Regional Board, SWRCB, or USEPA within a reasonable time, any information which

the Regional Board, SWRCB, or USPEA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this Order or to determine compliance with this Order. Upon request, the Copermittee shall also furnish to the Regional Board, SWRCB, or USEPA, copies of records required to be kept by this Order.

(b) *Signatory and Certification Requirements* [40 CFR 122.41(k)]

(1) All applications, reports, or information submitted to the Regional Board, SWRCB, or USEPA shall be signed and certified in accordance with Standard Provisions – Reporting 5(b)ii), 5(b)iii), 5(b)iv), and 5(b) (see 40 CFR 122.22)

(2) *Applications* [40 CFR 122.22(a)(3)] All permit applications shall be signed by either a principal executive officer or ranking elected official.

(3) *Reports* [40 CFR 122.22(b)]. All reports required by this Order, and other information requested by the Regional Board, SWRCB, or USEPA shall be signed by a person described in Standard Provisions – Reporting 5(b)(2) above, or by a duly authorized representative of that person. A person is a duly authorized representative only if:

i) The authorization is made in writing by a person described in Standard Provisions-Reporting 5(b)(2) above;

ii) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.); and,

iii) The written authorization is submitted to the Regional Water Board and State Water Board.

(4) *Changes to authorization* [40 CFR Section 122.22(c)] If an authorization under Standard Provisions – Reporting 5(b)(3)of this reporting requirement is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of Standard Provisions – Reporting 5(b)(3) above must be submitted to the Regional Water Board and State Water Board prior to or together with any reports, information, or applications to be signed by an authorized representative.

(5) *Certification* [40 CFR Section 122.22(d)] Any person signing a document under Standard Provisions – Reporting 5(b)(2), or 5(b)(3) above shall make the following certification:

”I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who

manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

(c) *Monitoring reports*. [40 CFR 122.41(l)(4)]

(1) Monitoring results shall be reported at the intervals specified in the Receiving Waters and Runoff Monitoring and Reporting Program No. R9-2009-0002.

(2) Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the Regional Board or SWRCB for reporting results of mentoring of sludge use or disposal practices.

(3) If the Copermittee monitors any pollutant more frequently than required by this Order using test procedures approved under 40 CFR Part 136 or, in the case of sludge use or disposal, approved under 40 CFR Part 136 unless otherwise specified in 40 CFR Part 503, or as specified in this Order, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the Regional Board.

(4) Calculations for all limitations, which require averaging of measurements, shall utilize an arithmetic mean unless otherwise specified in this Order.

(d) *Compliance schedules*. [40 CFR Section 122.41(l)(5)] Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this Order shall be submitted no later than 14 days following each schedule date.

(e) *Twenty-four hour reporting* [40 CFR Section 122.41(l)(6)]

(1) The Copermittee shall report any noncompliance that may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the Copermittee becomes aware of the circumstances. A written submission shall also be provided within five (5) days of the time the Copermittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

(2) The following shall be included as information, which must be reported within 24 hours under this paragraph:

i) Any unanticipated bypass that exceeds any effluent limitation in the Order (See 40 CFR 122.41(g)).
ii) Any upset which exceeds any effluent limitation in this Order.

(3) The Regional Board may waive the above-required written report under this

provision on a case-by-case basis if the oral report has been received within 24 hours.

(f) *Planned changes*. [40 CFR Section 122.41(l)(1)] The Copermittee shall give notice to the Regional Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required under this provision only when:

(1) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); or

(2) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants, which are not subject to effluent limitations in this Order.

(3) The alteration or addition results in a significant change in the Copermittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing Order, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan.

(g) *Anticipated noncompliance*. [40 CFR Section 122.41(l)(7)] The Copermittee shall give advance notice to the Regional Board or SWRCB of any planned changes in the permitted facility or activity, which may result in noncompliance with Order requirements.

(h) *Other noncompliance* [40 CFR Section 122.41(l) 7)] The Copermittee shall report all instances of noncompliance not reported under Standard Provisions 5(c), 5(d), and 5(e) above, at the time monitoring reports are submitted. The reports shall contain the information listed in Standard Provision – Reporting 5(e) above.

(i) *Other information* [40 CFR Section 122.41(l)(8)] When the Copermittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Regional Board, SWRCB, or USEPA, the Copermittee shall promptly submit such facts or information.

6. STANDARD PROVISIONS – ENFORCEMENT

(a) The Regional Board is authorized to enforce the terms of this permit under several provisions of the CWC, including, but not limited to, Sections 13385, 13386, and 13387.

7. ADDITIONAL STANDARD PROVISIONS

(a) *Municipal separate storm sewer systems* [40 CFR 122.42(c)]. The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the Director under 40 CFR 122.26(a)(1)(v) must submit an annual report by the anniversary of the date of the issuance of the

permit for such system. The report shall include:

(1) The status of implementing the components of the storm water management program that are established as permit conditions;

(2) Proposed changes to the storm water management programs that are established as permit conditions. Such proposed changes shall be consistent with 40 CFR 122.26(d)(2)(iii); and

(3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under 40 CFR 122.26(d)(2)(iv) and 40 CFR 122.26(d)(2)(v);

(4) A summary of data, including monitoring data, that is accumulated throughout the reporting year;

(5) Annual expenditures and budget for year following each annual report;

(6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; and

(7) Identification of water quality improvements or degradation.

(b) *Storm water discharges* [40 CFR 122.42(d)]. The initial permits for discharges composed entirely of storm water issued pursuant to 40 CFR 122.26(e)(7) shall require compliance with the conditions of the permit as expeditiously as practicable, but in no event later than three years after the date of issuance of the permit.

(c) *Other Effluent Limitations and Standards* [40 CFR 122.44(b)(1)]. If any toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant which is present in the discharge and that standard or prohibition is more stringent than any limitation on the pollutant in this Order, the Regional Board may institute proceedings under these regulations to modify or revoke and reissue the Order to conform to the toxic effluent standard or prohibition.

(d) *Discharge is a privilege* [CWC section 13263(g)]. No discharge of waste into the waters of the State, whether or not such discharge is made pursuant to waste discharge requirements, shall create a vested right to continue such discharge. All discharges of waste into waters of the State are privileges, not rights.

(e) *Review and revision of Order* [CWC section 13263(e)]. Upon application by any affected person, or on its own motion, the Regional Board may review and revise this permit.

(f) *Termination or modification of Order* [CWC section13381]. This permit may be terminated or modified for causes, including, but not limited to, all of the following:

(1) Violation of any condition contained in this Order.
(2) Obtaining this Order by misrepresentation, or failure to disclose fully all relevant facts.
(3) A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge.

(g) *Transfers*. When this Order is transferred to a new owner or operator, such requirements as may be necessary under the CWC may be incorporated into this Order.

(h) *Conditions not stayed*. The filing of a request by the Copermittee for modification, revocation and reissuance, or termination of this Order, or a notification of planned change in or anticipated noncompliance with this Order does not stay any condition of this Order.

(i) *Availability*. A copy of this Order shall be kept at a readily accessible location and shall be available to on-site personnel at all times.

(j) *Duty to minimize or correct adverse impacts*. The Copermittees shall take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this Order, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the noncompliance.

(k) *Interim Effluent Limitations.* The Copermittee shall comply with any interim effluent limitations as established by addendum, enforcement action, or revised waste discharge requirements which have been, or may be, adopted by this Regional Board.

(l) *Responsibilities, liabilities, legal action, penalties* [CWC sections 13385 and 13387]. The Porter-Cologne Water Quality Control Act provides for civil and criminal penalties comparable to, and in some cases greater than, those provided for under the CWA.

Nothing in this Order shall be construed to protect the Copermittee from its liabilities under federal, state, or local laws.

Except as provided for in 40CFR 122.41(m) and (n), nothing in this Order shall be construed to relieve the Copermittee from civil or criminal penalties for noncompliance.

Nothing in this Order shall be construed to preclude the institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties to which the Copermittee is or may be subject to under Section 311 of the CWA.

Nothing in this Order shall be construed to preclude institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authoring preserved by Section 510 of the CWA.

(m) *Noncompliance*. Any noncompliance with this Order constitutes violation of the CWC and is grounds for denial of an application for modification of the Order (also see 40 CFR 122.41(a).

(n) *Director*. For purposes of this Order, the term “Director” used in parts of 40 CFR

incorporated into this Order by reference and/or applicable to this Order shall have the same meaning as the term "Regional Board" used elsewhere in this Order, except that in 40 CFR 122.41(h) and (l), "Director" shall mean "Regional Board, SWRCB, and USEPA."

(o) The Regional Board has, in prior years, issued a limited number of individual NPDES permits for non-storm water discharges to MS4s. The Regional Board or SWRCB may in the future, upon prior notice to the Copermittee(s), issue an NPDES permit for any non-storm water discharge (or class of non-storm water discharges) to a MS4. Copermittees may prohibit any non-storm water discharge (or class of non-storm water discharges) to a MS4 that is authorized under such separate NPDES permits.

(p) *Effective date*. This Order shall become effective on the date of its adoption provided the USEPA has no objection. If the USEPA objects to its issuance, this Order shall not become effective until such objection is withdrawn. This Order supersedes Order No. 2001-01 upon the effective date of this Order.

(q) *Expiration*. This Order expires five years after adoption.

(r) *Continuation of expired order* [23 CCR 2235.4]. After this Order expires, the terms and conditions of this Order are automatically continued pending issuance of a new permit if all requirements of the federal NPDES regulations on the continuation of expired permits (40 CFR 122.6) are complied with.

(s) *Applications*. Any application submitted by a Copermittee for reissuance or modification of this Order shall satisfy all applicable requirements specified in federal regulations as well as any additional requirements for submittal of a Report of Waste Discharge specified in the CWC and the California Code of Regulations.

(t) *Confidentiality*. Except as provided for in 40 CFR 122.7, no information or documents submitted in accordance with or in application for this Order will be considered confidential, and all such information and documents shall be available for review by the public at the Regional Board office.

(u) *Severability*. The provisions of this Order are severable, and if any provision of this Order, or the application of any provisions of this Order to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this Order shall not be affected thereby.

(v) R*eport submittal*. The Copermittee shall submit reports and provide notifications as required by this Order to the following:

NORTHERN WATERSHED UNIT
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
9174 SKY PARK COURT, SUITE 100
SAN DIEGO CA 92123-4340
Telephone: (858) 467-2952 Fax: (858) 571-6972

EUGENE BROMLEY
US ENVIRONMENTAL PROTECTION AGENCY
REGION IX
PERMITS ISSUANCE SECTION (W-5-1)
75 HAWTHORNE STREET
SAN FRANCISCO CA 94105

Unless otherwise directed, the Copermittee shall submit one hard copy for the official record and one electronic copy of each report required under this Order to the Regional Board and one electronic copy to the EPA.

ATTACHMENT C

ACRONYMS AND ABBREVIATIONS

ADT	Average Daily Traffic
AMAL	Average Monthly Action Level
ASBS	Area of Special Biological Significance
AST	Active Sediment Treatment
BMP	Best Management Practice
Basin Plan	Water Quality Control Plan for the San Diego Basin
BU	Beneficial Use
CASQA	California Stormwater Quality Association
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWC	California Water Code
CZARA	Coastal Zone Act Reauthorization Amendments of 1990
DAMP	Drainage Area Management Plan
DNQ	Detected, but not Quantified
EIA	Effective Impervious Area
ESAs	Environmentally Sensitive Areas
GIS	Geographic Information System
HMP	Hydromodification Management Plan
IBI	Index of Biotic Integrity
JRMP	Jurisdictional Runoff Management Plan
LID	Low Impact Development
MDAL	Maximum Daily Action Level
MEP	Maximum Extent Practicable
ML	Minimum Level
MS4	Municipal Separate Storm Sewer System
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
OCVCD	Orange County Vector Control District
Copermittees	County of Orange, the 11 incorporated cities within the County of Orange in the San Diego Region, and the Orange County Flood Control District
Regional Board	California Regional Water Quality Control Board, San Diego Region
RGOs	Retail Gasoline Outlets
ROWD	Orange County Copermittees' Report of Waste Discharge (application for NPDES reissuance)
RWLs	Receiving Water Limitations
SAL	Storm Water Action Level
SIC	Standard Industrial Classification Code
SSMP	Standard Urban Storm Water Mitigation Plan
State Board	State Water Resources Control Board
SWQPA	State Water Quality Protected Area
TMDL	Total Maximum Daily Load

USEPA	United States Environmental Protection Agency
WLA	Waste Load Allocation
WQMP	Water Quality Management Plan
WRMP	Watershed Runoff Management Plan

DEFINITIONS

Active Sediment Treatment - Using mechanical or chemical means to flocculate and remove suspended sediment from runoff from construction sites prior to discharge.

Anthropogenic Litter – Trash generated from human activities, not including sediment.

Average Monthly Action Level – the highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month.

Basin Plan – Water Quality Control Plan, San Diego Basin, Region 9, and amendments, developed by the Regional Board.

Beneficial Uses - The uses of water necessary for the survival or well being of man, plants, and wildlife. These uses of water serve to promote tangible and intangible economic, social, and environmental goals. "Beneficial Uses" of the waters of the State that may be protected include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. Existing beneficial uses are uses that were attained in the surface or ground water on or after November 28, 1975; and potential beneficial uses are uses that would probably develop in future years through the implementation of various control measures. "Beneficial Uses" are equivalent to "Designated Uses" under federal law. [California Water Code Section 13050(f)].

Best Management Practices (BMPs) - Defined in 40 CFR 122.2 as schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. In the case of municipal storm water permits, BMPs are typically used in place of numeric effluent limits.

Bioassessment - The use of biological community information to evaluate the biological integrity of a water body and its watershed. With respect to aquatic ecosystems, bioassessment is the collection and analysis of samples of the benthic macroinvertebrate community together with physical/habitat quality measurements associated with the sampling site and the watershed to evaluate the biological condition (i.e. biological integrity) of a water body.

Biocriteria - Under the CWA, numerical values or narrative expressions that define a desired biological condition for a water body that are legally enforceable. The USEPA defines biocriteria as: "numerical values or narrative expressions that describe the

reference biological integrity of aquatic communities inhabiting waters of a given designated aquatic life use… (that)…describe the characteristics of water body segments least impaired by human activities."

Biofiltration - refers to practices that use vegetation and amended soils to detain and treat runoff from impervious areas. Treatment is through filtration, infiltration, adsorption, ion exchange, and biological uptake of pollutants.

Biological Integrity - Defined in Karr J.R. and D.R. Dudley. 1981. Ecological perspective on water quality goals. Environmental Management 5:55-68 as: "A balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitat of the region." Also referred to as ecosystem health.

Clean Water Act Section 402(p) [33 USC 1342(p)] - The federal statute requiring municipal and industrial dischargers to obtain NPDES permits for their discharges of storm water.

Clean Water Act Section 303(d) Water Body - An impaired water body in which water quality does not meet applicable water quality standards and/or is not expected to meet water quality standards, even after the application of technology based pollution controls required by the CWA. The discharge of runoff to these water bodies by the Copermittees is significant because these discharges can cause or contribute to violations of applicable water quality standards.

Construction Site – Any project, including projects requiring coverage under the General Construction Permit, that involves soil disturbing activities including, but not limited to, clearing, grading, disturbances to ground such as stockpiling, and excavation.

Contamination - As defined in the Porter-Cologne Water Quality Control Act, contamination is "an impairment of the quality of waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste whether or not waters of the State are affected."

Critical Channel Flow (Qc) – The channel flow that produces the critical shear stress that initiates bed movement or that erodes the toe of channel banks. When measuring Qc, it should be based on the weakest boundary material – either bed or bank.

CWA – Federal Clean Water Act

CWC – California Water Code

Daily Discharge – Daily Discharge is defined as either: (1) the total mass of the constituent discharged over the calendar day or any 24 hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g. concentration.)

The Daily Discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day, or other 24 hour period other than a day), or by the arithmetic mean of analytical results from one or more grab samples taken over the course of a day.

Detected, but not Quantified – those sample results less than the reporting level, but greater than or equal to the laboratory's Method of Detection Limit (MDL.)

Development Projects - New development or redevelopment with land disturbing activities; structural development, including construction or installation of a building or structure, the creation of impervious surfaces, public agency projects, and land subdivision.

Dilution Credit – the amount of dilution granted to a discharger in the calculation of a WQBEL, based on the allowance of a specific mixing zone. It is calculated from the dilution ratio, or determined through conducting of a mixing zone study, or modeling of the discharge and receiving water.

Dry Season – May 1 through September 30 of each year.

Dry Weather – weather is considered dry if the preceding 72 hours has been without precipitation.

Effectiveness Assessment Outcome Level 1 - Compliance with Activity-based Permit Requirements – Level 1 outcomes are those directly related to the implementation of specific activities prescribed by this Order or established pursuant to it.

Effectiveness Assessment Outcome Level 2 - Changes in Attitudes, Knowledge, and Awareness – Level 2 outcomes are measured as increases in knowledge and awareness among target audiences such as residents, businesses, and municipal employees.

Effectiveness Assessment Outcome Level 3 - Behavioral Change and BMP Implementation – Level 3 outcomes measure the effectiveness of activities in affecting behavioral change and BMP implementation.

Effectiveness Assessment Outcome Level 4 - Load Reductions – Level 4 outcomes measure load reductions which quantify changes in the amounts of pollutants associated with specific sources before and after a BMP or other control measure is employed.

Effectiveness Assessment Outcome Level 5 - Changes in Runoff and Discharge Quality – Level 5 outcomes are measured as changes in one or more specific constituents or stressors in discharges into or from MS4s.

Effectiveness Assessment Outcome Level 6 - Changes in Receiving Water Quality – Level 6 outcomes measure changes to receiving water quality resulting from discharges into and from MS4s, and may be expressed through a variety of means such as compliance with water quality objectives or other regulatory benchmarks, protection of biological integrity, or beneficial use attainment.

Enclosed Bays – Enclosed bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost bay works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays do not include inland surface waters or ocean waters.

Erosion – When land is diminished or worn away due to wind, water, or glacial ice. Often the eroded debris (silt or sediment) becomes a pollutant via storm water runoff. Erosion occurs naturally but can be intensified by land clearing activities such as farming, development, road building, and timber harvesting.

Environmentally Sensitive Areas (ESAs) - Areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Resources Control Board (Water Quality Control Plan for the San Diego Basin (1994) and amendments); State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Resources Control Board (Water Quality Control Plan for the San Diego Basin (1994) and amendments); areas designated as preserves or their equivalent under the Natural Communities Conservation Program within the Cities and County of Orange; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.

Estuaries – waters, including coastal lagoons, located at the mouth of streams that serve as areas of mixing fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and ocean water. Estuaries do not include inland surface waters or ocean waters.

Feasibility Analysis – Detailed description of the selection process for the treatment control BMPs for a Priority Development Project, including justification of why one BMP is selected over another. For a Priority Development Project where a treatment control BMP with a low removal efficiency ranking (as identified by the Model SUSMP) is proposed, the analysis shall include a detailed and adequate justification exhibiting the reasons implementation of a treatment control BMP with a higher removal efficiency is infeasible for the Priority Development Project or portion of the Priority Development Project.

Flow Duration – The long-term period of time that flows occur above a threshold that causes significant sediment transport and may cause excessive erosion damage to creeks and streams (not a single storm event duration). The simplest way to visualize this is to consider a histogram of pre- and post-project flows using long-term records of hourly data. To maintain pre-project flow duration means that the total number of hours (counts) within each range of flows in a flow-duration histogram cannot increase between the pre- and post-project condition. Flow duration within the range of geomorphologically significant flows is important for managing erosion.

GIS – Geographic Information System

Grading - The cutting and/or filling of the land surface to a desired slope or elevation.

Hazardous Material – Any substance that poses a threat to human health or the environment due to its toxicity, corrosiveness, ignitability, explosive nature or chemical reactivity. These also include materials named by the USEPA in 40 CFR 116 to be reported if a designated quantity of the material is spilled into the waters of the U.S. or emitted into the environment.

Hazardous Waste - Hazardous waste is defined as "any waste which, under Section 600 of Title 22 of this code, is required to be managed according to Chapter 30 of Division 4.5 of Title 22 of this code" [CCR Title 22, Division 4.5, Chapter 11, Article 1].

Household Hazardous Waste – Paints, cleaning products, and other wastes generated during home improvement or maintenance activities.

Hydromodification – The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, interflow and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

Illicit Connection – Any connection to the MS4 that conveys an illicit discharge.

Illicit Discharge - Any discharge to the MS4 that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from fire fighting activities [40 CFR 122.26(b)(2)].

Implementation Assessment – Assessment conducted to determine the effectiveness of Copermittee programs and activities in achieving measurable targeted outcomes, and in determining whether priority sources of water quality problems are being effectively addressed.

Inactive Slopes – Slopes on which no grading or other soil disturbing activities are conducted for 10 or more days.

Inland Surface Waters – all surface waters of the State that do not include the ocean, enclosed bays, or estuaries.

Integrated Assessment – Assessment to be conducted to evaluate whether program implementation is properly targeted to and resulting in the protection and improvement of water quality.

Jurisdictional Runoff Management Plan (JRMP) – A written description of the specific jurisdictional runoff management measures and programs that each Copermittee will implement to comply with this Order and ensure that storm water pollutant discharges in runoff are reduced to the MEP and do not cause or contribute to a violation of water quality standards.

Low Impact Development (LID) – A storm water management and land development strategy that emphasizes conservation and the use of on-site natural features integrated

with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions.

Maximum Daily Action Level (MDAL) – is the highest allowable daily discharge of a pollutant, over a calendar day (or 24 hour period). For pollutants with action levels expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with action levels expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

Maximum Extent Practicable (MEP) – The technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) for storm water that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) in combination with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than BAT. A definition for MEP is not provided either in the statute or in the regulations. Instead the definition of MEP is dynamic and will be defined by the following process over time: municipalities propose their definition of MEP by way of their runoff management programs. Their total collective and individual activities conducted pursuant to the runoff management programs becomes their proposal for MEP as it applies both to their overall effort, as well as to specific activities (e.g., MEP for street sweeping, or MEP for MS4 maintenance). In the absence of a proposal acceptable to the Regional Board, the Regional Board defines MEP.

In a memo dated February 11, 1993, entitled "Definition of Maximum Extent Practicable," Elizabeth Jennings, Senior Staff Counsel, SWRCB addressed the achievement of the MEP standard as follows:

> "*To achieve the MEP standard, municipalities must employ whatever Best Management Practices (BMPs) are technically feasible (i.e., are likely to be effective) and are not cost prohibitive. The major emphasis is on technical feasibility. Reducing pollutants to the MEP means choosing effective BMPs, and rejecting applicable BMPs only where other effective BMPs will serve the same purpose, or the BMPs would not be technically feasible, or the cost would be prohibitive. In selecting BMPs to achieve the MEP standard, the following factors may be useful to consider:*
>
> *a. Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?*
> *b. Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?*
> *c. Public Acceptance: Does the BMP have public support?*
> *d. Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?*
> *e. Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc?*
>
> *The final determination regarding whether a municipality has reduced pollutants*

to the maximum extent practicable can only be made by the Regional or State Water Boards, and not by the municipal discharger. If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit derived, it would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs that would address a pollutant source, or to pick a BMP base solely on cost, which would be clearly less effective. In selecting BMPs the municipality must make a serious attempt to comply and practical solutions may not be lightly rejected. In any case, the burden would be on the municipal discharger to show compliance with its permit. After selecting a menu of BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented."

Minimum Level – the concentration at which the entire analytical system must give a recognizable signal and acceptable calibration point. The ML is the concentration in a sample that is equivalent to the concentration of the lowest calibration standard analyzed by a specific analytical procedure, assuming that all the method sample weights, volumes and processing steps have been followed.

Municipal Separate Storm Sewer System (MS4) – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designated or used for collecting or conveying storm water; (iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.26.

National Pollutant Discharge Elimination System (NPDES) - The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the CWA.

NOI – Notice of Intent

Non-Storm Water - All discharges to and from a MS4 that do not originate from precipitation events (i.e., all discharges from a MS4 other than storm water). Non-storm water includes illicit discharges, non-prohibited discharges, and NPDES permitted discharges.

Nuisance - As defined in the Porter-Cologne Water Quality Control Act a nuisance is "anything which meets all of the following requirements: 1) Is injurious to health, or is indecent, or offensive to the senses, or an obstruction to the free use of property, so as

to interfere with the comfortable enjoyment of life or property. 2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. 3) Occurs during, or as a result of, the treatment or disposal of wastes."

Ocean Waters – the territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the State Board's California Ocean Plan.

Order – Order No. R9-2009-0002 (NPDES No. CAS0108740)

Person - A person is defined as an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof [40 CFR 122.2].

Point Source - Any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, landfill leachate collection systems, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

Pollutant - Any agent that may cause or contribute to the degradation of water quality such that a condition of pollution or contamination is created or aggravated.

Pollution - As defined in the Porter-Cologne Water Quality Control Act: "the alteration of the quality of the waters of the State by waste, to a degree that unreasonably affects the either of the following: 1) The waters for beneficial uses; or 2) Facilities that serve these beneficial uses." Pollution may include contamination.

Pollutants of Concern – Pollutants for which water bodies are listed as impaired under CWA section 303(d), pollutants associated with the land use type of a development, and/or pollutants commonly associated with runoff. Pollutants commonly associated with runoff include total suspended solids; sediment; pathogens (e.g., bacteria, viruses, protozoa); heavy metals (e.g., copper, lead, zinc, and cadmium); petroleum products and polynuclear aromatic hydrocarbons; synthetic organics (e.g., pesticides, herbicides, and PCBs); nutrients (e.g., nitrogen and phosphorus fertilizers); oxygen-demanding substances (decaying vegetation, animal waste, and anthropogenic litter).

Pollution Prevention - Pollution prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control BMPs, treatment control BMPs, or disposal.

Post-Construction BMPs - A subset of BMPs including structural and non-structural controls which detain, retain, filter, or educate to prevent the release of pollutants to surface waters during the final functional life of developments.

Pre-Project or Pre-Development Runoff Conditions (Discharge Rates, Durations, Etc.) – Runoff conditions that exist onsite immediately before the planned development activities occur. This definition is not intended to be interpreted as that period before any human-induced land activities occurred. This definition pertains to redevelopment as well as initial development.

Principal Copermittee – County of Orange

Priority Development Projects - New development and redevelopment project categories listed in Section F.1.d(2) of Order No. R9-2009-0002.

Receiving Waters – Waters of the United States.

Receiving Water Limitations (RWLs) - Waste discharge requirements issued by the Regional Board typically include both: (1) "Effluent Limitations" (or "Discharge Limitations") that specify the technology-based or water-quality-based effluent limitations; and (2) "Receiving Water Limitations" that specify the water quality objectives in the Basin Plan as well as any other limitations necessary to attain those objectives. In summary, the "Receiving Water Limitations" provision is the provision used to implement the requirement of CWA section 301(b)(1)(C) that NPDES permits must include any more stringent limitations necessary to meet water quality standards.

Redevelopment - The creation, addition, and or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include trenching and resurfacing associated with utility work; resurfacing existing roadways; new sidewalk construction, pedestrian ramps, or bikelane on existing roads; and routine replacement of damaged pavement, such as pothole repair.

Retain – to keep or hold in a particular place, condition, or position without discharge to surface waters.

Runoff - All flows in a storm water conveyance system that consists of the following components: (1) storm water (wet weather flows) and (2) non-storm water including dry weather flows.

Sediment - Soil, sand, and minerals washed from land into water. Sediment resulting from anthropogenic sources (i.e. human induced land disturbance activities) is considered a pollutant. This Order regulates only the discharges of sediment from anthropogenic sources and does not regulate naturally occurring sources of sediment. Sediment can destroy fish-nesting areas, clog animal habitats, and cloud waters so that sunlight does not reach aquatic plants.

Shared Treatment Control BMP - BMPs used by multiple developments to infiltrate, filter, or treat the required volume or flow prior to discharge to a receiving water. This could include, for example, a treatment BMP at the end of an enclosed storm drain that collects runoff from several commercial developments.

Source Control BMP – Land use or site planning practices, or structural or nonstructural measures that aim to prevent runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between pollutants and runoff.

State Water Quality Protection Area – A nonterrestrial marine or estuarine area designated to protect marine species or biological communities from an undesirable alteration in natural water quality, including, but not limited to, areas of special biological significance that have been designated by the State Water Resources Control Board through its water quality control planning process. Areas of special biological significance are a subset of State Water Quality Protection Areas, and require special protection as determined by the State Water Resources Control Board pursuant to the California Ocean Plan adopted and reviewed pursuant to Article 4 (commencing with Section 13160) of Chapter 3 of Division 7 of the California Water Code and pursuant to the Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California (California Thermal Plan) adopted by the state board.

Storm Water – Per 40 CFR 122.26(b)(13), means storm water runoff, snowmelt runoff and surface runoff and drainage. Surface runoff and drainage pertains to runoff and drainage resulting from precipitation events.

Standard Storm Water Mitigation Plan (SSMP) – A plan developed to mitigate the impacts of runoff from Priority Development Projects.

Third Party Inspectors - Industrial and commercial facility inspectors who are not contracted or employed by a regulatory agency or group of regulatory agencies, such as the Regional Board or Copermittees. The third party inspector is not a regular facility employee self-inspecting their own facility. The third party inspector could be a contractor or consultant employed by a facility or group of businesses to conduct inspections.

Total Maximum Daily Load (TMDL) - The maximum amount of a pollutant that can be discharged into a water body from all sources (point and non-point) and still maintain water quality standards. Under CWA section 303(d), TMDLs must be developed for all water bodies that do not meet water quality standards after application of technology-based controls.

Toxicity - Adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies). The water quality objectives for toxicity provided in the Water Quality Control Plan, San Diego Basin, Region 9, (Basin Plan), state in part…"All waters shall be free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.…The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge".

Treatment Control BMP – Any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media absorption or any other physical, biological, or chemical process.

Waste - As defined in CWC Section 13050(d), "waste includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal."

Article 2 of CCR Title 23, Chapter 15 (Chapter 15) contains a waste classification system that applies to solid and semi-solid waste, which cannot be discharged directly or indirectly to water of the state and which therefore must be discharged to land for treatment, storage, or disposal in accordance with Chapter 15. There are four classifications of waste (listed in order of highest to lowest threat to water quality): hazardous waste, designated waste, non-hazardous solid waste, and inert waste.

Water Quality Assessment – Assessment conducted to evaluate the condition of non-storm water and storm water discharges, and the water bodies which receive these discharges.

Water Quality Objective - Numerical or narrative limits on constituents or characteristics of water designated to protect designated beneficial uses of the water. [California Water Code Section 13050 (h)]. California's water quality objectives are established by the State and Regional Water Boards in the Water Quality Control Plans. Numeric or narrative limits for pollutants or characteristics of water designed to protect the beneficial uses of the water. In other words, a water quality objective is the maximum concentration of a pollutant that can exist in a receiving water and still generally ensure that the beneficial uses of the receiving water remain protected (i.e., not impaired). Since water quality objectives are designed specifically to protect the beneficial uses, when the objectives are violated the beneficial uses are, by definition, no longer protected and become impaired. This is a fundamental concept under the Porter Cologne Act. Equally fundamental is Porter Cologne's definition of pollution. A condition of pollution exists when the water quality needed to support designated beneficial uses has become unreasonably affected or impaired; in other words, when the water quality objectives have been violated. These underlying definitions (regarding beneficial use protection) are the reason why all waste discharge requirements implementing the federal NPDES regulations require compliance with water quality objectives. (Water quality objectives are also called water quality criteria in the CWA.)

Water Quality Standards - The beneficial uses (e.g., swimming, fishing, municipal drinking water supply, etc.,) of water and the water quality objectives necessary to protect those uses.

Waters of the State - Any water, surface or underground, including saline waters within the boundaries of the State [CWC section 13050 (e)]. The definition of the Waters of the State is broader than that for the Waters of the United States in that all water in the State is considered to be a Waters of the State regardless of circumstances or condition. Under this definition, a MS4 is always considered to be a Waters of the State.

Waters of the United States - As defined in the 40 CFR 122.2, the Waters of the U.S. are defined as: "(a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate "wetlands;" (c) All other waters such as intrastate lakes, rivers, streams (including

intermittent streams), mudflats, sandflats, “wetlands,” sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters otherwise defined as waters of the United States under this definition: (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial seas; and (g) “Wetlands” adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area’s status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA.”

Watershed - That geographical area which drains to a specified point on a water course, usually a confluence of streams or rivers (also known as drainage area, catchment, or river basin).

Watershed Runoff Management Plan (WRMP) – A written description of the specific watershed runoff management measures and programs that each watershed group of Copermittees will implement to comply with this Order and ensure that storm water pollutant discharges in runoff are reduced to the MEP and do not cause or contribute to a violation of water quality standards.

WDRs – Waste Discharge Requirements

Wet Season – October 1 through April 30 of each year.

ATTACHMENT D

SCHEDULED SUBMITTALS SUMMARY

Submittal	Permit Section	Completion Date	Frequency
Prohibitions on dry-weather discharges listed in Section B.2	B.2	365 days after adoption and in annual reports	Annual
Submit Certified Statement of Adequate Legal Authority	E.2	365 days after adoption of the Order	One time
Flood Control Structure BMP Inventory and Evaluation	F.3.a.(4)	2nd year JRMP Annual Report	One time
Fiscal Analysis	H.3	With annual JRMP report	Annual
Updated Jurisdictional Runoff Management Plans	K.1.a	365 days after adoption of the Order	One time
Updated Watershed Workplans	K.1.b	365 days after adoption of the Order	One time
Updated model SSMP	F.1.d, K.2.a	Two years after adoption of the Order	One time
Updated local SSMPs and amended ordinances and certified statement of adequate legal authority to implement LID and hydromodification requirements	E.2, F.1.d, K.2.a	180 days after RB determination that Model SSMP is in compliance	One time
Identify and remove barriers to LID implementation	F.1.d.(4)(a)(v)	2nd year JRMP Annual Report	One time
Report of Waste Discharge	K.2.b	At least 210 days prior to expiration of this Order	One time
Submit to Principal Copermittee(s) individual JRMP Annual Reports	K.3.a.(1)	Prior to September 30, 2011 and annually thereafter (Principal Copermittee specifies date of submittal)	Annual
Principal Copermittee submits JRMP Annual Reports to Regional Board	K.3.a.(2)	September 30, 2011 and annually thereafter	Annual
Principal Copermittee submits Notification of Principal Copermittee	M	180 days after adoption of the Order	One Time
Principal Copermittee submits description of Receiving Waters Monitoring Program	Monitoring and Reporting Program (M&R Program), III.A.1	September 1, 2010 and annually thereafter	Annual
Receiving Waters and Runoff Monitoring Annual Reports	M&R Program, III.A.2	October 1, 2011 and annually thereafter	Annual
Principal Copermittee submits interim Receiving Waters Monitoring Program Annual Report	M&R Program, III.B	January 31, 2011	One Time
Hydromodification Management Plan	F.1.h.4	Draft within 2 years of adoption of the Order	One Time for Draft
Trash and Litter Impairment Special Study	M&R Program II.D.5	Draft Monitoring Protocol and Locations within 365 days of Order adoption	One Time

Jurisdictional Runoff Management Program Annual Report Checklist

In the JRMP Annual Report each Copermittee shall provide an Annual Report Checklist. The Annual Report Checklist must be no longer than 2 pages, be current as of the 1st day of the rainy season of that year, and include a signed certification statement. The Annual Report Summary Checklist must provide the following information:

Order Requirements
Were All Requirements of this Order Met?

Construction
Number of Active Sites
Number of Inactive Sites
Number of Sites Inspected
Number of Inspections
Number of Violations
Number of Construction Enforcement Actions Taken

New Development
Number of Development Plan Reviews
Number of Grading Permits Issued
Number of Projects Exempted from Interim/Final Hydromodification Requirements

Post Construction Development
Number of Priority Development Projects
Number of SUSMP Required Post-Construction BMP Inspections
Number of SUSMP Required Post-Construction BMP Violations
Number of SUSMP Required Post-Construction BMP Enforcement Actions Taken

Illicit Discharges and Connections
Number of IC/ID Inspections
Number of IC/ID Detections by Staff
Number of IC/ID Detections from the Public
Number of IC/ID Eliminations
Number of IC/ID Violations
Number of IC/ID Enforcement Actions Taken

MS4 Maintenance
Number of Inspections Conducted
Amount of Waste Removed
Total Miles of MS4 Inspected

Municipal/Commercial/Industrial
Number of Facilities
Number of Inspections Conducted
Number of Facilities Inspected
Number of Violations
Number of Enforcement Actions Taken

Attachment E

RECEIVING WATERS AND MS4 DISCHARGE MONITORING AND REPORTING PROGRAM NO. R9-2009-0002

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I. PURPOSE

A. This Receiving Waters and MS4 Discharge Monitoring and Reporting Program is intended to meet the following goals:
   1. Assess compliance with Order No. R9-2009-002;
   2. Measure and improve the effectiveness of the Copermittees' runoff management programs;
   3. Assess the chemical, physical, and biological impacts to receiving waters resulting from MS4 discharges;
   4. Characterize storm water discharges;
   5. Identify sources of specific pollutants;
   6. Prioritize drainage and sub-drainage areas that need management actions;
   7. Detect and eliminate illicit discharges and illicit connections to the MS4; and
   8. Assess the overall health of receiving waters.
   9. Provide information to implement required BMP improvements

B. In addition, this Receiving Waters and MS4 Discharges Monitoring and Reporting Program is designed to answer the following core management questions1:
   1. Are conditions in receiving waters protective, or likely to be protective, of beneficial uses?
   2. What is the extent and magnitude of the current or potential receiving water problems?
   3. What is the relative MS4 discharge contribution to the receiving water problem(s)?
   4. What are the sources of MS4 discharge that contribute to receiving water problem(s)?
   5. Are conditions in receiving waters getting better or worse?

II. MONITORING PROGRAM

A. Receiving Waters Monitoring Program

Each Copermittee must collaborate with the other Copermittees to develop, conduct, and report on a year-round watershed based Receiving Waters Monitoring Program. The monitoring program design, implementation, analysis, assessment, and reporting must be conducted

[1] Core management questions from "*Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California: A report from the Stormwater Monitoring Coalition's Model Monitoring Technical Committee.*" Technical Report No. 419. August 2004.

on a watershed basis for each of the watershed management areas. The monitoring program must be designed to meet the goals and answer the questions listed in section I above. The monitoring program must include the following components:

1. MASS LOADING STATION (MLS) MONITORING

a. Locations: The following existing mass loading stations must continue to be monitored: Laguna Canyon, Aliso Creek, San Juan Creek, Trabuco Creek, Prima Deshecha Channel, and Segunda Deshecha Channel.

b. Frequency: Each mass loading station to be monitored in a given year must be monitored twice during wet weather events and twice during dry weather flow conditions.

c. Timing: Each mass loading station must be monitored for the first wet weather event of the season which meets the USEPA's criteria as described in 40 CFR 122.21(g)(7). Monitoring of the second wet weather event must be conducted after February 1. Dry weather mass loading monitoring events must be sampled at least three months apart between May and October. If flows are not evident in September or October for the second event, then sampling must be conducted during non-rain events in the wet weather season.

d. Protocols: Protocols for mass loading sampling and analysis must be SWAMP comparable. At a minimum, analytical methods, target reporting limits, and data reporting formats should be SWAMP comparable. If the mass loading sampling and analysis are determined to be impracticable with the SWAMP standards, the Copermittees must provide explanation and discussion to this effect in the Receiving Waters and MS4 Discharge Monitoring Annual Report. Wet weather samples may be time-weighted composites, collected for the duration of the entire runoff event, where practical, consistent with methods used by the Copermittees during for the Receiving Waters Monitoring Program conducted for Regional Board Order No. R9-2002-01. Where such monitoring is not practical, such as for large watersheds with significant groundwater recharge flows, composites must be collected at a minimum during the first 3 hours of flow. Dry weather event sampling may be time-weighted composites composed of 24 discrete hourly samples, whereby the mass loads of pollutants are calculated as the product of the composite sample concentration and the total volume of water discharged past the monitoring point during the time of

sample collection.

(1) Automatic samplers must be used to collect samples from mass loading stations.
(2) Grab samples must be analyzed for temperature, pH, specific conductance, biochemical oxygen demand, oil and grease, total coliform, fecal coliform, enterococcus and for total petroleum hydrocarbons whenever a sheen is observed.

e. Copermittees must measure or estimate flow rates and volumes for each mass loading station sampling event in order to determine mass loadings of pollutants. Data from nearby USGS gauging stations may be utilized, or flow rates may be estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), Section 3.2.1.

f. In the event that the required number of events is not sampled during one monitoring year at any given station, the Copermittees must submit, with the subsequent Receiving Waters Monitoring Annual Report, a written explanation for a lack of sampling data, including streamflow data from the nearest USGS gauging station.

g. The following constituents must be analyzed for each monitoring event at each station:

Table 1. Analytical Testing for Mass Loading, Urban Stream Bioassessment (excluding bacteriological), and Ambient Coastal Receiving Waters Stations

Conventionals, Nutrients, Hydrocarbons	**Pesticides**	**Metals (Total and Dissolved)**	**Bacteriological**
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • pH • Specific Conductance • Temperature • Dissolved Oxygen • Total Phosphorus • Dissolved Phosphorus • Nitrite° • Nitrate° • Total Kjeldahl Nitrogen • Ammonia	Diazinon Chlorpyrifos *Malathion* *Carbamates** *Pyrethroids**	Arsenic Cadmium Chromium Copper Lead Nickel Selenium Zinc	Total Coliform Fecal Coliform Enterococcus

• Biological Oxygen Demand, 5-day • Chemical Oxygen Demand • Total Organic Carbon • Dissolved Organic Carbon • Methylene Blue Active Substances • Oil and Grease			
˚ Nitrate and nitrate may be combined and reported as nitrate + nitrite. * Carbamate and Pyrethroid pesticides must initially be monitored in Prima Deshecha and Segunda Deshecha watersheds. If carbamate and/or pyrethroid pesticides are found to correlate with observed acute or chronic toxicity, then that pesticide must be added to all stations displaying toxicity.			

h. Toxicity testing must be conducted for each monitoring event at each station according to the following Table 2:

Table 2. Toxicity Testing for Mass Loading, Urban Stream Bioassessment, and Ambient Coastal Receiving Waters Stations

Program Component	***Dry Weather Flows***		***Storm Water Flows***	
	Freshwater Organisms	**Estuarine & Marine Organisms**	**Freshwater Organisms**	**Estuarine & Marine Organisms**
Mass Loading	2 chronic 2 acute	1 chronic**	2 acute	2 chronic 1 acute
Urban Stream Bioassessment	2 chronic* 2 acute*	n/a	n/a	n/a
Ambient Coastal Receiving Waters	n/a	2 chronic 1 acute	n/a	2 chronic 1 acute
Sediment Toxicity Special Study	1 chronic 1 acute 1	n/a	n/a	n/a
Table Notes * Urban Stream Bioassessment on Aliso Creek must also include use of *Pimephales promelas* (fathead minnow) for chronic and acute toxicity testing. ** Dry weather toxicity monitoring at a mass loading station may be omitted if either (a) the channel flows are diverted year-round in dry weather conditions to the sanitary sewer for treatment; or (b) dry weather toxicity with marine species is occurring at an Ambient Coastal Waters Receiving station where that channel reaches the Pacific Ocean. Species Notes: 1. Freshwater acute toxicity testing must include *Hyalella azteca*.				

2. Acute toxicity for may be determined during the course of chronic toxicity monitoring per U.S. EPA protocols. 3. *Americamysis bahia* may be used as a marine test organism if *Holmesimysis costata* cannot reasonably be obtained. The use of, and justification for, of *A. bahia* must be clearly reported in each Monitoring Report.

i. The presence of acute toxicity must be determined in accordance with USEPA protocol (EPA-821-R-02-012). The presence of chronic freshwater toxicity must be determined in accordance with USEPA protocol (EPA-821-R-02-013). The presence of chronic marine toxicity must be determined in accordance with USEPA guidance EPA 600/R95/136, except for chronic mysid tests that must be conducted in accordance with USEPA protocol EPA-821-R-02-014.

2. Urban Stream Bioassessment (BA) Monitoring

Copermittees must conduct Urban Stream Bioassessment Monitoring using a triad of indicators to assess the condition of biological communities in freshwater, urban receiving waters.

a. Locations: At a minimum, the program shall consist of station identification, sampling, monitoring, and analysis of data for six bioassessment stations in order to determine the biological and physical integrity of urban streams within the County of Orange. At least one urban bioassessment station shall be located within each watershed management area. In addition to the urban stream bioassessment stations, three reference bioassessment stations shall be identified, sampled, monitored, and analyzed. Locations of reference stations must be identified according to protocols outlined in "A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams," by Ode, et al. 2005.[2]

b. Frequency: Bioassessment stations which have year round flow conditions must be monitored in May or June (to represent the influence of wet weather on the communities) or September or October (to represent the influence of dry weather flows on the communities). Copermittees shall determine when the annual sampling for stations with year round flow will occur in accordance with the purposes of sampling, as outlined in Secion I of

[2] Ode, et al. 2005. "A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams." Environmental Management. Vol. 35, No. 1, pp. 1-13.

Attachment E. Those stations that do not have year round flow shall continue to be monitored twice per year. The timing of monitoring of bioassessment stations must coincide with dry weather monitoring of mass loading stations and Inland Aquatic Habitat stations.

c. Parameters / Methods: The triad of indicators for urban stream bioassessment monitoring must include bioassessment, aquatic chemistry, and aqueous toxicity.

(1) Aquatic chemistry and aqueous toxicity must be conducted using the same parameters and methods as the mass loading station monitoring, with the addition of pyrethroid pesticides.

(2) Bioassessment analysis procedures must include calculation of the Index of Biotic Integrity (IBI) for benthic macroinvertebrates for all bioassessment stations, as outlined in "A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams," by Ode, et al. 2005.

(3) Monitoring of bioassessment stations must be conducted according to bioassessment procedures developed by the Surface Water Ambient Monitoring Program (SWAMP), as amended. [3]

(4) Monitoring of bioassessment stations must incorporate assessment of algae in addition to macroinvertebrates, using the USEPA's 1999 Rapid Bioassessment Protocols for Use in Wadeable Streams and Rivers[4] and SWAMP's Incorporating bioassessment using freshwater algae into California's Surface Water Ambient Monitoring Program (SWAMP)[5]. Assessment of freshwater algae must include algal taxonomic composition (diatoms and soft algae) and algal biomass. Future bioassessment shall incorporate algal IBI scores, when developed.

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[3] Ode, P.R.. 2007. Standard operating procedures for collecting macroinvertebrate samples and associated physical and chemical data for ambient bioassessments in California. California State Water Resources Control Board Surface Water Ambient Monitoring Program (SWAMP) Bioassessment SOP 001.

[4] USEPA, 1999. *Rapid Bioassessment Protocols for Use in Wadeable Streams and Rivers*. EPA-841-B-99-002.

[5] Fetscher, E. A., and K. McLaughlin. 2008. Incorporating bioassessment using freshwater algae into California's Surface Water Ambient Monitoring Program (SWAMP). Southern California Coastal Water Research Project. Costa Mesa, CA

d. A qualified professional environmental laboratory must perform all sampling, laboratory, quality assurance, and analytical procedures.

3. FOLLOW-UP ANALYSIS AND ACTIONS

When results from the required monitoring indicate MS4 discharge induced degradation at a mass loading station, bioassessment, or dry weather discharge station, Copermittees within the watershed must evaluate the extent and causes of MS4 discharge pollution in receiving waters and prioritize and implement management actions to eliminate or reduce sources. Toxicity Identification Evaluations (TIEs) must be conducted to determine the cause of toxicity as outlined in Table 3 below. Other follow-up activities, which must be conducted by the Copermittees, are also identified in Table 3. Once the cause of toxicity has been identified by a TIE, the Copermittees must perform source identification projects as needed and implement the measures necessary to reduce or eliminate the pollutant discharges and abate the sources causing the toxicity.

Table 3. Triad Approach to Determining Follow-Up Actions[6]

	Chemistry	Toxicity	Benthic Alteration	Example Conclusions	Possible Actions or Decisions
1.	Exceedance of water quality objectives	Evidence of toxicity	Indications of alteration	Strong evidence of pollution-induced degradation	Use TIE to identify contaminants of concern, based on TIE metric Initiate upstream source identification as a high priority
2.	No persistent exceedances of water quality objectives	No evidence of toxicity	No indications of alteration	No evidence of current pollution-induced degradation Potentially harmful pollutants not yet concentrated enough to cause visible impact	No immediate action necessary Conduct periodic broad scans for new and/or potentially harmful pollutants
3.	Exceedance of water quality objectives	No evidence of toxicity	No indications of alteration	Contaminants are not bioavailable Test organisms not sensitive to problem pollutants	TIE would not provide useful information with no evidence of toxicity Continue monitoring for toxic and benthic impacts Initiate upstream source identification as a low priority Consider whether different or additional test organisms should be evaluated
4.	No persistent exceedances of water quality objectives	Evidence of toxicity	No indications of alteration	Unmeasured contaminant(s) or conditions have the potential to cause degradation Pollutant causing toxicity at very low levels	Recheck chemical analyses; verify toxicity test results Consider additional advanced chemical analyses Use TIE to identify contaminants of concern, based on TIE metric Initiate upstream source identification as a medium priority
5.	No persistent exceedances of water quality objectives	No evidence of toxicity	Indications of alteration	Alteration may not be due to toxic contamination Test organisms not sensitive to problem pollutants	No action necessary due to toxic chemicals Initiate upstream source identification (for physical sources) as a high priority Consider whether different or additional test organisms should be evaluated
6.	Exceedance of water quality objectives	Evidence of toxicity	No indications of alteration	Toxic contaminants are bioavailable, but in situ effects are not demonstrable Benthic analysis not sensitive enough to detect impact Potentially harmful pollutants not yet concentrated enough to change community	Determine if chemical and toxicity tests indicate persistent degradation Recheck benthic analyses; consider additional data analyses If recheck indicates benthic alteration, perform TIE to identify contaminants of concern, based on TIE metric Initiate upstream source identification as a high priority If recheck shows no effect, use TIE to identify contaminants of concern, based on TIE metric Initiate upstream source identification as a medium priority
7.	No persistent exceedances of water quality objectives	Evidence of toxicity	Indications of alteration	Unmeasured toxic contaminants are causing degradation Pollutant causing toxicity at very low levels Benthic impact due to habitat disturbance, not toxicity	Recheck chemical analyses and consider additional advanced analyses Use TIE to identify contaminants of concern, based on TIE metric Initiate upstream source identification as a high priority Consider potential role of physical habitat disturbance
8.	Exceedance of water quality objectives	No evidence of toxicity	Indications of alteration	Test organisms not sensitive to problem pollutants Benthic impact due to habitat disturbance, not toxicity	TIE would not provide useful information with no evidence of toxicity Initiate upstream source identification as a high priority Consider whether different or additional test organisms should be evaluated Consider potential role of physical habitat disturbance

4. AMBIENT COASTAL RECEIVING WATERS MONITORING (ACRW)

Copermittees must continue to conduct the Ambient Coastal Receiving Waters Monitoring (ACRW) program to assess the impact of MS4 discharge to ecologically-sensitive coastal areas by analyzing water chemistry and aqueous toxicity in both dry and wet weather and the magnitude of storm water discharge plumes to these areas. Copermittees must prioritize locations for further study and conduct special investigations.

[6] Orange County Storm Water Program, 2006. Report of Waste Discharge (San Diego Region), Section 11.

a. Locations: Copermittees must assess the existing Ambient Coastal Receiving Waters Monitoring (ACRW) stations to determine whether all ecologically-sensitive areas are represented. Stations must be established within all Areas of Special Biological Significance (ASBS) and Marine Life Refuges that receive significant MS4 discharges.

   (1) Dana Point Harbor must continue to be monitored. ACRW monitoring in Dana Point Harbor may be suspended as long as the Harbor is being monitored pursuant to the Regional Harbor Monitoring Program[7] and follow-up investigations are conducted when appropriate based on guidance from the Storm Water Monitoring Coalition.

b. Parameters: Aquatic chemistry and aqueous toxicity must be conducted using the same parameters and methods as the mass loading station monitoring.

c. ACRW monitoring must be concurrent with the mass loading station monitoring whenever feasible.

d. Special investigations Ambient Coastal Receiving Waters: Special investigations must be designed and conducted to most effectively answer each of questions 1-5 of section I.B above, with an emphasis on answering question 4.

5. REGIONAL MONITORING PROGRAMS

a. Regional Bacteria Monitoring

   The Copermittees shall participate in the development and implementation of monitoring for the collaborative regional bacteria monitoring program. It is expected that the regional monitoring will allow for a more effective and efficient bacteria monitoring program. The regional monitoring plan must be submitted to the Executive Officer for review and approval. Documentation of participation and monitoring shall be included in the annual report.

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[7] On July 24, 2003, the Regional Board required the County of Orange to participate in an Investigative Order to comprehensively assess the receiving water conditions of Dana Point Harbor. The Regional Harbor Monitoring Program is described in the *Regional Technical Report: Harbor Monitoring Program for San Diego Region San Diego Bay, Mission Bay, Oceanside Harbor, and Dana Point Harbor,* MEC Analytical Systems and Brock Bernstein, February 2004.

b. Regional Monitoring Programs

The Regional Board recognizes the importance and advantages of participation by Copermittees in Regional Monitoring Programs. As such, the Copermittees may propose participation in additional regional monitoring programs to supplement and/or replace existing monitoring requirements. The regional monitoring plan must be submitted to the Executive Officer for review and approval. Documentation of participation and monitoring shall be included in the annual report.

B. Wet Weather MS4 Discharge Monitoring

Each Copermittee must collaborate with the other Copermittees to develop, conduct, and report on a year-round watershed based Wet Weather MS4 Discharge Monitoring Program. The monitoring program design, implementation, analysis, assessment, and reporting must be conducted on a watershed basis for each of the hydrologic units. The monitoring program must be designed to meet the goals and answer the questions listed in section I above. The monitoring program must include the following components;

1. MS4 OUTFALL MONITORING

The Copermittees must collaborate to develop and implement a monitoring program to characterize pollutant discharges from MS4 outfalls in each watershed during wet weather. The program must include rationale and criteria for selection of outfalls to be monitored. The program must, at a minimum, include collection of samples for those pollutants causing or contributing to violations of water quality standards within the watershed. This monitoring program must be implemented within each watershed and must begin no later than the 2010-2011 monitoring year.

a. The program must comply with Section D of the Order for Storm Water Action Levels (SALs). Samples must be collected during the first 24 hours of the storm water discharge or for the entire storm water discharge if it is less than 24 hours.

1. Grab samples may be utilized only for pH, indicator bacteria, DO, temperature and hardness.

2. All other constituents must be sampled using 24 hour composite samples or for the entire storm water discharge if the storm event is less than 24 hours.

b. Sampling to compare MS4 outfall discharges with total metal SALs must include a measurement of receiving water hardness at each outfall. If a total metal concentration exceeds a SAL, that concentration must be compared to the California Toxic Rule criteria and the USEPA 1 hour maximum concentration for the detected level of receiving water hardness associated with that sample. If it is determined that the sample's total metal concentration for that specific pollutant exceeds the SAL but does not exceed the applicable 1 hour criteria for the measured level of hardness, then the SAL shall be considered not exceeded for that measurement.

2. SOURCE IDENTIFICATION MONITORING

The Copermittees must collaborate to develop and implement a monitoring program to identify sources of pollutants causing the priority water quality problems within each watershed. The monitoring program must include focused monitoring which moves upstream into each watershed as necessary to identify sources. This monitoring program must be implemented within each watershed and must begin no later than the 2010-2011 monitoring year.

C. Non-Storm Water Dry Weather Action Levels

Each Copermittee must collaborate with the other Copermittees to conduct, and report on a year-round watershed based Dry Weather Non-storm Water MS4 Discharge Monitoring Program. The monitoring program implementation, analysis, assessment, and reporting must be conducted on a watershed basis for each of the hydrologic units. The monitoring program must be designed to assess compliance with non-storm water dry weather action levels in section C of this Order, adopted dry weather Total Maximum Daily Loads Waste Load Allocations and assessment of the contribution of dry weather flows to 303(d) listed impairments. The monitoring program must include the following components;

Each Copermittee's program must be designed to determine levels of pollutants in effluent discharges from the MS4 into receiving waters. Each Copermittee must conduct the following dry weather field screening and analytical monitoring tasks:

a. Dry Weather Non-storm Water Effluent Analytical Monitoring Stations

(1) Stations must be major outfalls. Major outfalls chosen must include outfalls discharging to inland surface waters; to bays, harbors and lagoons/estuaries; and to the surf zone. Other outfall points (or any other point of access such as manholes) identified by the Copermittees as potential high risk sources of polluted effluent or as identified under Section C.3.e shall be sampled.

(2) Each Copermittee must clearly identify each dry weather effluent analytical monitoring station on its MS4 Map as either a separate GIS layer or a map overlay hereafter referred to as a Dry Weather Non-storm Water Effluent Analytical Stations Map.

b. Develop Dry Weather Non-storm Water Effluent Analytical Monitoring Procedures

Each Copermittee must develop and/or update written procedures for effluent analytical monitoring (these procedures must be consistent with 40 CFR part 136), including field observations, monitoring, and analyses to be conducted. At a minimum, the procedures must meet the following guidelines and criteria:

(1) Determining Sampling Frequency: Effluent analytical monitoring must be conducted at major outfalls and identified stations. The Copermittees must sample a representative number of major outfalls and identified stations. The sampling must be done to assess compliance with dry weather non-storm water action levels pursuant to section C of this Order. All monitoring conducted must be preceded by a minimum of 72 hours of dry weather.

(2) If ponded MS4 discharge is observed at a monitoring station, make observations and collect at least one (1) grab sample. If flow is evident a 1 hour composite sample may be taken. Record flow estimation (i.e., width of water surface, approximate depth of water, approximate flow velocity, flow rate).

(3) Effluent samples shall undergo analytical laboratory analysis for constituents in: *Table 1. Analytical Testing for Mass Loading, Urban Stream Bioassessment, and Ambient Coastal Receiving Waters Stations* and for those constituents with action levels under Section C of this Order. Effluent samples must also undergo analysis for Chloride, Sulfate and Total Dissolved Solids.

(4) If the station is dry (no flowing or ponded MS4 discharge), make and record all applicable observations.

(5) Develop and/or update criteria for dry weather non-storm water effluent analytical monitoring results:

(a) Criteria must include action levels in Section C of this Order.
(b) Criteria must include evaluation of LC_{50} levels for toxicity to appropriate test organisms

(6) Develop and/or update procedures for source identification follow up investigations in the event of exceedance of dry weather non-storm water effluent analytical monitoring result criteria. These procedures must be consistent with procedures required in section F.4.d and F.4.e. of this Order.

(7) Develop and/or update procedures to eliminate detected illicit discharges and connections. These procedures must be consistent with the non-storm water dry weather action levels in Section C and with each Copermittees' Illicit Discharge and Elimination component of its Jurisdictional Runoff Management Plan as discussed in section F.4 and F.4.e. of this Order.

c. Conduct Dry Weather Non-storm Water Effluent Analytical Monitoring

The Copermittees must commence implementation of dry weather effluent analytical monitoring under the requirements of this Order no later than May 1, 2011. If monitoring indicates an illicit connection or illegal discharge, conduct the follow-up investigation and elimination activities as described in submitted dry weather field screening and analytical monitoring procedures and found in sections C, F.4.d and F.4.e of Order No. R9-2009-0002.

(a) Until the dry weather non-storm water effluent analytical monitoring program is implemented under the requirements of this Order, each Copermittee must continue to implement dry weather field screening and analytical monitoring as it was most recently implemented pursuant to Order No. 2002-01.

D. Special Studies

1. Aliso Creek bacteria investigation: Each Copermittee within the Aliso Creek watershed must implement the Aliso Creek 13225 Directive Revised Monitoring Program Design – Integration with NPDES Program8 (December 2004). The Copermittees must include that monitoring program into the overall monitoring and reporting program.

2. The Copermittees must conduct special studies, including any monitoring required for TMDL development and implementation, as directed by the Executive Officer. A TMDL Monitoring Plan must be developed to comply with TMDL Resolution No. R9-2008-0027. The monitoring plan must be submitted within 365 days of Order adoption.

3. Stormwater Monitoring Coalition Regional Monitoring of Southern California's Coastal Watersheds:

   The Copermittees must implement the monitoring program developed by the Stormwater Monitoring Coalition for Regional Monitoring of the Southern California's Coastal Watersheds within the San Juan Hydrologic Unit. Each Copermittee must evaluate the results of the monitoring program within and downstream of its jurisdiction and integrate the results into program assessments and modifications.

4. Sediment Toxicity Study

   Copermittees must develop, submit to the Regional Board for review, and implement an approved special study which will investigate the toxicity of sediment in urban streams. The Study must be submitted within 24 months of adoption of Order R9-2009-0002. After Regional

[8] On October 12, 2005, the Regional Board accepted the revised Aliso Creek watershed bacteria monitoring plan proposal from the MS4 Copermittees. The Regional Board concluded that the scope of the current bacteria monitoring in the watershed was no longer warranted and that the proposed changes would constitute an effective interim program until adoption in the future of a Total Maximum Daily Load, requiring a bacteria reduction and assessment program for the watershed. In addition, the Regional Board recognized that as a result of reduced monitoring costs, the municipalities expect to direct additional resources toward implementation of management practices to reduce indicator bacteria and pathogens.

Board review, the Sediment Toxicity Study must be implemented in conjunction with the Urban Stream Bioassesment Monitoring and, at a minimum, contain the following:

a. Locations: At a minimum, 4 bioassessment locations must be sampled, including 1 reference site.

b. Frequency: At a minimum, sampling must occur once per year at each site for at least 2 years. Sampling must be done in conjunction with the bioassessment sampling required under Section II.A.2 of the Monitoring and Reporting Program of this Order.

c. Parameters/Methods: At a minimum, sediment toxicity analysis shall include the measurement of metals, pyrethroids and organochlorine pesticides. Analysis must include estimates of bioavailability based upon sediment grain size, organic carbon and receiving water temperature. Acute and chronic toxicity testing must be done using Hyalella azteca in accordance with Table 2.

d. Results: Results and a Discussion shall be included in the Monitoring Annual Report. The Discussion must include an assessment of the relationship between observed IBI scores under Section II.A.2 and all variables measured.

5. Trash and Litter Impairment Investigation

Copermittees must develop and implement a special investigation beginning no later than 2 years following the adoption of this Order to assess trash (including litter) as a pollutant within receiving waters on a watershed based scale. Litter is defined in California Government Code 68055.1g as “litter means all improperly discarded waste material, including, but not limited to, convenience food, beverage, and other product packages or container constructed of steel, aluminum, glass, paper, plastic and other natural and synthetic ,materials, thrown or deposited on lands and waters of the state, but not including the properly discarded waste of the primary processing of agriculture, mining, logging, sawmilling, or manufacturing.” A lead Copermittee may be selected for each watershed, and will be responsible for the following:

a. Locations: The lead Copermittee will identify suitable sampling locations within each watershed.

b. Frequency: Trash at each location shall be monitored a minimum of twice during the wet season following a qualified monitoring storm event (minimum of 0.1 inches preceded by 72 hours of dry weather) and twice during the dry season.

c. Protocol: The lead Copermittee for each watershed shall use the Final Monitoring Workplan for the Assessment of Trash in San Diego County Watersheds and A Rapid Trash Assessment Method Applied to Waters of the San Francisco Bay Region to develop a monitoring protocol for each Watershed. The draft monitoring protocol, including sampling locations and frequency, shall be submitted to the Regional Board for review no later than 365 days following the adoption of this Order. Although sampling must occur on a watershed basis, a County-wide protocol may be developed that incorporates each individual watershed.

d. Results and Discussion from the Trash and Litter Impairment Study shall be included in the Monitoring Annual Report.

E. Monitoring Provisions

All monitoring activities must meet the following requirements:

1. Where procedures are not otherwise specified in this Receiving Waters Monitoring and Reporting Program, sampling, analysis and quality assurance/quality control must be conducted in accordance with the Quality Assurance Management Plan (QAMP) for the State of California's Surface Water Ambient Monitoring Program (SWAMP), adopted by the State Water Resources Control Board (SWRCB).

2. Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity [40 CFR 122.41(j)(1)].

3. The Copermittees must retain records of all monitoring information, including all calibration and maintenance of monitoring instrumentation, copies of all reports required by this Order, and records of all data used to complete the Report of Waste Discharge and application for this Order, for a period of at least five (5) years from the date of the sample, measurement, report, or application. This period may be extended by request of the Regional Board or USEPA at any time and must be extended during the course of any unresolved litigation regarding this discharge. [40 CFR 122.41(j)(2), CWC section 13383(a)]

4. Records of monitoring information must include [40 CFR 122.41(j)(3)]:

    a. The date, exact place, and time of sampling or measurements;
    b. The individual(s) who performed the sampling or measurements;
    c. The date(s) analyses were performed;
    d. The individual(s) who performed the analyses;
    e. The analytical techniques or methods used; and
    f. The results of such analyses.

5. All sampling, sample preservation, and analyses must be conducted according to test procedures approved under 40 CFR part 136, unless other test procedures have been specified in this Receiving Waters Monitoring and Reporting Program or approved by the Executive Officer [40 CFR 122.41(j)(4)].

6. The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this Order must, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than two years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than four years, or both. [40 CFR 122.41(j)(5)]

7. Calculations for all limitations which require averaging of measurements must utilize an arithmetic mean unless otherwise specified in this Receiving Waters Monitoring and Reporting Program. [40 CFR 122.41(l)(4)(iii)]

8. All chemical, bacteriological, and toxicity analyses must be conducted at a laboratory certified for such analyses by the California Department of Health Services or a laboratory approved by the Executive Officer.

9. For priority toxic pollutants that are identified in the California Toxics Rule (CTR) (65 Fed. Reg. 31682), the Copermittees must instruct its laboratories to establish calibration standards that are equivalent to or lower than the Minimum Levels (MLs) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP). If a Copermittee can demonstrate that a particular ML is not attainable, in accordance with procedures set forth in 40 CFR 136, the lowest quantifiable concentration of the lowest calibration standard analyzed by a specific analytical procedure (assuming that all the method

specified sample weights, volumes, and processing steps have been followed) may be used instead of the ML listed in Appendix 4 of the SIP. The Copermittee must submit documentation from the laboratory to the Regional Board for approval prior to raising the ML for any priority toxic pollutant.

10. The Regional Board Executive Officer or the Regional Board may make revisions to this Receiving Waters and MS4 Discharge Monitoring and Reporting Program at any time during the term of Order No. R9-2009-002 and may include a reduction or increase in the number of parameters to be monitored, locations monitored, the frequency of monitoring, or the number and size of samples collected.

11. The Clean Water Act provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance must, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than six months per violation, or by both. [40 CFR 122.41(k)(2)]

12. Monitoring must be conducted according the USEPA test procedures approved under 40 CFR 136, "Guidelines Establishing Test Procedures for Analysis of Pollutants under the Clean Water Act" as amended, unless other test procedures have been specified in this Receiving Waters and MS4 Discharge Monitoring and Reporting Program, in Order No. R9-2009-002, or by the Executive Officer.

13. If the discharger monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR part 136, unless otherwise specified in the Order, the results of this monitoring must be included in the calculation and reporting of the data submitted in the reports requested by the Regional Board. [40 CFR 122.41(l)(4)(ii)]

III. REPORTING PROGRAM

A. Monitoring Reporting

1. Planned Monitoring Program: The Principal Copermittee must submit a description of the Receiving Waters and MS4 Discharge Monitoring Program to be implemented for every monitoring year. The submittals must begin on <u>September 1, 2010</u>, and continue every year thereafter.

The submittals must describe all monitoring to be conducted during the upcoming monitoring year. For example, the September 1, 2010. submittal must describe the monitoring to be conducted from October 1, 2010 through September 30, 2011.

2. Monitoring Annual Report: The Principal Copermittee must submit the Receiving Waters and MS4 Discharge Monitoring Annual Report to the Regional Board on October 1 of each year, beginning on October 1, 2011. Receiving Waters and MS4 Discharge Monitoring Annual Reports must meet the following requirements:

   a. Annual monitoring reports must include the data/results, methods of evaluating the data, graphical summaries of the data, and an explanation/discussion of the data for each monitoring program component.

   b. Annual monitoring reports must include a watershed-based analysis of the findings of each monitoring program component. Each watershed-based analysis must include:

      (1) Identification and prioritization of water quality problems within each watershed.
      (2) Identification and description of the nature and magnitude of potential sources of the water quality problems within each watershed.
      (3) Exhibition of pollutant load and concentration increases or decreases at each mass loading and temporary watershed assessment station.
      (4) Evaluation of pollutant loads and concentrations at mass loading and temporary watershed assessment stations with respect to land use, population, sources, and other characteristics of watersheds using tools such as multiple linear regression, factor analysis, and cluster analysis.
      (5) Identification of links between source activities/conditions and observed receiving water impacts.
      (6) Identification of recommended future monitoring to identify and address sources of water quality problems.
      (7) Results and discussion of any TIE conducted, together with actions that will be implemented to reduce the discharge of pollutants and abate the sources causing the toxicity.

   c. Aliso Creek Bacteria Investigation: Annual monitoring reports for the Aliso Creek Bacteria Investigation must contain the following information:

(1) Water quality data and assessment. The report must contain all data collected and an assessment of compliance with applicable water quality standards for each monitoring station;

(2) Program Assessment. A description and assessment of each municipality's program implemented within the high-priority storm drain locations to reduce storm water discharges of indicator fecal bacteria/pathogens. Water quality monitoring alone is not sufficient to assess progress of the municipal programs. Municipalities must demonstrate each year that their programs are effective and resulting in a reduction of bacteria sources.

(a) For structural and nonstructural management practices implemented, the assessment must contain a description of the practice, capital and maintenance costs, expectations for effectiveness, date implemented, and any observed results.

(b) For structural and nonstructural management practices implemented, the assessment must contain a description of the practice, capital and maintenance costs, expectations for effectiveness, date implemented, and any observed results

d. Annual monitoring reports must include discussions for each watershed which answer each of the management questions listed in section I.B of this Receiving Waters Monitoring and Reporting Program.

e. Annual monitoring reports must identify how each of the goals listed in section I.A of this Receiving Waters Monitoring and Reporting Program has been addressed by the Copermittees' monitoring.

f. Annual monitoring reports must include identification and analysis of any long-term trends in storm water or receiving water quality. Trend analysis must use nonparametric approaches, such as the Mann-Kendall test, including exogenous variables in a multiple regression model, and/or using a seasonal nonparametric trend model, where applicable.

g. Annual monitoring reports must provide an estimation of total pollutant loads (wet weather loads plus dry weather loads) due to MS4 Discharge for each of the watersheds specified in Table 3 of Order No. R9-2009-0002.

h. Annual monitoring reports must, for each monitoring program component listed above, include an assessment of compliance with applicable water quality standards.

i. Annual monitoring reports must describe monitoring station locations by latitude and longitude coordinates, frequency of sampling, quality assurance/quality control procedures, and sampling and analysis protocols.

j. Annual monitoring reports must use a standard report format and must include the following:

(1) A stand alone comprehensive executive summary addressing all sections of the monitoring report;
(2) Comprehensive interpretations and conclusions; and
(3) Recommendations for future actions.

k. All monitoring reports submitted to the Principal Copermittee or the Regional Board must contain the certified perjury statement described in Attachment B of this Order No. R9-2009-0002.

l. Annual monitoring reports must be reviewed prior to submittal to the Regional Board by a committee of the Copermittees (consisting of no less than three members).

m. Annual monitoring reports must be submitted in both electronic and paper formats. Electronic formats must be CEDEN or SWAMP-uploadable.[9]

3. The Principal Copermittee must submit by July 1, 2010, a detailed description of the monitoring programs to be implemented under requirement II.B.1 of Receiving Waters and MS4 Discharge Monitoring and Reporting Program No. R9-2009-002. The description must identify and provide the rationale for the constituents monitored, locations of monitoring, frequency of monitoring, and analyses to be conducted with the data generated.

4. Monitoring programs and reports must comply with section II.D of Receiving Waters and MS4 Discharge Monitoring and Reporting Program No. R9-2009-002 and Attachment B of Order No. R9-2009-002.

[9] For updates to the SWAMP templates and formats, see http://www.waterboards.ca.gov/swamp.

5. Following completion of an annual cycle of monitoring in October, the Copermittees must make the monitoring data and results available to the Regional Board at the Regional Board's request.

B. Interim Reporting Requirements

For the October 2009 to October 2010 monitoring period, the Principal Copermittee must submit the Receiving Waters Monitoring Annual Report by January 31, 2011. The Receiving Waters Monitoring Annual Report must address the monitoring conducted to comply with the requirements of Order No. 2002-001.

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Attachment F

SOURCE DATA

I. STORM WATER ACTION LEVELS 2

II. NON-STORM WATER NUMERIC ACTION LEVELS 9

I. STORM WATER ACTION LEVELS

N02+NO3 (mg/l)	Phosphorous Total (mg/l)	Cadmium Total (ug/l)	Copper Total (ug/l)	Lead Total (ug/l)	Nickel Total (ug/l)	Zinc Total (ug/l)	Turbidity (NTU)
4.70	7.90	9.80	800.00	660.00	120.00	22500.00	10
4.20	7.19	6.00	340.00	620.00	110.00	18000.00	15
3.90	4.96	6.00	320.00	540.00	100.00	11000.00	15
3.90	4.50	6.00	270.00	520.00	100.00	9970.00	16
3.60	4.40	6.00	244.00	460.00	95.00	9100.00	22
3.60	4.24	6.00	230.00	450.00	89.00	8800.00	23
3.60	2.59	5.30	220.00	450.00	87.00	6500.00	23
3.50	2.59	5.00	220.00	440.00	84.00	5500.00	24
3.30	2.50	4.10	210.00	430.00	81.00	5000.00	24
3.30	2.50	4.00	210.00	400.00	75.00	4900.00	30
3.10	2.50	4.00	209.00	380.00	71.00	4600.00	31
3.00	2.27	4.00	209.00	360.00	69.00	4300.00	33
2.96	2.00	4.00	200.00	350.00	68.00	3800.00	36
2.90	2.00	4.00	200.00	330.00	68.00	3800.00	36
2.70	2.00	4.00	200.00	320.00	64.00	3400.00	39
2.70	2.00	3.90	200.00	320.00	63.00	3390.00	40
2.60	1.90	3.80	200.00	320.00	60.00	3100.00	45
2.60	1.90	3.40	180.00	310.00	60.00	2500.00	50
2.60	1.80	3.40	180.00	310.00	59.00	2200.00	50
2.50	1.80	3.20	166.00	310.00	59.00	2100.00	60
2.50	1.70	3.10	163.00	310.00	58.00	1829.00	61
2.32	1.70	3.00	160.00	300.00	54.00	1700.00	62
2.30	1.70	3.00	150.00	290.00	54.00	1500.00	65
2.20	1.60	3.00	140.00	280.00	54.00	1400.00	65
2.20	1.60	3.00	140.00	270.00	54.00	1300.00	66
2.10	1.60	3.00	140.00	270.00	53.00	1300.00	69
2.10	1.53	3.00	140.00	270.00	53.00	1285.00	70
2.10	1.50	3.00	140.00	270.00	52.00	1200.00	72
2.10	1.50	3.00	130.00	260.00	52.00	1100.00	80
2.00	1.47	3.00	130.00	260.00	47.00	1054.00	84
2.00	1.46	3.00	128.00	250.00	47.00	1000.00	97
2.00	1.40	3.00	120.00	250.00	45.00	980.00	111
2.00	1.40	3.00	120.00	250.00	44.00	960.00	140
1.90	1.40	3.00	120.00	245.00	44.00	850.00	151
1.90	1.30	2.90	120.00	230.00	42.00	850.00	157
1.90	1.30	2.80	120.00	230.00	42.00	850.00	590
1.90	1.30	2.70	111.00	225.00	40.00	850.00	
1.90	1.30	2.60	111.00	220.00	39.00	840.00	
1.80	1.30	2.50	110.00	220.00	36.00	780.00	
1.80	1.30	2.40	110.00	210.00	35.00	768.00	
1.70	1.24	2.40	110.00	210.00	35.00	760.00	
1.70	1.20	2.30	110.00	200.00	34.00	750.00	

1.70	1.20	2.20	110.00	200.00	33.00	740.00	
1.70	1.20	2.10	110.00	190.00	33.00	740.00	
1.70	1.20	2.00	100.00	190.00	33.00	730.00	
1.70	1.10	2.00	100.00	190.00	33.00	720.00	
1.70	1.10	2.00	100.00	190.00	32.00	710.00	
1.60	1.10	2.00	100.00	170.00	32.00	710.00	
1.60	1.10	2.00	100.00	170.00	32.00	700.00	
1.60	1.06	2.00	100.00	170.00	32.00	700.00	
1.60	1.00	2.00	99.00	160.00	32.00	690.00	
1.60	0.96	2.00	94.00	160.00	30.00	690.00	
1.60	0.96	2.00	91.00	150.00	29.00	680.00	
1.60	0.94	2.00	91.00	150.00	28.00	680.00	
1.53	0.94	2.00	90.00	150.00	27.00	670.00	
1.50	0.92	2.00	90.00	150.00	27.00	660.00	
1.50	0.91	2.00	89.00	150.00	27.00	660.00	
1.50	0.85	2.00	87.00	140.00	27.00	660.00	
1.50	0.85	2.00	87.00	140.00	27.00	650.00	
1.50	0.85	2.00	84.00	140.00	26.00	630.00	
1.50	0.83	2.00	83.00	130.00	26.00	610.00	
1.40	0.83	2.00	82.00	130.00	25.00	610.00	
1.40	0.83	2.00	81.00	130.00	24.50	597.00	
1.40	0.81	2.00	81.00	130.00	24.00	590.00	
1.40	0.81	2.00	77.00	130.00	24.00	590.00	
1.40	0.81	2.00	77.00	123.00	24.00	576.00	
1.40	0.80	2.00	76.00	120.00	24.00	570.00	
1.40	0.80	2.00	74.00	120.00	23.00	570.00	
1.32	0.78	2.00	72.00	120.00	23.00	560.00	
1.30	0.78	1.90	72.00	120.00	23.00	560.00	
1.30	0.77	1.90	72.00	120.00	23.00	540.00	
1.30	0.77	1.90	72.00	115.00	23.00	540.00	
1.30	0.76	1.80	72.00	110.00	23.00	520.00	
1.30	0.76	1.80	71.00	110.00	22.00	520.00	
1.30	0.75	1.80	70.00	110.00	22.00	520.00	
1.30	0.75	1.70	70.00	110.00	22.00	510.00	
1.29	0.75	1.60	67.00	102.00	22.00	500.00	
1.20	0.74	1.60	66.00	100.00	21.00	500.00	
1.20	0.73	1.60	66.00	100.00	21.00	490.00	
1.20	0.72	1.60	66.00	100.00	21.00	480.00	
1.20	0.72	1.60	65.00	100.00	21.00	475.00	
1.20	0.72	1.60	65.00	100.00	21.00	470.00	
1.20	0.71	1.50	63.00	99.00	20.00	470.00	
1.20	0.71	1.50	63.00	97.00	20.00	462.00	
1.20	0.69	1.40	62.00	97.00	20.00	460.00	
1.20	0.68	1.30	62.00	97.00	19.00	460.00	
1.20	0.68	1.30	60.00	95.00	19.00	450.00	
1.20	0.68	1.20	60.00	91.00	19.00	440.00	
1.10	0.68	1.20	59.00	90.00	19.00	440.00	
1.10	0.68	1.20	56.59	90.00	19.00	440.00	

1.10	0.67	1.20	55.00	87.00	19.00	430.00	
1.10	0.66	1.10	55.00	86.00	19.00	430.00	
1.10	0.66	1.10	54.00	86.00	19.00	430.00	
1.10	0.65	1.10	54.00	84.00	18.40	420.00	
1.10	0.65	1.10	54.00	82.00	18.00	420.00	
1.10	0.65	1.10	53.00	82.00	18.00	410.00	
1.10	0.65	1.00	53.00	81.00	18.00	409.00	
1.00	0.63	1.00	52.00	78.00	18.00	400.00	
1.00	0.62	1.00	51.00	78.00	18.00	400.00	
1.00	0.61	1.00	50.00	78.00	17.00	400.00	
1.00	0.60	1.00	50.00	77.00	16.00	390.00	
1.00	0.60	1.00	50.00	76.00	16.00	390.00	
1.00	0.59	1.00	50.00	76.00	15.40	390.00	
0.99	0.57	1.00	50.00	69.00	15.00	390.00	
0.99	0.57	1.00	50.00	69.00	15.00	390.00	
0.98	0.56	1.00	50.00	67.00	15.00	370.00	
0.97	0.56	1.00	50.00	66.00	15.00	370.00	
0.96	0.55	1.00	49.00	66.00	14.00	370.00	
0.96	0.55	1.00	49.00	66.00	14.00	360.00	
0.95	0.55	1.00	49.00	65.00	14.00	360.00	
0.95	0.53	1.00	48.00	64.00	14.00	360.00	
0.93	0.53	1.00	48.00	61.00	14.00	360.00	
0.93	0.53	1.00	47.00	57.00	14.00	350.00	
0.93	0.52	1.00	46.08	57.00	14.00	350.00	
0.93	0.52	1.00	46.00	56.00	14.00	350.00	
0.92	0.52	1.00	46.00	56.00	13.00	340.00	
0.90	0.52	1.00	44.25	53.00	13.00	340.00	
0.88	0.51	1.00	44.00	53.00	13.00	340.00	
0.87	0.51	1.00	44.00	52.60	13.00	340.00	
0.86	0.50	1.00	44.00	52.00	13.00	340.00	
0.85	0.49	1.00	44.00	51.00	13.00	340.00	
0.84	0.49	1.00	43.00	51.00	13.00	334.00	
0.83	0.48	1.00	43.00	50.00	13.00	330.00	
0.81	0.48	1.00	43.00	50.00	13.00	330.00	
0.81	0.48	1.00	42.00	50.00	12.02	330.00	
0.80	0.47	1.00	42.00	50.00	12.00	330.00	
0.80	0.47	1.00	42.00	50.00	12.00	330.00	
0.78	0.47	1.00	41.00	50.00	12.00	330.00	
0.78	0.46	1.00	40.00	50.00	12.00	330.00	
0.77	0.46	1.00	40.00	50.00	12.00	320.00	
0.77	0.46	1.00	40.00	50.00	12.00	320.00	
0.77	0.45	1.00	40.00	50.00	11.40	320.00	
0.74	0.45	1.00	40.00	50.00	11.00	320.00	
0.73	0.44	1.00	39.00	49.00	11.00	310.00	
0.72	0.44	1.00	39.00	47.00	11.00	310.00	
0.69	0.44	1.00	39.00	46.00	11.00	310.00	
0.69	0.44	1.00	39.00	46.00	11.00	308.00	
0.69	0.44	1.00	39.00	44.00	11.00	300.00	

0.67	0.44	1.00	39.00	44.00	11.00	300.00	
0.67	0.44	1.00	37.00	43.00	11.00	300.00	
0.66	0.43	1.00	37.00	42.00	11.00	300.00	
0.66	0.42	1.00	37.00	41.00	10.50	290.00	
0.65	0.42	1.00	37.00	41.00	10.20	285.00	
0.63	0.41	1.00	37.00	41.00	10.20	280.00	
0.62	0.41	1.00	36.00	41.00	10.10	280.00	
0.62	0.41	1.00	36.00	41.00	10.00	280.00	
0.62	0.40	1.00	36.00	40.10	10.00	280.00	
0.60	0.40	1.00	36.00	40.00	10.00	280.00	
0.59	0.40	1.00	35.00	39.30	10.00	280.00	
0.59	0.40	1.00	35.00	39.00	10.00	280.00	
0.58	0.40	1.00	34.00	39.00	10.00	280.00	
0.57	0.40	1.00	34.00	39.00	10.00	280.00	
0.57	0.40	1.00	33.40	38.00	10.00	270.00	
0.55	0.40	1.00	33.00	38.00	10.00	270.00	
0.52	0.40	1.00	33.00	38.00	10.00	270.00	
0.50	0.40	1.00	33.00	37.00	9.70	270.00	
0.50	0.39	1.00	33.00	36.00	9.30	270.00	
0.46	0.39	1.00	33.00	36.00	9.20	270.00	
0.42	0.39	1.00	32.26	36.00	9.03	260.00	
0.42	0.38	1.00	32.01	36.00	9.00	260.00	
0.35	0.38	1.00	32.00	35.00	9.00	260.00	
0.10	0.38	1.00	32.00	34.00	9.00	260.00	
0.06	0.37	1.00	32.00	34.00	9.00	260.00	
	0.36	1.00	32.00	33.00	9.00	250.00	
	0.36	1.00	32.00	33.00	8.90	250.00	
	0.36	1.00	32.00	33.00	8.79	250.00	
	0.36	1.00	31.00	33.00	8.60	250.00	
	0.35	1.00	31.00	32.00	8.50	247.00	
	0.35	1.00	31.00	32.00	8.50	242.13	
	0.35	1.00	31.00	31.94	8.47	240.00	
	0.35	1.00	30.00	30.00	8.26	240.00	
	0.34	1.00	30.00	30.00	8.00	240.00	
	0.34	1.00	30.00	30.00	8.00	240.00	
	0.34	1.00	30.00	30.00	8.00	240.00	
	0.34	1.00	30.00	30.00	8.00	230.00	
	0.34	1.00	29.00	30.00	8.00	230.00	
	0.34	1.00	29.00	30.00	8.00	220.00	
	0.33	1.00	28.00	29.00	8.00	220.00	
	0.33	1.00	28.00	29.00	8.00	220.00	
	0.33	0.98	28.00	29.00	8.00	210.00	
	0.33	0.94	28.00	29.00	8.00	210.00	
	0.33	0.94	27.19	28.00	8.00	210.00	
	0.33	0.92	27.00	28.00	7.80	210.00	
	0.32	0.90	27.00	28.00	7.70	210.00	
	0.32	0.90	27.00	27.00	7.60	210.00	
	0.32	0.86	26.00	27.00	7.60	210.00	

	0.32	0.80	26.00	26.31	7.42	205.00	
	0.32	0.80	26.00	26.00	7.40	202.79	
	0.31	0.71	25.00	26.00	7.31	202.00	
	0.31	0.70	25.00	25.00	7.20	200.00	
	0.30	0.70	25.00	25.00	7.10	200.00	
	0.30	0.60	24.00	25.00	7.00	200.00	
	0.30	0.60	24.00	24.60	7.00	200.00	
	0.30	0.59	23.00	24.00	6.90	200.00	
	0.30	0.59	23.00	24.00	6.70	200.00	
	0.30	0.52	23.00	24.00	6.00	200.00	
	0.30	0.50	23.00	24.00	6.00	194.49	
	0.29	0.50	23.00	23.00	6.00	190.00	
	0.29	0.50	22.00	23.00	6.00	190.00	
	0.29	0.50	22.00	23.00	6.00	190.00	
	0.29	0.50	21.00	23.00	6.00	190.00	
	0.29	0.50	21.00	23.00	6.00	184.13	
	0.29	0.50	21.00	23.00	6.00	180.00	
	0.28	0.50	21.00	22.20	6.00	180.00	
	0.28	0.50	20.36	22.00	5.92	180.00	
	0.28	0.50	20.00	22.00	5.90	180.00	
	0.27	0.50	20.00	22.00	5.40	180.00	
	0.27	0.50	20.00	22.00	5.13	180.00	
	0.27	0.50	20.00	21.20	5.10	180.00	
	0.26	0.50	20.00	21.10	5.00	170.00	
	0.26	0.40	19.00	21.00	5.00	170.00	
	0.26	0.40	19.00	20.00	5.00	170.00	
	0.26	0.40	18.00	19.10	5.00	170.00	
	0.25	0.30	18.00	19.00	5.00	160.00	
	0.25	0.30	18.00	19.00	5.00	160.00	
	0.25	0.30	18.00	19.00	5.00	160.00	
	0.25	0.30	18.00	19.00	5.00	160.00	
	0.25	0.30	17.00	18.50	5.00	160.00	
	0.25	0.30	17.00	18.00	5.00	160.00	
	0.24	0.20	17.00	18.00	5.00	160.00	
	0.24	0.20	17.00	18.00	5.00	160.00	
	0.24	0.20	17.00	18.00	5.00	160.00	
	0.23	0.04	17.00	17.00	4.80	160.00	
	0.23		17.00	17.00	4.74	150.00	
	0.23		17.00	17.00	4.70	150.00	
	0.23		17.00	17.00	4.60	150.00	
	0.22		16.00	17.00	4.55	150.00	
	0.22		16.00	17.00	4.38	150.00	
	0.22		16.00	17.00	4.16	146.00	
	0.22		16.00	17.00	4.00	145.00	
	0.22		16.00	17.00	4.00	140.00	
	0.22		15.00	16.90	4.00	140.00	
	0.22		15.00	16.00	3.64	140.00	
	0.21		15.00	15.00	3.60	140.00	

	0.21		15.00	15.00	3.50	140.00	
	0.21		15.00	15.00	3.00	140.00	
	0.21		14.50	15.00	3.00	140.00	
	0.21		14.00	15.00	2.80	140.00	
	0.21		14.00	14.00	2.00	140.00	
	0.20		14.00	14.00	1.00	140.00	
	0.20		14.00	14.00	1.00	136.55	
	0.20		14.00	13.00		135.60	
	0.20		14.00	13.00		130.00	
	0.20		13.00	13.00		130.00	
	0.20		13.00	13.00		130.00	
	0.20		13.00	13.00		130.00	
	0.20		13.00	12.00		130.00	
	0.20		13.00	12.00		130.00	
	0.19		13.00	12.00		130.00	
	0.19		12.00	12.00		127.00	
	0.19		12.00	12.00		124.00	
	0.19		12.00	12.00		122.05	
	0.19		12.00	11.00		120.00	
	0.19		11.00	11.00		120.00	
	0.19		11.00	11.00		120.00	
	0.18		10.00	10.00		120.00	
	0.18		10.00	10.00		112.11	
	0.18		10.00	10.00		110.00	
	0.18		10.00	10.00		110.00	
	0.18		9.60	10.00		110.00	
	0.18		9.60	10.00		110.00	
	0.17		9.10	10.00		110.00	
	0.17		9.10	10.00		110.00	
	0.17		9.00	10.00		110.00	
	0.17		8.30	9.60		110.00	
	0.17		8.20	9.40		110.00	
	0.16		8.00	9.10		108.00	
	0.15		8.00	9.00		100.00	
	0.15		7.70	9.00		100.00	
	0.15		7.70	9.00		100.00	
	0.15		7.00	9.00		100.00	
	0.15		7.00	8.00		100.00	
	0.15		6.80	8.00		100.00	
	0.14		6.80	8.00		99.00	
	0.14		6.80	8.00		98.00	
	0.14		6.50	8.00		97.00	
	0.14		6.50	8.00		93.40	
	0.14		6.30	8.00		92.00	
	0.14		6.30	7.60		92.00	
	0.14		6.10	7.50		90.00	
	0.13		5.60	7.00		90.00	
	0.13		5.40	7.00		90.00	

	0.13		5.20	6.00		86.00	
	0.13		5.00	6.00		83.00	
	0.13		4.90	6.00		81.00	
	0.12		4.50	5.90		81.00	
	0.12		4.10	5.80		80.00	
	0.12		4.10	5.40		80.00	
	0.11		3.90	5.00		80.00	
	0.11		3.40	5.00		80.00	
	0.11		2.60	5.00		80.00	
	0.11		2.60	5.00		79.00	
	0.10		2.60	5.00		73.00	
	0.10		2.30	5.00		72.00	
	0.10		2.00	4.80		70.00	
	0.10		2.00	4.80		70.00	
	0.09		1.70	4.70		70.00	
	0.08		1.50	4.60		70.00	
	0.06		1.50	4.00		64.00	
	0.03		1.50	4.00		63.00	
			1.40	3.80		61.00	
			1.40	3.00		60.00	
				3.00		56.00	
				2.30		44.00	
				2.00		40.00	
				1.60		37.00	
						35.00	
						30.00	
						26.00	
						24.00	
						20.00	
						10.00	
						5.00	

II. NON-STORM WATER ACTION LEVELS

Site	Chromium	Nickel	Copper	Zinc	Silver	Cadmium	Lead	Total Coliform	Fecal Coliform	Enterococcus	Dissolved Oxygen	pH	Turbidity	Nitrate as N	Surfactsnats (MBAS)	Reactive Phosphorous
	µg/L							CFU/100mL			mg/L		NTU	mg/L		
AVJ01P26	<8.00	4.7	7.3	230	<2.00	<1.00	<2.00	41,000	21,000	5,100	7.92	7.5	12.2	3.9	0.4	2.88
AVJ01P26	<8.00	5.4	11	22	<2.00	<1.00	<2.00	30,000	21,000	45,000	9.73	7.52	2.79	8.3	0.3	2.98
AVJ01P26	<8.00	<4.00	13	45	<2.00	<1.00	<2.00	10,300	8,200	8,400	4.3	8.3	2.8	2.8		1.11
AVJ01P26	<8.00	5.6	8.3	44	<2.00	<1.00	<2.00	44,000	19,400	18,400	8.04	7.91	6.02	2.9		2.55
AVJ01P26	<8.00	32	39	140	<2.00	1.4	7.5	67,000	46,000	32,000	7.76	7.72	9.24	2.7		1.88
AVJ01P26	1.1	6.7	8	28	<0.50	0.51	<0.50	330,000	22,000	24,000	6.48	8.17	2.53	3.9	0.1	1.72
AVJ01P26	2.3	8.3	7.3	25	0.79	2	1.6	410,000	20,000	16,000	7.85	7.82	6.03	5.6	<0.05	2.87
AVJ01P26	<0.50	4.2	2.5	9.6	<0.50	<0.50	<0.50	130,000	21,000	6,000	7.8	7.85	2.5	4.1	<0.04	1.96
AVJ01P26	0.89	7	8.5	28	<0.50	<0.50	<0.50	NR	NR	NR	7.76	7.78	4.26	8.6	0.17	3.87
AVJ01P26	<0.50	5.3	5.1	21	<0.50	<0.50	<0.50	160,000	38,000	11,000	5.83	7.55	2.36	4.4	0.14	4.33
AVJ01P26	<0.50	4.3	7.8	11	<0.50	<0.50	<0.50	25,000	6,000	22,000	7.15	8	40.4	3.6	0.11	1.98
AVJ01P26	0.66	3.2	6.7	14	<0.50	<0.50	<0.50	28,000	3,100	760	9.51	8.07	3.91	5.4	0.05	2.79
AVJ01P26	<0.50	3.9	6.3	23	<0.50	1.2	<0.50	57,000	3,000	3,600	6.45	8.03	3.31	5.6	0.07	3.26
AVJ01P26	<0.50	4.1	3.6	17	<0.50	<0.50	<0.50	150,000	11,000	11,000	6.59	8.07	6.06	6.7	0.1	3.3
AVJ01P26	<0.50	3	4.3	25	<0.50	<0.50	<0.50	>24,000	220	2,500	8.48	7.95	3.25	5.3	0.23	1.67
AVJ01P26	0.54	3.4	23	15	<0.50	<0.50	<0.50	44,000	7,100	14,700	8.85	8.01	3.02	4.1	0.11	1.82
AVJ01P26	<0.50	4.6	4.4	12	<0.50	<0.50	<0.50	>45,000	10,000	30,000	11.45	7.87	4.36	5.9	0.1	2.7
AVJ01P26	0.57	4.9	3.3	16	<0.50	<0.50	<0.50	56,000	4,100	10,800	8.55	8.03	3.09	11.3	0.1	3.67
AVJ01P27	<8.00	8.5	7.4	55	<2.00	1.8	<2.00				10.67	7.85	23.7	7.6	0.3	4.03
AVJ01P27	<8.00	6.2	14	50	<2.00	1.8	<2.00	89,000	67,000	36,000	8.55	8.08	12.4	6	0.1	3.15
AVJ01P27	<8.00	6	7.7	46	<2.00	1.5	<2.00	88,000	31,000	71,000	7.38	6.97	7.72	8.5	0.15	3.14

AVJ01P27	<8.00	6.9	8.5	44	<2.00	1.5	<2.00	107,000	48,000	8,600	8.65	7.68	14.3	1.5	0.12	0.58
AVJ01P27	<8.00	7	10	130	<2.00	1.5	<2.00	80,000	31,000	33,000	4.73	7.66	11.5	1.9	3.34	2.5
AVJ01P27	<40.00	<20.00	27	91	<10.00	<5.00	<10.00	147,000	104,000	128,000	7.6	7.7	10.8	0.6		<0.06
AVJ01P27	<8.00	19	40	130	<2.00	2.1	<2.00	>200,000	>200,000	50,000	6.88	7.55	11.2	5.6		2.12
AVJ01P27	<8.00	5.2	7.9	47	<2.00	<1.00	<2.00	54,000	44,000	31,000	6.94	7.51	18.7	8.8		3.87
AVJ01P27	<8.00	29	39	130	<2.00	1.5	5.3	53,000	36,000	12,600	12.2	7.5	10.6	5.1		1.31
AVJ01P27	<8.00	28	38	74	<2.00	<1.00	<2.00	148,000	69,000	13,200	7.05	8.27	7.03	5.8	<0.05	2.34
AVJ01P27	2	18	5.6	18	<0.50	1.8	<0.50	350,000	9,000	23,000	5.9	7.9	3.77	6.6	0.2	1.78
AVJ01P27	1.1	11	6	24	<0.50	0.83	<0.50	430,000	>120,000	13,000	8	7.27	4.22	6.2	0.06	2.22
AVJ01P27	2.2	15	16	42	<0.50	2.3	2.8	410,000	120,000	59,000	7.3	7.43	18.9	5.1	0.06	5.3
AVJ01P27	0.94	9.2	4.7	21	<0.50	0.72	<0.50	250,000	58,000	22,000	7.89	7.6	4.33	7.9	<0.05	2.75
AVJ01P27	<0.50	8.5	3.4	23	<0.50	0.77	<0.50	120,000	82,000	20,000	6.68	7.72	3.5	8.2	<0.05	4.27
AVJ01P27	1.6	13	7.1	26	<0.50	1.2	<0.50	73,000	47,000	4,600	9.42	7.61	3.15	7.2	0.06	2.44
AVJ01P27	0.65	8.4	7.6	27	<0.50	0.82	<0.50	150,000	600	6,800	9.1	7.7	5.48	4.8	0.15	2.36
AVJ01P27	0.63	11	4.9	32	<0.50	0.86	<0.50	160,000	70,000	28,000	6.89	7.47	4.47	6.8	0.13	3.85
AVJ01P27	0.97	8.9	5.5	46	<0.50	0.71	<0.50	46,000	11,000	7,000	6.88	7.49	7.25	7.4	0.12	7.55
AVJ01P27	<0.50	5.7	2.6	10	<0.50	<0.50	<0.50	60,000	27,000	19,000	0	7.94	19.6	5.7	0.35	3.04
AVJ01P27	1	8.1	7.1	26	<0.50	1.5	<0.50	86,000	32,000	6,700	8.63	7.62	16.1	8.6	0.08	4.81
AVJ01P27	0.9	6	5.5	19	<0.50	0.84	<0.50	64,000	3,200	1,000	8.15	7.91	6.64	7.6	0.07	3.49
AVJ01P27	0.85	7.2	6.3	51	<0.50	0.87	<0.50	730,000	120,000	230,000	6.03	7.78	15.4	4.9	0.75	3.29
AVJ01P27	0.5	4.1	1.9	4.6	<0.50	<0.50	<0.50	34,000	5,800	5,500	6.17	7.79	7.1	3.5	0.05	1.78
AVJ01P27	<0.50	4.6	1.8	5.7	<0.50	<0.50	<0.50	190,000	7,600	7,000	0	8.25	5.35	4	0.05	2.39
AVJ01P27	1.1	7.3	3.5	15	<0.50	0.87	<0.50	90,000	20,000	10,700	9.61	7.76	4.79	7.2	1.05	2.17
AVJ01P27	1.1	11	5.4	20	<0.50	1.1	<0.50	>96,000	5,200	6,800	8.16	7.91	4.77	11.5	0.1	3.15
AVJ01P27	0.71	7.4	2.9	16	<0.50	0.56	<0.50	>84,000	11,000	29,000	6.09	7.89	5.25	7.9	0.1	2.78
AVJ01P27	0.87	8.8	3.1	8.4	<0.50	0.51	<0.50	>50,000	9,000	7,400	5.36	7.51	4.24	6.1	0.12	3.03
AVJ01P27	0.73	6.9	3	8.2	<0.50	<0.50	<0.50	70,000	3,800	9,100	5.94	7.85	7.92	7.8	0.1	2.18
AVJ01P27	0.72	7.4	4.7	16	<0.50	0.69	<0.50	72,000	6,800	16,700	8.63	7.76	5.53	8	0.1	3.92
AVJ01P27											8.66	7.71	6.33	11.7	0.1	4.03
AVJ01P28	<8.00	9.1	9.8	79	<2.00	<1.00	<2.00				5.14	7.89	22.3	4.6	0.6	3.54
AVJ01P28	<8.00	7.7	19	78	<2.00	<1.00	<2.00	83,000	26,000	6,600	7.22	7.97	7.98	6.5	0.5	4.3

AVJ01P28	<8.00	6.8	8.8	44	<2.00	<1.00	<2.00	94,000	44,000	52,000	8.1	7.11	9.69	8.4	0.35	3.81
AVJ01P28	<8.00	9.5	13	54	<2.00	<1.00	<2.00	119,000	31,000	23,000	10.7	7.89	24.2	2	0.26	0.87
AVJ01P28	<8.00	7.8	9.5	49	<2.00	<1.00	<2.00	101,000	33,000	26,000	4.76	7.98	15.3	2.2	0.5	1.12
AVJ01P28																
AVJ01P28	<8.00	11	12	140	<2.00	<1.00	<2.00	181,000	104,000	48,000	3.06	7.37		5.8	0.65	3.29
AVJ01P28	<8.00	8.9	10	95	<2.00	<1.00	<2.00	>200,000	>200,000	36,000	3.95	7.56	11.1	5.4	0.4	5.34
AVJ01P28																
AVJ01P28	<8.00	10	6.5	55	<2.00	<1.00	<2.00	<200,000	76,000	<200,000	8.63	7.78	20.7	7.4	0.07	5.16
AVJ01P28	<8.00	23	58	98	<2.00	<1.00	<2.00	<200,000	<200,000	44,000	7.05	8.15	67.6	6	0.2	3.44
AVJ01P28	<8.00	9.9	17	52	<2.00	<1.00	<2.00	<200,000	<200,000	54,000	5.09	8.32	27	7.3	0.26	4.84
AVJ01P28	0.52	9.1	11	34	<0.50	0.59	<0.50	>1,200,000	>120,000	15,000	4.58	7.6	4.8	5.4	1	4.91
AVJ01P28	<0.50	11	25	34	<0.50	<0.50	<0.50	840,000	>120,000	8,000	4.51	7.19	5.4	6.3	0.1	4.07
AVJ01P28	0.57	15	6.7	30	<0.50	3.1	0.92	660,000	60,000	13,000	4.91	7.49	5.54	6.6	0.06	4.92
AVJ01P28	<0.50	8.8	6.2	24	<0.50	<0.50	<0.50	>120,000	330,000	29,000	3.62	7.52	8.71	7.2	0.17	5.73
AVJ01P28	<0.50	9.3	8	50	<0.50	0.64	<0.50	770,000	260,000	250,000	7.03	7.75	18.1	8.4	0.12	4.5
AVJ01P28	0.59	13	9.8	47	<0.50	0.83	<0.50	1,010,000	530,000	3,800	4.61	7.63	9.01	5.6	0.4	4.98
AVJ01P28	<0.50	13	8.8	45	<0.50	0.83	<0.50	1,300,000	10,000	19,000	3.55	7.5	9.76	7.2	0.4	5.6
AVJ01P28	0.92	13	9.9	56	<0.50	0.67	<0.50	1,040,000	330,000	63,000	5.6	7.45	12.9	7.8	0.13	7.75
AVJ01P28	0.71	9.2	8.9	39	<0.50	0.57	<0.50	>1,200,000	290,000	8,000	3.13	7.6	10.2	4.8	0.17	5.36
AVJ01P28	<0.50	9	7.7	26	<0.50	0.86	<0.50	770,000	76,000	15,000	0	7.72	9.8	8.9	0.25	5.03
AVJ01P28	<0.50	8.8	11	44	<0.50	0.71	<0.50	530,000	21,000	8,200	5.9	7.62	14.5	9.3	0.45	6.58
AVJ01P28	1.5	11	16	34	<0.50	0.98	<0.50	320,000	11,000	1,700	8.35	7.97	5.96	10.8	3.6	4.26
AVJ01P28	0.51	14	8.6	27	<0.50	1	<0.50	800,000	30,000	16,000	8.01	7.98	11.9	9.2	0.45	3.19
AVJ01P28	<0.50	6.8	4.1	17	<0.50	<0.50	<0.50	310,000	7,000	2,500	7.19	7.87	23.1	7.4	0.15	3.89
AVJ01P28	<0.50	8.1	4.8	20	<0.50	<0.50	<0.50	910,000	38,000	6,000	0	7.87	63.3	9.4	0.3	4.2
AVJ01P28	1.1	11	22	22	<0.50	<0.50	<0.50	2,700,000	23,000	5,800	9.39	8.03	3.86	10.1	0.4	2.19
AVJ01P28	0.84	12	7.9	31	<0.50	0.72	<0.50	280,000	19,000	10,500	8.59	7.78	29.3	7.6	0.42	4.31
AVJ01P28	<0.50	8	5.9	18	<0.50	<0.50	<0.50	930,000	37,000	2,800	8.21	7.97	2.09	6.9	0.1	2.82
AVJ01P28	<0.50	2.7	2.1	7.6	<0.50	<0.50	<0.50	1,230,000	34,000	3,400	8.28	7.82	9.43	2.1	0.22	1.13
AVJ01P28	<0.50	7.8	5.1	20	<0.50	<0.50	<0.50	1,000,000	27,000	6,200	8.59	7.85	7.45	10	0.25	3.85
AVJ01P28								180,000	20,000	5,200	7.25	7.75	18.7	10	0.21	5.8
AVJ01P28											8	7.86	11.5	8.2	0.17	3.98

AVJ01P33	<8.00	6.1	3	15	<2.00	<1.00	<2.00	11,000	3,000	6,100	10.3	7.97	1.49	2.4	<0.05	2
AVJ01P33	<8.00	14	11	39	<2.00	1.5	<2.00	151,000	71,000	72,000	7.17	7.48	260	4.4	<0.05	9.84
AVJ01P33	<8.00	4.2	3.3	17	<2.00	<1.00	<2.00	37,000	14,600	9,700	8.65	7.33	1.81	3.8	<0.05	1.86
AVJ01P33	<8.00	9.1	6.8	69	<2.00	<1.00	<2.00	7,900	1,240	1,630	10.2	7.7	7.34	2.6		1.97
AVJ01P33	<8.00	9.2	15	160	<2.00	<1.00	2.4	199,000	177,000	29,000	8.22	8.38	17.2	8.3	1.4	2.59
AVJ01P33	<8.00	11	8	27	<2.00	<1.00	<2.00	86,000	67,000	123,000	10.23	8.47	1.85	2.3		2.17
AVJ01P33	<0.50	9.4	2.3	10	<0.50	<0.50	<0.50	43,000	3,800	7,000	9.34	7.84	4.75	3.8	0.08	1.91
AVJ01P33	1.7	6.3	15	8.9	<0.50	<0.50	<0.50	110,000	12,000	38,000	8.82	8.34	3.39	2.3	<0.05	2.53
AVJ01P33	<0.50	12	1.2	7.2	<0.50	<0.50	<0.50	19,000	4,300	600	9.36	8.24	0.7	3.3	<0.02	1.77
AVJ01P33	0.65	20	10	52	<0.50	1.2	<0.50	NR	NR	NR	8.65	7.89	6.01	10.3	0.1	13.35
AVJ01P33	<0.50	15	12	21	<0.50	1.1	<0.50	210,000	88,000	29,000	7.46	7.81	376	6.5	0.08	5.16
AVJ01P33	1.1	16	1.7	6.4	<0.50	0.92	<0.50	210,000	5,000	7,000	8.64	8.07	0.79	5.9	0.1	1.43
AVJ01P33	0.95	6.3	4.3	4.4	<0.50	<0.50	<0.50	2,200	400	4,300	10.19	8.3	2.7	4.9	0.07	1.48
AVJ01P33	0.64	14	2.3	6.8	<0.50	0.81	<0.50	33,000	2,700	6,500	7.32	8.21	1.01	5.4	0.05	1.93
AVJ01P33	<0.50	11	1.6	3.3	<0.50	<0.50	<0.50	12,000	1,700	900	8.64	8.19	0.47	5.6	0.05	1.59
AVJ01P33	0.58	4.8	3.5	12	<0.50	<0.50	<0.50	>4,800	160	1,000	10.02	8.16	3.76	3.9	0.1	1.42
AVJ01P33	1	7.5	2.4	11	<0.50	<0.50	<0.50	26,000	700	2,500	11.67	8.09	0.47	4	0.1	1.39
AVJ01P33	0.51	9.2	6	24	<0.50	3	<0.50	>135,000	36,000	7,400	11.04	7.66	2.48	4.7	0.1	6.15
AVJ01P33	0.68	5.8	3.8	7.1	<0.50	<0.50	<0.50	47,000	320	1,170	9.86	8.13	4.23	5.9	0.1	2.17
AVJ02P05	<8.00	6.2	50	120	<2.00	<1.00	3.4	17,650	6,850	20,600	9.21	8.17	3.35	2.1	0.15	0.96
AVJ02P05	<8.00	5.6	11	42	<2.00	<1.00	<2.00	82,000	17,000	33,000	9.2	7.57	15.7	9.1	<0.05	4.2
AVJ02P05	<8.00	<4.00	22	21	<2.00	<1.00	<2.00	92,000	31,000	38,000	9.22	7.54	9.45	4.2	0.65	1.17
AVJ02P05	<8.00	9.9	13	53	<2.00	<1.00	<2.00	38,000	15,800	12,800	9.18	8.23	2.49	7.2	<0.05	1.64
AVJ02P05	<8.00	8.8	14	67	<2.00	1	<2.00	>200,000	124,000	166,000	8.52	8.2	28.2	7.8	0.2	3.75
AVJ02P05	<8.00	12	8.6	40	<2.00	<1.00	<2.00	<200,000	<200,000	164,000	9.02	7.92	6.46	10.6	0.08	4.82
AVJ02P05	1	9.7	9.4	41	<0.50	<0.50	<0.50	50,000	9,000	9,000	9.8	7.85	1.25	4.4	0.06	0.61
AVJ02P05	0.65	8.8	9.1	32	<0.50	<0.50	<0.50	280,000	60,000	11,000	8.8	7.99	4.93	7.8	0.08	3.3
AVJ02P05	1.1	8.5	9	38	<0.50	<0.50	<0.50	22,000	20,000	6,300	8.9	7.9	0.9	5.5	<0.05	0.94
AVJ02P05	0.7	10	6.8	33	<0.50	<0.50	<0.50	NR	NR	NR	9.75	8.06	1.28	5.1	<0.05	0.95
AVJ02P05	0.6	6.3	9.1	29	<0.50	<0.50	<0.50	41,000	7,300	6,600	9.14	8.06	1.28	3.7	<0.05	3.06

AVJ02P05	1.3	3.4	5.9	29	<0.50	<0.50	<0.50	34,000	15,000	6,000	0	7.71	1.34	6.7	<0.01	1.04
AVJ02P05	1.1	8.7	9.4	96	<0.50	1.8	<0.50	9,300	1,300	11,000	9.66	8.04	3.44	7	0.05	3.59
AVJ02P05	1.5	5.8	9.6	36	<0.50	<0.50	<0.50	26,000	4,000	500	6.67	8.09	173	8.4	0.1	2.31
AVJ02P05	0.84	6.9	5.2	19	<0.50	1.2	<0.50	200,000	410,000	48,000	9.07	8.06	5.42	9.7	0.05	3.62
AVJ02P05	0.99	5.7	3.4	30	<0.50	<0.50	<0.50	>2,600	40	160	9.44	8.22	1.41	5.2	0.11	0.99
AVJ02P05	1.4	7.8	7.6	31	<0.50	0.57	<0.50	20,000	340	1,190	11.7	8.25	3.52	10	0.21	1.92
AVJ02P05	1.3	6.4	4.4	9.8	<0.50	0.84	<0.50	>43,000	430	6,200	12.63	7.68	33.8	10.8	0.22	2.03
AVJ02P05	1	5.7	14	28	<0.50	0.63	<0.50	47,000	4,100	15,000	9.87	8.07	6.34	5.1	0.1	0.9
COL02P50	<8.00	<4.00	2.8	55	<2.00	<1.00	<2.00	4,350	3,100	2,400	8.86	7.91	2.66	0.9	<0.05	2.24
COL02P50	<8.00	<4.00	<2.00	18	<2.00	<1.00	<2.00	620	130	280	6.92	7.5	2.24	1.1	<0.05	2.22
COL02P50	<8.00	<4.00	4.8	27	<2.00	<1.00	<2.00	1,490	130	870	6.93	7.07	7.38	1.2	<0.05	2.54
COL02P50	<8.00	5	<2.00	71	<2.00	<1.00	<2.00	530	380	590	8.84	7.55	1.02	1.1	0.13	1.48
COL02P50	<8.00	280	8.9	120	<2.00	88	<2.00	16,400	6,300	11,100	8.5	7.82	10.6	4	0.1	1.24
COL02P50																
COL02P50	<8.00	8.4	<2.00	38	<2.00	<1.00	<2.00	6,300	4,200	3,100	8.91	7.31	0.89	1.1		2.76
COL02P50	<0.50	12	0.97	6.6	<0.50	<0.50	<0.50	6,000	40	50	9.1	7.16	0.45	1.5	<0.05	0.89
COL02P50	<0.50	7.9	0.54	4.8	<0.50	<0.50	<0.50	4,500	20	90	8.39	7.31	0.63	1.9	<0.05	1.76
COL02P50	<0.50	7.5	0.59	4.7	<0.50	<0.50	<0.50	30	20	<10	8.87	7.27	0.4	1.2	<0.05	1.27
COL02P50	<0.50	12	0.8	7.4	<0.50	<0.50	<0.50	3,000	210	80	8.8	7.48	0.67	2.3	0.08	1.6
COL02P50	<0.50	11	<0.50	5.6	<0.50	<0.50	<0.50	190	60	140	10.14	7.19	1.51	1.4	0.1	2.55
COL02P50	<0.50	7.1	1.1	5.8	<0.50	<0.50	<0.50	8,000	600	400	8.52	7.7	0.78	1	0.13	1.48
COL02P50	<0.50	5.8	0.76	12	<0.50	<0.50	<0.50	280	10	<10	9.18	7.54	1.41	1.1	0.05	1.32
COL02P50	<0.50	5.7	1.2	8.6	<0.50	<0.50	<0.50	570	<10	200	8.3	7.67	1.01	1.4	0.05	1.39
COL02P50	<0.50	6	1	6.8	<0.50	<0.50	<0.50	2,300	200	500	8.23	7.65	0.78	1.3	0.05	1.61
COL02P50	<0.50	9.6	3.9	15	<0.50	0.83	<0.50	33,000	50	2,300	8.22	7.41	3.21	3.8	0.1	1.56
COL02P50	<0.50	7.1	2.2	8	<0.50	0.6	<0.50	>6,300	>380	840	9.22	8.04	0.92	2.5	0.12	1.3
COL02P50	<0.50	7.8	1.6	7	<0.50	<0.50	<0.50	>6,600	640	690	7.11	7.75	1.36	3.6	0.1	1.29
COL02P50	<0.50	5.7	1.9	9.2	<0.50	<0.50	<0.50	6,900	60	140	9.1	7.47	1.25	2.5	0.1	1.01
COL02P50											9.73	7.47	0.86	2.4	0.1	1.33
COL02P55	<8.00	61	4.1	33	<2.00	16	<2.00	27,000	18,000	13,000	7.38	8.09	3.98	1.7	<0.05	0.86

COL02P55	<8.00	230	5.9	75	<2.00	75	<2.00	18,700	3,600	5,800	6.86	8.2	8.05	5.2	<0.05	1.15
COL02P55	<8.00	290	4.3	87	<2.00	110	<2.00	6,800	4,100	5,400	7.52	7.42	4.92	6	<0.05	0.4
COL02P55	<8.00	210	5.2	120	<2.00	68	<2.00	16,800	3,900	10,400	9.59	7.95	15.9	3.9	<0.05	2.13
COL02P55	<8.00	6.6	3.2	35	<2.00	<1.00	<2.00	1,140	630	620	8.36	7.6	0.91	0.5	0.08	1.43
COL02P55																
COL02P55	0.61	210	4.8	73	<0.50	49	<0.50	470,000	43,000	113,000	6.83	7.65	15.6	3.8	0.12	1.84
COL02P55	<0.50	75	3.9	18	<0.50	18	<0.50	440,000	200,000	28,000	8.19	7.63	13.6	4	<0.05	2.01
COL02P55	<0.50	61	3.7	22	<0.50	12	<0.50	180,000	80,000	37,000	8.4	7.27	18.8	4.1	0.06	2.62
COL02P55	0.96	220	8.9	66	<0.50	61	<0.50	550,000	110,000	9,000	8.55	7.85	8.43	6.5	0.1	1.99
COL02P55	<0.50	88	6.5	39	<0.50	11	<0.50	640,000	26,000	47,000	6	7.5	8.57	4.6	0.18	2.74
COL02P55	0.63	71	5.1	30	<0.50	5.2	<0.50	67,000	27,000	16,000	7	7.8	5.46	4.5	0.18	2.43
COL02P55	0.51	140	8.1	59	<0.50	34	<0.50	260,000	16,000	11,000	6.24	7.62	7.73	3.8	0.14	1.6
COL02P55	<0.50	100	5.6	35	<0.50	13	<0.50	63,000	28,000	7,200	6.65	7.92	18.9	6.6	0.11	1.94
COL02P55	<0.50	69	4.5	24	<0.50	3.6	<0.50	80,000	30,000	26,000	6.01	8	12.2	4.2	0.05	2.28
COL02P55	<0.50	65	7.8	34	<0.50	4.6	<0.50	>143,000	3,000	23,000	7.2	7.57	14.2	5.1	0.12	2.7
COL02P55	<0.50	93	5	36	<0.50	8.6	<0.50	>86,000	2,100	10,700	6.62	8.04	5.16	5.3	0.12	0.91
COL02P55	<0.50	71	4.5	37	<0.50	3.9	<0.50	370,000	22,000	54,000	4.88	7.73	17.2	6.6	0.23	1.72
COL02P55	<0.50	100	4.8	53	<0.50	6.2	<0.50	76,000	>2,100	5,600	5.52	7.66	7.53	7.9	0.24	0.9
COL02P55											8.78	7.78	19.5	3.9	0.1	0.94
DPK01P04								>200,000	>200,000	35,000	9	7.93	6.91	3.3		0.95
DPK01P04	<8.00	98	7.4	58	<2.00	4.7	<2.00	86,000	16,000	89,000	9.01	7.85	6.57	3.2	0.1	1.65
DPK01P04	<0.50	100	45	35	<0.50	9.3	<0.50	240,000	74,000	11,600	5.91	7.96	8.74	3.5	0.07	1.43
DPK01P04	0.57	79	7.5	28	<0.50	4.5	<0.50	22,000	3,200	3,200	9.04	7.8	19.7	5.1	0.1	1.87
DPK01P04	<0.50	82	5.1	29	<0.50	3.7	<0.50	100,000	19,000	17,000	8.71	7.89	4.79	3.8	0.12	1.85
DPK01P04	3.8	59	7.2	45	<0.50	5.1	<0.50	420,000	690	5,000	8.43	7.83	4.74	24.3	0.11	3.06
DPK01P04	<0.50	93	8.6	32	<0.50	7.1	<0.50	1,200	270	150	9.47	7.53	4.24	3.8	0.14	3.12
DPK01P04	<0.50	90	9.1	26	<0.50	8.9	<0.50	30,000	6,900	9,000	8.45	7.79	6.2	4.2	0.08	1.65
DPK01P04	<0.50	140	5	130	<0.50	12	<0.50	34,000	14,000	5,800	9.39	7.92	5.55	3.4	0.12	1.45
DPK01P04	<0.50	88	9.1	36	<0.50	6.6	<0.50	49,000	11,000	17,000	8.89	7.89	3.47	3.5	0.1	1.76
DPK01P04	0.56	72	6.7	38	<0.50	3.3	<0.50	720,000	28,000	58,000	8.68	7.93	15.3	3.7	0.15	2.03
DPK01P04	0.5	86	7.5	33	<0.50	8.6	<0.50	>22,000	3,300	6,300	8.63	7.85	17.8	3.9	0.12	2.15

DPK01P04	<0.50	93	5.7	20	<0.50	1.4	<0.50	>28,000	1,800	3,300	9.66	8.21	5.2	4.1	0.1	1.06
DPK01P04	<0.50	83	4.6	15	<0.50	1.2	<0.50	86,000	7,400	20,000	8.24	7.94	7.69	4.5	0.1	0.93
DPK01P04											10.23	7.87	4.82	4.1	0.1	1.46
DPL01S02	<8.00	180	4.6	90	<2.00	13	<2.00	69,000	18,000	8,100	7.87	7.8	3.63	4.1	0.33	0.49
DPL01S02	<8.00	170	3	66	<2.00	20	<2.00	21,000	16,000	28,000	11.17	7.27	6.9	2.1	<0.05	<0.06
DPL01S02	<8.00	140	5	71	<2.00	6.5	<2.00	126,000	57,000	8,600	8.97	7.48	4.46	4.3	<0.05	0.24
DPL01S02	<8.00	140	4.7	63	<2.00	5.3	<2.00	46,000	23,000	33,000	4.59	7.58	3.74	1.5	0.18	0.08
DPL01S02	<8.00	170	3.2	100	<2.00	13	<2.00	73,000	22,000	47,000	9.02	7.55	3.63	4.1	0.3	0.29
DPL01S02	12	190	8.4	110	<2.00	12	4.5	10,600	6,300	4,300	13.36	7.75	2.32	4.7	0.08	0.34
DPL01S02	<8.00	150	5.5	92	<2.00	8.1	<2.00	28,000	20,000	12,400	8.08	7.77	2.94	3.8		0.44
DPL01S02	<8.00	160	10	56	<2.00	9.2	<2.00	2,900	2,200	810	11.34	7.66	2.82	4.7		0.28
DPL01S02	<8.00	250	3.7	68	<2.00	26	<2.00	4,600	3,300	4,100	14.7	7.8	2.1	5		0.4
DPL01S02	<8.00	220	2.9	88	<2.00	16	<2.00	76,000	44,000	66,000	13.1	7.9	2.7	5.4	0.1	0.45
DPL01S02	0.66	400	3.8	200	<0.50	48	<0.50	49,000	5,200	1,900	8.6	7.96	1.73	8	0.25	0.33
DPL01S02	0.71	510	6.4	220	<0.50	54	<0.50	120,000	20,000	1,400	8.54	8.27	2.26	9.9	0.09	0.39
DPL01S02	1.1	460	21	230	<0.50	54	<0.50	25,000	5,000	3,200	8.05	7.59	1.36	10.5	0.06	0.37
DPL01S02	0.74	410	4.2	160	<0.50	43	<0.50	33,000	17,000	2,600	8.47	7.75	1.88	9.4	0.1	0.31
DPL01S02	1.1	480	5.6	150	<0.50	34	<0.50	190,000	74,000	7,400	8.59	7.79	2	10.1	0.1	0.24
DPL01S02	0.64	470	4.4	210	<0.50	57	<0.50	3,200	1,190	560	10.27	7.66	1.06	9	0.07	0.27
DPL01S02	0.53	340	4.5	140	<0.50	34	<0.50	33,000	10,000	9,200	8.6	7.83	3.81	7.8	0.2	0.55
DPL01S02	0.75	260	3.9	84	<0.50	23	<0.50	32,000	40	2,300	7.98	7.9	1.46	6.3	0.07	0.45
DPL01S02	0.55	230	4.4	62	<0.50	19	<0.50	33,000	4,200	3,400	9.24	7.49	0.99	7.6	0.07	0.4
DPL01S02	0.66	360	6.7	110	<0.50	35	<0.50	>1,200,000	210,000	48,000	8.81	7.61	2.24	10.3	0.13	0.39
DPL01S02	0.73	300	4.4	140	<0.50	37	<0.50	77,000	5,500	600	9	7.87	1.38	8.8	0.15	0.51
DPL01S02	0.53	280	3.9	98	<0.50	33	<0.50	3,800	300	1,200	9.26	7.81	0.87	7.9	0.06	0.4
DPL01S02	0.51	230	3.1	71	<0.50	30	<0.50	7,500	500	1,400	8.89	7.42	1.33	7.2	0.1	0.32
DPL01S02	0.6	260	3	71	<0.50	35	<0.50	32,000	5,600	3,700	10.81	7.72	3.65	9.9	0.1	0.3
DPL01S02	0.62	320	3	98	<0.50	39	<0.50	42,000	5,200	1,900	8	7.81	1.17	11.1	0.05	0.42
DPL01S02	0.59	320	9.1	130	<0.50	40	<0.50	163,000	3,600	1,110	9.28	7.72	3.02	9.7	0.12	0.23
DPL01S02	0.56	340	3.4	140	<0.50	41	<0.50	36,000	490	860	6.63	8.03	2.77	8.8	0.1	0.3
DPL01S02	0.72	400	4.1	100	<0.50	14	<0.50	49,000	5,300	8,500	7.74	7.85	2.02	8.1	0.09	0.17

DPL01S02	<1.00	250	3	55	<1.00	5.7	<1.00	136,000	3,100	3,500	8.45	8.09	3	7.1	0.12	0.3
DPL01S02	0.52	210	3.7	60	<0.50	11	<0.50	78,000	4,100	3,700	8.09	8.31	2.77	7.8	0.1	0.3
DPL01S02	<1.00	310	5	130	<1.00	24	<1.00	31,000	4,400	3,100	7.96	7.75	2.25	8	0.11	0.3
DPL01S02	0.54	260	5.4	93	<1.00	30	<1.00	>7,500	220	470	9.44	7.73	2.52	7.3	0.1	0.32
DPL01S03	<8.00	5	5	82	<2.00	<1.00	<2.00	61,000	14,300	1,130	11.38	8.02	2.63	7.8	0.15	0.66
DPL01S03	<8.00	8.1	7.1	23	<2.00	<1.00	<2.00	30,000	22,000	42,000	7.93	8.22	3.37	6.1	<0.05	0.62
DPL01S03	<8.00	4.5	9.4	38	<2.00	<1.00	<2.00	19,900	10,500	14,900	1.13	8.25	4.29	2.1	0.19	0.11
DPL01S03	<8.00	5.9	3.4	17	<2.00	<1.00	<2.00	44,000	14,400	14,200	9.87	8.3	4.46	8.6	0.07	0.24
DPL01S03	<8.00	9.9	7.9	35	<2.00	<1.00	2.9	1,590	860	460	7.6	8.1	0.56	8.5	0.1	0.42
DPL01S03	<8.00	11	6.5	31	<2.00	<1.00	<2.00	21,400	16,000	6,300	8.37	8.19	1.79	7.8	<0.05	0.45
DPL01S03	<8.00	11	6.7	20	<2.00	<1.00	<2.00	6,300	4,400	1,670	11.33	7.95	2.84	7.6	0.1	0.2
DPL01S03	<8.00	13	3.3	<10.00	<2.00	<1.00	<2.00	14,200	11,000	5,500	15.2	8.4	2.9	7		0.47
DPL01S03	<8.00	14	4.2	22	<2.00	<1.00	<2.00	46,000	38,000	9,950	15.9	8.55	1.41	7.1	0.2	0.4
DPL01S03	1.2	24	3.1	7.5	<0.50	<0.50	1.6	27,000	6,300	2,100	8.69	8.23	0.66	13.3	<0.05	0.55
DPL01S03	<0.50	29	3.8	4.9	<0.50	<0.50	<0.50	20,000	10,000	3,000	9.41	7.65	1.03	12.7	0.1	0.28
DPL01S03	<0.50	26	4	12	<0.50	<0.50	<0.50	22,000	9,000	3,000	9.46	7.95	2.83	12.1	<0.05	0.47
DPL01S03	<0.50	13	7.6	12	<0.50	<0.50	<0.50	19,000	14,000	5,400	8.52	8.18	4.06	12.1	0.3	0.48
DPL01S03																
DPL01S03	<0.50	13	6.5	2.3	<0.50	<0.50	<0.50	4,000	3,200	480	8.94	8.13	0.8	13.1	<0.05	0.25
DPL01S03	<0.50	23	3.1	7.4	<0.50	<0.50	<0.50	8,400	5,300	560	9.4	8.07	3.53	11.4	<0.05	0.28
DPL01S03	<0.50	15	4.3	5	<0.50	<0.50	<0.50	8,600	6,000	2,300	9.95	8.07	1.67	8.5	<0.05	0.35
DPL01S03	<0.50	19	4	4.4	<0.50	<0.50	<0.50	21,000	100	360	7.72	7.98	1.4	11.8	0.13	0.4
DPL01S03	<0.50	4.7	3.5	2	<0.50	<0.50	<0.50	9,000	7,200	1,400	9.2	7.86	1.22	12.9	0.07	0.46
DPL01S03	0.94	17	9.4	5.2	<0.50	<0.50	<0.50	13,000	10,300	5,300	9.65	7.98	0.93	5.9	<0.05	0.39
DPL01S03	<0.50	8.5	3.2	5.6	<0.50	<0.50	<0.50	8,600	3,500	2,700	9.22	8.17	1.24	12.6	0.06	0.59
DPL01S03	<0.50	5.8	3.8	4.1	<0.50	<0.50	<0.50	9,000	6,100	690	9.25	8.19	4.41	12	0.07	0.61
DPL01S03	<0.50	5	3.7	4	<0.50	<0.50	<0.50	38,000	6,300	1,300	8.52	7.93	6.85	11.1	0.08	0.46
DPL01S03	<0.50	16	4.8	7.5	<0.50	<0.50	<0.50	56,000	23,000	5,400	10.55	8.15	7.51	10.7	0.1	0.44
DPL01S03	<0.50	5.9	2.1	2.2	<0.50	<0.50	<0.50	20,000	12,000	4,300	7.1	8.06	2.76	11.3	0.05	0.22
DPL01S03	<0.50	8.6	6.6	8.1	<0.50	<0.50	<0.50	48,000	8,400	3,300	9.9	8.23	1.61	12.5	0.12	0.49
DPL01S03	<0.50	6.9	3.8	2.9	<0.50	<0.50	<0.50	29,000	4,400	4,400	8.36	8.21	0.69	10.4	0.1	0.3

DPL01S03	0.82	8.5	8.3	6.8	<0.50	<0.50	<0.50	22,000	3,900	2,200	8.7	8.26	1.23	9.4	0.16	0.49
DPL01S03	<1.00	8	4.3	4.3	<1.00	<1.00	<1.00	>930,000	22,000	3,200	9.8	8.19	0.81	10.4	0.33	0.2
DPL01S03	<0.50	4.7	4.3	5.6	<0.50	<0.50	<0.50	32,000	7,000	4,900	9	8.12	3.02	14.3	0.1	0.59
DPL01S03	<0.50	4.3	6.1	6.6	<0.50	<0.50	<1.00	21,000	3,600	740	10.36	8.2	3.76	18.3	0.1	0.32
DPL01S03	<0.50	3.8	7.4	8.2	<0.50	<0.50	<1.00	5,200	350	220	11.73	8.08	2.88	8.3	0.1	0.38
DPL01SCWD	<0.50	130	5.1	28	<0.50	9.8	<0.50	550,000	>120,000	58,000	5.59	7.14	3.14	4.8	0.15	1.33
DPL01SCWD	<0.50	97	3.8	13	<0.50	12	<0.50	42,000	13,000	1,500	5.24	7.27	2.25	2.2	<0.05	0.93
DPL01SCWD	0.64	47	5.8	10	<0.50	3.7	<0.50	2,500	2,100	560	16.96	9.42	3.33	0.9	<0.05	0.08
DPL01SCWD	<0.50	59	6.5	8	<0.50	3.8	<0.50	22,000	9,000	2,700	7.8	7.79	6.46	4.6	0.06	2.73
DPL01SCWD	<0.50	63	4.9	13	<0.50	6.4	<0.50	260,000	113,000	7,200	6.3	8.31	3.6	2.8	<0.05	0.99
DPL01SCWD	0.53	230	4.4	39	<0.50	24	<0.50	25,000	14,000	450	6.75	7.55	2.18	3.7	0.07	0.6
DPL01SCWD	16	130	6.6	22	<0.50	16	<0.50	25,000	40	1,000	4.8	7.59	3.15	5.1	<0.05	0.94
DPL01SCWD	0.83	64	6.6	16	<0.50	5.6	<0.50	360,000	4,200	1,500	14.31	8.42	3.31	1.8	0.17	1.04
DPL01SCWD	<0.50	57	4.5	14	<0.50	2.7	<0.50	210,000	50,000	38,000		7.35	11.4	1.9	0.08	0.92
DPL01SCWD	<0.50	41	3.8	14	<0.50	2.6	<0.50	130,000	28,000	8,000	9.61	7.98	7.7	2.2	<0.05	0.85
DPL01SCWD	<0.50	96	4.4	25	<0.50	12	<0.50	29,000	2,700	3,600	3.03	7.93	2.01	3.9	1	0.69
DPL01SCWD	<0.50	87	3	20	<0.50	7.5	<0.50	31,000	1,200	3,100	7.85	7.85	2.76	2	0.07	0.95
DPL01SCWD	<0.50	85	3.1	17	<0.50	7.6	<0.50	160,000	6,100	16,000	0.2	7.87	1.92	2.8	0.06	1.62
DPL01SCWD	0.5	94	1.9	9.5	<0.50	1.6	<0.50	4,600	900	600	8.5	7.87	1.03	2.8	0.05	1.14
DPL01SCWD	<0.50	79	3.1	25	<0.50	6.8	<0.50	40,000	5,200	2,700	5.02	8	3.83	3.6	0.05	1.12
DPL01SCWD	<0.50	68	4.1	16	<0.50	6.5	<0.50	220,000	5,800	7,900	10.38	8.2	3.22	2.3	0.1	0.63
DPL01SCWD	0.56	89	4.5	24	<0.50	7.6	<0.50	89,000	8,000	5,600	13.23	8.18	4.39	2.6	0.22	0.84
DPL01SCWD	<0.50	76	5.2	12	<0.50	6.9	<0.50	>74,000	7,000	150	13.49	8.11	2.82	2.6	0.1	0.91
DPL01SCWD	<1.00	100	7.4	20	<0.50	8	<0.50	750,000	78,000	32,000	9.86	7.79	2.19	3.7	0.1	1.31
DPL01SCWD	<1.00	130	4.6	40	<1.00	20	<0.50	36,000	5,800	7,600	11.63	8.05	1.95	2.7	0.1	0.92
DPL01SCWD	<0.50	51	6.1	9.2	<0.50	3.6	<0.50	>183,000	>910	1,600	13.14	8.33	2.18	2	0.1	0.84
DPL01SCWD	<0.50	68	4.2	11	<0.50	8.1	<1.00	31,000	910	4,600	11.57	8.11	2.89	3.2	0.1	0.62
DPL01SCWD											9.81	8.07	1.41	2.3	0.1	0.76
DPM00P01	<8.00	130	12	79	<2.00	14	<2.00	14,000	12,400	11,400	9.46	7.71	56.5	3	0.17	2.74
DPM00P01	<8.00	160	14	84	<2.00	16	<2.00	12,200	2,350	6,100	9.53	7.76	10.2	3.1	<0.05	0.51

DPM00P01	<8.00	120	13	57	<2.00	14	<2.00	3,500	2,800	3,900	10.96	7.73	3.57	1.9	0.3	0.4
DPM00P01	<8.00	160	9.4	86	<2.00	15	<2.00	7,300	5,200	7,200	10.34	8.03	6.68	3	0.22	0.61
DPM00P01	<8.00	130	5.5	62	<2.00	12	<2.00	48,000	26,000	26,000	8.71	7.85	5.01	2.5	0.08	1.04
DPM00P01	<8.00	110	12	51	<2.00	9	<2.00	42,000	35,000	9,700	10.26	8.01	9.42	1.9		0.99
DPM00P01	<0.50	120	7.8	41	<0.50	11	<0.50	200,000	17,000	1,600	9.15	7.43	2.6	3.8	<0.05	0.62
DPM00P01	<0.50	110	5.3	31	<0.50	8.3	<0.50	12,100	6,000	1,300	9.35	7.82	3.61	6.1	<0.04	0.86
DPM00P01	<0.50	130	5.4	40	<0.50	13	<0.50	14,000	11,000	900	9.55	7.82	3.3	5.1	<0.05	0.64
DPM00P01	<0.50	130	6.7	42	<0.50	11	<0.50	110,000	2,200	6,000	10.51	7.8	11.3	3.6	0.2	0.84
DPM00P01	<0.50	100	6.7	34	<0.50	8.3	<0.50	50,000	2,300	7,000	9.24	7.67	5.41	4.5	0.12	0.82
DPM00P01	<0.50	120	6.8	34	<0.50	9.5	<0.50	21,000	9,300	9,100	9.5	7.86	5.26	3.2	0.06	0.7
DPM00P01	<0.50	100	7.7	41	<0.50	11	<0.50	3,600	1,100	1,400	9.41	7.94	204	3.8	0.07	0.92
DPM00P01	<0.50	140	5.3	50	<0.50	15	<0.50	53,000	4,400	9,400	7.17	7.78	13.6	5.1	0.08	1.11
DPM00P01	<0.50	79	5.1	29	<0.50	8.4	<0.50	380,000	89,000	>120,000	9.69	7.98	9.93	5	0.05	0.79
DPM00P01	<1.00	73	7.6	31	<0.50	5.2	<0.50	41,000	1,300	2,400	10.36	8.01	5.42	2.4	0.12	0.06
DPM00P01	<0.50	72	5.9	32	<1.00	6.8	<1.00	58,000	12,700	30,000	8.45	7.83	8.25	4.8	0.11	1.12
DPM00P01	<0.50	77	5.2	26	<0.50	6.1	<0.50	>85,000	17,000	24,000	20.19	7.77	7.37	3.1	0.18	0.59
DPM00P01											9.55	7.87	7.11	2.2	0.1	0.4
DPM00P05	<8.00	20	11	32	<2.00	<1.00	<2.00	1,700	265	2,500	23.65	9.01	3.14	0.3	0.14	0.21
DPM00P05	<8.00	15	8.7	51	<2.00	<1.00	<2.00	6,550	1,300	1,400	8.56	8.64	4.37	2.8	<0.05	0.44
DPM00P05	<8.00	10	9.3	13	<2.00	<1.00	<2.00	17,000	14,000	2,900		9.07	2.34	1.8	0.2	<0.06
DPM00P05																
DPM00P05	<8.00	18	3.7	42	<2.00	<1.00	<2.00	9,100	7,800	3,500	7.98	7.41	7.05	1.6	0.12	0.89
DPM00P05																
DPM00P05	<0.50	19	6.6	7.4	<0.50	<0.50	<0.50	17,000	600	1,600	16.82	8.22	1.67	1.6	0.09	0.29
DPM00P05	<0.50	21	6.1	8.1	<0.50	<0.50	<0.50	57,000	7,400	1,000	11.38	7.9	2.2	1.2	<0.03	0.39
DPM00P05	<0.50	19	2.7	7.4	<0.50	<0.50	<0.50	14,000	6,000	700	10.68	8.02	3.27	1.2	<0.05	0.59
DPM00P05	<0.50	25	4.9	11	<0.50	<0.50	<0.50	3,000	110	100	6.86	7.8	1.08	1.3	<0.05	0.27
DPM00P05	<0.50	20	3.8	5.4	<0.50	<0.50	<0.50	640	10	60	8.96	7.45	0.96	1	0.2	0.32
DPM00P05	<0.50	16	3.7	5.1	<0.50	<0.50	<0.50	6,300	3,700	1,800	9.74	7.8	0.56	1.4	0.14	0.29
DPM00P05	<0.50	12	11	5.1	<0.50	<0.50	<0.50	3,200	600	400	11.74	8.41	1.22	1.9	0.08	0.23
DPM00P05	<0.50	8.3	8.7	2.8	<0.50	<0.50	<0.50	6,000	<10	320	5.78	8.76	1.17	3.9	0.07	0.3

DPM00P05	<0.50	11	2.3	2.2	<0.50	<0.50	<0.50	19,000	4,700	4,300	10.13	8.05	2.32	1.3	0.07	0.25
DPM00P05	<1.00	24	7.6	5	<0.50	<0.50	<0.50	>560	100	170	12.3	8.29	2.85	2	0.13	0.3
DPM00P05	<0.50	11	2.6	5.9	<1.00	<1.00	<1.00	7,700	2,300	2,800	9.03	7.88	6.07	2.1	0.1	0.3
DPM00P05	<0.50	12	4.2	<2.00	<0.50	<0.50	<0.50	>15,000	20	20	16.11	8.11	12.7	2	0.1	0.3
DPM00P05	<0.50	13	9	5.9	<0.50	<0.50	<2.00	1,700	720	1,340	10.33	7.99	2.23	4.8	0.1	0.3
LBBLULGN	<0.50	5.2	3.3	3.6	<0.50	<0.50	<1.00	37,000	110	580	9.92	8.02	3.66	2	0.1	0.3
LBBLULGN	<0.50	3.5	4.3	2.5	<1.00	<1.00	<1.00	34,000	30	2,200	12.5	8.01	3.1	2	0.15	0.3
LBJ00P02	<8.00	13	4.9	29	<2.00	<1.00	<2.00	320	10	220	10.64	8.65	0.54	1.4	<0.05	0.5
LBJ00P02								630	630	2,410	10.3	8.05	2.1	1.5	<0.05	0.8
LBJ00P02	<8.00	13	6	27	<2.00	<1.00	<2.00	690	130	560	9.43	7.34	18.2	1.4	<0.05	0.72
LBJ00P02	<8.00	13	4.7	30	<2.00	<1.00	<2.00	30	10	20	9.89	8.25	0.34	1.4	<0.05	0.25
LBJ00P02	<8.00	11	3.9	26	<2.00	<1.00	<2.00	360	170	90	9.33	8.16	0.91	2.3		0.47
LBJ00P02	<8.00	11	<2.00	11	<2.00	<1.00	<2.00	1,620	310	350	7.17	7.76	10.3	0.7	0.1	0.7
LBJ00P02	0.67	15	3	16	<0.50	<0.50	<0.50	170	140	480	9.7	7.62	0.44	1.8	<0.05	0.36
LBJ00P02	0.56	14	2.3	10	<0.50	<0.50	<0.50	9,000	1,600	100	10.1	7.88	0.3	1.7	0.06	0.6
LBJ00P02	<0.50	14	2	6	<0.50	<0.50	<0.50	4,200	310	200	9.48	8.05	0.25	1.5	<0.05	0.51
LBJ00P02	0.52	15	2.5	7.2	<0.50	<0.50	<0.50	270	<10	10	9.65	8.12	0.19	1.8	<0.05	0.48
LBJ00P02	0.61	14	2.5	12	<0.50	<0.50	<0.50	16,000	6,000	9,000	10.09	7.93	0.19	0.8	0.1	0.4
LBJ00P02	0.61	12	3.8	7.1	<0.50	<0.50	<0.50	10,000	1,000	2,000	9.1	7.96	0.15	1.9	<0.05	0.49
LBJ00P02	<0.50	7.8	2.4	6.7	<0.50	<0.50	<0.50	2,400	2,000	100	11.39	8.22	0.7	0.9	0.09	0.63
LBJ00P02	1.9	8.2	2.4	12	<0.50	<0.50	<0.50	50,000	7,000	2,600	9.54	8.12	0.68	2.5	0.05	0.56
LBJ00P02	<0.50	6.5	1.5	27	<0.50	<0.50	<0.50	11,000	<10	200	10.3	8.15	0.54	0.8	0.05	0.58
LBJ00P02	<0.50	7.4	2.6	9	<0.50	<0.50	<0.50	>750	140	240	10.35	8.12	0.52	2.2	0.1	0.3
LBJ00P02	0.61	4.7	2.8	6.9	<0.50	<0.50	<0.50	2,700	9	490	10.55	8.34	0.3	2	0.1	0.34
LBJ00P02	0.61	4.4	2.9	8	<0.50	<0.50	<0.50	5,200	220	530	8.95	8.23	0.42	2	0.1	0.3
LBJ00P02											10.87	8.13	1.34	2	0.1	0.3
LBLCWI02	<0.50	2.5	2.3	4.7	<0.50	<0.50	<0.50	690	200	750	12.03	8.25	0.31	2	0.1	0.3
LBLCWI02	<0.50	2.6	3.4	3.5	<0.50	<0.50	<0.50	>5,800	200	2,500	11.07	8.14	0.63	2	0.1	0.3

LFJ01P01	<0.50	8.4	3.7	8.1	<0.50	<0.50	<0.50	140,000	10,000	7,400	8.53	7.5	0.58	8.7	<0.05	1.07
LFJ01P01	<0.50	15	3.7	14	<0.50	<0.50	<0.50	23,000	11,000	2,200	8.34	7.44	0.84	10.3	0.1	1.2
LFJ01P01	<0.50	8.5	2.2	6.2	<0.50	<0.50	<0.50	57,000	22,000	9,800	7.31	7.8	1.18	11.5	<0.05	1.08
LFJ01P01	<0.50	7.6	1.6	5.3	<0.50	<0.50	<0.50	86,000	16,000	7,900	6.16	7.76	2	10.1	<0.05	1.29
LFJ01P01	1.2	12	22	65	<0.50	<0.50	<0.50	110,000	12,000	11,000	5.26	8.01	5.1	11.9	0.16	1.14
LFJ01P01	<0.50	13	3.8	13	<0.50	<0.50	<0.50	6,700	3,300	2,500	12.35	7.86	3.64	9.7	<0.05	0.98
LFJ01P01	<0.50	3.5	2.6	12	<0.50	<0.50	<0.50	30,000	13,000	2,700	8.5	7.89	0.9	9.8	<0.05	1.2
LFJ01P01	<0.50	11	3.2	15	<0.50	<0.50	<0.50	49,000	44,000	7,000	7.65	7.68	1.49	8.1	<0.05	1.19
LFJ01P01	<0.50	2.7	4	15	<0.50	<0.50	<0.50	53,000	25,000	7,700	8.84	7.73	1.23	8	<0.05	0.9
LFJ01P01	<0.50	4.2	4.2	9.1	<0.50	<0.50	<0.50	97,000	33,000	39,000	7.14	7.98	5.94	8.5	0.08	1.21
LFJ01P01	0.64	2.3	6.3	8.2	<0.50	<0.50	<0.50	24,000	3,200	3,700	8.13	7.99	2.09	9.5	0.05	1.33
LFJ01P01	<0.50	2.1	1.6	6.3	<0.50	<0.50	<0.50	49,000	10,000	10,800	6.9	7.91	1.16	9.2	0.05	1.31
LFJ01P01	0.64	2.5	2.5	10	<0.50	<0.50	<0.50	50,000	13,000	7,000	7.67	7.89	1.46	9.1	0.37	1.97
LFJ01P01	<0.50	2.9	2.1	2.9	<0.50	<0.50	<0.50	39,000	16,000	20,000	7.39	8.01	2.85	8.1	0.05	1.37
LFJ01P01	<0.50	2.4	1.1	5.6	<0.50	<0.50	<0.50	41,000	63,000	3,800	6.29	7.8	2.95	10	0.1	2.16
LFJ01P01	0.53	4.2	3.1	10	<0.50	<0.50	<0.50	>30,000	10,000	44,000	9.04	8.11	2.57	11.6	0.1	2.15
LFJ01P01	<0.50	3.2	4.8	6.3	<0.50	<0.50	<0.50	34,000	7,400	4,600	8.26	8.09	0.96	9.2	0.11	1.02
LFJ01P01	<0.50	4	1.4	6.4	<0.50	<0.50	<0.50	19,000	6,700	3,400	8.17	8.02	1.31	8.1	0.1	1.23
LFJ01P01	<0.50	4.2	2.1	5.1	<0.50	<0.50	<0.50	27,000	12,000	6,300	7.48	7.74	1.41	7.8	0.1	1.38
LFJ01P01	<0.50	2.1	0.95	3.5	<0.50	<0.50	<0.50	61,000	14,000	4,100	8.01	7.7	0.94	10.1	0.1	1.37
LFJ01P01	<0.50	2	3.1	7.7	<0.50	<0.50	<0.50	>9,400	6,700	3,600	8.84	8.02	1.74	9.1	0.1	1.42
LFJ01P01	<0.50	1.7	1.8	5.8	<0.50	<0.50	<0.50	23,000	420	1,900	8.64	7.97	3.5	9.4	0.1	1.84
LFJ01P05	<8.00	9.2	23	65	<2.00	<1.00	2				7.83	8.25	12.2	0.5	1.3	4.47
LFJ01P05	<8.00	7.2	7.9	57	<2.00	<1.00	<2.00	3,600	1,800	5,400	9.13	7.31	14.6	0.4	1.6	3.98
LFJ01P05	<8.00	5.1	8	39	<2.00	<1.00	<2.00	34,000	21,000	110	8.39	7.61	5.47	1.1	0.25	3.24
LFJ01P05	<8.00	9.6	12	64	<2.00	<1.00	<2.00	46,000	5,000	470	8.83	8.11	10.4	0.9	0.35	1.41
LFJ01P05	<8.00	<4.00	4.5	34	<2.00	<1.00	<2.00	7,800	810	880	3.07	8.23	4.24	3.1	0.18	1.83
LFJ01P05																
LFJ01P05	<8.00	8.7	13	72	<2.00	<1.00	2.1	7,900	6,200	2,500	8	8.3	14.8	2.9	0.5	2.62
LFJ01P05																
LFJ01P05	<8.00	6.3	8.8	44	<2.00	<1.00	<2.00	59,000	44,000	5,900	8.27	8.15	8.2	1.7	0.2	2.33

LFJ01P05																
LFJ01P05	0.58	9.6	11	42	<0.50	<0.50	0.51	220,000	32,000	6,600	9.25	7.51	7.43	1.6	0.15	2.01
LFJ01P05	<0.50	5.8	5.9	47	<0.50	<0.50	0.56	410,000	140,000	14,000	8.1	8.03	1.91	1.9	0.22	1.87
LFJ01P05	<0.50	2.8	5.1	27	<0.50	<0.50	1.5	62,000	18,000	560	7.8	8.31	9.4	2.4	<0.05	0.63
LFJ01P05	0.52	5.4	11	45	<0.50	<0.50	0.79	830,000	42,000	19,000	13.79	8.01	8.77	2.7	<0.05	3.89
LFJ01P05	<0.50	12	3.5	15	<0.50	<0.50	<0.50	67,000	16,000	4,100	9.09	8.32	2.95	2	0.15	0.47
LFJ01P05	<0.50	4.6	5.4	41	<0.50	<0.50	0.52	>1,200,000	520,000	12,000	8.07	8.11	3.72	0.8	0.1	0.64
LFJ01P05	1.9	16	44	180	<0.50	<0.50	1.3	60,000	50,000	3,000	7.86	7.81	83.2	2.1	2.72	1.48
LFJ01P05	1.3	4.6	18	24	<0.50	<0.50	<0.50	380,000	52,000	10,200	8.93	8.35	4.56	1.3	0.15	3.33
LFJ01P05	0.84	4.2	17	52	<0.50	<0.50	1.6	240,000	22,000	29,000	8.75	8.36	5.9	1.3	0.1	11.68
LFJ01P05	9.1	8.9	27	50	<0.50	<0.50	1.2	420,000	10,000	120,000	7.46	8.12	6.99	1.7	0.36	2.74
LFJ01P05	0.79	4.2	15	120	<0.50	<0.50	3.1	840,000	44,000	17,000	8.62	8.29	7.13	2	0.15	4.18
LFJ01P05	1.2	12	13	80	<0.50	<0.50	0.82	>1,200,000	81,000	23,000	8.46	8.08	13.9	1.8	0.05	3.95
LFJ01P05	0.55	5.4	8	38	<0.50	<0.50	<0.50	46,000	22,000	2,600	9.25	8.13	5.34	3	0.15	2.16
LFJ01P05	0.82	6.3	10	42	<0.50	<0.50	0.62	64,000	1,320	3,600	9.45	8.33	3.65	2	0.45	1.29
LFJ01P05	0.67	5.1	15	84	<0.50	<0.50	0.7	340,000	35,000	47,000	9.83	8.24	7.88	2	0.1	3.23
LFJ01P05	0.82	5.2	12	55	<0.50	<0.50	0.69	>640,000	41,000	14,400	9.26	8.15	8.02	2	0.1	1.84
LFJ01P05	1.1	8.8	21	220	<0.50	0.63	4	>10,000,000	82,000	540,000	8.64	7.96	7.63	2	0.35	6.58
LFJ01P05	<0.50	2.8	4	18	<0.50	<0.50	<0.50	780,000	29,000	26,000	8.93	7.48	4.45	4	0.25	1.81
LFJ01P05	0.62	2.8	9.7	27	<0.50	<0.50	<0.50	3,900,000	80,000	11,100	8.61	8.13	15	2.6	0.16	1.47
LFJ01P05	<0.50	3	8.7	40	<0.50	<0.50	<0.50	8,000	130	2,500	11.51	8.3	4.96	2	0.16	0.9
LFJ01P05@RR	<0.50	5.4	3.3	13	<0.50	<0.50	<0.50	2,100,000	14,000	28,000	9.71	8.17	9.06	2	6.5	0.85
LFJ01P05@RR	<0.50	5.8	10	32	<0.50	<0.50	2	320,000	3,100	13,000	9.64	8.23	3.76	2	6	1.55
LFJ01P05@RR	<0.50	2.6	3.1	15	<0.50	<0.50	<0.50	>7,300	2,500	2,600	8.95	8.63	9.74	2	0.33	0.5
LFJ01P05@RR																
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LFJ01P05@RR																
LFJ01P08	<8.00	8.6	15	78	<2.00	3.3	<2.00	39,000	16,000	36,750	7.7	8.1	5.68	2.6	0.15	5.42

LFJ01P08	<8.00	6.2	8.9	29	<2.00	2.9	<2.00	38,000	16,000	55,000	6.3	6.65	3.1	2	0.1	1.29
LFJ01P08	<8.00	6.2	6.7	30	<2.00	3.3	<2.00	88,000	14,000	1,540	8.89	7.43	3.81	1.9	<0.05	1.83
LFJ01P08	<8.00	4	6.8	44	<2.00	2.3	<2.00	NR	NR	NR	8.88	8	3.18	2	0.43	1.49
LFJ01P08	<8.00	5.4	8.2	29	<2.00	1.3	<2.00	65,000	56,000	43,000	8.99	8	5.73	1.4	1.7	1.19
LFJ01P08	<8.00	7.6	7	34	<2.00	1.8	<2.00	101,000	38,000	79,000	7.63	7.91	13.6	2.2	0.1	1.5
LFJ01P08	<0.50	12	6.2	8.9	<0.50	3.6	<0.50	100,000	29,000	4,500	9.47	7.61	1.14	1.6	0.09	0.78
LFJ01P08																
LFJ01P08	1.2	9.1	7	14	<0.50	1.8	<0.50	160,000	37,000	24,000	8.97	8.22	5.33	0.9	0.13	1.41
LFJ01P08	<0.50	12	5.7	24	<0.50	1.8	<0.50	300,000	90,000	>120,000	7.76	7.97	4.13	3.9	0.13	1.65
LFJ01P08	<0.50	8.8	3.8	5.6	<0.50	0.86	<0.50	210,000	26,000	21,000	6.94	8.02	6.3	1.4	0.07	1.21
LFJ01P08	<0.50	12	3.8	11	<0.50	2.1	<0.50	190,000	21,000	10,000	7.71	7.96	2.2	1.5	<0.05	0.96
LFJ01P08	43	12	10	3.6	<0.50	0.98	<0.50	340,000	60,000	52,000	8.52	9.02	10.7	0.9	0.13	0.36
LFJ01P08	1.3	6.3	8.6	14	<0.50	1.6	<0.50	69,000	68,000	11,000	7.73	7.83	1.81	1.7	0.8	1.03
LFJ01P08	0.75	11	5	8.3	<0.50	1.4	<0.50	44,000	25,000	8,000	7.63	7.76	2.27	1.6	0.11	2.37
LFJ01P08	0.61	4.7	8.3	9.3	<0.50	1.4	<0.50	30,000	29,000	13,000	8.53	8.09	7.1	1	0.1	1.5
LFJ01P08	0.61	4.6	6.3	20	<0.50	1.2	<0.50	160,000	32,000	25,000	7.86	8.01	10.5	0.9	0.4	1.08
LFJ01P08	<0.50	3.8	3.6	8.3	<0.50	0.69	<0.50	37,000	6,400	3,100	9.37	8.15	5.01	2	0.1	1.58
LFJ01P08	0.74	6.4	12	26	<0.50	1.4	<0.50	190,000	>44,000	8,700	8.42	8.14	4.04	2.9	0.45	2.21
LFJ01P08	<0.50	7.5	4.3	8.1	<0.50	0.75	<0.50	>91,000	18,000	10,600	8.47	8.07	4.21	2.8	0.1	0.87
LFJ01P08	0.67	5.7	2.7	7.9	<0.50	1.1	<0.50	800,000	61,000	9,500	12.11	8.09	3.11	2.3	0.3	1.23
LFJ01P08											9.47	8.17	2.79	2	0.12	1.09
LHJ04P04	<8.00	5.4	4.8	32	<2.00	<1.00	<2.00	8,500	1,800	6,900	8.79	7.76	2.51	1.7	0.1	0.91
LHJ04P04	<8.00	<4.00	6.7	16	<2.00	<1.00	<2.00	129,000	21,000	6,400	6.33	7.56	12.3	2.2	0.08	2.69
LHJ04P04	<8.00	<4.00	5.6	23	<2.00	<1.00	<2.00	43,000	21,000	32,000	7.82	7.21	4.07	2.2	<0.05	1.73
LHJ04P04	<8.00	9.4	6.2	45	<2.00	<1.00	<2.00	41,000	12,400	12,200	8.14	7.77	2.58	1.8	0.09	0.82
LHJ04P04	<8.00	7.7	5.2	51	<2.00	<1.00	4.9	59,000	27,000	9,250	7.54	7.8	3.77	2.8	0.1	1.21
LHJ04P04	<8.00	11	6	17	<2.00	<1.00	<2.00	59,000	45,000	26,000	8.45	7.35	15.3	2.5	0.09	1.19
LHJ04P04	1.2	15	4.1	6.9	<0.50	2.7	<0.50	22,000	900	5,400	10.96	7.61	1.93	2.6	0	0.96
LHJ04P04	<0.50	20	9.2	11	<0.50	<0.50	<0.50	690,000	83,000	22,000	8.85	7.31	3.58	1.6	0.08	0.93
LHJ04P04	1	18	6.2	15	<0.50	0.63	<0.50	190,000	29,000	11,000	8.49	7.56	6.28	2.8	0.07	1.17
LHJ04P04	<0.50	14	4.2	9.6	<0.50	<0.50	<0.50	230,000	140,000	15,000	8.31	7.82	2.48	2.3	0.08	1.24

LHJ04P04	<0.50	18	4	9.3	<0.50	<0.50	<0.50	130,000	68,000	7,400	8.3	7.5	2.1	2.3	<0.05	0.97
LHJ04P04	<0.50	18	3	11	<0.50	<0.50	<0.50	42,000	7,800	5,600	12.04	7.67	2.87	2.8	<0.05	1.39
LHJ04P04	0.72	9.9	14	48	<0.50	<0.50	2.6	400,000	20,000	16,000	8.9	7.68	14.4	2.3	0.2	1.09
LHJ04P04	0.66	5.9	11	26	<0.50	<0.50	<0.50	210,000	17,000	15,000	8.24	7.74	7.62	3.4	0.15	1.23
LHJ04P04	<0.50	3.9	4.9	8.2	<0.50	<0.50	<0.50	240,000	95,000	19,000	7.3	6.83	4.27	2.6	0.07	1.16
LHJ04P04	<0.50	8.2	3.7	7.4	<0.50	0.57	<0.50	260,000	100,000	8,100	11.98	7.65	3.77	3.2	0.12	1.48
LHJ04P04	<0.50	4.1	3.8	12	<0.50	0.64	<0.50	4,400	900	320	9.23	7.88	1.39	2.7	0.1	0.72
LHJ04P04	<0.50	5.3	4	6.4	<0.50	0.5	<0.50	33,000	5,700	8,900	8.7	7.78	1.77	2.8	0.06	1.14
LHJ04P04	<0.50	3.8	3.5	6.1	<0.50	<0.50	<0.50	47,000	16,000	13,000	8.19	7.91	3.05	2.7	0.05	1.82
LHJ04P04	<0.50	3.9	3.4	4.2	<0.50	<0.50	<0.50	31,000	26,000	15,000	8.35	7.83	3.5	2.2	0.15	1.2
LHJ04P04	<0.50	3.2	3.1	5.6	<0.50	<0.50	<0.50	200,000	37,000	45,000	8.85	7.86	4.35	1.2	0.05	1
LHJ04P04	<0.50	5.4	4.2	8.2	<0.50	<0.50	<0.50	>41,000	3,800	14,400	9.08	7.85	5.03	3.5	0.12	1.21
LHJ04P04	<0.50	5.1	3.4	6.6	<0.50	<0.50	<0.50	31,000	2,000	10,200			3.85	2.1	0.1	0.97
LHJ04P04	<0.50	5.6	3.7	9.5	<0.50	<0.50	<0.50	60,000	24,000	5,700	7.94	7.82	4.48	2	0.18	0.97
LHJ04P04	<0.50	5.2	3.7	5.5	<0.50	<0.50	<0.50	>55,000	18,000	28,000	9.9	7.92	2.21	2.6	0.1	0.76
LHJ04P04	<0.50	3	3	6.8	<0.50	<0.50	<0.50	78,000	28,000	25,000	8.22	7.73	10.1	2.6	0.1	1.31
LHJ04P04	<0.50	6.2	2.7	3.9	<0.50	<0.50	<0.50	23,000	2,900	4,800	9.55	7.87	6.3	2.5	0.1	0.78
LHJ04P04											9.93	7.84	10.8	2	0.1	0.85
LHJ05P01	<0.50	180	3.7	19	<0.50	17	<0.50	2,200	2,000	2,200	6.53	7.04	5.94	3.9	0.14	1.07
LHJ05P01	<0.50	180	3.9	16	<0.50	7.5	<0.50	180,000	7,000	7,000	5.89	7.22	5.52	3.9	0.18	1.93
LHJ05P01	<0.50	89	3.4	27	<0.50	3.5	<0.50	130,000	90,000	44,000	3.58	6.81	6.85	4.5	0.08	2.06
LHJ05P01	<0.50	120	2.8	15	<0.50	5.1	<0.50	310,000	110,000	1,130,000	6.78	6.81	2.9	2.3	0.11	2.14
LHJ05P01	<0.50	120	4.6	14	<0.50	3.8	<0.50	330,000	70,000	86,000	4.5	7.66	3.97	3.7	0.06	2.45
LHJ05P01	<0.50	170	2.8	7.5	<0.50	4.9	<0.50	14,000	6,000	15,000	4.8	6.88	0.36	3	0.05	0.78
LHJ05P01	<0.50	94	5.1	23	<0.50	7	<0.50	>1,200,000	>1,200,000	20,000	5.76	7.26	3.85	4.1	0.12	6.78
LHJ05P01	<0.50	87	2.7	12	<0.50	3.6	<0.50	170,000	50,000	10,700	5.73	7.2	4.55	3	0.2	2.27
LHJ05P01	<0.50	55	2.6	8.1	<0.50	2.5	<0.50	40,000	10,000	10,800	4.71	6.97	3.05	1.9	0.07	1.42
LHJ05P01	<0.50	88	2.5	13	<0.50	3.5	<0.50	230,000	28,000	28,000	3.83	7.58	5.62	4	0.12	2.62
LHJ05P01	<0.50	91	7.5	20	<0.50	7	<0.50	150,000	12,600	66,000	7.2	7.25	3.77	3.88	0.1	5.49
LHJ05P01	<0.50	140	1.8	4.8	<0.50	3.5	<0.50	53,000	800	42,000	2.36	7.14	3.37	2.5	0.1	0.87
LHJ05P01	<0.50	55	2.5	6	<0.50	2	<0.50	>93,000	16,000	41,000	4.82	7.54	2.19	2	0.1	1.54

LHJ05P01	<0.50	97	1.4	5.1	<0.50	2.3	<0.50	>55,000	5,800	10,800	4.93	7.65	5.04	3	0.1	0.99
LHJ05P01	<0.50	80	2	8.4	<0.50	3.3	<0.50	>107,000	18,000	24,000	4.82	6.82	4.28	3.1	0.1	1.66
LHJ05P01	<1.00	150	2.3	40	<1.00	3.9	<1.00	>11,900	690	2,600	4.29	6.93	1.81	2.8	0.1	0.61
LHJ05P01	<0.50	150	3	4.8	<0.50	6.3	<0.50	6,500	120	2,300	6.27	6.9	0.53	2	0.1	0.59
LHL04TBN1	<0.50	5.4	4.3	34	<0.50	<0.50	<0.50	12,000	5,000	1,000	8.7	7.65	1.7	1.6	0.06	0.94
LHL04TBN1	1.1	14	19	1200	<0.50	1.8	7.1	200,000	23,000	8,500	9.16	7.68	3.19	1.6	0.35	10.85
LHL04TBN1	<0.50	3	3	23	<0.50	<0.50	0.75	39,000	17,000	1,600	9.52	8.01	2.17	1.5	0.1	1.28
LHL04TBN1	<0.50	2.7	2.4	17	<0.50	<0.50	<0.50	90,000	88,000	2,700	8.59	8.01	1.2	0.9	<0.05	1.32
LHL04TBN1	<0.50	3	2.1	14	<0.50	<0.50	<0.50	83,000	69,000	1,300	9.24	8.32	1.2	1	<0.05	1.15
LHL04TBN1	<0.50	7.5	12	85	<0.50	<0.50	<0.50	51,000	9,000	410	12.33	8.14	4.88	3	<0.05	0.97
LHL04TBN1	<0.50	5.8	14	41	<0.50	<0.50	<0.50	21,000	4,200	90	9.54	8.06	3.74	3	0.24	1.12
LHL04TBN1	<0.50	4.9	5.6	39	<0.50	<0.50	<0.50	8,400	3,400	460	8.51	8.2	1.37	2.3	0.14	1.12
LHL04TBN1	<0.50	2.7	7.3	37	<0.50	<0.50	<0.50	3,800	2,400	260	8.85	7.02	2.51	1.8	0.23	0.83
LHL04TBN1	<0.50	2.2	4.8	21	<0.50	<0.50	<0.50	860,000	42,000	3,000	8.22	8.41	2.28	1.3	0.65	0.95
LHL04TBN1	1.1	3	12	23	<0.50	<0.50	<0.50	20,000	800	130	12.2	8.92	5.19	3.4	0.1	0.81
LHL04TBN1	<0.50	1.9	4.7	14	<0.50	<0.50	<0.50	7,800	280	300	9.42	8.24	4.26	2.6	0.09	0.78
LHL04TBN1	7.3	5.2	34	44	<0.50	<0.50	1.4	29,000	2,000	3,900	10.13	8.33	3.95	4.9	0.32	1.19
LHL04TBN1	<0.50	4.5	8.2	56	<0.50	<0.50	0.98	27,000	14,000	700	8.06	8.2	5.61	1.8	0.65	1.63
LHL04TBN1	1.2	4.1	12	35	<0.50	<0.50	0.89	36,000	10,000	2,800	8.5	8.2	5.01	2.2	0.15	1.42
LHL04TBN1	<0.50	3.3	9.5	51	<0.50	<0.50	<0.50	540,000	11,800	5,400	10.05	8.37	3.08	2.4	0.3	0.67
LHL04TBN1	<0.50	2.9	6.3	32	<0.50	<0.50	<0.50	113,000	3,400	3,300			1.99	2.9	0.15	1.07
LHL04TBN1	<0.50	3.5	6.8	44	<0.50	<0.50	<0.50	>36,000	7,000	3,400	8.45	8.13	2.38	2	0.25	0.74
LHL04TBN1	6.4	8.4	8.3	24	<0.50	<0.50	<0.50	>10,500	2,000	1,300	9.21	7.89	1.62	16.7	0.13	2.23
LHL04TBN1	<0.50	2	2.8	16	<0.50	<0.50	<0.50	42,000	8,600	3,900	8.02	7.98	4.72	2	0.15	0.92
LHL04TBN1	<0.50	3	7.2	33	<0.50	<0.50	<0.50	8,900	140	1,000	10.34	8.35	3.53	2.4	0.12	0.52
LHL04TBN1											9.68	8.3	3.84	2	0.11	0.68
LNJ03P01	<8.00	26	4.6	52	<2.00	3	<2.00	149,000	77,000	416,000	9.35	7.82	5.41	2.8	0.08	0.96
LNJ03P01	<8.00	20	21	38	<2.00	2.4	<2.00	12,250	3,950	8,300	8.15	7.62	3.96	2.5	0.15	2
LNJ03P01	<8.00	18	6.1	52	<2.00	3.2	<2.00	2,900	2,600	3,700	9.49	7.56	2.7	1.3	<0.05	0.3
LNJ03P01	<8.00	28	12	58	<2.00	3	<2.00	9,900	6,200	8,450		7.79	4.38	3.8		1.59

LNJ03P01	<8.00	25	9.4	32	<2.00	2.4	<2.00	133,000	106,000	13,000	7.7	7.61	4.09	2	0.28	1.39
LNJ03P01	<8.00	39	520	190	<2.00	16	<2.00	39,000	26,000	7,900	7.36	7.35	6.9	3.4		1.26
LNJ03P01	0.64	52	4.3	29	<0.50	5.9	<0.50	60,000	1,800	1,800	8.23	7.62	1.17	4	<0.05	0.69
LNJ03P01	0.95	42	4.9	26	<0.50	3.8	<0.50	17,000	33,000	2,500	8.21	7.45	2.31	4	0.07	1.7
LNJ03P01	<0.50	32	3.9	17	<0.50	2.6	<0.50	150,000	23,000	6,000	8.1	7.64	3.12	3.6	<0.05	1.31
LNJ03P01	0.53	39	5.4	23	<0.50	4.1	<0.50	54,000	11,200	8,800	8.1	7.36	1.86	3.8	0.07	1.36
LNJ03P01	0.52	25	3.1	16	<0.50	1.1	<0.50	55,000	27,000	7,900	6.93	7.27	3.18	5.2	0.07	2.93
LNJ03P01	0.52	22	2.8	8	<0.50	0.93	<0.50	14,000	8,200	2,200	8.15	7.73	1.23	2.7	<0.05	1.19
LNJ03P01	0.59	21	4.9	19	<0.50	3.2	<0.50	50,000	1,700	1,800	8.8	7.58	1.4	2.9	0.1	1.14
LNJ03P01	0.5	26	3	20	<0.50	1.7	<0.50	34,000	14,000	7,900	8.51	7.65	2.88	4.5	0.05	2.92
LNJ03P01	<0.50	35	3.1	25	<0.50	3.8	<0.50	40,000	3,000	7,300	10.47	7.59	1.6	3.9	0.05	1.19
LNJ03P01	<0.50	20	2.6	14	<0.50	1.7	<0.50	>9,400	3,300	3,700	8.21	7.72	1.75	3.2	0.1	1.21
LNJ03P01	<0.50	23	2.4	13	<0.50	2.1	<0.50	28,000	800	2,100	7.95	7.79	2.08	3.6	0.1	1.02
LNJ03P01	<0.50	21	1.9	19	<0.50	2	<0.50	26,000	360	800	13.54	7.66	2.08	4	0.1	1.47
LNJ03P01											11.29	7.92	5.85	2.6	0.33	0.74
LNJ03P04	<0.50	120	9.3	40	<0.50	14	<0.50	63,000	20,000	8,100	12.17	7.67	8.78	4.2	0.75	1.59
LNJ03P04	<0.50	130	5.1	79	<0.50	12	<0.50	720,000	460,000	43,000	6.45	6.62	4.95	4.8	0.19	1.74
LNJ03P04	0.8	19	6.1	16	<0.50	1.1	<0.50	220,000	68,000	33,000	8.69	7.44	5.67	6.2	<0.05	3.58
LNJ03P04	<0.50	65	4	11	<0.50	2.2	<0.50	98,000	71,000	35,000	7.66	7.69	3.52	2.3	0.08	1.3
LNJ03P04	<0.50	32	4.1	13	<0.50	1.5	<0.50	160,000	120,000	73,000	7	7.73	5	14.7	<0.05	2.93
LNJ03P04	0.63	80	19	79	<0.50	11	<0.50	83,000	19,000	105,000	8.52	7.56	10.8	6.2	0.05	2.59
LNJ03P04	<0.50	60	5.4	20	<0.50	2.2	<0.50	63,000	8,700	17,000	8.46	7.75	7.09	5	0.08	2.18
LNJ03P04	<0.50	43	4.4	15	<0.50	2.2	<0.50	150,000	57,000	23,000	7.72	7.88	7.03	2.3	0.18	2.61
LNJ03P04	<0.50	39	8	22	<0.50	4	<0.50	280,000	160,000	40,000	6.8	7.7	8.63	3.4	2.8	2.81
LNJ03P04	<0.50	34	3	13	<0.50	1.2	<0.50	42,000	13,000	5,000	7.56	7.94	8.97	4.6	0.07	3.59
LNJ03P04	<0.50	58	3.6	13	<0.50	2	<0.50	>940,000	12,700	7,000	8.26	7.83	8.1	3.4	0.12	1.4
LNJ03P04	<0.50	20	5.1	15	<0.50	2.2	<0.50	33,000	1,200	5,200	12.58	7.79	3.79	3.2	0.11	1.72
LNJ03P04	<0.50	41	3.7	9.9	<0.50	1	<0.50	>84,000	23,000	21,000	7.62	8.11	5.33	2.3	0.12	0.89
LNJ03P04	<0.50	25	3.3	6.3	<0.50	1.1	<0.50	>90,000	21,000	29,000	7.83	7.98	3.82	2.9	0.38	1.18
LNJ03P04	0.51	130	3.8	8.8	<0.50	0.79	<0.50	200,000	27,000	13,100	7.99	8.07	14.8	3.7	0.11	0.3
LNJ03P04	<0.50	49	5.8	17	<0.50	2	<0.50	>77,000	10,000	49,000	9.7	7.89	5.69	3	0.11	0.83

LNJ03P04	<0.50	77	3.7	9.9	<0.50	1.3	<0.50	68,000	7,800	62,000	9.3	7.81	4.56	3.9	0.1	0.84
LNJ03P05	<0.50	53	8.5	25	<0.50	3.7	<0.50	23,000	7,000	2,100	13.5	7.88	8.91	3.3	<0.05	0.67
LNJ03P05	<0.50	130	8.3	62	<0.50	6.9	<0.50	43,000	13,000	3,600	9.12	7.7	3.71	4	0.85	1.13
LNJ03P05	<0.50	78	6.5	26	<0.50	3.3	<0.50	68,000	67,000	25,000	9.41	7.8	3.07	3.3	0.08	0.92
LNJ03P05	0.58	73	7.8	34	<0.50	6	<0.50	330,000	140,000	45,000	7.88	7.7	4.01	2.2	0.1	1.1
LNJ03P05	<0.50	81	11	29	<0.50	4.1	<0.50	56,000	42,000	6,000	7.34	7.57	3.16	4.1	0.25	1.48
LNJ03P05	<0.50	97	7.9	54	<0.50	8.3	<0.50	43,000	13,000	10,000	9.92	7.86	8.3	1.6	0.05	0.9
LNJ03P05	<0.50	49	6.8	27	<0.50	2.9	<0.50	220,000	37,000	16,000	8.02	7.46	8.08	6.4	0.09	3.96
LNJ03P05	<0.50	41	4.6	17	<0.50	1.7	<0.50	63,000	4,900	11,000	8.02	7.84	13.7	2.9	0.05	1.31
LNJ03P05	<0.50	39	7	16	<0.50	2	<0.50	380,000	200,000	68,000	8.19	7.98	2.8	1.8	0.28	1.76
LNJ03P05	<0.50	40	4.3	15	<0.50	2	<0.50	49,000	8,000	8,000	8.07	7.52	2.56	2.6	0.05	2.05
LNJ03P05	<0.50	130	4.4	20	<0.50	1.2	<0.50	>32,000	5,300	5,600	9.37	7.31	8.23	4.2	0.17	0.46
LNJ03P05	<0.50	46	6.2	23	<0.50	2.9	<0.50	300,000	14,000	23,000	13.82	7.59	4.13	2.8	0.15	0.86
LNJ03P05	<0.50	38	9.3	15	<0.50	1.8	<0.50	33,000	7,200	22,000	8.2	7.77	15.4	2	0.72	0.89
LNJ03P05	<0.50	55	5.8	14	<0.50	1.7	<0.50	24,000	5,800	5,000	9.48	8.08	3.66	2	0.1	0.77
LNJ03P05	<0.50	81	7.1	20	<0.50	0.81	<0.50	37,000	10,000	9,800	8.93	8.06	5.38	2.6	0.18	0.66
LNJ03P05	<0.50	130	4.5	40	<0.50	8.1	<0.50	28,000	3,400	14,200	9.7	7.93	3.23	3.4	0.1	0.45
LNJ03P05	<0.50	170	4.1	53	<0.50	0.7	<0.50	22,000	1,700	8,400	10.33	7.82	14.4	3.7	0.11	0.33
LNJ03P13	<0.50	390	3.6	190	<0.50	47	<0.50	15,000	3,100	340	7.95	7.44	0.47	4.7	0.06	0.24
LNJ03P13	<0.50	260	2.8	120	<0.50	18	<0.50	34,000	3,400	1,500	6.69	7.11	0.49	6.7	<0.05	0.48
LNJ03P13	<0.50	180	2.9	63	<0.50	4.6	<0.50	19,000	12,000	4,700	7.69	7.25	1.1	5.3	<0.05	0.65
LNJ03P13	0.55	220	3	76	<0.50	7.5	<0.50	43,000	7,900	5,600	8.54	7.33	1.11	6.4	0.06	0.46
LNJ03P13	<0.50	160	3.2	57	<0.50	5.3	<0.50	36,000	13,000	2,000	6.01	7.62	0.71	5.5	0.1	0.35
LNJ03P13	<0.50	180	2.8	110	<0.50	13	<0.50	14,000	610	230	8.35	7.07	0.35	3.2	0.05	0.46
LNJ03P13	<0.50	170	3.1	97	<0.50	12	<0.50	8,200	220	2,800	6.58	7.37	0.71	6.1	0.05	0.48
LNJ03P13	<0.50	120	2.6	57	<0.50	12	<0.50	29,000	3,500	8,800	5.82	7.45	1.83	4.8	0.06	0.68
LNJ03P13	<0.50	120	2.5	52	<0.50	8	<0.50	24,000	9,000	11,000	6.27	7.58	1.26	4.9	0.1	0.66
LNJ03P13	<0.50	86	1.9	35	<0.50	4.4	<0.50	24,000	1,100	800	7.08	7.75	0.33	5	0.05	0.3
LNJ03P13	0.56	160	3.3	82	<0.50	17	<0.50	>158,000	>46,000	860	6.32	7.52	1.04	5.7	0.11	0.24
LNJ03P13	<0.50	120	2.3	63	<0.50	13	<0.50	30,000	460	2,900	8.18	7.32	0.86	5.1	0.12	0.45

LNJ03P13	<0.50	110	2.5	45	<0.50	9	<0.50	4,900	1,330	910	6.02	7.88	0.6	4.3	0.1	0.3
LNJ03P13	<0.50	100	2.7	37	<0.50	7.7	<0.50	15,000	420	1,320	7.26	7.74	0.6	3.1	0.1	0.32
LNJ03P13	<0.50	81	3.1	43	<0.50	7.7	<0.50	5,800	510	950	7.14	8.05	0.96	6.6	0.1	0.3
LNJ03P13	0.56	120	2.9	52	<0.50	9.5	<0.50				8.09	7.5	0.4	3.4	0.1	0.3
LNJ03P13								22,000	390	550	9.73	7.65	0.54	4.6	0.1	0.38
LNJ04@LPAZ	0.51	100	2.3	23	<0.50	1.6	<0.50	>40,000	8,400	5,700	8.42	7.51	6	4	0.1	0.57
LNJ04@LPAZ								37,000	5,100	5,500	5.74	7.19	5.02	4.2	0.1	0.83
LNJ04DSRP	<0.50	57	6.2	35	<0.50	9.4	<0.50	170	<9	50	5.83	7.42	5.74	4.9	0.1	5.55
LNJ04DSRP								32,000	1,000	2,300	6.83	7.66	3.61	4.5	0.1	0.8
LNK01P07	<8.00	5.4	9.1	33	<2.00	<1.00	<2.00	24,000	16,000	8,200	8.85	8.39	8.83	2.4	<0.05	1.67
LNK01P07	<8.00	7.7	12	36	<2.00	<1.00	<2.00	18,600	5,000	3,900	8.99	6.89	2.48	4	0.1	2.37
LNK01P07	<8.00	6	13	29	<2.00	<1.00	<2.00	25,000	16,300	54,000	8.33	7.23	6.17	3	<0.05	2.03
LNK01P07	<8.00	5.5	13	35	<2.00	<1.00	<2.00	54,000	30,000	16,100	8.52	7.8	5.07	3	0.13	1.77
LNK01P07	<8.00	6.8	12	70	<2.00	<1.00	<2.00	12,600	6,900	11,800	8.29	8.2	2.2	2.9	0.08	1.79
LNK01P07	<8.00	8.8	18	39	<2.00	<1.00	<2.00	67,000	52,000	7,700	7	7.8	15.5	3.4		2.78
LNK01P07	<0.50	7.8	11	15	<0.50	<0.50	<0.50	410,000	116,000	143,000	8.33	7.3	2.62	4.6	0.16	2.24
LNK01P07	<0.50	9.5	7.6	25	<0.50	<0.50	<0.50	440,000	>120,000	86,000	8.6	7.68	6.68	3.3	<0.05	4.8
LNK01P07	<0.50	8.4	6	11	<0.50	<0.50	<0.50	330,000	100,000	280,000	8.67	7.91	5.32	4.3	<0.05	2.5
LNK01P07	<0.50	9.8	6.9	21	<0.50	<0.50	<0.50	570,000	117,000	11,000	8.8	7.9	3.19	4.5	0.06	2.83
LNK01P07	<0.50	12	8.7	31	<0.50	<0.50	<0.50	110,000	14,000	23,000	8.73	7.61	6.88	5.3	0.08	3.84
LNK01P07	<0.50	18	5.7	16	<0.50	<0.50	<0.50	91,000	66,000	36,000	8.34	7.59	6.57	3.2	0.1	2.92
LNK01P07	<0.50	5.2	6.6	16	<0.50	<0.50	<0.50	32,000	21,000	7,400	9.31	7.9	5.85	6.3	0.06	3.56
LNK01P07	<0.50	6.2	6.1	10	<0.50	<0.50	<0.50	107,000	17,000	22,000	9.2	8.1	1.99	3.5	0.05	1.76
LNK01P07	<0.50	4.2	13	13	<0.50	<0.50	<0.50	160,000	50,000	29,000	8.24	8.04	5.92	2.9	0.05	2.49
LNK01P07	<0.50	5.3	5.8	13	<0.50	<0.50	<0.50	510,000	22,000	7,400	10.65	7.94	5.73	4.8	0.1	1.86
LNK01P07	<0.50	5.6	6.7	17	<0.50	<0.50	<0.50	190,000	22,000	28,000	8.36	7.98	2.7	3.8	0.11	2.12
LNK01P07	<0.50	5.7	13	17	<0.50	<0.50	0.93	135,000	>4,600	30,000	14.45	8.64	14	2.7	0.18	1.9
LNK01P07	<0.50	3.6	5.2	11	<0.50	<0.50	<0.50	>29,000	>450	6,500	10.11	7.94	5.09	3.7	0.1	1.61
LNK01P07											9.87	8.12	5.82	4.2	0.1	1.98

LNK01P08	<8.00	6	10	31	<2.00	<1.00	<2.00	69,000	5,000	4,500	9.2	8.25	6.47	2.3	<0.05	1.45
LNK01P08	<8.00	4.1	12	40	<2.00	<1.00	<2.00	129,000	940	102,000	8.91	6.97	2.02	5.5	<0.05	3.87
LNK01P08	<8.00	<4.00	10	23	<2.00	<1.00	<2.00	35,000	4,300	46,000	8.71	7.4	2.71	2.9	<0.05	1.15
LNK01P08	<8.00	6.6	10	39	<2.00	<1.00	<2.00	88,000	42,000	17,700	8.5	7.9	3.44	2.4	0.9	1.86
LNK01P08	<8.00	9.1	15	63	<2.00	<1.00	<2.00	20,450	12,200	5,600	7.98	8.13	2.36	2.9	0.13	1.51
LNK01P08	<8.00	11	7.8	27	<2.00	<1.00	<2.00	10,000	7,300	6,500	8	7.9	4.44	2.6		2.02
LNK01P08	<0.50	12	6.4	12	<0.50	<0.50	<0.50	540,000	63,000	22,000	9.16	7.64	3.62	2.8	0.19	1.16
LNK01P08	<0.50	13	10	23	<0.50	<0.50	0.78	300,000	>120,000	109,000	8.87	7.88	6.07	3.2	0.22	2.27
LNK01P08	<0.50	7.9	4.3	7.6	<0.50	<0.50	<0.50	200,000	130,000	20,000	8.91	8.02	3.93	2.8	<0.05	1.44
LNK01P08	<0.50	14	7.7	13	<0.50	<0.50	<0.50	370,000	63,000	12,000	8.95	7.96	3.13	2.8	0.19	1.36
LNK01P08	<0.50	14	5.2	7.9	<0.50	<0.50	<0.50	54,000	9,500	19,000	9.28	8	3.13	2.2	0.15	1.76
LNK01P08	0.7	15	13	22	<0.50	0.58	1.3	390,000	250,000	22,000	8.45	7.66	29.7	2.8	0.08	1.26
LNK01P08	<0.50	4.8	11	12	<0.50	<0.50	<0.50	18,000	11,500	6,200	9.63	8.01	2.72	4.1	0.06	2.58
LNK01P08	<0.50	5.2	5.8	11	<0.50	<0.50	<0.50	48,000	6,700	13,000	8.95	8.16	3.06	2.7	0.1	1.53
LNK01P08	<0.50	3.9	3.2	9.1	<0.50	<0.50	<0.50	50,000	19,000	11,000	8.7	8.07	2.83	2.5	0.05	1.73
LNK01P08	<0.50	4.9	3.4	9.5	<0.50	<0.50	<0.50	>34,000	4,800	11,900	11.57	8.09	3.7	4.4	0.1	1.25
LNK01P08	<0.50	4.6	5.1	7.7	<0.50	<0.50	<0.50	>79,000	16,000	24,000	8.96	8.07	2.2	2.6	0.1	1.02
LNK01P08	<0.50	4.8	4.1	7	<0.50	<0.50	<0.50	56,000	3,600	9,900	13.86	8.24	4	2	0.23	1.11
LNK01P08	<0.50	4.3	3.3	8.9	<0.50	<0.50	<0.50	>48,000	>900	8,400	10.32	8.03	2.36	3.1	0.1	1.24
LNK01P08											9.9	8.14	5.96	3.8	0.1	2.13
LNK01P09	<8.00	6.3	6.3	47	<2.00	<1.00	<2.00	740	<10	1,400	10.26	8.16	22.7	2.9	<0.05	1.37
LNK01P09	<8.00	4.1	7	34	<2.00	<1.00	<2.00	<10	<10	1,550	10.28	6.45	7.1	3.1	0.08	1.99
LNK01P09	<8.00	<4.00	10	33	<2.00	<1.00	<2.00	39,000	29,000	37,000	9.93	7.31	17.8	4.2	<0.05	2.02
LNK01P09	<8.00	7.5	5.4	41	<2.00	<1.00	<2.00	510	350	610	11	8	3.99	2.8	0.15	1.71
LNK01P09	<8.00	9.1	6.1	63	<2.00	<1.00	<2.00	610	510	460	8.77	8.08	3.88	1.4		1.56
LNK01P09	<8.00	8.5	14	32	<2.00	<1.00	<2.00	70,000	57,000	35,000	3.4	7	3.33	3.4	0.1	2.14
LNK01P09	<0.50	19	6.3	11	<0.50	<0.50	<0.50	33,000	200	420	9.42	7.53	1.67	4.5	0.08	1.63
LNK01P09	<0.50	13	4.1	13	<0.50	<0.50	<0.50	16,000	9,000	700	9.31	7.84	1.23	3.4	<0.05	1.41
LNK01P09	<0.50	15	4.7	12	<0.50	<0.50	<0.50	50,000	30,000	590	9.45	7.85	0.73	5.2	<0.05	2.36
LNK01P09	<0.50	24	3.7	11	<0.50	<0.50	<0.50	4,700	1,500	410	9.38	7.83	0.8	3.7	<0.05	1.62

LNK01P09	<0.50	23	4.1	12	<0.50	<0.50	<0.50	6,300	100	9,200	9.84	7.87	1.55	2.3	0.18	1.85
LNK01P09	<0.50	24	5.7	15	<0.50	1.1	<0.50	5,200	1,400	800	8.77	7.62	0.47	3.1	0.1	2.24
LNK01P09	<0.50	5	3.7	12	<0.50	<0.50	<0.50	1,300	180	500	9.94	7.83	0.6	3.4	0.06	2.19
LNK01P09	<0.50	4.8	2.8	8.3	<0.50	<0.50	<0.50	520	110	80	9.69	8	1.09	3.1	0.1	1.98
LNK01P09	<0.50	4.3	1.9	9.1	<0.50	<0.50	<0.50	700	400	700	10.06	7.98	0.52	2	0.05	2.39
LNK01P09	<0.50	6	2	6.7	<0.50	<0.50	<0.50	>480	<9	240	11.74	7.95	0.58	2	0.1	2.27
LNK01P09	<0.50	6.3	5.5	8.4	<0.50	<0.50	<0.50	2,100	60	320	9.69	7.94	0.71	2.2	0.1	2.19
LNK01P09	<0.50	6.6	1.7	6.8	<0.50	<0.50	<0.50	590	<9	230	15.81	8.06	1	2	0.11	1.98
LNK01P09	<0.50	4.7	3.3	8.5	<0.50	<0.50	<0.50	2,800	200	370	11.09	7.91	0.66	3	0.1	2.3
LNK01P09											10.32	7.97	0.59	2.7	0.1	2.95
LNL03P03	0.81	9.6	4.6	34	<0.50	<0.50	<0.50	80,000	10,000	2,900	7.56	7.55	1.19	2.4	0.17	<0.06
LNL03P03	<0.50	12	3.8	34	<0.50	<0.50	<0.50	38,000	8,000	4,700	9.21	7.6	1.76	3.7	<0.05	1.38
LNL03P03	<0.50	7.1	4.4	32	<0.50	<0.50	<0.50	200,000	38,000	13,000	7.73	7.94	2.93	1.8	0.12	1.47
LNL03P03	<0.50	12	2.8	26	<0.50	<0.50	<0.50	1,180,000	1,090,000	27,000	7.5	7.9	2.9	2.5	<0.05	1.25
LNL03P03	<0.50	19	4.6	49	<0.50	0.58	<0.50	460,000	74,000	40,000	8.6	7.95	4.5	6.7	0.23	4.01
LNL03P03	0.91	9.5	7	51	<0.50	<0.50	<0.50	19,000	1,600	720	9.67	7.92	4.03	4.5	0.07	4.89
LNL03P03	<0.50	8.5	6.8	50	<0.50	<0.50	<0.50	1,000	<10	90	8.3	7.67	4.3	5.7	0.11	14.5
LNL03P03	<0.50	9.9	4.6	53	<0.50	0.55	0.52	76,000	140	14,000	7.29	7.7	1.79	8.1	0.13	4.38
LNL03P03	<0.50	6.4	5.7	54	<0.50	0.56	<0.50	58,000	40,000	28,000	7.72	7.57	4.29	7	0.15	3.63
LNL03P03	<0.50	6.6	3.1	22	<0.50	<0.50	<0.50	59,000	20,000	13,000	0	7.95	5.4	5.3	0.1	2.78
LNL03P03	<0.50	8.3	11	76	<0.50	1.1	1.1	230,000	45,000	520	8.12	7.82	2.8	12	0.35	3.33
LNL03P03	0.72	8.4	12	88	<0.50	0.74	0.78	6,500	1,900	1,200	8.53	8.07	5.49	10	0.19	3.54
LNL03P03	<0.50	6.5	3.6	39	<0.50	<0.50	0.66	37,000	3,600	6,800	6.15	7.98	1.45	4.5	0.06	3.5
LNL03P03	<0.50	6.6	3.4	44	<0.50	<0.50	1	90,000	29,000	6,700	7.85	7.76	2.82	7.4	0.1	2.57
LNL03P03	<0.50	7.7	3.1	38	<0.50	<0.50	0.56	7,700	2,000	2,100	6.45	7.87	1.55	7	0.05	4.4
LNL03P03	<0.50	4.6	3.5	41	<0.50	<0.50	<0.50	>21,000	2,200	5,200	6.6	7.86	2.12	2.2	0.1	1.44
LNL03P03	<0.50	5.4	4.1	31	<0.50	<0.50	<0.50	>19,500	>380	2,800	10.15	7.94	4.25	2	0.11	0.93
LNL03P03	<0.50	4.8	2.4	12	<0.50	2.3	<0.50	122,000	10,000	3,200	12.13	8.13	3.78	2	0.12	1.49
LNL03P03	<0.50	15	3.3	14	<0.50	4.1	<0.50	56,000	25,000	31,000	4.76	7.87	1.98	4.5	0.1	3.19
LNL03P03	<0.50	8.8	4	21	<0.50	1.9	<0.50	58,000	9,400	10,400	8.06	8.2	2.14	6	0.1	5.21
LNL03P03	<0.50	7.9	5.3	48	<0.50	<0.50	<0.50	76,000	8,200	5,800	8.43	8.12	4.62	12.9	0.1	6.83

LNL03P03	<0.50	2.8	3.7	23	<0.50	<0.50	<0.50	42,000	1,700	4,300	10.27	8.1	3.66	5.1	0.1	2.29
LNL03P04	<8.00	8.1	4.6	21	<2.00	<1.00	<2.00	<10	<10	<10	11.87	8.06	0.87	1.3	<0.05	0.66
LNL03P04	<8.00	7.8	5.6	43	<2.00	<1.00	<2.00	8,600	3,100	860	13.99	7.46	1.77	<0.20	<0.05	1.39
LNL03P04	<8.00	6.3	6.4	23	<2.00	<1.00	<2.00	3,800	3,100	760	11.4	8.11	1.24	1.1	0.5	0.42
LNL03P04	<8.00	13	7.9	51	<2.00	<1.00	<2.00	4,000	2,100	1,610	9.24	8.09	1.28	1.9	<0.05	0.85
LNL03P04	<8.00	13	5.9	24	<2.00	<1.00	<2.00	450	260	1,200	10.99	8.39	1.77	2.1		1
LNL03P04	<8.00	15	5.2	31	<2.00	<1.00	<2.00	300	110	1,130	7.97	7.75	1.53	1.1		1.69
LNL03P04	<0.50	31	4.5	19	<0.50	1.3	<0.50	140,000	50,000	6,500	11.45	8.1	1.95	3.7	0.09	0.49
LNL03P04																
LNL03P04	<0.50	29	3.4	19	<0.50	1	<0.50	22,000	2,500	810	8.2	7.86	1.32	3.5	0.08	1.32
LNL03P04	<0.50	20	2.7	15	<0.50	0.63	<0.50	100,000	30,000	3,600	9.73	7.98	1.88	2.5	<0.05	1.64
LNL03P04	<0.50	31	3.5	20	<0.50	<0.50	<0.50	30,000	6,900	3,500	9.22	7.62	2.22	4.7	0.13	1.56
LNL03P04	<0.50	25	2.6	13	<0.50	0.54	<0.50	9,500	690	1,200	5.69	7.5	2.01	4.3	0.15	0.92
LNL03P04	<0.50	13	3.6	13	<0.50	<0.50	<0.50	9,000	1,300	1,000	6.03	7.61	2.18	3	0.07	1.35
LNL03P04	<0.50	12	4.7	26	<0.50	1.5	<0.50	6,100	320	870	9.64	7.93	1.91	5.4	0.09	3.45
LNL03P04	<0.50	13	6.2	20	<0.50	0.9	<0.50	400	<10	100	5.23	7.77	0.61	3.6	0.07	1.38
LNL03P04	<0.50	31	2	22	<0.50	0.77	<0.50	8,000	900	1,900	6.08	7.78	1.41	3.7	0.06	1.79
LNL03P04	<0.50	16	2.6	18	<0.50	<0.50	<0.50	74,000	380	5,200	5.38	7.49	6.62	3.2	0.11	1.31
LNL03P04	<0.50	10	2.6	9.4	<0.50	<0.50	<0.50	>21,000	640	2,000	7.15	7.93	2.46	2.8	0.1	1.11
LNL03P04	<0.50	10	3.6	7.3	<0.50	<0.50	<0.50	>10,700	830	4,100	6.82	8	14.4	2	0.12	0.78
LNL03P04	<0.50	15	7.8	69	<0.50	0.84	<0.50	>1,300	70	190	8.15	7.86	0.85	2.9	0.1	0.45
LNL03P06	<8.00	38	15	41	<2.00	2.6	<2.00	1,900	1,400	1,100	8.77	7.38	1.35	7.3	<0.05	1.27
LNL03P06	<8.00	42	19	51	<2.00	2.3	<2.00	9,300	6,300	2,600	8.95	6.99	2.04	6.9	0.1	1.53
LNL03P06	<8.00	19	6.4	17	<2.00	4.3	<2.00	62,000	28,000	22,000	8.48	8.14	4.36	0.7	<0.05	0.45
LNL03P06	<8.00	11	7.4	42	<2.00	<1.00	<2.00	1,210	440	450	7.52	7.52	1000	1.4	0.1	0.27
LNL03P06	<8.00	42	36	43	<2.00	3.2	<2.00	38,000	13,200	42,000	1.11	8.03	8.89	7.9	0.21	1.86
LNL03P06	<8.00	33	18	91	<2.00	2.4	<2.00	78,000	45,000	18,800	7.54	7.95	24.3		0.18	2.71
LNL03P06	<8.00	41	29	86	<2.00	4.2	<2.00	26,000	8,050	10,300	8.26	7.79	7.23	4.5		1.73
LNL03P06	<8.00	31	22	11	<2.00	<1.00	<2.00	36,000	26,000	6,500	8.33	7.4	3.43	4.7		1.43
LNL03P06	<8.00	18	11	27	<2.00	<1.00	<2.00	65,000	34,000	11,900	13.39	8.05	81.7	2.6	0.2	2.24

LNL03P06	<8.00	24	21	68	<2.00	1.2	<2.00	<200,000	<200,000	<200,000	12.85	8.19	15	7.3	1.3	4.79
LNL03P06	<0.50	110	8.1	72	<0.50	8.2	<0.50	30,000	310	5,400	8.66	7.85	3.48	6	<0.05	0.83
LNL03P06	<0.50	80	9.6	41	<0.50	5.2	<0.50	90,000	3,400	3,900	9.12	7.56	2.26	7.8	0.1	1.31
LNL03P06	3.1	16	6.1	80	0.98	3.9	2.9	9,000	3,100	430	9.15	8	616	3.1	0.15	0.45
LNL03P06	<0.50	44	7.1	26	<0.50	2.1	<0.50	120,000	80,000	11,000	8.4	8	3.27	7.5	0.07	1.58
LNL03P06	0.59	200	7.5	49	<0.50	4.9	<0.50	45,000	33,000	3,700	8.4	7.81	2.3	5.8	0.08	1.16
LNL03P06	<0.50	24	13	45	<0.50	1.9	<0.50	43,000	10,000	880	7.04	7.29	3.42	5.3	0.11	5.39
LNL03P06	1	34	21	190	<0.50	5.8	0.66	45,000	130	250	7.51	7.47	10.3	5.9	1.6	6.65
LNL03P06	<0.50	28	7.9	32	<0.50	2.3	<0.50	23,000	<10	320	6.5	7.42	3.06	8	<0.05	5.43
LNL03P06	1.6	16	9.2	45	<0.50	2.5	<0.50	4,200	160	800	7.4	7.56	3.34	9.4	0.11	5.08
LNL03P06	<0.50	24	6.3	26	<0.50	2.7	<0.50	23,000	<10	<10	0	7.8	1.39	5.9	<0.04	3.64
LNL03P06	<0.50	48	15	38	<0.50	3.1	<0.50	37,000	780	700	8.59	7.75	3.19	8.9	0.12	3.25
LNL03P06	<0.50	25	13	26	<0.50	1.7	<0.50	25,000	900	6,100	8.98	7.92	1.51	8.7	0.12	2.02
LNL03P06	<0.50	23	13	20	<0.50	0.87	<0.50	140,000	55,000	13,000	7.38	7.96	1.67	6.9	0.05	2.3
LNL03P06	<0.50	12	4.7	20	<0.50	0.79	<0.50	50,000	23,000	47,000	7.96	7.75	1.63	6.2	0.05	2.48
LNL03P06	<0.50	13	9	27	<0.50	0.94	<0.50	320,000	19,000	6,000	6.3	7.8	3.99	4.3	0.11	3.22
LNL03P06	<0.50	16	7.1	21	<0.50	1.1	<0.50	35,000	3,700	5,200	8.93	7.96	4.3	6.6	0.1	1.19
LNL03P06	<0.50	16	4.5	20	<0.50	1.3	<0.50	27,000	3,300	2,300	10.88	8.18	1.87	4.2	0.08	0.65
LNL03P06	<0.50	24	4.8	13	<0.50	0.74	<0.50	13,000	>3,300	2,200	12.36	8.12	2.41	3.2	0.1	0.83
LNL03P06	<0.50	84	4.7	20	<0.50	3.1	<0.50	>124,000	46,000	23,000	8.68	7.72	38	14.3	0.1	5.31
LNL03P06	<0.50	30	6.3	21	<0.50	1.8	<0.50	84,000	18,400	8,400	10.87	8.04	3.99	8.3	0.15	2.74
LNL03P06	<0.50	84	8.2	38	<0.50	3.7	<0.50	>64,000	3,300	12,500	8.45	7.92	2.87	13.8	0.1	1.32
LNL03P06	<0.50	110	7.8	64	<0.50	2	<0.50	34,000	1,800	3,300	10.29	7.98	2.42	13.5	0.1	1.92
LWI02P18	<0.50	2.1	5.6	7.7	<0.50	<0.50	<0.50	31,000	4,400	3,900	9.6	7.7	4.67	1.9	0.08	0.75
LWI02P18	<0.50	1.9	1.4	<2.00	<0.50	<0.50	<0.50	18,000	990	2,800	7.84	7.76	835	1.1	0.09	0.57
LWI02P18	<0.50	4	3.5	6.6	<0.50	<0.50	<0.50	40,000	6,000	4,900	0	7.88	9.22	1.2	0.08	1.52
LWI02P18	<0.50	3.7	2.5	3.2	<0.50	<0.50	<0.50	7,100	700	1,300	8.2	7.67	23.3	1.8	0.06	1.85
LWI02P18	<0.50	4.9	2.1	6.2	<0.50	<0.50	<0.50	36,000	8,300	6,500	5.84	7.87	25.9	1.3	0.12	1.6
LWI02P18	<0.50	3.9	4.2	9.5	<0.50	<0.50	<0.50	>9,500	140	8,000	9.87	7.82	3.73	2.3	0.15	0.36
LWI02P18	<0.50	3.8	1.4	5.6	<0.50	<0.50	<0.50	36,000	24,000	5,700	12.27	7.85	12.9	2	0.11	0.3
LWI02P18	<0.50	4.4	1.8	6.2	<0.50	<0.50	<0.50	9,700	860	3,700	7.06	7.88	13.7	2	0.1	0.34

LWI02P18	<0.50	5.1	3.5	8.9	<0.50	<0.50	<0.50	16,000	2,500	8,200	7.31	7.35	21	2	0.25	0.45
LWI02P18	<0.50	3.7	1	3.6	<0.50	<0.50	<0.50	26,000	620	3,200	11.8	7.66	22.8	2	0.1	0.41
LWI02P18	<0.50	2.9	3.9	5	<0.50	<0.50	<0.50	2,300	210	500	9.41	7.61	14.1	2	0.1	0.3
LWI02P18	<0.50	2.9	6.6	6.7	<0.50	<0.50	<0.50	21,000	1,600	5,700	10.2	7.76	17.9	2	0.21	0.3
LWJ01ASVM	<0.50	100	2.4	27	<0.50	32	<0.50	9,000	3,500	130	8.94	7.34	0.31	1	0.1	1.08
LWJ01ASVM																
LWJ01ASVM	<0.50	110	2.6	29	<0.50	14	<0.50	3,100	330	200	9.42	7.75	0.26	1.1	<0.05	0.99
LWJ01ASVM	<0.50	97	2.1	20	<0.50	15	<0.50	16,000	13,000	240	8.62	7.61	0.37	3.5	<0.05	1.15
LWJ01ASVM	<0.50	90	2.2	16	<0.50	11	<0.50	17,000	3,700	740	8.16	7.55	0.4	1.6	<0.05	1.19
LWJ01ASVM	<0.50	100	2.7	55	<0.50	16	<0.50	27,000	2,000	1,900	8.12	7.72	0.6	1.9	<0.05	1.08
LWJ01ASVM	<0.50	120	2.4	26	<0.50	23	<0.50	2,600	1,100	490	13.4	7.6	0.96	1.9	0.06	1.18
LWJ01ASVM	<0.50	110	2.3	18	<0.50	17	<0.50	2,600	130	460	9.26	7.72	0.44	1.5	0.08	1.53
LWJ01ASVM	<0.50	100	2.1	18	<0.50	17	<0.50	3,700	540	220	8.72	7.7	0.56	0.9	0.09	1.4
LWJ01ASVM	<0.50	100	2	17	<0.50	11	<0.50	8,200	2,800	170	9.75	7.33	0.33	1.7	<0.05	1.27
LWJ01ASVM	<0.50	85	2.9	11	<0.50	23	<0.50	5,000	<10	<10	8.72	7.76	0.29	1.4	<0.05	1.15
LWJ01ASVM	<0.50	67	3.4	16	<0.50	12	<0.50	1,600	200	140	13.37	7.92	0.27	1.3	0.12	1.2
LWJ01ASVM	<0.50	68	3	18	<0.50	10	<0.50	3,100	1,700	1,100	9.21	7.95	0.31	0.8	0.05	1.14
LWJ01ASVM	<0.50	56	0.98	13	<0.50	6.2	<0.50	5,600	2,000	1,300	8.09	7.78	0.66	0.7	0.05	1.3
LWJ01ASVM	<0.50	57	2.6	15	<0.50	2.4	<0.50	17,000	6,900	4,100	8.05	7.86	2.79	0.4	0.5	1.32
LWJ01ASVM	<0.50	54	0.95	7	<0.50	0.68	<0.50	2,800	400	300	8.5	7.84	0.76	0.6	0.05	1.24
LWJ01ASVM	<0.50	83	1.8	18	<0.50	5.9	<0.50	>21,000	900	14,400	9.47	7.94	3.68	2	0.1	1.22
LWJ01ASVM	<0.50	78	0.93	14	<0.50	2.2	<0.50	>940	<9	200	8.72	7.68	0.56	2	0.1	0.96
LWJ01ASVM	<0.50	77	2.1	16	<0.50	11	<0.50	>10,400	1,800	1,130	7.83	7.84	1.68	2	0.12	1.39
LWJ01ASVM	<0.50	83	1.7	10	<0.50	6.8	<0.50	>900	210	60	10.06	7.71	1.83	1	0.1	1.12
LWJ01ASVM	<0.50	68	2	17	<0.50	10	<0.50	4,100	440	520	7.63	7.75	0.69	2	0.1	1.25
LWJ01ASVM	<1.00	76	2.6	19	<1.00	6.3	<1.00	>1,220	250	540	10.04	7.84	0.64	2	0.1	0.83
LWJ01ASVM								2,200	240	280	11.95	7.87	0.77	2	0.1	0.98
MVJ01P03	<8.00	5.5	19	70	<2.00	<1.00	2.1	27,000	12,000	40,400	7.28	7.93	5.44	1	0.19	1.13
MVJ01P03	<8.00	<4.00	6.1	37	<2.00	<1.00	<2.00	25,000	6,000	15,400	9.5	7.21	1.68	0.9	0.14	1.77
MVJ01P03	<8.00	4	12	35	<2.00	<1.00	<2.00	60,000	43,000	16,100	1.35	7.86	1.66	1.1	0.33	0.48

MVJ01P03	<8.00	4.6	16	40	<2.00	<1.00	<2.00	18,600	5,200	70	6.57	7.35	3.66	1.5	0.1	1.45
MVJ01P03	<8.00	<4.00	17	34	<2.00	<1.00	<2.00	34,000	7,600	15,800	2.17	7.62	4.65	1.6	0.3	1.36
MVJ01P03	<8.00	4.5	6.6	45	<2.00	<1.00	<2.00	25,000	15,200	7,000	11.1	7.89	2.85	1.5	0.1	1.37
MVJ01P03	<8.00	6.6	9.7	47	<2.00	<1.00	<2.00	85,000	70,000	23,000	7.8	7.7	2.3	1.5	0.25	7.82
MVJ01P03	<8.00	7.9	39	53	<2.00	<1.00	<2.00	28,000	13,000	49,000	7.79	7.57	3.72	1.9		1.82
MVJ01P03	<8.00	13	38	40	<2.00	<1.00	<2.00	106,000	71,000	18,400	6.8	7.7	3.6	1.8	0.2	2.04
MVJ01P03	<8.00	7	16	30	<2.00	<1.00	<2.00	47,000	30,000	34,000	7.9	7.52	4.13	2.1	0.4	2.33
MVJ01P03	2.4	9.4	72	35	<0.50	<0.50	<0.50	77,000	21,000	27,000	11.4	7.46	36.1	2.6	0.02	1.11
MVJ01P03	<0.50	13	11	19	<0.50	<0.50	<0.50	320,000	56,000	19,000	7.79	7.01	1.47	1.9	0.27	1.38
MVJ01P03	1.7	15	14	27	<0.50	<0.50	<0.50	200,000	11,000	3,900	8.75	7.43	1.34	3.1	<0.05	1.4
MVJ01P03	<0.50	9.8	4.2	14	<0.50	<0.50	<0.50	80,000	62,000	19,000	7.57	7.52	1.66	2.1	0.07	1.37
MVJ01P03	<0.50	7.5	3.4	9.9	<0.50	<0.50	<0.50	54,000	33,000	5,900	7.24	7.44	24.7	2.1	0.18	1.45
MVJ01P03	1.1	16	7.8	21	<0.50	<0.50	<0.50	53,000	29,000	3,000	9.6	7.4	1.96	2.7	<0.05	1.02
MVJ01P03	<0.50	<0.50	<0.50	<2.00	<0.50	<0.50	<0.50	1,050,000	130,000	3,900	8.02	7.52	3.79	2.6	0.12	0.91
MVJ01P03	0.65	5.9	12	27	<0.50	<0.50	<0.50	230,000	13,000	37,000	7.27	7.47	2.29	1.9	0.14	1.37
MVJ01P03	0.52	4.9	9	15	<0.50	<0.50	<0.50	41,000	33,000	4,900	7.62	7.16	1.69	1.7	0.13	1.33
MVJ01P03	<0.50	11	7.5	17	<0.50	<0.50	<0.50	310,000	25,000	7,200	11.9	7.61	1.49	1.5	<0.05	1.29
MVJ01P03	0.53	4.4	17	22	<0.50	<0.50	<0.50	350,000	11,000	16,000	8.73	7.75	2.38	2	0.11	0.71
MVJ01P03	1.2	4.9	8.7	16	<0.50	<0.50	<0.50	5,800	1,000	15,000	8.11	7.6	2.15	1.8	0.13	1.22
MVJ01P03	<0.50	5.5	3.6	13	<0.50	<0.50	<0.50	>1,200,000	18,000	>120,000	5.79	7.77	675	1.9	0.32	1.38
MVJ01P03	<0.50	4.3	7.3	13	<0.50	<0.50	<0.50	110,000	18,000	11,000	7.67	7.74	1.95	2.1	0.37	1.48
MVJ01P03	<0.50	4.6	13	13	<0.50	<0.50	<0.50	50,000	28,000	7,700	7.59	7.73	1.95	1.6	0.12	1.38
MVJ01P03	<0.50	4.9	6.9	15	<0.50	<0.50	<0.50	32,000	3,800	4,200	8.78	7.52	1.66	2.7	0.43	2
MVJ01P03	<0.50	5.2	6.3	18	<0.50	<0.50	<0.50	>40,000	2,200	12,200	9.46	7.81	1.56	1.5	0.1	1.1
MVJ01P03	<0.50	5.8	4	15	<0.50	<0.50	<0.50	48,000	7,500	3,300	7.24	7.95	1.61	0.2	0.12	1.29
MVJ01P03	<0.50	6	6.2	25	<0.50	<0.50	<0.50	>121,000	29,000	13,700	8.68	7.41	5.29	2.5	0.27	1.43
MVJ01P03	<0.50	4.1	4.8	20	<0.50	<0.50	<0.50	102,000	15,000	10,000	10.78	8.15	3.86	2	0.14	1.29
MVJ01P03	0.56	5	6.7	17	<0.50	<0.50	<0.50	39,000	320	2,600	7.94	7.69	1.86	2	0.34	0.74
MVJ01P03	0.52	7.1	5.5	22	<0.50	<0.50	<0.50	29,000	870	7,400	8.77	7.5	1.72	2.1	0.1	1.6
MVJ01P03											8.78	7.94	1.7	2.2	0.33	1.4
MVJ07P02	<8.00	8	18	50	<2.00	<1.00	<2.00	2,180	1,260	750	12.66	7.9	195	2.1	<0.05	1.87

MVJ07P02	<8.00	12	6.7	57	<2.00	1.5	<2.00	52,000	27,000	48,000	6.12	7.73	12.5	1.7	<0.05	0.94
MVJ07P02	<8.00	4.9	8.9	50	<2.00	1.3	<2.00	10,500	8,700	9,500	8.35	7.97	11.3	0.7	0.32	0.74
MVJ07P02	<8.00	6.9	13	52	<2.00	<1.00	<2.00	13,600	2,400	6,200	11.84	8.13	3.38	3.3		2.05
MVJ07P02	<8.00	<4.00	12	34	<2.00	<1.00	<2.00	123,000	81,000	18,600	7.96	8.31	5.66	2.8	0.22	1.31
MVJ07P02	<8.00	13	79	380	<2.00	2	3.3	159,000	95,000	197,000	9.21	8.03	7.37	3.1	0.25	3.81
MVJ07P02	<0.50	6.9	6.8	15	<0.50	<0.50	<0.50	270,000	>120,000	5,900	8.91	7.74	1.86	3.7	0.13	1.44
MVJ07P02	<0.50	5.9	9	13	<0.50	<0.50	<0.50	20,000	9,000	11,000	8.7	7.89	1.75	2.2	<0.05	1.66
MVJ07P02	<0.50	7.6	4.9	54	<0.50	<0.50	<0.50	240,000	140,000	10,400	7.77	7.96	7.4	3	0.09	1.81
MVJ07P02	<0.50	4.5	9.4	23	<0.50	<0.50	<0.50	170,000	5,300	4,000	8.3	8.22	2.23	1.6	0.18	1.01
MVJ07P02	0.53	3.7	9.8	17	<0.50	<0.50	<0.50	46,000	30,000	8,200	8.36	7.94	8.31	1.4	0.08	1.35
MVJ07P02	0.64	5.8	14	19	<0.50	<0.50	<0.50	190,000	32,000	7,100	8.05	8.02	2.06	0.9	0.1	1.98
MVJ07P02	<0.50	5.3	8.9	15	<0.50	<0.50	<0.50	140,000	4,000	6,000	9.61	8.33	1.69	1.6	0.19	1.67
MVJ07P02	<0.50	5.3	8.6	35	<0.50	<0.50	<0.50	38,000	25,000	13,000	8.6	8.07	3.52	2.3	0.15	1.49
MVJ07P02	<0.50	6.3	8.4	27	<0.50	<0.50	<0.50	160,000	6,000	7,300	10.58	8.17	2.32	3.1	0.1	1.62
MVJ07P02	<0.50	3.8	7.6	11	<0.50	<0.50	<0.50	>72,000	22,000	9,600	5.77	8.1	2.17	2.2	0.16	1.44
MVJ07P02	<0.50	6.4	10	30	<0.50	<0.50	<0.50	52,000	21,000	9,500	7.41	8.17	4	2.1	0.28	1.1
MVJ07P02	<0.50	4.6	4.5	8.9	<0.50	<0.50	<0.50	>10,600	2,100	1,590	13.66	8.39	1.6	2.8	0.1	1.61
MVJ07P02											9.66	8.29	4.47	3.6	0.1	1.65
MVL02P14	<0.50	13	6.6	14	<0.50	1.4	<0.50	270,000	270,000	21,000	4.69	7.63	3.16	5.1	0.14	1.35
MVL02P14	<0.50	11	7.4	13	<0.50	1.9	<0.50	390,000	20,000	31,000	8.97	7.86	3.38	2.1	0.2	1.42
MVL02P14	<0.50	12	11	35	<0.50	1.3	<0.50	420,000	170,000	33,000	7.42	7.62	5.94	2.2	0.14	1.17
MVL02P14	<0.50	7.8	13	10	<0.50	1.6	<0.50	230,000	9,000	51,000		7.72	5.34	1.6	0.11	1.44
MVL02P14	<0.50	7.7	9	13	<0.50	1.1	<0.50	170,000	40,000	15,000	11.32	8.02	2.54	12.8	<0.05	1.22
MVL02P14	<0.50	4.2	6.9	8.5	<0.50	<0.50	<0.50	10,700	9,100	8,800	9.57	8.05	3.6	2.1	0.1	1.36
MVL02P14	<0.50	3.3	6.4	9.1	<0.50	<0.50	<0.50	270,000	4,500	21,000	8.85	8.05	2.97	1.5	0.09	1.52
MVL02P14	<0.50	3.5	5.6	7.1	<0.50	<0.50	<0.50	65,000	14,000	17,000	8.22	8.35	4.01	1.4	0.11	1.59
MVL02P14	<0.50	4	8.4	7.6	<0.50	<0.50	<0.50	190,000	16,000	28,000	8.27	8.21	4.75	1.7	0.1	1.81
MVL02P14	<0.50	3.4	4.8	7.6	<0.50	<0.50	<0.50	270,000	54,000	48,000	7.93	8.01	5.38	1.2	0.05	1.88
MVL02P14	<0.50	4.2	5.2	10	<0.50	0.57	<0.50	>64,000	11,500	7,000	9.3	8.2	6.53	2.3	0.08	1.05
MVL02P14	<0.50	3.7	4.7	8	<0.50	<0.50	<0.50	>35,000	5,300	12,900	5.19	8.08	2.76	2.1	0.11	0.81
MVL02P14	<0.50	3.8	5.4	7.6	<0.50	<0.50	<0.50	>84,000	32,000	10,000	8.86	8.37	3.92	2	0.12	1.02

MVL02P14	<0.50	5.3	4.6	6	<0.50	0.53	<0.50	>124,000	38,000	14,100	9.75	8.16	2.38	2.3	0.1	1.04
MVL02P14	<0.50	4.1	4.3	7.1	<0.50	<0.50	<0.50	150,000	84,000	71,000	11.64	8.02	90.7	2	0.15	1.2
MVL02P14	<0.50	4.3	6.8	9	<0.50	<0.50	<0.50	34,000	5,800	11,100	10.29	8.29	3.74	2.5	0.1	1.48
MVL02P14											9.38	8.13	3.09	1.9	0.1	1.05
MVL02P20	<8.00	<4.00	9	20	<2.00	<1.00	<2.00	400	155	190	10.73	8.57	9.64	1.8	0.06	1.21
MVL02P20	<8.00	<4.00	7.8	27	<2.00	<1.00	<2.00	8,100	3,400	6,600	9.79	7.37	3.45	1.3	0.07	1.4
MVL02P20	<8.00	4.3	15	27	<2.00	<1.00	<2.00	75,000	42,000	53,000	8.92	7.98	1.9	1	0.2	0.65
MVL02P20																
MVL02P20	<8.00	8.7	16	77	<2.00	<1.00	<2.00	52,000	28,000	42,000	9.12	8.24	6.94	0.9	0.4	1.31
MVL02P20	<8.00	4	9.1	35	<2.00	<1.00	<2.00	36,000	28,000	10,600	8.66	8.41	2.37	1.5	0.16	1.82
MVL02P20	<8.00	5.1	7.6	29	<2.00	<1.00	<2.00	88,000	58,000	9,850	9.13	8.14	4.95	1.7	0.1	1.7
MVL02P20	1.1	7.1	22	48	<0.50	0.5	0.8	280,000	>120,000	33,000	8.78	7.74	26.6	2.5	38.8	1.36
MVL02P20	<0.50	6.1	5	11	<0.50	<0.50	<0.50	340,000	47,000	12,000	8.63	8.23	1.72	3.5	<0.05	1.44
MVL02P20	<0.50	4.6	8.7	10	<0.50	<0.50	<0.50	120,000	75,000	21,000	8.89	7.89	2.5	2	<0.05	2.54
MVL02P20	0.62	5.3	9.7	15	<0.50	<0.50	<0.50	240,000	16,000	10,000	4.94	7.74	2.83	1.9	0.15	21.35
MVL02P20	<0.50	4	10	9.1	<0.50	<0.50	<0.50	40,000	5,700	7,600	9.7	7.99	2.8	2	0.12	1.25
MVL02P20	<0.50	3.7	6.7	9.3	<0.50	<0.50	<0.50	270,000	170,000	65,000		7.82	4.48	1	0.21	1.64
MVL02P20	<0.50	2	4.6	6.2	<0.50	<0.50	<0.50	5,800	3,700	8,800	10.91	8.27	2.86	2.2	0.06	1.06
MVL02P20	<0.50	2.3	7.9	11	<0.50	<0.50	<0.50	47,000	7,000	48,000	8.5	8.18	4.87	1.8	0.07	1.53
MVL02P20	<0.50	3	6.6	21	<0.50	<0.50	<0.50	250,000	10,000	11,200	9.48	8.38	3.36	1.3	0.25	1.26
MVL02P20	<0.50	3.7	7.9	32	<0.50	<0.50	<0.50	>45,000	4,100	12,000	9.28	8.22	2.7	2.6	0.22	1.27
MVL02P20	<0.50	2.7	8.1	15	<0.50	<0.50	<0.50	>98,000	49,000	23,000	9.27	8.24	2.71	3.5	0.1	2.11
MVL02P20	<0.50	2.7	6.7	8.5	<0.50	<0.50	<0.50	61,000	12,000	12,300	8.86	8.21	4.38	3	0.1	1.15
MVL02P20	<0.50	2.2	5.9	9.4	<0.50	<0.50	<0.50	3,100,000	8,000	102,000	9.78	8.19	3.43	2.1	0.13	0.92
MVL02P20											9.49	8.09	5.34	2.8	0.14	4.87
MVL03P09	<0.50	71	3.6	29	<0.50	18	<0.50	25,000	2,300	1,300	8.17	6.67	7.42	1.3	<0.05	1.07
MVL03P09	0.73	82	5.1	36	<0.50	19	<0.50	33,000	2,000	2,800	7.83	6.5	2.01	2.6	<0.05	1.17
MVL03P09	<0.50	130	4.8	45	<0.50	33	<0.50	28,000	16,000	700	7.48	6.82	1.96	<0.20	<0.05	0.79
MVL03P09	<0.50	97	3.3	40	<0.50	15	<0.50	47,000	35,000	5,400	6.91	6.74	5	2.4	<0.05	1.44
MVL03P09	<0.50	110	4.2	37	<0.50	29	<0.50	41,000	20,000	980	7.27	7.09	4.1	2.3	0.06	0.73

MVL03P09	<0.50	110	6	41	<0.50	26	<0.50	50,000	6,000	300	8.47	6.8	1.75	3.2	<0.05	0.86
MVL03P09	<0.50	87	5.2	49	<0.50	18	<0.50	170,000	30,000	26,000	8.07	6.97	12.3	2.9	<0.05	1.23
MVL03P09	<0.50	79	4.8	40	<0.50	24	<0.50	43,000	20,000	8,000	7.35	7.2	15.7	2.1	0.11	1.13
MVL03P09	0.68	62	11	31	<0.50	15	<0.50	80,000	40,000	12,000	6.98	6.59	15.8	3.2	0.09	1.62
MVL03P09	<0.50	98	3.9	37	<0.50	24	<0.50	41,000	29,000	4,200	13.68	7.43	3.71	3.3	0.12	0.93
MVL03P09	<0.50	100	5.1	45	<0.50	26	<0.50	55,000	1,900	1,070	7.37	6.8	3.93	2	0.05	1.28
MVL03P09	0.91	87	5	38	<0.50	23	<0.50	25,000	10,000	4,600	7.63	6.97	9.01	2.4	0.08	1.24
MVL03P09	<0.50	100	4.5	40	<0.50	26	<0.50	37,000	7,600	1,500	7.24	7.36	2.16	2.2	0.05	0.84
MVL03P09	<0.50	67	6.2	30	<0.50	16	<0.50	110,000	28,000	21,000	7.21	7.11	5.1	1.7	0.1	1.02
MVL03P09	<0.50	60	4.1	28	<0.50	16	<0.50	220,000	42,000	9,000	8.02	7.25	2.38	1.9	0.06	1.34
MVL03P09	<0.50	65	4.1	26	<0.50	17	<0.50	21,000	890	860	8.72	7.02	3.33	3.2	0.1	0.82
MVL03P09	<0.50	89	4.6	33	<0.50	22	<0.50	>4,600	370	1,900	8.67	6.98	2.83	2.8	0.11	0.65
MVL03P09	<0.50	28	2.1	16	<0.50	4.3	<0.50	>8,000	5,300	1,070	7.93	7.82	6.26	2.1	0.1	1.01
MVL03P09	<0.50	66	4.8	27	<0.50	15	<0.50	>116,000	54,000	11,000	8.75	6.98	3.67	2.8	0.1	0.85
MVL03P09	<0.50	64	3.5	32	<0.50	18	<0.50	20,000	3,000	4,100	12.38	7.4	3.44	2.2	0.1	0.77
MVL03P09	<0.50	99	4.5	35	<0.50	21	<0.50	>38,000	1,400	3,100	7.3	7.11	3.17	2.2	0.13	0.62
MVL03P09	<0.50	69	5.5	30	<0.50	15	<0.50	>55,000	2,900	6,600	8.21	7.13	9.75	2.6	0.1	1.04
MVL03P09											8.85	7.3	4.04	2.2	0.1	0.62
MVL03P11	<8.00	8.4	7.3	18	<2.00	1.1	<2.00	40	<10	<10	11.16	7.96	7.5	2.4	0.15	2.5
MVL03P11	<8.00	8.1	5.2	26	<2.00	1.6	<2.00	28,000	12,200	2,800	9.72	7.21	1.14	2.1	<0.05	1.23
MVL03P11	<8.00	6	9.4	23	<2.00	1.5	<2.00	62,000	48,000	7,800	3.05	8.26	1.11	0.5	0.28	0.28
MVL03P11	<8.00	10	7.7	41	<2.00	<1.00	<2.00	15,300	8,800	6,700	8.08	8.2	2.18	2	1.1	0.08
MVL03P11	<8.00	13	7.5	22	<2.00	1.1	<2.00	29,000	15,600	6,000	8.33	8.18	1.87	2.7	0.15	0.85
MVL03P11	<8.00	12	6.9	22	<2.00	1.1	<2.00	52,000	32,000	19,600	9.28	8.17	3.28	1.7	0.1	0.96
MVL03P11	<0.50	19	4	8.5	<0.50	0.71	<0.50	69,000	10,700	87,000	8.93	7.64	11.1	3.2	0.09	1.58
MVL03P11	<0.50	20	6.7	18	<0.50	1.3	<0.50	18,000	8,000	3,400	8.13	7.83	1.9	2.5	0.92	1.52
MVL03P11	<0.50	14	5.6	25	<0.50	0.76	0.5	330,000	150,000	>120,000	8.32	8.12	2.18	2.9	<0.05	1.67
MVL03P11	<0.50	28	18	33	<0.50	2.2	0.6	30,000	12,000	1,300	5.68	7.92	3.84	3.1	0.11	1.34
MVL03P11	<0.50	24	4.2	7.8	<0.50	0.94	<0.50	46,000	3,300	3,600	9.37	7.88	1.31	2.9	0.1	0.94
MVL03P11	<0.50	9.5	5.7	7.9	<0.50	0.69	<0.50	70,000	16,000	17,000	8.83	7.86	4.18	1.8	0.06	1.38
MVL03P11	<0.50	6.6	4.7	9.4	<0.50	0.58	<0.50	7,600	4,000	18,000	9.5	8.19	2.35	3.6	0.05	1.28

MVL03P11	2.8	5.3	5.8	6.9	<0.50	0.71	<0.50	23,000	2,100	4,400	8.41	8.14	3.33	2.4	0.1	1.02
MVL03P11	0.89	7.3	5.1	8.2	<0.50	<0.50	<0.50	56,000	11,000	3,500	9.03	8.19	12	1.8	0.05	0.99
MVL03P11	<0.50	9	5.6	14	<0.50	0.74	<0.50	>20,000	5,400	5,900	9.54	8.16	4.79	2.4	0.2	1.2
MVL03P11	<0.50	6	3.7	4.8	<0.50	0.66	<0.50	56,000	8,400	5,600	8.21	8.18	1.78	2	0.11	1.11
MVL03P11	<0.50	4.4	3.6	5.3	<0.50	<0.50	<0.50	46,000	6,600	10,100	11.65	8.6	2	2.2	0.1	0.93
MVL03P11											9.55	7.93	0.78	2.6	0.1	0.91
RSML02@AP	<0.50	3.7	1.9	7.2	<0.50	<0.50	<0.50	>68,000	4,800	10,000	9.01	8.02	1.59	2	0.1	1.59
RSML02@AP	<0.50	2.1	1.8	4.4	<0.50	<0.50	<0.50	27,000	2,000	9,400	9.77	8.09	5.85	2	0.1	0.61
RSML02@AP	<0.50	2.3	2.6	5.2	<0.50	<0.50	<0.50	>76,000	24,000	5,200	9.28	8.06	1.63	2	0.45	0.3
RSML02@AP	<0.50	4.5	2.9	14	<0.50	<0.50	<0.50	6,400,000	2,200,000	1,490,000	9.77	7.81	11.3	2.3	0.12	1.03
RSML02@AP	<0.50	6.8	2.4	5.6	<0.50	<0.50	<0.50	64,000	14,000	7,500	12.62	7.9	2.76	2	0.2	0.85
RSML02@AP	<0.50	5.7	2.3	5.7	<0.50	<0.50	<0.50	38,000	390	5,000	10.25	7.98	1.86	2	0.11	1.12
RSML02@AP											9.54	7.86	2.11	2	0.1	0.99
RSML02P25	<8.00	<4.00	9.3	27	<2.00	<1.00	<2.00	8,200	4,700	7,050	8.94	8.19	2.7	1.5	0.2	1.42
RSML02P25	<8.00	<4.00	3.3	35	<2.00	<1.00	<2.00	37,000	7,850	1,900	9.29	7.28	6.87	1.9	<0.05	1.31
RSML02P25	<8.00	<4.00	4.5	23	<2.00	<1.00	<2.00	36,000	22,000	66,000	9.57	7.95	3.47	1.4	0.07	0.35
RSML02P25	<8.00	<4.00	4.2	43	<2.00	<1.00	<2.00	34,000	27,000	11,000	9.26	8	2.98		<0.05	0.55
RSML02P25	<8.00	5.2	6.5	32	<2.00	<1.00	<2.00	42,000	19,800	21,000	9.51	7.94	2.89	1.5		1.43
RSML02P25	<8.00	4.8	3.2	25	<2.00	<1.00	<2.00	31,000	21,000	10,600	8.38	7.93	1.75	0.9		0.74
RSML02P25	<0.50	6.9	2.6	7.9	<0.50	<0.50	<0.50	45,000	15,000	3,800	9.67	7.5	1.62	2.3	<0.05	0.65
RSML02P25	<0.50	5.9	2.7	9.2	<0.50	<0.50	<0.50	41,000	8,000	6,300	8.89	8.02	2.92	3.1	<0.05	1.25
RSML02P25	<0.50	6.9	2.5	6.9	<0.50	<0.50	<0.50	130,000	23,000	5,000	8.75	7.96	1.6	2	<0.05	0.96
RSML02P25	<0.50	10	3.2	9.9	<0.50	<0.50	<0.50	50,000	12,000	530	8.86	7.87	1.28	2.5	0.07	0.79
RSML02P25	<0.50	9.6	3.6	16	<0.50	<0.50	<0.50	44,000	7,000	25,000	9.14	7.82	2.4	2	<0.05	1.56
RSML02P25	<0.50	2.2	4	7.7	<0.50	<0.50	<0.50	36,000	26,000	17,000	8.62	7.7	2.41	1.3	0.07	0.92
RSML02P25	<0.50	2.3	2.8	5	<0.50	<0.50	<0.50	48,000	17,000	5,800	9.81	7.9	1.64	2.1	0.05	1
RSML02P25	<0.50	2.3	3.3	4.8	<0.50	<0.50	<0.50	63,000	22,000	7,300	7.2	8.1	2.44	1.4	0.05	0.99
RSML02P25	<0.50	2.3	2.1	4.6	<0.50	<0.50	<0.50	51,000	32,000	10,000	8.81	8.01	2.11	4.1	0.05	1.93
RSML02P25	<0.50	3.3	3.7	7.1	<0.50	<0.50	<0.50	>9,000	1,700	3,100	9.37	7.97	1.25	2.1	0.1	0.83
RSML02P25	<0.50	2.6	2.8	4	<0.50	<0.50	<0.50	21,000	8,500	6,200	9.78	8.55	1.95	2	0.12	0.74

RSML02P25	<0.50	2.3	2.3	3.9	<0.50	<0.50	<0.50	>7,900	3,900	5,100	12.81	8.23	0.99	2	0.12	0.69
RSML02P25	<0.50	4.8	4	4	<0.50	<0.50	<0.50	>7,100	1,200	2,000	11.12	8.08	1.09	2	0.1	0.76
RSML02P28	<8.00	17	19	75	<2.00	<1.00	<2.00	10,000	5,600	5,150	8.55	8.23	25.8	1.1	0.3	0.85
RSML02P28	<8.00	17	19	75	<2.00	<1.00	<2.00	4,200	1,450	1,850	9.33	6.77	10.2	1.8	0.22	0.17
RSML02P28	<8.00	4.1	16	61	<2.00	<1.00	<2.00	37,000	2,800	7,600	8.81	7.85	5.22	1	0.45	0.23
RSML02P28	<8.00	6.1	15	63	<2.00	<1.00	<2.00	11,200	7,200	6,800	14	8.3	5.59	1.4	0.55	1.13
RSML02P28	<8.00	7.4	6.4	63	<2.00	<1.00	<2.00	6,400	1,460	3,400	9	7.96	42.8	1.8		0.97
RSML02P28																
RSML02P28	0.88	7.4	19	50	<0.50	<0.50	0.6	340,000	800	970	9.91	7.84	5.99	1.4	0.6	1.57
RSML02P28	<0.50	6	7.5	20	<0.50	<0.50	<0.50	31,000	21,000	1,500	9.08	8.05	2.3	2.1	0.08	1.38
RSML02P28	<0.50	4.1	2.6	13	<0.50	<0.50	<0.50	20,000	1,190	1,900	8.52	8.2	3.1	2	<0.05	0.55
RSML02P28	<0.50	3.3	2.4	17	<0.50	<0.50	<0.50	5,100	3,200	150	9.45	8.4	0.98	2	0.08	0.41
RSML02P28	0.52	8.9	21	120	<0.50	<0.50	<0.50	420,000	68,000	4,300	9.26	8.11	4.21	2.1	0.35	1.03
RSML02P28	3.8	1	6.6	4.7	<0.50	<0.50	<0.50	5,600	3,100	200	8.69	8.22	25.9	1.4	0.06	0.62
RSML02P28	<0.50	2	9.4	20	<0.50	<0.50	<0.50	400,000	27,000	52,000	9.97	8.97	5.18	2.7	0.06	1.76
RSML02P28	<0.50	1.5	7.1	12	<0.50	<0.50	<0.50	460,000	66,000	4,400	7.21	8.32	2.3	1.7	0.05	0.74
RSML02P28	<0.50	2.2	5.1	15	<0.50	<0.50	<0.50	16,000	3,000	1,400	9.04	8.4	1.09	2.3	0.05	0.94
RSML02P28	5.1	15	25	410	<0.50	<0.50	0.71	>38,000	4,400	6,400	9.83	8.46	8.75	2.4	0.42	6.3
RSML02P28	2	6.4	6.9	470	<0.50	<0.50	<0.50	>9,100,000	>8,400	240,000	8.63	8.29	11.9	3.6	0.43	0.54
RSML02P28																
RSML02P28	<0.50	3.7	6	15	<0.50	<0.50	<0.50	>11,800	1,100	2,100	11.6	8.45	1.78	2.7	0.1	0.72
RSML02P32	<8.00	<4.00	23	41	<2.00	<1.00	<2.00	29,000	18,000	24,800	6.91	7.98	5.89	3.6	<0.05	1.15
RSML02P32	<8.00	<4.00	22	34	<2.00	<1.00	<2.00	4,950	1,800	3,300	9.34	7.01	11.6	2.4	0.22	1.34
RSML02P32	<8.00	<4.00	11	24	<2.00	<1.00	<2.00	8,900	6,200	8,000	7.93	7.71	3.16	1.2	0.15	0.39
RSML02P32	<8.00	<4.00	6.7	70	<2.00	<1.00	<2.00	16,100	8,950	10,000	8.41	8.1	4.9	3.9	0.13	1.21
RSML02P32	<8.00	4.8	12	41	<2.00	<1.00	<2.00	31,000	24,000	50,000	9.21	8.02	1.93	3		1.68
RSML02P32	<8.00	5.4	9.4	31	<2.00	<1.00	<2.00	45,000	35,000	9,450	8.71	7.77	2.88	2.9		1.34
RSML02P32	<0.50	4.7	24	12	<0.50	<0.50	<0.50	52,000	40,000	1,900	9.44	7.36	2.82	4.6	0.07	0.96
RSML02P32	<0.50	3.9	5.3	21	<0.50	<0.50	<0.50	33,000	8,000	7,000	8.37	8.02	6.59	3.4	0.08	1.4
RSML02P32	<0.50	4.4	5.2	11	<0.50	<0.50	<0.50	20,000	8,600	6,500	8.42	7.92	1.6	3.1	<0.05	1.48

RSML02P32	0.59	5.9	9.9	18	<0.50	<0.50	<0.50	190,000	150,000	53,000	8.98	7.87	8.05	3.4	<0.05	0.97
RSML02P32	<0.50	5.6	15	20	<0.50	<0.50	<0.50	19,000	4,100	17,000	9.2	7.84	1.95	3.4	0.48	2.3
RSML02P32	<0.50	1.9	7.5	11	<0.50	<0.50	<0.50	58,000	25,000	43,000	8.57	7.79	2.85	2.7	0.1	29.9
RSML02P32	0.64	1.2	3.3	9.2	<0.50	<0.50	<0.50	6,100	4,400	1,220	9.65	8.16	0.61	2.9	0.08	0.8
RSML02P32	0.53	1.9	6.7	11	<0.50	<0.50	<0.50	680,000	580,000	86,000	6.98	8.07	6.56	1	0.06	3.77
RSML02P32	<0.50	1.3	3.8	10	<0.50	<0.50	<0.50	57,000	28,000	16,000	8.8	8.17	1.6	2.1	0.23	1.29
RSML02P32	2.1	2.2	3.6	15	<0.50	<0.50	<0.50	>12,600	4,400	5,800	10.23	8.23	1.98	3.2	0.1	0.89
RSML02P32	0.54	2.5	4.6	10	<0.50	<0.50	<0.50	28,000	8,800	8,600	8.79	8.11	1.59	3	0.1	0.83
RSML02P32	<0.50	2	4.4	6.1	<0.50	<0.50	<0.50	49,000	11,000	15,400	12.75	7.94	2.39	3.4	0.1	0.9
RSML02P32	<0.50	1.4	4.8	7.8	<0.50	<0.50	<0.50	27,000	3,000	11,000	9.65	8.19	1.85	2	0.1	0.76
RSML02P32											9.72	8.14	0.86	2.5	0.1	0.97
RSML02P45	<8.00	<4.00	10	36	<2.00	<1.00	<2.00	9,550	8,300	5,500	7.74	8.26	7.81	3.5	<0.05	1.33
RSML02P45	<8.00	<4.00	4.2	22	<2.00	<1.00	<2.00	2,900	2,700	6,550	7.18	6.9	4.17	4.5	<0.05	0.36
RSML02P45	<8.00	<4.00	4.9	27	<2.00	<1.00	<2.00	26,000	14,600	8,100	7.84	8.1	2.85	1	0.1	0.33
RSML02P45	<8.00	<4.00	4.3	34	<2.00	<1.00	<2.00	30,000	23,000	10,600	7.17	7.9	1.74	1.7		0.96
RSML02P45	<8.00	6.1	7.3	37	<2.00	<1.00	<2.00	7,800	6,300	6,600	9.15	8.13	3.56	2.9	<0.05	1.72
RSML02P45	<8.00	<4.00	3.6	26	<2.00	<1.00	<2.00	10,600	7,300	5,600	9.53	7.97	2.91	2.7		1.28
RSML02P45	<0.50	5.8	4.7	5.5	<0.50	<0.50	<0.50	41,000	9,300	10,000	7.57	7.88	10.4	2.6	0.13	0.77
RSML02P45	<0.50	4.5	9	14	<0.50	<0.50	<0.50	17,000	11,000	5,200	8.89	7.94	1.35	2.5	<0.05	1.47
RSML02P45	<0.50	4.6	3.5	7.7	<0.50	<0.50	<0.50	43,000	7,500	4,900	21.82	8.03	1.3	2.9	<0.05	1.14
RSML02P45	<0.50	5.5	4.7	9.6	<0.50	<0.50	<0.50	120,000	17,000	1,200	8.84	8.01	3.82	2.8	0.08	1.07
RSML02P45	<0.50	4.8	4.1	6.5	<0.50	<0.50	<0.50	40,000	15,000	5,400	9.17	8.08	2.81	2.9	0.11	1.35
RSML02P45	0.65	8	7.4	5.7	<0.50	<0.50	<0.50	39,000	8,000	12,000	8.1	7.85	3.57	1.5	0.7	2.38
RSML02P45	<0.50	1.3	2.5	7.2	<0.50	<0.50	<0.50	40,000	5,100	8,100	10.71	8.28	1.23	2.5	0.1	1
RSML02P45	<0.50	1.3	3	7.8	<0.50	<0.50	<0.50	61,000	5,200	3,900	9.43	8.22	1.98	2.1	0.1	0.96
RSML02P45	<0.50	1.4	2.4	4.3	<0.50	<0.50	<0.50	39,000	8,000	7,200			1.64	2	0.1	0.79
RSML02P45	<0.50	1.9	4.8	9.5	<0.50	<0.50	<0.50	>52,000	38,000	88,000	11.34	8.33	3.56	2.4	0.2	1.01
RSML02P45	0.67	2.6	7.7	17	<0.50	<0.50	<0.50	>39,000	17,000	7,200	8.65	8.19	4.74	4.6	0.7	1.5
RSML02P45	<0.50	2.4	3.3	4.4	<0.50	<0.50	<0.50	>57,000	5,000	60,000	12.84	8.05	1.82	2.4	0.1	1.15
RSML02P45	<0.50	1.2	3.6	5.7	<0.50	<0.50	<0.50	46,000	2,700	9,300	9.82	8.22	1.73	2	0.1	0.45
RSML02P45											9.92	8.13	3.36	2.3	0.1	0.57

RSML11P02	<8.00	<4.00	26	58	<2.00	<1.00	<2.00	26,400	10,600	11,300	10.53	7.96	8.8	2.4	0.9	1.44
RSML11P02	<8.00	<4.00	9	42	<2.00	<1.00	<2.00	16,300	7,400	9,900	8.1	8.5	3.59	<0.20	<0.05	2.65
RSML11P02	<8.00	<4.00	8.2	22	<2.00	<1.00	<2.00	41,000	25,000	33,000	19.01	8.24	8.75	2	<0.05	1.73
RSML11P02	<8.00	<4.00	9.3	35	<2.00	<1.00	<2.00				8.36	8.23	2.13	2.9	0.08	1.44
RSML11P02	<8.00	<4.00	7.1	26	<2.00	<1.00	<2.00	42,000	7,900	28,000	8.37	8.04	5.22	2.8	0.15	1.4
RSML11P02	<8.00	5.5	7.6	39	<2.00	<1.00	<2.00	114,000	45,000	116,000	12	7.8	5.4	2.2	0.1	1.59
RSML11P02	0.59	6.1	17	19	<0.50	<0.50	<0.50	800,000	6,700	2,300	7.6	7.98	2.65	1.5	0.45	1.63
RSML11P02	<0.50	4.3	4.9	11	<0.50	<0.50	<0.50	240,000	210,000	44,000	9.4	7.94	4.17	2.2	<0.05	1.93
RSML11P02	<0.50	4	6.7	17	<0.50	<0.50	<0.50	300,000	130,000	34,000	9.03	8.15	4.6	2.2	0.1	1.56
RSML11P02	0.64	10	36	180	<0.50	<0.50	<0.50	330,000	65,000	42,000	8.63	7.94	8.49	3	<0.05	2.08
RSML11P02	<0.50	5.1	9.1	15	<0.50	<0.50	<0.50	360,000	120,000	20,000	9.13	8.09	5.54	1.9	0.25	1.89
RSML11P02	<0.50	6	4.6	12	<0.50	<0.50	<0.50	150,000	90,000	23,000	8.64	7.91	4.34	1.5	0.1	1.71
RSML11P02	<0.50	2.4	12	12	<0.50	<0.50	<0.50	38,000	4,300	8,300	9.43	8.2	11	2.9	0.13	1.13
RSML11P02	<0.50	1.9	5.5	11	<0.50	<0.50	<0.50	190,000	22,000	23,000	9.32	8.16	3.46	2.3	0.09	1.27
RSML11P02	<0.50	2.6	4.5	8.5	<0.50	<0.50	<0.50	70,000	26,000	32,000			3.98	2.7	0.25	1.91
RSML11P02	<0.50	2.6	5.6	17	<0.50	<0.50	<0.50	34,000	5,900	13,200	11.03	8.32	3.73	2.4	0.18	0.87
RSML11P02	<0.50	2.8	8.6	13	<0.50	<0.50	<0.50	380,000	110,000	500,000	8.61	8.2	3.14	2.4	0.11	1.21
RSML11P02	<0.50	2.5	3.1	7.4	<0.50	<0.50	<0.50	680,000	38,000	42,000	12.92	7.93	3.8	2.2	0.12	1.31
RSML11P02	<0.50	1.8	6.5	8.4	<0.50	<0.50	<0.50	33,000	2,400	23,000	9.74	8.2	3.21	2.1	0.1	0.87
RSML11P02											9.77	8.2	8.14	2	0.1	0.74
SCBS@M02	<8.00	41	62	220	<2.00	3.2	4.3	78,000	37,000	58,000	5.23	7.89	18.8	2.6	2.6	12.76
SCBS@M02	<8.00	18	3.9	30	<2.00	1.9	<2.00	62,000	14,000	4,300	5.32	7.32	8.13	3.2	0.12	1.26
SCBS@M02	<8.00	18	7.1	44	<2.00	<1.00	<2.00	<10	<10	<10	5.23	8	10.2	1.8	0.3	0.27
SCBS@M02	<8.00	21	9.1	27	<2.00	<1.00	<2.00	14,500	27,000	78,000	1.69	8.04	5	0.9	0.55	0.22
SCBS@M02	<8.00	19	18	52	<2.00	2.2	<2.00	166,000	46,000	119,000	1.75	8.01	10.6	0.8	1.35	0.86
SCBS@M02																
SCBS@M02	<8.00	21	8.4	62	<2.00	<1.00	<2.00	10,400	8,850	12,700	7.66	8.19	7.48	4.4	0.38	2.02
SCBS@M02	<8.00	20	9	39	<2.00	<1.00	<2.00	64,000	37,000	11,200	8.85	8.18	7.82	4.7	0.13	1.27
SCBS@M02	<8.00	26	13	97	<2.00	<1.00	<2.00	<200,000	<200,000	129,000	7.98	8.13	6.5	3	0.45	1.69
SCBS@M02	<8.00	29	10	15	<2.00	<1.00	<2.00	28,000	20,222	49,000	14.4	8.3	6.7	4.4	0.15	1.04

SCBS@M02	<8.00	31	5.2	16	<2.00	<1.00	<2.00	7,900	4,800	2,100	14	8.3	33.7	2.32	0.2	1.36
SCBS@M02	<0.50	71	5.9	28	<0.50	4.5	<0.50	38,000	30,000	3,000	7.73	8.03	2.03	3	<0.05	0.52
SCBS@M02	<0.50	86	4.6	11	<0.50	1.4	<0.50	370,000	47,000	9,400	8.9	7.53	1.7	5.1	0.14	0.55
SCBS@M02	0.89	36	7	4.2	<0.50	1.6	<0.50	200,000	150,000	4,200	9.05	8.03	1.52	2.9	0.29	0.51
SCBS@M02	<0.50	67	6.1	11	<0.50	2	<0.50	720,000	190,000	240	8.8	8.02	1.8	3.3	<0.05	0.43
SCBS@M02	<0.50	54	9.2	3	<0.50	1.3	<0.50	310,000	45,000	1,700	8.88	8.05	1.2	5	<0.05	0.44
SCBS@M02	<0.50	45	5.8	16	<0.50	1.9	<0.50	200,000	58,000	730	8.43	8.04	1.22	5.1	0.44	0.35
SCBS@M02	<0.50	39	4.4	9.6	<0.50	1.6	<0.50	76,000	42,000	2,200	9.03	7.97	1.44	3.9	0.12	0.62
SCBS@M02	1.3	49	17	20	<0.50	1.6	<0.50	160,000	10	18,300	7.44	8.08	5.91	3.5	0.32	1.01
SCBS@M02	<0.50	34	9.3	14	<0.50	1.4	<0.50	1,190,000	480,000	4,100	7.92	7.87	1.71	3.3	0.5	0.73
SCBS@M02	<0.50	37	5.8	4.8	<0.50	0.53	<0.50	87,000	12,000	9,600	9.98	7.81	3.75	2.2	0.15	0.5
SCBS@M02	0.53	14	18	17	<0.50	1.5	<0.50	>1,200,000	>1,200,000	640	7.94	8.12	6.12	5.8	0.65	2.32
SCBS@M02	1.1	30	67	130	<0.50	1.2	1.1	270,000	6,300	62,000	8.1	8.19	113	4.5	5.2	2.92
SCBS@M02	<0.50	13	5.4	6.2	<0.50	<0.50	<0.50	36,000	7,700	5,500	9.5	8.06	5.26	3.4	0.05	0.83
SCBS@M02	<0.50	16	4.6	7.8	<0.50	<0.50	<0.50	30,000	1,700	4,900	9.48	8.16	4.19	4	0.05	0.97
SCBS@M02	0.73	14	5.8	23	<0.50	<0.50	<0.50	240,000	2,900	3,800	6.65	8.05	4	4.2	0.15	0.43
SCBS@M02	<0.50	17	5.2	9.4	<0.50	0.92	<0.50	390,000	6,100	3,100	9.72	8.21	4.65	2.3	0.23	0.56
SCBS@M02	<0.50	8.8	3.4	4.4	<0.50	<0.50	<0.50	51,000	2,800	3,900	8.92	8.28	2.98	2.8	0.11	0.54
SCBS@M02	<2.50	11	4	<10.00	<2.50	<2.50	<2.50	9,600,000	43,000	7,800	9.16	8.03	20.5	5.1	1.05	0.74
SCBS@M02	<0.50	10	3.9	8.6	<0.50	<0.50	<1.00	31,000	2,700	1,140	12.22	8.06	2.6	5.7	0.33	0.69
SCBS@M02	<1.00	11	13	8.8	<1.00	<1.00	<0.50	640,000	46,000	84,000	13.94	8.16	21.9	4.7	0.15	0.95
SCBS@M02	<1.00	13	4.5	9.1	<1.00	<1.00	<2.50	116,000	>99	8,400	10.85	8.21	1.45	2.8	0.24	0.45
SCBS@M02	<0.50	9.9	7.8	23	<2.50	<2.50	<2.50	95,000	2,200	42,000	15.85	8.21	3.15	4.9	0.19	0.51
SCM00P03	<8.00	15	12	62	<2.00	<1.00	<2.00	89,000	42,000	10,800	13.6	8.19	2.77	0.4	0.65	0.27
SCM00P03																
SCM00P03	<8.00	18	6.5	39	<2.00	<1.00	<2.00				8.07	7.75		2.4	0.35	0.69
SCM00P03	<8.00	19	8.2	36	<2.00	<1.00	<2.00	27,000	17,800	1,400	4.18	7.58	1.6	2.1	0.15	0.74
SCM00P03	0.53	24	13	81	<0.50	0.54	<0.50	370,000	4,600	13,000	9.08	7.65	3.35	2.9	0.18	1.4
SCM00P03	0.58	39	8.6	6.2	<0.50	1.1	<0.50	15,000	2,400	800	12.17	8.27	2.01	0.4	<0.03	0.6
SCM00P03	0.85	18	23	66	<0.50	0.78	1.1	37,000	31,000	2,500	9.52	8.14	4.43	4.4	1.02	2.95
SCM00P03	0.79	38	11	20	<0.50	0.85	<0.50	3,200	600	2,000	13.92	8.27	16.1	1.3	0.08	0.67

SCM00P03	1	9.9	14	500	<0.50	<0.50	<0.50	>1,200,000	5,100	7,400	9.08	8.25	22.9	1.8	4.3	1.49
SCM00P03	1.8	15	8.9	77	<0.50	<0.50	<0.50	160,000	21,000	11,000	9.73	8.22	4.49	1.9	0.7	1.37
SCM00P03	<0.50	10	6.7	47	<0.50	0.63	<0.50	2,800	1,200	1,100	9.94	8.28	2.66	2.5	0.09	1.48
SCM00P03	<0.50	14	6.6	62	<0.50	3.5	<0.50	3,800	500	600	5.79	8.21	4.85	2.1	0.05	1.26
SCM00P03																
SCM00P03	<0.50	19	5.8	52	<0.50	0.73	<0.50	>2,400	110	590	10.85	8.14	0.33	2	0.11	0.53
SCM00P03	0.51	14	4.6	48	<1.00	<1.00	<1.00	49,000	>130	8,200	8.71	8.01	4.8	2.2	0.1	0.83
SCM00P03	<2.00	16	5.7	15	<0.50	<0.50	<0.50	27,000	240	3,400	13.51	7.66	15.6	3.6	0.12	0.76
SCM00P03											9.8	8.06	7	2	0.1	1.26
SCM02XXX	<8.00	760	<2.00	130	<2.00	54	<2.00	16,000	2,850	12,650	10.54	7.89	7.82	6.7	<0.05	0.3
SCM02XXX	120	9.8	9.6	50	<2.00	<1.00	<2.00	3,800	3,100	1,760	8.87	8.1	403	1.3	0.45	0.18
SCM02XXX	<8.00	14	7.4	160	<2.00	<1.00	<2.00	12,000	6,100	3,900	9.33	8.27	13.5	0.7	0.1	1.56
SCM02XXX	<8.00	25	13	54	<2.00	5.4	<2.00	77,000	67,000	4,700	7.02	7.38	3.44	3.1	1.5	2.49
SCM02XXX																
SCM02XXX	<8.00	12	7.8	<10.00	<2.00	<1.00	<2.00	111,000	85,000	17,200	9.14	8.1	62.1	1.5		2.33
SCM02XXX	0.82	22	6.1	4.5	<0.50	0.52	<0.50	22,000	5,200	13,000	7.23	8.3	7.13	3.5	<0.05	1.5
SCM02XXX	0.54	29	5.2	4.1	<0.50	<0.50	<0.50	65,000	27,000	5,700	9.75	8.05	46.9	1.7	<0.05	1.28
SCM02XXX	0.58	24	4	3.3	<0.50	0.52	<0.50	25,000	12,000	4,800	9.6	8.13	3.1	1.8	0.06	1.51
SCM02XXX	0.64	11	5.3	7.6	<0.50	<0.50	<0.50	5,900	3,600	530	9.49	8.14	16.9	1.8	0.35	0.79
SCM02XXX	<0.50	7.6	6.9	11	<0.50	<0.50	<0.50	630	270	400	9.26	8.14	16.1	1.9	0.08	1.64
SCM02XXX	<0.50	12	5.9	75	<0.50	<0.50	<0.50	52,000	2,900	3,000	8.34	8.02	16.1	4	0.06	1.67
SCM02XXX	0.55	16	4.6	6.8	<0.50	0.53	<0.50	15,000	9,000	4,900	10.34	8.26	5.17	2.8	0.09	1.23
SCM02XXX	0.69	14	4.9	7.9	<0.50	0.56	<0.50	37,000	930	2,000	7.45	8.19	3.95	3.1	0.05	1.39
SCM02XXX	<0.50	7.8	3.7	18	<0.50	<0.50	<0.50	150,000	22,000	39,000	6.5	7.8	3.51	11.2	0.07	2.35
SCM02XXX																
SCM02XXX	0.52	12	6.4	9.9	<0.50	0.57	<0.50	32,000	2,600	2,400	11.26	8.08	676	4	0.11	1.1
SCM02XXX	<0.50	9.9	5.4	15	<0.50	0.62	<0.50	>44,000	28,000	51,000	11.48	8.16	6.2	3.1	0.12	3.11
SCM02XXX	<0.50	11	4.2	8	<0.50	0.52	<0.50	33,000	5,300	9,200	15.27	8.23	6.93	4.1	0.1	1.77
SCM02XXX											11.16	7.92	2.36	2.8	0.1	1.64
SCM03P01	<8.00	22	8	35	<2.00	3.3	<2.00	94,000	56,000	2,950	7.86	7.44	17.6	2	<0.05	0.53

SCM03P01	<8.00	17	8.4	19	<2.00	2	<2.00	59,000	5,000	3,200	7.08	7.8	4.88	3.2	0.15	1.98
SCM03P01	<8.00	26	9.2	53	<2.00	4.3	<2.00	4,500	3,200	5,900	7.83	7.47	6.94	1.1	0.1	0.41
SCM03P01	<8.00	37	9.3	63	<2.00	8.8	<2.00	8,000	2,800	6,000	7.67	7.34	3.07	2.6		1.24
SCM03P01	<8.00	14	7	21	<2.00	<1.00	<2.00	84,000	49,000	58,000	9.34	8.3	4.79	1.5	0.1	1.24
SCM03P01	<8.00	30	9	54	<2.00	5.9	<2.00	3,200	1,400	1,080	6.53	7.33	1.59	2.5	0.1	1.53
SCM03P01	0.5	42	5.8	22	<0.50	6.6	<0.50	36,000	30,000	8,000	5.02	7.3	2.03	3.4	<0.05	1.14
SCM03P01	<0.50	42	6.9	26	<0.50	7.9	<0.50	180,000	190,000	13,800	6.56	7.17	2.13	3.2	<0.05	1.12
SCM03P01	<0.50	35	5.5	19	<0.50	6.6	<0.50	48,000	16,000	6,200	7.55	7.48	2.5	2.9	<0.05	1.36
SCM03P01	0.58	66	5.3	40	<0.50	15	<0.50	28,000	2,400	800	7.56	7.4	0.85	5.3	<0.03	1.02
SCM03P01	<0.50	59	6.7	46	<0.50	13	<0.50	1,080,000	570,000	>1,200,000	7.59	7.57	2.57	3.6	0.28	2.06
SCM03P01	<0.50	57	6.1	37	<0.50	12	<0.50	450,000	50,000	86,000	4.8	7.71	2.56	4.8	0.18	1.94
SCM03P01	<0.50	60	5.3	32	<0.50	13	<0.50	4,600	50,000	500	6.24	7.44	1.12	5	0.1	0.99
SCM03P01	<0.50	73	7	45	<0.50	16	<0.50	290,000	27,000	20,000	4.81	7.63	1.4	5.4	0.07	1.19
SCM03P01	<0.50	81	4.5	54	<0.50	21	<0.50	5,000	3,000	500	6.47	7.43	1.82	5.6	0.05	1.27
SCM03P01	<0.50	11	5.3	13	<0.50	1.3	<0.50	>35,000	6,400	10,800	8.96	7.65	2.35	5.2	0.17	1.17
SCM03P01	<0.50	26	3.9	15	<0.50	3.5	<0.50	20,000	3,600	3,100	8.57	7.96	2.12	3.7	0.1	1.61
SCM03P01	<0.50	24	2.1	21	<0.50	2.4	<0.50	>8,000	2,700	7,400	10.67	8.2	2.53	4.7	0.1	1.21
SCM03P01											7.54	6.96	5.1	5.6	0.14	1.35
SJCL01@CC	<8.00	<4.00	5	56	<2.00	<1.00	<2.00	2,070	725	580	10.88	8.41	2.4	0.8	<0.05	0.82
SJCL01@CC	<8.00	6.9	13	370	<2.00	<1.00	6.1	39,000	960	1,030	10.2	7.62	5.43	6.4	<0.05	1.22
SJCL01@CC	<8.00	<4.00	3.5	17	<2.00	<1.00	<2.00	1,130	980	960	8.69	7.82	1.14	1.7	<0.05	0.44
SJCL01@CC	<8.00	<4.00	12	42	<2.00	<1.00	<2.00	8,200	4,300	6,100	7.6	8.21	6.72	0.8	0.18	0.16
SJCL01@CC	<8.00	<4.00	2.2	15	<2.00	<1.00	<2.00	8,700	3,300	3,900	9.7	8.29	0.88	0.9	<0.05	0.17
SJCL01@CC	<8.00	5.3	12	80	<2.00	<1.00	2.2	79,000	72,000	2,800	10.23	8.51	3.05	1.2	0.24	1.43
SJCL01@CC	<8.00	6.2	10	88	<2.00	<1.00	<2.00	4,700	3,300	1,290	4.24	7.84	10.9	1.3	0.15	1.68
SJCL01@CC	<8.00	5.1	7.2	40	<2.00	<1.00	<2.00	11,400	8,900	1,210	9.51	8.36	1.95	0.8	0.15	1.03
SJCL01@CC	<8.00	23	9.2	37	<2.00	<1.00	<2.00	73,000	58,000	87,000	14.6	8.2	6.4		0.1	3.85
SJCL01@CC	<8.00	7.1	10	150	<2.00	<1.00	<2.00	62,000	50,000	53,000	13.8	8.6	15.9		0.9	3.87
SJCL01@CC	<0.50	4.4	5.5	28	<0.50	<0.50	<0.50	30,000	400	3,000	8.11	8.26	1.97	2.7	0.08	0.77
SJCL01@CC	<0.50	10	15	460	<0.50	0.62	3.7	820,000	>100,000	103,000	8.2	7.53	2.4	1.4	0.45	5.02
SJCL01@CC	1.5	5.1	3.6	60	0.72	1.1	1.4	>1,200,000	>120,000	>120,000	7.36	7.87	2.11	0.9	0.6	1.15

SJCL01@CC	<0.50	4.4	3.5	25	<0.50	<0.50	<0.50	40,000	18,000	6,000	8.41	8.28	1.08	4.7	0.11	1.83
SJCL01@CC	<0.50	5	4.5	55	<0.50	<0.50	<0.50	24,000	7,900	1,500	8.29	8.08	2.1	2.8	0.14	1.82
SJCL01@CC	<0.50	8.2	8.6	49	<0.50	<0.50	<0.50	600,000	110,000	3,400	10.25	8.08	1.93	3.3	0.5	1.14
SJCL01@CC	<0.50	5.5	7.8	39	<0.50	<0.50	<0.50	710,000	9,200	3,000	8.75	8.07	4.3	1.4	0.22	1.61
SJCL01@CC	<0.50	6.1	6.9	45	<0.50	<0.50	<0.50	39,000	<10	7,700	9.09	8.21	1.6	1.5	0.15	1.56
SJCL01@CC	<0.50	1.9	6	31	<0.50	<0.50	<0.50	24,000	5,000	4,300	9.1	7.88	1.58	1.7	0.22	1.45
SJCL01@CC	<0.50	1.3	4.1	14	<0.50	0.64	<0.50	<10	<10	<10	0	8.34	0.34	1.6	0.12	0.23
SJCL01@CC	1.1	2.4	8.2	35	<0.50	<0.50	<0.50	30,000	3,000	1,000	9.06	8.12	6.51	2.1	0.18	0.74
SJCL01@CC	<0.50	5.9	13	500	<0.50	0.67	5.2	14,000	1,500	6,200	8.81	8.14	1.22	0.8	0.48	2.71
SJCL01@CC	<0.50	3.2	10	47	<0.50	<0.50	0.53	22,000	4,200	15,000	7.5	8.37	1.61		0.27	1.33
SJCL01@CC	<0.50	3.2	5.4	43	<0.50	<0.50	<0.50	540,000	220,000	84,000	8.99	8.03	1.58	1.8	0.3	2
SJCL01@CC	1.3	4.4	7.3	43	<0.50	<0.50	3	800,000	210,000	18,000	8.04	8.17	13.3	1.2	0.45	2.19
SJCL01@CC	<0.50	4.1	6.1	39	<0.50	<0.50	<0.50	6,400	5,600	2,400	9.74	8.3	4.51	2.3	0.3	1.46
SJCL01@CC	<0.50	2.9	5.6	41	<0.50	<0.50	<0.50	40,000	8,600	7,400	10.67	8.33	2.74	0.2	0.25	1.04
SJCL01@CC	<0.50	5.9	7.9	250	<0.50	<0.50	2	166,000	98,000	145,000	12.7	8.2	2.8	2.4	0.83	1.9
SJCL01@CC	<0.50	3.5	4.8	41	<0.50	<0.50	<0.50	>7,800	3,100	4,000	11.05	8.29	2.81	2	0.12	0.73
SJCL01@CC	<0.50	4.3	6.8	44	<0.50	<0.50	<0.50	410,000	48,000	13,100	8.95	8.33	5.48	2.5	0.18	1.16
SJCL01@CC	<0.50	3.2	5.1	30	<0.50	<0.50	<0.50	79,000	25,000	51,000	9.66	8.25	2.95	2	0.14	1.09
SJCL01@CC	<0.50	6	8	100	<0.50	<0.50	<0.50	7,900,000	24,000	58,000	10.59	8.22	3.81	2	0.36	0.52
SJCL01P03	<8.00	<4.00	15	19	<2.00	<1.00	<2.00	29,000	17,000	13,750	8.62	8.28	3.96	6	<0.05	0.63
SJCL01P03	<8.00	<4.00	6.2	96	<2.00	<1.00	<2.00	24,000	6,550	5,450	8.23	8.02	9.74	2.8	<0.05	0.61
SJCL01P03	<8.00	<4.00	4.1	19	<2.00	<1.00	<2.00	7,100	6,200	6,500	8.47	8.33	2.43	7	<0.05	0.88
SJCL01P03	<8.00	8.2	5.8	44	<2.00	<1.00	<2.00	12,400	9,750	5,200	9.72	8.36	3.6	2.5	0.08	1.02
SJCL01P03	<8.00	6.6	7.5	75	<2.00	<1.00	<2.00	52,000	44,000	10,000	7.57	8.23	3.17	5.6	<0.05	1.03
SJCL01P03	<8.00	5.7	12	25	<2.00	<1.00	<2.00	15,200	11,600	17,000	10.32	8.01	7.03	5.6		1
SJCL01P03	<0.50	13	3.8	13	<0.50	0.9	<0.50	100,000	2,800	5,400	8.4	7.69	2.65	5.9	<0.05	0.63
SJCL01P03	<0.50	9.5	3.3	10	<0.50	<0.50	<0.50	53,000	17,000	17,000	8.17	8.05	7.92	4.6	<0.05	4.36
SJCL01P03								270,000	48,000	30,000	8.01	8.22	16.7	2.9	0.07	3.01
SJCL01P03	0.52	11	2.8	9.1	<0.50	<0.50	<0.50	66,000	11,700	3,400	8.68	8.18	1.7	4.3	0.08	<0.06
SJCL01P03	<0.50	8.5	4.6	9.2	<0.50	<0.50	<0.50	85,000	1,400	34,000	7.65	7.98	64.3	4.2	0.13	2.09
SJCL01P03	0.56	3.7	11	25	<0.50	<0.50	1.2	140,000	18,000	17,000	6.71	8.21	227	3.5	0.25	1.74

SJCL01P03	<0.50	2.3	3	10	<0.50	<0.50	<0.50	19,000	5,900	6,100	8.72	8.18	3.4	4	0.08	0.95
SJCL01P03	<0.50	3.6	2.2	6	<0.50	<0.50	<0.50	30,000	3,400	8,900	8.11	8.3	2.97	4.4	0.1	1.36
SJCL01P03	<0.50	3.2	3.4	13	<0.50	<0.50	<0.50	47,000	5,400	7,600	7.5	8.05	52.3	3.3	0.35	1.34
SJCL01P03	<0.50	3.5	6.2	11	<0.50	<0.50	<0.50	>34,000	3,500	7,600	8.14	8.12	2.24	4	0.12	0.69
SJCL01P03	<0.50	2.5	2.6	2.9	<0.50	<0.50	<0.50	41,000	5,600	6,400	8.18	8.54	3.24	2	0.1	0.47
SJCL01P03	0.5	4.8	2.9	5.6	<0.50	<0.50	<0.50	32,000	3,600	8,100	13.68	8.33	0.66	3.3	0.1	0.68
SJCL01P03											8.82	8.2	3.71	2	0.1	1.21
SJCL01S01	<0.50	5.3	3.6	7.7	<0.50	<0.50	<0.50	31,000	3,800	3,300	9.61	8.14	1.92	3.1	0.12	0.61
SJCL01S01	0.53	5.8	5.6	14	<0.50	1.3	<0.50	>5,100	220	780	9.29	8.09	3.06	3.9	0.12	0.87
SJCL01S01	<0.50	1.6	2.2	16	<0.50	<0.50	<0.50	3,700	210	9,400	11.06	7.98	1.94	2	0.1	0.3
SJCL01S01	<0.50	7.3	4	13	<0.50	<0.50	<0.50	>39,000	13,000	10,900	9.85	8.07	9.53	4.1	0.1	1.17
SJCL01S01	<0.50	6.4	2.9	4.8	<0.50	<0.50	<0.50	21,000	3,400	8,800	9.47	8.06	1.67	3.6	0.1	0.86
SJCL01S01	<0.50	6.9	4.2	5.1	<0.50	<0.50	<0.50	>5,900	100	600	10.29	8.24	2.23	3.2	0.1	0.92
SJCL01S01	<0.50	3.1	4.4	5.8	<0.50	<0.50	<1.00	38,000	330	1,860	13.2	8.12	2.95	4.2	0.1	1.61
SJCL01S01											10.32	8.06	3.16	3.7	0.1	0.99
SJCL01TBN1	<0.50	4.3	12	9.5	<0.50	<0.50	<0.50	100,000	8,000	4,000	7.78	9.07	7.38	1.9	0.2	1.23
SJCL01TBN1	<0.50	5.2	11	11	<0.50	<0.50	<0.50	220,000	14,000	26,000	8.49	7.71	6.12	2.6	0.2	2.38
SJCL01TBN1	0.76	4.6	15	11	<0.50	<0.50	<0.50	140,000	38,000	16,000	8.94	7.99	10	2	0.08	1.86
SJCL01TBN1	93	92	23	87	<0.50	25	26	NR	NR	NR	8.02	8.1	6.1	1	0.1	1.2
SJCL01TBN1	0.59	6.8	4.1	18	<0.50	<0.50	<0.50	62,000	38,000	38,000	8.86	8.04	3.3	1.6	0.35	1.9
SJCL01TBN1	0.54	5	11	8.5	<0.50	<0.50	<0.50	23,000	8,000	3,900	9.51	8	3.23	3.6	0.18	1.51
SJCL01TBN1	0.85	4.8	13	8	<0.50	<0.50	<0.50	280,000	480	56,000	10.75	8.46	4.86	5.1	0.1	3.43
SJCL01TBN1	0.63	6.4	16	19	<0.50	<0.50	<0.50	24,000	3,200	10,000	11.27	8.5	3.46	3.9	0.25	2.73
SJCL01TBN1	<0.50	2.1	13	8.8	<0.50	<0.50	<0.50	470,000	54,000	57,000	9.99	8.17	4.65	3.3	0.18	3.65
SJCL01TBN1	<0.50	2.9	8.1	5.7	<0.50	<0.50	<0.50	210,000	22,000	12,000	12.3	8.1	2.41	1.8	<0.05	1.3
SJCL01TBN1	0.61	3.1	20	13	<0.50	<0.50	<0.50	102,000	20,000	15,000	3.94	8.21	3.63	6.3	0.8	2.94
SJCL01TBN1	<0.50	1.4	20	5.1	<0.50	<0.50	<0.50	6,300	790	5,100	9.28	8.17	1.32	2.7	0.11	3.77
SJCL01TBN1	<0.50	2.1	9.6	5.5	<0.50	<0.50	<0.50	36,000	13,000	56,000	0.2	8.16	2.2	3.1	0.05	3.51
SJCL01TBN1	<0.50	1.7	8.4	4.4	<0.50	<0.50	<0.50	32,000	1,600	4,100	8.51	8.11	5.2	2.2	0.1	1.37
SJCL01TBN1	<0.50	2.4	7.9	9	<0.50	<0.50	<0.50	63,000	15,000	4,000	6.4	8.18	3.46	2.9	0.25	3.26

SJCL01TBN1																
SJCL01TBN1	<0.50	2.7	9.9	9.9	<0.50	<0.50	<0.50	28,000	2,400	9,700	8.84	8.04	1.63	3.2	0.1	1.03
SJCL01TBN1	<0.50	2.9	8.2	12	<0.50	<0.50	<0.50	>75,000	3,800	11,100	11.95	8.06	3.33	4.3	0.3	2.44
SJCL01TBN1																
SJCL01TBN1	<0.50	2.9	6	4.2	<0.50	<0.50	<0.50	163,000	9,700	6,700	7.01	8.13	6.43	2.3	0.1	1.37
SJCL01TBN1	<0.50	3.9	9.3	12	<0.50	<0.50	<0.50	>24,000	>230	20,000	7.86	7.98	4.69	3	0.33	1.6
SJCL01TBN1	0.88	2.3	8.9	11	<0.50	<0.50	<0.50	>69,000	4,300	14,500	9.68	8.04	4.53	2	0.56	2.41
SJCL01TBN1																
SJCL02P02	<8.00	4.9	8.5	36	<2.00	<1.00	<2.00	87,000	42,000	50,660	7.08	7.99	6.31	0.9	0.2	2.9
SJCL02P02	24	35	77	2900	<2.00	3.2	16	98,000	41,000	3,450	4.61	7.46	19.4	2.1	<0.05	2.01
SJCL02P02	<8.00	4.3	11	41	<2.00	<1.00	<2.00	81,000	36,000	66,000	7.46	7.5	3.76	2.9	0.17	1.43
SJCL02P02	<8.00	6.9	22	190	<2.00	<1.00	<2.00	18,500	12,600	8,450	7.27	7.95	2.89	1.3	0.16	1.81
SJCL02P02	<8.00	6.4	10	84	<2.00	<1.00	6.2	>200,000	110,000	76,000	6.56	8.05	3.96	0.8	0.33	2.25
SJCL02P02	<8.00	7.9	5.9	69	<2.00	<1.00	<2.00	<200,000	58,000	170,000	5.26	7.55	12.4	0.9	0.6	2.97
SJCL02P02	<0.50	10	7.6	17	<0.50	<0.50	<0.50	180,000	6,000	3,800	6.63	7.44	1.46	1.4	0.08	1.52
SJCL02P02																
SJCL02P02	<0.50	4.4	2.2	6	<0.50	<0.50	<0.50	200,000	47,000	7,900	7.07	8.02	16.7	1.8	<0.05	1.56
SJCL02P02	<0.50	6.4	5.9	9.8	<0.50	<0.50	<0.50	40,000	4,800	3,800	10.46	8.1	2.02	0.7	0.06	<0.06
SJCL02P02	<0.50	6.9	6.4	18	<0.50	<0.50	<0.50	45,000	720	6,900	6.72	7.99	1.78	3.7	0.17	2.11
SJCL02P02	<0.50	4.5	4.1	10	<0.50	<0.50	<0.50	53,000	10,000	11,000	6.22	8.04	6.2	0.9	0.4	1.53
SJCL02P02	<0.50	7	7.7	27	<0.50	<0.50	<0.50	160,000	80,000	48,000	9.3	8.03	4.65	1.2	0.15	2.58
SJCL02P02	0.86	5.6	13	29	<0.50	<0.50	0.5	43,000	1,100	5,900	6.43	8.03	5.66	4.7	0.32	3
SJCL02P02	<0.50	2.6	4.2	8.9	<0.50	<0.50	<0.50	170,000	48,000	30,000	6.88	8.1	4.78	3	0.8	1.85
SJCL02P02	<0.50	3.9	8	19	<0.50	<0.50	<0.50	>41,000	2,500	2,800	12.8	8.61	2.31	1.8	0.42	1.25
SJCL02P02	0.86	7.3	14	85	<0.50	<0.50	1.4	480,000	80,000	44,000	5.57	8.04	17.2	1.1	1.15	1.82
SJCL02P02	<0.50	2.8	1.8	11	<0.50	<0.50	<0.50	99,000	11,900	30,000	12.09	8.2	3.18	2	0.2	1.44
SJCL02P02											12.35	8.29	6.8	2	0.78	1.92

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

FACT SHEET / TECHNICAL REPORT

FOR

ORDER NO. R9-2009-0002
NPDES NO. CAS0108740

WASTE DISCHARGE REQUIREMENTS

FOR

DISCHARGES OF RUNOFF FROM
THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s)
DRAINING THE WATERSHEDS OF THE
COUNTY OF ORANGE,
THE INCORPORATED CITIES OF ORANGE COUNTY,
AND THE ORANGE COUNTY FLOOD CONTROL DISTRICT
WITHIN THE SAN DIEGO REGION

December 16, 2009

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LIST OF ACRONYMS AND ABBREVIATIONS

ADT - Average Daily Traffic
ASBS - Area of Special Biological Significance
AST – Active Sediment Treatment
BAT - Best Available Technology
BIA - Building Industry Association of San Diego County
BMP - Best Management Practice
Basin Plan - Water Quality Control Plan for the San Diego Basin
BU – Beneficial Uses
CASQA - California Stormwater Quality Association
CCC - California Coastal Commission
CDFG - California Department of Fish and Game
CEQA - California Environmental Quality Act
CFR - Code of Federal Regulations
Copermittees - County of Orange, the 11 incorporated cities within the County of Orange in the San Diego Region, and the Orange County Flood Control District
CWA - Clean Water Act
CWC - California Water Code
CZARA - Coastal Zone Act Reauthorization Amendments of 1990
DAMP – Drainage Area Management Plan
ESAs - Environmentally Sensitive Areas
FR - Federal Register
GIS - Geographic Information System
HMP – Hydromodification Management Plan
IBI – Index of Biotic Integrity
IC/ID - Illicit Connections and Illicit Discharges
JRMP - Jurisdictional Runoff Management Plan
LARWQCB – California Regional Water Quality Control Board, Los Angeles Region
LID – Low Impact Development
MEP - Maximum Extent Practicable
MRP - Receiving Waters Monitoring and Reporting Program
MS4 - Municipal Separate Storm Sewer System
NOI - Notice of Intent
NPDES - National Pollutant Discharge Elimination System
NRDC - Natural Resources Defense Council
NURP - Nationwide Urban Runoff Program
OCVCD – Orange County Vector Control District
Regional Board – California Regional Water Quality Control Board, San Diego Region
RGOs - Retail Gasoline Outlets
ROWD - Orange County Copermittees' Report of Waste Discharge (application for NPDES reissuance)
RWLs - Receiving Water Limitations
SAL - Storm Water Action Level
SIC - Standard Industrial Classification Code
SSMP - Standard Storm Water Mitigation Plan
State Board - State Water Resources Control Board
SWMP - Storm Water Management Plan
SWPPP - Storm Water Pollution Prevention Plan
SWQPA - State Water Quality Protected Area
TAC - State Water Resources Control Board Urban Runoff Technical Advisory Committee
TIE - Toxicity Identification Evaluation
TMDL - Total Maximum Daily Load
USEPA - United States Environmental Protection Agency

USACE – United States Army Corps of Engineers
WDRs - Waste Discharge Requirements
WLA - Waste Load Allocation
WQC - Water Quality Criteria
WQBEL - Water Quality Based Effluent Limitations
WQMP – Water Quality Management Plan
WSPA - Western States Petroleum Association
WRMP - Watershed Runoff Management Plan

I. FACT SHEET FORMAT

This Fact Sheet briefly sets forth the principle facts and the significant factual, legal, methodological, and policy questions that the California Regional Water Quality Control Board, San Diego Region (Regional Board) considered in preparing Order No. R9-2009-0002. In accordance with the Code of Federal Regulations (CFR) title 40 parts 124.8 and 124.56, this Fact Sheet includes, but is not limited to, the following information:

A. Contact information
B. Public process and notification procedures
C. Background information
D. Permitting approach
E. Economic issues
F. Legal authority
G. Findings
H. Directives

Tentative Order No. R9-2008-0001 was distributed for review on February 9, 2007. A public hearing was subsequently held on April 11, 2007 in the City of Mission Viejo to receive oral comments from interested persons, and the Regional Board accepted written comments on the Tentative Order until April 25, 2007. Following review of the comments, a Revised Tentative Order was distributed on July 6, 2007 with a Response to Comments document (RTC 1). A second set of written comments were received on the revisions until August 23, 2007. Following review of the second round of written comments, the Regional Board further revised specific sections of the Order and distributed a second Response to Comments document (RTC 2). Tentative Order No. R9-2008-0001 was submitted to the Board for adoption on February 13, 2008. Upon review and comment, the Board chose not to adopt Tentative Order No. R9-2008-0001 and sent the Order back to staff with comments for changes. Tentative Order No. R9-2009-0002 was distributed for review on March 13, 2009. Written comments received on the tentative Order prior to June 19, 2009 were provided to Regional Board members for a public hearing regarding the Tentative Order held on July 1, 2009. On August 12, 2009, the sixth version of the Tentative Order was distributed for review. On November 18, 2009 an adoption hearing was held on the Tentative Order. The Regional Board directed staff to make specific changes and bring the Tentative Order back for consideration.

The Regional Board's files applicable to the issuance of Order No. R9-2009-0002 are incorporated into the administrative record in support of the findings and requirements of Order No. R9-2009-0002.

II. CONTACT INFORMATION

Regional Board

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The Order and other related documents can be downloaded from the Regional Board website at http://www.waterboards.ca.gov/sandiego/programs/oc_stormwater.html.

All documents referenced in this Fact Sheet and in Order No. R9-2009-0002 are available for public review at the Regional Board office, located at the address listed above. Public records are available for inspection during regular business hours, from 8:00 am to 5:00 pm Monday through Friday. To schedule an appointment to inspect public records, contact Sylvia Wellnitz at 858-637-5593 or DiAnne Broussard at 858-492-1763.

Copermittees

County of Orange	City of Laguna Woods
Orange County Flood Control District	City of Lake Forest
City of Aliso Viejo	City of Mission Viejo
City of Dana Point	City of Rancho Santa Margarita
City of Laguna Beach	City of San Clemente
City of Laguna Hills	City of San Juan Capistrano
City of Laguna Niguel	

III. PUBLIC PROCESS AND NOTIFICATION PROCEDURES

The Regional Board followed the schedule listed below for the preparation of Order No. R9-2009-0002:

A. In April 2006 and July 2006, the Northern Watershed Unit of the Regional Board met with the Copermittees to discuss the Report of Waste Discharge (ROWD) and potential changes to the permit based on the annual reports and the tentative permit for San Diego County.
B. On August 18, 2006, the Regional Board received the ROWD for the permit renewal.
C. On October 20, 2006 the Regional Board provided written comments on the ROWD to the Copermittees.
D. On November 15, 2006, the Regional Board received the 2005-06 annual reports from the Copermittees for the existing permit.
E. On January 11, 2007, the Regional Board notified all known interested parties that an electronic email listserv had been established to provide information and notices on the reissuance of the municipal storm water NPDES permit for southern Orange County.
F. On February 9, 2007, the Regional Board released the tentative Order and notified interested parties of a planned workshop. Written comments were accepted until April 25, 2007.
G. A public workshop was held on March 12, 2007.
H. A public hearing of the tentative Order was conducted on April 11, 2007.
I. A revised tentative Order was released on July 6, 2007. Written comments were accepted until August 23, 2007.
J. A second revised tentative Order was released on December 12, 2007.
K. A public hearing was conducted on February 13, 2008. The Regional Board chose not to adopt the tentative Order, and sent it back to staff for revision.
L. On March 13, 2009 the Regional Board released a fourth version of the revised tentative Order and notified interested parties of a planned workshop.
M. On April 03, 2009 and May 06, 2009 the Regional Board held public workshops.
N. A public hearing of the tentative Order was held on July 01, 2009.
O. On August 12, 2009 the Regional Board released an additional version of the revised tentative Order for public review. Written comments were accepted until September 28, 2009.
P. An adoption hearing of the tentative Order was conducted on November 18, 2009. The Regional Board chose not to adopt the tentative Order and directed staff to make specific changes.

IV. BACKGROUND

Tentative Order No. R9-2009-0002 is the fourth iteration of the storm water permit for the municipal separate storm sewer systems (MS4s) in the Orange County portion of the San Diego region. The first permit was adopted in 1990, and the permit was reissued in 1996 and 2002.

Municipal Storm Water Permits are required by the Federal Clean Water Act 1987 Amendments. The federal Clean Water Act (CWA) was amended in 1987 to address storm water runoff from municipal and industrial dischargers. One requirement of the amendment was that many municipalities throughout the United States were obligated for the first time to obtain National Pollutant Discharge Elimination System (NPDES) permits for discharges of storm water runoff from their MS4s. In response to the CWA amendment (and the pending federal NPDES regulations which would implement the amendment), the Regional Board issued a municipal storm water permit, Order No. 90-38, in July 1990 to the Copermittees for their MS4 discharges.[1]

The First and Second Term Permits, Order Nos. 90-38 and 96-03, provided maximum flexibility. Order No. 90-38 contained the "essentials" of the 1990 regulations, but the requirements were written in very broad, generic terms. This was done in order to provide the maximum amount of flexibility to the Copermittees in implementing the new requirements (flexibility was, in fact, the stated reason for issuing the permit in advance of the final regulations). This lack of specificity was reflected in the Drainage Area Management Plan (DAMP) implemented under this First Term Permit in 1993 and renewed under the Second Term Permit in 1996. From staff's perspective however, this same lack of specificity, combined with the lack of funding and political will, also provided the Copermittees with ample reasons to take few substantive steps towards permit compliance. The situation was exacerbated by the Regional Board's own lack of storm water resources.

By 2000 the Regional Board and Copermittees recognized the importance of an improved storm water program. Although renewed in 1996 as Order No. 96-03, the 1993 DAMP implemented by the Copermittees was not significantly updated until 2000. The 2000 DAMP submitted to the Regional Board for the Third-Term Permit renewal was improved over the earlier DAMP. Regional Board staff concluded, however, that it reflected only the basic requirements of the 1990 Federal Regulations and in most cases did not represent significant improvement over the 1993 DAMP. Continued implementation of the DAMP without amendment would not have adequately addressed the impacts to receiving waters resulting from the discharge of storm water runoff and would not have achieved the maximum extent practicable standard (MEP) as defined in the Order.

[1] The 1990 permit was issued to the County of Orange, the Orange County Flood Control District, and six incorporated cities. Additional municipalities have been added to the MS4 NPDES permit as they have incorporated.

In order to provide the Copermittees with the minimum requirements to meet the MEP standard for storm water of the Regional Board, a more detailed Order was adopted (Order No. R9-2002-01) that emphasized the strong jurisdictional level programs developed by the Copermittees during the First and Second Term Permits as well as the watershed-level approach embodied in the proposed DAMP.

The Third-Term Permit introduced specific requirements. The regulatory approach incorporated into Order No. R9-2002-01 was a significant departure from the regulatory approach of the First and Second-Term Permits. Where Order Nos. 90-38 and 96-03 included broad, nonspecific requirements in order to provide the Copermittees with the maximum amount of flexibility in developing their programs, Order No. R9-2002-01 used detailed, specific requirements which outlined the minimum level of implementation required for the Copermittees' programs. The shift in permitting approaches resulted from the Regional Board's conclusion that the lack of specificity in earlier Orders resulted in frequently unenforceable permit requirements, which in turn allowed some Copermittees to only make limited progress in implementing their programs.

The Third-Term Permit followed the San Diego County permit template. The shift in regulatory approaches for MS4 permits was first manifested in the 2001 MS4 permit to the owners and operators of San Diego County MS4s (Order No. R9-2001-01). The Third-Term Orange County Permit included similar requirements as the 2001 San Diego County Permit. Both the San Diego and Orange County Permits were appealed to the State Water Resources Control Board (State Board).[2] Minor modifications of each were made by the State Board, but the vast majority of the requirements were upheld. The San Diego County permit was also challenged in the Superior Court of the State of California and the Court of Appeal, Fourth Appellate District. Further litigation on the Orange County permit was held pending the precedential decisions on the San Diego Permit. The San Diego Permit was largely upheld in the Superior and Appellate Courts. The State of California Supreme Court declined to hear a final appeal from the Building Industry Association in March 2005. Thus, the Third-Term Orange County permit requirements remained as slightly modified by the State Board.

[2] Seven petitions were filed with the State Board over the Third-Term Orange County Permit. Six were placed in abeyance. Three of the petitioners sought stays. One stay request was dismissed and one was withdrawn. The active petition and stays were addressed by the State Board in Order No. WQO 2002-0014. That Order stayed provision F.5.f regarding sewage spills and modified Finding No. 26 regarding chronic toxicity.

The Third-Term Permit was adopted following substantial public participation. Public participation was extensive during the adoption process of the Third-Term Permit. The draft permit was released for public review and comment on July 2, 2001, and revised in response to comments and State Board Order WQ 2001-15 on the petition to review the San Diego Municipal Storm Water Permit. Because the proposed requirements for Orange County were similar to those that had recently been adopted and contested in San Diego County, much of the public participation dialogue echoed the discussions held during the San Diego renewal. Approximately 684 comments were received and responded to during two public workshops and a written comment period on the Tentative Order for the Third-Term Orange County permit. Following the extensive public participation process, the Regional Board adopted Order No. R9-2002-01 on February 13, 2002.

Storm water programs have improved under the Third-Term Permit. Since adoption of Order No. R9-2002-01, the Copermittees' storm water programs have expanded dramatically. Audits of the Copermittees' programs and reviews of annual reports exhibit that the Copermittees' jurisdictional programs are largely in compliance with the Order. Some of the efforts currently being conducted on a regular basis by the Copermittees that were not conducted on a widespread basis prior to adoption of Order No. R9-2002-01, include: construction site storm water inspections, industrial and commercial facility storm water inspections, municipal facility storm water inspections, management of storm water quality from new development, development of BMP requirements for existing development, interdepartmental coordination, comprehensive water quality monitoring, and assessment of storm water program effectiveness.

Significant challenges remain. When viewed relative to the magnitude of the storm water runoff problem, enormous challenges remain, particularly regarding the management of storm water runoff on a watershed scale. Today, storm and non-storm water discharges from the MS4 continue to be the leading cause of water quality impairment in the San Diego Region.[3] The Copermittees' monitoring data exhibits persistent exceedances of water quality objectives in most watersheds.[4] Many watersheds also have conditions that are frequently toxic to aquatic life. Bioassessment data from the watersheds further reflects these conditions, finding that macroinvertebrate communities in creeks have widespread Poor to Very Poor Index of Biotic Integrity ratings. Finally, the now too familiar "health advisory" or "beach closure" signs, which often result from high levels of bacteria in storm and non-storm water, exhibit the continued threat to public health by such discharges.

[3] The potential sources of impairments are identified on the CWA section 303(d) list of impaired water bodies for the San Diego Region.
[4] Data is provided in annual reports to the Regional Board. A summary of data collected during the third-term permit is provided in the Copermittees' application for permit reissuance. That summary is available on-line at: http://www.ocwatersheds.com/StormWater/documents_ROWD.asp

V. PERMITTING APPROACH (PROGRAM INTEGRATION, FLEXIBILITY, AND DETAIL)

The Order contains an increased emphasis on storm water discharge management on a watershed basis. This shift towards increased watershed management is consistent with planning efforts conducted by the Regional Board regarding reissuance of the San Diego Permit (Order No. R9-2007-0001), and it is also consistent with the Copermittees' most recent Report of Waste Discharge (ROWD).[5] This shift reflects recognition of the maturity of the storm water programs since they began implementing the Third-Term Permit. Addressing storm water discharge management on a watershed basis is only possible if effective jurisdictional programs have been established, and maintaining effective jurisdictional programs is crucial to the success of watershed-focused management.

There are several reasons for this shift in emphasis. First, the Copermittees are generally doing an effective job at implementing their jurisdictional programs; while on the other hand, an emphasis on watersheds is necessary to shift the focus of the Copermittees from program development and implementation to water quality results. After over 15 years of Copermittee program implementation, it is critical that the Copermittees link their efforts with positive impacts on water quality. Addressing storm water on a watershed scale focuses on water quality results by emphasizing the receiving waters within the watershed. The conditions of the receiving waters drive management actions, which in turn focus on the water quality problems in each watershed.

Focusing on watershed implementation does not mean that the Copermittees must expend funds outside of their jurisdictions. Rather, the Copermittees within each watershed are expected to collaborate to develop a watershed strategy to address the high priority water quality problems within each watershed. They have the option of implementing the strategy in the manner they find to be most effective. Each Copermittee can implement the strategy individually within its jurisdiction, or the Copermittees can group together to implement the strategy throughout the watershed.

While the Order includes a new emphasis on addressing storm water discharges on a watershed basis, the Order includes recognition of the importance of continued program implementation on jurisdictional and countywide levels. The Order also acknowledges that jurisdictional, watershed, and countywide efforts are not always mutually exclusive. For this reason, an attempt has been made to allow for the Copermittees' jurisdictional, watershed, and countywide programs to integrate.

[5] The Report of Waste Discharge (ROWD) was submitted to the Regional Board on August 18, 2006 by the Principal Permittee (County of Orange) on behalf of all Copermittees.

In the Order, the watershed requirements serve as the mechanism for this program integration. Since jurisdictional and countywide activities can also serve watershed purposes, such activities can be integrated into the Copermittees' watershed programs, provided the activities meet certain criteria. In this manner, the Copermittees' activities do not always need to distinguish between jurisdictional, watershed, and countywide levels of implementation. Instead, they can be integrated on multiple levels.

Such opportunities for program integration inherently provide flexibility to the Copermittees in implementing their programs. Program integration can be expanded or minimized as the Copermittees see fit. For example, there is flexibility provided in determining the activities to be integrated and implemented in the watershed programs – watershed-based efforts, countywide efforts, enhanced jurisdictional efforts, or a mixture of the three. Significant flexibility is also provided throughout other portions of the Order.

Copermittees can choose the best management practices (BMPs) to be implemented, or required to be implemented, for development, construction, and existing development areas. Flexibility to determine which industrial or commercial sites are to be inspected is also provided to the Copermittees. Educational approaches are also to be determined by the Copermittees under the Order. Implementation of certain efforts on a countywide basis is largely optional for the Copermittees as well. Significant leeway is also provided to the Copermittees in using methods to assess the effectiveness of their various runoff management programs. This flexibility is further extended to the monitoring program requirements, which allow the Copermittees to develop monitoring approaches to several aspects of the monitoring program.

The challenge in drafting the Order is to provide the flexibility described above while ensuring that the Order is still enforceable. To achieve this, the Order frequently prescribes minimum measurable outcomes, while providing the Copermittees with flexibility in the approaches they use to meet those outcomes. Enforceability has been found to be a critical aspect of the Order. For example, the watershed requirements of Order No. R9-2002-01 were some of the Order's most flexible requirements. This lack of specificity in the watershed requirements resulted in inefficient watershed compliance efforts. This situation reflects a common outcome of flexible permit language. Such language can be unclear and unenforceable, and it can lead to implementation of inadequate programs.

To avoid these types of situations, a balance between flexibility and enforceability has been crafted into the Order. Minimum measurable outcomes are utilized to ensure the Order is enforceable, while the Copermittees are provided flexibility in deciding how they will implement their programs to meet the minimum measurable outcomes.

GENERAL CRITERIA

Non-storm water discharges may contain pollutants which result from various activities that occur within areas draining into the MS4. This includes, but is not limited to, illicit discharges and connections, exempted categories of discharge not a source of pollutants (40 CFR 122.26(d)), and discharges into the MS4 covered under a separate NPDES permit. As such, existing and proposed discharges of non-storm water from MS4s:

a) Result from similar activities through the MS4 system;
b) Are the same type of water;
c) Require similar effluent limitations for the protection of the Beneficial Uses of the receiving waters;
d) Require similar monitoring;
e) Are under the control of the owner and operator of the MS4 system; and
f) Are more appropriately regulated under a general permit than individual permits.

VI. ECONOMIC ISSUES

Economic discussions of storm and non-storm water management programs tend to focus on the significant costs incurred by municipalities in developing and implementing the programs. However, when considering the cost of implementing the programs, it is also important to consider the alternative costs incurred by not fully implementing the programs, as well as the benefits which result from program implementation. For instance, unhealthful coastal water quality conditions negatively affect residents, tourists, and related portions of the Orange County economy.[6]

[6] Orange County 2006 Community Indicators Project. 2006. Sponsored by the County of Orange, the Orange County Business Council, and the Children and Families Commission of Orange County. Available on-line at www.oc.ca.gov/ceocommunity.asp

It is very difficult to ascertain the true cost of implementation of the Copermittees' management programs because of inconsistencies in reporting by the Copermittees. Reported costs of compliance for the same program element can vary widely from city to city, often by a very wide margin that is not easily explained.[7] Despite these problems, efforts have been made to identify management program costs, which can be helpful in understanding the costs of program implementation. The Orange County Municipalities plan to prepare a common fiscal reporting strategy to better define the expenditure and budget line items included in annual reports.[8]

Estimates of Phase I Storm Water Program Costs.

The United States Environmental Protection Agency (USEPA), the California Regional Water Quality Control Boards, and the State Board have attempted to evaluate the costs of implementing municipal storm water programs. The assessments demonstrate that true costs are difficult to ascertain and reported costs vary widely. Nonetheless, they provide a useful context for considering the costs of requirements within Tentative Order No. R9-2008-0001. In addition, reported fiscal analyses tend to neglect the costs incurred to municipalities when storm water runoff is not effectively managed. Such costs result from pollution, contamination, nuisance, and damage to ecosystems, property, and human health.

In 1999 USEPA reported on multiple studies it conducted to determine the cost of management programs. A study of Phase II municipalities determined that the annual cost of the Phase II program was expected to be $9.16 per household. USEPA also studied 35 Phase I municipalities, finding costs to be $9.08 per household annually, similar to those anticipated for Phase II municipalities.[9] The USEPA cost estimate for Phase I municipalities is valuable because it considers municipalities in Orange County.
A study on program cost was also conducted by the California Regional Water Quality Control Board, Los Angeles Region (LARWQCB), where program costs reported in the municipalities' annual reports were assessed. The LARWQCB estimated that average per household cost to implement the MS4 program in Los Angeles County was $12.50.[10] Since the Los Angeles County permit is very similar to Order No. R9-2002-01, this estimate is also useful in assessing general program costs in Orange County.

[7] LARWQCB, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.
[8] Orange County Storm Water Copermittees. 2006. Report of Waste Discharge (San Diego Region)
[9] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791-68792.
[10] LARWQCB, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.

The State Board also recently commissioned a study by the California State University, Sacramento to assess costs of the Phase I MS4 program. This study includes an assessment of costs incurred by Phase I MS4s throughout the State to implement their programs. Annual cost per household in the study ranged from $18-46, with the City of Encinitas in San Diego County representing the upper end of the range.[11] Although no Orange County municipalities were assessed, the cost of the City of Encinitas' program may be somewhat representative of the upper range of Orange County MS4 programs. Encinitas shares similarities with southern Orange County, including the similarity of the San Diego MS4 permit to the Orange County MS4 permit, the city's coastal location, and its reliance on tourism. However, the City's program cost can be considered as the high end of the spectrum for management program costs because the City has a consent decree with environmental groups regarding its program, and City of Encinitas has received recognition for implementing a superior program.

It is important to note that reported program costs are not all attributable to compliance with MS4 permits. Many program components, and their associated costs, existed before any MS4 permits were ever issued. For example, street sweeping and trash collection costs cannot be solely or even principally attributable to MS4 permit compliance, since these practices have long been implemented by municipalities. Therefore, true program cost resulting from MS4 permit requirements is some fraction of reported costs. The California State University, Sacramento study found that only 38 percent of program costs are new costs fully attributable to MS4 permits. The remainder of the program costs were either pre-existing or resulted from enhancement of pre-existing programs.[12] In 2000, the County of Orange found that even lesser amounts of program costs are solely attributable to MS4 permit compliance, reporting that the amount attributable to implement the Drainage Area Management Plan (DAMP), was less than 20 percent of the total budget. The remaining 80 percent was attributable to pre-existing programs.[13]

Estimating Costs of Reissued Storm Water Permits

The vast majority of costs that will be incurred as a result of implementing Order No. R9-2009-0002 are not new. Storm water management programs have been in place in Orange County for over 15 years. Any increase in cost to the Copermittees will be incremental in nature. Moreover, since Order No. R9-2009-0002 "fine tunes" the requirements of Order No. R9-2002-01, these cost increases are expected to be modest.

[11] State Water Board, 2005. NPDES Stormwater Cost Survey. P. ii.
[12] Ibid. P. 58.
[13] County of Orange, 2000. A NPDES Annual Progress Report. P. 60. More current data from the County of Orange is not used in this discussion because the County of Orange no longer reports such information.

The anticipated costs of program changes are difficult to estimate because of the flexibility inherent within the Permit and the recognition that program modifications will vary among the municipalities in response to the specific needs of the local and watershed programs. In other words, the Permit is intended to allow each Permittee to de-emphasize some program components and strengthen others based on the experience of the jurisdictional programs.

The changes in Order No. R9-2009-0002 reflect the iterative process of BMP implementation and the necessarily adaptive nature of storm water management that is expected by the USEPA. In 1996, USEPA recognized that changes to MS4 programs would occur during the reapplication period based on new information on the relative magnitude of a problem, new data on water quality impacts of the storm water discharges, and experience gained under the prior permit.[14] Some program changes have been proposed by the Copermittees in the permit reapplication package, and others have been included because the Regional Board considers those measures necessary and feasible to protect water quality from the effects of MS4 discharges.

Other Economic Considerations.

Economic considerations of management programs cannot be limited only to program costs. Evaluation of programs requires information on the implementation costs and information on the benefits derived from environmental protection and improvement.[15] Attention is often focused on program costs, but the programs must also be viewed in terms of their value to the public.

For example, household willingness to pay for improvements in fresh water quality for fishing and boating has been estimated by USEPA to be $158-210.[16] This estimate can be considered conservative, since it does not include important considerations such as marine waters benefits, wildlife benefits, or flood control benefits. The California State University, Sacramento study corroborates USEPA's estimates, reporting annual household willingness to pay for statewide clean water to be $180.[17] When viewed in comparison to household costs of existing management programs, household willingness to pay estimates exhibit that per household costs incurred by Copermittees to implement their management programs remain reasonable.

[14] Federal Register / Vol. 61, No. 155 / Friday, August 9, 1996 / Rules and Regulations. Interpretive policy memorandum on reapplication requirements for MS4s.
[15] Ribaudo M.O. and D. Heelerstein. 1992, *Estimating Water Quality Benefits: Theoretical and Methodological Issues.* U.S. Department of Agriculture. Technical Bulletin No. 1808.
[16] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68793.
[17] State Board, 2005. NPDES Stormwater Cost Survey. P. iv.

The effect of storm and non-storm water discharges on receiving waters can also influence the value of real estate in southern Orange County. For instance, recent marketing of new developments in the region prominently features access or proximity to the ocean.[18] This demonstrates the added value of healthy aquatic environments to property values. The real estate industry recognizes that home buyers are willing to pay for access to clean water environments. The ability to market water-based recreational activities is dependent on healthy water quality conditions.

Municipalities and business groups in Orange County recognize the value of programs to prevent and treat storm water pollution in Orange County. For instance, both coastal and inland Orange County cities positively promote their access to the Pacific Ocean as a valuable quality of life feature.[19] In addition, the South Orange County Regional Chamber of Commerce's legislative policy for infrastructure includes the support of programs and solutions for non-point source storm water runoff. This demonstrates that the business community realizes the negative economic effects that result from polluted storm water.

Another important way to consider management program costs is to consider implementation in terms of costs incurred by not improving the programs. Storm and non-storm water discharges from MS4s in southern California has been found to cause illness in people bathing near storm drains.[20] A study of south Huntington Beach and north Newport Beach (both located in northern Orange County) found that an illness rate of about 0.8 percent among bathers at those beaches resulted in about $3 million annually in health-related expenses.[21] Extrapolation of such numbers to the wide range of beaches of Orange County could result in huge public expenses.

[18] Examples include the "Marblehead Coastal" project in San Clemente (http://www.marbleheadonthecoast.com), the "Pacifica San Juan" project in San Juan Capistrano (http://pacificasanjuan.com), and "The Strand at Headlands" in Dana Point (http://strandoc.com).
[19] For a coastal city, see Laguna Beach Overview at http://www.lagunabeachcity.net/about/overview. For an inland city, see the Lake Forest 2005 Economic Profile at http://www.thearbor.info/pdf/2005%20Economic%20Profile.pdf.
[20] Haile, R.W., et al, 1996. An Epidemiological Study of Possible Adverse Health Effects of Swimming in Santa Monica Bay. Santa Monica Bay Restoration Project.
[21] Dwight, R.H., et al., 2005. Estimating the Economic Burden From Illnesses Associated With Recreational Coastal Water Pollution – A Case Study in Orange County, California. Journal of Enviro. Management Vol.76. No.2 p.95-103. Also reported in: Los Angeles Times, May 2, 2005. Here's What Ocean Germs Cost You: A UC Irvine Study Tallies the Cost of Treatment and Lost Wages for Beachgoers Who Get Sick.

Storm and non-storm water MS4 discharges, and their impact on receiving waters also affect tourism. In past years, Orange County was featured in the national press for its water quality problems. Such news is likely to have a negative impact on tourism, since polluted beaches are generally not attractive to tourists. According to the Orange County Community Indicators Project, the County's visitors spent an average of $107.70 per day in 2004.[22] The experience of Huntington Beach provides an example of the potential economic impact of poor water quality. Approximately eight miles of Huntington Beach were closed for two months in the middle of summer of 1999, severely impacting beach visitation. When considered with the number of visitors and their average expenditure, the negative effects to the local economy are obvious.

Coastal tourism is an important industry in Orange County and is dependent upon effective management of storm water pollution and the prevention of non-storm water pollution. The following examples reflect that relationship.

> DANA POINT: In response to a Grand Jury finding (1999-2000 Rainy Season's First Flush Hits the Harbors of Orange County), the city of Dana Point notes the interrelationship between the clean coastal water and the economic health of the city. Dana Point reports receiving $5.2 million in transit occupancy tax funds in FY 1999-2000 "due in large part because of proximity to the beach. Without clean beaches, Dana Point risks losing its major revenue source."[23] More recently, the City budget report estimates that transit occupancy taxes comprise 35 percent of general fund revenues for the 2006 fiscal year.
>
> LAGUNA BEACH: Tourism is one of the primary components of the Laguna Beach economy, and the beach is one of the main tourist attractions in the city. In 1999, hotel/motel bed tax revenue was approximately $3 million, representing 13 percent of the City's general fund revenue.[24] In 2006, the City expects transit occupancy taxes to represent about 11 percent of general fund revenue.[25] The proportional decrease is due to an increase in property taxes, which is also affected in part by the quality of coastal waters. The City Council recognizes the value of the beaches to tourists, and the local population and has funded several low-flow non-storm water diversion systems in an attempt to prevent beach pollution and beach closures.

[22] Orange County 2006 Community Indicators Project. 2006. Sponsored by the County of Orange, the Orange County Business Council, and the Children and Families Commission of Orange County. Available on-line at www.oc.ca.gov/ceocommunity.asp
[23] Orange County Grand Jury. 1999-2000 Rainy Season's First Flush Hits the Harbors of Orange County.
[24] Laguna Beach at a Glance. May 2000. Prepared by Moore Iacofano Goltsman, Inc.
[25] City of Laguna Beach, adopted budget 2006-2007. Available on-line at: http://www.lagunabeachcity.net/government/reference/budget07

DOHENY STATE BEACH: In 1997, the U.S. Army Corps of Engineers (USACE) prepared an economic analysis as part of the San Juan Creek and Aliso Creek Watershed Study. Recreational value for Doheny State Beach, based on annual visitation of 670,545 people in 1995, was calculated at $2,850,000. Furthermore, the USACE notes that lifeguards reported that beach attendance falls dramatically when there are unhealthy conditions in the ocean. In 1999, the USACE prepared an updated economic study as part of the Feasibility Phase of the San Juan Creek Watershed Management Study. The 1999 study reports that average beach attendance from 1996 to 1998 increased to 918,735. The USACE places a recreation value per visitor at $5.76, which implies the annual recreational value of Doheny State Beach for 1996 to 1998 was $5,291,914.

ALISO BEACH: In 1997, the USACE prepared an economic analysis as part of the San Juan Creek and Aliso Creek Watershed Study. Recreational value for Aliso Beach, based on annual visitation of 3,477,369 people in 1995, was calculated at $14,779,000. In the 1999 Draft Feasibility Report for the Aliso Creek Watershed Management Study, the USACE noted that the average beach attendance from 1996 to 1998 decreased to 1,148,374. The recreation value per visitor was calculated at $4.50 and the average annual impact from water quality-related beach closures at Aliso Beach Park was estimated to be $468,392. This number is comparable to an economic analysis conducted as part of the Aliso Creek Watershed 205(j) study that estimated the annual average recreational value impact of beach closures at Aliso Beach Park to be $468,400.

Finally, it is important to consider the benefits of management programs in conjunction with their costs. A recent study conducted by the University of Southern California and University of California, Los Angeles assessed the costs and benefits of implementing various approaches for achieving compliance with the MS4 permits in the Los Angeles Region. The study found that non-structural systems would cost $2.8 billion but provide $5.6 billion in benefit. If structural systems were determined to be needed, the study found that total costs would be $5.7 to $7.4 billion, while benefits could reach $18 billion.[26] Costs are anticipated to be borne over many years – probably ten years at least. As can be seen, the benefits of the programs are expected to considerably exceed their costs. Such findings are corroborated by USEPA, which found that the benefits of implementation of its Phase II storm water rule would also outweigh the costs.[27]
Additional discussion of economic issues can be found at section 3 of the Fact Sheet/Technical Report for Regional Board Order No. R9-2002-01, available at:

http://www.waterboards.ca.gov/sandiego/programs/oc_stormwater.html.

[26] LARWQCB, 2004. Alternative Approaches to Stormwater Control.
[27] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791.

VII. LEGAL AUTHORITY

The following statutes, regulations, and Water Quality Control Plans provide the basis for the requirements of Order No. R9-2009-0002: Clean Water Act (CWA), California Water Code (CWC), 40 CFR Parts 122, 123, 124 (National Pollutant Discharge Elimination System Permit Application Regulations for Storm Water Discharges, Final Rule), Part II of 40 CFR Parts 9, 122, 123, and 124 (National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule), Water Quality Control Plan – Ocean Waters of California (California Ocean Plan), Water Quality Control Plan for the San Diego Basin (Basin Plan), 40 CFR 131 Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule (California Toxics Rule), and the California Toxics Rule Implementation Plan.

The legal authority citations below generally apply to directives in Order No. R9-2009-0002, and provide the Regional Board with ample underlying authority to require each of the directives of Order No. R9-2009-0002. Legal authority citations are also provided with each permit section discussion in section IX of this Fact Sheet/Technical Report.

CWA 402(p)(3)(B)(ii) – The CWA requires in section 402(p)(3)(B)(ii) that permits for discharges from municipal storm sewers "shall include a requirement to effectively prohibit non-storm water discharges into the storm sewers."

CWA 402(p)(3)(B)(iii) – The CWA requires in section 402(p)(3)(B)(iii) that permits for discharges from municipal storm sewers "shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants."

40 CFR 122.26(d)(2)(i)(B,C,E, and F) – Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) provide that each Copermittee's permit application "shall consist of: (i) Adequate legal authority. A demonstration that the applicant can operate pursuant to legal authority established by statute, ordinance or series of contracts which authorizes or enables the applicant at a minimum to: […] (B) Prohibit through ordinance, order or similar means, illicit discharges to the municipal separate storm sewer; (C) Control through ordinance, order or similar means the discharge to a municipal separate storm sewer of spills, dumping or disposal of materials other than storm water; […] (E) Require compliance with condition in ordinances, permits, contracts or orders; and (F) Carry out all inspection, surveillance and monitoring procedures necessary to determine compliance and noncompliance with permit conditions including the prohibition on illicit discharges to the municipal separate storm sewer."

40 CFR 122.26(d)(2)(iv) – Federal NPDES regulation 40 CFR 122.26(d)(2)(iv) provides that the Copermittee shall develop and implement a proposed management program which "shall include a comprehensive planning process which involves public participation and where necessary intergovernmental coordination, to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and such other provisions which are appropriate. The program shall also include a description of staff and equipment available to implement the program. […] Proposed programs may impose controls on a system wide basis, a watershed basis, a jurisdiction basis, or on individual outfalls. […] Proposed management programs shall describe priorities for implementing controls."

40 CFR 122.26(d)(2)(iv)(A - D) – Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(A - D) require municipalities to implement controls to reduce pollutants in storm water runoff from new development and significant redevelopment, construction, and commercial, residential, industrial, and municipal land uses or activities. Prevention of illicit discharges is also required.

CWC 13377 – CWC section 13377 provides that "Notwithstanding any other provision of this division, the State Board or the regional boards shall, as required or authorized by the CWA, as amended, issue waste discharge requirements and dredged or fill material permits which apply and ensure compliance with all applicable provisions of the act and acts amendatory thereof or supplementary, thereto, together with anymore stringent effluent standards or limitation necessary to implement water quality control plans, or for the protection of beneficial uses, or to prevent nuisance."

Order No. R9-2009-0002 is an essential mechanism for achieving the water quality objectives that have been established for protecting the beneficial uses of the water resources in the San Diego Regional Board's portion of Orange County. Federal NPDES regulation 40 CFR 122.44(d)(1) requires MS4 permits to include any requirements necessary to "achieve water quality standards established under CWA section 303, including State narrative criteria for water quality." The term "water quality standards" in this context refers to a water body's beneficial uses and the water quality objectives necessary to protect those beneficial uses as established in the Basin Plan and antidegradation policies.

VIII. FINDINGS

The findings of the Order have been modified to reduce repetition in their discussions and address new requirements. Each finding of the Order is provided and discussed below. Additional discussion relative to the findings can be found in section IX of the Fact Sheet, which provides discussions of the Order's directives.

A. Basis For the Order

Finding A.1. This Order is based on the federal Clean Water Act (CWA), the Porter-Cologne Water Quality Control Act (Division 7 of the Water Code, commencing with Section 13000), applicable state and federal regulations, all applicable provisions of statewide Water Quality Control Plans and Policies adopted by the State Water Resources Control Board (State Board), the Water Quality Control Plan for the San Diego Basin adopted by the Regional Board, the California Toxics Rule, and the California Toxics Rule Implementation Plan.

Discussion of Finding A.1. In 1987, Congress established CWA Amendments to create requirements for storm water discharges under the NPDES program, which provides for permit systems to regulate the discharge of pollutants. Under the Porter-Cologne Water Quality Control Act, the State Board and the nine Regional Water Quality Control Boards have primary responsibility for the coordination and control of water quality, including the authority to implement the CWA. Porter-Cologne (section 13240) directs the Regional Water Quality Control Boards to set water quality objectives via adoption of Basin Plans that conform to all State policies for water quality control.

As a means for achieving those water quality objectives, Porter-Cologne (section 13243) further authorizes the Regional Water Quality Control Boards to establish waste discharge requirements (WDRs) to prohibit waste discharges in certain conditions or areas. Since 1990, the San Diego Regional Board has issued area-wide MS4 NPDES permits. The Order will renew Order No. R9-2002-01 to comply with the CWA and attain water quality objectives in the Basin Plan by limiting the contributions of pollutants conveyed by storm water and by including numeric action levels for dry weather non-storm water discharges designed to ensure that the Copermittees comply with the requirement to effectively prohibit all types of unauthorized non-storm water discharges into their MS4. Further discussions of the legal authority associated with the prohibitions and directives of the Order are provided in section VII this document.

Finding A.2. This Order renews National Pollutant Discharge Elimination System (NPDES) Permit No. CAS0108740, which was first issued on July 16, 1990 (Order No. 90-38), and then renewed on August 8, 1996 (Order No. 96-03) and February 13, 2002 (Order No. R9-2002-01). On August 21, 2006, in accordance with Order No. R9-2002-01, the County of Orange, as the Principal Permittee, submitted a Report of Waste Discharge (ROWD) for renewal of the MS4 Permit.

Discussion of Finding A.2. This Order renews National Pollutant Discharge Elimination System (NPDES) Permit No. CAS0108740, which was first issued on July 16, 1990 (Order No. 90-38), and then renewed on August 8, 1996 (Order No. 96-03) and February 13, 2002 (Order No. R9-2002-01). On August 21, 2006, in accordance with Order No. R9-2002-01, the County of Orange, as the Principal Permittee, submitted a Report of Waste Discharge (ROWD) for renewal of the MS4 Permit. Supporting information discussing the topic of this finding can be found in section V of this document.

Finding A.3. This Order is consistent with the following precedential Orders adopted by the State Water Resources Control Board (State Board) addressing municipal storm water NPDES Permits: Order 99-05, Order WQ-2000-11, Order WQ 2001-15, Order WQO 2002-0014, and Order WQ-2009-0008 (*SWRCB/OCC FILE A-1780)*.

Discussion of Finding A.3. In recent years the State Board has considered several appeals of MS4 permits issued by the Regional Boards. In Order 99-05, the State Board established language for Receiving Water Limitation Language for MS4 permits. In Order No. WQ-2000-11, the State Board addressed design standards for Standard Urban Storm Water Mitigation Plan (SUSMP) requirements. Order WQ 2001-15 addressed Petitions of the San Diego County MS4 Permit issued by the Regional Board in 2001 (Order No. R9-2001-01). Order WQO 2002-0014 addresses Petitions of the Orange County MS4 Permit issued by the Regional Board in 2002 (Order No. R9-2002-01).

B. Regulated Parties

Finding B.1. Each of the persons in Table 1 of the Order, hereinafter called Copermittees or dischargers, owns or operates a municipal separate storm sewer system (MS4), through which it discharges storm water and non-storm water into waters of the United States within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the United States.

Discussion of Finding B.1. Section 402 of the CWA prohibits the discharge of any pollutant to waters of the United States from a point source, unless that discharge is authorized by a NPDES permit. Though storm water and non-storm water may come from a diffuse source, it is discharged through MS4s, which are point sources under the CWA. Federal NPDES regulation 40 CFR 122.26(a) (iii) and (iv) provide that discharges from MS4s, which service medium or large populations greater than 100,000 or 250,000 respectively, shall be required to obtain a NPDES permit. Federal NPDES regulation 40 CFR 122.26(a)(v) also provides that a NPDES permit is required for "A [storm water] discharge which the Director, or in states with approved NPDES programs, either the Director or the USEPA Regional Administrator, determines to contribute to a violation of a water quality standard or is a significant contributor of pollutants to waters of the United States." Such sources are then designated into the program.

Other small MS4s, such as those serving universities and military installations, also exist within the watersheds of Orange County in the San Diego Region. While these MS4s are not subject to this Order, they are subject to the Phase II NPDES storm water regulations. Over time, these MS4s will be designated for coverage under the State Board's statewide general storm water permit for small MS4s.

C. Discharge Characteristics

Finding C.1. Runoff discharged from an MS4 contains waste, as defined in the California Water Code (CWC), and pollutants that adversely affect the quality of the waters of the State. The discharge of runoff from an MS4 is a "discharge of pollutants from a point source" into waters of the U.S. as defined in the CWA.

Discussion of Finding C.1. Section 13050(d) of the CWC defines "waste" as "sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal." 40 CFR 122.2 defines "point source" as "any discernable, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff." 40 CFR 122.2 defines "discharge of a pollutant" as "Any addition of any pollutant or combination of pollutants to waters of the U.S. from any point source." Also, the justification for control of pollution into waters of the state can be found at CWC section 13260(a)(1). State Board Order WQ 2001-15 verifies that discharges from the MS4 contain waste.[28]

The term urban runoff has been removed throughout Tentative Order R9-2009-0002 and replaced with storm water (wet weather) or non-storm water (dry weather) runoff. This clarification is necessary to prevent the misunderstanding that regulation under this permit is subject only to urbanized areas. The term "urban runoff" is not defined in the Code of Federal Regulations or Federal Register in the regulation of phase 1 MS4 discharges.

The discharge of runoff from an MS4 is a "discharge of pollutants from a point source" into waters of the U.S. as defined in the Clean Water Act (CWA). The Permit defines runoff as all flows in a storm water conveyance system (MS4 defined below) and consists of the following components:

(1) storm water (wet weather flows) and
(2) non-storm water discharges (dry weather flows).

The Permit defines an MS4 as a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains):

[28] State Board, 2001. Order WQ 2001-15. In the Matter of Petitions of Building Industry Association of San Diego County and Western States Petroleum Association: For Review of Waster Discharge Requirements Order No. 2001-01 for Urban Runoff from San Diego County [NPDES No. CAS0108758] Issued by the Regional Board.

(i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to waters of the United States;

(ii) Designated or used for collecting or conveying storm water;

(iii) Which is not a combined sewer;

(iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.26.

Permit finding D.3.c. includes natural streams that convey runoff as part of the MS4. The presence of an MS4 system is not limited to areas considered to be "urban" in nature. Though the term urban is often referred to specifically as pertaining to cities, runoff means all flows in a storm water conveyance system, regardless of the location of the conveyance system. A conveyance system owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law), may be located in a setting (e.g. unincorporated area, low density residential) that is not considered by the public to be "urban" in nature. These areas are contributing pollutants to the MS4 system that must be addressed. The term runoff applies to all flows in an MS4 system, no matter where the MS4 may be located in regards to incorporated or unincorporated property.

The Code of Federal Regulations (CFR) at 40 CFR 122.26 requires that large and medium MS4s obtain a permit for all discharges from their systems. Appendix I to 40 CFR 122 designates Orange County as having a large and medium MS4 requiring a permit. The regulations do not differentiate discharges from urban or rural MS4 systems. Rather, the regulations require the permit for all discharges from their systems. In the Final Rule establishing the Phase 1 storm water regulations, the USEPA clarified that all discharges are subject to a permit. On page 48041 of the Final Rule, the USEPA states:

> "EPA recognizes that some of the counties addressed by today's rule have, in addition to areas with high unincorporated urbanized populations, areas that are essentially rural or uninhabited and may not be the subject of planned development. While permits issued for these municipal systems ***will cover*** *(emphasis added) municipal systems discharges in unincorporated portions of the county* (emphasis added), it is the intent of EPA that management plans

> and other components of the programs focus on the urbanized and developing areas of the county."

So, while the Permit covers all MS4 discharges regardless if that discharge is in an urban or unincorporated area; the Copermittees management program should focus on urbanized areas. Due to the Permit's requirements, the Copermittees management programs will naturally focus on urbanized areas. Urbanized areas have more industry, construction, pollution and MS4s that require more inspection, maintenance, monitoring, enforcement and complaint follow-up.

USEPA further clarified on page 48041 that all MS4 discharges require permit coverage when addressing highway MS4 systems:

> "[The regulations] will result in discharges from separate storm sewer systems serving State highways and other highways through storm sewers … in unincorporated portions of specified unincorporated portions of specified counties being included as part of the large or medium municipal separate storm sewer systems, since all municipal separate storm sewers within the boundaries of these political entities are included."

In their summary on page 48043, the USEPA states:

> "The definition [of MS4] provides that all systems within a geographical area including highways and flood controls will be covered, thereby avoiding fragmented and ill-coordinated programs;"

Neither the State Board's storm water permit for Caltrans (Order No. 99-06-DWQ) nor the Los Angeles Regional Board's draft MS4 permit for Ventura County include the term "urban runoff" in a significant regulatory capacity. The Caltrans permit has one reference to "urban runoff" where the term is used interchangeably with "storm water." The draft Ventura permit uses the term "urban runoff" when referring to titles of reference documents, previously adopted management plans and municipal ordinances that may contain the phrase.

Understandably, the Copermittees have expressed concern regarding the regulation of pollutants from natural, undeveloped areas that enter the MS4 in an unincorporated area. The MS4 collection could change a natural sheet flow discharge to a concentrated point discharge. The MS4 does not provide natural infiltration or other pollutant remediation that these flows would receive in an otherwise natural drainage system. The MS4 may concentrate these natural pollutants and flows. In some cases, the MS4 may ultimately discharge the elevated concentrations of natural pollutants and flow rates to waters of the US far from the natural pollutant and flow source, causing a condition of pollution or a violation of water quality standards.

Finding C.2. MS4 storm water and non-storm water discharges are likely to contain pollutants that cause or threaten to cause a violation of surface water quality standards, as outlined in the Regional Board's Water Quality Control Plan for the San Diego Basin (Basin Plan). Storm water and non-storm water discharges from the MS4 are subject to the conditions and requirements established in the San Diego Basin Plan for point source discharges. These water quality standards must be complied with at all times, irrespective of the source and manner of discharge.

Discussion of Finding C.2. This finding is a clarification regarding the potential for discharges of storm water and non-storm water to impact the Beneficial Uses as described in the Basin Plan. As such these point source discharges require Waste Discharge Requirements (WDRs) to ensure that water quality standards are met. Furthermore, since point source discharges require WDRs, the discharges are subject to the prohibitions, conditions and requirements of the Basin Plan.

In addition, municipal discharges have been split into storm water and non-storm water discharges to represent the differing regulations applicable to storm water and non-storm water, though both types of discharges are likely to contain pollutants.

Finding C.3. The most common categories of pollutants in runoff include total suspended solids, sediment (due to anthropogenic activities); pathogens (e.g., bacteria, viruses, protozoa); heavy metals (e.g., copper, lead, zinc and cadmium); petroleum products and polynuclear aromatic hydrocarbons; synthetic organics (e.g., pesticides, herbicides, and PCBs); nutrients (e.g., nitrogen and phosphorus fertilizers); oxygen-demanding substances (decaying vegetation, animal waste); detergents; and trash.

Discussion of Finding C.3. The National Urban Runoff Program (NURP) study showed that heavy metals, organics, coliform bacteria, nutrients, oxygen demanding substances (e.g., decaying vegetation), and total suspended solids are found at relatively high levels in storm water and non-storm water discharges.[29] It also found that MS4 discharges draining residential, commercial, and light industrial areas contain significant loadings of total suspended solids and other pollutants. The Basin Plan goes on to identify runoff pollutants to include lawn and garden chemicals, household and automotive care products dumped or drained on streets, and sediment that erodes from construction sites.[30] In addition, the State Board Urban Runoff Technical Advisory Committee (TAC) finds that urban runoff pollutants include sediments, nutrients, oxygen-demanding substances, heavy metals, petroleum hydrocarbons, pathogenic bacteria, viruses, and pesticides.[31] Runoff that flows over streets, parking lots, construction sites, and industrial, commercial, residential, and municipal areas carries these untreated pollutants through storm drain networks directly to the receiving waters of the San Diego Region.

Finding C.4. The discharge of pollutants and/or increased flows from MS4s may cause or threaten to cause the concentration of pollutants to exceed applicable receiving water quality objectives and impair or threaten to impair designated beneficial uses resulting in a condition of pollution (i.e., unreasonable impairment of water quality for designated beneficial uses), contamination, or nuisance.

Discussion of Finding C.4. The 1992, 1994, and 1996 National Water Quality Inventory Reports to Congress prepared by USEPA showed a trend of impairment in the nation's waters from contaminated storm and non-storm water runoff.[32] The 1998 National Water Quality Inventory Report showed that runoff discharges affect 11 percent of rivers, 12 percent of lakes, and 28 percent of estuaries. The report states that ocean shoreline impairment due to runoff increased from 55 percent in 1996 to 63 percent in 1998. The report notes that runoff discharges are the leading source of pollution and the main factor in the degradation of surface water quality in California's coastal waters, rivers, and streams. Furthermore, the NURP study found that pollutant levels from illicit non-storm water discharges were high enough to significantly degrade receiving water quality, and threaten aquatic life, wildlife, and human health.[33]

[29] Ibid.
[30] Regional Board, 1994. Water Quality Control Plan, San Diego Basin, Region 9. San Diego.
[31] State Board, 1994. Urban Runoff Technical Advisory Committee Report and Recommendations. Nonpoint Source Management Program.
[32] USEPA, 2000. Quality of Our Nation's Waters: Summary of the National Water Quality Inventory 1998 Report to Congress – USEPA 841-S-00-001; Water Quality Conditions in the United States: Profile from the 1998 National Water Quality Inventory Report to Congress – USEPA 841-F-00-006.
[33] USEPA, 1993. Results of the Nationwide Urban Runoff Program, Volume 1 – Final Report.

In addition, the Region's CWA section 303(d) list, which identifies water bodies with impaired beneficial uses within the region, also indicates that the impacts of storm water and non-storm water runoff on receiving waters are significant. Many of the impaired water bodies on the 303(d) list are impaired by constituents that have been found at high levels within storm water and non-storm water runoff by the County of Orange storm water monitoring program.[34] Examples of constituents frequently responsible for beneficial use impairment include indicator fecal bacteria, heavy metals, and sediment; these constituents have been found at high levels in runoff both regionally and nationwide.[35,36] In addition, impairments may be caused by synergistic effects of multiple contaminants or by pollutants not currently monitored by storm water programs[37].

Finding C.5. Pollutants in runoff can threaten and adversely affect human health. Human illnesses have been clearly linked to recreating near storm drains flowing to coastal waters. Also, runoff pollutants in receiving waters can bioaccumulate in the tissues of invertebrates and fish, which may be eventually consumed by humans.

[34] County of Orange, 2006. Orange County Municipal Copermittees 2005-2006 Annual Storm Water Program Report, Section 11.
[35] Ibid.
[36] USEPA, 1983. Results of the Nationwide Urban Runoff Program, Volume 1 – Final Report.
[37] County of Orange, 2006. Orange County Municipal Copermittees 2005-2006 Annual Storm Water Program Report, Section 11.

Discussion of Finding C.5. A landmark study, conducted by the Santa Monica Bay Restoration Project, found that there was an increased occurrence of illness in people that swam in proximity to a flowing storm drain.[38] A study of south Huntington Beach and north Newport Beach (both located in northern Orange County) found that an illness rate of about 0.8 percent among bathers at those beaches resulted in about $3 million annually in health-related expenses.[39] Furthermore, runoff pollutants in receiving waters can bioaccumulate in the tissues of invertebrates and fish, which may eventually be consumed by humans. Pollutants such as heavy metals and pesticides, which are commonly found in MS4 runoff, have been found to bioaccumulate and biomagnify in long-lived organisms at the higher trophic levels.[40] Since many aquatic species are utilized for human consumption, toxic substances accumulated in species' tissues can pose a significant threat to public health. USEPA supports this finding when it states, "As runoff flows over areas altered by development, it picks up harmful sediment and chemicals such as oil and grease, pesticides, heavy metals, and nutrients (e.g., nitrogen and phosphorus). These pollutants often become suspended in runoff and are carried to receiving waters, such and lakes, ponds, and streams. Once deposited, these pollutants can enter the food chain through small aquatic life, eventually entering the tissues of fish and humans."[41]

Finding C.6. Runoff discharges from MS4s often contain pollutants that cause toxicity to aquatic organisms (i.e., adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies). Toxic pollutants impact the overall quality of aquatic systems and beneficial uses of receiving waters.

[38] Haile, R.W., et al., 1996. An Epidemiological Study of Possible Adverse Health Effects of Swimming in Santa Monica Bay. Santa Monica Bay Restoration Project.
[39] Dwight, R.H., et al., 2005. Estimating the Economic Burden From Illnesses Associated With Recreational Coastal Water Pollution – A Case Study in Orange County, California. Journal of Enviro. Management Vol.76. No.2 p.95-103. Also reported in: Los Angeles Times, May 2, 2005. Here's What Ocean Germs Cost You: A UC Irvine Study Tallies the Cost of Treatment and Lost Wages for Beachgoers Who Get Sick.
[40] Abel, P.D, 1996. Water Pollution Biology.
[41] USEPA, 2000. Storm Water Phase II Compliance Assistance Guide. Washington D.C. EPA 833-R-00-002.

Discussion of Finding C.6. The Copermittees' monitoring data exhibits frequent toxic conditions in runoff during storm events and dry weather. Toxicity is observed in both fresh and marine receiving waters, but varies significantly within and among sites and over time. However, according to the County of Orange, toxicity in both dry and wet weather appears concentrated along the coast. This supports the conclusion that toxicity is associated with anthropogenic activities and is caused by pollutants that flow downstream and become concentrated near the bottom of developed watersheds. Physical channel modification and hydromodification are also greatest near the coast and likely contribute to findings of toxicity. The cause of toxicity may vary between locations, dates, and indicator organisms. The actual cause may be influenced by various factors such as development, runoff management, habitat modification, hydromodification, and native aquatic environment. Toxicity identification evaluations (TIEs) have failed to confirm initial findings of toxicity. Follow-up studies by the County of Orange implicate both pollutants and physical stream habitat degradation (e.g. channel modification and hydromodification) as factors related to toxicity findings.[42]

Finding C.7. The Copermittees discharge runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within one of the eleven hydrologic units (San Juan Hydrologic Unit) comprising the San Diego Region as shown in Tables 2a and 2b. Some of the receiving water bodies have been designated as impaired by the Regional Board and the United States Environmental Protection Agency (USEPA) in 2006 pursuant to CWA section 303(d). Also shown in the Tables are the watershed management areas (WMAs) as defined in the Regional Board report, Watershed Management Approach, January 2002.

Discussion of Finding C.7. This finding identifies the Copermittees responsible for MS4 discharges in each watershed management area. The list is identical to Order No. R9-2002-0001. The CWA Section 303(d) List of Impaired Waters, 2006 Update has been approved by the Regional Board, State Board, and USEPA.[43] This 303(d) list identifies waters that do not meet water quality standards after applying certain required technology-based effluent limits ("impaired" water bodies). As part of this listing process, states are required to prioritize waters/watersheds for future development of Total Maximum Daily Loads (TMDLs). The listed 303(d) pollutant(s) of concern do not necessarily reflect impairment of the entire corresponding WMA or all corresponding major surface water bodies. The specific impaired portions of each WMA are listed in the State Board's 2006 Section 303(d) List of Water Quality Limited Segments.

[42] County of Orange, 2006. Orange County Municipal Copermittees 2005-2006 Annual Storm Water Program Report, Section 11.
[43] The approved 2006 Clean Water Act Section 303(d) List of Water Quality Limited Segments is on-line at: http://www.waterboards.ca.gov/tmdl/303d_lists2006.html

Finding C.8. Trash is a persistent pollutant which can enter receiving waters from the MS4 resulting in accumulation and transport in receiving waters over time. Trash poses a serious threat to the Beneficial Uses of the receiving waters, including, but not limited to, human health, rare and endangered species, navigation and human recreation.

Discussion of Finding C.8. The Copermittees to date have documented high volumes of trash coming from the MS4 system and in receiving waters.[44]

The Basin Plan specifies the following narrative Water Quality Objective (WQO) for Floating Material:

> *"Waters shall not contain floating material, including solids, liquids, foams, and scum in concentrations which cause nuisance or adversely affect beneficial uses."*

The Basin Plan specifies the following narrative WQO for Suspended and Settleable Solids: Material:

> *"Waters shall not contain suspended and settleable solids in concentrations of solids that cause nuisance or adversely affect beneficial uses."*

Additionally, high density urban areas in Southern California have been shown to be responsible for up to 60 percent of the trash that enters receiving waters from the MS4.[45] The retrofitting of existing MS4 systems, such as catch basins, in targeted high trash areas can result in significant reductions in the amount of trash entering receiving waters from the MS4.

Trash, as litter in both solid and liquid form, is consistently found on and adjacent to roadways. A California Department of Transportation Litter Management Pilot Study found that of roadway trash, plastics and Styrofoam accounted for 33 percent of trash by weight, and 43 percent by volume. Further, the study found that approximately 80 percent of the litter associated with roadways was floatable, indicating that, without capture, this litter would enter Waters of the State after a storm event, resulting in the impairment of Beneficial Uses.[46] The study, however, relied upon a mesh capture size of 0.25 inches (6.35 millimeters). This size is too large to effectively capture plastic pre-production pellets (aka "nurdles"), which are roughly 3 mm in size, and likely underestimated the total contribution of plastics. Plastics, including pre-production pellets, have been found to be the dominant pollutant on beaches in the County of Orange.[47] Furthermore, pre-production plastic pellets, which are small enough to be easily digested, have been found to carry persistent organic pollutants, including PCBs

[44] Aliso Creek Watershed 27th, 28th, 29th and 30th Quarterly Progress Reports. 2007-2008.
[45] The City of Los Angeles Meets Trash TMDLs Compliance with CB Inserts and Opening Covers. August 06, 2008.
[46] California Department of Transportation District 7 Litter Management Pilot Study. June 26, 2000.
[47] Moore, S.L., Gregorio, D., Carreon, M., Weisberg, S.B. and M. K. Leecaster. 1998. Composition and Distribution of Beach Debris in Orange County, California. *Marine Pollution Bulletin*. Vol. 42

and DDT.[48]

Finding C.9. The Copermittees' water quality monitoring data submitted to date documents persistent violations of Basin Plan water quality objectives for various runoff-related pollutants (fecal coliform bacteria, total suspended solids, turbidity, metals, etc.) at various watershed monitoring stations. Persistent toxicity has also been observed at some watershed monitoring stations. In addition, bioassessment data indicates that the majority of urbanized receiving waters have Poor to Very Poor Index of Biotic Integrity ratings. In sum, the above findings indicate that runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in Orange County.

Discussion of Finding C.9. The Copermittees have produced data that demonstrates water quality objectives are frequently not met during dry and wet weather. The 2006 Report of Waste Discharge and the 2005-06 Annual Reports document that receiving water monitoring stations often fail to meet water quality objectives established in the Basin Plan. Similar conclusions are found in monitoring reported to the Regional Board pursuant to Investigative Orders issued between 2001 and 2006 for Aliso Creek, Salt Creek[49], Prima Deshecha[50], and North Creek at Doheny Beach[51]. Monitoring reported to the State Board pursuant to funding grant agreements also demonstrates that discharges from MS4s routinely exceed water quality objectives. [52,53, 54, 55, 56].

[48] Rios, L.M., Moore, C. and Patrick R. Jones. 2007. Persistent organic pollutants carried by synthetic polymers in the ocean environment. *Marine Pollution Bulletin.* Vol. 54.
[49] An Investigative Order was issued on March 6, 2003 to the City of Dana Point for water quality conditions of Salt Creek near Monarch Beach.
[50] An Investigative Order was issued on July 3, 2002 to the City of San Clemente and the County of Orange for water quality conditions of Prima Deshecha Canada (including Poche Beach).
[51] Investigative Order No. R9-2006-0039 was issued on April 4, 2006 to the City of Dana Point and Quantum Ozone, Inc. for an assessment of water quality conditions at North Creek, Doheny Beach.
[52] City of Dana Point. 2005. *Final Report for the Del Obispo Storm Drain Project*. Prepared for the State Water Resources Control Board Agreement No. 02-216-550-0.
[53] City of Dana Point. 2004. *Final Report For The Alipaz Storm Drain Treatment And Low Flow Diversion Project" by the City of Dana Point.* Prepared for State Water Resources Control Board Agreement Number: 01-068-550-0.
[54] James Volz. 2005. *Final Report for Poche Beach Urban Runoff Ultraviolet Light Bacteria Disinfection Project*. Prepared by the County of Orange for State Water Resources Control Board Agreement No. 01-236-550-1.
[55] Max Anderson. 2005. Final Report: Aliso Beach Clean Beach Initiatives, J01P28 Interim Water Quality Improvement Package Plant Best Management Practices. Prepared by the County of Orange for State Water Resources Control Board Agreement No. 01-227-550-0.
[56] City of Laguna Niguel and CH2MHILL. 2004. *Final Report: Wetland Capture and Treatment (WetCAT) Network.* Prepared for State Water Resources Control Board Agreement No. 01-122-259-0.

Water quality in receiving waters downstream of MS4 discharges fail to meet Ocean Plan standards[57], California Toxics Rule standards[58], and Basin Plan objectives. Data submitted in the MS4 Annual Reports indicate that at various times chemical, bacteria, pesticide, and metal concentrations may exceed water quality objectives in marine and fresh water receiving waters in both wet and dry weather conditions. Although wet weather MS4 effluent data is not generally reported, dry-weather non-storm water MS4 effluent data demonstrates that the effluent contains concentrations of pollutants that would exceed receiving water quality objectives.

In most of these watersheds, there are no other significant NPDES permits discharging to the creeks. For instance, there are no live-stream discharges of treated waste water in south Orange County. The few NPDES permits in the watersheds are mainly for recycled water which only discharges occasionally during the rainy season. Because the water quality monitoring indicates exceedances of water quality standards and MS4 discharges are the main source of pollutants in the watersheds, it can be inferred that the MS4 discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in Orange County.

Finding C.10. When natural vegetated pervious ground cover is converted to impervious surfaces such as paved highways, streets, rooftops, and parking lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving a developed area is significantly greater in runoff volume, velocity, and peak flow rate than pre-development runoff from the same area. Runoff durations can also increase as a result of flood control and other efforts to control peak flow rates. Increased volume, velocity, rate, and duration of runoff greatly accelerate the erosion of downstream natural channels. Significant declines in the biological integrity and physical habitat of streams and other receiving waters have been found to occur with as little as a 3-5 percent conversion from natural to impervious surfaces. The increased runoff characteristics from new development must be controlled to protect against increased erosion of channel beds and banks, sediment pollutant generation, or other impacts to beneficial uses and stream habitat due to increased erosive force.

Finding C.11. Development creates new pollution sources as human population density increases and brings with it proportionately higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, trash, etc. which can either be washed or directly dumped into the MS4. As a result, the runoff leaving the developed area is significantly greater in pollutant load than the pre-development runoff from the same area. These increased pollutant loads must be controlled to protect downstream receiving water quality.

[57] The Basin Plan incorporates terms and conditions of the State Board's *Water Quality Control Plan for Ocean Waters of California* (Ocean Plan) as a water quality objective for Ocean Waters in the San Diego Region.
[58] The California Toxics Rule criteria promulgated by the USEPA are directly applicable water quality standards for certain priority toxic pollutants in inland surface waters and enclosed bays and estuaries in California.

Discussion of Findings C.10 and C.11.
The Natural Resources Defense Council (NRDC) 1999 Report, "*Stormwater Strategies, Community Responses to Runoff Pollution*" identifies two main causes of the storm water pollution problem in developed areas. Both causes are directly related to development:

1. Increased volume and velocity of surface runoff. There are three types of human-made impervious covers that increase the volume and velocity of runoff: (i) rooftop, (ii) transportation imperviousness, and (iii) non-porous (impervious) surfaces. As these impervious surfaces increase, infiltration will decrease, forcing more water to run off the surface, picking up speed and pollutants.

2. The concentration of pollutants in the runoff. Certain industrial, commercial, residential and construction activities are large contributors of pollutant concentrations in storm water runoff. As human population density increases, it brings with it proportionately higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, trash, etc.

As a result of these two causes, runoff leaving developed areas is significantly greater in volume, velocity, and pollutant load than pre-development runoff from the same area.

By accommodating the traditional approach to storm water management, development has also altered the flow regime (rate, magnitude, frequency, timing, and flashiness of runoff) that supports aquatic and riparian habitats. These hydrologic changes are driven by the loss of water storage capacity in the watersheds,[59] and exacerbated by physical alterations of the stream channel network.[60] This relationship between development and stream channel integrity has been documented nationally and in southern California.

[59] Konrad, Christopher P. and Derek K. Booth, 2005. *Hydrologic Changes in Urban Streams and Their Ecological Significance.* American Fisheries Society Symposium Vol.47 pp.157-177.
[60] Poff. N.L. et al. 1997. The Natural Flow Regime: A paradigm for river conservation and restoration. Bioscience Vol. 47, No. 11, pp.769-784.

Hydrologic changes from development also directly and indirectly adversely affect wetlands. Natural wetlands support many beneficial uses and provide important water-quality related ecological services, including pollutant removal, flood attenuation, and groundwater recharge.[61] The Center for Watershed Protection recently provided USEPA with a synthesis of more than 100 scientific studies on the direct and indirect impacts of development, particularly urbanization, on wetlands and the role wetlands play in watershed quality. The report found that the three changes from land development with the most potential to impact wetlands include: Increased storm water runoff; decreased groundwater recharge; and flow constriction.[62] Each of these changes can often be avoided or minimized by implementing LID and hydromodification BMPs.

When Order No. R9-2002-01 was adopted, studies had shown that the level of imperviousness in an area strongly correlates with the quality of nearby receiving waters.[63] One comprehensive study, which looked at numerous areas, variables, and methods, revealed that stream degradation occurs at levels of imperviousness as low as 10 – 20 percent.[64] Stream degradation is a decline in the biological integrity and physical habitat conditions that are necessary to support natural biological diversity. For instance, few urban streams can support diverse benthic communities with imperviousness greater than or equal to 25 percent.[65] To provide some perspective, a medium density, single-family home area can be from 25 percent to 60 percent impervious (variation due to street and parking design).[66]

More recently, a report on the effects of impervious in southern California streams found that local ephemeral and intermittent streams are more sensitive to such effects than streams in other parts of the country. This study, by the Southern California Coastal Water Research Program, estimated a threshold of response at a two to three percent change in percent of impervious cover in a watershed. [67] This threshold is lower than the previously reported estimates by the USEPA that were cited in the Fact Sheet for Order No. R9-2002-01.

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[61] Wright, Tiffany, et al. 2006. "Direct and Indirect Impacts of Urbanization on Wetland Quality." Prepared by the Center for Watershed Protection. Available at: http://www.cwp.org. 81p.
[62] Ibid p.26
[63] USEPA, 1999. Part II. 40 CFR Parts 9, 122, 123, and 124. National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. Federal Register.
[64] Ibid.
[65] Ibid.
[66] Schueler, T.R., 1994. The Importance of Imperviousness. Watershed Protection Techniques. As cited in 64 Fed. Reg. 68725.
[67] Coleman, Derrick, et al. 2005. *Effect of Increases in Peak Flows and Imperviousness on the Morphology of Southern California Streams.* Technical Report No. 450 of the Southern California Coastal Water Research Project.

To demonstrate the principle of increased volume and velocity of runoff from urbanization, Figure 1 shows the flow rate of an urban vs. a natural stream. What the figure demonstrates is that urban stream flows have greater peaks and volumes, as well as shorter retention times than natural stream flows. The greater peak flows and volumes result in stream degradation through increased erosion of stream banks and damage to aquatic habitat. The shorter retention times result in less time for sediments and other pollutants to settle before being carried out to the ocean. This sediment, and the associated pollutants it carries, can be a significant cause of water quality degradation.

Figure 1. Flow Rate of Urban and Natural Streams[68]

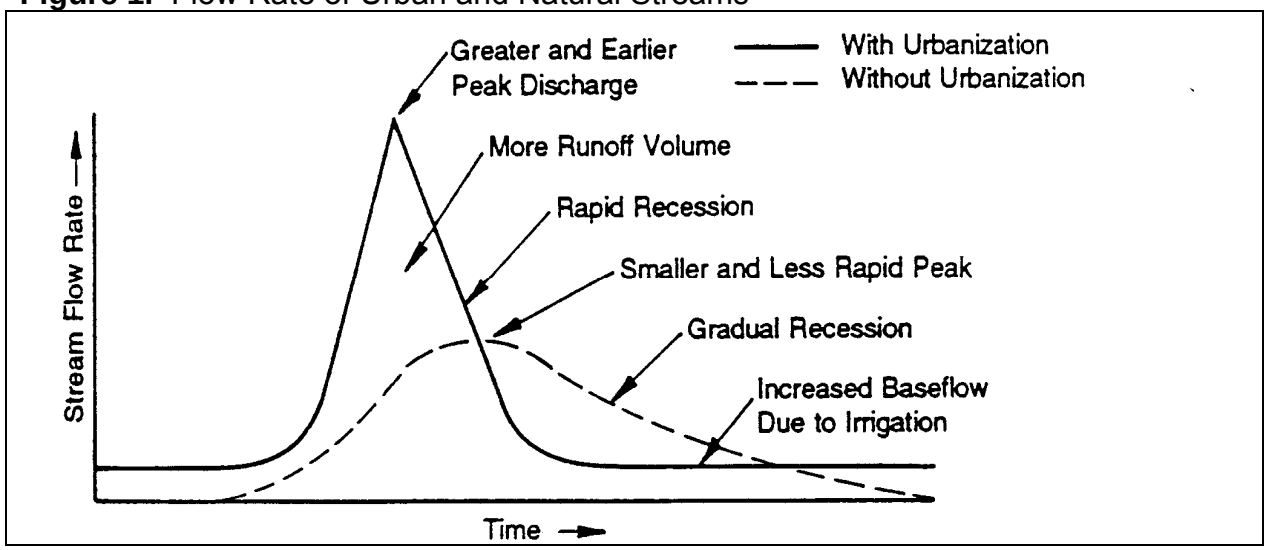

Increased volume and velocity of runoff adversely impacts receiving waters and their beneficial uses in many ways. According to the Urban Runoff TAC report,[69] increases in population density and imperviousness result in changes to stream hydrology including:

1. Increased peak discharges compared to pre-development levels;
2. Increased volume of storm water runoff with each storm compared to pre-development levels;
3. Decreased travel time to reach receiving water; increased frequency and severity of floods;
4. Reduced stream flow during prolonged periods of dry weather due to reduced levels of infiltration;
5. Increased runoff velocity during storms due to a combination of effects of higher discharge peaks, rapid time of concentration, and smoother hydraulic surfaces from channelization; and

[68] Adapted from Schueler, T.R., 1987. Controlling Urban Runoff: A Practical Manual for Planning and Designing Urban BMPs. Metropolitan Washington Council of Governments.
[69] State Board, 1994. Urban Runoff Technical Advisory Committee Report and Recommendations. Nonpoint Source Management Program.

6. Decreased infiltration and diminished ground water recharge.

Even though the rainfall depths in arid watersheds are lower, watershed development can greatly increase peak discharge rates during rare flood events.[70] A study conducted in arid watersheds around Riverside, CA showed that, over two decades, impervious cover increased from 9 percent to 22 percent, which resulted in an increase of more than 100 percent in the peak flow rate for the two-year storm event. The study also showed that the average annual storm water runoff volume had increased by 115 percent to 130 percent over the same time span.[71]

Prior hydromodification studies in California have shown that the increase in impervious cover, and thus change in runoff volume, velocity, rate, and duration, results in a shift in the range of storms that produce geomorphically significant flows within receiving waters (see above discussion). Additionally, studies in California have determined that ninety percent of the geomorphic "work" done within channels receiving flows from developed areas now occurs from flows below the 10 year peak flow event.[72]

This increased volume, velocity, rate, and duration of runoff greatly accelerates the erosion of the beds and banks within downstream receiving waters. Additionally, storm water flows which runoff directly from impervious surfaces into the MS4 and thus receiving waters prevent the associated runoff of natural sediments which would occur in pre-project conditions. This combined alteration of the physical condition of storm water runoff results in accelerated downstream erosion of receiving water bed and banks. The excessive erosion of stream beds and banks releases pollutants found in soils into receiving waters, degrades macroinvertebrate habitat (see D.2.c), eliminates spawning habitat, reduces associated wetland and riparian habitat, and threatens existing infrastructure adjacent to receiving waters. Bank sloughing within creeks and streams increases the pollutant loading to those receiving waters, particularly for turbidity and phosphorous.[73] In arid environments, accelerated channel erosion has been shown to have synergistic impacts within watersheds. Increased channel erosion within Las Vegas wash has resulted in the loss of over 1,000 acres of wetland and riparian habitat, released additional pollutants into downstream receiving waters, and eliminated in-stream habitat and water quality conditions required for existing threatened and endangered species.[74]

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[70] Schueler and Holland, 2000. Storm Water Strategies for Arid and Semi-Arid Watersheds (Article 66). The Practice of Watershed Protection. P. 695-706.
[71] Ibid.
[72] Santa Clara Valley Hydromodification Management Plan. April 21, 2005.
[73] Sekely, A.C., Mulla, D.J. and D.W. Bauer. 2002. Streambank slumping and its contribution to the phosphorus and suspended sediment loads of the Blue Earth River, Minnesota. *Journal of Soil and Water Conservation.* September 2002 vol. 57 no. 5 243-250.
[74] Tuttle, P.L.. and E..L.. Orsak. 2002. Las Vegas Wash Water Quality and Implications to Fish and Wildlife. U.S.

Regarding the impact of development on storm water runoff pollutant loads, the Regional Board's Basin Plan states:

> *Nonpoint source pollution is primarily the result of man's uses of land such as urbanization, roads and highways, vehicles, agriculture, construction, industry, mineral extraction, physical habitat alteration (dredging/filling), hydromodification (diversion, impoundment, channelization), silviculture (logging), and other activities which disturb land.*[75] *As a result, when rain falls on and drains through urban freeways, industries, construction sites, and neighborhoods it picks up a multitude of pollutants. The pollutants can be dissolved in the runoff and quickly transported by gravity flow through a vast network of concrete channels and underground pipes referred to as storm water conveyance systems. Such systems ultimately discharge the polluted runoff, without treatment, into the nation's creeks, rivers, estuaries, bays, and oceans.*[76]

According to the Center for Watershed Protection, urbanization strongly shapes the quality of both surface and ground water in arid and semi-arid regions of the southwest. Since rain events are so rare, pollutants have more time to build up on impervious surfaces compared to humid regions. Therefore, the pollutant concentrations of storm water runoff from arid watersheds tends to be higher than that of humid watersheds.[77] The effect of antecedent rainfall events is demonstrated in a recent report from the California Department of Transportation (Caltrans) that found the concept of a seasonal first flush is applicable to the southern California climate.[78]

Finding C.12. Development and urbanization especially threaten environmentally sensitive areas (ESAs), such as water bodies designated as supporting a RARE beneficial use (supporting rare, threatened or endangered species) and CWA 303(d)-impaired water bodies. Such areas have a much lower capacity to withstand pollutant shocks than might be acceptable in other areas. In essence, development that is ordinarily insignificant in its impact on the environment may become significant in a particularly sensitive environment. Therefore, additional control to reduce storm water pollutants from new and existing development may be necessary for areas adjacent to or discharging directly to an ESA.

Fish and Wildlife Service.

[75] Regional Board, 1994. Water Quality Control Plan for the San Diego Basin. P. 4-66.

[76] Ibid. P. 4-69 - 4-70.

[77] Schueler and Holland, 2000. Storm Water Strategies for Arid and Semi-Arid Watersheds (Article 66). The Practice of Watershed Protection. P. 695-706.

[78] Stenstrom, Michael and Masoud Kayhanian, 2005. *First Flush Phenomenon Characterization.* Prepared for Caltrans. Report No. CTSW-RT-05-73-02.6 Study jointly performed by UCLA and UCD. Most of the data presented was collected from three highly urbanized highway sites in west Los Angeles. Much effort went into developing a quantitative way of defining the mass first flush. Other aspects include: variability of water quality during storm events, litter characteristics, correlation among constituents, first flush of organics and particle size distribution, new methods for measuring oil and grease, and grab and composite sampling strategies. The report is available on-line at: http://www.dot.ca.gov/hq/env/stormwater/special/newsetup/

Discussion of Finding C.12. ESAs are defined in the Order as "Areas that include but are not limited to all CWA Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the Basin Plan ; water bodies designated with the RARE beneficial use by the Basin Plan; areas designated as preserves or their equivalent under the Natural Communities Conservation Program within the Cities and County of Orange; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees."

Areas that meet this definition are inherently sensitive habitats containing unique, rare, threatened, or endangered species, or are not achieving their designated beneficial uses. As discussed above, runoff is known to contain a wide range of pollutants and has demonstrated toxicity to plants and animals. Therefore, it is necessary to apply additional storm water controls for developments within, adjacent to, or directly discharging to ESAs. This need for additional storm water controls is addressed within each component of the Order. USEPA supports the requirement for additional storm water controls, stating "For construction sites that discharge to receiving waters that do not support their designated use or other waters of special concern, additional construction site controls are probably warranted and should be strongly considered."[79] Further support for requiring additional controls to reduce pollutants in storm water discharges to ESAs can be found in *Mitigation of Storm Water Impacts From New Developments in Environmentally Sensitive Areas*, a technical report written by the LARWQCB.[80]

ESAs within the area subject to this Order are expected to be substantially similar to the previous Order. Additions may be necessary once the South County Natural Community Conservation Plan/Habitat Conservation Plan (NCCP/HCP) is formally adopted. Other modifications may reflect updated descriptions or findings of threatened or endangered aquatic species.

Finding C.13. Although dependent on several factors, the risks typically associated with properly managed infiltration of runoff (especially from residential land use areas) are not significant. The risks associated with infiltration can be managed by many techniques, including (1) designing landscape drainage features that promote infiltration of runoff, but do not "inject" runoff (injection bypasses the natural processes of filtering and transformation that occur in the soil); (2) taking reasonable steps to prevent the illegal disposal of wastes; (3) protecting footings and foundations; (4) ensuring that each drainage feature is adequately maintained in perpetuity; and (5) pretreatment.

[79] USEPA, 1992. Guidance Manual for the Preparation of Part II of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems. Washington D.C. EPA/833-B-92-002.
[80] LARWQCB, 2001. Mitigation of Storm Water Impacts From New Developments In Environmentally Sensitive Areas.

Discussion of Finding C.13. Infiltration is an effective means for managing runoff. However, measures must be taken to protect groundwater quality when infiltration of runoff is implemented. USEPA supports runoff infiltration and provides guidance for protection of groundwater: "With a reasonable degree of site-specific design considerations to compensate for soil characteristics, infiltration may be very effective in controlling both urban runoff quality and quantity problems. This strategy encourages infiltration of urban runoff to replace the natural infiltration capacity lost through urbanization and to use the natural filtering and sorption capacity of soils to remove pollutants; however, the potential for some types of urban runoff to contaminate groundwater through infiltration requires some restrictions."[81] The restrictions placed on runoff infiltration in this Order are based on recommendations provided by the USEPA Risk Reduction Engineering Laboratory. The State Board found in Order WQ 2000-11 on the appeal of the LARWQCB's Standard Urban Storm Water Mitigation Plan (SUSMP) requirements that the guidance provided in the above referenced document by the USEPA Risk Reduction Engineering Laboratory is sufficient for the protection of groundwater quality from runoff infiltration. To further protect groundwater quality, the Order also includes guidance from the LARWQCB,[82] the State of Washington,[83] and the State of Maryland.[84] Subsequently, the California Storm Water Quality Association (CASQA) has produced technical guidance for post-construction treatment BMPs to protect ground water quality[85].

Finding C.14. Non-storm water (dry weather) discharge from the MS4 is not considered a storm water (wet weather) discharge and therefore is not subject to regulation under the Maximum Extent Practicable (MEP) standard from CWA 402(p)(3)(B)(iii), which is explicitly for "Municipal … *Stormwater Discharges* (emphasis added)" from the MS4. Non-storm water discharges, per CWA 402(p)(3)(B)(ii), are to be effectively prohibited. Such dry weather non-storm water discharges have been shown to contribute significant levels of pollutants and flow in arid, developed Southern California watersheds and are not to be effectively prohibited under the Clean Water Act.

Discussion of Finding C.14.

<u>Permitting Framework</u>
The Clean Water Act (CWA) employs the strategy of prohibiting the discharge of any pollutant from a point source into waters of the United States unless the discharger of the pollutant(s) obtains a NPDES permit pursuant to Section 402 of the Clean Water

[81] USEPA, 1994. Potential Groundwater Contamination from Intentional and Nonintentional Stormwater Infiltration. EPA 600 SR-94 051.
[82] LARWQCB, 2000. Standard Urban Storm Water Mitigation Plan for Los Angeles County and Cities in Los Angeles County.
[83] Washington State Department of Ecology, 1999. Draft Stormwater Management in Washington State. Volume V – Runoff Treatment BMPs. Pub. No. 99-15.
[84] Maryland Department of the Environment, 1999. 2000 Maryland Stormwater Design Manual. Volume I.
[85] CASQA. The New Development and Redevelopment Handbook, 2003. Available on-line at http://www.cabmphandbooks.org/Development.asp

Act. The discharge of storm water and/or non-storm water from an MS4 system is considered a discharge from a point source. As discussed below, however, the Clean Water Act regulates storm water and non-storm water discharges under different standards.

In 1987 the CWA was amended to include provisions that specifically concerned NPDES permitting requirements for storm water discharges from MS4 systems. Section 402(p) of the CWA regulates the discharge of storm water from a point source, the municipal separate storm sewers. Such discharges of storm water are subject to the maximum extent practicable (MEP) storm water standard and the related iterative process. The MEP standard for storm water discharges reflects Congress' recognition that the variability of flow and intensity of storm events render difficult strict compliance with water quality standards by MS4s. However, this standard was not considered applicable to non-storm water discharges, which under 402(p) are required to be effectively prohibited from entering the MS4. Clearly, if non-storm water discharges must be effectively prohibited from entering the MS4, the very next requirement (402(p)(3)(B)(iii)) requiring discharges from the MS4 be reduced to the MEP intends that the discharge of pollutants be limited to storm water. Unless exempt or authorized under a separate NPDES permit, non-storm water discharges are not authorized to enter the MS4 in the first instance and are considered to be illicit discharges.

The Federal Register further clarifies that such discharges through an MS4 are not authorized under the CWA (55 Fed. Reg. 47995):

> "Today's rule defines the term "illicit discharge" to describe any discharge through a municipal separate storm sewer system that is not composed entirely of storm water and that is not covered by an NPDES permit. Such illicit discharges are not authorized under the Clean Water Act. Section 402(p(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit."

The federal regulations (40 Code of Federal Regulations (CFR) 122.26(d)(vi)(2)(B)) require that the municipal separate storm sewer discharger prohibit "through ordinance, order or similar means, illicit discharges to the municipal separate storm sewer." As owners and operators of the MS4, Copermittees cannot passively receive discharges from third parties (Federal Register 68766) and thus are responsible for the discharge of any non-storm water from their MS4.

The State Water Board's recent precedential order (Order WQ-2009-0008) affirming a Los Angeles County MS4 permit modification, consistent with USEPA's prior interpretations, recognizes that "[n]either the Clean Water Act nor the federal storm water regulations define 'non-storm water.' 'Illicit discharge' is defined as any discharge to an MS4 'not composed entirely of storm water.'[fn]. Thus, 'illicit

discharge' is the most nearly applicable definition of 'non-storm water' found in federal law and is often used interchangeably with that term."[86]

Storm Water and Non-storm Water Definitions

By definition non-storm water is not precipitation related. 40 CFR 122.26(b)(13) states that: "Storm water means storm water runoff, snowmelt runoff, and surface runoff and drainage." While "surface runoff and drainage" is not defined in federal law, it is related to precipitation events such as rain and/or snowmelt (see 55 Fed Reg 47995-96). The Federal Register (55, page 47995) includes an entire section on the definition of storm water and non-storm water. The term "surface runoff and drainage" does not include all incidental flows in the MS4 system, but consists of flows relating to precipitation events as clarified by the Federal Register, USEPA's documents and permitting, and other Regional Board Orders.

The Federal Register (55 Fed Reg 47995-47996) provides clarification on the distinction between storm water and non-storm water discharges, including their regulation:

> "In response to the comments which requested EPA to define the term storm water broadly to include a number of classes of discharges **which are not in any way related to precipitation events, EPA believes that this rulemaking is not an appropriate forum for addressing the appropriate regulation of such non-storm water discharges**, even though some classes of non-storm water discharges may typically contain only minimal amounts of pollutants. Congress did not intend that the term storm water be used to describe any discharge that has a de minimis amount of pollutants, not did it intend for section 402(p) to be used to provide a moratorium from permitting other non-storm water discharges."

As recently recognized by the State Water Board in a precedential decision upholding an MS4 permit modification adopted by the Los Angeles Regional Water Board, "U.S. EPA has previously rejected the notion that 'storm water,' as defined at 40 Code of Federal Regulations section 122.26(b)(13), includes dry weather flows. In U.S. EPA's preamble to the storm water regulations, U.S. EPA rejected an attempt to define storm water to include categories of discharges 'not in any way related to precipitation events.'[fn]."[87] Thus, USEPA has made it clear that it deems discharges unrelated to precipitation events to be non-storm water discharges. 40 CFR 122.26(d)(iv)(B) itself provides specific examples of non-storm water discharges:

> "…the following category of non-storm water discharges or flows shall only be addressed where such discharges are identified by the municipality as sources of pollutants to the United States: water line flushing, landscape irrigation,

[86] State Water Board Order WQ-2009-0008 (*In the Matter of the Petition of County of Los Angeles and Los Angeles County Flood Control District*, adopted August 4, 2009), p. 4.
[87] State Water Board Order WQ-2009-0008 (*In the Matter of the Petition of County of Los Angeles and Los Angeles County Flood Control District*, adopted August 4, 2009), p. 7.

> diverted stream flows, rising ground waters, uncontaminated groundwater infiltration (as defined at 40 CFR 35.2005(20) to separate storm sewers, uncontaminated pumped groundwater,…"

USEPA also removed street wash waters from the definition of storm water, as USEPA specifically identified this discharge as being non-storm water (55 Fed. Reg. page 47996). Additionally, section 1.2.2.2. of USEPA's Multi-Sector General Permit for Industrial Activities (MSGP-2000) considers fire hydrant flushings, irrigation drainage, landscape watering, and foundation or footing drains to be non-storm water discharges. USEPA's September 1999 Storm Water Management Fact Sheet for Non-Storm Water Discharges to Storm Sewers states that non-storm water discharges can include discharges of process water, air conditioning condensate, non-contact cooling water, vehicle wash water, or sanitary wastes.

While these types of non-storm water discharges (or illicit discharges) may be regulated under storm water permits because as a practical matter they can enter and be discharged from the MS4 systems, they are not regulated as storm water discharges under the Clean Water Act because they are unrelated to precipitation events. As indicated above, the State Water Resources Control Board recent discussion of this issue supports the conclusion that non-storm water discharges are unrelated to precipitation events. In its Order affirming amendments to the Los Angeles County MS4 permit to implement a TMDL to control bacteria in dry weather flows, the State Water Board rejected petitioners County of Los Angeles and the Los Angeles County Flood Control District implied assertion that the definition of "storm water" contained in the federal regulations (defined as "surface run-off and drainage") includes the run-off and drainage from non-storm events. The State Water Board notes that the challenged permit provisions do not apply to storm water flows in that they apply only during dry weather conditions as defined in the permit. In upholding the challenged order, the State Water Board notes that the Los Angeles Water Board's permit language followed USEPA's approach, referring to USEPA's rejection of attempts to define storm water to include categories of discharges "not in any way related to precipitation events."[88]

Lastly, the Regional Board and State Board have issued multiple permits for non-storm water discharges, including, but not limited to, R9-2008-0002 (extracted groundwater), R9-2002-0020 (hydrostatic discharge) and 2006-008 DWQ (utility vaults), pursuant to section 402 of the CWA.

<u>Permitting Non-storm Water Discharges</u>
The U.S. EPA's approach (and the Regional Board's under its approved program) for non-storm water discharges from MS4s is to regulate these discharges under the existing 402 NPDES framework (Fed Reg 47995 and 48037 see below) for discharges

[88] State Water Board Order WQ-2009-0008 (*In the Matter of the Petition of County of Los Angeles and Los Angeles County Flood Control District*, adopted August 4, 2009), p. 7 (quoting 55 Fed. Reg. 47990. 47995).

to surface waters. The NPDES program (40 CFR 122.44(d)) utilizes discharge prohibitions and effluent limitations as regulatory mechanisms to regulate non-storm water discharges, including the use of technology and water quality-based effluent limitations. Non-numerical effluent limitations, such as BMPs for non-storm water discharges may only be authorized where numerical effluent limits are infeasible or where the practices are reasonably necessary to achieve effluent limitations and standards or to carry out the purposes and intent of the CWA (40 CFR 122.44(k) see below).

The Federal Register (55, page 48037) provides clarification that non-storm water discharges from the MS4 are to be regulated under section 402, not 402(p):

> "Conveyances which continue to accept other "non-storm water" discharges (e.g. discharges without an NPDES permit) with the exceptions noted above (*exempted discharges that are not a source of pollutants*) do not meet the definition of municipal separate storm sewer and are not subject to 402(p)(3)(B) of the CWA unless such discharges are issued separate NPDES permits. Instead, conveyances which continue to accept non-storm water discharges which have not been issued separate NPDES permits are subject to sections 301 and 402 of the CWA."

This regulatory approach is consistent with the approach recently upheld by the State Water Board in a precedential order adopted on August 4, 2009. In this Order, the State Water Board rejected a challenge to amendments to the Los Angeles County MS4 permit that require compliance with receiving water limitations and discharge prohibitions for dry weather, non-storm water discharges. Petitioners there argued that the receiving water limits and discharge prohibitions for dry weather dischargers were inappropriate and that the Los Angeles Water Board should instead have regulated the discharges with the maximum extent practicable standard, through an iterative process. The State Water Board concludes that dry weather discharges, as defined in the permit and in the underlying TMDL, "are more appropriately regarded as non-storm water discharges, which the Clean Water Act requires to be effectively prohibited."[89]

As stated above, for NPDES permits under 402 of the CWA, the Code of Federal Regulations (122.44(k)) clarify that a discharger may utilize BMPs to control or abate the discharge of pollutants when:

> "(1) Authorized under section 304(e) of the CWA for the control of toxic pollutants and hazardous substances from ancillary industrial activities;
> (2) Authorized under section 402(p) of the CWA for the control of storm water discharges;
> (3) Numeric limits are infeasible; or
> (4) The practices are reasonably necessary to achieve effluent limitations and standards or to carry out the purposes and intent of the CWA."

[89] State Water Board Order WQ-2009-0008 (*In the Matter of the Petition of County of Los Angeles and Los Angeles County Flood Control District*, adopted August 4, 2009), p. 8

For the last 19 years, Southern Orange County NPDES permits for discharges of storm water have regulated non-storm water discharges from the MS4. These permits required Copermittees (dischargers) to prohibit non-storm water discharges into (thus through and from) their MS4 systems, implement a program to prevent illicit discharges, and monitor to identify illicit discharges and exempted discharges that are a source of pollution. These measures are considered Best Management Practices (BMPs), are required to be included in NPDES permits issued under Section 402(p) of the CWA, and are considered by USEPA to be an interim approach to permitting non-storm water discharges from the MS4 in accordance with section 402 of the CWA and CFR 122.44(k).

As explained in the discussion of Finding C.15., below, the Copermittees' reliance on BMPs for the past 19 years has not resulted in compliance with applicable water quality standards. The Regional Board has evaluated (in accordance with 40 CFR 122.44(d)(1)) past and existing controls (BMPs), non-storm water effluent monitoring results, the sensitivity of the species in receiving waters (e.g. endangered species), and the potential for effluent dilution, and has determined that existing BMPs to control pollutants in storm water discharges are not sufficient to protect water quality standards in receiving waters and the existing requirement that Copermittees effectively prohibit all types of unauthorized non-storm water discharges into the MS4 historically results in the discharge of pollutants to the receiving waters. Thus, numeric action levels for non-storm water, dry weather, discharges from the MS4 and required actions following observed exceedances of numeric action levels have been established. For further discussion regarding the development of action levels please see Finding E.12 and discussion.

Dry weather action levels are applicable to non-storm water discharges of effluent from the MS4 system. Non-storm water effluent discharges from the MS4 are those which occur during dry weather conditions. These action levels are not applied to storm water discharges, as defined within the Order. Storm water discharges regulated by the Order are required to meet the MEP standard and related iterative process and have separate action levels.

Dry weather action levels are applicable to non-storm water discharges from the MS4 system into receiving waters. Non-storm water discharges are already required to be prohibited unless specifically exempted or covered under a separate NPDES permit. Dry weather action levels apply to non-storm water discharges of effluent from a point source into receiving waters. The MS4 is not a receiving water. Should a discharger wish to discharge a non-exempt category to the MS4 system, such discharges require a separate NPDES permit pursuant to sections 402 and 301 of the CWA. It is also infeasible to monitor and sample every discharge into the MS4, as such discharges are diffuse by nature and may vary spatially and temporally.

Finding C.15. Non-storm water discharges to the MS4 granted an influent exception (i.e., which are exempt from the effective prohibition requirement set forth in CWA section 402(p)(3)(B)(ii)) under 40 CFR 122. 26 are included within this Order. Any exempted discharges identified by Copermittees as a source of pollutants are subsequently required to be *addressed* (emphasis added) as illicit discharges through prohibition and incorporation into existing IC/ID programs. The Copermittees have identified landscape irrigation, irrigation water and lawn water, previously exempted discharges, as a source of pollutants and conveyance of pollutants to waters of the United States.

Discussion of Finding C.15. The Federal Register (55, page 48037) and 40 CFR 122.26(d)(iv)(B) clarify that certain components and categories of non-storm water discharges into the MS4 are not required to be prohibited. The Code of Federal Regulations requires the discharger have:

> "…a program, including inspections, to implement through ordinance, orders or similar means to prevent illicit discharges to the municipal separate storm sewer system; this program shall address all types of illicit discharges, however, the following category of non-storm water discharges or flows shall only be addressed where such discharges are identified by the municipality as sources of pollutants to the United States: water line flushing, landscape irrigation, diverted stream flows, rising ground waters, uncontaminated groundwater infiltration (as defined at 40 CFR 35.2005(20) to separate storm sewers, uncontaminated pumped groundwater,…"

As such, the identification of any of these categories as a source of pollutants requires them to be addressed as illicit discharges, which are not authorized under the CWA, and are required to be "effectively prohibited" as illicit discharges via ordinance, order or similar means. The prohibition of previously exempted discharges of non-storm water to waters of the United States from entering, and necessarily being discharged from an MS4, conforms with CWA requirements for standards and enforcement for effluent limitations to necessary to meet water quality standards (33 U.S.C. 1311(b)(1)(C)).

To date the Copermittees have identified overspray and drainage from potable and reclaimed water landscape irrigation as a substantial source and conveyance mechanism for pollutants into waters of the United States. Irrigation runoff into the MS4, as identified by the Copermittees, is a source of pollutants to waters of the United States, and is required to be *addressed* (emphasis added) as an illicit discharge per 40 CFR 122.26(d)(2)(iv)(B)(1) by prohibition through implementing and enforcing an ordinance, order or similar means. The Copermittees have identified irrigation water as a source of pollutants and conveyance of pollutants to waters of the United States, when applied improperly in excess and thereafter entering the MS4, in the following documents:

- Per requirements of 401 Water Quality Certification 02C-055, the County of Orange conducted a **Drainage Area Reconnaissance and Urban Runoff**

Characterization study. From the reconnaissance and characterization, the County of Orange determined that:

> "…*water quality results provided two important findings*." First, "*analytical data strongly indicates that irrigation overspray and drainage constitutes a very substantial source and conveyance mechanism for fecal indicator bacteria into Aliso Creek, and suggests that reduction measures for this source of urban runoff could provide meaningful reduction in bacteria loading to the stream*."

- Aliso Creek, currently 303(d) listed as impaired for Indicator Bacteria, is included in the Bacteria Project I TMDL adopted by the Regional Board on December 12, 2007. Secondly, reclaimed water high in electrical conductivity and Nitrate was indicated as:

  > "…*the source water at three of the excessive runoff locations (P1,P2,J01). These dissolved nitrogen concentration and flow rates create relatively high nitrogen loadings, which have the potential to contribute to undesirable levels of periphytic algal growth in Aliso Creek.*"

- On November 15, 2007 the **Unified Annual Progress Report Program Effectiveness Assessment** for the 2006-2007 reporting period was submitted by the Copermittees. Within the report, the Copermittees demonstrate that a "*wide range of constituents exceeded the tolerance interval bounds*", including orthophosphate. Tolerance interval bounds are pollutant levels set by the Copermittees that represent when a problem may be occurring. These tolerance levels sometimes equate with Basin Plan Objectives (BPOs) and California Toxic Rules (CTR) and USEPA Criteria. The report states that "*high levels of orthophosphate concentration are most likely the result of fertilizer runoff or reclaimed water runoff*". Aliso Creek is currently 303(d) listed as impaired for phosphorous.

- On November 15, 2007 the **Watershed Action Plan Annual Report**(s) for the 2006-2007 reporting period was submitted by the County of Orange, Orange County Flood Control District and Copermittees within the San Juan Creek, Laguna Coastal Streams, Aliso Creek, and Dana Point Coastal Streams Watersheds. San Juan Creek, Laguna Coastal Streams, Aliso Creek and Dana Point Coastal Streams are all currently 303(d) listed as impaired for Indicator Bacteria within their watersheds and/or in the Pacific Ocean at the discharge points of their watersheds. These locations are included in the Bacteria Project I TMDL adopted by the Regional Board on December 12, 2007. The Copermittees, within their Watershed Action Strategy Table for Fecal Indicator Bacteria

  > "*Support programs to reduce or eliminate the discharge of anthropogenic dry weather nuisance flow throughout the […] watershed. Dry weather flow is the transport medium for bacteria and other 303(d) constituents of*

concern". Additionally, they state that "*conditions in the MS4 contribute to high seasonal bacteria propagation in-pipe during warm weather. Landscape irrigation is a major contributor to dry weather flow, both as surface runoff due to over-irrigation and overspray onto pavements; and as subsurface seepage that finds its way into the MS4*."

- In 2006, the State Water Quality Control Board (State Board) allocated Grant funding to the **SmartTimer/Edgescape Evaluation Program (SEEP)**. Project partners include the following Copermittees: the Cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Nigel, Laguna Woods, Lake Forest, Mission Viejo, Rancho Santa Margarita and San Juan Capistrano. Also included in the study were the Metropolitan Water District of Southern California, the Department of Agriculture and ten south Orange County water districts. The project targets irrigation runoff by retrofitting existing development and documenting the conservation and runoff improvements. The Grant Application states that:

  "*Irrigation runoff contributes flow & pollutant loads to creeks and beaches that are 303(d) listed for bacteria indicators.*"

  Furthermore, the grant application states:

  "*Regional program managers agree that the reduction and/or elimination of irrigation-related urban flows and associated pollutant loads may be key to successful attainment of water quality and beneficial use goals as outlined in the San Diego Basin Plan and Bacteria TMDL over the long term.*"

  This is reinforced in the project descriptions and objectives:

  "*Elevated dry-weather storm drain flows, composed primarily in the South Orange County Region of landscape irrigation water wasted as runoff, carry pollutants that impair recreational use and aquatic habitats all along Southern California's urbanized coastline. Storm drain systems carry the wasted water, along with landscape derived pollutants such as bacteria, nutrients and pesticides, to local creeks and the ocean. Given the local Mediterranean climate, excessive perennial dry season stream flows are an unnatural hydrologic pattern, causing species shifts in local riparian communities and warm, unseasonal contaminated freshwater plumes in the near-shore marine environment*".

  The basis of this grant project, conducted by the Copermittees and additional water use partners, is that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 is a source and conveyance of pollutants. In addition, they indicate that this alteration of natural flows is impacting the Beneficial Uses of Waters of the State and U.S.

D. Runoff Management Programs

Finding D.1.a. This Order specifies requirements necessary for the Copermittees to reduce the discharge of pollutants in storm water runoff to the maximum extent practicable (MEP). However, since MEP is a dynamic performance standard, which evolves over time as runoff management knowledge increases, the Copermittees' runoff management programs must continually be assessed and modified to incorporate improved programs, control measures, best management practices (BMPs), etc. in order to achieve the evolving MEP standard. Absent evidence to the contrary, this continual assessment, revision, and improvement of runoff management program implementation is expected to ultimately achieve compliance with water quality standards in the Region.

Discussion of Finding D.1.a. Under CWA section 402(p), municipalities are required to reduce the discharge of storm water pollutants from their MS4s to the maximum extent practicable (MEP). MEP is the critical technology-based performance standard that municipalities must attain. The MEP standard is an ever-evolving, flexible, and advancing concept, which considers technical and economic feasibility. As knowledge about controlling storm water runoff continues to evolve, so does that which constitutes MEP. Reducing the discharge of storm water pollutants to the MEP requires Copermittees to assess each program component and revise activities, control measures, best management practices (BMPs), and measurable goals, as necessary to meet MEP.

To achieve the MEP standard, municipalities must employ whatever BMPs are technically feasible (i.e., are likely to be effective) and are not cost prohibitive. The major emphasis is on technical feasibility. Reducing storm water pollutants to the MEP means choosing effective BMPs, and rejecting applicable BMPs only where other effective BMPs will serve the same purpose, or the BMPs would not be technically feasible, or the cost would be prohibitive. In selecting BMPs to achieve the MEP standard, the following factors may be useful to consider:

1. Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?
2. Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?
3. Public Acceptance: Does the BMP have public support?
4. Cost: Will the cost of implementing the BMP have a reasonable relationship to he pollution control benefits to be achieved?
5. Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc?

If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive BMPs, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost is prohibitive, it would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs that would address a pollutant source, or to pick a BMP based solely on cost, which would be clearly less effective. In selecting BMPs the municipality must make a serious attempt to comply and practical solutions may not be easily dismissed. In any case, the burden is on the municipal discharger to show compliance with its permit. After selecting BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented.[90]

A definition of MEP is not provided in either the federal statute or in the federal regulations. The final determination regarding whether a municipality has reduced storm water pollutants to the MEP can only be made by the Regional Board or the State Board, and not by the municipal discharger. While the Regional Board or the State Board ultimately define MEP, it is the responsibility of the Copermittees to initially propose actions that implement BMPs to reduce storm water pollution to the MEP. In other words, the Copermittees' runoff management programs to be developed under the Order are the Copermittees' proposals of MEP. Their total collective and individual activities conducted pursuant to their runoff management programs become their proposal for MEP as it applies both to their overall effort, as well as to specific activities. The Order provides a minimum framework to guide the Copermittees in meeting the MEP standard for storm water.

It is the Regional Board's responsibility to evaluate the proposed programs and specific BMPs to determine what constitutes MEP, using the above guidance and the court's 1994 decision in NRDC v. California Department of Transportation, Federal District Court, Central District of California. The federal court stated that a Copermittee must evaluate and implement BMPs except where (1) other effective BMPs will achieve greater or substantially similar pollution control benefits; (2) the BMP is not technically feasible; or (3) the cost of BMP implementation greatly outweighs the pollution control benefits. In the absence of a proposal acceptable to the Regional Board, the Regional Board will define MEP by requiring implementation of additional measures by the Copermittees.

[90] State Water Resources Control Board, 1993. Memo Entitled Definition of Maximum Extent Practicable.

The Copermittees' continual evolution in meeting the MEP standard is expected to achieve compliance with water quality standards. USEPA has consistently supported this expectation. In its Interim Permitting Approach for Water Quality-Based Effluent Limitations (WQBELs) in Storm Water Permits, USEPA states "the interim permitting approach uses best management practices (BMPs) in first-round storm water permits, and expanded or better-tailored BMPs in subsequent permits, where necessary, to provide for attainment of water quality standards."[91] USEPA reiterated its position in 1999, when it stated regarding the Phase II municipal storm water regulations that "successive iterations of the mix of BMPs and measurable goals will be driven by the objective of assuring maintenance of water quality standards" and "EPA anticipates that a permit for a regulated small MS4 operator implementing BMPs to satisfy the six minimum control measures will be sufficiently stringent to protect water quality, including water quality standards […]."[92]

The requirements of the Order are expected to achieve compliance with receiving water quality standards. The approach to be used is the continual assessment, revision, and improvement of Copermittee best management practice implementation. This approach is consistent with the Clean Water Act and State Board guidance. In Defenders of Wildlife v. Browner (1999, 197 F. 3d 1035), the United States Court of Appeals for the Ninth Circuit states: "Under 33 U.S.C. section 1342 (p)(3)(B)(iii), the EPA's choice to include either management practices or numeric limitations in the permits was within its discretion." In addition, the approach is consistent with State Board Order WQ 99-05, which outlines an iterative approach for achieving compliance with water quality standards.

Finding D.1.b. The Copermittees have generally been implementing the jurisdictional runoff management programs required pursuant to Order No. R9-2002-01 since February 13, 2003. Prior to that, the Copermittees were regulated by Order No. 96-03 since August 8, 1996. Runoff discharges, however, continue to cause or contribute to violations of water quality standards as evidenced by the Copermittees monitoring results.[93]

[91] Federal Register / Vol. 61, No. 166 / August 26, 1996 / P. 43761.
[92] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68753-68754.
[93] Orange County Storm Water Program, 2006. Unified Annual Progress Report, Program Effectiveness Assessment (San Diego Region).

Discussion of Finding D.1.b. In response to Order No. R9-2002-01, the Copermittees have improved their runoff management programs. For instance, comprehensive runoff management plans have been developed. In order to implement the plans, the Copermittees have, among other things, developed BMP requirements, improved inter- and intra-governmental coordination, improved training programs, improved illicit discharge detection procedures, and improved their monitoring efforts. Although the programmatic improvements have led to better implementation of BMPs, the Copermittees' monitoring data demonstrate that additional or revised BMPs are necessary to prevent discharges from MS4s from causing and contributing to violations of water quality standards. A discussion of data collected by the Copermittees is included in the discussion for Finding C.9.

Finding D.1.c. This Order contains new or modified requirements that are necessary to improve Copermittees' efforts to reduce the discharge of storm water pollutants in runoff to the MEP and achieve water quality standards. Some of the new or modified requirements, such as the revised Watershed Runoff Management Program section, are designed to specifically address these high priority water quality problems. Other new or modified requirements address program deficiencies that have been noted during audits, report reviews, and other Regional Board compliance assessment activities.

Discussion of Finding D.1.c. The Copermittees are required to update and expand their runoff management programs on jurisdictional and watershed levels in order to improve their efforts to reduce the contribution of storm water pollutants in runoff to the MEP and meet water quality standards. Changes to Order No. R9-2002-01's requirements have been made to help ensure these two standards are achieved by the Copermittees.

The Orders' jurisdictional requirements have changed based on findings by the Regional Board during typical compliance assurance activities or receipt of complaints.[94] The Regional Board performed full jurisdictional program audits of 8 of the 13 Copermittees during the Order No. R9-2002-01 permit term. Where the audits found common implementation problems, requirements have been altered to better ensure compliance. In addition, the Regional Board conducted detailed reviews of every jurisdictional annual report submitted by the Copermittees. Updates to the Copermittees' programs are also based on recommendations found in the Copermittees' ROWD.[95] In many instances, the Copermittees and the Regional Board have identified similar issues that merit program modifications.

[94] Audit reports, report reviews, and inspection reports are available for review at the Regional Board office.
[95] All significant changes made to the Order's requirements are described and explained in detail in Fact Sheet section X.

To better focus on attainment of water quality standards, the Order's watershed requirements have been improved. The conditions of the receiving waters now drive management actions, which in turn focus diminishing resources on the highest priority water quality problems within the receiving waters in each watershed. Improvements to watershed requirements were also made to facilitate a mutually clear understanding of the requirements between the Regional Board and Copermittees.

Finding D.1.d. Updated Jurisdictional Runoff Management Plans (JRMPs) and Watershed Runoff Management Plans (WRMPs), which describe the Copermittees' runoff management programs in their entirety, are needed to guide the Copermittees' runoff management efforts and aid the Copermittees in tracking runoff management program implementation. It is practicable for the Copermittees to update the JRMPs and WRMPs within one year, since significant efforts to develop these programs have already occurred.

Discussion of Finding D.1.d. Development of runoff management plans is a crucial runoff management measure and should be considered a BMP. The plans help organize and focus the Copermittees' programs and guide their implementation. In its statewide assessment report to USEPA Region IX and the State Board, Tetra Tech, Inc. concluded that the lack of a master storm water planning document must be considered a serious program deficiency[96]. When submitted to the Regional Board, the plans provide useful correspondence between the Copermittees and the Regional Board. The Plans also become available for review by the public, and thus facilitate public participation in runoff management decisions. Finally, while development and submittal of runoff management plans are not necessary to ensure compliance of the Copermittees' runoff management programs with the Order, the Regional Board is provided with a means to track Copermittee implementation.

The focus of the Order is on development and implementation of storm water programs which meet MEP, rather than creation of Copermittee plans which exhibit MEP. While the Order does not rely upon the plans to ensure MEP and other standards are achieved, the plans still serve a useful purpose. As stated above, the plans serve to organize the Copermittees' efforts to address runoff. As a practical matter, any program of the size required by the Order should be documented in writing. This serves to guide implementation of the program by the numerous individuals responsible for program implementation.

[96] Tetra Tech, Inc. 2006. *Assessment Report on Tetra Tech's Support of California's MS4 Stormwater Program.* Produced for USEPA Region IX and the California State and Regional Water Quality Control Boards.

Runoff management plans are not necessary for ensuring compliance with the Order because the Order itself contains sufficient detailed requirements to ensure that compliance with discharge prohibitions, receiving water limitations, and the narrative standard of MEP for storm water are achieved. Implementation by the Copermittees of programs in compliance with the Order's requirements, prohibitions, and receiving water limitations is the pertinent compliance standard to be used under the Order, as opposed to assessing compliance by reviewing the Copermittees' implementation of their plans alone. The Regional Board ensures compliance with the Order by reviewing annual reports, conducting inspections, performing audits, and through other general program oversight.

Runoff management plans are particularly important and useful for municipalities when program implementation is spread across several departments and/or when municipalities experience staff turnover.[97] Each Copermittee relies on multiple employees or contractors for program implementation, but the spread of responsibility varies among Copermittees.[98] Written jurisdictional plans ensure appropriate coordination within each municipality.

Copermittees' runoff management plans are simply descriptions of their runoff management programs required under the Order. These plans serve as procedural correspondence which guides program implementation and aids the Copermittees and Regional Board in tracking implementation of the programs. In this manner, the plans are not functional equivalents of the Order. For these reasons, the Copermittees' runoff management plans need not be an enforceable part of the Order.

The Copermittees' plans and programs can be updated within one year because much of their plans and programs are already in existence. In fact, many parts of their plans and programs have been in place for 15 years. Moreover, the adoption of Order No. R9-2002-01 required a larger scale reorganization of the Copermittees' programs than Tentative Order No. R9-2009-0002, but also allowed one year for program updates. The Copermittees were generally able to meet the time schedule required under Order No. R9-2002-01.

Finding D.1.e. Pollutants can be effectively reduced in storm water runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Pollution prevention is the reduction or elimination of pollutant generation at its source and is the best "first line of defense". Source control BMPs (both structural and non-structural) minimize the contact between pollutants and flows (e.g., rerouting run-on around pollutant sources or keeping pollutants on-site and out of receiving waters). Treatment control BMPs remove pollutants that have been mobilized by wet-weather or dry-weather flows.

[97] Tetra Tech, Inc. 2005. Program Evaluation Report. Orange County Storm Water Program: Cities of Laguna Beach, Laguna Hills, Lake Forest, and Rancho Santa Margarita.
[98] Responsible departments and employees are described in the 2005-06 Annual Reports for the MS4 programs.

Discussion of Finding D.1.e. The State Board finds in its Order No. WQ 98-01 that BMPs are effective in reducing pollutants in storm water runoff, stating that "implementation of BMPs [is] generally the most appropriate form of effluent limitations when designed to satisfy technology requirements, including reduction of pollutants to the maximum extent practicable." A State Board TAC further supports this finding by recommending "that nonpoint source pollution control can be accomplished most effectively by giving priority to [BMPs] in the following order:

1. Pollution Prevention – implementation of practices that use or promote pollution free alternatives;
2. Source Control – implementation of control measures that focus on preventing or minimizing urban runoff from contacting pollution sources;
3. Treatment Control – implementation of practices that require treatment of polluted runoff either onsite or offsite."[99]

Pollution prevention, the reduction or elimination of pollutant generation at its source, is an essential aspect of BMP implementation. Fewer pollutants are available to be washed from developed areas when the generation of pollutants by activities is limited. Thus, pollutant loads in storm water discharges are reduced from these areas. In addition, there is no need to control or treat pollutants that are never generated.[100] Furthermore, pollution prevention BMPs are generally more cost effective than removal of pollutants by treatment facilities or cleanup of contaminated media.[101,102]

In the Pollution Prevention Act of 1990, Congress established a national policy that emphasizes pollution prevention over control and treatment. CWC section 13263.3(a) also supports pollution prevention, stating "The Legislature finds and declares that pollution prevention should be the first step in a hierarchy for reducing pollution and managing wastes, and to achieve environmental stewardship for society. The Legislature also finds and declares that pollution prevention is necessary to support the federal goal of zero discharge of pollutants into navigable waters." Finally, the Basin Plan also supports this finding by stating "To eliminate pollutants in storm water, one can either clean it up by removing pollutants or prevent it from becoming polluted in the first place. Because of the overwhelming volume of storm water and the enormous costs associated with pollutant removal, pollution prevention is the only approach that makes sense."[103]

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[99] State Board, 1994. Urban Runoff Technical Advisory Committee Report and Recommendations. Nonpoint Source Management Program.
[100] Orange County Storm Water Copermittees. 2006. Report of Waste Discharge (San Diego Region).
[101] Devinny, J.S. et al. 2004. *Alternative Approaches to Stormwater Quality Control.* Prepared for the Los Angeles Regional Water Quality Control Board. Found as Appendix H to *NPDES Stormwater Cost Survey.* Prepared for the California State Water Resources Control Board by the Office of Water Programs California State University, Sacramento. Available on-line at: http://www.owp.csus.edu/research/npdes/
[102] Schueler, T.R.., 2000. Center for Watershed Protection. Assessing the Potential for Urban Watershed Restoration, Article 142.
[103] Regional Board, 1994. Water Quality Control Plan, San Diego Basin, Region 9.

USEPA also supports the utilization of a combination of BMPs to address pollutants in runoff. For example, USEPA has found there has been success in addressing illicit discharge related problems through BMP initiatives like storm drain stenciling and recycling programs, including household hazardous waste special collection days.[104] Structural BMP performance data has also been compiled and summarized by USEPA.[105]

The summary provides the performance ranges of various types of structural BMPs for removing suspended solids, nutrients, pathogens, and metals from storm water flows. These pollutants are generally a concern in storm water in the San Diego Region and Orange County.[106] For suspended solids, the least effective structural BMP type was found to remove 30-65 percent of the pollutant load, while the most effective was found to remove 65-100 percent of the pollutant load. For nutrients, the least effective structural BMP type was found to remove 15-45 percent of the pollutant load, while the most effective was found to remove 65-100 percent of the pollutant load. For pathogens, the least effective structural BMP type was found to remove <30 percent of the pollutant load, while the most effective was found to remove 65-100 percent of the pollutant load. For metals, the least effective structural BMP type was found to remove 15-45 percent of the pollutant load, while the most effective was found to remove 65-100 percent of the pollutant load.

Several studies conducted in the last few years have measured the effectiveness of treatment BMPs in southern Orange County. Studies have been conducted on both dry weather and wet weather flows. Each demonstrates that treatment control BMPs can, to varying degrees, remove pollutants from runoff, but that pollution prevention and source control BMPs are necessary to reduce storm water pollutant discharges to the point of supporting water quality objectives in the receiving waters. A partial list of such studies includes:

1. "Assessment of Best Management Practice (BMP) Effectiveness" by the Southern California Coastal Water Research Project (SCCWRP).[107] This project assesses the effectiveness of BMPs in southern California for improving water quality related to toxicity.

2. "Final Report for the Del Obispo Storm Drain Project" by the City of Dana Point.[108] This report assesses the implementation of a solids removal unit and low-flow diversion project.

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[104] USEPA, 1999. 40 CFR Parts 9, 122, 123, and 124 National Pollutant Discharge Elimination System-Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges. 64 FR 68728.
[105] USEPA, 1999. Preliminary Data Summary of Urban Storm Water Best Management Practices. EPA 821-R-99-012.
[106] Orange County Stormwater Program, Appendix E1 BMP Effectiveness and Applicability for Orange County (updated June 2005).
[107] Jeffrey S. Brown and Steven M. Bay 2005. *Assessment of Best Management Practice (BMP) Effectiveness.* SCCWRP Technical Report 461.
[108] City of Dana Point. 2005. *Final Report for the Del Obispo Storm Drain Project*. Prepared for the State Water Resources Control Board Agreement No. 02-216-550-0.

3. "Final Report for the Alipaz Storm Drain Treatment and Low Flow Diversion Project" by the City of Dana Point.[109] This report assesses the implementation of a solids removal unit and low-flow diversion project.

4. "Final Report for Poche Beach Urban Runoff Ultraviolet Light Bacteria Disinfection Project" by the County of Orange.[110] This report assesses the implementation of an ultraviolet system within a box culvert.

5. Final Report for J01P28 Interim Water Quality Improvement Package Plant Best Management Practices.[111] This report assesses the implementation of an ultraviolet treatment system at an inland waters storm drain outfall.

6. "Final Report for Wetland Capture and Treatment (WetCAT) Network" by the City of Laguna Niguel.[112] This report assesses the implementation of constructed wetlands.

Results of these recent studies demonstrate that treatment at the MS4 outfalls for pollutants that have already been discharged *into* the MS4 is generally unlikely to reduce pollutant concentrations to levels that would support water quality objectives. It also demonstrates that non-storm water discharges are occurring into the MS4 that are illicit discharges, exempted discharges that are a source of pollutants and/or discharges under a separate NPDES permit that are in violation of that permit.

It is important to note that the Clean Water Act and NPDES federal regulations clearly require control of discharges into the MS4. Section 402(p)(3)(B)(ii) of the Clean Water Act states that MS4 permits must "prohibit non-storm water discharges into the storm sewers." 40 CFR 122.26(d)(2)(iv)(B) requires Copermittees to "detect and remove […] illicit discharges and improper disposal into the storm sewer." See Finding C.14 and Discussion.

[109] City of Dana Point. 2004. *Final Report For The Alipaz Storm Drain Treatment And Low Flow Diversion Project" by the City of Dana Point.* Prepared for State Water Resources Control Board Agreement Number: 01-068-550-0.
[110] Volz, James. 2005. *Final Report for Poche Beach Urban Runoff Ultraviolet Light Bacteria Disinfection Project*. Prepared by the County of Orange for State Water Resources Control Board Agreement No. 01-236-550-1.
[111] Anderson, Max. 2005. Final Report: Aliso Beach Clean Beach Initiatives, J01P28 Interim Water Quality Improvement Package Plant Best Management Practices. Prepared by the County of Orange for State Water Resources Control Board Agreement No. 01-227-550-0.
[112] City of Laguna Niguel and CH2MHILL. 2004. *Final Report: Wetland Capture and Treatment (WetCAT) Network.* Prepared for State Water Resources Control Board Agreement No. 01-122-259-0.

The Order's approach to regulating discharges into and from the MS4 is in accordance with State Board Order WQ 2001-15. In that order, the State Board reviewed the San Diego County permit (Order No. 2001-01) requirements and made one change to one prohibition.[113] The Order upheld all other requirements of the current permit. Order No. R9-2009-0002 incorporates the one change made by the State Board, and continues the approach of Order No. 2001-01 (the basis for the current permit), as it was upheld by the State Board in Order WQ 2001-15. State Board Order WQ 2001-15 supports such requirements, stating: "It is important to emphasize that dischargers into MS4s continue to be required to implement a full range of BMPs, including source control."

The Court of Appeals, Fourth Appellate District, found that the current permit's approach to regulation of discharges into the MS4 was appropriate. Since the Tentative Order utilizes the same approach, the court decision supports the Tentative Order's requirements.

Finding D.1.f. Runoff needs to be addressed during the three major phases of urban development (planning, construction, and use) in order to reduce the discharge of storm water pollutants to the MEP, effectively prohibit non-storm water discharges and protect receiving waters. Development which is not guided by water quality planning policies and principles can unnecessarily result in increased pollutant load discharges, flow rates, and flow durations which can impact receiving water beneficial uses. Construction sites without adequate BMP implementation result in sediment runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. Existing development generates substantial pollutant loads which are discharged in runoff to receiving waters.

Discussion of Finding D.1.f. MS4 permits are issued to municipalities because of their land use authority. The ultimate responsibility for the pollutant discharges, increased runoff, and inevitable long-term water quality degradation that results from development lies with local governments. This responsibility is based on the fact that it is the local governments that have authorized the development (i.e., conversion of natural pervious ground cover to impervious surfaces) and the land uses that generate the pollutants and runoff. Furthermore, the MS4 through which the pollutants and increased flows are conveyed, and ultimately discharged into natural receiving waters, are owned and operated by the same local governments. In summary, the Copermittees under the Order are responsible for discharges into and out of their MS4s because (1) they own and operate the MS4; and (2) they have the legal authority that authorizes the very development and land uses with generate the pollutants and increased flows in the first place.

[113] The State Board removed the prohibition of discharges *into* the MS4 that cause or contribute to exceedances of water quality objectives. The revision allows for treatment of storm water flows once the pollutants have entered the MS4. It does not affect the effective prohibition on certain dry-weather flows into the MS4 that is required by the Clean Water Act.

For example, since grading cannot commence prior to the issuance of a local grading permit, the Copermittees have a built-in mechanism to ensure that all grading activities are protective of receiving water quality. The Copermittee has the authority to withhold issuance of the grading permit until the project proponent has demonstrated to the satisfaction of the Copermittee that the project will not violate their ordinances or cause the Copermittee to be in violation of its MS4 permit. Since the Copermittee will ultimately be held responsible for any discharges from the grading project by the Regional Board, the Copermittee will want to use its own permitting authority to ensure that whatever measures the Copermittee deems necessary to protect discharges into its MS4 are in fact taken by the project proponent.

The Order holds the local government accountable for this direct link between its land use decisions and water quality degradation. The Order recognizes that each of the three major stages in the development process (development planning, construction, and the use or operational stage) are controlled by and must be authorized by the local government. Accordingly, this permit requires the local government to implement, or require others to implement, appropriate best management practices to reduce storm water pollutant discharges and increased flow during each of the three stages of development.

Including plans for BMP implementation during the design phase of new development and redevelopment offers the most cost effective strategy to reduce storm water runoff pollutant loads to surface waters.[114] The Phase II regulations for small municipalities reflect the necessity of addressing runoff during the early planning phase. Due to the greater water quality concerns generally experienced by larger municipalities, Phase II requirements for small municipalities are also applicable to larger municipalities such as the Copermittees. The Phase II regulations direct municipalities to develop, implement, and enforce a program to address storm water runoff from new development and redevelopment projects that disturb greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale. The program must ensure that controls are in place that would prevent or minimize water quality impacts. This includes developing and implementing strategies which include a combination of structural and/or non-structural BMPs appropriate to the locality. The program must also ensure the adequate long-term operation and maintenance of BMPs.[115] USEPA expands on the Phase II regulations for urban development when it recommends that Copermittees:

[114] USEPA, 2000. Storm Water Phase II Compliance Assistance Guide. EPA 833-R-00-002.
[115] USEPA, 1999. 40 CFR Parts 9, 122, 123, and 124 National Pollutant Discharge Elimination System-Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. 64 FR 68845.

> "Adopt a planning process that identifies the municipality's program goals (e.g., minimize water quality impacts resulting from post-construction runoff from new development and redevelopment), implementation strategies (e.g., adopt a combination of structural and/or non-structural BMPs), operation and maintenance policies and procedures, and enforcement procedures. In developing your program, you should consider assessing existing ordinances, policies, programs and studies that address storm water runoff quality."

Management of storm water runoff during the construction phase is also essential. USEPA explains in the preamble to the Phase II regulations that storm water discharges generated during construction activities can cause an array of physical, chemical, and biological water quality impacts. Specifically, the biological, chemical and physical integrity of the waters may become severely compromised due to runoff from construction sites. Fine sediment from construction sites can adversely affect aquatic ecosystems by reducing light penetration, impeding sight-feeding, smothering benthic organisms, abrading gills and other sensitive structures, reducing habitat by clogging interstitial spaces within the streambed, and reducing intergravel dissolved oxygen by reducing the permeability of the bed material. Water quality impairment also results, in part, because a number of pollutants are preferentially absorbed onto mineral or organic particles found in fine sediment. The interconnected process of erosion (detachment of the soil particles), sediment transport, and delivery is the primary pathway for introducing key pollutants, such as nutrients, metals, and organic compounds into aquatic systems.[116]

Finally, storm water and non-storm water runoff from existing development must be addressed. The Copermittees' monitoring data exhibits that significant water quality problems exist in receiving waters which receive runoff from areas with extensive existing development, such as Aliso Creek. Source identification, BMP requirements, inspections, and enforcement are all important measures which can be implemented to address runoff from existing development. USEPA supports inspections and enforcement by municipalities when it states "Effective inspection and enforcement requires […] penalties to deter infractions and intervention by the municipal authority to correct violations. Enforcement mechanisms […] also must be described."[117]

Finding D.1.g. Annual reporting requirements included in this Order are necessary to meet federal requirements and to evaluate the effectiveness and compliance of the Copermittees' programs.

Discussion of Finding D.1.g. The annual reporting requirements are consistent with federal NPDES regulation 40 CFR 122.41, which states:

[116] Ibid., 64 FR 68728.
[117] USEPA, 1992. Guidance Manual for the Preparation of Part II of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems. EPA 833-B-92-002.

> "The operator of a large or medium municipal separate storm sewer system of a municipal separate storm sewer system that has been designated by the Director under section 122.26(a)(1)(v) of this part must submit an annual report by the anniversary of the date of the issuance of the permit for such a system. The report shall include: (1) The status of implementing the components of the storm water management program that are established as permit conditions; (2) Proposed changes to the storm water management program that are established as permit condition, Such proposed changes shall be consistent with § 122.26(d)(2)iii) of this part; (3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under § 122.26(d)(2)iv) and (d)(2)(v) of this part; (4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; (5) Annual expenditures and budget for year following each annual report; (6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; and (7) Identification of water quality improvements or degradation."

CWC section 13267 provides that "the regional board may require that any person who has discharged […] shall furnish, under penalty of perjury, technical or monitoring reports which the regional board requires."

The Regional Board must assess the reports to ensure that the Copermittees' programs are adequate to assess and address water quality. The reporting requirements can also be useful tools for the Copermittees to review, update, or revise their programs. Areas or issues which have received insufficient efforts can also be identified and improved.

Finding D.1.h. This Order establishes Storm Water Action Levels (SALs) for selected pollutants based on USEPA Rain Zone 6 (arid southwest) Phase I MS4 monitoring data for pollutants in storm water. The SALs were computed as the 90th percentile of the data set, utilizing the statistical based population approach, one of three approaches recommended by the California Water Board's Storm Water Panel in its report, 'The Feasibility of Numerical Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities (June 2006). SALs are identified in Section D of this Order. Copermittees shall implement a timely, comprehensive, cost-effective storm water pollution control program to reduce the discharge of pollutants in storm water from the permitted areas so as not to exceed the SALs. SALs express an integration of the adequacy/inadequacy of programmatic measures and BMPs required in this Order.

Discussion of Finding D.1.h. Section 402(p) of the CWA states MS4 permits for storm water shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the

Administrator or the State determines appropriate for the control of such pollutants. This includes requiring numeric effluent limitations for storm water.

SALs are not numeric effluent limitations, which is reflected in language which clarifies an excursion above a SAL does not create a presumption that MEP is not being met. Instead, a SAL exceedance is to be used by the Copermittee as an indication that the MS4 storm water discharge point is a definitive "bad actor," and the result from the monitoring needs to be considered as part of the iterative process for reducing pollutants in storm water to the MEP.

The CWA defines effluent limitations as:
“Any restriction imposed by the Director on quantities, discharge rates, and concentrations of pollutants which are “discharged” from “point sources” into “waters of the United States”…” A SAL is not a restriction on a quantity, rate or concentration, but is a level at which actions that further reduce pollutants from that discharge point need to be evaluated in order to reduce storm water pollutants to the MEP. Thus, SALs are not effluent limitations as defined by the CWC or CWA.

The approach of using "action levels" is consistent with recommendations made by USEPA in their Interim Permitting Approach for Water Quality-Based Effluent Limitations in Storm Water Permits, dated August 26, 1996:
"Under the Clean Water Act(CWA) and NPDES regulations, permitting authorities may employ a variety of conditions and limitations in storm water permits, including best management practices, performance objectives, narrative conditions, monitoring triggers, action levels (e.g., monitoring benchmarks, toxicity reduction evaluation action levels), etc., as the necessary water-quality based limitations, where numeric water quality based effluent limitations are determined to be unnecessary or infeasible". As such, these action levels are not considered numeric water quality-based effluent limitations.

It should be noted that a purpose of monitoring, required under this and previous Orders, is to aid in the evaluation of implemented programs and BMPs in reducing pollutants in storm water discharges to the MEP. The tentative Monitoring and Reporting Program states:

This Receiving Waters and Runoff Monitoring and Reporting Program is intended to meet the following goals:

2. Measure and improve the effectiveness of the Permittees’ runoff management programs;
3. Assess the chemical, physical, and biological impacts to receiving waters resulting from runoff discharges;
4. Characterize runoff discharges;
5. Identify sources of specific pollutants;
6. Prioritize drainage and sub-drainage areas that need management actions; and

9. Provide information to implement required BMP improvements.

For the past 4 permit cycles (19 years), Copermittees have utilized non-numerical limitations (BMPs) to control and abate the discharge of any pollutants in storm water discharges to the MEP. Copermittees have been accorded 19 years to research, develop, and deploy BMPs that are capable of reducing storm water discharges from the MS4 to levels represented in SALs. Storm Water Action Levels are set at such a level that any exceedance of a SAL will clearly indicate BMPs being implemented are insufficient to protect the Beneficial Uses of waters of the State. Copermittee shall utilize the exceedance information as a high priority consideration when adjusting and executing annual work plans, as required by this Permit. Failure to appropriately consider and react to SAL exceedances in an iterative manner creates a presumption that the Copermittee(s) have not complied to the MEP.

SALs have been developed utilizing Phase I storm water effluent data (updated February 2008, http://rpitt.eng.ua.edu/Research/ms4/mainms4.shtml) from the arid west region (USEPA Rain Zone 6). USEPA Rainfall Zone 6, which includes MS4 effluent data from Orange, San Diego, Los Angeles and Ventura County. While the County of Orange has a large monitoring data set, Regional Board staff have concluded that there is a lack of effluent monitoring from major outfalls that are representative of conditions throughout the Region. The approach taken to derive SALs is a straightforward percentile approach, with the SAL being set as the 90th percentile of the dataset for each constituent. This approach is consistent with the 2006 State Board Panel Report:

> "The statistically based population approach would once again rely on the average distribution of measured water quality values developed from many water quality samples taken for many events at many locations. In this case, however, the Action Level would be defined by the central tendency and variance estimates from the population data. For example, the Action Level could be set as two standard deviations above the mean, i.e. if measured concentrations are consistently higher than two standard deviations above the mean, an Action Level would be triggered. Other population based measures of central tendency could be used (i.e. geomean, median, etc.) or estimates of variance (i.e. prediction intervals, etc.). Regardless of which population based estimators are used (or percentile from above), the idea would be to identify the [statistically derived] point at which managers feel concentrations are significantly beyond the norm."

SALs are a measurable criteria which quantifies the performance of BMPs for a particular watershed or subwatershed that discharges storm water MS4 effluent from that particular discharge point. Thus, Copermittees can utilize SAL results to determine the effectiveness BMPs on the effluent from a particular area of the MS4.

SALs represent the lowest 10 percent of pollutant reduction for USEPA Rain Zone 6 MS4 Phase I programs discharging to waters of the United States. For the past 4

permit cycles (19 years), Copermittees have utilized non-numerical limitations (BMPs) to control and abate the discharge of any pollutants in storm water discharges to the MEP. Copermittees have been accorded 19 years to research, develop, and deploy BMPs that are capable of reducing storm water discharges from the MS4 to levels represented in SALs. Storm Water Action Levels are set at such a level that any exceedance of a SAL will indicate to the Copermittee(s) that the discharge is within the lowest 10% of monitored outfalls. Therefore, an exceedance of a SAL warrants priority consideration within the Copermittee iterative process.

Finding D.2.a. The Standard Storm Water Mitigation Plan (SSMP) requirements contained in this Order are consistent with Order WQ-2000-11 adopted by the State Water Resources Control Board (State Board) on October 5, 2000. In the precedential order, the State Board found that the design standards, which essentially require that runoff generated by 85 percent of storm events from specific development categories be infiltrated or treated, reflect the MEP standard. The order also found that the SSMP requirements are appropriately applied to the majority of the Priority Development Project categories contained in Section D.1 of this Order. The State Board also gave Regional Water Quality Control Boards the needed discretion to include additional categories and locations, such as retail gasoline outlets (RGOs), in SSMPs.

Discussion of Finding D.2.a. The post-construction requirements and design standards contained in the SSMP section of Order No. R9-2009-0002 constitute MEP consistent with State Board guidance, court decisions, and Regional Board requirements. The State Board and Regional Boards have made several recent decisions in regards to inclusion of SSMP requirements in MS4 permits. In a precedential decision, State Board WQ Order No. 2000-11, the State Board found that the SSMP provisions constitute MEP for addressing storm water pollutant discharges resulting from Priority Development Projects. The provisions of the SSMP section of the Order are also consistent with those previously issued by the Regional Board for Orange County (Order No. R9-2002-0001) and San Diego County (Order Nos. R9-2001-01 and R9-2007-0001), as well as requirements in the Los Angeles County MS4 permit (Order No. R4-2001-182). In State Board Order WQ 2001-15, the State Board reaffirmed that SSMP requirements constitute MEP. Moreover, the SSMP requirements of the San Diego County MS4 permit (Order No. R9-2001-01) were upheld when the California State Supreme Court declined to hear the matter on appeal.

Finding D.2.b. Controlling runoff pollution by using a combination of onsite source control and site design BMPs augmented with treatment control BMPs before the runoff enters the MS4 is important for the following reasons: (1) Many end-of-pipe BMPs (such as diversion to the sanitary sewer) are typically ineffective during significant storm events. Whereas, onsite source control BMPs can be applied during all runoff conditions; (2) End-of-pipe BMPs are often incapable of capturing and treating the wide range of pollutants which can be generated on a sub-watershed scale; (3) End-of-pipe BMPs are more effective when used as polishing BMPs, rather than the sole BMP to be implemented; (4) End-of-pipe BMPs do not protect the quality or beneficial uses of receiving waters between the pollutant source and the BMP; and (5) Offsite end-of-pipe BMPs do not aid in the effort to educate the public regarding sources of pollution and their prevention.

Discussion of Finding D.2.b. Many end-of-pipe BMPs are designed for low flow conditions because their end-of-pipe location prevents them from being designed for large storm events. This results in the end-of-pipe BMPs being overwhelmed, bypassed, or ineffective during larger storm events more frequently than onsite BMPs designed for larger storms. BMPs are also frequently most effective for a particular type of pollutant (such as sediment). Such BMPs may be appropriate for small sites with a limited suite of pollutants generated; however, end-of-pipe BMPs must typically be able to address a wide range of pollutants generated by a sub-watershed, limiting their effectiveness and/or increasing costs. Moreover, the location of some end-of-pipe BMPs allow for untreated pollutants to be discharged to and degrade receiving waters prior to their reaching the BMPs. This fails to protect receiving waters, which is the purpose of BMP implementation. In addition, opportunities to educate the public regarding runoff pollution can be lost when end-of-pipe BMPs are located away from pollutant sources and out of sight. Onsite BMPs can lead to a better public understanding of runoff issues since their presence can provide a visible and/or tangible lesson in pollution prevention.

Finding D.2.c. Use of Low-Impact Development (LID) site design BMPs at new development, redevelopment and retrofit projects can be an effective means for minimizing the impact of storm water runoff discharges from the development projects on receiving waters. LID is a site design strategy with a goal of maintaining or replicating the pre-development hydrologic regime through the use of design techniques. LID site design BMPs help preserve and restore the natural hydrologic cycle of the site, allowing for filtration and infiltration which can greatly reduce the volume, peak flow rate, velocity, and pollutant loads of storm water runoff. Current runoff management, knowledge, practices and technology have resulted in the use of LID BMPs as an acceptable means of meeting the storm water MEP standard.

Discussion of Finding D.2.c. The Clean Water Act (CWA) is the cornerstone of surface water quality protection in the United States. (The Act does not deal directly with ground water nor with water quantity issues.) The statute employs a variety of regulatory and nonregulatory tools to sharply reduce direct pollutant discharges into

waterways, and manage polluted runoff. These tools are employed to achieve the broader goal of restoring and maintaining the chemical, physical, and biological integrity of the nation's waters so that they can support the protection and propagation of fish, shellfish, wildlife and recreation in and on the water.

Increasing the volume, velocity, frequency and discharge duration of storm water runoff from developed areas will eventually greatly accelerate downstream erosion, impair stream habitat in natural drainages, and negatively impact beneficial uses. Development and urbanization increase pollutant loads and volume while simultaneously increasing impervious area. Impervious surfaces can neither absorb water nor remove pollutants and thus lose the purification and infiltration provided by naturally vegetated soil. Furthermore, impervious surfaces tend to concentrate pollutants on the top of the surface that are then washed off into the MS4 and waters of the State in a concentrated manner. The use of Low-Impact Development (LID) site design BMPs can be an effective means of minimizing the impact of runoff discharges on receiving waters. By reducing water pollution, reducing runoff and increasing groundwater recharge, LID helps to improve the quality of receiving surface waters, stabilize the flow rates of receiving waters (preventing downstream hydromodification), reduce downstream flooding and protect and enhance water supply sources. Current runoff management, knowledge, practice and technology has resulted in the use of LID BMPs as an acceptable means of meeting the MEP standard for storm water treatment.

Current municipal codes may oppose or hinder the design, use and implementation of specific elements of LID. These codes include, but are not limited to, emergency services access requirements, building landscape ordinances, building height limits and parking space requirements. It is essential for Copermittees to work with other responsible agencies and/or update codes that have the potential to impact the use of LID.

The Local Government Commission, a non-profit organization working to build livable communities, developed a set of principles known as the *Ahwahnee Water Principles for Resource-Efficient Land Use*[118] that provide the opportunity to reduce costs and improve the reliability and quality of our water resources. Implementation of LID incorporates several of the Ahwahnee principles such as:

> 1. "Community Design should be compact, mixed use, walkable and transit-oriented so that urban runoff pollutants are minimized and the open lands that absorb water are preserved to the maximum extent possible."
> 3. "Water holding areas such as creek beds, recessed athletic fields, ponds, cisterns, and other features that serve to recharge groundwater, reduce runoff, improve water quality and decrease flooding should be incorporated into the urban landscape."

[118] Local Government Commission, "The Ahwahnee Water Principles – A Blueprint for Regional Sustainability", http://water.lgc.org/Members/tony/docs/lgc_water_guide.pdf

4. "All aspects of landscaping from the selection of plants to soil preparation and the installation of irrigation systems should be designed to reduce water demand, retain runoff, decrease flooding, and recharge groundwater."
5. "Permeable surfaces should be used for hardscape. Impervious surfaces such as driveways, streets, and parking lots should be minimized so that land is available to absorb storm water, reduce polluted urban runoff, recharge groundwater and reduce flooding."

The use of LID site design BMPs helps reduce the amount of impervious area associated with development and allows storm water to infiltrate into the soil. Natural vegetation and soil filters storm water runoff and reduces the volume and pollutant loads of storm water. Studies have revealed that the level of imperviousness resulting from development and urbanization is strongly correlated with the water quality impairment of nearby receiving waters.[119] In many cases, the impacts on receiving waters due to changes in hydrology can be more significant than those attributable to the contaminants found in storm water discharges.[120] These impacts include stream bank erosion (increased sediment load and subsequent deposition), benthic habitat degradation, and decreased diversity of macroinvertebrates. Although conventional BMPs do reduce storm water pollutant loads, they may not effectively control adverse effects from changes in the discharge hydrologic conditions.[121]

The Order includes requirements for developments to include site design BMPs that mimic or replicate the natural hydrologic cycle. Open space designs which maximize pervious surfaces and retention of "natural" drainages have been found to reduce both the costs of development and pollutant export.[122] Moreover, USEPA finds including plans for a "natural" site design and BMP implementation during the design phase of new development and redevelopment offers the most cost effective strategy to reduce storm water pollutant loads to surface waters.[123] In addition, a recent U.S. Department of Housing and Urban Development guidance document on low-impact development notes that the use of LID-based storm water management design allows land to be developed, but in a cost-effective manner that helps mitigate potential environmental impacts.[124]

[119] USEPA, 1999. 40 CFR Parts 9, 122, 123, and 124 National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule.
[120] Ibid.
[121] USEPA, 2000. Low-Impact Development: A literature review. EPA-841-B-00-005. 35p.
[122] Center for Watershed Protection, 2000. "The Benefits of Better Site Design in Residential Subdivisions." Watershed Protection Techniques. Vol. 3. No. 2.
[123] USEPA, 1999. 40 CFR Parts 9, 122, 123, and 124 National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule.
[124] U.S. Department of Housing and Urban Development, Office of Policy Development and Research, 2003. "The Practice of Low Impact Development." Prepared by: NAHB Research Center, Inc. Upper Marlboro, Maryland. Contract No. H-21314CA. 131p.

Finding D.2.d. Retail Gasoline Outlets (RGOs) are significant sources of pollutants in storm water runoff. RGOs are points of convergence for motor vehicles for automotive related services such as repair, refueling, tire inflation, and radiator fill-up and consequently produce significantly higher loadings of hydrocarbons and trace metals (including copper and zinc) than other developed areas.

Discussion of Finding D.2.d. RGOs are included in the Order as a Priority Development Project category because RGOs produce significantly greater loadings of hydrocarbons and trace metals (including copper and zinc) than other developed areas. To meet the storm water MEP standard, source control and structural treatment BMPs are needed at RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) an ADT of 100 or more vehicles per day. These are appropriate thresholds since vehicular development size and volume of traffic are good indicators of potential impacts of storm water runoff from RGOs on receiving waters.

This finding has been added to satisfy State Board WQ Order No. 2000-11's requirements for including RGOs as a Priority Development Category. Order No. 2000-11 acknowledged that a threshold (size, average daily traffic, etc.) appropriate to trigger SSMP requirements should be developed for RGOs and that specific findings regarding RGOs should be included in MS4 permits to justify the requirement.[125] Additional detail to support the inclusion of RGOs can be found in the Fact Sheet discussion of Section D.1.d.2.j.

Finding D.2.e. Industrial sites are significant sources of pollutants in runoff. Pollutant concentrations and loads in runoff from industrial sites are similar or exceed pollutant concentrations and loads in runoff from other land uses, such as commercial or residential land uses. As with other land uses, LID site design, source control, and treatment control BMPs are needed at industrial sites in order to meet the MEP standard. These BMPs are necessary where the industrial site is larger than 10,000 square feet. The 10,000 square feet threshold is appropriate, since it is consistent with requirements in other Phase I NPDES storm water regulations throughout California.

[125] State Board, 2000. Order WQ 2000-11. In the Matter of the Petitions of The Cities Of Bellflower, Et Al., The City Of Arcadia, And Western States Petroleum Association Review of January 26, 2000 Action of the Regional Board And Actions and Failures to Act by both the California Regional Water Quality Control Board, Los Angeles Region and Its Executive Officer Pursuant to Order No. 96-054, Permit for Municipal Storm Water and Urban Run-Off Discharges Within Los Angeles County [NPDES NO. CAS614001] SWRCB/OCC FILES A-1280, A-1280(a) and A-1280(b)

Discussion of Finding D.2.e. Industrial sites can be a significant source of pollutants in storm water runoff. In an extensive review of storm water literature, the LARWQCB found widespread support for the finding that "industrial and commercial activities can also be considered hot spots as sources of pollutants." It also found that "industrial and commercial areas were likely to be the most significant pollutant source areas" of heavy metals.[126] Likewise, storm water runoff from heavy industry in the Santa Clara Valley has been found to be extremely toxic.[127] These findings are corroborated by USEPA, which states in the preamble to the 1990 Phase I NPDES storm water regulations that "Because storm water from industrial facilities may be a major contributor of pollutants to municipal separate storm sewer systems, municipalities are obligated to develop controls for storm water discharges associated with industrial activity through their system in their storm water management program." Since heavy industrial sites can be a significant source of pollutants in runoff in a manner similar to other SSMP project categories such as commercial development or automotive repair shops, it is appropriate to include heavy industrial sites as a SSMP category in the Order.

The Phase I NPDES storm water regulations require the Copermittees to "control through ordinance, permit, contract, order, or similar means, the contribution of pollutants to the municipal storm sewer by storm water discharges associated with industrial activity and the quality of storm water discharged from sites of industrial activity" (40 CFR 122.26(d)(2)(i)). In addition, it has been established that the MEP standard for the control of storm water runoff from new development projects includes incorporation of the SSMP requirements. Since the Copermittees must both control storm water pollutants from industrial sites and meet the storm water MEP standard for new development, it is appropriate to apply the SSMP requirements to heavy industrial sites.

The State Board's Order WQ 2000-11 indicates that it is appropriate to apply SSMP requirements to categories of development where evidence shows the category of development can be a significant source of pollutants. As evidenced above, heavy industrial sites can be a significant source of pollutants. Therefore, the Order includes heavy industrial sites as a SSMP Priority Development Project category.

[126] Los Angeles Regional Water Quality Control Board. 2001.
[127] Schueler and Holland, 2000. Storm Water Strategies for Arid and Semi-Arid Watersheds (Article 66). The Practice of Watershed Protection.

Finding D.2.f. If not properly designed or maintained, certain BMPs implemented or required by municipalities for runoff management may create a habitat for vectors (e.g. mosquitoes and rodents). However, proper BMP design and maintenance to avoid standing water can prevent the creation of vector habitat. Nuisances and public health impacts resulting from vector breeding can be prevented with close collaboration and cooperative effort between municipalities, the Orange County Vector Control District, and the California Department of Public Health during the development and implementation of runoff management programs.

Discussion of Finding D.2.f. The implementation of certain structural BMPs or other runoff treatment systems can result in significant vector problems in the form of increased breeding or harborage habitat for mosquitoes, rodents or other potentially disease transmitting organisms. The implementation of BMPs that retain water may provide breeding habitat for a variety of mosquito species, some of which have the potential to transmit diseases such as Western Equine Encephalitis, St. Louis Encephalomyelitis, and malaria. Recent BMP implementation studies by Caltrans[128] in District 7 and District 11 have demonstrated mosquito breeding associated with some types of BMPs. The Caltrans BMP Retrofit Pilot study cited lack of maintenance and improper design as factors contributing to mosquito production. However, a Watershed Protection Techniques article describes management techniques for selecting, designing, and maintaining structural treatment BMPs to minimize mosquito production.[129] State and local runoff management programs that include structural BMPs with the potential to retain water have been implemented in Florida and the Chesapeake Bay region without resulting in significant public health threats from mosquitoes or other vectors.[130]

Finding D.2.g. The increased volume, velocity, frequency and discharge duration of storm water runoff from developed areas has the potential to greatly accelerate downstream erosion, impair stream habitat in natural drainages, and negatively impact beneficial uses. Development and urbanization increase pollutant loads in storm water runoff and the volume of storm water runoff. Impervious surfaces can neither absorb water nor remove pollutants and thus lose the purification and infiltration provided by natural vegetated soil. Hydromodification measures for discharges to hardened channels allow for the future restoration of the hardened channels to their natural state, thereby restoring the chemical, physical, and biological integrity and Beneficial Uses of local receiving waters.

[128] Caltrans, 2000. BMP Retrofit Pilot Studies: A Preliminary Assessment of Vector Production.
[129] Watershed Protection Techniques, 1995. Mosquitoes in Constructed Wetlands: A Management Bugaboo? 1(4):203-207.
[130] Shaver, E. and R. Baldwin , 1995. Sand Filter Design for Water Quality Treatment in Herricks, E., Ed. Stormwater Runoff and Receiving Systems: Impact, Monitoring, and Assessment, CRC Lewis Publishers, New York, NY.

Discussion of Finding D.2.g. Increasing the volume, velocity, frequency and discharge duration of storm water runoff from developed areas will eventually greatly accelerate downstream erosion, impair stream habitat in natural drainages, and negatively impact beneficial uses. Development and urbanization increase pollutant loads and volume while simultaneously increasing impervious area. Impervious surfaces can neither absorb water nor remove pollutants and thus lose the purification and infiltration provided by naturally vegetated soil.

Historic hydromodification impacts, such as concrete lining and channelization, have impacted the natural physical habitat of urban streams resulting in low Index of Biotic Integrity (IBI) scores. The Copermittee's 2006-2007 monitoring indicated decreased IBI scores in the developed watersheds. In the absence of water chemistry and toxicity impacts, these low scores were attributed to be a result of poor physical habitat conditions.[131]

Hydromodification impacts result in poor physical habitat conditions through streambed scour, erosion, vegetation displacement, sediment deposition, channelization and channel modifications. Increased sediment loads from hydromodification causes other impacts to physical habitats including increased turbidity which then may cause increased temperatures. In addition, an increased sediment load may have an increased biological content thereby increasing the sediment oxygen demand and lowering the dissolved oxygen available for aquatic life.[132]

The objective of the CWA is "to restore and maintain the chemical, *physical,* and biological integrity of the Nation's waters (emphasis added)." Stream restoration by removing concrete and other unnatural materials is a major step toward achieving that objective. The success of future stream restoration and stabilization is, however, dependent on preventing and reducing physical impacts from activities upstream. Therefore, hydromodification management measures are necessary upstream of modified (e.g. concrete, rip rap, etc.) channels in addition to non-modified channels.

Please see discussion of Findings C.10 and C.11.

[131] Orange County Copermittees, November 15, 2007. 2006-2007 Unified Annual Progress Report Program Effectiveness Assessment (San Diego Region).
[132] USEPA, National Management Measures to Control Nonpoint Source Pollution from Hydromodification, EPA 841-B-07-002, July 2007.

Finding D.3.a. In accordance with federal NPDES regulations and to ensure the most effective oversight of industrial and construction site discharges, discharges of runoff from industrial and construction sites are subject to dual (state and local) storm water regulation. Under this dual system, each Copermittee is responsible for enforcing its local permits, plans, and ordinances, and the Regional Board is responsible for enforcing the General Construction Activities Storm Water Permit, State Board Order 99-08 DWQ, NPDES No. CAS000002 (General Construction Permit) and the General Industrial Activities Storm Water Permit, State Board Order 97-03 DWQ, NPDES No. CAS000001 (General Industrial Permit). NPDES municipal regulations require that municipalities develop and implement measures to address runoff from industrial and construction activities. Those measures may require the implementation of additional BMPs than are required under the statewide general permits for activities subject to both state and local regulation.

Discussion of Finding D.3.a. USEPA finds the control of pollutant discharges from industry and construction so important to receiving water quality that it has established a double system of regulation over industrial and construction sites. This double system of regulation consists of two parallel regulatory systems with the same common objective: to keep pollutants from industrial and construction sites out of the MS4. In this double system of regulation for runoff from industrial and construction sites, local governments must enforce their legal authorities (i.e., local ordinances and permits) while the Regional Board must enforce its legal authority (i.e., statewide general industrial and construction storm water permits). These two regulatory systems are designed to complement and support each other. Municipalities are not required to enforce Regional Board and State Board permits; however, they are required to enforce their ordinances and permits. The Federal regulations are clear that municipalities have responsibility to prevent non-storm water and address storm water runoff from industrial and construction sites which enters their MS4s.

Municipalities have this responsibility because they have the authority to issue land use and development permits. Since municipalities are the lead permitting authority for industrial land use and construction activities, they are also the lead for enforcement regarding runoff discharges from these sites. For sites where the municipality is the lead permitting authority, the Regional Board will work with the municipality and provide support where needed. The Regional Board will assist municipalities in enforcement against non-compliant sites after the municipality has exhibited a good faith effort to bring the site into compliance.

According to USEPA, the storm water regulations envision that NPDES permitting authorities and municipal operators will cooperate to develop programs to monitor and control pollutants in storm water discharges from industrial facilities.[133] USEPA discusses the "dual regulation" of construction sites in its Storm Water Phase II Compliance Assistance Guide, which states "Even though all construction sites that disturb more than one acre are covered nationally by an NPDES storm water permit, the construction site runoff control minimum measure […] is needed to induce more localized site regulation and enforcement efforts, and to enable operators […] to more effectively control construction site discharges into their MS4s."[134] While the Storm Water Phase II Compliance Assistance Guide applies to small municipalities, it is applicable to the Copermittees, because they are similar in size and have the potential to discharge similar pollutant types as Phase II municipalities.

Finding D.3.b. Identification of sources of pollutants in runoff (such as municipal areas and activities, industrial and commercial sites/sources, construction sites, and residential areas), development and implementation of BMPs to address those sources, and updating ordinances and approval processes are necessary for the Copermittees to ensure that discharges of pollutants from its MS4 in storm water are reduced to the MEP and that non-storm water discharges are not occurring. Inspections and other compliance verification methods are needed to ensure minimum BMPs are implemented. Inspections are especially important at high risk areas for pollutant discharges.

Discussion of Finding D.3.b. Source identification is necessary to characterize the nature and extent of pollutants in discharges and to develop appropriate BMPs. It is the first step in a targeted approach to runoff management. Source identification helps identify the location of potential sources of pollutants in runoff. Pollutants found to be present in receiving waters can then be traced to the sites which frequently generate such pollutants. In this manner source inventories can help to target inspections, monitoring, and potential enforcement. This allows for limited inspection, monitoring, and enforcement time to be most effective. USEPA supports source identification as a concept when it recommends construction, municipal, and industrial source identification in guidance and the federal regulations.[135,136]

[133] USEPA, 1992. Guidance Manual for the Preparation of Part II of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems. EPA 833-B-92-002.
[134] USEPA, 2000. Storm Water Phase II Compliance Assistance Guide. EPA 833-R-00-002.
[135] USEPA, 1992. Guidance Manual for the Preparation of Part II of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems. EPA 833-B-92-002.
[136] 40 CFR 122.26(d)(2)(ii)

The development of BMPs for identified sources will help ensure that appropriate, consistent controls are implemented at all types of development and areas. Copermittees must reduce the discharge of pollutants in storm water runoff to the maximum extent practicable. To achieve this level of pollutant reduction, BMPs must be implemented. Designation of minimum BMPs helps ensure that appropriate BMPs are implemented for various sources. These minimum BMPs also serve as guidance as to the level of water quality protection required. USEPA requires development and implementation of BMPs for construction, municipal, commercial, industrial, and residential sources at 40 CFR 122.26(d)(2)(iv)(A-D).

Updating ordinances and approval processes is necessary in order for the Copermittees to control discharges to their MS4s. USEPA supports updating ordinances and approval processes when it states "A crucial requirement of the NPDES storm water regulation is that a municipality must demonstrate that it has adequate legal authority to control the contribution of pollutants in storm water discharged to its MS4. […] In order to have an effective municipal storm water management program, a municipality must have adequate legal authority to control the contribution of pollutants to the MS4. […] 'Control,' in this context, means not only to require disclosure of information, but also to limit, discourage, or terminate a storm water discharge to the MS4."[137]

Inspections provide a necessary means for the Copermittees to evaluate compliance of pollutant sources with their municipal ordinances and minimum BMP requirements. USEPA supports inspections when it recommends inspections of construction, municipal, and industrial sources.[138] Inspection of high risk sources are especially important because of the ability of frequent inspections to help ensure compliance, thereby reducing the risk associated with such sources. USEPA suggests that inspections can improve compliance when it states "Effective inspection and enforcement requires […] penalties to deter infractions and intervention by the municipal authority to correct violations."[139]

Finding D.3.c. Historic and current development makes use of natural drainage patterns and features as conveyances for runoff. Urban streams used in this manner are part of the municipalities MS4 regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the urban stream is both an MS4 and receiving water.

[137] USEPA, 1992. Guidance Manual for the Preparation of Part II of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems. EPA 833-B-92-002.
[138] Ibid.
[139] USEPA, 1992. Guidance Manual for the Preparation of Part II of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems. EPA 833-B-92-002.

Discussion of Finding D.3.c. An MS4 is defined in the federal regulations as a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains), owned or operated by a Copermittee, and designed or used for collecting or conveying runoff.[140] Natural drainage patterns and urban streams are frequently used by municipalities to collect and convey runoff away from development within their jurisdiction. Therefore, the Regional Board considers natural drainages that are used for conveyances of runoff, regardless of whether or not they've been altered by the municipality, as both part of the MS4s and as receiving waters. To clarify, an unaltered natural drainage, which receives runoff from a point source (channeled by a Copermittee to drain an area within their jurisdiction), which then conveys the runoff to an altered natural drainage or a man-made MS4, is both an MS4 and a receiving water.[141]

Finding D.3.d. As operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not prohibit or control. These discharges may cause or contribute to a condition of contamination or a violation of water quality standards.

[140] USEPA, 2000. EPA Administered Permit Programs: The National Pollutant Discharge Elimination System. Code of Federal Regulations, Vol. 40, Part 122.
[141] Regional Board, 2001. Response in Opposition to Petitions for Review of California Regional Water Quality Control Board San Diego Region Order No. 2001-01 – NPDES Permit No. CAS0108758 (San Diego Municipal Storm Water Permit).

Discussion of Finding D.3.d. CWA section 402(p) requires operators of MS4s to prohibit non-storm water discharges into their MS4s. This is necessary because pollutants which enter the MS4 generally are conveyed through the MS4 to be eventually discharged into receiving waters. If a municipality does not prohibit non-storm water discharges, it is providing the pathway (its MS4) which enables pollutants to reach receiving waters. Since the municipality's storm water management service can result in pollutant discharges to receiving waters, the municipality must accept responsibility for the water quality consequences resulting from this service. Furthermore, third party discharges can cause a municipality to be out of compliance with its permit. Since pollutants from third parties which enter the MS4 will eventually be discharged from the MS4 to receiving waters, the third party discharges can result in a situation of municipality non-compliance if the discharges lead to an exceedance of water quality standards. For these reasons, each Copermittee must prohibit and/or control discharges from third parties to its MS4. USEPA supports this concept when it states "the operators of regulated small MS4s cannot passively receive and discharge pollutants from third parties" and "the operator of a small MS4 that does not prohibit and/or control discharges into its system essentially accepts 'title' for those discharges. At a minimum, by providing free and open access to the MS4s that convey discharges to the waters of the United States, the municipal storm sewer system enables water quality impairment by third parties."[142]

Finding D.3.e. Waste and pollutants which are deposited and accumulate in MS4 drainage structures will be discharged from these structures to waters of the U.S. unless they are removed. These discharges may cause or contribute to, or threaten to cause or contribute to, a condition of pollution in receiving waters. For this reason, pollutant discharges from storm water into MS4s must be reduced using a combination of management measures, including source control, and an effective MS4 maintenance program must be implemented by each Copermittee.

Discussion of Finding D.3.e. When rain falls and drains freeways, industries, construction sites, and neighborhoods, it picks up a multitude of pollutants. Gravity flow transports the pollutants to the MS4. Illicit discharges and connections also can contribute a significant amount of pollutants to MS4s. MS4s are commonly designed to convey their contents as quickly as possible. Due to the resulting typically high flow rates within the concrete conveyance systems of MS4s, pollutants which enter or are deposited in the MS4 and not removed are generally flushed unimpeded through the MS4 to waters of the United States. Since treatment generally does not occur within the MS4, in such cases reduction of storm water pollutants to the MEP must occur prior to discharges entering the MS4.

[142] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68765-68766.

The importance of this concept is supported by the tons of wastes/pollutants that have been removed from the Copermittees' MS4s as reported in their ROWD.[143] Moreover, these pollutants will be discharged into receiving waters unless an effective MS4 and structural treatment BMP maintenance program is implemented by the Copermittees. The requirement for Copermittees to conduct a MS4 maintenance program is specifically directed in both the Phase I and Phase II storm water regulations. Regarding MS4 cleaning, USEPA states "The removal of sediment, decaying debris, and highly polluted water from catch basins has aesthetic and water quality benefits, including reducing foul odors, reducing suspended solids, and reducing the load of oxygen-demanding substances that reach receiving waters."[144] It goes on to say, "Catch basin cleaning is an efficient and cost-effective method for preventing the transport of sediment and pollutants to receiving water bodies." USEPA also finds that "Lack of maintenance often limits the effectiveness of storm water structural controls such as detention/retention basins and infiltration devices. […] The proposed program should provide for maintenance logs and identify specific maintenance activities for each class of control, such as removing sediment from retention ponds every five years, cleaning catch basins annually, and removing litter from channels twice a year."[145]

Finding D.3.f. Enforcement of local runoff related ordinances, permits, and plans is an essential component of every runoff management program and is specifically required in the federal storm water regulations and this Order. Each Copermittee is individually responsible for adoption and enforcement of ordinances and/or policies, implementation of identified control measures/BMPs needed to prevent or reduce pollutants in storm water runoff, and for the allocation of funds for the capital, operation and maintenance, administrative, and enforcement expenditures necessary to implement and enforce such control measures/BMPs under its jurisdiction. Education is an important aspect of every effective runoff management program and the basis for changes in behavior at a societal level. Education of municipal planning, inspection, and maintenance department staffs is especially critical to ensure that in-house staffs understand how their activities impact water quality, how to accomplish their jobs while protecting water quality, and their specific roles and responsibilities for compliance with this Order. Public education, designed to target various urban land users and other audiences, is also essential to inform the public of how individual actions affect receiving water quality and how adverse effects can be minimized.

[143] Orange County Storm Water Copermittees. 2006. Report of Waste Discharge (San Diego Region).
[144] USEPA, 1999. Storm Water O&M Fact Sheet, Catch Basin Cleaning. EPA 832-F-99-011.
[145] USEPA, 1992. Guidance Manual for the Preparation of Part II of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems. EPA 833-B-92-002.

Discussion of Finding D.3.f. The Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(A – D) are clear in placing responsibility on municipalities for control of runoff from third party activities and land uses to their MS4.[146] In order for municipalities to assume this responsibility, they must implement ordinances, permits, and plans addressing runoff from third parties. Assessments for compliance with their ordinances, permits, and plans are essential for a municipality to ensure that third parties are not causing the municipality to be in violation of its municipal storm water permit. When conditions of non-compliance are determined, enforcement is necessary to ensure that violations of municipality ordinances and permits are corrected. When the Copermittees determine a violation of its storm water ordinance, it must pursue correction of the violation. Without enforcement, third parties do not have incentive to correct violations. USEPA supports enforcement by municipalities when it states "Effective inspection and enforcement requires […] penalties to deter infractions and intervention by the municipal authority to correct violations. Enforcement mechanisms […] also must be described."[147]

Education is a critical BMP and an important aspect of runoff management programs. USEPA finds that "An informed and knowledgeable community is critical to the success of a storm water management program since it helps ensure the following: Greater support for the program as the public gains a greater understanding of the reasons why it is necessary and important, [and] greater compliance with the program as the public becomes aware of the personal responsibilities expected of them and others in the community, including the individual actions they can take to protect or improve the quality of area waters."[148]

Regarding target audiences, USEPA also states "The public education program should use a mix of appropriate local strategies to address the viewpoints and concerns of a variety of audiences and communities, including minority and disadvantaged communities, as well as children."

Finding D.3.g. Public participation during the development of runoff management programs is necessary to ensure that all stakeholder interests and a variety of creative solutions are considered.

Discussion of Finding D.3.g.
This finding is supported by the Phase II Storm Water Regulations, which state "early and frequent public involvement can shorten implementation schedules and broaden public support for a program." USEPA goes on to explain, "Public participation is likely to ensure a more successful storm water program by providing valuable expertise and a conduit to other programs and governments."[149]

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[146] USEPA, 2000. EPA Administered Permit Programs: The National Pollutant Discharge Elimination System. Code of Federal Regulations, Vol. 40, Part 122.
[147] USEPA, 1992. Guidance Manual for the Preparation of Part II of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems. EPA/833-B-92-002.
[148] USEPA, 2000. Storm Water Phase II Compliance Assistance Guide. EPA 833-R-00-002.
[149] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68755.

Finding D.3.h. Retrofitting existing development with storm water treatment controls including LID, is necessary to address storm water discharges from existing development that may cause or contribute to a condition of pollution or a violation of water quality standards. Although SSMP BMPs are required for redevelopment, the current rate of redevelopment will not address water quality problems in a timely manner. Cooperation with private landowners is necessary to effectively identify, implement and maintain retrofit projects for the preservation, restoration, and enhancement of water quality.

Discussion of Finding D.3.h. Existing BMPs are not sufficient to protect the Beneficial Uses of receiving waters from storm water MS4 discharges, as evidenced by 303(d) listings and exceedances of Water Quality Objectives from the Copermittees monitoring reports. Implementing more advanced BMPs, including the retrofitting of existing development with LID, is part of the iterative process. Based on the current rate of redevelopment compared to existing BMPs, the use of LID only on new and redevelopment will not adequately address current water quality problems, including downstream hydromodification. Retrofitting existing development is practicable for a municipality through a systematic evaluation, prioritization and implementation plan focused on impaired water bodies, pollutants of concern, areas of downstream hydromodification, feasibility and effective communication and cooperation with private property owners.

Finding D.4.a. Since runoff within a watershed can flow from and through multiple land uses and political jurisdictions, watershed-based runoff management can greatly enhance the protection of receiving waters. Such management provides a means to focus on the most important water quality problems in each watershed. By focusing on the most important water quality problems, watershed efforts can maximize protection of beneficial use in an efficient manner. Effective watershed-based runoff management actively reduces pollutant discharges and abates pollutant sources causing or contributing to watershed water quality problems. Watershed-based runoff management that does not actively reduce pollutant discharges and abate pollutant sources causing or contributing to watershed water quality problems can necessitate implementation of the iterative process outlined in section A.3 of the Tentative Order. Watershed management of runoff does not require Copermittees to expend resources outside of their jurisdictions. Watershed management requires the Copermittees within a watershed to develop a watershed-based management strategy, which can then be implemented on a jurisdictional basis.

Discussion of Finding D.4.a. In recent years, addressing water quality issues from a watershed perspective has increasingly gained attention. Regarding watershed-based permitting, the USEPA *Watershed-Based NPDES Permitting Policy Statement* issued on Jan. 7, 2004 states the following:

> USEPA continues to support a holistic watershed approach to water quality management. The process for developing and issuing NPDES permits on a watershed basis is an important tool in water quality management. USEPA believes that developing and issuing NPDES permits on a watershed basis can benefit all watershed stakeholders, from the NPDES permitting authority to local community members. A watershed-based approach to point source permitting under the NPDES program may serve as one innovative tool for achieving new efficiencies and environmental results. USEPA believes that watershed-based permitting can:
>
> - Lead to more environmentally effective results;
> - Emphasize measuring the effectiveness of targeted actions on improvements in water quality;
> - Provide greater opportunities for trading and other market based approaches;
> - Reduce the cost of improving the quality of the nation's waters;
> - Foster more effective implementation of watershed plans, including total maximum daily loads (TMDLs); and
> - Realize other ancillary benefits beyond those that have been achieved under the CWA (e.g., facilitate program integration including integration of clean water act and safe drinking water act programs).
>
> Watershed-based permitting is a process that ultimately produces NPDES permits that are issued to point sources on a geographic or watershed basis. In establishing point source controls in a watershed-based permit, the permitting authority may focus on watershed goals, and consider multiple pollutant sources and stressors, including the level of nonpoint source control that is practicable. In general, there are numerous permitting mechanisms that may be used to develop and issue permits within a watershed approach.

This USEPA guidance is in line with State Board and Regional Board watershed management goals. For example, the State Board's TAC recommends watershed-based water quality protection, stating "Municipal permits should have watershed specific components." The TAC further recommends that "All NPDES permits and Waste Discharge Requirements should be considered for reissuance on a watershed basis."

In addition, the Basin Plan states that "public agencies and private organizations concerned with water resources have come to recognize that a comprehensive evaluation of pollutant contributions on a watershed scale is the only way to realistically assess cumulative impacts and formulate workable strategies to truly protect our water resources. Both water pollution and habitat degradation problems can best be solved by following a basin-wide approach."

In light of USEPA's policy statement and the State Board's and Regional Board's watershed management goals, the Regional Board seeks to expand watershed management in the regulation of runoff from the MS4. Watershed-based MS4 permits can provide for more effective receiving water quality protection by focusing on specific water quality problems. The entire watershed for the receiving water can be assessed, allowing for critical areas and practices to be targeted for corrective actions. Known sources of pollutants of concern can be investigated for potential water quality impacts. Problem areas can then be addressed, leading to eventual improvements in receiving water quality. Management of runoff on a watershed basis allows for specific water quality problems to be targeted so that efforts result in maximized water quality improvements.[150]

Finding D.4.b. Some runoff issues, such as general education and training, can be effectively addressed on a regional basis. Regional approaches to runoff management can improve program consistency and promote sharing of resources, which can result in implementation of more efficient programs.

Discussion of Finding D.4.b. Copermittees in Orange County participate in several runoff-related activities whose scope extends beyond the area subject to this Order. These include countywide activities (e.g., portions of Orange County fall under the jurisdiction of the Santa Ana Regional Board), southern California, and statewide activities. Copermittees' participation in these regional activities is generally directed at improving management capability, preventing redundancy and taking advantage of economies of scale. For instance, Copermittees seek to develop consistency between watershed and/or jurisdictional programs (e.g., through standards development), and to collaborate on certain program activities such as education, training, and monitoring. The Copermittees report agreeing that jurisdictional, watershed, and regional programs cannot be effectively developed and implemented in isolation. In addition, the Copermittees, through WRMP implementation efforts, have learned that many watershed activities can be more effectively implemented (e.g., achieve more water quality benefits) at the regional level due to economies of scale and agree watershed protection should be increasingly emphasized as a focal point of Copermittee efforts under the re-issued Permit.[151]

Finding D.4.c. It is important for the Copermittees to coordinate their water quality protection and land use planning activities to achieve the greatest protection of receiving water bodies. Copermittee coordination with other watershed stakeholders, especially Caltrans, the Department of Defense, and water and sewer districts, is also important.

[150] Regional Board, 2004. San Diego County Municipal Storm Water Permit Reissuance Analysis Summary. P. 1.

[151] Orange County Storm Water Copermittees. 2006. Report of Waste Discharge (San Diego Region).

Discussion of Finding D.4.c. Conventional planning and zoning can be limited in their ability to protect the environmental quality of creeks, rivers, and other waterbodies. Watershed-based planning is often ignored, despite the fact that receiving waters unite land by collecting runoff from throughout the watershed. Since watersheds unite land, they can be used as an effective basis for planning. Watershed-based planning enables local and regional areas to realize economic, social, and other benefits associated with growth, while conserving the resources needed to sustain such growth, including water quality.

This type of planning can involve four steps: (1) Identify the watersheds shared by the participating jurisdictions; (2) Identify, assess, and prioritize the natural, social, and other resources in the watersheds; (3) Prioritize areas for growth, protection, and conservation, based on prioritized resources; and (4) Develop plans and regulations to guide growth and protect resources. Local governments have started with simple, yet effective, steps toward watershed planning, such as adopting a watershed-based planning approach, articulating the basic strategy in their General Plans, and beginning to pursue the basic strategy in collaboration with neighboring local governments who share the watersheds. Examples of new mechanisms created to facilitate watershed-based planning and zoning include the San Francisquito Creek Watershed Coordinated Resource Management Process and the Santa Clara Basin Watershed Management Initiative.[152]

[152] Bay Area Stormwater Management Agencies Association., 1999. Start at the Source. Forbes Custom Publishing. Available on-line at: http://www.scvurppp-w2k.com/basmaa_satsm.htm

E. Statute and Regulatory Considerations

Finding E.1. The Receiving Water Limitations (RWL) language specified in this Order is consistent with language recommended by the USEPA and established in State Board Water Quality Order 99-05, *Own Motion Review of the Petition of Environmental Health Coalition to Review Waste Discharge Requirements Order No. 96-03, NPDES Permit No. CAS0108740*, adopted by the State Board on June 17, 1999. The RWL in this Order require compliance with water quality standards, which for storm water discharges is to be achieved through an iterative approach requiring the implementation of improved and better-tailored BMPs over time. Compliance with receiving water limitations based on applicable water quality standards is necessary to ensure that MS4 discharges will not cause or contribute to violations of water quality standards and the creation of conditions of pollution.

Discussion of Finding E.1. The RWLs in the Order require storm water compliance with water quality standards through an iterative approach for implementing improved and better-tailored BMPs over time. The iterative BMP process requires the implementation of increasingly stringent BMPs until receiving water standards are achieved. This is necessary because implementation of BMPs alone cannot ensure attainment of receiving water quality standards. For example, a BMP that is effective in one situation may not be applicable in another. An iterative process of BMP development, implementation, and assessment is needed to promote consistent compliance with receiving water quality objectives. If assessment of a given BMP confirms that the BMP is ineffective, the iterative process should be restarted, with redevelopment of a new BMP that is anticipated to result in compliance with receiving water quality objectives.

The issue of whether storm water discharges from MS4s must meet water quality standards has been intensely debated in past years. The argument arises because CWA section 402(p) fails to clearly state that municipal dischargers of storm water must meet water quality standards. On the issue of industrial discharges of storm water, the statute clearly indicates that industrial dischargers must meet both (1) the technology-based standard of “best available technology economically achievable (BAT)” and (2) applicable water quality standards. On the issue of municipal discharges however, the statute states that municipal dischargers must meet (1) the technology-based standard of MEP” and (2) “such other provisions that the Administrator or the State determines appropriate for the control of such pollutants.” The statute fails, however, to specifically state that municipal dischargers must meet water quality standards.

As a result, the municipal storm water dischargers have argued that they do not have to meet water quality standards; and that they only are required to meet MEP for storm water. Environmental interest groups maintain that not only do MS4 discharges have to meet water quality standards, but that MS4 permits must also comply with numeric effluent limitations for the purpose of meeting water quality standards. On the issue of water quality standards, USEPA, the State Board, and the Regional Board have consistently maintained that MS4s must indeed comply with water quality standards. On the issue of whether water quality standards must be met by numeric effluent limitations, USEPA, the State Board (in Orders WQ 91-03 and WQ 91-04), and the Regional Board have maintained that MS4 permits can contain narrative requirements for the implementation of BMPs in place of numeric effluent limitations for storm water discharges.[153]

In addition to relying on USEPA's legal opinion concluding that MS4s must meet MEP for storm water and water quality standards, the State Board also relied on the CWA's explicit authority for States to require "such other provisions that the Administrator or the State determines appropriate for the control of such pollutants" in addition to the technology-based standard of MEP for storm water discharges. To further support its conclusions that MS4 permit dischargers must meet water quality standards, the State Board relied on provisions of the CWC that specify that all waste discharge requirements must implement applicable Basin Plans and take into consideration the appropriate water quality objectives for the protection of beneficial uses.

The State Board first formally concluded that permits for MS4s must contain effluent limitations based on water quality standards in its Order WQ 91-03. In that Order, the State Board also concluded that it was appropriate for Regional Boards to achieve this result by requiring best management practices, rather than by inserting numeric effluent limitations into MS4 permits. Later, in Order WQ 98-01, the State Board prescribed specific precedent setting Receiving Water Limitations language to be included in all future MS4 permits. This language specifically requires that MS4 dischargers meet water quality standards and allows for the use of narrative BMPs (increasing in stringency and implemented in an iterative process) as the mechanism by which water quality standards can be met for storm water discharges.

In Order WQ 99-05, the State Board modified its receiving water limitations language in Order WQ 98-01 to meet specific objections by USEPA (the modifications resulted in stricter compliance with water quality standards). State Board Order WQ 99-05 states:

[153] For the most recent assessment, see Storm Water Panel Recommendations to the California State Water Resources Control Board, 2006. *The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial, and Construction Activities.*

> "In Order WQ 98-01, the State Board ordered that certain receiving water limitation language be included in future municipal storm water permits. Following inclusion of that language in permits issued by the San Francisco Bay and San Diego Regional Boards for Vallejo and Riverside respectively, the USEPA objected to the permits. The USEPA objection was based on the receiving water limitation language. The USEPA has now issued those permits itself and has included receiving water limitation language it deems appropriate.
>
> In light of USEPA's objection to the receiving water limitation language in Order WQ 98-01 and its adoption of alternative language, the State Board is revising its instructions regarding receiving water limitation language for municipal storm water permits. It is hereby ordered that Order WQ 98-01 will be amended to remove the receiving water limitation language contained therein and to substitute the USEPA language. Based on the reasons stated here, and as a precedent decision, the following receiving water limitation language shall be included in future municipal storm water permits."

In the 1999 case involving MS4 permits issued by USEPA to several Arizona cities (*Defenders of Wildlife v. Browner*, 1999, 197 F. 3d 1035), the United States Court of Appeals for the Ninth Circuit upheld USEPA's requirement for MS4 dischargers to meet water quality standards, but it did so on the basis of USEPA's discretion rather than on the basis of strict compliance with the Clean Water Act. In other words, while holding that the Clean Water Act does not require all MS4 discharges to comply strictly with state water quality standards, the Court also held that USEPA has the authority to determine that ensuring strict compliance with state water quality standards is necessary to control pollutants. On the question of whether MS4 permits must contain numeric effluent limitations, the court upheld USEPA's use of iterative BMPs in place of numeric effluent limitations for storm water discharges.

On October 14, 1999, the State Board issued a legal opinion on the federal appellate decision and provided advice to the Regional Boards on how to proceed in the future. In the memorandum, the State Board concludes that the recent Ninth Circuit opinion upholds the discretion of USEPA and the State to (continue to) issue storm water permits to MS4s that require compliance with water quality standards through iterative BMPs. Moreover, the memorandum states that "[…] because most MS4 discharges enter impaired water bodies, there is a real need for permits to include stringent requirements to protect those water bodies. As TMDLs are developed, it is likely that MS4s will have to participate in pollutant load reductions, and the MS4 permits are the most effective vehicles for those reductions." In summary, the State Board found that the Regional Boards should continue to include the RWL established in State Board Order WQ 99-05 in all future permits.

The issue of the RWLs language was also central to BIA's (and others') appeal of Order No. 2001-01 (San Diego MS4 permit), which was used as a template for Order No. R9-2002-01. BIA contended that the storm water MEP standard was a ceiling on what could be required of the Copermittees in implementing their runoff management programs, and that Order No. 2001-01's receiving water limitations requirements exceeded that ceiling. In other words, BIA argued that the Copermittees could not be required to comply with receiving water limitations if they necessitated efforts which went beyond the MEP standard. Again, the courts upheld the Regional Board's discretion to require compliance with water quality standards in municipal storm water permits, without limitation. The Court of Appeal, Fourth Appellate District found that the Regional Board has "the authority to include a permit provision requiring compliance with water quality standards."[154] On further appeal by BIA, the California State Supreme Court declined to hear the matter.

While implementation of the iterative BMP process is a means to achieve compliance with water quality objectives for storm water MS4 discharges, it does not shield the discharger from enforcement actions for continued non-compliance with water quality standards. Consistent with USEPA guidance,[155] regardless of whether or not an iterative process is being implemented, discharges that cause or contribute to a violation of water quality standards are in violation of Order No. R9-2008-0001.

Finding E.2. The Water Quality Control Plan for the San Diego Basin (Basin Plan), identifies the following beneficial uses for surface waters in Orange County: Municipal and Domestic Supply (MUN)[156], Agricultural Supply (AGR), Industrial Process Supply (PROC), Industrial Service Supply (IND), Ground Water Recharge (GWR), Contact Water Recreation (REC1) Non-contact Water Recreation (REC2), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Freshwater Replenishment (FRSH), Hydropower Generation (POW), and Preservation of Biological Habitats of Special Significance (BIOL). The following additional beneficial uses are identified for coastal waters of Orange County: Navigation (NAV), Commercial and Sport Fishing (COMM), Estuarine Habitat (EST), Marine Habitat (MAR), Aquaculture (AQUA), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN), and Shellfish Harvesting (SHELL).

[154] Building Industry Association et al., v. State Water Resources Control Board, et al. 2004.
[155] USEPA, 1998. Jan. 21, 1998 correspondence, "State Board/OCC File A-1041 for Orange County," from Alexis Strauss to Walt Petit, and March 17, 1998 correspondence from Alexis Strauss to Walt Petit.
[156] Subject to exceptions under the "Sources of Drinking Waters" Policy (Resolution No. 89-33)

Discussion of Finding E.2. The southern portion of Orange County is within the San Diego Region. The Orange County portion of the San Diego Region falls within and comprises the majority of the San Juan Hydrologic Unit. Major streams within the Orange County watersheds include San Juan Creek, Trabuco Creek, and San Mateo Creek. Other surface water bodies include Aliso Creek, Prima Deshecha Canada, Segunda Deshecha Canada, Oso Creek, Salt Creek, Laguna Canyon Channel, Canada Gobernadora, and Bell Canyon. Several small canyon streams drain directly to the Ocean. Major inland waterbodies include Oso Reservoir, El Toro Reservoir, and Sulphur Creek Reservoir.

The Orange County watersheds include unincorporated portions of Orange County, the Cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Lake Forest, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano. The uppermost portions of the San Mateo, San Juan, Trabuco, and Aliso Creek watersheds are within the Cleveland National Forests.

Approximately 500,000 people reside within the permitted area. This estimate is based on the 2000 census, which does not represent exact numbers because three municipalities (County of Orange and the Cities of Laguna Hills and Lake Forest) lie within both the San Diego Region and the Santa Ana Region. In addition, new developments have increased the housing stock of the area since the 2000 census. This includes the master planned developments of Ladera Ranch in the San Juan Creek watershed and Talega in the San Clemente Coastal and San Mateo Creek watersheds.

Finding E.3. This Order is in conformance with State Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality Waters in California*, and the federal Antidegradation Policy described in 40 CFR 131.12.

Discussion of Finding E.3. Runoff management programs are required to be designed to reduce pollutants in storm water MS4 discharges to the maximum extent practicable and achieve compliance with water quality standards. Therefore, implementation of runoff management programs, which satisfy the requirements of Order No. R9-2009-0002, will prevent violations of receiving water quality standards. The Basin Plan states that "Water quality objectives must […] conform to US EPA regulations covering antidegradation (40 CFR 131.12) and State Board Resolution 68-16, Statement of Policy with Respect to Maintaining High Quality of Waters in California." As a result, when water quality standards are met, USEPA and State Board antidegradation policy requirements are also met.

Finding E.4. Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states with approved coastal zone management programs to address non-point pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point pollution: agriculture, silviculture, urban, marinas, and hydromodification. This NPDES permit addresses the management measures required for the urban category, with the exception of septic systems. The adoption and implementation of this NPDES permit relieves the Permittee from developing a non-point source plan, for the urban category, under CZARA. The Regional Board addresses septic systems through the administration of other programs.

Discussion of Finding E.4. Coastal states are required to develop programs to protect coastal waters from nonpoint source pollution, as mandated by the federal CZARA. CZARA Section 6217 identifies polluted runoff as a significant factor in coastal water degradation, and requires implementation of management measures and enforceable policies to restore and protect coastal waters. In lieu of developing a separate NPS program for the coastal zone, California's NPS Pollution Control Program was updated in 2000 to address the requirements of both the CWA section 319 and the CZARA section 6217 on a statewide basis. The California Coastal Commission (CCC), the State Board, and the nine Regional Water Quality Control Boards are the lead State agencies for upgrading the program, although 20 other State agencies also participate. Pursuant to the CZARA (6217(g) Guidance Document the development of runoff management programs pursuant to this NPDES permit fulfills the need for coastal cities to develop an runoff non-point source plan identified in the State's Non-point Source Program Strategy and Implementation Plan.[157]

Finding E.5. Section 303(d)(1)(A) of the CWA requires that "Each state shall identify those waters within its boundaries for which the effluent limitations…are not stringent enough to implement any water quality standard (WQS) applicable to such waters." The CWA also requires states to establish a priority ranking of impaired waterbodies known as Water Quality Limited Segments and to establish Total Maximum Daily Loads (TMDLs) for such waters. This priority list of impaired waterbodies is called the Section 303(d) List. The current Section 303(d) List was approved by the State Board on February 4, 2003 and on July 25, 2003 by USEPA. The List was recently updated by the State Board on October 25, 2006. On June 28, 2007 the 2006 303(d) list for California was given final approval by the United States Environmental Protection Agency (USEPA).

[157] State Board/CCC, 2000. Nonpoint Source Program Strategy and Implementation Plan, 1998-2013 (PROSIP).

Discussion of Finding E.5. Section 303(d) of the federal CWA (CWA, 33 USC 1250, et seq., at 1313(d)), requires States to identify waters that do not meet water quality standards after applying certain required technology-based effluent limits ("impaired" water bodies). States are required to compile this information in a list and submit the list to USEPA for review and approval. This list is known as the Section 303(d) list of impaired waters. As part of this listing process, States are required to prioritize waters/watersheds for future development of TMDLs. The State Board and Regional Boards have ongoing efforts to monitor and assess water quality, to prepare the Section 303(d) list, to prioritize waters/watersheds for TMDL development and to subsequently develop TMDLs. TMDLs developed and adopted by the Regional Board are incorporated into the Basin Plan via a Basin Plan Amendment as authorized under section 13240 of the California Water Code. The 2006 California 303(d) List identifies impaired receiving water bodies and their watersheds within the State of California. Storm water and non-storm water runoff that is discharged from the Copermittees' MS4s is a leading cause of receiving water quality impairment in the San Diego Region.[158] TMDLs Project I and II for bacteria are considered priority development TMDLs due to impacts to REC 1 benefits due to impairment of waters for human contact recreation.

Finding E.6. This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following. First, this Order implements federally mandated requirements under federal Clean Water Act section 402. (33 U.S.C. § 1342(p)(3)(B).) Second, the local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental and new dischargers who are issued NPDES permits for storm water and non-storm water discharges. Third, the local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order. Fourth, the Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in federal Clean Water Act section 301, subdivision (a) (33 U.S.C. § 1311(a)) and in lieu of numeric restrictions on their storm water discharges. Fifth, the local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under State law predates the enactment of Article XIIIB, Section (6) of the California Constitution. Likewise, the provisions of this Order to implement total maximum daily loads (TMDLs) are federal mandates. The federal Clean Water Act requires TMDLs to be developed for water bodies that do not meet federal water quality standards. (33 U.S.C. sec. 1313(d).) Once the U.S. Environmental Protection Agency or a state develops a TMDL, federal law requires that permits must contain effluent limitations consistent with the assumptions of any applicable wasteload allocation. (40 C.F.R. sec. 122.44(d)(1)(vii)(B).)

[158] The approved 2006 Clean Water Act Section 303(d) List of Water Quality Limited Segments is on-line at: http://www.waterboards.ca.gov/tmdl/303d_lists2006.html.

Discussion of Finding E.6. This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following. First, this Order implements federally mandated requirements under federal Clean Water Act section 402, subdivision (p)(3)(B). (33 U.S.C. § 1342(p)(3)(B).) This includes federal requirements to effectively prohibit non-storm water discharges, to reduce the discharge of pollutants in storm water to the maximum extent practicable, and to include such other provisions as the Administrator or the State determines appropriate for the control of such pollutants. Federal cases have held these provisions require the development of permits and permit provisions on a case-by-case basis to satisfy federal requirements. (Natural Resources Defense Council, Inc. v. U.S. E.P.A. (9th Cir. 1992) 966 F.2d 1292, 1308, fn. 17.)

The authority exercised under this Order is not reserved state authority under the Clean Water Act's savings clause (cf. Burbank v. State Water Resources Control Bd. (2005) 35 Cal.4th 613, 627-628 [relying on 33 U.S.C. § 1370, which allows a state to develop requirements which are not "less stringent" than federal requirements]), but instead, is part of a federal mandate to develop pollutant reduction requirements for municipal separate storm sewer systems. To this extent, it is entirely federal authority that forms the legal basis to establish the permit provisions. (See, City of Rancho Cucamonga v. Regional Water Quality Control Bd.-Santa Ana Region (2006) 135 Cal.App.4th 1377, 1389; Building Industry Ass'n of San Diego County v. State Water Resources Control Bd. (2004) 124 Cal.App.4th 866, 882-883.)

Second, the local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental dischargers who are issued NPDES permits for storm water discharges. With a few inapplicable exceptions, the Clean Water Act regulates the discharge of pollutants from point sources (33 U.S.C. § 1342) and the Porter-Cologne regulates the discharge of waste (Wat. Code, § 13263), both without regard to the source of the pollutant or waste. As a result, the "costs incurred by local agencies" to protect water quality reflect an overarching regulatory scheme that places similar requirements on governmental and nongovernmental dischargers. (See County of Los Angeles v. State of California (1987) 43 Cal.3d 46, 57-58 [finding comprehensive workers compensation scheme did not create a cost for local agencies that was subject to state subvention].)

The Clean Water Act and the Porter-Cologne Water Quality Control Act largely regulate storm water with an even hand, but to the extent there is any relaxation of this even-handed regulation, it is in favor of the local agencies. Except for municipal separate storm sewer systems, the Clean Water Act requires point source dischargers, including discharges of storm water associated with industrial or construction activity, to comply strictly with water quality standards. (33 U.S.C. § 1311(b)(1)(C), Defenders of Wildlife v. Browner (1999) 191 F.3d 1159, 1164-1165 [noting that industrial storm water discharges must strictly comply with water quality standards].) As discussed in prior State Water Resources Control Board decisions, this Order does not require strict compliance with water quality standards. (SWRCB Order No. WQ 2001-15, p. 7.) The Order, therefore, regulates the discharge of waste in municipal storm water more leniently than the discharge of waste from non-governmental sources.

Third, the local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order. The fact sheet demonstrates that numerous activities contribute to the pollutant loading in the municipal separate storm sewer system. Local agencies can levy service charges, fees, or assessments on these activities, independent of real property ownership. (See, e.g., Apartment Ass'n of Los Angeles County, Inc. v. City of Los Angeles (2001) 24 Cal.4th 830, 842 [upholding inspection fees associated with renting property].) The ability of a local agency to defray the cost of a program without raising taxes indicates that a program does not entail a cost subject to subvention. (County of Fresno v. State of California (1991) 53 Cal.3d 482, 487-488.)

Fourth, the Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in federal Clean Water Act section 301, subdivision (a) (33 U.S.C. § 1311(a)) and in lieu of numeric restrictions on their storm water discharges. To the extent, the local agencies have voluntarily availed themselves of the permit, the program is not a state mandate. (Accord County of San Diego v. State of California (1997) 15 Cal.4th 68, 107-108.) Likewise, the Copermittees have voluntarily sought a program-based municipal storm water permit in lieu of a numeric limitations approach on their storm water discharge. (See City of Abilene v. U.S. E.P.A. (5th Cir. 2003) 325 F.3d 657, 662-663 [noting that municipalities can choose between a management permit or a permit with numeric limitations].) The local agencies' voluntary decision to file a report of waste discharge proposing a program-based permit is a voluntary decision not subject to subvention. (See Environmental Defense Center v. USEPA (9th Cir. 2003) 344 F.3d 832, 845-848.)

Fifth, the local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under state law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

Finding E. 7. Runoff treatment and/or mitigation must occur prior to the discharge of runoff into receiving waters. Treatment BMPs must not be constructed in waters of the U.S. or State unless the runoff flows are sufficiently pretreated to protect the values and functions of the water body. Federal regulations at 40 CFR 131.10(a) state that in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S. Authorizing the construction of an runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to accepting waste assimilation as an appropriate use for that water body. Furthermore, the construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body. Without federal authorization (e.g., pursuant to Clean Water Act Section 404), waters of the U.S. may not be converted into, or used as, waste treatment or conveyance facilities. Similarly, waste discharge requirements pursuant to California Water Code Section 13260 are required for the conversion or use of waters of the State as waste treatment or conveyance facilities. Diversion from waters of the U.S./State to treatment facilities and subsequent return to waters of the U.S. is allowable, provided that the effluent complies with applicable NPDES requirements.

Discussion of Finding E.7. Runoff treatment and/or mitigation in accordance with any of the requirements in the Order must occur prior to the discharge of storm water into receiving waters. Allowing storm water polluted runoff to enter receiving waters prior to treatment to the MEP will result in degradation of the water body and potential exceedances of water quality standards, from the discharge point to the point of dissipation, infiltration, or treatment. Furthermore, the construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body. This requirement is supported by federal regulation 40 CFR 131.10(a) and USEPA guidance. According to USEPA,[159] "To the extent possible, municipalities should avoid locating structural controls in natural wetlands. Before considering siting of controls in a natural wetland, the municipality should demonstrate that it is not possible or practicable to construct them in sites that do not contain natural wetlands… Practices should be used that settle solids, regulate flow, and remove contaminants prior to discharging storm water into a wetland."

Additional Federal guidance discusses the implementation of wetlands to treat municipal storm water discharges (USEPA, 2000. *Guiding Principles for Constructed Treatment Wetlands: Providing for Water Quality and Wildlife Habitat*). It states:

[159] USEPA, 1992. Guidance Manual for the Preparation of Part II of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems. EPA 833-B-92-002.

> *"..treatment wetlands should not be constructed in a waters of the U.S. unless you can sufficiently pretreat the stormwater flows to protect the values and functions of the waters of the U.S. Because storm water is an unpredictable effluent source and can contain high levels of toxic substances, nutrients, and pathogens, we strongly encourage that you construct the treatment wetland in uplands and use best management practices in these projects."*[160]

Consistent with USEPA guidance, the conversion or use of waters of the U.S./State into runoff treatment facilities or conveyance facilities for untreated storm water discharges must be appropriately reviewed by both Federal and State resource agencies. Such projects may be subject to federal permitting pursuant to Clean Water Act Section 404 if discharges of dredged or fill material is involved.

The placement of hydromodification controls within waters of the U.S./State may also be subject to federal and/or state permitting, but would not necessarily be considered a pollutant treatment BMP. Provided the grade control structures are designed to re-establish a natural channel gradient and correct excessive changes to the sediment transport regime caused by urbanization, rather than to create a series of artificial hydrological impoundments for the purpose of treating pollution, this type of project is not considered an in-stream treatment BMP.

Finding E. 8. The issuance of waste discharge requirements and an NPDES permit for the discharge of runoff from MS4s to waters of the U.S. is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 et seq.) in accordance with the CWC section 13389.

Discussion of Finding E. 8. CWC Section 13389 exempts the adoption of waste discharge requirements (such as NPDES permits) from CEQA requirements: "Neither the State Board nor the regional boards shall be required to comply with the provisions of Chapter 3 (commencing with section 21100) of Division 13 of the Public Resources Code prior to the adoption of any waste discharge requirement, except requirements for new sources as defined in the Federal Water Pollution Control Act or acts amendatory thereof or supplementary thereto."

[160] USEPA, 2000. Guiding Principles for Constructed Treatment Wetlands: Providing for Water Quality and Wildlife Habitat, (EPA 843-B-00-003).

This CEQA exemption was challenged during BIA's (and others') appeal of Order No. 2001-01. BIA contended that the CEQA exemption did not apply to permit requirements where the Regional Board utilized its discretion to craft permit requirements which were more prescriptive than required by federal law. The Court of Appeal, Fourth Appellate District disagreed with this argument, stating "we also reject Building Industry's argument to the extent it contends the statutory CEQA exemption in Water Code section 13389 is inapplicable to a particular NPDES permit provision that is discretionary, rather than mandatory, under the CWA."[161] On further appeal by BIA, the California State Supreme Court declined to hear the matter.

In a recent decision, the Court of Appeal of the State of California, Second Appellate District, upheld the CEQA exemption for municipal storm water NPDES permits (County of Los Angeles, et al. v. California State Water Resources Control Board, et al.).[162]

Finding E.9. Multiple water bodies in Orange County have been identified as impaired and placed on the 303(d) list. In 2004, Bacteria Impaired Waters TMDL Project II included six bacteria impaired shorelines in Dana Point Harbor and San Diego Bay: Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park, B Street, G Street Pier, Tidelands Park, and Chula Vista Marina in San Diego Bay. Since then, only Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay can be confirmed as still impaired by indicator bacteria. On June 11, 2008 the Regional Board adopted a Basin Plan amendment to incorporate *Bacteria Impaired Waters TMDL Project II for San Diego Bay and Dana Point Harbor Shorelines*. On June 16, 2009, the State Board approved the Basin Plan amendment. This action meets requirements of section 303(d) of the Clean Water Act (CWA). The Basin Plan amendment process is authorized under section 13240 of the Water Code. The State's Office of Administrative Law (OAL) approved the TMDLs on September 15, 2009. The effective date of the TMDLs is the date of OAL approval. USEPA approved the TMDLs on October 26, 2009.

Finding E.10. Storm water discharges from developed and developing areas in Orange County are significant sources of certain pollutants that cause, may be causing, threatening to cause or contributing to water quality impairment in the waters of Orange County. Furthermore, as delineated in the CWA section 303(d) list in Table 3, the Regional Board has found that there is a reasonable potential that municipal storm water and non-storm water discharges from MS4s cause or may cause or contribute to an excursion above water quality standards for the following pollutants: Indicator Bacteria, Phosphorous, Toxicity and Turbidity. In accordance with CWA section 303(d), the Regional Board is required to establish Total Maximum Daily Loads (TMDLs) for these pollutants to these waters to eliminate impairment and attain water quality standards. Therefore, certain early pollutant control actions and further pollutant impact assessments by the Copermittees are warranted and required

[161] Building Industry Association et al., v. State Water Resources Control Board, et al. 2004.
[162] Los Angeles County Super. Ct. No. BS080792. Partial publication dated November 6, 2006.

pursuant to this Order.

Finding E.11. This Order incorporates only those MS4 Waste Load Allocations (WLAs) developed in TMDLs that have been adopted by the Regional Water Board and have been approved by the State Board, Office of Administrative Law and U.S. EPA. Approved TMDL WLAs are to be addressed using water quality-based effluent limitations (WQBELs) calculated as numeric limitations (either in the receiving waters and/or at the point of MS4 discharge) and/or as BMPs. In most cases, the numeric limitation must be achieved to ensure the adequacy of the BMP program. Waste load allocations for storm water and non-storm water discharges have been included within this Order only if the TMDL has received all necessary approvals. This Order establishes WQBELs and conditions consistent with the requirements and assumptions of the WLAs in the TMDLs as required by 40 CFR 122.44(d)(1)(vii)(B).

A TMDL is the total amount of a particular pollutant that a water body can receive and still meet Water Quality Standards (WQSs), which are comprised of Water Quality Objectives (WQOs), Beneficial Uses and the States Policy on Maintaining High Quality Waters[163]. The WQOs serve as the primary basis for protecting the associated Beneficial Use. The Numeric Target of a TMDL interprets and applies the numeric and/or narrative WQOs of the WQSs as the basis for the WLAs. This Order addresses TMDLs through Water Quality Based Effluent Limitations (WQBELs) that must be consistent with the assumptions and requirements of the WLA[164]. Federal guidance[165] states that when adequate information exists, storm water permits are to incorporate numeric water quality based effluent limitations. In most cases, the numeric target(s) of a TMDL are a component of the WQBELs. When the numeric target is based on one or more numeric WQOs, the numeric WQOs and underlying assumptions and requirements will be used in the WQBELs as numeric effluent limitations by the end of the TMDL compliance schedule, unless additional information is required. When the numeric target interprets one or more narrative WQOs, the numeric target may assess the efficacy and progress of the BMPs in meeting the WLAs and restoring the Beneficial Uses by the end of the TMDL compliance schedule.

This Order fulfills a component of the TMDL Implementation Plan adopted by this Regional Board on June 11, 2008 for indicator bacteria in Baby Beach by establishing WQBELs expressed as both BMPs to achieve the WLAs and as numeric limitations[166] for the City of Dana Point and the County of Orange. The establishment of WQBELs expressed as BMPs should be sufficient to achieve the WLA specified in the TMDL. The Waste Load Allocations (WLAs) and Numeric Targets are the necessary metrics to ensure that the BMPs achieve appropriate concentrations of bacterial indicators in

[163] State Water Resources Control Board, Resolution No. 68-16
[164] 40 CFR 122.44(d)(1)(vii)(B)
[165] USEPA, *Interim Permitting Approach for Water Quality-Based Effluent Limitations in Storm Water Permits,* 61 FR 43761, August 26, 1996
[166] The Waste Load Allocations are defined in Resolution No. R9-2008-0027, A Resolution to Adopt an Amendment to the *Water Quality Control Plan for the San Diego Basin (9)* to Incorporate Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay.

the receiving waters.

Discussion of Finding E.9, E.10, E.11. Section 303(d)(1)(A) of the Clean Water Act (CWA) requires that:

> "*Each state must identify those waters within its boundaries for which the effluent limitations…are not stringent enough to implement any water quality standard (WQS) applicable to such waters.*"

The CWA also requires states to establish a priority ranking of impaired waterbodies known as Water Quality Limited Segments and to establish Total Maximum Daily Loads (TMDLs) for such waters. This priority list of impaired waterbodies is called the Section 303(d) List. The current Section 303(d) List was approved by the State Water Resources Control Board (State Board) on October 25, 2006. On June 28, 2007 the 2006 303(d) list for California was given final approval by the United States Environmental Protection Agency (USEPA). Every two years the State of California is required by CWA section 303(d) and 40 CFR(130.7) to develop and submit to the USEPA for approval an updated 303(d) list of impaired waterbodies. The Regional Board is currently undergoing the required 2 year (2008) update for submittal to the State Board.

Multiple water bodies in Orange County have been identified as impaired and placed on the Section 303(d) list. The Regional Board has 78 current 303(d) listings for which TMDLs must be prioritized and subsequently developed. The 303(d) listing of a waterbody and subsequent TMDL development is required when regulations under current permits, such as Technology Based Effluent Limitations (TBELS), are not stringent enough to meet Water Quality Standards and protect the Beneficial Uses of Waters of the State. In 2004, the *Bacteria Impaired Waters TMDL Project II* addressed six bacteria impaired shorelines including Baby Beach in Dana Point Harbor. On June 11, 2008 the Regional Board adopted a Basin Plan amendment to incorporate *TMDLs for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay*. On June 16, 2009, the State Board approved the Basin Plan amendment The *TMDLs for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay* are pending approval by the State Office of Administrative Law (OAL) and USEPA.

Storm water discharges from developed and developing areas in Orange County are a significant source of certain pollutants that cause, may be causing, threatening to cause or contributing to water quality impairment in the waters of Orange County. Furthermore, the CWA section 303(d) list indicates that there is a reasonable potential that municipal storm water and dry weather discharges from MS4s cause or may cause or contribute to an excursion above water quality standards for the following pollutants: Indicator Bacteria, Phosphorous, Toxicity and Turbidity. In accordance with CWA section 303(d), the Regional Board is required to establish TMDLs for these pollutants in these waters to eliminate impairment and attain water quality standards. Per 40 CFR(130.7), WLAs are required for all point sources, including storm water and

non-storm water discharges from MS4s. Therefore, focused pollutant control actions and further pollutant impact assessments by the Copermittees are warranted and required pursuant to this Order.

MS4 Permits address only those TMDL WLAs that have been adopted by the Regional Board and have been approved by the State Board, OAL and USEPA. WLAs are portions of a receiving water's loading capacity that is allocated to one of its existing or future point sources of pollution. The TMDL WLAs in MS4 Permits can be addressed using water quality-based numeric effluent limitations (WQBELs) calculated at end-of-pipe. WQBELs must be consistent with the assumptions and requirements of the WLAs.[167]

Assessment of compliance with WLAs is to be assessed at the point of discharge to the receiving water and within the receiving water. TMDL WLAs evaluated end-of-pipe will be assessed using WQBELs. Determination of compliance may also be assessed within the receiving waters to evaluate WLA reductions, program effectiveness and to assess overall water quality. As Numeric Targets serve to establish WLAs, they are part of the underlying assumptions of the WLA and can serve as points of compliance.

Finding E.12. This Order requires each Copermittee to effectively prohibit all types of unauthorized discharges of non-storm water into its MS4. However, historically pollutants have been identified as present in dry weather non-storm water discharges from the MS4s through 303(d) listings, monitoring conducted by the Copermittees under Order No. R9-2002-0001, and there are others expected to be present in dry weather non-storm water discharges because of the nature of these discharges. This Order includes action levels for pollutants in non-storm water, dry weather, discharges from the MS4 designed to ensure that the requirement to effectively prohibit all types of unauthorized discharges of non-storm water in the MS4 is being complied with. Action levels in the Order are based upon numeric or narrative water quality objectives and criteria as outlined in the Basin Plan, Water Quality Control Plan for Ocean Waters of California (Ocean Plan), and State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP). An exceedance of an action level requires specified responsive action by the Copermittees. This Order describes what actions the Copermittees must take when an exceedance of an action level is observed. Exceedances of non-storm water action levels do not alone constitute a violation of this Order but could indicate non-compliance with the requirement to effectively prohibit all types of unauthorized non-storm water discharges into the MS4 or other prohibitions established in this Order. Failure to undertake required source investigation and elimination action following an exceedance of a non-storm water action level (NAL or action level) is a violation of this Order. The Regional Board recognizes that use of action levels will not necessarily result in detection of all unauthorized sources of non-storm water discharges because there may be some

[167] Per 40 CFR 122.44(d)(1)(vii)(B)

discharges in which pollutants do not exceed established action levels. However, establishing NALs at levels appropriate to protect water quality standards is expected to lead to the identification of significant sources of pollutants in dry weather non-storm water discharges.

Discussion of Finding E.12. This Order includes the existing requirement that Copermittees effectively prohibit all types of unauthorized non-storm water discharges in the MS4s. It also includes the following prohibition set forth in the Basin Plan: "The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in California Water Code section 13050 is prohibited." (Prohibition A.1.) As discussed in the Order's Findings on discharge characteristics, e.g., C.2.,C.4., C.6., C.7., C.9., C.14., and C.15., the Copermittees' reliance on BMPs for the past 19 years has not resulted in compliance with applicable water quality standards or compliance with the requirement to effectively prohibit all types of unauthorized discharges of non-storm water in the MS4. The Regional Board has evaluated (in accordance with 40 CFR 122.44(d)(1)) past and existing control (BMPs), non-storm water effluent monitoring results, the sensitivity of the species in receiving waters (e.g. endangered species), and the potential for effluent dilution and has determined that existing BMPs to control pollutants in storm water discharges are not sufficient to protect water quality standards in receiving waters and the existing requirement that Copermittees effectively prohibit all types of unauthorized non-storm water discharges into the MS4 historically results in the discharge of pollutants to the receiving waters.

Therefore it is appropriate to establish dry weather non-storm water action levels based upon established water quality standards to measure pollutants levels in the discharge of dry weather non-storm water that could indicate non-compliance with the requirement to effectively prohibit al types of unauthorized non-storm water discharges into the MS4 and/or that these discharges are causing, or threatening to cause, a condition of pollution, contamination or nuisance in the receiving waters. NALs are not numeric effluent limitations. While not alone a violation of this Order, an exceedance of an NAL requires the Copermittees to initiate a series of source investigation and elimination actions to address the exceedance. Results from the NAL monitoring are to be used in developing the Copermittees annual work plans. Failure to undertake required source investigation and elimination action following an exceedance of an NAL is a violation of this Order. Please see further discussion in the directives section C of the fact sheet.

A purpose of monitoring, required under this and previous Orders, as stated in the Monitoring and Reporting Program is to "detect and eliminate illicit discharges and illicit connections to the MS4" and to answer the following core management questions:

1. Are conditions in receiving waters protective, or likely to be protective, of beneficial uses?

2. What is the extent and magnitude of the current or potential receiving water problems?
3. What is the relative MS4 discharge contribution to the receiving water problem(s)?
4. What are the sources of MS4 discharge that contribute to receiving water problem(s)?
5. Are conditions in receiving waters getting better or worse?

For the past 4 permit cycles (19 years), Copermittees have utilized their IC/ID program to identify and eliminate non-storm water discharges that are sources of pollutants to the MS4. The Copermittees are also subject to the requirement to effectively prohibit all types of unauthorized discharges of non-storm water into the MS4s. Historically, discharges of unauthorized non-storm water do occur, resulting in the discharge of pollutants to the receiving water. NALs have been included in this Order to ensure that the Copermittees comply with the requirement to effectively prohibit all types of unauthorized non-storm water discharges that are a source of pollutants in the receiving waters.

F. Public Process

Finding F.1. The Regional Board has notified the Copermittees, all known interested parties, and the public of its intent to consider adoption of an Order prescribing waste discharge requirements that would serve to renew an NPDES permit for the existing discharge of runoff.

Discussion of Finding F.1. Public notification of development of a draft permit is required under Federal regulation 40 CFR 124.10(a)(1)(ii). This regulation states "(a) Scope. (1) The Director shall give public notice that the following actions have occurred: (ii) A draft permit has been prepared under Sec. 124.6(d)." Public notifications "shall allow at least 30 days for public comment," as required under Federal regulation 40 CFR 124.10(b)(1).

Finding F.2. The Regional Board has held public hearings on April 11, 2007, February 13, 2008, July 1, 2009, and November 18, 2009 and heard and considered all comments pertaining to the terms and conditions of this Order.

Discussion of Finding F.2. Public hearings are required under CWC Section 13378, which states "Waste discharge requirements and dredged or fill material permits shall be adopted only after notice and any necessary hearing." Federal regulation 40 CFR 124.12(a)(1) also requires public hearings for draft permits, stating "The Director shall hold a public hearing whenever he or she finds, on the basis or requests, a significant degree of public interest in a draft permit(s)." Regarding public notice of a public hearing, Federal regulation 40 CFR 124.10(b)(2) states that "Public notice of a public hearing shall be given at least 30 days before the hearing."

IX. DIRECTIVES

This section discusses significant changes which have been made to the requirements of the Order from the requirements which were previously included in Order No. R9-2002-0001. For each section of the Order than has been changed there is a discussion which describes the change that was made and provides the rationale for the change. In addition, comments on the Copermittees' ROWD recommendations, as they pertain to each changed requirement of the Order, are provided.

Requirements of the Order that are not discussed in this section have not been significantly changed from those requirements previously included in Order No. 2002-0001. For such requirements, discussions and rationale for the requirements can be found in section VII of the Fact Sheet/Technical Report for Regional Board Order No. R9-2002-0001, dated February 13, 2002. Section VII also provides additional background information for those requirements that have undergone significant change which are described in detail in this report. The Fact Sheet/Technical Report is available for download at:

http://www.waterboards.ca.gov/sandiego/programs/oc_stormwater.html

Legal authority citations are provided for each major section of the Tentative Order. These citations apply to all applicable requirements within the section for which they are provided.

A. Prohibitions and Receiving Water Limitations

The following legal authority applies to section A:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: The Regional Board Water Quality Control Plan for the San Diego Basin (Basin Plan) contains the following waste discharge prohibition: "The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination, or nuisance as defined in California Water Code Section 13050, is prohibited."

California Water Code section 13050(l) states "(1) 'Pollution' means an alteration of the quality of waters of the state by waste to a degree which unreasonably affects either of the following: (A) The water for beneficial uses. (B) Facilities which serve beneficial uses. (2) 'Pollution' may include "contamination."

California Water Code section 13050(k) states "'Contamination' means an impairment of the quality of waters of the state by waste to a degree which creates a hazard to public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste, whether or not waters of the state are affected."

California Water Code section 13050(m) states "'Nuisance' means anything which meets all of the following requirements: (1) Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. (2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. (3) Occurs during, or as a result of, the treatment or disposal of wastes."

California Water Code section 13241 requires each regional board to "establish such water quality objectives in water quality control plans as in its judgment will ensure the reasonable protection of beneficial uses and the prevention of nuisance […]."

California Water Code Section 13243 provides that "A regional board, in a water quality control plan or in waste discharge requirements, may specify certain conditions or areas where the discharge of waste, or certain types of waste, will not be permitted."

California Water Code Section 13263(a) provides that waste discharge requirements prescribed by the Regional Board implement the Basin Plan.

Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(A - D) require municipalities to implement controls to reduce pollutants in storm water runoff from commercial, residential, industrial, and construction land uses or activities.

Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(A - D) require municipalities to have legal authority to control various discharges to their MS4.

Federal NPDES regulation 40 CFR 122.44(d)(1) requires municipal storm water permits to include any requirements necessary to "[a]cheive water quality standards established under section 303 of the CWA, including State narrative criteria for water quality."

Federal NPDES regulation 40 CFR 122.44(d)(1)(i) requires NPDES permits to include limitations to "control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines are or may be discharged at a level which will cause, have reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality."

Section A of the Order combines two previously distinct requirement sections – Prohibitions and RWLs. These sections have been combined into one section for organization purposes and to reduce redundancy, since both sections address the same issue. These changes have no net effect on the implementation and enforcement of the Order.

Section A.3 describes the “iterative process.” The Copermittees must reduce the discharge of storm water pollutants to the MEP and ensure that their MS4 discharges do not cause or contribute to violations of water quality standards. If the Copermittees have reduced storm water pollutant discharges to the MEP, but their discharges are still causing or contributing to violations of water quality standards, the Order provides a clear and detailed process for the Copermittees to follow. This process is often referred to as the "iterative process" and can be found at section A.3. The language of section A.3 is prescribed by the State Board and is included in MS4 permits statewide. Section A.3 essentially requires additional BMPs to be implemented until MS4 storm water discharges no longer cause or contribute to a violation of water quality standards.

The State Policy with respect to maintaining high quality waters has been added to clarify that discharges from the MS4 that cause or contribute to a violation of the Policy for high quality waters is prohibited.

B. Non-Storm Water Discharges

The following legal authority applies to section B:

Broad Legal Authority: CWA sections 402, 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F), 40 CFR 122.26(d)(2)(iv) and 40 CFR 122.44.

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B) requires MS4 operators "to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B)(1) provides that the Copermittees shall prevent all types of illicit discharges into the MS4 except for certain non-storm water discharges.

Section B of the Order has been reworded to simplify and clarify the requirements for addressing non-storm water discharges that are not prohibited. This rewording has no net effect on the implementation and enforcement of the Order.

Section B.2 has been modified by the removal of landscape irrigation, irrigation water and lawn watering from the list of non-storm water discharges that are not prohibited, i.e. landscape irrigation, irrigation water and lawn watering discharges into and from the MS4 are now prohibited. Saline swimming pool discharges have been added as a footnote to the list provided the discharge is directly to a saline water body (see Finding C.14 and Discussion). Language has been added to the section to clarify differences in the federal regulations under 40 CFR 122.26(d)(iv)(B) and for the authority of the Director (Regional Board) in regards to exempted discharges.

The following exemptions have been removed from Section B, per identification as a source and conveyance of pollutants to waters of the United States when discharged from the MS4: landscape irrigation, irrigation water and lawn watering. Therefore, these illicit discharges must be addressed per 40 CFR 122.26(B). These previously exempted discharges have been identified by Permittees as a source of pollutants and conveyance of pollutants to waters of the United States in the following:

The County of Orange conducted, per requirements of 401 Water Quality Certification 02C-055, a Drainage Area Reconnaissance and Urban Runoff Characterization study. From the reconnaissance and characterization, the County of Orange determined that "water quality results provided two important findings". First, "analytical data strongly indicates that irrigation overspray and drainage constitutes a very substantial source and conveyance mechanism for fecal indicator bacteria into Aliso Creek, and suggests that reduction measures for this source of urban runoff could provide meaningful reduction in bacteria loading to the stream". Aliso Creek, currently 303(d) listed as impaired for Indicator Bacteria, is included in the Bacteria Project I TMDL adopted by the San Diego Regional Board on December 12, 2007. Secondly, reclaimed water high in electrical conductivity and Nitrate was indicated as "the source water at three of the excessive runoff locations (P1,P2,J01P02). These dissolved nitrogen concentration and flow rates create relatively high nitrogen loadings, which have the potential to contribute to undesirable levels of periphytic algal growth in Aliso Creek".

The County of Orange, Cities of Orange County and Orange County Flood Control District on November 15, 2007 submitted their Unified Annual Progress Report for the 2006-2007 reporting period. Within the report, the Copermittees demonstrate that a "wide range of constituents exceeded the tolerance interval bounds", including orthophosphate. "These high levels of orthophosphate concentration are most likely the result of fertilizer runoff or reclaimed water runoff". Aliso Creek is currently 303(d) listed as impaired for phosphorous.

The County of Orange, Orange County Flood Control District and Permittees within the San Juan Creek, Laguna Coastal Streams, Aliso Creek, and Dana Point Coastal Streams Watersheds on November 15, 2007 submitted their Watershed Action Plan Annual Reports for the 2006-2007 reporting period. San Juan Creek, Laguna Coastal Streams, Aliso Creek and Dana Point Coastal Streams are all currently 303(d) listed as impaired for Indicator Bacteria within the watershed and/or Pacific Ocean at the discharge point of the watershed. These locations are included in the Bacteria Project I TMDL adopted by the San Diego Regional Board on December 12, 2007. The Copermittees, within their Watershed Action Strategy Table for Fecal Indicator Bacteria "Support programs to reduce or eliminate the discharge of anthropogenic dry weather nuisance flow throughout the […] watershed. Dry weather flow is the transport medium for bacteria and other 303(d) constituents of concern". Additionally, they state that "conditions in the MS4 contribute to high seasonal bacteria propagation in-pipe during warm weather. Landscape irrigation is a major contributor to dry weather flow, both as surface runoff due to over-irrigation and overspray onto pavements; and as subsurface seepage that finds its way into the MS4".

In 2006, the State Water Quality Control Board allocated Grant funding to the Smarttimer/Edgescape Evaluation Program (SEEP). Project partners include the cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Nigel, Laguna Woods, Lake Forest, Mission Viejo, Rancho Santa Margarita and San Juan Capistrano as well as the Metropolitan Water District of Southern California, the Department of Agriculture and ten south Orange County water districts. The project targets irrigation runoff by retrofitting existing development and documenting the conservation and runoff improvements. The Grant Application states that "Irrigation runoff contributes flow & pollutant loads to creeks and beaches that are 303(d) listed for bacteria indicators". Furthermore, the grant application states that "Regional program managers agree that the reduction and/or elimination of irrigation-related urban flows and associated pollutant loads may be key to successful attainment of water quality and beneficial use goals as outlined in the San Diego Basin Plan and Bacteria TMDL over the long term". This is reinforced in the project descriptions and objectives: "Elevated dry-weather storm drain flows, composed primarily in the South Orange County Region of landscape irrigation water wasted as runoff, carry pollutants that impair recreational use and aquatic habitats all along Southern California's urbanized coastline. Storm drain systems carry the wasted water, along with landscape derived pollutants such as bacteria, nutrients and pesticides, to local creeks and the ocean. Given the local Mediterranean climate, excessive perennial dry season stream flows are an unnatural hydrologic pattern, causing species shifts in local riparian communities and warm, unseasonal contaminated freshwater plumes in the near-shore marine environment". The basis of this grant project, conducted by the Permittees and additional water use partners, is that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 is a source and conveyance of pollutants. In addition, they indicate that the alteration of natural flows is impacting the Beneficial Uses of waters of the State.

Section B.3 has been clarified by the recognition of building fire suppression system maintenance (e.g. fire sprinklers) as an illicit discharge. The Regional Board has found that such discharges contain waste, and as such the Regional Board is requiring these discharges be addressed as illicit discharges by the Copermittees. This is consistent with the Federal Regulations (55 Fed Reg 48037). Thus, the discharges are to be prohibited via ordinance, order or similar means and incorporated as part of the Copermittees IC/ID program.

C. Non Storm Water Dry Weather Action Levels

The following legal authority applies to Section C:

Broad Legal Authority: CWA section 402, 402(p)(3)(B)(ii), CWC §13377. 40 CFR 122.26(d)(2)(i)(B, C, E, and F), and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority:
The Clean Water Act section 402(p)(3)(B)(ii) provides that MS4 permits "shall include a requirement to effectively prohibit non-storm water discharges into the storm sewers."

Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(B) provides that the proposed management program "shall be based on a description of a program including a schedule, to detect and remove (or require the discharger to the municipal storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B)(1) provides that the Copermittee include in its proposed management program "a program, including inspections, to implement and enforce an ordinance, orders or similar means to prevent illicit discharges to the municipal storm sewer system; this program description shall address all types of illicit discharges, however the [listed exempt] category of non-storm water discharges or flows shall be addressed where such discharges are identified by the municipality as sources of pollutants to waters of the United States."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B)(2) provides that the Copermittee include in its proposed management program "a description of procedures to conduct on-going field screening activities during the life of the permit, including areas or locations that will be evaluated by such field screens."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B)(3) provides that the Copermittee include in its proposed management program "procedures to be followed to investigate portions of the separate storm sewer system that, based on the results of the field scree, or other appropriate information, indicate a reasonable potential of containing illicit discharges or other sources of non-storm water."

Section C establishes non-storm water dry weather action levels (see also Finding C.14, Finding E.12, and the Discussion for those sections).

Non-exempted, non-storm water discharges are to be effectively prohibited from entering the MS4 or become subject to another NPDES permit (see Federal Register, Vol. 55, No. 222, pg. 47995). Conveyances which continue to accept non-exempt, non-storm water discharges do not meet the definition of MS4 and are not subject to

section 402(p)(3)(B) of the CWA unless the discharges are issued separate NPDES permits. Instead, conveyances that continue to accept non-exempt, non-storm water discharges that do not have a separate NPDES permit are subject to sections 301 and 402 of the CWA (see Federal Register, Vol. 55, No. 222, pg. 48037).

The Order requires the sampling of a representative percentage of major outfalls and other identified stations within each hydrologic subarea. While it is important to assess all major outfall discharges from the MS4 into receiving waters, to date the Copermittees have implemented a dry-weather monitoring program that has identified major outfalls that are representative of each hydrologic subarea and have randomly sampled other major outfalls. Thus, it is expected that the Copermittees will utilize past dry weather monitoring in the selection and annual sampling of a representative percentage of major outfalls in accordance with the requirements under Section C.4.

Background and Rationale for Requirements

The Regional Board developed the requirements for dry weather, non-storm water action levels based upon an evaluation of existing controls, monitoring and reporting programs (effluent and receiving water), special studies, and based upon Findings C.1 C.3, C.4, C.6, C.7 and C.14.

Water Quality Control Plan

Section 303(C) of the Clean Water Act requires the state to establish Water Quality Standards (WQS). WQS define the water quality goals of a waterbody, or part thereof, by designating their use or uses to be made of the water and by setting criteria necessary to protect those uses.

The Regional Board's Water Quality Control Plan for the San Diego Basin (Basin Plan) designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters addressed through the Basin Plan. The Basin Plan was adopted by the Regional Board on September 8, 1994, and was subsequently approved by the State Board on December 13, 1994. Subsequent revisions to the Basin Plan have also been adopted by the Regional Board and State Board.

State Board Resolution No. 88-63 establishes state policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal and domestic supplies. Requirements of this Order do not include effluent limitations reflecting municipal and domestic supply use as all waters within the County of Orange under this Order are specifically exempted from municipal and domestic supply as a Beneficial Use.

The State Board adopted the Water Quality Control Plan for Ocean Waters of California (Ocean Plan) in 2005, it was approved by USEPA, and became effective on February 14, 2006. The Ocean Plan establishes Water Quality Objectives, general requirements for management of waste discharged to the ocean, effluent quality

requirements, discharge provisions, and general provisions. Limitations derived from the Ocean Plan have been included in this Order as action levels to protect the Beneficial Uses of enclosed bays and estuaries because their Beneficial Uses are similar

National Toxics Rule (NTR) and California Toxics Rule (CTR)
The USEPA adopted the NTR on December 22, 1992, which was amended on May 4, 1995, and November 9, 1999. The CTR was adopted by USEPA on May 18, 2000, and amended on February 13, 2001. These rules include water quality criteria for priority pollutants and are applicable to non-storm water discharges from the MS4. Criteria for 126 priority pollutants are established by the CTR. USEPA promulgated this rule to fill a gap in California water quality standards that was created in 1994 when a California court overturned the State's water quality control plans containing criteria for priority toxic pollutants. The federal criteria are legally applicable in the State of California for inland surface waters, enclosed bays and estuaries for all purposes and programs under the CWA.

Antidegradation Policy
Section 131.12 of 40 CFR requires that the State water quality standards include an antidegradation policy consistent with the federal policy. The State Board established California's antidegradation policy in State Board Resolution No. 68-16. Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The Regional Boards' Basin Plans implement, and incorporate by reference, both the State and federal antidegradation policies. Permitted non-storm water discharges from the MS4 are consistent with the antidegradation provision of 40 CFR section 131.12 and State Board Resolution No. 68-16.

Monitoring and Reporting
40 CFR Section 122.48 requires that all NPDES permits specify requirements for recording and reporting monitoring results. Sections 13267 and 13383 of CWC authorize the Regional Boards to require technical and monitoring reports. The Monitoring and Reporting Program establishes monitoring and reporting requirements to implement state and federal regulations. The Monitoring and Reporting Program can be found as Attachment E of the Order.

Dilution or Mixing Zones
In order to protect the Beneficial Uses of receiving waters from pollutants as a result of non-storm water MS4 discharges, this Order does not provide for a mixing zone or a zone of initial dilution except when the discharge is to the surf zone.

The San Diego Region has predominately intermittent and ephemeral rivers and streams (Inland Surface Waters) which vary in flow volume and duration at spatial and temporal scales. Therefore, it is assumed that any non-storm water discharge from

the MS4 into the receiving water is likely to be of a quantity and duration that does not allow for dilution or mixing. For ephemeral systems, non-storm water discharges from the MS4 are likely to be the only surface flows present within the receiving water during the dry season.

MS4 discharge points to bays, estuaries and lagoons are not designed to achieve maximum initial dilution and dispersion of non-storm water discharges. Thus, initial dilution factors for non-storm water discharges from the MS4 into bays, estuaries, and lagoons are conservatively assumed to equal zero.

It is appropriate to base numeric action levels for dry weather non-storm water discharges on these considerations.

California Ocean Plan

A discharge to a surf zone occurs when the non-storm water discharge point from the MS4 discharges:

a) Directly into the ocean in a wave induced area subject to long-shore conditions; or
b) Across a primarily sandy substrate beach and subsequently directly into a wave induced area subject to long-shore conditions;

Establishment of Action Levels

Action levels in the Order are based upon numeric or narrative water quality objectives and criteria as defined in the Basin Plan, the Water Quality Control Plan for Ocean Waters of California (Ocean Plan), and the State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP). The Regional Board recognizes that use of action levels will not necessarily result in detection of all unauthorized sources of non-storm water discharges because there may be some discharges in which pollutants do not exceed established action levels.

In June of 2006, the California Water Board's Blue Ribbon Storm Water Panel released its report titled 'The Feasibility of Numerical Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities.' The report only examined numerical limits as applied to storm water and not non-storm water. In the recommendations, the Blue Ribbon panel proposed storm water action levels which are computed using statistical based population approaches. For example, Section D of the Permit uses a recommended statistical approach to develop storm water action levels. The Blue Ribbon panel did not examine the efficacy of action levels or recommendations for development of action levels for non-storm water discharges.

For discharges to inland surface waters, action levels are based on the EPA water quality criteria for the protection of aquatic species, the EPA water quality criteria for the protection of human health, water quality criteria and objectives in the applicable

State plans, effluent concentration available using best available technology, and 40 CFR 131.38. Since the assumed initial dilution factor for the discharge is zero and a mixing zone is not allowed, a non-storm water discharge from the MS4 could not cause an excursion from numeric receiving water quality objectives if the discharge is in compliance with the action levels contained in the Order. Likewise, discharges in compliance with action levels to the surf zone cannot cause excursions from water quality objectives.

Dry weather monitoring of non-storm water MS4 effluent conducted under the previous Order (R9-2002-001), which relies on BMPs as controls to protect water quality standards, has identified pollutants that are found in non-storm water discharges. Monitoring of pH, Dissolved Oxygen, Phosphorus, Nitrate, Turbidity and Methylene Blue Active Substances (MBAS) in non-storm water MS4 discharges has shown that the effluent exceeds state water quality criteria. It is appropriate to establish numeric action levels for these pollutants to ensure that the Copermittees are complying with the requirement to effectively prohibit all types of unauthorized non-storm water discharges into the MS4s.

Water Quality Limited Segments on the current 303(d) list (2006) within the jurisdiction of this Order have been identified due to exceedances of Sulfate, Chloride and Total Dissolved Solids criteria from a source which is currently unknown (see Table 2a). These pollutants are not monitored for under the current non-storm water MS4 effluent monitoring program. While this Order does not establish a numeric action level for these constituents at this time, this Order now requires non-storm water MS4 discharge monitoring to include monitoring for Sulfates, Chlorides and Total Dissolved Solids.

Priority pollutants analyzed included Cadmium, Copper, Chromium, Lead, Nickel, Silver and Zinc. These priority pollutants are likely to be present in non-storm water MS4 discharges (see Finding C.3) and dissolved metal effluent monitoring is available from the previous Order. The most stringent applicable water quality criteria have been identified for these seven metals and, excluding Chromium (VI), and all are dependent on receiving water hardness. The conversion factors for Cadmium and Lead are also water hardness dependent (40 CFR 131.38(b)(2)). These levels are established as the action levels for these constituents.

While effluent monitoring is available from the previous Order, the monitoring was done for dissolved concentrations and lacked a measurement of receiving water hardness. Due to the multiple point source discharges of non-storm water from the MS4, a discharge may enter a receiving water whose hardness will vary temporally. In addition, hardness may vary spatially within and among receiving waters.

However, other information is available to determine the appropriateness of an action level. Existing effluent monitoring concentrations absent of receiving water data, no dilution credit or mixing zone allowance, current 303(d) listings of receiving waters for

other pollutants, receiving water monitoring data, and the classification of waters as critical habitat for endangered and species of concern, provide evidence that NALs are appropriate for these priority pollutants at this time in order to ensure that the Copermittees comply with the requirement to effectively prohibit all types of unauthorized non-storm water discharges into the MS4s.

Existing effluent data (see attachment F), absent receiving water hardness, provides evidence that it is appropriate to include NALs based on a conservative hardness level. Absent receiving water hardness, all analyzed metals, are discharged at concentrations which may be in exceedance of CTR criteria depending on receiving water hardness. Chromium effluent data that is available is in the form of total Chromium. However, per the SIP, Chromium criteria are for Chromium III and Chromium VI. Therefore, the total Chromium measurement is inadequate, but can be used as an estimate of Chromium III and VI concentrations.

As discussed, inland surface waters, enclosed bays, and estuaries have conservatively been allotted a mixing zone and dilution credit of zero. As such, any discharge of these priority pollutants is likely to impact the receiving water, regardless of the quantity or rate of discharge.

As discussed in Finding C.7 and discussion, multiple receiving waters within the County of Orange are 303(d) listed for a number of pollutants, including toxicity. The 303(d) listing of a waterbody as impaired provides evidence that the receiving water(s) are already experiencing negative impacts. These water quality limited segments are more susceptible to degradation from the synergistic addition of more pollutants, even from upstream discharges. It is therefore appropriate to include numeric action levels designed to ensure that the Copermittees are complying with the requirement to effectively prohibit all types of unauthorized discharges of non-storm water into the MS4s.

Copermittees have monitored the receiving waters for MS4 discharges pursuant to requirements under Order R9-2002-0002. Dry weather receiving water data indicates poor conditions within waters receiving non-storm water MS4 discharges. Urban stream bioassessment conducted under the Order (2002-2008) has documented all non-reference sites as consistently having poor or very poor Index of Biotic Integrity (IBI) scores, in part due to receiving water toxicity[168].

Receiving waters within the jurisdiction of this Order are classified as critical habitat, including being designated with the RARE beneficial use, for endangered, threatened and species of concern including, but not limited to, *O. mykiss irideus*, *E. newberryil, A. marmorata pallida* and *G. orcutti.*

[168] 2006-07 and 2007-08 Unified Annual Progress Reports.

The Regional Board evaluated discharges to the surf zone, per the California Ocean Plan, Appendix VI and in accordance with 40 CFR 122.44(d). Indicator bacteria, pH, turbidity (NTU), and metals were analyzed for the purpose of determining the levels of these constituents in non-storm water discharges from the MS4.

The Regional Board has determined that there is not sufficient information at this time to develop action levels for pH, turbidity and metals. While non-storm water MS4 effluent data is available, the data collected is for discharges to inland surface waters, enclosed bays and estuaries. Preliminary receiving water data and limited non-storm water MS4 discharge data collected under the Ambient Coastal Receiving Water Monitoring indicates some exceedances of criteria for metals in the discharge, and toxicity in receiving waters[169]. However, the Regional Board believes the level of data available is insufficient, and is requiring additional monitoring of pH, turbidity and metals in non-storm water MS4 discharges to ocean waters (discharges to the surf zone).

Water Quality Limited Segments on the current 303(d) list (2006) for the Pacific Ocean shoreline within the jurisdiction of this Order have been identified due to exceedances of Indicator Bacteria criteria whose known source includes non-storm water discharges from the MS4. These 303(d) listed segments support extensive REC-1 beneficial uses and are located within State Marine Reserves and Conservation Areas. The listing of receiving waters as 303(d) listed for bacteria supports the inclusion of action levels to ensure that the Copermittees are complying with the requirement to effectively prohibit all types of unauthorized non-storm water discharges into the MS4. In addition, no dilution credit or mixing zone allowance is included in developing numeric action levels for the discharge of a pollutant to waters which are 303(d) listed as impaired for that pollutant.

Dry Weather Non-Storm Water Action Levels Calculations for Discharges to Inland Surface Waters, Enclosed Bays, and Estuaries

On the basis of the foregoing discussion, the NALs were calculated with the following considerations and assumptions:

> No dilution credit is considered for the discharge. Therefore, the discharge must comply with the Water Quality Objective at the point of discharge.
>
> For NALs based on CTR, implementation was done using the procedure list as outlined in the SIP (see below example).

NAL CTR/SIP Calculation – Zinc Example:

Criteria for Priority Toxic Pollutants in the State of California is described in the CTR

[169] 2007-08 Unified Annual Progress Report.

table listed in 40 CFR 131.38.

A		B Freshwater		C Saltwater		D Human Health (10^{-6} risk for carcinogens) For consumption of:	
# Compound	CAS Number	Criterion Maximum Conc. [d] B1	Criterion Continuous Conc. [d] B2	Criterion Maximum Conc. [d] C1	Criterion Continuous Conc. [d] C2	Water & Organisms (µg/L) D1	Organisms Only (µg/L) D2
1. Antimony	7440360					14 a,s	4300 a,t
2. Arsenic [b]	7440382	340 i,m,w	150 i,m,w	69 i,m	36 i,m		
3. Beryllium	7440417					n	n
4. Cadmium [b]	7440439	4.3 e,i,m,w,x	2.2 e,i,m,w	42 i,m	9.3 i,m	n	n
5a. Chromium (III)	16065831	550 e,i,m,o	180 e,i,m,o			n	n
5b. Chromium (VI) [b]	18540299	16 i,m,w	11 i,m,w	1100 i,m	50 i,m	n	n
6. Copper [b]	7440508	13 e,i,m,w,x	9.0 e,i,m,w	4.8 i,m	3.1 i,m	1300	
7. Lead [b]	7439921	65 e,i,m	2.5 e,i,m	210 i,m	8.1 i,m	n	n
8. Mercury [b]	7439976	[Reserved]	[Reserved]	[Reserved]	[Reserved]	0.050 a	0.051 a
9. Nickel [b]	7440020	470 e,i,m,w	52 e,i,m,w	74 i,m	8.2 i,m	610 a	4600 a
10. Selenium [b]	7782492	[Reserved] p	5.0 q	290 i,m	71 i,m	n	n
11. Silver [b]	7440224	3.4 e,i,m		1.9 i,m			
12. Thallium	7440280					1.7 a,s	6.3 a,t
13. Zinc [b]	7440666	120 e,i,m,w,x	120 e,i,m,w	90 i,m	81 i,m		

Saltwater criterion maximum concentration (CMC) = 90 ug/L
Saltwater criterion continuous concentration (CCC) = 81 ug/L

These criteria are expressed in terms of the dissolved fraction of the metal in the water column. [See footnote “m” to Table in paragraph (b)(1) of 40 CFR 131.38].

40 CFR 122.45(c) requires that this Order include effluent limitations as total recoverable concentration; therefore it is appropriate to include action levels also as total recoverable concentration.

The SIP requires that if it is necessary to express a dissolved metal value as a total recoverable and a site-specific translator has not yet been developed, the Regional Board shall use the applicable conversion factor from 40 CFR 131.38.

The term “Conversion Factor” (CF) represents the recommended conversion factor for converting a metal criterion expressed as the total recoverable fraction in the water column to a criterion expressed as the dissolved fraction in the water column.

Total recoverable concentration * CF = Dissolved concentration criterion

or

Total recoverable concentration = Dissolved concentration criterion/ CF

§ 131.38 40 CFR Ch. I (7–1–08 Edition)

Metal	Conversion factor (CF) for freshwater acute criteria	CF for freshwater chronic criteria	CF for saltwater acute criteria	CF [a] for saltwater chronic criteria
Silver	0.85	([d])	0.85	([d])
Thallium	([d])	([d])	([d])	([d])
Zinc	0.978	0.986	0.946	0.946

CF for Zinc = .946, so the total recoverable concentrations for zinc:
90 ug/L dissolved (CMC)/ 0.946 (CF) = 95 ug/L total recoverable CMC
81 ug/L dissolved (CCC) / 0.946 (CF) = 86 ug/L total recoverable CCC

<u>Effluent Variability multiplier and Coefficient of Variation (CV)</u>
For each concentration based on an aquatic life criterion, the long-term average (LTA) is calculated by multiplying the concentration with a factor that adjusts for effluent variability. The multiplier can be found in Table 1 of the SIP. Since this Order does not have existing data to properly conduct a variability analysis in accordance with the SIP, the CV has been set equal to 0.6 per SIP requirements. The current effluent data is limited due to the small number of representative outfalls sampled, the lack of outfalls discharging to representative waterbodies within the Region, and the targeted nature of the sampling design.

Based upon a CV of 0.6, Table 1 of the SIP requires an effluent variability as follows:
Acute Multiplier = 0.321
Chronic Multiplier = 0.527

The long-term average (LTA) is calculated by multiplying the total recoverable concentrations for zinc with the acute and chronic multipliers:
LTA Acute = 95 ug/L * 0.321 = 30.5
LTA Chronic = 86 ug/L * 0.527 = 45.3
The MDAL and AMAL will be based on the most limiting of the acute and chronic LTA, in the case for copper the most limiting LTA is the acute of 30.5 ug/L

NALs are calculated by multiplying the most limiting LTA with a multiplier that adjusts for the averaging periods and exceedance frequencies of the criteria and the effluent limitations. The multiplier can be found in Table 2 of the SIP. Since this Order has insufficient data, the CV has been set to 0.6 and since sampling frequency is four times a month or less, n has been set equal to 4 per the SIP.

Table 2. Long-Term Average (LTA) Multipliers for Calculating Effluent Limitations

Coefficient of Variation	MDEL Multiplier	AMEL Multiplier			MDEL/AMEL Multiplier		
	99th Percentile Occurrence Probability	95th Percentile Occurrence Probability			MDEL = 99th Percentile AMEL = 95th Percentile Occurrence Probability		
(CV)		n = 4	n = 8	n = 30	n = 4	n = 8	n = 30
0.1	1.25	1.08	1.06	1.03	1.16	1.18	1.22
0.2	1.55	1.17	1.12	1.06	1.33	1.39	1.46
0.3	1.90	1.26	1.18	1.09	1.50	1.60	1.74
0.4	2.27	1.36	1.25	1.12	1.67	1.82	2.02
0.5	2.68	1.45	1.31	1.16	1.84	2.04	2.32
0.6	3.11	1.55	1.38	1.19	2.01	2.25	2.62

Therefore, from Table 2 of the SIP, the LTA multipliers will be as follows:
MDAL Multiplier = 3.11
AMAL Multiplier = 1.55

The MDAL and AMAL limits are calculated by multiplying the LTA with an LTA multiplier for each limit:
MDAL = 30.5 ug/L * 3.11 = 95 ug/L
AMAL = 30.5 ug/L * 1.55 = 47 ug/L

Dry Weather Non-Storm Water Action Levels Calculations for Discharges to the Surf Zone
Based on the foregoing discussion, the Average Monthly and Maximum Daily NALs were calculated with the following considerations and assumptions:

No dilution credit is considered for the discharge. Therefore, the discharge must comply with the Water Quality Objective at the point of discharge.

Whole Effluent Toxicity (WET) Testing Requirements
A WET limit is required if a discharge causes, has a reasonable potential to cause, or contributes to an exceedance of applicable water quality standards, including numeric and narrative. Since these types of discharges are prohibited under this Order, WET limits are not applicable.

Discussion of AMALs, MDALs and Instantaneous Maximums
Where practical, action levels in this Order have been expressed as both AMALs and MDALs. Certain action levels may not practicably be expressed as AMALs and MDALs due to specific BPO language, sampling requirements and/or a lack of Criteria. Based upon the likely sampling frequency of the Copermittees, the frequency of sampling will occur such that grab samples are taken once per sampling day. This single sample would then be subject to MDALs and Instantaneous Maximum levels. In this case, the more conservative action level would apply. In addition, it is expected that some effluent monitoring will occur less than or equal to once per month. In this scenario, the MDAL, AMAL and Instantaneous Maximum levels would need to be met based upon one sample, unless sampling did not occur. For some BPOs, AMALs have been excluded and only MDALs/Instantaneous Maximums set to prevent redundancy in action levels.

Compliance with Action levels (Priority Pollutants)
Compliance with action levels shall be determined as follows:

Dischargers shall be deemed out of compliance with this Order if the Copermittee failed to take the prescribed action in response to a concentration of the priority pollutant in the monitoring sample that is greater than the action level and greater than or equal to the reported Minimum Level (exceedance of an action level). Regardlss of the Copermittee's actions in response to an exceedance, they are still subject to the prohibitions found in Section A and B of the Order.

When determining to take an action in response to the AMALs and more than one sample result is available in a month, the discharger shall compute the arithmetic mean unless the data set contains one or more reported determinations of DNQ or ND. In those cases, the discharger shall compute the median in place of the arithmetic mean in accordance with the following procedure:

(1) The data set shall be ranked from low to high, reported ND determinations lowest, DNQ determinations next, followed by quantified values (if any). The order of the individual ND or DNQ determinations is unimportant.

(2) The median value of the data set shall be determined. If the data set has an odd number of data points then the median is the middle value. If the data set has an even number of data points, then the median is the average of the two values around the middle unless one or both of those points are ND or DNQ, in which case the median value shall be the lower of the two data points where DNQ is lower than a value and ND is lower than DNQ.

D. Storm Water Action Levels

Section D has been added to establish storm water action levels (see also Finding D.1.h and Discussion).

Introduction
In response to comments at the initial public workshop, meetings with the principle Permittees, and comments from the July 01, 2009 Regional Board meeting, SAL concentrations, standards and constituents have been updated, Order language has been clarified and additions to the monitoring requirements have been made.

SAL Concentration/Standards Updates
SAL pollutant levels have been updated and now come from a regional subset of nationwide Phase I MS4 data. Regional Board staff have chosen to update SALs by using USEPA Climate Zone 6 (arid west) data when computing SALs. Utilizing data from USEPA Climate Zone 6 is expected to produce SALs which closely reflect the environmental conditions experienced in Orange County. The localized subset of data includes sampling events from multiple Southern California locations including Orange, San Diego, Riverside, Los Angeles and San Bernardino Counties. The dataset includes samples taken from highly built-out impervious areas and from storm events representative of Southern California conditions.

Additionally, utilization of regional data is appropriate due to the addition of data into the nationwide Phase I MS4 monitoring dataset in February 2008. This additional data increased the number of USEPA Climate Zone 6 samples to more than 400, and included additional monitoring events within Southern California (see Figure 2).

Figure 2. Sample Sizes Used to Calculate Storm Water Action Levels

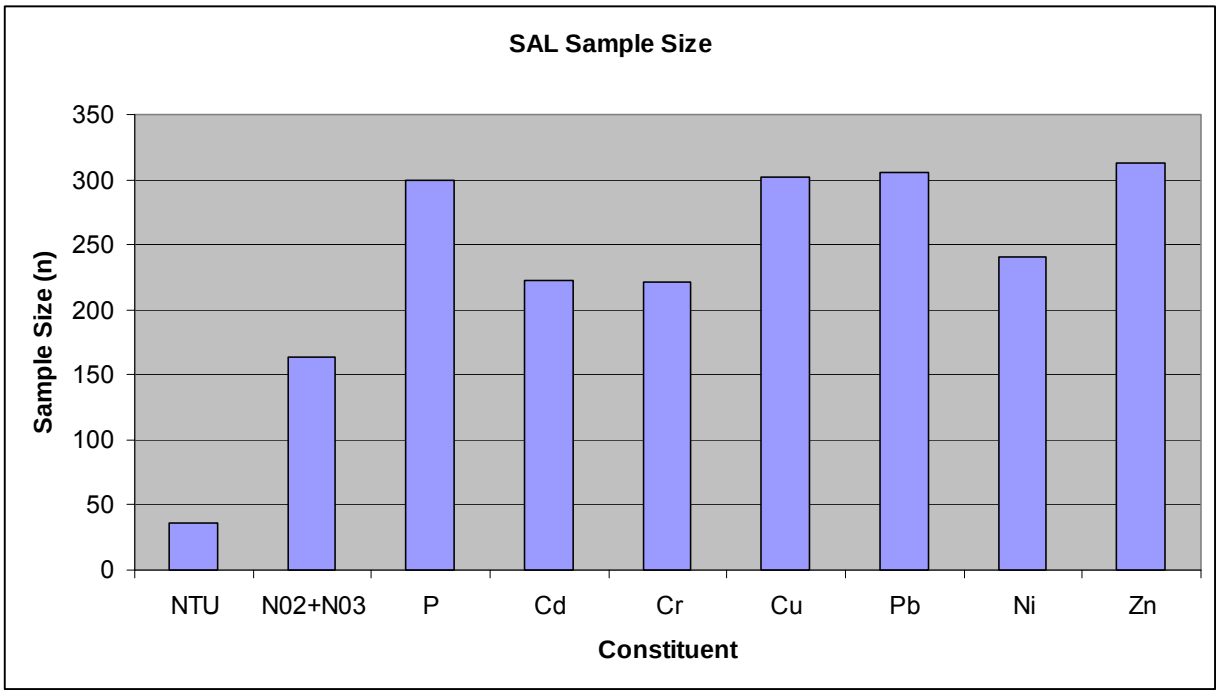

Additional changes have been made by staff to update SALs to reflect the water quality standards in the San Diego Regional Water Quality Control Board Basin Plan, the California Toxic Rule and USEPA Water Quality Criteria. Since it is the goal of the SALs, through the iterative and MEP process, to have outfall storm water discharges meet all applicable water quality objectives, the list of constituents to be tested and protocol for testing has been updated to provide a reference point to evaluate the iterative MEP process. As such, Kjedahl Nitrogen (TKN) and Total Suspended Solids (TSS) have been removed from the SAL table. There currently are no appropriate criteria for TKN or TSS, and alternate constituents are available which do have BPOs for comparative purposes. Instead, Nitrate/Nitrite and Turbidity, which have BPOs of 1.0 mg/L and 20 NTUs respectively, are included with associated SALs.

Metals included in SALs include Cadmium, Chromium, Nickel, Zinc, Lead and Copper. In receiving water quality monitoring collected by the Copermittees to date, these metals have been detected and shown to contribute to toxicity at mass loading stations within Southern Orange County.

Monitoring Updates

SAL language has been updated to require the measurement of hardness and to provide more specificity in the assessment of samples with SALs for total metal concentrations. While USEPA Climate Region 6 data includes a large sample size for concentrations of total metals, the impact the concentration will have on receiving waters will vary with receiving water hardness. Since it is the goal of the SALs,

through the iterative and MEP process, to have MS4 storm water discharges meet all applicable water quality objectives, the hardness of the receiving water should be used when assessing the total metal concentration of a sample. Thus, when an exceedance of a SAL concentration is detected for a metal the Copermittee must determine if that exceedance is above the existing applicable water quality limitation based upon the hardness of the receiving water. The water quality limitations Permittees must use to assess total metal SAL exceedances are the California Toxic Rule (CTR) and USEPA National Recommended Water Quality Criteria for Freshwater Aquatic Life 1 hour maximum concentrations. The 1 hour maximum concentration is to be used for comparison since it is expected to most replicate the impacts to waters of the State from the first flush following a precipitation event.

E. Legal Authority

The following legal authority applies to section E:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(i)(A) provides that the Copermittees shall develop and implement legal authority to "Control through ordinance, order or similar means, the contribution of pollutants to the municipal storm sewer by storm water discharges associated with industrial activity and the quality of storm water discharged from sites of industrial activity."

Federal NPDES regulation 40 CFR 122.26(d)(2)(i)(D) provides that the Copermittees shall develop and implement legal authority to "Control through interagency agreements among coapplicants the contribution of pollutants from one portion of the municipal system to another portion of the municipal system."

Illicit discharge is defined under Federal NPDES regulation 40 CFR 122.26(b)(2) as "any discharge to a municipal separate storm sewer system that is not composed entirely of storm water except discharges pursuant to a NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer) and discharges resulting from fire fighting activities."

Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(A - D) require municipalities to implement controls to reduce pollutants in storm water runoff from commercial, residential, industrial, and construction land uses or activities.

Federal NPDES regulation 40 CFR 122.26(d)(1)(ii) requires from the Copermittee "A description of existing legal authority to control discharges to the municipal separate storm sewer system."

Section E.1.b Prohibit all identified illicit discharges not otherwise allowed pursuant to section B.2 including but not limited to:

(1) Sewage;
(2) Discharges of wash water resulting from the hosing or cleaning of gas stations, auto repair garages, or other types of automotive services facilities;
(3) Discharges resulting from the cleaning, repair, or maintenance of any type of equipment, machinery, or facility including motor vehicles, cement-related equipment, and port-a-potty servicing, etc.;
(4) Discharges of wash water from mobile operations such as mobile automobile washing, steam cleaning, power washing, and carpet cleaning, etc.;

(5) Discharges of wash water from the cleaning or hosing of impervious surfaces in municipal, industrial, commercial, and residential areas including parking lots, streets, sidewalks, driveways, patios, plazas, work yards and outdoor eating or drinking areas, etc.;
(6) Discharges of runoff from material storage areas containing chemicals, fuels, grease, oil, or other hazardous materials;
(7) Discharges of pool or fountain water containing chlorine, biocides, toxic amounts of salt, or other chemicals; discharges of pool or fountain filter backwash water;
(8) Discharges of sediment, pet waste, vegetation clippings, or other landscape or construction-related wastes; and

Duplicative language has been removed from this section.

Section E.1.j has been added to the Order to ensure that BMPs implemented by third parties are effective. Since the Copermittees cannot passively receive and discharge pollutants from third parties, the Copermittees must ensure discharges of storm water pollutants to the MS4 are reduced to the MEP. In order to achieve this, the Copermittees must be able to ensure that effective BMPs are being implemented by requiring the third parties to document BMP effectiveness. Regarding the Copermittees' ability to require documentation and reporting from third parties, USEPA states "municipalities should provide documentation of their authority to enter, sample, inspect, review, and copy records, etc., as well as demonstrate their authority to require regular reports."[170]

[170] USEPA, 1992. Guidance Manual for the Preparation of Part 2 of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems. EPA 833-B-92-002.

F. Jurisdictional Runoff Management Program

F.1. Development Planning

The following legal authority applies to section F.1:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWA section 402(a), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F), 40 CFR 131.12, and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(2) provides that Copermittees develop and implement a management program which is to include "A description of planning procedures including a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal separate storm sewers which receive discharges from areas of new development and significant redevelopment. Such plans shall address controls to reduce pollutants in discharges from municipal separate storm sewers after construction is completed."

Federal NPDES regulation 40 CFR 122.44(d)(1) requires municipal storm water permits to include any requirements necessary to "[a]cheive water quality standards established under section 303 of the CWA, including State narrative criteria for water quality."

Sections F.1.a and F.1.b (General Plan and Environmental Review Process) require the Copermittees to update and revise their General Plan (or equivalent plan) and environmental review processes to ensure water quality and watershed protection principles are included. The Copermittees are required to detail any changes to the General Plan or environmental review process in their Jurisdictional Runoff Management Program Annual Reports.

The change made to these sections requires updating the General Plan and Environmental Review Process on an as-needed basis, is supported by information provided in the Copermittees' Report of Waste Discharge (ROWD) and Annual Reports. Each Copermittee has either updated, is in the process of updating, or has assessed its General Plan to ensure the General Plans include the required principles and are in compliance with Order No. R9-2002-0001. The ROWD also states that although all the Copermittees have reviewed their environmental review processes, a number of Copermittees want the overall planning approval process to more effectively ensure that water quality protection is considered in the earliest phases of project consideration.

Section F.1.a has been modified to include redevelopment projects in the General Plan. This change requires Copermittees to update their General Plan to include water quality and watershed protection for all new development and redevelopment projects.

Section F.1.c (Approval Process Criteria and Requirements) requires that all development projects (regardless of size) implement BMPs to reduce storm water pollutant discharges to the MEP. Source control and site design BMP requirements were not clearly described in this section of Order No. R9-2002-0001. Additional detail has been added to this section to better describe the source control and site design BMPs needed for implementation. This additional detail is consistent with the requirements of the SSMP, known in Orange County as the Water Quality Management Plan (WQMP). However, only source control and site design BMPs that apply to all types of development projects are required (i.e., properly designed trash storage areas).

The requirements are consistent with Order No. R9-2002-0001, section F.1.b.1. However, some elements are not contained in the current or proposed DAMP[171] (e.g., buffer zones). One exception is that Order No. R9-2002-0001's requirement that applicants must provide evidence of coverage under the General Industrial Permit has been removed, since industrial tenants for a development project are usually not known during the planning stage.

The section has been modified to reflect the prohibition of over-irrigation runoff to the MS4, as well as LID requirements. Additionally, this section requires the use of native and/or low water use plants for landscaping, where feasible.

Sections F.1.d and F.1.d.(1) (Standard Storm Water Mitigation Plans) require the Copermittees to review and update their local SSMPs (also known in Orange County as Water Quality Management Plans – WQMPs) for compliance with the Order. The sections also require all Priority Development Projects falling under certain categories to meet SSMP requirements. The update is necessary to ensure that the Copermittees' local SSMPs are consistent with the changes that have been made to the Order's SSMP requirements. The requirement for the development/adoption of a Model SSMP has been removed since a model was completed and adopted in 2003.

The SSMP section of the Order has been reformatted for clarity. There are also some significant changes. Changes have been made in response to experience gained by the Orange County Storm Water program, USEPA program evaluations, recent BMP development and effectiveness studies, recent reports on the magnitude of problems caused by hydromodification, and reviews of annual reports and the ROWD submitted by the Copermittees.

[171] Orange County Storm Water Copermittees. *Drainage Area Management Plan (DAMP) 2007.* July 21, 2006. The 2007 DAMP was submitted to the Regional Board with the Report of Waste Discharge as part of the application for NPDES Permit reissuance.

In addition, the Order requires that a one-acre threshold be phased in over three years for the priority development category. This threshold was selected to be consistent with the Phase II NPDES regulations for small municipalities. The one-acre determination applies to the amount of ground area disturbed, not the total size of the parcel or project. Each Copermittee may also lower this threshold if desired.

Section F.1.d.(2) (Priority Development Project Categories) includes several changes to improve, simplify, and clarify the Priority Development Project categories.

The most significant change is that where a new Development Project feature, such as a parking lot, falls into a Priority Development Project Category, the entire project footprint is subject to SSMP requirements. This criterion was not included in Order No. R9-2002-0001. It is included, however, in the Model San Diego SSMP that was approved by the Regional Board in 2002. It is included in this Order because existing development inspections by Orange County municipalities show that facilities included in the Priority Development Project Categories routinely pose threats to water quality. This permit requirement will improve water quality and program efficiency by preventing future problems associated with partly treated storm water runoff from redevelopment sites. This approach to improving storm water runoff from existing developments is practicable because municipalities have a better ability to regulate new developments than existing developments.

Industrial sites and retail gasoline outlets have been added to the priority development categories. This heavy industrial category was not included in Order No. R9-2002-0001 because industrial NPDES requirements already establish storm water criteria. This category is included in the Order to be consistent with Phase II rules and to close loopholes. A discussion of retail gasoline outlets is below.

The criterion for commercial developments has been lowered to one acre from 100,000 square feet (2.3 acres). It is modified in order to be consistent with USEPA Phase II guidance, and to reflect the findings from Permittees that smaller commercial developments pose high threats to storm water discharges.

Housing and restaurant criteria have been clarified. The two housing development categories are now combined into one category that includes 10 or more housing units. In addition, requirements which specifically apply to restaurants have been combined in this section. The section has been modified to clarify that restaurants with less than 5,000 square feet of development are subject to SSMP requirements, except for the treatment control BMP and hydromodification control requirements. This is consistent with Order No. R9-2002-0001's approach for applying SSMP requirements to restaurants.

Section F.1.d.(2)(j) includes Retail Gasoline Outlets (RGOs) as a Priority Development Project category because RGOs are points of confluence for motor vehicles for automotive related services such as repair, refueling, tire inflation, and radiator fill-up. RGOs consequently produce significantly greater pollutant loadings of hydrocarbons and trace metals (including copper and zinc) than other developed areas. To meet the storm water MEP standard, source control and structural treatment BMPs are needed at RGOs that meet the following criteria: (a) 5,000 square feet or more of developed area, or (b) a projected average daily traffic of 100 or more vehicles per day. These are appropriate thresholds since development size and volume of traffic are good indicators of potential impacts of runoff from RGOs on receiving waters. RGOs were proposed, but not included in Order No. R9-2002-0001 pending guidance from the State Board in its review of the San Diego MS4 Permit, Order No. 2001-0001.

In State Board WQ Order No. 2000-11, the State Board removed RGOs as a SSMP category because the State Board found that RGOs were already heavily regulated and limited in their ability to construct infiltration devices or perform treatment. Order No. 2000-11 also acknowledged that a threshold (size, average daily traffic, etc.) appropriate to trigger SSMP requirements should be developed, and that specific findings regarding RGOs should be included in MS4 permits to justify the requirement.[172] The State Board also removed the RGO category from the San Diego County MS4 permit (Order No. 2001-01) because the Regional Board did not specifically address the issues raised in WQ Order No. 2000-11.

As discussed further below, the LARWQCB and the Regional Board have adequately addressed these issues. RGOs have been included as a SSMP category in the Los Angeles County MS4 permit (Order No. R4-01-182), the statewide general Phase II MS4 permit (WQ Order No. 2003-0005-DWQ), and the Regional Board Southern Riverside County MS4 permit (Order No. R9-2004-001). The State Board also addressed the inclusion of RGOs through the appeals of MS4 permits issued by the Los Angeles and San Francisco Bay Area Regional Boards. The State Board held a workshop addressing RGOs and identified RGOs as significant sources of pollutants. The State Board then dismissed the petitions for removal of RGOs from the SSMP requirements in the Los Angeles and San Francisco Bay Area MS4 permits.

Inexpensive and effective structural treatment BMPs which reduce storm water pollutants and control peak flow rates and velocities are available for use at RGOs. Studies have shown that some catch basin inserts can remove hydrocarbons and heavy metals, which are typical pollutants of concern at RGOs. Sand or media filters have also been found to be effective and available for use at RGOs. Site design measures to control flow include cisterns, small weirs, baffles, and redirecting roof runoff to pervious areas.

[172] State Board, 2000. Order WQ 2000-11.

No evidence has been provided to indicate that use of these structural BMPs at RGOs will pose a safety risk. In fact, filter BMPs have been installed at RGOs in some municipalities without apparent adverse safety effects. In addition, similar BMPs such as oil/water separators have been used for years by RGOs without safety problems.

Threshold - Studies indicate that runoff from RGOs contains similar pollutants to runoff from commercial parking lots. In precedential WQ Order 2000-11, the State Board determined that parking lots with a size threshold of 5,000 square feet or more is an appropriate SUSMP category. Based in part on the similarity of pollutants, the 5,000 square feet size threshold was also included for RGOs in the Order. In addition, other municipalities currently use similar size thresholds for RGOs when requiring design standards to mitigate storm water runoff. To provide additional flexibility for the Copermittees, another threshold of 100 or more motor vehicles ADT has been added to the Order. This threshold is based on requirements used in Washington and Oregon for what are considered “high use” sites. This is an appropriate threshold since vehicular traffic is a good indicator of the amount of pollutants generated at a site.

The Regional Board followed the State Board’s direction regarding RGOs by including the above discussion in this Fact Sheet, as well as a specific finding that justifies the regulation of runoff from RGOs that meet certain criteria. Considering all of the supporting documentation discussed above, it is appropriate to include RGOs as a Priority Development Project category.

Additional detailed supporting information can be found in the 2001 technical report titled *Retail Gasoline Outlets: New Development Design Standards for Mitigation of Storm Water Impacts* by the LARWQCB and the Regional Board.

Section F.1.d.(3) (Pollutants of Concern) requires Copermittees to update their procedures for identifying pollutants of concern for each Priority Development Project. This is important to do periodically because of changing water quality conditions and designations of impairments or areas of concern. Furthermore Copermittees continually learn more about pollutant-generating activities as they conduct inspections and investigations, and that information must be incorporated into the SSMP process.

Section F.1.d.(4) This Section has been modified to clarify some elements of low impact development. This section requires Copermittees to require or implement site design BMPs at Priority Development Projects in order to reduce the amount of polluted storm water runoff from those sites. The primary approach in site design BMPs is to limit the permanent loss of existing infiltration capacity because loss of infiltration is a major contributor to wet weather pollution discharges. General means to accomplish that goal include retaining natural infiltration areas of a site and limiting the amount of impervious surfaces. The Order does not require a specific or relative amount of pervious surfaces be added to a project. The Order seeks to retain on-site capture of the 85th percentile storm.

The site design BMP options listed in these sections are consistent with the site design BMPs currently required by the Copermittees in the Model WQMP. In the ROWD, the Copermittees propose to improve the process of selecting site design BMPs. Specifically, they propose to develop recommendations for incorporating low-impact design (LID) techniques and site design BMPs. However, the Model WQMP employs an open-ended approach to requirements for site design BMPs, requiring implementation of site design BMPs "where applicable and feasible" and "where appropriate." Unfortunately, this approach has proven to be ineffective in integrating site design BMPs in project designs. Audits conducted in 2005 of four Copermittees found that municipalities need to work with project applicants to improve the quality of site design BMPs.[173] As a result, the Order establishes two sets of site design BMP criteria.

First, section F.1.d.(4)(b) of the Order directs the Copermittees to require, rather than consider, new development projects to employ certain classes of site design BMPs. The required site design BMPs take advantage of features that are incorporated into the Priority Development Project, such as landscaping or walkways. It also requires that projects seek to maintain natural water drainage features rather than instinctively convey water in buried pipes and engineered ditches that eliminate natural water quality treatment functions. These types of site design BMPs are both effective and achievable. These requirements are consistent with the guidelines of Order No. R9-2002-0001 and both the 2003 and 2007 DAMPs.[174]

Next, section F.1.d.(4)(d) of the Order requires that LID BMPs be sized and designed to ensure onsite retention without runoff, of the volume of runoff produced from a 24-hour 85th percentile storm event. This is consistent with other municipal stormwater NPDES permits recently adopted by the Los Angeles and Santa Ana Regional Boards. In those permits, the stakeholders were involved in drafting the numerical performance criteria. The requirement for a numerical BMP design standard is well established for treatment control BMPs and is required in permits throughout the nation such as in Pennsylvania, West Virginia, Georgia, and Washington D.C. Since the 85th percentile storm event has previously been used as the numeric design standard for treatment control BMPs; the same size storm event can be applied as the numeric design standard for LID BMPs. According to information provided by the County of Orange, the 24 hour, 85th percentile rainfall is between 0.7 to 0.8 inches of rain for the majority of the area covered by this permit.

[173] Tetra Tech, Inc. 2005. Program Evaluation Report. Orange County Storm Water Program: Cities of Laguna Beach, Laguna Hills, Lake Forest, and Rancho Santa Margarita.
[174] The 2003 and 2007 DAMPs include preserving natural drainage features as a recommended site design BMP requirement that was to be reviewed and used where applicable and feasible. The DAMPs note this as a way to mimic a site's natural hydrologic regime.

The retention of natural drainage features, such as ephemeral streams, wetlands, and depressions, can be particularly important because small tributaries are essential to the maintenance of the chemical, biological, and physical integrity of larger waterbodies.[175] The loss and modification of such natural water resources to accommodate post-development storm water management leads to direct and indirect adverse effects on water quality that are felt both on the project site and off the site within the watershed.[176,177,178] Effects to aquatic beneficial uses from altered drainage features can occur downstream and upstream. The length of upstream or downstream effect of channel modifications is dependant on the specific structure type and channel slope.[179] For instance, road culverts can act as partial barriers to upstream distribution of native aquatic macroinvertebrates in urban streams, while bridges can provide adequate passage.[180] As a result of the adverse effects to water quality and beneficial uses, the State of California nonpoint source pollution program management measures for urban areas includes limiting the destruction of natural drainage features and natural conveyance areas. [181]

Through its process of conditioning development projects under the CWA section 401 Water Quality Certification program, the Regional Board finds that the level of site design BMP implementation in the Order is feasible for all projects. This site design BMP requirement will help ensure that site design BMPs are implemented for new development projects. Site design BMPs are a critical component of storm water runoff management at new development projects, since the BMPs provide multiple benefits including preservation of hydrologic conditions, reduction of pollutant discharges, cost effectiveness, and green space.

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[175] Aquatic scientists comment letter (April 10, 2003) on the Advanced Notice of Proposed Rulemaking (ANPRM) on the Clean Water Act Regulatory Definition of "Waters of the United States." (Docket ID No. OW-2002-0050). This letter is a synthesis of scientific information regarding ephemeral, intermittent, and headwater streams. It was written to USEPA by 85 leading aquatic scientists.

[176] Wright, Tiffany, et al. 2006. *Direct and Indirect Impacts of Urbanization on Wetland Quality.* Prepared by the Center for Watershed Protection for the USEPA Office of Wetlands, Oceans, an Watersheds. 81p. Available on-line at http://www.cwp.org

[177] Konrad, Christopher P. and Derek K. Booth, 2005. *Hydrologic Changes in Urban Streams and Their Ecological Significance.* American Fisheries Society Symposium. Vol. 45 pp.157-177.

[178] Coleman, Derrick, et al. 2005. *Effect of Increases in Peak Flows and Imperviousness on the Morphology of Southern California Streams*. Technical Report No. 450 of the Southern California Coastal Water Research Project.

[179] Fischenich, J.C. 2001. "*Impacts of stabilization measures*," EMRRP Technical Notes Collection (ERDC TNEMRRP- SR-32), U.S. Army Engineer Research and Development Center, Vicksburg, MS. http://www.wes.army.mil/el/emrrp

[180] Blakely, Tanya J., et al. 2006. *Barriers To The Recovery Of Aquatic Insect Communities In Urban Streams* Freshwater Biology Vol. 51(9), 1634–1645.

[181] California Nonpoint Source Encyclopedia, Management Measure 3.1.b. Runoff from Developing Areas, Site Development and Management Measure 3.3.a. Runoff from Existing Development, Existing Development.

The site design BMP options listed do not need to be costly.[182] Some design options, such as concave vegetated surfaces or routing rooftop or walkway runoff to landscaped areas, are cost neutral.[183] Other site design BMPs, such as minimizing parking stall widths or use of efficient irrigation devices, are oftentimes already required. In addition, use of site design BMPs reduces storm water runoff quantity, allowing for treatment control BMPs and other storm water infrastructure on site to be smaller, therefore savings costs for both developers and municipalities.[184,185]

Because of the potential economic and environmental benefits of using low-impact development site design, the U.S. Department of Housing and Urban Development, Office of Policy Development and Research, developed "*The Practice of Low Impact Development (LID)*" to assist the housing industry during the land development process. [186] This document focuses specifically on technologies that affect both the cost impacts and environmental issues associated with land development. Much of the report focuses on storm water management because low-impact development storm water management systems can save capital costs for developers and maintenance costs for municipalities.[187] The executive summary of the HUD report notes:

> *This approach to land development, called Low Impact Development (LID), uses various land planning and design practices and technologies to simultaneously conserve and protect natural resource systems and reduce infrastructure costs. LID still allows land to be developed, but in a cost-effective manner that helps mitigate potential environmental impacts. LID is best suited for new, suburban development.*

Developers can use site and structure designs that reduce building footprints, decrease the amount of paved infrastructure, and provide for dispersed drainage and infiltration of runoff from impervious surfaces to reduce the effective impervious surface.[188] The concept of effective impervious surface is important, because when runoff from these surfaces is directed to pervious areas rather to an impervious drainage system (i.e., curbs, gutters, street surfaces, storm drain pipes), it can infiltrate, evaporate, or be taken up by vegetation, thereby reducing the total volume of storm water runoff leaving a site.

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[182] USEPA, 2000. Low-Impact Development: A literature review. EPA-841-B-00-005. 35p.
[183] Bay Area Stormwater Management Agencies Association., 1999. Start at the Source. Forbes Custom Publishing. Available on-line at: http://www.scvurppp-w2k.com/basmaa_satsm.htm. pp. 149.
[184] National Association of Home Builders Research Center. *Builders Guide to Low Impact Development.* Available on-line at http://www.toolbase.org
[185] National Association of Home Builders Research Center. *Municipal Guide to Low Impact Development.* Available on-line at http://www.toolbase.org
[186] U.S. Department of Housing and Urban Development, Office of Policy Development and Research, 2003. *The Practice of Low Impact Development."* Prepared by: NAHB Research Center, Inc. Upper Marlboro, Maryland. Contract No. H-21314CA.
[187] Ibid. Executive Summary, p.x.
[188] Bay Area Stormwater Management Agencies Association. 2003. *Using Site Design Techniques to Meet Development Standards for Stormwater Quality*. Available on-line at: http://www.basmaa.org/

The Order continues to provide the Copermittees with flexibility in implementing site design BMP requirements by providing a LID BMP waiver program.

Section F.1.d.(5) (Source Control BMP Requirements) requires that Priority Development Projects implement minimum source control BMPs. This section has been added to provide more detail and clarify the Order's requirements for source control BMPs. The minimum source control BMPs listed in the section are consistent with the Model WQMP.

Section F.1.d.(6) (Treatment Control BMP Requirements) is consistent with Order No. R9-2002-0001, with two exceptions. First, the Order limits the selections of methods used to determine the appropriate volume of storm water runoff to be treated. The modification ensures that priority development project proponents utilize the most accurate information to determine the volume or flow of runoff which must be treated. Using detailed local rainfall data, the County of Orange has developed the 85th Percentile Precipitation Isopluvial Map, which exhibits the size of the 85th percentile storm event throughout Orange County.[189] Since this map uses detailed local rainfall data, it is more accurate for calculating the 85th percentile storm event than other methods which were included in Order No. R9-2002-0001. The other methods found in Order No. R9-2002-0001 were included as options to be used in the event that detailed accurate rainfall data did not exist for various locations within Orange County. The development of the 85th Percentile Precipitation Isopluvial Map makes these other less accurate methods superfluous. Therefore, these other methods for calculating the 85th percentile storm event have been removed from the current Order.

Second, the Order requires that treatment control BMPs selected for implementation at Priority Development Projects have a removal efficiency rating that is higher than the "low removal efficiency," as presented in the Model SSMP/WQMP. The requirement allows exceptions for those projects that, with a feasibility analysis, can justify the use of a treatment control BMP with a low removal efficiency for a Priority Development Project. This requirement is needed because to date, the Copermittees have generally approved low removal efficiency treatment control BMPs without justification or evidence that use of higher efficiency treatment BMPs was considered and found to be infeasible. Specifically, it has been found during audits of the Copermittees' SSMP programs that many SSMP reports do not adequately describe the selection of treatment control BMPs.[190] Moreover, USEPA's contractor Tetra Tech, Inc. recommends that "project proponents should begin with the treatment control that is most effective at removing the pollutants of concern […] and provide justification if that treatment control BMP is not selected."[191]

[189] The isopluvial map can be found as Exhibit 7.II in the Model WQMP.
[190] Tetra Tech, Inc. 2005. Program Evaluation Report. Orange County Storm Water Program: Cities of Laguna Beach, Laguna Hills, Lake Forest, and Rancho Santa Margarita.
[191] Tetra Tech, Inc., 2005. Program Evaluation Report –San Diego Standard Urban Storm Water Mitigation Plan (SUSMP) Evaluation. P. 5.

In the ROWD, the Copermittees acknowledge the need for further attention to the selection and implementation of effective treatment BMPs. They propose to revise the model WQMP table of BMP effectiveness. The requirement is needed to provide clarification that selection of low efficiency treatment control BMPs over high efficiency BMPs without justification does not meet permit requirements and is not in compliance with the storm water MEP standard.

In addition, treatment control BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors, such as mosquitoes, rodents, and flies. Related guidelines are identified in guidance from CASQA.[192] Additional considerations are outlined in publications from the California Department of Health Services and University of California Division of Agriculture and Natural Resources.[193]

Section F.1.d.(7). (Low-Impact Design BMP Waiver Program) allows Copermittees to develop a LID BMP waiver program, under which projects where it is technically infeasible to implement the required LID BMPs could substitute with treatment control BMPs and a mitigation project, payment into an in-lieu funding program, and/or watershed equivalent BMPs. Some sites may be technically infeasible to implement the required LID BMPs due to the site constraints. For this reason, the Regional Board has added to the Order a requirement for the Copermittees to develop such a program. The program would provide the opportunity for development projects to avoid partial or full LID BMP implementation in exchange for implementation of treatment control BMPs and mitigation. The program would maintain equal water quality benefits as properly implemented LID BMPs when partial LID BMPs are coupled with a mitigation project or in-lieu funding.

The Order includes specific minimum requirements so that the program will achieve similar water quality benefits. Any program which allows development projects to forgo LID BMP implementation must include provisions which will achieve similar water quality benefits. To ensure that this is the case for the LID BMP waiver program, minimum provisions for the program have been added to the Order

[192] For example, see the California Stormwater BMP Handbook guidelines for Extended Detention Basins (TC-22) at http://www.cabmphandbooks.org.
[193] Marco Metzger. "Managing Mosquitoes in Stormwater Treatment Devices." University of California Division of Agriculture and Natural Resources Publication No. 8125. Available at http://anrcatalog.ucdavis.edu.

Section F.1.d.(8). (BMP Design Standards) addresses a need for the Copermittees to develop and apply consistent criteria for the design and maintenance of structural treatment BMPs. Correct BMP design is critical to ensure that BMPs are effective and perform as intended. Without design criteria, there is no assurance that this will occur, since there is no standard for design or review. As an example, Ventura County has developed a BMP manual that includes standard design procedure forms for BMPs. Ventura County's *Technical Guidance Manual for Storm Water Quality Control Measures* is available at http://www.vcstormwater.org/ publications.htm."[194] California Stormwater Quality Association (CASQA) also confirms the necessity of design criteria when it includes such criteria in its New Development and Redevelopment BMP Handbook.[195] This issue is noted in the ROWD, and the Copermittees propose to develop standard design checklist/plans/details for selected source control and treatment BMPs.

Section F.1.d.(9). (Implementation process) requires the Copermittee to implement a process to verify compliance with SSMP requirements. As part of the SSMP, requires identification at what point in the planning process that projects must meet SUSMP requirements and what are roles/responsibilities of municipal departments. The intent of this requirement is to provide consistency in the application of the SSMPs between the Copermittees. This requirement was included in previous Order No. R9-2002-0001.

Section F.1.d.(10) (Annual Review of Treatment BMPs) requires Copermittees to keep their SSMPs up to date with BMP effectiveness studies for low-impact design and treatment control BMPs. The ROWD includes commitments to develop a library of BMP performance reports and to revise the model WQMP table for the latest information on BMPs. This requirement will ensure that two important types of information be included in those efforts: Site design BMPs and treatment BMPs that are assessed as part of contracts with the State Board and Regional Board. The later types of projects include those funded with Clean Beach Initiative grants and other grants. Projects funded with such state grants must include effectiveness assessments using a quality assurance plan. As a result, such studies generally provide reliable sources of local data and should be included in local SSMPs.

[194] Ibid.
[195] California Stormwater Quality Association, 2003. Stormwater Best Management Practice Handbook – New Development and Redevelopment.

Sections F.1.e and F.1.f. (BMP Verification and Treatment BMP Maintenance Tracking) are included in the Order to improve the effectiveness of the BMP requirements. They are included in response to findings from the Audits[196] and recommendations from USEPA.[197] The Copermittees recognize a need to improve the verification of post-construction BMPs. The 2007 DAMP proposes to verify 90 percent of WQMPs (including structural and non-structural BMPs) by inspection, self-certifications, surveys or other means. The Regional Board finds that 90 percent is a reasonable annual target, but considers inspections to be essential to achieve optimal results. Therefore, the Order requires high priority sites to be inspected annually, and allows other measures to be used for lower priority treatment control BMPs.

Section F.1.h. (Hydromodification) expands and clarifies current requirements for control of MS4 discharges to limit hydromodification effects caused by changes in runoff resulting from development and urbanization. The requirements are based on findings and recommendations of the Orange County Storm Water Program, the Stormwater Monitoring Coalition (SMC),[198,199] and the Storm Water Panel on Numeric Effluent Limits (Numeric Effluent Panel).[200] Added specificity is needed due to the current lack of a clear standard for controlling hydromodification resulting from development. More specific requirements are also warranted because hydromodification is increasingly recognized as a major factor affecting water quality and beneficial uses, and the Copermittees have proposed only vague and voluntary modifications to the Model WQMP. The Order is intended to ensure the intent of the proposed modifications is incorporated into each Copermittees' SSMP.

[196] The 2005 audits performed by Tetra Tech, Inc. found that cities are not tracking post-construction BMPs. The final audit report recommended (Section 2.1.2) that each city should develop a system to verify implementation and track post-construction BMPs to ensure that they are adequately maintained.
[197] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68845. USEPA recommends such practices in the Phase II storm water regulations, promoting "inspections during construction to verify BMPs are built as designed."
[198] Coleman, Derrick, et al. 2005. *Effect of Increases in Peak Flows and Imperviousness on the Morphology of Southern California Streams.* Technical Report No. 450 of the Southern California Coastal Water Research Project.
[199] Stein, Eric and Susan Zaleski. 2005. Managing Runoff to Protect Natural Streams: The Latest Developments on Investigation and Management of Hydromodification in California. Proceedings of a special technical workshop co-sponsored by California Stormwater Quality Association (CASQA), Stormwater Monitoring Coalition (SMC), and University of Southern California Sea Grant (USC Sea Grant). Technical Report No. 475 of the Southern California Coastal Water Research Project.
[200] Storm Water Panel Recommendations to the California State Water Resources Control Board. 2006. The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial, and Construction Activities.

Hydromodification is the change in a watershed's runoff characteristics resulting from development, together with associated morphological changes to channels receiving the runoff. As the total area of impervious surfaces increases, infiltration of rainfall decreases, causing more water to run off the surface and at a higher velocity. Runoff from developed areas can produce erosive flows in channels under rainfall conditions which were not previously problematic. Moreover, runoff from developed areas increases the duration of time that channels are exposed to erosive flows. The increase in the volume of runoff and the length of time that erosive flows occur ultimately intensify sediment transport, causing changes in sediment transport characteristics and the hydraulic geometry (width, depth, and slope) of channels.[201]

These types of changes have been documented in southern California. It has been reported that researchers studying flood frequencies in Riverside County have found that increases in watershed imperviousness of only 9-22 percent can result in increases in peak flow rates for the two-year storm event of up to 100 percent.[202] Such changes in runoff have significant impacts on channel morphology. It has recently been found that ephemeral/intermittent channels in southern California appear to be more sensitive to changes in imperviousness than channels in other areas. Morphology of small channels in southern California was found to change with only 2-3 percent watershed imperviousness, as opposed to 7-10 percent watershed imperviousness in other parts of the nation.[203]

Effects of hydromodification are evident in southern Orange County and recognized by the Copermittees. Analyses of bioassessment data, for example, indicate that physical changes to stream channels caused by hydromodification are likely responsible, in part, for the low bioassessment scores in urbanized settings.[204] It is important to recognize that the physical changes are a direct result of MS4 discharges, but that two separate mechanisms are involved. First, is a change in the flow regime caused by the increase in impervious surfaces and loss of natural conveyance systems. Discharges to receiving waters from the MS4 outfalls do not mimic the natural discharges from former tributaries to that receiving water, and the change results in erosion. Second, the physical stream habitat in many places has been severely modified in order to efficiently convey those increased storm water discharges to the ocean. Where streams are hardened and/or buried to convey storm water, they cannot provide adequate water quality and other necessary conditions to support beneficial uses. Both of these issues are addressed in the Order.

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[201] Santa Clara Valley Urban Runoff Pollution Prevention Program, 2005. Hydromodification Management Plan. P. 1-1.
[202] Schueler and Holland, 2000. Storm Water Strategies for Arid and Semi-Arid Watersheds (Article 66). The Practice of Watershed Protection.
[203] Coleman, et. al., 2005. Effect of Increases in Peak Flows and Imperviousness on the Morphology of Southern California Streams. P. iv.
[204] See Chapter 11 of the ROWD and the 2005-06 Unified Annual Report for the analyses.

The Copermittees' recognize the need to improve management of hydromodification. The ROWD proposes to revise the Model WQMP to incorporate additional information from ongoing hydromodification studies conducted by the SMC. The Order allows the Copermittees to adopt criteria consistent with future SMC findings in the development of their Hydromodification Management Plan (see below).

Section F.1.h. requires the Copermittees to submit a Hydromodification Management Plan (HMP) within two years of permit adoption. This is consistent with other Southern California MS4 permits and in direct response to comments from the USEPA on Tentative Order R9-2008-001.

Section F.1.h (1) describes several elements that must be included in the HMP. For example, the HMP must identify a method for assessing susceptibility of channel segments which receive runoff discharges from Priority Development Projects, and include a channel standard to ensure that the stability of the channel is not compromised as a result of discharges from the Priority Development Projects. The HMP must also identify a range of flows where Priority Development Projects could cause hydromodification effects and subsequent stream instability.

Additionally, the HMP must require Priority Development Projects to implement hydrologic control measures (such as LID or detention basins) to prevent hydromodification and resultant degradation of stream conditions downstream of project sites. To compare post-project flow rates and durations to pre-project flow rates and durations, the HMP must specify that the pre-developed (naturally occurring) flow rates and durations shall be used when assessing pre-project conditions, so that the naturally occurring hydrology is eventually restored.

In cases where a stream has been armored with concrete, rip rap, or other man-made materials, the HMP shall require the assessment of a comparable soft-bottom channel as the channel standard, as opposed to using the characteristics of the hardened channel as the channel standard. This is to ensure that hydromodification management measures are already in place should any portion of the hardened channel be returned to its natural state, thereby restoring the physical integrity of the creek and its Beneficial Uses. For this reason, the waiver provision for hydromodification management measures for projects discharging into hardened channels was deleted from the Tentative Order. The remaining exception is for projects that discharge storm water runoff into underground storm drains discharging directly into bays or the ocean and for projects discharging to waters where the entire channel bed and banks have been concrete lined all the way to ocean receiving waters.

The HMP must also include metrics for assessing impacts to downstream watercourses from Priority Development Projects, as well as assessing improvements to these watercourses. One metric that must be included is the Index of Biotic Integrity (IBI) score for benthic macroinvertebrates. This is because historic hydromodification

impacts, such as concrete lining and channelization, have impacted the natural physical habitat of urban streams resulting in low IBI scores. The Copermittee's 2006-2007 monitoring indicated decreased IBI scores in the urbanized watersheds. In the absence of water chemistry and toxicity impacts, these low scores were attributed to be a result of poor physical habitat conditions.[205] Therefore, the IBI score will be a useful metric in terms of assessing both impacts to streams from Priority Development Projects and improvements due to implementation of management measures.

In addition to the hydrologic control measures that must be included in the HMP to prevent or minimize hydromodification effects from Priority Development Projects, the HMP must also include additional measures to be used on Priority Development Projects based on a prioritized consideration of the following elements in this order: 1) site-design hydrologic control measures, 2) on-site management measures, 3) the use of regional controls upstream of receiving waters, and lastly, 4) in-stream controls (not to include reinforcement with non-naturally occurring materials). The suite of management measures must also include stream restoration as a viable option to achieve the channel standard and subsequently restore Beneficial Uses.

Section F.1.h (5) describes interim hydromodification criteria that must be implemented by the Copermittees within one year of adoption of the Tentative Order and concurrent to development of the local HMP. The values chosen for the interim criteria are those currently being implemented by Copermittees in the San Diego area.

Finally, the requirements included in section F.1.h do not supersede the requirements for LID presented in section F.1.d. (4). In certain situations, the requirements to incorporate LID will satisfy the requirements for hydromodification management. For example, detention basins are a common BMP used to manage high flow rates but behave hydrologically different than distributed systems used in LID. Using LID is a viable option for both accomplishing hydromodification management and pollutant load reductions.

F.2. Construction

The following legal authority applies to section F.2:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

[205] Orange County Copermittees, November 15, 2007. 2006-2007 Unified Annual Progress Report Program Effectiveness Assessment (San Diego Region).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D) provides that the proposed management program include "A description of a program to implement and maintain structural and non-structural best management practices to reduce pollutants in storm water runoff from construction sites to the municipal storm sewer system."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D)(1) provides that the proposed management program include "A description of procedures for site planning which incorporate consideration of potential water quality impacts."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D)(2) provides that the proposed management program include "A description of requirements for nonstructural and structural best management practices."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D)(3) provides that the proposed management program include "A description of procedures for identifying priorities for inspecting sites and enforcing control measures which consider the nature of the construction activity, topography, and the characteristics of soils and receiving water quality."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D)(4) provides that the proposed management program include "A description of appropriate educational and training measures for construction site operators."

Federal NPDES regulation 40 CFR 122.26(d)(2)(i)(A) provides that each Copermittee must demonstrate that it can control "through ordinance, permit, contract, order or similar means, the contribution of pollutants to the municipal storm sewer by storm water discharges associated with industrial activity and the quality of storm water discharged from site of industrial activity."

Federal NPDES regulation 40 CFR 122.26(b)(14) provides that "The following categories of facilities are considered to be engaging in 'industrial activity' for the purposes of this subsection: […] (x) Construction activity including cleaning, grading and excavation activities […]."

Federal NPDES regulation 40 CFR 122.44(d)(1)(i) requires NPDES permits to include limitations to "control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines are or may be discharged at a level which will cause, have reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality."

Section F.2 has additions to ensure the protection of threatened and endangered species and requires the consideration of potential impacts from the use of Active Treatment Systems. These requirements were added to ensure additional protection of the Beneficial Uses of waters of the State.

Section F.2.a. (Ordinance Update) requires each Copermittee to review and update its grading and storm water ordinances as necessary to comply with the MS4 permit. By updating the grading and storm water ordinances, the Copermittees will have the necessary legal authority to require construction sites to implement effective BMPs that will reduce pollutant discharges to the maximum extent practicable. The Order allows the Copermittees 365 days to review and update their ordinances. The 365 days should be adequate to allow for the relatively minor changes that might be needed since their ordinances were last updated under Order No. R9-2002-0001.

Section F.2.b. (Source Identification) requires the Copermittees to develop and update a watershed based inventory of all construction sites regardless of size or ownership. This section has been modified to require the inventory be updated regularly, rather than annually. More frequent updates will ensure the Copermittees have a more accurate inventory of construction sites within their jurisdiction. A regularly updated inventory of active construction sites will assist the Copermittees in ensuring that all sites are inspected per Order requirements. The Order does not specify the frequency of updates, and instead relies on each Copermittee to develop updates appropriate to local construction activity. The 2007 DAMP proposes that the inventory be updated "at a minimum" prior to the start of the rainy season. Such a minimum standard may not be appropriate for each Copermittee. Failure to maintain a useful inventory would be a violation of the Order.

Section F.2.c. (Site Planning and Project Approval Process) requires Copermittees to incorporate consideration of potential water quality impacts prior to approval and issuance of construction and grading permits. The Copermittees[206] and our program evaluations in 2005[207] recommend that storm water requirements need to be better incorporated into the pre-construction process.

[206] Orange County Storm Water Copermittees. 2006. Report of Waste Discharge (San Diego Region), Section 7, New Development.
[207] Tetra Tech, Inc. 2005. Program Evaluation Report. Orange County Storm Water Program: Cities of Laguna Beach, Laguna Hills, Lake Forest, and Rancho Santa Margarita.

This section now requires the Copermittees to review project proponents' runoff management plans for compliance with local regulations, policies, and procedures. USEPA recommends that it is often easier and more effective to incorporate storm water quality controls during the site plan review process or earlier.[208] In the Phase I storm water regulations, USEPA states that a primary control technique is good site planning.[209] USEPA goes on to say that the most efficient controls result when a comprehensive storm water management system is in place.[210] To determine if a construction site is in compliance with construction and grading ordinances and permits, USEPA states that the "MS4 operator should review the site plans submitted by the construction site operator before ground is broken."[211] Site plan review aids in compliance and enforcement efforts since it alerts the "MS4 operator early in the process to the planned use or non-use of proper BMPs and provides a way to track new construction activities."[212] During audits of Orange County Copermittee storm water programs, it was found that site plan and SWPPP review were inadequate and inconsistent.[213]

Section F.2.d. (BMP Implementation) includes modifications to the requirements for each Copermittee to designate and ensure implementation of a set of minimum BMPs at construction sites. These modifications are based on Regional Board findings and experience during implementation of Order No. R9-2002-0001.

[208] USEPA, 1992. Guidance 833-8-92-002. Section 6.3.2.1.
[209] Federal Register / Vol. 55, No. 222 / Friday, November 16, 1990 / Rules and Regulations. P. 48034.
[210] Ibid.
[211] USEPA, 2000. Guidance 833-R-00-002. Section 4.6.2.4, P. 4-30.
[212] Ibid., P. 4-31.
[213] Tetra Tech, Inc. 2005. Program Evaluation Report. Orange County Storm Water Program: Cities of Laguna Beach, Laguna Hills, Lake Forest, and Rancho Santa Margarita.

Unlike Order No. R9-2002-0001, this Order does not require the Copermittee to designate a set of minimum BMPs for high, medium, and low threat to water quality construction sites. This change was made in recognition of most Copermittees' application of one consistent set of BMPs throughout their jurisdictions. The Copermittees also desire to move toward a risk-based approach to BMP requirements.[214] As a result, the Order requires a minimum set of BMPs to be designated for all sites and that enhanced BMPs, including advanced treatment systems, be designated for sites upstream of 303(d) impairments and ESAs. Advanced treatment has been effectively implemented extensively in the other states and in the Central Valley Region of California.[215] In addition, the Regional Board's inspectors have observed advanced treatment being effectively implemented at large sites greater than 100 acres and at small, less than 5 acre, in-fill sites. Advanced treatment is often necessary for Copermittees to ensure that discharges from construction sites are not causing or contributing to a violation of water quality standards. For example, the Basin Plan lists the water quality objective for turbidity as 20 NTU for all hydrologic areas and subareas except for the Coronado HA (10.10) and the Tijuana Valley (11.10). For certain construction sites with large slopes and exposed areas, the only technology that is likely to meet 20 NTU is advanced treatment combined with erosion and sediment controls. To ensure the MEP standard and water quality standards are met, the requirement for implementation of advanced treatment at high threat construction sites has been added to the Order, while still providing sufficient flexibility for each Copermittee's unique program.

[214] Orange County Storm Water Copermittees. 2006. Report of Waste Discharge (San Diego Region), Section 8, Construction
[215] SWRCB, 2004. Conference on Advanced Treatment at Construction Sites.

The Order does not include seasonal restrictions on grading. Seasonal restrictions on grading for storm water are difficult to implement due to the conflict between seasonal grading restrictions, endangered birds' breeding seasons and the seasonal passage of endangered salmonids; therefore the seasonal grading restrictions have not been included with the other BMPs in the Order. Found in southern California, the Least Bell's Vireo and the Coastal California Gnatcatcher are listed as federally endangered and threatened, respectively.[216] Permits issued by the California Department of Fish and Game (CDFG) restrict grading during these birds' breeding seasons, which is from April 10 to August 31 for the Least Bell's Vireo[217] and from February 15 to August 31 for the Coastal California Gnatcatcher.[218] Ideally storm water restrictions on grading would be during the wet season from October 1 through April 30.[219] Combined, these restrictions would limit construction grading to be during the month of September, which is infeasible. Section D.2.d of the Order still requires project proponents to minimize grading during the wet season and coincide grading with seasonal dry weather periods to the extent feasible.

Section F.2.e. (Inspections) establishes criteria for inspections based on risk factors including size, season, and location of the construction site. Modifications have been made to requirements of Order No. R9-2002-0001 based on the experience of the Copermittees and Regional Board construction programs.

The Order requires sites in active grading during the wet season that are over 30 acres be inspected every two weeks, rather than sites over 50 acres being inspected weekly. In south Orange County approximately 15 percent (34 sites) of construction sites over one acre are larger than 30 acres, whereas about 9 percent (21 sites) of sites are over 50 acres.[220] This may result in a net decrease of inspections of large sites, although more sites will be covered. The reduction in inspection frequency for sites greater than 50 acres is justified because the sites have generally improved their erosion and sediment control measures since adoption of Order No. R9-2002-0001. Biweekly inspections of these sites in the future should be sufficient to ensure compliance with local regulations.

[216] State of California, Department of Fish and Game, 2005. State and Federally Listed Endangered and Threatened Animals of California.
[217] United States Department of the Interior, Fish and Wildlife Service, 2001. Least Bell's Vireo Survey Guidelines.
[218] United States Department of the Interior, Fish and Wildlife Service, 1997. Coastal California Gnatcatcher (*Polioptila californica californica)* Presence/Absence Survey Guidelines.
[219] Regional Board, 2001. Order No. 2001-01, San Diego County MS4 Permit. Directive F.2.g.(2).
[220] Based on the State Board's database of sites covered by the Construction Storm Water General NPDES Permit, Order No. 99-08-DWQ. That general permit requires sites disturbing over one acre to file for coverage, so it provides a good basis for assessment.

The Order lowers the size of construction sites adjacent to or discharging directly to ESAs that receive scrutiny. Order No. R9-2002-0001 requires such sites five acres and more to be inspected weekly during the wet season. This Order requires such sites one acre and above to be inspected every two weeks during the wet season and once during August or September. The lower size threshold is consistent with Phase II storm water permits.

The Order omits Order No. R9-2002-0001's provision allowing a Copermittee to decrease the inspection frequency for high priority sites if the Copermittee certifies in writing to the Regional Board that they have recorded the site's Waste Discharge Identification Number, reviewed the site's Storm Water Pollution Prevention Plan (SWPPP), assured the site's SWPPP is in compliance, and assured the SWPPP is properly implemented at the site. Under Order No. R9-2002-0001, the Regional Board never received from any of the Copermittees a certification to decrease the inspection frequency at high priority sites. Since the certification process was never used, the language has been deleted from the Order.

This section also requires the Copermittees to track the number of inspections for each inventoried construction site. This requirement has been added to ensure that the Copermittees can demonstrate that construction sites are inspected at the minimum frequencies.

Section F.2.g.2 includes an additional requirement for notification to the Regional Board regarding construction sites has been added to this section. Copermittees are required to annually notify the Regional Board of construction sites that have suspected violations. This was added to enhance Regional Board and Permittee communication and coordination in regulating construction sites.

F.3 Existing Development

F.3.a. Municipal

The following legal authority applies to section D.3.a:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(1) provides that the proposed management program include "A description of maintenance activities and a maintenance schedule for structural controls to reduce pollutants (including floatables) in discharges from municipal separate storm sewers."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(3) provides that the proposed management program include "A description for operating and maintaining public streets, roads and highways and procedures for reducing the impact on receiving waters of discharges from municipal storm sewer systems, including pollutants discharged as a result of de-icing activities."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(4) provides that the proposed management program include "A description of procedures to assure that flood management projects assess the impacts on the water quality of receiving water bodies and that existing structural flood control devices have been evaluated to determine if retrofitting the device to provide additional pollutant removal from storm water is feasible."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(5) provides that the proposed management program include "A description of a program to monitor pollutants in runoff from operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste, which shall identify priorities and procedures for inspections and establishing and implementing control measures for such discharges."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(6) provides that the proposed management program include "A description of a program to reduce to the maximum extent practicable, pollutants in discharges from municipal separate storm sewers associated with the application of pesticides, herbicides, and fertilizer which will include, as appropriate, controls such as educational activities, permits, certifications, and other measures for commercial applicators and distributors, and controls for application in public right-of-ways and at municipal facilities."

Federal NPDES regulation 40 CFR 122.44(d)(1)(i) requires NPDES permits to include limitations to "control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines are or may be discharged at a level which will cause, have reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality."

Section F.3.a.2. (General BMP Implementation) requires the Copermittees to designate minimum BMPs for general municipal areas and activities, regardless of their threat to water quality. The requirement that different types of BMPs be designated for different threats to water quality categories of municipal areas and activities has been removed from the Order. This was done to help simplify and clarify the Order's requirements. BMPs required to be implemented at a site can now be based on the sources or activities present at the site. This is closer to the approach taken by the Copermittees in their JRMPs. Threat to water quality is used to determine inspection frequencies in section F.3.a.(7).

Section F.3.a.3, F.3.a.4, and F.3.a.5. (Specific BMP Implementation Categories) establishes requirements for specific categories of activities and areas. These are selected based on the CWA and findings of the Permittees in annual reports and ROWD that identify these activities as warranting special attention.

Pesticides, Herbicides, and Fertilizers. 40 CFR 122.26(d)(2)(iv)(A)(6) requires a description of a storm water program for pesticides, herbicides, and fertilizers. In addition, water quality data demonstrates widespread presence of such pollutants in receiving waters and MS4 discharges. In response to similar requirements of Order No. R9-2002-0001, the Copermittees have developed a specific model Integrated Pest Management, Pesticides, and Fertilizer guidelines.

Flood Control Structures. In order to more closely meet the intent of the federal regulations and guidance, the requirement has been modified. 40 CFR 122.26(d)(2)(iv)(A)(4) requires "A description of procedures to assure that flood management projects assess the impacts on the water quality of receiving water bodies and that existing structural flood control devices have been evaluated to determine if retrofitting the device to provide additional pollutant removal from storm water is feasible." Retrofitting flood control devices can reduce storm water pollutants and improve water quality. Copermittees have conducted many flood control retrofit projects, many of which have been partially funded with State grant awards.

USEPA expands on the federal provision with the following information: "Storm water management devices and structures that focus solely on water quantity are usually not designed to remove pollutants, and may sometimes harm aquatic habitat and aesthetic values" (1992). As flood control structures and other elements of the MS4 age and retrofitting becomes necessary, opportunities for water quality improvements arise.

Conveyance systems which take water quality consideration into account (such as grassed swales, vegetated detention ponds, etc.) can often cost less to construct than traditional concrete systems. Evaluation of the applicability of such systems during retrofitting must occur to ensure that pollutants in storm water runoff are reduced to the maximum extent practicable. USEPA supports utilizing BMPs for pollution reduction in flood management projects, stating that "The proposed management program must demonstrate that flood management projects take into account the effects on the water quality of receiving water bodies. […] Opportunities for pollutant reduction should be considered".[221]

[221] USEPA, 1992. Guidance Manual for the Preparation of Part II of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems. Washington D.C. EPA/833-B-92-002.

Existing Copermittee projects include two types of retrofits. The first type involves adding an engineered device to an existing structure in order to treat or divert runoff. Examples include catch basin inlet filters/screens, ultraviolet disinfection facilities, hydrodynamic separators, and diversions to the sanitary sewer. The second type involves re-installing pervious or natural treatment features to facilities. Examples include removing concrete portions of conveyances to create pervious conveyances; and creating treatment wetlands within flood detention facilities. The later type of retrofit is preferred by the Regional Board. They are likely more sustainable over the long-term because they may require less rigorous operation and maintenance than the former. They may also provide the additional benefit of providing significant or incidental opportunities for beneficial uses (e.g., recreation, wildlife, water supply).[222,223]

Sweeping of Municipal Areas. Sweeping municipal areas would likely be done in the absence of the Order. However, in certain cases it is an important component of a jurisdictional runoff management program. The Order contains requirements to ensure that the use of street sweeping is optimized for runoff applications if it is to be used and reported as a BMP. The criteria in the Order are taken from industry guidance as reported by the Permittees in the Aliso Creek watershed.[224]

Section F.3.a.(6). (Operation and Maintenance of MS4 and Structural Controls) requires the Copermittees to inspect and remove waste from their MS4s prior to the rainy season.

Maintenance is critical to the successful implementation of every storm water runoff management program. USEPA finds that "Lack of maintenance often limits the effectiveness of storm water structural controls such as detention/retention basins and infiltration devices. […] The proposed program should provide for maintenance logs and identify specific maintenance activities for each class of control, such as removing sediment from retention ponds every five years, cleaning catch basins annually, and removing litter from channels twice a year.

[222] Burton, Carmen et al. 2005. Assessing Water Source and Channel Type as Factors Affecting Benthic Macroinvertebrate and Periphyton Assemblages in the Highly Urbanized Santa Ana River Basin, California. American Fisheries Society Symposium. Vol.47 pp.239-262.
[223] Stromberg, Juliet C. 2001. Restoration of Riparian Vegetation in the South-Western United States: the importance of flow regimes and fluvial dynamism. Journal of Arid Environments. Vol49, pp.17-34.
[224] See 20th and 21st quarterly reports for the Aliso Creek watershed bacteria investigation, prepared by the Orange County Copermittees within the Aliso Creek watershed.

If maintenance activities are scheduled infrequently, inspections must be scheduled to ensure that the control is operating adequately. In cases where scheduled maintenance is not appropriate, maintenance should be based on inspections of the control structure or frequency of storm events. If maintenance depends on the results of inspections or if it occurs infrequently, the applicant must provide an inspection schedule. The applicant should also identify the municipal department(s) responsible for the maintenance program".[225] The MS4 maintenance requirements are based on the above USEPA recommendations. This maintenance will help ensure that structural controls are in adequate condition to be effective year round, but especially at the beginning of and throughout the rainy season.

Two requirements have been added to the Order that were not within Order No. 2002-0001. Subsection (3) allows a decreased inspection frequency for facilities that are routinely clean, and Subsection (4) requires trash to be removed from channels in a timely manner. Typically, Copermittees have reported annual or semi-annual creek cleanups as significant BMPs. The large volumes of trash reported to be removed during these events demonstrates the significant amount of trash that accumulates in the channels. In addition, storm water runoff is a leading contributor to the accumulation of trash and debris along the beaches of Orange County.[226] In order to reduce the effect of the trash, the Order requires that trash be removed more frequently.

Section F.3.a.(7). (Sewage Infiltration) requires the Copermittees to implement controls and measures to prevent and eliminate sewage infiltration or seepage from municipal sanitary sewers to MS4s through thorough, routine preventive maintenance of the MS4. This requirement is in Order No. R9-2002-0001 in the section on Illicit Discharge Detection and Elimination (section F.5.i).

Sections F.3.a.(8) and F.3.a.(9). (Inspections and Enforcement) establishes a minimum set of municipal areas and activities for oversight and inspection by the Copermittees and requires that Copermittees properly enforce runoff requirements at municipal areas and activities.

[225] USEPA, 1992. Guidance Manual for the Preparation of Part II of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems. Washington D.C. EPA/833-B-92-002.
[226] Moore, S.L., D. Gregorio, M. Carreon, S B. Weisberg, and M. K. Leecaster. 2001. *Composition and distribution of beach debris in Orange County, California*. Marine Pollution Bulletin 42(3): 241-245..

F.3.b. Industrial and Commercial
The following legal authority applies to section F.3.b:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(C) provides that the proposed management program include "A description of a program to monitor and control pollutants in storm water discharges to municipal systems from municipal landfills, hazardous waste treatment, disposal and recovery facilities, industrial facilities that are subject to section 313 of title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA), and industrial facilities that the municipal permit applicant determines are contributing a substantial pollutant loading to the municipal storm sewer system."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(C)(1) provides that the Copermittee must "identify priorities and procedures for inspections and establishing and implementing control measures for such discharges."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(C)(2) provides that the proposed management program shall "Describe a monitoring program for storm water discharges associated with the industrial facilities identified in paragraph (d)(2)(iv)(C) of this section, to be implemented during the term of the permit, including the submission of quantitative data on the following constituents: any pollutants limited in effluent guidelines subcategories, where applicable; any pollutant listed in an existing NPDES permit for a facility; oil and grease, COD, pH, BOD5 , TSS, total phosphorus, total Kjeldhal nitrogen, nitrate plus nitrite nitrogen, and any information on discharges required under 40 CFR 122.21(g)(7)(iii) and (iv)."

Federal NPDES regulation 40 CFR 122.26(d)(2)(ii) provides that the Copermittee "Provide an inventory, organized by watershed of the name and address, and a description (such as Standard Industrial Classification [SIC] codes) which best reflects the principal products or services provided by each facility which may discharge, to the municipal separate storm sewer, storm water associated with industrial activity."

Federal NPDES regulation 40 CFR 122.44(d)(1)(i) requires NPDES permits to include limitations to "control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines are or may be discharged at a level which will cause, have reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality."

Federal NPDES regulation 40 CFR 122.26(d)(2)(i)(A) provides that each Copermittee must demonstrate that it can control "through ordinance, permit, contract, order or similar means, the contribution of pollutants to the municipal storm sewer by storm water discharges associated with industrial activity and the quality of storm water discharged from site of industrial activity."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A) provides that the Copermittee develop a proposed management program which includes "A description of structural and source control measures to reduce pollutants from runoff from commercial and residential areas that are discharged from the municipal storm sewer system that are to be implemented during the life of the permit, accompanied with an estimate of the expected reduction of pollutant loads and a proposed schedule for implementing such controls."

Section F.3.b. (Industrial and Commercial) requires the Copermittees to implement an industrial and commercial program to reduce pollutants in storm water runoff from all industrial and commercial sites/sources. The industrial and commercial sections of Order No. 2002-0001 have been combined into one section in this Order. This change will streamline and simplify the Order, without negatively impacting water quality. This change is not unprecedented because industrial and commercial facilities are commonly addressed together. For example, the Southern Riverside County MS4 Permit[227] combined industrial and commercial programs into one section. In addition, in their Annual Reports and ROWD,[228] the Copermittees jointly address industrial and commercial components. USEPA contractor Tetra Tech also evaluated and reported on the industrial and commercial programs jointly during their program evaluations.[229]

Section F.3.b.(1)(a) (Source Identification) requires that building material retailers and storage, animal facilities, and power washing services be included in the Copermittees' inventory of commercial sites/sources. These activities have been identified annual MS4 program reports and quarterly Aliso Creek watershed reports as potentially significant sources of pollutants. This is not a significant change because Order No. R9-2002-0001 requires that any commercial site or source determined by a Copermittee to contribute a significant pollutant load to the MS4 be added to its inventory of commercial sites. Furthermore, the commercial BMP fact sheets developed by the Copermittees generally address the types of activities occurring at these facilities and practices.

[227] Regional Board, 2004. Order No. R9-2004-001; Riverside County MS4 Permit. Section H.2; P. 24.
[228] Orange County Storm Water Copermittees. 2006. Report of Waste Discharge (San Diego Region). Section 9.
[229] Tetra Tech, Inc., 2005. Program Evaluation Reports Orange County Storm Water Programs: Cities of Laguna Beach, Laguna Hills, Lake Forest, and Rancho Santa Margarita.

The Order has revised requirements for identifying industrial sites/sources. The revised requirements are identical to those found in the Southern Riverside County MS4 permit.[230] USEPA requires the same identification: "Measures to reduce pollutants in storm water discharges to municipal separate storm sewers from municipal landfills, hazardous waste treatment, disposal and recovery facilities, industrial facilities that are subject to section 313 of title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA)."[231] USEPA "also requires the municipal storm sewer permittee to describe a program to address industrial dischargers that are covered under the municipal storm sewer permit."[232] In order to more closely follow USEPA's guidance, this Order also includes operating and closed landfills, and hazardous waste treatment, disposal, storage and recovery facilities.

Section F.3.b.3. (Mobile Businesses) requires each Copermittee to develop and implement a program to reduce the discharge of storm water pollutants from mobile businesses to the MEP and to prevent the discharge of non-storm water. Mobile businesses are service industries that travel to the customer to perform the service rather than the customer traveling to the business to receive the service. Examples of mobile businesses are power washing, mobile vehicle washers, carpet cleaners, port-a-potty servicing, pool and fountain cleaning, mobile pet groomers, and landscapers. These mobile services produce waste streams that could potentially impact water quality if appropriate BMPs are not implemented.

Order No. R9-2002-0001 also requires BMP implementation for certain mobile businesses (e.g., mobile vehicle washing and mobile carpet cleaning). These storm water requirements of Order No. R9-2009-0002 are not significantly different from the existing requirements. The Order specifies mobile businesses must prevent non storm water dry weather flows from entering the MS4 (see C.1.b) for special attention based on reports from the Copermittees that mobile businesses have been difficult to control with existing programs.

Mobile businesses present a unique difficulty in storm water regulation. Due to the transient nature of the business, the regular, effective practice of unannounced inspections is difficult to implement. Also, tracking these mobile businesses is difficult because they are often not permitted or licensed and their services cross Copermittee jurisdictions. Mobile businesses that operate within a municipality may be based in another municipality or even outside the Region. The Order takes into account the difficulties in regulating mobile businesses.

Because BMPs have been developed already, but communication with mobile businesses may be difficult, the Order provides broad flexibility to the Copermittees for developing a targeted program within the Commercial portion of each JRMP.

[230] Regional Board, 2004. Order No. R9-2004-001; Riverside County MS4 Permit. Section H.2.b)(2); P. 25.
[231] Federal Register / Vol. 55, No. 222 / Friday, November 16, 1990 / Rules and Regulations. P. 48056.
[232] Ibid.

Section F.3.b.4. (Inspections) includes requirements for inspections of industrial and commercial sites/sources. The Order is similar to the Southern Riverside County MS4 permit[233] in requiring that inspections check for coverage under the General Industrial Permit; assessment of compliance with Copermittee ordinances and permits related to storm water and non-storm water runoff; assessment of BMP implementation, maintenance, and effectiveness; visual observations for non-storm water discharges, potential illicit connections, and potential discharge of pollutants in storm water runoff; and education and outreach on storm water pollution prevention. The Order also requires that inspections include review of BMP implementation plans if the site uses or is required to use such a plan, and the review of facility monitoring data if the site monitors its runoff. Order No. 2002-0001 did not contain requirements for inspection procedures.

Changes in the Order's requirements for inspection procedures mimic USEPA's guidance: "Site inspections should include (1) an evaluation of the pollution prevention plan and any other pertinent documents, and (2) an onsite visual inspection of the facility to evaluate the potential for discharges of contaminated storm water from the site and to assess the effectiveness of the pollution prevention plan."[234] In 1999, USEPA "recognized visual inspection as a baseline BMP for over 10 years," and "visual inspections are an effective way to identify a variety of problems. Correcting these problems can improve the water quality of the receiving water."[235] Most, if not all, of the Order's procedures are being conducted by the Copermittees that follow the Model Existing Development Program of the DAMP.

With the exception of restaurants, the Order allows Copermittees to establish inspection frequencies, as long as at least 20 percent of the sites are inspected annually. Restaurants are now required to be inspected annually. Inspection frequencies in the Order have been modified from Order No. R9-2002-0001. Order No. R9-2002-0001 specifies frequencies for inspecting industrial sites based on threat to water quality and requires high priority commercial sites to be inspected as needed. Copermittees have been inspecting industrial sites according to Order No. R9-2002-0001. The Copermittees have been inspecting restaurants annually as part of the County Health Department inspections. For other commercial sites, the Copermittees have been focusing annual activities on certain commercial sectors, such as automobiles, with the goal of inspecting every high priority site at least once during the permit term. This change is not considered significant because it should allow the Copermittees to continue existing programs.

[233] Regional Board, 2004. Order No. R9-2004-001; Riverside County MS4 Permit. Section H.2.d)(3);
[234] USEPA, 1992. Guidance 833-8-92-002, section 6.3.3.4 "Inspection and Monitoring".
[235] USEPA, 1999. 832-F-99-046, "Storm Water Management Fact Sheet – Visual Inspection".

Reports from the Aliso Creek watershed Copermittees demonstrate that as-needed inspections for restaurants means at least annually. Restaurants have been found to present many threats to water quality and standard educational efforts are not effective because restaurants are subject to frequent management changes. For these reasons, the Order requires restaurants to be inspected annually.

An additional notification to the Regional Board regarding industrial sites has been added. Copermittees are required to annually notify the Regional Board of industrial sites that have suspected violations. This was added to enhance Regional Board and Permittee communication and coordination in regulating industrial sites.

Section F.3.b.(6). (Training and Education) requires training and education measures generally consistent with the existing storm water programs. One distinction is that the Order requires each Copermittee to notify the owner/operator of each inventoried industrial and commercial site/source of the BMP requirements applicable to the site/source. This requirement is necessary to ensure that the owners and operators of commercial sites stay informed of appropriate BMPs. This is especially important because sites may be inspected as little as once every five years.

Section F.3.c. (Residential Component)
The following legal authority applies to section F.3.c:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A) provides that the Copermittee develop a proposed management program which includes “A description of structural and source control measures to reduce pollutants from runoff from commercial and residential areas that are discharged from the municipal storm sewer system that are to be implemented during the life of the permit, accompanied with an estimate of the expected reduction of pollutant loads and a proposed schedule for implementing such controls.”

Federal NPDES regulation 40 CFR 122.44(d)(1)(i) requires NPDES permits to include limitations to “control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines are or may be discharged at a level which will cause, have reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality.”

Section F.3.c (Residential Component) moves the common interest areas / homeowners' association component and the requirement for proper management of used oil, toxic materials, and other household hazardous wastes to the residential section of the Order, since these requirements generally apply to residential areas. These changes improve the organization of the Order and have no net effect on its implementation and enforcement. Other requirements for prioritization, BMP implementation, and enforcement are consistent with Order No. R9-2002-01.

Section F.3.d. (Retrofitting Existing Development)

Legal Authority: The legal authority for retrofitting existing development is the same legal authority as that identified for municipal, industrial, commercial and residential development sections (See fact sheet discussion on those sections, F.3.a – c). In particular, CWA sections 402(p)(3)(B)(ii-iii), and CWC section 13377 give the Regional Board the legal authority to require retrofitting of existing development.

A section has been added to require the retrofit of existing development (see Finding D.3.i and Discussion). This section contains specific requirements for the retrofit process. Retrofitting existing development is a widespread practice across the United States. Successful retrofitting programs have been implemented in such diverse locations as Seattle, Washington[236]; Portland Oregon[237], Santa Monica, California[238]; Kansas City, Kansas[239]; and Montgomery County, MD[240]. When appropriately applied as the draft Tentative Order, retrofitting existing development meets the maximum extent practicable standard.

Existing BMPs are not sufficient, as evidenced by 303(d) listings and exceedances of Water Quality Objectives from the Copermittees monitoring reports. More advanced BMPs, including the retrofitting of existing development with LID, are part of the iterative process. Previous permits limited the requirement of treatment control BMPs to new development and redevelopment. Based on the current rate of redevelopment compared to existing BMPs, the use of LID only on new and redevelopment will not adequately address current water quality problems, including downstream hydromodification. Retrofitting existing development is practicable for a municipality through a systematic evaluation, prioritization and implementation plan focused on impaired water bodies, pollutants of concern, areas of downstream hydromodification, feasibility and effective communication and cooperation with private property owners.

[236] SEA Street, http://www.seattle.gov/dpd/Planning/CityDesign/What_We_Do/Outreach/Folio/DPDS_008014.asp
[237] Clean River Rewards, http://www.portlandonline.com/BES/index.cfm?c=edeef
[238] City of Santa Monica, Urban Runoff program, http://www.smgov.net/Departments/OSE/categories/content.aspx?id=4007
[239] 10,000 Rain Gardens, http://www.rainkc.com/
[240] Rainscapes, http://www.montgomerycountymd.gov/Content/DEP/Rainscapes/home.html

F.4. Illicit Discharge Detection and Elimination

The following legal authority applies to section F.4:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(B) provides that the proposed management program "shall be based on a description of a program, including a schedule, to detect and remove (or require the discharger to the municipal storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B)(1) provides that the Copermittee include in its proposed management program "a program, including inspections, to implement and enforce an ordinance, orders or similar means to prevent illicit discharges to the municipal storm sewer system."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B)(2) provides that the Copermittee include in its proposed management program "a description of procedures to conduct on-going field screening activities during the life of the permit, including areas or locations that will be evaluated by such field screens."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B)(3) provides that the Copermittee include in its proposed management program "procedures to be followed to investigate portions of the separate storm sewer system that, based on the results of the field screen, or other appropriate information, indicate a reasonable potential of containing illicit discharges or other sources of non-storm water."

Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(B)(4) provides that the Copermittee include in its proposed management program "a description of procedures to prevent, contain, and respond to spills that may discharge into the municipal separate storm sewer."

Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(B)(5) provides that the Copermittee include in its proposed management program "a description of a program to promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges from municipal separate storm sewers."

Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(B)(6) provides that the Copermittee include in its proposed management program "a description of educational activities, public information activities, and other appropriate activities to facilitate the proper management and disposal of used oil and toxic materials."

Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(B)(7) provides that the Copermittee include in its proposed management program "a description of controls to limit infiltration of seepage from municipal sanitary sewers to municipal separate storm sewer systems where necessary."

Section F.4.a-b. (Prevent and Detect Illicit Discharges) requires the Copermittees to implement a program to actively seek and eliminate illicit connections and discharges (IC/ID). Additional wording has been added to this section to clarify and ensure that all appropriate (i.e., field personnel) municipal personnel are utilized in the program to observe and report these illicit discharges and connections. requirement has been added requiring submittal of the GIS layers of the MS4 map within 365 days of Order adoption.

Section F.4.e (Investigations) requires the Copermittees to conduct follow up investigations and inspect portions of the MS4 for illicit discharges and connections, based on dry weather effluent analytical monitoring results. The section also requires the Copermittees to establish criteria for triggering follow up investigations. Additional language has been added to this section to clarify the minimum level of effort and timeframes for follow up investigations when dry weather limitations are exceeded. Timely investigation and follow up of exceedances is necessary to identify sources of illicit discharges, especially since many of the discharges are transitory. The requirements for a 48-hour minimum response time when action levels are exceeded and for immediate response to obvious illicit discharges is necessary to ensure timely response by the Copermittees.

The Copermittees currently use action levels to facilitate the determination of when source investigation studies are warranted based on data from the dry-weather monitoring program. One set of criteria is based on regional averages of constituent concentrations that were developed based on randomly selected storm drains. Another set of criteria is based on trends at a particular station. These are reasonable criteria if decision-makers are properly trained and action levels set by the County are in compliance with dry weather non-storm water action levels as required in Section C. The ability of the local managers to interpret dry-weather monitoring data collected by the County has greatly improved in the last two years, and continued training is required in section F.4.i.

Section F.4.h. (Spill Response) requires each Copermittee to implement measures to prevent and respond to spills into its MS4. These requirements are similar to Order No. R9-2002-0001 and based on federal regulations at 40 CFR 122.26(d)(2)(iv)(B)(4). Those federal NPDES regulations clearly require that owners and operators of MS4s have procedures to prevent, contain, and respond to spills that may discharge into the municipal separate storm sewer.

The Tentative Order includes sewage and non-sewage spills in the requirement for spill prevention and response. Federal regulations clearly define sewage as an illicit discharge that must be addressed by municipalities (see Phase II Final Rule, p.68758). Sewage is an illicit discharge to the MS4 that threatens public health. As such, the Copermittees must implement measures to prevent sewage from entering the MS4 system and must respond to illicit discharges that have entered the system. This section has been revised to clarify that management measures and procedures must be implemented to prevent, respond to, and cleanup spills.

This same requirement was adopted by the Regional Board in Order No, 2002-0001, but was subsequently stayed by the State Board in Order WQO 2002-0014. The City of Mission Viejo challenged the requirement to prevent and respond to sewage spills on the grounds that since the sanitary sewer systems in the City are operated by three water districts already regulated by a NPDES permit from the Regional Board, this requirement would cause delayed spill responses as the City and agencies try to determine jurisdiction and responsibilities. The State Board found that the costs of this requirement did not constitute harm, but agreed that harm could ensue from potential response delay and confusion. Although the entire permit requirement was stayed, neither the State Board, nor the Petitioner discussed spills other than sewage.

Subsequently, the Copermittees and the local sewer agencies have developed mature relationships and implemented procedures for spill response and sewage spill response.[241]. As a result, the concerns expressed by the State Water Board are no longer warranted. The Model Sewage Spill Response Procedure is outlined in the Copermittees' Proposed 2007 Drainage Area Management Plan (DAMP). According to the 2007 DAMP, regardless of where the spill originates, if the spill has entered or may enter the storm drain system, the Copermittees respond to assist with the cleanup and remediation of the area.

Only three Permittees (Laguna Beach, San Clemente, and San Juan Capistrano) own or operate their own sewage collection systems, yet all Copermittees implement the programs for spill response. For the Copermittees that do not own or operate sewage systems, the Regional Board expects that they will continue to respond appropriately to reported or identified spills to the MS4 system.

[241] Sections 10.2.4 and 10.2.5 in the 2007 DAMP.

Section F.3.a.7 of the Tentative Order includes requirements for measures that must be taken to prevent sewage spills. Examples of measures being implemented by Copermittees include inspections of fats, oils, and grease management at restaurants. Other preventative measures can be implemented during routine planning efforts for new development and redevelopment projects. Similarly, building permit inspections should be used to verify the integrity of the sanitary and storm sewer infrastructure and ensure that cross-connections between the two are avoided.

G. Watershed Runoff Management Programs

The following legal authority applies to section G:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(a)(3)(ii) states: "The Director may […] issue distinct permits for appropriate categories of discharges […] including, but not limited to […] all discharges within a system that discharge to the same watershed […]"

Federal NPDES regulations 40 CFR 122.26(a)(3)(v) states: "Permits for all or a portion of all discharges from large or medium municipal separate storm sewer systems that are issued on a system-wide, jurisdiction-wide, watershed, or other basis may specify different conditions relating to different discharges covered by the permit, including different management programs for different drainage areas [watersheds] which contribute storm water to the system."

Federal NPDES regulation 40 CFR 122.26(a)(5) states: "The Director may issue permits for municipal separate storm sewers that are designated under paragraph (a)91)(v) of this section on a system-wide basis, a jurisdiction-wide basis, watershed basis, or other appropriate basis."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv) states: "Proposed programs may impose controls on a system-wide basis, a watershed basis, a jurisdiction basis, or on individual outfalls."

Section G. (Watershed Runoff Management Program) requires Copermittees to continue implementation of their watershed runoff management programs (WRMPs), however the implementation approach has changed. Order No. R9-2002-01 required watershed RMPs to include a collaborative strategy to abate the sources and reduce the discharges causing high priority water quality problems. This strategy was to guide Watershed Copermittee's selection and implementation of Watershed Activities, so that the activities selected and implemented would remove that pollutant contribution responsible for the identified high priority water quality problem. Outcomes of these requirements were not able to demonstrate improvements to water quality.

Revised language in Order R9-2009-002 attempts to focus watershed copermittee's efforts and resources on addressing the highest water quality problems in the watershed by focusing attention on the health of the receiving water body and the most efficient use of the Watershed Copermittee's time and resources. Order R9-2009-002 requires the Watershed Copermittee's to follow a workplan approach towards assessing receiving water body conditions, prioritizing the Watershed Management Area's (WMAs) highest priority water quality problems, implementing effective BMPs, and measuring water quality improvement in the receiving water.

G1. (Lead Watershed Copermittee Identification) requires the watershed copermittee's to identify a Lead Watershed Copermittee for their WMA.

This requirement is the same to that found in Order 2002-01.

G.2 a-f. (Watershed Workplan) requires the Watershed Copermittees to develop and implement a collective watershed strategy to assess and prioritize the water quality problems within the watershed's receiving waters, identify and model sources of the highest priority water quality problem(s), develop a watershed-wide BMP implementation strategy to abate highest priority water quality problems, and a monitoring strategy to evaluate BMP effectiveness and changing water quality prioritization in the WMA. Development of a workplan rather than watershed activities will allow the Copermittees flexibility to iteratively modify their watershed strategy over the course of future planning years as priorities change.

G.3. Watershed Workplan Implementation – Watershed Copermittee's shall begin implementing the Watershed Workplan within 30-days of approval by the Regional Board Executive Officer. Since the Copermittees are already familiar with the watershed program requirements implementing the watershed workplan within 30-days of approval by the Regional Board Executive Officer is reasonable.

G.4. Copermittee Collaboration – Watershed Copermittees shall collaborate to develop and implement the Watershed Workplan. Watershed Copermittee collaboration shall include frequent regularly scheduled meetings.

This requirement is the same to that found in Order 2002-01.

G.5. Public Participation – Watershed Copermittees shall implement a watershed-specific public participation mechanism within each watershed. A required component of the watershed-specific public participation shall be a minimum 30-day public review of the Watershed Workplan. Opportunity for the public to review and comment on the Watershed Workplan must occur before the workplan is implemented.

This requirement is similar to that found in Order 2002-01.

G.6. Watershed Workplan Review and Updates – Watershed Copermittees shall

review and update the Watershed Workplan annually to identify need changes to the prioritized water quality problem(s) listed in the workplan. All updates to the Watershed Workplan shall be presented during an Annual Watershed Review Meeting. Annual Watershed Review Meetings shall be conducted by the Watershed Copermittees, open to the public and adequately noticed, and occur once every calendar year. Individual Watershed Copermittees shall also review and modify their jurisdictional programs and JRMP Annual Reports, as necessary, so that they are consistent with the updated Watershed Workplan.

This section requires the copermittee's to review and update their workplan each year to incorporate changing priorities and evolving watershed strategies. This requirement is meant to take the place of Order No. 2002-01 requirement to submit Watershed Annual Reports.

G.7. Aliso Creek Watershed RMP Provisions. This requirement is the same to that found in Order 2002-01.

H. Fiscal Analysis

The following legal authority applies to section H:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(vi) provides that "[The Copermittee must submit] for each fiscal year to be covered by the permit, a fiscal analysis of the necessary capital and operation and maintenance expenditures necessary to accomplish the activities of the programs under paragraphs (d)(2)(iii) and (iv) of this section. Such analysis shall include a description of the source of funds that are proposed to meet the necessary expenditures, including legal restrictions on the use of such funds."

Section H has been expanded in order to develop more useful and meaningful fiscal reporting. The Copermittees have identified a need to assess the current fiscal reporting process and have proposed to prepare a fiscal reporting strategy to better define the expenditure and budget line items included in the fiscal reports.[242] The Regional Board agrees that the process should be improved. A revamped fiscal reporting strategy will provide the Regional Board and the Copermittees with better capability to manage performance of the programs.

The Copermittees' effort is expected to provide standardization of reporting so that figures between Copermittees are comparable, which is one of many types of information which can be used by the Regional Board to better understand Copermittee program implementation. Standardization and comparison of fiscal analysis reporting is supported by the State Board funded NPDES Stormwater Cost Survey, which finds that "standards for reporting costs and stormwater activities are needed to allow accurate cost comparisons to be made between stormwater activities."[243] This document also provides guidance regarding categorization of expenditures for tracking and reporting.

The Order establishes criterion for when Copermittees must add narrative evaluations to the tables. This will address some of the variability in reporting and will provide the public and Regional Board with improved understanding of how resources are shifted in response to annual assessments. This will also help ensure that projected annual costs adequately reflect planned program modifications described in the annual reports.

[242] Orange County Storm Water Copermittees. 2006. Report of Waste Discharge (San Diego Region), section 2.3.4.
[243] Currier, et al., 2005. *NPDES Storm Water Cost Survey Final Report*. Prepared for California State Water Resources Control Board by Office of Water Programs, California State University, Sacramento. P. 63.

The Regional Board has chosen not to require a description of fiscal benefits realized from implementation of the storm water protection program. This is a recommendation from the National Association of Flood and Stormwater Management Agencies.[244] For instance, the current fiscal assessment does not address city-wide fiscal benefits of protection (e.g., public health, tourism, property values, economic activity, beneficial uses, etc.), even though many costs currently reported to the Regional Board are for related activities. This type of assessment may help Copermittees improve the allocation of resources and it may help the Copermittees secure adequate funding for the program. Finally, it will provide a clearer picture of the storm water and non-storm water runoff program to the public and Regional Board. However, qualitative assessments could be overly subjective and most Copermittees likely lack the ability to provide accurate quantitative assessments. The Regional Board encourages Copermittees to consider means for conducting assessments of fiscal benefits derived from the programs. Such assessments could be conducted on a regional scale similar to studies of program costs conducted by the State Water Board[245] or community indicators by the Community Indicators Project.[246]

Currently, each Orange County municipality's annual report includes a table based on a template developed by the principal Copermittee. The template was meant to facilitate reporting consistency among the 13 Copermittees. The annual report table contains estimates of spending during the reported period and estimates of the next year's spending. The tables separate capital costs from operations and maintenance costs and are arranged by program element. In addition to the tables, each municipality reports on the sources of the funds, (e.g., general fund, special fee, grants, etc.) to demonstrate that resources have been secured. There is very heavy reliance on general funds.

Review of the fiscal analysis tables included in the annual reports has not been as straightforward as expected, and the value of the information is moderate. Generally, questions regarding the financial reporting process of individual Permittees have been adequately resolved during meetings to discuss the annual reports. Based on those meetings, the Regional Board staff has found that cities do not use consistent methods to fill in the tables because they use different accounting and budgeting processes, and certain stormwater program expenditures are not easily categorized into the table formats. Furthermore, stormwater permit-related activities involve several departments, which makes it difficult for the storm water manager to gather and decipher actual costs.

[244] National Association of Flood and Stormwater Management Agencies. 2006. *Guidance for Municipal Stormwater Funding.* Prepared under a grant provided by the USEPA.
[245] State Water Board, 2005. NPDES Stormwater Cost Survey.
[246] Orange County 2006 Community Indicators Project. 2006. Sponsored by the County of Orange, the Orange County Business Council, and the Children and Families Commission of Orange County. Available on-line at www.oc.ca.gov/ceocommunity.asp

These issues also make it difficult for the Copermittees to accurately compartmentalize expenditures within the format. The Copermittees are aware of the reporting discrepancies and have planned to modify the reporting template and guidelines. As a result, the current financial reporting provides estimates at best and cannot be reliably used to compare program implementation among most municipalities.

I. Total Maximum Daily Loads

This section has been added to address any TMDLs that are adopted by the Regional Board. See Finding E.10 and Discussion.

J. Program Effectiveness Component

The following legal authority applies to section J:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(v) provides that the Copermittees must include "Estimated reductions in loadings of pollutants from discharges of municipal storm sewer constituents from municipal storm sewer systems expected as the result of the municipal storm water quality management program. The assessment shall also identify known impacts of storm water controls on ground water." Under Federal NPDES regulation 40 CFR 122.42(c) applicants must provide annual reports on the progress of their storm water management programs.

Section J.1 (jurisdictional program effectiveness assessments) of the Order requires the Copermittees to assess the effectiveness of the implementation of their jurisdictional programs and activities. The section requires that the effectiveness strategy of the programs be designed around four classes of objectives and that the results are used to direct program modifications. The section does not specify the assessments to be conducted, but does require that assessment measures conform to the guidance developed by the California Storm Water Quality Association (CASQA). The Orange County Storm Water Program is supportive of the CASQA effort, and use of CASQA assessment techniques is consistent with the methodology proposed in the ROWD.[247] [248]

The section is also consistent with the plan of the Copermittees to improve the efficacy of the assessment process.[249] The Copermittees currently report a series of metrics for spatial and temporal assessments across the County. The Program Effectiveness requirements of the Order provide the Copermittees with the framework for improving their standard assessment metrics.

[247] The structure of planned program effectiveness is proposed in section 1.2.2 of the 2007 ROWD. The ROWD then identifies current and potential assessment outcome levels within each major program chapter (e.g., new development, construction, etc.).
[248] CASQA 2007. Municipal Stormwater Program Effectiveness Assessment Guidance.
[249] Orange County Storm Water Copermittees. 2006. Report of Waste Discharge (San Diego Region), section 3.3.2.

The Order provides focus to the assessment methodology by requiring that impaired waterbodies and environmentally-sensitive areas are specifically addressed. In this way, the high priority water quality issues will receive a high level of attention, consistent with USEPA and CASQA guidance for prioritization. The Order provides flexibility to establish the actual metrics for each assessment outcome level. The Order also provides the Copermittees flexibility to develop objectives for the general program components based on the CASQA guidance, as is proposed in the ROWD and DAMP.

In addition, Section J.1 requires that an effectiveness assessment strategy is developed and implemented in response to actions taken by a Copermittee to comply with Section A.3 (Prohibitions and Receiving Water Limitations) of the Order. Section A.3 outlines the procedure for addressing instances when jurisdictional programs implement control actions in response to determinations that discharges from the MS4 are causing or contributing to violations of water quality standards.

This section includes a requirement for the Copermittees to develop and implement a workplan identifying and addressing the highest priority issues in the watershed. The workplan requirement in the JRMP section has been added to ensure Copermittees are allocating resources and effort to address priority problems and pollutants identified in the watershed analysis. This section has been added to ensure Copermittees use the annual watershed water quality assessment to asses, adjust and tailor their JRMP programs.

Section J.2 (program modification) of the Order requires the Copermittees to improve jurisdictional activities or BMPs when they are found to be ineffective or when water quality impairments are continuing. This requirement fulfills the purpose of conducting effectiveness assessments – to improve and refine the Copermittees' programs. The requirement is consistent with USEPA's Phase II regulations, which state: "If the permittee determines that its original combination of BMPs are not adequate to achieve the objectives of the municipal program, the MS4 should revise its program to implement BMPs that are adequate […]."[250]

Section J.3 (reporting) of the Order describes the information required to be submitted in jurisdictional annual reports pertaining to program effectiveness assessments, review, and response. The reporting will demonstrate whether Copermittees have appropriately responded to the effectiveness assessments.

[250] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68762.

K. Reporting

The following legal authority applies to section K:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.42(c) requires that "The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer system that has been designated by the director under § 122.26(a)(1)(v) of this part must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report shall include: (1) The status of implementing the components of the storm water management program that are established as permit conditions; (2) Proposed changes to the storm water management program that are established as permit condition. Such proposed changes shall be consistent with § 122.26(d)(2)(iii) of this part; (3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under § 122.26(d)(2)(iv) and (d)(2)(v) of this part; (4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; (5) Annual expenditures and budget for year following each annual report; (6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; (7) Identification of water quality improvements or degradation."

California Water Code section 13267 provides that "the Regional Board may require than any person who has discharged […] shall furnish, under penalty of perjury, technical or monitoring reports which the regional board requires."

Section K.1 (Jurisdictional Runoff Management Plans and Watershed Workplans) outlines the process and due dates for submitting plans. The information to be included in the Jurisdictional and Watershed plans must be sufficient to demonstrate the capacity to implement the requirements of Section G and Section J, respectively, of the Order.

Two general modifications from Order No. R9-2002-0001 result in reduced reporting effort by the Copermittees. First, in many cases, the requirements of the Order should not necessitate a complete rewrite of the plans, as was basically done in 2003. Only sections of the Order which are new or have been significantly changed should warrant rewriting of plans' sections. Second, the WRMP annual reporting is no longer due in January. Annual reporting will occur during a watershed review meeting conducted some time during the calendar year. The Regional Board plans to work with the Copermittees and provide guidance regarding where JRMPs must be updated in accordance with the Order. This will help ensure that rewriting, reporting, and review efforts are minimized.

The reporting requirements include two significant additions. The first addition is a summary reporting checklist which has been added to the reporting requirements. The checklist has been added to ensure that Copermittees evaluate and demonstrate compliance with all requirements in the Order.
Section K.2 (Other Required Reports) include requirements for information to be included in the SSMP update and the Report of Waste Discharge for the next permit reissuance. The Order requires submittal of a ROWD prior to the expiration of the Order. The section identifies the minimum information to be included in the ROWD, based on USEPA's May 17, 1996 guidance "Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems."

Section K.3 (Annual Reports) outlines the process and roles of the Copermittees for developing and submitting the JRMP annual report. Information to be included in the annual reports is described in Section K.3.a.3. The due dates have been changed. The JRMP is due approximately six weeks earlier than under Order No. R9-2002-0001. This change is necessary because the existing timelines prevented efficient response by the Copermittees to comments from the Regional Board and the Copermittees' own review. However, the Copermittees may propose alternate reporting criteria and schedules, as part of their updated JRMP, for the Executive Officer's acceptance.

Each Copermittee is required to maintain records demonstrating that Permit activity requirements have been met, which allows the Regional Board to confirm compliance as needed, such as via inspections, program audits, or requests for information per California Water Code Sections 13225 and 13267.

Reporting requirements in the Order focus on results and responses to the effectiveness assessments conducted by the Copermittees. This will allow the Regional Board to determine how appropriately municipalities adapt and tailor their programs to findings from activities and monitoring results. Assessment of progress toward meeting the objectives is possible because the data collected by the Copermittees under Order No. R9-2002-0001 can be used to establish baseline conditions. Compared to activity-based reporting, this will greatly enhance the ability of the Regional Board, Copermittees, and the public to determine whether the programs are successful.

The Order reduces the amount of program activity-based reporting from Order No. R9-2002-0001. Under the CASQA assessment model, activity-based reporting includes primarily outcomes that document compliance with permit requirements (Level 1 outcomes), rather than being indicators of the impact of activity implementation.[251] This approach is consistent with guidance from the USEPA, which notes that annual reports should highlight program effectiveness as well as describing activities.[252] This emphasis is also consistent with recommendations from the National Academy of Public Administration in its report to USEPA on Evaluating Environmental Progress, which suggest that reviewing activities data provides limited value when evaluating the effectiveness of programs and resulting environmental conditions.[253]

The Order maintains some reporting requirements for certain activity-based outcomes. These are mostly focused on activities that establish or revise municipal processes related to storm water runoff and management. The processes required by the Order are especially important in situations where sustaining water quality improvements may require activities that extend beyond the five-year period of the NPDES permit.

In addition, the Order maintains many activity-based reporting requirements related to enforcement of local requirements, with an emphasis on the results from such activities. This is intended to facilitate review of the contributions that inspection and enforcement activities have made toward meeting the goals of the Order. Reporting of these types of activities is supported by recommendations from the National Academy of Public Administration in its report to the USEPA: *Evaluating Environmental Progress: How EPA and the States Can Improve the Quality of Enforcement and Compliance Information* (June 2001).[254] Other activity-based reporting has been reduced to selected items based on consideration of program priorities.

Another source of prioritization for activity-based reporting is the *Storm Water Panel Recommendations to the California State Water Resources Control Board The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities* (June 19, 2006). In particular, the panel highlighted needs to improve the design, maintenance, and inspections of best management practices.

[251] Level 1 outcomes under the CASQA guidance include documentation that required activities have been implemented.
[252] USEPA 2007. *MS4 Program Evaluation Guidance.* USEPA Office of Wastewater Management EPA-833-R-07-003. January 2007 field test version.
[253] National Academy of Public Adminstration 2001. Evaluating Environmental Progress: How EPA and the States Can Improve the Quality of Enforcement and Compliance Information (June 2001). http://www.napawash.org
[254] The National Academy of Public Administration report is available on-line at http://www.napawash.org

L. Modification of Programs

The following legal authority applies to section L:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Section L of the Order provides a process for the Copermittees to modify their runoff management programs. This process will be useful so that the Copermittees can continue to refine and improve their programs based on the findings of their annual program effectiveness assessments. The process allows for minor modifications to the Copermittees' programs where the Copermittees can exhibit that the modifications meet or exceed existing legal requirements under the Order. Such a process avoids lengthy and time consuming formal approvals of proposed modifications before the Regional Board, while still ensuring compliance with applicable legal standards and the Order. The process included in the Order is based on a process utilized by the San Francisco Bay Area Regional Water Quality Control Board in their MS4 permit for Alameda County.[255]

[255] San Francisco Bay Area Regional Water Quality Control Board, 2003. Order No. R2-2003-0021. P. 45.

M. Principal Permittee Responsibilities

The following legal authority applies to section M:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(a)(3)(iii)(C) provides that "A regional authority may be responsible for submitting a permit application."

Federal NPDES regulation 40 CFR 122.26(d)(2)(i)(D) provides that "[The Copermittee must demonstrate that it can control] through interagency agreements among coapplicants the contribution of pollutants from one portion of the municipal system to another portion of the municipal system."

No significant changes were made to this section.

N. Receiving Waters Monitoring and Reporting

The following legal authority applies to section N:

Broad Legal Authority: CWA sections 402, 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Copermittees must conduct a comprehensive monitoring program as required under Federal NPDES regulations 40 CFR 122.26(d)(2)(iii) and 122.44.

See section T of this Fact Sheet/Technical Report for a discussion of changes to the Receiving Waters Monitoring and Reporting Program.

O. Standard Provisions, Reporting Requirements, And Notifications

The following legal authority applies to section O:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Standard provisions, reporting requirements, and notifications are consistent to all NPDES permits and are generally found in Federal NPDES regulation 40 CFR 122.41.

Section L.2 of the Order has been changed to remove the statement that all plans and reports submitted in compliance with the Order are an enforceable part of the Order. This statement has been removed because it is unnecessary. The Order itself contains sufficient detailed requirements to ensure that compliance with discharge prohibitions, receiving water limitations, non-storm water action levels and the narrative standard of MEP for storm water are achieved. Implementation by the Copermittees of programs in compliance with the Order's requirements, prohibitions, and receiving water limitations is the pertinent compliance standard to be used under the Order, as opposed to assessing compliance by reviewing the Copermittees' implementation of their plans alone.

Rather than being substantive components of the Order itself, the Copermittees' management plans are simply descriptions of their runoff management programs required under the Order. These plans serve as procedural correspondence which guides program implementation and aids the Copermittees and Regional Board in tracking implementation of the programs. In this manner, the plans are not functional equivalents of the Order. For these reasons, the Copermittees' runoff management plans need not be an enforceable part of the Order.

P. Attachment A – Basin Plan Prohibitions

The following legal authority applies to Attachment A:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: California Water Code Section 13243 provides that "A regional board, in a water quality control plan or in waste discharge requirements, may specify certain conditions or areas where the discharge of waste, or certain types of waste, will not be permitted."

California Water Code Section 13263(a) provides that waste discharge requirements prescribed by the SDRWQCB implement the Basin Plan.

No significant changes were made to this attachment.

Q. Attachment B – Standard Provisions

The following legal authority applies to Attachment B:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Standard provisions, reporting requirements, and notifications are consistent to all NPDES permits and are generally found in Federal NPDES regulation 40 CFR 122.41.

Attachment B includes Standard Provisions which have been developed by the State Board. These Standard Provisions ensure that NPDES permits are consistent and compatible with USEPA's federal regulations. Some Standard Provisions sections specific to publicly owned sewage treatment works are not included in Attachment B.

R. Attachment C – Definitions

The following legal authority applies to Attachment C:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Attachment C contains definitions for terms found in the Order. In addition, definitions for terms previously defined in Order No. R9-2002-0001 Attachment D, but which are not found in the current Order, have been deleted.

An additional section which includes acronyms and abbreviations has been added. This is to ensure clarity and prevent confusion of terms. Definitions have been added for new terms used in the permit to provide a clear understanding of their meaning and use.

S. Attachment D – Summary of Submittals

The following legal authority applies to Attachment D:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, 13383, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv) and 122.44(i).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.42(c) requires that "The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer system that has been designated by the director under § 122.26(a)(1)(v) of this part must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report shall include: (1) The status of implementing the components of the storm water management program that are established as permit conditions; (2) Proposed changes to the storm water management program that are established as permit condition. Such proposed changes shall be consistent with § 122.26(d)(2)(iii) of this part; (3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under § 122.26(d)(2)(iv) and (d)(2)(v) of this part; (4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; (5) Annual expenditures and budget for year following each annual report; (6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; (7) Identification of water quality improvements or degradation."

California Water Code section 13267 provides that "the regional board may require than any person who has discharged […] shall furnish, under penalty of perjury, technical or monitoring reports which the regional board requires."

Attachment D to the Order provides a table summary of scheduled submittals required by the Order. Unscheduled submittals are no longer added to the table, since there is no proper due date for such submittals. A task summary has not been created for the Order, since the previous task summary was found to be redundant, repeating information found in the submittal summary and elsewhere in the Order.

A Jurisdictional Runoff Management Program (JRMP) Annual Report Checklist has been added to the reporting requirements. This addition is to determine and ensure that all requirements of the permit are being met. A Jurisdictional Runoff Management Program (JRMP) Annual Report Checklist has been added to the reporting requirements. This addition is to determine and ensure that all requirements of the permit are being met.

T. Attachment E - Receiving Waters and MS4 Discharge Monitoring and Reporting Program

The following legal authority applies to the Receiving Waters and MS4 Discharge Monitoring and Reporting Program:

Broad Legal Authority: CWA sections 402, 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv), 122.44 and 122.45.

Specific Legal Authority: Copermittees must conduct a comprehensive monitoring program as required under Federal NPDES regulations 40 CFR 122.26(d)(2)(iii).

Federal NPDES regulation 40 CFR 122.42(c) requires that "The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer system that has been designated by the director under § 122.26(a)(1)(v) of this part must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report shall include: (1) The status of implementing the components of the storm water management program that are established as permit conditions; (2) Proposed changes to the storm water management program that are established as permit condition. Such proposed changes shall be consistent with § 122.26(d)(2)(iii) of this part; (3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under § 122.26(d)(2)(iv) and (d)(2)(v) of this part; (4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; (5) Annual expenditures and budget for year following each annual report; (6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; (7) Identification of water quality improvements or degradation."

California Water Code section 13267 provides that "the regional board may require than any person who has discharged […] shall furnish, under penalty of perjury, technical or monitoring reports which the regional board requires."

1. Purpose

According to USEPA, the benefits of sampling data include, but are not limited to:

1. Providing a means for evaluating the environmental risk of storm water discharges by identifying types and amounts of pollutants present;
2. Determining the relative potential for storm water discharges to contribute to water quality impacts or water quality standard violations;
3. Identifying potential sources of pollutants; and

4. Eliminating or controlling identified sources more specifically through permit conditions.[256]

Equally important, monitoring programs are an essential link in the improvement of storm water management efforts. Data collected from monitoring programs can be assessed to determine the effectiveness of management programs and practices, which is vital for the success of the iterative approach used to meet the MEP standard for storm water. Specifically, when data indicates that a particular BMP or program component is not effective, improved efforts can be selected and implemented. Also, when water quality data indicate that water quality standards or objectives are being exceeded, particular pollutants, sources, and drainage areas can be identified and targeted for specific management efforts.

Considering the benefits described above, the Receiving Waters Monitoring and Reporting Program (MRP) has been designed to determine impacts to receiving water quality and beneficial uses from storm water runoff and to use the results to refine the Copermittees' storm water runoff management programs for the reduction of storm water pollutant loadings to the MEP. For non-storm water discharges, monitoring has been designed for the identification of prohibited illicit discharges and to determine appropriate actions to take in response to dry weather non-storm water action levels. Additionally, the results from dry weather non-storm water monitoring can be used to evaluate exempted non-storm water discharges as a source or conveyance of pollutants. The primary goals of the MRP include:

1. Assess compliance with Order No. R9-2009-0002;
2. Measure and improve the effectiveness of the Copermittees' runoff management programs;
3. Assess the chemical, physical, and biological impacts of receiving waters from MS4 discharges;
4. Characterize storm water runoff discharges;
5. Identify sources of specific pollutants;
6. Prioritize drainage and sub-drainage areas that need management actions;
7. Detect and eliminate illicit discharges and illicit connections to the MS4;
8. Assess the overall health of receiving waters; and
9. Provide information to implement required BMP improvements

[256] USEPA, 1992. NPDES Storm Water Sampling Guidance Document. EPA/833-B-92-001.

Each of the components of the MRP is necessary to meet the objectives listed above. In addition, the MRP has been designed in accordance with the guidance provided by the Southern California Stormwater Monitoring Coalition's Model Monitoring Technical Committee in its August 2004 "Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California." This guidance document was developed in response to Senate Bill 72 (Kuehl), which addressed the standardization of sampling and analysis protocols in municipal stormwater monitoring programs. The technical committee which developed the guidance included representatives from Southern California Regional Water Quality Control Boards (including San Diego), municipal storm water Permittees (including the County of Orange), Heal the Bay, and the Southern California Coastal Water Research Project.

As its title suggests, the guidance essentially developed a model municipal storm water monitoring program for use in Southern California. The model program is structured around five fundamental management questions, outlined below. The MRP is designed as an iterative step towards ensuring that the Copermittees' monitoring program can fully answer each of the five management questions.

1. Are conditions in receiving waters protective, or likely to be protective, of beneficial uses?
2. What is the extent and magnitude of the current or potential receiving water problems?
3. What is the relative storm water runoff contribution to the receiving water problem(s)?
4. What are the sources of storm water runoff that contribute to receiving water problem(s)?
5. Are conditions in receiving waters getting better or worse?

The justifications for each component of the monitoring program are discussed below.

2. Monitoring Program

Mass Loading Station Monitoring

The intent of current mass loading monitoring as conducted by the Copermittees is to use water chemistry data from storm events and dry weather flows to calculate pollutant loads and to assess water quality with respect to applicable acute and chronic toxicity criteria from the California Toxics Rule (CTR).[257]

[257] Orange County Storm Water Permittees. 2006. Report of Waste Discharge, section C-11.3.2.

Section II.A.1 of the MRP requires mass loading and toxicity monitoring at monitoring stations located at the bottom of major watersheds within Orange County. The mass loading monitoring will provide data representing event mean concentrations of pollutants, total pollutant loadings, and toxicity conditions from specific drainage areas. Mass loading monitoring stations are recommended by the Model Monitoring Technical Committee in order to answer management questions 1, 2, and 5.[258] The stations are also expected to contribute towards meeting MRP goals 1, 2, 3, 4, 6, and 8. The locations of the mass loading monitoring stations are not changed from Order No. R9-2002-0001. However, the frequency of monitoring has been changed, and some revisions to the constituents have been made.

The frequency of mass loading monitoring in Order No. 2009-0002 has been modified to include two wet and two dry weather events. Currently three wet events have been targeted (though usually two or less have been sampled). This modification is not expected to affect long-term trend analyses for storm events since the monitoring to date has been sporadic.[259] Dry weather monitoring is necessary because dry-weather flows in these watersheds are now perennial and changes have been made to the Order for non-storm water discharges. The addition of dry weather monitoring provides a more comprehensive temporal view of the watershed, which will improve the Copermittees' ability to understand the dynamics of annual pollutant loading.

In addition, the required constituents include some revisions to Order No. R9-2002-0001. The changes are made to be compatible with the federal NPDES regulations and in response to data collected during the current permit term. The changes include:

1. All events must now include Biological Oxygen Demand, 5-day Chemical Oxygen Demand, Total Organic Carbon, Dissolved Organic Carbon. These are specifically identified in 40 CFR 122.26(d)(2)(iii)(B), but were omitted from Order No. R9-2002-01.

2. Carbamate and Pyrethroid pesticides must initially be monitored in Prima Deshecha and Segunda Deshecha watersheds. If carbamate and/or pyrethroid pesticides are found to correlate with observed acute or chronic toxicity, then sampling and analysis for that pesticide must be added to all stations displaying toxicity. The Copermittees suggest adding these pesticides to Prima and Segunda Deshecha watersheds in an attempt to find a cause for observed persistent toxicity at those stations.[260] If these pesticides are found in these watersheds, then they will likely be present in the other developed watersheds of the Region.

[258] Model Monitoring Technical Committee, 2004. Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California. Chapter 5.
[259] Mass loading monitoring has been hampered by technical difficulties. For instance, only four of six stations were operational during the 2004-05 season, and only three stations were operational during 2002-04 season.
[260] Orange County Storm Water Permittees. 2006. Report of Waste Discharge, section C-11.4.1.

3. Impaired water body pollutants. Specific pollutants have been added in response to the U.S. Environmental Protection Agency approval of California's 2004-2006 Section 303(d) Water Quality Limited Waters List. Monitoring for these pollutants is specific to the watershed in which the impairment is located.

4. Dimethoate monitoring has been eliminated because data collected to date has not observed any significant levels at the mass emissions stations.

5. A requirement to collect a grab sample for total petroleum hydrocarbons whenever a sheen is observed has been added at the suggestion of the County of Orange.

Bioassessment

Section II.A.2 of the MRP requires the Copermittees to conduct bioassessment monitoring. Bioassessment monitoring is a cost-effective tool that measures the effects of water quality over time.[261] It is an important indicator of stream health and impacts from storm water and non-storm water runoff. It can detect impacts that chemical and toxicity monitoring cannot. USEPA encourages permitting authorities to consider requiring biological monitoring methods to fully characterize the nature and extent of impacts from runoff.[262] Therefore, the Regional Board commonly requires bioassessment monitoring in MS4 and other types of discharge permits.

Bioassessment is the direct measurement of the biological condition, physical condition, and attainment of beneficial uses of receiving waters (typically using benthic macroinvertebrates, periphyton, and fish). Bioassessment monitoring integrates the effects of both water chemistry and physical habitat impacts (e.g., sedimentation or erosion) of various discharges on the biological community native to the receiving waters. Moreover, bioassessment is a direct measurement of the impact of cumulative, sub-lethal doses of pollutants that may be below reasonable water chemistry detection limits, but that still have biological affects.

[261] California Department of Fish and Game, 2002. California Regional Water Quality Control Board, San Diego Region 2002 Biological Assessment Report: Results of May 2001 Reference Site Study and Preliminary Index of Biotic Integrity.
[262] USEPA, 1999. Rapid Bioassessment Protocols for Use in Wadeable Streams and Rivers. EPA 841-B-99-002. P. 2-5.

Because bioassessment focuses on communities of living organisms as integrators of cumulative impacts resulting from water quality or habitat degradation, it defines the ecological risks resulting from storm water and non-storm water MS4 runoff. Bioassessment not only identifies that an impact has occurred, but also measures the effect of the impact and tracks recovery when control or restoration measures have been taken. These features make bioassessment a powerful tool to assess compliance, evaluate the effectiveness of BMPs, and to track both short and long-term trends (MRP goals 1,2,3, and 8). Bioassessment can also help answer management questions 1, 2, and 5.

The Order also identifies the most current established protocol to be used in identifying bioassessment reference stations. The protocol referenced in the Order is specified because it provides a qualitative and repeatable method for identifying reference sites. Moreover, the protocol is well established, since it has been peer reviewed and published.

The Order includes four modifications to the bioassessment monitoring required under Order 2002-0001. These changes include:

1. Bioassessment monitoring must utilize the targeted riffle composite approach, which is consistent with the State Board's Surface Water Ambient Monitoring Program (SWAMP) Quality Assurance Management Plan (QAMP), as amended. Through SWAMP, various bioassessment methods were evaluated and it was found that the targeted riffle composite approach was a particularly efficient method, providing accurate data in a cost efficient manner.

2. Bioassessment monitoring to include assessment of periphyton (algae). Advantages of bioassessment using periphyton include: (1) they have rapid reproduction rates and very short life cycles, making them valuable indicators of short-term impacts; (2) as primary producers, they are most directly affected by physical and chemical factors; (3) sampling is easy and inexpensive; and (4) algal assemblages are sensitive to some pollutants which may not visibly affect other aquatic assemblages.[263] Future bioassessment must use algal IBI scores, when developed.

[263] USEPA, 1999. Rapid Bioassessment Protocols for Use in Wadeable Streams and Rivers. EPA 841-B-99-002. P. 3-3.

3. One of the two required annual monitoring events has been eliminated for streams exhibiting perennial flows. The Copermittees suggest this approach in response to analyses that indicate that the physical habitat conditions are better correlated than aquatic chemistry data with IBI scores.[264] The Copermittees analyses indicate that although biological communities are different in the Fall and Spring, both seasonal communities indicate the same common relationships to spatial biological patterns and potential variables that explain the differences. For instance, downstream urbanized locations which exhibit perennial flows display lower IBI scores than reference sites regardless of the season, even if the biological community at a downstream site differs between the Fall and Spring.

4. The number of bioassessment stations has been reduced from 12 to six. This will allow resources to be available to implement the Stormwater Monitoring Coalition's program for Regional Monitoring of Southern California's Coastal Watersheds (Section II.D.3). The Regional Monitoring program calls for six sites to be sampled each year and includes each of the basic elements within the Copermittees' bioassessment monitoring program. Although the amount of toxicity tests are reduced, wetland status analyses will also be analyzed. The Regional Monitoring program is discussed in Section II.D.3 below.

Follow-up Analyses and Actions

Section II.A.3 of the MRP requires the Copermittees to use the results of the chemistry, toxicity, and bioassessment monitoring to determine if impacts from MS4 discharges are occurring and when follow-up actions are necessary. The triad approach allows a wide range of measurements to be combined to more efficiently identify pollutants, their sources, and appropriate follow-up actions. Results from the three types of monitoring shall be assessed to evaluate the extent and causes of pollution in receiving waters and to prioritize management actions to eliminate or reduce the sources. The framework provided is to be used to determine conclusions from the data and appropriate follow-up actions. The framework is proposed by the Copermittees and derived from the Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California.[265] These follow-up actions are expected to primarily help answer management questions 2 and 4, as well as address MRP goals 2, 4, 5, 6 and 7.

[264] Orange County Storm Water Copermittees. 2006. Report of Waste Discharge (San Diego Region), section 11 and 2005-06 Annual Report section 11.3
[265] Model Monitoring Technical Committee, 2004. Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California. P. 5-61.

When, based on the framework in Table 2 of the M&R Program, data indicates the presence of toxic pollutants in runoff, the Copermittees are required to conduct a Toxicity Identification Evaluation (TIE). A TIE is a set of procedures used to identify the specific chemical(s) responsible for toxicity to aquatic organisms. When discharges are toxic to a test organism, a TIE must be conducted to confirm potential constituents of concern and rule out others, therefore allowing Copermittees to determine and prioritize appropriate management actions. If a sample is toxic to more than one species, it is necessary to determine the toxicant(s) affecting each species. If the type and source of pollutants can be identified based on the data alone and an analysis of potential sources in the drainage area, a TIE is not necessary.

When a TIE identifies a pollutant associated with MS4 discharge as a cause of toxicity, it is then necessary to conduct follow-up actions to identify the causative agents of toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in toxicity. Follow-up actions should analyze all potential source(s) causing toxicity, potential BMPs to eliminate or reduce the pollutants causing toxicity, and suggested monitoring to demonstrate that toxicity has been removed.

Ambient Coastal Receiving Waters Monitoring

The Copermittees have been implementing a phased Ambient Coastal Monitoring Program that initially involved monitoring chemistry and aquatic toxicity of dry and storm water discharges to ecologically sensitive areas along the coastline. Later, aerial photographs of storm water plumes were taken to estimate the spatial extent of the impact of storm water runoff. The results were used to identify storm drains for source and toxicity identification studies, including sampling of storm water plumes.

Section II.A.4 of the MRP allows the Copermittees to continue the existing program, while requiring that the special studies be consistent with the MRP goals and that stations be located within Areas of Special Biological Significance.

Coastal Storm Drain Monitoring

Section II.A.5 of the MRP has been extensively modified and changed to a Regional Monitoring Program.

Section II.A.5.a. Coastal storm drain monitoring has been replaced with a Regional Bacteria Monitoring section. Coastal storm drain monitoring is critical because one of the primary impacts to coastal receiving waters is the loss of recreational beneficial uses resulting from high levels of bacteria in storm water and non-storm water MS4 runoff. The regional monitoring program is expected to help answer management questions 1, 2, 3, 4 and 5, as well as address MRP goals 1, 2, 3, 4, 5, 6, 7, and 8.

The changes to the coastal storm drain monitoring program have been made in response to the Copermittees' request. The Copermittees recommend participation in the regional program to save cost, prevent redundancy, improve notification times and provide more effort toward intensive investigations of problematic storm drains.[266] This section has been modified to allow the Copermittees to participate in the development and subsequent regional bacteria monitoring program upon review and approval from the Executive Officer. An adaptive approach is consistent with the Model Monitoring Technical Committee's recommendations.

High Priority Inland Aquatic Habitats

Section II.A.6 of the MRP has been removed.

Wet Weather MS4 Runoff Discharge Monitoring

Section II.B of the MRP requires the Copermittees to develop and implement a program to monitor and characterize pollutant discharges from MS4 outfalls. Currently the Copermittees do not monitor the discharge of storm water from the MS4 outfalls. As a result, a substantial amount of information regarding the quality of MS4 effluent is unknown. The collection of wet-weather data will enable the Copermittees to assess the effectiveness of existing storm water BMP measures. This data can be used to more effectively target storm water management program efforts. The MRP also requires compliance with Section D of the Order for Storm Water Action Levels.

The monitoring of outfalls is expected to be used to identify storm drains that are discharging pollutants in concentrations that may pose a threat to receiving waters. Source investigations are expected to be conducted as a response to the data.

The MRP provides the Copermittees great flexibility in assigning stations for wet-weather monitoring. Copermittees are to choose the number and frequency of monitoring stations, thus determining the overall cost of their program.

The monitoring requirements also include a requirement to measure receiving water hardness when comparing storm water MS4 discharge data to Storm Water Action Levels for priority pollutants (e.g. metals). The effect of these constituents upon receiving waters will vary depending upon the hardness of receiving waters.

[266] Ibid

Section II.B.2 requires the Copermittees to develop and implement a program to identify sources of discharges of pollutants causing the high priority water quality problems within each watershed. This requirement should be easily met because of the foundation already developed by the Copermittees in response to Order No. R9-2002-0001. To some extent, the Copermittees do conduct follow-up monitoring in response to dry-weather outfall data. The ROWD and 2007 DAMP describe some guidance that is provided by the County to the Copermittees, and it is expected that the Copermittees will develop follow-up monitoring programs for storm water discharges. The ROWD does recommend that additional training be provided for the municipalities with respect to interpreting and using the data collected by the County. In addition, many of the Copermittees have developed procedures and experience in conducting follow-up investigations in response to the bacteria investigations in the Aliso Creek watershed.[267]

Identification of sources causing high priority water quality problems is a central purpose of storm water runoff management programs. Monitoring which enables the Copermittees to identify sources of water quality problems aids the Copermittees in focusing their management efforts, improving their programs and choosing additional and/or better BMPs. In turn, the Copermittees' programs can abate identified sources, which will improve the quality of storm water runoff discharges and receiving waters. This monitoring is needed to address management question 4. Moreover, in its review of the San Diego County Copermittees' monitoring proposal, Tetra Tech, Inc. finds that "after some years of assessment monitoring, it is time to look more systematically at determining the relative urban contributions and the sources of urban runoff that contribute to identified receiving water problems."[268]

<u>Non-storm Water Dry Weather Action Levels</u>

Section II.C of the MRP describes the monitoring to be conducted by the Copermittees to determine compliance with dry weather, non-storm water action levels.

Section II.B.3 has been changed by removal of the Dry Weather Field Screening and Analytical Monitoring and subsequent replacement with section II.C for Dry Weather Non-Storm Water Action Level Monitoring. This change is required to assess compliance with action levels for non-storm water discharges from the MS4 into receiving waters. The required sampling frequency has been changed to allow Copermittees to sample a representative number of discharge points and the sampling methodology has been changed to grab sampling. This is expected to allow Copermittees to maintain a cost-neutral dry weather monitoring program that is similar to their existing IC/ID monitoring program.

[267] Copermittees in the Aliso Creek watershed include the County of Orange and the Cities of Aliso Viejo, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Lake Forest, and Mission Viejo.
[268] Tetra Tech Inc., 2006. Review of San Diego County MS4 Monitoring Program.

Special Studies

Section II.D.1 of the MRP absorbs the bacteria monitoring and reporting program currently in place in the Aliso Creek watershed.[269] This monitoring effort has been required by the Regional Board pursuant to authorities provided under California Water Code sections 13225 and 13267. The monitoring and reporting is focused solely on the MS4s in the Aliso Creek watershed and has effectively been integrated already into the Copermittees' programs. Inclusion of it into the MRP is done for organizational purposes and will have no other net effect.

Section II.D.3 includes a requirement to participate in the program for Regional Monitoring of Southern California's Coastal Watersheds developed by the Stormwater Monitoring Coalition. That program calls for the sampling of six locations within the Permit area each year. All sampling will be SWAMP comparable. Sampling includes water chemistry, aquatic toxicity (*Ceriodaphnia dubia*), physical habitat, benthic macroinvertebrates, wetland status (based on California Rapid Assessment Method protocols), and periphyton.

Section II.D.4 includes a requirement that the Copermittees conduct a sediment toxicity special study. This study has been added to the Monitoring and Reporting requirements to assess the quality of urban stream sediments and possible contamination due to runoff from the MS4. Toxicity tests focusing on aqueous toxicity may not account for the full toxicity of receiving waters if constituents, such as heavy metals or pesticides, are bound to sediments. Southern California studies have shown that stream sediments can exhibit significant levels of toxic metals and pesticides.[270,271]

Section II.D.5 includes a requirement that the Copermittees conduct a Trash and Litter Impairment Investigation (see Finding C.8 and Discussion).

Monitoring Provisions

Section II.E of the MRP includes monitoring provisions which are standard requirements for all municipal storm water permits.

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[269] On October 12, 2005, the Regional Board accepted the revised Aliso Creek watershed bacteria monitoring plan proposal from the MS4 Permittees. The Regional Board concluded that the scope of the current bacteria monitoring in the watershed was no longer warranted and that the proposed changes would constitute an effective interim program until adoption of a Total Maximum Daily Load, requiring a bacteria reduction and assessment program for the watershed. In addition, the Regional Board recognized that as a result of reduced monitoring costs, the municipalities expect to direct additional resources toward implementation of management practices to reduce indicator bacteria and pathogens.

[270] Holmes, R.W., Anderson, B.S., Phillips, B.M., Hunt, J.W., Crane, D.B., Mekebri, A. and V. Connor. 2008. Statewide Investigation of the Role of Pyrethroid Pesticides in Sediment Toxicity in California's Urban Waterways. *Environmental Science Technology* 42: 7003-7009..

[271] Crane, D.B. and C. Younghans-Haug. 1992. Oxadiazon residue concentrations in sediment, fish, and shellfish from a combined residential/agricultural area in Southern California. *Bulletin of Environmental Contamination and Toxicology.* Volume 48, no. 4.

2. Reporting Program

Section III of the MRP discusses submittal of the Jurisdictional Runoff Management Program Annual Reports and the Receiving Waters Monitoring Annual Reports. In effect, a description of the monitoring program will be submitted with the Jurisdictional RMPs, and the monitoring data and assessment will be submitted one month later. The MRP continues the reporting approach utilized under the requirements of Order No. R9-2002-0001, where Lead Permittees for each watershed submit their annual reports to the Principal Permittee to be unified into one document.

The reporting requirements for the Aliso Creek watershed are also specified in this section. These reporting requirements are identical to the current reporting required by the Regional Board for the bacteria investigation. They are specified in this section because the requirements are more specific than reporting required for other watershed RMPs.

U. Attachment F - Source Data

Attachment F contains data utilized for the development of Storm Water Action Levels and Non-storm Water Action Levels.

California Regional Water Quality Control Board
San Diego Region

Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the County of Riverside, the Incorporated Cities of Riverside County, and the Riverside County Flood Control and Water Conservation District within the San Diego Region

Order No. R9-2010-0016
NPDES No. CAS0108766

November 10, 2010

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Documents also are available at: http://www.waterboards.ca.gov/sandiego

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The California Regional Water Quality Control Board, San Diego Region (hereinafter San Diego Water Board), finds that:

A. BASIS FOR THE ORDER

1. This Order is based on the federal Clean Water Act (CWA), the Porter-Cologne Water Quality Control Act (Division 7 of the Water Code, commencing with Section 13000), applicable State and federal regulations, all applicable provisions of statewide Water Quality Control Plans and Policies adopted by the State Water Resources Control Board (State Water Board), the Water Quality Control Plan for the San Diego Basin adopted by the San Diego Water Board (Basin Plan), the California Toxics Rule, and the California Toxics Rule Implementation Plan.

2. This Order reissues National Pollutant Discharge Elimination System (NPDES) Permit No. CAS0108766, which was first adopted by the San Diego Water Board on July 16, 1990 (Order No. 90-38), and then reissued on May 13, 1998 (Order No. 98-02). On May 26, 1998, the United States Environmental Protection Agency (USEPA), Region IX, objected to Order No. 98-02 due to concerns regarding Receiving Water Limitations (RWL) language. The USEPA concluded that the RWL language in the permit did not comply with the CWA and its implementing regulations. On April 27, 1999, the USEPA reissued the MS4 permit, which the San Diego Water Board adopted as Addendum No. 1 to Order No. 98-02 on November 8, 2000. On July 14, 2004, the San Diego Water Board adopted the third term MS4 permit, Order No. R9-2004-001. On January 15, 2009, the Riverside County Flood Control and Water Conservation District (RCFCD), as the Principal Copermittee, submitted a Report of Waste Discharge (ROWD) for reissuance of the municipal separate storm sewer system (MS4) Permit.

3. This Order is consistent with the following precedential Orders adopted by the State Water Board addressing MS4 NPDES Permits: Order 99-05, Order WQ-2000-11, Order WQ 2001-15, and Order WQO 2002-0014.[1]

[1] In July 2010, the court in Los Angeles County v. State Water Resources Control Board remanded the Los Angeles Water Board's MS4 permit underlying Order WQ 2009-0008 for procedural reasons occurring during the permit adoption process. The court did not evaluate or rule upon the substantive findings and reasoning set forth in Order WQ 2009-0008. The State Water Board rescinded and voided Order WQ 2009-0008 to comply with the court's order. While the San Diego Water Board may no longer cite Order WQ 2009-0008, the San Diego Water Board has independently considered whether the requirement to eliminate non-storm water discharges is subject to the MEP standard. The San Diego Water Board concludes that the MEP standard does not apply to non-storm water discharges for the same reasons expressed by the State Water Board.

4. The Fact Sheet / Technical Report for the Order No. R9-2010-0016, NPDES No. CAS0108766, Waste Discharge Requirements for Discharges from the MS4s Draining the County of Riverside, the Incorporated Cities of Riverside County, and the Riverside County Flood Control and Water Conservation District within the San Diego Region, includes cited regulatory and legal references and additional explanatory information and data in support of the requirements of this Order. This information, including any supplements thereto, is hereby incorporated by reference into these findings.

B. REGULATED PARTIES

Each of the persons in Table 1 below, hereinafter called Copermittees or dischargers, owns or operates an MS4, through which it discharges into waters of the United States (U.S.) within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 that contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the U.S.

Table 1. Municipal Copermittees

1. City of Murrieta	4. County of Riverside
2. City of Temecula	5. Riverside County Flood Control and Water Conservation District
3. City of Wildomar	

The Cities of Murrieta, Menifee and Wildomar also discharge into the waters of the U.S. in the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board), so are located partially within both the San Diego and Santa Ana Water Board boundaries. Water Code (WC) section 13228 provides a way to streamline the regulation of entities whose jurisdictions straddle the border of two or more Regions. WC section 13228 is implemented in this Order to ease the regulatory burden on Storm Water Agencies and Municipalities that lie in both the San Diego Water Board and the adjacent Santa Ana Water Board's jurisdiction. As allowed by California Water Code (CWC) §13228, the Cities of Murietta, Menifee, and Wildomar submitted written requests to be regulated for MS4 purposes under a permit adopted by only one Water Board. As authorized by CWC §13228 and pursuant to written agreements dated September 28, 2010 between the San Diego Water Board and the Santa Ana Water Board, the Cities of Murrieta and Wildomar are wholly regulated by the San Diego Water Board under this Order, including those portions of the Cities jurisdiction not within the San Diego Water Board's region. Similarly, the City of Menifee is wholly regulated by the Santa Ana Water Board under Order No. R8-2010-0033, including those portions of the City of Menifee within the San Diego Water Board's region.

C. DISCHARGE CHARACTERISTICS

1. Discharges from the MS4 contain waste, as defined in the CWC, and pollutants that adversely affect the quality of the waters of the State. The discharge from an MS4 is a "discharge of pollutants from a point source" into waters of the U.S. as defined in the CWA.

2. MS4 storm water and non-storm water discharges are likely to contain pollutants that cause or threaten to cause a violation of water quality standards, as outlined in the Basin Plan. Storm water and non-storm water discharges from the MS4 are subject to the conditions and requirements established in the Basin Plan for point source discharges.

3. The most common categories of pollutants in runoff include total suspended solids, sediment, pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., copper, lead, zinc and cadmium), petroleum products and polynuclear aromatic hydrocarbons, synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus fertilizers), oxygen-demanding substances (decaying vegetation, animal waste), detergents, and trash.

4. The discharge of pollutants and/or increased flows from MS4s may cause or threaten to cause the concentration of pollutants to exceed applicable receiving water quality objectives and/or impair or threaten to impair designated beneficial uses resulting in a condition of pollution (i.e., unreasonable impairment of water quality for designated beneficial uses), contamination, or nuisance.

5. Pollutants in runoff can threaten and adversely affect human health. Human illnesses have been clearly linked to recreating near storm drains flowing to receiving waters. Also, runoff pollutants in receiving waters can bioaccumulate in the tissues of invertebrates and fish, which may be eventually consumed by humans.

6. Runoff discharges from MS4s often contain pollutants that cause toxicity to aquatic organisms (i.e., adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies). Toxic pollutants impact the overall quality of aquatic systems and beneficial uses of receiving waters.

7. The Copermittees discharge runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within one of the eleven hydrologic units (Santa Margarita Hydrologic Unit) comprising the San Diego Region as shown in Table 2. Some of the receiving water bodies have been designated as impaired by the San Diego Water Board in 2009 pursuant to CWA section 303(d).

Table 2. Common Watersheds and CWA Section 303(d) Impaired Waters in the San Diego Region.

Hydrologic Area (HA) or Hydrologic Subarea (HSA) of the Santa Margarita Hydrologic Unit	Major Receiving Water Bodies	303(d) Pollutant(s)/Stressor or Water Quality Effect[2]
DeLuz Creek HSA (902.21)	De Luz Creek	Iron, Manganese, Nitrogen, Sulfates
Murrieta HSA (902.32)	Long Canyon Creek (tributary to Murrieta Creek)	Chlorpyrifos, E. Coli, Fecal Coliform, Iron, Manganese
Wolf HSA (902.52)	Murrieta Creek	Chlorpyrifos, Copper, Iron, Manganese, Nitrogen, Toxicity
Pauba HSA (902.51)	Redhawk Channel	Chlorpyrifos, Copper, Diazinon, E. Coli, Fecal Coliform, Iron, Manganese, Nitrogen, Phosphorus, Total Dissolved Solids
Gavilan HSA (902.22)	Sandia Creek	Iron, Sulfates
Gertrudis HSA (902.42)	Santa Gertrudis Creek	Chlorpyrifos, Copper, E. Coli, Fecal Coliform, Iron, Phosphorous
Lower Ysidora HSA (902.11)	Santa Margarita Lagoon	Eutrophic
Lower Ysidora HSA (902.11)	Santa Margarita River (Lower)	Enterococcus, Fecal Coliform, Phosphorus, Total Nitrogen as N
Gavilan HSA (902.22)	Santa Margarita River (Upper)	Toxicity
Pauba HSA (902.51)	Temecula Creek	Chlorpyrifos, Copper, Phosphorus, Total Dissolved Solids, Toxicity
French HSA (902.33)	Warm Springs Creek (Riverside County)	Chlorpyrifos, E. Coli, Fecal Coliform, Iron, Manganese, Phosphorus, Total Nitrogen as N

[2] The listed 303(d) pollutant(s) do not necessarily reflect impairment of the entire corresponding WMA or all corresponding major surface water bodies. The specific impaired portions of each WMA are listed in the State Water Resources Control Board's 2008 Section 303(d) List of Water Quality Limited Segments.

8. Trash is a persistent pollutant that can enter receiving waters from the MS4, accumulate, and be transported downstream into receiving waters over time. Trash poses a serious threat to the beneficial uses of the receiving waters, including, but not limited to, human health, rare and endangered species, navigation and human recreation.

9. The Copermittees' water quality monitoring data submitted to date documents persistent violations of Basin Plan water quality objectives for various runoff-related pollutants (indicator bacteria, dissolved solids, turbidity, metals, pesticides, etc.) at various watershed monitoring stations. Persistent toxicity has also been observed at some watershed monitoring stations. In addition, bioassessment data indicate that the majority of the monitored receiving waters have Poor to Very Poor Index of Biotic Integrity ratings. In sum, the above findings indicate that runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in Riverside County.

10. When natural vegetated pervious ground cover is converted to impervious surfaces such as paved highways, streets, rooftops, and parking lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving a developed area is significantly greater in runoff volume, velocity, and peak flow rate than pre-development runoff from the same area. Runoff durations can also increase as a result of flood control and other efforts to control peak flow rates. Increased volume, velocity, rate, and duration of runoff, and decreased natural clean sediment loads, greatly accelerate the erosion of downstream natural channels. Significant declines in the biological integrity and physical habitat of streams and other receiving waters have been found to occur with as little as a 3-5 percent conversion from natural to impervious surfaces. The increased runoff characteristics from new development must be controlled to protect against increased erosion of channel beds and banks, sediment pollutant generation, or other impacts to beneficial uses and stream habitat due to increased erosive force.

11. Development creates new pollution sources as human population density increases and brings with it proportionately higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, trash, etc. which can either be washed or directly dumped into the MS4. As a result, the runoff leaving the developed urban area is significantly greater in pollutant load than the pre-development runoff from the same area. These increased pollutant loads must be controlled to protect downstream receiving water quality.

12. Development and urbanization especially threaten environmentally sensitive areas (ESAs), such as water bodies designated as supporting a RARE beneficial use (supporting rare, threatened or endangered species) and CWA 303(d)-impaired water bodies. Such areas have a much lower capacity to withstand pollutant loads than other, more sensitive areas. In essence, development that is ordinarily insignificant in its impact on the environment may become significant in a particularly sensitive environment. Therefore, additional controls to reduce storm water pollutants from new and existing development may be necessary for areas adjacent to or discharging directly to an ESA.

13. Although dependent on several factors, the risks typically associated with properly managed infiltration of runoff (especially from residential land use areas) are not significant. The risks associated with infiltration can be managed by many techniques, including (1) designing landscape drainage features that promote infiltration of runoff, but do not "inject" runoff (injection bypasses the natural processes of filtering and transformation that occur in the soil); (2) taking reasonable steps to prevent the illegal disposal of wastes; (3) protecting footings and foundations; (4) ensuring that each drainage feature is adequately maintained in perpetuity; and (5) pretreatment.

14. Non-storm water (dry weather) discharge from the MS4 is not considered a storm water (wet weather) discharge and therefore is not subject to regulation under the Maximum Extent Practicable (MEP) standard from CWA 402(p)(3)(B)(iii), which is explicitly for "Municipal … *Stormwater Discharges* (emphasis added)" from the MS4. Rather, non-storm water discharges into the storm sewers, per CWA 402(p)(3)(B)(ii), are to be effectively prohibited. Such dry weather non-storm water discharges have been shown to contribute significant levels of pollutants and flow in arid, developed Southern California watersheds and are to be effectively prohibited under the CWA.

15. Non-storm water discharges to the MS4 granted an influent exception [i.e., which are exempt from the effective prohibition requirement set forth in CWA section 402(p)(3)(B)(ii)] under 40 CFR 122.26 are included within this Order. Any exempted discharges identified by Copermittees as a source of pollutants are subsequently required to be *addressed* (emphasis added) as illicit discharges through prohibition and incorporation into existing IC/ID programs. Furthermore, the USEPA contemplates that permitting agencies such as the San Diego Water Board may also identify exempted discharges as a source of pollutants required to be addressed as illicit discharges (See Vol. 55 Fed. Reg. 48037). The San Diego Water Board and the Copermittees have identified landscape irrigation, irrigation water and lawn water, previously exempted discharges, as a source of pollutants and conveyance of pollutants to waters of the U.S.

D. RUNOFF MANAGEMENT PROGRAMS

1. General

a. This Order specifies requirements necessary for the Copermittees to reduce the discharge of pollutants in storm water to the MEP. However, since MEP is a dynamic performance standard, which evolves over time as runoff management knowledge increases, the Copermittees' runoff management programs must continually be assessed and modified to incorporate improved programs, control measures, best management practices (BMPs), etc. in order to achieve the evolving MEP standard. Absent evidence to the contrary, this continual assessment, revision, and improvement of runoff management program implementation is expected to ultimately achieve compliance with water quality standards in the Region.

b. The Copermittees have generally been implementing the jurisdictional runoff management programs (JRMPs) required pursuant to Order No. R9-2004-001 since July 14, 2005. Prior to that, the Copermittees were regulated by Order No. 98-02, since May 13, 1998. MS4 discharges, however, continue to cause or contribute to violations of water quality standards as evidenced by the Copermittees' monitoring results.

c. This Order contains new or modified requirements that are necessary to improve Copermittees' efforts to reduce the discharge of pollutants in storm water runoff to the MEP and achieve water quality standards. Some of the new or modified requirements, such as the revised Watershed Water Quality Workplan (Watershed Workplan) section, are designed to specifically address high priority water quality problems. Other requirements, such as for unpaved roads, are a result of San Diego Water Board's identification of water quality problems through investigations and complaints during the previous permit period. Other new or modified requirements address program deficiencies that have been noted during audits, report reviews, and other San Diego Water Board compliance assessment activities. Additional changes in the monitoring program provide consistency with the Code of Federal Regulations, USEPA guidance, State Water Board guidance, and the Southern California Monitoring Coalition recommendations.

d. Updated individual Storm Water Management Plans (Individual SWMP or JRMP), and Watershed Stormwater Management Plans (watershed SWMPs or Watershed Workplans), which, together with references in the DAMP, describe the Copermittees' runoff management programs in their entirety, are needed to guide the Copermittees' runoff management efforts and aid the Copermittees in tracking runoff management program implementation. Hereinafter, the individual SWMP is referred to as the JRMPs and the Watershed SWMP is referred to as the Watershed Workplan. It is practicable for the Copermittees to update the

JRMPs and Watershed Workplans within the timeframe specified in this Order, since significant efforts to develop these programs have already occurred.

e. Pollutants can be effectively reduced in storm water runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Pollution prevention is the reduction or elimination of pollutant generation at its source and is the best "first line of defense." Source control BMPs (both structural and non-structural) minimize the contact between pollutants and flows (e.g., rerouting run-on around pollutant sources or keeping pollutants on-site and out of receiving waters). Treatment control BMPs remove pollutants that have been mobilized by wet-weather or dry-weather flows.

f. Runoff needs to be addressed during the three major phases of urban development (planning, construction, and use) in order to reduce the discharge of pollutants from storm water to the MEP, effectively prohibit non-storm water discharges and protect receiving waters. Development which is not guided by water quality planning policies and principles can unnecessarily result in increased pollutant load discharges, flow rates, and flow durations which can negatively impact receiving water beneficial uses. Construction sites without adequate BMP implementation result in sediment runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. Existing development generates substantial pollutant loads which are discharged in runoff to receiving waters.

g. Annual reporting requirements included in this Order are necessary to meet federal requirements and to evaluate the effectiveness and compliance of the Copermittees' programs.

h. This Order establishes Storm Water Action Levels (SALs) for selected pollutants based on USEPA Rain Zone 6 (arid southwest) Phase I MS4 monitoring data for pollutants in storm water. The SALs were computed as the 90th percentile of the data set, utilizing the statistical based population approach, one of three approaches recommended by the State Water Board's Storm Water Panel in its report, 'The Feasibility of Numerical Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities (June 2006). SALs are identified in Section D of this Order. Copermittees must implement a timely, comprehensive, cost-effective storm water pollution control program to reduce the discharge of pollutants in storm water from the permitted areas so as not to exceed the SALs. Exceedance of SALs may indicate inadequacy of programmatic measures and BMPs required in this Order.

2. Development Planning

a. The Standard Storm Water Mitigation Plan (SSMP) requirements contained in this Order are consistent with Order WQ-2000-11 adopted by the State Water Board on October 5, 2000. In the precedential order, the State Water Board

found that the design standards, which essentially require that runoff generated by 85 percent of storm events from specific development categories be infiltrated or treated, reflect the MEP standard. The order also found that the SSMP requirements are appropriately applied to the majority of the Priority Development Project categories that are also contained in Section F.1 of this Order. The State Water Board also gave California Regional Water Quality Control Boards (Regional Water Boards) the needed discretion to include additional categories and locations, such as retail gasoline outlets (RGOs), in SSMPs.

b. Controlling runoff pollution by using a combination of onsite source control and site design BMPs augmented with treatment control BMPs before the runoff enters the MS4 is important for the following reasons: (1) Many end-of-pipe BMPs (such as diversion to the sanitary sewer) are typically ineffective during significant storm events. (2) Whereas, onsite source control BMPs can be applied during all runoff conditions end-of-pipe BMPs are often incapable of capturing and treating the wide range of pollutants which can be generated on a sub-watershed scale; (3) End-of-pipe BMPs are more effective when used as polishing BMPs, rather than the sole BMP to be implemented; (4) End-of-pipe BMPs do not protect the quality or beneficial uses of receiving waters between the pollutant source and the BMP; and (5) Offsite end-of-pipe BMPs do not aid in the effort to educate the public regarding sources of pollution and their prevention.

c. Use of Low-Impact Development (LID) site design BMPs at new development, redevelopment and retrofit projects can be an effective means for minimizing the impact of storm water runoff discharges from the development projects on receiving waters. LID is a site design strategy with a goal of maintaining or replicating the pre-development hydrologic regime through the use of design techniques. LID site design BMPs help preserve and restore the natural hydrologic cycle of the site, allowing for filtration and infiltration which can greatly reduce the volume, peak flow rate, velocity, and pollutant loads of storm water runoff. Current runoff management, knowledge, practices and technology have resulted in the use of LID BMPs as an acceptable means of meeting the storm water MEP standard.

d. RGOs are significant sources of pollutants in storm water runoff. RGOs are points of convergence for motor vehicles for automotive related services such as repair, refueling, tire inflation, and radiator fill-up and consequently produce significantly higher loadings of hydrocarbons and trace metals (including copper and zinc) than other developed areas.

e. Industrial sites are significant sources of pollutants in runoff. Pollutant concentrations and loads in runoff from industrial sites are similar or exceed pollutant concentrations and loads in runoff from other land uses, such as commercial or residential land uses. As with other land uses, LID site design,

source control, and treatment control BMPs are needed at industrial sites in order to meet the MEP standard. These BMPs are necessary where the industrial site is larger than 10,000 square feet. The 10,000 square feet threshold is appropriate, since it is consistent with requirements in other Phase I NPDES storm water regulations throughout California.

f. If not properly designed or maintained, certain BMPs implemented or required by municipalities for runoff management may create a habitat for vectors (e.g. mosquitoes and rodents). Proper BMP design and maintenance to avoid standing water, however, can prevent the creation of vector habitat. Nuisances and public health impacts resulting from vector breeding can be prevented with close collaboration and cooperative effort between municipalities, local vector control agencies, and the California Department of Public Health during the development and implementation of runoff management programs.

g. The increased volume, velocity, frequency and discharge duration of storm water runoff from developed areas has the potential to greatly accelerate downstream erosion, impair stream habitat in natural drainages, and negatively impact beneficial uses. Development and urbanization increase pollutant loads in storm water runoff and the volume of storm water runoff. Impervious surfaces can neither absorb water nor remove pollutants and thus lose the purification and infiltration provided by natural vegetated soil. Hydromodification measures for discharges to hardened channels are needed for the future restoration of the hardened channels to their natural state, thereby restoring the chemical, physical, and biological integrity and beneficial uses of local receiving waters.

3. Construction and Existing Development

a. In accordance with federal NPDES regulations and to ensure the most effective oversight of industrial and construction site discharges, discharges of runoff from industrial and construction sites are subject to dual (State and local) storm water regulation. Under this dual system, each Copermittee is responsible for enforcing its local permits, plans, and ordinances, and the San Diego Water Board is responsible for enforcing the General Construction Activities Storm Water Permit, State Water Board Order 2009-0009-DWQ, NPDES No. CAS000002 (General Construction Permit) and the General Industrial Activities Storm Water Permit, State Water Board Order 97-03 DWQ, NPDES No. CAS000001 (General Industrial Permit) and any reissuance of these permits. NPDES municipal regulations require that municipalities develop and implement measures to address runoff from industrial and construction activities. Those measures may include the implementation of other BMPs in addition to those BMPs that are required under the statewide general permits for activities subject to both State and local regulation.

b. Identification of sources of pollutants in runoff (such as municipal areas and activities, industrial and commercial sites/sources, construction sites, and residential areas), development and implementation of BMPs to address those sources, and updating ordinances and approval processes are necessary for the Copermittees to ensure that discharges of pollutants from its MS4 in storm water are reduced to the MEP and that non-storm water discharges are not occurring. Inspections and other compliance verification methods are needed to ensure minimum BMPs are implemented. Inspections are especially important at areas that are at high risk for pollutant discharges.

c. Historic and current development makes use of natural drainage patterns and features as conveyances for runoff. Urban streams used in this manner are part of the municipalities' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the urban stream is both an MS4 and receiving water.

d. As operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not prohibit or otherwise control. These discharges may cause or contribute to a condition of contamination or a violation of water quality standards.

e. Waste and pollutants which are deposited and accumulate in MS4 drainage structures will be discharged from these structures to waters of the U.S. unless they are removed. These discharges may cause or contribute to, or threaten to cause or contribute to, a condition of pollution in receiving waters. For this reason, pollutant discharges from storm water into MS4s must be reduced using a combination of management measures, including source control and an effective MS4 maintenance program implemented by each Copermittee.

f. Enforcement of local runoff related ordinances, permits, and plans is an essential component of every runoff management program and is specifically required in the federal storm water regulations and this Order. Each Copermittee is individually responsible for adoption and enforcement of ordinances and/or policies, implementation of identified control measures/BMPs needed to prevent or reduce pollutants in storm water runoff, and for the allocation of funds for the capital, operation and maintenance, administrative, and enforcement expenditures necessary to implement and enforce such control measures/BMPs under its jurisdiction. Education is an important aspect of every effective runoff management program and the basis for changes in behavior at a societal level. Education of municipal planning, inspection, and maintenance department staffs is especially critical to ensure that in-house staffs understand how their activities impact water quality, how to accomplish their jobs while protecting water quality, and understand their specific roles and responsibilities for compliance with this

Order. Public education, designed to target various urban land users and other audiences, is also essential to inform the public of how individual actions affect receiving water quality and how adverse effects can be minimized.

g. Public participation during the development of runoff management programs is necessary to ensure that all stakeholder interests and a variety of creative solutions are considered.

h. Retrofitting existing development with storm water treatment controls, including LID, is necessary to address storm water discharges from existing development that may cause or contribute to a condition of pollution or a violation of water quality standards. Although SSMP BMPs are required for redevelopment, the current rate of redevelopment will not address water quality problems in a timely manner. Cooperation with private landowners is necessary to effectively identify, implement and maintain retrofit projects for the preservation, restoration, and enhancement of water quality.

4. Watershed Runoff Management

a. Since runoff within a watershed can flow from and through multiple land uses and political jurisdictions, watershed-based runoff management can greatly enhance the protection of receiving waters. Such management provides a means to focus on the most important water quality problems in each watershed. By focusing on the most important water quality problems, watershed efforts can maximize protection of beneficial use in an efficient manner. Effective watershed-based runoff management actively reduces pollutant discharges and abates pollutant sources causing or contributing to watershed water quality problems. Watershed-based runoff management that does not actively reduce pollutant discharges and abate pollutant sources causing or contributing to watershed water quality problems can necessitate implementation of the iterative process outlined in section A.3 of this Order. Watershed management of runoff does not require Copermittees to expend resources outside of their jurisdictions. In some cases, however, this added flexibility provides more, and possibly more effective, alternatives for minimizing waste discharges. Watershed management requires the Copermittees within a watershed to develop a watershed-based management strategy, which can then be implemented on a jurisdictional basis.

b. Some runoff issues, such as general education and training, can be effectively addressed on a regional basis. Regional approaches to runoff management can improve program consistency and promote sharing of resources, which can result in implementation of more efficient programs.

c. It is important for the Copermittees to coordinate their water quality protection and land use planning activities to achieve the greatest protection of receiving water bodies. Copermittee coordination with other watershed stakeholders, especially the State of California Department of Transportation, the U.S. federal government, sovereign American Indian tribes, and water and sewer districts, is also important.

E. STATUTE AND REGULATORY CONSIDERATIONS

1. The RWL language specified in this Order is consistent with language recommended by the USEPA and established in State Water Board Order WQ-99-05, *Own Motion Review of the Petition of Environmental Health Coalition to Review Waste Discharge Requirements Order No. 96-03, NPDES Permit No. CAS0108740*, adopted by the State Water Board on June 17, 1999. The RWL language in this Order requires compliance with water quality standards, which for storm water discharges is to be achieved through an iterative approach requiring the implementation of improved and better-tailored BMPs over time. Compliance with receiving water limits based on applicable water quality standards is necessary to ensure that MS4 discharges will not cause or contribute to violations of water quality standards and the creation of conditions of pollution, contamination, or nuisance.

2. The Basin Plan, identifies the following existing and potential beneficial uses for surface waters in Riverside County: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Process Supply (PROC), Hydropower Generation (POW), Industrial Service Supply (IND), Ground Water Recharge (GWR), Contact Water Recreation (REC1), Non-contact Water Recreation (REC2), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Spawning, Reproduction and/or Early Development (SPWN) and Preservation of Biological Habitats of Special Significance (BIOL).

3. This Order is in conformance with State Water Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality Waters in California*, and the federal Antidegradation Policy described in 40 CFR 131.12.

4. Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states with approved coastal zone management programs to address non-point pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point pollution: agriculture, silviculture, urban, marinas, and hydromodification. This NPDES permit addresses the management measures required for the urban category, with the exception of septic systems. The adoption and implementation of this NPDES permit relieves the Copermittee from developing a non-point source plan, for the urban category, under CZARA. The San Diego Water Board addresses septic systems through the administration of other programs.

5. Section 303(d)(1)(A) of the CWA requires that "Each state shall identify those waters within its boundaries for which the effluent limitations…are not stringent enough to implement any water quality standard (WQS) applicable to such waters." The CWA also requires states to establish a priority ranking of impaired water bodies known as Water Quality Limited Segments and to establish Total Maximum Daily Loads (TMDLs) for such waters. This priority list of impaired water bodies is called the Section 303(d) List. The 2006 Section 303(d) List was approved by the State Water Board on October 25, 2006. On June 28, 2007, the 2006 303(d) List for California was given final approval by the USEPA. The 303(d) List was recently updated, and on December 16, 2009, the 2008 303(d) List was approved by the San Diego Water Board. The 2008 303(d) List for the San Diego Region was approved by the State Water Board on August 4, 2010. The 2008 303(d) List is awaiting USEPA approval.

6. This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following. First, this Order implements federally mandated requirements under CWA §402. (33 U.S.C. § 1342(p)(3)(B).) Second, the local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental and new dischargers who are issued NPDES permits for storm water and non-storm water discharges. Third, the local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order. Fourth, the Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA §301, subdivision (a) (33 U.S.C. § 1311(a)) and in lieu of numeric restrictions on their MS4 discharges (i.e. effluent limitations). Fifth, the local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under State law predates the enactment of Article XIIIB, Section (6) of the California Constitution. Likewise, the provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards. (33 U.S.C. sec. 1313(d).) Once the USEPA or a state develops a TMDL, federal law requires that permits must contain effluent limitations consistent with the assumptions of any applicable wasteload allocation. (40 C.F.R. sec. 122.44(d)(1)(vii)(B).)

7. Runoff treatment and/or mitigation must occur prior to the discharge of runoff into receiving waters. Treatment BMPs must not be constructed in waters of the U.S. or State unless the runoff flows are sufficiently pretreated to protect the values and functions of the water body. Federal regulations at 40 CFR 131.10(a) state that in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S. Authorizing the construction of an runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to accepting waste assimilation as an appropriate use for that water body. Furthermore, the

construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body. Without federal authorization (e.g., pursuant to CWA § 404), waters of the U.S. may not be converted into, or used as, waste treatment or conveyance facilities. Similarly, waste discharge requirements pursuant to CWC §13260 are required for the conversion or use of waters of the State as waste treatment or conveyance facilities. Diversion from waters of the U.S./State to treatment facilities and subsequent return to waters of the U.S. is allowable, provided that the effluent complies with applicable NPDES requirements.

8. The issuance of waste discharge requirements and an NPDES permit for the discharge of runoff from MS4s to waters of the U.S. is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 et seq.) in accordance with the CWC section 13389.

9. Storm water discharges from developed and developing areas in Riverside County are significant sources of certain pollutants that cause, may be causing, threatening to cause or contributing to water quality impairment in the waters of Riverside County. Furthermore, as delineated in the CWA section 303(d) list in Table 2, the San Diego Water Board has found that there is a reasonable potential that municipal storm water and non-storm water discharges from MS4s cause or may cause or contribute to an excursion above water quality standards for the following pollutants: Indicator Bacteria (including Fecal Coliform and E. Coli), Copper, Manganese, Iron, Chlorpyrifos, Diazinon, Sulfates, Phosphorous, Nitrogen, Total Dissolved Solids (TDS), and Toxicity. In accordance with CWA section 303(d), the San Diego Water Board is required to establish TMDLs for these pollutants to these waters to eliminate impairment and attain water quality standards. Therefore, certain early pollutant control actions and further pollutant impact assessments by the Copermittees are warranted and required pursuant to this Order.

10. This Order requires each Copermittee to effectively prohibit all types of unauthorized discharges of non-storm water into its MS4. However, historically pollutants have been identified as present in dry weather non-storm water discharges from the MS4s through 303(d) listings, monitoring conducted by the Copermittees under Order No. R9-2004-0001, and there are others expected to be present in dry weather non-storm water discharges because of the nature of these discharges. This Order includes action levels for pollutants in non-storm water, dry weather discharges from the MS4. The non-storm water action levels are designed to ensure that the Order's requirement to effectively prohibit all types of unauthorized discharges of non-storm water into the MS4 is being complied with. Non-storm water action levels in the Order are based upon numeric or narrative water quality objectives and criteria as defined in the Basin Plan, the State Water Board's Water Quality Control Plan for Ocean Waters of California (Ocean Plan), and the State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP). An exceedance of an action level

requires specified responsive action by the Copermittees. This Order describes what actions the Copermittees must take when an exceedance of an action level is observed. Exceedances of non-storm water action levels do not alone constitute a violation of this Order but could indicate non-compliance with the requirement to effectively prohibit all types of unauthorized non-storm water discharges into the MS4 or other prohibitions established in this Order. Failure to undertake required source investigation and elimination action following an exceedance of a non-storm water action level (NAL or action level) is a violation of this Order. The San Diego Water Board recognizes that use of action levels will not necessarily result in detection of all unauthorized sources of non-storm water discharges because there may be some discharges in which pollutants do not exceed established action levels. However, establishing NALs at levels appropriate to protect water quality standards is expected to lead to the identification of significant sources of pollutants in dry weather non-storm water discharges.

11. In addition to federal regulations cited in the Fact Sheet / Technical Report for the Order No. R9-2010-0016, monitoring and reporting required under Order No. R9-2010-0016 is required pursuant to authority under CWC section 13383.

12. With this Order, the San Diego Water Board has completed the re-issuance of the fourth iteration of the Phase I MS4 NPDES Permits for the Copermittees in the portions of San Diego County, Orange County, and Riverside County within the San Diego Region. The NPDES Permit requirements issued to the Copermittees in each county have substantially the same core requirements such as discharge prohibitions, receiving water limitations, jurisdictional components, and monitoring. In addition, the Copermittees cooperate regionally to develop monitoring with the Southern California Stormwater Monitoring Coalition and to develop program effectiveness with the California Stormwater Quality Association. Regional programs could improve the Copermittees' compliance with other permit components such as development of the Hydromodification Management Plans and Retrofitting Existing Development with more consistent implementation and cost sharing. Re-issuing the NPDES Permit requirements within five years for three counties under three different permits requires the San Diego Water Board to expend significant time and resources for issuance of the permits through three separate public proceedings, thereby greatly reducing the time and resources available to oversee compliance. Multiple permits also create confusion for determining compliance among regulated entities, especially the land development community. The San Diego Water Board recognizes that issuing a single MS4 permit for all Phase I entities in the San Diego Region will provide consistent implementation, improve communication among agencies within watersheds crossing multiple jurisdictions, and minimize staff resources spent with each permit renewal. The San Diego Water Board plans to develop a single regional MS4 permit prior to the expiration of this Order that will transfer the Copermittees' enrollment to the regional permit upon expiration of this Order.

F. PUBLIC PROCESS

1. The San Diego Water Board has notified the Copermittees, all known interested parties, and the public of its intent to consider adoption of an Order prescribing waste discharge requirements that would serve to renew an NPDES permit for the existing MS4 discharges of pollutants in waters of the U.S.

2. The San Diego Water Board has held a public hearing on November 10, 2010 and heard and considered all comments pertaining to the terms and conditions of this Order.

IT IS HEREBY ORDERED that the Copermittees, in order to meet the provisions contained in Division 7 of the CWC and regulations adopted thereunder, and the provisions of the CWA and regulations adopted thereunder, must each comply with the following:

A. PROHIBITIONS AND RECEIVING WATER LIMITATIONS

1. Discharges into and from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC section 13050), in receiving waters of the state are prohibited.[3]

2. Storm water discharges from MS4s containing pollutants which have not been reduced to the MEP are prohibited.[3]

3. Discharges from MS4s that cause or contribute to the violation of water quality standards (designated beneficial uses, water quality objectives developed to protect beneficial uses, and the State policy with respect to maintaining high quality waters) are prohibited.

a. Each Copermittee must comply with section A.3 and section A.4 as it applies to Prohibition 5 in Attachment A of this Order through timely implementation of control measures and other actions to reduce pollutants in storm water discharges in accordance with this Order, including any modifications. If exceedance(s) of water quality standards persist notwithstanding implementation of this Order, the Copermittee must assure compliance with section A.3 and section A.4 as it applies to Prohibition 5 in Attachment A of this Order by complying with the following procedure:

(1) Upon a determination by either the Copermittee or the San Diego Water Board that storm water MS4 discharges are causing or contributing to an exceedance of an applicable water quality standard, the Copermittee must notify the San Diego Water Board within 30 days and thereafter submit a report to the San Diego Water Board that describes best management practices (BMPs) that are currently being implemented and additional BMPs that will be implemented to prevent or reduce any pollutants that are causing or contributing to the exceedance of water quality standards. The report may be incorporated in the Annual Report unless the San Diego Water Board[4] directs an earlier submittal. The report must include an implementation

[3] This prohibition does not apply to MS4 discharges which receive subsequent treatment to reduce pollutants in storm water discharges to the MEP prior to entering receiving waters (e.g., low flow diversions to the sanitary sewer). Runoff treatment and/or mitigation must occur prior to the discharge of runoff into receiving waters per finding E.7.

[4] The San Diego Water Board by prior resolution has delegated all matters that may legally be delegated to its Executive Officer to act on its behalf pursuant to CWC §13223. Therefore, the Executive Officer is authorized to act on the San Diego Water Board's behalf on any matter within this Order unless such delegation is unlawful under CWC §13223 or this Order explicitly states otherwise.

schedule. The San Diego Water Board may require modifications to the report

(2) Submit any modifications to the report required by the San Diego Water Board within 30 days of notification;

(3) Within 30 days following acceptance of the report described above by the San Diego Water Board, the Copermittee must revise its JRMP and monitoring program to incorporate the approved modified BMPs that have been and will be implemented, the implementation schedule, and any additional monitoring required; and

(4) Implement the revised JRMP and monitoring program in accordance with the approved schedule.

b. The Copermittee must repeat the procedure set forth above to comply with the receiving water limitations for continuing or recurring exceedances of the same water quality standard(s) following implementation of scheduled actions unless directed to do otherwise by the San Diego Water Board's Executive Officer.

c. Nothing in section A.3 prevents the San Diego Water Board from enforcing any provision of this Order while the Copermittee prepares and implements the above report.

4. In addition to the above prohibitions, discharges from MS4s are subject to all Basin Plan prohibitions cited in Attachment A to this Order.

B. NON-STORM WATER DISCHARGES

1. Each Copermittee must effectively prohibit all types of non-storm water discharges into its MS4 unless such discharges are either authorized by a separate NPDES permit; or not prohibited in accordance with sections B.2 and B.3 below.

2. The following categories of non-storm water discharges are not prohibited unless a Copermittee or the San Diego Water Board identifies the discharge category as a source of pollutants to waters of the U.S. Where the Copermittee(s) have identified a category as a source of pollutants, the category must be addressed as an illicit discharge and prohibited through ordinance, order or similar means. The San Diego Water Board may identify categories of discharge that either require prohibition, or other controls for non-anthropogenic sources. For a discharge category determined to be a source of pollutants, the Copermittee, under direction of the San Diego Water Board, must either prohibit the discharge category or develop and implement appropriate control measures for non-anthropogenic sources to prevent the discharge of pollutants to the MS4 and report to the San Diego Water Board pursuant to Section K.1 and K.3 of this Order. The discharge categories are:

a. Diverted stream flows;
b. Rising ground waters;
c. Uncontaminated ground water infiltration [as defined at 40 CFR 35.2005(20)] to MS4s;
d. Uncontaminated pumped ground water[5];
e. Foundation drains[5];
f. Springs;
g. Water from crawl space pumps[5];
h. Footing drains[5];
i. Air conditioning condensation;
j. Flows from riparian habitats and wetlands;
k. Water line flushing[6,7];
l. Discharges from potable water sources not subject to NPDES Permit No. CAG679001, other than water main breaks;
m. Individual residential car washing; and
n. Dechlorinated swimming pool discharges[8].

3. Emergency fire fighting flows (i.e., flows necessary for the protection of life or property) do not require BMPs and need not be prohibited.

a. As part of the JRMP, each Copermittee must develop and implement a program to address pollutants from non-emergency fire fighting flows (i.e., flows from controlled or practice blazes and maintenance activities) identified as significant sources of pollutants to waters of the U.S.

b. Building fire suppression system maintenance discharges (e.g. sprinkler line flushing) contain waste. Therefore, such discharges are to be prohibited by the Copermittees as illicit discharges through ordinance, order, or similar means.

4. Each Copermittee must examine all dry weather effluent analytical monitoring results collected in accordance with section F.4 of this Order and Receiving Waters and MS4 Discharge Monitoring and Reporting Program No. R9-2010-0016 to identify water quality problems which may be the result of any non-prohibited discharge category(ies) identified above in section B.2. Follow-up investigations must be conducted to identify and control, pursuant to section B.2, any non-prohibited discharge category(ies) listed above.

[5] Requires enrollment under Order R9-2008-002. Discharges into the MS4 require authorization from the owner and operator of the MS4 system.
[6] This exemption does not include fire suppression sprinkler system maintenance and testing discharges. Those discharges may be regulated under Section B.3.
[7] Requires enrollment under Order R9-2002-0020.
[8] Excluding saline swimming pool discharges.

C. NON-STORM WATER DRY WEATHER ACTION LEVELS

1. Each Copermittee, beginning no later than July 1, 2012, must implement the non-storm water dry weather action level (NAL) monitoring as described in Attachment E of this Order.

2. In response to an exceedance of an NAL, the Copermittee(s) having jurisdiction must investigate and seek to identify the source of the exceedance in a timely manner. However, if any Copermittee identifies a number of NAL exceedances that prevents it from adequately conducting source investigations at all sites in a timely manner, then that Copermittee may submit a prioritization plan and timeline that identifies the timeframe and planned actions to investigate and report its findings on all of the exceedances. Depending on the source of the pollutant exceedance, the Copermittee(s) having jurisdiction must take action as follows:

a. If the Copermittee identifies the source of the exceedance as natural (non-anthropogenically influenced) in origin and in conveyance into the MS4; then the Copermittee must report its findings and documentation of its source investigation to the San Diego Water Board in its Annual Report.

b. If the Copermittee identifies the source of the exceedance as an illicit discharge or connection, then the Copermittee must eliminate the discharge to its MS4 pursuant to Section F.4.f and report the findings, including any enforcement action(s) taken, and documentation of the source investigation to the San Diego Water Board in the Annual Report. If the Copermittee is unable to eliminate the source of discharge prior to the Annual Report submittal, then the Copermittee must submit, as part of its Annual Report, its plan and timeframe to eliminate the source of the exceedance. Those dischargers seeking to continue such a discharge must become subject to a separate NPDES permit prior to continuing any such discharge.

c. If the Copermittee identifies the source of the exceedance as an exempted category of non-storm water discharge, then the Copermittees must determine if this is an isolated circumstance or if the category of discharges must be addressed through the prevention or prohibition of that category of discharge as an illicit discharge. The Copermittee must submit its findings including a description of the steps taken to address the discharge and the category of discharge, to the San Diego Water Board for review in its Annual Report. Such description must include relevant updates to or new ordinances, orders, or other legal means of addressing the category of discharge, and the anticipated schedule for doing so. The Copermittees must also submit a summary of its findings with the Report of Waste Discharge.

d. If the Copermittee identifies the source of the exceedance as a non-storm water discharge in violation or potential violation of an existing separate NPDES permit

(e.g. the groundwater dewatering permit), then the Copermittee must report, within three business days, the findings to the San Diego Water Board including all pertinent information regarding the discharger and discharge characteristics.

e. If the Copermittee is unable to identify the source of the exceedance after taking and documenting reasonable steps to do so, then the Copermittee must perform additional focused sampling. If the results of the additional sampling indicate a recurring exceedance of NALs with an unidentified source, then the Copermittee must update its programs within a year to address the common contributing sources that may be causing such an exceedance. The Copermittee's annual report must include these updates to its programs including, where applicable, updates to their watershed workplans (Section G.2), retrofitting consideration (Section F.3.d) and program effectiveness work plans (Section J.4).

f. The Copermittees, or any interested party, may evaluate existing NALs and propose revised NALs for future Board consideration.

3. NALs can help provide an assessment of the effectiveness of the prohibition of non-storm water discharges and of the appropriateness of exempted non-storm water discharges. An exceedance of an NAL does not alone constitute a violation of the provisions of this Order. An exceedance of an NAL may indicate a lack of compliance with the requirement that Copermittees effectively prohibit all types of unauthorized non-storm water discharges into the MS4 or other prohibitions set forth in Sections A and B of this Order. Failure to timely implement required actions specified in this Order following an exceedance of an NAL constitutes a violation of this Order. Neither the absence of exceedances of NALs nor compliance with required actions following observed exceedances, excuses any non-compliance with the requirement to effectively prohibit all types of unauthorized non-storm water discharges into the MS4s or any non-compliance with the prohibitions in Sections A and B of this Order. During any annual reporting period in which one or more exceedances of NALs have been documented the Copermittee must report in response to Section C.2 above, a description of whether and how the observed exceedances did or did not result in a discharge from the MS4 that caused, or threatened to cause or contribute to a condition of pollution, contamination, or nuisance in the receiving waters.

4. Monitoring of effluent will occur at the end-of-pipe prior to discharge into the receiving waters, with a focus on Major Outfalls, as defined in 40 CFR 122.26(B 5-6) and Attachment E of this Order. The Copermittees must develop their monitoring plans to sample a representative percentage of major outfalls and identified stations within each hydrologic subarea. At a minimum, outfalls that exceed any NALs once during any year must be monitored in the subsequent year. Any station that does not exceed an NAL, or only has exceedances that are identified as natural in origin and conveyance into the MS4 pursuant to Section C.2.a, for 3 successive years may be replaced with a different station.

5. Each Copermittee must monitor for the non-storm water dry weather action levels, which are incorporated into this Order as follows:

Action levels for discharges to inland surface waters:

Table 3.a: General Constituents

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Fecal Coliform	MPN/ 100 ml	200[A] 400[B]	-		BPO
Enterococci	MPN/ 100 ml	33	-	61[C]	BPO
Turbidity	NTU	-	20		BPO
pH	Units	Within limit of 6.5 to 8.5 at all times			BPO
Dissolved Oxygen	mg/L	Not less than 5.0 in WARM waters and not less than 6.0 in COLD waters			BPO
Total Nitrogen	mg/L	-	1.0	See MDAL	BPO
Total Phosphorus	mg/L	-	0.1	See MDAL	BPO
Methylene Blue Active Substances	mg/L	-	0.5	See MDAL	BPO
Iron	mg/L	-	0.3	See MDAL	BPO
Manganese	mg/L	-	0.05	See MDAL	BPO

A – Based on a minimum of not less than five samples for any 30-day period
B – No more than 10 percent of total samples may exceed 400 per 100 ml during any 30 day period
C – This Value has been set to Basin Plan Criteria for Designated Beach Areas
BPO – Basin Plan Objective
MDAL – Maximum Daily Action Level
AMAL – Average Monthly Action Level

Table 3.b: Priority Pollutants

		Freshwater (CTR)	
Parameter	Units	MDAL	AMAL
Cadmium	ug/L	**	**
Copper	ug/L	*	*
Chromium III	ug/L	**	**
Chromium VI (hexavalent)	ug/L	16	8.1
Lead	ug/L	*	*
Nickel	ug/L	**	**
Silver	ug/L	*	*
Zinc	ug/L	*	*

CTR – California Toxic Rule
*- Action Levels developed on a case-by-case basis (see below)
**- Action Levels developed on a case-by-case basis (see below), but calculated criteria are not to exceed Maximum Contaminant Levels under the California Code of Regulations[9]

[9] California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64431.

The NALs for Cadmium, Copper, Chromium (III), Lead, Nickel, Silver and Zinc will be developed on a case-by-case basis because the freshwater criteria are based on site-specific water quality data (receiving water hardness). For these priority pollutants, the following equations (40 CFR 131.38.b.2) will be required:

Cadmium (Total Recoverable) = exp(0.7852[ln(hardness)] -2.715)
Chromium III (Total Recoverable) = exp(0.8190[ln(hardness)] + .6848)
Copper (Total Recoverable) = exp(0.8545[ln(hardness)] - 1.702)
Lead (Total Recoverable) = exp(1.273[ln(hardness)] - 4.705)
Nickel (Total Recoverable) = exp(.8460[ln(hardness)] + 0.0584)
Silver (Total Recoverable) = exp(1.72[ln(hardness)] - 6.52)
Zinc (Total Recoverable) = exp(0.8473[ln(hardness)] + 0.884)

D. STORM WATER ACTION LEVELS

1. The Copermittees must implement the Wet Weather MS4 Discharge Monitoring as described in Attachment E of this Order, and beginning three years after the Order adoption date, the Copermittees must annually evaluate their data compared to the Stormwater Action Levels (SALs). At each monitoring station, a running average of twenty percent or greater of exceedances of any discharge of storm water from the MS4 to waters of the U.S. that exceed the SALs for each of the pollutants listed in Table 4 (below) requires the Copermittee(s) having jurisdiction to affirmatively augment and implement all necessary storm water controls and measures to reduce the discharge of the associated class of pollutants(s) to the MEP. The Copermittees must utilize the exceedance information when adjusting and executing annual work plans, as required by this Order. Copermittees must take the magnitude, frequency, and number of constituents exceeding the SAL(s), in addition to receiving water quality data and other information, into consideration when prioritizing and reacting to SAL exceedances in an iterative manner. Failure to appropriately consider and react to SAL exceedances in an iterative manner creates a presumption that the Copermittee(s) have not reduced pollutants in storm water discharges to the MEP.

Table 4. Storm Water Action Levels

Pollutant	Action Level
Turbidity (NTU)	126
Nitrate & Nitrite total (mg/L)	2.6
P total (mg/L)	1.46
Cd total (µg/L)	3.0
Cu total (µg/L)	127
Pb total (µg/L)	250
Zn total (µg/L)	976

2. The end-of-pipe assessment points for the determination of SAL compliance are major outfalls, as defined in 40 CFR 122.26(b)(5) and (b)(6) and Attachment E of this Order. The Copermittees must develop their monitoring plans to sample a representative percentage of the major outfalls within each hydrologic subarea. At a minimum, outfalls that exceed SALs must be monitored in the subsequent year. Any station that does not exceed an SAL for 3 successive years may be replaced with a different station. SAL samples must be 24 hour time-weighted composites.

3. The absence of SAL exceedances does not relieve the Copermittees from implementing all other required elements of this Order.

4. This Order does not regulate natural sources and conveyances into the MS4 of constituents listed in Table 5. To be relieved of the requirements to take action as described in D.1 above, the Copermittee must demonstrate that the likely and expected cause of the SAL exceedance is not anthropogenic in nature. This demonstration does not need to be repeated for subsequent exceedances of the same SAL at the same monitoring station.

5. The SALs will be reviewed and updated at the end of every permit cycle. The data collected pursuant to D.2 above and Attachment E can be used to create SALs based upon local data. The purpose of establishing the SALs is that through the iterative and MEP process, outfall storm water discharges will meet all applicable water quality standards.

E. LEGAL AUTHORITY

1. Each Copermittee must establish, maintain, and enforce adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 through ordinance, statute, permit, contract or similar means. Nothing herein shall authorize a Copermittee or other discharger regulated under the terms of this order to divert, store or otherwise impound water if such action is reasonably anticipated to harm downstream water rights holders in the exercise of their water rights. This legal authority must, at a minimum, authorize the Copermittee to:

a. Control the contribution of pollutants in discharges of runoff associated with industrial and construction activity to its MS4 and control the quality of runoff from industrial and construction sites. This requirement applies both to industrial and construction sites which have coverage under the statewide general industrial or construction storm water permits, as well as to those sites which do not. Grading ordinances must be updated and enforced as necessary to comply with this Order;
b. Prohibit all identified illicit discharges not otherwise allowed pursuant to section B.2;
c. Prohibit and eliminate illicit connections to the MS4;

d. Control the discharge of spills, dumping, or disposal of materials other than storm water to its MS4;
e. Require compliance with conditions in Copermittee ordinances, permits, contracts or orders (i.e., hold dischargers to its MS4 accountable for their contributions of pollutants and flows);
f. Utilize enforcement mechanisms to require compliance with Copermittee storm water ordinances, permits, contracts, or orders;
g. Control the contribution of pollutants from one portion of the shared MS4 to another portion of the MS4 through interagency agreements among Copermittees;
h. Control of the contribution of pollutants from one portion of the shared MS4 to another portion of the MS4 through interagency agreements with other owners of the MS4 such as the State of California Department of Transportation, the U.S. federal government, or sovereign Native American Tribes is encouraged;
i. Carry out all inspections, surveillance, and monitoring necessary to determine compliance and noncompliance with local ordinances and permits and with this Order, including the prohibition on illicit discharges to the MS4. This means the Copermittee must have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from industrial facilities discharging into its MS4, including construction sites;
j. Require the use of BMPs to prevent or reduce the discharge of pollutants into MS4s from storm water to the MEP; and
k. Require documentation on the effectiveness of BMPs implemented to reduce the discharge of storm water pollutants to the MS4 to the MEP.

2. Each Copermittee must submit on or before June 30, 2012, a statement certified by its chief legal counsel that the Copermittee has taken the necessary steps to obtain and maintain full legal authority within its jurisdiction to implement and enforce each of the requirements contained in 40 CFR 122.26(d)(2)(i)(A-F) and this Order. These statements must include:

a. Citation of runoff related ordinances and the reasons they are enforceable;
b. Identification of the local administrative and legal procedures available to mandate compliance with runoff related ordinances and therefore with the conditions of this Order, and a statement as to whether enforcement actions can be completed administratively or whether they must be commenced and completed in the judicial system; and
c. A brief description of how runoff related ordinances are adopted and the process by which they may be challenged.

F. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM (JRMP)

Each Copermittee must implement all requirements of section F of this Order no later than July 1, 2012, unless otherwise specified. Upon adoption of this Order and until an updated JRMP is developed and implemented or July 1, 2012, whichever occurs first, each Copermittee must at a minimum implement its JRMP document, as the document was developed and amended to comply with the requirements of Order No. R9-2004-001.

Each Copermittee must develop and implement an updated JRMP for its jurisdiction no later than July 1, 2012. Each updated JRMP must meet the requirements of section F of this Order, reduce the discharge of storm water pollutants from the MS4 to the MEP, effectively prohibit non-storm water discharges, and prevent runoff discharges from the MS4 from causing or contributing to a violation of water quality standards. In addition, each Copermittee's JRMP must identify all departments and positions within its jurisdiction that conduct runoff related activities, and their roles and responsibilities under this Order. This identification must include an up to date organizational chart specifying these departments and key personnel.

1. DEVELOPMENT PLANNING COMPONENT

Each Copermittee must implement a program which meets the requirements of this section and (1) reduces Development Project discharges of storm water pollutants from the MS4 to the MEP; (2) prevents Development Project discharges from the MS4 from causing or contributing to a violation of water quality standards; (3) prevents illicit discharges into the MS4; and (4) manages increases in runoff discharge rates and durations from Development Projects that are likely to cause increased erosion of stream beds and banks, silt pollutant generation, or other impacts to beneficial uses and stream habitat due to increased erosive force.

a. GENERAL PLAN

Each Copermittee must revise as needed its General Plan or equivalent plan (e.g., Comprehensive, Master, or Community Plan) to include water quality and watershed protection principles and policies that direct land-use decisions and require implementation of consistent water quality protection measures for all development, redevelopment, and retrofit projects. Examples of water quality and watershed protection principles and policies to be considered include the following:

(1) Minimize the amount of impervious surfaces and directly connected impervious surfaces in areas of new development and redevelopment and where feasible slow runoff and maximize on-site infiltration of runoff.

(2) Implement pollution prevention methods supplemented by pollutant source controls and treatment BMPs. Use small collection strategies located at, or as close as possible to, the source (i.e., the point where water initially meets the ground) to minimize the transport of urban runoff and pollutants offsite and into an MS4.

(3) Preserve, and where possible, create, or restore areas that provide important water quality benefits, such as riparian corridors, wetlands, and buffer zones. Encourage land acquisition of such areas.

(4) Limit disturbances of natural water bodies and natural drainage systems caused by development including roads, highways, and bridges.

(5) Prior to making land use decisions, utilize methods available to estimate increases in pollutant loads and flows resulting from projected future development. Require incorporation of BMPs to mitigate the projected increases in pollutant loads and flows.

(6) Avoid development of areas that are particularly susceptible to erosion and sediment loss; or establish development guidance that identifies these areas and protects them from erosion and sediment loss.

(7) Reduce pollutants associated with vehicles and increasing traffic resulting from development.

(8) Post-development runoff from a site must not contain pollutant loads that cause or contribute to an exceedance of receiving water quality objectives and which have not been reduced to the MEP.

b. **ENVIRONMENTAL REVIEW PROCESS**

Each Copermittee must revise as needed its current environmental review processes to accurately evaluate water quality impacts and cumulative impacts and identify appropriate measures to avoid, minimize, and mitigate those impacts for all Development Projects.

c. **APPROVAL PROCESS CRITERIA AND REQUIREMENTS FOR ALL DEVELOPMENT PROJECTS**

For all proposed Development Projects, each Copermittee, during the planning process, and prior to project approval and issuance of local permits, must prescribe the necessary requirements so that Development Project discharges of storm water pollutants from the MS4 will be reduced to the MEP, will not cause or

contribute to a violation of water quality standards, and will comply with the Copermittee's ordinances, permits, plans, and requirements, and with this Order.

Performance Criteria: Discharges from each approved development project must be subject to the following management measures:

(1) Source control BMPs that reduce storm water pollutants of concern in runoff; prevent illicit discharges into the MS4; prevent irrigation runoff; storm drain system stenciling or signage; properly design outdoor material storage areas; properly design outdoor work areas; and properly design trash storage areas.

(2) The following LID BMPs listed below must be implemented at all Development Projects where applicable and feasible.

(a) Conserve natural areas, including existing trees, other vegetation, and soils;
(b) Construct streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided that public safety is not compromised;
(c) Minimize the impervious footprint of the project;
(d) Minimize soil compaction to landscaped areas;
(e) Minimize disturbances to natural drainages (e.g., natural swales, topographic depressions, etc.); and
(f) Disconnect impervious surfaces through distributed pervious areas.

(3) Buffer zones for natural water bodies, where technically feasible. Where buffer zones are technically infeasible, require project proponent to implement other buffers such as trees, access restrictions, etc.

(4) Other measures necessary so that grading or other construction activities meet the provisions specified in section F.2 of this Order.

(5) Submittal of documentation of a mechanism under which ongoing long-term maintenance of all structural post-construction BMPs will be conducted.

(6) Infiltration and Groundwater Protection

To protect groundwater quality, each Copermittee must apply restrictions to the use of treatment control BMPs that are designed to primarily function as large, centralized infiltration devices (such as large infiltration trenches and infiltration basins). Such restrictions must be designed so that the use of such infiltration treatment control BMPs does not cause or contribute to an exceedance of groundwater quality objectives. At a minimum, each treatment control BMP designed to primarily function as a centralized infiltration device must meet the restrictions below, unless the Development Project demonstrates to the Copermittee that a restriction is not necessary to protect groundwater quality. The Copermittees may collectively or individually

develop alternative restrictions on the use of treatment control BMPs which are designed to primarily function as centralized infiltration devices. Alternative restrictions developed by the Copermittees can partially or wholly replace the restrictions listed below. The restrictions do not apply to small infiltration systems dispersed throughout a development project.

(a) Runoff must undergo pretreatment such as sedimentation or filtration prior to infiltration;

(b) All dry weather flows containing significant pollutant loads must be diverted from infiltration devices and treated through other BMPs;

(c) Pollution prevention and source control BMPs must be implemented at a level appropriate to protect groundwater quality at sites where infiltration treatment control BMPs are to be used;

(d) Infiltration treatment control BMPs must be adequately maintained so that they remove storm water pollutants to the MEP;

(e) The vertical distance from the base of any infiltration treatment control BMP to the seasonal high groundwater mark must be at least 10 feet. Where groundwater basins do not support beneficial uses, this vertical distance criteria may be reduced, provided groundwater quality is maintained;

(f) The soil through which infiltration is to occur must have physical and chemical characteristics (such as appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses;

(g) Infiltration treatment control BMPs must not be used for areas of industrial or light industrial activity; and other high threat to water quality land uses and activities as designated by each Copermittee unless first treated or filtered to remove pollutants prior to infiltration; and

(h) Infiltration treatment control BMPs must be located a minimum of 100 feet horizontally from any water supply wells.

(7) Where feasible, landscaping with native or low water species shall be preferred in areas that drain to the MS4 or to waters of the U.S.

(8) Rain water harvesting and water reuse, where feasible, must be encouraged as part of the site design and construction to reduce pollutants in storm water discharges to the MEP.

d. **STANDARD STORM WATER MITIGATION PLANS (SSMPS) – APPROVAL PROCESS CRITERIA AND REQUIREMENTS FOR PRIORITY DEVELOPMENT PROJECTS**

On or before June 30, 2012, the Copermittees must submit an updated SSMP, to the San Diego Water Board's Executive Officer for a 30 day public review and comment period. The San Diego Water Board's Executive Officer has the discretion to determine whether to hold a public hearing or to limit public input to written comments. Within 180 days of determination that the SSMP is in compliance with this Order's provisions, each Copermittee must amend its local ordinances consistent with the updated SSMP, and begin implementing the updated SSMP. Any updated local ordinances must be submitted to the San Diego Water Board with the Annual Report. The SSMP must meet the requirements of section F.1.d of this Order to (1) reduce Priority Development Project discharges of storm water pollutants from the MS4 to the MEP, and (2) prevent Priority Development Project runoff discharges from the MS4 from causing or contributing to a violation of water quality standards.[10]

(1) Definition of Priority Development Project:

Priority Development Projects are:

(a) All new Development Projects that fall under the project categories or locations listed in section F.1.d.(2), and

(b) Those redevelopment projects that create, add, or replace at least 5,000 square feet of impervious surfaces on an already developed site and the existing development and/or the redevelopment project falls under the project categories or locations listed in section F.1.d.(2). Where redevelopment results in an increase of less than fifty percent of the impervious surfaces of a previously existing development, and the existing development was not subject to SSMP requirements, the numeric sizing criteria discussed in section F.1.d.(6) applies only to the addition or replacement, and not to the entire development. Where redevelopment

[10] Updated SSMP and hydromodification requirements must apply to all priority projects or phases of priority projects which have not yet begun grading or construction activities at the time any updated SSMP or hydromodification requirement commences. If lawful prior approval of a project exists, whereby application of an updated SSMP or hydromodification requirement to the project is illegal, the updated SSMP or hydromodification requirement need not apply to the project. Updated Development Planning requirements set forth in Sections F.1. (a) through (h) of this Order must apply to all projects or phases of projects, unless, at the time any updated Development Planning requirement commences, the projects or project phases meet any one of the following conditions: (i) the project or phase has begun grading or construction activities; or (ii) a Copermittee determines that lawful prior approval rights for a project or project phase exist, whereby application of the Updated Development Planning requirement to the project is legally infeasible. Where feasible, the Permittees must utilize the SSMP and hydromodification update periods to ensure that projects undergoing approval processes include application of the updated SSMP and hydromodification requirements in its plans.

results in an increase of more than fifty percent of the impervious surfaces of a previously existing development, the numeric sizing criteria applies to the entire development.

(c) One acre threshold: In addition to the Priority Development Project Categories identified in section F.1.d.(2), Priority Development Projects must also include all other post-construction pollutant-generating new Development Projects that result in the disturbance of one acre or more of land by July 1, 2012.[11]

(2) Priority Development Project Categories

Where a new Development Project feature, such as a parking lot, falls into a Priority Development Project Category, the entire project footprint is subject to SSMP requirements.

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site) including commercial, industrial, residential, mixed-use, and public projects. This category includes development projects on public or private land which fall under the planning and building authority of the Copermittees.

(b) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

(c) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812), where the land area for development is greater than 5,000 square feet. Restaurants where land development is less than 5,000 square feet must meet all SSMP requirements except for structural treatment BMP and numeric sizing criteria requirement F.1.d.(6) and hydromodification requirement F.1.h.

(d) All hillside development greater than 5,000 square feet. This category is defined as any development which creates 5,000 square feet of impervious surface which is located in an area with known erosive soil conditions, where the development will grade on any natural slope that is twenty-five percent or greater.

(e) Environmentally Sensitive Areas (ESAs). All development located within, or directly adjacent to, or discharging directly to an ESA (where

[11] Pollutant generating Development Projects are those projects that generate pollutants at levels greater than natural background levels.

discharges from the development or redevelopment will enter receiving waters within the ESA), which either creates 2,500 square feet of impervious surface on a proposed project site or increases the area of imperviousness of a proposed project site to 10 percent or more of its naturally occurring condition. "Directly adjacent" means situated within 200 feet of the ESA. "Discharging directly to" means outflow from a drainage conveyance system that is composed entirely of flows from the subject development or redevelopment site, and not commingled with flows from adjacent lands.

(f) Impervious parking lots 5,000 square feet or more and potentially exposed to runoff. Parking lot is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce.

(g) Street, roads, highways, and freeways. This category includes any paved impervious surface that is 5,000 square feet or greater used for the transportation of automobiles, trucks, motorcycles, and other vehicles. To the extent that the Copermittees develop revised standard roadway design and post-construction BMP guidance that comply with the provisions of Section F.1 of the Order, then public works projects that implement the revised standard roadway sections do not have to develop a project specific SSMP. The standard roadway design and post-construction BMP guidance must be submitted with the Copermittee's updated SSMP.

(h) Retail Gasoline Outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

(3) Pollutants of Concern

As part of its local SSMP, each Copermittee must implement an updated procedure for identifying pollutants of concern for each Priority Development Project. The procedure must address, at a minimum: (1) Receiving water quality (including pollutants for which receiving waters are listed as impaired under CWA section 303(d)); (2) Land-use type of the Development Project and pollutants associated with that land use type; and (3) Pollutants expected to be present on site.

(4) Low Impact Development BMP Requirements

Each Copermittee must require each Priority Development Project to implement LID BMPs which will collectively minimize directly connected impervious areas, limit loss of existing infiltration capacity, and protect areas that provide important water quality benefits necessary to maintain riparian and aquatic biota, and/or are particularly susceptible to erosion and sediment loss.

(a) The Copermittees must take the following measures to ensure that LID BMPs are implemented at Priority Development Projects:

(i) Each Copermittee must require LID BMPs or make a finding of technical infeasibility for each Priority Development Project in accordance with the LID waiver program in Section F.1.d.(7);

(ii) Each Copermittee must incorporate formalized consideration, such as thorough checklists, ordinances, and/or other means, of LID BMPs into the plan review process for Priority Development Projects; and

(iii) On or before July 1, 2012, each Copermittee must review its local codes, policies, and ordinances and identify barriers therein to implementation of LID BMPs. Following the identification of these barriers to LID implementation, where feasible, the Copermittee must take, by the end of the permit cycle, appropriate actions to remove such barriers. The Copermittees must include this review with the updated JRMP.

(b) The following LID BMPs must be implemented at each Priority Development Project:

(i) Maintain or restore natural storage reservoirs and drainage corridors (including depressions, areas of permeable soils, swales, and ephemeral and intermittent streams) to the extent feasible[12].

(ii) Projects with landscaped or other pervious areas must, where feasible, properly design and construct the pervious areas to effectively receive and infiltrate, retain and/or treat runoff from impervious areas, prior to discharge to the MS4. Soil compaction for these areas must be minimized. The amount of the impervious areas that are to drain to pervious areas must be based upon the total size, soil conditions, slope, and other pertinent factors.

(iii) Projects with low traffic areas and appropriate soil conditions must be constructed with permeable surfaces.

[12] Priority Development Projects proposing to dredge or fill materials in waters of the U.S. must obtain a CWA Section 401 Water Quality Certification. Priority Development Projects proposing to dredge or fill waters of the State must obtain Waste Discharge Requirements.

(c) LID BMPs sizing criteria:

(i) LID BMPs must be sized and designed to ensure onsite retention without runoff, of the volume of runoff produced from a 24-hour 85th percentile storm event[13] ("design capture volume");

(ii) If onsite retention[14] LID BMPs are technically infeasible per section F.1.d.(7)(b), other LID BMPs may treat any volume that is not retained onsite provided that the total volume of the other LID BMPs, including pore spaces and pre-filter detention volume, are sized to hold at least 0.75 times the portion of the design capture volume that is not retained onsite. The LID BMPs must be designed for an appropriate surface loading rate to prevent erosion, scour and channeling within the BMP.

(d) If it is shown to be technically infeasible per Section F.1.d.(7)(b) to retain and/or treat the remaining volume up to and including the design capture volume using LID BMPs, then the project must implement conventional treatment control BMPs in accordance with Section F.1.d.(6) below and must participate in the LID waiver program in Section F.1.d.(7).

(e) All LID BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors, such as mosquitoes, rodents, and flies.

(5) Source Control BMP Requirements

Each Copermittee must require each Priority Development Project to implement applicable source control BMPs. The source control BMPs to be required must:

(a) Prevent illicit discharges into the MS4;
(b) Minimize storm water pollutants of concern in runoff;
(c) Eliminate irrigation runoff;

[13] This volume is not a single volume to be applied to all of Riverside County. The size of the 85th percentile storm event is different for various parts of the County. The Copermittees are encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction (0.6 inch standard is a rough average for the County and should only be used where appropriate rain data is not available). In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its SSMPs.

[14] Infiltration LID BMPs are the preferred method for onsite retention, but does not preclude the use and implementation of all other retention LID BMPs (e.g. evapotranspiration, evaporation, and/or harvest), where technically feasible, prior to considering biofiltration LID BMPs for treatment of the design capture volume that is not otherwise retained onsite.

(d) Include storm drain system stenciling or signage;
(e) Include properly designed outdoor material storage areas;
(f) Include properly designed outdoor work areas;
(g) Include properly designed trash storage areas; and
(h) Include water quality protection requirements applicable to individual priority project categories.

(6) Treatment Control BMP Requirements

Each Copermittee must require each Priority Development Project that meets the Copermittee's technical infeasibility criteria in Section F.1.d(7) below, to implement conventional treatment control BMPs to treat the portion of the "design capture volume" that was not treated by LID BMPs per Section F.1.d(4) above. Conventional treatment control BMPs must meet the following requirements:

(a) All treatment control BMPs for a single Priority Development Project must collectively be sized to comply with the following numeric sizing criteria:

(i) Volume-based treatment control BMPs must be designed to mitigate (infiltrate, filter, or treat) the remaining portion of the design capture volume that was not retained and/or treated with LID BMPs; or

(ii) Flow-based treatment control BMPs must be designed to mitigate (filter, or treat) either: a) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event; or b) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two.

(b) All treatment control BMPs for Priority Development Projects must, at a minimum:

(i) Be ranked with high or medium pollutant removal efficiency for the project's most significant pollutants of concern, as the pollutant removal efficiencies are identified in the Copermittees' SSMP. Treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.
(ii) Be correctly sized and designed so as to remove storm water pollutants to the MEP.

(c) Target removal of pollutants of concern from runoff.

(d) Be implemented close to pollutant sources, and prior to discharging into waters of the U.S.

(e) Include proof of a mechanism under which ongoing long-term maintenance will be conducted to ensure proper maintenance for the life of the project. The mechanisms may be provided by the project proponent or Copermittee.

(f) Be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors, such as mosquitoes, rodents, and flies.

(7) Low Impact Development (LID) BMP Waiver Program

The Copermittees must develop, collectively or individually, a LID waiver program for incorporation into the SSMP, which would allow a Priority Development Project to substitute implementation of all or a portion of required LID BMPs in Section F.1.d(4) with implementation of treatment control BMPs and either 1) on-site mitigation, 2) an off-site mitigation project, and/or 3) other mitigation developed by the Copermittees. The Copermittees must submit the LID waiver program as part of their updated SSMP. At a minimum, the program must meet the requirements below:

(a) Prior to implementation, the LID waiver program must clearly exhibit that it will not allow Priority Development Projects to result in a net impact (after consideration of any mitigation) from pollutant loadings over and above the impact caused by projects meeting the onsite LID retention requirements;

(b) For each Priority Development Project participating, the Copermittee must find that it is technically infeasible to implement LID BMPs that comply with the requirements of Section F.1.(d)(4). The Copermittee(s) must develop criteria to determine the technical feasibility of implementing LID BMPs . Each Priority Development Project participating must demonstrate that LID BMPs were implemented as much as feasible given the site's unique conditions. Technical infeasibility may result from conditions including, but not limited to:

(i) Locations that cannot meet the infiltration and groundwater protection requirements in section F.1.c.(6) for large, centralized infiltration BMPs. Where infiltration is technically infeasible, the project must still examine the feasibility of other onsite LID BMPs;
(ii) Insufficient demand for storm water reuse;

(iii) Smart growth and infill or redevelopment locations where the density and/or nature of the project would create significant difficulty for compliance with the LID BMP requirements; and

(iv) Other site, geologic, soil, or implementation constraints identified in the Copermittees updated SSMP document.

(c) Each Priority Development Project that participates in the LID waiver program must mitigate for the pollutant loads expected to be discharged due to not implementing the LID retention BMPs in section F.1.d.(4). The pollutant loading must be estimated for each project participating in the LID waiver program. The estimated impacts from not implementing the required LID retention BMPs in section F.1.d.(4) must be fully mitigated. Mitigation projects must be implemented within the same hydrologic unit as the Priority Development Project. Mitigation projects outside of the hydrologic subarea but within the same hydrologic unit may be approved provided that the project proponent demonstrates that mitigation projects within the same hydrologic subarea are infeasible and that the mitigation project will address similar beneficial use impacts as expected from the Priority Development Projects pollutant load. Onsite mitigation may include increasing the conventional treatment sizing factors to achieve pollutant load removal equal to or greater than the pollutant load removal expected from implementing onsite retention of the design capture volume. Offsite mitigation projects may include green streets projects, existing development retrofit projects, retrofit incentive programs, regional BMPs and/or riparian restoration projects. Project applicants seeking to utilize these alternative compliance provisions may propose other offsite mitigation projects, which the Copermittees may approve if they meet the requirements of this subpart.

(d) A Copermittee may choose to implement additional mitigation programs (e.g., pollutant credit system, mitigation fund) as part of the LID waiver program provided that the mitigation program clearly exhibits that it will not allow Priority Development Projects to result in a net impact from pollutant loadings over and above the impact caused by projects meeting LID requirements. Any additional mitigation programs that a Copermittee chooses to implement must be submitted to the San Diego Water Board Executive Officer for review and acceptance prior to implementation.

(8) <u>LID and Treatment Control BMP Standards</u>

(a) As part of the SSMP, each Copermittee must develop and require Priority Development Projects to implement siting, design, and maintenance criteria for each LID and treatment control BMP listed in the SSMP to determine feasibility and applicability and so that implemented LID and treatment control BMPs are constructed correctly and are effective at pollutant removal, runoff control, and vector minimization. Development of

BMP design worksheets which can be used by project proponents is encouraged.

(b) LID and treatment control BMPs implemented at any Priority Development Projects must mitigate (treat through infiltration, settling, filtration or other unit processes) the required volume or flow of runoff from all developed portions of the project, including landscaped areas.

(c) All LID and treatment control BMPs must be located so as to remove pollutants from runoff prior to its discharge to any receiving waters. Multiple Priority Development Projects may use shared post-construction BMPs as long as construction of any shared BMP is completed prior to the use or occupation of any Priority Development Project from which the BMP will receive runoff. Post construction BMPs must not be constructed within a waters of the U.S. or waters of the State.

(9) Implementation Process

(a) As part of its local SSMP, each Copermittee must implement a process to verify compliance with SSMP requirements. The process must identify at what point in the planning process Priority Development Projects will be required to meet SSMP requirements and at a minimum, the Priority Development Project must implement the required post-construction BMPs prior to occupancy and/or the intended use of any portion of that project. The process must also include identification of the roles and responsibilities of various municipal departments in implementing the SSMP requirements, as well as any other measures necessary for the implementation of SSMP requirements.

(b) Each Copermittee must establish a mechanism not only to track post-construction BMPs, but also to ensure that appropriate easements and ownerships are properly recorded in public records and the information is conveyed to all appropriate parties when there is a change in project or site ownership.

(10) Post-construction BMP Review

(a) The Copermittees must review and update the BMPs that are listed in their SSMP as options for treatment control. At a minimum, the update must include removal of obsolete or ineffective BMPs and addition of LID BMPs that can be used for treatment, such as bioretention cells, bioretention swales, etc. The update must also add appropriate LID BMPs to any tables or discussions in the local SSMPs addressing pollutant removal efficiencies of treatment control BMPs. In addition, the update must include review and revision where necessary of treatment control BMP pollutant removal efficiencies.

(b) The update must incorporate findings from BMP effectiveness studies conducted by the Copermittees for projects funded wholly or in part by the State Water Board or Regional Water Boards.

(c) Each Copermittee must implement a mechanism for annually incorporating findings from local treatment BMP effectiveness studies (e.g., ones conducted by, or on-behalf of, public agencies in Riverside County) into SSMP project reviews and permitting.

e. **BMP CONSTRUCTION VERIFICATION**

Prior to occupancy and/or intended use of any portion of the Priority Development Project subject to SSMP requirements, each Copermittee must inspect the constructed site design, source control, and treatment control BMPs applicable to the constructed portion of the project to verify that they have been constructed and are operating in compliance with all specifications, plans, permits, ordinances, and this Order.

f. **BMP MAINTENANCE TRACKING**

(1) Inventory of SSMP projects: Each Copermittee must develop and maintain a watershed-based database to track and inventory all projects constructed within their jurisdiction, that have a final approved SSMP (SSMP projects), and its structural post-construction BMPs implemented therein since July, 2005. LID BMPs implemented on a lot by lot basis at single family residential houses, such as rain barrels, are not required to be tracked or inventoried. At a minimum, the database must include information on BMP type(s), location, watershed, date of construction, party responsible for maintenance, dates and findings of maintenance verifications, and corrective actions, including whether the site was referred to the local vector control agency or department.

(2) Each Copermittee must verify that approved post-construction BMPs are operating effectively and have been adequately maintained by implementing the following measures:

(a) The designation of high priority SSMP Projects must consider the following:

(i) BMP size,
(ii) Recommended maintenance frequency,
(iii) Likelihood of operational and maintenance issues,
(iv) Location,

(v) Receiving water quality,
(vi) Compliance record,
(vii) Land use, and
(viii) Other pertinent factors;

At a minimum, high priority projects include those projects that generate pollutants (prior to treatment) within the tributary area of and within the same hydrologic subarea as a 303(d) listed waterbody impaired for that pollutant; or those projects generating pollutants within the tributary area for and within the same hydrologic subarea as an observed action level exceedance of that pollutant.

(b) Beginning on July 1, 2012, each Copermittee must verify that the required structural post-construction BMPs on the inventoried SSMP projects have been implemented, are maintained, and are operating effectively through inspections, self-certifications, surveys, or other equally effective approaches with the following conditions:

(i) The implementation, operation, and maintenance of all (100 percent) approved and inventoried final project public and private SSMPs (a.k.a. WQMPs) must be verified every five years;
(ii) All (100 percent) projects with BMPs that are high priority must be inspected by the Copermittee annually prior to each rainy season;
(iii) All (100 percent) Copermittee projects with BMPs must be inspected by the Copermittee annually;
(iv) At the discretion of the Copermittee, its inspections may be coordinated with the facility inspections implemented pursuant to section F.3. of this Order;
(v) For verifications performed through a means other than direct Copermittee inspection, adequate documentation must be submitted to the Copermittee to provide assurance that the required maintenance has been completed;
(vi) Appropriate follow-up measures (including re-inspections, enforcement, maintenance, etc.) must be conducted to ensure the treatment BMPs continue to reduce storm water pollutants as originally designed; and
(vii) Inspections must note observations of vector conditions, such as mosquitoes. Where conditions are identified as contributing to mosquito production, the Copermittee must notify its local vector control agency.

g. **ENFORCEMENT OF DEVELOPMENT SITES**

Each Copermittee must enforce its storm water ordinance for all development projects as necessary to maintain compliance with this Order. Copermittee ordinances or other regulatory mechanisms must include appropriate sanctions to achieve compliance. Sanctions must include the following tools or their equivalent: Non-monetary penalties, fines, bonding requirements, liens, and/or permit or occupancy denials for non-compliance.

h. **HYDROMODIFICATION – LIMITATIONS ON INCREASES OF RUNOFF DISCHARGE RATES AND DURATIONS**[15]

Each Copermittee shall collaborate with the other Copermittees to develop and implement a Hydromodification Management Plan (HMP) to manage increases in runoff discharge rates and durations from all Priority Development Projects. The HMP must be incorporated into the SSMP and implemented by each Copermittee so that estimated post-project runoff discharge rates and durations must not exceed pre-development discharge rates and durations. Where the proposed project is located on an already developed site, the pre-project discharge rate and duration must be that of the pre-developed, naturally occurring condition. The draft HMP must be submitted to the San Diego Water Board on or before June 30, 2013. The HMP will be made available for public review and comment and the San Diego Water Board Executive Officer will determine whether to hold a public hearing before the full San Diego Water Board or whether public input will be through written comments to the Executive Officer only.

(1) The HMP must:

(a) Identify a method for assessing susceptibility and geomorphic stability of channel segments which receive runoff discharges from Priority Development Projects. A performance standard must be established that ensures that the geomorphic stability within the channel will not be compromised as a result of receiving runoff discharges from Priority Development Projects.

[15] Updated SSMP and hydromodification requirements must apply to all Priority Development Projects or phases of Priority Development Projects which have not yet begun grading or construction activities at the time any updated SSMP or hydromodification requirement commences. If a Copermittee determines that lawful prior approval of a project exists, whereby application of an updated SSMP or hydromodification requirement to the project is legally infeasible, the updated SSMP or hydromodification requirement need not apply to the project. The Copermittees must utilize the SSMP and hydromodification update periods to ensure that projects undergoing approval processes include application of the updated SSMP and hydromodification requirements in its plans.

(b) Identify a range of runoff flows[16] based on continuous simulation of the entire rainfall record (or other analytical method proposed by the Copermittees and deemed acceptable by the San Diego Water Board) for which Priority Development Project post-project runoff flow rates and durations must not exceed pre-development (naturally occurring) runoff flow rates and durations by more than 10 percent, where the increased flow rates and durations will result in increased potential for erosion or other significant adverse impacts to beneficial uses. The lower boundary of the range of runoff flows identified must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks. The identified range of runoff flows may be different for specific watersheds, channels, or channel reaches. In the case of an artificially hardened (concrete lined, rip rap, etc.) channel, the lower boundary of the range of runoff flows identified must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks of a comparable natural channel (i.e. non-hardened, pre-development).

(c) Identify a method to assess and compensate for the loss of sediment supply to streams due to development. A performance and/or design standard must be created and required to be met by Priority Development Projects to ensure that the loss of sediment supply due to development does not cause or contribute to increased erosion within channel segments downstream of Priority Development Project discharge points.

(d) Designate and require Priority Development Projects to implement control measures so that (1) post-project runoff flow rates and durations do not exceed pre-development (naturally occurring) runoff flow rates and durations by more than 10 percent for the range of runoff flows identified under section F.1.h.(1)(b), where the increased flow rates and durations will result in increased potential for erosion or other significant adverse impacts to beneficial uses; (2) post-project runoff flow rates and durations do not result in channel conditions which do not meet the channel standard developed under section F.1.h.(1)(a) for channel segments downstream of Priority Development Project discharge points; and (3) the design of the project and/or control measures compensate for the loss of sediment supply due to development.

[16] The identified range of run off flows to be controlled should be expressed in terms of peak flow rates of rainfall events, such as “10% of the pre-development 2-year runoff event up to the pre-development 10-year runoff event.”

(e) Include a protocol to evaluate potential hydrograph change impacts to downstream watercourses from Priority Development Projects to meet the range of runoff flows identified under Section F.1.h.(1)(b).

(f) Include other performance criteria (numeric or otherwise) for Priority Development Projects as necessary to prevent runoff from the projects from increasing and/or continuing unnatural rates of erosion of channel beds and banks, silt pollutants generation, or other impacts to beneficial uses and stream habitat due to increased erosive force.

(g) Include a review of pertinent literature.

(h) Identify areas within the Santa Margarita Hydrologic Unit for potential opportunities to restore or rehabilitate stream channels with historic hydromodification of receiving waters that are tributary to documented low or very low Index of Biotic Integrity (IBI) scores.

(i) Include a description of how the Copermittees will incorporate the HMP requirements into their local approval processes.

(j) Include criteria on selection and design of management practices and measures (such as detention, retention, and infiltration) to control flow rates and durations and address potential hydromodification impacts.

(k) Include technical information, including references, supporting any standards and criteria proposed.

(l) Include a description of inspections and maintenance to be conducted for management practices and measures to control flow rates and durations and address potential hydromodification impacts.

(m) Include a description of monitoring and other program evaluations to be conducted to assess the effectiveness of implementation of the HMP. Monitoring and other program evaluations must include an evaluation of changes to physical (e.g., cross-section, slope, discharge rate, vegetation, pervious/impervious area) and biological (e.g., habitat quality, benthic flora and fauna, IBI scores) conditions of receiving water channels as areas with Priority Development Projects are constructed (i.e. pre- and post-project), as appropriate.

(n) Include mechanisms for assessing and addressing cumulative impacts of Priority Development Projects within a watershed on channel morphology.

(2) In addition to the control measures that must be implemented by Priority Development Projects per section F.1.h.(1)(d), the HMP must include a suite of management measures that can be used on Priority Development Projects to mitigate hydromodification impacts, protect and restore downstream beneficial uses and prevent or further prevent adverse physical changes to downstream channels. The measures must be based on a prioritized consideration of the following elements in this order:

(a) Site design control measures;
(b) On-site management measures;
(c) Regional control measures located upstream of receiving waters; and
(d) In-stream management and control measures.

Where stream channels are adjacent to, or are to be modified as part of a Priority Development Project, management measures must include buffer zones and setbacks. The suite of management measures must also include stream restoration as a viable option to achieve the channel standard in section F.1.h.(1)(a). In-stream controls used as management measures to protect and restore downstream beneficial uses and for preventing or minimizing further adverse physical changes must not include the use of non-naturally occurring hardscape materials such as concrete, riprap, gabions, etc. to reinforce stream channels.

(3) As part of the HMP, the Copermittees may develop a waiver program that allows a redevelopment Priority Development Project, as defined in Section F.1.d.(1)(b), to implement offsite mitigation measures. A waiver may be granted if onsite management and control measures are technically infeasible to fully achieve post-project runoff flow rates and durations that do not exceed the pre-development (naturally occurring) runoff flow rates and durations. Redevelopment projects that are granted a waiver under the program must not have post-project runoff flow rates and durations that exceed the pre-project runoff flow rates and durations. The estimated incremental hydromodification impacts from not achieving the pre-development (naturally occurring) runoff flow rates and durations for the project site must be fully mitigated. The offsite mitigation must be within the same stream channel system to which the project discharges. Mitigation projects not within the same stream channel system but within the same hydrologic unit may be approved provided that the project proponent demonstrates that mitigation within the same stream channel is infeasible and that the mitigation project will address similar impacts as expected from the project.

(4) Each individual Copermittee has the discretion to not require Section F.1.h. at Priority Development Projects where the project:

(a) Discharges storm water runoff into underground storm drains discharging directly to water storage reservoirs and lakes;

(b) Discharges storm water runoff into conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to water storage reservoirs and lakes; or
(c) Discharges storm water runoff into other areas identified in the HMP as acceptable to not need to meet the requirements of Section F.1.h by the San Diego Water Board Executive Officer.

(5) HMP Reporting and Implementation

(a) On or before June 30, 2013, the Copermittees must submit to the San Diego Water Board a draft HMP that has been reviewed by the public, including the identification of the appropriate limiting range of flow rates per section F.1.h.(1)(b).

(b) Within 180 days of receiving San Diego Water Board comments on the draft HMP, the Copermittees must submit a final HMP that addressed the San Diego Water Board's comments.

(c) Within 90 days of receiving a determination of adequacy from the San Diego Water Board, each Copermittee must incorporate and implement the HMP for all Priority Development Projects.

(d) Prior to acceptance of the HMP by the San Diego Water Board, the early implementation measures likely to be included in the HMP must be encouraged by the Copermittees.

(6) Interim Hydromodification Criteria

Immediately following adoption of this Order and until the final HMP required by this Order has been determined by the San Diego Water Board to be adequate, each Copermittee must ensure that all Priority Development Projects are implementing the hydromodification (aka Hydrologic Condition of Concern) requirements found in Section 4.4 of the 2006 Riverside County WQMP (updated in 2009) unless one of the following conditions in lieu of those specified in the WQMP are met:

(a) Runoff from the Priority Development Project discharges (1) directly to a conveyance channel or storm drain that is concrete lined all the way from the point of discharge to the ocean, bay, lagoon, water storage reservoir or lake; and (2) the discharge is in full compliance with Copermittee requirements for connections and discharges to the MS4 (including both quality and quantity requirements); and (3) the discharge will not cause increased upstream or downstream erosion or adversely impact downstream habitat; and (4) the discharge is authorized by the Copermittee.

(b) The Priority Development Project disturbs less than one acre. The Copermittee has the discretion to require a project specific WQMP to address hydrologic condition concerns on projects less than one acre on a case by case basis. The disturbed area calculation should include all disturbances associated with larger common plans of development.

(c) The runoff flow rate, volume, velocity, and duration for the post-development condition of the Priority Development Project do not exceed the pre-development (i.e. naturally occurring) condition for the 2-year, 24-hour and 10-year, 24-hour rainfall events. This condition must be substantiated by hydrologic modeling acceptable to the Copermittee.

Once a final HMP is determined to be adequate and is required to be implemented, compliance with the final HMP is required by this Order and compliance with the 2004 WQMP (updated in 2009) or the in-lieu interim hydromodification criteria set forth above no longer satisfies the requirements of this Order.

(7) No part of section F.1.h eliminates the Copermittees' responsibilities for implementing the Low Impact Development requirements under section F.1.d.(4).

i. UNPAVED ROADS DEVELOPMENT

The Copermittees must develop, where they do not already exist, and implement or require implementation of erosion and sediment control BMPs after construction of new unpaved roads. At a minimum, the BMPs must include the following, or alternative BMPs that are equally effective:

(1) Practices to minimize road related erosion and sediment transport;
(2) Grading of unpaved roads to slope outward where consistent with road engineering safety standards;
(3) Installation of water bars as appropriate; and
(4) Unpaved roads and culvert designs that do not impact creek functions and where applicable, that maintain migratory fish passage.

2. CONSTRUCTION COMPONENT

Each Copermittee must implement a construction program which meets the requirements of this section, prevents illicit discharges into the MS4, implements and maintains structural and non-structural BMPs to reduce pollutants in storm water runoff from construction sites to the MS4, reduces construction site discharges of storm water pollutants from the MS4 to the MEP, and prevents construction site discharges from the MS4 from causing or contributing to a violation of water quality standards.

a. ORDINANCE UPDATE

By July 1, 2012, each Copermittee must review and update its grading ordinances and other ordinances as necessary to achieve full compliance with this Order, including requirements for the implementation of all designated BMPs and other measures.

b. SOURCE IDENTIFICATION

Each Copermittee must maintain an updated watershed-based inventory of all construction sites within its jurisdiction. The use of an automated database system, such as Geographical Information Systems (GIS) is strongly encouraged.

c. SITE PLANNING AND PROJECT APPROVAL PROCESS

Each Copermittee must incorporate consideration of potential water quality impacts prior to approval and issuance of construction and grading permits.

(1) Each construction and grading permit must require proposed construction sites to implement designated BMPs and other measures so that illicit discharges into the MS4 are prevented, storm water pollutants discharged from the site will be reduced to the MEP, and construction discharges from the MS4 are prevented from causing or contributing to a violation of water quality standards.

(2) Prior to permit issuance, the project proponent's runoff management plan (or equivalent construction BMP plan) must be required to comply, and reviewed to verify compliance with the local grading ordinance, other applicable local ordinances, and this Order.

(3) Prior to permit issuance, each Copermittee must verify that project proponents subject to California's statewide General NPDES Permit for Storm Water Discharges Associated With Construction Activities, (hereinafter General Construction Permit), have existing coverage under the General Construction Permit.

d. **BMP IMPLEMENTATION**

(1) Designate BMPs: Each Copermittee must designate a minimum set of BMPs and other measures to be implemented at all construction sites. The designated minimum set of BMPs must include:

(a) Management Measures:

(i) Pollution prevention, where appropriate;
(ii) Development and implementation of a runoff management plan;
(iii) Minimization of areas that are cleared and graded to only the portion of the site that is necessary for construction;
(iv) Minimization of exposure time of disturbed soil areas;
(v) Minimization of grading during the rainy season and correlation of grading with seasonal dry weather periods to the extent feasible;
(vi) Limitation of grading to a maximum disturbed area as determined by each Copermittee before either temporary or permanent erosion controls are implemented to prevent storm water pollution. The Copermittee has the option of temporarily increasing the size of disturbed soil areas by a set amount beyond the maximum, if the individual site is in compliance with applicable storm water regulations and the site has adequate control practices implemented to prevent storm water pollution;
(vii) Temporary stabilization and reseeding of disturbed soil areas as rapidly as feasible;
(viii) Wind erosion controls;
(ix) Tracking controls;
(x) Non-stormwater management measures to prevent illicit discharges and control storm water pollution sources;
(xi) Waste management measures;
(xii) Preservation of natural hydrologic features where feasible;
(xiii) Preservation of riparian buffers and corridors where feasible;
(xiv) Evaluation and maintenance of all BMPs, until removed; and
(xv) Retention, reduction, and proper management of all storm water pollutant discharges on site to the MEP standard.

(b) Erosion and Sediment Controls:

(i) Erosion prevention. Erosion prevention is to be used as the most important measure for keeping sediment on site during construction;
(ii) Sediment controls. Sediment controls are to be used as a supplement to erosion prevention for keeping sediment on-site during construction;

(iii) Slope stabilization must be used on all active slopes during rain events regardless of the season and on all inactive slopes during the rainy season and during rain events in the dry season;
(iv) Permanent revegetation or landscaping as early as feasible; and
(v) Erosion and sediment controls must be required during the construction of unpaved roads.

(2) Each Copermittee must implement, or require implementation of, enhanced[17] measures to address the threat to water quality posed by all construction sites tributary to CWA section 303(d) water body segments impaired for sediment or turbidity. Each Copermittee must also implement, or require implementation of, enhanced, measures for construction sites within, or adjacent to, or discharging directly to receiving waters within environmentally sensitive areas (as defined in Attachment C of this Order).

(3) Active/Passive Sediment Treatment (AST): Each Copermittee must require implementation of AST for sediment at construction sites (or portions thereof) that are determined by the Copermittee to be an exceptional threat to water quality. In evaluating the threat to water quality, the following factors must be considered by the Copermittee:

(a) Soil erosion potential or soil type;
(b) The site's slopes;
(c) Project size and type;
(d) Sensitivity of receiving water bodies;
(e) Proximity to receiving water bodies;
(f) Non-storm water discharges;
(g) Ineffectiveness of other BMPs;
(h) Proximity and sensitivity of aquatic threatened and endangered species of concern;
(i) Known effects of AST chemicals; and
(j) Any other relevant factors.

(4) Implement BMPs: Each Copermittee must implement, or require the implementation of, the designated minimum BMPs and any additional measures necessary to comply with this Order at each construction site within its jurisdiction year round. BMP implementation requirements, however, can vary based on wet and dry seasons. Dry season BMP implementation must plan for and address unseasonal rain events that may occur during the dry season (May 1 through September 30).

[17] Enhanced BMPs are control actions specifically targeted to the pollutant or condition of concern and of higher quality and effectiveness than the minimum control measures otherwise required. Enhanced in this Order means better, not simply more, BMPs.

e. **INSPECTION OF CONSTRUCTION SITES**

Each Copermittee must conduct construction site inspections for compliance with its ordinances (grading, storm water, etc.), permits (construction, grading, etc.), and this Order. Priorities for inspecting sites must consider the nature and size of the construction activity, topography, and the characteristics of soils and receiving water quality.

(1) During the rainy season, each Copermittee must inspect at least every two weeks, all construction sites within its jurisdiction meeting any of the following criteria:

(a) All sites 30 acres or more in size with rough grading or with active, unstabilized slopes occurring during the rainy season;

(b) All sites one acre or more, and within the same hydrologic subarea and tributary to a CWA section 303(d) water body segment impaired for sediment; or within, directly adjacent to, or discharging directly to a receiving water within an ESA; and

(c) Other sites determined by the Copermittees or the San Diego Water Board as a significant threat to water quality. In evaluating threat to water quality, the following factors must be considered: (1) soil erosion potential; (2) site slope; (3) project size and type; (4) sensitivity of receiving water bodies; (5) proximity to receiving water bodies; (6) non-storm water discharges; (7) known past record of non-compliance by the operators of the construction site; and (8) any other relevant factors.

(2) During the rainy season, each Copermittee must inspect at least monthly, all construction sites with one acre or more of soil disturbance not meeting the criteria specified above in section F.2.e.(1).

(3) During the rainy season, each Copermittee must inspect construction sites less than one acre in size as needed to ensure compliance with its ordinances and this Order.

(4) Each Copermittee must inspect all construction sites as needed during the dry season. Sites meeting the criteria in section F.2.e.(1) must be inspected at least once in August or September each year.

(5) Re-inspections: Based upon site inspection findings, each Copermittee must implement all follow-up actions (i.e., re-inspection, enforcement) necessary to comply with this Order. Reinspection frequencies must be determined by each Copermittee based upon the severity of deficiencies, the nature of the construction activity, and the characteristics of soils and receiving water quality.

(6) Inspections of construction sites must include, but not be limited to:

(a) Check for coverage under the General Construction Permit (Notice of Intent (NOI) and/or Waste Discharge Identification No.) during initial inspections;
(b) Assessment of compliance with Copermittee ordinances and permits related to runoff, including the implementation and maintenance of designated minimum BMPs;
(c) Assessment of BMP effectiveness;
(d) Visual observations for non-storm water discharges, potential illicit connections, and potential discharge of pollutants in storm water runoff;
(e) Review of site monitoring data results, if the site monitors its runoff
(f) Education and outreach on storm water pollution prevention, as needed; and
(g) Creation of a written or electronic inspection report.

(7) The Copermittees must track the number of inspections for each inventoried construction site throughout the reporting period to verify that each site is inspected at the minimum frequencies required.

f. **ENFORCEMENT OF CONSTRUCTION SITES**

(1) Each Copermittee must develop and implement an escalating enforcement process that achieves prompt corrective actions at construction sites for violations of the Copermittee's water quality protection permits, requirements, and ordinances. This enforcement process must include authorizing the Copermittee's construction site inspectors to take immediate enforcement actions when appropriate and necessary. The enforcement process must include appropriate sanctions such as stop work orders, non-monetary penalties, fines, bonding requirements, and/or permit denials for non-compliance.

(2) Each Copermittee must be able to respond to construction complaints received from third-parties and to ensure the San Diego Water Board that corrective actions have been implemented, if warranted.

g. **REPORTING OF NON-COMPLIANT SITES**

(1) In addition to the notification requirements in Attachment B, each Copermittee must notify the San Diego Water Board when the Copermittee issues high level enforcement (as defined in the Copermittee's JRMP) to a construction site that poses a significant threat to water quality in its jurisdiction as a result of violations of its storm water ordinances.

(2) Each Copermittee must annually notify the San Diego Water Board, prior to the commencement of the rainy season, of all construction sites with alleged violations that pose a significant threat to water quality. Information may be

provided as part of the JRMP annual report if submitted prior to the rainy season. Information provided must include, but not be limited to, the following:

(a) WDID number if enrolled under the General Construction Permit
(b) Site Location, including address
(c) Current violations or suspected violations

3. EXISTING DEVELOPMENT COMPONENT

a. MUNICIPAL

Each Copermittee must implement a municipal program for the Copermittee's areas and activities that meets the requirements of this section, prevents illicit discharges into the MS4, reduces municipal discharges of storm water pollutants from the MS4 to the MEP, and prevents municipal discharges from the MS4 from causing or contributing to a violation of water quality standards.

(1) Source Identification / Inventory

Each Copermittee must maintain an updated watershed-based inventory of all its municipal areas and those activities that have the potential to generate pollutants. The inventory must include the name, address (if applicable), and a description of the area/activity; which pollutants are potentially generated by the area/activity; whether the area/activity is adjacent to an ESA; and identification of whether the area/activity is tributary to and within the same hydrologic subarea as a CWA section 303(d) water body segment and generates pollutants for which the water body segment is impaired. Linear facilities, such as roads, streets, and highways, do not need to be individually inventoried. The use of an automated database system, such as Geographical Information Systems (GIS) is highly recommended.

(2) General BMP Implementation

(a) Pollution Prevention: Each Copermittee must implement pollution prevention methods in its municipal program and must require their use by appropriate departments, personnel, and contractors.

(b) Designate Minimum BMPs: Each Copermittee must designate a minimum set of BMPs for all municipal areas and those activities that have the potential to generate pollutants. The designated minimum BMPs for municipal areas and activities must be area or activity specific as appropriate.

(c) Each Copermittee must designate BMPs for special events that are expected to generate significant trash and litter. Controls to consider must include:

(i) Temporary screens on catch basins and storm drain inlets;
(ii) Temporary fencing to prevent windblown trash from entering adjacent water bodies and MS4 channels;
(iii) Proper management of trash and litter;
(iv) Catch basin cleaning following the special event and prior to an anticipated rain event;
(v) Street sweeping of roads, streets, highways and parking facilities following the special event; and
(vi) Other equivalent controls.

(d) Designate BMPs for ESAs and 303(d) Impairments: Each Copermittee must designate enhanced measures for its municipal areas and activities tributary to and within the same hydrologic subarea as CWA section 303(d) impaired water body segments when an area or those activities have the potential to generate pollutants for which the water body segment is impaired. Each Copermittee must also designate additional controls for its municipal areas and activities within or directly adjacent to or discharging directly to receiving waters within environmentally sensitive areas (as defined in Attachment C of this Order).

(e) Implement BMPs: Each Copermittee must implement, or require the implementation of, the designated minimum and enhanced BMPs and any additional measures necessary based on its inventory to comply with this Order for each of its municipal area and those activities that have the potential to discharge pollution.

(3) <u>BMP Implementation for Management of Pesticides, Herbicides, and Fertilizers</u>

Each Copermittee must implement BMPs to reduce the contribution of storm water pollutants to the MEP associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from its municipal areas and activities to MS4s and receiving waters. Such BMPs must include, at a minimum:

(a) Educational activities, permits, certifications and other measures for municipal applicators and distributors;
(b) Integrated Pest Management (IPM) measures that rely on non-chemical solutions;
(c) The use of native vegetation;
(d) Schedules for irrigation and chemical application; and

(e) The collection and proper disposal of unused pesticides, herbicides, and fertilizers.

(4) BMP implementation for Flood Control Structures

(a) Each Copermittee must implement procedures to assure that flood management projects assess the impacts on the water quality of receiving water bodies.

(b) Each Copermittee must include water quality protection measures, where feasible, when retrofitting existing flood control structural devices.

(c) Each Copermittee must evaluate its existing flood control structures as part of ongoing routine maintenance, identify structures causing or contributing to a condition of pollution, implement measures to reduce or eliminate the structure's effect on pollution, and evaluate the feasibility of retrofitting the structural flood control device. The inventory and evaluation must be completed by and submitted to the San Diego Water Board in each JRMP Annual Report.

(5) BMP Implementation for Sweeping of Municipal Areas

Where municipal area sweeping is implemented as an MS4 BMP for municipal roads, streets, highways, and parking facilities, each Copermittee must design and implement the program based on the following criteria:

(a) Roads, streets, highways, and parking facilities identified as consistently generating the highest volumes of trash and/or debris must be swept at least two times per month.

(b) Roads, streets, highways, and parking facilities identified as consistently generating moderate volumes of trash and/or debris must be swept at least monthly.

(c) Roads, streets, highways, and parking facilities identified as generating low volumes of trash and/or debris must be swept as necessary, but no less than once per year.

(6) Operation and Maintenance of Municipal Separate Storm Sewer System (MS4) and Treatment Controls

(a) Treatment Controls: Each Copermittee must implement a schedule of inspection and maintenance activities to verify proper operation of all its municipal structural treatment controls designed to reduce storm water pollutant discharges to or from its MS4s and related drainage structures.

(b) MS4 and Facilities: Each Copermittee must implement a schedule of maintenance activities for its MS4 and facilities (including but not limited to catch basins, storm drain inlets, detention basins, etc). The maintenance activities must, at a minimum, include:

(i) Inspection and removal of accumulated waste at least once a year between May 1 and September 30 of each year for all MS4 facilities;
(ii) Additional facilities cleaning as necessary between October 1 and April 30 of each year;
(iii) Following two years of inspections, any MS4 facility that requires inspection and cleaning less than annually may be inspected as needed, but not less than every other year;
(iv) Open channels and basins must be cleaned of observed anthropogenic litter in a timely manner;
(v) Maintenance activities within open channels must not adversely impact beneficial uses;
(vi) Record keeping of the maintenance and cleaning activities including the overall quantity of waste removed;
(vii) Proper disposal of waste removed pursuant to applicable laws; and
(viii) Measures to eliminate waste discharges during MS4 maintenance and cleaning activities.

(7) <u>Infiltration From Sanitary Sewer to MS4/Provide Preventive Maintenance</u>

(a) Each Copermittee must implement controls and measures to prevent and eliminate infiltration of seepage from sanitary sewers to MS4s through thorough, routine preventive maintenance of the MS4. Each Copermittee that operates both a municipal sanitary sewer system and a MS4 must implement controls and measures to prevent and eliminate infiltration of seepage from the sanitary sewers to the MS4s that must include overall sanitary sewer and MS4 surveys and thorough, routine preventive maintenance of both.

(b) Each Copermittee must implement controls to limit infiltration of seepage from sanitary sewers to municipal separate storm sewer systems where necessary. Such controls must include:

(i) Adequate plan checking for construction and new development;
(ii) Incident response training for its municipal employees that identify sanitary sewer spills;
(iii) Code enforcement inspections;
(iv) MS4 maintenance and inspections;
(v) Interagency coordination with sewer agencies; and

(vi) Proper education of its municipal staff and contractors conducting field operations on the MS4 or its municipal sanitary sewer (if applicable).

(8) Inspection of Municipal Areas and Activities

(a) At a minimum, each Copermittee must inspect the following high priority municipal areas and activities annually:

(i) Roads, Streets, Highways, and Parking Facilities;
(ii) Flood Management Projects and Flood Control Devices not otherwise inspected per Section F.3.a.(6)(b);
(iii) Areas and activities tributary to and within the same hydrologic subarea as a CWA section 303(d) impaired water body segment, where an area or activity generates pollutants for which the water body segment is impaired;
(iv) Areas and activities within or adjacent to or discharging directly to receiving waters within environmentally sensitive areas (as defined in Attachment C of this Order);
(v) Municipal Facilities:
[a] Active or closed municipal landfills;
[b] Publicly owned treatment works (including water and wastewater treatment plants) and sanitary sewage collection systems;
[c] Solid waste transfer facilities;
[d] Land application sites;
[e] Corporate yards including maintenance and storage yards for materials, waste, equipment and vehicles; and
[f] Household hazardous waste collection facilities.
(vi) Municipal airfields;
(vii) Parks and recreation facilities;
(viii) Special event venues following special events (festivals, sporting events, etc.);
(ix) Power washing activities; and
(x) Other municipal areas and activities that the Copermittee determines may contribute a significant pollutant load to the MS4.

(b) Other municipal areas and activities must be inspected as needed and in response to water quality data, valid public complaints, and findings from municipal or contract staff.

(c) Based upon site inspection findings, each Copermittee must implement all follow-up actions necessary to comply with this Order.

(9) Enforcement of Municipal Areas and Activities

Each Copermittee must enforce its storm water ordinance for all its municipal areas and activities as necessary to maintain compliance with this Order.

(10) Copermittee Maintained Unpaved Roads Maintenance

(a) The Copermittees must develop, where they do not already exist, and implement or require implementation of BMPs for erosion and sediment control measures during their maintenance activities on Copermittee maintained unpaved roads, particularly in or adjacent to receiving waters.

(b) The Copermittees must develop and implement or require implementation of appropriate BMPs to minimize impacts on streams and wetlands during their unpaved road maintenance activities.

(c) The Copermittees must maintain as necessary their unpaved roads adjacent to streams and riparian habitat to reduce erosion and sediment transport;

(d) Re-grading of unpaved roads during maintenance must be sloped outward where consistent with road engineering safety standards or alternative equally effective BMPs must be implemented to minimize erosion and sedimentation from unpaved roads; and

(e) Through their maintenance of unpaved roads, the Copermittees must examine the feasibility of replacing existing culverts or design of new culverts or bridge crossings to reduce erosion and maintain natural stream geomorphology.

b. COMMERCIAL / INDUSTRIAL

Each Copermittee must implement a commercial / industrial program that meets the requirements of this section, prevents illicit discharges into the MS4, reduces commercial / industrial discharges of storm water pollutants from the MS4 to the MEP, and prevents commercial / industrial discharges from the MS4 from causing or contributing to a violation of water quality standards.

(1) Source Identification

(a) Each Copermittee must maintain an updated watershed-based inventory of all industrial and commercial sites/sources within its jurisdiction (regardless of ownership) that could contribute a significant pollutant load to the MS4. The inventory must include the following minimum

information for each industrial and commercial site/source: name; address; pollutants potentially generated by the site/source; and identification of whether the site/source is tributary to a CWA §303(d) water body segment and generates pollutants for which the water body segment is impaired; and a narrative description including SIC codes which best reflects the principal products or services provided by each facility.

At a minimum, the following sites/sources must be included in the inventory:

(i) Commercial Sites/Sources:

[a] Automobile repair, maintenance, fueling, or cleaning;
[b] Airplane repair, maintenance, fueling, or cleaning;
[c] Boat repair, maintenance, fueling, or cleaning;
[d] Equipment repair, maintenance, fueling, or cleaning;
[e] Automobile and other vehicle body repair or painting;
[f] Mobile automobile or other vehicle washing;
[g] Automobile (or other vehicle) parking lots and storage facilities;
[h] Retail or wholesale fueling;
[i] Pest control services;
[j] Eating or drinking establishments, including such retail establishments with food markets;
[k] Mobile carpet, drape or furniture cleaning;
[l] Cement mixing or cutting;
[m] Masonry;
[n] Painting and coating;
[o] Botanical or zoological gardens and exhibits;
[p] Landscaping;
[q] Nurseries and greenhouses;
[r] Golf courses, parks and other recreational areas/facilities;
[s] Cemeteries;
[t] Pool and fountain cleaning;
[u] Marinas;
[v] Portable sanitary services;
[w] Building material retailers and storage;
[x] Animal boarding facilities and kennels;
[y] Mobile pet services;
[z] Power washing services;
[aa] Plumbing services; and
[bb] Other sites and sources with a history of un-authorized discharges to the MS4.

(ii) Industrial Sites/Sources:

[a] Industrial Facilities, as defined at 40 CFR § 122.26(b)(14), including those subject to the General Industrial Permit or other individual NPDES permit;
[b] Operating and closed landfills;
[c] Facilities subject to SARA Title III; and
[d] Hazardous waste treatment, disposal, storage and recovery facilities.

(iii) ESAs and 303(d) Listed Waterbodies: All other commercial or industrial sites/sources tributary to and within the same hydrologic subarea as a CWA Section 303(d) impaired water body segment, where the site/source generates pollutants for which the water body segment is impaired. All other commercial or industrial sites/sources within or directly adjacent to or discharging directly to receiving waters within environmentally sensitive areas (as defined in Attachment C of this Order) or that generate pollutants tributary to and within the same hydrologic subarea as an observed exceedance of an action level.

(iv) All other commercial or industrial sites/sources that the Copermittee determines may contribute a significant pollutant load to the MS4.

(2) <u>General BMP Implementation</u>

(a) Pollution Prevention: Each Copermittee must require the use of pollution prevention methods by the inventoried industrial and commercial sites/sources.

(b) Designate / Update Minimum BMPs: Each Copermittee must designate a minimum set of BMPs for all inventoried industrial and commercial sites/sources. Where BMPs have already been designated, each Copermittee must review and update its existing BMPs for adequacy no later than with the submittal of the JRMP. Copermittees may continue to regularly review and update their designated BMPs for adequacy and subsequently submit any updates in their Annual Report. The designated minimum BMPs must be specific to facility types and pollutant-generating activities, as appropriate.

(c) Designate Enhanced BMPs for ESAs and 303(d) Impairments: Each Copermittee must designate enhanced measures for inventoried industrial and commercial sites/sources tributary to and within the same hydrologic subarea as CWA section 303(d) impaired water body segments (where a site/source generates pollutants for which the water body segment is

impaired). Each Copermittee must also designate additional controls for industrial and commercial sites/sources within or directly adjacent to or discharging directly to coastal lagoons, the ocean, or other receiving waters within environmentally sensitive areas (as defined in Attachment C of this Order). Copermittees may continue to regularly review and update their designated enhanced BMPs for adequacy and subsequently submit any updates in their next Annual Report.

(d) Implement BMPs: Each Copermittee must implement, or require the implementation of, the designated minimum and enhanced BMPs and any additional measures necessary based on inspections, incident responses, and water quality data to comply with this Order at each industrial and commercial site/source within its jurisdiction.

(3) Mobile Businesses Program

(a) Each Copermittee must develop and implement a program to reduce the discharge of storm water pollutants from mobile businesses to the MEP and to prohibit non-storm water discharges pursuant to Section B of this Order. Each Copermittee must keep as part of its commercial source inventory a listing of mobile businesses known to operate within its jurisdiction that conduct services listed above in section F.3.b.(1)(a). The program must include:

(i) Development and implementation of minimum standards and BMPs to be required for each of the various types of mobile businesses;
(ii) Development and implementation of an enforcement strategy which specifically addresses the unique characteristics of mobile businesses;

(iii) Notification of those mobile businesses known to operate within the Copermittee's jurisdiction of the minimum standards and BMP requirements;
(iv) Development and implementation of an outreach and education strategy; and
(v) Inspection of mobile businesses as needed to implement the program.

(b) If they choose to, the Copermittees may cooperate in developing and implementing their programs for mobile businesses, including sharing of mobile business inventories, BMP requirements, enforcement action information, and education.

(4) Inspection of Industrial and Commercial Sites/Sources

Each Copermittee must conduct industrial and commercial site inspections for compliance with its ordinances, permits, and this Order. Mobile businesses must be inspected as needed pursuant to section F.3.b.(3).

(a) Inspection Procedures: Inspections must include but not be limited to:

(i) Review of BMP implementation plans not including SSMPs required pursuant to section F.1.d, if the site uses or is required to use such a plan;
(ii) Review of facility monitoring data, if the site monitors its runoff;
(iii) Check for coverage under the General Industrial Permit (Notice of Intent (NOI) and/or Waste Discharge Identification Number), if applicable;
(iv) Assessment of compliance with Copermittee ordinances and Copermittee issued permits related to runoff;
(v) Assessment of the implementation, maintenance and effectiveness of the designated minimum and/or enhanced BMPs;
(vi) Visual observations for non-storm water discharges, potential illicit connections, and potential discharge of pollutants in storm water runoff; and
(vii) Education and training on storm water pollution prevention, as conditions warrant.

(b) Frequencies: At a minimum all sites determined to pose a high threat to water quality must be inspected each year. All inventoried sites must be inspected at least once during a five year period. In evaluating threat to water quality, each Copermittee must consider, at a minimum, the following:

(i) Type of activity (SIC code);
(ii) Materials used at the facility;
(iii) Wastes generated;
(iv) Pollutant discharge potential, including whether the facility generates a pollutant that exceeds an action level;
(v) Non-storm water discharges;
(vi) Size of facility;
(vii) Proximity to receiving water bodies;
(viii) Sensitivity of receiving water bodies;
(ix) Whether the facility is subject to the General Industrial Permit or an individual NPDES permit;
(x) Whether the facility has filed a No Exposure Certification/Notice of Non-Applicability;
(xi) Facility design;

(xii) Total area of the site, portion of the site where industrial or commercial activities occur, and area of the site exposed to rainfall and runoff;
(xiii) The facility's compliance history; and
(xiv) Any other relevant factors.

(c) Third-Party Certifications: Each Copermittee may propose to develop and implement a third party certification program subject to San Diego Water Board Executive Officer acceptance. This program would verify industrial and commercial site/source compliance with the Copermittees' ordinances, permits, and this Order. To the extent that third party certifications are conducted to fulfill the requirements of Section F.3.b.(4) above, the Copermittee retains responsibility for compliance with this Order and will be responsible for conducting and documenting quality assurance and quality control of the third-party certifications.

The Copermittee's proposed third party certification program must include the following:

(i) A description of the procedures and measures for quality assurance and quality control;
(ii) A listing of sites/sources that may and may not participate in the program;
(iii) The representative percentage of certifications that would qualify to satisfy the inspection requirements in section F.3.b(4)(c) above;
(iv) Photo documentation of potential storm water violations identified during the third party inspection;
(v) Reporting to the Copermittee of identified significant potential violations, including imminent or observed illegal discharges, within 24 hours of the third party inspection;
(vi) Reporting to the Copermittee of all findings within one week of the inspection being conducted; and
(vii) Copermittee follow-up and/or enforcement actions for identified potential storm water violations within two business days of the potential violation report receipt.

(d) Based upon site inspection findings, each Copermittee must implement all follow-up actions and enforcement necessary to comply with this Order.

(e) To the extent that the San Diego Water Board has conducted an inspection of an industrial site during a particular year, the requirement for the responsible Copermittee to inspect this facility during the same year is deemed satisfied.

(f) The Copermittees must track the number of inspections for the inventoried industrial and commercial sites/sources throughout the reporting period to verify that the sites/sources are inspected at the minimum frequencies listed in this Order.

(5) Enforcement of Industrial and Commercial Sites/Sources

Each Copermittee must enforce its storm water ordinance for all industrial and commercial sites/sources as necessary to maintain compliance with this Order. Copermittee ordinances or other regulatory mechanisms must include appropriate sanctions to achieve compliance. Sanctions must include the following tools or their equivalent: Non-monetary penalties, fines, bonding requirements, liens and/or permit denials for non-compliance.

(6) Reporting of Non-Compliant Sites

Each Copermittee must annually notify the San Diego Water Board, prior to the commencement of the wet season, of any unresolved high level enforcement action (as defined in the Copermittees' JRMP) that poses a significant threat to water quality in its jurisdiction as a result of violations of their storm water ordinances.

c. RESIDENTIAL

Each Copermittee must implement a residential program that meets the requirements of this section, prevents illicit discharges into the MS4, reduces residential discharges of storm water pollutants from the MS4 to the MEP, and prevents residential discharges from the MS4 from causing or contributing to a violation of water quality standards.

(1) Threat to Water Quality Prioritization

Each Copermittee must identify residential areas and activities that pose a high threat to water quality. At a minimum, these must include:

(a) Automobile repair, maintenance, washing, and parking;
(b) Home and garden care activities and product use (pesticides, herbicides, and fertilizers);
(c) Disposal of trash, pet waste, green waste, and household hazardous waste (e.g., paints, cleaning products);
(d) Any other residential source that the Copermittee determines may contribute a significant pollutant load to the MS4;

(e) Any residential areas tributary to and within the same hydrologic subarea as a CWA section 303(d) impaired water body, where the residence generates pollutants for which the water body is impaired; and
(f) Any residential areas within or directly adjacent to or discharging directly to receiving waters within an environmentally sensitive area (as defined in Attachment C of this Order)

(2) BMP Implementation

(a) Pollution Prevention: Each Copermittee must actively encourage the use of pollution prevention methods by residents.

(b) Designate BMPs: Each Copermittee must designate minimum BMPs for high-threat-to-water quality residential areas and activities. The designated minimum BMPs for high-threat-to-water quality residential areas and activities must be area or activity specific.

(c) Hazardous Waste BMPs: Each Copermittee must facilitate the proper management and disposal of used oil, toxic materials, and other household hazardous wastes. Such facilitation must include educational activities, public information activities, and establishment of collection sites operated individually and/or jointly by the Copermittee(s) or a private entity. Curbside collection of household hazardous wastes is encouraged.

(d) Implement BMPs: Each Copermittee must implement, or require implementation of, the designated minimum BMPs and any additional measures necessary to comply with Sections A and B of this Order.

(e) Each Copermittee must implement, or require implementation of, BMPs for residential areas and activities that have not been designated a high threat to water quality, as necessary.

(3) Enforcement of Residential Areas and Activities

Each Copermittee must enforce its storm water ordinance for all residential areas and activities as necessary to maintain compliance with this Order.

(4) Common Interest Areas (CIA) / Home Owner Association (HOA) Areas, and Mobile Home Parks

Each Copermittee must ensure that effective measures exist and are implemented or required to be implemented to ensure that runoff within and from common interest developments, including areas managed by associations and mobile home parks, and meets the objectives of this section and Order.

(a) BMP Implementation: Each Copermittee must implement or require implementation of management measures based on a review of pertinent factors, including:

(i) Maintenance duties and procedures typically used by CIA/HOA maintenance associations within its jurisdiction;
(ii) Whether streets and storm drains are publicly or privately owned within the CIA/HOA or mobile home park;
(iii) Whether the CIA/HOA area or mobile home park has been identified as a high priority residential area based on an evaluation of the site potential to generate pollutants contributing to a 303(d) listed waterbody or an observed action level exceedance; and
(iv) Other activities conducted or authorized by the HOA that may pose a significant risk to inland receiving waters.

(b) Legal Authority and Enforcement: By July 1, 2012, each Copermittee must review, and if necessary update, its Municipal Code to verify that they have the legal authority to implement and enforce its ordinances within CIA/HOA areas and mobile home parks.

d. RETROFITTING EXISTING DEVELOPMENT

Each Copermittee must develop and implement a retrofitting program that meets the requirements of this section. The goals of the existing development retrofitting program are to address the impacts of existing development through retrofit projects that reduce impacts from hydromodification, promote LID, support riparian and aquatic habitat restoration, reduce the discharges of storm water pollutants from the MS4 to the MEP, and prevent discharges from the MS4 from causing or contributing to a violation of water quality standards. Where feasible, at the discretion of the Copermittee, the existing development retrofitting program may be coordinated with flood control projects and other infrastructure improvement programs.

(1) The Copermittee(s) must identify and inventory existing areas of development (i.e. municipal, industrial, commercial, residential) as candidates for retrofitting. Potential retrofitting candidates must include but are not limited to:

(a) Areas of development that generate pollutants of concern to a TMDL or an ESA;
(b) Receiving waters that are channelized or otherwise hardened;
(c) Areas of development tributary to receiving waters that are channelized or otherwise hardened;

(d) Areas of development tributary to receiving waters that are significantly eroded; and
(e) Areas of development tributary to an ASBS or SWQPA.

(2) Each Copermittee must evaluate and rank the inventoried areas of existing developments to prioritize retrofitting. Criteria for evaluation must include but is not limited to:

(a) Feasibility;
(b) Cost effectiveness;
(c) Pollutant removal effectiveness, including reducing pollutants exceeding action level;
(d) Tributary area potentially treated;
(e) Maintenance requirements;
(f) Landowner cooperation;
(g) Neighborhood acceptance;
(h) Aesthetic qualities;
(i) Efficacy at addressing concern; and
(j) Potential improvements on public health and safety.

(3) Each Copermittee must consider the results of the evaluation in prioritizing work plans for the following year in accordance with Sections G.1 and J. Highly feasible projects expected to benefit water quality should be given a high priority to implement source control and treatment control BMPs. Where feasible, the retrofit projects may be designed in accordance with the SSMP requirements within sections F.1.d.(3) through F.1.d.(8) and the Hydromodification requirements in Section F.1.h.

(4) The Copermittees must cooperate with private landowners to encourage site specific retrofitting projects. The Copermittee must consider the following practices in cooperating and encouraging private landowners to retrofit their existing development:

(a) Demonstration retrofit projects;
(b) Retrofits on public land and easements that treat runoff from private developments;
(c) Education and outreach;
(d) Subsidies for retrofit projects;
(e) Requiring retrofit projects as enforcement, mitigation or ordinance compliance;
(f) Public and private partnerships; and
(g) Fees for existing discharges to the MS4 and reduction of fees for retrofit implementation.

(5) The known completed retrofit BMPs must be tracked in accordance with Section F.1.f. Retrofit BMPs on publicly owned properties must be inspected per section F.1.f . Privately owned retrofit BMPs must be inspected as needed.

(6) Where constraints on retrofitting preclude effective BMP deployment on existing developments at locations critical to protect receiving waters (as identified in section F.3.d.(1)), a Copermittee may propose a regional mitigation project to improve water quality. Such regional projects may include but are not limited to:

(a) Regional water quality treatment BMPs;
(b) Urban creek or wetlands restoration and preservation;
(c) Daylighting and restoring underground creeks;
(d) Localized rainfall storage and reuse to the extent such projects are fully protective of downstream water rights;
(e) Hydromodification project; and
(f) Removal of invasive plant species.

(7) A retrofit project or regional mitigation project may qualify as a Watershed Water Quality Activity provided it meets the requirements in section G. Watershed Workplan.

4. ILLICIT DISCHARGE DETECTION AND ELIMINATION

Each Copermittee must implement a program that meets the requirements of this section to actively detect and eliminate illicit discharges and disposal into the MS4. The program must address all types of illicit discharges and connections excluding those non-storm water discharges not prohibited by the Copermittee in accordance with section B of this Order.

a. PREVENT AND DETECT ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must implement measures to prevent and detect illicit discharges to the MS4.

(1) Legal Authority: Each Copermittee must retain legal authority to prevent and eliminate illicit discharges and connections to the MS4.

(2) Inspections: Each Copermittee must include use of appropriate Copermittee personnel and contractors to assist in identifying illicit discharges and connections during their daily activities.

(a) Visual inspections for illegal discharges and connections must be conducted during routine maintenance of all MS4 facilities.

(b) Copermittee staff and contractors conducting non-MS4 field operations must be trained to report suspected illegal discharges and connections to proper Copermittee staff.

b. **MAINTAIN MS4 MAP**

Each Copermittee must maintain an updated map of its entire MS4 and the corresponding drainage areas within its jurisdiction. The use of GIS is strongly encouraged. The MS4 map must include all segments of the storm sewer system owned, operated, and maintained by the Copermittee, as well as all known locations of inlets that discharge and/or collect runoff into the Copermittee's MS4, all known locations of connections with other MS4s (e.g. Caltrans), and all known locations of all the outfalls that discharge runoff from the Copermittee's MS4. The accuracy of the MS4 map must be confirmed during dry weather field screening and analytical monitoring and must be updated at least annually. The MS4 map including any GIS layers must be submitted with the updated JRMP.

c. **FACILITATE PUBLIC REPORTING OF ILLICIT DISCHARGES AND CONNECTIONS - PUBLIC HOTLINE**

Each Copermittee must promote, publicize and facilitate public reporting of illicit discharges or water quality impacts associated with discharges into or from MS4s. Each Copermittee must facilitate public reporting through development and operation of a public hotline. Public hotlines can be Copermittee-specific or shared by Copermittees. All storm water hotlines must be capable of receiving reports in both English and Spanish 24 hours per day and seven days per week. All reported incidents, and how each was resolved, must be summarized in each Copermittee's Annual Report.

d. **DRY WEATHER FIELD SCREENING AND ANALYTICAL MONITORING**

Each Copermittee must conduct dry weather field screening and analytical monitoring of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect illicit discharges and connections in accordance with Receiving Waters and MS4 Discharge Monitoring and Reporting Program No. R9-2010-0016 in Attachment E of this Order.

e. **INVESTIGATION / INSPECTION AND FOLLOW-UP**

Each Copermittee must implement procedures to investigate and inspect portions of its MS4 that, based on the results of field screening, analytical monitoring, or other appropriate information, indicate a reasonable potential of containing illicit discharges, illicit connections, or other sources of pollutants in non-storm water.

(1) Develop response criteria for data: Each Copermittee must develop, update, and use numeric criteria action levels (or other actions level criteria where appropriate) to determine when follow-up investigations will be performed in response to water quality monitoring. The criteria must include required non-storm water action levels (see Section C) and a consideration of 303(d)-listed waterbodies and environmentally sensitive areas (ESAs) as defined in Attachment C.

(2) Respond to data: Each Copermittee must investigate portions of the MS4 for which water quality data or conditions indicates a potential illegal discharge or connection.

(a) Obvious illicit discharges (i.e. color, odor, or significant exceedances of action levels) must be investigated immediately.

(b) Field screen data: Within two business days of receiving dry weather field screening results that exceed action levels, the Copermittee(s) having jurisdiction must either initiate an investigation to identify the source of the discharge or document the rationale for why the discharge does not pose a threat to water quality and does not need further investigation. This documentation must be included in the Annual Report.

(c) Analytical data: Within five business days of receiving analytical laboratory results that exceed action levels, the Copermittee(s) having jurisdiction must either initiate an investigation to identify the source of the discharge or document the rationale for why the discharge does not pose a threat to water quality and does not need further investigation. This documentation must be included in the Annual Report.

(3) Respond to notifications: Each Copermittee must respond to and resolve each reported incident (e.g., public hotline, staff notification, etc.) made to the Copermittee in a timely manner. Criteria may be developed to assess the validity of, and prioritize the response to, each report.

f. **ELIMINATION OF ILLICIT DISCHARGES AND CONNECTIONS**

Each Copermittee must take immediate action to initiate steps necessary to eliminate all detected illicit discharges, illicit discharge sources, and illicit connections after detection within its jurisdiction. Elimination measures may include an escalating series of enforcement actions for those illicit discharges that are not a serious threat to public health or the environment. Illicit discharges that pose a serious threat to the public's health or the environment must be eliminated immediately.

g. **ENFORCE ORDINANCES**

Each Copermittee must implement and enforce its ordinances, orders, or other legal authority to prevent illicit discharges and connections to its MS4 and to eliminate detected illicit discharges and connections to its MS4.

h. **PREVENT AND RESPOND TO SEWAGE SPILLS (INCLUDING FROM PRIVATE LATERALS AND FAILING SEPTIC SYSTEMS) AND OTHER SPILLS**

Each Copermittee must implement management measures and procedures (including a notification mechanism) to prevent, respond to, contain and clean up all sewage (see below) and other spills that may discharge into its MS4 from any source (including private laterals and failing septic systems). Copermittees must coordinate with spill response teams to prevent entry of spills into the MS4 and contamination of surface water, ground water and soil. Each Copermittee must coordinate spill prevention, containment and response activities throughout all appropriate Copermittee departments, programs and agencies so that maximum water quality protection is available at all times.

5. PUBLIC PARTICIPATION COMPONENT

Each Copermittee must incorporate a mechanism for public participation in the updating, development, and implementation of the JRMP.

6. EDUCATION COMPONENT

Each Copermittee must implement education programs to (1) measurably increase the knowledge regarding MS4s, impacts of runoff on receiving waters, and potential BMP solutions for the target audience; and (2) to measurably change the behavior of target communities and thereby reduce pollutants in storm water discharges and eliminate prohibited non-storm water discharges to MS4s and the environment. At a minimum, the education programs must meet the requirements of this section and address the following target communities:

- Copermittee Departments and Personnel
- New Development / Redevelopment Project Applicants, Developers, Contractors, Property Owners, and other Responsible Parties
- Construction Site Owners and Operators
- Commercial Owners and Operators
- Industrial Owners and Operators
- Residential Community and General Public

a. **GENERAL REQUIREMENTS**

(1) At a minimum, the Copermittee education programs must educate each target community on the following topics, as appropriate to the target community's potential storm water and non-storm water discharges to the MS4:

(a) Applicable water quality laws, regulations, permits, and requirements;
(b) Best management practices;
(c) General runoff concepts;
(d) Existing water quality, including local water quality conditions, impaired waterbodies and environmentally sensitive areas; and
(e) Other topics, as determined by the Copermittee(s), such as public reporting mechanisms, water conservation, low-impact development techniques, and public health and vector issues associated with runoff.

(2) Each Copermittee must implement educational activities, public information activities, and other appropriate activities to facilitate the proper management and disposal of used oil and toxic materials.

b. **SPECIFIC REQUIREMENTS**

(1) <u>Copermittee Departments and Personnel</u>

(a) Each Copermittee must implement an education program so its staff and contractors (and Planning Boards and Elected Officials, if applicable) responsible for implementing the requirements of this Order have an understanding of the following topics as applicable to their responsibilities:

(i) Applicable water quality laws and regulations;
(ii) The potential effects and impacts that Copermittee departments and personnel activities related to their job duties can have on water quality);
(iii) Plan review policies and procedures to verify consistent application;
(iv) Methods of minimizing impacts to receiving water quality resulting from development, construction, and other potential pollutant generating activities;

(v) Proper implementation of erosion and sediment control, source control, treatment control, and other BMPs to minimize the impacts to receiving water quality resulting from development, construction, and other potential pollutant generating activities;
(vi) Applicable recordkeeping and tracking mechanisms; and
(vii) Inspection and enforcement procedures, BMP implementation, and review of monitoring data.

(b) Each Copermittee must train its staff responsible for oversight and conducting storm water compliance inspections and enforcement of construction activities (e.g. construction, building, code enforcement, grading review staffs, inspectors, and other responsible construction staff) annually prior to the rainy season.

(c) Each Copermittee must train its staff responsible for conducting storm water compliance inspections and enforcement of industrial and commercial facilities at least once a year.

(2) New Development / Redevelopment and Construction Sites

As early in the planning and development process as possible and all through the permitting and construction process, each Copermittee must notify parties responsible for the project about the importance of educating all construction workers in the field about storm water issues and BMPs, in addition to the topics under Section F.6.a.(1).

(3) Commercial and Industrial Sites / Sources

At least once during the five-year period of this Order, each Copermittee must notify the owner/operator of each of its inventoried commercial and industrial site/source of the BMP requirements applicable to the site/source.

(4) Residential and General Public

Each Copermittee shall collaboratively conduct or participate in development and implementation of a program to educate residential and general public target communities. The Copermittee residential and general public education programs must address potential pollutant generating activities (e.g., car washing, mobile operations, yard maintenance) and pollutant generating products (e.g., pesticides, fertilizers, household chemicals). The target audiences of the residential and general public education programs must include underserved target audiences (e.g., disadvantaged communities), residents and managers of CIA/HOA areas, and owners and residents of mobile home parks.

G. WATERSHED WATER QUALITY WORKPLAN

Each Copermittee must collaborate with other Copermittees to develop and implement a Watershed Water Quality Workplan (Watershed Workplan) to identify, prioritize, address, and mitigate the highest priority water quality issues/pollutants in the Upper Santa Margarita Watershed.

1. Watershed Workplan Components

The work plan must, at a minimum:

a. Characterize the receiving water quality in the watershed. Characterization must include assessment and analysis of regularly collected water quality data, reports, monitoring and analysis generated in accordance with the requirements of the Receiving Waters Monitoring and Reporting Program, as well as applicable information available from other public and private organizations. This characterization must include an updated watershed map.

b. Identify and prioritize water quality problem(s) in terms of constituents by location, in the watershed's receiving waters. In identifying water quality problem(s), the Copermittees must, at a minimum, give consideration to TMDLs, receiving waters listed on the CWA section 303(d) list, waters with persistent violations of water quality standards, toxicity, or other impacts to beneficial uses, and other pertinent conditions.

c. Identify the likely sources, pollutant discharges and/or other factors causing the highest water quality problem(s) within the watershed. Efforts to determine such sources must include, but not be limited to: use of information from the construction, industrial/commercial, municipal, and residential source identification programs required within the JRMP of this Order; water quality monitoring data collected as part of the Receiving Water Monitoring and Reporting Program required by this Order, and additional focused water quality monitoring to identify specific sources within the watershed.

d. Develop a watershed BMP implementation strategy to attain receiving water quality objectives in the identified highest priority water quality problem(s) and locations. The BMP implementation strategy must include a schedule for implementation of the BMPs to abate specific receiving water quality problems and a list of criteria to be used to evaluate BMP effectiveness. Identified watershed water quality problems may be the result of jurisdictional discharges that will need to be addressed with BMPs applied in a specific jurisdiction in order to generate a benefit to the watershed. This implementation strategy must include a map of any implemented and/or proposed BMPs.

e. Develop a strategy to monitor improvements in receiving water quality directly

resulting from implementation of the BMPs described in the Watershed Workplan. The monitoring strategy must review the necessary data to report on the measured pollutant reduction that results from proper BMP implementation. Monitoring must, at a minimum, be conducted in the receiving water to demonstrate reduction in pollutant concentrations and progression towards attainment of receiving water quality objectives.

f. Establish a schedule for development and implementation of the Watershed strategy outlined in the Workplan. The schedule must, at a minimum, include forecasted dates of planned actions to address Provisions E.2(a) through E.2(e) and dates for watershed review meetings through the remaining portion of this Permit cycle. Annual watershed workplan review meetings must be open to the public and appropriately publically noticed such that interested parties may come and provide comments on the watershed program.

2. Watershed Workplan Implementation

Watershed Copermittee's must implement the Watershed Workplan within 90 days of submittal unless otherwise directed by the San Diego Water Board.

3. Copermittee Collaboration

Watershed Copermittees must collaborate to develop and implement the accepted Watershed Workplan. Watershed Copermittee collaboration must include frequent regularly scheduled meetings. The Copermittees must pursue efforts to obtain any interagency agreements, or other coordination efforts, with non-Copermittee owners of the MS4 (such as Caltrans, Native American tribes, and school districts) to control the contribution of pollutants from one portion of the shared MS4 to another portion of the shared MS4. The Copermittees must, as appropriate, participate in watershed management efforts to address water quality issues within the entire Santa Margarita Watershed (such as the County of San Diego and U.S. Marine Corps Camp Pendleton).

4. Public Participation

Watershed Copermittees must implement a watershed-specific public participation mechanism within each watershed. A required component of the watershed-specific public participation mechanism must be a minimum 30-day public review of and opportunity to comment on the Watershed Workplan prior to submittal to the San Diego Water Board. The Workplan must include a description of the public participation mechanisms to be used and identification of the persons or entities anticipated to be involved during the development and implementation of the Watershed Workplan.

5. Watershed Workplan Review and Updates

Watershed Copermittees must review and update the Watershed Workplan annually to identify needed changes to the prioritized water quality problem(s) listed in the workplan. All updates to the Watershed Workplan must be presented during an Annual Watershed Review Meeting. Annual Watershed Review Meetings must occur once every calendar year and be conducted by the Watershed Copermittees. Annual Watershed Review Meetings must be open to the public and adequately noticed. Individual Watershed Copermittees must also review and modify their jurisdictional programs and JRMP Annual Reports, as necessary, so that they are consistent with the updated Watershed Workplan.

6. Pyrethroid Toxicity Reduction Evaluation

The Watershed Copermittees must incorporate the pyrethroid pollutant reduction program[18] into the Watershed Workplan. The pyrethroid pollutant reduction program must include the following elements:

a. Pursue state and federal regulatory change;
b. Implement a set of source controls targeted specifically at urban pyrethroid use;
c. Through the annual reporting process, monitor the implementation of those controls, assess effectiveness, and identify sources or areas where additional effort is needed;
d. Implement additional controls as needed; and
e. Continue to monitor implementation, as well as conditions within the target receiving waters, assess effectiveness, and re-evaluate control programs.

H. FISCAL ANALYSIS

1. Secure Resources: Each Copermittee must exercise its full authority to secure the resources necessary to meet all requirements of this Order.

2. Annual Analysis: Each Copermittee must conduct an annual fiscal analysis of the necessary capital and operation and maintenance expenditures necessary to accomplish the activities of the programs required by this Order. The analysis must include estimated expenditures for the current reporting period, the preceding period, and the next reporting period.

a. Each analysis must include a description of the source of funds that are proposed to meet the necessary expenditures.
b. Each analysis must include a narrative description of circumstances resulting in a 25 percent or greater annual change for any budget line items.

[18] The pyrethroid pollutant reduction program is described in the "Riverside County – Santa Margarita Region Pyrethroid Source Identification Toxicity Reduction Evaluation, Final Phase II Report", January 2009 by MACTEC.

3. Annual Reporting: Each Copermittee must submit its annual fiscal analysis with the annual JRMP report.

I. TOTAL MAXIMUM DAILY LOADS

1. The waste load allocations (WLAs) of fully approved and adopted TMDLs are incorporated as Water Quality Based Effluent Limitations on a pollutant by pollutant, watershed by watershed basis. Early TMDL requirements, including monitoring, may be required and inserted into this Order pursuant to Finding E.10.

2. The Cities of Wildomar and Murrieta must comply with the requirements and WLAs assigned to the discharges from their MS4s contributing to the Lake Elsinore/Canyon Lake (San Jacinto Watershed) Nutrient TMDLs as specified in Section VI.D.2 of the Santa Ana Water Board's Order R8-2010-0033, including relevant sections of the fact sheet and findings, and subsequent revisions thereto.

J. PROGRAM EFFECTIVENESS ASSESSMENT AND REPORTING

Beginning with the Annual Report due in 2013, each Copermittee must annually assess and report upon the effectiveness of its JRMP and Watershed Workplan implementation to (1) reduce the discharge of storm water pollutants from its MS4 to the MEP; (2) prohibit non-stormwater discharges; and (3) prevent runoff discharges from the MS4 from causing or contributing to a violation of water quality standards.

1. Program Effectiveness Assessments

a. IDENTIFY EFFECTIVENESS ASSESSMENTS

With the JRMP and Watershed Workplan submittal, each Copermittee must establish assessment measures or methods for each of the six outcome levels described by CASQA[19], using data from each JRMP program component, the MRP, and the Watershed Workplan.

(1) Assessment interval: For each established assessment measure or method, an assessment interval must be established as appropriate to the measure or method.

(2) Projected Timeframe: For each established assessment measure or method, each Copermittee must identify the projected timeframe within which the associated outcome level can adequately assess change.

[19] Effectiveness assessment outcome levels as defined by CASQA are defined in Attachment C of this Order. See "*Municipal Stormwater Program Effectiveness Assessment Guidance"* (CASQA, May 2007) for guidance for assessing program activities at the various outcome levels.

b. **PERFORM ASSESSMENTS**

(1) Annually: Each year, the Copermittee must perform each applicable assessment based on the associated assessment interval, and determine whether the desired outcome has been met.

(2) With the submittal of the Report of Waste Discharge, the Copermittees must determine whether their program implementation is resulting in the protection and/or improvement of water quality through an Integrated Assessment.

2. Respond to Assessments

a. Where the assessments indicate that the desired outcome level has not been achieved at the end of the projected timeframe, the Copermittee must review its applicable activities and BMPs to identify any modifications and improvements needed to maximize effectiveness, as necessary to comply with this Order. If the Copermittee determines that the existing activities/BMPs are adequate, or that the projected timeframe should be extended, justification and an updated timeframe for attainment of the outcome level must be provided in the Annual Report.

b. Each Copermittee must develop and implement a work plan and schedule to address any program modifications and improvements in response to the findings of its assessment. The work plan and schedule must be provided and updated with the applicable Annual Report. The work plan must include, at a minimum, the following:

(1) The problems and priorities identified during the assessment;
(2) A list of priority pollutants and known or suspected sources;
(3) A brief description of the strategy employed to reduce, eliminate or mitigate the negative impacts;
(4) A description and schedule for new and/or modified BMPs. The schedule is to include dates for significant milestones;
(5) A description of how the selected activities will address an identified high priority problem. This will include a description of the expected effectiveness and benefits of the new and/or modified BMPs;
(6) A description of implementation effectiveness metrics;
(7) A description of how efficacy results will be used to modify priorities and implementation; and
(8) A review of past activities implemented, progress in meeting water quality standards, and planned program adjustments.

3. Assessment and Response Reporting

Each Copermittee must include a summary of its effectiveness assessments within each Annual Report. Beginning with the FY 2012-2013 Annual Report, the Program Effectiveness reporting must include:

a. The results of each of the effectiveness assessments performed pursuant to J.1.b, including the demonstrated CASQA effectiveness level(s);

b. Responses to effectiveness assessments: A description of any program modifications planned in accordance with section J.2, including the work plan and identified schedule for implementation. The description must include the basis for determining that each modified activity and/or BMP represents an improvement expected to result in improved water quality; and

c. A description of any steps to be implemented to improve the Copermittee's ability to assess program effectiveness.

K. REPORTING

The Copermittees may propose alternate reporting criteria and schedules, as part of their updated JRMP, for the Executive Officer's acceptance.

1. Runoff Management Plans

a. **JURISDICTIONAL RUNOFF MANAGEMENT PLANS**

(1) The written account of the overall program to be conducted by each Copermittee to meet the jurisdictional requirements of section F of this Order is referred to as the Jurisdictional Runoff Management Plan (JRMP). Each Copermittee must revise and update its existing JRMP so that it describes all activities the Copermittee will undertake to implement the requirements of this Order. Each Copermittee must submit its updated and revised JRMP to the San Diego Water Board <u>no later than June 30, 2012</u>.

(2) At a minimum, each Copermittee's JRMP must be updated and revised to demonstrate compliance with each applicable section of this Order.

b. **WATERSHED WORKPLANS**

Copermittees must update and revise the Watershed Workplan to describe any changes in water quality problems or priorities, and any necessary change to actions Copermittees will take to implement jurisdictional or watershed BMPs to address those identified. The Copermittees must assemble and submit the Watershed Workplan to the San Diego Water Board no later than June 30, 2012, and must implement the Workplan within 90 days unless otherwise directed by the San Diego Water Board.

2. Other Required Reports and Plans

a. **SSMP UPDATES**

(1) Copermittees must submit their updated SSMP in accordance with the applicable requirements of section F.1 with the JRMP by June 30, 2012.

(2) Within 180 days of determination that the SSMP is in compliance with this Order's provisions, each Copermittee must amend its ordinances consistent with the SSMP and implement the updated SSMP. Any amended or new ordinances must be submitted to the San Diego Water Board the applicable Annual Report.

b. **HMP**

(1) By June 30, 2013, the Copermittees must submit to the San Diego Water Board Executive Officer a draft HMP that has been reviewed by the public, including identification of the appropriate limiting range of flow rates in accordance with the applicable requirements of section F.1.h.

(2) Within 180 of receiving San Diego Water Board comments on the draft HMP, the Copermittees must submit a final HMP that addressed the San Diego Water Board's comments.

(3) Within 90 days of receiving a finding of adequacy from the Executive Officer each Copermittee must incorporate and implement the HMP for all Priority Development Projects.

(4) Prior to acceptance of the HMP by the San Diego Water Board, the early implementation measures likely to be included in the HMP shall be encouraged by the Copermittees.

c. **REPORT OF WASTE DISCHARGE**

The Copermittees must submit to the San Diego Water Board, no later than 180 days in advance of the expiration date of this Order, a Report of Waste Discharge (ROWD) as an application for issuance of new waste discharge requirements. The fourth annual report for this Order may supplement the ROWD, provided the ROWD contains the minimum information below.

At a minimum, the ROWD must include the following: (1) Proposed changes to the Copermittees' runoff management programs; (2) Proposed changes to monitoring programs; (3) Justification for proposed changes; (4) Name and mailing addresses of the Copermittees; (5) Names and titles of primary contacts of the Copermittees; (6) Any other information necessary for the reissuance of this Order and (7) Any other information required by federal regulations for permit reapplications.

3. Annual Reports

JURISDICTIONAL RUNOFF MANAGEMENT PROGRAM (JRMP) ANNUAL REPORTS

a. Each Copermittee must generate individual JRMP Annual Reports that cover implementation of its jurisdictional activities during the past annual reporting period. Each Annual Report must verify and document compliance with this Order as directed in this section. Each Copermittee must retain records in accordance with the Standard Provisions in Attachment B of this Order, available for review, that document compliance with each requirement of this Order. The reporting period for these annual reports must be the previous fiscal year.

b. Each Copermittee must submit its JRMP Annual Reports to the San Diego Water Board by October 31of each year, beginning on October 31, 2013.

c. Each JRMP Annual Report must contain, at a minimum, the following information, as applicable to the Copermittee:

(1) Information required to be reported annually in Section H (Fiscal Analysis) of this Order;
(2) Information required to be reported annually in Section J (Program Effectiveness) of this Order;
(3) The completed Reporting Checklist found in Attachment D; and
(4) Information for each program component as described in the following Table 5:

Table 5. Annual Reporting Requirements

Program Component	Reporting Requirement
New Development	1. All updated relevant sections of the General Plan and environmental review process and a description of any planned updates within the next annual reporting period, if applicable;
	2. All revisions to the SSMP, including where applicable: (a) Identification and summary of where the SSMP fails to meet the requirements of this Order; (b) Updated procedures for identifying pollutants of concern for each Priority Development Project; (c) Updated treatment BMP ranking matrix; (d) Updated site design and treatment control BMP design standards;
	3. Number of Priority Development Projects reviewed and approved during the reporting period. Brief description of BMPs required at approved Priority Development Projects. Verification that site design, source control, and treatment BMPs were required on all applicable Priority Development Projects;
	4. Name and location of all Priority Development Projects that were granted a waiver from implementing LID BMPs pursuant to section F.1.d.(4) during the reporting period;
	5. Updated watershed-based BMP maintenance tracking database of approved treatment control BMPs and treatment control BMP maintenance within its jurisdiction, including updates to the list of high-priority Priority Development Projects; and verification that the requirements of this Order were met during the reporting period;

Table 5. Annual Reporting Requirements (Cont'd)

Program Component	Reporting Requirement
New Development (Cont'd)	6. Name and brief description of all approved Priority Development Projects required to implement hydrologic control measures in compliance with section F.1.h including a brief description of the management measures planned to protect downstream beneficial uses and prevent adverse physical changes to downstream stream channels;
	7. Number and description of all enforcement activities applicable to the new development and redevelopment component and a summary of the effectiveness of those activities.
Construction	1. All updated relevant ordinances and description of planned ordinance updates within the next annual reporting period, if applicable;
	2. A description of any changes to procedures used for identifying priorities for inspecting sites and enforcing control measures that consider the nature of the construction activity, topography, and the characteristics of soils and receiving water quality;
	3. Any changes to the designated minimum and enhanced BMPs;
	4. Summary of the inspection program, including the following information: (a) Total number and date of inspections conducted at each facility; (b) Number, date, and types of enforcement actions by facility; (c) Brief description of each high-level enforcement actions at construction sites including the effectiveness of the enforcement. Supporting paper (or electronic) files must be maintained by the Copermittees and made available upon San Diego Water Board request. Supporting files must include a record of inspection dates, the results of each inspection, photographs (if any), and a summary of any enforcement actions taken.
Municipal	1. Updated source inventory;
	2. All changes to the designated municipal BMPs;
	3. Descriptions of any changes to procedures to assure that flood management projects assess the impacts on the water quality of receiving water bodies;
	4. Summary and assessment of BMP retrofits implemented at flood control structures, including: (a) List of projects retrofitted; (b) List and description of structures evaluated for retrofitting; (c) List of structures still needing to be evaluated and the schedule for evaluation;

Table 5. Annual Reporting Requirements (Cont'd)

Program Component	Reporting Requirement
Municipal (Cont'd)	5. Summary of the municipal structural treatment control operations and maintenance activities, including: (a) Number of inspections and types of facilities; (b) Summary of findings;
	6. Summary of the MS4 and MS4 facilities operations and maintenance activities, including: (a) Number and types of facilities maintained; (b) Amount of material removed; (c) List of facilities planned for bi-annual inspections and the justification;
	7. Summary of the municipal areas/programs inspection activities, including: (a) Number and date of inspections conducted at each facility; (b) The BMP violations identified during the inspection by facility; (c) Number, date and types of enforcement actions by facility; (d) Summary of inspection findings and follow-up activities for each facility;
	8. Description of activities implemented to address sewage infiltration into the MS4;
	9. Description of BMPs and their implementation for unpaved roads construction and maintenance.
Commercial / Industrial	1. Updated inventory of commercial / industrial sources;
	2. Summary of the inspection program, including the following information: (a) Number and date of inspections conducted at each facility or mobile business; (b) The BMP violations identified during the inspection by facility; (c) Number, date, and types of enforcement actions by facility or mobile business; (d) Brief description of each high-level enforcement actions at commercial/industrial sites including the effectiveness of the enforcement and follow-up activities for each facility;
	3. All changes to designated minimum and enhanced BMPs;
	4. A list of industrial sites, including each name, address, and SIC code, that the Copermittee suspects may require coverage under the General Industrial Permit, but has not submitted an NOI.

Table 5. Annual Reporting Requirements (Cont'd)

Program Component	Reporting Requirement
Residential	1. All updated minimum BMPs required for residential areas and activities;
	2. Quantification and summary of applicable runoff and storm water enforcement actions within residential areas and activities;
	3. Description of efforts to manage runoff and storm water pollution in common interest areas and mobile home parks.
Retrofitting Existing Development	1. Updated inventory and prioritization of existing developments identified as candidates for retrofitting;
	2. Description of efforts to retrofit existing developments during the reporting year;
	3. Description of efforts taken to encourage private landowners to retrofit existing development;
	4. A list of all retrofit projects that have been implemented, including site location, a description of the retrofit project, pollutants expected to be treated, and the tributary acreage of runoff that will be treated;
	5. Any proposed retrofit or regional mitigation projects and timelines for future implementation;
	6. Any proposed changes to the Copermittee's overall retrofitting program.
Illicit Discharge Detection and Elimination	1. Any changes to the legal authority to implement Illicit Discharge Detection and Elimination activities;
	2. Any Changes to the established investigation procedures;
	3. Any changes to public reporting mechanisms, including phone numbers and web pages;
	4. Summaries of illicit discharges (including spills and water quality data events) and how each significant case was resolved;
	5. A description of instances when field screening and analytical data exceeded action levels, including those instances for which no investigation was conducted;
	6. A description of follow-up and enforcement actions taken in response to investigations of illicit discharges and a description of the outcome of the investigation/enforcement actions.
Workplans	Updated workplans including priorities, strategy, implementation schedule and effectiveness evaluation.

d. Each JRMP Annual Report must also include the following information regarding non-storm water discharges (see Section B.2. of this Order):

(1) Identification of non-storm water discharge categories identified as a source of pollutants to waters of the U.S;
(2) A description of any updates to ordinances, orders, or similar means to prohibit non-storm water discharge categories identified under section B.2 above ;
(3) Identification of any control measures to be required and implemented for

non-storm water discharge categories identified as needing controls by the San Diego Water Board; and

(4) A description of a program to address pollutants from non-emergency fire fighting flows identified by the Copermittee to be significant sources of pollutants.

4. Interim Reporting Requirements

For the reporting periods, prior to submittal of the JRMP, each JRMP Annual Report must be submitted in accordance with the requirements and deadlines described in Order No. 2004-001.

5. Universal Reporting Requirements

All submittals must include an executive summary, introduction, conclusion, recommendations, and signed certified statement. Each Copermittee must submit a signed certified statement covering its responsibilities for each applicable submittal. The Principal Copermittee must submit a signed certified statement covering its responsibilities for each applicable submittal and the sections of the submittals for which it is responsible.

L. MODIFICATION OF PROGRAMS

Modifications of JRMPs and/or Watershed Workplan may be initiated by the Executive Officer of the San Diego Water Board or by the Copermittees. Requests by Copermittees must be made to the Executive Officer, and must be submitted during the annual review process. Requests for modifications should be incorporated, as appropriate, into the Annual Reports or other deliverables required or allowed under this Order.

1. Minor modifications to JRMPs, and/or Watershed Workplan, may be accepted by the Executive Officer where the Executive Officer finds the proposed modification complies with all discharge prohibitions, receiving water limitations, and other requirements of this Order.

2. Proposed modifications that are not minor require amendment of this Order in accordance with this Order's rules, policies, and procedures.

M. PRINCIPAL COPERMITTEE RESPONSIBILITIES

Within 180 days of adoption of this Order, the Copermittees must designate the Principal Copermittee and notify the San Diego Water Board of the name of the Principal Copermittee. The Principal Copermittee must, at a minimum:

1. Serve as liaison between the Copermittees and the San Diego Water Board on general permit issues, and when necessary and appropriate, represent the Copermittees before the San Diego Water Board.

2. Coordinate permit activities among the Copermittees and facilitate collaboration on the development and implementation of programs required under this Order.

3. Coordinate the submittal of the documents and reports as required by section K of this Order and Receiving Waters and MS4 Discharge Monitoring and Reporting Program No. R9-2010-0016 in Attachment E of this Order.

N. RECEIVING WATERS AND MS4 DISCHARGE MONITORING AND REPORTING PROGRAM

Pursuant to CWC section 13267, the Copermittees must comply with all the requirements contained in Receiving Waters and MS4 Discharge Monitoring and Reporting Program (MRP) No. R9-2010-0016 in Attachment E of this Order.

O. STANDARD PROVISIONS, REPORTING REQUIREMENTS, AND NOTIFICATIONS

1. Each Copermittee must comply with Standard Provisions, Reporting Requirements, and Notifications contained in Attachment B of this Order. This includes 24 hour/5 day reporting requirements for any instance of non-compliance with this Order as described in section 5.e of Attachment B.

2. All plans, reports and subsequent amendments submitted in compliance with this Order must be implemented immediately (or as otherwise specified). All submittals by Copermittees must be adequate to implement the requirements of this Order.

P. ADDITIONAL PROVISIONS

The Executive Officer shall meet with Camp Pendleton and other stakeholders at six (6) month intervals to identify and investigate water quality impacts, flow impacts, and impacts to water rights that may derive from the implementation of Low Impact Development BMPs required by Order R9-2010-0016 as they are developed by the storm water Copermittees. Any key issues or amendments to the Order that derive from those analyses and discussions will be promptly brought to the San Diego Water Board for their consideration.

I, David W. Gibson, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on November 10, 2010.

David W. Gibson
Executive Officer

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ATTACHMENT A

BASIN PLAN PROHIBITIONS

California Water Code Section 13243 provides that a Regional Board, in a water quality control plan, may specify certain conditions or areas where the discharge of waste or certain types of waste is not permitted. The following discharge prohibitions are applicable to any person, as defined by Section 13050(c) of the California Water Code, who is a citizen, domiciliary, or political agency or entity of California whose activities in California could affect the quality of waters of the state within the boundaries of the San Diego Region.

1. The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in California Water Code Section 13050, is prohibited.

2. The discharge of waste to land, except as authorized by waste discharge requirements or the terms described in California Water Code Section 13264 is prohibited.

3. The discharge of pollutants or dredged or fill material to waters of the United States except as authorized by a NPDES permit or a dredged or fill material permit (subject to the exemption described in California Water Code Section 13376) is prohibited.

4. Discharges of recycled water to lakes or reservoirs used for municipal water supply or to inland surface water tributaries thereto are prohibited, unless this Regional Board issues a NPDES permit authorizing such a discharge; the proposed discharge has been approved by the State Department of Health Services and the operating agency of the impacted reservoir; and the discharger has an approved fail-safe long-term disposal alternative.

5. The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the Regional Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

6. The discharge of waste in a manner causing flow, ponding, or surfacing on lands not owned or under the control of the discharger is prohibited, unless the discharge is authorized by the Regional Board.

7. The dumping, deposition, or discharge of waste directly into waters of the state, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the Regional Board.

8. Any discharge to a storm water conveyance system that is not composed entirely of "storm water" is prohibited unless authorized by the Regional Board. [The federal regulations, 40 CFR 122.26(b)(13), define storm water as storm water

runoff, snow melt runoff, and surface runoff and drainage. 40 CFR 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from fire fighting activities. [§122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

9. The unauthorized discharge of treated or untreated sewage to waters of the state or to a storm water conveyance system is prohibited.

10. The discharge of industrial wastes to conventional septic tank/subsurface disposal systems, except as authorized by the terms described in California Water Code Section 13264, is prohibited.

11. The discharge of radioactive wastes amenable to alternative methods of disposal into the waters of the state is prohibited.

12. The discharge of any radiological, chemical, or biological warfare agent into waters of the state is prohibited.

13. The discharge of waste into a natural or excavated site below historic water levels is prohibited unless the discharge is authorized by the Regional Board.

14. The discharge of sand, silt, clay, or other earthen materials from any activity, including land grading and construction, in quantities which cause deleterious bottom deposits, turbidity or discoloration in waters of the state or which unreasonably affect, or threaten to affect, beneficial uses of such waters is prohibited.

15. The discharge of treated or untreated sewage from vessels to Mission Bay, Oceanside Harbor, Dana Point Harbor, or other small boat harbors is prohibited.

ATTACHMENT B

STANDARD PROVISIONS, REPORTING REQUIREMENTS, AND NOTIFICATIONS

1. STANDARD PROVISIONS – PERMIT COMPLIANCE [40 CFR 122.41]

(a) *Duty to comply* [40 CFR 122.41(a)].

(1) The Copermittee must comply with all of the conditions of this Order. Any noncompliance constitutes a violation of the Clean Water Act (CWA) and the California Water Code (CWC) and is grounds for enforcement action, for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

(2) The Copermittee shall comply with effluent standards or prohibitions established under section 307(a) of the CWA toxic pollutants and with standards for sewage sludge use or disposal established under section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the Order has not yet been modified to incorporate the requirement.

(b) *Need to halt or reduce activity not a defense* [40 CFR 122.41(c)]. It shall not be a defense for the Copermittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this Order.

(c) *Duty to mitigate* [40 CFR 122.41(d)]. The Copermittee shall take all reasonable steps to minimize or prevent any discharge or prevent any discharge or sludge use or disposal in violation of this Order that has a reasonable likelihood of adversely affecting human health or the environment.

(d) *Proper operation and maintenance* [40 CFR 122.41(e)]. The Copermittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Copermittee to achieve compliance with the conditions of this Order. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by the Copermittee only when necessary to achieve compliance with the conditions of this Order.

(e) *Property rights* [40 CFR 122.41(g)].

(1) This Order does not convey any property rights of any sort or any exclusive privilege.
(2) The issuance of this Order does not authorize any injury to persons or property or invasion of other private rights, or any infringement of State or local law or regulations.

(f) *Inspection and entry* [40 CFR 122.41(i)]. The Copermittee shall allow the Regional Water Quality Control Board, San Diego Region (Regional Board), State Water Resources Control Board (SWRCB), United States Environmental Protection Agency

(USEPA), and/or their authorized representatives (including an authorized contractor acting as their representative), upon presentation of credentials and other documents as may be required by law, to:

(1) Enter upon the Copermittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this Order;
(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this Order;
(3) Inspect and photograph, at reasonable times, any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Order; and
(4) Sample or monitor, at reasonable times, for the purpose of assuring Order compliance or as otherwise authorized by the CWA or the CWC, any substances or parameters at any location.

(g) *Bypass* [40 CFR 122.41(m)]

(1) Definitions:

i) "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility.
ii) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities, which causes them to become inoperable, or substantial and permanent loss of natural resources that can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

(2) Bypass not exceeding limitations - The Copermittee may allow any bypass to occur which does not cause exceedances of effluent limitations, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions listed in Standard Provisions – Permit Compliance (g)(3), (g)(4) and (g)(5) below.

(3) Prohibition of Bypass - Bypass is prohibited, and the Regional Board may take enforcement action against a Copermittee for bypass, unless:

i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and
iii) The Copermittee submitted notice as required under Standard Provisions – Permit Compliance (g)(3) above.

(4) Notice

i) Anticipated bypass. If the Copermittee knows in advance of the need for a bypass, it shall submit a notice, if possible at least ten days before the date of the bypass.
ii) Unanticipated bypass. The Copermittee shall submit notice of an unanticipated bypass as required in Standard Provisions 5(e) below (24-hour notice).

(h) *Upset* [40 CFR 122.41(n)] Upset means an exceptional incident in which there is unintentional and temporary noncompliance with technology based effluent limitations because of factors beyond the reasonable control of the Copermittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

(1) Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of Standard Provisions – Permit Compliance (h)(2) below are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

(2) Conditions necessary for a demonstration of upset. A Copermittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

i) An upset occurred and that the Copermittee can identify the cause(s) of the upset;
ii) The permitted facility was at the time being properly operated;
iii) The Copermittee submitted notice of the upset as required in Standard Provisions – Permit Compliance (5)(e)(ii)(B) below (24-hour notice); and
iv) The Copermittee complied with any remedial measures required under Standard Provisions – Permit Compliance 1(c) above.

(3) Burden of Proof. In any enforcement proceeding, the Copermittee seeking to establish the occurrence of an upset has the burden of proof.

2. STANDARD PROVISIONS – PERMIT ACTION

(a) *General* [40 CFR 122.41(f)] This Order may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Copermittee for modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any Order condition.

(b) *Duty to reapply* [40 CFR 122.41(b)]. If the Copermittee wishes to continue an activity regulated by this Order after the expiration date of this Order, the Copermittee must apply for and obtain new permit.

(c) *Transfers*. This Order is not transferable to any person except after notice to the Regional Board. The Regional Board may require modification or revocation and

reissuance of the Order to change the name of the Copermittee and incorporate such other requirements as may be necessary under the CWA and the CWC.

3. STANDARD PROVISIONS – MONITORING

(a) Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. [40 CFR Section 122.41 (j) (1)]

(b) Monitoring results must be conducted according to test procedures under 40 CFR Part 136, or in the case of sludge use or disposal, approved under 40 CFR Part 136 unless otherwise specified in 40 CFR Part 503 unless other test procedures have been specified in this Order [40 CFR Section 122.41(j)(4)][40 CFR Section 122.44(i)(1)(iv)].

4. STANDARD PROVISIONS – RECORDS

(a) Except for records of monitoring information required by this Order related to the Copermittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five years (or longer as required by 40 CFR Part 503), the Copermittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this Order, and records of all data used to complete the application for this Order, for a period of at least three (3) years from the date of the sample, measurement, report or application, This period may be extended by request of the Regional Water Board Executive Officer at any rime [40 CFR Section 122.41(j)(2)].

(b) *Records of monitoring information* [40 CFR 122.41(j) (3)] shall include:

(1) The date, exact place, and time of sampling or measurements;
(2) The individual(s) who performed the sampling or measurements;
(3) The date(s) analyses were performed;
(4) The individual(s) who performed the analyses;
(5) The analytical techniques or methods used; and
(6) The results of such analyses.

(c) *Claims of confidentiality* [40 CFR Section 122.7(b)] of the following information will be denied:

(1) The name and address of any permit applicant or Copermittee; and
(2) Permit applications and attachments, permits and effluent data.

5. STANDARD PROVISIONS – REPORTING

(a) *Duty to provide information* [40 CFR 122.41(h)]. The Copermittee shall furnish to the Regional Board, SWRCB, or USEPA within a reasonable time, any information which the Regional Board, SWRCB, or USPEA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this Order or to determine compliance with this Order. Upon request, the Copermittee shall also furnish to the Regional Board, SWRCB, or USEPA, copies of records required to be kept by this Order.

(b) *Signatory and Certification Requirements* [40 CFR 122.41(k)]

(1) All applications, reports, or information submitted to the Regional Board, SWRCB, or USEPA shall be signed and certified in accordance with Standard Provisions – Reporting 5(b)ii), 5(b)iii), 5(b)iv), and 5(b) (see 40 CFR 122.22)

(2) *Applications* [40 CFR 122.22(a)(3)] All permit applications shall be signed by either a principal executive officer or ranking elected official.

(3) *Reports* [40 CFR 122.22(b)]. All reports required by this Order, and other information requested by the Regional Board, SWRCB, or USEPA shall be signed by a person described in Standard Provisions – Reporting 5(b)(2) above, or by a duly authorized representative of that person. A person is a duly authorized representative only if:

i) The authorization is made in writing by a person described in Standard Provisions-Reporting 5(b)(2) above;

ii) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.); and,

iii) The written authorization is submitted to the Regional Water Board and State Water Board.

(4) *Changes to authorization* [40 CFR Section 122.22(c)] If an authorization under Standard Provisions – Reporting 5(b)(3)of this reporting requirement is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of Standard Provisions – Reporting 5(b)(3) above must be submitted to the Regional Water Board and State Water Board prior to or together with any reports, information, or applications to be signed by an authorized representative.

(5) *Certification* [40 CFR Section 122.22(d)] Any person signing a document under Standard Provisions – Reporting 5(b)(2), or 5(b)(3) above shall make the following certification:

”I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.”

(c) *Monitoring reports*. [40 CFR 122.41(l)(4)]

(1) Monitoring results shall be reported at the intervals specified in the Receiving Waters and Runoff Monitoring and Reporting Program No. R9-2009-0002.

(2) Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the Regional Board or SWRCB for reporting results of mentoring of sludge use or disposal practices.

(3) If the Copermittee monitors any pollutant more frequently than required by this Order using test procedures approved under 40 CFR Part 136 or, in the case of sludge use or disposal, approved under 40 CFR Part 136 unless otherwise specified in 40 CFR Part 503, or as specified in this Order, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the Regional Board.

(4) Calculations for all limitations, which require averaging of measurements, shall utilize an arithmetic mean unless otherwise specified in this Order.

(d) *Compliance schedules*. [40 CFR Section 122.41(l)(5)] Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this Order shall be submitted no later than 14 days following each schedule date.

(e) *Twenty-four hour reporting* [40 CFR Section 122.41(l)(6)]

(1) The Copermittee shall report any noncompliance that may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the Copermittee becomes aware of the circumstances. A written submission shall also be provided within five (5) days of the time the Copermittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

(2) The following shall be included as information, which must be reported within 24 hours under this paragraph:

i) Any unanticipated bypass that exceeds any effluent limitation in the Order (See 40 CFR 122.41(g)).
ii) Any upset which exceeds any effluent limitation in this Order.

(3) The Regional Board may waive the above-required written report under this provision on a case-by-case basis if the oral report has been received within 24 hours.

(f) *Planned changes*. [40 CFR Section 122.41(l)(1)] The Copermittee shall give notice to the Regional Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required under this provision only when:

(1) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); or

(2) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants, which are not subject to effluent limitations in this Order.

(3) The alteration or addition results in a significant change in the Copermittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing Order, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan.

(g) *Anticipated noncompliance*. [40 CFR Section 122.41(l)(7)] The Copermittee shall give advance notice to the Regional Board or SWRCB of any planned changes in the permitted facility or activity, which may result in noncompliance with Order requirements.

(h) *Other noncompliance* [40 CFR Section 122.41(l) 7)] The Copermittee shall report all instances of noncompliance not reported under Standard Provisions 5(c), 5(d), and 5(e) above, at the time monitoring reports are submitted. The reports shall contain the information listed in Standard Provision – Reporting 5(e) above.

(i) *Other information* [40 CFR Section 122.41(l)(8)] When the Copermittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Regional Board, SWRCB, or USEPA, the Copermittee shall promptly submit such facts or information.

6. STANDARD PROVISIONS – ENFORCEMENT

(a) The Regional Board is authorized to enforce the terms of this permit under several provisions of the CWC, including, but not limited to, Sections 13385, 13386, and 13387.

7. ADDITIONAL STANDARD PROVISIONS

(a) *Municipal separate storm sewer systems* [40 CFR 122.42(c)]. The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the Director under 40 CFR 122.26(a)(1)(v) must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report shall include:

(1) The status of implementing the components of the storm water management program that are established as permit conditions;

(2) Proposed changes to the storm water management programs that are established as permit conditions. Such proposed changes shall be consistent with 40 CFR 122.26(d)(2)(iii); and

(3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under 40 CFR 122.26(d)(2)(iv) and 40 CFR

122.26(d)(2)(v);

(4) A summary of data, including monitoring data, that is accumulated throughout the reporting year;

(5) Annual expenditures and budget for year following each annual report;

(6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; and

(7) Identification of water quality improvements or degradation.

(b) *Storm water discharges* [40 CFR 122.42(d)]. The initial permits for discharges composed entirely of storm water issued pursuant to 40 CFR 122.26(e)(7) shall require compliance with the conditions of the permit as expeditiously as practicable, but in no event later than three years after the date of issuance of the permit.

(c) *Other Effluent Limitations and Standards* [40 CFR 122.44(b)(1)]. If any toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant which is present in the discharge and that standard or prohibition is more stringent than any limitation on the pollutant in this Order, the Regional Board may institute proceedings under these regulations to modify or revoke and reissue the Order to conform to the toxic effluent standard or prohibition.

(d) *Discharge is a privilege* [CWC section 13263(g)]. No discharge of waste into the waters of the State, whether or not such discharge is made pursuant to waste discharge requirements, shall create a vested right to continue such discharge. All discharges of waste into waters of the State are privileges, not rights.

(e) *Review and revision of Order* [CWC section 13263(e)]. Upon application by any affected person, or on its own motion, the Regional Board may review and revise this permit.

(f) *Termination or modification of Order* [CWC section13381]. This permit may be terminated or modified for causes, including, but not limited to, all of the following:

(1) Violation of any condition contained in this Order.
(2) Obtaining this Order by misrepresentation, or failure to disclose fully all relevant facts.
(3) A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge.

(g) *Transfers*. When this Order is transferred to a new owner or operator, such requirements as may be necessary under the CWC may be incorporated into this Order.

(h) *Conditions not stayed*. The filing of a request by the Copermittee for modification, revocation and reissuance, or termination of this Order, or a notification of planned change in or anticipated noncompliance with this Order does not stay any condition of this Order.

(i) *Availability*. A copy of this Order shall be kept at a readily accessible location and shall be available to on-site personnel at all times.

(j) *Duty to minimize or correct adverse impacts*. The Copermittees shall take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this Order, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the noncompliance.

(k) *Interim Effluent Limitations.* The Copermittee shall comply with any interim effluent limitations as established by addendum, enforcement action, or revised waste discharge requirements which have been, or may be, adopted by this Regional Board.

(l) *Responsibilities, liabilities, legal action, penalties* [CWC sections 13385 and 13387]. The Porter-Cologne Water Quality Control Act provides for civil and criminal penalties comparable to, and in some cases greater than, those provided for under the CWA.

Nothing in this Order shall be construed to protect the Copermittee from its liabilities under federal, state, or local laws.

Except as provided for in 40CFR 122.41(m) and (n), nothing in this Order shall be construed to relieve the Copermittee from civil or criminal penalties for noncompliance.

Nothing in this Order shall be construed to preclude the institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties to which the Copermittee is or may be subject to under Section 311 of the CWA.

Nothing in this Order shall be construed to preclude institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authoring preserved by Section 510 of the CWA.

(m) *Noncompliance*. Any noncompliance with this Order constitutes violation of the CWA and is grounds for denial of an application or modification of the Order (also see 40 CFR 122.41(a)).

(n) *Director*. For purposes of this Order, the term “Director” used in parts of 40 CFR incorporated into this Order by reference and/or applicable to this Order shall have the same meaning as the term “Regional Board” used elsewhere in this Order, except that in 40 CFR 122.41(h) and (I), “Director” shall mean “Regional Board, SWRCB, and USEPA.”

(o) The Regional Board has, in prior years, issued a limited number of individual NPDES permits for non-storm water discharges to MS4s. The Regional Board or SWRCB may in the future, upon prior notice to the Copermittee(s), issue an NPDES permit for any non-storm water discharge (or class of non-storm water discharges) to a MS4. Copermittees may prohibit any non-storm water discharge (or class of non-storm water discharges) to a MS4 that is authorized under such separate NPDES permits.

(p) *Effective date*. This Order shall become effective on the date of its adoption provided the USEPA has no objection. If the USEPA objects to its issuance, this Order shall not become effective until such objection is withdrawn. This Order supersedes Order No. 2001-01 upon the effective date of this Order.

(q) *Expiration*. This Order expires five years after adoption.

(r) *Continuation of expired order* [23 CCR 2235.4]. After this Order expires, the terms and conditions of this Order are automatically continued pending issuance of a new permit if all requirements of the federal NPDES regulations on the continuation of expired permits (40 CFR 122.6) are complied with.

(s) *Applications*. Any application submitted by a Copermittee for reissuance or modification of this Order shall satisfy all applicable requirements specified in federal regulations as well as any additional requirements for submittal of a Report of Waste Discharge specified in the CWC and the California Code of Regulations.

(t) *Confidentiality*. Except as provided for in 40 CFR 122.7, no information or documents submitted in accordance with or in application for this Order will be considered confidential, and all such information and documents shall be available for review by the public at the Regional Board office.

(u) *Severability*. The provisions of this Order are severable, and if any provision of this Order, or the application of any provisions of this Order to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this Order shall not be affected thereby.

(v) R*eport submittal*. The Copermittee shall submit reports and provide notifications as required by this Order to the following:

NORTHERN WATERSHED UNIT
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
9174 SKY PARK COURT, SUITE 100
SAN DIEGO CA 92123-4340
Telephone: (858) 467-2952 Fax: (858) 571-6972

EUGENE BROMLEY
US ENVIRONMENTAL PROTECTION AGENCY
REGION IX
PERMITS ISSUANCE SECTION (W-5-1)
75 HAWTHORNE STREET
SAN FRANCISCO CA 94105

Unless otherwise directed, the Copermittee shall submit one hard copy for the official record and one electronic copy of each report required under this Order to the Regional Board and one electronic copy to the EPA.

ATTACHMENT C

ACRONYMS AND ABBREVIATIONS

ADT	Average Daily Traffic
AMAL	Average Monthly Action Level
ASBS	Area of Special Biological Significance
AST	Active/Passive Sediment Treatment
BMP	Best Management Practice
Basin Plan	Water Quality Control Plan for the San Diego Basin
BU	Beneficial Use
CASQA	California Stormwater Quality Association
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWC	California Water Code
CZARA	Coastal Zone Act Reauthorization Amendments of 1990
DAMP	Drainage Area Management Plan
DNQ	Detected, but not Quantified
EIA	Effective Impervious Area
ESAs	Environmentally Sensitive Areas
GIS	Geographic Information System
HMP	Hydromodification Management Plan
IBI	Index of Biotic Integrity
JRMP	Jurisdictional Runoff Management Plan
LID	Low Impact Development
MDAL	Maximum Daily Action Level
MEP	Maximum Extent Practicable
ML	Minimum Level
MS4	Municipal Separate Storm Sewer System
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
Copermittees	County of Riverside, the 4 incorporated cities within the County of Riverside in the San Diego Region, and the Riverside County Flood Control District
RGOs	Retail Gasoline Outlets
ROWD	Riverside County Copermittees' Report of Waste Discharge (application for NPDES reissuance)
RWLs	Receiving Water Limitations
SAL	Storm Water Action Level
San Diego Water Board	California Regional Water Quality Control Board, San Diego Region
SIC	Standard Industrial Classification Code
SSMP	Standard Urban Storm Water Mitigation Plan
State Board	State Water Resources Control Board
SWQPA	State Water Quality Protected Area
TMDL	Total Maximum Daily Load

USEPA	United States Environmental Protection Agency
WLA	Waste Load Allocation
WQMP	Water Quality Management Plan
WRMP	Watershed Runoff Management Plan

DEFINITIONS

Active/Passive Sediment Treatment - Using mechanical, electrical or chemical means to flocculate or coagulate suspended sediment for removal from runoff from construction sites prior to discharge.

Anthropogenic Litter – Trash generated from human activities, not including sediment.

Average Monthly Action Level – the highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month.

Basin Plan – Water Quality Control Plan, San Diego Basin, Region 9, and amendments, developed by the Regional Board.

Beneficial Uses - The uses of water necessary for the survival or well being of man, plants, and wildlife. These uses of water serve to promote tangible and intangible economic, social, and environmental goals. "Beneficial Uses" of the waters of the State that may be protected include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. Existing beneficial uses are uses that were attained in the surface or ground water on or after November 28, 1975; and potential beneficial uses are uses that would probably develop in future years through the implementation of various control measures. "Beneficial Uses" are equivalent to "Designated Uses" under federal law. [California Water Code Section 13050(f)].

Best Management Practices (BMPs) - Defined in 40 CFR 122.2 as schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. In the case of municipal storm water permits, BMPs are typically used in place of numeric effluent limits.

Bioassessment - The use of biological community information to evaluate the biological integrity of a water body and its watershed. With respect to aquatic ecosystems, bioassessment is the collection and analysis of samples of the benthic macroinvertebrate community together with physical/habitat quality measurements associated with the sampling site and the watershed to evaluate the biological condition (i.e. biological integrity) of a water body.

Biocriteria - Under the CWA, numerical values or narrative expressions that define a desired biological condition for a water body that are legally enforceable. The USEPA

defines biocriteria as: "numerical values or narrative expressions that describe the reference biological integrity of aquatic communities inhabiting waters of a given designated aquatic life use… (that)…describe the characteristics of water body segments least impaired by human activities."

Biofiltration - refers to practices that use vegetation and amended soils to detain and treat runoff from impervious areas. Treatment is through filtration, infiltration, adsorption, ion exchange, and biological uptake of pollutants.

Biological Integrity - Defined in Karr J.R. and D.R. Dudley. 1981. Ecological perspective on water quality goals. Environmental Management 5:55-68 as: "A balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitat of the region." Also referred to as ecosystem health.

Clean Water Act Section 402(p) [33 USC 1342(p)] - The federal statute requiring municipal and industrial dischargers to obtain NPDES permits for their discharges of storm water.

Clean Water Act Section 303(d) Water Body - An impaired water body in which water quality does not meet applicable water quality standards and/or is not expected to meet water quality standards, even after the application of technology based pollution controls required by the CWA. The discharge of runoff to these water bodies by the Copermittees is significant because these discharges can cause or contribute to violations of applicable water quality standards.

Construction Site – Any project, including projects requiring coverage under the General Construction Permit, that involves soil disturbing activities including, but not limited to, clearing, grading, disturbances to ground such as stockpiling, and excavation.

Contamination - As defined in the Porter-Cologne Water Quality Control Act, contamination is "an impairment of the quality of waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste whether or not waters of the State are affected."

Critical Channel Flow (Qc) – The channel flow that produces the critical shear stress that initiates bed movement or that erodes the toe of channel banks. When measuring Qc, it should be based on the weakest boundary material – either bed or bank.

CWA – Federal Clean Water Act

CWC – California Water Code

Daily Discharge – Daily Discharge is defined as either: (1) the total mass of the constituent discharged over the calendar day or any 24 hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g. concentration.)

The Daily Discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day, or other 24 hour period other than a day), or by the arithmetic mean of analytical results from one or more grab samples taken over the course of a day.

Detected, but not Quantified – those sample results less than the reporting level, but greater than or equal to the laboratory's Method of Detection Limit (MDL.)

Development Projects - Construction, rehabilitation, redevelopment, or reconstruction of any public or private residential project, industrial, commercial, or any other projects.

Dilution Credit – the amount of dilution granted to a discharger in the calculation of a WQBEL, based on the allowance of a specific mixing zone. It is calculated from the dilution ratio, or determined through conducting of a mixing zone study, or modeling of the discharge and receiving water.

Dry Season – May 1 through September 30 of each year.

Dry Weather – weather is considered dry if the preceding 72 hours has been without precipitation.

Effectiveness Assessment Outcome Level 1 - Compliance with Activity-based Permit Requirements – Level 1 outcomes are those directly related to the implementation of specific activities prescribed by this Order or established pursuant to it.

Effectiveness Assessment Outcome Level 2 - Changes in Attitudes, Knowledge, and Awareness – Level 2 outcomes are measured as increases in knowledge and awareness among target audiences such as residents, businesses, and municipal employees.

Effectiveness Assessment Outcome Level 3 - Behavioral Change and BMP Implementation – Level 3 outcomes measure the effectiveness of activities in affecting behavioral change and BMP implementation.

Effectiveness Assessment Outcome Level 4 - Load Reductions – Level 4 outcomes measure load reductions which quantify changes in the amounts of pollutants associated with specific sources before and after a BMP or other control measure is employed.

Effectiveness Assessment Outcome Level 5 - Changes in Runoff and Discharge Quality – Level 5 outcomes are measured as changes in one or more specific constituents or stressors in discharges into or from MS4s.

Effectiveness Assessment Outcome Level 6 - Changes in Receiving Water Quality – Level 6 outcomes measure changes to receiving water quality resulting from discharges into and from MS4s, and may be expressed through a variety of means such as compliance with water quality objectives or other regulatory benchmarks, protection of biological integrity, or beneficial use attainment.

Enclosed Bays – Enclosed bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all

bays where the narrowest distance between the headlands or outermost bay works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays do not include inland surface waters or ocean waters.

Erosion – When land is diminished or worn away due to wind, water, or glacial ice. Often the eroded debris (silt or sediment) becomes a pollutant via storm water runoff. Erosion occurs naturally but can be intensified by land clearing activities such as farming, development, road building, and timber harvesting.

Environmentally Sensitive Areas (ESAs) - Areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Resources Control Board (Water Quality Control Plan for the San Diego Basin (1994) and amendments); State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Resources Control Board (Water Quality Control Plan for the San Diego Basin (1994) and amendments); areas designated as preserves or their equivalent under the Natural Communities Conservation Program within the Cities and County of Orange; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.

Estuaries – waters, including coastal lagoons, located at the mouth of streams that serve as areas of mixing fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and ocean water. Estuaries do not include inland surface waters or ocean waters.

Feasibility Analysis – Detailed description of the selection process for the treatment control BMPs for a Priority Development Project, including justification of why one BMP is selected over another. For a Priority Development Project where a treatment control BMP with a low removal efficiency ranking (as identified by the Model SUSMP) is proposed, the analysis shall include a detailed and adequate justification exhibiting the reasons implementation of a treatment control BMP with a higher removal efficiency is infeasible for the Priority Development Project or portion of the Priority Development Project.

Flow Duration – The long-term period of time that flows occur above a threshold that causes significant sediment transport and may cause excessive erosion damage to creeks and streams (not a single storm event duration). The simplest way to visualize this is to consider a histogram of pre- and post-project flows using long-term records of hourly data. To maintain pre-project flow duration means that the total number of hours (counts) within each range of flows in a flow-duration histogram cannot increase between the pre- and post-project condition. Flow duration within the range of geomorphologically significant flows is important for managing erosion.

GIS – Geographic Information System

Grading - The cutting and/or filling of the land surface to a desired slope or elevation.

Hazardous Material – Any substance that poses a threat to human health or the environment due to its toxicity, corrosiveness, ignitability, explosive nature or chemical

reactivity. These also include materials named by the USEPA in 40 CFR 116 to be reported if a designated quantity of the material is spilled into the waters of the U.S. or emitted into the environment.

Hazardous Waste - Hazardous waste is defined as "any waste which, under Section 600 of Title 22 of this code, is required to be managed according to Chapter 30 of Division 4.5 of Title 22 of this code" [CCR Title 22, Division 4.5, Chapter 11, Article 1].

Household Hazardous Waste – Paints, cleaning products, and other wastes generated during home improvement or maintenance activities.

Hydromodification – The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, interflow and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

Illicit Connection – Any connection to the MS4 that conveys an illicit discharge.

Illicit Discharge - Any discharge to the MS4 that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from fire fighting activities [40 CFR 122.26(b)(2)].

Implementation Assessment – Assessment conducted to determine the effectiveness of Copermittee programs and activities in achieving measurable targeted outcomes, and in determining whether priority sources of water quality problems are being effectively addressed.

Inactive Slopes – Slopes on which no grading or other soil disturbing activities are conducted for 10 or more days.

Inland Surface Waters – all surface waters of the State that do not include the ocean, enclosed bays, or estuaries.

Integrated Assessment – Assessment to be conducted to evaluate whether program implementation is properly targeted to and resulting in the protection and improvement of water quality.

Jurisdictional Runoff Management Plan (JRMP) – A written description of the specific jurisdictional runoff management measures and programs that each Copermittee will implement to comply with this Order and ensure that storm water pollutant discharges in runoff are reduced to the MEP and do not cause or contribute to a violation of water quality standards.

Low Impact Development (LID) – A storm water management and land development strategy that emphasizes conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions.

Low Impact Development Best Management Practices (LID BMPs) – LID BMPs include schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States through storm water management and land development strategies that emphasize conservation sand the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions. LID BMPs include retention practices that do not allow runoff, such as infiltration, rain water harvesting and reuse, and evapotranspiration. LID BMPs also include flow-through practices such as biofiltration that may have some discharge of storm water following pollutant reduction.

Maximum Daily Action Level (MDAL) – is the highest allowable daily discharge of a pollutant, over a calendar day (or 24 hour period). For pollutants with action levels expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with action levels expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

Maximum Extent Practicable (MEP) – The technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) for storm water that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) <u>in combination</u> with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than BAT. A definition for MEP is not provided either in the statute or in the regulations. Instead the definition of MEP is dynamic and will be defined by the following process over time: municipalities propose their definition of MEP by way of their runoff management programs. Their total collective and individual activities conducted pursuant to the runoff management programs becomes their proposal for MEP as it applies both to their overall effort, as well as to specific activities (e.g., MEP for street sweeping, or MEP for MS4 maintenance). In the absence of a proposal acceptable to the Regional Board, the Regional Board defines MEP.

In a memo dated February 11, 1993, entitled "Definition of Maximum Extent Practicable," Elizabeth Jennings, Senior Staff Counsel, SWRCB addressed the achievement of the MEP standard as follows:

> "*To achieve the MEP standard, municipalities must employ whatever Best Management Practices (BMPs) are technically feasible (i.e., are likely to be effective) and are not cost prohibitive. The major emphasis is on technical feasibility. Reducing pollutants to the MEP means choosing effective BMPs, and rejecting applicable BMPs only where other effective BMPs will serve the same purpose, or the BMPs would not be technically feasible, or the cost would be prohibitive. In selecting BMPs to achieve the MEP standard, the following factors may be useful to consider:*
>
> *a. Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?*

b. Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?
c. Public Acceptance: Does the BMP have public support?
d. Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?
e. Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc?

The final determination regarding whether a municipality has reduced pollutants to the maximum extent practicable can only be made by the Regional or State Water Boards, and not by the municipal discharger. If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit derived, it would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs that would address a pollutant source, or to pick a BMP base solely on cost, which would be clearly less effective. In selecting BMPs the municipality must make a serious attempt to comply and practical solutions may not be lightly rejected. In any case, the burden would be on the municipal discharger to show compliance with its permit. After selecting a menu of BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented."

Minimum Level – the concentration at which the entire analytical system must give a recognizable signal and acceptable calibration point. The ML is the concentration in a sample that is equivalent to the concentration of the lowest calibration standard analyzed by a specific analytical procedure, assuming that all the method sample weights, volumes and processing steps have been followed.

Monitoring Year – the monitoring year includes a full wet season and dry season, beginning annually on October 1st and ending on September 30th.

Municipal Separate Storm Sewer System (MS4) – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designated or used for collecting or conveying storm water; (iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.26.

National Pollutant Discharge Elimination System (NPDES) - The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the CWA.

NOI – Notice of Intent

Non-Storm Water - All discharges to and from a MS4 that do not originate from precipitation events (i.e., all discharges from a MS4 other than storm water). Non-storm water includes illicit discharges, non-prohibited discharges, and NPDES permitted discharges.

Nuisance - As defined in the Porter-Cologne Water Quality Control Act a nuisance is "anything which meets all of the following requirements: 1) Is injurious to health, or is indecent, or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. 2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. 3) Occurs during, or as a result of, the treatment or disposal of wastes."

Ocean Waters – the territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the State Board's California Ocean Plan.

Order – Order No. R9-2009-0002 (NPDES No. CAS0108740)

Person - A person is defined as an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof [40 CFR 122.2].

Point Source - Any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, landfill leachate collection systems, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

Pollutant - Any agent that may cause or contribute to the degradation of water quality such that a condition of pollution or contamination is created or aggravated.

Pollution - As defined in the Porter-Cologne Water Quality Control Act: "the alteration of the quality of the waters of the State by waste, to a degree that unreasonably affects the either of the following: 1) The waters for beneficial uses; or 2) Facilities that serve these beneficial uses." Pollution may include contamination.

Pollutants of Concern – Pollutants for which water bodies are listed as impaired under CWA section 303(d), pollutants associated with the land use type of a development, and/or pollutants commonly associated with runoff. Pollutants commonly associated with runoff include total suspended solids; sediment; pathogens (e.g., bacteria, viruses, protozoa); heavy metals (e.g., copper, lead, zinc, and cadmium); petroleum products and polynuclear aromatic hydrocarbons; synthetic organics (e.g., pesticides, herbicides,

and PCBs); nutrients (e.g., nitrogen and phosphorus fertilizers); oxygen-demanding substances (decaying vegetation, animal waste, and anthropogenic litter).

Pollution Prevention - Pollution prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control BMPs, treatment control BMPs, or disposal.

Post-Construction BMPs - A subset of BMPs including structural and non-structural controls which detain, retain, filter, or educate to prevent the release of pollutants to surface waters during the final functional life of developments.

Pre-Project or Pre-Development Runoff Conditions (Discharge Rates, Durations, Etc.) – Runoff conditions that exist onsite immediately before the planned development activities occur. This definition is not intended to be interpreted as that period before any human-induced land activities occurred. This definition pertains to redevelopment as well as initial development.

Principal Copermittee – County of Orange

Priority Development Projects - New development and redevelopment project categories listed in Section F.1.d(2) of Order No. R9-2009-0002.

Rainy Season – (aka Wet Season) is the period of time from October 1 forward to April 30 when the San Diego region experiences the most rainfall.

Receiving Waters – Waters of the United States.

Receiving Water Limitations (RWLs) - Waste discharge requirements issued by the Regional Board typically include both: (1) “Effluent Limitations” (or “Discharge Limitations”) that specify the technology-based or water-quality-based effluent limitations; and (2) “Receiving Water Limitations” that specify the water quality objectives in the Basin Plan as well as any other limitations necessary to attain those objectives. In summary, the “Receiving Water Limitations” provision is the provision used to implement the requirement of CWA section 301(b)(1)(C) that NPDES permits must include any more stringent limitations necessary to meet water quality standards.

Redevelopment - The creation, addition, and or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include trenching and resurfacing associated with utility work; resurfacing existing roadways; new sidewalk construction, pedestrian ramps, or bikelane on existing roads; and routine replacement of damaged pavement, such as pothole repair.

Retain – to keep or hold in a particular place, condition, or position without discharge to surface waters.

Runoff - All flows in a storm water conveyance system that consists of the following components: (1) storm water (wet weather flows) and (2) non-storm water including dry weather flows.

San Diego Water Board – As used in this document the term "San Diego Water Board" is synonymous with the term "Regional Board" as defined in Water Code section 13050(b) and is intended to refer to the California Regional Water Quality Control Board for the San Diego Region as specified in Water Code Section 13200.

Sediment - Soil, sand, and minerals washed from land into water. Sediment resulting from anthropogenic sources (i.e. human induced land disturbance activities) is considered a pollutant. This Order regulates only the discharges of sediment from anthropogenic sources and does not regulate naturally occurring sources of sediment. Sediment can destroy fish-nesting areas, clog animal habitats, and cloud waters so that sunlight does not reach aquatic plants.

Shared Treatment Control BMP - BMPs used by multiple developments to infiltrate, filter, or treat the required volume or flow prior to discharge to a receiving water. This could include, for example, a treatment BMP at the end of an enclosed storm drain that collects runoff from several commercial developments.

Source Control BMP – Land use or site planning practices, or structural or nonstructural measures that aim to prevent runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between pollutants and runoff.

State Water Quality Protection Area – A nonterrestrial marine or estuarine area designated to protect marine species or biological communities from an undesirable alteration in natural water quality, including, but not limited to, areas of special biological significance that have been designated by the State Water Resources Control Board through its water quality control planning process. Areas of special biological significance are a subset of State Water Quality Protection Areas, and require special protection as determined by the State Water Resources Control Board pursuant to the California Ocean Plan adopted and reviewed pursuant to Article 4 (commencing with Section 13160) of Chapter 3 of Division 7 of the California Water Code and pursuant to the Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California (California Thermal Plan) adopted by the state board.

Storm Water – Per 40 CFR 122.26(b)(13), means storm water runoff, snowmelt runoff and surface runoff and drainage. Surface runoff and drainage pertains to runoff and drainage resulting from precipitation events.

Standard Storm Water Mitigation Plan (SSMP) – A plan developed to mitigate the impacts of runoff from Priority Development Projects.

Third Party Inspectors - Industrial and commercial facility inspectors who are not contracted or employed by a regulatory agency or group of regulatory agencies, such as the Regional Board or Copermittees. The third party inspector is not a regular facility employee self-inspecting their own facility. The third party inspector could be a contractor or consultant employed by a facility or group of businesses to conduct inspections.

Total Maximum Daily Load (TMDL) - The maximum amount of a pollutant that can be discharged into a water body from all sources (point and non-point) and still maintain water quality standards. Under CWA section 303(d), TMDLs must be developed for all water bodies that do not meet water quality standards after application of technology-based controls.

Toxicity - Adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies). The water quality objectives for toxicity provided in the Water Quality Control Plan, San Diego Basin, Region 9, (Basin Plan), state in part…"All waters shall be free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life….The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge".

Treatment Control BMP – Any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media absorption or any other physical, biological, or chemical process.

Unpaved Road – is a long, narrow stretch without pavement used for traveling by motor passenger vehicle between two or more points. Unpaved roads are generally constructed of dirt, gravel, aggregate or macadam and may be improved or unimproved.

Waste - As defined in CWC Section 13050(d), "waste includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal."

Article 2 of CCR Title 23, Chapter 15 (Chapter 15) contains a waste classification system that applies to solid and semi-solid waste, which cannot be discharged directly or indirectly to water of the state and which therefore must be discharged to land for treatment, storage, or disposal in accordance with Chapter 15. There are four classifications of waste (listed in order of highest to lowest threat to water quality): hazardous waste, designated waste, non-hazardous solid waste, and inert waste.

Water Quality Assessment – Assessment conducted to evaluate the condition of non-storm water and storm water discharges, and the water bodies which receive these discharges.

Water Quality Objective - Numerical or narrative limits on constituents or characteristics of water designated to protect designated beneficial uses of the water. [California Water Code Section 13050 (h)]. California's water quality objectives are established by the State and Regional Water Boards in the Water Quality Control Plans. Numeric or narrative limits for pollutants or characteristics of water designed to protect the beneficial uses of the water. In other words, a water quality objective is the maximum concentration of a pollutant that can exist in a receiving water and still generally ensure that the beneficial uses of the receiving water remain protected (i.e., not impaired). Since water quality objectives are designed specifically to protect the

beneficial uses, when the objectives are violated the beneficial uses are, by definition, no longer protected and become impaired. This is a fundamental concept under the Porter Cologne Act. Equally fundamental is Porter Cologne's definition of pollution. A condition of pollution exists when the water quality needed to support designated beneficial uses has become unreasonably affected or impaired; in other words, when the water quality objectives have been violated. These underlying definitions (regarding beneficial use protection) are the reason why all waste discharge requirements implementing the federal NPDES regulations require compliance with water quality objectives. (Water quality objectives are also called water quality criteria in the CWA.)

Water Quality Standards - The beneficial uses (e.g., swimming, fishing, municipal drinking water supply, etc.,) of water and the water quality objectives necessary to protect those uses.

Waters of the State - Any water, surface or underground, including saline waters within the boundaries of the State [CWC section 13050 (e)]. The definition of the Waters of the State is broader than that for the Waters of the United States in that all water in the State is considered to be a Waters of the State regardless of circumstances or condition. Under this definition, a MS4 is always considered to be a Waters of the State.

Waters of the United States - As defined in the 40 CFR 122.2, the Waters of the U.S. are defined as: "(a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate "wetlands;" (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters otherwise defined as waters of the United States under this definition: (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial seas; and (g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA."

Watershed - That geographical area which drains to a specified point on a water course, usually a confluence of streams or rivers (also known as drainage area, catchment, or river basin).

Watershed Runoff Management Plan (WRMP) – A written description of the specific watershed runoff management measures and programs that each watershed group of Copermittees will implement to comply with this Order and ensure that storm water pollutant discharges in runoff are reduced to the MEP and do not cause or contribute to a violation of water quality standards.

WDRs – Waste Discharge Requirements

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ATTACHMENT D

SCHEDULED SUBMITTALS SUMMARY AND REPORTING CHECKLIST

Submittal	Permit Section	Completion Date	Frequency
Prohibitions on dry-weather discharges not listed in Section B.2	B.2	July 1, 2012, then in JRMP Annual Report	Annual
Submit Certified Statement of Adequate Legal Authority	E.2	June 30, 2012	One time
Updated SSMP	F.1.d, K.2.a	June 30, 2012	One time
Identify and remove barriers to LID implementation	F.1.d.(4)(a)(v)	With JRMP Annual Report	Annual
Hydromodification Management Plan	F.1.h.(5), K.2.b	June 30, 2013	One Time for Draft
Flood Control Structure BMP Inventory and Evaluation	F.3.a.(4)	With JRMP Annual Report	Annual
Retrofitting Program	F.3.d.(3)	With JRMP Annual Report	Annual
Updated Watershed Workplans	G.1 K.1.b	June 30, 2012	One time
Fiscal Analysis	H.3	With JRMP Annual Report	Annual
Updated Jurisdictional Runoff Management Plans	K.1.a	June 30, 2012	One time
Report of Waste Discharge	K.2.c	At least 180 days prior to expiration of this Order	One time
Principal Copermittee submits JRMP Annual Reports to Regional Board	K.3.a.(2)	October 31, 2013 and annually thereafter	Annual
Principal Copermittee submits Notification of Principal Copermittee	M	180 days after adoption of the Order	One Time

Jurisdictional Runoff Management Program Annual Report Checklist

In the JRMP Annual Report each Copermittee shall provide an Annual Report Checklist. The Annual Report Checklist must be no longer than 2 pages, be current as of the 1st day of the rainy season of that year, and include a signed certification statement. The Annual Report Summary Checklist must provide the following information:

Order Requirements
Were All Requirements of this Order Met?

Construction
Number of Active Sites
Number of Inactive Sites
Number of Sites Inspected
Number of Inspections
Number of Violations
Number of Construction Enforcement Actions Taken

New Development
Number of Development Plan Reviews
Number of Grading Permits Issued
Number of Projects Exempted from Interim/Final Hydromodification Requirements

Post Construction Development
Number of Priority Development Projects
Number of SUSMP Required Post-Construction BMP Inspections
Number of SUSMP Required Post-Construction BMP Violations
Number of SUSMP Required Post-Construction BMP Enforcement Actions Taken

Illicit Discharges and Connections
Number of IC/ID Inspections
Number of IC/ID Detections by Staff
Number of IC/ID Detections from the Public
Number of IC/ID Eliminations
Number of IC/ID Violations
Number of IC/ID Enforcement Actions Taken

MS4 Maintenance
Number of Inspections Conducted
Amount of Waste Removed
Total Miles of MS4 Inspected

Municipal/Commercial/Industrial
Number of Facilities
Number of Inspections Conducted
Number of Facilities Inspected
Number of Violations
Number of Enforcement Actions Taken

Attachment E

RECEIVING WATERS AND MS4 DISCHARGE MONITORING AND REPORTING PROGRAM NO. R9-2010-0016

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I. PURPOSE

A. This Receiving Waters and MS4 Discharge Monitoring and Reporting Program (MRP) is intended to meet the following goals:
   1. Assess compliance with Order No. R9-2010-0016;
   2. Measure and improve the effectiveness of the Copermittees' runoff management programs;
   3. Assess the chemical, physical, and biological impacts to receiving waters resulting from MS4 discharges;
   4. Characterize storm water discharges;
   5. Identify sources of specific pollutants;
   6. Prioritize drainage and sub-drainage areas that need management actions;
   7. Detect and eliminate illicit discharges and illicit connections to the MS4;
   8. Assess the overall health of receiving waters; and
   9. Provide information to implement required BMP improvements.

B. This Receiving Waters and MS4 Discharges Monitoring and Reporting Program is designed to answer the following core management questions[1]:
   1. Are conditions in receiving waters protective, or likely to be protective, of beneficial uses?
   2. What is the extent and magnitude of the current or potential receiving water problems?
   3. What is the relative MS4 discharge contribution to the receiving water problem(s)?
   4. What are the sources of MS4 discharge that contribute to receiving water problem(s)?
   5. Are conditions in receiving waters getting better or worse?

II. MONITORING PROGRAM

The Monitoring Program is designed to assess the condition of receiving waters, monitor pollutants in storm and non-storm water effluent from the MS4, and conduct Special Studies to address conditions of concern. Where feasible, the Monitoring Program is designed to allow the Copermittees to combine required monitoring elements or efforts that are not mutually exclusive while still meeting the requirements of the Order.

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[1] Core management questions from "*Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California: A report from the Stormwater Monitoring Coalition's Model Monitoring Technical Committee.*" Technical Report No. 419. August 2004.

A. Receiving Waters Monitoring Program

Each Copermittee must collaborate with the other Copermittees to develop, conduct, and report on a year-round watershed based Receiving Waters Monitoring Program. The monitoring program design, implementation, analysis, assessment, and reporting must be conducted on a watershed basis for the Santa Margarita Hydrologic Unit (HU) and must be designed to meet the goals and answer the questions listed in section I above. The monitoring program must include the following components:

1. MASS LOADING STATION (MLS) MONITORING

a. Locations: The following existing mass loading stations must continue to be monitored: Lower Temecula Creek, Lower Murrieta Creek at the USGS Weir, and a permanent reference station.[2] Copermittees may propose, for San Diego Water Board review and approval, changing the location of a mass loading station.

b. Frequency: Each mass loading station must be monitored each year three times during wet weather events and twice during dry weather flow conditions.

c. Timing: Each mass loading station must be monitored for the first wet weather event of the season which meets USEPA's criteria described in 40 CFR 122.21(g)(7). Monitoring of the third wet weather event must be conducted after February 1. Dry weather mass loading monitoring events must be sampled at least three months apart between May and October. If flows are not evident for the second event, then sampling must be conducted during non-rain events in the following wet weather season.

d. Protocols: Protocols for mass loading sampling and analysis including analytical methods, target reporting limits, and data reporting formats must be compatible with the State Water Resources Control Board's (State Water Board's) State Surface Water Ambient Monitoring Program (SWAMP). If the mass loading sampling and analysis are determined to be impracticable with the SWAMP standards, the Copermittees must provide a written explanation and discussion in the submittal of the Planned Monitoring Program. Wet weather samples must be flow-weighted composites, collected for the duration of the entire runoff event. Where such monitoring is not practical, such as for large watersheds with significant groundwater recharge flows, composites must be collected at a minimum during the first 3 hours of

[2] A map depicting mass loading stations can be found in the Fact Sheet for Order R9-2010-0016.

flow. Dry weather event sampling must be time-weighted composites composed of 24 discrete hourly samples, whereby the mass loads of pollutants are calculated as the product of the composite sample concentration and the total volume of water discharged past the monitoring point during the time of sample collection.

(1) Automatic samplers must be used to collect samples from mass loading stations.

(2) Grab samples must be analyzed for temperature, pH, specific conductance, biochemical oxygen demand, oil and grease, E. coli , fecal coliform, enterococcus and for total petroleum hydrocarbons whenever a sheen is observed.

e. Copermittees must measure or estimate flow rates and volumes for each mass loading station sampling event to determine mass loadings of pollutants. Data from nearby USGS gauging stations may be utilized, or flow rates may be estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), Section 3.2.1.

f. In the event that the required number of sampling events are not conducted during one monitoring year at any given station, the Copermittees must provide a written explanation for the reduced number of sampling events in the subsequent Receiving Waters Monitoring Annual Report. The explanation must include, at a minimum, streamflow data from the nearest USGS gauging station, a full description of any equipment failures and subsequent remedies if applicable, efforts made to resample a future event, and any quality assurance or quality control issues encountered. The explanation must also include a description of steps taken to prevent further sampling failures.

g. The following constituents must be analyzed for each monitoring event at each station:

Table 1. Analytical Testing for Mass Loading (II.A.1) and Stream Assessment (II.A.2)

Conventionals, Nutrients, Hydrocarbons	Pesticides	Metals (Total and Dissolved)	Bacteriological (mass loading)
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • pH • Specific Conductance • Temperature • Dissolved Oxygen • Total Phosphorus • Dissolved Phosphorus • Nitrite ◌̊ • Nitrate ◌̊ • Total Kjeldahl Nitrogen • Ammonia • Biological Oxygen Demand, 5-day • Chemical Oxygen Demand • Total Organic Carbon • Dissolved Organic Carbon • Methylene Blue Active Substances • Oil and Grease • Sulfate	• Diazinon • Chlorpyrifos • Malathion • Carbamates • Pyrethroids	• Arsenic • Cadmium • Total Chromium • Hexavalent Chromium** • Copper • Lead • Iron • Manganese • Nickel • Selenium • Zinc • Mercury • Silver • Thallium	• E. coli • Fecal Coliform • Enterococcus

◌̊ Nitrate and nitrite may be combined and reported as nitrate + nitrite.
** Hexavalent Chromium sampling must occur only for mass loading stations for the 1st wet weather event and 1 dry weather event.

h. Toxicity testing must be conducted for each monitoring event at each station according to the following Table 2:

Table 2. Toxicity Testing for Mass Loading (II.A.1) and Stream Assessment (II.A.2)

Program Component	***Dry Weather Flows***	***Storm Water Flows***
	Freshwater Organisms	**Freshwater Organisms**
Mass Loading	3 chronic* 3 acute*	3 acute*
Stream Assessment**	3 chronic* 3 acute*	n/a
Sediment Toxicity Special Study	1 chronic 1 acute	n/a

Table Notes
* Toxicity testing must include use of *Pimephales promelas* (fathead minnow), *Hyalella azteca* and *Pseudokirchneriella subcapitata (*formerly *Selenastrum capricornutum,* unicellular algae).
** Duplicative toxicity testing is not required for Stream Assessment Monitoring stations co-located at mass loading stations since Stream Assessment Monitoring must be conducted in conjunction with dry weather mass loading.

Species Notes:
1. Acute toxicity may be determined during the course of chronic toxicity monitoring per U.S. EPA protocols.

i. The presence of acute toxicity must be determined in accordance with USEPA protocol (EPA-821-R-02-012). The presence of chronic freshwater toxicity must be determined in accordance with USEPA protocol (EPA-821-R-02-013).

2. <u>Stream Assessment Monitoring</u>

Copermittees must conduct Stream Assessment Monitoring using multiple lines of evidence to assess the condition of biological communities in freshwater receiving waters. Stream assessment must include the collection and reporting of the following specified instream biological, chemical, and physical (including habitat) data.

a. Locations: At a minimum, the program must consist of station identification, sampling, monitoring, and analysis of data for six stream assessment stations in order to determine the biological, chemical and physical integrity of streams within the County of Riverside. The two existing mass loading stations at Murrieta and Temecula Creeks must continue to be monitored. Copermittees may propose, for San Diego Water Board review and approval, changing the location of stream assessment monitoring stations where the mass loading stations

location has changed pursuant to section II.A.1.a. Two reference stream assessment stations, including the existing Adobe Creek station, must be identified, sampled, monitored, and analyzed. Locations of reference stations must be identified according to protocols outlined in "A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams," by Ode, et al. 2005.[3]

b. Frequency: Stream assessment stations must be monitored in May or June (to represent the influence of wet weather on the communities). The timing of monitoring of stream assessment stations located at mass loading stations must coincide with dry weather monitoring of those mass loading stations.

c. Parameters / Methods: Stream assessment monitoring must include bioassessment, aquatic chemistry, and aqueous toxicity.

(1) Aquatic chemistry and aqueous toxicity must be conducted as outlined in Tables 1 and 2 using the same parameters and methods as the mass loading station monitoring.

(2) Bioassessment analysis procedures must include calculation of the Index of Biotic Integrity (IBI) for benthic macroinvertebrates for all bioassessment stations, as outlined in "A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams," by Ode, et al. 2005.

(3) Monitoring of stream assessment stations must be conducted according to the most current bioassessment Standard Operating Procedures (SOP) developed by the Surface Water Ambient Monitoring Program (SWAMP), and amendments, as applicable.[4] In collecting macroinvertebrate samples, the discharger must use the "Reachwide Benthos (Multihabitat) Procedure." The discharger must conduct, concurrently with all required macroinvertebrate collections, the "full" suite of physical/habitat characterization measurements specified in the SWAMP Bioassessment SOP, and as summarized in the *SWAMP Stream Habitat Characterization Form — Full Version*. [5]

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[3] Ode, et al. 2005. "A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams." Environmental Management. Vol. 35, No. 1, pp. 1-13.

[4] Ode, P.R.. 2007. Standard operating procedures for collecting macroinvertebrate samples and associated physical and chemical data for ambient bioassessments in California. California State Water Resources Control Board Surface Water Ambient Monitoring Program (SWAMP) Bioassessment SOP 001. http://www.swrcb.ca.gov/water_issues/programs/swamp/tools.shtml#monitoring

[5] Available at: http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/reports/fieldforms_fullversion052908.pdf

(4) Monitoring of stream assessment stations must incorporate assessment of algae using SWAMP's SOP for Collecting Stream Algae Samples.[6] Assessment of freshwater algae must include algal taxonomic composition (diatoms and soft algae) and algal biomass. Future bioassessment must incorporate algal IBI scores, when developed.

d. A qualified professional environmental laboratory must perform all sampling, laboratory, quality assurance, and analytical procedures in accordance with the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan.[7] The Copermittees must utilize future Quality Assurance Project Plans as developed by SWAMP.

(1) The Copermittees must have and follow a quality assurance (QA) plan that covers the required stream assessment monitoring. External QA checks must be funded by the Copermittees, and performed by the California Department of Fish and Game's Aquatic Bioassessment Laboratory. An alternate laboratory with equivalent expertise and performance may be used if approved in advance in writing by San Diego Water Board.

(2) Identified organisms must be archived (i.e., retained) by the Copermittee(s) for a period of not less than three years from the date that all QA steps are completed. The identified organisms must be relinquished to the San Diego Water Board upon request by the San Diego Water Board.

(3) The macroinvertebrate results (i.e., taxonomic identifications consistent with the specified SAFIT STEs, and number of organisms within each taxa) must be submitted to the San Diego Water Board in electronic format. SWAMP is currently developing standardized formats for reporting bioassessment data. All bioassessment data collected after those formats become available must be submitted using the SWAMP formats. Until those formats are available, the biological data must be submitted in MS-Excel[8] (or equivalent) format.

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[6] Fetscher et al. 2009. Standard Operating Procedures for Collecting Stream Algae Samples and Associated Physical Habitat and Chemical Data for Ambient Bioassessments in California.
[7] Version 1.0 of the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Program Plan was released on June 25, 2009.
[8] Any version of Excel, 2000 or later, may be used.

The physical/habitat data must be reported using the standard format titled *SWAMP Stream Habitat Characterization Form — Full Version*.

3. FOLLOW-UP ANALYSIS AND ACTIONS (TIE AND TRE TRIAD APPROACH)

When results from the required monitoring indicate adverse water quality effects at a mass loading station or stream assessment station as defined in Table 3, Copermittees within the watershed(s) that discharge to that location must evaluate the extent and causes of MS4 discharge pollution to the adverse effects in receiving waters and prioritize and implement management actions to eliminate non-storm water discharges and/or reduce storm water sources from the MS4 as described in Table 3. Toxicity Identification Evaluations (TIEs) must be conducted to determine the cause of toxicity as outlined in Table 3 below. Other follow-up activities, which must be conducted by the Copermittees, are also identified in Table 3. Once the cause of toxicity has been identified by a TIE, the Copermittees must perform source identification projects as needed and implement the measures necessary to reduce or eliminate the pollutant discharges and abate the sources causing the toxicity.

Table 3. Triad Approach to Determining Follow-Up Actions[9]

	Chemistry	Toxicity	Benthic Alteration	Example Conclusions	Possible Actions or Decisions
1.	Exceedance of water quality objectives	Evidence of toxicity	Indications of alteration	Strong evidence of pollution-induced degradation	Use TIE to identify contaminants of concern, based on TIE metric Initiate upstream source identification as a high priority
2.	No persistent exceedances of water quality objectives	No evidence of toxicity	No indications of alteration	No evidence of current pollution-induced degradation Potentially harmful pollutants not yet concentrated enough to cause visible impact	No immediate action necessary Conduct periodic broad scans for new and/or potentially harmful pollutants
3.	Exceedance of water quality objectives	No evidence of toxicity	No indications of alteration	Contaminants are not bioavailable Test organisms not sensitive to problem pollutants	TIE would not provide useful information with no evidence of toxicity Continue monitoring for toxic and benthic impacts Initiate upstream source identification as a low priority Consider whether different or additional test organisms should be evaluated
4.	No persistent exceedances of water quality objectives	Evidence of toxicity	No indications of alteration	Unmeasured contaminant(s) or conditions have the potential to cause degradation Pollutant causing toxicity at very low levels	Recheck chemical analyses; verify toxicity test results Consider additional advanced chemical analyses Use TIE to identify contaminants of concern, based on TIE metric Initiate upstream source identification as a medium priority
5.	No persistent exceedances of water quality objectives	No evidence of toxicity	Indications of alteration	Alteration may not be due to toxic contamination Test organisms not sensitive to problem pollutants	No action necessary due to toxic chemicals Initiate upstream source identification (for physical sources) as a high priority Consider whether different or additional test organisms should be evaluated
6.	Exceedance of water quality objectives	Evidence of toxicity	No indications of alteration	Toxic contaminants are bioavailable, but in situ effects are not demonstrable Benthic analysis not sensitive enough to detect impact Potentially harmful pollutants not yet concentrated enough to change community	Determine if chemical and toxicity tests indicate persistent degradation Recheck benthic analyses; consider additional data analyses If recheck indicates benthic alteration, perform TIE to identify contaminants of concern, based on TIE metric Initiate upstream source identification as a high priority If recheck shows no effect, use TIE to identify contaminants of concern, based on TIE metric Initiate upstream source identification as a medium priority
7.	No persistent exceedances of water quality objectives	Evidence of toxicity	Indications of alteration	Unmeasured toxic contaminants are causing degradation Pollutant causing toxicity at very low levels Benthic impact due to habitat disturbance, not toxicity	Recheck chemical analyses and consider additional advanced analyses Use TIE to identify contaminants of concern, based on TIE metric Initiate upstream source identification as a high priority Consider potential role of physical habitat disturbance
8.	Exceedance of water quality objectives	No evidence of toxicity	Indications of alteration	Test organisms not sensitive to problem pollutants Benthic impact due to habitat disturbance, not toxicity	TIE would not provide useful information with no evidence of toxicity Initiate upstream source identification as a high priority Consider whether different or additional test organisms should be evaluated Consider potential role of physical habitat disturbance

4. REGIONAL MONITORING PROGRAMS

The San Diego Water Board recognizes the importance and advantages of participation by Copermittees in Regional Monitoring Programs. As such, the Copermittees may propose participation in additional regional monitoring programs to supplement and/or replace monitoring required under this Order. The regional monitoring plan must be submitted to the San Diego Water Board[10] for review and approval. Documentation of participation and monitoring must be included in the annual report(s).

[9] Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California. Stormwater Monitoring Coalition August 2004. See Table 5-4 for definitions.

[10] For the purposes of Receiving Waters and MS4 Discharge Monitoring and Reporting Program No. R9-2010-0016, review and approval by the San Diego Water Board of draft monitoring plans, proposals or protocols shall be conducted by the San Diego Water Board Executive Officer.

B. Wet Weather MS4 Discharge Monitoring

Each Copermittee must collaborate with the other Copermittees to develop, conduct, and report on a year-round, watershed-based, Wet Weather MS4 Discharge Monitoring Program. The monitoring program design, implementation, analysis, assessment, and reporting must be conducted on a watershed basis for each of the hydrologic subareas within the Santa Margarita HU under jurisdiction of the Copermittees. The monitoring program must be designed to meet the goals, and answer the questions, listed in Section I above, as well as to implement required Storm Water Action Levels (SALs) in the Order. The monitoring program must include the following components;

1. MS4 OUTFALL MONITORING

   The Copermittees must collaborate to develop and implement a monitoring program to characterize pollutant discharges from MS4 outfalls in each watershed during wet weather. The program must include the rationale and criteria for selection of outfalls to be monitored. The program must, at a minimum, include collection of samples for pollutants listed in Table 4 (below). This monitoring program must be designed to sample a representative percentage[11] of the major outfalls within each hydrologic subarea and must begin no later than the 2012-2013 monitoring year.

   a. The program must comply with Section D of this Order for Storm Water Action Levels (SALs). Samples must be collected during the first 24 hours of the storm water discharge or for the entire storm water discharge if it is less than 24 hours.

      (1) Grab samples may be utilized only for pH, indicator bacteria, DO, temperature and hardness.

      (2) All other constituents must be sampled using 24-hour composite samples or for the entire storm water discharge if the storm event is less than 24 hours.

   b. Sampling to compare MS4 outfall discharges with total metal SALs must include a measurement of receiving water hardness at each outfall. If a total metal concentration exceeds a SAL in Section D of

[11] A representative percentage determination must consider hydrologic conditions, total drainage area of the site, population density of the site, traffic density, age of the structures or buildings in the area, and land use types (commercial, residential and industrial).

the Order, that concentration must be compared to the California Toxic Rule criteria and the USEPA 1-hour maximum concentration for the detected level of receiving water hardness associated with that sample. If it is determined that the sample's total metal concentration for that specific pollutant exceeds the SAL but does not exceed the applicable 1-hour criteria for the measured level of hardness, then the SAL shall be considered not exceeded for that measurement.

Table 4. Analytical Testing for Wet Weather MS4 Discharges

Conventionals, Nutrients, Hydrocarbons	Pesticides	Metals (Total and Dissolved)	Bacteriological
• Total Dissolved Solids • Total Suspended Solids • Turbidity★ • Total Hardness • pH • Specific Conductance • Temperature • Dissolved Oxygen • Total Phosphorus★ • Dissolved Phosphorus • Nitrite ♢★ • Nitrate ♢★ • Total Kjeldahl Nitrogen • Ammonia • Biological Oxygen Demand, 5-day • Chemical Oxygen Demand • Total Organic Carbon • Dissolved Organic Carbon • Oil and Grease • Sulfate	• Diazinon • Chlorpyrifos • Pyrethroids	• Arsenic • Cadmium★ • Chromium • Copper★ • Lead★ • Nickel • Selenium • Zinc★ • Mercury • Silver • Thallium • Iron • Manganese	• Fecal Coliform • Enterococcus • E. coli
♢ Nitrate and nitrate may be combined and reported as nitrate + nitrite. ★Pollutant for which there is a Storm Water Action Level			

2. SOURCE IDENTIFICATION MONITORING

The Copermittees must collaborate to develop and implement a monitoring program to identify sources of pollutants causing the priority water quality problems within each hydrologic subarea. The monitoring program must include focused monitoring which moves upstream into each watershed as necessary to identify sources. This monitoring program must be implemented within each hydrologic subarea and must begin no later than the 2012-2013 monitoring year.

3. COMMENCEMENT OF MS4 OUTFALL AND SOURCE IDENTIFICATION MONITORING

The Principal Copermittee must submit to the San Diego Water Board for review and approval, a detailed draft of the wet weather MS4 discharge monitoring program to be implemented. The description must identify and provide the rationale for all constituents monitored, locations of monitoring, frequency of monitoring, and analyses to be conducted with the data generated. The draft must be submitted with the proposed monitoring program (Section III.A.1).

C. Non-Storm Water Dry Weather Action Levels and Illicit Discharge Detection and Elimination

Each Copermittee must collaborate with the other Copermittees to conduct, and report on a year-round watershed based Dry Weather Non-storm Water MS4 Discharge Monitoring Program. The monitoring program's implementation, analysis, assessment, and reporting must be conducted to assess compliance with section B and C of this Order, meet the goals of the MRP, and conduct Illicit Discharge Detection and Elimination Activities under Section F.4 of this Order. The monitoring program must also be designed to assess the contribution of dry weather flows to Clean Water Act Section 303(d) listed impairments. The monitoring program must include the following components:

1. MS4 OUTFALL MONITORING

Each Copermittee's program must be designed to determine levels of pollutants in effluent discharges from the MS4 into receiving waters. Each Copermittee must conduct the following dry weather field screening and analytical monitoring tasks:

a. Dry Weather Non-storm Water Effluent Analytical Monitoring Station Identification

(1) Sampling Stations must be located at major outfalls pursuant to section C of this Order. Other outfall sampling points (or any other point of access such as manholes) identified by the Copermittees as potential high risk sources of polluted effluent or as identified under Section C.4 of the Order must be sampled.

(2) Each Copermittee must clearly identify each dry weather effluent analytical monitoring station on its MS4 Map as either a separate GIS layer or a map overlay hereinafter referred to as a Dry Weather Non-storm Water Effluent Analytical Stations Map.

b. Develop Dry Weather Non-storm Water Effluent Analytical Monitoring Procedures

Each Copermittee must develop and/or update written procedures for effluent analytical monitoring including field observations, monitoring, and analyses to be conducted. These procedures must be consistent with 40 CFR part 136. At a minimum, the procedures must meet the following guidelines and criteria:

(1) Determining Sampling Frequency: Effluent analytical monitoring must be conducted at major outfalls and identified stations. The Copermittees must sample a representative percentage of major outfalls and identified stations within each hydrologic subarea.[12] The sampling must be done to assess compliance with dry weather non-storm water action levels pursuant to section C of this Order. All monitoring conducted must be preceded by a minimum of 72 hours of dry weather.

(2) Sampling of non-storm water discharges may be done utilizing grab samples. If a ponded MS4 discharge is observed at a monitoring station, the Copermittee(s) must record the observation and collect at least one (1) grab sample. If flow is evident, a 1-hour composite sample may be taken. The Copermittee(s) must estimate the discharge flow by measuring the width of water surface, approximate depth of water, and approximate flow velocity. A flow meter may also be utilized.

(3) Effluent samples must undergo analytical laboratory analysis for (a) all constituents described in *Table 1. Analytical Testing for Mass Loading and Stream Assessment* of this Order; (b) Constituents with assigned non-storm water action levels under Section C of this Order; and (c) Total Residual Chlorine.

(4) If the station is dry (i.e. no flowing or ponded MS4 discharge is observed), the Copermittee(s) must make and record all applicable observations on the MS4 outfall and receiving waters, including any evidence of past non-storm water flows and the presence of trash.

[12] A representative percentage determination must consider hydrologic conditions, total drainage area of the site, population density of the site, traffic density, age of the structures or buildings in the area, and land use types (commercial, residential and industrial).

2. SOURCE IDENTIFICATION MONITORING

The Copermittees must collaborate to develop and implement a monitoring program to identify sources of pollutants in non-storm water discharges in accordance with Sections C and F.4 of this Order. The source identification portion of the monitoring program must include: the following components:

a. Development and/or update of response criteria for dry weather non-storm water effluent analytical monitoring results:

(1) Response criteria must include action levels described in Section C of this Order.

(2) Response criteria must include evaluation of LC_{50} levels for toxicity to appropriate test organisms.

b. Develop and/or update Illicit Discharge Detection and Elimination response procedures for source identification follow up investigations and elimination in the event of exceedance of dry weather non-storm water effluent analytical monitoring response criteria (see above). These procedures must be consistent with procedures required in section C, F.4.d, and F.4.e. of this Order.

3. COMMENCEMENT OF MS4 OUTFALL AND SOURCE IDENTIFICATION MONITORING

The Copermittees must commence implementation of dry weather effluent analytical monitoring under the requirements of this Order no later than **July 1, 2012**. If monitoring indicates an illicit connection or illegal discharge, the Copermittee(s) must conduct the follow-up investigation and elimination activities described in sections C, F.4.d and F.4.e of this Order. In the interim period until the dry weather non-storm water effluent analytical monitoring program of this Order is implemented, each Copermittee must continue to implement dry weather field screening and analytical monitoring as it was most recently implemented pursuant to Order No. 2004-001.

D. High Priority Inland Aquatic Habitat Monitoring

The Copermittees must develop and submit to the San Diego Water Board by April 01, 2012, an inland aquatic habitat monitoring program for areas supporting high priority aquatic and/or riparian species. The goal of the monitoring program is to assess if MS4 storm water and non-storm water

discharges are affecting high priority inland aquatic habitat. The monitoring will assist the Copermittees in preventing the degradation of high quality waters within the jurisdiction of this Order that support high priority species by identifying discharges from MS4s which may cause or have the potential to cause impairment of beneficial uses within these areas.[13] High priority species include those federally and/or state listed as endangered, threatened, or as a species of concern. The design and goal of the monitoring program must be consistent with the criteria listed in Section I.B of this Monitoring Program, including evaluation of the protection of high priority species in receiving waters. The Copermittees must implement the program unless otherwise directed in writing by the San Diego Water Board.

The monitoring program must include the following components:

1. OUTFALL AND RECEIVING WATER MONITORING

   The program must be designed to determine levels of pollutants in storm water and non-storm water effluent discharges from the MS4 discharged into high priority inland aquatic habitat(s) and the level of those pollutants found in ambient receiving waters subject to the discharge. The Copermittees must conduct the following field screening and analytical monitoring tasks:

   a. MS4 and Receiving Waters Monitoring Station Identification

      (1) MS4 discharge stations must be major outfalls that directly discharge into high priority inland aquatic habitat. MS4 discharge stations may be selected in conjunction with monitoring required under Section II.B and II.C of the Receiving Waters and MS4 Discharge Monitoring Program.

      (2) Receiving water station(s) must be located upstream and downstream of the discharge within the high priority inland aquatic habitat. Receiving water stations must be located to prevent any significant co-mingling of receiving water flows with other sources.

[13] In accordance with requirements of State Water Resources Control Board Resolution No. 68-16, Statement of Policy with Respect to Maintaining High Quality Waters in California.

b. Develop Analytical Monitoring Procedures

Each Copermittee must develop procedures for analytical monitoring (these procedures must be consistent with 40 CFR part 136), including field observations, pollutants to be monitored, analyses to be conducted, and quality assurance/control. At a minimum, the procedures must meet the following guidelines and criteria:

(1) Determining Sampling Frequency: The Copermittees must sample a representative number of major outfalls and receiving waters that are considered high priority inland aquatic habitat. Sampling of the discharge and receiving waters must be paired and occur during both storm and non-storm conditions.

(2) Sampling in receiving waters may be done utilizing grab samples, though composite samples are encouraged. Sampling of storm and non-storm water discharges from the MS4 must be done in accordance with Section II.B and II.C. If ponded receiving waters is/are observed at a monitoring station, the Copermittees must make written observations and collect at least one (1) grab sample. The Copermittee(s) must estimate the flow by measuring the width of water surface, approximate depth of water, and approximate flow velocity

(3) The proposed constituents for which samples will undergo analytical laboratory analysis.

(4) Procedures for recording applicable observations when monitoring stations are dry (i.e. no flowing water or ponded conditions).

3. ASSESSMENT OF MONITORING RESULTS

The program must include a discussion of monitoring results within the monitoring annual report. The discussion must include an evaluation of the contribution of MS4 discharges to ambient water conditions within high priority inland aquatic habitats, as well as any actions taken to prevent and/or reduce sources of those pollutants.

4. SOURCE IDENTIFICATION MONITORING

The Copermittees must collaborate to conduct source identification monitoring in accordance with Section II.B and II.C of the Monitoring and Reporting Program of this Order.

E. Special Studies

1. The Copermittees must conduct special studies, including any monitoring and/or modeling required for TMDL development and implementation, as directed by the San Diego Water Board.

2. Sediment Toxicity Study

   The Copermittees must develop and submit to the San Diego Water Board by April 01, 2012, a special study workplan to investigate the toxicity of sediment in streams and potential impact on benthic macroinvertebrate IBI scores. The Sediment Toxicity Special Study must be implemented in conjunction with the Stream Assessment Monitoring in II.A.2. The Copermittees must implement the special study unless otherwise directed in writing by the San Diego Water Board.

   The Sediment Toxicity Special Study must include the following elements:

   a. Sampling Locations: At least 4 stream assessment locations must be sampled, including 1 reference site and 1 mass loading site. Selection of sites must be done with consideration of subjectivity of receiving waters to discharges from residential and agricultural land uses.

   b. Frequency: At a minimum, sampling must occur once per year at each site for at least 2 years. Sampling must be done in conjunction with the stream assessment sampling required under Section II.A.2 of the Monitoring and Reporting Program of this Order.

   c. Parameters/Methods: At a minimum, sediment toxicity analysis must include the measurement of metals, pyrethroids and organochlorine pesticides. The analysis must include estimates of bioavailability based upon sediment grain size, organic carbon and receiving water temperature at the sampling site. Acute and chronic toxicity testing must be done using *Hyalella azteca* in accordance with Table 2.

   d. Results: Results and a Discussion must be included in the Monitoring Annual Report (see III.A). The Discussion must include an assessment of the relationship between observed IBI scores under Section II.A.2 and all variables measured.

3. Trash and Litter Investigation

The Copermittees must develop and submit to the San Diego Water Board by September 01, 2012, a special study workplan to assess trash (including litter) as a pollutant within receiving waters on a watershed based scale. Litter is defined in California Government Code 68055.1g as "…improperly discarded waste material, including, but not limited to, convenience food, beverage, and other product packages or container constructed of steel, aluminum, glass, paper, plastic and other natural and synthetic, materials, thrown or deposited on lands and waters of the state, but not including the properly discarded waste of the primary processing of agriculture, mining, logging, sawmilling, or manufacturing." A lead Copermittee must be selected for the Santa Margarita HU for the purposes of this Special Study. The Copermittees must implement the special study unless otherwise directed in writing by the San Diego Water Board

The Trash and Litter Investigation must include the following elements:

a. Locations: The lead Copermittee must identify suitable sampling locations within the Santa Margarita HU.

b. Frequency: Trash at each location must be monitored a minimum of twice during the wet season following a qualified monitoring storm event (minimum of 0.1 inches preceded by 72 hours of dry weather) and twice during the dry season.

c. Protocol: The lead Copermittee for the Santa Margarita HU must use the "Final Monitoring Workplan for the Assessment of Trash in San Diego County Watersheds" and "A Rapid Trash Assessment Method Applied to Waters of the San Francisco Bay Region" to develop a monitoring protocol for the Santa Margarita HU.

d. Results and Discussion from the Trash and Litter Study must be included in the Monitoring Annual Report. The Results and Discussion must, at a minimum, include source identification, an evaluation of BMPs for trash reduction and prevention, and a description of any BMPs implemented in response to study results.

4. Agricultural, Federal and Tribal Input Study

The Copermittees must develop and submit to the San Diego Water Board by September 01, 2012, a special study workplan to investigate the water quality of agricultural, federal and tribal runoff that is discharged into

their MS4 (see Finding D.3.c of the Order). The Copermittees must implement the special study unless otherwise directed in writing by the San Diego Water Board.

The Agricultural, Federal and Tribal Input Special Study must include the following elements:

a. Locations: The Copermittees must identify a representative number of sampling stations within their MS4 that receive discharges of agricultural, federal, and tribal runoff that has not co-mingled with any other source. At least one station from each category must be identified.

b. Frequency: One storm event must be monitored at each sampling location each year for at least 2 years.

c. Parameters/Methods: At a minimum, analysis must include those constituents listed in Table 1 of the MRP (see II.A.1). Grab samples may be utilized, though composite samples are preferred. Copermittees must also measure or estimate flow rates and volumes of discharges into the MS4.

d. Results: Results and Discussion from the Agricultural, Federal and Tribal Input Study must be included in the Monitoring Annual Report.

5. MS4 and Receiving Water Maintenance Study

The Copermittees must develop and submit to the San Diego Water Board by April 01, 2012, a special study workplan to investigate receiving waters that are also considered part of the MS4 (see Finding D.3.c of the Order) and which are subject to continual vegetative clearance activities (e.g. mowing). The study must be designed to assess the effects of vegetation removal activities and water quality, including, but not limited to, modification of biogeochemical functions, in-stream temperatures, receiving water bed and bank erosion potential and sediment transport. The Copermittees must implement the special study unless otherwise directed in writing by the San Diego Water Board.

The MS4 and Receiving Water Maintenance Special Study must include the following elements:

a. Locations: The Copermittees must identify suitable sampling locations, including at least one reference system that is not subject to maintenance activities.

b. Parameters/Methods: At a minimum, the Copermittees must monitor pre and post maintenance activities for indicator bacteria, turbidity (NTU), temperature, dissolved oxygen and nutrients (Nitrite, Nitrate, Total Kjeldahl Nitrogen, Ammonia and Total Phosphorous). Copermittees must also measure or estimate flow rates and volumes.

c. Results and Discussion from the MS4 and Receiving Water Maintenance Study must be included in the Annual Monitoring Report. The Discussion must include relevance of findings to CWA Section 303(d) listed impaired waters.

6. Intermittent and Ephemeral Stream Perennial Conversion Study

The Copermittees must develop and submit to the San Diego Water Board by April 01, 2013, a special study workplan to investigate the extent of any impacts to beneficial uses from the conversion of historically ephemeral or intermittent receiving waters to perennially flowing waters due to the continued discharge of currently exempted non-storm water from the MS4 and/or discharges into MS4s covered under a separate NPDES permit into receiving waters. The goal of the study is to assess if any impacts to beneficial uses, including, but not limited to, WILD, WARM, COLD or RARE, have occurred due to continuous discharge of currently exempted non-storm water discharges, and if the discharges should no longer be exempt. The Copermittees must implement the special study unless otherwise directed in writing by the San Diego Water Board.

The Intermittent and Ephemeral Stream Perennial Conversion Special Study must include the following elements:

a. Locations: The Copermittees must investigate their MS4 and adjacent downstream receiving waters to identify portions that have historically been ephemeral or intermittent but currently exhibit perennial flow due to exempted non-storm water discharges. Investigation must include historic habitat assessments, USGS gauging information, and historic aerial photography. Sampling must occur at a minimum of 2 identified perennially converted locations. Should the Copermittees be unable to locate any converted waters, a full description of the investigation must be documented in the annual report.

b. Parameters/Methods: The Copermittees must conduct water quality monitoring of the non-storm water discharge in accordance with Section C of this Order. In addition, the Copermittees must select a minimum of 2 downstream sampling points within the receiving waters subject the discharge and conduct the following:

(1) Grab samples must be taken and analyzed for indicator bacteria, nutrients (Nitrite, Nitrate, Total Kjeldahl Nitrogen, Ammonia and Total Phosphorous), turbidity (NTU), temperature, dissolved oxygen, total hardness, pH and 303(d) listed pollutants for all receiving waters at or downstream of the sampling site. The Copermittees must measure or estimate flow rates and volumes at each sampling point.

(2) Sampling at each site must include a quantitative and qualitative evaluation of beneficial uses. At a minimum, sampling must include observation estimation of active bed and bank erosion and erosion potential, invasive/non-native plant cover, aquatic non-native species, and potential vector control requirements.

c. Results and Discussion from the Intermittent and Ephemeral Stream Perennial Conversion Study must be included in the Annual Monitoring Report.

7. Stormwater Monitoring Coalition (SMC) Regional Monitoring of Southern California Coastal Watersheds:

The Copermittees must implement the monitoring program developed by the SMC for Regional Monitoring of the southern California coastal watersheds within the Santa Margarita Hydrologic Unit. Each Copermittee must evaluate the results of the monitoring program within and downstream of their jurisdiction and integrate the results into program assessments and modifications.

F. Monitoring Provisions

All monitoring activities must meet the following requirements:

1. Where procedures are not otherwise specified in this Receiving Waters Monitoring and Reporting Program, sampling, analysis and quality assurance/quality control must be conducted in accordance with the Quality Assurance Management Plan (QAMP) for the State of California's Surface Water Ambient Monitoring Program (SWAMP), adopted by the State Water Resources Control Board (SWRCB).

2. Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity [40 CFR 122.41(j)(1)].

3. The Copermittees must retain records of all monitoring information, including all calibration and maintenance of monitoring instrumentation, copies of all reports required by this Order, and records of all data used to complete the Report of Waste Discharge and application for this Order, for a period of at least five (5) years from the date of the sample, measurement, report, or application. This period may be extended by request of the San Diego Water Board or USEPA at any time and must be extended during the course of any unresolved litigation regarding this discharge. [40 CFR 122.41(j)(2), CWC section 13383(a)]

4. Records of monitoring information must include [40 CFR 122.41(j)(3)]:

   a. The date, exact place, and time of sampling or measurements;
   b. The individual(s) who performed the sampling or measurements;
   c. The date(s) analyses were performed;
   d. The individual(s) who performed the analyses;
   e. The analytical techniques or methods used; and
   f. The results of such analyses.

5. All sampling, sample preservation, and analyses must be conducted according to test procedures approved under 40 CFR part 136, unless other test procedures have been specified in this Receiving Waters Monitoring and Reporting Program or approved by the San Diego Water Board [40 CFR 122.41(j)(4)].

6. The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this Order must, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than two years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than four years, or both. [40 CFR 122.41(j)(5)]

7. Calculations for all limitations which require averaging of measurements must utilize an arithmetic mean unless otherwise specified in this Receiving Waters Monitoring and Reporting Program. [40 CFR 122.41(l)(4)(iii)]

8. All chemical, bacteriological, and toxicity analyses must be conducted at a laboratory certified for such analyses by the California Department of Health Services or a laboratory approved by the San Diego Water Board.

9. For priority toxic pollutants that are identified in the California Toxics Rule (CTR) (65 Fed. Reg. 31682), the Copermittees must instruct their laboratories to establish calibration standards that are equivalent to or lower than the Minimum Levels (MLs) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP). If a Copermittee can demonstrate that a particular ML is not attainable, in accordance with procedures set forth in 40 CFR 136, the lowest quantifiable concentration of the lowest calibration standard analyzed by a specific analytical procedure (assuming that all the method specified sample weights, volumes, and processing steps have been followed) may be used instead of the ML listed in Appendix 4 of the SIP. The Copermittee must submit documentation from the laboratory to the San Diego Water Board for approval prior to raising the ML for any priority toxic pollutant.

10. The San Diego Water Board may make revisions to this Receiving Waters and MS4 Discharge Monitoring and Reporting Program at any time during the term of Order No. R9-2010-0016 and may include a reduction or increase in the number of parameters to be monitored, locations monitored, the frequency of monitoring, or the number and size of samples collected.

11. The Clean Water Act provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance must, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than six months per violation, or by both. [40 CFR 122.41(k)(2)]

12. Monitoring must be conducted according the USEPA test procedures approved under 40 CFR 136, “Guidelines Establishing Test Procedures for Analysis of Pollutants under the Clean Water Act” as amended, unless other test procedures have been specified in this Receiving Waters and MS4 Discharge Monitoring and Reporting Program, in Order No. R9-2010-0016, or by the San Diego Water Board.

13. If a Copermittee(s) monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR part 136, unless otherwise specified in the Order, the results of this monitoring must

be included in the calculation and reporting of the data submitted in the reports requested by the San Diego Water Board. [40 CFR 122.41(l)(4)(ii)]

III. REPORTING PROGRAM

A. Monitoring Reporting

1. Planned Monitoring Program: The Principal Copermittee must submit to the San Diego Water Board by **June 1, 2012,** a proposed workplan describing the Receiving Waters and MS4 Discharge Monitoring Program to be implemented. Any updates to the planned monitoring program workplan proposed by the Copermittees shall be submitted with each Monitoring Annual Report. The Copermittees shall implement the proposed workplan unless otherwise directed in writing by the San Diego Water Board.

2. Monitoring Annual Report: The Principal Copermittee must submit the Receiving Waters and MS4 Discharge Monitoring Annual Report to the San Diego Water Board on October 1 of each year, beginning on **October 1, 2013**. Receiving Waters and MS4 Discharge Monitoring Annual Reports must include monitoring conducted under the previous fiscal year, must meet the following requirements:

   a. Annual monitoring reports must include the data/results, methods of evaluating the data, graphical summaries of the data, and an explanation/discussion of the data for each monitoring program component.

   b. Annual monitoring reports must include a watershed-based analysis of the findings of each monitoring program component (mass loading, bioassessment, etc…). Each watershed-based analysis must include:

      (1) Identification and prioritization of water quality problems within each watershed.
      (2) Identification and description of the nature and magnitude of potential sources of the water quality problems within each watershed.
      (3) Evaluation and presentation of pollutant load and concentration increases or decreases at each mass loading station over time.
      (4) Evaluation of pollutant loads and concentrations measured at mass loading stations with respect to land use, population, sources, and other characteristics of watersheds using tools such as multiple linear regression, factor analysis, and cluster analysis.

(5) Identification of links between source activities/conditions and observed receiving water impacts.
(6) Identification of recommended future monitoring to identify and address sources of water quality problems.
(7) Results and discussion of any TIE conducted, together with actions that will be implemented to reduce the discharge of pollutants in storm water, eliminate any discharge of pollutants in non-storm water, and abate the sources causing the toxicity.

c. Annual monitoring reports must include an analysis and interpretation of the data for each watershed with respect to the management questions listed in section I.B of this Receiving Waters Monitoring and Reporting Program.

d. Annual monitoring reports must include a discussion describing how each of the goals listed in section I.A of this MRP is addressed by the Copermittees' monitoring program for the monitoring year covered by the report.

e. Annual monitoring reports must include identification and analysis of any long-term trends in storm water or receiving water quality. Trend analysis must use nonparametric approaches, such as the Mann-Kendall test, including exogenous variables in a multiple regression model, and/or using a seasonal nonparametric trend model, where applicable.

f. Annual monitoring reports must provide an estimation of total pollutant loads (wet weather loads plus dry weather loads) due to MS4 Discharge for each of the hydrologic subareas, including for 303(d) pollutants specified in Table 2 of the Order.

g. Annual monitoring reports must, for each monitoring program component listed above, include an assessment of compliance with applicable water quality standards.

h. Annual monitoring reports must describe monitoring station locations by latitude and longitude coordinates, frequency of sampling, quality assurance/quality control procedures, and sampling and analysis protocols.

i. Annual monitoring reports must use a standard report format and include the following elements:

(1) A stand alone comprehensive executive summary addressing all sections of the monitoring report;
(2) Comprehensive interpretations and conclusions; and
(3) Recommendations for future actions.

j. All monitoring reports submitted to the Principal Copermittee or the San Diego Water Board must contain the certified perjury statement described in Attachment B of this Order No. R9-2010-0016.

k. Annual monitoring reports must be reviewed prior to submittal to the San Diego Water Board by a committee of the Copermittees (consisting of no less than three different Copermittee members).

l. Annual monitoring reports must be submitted in both electronic and paper formats. Electronic formats must be CEDEN or SWAMP-uploadable.[14]

3. Monitoring programs and reports must comply with section II.F of Receiving Waters and MS4 Discharge Monitoring and Reporting Program No. R9-2010-0016 and Attachment B of this Order.

4. Following completion of an annual cycle of monitoring in October, the Copermittees must make the monitoring data and results available to the San Diego Water Board at the San Diego Water Board's request. Following completion of the annual cycle of monitoring, the Copermittees must upload monitoring data and results into the California Environmental Data Exchange Network (CEDEN)[15].

B. Interim Reporting Requirements

For the October 2010 to October 2012 monitoring period, the Principal Copermittee must submit the Receiving Waters Monitoring Annual Report as required under Order No. 2004-001. The Receiving Waters Monitoring Annual Report must address the monitoring conducted to comply with the requirements of Order No. 2004-0001.

[14] For updates to the SWAMP templates and formats, see http://www.waterboards.ca.gov/swamp.
[15] http://www.ceden.org/

C. Reporting Dates

Table 5. Table of Required MRP Reporting Dates and Frequencies.

Submittal	Section	Completion Date	Frequency
Description of Proposed Monitoring Program	III.A.1	June 1, 2012	One Time
Receiving Waters and MS4 Discharge Monitoring Annual Reports, Including Proposed Updates to the Monitoring Program	III.A.2	Starting October 1, 2013	Annual
Copermittees submit Interim Monitoring Program Annual Report	III.B	As required under Order No. 2004-001	One Time
Draft Wet Weather MS4 Discharge Monitoring Program	II.B	June 01, 2012	One Time
Draft High Priority Inland Aquatic Habitat Monitoring	II.D	April 01, 2012	One Time
Draft Sediment Toxicity Special Study	II.E.2	April 01, 2012	One Time
Draft Trash and Litter Special Study	II.E.3	September 01, 2012	One Time
Draft Agricultural, Federal and Tribal Input Study	II.E.4	September 01, 2012	One Time
Draft MS4 and Receiving Water Maintenance Study	II.E.5	April 01, 2012	One Time
Draft Intermittent and Ephemeral Stream Perennial Conversion Study	II.E.6	April 01, 2013	One Time

Attachment F

SOURCE DATA

I. STORM WATER ACTION LEVELS DATABASE.....2

II. NUMERIC ACTION LEVELS EVALUATION DATA[1] 9

[1] Represented data from monitoring conducted by the Copermittees and provided in the 2008-09 Annual Monitoring Report.

I. STORM WATER ACTION LEVELS DATABASE

N02+NO3 (mg/l)	Phosphorous Total (mg/l)	Cadmium Total (ug/l)	Copper Total (ug/l)	Lead Total (ug/l)	Zinc Total (ug/l)	Turbidity (NTU)
4.70	7.90	9.80	800.00	660.00	22500.00	10
4.20	7.19	6.00	340.00	620.00	18000.00	15
3.90	4.96	6.00	320.00	540.00	11000.00	15
3.90	4.50	6.00	270.00	520.00	9970.00	16
3.60	4.40	6.00	244.00	460.00	9100.00	22
3.60	4.24	6.00	230.00	450.00	8800.00	23
3.60	2.59	5.30	220.00	450.00	6500.00	23
3.50	2.59	5.00	220.00	440.00	5500.00	24
3.30	2.50	4.10	210.00	430.00	5000.00	24
3.30	2.50	4.00	210.00	400.00	4900.00	30
3.10	2.50	4.00	209.00	380.00	4600.00	31
3.00	2.27	4.00	209.00	360.00	4300.00	33
2.96	2.00	4.00	200.00	350.00	3800.00	36
2.90	2.00	4.00	200.00	330.00	3800.00	36
2.70	2.00	4.00	200.00	320.00	3400.00	39
2.70	2.00	3.90	200.00	320.00	3390.00	40
2.60	1.90	3.80	200.00	320.00	3100.00	45
2.60	1.90	3.40	180.00	310.00	2500.00	50
2.60	1.80	3.40	180.00	310.00	2200.00	50
2.50	1.80	3.20	166.00	310.00	2100.00	60
2.50	1.70	3.10	163.00	310.00	1829.00	61
2.32	1.70	3.00	160.00	300.00	1700.00	62
2.30	1.70	3.00	150.00	290.00	1500.00	65
2.20	1.60	3.00	140.00	280.00	1400.00	65
2.20	1.60	3.00	140.00	270.00	1300.00	66
2.10	1.60	3.00	140.00	270.00	1300.00	69
2.10	1.53	3.00	140.00	270.00	1285.00	70
2.10	1.50	3.00	140.00	270.00	1200.00	72
2.10	1.50	3.00	130.00	260.00	1100.00	80
2.00	1.47	3.00	130.00	260.00	1054.00	84
2.00	1.46	3.00	128.00	250.00	1000.00	97
2.00	1.40	3.00	120.00	250.00	980.00	111
2.00	1.40	3.00	120.00	250.00	960.00	140
1.90	1.40	3.00	120.00	245.00	850.00	151
1.90	1.30	2.90	120.00	230.00	850.00	157
1.90	1.30	2.80	120.00	230.00	850.00	590
1.90	1.30	2.70	111.00	225.00	850.00	
1.90	1.30	2.60	111.00	220.00	840.00	
1.80	1.30	2.50	110.00	220.00	780.00	
1.80	1.30	2.40	110.00	210.00	768.00	
1.70	1.24	2.40	110.00	210.00	760.00	
1.70	1.20	2.30	110.00	200.00	750.00	

1.70	1.20	2.20	110.00	200.00	740.00	
1.70	1.20	2.10	110.00	190.00	740.00	
1.70	1.20	2.00	100.00	190.00	730.00	
1.70	1.10	2.00	100.00	190.00	720.00	
1.70	1.10	2.00	100.00	190.00	710.00	
1.60	1.10	2.00	100.00	170.00	710.00	
1.60	1.10	2.00	100.00	170.00	700.00	
1.60	1.06	2.00	100.00	170.00	700.00	
1.60	1.00	2.00	99.00	160.00	690.00	
1.60	0.96	2.00	94.00	160.00	690.00	
1.60	0.96	2.00	91.00	150.00	680.00	
1.60	0.94	2.00	91.00	150.00	680.00	
1.53	0.94	2.00	90.00	150.00	670.00	
1.50	0.92	2.00	90.00	150.00	660.00	
1.50	0.91	2.00	89.00	150.00	660.00	
1.50	0.85	2.00	87.00	140.00	660.00	
1.50	0.85	2.00	87.00	140.00	650.00	
1.50	0.85	2.00	84.00	140.00	630.00	
1.50	0.83	2.00	83.00	130.00	610.00	
1.40	0.83	2.00	82.00	130.00	610.00	
1.40	0.83	2.00	81.00	130.00	597.00	
1.40	0.81	2.00	81.00	130.00	590.00	
1.40	0.81	2.00	77.00	130.00	590.00	
1.40	0.81	2.00	77.00	123.00	576.00	
1.40	0.80	2.00	76.00	120.00	570.00	
1.40	0.80	2.00	74.00	120.00	570.00	
1.32	0.78	2.00	72.00	120.00	560.00	
1.30	0.78	1.90	72.00	120.00	560.00	
1.30	0.77	1.90	72.00	120.00	540.00	
1.30	0.77	1.90	72.00	115.00	540.00	
1.30	0.76	1.80	72.00	110.00	520.00	
1.30	0.76	1.80	71.00	110.00	520.00	
1.30	0.75	1.80	70.00	110.00	520.00	
1.30	0.75	1.70	70.00	110.00	510.00	
1.29	0.75	1.60	67.00	102.00	500.00	
1.20	0.74	1.60	66.00	100.00	500.00	
1.20	0.73	1.60	66.00	100.00	490.00	
1.20	0.72	1.60	66.00	100.00	480.00	
1.20	0.72	1.60	65.00	100.00	475.00	
1.20	0.72	1.60	65.00	100.00	470.00	
1.20	0.71	1.50	63.00	99.00	470.00	
1.20	0.71	1.50	63.00	97.00	462.00	
1.20	0.69	1.40	62.00	97.00	460.00	
1.20	0.68	1.30	62.00	97.00	460.00	
1.20	0.68	1.30	60.00	95.00	450.00	
1.20	0.68	1.20	60.00	91.00	440.00	
1.10	0.68	1.20	59.00	90.00	440.00	
1.10	0.68	1.20	56.59	90.00	440.00	

1.10	0.67	1.20	55.00	87.00	430.00	
1.10	0.66	1.10	55.00	86.00	430.00	
1.10	0.66	1.10	54.00	86.00	430.00	
1.10	0.65	1.10	54.00	84.00	420.00	
1.10	0.65	1.10	54.00	82.00	420.00	
1.10	0.65	1.10	53.00	82.00	410.00	
1.10	0.65	1.00	53.00	81.00	409.00	
1.00	0.63	1.00	52.00	78.00	400.00	
1.00	0.62	1.00	51.00	78.00	400.00	
1.00	0.61	1.00	50.00	78.00	400.00	
1.00	0.60	1.00	50.00	77.00	390.00	
1.00	0.60	1.00	50.00	76.00	390.00	
1.00	0.59	1.00	50.00	76.00	390.00	
0.99	0.57	1.00	50.00	69.00	390.00	
0.99	0.57	1.00	50.00	69.00	390.00	
0.98	0.56	1.00	50.00	67.00	370.00	
0.97	0.56	1.00	50.00	66.00	370.00	
0.96	0.55	1.00	49.00	66.00	370.00	
0.96	0.55	1.00	49.00	66.00	360.00	
0.95	0.55	1.00	49.00	65.00	360.00	
0.95	0.53	1.00	48.00	64.00	360.00	
0.93	0.53	1.00	48.00	61.00	360.00	
0.93	0.53	1.00	47.00	57.00	350.00	
0.93	0.52	1.00	46.08	57.00	350.00	
0.93	0.52	1.00	46.00	56.00	350.00	
0.92	0.52	1.00	46.00	56.00	340.00	
0.90	0.52	1.00	44.25	53.00	340.00	
0.88	0.51	1.00	44.00	53.00	340.00	
0.87	0.51	1.00	44.00	52.60	340.00	
0.86	0.50	1.00	44.00	52.00	340.00	
0.85	0.49	1.00	44.00	51.00	340.00	
0.84	0.49	1.00	43.00	51.00	334.00	
0.83	0.48	1.00	43.00	50.00	330.00	
0.81	0.48	1.00	43.00	50.00	330.00	
0.81	0.48	1.00	42.00	50.00	330.00	
0.80	0.47	1.00	42.00	50.00	330.00	
0.80	0.47	1.00	42.00	50.00	330.00	
0.78	0.47	1.00	41.00	50.00	330.00	
0.78	0.46	1.00	40.00	50.00	330.00	
0.77	0.46	1.00	40.00	50.00	320.00	
0.77	0.46	1.00	40.00	50.00	320.00	
0.77	0.45	1.00	40.00	50.00	320.00	
0.74	0.45	1.00	40.00	50.00	320.00	
0.73	0.44	1.00	39.00	49.00	310.00	
0.72	0.44	1.00	39.00	47.00	310.00	
0.69	0.44	1.00	39.00	46.00	310.00	
0.69	0.44	1.00	39.00	46.00	308.00	
0.69	0.44	1.00	39.00	44.00	300.00	

0.67	0.44	1.00	39.00	44.00	300.00	
0.67	0.44	1.00	37.00	43.00	300.00	
0.66	0.43	1.00	37.00	42.00	300.00	
0.66	0.42	1.00	37.00	41.00	290.00	
0.65	0.42	1.00	37.00	41.00	285.00	
0.63	0.41	1.00	37.00	41.00	280.00	
0.62	0.41	1.00	36.00	41.00	280.00	
0.62	0.41	1.00	36.00	41.00	280.00	
0.62	0.40	1.00	36.00	40.10	280.00	
0.60	0.40	1.00	36.00	40.00	280.00	
0.59	0.40	1.00	35.00	39.30	280.00	
0.59	0.40	1.00	35.00	39.00	280.00	
0.58	0.40	1.00	34.00	39.00	280.00	
0.57	0.40	1.00	34.00	39.00	280.00	
0.57	0.40	1.00	33.40	38.00	270.00	
0.55	0.40	1.00	33.00	38.00	270.00	
0.52	0.40	1.00	33.00	38.00	270.00	
0.50	0.40	1.00	33.00	37.00	270.00	
0.50	0.39	1.00	33.00	36.00	270.00	
0.46	0.39	1.00	33.00	36.00	270.00	
0.42	0.39	1.00	32.26	36.00	260.00	
0.42	0.38	1.00	32.01	36.00	260.00	
0.35	0.38	1.00	32.00	35.00	260.00	
0.10	0.38	1.00	32.00	34.00	260.00	
0.06	0.37	1.00	32.00	34.00	260.00	
	0.36	1.00	32.00	33.00	250.00	
	0.36	1.00	32.00	33.00	250.00	
	0.36	1.00	32.00	33.00	250.00	
	0.36	1.00	31.00	33.00	250.00	
	0.35	1.00	31.00	32.00	247.00	
	0.35	1.00	31.00	32.00	242.13	
	0.35	1.00	31.00	31.94	240.00	
	0.35	1.00	30.00	30.00	240.00	
	0.34	1.00	30.00	30.00	240.00	
	0.34	1.00	30.00	30.00	240.00	
	0.34	1.00	30.00	30.00	240.00	
	0.34	1.00	30.00	30.00	230.00	
	0.34	1.00	29.00	30.00	230.00	
	0.34	1.00	29.00	30.00	220.00	
	0.33	1.00	28.00	29.00	220.00	
	0.33	1.00	28.00	29.00	220.00	
	0.33	0.98	28.00	29.00	210.00	
	0.33	0.94	28.00	29.00	210.00	
	0.33	0.94	27.19	28.00	210.00	
	0.33	0.92	27.00	28.00	210.00	
	0.32	0.90	27.00	28.00	210.00	
	0.32	0.90	27.00	27.00	210.00	
	0.32	0.86	26.00	27.00	210.00	

	0.32	0.80	26.00	26.31	205.00	
	0.32	0.80	26.00	26.00	202.79	
	0.31	0.71	25.00	26.00	202.00	
	0.31	0.70	25.00	25.00	200.00	
	0.30	0.70	25.00	25.00	200.00	
	0.30	0.60	24.00	25.00	200.00	
	0.30	0.60	24.00	24.60	200.00	
	0.30	0.59	23.00	24.00	200.00	
	0.30	0.59	23.00	24.00	200.00	
	0.30	0.52	23.00	24.00	200.00	
	0.30	0.50	23.00	24.00	194.49	
	0.29	0.50	23.00	23.00	190.00	
	0.29	0.50	22.00	23.00	190.00	
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	0.28	0.50	20.36	22.00	180.00	
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	0.27	0.50	20.00	22.00	180.00	
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	0.26	0.50	20.00	21.10	170.00	
	0.26	0.40	19.00	21.00	170.00	
	0.26	0.40	19.00	20.00	170.00	
	0.26	0.40	18.00	19.10	170.00	
	0.25	0.30	18.00	19.00	160.00	
	0.25	0.30	18.00	19.00	160.00	
	0.25	0.30	18.00	19.00	160.00	
	0.25	0.30	18.00	19.00	160.00	
	0.25	0.30	17.00	18.50	160.00	
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	0.23		17.00	17.00	150.00	
	0.23		17.00	17.00	150.00	
	0.22		16.00	17.00	150.00	
	0.22		16.00	17.00	150.00	
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	0.22		16.00	17.00	145.00	
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	0.22		15.00	16.00	140.00	
	0.21		15.00	15.00	140.00	

	0.21		15.00	15.00	140.00	
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	0.21		14.00	14.00	140.00	
	0.20		14.00	14.00	140.00	
	0.20		14.00	14.00	136.55	
	0.20		14.00	13.00	135.60	
	0.20		14.00	13.00	130.00	
	0.20		13.00	13.00	130.00	
	0.20		13.00	13.00	130.00	
	0.20		13.00	13.00	130.00	
	0.20		13.00	12.00	130.00	
	0.20		13.00	12.00	130.00	
	0.19		13.00	12.00	130.00	
	0.19		12.00	12.00	127.00	
	0.19		12.00	12.00	124.00	
	0.19		12.00	12.00	122.05	
	0.19		12.00	11.00	120.00	
	0.19		11.00	11.00	120.00	
	0.19		11.00	11.00	120.00	
	0.18		10.00	10.00	120.00	
	0.18		10.00	10.00	112.11	
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	0.18		10.00	10.00	110.00	
	0.18		9.60	10.00	110.00	
	0.18		9.60	10.00	110.00	
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	0.17		9.10	10.00	110.00	
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	0.17		8.30	9.60	110.00	
	0.17		8.20	9.40	110.00	
	0.16		8.00	9.10	108.00	
	0.15		8.00	9.00	100.00	
	0.15		7.70	9.00	100.00	
	0.15		7.70	9.00	100.00	
	0.15		7.00	9.00	100.00	
	0.15		7.00	8.00	100.00	
	0.15		6.80	8.00	100.00	
	0.14		6.80	8.00	99.00	
	0.14		6.80	8.00	98.00	
	0.14		6.50	8.00	97.00	
	0.14		6.50	8.00	93.40	
	0.14		6.30	8.00	92.00	
	0.14		6.30	7.60	92.00	
	0.14		6.10	7.50	90.00	
	0.13		5.60	7.00	90.00	
	0.13		5.40	7.00	90.00	

	0.13		5.20	6.00	86.00	
	0.13		5.00	6.00	83.00	
	0.13		4.90	6.00	81.00	
	0.12		4.50	5.90	81.00	
	0.12		4.10	5.80	80.00	
	0.12		4.10	5.40	80.00	
	0.11		3.90	5.00	80.00	
	0.11		3.40	5.00	80.00	
	0.11		2.60	5.00	80.00	
	0.11		2.60	5.00	79.00	
	0.10		2.60	5.00	73.00	
	0.10		2.30	5.00	72.00	
	0.10		2.00	4.80	70.00	
	0.10		2.00	4.80	70.00	
	0.09		1.70	4.70	70.00	
	0.08		1.50	4.60	70.00	
	0.06		1.50	4.00	64.00	
	0.03		1.50	4.00	63.00	
			1.40	3.80	61.00	
			1.40	3.00	60.00	
				3.00	56.00	
				2.30	44.00	
				2.00	40.00	
				1.60	37.00	
					35.00	
					30.00	
					26.00	
					24.00	
					20.00	
					10.00	
					5.00	

II. NUMERIC ACTION LEVELS EVALUATION DATA

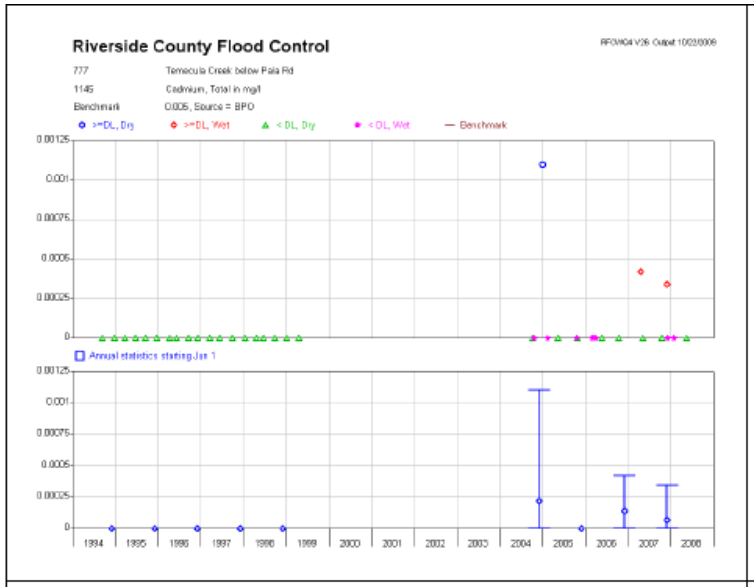

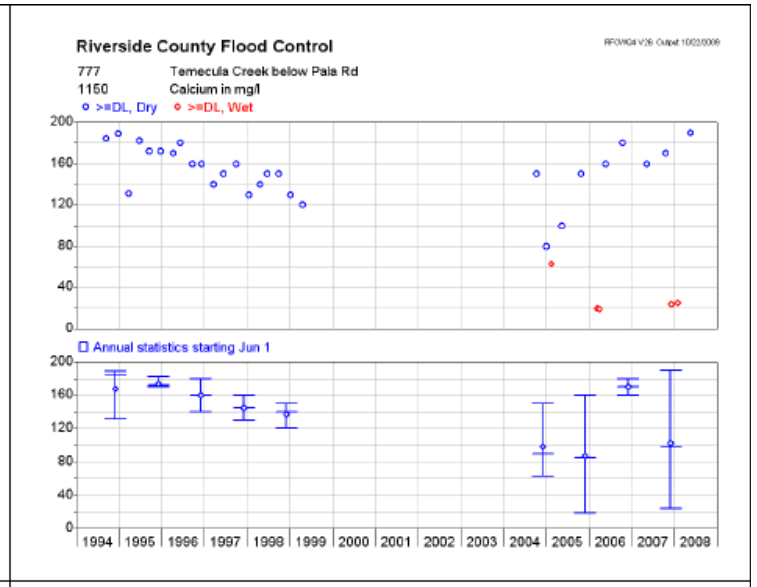

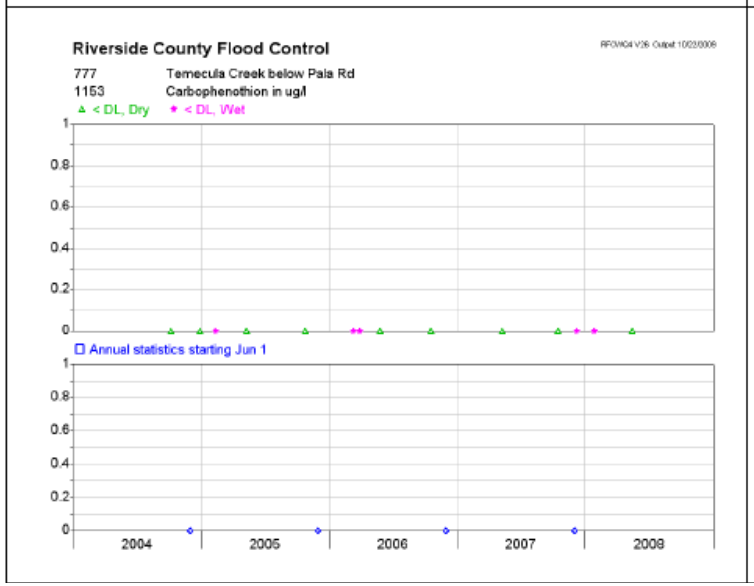

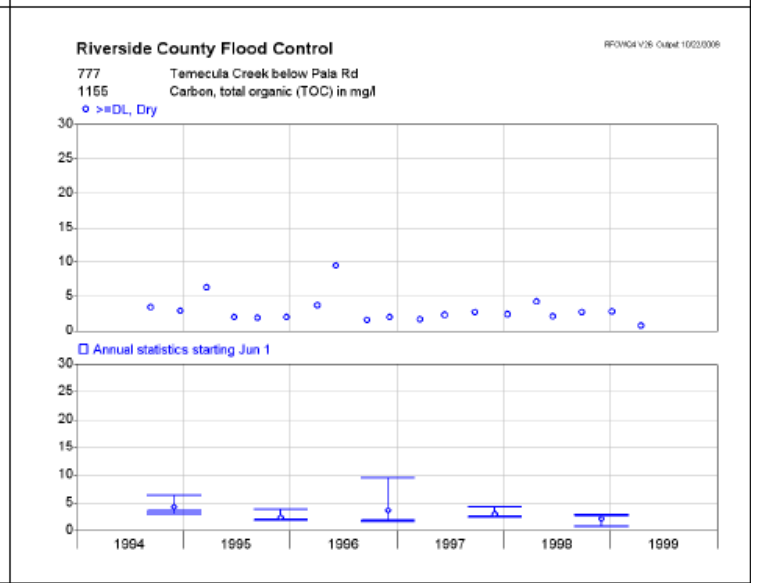

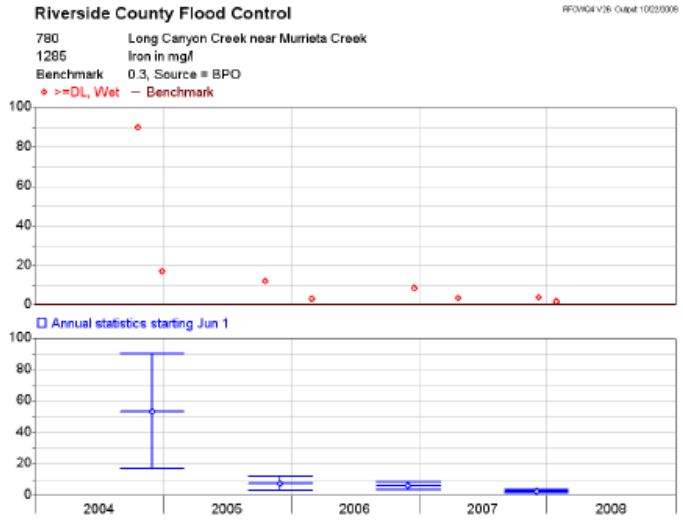
Riverside County Flood Control
780 Long Canyon Creek near Murrieta Creek
1285 Iron in mg/l
Benchmark 0.3, Source = BPO
>=DL, Wet
Benchmark
Annual statistics starting Jun 1
2004
2005
2006
2007
2008

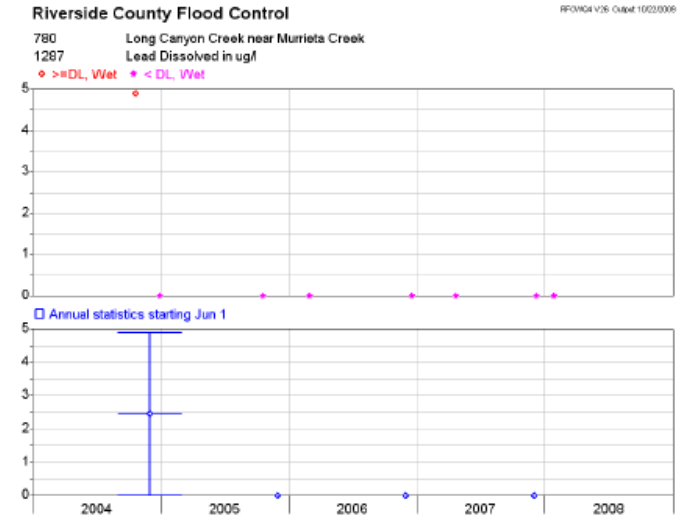
Riverside County Flood Control
780 Long Canyon Creek near Murrieta Creek
1287 Lead Dissolved in ug/l
>=DL, Wet
< DL, Wet
Annual statistics starting Jun 1
2004
2005
2006
2007
2008

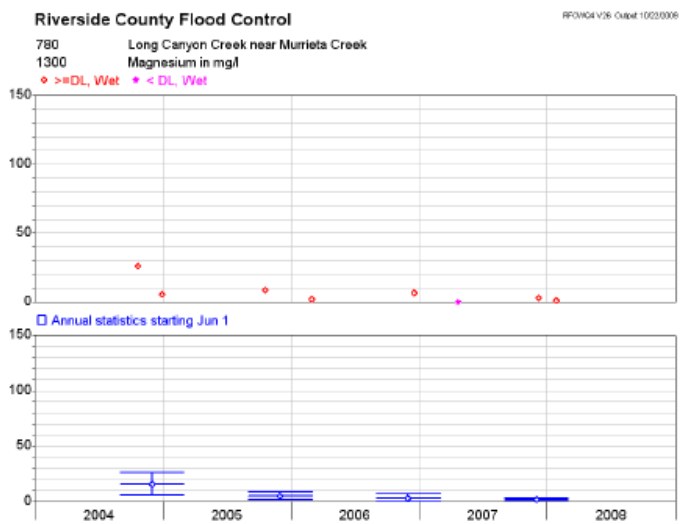
Riverside County Flood Control
780 Long Canyon Creek near Murrieta Creek
1300 Magnesium in mg/l
>=DL, Wet
< DL, Wet
Annual statistics starting Jun 1
2004
2005
2006
2007
2008

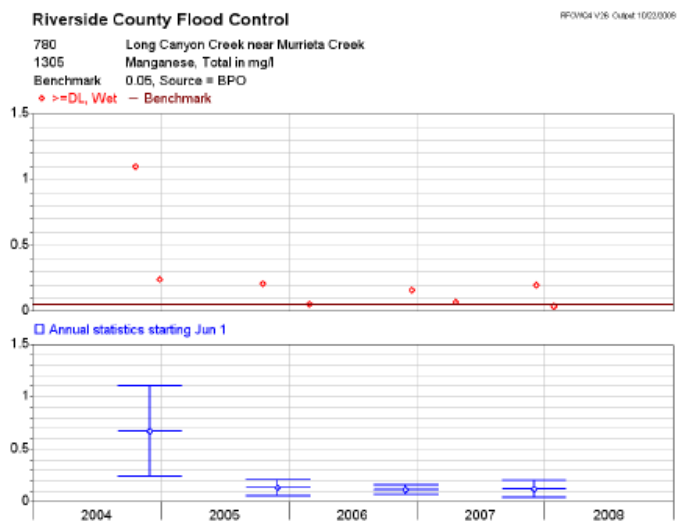
Riverside County Flood Control
780 Long Canyon Creek near Murrieta Creek
1305 Manganese, Total in mg/l
Benchmark 0.05, Source = BPO
>=DL, Wet
Benchmark
Annual statistics starting Jun 1
2004
2005
2006
2007
2008

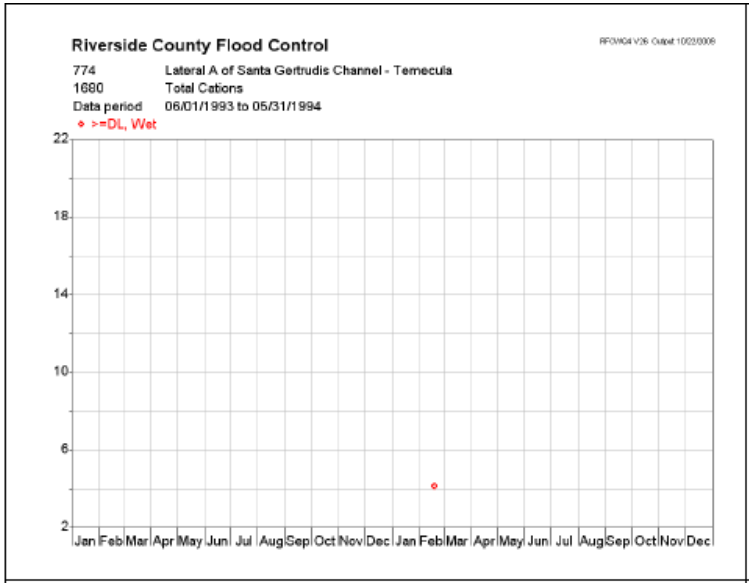
Riverside County Flood Control
774 Lateral A of Santa Gertrudis Channel - Temecula
1680 Total Cations
Data period 06/01/1993 to 05/31/1994
>=DL, Wet
22
18
14
10
6
2
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

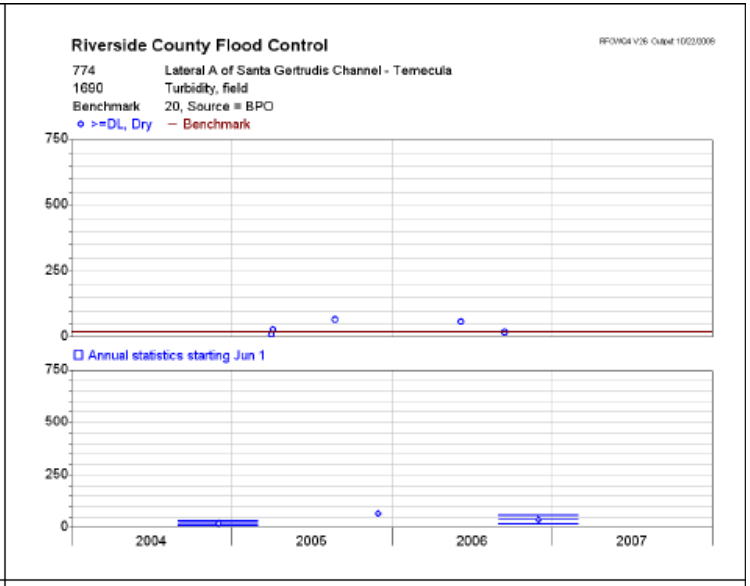
Riverside County Flood Control
774 Lateral A of Santa Gertrudis Channel - Temecula
1690 Turbidity, field
Benchmark 20, Source = BPO
>=DL, Dry
Benchmark
750
500
250
0
Annual statistics starting Jun 1
2004
2005
2006
2007

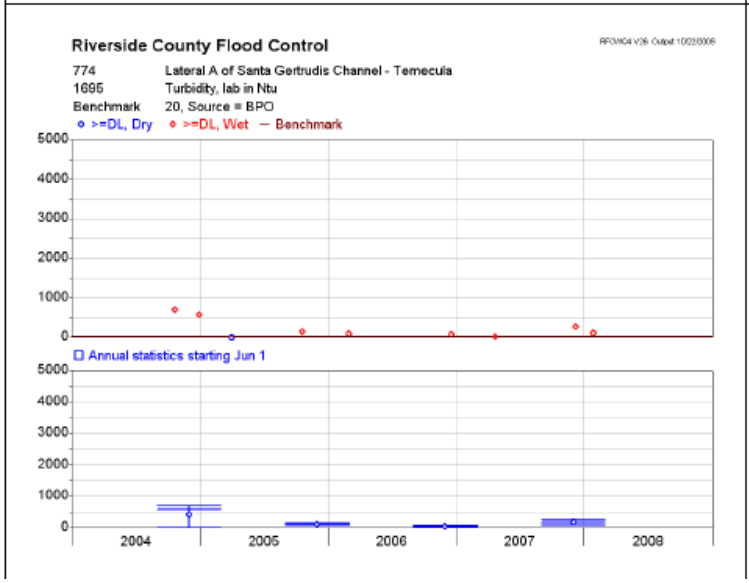
Riverside County Flood Control
774 Lateral A of Santa Gertrudis Channel - Temecula
1695 Turbidity, lab in Ntu
Benchmark 20, Source = BPO
>=DL, Dry
>=DL, Wet
Benchmark
5000
4000
3000
2000
1000
0
Annual statistics starting Jun 1
2004
2005
2006
2007
2008

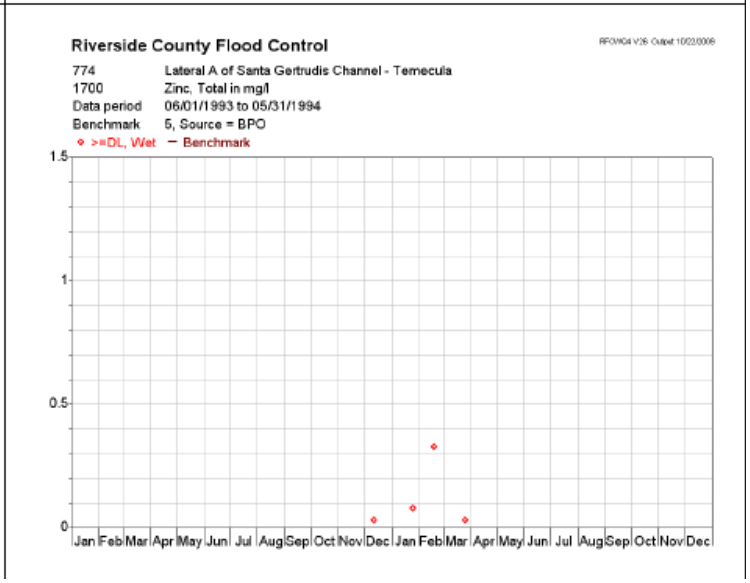
Riverside County Flood Control
774 Lateral A of Santa Gertrudis Channel - Temecula
1700 Zinc, Total in mg/l
Data period 06/01/1993 to 05/31/1994
Benchmark 5, Source = BPO
>=DL, Wet
Benchmark
1.5
1
0.5
0
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

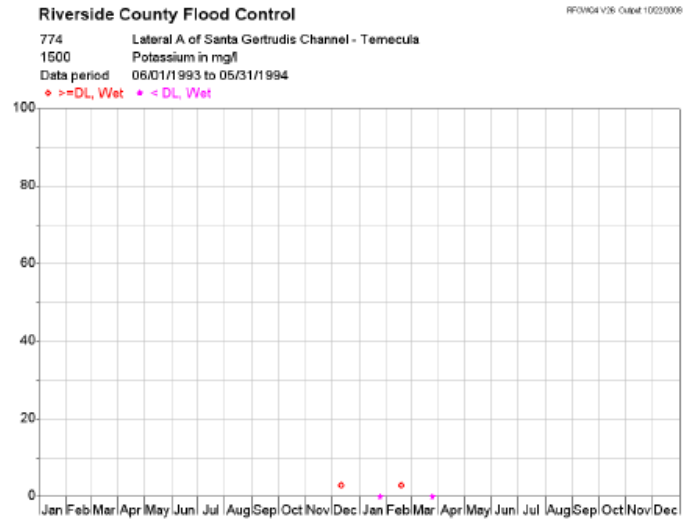
Riverside County Flood Control
774 Lateral A of Santa Gertrudis Channel - Temecula
1500 Potassium in mg/l
Data period 06/01/1993 to 05/31/1994
>=DL, Wet
< DL, Wet
100
80
60
40
20
0
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

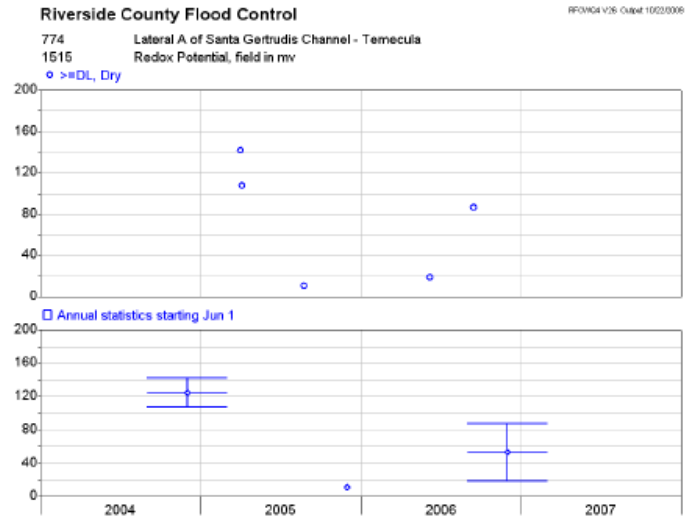
Riverside County Flood Control
774 Lateral A of Santa Gertrudis Channel - Temecula
1515 Redox Potential, field in mv
>=DL, Dry
Annual statistics starting Jun 1
200
160
120
80
40
0
2004
2005
2006
2007

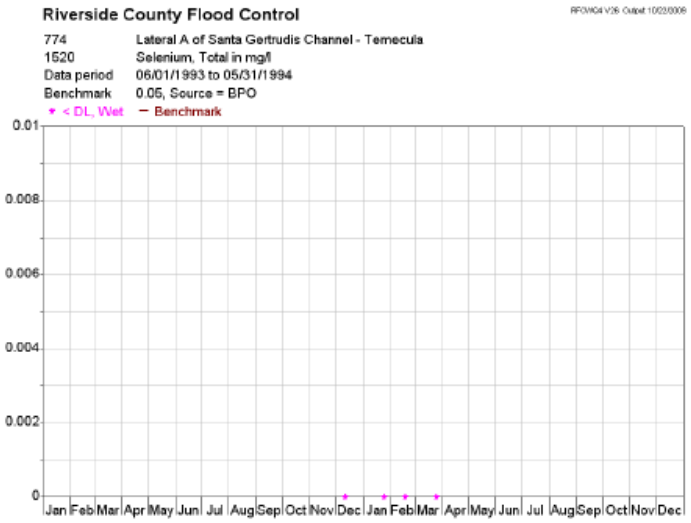
Riverside County Flood Control
774 Lateral A of Santa Gertrudis Channel - Temecula
1520 Selenium, Total in mg/l
Data period 06/01/1993 to 05/31/1994
Benchmark 0.05, Source = BPO
< DL, Wet
Benchmark
0.01
0.008
0.006
0.004
0.002
0
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

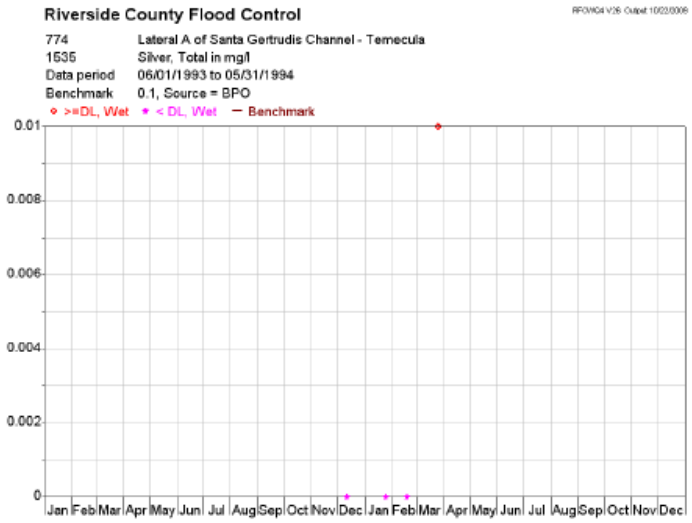
Riverside County Flood Control
774 Lateral A of Santa Gertrudis Channel - Temecula
1535 Silver, Total in mg/l
Data period 06/01/1993 to 05/31/1994
Benchmark 0.1, Source = BPO
>=DL, Wet
< DL, Wet
Benchmark
0.01
0.008
0.006
0.004
0.002
0
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

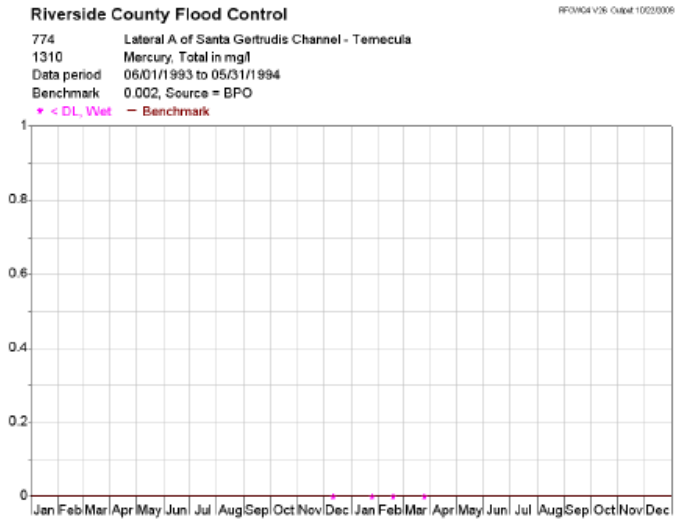
Riverside County Flood Control
774 Lateral A of Santa Gertrudis Channel - Temecula
1310 Mercury, Total in mg/l
Data period 06/01/1993 to 05/31/1994
Benchmark 0.002, Source = BPO
< DL, Wet
Benchmark
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

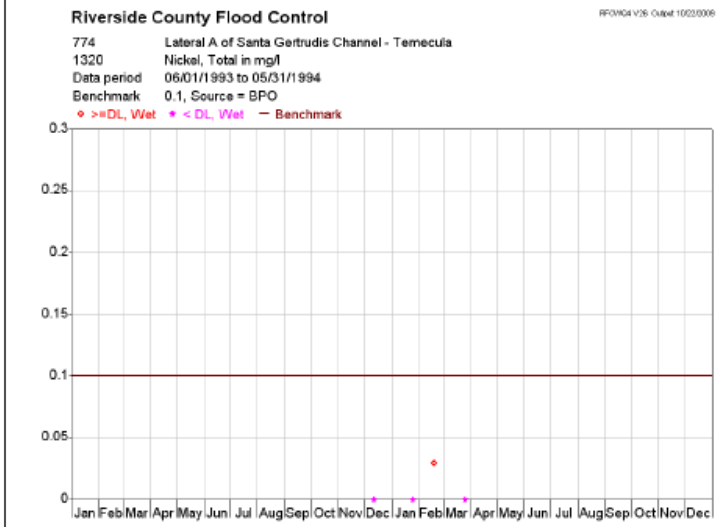
Riverside County Flood Control
774 Lateral A of Santa Gertrudis Channel - Temecula
1320 Nickel, Total in mg/l
Data period 06/01/1993 to 05/31/1994
Benchmark 0.1, Source = BPO
>=DL, Wet
< DL, Wet
Benchmark
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

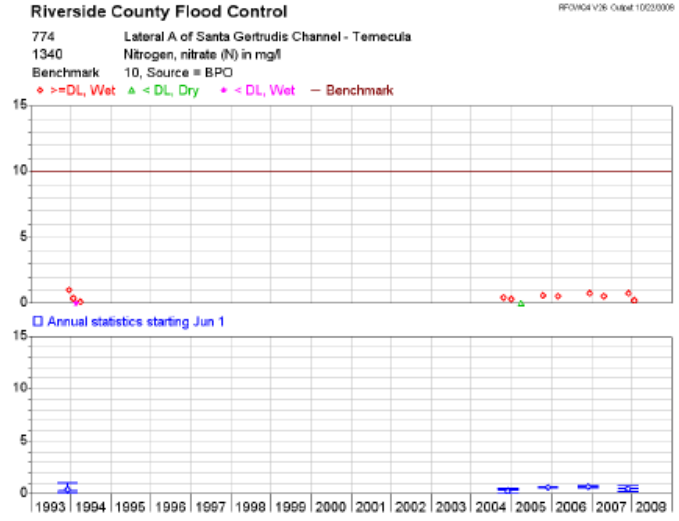
Riverside County Flood Control
774 Lateral A of Santa Gertrudis Channel - Temecula
1340 Nitrogen, nitrate (N) in mg/l
Benchmark 10, Source = BPO
>=DL, Wet
< DL, Dry
< DL, Wet
Benchmark
Annual statistics starting Jun 1
1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008

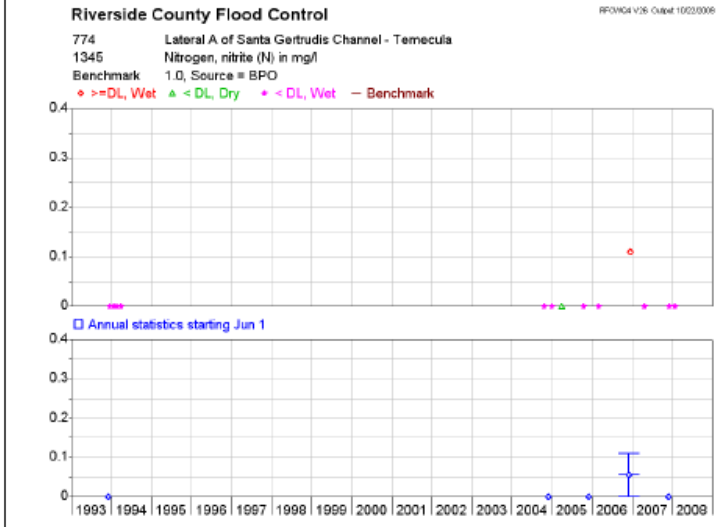
Riverside County Flood Control
774 Lateral A of Santa Gertrudis Channel - Temecula
1345 Nitrogen, nitrite (N) in mg/l
Benchmark 1.0, Source = BPO
>=DL, Wet
< DL, Dry
< DL, Wet
Benchmark
Annual statistics starting Jun 1
1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008

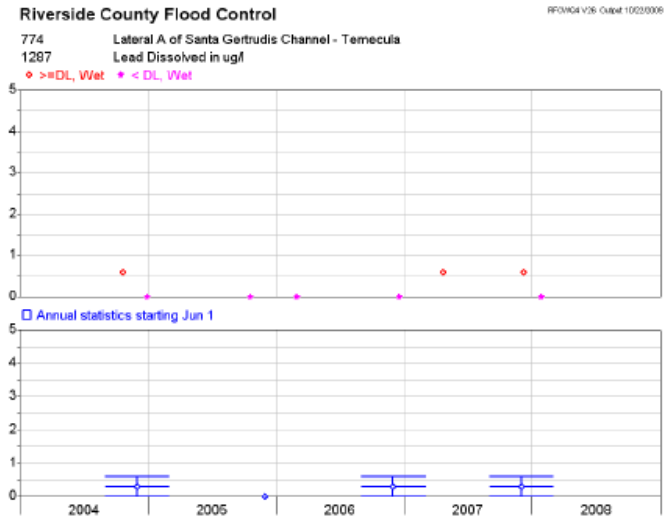
Riverside County Flood Control
774 Lateral A of Santa Gertrudis Channel - Temecula
1287 Lead Dissolved in ug/l
>=DL, Wet
< DL, Wet
Annual statistics starting Jun 1
2004
2005
2006
2007
2008

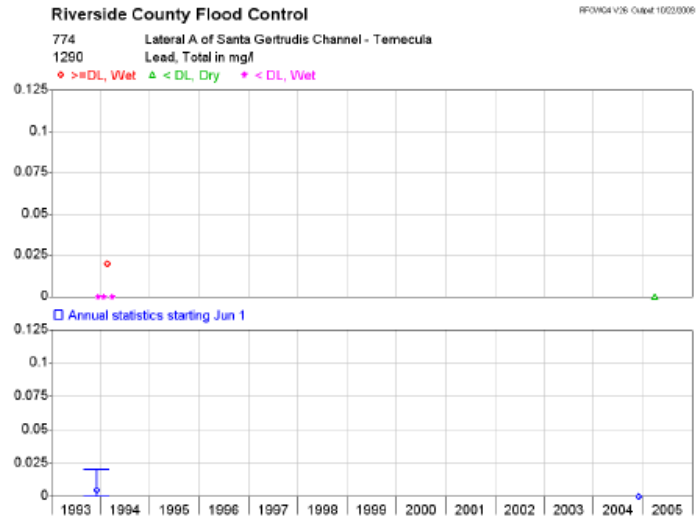
Riverside County Flood Control
774 Lateral A of Santa Gertrudis Channel - Temecula
1290 Lead, Total in mg/l
>=DL, Wet
< DL, Dry
< DL, Wet
Annual statistics starting Jun 1
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005

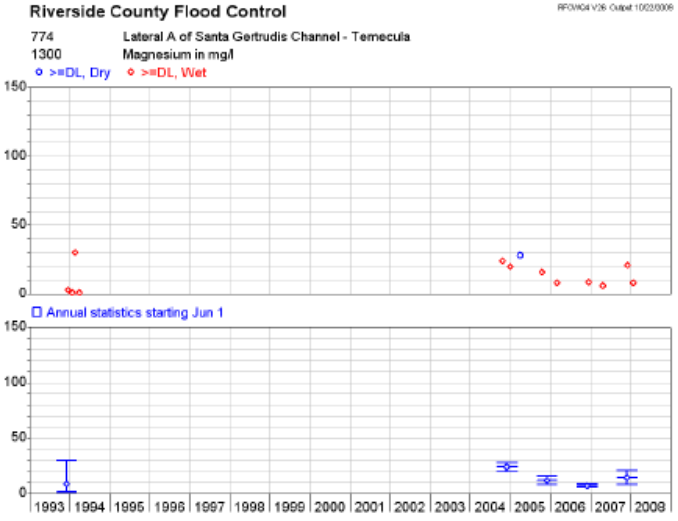
Riverside County Flood Control
774 Lateral A of Santa Gertrudis Channel - Temecula
1300 Magnesium in mg/l
>=DL, Dry
>=DL, Wet
Annual statistics starting Jun 1
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008

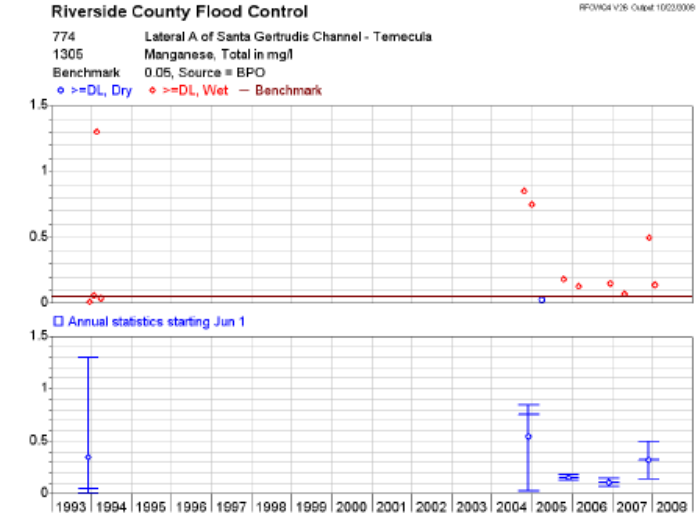
Riverside County Flood Control
774 Lateral A of Santa Gertrudis Channel - Temecula
1305 Manganese, Total in mg/l
Benchmark 0.05, Source = BPO
>=DL, Dry
>=DL, Wet
Benchmark
Annual statistics starting Jun 1
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008

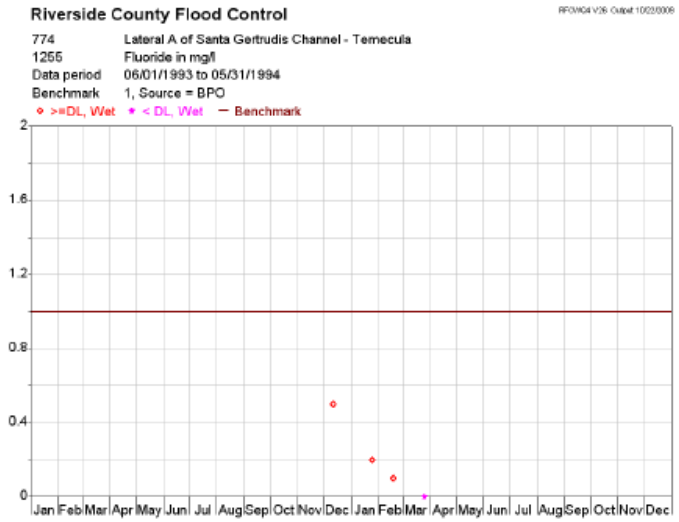
Riverside County Flood Control
774 Lateral A of Santa Gertrudis Channel - Temecula
1255 Fluoride in mg/l
Data period 06/01/1993 to 05/31/1994
Benchmark 1, Source = BPO
>=DL, Wet
< DL, Wet
Benchmark
2
1.6
1.2
0.8
0.4
0
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

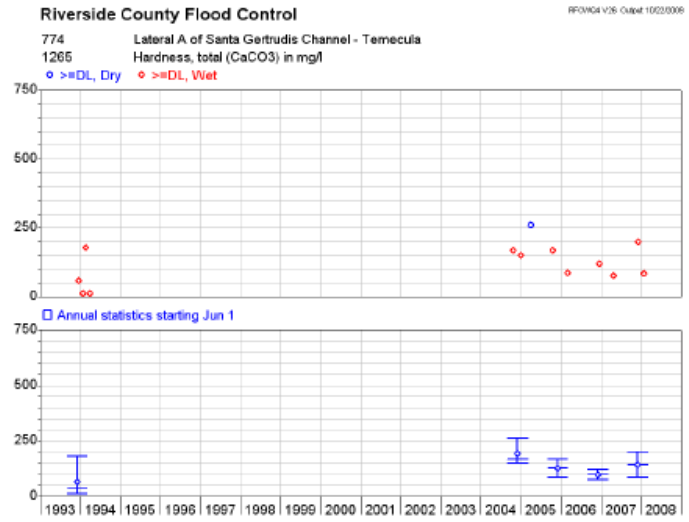
Riverside County Flood Control
774 Lateral A of Santa Gertrudis Channel - Temecula
1265 Hardness, total (CaCO3) in mg/l
>=DL, Dry
>=DL, Wet
750
500
250
0
Annual statistics starting Jun 1
750
500
250
0
1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008

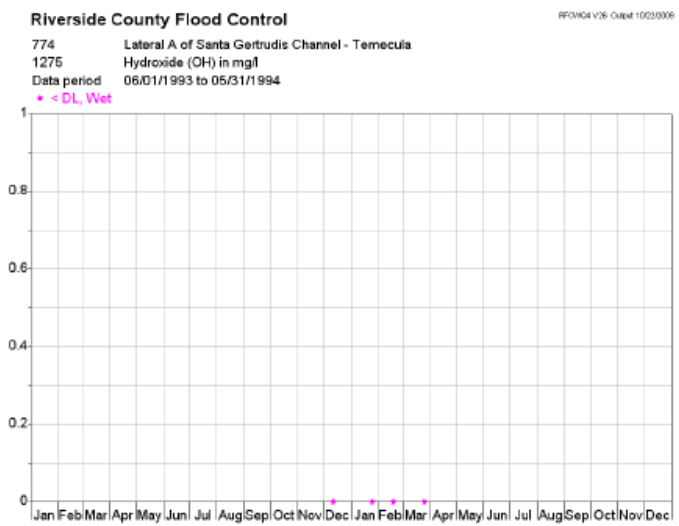
Riverside County Flood Control
774 Lateral A of Santa Gertrudis Channel - Temecula
1275 Hydroxide (OH) in mg/l
Data period 06/01/1993 to 05/31/1994
< DL, Wet
1
0.8
0.6
0.4
0.2
0
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

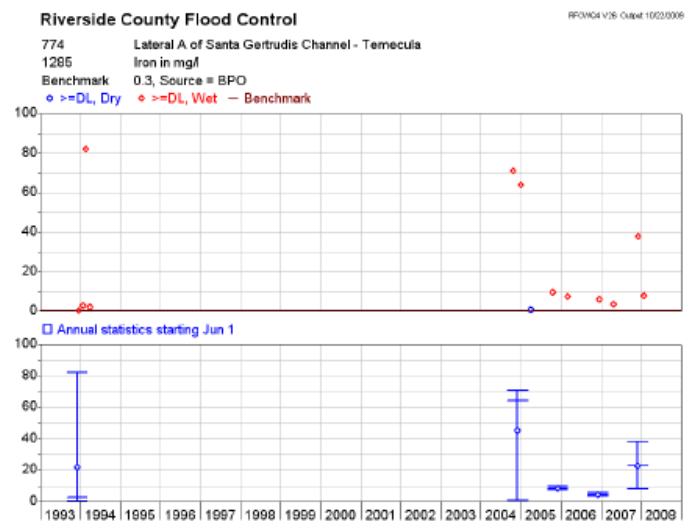
Riverside County Flood Control
774 Lateral A of Santa Gertrudis Channel - Temecula
1285 Iron in mg/l
Benchmark 0.3, Source = BPO
>=DL, Dry
>=DL, Wet
Benchmark
100
80
60
40
20
0
Annual statistics starting Jun 1
100
80
60
40
20
0
1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008

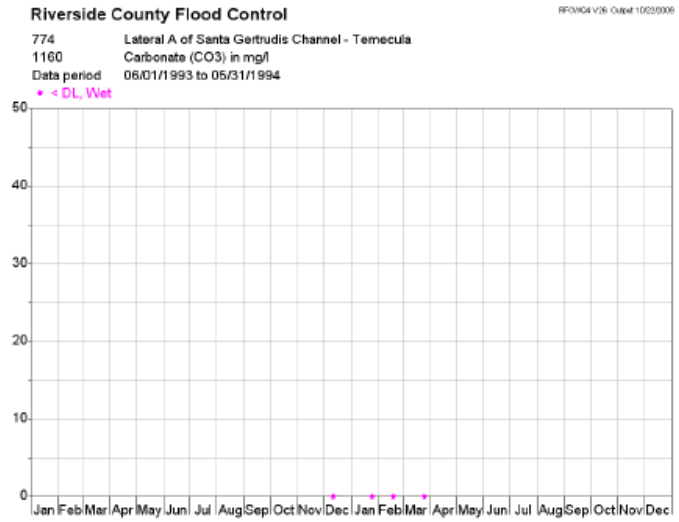
Riverside County Flood Control
774 Lateral A of Santa Gertrudis Channel - Temecula
1160 Carbonate (CO3) in mg/l
Data period 06/01/1993 to 05/31/1994
< DL, Wet
50
40
30
20
10
0
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

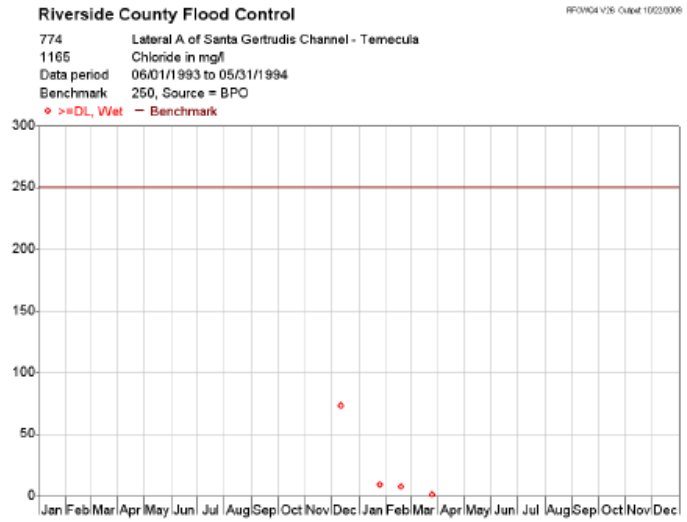
Riverside County Flood Control
774 Lateral A of Santa Gertrudis Channel - Temecula
1165 Chloride in mg/l
Data period 06/01/1993 to 05/31/1994
Benchmark 250, Source = BPO
>=DL, Wet
Benchmark
300
250
200
150
100
50
0
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

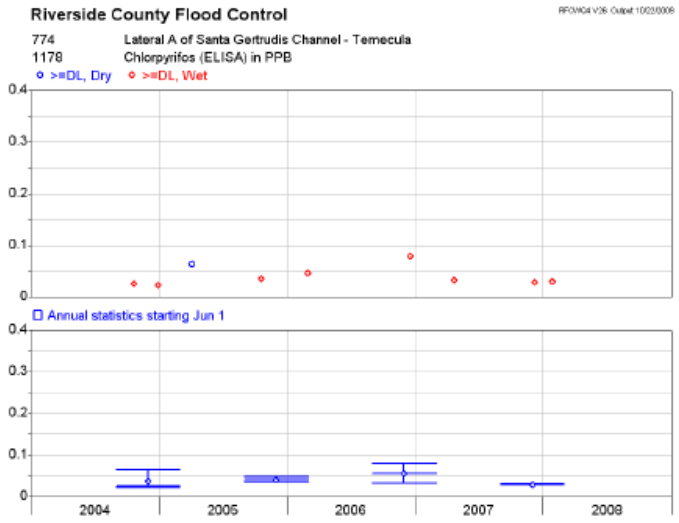
Riverside County Flood Control
774 Lateral A of Santa Gertrudis Channel - Temecula
1178 Chlorpyrifos (ELISA) in PPB
>=DL, Dry
>=DL, Wet
0.4
0.3
0.2
0.1
0
Annual statistics starting Jun 1
0.4
0.3
0.2
0.1
0
2004
2005
2006
2007
2008

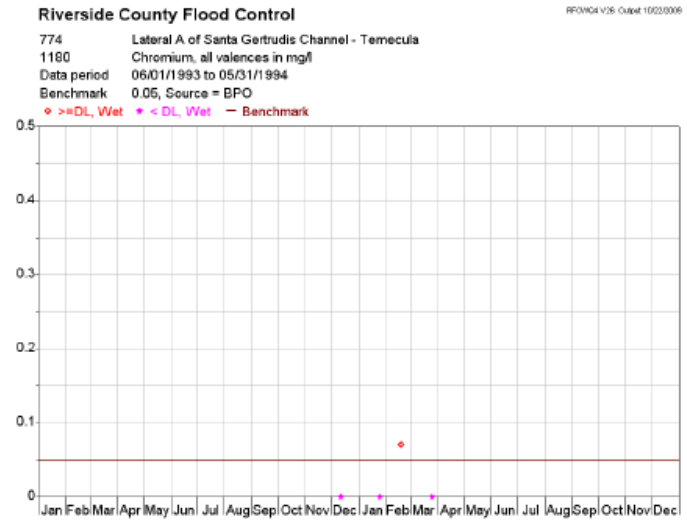
Riverside County Flood Control
774 Lateral A of Santa Gertrudis Channel - Temecula
1180 Chromium, all valences in mg/l
Data period 06/01/1993 to 05/31/1994
Benchmark 0.05, Source = BPO
>=DL, Wet
< DL, Wet
Benchmark
0.5
0.4
0.3
0.2
0.1
0
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

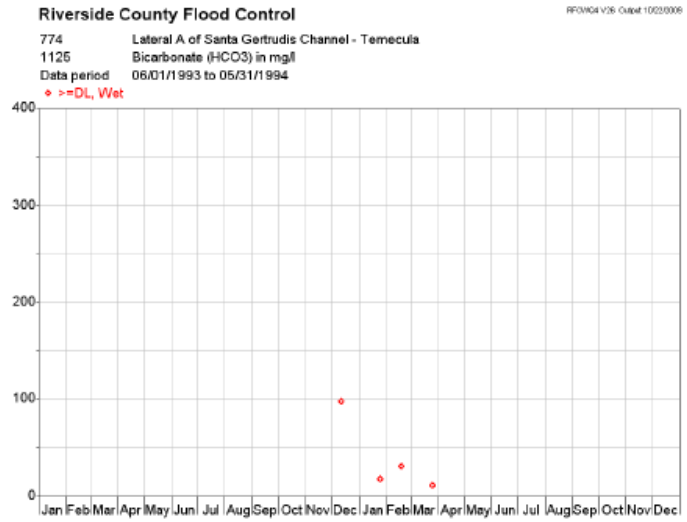
Riverside County Flood Control
774 Lateral A of Santa Gertrudis Channel - Temecula
1125 Bicarbonate (HCO3) in mg/l
Data period 06/01/1993 to 05/31/1994
>=DL, Wet
400
300
200
100
0
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

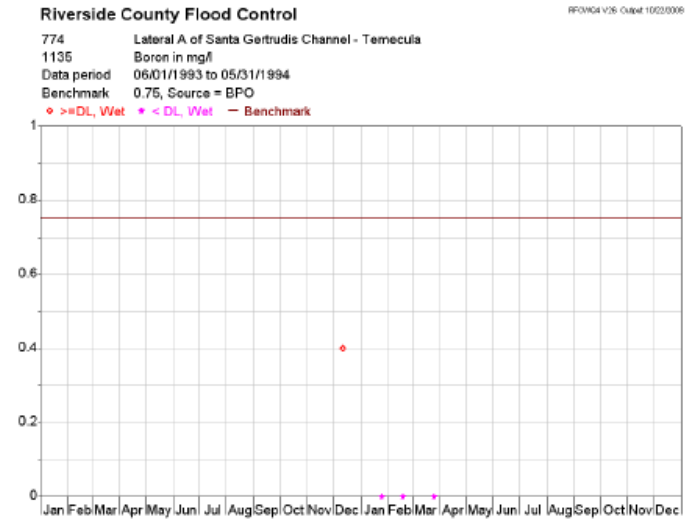
Riverside County Flood Control
774 Lateral A of Santa Gertrudis Channel - Temecula
1135 Boron in mg/l
Data period 06/01/1993 to 05/31/1994
Benchmark 0.75, Source = BPO
>=DL, Wet
< DL, Wet
Benchmark
1
0.8
0.6
0.4
0.2
0
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

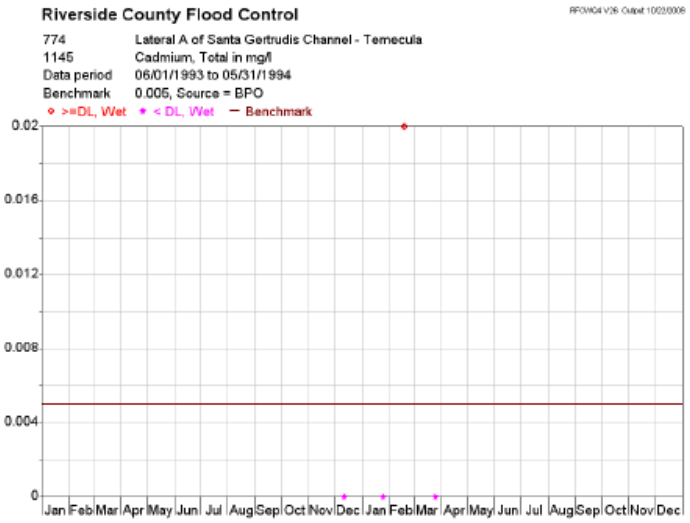
Riverside County Flood Control
774 Lateral A of Santa Gertrudis Channel - Temecula
1145 Cadmium, Total in mg/l
Data period 06/01/1993 to 05/31/1994
Benchmark 0.005, Source = BPO
>=DL, Wet
< DL, Wet
Benchmark
0.02
0.016
0.012
0.008
0.004
0
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

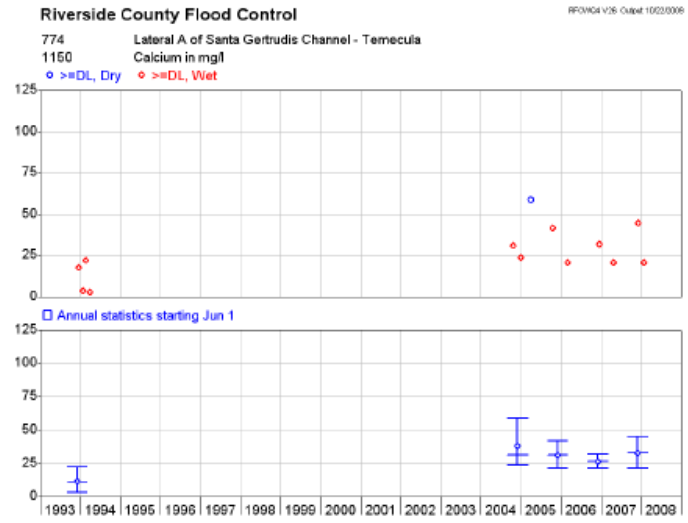
Riverside County Flood Control
774 Lateral A of Santa Gertrudis Channel - Temecula
1150 Calcium in mg/l
>=DL, Dry
>=DL, Wet
125
100
75
50
25
0
Annual statistics starting Jun 1
1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008

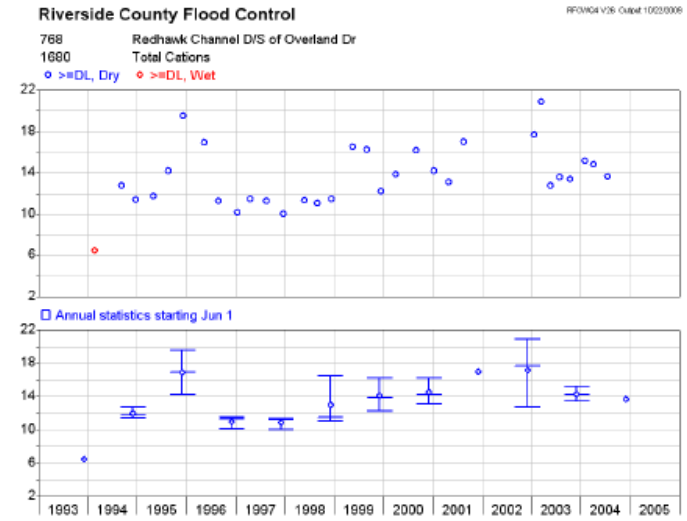
Riverside County Flood Control
768 Redhawk Channel D/S of Overland Dr
1680 Total Cations
>=DL, Dry
>=DL, Wet
Annual statistics starting Jun 1

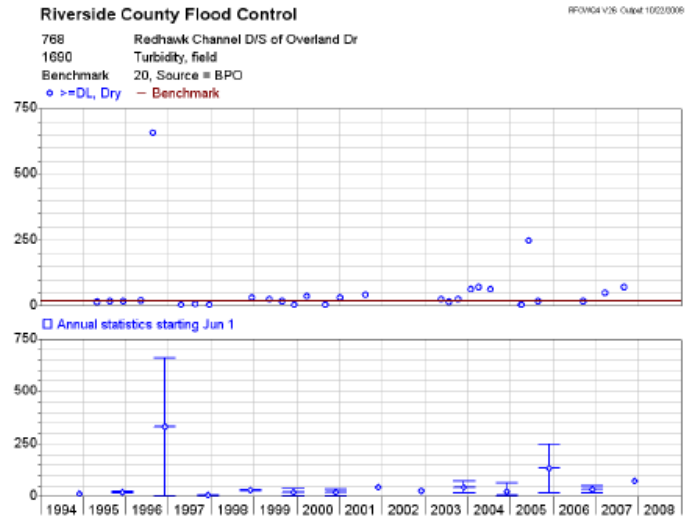
Riverside County Flood Control
768 Redhawk Channel D/S of Overland Dr
1690 Turbidity, field
Benchmark 20, Source = BPO
>=DL, Dry
Benchmark
Annual statistics starting Jun 1

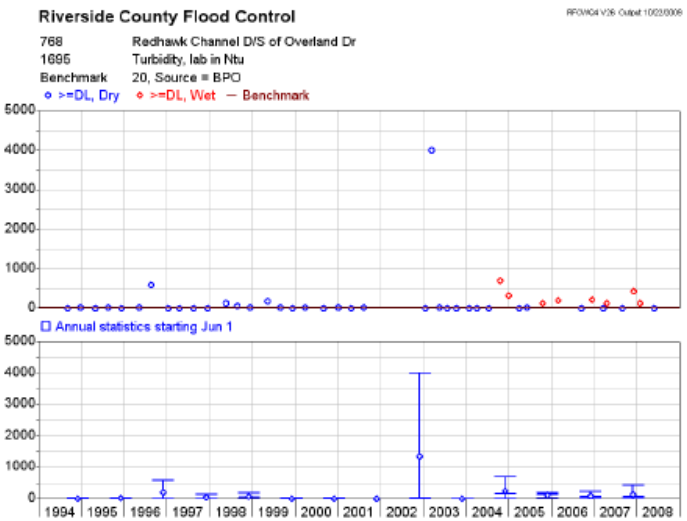
Riverside County Flood Control
768 Redhawk Channel D/S of Overland Dr
1695 Turbidity, lab in Ntu
Benchmark 20, Source = BPO
>=DL, Dry
>=DL, Wet
Benchmark
Annual statistics starting Jun 1

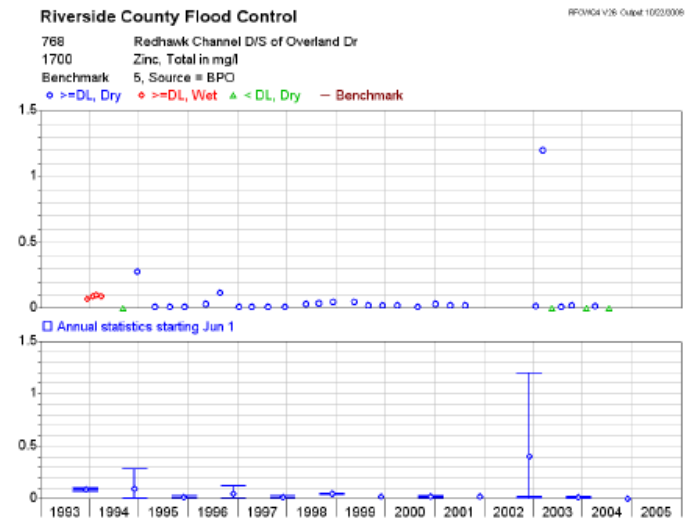
Riverside County Flood Control
768 Redhawk Channel D/S of Overland Dr
1700 Zinc, Total in mg/l
Benchmark 5, Source = BPO
>=DL, Dry
>=DL, Wet
< DL, Dry
Benchmark
Annual statistics starting Jun 1

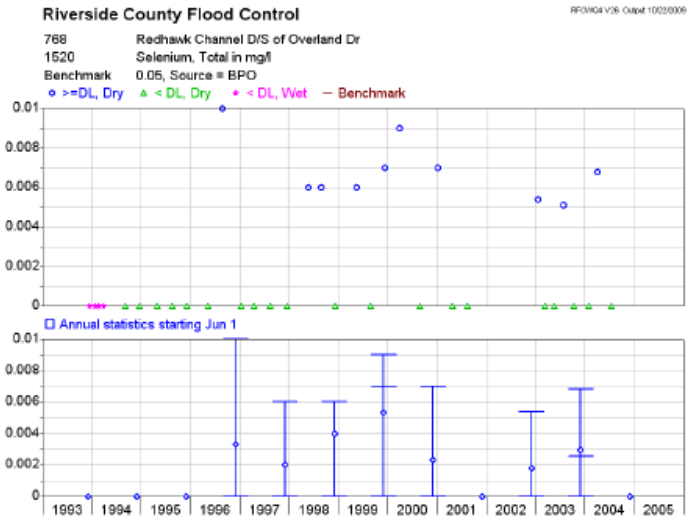
Riverside County Flood Control
768 Redhawk Channel D/S of Overland Dr
1520 Selenium, Total in mg/l
Benchmark 0.05, Source = BPO
>=DL, Dry
< DL, Dry
< DL, Wet
Benchmark
Annual statistics starting Jun 1
0.01
0.008
0.006
0.004
0.002
0
1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005

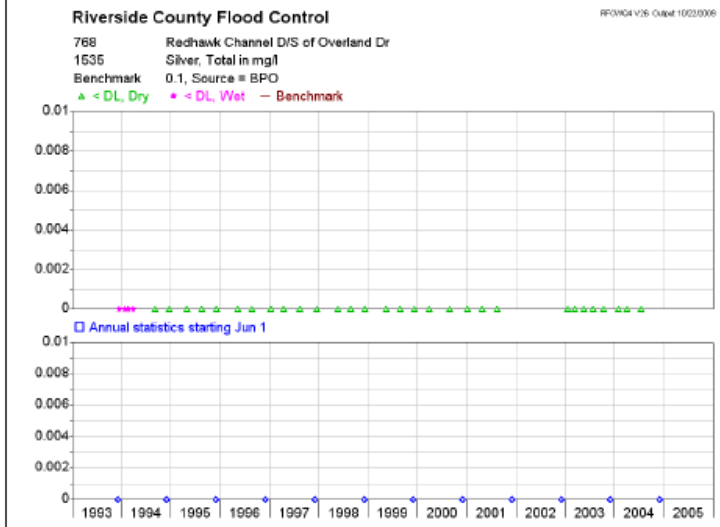
Riverside County Flood Control
768 Redhawk Channel D/S of Overland Dr
1535 Silver, Total in mg/l
Benchmark 0.1, Source = BPO
< DL, Dry
< DL, Wet
Benchmark
Annual statistics starting Jun 1
0.01
0.008
0.006
0.004
0.002
0
1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005

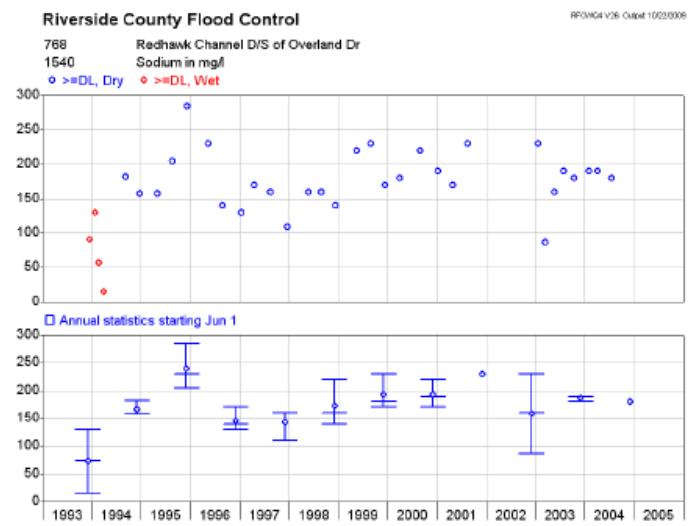
Riverside County Flood Control
768 Redhawk Channel D/S of Overland Dr
1540 Sodium in mg/l
>=DL, Dry
>=DL, Wet
Annual statistics starting Jun 1
300
250
200
150
100
50
0
1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005

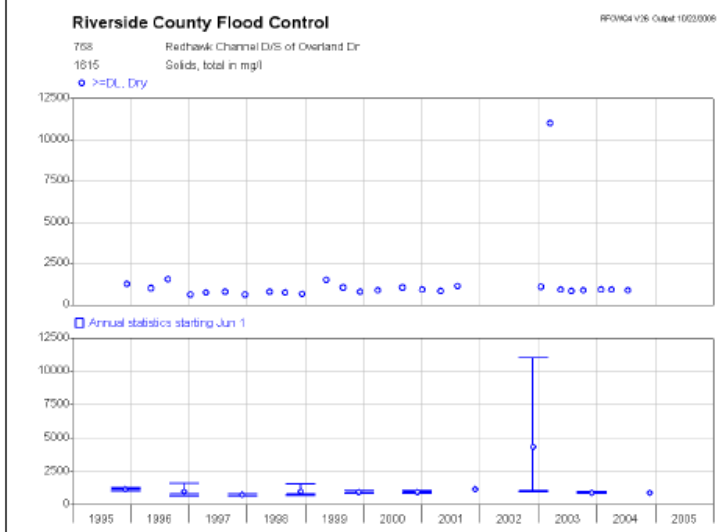
Riverside County Flood Control
768 Redhawk Channel D/S of Overland Dr
1615 Solids, total in mg/l
>=DL, Dry
Annual statistics starting Jun 1
12500
10000
7500
5000
2500
0
1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005

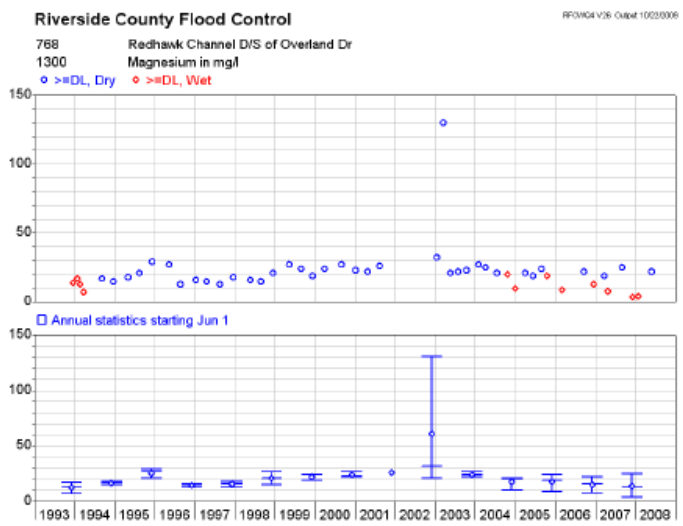
Riverside County Flood Control
768 Redhawk Channel D/S of Overland Dr
1300 Magnesium in mg/l
>=DL, Dry
>=DL, Wet
Annual statistics starting Jun 1
150
100
50
0
1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008

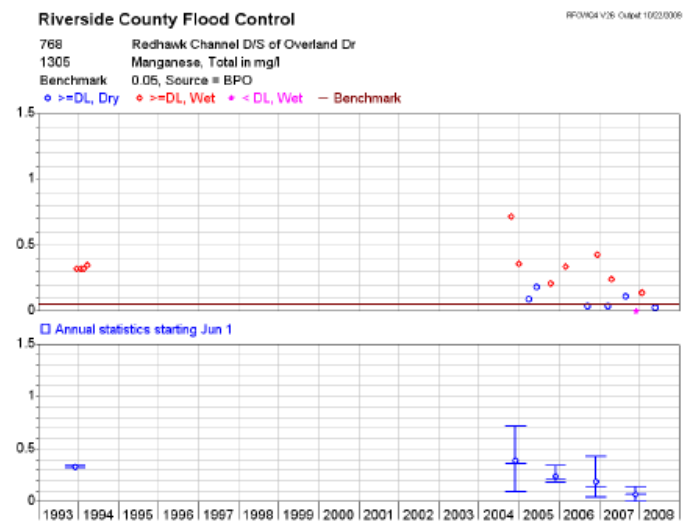
Riverside County Flood Control
768 Redhawk Channel D/S of Overland Dr
1305 Manganese, Total in mg/l
Benchmark 0.05, Source = BPO
>=DL, Dry
>=DL, Wet
< DL, Wet
Benchmark
Annual statistics starting Jun 1
1.5
1
0.5
0
1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008

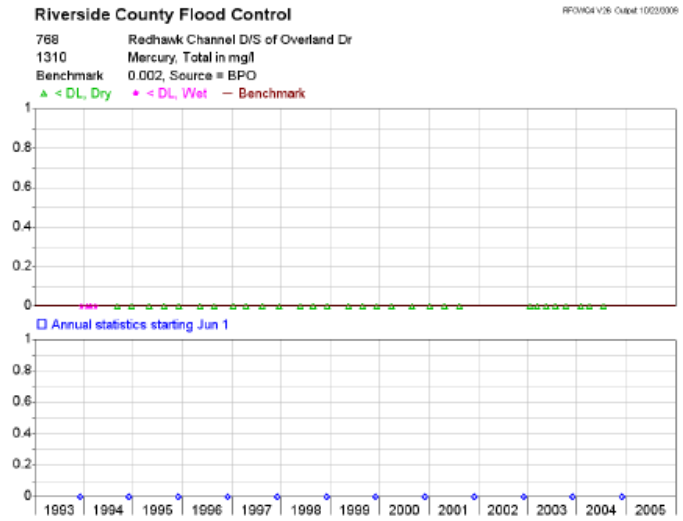
Riverside County Flood Control
768 Redhawk Channel D/S of Overland Dr
1310 Mercury, Total in mg/l
Benchmark 0.002, Source = BPO
< DL, Dry
< DL, Wet
Benchmark
Annual statistics starting Jun 1
1
0.8
0.6
0.4
0.2
0
1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005

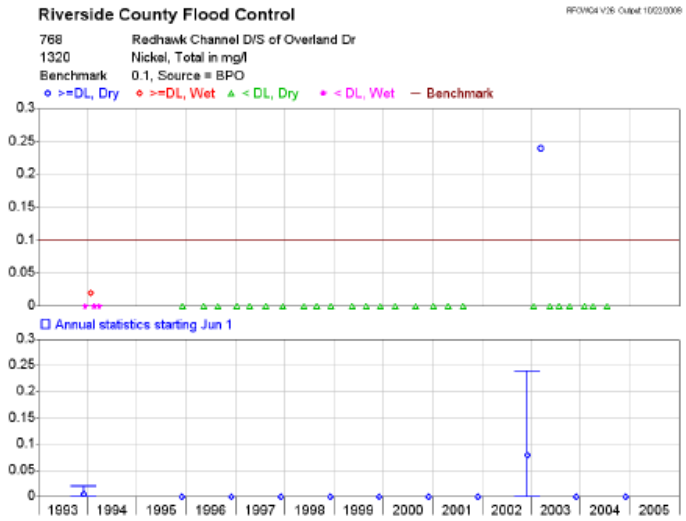
Riverside County Flood Control
768 Redhawk Channel D/S of Overland Dr
1320 Nickel, Total in mg/l
Benchmark 0.1, Source = BPO
>=DL, Dry
>=DL, Wet
< DL, Dry
< DL, Wet
Benchmark
Annual statistics starting Jun 1
0.3
0.25
0.2
0.15
0.1
0.05
0
1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005

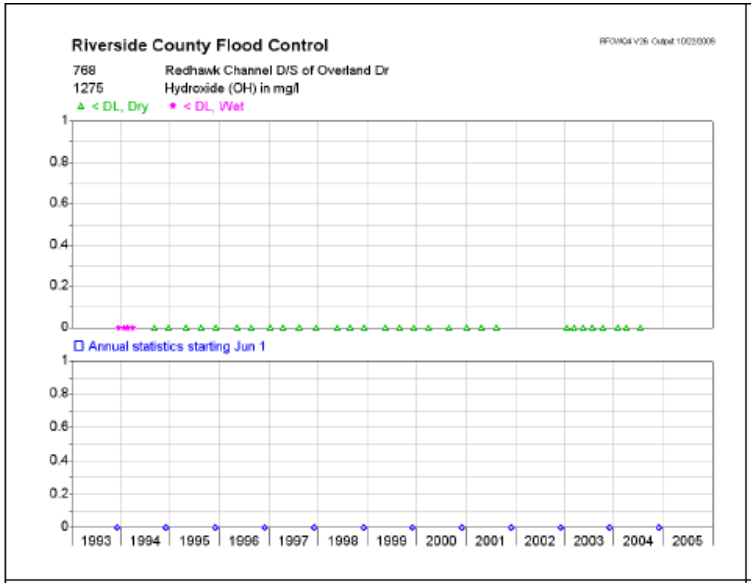
Riverside County Flood Control
768 Redhawk Channel D/S of Overland Dr
1275 Hydroxide (OH) in mg/l
< DL, Dry < DL, Wet
Annual statistics starting Jun 1

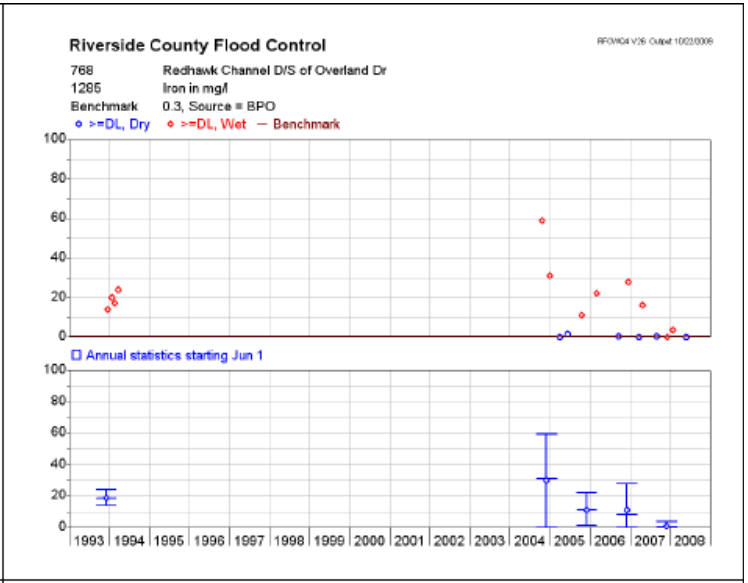
Riverside County Flood Control
768 Redhawk Channel D/S of Overland Dr
1285 Iron in mg/l
Benchmark 0.3, Source = BPO
>=DL, Dry >=DL, Wet Benchmark
Annual statistics starting Jun 1

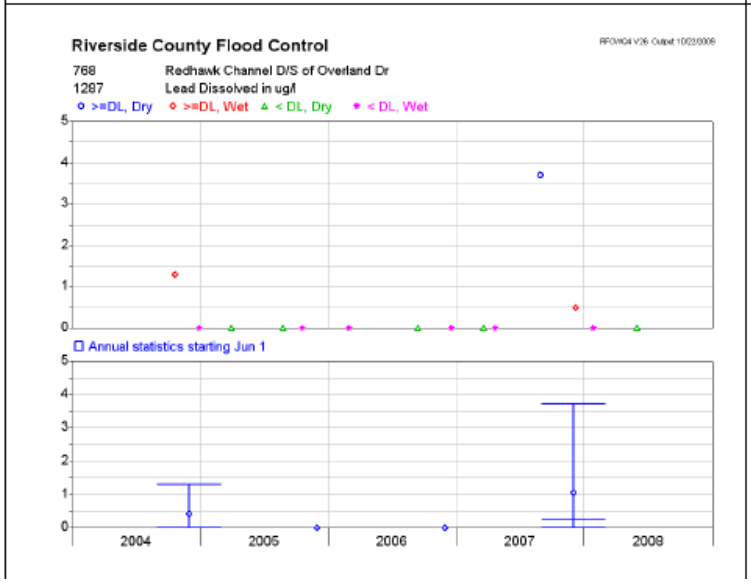
Riverside County Flood Control
768 Redhawk Channel D/S of Overland Dr
1287 Lead Dissolved in ug/l
>=DL, Dry >=DL, Wet < DL, Dry < DL, Wet
Annual statistics starting Jun 1

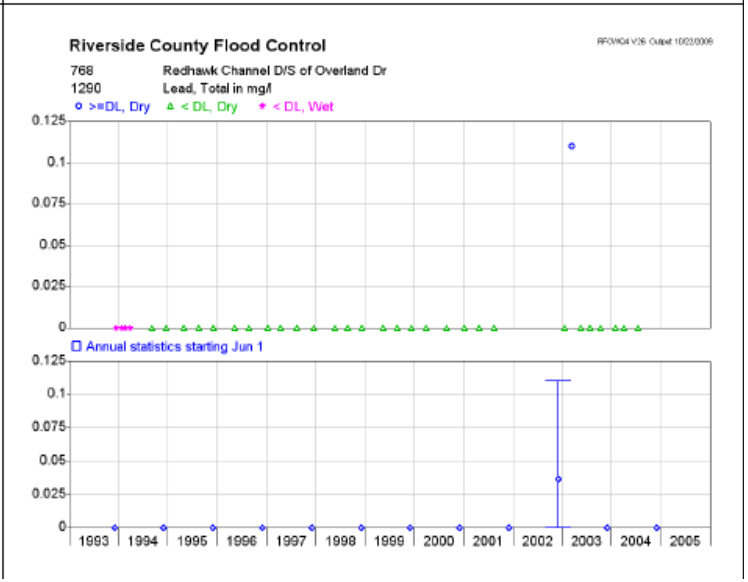
Riverside County Flood Control
768 Redhawk Channel D/S of Overland Dr
1290 Lead, Total in mg/l
>=DL, Dry < DL, Dry < DL, Wet
Annual statistics starting Jun 1

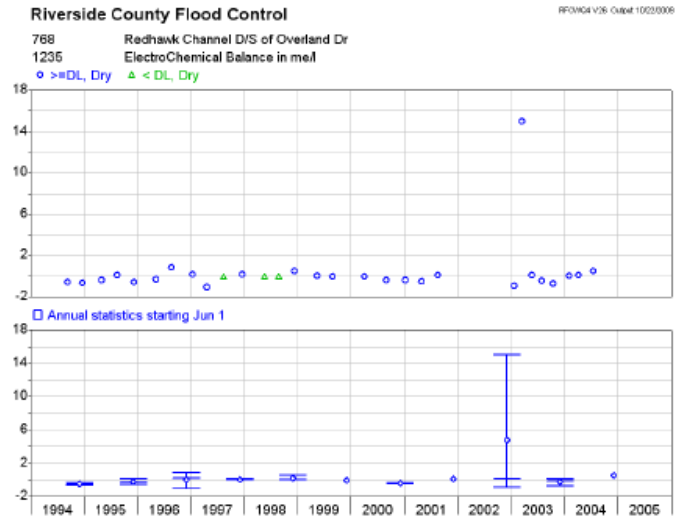
Riverside County Flood Control
768 Redhawk Channel D/S of Overland Dr
1235 ElectroChemical Balance in me/l
>=DL, Dry
< DL, Dry
Annual statistics starting Jun 1

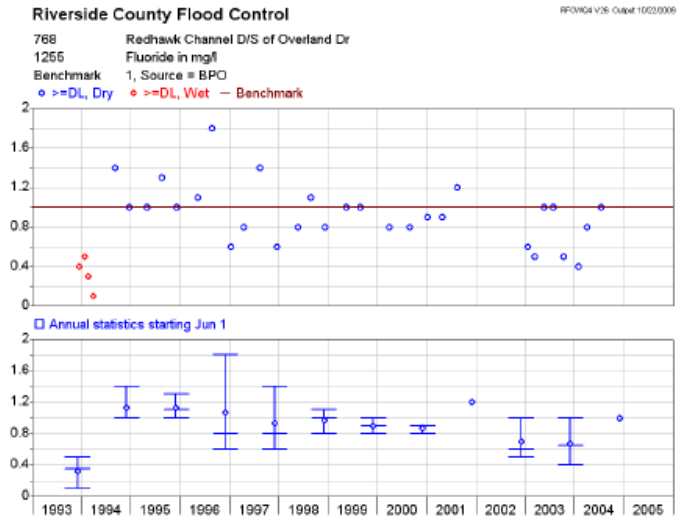
Riverside County Flood Control
768 Redhawk Channel D/S of Overland Dr
1255 Fluoride in mg/l
Benchmark 1, Source = BPO
>=DL, Dry
>=DL, Wet
Benchmark
Annual statistics starting Jun 1

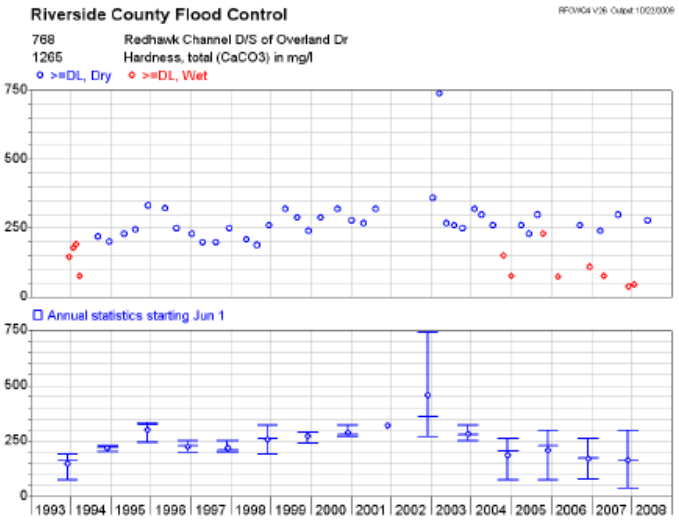
Riverside County Flood Control
768 Redhawk Channel D/S of Overland Dr
1265 Hardness, total (CaCO3) in mg/l
>=DL, Dry
>=DL, Wet
Annual statistics starting Jun 1

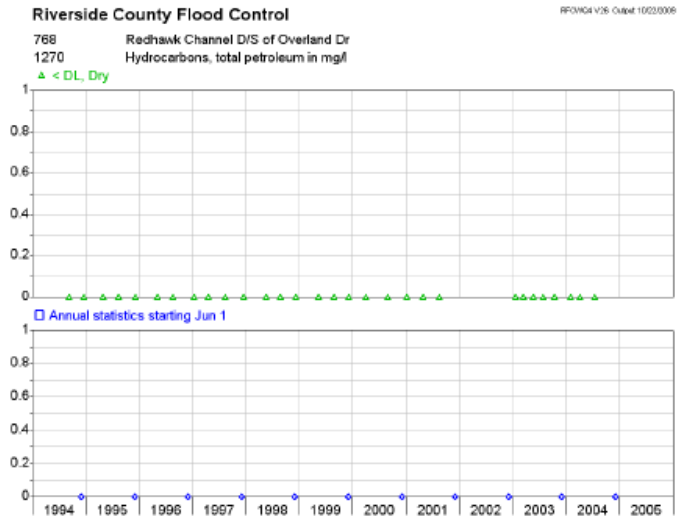
Riverside County Flood Control
768 Redhawk Channel D/S of Overland Dr
1270 Hydrocarbons, total petroleum in mg/l
< DL, Dry
Annual statistics starting Jun 1

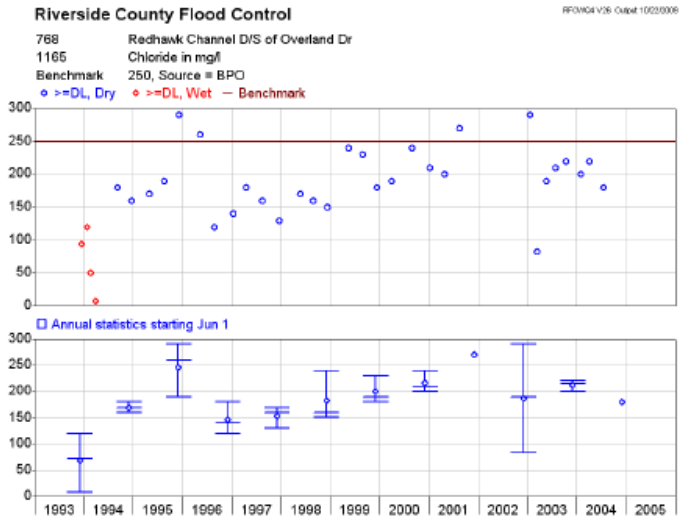
Riverside County Flood Control
768 Redhawk Channel D/S of Overland Dr
1165 Chloride in mg/l
Benchmark 250, Source = BPO
>=DL, Dry
>=DL, Wet
Benchmark
Annual statistics starting Jun 1
1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005

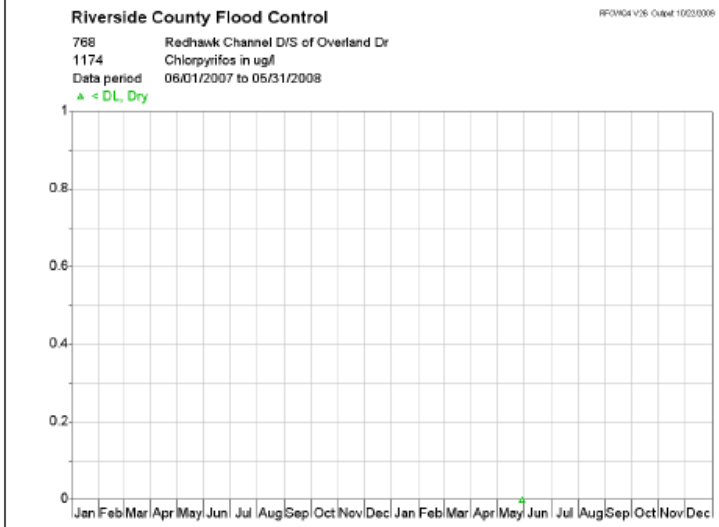
Riverside County Flood Control
768 Redhawk Channel D/S of Overland Dr
1174 Chlorpyrifos in ug/l
Data period 06/01/2007 to 05/31/2008
< DL, Dry
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

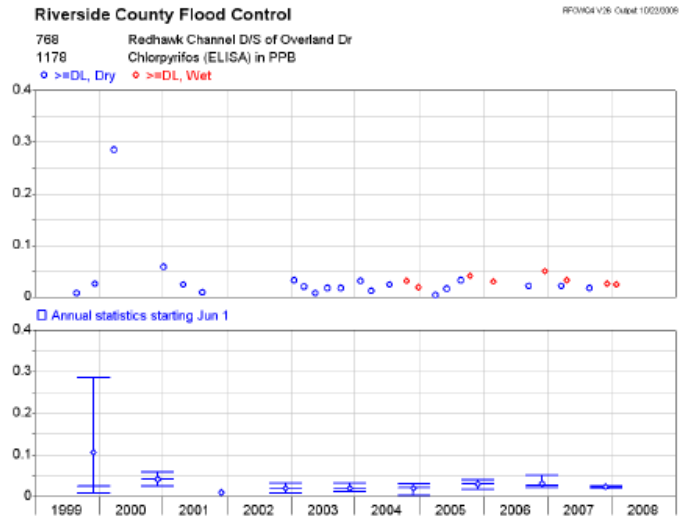
Riverside County Flood Control
768 Redhawk Channel D/S of Overland Dr
1178 Chlorpyrifos (ELISA) in PPB
>=DL, Dry
>=DL, Wet
Annual statistics starting Jun 1
1999 2000 2001 2002 2003 2004 2005 2006 2007 2008

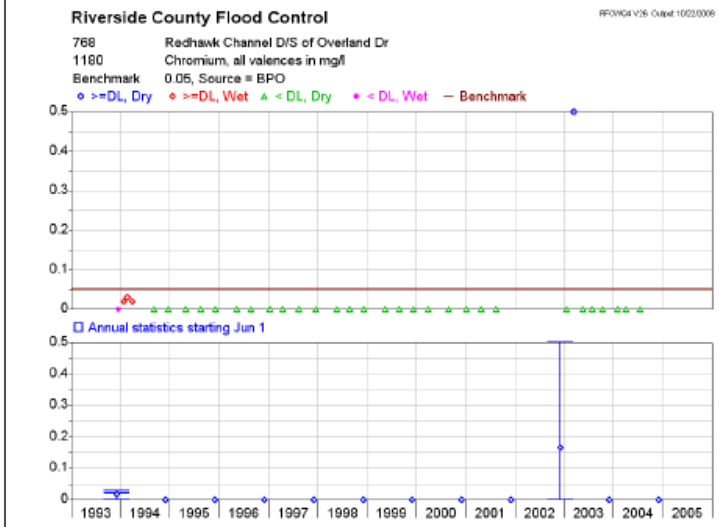
Riverside County Flood Control
768 Redhawk Channel D/S of Overland Dr
1180 Chromium, all valences in mg/l
Benchmark 0.05, Source = BPO
>=DL, Dry
>=DL, Wet
< DL, Dry
< DL, Wet
Benchmark
Annual statistics starting Jun 1
1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005

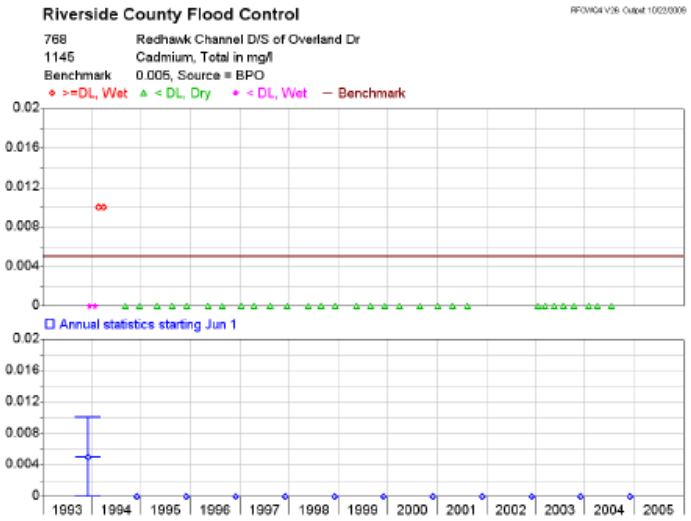
Riverside County Flood Control
768 Redhawk Channel D/S of Overland Dr
1145 Cadmium, Total in mg/l
Benchmark 0.005, Source = BPO
>=DL, Wet
< DL, Dry
< DL, Wet
Benchmark
Annual statistics starting Jun 1

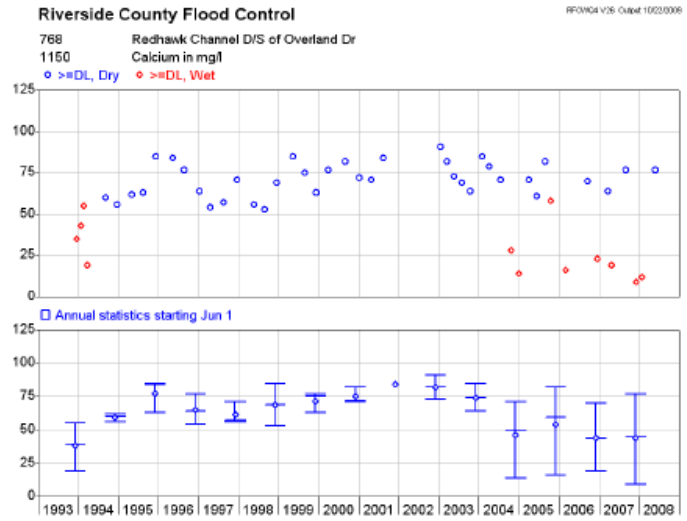
Riverside County Flood Control
768 Redhawk Channel D/S of Overland Dr
1150 Calcium in mg/l
>=DL, Dry
>=DL, Wet
Annual statistics starting Jun 1

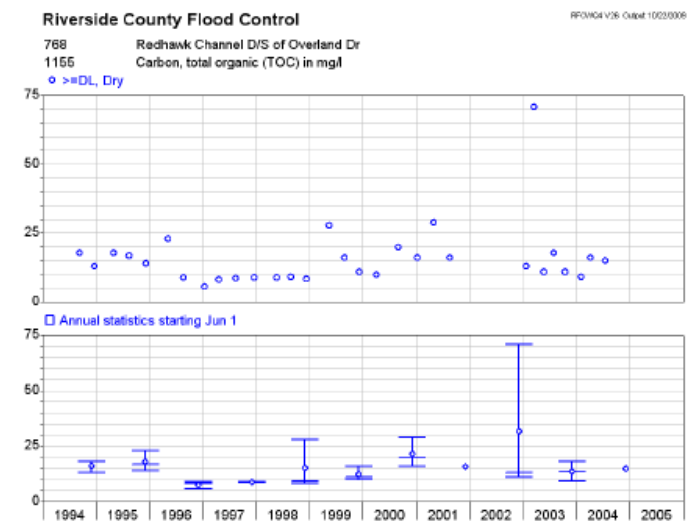
Riverside County Flood Control
768 Redhawk Channel D/S of Overland Dr
1155 Carbon, total organic (TOC) in mg/l
>=DL, Dry
Annual statistics starting Jun 1

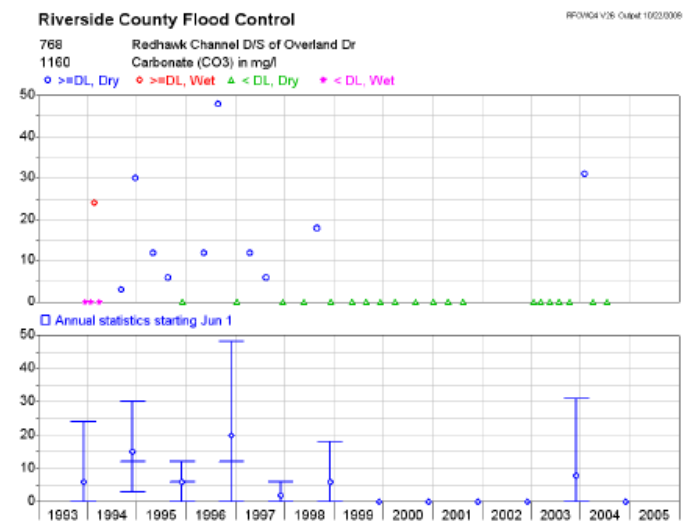
Riverside County Flood Control
768 Redhawk Channel D/S of Overland Dr
1160 Carbonate (CO3) in mg/l
>=DL, Dry
>=DL, Wet
< DL, Dry
< DL, Wet
Annual statistics starting Jun 1

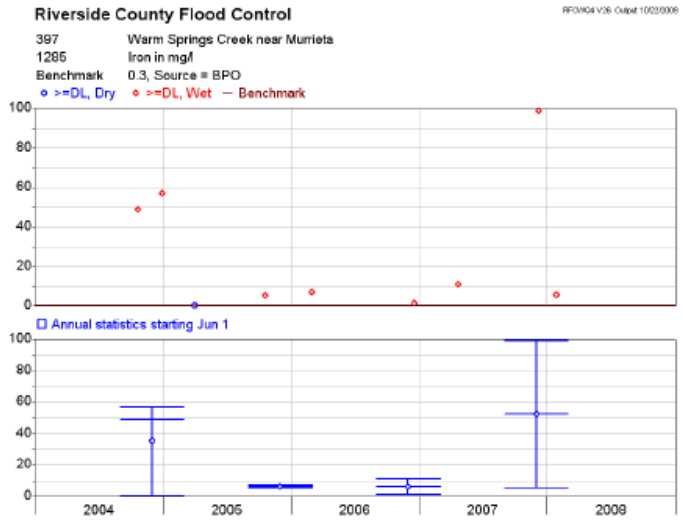
Riverside County Flood Control
397 Warm Springs Creek near Murrieta
1285 Iron in mg/l
Benchmark 0.3, Source = BPO
>=DL, Dry
>=DL, Wet
Benchmark
Annual statistics starting Jun 1
2004
2005
2006
2007
2008

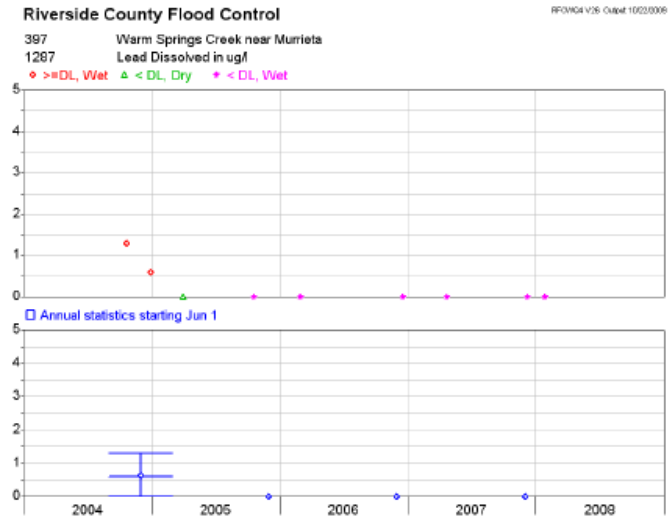
Riverside County Flood Control
397 Warm Springs Creek near Murrieta
1287 Lead Dissolved in ug/l
>=DL, Wet
< DL, Dry
< DL, Wet
Annual statistics starting Jun 1
2004
2005
2006
2007
2008

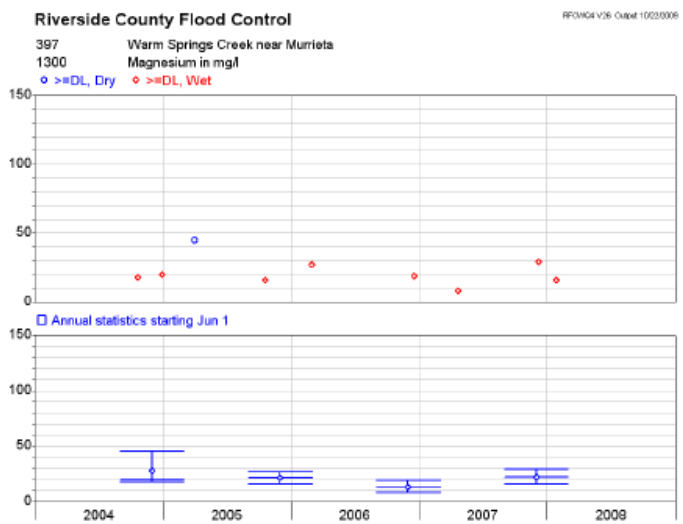
Riverside County Flood Control
397 Warm Springs Creek near Murrieta
1300 Magnesium in mg/l
>=DL, Dry
>=DL, Wet
Annual statistics starting Jun 1
2004
2005
2006
2007
2008

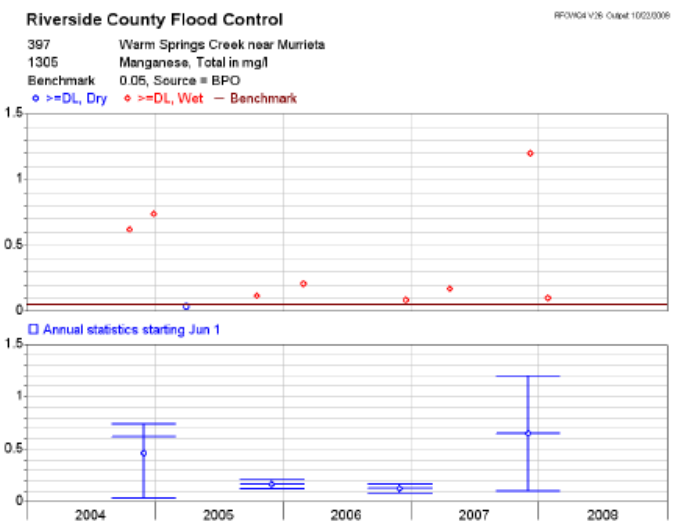
Riverside County Flood Control
397 Warm Springs Creek near Murrieta
1305 Manganese, Total in mg/l
Benchmark 0.05, Source = BPO
>=DL, Dry
>=DL, Wet
Benchmark
Annual statistics starting Jun 1
2004
2005
2006
2007
2008

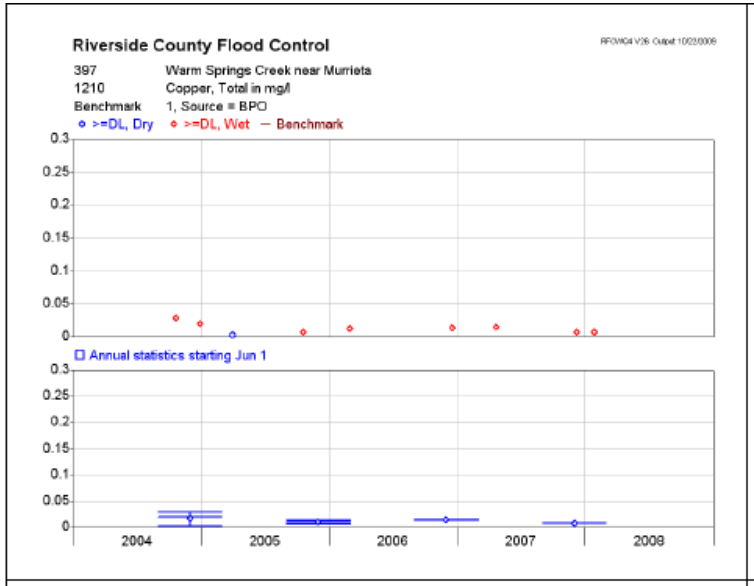
Riverside County Flood Control
397 Warm Springs Creek near Murrieta
1210 Copper, Total in mg/l
Benchmark 1, Source = BPO
>=DL, Dry
>=DL, Wet
Benchmark
Annual statistics starting Jun 1
2004
2005
2006
2007
2008

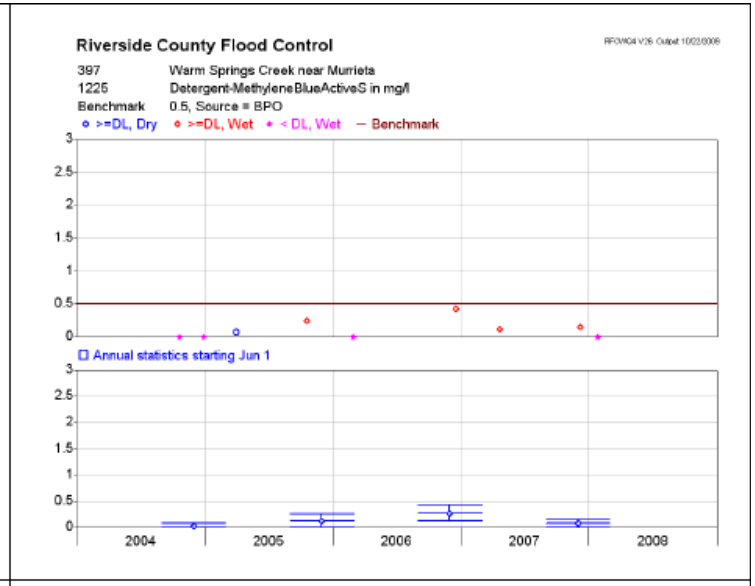
Riverside County Flood Control
397 Warm Springs Creek near Murrieta
1225 Detergent-MethyleneBlueActiveS in mg/l
Benchmark 0.5, Source = BPO
>=DL, Dry
>=DL, Wet
< DL, Wet
Benchmark
Annual statistics starting Jun 1
2004
2005
2006
2007
2008

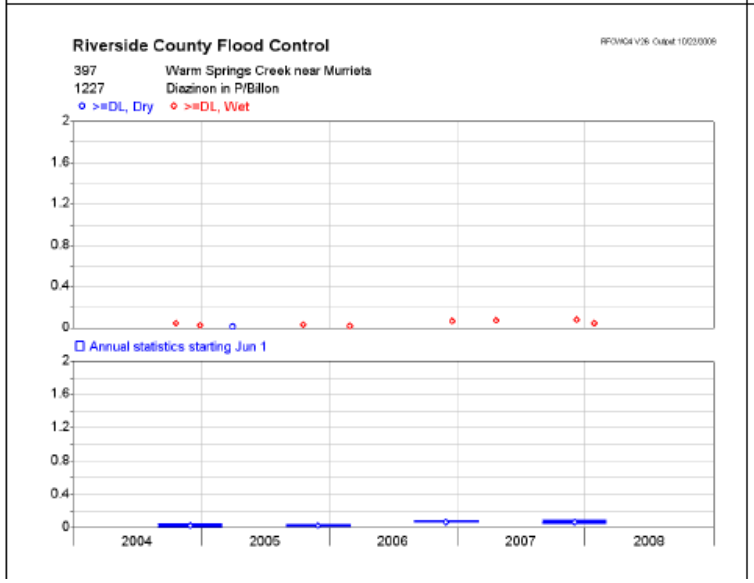
Riverside County Flood Control
397 Warm Springs Creek near Murrieta
1227 Diazinon in P/Billon
>=DL, Dry
>=DL, Wet
Annual statistics starting Jun 1
2004
2005
2006
2007
2008

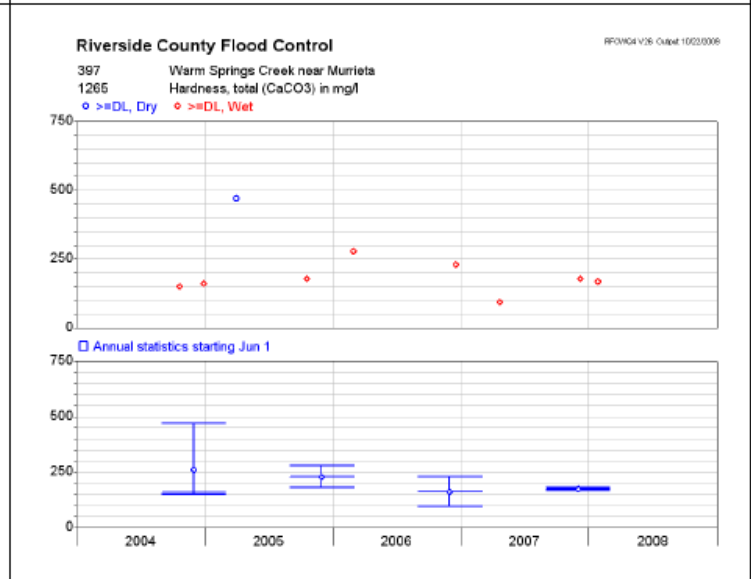
Riverside County Flood Control
397 Warm Springs Creek near Murrieta
1265 Hardness, total (CaCO3) in mg/l
>=DL, Dry
>=DL, Wet
Annual statistics starting Jun 1
2004
2005
2006
2007
2008

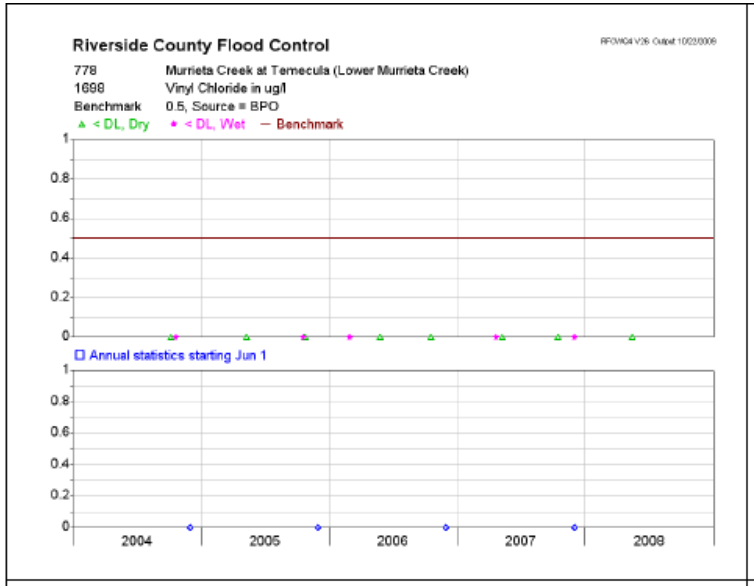
Riverside County Flood Control
778 Murrieta Creek at Temecula (Lower Murrieta Creek)
1698 Vinyl Chloride in ug/l
Benchmark 0.5, Source = BPO
< DL, Dry
< DL, Wet
Benchmark
Annual statistics starting Jun 1
2004
2005
2006
2007
2008

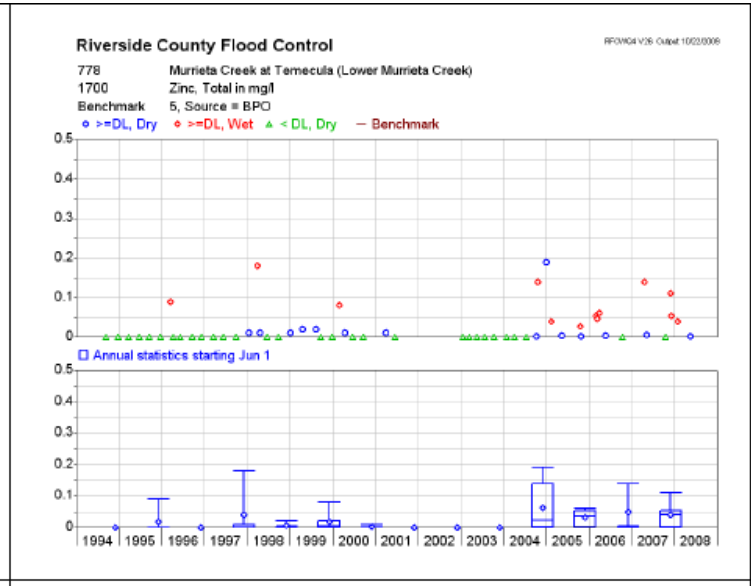
Riverside County Flood Control
778 Murrieta Creek at Temecula (Lower Murrieta Creek)
1700 Zinc, Total in mg/l
Benchmark 5, Source = BPO
>=DL, Dry
>=DL, Wet
< DL, Dry
Benchmark
Annual statistics starting Jun 1
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008

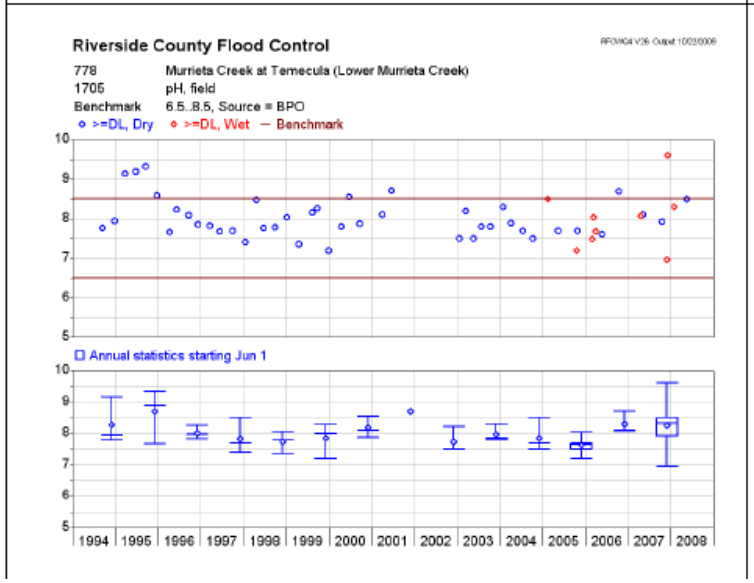
Riverside County Flood Control
778 Murrieta Creek at Temecula (Lower Murrieta Creek)
1705 pH, field
Benchmark 6.5..8.5, Source = BPO
>=DL, Dry
>=DL, Wet
Benchmark
Annual statistics starting Jun 1
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008

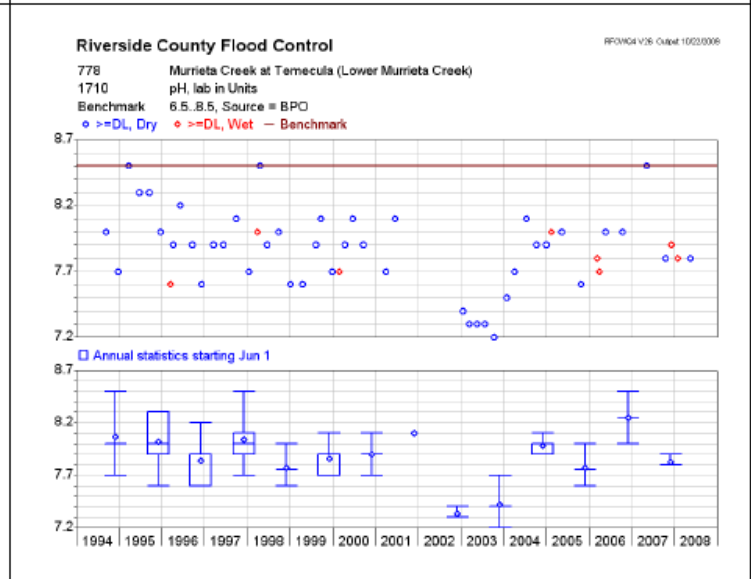
Riverside County Flood Control
778 Murrieta Creek at Temecula (Lower Murrieta Creek)
1710 pH, lab in Units
Benchmark 6.5..8.5, Source = BPO
>=DL, Dry
>=DL, Wet
Benchmark
Annual statistics starting Jun 1
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008

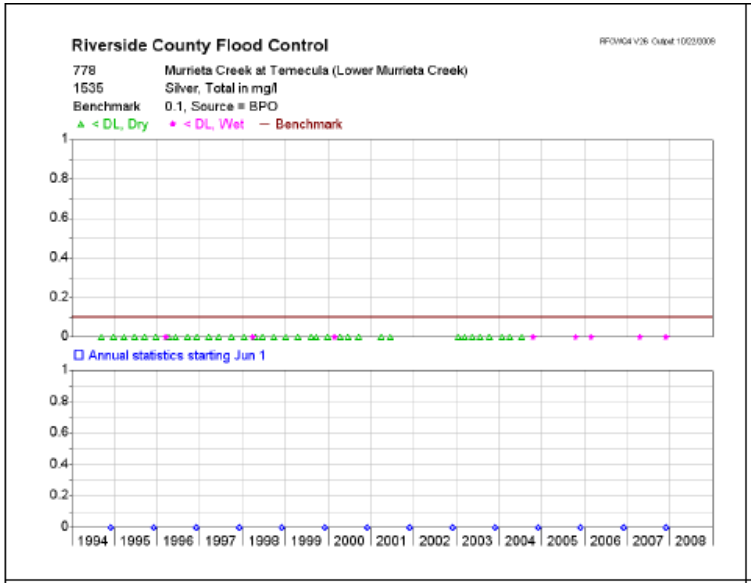
Riverside County Flood Control
778 Murrieta Creek at Temecula (Lower Murrieta Creek)
1535 Silver, Total in mg/l
Benchmark 0.1, Source = BPO
< DL, Dry
< DL, Wet
Benchmark
Annual statistics starting Jun 1
1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008

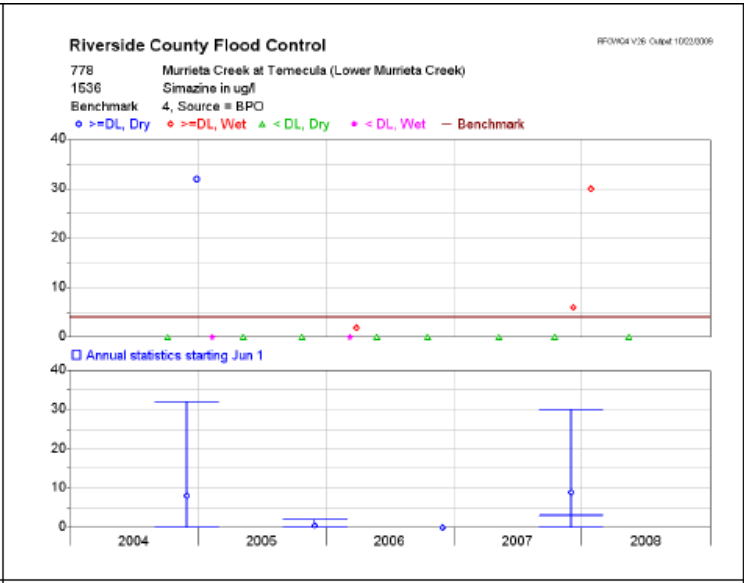
Riverside County Flood Control
778 Murrieta Creek at Temecula (Lower Murrieta Creek)
1536 Simazine in ug/l
Benchmark 4, Source = BPO
>=DL, Dry
>=DL, Wet
< DL, Dry
< DL, Wet
Benchmark
Annual statistics starting Jun 1
2004 2005 2006 2007 2008

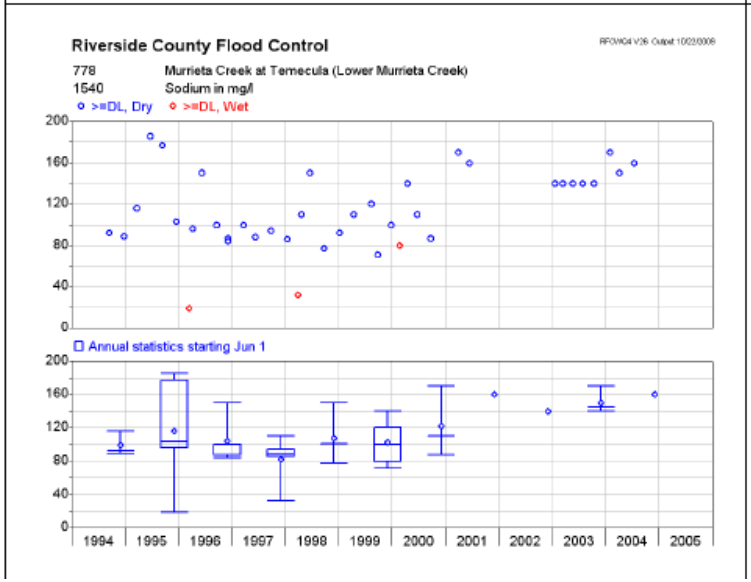
Riverside County Flood Control
778 Murrieta Creek at Temecula (Lower Murrieta Creek)
1540 Sodium in mg/l
>=DL, Dry
>=DL, Wet
Annual statistics starting Jun 1
1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005

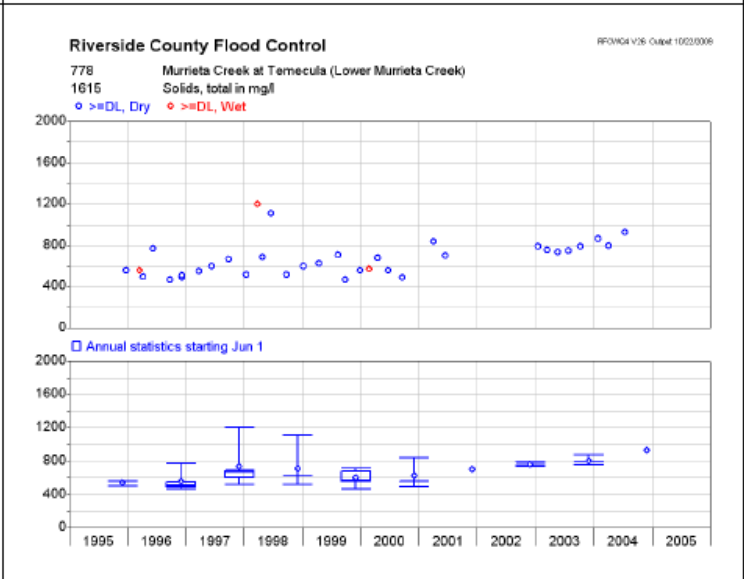
Riverside County Flood Control
778 Murrieta Creek at Temecula (Lower Murrieta Creek)
1615 Solids, total in mg/l
>=DL, Dry
>=DL, Wet
Annual statistics starting Jun 1
1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005

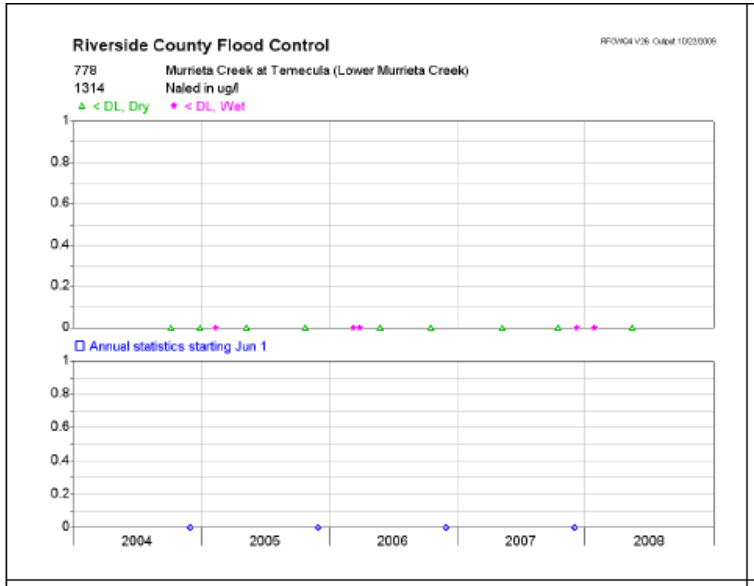
Riverside County Flood Control
778 Murrieta Creek at Temecula (Lower Murrieta Creek)
1314 Naled in ug/l
< DL, Dry
< DL, Wet
Annual statistics starting Jun 1
2004
2005
2006
2007
2008

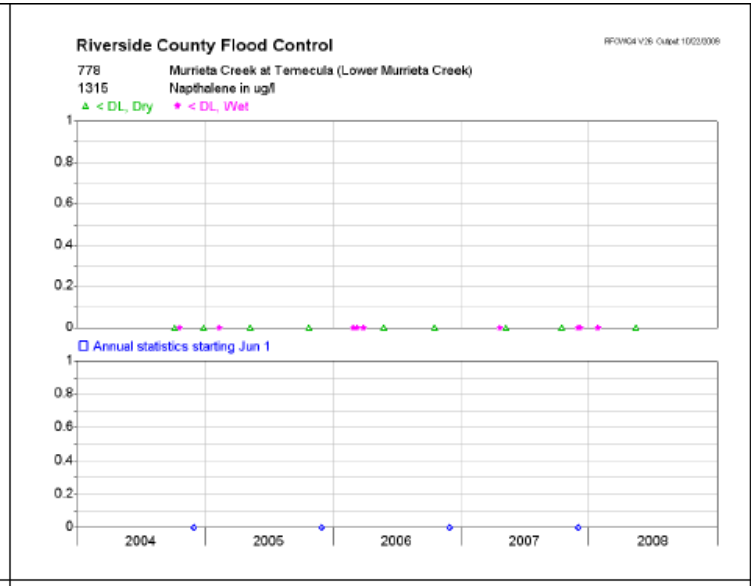
Riverside County Flood Control
778 Murrieta Creek at Temecula (Lower Murrieta Creek)
1315 Napthalene in ug/l
< DL, Dry
< DL, Wet
Annual statistics starting Jun 1
2004
2005
2006
2007
2008

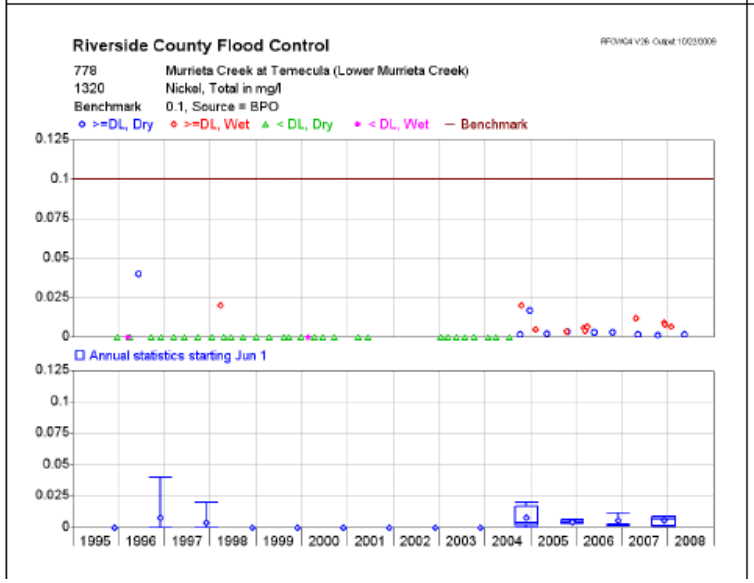
Riverside County Flood Control
778 Murrieta Creek at Temecula (Lower Murrieta Creek)
1320 Nickel, Total in mg/l
Benchmark 0.1, Source = BPO
>=DL, Dry
>=DL, Wet
< DL, Dry
< DL, Wet
Benchmark
Annual statistics starting Jun 1
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008

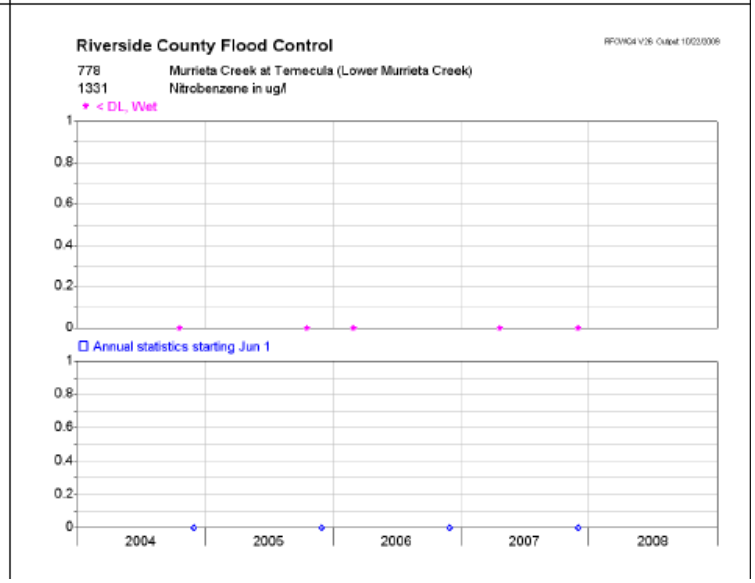
Riverside County Flood Control
778 Murrieta Creek at Temecula (Lower Murrieta Creek)
1331 Nitrobenzene in ug/l
< DL, Wet
Annual statistics starting Jun 1
2004
2005
2006
2007
2008

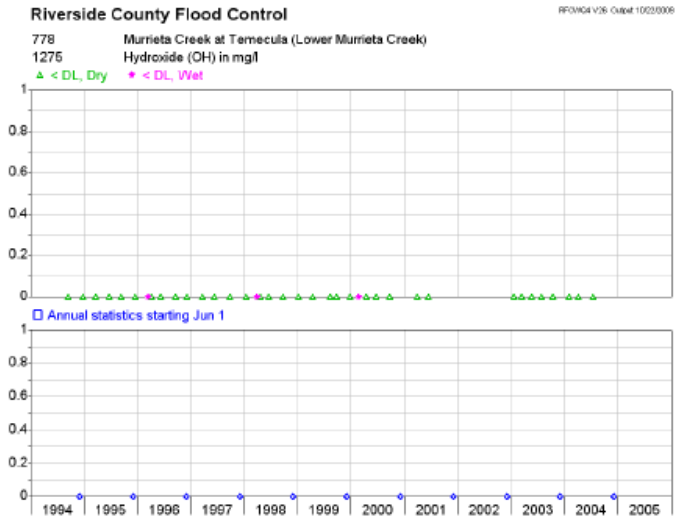
Riverside County Flood Control
778 Murrieta Creek at Temecula (Lower Murrieta Creek)
1275 Hydroxide (OH) in mg/l
< DL, Dry
< DL, Wet
Annual statistics starting Jun 1
1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005

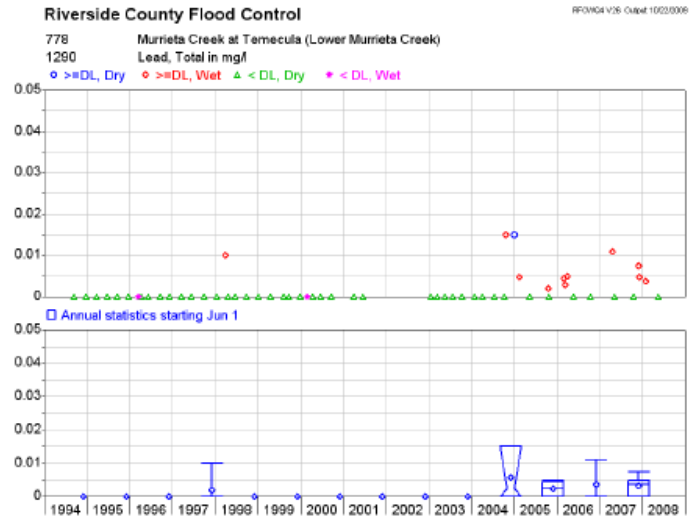
Riverside County Flood Control
778 Murrieta Creek at Temecula (Lower Murrieta Creek)
1290 Lead, Total in mg/l
>=DL, Dry
>=DL, Wet
< DL, Dry
< DL, Wet
Annual statistics starting Jun 1
1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008

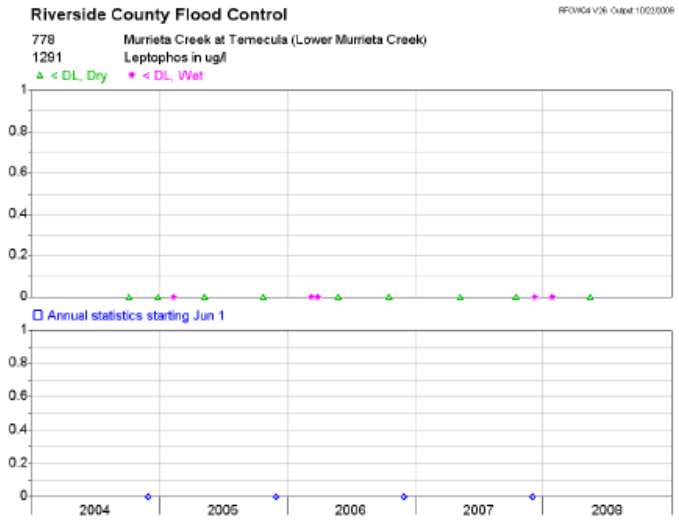
Riverside County Flood Control
778 Murrieta Creek at Temecula (Lower Murrieta Creek)
1291 Leptophos in ug/l
< DL, Dry
< DL, Wet
Annual statistics starting Jun 1
2004 2005 2006 2007 2008

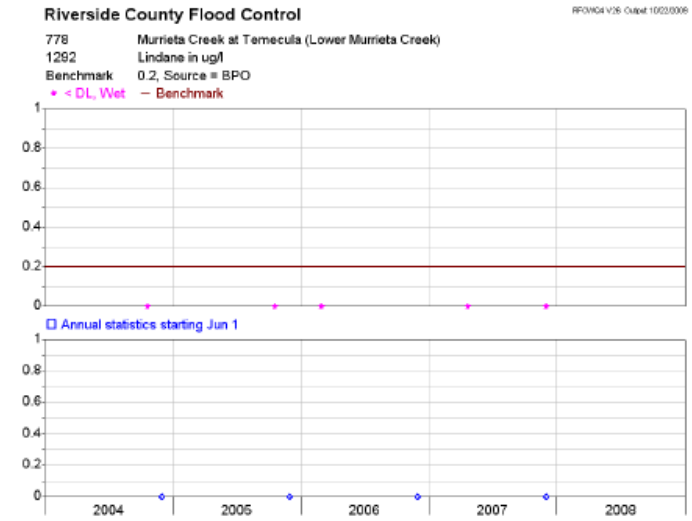
Riverside County Flood Control
778 Murrieta Creek at Temecula (Lower Murrieta Creek)
1292 Lindane in ug/l
Benchmark 0.2, Source = BPO
< DL, Wet
Benchmark
Annual statistics starting Jun 1
2004 2005 2006 2007 2008

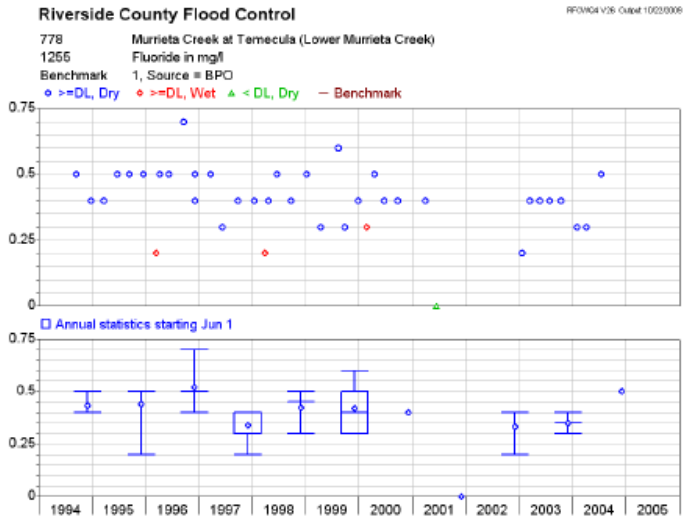
Riverside County Flood Control
778 Murrieta Creek at Temecula (Lower Murrieta Creek)
1255 Fluoride in mg/l
Benchmark 1, Source = BPO
>=DL, Dry
>=DL, Wet
< DL, Dry
Benchmark
Annual statistics starting Jun 1
0.75
0.5
0.25
0
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005

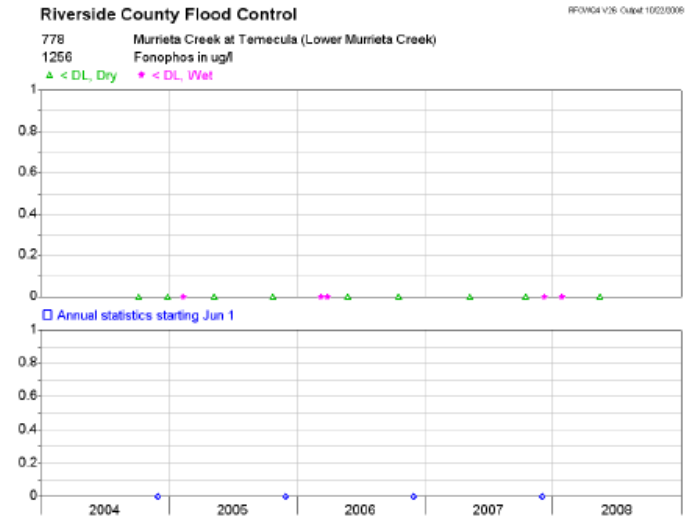
Riverside County Flood Control
778 Murrieta Creek at Temecula (Lower Murrieta Creek)
1256 Fonophos in ug/l
< DL, Dry
< DL, Wet
Annual statistics starting Jun 1
1
0.8
0.6
0.4
0.2
0
2004
2005
2006
2007
2008

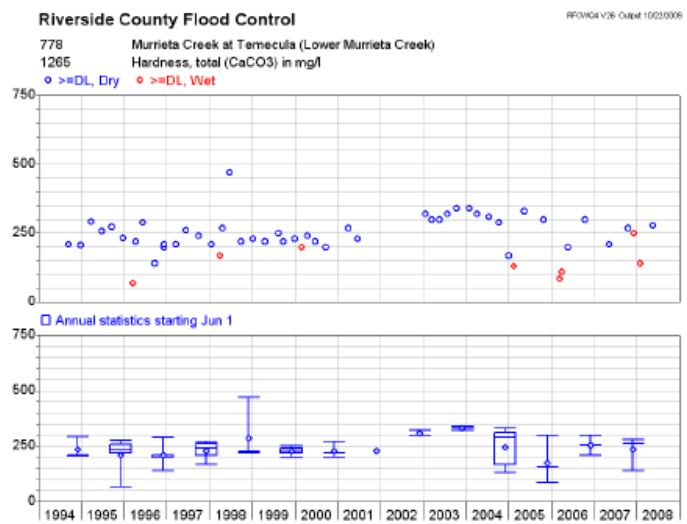
Riverside County Flood Control
778 Murrieta Creek at Temecula (Lower Murrieta Creek)
1265 Hardness, total (CaCO3) in mg/l
>=DL, Dry
>=DL, Wet
Annual statistics starting Jun 1
750
500
250
0
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008

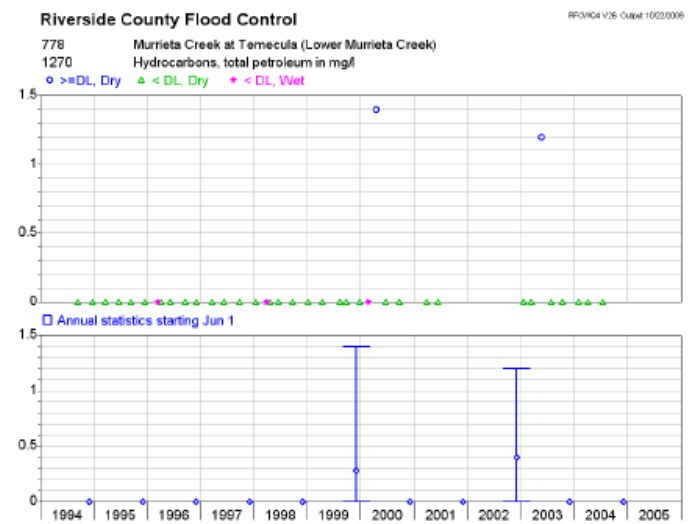
Riverside County Flood Control
778 Murrieta Creek at Temecula (Lower Murrieta Creek)
1270 Hydrocarbons, total petroleum in mg/l
>=DL, Dry
< DL, Dry
< DL, Wet
Annual statistics starting Jun 1
1.5
1
0.5
0
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005

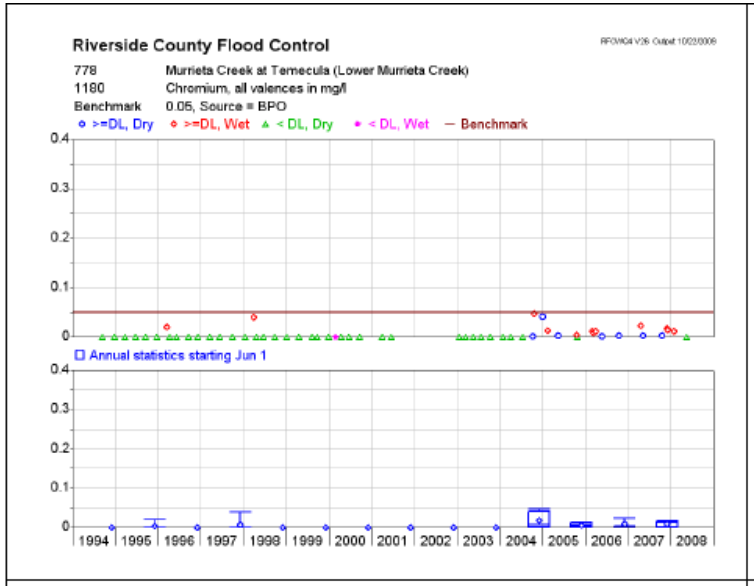
Riverside County Flood Control
778 Murrieta Creek at Temecula (Lower Murrieta Creek)
1180 Chromium, all valences in mg/l
Benchmark 0.05, Source = BPO
>=DL, Dry >=DL, Wet < DL, Dry < DL, Wet Benchmark
Annual statistics starting Jun 1
1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008

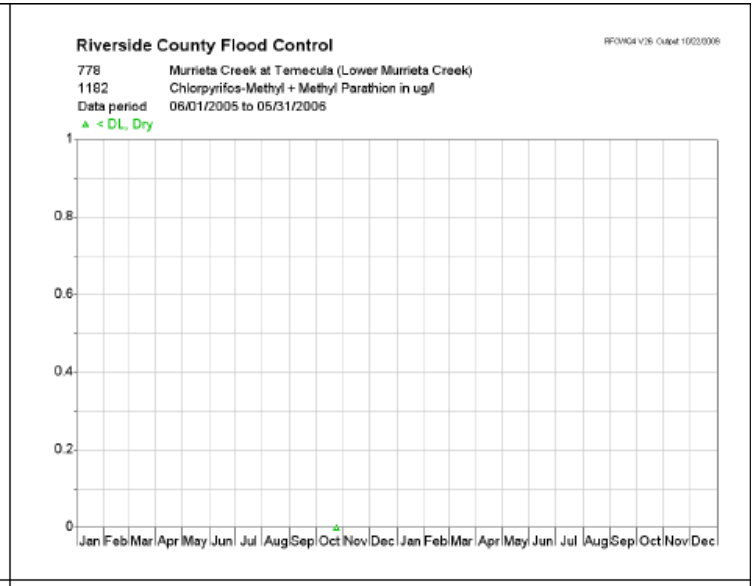
Riverside County Flood Control
778 Murrieta Creek at Temecula (Lower Murrieta Creek)
1182 Chlorpyrifos-Methyl + Methyl Parathion in ug/l
Data period 06/01/2005 to 05/31/2006
< DL, Dry
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

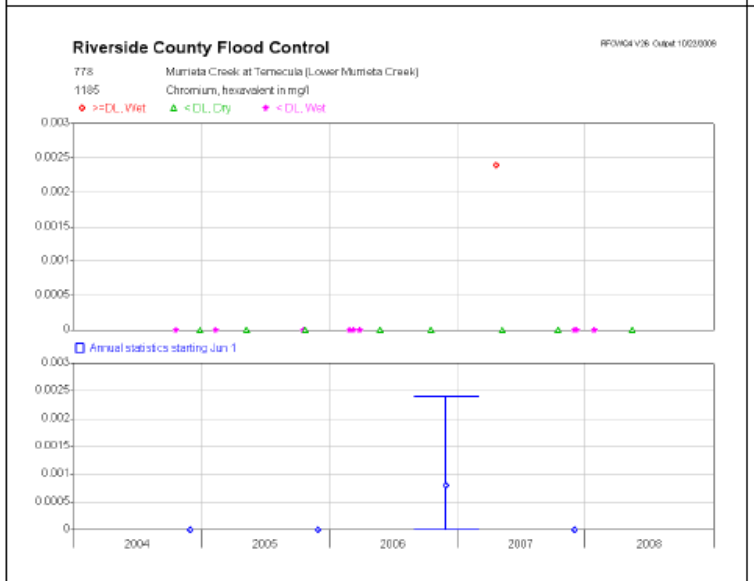
Riverside County Flood Control
778 Murrieta Creek at Temecula (Lower Murrieta Creek)
1185 Chromium, hexavalent in mg/l
>=DL, Wet < DL, Dry < DL, Wet
Annual statistics starting Jun 1
2004 2005 2006 2007 2008

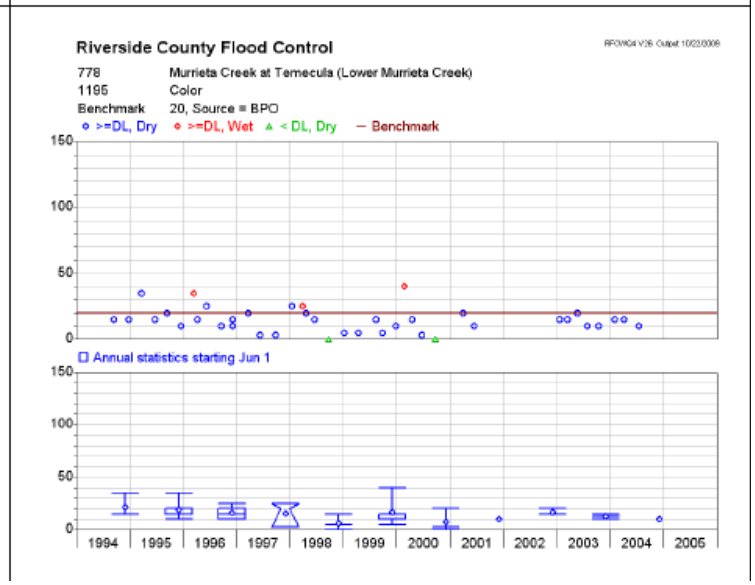
Riverside County Flood Control
778 Murrieta Creek at Temecula (Lower Murrieta Creek)
1195 Color
Benchmark 20, Source = BPO
>=DL, Dry >=DL, Wet < DL, Dry Benchmark
Annual statistics starting Jun 1
1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005

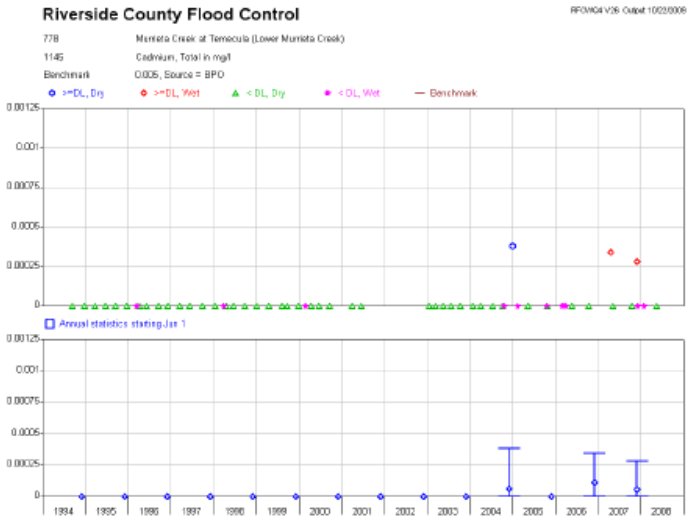
Riverside County Flood Control
778 Murrieta Creek at Temecula (Lower Murrieta Creek)
1145 Cadmium, Total in mg/l
Benchmark 0.005, Source = BPO
>=DL, Dry
>=DL, Wet
< DL, Dry
< DL, Wet
Benchmark
Annual statistics starting Jun 1

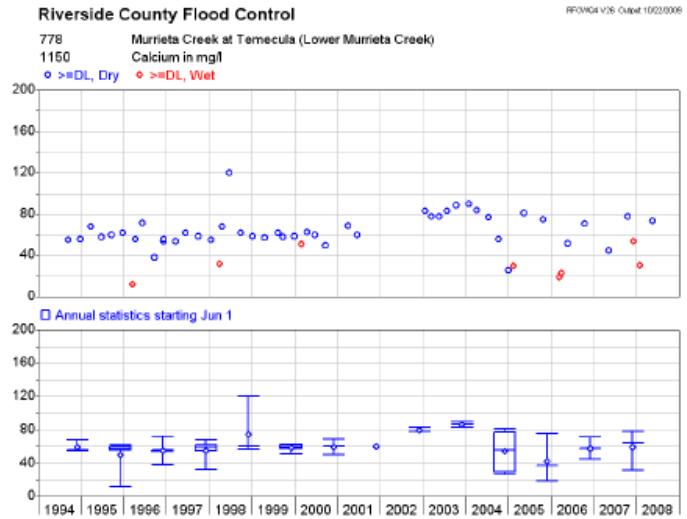
Riverside County Flood Control
778 Murrieta Creek at Temecula (Lower Murrieta Creek)
1150 Calcium in mg/l
>=DL, Dry
>=DL, Wet
Annual statistics starting Jun 1
1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008

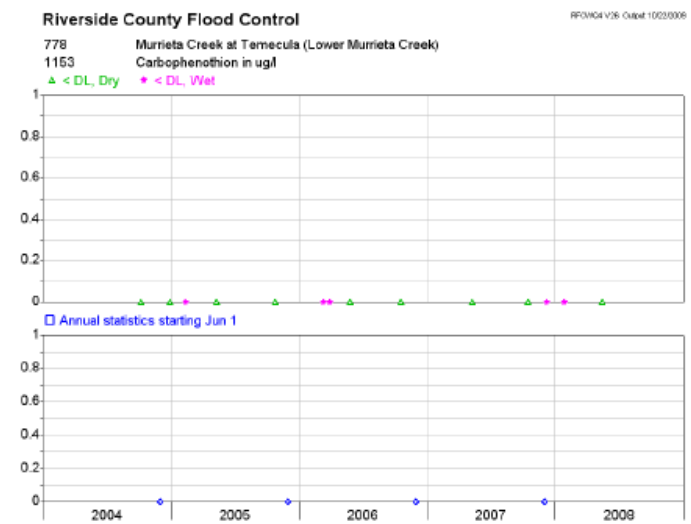
Riverside County Flood Control
778 Murrieta Creek at Temecula (Lower Murrieta Creek)
1153 Carbophenothion in ug/l
< DL, Dry
< DL, Wet
Annual statistics starting Jun 1
2004 2005 2006 2007 2008

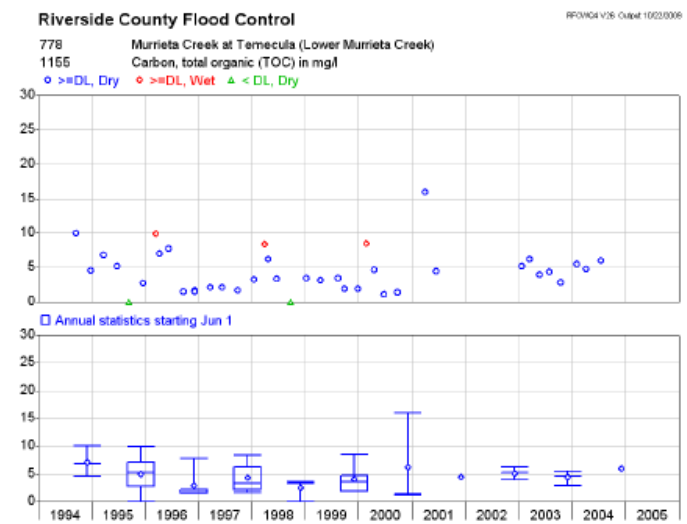
Riverside County Flood Control
778 Murrieta Creek at Temecula (Lower Murrieta Creek)
1155 Carbon, total organic (TOC) in mg/l
>=DL, Dry
>=DL, Wet
< DL, Dry
Annual statistics starting Jun 1
1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005

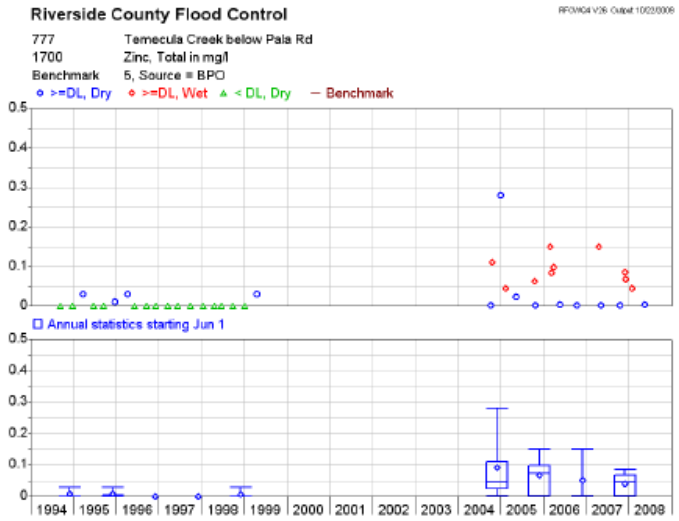
Riverside County Flood Control
777 Temecula Creek below Pala Rd
1700 Zinc, Total in mg/l
Benchmark 5, Source = BPO
>=DL, Dry
>=DL, Wet
< DL, Dry
Benchmark
Annual statistics starting Jun 1
1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008

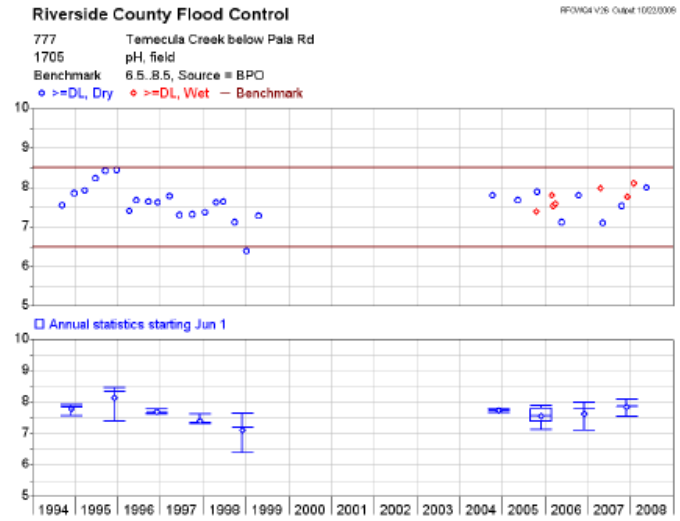
Riverside County Flood Control
777 Temecula Creek below Pala Rd
1705 pH, field
Benchmark 6.5..8.5, Source = BPO
>=DL, Dry
>=DL, Wet
Benchmark
Annual statistics starting Jun 1
1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008

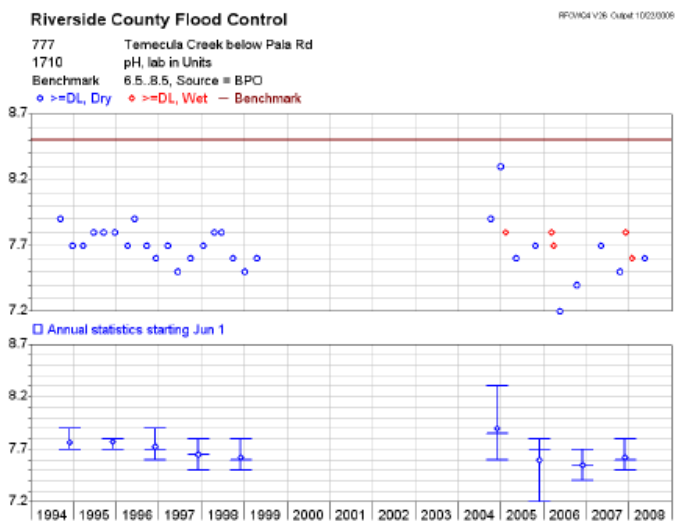
Riverside County Flood Control
777 Temecula Creek below Pala Rd
1710 pH, lab in Units
Benchmark 6.5..8.5, Source = BPO
>=DL, Dry
>=DL, Wet
Benchmark
Annual statistics starting Jun 1
1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008

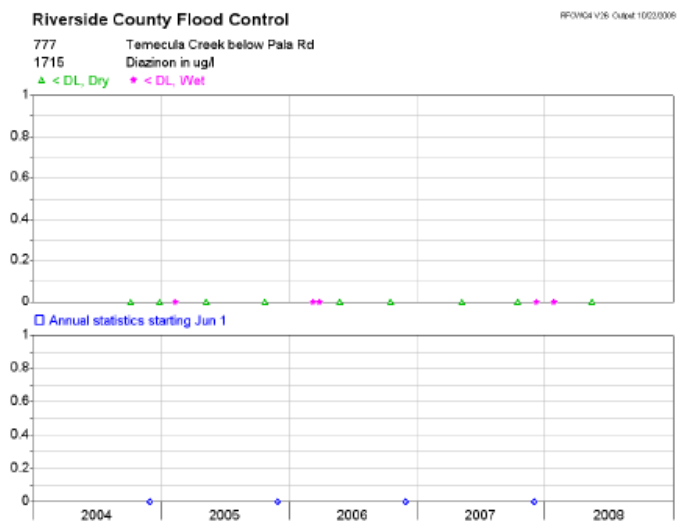
Riverside County Flood Control
777 Temecula Creek below Pala Rd
1715 Diazinon in ug/l
< DL, Dry
< DL, Wet
Annual statistics starting Jun 1
2004 2005 2006 2007 2008

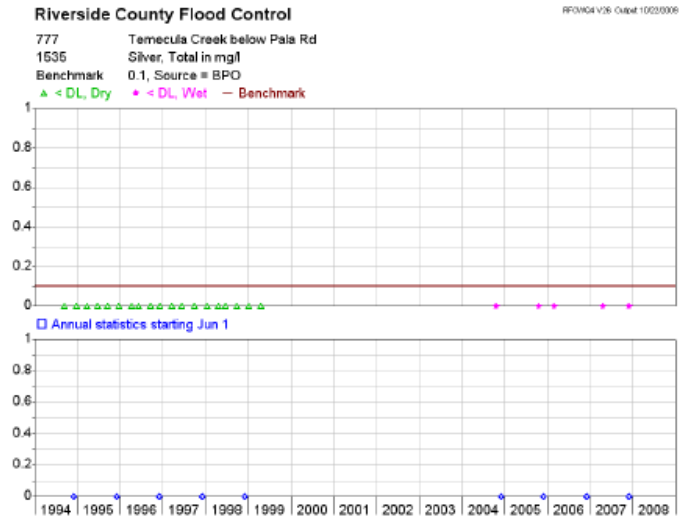
Riverside County Flood Control
777 Temecula Creek below Pala Rd
1535 Silver, Total in mg/l
Benchmark 0.1, Source = BPO
< DL, Dry
< DL, Wet
Benchmark
Annual statistics starting Jun 1
1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008

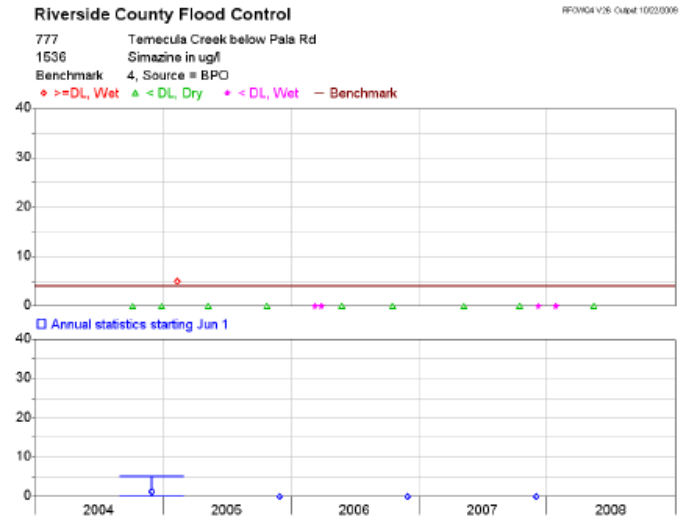
Riverside County Flood Control
777 Temecula Creek below Pala Rd
1536 Simazine in ug/l
Benchmark 4, Source = BPO
>=DL, Wet
< DL, Dry
< DL, Wet
Benchmark
Annual statistics starting Jun 1
2004 2005 2006 2007 2008

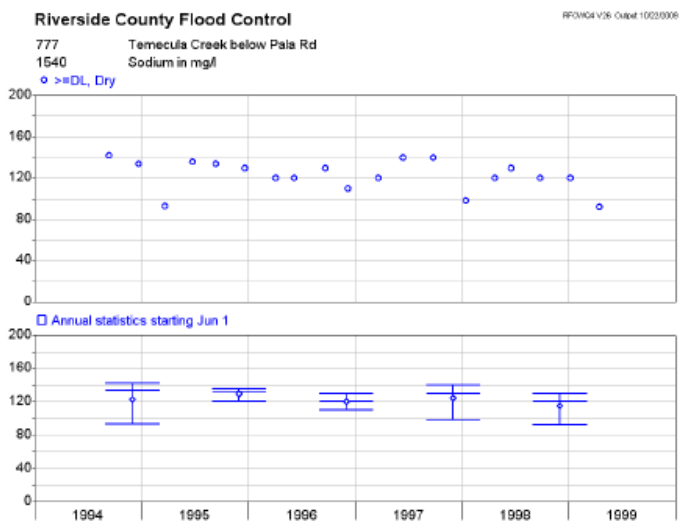
Riverside County Flood Control
777 Temecula Creek below Pala Rd
1540 Sodium in mg/l
>=DL, Dry
Annual statistics starting Jun 1
1994 1995 1996 1997 1998 1999

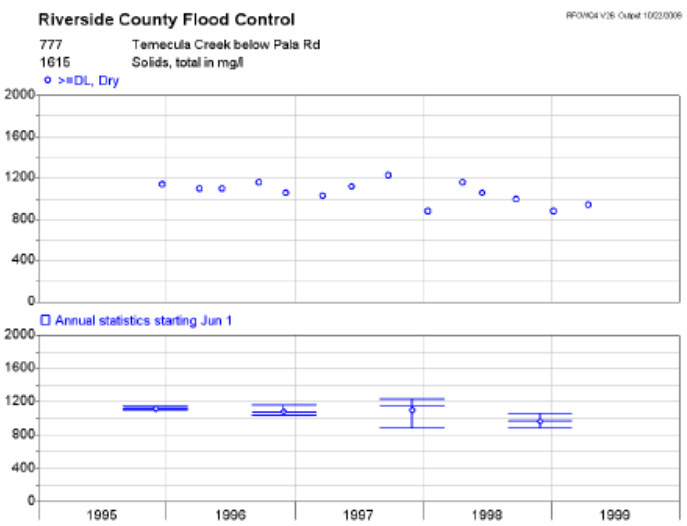
Riverside County Flood Control
777 Temecula Creek below Pala Rd
1615 Solids, total in mg/l
>=DL, Dry
Annual statistics starting Jun 1
1995 1996 1997 1998 1999

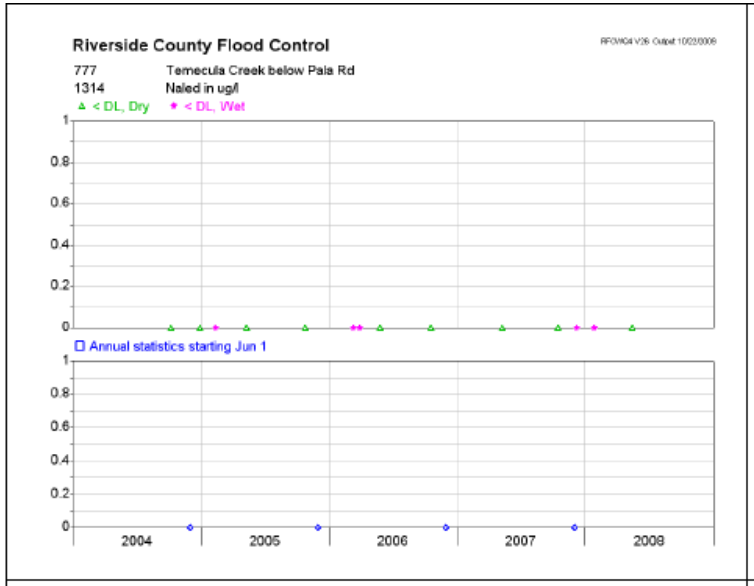
Riverside County Flood Control
777 Temecula Creek below Pala Rd
1314 Naled in ug/l
< DL, Dry
< DL, Wet
Annual statistics starting Jun 1
2004
2005
2006
2007
2008

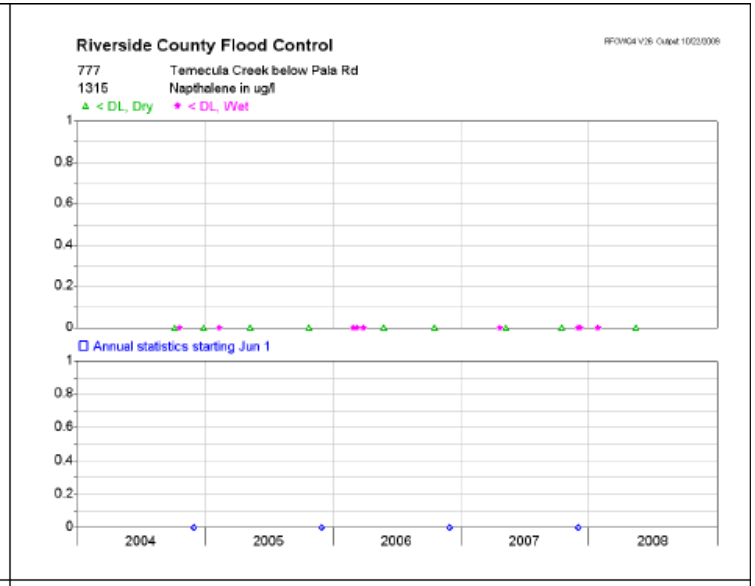
Riverside County Flood Control
777 Temecula Creek below Pala Rd
1315 Napthalene in ug/l
< DL, Dry
< DL, Wet
Annual statistics starting Jun 1
2004
2005
2006
2007
2008

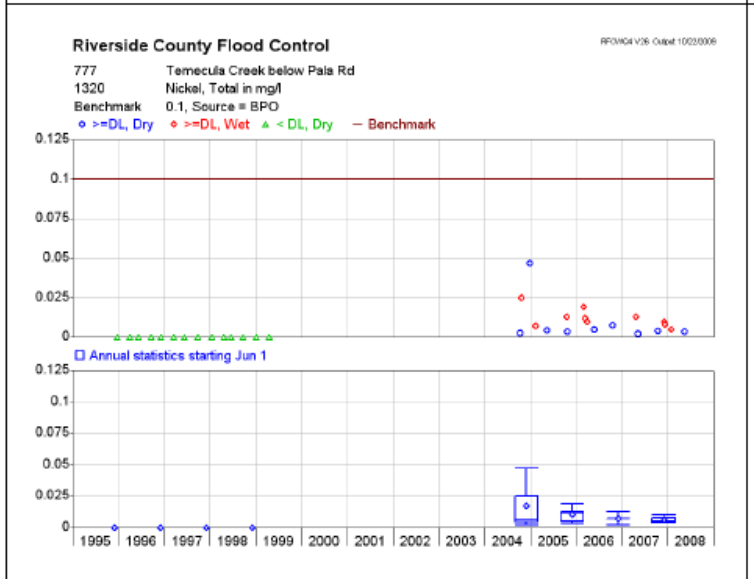
Riverside County Flood Control
777 Temecula Creek below Pala Rd
1320 Nickel, Total in mg/l
Benchmark 0.1, Source = BPO
>=DL, Dry
>=DL, Wet
< DL, Dry
Benchmark
Annual statistics starting Jun 1
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008

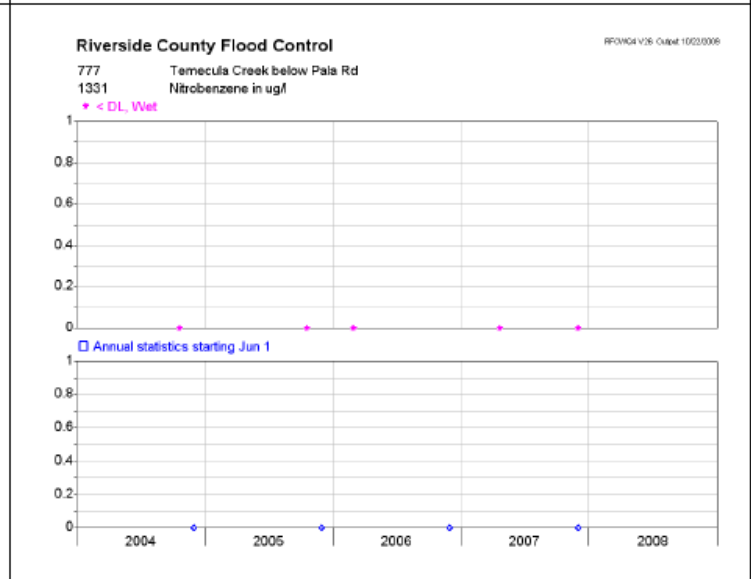
Riverside County Flood Control
777 Temecula Creek below Pala Rd
1331 Nitrobenzene in ug/l
< DL, Wet
Annual statistics starting Jun 1
2004
2005
2006
2007
2008

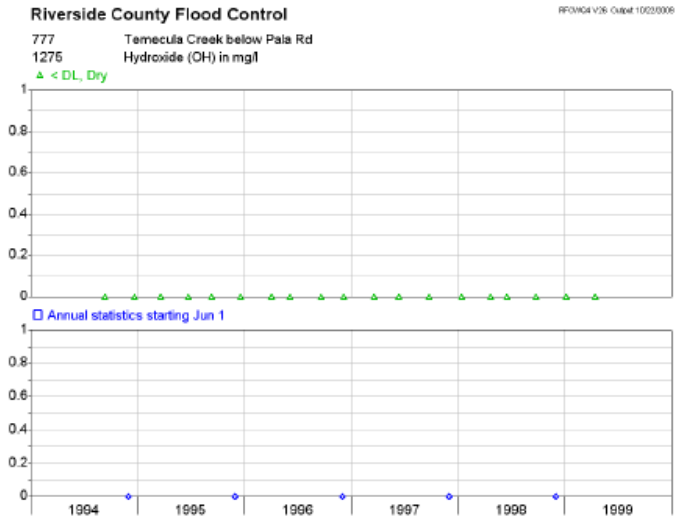
Riverside County Flood Control
777 Temecula Creek below Pala Rd
1275 Hydroxide (OH) in mg/l
< DL, Dry
Annual statistics starting Jun 1
1994
1995
1996
1997
1998
1999

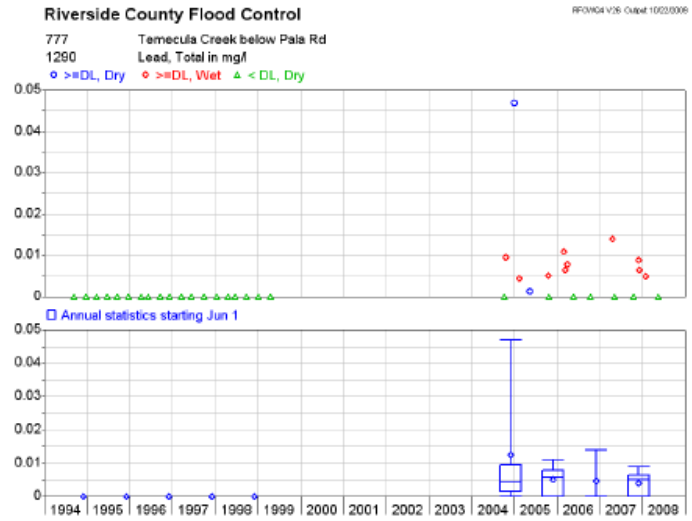
Riverside County Flood Control
777 Temecula Creek below Pala Rd
1290 Lead, Total in mg/l
>=DL, Dry
>=DL, Wet
< DL, Dry
Annual statistics starting Jun 1
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008

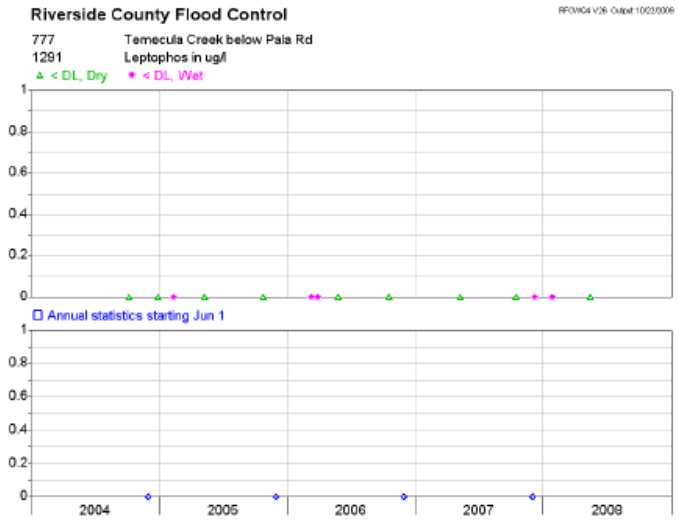
Riverside County Flood Control
777 Temecula Creek below Pala Rd
1291 Leptophos in ug/l
< DL, Dry
< DL, Wet
Annual statistics starting Jun 1
2004
2005
2006
2007
2008

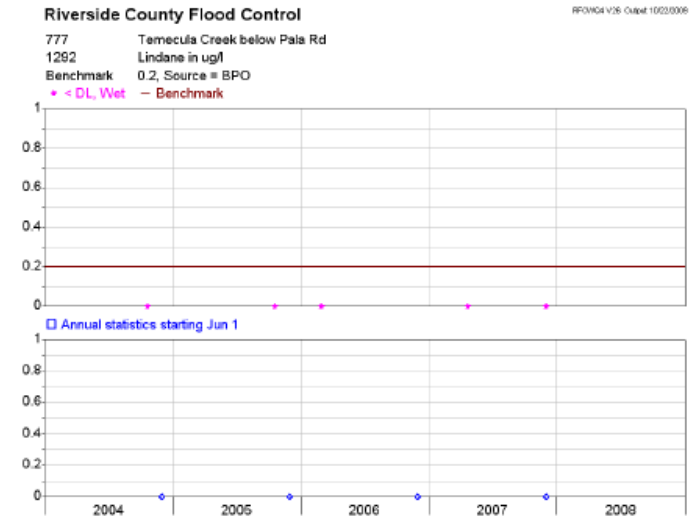
Riverside County Flood Control
777 Temecula Creek below Pala Rd
1292 Lindane in ug/l
Benchmark 0.2, Source = BPO
< DL, Wet
Benchmark
Annual statistics starting Jun 1
2004
2005
2006
2007
2008

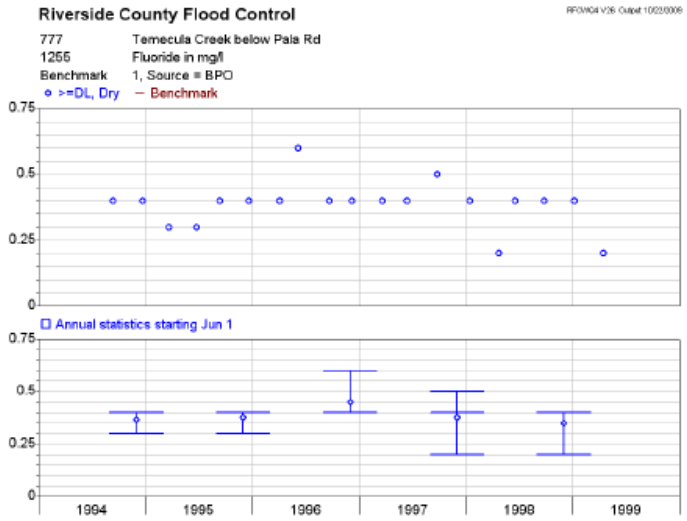
Riverside County Flood Control
777 Temecula Creek below Pala Rd
1255 Fluoride in mg/l
Benchmark 1, Source = BPO
>=DL, Dry
Benchmark
Annual statistics starting Jun 1
0.75
0.5
0.25
0
1994
1995
1996
1997
1998
1999

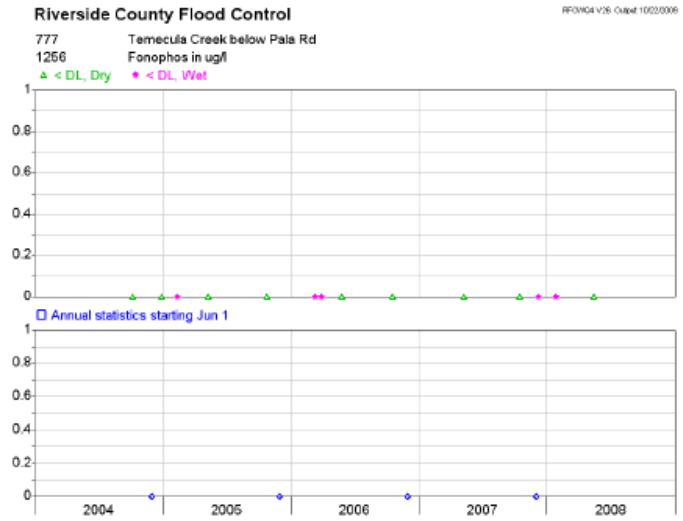
Riverside County Flood Control
777 Temecula Creek below Pala Rd
1256 Fonophos in ug/l
< DL, Dry
< DL, Wet
Annual statistics starting Jun 1
1
0.8
0.6
0.4
0.2
0
2004
2005
2006
2007
2008

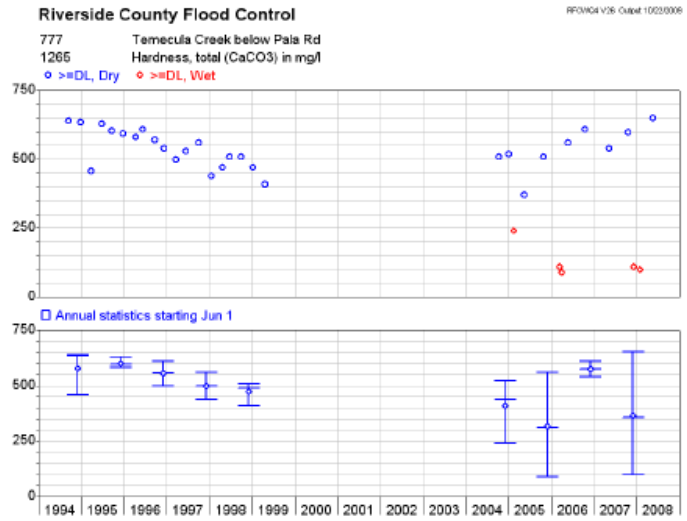
Riverside County Flood Control
777 Temecula Creek below Pala Rd
1265 Hardness, total (CaCO3) in mg/l
>=DL, Dry
>=DL, Wet
Annual statistics starting Jun 1
750
500
250
0
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008

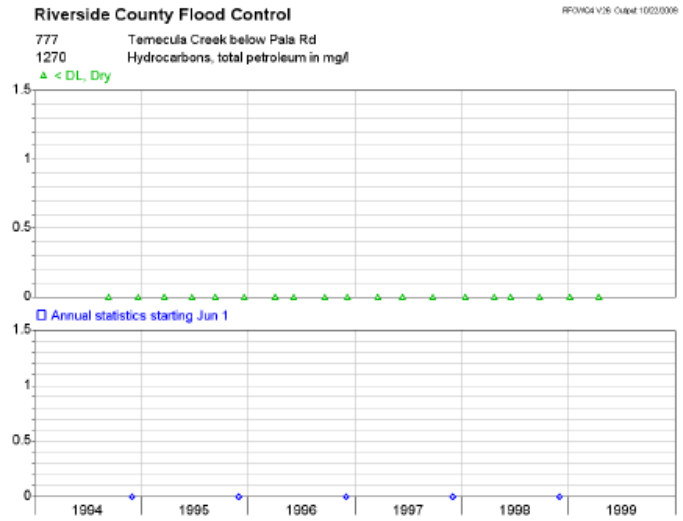
Riverside County Flood Control
777 Temecula Creek below Pala Rd
1270 Hydrocarbons, total petroleum in mg/l
< DL, Dry
Annual statistics starting Jun 1
1.5
1
0.5
0
1994
1995
1996
1997
1998
1999

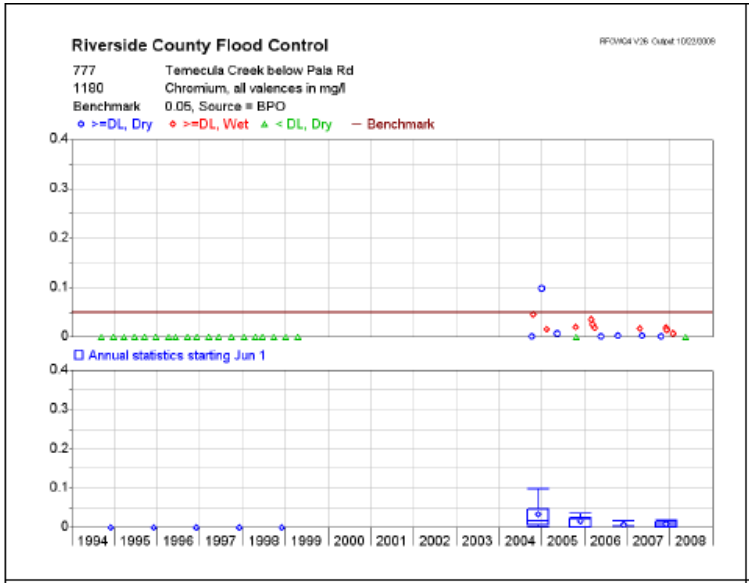
Riverside County Flood Control
777 Temecula Creek below Pala Rd
1180 Chromium, all valences in mg/l
Benchmark 0.05, Source = BPO
>=DL, Dry
>=DL, Wet
< DL, Dry
Benchmark
Annual statistics starting Jun 1
1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008

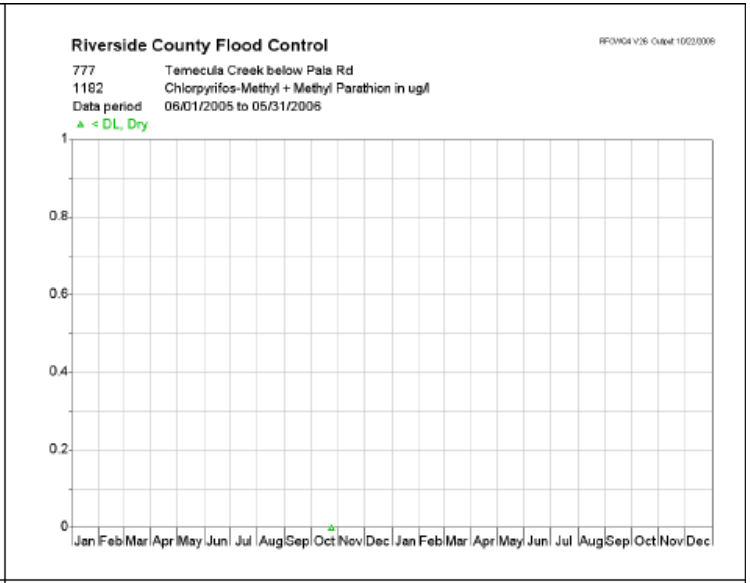
Riverside County Flood Control
777 Temecula Creek below Pala Rd
1182 Chlorpyrifos-Methyl + Methyl Parathion in ug/l
Data period 06/01/2005 to 05/31/2006
< DL, Dry
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

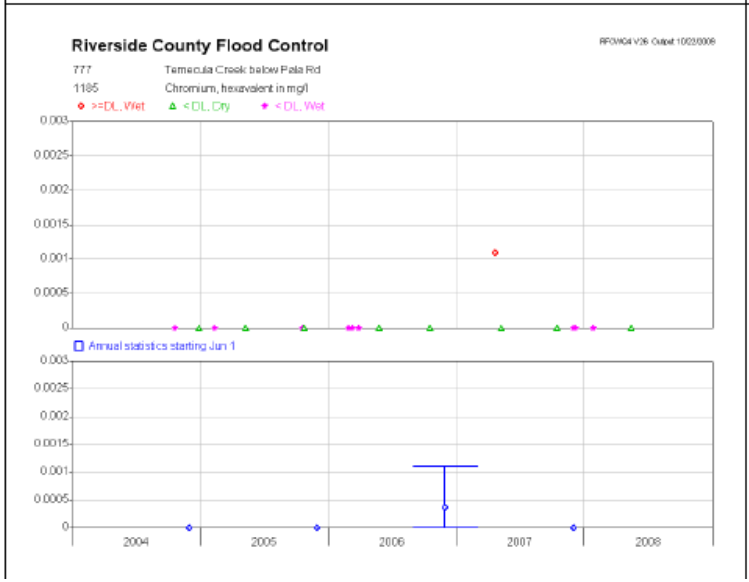
Riverside County Flood Control
777 Temecula Creek below Pala Rd
1185 Chromium, hexavalent in mg/l
>=DL, Wet
< DL, Dry
< DL, Wet
Annual statistics starting Jun 1
2004 2005 2006 2007 2008

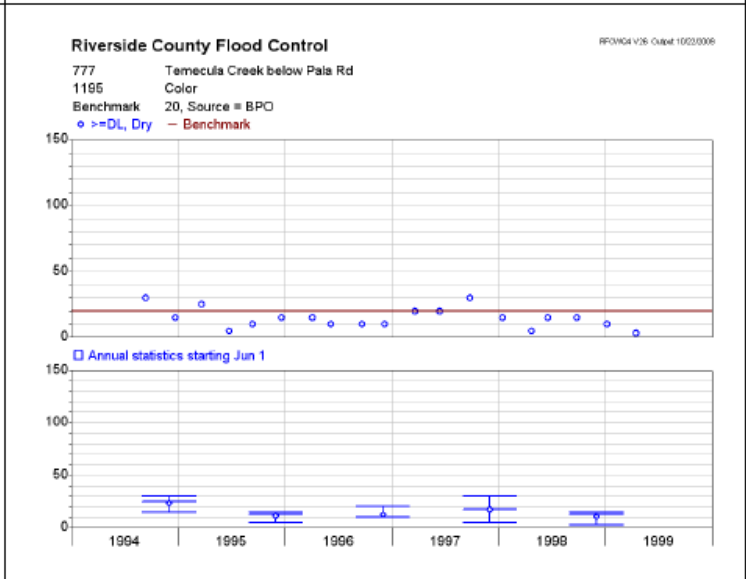
Riverside County Flood Control
777 Temecula Creek below Pala Rd
1195 Color
Benchmark 20, Source = BPO
>=DL, Dry
Benchmark
Annual statistics starting Jun 1
1994 1995 1996 1997 1998 1999

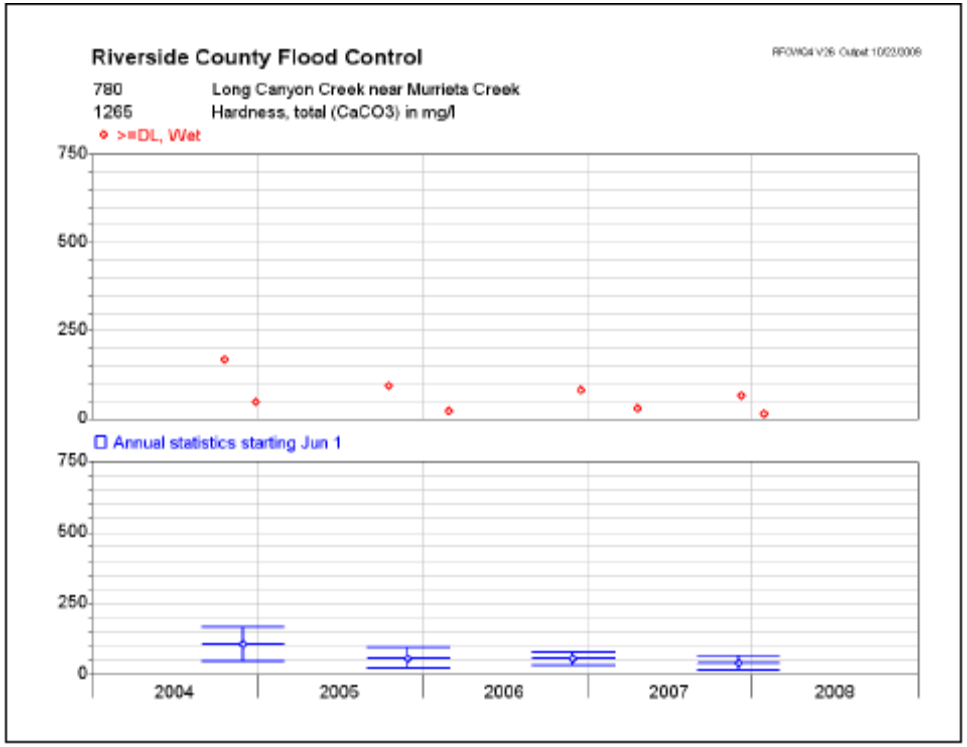
Riverside County Flood Control
780 Long Canyon Creek near Murrieta Creek
1265 Hardness, total (CaCO3) in mg/l
>=DL, Wet
750
500
250
0
Annual statistics starting Jun 1
750
500
250
0
2004
2005
2006
2007
2008

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

FACT SHEET / TECHNICAL REPORT

FOR

ORDER NO. R9-2010-0016
NPDES NO. CAS0108766

WASTE DISCHARGE REQUIREMENTS

FOR

DISCHARGES FROM THE
MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s)
DRAINING THE COUNTY OF RIVERSIDE,
THE INCORPORATED CITIES OF RIVERSIDE COUNTY,
AND THE RIVERSIDE COUNTY FLOOD CONTROL
AND WATER CONSERVATION DISTRICT
WITHIN THE SAN DIEGO REGION

NOVEMBER 10, 2010

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LIST OF ACRONYMS AND ABBREVIATIONS

ADT	Average Daily Traffic
AMAL	Average Monthly Action Level
AST	Active/Passive Sediment Treatment
BAT	Best Available Technology
BIA	Building Industry Association
BMP	Best Management Practice
Basin Plan	Water Quality Control Plan for the San Diego Basin
CASQA	California Stormwater Quality Association
CCC	California Coastal Commission
CC&Rs	Covenants, Conditions and Restrictions
CDFG	California Department of Fish and Game
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
Colorado River Water Board	California Regional Water Quality Control Board, Colorado River Region
Copermittees	County of Riverside, the 4 incorporated cities within the County of Riverside in the San Diego Region, and the Riverside County Flood Control and Water Conservation District
CWA	Clean Water Act
CWC	California Water Code
CZARA	Coastal Zone Act Reauthorization Amendments of 1990
DAMP	Drainage Area Management Plan
DNQ	Did Not Quantify
ESAs	Environmentally Sensitive Areas
FR	Federal Register
GIS	Geographic Information System
HMP	Hydromodification Management Plan
HU	Hydrologic Unit
IBI	Index of Biotic Integrity
IC/ID	Illicit Connections and Illicit Discharges
JRMP	Jurisdictional Runoff Management Plan
Los Angeles Water Board	California Regional Water Quality Control Board, Los Angeles Region
LID	Low Impact Development
MDAL	Maximum Daily Action Level
MEP	Maximum Extent Practicable
MRP	Receiving Waters Monitoring and Reporting Program
MS4	Municipal Separate Storm Sewer System

LIST OF ACRONYMS AND ABBREVIATIONS (CONT'D)

NAL	Non-storm Water Action Levels
ND	Not Detected
NPDES	National Pollutant Discharge Elimination System
NRDC	Natural Resources Defense Council
NURP	Nationwide Urban Runoff Program
OAL	Office of Administrative Law
RCFCD	Riverside County Flood Control and Water Conservation District
Regional Water Board	California Regional Water Quality Control Board
RGOs	Retail Gasoline Outlets
ROWD	Riverside County Copermittees' Report of Waste Discharge (application for NPDES reissuance)
RWL	Receiving Water Limitations
SAL	Storm Water Action Level
Santa Ana Water Board	California Regional Water Quality Control Board, Santa Ana Region
San Diego Water Board	California Regional Water Quality Control Board, San Diego Region
San Francisco Bay Water Board	California Regional Water Quality Control Board, San Francisco Bay Region
SIC	Standard Industrial Classification Code
SIP	State Implementation Plan
SSMP	Standard Storm Water Mitigation Plan
State Water Board	State Water Resources Control Board
SWMP	Storm Water Management Plan
TAC	State Water Resources Control Board Urban Runoff Technical Advisory Committee
TIE	Toxicity Identification Evaluation
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
WDRs	Waste Discharge Requirements
WLA	Waste Load Allocation
WQO	Water Quality Objective
WQBEL	Water Quality Based Effluent Limitations
WQMP	Water Quality Management Plan
WQS	Water Quality Standard
WRMP	Watershed Runoff Management Plan

I. FACT SHEET FORMAT

This Fact Sheet briefly sets forth the principle facts and the significant factual, legal, methodological, and policy questions that the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) considered in preparing Order No. R9-2010-0016. In accordance with the Code of Federal Regulations (CFR) title 40 parts 124.8 and 124.56 (40 CFR 124.8 and 124.56), this Fact Sheet includes, but is not limited to, the following information:

A. Contact information
B. Public process and notification procedures
C. Background information
D. Permitting approach
E. Economic issues
F. Legal authority
G. Findings
H. Directives

Tentative Order No. R9-2010-0016 was distributed for public review on July 23, 2010. The San Diego Water Board accepted written comments on the Tentative Order until September 7, 2010. A public hearing was subsequently held on November 10, 2010 to receive oral comments from interested persons.

The San Diego Water Board's files applicable to the issuance of Order No. R9-2010-0016 are incorporated into the administrative record in support of the findings and requirements of Order No. R9-2010-0016.

II. CONTACT INFORMATION

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The Order and other related documents can be downloaded from the San Diego Water Board website at
http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/rsd_stormwater.shtml

All documents referenced in this Fact Sheet and in Order No. R9-2010-0016 are available for public review at the San Diego Water Board office, located at the address listed above. Public records are available for inspection during regular business hours, from 8:00 am to 5:00 pm Monday through Friday. To schedule an appointment to inspect public records, contact the San Diego Water Board Records Management Officer at 858-467-2952.

Copermittees

1. City of Murrieta	4. County of Riverside
2. City of Temecula	5. Riverside County Flood Control and Water Conservation District
3. City of Wildomar	

III. PUBLIC PROCESS AND NOTIFICATION PROCEDURES

The San Diego Water Board followed the schedule listed below for the preparation of Order No. R9-2010-0016:

A. In December 2008, the San Diego Water Board met with the Copermittees to discuss the Report of Waste Discharge (ROWD) required by Order No. R9-2004-001.
B. On January 15, 2009, the San Diego Water Board received the ROWD for the permit renewal.
C. On October 29, 2009, the San Diego Water Board received the 2008-09 annual reports from the Copermittees for the existing permit.
D. On February 8, 2010, the San Diego Water Board notified all known interested parties that an electronic email listserv had been established to provide information and notices on the reissuance of the municipal storm water NPDES permit for southern Riverside County.
E. On February 18, 2010 the San Diego Water Board provided written comments on the ROWD to the Copermittees.
F. On March 22, 2010, the San Diego Water Board met with the Copermittees to discuss the potential changes to the permit based on the ROWD and annual reports.
G. Between April 22 and July 23, 2010, the San Diego Water Board met with the Copermittees on a weekly basis to discuss the Copermittees' concerns with the provisions of the Tentative Order.
H. On July 23, 2010, the San Diego Water Board released the Tentative Order for public review and comment.
I. Written comments were accepted until September 7, 2010.
J. A public hearing of the Tentative Order was conducted on November 10, 2010.

IV. BACKGROUND

Order No. R9-R9-2010-0016 is the fourth iteration of the storm water permit for the municipal separate storm sewer systems (MS4s) in the Riverside County portion of the San Diego Region. The first permit was adopted in 1990. The San Diego Water Board adopted the second iteration of the permit in 1998. The U.S. Environmental Protection Agency (USEPA) objected to the 1998 permit and reissued the permit in 1999. In 2000, the San Diego Water Board issued an addendum to the 1998 permit and incorporated the USEPA's permit by reference. The San Diego Water Board reissued the third iteration of the permit in 2004.

Municipal Storm Water Permits are required by the Federal Clean Water Act 1987 Amendments. The federal Clean Water Act (CWA) was amended in 1987 to address storm water runoff from municipal and industrial dischargers. One requirement of the amendment was that many municipalities throughout the United States were obligated for the first time to obtain National Pollutant Discharge Elimination System (NPDES) permits for discharges of storm water runoff from their MS4s. In response to the CWA amendment (and the pending federal NPDES regulations which would implement the amendment), the San Diego Water Board issued a municipal storm water permit, Order No. 90-46, in July 1990 to the Copermittees for their municipal separate storm sewer system (MS4) discharges.[1]

The First and Second Term Permits, Order Nos. 90-46 and 98-02, provided maximum flexibility. San Diego Water Board Order No. 90-46 contained the "essentials" of the 1990 regulations, but the requirements were written in very broad, generic terms. This was done in order to provide the maximum amount of flexibility to the Copermittees in implementing the new requirements (flexibility was, in fact, the stated reason for issuing the permit in advance of the final regulations). From staff's perspective however, "flexibility" in the form of lack of specificity, combined with the Copermittees' lack of funding and political will, also provided the Copermittees with ample reasons to take few substantive steps towards achieving water quality standards. The situation was exacerbated by the San Diego Water Board's own lack of storm water resources for oversight.

The Third-Term Permit introduced specific requirements. The regulatory approach incorporated into Order No. R9-2004-001 was a significant departure from the regulatory approach of the First and Second-Term Permits. Where San Diego Water Board Order Nos. 90-46 and 98-02 included broad, nonspecific requirements in order to provide the Copermittees with the maximum amount of flexibility in developing their programs, Order No. R9-2004-001 used detailed, specific requirements which outlined the minimum level of implementation required for the Copermittees' programs. In order to provide the Copermittees with the minimum requirements to meet the

[1] The 1990 permit was issued to the County of Riverside, the Orange County Flood Control and Water Conservation District, and the City of Temecula. Additional municipalities have been added to the MS4 NPDES permit as they have incorporated.

maximum extent practicable (MEP) standard for storm water of the San Diego Water Board, Order No. R9-2004-001 included more detail to emphasize the strong jurisdictional level programs developed by the Copermittees during the First and Second-Term Permits, as well as including the watershed-level program. The shift in permitting approaches resulted from the San Diego Water Board's conclusion that the lack of specificity in earlier Orders resulted in frequently unenforceable permit requirements, which in turn allowed some Copermittees to only make limited progress in implementing their programs.

The Third-Term Permit followed the San Diego County and Orange County permit templates. The shift in regulatory approaches for MS4 permits was first manifested in the 2001 MS4 permit to the owners and operators of San Diego County MS4s (Order No. 2001-01) and subsequently incorporated into the 2002 MS4 permit to the owners and operators of the Orange County MS4s (Order No. R9-2002-0001). The Third-Term Riverside County Permit included similar requirements as the 2001 San Diego County Permit and the 2002 Orange County Permit. Both the San Diego and Orange County Permits were appealed to the State Water Resources Control Board (State Water Board).[2] Minor modifications of each were made by the State Water Board, but the vast majority of the requirements were upheld. The San Diego County permit was also challenged in the Superior Court of the State of California and the Court of Appeal, Fourth Appellate District. Further litigation on the Orange County permit was held pending the precedential decisions on the San Diego Permit. The San Diego Permit was largely upheld in the Superior and Appellate Courts. The State of California Supreme Court declined to hear a final appeal from the Building Industry Association in March 2005. Thus, the Third-Term Riverside County permit requirements remained as slightly modified by the State Water Board.

The Third-Term Permit was adopted following substantial public participation. Public participation was extensive during the adoption process of the Third-Term Permit. The draft permit was released for public review and comment on December 15, 2003. Because the proposed requirements for Riverside County were similar to those that had recently been adopted and contested in San Diego County, much of the public participation dialogue echoed the discussions held during the San Diego renewal. A public workshop was held at the Temecula City Hall on January 23, 2004 to answer questions about the Tentative Order for the Third-Term Riverside County permit. A public hearing was held on February 11, 2004 to receive testimony. The public comment period was closed on March 10, 2004. Approximately 165 written and verbal comments were received and responded to during the public workshop, the public hearing, and the written comment period on the Tentative Order for the Third-Term Riverside County permit. Following the extensive public participation process, the San Diego Water Board adopted Order No. R9-2004-001 on July 14, 2004.

[2] Seven petitions were filed with the State Water Board over the Third-Term Orange County Permit. Six were placed in abeyance. Three of the petitioners sought stays. One stay request was dismissed and one was withdrawn. The active petition and stays were addressed by the State Water Board in Order WQO 2002-0014. That Order stayed provision F.5.f regarding sewage spills and modified Finding No. 26 regarding chronic toxicity.

Storm water programs have improved under the Third-Term Permit. Since adoption of Order No. R9-2004-001, the Copermittees' storm water programs have expanded. Audits of the Copermittees' programs and reviews of annual reports exhibit that the Copermittees' jurisdictional programs are largely in compliance with the Order. Some of the efforts currently being conducted on a regular basis by the Copermittees that were not conducted on a widespread basis prior to adoption of Order No. R9-2004-001, include: construction site storm water inspections, industrial and commercial facility storm water inspections, municipal facility storm water inspections, management of storm water quality from new development, development of best management practice (BMP) requirements for existing development, interdepartmental coordination, comprehensive water quality monitoring, and assessment of storm water program effectiveness.

Significant challenges remain. When viewed relative to the magnitude of the storm water runoff problem, enormous challenges remain, particularly regarding the management of storm water runoff on a watershed scale. Today, storm and non-storm water discharges from the MS4 continue to be the leading cause of water quality impairment in the San Diego Region.[3] Since 1998, the number of impaired water bodies in the Riverside County portion of the San Diego Region on the CWA section 303(d) List of Water Quality Impaired Segments (303(d) List) has increased with each new list (i.e. new impaired water bodies listed on the 2002, 2006, and 2008 303(d) Lists). The Copermittees' monitoring data exhibits persistent exceedances of water quality objectives in the Santa Margarita watershed.[4] The Santa Margarita watershed also has conditions that are frequently toxic to aquatic life. Bioassessment data from the watersheds further reflects these conditions, finding that macroinvertebrate communities in creeks have widespread Poor to Very Poor Index of Biotic Integrity (IBI) ratings.

[3] The potential sources of impairments are identified on the CWA section 303(d) list of impaired water bodies for the San Diego Region.
[4] Data is provided in annual reports to the San Diego Water Board. A summary of data collected during the Third-Term Permit is provided in the Riverside County Copermittees' application for permit reissuance. That summary is available on-line at:
http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/rsd_stormwater.shtml

V. PERMITTING APPROACH (PROGRAM INTEGRATION, FLEXIBILITY, AND DETAIL)

The Order contains an increased emphasis on storm water discharge management on a watershed basis. This shift towards increased watershed management is consistent with planning efforts conducted by the San Diego Water Board regarding reissuance of the San Diego Permit (Order No. R9-2007-0001) and Orange County Permit (Order No. R9-2009-0002). This shift reflects recognition of the maturity of the storm water programs since they began implementing the Third-Term Permit. Addressing storm water discharge management on a watershed basis is only possible if effective jurisdictional programs have been established, and maintaining effective jurisdictional programs is crucial to the success of watershed-focused management.

There are several reasons for this shift in emphasis. An emphasis on watersheds is necessary to shift the focus of the Copermittees from program development and implementation to water quality results. After over 20 years of Copermittee program implementation, it is critical that the Copermittees link their efforts with positive impacts on water quality. Addressing storm water on a watershed scale focuses on water quality results by emphasizing the receiving waters within the watershed. The conditions of the receiving waters drive management actions, which in turn focus on the water quality problems in each watershed.

Focusing on watershed implementation does not mean that the Copermittees must expend funds outside of their jurisdictions. Rather, the Copermittees within each watershed are expected to collaborate to develop a watershed strategy to address the high priority water quality problems within each watershed. They have the option of implementing the strategy in the manner they find to be most effective. Each Copermittee can implement the strategy individually within its jurisdiction, or the Copermittees can group together to implement the strategy throughout the watershed.

While the Order includes a new emphasis on addressing storm water discharges on a watershed basis, the Order includes recognition of the importance of continued program implementation on jurisdictional and countywide levels. The Order also acknowledges that jurisdictional, watershed, and countywide efforts are not always mutually exclusive. For this reason, an attempt has been made to allow for the Copermittees' jurisdictional, watershed, and countywide programs to integrate.

In the Order, the watershed requirements serve as the mechanism for this program integration. Since jurisdictional and countywide activities can also serve watershed purposes, such activities can be integrated into the Copermittees' watershed programs, provided the activities meet certain criteria. In this manner, the Copermittees' activities do not always need to distinguish between jurisdictional, watershed, and countywide levels of implementation. Instead, they can be integrated on multiple levels.

Such opportunities for program integration inherently provide flexibility to the Copermittees in implementing their programs. Program integration can be expanded or minimized as the Copermittees see fit. For example, there is flexibility provided in determining the activities to be integrated and implemented in the watershed programs – watershed-based efforts, countywide efforts, enhanced jurisdictional efforts, or a mixture of the three. Significant flexibility is also provided throughout other portions of the Order.

Copermittees can choose the best management practices (BMPs) to be implemented, or required to be implemented, for development, construction, and existing development areas. Flexibility to determine which industrial or commercial sites are to be inspected is also provided to the Copermittees. Educational approaches are also to be determined by the Copermittees under the Order. Implementation of certain efforts on a countywide basis is largely optional for the Copermittees as well. Significant leeway is also provided to the Copermittees in using methods to assess the effectiveness of their various runoff management programs. This flexibility is further extended to the monitoring program requirements, which allow the Copermittees to develop monitoring approaches to several aspects of the monitoring program.

The challenge in drafting the Order is to provide the flexibility described above while ensuring that the Order is still enforceable. To achieve this, the Order frequently prescribes minimum measurable outcomes, while providing the Copermittees with flexibility in the approaches they use to meet those outcomes. Enforceability has been found to be a critical aspect of the Order. For example, the watershed requirements of Order No. R9-2004-001 were some of the Order's most flexible requirements. This lack of specificity in the watershed requirements resulted in inefficient watershed compliance efforts. This situation reflects a common outcome of flexible permit language. Such language can be unclear and unenforceable, and it can lead to implementation of inadequate programs.

To avoid these types of situations, a balance between flexibility and enforceability has been crafted into the Order. Minimum measurable outcomes are utilized to ensure the Order is enforceable, while the Copermittees are provided flexibility in deciding how they will implement their programs to meet the minimum measurable outcomes.

VI. ECONOMIC ISSUES

Economic discussions of storm and non-storm water management programs tend to focus on the significant costs incurred by municipalities in developing and implementing the programs. However, when considering the cost of implementing the programs, it is also important to consider the alternative costs incurred by not fully implementing the programs, as well as the benefits which result from program implementation.

The financial crisis and current economic environment has amplified the concerns about the costs incurred by the municipalities in implementing their programs. It is frequently cited by many of the Copermittees as a justification for reducing or modifying the requirements that must be met by their programs. While the current economic environment is a cause for concern in the short term, it also provides an opportunity for these programs to find and implement improvements and efficiencies before the next period of growth and development.

It is very difficult to ascertain the true cost of implementation of the Copermittees' management programs because of inconsistencies in reporting by the Copermittees. Reported costs of compliance for the same program element can vary widely from city to city, often by a very wide margin that is not easily explained.[5] Despite these problems, efforts have been made to identify management program costs, which can be helpful in understanding the costs of program implementation.

Estimates of Phase I Storm Water Program Costs

The USEPA, the California Regional Water Quality Control Boards (Regional Water Boards), and the State Water Board have attempted to evaluate the costs of implementing municipal storm water programs. The assessments demonstrate that true costs are difficult to ascertain and reported costs vary widely. Nonetheless, they provide a useful context for considering the costs of requirements within Order No. R9-2010-0016. In addition, reported fiscal analyses tend to neglect the costs incurred to municipalities when storm water runoff is not effectively managed. Such costs result from pollution, contamination, nuisance, and damage to ecosystems, property, and human health.

In 1999 USEPA reported on multiple studies it conducted to determine the cost of management programs. A study of Phase II municipalities determined that the annual cost of the Phase II program was expected to be $9.16 per household. USEPA also studied 35 Phase I municipalities, finding costs to be $9.08 per household annually, similar to those anticipated for Phase II municipalities.[6]

[5] LARWQCB, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.
[6] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791-68792.

A study on Phase I MS4 program cost was also conducted by the California Regional Water Quality Control Board, Los Angeles Region (Los Angeles Water Board), where program costs reported in the municipalities' annual reports were assessed. The Los Angeles Water Board estimated that average per household cost to implement the MS4 program in Los Angeles County was $12.50.[7] Since the Los Angeles County permit is very similar to Order No. R9-2004-001, this estimate is also useful in assessing general program costs in Riverside County.

The State Water Board also commissioned a study by the California State University, Sacramento to assess costs of the Phase I MS4 program. This study includes an assessment of costs incurred by Phase I MS4s throughout the State to implement their programs. Annual cost per household in the study ranged from $18-46, with the Fresno-Clovis Metropolitan Area (FCMA) representing the lower end of the range, and the City of Encinitas (in San Diego County) representing the upper end of the range.[8] Included in the study is the City of Corona, which is in Riverside County under the jurisdiction of the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board).

The annual cost per household for the City of Corona's program was estimated to be $32, which should be similar to the costs to implement the MS4 programs in the Riverside County portion of the San Diego Region. In contrast, the cost of the City of Encinitas' program, with an annual cost per household estimated to be $46, may represent the upper range of Riverside County MS4 programs. However, the City of Encinitas's program cost can be considered as the high end of the spectrum for management program costs because the City has a consent decree with environmental groups regarding its program, and City of Encinitas has received recognition for implementing a superior program.

The annual costs for the City of Corona and City of Encinitas were estimated from data collected in 2003-2004. Between 2003 and 2008, the number of households in both cities has increased by approximately 3 percent and 7 percent, respectively.[9] In contrast, between 2003 and 2008 the number of households in the City of Temecula has increased from 23,199 to 31,135 (34 percent)[10] and the City of Murrieta has increased from 22,020 to 32,664 (48 percent).[11] This significant increase in number of households indicates a significant increase in the tax base (sales and property tax) available to fund the implementation of the MS4 programs for the City of Temecula and City of Murrieta, as well as for the County of Riverside and recently incorporated cities.

[7] Los Angeles Water Board, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003. P. 2.
[8] State Water Board, 2005. NPDES Stormwater Cost Survey. P. ii.
[9] Southern California Association of Governments, Profile of the City of Corona, dated May 2009; and City of Encinitas, Comprehensive Financial Annual Report, dated June 30, 2009.
[10] Southern California Association of Governments, Profile of the City of Temecula, dated May 2009.
[11] Southern California Association of Governments, Profile of the City of Murrieta, dated May 2009.

The average amount spent per household in the Cities of Temecula and Murrieta, however, does not correspond with the increase in the number of households or the amount spent in municipalities in other regions. The table below compares the reported expenditures for the MS4 programs from 2006-07 to 2008-09 compared to number of households in the Cities of Encinitas, Corona, Temecula, and Murrieta.[12]

	2006-07			2007-08			2008-09		
City	$ Spent	House-holds	$/House-hold	$ Spent	House-holds	$/House-hold	$ Spent	House-holds	$/House-hold
Encinitas	$1,192,174	23,798	$50.10	$2,052,671	23,871	$85.99	$1,729,962	24,100	$71.78
Corona	$988,547	43,000	$22.99	$1,151,779	43,482	$26.49	$1,162,928*	43,827	$26.53
Temecula	$566,952	28,890	$19.62	$748,267	30,222	$24.76	$534,492	31,135	$17.17
Murrieta	$186,377	30,237	$6.16	$258,247	31,758	$8.13	$541,180*	32,664	$16.56

It is important to note that the program costs reported above may not include costs incurred by other departments or programs that may support the MS4 permit programs. The costs only represent the funds spent by each municipality as reported in their jurisdictional program annual reports. In any case, the figures in the table above illustrate the disparity in the amounts reportedly budgeted and spent for the programs in the Riverside County portion of the San Diego Region in comparison to the amounts budgeted and spent in the Santa Ana Region and in the San Diego County portion of the San Diego Region.

It is also important to note that reported program costs are not all attributable to compliance with MS4 permits. Many program components, and their associated costs, existed before any MS4 permits were ever issued. For example, street sweeping and trash collection costs cannot be solely or even principally attributable to MS4 permit compliance, since these practices have long been expected from and implemented by municipalities.

Therefore, true program cost resulting from MS4 permit requirements is some fraction of reported costs. The California State University, Sacramento study found that only 38 percent of program costs are new costs fully attributable to MS4 permits. The remainder of the program costs was either pre-existing or resulted from enhancement of pre-existing programs.[13] In 2000, the County of Orange found that even lesser amounts of program costs are solely attributable to MS4 permit compliance, reporting that the amount attributable to implement the County or Orange Drainage Area Management Plan (DAMP), was less than 20 percent of the total budget. The remaining 80 percent was attributable to pre-existing programs.[14]

[12] Amount ($) Spent figures are the actual expenditures reported in the 2006-07, 2007-08, and/or 2008/09 Annual Reports for the jurisdictional programs for each municipality (figures with * are estimated/budgeted expenditures). Number of households derived from SCAG 2009 profiles of Corona, Temecula, and Murrieta, and from City of Encinitas 2009 Financial Annual Report.
[13] State Water Board, 2005. NPDES Stormwater Cost Survey. P. 58.
[14] County of Orange, 2000. A NPDES Annual Progress Report. P. 60. More current data from the County of Orange is not used in this discussion because the County of Orange no longer reports such information.

Estimating Costs of Reissued Storm Water Permits

The vast majority of costs that will be incurred as a result of implementing Order No. R9-2010-0016 is not new. Storm water management programs have been in place in Riverside County for over 15 years. As shown in the discussion above, the amount spent for MS4 Permit compliance per household in the municipalities in the Riverside County portion of the San Diego Region is already low compared to other regions. Any increase in cost to the Copermittees, however, is still expected to be incremental in nature. Since Order No. R9-2010-0016 "fine tunes" the requirements of Order No. R9-2004-001, these cost increases are expected to be modest.

Where there may be additional elements that will incur new costs, the Riverside County Copermittees are given the time to develop the budgets and funding mechanisms to phase those elements into their programs. Additionally, development of these additional elements by the Riverside County Copermittees will have the benefit of the experiences and work already done by the San Diego County and Orange County Copermittees.

The anticipated costs of program changes are difficult to estimate because of the flexibility inherent within the Permit and the recognition that program modifications will vary among the municipalities in response to the specific needs of the local and watershed programs. In other words, the Permit is intended to allow each Copermittee to de-emphasize some program components and strengthen others based on the experience of the jurisdictional programs.

The changes in Order No. R9-2010-0016 reflect the iterative process of BMP implementation and the necessarily adaptive nature of storm water management that is expected by the USEPA. In 1996, USEPA recognized that changes to MS4 programs would occur during the reapplication period based on new information on the relative magnitude of a problem, new data on water quality impacts of the storm water discharges, and experience gained under the prior permit.[15] Some changes have been proposed by the Copermittees in the permit reapplication package, and others have been included because the San Diego Water Board considers those measures necessary and feasible to protect water quality from the effects of MS4 discharges.

[15] Federal Register / Vol. 61, No. 155 / Friday, August 9, 1996 / Rules and Regulations. Interpretive policy memorandum on reapplication requirements for MS4s.

Other Economic Considerations

Economic considerations of management programs cannot be limited only to program costs. Evaluation of programs requires information on the implementation costs and information on the benefits derived from environmental protection and improvement.[16] Attention is often focused on program costs, but the programs must also be viewed in terms of their value to the public.

For example, household willingness to pay for improvements in fresh water quality for fishing and boating has been estimated by USEPA to be $158-210.[17] This estimate can be considered conservative, since it does not include important considerations such as marine waters benefits, wildlife benefits, or flood control benefits. The California State University, Sacramento study reports that the annual household willingness to pay for statewide clean water is approximately $180.[18] When viewed in comparison to household costs for existing management programs, household willingness to pay estimates exhibit that per household costs incurred by the Riverside County Copermittees to implement their management programs are very low.

Placing a value on good water quality in receiving waters is very difficult. The Santa Margarita River is one of the few remaining natural gorge rivers in southern California, with approximately 70 species of special concern (rare, threatened, or endangered) regularly inhabiting the watershed, including 30 that are currently protected under the Federal Endangered Species Act.[19] The Upper Santa Margarita Watershed provides significant habitat and recreation opportunities. In addition, residents and businesses in the Upper Santa Margarita Watershed rely heavily of local water for drinking, agriculture, and industrial supply.

Often the value of receiving waters with good water quality manifests in other forms, such as tourism, recreational opportunities, and increased property values. When surface waters are degraded, thereby degrading the habitat, the public loses the aesthetic value and benefit of being able to use the area in and around the water. Surface waters that are able to support the beneficial uses designated in the Water Quality Control Plan for the San Diego Basin (Basin Plan) can sustain plants and wildlife that can attract visitors and residents, providing aesthetic, recreational, as well as monetary value to the public. At this time, however, there have been no studies for the Riverside County portion of the San Diego Region to quantify the added value that surface waters with healthy water quality can provide.

It is also important to consider the benefits of management programs in conjunction with their costs. A study conducted by the University of Southern California and University of California, Los Angeles assessed the costs and benefits of implementing

[16] Ribaudo M.O. and D. Heelerstein. 1992, *Estimating Water Quality Benefits: Theoretical and Methodological Issues.* U.S. Department of Agriculture. Technical Bulletin No. 1808.
[17] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68793.
[18] State Water Board, 2005. NPDES Stormwater Cost Survey. P. iv.
[19] Stein, E. and Ambrose, R. 1998. Cumulative Impacts of Section 404 Clean Water Act Permitting on the Riparian Habitat of the Santa Margarita, California Watershed. Wetlands, Vol. 18, No. 3.

various approaches for achieving compliance with the MS4 permits in the Los Angeles Region. The study found that non-structural systems would cost $2.8 billion but provide $5.6 billion in benefit. If structural systems were determined to be needed, the study found that total costs would be $5.7 to $7.4 billion, while benefits could reach $18 billion.[20] Costs are anticipated to be borne over many years – probably ten years at least. As can be seen, the benefits of the programs are expected to considerably exceed their costs. Such findings are corroborated by USEPA, which found that the benefits of implementation of its Phase II storm water rule would also outweigh the costs.[21]

[20] Los Angeles Water Board, 2004. Alternative Approaches to Stormwater Control.
[21] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791.

VII. LEGAL AUTHORITY

The following statutes, regulations, and Water Quality Control Plans provide the basis for the requirements of Order No. R9-2010-0016: Clean Water Act (CWA), California Water Code (CWC), Title 40 of the Code of Federal Regulations (40 CFR) Parts 122, 123, 124 (National Pollutant Discharge Elimination System Permit Application Regulations for Storm Water Discharges, Final Rule), Part II of 40 CFR Parts 9, 122, 123, and 124 (National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule), Water Quality Control Plan – Ocean Waters of California (California Ocean Plan), Water Quality Control Plan for the San Diego Basin (Basin Plan), 40 CFR 131 Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule (California Toxics Rule), and the California Toxics Rule Implementation Plan.

The legal authority citations below generally apply to directives in Order No. R9-2010-0016, and provide the San Diego Water Board with ample underlying authority to require each of the directives of Order No. R9-2010-0016. Legal authority citations are also provided with each permit section discussion in section IX of this Fact Sheet/Technical Report.

CWA 402(p)(3)(B)(ii) – The CWA requires in section 402(p)(3)(B)(ii) that permits for discharges from municipal storm sewers "shall include a requirement to effectively prohibit non-storm water discharges into the storm sewers."

CWA 402(p)(3)(B)(iii) – The CWA requires in section 402(p)(3)(B)(iii) that permits for discharges from municipal storm sewers "shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants."

40 CFR 122.26(d)(2)(i)(B,C,E, and F) – Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) provide that each Copermittee's permit application "shall consist of: (i) Adequate legal authority. A demonstration that the applicant can operate pursuant to legal authority established by statute, ordinance or series of contracts which authorizes or enables the applicant at a minimum to: […] (B) Prohibit through ordinance, order or similar means, illicit discharges to the municipal separate storm sewer; (C) Control through ordinance, order or similar means the discharge to a municipal separate storm sewer of spills, dumping or disposal of materials other than storm water; […] (E) Require compliance with condition in ordinances, permits, contracts or orders; and (F) Carry out all inspection, surveillance and monitoring procedures necessary to determine compliance and noncompliance with permit conditions including the prohibition on illicit discharges to the municipal separate storm sewer."

40 CFR 122.26(d)(2)(iv) – Federal NPDES regulation 40 CFR 122.26(d)(2)(iv) provides that the Copermittee shall develop and implement a proposed management program which "shall include a comprehensive planning process which involves public participation and where necessary intergovernmental coordination, to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and such other provisions which are appropriate. The program shall also include a description of staff and equipment available to implement the program. […] Proposed programs may impose controls on a system wide basis, a watershed basis, a jurisdiction basis, or on individual outfalls. […] Proposed management programs shall describe priorities for implementing controls."

40 CFR 122.26(d)(2)(iv)(A - D) – Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(A - D) require municipalities to implement controls to reduce pollutants in storm water runoff from new development and significant redevelopment, construction, and commercial, residential, industrial, and municipal land uses or activities. Prevention of illicit discharges is also required.

CWC 13377 – CWC section 13377 provides that "Notwithstanding any other provision of this division, the State Water Board or the Regional Water Boards shall, as required or authorized by the CWA, as amended, issue waste discharge requirements and dredged or fill material permits which apply and ensure compliance with all applicable provisions of the act and acts amendatory thereof or supplementary, thereto, together with anymore stringent effluent standards or limitation necessary to implement water quality control plans, or for the protection of beneficial uses, or to prevent nuisance."

Order No. R9-2010-0016 is an essential mechanism for achieving the water quality objectives that have been established for protecting the beneficial uses of the water resources in the San Diego Water Board's portion of Riverside County. Federal NPDES regulation 40 CFR 122.44(d)(1) requires MS4 permits to include any requirements necessary to "achieve water quality standards established under CWA section 303, including State narrative criteria for water quality." The term "water quality standards" in this context refers to a water body's beneficial uses and the water quality objectives necessary to protect those beneficial uses as established in the Basin Plan and antidegradation policies.

VIII. FINDINGS

The findings of the Order have been modified to reduce repetition in their discussions and address new requirements. Each finding of the Order is provided and discussed below. Additional discussion relative to the findings can be found in section IX of the Fact Sheet, which provides discussions of the Order's directives.

A. Basis For the Order

Finding A.1. This Order is based on the federal Clean Water Act (CWA), the Porter-Cologne Water Quality Control Act (Division 7 of the Water Code, commencing with Section 13000), applicable State and federal regulations, all applicable provisions of statewide Water Quality Control Plans and Policies adopted by the State Water Resources Control Board (State Water Board), the Water Quality Control Plan for the San Diego Basin adopted by the San Diego Water Board (Basin Plan), the California Toxics Rule, and the California Toxics Rule Implementation Plan.

Discussion of Finding A.1. In 1987, Congress established CWA Amendments to create requirements for storm water discharges under the NPDES program, which provides for permit systems to regulate the discharge of pollutants. Under the Porter-Cologne Water Quality Control Act, the State Water Board and the nine Regional Water Boards have primary responsibility for the coordination and control of water quality, including the authority to implement the CWA. Porter-Cologne (section 13240) directs the Regional Water Boards to set water quality objectives via adoption of Water Quality Control Plans (Basin Plans) that conform to all State policies for water quality control.

As a means for achieving those water quality objectives, Porter-Cologne (section 13243) further authorizes the Regional Water Boards to establish waste discharge requirements (WDRs) to prohibit waste discharges in certain conditions or areas. Since 1990, the San Diego Water Board has issued area-wide MS4 NPDES permits. The Order will renew Order No. R9-2004-001 to comply with the CWA and attain water quality objectives in the Basin Plan by including numeric storm water action levels to limit the contributions of pollutants conveyed by storm water, and by including numeric non-storm water action levels for dry weather non-storm water discharges designed to ensure that the Copermittees comply with the requirement to effectively prohibit all types of unauthorized non-storm water discharges into their MS4. Further discussions of the legal authority associated with the prohibitions and directives of the Order are provided in section VII this document.

Finding A.2. This Order reissues National Pollutant Discharge Elimination System (NPDES) Permit No. CAS0108766, which was first adopted by the San Diego Water Board on July 16, 1990 (Order No. 90-38), and then reissued on May 13, 1998 (Order No. 98-02). On May 26, 1998, the United States Environmental Protection Agency

(USEPA), Region IX, objected to Order No. 98-02 due to concerns regarding Receiving Water Limitations (RWL) language. The USEPA concluded that the RWL language in the permit did not comply with the CWA and its implementing regulations. On April 27, 1999, the USEPA reissued the MS4 permit, which the San Diego Water Board adopted as Addendum No. 1 to Order No. 98-02 on November 8, 2000. On July 14, 2004, the San Diego Water Board adopted the third term MS4 permit, Order No. R9-2004-001. On January 15, 2009, the Riverside County Flood Control and Water Conservation District (RCFCD), as the Principal Copermittee, submitted a Report of Waste Discharge (ROWD) for reissuance of the municipal separate storm sewer system (MS4) Permit.

Discussion of Finding A.2. This Order renews National Pollutant Discharge Elimination System (NPDES) Permit No. CAS0108766, which was first issued on July 16, 1990 (Order No. 90-38), and then renewed on May 13, 1998 (Order No. 98-02). The USEPA determined that Order No. 98-02 the Receiving Water Limitations (RWL) language in the permit did not comply with the CWA and its implementing regulations. The USEPA assumed responsibility and reissued the Riverside County MS4 permit on April 27, 1999. Subsequently, the San Diego Water Board adopted Addendum No. 1 to Order No. 98-02 on November 8, 2000, which incorporated the USEPA's permit by reference. On July 14, 2004, the San Diego Water Board adopted the third term MS4 permit, Order No. R9-2004-001. On January 15, 2009, in accordance with Order No. R9-2004-001, the Riverside County Flood Control and Water Conservation District (District), as the Principal Copermittee, submitted a Report of Waste Discharge (ROWD) for reissuance of the municipal separate storm sewer system (MS4) Permit. Supporting information discussing the topic of this finding can be found in section V of this document.

Finding A.3. This Order is consistent with the following precedential Orders adopted by the State Water Board addressing MS4 NPDES Permits: Order WQ 99-05, Order WQ 2000-11, Order WQ 2001-15, Order WQO 2002-0014, and Order WQ 2009-0008 (*SWRCB/OCC FILE A-1780)*.

Discussion of Finding A.3. In recent years the State Water Board has considered several appeals of MS4 permits issued by the Regional Water Boards. In State Water Board Order WQ 99-05, the State Water Board established Receiving Water Limitation Language for MS4 permits. In State Water Board Order WQ 2000-11, the State Water Board addressed design standards for Standard Urban Storm Water Mitigation Plan (SUSMP) requirements. In State Water Board Order WQ 2001-15, the State Water Board addressed Petitions of the San Diego County MS4 Permit issued by the San Diego Water Board in 2001 (San Diego Water Board Order No. 2001-001). In State Water Board Order WQO 2002-0014, the State Water Board addresses Petitions of the Orange County MS4 Permit issued by the San Diego Water Board in 2002 (San Diego Water Board Order No. R9-2002-0001). In State Water Board Order WQ 2009-0008, the State Water Board addresses Petitions of the Los Angeles County MS4 Permit issued by the Los Angeles Water Board in 2006 (Los Angeles Water Board Order No. R4-2006-0074).

Finding A.4. The Fact Sheet / Technical Report for the Order No. R9-2010-0016, NPDES No. CAS0108766, Waste Discharge Requirements for Discharges from the MS4s Draining the County of Riverside, the Incorporated Cities of Riverside County, and the Riverside County Flood Control and Water Conservation District within the San Diego Region, includes cited regulatory and legal references and additional explanatory information and data in support of the requirements of this Order. This information, including any supplements thereto, is hereby incorporated by reference into these findings.

Discussion of Finding A.4. This Fact Sheet briefly sets forth the principle facts and the significant factual, legal, methodological, and policy questions that the San Diego Water Board considered in preparing Order No. R9-2010-0016, in accordance with the Code of Federal Regulations (CFR) title 40 parts 124.8 and 124.56 (40 CFR 124.8 and 124.56). This Fact Sheet includes general information regarding the watershed and the Copermittees' discharges from their MS4 systems. The discussions in the Fact Sheet include references to applicable statutes and regulations, as well as other supporting documents. The discussions in the Fact Sheet also can clarify the permit writer's intent for requirements that may appear vague or open to multiple interpretations.

B. Regulated Parties

Finding B.1. Each of the persons in Table 1 below, hereinafter called Copermittees or dischargers, owns or operates an MS4, through which it discharges storm water and non-storm water into waters of the United States (U.S.) within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the U.S.

The Cities of Murietta, Menifee and Wildomar also discharge into waters of the U.S. in the California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board), so are located partially within both the San Diego and Santa Ana Water Board boundaries. As allowed by California Water Code (CWC) §13228, these Cities submitted written requests to be regulated for MS4 purposes under a permit adopted by only one Water Board. As authorized by CWC § 13228 and pursuant to a written agreement between the San Diego Water Board and the Santa Ana Water Board, the Cities of Murrieta and Wildomar are wholly regulated by the San Diego Water Board under this Order, including those portions of the Cities jurisdiction not within the San Diego Water Board's region. Similarly, the City of Menifee is wholly regulated by the Santa Ana Water Board under Order No. R8-2010-0033, including those portions of the City of Menifee within the San Diego Water Board's region.

Discussion of Finding B.1. Section 402 of the CWA prohibits the discharge of any pollutant to waters of the United States from a point source, unless that discharge is authorized by a NPDES permit. Though storm water and non-storm water may come from a diffuse source, it is discharged through MS4s, which are point sources under the CWA. Federal NPDES regulation 40 CFR 122.26(a) (iii) and (iv) provide that discharges from MS4s, which service medium or large populations greater than 100,000 or 250,000 respectively, shall be required to obtain a NPDES permit. Federal NPDES regulation 40 CFR 122.26(a)(v) also provides that a NPDES permit is required for "A [storm water] discharge which the Director, or in states with approved NPDES programs, either the Director or the USEPA Regional Administrator, determines to contribute to a violation of a water quality standard or is a significant contributor of pollutants to waters of the United States." Such sources are then designated into the program.

Included in Table 1 of the Order are the Cities of Murrieta, Temecula, and Wildomar, the County of Riverside, and the Riverside County Flood Control and Water Conservation District. The Cities of Wildomar and Menifee are newly incorporated cities. Both Cities were previously a part of the County of Riverside's jurisdiction and have an MS4 interrelated to other Copermittee MS4s in the San Diego Region. The boundaries of the Cities of Menifee, Murrieta, and Wildomar fall within the jurisdiction of both the San Diego Water Board and the Santa Ana Water Board.

As requested by the Cities of Menifee, Murrieta, and Wildomar, and pursuant to an agreement between the San Diego and Santa Ana Water Boards as authorized by CWC section 13228, the MS4s of the Cities of Murrieta and Wildomar are to be wholly regulated by the San Diego Water Board under this Order, and the MS4 of the City of Menifee is to be wholly regulated by the Santa Ana Water Board under Order No. R8-2010-0033. The agreement between the San Diego and Santa Ana Water Board to regulate the Cities of Menifee, Murrieta, and Wildomar will be subject to change with sufficient notice, and for good cause.

Other small MS4s also exist within the portion of Riverside County in the San Diego Region. While these small MS4s are not subject to this Order, they are subject to the Phase II NPDES storm water regulations. Over time, these small MS4s will be designated for coverage under the State Water Board's statewide general storm water permit for small MS4s.

C. Discharge Characteristics

Finding C.1. Discharges from the MS4 contain waste, as defined in the CWC, and pollutants that adversely affect the quality of the waters of the State. The discharge from an MS4 is a "discharge of pollutants from a point source" into waters of the U.S. as defined in the CWA.

Discussion of Finding C.1. Section 13050(d) of the CWC defines "waste" as "sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal." 40 CFR 122.2 defines "point source" as "any discernable, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff." 40 CFR 122.2 defines "discharge of a pollutant" as "Any addition of any pollutant or combination of pollutants to waters of the U.S. from any point source." Also, the justification for control of pollution into waters of the state can be found at CWC section 13260(a)(1). State Water Board Order No. WQ 2001-15 verifies that discharges from the MS4 contain waste.[22]

The term "urban runoff" has been removed throughout Order No. R9-2010-0016 and replaced with storm water (wet weather) or non-storm water (dry weather) runoff. This clarification is necessary to prevent the misunderstanding that regulation under this permit is subject only to urbanized areas. The term "urban runoff" is not defined in the Code of Federal Regulations or Federal Register in the regulation of Phase I MS4 discharges.

In the Copermittees' ROWD, a distinction is made between urban land use areas and non-urban land use areas. Urban land use areas include commercial, industrial, *urban residential (less than 1 acre)*, parks and recreation facilities, and streets and roads land use categories. Non-urban land use areas include preserves and open space, agriculture, federal/state/tribal lands/non-County jurisdiction, and *rural residential (greater than 1 acre)*. The ROWD implies that only discharges from the urban land use areas are subject to the requirements of the MS4 Permit, thus rural residential (greater than 1 acre) land use areas would not be subject to the requirements of the MS4 Permit. Rural residential land use areas, however, are subject to the requirements of the MS4 Permit. The removal of the term urban runoff will further clarify the application of the requirements of the MS4 Permit.

[22] State Water Board, 2001. Order WQ 2001-15. In the Matter of Petitions of Building Industry Association of San Diego County and Western States Petroleum Association: For Review of Waster Discharge Requirements Order No. 2001-01 for Urban Runoff from San Diego County [NPDES No. CAS0108758] Issued by the Regional Board.

The discharge of runoff from an MS4 is a “discharge of pollutants from a point source” into waters of the U.S. as defined in the CWA. The Permit defines runoff as all flows in a storm water conveyance system (MS4 defined below) and consists of the following components:

(1) storm water (wet weather flows) and
(2) non-storm water discharges (dry weather flows).

The Permit defines an MS4 as a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains):

(i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to waters of the United States;

(ii) Designated or used for collecting or conveying storm water;

(iii) Which is not a combined sewer;

(iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.26.

Permit finding D.3.c. includes natural streams that convey runoff as part of the MS4. The presence of an MS4 system is not limited to areas considered to be “urban” in nature. Though the term urban is often referred to specifically as pertaining to cities, runoff means all flows in a storm water conveyance system, regardless of the location of the conveyance system. A conveyance system owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law), may be located in a setting (e.g. unincorporated area, low density residential) that is not considered by the public to be “urban” in nature. These areas are contributing pollutants to the MS4 system that must be addressed. The term runoff applies to all flows in an MS4 system, no matter where the MS4 may be located in regards to incorporated or unincorporated property. Storm water and non-storm water discharges from the rural residential (greater than 1 acre) land use category, characterized as non-urban, that enter into any part of the MS4 system (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains), are also subject to the requirements of the MS4 Permit.

The Code of Federal Regulations (CFR) at 40 CFR 122.26 requires that large and medium MS4s obtain a permit for all discharges from their systems. Appendix I to 40 CFR 122 designates Riverside County as having a large and medium MS4 requiring a permit. The regulations do not differentiate discharges from urban or rural MS4 systems. Rather, the regulations require the permit for all discharges from their systems. In the Final Rule establishing the Phase 1 storm water regulations, the USEPA clarified that all discharges are subject to a permit. On page 48041 of the Final Rule, the USEPA states:

> "EPA recognizes that some of the counties addressed by today's rule have, in addition to areas with high unincorporated urbanized populations, areas that are essentially rural or uninhabited and may not be the subject of planned development. While permits issued for these municipal systems ***will cover*** *(emphasis added) municipal systems discharges in unincorporated portions of the county* (emphasis added), it is the intent of EPA that management plans and other components of the programs focus on the urbanized and developing areas of the county."

So, while the Permit covers all MS4 discharges regardless if that discharge is in an urban or unincorporated area; the Copermittees management program should focus on urbanized areas. Due to the Permit's requirements, the Copermittees management programs will naturally focus on urbanized areas. Urbanized areas have more industry, construction, pollution and MS4s that require more inspection, maintenance, monitoring, enforcement and complaint follow-up.

USEPA further clarified on page 48041 that all MS4 discharges require permit coverage when addressing highway MS4 systems:

> "[The regulations] will result in discharges from separate storm sewer systems serving State highways and other highways through storm sewers … in unincorporated portions of specified counties being included as part of the large or medium municipal separate storm sewer systems, since all municipal separate storm sewers within the boundaries of these political entities are included."

In their summary on page 48043, the USEPA states:

> "The definition [of MS4] provides that all systems within a geographical area including highways and flood controls will be covered, thereby avoiding fragmented and ill-coordinated programs;"

Neither the State Water Board's storm water permit for Caltrans (State Water Board Order No. 99-06-DWQ) nor the Los Angeles Water Board's MS4 permit for Ventura County include the term "urban runoff" in a significant regulatory capacity. The Caltrans permit has one reference to "urban runoff" where the term is used interchangeably with "storm water." The draft Ventura permit uses the term "urban

runoff" when referring to titles of reference documents, previously adopted management plans and municipal ordinances that may contain the phrase.

The Copermittees have expressed concern regarding the regulation of pollutants from natural, undeveloped areas that enter the MS4 in an unincorporated area. Runoff and pollutants from any source entering the MS4, however, become the responsibility of the Copermittees upon entering the MS4. The assimilation of pollutants from natural, undeveloped areas is different under natural conditions compared to when they are transported through the MS4. The MS4 collection could change a natural sheet flow discharge to a concentrated point discharge. The MS4 does not provide natural infiltration or other pollutant remediation that these flows would receive in an otherwise natural drainage system. The MS4 may concentrate these natural pollutants and flows. In some cases, the MS4 may ultimately discharge the elevated concentrations of natural pollutants and flow rates to waters of the US far from the natural pollutant and flow source, causing a condition of pollution or a violation of water quality standards.

Finding C.2. MS4 storm water and non-storm water discharges are likely to contain pollutants that cause or threaten to cause a violation of surface water quality standards, as outlined in the Basin Plan. Storm water and non-storm water discharges from the MS4 are subject to the conditions and requirements established in the Basin Plan for point source discharges.

Discussion of Finding C.2. This finding is a clarification regarding the potential for discharges of storm water and non-storm water to impact the Beneficial Uses as described in the Basin Plan. As such these point source discharges require Waste Discharge Requirements (WDRs) to ensure that water quality standards are met. Furthermore, since point source discharges require WDRs, the discharges are subject to the prohibitions, conditions and requirements of the Basin Plan.

In addition, municipal discharges have been split into storm water and non-storm water discharges to represent the differing regulations applicable to storm water and non-storm water, though both types of discharges are likely to contain pollutants.

Finding C.3. The most common categories of pollutants in runoff include total suspended solids, sediment, pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., copper, lead, zinc and cadmium), petroleum products and polynuclear aromatic hydrocarbons, synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus fertilizers), oxygen-demanding substances (decaying vegetation, animal waste), detergents, and trash.

Discussion of Finding C.3. The National Urban Runoff Program (NURP) study showed that heavy metals, organics, coliform bacteria, nutrients, oxygen demanding substances (e.g., decaying vegetation), and total suspended solids are found at

relatively high levels in storm water and non-storm water discharges.[23] It also found that MS4 discharges draining residential, commercial, and light industrial areas contain significant loadings of total suspended solids and other pollutants. The Basin Plan goes on to identify runoff pollutants to include lawn and garden chemicals, household and automotive care products dumped or drained on streets, and sediment that erodes from construction sites.[24] In addition, the State Water Board Urban Runoff Technical Advisory Committee (TAC) finds that urban runoff pollutants include sediments, nutrients, oxygen-demanding substances, heavy metals, petroleum hydrocarbons, pathogenic bacteria, viruses, and pesticides.[25] Runoff that flows over streets, parking lots, construction sites, and industrial, commercial, residential, and municipal areas carries these untreated pollutants through storm drain networks directly to the receiving waters of the San Diego Region.

Finding C.4. The discharge of pollutants and/or increased flows from MS4s may cause or threaten to cause the concentration of pollutants to exceed applicable receiving water quality objectives and impair or threaten to impair designated beneficial uses resulting in a condition of pollution (i.e. unreasonable impairment of water quality for designated beneficial uses), contamination, or nuisance.

Discussion of Finding C.4. The 1992, 1994, and 1996 National Water Quality Inventory Reports to Congress prepared by USEPA showed a trend of impairment in the nation's waters from contaminated storm and non-storm water runoff.[26] The 1998 National Water Quality Inventory Report showed that runoff discharges affect 11 percent of rivers, 12 percent of lakes, and 28 percent of estuaries. Primary sources of impairment to rivers and streams included sediment, bacteria, nutrients, oxygen-depleting substances, metals, and pesticides. The report notes that runoff discharges are the leading source of pollution and the main factor in the degradation of surface water quality in California's coastal waters, rivers, and streams. Furthermore, the NURP study found that pollutant levels from illicit non-storm water discharges were high enough to significantly degrade receiving water quality, and threaten aquatic life, wildlife, and human health.[27]

In addition, the Region's CWA section 303(d) list, which identifies water bodies with impaired beneficial uses within the region, also indicates that the impacts of storm water and non-storm water runoff on receiving waters are significant. Many of the impaired water bodies on the 303(d) list are impaired by constituents that have been found at high levels within storm water and non-storm water runoff by the Riverside County storm water monitoring program.[28] Examples of constituents frequently

[23] Ibid.
[24] San Diego Water Board, 1994. Water Quality Control Plan, San Diego Basin, Region 9. San Diego.
[25] State Water Board, 1994. Urban Runoff Technical Advisory Committee Report and Recommendations. Nonpoint Source Management Program.
[26] USEPA, 2000. Quality of Our Nation's Waters: Summary of the National Water Quality Inventory 1998 Report to Congress – USEPA 841-S-00-001; Water Quality Conditions in the United States: Profile from the 1998 National Water Quality Inventory Report to Congress – USEPA 841-F-00-006.
[27] USEPA, 1993. Results of the Nationwide Urban Runoff Program, Volume 1 – Final Report.
[28] County of Riverside, 2009. Riverside County Municipal Copermittees 2008-09 Annual Storm Water Program Report, Section 11.

responsible for beneficial use impairment include indicator fecal bacteria, heavy metals, toxicity, pesticides, dissolved solids, turbidity, and nutrients. These constituents have been found at high levels in runoff both regionally and nationwide.[29,30] In addition, impairments may be caused by synergistic effects of multiple contaminants or by pollutants not currently monitored by storm water programs.

Finding C.5. Pollutants in runoff can threaten and adversely affect human health. Human illnesses have been clearly linked to recreating near storm drains flowing to receiving waters. Also, runoff pollutants in receiving waters can bioaccumulate in the tissues of invertebrates and fish, which may be eventually consumed by humans.

Discussion of Finding C.5. Human illnesses have been clearly linked to recreating near storm drains flowing to coastal waters. A landmark study, conducted by the Santa Monica Bay Restoration Project, found that there was an increased occurrence of illness in people that swam in proximity to a flowing storm drain.[31] A study of south Huntington Beach and north Newport Beach (both located in northern Orange County) found that an illness rate of about 0.8 percent among bathers at those beaches resulted in about $3 million annually in health-related expenses.[32] Although the Upper Santa Margarita Watershed is inland, the watershed drains to the Pacific Ocean, and pollutants generated in the area may impact coastal waters. For example, the Santa Margarita River system provides the main source of beach sand for the beaches in northern San Diego County.[33] In addition, residents from the Upper Santa Margarita Watershed, who recreate at southern California beaches, benefit from clean water.

Residents and businesses in the Upper Santa Margarita Watershed also rely heavily on local water for drinking, agriculture and industrial supply. Over 40 percent of the water used in the watershed is locally produced.[34] In addition, surface and ground water from the Upper Santa Margarita Watershed flow to Fallbrook in San Diego County and the U.S. Marine Corps Base Camp Pendleton where it is used as part of the municipal and domestic water supply.

According to the USEPA, spilled fuel, solvents, waste oil, paints, and other maintenance fluids pose a risk to the environment, but may be especially harmful if they enter someone's drinking water supply.[35] Discharges of runoff from urban areas were identified by the California Department of Health Services as one of the most

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[29] Ibid.
[30] USEPA, 1983. Results of the Nationwide Urban Runoff Program, Volume 1 – Final Report.
[31] Haile, R.W., et al., 1996. An Epidemiological Study of Possible Adverse Health Effects of Swimming in Santa Monica Bay. Santa Monica Bay Restoration Project.
[32] Dwight, R.H., et al., 2005. Estimating the Economic Burden From Illnesses Associated With Recreational Coastal Water Pollution – A Case Study in Orange County, California. Journal of Enviro. Management Vol.76. No.2 p.95-103. Also reported in: Los Angeles Times, May 2, 2005. Here's What Ocean Germs Cost You: A UC Irvine Study Tallies the Cost of Treatment and Lost Wages for Beachgoers Who Get Sick.
[33] Shapiro. 1991. Refuge in an urbanized land, the Santa Margarita River: cultural and natural resource value. Santa Margarita Research Foundation, Fallbrook, CA.
[34] Jenks, .J. 2002. Santa Margarita River Watershed Annual Watermaster Report: Water Year 2000-2001.
[35] USEPA. 2004. Municipal Storm Water and Ground Water Discharge Regulations in California. F-909-04-004.

prevalent possible contaminating activities for drinking water sources.[36] This issue of potential source water contamination is of fundamental importance, because of the dependence on local water for domestic use in the Santa Margarita Watershed.

Furthermore, runoff pollutants in receiving waters can bioaccumulate in the tissues of invertebrates and fish, which may eventually be consumed by humans. Pollutants such as heavy metals and pesticides, which are commonly found in MS4 runoff, have been found to bioaccumulate and biomagnify in long-lived organisms at the higher trophic levels.[37] Since many aquatic species are utilized for human consumption, toxic substances accumulated in species' tissues can pose a significant threat to public health. USEPA supports this finding when it states, "As runoff flows over areas altered by development, it picks up harmful sediment and chemicals such as oil and grease, pesticides, heavy metals, and nutrients (e.g., nitrogen and phosphorus). These pollutants often become suspended in runoff and are carried to receiving waters, such and lakes, ponds, and streams. Once deposited, these pollutants can enter the food chain through small aquatic life, eventually entering the tissues of fish and humans."[38]

Finding C.6. Runoff discharges from MS4s often contain pollutants that cause toxicity to aquatic organisms (i.e. adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies). Toxic pollutants impact the overall quality of aquatic systems and beneficial uses of receiving waters.

Discussion of Finding C.6. The Copermittees' monitoring data exhibits frequent toxic conditions in runoff during storm events and dry weather. Toxicity varies significantly within and among sites and over time. The cause of toxicity may vary between locations, dates, and indicator organisms. The actual cause may be influenced by various factors such as development, land uses, runoff management, habitat modification, hydromodification, and native aquatic environment. Some toxicity identification evaluations (TIEs) have identified pyrethroids as a cause of toxicity in the receiving waters.[39]

Finding C.7. The Copermittees discharge runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within one of the eleven hydrologic units (Santa Margarita Hydrologic Unit) comprising the San Diego Region as shown in Table 2. Some of the receiving water bodies have been designated as impaired by the San Diego Water Board in 2009 pursuant to CWA section 303(d).

[36] Ibid.
[37] Abel, P.D, 1996. Water Pollution Biology.
[38] USEPA, 2000. Storm Water Phase II Compliance Assistance Guide. Washington D.C. EPA 833-R-00-002.
[39] County of Riverside, 2009. Riverside County Municipal Copermittees 2008-09 Annual Storm Water Program Report, Section 11.

Discussion of Finding C.7. This finding identifies the major receiving water bodies in the Riverside County portion of the Santa Margarita Hydrologic Unit that are listed as impaired on the CWA section 303(d) List of Impaired Waters (303(d) List). The 2006 303(d) List has been approved by the San Diego Water Board, State Water Board, and USEPA.[40] The 2008 303(d) List was approved by the San Diego Water Board on December 18, 2009 and by the State Water Board on August 4, 2010, and is awaiting USEPA approval.[41] The 303(d) list identifies waters that do not meet water quality standards after applying certain required technology-based effluent limits ("impaired" water bodies). As part of this listing process, states are required to prioritize waters/watersheds for future development of Total Maximum Daily Loads (TMDLs). The listed 303(d) pollutant(s) of concern do not necessarily reflect impairment of the entire corresponding major surface water bodies. The specific impaired portions of each water body are listed in the 2006 and 2008 303(d) Lists.

Since 2002, the number of water bodies and water body – pollutant combinations included on the 303(d) List, located in the Riverside County portion of the San Diego Region, has increased. A comparison of the 2002, 2006, and 2008 303(d) listings are summarized in the following table.

[40] The approved 2006 Clean Water Act Section 303(d) List of Water Quality Limited Segments is on-line at: http://www.waterboards.ca.gov/tmdl/303d_lists2006.html
[41] The 2008 Clean Water Act Section 303(d) List of Water Quality Limited Segments, approved by the San Diego Water Board and State Water Board, is available on-line at http://www.swrcb.ca.gov/rwqcb9/water_issues/programs/303d_list/index.shtml

Comparison of Riverside County 303(d) Listings

Watershed[1]	2002 303(d) List		2006 303(d) List		2008 303(d) List[2]	
	Listed Water Body	Impairing Pollutants	Listed Water Body	Impairing Pollutants	Listed Water Body	Impairing Pollutants
De Luz Creek HSA (902.21)	NO LISTINGS	NOT APPLICABLE	De Luz Creek	Iron Manganese	De Luz Creek	Iron Manganese Nitrogen Sulfates
Gavilan HSA (902.22)	Sandia Creek	TDS	Sandia Creek	Iron Manganese Nitrogen Sulfates TDS	Sandia Creek	Iron Sulfates TDS
	Santa Margarita River (Upper)	Phosphorus	Santa Margarita River (Upper)	Phosphorus	Santa Margarita River (Upper)	Phosphorus Toxicity
Murrieta HSA (902.32)	NO LISTINGS	NOT APPLICABLE	Long Canyon Creek	TDS	Long Canyon Creek	Chlorpyrifos E. Coli Fecal Coliform Iron Manganese
French HSA (902.33)	NO LISTINGS	NOT APPLICABLE	NO LISTINGS	NOT APPLICABLE	Warm Springs Creek	Chlorpyrifos E. Coli Fecal Coliform Iron Manganese Phosphorus Total Nitrogen as N

Comparison of Riverside County 303(d) Listings (Cont'd)

Watershed[1]	2002 303(d) List		2006 303(d) List		2008 303(d) List[2]	
	Listed Water Body	Impairing Pollutants	Listed Water Body	Impairing Pollutants	Listed Water Body	Impairing Pollutants
Gertrudis HSA (902.42)	NO LISTINGS	NOT APPLICABLE	NO LISTINGS	NOT APPLICABLE	Santa Gertrudis Creek	Chlorpyrifos Copper E. Coli Fecal Coliform Iron Phosphorus
Pauba HSA (902.51)	NO LISTINGS	NOT APPLICABLE	Temecula Creek	TDS Phosphorus Nitrogen	Temecula Creek	Chlorpyrifos Copper Phosphorus TDS Toxicity
	NO LISTINGS	NOT APPLICABLE	NO LISTINGS	NOT APPLICABLE	Redhawk Channel	Chlorpyrifos Copper Diazinon E. Coli Fecal Coliform Iron Manganese Nitrogen Phosphorus TDS
Wolf HSA (902.52)	Murrieta Creek	Phosphorus	Murrieta Creek	Phosphorus	Murrieta Creek	Chlorpyrifos Copper Iron Manganese Nitrogen Phosphorus Toxicity

Notes:
1. Hydrologic subarea (HSA) within the Santa Margarita Hydrologic Unit (HU), located in the Riverside County portion of the San Diego Basin.
2. Water bodies and pollutants on the 2008 303(d) List were approved by the San Diego Water Board on December 18, 2009 and by the State Water Board on August 4, 2010, and are awaiting final approval by the USEPA.

Finding C.8. Trash is a persistent pollutant which can enter receiving waters from the MS4, accumulate and be transported downstream into receiving waters over time. Trash poses a serious threat to the beneficial uses of the receiving waters, including, but not limited to, human health, rare and endangered species, navigation and human recreation.

Discussion of Finding C.8. The Copermittees to date have documented high volumes of trash coming from the MS4 system and in receiving waters.[42]

The Basin Plan specifies the following narrative Water Quality Objective (WQO) for Floating Material:

> *"Waters shall not contain floating material, including solids, liquids, foams, and scum in concentrations which cause nuisance or adversely affect beneficial uses.*"

The Basin Plan specifies the following narrative WQO for Suspended and Settleable Solids: Material:

> *"Waters shall not contain suspended and settleable solids in concentrations of solids that cause nuisance or adversely affect beneficial uses.*"

Additionally, high density urban areas in Southern California have been shown to be responsible for up to 60 percent of the trash that enters receiving waters from the MS4.[43] The retrofitting of existing MS4 systems, such as catch basins, in targeted high trash areas can result in significant reductions in the amount of trash entering receiving waters from the MS4.

Trash, as litter in both solid and liquid form, is consistently found on and adjacent to roadways. A California Department of Transportation Litter Management Pilot Study found that of roadway trash, plastics and Styrofoam accounted for 33 percent of trash by weight, and 43 percent by volume. Further, the study found that approximately 80 percent of the litter associated with roadways was floatable, indicating that, without capture, this litter would enter Waters of the State after a storm event, resulting in the impairment of Beneficial Uses.[44] The study, however, relied upon a mesh capture size of 0.25 inches (6.35 millimeters). This size is too large to effectively capture plastic pre-production pellets (a.k.a. "nurdles"), which are roughly 3 mm in size, and likely underestimated the total contribution of plastics. Furthermore, pre-production plastic pellets, which are small enough to be easily digested, have been found to carry persistent organic pollutants, including PCBs and DDT.[45]

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[42] Fiscal Year 2008-2009 Santa Margarita Watershed Annual Report
[43] The City of Los Angeles Meets Trash TMDLs Compliance with CB Inserts and Opening Covers. August 06, 2008.
[44] California Department of Transportation District 7 Litter Management Pilot Study. June 26, 2000.
[45] Rios, L.M., Moore, C. and Patrick R. Jones. 2007. Persistent organic pollutants carried by synthetic polymers in the ocean environment. *Marine Pollution Bulletin.* Vol. 54.

Finding C.9. The Copermittees' water quality monitoring data submitted to date documents persistent violations of Basin Plan water quality objectives for various runoff-related pollutants (indicator bacteria, dissolved solids, turbidity, metals, pesticides, etc.) at various watershed monitoring stations. Persistent toxicity has also been observed at some watershed monitoring stations. In addition, bioassessment data indicate that the majority of the monitored receiving waters have Poor to Very Poor IBI ratings. In sum, the above findings indicate that runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in Riverside County.

Discussion of Finding C.9. The Copermittees have produced data that demonstrates water quality objectives are frequently not met during dry and wet weather. The 2009 Report of Waste Discharge and the 2008-2009 Annual Reports document that receiving water monitoring stations often fail to meet water quality objectives established in the Basin Plan.

Water quality in receiving waters downstream of MS4 discharges fail to meet California Toxics Rule standards[46] and Basin Plan objectives. Data submitted in the MS4 Annual Reports indicate that at various times chemical, bacteria, pesticide, and metal concentrations may exceed water quality objectives in receiving waters in both wet and dry weather conditions.

There are no other significant NPDES permitted discharges to the creeks. For instance, there are no live-stream discharges of treated waste water in the Riverside County area of the Santa Margarita watershed. The few NPDES permits in the watershed are mainly for recycled water which only discharges occasionally during the rainy season. Because the water quality monitoring indicates exceedances of water quality standards and MS4 discharges are the main source of pollutants in the watersheds, it can be inferred that the MS4 discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in Riverside County.

Finding C.10. When natural vegetated pervious ground cover is converted to impervious surfaces such as paved highways, streets, rooftops, and parking lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving a developed area is significantly greater in runoff volume, velocity, and peak flow rate than pre-development runoff from the same area. Runoff durations can also increase as a result of flood control and other efforts to control peak flow rates. Increased volume, velocity, rate, and duration of runoff greatly accelerate the erosion of downstream natural channels. Significant declines in the biological integrity and physical habitat of streams and other receiving waters have been found to occur with as little as a 3-5 percent conversion from natural to impervious surfaces. The increased runoff characteristics from new development must be controlled to protect

[46] The California Toxics Rule criteria promulgated by the USEPA are directly applicable water quality standards for certain priority toxic pollutants in inland surface waters and enclosed bays and estuaries in California.

against increased erosion of channel beds and banks, sediment pollutant generation, or other impacts to beneficial uses and stream habitat due to increased erosive force.

Finding C.11. Development creates new pollution sources as human population density increases and brings with it proportionately higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, trash, etc. which can either be washed or directly dumped into the MS4. As a result, the runoff leaving the developed area is significantly greater in pollutant load than the pre-development runoff from the same area. These increased pollutant loads must be controlled to protect downstream receiving water quality.

Discussion of Findings C.10 and C.11. The Natural Resources Defense Council (NRDC) 1999 Report, "*Stormwater Strategies, Community Responses to Runoff Pollution*" identifies two main causes of the storm water pollution problem in developed areas. Both causes are directly related to development:

1. Increased volume and velocity of surface runoff. There are three types of human-made impervious covers that increase the volume and velocity of runoff: (i) rooftop, (ii) transportation imperviousness, and (iii) non-porous (impervious) surfaces. As these impervious surfaces increase, infiltration will decrease, forcing more water to run off the surface, picking up speed and pollutants.

2. The concentration of pollutants in the runoff. Certain industrial, commercial, residential and construction activities are large contributors of pollutant concentrations in storm water runoff. As human population density increases, it brings with it proportionately higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, trash, etc.

As a result of these two causes, runoff leaving developed areas is significantly greater in volume, velocity, and pollutant load than pre-development runoff from the same area.

By accommodating the traditional approach to storm water management, development has also altered the flow regime (rate, magnitude, frequency, timing, and flashiness of runoff) that supports aquatic and riparian habitats. These hydrologic changes are driven by the loss of water storage capacity in the watersheds,[47] and exacerbated by physical alterations of the stream channel network.[48] This relationship between development and stream channel integrity has been documented nationally and in southern California. The Copermittees support these findings in their 1993 DAMP,[49] which states:

[47] Konrad, Christopher P. and Derek K. Booth, 2005. *Hydrologic Changes in Urban Streams and Their Ecological Significance.* American Fisheries Society Symposium Vol.47 pp.157-177.
[48] Poff. N.L. et al. 1997. The Natural Flow Regime: A paradigm for river conservation and restoration. Bioscience Vol. 47, No. 11, pp.769-784.
[49] Riverside County Copermittees. 1993. Santa Margarita Regional Drainage Area Management Plan.

> "Many storm water runoff problems are primarily a consequence of urbanization. Water that previously soaked into the ground, removing pollutants by filtering through soil, and eventually replenishing groundwater supplies, now must flow overland and therefore enters local streams more rapidly. The rapid transport of water increases the erosion of stream banks and hillsides and does not permit filtering pollutants. Sediment carried by storm water runoff can build up in streambeds, harming fish and aquatic habitat. The sediment acts as a transport mechanism for pollutants which adhere to soil particles. Typical urban runoff pollutants found in surface waters include heavy metals, nutrients, petroleum products, sediment, bacteria, chemicals, and litter."

Hydrologic changes from development also directly and indirectly adversely affect wetlands. Natural wetlands support many beneficial uses and provide important water-quality related ecological services, including pollutant removal, flood attenuation, and groundwater recharge.[50] The Center for Watershed Protection recently provided USEPA with a synthesis of more than 100 scientific studies on the direct and indirect impacts of development, particularly urbanization, on wetlands and the role wetlands play in watershed quality. The report found that the three changes from land development with the most potential to impact wetlands include: Increased storm water runoff; decreased groundwater recharge; and flow constriction.[51] Each of these changes can often be avoided or minimized by implementing low impact development (LID) and hydromodification BMPs.

When Order No. R9-2004-001 was adopted, studies had shown that the level of imperviousness in an area strongly correlates with the quality of nearby receiving waters.[52] One comprehensive study, which looked at numerous areas, variables, and methods, revealed that stream degradation occurs at levels of imperviousness as low as 10 – 20 percent.[53] Stream degradation is a decline in the biological integrity and physical habitat conditions that are necessary to support natural biological diversity. For instance, few urban streams can support diverse benthic communities with imperviousness greater than or equal to 25 percent.[54] To provide some perspective, a medium density, single-family home area can be from 25 percent to 60 percent impervious (variation due to street and parking design).[55]

More recently, a report on the effects of impervious in southern California streams found that local ephemeral and intermittent streams are more sensitive to such effects than streams in other parts of the country. This study, by the Southern California

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[50] Wright, Tiffany, et al. 2006. "Direct and Indirect Impacts of Urbanization on Wetland Quality." Prepared by the Center for Watershed Protection. Available at: http://www.cwp.org. 81p.
[51] Ibid p.26
[52] USEPA, 1999. Part II. 40 CFR Parts 9, 122, 123, and 124. National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. Federal Register.
[53] Ibid.
[54] Ibid.
[55] Schueler, T.R., 1994. The Importance of Imperviousness. Watershed Protection Techniques. As cited in 64 FR 68725.

Coastal Water Research Program, estimated a threshold of response at a two to three percent change in percent of impervious cover in a watershed. [56] This threshold is lower than the previously reported estimates by the USEPA that were cited in the Fact Sheet for Order No. R9-2004-001.

To demonstrate the principle of increased volume and velocity of runoff from urbanization, the figure below shows the flow rate of an urban vs. a natural stream. What the figure demonstrates is that urban stream flows have greater peaks and volumes, as well as shorter retention times than natural stream flows. The greater peak flows and volumes result in stream degradation through increased erosion of stream banks and damage to aquatic habitat. The shorter retention times result in less time for sediments and other pollutants to settle before being carried out to the ocean. This sediment, and the associated pollutants it carries, can be a significant cause of water quality degradation.

Flow Rate of Urban and Natural Streams[57]

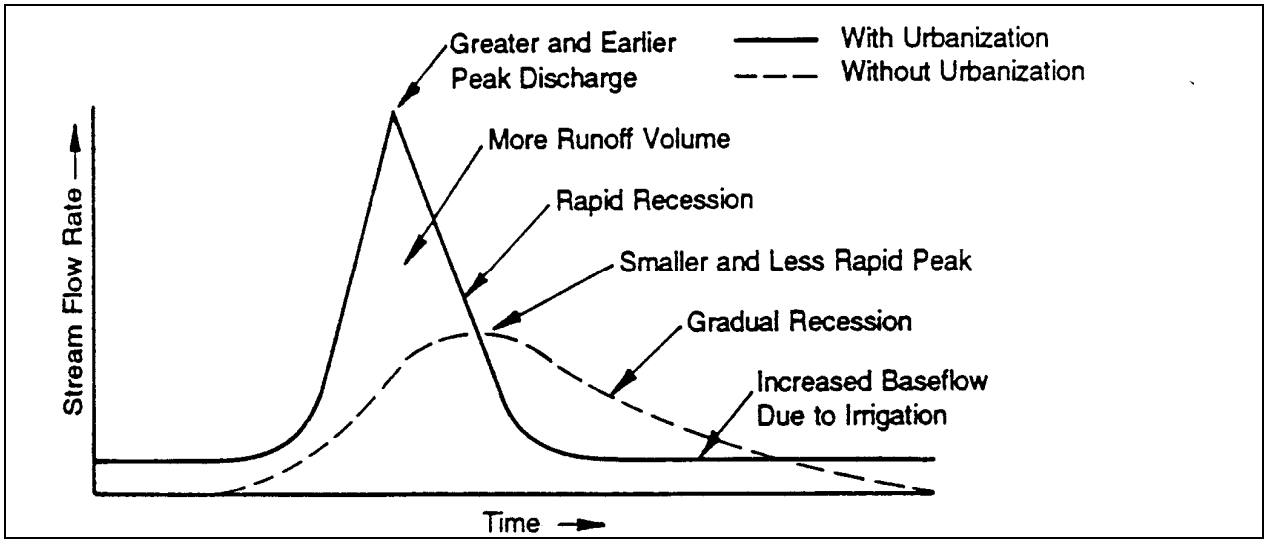

Increased volume and velocity of runoff adversely impacts receiving waters and their beneficial uses in many ways. According to the Urban Runoff TAC report,[58] increases in population density and imperviousness result in changes to stream hydrology including:

1. Increased peak discharges compared to pre-development levels;
2. Increased volume of storm water runoff with each storm compared to pre-development levels;

[56] Coleman, Derrick, et al. 2005. *Effect of Increases in Peak Flows and Imperviousness on the Morphology of Southern California Streams.* Technical Report No. 450 of the Southern California Coastal Water Research Project.
[57] Adapted from Schueler, T.R., 1987. Controlling Urban Runoff: A Practical Manual for Planning and Designing Urban BMPs. Metropolitan Washington Council of Governments.
[58] State Water Board, 1994. Urban Runoff Technical Advisory Committee Report and Recommendations. Nonpoint Source Management Program.

3. Decreased travel time to reach receiving water; increased frequency and severity of floods;
4. Reduced stream flow during prolonged periods of dry weather due to reduced levels of infiltration;
5. Increased runoff velocity during storms due to a combination of effects of higher discharge peaks, rapid time of concentration, and smoother hydraulic surfaces from channelization; and
6. Decreased infiltration and diminished ground water recharge.

Even though the rainfall depths in arid watersheds are lower, watershed development can greatly increase peak discharge rates during rare flood events.[59] A study conducted in arid watersheds around Riverside, CA showed that, over two decades, impervious cover increased from 9 percent to 22 percent, which resulted in an increase of more than 100 percent in the peak flow rate for the two-year storm event. The study also showed that the average annual storm water runoff volume had increased by 115 percent to 130 percent over the same time span.[60]

Flooding caused by the increased volume and velocity of runoff from urbanization in the upper Santa Margarita watershed are clear examples of the effects described above. Disastrous flooding has occurred more frequently in recent years. In the last century, flood events occurred in 1938, 1969, 1980, 1993, 1995, and 1998.[61] In the 1993 flood event, the Cities of Murrieta and Temecula sustained $12 million dollars in damage, and Camp Pendleton sustained $88 million in damage. Future flooding is expected to occur more frequently because of continued urban development within the watershed, and flood damages are expected to continue accruing at an estimated annual rate of $1,780,300.

Prior hydromodification studies in California have shown that the increase in impervious cover, and thus change in runoff volume, velocity, rate, and duration, results in a shift in the range of storms that produce geomorphically significant flows within receiving waters (see above discussion). Additionally, studies in California have determined that ninety percent of the geomorphic “work” done within channels receiving flows from developed areas now occurs from flows below the 10 year peak flow event.[62]

This increased volume, velocity, rate, and duration of runoff greatly accelerates the erosion of the beds and banks within downstream receiving waters. Additionally, storm water flows which runoff directly from impervious surfaces into the MS4 and thus receiving waters prevent the associated runoff of natural sediments which would occur in pre-project conditions. This combined alteration of the physical condition of storm water runoff results in accelerated downstream erosion of receiving water bed and

[59] Schueler and Holland, 2000. Storm Water Strategies for Arid and Semi-Arid Watersheds (Article 66). The Practice of Watershed Protection. P. 695-706.
[60] Ibid.
[61] U.S. Army Corps of Engineers, 2000. Final EIS/EIR, Murrieta Creek Flood Control Project.
[62] Santa Clara Valley Hydromodification Management Plan. April 21, 2005.

banks. The excessive erosion of stream beds and banks releases pollutants found in soils into receiving waters, degrades macroinvertebrate habitat (see D.2.c), eliminates spawning habitat, reduces associated wetland and riparian habitat, and threatens existing infrastructure adjacent to receiving waters. Bank sloughing within creeks and streams increases the pollutant loading to those receiving waters, particularly for turbidity and phosphorous.[63] In arid environments, accelerated channel erosion has been shown to have synergistic impacts within watersheds. Increased channel erosion within Las Vegas wash has resulted in the loss of over 1,000 acres of wetland and riparian habitat, released additional pollutants into downstream receiving waters, and eliminated in-stream habitat and water quality conditions required for existing threatened and endangered species.[64]

Regarding the impact of development on storm water runoff pollutant loads, the San Diego Water Board's Basin Plan states:

> *Nonpoint source pollution is primarily the result of man's uses of land such as urbanization, roads and highways, vehicles, agriculture, construction, industry, mineral extraction, physical habitat alteration (dredging/filling), hydromodification (diversion, impoundment, channelization), silviculture (logging), and other activities which disturb land.[65] As a result, when rain falls on and drains through urban freeways, industries, construction sites, and neighborhoods it picks up a multitude of pollutants. The pollutants can be dissolved in the runoff and quickly transported by gravity flow through a vast network of concrete channels and underground pipes referred to as storm water conveyance systems. Such systems ultimately discharge the polluted runoff, without treatment, into the nation's creeks, rivers, estuaries, bays, and oceans.[66]*

According to the Center for Watershed Protection, urbanization strongly shapes the quality of both surface and ground water in arid and semi-arid regions of the southwest. Since rain events are so rare, pollutants have more time to build up on impervious surfaces compared to humid regions. Therefore, the pollutant concentrations of storm water runoff from arid watersheds tend to be higher than that of humid watersheds.[67] The effect of antecedent rainfall events is demonstrated in a report from the California Department of Transportation (Caltrans) that found the concept of a seasonal first flush is applicable to the southern California climate.[68]

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[63] Sekely, A.C., Mulla, D.J. and D.W. Bauer. 2002. Streambank slumping and its contribution to the phosphorus and suspended sediment loads of the Blue Earth River, Minnesota. *Journal of Soil and Water Conservation.* September 2002 vol. 57 no. 5 243-250.

[64] Tuttle, P.L.. and E..L.. Orsak. 2002. Las Vegas Wash Water Quality and Implications to Fish and Wildlife. U.S. Fish and Wildlife Service.

[65] San Diego Water Board, 1994. Water Quality Control Plan for the San Diego Basin. P. 4-66.

[66] Ibid. P. 4-69 - 4-70.

[67] Schueler and Holland, 2000. Storm Water Strategies for Arid and Semi-Arid Watersheds (Article 66). The Practice of Watershed Protection. P. 695-706.

[68] Stenstrom, Michael and Masoud Kayhanian, 2005. *First Flush Phenomenon Characterization.* Prepared for Caltrans. Report No. CTSW-RT-05-73-02.6 Study jointly performed by UCLA and UCD. Most of the data presented was collected from three highly urbanized highway sites in west Los Angeles. Much effort went into developing a quantitative way of defining the mass first flush. Other aspects include: variability of water quality during storm events, litter characteristics, correlation among constituents, first flush of organics and particle size

Finding C.12. Development and urbanization especially threaten environmentally sensitive areas (ESAs), such as water bodies designated as supporting a RARE beneficial use (supporting rare, threatened or endangered species) and CWA 303(d)-impaired water bodies. Such areas have a much lower capacity to withstand pollutant loads than other, more sensitive areas. In essence, development that is ordinarily insignificant in its impact on the environment may become significant in a particularly sensitive environment. Therefore, additional controls to reduce storm water pollutants from new and existing development may be necessary for areas adjacent to or discharging directly to an ESA.

Discussion of Finding C.12. ESAs are defined in the Order as "Areas that include but are not limited to all CWA section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the Basin Plan; water bodies designated with the RARE beneficial use by the Basin Plan; areas designated as preserves or their equivalent under the Natural Communities Conservation Program within the Cities and County of Riverside; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees."

Areas that meet this definition are inherently sensitive habitats containing unique, rare, threatened, or endangered species, or are not achieving their designated beneficial uses. As discussed above, runoff is known to contain a wide range of pollutants and has demonstrated toxicity to plants and animals. Therefore, it is necessary to apply additional storm water controls for developments within, adjacent to, or directly discharging to ESAs. This need for additional storm water controls is addressed within each component of the Order. USEPA supports the requirement for additional storm water controls, stating "For construction sites that discharge to receiving waters that do not support their designated use or other waters of special concern, additional construction site controls are probably warranted and should be strongly considered."[69] Further support for requiring additional controls to reduce pollutants in storm water discharges to ESAs can be found in *Mitigation of Storm Water Impacts From New Developments in Environmentally Sensitive Areas*, a technical report written by the Los Angeles Water Board.[70]

Finding C.13. Although dependent on several factors, the risks typically associated with properly managed infiltration of runoff (especially from residential land use areas) are not significant. The risks associated with infiltration can be managed by many techniques, including (1) designing landscape drainage features that promote infiltration of runoff, but do not "inject" runoff (injection bypasses the natural processes of filtering and transformation that occur in the soil); (2) taking reasonable steps to prevent the illegal disposal of wastes; (3) protecting footings and foundations; (4)

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distribution, new methods for measuring oil and grease, and grab and composite sampling strategies. The report is available on-line at: http://www.dot.ca.gov/hq/env/stormwater/special/newsetup/

[69] USEPA, 1992. Guidance Manual for the Preparation of Part II of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems. Washington D.C. EPA/833-B-92-002.

[70] Los Angeles Water Board, 2001. Mitigation of Storm Water Impacts From New Developments In Environmentally Sensitive Areas.

ensuring that each drainage feature is adequately maintained in perpetuity; and (5) pretreatment.

Discussion of Finding C.13. Infiltration is an effective means for managing runoff. However, measures must be taken to protect groundwater quality when infiltration of runoff is implemented. USEPA supports runoff infiltration and provides guidance for protection of groundwater: "With a reasonable degree of site-specific design considerations to compensate for soil characteristics, infiltration may be very effective in controlling both urban runoff quality and quantity problems. This strategy encourages infiltration of urban runoff to replace the natural infiltration capacity lost through urbanization and to use the natural filtering and sorption capacity of soils to remove pollutants; however, the potential for some types of urban runoff to contaminate groundwater through infiltration requires some restrictions."[71] The restrictions placed on runoff infiltration in this Order are based on recommendations provided by the USEPA Risk Reduction Engineering Laboratory. The State Water Board found in Order WQ 2000-11 on the appeal of the Los Angeles Water Board's Standard Urban Storm Water Mitigation Plan (SUSMP) requirements that the guidance provided in the above referenced document by the USEPA Risk Reduction Engineering Laboratory is sufficient for the protection of groundwater quality from runoff infiltration. To further protect groundwater quality, the Order also includes guidance from the Los Angeles Water Board,[72] the State of Washington,[73] and the State of Maryland.[74] Subsequently, the California Storm Water Quality Association (CASQA) has produced technical guidance for post-construction treatment BMPs to protect ground water quality[75].

Finding C.14. Non-storm water (dry weather) discharge from the MS4 is not considered a storm water (wet weather) discharge and therefore is not subject to regulation under the Maximum Extent Practicable (MEP) standard from CWA 402(p)(3)(B)(iii), which is explicitly for "Municipal … *Stormwater Discharges* (emphasis added)" from the MS4. Rather, non-storm water discharges into the storm sewers, per CWA 402(p)(3)(B)(ii), are to be effectively prohibited. Such dry weather non-storm water discharges have been shown to contribute significant levels of pollutants and flow in arid, developed Southern California watersheds and are to be effectively prohibited under the CWA.

[71] USEPA, 1994. Potential Groundwater Contamination from Intentional and Nonintentional Stormwater Infiltration. EPA 600 SR-94 051.
[72] Los Angeles Water Board, 2000. Standard Urban Storm Water Mitigation Plan for Los Angeles County and Cities in Los Angeles County.
[73] Washington State Department of Ecology, 1999. Draft Stormwater Management in Washington State. Volume V – Runoff Treatment BMPs. Pub. No. 99-15.
[74] Maryland Department of the Environment, 1999. 2000 Maryland Stormwater Design Manual. Volume I.
[75] CASQA. The New Development and Redevelopment Handbook, 2003. Available on-line at http://www.cabmphandbooks.org/Development.asp

Discussion of Finding C.14.

Permitting Framework

The CWA prohibits the discharge of any pollutant from a point source into waters of the United States unless the discharger of the pollutant(s) obtains a NPDES permit pursuant to CWA section 402. The discharge of storm water and/or non-storm water from an MS4 system is considered a discharge from a point source. As discussed below, however, the CWA regulates storm water and non-storm water discharges under different standards.

In 1987 the CWA was amended to include provisions that specifically concerned NPDES permitting requirements for storm water discharges from MS4 systems. Section 402(p) of the CWA regulates the discharge of storm water from a point source, the municipal separate storm sewers. Such discharges of storm water are subject to the maximum extent practicable (MEP) storm water standard and the related iterative process. The MEP standard for storm water discharges reflects Congress' recognition that the variability of flow and intensity of storm events render difficult strict compliance with water quality standards by MS4s. However, this standard was not considered applicable to non-storm water discharges, which under 402(p) are required to be effectively prohibited from entering the MS4. Clearly, if non-storm water discharges must be effectively prohibited from entering the MS4, the very next requirement (402(p)(3)(B)(iii)) requiring discharges from the MS4 be reduced to the MEP intends that the discharge of pollutants be limited to storm water. Unless exempt or authorized under a separate NPDES permit, non-storm water discharges are not authorized to enter the MS4 in the first instance and are considered to be illicit discharges.

The Federal Register further clarifies that such discharges through an MS4 are not authorized under the CWA (55 Federal Register (FR) 47995):

> "Today's rule defines the term "illicit discharge" to describe any discharge through a municipal separate storm sewer system that is not composed entirely of storm water and that is not covered by an NPDES permit. Such illicit discharges are not authorized under the Clean Water Act. Section 402(p(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit."

The federal regulations (40 CFR 122.26(d)(vi)(2)(B)) require that the municipal separate storm sewer discharger prohibit "through ordinance, order or similar means, illicit discharges to the municipal separate storm sewer." As owners and operators of the MS4, Copermittees cannot passively receive discharges from third parties (Federal Register 68766) and thus are responsible for the discharge of any non-storm water from their MS4.

The State Water Board recently recognized in order (Order WQ 2009-0008) that "[n]either the Clean Water Act nor the federal storm water regulations define 'non-storm water.' 'Illicit discharge' is defined as any discharge to an MS4 'not composed entirely of storm water.' Thus, 'illicit discharge' is the most nearly applicable definition of 'non-storm water' found in federal law and is often used interchangeably with that term."[76] In July 2010, the court in Los Angeles County v. State Water Resources Control Board remanded the Los Angeles Water Board's MS4 permit underlying Order WQ 2009-0008 for procedural reasons occurring during the permit adoption process. The court did not evaluate or rule upon the substantive findings and reasoning set forth in Order WQ 2009-0008. The State Water Board rescinded and voided Order WQ 2009-0008 to comply with the court's order. While the San Diego Water Board may no longer cite Order WQ 2009-0008, the San Diego Water Board has independently considered whether the requirement to eliminate non-stormwater discharges is subject to the MEP standard. The San Diego Water Board concludes that the MEP standard does not apply to non-stormwater discharges for the same reasons expressed by the State Water Board.

Storm Water and Non-storm Water Definitions

By definition non-storm water is not precipitation related. 40 CFR 122.26(b)(13) states that: "Storm water means storm water runoff, snowmelt runoff, and surface runoff and drainage." While "surface runoff and drainage" is not defined in federal law, it is related to precipitation events such as rain and/or snowmelt (see 55 FR 47995-96). The term "surface runoff and drainage" does not include all incidental flows in the MS4 system, but consists of flows relating to precipitation events as clarified by the Federal Register, USEPA's documents and permitting, and other Regional Water Board Orders.

The Federal Register (55 FR 47995-47996) provides clarification on the distinction between storm water and non-storm water discharges, including their regulation:

> "In response to the comments which requested EPA to define the term storm water broadly to include a number of classes of discharges **which are not in any way related to precipitation events, EPA believes that this rulemaking is not an appropriate forum for addressing the appropriate regulation of such non-storm water discharges**, even though some classes of non-storm water discharges may typically contain only minimal amounts of pollutants. Congress did not intend that the term storm water be used to describe any discharge that has a de minimis amount of pollutants, not did it intend for section 402(p) to be used to provide a moratorium from permitting other non-storm water discharges."

As recently recognized by the State Water Board in a precedential decision upholding an MS4 permit modification adopted by the Los Angeles Water Board, "U.S. EPA has previously rejected the notion that 'storm water,' as defined at 40 Code of Federal

[76] State Water Board Order WQ-2009-0008 (*In the Matter of the Petition of County of Los Angeles and Los Angeles County Flood Control District*, adopted August 4, 2009), p. 4.

Regulations section 122.26(b)(13), includes dry weather flows. In U.S. EPA's preamble to the storm water regulations, U.S. EPA rejected an attempt to define storm water to include categories of discharges 'not in any way related to precipitation events.'[77] Thus, USEPA has made it clear that it deems discharges unrelated to precipitation events to be non-storm water discharges. 40 CFR 122.26(d)(iv)(B) itself provides specific examples of non-storm water discharges:

> "…the following category of non-storm water discharges or flows shall only be addressed where such discharges are identified by the municipality as sources of pollutants to the United States: water line flushing, landscape irrigation, diverted stream flows, rising ground waters, uncontaminated groundwater infiltration (as defined at 40 CFR 35.2005(20) to separate storm sewers, uncontaminated pumped groundwater,…"

USEPA also removed street wash waters from the definition of storm water, as USEPA specifically identified this discharge as being non-storm water (55 FR page 47996). Additionally, section 1.2.2.2 of USEPA's Multi-Sector General Permit for Industrial Activities (MSGP-2000) considers fire hydrant flushings, irrigation drainage, landscape watering, and foundation or footing drains to be non-storm water discharges. USEPA's September 1999 Storm Water Management Fact Sheet for Non-Storm Water Discharges to Storm Sewers states that non-storm water discharges can include discharges of process water, air conditioning condensate, non-contact cooling water, vehicle wash water, or sanitary wastes.

While these types of non-storm water discharges (or illicit discharges) may be regulated under storm water permits because as a practical matter they can enter and be discharged from the MS4 systems, they are not regulated as storm water discharges under the CWA because they are unrelated to precipitation events. As indicated above, the State Water Board's recent discussion of this issue supports the conclusion that non-storm water discharges are unrelated to precipitation events. In its Order affirming amendments to the Los Angeles County MS4 permit to implement a TMDL to control bacteria in dry weather flows, the State Water Board rejected petitioners County of Los Angeles and the Los Angeles County Flood Control District implied assertion that the definition of "storm water" contained in the federal regulations (defined as "surface run-off and drainage") includes the run-off and drainage from non-storm events. The State Water Board notes that the challenged permit provisions do not apply to storm water flows in that they apply only during dry weather conditions as defined in the permit. In upholding the challenged order, the State Water Board notes that the Los Angeles Water Board's permit language followed USEPA's approach, referring to USEPA's rejection of attempts to define storm water to include categories of discharges "not in any way related to precipitation events."[78]

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[77] State Water Board Order WQ-2009-0008 (*In the Matter of the Petition of County of Los Angeles and Los Angeles County Flood Control District*, adopted August 4, 2009), p. 7.
[78] State Water Board Order WQ-2009-0008 (*In the Matter of the Petition of County of Los Angeles and Los Angeles County Flood Control District*, adopted August 4, 2009), p. 7 (quoting 55 FR 47990. 47995).

Lastly, the San Diego Water Board and State Water Board have issued multiple, separate NPDES permits for non-storm water discharges, including, but not limited to, San Diego Water Board Order No. R9-2008-0002 (extracted groundwater), San Diego Water Board Order No. R9-2002-0020 (hydrostatic discharge), and State Water Board Order No. 2006-0008-DWQ (utility vaults), pursuant to section 402 of the CWA.

Permitting Non-storm Water Discharges

Non-storm water discharges may contain pollutants which result from various activities that occur within areas draining into the MS4. This includes, but is not limited to, illicit discharges and connections, exempted categories of discharge not a source of pollutants (40 CFR 122.26(d)), and discharges into the MS4 covered under a separate NPDES permit. As such, existing and proposed discharges of non-storm water from MS4s:

a) Result from similar activities through the MS4 system;
b) Are the same type of water;
c) Require similar action levels for the protection of the Beneficial Uses of the receiving waters;
d) Require similar monitoring;
e) Are under the passive control of the owner and operator of the MS4 system; and
f) Are more appropriately regulated under a general permit than individual permits.

The U.S. EPA's approach (and the San Diego Water Board's under its approved program) for non-storm water discharges from MS4s is to regulate these discharges under the existing 402 NPDES framework (FR 47995 and 48037 see below) for discharges to surface waters. The NPDES program (40 CFR 122.44(d)) utilizes discharge prohibitions and effluent limitations as regulatory mechanisms to regulate non-storm water discharges, including the use of technology and water quality-based effluent limitations. Non-numerical effluent limitations, such as BMPs for non-storm water discharges may only be authorized where numerical effluent limits are infeasible or where the practices are reasonably necessary to achieve effluent limitations and standards or to carry out the purposes and intent of the CWA (40 CFR 122.44(k) see below).

The Federal Register (55, page 48037) provides clarification that non-storm water discharges from the MS4 are to be regulated under section 402, not 402(p):

> "Conveyances which continue to accept other "non-storm water" discharges (e.g. discharges without an NPDES permit) with the exceptions noted above (*exempted discharges that are not a source of pollutants*) do not meet the definition of municipal separate storm sewer and are not subject to 402(p)(3)(B) of the CWA unless such discharges are issued separate NPDES permits. Instead, conveyances which continue to accept non-storm water discharges

> which have not been issued separate NPDES permits are subject to sections 301 and 402 of the CWA."

This regulatory approach is consistent with the approach recently upheld by the State Water Board in a precedential order adopted on August 4, 2009. In this Order, the State Water Board rejected a challenge to amendments to the Los Angeles County MS4 permit that require compliance with receiving water limitations and discharge prohibitions for dry weather, non-storm water discharges. Petitioners there argued that the receiving water limits and discharge prohibitions for dry weather dischargers were inappropriate and that the Los Angeles Water Board should instead have regulated the discharges with the maximum extent practicable standard, through an iterative process. The State Water Board concludes that dry weather discharges, as defined in the permit and in the underlying TMDL, "are more appropriately regarded as non-storm water discharges, which the Clean Water Act requires to be effectively prohibited."[79]

As stated above, for NPDES permits under 402 of the CWA, the Code of Federal Regulations (122.44(k)) clarify that a discharger may utilize BMPs to control or abate the discharge of pollutants when:

> "(1) Authorized under section 304(e) of the CWA for the control of toxic pollutants and hazardous substances from ancillary industrial activities;
> (2) Authorized under section 402(p) of the CWA for the control of storm water discharges;
> (3) Numeric limits are infeasible; or
> (4) The practices are reasonably necessary to achieve effluent limitations and standards or to carry out the purposes and intent of the CWA."

For the last 20 years, Riverside County NPDES permits for discharges of storm water have regulated non-storm water discharges from the MS4. These permits required Copermittees (dischargers) to prohibit non-storm water discharges into (thus through and from) their MS4 systems, implement a program to prevent illicit discharges, and monitor to identify illicit discharges and exempted discharges that are a source of pollution. These measures are considered Best Management Practices (BMPs), are required to be included in NPDES permits issued under section 402(p) of the CWA, and are considered by USEPA to be an interim approach to permitting non-storm water discharges from the MS4 in accordance with section 402 of the CWA and CFR 122.44(k).

As explained in the discussion of Finding C.15., below, the Copermittees' reliance on BMPs for the past 20 years has not resulted in compliance with applicable water quality standards. The San Diego Water Board has evaluated (in accordance with 40 CFR 122.44(d)(1)) past and existing controls (BMPs), non-storm water monitoring results, the sensitivity of the species in receiving waters (e.g. endangered species),

[79] State Water Board Order WQ-2009-0008 (*In the Matter of the Petition of County of Los Angeles and Los Angeles County Flood Control District*, adopted August 4, 2009), p. 8

and the potential for effluent dilution, and has determined that existing BMPs to control pollutants in storm water discharges are not sufficient to protect water quality standards in receiving waters and the existing requirement that Copermittees effectively prohibit all types of unauthorized non-storm water discharges into the MS4 historically results in the discharge of pollutants to the receiving waters. Thus, numeric action levels for non-storm water, dry weather, discharges from the MS4 and required actions following observed exceedances of numeric action levels have been established. For further discussion regarding the development of action levels please see Finding E.10 and discussion.

Dry weather action levels are applicable to non-storm water discharges of effluent from the MS4 system. Non-storm water effluent discharges from the MS4 are those which occur during dry weather conditions. These action levels are not applied to storm water discharges, as defined within the Order. Storm water discharges regulated by the Order are required to meet the MEP standard and related iterative process and have separate action levels.

Dry weather action levels are applicable to non-storm water discharges from the MS4 system into receiving waters. Non-storm water discharges are already required to be prohibited unless specifically exempted or covered under a separate NPDES permit. Dry weather action levels apply to non-storm water discharges of effluent from a point source into receiving waters. The MS4 is not a receiving water. Should a discharger wish to discharge a non-exempt category to the MS4 system, such discharges require a separate NPDES permit pursuant to sections 402 and 301 of the CWA. It is also infeasible to monitor and sample every discharge into the MS4, as such discharges are diffuse by nature and may vary spatially and temporally.

Finding C.15. Non-storm water discharges to the MS4 granted an influent exception [i.e. which are exempt from the effective prohibition requirement set forth in CWA section 402(p)(3)(B)(ii)] under 40 CFR 122. 26 are included within this Order. Any exempted discharges identified by Copermittees as a source of pollutants are subsequently required to be *addressed* (emphasis added) as illicit discharges through prohibition and incorporation into existing IC/ID programs. Furthermore, the USEPA contemplates that permitting agencies such as the San Diego Water Board may also identify exempted discharges as a source of pollutants required to be addressed as illicit discharges (See Vol. 55 FR 48037). The San Diego Water Board and the Copermittees have identified landscape irrigation, irrigation water and lawn water, previously exempted discharges, as a source of pollutants and conveyance of pollutants to waters of the U.S.

Discussion of Finding C.15. The FR (Vol. 55, page 48037) and 40 CFR 122.26(d)(iv)(B) clarify that certain components and categories of non-storm water discharges into the MS4 are not required to be prohibited. The Code of Federal Regulations requires the discharger have:

> "…a program, including inspections, to implement through ordinance, orders or similar means to prevent illicit discharges to the municipal separate storm sewer system; this program shall address all types of illicit discharges, however, the following category of non-storm water discharges or flows shall only be addressed where such discharges are identified by the municipality as sources of pollutants to waters of the United States: water line flushing, landscape irrigation, diverted stream flows, rising ground waters, uncontaminated groundwater infiltration (as defined at 40 CFR 35.2005(20) to separate storm sewers, uncontaminated pumped groundwater,…"

The categories of non-storm water discharges into the MS4, as listed under 40 CFR 122.26(d)(iv)(B), are not required to be prohibited unless identified by the Copermittees as sources of pollutants to waters of the United States. The FR (Vol. 55, page 48037), however, goes on to clarify that:

> "However, the Director may include permit conditions that either require municipalities to prohibit or otherwise control any of these types of discharge where appropriate."

Thus, the Copermittees or the San Diego Water Board may identify any of these categories of non-storm water discharges as a source of pollutants. As such, the identification of any of these categories as a source of pollutants requires them to be addressed as illicit discharges, which are not authorized under the CWA, and are required to be "effectively prohibited" as illicit discharges via ordinance, order or similar means. The prohibition of previously exempted discharges of non-storm water to waters of the United States from entering, and necessarily being discharged from an MS4, conforms with CWA requirements for standards and enforcement for effluent limitations necessary to meet water quality standards (33 U.S.C. 1311(b)(1)(C)).

To date the San Diego Water Board and the Copermittees have identified overspray and drainage from potable and reclaimed water landscape irrigation as a substantial source and conveyance mechanism for pollutants into waters of the United States. Several municipalities throughout the San Diego Region (e.g., cities and counties of Orange County and San Diego County) have reported and/or identified runoff originating from landscape irrigation as potential sources of dry weather flows conveying pollutants into their MS4s. This is also supported by legislation (Assembly Bill 1881) recently enacted by the State of California, which has identified runoff resulting from over irrigation not only as a waste of water resources, but also as a source of pollutants to the state's waterways.

Irrigation runoff into the MS4, as identified by the San Diego Water Board and the Copermittees, is a source of pollutants to waters of the United States, and is required to be *addressed* (emphasis added) as an illicit discharge per 40 CFR 122.26(d)(2)(iv)(B)(1) by prohibition through implementing and enforcing an ordinance, order or similar means. The San Diego Water Board and the Copermittees have identified irrigation water as a source of pollutants and conveyance of pollutants to waters of the United States, when

applied improperly in excess and thereafter entering the MS4, in the following documents:

- The Cities and County of Riverside "Only Rain in the Storm Drain" Pollution Prevention Program identifies runoff from irrigation as a source of pollutants to waters of the United States in the following documents:

    1) The Landscape and Garden public education brochure states:

    "Soil, yard wastes, over-watering [emphasis added] *and garden chemicals become part of the urban runoff mix that winds it way through streets, gutters and storm drains before entering lakes, rivers, streams, etc."*

    2) In a survey distributed at public outreach events,[80] the answer to the question about where lawn irrigation water goes states:

    "Water that leaves your lawn from irrigation…can pick up motor oil and grease from vehicles, excess fertilizer from your lawn, bacteria from pet waste, and excess pesticides from your yard. These pollutants can be carried down streets and storm drains directly to our streams, lakes and rivers without treatment!"

- In 2006, the State Water Board allocated Grant funding to the **SmartTimer/Edgescape Evaluation Program (SEEP)**. The project targets irrigation runoff by retrofitting existing development and documenting the conservation and runoff improvements. The Grant Application states that:

    "*Irrigation runoff contributes flow & pollutant loads to creeks and beaches that are 303(d) listed for bacteria indicators.*"

    Furthermore, the grant application states:

    "*Regional program managers agree that the reduction and/or elimination of irrigation-related urban flows and associated pollutant loads may be key to successful attainment of water quality and beneficial use goals as outlined in the San Diego Basin Plan and Bacteria TMDL over the long term.*"

    This is reinforced in the project descriptions and objectives:

    "*Elevated dry-weather storm drain flows, composed primarily … of landscape irrigation water wasted as runoff, carry pollutants that impair recreational use and aquatic habitats all along Southern California's*

[80] A copy of the survey was provided in the Riverside County Copermittees' Report of Waste Discharge, dated January 15, 2009, page 39.

urbanized coastline. Storm drain systems carry the wasted water, along with landscape derived pollutants such as bacteria, nutrients and pesticides, to local creeks and the ocean. Given the local Mediterranean climate, excessive perennial dry season stream flows are an unnatural hydrologic pattern, causing species shifts in local riparian communities and warm, unseasonal contaminated freshwater plumes in the near-shore marine environment".

The basis of this grant project is that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 is a source and conveyance of pollutants. In addition, they indicate that this alteration of natural flows is impacting the Beneficial Uses of Waters of the State and U.S. The results of this study can be applied broadly to any area where over-irrigation takes place, including Riverside County. Preliminary results from the study indicate that that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 *is* a source and conveyance of pollutants.

- Several municipalities in the San Diego Region have identified runoff from irrigation as a source of pollutants to waters of the United States in the following documents:

  1) The **Watershed Action Plan Annual Report**(s) for the 2006-2007 reporting period was submitted by the County of Orange, Orange County Flood Control District and Copermittees within the San Juan Creek, Laguna Coastal Streams, Aliso Creek, and Dana Point Coastal Streams Watersheds. San Juan Creek, Laguna Coastal Streams, Aliso Creek and Dana Point Coastal Streams are all currently 303(d) listed as impaired for Indicator Bacteria within their watersheds and/or in the Pacific Ocean at the discharge points of their watersheds. The Orange County Copermittees, within their Watershed Action Strategy Table for Fecal Indicator Bacteria:

     "*Support programs to reduce or eliminate the discharge of anthropogenic dry weather nuisance flow throughout the […] watershed. Dry weather flow is the transport medium for bacteria and other 303(d) constituents of concern*". Additionally, they state that "*conditions in the MS4 contribute to high seasonal bacteria propagation in-pipe during warm weather. Landscape irrigation is a major contributor to dry weather flow, both as surface runoff due to over-irrigation and overspray onto pavements; and as subsurface seepage that finds its way into the MS4*."

  2) The **Carlsbad Watershed Urban Runoff Management Program (WURMP) Fiscal Year 2008 Annual Report** was submitted by the Carlsbad Watershed Copermittees (Cities of Carlsbad, Encinitas, Escondido, Oceanside, San Marcos, Solana Beach, and Vista, and the County of San Diego). In the WUMRP Annual Report, the Carlsbad

Watershed Copermittees stated the following:

"The Carlsbad Watershed Management Area (WMA) collective watershed strategy identifies bacteria, sediment, and nutrients as high priority water quality pollutants in the Agua Hedionda (904.3 – bacteria and sediment), Buena Vista (904.2 – bacteria), and San Marcos Creek (904.5 – nutrients) Hydrologic Areas. Bacteria, sediment, and nutrients have been identified as potential discharges from over-irrigation."

3) The **San Diego Bay Watershed Urban Runoff Management Program (WURMP) 2007-2008 Annual Report** was submitted by the San Diego Bay Watershed Copermittees (Cities of Chula Vista, Coronado, Imperial Beach, La Mesa, Lemon Grove, National City, and San Diego, the County of San Diego, the Port of San Diego, and the San Diego County Airport Authority). In Appendix D of the WUMRP Annual Report, titled Likely Sources of Pollutants, the San Diego Bay Watershed Copermittees identified over-irrigation of lawns as a pollutant generating activity from business and/or residential land uses for bacteria, pesticides, and sediment.

Within the reports above, municipalities throughout San Diego and Orange counties have acknowledged that runoff from over-irrigation is a potential or likely source of several types of pollutants to waters of the United States. Because there are landscaped areas in Riverside County that receive irrigation similar to San Diego and Orange counties, runoff from over-irrigation is also a likely source of pollutants to waters of the United States in Riverside County.

- There is statewide recognition of the pollution caused by over-irrigation, and current legislation already requires cities and counties to prohibit over-irrigation. On September 28, 2006 Governor Arnold Schwarzenegger approved Assembly Bill 1881, The Water Conservation in Landscaping Act (AB 1881, Laird). The act requires cities, counties, and charter cities and charter counties, to adopt landscape water conservation ordinances by January 1, 2010. Additionally, the law required the Department of Water Resources (DWR) to prepare a Model Water Efficient Landscape Ordinance for use by local agencies. The Water Efficient Landscape Ordinance was approved by the Office of Administrative Law on September 10, 2009. All local agencies were required to adopt a water efficient landscape ordinance by January 1, 2010. Local agencies could adopt the Water Efficient Landscape Ordinance developed by DWR, or an ordinance considered at least as effective as the Model Ordinance. The Water Efficient Landscape Ordinance includes a requirement that local agencies prohibit runoff from irrigation (§ 493.2):

  "(a) Local agencies shall prevent water waste resulting from inefficient landscape irrigation by prohibiting runoff *[emphasis added] from leaving the target landscape due to low head drainage, overspray, or other*

similar conditions where water flows onto adjacent property, non-irrigated areas, walks, roadways, parking lots, or structures. Penalties for violation of these prohibitions shall be established locally."

- On October 08, 2009, the State of California Department of Water Resources issued a letter to all cities and counties within the State of California giving reminder of required adoption of the Water Efficient Landscape Ordinance. The letter states that:

  "Other benefits include reduced irrigation runoff, reduced pollution of waterways, drought resistance, and less green waste."

- On December 18, 2009, the San Diego Water Board adopted Order No. R9-2009-0002, the fourth-term Orange County permit, which found that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 is a source and conveyance of pollutants. Landscape irrigation, irrigation water, and lawn watering were categories removed from the list of non-storm water discharges not prohibited to be discharged into the MS4.

D. Runoff Management Programs

Finding D.1.a. This Order specifies requirements necessary for the Copermittees to reduce the discharge of pollutants in storm water to the MEP. However, since MEP is a dynamic performance standard, which evolves over time as runoff management knowledge increases, the Copermittees' runoff management programs must continually be assessed and modified to incorporate improved programs, control measures, best management practices (BMPs), etc. in order to achieve the evolving MEP standard. Absent evidence to the contrary, this continual assessment, revision, and improvement of runoff management program implementation is expected to ultimately achieve compliance with water quality standards in the Region.

Discussion of Finding D.1.a. Under CWA section 402(p), municipalities are required to reduce the discharge of storm water pollutants from their MS4s to the maximum extent practicable (MEP). MEP is the critical technology-based performance standard that municipalities must attain. The MEP standard is an ever-evolving, flexible, and advancing concept, which considers technical and economic feasibility. As knowledge about controlling storm water runoff continues to evolve, so does that which constitutes MEP. Reducing the discharge of storm water pollutants to the MEP requires Copermittees to assess each program component and revise activities, control measures, best management practices (BMPs), and measurable goals, as necessary to meet MEP.

To achieve the MEP standard, municipalities must employ whatever BMPs are technically feasible (i.e. are likely to be effective) and are not cost prohibitive. The major emphasis is on technical feasibility. Reducing storm water pollutants to the MEP means choosing effective BMPs, and rejecting applicable BMPs only where other effective BMPs will serve the same purpose, or the BMPs would not be technically feasible, or the cost would be prohibitive. In selecting BMPs to achieve the MEP standard, the following factors may be useful to consider:

1. Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?
2. Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?
3. Public Acceptance: Does the BMP have public support?
4. Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?
5. Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc?

If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive BMPs, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost is prohibitive, it

would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs that would address a pollutant source, or to pick a BMP based solely on cost, which would be clearly less effective. In selecting BMPs the municipality must make a serious attempt to comply and practical solutions may not be easily dismissed. In any case, the burden is on the municipal discharger to comply with its permit. After selecting BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented.[81]

A definition of MEP is not provided in either the federal statute or in the federal regulations. The final determination regarding whether a municipality has reduced storm water pollutants to the MEP can only be made by the San Diego Water Board or the State Water Board, and not by the municipal discharger. While the San Diego Water Board or the State Water Board ultimately define MEP, it is the responsibility of the Copermittees to initially propose actions that implement BMPs to reduce storm water pollution to the MEP. In other words, the Copermittees' runoff management programs to be developed under the Order are the Copermittees' proposals of MEP. Their total collective and individual activities conducted pursuant to their runoff management programs become their proposal for MEP as it applies both to their overall effort, as well as to specific activities. The Order provides a minimum framework to guide the Copermittees in meeting the MEP standard for storm water.

It is the San Diego Water Board's responsibility to evaluate the proposed programs and specific BMPs to determine what constitutes MEP, using the above guidance and the court's 1994 decision in NRDC v. California Department of Transportation, Federal District Court, Central District of California. The federal court stated that a Copermittee must evaluate and implement BMPs except where (1) other effective BMPs will achieve greater or substantially similar pollution control benefits; (2) the BMP is not technically feasible; or (3) the cost of BMP implementation greatly outweighs the pollution control benefits. In the absence of a proposal acceptable to the San Diego Water Board, the San Diego Water Board will define MEP by requiring implementation of additional measures by the Copermittees.

The Copermittees' continual evolution in meeting the MEP standard is expected to achieve compliance with water quality standards. USEPA has consistently supported this expectation. In its Interim Permitting Approach for Water Quality-Based Effluent Limitations (WQBELs) in Storm Water Permits, USEPA states "the interim permitting approach uses best management practices (BMPs) in first-round storm water permits, and expanded or better-tailored BMPs in subsequent permits, where necessary, to provide for attainment of water quality standards."[82] USEPA reiterated its position in 1999, when it stated regarding the Phase II municipal storm water regulations that "successive iterations of the mix of BMPs and measurable goals will be driven by the objective of assuring maintenance of water quality standards" and "EPA anticipates

[81] State Water Board, 1993. Memo Entitled Definition of Maximum Extent Practicable.
[82] Federal Register / Vol. 61, No. 166 / August 26, 1996 / P. 43761.

that a permit for a regulated small MS4 operator implementing BMPs to satisfy the six minimum control measures will be sufficiently stringent to protect water quality, including water quality standards […].”[83]

The requirements of the Order are expected to achieve compliance with receiving water quality standards. The approach to be used is the continual assessment, revision, and improvement of Copermittee best management practice implementation. This approach is consistent with the CWA and State Water Board guidance. In Defenders of Wildlife v. Browner (1999, 197 F. 3d 1035), the United States Court of Appeals for the Ninth Circuit states: “Under 33 U.S.C. section 1342 (p)(3)(B)(iii), the EPA’s choice to include either management practices or numeric limitations in the permits was within its discretion.” In addition, the approach is consistent with State Water Board Order WQ 99-05, which outlines an iterative approach for achieving compliance with water quality standards.

Finding D.1.b. The Copermittees have generally been implementing the Jurisdictional Runoff Management Programs (JRMPs) required pursuant to Order No. R9-2004-001 since July 14, 2005. Prior to that, the Copermittees were regulated by Order No. 98-02 since May 13, 1998. MS4 discharges, however, continue to cause or contribute to violations of water quality standards as evidenced by the Copermittees’ monitoring results.[84]

Discussion of Finding D.1.b. In response to Order No. R9-2004-001, the Copermittees have developed their runoff management programs. In order to implement the plans, the Copermittees have, among other things, developed BMP requirements, improved inter- and intra-governmental coordination, improved training programs, improved illicit discharge detection procedures, and improved their monitoring efforts. Although the programmatic improvements have led to better implementation of BMPs, the Copermittees’ monitoring data demonstrate that additional or revised BMPs are necessary to prevent discharges from MS4s from causing and contributing to violations of water quality standards. A discussion of data collected by the Copermittees is included in the discussion for Finding C.9.

Finding D.1.c. This Order contains new or modified requirements that are necessary to improve Copermittees’ efforts to reduce the discharge of pollutants in storm water runoff to the MEP and achieve water quality standards. Some of the new or modified requirements, such as the revised Watershed Water Quality Workplan (Watershed Workplan) section, are designed to specifically address these high priority water quality problems. Other requirements, such as for unpaved roads, are a result of San Diego Water Board’s identification of water quality problems through investigations and complaints during the previous permit period. Other new or modified requirements address program deficiencies that have been noted during audits, report reviews, and other San Diego Water Board compliance assessment activities.

[83] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68753-68754.
[84] County of Riverside, 2009. Riverside County Municipal Copermittees 2008-09 Annual Storm Water Program Report, Section 11..

Additional changes in the monitoring program provide consistency with the Code of Federal Regulations, USEPA guidance, State Water Board guidance, and the Southern California Monitoring Coalition recommendations.

Discussion of Finding D.1.c. The Copermittees are required to update and expand their runoff management programs on jurisdictional and watershed levels in order to improve their efforts to reduce the contribution of storm water pollutants in runoff to the MEP and meet water quality standards. Changes to Order No. R9-2004-001's requirements have been made to help ensure these two standards are achieved by the Copermittees.

The Orders' jurisdictional requirements have changed based on findings by the San Diego Water Board during typical compliance assurance activities, audits, or receipt of complaints.[85] Where the audits found common implementation problems, requirements have been altered to better ensure compliance. In addition, the San Diego Water Board conducted reviews of the jurisdictional annual reports submitted by the Copermittees. Updates to the requirements for the Copermittees' programs are also based in part on information found in the Copermittees' ROWD,[86] requirements that were included in the San Diego and Orange County MS4 permits, and discussions with the Riverside County Copermittees.

To better focus on attainment of water quality standards, the Order's jurisdictional and watershed requirements have been improved. The conditions of the receiving waters now drive management actions, which in turn focus diminishing resources on the highest priority water quality problems within the receiving waters in the watershed. Improvements to jurisdictional and watershed requirements were also made to facilitate a mutually clear understanding of the requirements between the San Diego Water Board and Copermittees.

During the previous permit period, the San Diego Water Board identified, through investigations and complaints, sediment discharges from unpaved roads as a significant source of water quality problems in the Riverside County portion of the San Diego Region. Enforcement and inspection activities conducted by the San Diego Water Board during the previous permit term have found a lack of source control for many unpaved roads within the jurisdiction of the Copermittees. Unpaved roads are a source of sediment that can be discharged in runoff to receiving waters, especially during storm events. Erosion of unpaved roadways occurs when soil particles are loosened and carried away from the roadway base, ditch, or road bank by water, wind, traffic, or other transport means. Exposed soils, high runoff velocities and volumes, sandy or silty soil types, and poor compaction increase the potential for erosion.

Road construction, culvert installation, and other maintenance activities can disturb the soil and drainage patterns to streams in undeveloped areas, causing excess runoff

[85] Audit reports, report reviews, and inspection reports are available for review at the San Diego Water Board office.
[86] All significant changes made to the Order's requirements are described and explained in detail in Fact Sheet section IX.

and thereby erosion and the release of sediment. Poorly designed roads can act as preferential drainage pathways that carry runoff and sediment into natural streams, impacting water quality. In addition, other public works activities along unpaved roads have the potential to significantly affect sediment discharge and transport within streams and other waterways, which can degrade the beneficial uses of those waterways.

USEPA also recognizes that discharges from unpaved roads are a threat to water quality. USEPA guidance[87] emphasizes the threat of unpaved roads to water quality:

> "*Dirt and gravel roads are a major potential source of these pollutants [sediment] and pollutants that bind to sediment such as oils, nutrients, pesticides, herbicides, and other toxic substances]. Many roads have unstable surfaces and bases. Roads act like dams, concentrating flows that accelerate erosion of road materials and roadsides. Both unstable surfaces and accelerated erosion then lead to sediment and dust.*"

There are several guidance documents, developed by the USEPA,[88] the US Forest Service,[89] the University of California,[90] and others, that include design and construction specifications and BMPs that are readily available for implementation by private and public entities. Implementing design and other source control BMPs for unpaved roads in the region is necessary to reduce and minimize the impacts of sediment discharged during storm events from unpaved roads to the MS4s and receiving waters.

Finding D.1.d. Updated individual Storm Water Management Plans (individual SWMPs or JRMPs) and Watershed Stormwater Management Plans (watershed SWMPs or Watershed Workplans), which, together with references in the DAMP, describe the Copermittees' runoff management programs in their entirety, are needed to guide the Copermittees' runoff management efforts and aid the Copermittees in tracking runoff management program implementation. Hereinafter, the individual SWMP is referred to as the JRMPs and the Watershed SWMP is referred to as the Watershed Workplan. It is practicable for the Copermittees to update the JRMPs and Watershed Workplans within the timeframe specified in this Order, since significant efforts to develop these programs have already occurred.

Discussion of Finding D.1.d. Development of runoff management plans is a crucial runoff management measure and should be considered a BMP. The plans help organize and focus the Copermittees' programs and guide their implementation. In its statewide assessment report to USEPA Region IX and the State Water Board, Tetra

[87] USEPA 2006 "Environmentally Sensitive Maintenance for Dirt and Gravel Roads." Gesford and Anderson, USEPA-PA-2005.
[88] Ibid.
[89] US Forest Service, 1996. Forest Service Specifications for Construction of Roads & Bridges. EM-7720-100. Revised August 1996.
[90] University of California Division of Agriculture and Natural Resources, 2007. Rural Roads: A Construction and Maintenance Guide of California Landowners. Publication 8262.

Tech, Inc. concluded that the lack of a master storm water planning document must be considered a serious program deficiency[91]. When submitted to the San Diego Water Board, the plans provide useful correspondence between the Copermittees and the San Diego Water Board. The Plans also become available for review by the public, and thus facilitate public participation in runoff management decisions. Finally, while development and submittal of runoff management plans are not necessary to ensure compliance of the Copermittees' runoff management programs with the Order, the San Diego Water Board is provided with a means to track Copermittee implementation.

The focus of the Order is on development and implementation of storm water programs which meet MEP, rather than creation of Copermittee plans which exhibit MEP. While the Order does not rely upon the plans to ensure MEP and other standards are achieved, the plans still serve a useful purpose. As stated above, the plans serve to organize the Copermittees' efforts to address runoff. As a practical matter, any program of the size required by the Order should be documented in writing. This serves to guide implementation of the program by the numerous individuals responsible for program implementation.

Runoff management plans are not necessary for ensuring compliance with the Order because the Order itself contains sufficient detailed requirements to ensure that compliance with discharge prohibitions, receiving water limitations, and the narrative standard of MEP for storm water are achieved. Implementation by the Copermittees of programs in compliance with the Order's requirements, prohibitions, and receiving water limitations is the pertinent compliance standard to be used under the Order, as opposed to assessing compliance by reviewing the Copermittees' implementation of their plans alone. The San Diego Water Board ensures compliance with the Order by reviewing annual reports, conducting inspections, performing audits, and through other general program oversight.

Runoff management plans are particularly important and useful for municipalities when program implementation is spread across several departments and/or when municipalities experience staff turnover.[92] Each Copermittee relies on multiple employees or contractors for program implementation, but the spread of responsibility varies among Copermittees.[93] Written jurisdictional plans ensure appropriate coordination within each municipality.

Copermittees' runoff management plans are simply descriptions of their runoff management programs required under the Order. These plans serve as procedural correspondence which guides program implementation and aids the Copermittees and San Diego Water Board in tracking implementation of the programs. In this manner,

[91] Tetra Tech, Inc. 2006. *Assessment Report on Tetra Tech's Support of California's MS4 Stormwater Program.* Produced for USEPA Region IX and the California State and Regional Water Quality Control Boards.
[92] Tetra Tech, Inc. 2005. Program Evaluation Report. Orange County Storm Water Program: Cities of Laguna Beach, Laguna Hills, Lake Forest, and Rancho Santa Margarita.
[93] Responsible departments and employees are described in the 2005-06 Annual Reports for the MS4 programs.

the plans are not functional equivalents of the Order. For these reasons, the Copermittees' runoff management plans need not be an enforceable part of the Order.

The Copermittees' plans and programs can be updated on or before June 30, 2012 because much of their plans and programs are already in existence. In fact, many parts of their plans and programs have been in place for 15 years. Moreover, the adoption of Order No. R9-2004-001 required a larger scale reorganization of the Copermittees' programs than Order No. R9-2010-0016, but also only allowed one year for program updates. The Copermittees were generally able to meet the time schedule required under Order No. R9-2004-001. After discussions with the Copermittees, based on the timing of the adoption of the Order and the Copermittee's fiscal planning cycles, in conjunction with consideration for the current economic conditions, the San Diego Water Board agreed that additional time to update the Copermittees' plans and programs may be warranted. Thus, the Copermittees must update their plans and programs on or before June 30, 2012, which provides the Copermittees over 18 months, instead of 1 year, to update their plans and programs.

Finding D.1.e. Pollutants can be effectively reduced in storm water runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Pollution prevention is the reduction or elimination of pollutant generation at its source and is the best "first line of defense". Source control BMPs (both structural and non-structural) minimize the contact between pollutants and flows (e.g., rerouting run-on around pollutant sources or keeping pollutants on-site and out of receiving waters). Treatment control BMPs remove pollutants that have been mobilized by wet-weather or dry-weather flows.

Discussion of Finding D.1.e. The State Water Board finds in its Order WQ 98-01 that BMPs are effective in reducing pollutants in storm water runoff, stating that "implementation of BMPs [is] generally the most appropriate form of effluent limitations when designed to satisfy technology requirements, including reduction of pollutants to the maximum extent practicable." A State Water Board TAC further supports this finding by recommending "that nonpoint source pollution control can be accomplished most effectively by giving priority to [BMPs] in the following order:

1. Pollution Prevention – implementation of practices that use or promote pollution free alternatives;
2. Source Control – implementation of control measures that focus on preventing or minimizing urban runoff from contacting pollution sources;
3. Treatment Control – implementation of practices that require treatment of polluted runoff either onsite or offsite."[94]

Pollution prevention, the reduction or elimination of pollutant generation at its source, is an essential aspect of BMP implementation. Fewer pollutants are available to be washed from developed areas when the generation of pollutants by activities is limited.

[94] State Water Board, 1994. Urban Runoff Technical Advisory Committee Report and Recommendations. Nonpoint Source Management Program.

Thus, pollutant loads in storm water discharges are reduced from these areas. In addition, there is no need to control or treat pollutants that are never generated. Furthermore, pollution prevention BMPs are generally more cost effective than removal of pollutants by treatment facilities or cleanup of contaminated media.[95,96]

In the Pollution Prevention Act of 1990, Congress established a national policy that emphasizes pollution prevention over control and treatment. CWC section 13263.3(a) also supports pollution prevention, stating "The Legislature finds and declares that pollution prevention should be the first step in a hierarchy for reducing pollution and managing wastes, and to achieve environmental stewardship for society. The Legislature also finds and declares that pollution prevention is necessary to support the federal goal of zero discharge of pollutants into navigable waters." Finally, the Basin Plan also supports this finding by stating "To eliminate pollutants in storm water, one can either clean it up by removing pollutants or prevent it from becoming polluted in the first place. Because of the overwhelming volume of storm water and the enormous costs associated with pollutant removal, pollution prevention is the only approach that makes sense."[97]

USEPA also supports the utilization of a combination of BMPs to address pollutants in runoff. For example, USEPA has found there has been success in addressing illicit discharge related problems through BMP initiatives like storm drain stenciling and recycling programs, including household hazardous waste special collection days.[98] Structural BMP performance data has also been compiled and summarized by USEPA.[99]

The summary provides the performance ranges of various types of structural BMPs for removing suspended solids, nutrients, pathogens, and metals from storm water flows. These pollutants are generally a concern in storm water in the San Diego Region and Riverside County. For suspended solids, the least effective structural BMP type was found to remove 30-65 percent of the pollutant load, while the most effective was found to remove 65-100 percent of the pollutant load. For nutrients, the least effective structural BMP type was found to remove 15-45 percent of the pollutant load, while the most effective was found to remove 65-100 percent of the pollutant load. For pathogens, the least effective structural BMP type was found to remove <30 percent of the pollutant load, while the most effective was found to remove 65-100 percent of the pollutant load. For metals, the least effective structural BMP type was found to

[95] Devinny, J.S. et al. 2004. *Alternative Approaches to Stormwater Quality Control.* Prepared for the Los Angeles Regional Water Quality Control Board. Found as Appendix H to *NPDES Stormwater Cost Survey.* Prepared for the California State Water Resources Control Board by the Office of Water Programs California State University, Sacramento. Available on-line at: http://www.owp.csus.edu/research/npdes/
[96] Schueler, T.R.., 2000. Center for Watershed Protection. Assessing the Potential for Urban Watershed Restoration, Article 142.
[97] San Diego Water Board, 1994. Water Quality Control Plan, San Diego Basin, Region 9.
[98] USEPA, 1999. 40 CFR Parts 9, 122, 123, and 124 National Pollutant Discharge Elimination System-Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges. 64 FR 68728.
[99] USEPA, 1999. Preliminary Data Summary of Urban Storm Water Best Management Practices. EPA 821-R-99-012.

remove 15-45 percent of the pollutant load, while the most effective was found to remove 65-100 percent of the pollutant load.

It is important to note that the CWA and NPDES federal regulations clearly require control of discharges into the MS4. CWA section 402(p)(3)(B)(ii) states that MS4 permits must "prohibit non-storm water discharges into the storm sewers." 40 CFR 122.26(d)(2)(iv)(B) requires Copermittees to "detect and remove […] illicit discharges and improper disposal into the storm sewer." See Finding C.14 and Discussion.

The Order's approach to regulating discharges into and from the MS4 is in accordance with State Water Board Order WQ 2001-15. In that order, the State Water Board reviewed the San Diego County permit (Order No. 2001-01) requirements and made one change to one prohibition.[100] The Order upheld all other requirements of the current permit. Order No. R9-2010-0016 incorporates the one change made by the State Water Board, and continues the approach of Order No. 2001-01 (the basis for the current permit), as it was upheld by the State Water Board in Order WQ 2001-15. State Water Board Order WQ 2001-15 supports such requirements, stating: "It is important to emphasize that dischargers into MS4s continue to be required to implement a full range of BMPs, including source control."

The Court of Appeals, Fourth Appellate District, found that the current permit's approach to regulation of discharges into the MS4 was appropriate. Since the Order utilizes the same approach, the court decision supports the Order's requirements.

Finding D.1.f. Runoff needs to be addressed during the three major phases of urban development (planning, construction, and use) in order to reduce the discharge of storm water pollutants to the MEP, effectively prohibit non-storm water discharges and protect receiving waters. Development which is not guided by water quality planning policies and principles can unnecessarily result in increased pollutant load discharges, flow rates, and flow durations which can negatively impact receiving water beneficial uses. Construction sites without adequate BMP implementation result in sediment runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. Existing development generates substantial pollutant loads which are discharged in runoff to receiving waters.

Discussion of Finding D.1.f. MS4 permits are issued to municipalities because of their land use authority. The ultimate responsibility for the pollutant discharges, increased runoff, and inevitable long-term water quality degradation that results from development lies with local governments. This responsibility is based on the fact that it is the local governments that have authorized the development (i.e. conversion of natural pervious ground cover to impervious surfaces) and the land uses that generate the pollutants and runoff. Furthermore, the MS4 through which the pollutants and

[100] The State Water Board removed the prohibition of discharges *into* the MS4 that cause or contribute to exceedances of water quality objectives. The revision allows for treatment of storm water flows once the pollutants have entered the MS4. It does not affect the effective prohibition on certain dry-weather flows into the MS4 that is required by the Clean Water Act.

increased flows are conveyed, and ultimately discharged into natural receiving waters, are owned and operated by the same local governments. In summary, the Copermittees under the Order are responsible for discharges into and out of their MS4s because (1) they own and operate the MS4; and (2) they have the legal authority that authorizes the very development and land uses with generate the pollutants and increased flows in the first place.

For example, since grading cannot commence prior to the issuance of a local grading permit, the Copermittees have a built-in mechanism to ensure that all grading activities are protective of receiving water quality. The Copermittee has the authority to withhold issuance of the grading permit until the project proponent has demonstrated to the satisfaction of the Copermittee that the project will not violate their ordinances or cause the Copermittee to be in violation of its MS4 permit. Since the Copermittee will ultimately be held responsible for any discharges from the grading project by the San Diego Water Board, the Copermittee will want to use its own permitting authority to ensure that whatever measures the Copermittee deems necessary to protect discharges into its MS4 are in fact taken by the project proponent.

The Order holds the local government accountable for this direct link between its land use decisions and water quality degradation. The Order recognizes that each of the three major stages in the development process (development planning, construction, and the use or operational stage) are controlled by and must be authorized by the local government. Accordingly, this permit requires the local government to implement, or require others to implement, appropriate best management practices to reduce storm water pollutant discharges and increased flow during each of the three stages of development.

Including plans for BMP implementation during the design phase of new development and redevelopment offers the most cost effective strategy to reduce storm water runoff pollutant loads to surface waters.[101] The Phase II regulations for small municipalities reflect the necessity of addressing runoff during the early planning phase. Due to the greater water quality concerns generally experienced by larger municipalities, Phase II requirements for small municipalities are also applicable to larger municipalities such as the Copermittees. The Phase II regulations direct municipalities to develop, implement, and enforce a program to address storm water runoff from new development and redevelopment projects that disturb greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale. The program must ensure that controls are in place that would prevent or minimize water quality impacts. This includes developing and implementing strategies which include a combination of structural and/or non-structural BMPs appropriate to the locality. The program must also ensure the adequate long-term operation and maintenance of BMPs.[102] USEPA expands on the Phase II regulations for urban development when it recommends that Copermittees:

[101] USEPA, 2000. Storm Water Phase II Compliance Assistance Guide. EPA 833-R-00-002.
[102] USEPA, 1999. 40 CFR Parts 9, 122, 123, and 124 National Pollutant Discharge Elimination System-Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. 64 FR 68845.

> "Adopt a planning process that identifies the municipality's program goals (e.g., minimize water quality impacts resulting from post-construction runoff from new development and redevelopment), implementation strategies (e.g., adopt a combination of structural and/or non-structural BMPs), operation and maintenance policies and procedures, and enforcement procedures. In developing your program, you should consider assessing existing ordinances, policies, programs and studies that address storm water runoff quality."

Management of storm water runoff during the construction phase is also essential. USEPA explains in the preamble to the Phase II regulations that storm water discharges generated during construction activities can cause an array of physical, chemical, and biological water quality impacts. Specifically, the biological, chemical and physical integrity of the waters may become severely compromised due to runoff from construction sites. Fine sediment from construction sites can adversely affect aquatic ecosystems by reducing light penetration, impeding sight-feeding, smothering benthic organisms, abrading gills and other sensitive structures, reducing habitat by clogging interstitial spaces within the streambed, and reducing intergravel dissolved oxygen by reducing the permeability of the bed material. Water quality impairment also results, in part, because a number of pollutants are preferentially absorbed onto mineral or organic particles found in fine sediment. The interconnected process of erosion (detachment of the soil particles), sediment transport, and delivery is the primary pathway for introducing key pollutants, such as nutrients, metals, and organic compounds into aquatic systems.[103]

Finally, storm water and non-storm water runoff from existing development must be addressed. The Copermittees' monitoring data exhibits that significant water quality problems exist in receiving waters which receive runoff from areas with extensive existing development, such as Aliso Creek. Source identification, BMP requirements, inspections, and enforcement are all important measures which can be implemented to address runoff from existing development. USEPA supports inspections and enforcement by municipalities when it states "Effective inspection and enforcement requires […] penalties to deter infractions and intervention by the municipal authority to correct violations. Enforcement mechanisms […] also must be described."[104]

Finding D.1.g. Annual reporting requirements included in this Order are necessary to meet federal requirements and to evaluate the effectiveness and compliance of the Copermittees' programs.

[103] Ibid., 64 FR 68728.
[104] USEPA, 1992. Guidance Manual for the Preparation of Part II of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems. EPA 833-B-92-002.

Discussion of Finding D.1.g. The annual reporting requirements are consistent with federal NPDES regulation 40 CFR 122.41, which states:

> "The operator of a large or medium municipal separate storm sewer system of a municipal separate storm sewer system that has been designated by the Director under section 122.26(a)(1)(v) of this part must submit an annual report by the anniversary of the date of the issuance of the permit for such a system. The report shall include: (1) The status of implementing the components of the storm water management program that are established as permit conditions; (2) Proposed changes to the storm water management program that are established as permit condition, Such proposed changes shall be consistent with § 122.26(d)(2)iii) of this part; (3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under § 122.26(d)(2)iv) and (d)(2)(v) of this part; (4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; (5) Annual expenditures and budget for year following each annual report; (6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; and (7) Identification of water quality improvements or degradation."

CWC section 13267 provides that "the regional board may require that any person who has discharged […] shall furnish, under penalty of perjury, technical or monitoring reports which the regional board requires."

The San Diego Water Board must assess the reports to ensure that the Copermittees' programs are adequate to assess and address water quality. The reporting requirements can also be useful tools for the Copermittees to review, update, or revise their programs. Areas or issues which have received insufficient efforts can also be identified and improved.

Finding D.1.h. This Order establishes Storm Water Action Levels (SALs) for selected pollutants based on USEPA Rain Zone 6 (arid southwest) Phase I MS4 monitoring data for pollutants in storm water. The SALs were computed as the 90th percentile of the data set, utilizing the statistical based population approach, one of three approaches recommended by the State Water Board's Storm Water Panel in its report, 'The Feasibility of Numerical Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities (June 2006). SALs are identified in section D of this Order. Copermittees must implement a timely, comprehensive, cost-effective storm water pollution control program to reduce the discharge of pollutants in storm water from the permitted areas so as not to exceed the SALs. Exceedance of SALs may indicate inadequacy of programmatic measures and BMPs required in this Order.

Discussion of Finding D.1.h. Section 402(p) of the CWA states MS4 permits for storm water shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants. This includes requiring numeric effluent limitations for storm water.

SALs are not numeric effluent limitations, which is reflected in language which clarifies an excursion above a SAL does not create a presumption that MEP is not being met. Instead, a SAL exceedance is to be used by the Copermittee as an indication that the MS4 storm water discharge point is a definitive "bad actor," and the result from the monitoring needs to be considered as part of the iterative process for reducing pollutants in storm water to the MEP.

The CWA defines effluent limitations as:

> “Any restriction imposed by the Director on quantities, discharge rates, and concentrations of pollutants which are “discharged” from “point sources” into “waters of the United States”…” A SAL is not a restriction on a quantity, rate or concentration, but is a level at which actions that further reduce pollutants from that discharge point need to be evaluated in order to reduce storm water pollutants to the MEP. Thus, SALs are not effluent limitations as defined by the CWC or CWA.

The approach of using "action levels" is consistent with recommendations made by USEPA in their Interim Permitting Approach for Water Quality-Based Effluent Limitations in Storm Water Permits, dated August 26, 1996:

> "Under the Clean Water Act (CWA) and NPDES regulations, permitting authorities may employ a variety of conditions and limitations in storm water permits, including best management practices, performance objectives, narrative conditions, monitoring triggers, action levels (e.g., monitoring benchmarks, toxicity reduction evaluation action levels), etc., as the necessary water-quality based limitations, where numeric water quality based effluent limitations are determined to be unnecessary or infeasible". As such, these action levels are not considered numeric water quality-based effluent limitations.

It should be noted that a purpose of monitoring, required under this and previous Orders, is to aid in the evaluation of implemented programs and BMPs in reducing pollutants in storm water discharges to the MEP. The Monitoring and Reporting Program states:

This Receiving Waters Monitoring and Reporting Program is intended to meet the following goals:

2. Measure and improve the effectiveness of the Copermittees' runoff management programs;
3. Assess the chemical, physical, and biological impacts to receiving waters resulting from MS4 discharges;
4. Characterize storm water discharges;
5. Identify sources of specific pollutants;
6. Prioritize drainage and sub-drainage areas that need management actions; and
9. Provide information to implement required BMP improvements.

Since the first permit (adopted 20 years ago), Copermittees have utilized non-numerical limitations (BMPs) to control and abate the discharge of any pollutants in storm water discharges to the MEP. Copermittees have been accorded 20 years to research, develop, and deploy BMPs that are capable of reducing storm water discharges from the MS4 to levels represented in SALs. Storm Water Action Levels are set at such a level that any exceedance of a SAL will clearly indicate BMPs being implemented are insufficient to protect the Beneficial Uses of waters of the State. Copermittee shall utilize the exceedance information as a high priority consideration when adjusting and executing annual work plans, as required by this Permit. Failure to appropriately consider and react to SAL exceedances in an iterative manner creates a presumption that the Copermittee(s) have not complied to the MEP.

SALs have been developed utilizing Phase I storm water effluent data (updated February 2008, http://rpitt.eng.ua.edu/Research/ms4/mainms4.shtml) from the arid west region (USEPA Rain Zone 6). USEPA Rainfall Zone 6, which includes MS4 effluent data from Orange, San Diego, Los Angeles, Ventura and San Bernadino County. The approach taken to derive SALs is a straightforward percentile approach, with the SAL being set as the 90th percentile of the dataset for each constituent. This approach is consistent with the 2006 State Water Board Panel Report:

> "The statistically based population approach would once again rely on the average distribution of measured water quality values developed from many water quality samples taken for many events at many locations. In this case, however, the Action Level would be defined by the central tendency and variance estimates from the population data. For example, the Action Level could be set as two standard deviations above the mean, i.e. if measured concentrations are consistently higher than two standard deviations above the mean, an Action Level would be triggered. Other population based measures of central tendency could be used (i.e. geometric mean, median, etc.) or estimates of variance (i.e. prediction intervals, etc.). Regardless of which population based estimators are used (or percentile from above), the idea would be to identify the [statistically derived] point at which managers feel concentrations are significantly beyond the norm."

SALs are measurable criteria which quantify the performance of BMPs for a particular watershed or subwatershed that discharges storm water MS4 effluent from that particular discharge point. Thus, Copermittees can utilize SAL results to determine the effectiveness BMPs on the effluent from a particular area of the MS4.

SALs represent the lowest 10 percent of pollutant reduction for USEPA Rain Zone 6 MS4 Phase I programs discharging to waters of the United States. For the past 20 years, Copermittees have utilized non-numerical limitations (BMPs) to control and abate the discharge of any pollutants in storm water discharges to the MEP. Copermittees have been accorded 20 years to research, develop, and deploy BMPs that are capable of reducing storm water discharges from the MS4 to levels represented in SALs. Storm Water Action Levels are set at such a level that any exceedance of a SAL will indicate to the Copermittee(s) that the discharge is within the lowest 10% of monitored outfalls. Therefore, an exceedance of a SAL warrants priority consideration within the Copermittee iterative process.

Finding D.2.a. The Standard Storm Water Mitigation Plan (SSMP) requirements contained in this Order are consistent with Order WQ 2000-11 adopted by the State Water Board on October 5, 2000. In the precedential order, the State Water Board found that the design standards, which essentially require that runoff generated by 85 percent of storm events from specific development categories be infiltrated or treated, reflect the MEP standard. The order also found that the SSMP requirements are appropriately applied to the majority of the Priority Development Project categories that are also contained in section F.1 of this Order. The State Water Board also gave California Regional Water Quality Control Boards (Regional Water Boards) the needed discretion to include additional categories and locations, such as retail gasoline outlets (RGOs), in SSMPs.

Discussion of Finding D.2.a. The post-construction requirements and design standards contained in the SSMP section of Order No. R9-2010-0016 constitute MEP consistent with State Water Board guidance, court decisions, and San Diego Water Board requirements. The State Water Board and San Diego Water Board have made several recent decisions in regards to inclusion of SSMP requirements in MS4 permits. In a precedential decision, State Water Board Order WQ 2000-11, the State Water Board found that the SSMP provisions constitute MEP for addressing storm water pollutant discharges resulting from Priority Development Projects. The provisions of the SSMP section of the Order are also consistent with those previously issued by the San Diego Water Board for Riverside County (Order No. R9-2004-001), Southern Orange County (Order Nos. R9-2002-0001 and R9-2009-0002) and San Diego County (Order Nos. R9-2001-01 and R9-2007-0001), as well as requirements in the Los Angeles County MS4 permit (Order No. R4-2001-182). In State Water Board Order WQ 2001-15, the State Water Board reaffirmed that SSMP requirements constitute MEP. Moreover, the SSMP requirements of the San Diego County MS4 permit (Order No. R9-2001-01) were upheld when the California State Supreme Court declined to hear the matter on appeal.

Finding D.2.b. Controlling runoff pollution by using a combination of onsite source control and site design BMPs augmented with treatment control BMPs before the runoff enters the MS4 is important for the following reasons: (1) Many end-of-pipe BMPs (such as diversion to the sanitary sewer) are typically ineffective during significant storm events; (2) Whereas, onsite source control BMPs can be applied during all runoff conditions end-of-pipe BMPs are often incapable of capturing and treating the wide range of pollutants which can be generated on a sub-watershed scale; (3) End-of-pipe BMPs are more effective when used as polishing BMPs, rather than the sole BMP to be implemented; (4) End-of-pipe BMPs do not protect the quality or beneficial uses of receiving waters between the pollutant source and the BMP; and (5) Offsite end-of-pipe BMPs do not aid in the effort to educate the public regarding sources of pollution and their prevention.

Discussion of Finding D.2.b. Many end-of-pipe BMPs are designed for low flow conditions because their end-of-pipe location prevents them from being designed for large storm events. This results in the end-of-pipe BMPs being overwhelmed, bypassed, or ineffective during larger storm events more frequently than onsite BMPs designed for larger storms. BMPs are also frequently most effective for a particular type of pollutant (such as sediment). Such BMPs may be appropriate for small sites with a limited suite of pollutants generated; however, end-of-pipe BMPs must typically be able to address a wide range of pollutants generated by a sub-watershed, limiting their effectiveness and/or increasing costs. Moreover, the location of some end-of-pipe BMPs allow for untreated pollutants to be discharged to and degrade receiving waters prior to their reaching the BMPs. This fails to protect receiving waters, which is the purpose of BMP implementation. In addition, opportunities to educate the public regarding runoff pollution can be lost when end-of-pipe BMPs are located away from pollutant sources and out of sight. Onsite BMPs can lead to a better public understanding of runoff issues since their presence can provide a visible and/or tangible lesson in pollution prevention.

Finding D.2.c. Use of Low-Impact Development (LID) site design BMPs at new development, redevelopment and retrofit projects can be an effective means for minimizing the impact of storm water runoff discharges from the development projects on receiving waters. LID is a site design strategy with a goal of maintaining or replicating the pre-development hydrologic regime through the use of design techniques. LID site design BMPs help preserve and restore the natural hydrologic cycle of the site, allowing for filtration and infiltration which can greatly reduce the volume, peak flow rate, velocity, and pollutant loads of storm water runoff. Current runoff management, knowledge, practices and technology have resulted in the use of LID BMPs as an acceptable means of meeting the storm water MEP standard.

Discussion of Finding D.2.c. The CWA is the cornerstone of surface water quality protection in the United States. (The Act does not deal directly with ground water or with water quantity issues.) The statute employs a variety of regulatory and nonregulatory tools to sharply reduce direct pollutant discharges into waterways, and manage polluted runoff. These tools are employed to achieve the broader goal of

restoring and maintaining the chemical, physical, and biological integrity of the nation's waters so that they can support the protection and propagation of fish, shellfish, wildlife and recreation in and on the water.

Increasing the volume, velocity, frequency and discharge duration of storm water runoff from developed areas will eventually greatly accelerate downstream erosion, impair stream habitat in natural drainages, and negatively impact beneficial uses. Development and urbanization increase pollutant loads and volume while simultaneously increasing impervious area. Impervious surfaces can neither absorb water nor remove pollutants and thus lose the purification and infiltration provided by naturally vegetated soil. Furthermore, impervious surfaces tend to concentrate pollutants on the top of the surface that are then washed off into the MS4 and waters of the State in a concentrated manner. The use of LID site design BMPs can be an effective means of minimizing the impact of runoff discharges on receiving waters. By reducing water pollution, reducing runoff and increasing groundwater recharge, LID helps to improve the quality of receiving surface waters, stabilize the flow rates of receiving waters (preventing downstream hydromodification), reduce downstream flooding and protect and enhance water supply sources. Current runoff management, knowledge, practice and technology has resulted in the use of LID BMPs as an acceptable means of meeting the MEP standard for storm water treatment.

Current municipal codes may oppose or hinder the design, use and implementation of specific elements of LID. These codes include, but are not limited to, emergency services access requirements, building landscape ordinances, building height limits and parking space requirements. It is essential for Copermittees to work with other responsible agencies and/or update codes that have the potential to impact the use of LID.

The Local Government Commission, a non-profit organization working to build livable communities, developed a set of principles known as the *Ahwahnee Water Principles for Resource-Efficient Land Use*[105] that provide the opportunity to reduce costs and improve the reliability and quality of our water resources. Implementation of LID incorporates several of the Ahwahnee principles such as:

1. "Community Design should be compact, mixed use, walkable and transit-oriented so that urban runoff pollutants are minimized and the open lands that absorb water are preserved to the maximum extent possible."
3. "Water holding areas such as creek beds, recessed athletic fields, ponds, cisterns, and other features that serve to recharge groundwater, reduce runoff, improve water quality and decrease flooding should be incorporated into the urban landscape."
4. "All aspects of landscaping from the selection of plants to soil preparation and the installation of irrigation systems should be designed to reduce water demand, retain runoff, decrease flooding, and recharge groundwater."

[105] Local Government Commission, "The Ahwahnee Water Principles – A Blueprint for Regional Sustainability", http://water.lgc.org/Members/tony/docs/lgc_water_guide.pdf

5. "Permeable surfaces should be used for hardscape. Impervious surfaces such as driveways, streets, and parking lots should be minimized so that land is available to absorb storm water, reduce polluted urban runoff, recharge groundwater and reduce flooding."

The use of LID site design BMPs helps reduce the amount of impervious area associated with development and allows storm water to infiltrate into the soil. Natural vegetation and soil filters storm water runoff and reduces the volume and pollutant loads of storm water. Studies have revealed that the level of imperviousness resulting from development and urbanization is strongly correlated with the water quality impairment of nearby receiving waters.[106] In many cases, the impacts on receiving waters due to changes in hydrology can be more significant than those attributable to the contaminants found in storm water discharges.[107] These impacts include stream bank erosion (increased sediment load and subsequent deposition), benthic habitat degradation, and decreased diversity of macroinvertebrates. Although conventional BMPs do reduce storm water pollutant loads, they may not effectively control adverse effects from changes in the discharge hydrologic conditions.[108]

The Order includes requirements for developments to include site design BMPs that mimic or replicate the natural hydrologic cycle. Open space designs which maximize pervious surfaces and retention of "natural" drainages have been found to reduce both the costs of development and pollutant export.[109] Moreover, USEPA finds including plans for a "natural" site design and BMP implementation during the design phase of new development and redevelopment offers the most cost effective strategy to reduce storm water pollutant loads to surface waters.[110] In addition, a recent U.S. Department of Housing and Urban Development guidance document on low-impact development notes that the use of LID-based storm water management design allows land to be developed, but in a cost-effective manner that helps mitigate potential environmental impacts.[111]

Finding D.2.d. RGOs are significant sources of pollutants in storm water runoff. RGOs are points of convergence for motor vehicles for automotive related services such as repair, refueling, tire inflation, and radiator fill-up and consequently produce significantly higher loadings of hydrocarbons and trace metals (including copper and zinc) than other developed areas.

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[106] USEPA, 1999. 40 CFR Parts 9, 122, 123, and 124 National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule.
[107] Ibid.
[108] USEPA, 2000. Low-Impact Development: A literature review. EPA-841-B-00-005. 35p.
[109] Center for Watershed Protection, 2000. "The Benefits of Better Site Design in Residential Subdivisions." Watershed Protection Techniques. Vol. 3. No. 2.
[110] USEPA, 1999. 40 CFR Parts 9, 122, 123, and 124 National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule.
[111] U.S. Department of Housing and Urban Development, Office of Policy Development and Research, 2003. "The Practice of Low Impact Development." Prepared by: NAHB Research Center, Inc. Upper Marlboro, Maryland. Contract No. H-21314CA. 131p.

Discussion of Finding D.2.d. RGOs are included in the Order as a Priority Development Project category because RGOs produce significantly greater loadings of hydrocarbons and trace metals (including copper and zinc) than other developed areas. To meet the storm water MEP standard, source control and structural treatment BMPs are needed at RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) an average daily traffic (ADT) of 100 or more vehicles per day. These are appropriate thresholds since vehicular development size and volume of traffic are good indicators of potential impacts of storm water runoff from RGOs on receiving waters.

This finding has been added to satisfy State Water Board Order WQ 2000-11's requirements for including RGOs as a Priority Development Category. State Water Board Order WQ 2000-11 acknowledged that a threshold (size, average daily traffic, etc.) appropriate to trigger SSMP requirements should be developed for RGOs and that specific findings regarding RGOs should be included in MS4 permits to justify the requirement.[112]

Finding D.2.e. Industrial sites are significant sources of pollutants in runoff. Pollutant concentrations and loads in runoff from industrial sites are similar or exceed pollutant concentrations and loads in runoff from other land uses, such as commercial or residential land uses. As with other land uses, LID site design, source control, and treatment control BMPs are needed at industrial sites in order to meet the MEP standard. These BMPs are necessary where the industrial site is larger than 10,000 square feet. The 10,000 square feet threshold is appropriate, since it is consistent with requirements in other Phase I NPDES storm water regulations throughout California.

Discussion of Finding D.2.e. Industrial sites can be a significant source of pollutants in storm water runoff. In an extensive review of storm water literature, the Los Angeles Water Board found widespread support for the finding that "industrial and commercial activities can also be considered hot spots as sources of pollutants." It also found that "industrial and commercial areas were likely to be the most significant pollutant source areas" of heavy metals.[113] Likewise, storm water runoff from heavy industry in the Santa Clara Valley has been found to be extremely toxic.[114] These findings are corroborated by USEPA, which states in the preamble to the 1990 Phase I NPDES storm water regulations that "Because storm water from industrial facilities may be a major contributor of pollutants to municipal separate storm sewer systems, municipalities are obligated to develop controls for storm water discharges associated

[112] State Water Board, 2000. Order WQ 2000-11. In the Matter of the Petitions of The Cities Of Bellflower, Et Al., The City Of Arcadia, And Western States Petroleum Association Review of January 26, 2000 Action of the Regional Board And Actions and Failures to Act by both the California Regional Water Quality Control Board, Los Angeles Region and Its Executive Officer Pursuant to Order No. 96-054, Permit for Municipal Storm Water and Urban Run-Off Discharges Within Los Angeles County [NPDES NO. CAS614001] SWRCB/OCC FILES A-1280, A-1280(a) and A-1280(b)
[113] Los Angeles Water Board. 2001.
[114] Schueler and Holland, 2000. Storm Water Strategies for Arid and Semi-Arid Watersheds (Article 66). The Practice of Watershed Protection.

with industrial activity through their system in their storm water management program." Since heavy industrial sites can be a significant source of pollutants in runoff in a manner similar to other SSMP project categories such as commercial development or automotive repair shops, it is appropriate to include heavy industrial sites as a SSMP category in the Order.

The Phase I NPDES storm water regulations require the Copermittees to "control through ordinance, permit, contract, order, or similar means, the contribution of pollutants to the municipal storm sewer by storm water discharges associated with industrial activity and the quality of storm water discharged from sites of industrial activity" (40 CFR 122.26(d)(2)(i)). In addition, it has been established that the MEP standard for the control of storm water runoff from new development projects includes incorporation of the SSMP requirements. Since the Copermittees must both control storm water pollutants from industrial sites and meet the storm water MEP standard for new development, it is appropriate to apply the SSMP requirements to heavy industrial sites.

The State Water Board's Order WQ 2000-11 indicates that it is appropriate to apply SSMP requirements to categories of development where evidence shows the category of development can be a significant source of pollutants. As evidenced above, heavy industrial sites can be a significant source of pollutants. Therefore, the Order includes heavy industrial sites as a SSMP Priority Development Project category.

Finding D.2.f. If not properly designed or maintained, certain BMPs implemented or required by municipalities for runoff management may create a habitat for vectors (e.g. mosquitoes and rodents). Proper BMP design and maintenance to avoid standing water, however, can prevent the creation of vector habitat. Nuisances and public health impacts resulting from vector breeding can be prevented with close collaboration and cooperative effort between municipalities, local vector control agencies, and the California Department of Public Health during the development and implementation of runoff management programs.

Discussion of Finding D.2.f. The implementation of certain structural BMPs or other runoff treatment systems can result in significant vector problems in the form of increased breeding or harborage habitat for mosquitoes, rodents or other potentially disease transmitting organisms. The implementation of BMPs that retain water may provide breeding habitat for a variety of mosquito species, some of which have the potential to transmit diseases such as Western Equine Encephalitis, St. Louis Encephalomyelitis, and malaria. Recent BMP implementation studies by Caltrans[115] in District 7 and District 11 have demonstrated mosquito breeding associated with some types of BMPs. The Caltrans BMP Retrofit Pilot study cited lack of maintenance and improper design as factors contributing to mosquito production. However, a Watershed Protection Techniques article describes management techniques for selecting, designing, and maintaining structural treatment BMPs to minimize mosquito

[115] Caltrans, 2000. BMP Retrofit Pilot Studies: A Preliminary Assessment of Vector Production.

production.[116] State and local runoff management programs that include structural BMPs with the potential to retain water have been implemented in Florida and the Chesapeake Bay region without resulting in significant public health threats from mosquitoes or other vectors.[117]

Finding D.2.g. The increased volume, velocity, frequency and discharge duration of storm water runoff from developed areas has the potential to greatly accelerate downstream erosion, impair stream habitat in natural drainages, and negatively impact beneficial uses. Development and urbanization increase pollutant loads in storm water runoff and the volume of storm water runoff. Impervious surfaces can neither absorb water nor remove pollutants and thus lose the purification and infiltration provided by natural vegetated soil. Hydromodification measures for discharges to hardened channels allow for the future restoration of the hardened channels to their natural state, thereby restoring the chemical, physical, and biological integrity and beneficial uses of local receiving waters.

Discussion of Finding D.2.g. Increasing the volume, velocity, frequency and discharge duration of storm water runoff from developed areas will eventually greatly accelerate downstream erosion, impair stream habitat in natural drainages, and negatively impact beneficial uses. Development and urbanization increase pollutant loads and volume while simultaneously increasing impervious area. Impervious surfaces can neither absorb water nor remove pollutants and thus lose the purification and infiltration provided by naturally vegetated soil.

Historic hydromodification impacts, such as concrete lining and channelization, have impacted the natural physical habitat of urban streams resulting in low IBI scores. The Copermittee's monitoring to date indicates decreased IBI scores in the developed watersheds when compared to reference sites, with developed sites consistently having poor or very poor IBI scores. While habitat scores remained stable over the last reporting period, with scores of marginal to sub-optimal, the Copermittees have consistently monitored high levels of fine sediment in habitat assessments and often changing vegetative cover. However, the impact of persistent toxicity at the bioassessment stations in conjunction with physical habitat scores is unknown.[118]

Hydromodification impacts result in poor physical habitat conditions through streambed scour, erosion, vegetation displacement, sediment deposition, channelization, and channel modifications. Increased sediment loads from hydromodification causes other impacts to physical habitats including increased turbidity which then may cause increased temperatures. In addition, an increased sediment load may have an increased biological content thereby increasing the

[116] Watershed Protection Techniques, 1995. Mosquitoes in Constructed Wetlands: A Management Bugaboo? 1(4):203-207.
[117] Shaver, E. and R. Baldwin , 1995. Sand Filter Design for Water Quality Treatment in Herricks, E., Ed. Stormwater Runoff and Receiving Systems: Impact, Monitoring, and Assessment, CRC Lewis Publishers, New York, NY.
[118] Riverside County Copermittees, 2008-2009 Santa Margarita Watershed Annual Report.

sediment oxygen demand and lowering the dissolved oxygen available for aquatic life.[119]

The objective of the CWA is "to restore and maintain the chemical, *physical,* and biological integrity of the Nation's waters (emphasis added)." Stream restoration by removing concrete and other unnatural materials is a major step toward achieving that objective. The success of future stream restoration and stabilization is, however, dependent on preventing and reducing physical impacts from activities upstream. Therefore, hydromodification management measures are necessary upstream of modified (e.g. concrete, rip rap, etc.) channels in addition to non-modified channels.

Please see discussion of Findings C.10 and C.11 for additional information about impacts due to increasing volume, velocity, frequency and discharge duration of storm water runoff from developed areas.

Finding D.3.a. In accordance with federal NPDES regulations and to ensure the most effective oversight of industrial and construction site discharges, discharges of runoff from industrial and construction sites are subject to dual (State and local) storm water regulation. Under this dual system, each Copermittee is responsible for enforcing its local permits, plans, and ordinances, and the San Diego Water Board is responsible for enforcing the General Construction Activities Storm Water Permit, State Water Board Order 2009-0009-DWQ, NPDES No. CAS000002 (General Construction Permit) and the General Industrial Activities Storm Water Permit, State Water Board Order97-03-DWQ, NPDES No. CAS000001 (General Industrial Permit). NPDES municipal regulations require that municipalities develop and implement measures to address runoff from industrial and construction activities. Those measures may include the implementation of other BMPs in addition to those BMPs that are required under the statewide general permits for activities subject to both State and local regulation.

Discussion of Finding D.3.a. USEPA finds the control of pollutant discharges from industry and construction so important to receiving water quality that it has established a double system of regulation over industrial and construction sites. This double system of regulation consists of two parallel regulatory systems with the same common objective: to keep pollutants from industrial and construction sites out of the MS4. In this double system of regulation for runoff from industrial and construction sites, local governments must enforce their legal authorities (i.e. local ordinances and permits) while the San Diego Water Board must enforce its legal authority (i.e. statewide general industrial and construction storm water permits). These two regulatory systems are designed to complement and support each other. Municipalities are not required to enforce San Diego Water Board and State Water Board permits. They are required, however, to enforce their ordinances and permits. The Federal regulations are clear that municipalities have responsibility to prevent

[119] USEPA, National Management Measures to Control Nonpoint Source Pollution from Hydromodification, EPA 841-B-07-002, July 2007.

non-storm water and address storm water runoff from industrial and construction sites which enters their MS4s.

Municipalities have this responsibility because they have the authority to issue land use and development permits. Since municipalities are the lead permitting authority for industrial land use and construction activities, they are also the lead for enforcement regarding runoff discharges from these sites. For sites where the municipality is the lead permitting authority, the San Diego Water Board will work with the municipality and provide support where needed. The San Diego Water Board will assist municipalities in enforcement against non-compliant sites after the municipality has exhibited a good faith effort to bring the site into compliance.

According to USEPA, the storm water regulations envision that NPDES permitting authorities and municipal operators will cooperate to develop programs to monitor and control pollutants in storm water discharges from industrial facilities.[120] USEPA discusses the "dual regulation" of construction sites in its Storm Water Phase II Compliance Assistance Guide, which states "Even though all construction sites that disturb more than one acre are covered nationally by an NPDES storm water permit, the construction site runoff control minimum measure […] is needed to induce more localized site regulation and enforcement efforts, and to enable operators […] to more effectively control construction site discharges into their MS4s."[121] While the Storm Water Phase II Compliance Assistance Guide applies to small municipalities, it is applicable to the Copermittees, because they are similar in size and have the potential to discharge similar pollutant types as Phase II municipalities.

Finding D.3.b. Identification of sources of pollutants in runoff (such as municipal areas and activities, industrial and commercial sites/sources, construction sites, and residential areas), development and implementation of BMPs to address those sources, and updating ordinances and approval processes are necessary for the Copermittees to ensure that discharges of pollutants from its MS4 in storm water are reduced to the MEP and that non-storm water discharges are not occurring. Inspections and other compliance verification methods are needed to ensure minimum BMPs are implemented. Inspections are especially important at areas that are at high risk for pollutant discharges.

Discussion of Finding D.3.b. Source identification is necessary to characterize the nature and extent of pollutants in discharges and to develop appropriate BMPs. It is the first step in a targeted approach to runoff management. Source identification helps identify the location of potential sources of pollutants in runoff. Pollutants found to be present in receiving waters can then be traced to the sites which frequently generate such pollutants. In this manner source inventories can help to target inspections, monitoring, and potential enforcement. This allows for limited inspection, monitoring, and enforcement time to be most effective. USEPA supports source identification as a

[120] USEPA, 1992. Guidance Manual for the Preparation of Part II of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems. EPA 833-B-92-002.
[121] USEPA, 2000. Storm Water Phase II Compliance Assistance Guide. EPA 833-R-00-002.

concept when it recommends construction, municipal, and industrial source identification in guidance and the federal regulations.[122,123]

The development of BMPs for identified sources will help ensure that appropriate, consistent controls are implemented at all types of development and areas. Copermittees must reduce the discharge of pollutants in storm water runoff to the maximum extent practicable. To achieve this level of pollutant reduction, BMPs must be implemented. Designation of minimum BMPs helps ensure that appropriate BMPs are implemented for various sources. These minimum BMPs also serve as guidance as to the level of water quality protection required. USEPA requires development and implementation of BMPs for construction, municipal, commercial, industrial, and residential sources at 40 CFR 122.26(d)(2)(iv)(A-D).

Updating ordinances and approval processes is necessary in order for the Copermittees to control discharges to their MS4s. USEPA supports updating ordinances and approval processes when it states "A crucial requirement of the NPDES storm water regulation is that a municipality must demonstrate that it has adequate legal authority to control the contribution of pollutants in storm water discharged to its MS4. […] In order to have an effective municipal storm water management program, a municipality must have adequate legal authority to control the contribution of pollutants to the MS4. […] 'Control,' in this context, means not only to require disclosure of information, but also to limit, discourage, or terminate a storm water discharge to the MS4."[124]

Inspections provide a necessary means for the Copermittees to evaluate compliance of pollutant sources with their municipal ordinances and minimum BMP requirements. USEPA supports inspections when it recommends inspections of construction, municipal, and industrial sources.[125] Inspection of high risk sources are especially important because of the ability of frequent inspections to help ensure compliance, thereby reducing the risk associated with such sources. USEPA suggests that inspections can improve compliance when it states "Effective inspection and enforcement requires […] penalties to deter infractions and intervention by the municipal authority to correct violations."[126]

Finding D.3.c. Historic and current development makes use of natural drainage patterns and features as conveyances for runoff. Urban streams used in this manner are part of the municipalities MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the urban stream is both an MS4 and receiving water.

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[122] USEPA, 1992. Guidance Manual for the Preparation of Part II of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems. EPA 833-B-92-002.
[123] 40 CFR 122.26(d)(2)(ii)
[124] USEPA, 1992. Guidance Manual for the Preparation of Part II of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems. EPA 833-B-92-002.
[125] Ibid.
[126] USEPA, 1992. Guidance Manual for the Preparation of Part II of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems. EPA 833-B-92-002.

Discussion of Finding D.3.c. An MS4 is defined in the federal regulations as a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains), owned or operated by a Copermittee, and designed or used for collecting or conveying runoff.[127] Natural drainage patterns and urban streams are frequently used by municipalities to collect and convey runoff away from development within their jurisdiction. Therefore, the San Diego Water Board considers natural drainages that are used for conveyances of runoff, regardless of whether or not they've been altered by the municipality, as both part of the MS4s and as receiving waters. To clarify, an unaltered natural drainage, which receives runoff from a point source (channeled by a Copermittee to drain an area within their jurisdiction), which then conveys the runoff to an altered natural drainage or a man-made MS4, is both an MS4 and a receiving water.[128]

Finding D.3.d. As operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not prohibit or otherwise control. These discharges may cause or contribute to a condition of contamination or a violation of water quality standards.

Discussion of Finding D.3.d. CWA section 402(p) requires operators of MS4s to prohibit non-storm water discharges into their MS4s. This is necessary because pollutants which enter the MS4 generally are conveyed through the MS4 to be eventually discharged into receiving waters. If a municipality does not prohibit non-storm water discharges, it is providing the pathway (its MS4) which enables pollutants to reach receiving waters. Since the municipality's storm water management service can result in pollutant discharges to receiving waters, the municipality must accept responsibility for the water quality consequences resulting from this service. Furthermore, third party discharges can cause a municipality to be out of compliance with its permit. Since pollutants from third parties which enter the MS4 will eventually be discharged from the MS4 to receiving waters, the third party discharges can result in a situation of municipality non-compliance if the discharges lead to an exceedance of water quality standards. For these reasons, each Copermittee must prohibit and/or control discharges from third parties to its MS4. USEPA supports this concept when it states "the operators of regulated small MS4s cannot passively receive and discharge pollutants from third parties" and "the operator of a small MS4 that does not prohibit and/or control discharges into its system essentially accepts 'title' for those discharges. At a minimum, by providing free and open access to the MS4s that convey discharges

[127] USEPA, 2000. EPA Administered Permit Programs: The National Pollutant Discharge Elimination System. Code of Federal Regulations, Vol. 40, Part 122.
[128] San Diego Water Board, 2001. Response in Opposition to Petitions for Review of California Regional Water Quality Control Board San Diego Region Order No. 2001-01 – NPDES Permit No. CAS0108758 (San Diego Municipal Storm Water Permit).

to the waters of the United States, the municipal storm sewer system enables water quality impairment by third parties."[129]

In a recent decision issued for *United States v. Washington State Department of Transportation (WSDOT)*,[130] the court found that WSDOT, by allowing runoff from its MS4 to a receiving water that is part of a Superfund site, is an "arranger" of "disposal or treatment of hazardous substances" as defined under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) by "designing, constructing, and operating drainage systems whose sole function was to collect highway runoff and dispose of it into nearby water-bodies." The court went on to state that "WSDOT did design the drainage system and…has the ability to redirect, contain or treat its contaminated runoff."

Finding D.3.e. Waste and pollutants which are deposited and accumulate in MS4 drainage structures will be discharged from these structures to waters of the U.S. unless they are removed. These discharges may cause or contribute to, or threaten to cause or contribute to, a condition of pollution in receiving waters. For this reason, pollutant discharges from storm water into MS4s must be reduced using a combination of management measures, including source control and an effective MS4 maintenance program implemented by each Copermittee.

Discussion of Finding D.3.e. When rain falls and drains freeways, industries, construction sites, and neighborhoods, it picks up a multitude of pollutants. Gravity flow transports the pollutants to the MS4. Illicit discharges and connections also can contribute a significant amount of pollutants to MS4s. MS4s are commonly designed to convey their contents as quickly as possible. Due to the resulting typically high flow rates within the concrete conveyance systems of MS4s, pollutants which enter or are deposited in the MS4 and not removed are generally flushed unimpeded through the MS4 to waters of the United States. Since treatment generally does not occur within the MS4, in such cases reduction of storm water pollutants to the MEP must occur prior to discharges entering the MS4.

The importance of this concept is supported by the tons of wastes/pollutants that have been removed from the Copermittees' MS4s as reported in their ROWD.[131] Moreover, these pollutants will be discharged into receiving waters unless an effective MS4 and structural treatment BMP maintenance program is implemented by the Copermittees. The requirement for Copermittees to conduct a MS4 maintenance program is specifically directed in both the Phase I and Phase II storm water regulations. Regarding MS4 cleaning, USEPA states "The removal of sediment, decaying debris, and highly polluted water from catch basins has aesthetic and water quality benefits, including reducing foul odors, reducing suspended solids, and reducing the load of

[129] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68765-68766.
[130] United State District Court, Western District of Washington at Tacoma, Case No. C08-5722RJB, Order on Motions for Partial Summary Judgment, dated June 7, 2010.
[131] Riverside County Copermittees. 2009. Report of Waste Discharge (San Diego Region).

oxygen-demanding substances that reach receiving waters."[132] It goes on to say, "Catch basin cleaning is an efficient and cost-effective method for preventing the transport of sediment and pollutants to receiving water bodies." USEPA also finds that "Lack of maintenance often limits the effectiveness of storm water structural controls such as detention/retention basins and infiltration devices. […] The proposed program should provide for maintenance logs and identify specific maintenance activities for each class of control, such as removing sediment from retention ponds every five years, cleaning catch basins annually, and removing litter from channels twice a year."[133]

Finding D.3.f. Enforcement of local runoff related ordinances, permits, and plans is an essential component of every runoff management program and is specifically required in the federal storm water regulations and this Order. Each Copermittee is individually responsible for adoption and enforcement of ordinances and/or policies, implementation of identified control measures/BMPs needed to prevent or reduce pollutants in storm water runoff, and for the allocation of funds for the capital, operation and maintenance, administrative, and enforcement expenditures necessary to implement and enforce such control measures/BMPs under its jurisdiction. Education is an important aspect of every effective runoff management program and the basis for changes in behavior at a societal level. Education of municipal planning, inspection, and maintenance department staffs is especially critical to ensure that in-house staffs understand how their activities impact water quality, how to accomplish their jobs while protecting water quality, and understand their specific roles and responsibilities for compliance with this Order. Public education, designed to target various urban land users and other audiences, is also essential to inform the public of how individual actions affect receiving water quality and how adverse effects can be minimized.

Discussion of Finding D.3.f. The Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(A – D) are clear in placing responsibility on municipalities for control of runoff from third party activities and land uses to their MS4.[134] In order for municipalities to assume this responsibility, they must implement ordinances, permits, and plans addressing runoff from third parties. Assessments for compliance with their ordinances, permits, and plans are essential for a municipality to ensure that third parties are not causing the municipality to be in violation of its municipal storm water permit. When conditions of non-compliance are determined, enforcement is necessary to ensure that violations of municipality ordinances and permits are corrected. When the Copermittees determine a violation of its storm water ordinance, it must pursue correction of the violation. Without enforcement, third parties do not have incentive to correct violations. USEPA supports enforcement by municipalities when it states "Effective inspection and enforcement requires […] penalties to deter

[132] USEPA, 1999. Storm Water O&M Fact Sheet, Catch Basin Cleaning. EPA 832-F-99-011.
[133] USEPA, 1992. Guidance Manual for the Preparation of Part II of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems. EPA 833-B-92-002.
[134] USEPA, 2000. EPA Administered Permit Programs: The National Pollutant Discharge Elimination System. Code of Federal Regulations, Vol. 40, Part 122.

infractions and intervention by the municipal authority to correct violations. Enforcement mechanisms […] also must be described."[135]

Education is a critical BMP and an important aspect of runoff management programs. USEPA finds that "An informed and knowledgeable community is critical to the success of a storm water management program since it helps ensure the following: Greater support for the program as the public gains a greater understanding of the reasons why it is necessary and important, [and] greater compliance with the program as the public becomes aware of the personal responsibilities expected of them and others in the community, including the individual actions they can take to protect or improve the quality of area waters."[136]

Regarding target audiences, USEPA also states "The public education program should use a mix of appropriate local strategies to address the viewpoints and concerns of a variety of audiences and communities, including minority and disadvantaged communities, as well as children."

Finding D.3.g. Public participation during the development of runoff management programs is necessary to ensure that all stakeholder interests and a variety of creative solutions are considered.

Discussion of Finding D.3.g. This finding is supported by the Phase II Storm Water Regulations, which state "early and frequent public involvement can shorten implementation schedules and broaden public support for a program." USEPA goes on to explain, "Public participation is likely to ensure a more successful storm water program by providing valuable expertise and a conduit to other programs and governments."[137]

Finding D.3.h. Retrofitting existing development with storm water treatment controls, including LID, is necessary to address storm water discharges from existing development that may cause or contribute to a condition of pollution or a violation of water quality standards. Although SSMP BMPs are required for redevelopment, the current rate of redevelopment will not address water quality problems in a timely manner. Cooperation with private landowners is necessary to effectively identify, implement, and maintain retrofit projects for the preservation, restoration, and enhancement of water quality.

Discussion of Finding D.3.h. Existing BMPs are not sufficient to protect the Beneficial Uses of receiving waters from storm water MS4 discharges, as evidenced by 303(d) listings and exceedances of Water Quality Objectives from the Copermittees' monitoring reports. As recognized in USEPA guidance, waters in the region cannot be protected without also addressing degradation caused by storm

[135] USEPA, 1992. Guidance Manual for the Preparation of Part II of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems. EPA/833-B-92-002.
[136] USEPA, 2000. Storm Water Phase II Compliance Assistance Guide. EPA 833-R-00-002.
[137] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68755.

water discharges from existing development. This requires more than just a new development and redeveloped sites program, which at best can only hold the line. For this reason USEPA recommends that storm water programs include a retrofit plan or program for retrofitting existing development.[138]

Implementing more advanced BMPs, including the retrofitting of existing development with LID BMPs, is part of the iterative process. Based on the current rate of redevelopment compared to existing BMPs, the use of LID only on new and redevelopment will not adequately address current water quality problems, including downstream hydromodification. Retrofitting existing development is practicable for a municipality through a systematic evaluation, prioritization and implementation plan focused on impaired water bodies, pollutants of concern, areas of downstream hydromodification, feasibility and effective communication and cooperation with private property owners.

To actually improve the quality of receiving waters, discharges from existing developed sites need to be mitigated, which generally means implementation of measures to retrofit existing development sites with storm water control measures that can retain and/or treat storm water on site. Retrofitting existing development is possible and reasonable to significantly improve water quality in receiving waters.

Successful retrofitting programs have been implemented in such diverse locations as Seattle, Washington[139]; Portland, Oregon[140], Santa Monica, California[141]; Kansas City, Kansas[142]; and Montgomery County, MD[143]. When appropriately applied as in this Order, retrofitting existing development meets MEP.

Finding D.4.a. Since runoff within a watershed can flow from and through multiple land uses and political jurisdictions, watershed-based runoff management can greatly enhance the protection of receiving waters. Such management provides a means to focus on the most important water quality problems in each watershed. By focusing on the most important water quality problems, watershed efforts can maximize protection of beneficial use in an efficient manner. Effective watershed-based runoff management actively reduces pollutant discharges and abates pollutant sources causing or contributing to watershed water quality problems. Watershed-based runoff management that does not actively reduce pollutant discharges and abate pollutant sources causing or contributing to watershed water quality problems can necessitate implementation of the iterative process outlined in section A.3 of the this Order. Watershed management of runoff does not require Copermittees to expend resources outside of their jurisdictions. In some cases, however, this added flexibility provides more, and possibly more effective, alternatives for minimizing waste discharges.

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[138] USEPA, 2010. MS4 Permit Improvement Guide. EPA 833-R-10-001.
[139] SEA Street, http://www.seattle.gov/dpd/Planning/CityDesign/What_We_Do/Outreach/Folio/DPDS_008014.asp
[140] Clean River Rewards, http://www.portlandonline.com/BES/index.cfm?c=edeef
[141] City of Santa Monica, Urban Runoff program, http://www.smgov.net/Departments/OSE/categories/content.aspx?id=4007
[142] 10,000 Rain Gardens, http://www.rainkc.com/
[143] Rainscapes, http://www.montgomerycountymd.gov/Content/DEP/Rainscapes/home.html

Watershed management requires the Copermittees within a watershed to develop a watershed-based management strategy, which can then be implemented on a jurisdictional basis.

Discussion of Finding D.4.a. In recent years, addressing water quality issues from a watershed perspective has increasingly gained attention. Regarding watershed-based permitting, the USEPA *Watershed-Based NPDES Permitting Policy Statement* issued on Jan. 7, 2004 states the following:

> USEPA continues to support a holistic watershed approach to water quality management. The process for developing and issuing NPDES permits on a watershed basis is an important tool in water quality management. USEPA believes that developing and issuing NPDES permits on a watershed basis can benefit all watershed stakeholders, from the NPDES permitting authority to local community members. A watershed-based approach to point source permitting under the NPDES program may serve as one innovative tool for achieving new efficiencies and environmental results. USEPA believes that watershed-based permitting can:
>
> - Lead to more environmentally effective results;
> - Emphasize measuring the effectiveness of targeted actions on improvements in water quality;
> - Provide greater opportunities for trading and other market based approaches;
> - Reduce the cost of improving the quality of the nation's waters;
> - Foster more effective implementation of watershed plans, including total maximum daily loads (TMDLs); and
> - Realize other ancillary benefits beyond those that have been achieved under the CWA (e.g., facilitate program integration including integration of Clean Water Act and Safe Drinking Water Act programs).
>
> Watershed-based permitting is a process that ultimately produces NPDES permits that are issued to point sources on a geographic or watershed basis. In establishing point source controls in a watershed-based permit, the permitting authority may focus on watershed goals, and consider multiple pollutant sources and stressors, including the level of nonpoint source control that is practicable. In general, there are numerous permitting mechanisms that may be used to develop and issue permits within a watershed approach.

This USEPA guidance is in line with State Water Board and San Diego Water Board watershed management goals. For example, the State Water Board's TAC recommends watershed-based water quality protection, stating "Municipal permits should have watershed specific components." The TAC further recommends that "All NPDES permits and Waste Discharge Requirements should be considered for reissuance on a watershed basis."

In addition, the Basin Plan states that "public agencies and private organizations concerned with water resources have come to recognize that a comprehensive evaluation of pollutant contributions on a watershed scale is the only way to realistically assess cumulative impacts and formulate workable strategies to truly protect our water resources. Both water pollution and habitat degradation problems can best be solved by following a basin-wide approach."

In light of USEPA's policy statement and the State Water Board's and San Diego Water Board's watershed management goals, the San Diego Water Board seeks to expand watershed management in the regulation of runoff from the MS4. Watershed-based MS4 permits can provide for more effective receiving water quality protection by focusing on specific water quality problems. The entire watershed for the receiving water can be assessed, allowing for critical areas and practices to be targeted for corrective actions. Known sources of pollutants of concern can be investigated for potential water quality impacts. Problem areas can then be addressed, leading to eventual improvements in receiving water quality. Management of runoff on a watershed basis allows for specific water quality problems to be targeted so that efforts result in maximized water quality improvements.[144]

Finding D.4.b. Some runoff issues, such as general education and training, can be effectively addressed on a regional basis. Regional approaches to runoff management can improve program consistency and promote sharing of resources, which can result in implementation of more efficient programs.

Discussion of Finding D.4.b. Copermittees in Riverside County participate in several runoff-related activities whose scope extends beyond the area subject to this Order. These include countywide activities (e.g., portions of Riverside County fall under the jurisdictions of the Santa Ana Water Board and California Regional Water Quality Control Board, Colorado River Region (Colorado River Water Board)), southern California, and statewide activities. Copermittees' participation in these regional activities is generally directed at improving management capability, preventing redundancy and taking advantage of economies of scale. For instance, Copermittees seek to develop consistency between watershed and/or jurisdictional programs (e.g., through standards development), and to collaborate on certain program activities such as education, training, and monitoring.

Finding D.4.c. It is important for the Copermittees to coordinate their water quality protection and land use planning activities to achieve the greatest protection of receiving water bodies. Copermittee coordination with other watershed stakeholders, especially the State of California Department of Transportation, the U.S. federal government, sovereign American Indian tribes, and water and sewer districts, is also important.

[144] San Diego Water Board, 2004. San Diego County Municipal Storm Water Permit Reissuance Analysis Summary. P. 1.

Discussion of Finding D.4.c. Conventional planning and zoning can be limited in their ability to protect the environmental quality of creeks, rivers, and other water bodies. Watershed-based planning is often ignored, despite the fact that receiving waters unite land by collecting runoff from throughout the watershed. Since watersheds unite land, they can be used as an effective basis for planning. Watershed-based planning enables local and regional areas to realize economic, social, and other benefits associated with growth, while conserving the resources needed to sustain such growth, including water quality.

This type of planning can involve four steps: (1) Identify the watersheds shared by the participating jurisdictions; (2) Identify, assess, and prioritize the natural, social, and other resources in the watersheds; (3) Prioritize areas for growth, protection, and conservation, based on prioritized resources; and (4) Develop plans and regulations to guide growth and protect resources. Local governments have started with simple, yet effective, steps toward watershed planning, such as adopting a watershed-based planning approach, articulating the basic strategy in their General Plans, and beginning to pursue the basic strategy in collaboration with neighboring local governments who share the watersheds. Examples of new mechanisms created to facilitate watershed-based planning and zoning include the San Francisquito Creek Watershed Coordinated Resource Management Process and the Santa Clara Basin Watershed Management Initiative.[145]

[145] Bay Area Stormwater Management Agencies Association., 1999. Start at the Source. Forbes Custom Publishing. Available on-line at: http://www.scvurppp-w2k.com/basmaa_satsm.htm

E. Statute and Regulatory Considerations

Finding E.1. The RWL language specified in this Order is consistent with language recommended by the USEPA and established in State Water Board Order WQ-99-05, *Own Motion Review of the Petition of Environmental Health Coalition to Review Waste Discharge Requirements Order No. 96-03, NPDES Permit No. CAS0108740*, adopted by the State Water Board on June 17, 1999. The RWL language in this Order requires compliance with water quality standards, which for storm water discharges is to be achieved through an iterative approach requiring the implementation of improved and better-tailored BMPs over time. Compliance with receiving water limitations based on applicable water quality standards is necessary to ensure that MS4 discharges will not cause or contribute to violations of water quality standards and the creation of conditions of pollution, contamination, or nuisance.

Discussion of Finding E.1. The RWL language in the Order requires storm water compliance with water quality standards through an iterative approach for implementing improved and better-tailored BMPs over time. The iterative BMP process requires the implementation of increasingly stringent BMPs until receiving water quality standards are achieved. This is necessary because implementation of BMPs alone cannot ensure attainment of receiving water quality standards. For example, a BMP that is effective in one situation may not be applicable in another. An iterative process of BMP development, implementation, and assessment is needed to promote consistent compliance with receiving water quality objectives. If assessment of a given BMP confirms that the BMP is ineffective, the iterative process should be restarted, with redevelopment of a new BMP that is anticipated to result in compliance with receiving water quality objectives.

The issue of whether storm water discharges from MS4s must meet water quality standards has been intensely debated in past years. The argument arises because CWA section 402(p) fails to clearly state that municipal dischargers of storm water must meet water quality standards. On the issue of industrial discharges of storm water, the statute clearly indicates that industrial dischargers must meet both (1) the technology-based standard of “best available technology economically achievable (BAT)” and (2) applicable water quality standards. On the issue of municipal discharges however, the statute states that municipal dischargers must meet (1) the technology-based standard of MEP” and (2) “such other provisions that the Administrator or the State determines appropriate for the control of such pollutants.” The statute fails, however, to specifically state that municipal dischargers must meet water quality standards.

As a result, the municipal storm water dischargers have argued that they do not have to meet water quality standards; and that they only are required to meet MEP for storm water. Environmental interest groups maintain that not only do MS4 discharges have to meet water quality standards, but that MS4 permits must also comply with numeric effluent limitations for the purpose of meeting water quality standards. On the issue of water quality standards, USEPA, the State Water Board, and the San Diego Water

Board have consistently maintained that MS4s must indeed comply with water quality standards. On the issue of whether water quality standards must be met by numeric effluent limitations, USEPA, the State Water Board (in Orders WQ 91-03 and WQ 91-04), and the San Diego Water Board have maintained that MS4 permits can contain narrative requirements for the implementation of BMPs in place of numeric effluent limitations for storm water discharges.[146]

In addition to relying on USEPA's legal opinion concluding that MS4s must meet MEP for storm water and water quality standards, the State Water Board also relied on the CWA's explicit authority for States to require "such other provisions that the Administrator or the State determines appropriate for the control of such pollutants" in addition to the technology-based standard of MEP for storm water discharges. To further support its conclusions that MS4 permit dischargers must meet water quality standards, the State Water Board relied on provisions of the CWC that specify that all waste discharge requirements must implement applicable Basin Plans and take into consideration the appropriate water quality objectives for the protection of beneficial uses.

The State Water Board first formally concluded that permits for MS4s must contain effluent limitations based on water quality standards in its Order WQ 91-03. In that Order, the State Water Board also concluded that it was appropriate for Regional Water Boards to achieve this result by requiring best management practices, rather than by inserting numeric effluent limitations into MS4 permits. Later, in Order WQ 98-01, the State Water Board prescribed specific precedent setting Receiving Water Limitations language to be included in all future MS4 permits. This language specifically requires that MS4 dischargers meet water quality standards and allows for the use of narrative BMPs (increasing in stringency and implemented in an iterative process) as the mechanism by which water quality standards can be met for storm water discharges.

In Order WQ 99-05, the State Water Board modified its receiving water limitations language in Order WQ 98-01 to meet specific objections by USEPA (the modifications resulted in stricter compliance with water quality standards). State Water Board Order WQ 99-05 states:

> "In Order WQ 98-01, the State Board ordered that certain receiving water limitation language be included in future municipal storm water permits. Following inclusion of that language in permits issued by the San Francisco Bay and San Diego Water Boards for Vallejo and Riverside respectively, the USEPA objected to the permits. The USEPA objection was based on the receiving water limitation language. The USEPA has now issued those permits itself and has included receiving water limitation language it deems appropriate.

[146] For the most recent assessment, see Storm Water Panel Recommendations to the California State Water Resources Control Board, 2006. *The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial, and Construction Activities.*

> In light of USEPA's objection to the receiving water limitation language in Order WQ 98-01 and its adoption of alternative language, the State Board is revising its instructions regarding receiving water limitation language for municipal storm water permits. It is hereby ordered that Order WQ 98-01 will be amended to remove the receiving water limitation language contained therein and to substitute the USEPA language. Based on the reasons stated here, and as a precedent decision, the following receiving water limitation language shall be included in future municipal storm water permits."

In the 1999 case involving MS4 permits issued by USEPA to several Arizona cities (*Defenders of Wildlife v. Browner*, 1999, 197 F. 3d 1035), the United States Court of Appeals for the Ninth Circuit upheld USEPA's requirement for MS4 dischargers to meet water quality standards, but it did so on the basis of USEPA's discretion rather than on the basis of strict compliance with the CWA. In other words, while holding that the CWA does not require all MS4 discharges to comply strictly with state water quality standards, the Court also held that USEPA has the authority to determine that ensuring strict compliance with state water quality standards is necessary to control pollutants. On the question of whether MS4 permits must contain numeric effluent limitations, the court upheld USEPA's use of iterative BMPs in place of numeric effluent limitations for storm water discharges.

On October 14, 1999, the State Water Board issued a legal opinion on the federal appellate decision and provided advice to the Regional Water Boards on how to proceed in the future. In the memorandum, the State Water Board concludes that the recent Ninth Circuit opinion upholds the discretion of USEPA and the State to (continue to) issue storm water permits to MS4s that require compliance with water quality standards through iterative BMPs. Moreover, the memorandum states that "[…] because most MS4 discharges enter impaired water bodies, there is a real need for permits to include stringent requirements to protect those water bodies. As TMDLs are developed, it is likely that MS4s will have to participate in pollutant load reductions, and the MS4 permits are the most effective vehicles for those reductions." In summary, the State Water Board found that the Regional Water Boards should continue to include the RWL established in State Water Board Order WQ 99-05 in all future permits.

The issue of the RWLs language was also central to the Building Industry Association's (BIA's) (and others') appeal of San Diego Water Board Order No. 2001-01 (San Diego MS4 permit), which was used as a template for San Diego Water Board Order No. R9-2002-0001 (Orange County MS4 permit). BIA contended that the storm water MEP standard was a ceiling on what could be required of the Copermittees in implementing their runoff management programs, and that Order No. 2001-01's receiving water limitations requirements exceeded that ceiling. In other words, BIA argued that the Copermittees could not be required to comply with receiving water limitations if they necessitated efforts which went beyond the MEP standard. Again, the courts upheld the San Diego Water Board's discretion to require compliance with water quality standards in municipal storm water permits, without limitation. The Court

of Appeal, Fourth Appellate District found that the San Diego Water Board has "the authority to include a permit provision requiring compliance with water quality standards."[147] On further appeal by BIA, the California State Supreme Court declined to hear the matter.

While implementation of the iterative BMP process is a means to achieve compliance with water quality objectives for storm water MS4 discharges, it does not shield the discharger from enforcement actions for continued non-compliance with water quality standards. Consistent with USEPA guidance,[148] regardless of whether or not an iterative process is being implemented, discharges that cause or contribute to a violation of water quality standards are in violation of Order No. R9-2010-0016.

Finding E.2. The Basin Plan, identifies the following existing and potential beneficial uses for surface waters in Riverside County: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Process Supply (PROC), Hydropower Generation (POW), Industrial Service Supply (IND), Ground Water Recharge (GWR), Contact Water Recreation (REC1), Non-contact Water Recreation (REC2), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Spawning, Reproduction and/or Early Development (SPWN) and Preservation of Biological Habitats of Special Significance (BIOL).

Discussion of Finding E.2. The southwestern portion of Riverside County is within the San Diego Region. The Riverside County portion of the San Diego Region falls within Santa Margarita Hydrologic Unit. The major streams within the Riverside County portion of the Santa Margarita Hydrologic Unit are the Santa Margarita River, Temecula Creek, and Murrieta Creek. Other surface water bodies include De Luz Creek, Sandia Canyon Creek, Warm Springs Creek, San Gertrudis Creek, and Wilson Creek. Major inland water bodies include Lake Skinner and Vail Lake.

The Riverside County portion of the Santa Margarita Hydrologic Unit includes unincorporated portions of Riverside County, the Cities of Menifee, Murrieta, Temecula, and Wildomar..

Based on the 2000 census, approximately 150,000 people resided within the permitted area. Since the 2000 census, however, several new developments, especially in the Cities of Temecula and Murrieta have increased the housing stock of the area, and the population is now significantly higher. As of January 1, 2009, approximately 250,000 people reside in the permitted area, with approximately 30,000 people living in the unincorporated area of Riverside County (31,163) and approximately 220,000 living in the Cities of Menifee (613), Murrieta (99,574), Temecula (102,604), and Wildomar (22,240).[149]

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[147] Building Industry Association et al., v. State Water Resources Control Board, et al. 2004.
[148] USEPA, 1998. Jan. 21, 1998 correspondence, "State Board/OCC File A-1041 for Orange County," from Alexis Strauss to Walt Petit, and March 17, 1998 correspondence from Alexis Strauss to Walt Petit.
[149] Fiscal Year 2008-2009 Santa Margarita Watershed Annual Progress Report

Finding E.3. This Order is in conformance with State Water Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality Waters in California*, and the federal Antidegradation Policy described in 40 CFR 131.12.

Discussion of Finding E.3. Runoff management programs are required to be designed to reduce pollutants in storm water MS4 discharges to the maximum extent practicable and achieve compliance with water quality standards. Therefore, implementation of runoff management programs, which satisfy the requirements of Order No. R9-2010-0016, will prevent violations of receiving water quality standards. The Basin Plan states that "Water quality objectives must […] conform to US EPA regulations covering antidegradation (40 CFR 131.12) and State Water Board Resolution No. 68-16, Statement of Policy with Respect to Maintaining High Quality of Waters in California." As a result, when water quality standards are met, USEPA and State Water Board antidegradation policy requirements are also met.

Finding E.4. Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states with approved coastal zone management programs to address non-point pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point pollution: agriculture, silviculture, urban, marinas, and hydromodification. This NPDES permit addresses the management measures required for the urban category, with the exception of septic systems. The adoption and implementation of this NPDES permit relieves the Copermittee from developing a non-point source plan, for the urban category, under CZARA. The San Diego Water Board addresses septic systems through the administration of other programs.

Discussion of Finding E.4. Coastal states are required to develop programs to protect coastal waters from nonpoint source pollution, as mandated by the federal CZARA. CZARA section 6217 identifies polluted runoff as a significant factor in coastal water degradation, and requires implementation of management measures and enforceable policies to restore and protect coastal waters. In lieu of developing a separate NPS program for the coastal zone, California's NPS Pollution Control Program was updated in 2000 to address the requirements of both the CWA section 319 and the CZARA section 6217 on a statewide basis. The California Coastal Commission (CCC), the State Water Board, and the nine Regional Water Boards are the lead State agencies for upgrading the program, although 20 other State agencies also participate. Pursuant to the CZARA (section 6217(g)) Guidance Document the development of runoff management programs pursuant to this NPDES permit fulfills the need for cities within watersheds that discharge to the coastal zone to develop an runoff non-point source plan identified in the State's Non-point Source Program Strategy and Implementation Plan.[150]

[150] State Water Board/CCC, 2000. Nonpoint Source Program Strategy and Implementation Plan, 1998-2013 (PROSIP).

Finding E.5. Section 303(d)(1)(A) of the CWA requires that "Each state shall identify those waters within its boundaries for which the effluent limitations…are not stringent enough to implement any water quality standard (WQS) applicable to such waters." The CWA also requires states to establish a priority ranking of impaired waterbodies known as Water Quality Limited Segments and to establish Total Maximum Daily Loads (TMDLs) for such waters. This priority list of impaired waterbodies is called the Section 303(d) List. The 2006 303(d) List was approved by the State Water Board on October 25, 2006. On June 28, 2007 the 2006 303(d) List for California was given final approval by the USEPA. The 303(d) List was recently updated, and on December 16, 2009 the 2008 303(d) List was approved by the San Diego Water Board. The 2008 303(d) List for the San Diego Region was approved by the State Water Board on August 4, 2010. The 2008 303(d) List is awaiting USEPA approval.

Discussion of Finding E.5. Section 303(d) of the federal CWA (CWA, 33 USC 1250, et seq., at 1313(d)), requires States to identify waters that do not meet water quality standards after applying certain required technology-based effluent limits ("impaired" water bodies). States are required to compile this information in a list and submit the list to USEPA for review and approval. This list is known as the Section 303(d) list of impaired waters, or 303(d) List. As part of this listing process, States are required to prioritize waters/watersheds for future development of TMDLs. The State Water Board and Regional Water Boards have ongoing efforts to monitor and assess water quality, to prepare the 303(d) List, to prioritize waters/watersheds for TMDL development, and to subsequently develop TMDLs. TMDLs developed and adopted by the San Diego Water Board are incorporated into the Basin Plan via a Basin Plan Amendment as authorized under CWC section 13240.

The 2006 California 303(d) List identifies impaired receiving water bodies and their watersheds within the State of California.[151] The San Diego Water Board recently updated the 303(d) List for the San Diego Region and adopted the 2008 303(d) List on December 16, 2009.[152] The number of water bodies listed as impaired in the Riverside County portion of the Santa Margarita Hydrologic Unit increased from 6 water bodies (13 water body / impairing pollutant combinations) on the 2006 303(d) List to 9 water bodies (49 water body / impairing pollutant combinations) on the 2008 303(d) List, indicating the receiving water quality has been degraded further (see Table 2). Storm water and non-storm water runoff that is discharged from the Copermittees' MS4s is a leading cause of receiving water quality impairment in the San Diego Region.

Finding E.6. This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following. First, this Order implements federally mandated requirements under CWA § 402. (33 U.S.C. §

[151] The approved 2006 Clean Water Act Section 303(d) List of Water Quality Limited Segments is on-line at: http://www.waterboards.ca.gov/tmdl/303d_lists2006.html.
[152] The 2008 Clean Water Act Section 303(d) List of Water Quality Limited Segments, approved by the San Diego Water Board and State Water Board, is available on-line at http://www.swrcb.ca.gov/rwqcb9/water_issues/programs/303d_list/index.shtml

1342(p)(3)(B).) Second, the local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental and new dischargers who are issued NPDES permits for storm water and non-storm water discharges. Third, the local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order. Fourth, the Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA § 301, subdivision (a) (33 U.S.C. § 1311(a)) and in lieu of numeric restrictions on their MS4 discharges (i.e. effluent limitations). Fifth, the local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under State law predates the enactment of Article XIIIB, Section (6) of the California Constitution. Likewise, the provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards. (33 U.S.C. sec. 1313(d).) Once the UUSEPA or a state develops a TMDL, federal law requires that permits must contain effluent limitations consistent with the assumptions of any applicable wasteload allocation. (40 C.F.R. sec. 122.44(d)(1)(vii)(B).)

Discussion of Finding E.6. This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following. First, this Order implements federally mandated requirements under CWA section 402, subdivision (p)(3)(B). (33 U.S.C. § 1342(p)(3)(B).) This includes federal requirements to effectively prohibit non-storm water discharges, to reduce the discharge of pollutants in storm water to the maximum extent practicable, and to include such other provisions as the Administrator or the State determines appropriate for the control of such pollutants. Federal cases have held these provisions require the development of permits and permit provisions on a case-by-case basis to satisfy federal requirements. (Natural Resources Defense Council, Inc. v. U.S. E.P.A. (9th Cir. 1992) 966 F.2d 1292, 1308, fn. 17.)

The authority exercised under this Order is not reserved state authority under the CWA's savings clause (cf. Burbank v. State Water Resources Control Bd. (2005) 35 Cal.4th 613, 627-628 [relying on 33 U.S.C. § 1370, which allows a state to develop requirements which are not "less stringent" than federal requirements]), but instead, is part of a federal mandate to develop pollutant reduction requirements for municipal separate storm sewer systems. To this extent, it is entirely federal authority that forms the legal basis to establish the permit provisions. (See, City of Rancho Cucamonga v. Regional Water Quality Control Bd.-Santa Ana Region (2006) 135 Cal.App.4th 1377, 1389; Building Industry Ass'n of San Diego County v. State Water Resources Control Bd. (2004) 124 Cal.App.4th 866, 882-883.)

Second, the local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental dischargers who are issued NPDES permits for storm water discharges. With a few

inapplicable exceptions, the CWA regulates the discharge of pollutants from point sources (33 U.S.C. § 1342) and the Porter-Cologne regulates the discharge of waste (CWC § 13263), both without regard to the source of the pollutant or waste. As a result, the "costs incurred by local agencies" to protect water quality reflect an overarching regulatory scheme that places similar requirements on governmental and nongovernmental dischargers. (See County of Los Angeles v. State of California (1987) 43 Cal.3d 46, 57-58 [finding comprehensive workers compensation scheme did not create a cost for local agencies that was subject to state subvention].)

The CWA and the Porter-Cologne Water Quality Control Act largely regulate storm water with an even hand, but to the extent there is any relaxation of this even-handed regulation, it is in favor of the local agencies. Except for municipal separate storm sewer systems, the CWA requires point source dischargers, including discharges of storm water associated with industrial or construction activity, to comply strictly with water quality standards. (33 U.S.C. § 1311(b)(1)(C), Defenders of Wildlife v. Browner (1999) 191 F.3d 1159, 1164-1165 [noting that industrial storm water discharges must strictly comply with water quality standards].) As discussed in prior State Water Board decisions, this Order does not require strict compliance with water quality standards. (State Water Board Order WQ 2001-15, p. 7.) The Order, therefore, regulates the discharge of waste in municipal storm water more leniently than the discharge of waste from non-governmental sources.

Third, the local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order. The fact sheet demonstrates that numerous activities contribute to the pollutant loading in the municipal separate storm sewer system. Local agencies can levy service charges, fees, or assessments on these activities, independent of real property ownership. (See, e.g., Apartment Ass'n of Los Angeles County, Inc. v. City of Los Angeles (2001) 24 Cal.4th 830, 842 [upholding inspection fees associated with renting property].) The ability of a local agency to defray the cost of a program without raising taxes indicates that a program does not entail a cost subject to subvention. (County of Fresno v. State of California (1991) 53 Cal.3d 482, 487-488.)

Fourth, the Copermittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in CWA section 301, subdivision (a) (33 U.S.C. § 1311(a)) and in lieu of numeric effluent limitations on their storm water discharges. To the extent, the local agencies have voluntarily availed themselves of the permit, the program is not a state mandate. (Accord County of San Diego v. State of California (1997) 15 Cal.4th 68, 107-108.) Likewise, the Copermittees have voluntarily sought a program-based municipal storm water permit in lieu of a numeric limitations approach on their storm water discharge. (See City of Abilene v. U.S. E.P.A. (5th Cir. 2003) 325 F.3d 657, 662-663 [noting that municipalities can choose between a management permit or a permit with numeric limitations].) The local agencies' voluntary decision to file a report of waste discharge proposing a program-based permit is a voluntary decision not subject to subvention. (See Environmental Defense Center v. USEPA (9th Cir. 2003) 344 F.3d 832, 845-848.)

Fifth, the local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under state law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

The San Diego Water Board recognizes that the Commission on State Mandates recently found that certain provisions within two municipal storm water permits constituted reimbursable state mandates within the meaning of the California Constitution. The Commission did not determine the validity of those provisions; it only determined that the State must reimburse the claimants for the costs of implementing those provisions. The decisions directly affect only the municipal storm water permits identified in the two test claims. That is, the effect of the decisions is limited to the provisions of Los Angeles Water Board Order 01-182 and San Diego Order R9-2007-0001 identified by the Commission as reimbursable state mandates. No other municipal storm water permits or provisions therein are directly affected by the decisions and the San Diego Water Board is not precluded from adopting similar or identical provisions in the Tentative Order. Subsequent proceedings before the Commission to determine the local governments entitled to reimbursement and the amount of reimbursement are underway before the Commission. Separately, the State Water Board and San Diego and Los Angeles Water Boards have challenged these decisions in court.

Finding E.7. Runoff treatment and/or mitigation must occur prior to the discharge of runoff into receiving waters. Treatment BMPs must not be constructed in waters of the U.S. or State unless the runoff flows are sufficiently pretreated to protect the values and functions of the water body. Federal regulations at 40 CFR 131.10(a) state that in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S. Authorizing the construction of a runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to accepting waste assimilation as an appropriate use for that water body. Furthermore, the construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body. Without federal authorization (e.g., pursuant to CWA § 404), waters of the U.S. may not be converted into, or used as, waste treatment or conveyance facilities. Similarly, waste discharge requirements pursuant to CWC §13260 are required for the conversion or use of waters of the State as waste treatment or conveyance facilities. Diversion from waters of the U.S./State to treatment facilities and subsequent return to waters of the U.S. is allowable, provided that the effluent complies with applicable NPDES requirements.

Discussion of Finding E.7. Runoff treatment and/or mitigation in accordance with any of the requirements in the Order must occur prior to the discharge of storm water into receiving waters. Allowing storm water polluted runoff to enter receiving waters prior to treatment to the MEP will result in degradation of the water body and potential

exceedances of water quality standards, from the discharge point to the point of dissipation, infiltration, or treatment. Furthermore, the construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body. This requirement is supported by federal regulation 40 CFR 131.10(a) and USEPA guidance. According to USEPA,[153] "To the extent possible, municipalities should avoid locating structural controls in natural wetlands. Before considering siting of controls in a natural wetland, the municipality should demonstrate that it is not possible or practicable to construct them in sites that do not contain natural wetlands. Practices should be used that settle solids, regulate flow, and remove contaminants prior to discharging storm water into a wetland."

Additional Federal guidance discusses the implementation of wetlands to treat municipal storm water discharges (USEPA, 2000. *Guiding Principles for Constructed Treatment Wetlands: Providing for Water Quality and Wildlife Habitat*). It states:

> *"..treatment wetlands should not be constructed in a waters of the U.S. unless you can sufficiently pretreat the stormwater flows to protect the values and functions of the waters of the U.S. Because storm water is an unpredictable effluent source and can contain high levels of toxic substances, nutrients, and pathogens, we strongly encourage that you construct the treatment wetland in uplands and use best management practices in these projects."*[154]

Consistent with USEPA guidance, the conversion or use of waters of the U.S./State into runoff treatment facilities or conveyance facilities for untreated storm water discharges must be appropriately reviewed by both Federal and State resource agencies. Such projects may be subject to federal permitting pursuant to CWA section 404 if discharges of dredged or fill material is involved.

The placement of hydromodification controls within waters of the U.S./State may also be subject to federal and/or state permitting, but would not necessarily be considered a pollutant treatment BMP. Provided that grade control structures are designed to re-establish a natural channel gradient and correct excessive changes to the sediment transport regime caused by urbanization, rather than to create a series of artificial hydrological impoundments for the purpose of treating pollution, this type of project is not considered an in-stream treatment BMP.

Finding E.8. The issuance of waste discharge requirements and an NPDES permit for the discharge of runoff from MS4s to waters of the U.S. is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 et seq.) in accordance with the CWC section 13389.

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[153] USEPA, 1992. Guidance Manual for the Preparation of Part II of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems. EPA 833-B-92-002.
[154] USEPA, 2000. Guiding Principles for Constructed Treatment Wetlands: Providing for Water Quality and Wildlife Habitat, (EPA 843-B-00-003).

Discussion of Finding E.8. CWC section 13389 exempts the adoption of waste discharge requirements (such as NPDES permits) from CEQA requirements: "Neither the State Water Board nor the Regional Water Boards shall be required to comply with the provisions of Chapter 3 (commencing with section 21100) of Division 13 of the Public Resources Code prior to the adoption of any waste discharge requirement, except requirements for new sources as defined in the Federal Water Pollution Control Act or acts amendatory thereof or supplementary thereto."

This CEQA exemption was challenged during BIA's (and others') appeal of Order No. 2001-01. BIA contended that the CEQA exemption did not apply to permit requirements where the San Diego Water Board utilized its discretion to craft permit requirements which were more prescriptive than required by federal law. The Court of Appeal, Fourth Appellate District disagreed with this argument, stating "we also reject Building Industry's argument to the extent it contends the statutory CEQA exemption in CWC section 13389 is inapplicable to a particular NPDES permit provision that is discretionary, rather than mandatory, under the CWA."[155] On further appeal by BIA, the California State Supreme Court declined to hear the matter.

In a recent decision, the Court of Appeal of the State of California, Second Appellate District, upheld the CEQA exemption for municipal storm water NPDES permits (County of Los Angeles, et al. v. California State Water Resources Control Board, et al.).[156]

Finding E.9. Storm water discharges from developed and developing areas in Riverside County are significant sources of certain pollutants that cause, may be causing, threatening to cause or contributing to water quality impairment in the waters of Riverside County. Furthermore, as delineated in the CWA section 303(d) list in Table 2, the San Diego Water Board has found that there is a reasonable potential that municipal storm water and non-storm water discharges from MS4s cause or may cause or contribute to an excursion above water quality standards for the following pollutants: Indicator Bacteria (including Fecal Coliform and E. Coli), Copper, Manganese, Iron, Chlorpyrifos, Diazinon, Sulfates, Phosphorous, Nitrogen, Total Dissolved Solids (TDS), and Toxicity. In accordance with CWA section 303(d), the San Diego Water Board is required to establish TMDLs for these pollutants to these waters to eliminate impairment and attain water quality standards. Therefore, certain early pollutant control actions and further pollutant impact assessments by the Copermittees are warranted and required pursuant to this Order.

Discussion of Finding E.9. CWA section 303(d)(1)(A) requires that:

> "*Each state must identify those waters within its boundaries for which the effluent limitations…are not stringent enough to implement any water quality standard (WQS) applicable to such waters.*"

[155] Building Industry Association et al., v. State Water Resources Control Board, et al. 2004.
[156] Los Angeles County Super. Ct. No. BS080792. Partial publication dated November 6, 2006.

The CWA also requires states to establish a priority ranking of impaired water bodies known as Water Quality Limited Segments and to establish Total Maximum Daily Loads (TMDLs) for such waters. This priority list of impaired water bodies is called the 303(d) List. The current 303(d) List was approved by the State Water Board on October 25, 2006. On June 28, 2007 the 2006 303(d) List for California was given final approval by USEPA. Every two years the State of California is required by CWA section 303(d) and 40 CFR(130.7) to develop and submit to the USEPA for approval an updated 303(d) list of impaired water bodies. The San Diego Water Board recently updated the 303(d) List and adopted the 2008 303(d) List on December 16, 2009.[157] The 2008 303(d) List for the San Diego Region was approved by the State Water Board on August 4, 2010. The 2008 303(d) List is awaiting approval by the USEPA. The number of water bodies listed as impaired in the Riverside County portion of the Santa Margarita Hydrologic Unit increased from 6 water bodies (13 water body / pollutant combinations) on the 2006 303(d) List to 9 water bodies (49 water body / pollutant combinations) on the 2008 303(d) List, indicating the receiving water quality has been degraded further (see Table 2).

Multiple water bodies in Riverside County have been identified as impaired and placed on the 303(d) List. The 303(d) listing of a water body and subsequent TMDL development is required when regulations under current permits, such as Technology Based Effluent Limitations (TBELs), are not stringent enough to meet Water Quality Standards and protect the Beneficial Uses of Waters of the State.

Storm water discharges from developed and developing areas in Riverside County are a significant source of certain pollutants that cause, may be causing, threatening to cause, or contributing to water quality impairment in the waters of Riverside County. Furthermore, the CWA section 303(d) list indicates that there is a reasonable potential that municipal storm water and dry weather discharges from MS4s cause, or may cause, or contribute to an excursion above water quality standards for the following pollutants: Indicator Bacteria, Copper, Manganese, Iron, Chlorpyrifos, Sulfates, Phosphorous, Nitrogen, Total Dissolved Solids, Toxicity and Turbidity (see Table 2). In accordance with CWA section 303(d), the San Diego Water Board is required to establish TMDLs for these pollutants in these waters to eliminate impairment and attain water quality standards. Per 40 CFR(130.7), WLAs are required for all point sources, including storm water and non-storm water discharges from MS4s. Therefore, focused pollutant control actions and further pollutant impact assessments by the Copermittees are warranted and required pursuant to this Order.

MS4 Permits address only those TMDL WLAs that have been adopted by the San Diego Water Board and have been approved by the State Water Board, Office of Administrative Law (OAL) and USEPA. WLAs are portions of a receiving water's loading capacity that is allocated to one of its existing or future point sources of

[157] The 2008 Clean Water Act Section 303(d) List of Water Quality Limited Segments, approved by the San Diego Water Board and State Water Board, is available on-line at http://www.swrcb.ca.gov/rwqcb9/water_issues/programs/303d_list/index.shtml

pollution. To date, no TMDLs and WLAs have been adopted to address impaired water bodies in the Riverside County portion of the Santa Margarita Hydrologic Unit. When TMDLs and WLAs are adopted and approved, they will be incorporated into the MS4 permit. The TMDL WLAs in MS4 Permits can be addressed using water quality-based numeric effluent limitations (WQBELs) calculated at end-of-pipe. WQBELs must be consistent with the assumptions and requirements of the WLAs.[158]

Finding E.10. This Order requires each Copermittee to effectively prohibit all types of unauthorized discharges of non-storm water into its MS4. However, historically pollutants have been identified as present in dry weather non-storm water discharges from the MS4s through 303(d) listings, monitoring conducted by the Copermittees under Order No. R9-2004-001, and there are others expected to be present in dry weather non-storm water discharges because of the nature of these discharges. This Order includes action levels for pollutants in non-storm water, dry weather discharges from the MS4. The non-storm water action levels are designed to ensure that the Order's requirement to effectively prohibit all types of unauthorized discharges of non-storm water into the MS4 is being complied with. Non-storm water action levels in the Order are based upon numeric or narrative water quality objectives and criteria as outlined in the Basin Plan, the State Water Board's Water Quality Control Plan for Ocean Waters of California (Ocean Plan), and State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP). An exceedance of an action level requires specified responsive action by the Copermittees. This Order describes what actions the Copermittees must take when an exceedance of an action level is observed. Exceedances of non-storm water action levels do not alone constitute a violation of this Order but could indicate non-compliance with the requirement to effectively prohibit all types of unauthorized non-storm water discharges into the MS4 or other prohibitions established in this Order. Failure to undertake required source investigation and elimination action following an exceedance of a non-storm water action level (NAL or action level) is a violation of this Order. The San Diego Water Board recognizes that use of action levels will not necessarily result in detection of all unauthorized sources of non-storm water discharges because there may be some discharges in which pollutants do not exceed established action levels. However, establishing NALs at levels appropriate to protect water quality standards is expected to lead to the identification of significant sources of pollutants in dry weather non-storm water discharges.

Discussion of Finding E.10. This Order includes the existing requirement that Copermittees effectively prohibit all types of unauthorized non-storm water discharges in the MS4s. It also includes the following prohibition set forth in the Basin Plan: "The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in CWC section 13050 is prohibited." (Prohibition A.1.) As discussed in the Order's Findings on discharge characteristics, e.g., C.2., C.4., C.6., C.7., C.9., C.14., and C.15., the Copermittees'

[158] Per 40 CFR 122.44(d)(1)(vii)(B)

reliance on BMPs for the past 20 years has not resulted in compliance with applicable water quality standards or compliance with the requirement to effectively prohibit all types of unauthorized discharges of non-storm water in the MS4. The San Diego Water Board has evaluated (in accordance with 40 CFR 122.44(d)(1)) past and existing control BMPs, non-storm water effluent monitoring results, the sensitivity of the species in receiving waters (e.g. endangered species), and the potential for effluent dilution, and has determined that existing BMPs to control pollutants in storm water discharges are not sufficient to protect water quality standards in receiving waters, and the existing requirement that Copermittees effectively prohibit all types of unauthorized non-storm water discharges into the MS4, historically results in the discharge of pollutants to the receiving waters.

Therefore it is appropriate to establish dry weather non-storm water action levels based upon established water quality standards to measure pollutants levels in the discharge of dry weather non-storm water that could indicate non-compliance with the requirement to effectively prohibit all types of unauthorized non-storm water discharges into the MS4 and/or that these discharges are causing, or threatening to cause, a condition of pollution, contamination or nuisance in the receiving waters. NALs are not numeric effluent limitations. While not alone a violation of this Order, an exceedance of an NAL requires the Copermittees to initiate a series of source investigation and elimination actions to address the exceedance. Results from the NAL monitoring are to be used in developing the Copermittees annual work plans. Failure to undertake required source investigation and elimination action following an exceedance of an NAL is a violation of this Order. Also refer to further discussion in the Directives section C of the Fact Sheet.

A purpose of monitoring, required under this and previous Orders, as stated in the Monitoring and Reporting Program is to “detect and eliminate illicit discharges and illicit connections to the MS4” and to answer the following core management questions:

1. Are conditions in receiving waters protective, or likely to be protective, of beneficial uses?
2. What is the extent and magnitude of the current or potential receiving water problems?
3. What is the relative MS4 discharge contribution to the receiving water problem(s)?
4. What are the sources of MS4 discharge that contribute to receiving water problem(s)?
5. Are conditions in receiving waters getting better or worse?

For the past 20 years, Copermittees have utilized their illicit connection / illicit discharge (IC/ID) program to identify and eliminate non-storm water discharges that are sources of pollutants to the MS4. The Copermittees are also subject to the requirement to effectively prohibit all types of unauthorized discharges of non-storm water into the MS4s. Historically, discharges of unauthorized non-storm water do

occur, resulting in the discharge of pollutants to the receiving water. NALs have been included in this Order to ensure that the Copermittees comply with the requirement to effectively prohibit all types of unauthorized non-storm water discharges that are a source of pollutants in the receiving waters.

Finding E.12. With this Order, the San Diego Water Board has completed the re-issuance of the fourth iteration of the Phase I MS4 NPDES Permits for the Copermittees in the portions of San Diego County, Orange County, and Riverside County within the San Diego Region. The NPDES Permit requirements issued to the Copermittees in each county have substantially the same core requirements such as discharge prohibitions, receiving water limitations, jurisdictional components, and monitoring. In addition, the Copermittees cooperate regionally to develop monitoring with the Southern California Stormwater Monitoring Coalition and to develop program effectiveness with the California Stormwater Quality Association. Regional programs could improve the Copermittees' compliance with other permit components such as development of the Hydromodification Management Plans and Retrofitting Existing Development with more consistent implementation and cost sharing. Re-issuing the NPDES Permit requirements within five years for three counties under three different permits requires the San Diego Water Board to expend significant time and resources for issuance of the permits through three separate public proceedings, thereby greatly reducing the time and resources available to oversee compliance. Multiple permits also create confusion for determining compliance among regulated entities, especially the land development community. The San Diego Water Board recognizes that issuing a single MS4 permit for all Phase I entities in the San Diego Region will provide consistent implementation, improve communication among agencies within watersheds crossing multiple jurisdictions, and minimize staff resources spent with each permit renewal. The San Diego Water Board plans to develop a single regional MS4 permit prior to the expiration of this Order that will transfer the Copermittees' enrollment to the regional permit upon expiration of this Order.

Discussion of Finding E.12. With the advances in storm water science and regulation in the last decade, the additional complexity has resulted in a more significant amount of San Diego Water Board staff time and resources required to complete each Phase I MS4 Permit renewal. On average, the renewal of the fourth iteration of the Phase I MS4 Permits for each county has taken approximately 2 years and multiple staff to complete. The time and resources required to complete each renewal has diverted staff time and resources away from the San Diego Water Board's ability to oversee and ensure compliance with the permit provisions and requirements.

With the adoption of this Order, all the Phase I MS4s in the San Diego Region (i.e. Copermittees of Orange County, Riverside County and San Diego County) will essentially be subject to the same set of core requirements. Because there are now more similarities than differences among the permit provisions and requirements, developing and issuing a single regionwide permit to the Phase I MS4 entities may be appropriate with the next (i.e. fifth) iteration of the Phase I MS4 Permits.

This approach would provide a consistent set of regulatory requirements throughout the San Diego Region, thereby reducing the confusion that is created with different sets of requirements between areas in close proximity to each other. A regional set of requirements for the discharge prohibitions, receiving water limitations, jurisdictional program components (i.e., new development, construction, existing development, retrofitting), hydromodification management plans, low impact development design requirements, and monitoring would also make it easier for the programs in the three counties to share and transfer information and program efficiencies, and cooperate on a regionwide basis. Regionwide consistency would be especially beneficial where there are multiple counties involved in implementing permit requirements, such as the Santa Margarita watershed with parts of San Diego County and Riverside County, regional TMDLs (e.g., beaches and creeks bacteria TMDLs), or regional monitoring efforts or studies (e.g., Southern California Stormwater Monitoring Coalition, Bight ’08).

An additional benefit would be the reduction of staff time and resources that will be required to renew future Phase I MS4 Permits, which would only be required once every 5 years for a single regionwide permit instead of once every 1 to 3 years for three separate permits. Because of these benefits, the San Diego Water Board plans to develop a single regional Phase I MS4 Permit with the next iteration of the San Diego County MS4 Permit, which will incorporate the Orange County and Riverside County Phase I MS4 entities upon the expiration of their respective permits, or sooner.

F. Public Process

Finding F.1. The San Diego Water Board has notified the Copermittees, all known interested parties, and the public of its intent to consider adoption of an Order prescribing waste discharge requirements that would serve to renew an NPDES permit for the existing MS4 discharges of pollutants to waters of the U.S.

Discussion of Finding F.1. Public notification of development of a draft permit is required under Federal regulation 40 CFR 124.10(a)(1)(ii). This regulation states "(a) Scope. (1) The Director shall give public notice that the following actions have occurred: (ii) A draft permit has been prepared under Sec. 124.6(d)." Public notifications "shall allow at least 30 days for public comment," as required under Federal regulation 40 CFR 124.10(b)(1).

Finding F.2. The San Diego Water Board has held a public hearing on November 10, 2010 and heard and considered all comments pertaining to the terms and conditions of this Order.

Discussion of Finding F.2. Public hearings are required under CWC section 13378, which states "Waste discharge requirements and dredged or fill material permits shall be adopted only after notice and any necessary hearing." Federal regulation 40 CFR 124.12(a)(1) also requires public hearings for draft permits, stating "The Director shall hold a public hearing whenever he or she finds, on the basis or requests, a significant degree of public interest in a draft permit(s)." Regarding public notice of a public hearing, Federal regulation 40 CFR 124.10(b)(2) states that "Public notice of a public hearing shall be given at least 30 days before the hearing."

IX. DIRECTIVES

This section discusses significant changes which have been made to the requirements of the Order from the requirements which were previously included in Order No. R9-2004-001. For each section of the Order than has been changed there is a discussion which describes the change that was made and provides the rationale for the change. In addition, comments on the Copermittees' ROWD recommendations, as they pertain to each changed requirement of the Order, are provided.

Requirements of the Order that are not discussed in this section have not been significantly changed from those requirements previously included in Order No. R9-2004-001. For such requirements, discussions and rationale for the requirements can be found in section VIII of the Fact Sheet/Technical Report for San Diego Water Board Order No. R9-2004-001, dated July 14, 2004. Section VIII also provides additional background information for those requirements that have undergone significant change which are described in detail in this report. The Fact Sheet/Technical Report is available for download at:

http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/rsd_stormwater.shtml

Legal authority citations are provided for each major section of the Order. These citations apply to all applicable requirements within the section for which they are provided.

A. Prohibitions and Receiving Water Limitations

The following legal authority applies to section A:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: The Water Quality Control Plan for the San Diego Basin (Basin Plan) contains the following waste discharge prohibition: "The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination, or nuisance as defined in CWC section 13050, is prohibited."

CWC section 13050(l) states "(1) 'Pollution' means an alteration of the quality of waters of the state by waste to a degree which unreasonably affects either of the following: (A) The water for beneficial uses. (B) Facilities which serve beneficial uses. (2) 'Pollution' may include "contamination."

CWC section 13050(k) states "Contamination' means an impairment of the quality of waters of the state by waste to a degree which creates a hazard to public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste, whether or not waters of the state are affected."

CWC section 13050(m) states "Nuisance' means anything which meets all of the following requirements: (1) Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. (2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. (3) Occurs during, or as a result of, the treatment or disposal of wastes."

CWC section 13241 requires each Regional Water Board to "establish such water quality objectives in water quality control plans as in its judgment will ensure the reasonable protection of beneficial uses and the prevention of nuisance […]."

CWC section 13243 provides that "A regional board, in a water quality control plan or in waste discharge requirements, may specify certain conditions or areas where the discharge of waste, or certain types of waste, will not be permitted."

CWC section 13263(a) provides that waste discharge requirements prescribed by the San Diego Water Board implement the Basin Plan.

Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(A - D) require municipalities to implement controls to reduce pollutants in storm water runoff from commercial, residential, industrial, and construction land uses or activities.

Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(A - D) require municipalities to have legal authority to control various discharges to their MS4.

Federal NPDES regulation 40 CFR 122.44(d)(1) requires municipal storm water permits to include any requirements necessary to "[a]cheive water quality standards established under section 303 of the CWA, including State narrative criteria for water quality."

Federal NPDES regulation 40 CFR 122.44(d)(1)(i) requires NPDES permits to include limitations to "control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines are or may be discharged at a level which will cause, have reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality."

Section A of the Order combines two previously distinct requirement sections – Prohibitions and Receiving Water Limitations. These sections have been combined into one section for organization purposes and to reduce redundancy, since both sections address the same issue. These changes have no net effect on the implementation and enforcement of the Order.

Section A.3 describes the "iterative process." The Copermittees must reduce the discharge of storm water pollutants to the MEP and ensure that their MS4 discharges do not cause or contribute to violations of water quality standards. If the Copermittees have reduced storm water pollutant discharges to the MEP, but their discharges are still causing or contributing to violations of water quality standards, the Order provides a clear and detailed process for the Copermittees to follow. This process is often referred to as the "iterative process" and can be found at section A.3. The language of section A.3 is prescribed by the State Water Board and is included in MS4 permits statewide. Section A.3 essentially requires additional BMPs to be implemented until MS4 storm water discharges no longer cause or contribute to a violation of water quality standards.

The State Policy with respect to maintaining high quality waters has been added to clarify that discharges from the MS4 that cause or contribute to a violation of the Policy for high quality waters is prohibited.

The Copermittee must notify the San Diego Water Board of storm water discharges that are causing or contributing to an exceedance of applicable water quality standards. This notification can be in the form of an email or letter, with a summary of the pollutants in the storm water discharge that are exceeding the applicable water quality standards, and where and when the exceedances occurred. After notification is provided to the San Diego Water Board, the Copermittee must submit a report that describes the BMPs that are currently being implemented and the additional BMPs that will be implemented by the Copermittee to prevent or reduce the pollutants in the storm water discharge from causing or contributing to the exceedances of the applicable water quality standards. The report is separate from the notification and may be submitted with the Annual Report, unless the San Diego Water Board requests an earlier submittal of the report.

B. Non-Storm Water Discharges

The following legal authority applies to section B:

Broad Legal Authority: CWA sections 402, 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F), 40 CFR 122.26(d)(2)(iv) and 40 CFR 122.44.

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B) requires MS4 operators "to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B)(1) provides that the Copermittees shall prevent all types of illicit discharges into the MS4 except for certain non-storm water discharges.

Section B of the Order has been reworded to simplify and clarify the requirements for addressing non-storm water discharges that are not prohibited. This rewording has no net effect on the implementation and enforcement of the Order.

Section B.2 identifies categories of non-storm water discharges that do not have to be addressed as illicit discharges unless identified by a Copermittee or the San Diego Water Board as a category that is a source of pollutants to waters of the U.S. If a Copermittee or the San Diego Water Board identifies a category of non-storm water discharges as a source of pollutants to waters of the U.S., the category must be addressed through a program, including inspections, to implement and enforce an ordinance, orders, or other similar means to prevent illicit discharges to the MS4.[159]

The program includes enforcement of an ordinance, orders, or other legal authority that prohibits the category of non-storm water discharges from entering the MS4. Implementation of the program is through the IC/ID program, described in Directive F.4, which includes requirements for investigating/inspecting illicit discharges and enforcing the ordinance, orders, or other legal authority that prohibits the category of non-storm water discharges from entering the MS4.

The federal regulations list several categories of non-storm water discharges or flows that do not have to be addressed by the program unless a Copermittee or the San Diego Water Board identifies a category as a source of pollutants to waters of the U.S. These categories are often referred to as "exempt" discharges that are "allowed" to be discharged into the MS4. There are two types of categories of non-storm water discharges or flows that are considered "exempt": 1) anthropogenic (e.g., water line

[159] Code of Federal Regulations Title 40 section 122.26(d)(2)(iv)(B)(1)

flushing, air conditioner condensate), and 2) non-anthropogenic (e.g., springs, rising ground water).

For "exempt" anthropogenic categories of non-storm water discharges or flows that are identified as sources of pollutants to waters of the U.S., those categories become illicit discharges and are no longer "allowed" to be discharged to the MS4. The IC/ID program addresses those discharges (i.e. investigation of illicit discharges and enforcement of ordinances prohibiting illicit discharges to the MS4).

For "exempt" non-anthropogenic discharges or flows that are identified as sources of pollutants to waters of the U.S., the IC/ID program cannot be fully implemented with enforcement. Categories of non-storm water discharges or flows that originate due to a natural source (e.g., springs or rising ground water) can be investigated and identified, but it would be difficult to enforce ordinances prohibiting these discharges to the MS4. In these cases, the Copermittee may need to implement other control measures to prevent the illicit discharges from non-anthropogenic sources from entering the MS4 (e.g., sealing the storm drains to prevent infiltration).

The IC/ID program also identifies categories of "exempt" non-storm water discharges that are sources of pollutants to waters of the U.S. If an individual discharge within a category of "exempt" non-storm water discharges is found to be an isolated incidence or source of pollutants and not representative of the category as a whole, the entire category does not need to be removed from the list of "exempt" categories of non-storm water discharges. If, however, the Copermittees or the San Diego Water Board find that a pattern of isolated incidents or sources are consistently discharging pollutants to waters of the U.S. over a period of time, or throughout the region, the category must be identified as a source of pollutants to waters of the U.S. warranting removal from the list of "exempt" categories of non-storm water discharges.

The San Diego Water Board and several municipalities throughout the San Diego Region (e.g., cities and counties of Orange County and San Diego County) have reported and/or identified runoff originating from landscape irrigation as likely sources of dry weather flows conveying pollutants into their MS4s. This is also supported by legislation (Assembly Bill 1881) recently enacted by the State of California, which has identified runoff resulting from over irrigation not only as a waste of water resources, but also as a source of pollutants to the state's waterways. Discharges from landscape irrigation have been identified by the San Diego Water Board and the Copermittees as a source of pollutants and conveyance of pollutants to waters of the United States in the following:

- In educational materials developed by The Cities and County of Riverside "Only Rain in the Storm Drain" Pollution Prevention Program, the Landscape and Garden brochure states: "Soil, yard wastes, *over-watering* [emphasis added] and garden chemicals become part of the urban runoff mix that winds it way through streets, gutters and storm drains before entering lakes, rivers, streams, etc."

- In an educational survey developed by The Cities and County of Riverside "Only Rain in the Storm Drain" Pollution Prevention Program distributed at Public Outreach events, the answer to the question about where lawn irrigation water goes states: *"Water that leaves your lawn from irrigation…can pick up motor oil and grease from vehicles, excess fertilizer from your lawn, bacteria from pet waste, and excess pesticides from your yard. These pollutants can be carried down streets and storm drains directly to our streams, lakes and rivers without treatment!"*

- In 2006, the State Water Board allocated Grant funding to the Smarttimer/Edgescape Evaluation Program (SEEP). The project targets irrigation runoff by retrofitting existing development and documenting the conservation and runoff improvements. The Grant Application states that "Irrigation runoff contributes flow & pollutant loads to creeks and beaches that are 303(d) listed for bacteria indicators". Furthermore, the grant application states that "Regional program managers agree that the reduction and/or elimination of irrigation-related urban flows and associated pollutant loads may be key to successful attainment of water quality and beneficial use goals as outlined in the Basin Plan and Bacteria TMDL over the long term". This is reinforced in the project descriptions and objectives: "Elevated dry-weather storm drain flows, composed primarily … of landscape irrigation water wasted as runoff, carry pollutants that impair recreational use and aquatic habitats all along Southern California's urbanized coastline. Storm drain systems carry the wasted water, along with landscape derived pollutants such as bacteria, nutrients and pesticides, to local creeks and the ocean. Given the local Mediterranean climate, excessive perennial dry season stream flows are an unnatural hydrologic pattern, causing species shifts in local riparian communities and warm, unseasonal contaminated freshwater plumes in the near-shore marine environment". The basis of this grant project is that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 is a source and conveyance of pollutants. In addition, they indicate that the alteration of natural flows is impacting the Beneficial Uses of waters of the State. The results of this study can be applied broadly to any area where over-irrigation takes place, including Riverside County. Preliminary results from the study indicate that that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 *is* a source and conveyance of pollutants.

- In the Watershed Action Plan Annual Report(s) for the 2006-2007 reporting period, submitted by the County of Orange, Orange County Flood Control District and Copermittees within the San Juan Creek, Laguna Coastal Streams, Aliso Creek, and Dana Point Coastal Streams Watersheds, the Orange County Copermittees, within their Watershed Action Strategy Table for Fecal Indicator Bacteria state that "*Support programs to reduce or eliminate the discharge of anthropogenic dry weather nuisance flow throughout the […] watershed. Dry weather flow is the transport medium for bacteria and other 303(d) constituents of concern*". Additionally, they state that "*conditions in the MS4 contribute to high seasonal bacteria propagation in-pipe during warm weather. Landscape irrigation is a major*

contributor to dry weather flow, both as surface runoff due to over-irrigation and overspray onto pavements; and as subsurface seepage that finds its way into the MS4."

- In the Carlsbad Watershed Urban Runoff Management Program (WURMP) Fiscal Year 2008 Annual Report, submitted by the Carlsbad Watershed Copermittees (Cities of Carlsbad, Encinitas, Escondido, Oceanside, San Marcos, Solana Beach, and Vista, and the County of San Diego), the Carlsbad Watershed Copermittees state *"The Carlsbad Watershed Management Area (WMA) collective watershed strategy identifies bacteria, sediment, and nutrients as high priority water quality pollutants in the Agua Hedionda (904.3 – bacteria and sediment), Buena Vista (904.2 – bacteria), and San Marcos Creek (904.5 – nutrients) Hydrologic Areas. Bacteria, sediment, and nutrients have been identified as potential discharges from over-irrigation."*

- In Appendix D of the San Diego Bay WURMP 2007-2008 Annual Report, submitted by the San Diego Bay Watershed Copermittees (Cities of Chula Vista, Coronado, Imperial Beach, La Mesa, Lemon Grove, National City, and San Diego, the County of San Diego, the Port of San Diego, and the San Diego County Airport Authority), the San Diego Bay Watershed Copermittees identified *over-irrigation of lawns* from business and/or residential land uses as a likely pollutant source for bacteria, pesticides, and sediment.

- On September 28, 2006 Governor Arnold Schwarzenegger approved Assembly Bill 1881, The Water Conservation in Landscaping Act (AB 1881, Laird). The act requires cities, counties, and charter cities and charter counties, to adopt landscape water conservation ordinances by January 1, 2010. Additionally, the law required the Department of Water Resources (DWR) to prepare a Model Water Efficient Landscape Ordinance for use by local agencies. The Water Efficient Landscape Ordinance was approved by the Office of Administrative Law on September 10, 2009. All local agencies were required to adopt a water efficient landscape ordinance by January 1, 2010. Local agencies could adopt the Water Efficient Landscape Ordinance developed by DWR, or an ordinance considered at least as effective as the Model Ordinance. The Water Efficient Landscape Ordinance includes a requirement that local agencies prohibit runoff from irrigation (§ 493.2): "*Local agencies shall prevent water waste resulting from inefficient landscape irrigation by* prohibiting runoff from leaving the target landscape *[emphasis added] due to low head drainage, overspray, or other similar conditions where water flows onto adjacent property, non-irrigated areas, walks, roadways, parking lots, or structures. Penalties for violation of these prohibitions shall be established locally.*"

- On October 08, 2009, the State of California Department of Water Resources issued a letter to all cities and counties within the State of California giving reminder of required adoption of the Water Efficient Landscape Ordinance. The letter states that: "*Other benefits include reduced irrigation runoff,* reduced

pollution of waterways *[emphasis added], drought resistance, and less green waste*."

- On December 18, 2009, the San Diego Water Board adopted Order. No. R9-2009-0002, the fourth-term Orange County permit, which found that over-irrigation (landscape irrigation, irrigation water and lawn watering) into the MS4 is a source and conveyance of pollutants. Landscape irrigation, irrigation water, and lawn watering were categories removed from the list of non-storm water discharges not prohibited to be discharged into the MS4.

- The San Diego Water Board has responded to complaints about and observed runoff from over-irrigation entering the MS4s in the Riverside County portion of the San Diego Region.

Several significant changes have been made to the list of categories of non-storm water discharges that do not have to be addressed as illicit discharges. A footnote has been added to dechlorinated swimming pool discharges on the list to specify that this category does not include saline swimming pool discharges. The list has been modified to remove the landscape irrigation, irrigation water and lawn watering "exempt" discharge categories (i.e. no longer "allowed" to enter the MS4). Language has been also added to the section to clarify differences in the federal regulations under 40 CFR 122.26(d)(iv)(B) and for the authority of the Director (i.e. San Diego Water Board) in regards to identifying exempted discharges.

Because the landscape irrigation, irrigation water and lawn watering "exempt" discharge categories have been removed from section B, per identification as a source and conveyance of pollutants to waters of the United States when discharged from the MS4, these illicit discharges must be addressed per 40 CFR 122.26(d)(iv)(B). The San Diego Water Board is requiring these discharges be addressed as illicit discharges by the Copermittees. This is consistent with the Federal Regulations (55 FR 48037). Thus, the discharges are to be prohibited via ordinance, order, or similar means and incorporated as part of the Copermittees IC/ID program.

Section B.3 has been clarified by the recognition of building fire suppression system maintenance (e.g. fire sprinklers) as an illicit discharge. The San Diego Water Board has found that such discharges contain waste, and as such the San Diego Water Board is requiring these discharges be addressed as illicit discharges by the Copermittees. This is consistent with the Federal Regulations (55 FR 48037). Thus, the discharges are to be prohibited via ordinance, order or similar means and incorporated as part of the Copermittees IC/ID program.

C. Non Storm Water Dry Weather Action Levels

The following legal authority applies to section C:

Broad Legal Authority: CWA section 402, 402(p)(3)(B)(ii), CWC §13377. 40 CFR 122.26(d)(2)(i)(B, C, E, and F), and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority:
CWA section 402(p)(3)(B)(ii) provides that MS4 permits "shall include a requirement to effectively prohibit non-storm water discharges into the storm sewers."

Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(B) provides that the proposed management program "shall be based on a description of a program including a schedule, to detect and remove (or require the discharger to the municipal storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B)(1) provides that the Copermittee include in its proposed management program "a program, including inspections, to implement and enforce an ordinance, orders or similar means to prevent illicit discharges to the municipal storm sewer system; this program description shall address all types of illicit discharges, however the [listed exempt] category of non-storm water discharges or flows shall be addressed where such discharges are identified by the municipality as sources of pollutants to waters of the United States."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B)(2) provides that the Copermittee include in its proposed management program "a description of procedures to conduct on-going field screening activities during the life of the permit, including areas or locations that will be evaluated by such field screens."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B)(3) provides that the Copermittee include in its proposed management program "procedures to be followed to investigate portions of the separate storm sewer system that, based on the results of the field screen, or other appropriate information, indicate a reasonable potential of containing illicit discharges or other sources of non-storm water."

Section C establishes non-storm water dry weather action levels (see also Finding C.14, Finding E.10, and the Discussion for those sections).

Non-exempted, non-storm water discharges are to be effectively prohibited from entering the MS4 or become subject to another NPDES permit (see Federal Register, Vol. 55, No. 222, pg. 47995). Conveyances which continue to accept non-exempt, non-storm water discharges do not meet the definition of MS4 and are not subject to section 402(p)(3)(B) of the CWA unless the discharges are issued separate NPDES permits. Instead, conveyances that continue to accept non-exempt, non-storm water

discharges that do not have a separate NPDES permit are subject to sections 301 and 402 of the CWA (see Federal Register, Vol. 55, No. 222, pg. 48037).

The Order requires the sampling of a representative percentage of major outfalls and other identified stations within each hydrologic subarea. While it is important to assess all major outfall discharges from the MS4 into receiving waters, to date the Copermittees have implemented a dry-weather monitoring program that has consisted of 4 water quality parameters collected in receiving waters, not major outfalls. In the ROWD the Copermittees have proposed relocating IC/ID (non-storm water) monitoring sites to major outfalls and increasing the level of monitoring. It is expected that the Copermittees will need to utilize current 303(d) listings, land use, the history of IC/ID complaints and the sensitivity of receiving waters in the selection and annual sampling of a representative percentage of major outfalls in accordance with the requirements under section C.4. It is expected the selection of major outfalls will be done in conjunction with the Copermittees' required updates to the MS4 map in section F.4.b of the Order.

The Order requires an increase in the number and type of pollutants sampled in non-storm water from major outfalls. To date, Copermittees have not sampled major outfalls, only receiving waters, and sampling was limited to total dissolved solids, dissolved oxygen, pH, turbidity and specific conductance. Additional sampling was generally, though not always, conducted by Copermittees if initial sampling exceeded a Copermittee threshold. With the exception of dissolved oxygen, the current thresholds do not represent water quality objectives, as sampling may not trigger a threshold, but may still be exceeding a water quality objective. This Order requires non-storm water discharges to be sampled for additional pollutants including indicator bacteria, nutrients (nitrate and phosphorous), Methylene Blue Active Substances (MBAS), pesticides and metals. These pollutants are expected to be present in non-storm water discharges, are pollutants for which receiving waters are 303(d) listed as impaired or have been identified as present through receiving water monitoring.

Background and Rationale for Requirements

The San Diego Water Board developed the requirements for dry weather, non-storm water action levels based upon an evaluation of existing controls, monitoring and reporting programs (effluent and receiving water), special studies, and based upon Findings C.1 C.3, C.4, C.6, C.7 and C.14. In addition, the Copermittees' ROWD supports the establishment of action levels which can be used in the effectiveness assessment program to ensure a minimum level of program implementation and identify shortcomings in their MS4 programs.[160]

[160] Riverside County Copermittees. 2009. Report of Waste Discharge (San Diego Region).

Water Quality Control Plan

CWA section 303(c) requires the state to establish Water Quality Standards (WQS). WQS define the water quality goals of a water body, or part thereof, by designating their use or uses to be made of the water and by setting criteria necessary to protect those uses.

The San Diego Water Board's Water Quality Control Plan for the San Diego Basin (Basin Plan) designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters addressed through the Basin Plan. The Basin Plan was adopted by the San Diego Water Board on September 8, 1994, and was subsequently approved by the State Water Board on December 13, 1994. Subsequent revisions to the Basin Plan have also been adopted by the San Diego Water Board and State Water Board.

National Toxics Rule (NTR) and California Toxics Rule (CTR)

The USEPA adopted the NTR on December 22, 1992, which was amended on May 4, 1995, and November 9, 1999. The CTR was adopted by USEPA on May 18, 2000,[161] and amended on February 13, 2001.[162] These rules include water quality criteria for priority pollutants and are applicable to non-storm water discharges from the MS4. Criteria for 126 priority pollutants are established by the CTR. USEPA promulgated this rule to fill a gap in California water quality standards that was created in 1994 when a California court overturned the State's water quality control plans containing criteria for priority toxic pollutants. The federal criteria are legally applicable in the State of California for inland surface waters, enclosed bays and estuaries for all purposes and programs under the CWA.

Antidegradation Policy

Section 131.12 of 40 CFR requires that the State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The Regional Water Boards' Basin Plans implement, and incorporate by reference, both the State and federal antidegradation policies. Permitted non-storm water discharges from the MS4 are consistent with the antidegradation provision of 40 CFR section 131.12 and State Water Board Resolution No. 68-16.

[161] Federal Register / Vol. 65, No. 97 / May 18, 2000 / Rules and Regulation P. 31861-31719; Code of Federal Regulations Title 40 Part 131

[162] Federal Register / Vol. 66, No. 30 / February 13, 2001 / Rules and Regulation P. 9960-9962; Code of Federal Regulations Title 40 Part 131

Sources of Drinking Water Policy
State Water Board Resolution No. 88-63 establishes state policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal and domestic supplies. Requirements of this Order include action levels, where appropriate, reflecting municipal and domestic supply use as all waters within the County of Riverside under this Order are specifically assigned municipal and domestic supply as a Beneficial Use.

Monitoring and Reporting
40 CFR section 122.48 requires that all NPDES permits specify requirements for recording and reporting monitoring results. Sections 13267 and 13383 of CWC authorize the Regional Water Boards to require technical and monitoring reports. The Monitoring and Reporting Program establishes monitoring and reporting requirements to implement state and federal regulations. The Monitoring and Reporting Program can be found as Attachment E of the Order.

Dilution or Mixing Zones
In order to protect the Beneficial Uses of receiving waters from pollutants as a result of non-storm water MS4 discharges, this Order does not provide for a mixing zone or a zone of initial dilution except when the discharge is to the surf zone.

The San Diego Region has predominantly intermittent and ephemeral rivers and streams (Inland Surface Waters) which vary in flow volume and duration at spatial and temporal scales. Therefore, it is assumed that any non-storm water discharge from the MS4 into the receiving water is likely to be of a quantity and duration that does not allow for dilution or mixing. For ephemeral systems, non-storm water discharges from the MS4 are likely to be the only surface flows present within the receiving water during the dry season. Additionally, all surface waters within the jurisdiction of this Order have been designated in the Basin Plan with municipal supply (MUN) as a beneficial use.

It is appropriate to base numeric action levels for dry weather non-storm water discharges on these considerations.

Establishment of Action Levels
Action levels in the Order are based upon numeric or narrative water quality objectives and criteria as defined in the Basin Plan and the State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP). The San Diego Water Board recognizes that use of action levels will not necessarily result in detection of all unauthorized sources of non-storm water discharges because there may be some discharges in which pollutants do not exceed established action levels.

In June of 2006, the State Water Board's Blue Ribbon Storm Water Panel released its report titled 'The Feasibility of Numerical Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities.' The

report only examined numerical limits as applied to storm water and not non-storm water. In the recommendations, the Blue Ribbon panel proposed storm water action levels which are computed using statistical based population approaches. For example, section D of the Permit uses a recommended statistical approach to develop storm water action levels. The Blue Ribbon panel did not examine the efficacy of action levels or recommendations for development of action levels for non-storm water discharges.

For discharges to inland surface waters, action levels are based on the USEPA water quality criteria for the protection of aquatic species, the USEPA water quality criteria for the protection of human health, water quality criteria and objectives in the applicable State plans, effluent concentration available using best available technology, and 40 CFR 131.38. Since the assumed initial dilution factor for the discharge is zero and a mixing zone is not allowed, a non-storm water discharge from the MS4 could not cause an excursion from numeric receiving water quality objectives if the discharge is in compliance with the action levels contained in the Order.

Dry weather monitoring of non-storm water conducted in receiving waters under the previous Order (Order No. R9-2004-001), which relies on BMPs as controls to protect water quality standards, has identified the presence of pollutants commonly found in non-storm water discharges. Monitoring of Indicator Bacteria, pH, Dissolved Oxygen, Phosphorus, Nitrate, Turbidity, Methylene Blue Active Substances (MBAS), and metals in receiving waters has shown concentrations that exceed state water quality criteria. It is appropriate to establish numeric action levels for these pollutants to ensure that the Copermittees are complying with the requirement to effectively prohibit all types of unauthorized non-storm water discharges into the MS4s.

Water Quality Limited Segments on the current 303(d) list (2008) within the jurisdiction of this Order have been identified due to exceedances of Sulfate and Total Dissolved Solids criteria from a source which is currently unknown (see Table 2). These pollutants are not monitored for in non-storm water effluent under the current non-storm water MS4 monitoring program. While this Order does not establish a numeric action level for these constituents at this time, this Order now requires non-storm water MS4 discharge monitoring to include monitoring for Sulfates, Total Dissolved Solids, and Chlorides.

Priority pollutants analyzed included Cadmium, Copper, Chromium, Lead, Nickel, Silver and Zinc. These priority pollutants are likely to be present in non-storm water MS4 discharges (see Finding C.3) though dissolved metal effluent monitoring was not conducted under the previous Order. The most stringent applicable water quality criteria have been identified for these seven metals and, excluding Chromium (VI), and all are dependent on receiving water hardness. The conversion factors for Cadmium and Lead are also water hardness dependent (40 CFR 131.38(b)(2)). These levels are established as the action levels for these constituents.

While effluent monitoring is not available from the previous Order, the monitoring that was done for metal concentrations in receiving waters often lacked a measurement of receiving water hardness. Due to the multiple point source discharges of non-storm water from the MS4, a discharge may enter a receiving water whose hardness will vary temporally. In addition, hardness may vary spatially within and among receiving waters.

However, other information is available to determine the appropriateness of an action level. Existing monitoring concentrations absent of receiving water data, no dilution credit or mixing zone allowance, current 303(d) listings of receiving waters for other pollutants, receiving water monitoring data, and the classification of waters as critical habitat for endangered and species of concern, provide evidence that NALs are appropriate for these priority pollutants at this time in order to ensure that the Copermittees comply with the requirement to effectively prohibit all types of unauthorized non-storm water discharges into the MS4s.

Existing receiving water pollutant concentration data (see attachment F) provides evidence that it is appropriate to include NAL based comparisons to water quality criteria given observed hardness levels, assumption of a conservative hardness level when data is absent, or designation of receiving waters as having MUN as a beneficial use. Although dry weather receiving water data is limited (see attachment F), data has been collected that documents exceedances of CTR criteria for Lead, Nickel, and Copper given the measured hardness for the receiving water. Absent receiving water hardness, Zinc has been detected in receiving waters at concentrations which may be in exceedance of CTR criteria depending on receiving water hardness. Additionally, Cadmium and Chromium were detected at elevated levels, though the concentrations were within CTR criteria given the observed receiving water hardness. However, these detections typically coincided with detections of other exceedances of water quality standards for other pollutants, including metals. Chromium and Nickel were also detected at levels that did not exceed CTR, but did exceed Maximum Contaminant Levels (MCLs) for receiving waters.

As discussed, inland surface waters have conservatively been allotted a mixing zone and dilution credit of zero. As such, any discharge of these priority pollutants is likely to impact the receiving water, regardless of the quantity or rate of discharge.

As discussed in Finding C.7 and discussion, multiple receiving waters within the County of Riverside are 303(d) listed for a number of pollutants, including toxicity. The 303(d) listing of a water body as impaired provides evidence that the receiving water(s) are already experiencing negative impacts. These water quality limited segments are more susceptible to degradation from the synergistic addition of more pollutants, even from upstream discharges. It is therefore appropriate to include NALs designed to ensure that the Copermittees are complying with the requirement to effectively prohibit all types of unauthorized discharges of non-storm water into the MS4s.

Copermittees have monitored the receiving waters for MS4 discharges pursuant to requirements under Order No. R9-2004-001. Dry weather receiving water data indicates poor conditions within waters receiving non-storm water MS4 discharges. Bioassessment conducted under the Order (2004-present) has documented all non-reference sites as consistently having poor or very poor IBI scores, likely due in part to receiving water chemistry and toxicity[163].

Receiving waters and downstream receiving waters within the jurisdiction of this Order contain species and/or are classified as critical habitat (or are exempted pursuant to Integrated National Resource Management Plans) for endangered, threatened, and state species of special concern including, but not limited to, *E. newberryi, A. marmorata pallida*, and *G. orcutti.*

Furthermore, the Santa Margarita River has been designated with the RARE beneficial use.

Dry Weather Non-Storm Water Action Levels Calculations for Discharges to Inland Surface Waters

On the basis of the foregoing discussion, the NALs were calculated with the following considerations and assumptions:

> No dilution credit is considered for the discharge. Therefore, the discharge must comply with the Water Quality Objective at the point of discharge.
>
> For NALs based on CTR, implementation was done using the procedure list as outlined in the State Implementation Plan (SIP) (see below example).

NAL CTR/SIP Calculation – Chromium VI Example:

Criteria for Priority Toxic Pollutants in the State of California is described in the CTR table listed in 40 CFR 131.38.

[163] Riverside County Copermittees 2007-08 and 2008-09 Annual Progress Reports.

A		B Freshwater		C Saltwater		D Human Health (10^{-6} risk for carcinogens) For consumption of:	
# Compound	CAS Number	Criterion Maximum Conc. [d] B1	Criterion Continuous Conc. [d] B2	Criterion Maximum Conc. [d] C1	Criterion Continuous Conc. [d] C2	Water & Organisms (µg/L) D1	Organisms Only (µg/L) D2
1. Antimony	7440360					14 a,s	4300 a,t
2. Arsenic [b]	7440382	340 i,m,w	150 i,m,w	69 i,m	36 i,m		
3. Beryllium	7440417					n	n
4. Cadmium [b]	7440439	4.3 e,i,m,w,x	2.2 e,i,m,w	42 i,m	9.3 i,m	n	n
5a. Chromium (III)	16065831	550 e,i,m,o	180 e,i,m,o			n	n
5b. Chromium (VI) [b]	18540299	16 i,m,w	11 i,m,w	1100 i,m	50 i,m	n	n
6. Copper [b]	7440508	13 e,i,m,w,x	9.0 e,i,m,w	4.8 i,m	3.1 i,m	1300	
7. Lead [b]	7439921	65 e,i,m	2.5 e,i,m	210 i,m	8.1 i,m	n	n
8. Mercury [b]	7439976	[Reserved]	[Reserved]	[Reserved]	[Reserved]	0.050 a	0.051 a
9. Nickel [b]	7440020	470 e,i,m,w	52 e,i,m,w	74 i,m	8.2 i,m	610 a	4600 a
10. Selenium [b]	7782492	[Reserved] p	5.0 q	290 i,m	71 i,m	n	n
11. Silver [b]	7440224	3.4 e,i,m		1.9 i,m			
12. Thallium	7440280					1.7 a,s	6.3 a,t
13. Zinc [b]	7440666	120 e,i,m,w,x	120 e,i,m,w	90 i,m	81 i,m		

Freshwater criterion maximum concentration (CMC) = 16 ug/L
Freshwater criterion continuous concentration (CCC) = 11 ug/L

These criteria are expressed in terms of the dissolved fraction of the metal in the water column. [See footnote “m” to Table in paragraph (b)(1) of 40 CFR 131.38].

40 CFR 122.45(c) requires that this Order include effluent limitations as total recoverable concentration; therefore it is appropriate to include action levels also as total recoverable concentration.

The SIP requires that if it is necessary to express a dissolved metal value as a total recoverable and a site-specific translator has not yet been developed, the San Diego Water Board shall use the applicable conversion factor from 40 CFR 131.38.

The term “Conversion Factor” (CF) represents the recommended conversion factor for converting a metal criterion expressed as the total recoverable fraction in the water column to a criterion expressed as the dissolved fraction in the water column.

Total recoverable concentration * CF = Dissolved concentration criterion

or

Total recoverable concentration = Dissolved concentration criterion/ CF

§ 131.38 40 CFR Ch. I (7–1–08 Edition)

Metal	Conversion factor (CF) for freshwater acute criteria	CF for freshwater chronic criteria	CF for saltwater acute criteria	CF[a] for saltwater chronic criteria
Antimony	([d])	([d])	([d])	([d])
Arsenic	1.000	1.000	1.000	1.000
Beryllium	([d])	([d])	([d])	([d])
Cadmium	[b]0.944	[b]0.909	0.994	0.994
Chromium (III)	0.316	0.860	([d])	([d])
Chromium (VI)	0.982	0.962	0.993	0.993
Copper	0.960	0.960	0.83	0.83
Lead	[b]0.791	[b]0.791	0.951	0.951
Mercury				
Nickel	0.998	0.997	0.990	0.990
Selenium		([c])	0.998	0.998

CF for Chromium VI = .982 and .962, so the total recoverable concentrations for chromium VI:
16 ug/L dissolved (CMC)/ 0.982 (CF) = 16.3 ug/L total recoverable CMC
11 ug/L dissolved (CCC) / 0.962 (CF) = 11.4 ug/L total recoverable CCC

<u>Effluent Variability multiplier and Coefficient of Variation (CV)</u>
For each concentration based on an aquatic life criterion, the long-term average (LTA) is calculated by multiplying the concentration with a factor that adjusts for effluent variability. The multiplier can be found in Table 1 of the SIP. Since this Order does not have existing data to properly conduct a variability analysis in accordance with the SIP, the CV has been set equal to 0.6 per SIP requirements. The current effluent data is limited due to the small number of representative outfalls sampled, the lack of outfalls discharging to representative water bodies within the Region, and the targeted nature of the sampling design.

Based upon a CV of 0.6, Table 1 of the SIP requires an effluent variability as follows:
Acute Multiplier = 0.321
Chronic Multiplier = 0.527

The long-term average (LTA) is calculated by multiplying the total recoverable concentrations for zinc with the acute and chronic multipliers:
LTA Acute = 16.3 ug/L * 0.321 = 5.23
LTA Chronic = 86 11.4 ug/L * 0.527 = 6.01

The maximum daily action level (MDAL) and average monthly action level (AMAL) will be based on the most limiting of the acute and chronic LTA, in the case for chromium VI the most limiting LTA is the acute of 5.23 ug/L

NALs are calculated by multiplying the most limiting LTA with a multiplier that adjusts for the averaging periods and exceedance frequencies of the criteria and the effluent limitations. The multiplier can be found in Table 2 of the SIP. Since this Order has insufficient data, the CV has been set to 0.6 and since sampling frequency is four times a month or less, n has been set equal to 4 per the SIP.

Table 2. Long-Term Average (LTA) Multipliers for Calculating Effluent Limitations

Coefficient of Variation	MDEL Multiplier	AMEL Multiplier			MDEL/AMEL Multiplier		
	99th Percentile Occurrence Probability	95th Percentile Occurrence Probability			MDEL = 99th Percentile AMEL = 95th Percentile Occurrence Probability		
(CV)		n = 4	n = 8	n = 30	n = 4	n = 8	n = 30
0.1	1.25	1.08	1.06	1.03	1.16	1.18	1.22
0.2	1.55	1.17	1.12	1.06	1.33	1.39	1.46
0.3	1.90	1.26	1.18	1.09	1.50	1.60	1.74
0.4	2.27	1.36	1.25	1.12	1.67	1.82	2.02
0.5	2.68	1.45	1.31	1.16	1.84	2.04	2.32
0.6	3.11	1.55	1.38	1.19	2.01	2.25	2.62

Therefore, from Table 2 of the SIP, the LTA multipliers will be as follows:
MDAL Multiplier = 3.11
AMAL Multiplier = 1.55

The MDAL and AMAL limits are calculated by multiplying the LTA with an LTA multiplier for each limit:
MDAL = 5.23 ug/L * 3.11 = 16 ug/L
AMAL = 5.23 ug/L * 1.55 = 8.1 ug/L

Whole Effluent Toxicity (WET) Testing Requirements
A WET limit is required if a discharge causes, has a reasonable potential to cause, or contributes to an exceedance of applicable water quality standards, including numeric and narrative. Since these types of discharges are prohibited under this Order, WET limits are not applicable.

Discussion of AMALs, MDALs and Instantaneous Maximums
Where practical, action levels in this Order have been expressed as both AMALs and MDALs. Certain action levels may not practicably be expressed as AMALs and MDALs due to specific Basin Plan water quality objective language, sampling requirements and/or a lack of Criteria. Based upon the likely sampling frequency of the Copermittees, the frequency of sampling will occur such that grab samples are taken once per sampling day. This single sample would then be subject to MDALs and Instantaneous Maximum levels. In this case, the more conservative action level would apply. In addition, it is expected that some effluent monitoring will occur less than or equal to once per month. In this scenario, the MDAL, AMAL and Instantaneous Maximum levels would need to be met based upon one sample (unless sampling did

not occur). For some Basin Plan water quality objectives, AMALs have been excluded and only MDALs/Instantaneous Maximums set to prevent redundancy in action levels.

Compliance with Action Levels (Priority Pollutants)
Compliance with action levels shall be determined as follows:

Dischargers shall be deemed out of compliance with this Order if the Copermittee failed to take the prescribed action in response to a concentration of the priority pollutant in the monitoring sample that is greater than the action level and greater than or equal to the reported Minimum Level (exceedance of an action level). Regardless of the Copermittee's actions in response to an exceedance, they are still subject to the prohibitions found in sections A and B of the Order.

When determining to take an action in response to the AMALs and more than one sample result is available in a month, the discharger shall compute the arithmetic mean unless the data set contains one or more reported determinations of "did not quantify" (DNQ) or "not detected" (ND). In those cases, the discharger shall compute the median in place of the arithmetic mean in accordance with the following procedure:

(1) The data set shall be ranked from low to high, reported ND determinations lowest, DNQ determinations next, followed by quantified values (if any). The order of the individual ND or DNQ determinations is unimportant.

(2) The median value of the data set shall be determined. If the data set has an odd number of data points then the median is the middle value. If the data set has an even number of data points, then the median is the average of the two values around the middle unless one or both of those points are ND or DNQ, in which case the median value shall be the lower of the two data points where DNQ is lower than a value and ND is lower than DNQ.

D. Storm Water Action Levels

The following legal authority applies to section D:

Broad Legal Authority: CWA §402, §402(p)(3)(B)(iii), CWC §13377, 40 CFR §122.44, 40 CFR §122.26(d)(1)(iv), 40 CFR §122.26(d)(2)(i)(E and F), and 40 CFR §122.26(d)(2)(iii and iv).

Specific Legal Authority:
CWA section 402(p)(3)(B)(iii) provides that MS4 permits "shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants."

Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(E and F) provides that the Copermittee "Require compliance with conditions in ordinances, permits, contracts or orders;" and "Carry out all inspection, surveillance and monitoring procedures necessary to determine compliance and noncompliance with permit conditions …"

Copermittees must conduct a comprehensive monitoring program as required under Federal NPDES regulations 40 CFR 122.26(d)(2)(iii), including the collection of quantitative MS4 storm water effluent data from outfalls.

Federal NPDES regulations 40 CFR 122.44 (d) provide that NPDES permits include any requirements necessary to "Achieve water quality standards,… including State narrative criteria for water quality."

Section D has been added to establish storm water action levels (see also Finding D.1.h and Discussion).

<u>Introduction</u>
The Copermittees' ROWD supports the establishment of action levels which can be used in the effectiveness assessment program to ensure a minimum level of program implementation and identify shortcomings in their MS4 programs.[164] Storm Water Action Level (SAL) concentrations, standards and constituents have been developed and incorporated into the monitoring requirements for wet weather.

[164] Riverside County Copermittees. 2009. Report of Waste Discharge (San Diego Region).

SAL Concentration/Standards

SAL pollutant levels were developed from a regional subset of nationwide Phase I MS4 data by using USEPA Climate Zone 6 (arid west) data.[165] Utilizing data from USEPA Climate Zone 6 resulted in SALs which closely reflect the environmental conditions experienced in Riverside County. The localized subset of data includes sampling events from multiple Southern California locations including Orange, San Diego, Riverside, Los Angeles, and San Bernardino Counties. The dataset includes samples taken from highly built-out impervious areas and from storm events representative of Southern California conditions.

Additionally, utilization of regional data is appropriate due to the addition of data into the nationwide Phase I MS4 monitoring dataset in February 2008. This additional data increased the number of USEPA Climate Zone 6 samples to more than 400, and included additional monitoring events within Southern California (see figure below).

Sample Sizes Used to Calculate Storm Water Action Levels

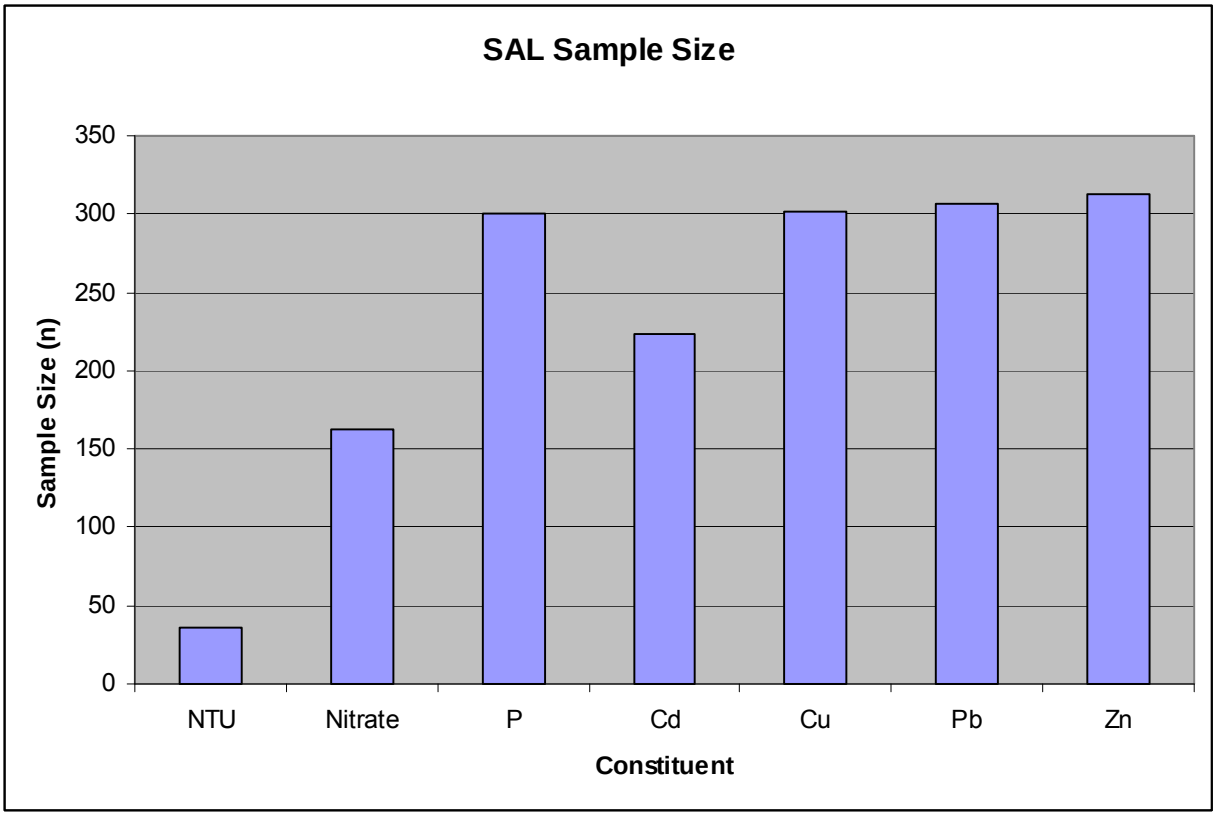

In addition, the SALs reflect the water quality standards in the Basin Plan for the San Diego Region, the California Toxic Rule and USEPA Water Quality Criteria. Since it is the goal of the SALs, through the iterative and MEP process, to have outfall storm water discharges meet all applicable water quality objectives, the list of constituents to

[165] Data used to develop SAL are provided in Attachment F to Order No. R9-2010-0016, and obtained from http://rpitt.eng.ua.edu/Research/ms4/mainms4.shtml

be tested and protocol for testing has been developed to provide a reference point to evaluate the iterative MEP process.

SALs were developed based upon receiving water monitoring results and CWA section 303(d) impaired waters listings. Nitrogen, Copper and Phosphorous are all pollutants for which receiving waters are 303(d) listed as impaired and for which sufficient data was available to develop SALs. Additionally, receiving water monitoring, including from storm events monitored by the Copermittees, has demonstrated excursions and/or potential excursions, often absent receiving water hardness, above water quality criteria for turbidity (NTU), Cadmium, Lead, and Zinc. SALs were not developed for some pollutants for which receiving waters are 303(d) listed as impaired due to a lack of representative data available. These pollutants are required to be monitored but are not subject to a SAL under the Order.

Monitoring

The SALs require the measurement of hardness and to provide more specificity in the assessment of samples with SALs for total metal concentrations. While USEPA Climate Region 6 data includes a large sample size for concentrations of total metals, the impact the concentration will have on receiving waters will vary with receiving water hardness. Since it is the goal of the SALs, through the iterative and MEP process, to have MS4 storm water discharges meet all applicable water quality objectives, the hardness of the receiving water should be used when assessing the total metal concentration of a sample. Thus, when an exceedance of a SAL concentration is detected for a metal, the Copermittee must determine if that exceedance is above the existing applicable water quality limitation based upon the hardness of the receiving water. The water quality limitations Copermittees must use to assess total metal SAL exceedances are the California Toxic Rule (CTR) and USEPA National Recommended Water Quality Criteria for Freshwater Aquatic Life 1 hour maximum concentrations. The 1 hour maximum concentration is to be used for comparison since it is expected to most replicate the impacts to waters of the State from the first flush following a precipitation event.

E. Legal Authority

The following legal authority applies to section E:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(i)(A) provides that the Copermittees shall develop and implement legal authority to "Control through ordinance, order or similar means, the contribution of pollutants to the municipal storm sewer by storm water discharges associated with industrial activity and the quality of storm water discharged from sites of industrial activity."

Federal NPDES regulation 40 CFR 122.26(d)(2)(i)(D) provides that the Copermittees shall develop and implement legal authority to "Control through interagency agreements among coapplicants the contribution of pollutants from one portion of the municipal system to another portion of the municipal system."

Illicit discharge is defined under Federal NPDES regulation 40 CFR 122.26(b)(2) as "any discharge to a municipal separate storm sewer system that is not composed entirely of storm water except discharges pursuant to a NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer) and discharges resulting from fire fighting activities."

Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(A - D) require municipalities to implement controls to reduce pollutants in storm water runoff from commercial, residential, industrial, and construction land uses or activities.

Federal NPDES regulation 40 CFR 122.26(d)(1)(ii) requires from the Copermittee "A description of existing legal authority to control discharges to the municipal separate storm sewer system."

Section E.1.b requires the Copermittees to prohibit all identified illicit discharges not otherwise allowed pursuant to section B.2 including but not limited to:

(1) Sewage;
(2) Discharges of wash water resulting from the hosing or cleaning of gas stations, auto repair garages, or other types of automotive services facilities;
(3) Discharges resulting from the cleaning, repair, or maintenance of any type of equipment, machinery, or facility including motor vehicles, cement-related equipment, and port-a-potty servicing, etc.;
(4) Discharges of wash water from mobile operations such as mobile automobile washing, steam cleaning, power washing, and carpet cleaning, etc.;

(5) Discharges of wash water from the cleaning or hosing of impervious surfaces in municipal, industrial, commercial, and residential areas including parking lots, streets, sidewalks, driveways, patios, plazas, work yards and outdoor eating or drinking areas, etc.;
(6) Discharges of runoff from material storage areas containing chemicals, fuels, grease, oil, or other hazardous materials;
(7) Discharges of pool or fountain water containing chlorine, biocides, toxic amounts of salt, or other chemicals; discharges of pool or fountain filter backwash water;
(8) Discharges of sediment, pet waste, vegetation clippings, or other landscape or construction-related wastes; and
(9) Discharges of food-related wastes (e.g., grease, fish processing, and restaurant kitchen mat and trash bin wash water, etc.).

Section E.1.j has been added to the Order to ensure that BMPs implemented by third parties are effective. Since the Copermittees cannot passively receive and discharge pollutants from third parties, the Copermittees must ensure discharges of storm water pollutants to the MS4 are reduced to the MEP. In order to achieve this, the Copermittees must be able to ensure that effective BMPs are being implemented by requiring the third parties to document BMP effectiveness. Regarding the Copermittees' ability to require documentation and reporting from third parties, USEPA states "municipalities should provide documentation of their authority to enter, sample, inspect, review, and copy records, etc., as well as demonstrate their authority to require regular reports."[166]

[166] USEPA, 1992. Guidance Manual for the Preparation of Part 2 of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems. EPA 833-B-92-002.

F. Jurisdictional Runoff Management Program

F.1. Development Planning Component

The following legal authority applies to section F.1:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWA section 402(a), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F), 40 CFR 131.12, and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(2) provides that Copermittees develop and implement a management program which is to include "A description of planning procedures including a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal separate storm sewers which receive discharges from areas of new development and significant redevelopment. Such plans shall address controls to reduce pollutants in discharges from municipal separate storm sewers after construction is completed."

Federal NPDES regulation 40 CFR 122.44(d)(1) requires municipal storm water permits to include any requirements necessary to "[a]cheive water quality standards established under section 303 of the CWA, including State narrative criteria for water quality."

Sections F.1.a and F.1.b (General Plan and Environmental Review Process) require the Copermittees to update and revise their General Plan (or equivalent plan) and environmental review processes to ensure water quality and watershed protection principles are included. The Copermittees are required to detail any changes to the General Plan or environmental review process in their Jurisdictional Runoff Management Program Annual Reports. The General Plan must be updated to include water quality and watershed protection principles for all new development and redevelopment projects.

The change made to these sections requires updating the General Plan and Environmental Review Process on an as-needed basis. Each Copermittee has either updated, is in the process of updating, or has assessed its General Plan to ensure the General Plans include the required principles and are in compliance with Order No. R9-2004-001.

Section F.1.c (Approval Process Criteria and Requirements) requires that all development projects (regardless of size) implement BMPs to reduce storm water pollutant discharges to the MEP. Source control and site design BMP requirements were not clearly described in this section of Order No. R9-2004-001. Additional detail has been added to this section to better describe the source control and site design BMPs needed for implementation. This additional detail is consistent with the

requirements of the SSMP, also known in Riverside County as the Water Quality Management Plan (WQMP). However, only source control and site design BMPs that apply to all types of development projects are required (e.g., properly designed trash storage areas).

The requirements are consistent with Order No. R9-2004-001. However, some elements are not contained in the current DAMP[167] (e.g., buffer zones). One exception is that Order No. R9-2004-001's requirement that applicants must provide evidence of coverage under the General Industrial Permit has been removed, since industrial tenants for a development project are usually not known during the planning stage.

The section has also been modified to reflect the prohibition of over-irrigation runoff to the MS4, as well as LID requirements. Additionally, this section requires the use of native and/or low water use plants for landscaping, and rainwater harvesting, where feasible.

Sections F.1.d and F.1.d.(1) (Standard Storm Water Mitigation Plans and Definition of Priority Development Project) require the Copermittees to review and update their SSMPs (also known in Riverside County as Water Quality Management Plans – WQMPs) for compliance with the Order. The sections also require all Priority Development Projects falling under certain categories to meet SSMP requirements. The update is necessary to ensure that the Copermittees' SSMPs are consistent with the changes that have been made to the Order's SSMP requirements. The requirement for the development/adoption of a Model SSMP has been removed since a model was completed and adopted in 2005.

The SSMP section of the Order has been reformatted for clarity. There are also some significant changes. Changes have been made in response to USEPA program evaluations, recent BMP development and effectiveness studies, recent reports on the magnitude of problems caused by hydromodification, and reviews of annual reports and the ROWD submitted by the Copermittees.

In addition, the Order requires that a one-acre threshold be phased in over two years for the priority development category. This one-acre threshold was selected to be consistent with the State Water Board's Phase II NPDES requirements for small municipalities (Order No. 2003-0005-DWQ). The one-acre threshold is also included to be consistent with the State Water Board's Construction General Permit (Order No. 2009-0009-WQO), to ensure all Development Projects subject to the post-construction BMP requirements of the Construction General Permit will implement SSMP post-construction BMP requirements. The one-acre determination applies to the amount of ground area disturbed, not the total size of the parcel or project. Each Copermittee may also lower this threshold if desired.

[167] Riverside County Copermittees. *Drainage Area Management Plan (DAMP)2006.* July 21, 2006.

Section F.1.d.(2) (Priority Development Project Categories) includes several changes to improve, simplify, and clarify the Priority Development Project categories.

One of the most significant changes is that where a new Development Project feature, such as a parking lot, falls into a Priority Development Project Category, the entire project footprint is subject to SSMP requirements. This criterion was not included in Order No. R9-2004-001. It is included, however, in the Model San Diego SSMP that was approved by the San Diego Water Board in 2002. It is included in this Order because existing development inspections by Riverside County municipalities show that facilities included in the Priority Development Project Categories routinely pose threats to water quality. This permit requirement will improve water quality and program efficiency by preventing future problems associated with partly treated storm water runoff from redevelopment sites. This approach to improving storm water runoff from existing developments is practicable because municipalities have a better ability to regulate new developments than existing developments.

Another significant change is a new category for any new development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This category applies to commercial, industrial, residential, mixed use, and public projects on private or public land.

Section F.1.d.(2)(g) was modified to allow the Copermittees to develop a standard roadway design and post-construction BMP guidance document that could be used by the Copermittees in lieu of a project specific SSMP for each public works road construction project. The guidance document must comply with the SSMP requirements, including the LID and hydromodification BMP requirements. The roadway design and post-construction BMP guidance must be included in the updated SSMP, and may be utilized after the San Diego Water Board has determined that the updated SSMP is acceptable.

Development of new industrial sites was not included as a category in the Priority Development Projects in Order No. R9-2004-001 because industrial NPDES requirements already establish storm water criteria. Industrial sites are now included in the new development category of the Order to be consistent with Phase II rules and to close loopholes.

Section F.1.d.(3) (Pollutants of Concern) requires Copermittees to update their procedures for identifying pollutants of concern for each Priority Development Project. This is important to do periodically because of changing water quality conditions and designations of impairments or areas of concern. Furthermore Copermittees continually learn more about pollutant-generating activities as they conduct inspections and investigations, and that information must be incorporated into the SSMP process.

Section F.1.d.(4) (Low Impact Development BMP Requirements) requires the Copermittees to require each Priority Development Project to implement low impact development (LID) BMPs to reduce the amount of polluted storm water runoff from

those sites. The Copermittees' ROWD proposes to revise the Riverside County Storm Water Quality BMP Design Handbook to incorporate LID design concepts.[168] The primary approach in LID site design BMPs is to limit the permanent loss of existing infiltration capacity because loss of infiltration is a major contributor to wet weather pollution discharges. General means to accomplish that goal include retaining natural infiltration areas of a site and limiting the amount of impervious surfaces. The Order does not require a specific or relative amount of pervious surfaces be added to a project. The Order seeks to retain on-site capture of the 85th percentile storm.

The Copermittees must require LID BMPs to be implemented for each Priority Development Project, unless found to be technically infeasible. LID BMPs must be formally considered during the plan review process for Priority Development Projects. The LID review process for each Priority Development Project is expected to include an assessment of LID BMP techniques to infiltrate, filter, store, evaporate, and/or retain runoff close to the source of the runoff. The review process is also expected to include an assessment of the potential collection of storm water for on site and off site reuse opportunities. In cases where LID BMPs are found to be technically infeasible, the Copermittees may grant a waiver to the Priority Development Project for all or a portion of the LID BMP requirements.

The Order directs the Copermittees to require new development projects to employ certain classes of LID site design BMPs. The required LID site design BMPs take advantage of features that are incorporated into the Priority Development Project, such as landscaping or walkways. It also requires that projects seek to maintain natural water drainage features rather than instinctively convey water in buried pipes and engineered ditches that eliminate natural water quality treatment functions. These types of site design BMPs are both effective and achievable.

LID BMPs must be sized and designed to ensure onsite retention without runoff, of the volume of runoff produced from a 24-hour 85th percentile storm event ("design capture volume"). This is consistent with other municipal storm water NPDES permits recently adopted by the Los Angeles and Santa Ana Water Boards, as well as the permit recently adopted by the San Diego Water Board for Orange County. The requirement for a numerical BMP design standard is well established for treatment control BMPs and is required in permits throughout the nation such as in Pennsylvania, West Virginia, Georgia, and Washington D.C. Since the 85th percentile storm event has previously been used as the numeric design standard for treatment control BMPs; the same size storm event can be applied as the numeric design standard for LID BMPs. The average 24-hour, 85th percentile rainfall for the Riverside County portion of the San Diego Region was calculated to be approximately 0.6 inches of rain.[169]

The retention and restoration of natural drainage features, such as ephemeral streams, wetlands, and depressions, can be particularly important because small tributaries are essential to the maintenance of the chemical, biological, and physical

[168] Riverside County Copermittees. 2009. Report of Waste Discharge (San Diego Region).
[169] San Diego Water Board, 2004. Fact Sheet/Technical report for Order No. R9-2004-001, dated July 14, 2004.

integrity of larger water bodies.[170] The loss and modification of such natural water resources to accommodate post-development storm water management leads to direct and indirect adverse effects on water quality that are felt both on the project site and off the site within the watershed.[171,172,173] Effects to aquatic beneficial uses from altered drainage features can occur downstream and upstream. The length of upstream or downstream effect of channel modifications is dependant on the specific structure type and channel slope.[174] For instance, road culverts can act as partial barriers to upstream distribution of native aquatic macroinvertebrates in urban streams, while bridges can provide adequate passage.[175] As a result of the adverse effects to water quality and beneficial uses, the State of California nonpoint source pollution program management measures for urban areas includes limiting the destruction of natural drainage features and natural conveyance areas.[176] Additionally, any project proposing to discharge dredge and/or fill material to waters of the United States and/or State is required to obtain a CWA section 401 Water Quality Certification and/or Waste Discharge Requirements from the San Diego Water Board or State Water Board.

LID site design BMP options do not need to be costly.[177] Some design options, such as concave vegetated surfaces or routing rooftop or walkway runoff to landscaped areas, are cost neutral.[178] Other LID site design BMPs, such as minimizing parking stall widths or use of efficient irrigation devices, are oftentimes already required. In addition, use of LID site design BMPs reduces storm water runoff quantity, allowing for treatment control BMPs and other storm water infrastructure on site to be smaller, therefore savings costs for both developers and municipalities.[179,180]

Because of the potential economic and environmental benefits of using LID site design, the U.S. Department of Housing and Urban Development, Office of Policy

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[170] Aquatic scientists comment letter (April 10, 2003) on the Advanced Notice of Proposed Rulemaking (ANPRM) on the Clean Water Act Regulatory Definition of "Waters of the United States." (Docket ID No. OW-2002-0050). This letter is a synthesis of scientific information regarding ephemeral, intermittent, and headwater streams. It was written to USEPA by 85 leading aquatic scientists.
[171] Wright, Tiffany, et al. 2006. *Direct and Indirect Impacts of Urbanization on Wetland Quality.* Prepared by the Center for Watershed Protection for the USEPA Office of Wetlands, Oceans, an Watersheds. 81p. Available on-line at http://www.cwp.org
[172] Konrad, Christopher P. and Derek K. Booth, 2005. *Hydrologic Changes in Urban Streams and Their Ecological Significance.* American Fisheries Society Symposium. Vol. 45 pp.157-177.
[173] Coleman, Derrick, et al. 2005. *Effect of Increases in Peak Flows and Imperviousness on the Morphology of Southern California Streams*. Technical Report No. 450 of the Southern California Coastal Water Research Project.
[174] Fischenich, J.C. 2001. "*Impacts of stabilization measures*," EMRRP Technical Notes Collection (ERDC TNEMRRP- SR-32), U.S. Army Engineer Research and Development Center, Vicksburg, MS. http://www.wes.army.mil/el/emrrp
[175] Blakely, Tanya J., et al. 2006. *Barriers To The Recovery Of Aquatic Insect Communities In Urban Streams* Freshwater Biology Vol. 51(9), 1634–1645.
[176] California Nonpoint Source Encyclopedia, Management Measure 3.1.b. Runoff from Developing Areas, Site Development and Management Measure 3.3.a. Runoff from Existing Development, Existing Development.
[177] USEPA, 2000. Low-Impact Development: A literature review. EPA-841-B-00-005. 35p.
[178] Bay Area Stormwater Management Agencies Association., 1999. Start at the Source. Forbes Custom Publishing. Available on-line at: http://www.scvurppp-w2k.com/basmaa_satsm.htm. pp. 149.
[179] National Association of Home Builders Research Center. *Builders Guide to Low Impact Development.* Available on-line at http://www.toolbase.org
[180] National Association of Home Builders Research Center. *Municipal Guide to Low Impact Development.* Available on-line at http://www.toolbase.org

Development and Research, developed "*The Practice of Low Impact Development (LID)*" to assist the housing industry during the land development process. [181] This document focuses specifically on technologies that affect both the cost impacts and environmental issues associated with land development. Much of the report focuses on storm water management because LID storm water management systems can save capital costs for developers and maintenance costs for municipalities.[182] The executive summary of the HUD report notes:

> *This approach to land development, called Low Impact Development (LID), uses various land planning and design practices and technologies to simultaneously conserve and protect natural resource systems and reduce infrastructure costs. LID still allows land to be developed, but in a cost-effective manner that helps mitigate potential environmental impacts. LID is best suited for new, suburban development.*

Developers can use site and structure designs that reduce building footprints, decrease the amount of paved infrastructure, and provide for dispersed drainage and infiltration of runoff from impervious surfaces to reduce the effective impervious surface.[183] The concept of effective impervious surface is important, because when runoff from these surfaces is directed to pervious areas rather to an impervious drainage system (i.e. curbs, gutters, street surfaces, storm drain pipes), it can infiltrate, evaporate, or be taken up by vegetation, thereby reducing the total volume of storm water runoff leaving a site.

In addition to all the benefits discussed above, LID BMPs have several other advantages over conventional treatment control BMPs. As previously discussed, implementing LID BMPs can save on maintenance costs for municipalities and property owners. LID BMPs are typically easier to operate and maintain compared to conventional mechanical treatment control BMP technologies. Because LID BMPs are easier to operate and maintain, they are also more reliable compared to conventional mechanical treatment control BMP technologies, thus more sustainable over the long term.

Through its process of conditioning development projects under the CWA section 401 Water Quality Certification program, the San Diego Water Board finds that the level of LID site design BMP implementation in the Order is feasible for all projects. The LID BMP requirements will help ensure that LID site design BMPs are implemented for new development projects. LID site design BMPs are a critical component of storm water runoff management at new development projects, since the LID BMPs provide multiple benefits including preservation of hydrologic conditions, reduction of pollutant discharges, cost effectiveness, and green space.

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[181] U.S. Department of Housing and Urban Development, Office of Policy Development and Research, 2003. *The Practice of Low Impact Development."* Prepared by: NAHB Research Center, Inc. Upper Marlboro, Maryland. Contract No. H-21314CA.
[182] Ibid. Executive Summary, p.x.
[183] Bay Area Stormwater Management Agencies Association. 2003. *Using Site Design Techniques to Meet Development Standards for Stormwater Quality*. Available on-line at: http://www.basmaa.org/

The Order provides the Copermittees with flexibility in implementing the LID site design BMP requirements by providing a LID BMP waiver program. The Riverside County Copermittees plan on allowing the implementation of the LID BMPs contained in the Riverside County LID Design Manual if retention LID BMPs are found to be technically infeasible to retain all of the design capture volume. Other LID BMP design and guidance manuals that are acceptable to the Copermittees and/or San Diego Water Board may also be considered.

If retention LID BMPs and/or other LID BMPs are technically infeasible to retain and/or treat all or part of the design capture volume for a Priority Development Project, a waiver may be granted for the remaining portion of the design capture volume. The waiver would allow the remaining portion of the design capture volume to be treated with conventional treatment control BMPs and some form of mitigation.

The use of conventional treatment control BMPs for Priority Development Projects is expected to be allowed by the Copermittees on a very limited basis, and only when a Copermittee finds that LID BMPs are technically infeasible for retaining and/or treating the full design capture volume. In such cases, the Copermittee may issue a waiver for the Priority Development Project from all or a portion of the LID BMP requirements. The LID BMP waiver program that must be developed and implemented by the Copermittee(s) is discussed below under section F.1.d.(7). The criteria that the Copermittee(s) may use to make a finding of technical infeasibility for implementing LID BMPs are also discussed under section F.1.d.(7).

Section F.1.d.(5) (Source Control BMP Requirements) requires that Priority Development Projects implement a minimum set of source control BMPs to protect the water quality of receiving waters from discharges of runoff from these projects. This section has been added to provide more detail and clarify the Order's requirements for source control BMPs. The minimum source control BMPs listed as required by this section must be implemented by each Priority Development Project. In cases where one or more of the minimum source control BMPs are not warranted as part of the site design for the Priority Development Project (e.g., no outdoor material storage and/or work areas), those source control BMPs are not expected to be implemented.

Section F.1.d.(6) (Treatment Control BMP Requirements) includes several design requirements for any treatment control BMPs that are allowed to be implemented (i.e. granted a waiver for all or part of the LID BMP requirements) on Priority Development Projects. These requirements are generally consistent with Order No. R9-2004-001, with two exceptions. First, the Order limits the selections of methods used to determine the appropriate volume of storm water runoff to be treated. The modification ensures that priority development project proponents utilize the most accurate information to determine the volume or flow of runoff which must be treated.

Second, the Order requires that treatment control BMPs selected for implementation at Priority Development Projects have a removal efficiency rating that is ranked with high

or medium pollutant removal frequency for the project's most significant pollutants of concern. The requirement allows exceptions for those projects that, with a feasibility analysis, can justify the use of a treatment control BMP with a low removal efficiency for a Priority Development Project. This requirement is needed because to date, the Copermittees have generally approved low removal efficiency treatment control BMPs without justification or evidence that use of higher efficiency treatment BMPs was considered and found to be infeasible. Specifically, it has been found during audits of the Copermittees' SSMP programs that many SSMP reports do not adequately describe the selection of treatment control BMPs.[184] Moreover, USEPA's contractor Tetra Tech, Inc. recommends that "project proponents should begin with the treatment control that is most effective at removing the pollutants of concern […] and provide justification if that treatment control BMP is not selected."[185]

In addition, treatment control BMPs must be designed and implemented with measures to avoid the creation of nuisance or pollution associated with vectors, such as mosquitoes, rodents, and flies. Related guidelines are identified in guidance from CASQA.[186] Additional considerations are outlined in publications from the California Department of Health Services and University of California Division of Agriculture and Natural Resources.[187]

Section F.1.d.(7) (Low-Impact Development BMP Waiver Program) requires the Copermittees to develop, collectively or individually, a LID BMP waiver program. For some Priority Development Project sites, it may be technically infeasible to implement the required LID BMPs to retain and/or treat the design capture volume due to the site constraints. For this reason, the San Diego Water Board has added to the Order a requirement for the Copermittees to develop such a program. The LID BMP waiver program would provide the opportunity for development projects to avoid partial or full LID BMP implementation in exchange for implementation of conventional treatment control BMPs and mitigation. The program would maintain equal water quality benefits as properly implemented LID BMPs when partial LID BMPs are coupled with some form of mitigation.

LID BMPs are not limited to infiltration BMPs, and may also include storage, evaporation, evapotranspiration, filtration, and/or on site reuse BMPs. Thus, the San Diego Water Board expects that every site will be able to implement some form of LID BMPs to some extent. The LID BMP waiver program is expected to be used by the Copermittees on a limited basis, and only when a Copermittee finds that LID BMPs are technically infeasible for retaining and/or treating the full design capture volume. The Order provides several conditions under which a Copermittee may find that the

[184] PG Environmental, 2008. Riverside County Flood Control and Water Conservation District and County of Riverside MS4 Inspection Report.
[185] Tetra Tech, Inc., 2005. Program Evaluation Report –San Diego Standard Urban Storm Water Mitigation Plan (SUSMP) Evaluation. P. 5.
[186] For example, see the California Stormwater BMP Handbook guidelines for Extended Detention Basins (TC-22) at http://www.cabmphandbooks.org.
[187] Marco Metzger. "Managing Mosquitoes in Stormwater Treatment Devices." University of California Division of Agriculture and Natural Resources Publication No. 8125. Available at http://anrcatalog.ucdavis.edu.

implementation of LID BMPs to retain and/or treat the design capture volume is technically infeasible [see section F.1.d.(7)(b)(i)-(iii)]. The Copermittees are not limited to the conditions listed in the Order, and may identify other conditions in the SSMP that would allow a finding of technical infeasibility.

Making a finding of technical infeasibility for the implementation of the LID BMP requirements on any Priority Development Project is at the discretion of each Copermittee through their SSMP plan review process. For any project proponent that would like to receive a waiver for all or part of the LID BMP requirements, the Copermittees may require and/or use any information to make a finding of technical infeasibility.

A separate technical report developed by the project proponent or the Copermittee to support a finding of technical infeasibility may not always be necessary to meet the requirements of this Order. In most cases, it is expected that the information that is provided in the project proponent's SSMP plan review documents (e.g., geotechnical reports, site design plans) will allow the Copermittees to determine whether or not it is technically feasible for LID BMPs to be implemented to retain and/or treat all or part of the design capture volume. The reason(s) for a Copermittee making a finding a technical infeasibility and granting a LID BMP waiver for any project must be provided in the Annual Report.

For Priority Development Projects that are granted a waiver for all or a portion of the LID BMP requirements, mitigation will be required to achieve water quality benefits that will be lost without the LID BMP retention and/or treatment. Any LID BMP waiver program which allows development projects to forgo all or part of the LID BMP implementation requirements must include mitigation provisions which will achieve similar water quality benefits. To ensure that this is the case for the LID BMP waiver program, minimum mitigation provisions for the program have been added to the Order.

Mitigation can be achieved on site or off site. On site mitigation may include additional sizing multipliers for conventional treatment control BMPs implemented on the site to treat a larger range of storm events to achieve the same or greater pollutant load removal expected from retention of the design capture volume. Off site mitigation may include other pollutant treatment projects that are not located on the site that will achieve the same or greater pollutant removal expected from on site LID BMPs for the design capture volume. For example, off site mitigation projects may include green streets projects, existing development retrofit projects, retrofit incentive programs, regional BMPs and/or riparian restoration projects. Off site mitigation projects may also satisfy the Order's retrofitting requirements in section F.3.d.

In addition to these mitigation options, the Order allows the Copermittees to develop and propose additional forms of mitigation (e.g., pollutant credit system, mitigation fund) that could be implemented as part of the LID BMP waiver program by the Copermittee(s). Any additional forms of mitigation proposed by the Copermittees

would be subject to approval by the San Diego Water Board Executive Officer prior to implementation.

Section F.1.d.(8) (LID and Treatment Control BMP Standards) addresses a need for the Copermittees to develop and apply consistent criteria for the design and maintenance of structural treatment BMPs. Correct BMP design is critical to ensure that BMPs are effective and perform as intended. Without design criteria, there is no assurance that this will occur, since there is no standard for design or review. As an example, Ventura County has developed a BMP manual that includes standard design procedure forms for BMPs. Ventura County's *Technical Guidance Manual for Storm Water Quality Control Measures* is available at http://www.vcstormwater.org/publications.htm."[188] CASQA also confirms the necessity of design criteria when it includes such criteria in its New Development and Redevelopment BMP Handbook.[189] This issue is noted in the ROWD, and the Copermittees propose to develop standard design checklist/plans/details for selected source control and treatment BMPs.[190]

Section F.1.d.(9) (Implementation Process) requires the Copermittee to implement a process to verify compliance with SSMP requirements. The process must identify at what point in the planning process that projects must meet SSMP requirements and what are roles/responsibilities of municipal departments. The intent of this requirement is to provide consistency in the application of the SSMP between the Copermittees. This requirement was included in previous Order No. R9-2004-001.

Section F.1.d.(10) (Post-construction BMP Review) requires the Copermittees to keep their SSMP up to date with BMP effectiveness studies for low-impact design and treatment control BMPs. This requirement will ensure that two important types of information be included in those efforts: Site design BMPs and treatment BMPs that are assessed as part of contracts with the State Water Board and San Diego Water Board. Projects funded with such state grants must include effectiveness assessments using a quality assurance plan. As a result, such studies generally provide reliable sources of local data and should be included in the SSMP.

Sections F.1.e (BMP Construction Verification)requires the Copermittees to verify that the BMPs are being constructed for each Priority Development Project subject to SSMP requirements (SSMP project). SSMP projects that improperly construct or fail to construct site design, source control, and treatment control BMPs can pose a significant threat to water quality. Section F.1.e is included in response to recommendations from USEPA.[191]

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[188] Ibid.
[189] California Stormwater Quality Association, 2003. Stormwater Best Management Practice Handbook – New Development and Redevelopment.
[190] Riverside County Copermittees. 2009. Report of Waste Discharge (San Diego Region).
[191] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68845. USEPA recommends such practices in the Phase II storm water regulations, promoting "inspections during construction to verify BMPs are built as designed."

In some cases SSMP projects may wish to allow occupancy and/or use of a portion of the site prior to full completion of the project. Section F.1.e is not intended to require a project to be fully (i.e. all phases and areas) completed before the occupancy and/or intended use of a portion of the site is allowed. A Copermittee, however, must verify that the BMPs designed to treat and control pollutants from the completed portion of the project are properly constructed before the occupancy and/or intended use of the completed portion is allowed. The BMPs must be specifically designed to control pollutants from the completed portion of the site that will be occupied and/or used prior to the full completion of the SSMP project.

Section F.1.f (BMP Maintenance Tracking) is included in the Order to ensure the continued effectiveness of the post-construction BMP requirements. BMPs need to be properly constructed and adequately maintained to ensure that they are operating correctly and remain effective in removing pollutants from a project site's runoff prior to discharging to receiving waters.

To facilitate the tracking of BMP maintenance, each Copermittee must develop and maintain a database of Priority Development Projects subject to SSMP requirements (SSMP projects) and the post-construction BMPs implemented for each SSMP project. The inventory is not expected or required to include LID BMPs that are implemented on a lot by lot basis at single family residential houses. The inventory, however, must include the post-construction BMPs for all other development or redevelopment SSMP project sites.

The Order requires BMPs at all high priority SSMP project sites as well as all Copermittee project sites with BMPs to be inspected by the Copermittees annually. Other measures, verification methods, and inspection frequencies may be used for BMPs at lower priority SSMP project sites. SSMP project sites with the highest potential for causing or contributing to a threat to water quality or an existing impairment of water quality are required to be inspected by the Copermittees on an annual basis.

The prioritization of the SSMP project sites requiring inspections by the Copermittees will be developed by the Copermittees and reported in the updated JRMP. The prioritization of SSMP project sites may be revised on an annual basis based on inspection findings, and the Copermittees must report changes in prioritization, and justification for each change, in the Annual Report.

The Order includes several criteria that must be considered by the Copermittees in determining the priority of a SSMP project site's threat to water quality. Receiving waters that are listed as impaired by pollutants and/or with discharges exceeding action levels are water bodies most at risk for impairment of beneficial uses. Thus, at a minimum, high priority SSMP projects must include sites that are known or suspected to generate pollutants in an area that is tributary (i.e. upstream within the same Hydrologic Subarea) to a receiving water body listed as impaired for those pollutants; and/or, a receiving water body where exceedances of action levels for

those pollutants are observed; and/or, a receiving water body where exceedances of NALs for those pollutants are observed and the Copermittee has not been able to identify the source.

Section F.1.h (Hydromodification) expands and clarifies current requirements for control of MS4 discharges to limit hydromodification effects caused by changes in runoff resulting from development and urbanization. The requirements are based on findings and recommendations of the Riverside County Storm Water Program,[192] the Stormwater Monitoring Coalition (SMC),[193,194] and the Storm Water Panel on Numeric Effluent Limits (Numeric Effluent Panel).[195] Added specificity is needed due to the current lack of a clear standard for controlling hydromodification resulting from development. More specific requirements are also warranted because hydromodification is increasingly recognized as a major factor affecting water quality and beneficial uses.

Hydromodification is the change in a watershed's runoff characteristics resulting from development, together with associated morphological changes to channels receiving the runoff. As the total area of impervious surfaces increases, infiltration of rainfall decreases, causing more water to run off the surface and at a higher velocity than natural conditions. While erosion in channels is a naturally occurring process, increased runoff rates, volumes, and velocities from developed areas can produce erosive flows in channels under rainfall conditions which are unnatural and were not previously problematic. Moreover, runoff from developed areas increases the duration of time that channels are exposed to erosive flows. The increase in the volume of runoff and the length of time that erosive flows occur ultimately intensify the amount and potential of channel erosion, subsequently causing changes in sediment transport characteristics and the hydraulic geometry (width, depth, and slope) of channels.[196]

These types of changes have been documented in southern California. It has been reported that researchers studying flood frequencies in Riverside County have found that increases in watershed imperviousness of only 9-22 percent can result in increases in peak flow rates for the two-year storm event of up to 100 percent.[197] Such changes in runoff have significant impacts on channel morphology. It has recently been found that ephemeral/intermittent channels in southern California appear to be

[192] Riverside County Copermittees. 2009. Report of Waste Discharge (San Diego Region).
[193] Coleman, Derrick, et al. 2005. *Effect of Increases in Peak Flows and Imperviousness on the Morphology of Southern California Streams.* Technical Report No. 450 of the Southern California Coastal Water Research Project.
[194] Stein, Eric and Susan Zaleski. 2005. Managing Runoff to Protect Natural Streams: The Latest Developments on Investigation and Management of Hydromodification in California. Proceedings of a special technical workshop co-sponsored by California Stormwater Quality Association (CASQA), Stormwater Monitoring Coalition (SMC), and University of Southern California Sea Grant (USC Sea Grant). Technical Report No. 475 of the Southern California Coastal Water Research Project.
[195] Storm Water Panel Recommendations to the California State Water Resources Control Board. 2006. The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial, and Construction Activities.
[196] Santa Clara Valley Urban Runoff Pollution Prevention Program, 2005. Hydromodification Management Plan. P. 1-1.
[197] Schueler and Holland, 2000. Storm Water Strategies for Arid and Semi-Arid Watersheds (Article 66). The Practice of Watershed Protection.

more sensitive to changes in imperviousness than channels in other areas. Morphology of small channels in southern California was found to change with only 2-3 percent watershed imperviousness, as opposed to 7-10 percent watershed imperviousness in other parts of the nation.[198]

Sediment that would normally be eroded from the developed areas (i.e. naturally eroded if the area remained undeveloped) is typically coarser grained and deposited closer to the source. Coarser grained sediments that are deposited also provide or contribute to habitat that is more hospitable to aquatic flora and fauna.

Developed areas and increased impervious surface change the types and quality of sediment that are discharged in runoff to the channels under rainfall conditions, which can have an adverse impact on downstream habitats. Sediment in runoff from developed areas and impervious surfaces are typically finer grained, which remains suspended for longer periods of time and can affect aquatic flora (e.g., reduce photosynthesis by limiting transmittance of light) and fauna (e.g., interfere with respiration). Several types of pollutants generated on developed areas (e.g., pesticides, nutrients, bacteria, metals, hydrocarbons) also tend to adsorb on to finer grained sediments. In addition, finer grained sediments get deposited further away from the source or point of discharge. These changes in the characteristics and quality of the sediment in the runoff from developed areas also contribute to the hydromodification effects on downstream channels.

Effects of hydromodification are evident in Riverside County and recognized by the Copermittees. Analyses of bioassessment data within the San Diego Region has indicated that physical changes to stream channels caused by hydromodification are likely responsible, in part, for the low bioassessment scores in urbanized settings.[199] This pattern is consistent under Order No. R9-2004-001, although non-reference bioassessment monitoring was limited to two sites located at mass loading stations. These sites consistently exhibited poor or very poor IBI scores and sub-optimal or marginal habitat. In addition to poor habitat, water chemistry and toxicity impacts were documented at mass and tributary loading stations, likely exacerbating the observed low IBI scores.[200] It is important to recognize that the physical changes in stream channels are a direct result of MS4 discharges, but that two separate mechanisms are involved in bringing about those changes. First, is a change in the flow regime caused by the increase in impervious surfaces and loss of natural conveyance systems. Discharges to receiving waters from the MS4 outfalls do not mimic the natural discharges from former tributaries to that receiving water, and the change results in erosion. Second, the physical stream habitat in many places has been severely modified in order to efficiently convey those increased storm water discharges to the ocean. Where streams are hardened and/or buried to convey storm water, they

[198] Coleman, et. al., 2005. Effect of Increases in Peak Flows and Imperviousness on the Morphology of Southern California Streams. P. iv.
[199] See San Diego Water Board Order No. R9-2009-002 Fact Sheet.
[200] Riverside County Copermittees Fiscal Year 2008-2009 Santa Margarita Watershed Annual Progress Report.

cannot provide adequate water quality and other necessary conditions to support beneficial uses. Both of these issues are addressed in the Order.

The Copermittees' recognize the need to improve management of hydromodification. The ROWD proposes to revise the SSMP to incorporate additional information from ongoing hydromodification studies conducted by the SMC. The Order allows the Copermittees to adopt criteria consistent with future SMC findings in the development of their Hydromodification Management Plan.

Section F.1.h. requires the Copermittees to submit a draft Hydromodification Management Plan (HMP) on or before June 30, 2013. This will provide the Copermittees over 2 years to develop the draft HMP.

Section F.1.h (1) describes several elements that must be included in the HMP. For example, the HMP must identify a method for assessing susceptibility of channel segments which receive runoff discharges from Priority Development Projects, and include a channel standard to ensure that the stability of the channel is not compromised as a result of discharges from the Priority Development Projects. The HMP must also identify a range of flows where Priority Development Projects could cause hydromodification effects and subsequent stream instability.

Maintaining the pre-development flows and durations from a Priority Development Project will significantly reduce the potential for increased erosion caused by development. Loss of natural sediment that will be removed because of otherwise pervious areas covered by the impervious development and removal of pollutants in runoff from Priority Development Projects, however, can still increase the potential for increased erosion. Runoff that is discharged from a project that lacks sediment becomes "sediment hungry" and can result in increased erosion upstream and downstream from the point of discharge. Thus, the HMP must also identify a method and compensate for the loss of sediment supply that is expected due to development and include a performance and/or design standard that will be able to mitigate for that expected loss of sediment supply.

The HMP must require Priority Development Projects to implement control measures (such as LID or detention basins) to prevent hydromodification and resultant degradation of stream conditions upstream and/or downstream of project sites. To compare post-project flow rates and durations to pre-project flow rates and durations, the HMP must specify that the pre-development (naturally occurring) flow rates and durations shall be used when assessing pre-project conditions, so that the naturally occurring hydrology throughout the watershed is eventually restored.

In cases where a stream has been armored with concrete, rip rap, or other man-made materials, the HMP shall require the assessment of a comparable soft-bottom channel as the channel standard, as opposed to using the characteristics of the hardened channel as the channel standard. This is to ensure that hydromodification management measures are already in place should any portion of the hardened

channel be returned to its natural state, thereby restoring the physical integrity of the creek and its Beneficial Uses. The only exceptions are for projects that discharge storm water runoff into underground storm drains or conveyance channels with bed and banks that have been concrete lined all the way to water storage reservoirs or lakes, where effects from hydromodification are not expected. Other exceptions that are acceptable to the San Diego Water Board may be identified in the final HMP.

The HMP must also include metrics for assessing impacts to downstream watercourses from Priority Development Projects, as well as assessing improvements to these watercourses. The metrics must be able to assess changes to the channels as Priority Development Projects are developed and constructed in the watershed. Monitoring and evaluating changes to the physical conditions of the channels receiving runoff discharges from Priority Development Projects will provide the Copermittees data that can be used to determine whether or not the HMP is effective at reducing the increased erosive forces caused by development and impervious surfaces over time.

In addition to metrics to assess changes to the physical conditions of the channels, the Copermittees must monitor and evaluate the biological conditions (e.g., habitat quality, benthic flora and fauna, IBI scores) of the channels. This is because historic hydromodification impacts, such as concrete lining and channelization, are suspected to have impacted the natural physical habitat of urban streams resulting in low IBI scores. The Copermittee's 2008-2009 monitoring report indicated decreased IBI scores at mass loading stations below urbanized watersheds, in part due to marginal or suboptimal habitat. The Monitoring and Reporting Program in the Order includes new requirements for monitoring of habitat for bioassessment, with the "Full" suite of physical/habitat characterization measurements found in the SWAMP Bioassessment Standard Operating Procedures being required with each bioassessment sample. Additional bioassessment sites are also required at locations higher in the watershed, which is expected to more closely reflect localized impacts. Therefore, the IBI scores required by the Monitoring and Reporting Program will be a useful metric in terms of assessing both impacts to streams from Priority Development Projects and improvements due to implementation of the HMP management measures. The Copermittees may also develop or utilize other metrics and identify other monitoring locations that can be used to assess the effectiveness of the HMP on the physical and biological conditions of the channels.

In addition to the control measures that must be included in the HMP to prevent or minimize hydromodification effects from Priority Development Projects, section F.1.h.(2) requires the HMP to include additional management measures that can be used on Priority Development Projects based on a prioritized consideration of the following elements in this order: 1) site-design control measures, 2) on-site management measures, 3) the use of regional control measures upstream of receiving waters, and lastly, 4) in-stream management and control measures (not to include reinforcement with non-naturally occurring materials). The suite of management measures must also include stream restoration as a viable option to achieve the channel standard and subsequently restore Beneficial Uses. In-stream controls are

expected to be in the form of stream restoration or rehabilitation. The use of stream restoration is expected to be an option that is used in conjunction with other on site management measures and not by itself as the only management measure. Stream restoration or rehabilitation projects that are considered in-stream controls for the purpose of preventing or minimizing hydromodification effects do not include projects that use non-naturally occurring materials (e.g., concrete, rip-rap, or gabions, etc.), but may include projects that use natural materials and/or create stable and sustainable channel configurations.

The San Diego Water Board recognizes that fully achieving post-project runoff flow rates and durations that do not exceed pre-development (naturally occurring) runoff flow rates and durations on redevelopment projects with existing impervious surfaces may be challenging. Thus, section F.1.h.(3) has been included to allow the Copermittees to propose, as part of the HMP, a waiver program specifically for Priority Development Projects that are redevelopment projects, as defined by section F.1.d.(1)(b). Because redevelopment projects may not be able to achieve post-project runoff flow rates and durations that do not exceed pre-development (naturally occurring) runoff flow rates and durations through onsite management and control measures, offsite mitigation measures may be required. Redevelopment projects must achieve post-project runoff flow rates and durations that are less than or equal to pre-project and down to pre-development runoff flow rates and durations to be eligible to receive a waiver under the program. For a redevelopment project, the pre-project runoff flow rates and durations are those currently being discharged by the existing development prior to the redevelopment project being built. Meeting pre-project runoff flow rates and durations is usually a less stringent performance criteria than meeting the pre-development runoff flow rates and durations. Implementing BMPs to meet the pre-project flow rates and durations is significantly easier and cheaper for a redevelopment project compared to meeting pre-development flow rates and durations. If a project is granted a waiver, the estimated incremental hydromodification impacts from not achieving the pre-development (naturally occurring) runoff flow rates and durations for the project site must be fully mitigated with offsite mitigation. Offsite mitigation measures may include utilizing regional hydrologic control measures (e.g., regional detention or infiltration basins) or rehabilitation of stream channels to achieve sustainable channel configurations.

Section F.1.h (6) describes interim hydromodification criteria that must be implemented by the Copermittees until the final HMP is found to be adequate by the San Diego Water Board Executive Officer. The Copermittees currently have hydromodification requirements in the SSMP (section 4.4 of the Riverside County WQMP). Until the final HMP is required to be implemented, the Copermittees must continue implementing their existing hydromodification requirements. The existing hydromodification requirements[201] allow exemptions for Priority Development Projects if they meet one of three conditions. One of those conditions is if a project discharges directly to a publicly-owned, operated and maintained MS4. This condition has been

[201] Riverside County Copermittees, 2006 (updated in 2009). Riverside County Water Quality Management Plan (WQMP), Section 4.4.

too broadly applied and has resulted in many projects being exempt from the hydromodification requirements in the past.

Therefore, the Order modifies the conditions that may exempt Priority Development Projects from implementing the interim hydromodification criteria. The modifications to the conditions are minor and can be implemented in the interim until the final HMP is approved. This allows the Copermittees to focus their resources on development of the final HMP.

Finally, the requirements included in section F.1.h do not supersede the LID BMP requirements in section F.1.d. (4). In certain situations, the requirements to incorporate LID BMPs will satisfy the requirements for hydromodification management. Using LID is a viable option for both accomplishing hydromodification management and pollutant load reductions.

Section F.1.i (Unpaved Roads Development) specifically requires the Copermittees to implement or require implementation of BMPs for erosion and sediment control after construction of all new unpaved roads. As discussed for Finding D.1c, design and source control BMPs for unpaved roads are needed to minimize the discharge of sediment to the MS4s and receiving waters, especially during storm events. There are several guidance documents available (see Discussion for Finding D.1.c) that include design and source control BMPs that can be readily implemented by the Copermittees for the development of new unpaved roads.

F.2. Construction Component

The following legal authority applies to section F.2:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D) provides that the proposed management program include “A description of a program to implement and maintain structural and non-structural best management practices to reduce pollutants in storm water runoff from construction sites to the municipal storm sewer system.”

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D)(1) provides that the proposed management program include “A description of procedures for site planning which incorporate consideration of potential water quality impacts.”

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D)(2) provides that the proposed management program include “A description of requirements for nonstructural and structural best management practices.”

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D)(3) provides that the proposed management program include "A description of procedures for identifying priorities for inspecting sites and enforcing control measures which consider the nature of the construction activity, topography, and the characteristics of soils and receiving water quality."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D)(4) provides that the proposed management program include "A description of appropriate educational and training measures for construction site operators."

Federal NPDES regulation 40 CFR 122.26(d)(2)(i)(A) provides that each Copermittee must demonstrate that it can control "through ordinance, permit, contract, order or similar means, the contribution of pollutants to the municipal storm sewer by storm water discharges associated with industrial activity and the quality of storm water discharged from site of industrial activity."

Federal NPDES regulation 40 CFR 122.26(b)(14) provides that "The following categories of facilities are considered to be engaging in 'industrial activity' for the purposes of this subsection: […] (x) Construction activity including cleaning, grading and excavation activities […]."

Federal NPDES regulation 40 CFR 122.44(d)(1)(i) requires NPDES permits to include limitations to "control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines are or may be discharged at a level which will cause, have reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality."

Section F.2 has additions to ensure the protection of threatened and endangered species and requires the consideration of potential impacts from the use of Active/Passive Sediment Treatment (AST) at sites determined by the Copermittees to be exceptional threats to water quality. These requirements were added to ensure additional protection of the Beneficial Uses of waters of the State.

Section F.2.a (Ordinance Update) requires each Copermittee to review and update its grading and storm water ordinances as necessary to comply with the MS4 permit. By updating the grading and storm water ordinances, the Copermittees will have the necessary legal authority to require construction sites to implement effective BMPs that will reduce pollutant discharges to the maximum extent practicable. The Order allows the Copermittees 365 days to review and update their ordinances. The 365 days should be adequate to allow for the relatively minor changes that might be needed since their ordinances were last updated under Order No. R9-2004-001.

Section F.2.b (Source Identification) requires the Copermittees to develop and update a watershed based inventory of all construction sites regardless of size or ownership. This section has been modified to require the inventory be updated regularly, rather than annually because constructions sites tend to change often within the course of a year. More frequent updates will ensure the Copermittees have a more accurate inventory of construction sites within their jurisdiction. A regularly updated inventory of active construction sites will assist the Copermittees in ensuring that all sites are inspected per Order requirements. The Order does not specify the frequency of updates, and instead relies on each Copermittee to develop updates appropriate to local construction activity. Failure to maintain a useful inventory would be a violation of the Order.

Section F.2.c (Site Planning and Project Approval Process) requires Copermittees to incorporate consideration of potential water quality impacts prior to approval and issuance of construction and grading permits.

This section now requires the Copermittees to review project proponents' runoff management plans for compliance with local regulations, policies, and procedures. USEPA recommends that it is often easier and more effective to incorporate storm water quality controls during the site plan review process or earlier.[202] In the Phase I storm water regulations, USEPA states that a primary control technique is good site planning.[203] USEPA goes on to say that the most efficient controls result when a comprehensive storm water management system is in place.[204] To determine if a construction site is in compliance with construction and grading ordinances and permits, USEPA states that the "MS4 operator should review the site plans submitted by the construction site operator before ground is broken."[205] Site plan review aids in compliance and enforcement efforts since it alerts the "MS4 operator early in the process to the planned use or non-use of proper BMPs and provides a way to track new construction activities."[206]

The Copermittees have the discretion to determine the depth and detail of the review, as well as the method by which the review will be conducted. The Copermittees review must at least verify that the project proponent's runoff management plan complies with the Copermittee's construction, storm water, and grading ordinances and permits prior to issuing the permit.

Section F.2.d (BMP Implementation) includes modifications to the requirements for each Copermittee to designate and ensure implementation of a set of minimum BMPs at construction sites. These modifications are based on San Diego Water Board findings and experience during implementation of Order No. R9-2004-001.

[202] USEPA, 1992. Guidance 833-8-92-002. Section 6.3.2.1.
[203] Federal Register / Vol. 55, No. 222 / Friday, November 16, 1990 / Rules and Regulations. P. 48034.
[204] Ibid.
[205] USEPA, 2000. Guidance 833-R-00-002. Section 4.6.2.4, P. 4-30.
[206] Ibid., P. 4-31.

As a result, the Order requires a minimum set of BMPs to be designated for all sites. In addition to the minimum set of BMPs, enhanced BMPs must be designated and implemented for sites tributary to (i.e. upstream within the same Hydrologic Subarea of) a 303(d) listed water body, or within, directly adjacent to, or discharging directly to ESAs. Enhanced BMPs are control actions and measures specifically targeted to the pollutant or condition of concern and of higher quality and effectiveness than the minimum control measures otherwise required. Enhanced BMPs are expected to be better and more effective for pollutant removal than the minimum set of BMPs.

For sites that are identified as exceptional threat to water quality, active/passive sediment treatment (AST) is required to be implemented in addition to the minimum set and/or enhanced sediment control BMPs. AST is required at construction sites that are identified by the Copermittee as an exceptional threat to water quality due to high turbidity or suspended sediment levels in the site's effluent even when other sediment control BMPs have been implemented. In cases where the Copermittee's designated minimum set of BMPs and/or enhanced BMPs are not able or expected to be able to reduce turbidity or suspended sediment levels to a level that will be protective of water quality, AST is necessary and is considered MEP for the discharges from these sites.

AST has been effectively implemented extensively in the other states and in the Central Valley Region of California.[207] In addition, the San Diego Water Board's inspectors have observed AST being effectively implemented at large sites greater than 100 acres and at small, less than 5 acre, in-fill sites. AST is often necessary for Copermittees to ensure that discharges from construction sites are not causing or contributing to a violation of water quality standards. For example, the Basin Plan lists the water quality objective for turbidity as 20 NTU for all hydrologic areas and subareas except for the Coronado HA (10.10) and the Tijuana Valley (11.10). For certain construction sites with high clay content soils, large slopes and exposed areas, the only technology that is likely to meet 20 NTU is AST combined with erosion and sediment controls. To ensure the MEP standard and water quality standards are met, the requirement for implementation of AST at exceptional threat construction sites has been added to the Order, while still providing sufficient flexibility for each Copermittee's unique program.

The Copermittees may define types of construction sites, and/or at any time identify any construction sites after inspections, that are considered exceptional threats to water quality warranting AST. AST may include any sediment control technologies that are capable of reducing turbidity or suspended sediment levels in a construction site's discharge to meet water quality standards in receiving waters.

The Order does not include seasonal restrictions on grading. Seasonal restrictions on grading for storm water are difficult to implement due to the conflict between seasonal grading restrictions, avian breeding and nesting seasons and the seasonal passage of

[207] State Water Board, 2004. Conference on Advanced Treatment at Construction Sites.

endangered salmonids; therefore the seasonal grading restrictions have not been included with the other BMPs in the Order. For example, the Least Bell's Vireo and the Coastal California Gnatcatcher, found in southern California, are listed as federally endangered and threatened, respectively.[208] Permits issued by the California Department of Fish and Game (CDFG) restrict grading during these birds' breeding seasons, which is from April 10 to August 31 for the Least Bell's Vireo[209] and from February 15 to August 31 for the Coastal California Gnatcatcher.[210] Ideally storm water restrictions on grading would be during the rainy season from October 1 through April 30.[211] Combined, these restrictions would limit construction grading to be during the month of September, which is infeasible. Section D.2.d of the Order still requires project proponents to minimize grading during the rainy season and coincide grading with seasonal dry weather periods to the extent feasible.

Section F.2.e (Inspections) establishes criteria for inspections based on risk factors including size, season, and location of the construction site. Modifications have been made to requirements of Order No. R9-2004-001 based on the experience of the Copermittees and San Diego Water Board construction programs.

The types of construction sites that must be inspected every two weeks during the rainy season have been changed from Order No. R9-2004-001. In general, because large construction sites (i.e. greater than 50 acres) have been closely scrutinized during the last permit period, they tend to be adequately implementing BMPs. Smaller construction sites (i.e. site with less than 50 acres), however, were not inspected as frequently and can pose a significant threat to water quality. The final rule recently promulgated by USEPA for construction sites[212] identified construction sites with 20 or more acres of land disturbed at one time as posing a significant threat to water quality during the rainy season. Thus, the San Diego Water Board recognized that smaller construction sites needed to be inspected more frequently. As with the construction inspection requirements that were recently adopted for the Orange County Phase I MS4s, this Order requires sites in active grading during the rainy season that are over 30 acres, rather than sites over 50 acres, be inspected every two weeks.

The Order also lowers the size of construction sites adjacent to or discharging directly to ESAs that receive scrutiny. Order No. R9-2004-001 requires such sites five acres and more to be inspected every two weeks during the rainy season. This Order requires such sites one acre and above and tributary to (i.e. with the same Hydrologic Subarea of) a CWA section 303(d) water body segment impaired for sediment; or within, directly adjacent to, or discharging directly to a receiving water within an ESA to be inspected every two weeks during the rainy season and once during August or

[208] State of California, Department of Fish and Game, 2010. State and Federally Listed Endangered and Threatened Animals of California.
[209] United States Department of the Interior, Fish and Wildlife Service, 2001. Least Bell's Vireo Survey Guidelines.
[210] United States Department of the Interior, Fish and Wildlife Service, 1997. Coastal California Gnatcatcher (*Polioptila californica californica)* Presence/Absence Survey Guidelines.
[211] San Diego Water Board, 2001. Order No. 2001-01, San Diego County MS4 Permit. Directive F.2.g.(2).

September. The lower size threshold is consistent with Phase II storm water permits and the Construction General Permit, State Water Board Order No. 2009-0009-DWQ.

The Copermittees also have the discretion to define or identify other construction sites that are significant threats to water quality that must be inspected every two weeks. Several factors are provided that must be considered by each Copermittee in evaluating threat to water quality.

Finally, types of construction sites that must be inspected at least monthly during the rainy season have been changed from Order No. R9-2004-001. All construction sites with one acre or more of soil disturbance must be inspected monthly during the rainy season instead of just 3 times during the rainy season. This level of inspection is necessary by the Copermittees to ensure adequate compliance with their grading, building, storm water or other water quality related orders and provisions.

This section also requires the Copermittees to track the number of inspections for each inventoried construction site. This requirement has been added to ensure that the Copermittees can demonstrate that construction sites are inspected at the minimum frequencies.

Section F.2.g requires the Copermittees to notify the San Diego Water Board when high level enforcement has been issued to a construction site as a result of storm water violations. The Copermittees will define the types of high level enforcement that will warrant a notification of the San Diego Water Board in their JRMPs. Copermittees are also required to annually notify the San Diego Water Board of construction sites that have alleged violations. This section was added to enhance San Diego Water Board and Copermittee communication and coordination in regulating construction sites.

F.3 Existing Development Component

F.3.a. Municipal
The following legal authority applies to section D.3.a:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(1) provides that the proposed management program include “A description of maintenance activities and a maintenance schedule for structural controls to reduce pollutants (including floatables) in discharges from municipal separate storm sewers.”

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(3) provides that the proposed management program include “A description for operating and maintaining public streets, roads and highways and procedures for reducing the impact on receiving

waters of discharges from municipal storm sewer systems, including pollutants discharged as a result of de-icing activities."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(4) provides that the proposed management program include "A description of procedures to assure that flood management projects assess the impacts on the water quality of receiving water bodies and that existing structural flood control devices have been evaluated to determine if retrofitting the device to provide additional pollutant removal from storm water is feasible."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(5) provides that the proposed management program include "A description of a program to monitor pollutants in runoff from operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste, which shall identify priorities and procedures for inspections and establishing and implementing control measures for such discharges."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(6) provides that the proposed management program include "A description of a program to reduce to the maximum extent practicable, pollutants in discharges from municipal separate storm sewers associated with the application of pesticides, herbicides, and fertilizer which will include, as appropriate, controls such as educational activities, permits, certifications, and other measures for commercial applicators and distributors, and controls for application in public right-of-ways and at municipal facilities."

Federal NPDES regulation 40 CFR 122.44(d)(1)(i) requires NPDES permits to include limitations to "control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines are or may be discharged at a level which will cause, have reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality."

Section F.3.a.(2) (General BMP Implementation) requires the Copermittees to designate minimum BMPs for general municipal areas and activities, regardless of their threat to water quality. BMPs must also be designated for special events. The designated minimum BMPs required to be implemented at a site can be based on the sources or activities present at the site. Threat to water quality is used to determine inspection frequencies in section F.3.a.(8).

Section F.3.a.(3), F.3.a.(4), and F.3.a.(5) (BMP Implementation for Specific Categories) establishes requirements for specific categories of activities and areas. These are selected based on the CWA and findings of the Copermittees in annual reports and ROWD that identify these activities as warranting special attention.

<u>Pesticides, Herbicides, and Fertilizers</u>. 40 CFR 122.26(d)(2)(iv)(A)(6) requires a description of a storm water program for pesticides, herbicides, and fertilizers. In addition, water quality data demonstrates widespread presence of such pollutants in

receiving waters and MS4 discharges. In response to similar requirements of Order No. R9-2004-001, the Copermittees have developed a specific Integrated Pest Management, Pesticides, and Fertilizer guidelines.

Flood Control Structures. In order to more closely meet the intent of the federal regulations and guidance, the requirement has been modified. 40 CFR 122.26(d)(2)(iv)(A)(4) requires "A description of procedures to assure that flood management projects assess the impacts on the water quality of receiving water bodies and that existing structural flood control devices have been evaluated to determine if retrofitting the device to provide additional pollutant removal from storm water is feasible." Retrofitting flood control devices can reduce storm water pollutants and improve water quality.

USEPA expands on the federal provision with the following information: "Storm water management devices and structures that focus solely on water quantity are usually not designed to remove pollutants, and may sometimes harm aquatic habitat and aesthetic values".[213] As flood control structures and other elements of the MS4 age and retrofitting becomes necessary, opportunities for water quality improvements arise.

Conveyance systems which take water quality consideration into account (such as grassed swales, vegetated detention ponds, etc.) can often cost less to construct than traditional concrete systems. Evaluation of the applicability of such systems during retrofitting must occur to ensure that pollutants in storm water runoff are reduced to the maximum extent practicable. USEPA supports utilizing BMPs for pollution reduction in flood management projects, stating that "The proposed management program must demonstrate that flood management projects take into account the effects on the water quality of receiving water bodies. […] Opportunities for pollutant reduction should be considered".[214]

There are generally two types of retrofits for flood control structures. The first type involves adding an engineered device to an existing structure in order to treat or divert runoff. Examples include catch basin inlet filters/screens, ultraviolet disinfection facilities, hydrodynamic separators, and diversions to the sanitary sewer. The second type involves re-installing pervious or natural treatment features to facilities. Examples include removing concrete portions of conveyances to create pervious conveyances; and creating treatment wetlands within flood detention facilities. The later type of retrofit is preferred by the San Diego Water Board. They are likely more sustainable over the long-term because they may require less rigorous operation and maintenance than the former. They may also provide the additional benefit of providing significant

[213] USEPA, 1992. Guidance Manual for the Preparation of Part II of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems. Washington D.C. EPA/833-B-92-002.
[214] Ibid.

or incidental opportunities for beneficial uses (e.g., recreation, wildlife, water supply).[215,216]

Sweeping of Municipal Areas. Sweeping municipal areas would likely be done in the absence of the Order. However, in certain cases it is an important component of a jurisdictional runoff management program. The Order contains requirements to ensure that the use of street sweeping is optimized for runoff applications if it is to be used and reported as a BMP.

Section F.3.a.(6) (Operation and Maintenance of MS4 and Treatment Controls) requires the Copermittees to inspect and remove waste from their MS4s prior to the rainy season.

Maintenance is critical to the successful implementation of every storm water runoff management program. USEPA finds that "Lack of maintenance often limits the effectiveness of storm water structural controls such as detention/retention basins and infiltration devices. […] The proposed program should provide for maintenance logs of, and identify specific maintenance activities for, each class of control, such as removing sediment from retention ponds every five years, cleaning catch basins annually, and removing litter from channels twice a year.

If maintenance activities are scheduled infrequently, inspections must be scheduled to ensure that the control is operating adequately. In cases where scheduled maintenance is not appropriate, maintenance should be based on inspections of the control structure or frequency of storm events. If maintenance depends on the results of inspections or if it occurs infrequently, the applicant must provide an inspection schedule. The applicant should also identify the municipal department(s) responsible for the maintenance program".[217] The MS4 maintenance requirements are based on the above USEPA recommendations. This maintenance will help ensure that structural controls are in adequate condition to be effective year round, but especially at the beginning of and throughout the rainy season.

Two requirements have been added to the Order that were not within Order No. R9-2004-001. Subsection (iii) allows a decreased inspection frequency for facilities that are routinely clean, and subsection (iv) requires trash to be removed from open channels and detention basins in a timely manner. Typically, Copermittees have reported annual or semi-annual creek cleanups as significant BMPs. The large volumes of trash reported to be removed during these events demonstrates the significant amount of trash that accumulates in the channels. In order to reduce the effect of the trash, the Order requires that trash be removed more frequently.

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[215] Burton, Carmen et al. 2005. Assessing Water Source and Channel Type as Factors Affecting Benthic Macroinvertebrate and Periphyton Assemblages in the Highly Urbanized Santa Ana River Basin, California. American Fisheries Society Symposium. Vol.47 pp.239-262.
[216] Stromberg, Juliet C. 2001. Restoration of Riparian Vegetation in the South-Western United States: the importance of flow regimes and fluvial dynamism. Journal of Arid Environments. Vol49, pp.17-34.
[217] USEPA, 1992. Guidance Manual for the Preparation of Part II of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems. Washington D.C. EPA/833-B-92-002.

Section F.3.a.(7) (Infiltration from Sanitary Sewer to MS4) requires the Copermittees to implement controls and measures to prevent and eliminate sewage infiltration or seepage from municipal sanitary sewers to MS4s through thorough, routine preventive maintenance of the MS4.

Sections F.3.a.(8) and F.3.a.(9) (Inspections and Enforcement) establishes a minimum set of municipal areas and activities for oversight and inspection by the Copermittees and requires that Copermittees properly enforce runoff requirements at municipal areas and activities.

Section F.3.a.(10) (Copermittee Maintained Unpaved Roads Maintenance) requires the Copermittees to implement or require implementation of BMPs for erosion and sediment control during and after maintenance activities on the unpaved roads that the Copermittees are responsible for maintaining, particularly in or adjacent to stream channels or wetlands. As discussed for Finding D.1c, source control BMPs for unpaved roads are needed to minimize the discharge of sediment to the MS4s and receiving waters. There are several guidance documents available (see Discussion for Finding D.1.c) that include BMPs that can be readily implemented by the Copermittees for the development of new unpaved roads. This requirement is necessary to ensure the Copermittees minimize the discharge of sediment from their unpaved roads used for their maintenance activities.

F.3.b. Commercial / Industrial
The following legal authority applies to section F.3.b:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(C) provides that the proposed management program include “A description of a program to monitor and control pollutants in storm water discharges to municipal systems from municipal landfills, hazardous waste treatment, disposal and recovery facilities, industrial facilities that are subject to section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA), and industrial facilities that the municipal permit applicant determines are contributing a substantial pollutant loading to the municipal storm sewer system.”

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(C)(1) provides that the Copermittee must “identify priorities and procedures for inspections and establishing and implementing control measures for such discharges.”

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(C)(2) provides that the proposed management program shall “Describe a monitoring program for storm water discharges associated with the industrial facilities identified in paragraph (d)(2)(iv)(C)

of this section, to be implemented during the term of the permit, including the submission of quantitative data on the following constituents: any pollutants limited in effluent guidelines subcategories, where applicable; any pollutant listed in an existing NPDES permit for a facility; oil and grease, COD, pH, BOD_5 , TSS, total phosphorus, total Kjeldhal nitrogen, nitrate plus nitrite nitrogen, and any information on discharges required under 40 CFR 122.21(g)(7)(iii) and (iv)."

Federal NPDES regulation 40 CFR 122.26(d)(2)(ii) provides that the Copermittee "Provide an inventory, organized by watershed of the name and address, and a description (such as Standard Industrial Classification [SIC] codes) which best reflects the principal products or services provided by each facility which may discharge, to the municipal separate storm sewer, storm water associated with industrial activity."

Federal NPDES regulation 40 CFR 122.44(d)(1)(i) requires NPDES permits to include limitations to "control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines are or may be discharged at a level which will cause, have reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality."

Federal NPDES regulation 40 CFR 122.26(d)(2)(i)(A) provides that each Copermittee must demonstrate that it can control "through ordinance, permit, contract, order or similar means, the contribution of pollutants to the municipal storm sewer by storm water discharges associated with industrial activity and the quality of storm water discharged from site of industrial activity."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A) provides that the Copermittee develop a proposed management program which includes "A description of structural and source control measures to reduce pollutants from runoff from commercial and residential areas that are discharged from the municipal storm sewer system that are to be implemented during the life of the permit, accompanied with an estimate of the expected reduction of pollutant loads and a proposed schedule for implementing such controls."

Section F.3.b.(1) (Source Identification) requires that botanical and zoological gardens and exhibits, building material retailers and storage, animal boarding facilities and kennels, mobile pet services, plumbing services, and power washing services be included in the Copermittees' inventory of commercial sites/sources. These commercial or industrial sites and sources have been identified by the Copermittees and/or the San Diego Water Board as facilities that may contribute a significant pollutant load to the MS4. In cases where a particular type of facility is not present or known to operate within a Copermittee's jurisdiction, there is no expectation that there would be any such facilities included in the inventory. If, however, that type of facility does become established or begins operating within a Copermittee's jurisdiction during the period of this Order, the Copermittees are expected to identify those sites or sources and include them in their inventory of commercial or industrial facilities. This

is not a significant change because Order No. R9-2004-001 requires that any commercial or industrial site or source determined by a Copermittee to contribute a significant pollutant load to the MS4 be added to its inventory of commercial or industrial sites.

The inventory of commercial and industrial facilities is expected to be reviewed and, if necessary, updated at least annually and included in the Annual Report. The inventory is expected to include the prioritization of each facility to ensure the facility is inspected at the correct frequency. If changes are made to the prioritization for any facilities, justification for the changes is expected to be reported in the Annual Report. The inventory is the foundation for the tracking of BMP implementation, number and date(s) of inspections performed, inspection findings, violations, and enforcement actions for each commercial or industrial facility, all of which are expected to be included in the Annual Report.

Section F.3.b.(3) (Mobile Businesses Program) requires each Copermittee to develop and implement a program to reduce the discharge of storm water pollutants from mobile businesses to the MEP and to prevent the discharge of non-storm water. Mobile businesses are service industries that travel to the customer to perform the service rather than the customer traveling to the business to receive the service. Examples of mobile businesses are power washing, mobile vehicle washers, carpet cleaners, port-a-potty servicing, pool and fountain cleaning, mobile pet groomers, plumbers, and landscapers. These mobile services produce waste streams that could potentially impact water quality if appropriate BMPs are not implemented.

Order No. R9-2004-001 also requires BMP implementation for certain mobile businesses (e.g., mobile vehicle washing and mobile carpet cleaning). These storm water requirements of Order No. R9-2004-001 are not significantly different from the existing requirements. The Order specifies the Copermittees must prevent non storm water dry weather flows from entering the MS4 (see section C.2.b). Special attention is required for mobile businesses because of the difficultly of controlling discharges from mobile businesses with existing programs.

Mobile businesses present a unique difficulty in storm water regulation. Due to the transient nature of the business, the regular, effective practice of unannounced inspections is difficult to implement. Also, tracking these mobile businesses is difficult because they are often not permitted or licensed and their services cross Copermittee jurisdictions. Mobile businesses that operate within a municipality may be based in another municipality or even outside the Region.

The Order takes into account the difficulties in regulating mobile businesses. The Copermittees may choose to cooperate in developing and implementing their programs for mobile businesses, including sharing of mobile business inventories, BMP requirements, enforcement action information, and education. Sharing information will allow the Copermittees to better identify and track mobile businesses operating in their jurisdictions.

Because BMPs have been developed already, but communication with mobile businesses may be difficult, the Order provides broad flexibility to the Copermittees for developing a targeted program within the Commercial portion of each JRMP.

Section F.3.b.(4) (Inspection of Industrial and Commercial Sites/Sources) includes requirements for inspections of industrial and commercial sites/sources. The Order is similar to the Order No. R9-2004-001 in requiring that inspections check for coverage under the General Industrial Permit; assessment of compliance with Copermittee ordinances and permits related to storm water and non-storm water runoff; assessment of BMP implementation, maintenance, and effectiveness; visual observations for non-storm water discharges, potential illicit connections, and potential discharge of pollutants in storm water runoff; and education and outreach on storm water pollution prevention.

The Order also requires that inspections include review of BMP implementation plans if the site uses or is required to use such a plan, and the review of facility monitoring data if the site monitors its runoff. BMP implementation plans do not include SSMPs required pursuant to section F.1.d. If a facility is not required to have a BMP implementation plan or required to collect monitoring data, the inspection does not need to include a review of this information. BMP implementation plans and monitoring data are expected to be available for any facility that is covered under the General Industrial Permit. The BMP implementation plans and monitoring data can provide the inspector pertinent information that can be used during the visual inspection of the facility (e.g., BMPs implemented, maintenance records for BMPs, pollutants in storm water runoff). The Copermittees' inspectors have the discretion to determine the depth and detail of the review and use of the information in conducting the inspection.

Changes in the Order's requirements for inspection procedures mimic USEPA's guidance: "Site inspections should include (1) an evaluation of the pollution prevention plan and any other pertinent documents, and (2) an onsite visual inspection of the facility to evaluate the potential for discharges of contaminated storm water from the site and to assess the effectiveness of the pollution prevention plan."[218] In 1999, USEPA "recognized visual inspection as a baseline BMP for over 10 years," and "visual inspections are an effective way to identify a variety of problems. Correcting these problems can improve the water quality of the receiving water."[219]

Inspection frequencies in the Order have been modified from Order No. R9-2004-001. Order No. R9-2004-001 specifies frequencies for inspecting commercial/industrial sites based on threat to water quality and requires high priority sites to be inspected annually. For sites not identified as high priority, each site must be inspected at least once within a 5 year period.

[218] USEPA, 1992. Guidance 833-8-92-002, section 6.3.3.4 "Inspection and Monitoring".
[219] USEPA, 1999. 832-F-99-046, "Storm Water Management Fact Sheet – Visual Inspection".

Also, the option for implementing a third party certification program is included. To the extent that third party certifications are conducted to fulfill the inspection requirements for this section of this Order, the Copermittee will be responsible for conducting and documenting quality assurance and quality control of the third-party certifications. The Copermittees may propose a third party certification program that must receive approval from the San Diego Water Board Executive Officer prior to implementation. The Order includes several requirements that must be included in the third party certification program in order for it to be considered for approval by the San Diego Water Board.

Section F.3.b.(6) (Reporting of Non-Compliant Sites) has been added as additional notification to the San Diego Water Board regarding commercial and industrial sites. Copermittees are required to annually notify, prior to the rainy season, the San Diego Water Board of commercial and industrial sites that have any unresolved high level enforcement actions. This was added to enhance San Diego Water Board and Copermittee communication. Information may be provided as part of the JRMP annual report if submitted prior to the rainy season.

F.3.c. Residential
The following legal authority applies to section F.3.c:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A) provides that the Copermittee develop a proposed management program which includes “A description of structural and source control measures to reduce pollutants from runoff from commercial and residential areas that are discharged from the municipal storm sewer system that are to be implemented during the life of the permit, accompanied with an estimate of the expected reduction of pollutant loads and a proposed schedule for implementing such controls.”

Federal NPDES regulation 40 CFR 122.44(d)(1)(i) requires NPDES permits to include limitations to “control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines are or may be discharged at a level which will cause, have reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality.”

Section F.3.c.(4) (Common Interest Areas / Home Owner Association Areas / Mobile Home Parks) includes requirements for common interest areas / homeowners’ associations and mobile home parks. Many residential neighborhoods and some commercial areas within the jurisdiction of the Copermittees are within common interest developments and are, therefore, subject to management of common areas by associations. The Declaration of the Covenants, Conditions and Restrictions (CC&Rs)

contains the ground rules for the operation of such an association. CC&Rs are an appropriate method for protecting the common plan of developments and to provide for a mechanism for financial support for the upkeep of common areas including roads, storm drains, and other components of storm water conveyance systems.

This Order interprets common interest areas as property subject to the codes and ordinance and enforcement mechanisms of the city or county in which it resides and, therefore, holds the local government responsible for the discharge of wastes from storm water conveyance systems located within these areas.

Section F.3.d. Retrofitting Existing Development
The following legal authority applies to section F.3.d:

Legal Authority: The legal authority for retrofitting existing development is the same legal authority as that identified for municipal, industrial, commercial and residential development sections (See fact sheet discussion on those sections, F.3.a – c). In particular, CWA sections 402(p)(3)(B)(ii-iii), and CWC section 13377 give the Regional Water Board the legal authority to require retrofitting of existing development.

Section F.3.d has been added to require a plan for the retrofit of existing development (see Finding D.3.h and Discussion). This section contains specific requirements for a program to retrofit existing development. When appropriately applied as in this Order, retrofitting existing development meets MEP standards.

Existing BMPs are not sufficient, as evidenced by 303(d) listings and exceedances of Water Quality Objectives from the Copermittees monitoring reports. More advanced BMPs, including the retrofitting of existing development with LID, are part of the iterative process. Previous permits limited the requirement of treatment control BMPs to new development and redevelopment. Based on the current rate of redevelopment compared to existing BMPs, the use of LID only on new and redevelopment will not adequately address current water quality pollution and problems, including downstream hydromodification. Retrofitting existing development is practicable for a municipality through a systematic evaluation, prioritization and implementation plan focused on impaired water bodies, pollutants of concern, areas of downstream hydromodification, feasibility and effective communication and cooperation with private property owners. The retrofitting requirements are based largely on guidance from the USEPA[220] and the Center for Watershed Protection.[221]

Section F.3.d.(1) requires the Copermittees to identify and inventory areas of existing development within their jurisdiction as candidates for retrofitting projects. The Copermittees are expected to examine the inventories that they are maintaining as required under sections F.3.a-c, inspection findings, and any other forms of data and information to identify the candidates for retrofitting projects. Several areas of existing

[220] USEPA , MS4 Permit Improvement Guide, EPA 833-R-10-001, April, 2010.
[221] Center for Watershed Protection, Urban Subwatershed Restoration Manual No. 3, Urban Stormwater Retrofit Practices Manual, Version 1.0, July/August 2007.

development that must be identified as candidates for retrofitting projects are listed. Based in part on guidance developed by the Center for Watershed Protection, these areas of existing development are expected to provide the most immediate improvements for water quality through retrofitting. This list of areas that must be considered does not limit the Copermittees from identifying other areas within their jurisdiction that may be evaluated for retrofitting projects.

Section F.3.d.(2) requires each Copermittee to evaluate the candidates identified under section F.3.d.(1) and rank them based on several criteria. One or more types of retrofit source control or treatment control BMPs may be evaluated for each candidate. Landowner cooperation is among the criteria to evaluate and prioritize retrofitting. For example, retrofitting projects on publicly owned properties are likely and expected to be feasible with sufficient funding secured.

Section F.3.d.(4) requires each Copermittee to cooperate with private property owners to encourage the implementation of site specific retrofitting projects. Because the Copermittees have limited authority to directly require retrofitting projects on private property, the Copermittees must encourage private property owners to implement retrofitting projects through indirect programs and incentives. Several programs and incentives that have been successful in other areas are provided in the Order for the Copermittees consideration in developing their practices to encourage private property owners to retrofit their sites. This list, however, does not limit the Copermittees from identifying and considering other practices that may be effective in encouraging private property owners to implement retrofitting projects on their sites.

Section F.3.d.(5) requires retrofit BMPs that are implemented to be tracked in accordance with section F.1.f. The retrofit BMPs must also be inspected. Retrofit BMPs on publicly owned properties must be inspected per section F.1.f. Privately owned retrofit BMPs must be inspected as needed to ensure proper operation and maintenance. Tracking and inspecting retrofit BMPs is necessary for the Copermittee to ensure that the retrofit BMPs are not removed and are maintained to remain effective. Inspections can also provide the Copermittee useful information on the effectiveness of individual retrofit BMPs. For retrofit BMPs on publicly owned properties, tracking and inspection will correct any problems with the BMPs as soon as a problem arises and will ensure proper maintenance.

For retrofit BMPs on privately owned properties, retrofit BMPs are expected to be implemented and maintained by the property owner on a voluntary basis. The retrofit BMPs must be tracked by the Copermittees, but their inspections are required less frequently due to access issues (i.e. on an as-needed basis). Voluntary retrofitting projects do not warrant frequent Copermittee inspections due to the property owner's willingness to retrofit. Periodic inspections may be performed to ensure the site owner has not removed the retrofit BMPs. Periodic inspections would also ensure that the retrofit BMPs remain effective by providing an opportunity for the inspector to educate the original and subsequent site owner(s) if the retrofit BMP is not operating effectively and requires some maintenance.

F.4. Illicit Discharge Detection and Elimination

The following legal authority applies to section F.4:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(B) provides that the proposed management program "shall be based on a description of a program, including a schedule, to detect and remove (or require the discharger to the municipal storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B)(1) provides that the Copermittee include in its proposed management program "a program, including inspections, to implement and enforce an ordinance, orders or similar means to prevent illicit discharges to the municipal storm sewer system."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B)(2) provides that the Copermittee include in its proposed management program "a description of procedures to conduct on-going field screening activities during the life of the permit, including areas or locations that will be evaluated by such field screens."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B)(3) provides that the Copermittee include in its proposed management program "procedures to be followed to investigate portions of the separate storm sewer system that, based on the results of the field screen, or other appropriate information, indicate a reasonable potential of containing illicit discharges or other sources of non-storm water."

Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(B)(4) provides that the Copermittee include in its proposed management program "a description of procedures to prevent, contain, and respond to spills that may discharge into the municipal separate storm sewer."

Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(B)(5) provides that the Copermittee include in its proposed management program "a description of a program to promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges from municipal separate storm sewers."

Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(B)(6) provides that the Copermittee include in its proposed management program "a description of educational activities, public information activities, and other appropriate activities to facilitate the proper management and disposal of used oil and toxic materials."

Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(B)(7) provides that the Copermittee include in its proposed management program "a description of controls to limit infiltration of seepage from municipal sanitary sewers to municipal separate storm sewer systems where necessary."

Section F.4.a (Prevent and Detect Illicit Discharges and Connections) requires the Copermittees to implement a program to actively seek and eliminate IC/IDs. Additional wording has been added to this section to clarify and ensure that all appropriate municipal personnel (i.e. field personnel) are utilized in the program to observe and report these illicit discharges and connections.

Section F.4.b (Maintain MS4 Map) requires each Copermittee to maintain an updated map of its entire MS4 and the corresponding drainage areas within its jurisdiction. The Order specifies that the map must include the segments of the storm sewer system owned, operated, and maintained by the Copermittee, and include locations of all known inlets, connections with other MS4s, and outfalls to the Copermittee's MS4. Knowing where their inlets, access points, connections with other MS4s, and outfalls are located will allow the Copermittees to better track, identify, and eliminate IC/IDs. The use of a geographic information system (GIS) by the Copermittees is strongly encouraged for the MS4 map. The Riverside County Flood Control and Water Conservation District (RCFCD) currently maintains a GIS layer that is a compilation of all the Copermittee MS4 maps. Although an individual Copermittee may not have GIS capabilities, each Copermittee has agreements with RCFCD for providing updated MS4 maps to the RCFCD to update this GIS layer and subsequent submittal to the San Diego Water Board.

Section F.4.e (Investigation / Inspection and Follow-Up) requires the Copermittees to conduct follow up investigations and inspect portions of the MS4 for illicit discharges and connections, based on dry weather effluent analytical monitoring results. The section also requires the Copermittees to establish criteria for triggering follow up investigations. Additional language has been added to this section to clarify the minimum level of effort and timeframes for follow up investigations when dry weather limitations are exceeded. This section requires the Copermittees to include and evaluate the specified action levels in their response criteria and to develop response criteria for pollutants without action levels.

Timely investigation and follow up of exceedances is necessary to identify sources of illicit discharges, especially since many of the discharges are transitory. The requirements for immediate response to obvious illicit discharges and a 2 business day minimum response time when field screening action levels are exceeded is necessary to ensure timely response by the Copermittees. When analytical data indicate an exceedance of action levels, the Copermittee(s) have 5 business days to confirm the need to initiate an investigation to identify the source of the exceedance. The Copermittees are expected to investigate for potential sources of the pollutant(s) that may have caused the exceedance of action levels upstream of the collection point and collect additional analytical and field data as necessary. If the quality of the data

is confirmed to be unreliable or inaccurate and the investigation indicates there were no sources of the pollutant that could have caused an exceedance of the applicable action level, then further investigation is no longer warranted and should be documented in the Annual Report.

Section F.4.f (Elimination of Illicit Discharges and Connections) requires the Copermittee(s) to take immediate action to initiate steps necessary to eliminate illicit discharges, illicit discharge sources, and illicit connections that have been detected as a result of the investigations required under section F.4.e. The steps necessary to eliminate the illicit discharge or connection are typically initiated with identifying and contacting the person responsible for the illicit discharge or connection. The Copermittee(s) are expected to eliminate the detected illicit discharges and connections as soon as possible after they are able to contact the person responsible for the illicit discharge or connection. The steps expected and/or necessary to eliminate illicit discharges and connections under different scenarios and for different sources should be developed and implemented by the Copermittee(s). These steps may be outlined by the Copermittee(s) in their JRMPs.

In some cases, the Copermittee(s) may determine that one of the necessary steps is to contact the San Diego Water Board to assist in resolving and eliminating illicit discharges and connections. The Copermittee(s), however, are expected to exhaust all of their available administrative and enforcement authorities and mechanisms for addressing and eliminating illicit discharges and connections before contacting the San Diego Water Board for assistance.

Section F.4.h (Prevent and Response to Sewage Spills and Other Spills) requires each Copermittee to implement measures to prevent and respond to spills into its MS4. These requirements are consistent with Order No. R9-2004-001 and based on federal regulations at 40 CFR 122.26(d)(2)(iv)(B)(4). Those federal NPDES regulations clearly require that owners and operators of MS4s have procedures to prevent, contain, and respond to spills that may discharge into the municipal separate storm sewer.

The Order includes sewage and non-sewage spills in the requirement for spill prevention and response. Federal regulations clearly define sewage as an illicit discharge that must be addressed by municipalities (see Phase II Final Rule, p.68758). Sewage is an illicit discharge to the MS4 that threatens public health. As such, the Copermittees must implement measures to prevent sewage from entering the MS4 system and must respond to illicit discharges that have entered the system. This section has been revised to clarify that management measures and procedures must be implemented to prevent, respond to, and cleanup spills. In addition to the management measures and procedures, a mechanism for the Copermittees to be notified of spills is necessary in order for those management measures and procedures to be implemented as soon as possible after a spill has occurred. The facilitation of public reporting of illicit discharges required by section F.4.c, in addition to regular and open communication with other agencies (e.g., sanitary sewer districts),

may also serve as a mechanism for notifying the Copermittees of spills within their jurisdiction.

Section F.3.a.(7) of the Order includes requirements for measures that must be taken to prevent sewage spills. Examples of measures being implemented by Copermittees include inspections of fats, oils, and grease management at restaurants. Other preventative measures can be implemented during routine planning efforts for new development and redevelopment projects. Similarly, building permit inspections should be used to verify the integrity of the sanitary and storm sewer infrastructure and ensure that cross-connections between the two are avoided.

F.5. Public Participation Component

The following legal authority applies to section F.5:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

No significant changes from Order No. R9-2004-001 have been made to this section of the Order.

F.6. Education Component

The following legal authority applies to section F.6:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(6) provides that the proposed management program include “A description of a program to reduce to the maximum extent practicable, pollutants in discharges from municipal separate storm sewers associated with the application of pesticides, herbicides, and fertilizer which will include, as appropriate, controls such as *educational activities*, permits, certifications, and other measures for commercial applicators and distributors, and controls for application in public right-of-ways and at municipal facilities."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B)(6) provides that the proposed management program include “A description of educational activities, public information activities, and other appropriate activities to facilitate the proper management and disposal of used oil and toxic materials.”

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D)(4) provides that the proposed management program include “A description of appropriate educational and training measures for construction site operators.”

Section F.6 (Education Component) includes an introductory paragraph that is the same as in Order No. R9-2004-001, except for the addition of New Development / Redevelopment Project Applicants, Developers, Contractors, Property Owners, and other Responsible Parties to the list of target communities.

Section F.6.a (General Requirements) includes education topics that are required for the education programs developed and implemented for the target communities. The Copermittees can choose how and to what degree to address these topics. Some topics may be more important for certain target communities.

The requirement for educational activities, public information activities, and other appropriate activities to facilitate the proper management and disposal of used oil and toxic materials has been moved to this section from the Illicit Discharge Detection and Elimination section.

Section F.6.b (Specific Requirements) includes requirements for specific target communities, which are in addition to the general requirements. The education and training requirements previously included in other sections of Order No. R9-2004-001 (i.e. Development Planning, Construction, Existing Development) have been removed and consolidated under this section. Specific education requirements are included for: 1) the Copermittees' departments and personnel (i.e. staff and contractors, and Planning Boards and Elected Officials, if applicable), 2) new development / redevelopment and construction sites, 3) commercial and industrial sites/sources, and 4) residential and general public communities.

Section F.6.b.(1) (Copermittee Departments and Personnel) requires the Copermittees to implement an education program for their staff and contractors. Education is required at all levels of municipal staff and contractors. Education is especially important for the staff responsible for planning and development review, oversight, inspection and enforcement of construction activities, selecting and implementing BMPs for Copermittee areas, inspection and enforcement of industrial and commercial facilities, and other Copermittee activities which might result in discharges of pollutants if proper BMPs are not used.

Education of Copermittee departments and personnel may be conducted with joint and/or individual training programs (i.e. on a regional and/or jurisdictional scale), and may include both formal and informal training. The Copermittees may choose the scale and methods for educating their departments and personnel.

The annual training required for construction, building, code enforcement, grading review staffs, inspectors, and other responsible construction staff requires the training to occur annually, prior to the rainy season.

Section F.6.b.(2) (New Development / Redevelopment and Construction Sites) requires the Copermittees to educate parties responsible for a project (i.e. project applicants, developers, contractors, property owners, community planning groups, and other responsible parties) about storm water issues and BMPs. Different levels of training will be needed for planning groups, owners, developers, contractors, and construction workers, but all should get a general education of storm water requirements. Education of all construction workers can prevent unintentional discharges, such as discharges by workers who are not aware that they are not allowed to wash things down the storm drains. Training for BMP installation workers is imperative because the BMPs will fail if not properly installed and maintained. Training for field level workers can be formal or informal tail-gate format.

Section F.6.b.(3) (Commercial and Industrial Sites / Sources) requires the Copermittees to notify the owner/operator of each of their inventoried commercial and industrial sites/sources of the BMP requirements applicable to the site/source at least twice during the five-year period of the Order. Notification of BMP requirements may be fulfilled during the business license application/renewal process and/or during site inspections. Notifying commercial and industrial sites/sources of the BMP requirements will ensure the business owners are aware of the appropriate BMPs to implement that prevent discharges of pollutants from these sites/sources.

Section F.6.b.(4) (Residential and General Public) requires the target audiences for residential and general public communities to include underserved target audiences (e.g., disadvantaged communities), residents and managers of Common Interest Areas / Homeowner Associations, and owners and residents of mobile home parks. These communities are frequently neglected or underserved by most water quality education programs, but can be significant sources of pollutants. Thus, it is important for the residential and general public education programs to reach out to and educate these communities on their potential impacts to water quality.

G. Watershed Water Quality Workplan

The following legal authority applies to section G:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(a)(3)(ii) states: "The Director may […] issue distinct permits for appropriate categories of discharges […] including, but not limited to […] all discharges within a system that discharge to the same watershed […]"

Federal NPDES regulations 40 CFR 122.26(a)(3)(v) states: "Permits for all or a portion of all discharges from large or medium municipal separate storm sewer systems that are issued on a system-wide, jurisdiction-wide, watershed, or other basis may specify different conditions relating to different discharges covered by the permit, including different management programs for different drainage areas [watersheds] which contribute storm water to the system."

Federal NPDES regulation 40 CFR 122.26(a)(5) states: "The Director may issue permits for municipal separate storm sewers that are designated under paragraph (a)91)(v) of this section on a system-wide basis, a jurisdiction-wide basis, watershed basis, or other appropriate basis."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv) states: "Proposed programs may impose controls on a system-wide basis, a watershed basis, a jurisdiction basis, or on individual outfalls."

Section G requires Copermittees to continue implementation of their watershed runoff management program (WRMP), however the implementation approach has changed. Order No. R9-2004-001 required a Watershed SWMP that included a collaborative strategy to abate the sources and reduce the discharges causing high priority water quality problems. This strategy was to guide each watershed Copermittee's selection and implementation of Watershed Activities, so that the activities selected and implemented would remove that pollutant contribution responsible for the identified high priority water quality problem. Outcomes of these requirements were not able to demonstrate improvements to water quality.

Revised language in Order No. R9-2010-0016 attempts to focus each watershed Copermittee's efforts and resources on addressing the highest water quality problems in the watershed by focusing attention on the health of the receiving water body and the most efficient use of the watershed Copermittee's time and resources. Order No. R9-2010-0016 requires the watershed Copermittees to develop and follow a workplan approach towards assessing receiving water body conditions, prioritizing the highest

priority water quality problems, implementing effective BMPs, and measuring water quality improvement in the receiving water.

Section G.1. (Watershed Workplan Components) requires the watershed Copermittees to develop a workplan that will implement a collective watershed strategy to assess and prioritize the water quality problems, and identify, address, and mitigate the highest priority water quality issues/pollutants within the Upper Santa Margarita watershed's receiving waters. This section specifies the minimum components that must be included in the Watershed Workplan. Development of a workplan rather than watershed activities will allow the Copermittees flexibility to iteratively modify their watershed strategy over the course of future planning years as priorities change.

Section G.2 (Watershed Workplan Implementation) requires the Copermittee's to begin implementing the Watershed Workplan within 90 days of submittal unless otherwise directed by the San Diego Water Board. The Watershed Workplan must meet the requirements of the Order. The San Diego Water Board expects that implementing the Watershed Workplan, which will coordinate the Copermittees' efforts in the watershed, will result in water quality improvements sooner than later. If there are deficiencies in the Watershed Workplan, the San Diego Water Board will provide guidance to remedy those deficiencies as appropriate.

Section G.3 (Copermittee Collaboration) requires the Copermittees to collaborate to develop and implement the Watershed Workplan. Watershed Copermittee collaboration must include frequent regularly scheduled meetings. Because there are several other agencies with MS4s in the Upper Santa Margarita watershed that the Copermittees have indicated in the ROWD are a source of pollutants that may discharge into the MS4 systems of the Copermittees, the Copermittees are also required to pursue interagency agreements, or similar cooperative efforts, with non-Copermittee owners of the MS4 (such as Caltrans, Native American tribes, and school districts) to control the contribution of pollutants from one portion of the shared MS4 to another portion of the shared MS4. In addition, the Copermittees are required, as appropriate, to participate in watershed management efforts to address water quality issues within the entire Santa Margarita Watershed (such as the County of San Diego and United States Marine Corps Camp Pendleton).

Section G.4 (Public Participation) requires the Copermittees to implement a watershed-specific public participation mechanism within each watershed. A required component of the watershed-specific public participation mechanism must be a minimum 30-day public review of the Watershed Workplan. Opportunity for the public to review and comment on the Watershed Workplan must occur before the workplan is implemented.

Section G.5 (Watershed Workplan Review and Updates) requires the Copermittees to review and update the Watershed Workplan annually to identify needed changes to the prioritized water quality problem(s) listed in the workplan. This section requires the Copermittees to review and update their workplan each year to incorporate changing priorities and evolving watershed strategies.

Section G.6 (Pyrethroid Toxicity Reduction Evaluation) requires the Copermittees to incorporate the pyrethroid pollutant reduction program into the Watershed Workplan, as described in the ROWD.

H. Fiscal Analysis

The following legal authority applies to section H:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(vi) provides that "[The Copermittee must submit] for each fiscal year to be covered by the permit, a fiscal analysis of the necessary capital and operation and maintenance expenditures necessary to accomplish the activities of the programs under paragraphs (d)(2)(iii) and (iv) of this section. Such analysis shall include a description of the source of funds that are proposed to meet the necessary expenditures, including legal restrictions on the use of such funds."

Section H has been expanded in order to develop more useful and meaningful fiscal reporting. A revamped fiscal reporting strategy will provide the San Diego Water Board and the Copermittees with better capability to manage performance of the programs.

The Copermittees' effort is expected to provide standardization of reporting so that figures between Copermittees are comparable, which is one of many types of information which can be used by the San Diego Water Board to better understand Copermittee program implementation. Standardization and comparison of fiscal analysis reporting is supported by the State Water Board funded NPDES Stormwater Cost Survey, which finds that "standards for reporting costs and storm water activities are needed to allow accurate cost comparisons to be made between storm water activities."[222] This document also provides guidance regarding categorization of expenditures for tracking and reporting.

The Order establishes a criterion for when Copermittees must add narrative evaluations to the tables. This will address some of the variability in reporting and will provide the public and San Diego Water Board with improved understanding of how resources are shifted in response to annual assessments. This will also help ensure that projected annual costs adequately reflect planned program modifications described in the annual reports.

The San Diego Water Board has chosen not to require a description of fiscal benefits realized from implementation of the storm water protection program. This is a recommendation from the National Association of Flood and Stormwater Management

[222] Currier, et al., 2005. *NPDES Storm Water Cost Survey Final Report*. Prepared for California State Water Resources Control Board by Office of Water Programs, California State University, Sacramento. P. 63.

Agencies.[223] For instance, the current fiscal assessment does not address city-wide fiscal benefits of protection (e.g., public health, tourism, property values, economic activity, beneficial uses, etc.), even though many costs currently reported to the San Diego Water Board are for related activities. This type of assessment may help Copermittees improve the allocation of resources and it may help the Copermittees secure adequate funding for the program. Finally, it will provide a clearer picture of the storm water and non-storm water runoff program to the public and San Diego Water Board. However, qualitative assessments could be overly subjective and most Copermittees likely lack the ability to provide accurate quantitative assessments. The San Diego Water Board encourages Copermittees to consider means for conducting assessments of fiscal benefits derived from the programs. Such assessments could be conducted on a regional scale similar to studies of program costs conducted by the State Water Board.[224]

Currently, each Riverside County municipality's annual report includes a table based on a template developed by the principal Copermittee. The template was meant to facilitate reporting consistency among the Copermittees. The annual report table contains estimates of spending during the reported period and estimates of the next year's spending.

Review of the fiscal analysis tables included in the annual reports has not been as straightforward as expected, and the value of the information is moderate. The reviews indicate that cities do not use consistent methods to fill in the tables because they use different accounting and budgeting processes, and certain storm water program expenditures are not easily categorized into the table formats. Furthermore, storm water permit-related activities involve several departments, which makes it difficult for the storm water manager to gather and decipher actual costs.

These issues also make it difficult for the Copermittees to accurately compartmentalize expenditures within the format. As a result, the current financial reporting provides estimates at best and cannot be reliably used to compare program implementation among most municipalities.

[223] National Association of Flood and Stormwater Management Agencies. 2006. *Guidance for Municipal Stormwater Funding.* Prepared under a grant provided by the USEPA.
[224] State Water Board, 2005. NPDES Stormwater Cost Survey.

I. Total Maximum Daily Loads

The following legal authority applies to section I:

Broad Legal Authority: CWA section 303(d)(1)(A) and (C), and Federal regulations 40 CFR 130.2(i), 40 CFR 130.7(b)(1) and 40 CFR 122.44(d)(1)(vii)(B).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.44(d)(1)(vii)(B) requires that NPDES permit requirements incorporate water quality based effluent limitations that must be consistent with the requirements and assumptions of wasteload allocations (WLAs) assigned to the MS4 as part of the calculated TMDLs.

Section I.1. is a placeholder for the requirements and WLAs assigned to the Copermittees' MS4 discharges of any future TMDLs that are adopted by the San Diego Water Board.

Section I.2 includes, by reference to Santa Ana Water Board Order No. R8-2010-0033, including the relevant sections of the fact sheet and findings (and subsequent revisions), the requirements and WLAs assigned to the MS4s for the Lake Elsinore/Canyon Lake (San Jacinto Watershed) Nutrient TMDLs that are being implemented for the Santa Ana Water Board. Because the San Jacinto Watershed is within the boundaries of the Santa Ana Water Board's region, the Lake Elsinore/Canyon Lake Nutrient TMDLs and its requirements must be implemented by the Cities of Murrieta and Wildomar for the areas within their jurisdictions located in the Santa Ana Region (Region 8).

J. Program Effectiveness Component

The following legal authority applies to section J:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(v) provides that the Copermittees must include "Estimated reductions in loadings of pollutants from discharges of municipal storm sewer constituents from municipal storm sewer systems expected as the result of the municipal storm water quality management program. The assessment shall also identify known impacts of storm water controls on ground water." Under Federal NPDES regulation 40 CFR 122.42(c) applicants must provide annual reports on the progress of their storm water management programs.

Section J.1 (Program Effectiveness Assessments) of the Order requires the Copermittees to assess the effectiveness of the implementation of their jurisdictional, watershed, and monitoring programs and activities. The Riverside County Storm Water Program is supportive of the CASQA effort, and use of CASQA assessment techniques is consistent with the methodology proposed in the ROWD.[225,226]

This section requires the Copermittees to establish assessment measures or methods for each of the six outcome levels described by CASQA that will be used to assess the effectiveness of the Jurisdictional Runoff Management Program (JRMP) and Watershed Workplan implementation at (1) reducing the discharge of storm water pollutants from its MS4 to the MEP; (2) prohibit non-storm water discharges; and (3) preventing runoff discharges from the MS4 from causing or contributing to a violation of water quality standards.

The effectiveness assessment measures or methods must be established and included as part of the updated JRMPs and Watershed Workplan that are due on or before June 30, 2012. Beginning with the Annual Report due in 2013, the Copermittees are required to annually perform the assessments using the established assessment measures or methods.

Section J.2 (Respond to Assessments) of the Order requires the Copermittees to improve jurisdictional and watershed activities or BMPs when they are found to be ineffective or when water quality impairments are continuing. This requirement fulfills the purpose of conducting effectiveness assessments – to improve and refine the Copermittees' programs. The requirement is consistent with USEPA's Phase II

[225] The Riverside County Copermittees proposed an assessment strategy based on the CASQA Municipal Stormwater Program Effectiveness Assessment Guidance in section 6.1.2.1 of the ROWD.
[226] CASQA 2007. Municipal Stormwater Program Effectiveness Assessment Guidance.

regulations, which state: "If the permittee determines that its original combination of BMPs are not adequate to achieve the objectives of the municipal program, the MS4 should revise its program to implement BMPs that are adequate […]."[227]

Each Copermittee must update the effectiveness assessment work plan and schedule to address any program modifications and improvements in response to the findings of their assessment. The updates to the work plan and schedule must be incorporated into the applicable Annual Report.

Section J.3 (Assessment and Response Reporting) of the Order describes the information required to be submitted in the Annual Report pertaining to program effectiveness assessments, review, and response. A summary of the effectiveness assessments, responses to the effectiveness assessments, and any steps implemented to improve the Copermittee's ability to assess program effectiveness must be included with the Annual Report. The reporting will demonstrate whether Copermittees have appropriately responded to the effectiveness assessments.

[227] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68762.

K. Reporting

The following legal authority applies to section K:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.42(c) requires that "The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer system that has been designated by the director under § 122.26(a)(1)(v) of this part must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report shall include: (1) The status of implementing the components of the storm water management program that are established as permit conditions; (2) Proposed changes to the storm water management program that are established as permit condition. Such proposed changes shall be consistent with § 122.26(d)(2)(iii) of this part; (3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under § 122.26(d)(2)(iv) and (d)(2)(v) of this part; (4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; (5) Annual expenditures and budget for year following each annual report; (6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; (7) Identification of water quality improvements or degradation."

CWC section 13267 provides that "the Regional Board may require than any person who has discharged […] shall furnish, under penalty of perjury, technical or monitoring reports which the regional board requires."

Section K.1 (Runoff Management Plans) outlines the process and due dates for submitting JRMPs and Watershed Workplan. The information to be included in the Jurisdictional and Watershed plans must be sufficient to demonstrate the capacity to implement the requirements of section F and G, respectively, of the Order.

In many cases, the requirements of the Order should not necessitate a complete rewrite of the plans, as was basically done in 2005. Only sections of the Order which are new or have been significantly changed should warrant rewriting of plans' sections. The San Diego Water Board plans to work with the Copermittees and provide guidance regarding where JRMPs and Watershed Workplan must be updated in accordance with the Order. This will help ensure that rewriting, reporting, and review efforts are minimized.

Section K.2 (Other Required Reports and Plans) include requirements for information to be included in the SSMP update, the HMP, and the Report of Waste Discharge (ROWD) for the next permit reissuance. The Order requires submittal of an updated SSMP on or before June 30, 2012; a draft HMP on or before June 30, 2013; and a

ROWD 180 days in advance of the expiration of this Order. The section also identifies the minimum information to be included in the ROWD, based on USEPA's May 17, 1996 guidance "Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems."

Section K.3 (Annual Reports) outlines the process and roles of the Copermittees for developing and submitting the JRMP Annual Report. Information to be included in the Annual Reports is described in section K.3.a.(3).

Each Copermittee is required to maintain records demonstrating that Permit activity requirements have been met, which allows the San Diego Water Board to confirm compliance as needed, such as via inspections, program audits, or requests for information per CWC sections 13225 and 13267.

Reporting requirements in the Order focus on results and responses to the effectiveness assessments conducted by the Copermittees. This will allow the San Diego Water Board to determine how appropriately municipalities adapt and tailor their programs to findings from activities and monitoring results. Assessment of progress toward meeting the objectives is possible because the data collected by the Copermittees under Order No. R9-2004-001 can be used to establish baseline conditions. Compared to activity-based reporting, this will greatly enhance the ability of the San Diego Water Board, Copermittees, and the public to determine whether the programs are successful.

The Order reduces the amount of program activity-based reporting from Order No. R9-2004-001. Under the CASQA assessment model, activity-based reporting includes primarily outcomes that document compliance with permit requirements (Level 1 outcomes), rather than being indicators of the impact of activity implementation.[228] This approach is consistent with guidance from the USEPA, which notes that annual reports should highlight program effectiveness as well as describing activities.[229] This emphasis is also consistent with recommendations from the National Academy of Public Administration in its report to USEPA on Evaluating Environmental Progress, which suggest that reviewing activities data provides limited value when evaluating the effectiveness of programs and resulting environmental conditions.[230]

The Order maintains some reporting requirements for certain activity-based outcomes. These are mostly focused on activities that establish or revise municipal processes related to storm water runoff and management. The processes required by the Order are especially important in situations where sustaining water quality improvements may require activities that extend beyond the five-year period of the NPDES permit.

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[228] Level 1 outcomes under the CASQA guidance include documentation that required activities have been implemented.
[229] USEPA 2007. *MS4 Program Evaluation Guidance.* USEPA Office of Wastewater Management EPA-833-R-07-003. January 2007 field test version.
[230] National Academy of Public Adminstration 2001. Evaluating Environmental Progress: How EPA and the States Can Improve the Quality of Enforcement and Compliance Information (June 2001). http://www.napawash.org

In addition, the Order maintains many activity-based reporting requirements related to enforcement of local requirements, with an emphasis on the results from such activities. This is intended to facilitate review of the contributions that inspection and enforcement activities have made toward meeting the goals of the Order. Reporting of these types of activities is supported by recommendations from the National Academy of Public Administration in its report to the USEPA: *Evaluating Environmental Progress: How EPA and the States Can Improve the Quality of Enforcement and Compliance Information* (June 2001).[231] Other activity-based reporting has been reduced to selected items based on consideration of program priorities.

Another source of prioritization for activity-based reporting is the *Storm Water Panel Recommendations to the California State Water Resources Control Board The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities* (June 19, 2006). In particular, the panel highlighted needs to improve the design, maintenance, and inspections of best management practices.

Section K.4 (Interim Reporting Requirements) specifies that the JRMP Annual Reports must be submitted in accordance with the requirements of Order No. R9-2004-001 prior to submittal of the JRMPs required under section K.1a.

[231] The National Academy of Public Administration report is available on-line at http://www.napawash.org

L. Modification of Programs

The following legal authority applies to section L:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Section L of the Order provides a process for the Copermittees to modify their runoff management programs. This process will be useful so that the Copermittees can continue to refine and improve their programs based on the findings of their annual program effectiveness assessments. The process allows for minor modifications to the Copermittees' programs where the Copermittees can exhibit that the modifications meet or exceed existing legal requirements under the Order. Such a process avoids lengthy and time consuming formal approvals of proposed modifications before the San Diego Water Board, while still ensuring compliance with applicable legal standards and the Order. The process included in the Order is based on a process utilized by the California Regional Water Quality Control Board, San Francisco Bay Region (San Francisco Bay Water Board) in their MS4 permit for Alameda County.[232]

[232] San Francisco Bay Water Board, 2003. Order No. R2-2003-0021. P. 45.

M. Principal Permittee Responsibilities

The following legal authority applies to section M:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(a)(3)(iii)(C) provides that "A regional authority may be responsible for submitting a permit application."

Federal NPDES regulation 40 CFR 122.26(d)(2)(i)(D) provides that "[The Copermittee must demonstrate that it can control] through interagency agreements among coapplicants the contribution of pollutants from one portion of the municipal system to another portion of the municipal system."

No significant changes were made to this section.

N. Receiving Waters and MS4 Discharge Monitoring and Reporting Program

The following legal authority applies to section N:

Broad Legal Authority: CWA sections 402, 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Federal NPDES regulations 40 CFR 122.26(d)(2)(iii) and 122.44 require the Copermittees to conduct a comprehensive monitoring program.

See section T of this Fact Sheet/Technical Report for a discussion of changes to the Receiving Waters Monitoring and Reporting Program.

O. Standard Provisions, Reporting Requirements, And Notifications

The following legal authority applies to section O:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Standard provisions, reporting requirements, and notifications are consistent to all NPDES permits and are generally found in Federal NPDES regulation 40 CFR 122.41.

Section O.2 of the Order has been changed to remove the statement that all plans and reports submitted in compliance with the Order are an enforceable part of the Order. This statement has been removed because it is unnecessary. The Order itself contains sufficient detailed requirements to ensure that compliance with discharge prohibitions, receiving water limitations, non-storm water action levels and the narrative standard of MEP for storm water are achieved. Implementation by the Copermittees of programs in compliance with the Order's requirements, prohibitions, and receiving water limitations is the pertinent compliance standard to be used under the Order, as opposed to assessing compliance by reviewing the Copermittees' implementation of their plans alone.

Rather than being substantive components of the Order itself, the Copermittees' management plans are simply descriptions of their runoff management programs required under the Order. These plans serve as procedural correspondence which guides program implementation and aids the Copermittees and San Diego Water Board in tracking implementation of the programs. In this manner, the plans are not functional equivalents of the Order. For these reasons, the Copermittees' runoff management plans need not be an enforceable part of the Order.

P. Attachment A – Basin Plan Prohibitions

The following legal authority applies to Attachment A:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: CWC section 13243 provides that "A regional board, in a water quality control plan or in waste discharge requirements, may specify certain conditions or areas where the discharge of waste, or certain types of waste, will not be permitted."

CWC section 13263(a) provides that waste discharge requirements prescribed by the San Diego Water Board implement the Basin Plan.

No significant changes were made to this attachment.

Q. Attachment B – Standard Provisions

The following legal authority applies to Attachment B:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: Standard provisions, reporting requirements, and notifications are consistent to all NPDES permits and are generally found in Federal NPDES regulation 40 CFR 122.41.

Attachment B includes Standard Provisions which have been developed by the State Water Board. These Standard Provisions ensure that NPDES permits are consistent and compatible with USEPA's federal regulations. Some Standard Provisions sections specific to publicly owned sewage treatment works are not included in Attachment B.

R. Attachment C – Definitions

The following legal authority applies to Attachment C:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Attachment C contains definitions for terms found in the Order. In addition, definitions for terms previously defined in Order No. R9-2004-001 Attachment C, but which are not found in the current Order, have been deleted.

An additional section which includes acronyms and abbreviations has been added. This is to ensure clarity and prevent confusion of terms. Definitions have been added for new terms used in the permit to provide a clear understanding of their meaning and use.

S. Attachment D – Summary of Submittals

The following legal authority applies to Attachment D:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, 13383, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv) and 122.44(i).

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.42(c) requires that "The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer system that has been designated by the director under § 122.26(a)(1)(v) of this part must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report shall include: (1) The status of implementing the components of the storm water management program that are established as permit conditions; (2) Proposed changes to the storm water management program that are established as permit condition. Such proposed changes shall be consistent with § 122.26(d)(2)(iii) of this part; (3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under § 122.26(d)(2)(iv) and (d)(2)(v) of this part; (4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; (5) Annual expenditures and budget for year following each annual report; (6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; (7) Identification of water quality improvements or degradation."

CWC section 13267 provides that "the regional board may require than any person who has discharged […] shall furnish, under penalty of perjury, technical or monitoring reports which the regional board requires."

Attachment D to the Order provides a table summary of scheduled submittals required by the Order. Unscheduled submittals are no longer added to the table, since there is no proper due date for such submittals. A task summary has not been created for the Order, since the previous task summary was found to be redundant, repeating information found in the submittal summary and elsewhere in the Order.

A Jurisdictional Runoff Management Program (JRMP) Annual Report Checklist has been added to the reporting requirements. This addition is to determine and ensure that all requirements of the permit are being met. A Jurisdictional Runoff Management Program (JRMP) Annual Report Checklist has been added to the reporting requirements. This addition is to determine and ensure that all requirements of the permit are being met.

T. Attachment E - Receiving Waters and MS4 Discharge Monitoring and Reporting Program

The following legal authority applies to the Receiving Waters and MS4 Discharge Monitoring and Reporting Program:

Broad Legal Authority: CWA sections 402, 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv), 122.44 and 122.45.

Specific Legal Authority: Federal NPDES regulations 40 CFR 122.26(d)(2)(iii) requires the Copermittees to conduct a comprehensive monitoring program.

Federal NPDES regulation 40 CFR 122.42(c) requires that "The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer system that has been designated by the director under § 122.26(a)(1)(v) of this part must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report shall include: (1) The status of implementing the components of the storm water management program that are established as permit conditions; (2) Proposed changes to the storm water management program that are established as permit condition. Such proposed changes shall be consistent with § 122.26(d)(2)(iii) of this part; (3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under § 122.26(d)(2)(iv) and (d)(2)(v) of this part; (4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; (5) Annual expenditures and budget for year following each annual report; (6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; (7) Identification of water quality improvements or degradation."

CWC section 13267 provides that "the regional board may require than any person who has discharged […] shall furnish, under penalty of perjury, technical or monitoring reports which the regional board requires."

I. Purpose

According to USEPA, the benefits of sampling data include, but are not limited to:

1. Providing a means for evaluating the environmental risk of storm water discharges by identifying types and amounts of pollutants present;
2. Determining the relative potential for storm water discharges to contribute to water quality impacts or water quality standard violations;
3. Identifying potential sources of pollutants; and

4. Eliminating or controlling identified sources more specifically through permit conditions.[233]

Equally important, monitoring programs are an essential link in the improvement of storm water management efforts. Data collected from monitoring programs can be assessed to determine the effectiveness of management programs and practices, which is vital for the success of the iterative approach used to meet the MEP standard for storm water. When water quality data indicate that water quality standards or objectives are being exceeded, particular pollutants, sources, and drainage areas can be identified and targeted for specific management efforts. When data indicate that a particular BMP or program component is not effective, improved efforts can be selected and implemented.

Considering the benefits described above, the Receiving Waters Monitoring and Reporting Program (MRP) has been designed to determine impacts to receiving water quality and beneficial uses from storm water runoff and to use the results to refine the Copermittees' storm water runoff management programs for the reduction of storm water pollutant loadings to the MEP. For non-storm water discharges, monitoring has been designed to identify and eliminate prohibited illicit discharges and to determine appropriate actions to take in response to dry weather non-storm water action levels. Additionally, the results from dry weather non-storm water monitoring can be used to evaluate exempted non-storm water discharges as a source or conveyance of pollutants. The primary goals of the MRP include:

1. Assess compliance with Order No. R9-2010-0016;
2. Measure and improve the effectiveness of the Copermittees' runoff management programs;
3. Assess the chemical, physical, and biological impacts of receiving waters from MS4 discharges;
4. Characterize storm water runoff discharges;
5. Identify sources of specific pollutants;
6. Prioritize drainage and sub-drainage areas that need management actions;
7. Detect and eliminate illicit discharges and illicit connections to the MS4;
8. Assess the overall health of receiving waters; and
9. Provide information to implement required BMP improvements

Each of the components of the MRP is necessary to meet the objectives listed above. In addition, the MRP has been designed in accordance with the guidance provided by the Southern California Stormwater Monitoring Coalition's Model Monitoring Technical Committee in its August 2004 "Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California." This guidance document was developed in response to Senate Bill 72 (Kuehl), which addressed the standardization of sampling and analysis protocols in municipal storm water monitoring programs. The technical committee which developed the guidance included representatives from

[233] USEPA, 1992. NPDES Storm Water Sampling Guidance Document. EPA/833-B-92-001.

Southern California Regional Water Boards (including the San Diego Water Board), municipal storm water Copermittees (including Riverside County Flood Control District), Heal the Bay, and the Southern California Coastal Water Research Project.

As its title suggests, the guidance essentially developed a model municipal storm water monitoring program for use in Southern California. The model program is structured around five fundamental management questions, outlined below. The MRP is designed as an iterative step towards ensuring that the Copermittees' monitoring program can fully answer each of the five management questions.

1. Are conditions in receiving waters protective, or likely to be protective, of beneficial uses?
2. What is the extent and magnitude of the current or potential receiving water problems?
3. What is the relative storm water runoff contribution to the receiving water problem(s)?
4. What are the sources of storm water runoff that contribute to receiving water problem(s)?
5. Are conditions in receiving waters getting better or worse?

The three MS4 NPDES permits within San Diego Water Board jurisdiction each have very similar core monitoring requirements that include receiving water monitoring, effluent monitoring, and special studies (see Finding E.12 and Discussion). The justifications for each component of the monitoring program are discussed below.

II. Monitoring Program

The Monitoring Program has been organized into distinct sections and includes receiving water monitoring, MS4 effluent monitoring, a monitoring program in high priority inland aquatic habitat, and special studies. Each monitoring program is expected to answer specific questions and achieve goals outlined in section I. Some of these questions require the linkage of both receiving water monitoring and MS4 discharge monitoring that is required in the Order. As such, the Monitoring Program has been written to allow the Copermittees to utilize the same data and/or sampling effort where monitoring requirements overlap. For example, the Copermittees may elect to develop a Trash Special Study where the sampling is done at the same location and time as stream assessment monitoring. The Copermittees may evaluate the goals and questions of the Monitoring Program when evaluating how required monitoring programs may overlap.

Section II.A.1 (Mass Loading Station Monitoring) of the MRP requires mass loading and toxicity monitoring at monitoring stations located at the bottom of the Riverside County portion of the Santa Margarita watershed (see figure below).

Locations of Mass Loading Stations (MLS) under Order No. R9-2004-0001

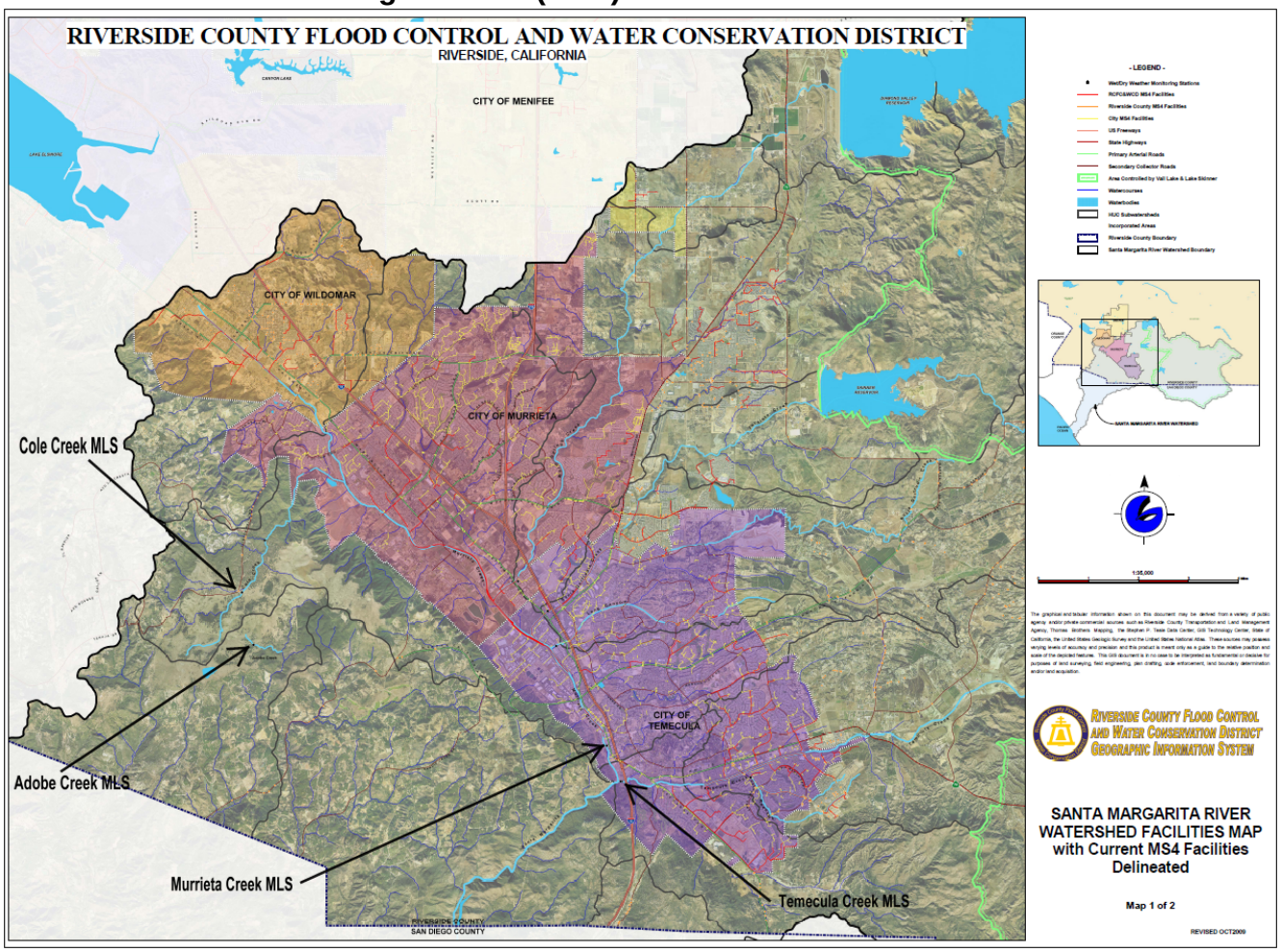

The intent of current mass loading monitoring as conducted by the Copermittees under Order No. R9-2004-001 is to use water chemistry data from storm events and dry weather flows to calculate pollutant loads and to assess water quality with respect to applicable acute and chronic toxicity criteria from the California Toxics Rule (CTR) and bioassessment as part of the triad monitoring approach.[234] The mass loading monitoring that is required by the Order will provide data representing event mean concentrations of pollutants, total pollutant loadings, and toxicity conditions from specific drainage areas. Mass loading monitoring stations are recommended by the Model Monitoring Technical Committee in order to answer management questions 1, 2, and 5.[235] The stations are also expected to contribute towards meeting MRP goals

[234] Riverside County Copermittees. 2009. Report of Waste Discharge, section 6.4 .
[235] Model Monitoring Technical Committee, 2004. Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California. Chapter 5.

1, 2, 3, 4, 6, and 8. The locations of the mass loading monitoring stations are not changed from Order No. R9-2004-001. The MRP, however, retains flexibility to allow the Copermittees to propose changing the location of a mass loading station. The Copermittees may also propose additional mass loading stations should they determine more are needed. The Copermittees will identify a permanent mass loading reference station for the permit term.

Some revisions to the required list of constituents to be monitored at mass loading stations have been made. The changes are made to be compatible with the federal NPDES regulations and in response to data collected during the current permit term. Audits of the Copermittees' monitoring program and reviews of annual reports during the last permit term have found consistent shortcomings in the Copermittees' monitoring programs. As a result, some changes have been made to the monitoring requirements. The changes include:

1. All events must now include: Biological Oxygen Demand, 5-day Chemical Oxygen Demand, Total Organic Carbon, Dissolved Organic Carbon. These are specifically required by 40 CFR 122.26(d)(2)(iii)(A) and (B), but were omitted from collection and reporting required by Order No. R9-2004-001.

2. Carbamate and Pyrethroid pesticides must be monitored. Pyrethroid pesticides were identified from TIEs conducted in response to toxicity observed during sampling as part of the triad approach at Temecula and Murrieta Creek. Long term monitoring of pesticide presence is critical to evaluate Copermittees BMP efforts and program effectiveness. Carbamate pesticides are utilized in residential, agricultural and commercial applications, and have been shown to have negative direct and indirect impacts on aquatic invertebrates and vertebrates, as well as associated riparian species.[236] In addition, the National Marine Fisheries Service (NMFS) issued a Biological Opinion in 2009 that concluded pesticide products containing carbaryl and carbofuran are likely to jeopardize 22 listed salmonids, including Southern California Steelhead.[237]

3. Impaired water body pollutants. Specific pollutants have been added in response to the U.S. Environmental Protection Agency approval of California's 2004-2006 and the San Diego Water Board approval of the 2008 303(d) List.

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[236] See:
Boone and James. 2003. Interactions of an insecticide, herbicide, and natural stressors in amphibian community mesocosms. *Ecological Applications*: 13(3) pp. 829-841.
Hanazato. 2001. Pesticide effects on freshwater zooplankton: an ecological perspective. *Environmental Pollution*: 112 pp. 1-10.
USGS. 1999. Field Manual of Wildlife Diseases: General Field Procedures and Diseases of Birds. Chapter 39.
California Department of Pesticide Regulation. 2010. Urban Pesticide Monitoring in Northern and Southern California. http://www.cdpr.ca.gov/docs/emon/surfwtr/presentations.htm

[237] NMFS. 2009. Endangered Species Act Section 7 Consultation Biological Opinion: Environmental Protection Agency Registration of Pesticides Containing Carbaryl, Carbofuran, and Methomyl.

4. A requirement to collect a grab sample for total petroleum hydrocarbons whenever a sheen is observed has been added based upon results from IC/ID programs in existing southern California NPDES MS4 permits.

5. The required organisms for toxicity testing have changed from the previous order to be consistent with USEPA guidance.[238] *Ceriodaphnia dubia* (water flea) has been replaced with *Pimephales promelas* (fathead minnow) to provide at least three test species from different phyla. *Hyalella azteca* has been retained as a test organism due to sensitivity to pyrethroid pesticides.

6. A constituent-specific table has been added to provide clarity to the list of pollutants that are required to be monitored as part of the triad approach.

7. More prescriptive reporting requirements have been added in the event the Copermittees fail to monitor the required number of mass loading events.

Section II.A.2 (Stream Assessment Monitoring) of the MRP requires the Copermittees to conduct bioassessment monitoring using a multiple lines of evidence approach which includes collection of benthic macroinvertebrates and algae, a full physical habitat assessment, water chemistry sampling, and toxicity testing. Bioassessment monitoring is a cost-effective tool that measures the effects of water quality over time.[239] It is an important indicator of stream health and impacts from storm water and non-storm water runoff. It can detect impacts that chemical and toxicity monitoring alone cannot. USEPA encourages permitting authorities to consider requiring biological monitoring methods in conjunction with chemical and toxicity testing to fully characterize the nature and extent of impacts from runoff.[240] Therefore, the San Diego Water Board commonly requires bioassessment monitoring in MS4 and other types of discharge permits.

Bioassessment is the direct measurement of the biological, chemical, and physical condition, and attainment of beneficial uses of receiving waters (typically using benthic macroinvertebrates, periphyton, and fish). Bioassessment monitoring integrates the effects of both water chemistry (including toxicity) and physical habitat impacts (e.g., sedimentation or erosion) of various discharges on the biological community native to the receiving waters. Moreover, bioassessment is a direct measurement of the impact of cumulative, sub-lethal doses of pollutants that may be below reasonable water chemistry detection limits, but that still have biological affects.

Because bioassessment focuses on communities of living organisms as integrators of cumulative impacts resulting from water quality or habitat degradation, it defines the ecological risks resulting from storm water and non-storm water MS4 runoff.

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[238] USEPA, 1991. Technical Support Document for Water Quality Based Toxics Control. EPA 505-2-90-001.
[239] California Department of Fish and Game, 2002. California Regional Water Quality Control Board, San Diego Region 2002 Biological Assessment Report: Results of May 2001 Reference Site Study and Preliminary Index of Biotic Integrity.
[240] USEPA, 1999. Rapid Bioassessment Protocols for Use in Wadeable Streams and Rivers. EPA 841-B-99-002. P. 2-5.

Bioassessment not only identifies that an impact has occurred, but also measures the effect of the impact and tracks recovery when control or restoration measures have been taken. These features make bioassessment a powerful tool to assess compliance, evaluate the effectiveness of BMPs, and to track both short and long-term trends (MRP goals 1, 2, 3, and 8). Bioassessment can also help answer management questions 1, 2, and 5.

The Order also identifies the most current established protocol to be used in identifying bioassessment reference stations. The protocol referenced in the Order is specified because it provides a qualitative and repeatable method for identifying reference sites. Moreover, the protocol is well established, since it has been peer reviewed and published.

The Order includes four significant modifications to the bioassessment monitoring required under Order No. R9-2004-001. These changes include:

1. Bioassessment monitoring must be consistent with the State Water Board's Surface Water Ambient Monitoring Program (SWAMP) Standard Operating Procedures (SOP) as amended.[241]

2. Bioassessment monitoring is to include an assessment of periphyton (algae).[242] Advantages of bioassessment using periphyton include: (1) they have rapid reproduction rates and very short life cycles, making them valuable indicators of short-term impacts; (2) as primary producers, they are most directly affected by physical and chemical factors; (3) sampling is easy and inexpensive; and (4) algal assemblages are sensitive to some pollutants which may not visibly affect other aquatic assemblages.[243] Future bioassessment must use algal IBI scores, when developed.

3. The number of bioassessment stations has been increased from three to six. The Copermittees currently conduct bioassessment monitoring at one reference station and at the two mass loading stations at Temecula and Murrieta Creek. The increase in required sampling is needed to evaluate more localized impacts higher in the Santa Margarita Hydrologic Unit (HU) in conjunction with SAL and NAL monitoring, as well as to evaluate any impacts that occur from hydromodification. The additional required reference station will aid in detecting any differences in bioassessment scores over time that may be independent of MS4 discharges.

4. The bioassessment section title has been changed to Stream Assessment Monitoring. This was done to prevent confusion by the Copermittees in

[241] SWAMP February 2007 (amended September 2008). Standard Operating Procedures for Collecting Benthic Macroinvertebrate Samples and Associated Physical and Chemical Data for Ambient Bioassessments in California
[242] SWAMP June 2009. Standard Operating Procedures for Collecting Stream Algae Samples and Associated Physical Habitat and Chemical Data for Ambient Bioassessments in Califorinia.
[243] USEPA, 1999. Rapid Bioassessment Protocols for Use in Wadeable Streams and Rivers. EPA 841-B-99-002. P. 3-3.

understanding sampling differences between mass loading stations and bioassessment sites. Under Order No. 2004-0001 all bioassessment sites were co-located with mass loading stations. Thus, the collection of water chemistry and toxicity data was done simultaneously for mass loading and bioassessment purposes, which prevented duplicative water chemistry and toxicity testing. For new "Stream Assessment Monitoring" sites not located at mass loading stations, the nomenclature for monitoring has been changed to prevent possible misinterpretation of the term "bioassessment" to mean only the collection of benthic macroinvertebrates and physical habitat data.

Section II.A.3 (Follow-up Analysis and Actions) of the MRP requires the Copermittees to use the results of the receiving water monitoring to determine if impacts from MS4 discharges are occurring and when follow-up actions are necessary. The triad approach allows a wide range of measurements to be combined to more efficiently identify pollutants, their sources, and appropriate follow-up actions. Results from the three types of monitoring must be assessed to evaluate the extent and causes of pollution in receiving waters and to prioritize management actions to eliminate or reduce the sources. The framework provided is to be used to determine conclusions from the data and appropriate follow-up actions. The framework is proposed by the Copermittees and derived from the Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California.[244] These follow-up actions are expected to primarily help answer management questions 2 and 4, as well as address MRP goals 2, 4, 5, 6 and 7.

When, based on the framework in Table 3 of the MRP, data indicates the presence of toxic pollutants in runoff, the Copermittees are required to conduct a Toxicity Identification Evaluation (TIE). A TIE is a set of procedures used to identify the specific chemical(s) responsible for toxicity to aquatic organisms. When discharges are toxic to a test organism, a TIE must be conducted to confirm potential constituents of concern and rule out others, therefore allowing Copermittees to determine and prioritize appropriate management actions. If a sample is toxic to more than one species, it is necessary to determine the toxicant(s) affecting each species. If the type and source of pollutants can be identified based on the data alone and an analysis of potential sources in the drainage area, a TIE is not necessary.

When a TIE identifies a pollutant associated with MS4 discharge as a cause of toxicity, it is then necessary to conduct follow-up actions to identify the causative agents of toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in toxicity. Follow-up actions should analyze all potential source(s) causing toxicity, potential BMPs to eliminate or reduce the pollutants causing toxicity, and suggested monitoring to demonstrate that toxicity has been removed.

[244] Model Monitoring Technical Committee, 2004. Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California. P. 5-61.

Section II.A.4 (Regional Monitoring Programs) of the MRP identifies that the San Diego Water Board recognizes the importance of regional monitoring efforts to answer monitoring questions and/or address problems that may not be specific to only the Santa Margarita hydrologic unit (see Finding E.12 and Discussion). Additionally, the Copermittees' jurisdiction does not encompass the entire Santa Margarita hydrologic unit, as portions of the hydrologic unit include, but are not limited to, San Diego County, tribal lands, the Cleveland National Forest, and Marine Corps Base at Camp Pendleton.

Section II.B (Wet Weather MS4 Discharge Monitoring) of the MRP requires the Copermittees to develop and implement a program, in accordance with 40 CFR 122.26(d)(2)(iii), to monitor and characterize pollutants in discharges of storm water effluent from major MS4 outfalls. Currently the Copermittees do not monitor the discharge of storm water from the MS4 outfalls. As a result, a substantial amount of information regarding the quality of MS4 effluent is unknown, and in-stream stations monitored under R9-2004-001 have not accurately characterized MS4 effluent data during the permit term.[245] The collection of wet-weather MS4 effluent data will enable the Copermittees to assess the effectiveness of existing storm water BMP measures, estimate cumulative annual pollutant loads from MS4 storm water discharges, and estimate seasonal pollutant loads from individual major outfalls. This data can be used to more effectively target storm water management program efforts. The MRP also requires compliance with section D of the Order for Storm Water Action Levels.

The monitoring of outfalls is expected to be used to identify storm drains that are discharging pollutants in concentrations that may pose a threat to receiving waters. Source investigations are expected to be conducted as a response to the data. The Copermittees are required to monitor for those pollutants in 40CFR 122.26(d)(2)(iii)(B); for 303(d) listed pollutants for the Santa Margarita Hydrologic Unit; and for pollutants with Storm Water Action Levels.

The MRP provides the Copermittees great flexibility in assigning stations and sampling frequency for wet-weather monitoring. Copermittees are to propose the number and frequency of monitoring stations, thus proposing the overall cost of their program. The San Diego Water Board will review the proposed program to ensure it will comply with Federal regulations and section D of the Order for Storm Water Action Levels.

The monitoring requirements also include a requirement to measure receiving water hardness when comparing storm water MS4 discharge data to Storm Water Action Levels for priority pollutants (e.g. metals). The effect of these constituents upon receiving waters will vary depending upon the hardness of receiving waters.

Section II.B.2 (Source Identification Monitoring) requires the Copermittees to develop and implement a program to identify sources of discharges of pollutants causing the high priority water quality problems within each hydrologic subarea. The current

[245] Riverside County Copermittees. 2009. Report of Waste Discharge, section 5.1.

source identification monitoring program conducted by the Copermittees has not been demonstrated to be effective due to the continued receiving water monitoring that documents persistent exceedances of water quality objectives for 303(d) listed pollutants, as well as the listing of new water bodies and pollutants (see Finding C.7). Furthermore, all monitoring conducted under Order R9-2004-001 focused on receiving water conditions rather than MS4 effluent discharges. Outside of required toxicity identification and reduction evaluations, little to no source identification was conducted for observed exceedances of water quality standards in receiving waters.

Identification of sources causing high priority water quality problems is a central purpose of storm water runoff management programs. Monitoring which enables the Copermittees to identify sources of water quality problems aids the Copermittees in focusing their management efforts, improving their programs and choosing additional and/or better BMPs. In turn, the Copermittees' programs can abate identified sources, which will improve the quality of storm water runoff discharges and receiving waters. This monitoring is needed to address management questions 3 and 4, in addition to ensuring that pollutants in storm water discharges from the MS4 are reduced to the MEP. Moreover, in its review of the San Diego County Copermittees' monitoring proposal, Tetra Tech, Inc. finds that "after some years of assessment monitoring, it is time to look more systematically at determining the relative urban contributions and the sources of urban runoff that contribute to identified receiving water problems."[246]

Section II.C (Non-Storm Water Dry Weather Action Levels) of the MRP describes the monitoring to be conducted by the Copermittees to determine compliance with dry weather, non-storm water action levels.

The section for Dry Weather Non-Storm Water Action Level Monitoring has taken the place of Illicit Discharge Detection and Elimination Monitoring under the previous Order. This change is required to assess compliance with action levels for non-storm water discharges from the MS4 into receiving waters while the Copermittees simultaneously conduct Illicit Discharge Detection and Elimination activities. The prior Order did not require the testing of non-storm water MS4 effluent prior to discharge into receiving waters, and thus Illicit Discharge Detection and Elimination Monitoring was conducted in receiving waters that were technically considered part of the MS4 but did not necessarily contain solely MS4 effluent. Discussions between the San Diego Water Board and Copermittees identified this shortcoming, which is reflected in the Copermittees Annual Reports (2007-08 and 2008-09), and the Copermittees have requested the point of monitoring for non-storm water be changed to sample MS4 effluent.[247] The required sampling frequency has great flexibility and allows Copermittees to sample a representative number of discharge points while the sampling methodology continues to be grab sampling. Additionally, the selection of representative outfalls or other identified stations has been clarified to ensure that those selected are consistent with federal requirements under 40 CFR 122.26(d) and section C of the Order.

[246] Tetra Tech Inc., 2006. Review of San Diego County MS4 Monitoring Program.
[247] Riverside County Copermittees ROWD, January 2009. Section 7.8.2.

Section II.C.2 (Source Identification Monitoring) requires the Copermittees to develop and implement a program to identify the sources of pollutants in non-storm water discharges. The section provides clarification that the program must utilize action levels pursuant to section C of the Order as a source identification response criteria. The source identification monitoring program is required under sections C, F.4.d, and F.4.e of the Order and to comply with 40 CFR 122.26(d)(2)(iv)(B), which requires the Copermittees have a program to detect and remove illicit discharges into the MS4.

Section II.D (High Priority Inland Aquatic Habitat) of the MRP describes required monitoring to be done in order to assess if MS4 storm water and/or non-storm water discharges are affecting high priority aquatic and/or riparian species. The existing monitoring program does almost all monitoring at or near mass loading stations, which are located at and below the confluence of multiple major hydrologic subareas. While this approach may estimate cumulative loadings and impacts from entire hydrologic areas, it provides little information regarding localized impacts to receiving waters subject to MS4 discharges, especially for high priority habitats. This approach is also recommended by the Southern California Stormwater Monitoring Coalition's Model Monitoring Technical Committee as an integral part of a storm water monitoring program. The Model Monitoring Technical Committee, which includes a member from RCFCD, recommends the use of "site-specific stations focused on the status of high-priority inland habitats of concern, with monitoring based primarily on the Triad approach for dry weather sampling and on chemistry and toxicity for wet weather."[248]

The monitoring of MS4 discharges into high-priority inland habitats is of special importance to the species which rely on the habitat subject to the discharge. The Santa Margarita River, and its tributaries, has been designated with BIOL, WARM, COLD, RARE and WILD beneficial uses, in part due to the presence of threatened and endangered species.[249] Portions of the Santa Margarita HU also include areas designated as critical habitat by state and Federal agencies. Federal and State threatened and endangered species are particularly susceptible to negative direct and indirect effects of MS4 discharges because the habitat available to them has already been reduced, restricted, and/or degraded, and their populations have already been reduced to low levels.[250] Therefore, short-term or chronic degradation of habitat or exposure to pollutants caused by MS4 discharges results in a proportionally high level of negative impact to already impacted beneficial uses. Threatened or endangered species with reduced habitat availability may be restricted from avoiding pollutants associated with MS4 discharges,[251] and any reproductive impacts from pollutants would likely have significant negative effects on already low population sizes.

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[248] Model Monitoring Technical Committee, 2004. Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California.
[249] See Federal Register 50 CFR 71.11 and the California Code of Regulations, Title 14 Section 670.5.
[250] Carroll, R., Augspurger, C., Dobson, A., Franklin, J., Orians, G., Reid, W., Tracy, R., Wilcove, D. and J. Wilson. 1996. Strengthening the use of science in achieving the goals of the Endangered Species Act: An Assessment by the Ecological Society of America. *Ecological Applications*. 6(1) pp. 1-11.
[251] For example, see National Marine Fisheries Service Draft Southern Steelhead Recovery Plan, July 2009.

Information regarding the extent of environmentally-sensitive habitats is available from sources familiar to the Copermittees.[252] Examples include the Western Riverside Multiple Species Habitat Conservation Plan, Santa Margarita HU assessments conducted by the U.S. Army Corps of Engineers, and California Department of Fish and Game Ecological Reserves. Therefore, a relatively small level of effort will be required to collect information to determine high priority inland aquatic habitats. In addition, the Copermittees already are required to have updated inventories of inland MS4 outfall locations. As a result, a monitoring plan can be developed within 36 months to address the new requirement.

Section II.E.2 (Sediment Toxicity Study) includes a requirement that the Copermittees conduct a sediment toxicity special study. This study has been added to the Monitoring and Reporting requirements to assess the quality of stream sediments and possible contamination due to runoff from the MS4. Toxicity tests focusing on aqueous toxicity may not account for the full toxicity of receiving waters if constituents, such as heavy metals or pesticides, are bound to sediments. Southern California studies have shown that stream sediments can exhibit significant levels of toxic metals and pesticides, including pyrethroids.[253,254] Additionally, the Copermittees have identified the presence of aqueous toxicity at both mass loading stations due to pyrethroid pesticides, but their presence in sediments is unknown.

Section II.E.3 (Trash and Litter Investigation) includes a requirement that the Copermittees conduct a Trash and Litter Investigation (see Finding C.8 and Discussion). The objective of the study is to evaluate the quantity, type, and source(s) of trash and litter in receiving waters (see Finding E.12 and Discussion regarding regional efforts). Although trash can impair beneficial uses, the amount and type of trash discharged into receiving waters from the Copermittee(s) MS4 is unknown. Thus, the Copermittees have largely been unable to assess the effectiveness of their BMPs that target trash as a pollutant. The special study requires the Copermittees to utilize previously developed protocols to determine the source of trash and litter in receiving waters, assess BMP effectiveness, and implement additional BMPs if needed according to the requirements of the Order. Qualitative and quantitative protocols for trash assessment have already been developed for San Diego County and the San Francisco Bay Region. These protocols are required to be used in the development of the special study, are expected to reduce Copermittee costs, and promote regional consistency in trash and litter assessments.

Section II.E.4 (Agricultural, Federal and Tribal Input Study) includes a requirement for the Copermittees to draft and subsequently conduct a special study to determine the water quality of storm water flows which are entering their MS4 from agricultural,

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[252] See Riverside County Copermittees ROWD, January 2009. Section 4.3.3.

[253] Holmes, R.W., Anderson, B.S., Phillips, B.M., Hunt, J.W., Crane, D.B., Mekebri, A. and V. Connor. 2008. Statewide Investigation of the Role of Pyrethroid Pesticides in Sediment Toxicity in California's Urban Waterways. *Environmental Science Technology* 42: 7003-7009..

[254] Crane, D.B. and C. Younghans-Haug. 1992. Oxadiazon residue concentrations in sediment, fish, and shellfish from a combined residential/agricultural area in Southern California. *Bulletin of Environmental Contamination and Toxicology.* Volume 48, no. 4.

federal and tribal areas. The objective of the study is to determine the type, quantity and estimated loading of pollutants in these discharges. In the ROWD, the Copermittees specifically state their concern regarding the quality of storm water which is discharged into their MS4 from such areas, and state that these discharges may affect overall water quality, primarily in the Murrieta and Temecula Creek watersheds.[255] However, no data, information, or analyses were presented or identified on the level of pollutants in such flows into their MS4. The special study has been designed with sampling frequency and parameter requirements that lend flexibility to the Copermittees. The minimum requirements are limited to grab samples for pollutants expected to be present in storm water discharges and at a number of representative sites chosen be the Copermittees. The special study requires testing to be source specific (e.g. only sampling discharge into from one of the three sources) and does not allow for sampling to be done on co-mingled flows within the MS4. Additionally, the Copermittees may elect to conduct composite sampling, toxicity testing, more targeted sites, or a combination thereof.

Section II.E.5 (MS4 and Receiving Water Maintenance Study) includes a requirement that the Copermittees investigate impacts to Beneficial Uses from routine removal of vegetation from portions of the MS4 that are also receiving waters (see Finding D.3.c and Discussion). The objective of the study is to determine if there are short-term or long-term in-stream water quality impacts from maintenance activities and to assess if the activities exacerbate the impairment of receiving waters 303(d) listed as impaired wholly or partially from MS4 discharges. Receiving waters within the Copermittees jurisdiction have been routinely cleared of vegetation by the Copermittees as part of their MS4 maintenance programs without mitigation efforts. The in-stream modification of vegetation may result in changes in water quality and Beneficial Uses from changes in nutrient cycling, the storage of organic matter, infiltration, flow attenuation, temperature and erosion potential.[256,257,258] The relative contribution, if any, of maintenance activities to CWA 303(d) water quality impairments in unknown. The program is also expected to work in conjunction with other permit requirements of the Order. For example, the Copermittees may choose to utilize study results when implementing the HMP, LID, and retrofitting programs.

Section II.E.6 (Intermittent and Ephemeral Stream Perennial Conversion Study) includes a study to assess specifically exempted non-storm water discharges[259] into surface waters and discharges into MS4s covered under a separate NPDES permit in order to determine if the exempted discharges and/or separate NPDES discharges to the MS4 are causing or contributing to a condition of pollution, contamination or nuisance. For ephemeral and intermittent inland surface waters, modification of flows

[255] Riverside County Copermittees ROWD, January 2009. Sections 3.2 and 3.3.
[256] Fischenich, J.C. and R.R. Copeland. 2001. Environmental Considerations for Vegetation in Flood Control Channels. US Army Corps of Engineers.
[257] Shade et al. 2005. Hydrologic exchange and N uptake by riparian vegetation in an arid-land stream. *Journal of North American Benthological Society*. 24(1):19–28.
[258] Warner, R.E. and K.M. Hendrix. 1984. California Riparian Systems: Ecology, Conservation, and Productive Management. *pp. 160-189*. University of California Press.
[259] See Finding C.15 of the Order for discussion of exempted non-storm water discharges.

may impact beneficial uses through modification of in-stream ecology including, but not limited to, sediment transport, biogeochemical functioning, water temperature, non-native species presence and exclusion of native species.[260,261] The objective of the study is to determine if the alteration of natural in-stream hydrologic regimes from intermittent or ephemeral to perennial due to exempted non-storm water discharges has modified the beneficial uses of the receiving water. The evaluation includes both qualitative and quantitative measurements of parameters which will help the Copermittees determine if exempted discharges and/or separate NPDES discharges into the MS4 are causing a condition of pollution, contamination, or nuisance. Such a determination would potentially require an action to be taken by the Copermittee(s) (i.e. prohibition of an exempted discharge), permit modification for a separate NPDES permit, and/or an action by the San Diego Water Board.

Section II.F (Monitoring Provisions) of the MRP includes monitoring provisions which are standard requirements for all municipal storm water permits.

III. Reporting Program

Section III of the MRP discusses submittal of the Planned Monitoring Program, the Receiving Waters and MS4 Discharge Monitoring Annual Reports, and Interim Reporting Requirements. For the purposes of Receiving Waters and MS4 Discharge Monitoring and Reporting Program, required reviews and approvals by the San Diego Water Board of draft monitoring plans, proposals or protocols shall be conducted by the San Diego Water Board Executive Officer.

Section III.C (Table of Reporting Requirements) has been added to the MRP to provide a quick reference for all required reporting dates found in the MRP

[260] Naiman, R.J., Bunn, S.E., Nilsson, C., Petts, G.E., Pinay, G., and L.C. Thompson. 2002. Legitimizing Fluvial Ecosystems as Users of Water: An Overview. *Environmental Management*: 30(4) pp. 455-467.
[261] Marchetti, M.P., Light, T., Moyle, P.B. and J.H. Viers. 2004. Fish Invasions in California Watersheds: Testing Hypotheses Using Landscape Patterns. *Ecological Applications*. 14(5) pp. 1507-1525.

U. Attachment F - Source Data

Attachment F contains data utilized for the development of Storm Water Action Levels and Non-storm Water Action Levels.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

RESOLUTION NO. R9-2002-0123

CHOLLAS CREEK DIAZINON TOTAL MAXIMUM DAILY LOAD

AUGUST 14, 2002

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

RESOLUTION NO. R9-2002-0123

TOTAL MAXIMUM DAILY LOAD (TMDL) FOR DIAZINON IN CHOLLAS CREEK WATERSHED SAN DIEGO COUNTY

WHEREAS, The California Regional Water Quality Control Board, San Diego Region (hereinafter, Regional Board), finds that:

1. **BASIN PLAN AMENDMENT:** The proposed amendment of the Water Quality Control Plan for the San Diego Region (Basin Plan) described in the recitals below was developed in accordance with Water Code Section 13240 et seq.

2. **NECESSITY STANDARD:** [Government Code §11353(b)]**:** Amendment of the Basin Plan to establish and implement a total maximum daily load (TMDL) for Chollas Creek is necessary because water quality in Chollas Creek cannot satisfy applicable water quality objectives for toxicity and pesticides even with implementation of waste discharge requirements containing technology-based effluent limits or water quality-based effluent limits for discharges of pollutants to Chollas Creek and its tributaries. Clean Water Act Section 303(d) requires the Regional Board to develop and implement a TMDL under the conditions that exist in Chollas Creek. This TMDL for diazinon is necessary to ensure attainment of applicable water quality objectives and restoration of beneficial uses designated for Chollas Creek.

3. **CLEAN WATER ACT SECTION 303(d):** Chollas Creek is currently identified on the Clean Water Act Section 303(d) list of impaired waters due to toxicity during storm events. Results from toxicity identification evaluations (TIEs) indicate that the insecticide diazinon in Chollas Creek has in part caused the toxicity during storm events.

4. **BENEFICIAL USE IMPAIRMENTS:** Chollas Creek supports several beneficial uses. The most sensitive beneficial uses are those designated for protection of aquatic life and aquatic dependent wildlife as described in the Basin Plan definition of the warm freshwater habitat (WARM) and wildlife habitat (WILD) beneficial uses. The WARM and WILD beneficial uses of Chollas Creek are adversely affected by toxicity due to diazinon.

5. **WATER QUALITY OBJECTIVES:** Diazinon levels in Chollas Creek cause toxicity during storm events. The Basin Plan does not contain a specific water quality objective for diazinon. The Basin Plan establishes following the narrative water quality objectives for "toxicity" and "pesticides" to ensure the protection of the WARM and WILD beneficial uses.

Toxicity Objective: *All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.*

The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water factors, shall not be less than that for the same water body in areas unaffected by the waste discharge or, when necessary, for other control water that is consistent with requirements specified in US EPA, State Water Resources Control Board or other protocol authorized by the Regional Board. As a minimum, compliance with this objective as stated in the previous sentence shall be evaluated with a 96-hour acute bioassay.

In addition, effluent limits based upon acute bioassays of effluents will be prescribed where appropriate, additional numerical receiving water objectives for specific toxicants will be established as sufficient data become available, and source control of toxic substances will be encouraged.

Pesticide Objective: *No individual pesticide or combination of pesticides shall be present in the water column, sediments, or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.*

6. **WATER QUALITY OBJECTIVE VIOLATIONS:** Toxicity tests using the water flea *Ceriodaphnia dubia* indicate that Chollas Creek storm water flows are toxic. Toxicity Identification Evaluations (TIEs) show that diazinon is responsible for the toxicity to the water flea. Accordingly, diazinon concentrations in Chollas Creek cause violations of the above "toxicity" and "pesticide" water quality objectives during storm events. The average concentration of diazinon in Chollas Creek during storm events is 0.46 µg/L. Chollas Creek waters also contain metals that are responsible for toxicity to a marine invertebrate. A separate TMDL is under development to address metals in Chollas Creek.

7. **SOURCES OF DIAZINON:** Urban storm water flows represent the most significant source of diazinon in the Chollas Creek watershed.

8. **CONCENTRATION-BASED TMDL:** Because aquatic toxicity is the most significant adverse effect of diazinon and because aquatic toxicity is a function of water column concentrations, this TMDL is a concentration-based, rather than mass emission-based TMDL. The Numeric Targets, TMDL (Loading Capacity), and Waste Load and Load Allocations are all defined in terms of concentrations.

9. **NUMERIC TARGETS:** The TMDL Numeric Targets, which are derived from the water quality objectives, identify the specific water column, sediment, or tissue concentrations (or other endpoints) which equate to attainment of the Basin Plan water quality objectives and the protection of designated beneficial uses. Therefore, if the numeric targets (for all causative pollutants) are appropriately selected, attainment of the Numeric Targets will result in attainment of the underlying water quality objectives and beneficial use protection.

   The Numeric Targets for diazinon in Chollas Creek are set equal to the California Department of Fish and Game freshwater Water Quality Criteria for diazinon. The acute Water Quality Criterion of 0.08 µg/L diazinon protects aquatic life from short-term exposure to diazinon, while the chronic criterion of 0.05 µg/L diazinon protects aquatic life from long-term diazinon exposure.

10. **TOTAL MAXIMUM DAILY LOAD:** The term Total Maximum Daily Load (TMDL), or Loading Capacity, is defined as the maximum amount of a pollutant that a waterbody can receive and still attain water quality objectives and protection of designated beneficial uses. The concentration-based Loading Capacity for diazinon in Chollas Creek is set at exactly the same concentrations as the numeric targets.

11. **LINKAGE ANALYSIS:** The purpose of the linkage analysis is to confirm that the TMDL will result in the attainment of applicable water quality objectives and beneficial use protection. With respect to diazinon, this TMDL will result in the attainment of the "toxicity" and "pesticide" water quality objectives and the restoration of the WARM and WILD beneficial uses in the Chollas Creek watershed[1]. This is because the Numeric Targets are set equal to the diazinon Water Quality Criteria which are based on toxicity testing and are specifically established at levels to ensure the protection of aquatic life from acute and chronic exposure to diazinon. The Water Quality Criteria protect all aquatic life stages including the most sensitive stages.

12. **WASTE LOAD AND LOAD ALLOCATIONS:** The concentration-based Waste Load and Load Allocations of this TMDL are applied equally to all diazinon discharge sources in the Chollas Creek watershed. All allocations are set at 90% of the numeric targets resulting in a diazinon allocation equal to 0.072 µg/L under acute exposure conditions and a diazinon allocation of 0.045 µg/L under chronic exposure conditions. These allocations include an explicit 10 % margin of safety to account for uncertainties in the TMDL analysis. This concentration-based TMDL and its allocations apply year-round and will be protective during all flow conditions and seasons.

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[1] **MULTIPLE POLLUTANTS:** Finding 11 regarding attainment of water quality standards is qualified with the words "with respect to diazinon" because there are multiple pollutants causing toxicity. Toxicity conditions in Chollas Creek are caused by metals and diazinon. Successful implementation of both the Chollas Creek diazinon TMDL and the Chollas Creek metals TMDL is expected to result in full attainment of the "Toxicity" water quality objectives, and of the WARM and WILD beneficial uses.

13. **DIAZINON CONCENTRATION-BASED LOAD REDUCTIONS:** An 84% reduction of current diazinon concentration–based loads is needed to attain the acute diazinon allocations set forth in this TMDL. A 90% reduction of current diazinon concentration–based loads is needed to attain the chronic diazinon allocations set forth in this TMDL.

14. **RESPONSIBLE PARTIE(S):** As dischargers of diazinon in urban storm water flows to Chollas Creek, the City of San Diego, City of Lemon Grove, City of La Mesa, San Diego Unified Port District, County of San Diego and the California Department of Transportation (CalTrans) are responsible for implementation of this TMDL. These entities are regulated as municipal Copermittees under the San Diego MS4 Permit or the statewide CalTrans MS4 Permit.

15. **PRIMARY IMPLEMENTATION MECHANISMS:** The primary mechanisms to implement the diazinon waste load reductions required by this TMDL are:

    a. **USEPA's Diazinon Phase-Out and Elimination Program:** In January 2001, USEPA reached an agreement with registrants (manufacturers) of diazinon to phase-out most uses (USEPA 2002). Under the agreement, all indoor uses will be terminated, and all outdoor non-agricultural uses will be phased-out over the next few years. Retail sales of diazinon for home uses at indoor sites will be stopped after December 31, 2002. The USEPA's phase-out of diazinon is the single most significant mechanism to implement this TMDL. In the Chollas Creek watershed the phase-out actions are expected to significantly reduce the source loadings of diazinon, and resulting aquatic toxicity, to negligible levels over time.

    b. **Modification of Existing Waste Discharge Requirements / NPDES Permit** The Regional Board's San Diego Municipal Storm Water Permit, also known as the San Diego MS4 Permit is the primary broad-based NPDES permit which directly regulates most pollutant discharges, including diazinon, in the Chollas Creek watershed. Federal regulations require that NPDES permits contain effluent limitations that are consistent with waste load allocations developed under a TMDL (40CFR 122.44 (d)(vii)(B)). The Regional Board will revise the San Diego MS4 Permit as necessary to conform with this TMDL.

    Compliance with numeric limitations for diazinon will be required in accordance with a phased schedule of compliance. The compliance schedule will be jointly developed by the Regional Board and the Chollas Creek stakeholders and will be finalized no later than one year following adoption of this TMDL by the Regional Board. The phased compliance schedule will apply only to attainment of numeric limitations for diazinon. All other requirements of this TMDL will be immediately effective upon incorporation into applicable NPDES permits.

    c. **Activities By Municipal Copermittees Pursuant to MS4 Permit and CWC Section 13267** Pursuant to the MS4 Permit and under the authority of Water Code Section 13267, the Regional Board will direct the municipal Copermittees in the Chollas

Creek watershed to 1) enforce existing local ordinances and adopt new legal authority as needed; 2) implement a "Diazinon Toxicity Control Plan"; and 3) conduct a focused Public Outreach / Education program.

16. **SECONDARY IMPLEMENTATION MECHANISMS:** Secondary mechanisms to implement this TMDL include 1) compliance with MS4 Permit, 2) compliance with existing waste discharge prohibitions; 3) enforcement authority of Regional Board; 4) modification of other waste discharge requirements; 5) adoption of new waste discharge requirements/NPDES permits as needed for significant sources of diazinon in the Chollas Creek watershed, and additional investigations and reports as needed pursuant to Water Code Section 13225.

17. **MONITORING PLAN:** The Regional Board will direct the municipal Copermittees in the Chollas Creek watershed to develop and implement a Diazinon Monitoring Plan. The Plan shall be designed to assess the effectiveness of this TMDL, its implementation measures, and progress towards attainment of applicable water quality objectives and beneficial use protection in the Chollas Creek watershed.

18. **SCIENTIFIC PEER REVIEW:** The scientific basis of this TMDL has undergone external peer review pursuant to Health and Safety Code Section 57004. The Regional Board has considered and responded to all comments submitted by the peer review panel.

19. **IMPLEMENTATION CHAPTER OF BASIN PLAN:** This Basin Plan amendment amends the Implementation Chapter of the Basin Plan (Chapter 4) to establish a TMDL for diazinon in the Chollas Creek Watershed and includes a program to implement the TMDL and monitor its effectiveness.

20. **ECONOMIC ANALYSIS:** The Regional Board has considered the costs of implementing this Basin Plan amendment, and finds these costs to be reasonable relative to the water quality benefits derived from implementing the amendment.

21. **DE MINIMUS ENVIRONMENTAL EFFECTS:** The Regional Board has prepared environmental documentation. This Basin Plan amendment results in no potential for adverse effect, either individually or cumulatively, on wildlife.

22. **PUBLIC NOTICE:** The Regional Board has notified all known interested parties and the public of its intent to consider adoption of this Basin Plan amendment.

23. **PUBLIC HEARING:** The Regional Board held a public hearing on June 12, 2002 and extended the written comment period by fifteen days. The Regional Board has heard and considered all comments pertaining to this Basin Plan amendment.

NOW, THEREFORE, BE IT RESOLVED that

1. **AMENDMENT ADOPTION:** The Regional Board hereby adopts this amendment to the Implementation Chapter of the Basin Plan (Chapter 4) to incorporate the Chollas Creek Diazinon TMDL as set forth in Attachment A hereto.

2. **CERTIFICATE OF FEE EXEMPTION:** The Executive Officer is authorized to sign a Certificate of Fee Exemption.

3. **AGENCY APPROVALS:** The Executive Officer is directed to submit this Basin Plan amendment to the State Water Resources Control Board (State Board) in accordance with California Water Code Section 13245. The Regional Board requests that the State Board approve the Basin Plan amendment and forward it to Office of Administrative Law (OAL) and the United States Environmental Protection Agency for approval.

4. **NON-SUBSTANTIVE CORRECTIONS:** If, during the approval process for this amendment, the State Board or OAL determines that minor, non-substantive corrections to the language of the amendment are needed for clarity or consistency, the Executive Officer may make such changes, and shall inform the Regional Board of any such changes.

I, John H. Robertus, Executive Officer, do hereby certify the foregoing is a full, true and correct copy of a Resolution adopted by the California Regional Water Quality Control Board, San Diego Region, on August 14, 2002.

JOHN H. ROBERTUS
Executive Officer

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

BASIN PLAN AMENDMENT

(ATTACHMENT A TO RESOLUTION NO. R9-2002-0123)

CHOLLAS CREEK DIAZINON TOTAL MAXIMUM DAILY LOAD

AUGUST 14, 2002

ATTACHMENT A
TO RESOLUTION NO. R9-2002-0123

BASIN PLAN AMENDMENT

TOTAL MAXIMUM DAILY LOAD (TMDL) FOR DIAZINON IN CHOLLAS CREEK WATERSHED SAN DIEGO COUNTY

This Basin Plan amendment amends the Implementation Chapter of the Basin Plan (Chapter 4) to establish a TMDL for diazinon in the Chollas Creek Watershed, a program to implement the TMDL and monitor its effectiveness. The following text is added to Chapter 4 of the Basin Plan.

Total Maximum Daily Load (TMDL) For Diazinon, Chollas Creek Watershed, San Diego County

On August 14, 2002 the Regional Board adopted Resolution No. R9-2002–0123, *Total Maximum Daily Load (TMDL) For Diazinon In Chollas Creek Watershed, San Diego County*. The terms and conditions of Resolution No. R9-2002–0123 are incorporated into the Basin Plan. This amendment establishes the total maximum daily load (TMDL) of diazinon which Chollas Creek can receive and still attain applicable water quality objectives and support beneficial uses. This TMDL is allocated to all contributing sources of diazinon in the watershed by establishing Waste Load Allocations for all point sources and Load Allocations for all nonpoint sources in the watershed. This TMDL includes a margin of safety. The TMDL Implementation Plan and Monitoring Plan are presented below.

Necessity Standard [Government Code §11353(b)]**:** Amendment of the Basin Plan to establish and implement a Total Maximum Daily Load (TMDL) for Chollas Creek is necessary because water quality in Chollas Creek cannot satisfy applicable water quality objectives for "Toxicity" and "Pesticides" even with implementation of waste discharge requirements containing technology-based effluent limits or water quality-based effluent limits for discharges of pollutants to Chollas Creek and its tributaries. Clean Water Act Section 303(d) requires the Regional Board to develop an implement a TMDL under the conditions that exist in Chollas Creek. This TMDL for diazinon is necessary to ensure attainment of applicable water quality objectives and restoration of beneficial uses designated for Chollas Creek.

Clean Water Act Section 303(d): Chollas Creek is currently identified on the Clean Water Act Section 303(d) list of impaired waters due to toxicity during storm events. Results from toxicity identification evaluations (TIEs) indicate that the insecticide diazinon in Chollas Creek has in part caused the toxicity during storm events.

Beneficial Use Impairments: Chollas Creek supports several beneficial uses. The most sensitive beneficial uses are those designated for protection of aquatic life and aquatic

dependent wildlife as described in the Basin Plan definition of the warm freshwater habitat (WARM) and wildlife habitat (WILD) beneficial uses. The WARM and WILD beneficial uses of Chollas Creek are adversely affected by toxicity due to diazinon.

Water Quality Objectives: Diazinon levels in Chollas Creek cause toxicity during storm events. The Basin Plan does not contain a specific water quality objective for diazinon. The Basin Plan establishes narrative water quality objectives for "Toxicity" and "Pesticides" to ensure the protection of the WARM and WILD beneficial uses.

Water Quality Objective Violations: Toxicity tests using the water flea *Ceriodaphnia dubia* indicate that Chollas Creek storm water flows are toxic. Toxicity Identification Evaluations (TIEs) show that diazinon is responsible for the toxicity to the water flea. Accordingly diazinon concentrations in Chollas Creek cause violations of the "Toxicity" and "Pesticide" water quality objectives during storm events. The average concentration of diazinon in Chollas Creek during storm events is 0.46 µg/L. Chollas Creek waters also contain metals that are responsible for toxicity to a marine invertebrate. A separate TMDL is under development to address metals in Chollas Creek.

Sources of Diazinon: Urban storm water flows represent the most significant source of diazinon to the Chollas Creek watershed.

Concentration-Based TMDL: Because aquatic toxicity is the most significant adverse effect of diazinon and because aquatic toxicity is a function of water column concentrations, this TMDL is a concentration-based, rather than mass emission-based TMDL. The Numeric Targets, TMDL (Loading Capacity), and Waste Load and Load Allocations are all defined in terms of concentrations.

Numeric Targets: The TMDL Numeric Targets, which are derived from the water quality objectives, identify the specific water column, sediment, or tissue concentrations (or other endpoints) which equate to attainment of the Basin Plan water quality objectives and the protection of designated beneficial uses. Therefore, if the Numeric Targets are appropriately selected (for all causative pollutants), attainment of the Numeric Targets will result in attainment of the underlying water quality objectives and beneficial use protection.

The Numeric Targets for diazinon in Chollas Creek are set equal to the California Department of Fish and Game freshwater Water Quality Criteria for diazinon. The acute Water Quality Criterion of 0.08 µg/L diazinon protects aquatic life from short-term exposure to diazinon, while the chronic criterion of 0.05 µg/L diazinon protects aquatic life from long-term diazinon exposure.

Numeric Targets for Diazinon in Chollas Creek[1]

Exposure Duration	Numeric Target	Averaging Period	Frequency of Allowed Exceedance
Acute	0.08 µg/L	One-hour average	Once every three years on the average
Chronic	0.05 µg/L	Four-day average	Once every three years on the average

Total Maximum Daily Load: The term Total Maximum Daily Load (TMDL), or Loading Capacity, is defined as the maximum amount of a pollutant that a waterbody can receive and still attain water quality objectives and protection of designated beneficial uses. The concentration-based Loading Capacity for diazinon in Chollas Creek is set at exactly the same concentrations as the Numeric Targets.

TMDL (Loading Capacity)
for Diazinon in Chollas Creek

Exposure Duration	TMDL	Averaging Period
Acute	0.08 µg/L	One-hour average
Chronic	0.05 µg/L	Four-day average

Linkage Analysis: The purpose of the linkage analysis is to confirm that the TMDL will result in the attainment of applicable water quality objectives and beneficial use protection. With respect to diazinon, this TMDL will result in the attainment of the "Toxicity" and "Pesticide" water quality objectives and the restoration of the WARM and WILD beneficial uses in the Chollas Creek watershed [2]. This is because the Numeric Targets are set equal to the diazinon Water Quality Criteria which are based on toxicity testing and are specifically established at levels to ensure the protection of aquatic life from acute and chronic exposure to diazinon. The Water Quality Criteria protect all aquatic life stages including the most sensitive stages.

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[1] For the purpose of evaluating if the Numeric Targets have been attained, sample results shall be used as follows:

1. If only one sample is collected during the time period associated with the numeric target (e.g., one-hour average or four-day average), the single measurement shall be used to determine attainment of the numeric target for the entire time period.
2. The one-hour average shall be the moving arithmetic mean of grab samples over the specified one-hour period.
3. The four-day average shall apply to flow-weighted composite samples for the duration of a storm, or shall be the moving arithmetic mean of flow weighted 24-hour composite samples or grab samples.

[2] **MULTIPLE POLLUTANTS:** The attainment of water quality standards is qualified with the words "with respect to diazinon" because there are multiple pollutants causing toxicity. Toxicity conditions in Chollas Creek are caused by metals and diazinon. Successful implementation of both the Chollas Creek diazinon TMDL and the Chollas Creek metals TMDL is expected to result in full attainment of the "Toxicity" water quality objectives, and of the WARM and WILD beneficial uses.

Waste Load And Load Allocations: The concentration-based Waste Load and Load allocations of this TMDL are applied equally to all diazinon discharge sources in the Chollas Creek watershed. All allocations are set at 90% of the Numeric Targets resulting in a diazinon allocation equal to 0.072 µg/L under acute exposure conditions and a diazinon allocation of 0.045 µg/L under chronic exposure conditions. These allocations include an explicit 10 % margin of safety to account for uncertainties in the TMDL analysis. This concentration-based TMDL and its allocations apply year-round and will be protective during all flow conditions and seasons.

Waste Load and Load Allocations for Diazinon in Chollas Creek

Exposure Duration	Numeric Targets	Margin of Safety	Waste Load and Load Allocations
Acute	0.08 µg/L	0.008 µg/L	0.072 µg/L
Chronic	0.05 µg/L	0.005 µg/L	0.045 µg/L

Diazinon Load Reductions Needed: The current average concentration of diazinon in Chollas Creek measured during storm events was 0.46 µg/L during the monitoring period 1998 through 2001. An 84% reduction of current diazinon concentration–based loads is needed to attain the acute diazinon allocations set forth in this TMDL. A 90% reduction of current diazinon concentration–based loads is needed to attain the chronic diazinon allocations set forth in this TMDL.

Needed Load Reductions in Chollas Creek

	Allocation		Reduction Needed	
Average Diazinon Concentration (µg/L)	Chronic (µg/L)	Acute (µg/L)	Chronic (µg/L)	Acute (µg/L)
0.46	0.045	0.072	**90%**	**84%**

Seasonal Variations and Critical Conditions: This concentration–based diazinon TMDL and allocations apply year round and will be protective during all flow conditions and seasons.

Responsible Partie(s): As dischargers of diazinon in urban storm water flows to Chollas Creek, the City of San Diego, City of Lemon Grove, City of La Mesa, San Diego Unified Port District, County of San Diego, and the California Department of Transportation (CalTrans) are responsible for implementation of this TMDL. These entities are regulated as municipal Copermittees under the San Diego MS4 Permit or the statewide CalTrans MS4 Permit.

TMDL Implementation Plan

The three most important mechanisms to implement the diazinon waste load reductions required by this TMDL are (1) USEPA's ongoing diazinon phase-out and elimination program; (2) modification of the San Diego Municipal Storm Water Permit (MS4 Permit)[3] as needed for consistency with this TMDL; and (3) activities by the municipal Copermittees in the Chollas Creek watershed to reduce diazinon discharges pursuant to the MS4 Permit and Water Code Section 13267.

1. USEPA's Diazinon Phase-Out and Elimination Program

The single most important action to implement this TMDL is USEPA's national ongoing Diazinon Phase-Out and Elimination Program. In January 2001, USEPA reached an agreement with registrants (manufacturers) of diazinon to phase-out most uses (USEPA 2002). Under the agreement, all indoor uses will be terminated, and all outdoor non-agricultural uses will be phased-out over the next few years.

Specifically, the terms of the agreement implement the following phase-out schedules:

- For the indoor household use, the registration will be canceled on March 2001, and all retail sales will stop by December 2002.

- For all lawn, garden and turf uses, manufacturing stops in June 2003; all sales and distribution to retailers ends in August 2003. Further, the manufacturers will implement a product recovery program in 2004 to complete the phase-out of the product.

- Additionally, as part of the phase-out, for all lawn, garden, and turf uses, the agreement ratchets down the manufacturing amounts. Specifically, for 2002, there will be a 25 percent decrease in production; and for 2003, there will be a 50 percent decrease in production.

- Also, the agreement begins the process to cancel around 20 different uses on food crops.

In summary, the phase-out is designed to reduce diazinon use and sales, availability, and to increase its proper disposal. As a result of the phase-out, USEPA expects, on a national basis, that these actions will end over 90% of current diazinon uses. In the Chollas Creek watershed, since agricultural use is negligible, the phase-out should reduce current source loadings of diazinon, and the resulting aquatic toxicity, to negligible levels over time. For these reasons, the diazinon phase-out is by far the single most significant mechanism by which this TMDL will be implemented. The remaining TMDL implementation actions

[3] Regional Board Order No. 2001-01 NPDES No CAS0108758, *Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of San Diego, and the San Diego Unified Port District*.

described below are designed to reduce the discharge of diazinon to the Chollas Creek watershed due to interim (during the phase-out) and residual (post phase-out) diazinon sales, use, and disposal. It should be noted that actions taken by the municipalities and other stakeholders to reduce diazinon discharges to the Chollas Creek watershed will likely be effective in reducing the discharges of alternative pesticides in the long-term as well.

2. **Modification of Existing Waste Discharge Requirements / NPDES Permits**

The Regional Board's San Diego Municipal Storm Water Permit, also known as the San Diego MS4 Permit (Regional Board Order No. 2001-01 NPDES No CAS0108758) is the primary broad-based NPDES permit which directly regulates most pollutant discharges, including diazinon, in the Chollas Creek watershed. Federal regulations require that NPDES permits contain effluent limitations that are consistent with Waste Load Allocations developed under a TMDL (40CFR 122.44 (d)(vii)(B)). The Regional Board will revise existing waste discharge requirements / NPDES permits to incorporate effluent limitations in conformance with the Waste Load Allocations for diazinon as specified above. Modifications to the MS4 Permit can occur when the permit is reopened or during scheduled permit reissuance.

Compliance with numeric limitations for diazinon will be required in accordance with a phased schedule of compliance. The compliance schedule will be jointly developed by the Regional Board and the Chollas Creek stakeholders and will be finalized no later than one year following adoption of this TMDL by the Regional Board. The phased compliance schedule will apply only to attainment of numeric limitations for diazinon. All other requirements of this TMDL will be immediately effective upon incorporation into applicable NPDES permits.

3. **Activities By Municipal Copermittees Pursuant to MS4 Permit and CWC Section 13267**

Pursuant to the MS4 Permit and under the authority of Water Code Section 13267, the Regional Board will direct the municipal Copermittees in the Chollas Creek watershed to do the following:

a. *Legal Authority*
Enforce existing local ordinances, or adopt new legal authority, as needed to ensure Copermittee compliance with the Waste Load Allocations specified in this TMDL;

b. *Diazinon Toxicity Control Plan*
Develop and implement a "Diazinon Toxicity Control Plan" to promote Copermittee compliance with the Waste Load Allocations specified in this TMDL. The Plan should consist of pollution prevention and source control best management practices designed to reduce the discharge of diazinon to Chollas Creek.

c. *Diazinon Public Outreach / Education Program*
Develop and implement a focused Public Outreach / Education program designed to reduce the discharge of diazinon to the Chollas Creek watershed. By reducing the discharge of diazinon, the Program will promote Copermittee compliance with the Waste Load Allocations specified in this TMDL. The Program should contain the

components described in the Regional Board Technical Report, *Total Maximum Daily Load for Diazinon in Chollas Creek Watershed San Diego County,* dated August 14, 2002, or equivalent components. The diazinon public outreach / education program may be incorporated into the Diazinon Toxicity Control Plan.

4. **Compliance with MS4 Permit**

The municipal Copermittees in the Chollas Creek watershed shall implement the requirements of the MS4 Permit.

5. **Compliance with Existing Waste Discharge Prohibitions**

Prohibitions against discharges of waste that cause pollution or nuisance, described in the Basin Plan, including discharges of diazinon that cause or contribute to violation of water quality objectives are applicable to the urban land users and land owners in the Chollas Creek watershed. Dischargers of diazinon in the watershed shall also comply with all other applicable waste discharge prohibitions contained in the Basin Plan.

6. **Enforcement Authority of Regional Board**

The Regional Board will use its enforcement authority as necessary to ensure compliance with applicable waste discharge requirements and Basin Plan waste discharge prohibitions.

7. **Modification of Other Existing Waste Discharge Requirements**

The State Water Resources Control Board (State Board) has issued three additional NPDES storm water permits that regulate the discharge of pollutants including diazinon in the Chollas Creek watershed. These permits are the statewide Caltrans Municipal Storm Water Permit *(State Board Order No. 99-06-DWQ NPDES No. CAS 000003)*, the statewide General Industrial Storm Water Permit *(State Board Order No. 97-03-DWQ NPDES No. CAS 000001)*, and the statewide General Construction Storm Water Permit *(State Board Order No. 99-08-DWQ NPDES No. CAS 000002)* which directly regulate discharges from Caltrans owned and operated facilities, and from industrial and construction sites respectively, located within the Chollas Creek watershed. Discharges from industrial and construction sites in the Chollas Creek watershed are also indirectly regulated under the MS4 Permit which holds each municipal Copermittee ultimately responsible for all discharges from industrial and construction sites within its jurisdiction. The Regional Board will request the State Board to amend each of these three statewide permits as needed for consistency with this TMDL. Modifications to waste discharge requirements can occur when permits are reopened or reissued.

In addition to the broad-based regulation of discharges under the MS4 Permit, the discharge of pollutants, including diazinon, from utility companies and utility vaults is directly regulated under the State Board's General Permit for Utility Vaults *(State Board Order No.2001-11-DWQ NPDES No.CAG 990002)*. The Regional Board will request the State Board to also revise the General Permit for Utility Vaults as needed for consistency with this TMDL.

8. **Adoption of New Waste Discharge Requirements / NPDES Permits**

The Regional Board may adopt new waste discharge requirements / NPDES permits for any significant source(s) of diazinon identified by the municipal Copermittees or the Regional Board.

9. **Additional Investigations and Reports Pursuant to CWC Section 13225**

The Regional Board may use its authority under California Water Code Section 13225 to request the municipalities in the Chollas Creek watershed to conduct additional investigations which are beyond the purview of the MS4 permit and to report on the findings of such investigations. Any such investigations will address diazinon-related issues in the Chollas Creek watershed for the ultimate purpose of reducing diazinon discharges to the watershed.

10. **Monitoring Plan**

Pursuant to the MS4 permit and under the authority of Water Code Section 13267, the Regional Board will direct the municipal Copermittees in the Chollas Creek watershed to develop and implement a Monitoring Plan. The Plan shall be designed to assess the effectiveness of this TMDL, its implementation measures, and progress towards the attainment of applicable water quality standards in the Chollas Creek watershed. The Plan should contain the components described in the Regional Board Technical Report, *Total Maximum Daily Load for Diazinon in Chollas Creek Watershed San Diego County,* dated August 14, 2002, or equivalent components.

11. **Schedule of Implementation**

As described in Provision 2 above, *Modification of Existing Waste Discharge Requirements/ NPDES Permits,* compliance with numeric limitations for diazinon will be required in accordance with a phased schedule of compliance. All other requirements of this TMDL will be immediately effective upon incorporation into applicable NPDES permits as described below.

Action	Description	Responsible Parties	Due Date
USEPA cancels registration for indoor household uses of diazinon		USEPA	March 31, 2001
IPM Workshop(s)	Conduct first workshop	Chollas Creek Watershed Municipal Copermitees	Within 1 year after USEPA approves TMDL and annually thereafter
Monitoring Plan	Initiate Monitoring Plan	Chollas Creek Watershed Municipal Copermittees	30-days after USEPA approves TMDL

Action	Description	Responsible Parties	Due Date
Diazinon Toxicity Control Plan	Initiate DTCP	Chollas Creek Watershed Municipal Copermittees	30-days after USEPA approves TMDL
Retail sales of diazinon (indoor uses) end		USEPA	December 31, 2002
Manufacturing of diazinon for all lawn, garden and turf uses end		USEPA	June 31, 2003
Sales and distribution to retailers ends		USEPA	August 31, 2003
Phase out and eliminate diazinon usage and sales in the Chollas Creek watershed. Ensure proper disposal.		USEPA	2003 for non-agriculture uses
Modify MS4 Permit for consistency with TMDL		Regional Board	No later than 2006
Implement legal authority to reduce diazinon discharges in the Chollas Creek watershed.		Chollas Creek Watershed Municipal Copermittees	6 months after USEPA approves TMDL
Compliance with MS4 Permit		Chollas Creek Watershed Municipal Copermittees	Ongoing
Compliance with Existing Waste Discharge Prohibitions		Diazinon Dischargers	Ongoing
Enforcement Authority of Regional Board		Regional Board	Ongoing
Modification of Other Existing Waste Discharge Requirements		Regional Board and State Board	No later than next reissuance
Adoption of New Waste Discharge Requirements / NPDES Permits	For significant diazinon sources only.	Regional Board	As needed
Additional Investigations and Reports Pursuant to CWC Section 13225		Diazinon Dischargers	As needed
Submit Annual Reports	Effectiveness Reports and Monitoring Reports	Chollas Creek Watershed Municipal Copermittees	January 31 of each year.

California Regional Water Quality Control Board
San Diego Region

Technical Report
for
Total Maximum Daily Load for Diazinon in Chollas Creek Watershed San Diego County

Final

August 14, 2002

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Executive Summary

Chollas Creek is an urban creek located within the County of San Diego. The Chollas Creek watershed, which is relatively small and highly urbanized, drains a portion of downtown San Diego and is directly tributary to San Diego Bay. See Attachment A for Chollas Creek vicinity and watershed maps. The predominant land use in the watershed is residential. Flows in Chollas Creek are highly variable and storm dependent.

There is conclusive evidence that diazinon is causing acute and chronic toxicity to aquatic life in Chollas Creek. Municipal storm water is believed to be the primary source of diazinon entering Chollas Creek. Diazinon is a highly effective organophosphate pesticide common in indoor residential, landscape, and agricultural applications. Urban storm water flows are the primary source of diazinon to Chollas Creek . The average current concentration of diazinon in Chollas Creek during storm events is 0.46 µg/L.

Toxicity in Chollas Creek due to diazinon occurs predominantly during storm events and was in part the basis for the 1996 Clean Water Act Section 303(d) listing of Chollas Creek for "toxicity in storm water". A portion of the toxicity in Chollas Creek during storm events is due to metals. Federal law requires the Regional Board to develop a Total Maximum Daily Load (TMDL) for waters on the Section 303(d) list. The purpose of a TMDL is to attain applicable water quality objectives and restore the beneficial uses of "impaired" waters. A separate TMDL is being developed to address metal induced storm water toxicity in Chollas Creek.

The purpose of this TMDL is to reduce diazinon concentrations in Chollas Creek as needed to attain the narrative Basin Plan water quality objectives for "Toxicity" and "Pesticides" and to restore the "warm freshwater habitat" (WARM) and "wildlife habitat" (WILD) beneficial uses of Chollas Creek.

Because aquatic toxicity is the most significant adverse effect of diazinon and because aquatic toxicity is a function of water column concentrations, this TMDL is a concentration-based, rather than mass emission-based, TMDL. The Numeric Targets, TMDL (Loading Capacity), and Waste Load and Load Allocations are all defined in terms of concentrations.

The Regional Board has set the Numeric Targets and the TMDL (Loading Capacity) equal to the California Department of Fish and Game's Water Quality Criteria for the protection of freshwater aquatic organisms from diazinon. The acute Water Quality Criterion of 0.08 µg/L protects aquatic life from short-term exposure to diazinon, while the chronic criterion of 0.05 µg/L protects aquatic life from long-term diazinon exposure.

The Regional Board has applied the concentration-based Waste Load and Load Allocations of this TMDL equally to all diazinon discharge sources in the Chollas Creek watershed. All allocations are set at 90% of the Numeric Targets resulting in a diazinon allocation equal to 0.072 µg/L under acute exposure conditions and a diazinon allocation

of 0.045 µg/L under chronic exposure conditions. These allocations include an explicit 10 % margin of safety to account for uncertainties in the TMDL analysis. This concentration-based TMDL and its allocations apply year-round and will be protective during all flow conditions and seasons.

An 84% reduction of current diazinon loads in Chollas Creek is needed to attain the acute diazinon allocations set forth in this TMDL. A 90% reduction of current diazinon loads is needed to attain the chronic diazinon allocations set forth in this TMDL.

As dischargers of diazinon in urban storm water flows to Chollas Creek, the City of San Diego, City of Lemon Grove, City of La Mesa, San Diego Unified Port District, County of San Diego and the California Department of Transportation (CalTrans) are responsible for implementation of this TMDL. These entities are regulated as municipal Copermittees under the San Diego Municipal Storm Water Permit (San Diego MS4 Permit) or the statewide municipal CalTrans Storm Water Permit (CalTrans MS4 Permit).

The three most important mechanisms to implement the diazinon waste load reductions required by this TMDL are: (1) USEPA's ongoing diazinon phase-out and elimination program; (2) modification of the San Diego Municipal Storm Water Permit (MS4 Permit) as needed for consistency with this TMDL; and (3) activities by the municipal Copermittees in the Chollas Creek watershed to reduce diazinon discharges pursuant to the MS4 Permit and Water Code Section 13267. Such activities will include (1) enforce existing local ordinances and adopt new legal authority as needed;(2) implement a "Diazinon Toxicity Control Plan"; and (3) conduct a focused Public Outreach / Education program (which may be incorporated into the "Diazinon Toxicity Control Plan".

Compliance with numeric limitations for diazinon will be required in accordance with a phased schedule of compliance. The compliance schedule will be jointly developed by the Regional Board and the Chollas Creek stakeholders and will be finalized no later than one year following adoption of this TMDL by the Regional Board. The phased compliance schedule will apply only to attainment of numeric limitations for diazinon. All other requirements of this TMDL will be immediately effective upon incorporation into applicable NPDES permits.

In the Chollas Creek watershed, USEPA's ongoing phase-out is expected to significantly reduce current source loadings of diazinon, and the resulting aquatic toxicity, to negligible levels over time. Implementation mechanisms specified in this TMDL will reduce diazinon discharges during, and immediately following, the phase-out and may also be effective in reducing alternative pesticide use in the long-term.

With respect to diazinon, this TMDL will result in the attainment of the "Toxicity" and "Pesticide" water quality objectives and the restoration of the WARM and WILD beneficial uses

in the Chollas Creek watershed[1]. This is because the numeric targets are set equal to the diazinon Water Quality Criteria which are based on toxicity testing and are specifically established at levels to ensure the protection of aquatic life from acute and chronic exposure to diazinon. The Water Quality Criteria protects all aquatic life stages including the most sensitive stages.

The scientific basis of this TMDL has undergone external peer review pursuant to Health and Safety Code Section 57004. The Regional Board has considered and responded to all comments submitted by the peer review panel.

The Regional Board adopted Resolution No. R9-2002-0123, incorporating this Total Maximum Daily Load for diazinon in the Chollas Creek watershed, into the Basin Plan during a public meeting on August 14, 2002.

As with any Basin Plan amendment involving surface waters, once adopted by the Regional Board, this TMDL will not take effect until it has undergone subsequent agency approvals by the State Water Resources Control Board (SWRCB), the Office of Administrative Law (OAL), and the United States Environmental Protection Agency (USEPA).

[1] **MULTIPLE POLLUTANTS:** The attainment of water quality standards is qualified with the words "with respect to diazinon" because there are multiple pollutants causing toxicity. Toxicity conditions in Chollas Creek are caused by metals and diazinon. Successful implementation of both the Chollas Creek diazinon TMDL and the Chollas Creek metals TMDL is expected to result in full attainment of the "Toxicity" water quality objectives, and of the WARM and WILD beneficial uses.

Technical Report for Total Maximum Daily Load for Diazinon in Chollas Creek Watershed, San Diego County

1.0 Total Maximum Daily Load Fundamentals

Section 303(d)(1)(A) of the Clean Water Act requires that "Each State shall identify those waters within its boundaries for which the effluent limitations…are not stringent enough to implement any water quality standard applicable to such waters." The Clean Water Act also requires states to establish a priority ranking for waters on the section 303(d) list of impaired waters and to establish Total Maximum Daily Loads (TMDLs) for such waters.

The purpose of a total maximum daily load (TMDL) is to attain water quality objectives and restore and protect the beneficial uses of an impaired water body. A TMDL is defined as "the sum of the individual waste load allocations for point sources and load allocations for nonpoint sources and natural background (40 CFR 130.2) such that the capacity of the water body to assimilate pollutant loadings (i.e., the Loading Capacity) is not exceeded.

The TMDL process begins with the development of a technical TMDL which includes the following 8 components: (1) A **Problem Statement** describing which water quality objectives are not being attained and which beneficial uses are impaired; (2) identification of **Numeric Targets** which will result in attainment of the water quality objectives and protection of beneficial uses; (3) A **Source Analysis** to identify all of the point and nonpoint sources in the watershed and estimate the current pollutant loading from each; (4) a calculation of the maximum **Loading Capacity**, or TMDL, of the waterbody for the pollutant; i.e., the maximum amount of the pollutant that may be discharged to the water body without causing exceedances of water quality objectives and impairment of beneficial uses; (5) a **Linkage Analysis** to confirm that the TMDL, or Loading Capacity, will result in the attainment of the water quality objectives; (6) the division and **Allocation** of the total Loading Capacity amongst each of the contributing sources in the watershed, waste load allocations (WLA) for point sources and load allocations (LA) for non point sources; (7) a **Margin of Safety** (MOS) to account for uncertainties in the TMDL analysis; and (8) a description of how **Seasonal Variation and Critical Conditions** are accounted for in the TMDL. The document containing the above components is generally referred to as the Technical TMDL.

Upon completion of the Technical TMDL, a plan to implement the TMDL is developed along with a plan to monitor the results. The **Implementation Plan** describes the actions needed by each of the point and nonpoint source dischargers in the watershed to meet the load reductions specified in the TMDL and a time schedule taking such actions. The Implementation Plan also identifies all agencies with authority to take pollutant reducing actions and describes such actions. The purpose of the Monitoring Plan is to assess the effectiveness of the load reduction

activities in attaining water quality objectives and restoring beneficial uses and to document progress towards same.

Upon completion, the regulatory provisions of the TMDL, Implementation Plan, and Monitoring Plan are incorporated into the Region's Water Quality Control Plan, or Basin Plan. This is accomplished via a formal action by the Regional Board to amend its Basin Plan in a public hearing process. As with any Basin Plan amendment involving surface waters, a TMDL adopted by the Regional Board will not take effect until it has undergone subsequent agency approvals by the State Water Resources Control Board (SWRCB), the Office of Administrative Law (OAL), and the United States Environmental Protection Agency (USEPA).

Total maximum daily loads are not self implementing; nor are they enforceable simply by incorporation into the Basin Plan. Rather a TMDL must be made enforceable by the Regional Board in one of two ways: (1) the TMDL and load allocations are incorporated into waste discharge requirements and NPDES permits; or (2) a formal prohibition against a particular discharge of waste is established in the Basin Plan. The TMDL must then be implemented by the responsible point and nonpoint source dischargers of the pollutant within the watershed. In other words, each responsible party must take any load reduction actions necessary to comply with its assigned load or waste load allocation as specified in the TMDL.

2.0 Problem Statement

From 1994 until May 2001, storm water has been tested for toxicity at a station on the north fork of Chollas Creek called "SD8(1)". Toxicity testing is an accepted method for assessment of the potential impact of complex mixtures of pollutants (such as urban storm water runoff) on aquatic life in receiving waters. The water flea *Ceriodaphnia dubia* is an indicator test organism for examination of freshwater samples. Toxicity to reproduction and survival of the water flea has been found in storm water sampled at this station. Eighty-seven percent (87%)(16/18) of the '7-day No Observable Effects Concentration' tests have showed toxicity (see Attachment B-1). Furthermore, storm water flows from this station have been found to negatively affect growth in the indicator organism known as the fathead minnow, *Pimephales promelas.* Storm water was found to be toxic to the fathead minnow in sixty-seven percent (67%) (6/9) of the '7-day No Observable Effects Concentration' tests. Consequently, Chollas Creek storm water has not met the applicable water quality objective for toxicity. The toxicity of Chollas Creek storm water to aquatic test organisms indicates that the "warm freshwater habitat" and "wildlife habitat" beneficial uses of Chollas Creek have not been adequately protected.

A toxicity identification evaluation (TIE) has been conducted to determine the cause of the toxicity in Chollas Creek storm water (See Attachment C). Results from the TIE indicate that the insecticide diazinon has caused the toxicity to the water flea. Since the storm water toxicity has been caused by diazinon, Chollas Creek has not met the applicable water quality objective for pesticides and toxicity. Results from the TIE also indicate metals in Chollas Creek storm water

are toxic to a marine invertebrate indicator species. A separate TMDL is being developed for metals in Chollas Creek.

2.1 Diazinon

Diazinon is a widely used organophosphate insecticide that is a common pollutant in urban storm water runoff and dry weather flows. It is used in home, garden and commercial applications in urban areas of the Chollas Creek watershed.

On a national basis, diazinon is one of the most commonly found pesticides in air, rain, and drinking and surface water. Over 13,000,000 pounds of diazinon are applied in the United States annually. It is used on a variety of agricultural crops and livestock (about 20% of usage), on turf and for residential control of various insects, indoors and outdoors (about 80% of usage). For non-agricultural use the largest share is in homeowner outdoor insect control for turf and gardens (39%). Other large usage is in lawn care operators (19%) and pest control operators (11%). Indoor homeowner use is also registered. California, Texas and Florida are states with the most significant usage.

Diazinon is known by the formula names:

- *O,O*-diethyl *O*-[6-methyl-2-(1-methylethyl)-4-pyrimidinyl]ester (9CI);
- *O,O,*diethyl-2-isopropyl-4-methyl-6-pyrimidinyl-phosphorothionate;
- O, O-diethyl O-(2-isopropyl-6-methyl-4-pyrimidinyl) phosphorothioate;
- O,O-diethyl O-(2-isopropyl-6-methyl-4-pyrimidinyl) ester;
- Diethyl 2-isopropyl-4-methyl-6-pyrimidinyl phosphorothionate;
- Diethyl 2-isopropyl-4-methyl-6-pyrimidyl thionophosphate;
- Diethyl 4-(2-isopropyl-6-methylpyrimidinyl) phosphorothionate;
- Isopropylmethylpyrimidyl diethyl thiophosphate; and
- O-(2-Isopropyl-4-methylpyrimidyl) O,O-diethyl phosphorothioate <www.pesticideinfo.org>.

Diazinon is also known by the synonyms: Phosphorothioic acid, Alfa-Tox, Spectracide, Basudin, Sarolex, Antigal, Dacutox, Dassitox, Dazzel, Dianon, Diaterr-Fos, Diazajet, Diazide, Diazitol, Diazol, Dizinon, Dimpylate, Dimpylatum, Dipofene, Dyzol, Exodin, Flytrol, Galesan, Gardentox, Kayazinon, Kayazol, Neocidol, Nipsan, Nucidol, Sandoz, Diagran, Drawizon, D.z.n., Fezudin, Sarolex, Dymet, Diazinão and other synonyms <www.pesticideinfo.org>.

Diazinon is moderately persistent and mobile in the environment (USEPA, 2000). Diazinon degrades primarily by microbial metabolism with an average half life of about 38 days in laboratory soil metabolism studies (USEPA, 2000). Hydrolysis half lives are 23, 138 and 77 days at pH 5, 7 and 9 respectively. Photolysis half lives are about 15 days on soil and 26 days in water (USEPA, 2000) <www.epa.gov/pesticides/op/diazinon/risk_Oct2000.pdf>.

Diazinon degradates include diazoxon, isopropyl diazoxon, and oxypyrimidine (USEPA, 2000). Diazoxon is an intermediate degradate which degrades into oxypyrimidine. Oxypyrimidine is the primary degradate and appears to be more persistent than diazinon (USEPA, 2000)

<www.epa.gov/pesticides/op/diazinon/risk_Oct2000.pdf>. Though diazoxon was detected in field studies, it's persistence is unclear, since it is not reported to be a major degradate in laboratory studies (USEPA, 2000).

Diazinon acts as an anticholinesterase agent by phosphorylating acetylcholinesterase (AChE) (Menzer, 1991 in USEPA, 2000). Diazinon interferes with the metabolism of the neurotransmitter acetycholine (ACh) (USEPA, 2000). This results in accumulation of ACh in nerve and tissue effortor organs and causes a broad spectrum of clinical effects (e.g., central nervous system effects)(USEPA, 2000). Nevertheless, although diazinon's primary mode of action is characterized as inhibiting AChE, the parent compound itself cannot inhibit AChE but requires preliminary oxidation to diazoxon (Keiger et. al., 1995 in USEPA, 2000) to inhibit AChE.

Diazinon oxidizes to diazoxon (diethyl 2-isopropyl-6-methylpyrimidin-4-yl phosphate) (Wahia et. al., 1976 in Novartis Crop Protection, Inc., 1997) and also isopropyl diazoxon (USEPA, 2000). Evidence indicates diazoxon and isopropyl diazoxon are approximately 10,000 times more toxic than diazinon (Fujii and Asaka, 1982 in USEPA, 2000). Diazoxon is more effective than diazinon in inhibiting AChE activity (Fujii and Asaka, 1982 in Novartis Crop Protection, Inc., 1997). Diazoxon is believed to be the dominant *toxic* component of diazinon in surface waters (USEPA, 2000).

The concentration of the diazinon degradates diazoxon and isopropyl diazoxon is linked to the concentration of the parent diazinon. On average, diazoxon has been found in streams and rivers in California in concentrations that are 2.5% of the parent concentration (USEPA, 2000). While there is data on the parent diazinon, there is a paucity of data on the degradate diazoxon (USEPA, 2000). It is believed that reducing the concentration of the parent diazinon reaching storm water will reduce the amount of diazinon degradates. A correlation has been found between toxicity to *Ceriodaphnia dubia* and concentrations of diazinon in Chollas Creek storm water samples. A correlation coefficient of 0.7032 was obtained after analysis of 34 storm water samples collected during the period 1999 through 2001 (MEC, 2002).

Diazinon has a relatively high solubility and low adsorbtive capacity and tends to move into the liquid phase in a wet environment and tends to remain in that phase. Storm and irrigation water runoff is an efficient transport mechanism for diazinon. According to USEPA (2000), there is high certainty in all urban and suburban areas where diazinon is applied outdoors, and where there is sufficient irrigation or rainfall to cause runoff, there will be negative impacts on aquatic biota from the diazinon use.

Diazinon-induced toxicity in storm water has been found in the:

- San Diego Creek area, California (USEPA, 2002);
- San Francisco Bay area, California (Alameda County Flood Control and Water Conservation District, 1997);
- Sacramento-San Joaquin Valley, California (Menconi and Cox, 1994);

- Castro Valley Creek watershed in Alameda County, California (Hansen et. al., 1994);
- Crandall Creek and the Demonstration Urban Stormwater Treatment (DUST) Marsh system in Alameda County, California (Woodward-Clyde Consultants, 1995);
- Urban creeks (e.g., Arcade Creek and Elder Creek) in Sacramento, California (Bailey et. al., 2000); and
- Urban creeks (e.g., Mosher Slough) in Stockton, California (Bailey et. al., 2000).

In studies in Alameda County, California, diazinon was often detected in water and sediments of urban creeks throughout the year, not only during wet weather (URS Greiner Woodward Clyde, 1999). Diazinon has been found in dry weather flows in Alameda County, California creeks (Katznelson and Mumley, 1977). Dry weather samples collected in urban creeks in Sacramento, California (e.g., Arcade Creek) also contained diazinon(Katznelson and Mumley, 1977).

2.2 Creek and Watershed Description

The Chollas Creek watershed is located in the County of San Diego in the San Diego region as shown in the vicinity map contained in Attachment A-1. A more detailed map of the Chollas Creek watershed is described in Attachment A-2. For the purposes of this TMDL, the Chollas Creek watershed includes only those lands draining to Chollas Creek (i.e., those lands draining to Switzer Creek are not included in this TMDL). The watershed of Chollas Creek encompasses 16,273 acres. (Note: This acreage excludes Switzer Creek). The area of the north fork of the watershed (9,276 acres) is somewhat larger than that of the south fork (6,997 acres). As Table 2-1 indicates, the watershed is highly urbanized. Land use is predominantly residential, with some commercial and industrial use. A significant portion of the watershed consists of roadways. The remaining land in the watershed is open space. Approximately 84%, 8%, and 8% of the land within the watershed is contained within the cities of San Diego, Lemon Grove, and La Mesa, respectively. Less than 1% of the land within the watershed is unincorporated (SANDAG, 2002). A small portion of the watershed consists of “tidelands” immediately adjacent to San Diego Bay. Tidelands under the jurisdiction of the San Diego Unified Port District is also less than 1% of the watershed; the remainder is under the jurisdiction of the United States Navy.

Chollas Creek is an urban creek with highly variable flows. The highest flow rates are associated with storm events. During dry weather, there are often extended periods of no surface flows in the creek, although pools of standing water may be present. Much of the creek has been channelized and concrete lined, but some sections of earthen creek bed remain. The mouth of the creek is located on the eastern shoreline of the central portion of San Diego Bay.

The annual average rainfall in the Chollas Creek watershed (for the period October 1948 through February 2002 at La Mesa, California) is about 12.1 +/- 4.6 inches (Western Regional Climate Center, 2002). Rainfall statistics for the San Diego International Airport (a.k.a. Lindberg Field, located about 4 miles northwest of Chollas Creek, near San Diego Bay) indicate that an average of 18 storms occur each year (URS Greiner Woodward-Clyde, 1999).

Table 2-1
Land Use in the Chollas Creek Watershed
(Woodward-Clyde International-Americas, 1998)

Land Use	Percent of Total Area (Entire Watershed)	Percent of Sampled Area (North Fork Watershed)
Residential	67%	62%
Commercial	5%	9%
Industrial	7%	10%
Roadways	4%	5%
Open Space	16%	14%

2.3 Sampling History in the Watershed

2.31 Municipal Storm Water NPDES Permit Sampling

During the monitoring period between 1998 to 2001 the average concentration of diazinon in Chollas Creek during storm events was 0.46 µg/L. Monitoring of storm water in Chollas Creek began in the 1993-94 rainy season pursuant to the municipal storm water National Pollutant Discharge Elimination System (NPDES) permit for the County of San Diego. Each rainy season, storm water samples are collected during two or three storms at a station located on the north fork of Chollas Creek, upstream of the confluence of the north and south forks of the creek, near the intersection of 33rd and Durant Streets. This location was selected to avoid tidal influence. Runoff from approximately 57 percent of the entire watershed is sampled at this monitoring site. Storm water samples collected at this location are considered to be representative of runoff from the entire watershed because the land use mix in the north fork portion of the watershed is similar to the land use mix of the entire watershed, as Table 2-1 indicates.

Since the 1993-94 rainy season, storm water samples have been analyzed for general physical constituents, nutrients, biochemical oxygen demand, chemical oxygen demand, bacteriological constituents, organic constituents, and total recoverable metals. Some samples are also analyzed for dissolved metals. Toxicity testing began with the 1994-95 rainy season and is conducted using the fish commonly known as the fathead minnow (*Pimephales promelas*) and the water flea (*Ceriodaphnia dubia*). Testing using the fathead minnow has shown little, if any, adverse effect (URS Greiner Woodward Clyde, 1999). In contrast, every test using the water flea has found toxicity, as indicated by mortality (URS Greiner Woodward Clyde, 1999). Storm water toxicity testing in the San Francisco Bay area revealed a very similar pattern, where diazinon was discovered to be the major cause of toxicity to the water flea (URS Greiner Woodward Clyde, 1999). Chollas Creek storm water flows were not analyzed for diazinon until the 1998-99 rainy season, when concentrations of diazinon ranging from 0.46 µg/l to 0.53 µg/l were reported (URS Greiner Woodward Clyde, 1999). See Attachments B-1 and B-2 for a “Summary of Surface Water Monitoring for Diazinon, Chlorpyrifos and Toxicity”.

2.32 Toxicity Identification Evaluation (TIE)

A toxicity identification evaluation (TIE) is a procedure to determine the cause of toxicity. A TIE was conducted to determine the cause of the toxicity in Chollas Creek storm water flows. The TIE was conducted by the Southern California Coastal Water Research Project (SCCWRP) and Ogden Environmental, Energy, and Remediation Division (Ogden) under an agreement between the San Diego Regional Water Quality Control Board (SDRWQCB), the City of San Diego, the San Diego Unified Port District, and the California Department of Transportation (CalTrans) (See Attachment C). The TIE effort was initiated in March of 1999 and a final report was completed in November 1999 (SCCWRP 1999). Chollas Creek storm water from three storms in 1999 was evaluated in the TIE. The first task was to compare toxic responses of three commonly used test organisms; one freshwater species (the water flea *Ceriodaphnia dubia*) and two marine species (the purple sea urchin *Strongylocentrotus purpuratus* and the mysid shrimp *Mysidopsis bahia*). The salinity of storm water samples tested using the marine species was adjusted to approximate seawater salinity levels. A Phase I TIE was conducted to ascertain the class or group of constituents responsible for the observed toxicity. A Phase II TIE was conducted in an effort to determine the primary constituent(s) responsible for the observed toxicity. A Phase III TIE was conducted to confirm the primary constituent(s).

Water from the first two storms was found to be toxic to the water flea. Water from the third storm was not found to be toxic to the water flea. Water from all three storms was found to be toxic to the purple sea urchin. Water from all three storms was not found to be toxic to the mysid shrimp. The TIE results indicate that the toxicity to the water flea was caused by diazinon, which was found in concentrations from 0.32 µg/l to 0.54 µg/l. Consequently, this TMDL focuses on diazinon. The TIE results also indicate that toxicity to the purple sea urchin was caused by zinc. Work is underway on a separate TMDL for metals (including zinc) in storm water runoff from the Chollas Creek watershed.

2.4 Applicable Water Quality Standards (Water Quality Objectives and Beneficial Uses)

Water quality standards consist of beneficial uses and water quality objectives. The Water Quality Control Plan for the San Diego Basin (9) (Basin Plan) (SDRWQCB, 1994) specifies water quality standards for all waters in the San Diego Region, including Chollas Creek and San Diego Bay. The water quality standards that are applicable to this TMDL are the narrative water quality objectives for toxicity and pesticides in Chollas Creek and the beneficial uses of Chollas Creek that are adversely affected by toxicity and pesticides.

The following Basin Plan narrative water quality objective for toxicity is applicable to all inland surface waters (including Chollas Creek), enclosed bays (including San Diego Bay) and estuaries, coastal lagoons, and ground waters of the San Diego region.

> **Toxicity Objective**: *"All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined*

by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board."

"The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge or, when necessary, for other control water that is consistent with requirements specified in US EPA, State Water Resources Control Board or other protocol authorized by the Regional Board. As a minimum, compliance with this objective as stated in the previous sentence shall be evaluated with a 96-hour acute bioassay."

"In addition, effluent limits based upon acute bioassays of effluents will be prescribed where appropriate, additional numerical receiving water objectives for specific toxicants will be established as sufficient data become available, and source control of toxic substances will be encouraged."

The following Basin Plan narrative water quality objective for pesticides is applicable to all inland surface waters (including Chollas Creek), enclosed bays (including San Diego Bay) and estuaries, coastal lagoons, and ground waters of the San Diego region.

Pesticide Objective: *"No individual pesticide or combination of pesticides shall be present in the water column, sediments, or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms."*

The beneficial uses of Chollas Creek (and, for comparison, those of San Diego Bay) specified in the Basin Plan are listed in Table 2-2.

The occurrence of toxicity in Chollas Creek storm water indicates that the water quality objective for toxicity was not met in Chollas Creek. Since the toxicity was caused by the insecticide diazinon, the water quality objective for pesticides was not met in Chollas Creek. The "warm freshwater habitat" and "wildlife habitat" beneficial uses of Chollas Creek are adversely affected by toxicity and/or pesticides.

The water flea *Ceriodaphnia* that is used in toxicity tests serves as an indicator or surrogate for the aquatic life in Chollas Creek. Diazinon concentrations that cause toxicity to the water flea Ceriodaphnia may also cause toxicity to other aquatic life, such as aquatic insects. As a case in point, diazinon levels of **0.30 µg/L** in an experimental stream resulted in a 5 to 8 times decrease in sensitive aquatic insect (e.g., mayfly and caddisfly) emergence within three weeks of exposure; after twelve weeks, sensitive aquatic insects (e.g., mayflies, damselflies and caddisflies) and sensitive crustaceans (e.g., amphipods) were no longer detected in benthic samples (Arthur et. al., 1983). Toxicity of the storm water to aquatic insects or other aquatic life is of concern because

the function of the stream for supporting life is reduced. Aquatic insects and other invertebrates are necessary to support and maintain ecosystem balance. Fish, frogs, birds, and other creatures rely on aquatic insects for food. To the extent that diazinon-induced toxicity reduces the abundance or diversity of aquatic insects in Chollas Creek, the food supply of fish, frogs, birds, and other creatures is correspondingly reduced and the "warm freshwater habitat" and "wildlife habitat" beneficial uses of Chollas Creek are impaired. The average current concentration of diazinon in Chollas Creek during storm events is **0.46 µg/L.** According to USEPA (2000), there is high certainty in all urban and suburban areas where diazinon is applied outdoors, and where there is sufficient irrigation or rainfall to cause runoff, there will be negative impacts on aquatic biota from the diazinon use.

Table 2-2
Beneficial Uses of Chollas Creek and San Diego Bay

Beneficial Use	Chollas Creek	San Diego Bay
Industrial service supply		•
Navigation		•
Contact water recreation	O	•
Non-contact water recreation	•	•
Commercial and sport fishing		•
Preservation of biological habitats of special significance		•
Estuarine habitat		•
Warm freshwater habitat	•	
Wildlife habitat	•	•
Rare, threatened, or endangered species		•
Marine habitat		•
Migration of aquatic organisms		•
Shellfish harvesting		•

• Existing beneficial use
O Potential beneficial use

3.0 Numeric Targets

The TMDL Numeric Targets, which are derived from the water quality objectives, identify the specific water column, sediment, or tissue concentrations (or other endpoints) which equate to attainment of the Basin Plan water quality objectives and the protection of designated beneficial uses. Therefore, if the Numeric Targets are appropriately selected, attainment of the Numeric Targets will result in attainment of the underlying water quality objectives and beneficial use protection.

Where the applicable Basin Plan water quality objectives are expressed in numeric terms, the Numeric Targets for the TMDL are simply set equal to the water quality objectives. However, when the Basin Plan water quality objectives are narrative, such as with this TMDL, the numeric targets must quantitatively interpret the narrative water quality objectives. In other words the targets serve as numeric surrogates for the narrative water quality objectives. Numeric water quality objectives are expressed as water column concentrations. TMDL numeric targets are usually, but not always, also expressed as water column concentrations.

For the Chollas Creek diazinon TMDL the Regional Board has set the numeric targets equal to the California Department of Fish and Game (CDFG) Water Quality Criteria for the protection of freshwater aquatic organisms from diazinon (Menconi and Cox 1994) as shown in Table 3-1 below. The acute Water Quality Criterion protects aquatic life from short-term exposure to diazinon, while the chronic criterion protects aquatic life from long-term diazinon exposure.

Table 3-1
Numeric Targets for Diazinon in Chollas Creek [2]

Exposure Duration	Numeric Target	Averaging Period	Frequency of Allowed Exceedance
Acute	0.08 µg/L	One-hour average	Once every three years on the average
Chronic	0.05 µg/L	Four-day average	Once every three years on the average

By setting the numeric targets equal to the CDFG Water Quality Criteria for diazinon, the Regional Board is quantitatively interpreting the narrative water quality objective of "no toxics in toxic amounts" to mean "no diazinon concentrations in Chollas Creek in excess of 0.08 µg/L for any 1 hour period or in excess of 0.05 µg/L for any 4-day period". The pesticide water quality objective is interpreted in the same way.

Furthermore by selecting the water quality criteria as Numeric Targets for this TMDL, the Regional Board is asserting that attainment of the water quality criteria (or numeric targets) will result in attainment of the water quality objectives. This assertion is scientifically sound since,

[2] For the purpose of evaluating if the Numeric Targets have been attained, sample results shall be used as follows:

1. If only one sample is collected during the time period associated with the numeric target (e.g., one-hour average or four-day average), the single measurement shall be used to determine attainment of the numeric target for the entire time period.
2. The one-hour average shall be the moving arithmetic mean of grab samples over the specified one-hour period.
3. The four-day average shall apply to flow-weighted composite samples for the duration of a storm, or shall be the moving arithmetic mean of flow weighted 24-hour composite samples or grab samples.

Water Quality Criteria are derived on the basis of toxicity tests, and are by definition established at diazinon levels which will ensure protection of aquatic life.

4.0 Source Analysis

4.1 Diazinon Uses

The purpose of the Source Analysis is to identify all the point and nonpoint sources in the watershed and to estimate the current pollutant loading from each.

Diazinon is available in many different formulations (e.g., concentrated liquid, ready-to-use liquid, dust, granules, pressurized sprays, etc.) (Cooper, 1996) and is used on a broad spectrum of target pests. Because of the many possible combinations of diazinon formulations, application methods, and target pests, there are many potential pathways, both indirect and direct, by which diazinon reaches surface water. These pathways include runoff from rain, runoff from landscape irrigation, spills, improper disposal, and aerial deposition. Diazinon may enter surface water as a result of use in accordance with label instructions as well as use not in accordance with label instructions. Municipal storm water is believed to be the primary source of diazinon entering Chollas Creek.

In terms of environmental fate and transport, diazinon is relatively persistent in aquatic environments. It tends to be fairly soluble compared to other pesticides, and has a half-life of approximately 6 months under neutral pH conditions (EXTOXNET, 1996). Diazinon has a soil half-life of approximately 2-4 weeks (Siepmann, S. and B. Finlayson, 2000).

In a preliminary experiment done in the Castro Valley Creek watershed, in Alameda County, California, diazinon was applied according to label instructions to control ants on a specific property. Two days later, it rained, and runoff samples were collected within that property during that small rain event. The runoff samples contained up to 1,200 µg/L of diazinon (Scanlin and Feng, 1997). The City of Palo Alto, California found diazinon concentrations of 0.1 to 0.4 µg/L in the water in its creeks and discovered that less than a tablespoon of diazinon in “a day’s worth of creek flow” during a storm event was needed to create these concentrations (Cooper, 1996). One study suggests that ordinary use (not just misuse or dumping) could release sufficient diazinon into the environment to account for concentrations and toxicity measured in urban storm water runoff (Cooper, 1996). In most flow conditions, less than a tablespoon of diazinon in a day’s worth of creek flow during a storm event can exceed chronic and acute concentrations (See Attachment B-3).

The amount of diazinon actually discharged to surface waters from various sources is not well documented. In order to estimate the relative amounts of diazinon discharged from various sources to Chollas Creek, it was assumed that the amount of diazinon discharged from any use category was proportional to the amount of diazinon used in the watershed in the same use category. The actual relationship between the amount of diazinon used and the amount discharged to surface water is not known at this time.

Diazinon used in the Chollas Creek watershed consists of reported use and unreported use. Both reported and unreported uses of diazinon in the watershed were estimated using available data.

4.11 Reported Use of Diazinon

Since 1990, the California Department of Pesticide Regulation (DPR) has required reporting of pesticide use by agriculture and other commercial applicators. Reported uses include all uses for agriculture, parks, golf courses, rights-of-way, cemeteries, landscape maintenance, and structural pest control. Reporting of home and garden use and most industrial and institutional use is not required. DPR compiles all of the reported use information into the Pesticide Use Report database. Pesticide use reports include location, amounts applied, number of acres, and types of crops or places (e.g., structures and roadsides) treated. Commercial applications, including structural fumigation, structural pest control, and turf applications, must also be reported.

Reported diazinon use was calculated using the DPR Pesticide Use Report database for 1997 (DPR, 1997b). Pesticide use is generally expressed in terms of the amount of active ingredient, i.e. the component in the pesticide product that actively kills or otherwise controls the target pest. "Diazinon active ingredient" is pure diazinon with no inert substances. "Diazinon product" includes the inert substances that are mixed with the diazinon. Expressing pesticide use in terms of active ingredient enables meaningful comparisons of different products to be made. There are a variety of pesticide products that contain different concentrations of active ingredient and inert substances.

Table 4-1 shows the reported amount of diazinon used in California, as obtained from the "Summary of Pesticide Use Report Data" for 1993, 1994, 1995, 1996, and 1997 (DPR 1993, 1994, 1995, 1996 and 1997a). During this period, the maximum annual reported amount of diazinon used was approximately 2.5 times the minimum annual reported amount of diazinon used.

Table 4-1
Reported Diazinon Active Ingredient Use in California

Year	Amount Used (pounds)
1993	1,491,709
1994	1,387,854
1995	2,376,882
1996	1,093,120
1997	955,108

Table 4-2 shows reported diazinon use data for San Diego County as obtained from the Pesticide Use Report database for 1997 (DPR, 1997b). This database groups diazinon use into three use

categories: agriculture, landscape maintenance, and structural pest control. For each category, the pounds of diazinon active ingredient, pounds of diazinon product, and the number of applications are shown. Diazinon products used for agricultural purposes are generally more concentrated than diazinon products used for structural pest control. Diazinon products used for landscape maintenance are less concentrated than those used for agricultural or structural pest control purposes. The predominant reported use of diazinon in San Diego County in 1997 was for structural pest control. Structural pest control may be defined as the control of pests infesting a structure or its contents, and in general requires a structural pest control applicator license.

Table 4-2
Reported Diazinon Use in San Diego County (1997)

Use Category	Diazinon Active Ingredient (pounds)	Diazinon Product (pounds)	Number of Applications	Percent of Active Ingredient in Product
Agriculture	2,505	8,022	618	31%
Landscape Maintenance	850	9,205	2,191	9%
Structural Pest Control	24,240	96,730	43,553	25%
Total	27,595	113,957	46,362	

Information on the reported use of diazinon in the Chollas Creek watershed is not available. Therefore, the Regional Board estimated reported use for each use category identified in Table 4-2.

A survey of diazinon use in the Chollas Creek watershed was conducted by the Regional Board as part of the development of this TMDL. The survey focused on schools, city parks, cemeteries, kennels, the California Department of Transportation (CalTrans), and nurseries. A representative of each agency or facility was telephoned and surveyed on diazinon use. Generally, the telephone contact was followed up with a letter or other written information.

The same agencies and facilities were also surveyed on Integrated Pest Management (IPM), which is an ecosystem-based strategy that focuses on long-term control of pests or their damage through a combination of techniques, such as biological control, habitat manipulation, modification of cultural practices, and use of pest resistant plant varieties. In general, IPM provides for pesticide use only after monitoring indicates that, based on established guidelines, pesticides are actually needed. Under IPM, treatments are made with the goal of removing only the target organism, and pest control materials are selected and applied in a manner that minimizes risks to human health, beneficial and non-target organisms, and the environment. The findings of the survey are summarized below.

Schools – The San Diego Unified School District (school district) manages the public schools in the watershed. The school district has had an IPM plan since 1991. Of the approximately 165 public schools managed by the school district, 58 are in the Chollas Creek watershed. The school district reports that it used a total of 70 fluid ounces of a pesticide product containing diazinon from about mid-1997 through about mid-1999. Assuming the density of the diazinon product was the same as that of water (8.34 pounds per gallon) and assuming the diazinon product contained 25% diazinon active ingredient (see Table 4-2, structural pest control use category), this represents use of less than one pound of diazinon active ingredient per year.

City Parks – Portions of the cities of San Diego, Lemon Grove, and La Mesa are located in the Chollas Creek watershed. These cities own the main parks in the Chollas Creek watershed. All of these cities report that diazinon is not used on park landscaping. They also report that structural pest control is done by outside contract and no estimates of diazinon use were available. The cities of San Diego and Lemon Grove reported that they were developing an IPM plan. The City of La Mesa reported that it had an IPM plan.

Cemeteries – Four large cemeteries in the Chollas Creek watershed were contacted about diazinon usage: Cypress View-Bonham Brothers Mortuary, Greenwood Memorial Park and Mortuary, Holy Cross Catholic Cemetery and Mausoleum, and Mount Hope Cemetery. A fifth cemetery, the Home of Peace Cemetery, could not be reached. Only one cemetery indicated that it had used diazinon for landscape maintenance. That cemetery indicated that 9.25 gallons – of the pesticide Sunbugger (0.5% diazinon) was used for landscape maintenance from about mid-1997 through about mid-1999. Assuming the density of the diazinon product was the same as that of water (8.34 pounds per gallon), this represents use of less than one pound of diazinon active ingredient per year. The cemeteries reported that all structural pest control was done under outside contract and no estimates of diazinon use were available. The cemeteries had little or no knowledge of IPM and did not have IPM plans.

Kennels – Only one kennel is located in the Chollas Creek watershed and it reported no use of diazinon.

CalTrans – CalTrans is responsible for the major freeways that run through the watershed. Roadways make up about 4% of the land in the watershed. However, CalTrans reports that diazinon is not used on its facilities. CalTrans reported that it has an IPM plan.

Nurseries – There are four nurseries in the Chollas Creek watershed. Three of these nurseries reported using no diazinon onsite. One nursery reported onsite use of about one gallon per year of a pesticide product containing diazinon. Assuming the density of the diazinon product was the same as that of water (8.34 pounds per gallon) and assuming the diazinon product contained 31% diazinon active ingredient (see Table 4-2, agriculture use category), this represents use of less than three pounds of diazinon active ingredient.

Nurseries are the only potential diazinon users in the Chollas Creek watershed included in the agriculture use category. Based on the results of this survey summarized above, reported agricultural diazinon use in the watershed was estimated to be negligible.

Reported diazinon use for landscape maintenance and structural pest control was estimated assuming that all such use in San Diego County occurred in urban land use settings. Since the Chollas Creek watershed contains approximately 5% of the total urban land use area in San Diego County, reported diazinon use for landscape maintenance and structural pest control in the watershed was estimated to be 5% of the total reported diazinon use in those categories in San Diego County. For purposes of this TMDL, urban land uses were defined to consist of residential, commercial, and industrial uses. Roadways and open space were not considered urban land uses because diazinon is generally not used in these areas. As Table 4-3 indicates, structural pest control was estimated to be the predominant reported use of diazinon in the Chollas Creek watershed in 1997.

Table 4-3
Estimated Reported Diazinon Use in the Chollas Creek Watershed (1997)

Use Category	Diazinon Active Ingredient (pounds*)	Diazinon Product (pounds*)
Agricultural	Negligible	Negligible
Landscape Maintenance	42	460
Structural Pest Control	1,200	4,800
Total (*rounded to two significant figures)	1,200	5,300

4.12 Unreported Use of Diazinon

Unreported uses include home, garden, industrial, and institutional uses of over-the-counter diazinon products. The amount of unreported diazinon use in residential, commercial, industrial, and institutional settings is not well documented. According to the DPR 1997 Summary of Pesticide Use Report Data (DPR 1997a), about two-thirds of pesticide active ingredient sold in a given year is used for unreported uses. In a study of an urban area in Palo Alto California, unreported uses accounted for approximately 60% of total use of diazinon active ingredient (Cooper 1996). Therefore, assuming that diazinon is discharged from various use categories to Chollas Creek in proportion to the amounts used in those categories, it appears that more diazinon is discharged to Chollas Creek from unreported uses than from reported uses.

The 1997 unreported use of diazinon active ingredient in the Chollas Creek watershed was estimated to be approximately 1,800 pounds. This estimate was calculated based on the

assumption that 60% of the total use was unreported use and the estimate (from Table 4-3) of 1,200 pounds of reported use in the watershed in 1997.

Figure 4-1 depicts the estimated reported uses and unreported use of diazinon in the Chollas Creek watershed.

Figure 4-1
Estimated Total Diazinon Use in Chollas Creek Watershed in 1997

Category	Reported Use (active ingredient)	Unreported Use (active ingredient)	Total (pounds)
Agriculture	N/A	N/A	N/A
Landscape Maintenance	43	64	107
Structural Pest Control	1212	1818	3030
		Grand Total	3137

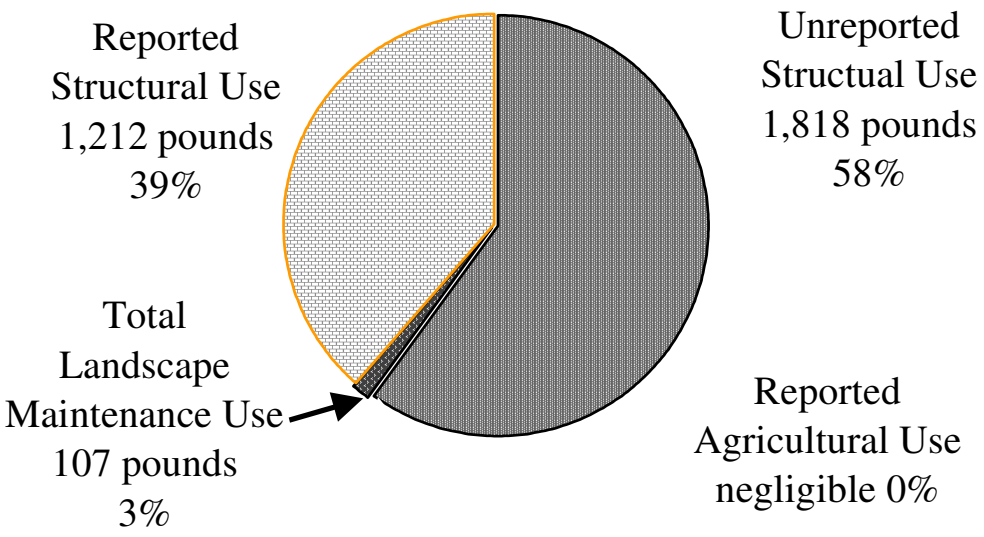

The most common location of insecticide applications in the insecticide use survey were around foundation of house (49%), in the garden (34%), on trees or shrubs (31%), on a patio or walkway (22%), on the lawn (22%), inside the house (16%), on the side or eves of the house (9%), or other (22%). The insecticide use survey indicated that discount stores (e.g., Home Depot, Home Base, Target, Kmart, and Wal-Mart) were the largest suppliers of insecticides in San Diego County.

NPDES Permittees – Discharges regulated by an NPDES permit can be considered a potential source of diazinon. There are several NPDES permits that regulate discharges that enter Chollas Creek directly or indirectly. Four of these permits are "storm water" permits, i.e. permits for discharges of runoff. These permits are listed in Table 4-4 and discussed below.

Table 4-4
NPDES Permits Regulating Point Source Discharges

NPDES permit
San Diego Municipal Storm Water Permit (aka MS4 Permit)
Statewide General Industrial Storm Water Permit
Statewide General Construction Storm Water Permit
Statewide Municipal Storm Water Permit for California Department of Transportation (aka CalTrans MS4 Permit)
General Permit for Utility Vault Discharges

The Regional Board has issued and oversees compliance with the San Diego Municipal Storm Water permit, aka the MS4 Permit. This permit regulates all discharges to and from the storm water conveyance systems of all the cities in San Diego County, as well as the County of San Diego, and the San Diego Unified Port District. Storm water conveyance systems are transmission routes through which pollutants enter surface waters. Storm water NPDES permits are intended to reduce or eliminate the discharge of pollutants to and from storm water conveyance systems. The local agencies, or municipal Copermittees, named in the municipal storm water NPDES permits are responsible for everything that is discharged to and from their storm water conveyance systems. The municipal Copermittees are responsible for isolating and controlling sources of pollutants within their jurisdictions, even if the municipal Copermittees do not actually use the pollutants. The municipal Copermittees regulated by this permit that have jurisdiction in the Chollas Creek watershed are the City of San Diego, the City of Lemon Grove, the City of La Mesa, County of San Diego, and the San Diego Unified Port District. These municipal Copermittees have responsibility for virtually all discharges to and from the municipal storm water conveyance system in the watershed.

The State Water Resources Control Board (State Board) has issued a statewide NPDES General Industrial Storm Water Permit site runoff discharges. The Regional Board oversees compliance with this permit in the San Diego Region. The municipal storm water Copermittees also have responsibility for runoff from industrial sites within their jurisdiction. The maximum number of sites in the Chollas Creek watershed to which this permit applies is estimated to be 87 sites.[S1] Industrial sites could be significant sources of diazinon discharges, compared to other areas of similar size. However, land use in the watershed is predominantly residential (Table 2-1).

The State Board has also issued a statewide General Construction Storm Water Permit. The Regional Board oversees compliance with this permit in the San Diego Region. The municipal storm water Copermittees also have responsibility for runoff from construction sites within their jurisdiction. The maximum number of sites in the Chollas Creek watershed to which this permit currently applies is estimated to be 30 sites. Construction sites would not seem to be likely sources of significant discharges of diazinon.

The State Board has also issued a statewide Municipal Storm Water permit to the California Department of Transportation (CalTrans). This permit regulates all runoff discharges from CalTrans roads and highways, rights-of-way, maintenance yards, and other sites and facilities. However, CalTrans reports that no diazinon is used on such areas. Therefore, such areas would not seem to be likely sources of significant discharges of diazinon to Chollas Creek.

The SWRCB has also issued a statewide NPDES general permit for utility vault discharges. The SDRWQCB oversees compliance with this permit in the San Diego region. Several utilities in the San Diego region are regulated under this permit.

4.13 Phase-Out of Diazinon

In January 2001, USEPA reached an agreement with registrants of diazinon to phase out most home uses, including all indoor uses and outdoor non-agricultural uses (USEPA 2001). After December 31, 2002 retail sales for indoor home uses will be stopped. Product registrations will (expire) be canceled, with no provision for existing stocks on December 31, 2004. Also, technical registrants will buy back existing products form retailers commencing December 31, 2004. Provisions of the agreement and associated USEPA actions are listed below in Table 4-5.

Table 4-5
Provisions of the USEPA Agreement with Registrants of Diazinon

Home Uses		
Site	**Mitigation Measures**	**Effective Dates**
Indoor Uses All uses inside any structure, vehicle, vessel, aircraft, or enclosed area and/or on any contents therein (except mushroom houses), including residences, food/feed handling establishments, schools, museums, stores, hospitals, sport facilities, warehouses, and greenhouses. All indoor pet uses including pet collars.	Product registrations are being cancelled or amended to delete indoor uses from end use product labels (except use in mushroom houses). USEPA's Federal Register notice of January 10, 2001 proposed to delete these uses.	Cancellations became effective after the USEPA 30-day public comment, upon issuance of a cancellation order in February 2001. As of March 1, 2001, manufacturing use products may no longer be used to formulate end use products for indoor uses. Retailers stop sale December 31, 2002.
Outdoor Non-Agricultural Uses Home lawn, garden, and any other outdoor residential or outdoor non-agricultural uses	Production will phase down Uses will be phased out Uses will be phased out Technical registrants will buy back existing products from retailers	Technical registrants reduce amount of diazinon produced by 50% or more by 2003. Stop formulation of products June 30, 2003. Stop sale to retailers August 31, 2003. Commencing December 31, 2004

Home Uses		
Site	**Mitigation Measures**	**Effective Dates**
	Product registrations will (expire) be canceled, with no provision for existing stocks.	December 31, 2004

As a result of the phase out, USEPA estimates that current uses of diazinon will be reduced by over 90%. In the Chollas Creek watershed, since agricultural use is negligible, the phase out should reduce current source loading to negligible levels over time.

4.2 Recommendations and Plans for Further Source Analysis

Because of the limited amount of information concerning sources of diazinon in the Chollas Creek watershed, additional source analysis activities are recommended. Some additional source analysis activities are currently ongoing or planned.

Additional monitoring has been sponsored by the City of San Diego, State Water Resources Control Board and the Department of Pesticide Regulation to evaluate diazinon concentrations in Chollas Creek. Sampling was conducted at nine locations along the creek during storm events. Results indicate a statistically significant correlation of elevated diazinon concentrations with aquatic toxicity (MEC Analytical Systems, 2002). No single tributary or source was identified as a major contributor, indicating the ubiquitous nature of the pollutant.

The Regional Board understands that the Department of Pesticide Regulation (DPR) is planning to conduct some urban source analysis monitoring programs in the next few years. These DPR monitoring programs will be designed to better identify the products and uses which cause the highest diazinon concentrations in urban runoff. The results of these DPR urban monitoring programs are intended to be applicable statewide, regardless of where the monitoring is actually conducted.

The monitoring program for the municipal storm water NPDES permit for San Diego County has been modified to address some source analysis questions. A pesticide use survey was conducted to characterize the use of diazinon by residential and commercial applicators in San Diego County, results are available in Attachment I, “Insecticide Use and Telephone Survey 1999-2000”. Also, additional monitoring for diazinon in Chollas Creek has been conducted, and results are available in Attachments B-1 and B-2.

Further investigation is needed to determine whether runoff from industrial sites, runoff from construction sites, and utility vault discharges may be significant sources of diazinon discharges to Chollas Creek. Such investigation may include surveys of diazinon use at industrial and construction sites and in utility vaults and monitoring of industrial and construction site runoff and utility vault discharges.

5.0 TMDL or Loading Capacity

The terms total maximum daily load (TMDL), Loading Capacity, and assimilative capacity are all synonymous. All refer to the maximum amount of a pollutant that a waterbody can receive and still attain water quality objectives and protection of designated beneficial uses.

An important step in the development of a TMDL is the calculation of the Loading Capacity of the waterbody for the pollutant of concern. A variety of methods are available to calculate Loading Capacities which range from complex predictive models to simple estimates. A particularly critical decision is the selection of units in which the loading capacity will be defined for any particular TMDL. Loading Capacities are typically expressed as mass emissions (mass per unit time), concentrations (weight per unit volume) or in toxicity units or toxicity equivalent units. The choice of units depends upon the physical and chemical nature of the pollutant and on the resulting impairments of concern.

For pollutants which are persistent (long-lived) in the environment due to their physical and chemical properties or are known to accumulate in bottom sediments, bioaccumlate in living tissues, or biomagnify in the food chain, the Loading Capacities are typically expressed in terms of mass emissions rather than in terms of concentrations. This is because attaining a particular water column concentration of a pollutant may protect aquatic organisms from toxicity, but may not protect a benthic organism that lives in and eats the bottom sediments or a predatory fish or bird that eats the benthic organism, or a human that ultimately consumes the fish. For such a TMDL, it will typically be necessary to convert the concentration-based numeric targets into mass emission-based loading capacities using available flow data.

On the other hand if the pollutant of concern in the TMDL is short-lived, not known to accumulate in sediments or bioaccumulate in tissues, and the impairment of concern is limited to aquatic toxicity, the establishment of a concentration-based Loading Capacity is the most logical choice. For this type of TMDL, the concentration-based calculations will be relatively simple.

The Chollas Creek diazinon TMDL is an example of a relatively simple TMDL. Diazinon is an organophosphate pesticide which causes adverse effects on aquatic life through relatively short-term exposures. Diazinon is considered to be moderately persistent. Although there is evidence of diazinon accumulating in creek bed sediments, such accumulation is generally not believed to pose the environmental threat of greatest concern. This is because diazinon has a relatively short half-life in the environment before degrading into less toxic forms. Diazinon does not bioaccumulate in tissues or biomagnify through higher trophic levels. Consequently it is the water column concentrations of diazinon, and resulting aquatic toxicity, that are of greatest concern in preventing adverse ecosystem effects. For all of these reasons, the Loading Capacity, and its component waste load and load allocations, are defined in terms of concentrations rather than in mass emissions.

The Regional Board has defined the concentration-based Loading Capacity for diazinon in Chollas Creek to be exactly the same concentrations as the numeric targets, see Table 5-1 below. Like the numeric targets, the loading capacity for Chollas Creek has two components, the maximum 1-hour average or acute concentration and the chronic or 4-day average concentration.

Table 5-1
TMDL (Loading Capacity) for Diazinon in Chollas Creek

Exposure Duration	TMDL	Averaging Period
Acute	0.08 µg/L	One-hour average
Chronic	0.05 µg/L	Four-day average

By establishing this TMDL or Loading Capacity for Chollas Creek, the Regional Board is asserting that if the concentrations of diazinon in the creek do not exceed the TMDL, the aquatic life in the creek will be protected against both short and long-term exposure to diazinon.

6.0 Linkage Analysis

The purpose of the linkage analysis is to confirm that the TMDL or Loading Capacity will result in the attainment of applicable water quality objectives and beneficial use protection. With respect to diazinon, this TMDL will result in the attainment of the "Toxicity" and "Pesticide" water quality objectives and the restoration of the WARM and WILD beneficial uses in the Chollas Creek watershed[3]. This is because the Numeric Targets are set equal to the diazinon Water Quality Criteria which are based on toxicity testing and are specifically established at levels to ensure the protection of aquatic life from acute and chronic exposure to diazinon. The Water Quality Criteria protect all aquatic life stages including the most sensitive stages.

7.0 Waste Load and Load Allocations

The following discussion makes most sense in the context of a mass-based TMDL. Once the TMDL or Loading Capacity of a waterbody for a particular pollutant has been determined, the next step is to divide and allocate the TMDL amongst each of the contributing sources in the watershed. Waste Load Allocations (WLA) are assigned to point sources and Load Allocations (LA) are assigned to nonpoint sources.

[3] **MULTIPLE POLLUTANTS:** The attainment of water quality standards is qualified with the words "with respect to diazinon" because there are multiple pollutants causing toxicity. Toxicity conditions in Chollas Creek are caused by metals and diazinon. Successful implementation of both the Chollas Creek diazinon TMDL and the Chollas Creek metals TMDL is expected to result in full attainment of the "Toxicity" water quality objectives, and of the WARM and WILD beneficial uses.

Additionally a margin of safety (MOS) is incorporated into each TMDL in order to account for uncertainties in the analysis including, in particular, the uncertainty in the relationship between pollutant loads and water quality effects. The margin of safety can be implicit or explicit. For this TMDL the Regional Board has included an explicit 10% margin of safety which will be discussed in section 10.0 of this document.

As shown in the equation below, a TMDL is defined as the sum of the individual waste load allocations for point sources and load allocations for nonpoint sources and natural background (40 CFR 130.2) such that the capacity of the water body to assimilate pollutant loadings (i.e., the Loading Capacity) is not exceeded. In this TMDL, because diazinon is anthropogenic in origin, there are no natural background concentrations to be considered.

$$TMDL = WLA + LA + MOS$$

For concentration-based TMDLs, allocations to point and nonpoint sources are not additive. Instead when establishing concentration-based allocations, one makes the assumption that if the Numeric Targets are achieved in all contributing discharges into the watershed, the Numeric Target will also be achieved in the receiving waterbody. Accordingly, concentration-based allocations are applied equally to all discharge sources in the watershed.

The Regional Board has initially set all concentration-based waste load and load allocations equal to the Numeric Targets. However, after applying the 10% margin of safety, the allocations are calculated as 90% of the Numeric Target under acute and chronic exposure conditions. In other words, although the Numeric Target for diazinon under short-term acute exposure conditions is 0.08 µg/L, the Waste Load and Load Allocations are set at 0.072 µg/L after subtraction of the 0.008 µg/L (10%) margin of safety as shown in Table 7-1 below.

Table 7-1
Waste Load and Load Allocations
for Diazinon in Chollas Creek

Exposure Duration	Numeric Targets	Margin of Safety	Waste Load and Load Allocations
Acute	0.08 µg/L	0.008 µg/L	0.072 µg/L
Chronic	0.05 µg/L	0.005 µg/L	0.045 µg/L

Since all wet and dry weather runoff flows and other discharges which enter Chollas Creek directly or indirectly are regulated by the San Diego MS4 Permit or other NPDES permit (as noted in the Source Analysis above), there are no true nonpoint source discharges of diazinon to the creek. Never-the-less, we have provided load allocations in this TMDL in order to account for any unknown or future sources of diazinon that may not be regulated by an NPDES permit.

8.0 Diazinon Load Reductions Needed

Table 8-1 below summarizes the estimated needed (concentration-based) load reductions for diazinon in order to achieve the TMDL Numeric Targets in Chollas Creek. The difference between the current load and the allocation is the needed reduction. To date, there are no clear indications of declining trends in diazinon usage in the Chollas Creek watershed. This table indicates the estimated needed reduction during average storm flows. The average concentration of diazinon in Chollas Creek during storm events was 0.46 µg/L during the monitoring period 1998 through 2001. As discussed above, the majority of the diazinon load derives from storm flows.

Table 8-1
Needed Load Reductions in Chollas Creek

	Allocation		**Reduction Needed**	
Average Diazinon Concentration (µg/L)	Chronic (µg/L)	Acute (µg/L)	Chronic (µg/L)	Acute (µg/L)
0.46	0.045	0.072	**90%**	**84%**

As discussed in the Implementation Plan, section 11.0 below, USEPA has recently reached an agreement with the registrants (manufacturers) to phase-out most diazinon uses over the next few years. While it is expected that this agreement will result in very significant decreases in the use of diazinon in the Chollas Creek watershed and resulting discharge concentrations to the creek over time, additional measures appear to be necessary to achieve the reductions set forth above. This is particularly true during, and immediately following, the phase-out (due to ongoing and residual diazinon sales, stock piling, usage, and disposal).

9.0 Seasonal Variations and Critical Conditions

Clean Water Act Section 303(d) and the regulations at 40 CFR 130.7 require that: "TMDLs shall be established at levels necessary to attain and maintain the applicable narrative and numerical water quality standards with seasonal variations and a margin of safety that takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality." (emphasis added.)

TMDLs must describe the methods used to account for seasonal variations and critical conditions (e.g., stream flows, pollutant loadings, and other water quality parameters). In the semi-arid climate of Southern California there are two seasons-dry weather during most of the years and intermittent wet weather events typically between November and March. This two-season climate creates significant differences in flows through creeks and streams. In general, 90% of

the water flow occurs during less than 10% of the year, i.e., the most significant storm events and associated high flows usually occur during the months of December, January and February.

Diazinon usage in the Chollas Creek watershed correlates roughly with the season. There is a considerable increase in diazinon usage during the dry season (warmer months) due to increased pest activity. However, aquatic impairment due to the diazinon occurs during wet weather events as surface runoff pollutes the freshwater tributaries. Runoff into Chollas Creek is greatest during the wet season, and higher diazinon concentrations are observed during storm events. These higher diazinon concentrations account for the toxicity observed in storm water samples collected in the watershed.

There is not sufficient information available to characterize critical conditions in Chollas Creek. Because the Chollas Creek watershed is small and there are significant seasonal differences in rainfall in the watershed, there are significant seasonal differences in runoff from the watershed to the creek, and, hence, significant seasonal differences in flow rates in the creek. There is significant flow in Chollas Creek only during and immediately following rainfall events, which occur primarily from November through April. Other factors being equal, flow rates are highest during and immediately following major rainfall events. During the dry season, there are often extended periods of no surface flow, although some pools of standing water may be present in the creek bed. Because the TMDL is expressed as a concentration, a more detailed analysis of critical condition is unnecessary.

In summary, the chronic water quality criteria used as the basis for the diazinon Numeric Targets are designed to ensure protection of aquatic life during all stages of life including the most sensitive stages. Accordingly the concentration–based diazinon allocations established by this TMDL apply year-round throughout the Chollas Creek watershed and will be protective during all flow conditions and seasons.

Additional considerations regarding seasonal variation and critical condition are discussed below. Studies conducted in Alameda County, California found that diazinon was often detected in water and sediments of urban creeks throughout the year, not only during wet weather flows (Scanlin, J. and S. Gosselin, 1997). These studies also suggest that diazinon in creek bed sediments is released to creek water (Scanlin, J. and S. Gosselin, 1997). Consequently, creek bed sediments represent a potential reservoir from which diazinon can enter flowing water in a creek (or standing water in pools) even when no runoff enters the creek. These studies also suggest that diazinon toxicity is higher at higher temperatures (Scanlin, J. and S. Gosselin, 1997).

Runoff is believed to be the primary pathway by which diazinon enters both the water and the sediments of the creek. Runoff may be categorized as either storm water runoff or nuisance water runoff (e.g., from landscape irrigation). In any twelve-month period, by far the majority of runoff entering the creek is storm water runoff. Therefore, in the absence of information indicating otherwise, storm water runoff is believed to contain most of the mass of diazinon that enters the creek.

It is possible that "first flush" phenomena may influence diazinon concentrations in storm water runoff. Higher diazinon concentrations may result in the first runoff from rain following extended periods without rainfall (e.g., early season and out of season rainfall). Also, higher diazinon concentrations may occur in runoff from the first increment (e.g., ¼ inch) of rainfall from a particular storm. The Chollas Creek storm water flow monitoring for diazinon that has been conducted to date has not been sufficient to draw any conclusions about the presence or absence of "first flush" phenomena.

Although storm water runoff is likely to contain most of the mass of diazinon on an annual basis, nuisance water runoff (e.g., from landscape irrigation) may also contain diazinon. Although the annual volume of nuisance water runoff entering the creek is small in comparison to the annual volume of storm water runoff, nuisance water runoff enters the creek year-round. Consequently, at times of the year when there is little or no flow in the creek (i.e., during dry weather), nuisance water runoff may be of seasonal importance to diazinon concentrations and toxicity in low flows and standing water. The potential significance of diazinon in nuisance water runoff is underscored by the apparent greater toxicity of diazinon at higher temperatures (Scanlin, J. and S. Gosselin, 1997) and the generally higher Chollas Creek water temperatures in the May through October dry season than in the November through April wet season.

10.0 Margin of Safety

A margin of safety is incorporated into each TMDL in order to account for uncertainty in the analysis. The margin of safety can either be incorporated implicitly through conservative analytical approaches and assumptions used to develop the TMDL or added explicitly as a separate component of the TMDL, or a combination of both.

For this TMDL an explicit 10% margin of safety was incorporated into the allocations. This explicit margin of safety is intended to account for uncertainties in TMDL calculation methods concerning pesticide effects such as potential additive and synergistic impacts from exposure to multiple organophosphate pesticides (e.g., chlorpyrifos) that may aggravate water quality impacts due to diazinon in the watershed.

In addition to the explicit margin of safety, conservative assumption were used in applying the numeric targets within the watershed. These conservative assumptions serve as implicit margins of safety to provide additional protection for aquatic life and minimize aquatic toxicity.

1. No adjustment was made to reflect the possibility of pesticide breakdown from the point of discharge to Chollas Creek. Scientists have measured that the half-life of diazinon in water ranges from a few days up to six months; therefore some degradation is likely to be occurring after application and within flowing waters. Assuming discharges are within the specified concentration-based allocations, and that such degradation (via biotic and abiotic processes) occurs, there will be sufficient protection for aquatic life.

2. No adjustment was made to reflect the possibility of mixing and dilution within the drainage channels. In particular, the dilution capacity provided by groundwater seepage has not been factored into the TMDL.

3. The selected numeric targets for diazinon are the most stringent concentration-based values for freshwater. The Regional Board has selected the lowest recommended values from the California Department of Fish and Game water quality criteria as the best water quality indicator for diazinon. An additional margin of safety is also built into the water quality criteria themselves (Siepmann and Finlayson, 2000).

11.0 Implementation Plan

State law requires that TMDLs be included in water quality control plans. Therefore, TMDLs are adopted as basin plan amendments. A plan of implementation, as well as an assessment of economic and environmental impact must be considered when adopting a TMDL.

The CWC [Section 13242] requires an implementation program for achieving water quality objectives to include, at a minimum, a:

- Description of the nature of actions which are necessary to achieve the water quality objectives, including any recommendations for appropriate action by any entity, public or private;

- Time schedule for actions to be taken; and

- Description of surveillance to be undertaken to determine compliance with the objectives.

Additional guidance regarding implementation is provided in Federal and State law. 40 CFR 130.6(c)(6) calls for identification of implementation measures necessary to carry out a Water Quality Control Plan, including addressing financing, the time needed to implement the plan, and economic, social and environmental impacts of carrying out the plan. State law requires the Regional Board to consider economic factors in relation to environmental analysis of the reasonably foreseeable methods of compliance when adopting a performance standard [Public Resources Code 21159], and identify the total cost of the program and potential sources of financing when implementing an agricultural water quality control program [CWC 13141].

11.10 Responsible Parties

Municipal Copermittees

As dischargers of diazinon in urban storm water flows to Chollas Creek, the City of San Diego, City of Lemon Grove, City of La Mesa, San Diego Unified Port District, County of San Diego and the California Department of Transportation (CalTrans) are responsible for implementation of this TMDL. These entities are regulated as municipal Copermittees under the San Diego

Municipal Stormwater Permit (aka San Diego MS4 Permit)[4] or the statewide CalTrans MS4 permit[5]. Although CalTrans operations were not identified as a significant source of diazinon, the MS4 may transport pollutants, including diazinon. CalTrans is responsible for ensuring that future operations do not contribute to the impairment of Chollas Creek.

Regulation of Pesticides

Pesticides are regulated in California by the United States Environmental Protection Agency (USEPA) and the California Department of Pesticide Regulation (DPR). The State and Regional Water Boards do not directly regulate the use and licensing of pesticides. For example, effective March 2001, the USEPA cancelled the registration for the indoor household uses of diazinon. USEPA reached agreement with the manufacturers, Syngenta and Makhteshim Agan, that all retail sales of diazinon for indoor household use are to stop by December 2002. Furthermore, the manufacturing of diazinon for all lawn, garden and turf uses will stop in June 2003, and all sales and distribution to retailers ends in August 2003.

As a result of this phase-out the current role of USEPA and DPR with respect to diazinon will diminish over time. A brief discussion of USEPA and DPRs regulatory role with respect to pesticide regulation in general is provided below.

USEPA

Pesticide products must be registered federally before distribution or sale to any person under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). Registration includes:

- submission of required data by the person seeking the registration, evaluation, and acceptance of these data by the USEPA;
- submission of a proposed label by the registrant;
- review and acceptance of the final labeling by USEPA,
- establishment of a tolerance (maximum residue level) for pesticides used on food or feed commodities; and
- the classification by USEPA of the pesticide product for restricted use or general use as appropriate.

Department of Pesticide Regulation

The Department of Pesticide Regulation (DPR) has primary responsibility for regulating all aspects of pesticide (e.g., diazinon) sales and use in California through state and federal

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[4] Order No. 2001-01, NPDES No. CAS0108758, *'Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer System (MS4s) Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego County, and the San Diego Unified Port District*

[5] Order No. 99-06-DWQ, NPDES No. CAS000003, *'National Pollutant Discharge Elimination System (NPDES) Permit Statewide Storm Water Permit and Waste Discharge Requirements (WDRs) for the State of California, Department of Transportation (CalTrans)*

authorities. Through the state authorities (Food and Agriculture Code and Title 3 California Code of Regulations), DPR is enabled to:

- evaluate and register pesticide products before their use in the State;
- monitor the sales within the State;
- regulate and record the use;
- protect workers who might come into contact with pesticides;
- identify pesticides with high risk to human health or the environment and regulate these in special manners;
- develop and implement reduced risk pest management strategies;
- restrict the use of pesticides that pose an unreasonable risk;
- implement on-going and new regulations
- oversee and coordinate regulatory programs of the California Agricultural Commissioner; and
- enforce the laws and regulations and take appropriate enforcement action when necessary.

Management Agency Agreement

The Management Agency Agreement (MAA) between the DPR and State Board was approved in 1997. It is the functional agreement between DPR and the State Board on pesticide and water quality issues. The purpose of the MAA (see Attachment J) is to:

- Enter into a voluntary agreement between two agencies having discretionary and complementary authority regarding pesticides.
- Ensure that all pesticides registered in California are used in a manner that protects water quality and beneficial uses of water while providing effective, environmentally sound pest management.
- Identify roles and responsibilities of the two agencies regarding both water quality protection and pesticide regulation, and to describe how the agencies will work cooperatively to protect water quality in these areas.
- Coordinate respective authorities in a cohesive manner to eliminate duplication of effort and inconsistency of action.
- Coordinate respective authorities to solve water quality problems related to pesticide use by promoting the development and use of preventive practices through self-regulatory and regulatory efforts.

County Agricultural Commissioner

The County Agricultural Commissioner (CAC) acts as the DPR's agent in enforcing all laws and regulations pertaining to pesticides. The CAC is appointed by the county Board of Supervisors and works with authority granted by the California Food and Agricultural Code. Although state law offers various enforcement options to the CAC, compliance is often encouraged through educational programs. These may include informal or formal compliance actions (e.g., warning letters), corrective interviews, presentations to community and industry groups, and training sessions for pesticide users.

The CAC issues permits to pest control businesses, pesticide dealers, agricultural pest control advisors and pest control operators. Part of the CAC's duty in issuing a permit is to decide the need for a particular pesticide and whether a safer pesticide or better method of application can be used and still prove effective. The CAC regulates pesticide use to prevent misapplication or drift, and possible contamination of people or the environment. Although called the County Agricultural Commissioner, CAC employees may check upon pesticides applied in non-agricultural or urban settings. For example, they may check maintenance gardeners to ensure they are licensed to apply pesticides and that their pesticides are labeled for professional landscaping. Also, CAC biologists inspect home pesticide applications, such as structural fumigations for termites, and check structural pest control employees for proper training and equipment. Furthermore, the CAC employees work with the state agencies (e.g. State Water Resources Control Board and California Regional Water Quality Control Board) to protect surface and ground water from pesticide contamination. CAC staff enforce regulations to protect surface and ground water from pesticide contamination.

It is the responsibility of the CAC to:

- inspect the operations and records of pest control businesses, pesticide dealers, and agricultural pest control advisors;
- register licensed pest control businesses, agricultural pest control advisors, and pest control operators (these individuals and/or businesses must obtain statewide licenses from DPR and register in each county where they operate);
- conduct pesticide incident investigations; and
- provide training to pesticide users.

With the exception of the CAC, local governments are prohibited from regulating pesticide use by section 11501.1 of the California Code of Regulations. However, storm drain system operators have the authority to regulate the disposal of pesticides to the storm drain system.

Pest Control Operator (PCO)

The Pest Control Operator (PCO) is the state licensed professional applicator of pesticides at commercial and residential sites. There is currently no requirement for the PCO to have Integrated Pest Management (IPM) training to obtain or renewal their license. The Pest Control Advisor advises the PCO.

Pest Control Advisor (PCA)

Pest Control Advisor (PCA) is a state licensed pest control professional that Chollas Creek watershed stakeholders may contact for pest control decisions. The PCA monitors the site utilizing numerous IPM practices to facilitate a decision on whether a treatment strategy is necessary. A PCA identifies pest pressures, provides advice on the need for control measures, writes a recommendation, and orders, warehouses, and delivers the control products. Therefore, the PCA is the key link to advise and recommend alternative pest control methods.

Every licensed PCA is required, as a condition to renewal of a license, to certify that he or she has completed the continuing education requirements. The number of hours required depends on

the number of branches of pest control in which the licenses are held. The continuing education credit may be assigned for accredited college courses, adult education courses, professional seminars or meetings, technical seminars or meetings, operators' courses and/or correspondence courses approved by the Structural Pest Control Board. In lieu of continuing education, a licensed operator or field representative may qualify for renewal by taking and passing an examination designed to cover developments in the field of pest control. <www.dca.gov/pestboard/overview.htm>.

11.20 TMDL Implementation Plan

The three most important mechanisms to implement the diazinon waste load reductions required by this TMDL are (1) USEPA's ongoing diazinon phase-out and elimination program; (2) modification of the San Diego Municipal Storm Water Permit (MS4 Permit) as needed for consistency with this TMDL; and (3) activities by the municipal Copermittees in the Chollas Creek watershed to reduce diazinon discharges pursuant to the MS4 permit and Water Code Section 13267.

1. USEPA's Diazinon Phase-Out and Elimination Program

The single most important action to implement this TMDL is USEPA's national ongoing Diazinon Phase-Out and Elimination Program. In January 2001, USEPA reached an agreement with registrants (manufacturers) of diazinon to phase-out most uses (USEPA 2001). Under the agreement, all indoor uses will be terminated, and all outdoor non-agricultural uses will be phased-out over the next few years. Retail sales of diazinon will be banned after December 31, 2002.

Specifically, the terms of the agreement implement the following phase-out schedules:

- For the indoor household use, the registration was canceled on March 2001, and all retail sales will stop by December 2002.

- For all lawn, garden and turf uses, manufacturing stops in June 2003; all sales and distribution to retailers ends in August 2003. Further, the manufacturers will implement a product recovery program in 2004 to complete the phase-out of the product.

- Additionally, as part of the phase-out, for all lawn, garden, and turf uses, the agreement ratchets down the manufacturing amounts. Specifically, for 2002, there will be a 25 percent decrease in production; and for 2003, there will be a 50 percent decrease in production.

- Also, the agreement begins the process to cancel around 20 different uses on food crops.

In summary, the phase-out is designed to reduce diazinon use, sales and availability, and to increase proper disposal. As a result of the phase-out, USEPA expects, on a national basis, that these actions will end over 90% of current diazinon uses. In the Chollas Creek watershed, since agricultural use is negligible, the phase-out should reduce current source loadings of diazinon, and the resulting aquatic toxicity, to negligible levels over time. For these reasons, the diazinon phase-out is by far the single most significant mechanism by which this TMDL will be implemented. The remaining TMDL implementation actions described below are designed to reduce the discharge of diazinon in the Chollas Creek watershed due to interim (during the phase-out) and residual (post phase-out) diazinon sales, use, and disposal. It should be noted that actions taken by the municipalities and other stakeholders to reduce diazinon discharges in the Chollas Creek watershed will likely be effective in reducing the discharges of alternative pesticides in the long-term.

2. **Modification of Existing Waste Discharge Requirements / NPDES Permits**

The Regional Board's San Diego Municipal Storm Water Permit, also known as the San Diego MS4 permit is the primary broad-based NPDES permit which directly regulates most pollutant discharges, including diazinon, in the Chollas Creek watershed. Federal regulations require that NPDES permits contain effluent limitations that are consistent with waste load allocations developed under a TMDL (40CFR 122.44 (d)(vii)(B)). The Regional Board will revise existing waste discharge requirements / NPDES permits to incorporate effluent limitations in conformance with the Waste Load Allocations for diazinon as specified in Table 7-1 of this document. Modifications to the MS4 Permit can occur when the permit is reopened or during scheduled permit reissuance.

3. **Activities By Municipal Copermittees Pursuant to MS4 Permit and CWC Section 13267**

Pursuant to the MS4 Permit and under the authority of Water Code Section 13267, the Regional Board will direct the municipal Copermittees in the Chollas Creek watershed to do the following:

a. *Legal Authority*
Enforce existing local ordinances, or adopt new legal authority, as needed to ensure Copermittee compliance with the waste load allocations specified in this TMDL;

b. *Diazinon Toxicity Control Plan*
Develop and implement a "Diazinon Toxicity Control Plan" to promote Copermittee compliance with the waste load allocations specified in this TMDL. The Plan should consist of pollution prevention and source control best management practices designed to reduce the discharge of diazinon to Chollas Creek. The "pesticide component" of the education program currently under development by the Copermittees pursuant to the MS4 permit, can serve as the Diazinon Toxicity

Control Plan required under this TMDL.

c. *Diazinon Public Outreach / Education Program*
Develop and implement a focused Public Outreach / Education program designed to reduce the discharge of diazinon in the Chollas Creek watershed. By reducing the discharge of diazinon the Program will promote Copermittee compliance with the waste load allocations specified in this TMDL. The Program should contain the components described in Attachment M of this document, or equivalent component. The Program should also contain an evaluation plan for determining the efficacy of the Public Outreach / Education Program. The *Diazinon Public Outreach / Education Program* may be incorporated into the Diazinon Toxicity Control Plan.

4. **Compliance with MS4 Permit**

The municipal Copermittees in the Chollas Creek watershed shall implement the requirements of the applicable MS4 Permit.

5. **Compliance with Existing Waste Discharge Prohibitions**

Prohibitions against discharges of waste that cause pollution or nuisance, described in the Basin Plan, including discharges of diazinon that cause or contribute to violation of water quality objectives are applicable to the urban land users and land owners in the Chollas Creek watershed. Dischargers of diazinon in the watershed shall also comply with all other applicable waste discharge prohibitions contained in the Basin Plan.

6. **Enforcement Authority of Regional Board**

The Regional Board will use its enforcement authority as necessary to ensure compliance with applicable waste discharge requirements and Basin Plan waste discharge prohibitions.

7. **Modification of Other Existing Waste Discharge Requirements**

The State Water Resources Control Board (State Board) has issued three additional NPDES storm water permits that regulate the discharge of pollutants including diazinon in the Chollas Creek watershed. These permits are the statewide CalTrans Municipal Storm Water Permit[6], the statewide General Industrial Storm Water Permit[7], and the

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[6] Order No. 99-06-DWQ NPDES No. CAS 000003 *Caltrans Municipal Storm Water Permit*

[7] Order No. 99-08-DWQ NPDES No. CAS 000001 *General Industrial Storm Water Permit*

statewide General Construction Storm Water Permit[8] which directly regulate discharges from CalTrans owned and operated facilities, and from industrial and construction site respectively located within the Chollas Creek watershed. Discharges from industrial and construction sites in the Chollas Creek watershed are also indirectly regulated under the MS4 Permit which holds each municipal Copermittee ultimately responsible for all discharges from industrial and construction sites within its jurisdiction. The Regional Board will request the State Board to amend each of these three statewide permits as needed for consistency with this TMDL. Modifications to waste discharge requirements can occur when permits are reopened or reissued.

In addition to the broad-based regulation of discharges under the MS4 permit, the discharge of pollutants, including diazinon, from utility companies and utility vaults is directly regulated under the State Board's General Permit for Utility Vaults[9]. The Regional Board will request the State Board to revise the General Permit for Utility Vaults as needed for consistency with this TMDL.

8. **Adoption of New Waste Discharge Requirements / NPDES Permits**

The Regional Board may adopt new waste discharge requirements / NPDES permits for any significant source(s) of diazinon identified by the municipal Copermittees during the conduct of the comprehensive Diazinon Source Analysis of Chollas Creek watershed.

9. **Promotion of Integrated Pest Management (IPM) Training**

The Regional Board will request the State Water Resources Control Board to encourage the Department of Pesticide Regulation (DPR) and the State Structural Pest Control Board to incorporate integrated pest management (IPM) into training programs for all Pest Control Advisors and Pest Control Operators. Likewise the Regional Board will encourage the County Agricultural Commissioner (CAC) to also provide IPM training. At a minimum the training should include the following:

a. Identification and quantification of the sources and pathways by which diazinon and other insecticides enter urban runoff;

b. environmental significance (or potential impact) of diazinon and other insecticides in urban runoff;

c. use of IPM including alternatives to insecticides; and

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[8] Order No. 99-08-DWQ NPDES No. CAS 000002 *General Construction Storm Water Permit*

[9] Order No. 2001-11-DWQ NPDES No. CAG 99002 *General Utility Vault Storm Water Permit*

d. least toxic methods of pest control for specific insect pests.

10. **Additional Investigations and Reports Pursuant to CWC Section 13225**

The Regional Board may use its authority under California Water Code Section 13225 to request the municipalities in the Chollas Creek watershed to conduct additional investigations which are beyond the purview of the MS4 Permit and to report on the findings of such investigations. Any such investigations will address diazinon-related issues in the Chollas Creek watershed for the ultimate purpose of reducing diazinon discharges in the watershed.

11.30 Monitoring Plan and Objective

Pursuant to the MS4 permit and under the authority of Water Code Section 13267, the Regional Board will direct the municipal Copermittees in the Chollas Creek watershed to develop and implement a Monitoring Plan. The objective of the Plan shall be to assess the effectiveness of this TMDL, its implementation measures, and progress towards the attainment of applicable water quality standards in the Chollas Creek watershed.

This TMDL does not require the development of a new and separate monitoring program. Rather these requirements are intended to **augment** the Copermittees existing monitoring activities in the Chollas Creek watershed pursuant to the MS4 permit. Monitoring in Chollas Creek can be used to fully or partially satisfy the monitoring requirement of both the MS4 permit as well as the TMDL.

At a minimum, the Plan shall include measures of water column diazinon concentrations and Ceriodaphnia dubia bioassays to measure toxicity. At a lower frequency, Chollas Creek sediments shall also be monitored for diazinon. Appropriate procedures and methods, as outlined in the following sections, are to be used for all sampling and analysis. Under this same authority, the Regional Board may also direct the Copermittees to conduct additional Toxicity Identification Evaluations (TIEs) if toxicity remains after diazinon and metal concentrations meet their respective TMDLs.

Sections 11.31 – 11.36 below contain further detail on the minimum required components of the monitoring plan as well as the Regional Board's recommendation for sampling frequency and number and location of sampling stations. The Copermittees are encouraged to design and propose the monitoring plan (to augment their existing activities) which they believe makes the most effective use of their monitoring dollars and which meets the stated objective above. The Regional Board must approve the proposed plan prior to implementation. Approval will likely be concurrent with the Regional Board's revision of the MS4 permit.

11.31 Sample Collection

Storm water samples shall be collected using a flow-weighted composite sampling strategy during wet-weather season identical to the current municipal storm water monitoring program[10]. The municipal storm water permit wet weather season is defined as October 1 through April 30 of each year. The monitoring program should include sampling at the stations identified in Table 11-1 during three (3) storm events. Sampling is suggested during the first two (2) storm events of the wet weather season which meet the United States Environmental Protection Agency's (USEPA's) criteria as described in 40 CFR §122.21(g)(7)[11]. For the third storm event, sampling is suggested during the first event after February 1 which meets the US EPA's criteria. The key components of USEPA's storm event criteria [§122.21(g)(7)] are summarized below.

- A rainfall of at least one-tenth (0.1) inch in the drainage area.
- No storm event in excess of one-tenth (0.1) inch in the drainage for at least seventy-two (72) hours prior to the sampled storm event.
- A storm event within plus or minus fifty (50) percent (%) of the average or median storm volume and duration for the region.

11.32 Location of Monitoring Stations

The monitoring program should include the eight stations identified in Table 11-1, below. There are two major forks of Chollas Creek, the northern branch of Chollas Creek which is known as North Chollas Creek or "Main Chollas Channel" and the southern branch of Chollas Creek which is known as South Chollas Creek.

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[10] Order No. 2001-01, NPDES No. CAS0108758, *'Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer System (MS4s) Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego County, and the San Diego Unified Port District*

[11] For the purpose of the Monitoring and Reporting Program the requirement that there be a one (1) month separation between storm event samples has been deleted.

Table 11-1.
Location and Description of Monitoring Stations within Chollas Creek

Station name	Location and description of monitoring station
SD8(1)	North Chollas Creek near Durant and 33rd Street. This station is also known as SD8 – Chollas, and was later renamed SD8 (1)-Chollas. This is the storm water monitoring program wet-weather mass loading station. The station is located in a concrete-lined section of the creek at the end of the 3300 block of Durant Street, near the intersection of 33rd Street, in the City of San Diego. The wet weather sampling from this station includes monitoring for diazinon, chlorpyrifos, and chronic 96-hour toxicity bioassays with the water flea, Ceriodaphnia dubia.
SD8(2)	Wabash Avenue Branch of North Chollas Creek. This station is also known as the Wabash Avenue (I-15) branch of the Main Chollas Channel. This is a City of San Diego field-screening site and an existing wet-weather mass loading station for the storm water program. The station is located just north of the Highway 94 and Interstate 15 interchange. Some of the vegetation in this portion of the watershed is protected under the Multiple Species Conservation Plan.
SD8(3)	Home Avenue Branch of North Chollas Creek. This is a City of San Diego field screening site and a wet-weather mass loading station for the storm water program. It is located next to the San Diego Police Department canine training field and the Police Pistol Range and is downstream from residential areas. This area tends to remain wet year-round as a result of irrigation runoff from upstream residential areas. This portion of the creek is channeled, but has a natural bottom.
SD8(4)	South Chollas Creek at 38th Street. This is an existing wet-weather mass loading station for the CalTrans storm water program. The station is located in Chollas Creek at the 38th Street bridge just north of Beta Street and several blocks east of Interstate 5. The station is located in a channelized portion of the creek and has a natural bottom. It is approximately 4 blocks upstream of the confluence with the north fork of Chollas Creek. This station is located within a designated open space area and the wetland water quality study area for the Chollas Creek Enhancement Project. This site is located near SD8 (10).
SD8(5)	Federal Boulevard Branch of South Chollas Creek. This is an existing wet-weather mass loading station for the Storm Water Program, added in January 2000. The funding for installation of the autosampler is from the City of Lemon Grove and La Mesa. This site is located next to State Route-94, west of 60th Street and Federal Boulevard. It is located in a light industrial/commercial area near the edge of San Diego City limits. Discharges from the City of Lemon Grove pass through here.
SD8(6)	Jamacha Road Branch of South Chollas Creek. This station is located just south of Jamacha Road at the 69th Street crossing of South Chollas Creek. The station is a City of San Diego field screening site and an existing wet-weather mass loading station for the storm water program. The station is located just downstream from Lemon Grove and upstream of designated open space. The station is along a natural portion of the creek within a residential area and is typically wet all year long.
DPR(1), SD8(9)	South Chollas Creek just west of Euclid Avenue and north of San Diego and Arizona Eastern train tracks. The nearest major cross street to Euclid Avenue is Market Street. This is the location of a DPR station established in 1999-2000.
DPR(2), SD8(10)	South Chollas Creek at the 38th Street bridge. This station is located just north of Alpha Street and a few blocks east of Interstate-5. National Avenue, a few blocks north of the site, is the nearest major cross street to 38th Street. This is the location of a DPR station established in 1999-2000, located near SD8(4).

11.33 Diazinon Test Method

The monitoring program should include diazinon testing of ambient water in Chollas Creek during each of three (3) storm events at the eight (8) stations identified in Table 11-1. The analytical method shall achieve the diazinon reporting limit of 0.05 µg/L (see Table 11-2).

Table 11-2
Test Method, Detection Limit and Reporting Limits for Diazinon in the Monitoring Program

Parameter	Method	Detection limit	Reporting limit
Diazinon	EPA 8141A	0.20 µg/L	0.05 µg/L

The monitoring program shall use the USEPA analytical chemistry method for diazinon (e.g., EPA 8141A). If desired, an equivalent test method may be used in conjunction with the USEPA analytical chemistry method. The diazinon analytical chemistry method EPA 8141A has a detection limit of 0.20 µg/L, so when using this method, it will be necessary to extract diazinon from a sufficient volume of sample to reach the 0.05 µg/L reporting limit.

11.34 Enzyme-Linked Immunosorbant Assay (ELISA)

If an equivalent test method (ELISA) is used for diazinon testing of ambient water in Chollas Creek, an external standard is to be quantified during every field survey. Split samples for quality assurance must document acceptable accuracy and precision of the alternate test method. At least 10% of the samples measured with ELISA kits are to be measured with EPA analytical chemistry methods for quality assurance comparisons.

11.35 Quality Assurance/Quality Control (QA/QC)

All field and laboratory handling must be conducted using "clean techniques." The monitoring program shall develop and implement a QA/QC plan for field and laboratory operations. The QA/QC plan for field operations shall cover the following, at a minimum:

- Quality assurance objectives;
- Sample container preparation, labeling and storage;
- Chain-of-custody tracking;
- Field setup;
- Sampler equipment check and setup;
- Sample collection;
- Use of field blanks to assess field contamination;
- Use of field duplicate samples;
- Transportation to the laboratory;
- Training of field personnel; and
- Evaluation, and enhancement if needed of the QA/QC plan.

The QA/QC plan for laboratory operations shall cover the following, at a minimum:

- Quality assurance objectives;
- Organization of laboratory personnel, their education, experience, and duties;
- Sample procedures;
- Sample custody;
- Calibration procedures and frequency;
- Analytical procedures;
- Data reduction, validation, and reporting;
- Internal quality control procedures;
- Performance and system audits;
- Preventive maintenance;
- Assessment of accuracy and precision;
- Correction actions; and a
- Quality assurance report.

11.36 Ambient Water Toxicity

The monitoring and reporting program shall include, at a minimum, one (1) 96-hour acute and one (1) 7-day chronic toxicity bioassay of ambient water in Chollas Creek using the water flea, *Ceriodaphnia dubia* during each of three (3) storm events at the mass loading station SD8(1).

The method to be used in the chronic toxicity testing is "Survival and Reproduction Test Method 1002.0, Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, EPA/600/4-91/002"[1] for *Ceriodaphnia dubia.*

The method to be used in the acute toxicity testing will be those outlined for a 96-hour acute test in "Methods for Measuring the Acute Toxicity of Effluents and Receiving Water to Freshwater and Marine Organisms, EPA/600/4-90/027F."[1]

The results of ambient chronic and acute water toxicity testing shall be reported as shown in Table 11-3, below:

Table 11-3
Ambient Water Toxicity Testing Results to be Reported

Description of Reporting Values	96-hour Acute	7-day Chronic
Mean % survival for control	Yes	Yes
% Survival in 100% concentration	Yes	Yes
Lethal concentration 50% (LC_{50}) - The toxicant concentration that would cause death in fifty percent (50%) of the test population.	Yes	Yes

Description of Reporting Values	96-hour Acute	7-day Chronic
No-Observed-Effect-Concentration (NOEC reproduction) –This is the highest concentration of toxicant to which organisms are exposed in a full life-cycle or partial life-cycle (short-term) test, that causes no observable effect on survival (NOEC $_{survival}$); and no observable effect on growth and reproduction (NOEC $_{growth}$) of the test population. This would mean that there is no significant difference between the test solution and the control, as determined by hypothesis testing.	Not Applicable	Yes
Lowest-Observed-Effect-Concentration (LOEC) - This is the lowest concentration of toxicant to which organisms are exposed in a full life-cycle or partial life-cycle (short-term) test, which causes adverse effects on the test organisms. The LOEC $_{survival}$ is the lowest toxicant concentration that causes adverse effects on survival; and the LOEC $_{growth/\ reproduction}$ is the lowest toxicant concentration that causes effects on growth and reproduction. This would mean that there is no significant difference between the test solution and the control, as determined by hypothesis testing.	Yes	Yes
Toxic-Unit for acute effects (TU_a) – The TU_a equals 100/NOEC$_{survival}$. A TU_a value of 1 indicates that no toxicity was observed.	Yes	Not Applicable
Toxic-Unit for chronic effects (TU_c) – The duration of exposure (in the original, 100% sample) that causes mortality in fifty percent (50%) of the test population.	Not Applicable	Yes
TU_c sublethal (reproduction) - A chronic or sublethal effect would include having an effect on reproduction or growth. The TU_c equals 100/NOEC $_{reproduction/growth}$. A TU_c value of 1 indicates that no toxicity was observed.	Not Applicable	Yes
Lethal-Time for 50% mortality (LT_{50})	Yes	Yes

11.40 Reporting Requirements

There will be two reporting requirements associated with the implementation of this TMDL: Annual Effectiveness Report and Annual Monitoring Report.

Effectiveness Report

Pursuant to the MS4 Permit and under the authority of Water Code Section 13267, the Regional Board will, direct each municipal Copermittee in the Chollas Creek watershed to describe the implementation schedule and effectiveness of: a) Legal Authority, b) Diazinon Toxicity Control Plan, and c) Diazinon Public Outreach/Education Program.

Monitoring Reports

Pursuant to the MS4 Permit and under the authority of Water Code Section 13267, the Regional Board will direct each municipal Copermittee to implement and report on the findings of the Monitoring Plan as described in section 11.30 above.

Annual Reports
Annual reports shall cover the reporting or monitoring period of October 1 – September 30. . The reports shall be submitted to the Regional Board by January 31 of the following year.

11.50 Schedule of Implementation

As previously described, compliance with numeric limitations for diazinon will be required in accordance with a phased schedule of compliance. All other requirements of this TMDL will be immediately effective upon incorporation into applicable NPDES permits as shown below.

Action	Description	Responsible Parties	Due Date
USEPA cancels registration for indoor household uses of diazinon		USEPA	March 31, 2001
IPM Workshop(s)	Conduct first workshop	Chollas Creek Watershed Municipal Copermittees	and annually thereafter
Monitoring Plan	Initiate Monitoring Plan	Chollas Creek Watershed Municipal Copermittees	30-days after US EPA approves of TMDL
Diazinon Toxicity Control Plan	Initiate DTCP	Chollas Creek Watershed Municipal Copermittees	30-days after US EPA approves of TMDL
Retail sales of diazinon (indoor uses) end		USEPA	December 31, 2002
Manufacturing of diazinon for all lawn, garden and turf uses end		USEPA	June 31, 2003
Sales and distribution to retailers ends		USEPA	August 31, 2003
Phase out and eliminate diazinon usage and sales in the Chollas Creek Watershed. Ensure proper disposal		USEPA	2003 for non-agriculture uses.
Modify MS4 Permit for consistency with TMDL		Regional Board	No later than 2006
Implement legal authority to reduce diazinon discharges reduction activities in Chollas Creek watershed.		Chollas Creek Watershed Municipal Copermittees	6 months after US EPA approval of TMDL

Action	Description	Responsible Parties	Due Date
Compliance with MS4 Permit		Chollas Creek Watershed Municipal Copermittees	Ongoing
Compliance with Existing Waste Discharge Prohibitions		Diazinon Dischargers	Ongoing
Enforcement Authority of Regional Board		Regional Board	Ongoing
Modification of Other Existing Waste Discharge Requirements		Regional Board	No later than next reissuance
Adoption of New Waste Discharge Requirements / NPDES Permits	For significant diazinon sources only.	Regional Board	As needed
Additional Investigations and Reports Pursuant to CWC Section 13255		Diazinon Dischargers	As needed
Submit Annual Reports	Effectiveness Reports and Monitoring Reports	Chollas Creek Watershed Municipal Copermittees	January 31 of each year

12.0 Environmental Review

The California Regional Water Quality Control Board, San Diego Region (hereinafter referred to as the Regional Board) is the Lead Agency for evaluating the environmental impacts of the proposed amendment to the "Water Quality Control Plan for the San Diego Basin (9)" (Basin Plan) to incorporate the Total Maximum Daily Load and Water Quality Attainment Strategy for Chollas Creek Diazinon. The Secretary of Resources has certified the basin planning process as exempt from certain requirements under the California Environmental Quality Act (CEQA), including preparation of an initial study, a negative declaration, and environmental impact report (California Code of Regulations, Title 14, Section 15251). As this proposed amendment to the Basin Plan is part of the basin planning process, the amendment process is considered 'functionally equivalent' to an initial study, negative declaration, and environmental impact report.

Any regulatory program of the Regional Board certified as functionally equivalent however, must satisfy the documentation requirements of California Code of Regulations, Title 23, Section 3777(a) which requires the following:

- A description of the proposed activity;
- An environmental checklist (Attachment K);
- A determination with respect to significant environmental impacts (Attachment K);
- A description of reasonable alternatives; and
- A description of mitigation measures to minimize any significant adverse impacts.

The environmental checklist, technical report and resolution to incorporate the Chollas Creek Diazinon Total Maximum Daily Load into the Basin Plan fulfill the requirements specified under section 3777.

12.10 Description of Proposed Activity

As required by Section 303(d) of the federal Clean Water Act, the Regional Board has prepared a Total Maximum Daily Load for Diazinon in Chollas Creek.

The Total Maximum Daily Load (TMDL) for diazinon is proposed in order to attain water quality objectives for toxicity and pesticides, and protect (from diazinon) the warm freshwater and wildlife habitat beneficial uses of Chollas Creek. Numeric targets, waste load allocations and load allocations are assigned to reduce diazinon inputs to the creek. Proposed implementation measures to meet the TMDL include implementation of best management practices (BMPs) and public outreach by the dischargers. Dischargers are responsible for taking measures, such as implementing BMPs, to reduce and manage their input of diazinon.

The adoption of a Basin Plan amendment to incorporate a TMDL and a TMDL implementation plan for Chollas Creek will not in itself have a significant adverse effect on the environment.

However, implementation of the TMDL will involve projects, which may have environmental impacts. The precise nature, location, and significance of these impacts cannot be determined at this time, since the implementation program establishes a process for identifying subsequent projects rather than specifying particular remedial projects at specific locations. Additionally, actions that result from the implementation of this TMDL may require separate environmental review. Therefore, impacts from these projects are considered indirect to this action and are discussed only as potential actions.

12.20 Alternatives

This section describes a range of reasonable alternatives to the project, and evaluates the comparative merits of the alternatives. The alternatives include:

- No Action;
- Regulatory Approach to TMDL Implementation;
- Adopting a Site-Specific Water Quality Objective; and/or
- Wait for the Phase Out of Diazinon.

12.21 No Action

The "no action" alternative is not to adopt the Basin Plan amendment to incorporate the diazinon TMDL and implementation plan. Selection of the "no action" alternative would mean the continuation of existing programs and operations in compliance with the general municipal storm water permit. There are currently no formal management or public outreach measures for control of diazinon occurring in the watershed. Previous community outreach efforts, developed during a 319(h) grant, encouraged nonpoint source control to middle school students, watershed residents, and high school mentors. These activities are no longer funded and have not been continued.

If the TMDL is not implemented in this watershed, implementation of BMPs will eventually be required for control of surface water runoff under the Nonpoint Source Plan, which could lead to some improvement in the water quality of the creek. However, until control of diazinon sources to surface water occurs, Chollas Creek will likely remain in violation of water quality objectives and the impairment of aquatic habitat will likely continue.

Ultimately, if the State does not adopt the proposed a TMDL and implementation plan, the USEPA is required to develop and adopt a TMDL pursuant to Section 303(d) of the Clean Water Act. Under revisions to the federal TMDL regulations, which are scheduled to take effect in April 2003, the USEPA would also adopt an implementation program. Thus, the "no action" alternative could eventually lead to federal, rather than state requirements for implementation projects with environmental impacts similar to those discussed in this Technical Report.

12.22 Regulatory Approach to TMDL Implementation

This alternative is a variation on the proposed action. This alternative would adopt the proposed TMDL but would use a regulatory approach to implement remedial water quality control (e.g., Waste Discharge Requirements, Enforcement Orders, and so on) instead of a primarily community-based watershed management approach. The regulatory approach would involve evaluating compliance of individual dischargers with waste discharge prohibitions in the Basin Plan. If violations of existing permits are found, enforcement actions would be initiated to reduce the discharges of diazinon to within acceptable limits. The regulatory approach could hasten implementation and ensure more rapid improvements in water quality and beneficial uses. However, this alternative would require a larger allocation of Regional Board resources for permit writing and enforcement, and it may not be well received by dischargers or the local community.

12.23 Wait for the Phase-Out of Diazinon

This alternative would delay the implementation of diazinon reduction education and outreach BMPs. The recommended TMDL contains a combination of two approaches. The first is legal restrictions on the availability and uses of diazinon which became effective March 2001, when the United States Environmental Protection Agency (USEPA) cancelled the registration for the indoor household uses of diazinon. USEPA reached agreement with the manufacturers, Syngenta and Makhteshim Agan, that all retail sales of diazinon for indoor household use are to stop by December 2002. The manufacturing of diazinon for all lawn, garden and turf uses will stop in June 2003, and all sales and distribution to retailers ends in August 2003.

The second approach involves education and outreach with the aim of reducing diazinon use, preventing improper disposal of diazinon, and encouraging alternative non-toxic pest control methods. In order for either approach (or any combination thereof) to be effective, similar measures are also likely to be necessary for other problematic pesticides (e.g., chlorpyrifos). In the absence of such measures, reductions in diazinon use may be offset by increased use of other pesticides. It is unknown to what degree these other pesticides will effect the aquatic community.

12.24 Mitigation Measures

The proposed action will not have any direct adverse environmental impacts. The implementation of the TMDL will in effect lead to an overall improvement in the quality of water and therefore the quality of the environment. Potential or indirect impacts could arise from the establishment of Best Management Practices that result from TMDL Implementation, however these projects and their impacts are speculative at this time. Additionally, subsequent environmental documents prepared for specific implementation projects will identify site-specific mitigation needs. Therefore, no mitigation or mitigation monitoring is currently required.

13.0 Economic Considerations

13.1 Introduction

State law requires the Regional Board to consider economic factors in relation to environmental analysis of the reasonably foreseeable methods of compliance when adopting a performance standard. A TMDL, in combination with the load allocations, may be considered a performance standard [Govt. Code § 11342(d)].

The purpose of this cost consideration is to provide the Regional Board with information concerning the potential cost of implementing this TMDL. This section takes into account a reasonable range of economic factors in fulfillment of the applicable provisions of the California Environmental Quality Act (Public Resources Code Section 21159.)

An evaluation of the costs of implementing this TMDL amounts to evaluating the costs of preventing diazinon from getting into the storm drains to the creek and the costs of monitoring and reporting diazinon concentrations in the creek. This report gives a summary overview of the costs associated with the most likely ways the municipal Copermittees will achieve the required reduction in discharges to the storm drain system and the costs of developing and implementing a Monitoring Plan. The following cost estimates of implementation are based on cost estimates provided by municipal Copermittees in the San Francisco bay area costs will vary widely depending on the methods selected.

13.2 Interagency Collaboration

Preventing diazinon from getting into the creek and its tributaries and is a costly endeavor and will take the combined efforts of dischargers including the City of San Diego, Lemon Grove and La Mesa, and the San Diego Unified Port District. Interagency collaboration is viewed as imperative due to the scope and duration of the Implementation Plan. The Implementation Plan seeks long-term behavior and habit changes through the education and outreach program; and through storm water policies, procedures and/or ordinances. Also, interagency collaboration is imperative for implementing the long-term monitoring plan that will assess the effectiveness of the diazinon reduction efforts. Furthermore, interagency collaboration should be done to help maximize available program funds and to share knowledge and resources.

13.3 Phase-out of Diazinon

Phase-out of diazinon will be the most effective TMDL implementation measure. The costs associated with this phase-out are unknown at this time.

13.4 Reductions in Diazinon Loadings through Integrated Pest Management (IPM)

Municipal Copermittees in the Chollas Creek watershed may consider Integrated Pest Management (IPM) in reducing diazinon loadings and ultimately improving water quality. A summary and overview of those costs estimates is presented below.

An IPM is an ecosystem-based strategy that focuses on long-term prevention of pests or their damage through a combination of techniques such as biological control, habitat manipulation, modification of cultural practices, and use of resistant varieties. Pest control materials are selected and applied in a manner that minimizes risks to human health, beneficial and nontarget organisms and the environment.

The main component of an IPM is a Public Relations Campaign focusing on education and outreach. Several staff would be required to develop and implement this campaign. Total estimated staff salaries for a Public Relations Coordinator, Storm water Coordinator, Master Gardener, Web Master, Demonstration Garden Caretaker, BMP Coordinator and Municipal Pesticide Storage and Application Coordinator is $216,300 to $251,6000 per year.

Campaign elements would consist of public service announcements, newspaper articles, printed information distribution and training / classes. These elements would be targeted toward all households, businesses, municipalities, construction and industrial stakeholders in the watershed. The 2000 Census lists the total number of occupied housing units in the Chollas Creek watershed at 111,112 (SourcePoint, 2000). An additional 10% of this number will be added to account for the other land users, for a total of 122,500 stakeholders to be targeted. Based on this target number, first year cost estimates for all campaign elements range from $450,000 to $1,107,000. The success of the first year, inflation and the degree of interagency collaboration will determine subsequent year costs.

13.5 Prevention of Illicit and Illegal Discharges of Diazinon and other Pesticides

Municipal Copermittees in the Chollas Creek watershed may consider mechanisms to describe the current and future steps each discharger will take to prevent illicit/illegal discharges of diazinon and other pesticides to the storm water conveyance system, including inspection and enforcement activities. This is already a required component of the *'San Diego Municipal Storm Water Permit'*, Section F.5. *'Illicit Discharge Detection and Elimination Component'* (See Attachment G). Therefore this activity/requirement does not incur additional cost to the dischargers.

13.6 Storage and Application of Pesticides at Municipal Areas

Municipal Copermittees in the Chollas Creek watershed may consider including a program to quantitatively identify their pesticide use/storage by preparing a periodically updated inventory of

pesticides currently used and/or stored by all internal departments, divisions, and other operational units as applicable to each discharger. Municipal Copermittees in the Chollas Creek watershed may describe pesticides currently stored and/or applied at municipal areas and the structural and non-structural BMPs currently being implemented and those being planned to ensure that the discharge of pesticides to the storm water conveyance system is prevented. Important municipal areas include municipal facilities, maintenance yards, public rights-of-way, park and ride facilities, weigh stations, parks, recreational facilities, golf courses, cemeteries, botanical or zoological gardens and exhibits, landscaped areas, and so on. Municipal Copermittees in the Chollas Creek watershed may include goals and implementing actions to replace pesticide use (especially diazinon use) with least toxic alternatives. The salary for the 'Municipal Pesticide Storage and Application Coordinator' is included in the estimated salaries of section 13.40.

13.7 Collection and Proper Disposal of Unused Diazinon and Other Pesticides

The County of San Diego Hazardous Materials Management already has a program in place for the collection and disposal of expired and/or unwanted hazardous materials (e.g., diazinon). Household hazardous waste collection is required by Assembly Bill 939 Public Resources Code, Chapter 3.5 Section 41750 and Section 41500. The estimate of the cost to educate and inform stakeholders in the Chollas Creek watershed about the household hazardous waste collection program is included in the total cost estimates presented in section 13.40.

13.8 Cost Estimates For Monitoring Plan

13.81 Wet Weather Monitoring Stations

The long-term monitoring plan includes wet weather sampling and analytical testing at eight (8) monitoring stations located at the following sites:

- SD8 (1) Main Chollas Channel
- SD8 (2) Wabash Avenue
- SD8 (3) Home Avenue
- SD8 (4) 38th Street
- SD8 (5) Federal Blvd.
- SD8 (6) Jamacha Road
- DPR (1) Euclid Avenue
- DPR (2) Beta Street

Costs for collecting and composting wet weather grab water samples from these stations in a storm event is shown in Table 13-13. Costs include providing four two-person field teams to monitor the eight stations during one storm event, perform grab sampling [between three (3) and five (5) grabs] throughout the course of the storm to provide a "flow weighted sample", and costs for delivery of the samples to the laboratory.

13.82 Analytical Testing

Table 13-13 also shows the costs for collecting composite wet weather grab samples, analytical testing for diazinon, and conducting 96-hour and 7-day toxicity tests of the sample from station SD8(1) using *Ceriodaphnia dubia*.

Table 13-13
Costs for Wet Weather Sampling, Analytical and Toxicity Testing

Analytical Test	Item Costs	# Per Storm	Subtotal Costs for a Storm Event	Notes
Wet weather sampling	$21,268	1	$21,268	8 stations
Chronic toxicity test	$1,200	1	$1,200	1 station (96 hour test)
Acute toxicity test	$700	1	$700	1 station (7 day test)
Diazinon EPA 8141A	$240	8	$1,920	8 stations (Requires a reporting limit of 0.05 µg/L)
ELISA (optional)	$120	Varies	$0	Optional test method
Shipping to laboratory	$70	8	$560	8 stations
Report	$5,600	1	$5,600	1 report per wet weather season
Subtotal			$31,248	For one storm event
Totals			$93,744	For 3 storm events

14.0 Public Participation

TMDLs are subject to public review (40 CFR 130.7). Legal public notice requirements have been fully satisfied and numerous opportunities for public participation have been provided as described below.

14.10 Public Notice Requirements

Federal Clean Water Act regulations (40 CFR 25.5) require the Regional Board to mail notice of a proposed Basin Plan amendment to all interested parties at least 45 days in advance of the public hearing. State CEQA regulations (23 California Code of Regulations Section 3777) require the Regional Board to make a draft TMDL report (which is a CEQA substitute) available for public comment for at least 45 days in advance of the public hearing. The Notice of Public Hearing for this Basin Plan amendment was posted 54 days in advance of the public hearing (April 19 to June 12). The draft technical report (including the draft Resolution and draft Basin Plan amendment) was available to the public for 45 days in advance of the public hearing (April 28 to June 12). The following actions were taken to fully satisfy all public notice requirements:

Notice of Public Hearing and Notice of Filing

- Mailed to RWQCB agenda mailing list on April 19, 2002
- Posted on RWQCB website on April 19, 2002
- Published in San Diego Union Tribune on April 24, 2002
- Mailed to interested parties list on April 24, 2002

Draft Technical Report (including Draft Resolution and Basin Plan Amendment)

- Posted on RWQCB website on April 28, 2002
- E-mailed to interested parties list on April 29, 2002
- Mailed to interested parties list on April 29, 2002

14.20 Chronology of Public Participation (See Attachment P)

Five public workshops were conducted by the Regional Board on March 17, 1999, August 3, 1999, December 17, 1999, May 17, 2000 and May 17, 2002 and have served to encourage public participation. Between the fourth and fifth workshop Regional Board staff occasionally met with City staff to discuss the City's Integrated Pest Management Program for potential application to the Chollas Creek watershed and progress on the TMDL. In addition, starting in 1999, the RWQCB began posting various elements of the draft TMDL as they were completed on the RWQCB's website for public review.

More recently, RWQCB staff conducted a series of four meetings (May 27, June 4, June 5, and June 10, 2002) with representatives of the Cities of San Diego, La Mesa and Lemon Grove, the County of San Diego, BayKeeper, the Sierra Club, the Port District of San Diego, Caltrans, the Navy and NASSCO. (Environmental Health Coalition was invited but was unable to attend.) These meetings were designed to afford all interested parties and stakeholders the chance to communicate their concerns with the proposed TMDL. As a consequence of these meetings, all parties have agreed to work collaboratively in developing a phased compliance schedule for meeting numeric limitations for diazinon.

On June 12, 2002 the RWQCB conducted a public hearing on the draft Chollas Creek diazinon TMDL and extended the written public comment period for fifteen days. Following the public hearing, on June 20, 2002, RWQCB staff met again with the City of San Diego and other key stakeholders to discuss and clarify late proposed changes to the draft. The RWQCB has reviewed comments submitted during the extended comment period. The RWCB has heard and considered all public comments on this matter.

Additionally, routine updates on TMDL development activities are provided in the monthly Executive Officer Reports prepared for the Regional Board. These reports, as well as other TMDL information, is available on the SDRWQCB website, <www.swrcb.ca.gov/rwqcb9/>.

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CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

RESOLUTION NO. R9-2005-0019

A RESOLUTION ADOPTING AN AMENDMENT TO THE WATER QUALITY CONTROL PLAN FOR THE SAN DIEGO REGION TO INCORPORATE A TOTAL MAXIMUM DAILY LOAD FOR DISSOLVED COPPER IN SHELTER ISLAND YACHT BASIN, SAN DIEGO BAY

WHEREAS, The California Regional Water Quality Control Board, San Diego Region (hereinafter, Regional Board), finds that:

1. **BASIN PLAN AMENDMENT**: The proposed amendment of the Water Quality Control Plan for the San Diego Basin – Region 9 (Basin Plan) described in the recitals below was developed in accordance with California Water Code (CWC) section 13240 et seq.

2. **NECESSITY STANDARD** [Government Code section 11353(b)]: This regulatory action meets the "Necessity" standard of the Administrative Procedures Act, Government Code, section 11353, subdivision (b). Amendment of the Basin Plan to establish and implement a Total Maximum Daily Load (TMDL) for Shelter Island Yacht Basin (SIYB) is necessary because the existing water quality does not meet applicable numeric water quality objectives for copper, or narrative water quality objectives for toxicity and pesticides. The federal Clean Water Act (CWA) section 303(d) requires the Regional Board to establish and oversee the implementation of a TMDL under the water quality conditions that exist in SIYB. This TMDL for dissolved copper is necessary to ensure attainment of applicable water quality objectives and restoration of beneficial uses designated for SIYB.

3. **CLEAN WATER ACT SECTION 303(d)**: The SIYB portion of San Diego Bay was placed on the Clean Water Act section 303(d) list of impaired waters in 1996 due to elevated levels of dissolved copper in the water column.

4. **BENEFICIAL USE IMPAIRMENTS**: SIYB supports the same suite of beneficial uses as San Diego Bay. The most sensitive beneficial uses are those designated for protection of marine aquatic life and aquatic dependent wildlife as described in the Basin Plan definition of the marine habitat (MAR) and wildlife habitat (WILD) beneficial uses. The MAR and WILD beneficial uses of SIYB are threatened or impaired due to elevated levels of dissolved copper.

5. **WATER QUALITY OBJECTIVES**: The water quality objectives for copper in SIYB specify that concentrations in seawater for dissolved copper should not exceed 3.1 micrograms/liter (µg/L) for continuous or chronic exposures (not to be exceeded over a four-day average), and 4.8 µg/L of copper for brief or acute exposures (not to be exceeded over a one-hour average). These water quality objectives are based on, and equal, to the California Toxics Rule (CTR) water quality criteria for dissolved copper promulgated by the

United States Environmental Protection Agency (USEPA). The USEPA's CTR criteria are the legally applicable water quality standards in the State of California for inland surface waters, enclosed bays, and estuaries for all purposes and programs under the CWA.

In addition, the Basin Plan establishes the following narrative water quality objectives for "toxicity" and "pesticides" to ensure the protection of the MAR and WILD beneficial uses.

Toxicity Objective: *All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.*

The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water factors, shall not be less than that for the same water body in areas unaffected by the waste discharge or, when necessary, for other control water that is consistent with requirements specified in USEPA, State Water Resources Control Board (State Board) or other protocol authorized by the Regional Board. As a minimum, compliance with this objective as stated in the previous sentence shall be evaluated with a 96-hour acute bioassay.

In addition, effluent limits based upon acute bioassays of effluents will be prescribed where appropriate, additional numerical receiving water objectives for specific toxicants will be established as sufficient data become available, and source control of toxic substances will be encouraged.

Pesticide Objective: *No individual pesticide or combination of pesticides shall be present in the water column, sediments, or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels that will bioaccumulate in aquatic organisms to levels harmful to human health, wildlife or aquatic organisms.*

Meeting the numeric water quality objectives for copper will ensure that the narrative toxicity and pesticides objectives are met in the water column with respect to copper.

6. **NUMERIC TARGETS**: TMDL Numeric Targets interpret and implement water quality standards (i.e., numeric and narrative water quality objectives and beneficial uses) and are established at levels necessary to achieve water quality standards. The Regional Board has set the copper TMDL Numeric Targets for both the numeric and narrative water quality objectives equal to the numeric water quality objectives for copper cited in Finding 5. The numeric targets for dissolved copper are 3.1 µg/L for continuous or chronic exposure (4-day average) and 4.8 µg/L (1-hour average) for brief or acute exposures. Attainment of the TMDL numeric targets will result in attainment of water quality standards in SIYB.

7. **SOURCES OF DISSOLVED COPPER**: Approximately 98 percent of the total copper loading to SIYB originates from copper-based antifouling paints applied to the hulls of recreational vessels moored in SIYB marinas. Of this total, 93 percent is attributable to

copper entering the water column through passive leaching of copper from antifouling paints. The remaining five percent enters the water column during periodic underwater hull cleaning of recreational vessel hulls in the marinas. Four other insignificant sources of copper were identified in the TMDL source analysis including urban runoff, direct atmospheric deposition, marine sediment and background.

8. **WATER QUALITY OBJECTIVE VIOLATIONS**: Elevated dissolved copper concentrations in SIYB have been sustained over time through continuous passive leaching of copper from antifouling paints. The effects of these discharges on water quality are exacerbated by factors such as a) the large number of vessels congregated in SIYB marinas (approximately 2,200 vessels); b) the large combined surface area of vessel hulls leaching copper; and c) reduced tidal flushing caused by the configuration of the enclosed basin. Furthermore, since recreational vessels spend most of their time moored in marinas, most of the copper from antifouling paints on the vessel hulls is released in the marinas. Sampling surveys conducted by the Regional Board in SIYB during 1994 and 2000 documented water column concentrations as high as12 μg/L and 8 μg/L of copper, respectively.

9. **ADVERSE EFFECTS OF COPPER**: Copper is used as the bioicide in antifouling paints because of its known toxicity to marine aquatic life. At relatively low concentration levels, copper is toxic to aquatic organisms. Copper toxicity to aquatic life varies between species and within individual species life stages. The early life stages of fish, bivalves and echinoderms are especially vulnerable to copper contamination. Copper tends to accumulate in sediment, threatening the benthic life at SIYB. Copper in the sediment may need to be removed through human intervention, such as dredging which can be very costly. Because of these adverse affects of copper, the use of copper-based antifouling paints is restricted or banned in parts of Europe.

10. **TOTAL MAXIMUM DAILY LOAD**: [40 Code of Federal Regulations (CFR), section 130.2(i)] The TMDL for copper discharges into SIYB is calculated to be 1.6 kilograms of copper per day (kg/day), or 567 kilograms of copper per year (kg/year). The TMDL is defined as the maximum amount of copper that SIYB can receive and still attain water quality objectives and protection of designated beneficial uses. The TMDL is comprised of the sum of all individual Wasteload Allocations (WLAs) for point source discharges of copper, the sum of all Load Allocations (LAs) for nonpoint source discharges of copper, and background. The TMDL includes a margin of safety (MOS) that takes into account any uncertainties in the TMDL calculation. (i.e. TMDL = WLAs + LAs + MOS). The TMDL calculations also account for seasonal variations and critical conditions.

11. **ALLOCATIONS AND REDUCTIONS**: A 76 percent overall reduction of residual copper loading to SIYB is required to meet the TMDL of 567 kg/year. The assigned allocations from each source translate into a percent reduction of dissolved copper from current loading. Loading due to passive leaching must be reduced by 81 percent from current loading. Loading due to underwater hull cleaning must be reduced by 28 percent from current loading. From an overall perspective, passive leaching loading must be reduced by 75 percent from the combined total loading of all sources to SIYB. Underwater hull cleaning

loading must be reduced by one percent from the combined total loading of all sources to SIYB.

12. **DISCHARGERS**: The San Diego Unified Port District (Port), SIYB marina owners/operators, persons owning boats moored in SIYB, and SIYB underwater hull cleaners are accountable for the discharges of copper from boat hull antifouling paints to SIYB. To a much lesser extent, the City of San Diego (City) also discharges copper from its Municipal Separate Storm Sewer Systems (MS4s).

13. **IMPLEMENTATION ACTIONS**: Strategies that the Regional Board could take to implement the TMDL are described in the Basin Plan Amendment and Technical Report for *Total Maximum Daily Load for Dissolved Copper in Shelter Island Yacht Basin, San Diego Bay,* dated February 9, 2005.

14. **SAMPLING PROTOCOL**: Future sampling should be done in accordance with the best current protocols to reduce sample bias regarding low concentrations of metals in marine waters.

15. **COMPLIANCE MONITORING**: Water quality monitoring will be required to assess compliance in SIYB with the copper load and wasteload reductions specified in this TMDL and with the water quality objectives for copper.

16. **COMPLIANCE SCHEDULE**: Copper load and wasteload reductions are required over a 17-year staged compliance schedule period. The first stage consists of an initial 2-year orientation period during which no copper load and wasteload reductions are required. The subsequent 15-year reduction period is comprised of three stages during which incremental copper load and wasteload reductions are required.

17. **SCIENTIFIC PEER REVIEW**: The scientific basis of this TMDL has undergone external peer review pursuant to Health and Safety Code section 57004. The Regional Board has considered and responded to all comments submitted by the peer review panel.

18. **STAKEHOLDER PARTICIPATION**: Interested persons and the public have had reasonable opportunity to participate in review of the amendment to the Basin Plan. A California Environmental Quality Act (CEQA) scoping meeting was held on March 19, 2003. Efforts to solicit public review and comment included three public workshops held between May 2000 and December 2003; a public review and comment period of 90 days preceding and following the Regional Board public hearing; a second public comment period of 30 days following the release of the revised TMDL Technical Report dated October 14, 2004; and written responses from the Regional Board to oral and written comments received from the public.

19. **ECONOMIC ANALYSIS**: The Regional Board has considered the costs of reasonably foreseeable methods of compliance with the load and wasteload reductions specified in this TMDL.

20. **CEQA REQUIREMENTS**: The basin planning process has been certified as functionally equivalent to the CEQA requirements for preparing environmental documents and is, therefore, exempt from those requirements (Public Resources Code section 21000 et seq.). The required environmental documentation (Basin Plan amendment, technical report, and environmental checklist) has been prepared.

    The Regional Board finds that the analysis contained in the TMDL Technical Report, the CEQA checklist, and the responses to comments comply with the requirements of the State Board's certified regulatory CEQA process, as set forth in the California Code of Regulations, title 23, section 3375 et seq. Furthermore, the Regional Board finds that the analysis fulfills the Regional Board's obligations attendant with the adoption of regulations "requiring the installation of pollution control equipment, or a performance standard treatment or requirement", as set forth in section 21159 of the Public Resources Code.

21. **DE MINIMIS ENVIRONMENTAL EFFECTS**: This Basin Plan amendment will result in no potential for adverse effect, either individually or cumulatively, on wildlife.

22. **PUBLIC NOTICE**: The Regional Board has notified all known interested parties and the public of its intent to consider adoption of this Basin Plan amendment in accordance with CWC section 13244.

23. **PUBLIC HEARING**: The Regional Board has, at a public meeting on December 10, 2003, held a public hearing and heard and considered all comments pertaining to this Basin Plan amendment.

24. **BASIN PLAN ORGANIZATION**: Basin Plan Chapter 4, Implementation needs to be reorganized to create a subsection in which to include the Shelter Island Yacht Basin Dissolved Copper TMDL, and the Chollas Creek Diazinon TMDL Basin Plan amendments, and any future TMDL Basin Plan amendments.

NOW, THEREFORE, BE IT RESOLVED that

1. **AMENDMENT ADOPTION**: The Regional Board hereby adopts this amendment to the Basin Plan to incorporate the Shelter Island Yacht Basin Dissolved Copper TMDL, and to reorganize Chapter 4 as set forth in Attachment A hereto.

2. **TECHNICAL REPORT APPROVAL**: The Regional Board hereby approves the Technical Report for *Total Maximum Daily Load for Dissolved Copper In Shelter Island Yacht Basin, San Diego Bay*, dated February 9, 2005.

3. **CERTIFICATE OF FEE EXEMPTION**: The Executive Officer is authorized to sign a Certificate of Fee Exemption.

4. **AGENCY APPROVALS**: The Executive Officer is directed to submit this Basin Plan amendment to the State Board in accordance with CWC section 13245. The Regional Board requests that the State Board approve the Basin Plan amendment and forward it to Office of

Administrative Law (OAL) and the USEPA for approval.

5. **NON-SUBSTANTIVE CORRECTIONS**: If, during the approval process for this amendment, the State Board or OAL determines that minor, non-substantive corrections to the language of the amendment are needed for clarity or consistency, the Executive Officer may make such changes, and shall inform the Regional Board of any such changes.

I, John H. Robertus, Executive Officer, do hereby certify the foregoing is a full, true and correct copy of a Resolution adopted by the California Regional Water Quality Control Board, San Diego Region, on February 9, 2005.

JOHN H. ROBERTUS
Executive Officer

ATTACHMENT A
TO RESOLUTION NO. R9-2005-0019

AMENDMENT TO THE WATER QUALITY CONTROL PLAN FOR THE SAN DIEGO REGION TO INCORPORATE A TOTAL MAXIMUM DAILY LOAD FOR DISSOLVED COPPER IN SHELTER ISLAND YACHT BASIN, SAN DIEGO BAY

This Basin Plan amendment establishes a Total Maximum Daily Load (TMDL) and associated load and wasteload reductions for dissolved copper in the Shelter Island Yacht Basin portion of San Diego Bay. This amendment includes a program to implement the TMDL and monitor its effectiveness. This amendment also reorganizes portions of Chapter 4 of the Basin Plan dealing with TMDLs and creates a new subsection in which to include the Chollas Creek Diazinon TMDL, the Shelter Island Yacht Basin Dissolved Copper TMDL, and any future TMDL Basin Plan amendments. Chapters 2, 3, and 4 of the Basin Plan are amended as follows:

Chapter 2, Beneficial Uses

Table 2-3. ***Beneficial Uses of Coastal Waters, San Diego Bay***

Add the following footnote 3 to San Diego Bay

> [3]The Shelter Island Yacht Basin portion of San Diego Bay is designated as an impaired water body for dissolved copper pursuant to Clean Water Act section 303(d). A Total Maximum Daily Load (TMDL) has been adopted to address this impairment. See Chapter 3, Water Quality Objectives for Pesticides, Toxicity and Toxic Pollutants and Chapter 4, Total Maximum Daily Loads.

Chapter 3, Water Quality Objectives

Inland Surface Waters, Enclosed Bays and Estuaries, Coastal Lagoons, and Ground Waters

Water Quality Objectives for Pesticides:

Add a third paragraph as follows:

> The Shelter Island Yacht Basin portion of San Diego Bay is designated as an impaired water body for dissolved copper pursuant to Clean Water Act section 303(d). A Total Maximum Daily Load (TMDL) has been adopted to address this impairment. See Chapters 2, Table 2-3, *Beneficial Uses of Coastal Waters, San Diego Bay, Footnote 3* and Chapter 4, Total Maximum Daily Loads.

Water Quality Objectives for Toxicity:

Add a fourth paragraph as follows:

> The Shelter Island Yacht Basin portion of San Diego Bay is designated as an impaired water body for dissolved copper pursuant to Clean Water Act section 303(d). A Total Maximum Daily Load (TMDL) has been adopted to address this

impairment. See Chapters 2, Table 2-3, *Beneficial Uses of Coastal Waters, San Diego Bay, Footnote 3* and Chapter 4, Total Maximum Daily Loads.

Water Quality Objectives for Toxic Pollutants:
Add a second paragraph as follows:

> The Shelter Island Yacht Basin portion of San Diego Bay is designated as an impaired water body for dissolved copper pursuant to Clean Water Act section 303(d). A Total Maximum Daily Load (TMDL) has been adopted to address this impairment. See Chapters 2, Table 2-3, *Beneficial Uses of Coastal Waters, San Diego Bay, Footnote 3* and Chapter 4, Total Maximum Daily Loads.

Chapter 4, Implementation
Change the second order subsection "***California Water Quality Assessment (WQA)***" to a first order section by removing it from and placing it before the section "***Other Programs***."

Change the second order subsection "***California's 303(d) Process***" to a first order section by removing it from the section "**Other Programs**" and placing it after the section "***California Water Quality Assessment (WQA)***." Change the name of the section "***California's 303(d) Process***" to "***Clean Water Act Section 303(d) Requirements for Impaired Waterbodies***." Move the sixth paragraph (which begins with "The 303(d) list of WQLS…") to the position after the first sentence in the second paragraph. Begin a new paragraph with the second sentence of paragraph 2 (which begins with "Section 303(d) requires…").

Remove "***(TMDL)***" from the title of the subsection "***Total Maximum Daily Load (TMDL) for Diazinon, Chollas Creek Watershed, San Diego County***" and move this subsection from "***Other Programs***" into the section "***Clean Water Act Section 303(d) Requirements for Impaired Waterbodies***."

After the subsection on the Chollas Creek Diazinon TMDL add the following subsection:

Total Maximum Daily Load for Dissolved Copper, Shelter Island Yacht Basin, San Diego Bay

On February 9, 2005, the Regional Board adopted Resolution No. R9-2005-0019, *A Resolution Adopting an Amendment to the Water Quality Control Plan for the San Diego Region to Incorporate a Total Maximum Daily Load for Dissolved Copper in the Shelter Island Yacht Basin, San Diego Bay.* The TMDL Basin Plan Amendment was subsequently approved by the State Water Resources Control Board on [Insert Date], the Office of Administrative Law on [Insert Date], and the United States Environmental Protection Agency on [Insert Date]. The TMDL is described in the *Total Maximum Daily Load for Dissolved Copper in Shelter Island Yacht Basin, San Diego Bay*, Technical Report dated February 9, 2005.

Problem Statement

Dissolved copper levels in Shelter Island Yacht Basin (SIYB) waters violate water quality objectives for copper, toxicity, and pesticides. Dissolved copper concentrations in SIYB threaten and impair the designated beneficial uses of marine habitat (MAR), and wildlife habitat (WILD).

Numeric Target

The TMDL Numeric Targets for copper, toxicity and pesticides are set equal to the numeric water quality objectives for dissolved copper as defined in the California Toxics Rule (CTR) and shown below.

Table 4-10. TMDL Numeric Targets.

Exposure	Water Quality Objective*	Numeric Target*
Continuous or Chronic (4 day average)	3.1 µg/L** of copper (Cu)	3.1 µg/L** of Cu
Maximum or Acute (1 hour average)	4.8 µg/L** of Cu	4.8 µg/L** of Cu

* Concentrations should not be exceeded more than once every three years.
** micrograms/liter (µg/L)

If the water quality objectives for dissolved copper in SIYB are modified in the future, as in the case of a site-specific objective, then the numeric targets will be set equal to the new water quality objectives.

Source Analysis

Approximately 98 percent of all copper loading to SIYB is attributable to copper-based antifouling paints applied to the hulls of recreational boats. The passive leaching of copper from antifouling paint is 93 percent of the total loading. The remaining five percent of total copper loading results from underwater hull cleaning operations in SIYB.

Table 4-11. Summary of Dissolved Copper Sources to SIYB.

Source	Mass Load (kg/year)	Percent Contribution (% Cu)
Passive Leaching	2,000	93
Hull Cleaning	100	5
Urban Runoff	30	1
Background	30	1
Direct Atmospheric Deposition	3	<1
Sediment	0	0
Combined Sources	**2,163**	**100**

Total Maximum Daily Load

The TMDL or loading capacity for dissolved copper discharges into SIYB is 1.6 kilograms/day (kg/day) or 567 kilograms/year (kg/year).

Margin of Safety

The TMDL includes an explicit and implicit margin of safety (MOS). Ten percent of the loading capacity was reserved as an explicit MOS and calculated to be 57 kg/year. The implicit MOS was incorporated into the TMDL source analysis through numerous conservative assumptions.

Allocations and Reductions

A 76 percent overall reduction of residual copper loading to SIYB is required to meet the TMDL of 567 kg/year as shown in the table below. The assigned allocations from each source translate into a percent reduction of dissolved copper from current loading. Loading due to passive leaching must be reduced by 81 percent from current loading. Loading due to underwater hull cleaning must be reduced by 28 percent from current loading. From an overall perspective, passive leaching loading must be reduced by 75 percent from the combined total loading of all sources to SIYB. Underwater hull cleaning loading must be reduced by one percent from the combined total loading of all sources to SIYB.

Table 4-12. TMDL and Allocation Summary.

Source	Current Load (kg/year of Cu)	Percent Contribution (% Cu)	Allocation (kg/year of Cu)	Percent Reduction From Current Source Load (%)	Percent Reduction from Total Loading to SIYB (%)
Passive Leaching	2,000	93	375	81	75
Hull Cleaning	100	5	72	28	1
Urban Runoff	30	1	30	0	0
Background	30	1	30	0	0
Direct Atmospheric Deposition	3	<1	3	0	0
Sediment	0	0	0	0	0
Current Mass Load	2,163	100			0
Margin of Safety			57		0
TMDL			567		0
Total Load Reduction				76	76

Recalculations if Water Quality Objectives Change

If the water quality objectives for dissolved copper in SIYB are changed in the future, then the MOS, TMDL and allocations will be recalculated using the method shown in Appendix D of the Basin Plan.

TMDL Implementation Plan

The TMDL will be implemented as follows:

- The Regional Board will coordinate with governmental agencies having legal authority over the use of copper-based antifouling paints to protect water quality from the adverse effects of copper-based antifouling paints in SIYB; and

- The Regional Board will regulate discharges of copper to SIYB through the issuance of Waste Discharge Requirments (WDRs), Waivers of WDRs (waivers), or adoption of Waste Discharge Prohibitions. WDRs could build upon pollution control programs developed by discharger organizations or the Port. Likewise, waivers or prohibitions could be conditioned on implementation of pollution control programs through third party agreements between the Regional Board and discharger organizations, and/or other agencies.

- The Regional Board will amend Order No. 2001-01, "Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm /Sewer Systems" to require that discharges of copper into SIYB waters via the City's municipal separate storm/sewer system not exceed a 30 mg/kg wasteload for copper.

The dischargers will be required to monitor SIYB waters and provide monitoring reports to the Regional Board for the purpose of assessing the effectiveness of the alternatives implemented.

Compliance Schedule

Copper load and wasteload reductions are required over a 17-year staged compliance schedule period. The first stage consists of an initial 2-year orientation period during which no copper load reductions are required. The subsequent 15-year reduction period is comprised of three stages during which incremental copper load and wasteload reductions are required as shown below.

Table 4-13. Interim Loading Targets for Attainment of the TMDL.

Stage	Time Period	Percent Reduction from Current Estimated Loading	Reduction to be Attained by End of Year	Estimated Interim Target Loading (kg/year of dissolved Cu)
Stage 1	Years 1-2	0%	N/A	N/A
Stage 2	Years 2-7	10%	7	1,900
Stage 3	Years 7-12	40%	12	1,300
Stage 4	Years 12-17	76%	17	567

At the end of the Basin Plan, add the following Appendix D:

APPENDIX D

METHOD FOR RECALCULATION OF THE TOTAL MAXIMUM DAILY LOAD FOR DISSOLVED COPPER IN THE SHELTER ISLAND YACHT BASIN, SAN DIEGO BAY

This appendix describes the method for recalculating the Shelter Island Yacht Basin TMDL for dissolved copper if the water quality objectives for dissolved copper are modified in the future.

Numeric Target

The numeric targets are set equal to the new water quality objectives.

Margin of Safety

The explicit margin of safety (MOS) equals ten percent of the loading capacity. The equation to calculate the loading capacity is given below.

Total Maximum Daily Load

The TMDL or loading capacity is recalculated using equations 1 through 4 below.

The loading capacity is recalculated according to equation 1 below:

$$(1) \quad R_S = C_2\left(\frac{KA_c}{\Delta x} + k_L V_2\right) - A_c C_1\left(\frac{eA_s}{A_c} + \frac{K}{\Delta x}\right)$$

where C_1 = average background concentration of copper measured in the area of San Diego Bay adjacent to SIYB, expressed as total copper, (0.05 µg/L)

C_2 = average target concentration for copper in the SIYB (expressed as total copper) when the maximum concentration of copper in SIYB is equal to or less than the numeric target (mass/volume)

K = dispersion coefficient calculated from salinity measurements and mixing length approximation (15.3 m^2/sec)

A_c = cross-sectional area of entrance to SIYB (1,000 m^2)

A_s = surface area of SIYB (740,000 m^2)

Δx = average mixing length between SIYB and adjacent area; estimated distance between the endpoints for S_1 and S_2 (2,000 m)

V_2 = volume of SIYB (31,000,000 m^3)

e = evaporation rate (0.43 cm/day)

k_l = rate of total copper loss to sediment (7%/day)

R_S = loading capacity, expressed as total copper (mass/time); R_S is calculated iteratively to find the maximum possible value that does not cause C_2 to exceed the numeric target.

The dispersion coefficient K is calculated using equation 2 below:

(2) $$K \cong \frac{eA_s S_1 \Delta x}{A_c (S_2 - S_1)}$$

where S_1, S_2 = salinity data obtained in SIYB and San Diego Bay adjoining SIYB (33.62 practical salinity units (psu) and 33.46 psu, respectively).

The average target concentration, C_2, must be lower than the numeric target concentration to ensure that the loading capacity will not cause an exceedance of the numeric target anywhere in SIYB. C_2 is calculated by multiplying the numeric target for chronic exposure by the ratio of the average measured concentration of copper in SIYB to the maximum measured concentration as expressed in equation 3 below:

(3) C_2 = numeric target [average measured concentration/maximum measured concentration]

Or,

C_2 = numeric target * [5.45 µg/L / 8 µg/L]

To convert C_2 from dissolved copper concentration to total copper concentration, the number calculated from equation 3 is multiplied by the ratio of dissolved copper to total copper in seawater. If site-specific data are not available, the ratio of 0.83 can be used. This is the USEPA's conversion factor for saltwater acute criteria.[1]

Finally, the TMDL is calculated according to equation 4 below:

(4) TMDL = Rs - MOS

Allocations

Equation 5 is used to determine the new allocation for passive leaching. In equation 5, the only variable is the allocation for passive leaching (Ap), while the other source allocations are constants. The allocation for hull cleaning remains the same, since it was based on the assumption that all of the divers will use Management Practices (MPs) to clean boat hulls that have copper bottom paints. Allocations for the other sources, namely urban runoff, background and sediment will not be recalculated because these sources of copper are insignificant.

(5) TMDL = Wasteload Allocation + Load Allocations + MOS

TMDL = Au + Ap + Ah + As + Ab + Aa + MOS

where:

Au = allocation for urban runoff = 30 kg/year
Ap = allocation for passive leaching
Ah = allocation for hull cleaning = 72 kg/year

[1] USEPA. 2000. Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. May 18, 2000.

As = allocation for sediment = load from sediment = 0 kg/year
Ab = allocation for background = load from background = 30 kg/year
Aa = allocation for direct atmospheric deposition = load from direct atmospheric deposition = 3 kg/year.

California Regional Water Quality Control Board
San Diego Region

Total Maximum Daily Load for Dissolved Copper In Shelter Island Yacht Basin, San Diego Bay

Resolution No. R9-2005-0019
Basin Plan Amendment and

Technical Report

February 9, 2005

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To request copies of the Resolution No. R9-2005-0019 Basin Plan Amendment and Technical Report for Total Maximum Daily Load for Dissolved Copper In Shelter Island Yacht Basin, San Diego Bay please contact Lesley Dobalian, Environmental Scientist at (858) 637-7139, ldobalian@waterboards.ca.gov, or Christina Arias, Water Resource Control Engineer at (858) 627-3931, carias@waterboards.ca.gov.

Documents also are available at: http://www.waterboards.ca.gov/sandiego

Total Maximum Daily Load for Dissolved Copper In Shelter Island Yacht Basin, San Diego Bay

Resolution No. R9-2005-0019
Basin Plan Amendment and

Technical Report

Adopted by the
California Regional Water Quality Control Board
San Diego Region
on February 9, 2005

Approved by the
State Water Resources Control Board
on _____, 2005
and the
Office of Administrative Law
on _____,2005
and the
United States Environmental Protection Agency
on _____. 2005

Cover Photograph: Shelter Island Yacht Basin, San Diego Bay (2004) by David T. Barker

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List of Acronyms and Abbreviations

Basin Plan	Water Quality Control Plan for the San Diego Basin – Region 9
BIOL	Preservation of biological habitats of special significance
CAC	San Diego County Agricultural Commissioner
CalEPA	California Environmental Protection Agency
CCC	California Coastal Commission
CCR	California Code of Regulations
CDFA	California Food and Agriculture Code
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
City	City of San Diego
COMM	Commercial and sport fishing
CTR	California Toxics Rule
Cu	Copper
CWA	Clean Water Act
CWC	California Water Code
DBW	California Department of Boating and Waterways
DPR	California Department of Pesticide Regulation
EMC	Event mean concentration
ERL	Effects range low
ERM	Effects range medium
EST	Estuarine habitat
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
IND	Industrial service supply
LA	Load allocations
LC	Loading capacity
MAA	Management Agency Agreement
MP	Management practice
MAR	Marine habitat
MIGR	Migration of aquatic organisms
MLLW	Mean lower low water
MM	Management measures
MOS	Margin of safety
MOU	Memorandum of Understanding
MS4	Municipal Separate Storm Sewer Systems
NAV	Navigation
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge and Elimination System
OAL	Office of Administrative Law
Port	San Diego Unified Port District
PRC	PRC Environmental Management, Inc.
RARE	Rare, threatened, or endangered species
REC1	Water contact recreation
REC2	Non-contact water recreation
Regional Board	California Regional Water Quality Control Board, San Diego Region

SCCWRP	Southern California Coastal Water Research Project
Sea Grant	University of California Sea Grant Extension Program
SHELL	Shellfish harvesting
SIYB	Shelter Island Yacht Basin
SPAWAR	US Navy's Space and Naval Warfare Systems Command
SQG	Sediment quality guidelines
SSO	Site-specific objective
State Board	State Water Resources Control Board
TBT	Tributyltin
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
WDR	Waste discharge requirements
WER	Water effects ratio
WILD	Wildlife habitat
WLA	Wasteload allocation
WQC	Water quality criteria

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD SAN DIEGO REGION

RESOLUTION NO. R9-2005-0019

A RESOLUTION ADOPTING AN AMENDMENT TO THE WATER QUALITY CONTROL PLAN FOR THE SAN DIEGO REGION TO INCORPORATE A TOTAL MAXIMUM DAILY LOAD FOR DISSOLVED COPPER IN SHELTER ISLAND YACHT BASIN, SAN DIEGO BAY

WHEREAS, The California Regional Water Quality Control Board, San Diego Region (hereinafter, Regional Board), finds that:

1. **BASIN PLAN AMENDMENT**: The proposed amendment of the Water Quality Control Plan for the San Diego Basin – Region 9 (Basin Plan) described in the recitals below was developed in accordance with California Water Code (CWC) section 13240 et seq.

2. **NECESSITY STANDARD** [Government Code section 11353(b)]: This regulatory action meets the "Necessity" standard of the Administrative Procedures Act, Government Code, section 11353, subdivision (b). Amendment of the Basin Plan to establish and implement a Total Maximum Daily Load (TMDL) for Shelter Island Yacht Basin (SIYB) is necessary because the existing water quality does not meet applicable numeric water quality objectives for copper, or narrative water quality objectives for toxicity and pesticides. The federal Clean Water Act (CWA) section 303(d) requires the Regional Board to establish and oversee the implementation of a TMDL under the water quality conditions that exist in SIYB. This TMDL for dissolved copper is necessary to ensure attainment of applicable water quality objectives and restoration of beneficial uses designated for SIYB.

3. **CLEAN WATER ACT SECTION 303(d)**: The SIYB portion of San Diego Bay was placed on the Clean Water Act section 303(d) list of impaired waters in 1996 due to elevated levels of dissolved copper in the water column.

4. **BENEFICIAL USE IMPAIRMENTS**: SIYB supports the same suite of beneficial uses as San Diego Bay. The most sensitive beneficial uses are those designated for protection of marine aquatic life and aquatic dependent wildlife as described in the Basin Plan definition of the marine habitat (MAR) and wildlife habitat (WILD) beneficial uses. The MAR and WILD beneficial uses of SIYB are threatened or impaired due to elevated levels of dissolved copper.

5. **WATER QUALITY OBJECTIVES**: The water quality objectives for copper in SIYB specify that concentrations in seawater for dissolved copper should not exceed 3.1 micrograms/liter (µg/L) for continuous or chronic exposures (not to be exceeded over a four-day average), and 4.8 µg/L of copper for brief or acute exposures (not to be exceeded over a one-hour average). These water quality objectives are based on, and equal, to the California Toxics Rule (CTR) water quality criteria for dissolved copper promulgated by United States Environmental Protection Agency (USEPA). The USEPA's CTR criteria are

the legally applicable water quality standards in the State of California for inland surface waters, enclosed bays, and estuaries for all purposes and programs under the CWA.

In addition, the Basin Plan establishes the following narrative water quality objectives for "toxicity" and "pesticides" to ensure the protection of the MAR and WILD beneficial uses.

Toxicity Objective: *All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.*

The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water factors, shall not be less than that for the same water body in areas unaffected by the waste discharge or, when necessary, for other control water that is consistent with requirements specified in USEPA, State Water Resources Control Board (State Board) or other protocol authorized by the Regional Board. As a minimum, compliance with this objective as stated in the previous sentence shall be evaluated with a 96-hour acute bioassay.

In addition, effluent limits based upon acute bioassays of effluents will be prescribed where appropriate, additional numerical receiving water objectives for specific toxicants will be established as sufficient data become available, and source control of toxic substances will be encouraged.

Pesticide Objective: *No individual pesticide or combination of pesticides shall be present in the water column, sediments, or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels that will bioaccumulate in aquatic organisms to levels harmful to human health, wildlife or aquatic organisms.*

Meeting the numeric water quality objectives for copper will ensure that the narrative toxicity and pesticides objectives are met in the water column with respect to copper.

6. **NUMERIC TARGETS**: TMDL Numeric Targets interpret and implement water quality standards (i.e., numeric and narrative water quality objectives and beneficial uses) and are established at levels necessary to achieve water quality standards. The Regional Board has set the copper TMDL Numeric Targets for both the numeric and narrative water quality objectives equal to the numeric water quality objectives for copper cited in Finding 5. The numeric targets for dissolved copper are 3.1 µg/L for continuous or chronic exposure (4-day average) and 4.8 µg/L (1-hour average) for brief or acute exposures. Attainment of the TMDL numeric targets will result in attainment of water quality standards in SIYB.

7. **SOURCES OF DISSOLVED COPPER**: Approximately 98 percent of the total copper loading to SIYB originates from copper-based antifouling paints applied to the hulls of recreational vessels moored in SIYB marinas. Of this total, 93 percent is attributable to copper entering the water column through passive leaching of copper from antifouling paints.

The remaining five percent enters the water column during periodic underwater hull cleaning of recreational vessel hulls in the marinas. Four other insignificant sources of copper were identified in the TMDL source analysis including urban runoff, direct atmospheric deposition, marine sediment and background.

8. **WATER QUALITY OBJECTIVE VIOLATIONS**: Elevated dissolved copper concentrations in SIYB have been sustained over time through continuous passive leaching of copper from antifouling paints. The effects of these discharges on water quality are exacerbated by factors such as a) the large number of vessels congregated in SIYB marinas (approximately 2,200 vessels); b) the large combined surface area of vessel hulls leaching copper; and c) reduced tidal flushing caused by the configuration of the enclosed basin. Furthermore, since recreational vessels spend most of their time moored in marinas, most of the copper from antifouling paints on the vessel hulls is released in the marinas. Sampling surveys conducted by the Regional Board in SIYB during 1994 and 2000 documented water column concentrations as high as12 µg/L and 8 µg/L of copper, respectively.

9. **ADVERSE EFFECTS OF COPPER**: Copper is used as the bioicide in antifouling paints because of its known toxicity to marine aquatic life. At relatively low concentration levels, copper is toxic to aquatic organisms. Copper toxicity to aquatic life varies between species and within individual species life stages. The early life stages of fish, bivalves and echinoderms are especially vulnerable to copper contamination. Copper tends to accumulate in sediment, threatening the benthic life at SIYB. Copper in the sediment may need to be removed through human intervention, such as dredging which can be very costly. Because of these adverse affects of copper, the use of copper-based antifouling paints is restricted or banned in parts of Europe.

10. **TOTAL MAXIMUM DAILY LOAD**: [40 Code of Federal Regulations (CFR), section 130.2(i)] The TMDL for copper discharges into SIYB is calculated to be 1.6 kilograms of copper per day (kg/day), or 567 kilograms of copper per year (kg/year). The TMDL is defined as the maximum amount of copper that SIYB can receive and still attain water quality objectives and protection of designated beneficial uses. The TMDL is comprised of the sum of all individual Wasteload Allocations (WLAs) for point source discharges of copper, the sum of all Load Allocations (LAs) for nonpoint source discharges of copper, and background. The TMDL includes a margin of safety (MOS) that takes into account any uncertainties in the TMDL calculation. (i.e. TMDL = WLAs + LAs + MOS). The TMDL calculations also account for seasonal variations and critical conditions.

11. **ALLOCATIONS AND REDUCTIONS**: A 76 percent overall reduction of residual copper loading to SIYB is required to meet the TMDL of 567 kg/year. The assigned allocations from each source translate into a percent reduction of dissolved copper from current loading. Loading due to passive leaching must be reduced by 81 percent from current loading. Loading due to underwater hull cleaning must be reduced by 28 percent from current loading. From an overall perspective, passive leaching loading must be reduced by 75 percent from the combined total loading of all sources to SIYB. Underwater hull cleaning loading must be reduced by one percent from the combined total loading of all sources to SIYB.

12. **DISCHARGERS**: The San Diego Unified Port District (Port), SIYB marina owners/operators, persons owning boats moored in SIYB, and SIYB underwater hull cleaners are accountable for the discharges of copper from boat hull antifouling paints to SIYB. To a much lesser extent, the City of San Diego (City) also discharges copper from its Municipal Separate Storm Sewer Systems (MS4s).

13. **IMPLEMENTATION ACTIONS**: Strategies that the Regional Board could take to implement the TMDL are described in the Basin Plan Amendment and Technical Report for *Total Maximum Daily Load for Dissolved Copper in Shelter Island Yacht Basin, San Diego Bay,* dated February 9, 2005.

14. **SAMPLING PROTOCOL**: Future sampling should be done in accordance with the best current protocols to reduce sample bias regarding low concentrations of metals in marine waters.

15. **COMPLIANCE MONITORING**: Water quality monitoring will be required to assess compliance in SIYB with the copper load and wasteload reductions specified in this TMDL and with the water quality objectives for copper.

16. **COMPLIANCE SCHEDULE**: Copper load and wasteload reductions are required over a 17-year staged compliance schedule period. The first stage consists of an initial 2-year orientation period during which no copper load and wasteload reductions are required. The subsequent 15-year reduction period is comprised of three stages during which incremental copper load and wasteload reductions are required.

17. **SCIENTIFIC PEER REVIEW**: The scientific basis of this TMDL has undergone external peer review pursuant to Health and Safety Code section 57004. The Regional Board has considered and responded to all comments submitted by the peer review panel.

18. **STAKEHOLDER PARTICIPATION**: Interested persons and the public have had reasonable opportunity to participate in review of the amendment to the Basin Plan. A California Environmental Quality Act (CEQA) scoping meeting was held on March 19, 2003. Efforts to solicit public review and comment included three public workshops held between May 2000 and December 2003; a public review and comment period of 90 days preceding and following the Regional Board public hearing; a second public comment period of 30 days following the release of the revised TMDL Technical Report dated October 14, 2004; and written responses from the Regional Board to oral and written comments received from the public.

19. **ECONOMIC ANALYSIS**: The Regional Board has considered the costs of reasonably foreseeable methods of compliance with the load and wasteload reductions specified in this TMDL.

20. **CEQA REQUIREMENTS**: The basin planning process has been certified as functionally equivalent to the CEQA requirements for preparing environmental documents and is,

therefore, exempt from those requirements (Public Resources Code section 21000 et seq.). The required environmental documentation (Basin Plan amendment, technical report, and environmental checklist) has been prepared.

The Regional Board finds that the analysis contained in the TMDL Technical Report, the CEQA checklist, and the responses to comments comply with the requirements of the State Board's certified regulatory CEQA process, as set forth in the California Code of Regulations, title 23, section 3375 et seq. Furthermore, the Regional Board finds that the analysis fulfills the Regional Board's obligations attendant with the adoption of regulations "requiring the installation of pollution control equipment, or a performance standard treatment or requirement", as set forth in section 21159 of the Public Resources Code.

21. **DE MINIMIS ENVIRONMENTAL EFFECTS**: This Basin Plan amendment will result in no potential for adverse effect, either individually or cumulatively, on wildlife.

22. **PUBLIC NOTICE**: The Regional Board has notified all known interested parties and the public of its intent to consider adoption of this Basin Plan amendment in accordance with CWC section 13244.

23. **PUBLIC HEARING**: The Regional Board has, at a public meeting on December 10, 2003, held a public hearing and heard and considered all comments pertaining to this Basin Plan amendment.

24. **BASIN PLAN ORGANIZATION**: Basin Plan Chapter 4, Implementation needs to be reorganized to create a subsection in which to include the Shelter Island Yacht Basin Dissolved Copper TMDL, and the Chollas Creek Diazinon TMDL Basin Plan amendments, and any future TMDL Basin Plan amendments.

NOW, THEREFORE, BE IT RESOLVED that

1. **AMENDMENT ADOPTION**: The Regional Board hereby adopts this amendment to the Basin Plan to incorporate the Shelter Island Yacht Basin Dissolved Copper TMDL, and to reorganize Chapter 4 as set forth in Attachment A hereto.

2. **TECHNICAL REPORT APPROVAL**: The Regional Board hereby approves the Technical Report for *Total Maximum Daily Load for Dissolved Copper In Shelter Island Yacht Basin, San Diego Bay*, dated February 9, 2005.

3. **CERTIFICATE OF FEE EXEMPTION**: The Executive Officer is authorized to sign a Certificate of Fee Exemption.

4. **AGENCY APPROVALS**: The Executive Officer is directed to submit this Basin Plan amendment to the State Board in accordance with CWC section 13245. The Regional Board requests that the State Board approve the Basin Plan amendment and forward it to Office of Administrative Law (OAL) and the USEPA for approval.

5. **NON-SUBSTANTIVE CORRECTIONS**: If, during the approval process for this amendment, the State Board or OAL determines that minor, non-substantive corrections to the language of the amendment are needed for clarity or consistency, the Executive Officer may make such changes, and shall inform the Regional Board of any such changes.

I, John H. Robertus, Executive Officer, do hereby certify the foregoing is a full, true and correct copy of a Resolution adopted by the California Regional Water Quality Control Board, San Diego Region, on February 9, 2005.

Original signed by
JOHN H. ROBERTUS
Executive Officer

ATTACHMENT A
TO RESOLUTION NO. R9-2005-0019

AMENDMENT TO THE WATER QUALITY CONTROL PLAN FOR THE SAN DIEGO REGION TO INCORPORATE A TOTAL MAXIMUM DAILY LOAD FOR DISSOLVED COPPER IN SHELTER ISLAND YACHT BASIN, SAN DIEGO BAY

This Basin Plan amendment establishes a Total Maximum Daily Load (TMDL) and associated wasteload allocations for dissolved copper in the Shelter Island Yacht Basin portion of San Diego Bay. This amendment includes a program to implement the TMDL and monitor its effectiveness. This amendment also reorganizes portions of Chapter 4 of the Basin Plan dealing with TMDLs and creates a new subsection in which to include the Chollas Creek Diazinon TMDL, the Shelter Island Yacht Basin Dissolved Copper TMDL, and any future TMDL Basin Plan amendments. Chapters 2, 3, and 4 of the Basin Plan are amended as follows:

Chapter 2, Beneficial Uses
Table 2-3. ***Beneficial Uses of Coastal Waters, San Diego Bay***

Add the following footnote 3 to San Diego Bay

> [3]The Shelter Island Yacht Basin portion of San Diego Bay is designated as an impaired water body for dissolved copper pursuant to Clean Water Act section 303(d). A Total Maximum Daily Load (TMDL) has been adopted to address this impairment. See Chapter 3, Water Quality Objectives for Pesticides, Toxicity and Toxic Pollutants and Chapter 4, Total Maximum Daily Loads.

Chapter 3, Water Quality Objectives
Inland Surface Waters, Enclosed Bays and Estuaries, Coastal Lagoons, and Ground Waters

Water Quality Objectives for Pesticides:
Add a third paragraph as follows:

> The Shelter Island Yacht Basin portion of San Diego Bay is designated as an impaired water body for dissolved copper pursuant to Clean Water Act section 303(d). A Total Maximum Daily Load (TMDL) has been adopted to address this impairment. See Chapters 2, Table 2-3, *Beneficial Uses of Coastal Waters, San Diego Bay, Footnote 3* and Chapter 4, Total Maximum Daily Loads.

Water Quality Objectives for Toxicity:
Add a fourth paragraph as follows:

> The Shelter Island Yacht Basin portion of San Diego Bay is designated as an impaired water body for dissolved copper pursuant to Clean Water Act section 303(d). A Total Maximum Daily Load (TMDL) has been adopted to address this

impairment. See Chapters 2, Table 2-3, *Beneficial Uses of Coastal Waters, San Diego Bay, Footnote 3* and Chapter 4, Total Maximum Daily Loads.

Water Quality Objectives for Toxic Pollutants:
Add a second paragraph as follows:

The Shelter Island Yacht Basin portion of San Diego Bay is designated as an impaired water body for dissolved copper pursuant to Clean Water Act section 303(d). A Total Maximum Daily Load (TMDL) has been adopted to address this impairment. See Chapters 2, Table 2-3, *Beneficial Uses of Coastal Waters, San Diego Bay, Footnote 3* and Chapter 4, Total Maximum Daily Loads.

Chapter 4, Implementation

Change the second order subsection "***California Water Quality Assessment (WQA)***" to a first order section by removing it from and placing it before the section "***Other Programs***."

Change the second order subsection "***California's 303(d) Process***" to a first order section by removing it from the section "**Other Programs**" and placing it after the section "***California Water Quality Assessment (WQA)***." Change the name of the section "***California's 303(d) Process***" to "***Clean Water Act Section 303(d) Requirements for Impaired Waterbodies***." Move the sixth paragraph (which begins with "The 303(d) list of WQLS…") to the position after the first sentence in the second paragraph. Begin a new paragraph with the second sentence of paragraph 2 (which begins with "Section 303(d) requires…").

Remove "***(TMDL)***" from the title of the subsection "***Total Maximum Daily Load (TMDL) for Diazinon, Chollas Creek Watershed, San Diego County***" and move this subsection from "***Other Programs***" into the section "***Clean Water Act Section 303(d) Requirements for Impaired Waterbodies***."

After the subsection on the Chollas Creek Diazinon TMDL add the following subsection:

Total Maximum Daily Load for Dissolved Copper, Shelter Island Yacht Basin, San Diego Bay

On February 9, 2005, the Regional Board adopted Resolution No. R9-2005-0019*, A Resolution Adopting an Amendment to the Water Quality Control Plan for the San Diego Region to Incorporate a Total Maximum Daily Load for Dissolved Copper in the Shelter Island Yacht Basin, San Diego Bay*. The TMDL Basin Plan Amendment was subsequently approved by the State Water Resources Control Board on [Insert Date], the Office of Administrative Law on [Insert Date], and the United States Environmental Protection Agency on [Insert Date]. The TMDL is described in the *Total Maximum Daily Load for Dissolved Copper in Shelter Island Yacht Basin, San Diego Bay*, Technical Report dated [insert date].

Problem Statement

Dissolved copper levels in Shelter Island Yacht Basin (SIYB) waters violate water quality objectives for copper, toxicity, and pesticides. Dissolved copper concentrations in SIYB threaten and impair the designated beneficial uses of marine habitat (MAR), and wildlife habitat (WILD).

Numeric Target

The TMDL Numeric Targets for copper, toxicity and pesticides are set equal to the numeric water quality objectives for dissolved copper as defined in the California Toxics Rule (CTR) and shown below.

Table 4-10. TMDL Numeric Targets.

Exposure	Water Quality Objective*	Numeric Target*
Continuous or Chronic (4 day average)	3.1 µg/L** of copper (Cu)	3.1 µg/L** of Cu
Maximum or Acute (1 hour average)	4.8 µg/L** of Cu	4.8 µg/L** of Cu

* Concentrations should not be exceeded more than once every three years.
** micrograms/liter (µg/L)

If the water quality objectives for dissolved copper in SIYB are modified in the future, as in the case of a site-specific objective, then the numeric targets will be set equal to the new water quality objectives.

Source Analysis

Approximately 98 percent of all copper loading to SIYB is attributable to copper-based antifouling paints applied to the hulls of recreational boats. The passive leaching of copper from antifouling paint is 93 percent of the total loading. The remaining five percent of total copper loading results from underwater hull cleaning operations in SIYB.

Table 4-11. Summary of Dissolved Copper Sources to SIYB.

Source	Mass Load (kg/year)	Percent Contribution (% Cu)
Passive Leaching	2,000	93
Hull Cleaning	100	5
Urban Runoff	30	1
Background	30	1
Direct Atmospheric Deposition	3	<1
Sediment	0	0
Combined Sources	**2,163**	**100**

Total Maximum Daily Load

The TMDL or loading capacity for dissolved copper discharges into SIYB is 1.6 kilograms/day (kg/day) or 567 kilograms/year (kg/year).

Margin of Safety

The TMDL includes an explicit and implicit margin of safety (MOS). Ten percent of the loading capacity was reserved as an explicit MOS and calculated to be 57 kg/year. The implicit MOS was incorporated into the TMDL source analysis through numerous conservative assumptions.

Allocations and Reductions

A 76 percent overall reduction of residual copper loading to SIYB is required to meet the TMDL of 567 kg/year as shown in the table below. The assigned allocations from each source translate into a percent reduction of dissolved copper from current loading. Loading due to passive leaching must be reduced by 81 percent from current loading. Loading due to underwater hull cleaning must be reduced by 28 percent from current loading. From an overall perspective, passive leaching loading must be reduced by 75 percent from the combined total loading of all sources to SIYB. Underwater hull cleaning loading must be reduced by one percent from the combined total loading of all sources to SIYB.

Table 4-12. TMDL and Allocation Summary.

Source	Current Load (kg/year of Cu)	Percent Contribution (% Cu)	Allocation (kg/year of Cu)	Percent Reduction From Current Source Load (%)	Percent Reduction from Total Loading to SIYB (%)
Passive Leaching	2,000	93	375	81	75
Hull Cleaning	100	5	72	28	1
Urban Runoff	30	1	30	0	0
Background	30	1	30	0	0
Direct Atmospheric Deposition	3	<1	3	0	0
Sediment	0	0	0	0	0
Current Mass Load	2,163	100			0
Margin of Safety			57		0
TMDL			567		0
Total Load Reduction				76	76

Recalculations if Water Quality Objectives Change

If the water quality objectives for dissolved copper in SIYB are changed in the future, then the MOS, TMDL and allocations will be recalculated using the method shown in Appendix D of the Basin Plan.

TMDL Implementation Plan

The TMDL will be implemented as follows:

- The Regional Board will coordinate with governmental agencies having legal authority over the use of copper-based antifouling paints to protect water quality from the adverse effects of copper-based antifouling paints in SIYB; and

- The Regional Board will regulate discharges of copper to SIYB through the issuance of Waste Discharge Requirements (WDRs), Waivers of WDRs (waivers), or adoption of Waste Discharge Prohibitions. WDRs could build upon pollution control programs developed by discharger organizations or the Port. Likewise, waivers or prohibitions could be conditioned on implementation of pollution control programs through third party agreements between the Regional Board and discharger organizations, and/or other agencies.

- The Regional Board will amend Order No. 2001-01, "Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm /Sewer Systems" to require that discharges of copper into SIYB waters via the City's municipal separate storm/sewer system not exceed a 30 mg/kg wasteload for copper.

The dischargers will be required to monitor SIYB waters and provide monitoring reports to the Regional Board for the purpose of assessing the effectiveness of the alternatives implemented.

Compliance Schedule

Copper load and wasteload reductions are required over a 17-year staged compliance schedule period. The first stage consists of an initial 2-year orientation period during which no copper load reductions are required. The subsequent 15-year reduction period is comprised of three stages during which incremental copper load and wasteload reductions are required as shown below.

Table 4-13. Interim Loading Targets for Attainment of the TMDL.

Stage	Time Period	Percent Reduction from Current Estimated Loading	Reduction to be Attained by End of Year	Estimated Interim Target Loading (kg/year of dissolved Cu)
Stage 1	Years 1-2	0%	N/A	N/A
Stage 2	Years 2-7	10%	7	1,900
Stage 3	Years 7-12	40%	12	1,300
Stage 4	Years 12-17	76%	17	567

At the end of the Basin Plan, add the following Appendix D:

APPENDIX D

METHOD FOR RECALCULATION OF THE TOTAL MAXIMUM DAILY LOAD FOR DISSOLVED COPPER IN THE SHELTER ISLAND YACHT BASIN, SAN DIEGO BAY

This appendix describes the method for recalculating the Shelter Island Yacht Basin TMDL for dissolved copper if the water quality objectives for dissolved copper are modified in the future.

Numeric Target

The numeric targets are set equal to the new water quality objectives.

Margin of Safety

The explicit margin of safety (MOS) equals ten percent of the loading capacity. The equation to calculate the loading capacity is given below.

Total Maximum Daily Load

The TMDL or loading capacity is recalculated using equations 1 through 4 below.

The loading capacity is recalculated according to equation 1 below:

$$(1) \quad R_S = C_2\left(\frac{KA_c}{\Delta x} + k_L V_2\right) - A_c C_1\left(\frac{eA_s}{A_c} + \frac{K}{\Delta x}\right)$$

where C_1 = average background concentration of copper measured in the area of San Diego Bay adjacent to SIYB, expressed as total copper, (0.05 µg/L)

C_2 = average target concentration for copper in the SIYB (expressed as total copper) when the maximum concentration of copper in SIYB is equal to or less than the numeric target (mass/volume)

K = dispersion coefficient calculated from salinity measurements and mixing length approximation (15.3 m^2/sec)

A_c = cross-sectional area of entrance to SIYB (1,000 m^2)

A_s = surface area of SIYB (740,000 m^2)

Δx = average mixing length between SIYB and adjacent area; estimated distance between the endpoints for S_1 and S_2 (2,000 m)

V_2 = volume of SIYB (31,000,000 m^3)

e = evaporation rate (0.43 cm/day)

k_l = rate of total copper loss to sediment (7%/day)

R_S = loading capacity, expressed as total copper (mass/time); R_S is calculated iteratively to find the maximum possible value that does not cause C_2 to exceed the numeric target.

The dispersion coefficient K is calculated using equation 2 below:

(2) $$K \cong \frac{eA_s S_1 \Delta x}{A_c (S_2 - S_1)}$$

where S_1, S_2 = salinity data obtained in SIYB and San Diego Bay adjoining SIYB (33.62 practical salinity units (psu) and 33.46 psu, respectively).

The average target concentration, C_2, must be lower than the numeric target concentration to ensure that the loading capacity will not cause an exceedance of the numeric target anywhere in SIYB. C_2 is calculated by multiplying the numeric target for chronic exposure by the ratio of the average measured concentration of copper in SIYB to the maximum measured concentration as expressed in equation 3 below:

(3) C_2 = numeric target [average measured concentration/maximum measured concentration]

Or,

C_2 = numeric target * [5.45 µg/L / 8 µg/L]

To convert C_2 from dissolved copper concentration to total copper concentration, the number calculated from equation 3 is multiplied by the ratio of dissolved copper to total copper in seawater. If site-specific data are not available, the ratio of 0.83 can be used. This is the USEPA's conversion factor for saltwater acute criteria.[1]

Finally, the TMDL is calculated according to equation 4 below:

(4) TMDL = Rs - MOS

Allocations

Equation 5 is used to determine the new allocation for passive leaching. In equation 5, the only variable is the allocation for passive leaching (Ap), while the other source allocations are constants. The allocation for hull cleaning remains the same, since it was based on the assumption that all of the divers will use Management Practices (MPs) to clean boat hulls that have copper bottom paints. Allocations for the other sources, namely urban runoff, background and sediment will not be recalculated because these sources of copper are insignificant.

(5) TMDL = Wasteload Allocation + Load Allocations + MOS

TMDL = Au + Ap + Ah + As + Ab + Aa + MOS

where:

Au = allocation for urban runoff = 30 kg/year
Ap = allocation for passive leaching
Ah = allocation for hull cleaning = 72 kg/year
As = allocation for sediment = load from sediment = 0 kg/year
Ab = allocation for background = load from background = 30 kg/year

[1] USEPA. 2000. Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. May 18, 2000.

Aa = allocation for direct atmospheric deposition = load from direct atmospheric deposition = 3 kg/year.

I. EXECUTIVE SUMMARY

Shelter Island Yacht Basin (SIYB) is a semi-enclosed popular recreational yacht basin located at the north end of San Diego Bay, in southern California. SIYB is comprised of recreational marinas and yacht clubs[2] that support a high density of recreational vessels in an area of low tidal flushing. Recreational vessels at SIYB are typically painted with copper-based antifouling paints to slow down the buildup of marine organisms on the vessels' hulls. The copper in antifouling paints is designed to leach into the environment to prevent marine fouling, in a process known as passive leaching. At relatively low concentrations copper is toxic to a wide range of aquatic organisms, not just fouling organisms, and is persistent in the environment.

The copper from antifouling paints on vessels at SIYB has resulted in elevated dissolved copper concentrations that have been sustained over time through continuous passive leaching. Since recreational vessels spend much of their time moored in marinas, most of the copper from antifouling paints on the vessel hulls is released in the marinas at SIYB. The effects of these discharges on water quality are exacerbated by factors such as the high density of recreational vessels congregated in SIYB marinas, the extensive combined surface area of vessel hulls leaching copper, and reduced tidal flushing caused by the configuration of the enclosed basin.

Section 303(d) of the federal Clean Water Act (CWA) requires that each state identify waterbodies within its boundaries for which the effluent limitations are not stringent enough to meet applicable water quality standards (i.e., water quality objectives and beneficial uses). Section 303(d) also requires states to establish a priority ranking for these impaired waters, known as the List of Impaired Water Bodies, or Section 303(d) list, and to establish Total Maximum Daily Loads (TMDLs) for such waters. The purpose of a TMDL is to restore the beneficial uses and to attain the water quality objectives in the waterbody. A TMDL represents the maximum amount of the pollutant of concern that the waterbody can receive and still attain water quality standards. Once this maximum pollutant amount has been calculated, it is then divided up and allocated amongst all of the contributing sources in the watershed. In order to meet the TMDL, an Implementation Plan is also developed that describes the pollutant reduction actions that must be taken by various dischargers to meet the allocations. The Implementation Plan includes a time schedule for meeting the required pollutant reductions and requirements for monitoring to assess the effectiveness of the load reduction activities in attaining water quality objectives and restoring beneficial uses. When the TMDL is fully implemented, i.e., all of the contributing sources have reduced their current loading of the pollutant to their assigned allocation, water quality standards are expected to again be achieved in the receiving water.

The California Regional Water Quality Control Board, San Diego Region (Regional Board) is responsible under the California Water Code (CWC) for protecting the beneficial uses of the waters of the State in the San Diego Region by regulating the discharge of pollutants to those waters, as required under the CWA. Due to high concentrations of dissolved copper, in 1996 the Regional Board placed SIYB on the list of impaired waterbodies, i.e. not meeting applicable water quality standards. Dissolved copper concentrations at SIYB exceed the numeric water quality objectives for copper and the narrative water quality objectives for toxicity and pesticides

[2] In this TMDL document, the term "marina" refers to marina facilities and yacht club facilities.

as defined in the Water Quality Control Plan for the San Diego Basin – Region 9 (Basin Plan). These exceedances threaten the wildlife habitat and marine habitat beneficial uses of SIYB. High levels of copper in the water column at SIYB are also a concern because of the increased potential to contaminate sediment, and adversely impact aquatic benthic life. A TMDL was developed to meet water quality objectives at SIYB and protect beneficial uses.

Technical TMDL

In this TMDL, the numeric targets were set equal to water quality criteria (WQC) for dissolved copper as set forth by the United States Environmental Protection Agency (USEPA) in the California Toxics Rule (CTR) (USEPA, 2000b). The CTR's WQC serve as legally applicable numeric water quality objectives for dissolved copper in the state of California. WQC are established by the USEPA at levels necessary to ensure the protection of aquatic life from acute and chronic toxicity. When the numeric targets are met, both the numeric water quality objective and the narrative water quality objectives for toxicity and pesticides due to dissolved copper in the water column are expected to be met at SIYB. The numeric target for dissolved copper is 3.1 micrograms/liter (µg/L) for continuous or chronic exposure (4-day average) and 4.8 µg/L (1-hour average) for maximum or acute exposures, not to be exceeded more than once every three years. Sampling surveys conducted at SIYB by the Regional Board demonstrate that levels exceed the numeric target (and numeric water quality objectives) by two to threefold, with concentrations as high as 8.0–12.0 µg/L of copper.

The analysis of the sources of dissolved copper to SIYB shows that the vast majority (98 percent) of copper enters the Basin from copper-based antifouling paints (Table i.). The greatest source of loading results from passive leaching of copper antifouling paints applied to the vessels moored in SIYB, accounting for approximately 93 percent (2,000 kilograms/year (kg/year) of copper) of total loading. The second most significant source results from underwater hull cleaning of the copper antifouling paints on vessel hulls in the marinas, accounting for approximately five percent (100 kg/year of copper) of total loading. Dissolved copper also enters SIYB from urban runoff, although the contribution is marginal compared to the other anthropogenic sources, at approximately one percent (30 kg/year) of the total load. In addition, copper is found naturally in seawater, and background loading accounts for approximately one percent (30 kg/year). Direct atmospheric deposition was also determined to be a relatively insignificant contributor of dissolved copper, accounting for less than one percent (3 kg/year) of the total load. Lastly, sediment was found to act primarily as a sink, rather than a source, of dissolved copper under current loading conditions to SIYB. This is of concern due to the likelihood of long-term contamination of sediment by copper.

Table i. Summary of Dissolved Copper Sources to SIYB.

Source	Mass Load (kg/year of Cu*)	Percent Contribution (% Cu*)
Passive Leaching	2,000	93
Hull Cleaning	100	5
Urban Runoff	30	1
Background	30	1
Direct Atmospheric Deposition	3	<1
Sediment	0	0
Combined Sources	2,163	100

* Copper (Cu)

A copper fate and transport model based on mass-balance principles was developed for SIYB to calculate the loading capacity or TMDL for copper discharges to SIYB. Using this model, the TMDL for dissolved copper at SIYB was calculated to be 567 kg/year (Table ii). An overall 76 percent reduction in loading is required from the sources to SIYB to achieve the TMDL. Most of the load reduction will be required from the most significant anthropogenic source, passive leaching, as well as to a lesser extent from the second most significant source, hull cleaning. No reductions will be required from the other much less significant sources. In terms of the total reduction necessary from all sources to meet the TMDL, 75 percent of the necessary reduction will be required from passive leaching, amounting to an 81 percent reduction from current passive leaching loading (Table ii). Furthermore, one percent of the necessary total reduction will be required from hull cleaning, amounting to a 28 percent reduction from current hull cleaning loading.

Reductions from passive leaching and hull cleaning are expected to be achieved through implementation of Management Practices (MPs), such as the use of nontoxic or less toxic antifouling paints in place of copper-based paints. Switching to nontoxic and less toxic antifouling paints will result in load reductions from both passive leaching and underwater hull cleaning. Achievement of the required copper load and wasteload reductions should result in the attainment of water quality objectives and restoration of beneficial uses in SIYB. As required by the basin planning process, the scientific basis for this TMDL has undergone external peer review pursuant to Health and Safety Code section 57004.

Table ii. TMDL and Allocation Summary.

Source	Current Load (kg/year)	Allocation (kg/year)	Percent Reduction from Current Loading (%)	Percent Reduction from Total Loading (%)
Passive Leaching	2,000	375	81	75
Hull Cleaning	100	72	27	1
Urban Runoff	30	30	0	0
Background	30	30	0	0
Direct Atmospheric Deposition	3	3	0	0
Sediment	0	0	0	0
Margin of Safety		57		
Combined Sources	2,163			76
TMDL		567		

Implementation Plan

Copper-based antifouling paints are legally registered pesticides subject to regulation by the USEPA under regulation pursuant to the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) and the California Department of Pesticide Regulation (DPR) regulation pursuant to the California Food and Agriculture Code. In this TMDL document, the "discharge of copper" refers to "residual copper" which is defined as any molecule of copper that leaches, dissolves, ablates, or erodes from boat hull antifouling paints into SIYB surrounding waters and does not reach a target fouling organism. This includes residual copper that results from legally registered hull antifouling paints used in accordance with label instructions in compliance with the FIFRA.

The Regional Board has the authority to use its administrative tools to regulate the San Diego Unified Port District, SIYB marina owners and operators, persons owning boats moored in SIYB, and hull cleaners operating in SIYB to reduce copper discharges to SIYB to reduce copper discharges to SIYB. To a much lesser extent, the City of San Diego also discharges copper from its Municipal Separate Storm Sewer Systems (MS4s). There are several strategies and management practices available to the dischargers to reduce copper loading to SIYB. They include:

- Transition to nontoxic and less toxic hull coatings;
- Reduce effects of copper-based paints through management practices;
- Conduct boater education programs;
- Conduct commercial demonstrations and scientific studies;
- Impose controls on SIYB boat owners;
- Implement financial incentives;

- Impose controls on SIYB marina owners and operators to limit use of copper-based hull paints; and

- Implement financial incentives to encourage the use of alternative antifouling strategies.

The TMDL will be implemented as follows:

- The Regional Board will coordinate with governmental agencies having legal authority over the use of copper-based antifouling paints to protect water quality from the adverse effects of copper-based antifouling paints in SIYB; and

- The Regional Board will regulate the discharge of copper to SIYB waters through the issuance of Waste Discharge Requirements (WDRs), Waivers of WDRs (waivers), or adoption of Waste Discharge Prohibitions. WDRs could build upon pollution control programs developed by discharger organizations or the Port. Likewise, waivers or prohibitions could be conditioned on implementation of pollution control programs through third party agreements between the Regional Board and discharger organizations, and/or the Port.

- The Regional Board will amend Order No. 2001-01, "Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm /Sewer Systems" to require that discharges of copper into SIYB waters not increase via the City's municipal separate storm /sewer system from existing loadings.

The dischargers will be required to monitor SIYB waters for the purpose of assessing the effectiveness of the alternatives implemented.

Compliance Schedule
Copper load reductions are required over a 17-year staged compliance schedule period. The first stage consists of an initial 2-year orientation period during which no copper load reductions are required. The subsequent 15-year reduction period is comprised of three stages during which incremental copper load reductions are required as shown below.

Table iii. Interim Loading Targets for Attainment of the TMDL.

Stage	Time Period	Percent Reduction from Current Estimated Loading	Reduction to be Attained by End of Year	Estimated Interim Target Loading (kg/year of dissolved Cu)
Stage 1	Years 1-2	0%	N/A	N/A
Stage 2	Years 2-7	10%	7	1,900
Stage 3	Years 7-12	40%	12	1,300
Stage 4	Years 12-17	76%	17	567

Environmental and Economic Analysis
The Regional Board is the lead agency for evaluating the environmental impacts of this Basin Plan amendment pursuant to the California Environmental Quality Act (CEQA). The Basin Planning process has been certified as functionally equivalent to CEQA requirements for

preparing environmental documents and is, therefore, exempt from those requirements (Public Resources Code section 21000 et seq.). The required environmental documentation (Basin Plan amendment, technical report, and environmental checklist) has been prepared. The Regional Board has identified environmental impacts, reasonable alternatives, and mitigation measures to minimize any significant adverse environmental impacts of the proposed Basin Plan amendment. The Regional Board has also considered the costs of reasonably foreseeable methods of compliance with the TMDL through an economic analysis.

As required by the Basin Planning process, the Regional Board has encouraged and provided numerous opportunities for stakeholder participation, including CEQA scoping meeting, stakeholder meetings, public workshops, a formal public review and comment period, and a public hearing. The Regional Board will hold a public hearing to consider adopting Resolution No. R9-2005-0019amending the Basin Plan to incorporate this TMDL. Once adopted, the Basin Plan amendment will be submitted to the State Board, the Office of Administrative Law, and the USEPA for subsequent approvals.

II. TECHNICAL ANALYSIS

Shelter Island Yacht Basin (SIYB) is a recreational yacht basin comprised of marinas and yacht clubs,[3] an anchorage, a fuel dock and other facilities that support the marine industry. SIYB is located near the mouth of San Diego Bay, California. Levels of dissolved copper in SIYB exceed numeric water quality objectives for copper and narrative water quality objectives for toxicity and pesticides, and threaten and impair the wildlife habitat and marine habitat beneficial uses in SIYB. Due to this exceedance, SIYB was placed on the list of impaired waterbodies compiled pursuant to federal Clean Water Act (CWA) section 303(d). This TMDL was developed to address and resolve this impairment.

1. Introduction

Section 303(d)(1)(A) of the federal CWA requires that "[e]ach State shall identify those waters within its boundaries for which the effluent limitations…are not stringent enough to implement any water quality standard applicable to such waters." Section 303(d) also requires states to establish a priority ranking for waters on the List of Impaired Waterbodies, or the Section 303(d) list, and to establish Total Maximum Daily Loads (TMDLs) for such waters.

The purpose of a TMDL is to attain water quality objectives and restore and protect the beneficial uses of an impaired waterbody. The TMDL represents a strategy for meeting water quality objectives by allocating quantitative limits for point and nonpoint pollution sources. A TMDL is defined as the sum of the individual wasteload allocations for point sources and load allocations for nonpoint sources and natural background (40 Code of Federal Regulations (CFR), section 130.2) such that the capacity of the waterbody to assimilate pollutant loading (i.e., the loading capacity) is not exceeded.

The TMDL process began with the development of this technical report which includes the following 7 components: (1) a **Problem Statement** describing which water quality objectives are not being attained and which beneficial uses are impaired; (2) identification of **Numeric Targets** which will result in attainment of the water quality objectives and protection of beneficial uses; (3) a **Source Analysis** to identify all of the point and nonpoint sources of the impairing pollutant in the watershed and to estimate the current pollutant loading for each source; (4) a **Linkage Analysis** to calculate the **Loading Capacity** of the waterbody for the pollutant; i.e., the maximum amount of the pollutant that may be discharged to the waterbody without causing exceedances of water quality objectives and impairment of beneficial uses; (5) a **Margin of Safety** (MOS) to account for uncertainties in the analysis; (6) the division and **Allocation** of the TMDL among each of the contributing sources in the watershed, wasteload allocations (WLA) for point sources and load allocations (LA) for nonpoint and background sources; (7) a description of how **Seasonal Variation and Critical Conditions** are accounted for in the TMDL determination. The document containing the above components is generally referred to as the technical TMDL report.

[3] In this TMDL document, the term "marina" refers to marina facilities and yacht club facilities.

This report also includes an **Implementation Plan** that describes the pollutant reduction actions that must be taken by various responsible parties to meet the allocations specified in the technical report. A time schedule for meeting the required pollutant reductions is included in the Implementation Plan. In addition, the Implementation Plan also includes requirements for a Monitoring Plan that must be implemented to assess the effectiveness of the load reduction activities in attaining water quality objectives and restoring beneficial uses. Public participation is a key element of the TMDL process, and stakeholder involvement was encouraged and required.

Once established, the regulatory provisions of the TMDL, Implementation Plan, and Monitoring Plan are incorporated into the Water Quality Control Plan for the San Diego Basin – Region 9 (Basin Plan) via a formal action by the California Regional Water Quality Control Board, San Diego Region (Regional Board) to amend the Basin Plan in a public hearing. Additional requirements of the Basin Plan amendment process also include an evaluation of economic and environmental considerations. As with any Basin Plan amendment involving surface waters, a TMDL adopted by the Regional Board will not take effect until it has undergone subsequent agency approvals by the State Water Resources Control Board (State Board), the Office of Administrative Law (OAL), and the United States Environmental Protection Agency (USEPA).

Following these approvals, the Regional Board is required to incorporate the regulatory provisions of the TMDL into all applicable regulatory mechanisms. Numeric limits for the impairing pollutant in the subject watershed may be added to the appropriate waste discharge requirements to implement and make the TMDL enforceable.

The final and most important step in the process is the implementation of the TMDL by the responsible parties. Per the governing waste discharge requirement (WDR) order (or other regulatory mechanism), each responsible party must reduce its current loading of the pollutant to its assigned allocation of the pollutant in accordance with the time schedule specified in the technical report (and implementing order). When each responsible party has achieved its required load reduction, water quality standards for the impairing pollutant are expected to be restored in the receiving waters.

2. Problem Statement

Levels of dissolved copper at SIYB, a recreational yacht basin in San Diego Bay, exceed numeric water quality objectives for copper and narrative water quality objectives for toxicity and pesticides in the water column. These exceedances threaten and impair the wildlife habitat and marine habitat beneficial uses in SIYB. In this analysis, the majority of dissolved copper entering SIYB was found to come from copper-based antifouling paints on the vessels moored in the Yacht Basin.

SIYB is a popular recreational yacht basin comprised of marinas and yacht clubs numerous marinas, yacht clubs, an anchorage, a fuel dock and other facilities that support the marine industry located in the north end of San Diego Bay. SIYB supports a high density of recreational vessels in an area of reduced tidal flushing. The vast majority of recreational vessels in SIYB are painted with copper-based antifouling paint coatings. Antifouling paints are applied

to vessel hulls to discourage attachment and growth of aquatic organisms, such as barnacles, which results in increased corrosion and drag, reduced safety and maneuverability, and decreased fuel efficiency and economy. Copper is typically the toxic component added to antifouling paints to prevent the attachment of these organisms. Copper is toxic to a wide range of aquatic organisms, however, not just to fouling organisms. The most common toxicant in copper-based paints used on recreational vessels is cuprous oxide, which acts as a preventative biocide by leaching into the water column. Copper in antifouling paints also enters the marine environment through underwater hull cleaning, a common practice used to help prevent the buildup of marine organisms on vessel hulls. Copper from these paints enters the water column, and is largely responsible for the high dissolved copper concentrations that persist in the Basin. Elevated copper levels in the water column also increase the likelihood of contamination of the sediment. Not surprisingly, copper is the most common pollutant found at toxic levels in marinas nationwide (USEPA, 1993).

Under the California Water Code (CWC), the Regional Board is responsible for protecting beneficial uses in the Region's surface waters, by regulating the discharge of pollutants to those waters, as required under the CWA. The Regional Board designated SIYB as an impaired waterbody on the Section 303(d) list due to elevated levels of dissolved copper in 1996. Current concentrations at SIYB exceed numeric water quality objectives for copper, which are equal to federal water quality criteria designed to protect marine aquatic life from toxicity to dissolved copper. Concentrations at SIYB also do not meet the narrative water quality objectives for toxicity and pesticides as defined in the Basin Plan. Elevated levels of dissolved copper threaten the designated beneficial uses of SIYB, including wildlife and marine habitat. A TMDL and Implementation Plan were developed to meet water quality objectives at SIYB and protect beneficial uses.

Watershed Characteristics

San Diego Bay is a semi-enclosed, crescent-shaped estuary that opens to the Pacific Ocean. The Bay is located in southern California, north of the Mexican border. San Diego Bay extends approximately 24 kilometers (km) in length and varies from about 0.4 to 5.8 km in width (State Board *et al.*, 1996). Extensive dredging of channels and near-shore filling has significantly altered the Bay in terms of depth and width (State Board *et al.*, 1996). Depths vary from less than one meter in the southern portion of the Bay to 18 meters near the mouth, with an average depth of 12 meters (State Board *et al.*, 1996).

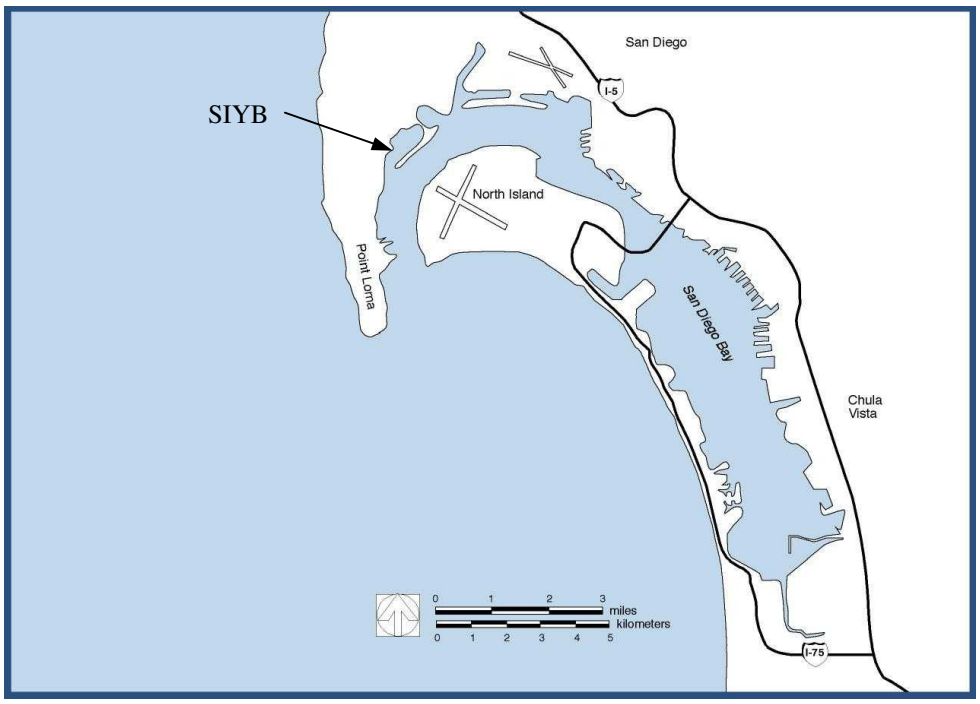

Figure 2.1. Map of San Diego Bay and Shelter Island Yacht Basin.

San Diego Bay may be divided into northern, central and southern portions that differ in hydrologic characteristics. High current velocities and rapid tidal flushing characterize the northern reaches of the Bay, and tidal currents primarily control surface water mixing. These characteristics decrease into the central and southern reaches of the Bay, which are characterized by lower current velocities and longer contaminant residence times (Valkirs *et al*., 1994). The semi-enclosed marinas and commercial basins located throughout the Bay also experience reduced tidal flushing and increased contaminant residence times (Seligman and Zirino, 1998).

The climate in the area is Mediterranean-like and may be characterized as semi-arid with little precipitation, and an annual rainfall of about 25 centimeters/year (Largier, 1995). There is very little freshwater input to the Bay and its salinity approaches that of seawater, especially closer to the mouth. During the dry season, the Bay may be characterized as hypersaline, particularly in the southern reaches of the Bay (Largier, 1995). Both temperature and salinity values increase from the Bay's entrance into the southern reaches (Katz, 1998).

The San Diego Bay watershed is composed of three main sub-watersheds that include Sweetwater, Otay and Pueblo San Diego for a total land area of 1,144 square kilometers (km^2). Runoff from the watersheds feed into the Bay. The San Diego Bay watershed is highly urbanized and industry dominates the shoreline around the Bay. Much of the bayside is owned and operated by the U.S. Navy. Industries located along the Bay may be divided into maritime, including boatyards and shipyards, aerospace, and various industries, such as power generating plants. San Diego Bay is also valued as a wildlife habitat and refuge for migratory and estuarine birds, endangered species, marine mammals, and as a spawning area for near-shore marine fishes. In addition, San Diego Bay supports many recreational uses including swimming, sport fishing, and recreational boating. Numerous marinas are located throughout San Diego Bay, and

according to the Port's annual pleasure craft survey, approximately 7,295 recreational vessels have a confirmed occupancy in San Diego Bay (Harbor Police, 1999). The major designated beneficial uses of San Diego Bay (and SIYB) include commercial, recreational, wildlife and industrial uses (Regional Board, 1994). Further discussion of beneficial uses is provided in Section 2.2.

SIYB is a semi-enclosed, human-made yacht basin located in the north end of San Diego Bay near the Bay's mouth, which opens to the Pacific Ocean (Calwater ID # 4912.000000). There are approximately ten popular recreational marinas and yacht clubs located in SIYB. SIYB supports the greatest number of moored vessels of all the yacht basins in San Diego Bay. Approximately 2,242 recreational boats are moored at SIYB (Harbor Police, 1999). The SIYB watershed is comprised of a portion of the Pueblo San Diego sub-watershed. There is a total drainage area of 2.64 km^2 directly to the SIYB by way of nine outfalls (City of San Diego, 2003). Land uses are classified as exclusively single family residential (City of San Diego, 2003). The average depth in SIYB is approximately 6 meters. A map of the Basin is provided in Figure 2.2.

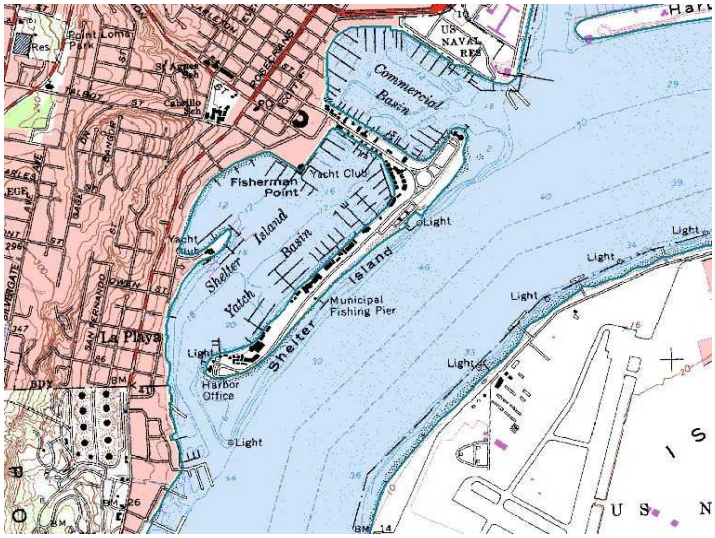

Figure 2.2. Map of the Shelter Island Yacht Basin in San Diego Bay.

Water Quality Standards

Water quality standards consist of water quality objectives and beneficial uses. Water quality objectives are defined under CWC section 13050(h) as "limits or levels of water quality constituents or characteristics which are established for the reasonable protection of beneficial uses of water." Under section 304(a)(1) of the CWA, the USEPA is required to publish water quality criteria that incorporate ecological and human health assessments based on current scientific information (USEPA, 1997). Water quality objectives must be based on scientifically sound water quality criteria (WQC), and be at least as stringent as those criteria.

The USEPA promulgated numeric water quality criteria for priority toxic pollutants, including dissolved copper, in the California Toxics Rule (CTR) (USEPA, 2000b). The passage of the CTR creates "legally applicable water quality standards in the State of California for inland

surface waters, enclosed bays and estuaries for all purposes and programs under the CWA" (USEPA, 2000b). Water quality criteria contained in the CTR for dissolved copper are the same as the national recommended criteria concentration values (USEPA, 1998). Numeric water quality objectives for copper in California are equal to federal water quality criteria as defined in the CTR (USEPA, 2000b).

In accordance with numeric water quality objectives, dissolved copper concentrations in seawater should not exceed 3.1 micrograms/liter (µg/L) for continuous or chronic exposures (not to be exceeded over a four-day average), and 4.8 µg/L for brief or acute exposures (not to be exceeded over a one-hour average). These concentration limits must not be exceeded more than once every three years (USEPA, 1994). The numeric water quality objectives for copper are shown in the table below:

Table 2.1. Numeric Water Quality Objectives for Dissolved Copper.

Exposure	***Water Quality Objective****
Chronic	3.1 µg/L
Acute	4.8 µg/L

*Concentrations should not be exceeded more than once every three years.

In December 2003, the USEPA issued the *Draft Update of Ambient Water Quality Criteria for Copper* (EPA-822-R-03-026), containing updated freshwater and saltwater aquatic life criteria for copper. These criteria revisions are based in part on new data that have become available since the USEPA's last comprehensive criteria updates for copper. In accordance with the CWA, the USEPA must develop, publish, and periodically revise criteria for water quality that accurately reflect the latest scientific knowledge. The USEPA's recommended water quality criteria provide guidance for states and authorized tribes to establish water quality standards under the CWA to protect human health and aquatic life.

For marine organisms, the proposed criteria are more stringent than the current water quality objectives shown in Table 2.1. Should the criteria be adopted and eventually promulgated as numeric water quality objectives in the CTR, the new values would be those shown in Table 2.2.

Table 2.2. Proposed Numeric Water Quality Criteria for Dissolved Copper.

Exposure	**Water Quality Objective***
Chronic	1.9 µg/L
Acute	3.1 µg/L

*Concentrations should not be exceeded more than once every three years.

In addition to numeric water quality objectives, the Basin Plan contains narrative water quality objectives for toxicity and for pesticides. These objectives are applicable to all inland surface waters, enclosed bays and estuaries, coastal lagoons, and ground waters of the San Diego Region (Regional Board, 1994), and are described below:

> **Toxicity Objective**: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by

use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.

Pesticide Objective: No individual pesticide or combination of pesticides shall be present in the water column, sediments, or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.

Water quality objectives must protect the most sensitive beneficial uses of a waterbody. Beneficial uses of San Diego Bay, all of which apply to SIYB, are described in the Basin Plan (Regional Board, 1994), and are listed below:

- Industrial service supply (IND)
- Navigation (NAV)
- Water contact recreation (REC1)
- Non-contact water recreation (REC2)
- Commercial and sport fishing (COMM)
- Preservation of biological habitats of special significance (BIOL)
- Estuarine habitat (EST)
- Wildlife habitat (WILD)
- Marine habitat (MAR)
- Migration of aquatic organisms (MIGR)
- Shellfish harvesting (SHELL)
- Rare, threatened, or endangered species (RARE)

Copper Speciation

Copper is a naturally occurring crustal metal that is ubiquitous in the environment and is found in water, sediment and biota. Copper also tends to be present in both industrial and urban discharges from anthropogenic sources.

Copper exists as a variety of chemical species, or forms, in natural waters that include particulate and dissolved forms (Figure 2.3). The particulate form of copper tends to become bound up in sediment where it may not be bioavailable, and therefore not toxic, to organisms, at least temporarily. Dissolved copper species are comprised of inorganic forms and organic complexes. Organic complexes are formed through complexation with organic molecules naturally found in the environment, such as humic substances and phytoplankton complexes. Copper has a strong affinity for organic molecules, and the predominant form of copper in seawater and estuaries is an organic complex. Inorganic forms include the ionic form (Cu^{2+}) and inorganic complexes, such as hydroxy- and carbonate-copper complexes. Inorganic complexation is fast and can effectively be considered an equilibrium process. The various copper species present in water, and thus toxic to aquatic life, is affected by factors such as pH, alkalinity, and the presence of organic ligands. For example, toxicity decreases with increased organic carbon and alkalinity.

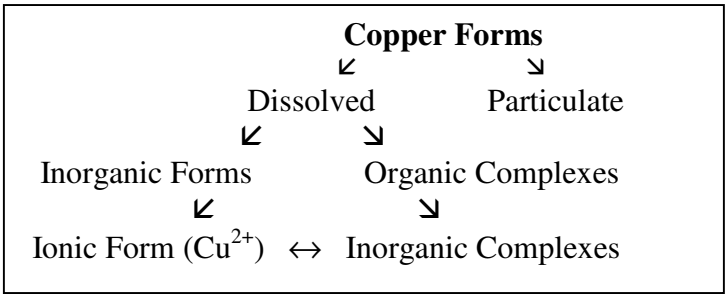

Figure 2.3. Speciation of Total Copper in Seawater.

Copper Toxicity to Aquatic Life

Aquatic life toxicity to copper is influenced by the copper species and complexes it forms. Dissolved copper is more readily available and toxic to aquatic organisms than the particulate form. Of the dissolved copper species, the inorganic or ionic forms tend to be substantially more toxic than organic complexes (USEPA, 1999). Free copper ions and weak inorganic complexes are the forms that most readily assimilate from the water. Copper toxicity can be most closely related to the concentration of free ions and weak inorganic complexes, as compared to the total copper concentration.

Copper concentrations considered protective of human health are much higher than for aquatic life. Copper is a minor nutrient for plants and animals at very low concentrations, however at concentrations not much higher, copper can be toxic to aquatic organisms. Toxicity to aquatic life varies between species and within individual species life stages. The early life stages of fish, bivalves and echinoderms are especially vulnerable to copper contamination (Seligman and Zirino, 1998). Phytoplankton and zooplankton, including bivalve larvae, are the most sensitive organisms to copper toxicity. Saltwater algae have been shown to be adversely affected by exposures of total copper ranging between 5 and 100 µg/L (USEPA, 1986). Aquatic organisms mainly take up copper through dietary exposure. Acute toxicity to saltwater animals has been documented to range from 5.8 µg/L to 600 µg/L total copper for the green crab (EPA, 1986). Oysters and mussels bioaccumulate copper and oysters can become bluish-green through exposure (USEPA, 1986). Under chronic exposure, the bay scallop was killed at 5 µg/L total copper (USEPA, 1986). There does not seem to be evidence of biomagnification up the food chain.

Copper Levels in San Diego Bay

Dissolved copper concentrations are elevated in many locations throughout San Diego Bay, particularly in the southern reaches and enclosed yacht basins (Katz, 1998; VanderWeele, 1996; McPherson and Peters, 1995; Valkirs *et al*., 1994). In a 1998 US Navy study designed to evaluate dissolved copper concentrations throughout San Diego Bay, over half of the samples taken exceeded the numeric water quality objective of 3.1 µg/L (Katz, 1998). In another study that sampled dissolved copper concentrations in the Bay from 1991 to 1993, levels ranged from 2.8 to 5.8 µg/L, with an average of 3.8 µg/L (Valkirs *et al*., 1994). Levels tended to be highest in south San Diego Bay and in the enclosed yacht basins.

Marinas tend to have elevated levels of pollutants in the water column and sediments, including copper. For example, results from the Southern California Bight 1998 regional monitoring study demonstrated that sediment from marinas throughout southern California had consistently elevated copper levels, and demonstrated the highest toxicity of all harbor and ocean strata in the Southern California Bight (Bay *et al.,* 2000). In another study conducted by the Regional Board in 1993 and 1994, dissolved copper concentrations were consistently higher in marina areas than in or near the main channel of San Diego Bay (McPherson and Peters, 1995). Elevated copper levels in marinas may be attributed to a number of factors. High densities of vessels and low hydrologic flushing characterize most marinas, and contribute to significant water quality problems, including increased pollutants in the water column, sediments, and tissues of aquatic organisms.

Sources of copper loading to San Diego Bay were investigated in two comprehensive analyses, one conducted by the US Navy and one by environmental consulting firms, PRC Environmental Management, Inc. (PRC), and Woodward-Clyde (Johnson *et al.,* 1998; PRC, 1997). PRC and Woodward-Clyde were contracted by the TMDL committee of the San Diego Bay Interagency Water Quality Panel to estimate copper loading to the Bay through funding provided under section 205(j) of the CWA. In both the Navy and PRC/Woodward-Clyde studies, the majority of dissolved copper loading to the Bay was attributed to copper-based antifouling paints, specifically from passive leaching and underwater hull cleaning. Antifouling paints are discussed in further detail in Section 4. Additional, but less significant sources of copper to the Bay include urban runoff and direct atmospheric deposition. In the past, waste discharges from boatyards and shipyards were known to be significant sources of copper to San Diego Bay. However, increasing regulations and controls over the past years has dramatically reduced the contribution of copper in boatyard and shipyard discharges.

Copper Levels in Shelter Island Yacht Basin

SIYB supports a high density of recreational vessels in a semi-enclosed, relatively shallow-water area. Concentrations of dissolved copper have been found to be consistently elevated over many years in SIYB (McPherson and Peters, 1995; Valkirs *et al.,* 1994; Johnston, 1990; Krett, 1980). Concentration levels were measured in 1991 through 1993 at SIYB as part of an US Navy study (Valkirs *et al.,* 1994). Researchers found that the mean concentration at SIYB over this time frame was 6.9 µg/L of copper. In another study conducted by the Regional Board in 1994, dissolved copper concentrations were found to be as high as 12 µg/L (McPherson and Peters, 1995). Recent surveys conducted by the Regional Board (2000) documented concentrations averaging as high as 8.0 µg/L of copper (Appendix 6). Elevated dissolved copper concentrations at SIYB are sustained over time through continual source loading mainly from copper-based antifouling paints, poor tidal flushing and low water circulation.

Elevated copper levels in SIYB have been associated with adverse effects on the biota at SIYB in a number of studies. In a 1980 study, investigators found that phytoplankton genera considered sensitive to copper were absent at SIYB, while copper tolerant genera were present (Krett, 1980). Another study documented a decrease in species diversity at SIYB that paralleled an increase in copper levels from the Basin's entrance towards the moored vessels (Johnston, 1990). In 1996, a study was conducted in which mussels were transplanted from a less contaminated site in San Diego to SIYB (VanderWeele, 1996). Researchers found that the mussels rapidly accumulated

copper in tissues to a degree that was proportional to concentration levels in the water column. Results from the State Mussel Watch Program also documented elevated copper levels in transplanted mussels at SIYB in 1987 and 1993 (State Board, 1995). Mussels are commonly used as biological indicators of water quality.

In order to provide more information about the levels of dissolved copper and the potential for toxicity to aquatic life in SIYB, the Regional Board conducted a sampling survey in the spring of 2000. Water column samples were obtained and analyzed for dissolved copper in May and June of 2000. Samples were analyzed using low detection methods of analysis. Results clearly demonstrate a copper concentration gradient at SIYB, with levels increasing from the entrance into the inner reaches (Appendix 6). The higher concentrations were associated with areas of greater boat density and reduced tidal flushing, as was expected. Concentration levels in north San Diego Bay near the mouth of SIYB (station G) averaged 1.5 µg/L of copper. Concentrations increased in the inner reaches of SIYB (station A) to average 8.0 µg/L of copper consistently over both sampling dates. These levels exceed the CTR water quality criterion for dissolved copper in seawater of 3.1 µg/L. As part of the study, developmental toxicity testing also was performed on the mussel, *Mytilus edulis*, using one water column sample taken from the inner portion of SIYB (station A) and one sample from the Bay near the entrance of SIYB (station G). Toxicity was observed in the laboratory on samples taken from the high concentration station A, but toxicity was not seen on the low concentration station G (toxicity testing was not preformed on the other stations). While the results of this test showed that toxicity did occur at the high concentration station, the test does not identify the cause of the toxicity. A diagram of the sampling stations and results of the water column survey are presented in Appendix 6.

3. Numeric Target

When calculating TMDLs, numeric targets are established to meet water quality objectives and ensure the protection of beneficial uses. The numeric targets for the SIYB TMDL were set equal to numeric water quality objectives for dissolved copper, as defined by the USEPA in the CTR to protect marine aquatic life from toxicity. These numeric targets should also ensure that the narrative water quality objectives for toxicity and pesticides due to copper exposures are met in the water column. The numeric target for dissolved copper is 3.1 µg/L for continuous or chronic exposure (4-day average) and 4.8 µg/L (1-hour average) for brief or acute exposures.

Table 3.1. Numeric Targets.

Exposure	Water Quality Objective*	Numeric Target*
Chronic	3.1 µg/L	3.1 µg/L
Acute	4.8 µg/L	4.8 µg/L

* Concentrations should not be exceeded more than once every three years.

As discussed in Section 2, the USEPA is considering adopting new aquatic life criteria for dissolved copper that are more stringent for marine organisms than the current values. Should the proposed aquatic criteria be adopted and eventually promulgated in the CTR in the form of legally applicable numeric water quality objectives, the numeric targets used in this TMDL would also be changed. If the water quality objectives for copper change in the future, as in the

case of a site-specific objective for copper in SIYB, then the TMDL would be recalculated and the new numeric target would be equal to the new water quality objective for chronic exposure.

4. Source Analysis

The source analysis section describes and quantifies the sources of dissolved copper to SIYB. In this analysis, dissolved copper was determined to enter SIYB primarily from passive leaching of copper-based antifouling paints applied to the hulls of recreational vessels moored in the Basin. Additional, albeit less significant sources of copper include boat hull cleaning of copper-based antifouling paint, natural background, urban runoff and direct atmospheric deposition. Passive leaching and hull cleaning are currently unregulated sources of pollution to surface waters. Urban runoff is regulated as a point source under one or more National Pollutant Discharge and Elimination System (NPDES) orders. In the source analysis sediment was determined to have a tendency to bind copper from the water column and act as a sink rather than a source of copper.

In quantifying source loading estimates, a number of assumptions were made throughout the source analysis, and are detailed in Appendix 1. The calculations used to generate current mass loading estimates are contained in Appendix 2. Figure 4.1 diagrams the sources and directions of flow of dissolved copper into and out of SIYB.

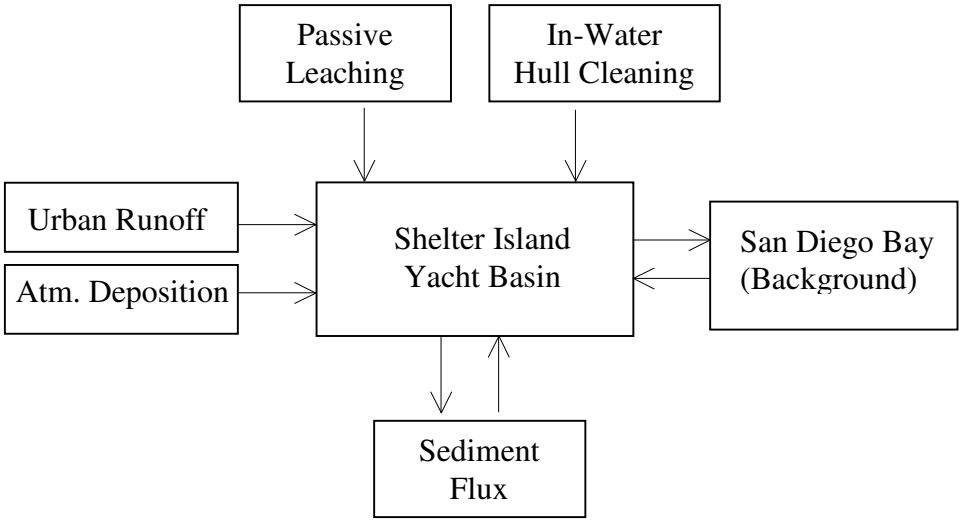

Figure 4.1. Sources of Dissolved Copper to Shelter Island Yacht Basin.

Passive Leaching

Antifouling paints applied to recreational vessels throughout California and the nation typically rely on copper as the toxic component to prevent marine fouling. While less toxic alternatives to copper antifoulants are available on the market, their use tends to be limited. Copper-based antifoulants are registered as pesticides with the California Department of Pesticide Regulation (DPR). These paints act as pesticides by leaching copper from vessel hulls directly into the water column to slow marine fouling. Copper from the paints generally enters the water column through two routes: passive leaching and underwater hull cleaning. Passive leaching from

copper-based antifouling paints is by far the most significant source of dissolved copper to both San Diego Bay (PRC, 1997) and SIYB (as determined in this analysis).

Conventional copper-based antifouling paints fall into two general categories: ablative paints and contact leaching paints (Conway and Locke, 1994). Ablative paints, also known as soft sloughing paints, are designed to erode when a vessel is moving and leach copper into the water column when a vessel is docked. The rate ablative paints leach copper is designed to be constant over the life of the paint. Contact leaching paints, or hard paints such as epoxy, however, are designed to have much higher copper release rates following initial application in order to preserve effectiveness and increase the longevity of the paint. Over the lifetime of the two paint types, leaching rates of ablative paints are estimated to be higher than contact leaching paints, by as much as 50 percent (Conway and Locke, 1994). According to representatives at a large-scale boating store located in Southern California, hard antifouling paints may be best suited for boats that are regularly moored in the water, which includes the majority of vessels at SIYB (West Marine, 2001). Furthermore, due to restrictions on air emissions of volatile organic carbons, ablative (soft-sloughing) paints are typically not applied to recreational vessels in boatyards in California. The vast majority of antifouling paint used on recreational vessels in San Diego Bay is hard paint, such as epoxy and vinyl (Johnson and Miller, 2002a).

Passive leaching rates from copper-based antifouling paints are dependent on a number of factors, including the type of paint, copper content, age of the paint, time since last hull cleaning, and frequency of painting. In San Diego Bay, painting frequency of recreational vessels generally ranges from one to three years, with most boats repainted on average every two years (Johnson *et al.,* 1998; Conway and Locke, 1994; Carson report*.,* 2002). Leaching rates also vary with environmental conditions such as pH, temperature and existing slime layer.

Rates of passive leaching of dissolved copper from copper antifoulants on recreational vessels were investigated in studies conducted in Southern California by the US Navy. Researchers with the US Navy conducted *in situ* studies on seven recreational vessels in San Diego Bay in October 1999 using a re-circulating dome system to estimate passive leaching rates (Valkirs *et al*., 2003).[4] All of the boats were painted with epoxy copper antifouling paints. The release rates of copper were estimated to range from 2-14 micrograms/square centimeters/day ($\mu g/cm^2/day$), with an average leaching rate of approximately 8.2 $\mu g/cm^2/day$. Neither the frequency of hull cleaning, nor the type nor age of the paint was known in the study. These factors may affect passive leaching rates from the vessels (Valkirs *et al*., 2003).

In another study conducted in Southern California, researchers with the Southern California Coastal Water Research Project (SCCWRP) investigated the environmental impacts associated with the use of copper-based antifouling paints. Funding for this research was provided by the State Board through the USEPA's 319(h) Nonpoint Source Implementation Grant Program, as well as through funds provided by the DPR. The study objective was to measure the mass emissions of dissolved copper from both passive leaching and underwater hull cleaning of copper-based antifouling paints on recreational vessels. In order to estimate emission rates,

[4] In the 2002 draft version of the Technical TMDL Report, the Valkirs *et al*., 2003 study was not yet available. However, the data from the study was available, and was referenced as Seligman *et al.*, 2001.

fiberglass panels were painted with copper-based antifouling paints and immersed in seawater in a harbor environment. The fiberglass panels were designed to simulate recreational vessel hulls, and passive leaching rates were estimated from the panels over time (Schiff *et al*., 2003). Measurements were made using the re-circulating dome system developed by the US Navy (Schiff *et al*., 2003). This was the same measurement technique used in the Valkirs *et al.* study to measure passive leaching rates on recreational vessels. SCCWRP researchers determined the average monthly flux rates for epoxy and hard vinyl copper antifouling paints to be approximately 4.3 and 3.7 $\mu g/cm^2/day$, respectively. Epoxy and hard vinyl copper antifouling paints are the two paint types most commonly applied to recreational vessels in San Diego Bay (Johnson and Miller, 2002a).

Both the US Navy (Valkirs *et al*., 2003) and SCCWRP (Schiff *et al*., 2003) studies estimated passive leaching rates for copper-based antifouling paints. Identical analytical techniques (*in situ* measurements using a re-circulating dome system) were used in the studies to measure passive leaching rates, and for this reason the studies were considered comparable in this analysis. However, the studies differ in a number of ways. In the SCCWRP study, fiberglass panels were used to simulate boat hulls, whereas in the US Navy study, data was collected on actual boat hulls. The behavior of epoxy paints may be different on the fiberglass panels compared to boat hulls. Also, in the SCCWRP study, the rate of passive leaching was measured several times over a one-month time period, beginning one day after hull cleaning. Over the course of the month, the passive leaching rate was defined by integrating the area under the curve generated from all the data points. In contrast, the US Navy looked at a "snapshot" of passive leaching rates for epoxy paints. An overall leaching rate was estimated by averaging the instantaneous rates measured on seven different boats. In addition, in the SCCWRP study, time since hull cleaning was known and factored into the analysis, whereas it was not in the US Navy study. Furthermore, the US Navy study estimated rates of leaching for epoxy copper antifouling paints, whereas the SCCWRP study estimated rates for both epoxy and vinyl paints.

In the SCCWRP study, the authors provided a discussion about the comparability of the results from the US Navy and SCCWRP studies (Schiff *et al*., 2003). According to the authors, the range of passive leaching measurements from the US Navy study was within the range of measurements from the SCCWRP study (Schiff *et al*., 2003). Therefore, the passive leaching rates determined in the two studies were concluded to be comparable, despite the fact that the US Navy study reported the rate as approximately twice the rate determined in the SCCWRP study.

After consultation with the principal authors of both studies, results from the US Navy and SCCWRP studies were combined to calculate a passive leaching rate for use in this analysis (Schiff, 2003a and Valkirs, 2003a) (Appendix 2). The results were combined to maximize the use of available data. Combining the data was considered appropriate since the analytical techniques used to measure emission rates were identical in the two studies. However, combining the data also increases the margin of error associated with the final value. Nonetheless, that the benefits of combining the results of the two studies outweigh the limitations. The passive leaching rate for vessels at SIYB was determined to be 6.5 $\mu g/cm^2/day$. This rate was used to calculate the annual loading of 2,000 kg/year of dissolved copper into SIYB from passive leaching (Appendix 2).

Underwater Hull Cleaning

Underwater hull cleaning of copper antifoulants is the second greatest source of dissolved copper to SIYB, although it is much less significant in magnitude than passive leaching, as determined in this analysis. Underwater hull cleaning is a common maintenance practice designed to remove the buildup of marine organisms on a vessel's hull. Although antifouling paints are effective at slowing growth, some growth does occur which will build up over time. This growth may be removed from recreational vessel hulls either through haul-out at a boatyard, or manually while the boat is in the water using underwater hull cleaning techniques. The majority of the pleasure crafts in the Bay are estimated to undergo periodic underwater hull cleaning (Conway and Locke, 1994). Similar to passive leaching, underwater hull cleaning is not currently subject to waste discharge requirements, and is an unregulated source of surface water pollution. Both underwater hull cleaning and passive leaching are sources of copper to SIYB that result from the use of copper antifoulants on recreational vessels in the Basin.

The physical process of removing marine growth on a vessel's hull while underwater results in a release of dissolved copper into the environment from copper-based antifouling paints. The amount of copper released is dependent on cleaning frequency, method of cleaning, type of paint, and frequency of painting. For regularly maintained recreational boats underwater hull cleaning takes place in San Diego Bay about once a month, or 14 times a year (Carson report., 2002). Painting frequency varies from one to three years, with most vessels repainted every two years (Conway and Locke, 1994 Johnson *et al.,* 1998). A recent study found that more abrasive cleaning techniques tend to release more copper into the environment, depending on the paint type (Schiff *et al*., 2003). In 1999, the state of Washington, through the departments of Natural Resources and Ecology, issued an advisory prohibiting underwater hull cleaning of ablative paints (Washington State Department of Ecology, 1999a). The prohibition was based on findings that soft paints contribute to contaminated sediments, dissolve quickly and do not last as long as hard paints (Washington State Department of Ecology, 1999a; Washington State Department of Ecology 1999b). Currently, there are no known published studies that quantitatively compare release rates based on paint age. That more frequently painted vessels with higher copper content paints will release more copper during hull cleanings is a reasonable assumption.

A study was conducted by US Navy researchers to investigate the environmental impacts associated with underwater hull cleaning of Navy vessels in San Diego Bay (Valkirs *et al.,* 1994). Researchers found that underwater hull cleaning resulted in elevated total copper (both dissolved and particulate) concentrations near the vicinity of the operation. Dissolved copper was released during and shortly after hull cleaning. Smaller amounts of dissolved copper also leached from debris and sediments after the cleaning ended. The particulate form of copper was rapidly incorporated into the bottom sediment, likely rendering it unavailable to water column organisms. The biologically active species of copper complexed rapidly, and dissolved copper levels returned to pre-cleaning conditions within minutes to hours after the hull cleaning ended. The authors concluded that potential adverse effects of hull cleaning on water column organisms from the increased dissolved copper concentrations were relatively short-term and pulsed in nature. Another conclusion was that the potential adverse effects of increased particulate copper

were probably long-term in nature, and dependent on re-suspension or sediment uptake from benthic organisms.

The Regional Board also conducted a study on the effects of underwater hull cleaning on copper water column concentrations and aquatic life toxicity (McPherson and Peters, 1995). In the study, an underwater hull cleaning operation was performed in SIYB using Management Practices (MPs) that involve less abrasive techniques (i.e., hand-wiping with a soft cloth) to remove fouling growth. The operation was performed on one vessel that was considered representative of those in SIYB in terms of size and degree of fouling growth. However, neither the type (hard versus soft paints) nor age of the paint was known. The majority of copper released during the cleaning was found to be in the form of dissolved copper. Prior to the hull cleaning, dissolved copper concentrations in the vicinity of the boat averaged 12 µg/L. During the hull cleaning, average concentrations increased from 12 µg/L to 56 µg/L of copper. Concentration levels decreased to 17 µg/L of copper within five minutes after the cleaning ended, and returned to pre-cleaning levels within ten minutes. Researchers found that the copper contaminant plume moved with the current, and that the degree of plume contamination was dependent upon fouling extent and exertion by the diver (McPherson and Peters, 1995). Based on the results, the authors concluded that underwater hull cleaning generates elevated concentrations in the vicinity of the operation, which return to background levels within minutes. The researchers did not identify the type of antifouling paint (ablative or contact leaching paint) or age of the antifouling paint on the vessel, or the time since last hull cleaning. While the study provided important information regarding impacts of underwater hull cleaning on water quality, it did not provide copper emission rates associated with hull cleaning.

A more recent study was conducted by SCCWRP in Southern California to estimate dissolved copper emissions rates associated with underwater hull cleaning. Fiberglass panels were painted with copper antifoulants to simulate the hulls of recreational vessels (Schiff *et al*., 2003). The study objective was to estimate the flux rates of dissolved copper from underwater hull cleaning of two commonly used types of copper-based antifouling paints in San Diego Bay. Researchers found that hull cleaning using MPs generated 8.6 micrograms/square centimeter/event ($\mu g/cm^2$/event) of copper for epoxy paint, and 3.8 $\mu g/cm^2$/event of copper for hard vinyl paint (Schiff *et al*., 2003). For epoxy paints, cleaning without MPs doubled the dissolved copper flux, from 8.6 $\mu g/cm^2$/event to 17.4 $\mu g/cm^2$/event. The flux rate from hard vinyl paints remained about the same, from 3.8 $\mu g/cm^2$/event with MPs to 4.2 $\mu g/cm^2$/event of copper without MPs. The study concluded that on the days when vessels are cleaned, underwater hull cleaning results in a greater daily load of copper to the environment than passive leaching. However, since hull cleaning is performed only once a month on average, passive leaching results in a much greater flux of dissolved copper into the environment. In terms of mass loading, the authors concluded that approximately 95 percent of dissolved copper from antifouling paint enters the environment via passive leaching, and only five percent enters from hull cleaning. The underwater hull cleaning rates from this study were used to determine the copper load to SIYB from hull cleaning, calculated to be roughly 100 kg/year. (Appendix 2).

Urban Runoff

Urban runoff is another source of dissolved copper to SIYB. Urban runoff discharges are regulated by the Regional Board through the issuance of waste discharge requirements subject to NPDES regulations. Urban runoff is regulated as a point source discharge due to its release from channelized, discrete conveyance pipe systems, or outfalls (Regional Board, 2000a). The City is responsible for urban runoff discharges into its storm water conveyance system and into SIYB under Regional Board Order No. 2001-01, "Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems." Furthermore, the City is responsible for meeting NPDES discharge requirements and conditions for urban runoff discharges from its storm water conveyance system.

Urban runoff is comprised of wet weather flow, or storm water, and dry weather flow. Wet weather flow is the result of runoff from precipitation events. As runoff travels along its drainage path, it serves to convey untreated pollutants that are discharged into surface waters through storm drains. On the other hand, dry weather flows occur in the absence of storm events, and are often referred to as nuisance or base flows. Dry weather flows may result from irrigation runoff, car washing activities, groundwater seepage into the storm water conveyance system, indirect connections, and direct illicit connections (Regional Board, 2000b; USEPA, 1983). Sources of copper in urban runoff discharge to San Diego Bay include brake pads, tires, water pipe leaching, architectural structures, and industrial sources (Woodward Clyde, 1997). Brake pads may account for up to 63 percent of the copper in urban storm water runoff (Woodward Clyde, 1997).

The watershed or drainage area of SIYB was characterized and mapped by the City, as shown in Figure 4.2 (City of San Diego, 2000a; City of San Diego, 2003). Total drainage area was determined to be approximately 3.15 km^2 (753 acres), while land use was classified as approximately 95 percent single-family residential (City of San Diego, 2003). . The runoff coefficient varied between 0.55 and 0.85, depending on land-use type (City of San Diego, 2003). In general, runoff coefficients represent the degree of imperviousness of the watershed, or the fraction of rainfall that is converted into runoff (Schueler, 1987). A map of the drainage area for the SIYB watershed is shown in Figure 4.2. The map depicts the drainage areas to each of the nine outfalls draining directly to the Basin.

Source: City of San Diego (2003).

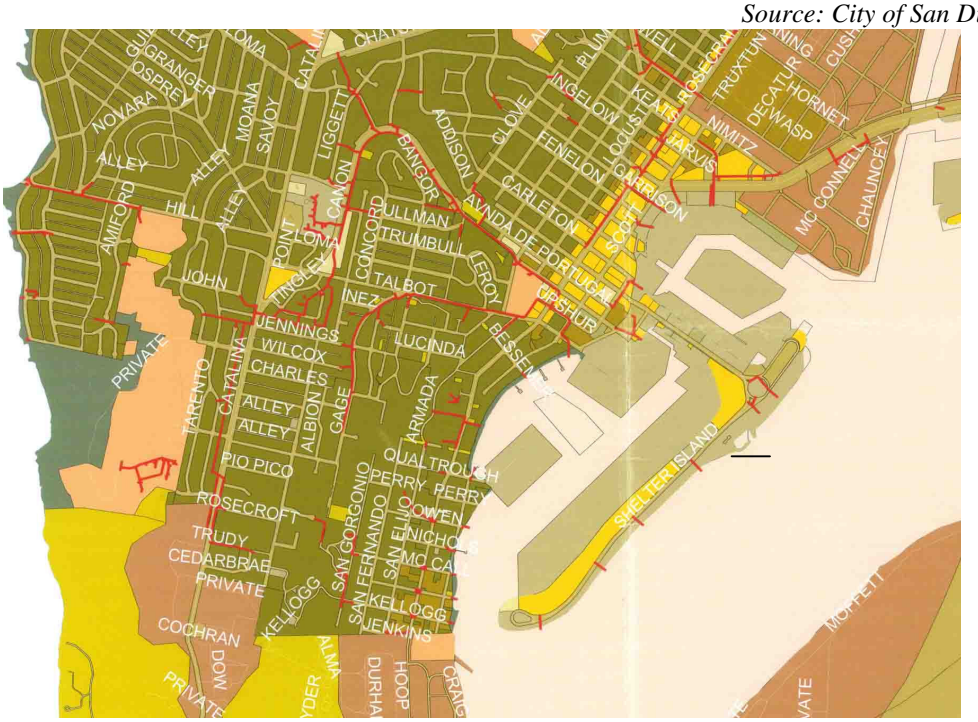

Figure 4.2. Drainage Area of the Shelter Island Yacht Basin.

Information regarding wet weather flow was obtained through data provided by the City in their annual Storm Water Monitoring Report, pursuant to Regional Board Order No. 2001-01 (City of San Diego, 2000a). The average measured concentration of an urban pollutant in runoff from a storm event is known as the event mean concentration (EMC) (Schueler, 1987). The EMC is defined as the total pollutant load divided by the total runoff volume generated by a storm (Woodward Clyde, 1999). EMC values were determined based on direct measurements of pollutant concentrations in flow-weighted composite samples from residential land use monitoring stations located throughout the county of San Diego. The average five-year residential land use EMC was calculated by averaging storm event EMCs from monitoring data collected from 1994/95 to 1998/99. This monitoring data included sampling results taken from the first two storm events of each wet weather season. Using this information, the average total copper EMC for runoff from residential land uses within the County of San Diego was determined to be 34 µg/L (City of San Diego, 2000a). After applying a dissolved copper conversion factor of 0.96 to the total copper EMC, the average dissolved copper EMC was determined to be approximately 32.6 µg/L (see Appendix 2 for calculations) (USEPA, 1996; USEPA, 2000b).

Information on pollutant concentrations in dry weather flows throughout California is limited. Not surprisingly, information on illegal discharges is essentially absent (Woodward Clyde, 1997). That dry weather flow can be a significant contributor of pollutants to receiving waters however, is known. In a 1987 study in Sacramento, California, close to half of the runoff from storm drains could not be attributed to precipitation (USEPA, 2000a). More information is needed on dry weather flows to better estimate dissolved copper concentrations.

Based on the limited data currently available and the knowledge that dry weather flows may contribute approximately half of the total flow discharged from storm water conveyance systems, dry weather flows to the SIYB were conservatively estimated to be equal to wet weather flows.

The dissolved copper load from urban runoff to SIYB was estimated to be roughly 30 kg/year (Appendix 2).

Background

All sources of dissolved copper into SIYB were considered in the analysis, including natural background sources of dissolved copper found in ambient seawater. SIYB is located in north end of San Diego Bay near its mouth, which opens to the Pacific Ocean. San Diego Bay water serves to flush SIYB and decrease the concentration of dissolved copper. Measurements of dissolved copper concentrations in San Diego Bay taken by the US Navy were used to characterize background conditions, and averaged 0.5 µg/L (Chadwick, 2002b). In order to estimate loading from ambient seawater and background conditions, a "box model" was developed based on mass balance principals to describe the fate and transport of copper into and out of SIYB (Chadwick, 2002b). The model was used to estimate background loading as well as the assimilative capacity of copper in the Basin (Section 5.0). The model and its derivation, including a discussion of the model's assumptions and limitations, are provided in Appendix 3.

The copper load from background to SIYB was estimated to be roughly 30 kg/year (Appendix 3).

Direct Atmospheric Deposition

Atmospheric deposition is another potential source of copper to SIYB. Copper in the atmosphere enters SIYB via direct and indirect deposition. Indirect atmospheric deposition occurs when dissolved copper enters the watershed that drains to SIYB. Indirect deposition is a component of urban runoff to SIYB, and is already accounted for in the urban runoff source analysis. Therefore, this section will only address direct atmospheric deposition. Direct atmospheric deposition results from both wet and dry deposition directly to the surface of the waterbody.

Direct atmospheric deposition rates of trace metals have been investigated in limited studies in California. Atmospheric deposition rates of trace metals, including copper, were determined for the San Francisco Estuary in a pilot study conducted in 1999 and 2000 (Tsai *et al.,* 2001). Direct wet and dry atmospheric deposition of copper to the estuary was found to represent a minor contribution to the total copper load (less than ten percent). In a study in southern California, atmospheric deposition of copper was calculated for Santa Monica Bay and the Santa Monica Bay watershed (Stolzenbach *et al.,* 2001). Copper atmospheric deposition was determined through a combination of direct and indirect methods to determine contaminant loading. Researchers found that atmospheric deposition, primarily through daily dry deposition, was a significant contributor of nonpoint source pollutant loading to Santa Monica Bay.

Information on atmospheric deposition of metals to the San Diego Region is not currently available, and more research is needed to characterize this source of loading. In an analyses of copper source loading to San Diego Bay, direct atmospheric deposition of dissolved copper was

determined to be negligible compared to other sources (Johnson *et al*., 1998; PRC, 1997). Direct atmospheric deposition of copper is expected to be insignificant to SIYB compared to other sources, in part due to the small surface area of the Basin. Direct atmospheric deposition to SIYB was calculated based on the results of the Santa Monica Bay study, and was found to be approximately 3 kg/year of copper to SIYB (Appendix 2). Therefore, direct atmospheric deposition of dissolved copper to SIYB was concluded to be negligible compared to estimations of copper loading from all other sources.

The total copper load from direct atmospheric deposition to SIYB was estimated to be roughly 3 kg/year (Appendix 2).

Sediment

Copper in the water column will tend to settle and can accumulate in sediment through adsorption or by partitioning in pore water. In this way, sediment acts as a "sink" for copper in the water column, and concentration levels can build up and persist over time. The rate of contamination of sediment is dependent on a variety of factors including sediment type and quality, organic matter content and the degree of contamination in the water column and associated sediment. Some of the copper adsorbed to sediment or sequestered in pore water may not be bioavailable for uptake by organisms in the water column, however, and may be rendered essentially nontoxic to these organisms. Nonetheless, as sediment copper concentrations increase, so does the potential for adverse impacts to aquatic benthic life. Copper in sediment may buildup to levels toxic to aquatic life such that costly remediation, i.e., dredging, is required to remove the contamination.

Sediment can also act as a source for copper in the water column. For example, copper associated with sediment can become re-suspended into the water column, such as through ship movements or by becoming stirred up by benthic organisms. Furthermore, as sediment concentration levels of copper increase, so does the potential for flux out of the sediment into the surrounding water column, leading to elevated dissolved copper concentrations.

Information on sediment flux rates is available throughout San Diego Bay, although rates are limited for SIYB. In a copper loading analysis study on San Diego Bay, average flux rates from sediment to the water column were estimated to be about six percent of the total load (PRC, 1997). However, this analysis did not take into account the flux rate from the water column to the sediment. The US Navy has collected more extensive data on net flux rates throughout the Bay. Using an instrument known as a "Benthic Flux Chamber," investigators evaluated the net exchange rate of copper between the sediment and water column. Analyses showed that, on average, the net loss of copper from the water column to the sediment is approximately four to seven percent per day throughout the Bay (Chadwick, 2002). Flux rates vary from this average depending on site-specific environmental conditions. Based on US Navy research, sediment generally acts as a sink for copper in San Diego Bay. Additionally, researchers concluded that approximately half of the copper load in San Diego Bay is flushed to the ocean, and half is deposited to the sediment (Chadwick, 2002).

There is direct evidence that suggests that sediment at SIYB acts a sink for copper from the water column. Sediment at SIYB is composed of a relatively high percentage of clay, which has

a tendency to bind copper (Valkirs *et al*., 1994). The US Navy has gathered some sediment flux data in the SIYB using the Benthic Flux Chamber, and documented negative flux rates. In other words, under current conditions of high anthropogenic copper loading at SIYB, copper is highly likely to move from the water column to the underlying sediment (Valkirs *et al.*, 1994).

Copper contamination to sediment at SIYB is a concern due to the potential for adverse effects on aquatic benthic life. In order to evaluate chemicals of concern such as copper, sediment quality guidelines (SQGs) have been developed by the National Oceanic and Atmospheric Administration (NOAA) to help identify concentration levels that may warrant further study (Long and MacDonald, 1998). These informal guidelines are based on empirical analyses of chemical and biological data from a nationwide database. SQG are used throughout the nation to help rank and prioritize sites and chemicals of concern (NOAA, 1999). They include an Effects Range Low (ERL), identified as the lower 10th percentile of available sediment data for toxic samples, and an Effects Range Medium (ERM), or the 50th percentile (median) of available sediment data for toxic samples (NOAA, 1999, Buchmann, 1999). Concentrations below the ERL represent a range where adverse effects are rarely observed, or may be observed in sensitive organisms (NOAA, 1999). Concentrations above or equal to the ERL, but below the ERM, represent a range where adverse effects occasionally occur (NOAA, 1999). Concentrations above the ERM are frequently toxic (NOAA, 1999). ERLs/ERMs were developed for a variety of constituents, including copper sediment contamination in seawater. The ERL for copper is 34 milligrams/kilogram (mg/kg), which corresponds to a 29 percent incidence of adverse biological effects, as shown in Table 4.1 (NOAA 1999). The ERM for copper is 270 mg/kg, which corresponds to an 84 percent incidence of adverse biological effects, as shown in Table 4.1 (NOAA 1999).

Table 4.1. Sediment Quality Guidelines for Copper.

ERL	Incidence of Probable Biological Effects	ERM	Incidence of Probable Biological Effects
34 mg/kg	29%	270 mg/kg	84%

There have also been some limited investigations into copper sediment concentrations at SIYB. US Navy researchers measured copper concentrations in sediment at SIYB, and found that they were relatively high compared to other areas in San Diego Bay (Valkirs *et al*., 1994). In the sample analysis conducted on two occasions in 1991 and one in 1993, sediment levels at a station in SIYB were between the ERL and ERM, from 133 to 212 mg/kg. In another study conducted as part of the Bay Protection and Toxic Cleanup Program (BPTCP), copper sediment chemistry levels and toxicity were evaluated at SIYB (SWRCB *et al.,* 1996). Three stations were sampled for sediment chemistry at SIYB from 1993 to 1994, and levels were found to range from 86 mg/kg to 150 mg/kg. In addition, toxicity testing was performed on sediment from SIYB, and the results yielded observed toxicity. Additional data on copper concentrations at SIYB was gathered and analyzed by researchers at the Scripps Institute of Oceanography, in conjunction with the US Navy, and presented in a preliminary report (Gieskes *et al.,* 2002). In this study, copper sediment concentrations collected at four stations in SIYB were found to range from just over the ERL, to levels greater than the ERM. No data was obtained in any of the studies on benthic community structure at SIYB. While reducing copper in the water column at SIYB is expected to also reduce the rate of sediment contamination, copper in the sediment tends

to buildup and persists over time. More information is needed to accurately assess the impacts of copper contamination on sediment and benthic life at SIYB.

Furthermore, although sediment is believed to act as a net sink for copper under current conditions, sediment could become a net source of copper during a period of low loading at SIYB. When copper in the water column is decreased, the net exchange of copper to the water column from historically contaminated sediments may prove to be significant. If copper in sediment is re-suspended and acts as a net source to the water column, meeting the numeric target at SIYB may take longer than anticipated.

Due to the tendency of sediment to act as a sink for copper under current external loading conditions, the copper load from sediment to the water column was assumed to be zero in this analysis. The contribution of sediment to copper concentrations in the water column will probably need to be reassessed in the future to determine if sediment will act as a more significant source, once primary sources such as copper-based antifouling paints have significantly decreased.

The current copper load from sediment to SIYB was assumed to be 0 kg/year (Appendix 2).

Summary of Loading Estimates

In summary, approximately 98 percent, or 2,100 kg/year, of dissolved copper loading to SIYB was determined to originate from copper-based antifouling paints applied to recreational vessels moored in the marina. The most significant individual source of dissolved copper is from passive leaching of copper-based paints, accounting for approximately 2,000 kg/year or 93 percent of total loading. The second most significant source comes from underwater hull cleaning, accounting for approximately 100 kg/year of copper, or five percent of loading. Urban runoff (including indirect atmospheric deposition) accounts for approximately 30 kg/year of copper, or one percent of total loading. Background loading amounts to approximately 30 kg/year of copper, or one percent of total loading. In addition, direct atmospheric deposition was determined to contribute approximately 3 kg/year of copper or less than one percent of total loading. Furthermore, sediment was found to act as a sink, rather than a source of dissolved copper to SIYB. No other sources of dissolved copper to the SIYB were identified. A summary of the results of the source loading analysis is presented in Table 4.2 and Figure 4.3. The values are presented as rough approximations to reflect the degree of uncertainties and assumptions in the calculations. These calculations are contained in Appendices 2 and 3.

Table 4.2. Summary of Dissolved Copper Sources to SIYB.

Source	Mass Load (kg/year)	Percent Contribution (% Copper)
Passive Leaching	2,000	93
Hull Cleaning	100	5
Urban Runoff	30	1
Background	30	1
Direct Atmospheric Deposition	3	<1
Sediment	0	0
Combined Sources	2,163	100

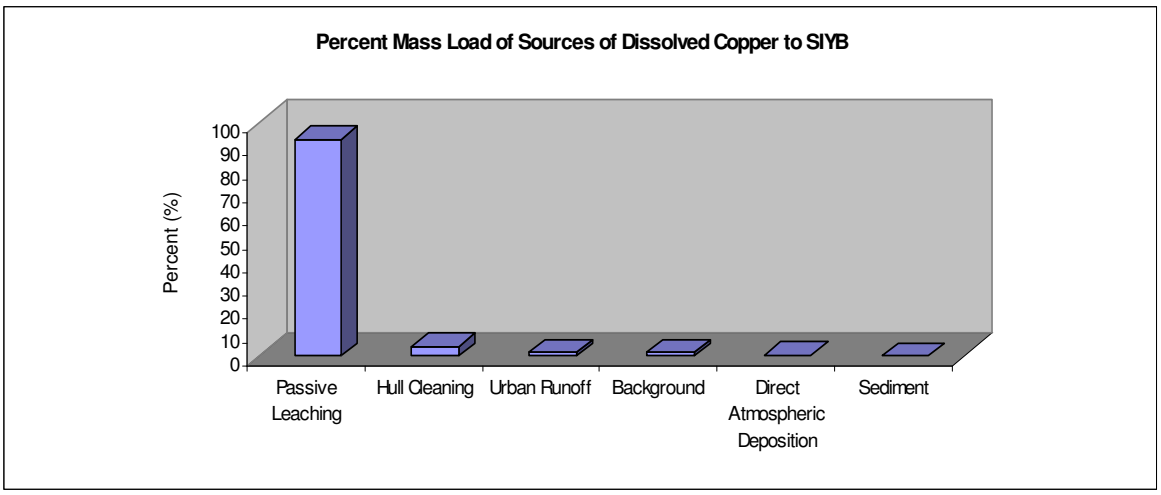

Figure 4.3. Percent Mass Load of Sources of Dissolved Copper to SIYB.

5. Linkage Analysis

The technical analysis of copper loading to SIYB and the waterbody response to this loading is referred to as the linkage analysis. The analysis results in the calculation of the total allowable copper loading to SIYB and the associated reductions in current loading from individual sources needed to meet water quality standards. Because the TMDL numeric targets are set equal to the numeric water quality objectives for copper, attainment of the numeric targets will result in attainment of water quality standards the water column at SIYB.

The linkage analysis describes the relationship between the numeric target and attainment of water quality standards by defining the waterbody's total assimilative capacity, or loading capacity, for the pollutant. The loading capacity is equal to the TMDL and represents the maximum amount of pollutant loading the waterbody can support and still maintain water quality standards. The linkage analysis therefore is the critical quantitative link between the TMDL and attainment of water quality standards.

At SIYB, the loading capacity is the maximum amount of dissolved copper that can enter the Basin and remain in the water column without exceeding the numeric target. Loading capacity at SIYB is a function of the different hydrodynamic processes that affect the environmental fate and transport of dissolved copper as it moves through the system. These processes include the circulation in SIYB, tidal flushing, chemical reactions, biological uptake, and sediment flux.

An accurate determination of loading capacity is dependent upon an understanding of the relationship between mass loading and movement of copper in these various hydrodynamic processes. In order to determine the loading capacity, a "box model" was developed for SIYB based on general mass-balance principles describing copper fate and transport. This model was developed by the US Navy's Space and Naval Warfare Systems Command (SPAWAR) for use by the Regional Board (Chadwick, 2000b). The box model was used to generate a theoretical maximum loading capacity, or TMDL, for the system to meet the numeric target, and hence attain water quality standards. If the water quality objectives for copper change in the future, as in the case of a site specific objective for copper in SIYB, the numeric target would be equal to the new water quality objective, and a new loading capacity would be calculated to meet the new numeric target. The TMDL was allocated among the various identified sources, as discussed in Section 7.

The box model results are dependent on certain input values, such as numeric targets, measured copper concentrations inside and outside SIYB, and salinity measurements to quantify local dispersion. In the model, the numeric target was set equal to water quality criteria designed to protect marine aquatic life from chronic exposures to dissolved copper (3.1 µg/L). Water quality criteria are intended to protect the most sensitive species throughout the year. Therefore, once the numeric targets are met, water quality objectives for dissolved copper are expected to be met, and associated beneficial uses in SIYB will be attained.

The derivation of the governing equations used in the box model, as well as a discussion of the model's input parameters and limitations is provided in Appendix 3. The box model also has several built-in assumptions, which are also discussed in Appendix 3.

6. Margin of Safety

The TMDL must contain a margin of safety (MOS) to account for uncertainty in the analysis. The MOS for the SIYB TMDL is both explicit as well as implicit. The explicit MOS was calculated by taking ten percent of the total loading capacity as generated by the box model. This was done to account for uncertainty associated with the calculations in the source analysis and linkage analysis. The explicit ten percent MOS was determined to be 57 kg/year of copper (Appendix 4). If the water quality objectives for copper should change in the future, as in the case of a site specific objective for copper in SIYB, then the TMDL would be recalculated and the new explicit MOS would be equal to 10 percent of the recalculated loading capacity.

In addition to an explicit MOS, an implicit MOS was incorporated into the TMDL through conservative assumptions made in the source analysis (Section 4, Appendix 1). For example, in the source estimates for passive leaching and underwater hull cleaning, a conservative assumption was made that all of the slips in marinas are always occupied. Furthermore, the dry

weather flow component of urban runoff to the SIYB was conservatively estimated to be equal to wet weather flows. These assumptions are conservative in that they were designed to be protective of water quality.

7. Total Maximum Daily Load and Allocations

In order to attain the numeric target, the loading must be less than or equal to the TMDL. The TMDL is divided into a total wasteload allocation (WLA) that specifies the amount of allowable loading for all point sources subject to waste discharge requirements in an NPDES order, and a total load allocation (LA) that specifies the allowable loading for all other sources including nonpoint, natural background, and unregulated point sources, and a margin of safety, as shown below:

TMDL = Wasteload Allocations + Load Allocations + MOS

Using the box model, the TMDL for SIYB was calculated to be 567 kg/year for copper. In order to achieve this TMDL, a 76 percent reduction from the current loading of approximately 2,163 kg/year is required. The value of 567 kg/year of copper is dependent on the numeric target, currently set at 3.1 µg/L. Should the USEPA's proposed aquatic criteria (discussed in Section 2.2) be adopted and eventually promulgated in the CTR in the form of legally applicable numeric water quality objectives, the numeric targets represented in this TMDL would also be changed. Since the proposed values are more stringent, the result would be a lower TMDL in SIYB, and a higher percent reduction required from current loading. The calculations and box model used to generate the loading capacity are shown in Appendix 3.

In order to assign allocations, a review of available management practices (MPs) was conducted for controlling pollution from marinas (USEPA, 1993; USEPA, 1999; USEPA, 2001; Johnson and Miller, 2002b). MPs to reduce pollution from copper antifouling paints in marinas include switching to nontoxic and less toxic antifouling paints, cleaning hulls underwater with less abrasive techniques, storing boats out of water when not in use, and public education. For example, if all underwater hull cleaners use less abrasive MPs to clean hulls with copper-based antifouling paints at SIYB, emissions from hull cleaning could drop by 28 percent (assuming that in the source analysis calculations, approximately 50 percent of divers use MPs at SIYB). Switching to nontoxic and less toxic antifouling paints would also essentially eliminate copper loading from both passive leaching and underwater hull cleaning to SIYB.

Copper load reductions were assigned to sources based on current loading contributions. The most significant anthropogenic source of copper, passive leaching, was assigned the largest required reduction of 81 percent in current loading, or a decrease from 2,000 kg/year to 375 kg/year. Hull cleaning, the second largest source, was assigned a reduction in current loading of 28 percent, or a decrease from 100 kg/year to 72 kg/year of copper. The other sources, including sediment, were not assigned reductions in loading due to the relatively insignificant magnitude of their contributions.

If, in the future, studies indicate that other potential sources such as sediment are indeed significant, then the TMDL and load allocations can be recalculated. As discussed in the source

analysis, there is limited data indicating that under current equilibrium conditions, the sediment acts as a net sink for dissolved copper in the water column. Further studies are necessary to better understand this phenomenon. If studies demonstrate that sediment is, or could become, a significant source once primary sources, such as copper-based antifouling paints have been reduced, then the TMDL and allocations could be amended at a later date. An allocation for sediment loading could be assigned to the dischargers responsible for the sediment contamination.

In terms of the total reduction necessary from all sources to meet the TMDL, 75 percent of the required reduction (a reduction of 76 percent total) should come from dischargers responsible for passive leaching, and one percent should come from dischargers responsible for hull cleaning.

Reductions in loading from copper antifouling paint discharges via passive leaching and hull cleaning will result in the achievement of the TMDL. The loading estimates and allocations for all sources are shown in Table 7.1.

Table 7.1. TMDL and Allocation Summary.

Source	Current Load (kg/year)	Allocation (kg/year)	Percent Reduction from Current Loading (%)	Percent Reduction from Total Loading (%)
Passive Leaching	2,000	375	81	75
Hull Cleaning	100	72	27	1
Urban Runoff	30	30	0	0
Background	30	30	0	0
Direct Atmospheric Deposition	3	3	0	0
Sediment	0	0	0	0
Margin of Safety		57		
Combined Sources	2,163			76
TMDL		567		

8. Seasonal Variation and Critical Conditions

Critical conditions that have the potential to affect the determination of the TMDL and alter estimates in loading and/or allocations, such as seasonal variation and anticipated future growth, must be considered in the TMDL. A number of critical conditions relevant to SIYB were incorporated into development of the TMDL. The numeric targets are based on water quality criteria designed to be protective of beneficial uses throughout the year. Boating in San Diego Bay is popular year round, and boats tend to be moored in SIYB throughout the year. According to the Port, there are no current plans for future marina expansions, nor is there likely to be an increase in the slip number in SIYB (Brown, 2001). Furthermore, in the source analysis, both wet and dry weather flows were included in calculating loading estimates for urban runoff. While future growth may occur within the watershed that drains to SIYB, leading to increased pollutant loading from urban runoff and direct atmospheric deposition, any increase is likely to be insignificant due to the small current contribution of these sources. Therefore, there is no need to include further allocations into the TMDL to account for critical conditions.

9. Assumptions

A number of assumptions were made throughout the technical analysis, particularly in the source analysis and linkage analysis, in order to calculate current copper loading and the loading capacity. Assumptions were based on the best available information at the time when the technical TMDL was developed. When faced with uncertainty, assumptions were designed to be conservative, or protective of water quality and associated beneficial uses. Assumptions may affect estimates of source loading, and could result in an over- or under-estimation of the contributions from individual sources. Assumptions may also affect proposed estimates of the loading capacity of the Basin. To address uncertainties associated with the analysis, the effectiveness of the allocations in meeting the numeric target should be monitored and evaluated over time. Assumptions are detailed in Appendices 1 and 3.

III. LEGAL AUTHORITY FOR TMDL IMPLEMENTATION PLAN

This section describes the legal authority for the TMDL Implementation Plan. The regulatory agencies and laws governing copper antifouling paint in California are also described. The Regional Board's authority to regulate the residual discharge of copper[5] to SIYB from legally applied hull bottom antifouling paints is established.

10. Copper Antifouling Paint Regulation

Pesticides,[6] including copper antifouling paints, are industrial chemicals produced specifically for the purpose and intent of killing target pest[7] organisms. They are designed to be toxic to target pests and must be purposely introduced into the environment to do their job. However, once introduced in the environment, the pesticide may also adversely affect non-target organisms.

Copper antifouling paints, like all pesticides, are subject to regulation under several state and federal laws. The laws which apply at any given time depend on whether copper, the pesticide active ingredient, is acting on target fouling organisms or on non-target aquatic organisms.

Regulation of Pesticides Acting on Target Organisms: FIFRA and California Food and Agriculture Code

Copper-based antifouling paints are legally registered pesticides subject to United States Environmental Protection Agency (USEPA) regulation pursuant to the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) and the California Department of Pesticide Regulation (DPR) regulation pursuant to the California Food and Agriculture Code.

USEPA

The USEPA is the federal government agency responsible for registering pesticides for sale or distribution within the United States pursuant to FIFRA. A pesticide cannot be legally used in the United States if it has not been registered with the USEPA's Office of Pesticide Programs. Pesticide registration is the process through which the USEPA examines the ingredients of a

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[5] In this TMDL, "discharge of copper" refers to "residual copper" which is defined as any molecule of copper that leaches, dissolves, ablates, or erodes from boat hull antifouling paints into SIYB surrounding waters and does not reach a target fouling organism. This includes residual copper that results from legally registered hull antifouling paint used in accordance with label instructions in compliance with the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). (Finding 5, *Water Quality Order No. 2001-12-DWQ Statewide General National Pollutant Discharge Elimination System (NPDES) Permit for Discharges of Aquatic Pesticides to Surface Waters of the United States (General Aquatic Pesticides Permit)).*

[6] A pesticide is any substance or mixture of substances intended to control, destroy, repel, or attract a pest. Though often misunderstood to refer only to insecticides, the term pesticide also applies to herbicides, fungicides, and various other substances used to control pests. Under U.S. and California law, a pesticide is also any substance or mixture of substances intended for use as a plant regulator, defoliant, or desiccant. *(Regulating Pesticides: The California Story, California Department of Pesticide Regulation, October 2001)*

[7] A target pest is defined as any living organism that causes damage or economic loss or transmits or produces disease. Pests can be animals (like insects, mice, or boat hull fouling organisms), unwanted plants (weeds), or microorganisms (like plant diseases and viruses). *(Regulating Pesticides: The California Story, California Department of Pesticide Regulation, October 2001)*

pesticide; the site or crop on which it is to be used; the amount, frequency and timing of its use; and storage and disposal practices. Through the registration process, the USEPA evaluates the pesticide to ensure that it will not have unreasonable adverse effects on humans, the environment, or non-target species when used in accordance with label specifications.

Under FIFRA, the USEPA establishes a nationally uniform labeling system to regulate pesticide use. Pesticide label language is under the sole jurisdiction of the USEPA.

California Department of Pesticide Regulation

The California Department of Pesticide Regulation (DPR) is the lead state agency for regulating the registration, sales, and use of pesticides in California. Local administration and enforcement is provided by County Agricultural Commissioners (see next section). The legal authority for California's pesticide regulatory program is found primarily in the Food and Agricultural Code.

Before a pesticide may be marketed and used in California, the DPR evaluates it to ensure that it will not harm human health or the environment. The DPR is required by law to protect the environment, including surface waters, from environmentally harmful pesticides by prohibiting, regulating, or controlling the uses of such pesticides. This is accomplished through a licensing process called "registration." As part of the pesticide registration process, the DPR evaluates data submitted by registrants to ensure that a product used according to label instructions will cause no harm (or "adverse impact") on non-target organisms that cannot be reduced (or "mitigated") with protective measures or use restrictions. Registrants are required to submit data on the effects of pesticides on target pests (efficacy) as well as non-target effects. Data on non-target effects include plant effects (phytotoxicity), fish and wildlife hazards (ecotoxicity), impacts on endangered species, effects on the environment, environmental fate, breakdown products, leachability and persistence. Pesticides that pass this scientific, legal, and administrative process are granted a license that permits their sale and use according to requirements set by the DPR to protect human health and the environment in California.

Pesticides must be registered both by the USEPA and the DPR before distribution in California. Because the USEPA has sole responsibility for label language, the DPR cannot require a manufacturer to make changes to its labels. However by refusing to allow registration and hence the possession, sale and use of any pesticide not meeting California standards, the DPR can place more restrictive requirements on pesticides than the USEPA.

County Agricultural Commissioner

The San Diego County Agricultural Commissioner (CAC) serves as the DPR's primary enforcement agent for pesticide laws and regulations in San Diego County. The CAC registers licensed pest control businesses, pest control aircraft pilots, and agricultural pest control advisers (these businesses and individuals must obtain statewide licenses from the DPR, and register in each county where they operate). The CAC conducts compliance inspections and takes enforcement actions if violations are found. The CAC also conducts pesticide incident and illness investigations and provides training to pesticide users. The San Diego CAC has the authority to adopt local regulations governing pest control operations in San Diego County, including additional more stringent use restrictions. Each regulation however must be approved by the DPR before it becomes effective.

Regulation of Residual Pesticides Acting on Non-Target Organisms: Clean Water Act and California Water Code

The USEPA, Office of Water, has responsibility on a federal level for regulating the discharge of "pollutants" to waters of the United States pursuant to the federal Clean Water Act. The USEPA has authorized the State Water Resources Control Board (State Board) and the Regional Water Quality Control Boards (Regional Boards) to implement and administer the provisions of the Clean Water Act in the State of California. The State Board and the Regional Boards also have primary responsibility for regulating the discharge of "waste" to waters of the State pursuant to the state statute, the California Water Code.

"Residual" Pesticide

A residual pesticide is defined as any molecule of pesticide that does not reach a target organism. This includes residual pesticides that result from the legally registered use in accordance with label instructions and in compliance with FIFRA and the California Food and Agriculture Code. A residual pesticide is a "waste" under the California Water Code as provided below.

11. Regional Board's Authority to Regulate Residual Copper Discharges

This TMDL is required because residual copper discharges from copper antifouling paints cause the water quality objectives for copper to be violated in SIYB. The residual copper discharges are the result of the legal use of copper antifouling paints in accordance with label instructions and in compliance with FIFRA.

The Regional Board has the authority to regulate the discharge of residual copper from boat hull antifouling paints in SIYB by way of waste discharge requirements (WDRs)[8], waivers of WDRs (waivers), Basin Plan prohibitions (prohibitions), or enforcement orders. The Regional Board's legal authority is found in the California Water Code, Division 7, Water Quality (a.k.a. Porter-Cologne Water Quality Control Act) and the federal Clean Water Act.

California Water Code (Porter-Cologne Water Quality Control Act)

To establish the applicability of the California Water Code's WDRs, discharge prohibitions, and enforcement remedies, a person must be shown to be (1) discharging or proposing to discharge (2) a waste (3) that could affect the quality of waters of the State.

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[8] WDRs include those issued for discharges of pollutants from point sources to navigable waters of the United States that implement federal NPDES regulations. While nearly everyone refers to the orders containing WDRs that implement NPDES regulations in California as "NPDES permits," in fact they are not NPDES permits. Technically, such WDRs are issued by the state pursuant to independent state authority (not authority delegated to the state by the USEPA or derived from the Clean Water Act). Pursuant to Chapter 5.5 of the Porter-Cologne Act, in order to avoid the issuance by the USEPA of separate and duplicative NPDES permits for discharges in California that would be subject to the Clean Water Act, the State's WDRs for such discharges implement the NPDES regulations and entail enforcement provisions that reflect the penalties imposed by the Clean Water Act for violation of NPDES permits issued by the USEPA.

Due to the fact that NPDES requirements serve in lieu of NPDES permits, and, contain all the substantive terms and conditions necessary for an NPDES permit, many people refer to NPDES requirements as "NPDES permits" and to the dischargers as "permittees." The prevalence of this common shorthand usage does not, however, alter the underlying legal reality that NPDES requirements are just a particular subset of WDRs for discharges that would be subject to NPDES permits in the absence of State regulation that is, at least, equivalent to what would be required by NPDES permitting.

Passive Leaching of Residual Copper is a Discharge of Waste

Any discharge of a chemical that affects water quality in a manner that detracts from the suitability of water for a beneficial use is a discharge of waste. California Water Code section 13050 defines "waste" as including sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of disposal. This broad definition encompasses any substance whose formation was caused by human activity or whose path through the ecosystem is controlled or affected by human agency.

The passive leaching (i.e., discharge) of "residual copper" from antifouling paints is a "waste" pursuant to California Water Code section 13050(d). A discharge of waste (residual copper) occurs as a consequence of properly using copper-based antifouling paints on boat hulls. Copper-based antifouling paint is a registered pesticide applied to vessel hulls for the purpose and intent of killing target fouling aquatic organisms. The pesticide is designed to poison the entire aquatic environment of a vessel hull surface in order to discourage or prevent the growth of marine fouling organisms. However, the impacts of copper antifouling paint are not limited to target fouling organisms–other aquatic life in the vicinity of the boat hull may also be impacted. Due to water movement in the vicinity of the boat hulls, residual copper (the active pesticide ingredient) can be carried to adjacent areas in concentrations high enough to cause adverse effects to non-target aquatic organisms. Every molecule of copper poison that does not reach a target organism is "waste". Every molecule of copper poison that affects water quality necessary to support a non-target organism is "pollution." Violations of the copper water quality objectives throughout SIYB provide ample evidence that discharges of residual copper are occurring.

Regional Board May Issue Waste Discharge Requirements or Other Appropriate Mechanism

The Porter-Cologne Water Quality Control Act provides that "All discharges of waste into the waters of the State are privileges, not rights."[9] Furthermore, all discharges are subject to regulation under the Porter-Cologne Act including both point and nonpoint source discharges.[10] In obligating the State Board and Regional Boards to address all discharges of waste that can affect water quality the legislature provided the State Board and Regional Boards with authority in the form of administrative tools (WDRs, waivers, and prohibitions) to address ongoing and proposed waste discharges. Hence, all current and proposed discharges must be regulated under WDRs, waivers, or a prohibition, or some combination of these administrative tools.

Pursuant to California Water Code section 13260, the Regional Board may require any person discharging a waste, such as residual copper in SIYB, to file a report of waste discharge in application for waste discharge requirements. Pursuant to California Water Code section 13263,

[9] See CWC section 13263(g).

[10] See CWC sections 13260 and 13376.

the Regional Board may issue waste discharge requirements[11] to SIYB dischargers to regulate the discharges of residual copper. Alternatively, the Regional Board may issue waivers or adopt prohibitions to regulate the discharges of residual copper.

Residual Copper Discharge is a Violation of a Basin Plan Discharge Prohibition

The Basin Plan contains the following discharge prohibition that is applicable to any person (as defined by section 13050(c) of the California Water Code) whose activities could affect the quality of waters of the State:

> *The discharge of waste to waters of the state in a manner causing, or threatening to cause, a condition of "pollution", contamination or nuisance as defined in California Water Code section 13050, is prohibited.*

"Pollution" is defined under California Water Code section 13050(l), in part, to mean an alteration of the quality of the waters of the state by waste to a degree which unreasonably affects beneficial uses. A condition of pollution exists when applicable water quality objectives are violated as a result of the discharge of waste.

A condition of pollution exists in SIYB because the discharge of residual copper from copper antifouling paints, applied in accordance with label instructions in compliance with FIFRA, is causing exceedances of the applicable water quality objectives for copper.

[11] Discharges of pollutants from point sources to waters of the United States are regulated under WDRs that implement National Pollutant Discharge Elimination System (NPDES) regulations. There are plausible arguments that passive leaching of copper from copper-based antifouling paints on boats in marinas constitutes a discharge of pollutants from point sources, and should be regulated under WDRs that implement NPDES regulations. However, to develop and apply appropriate numeric effluent limits and other conditions needed for NPDES requirements for passive leaching of copper to marinas or individual boat owners would be complex and controversial. Regardless of whether the copper discharge comes from a point source or nonpoint source, the requirements would essentially be the same.

Nothing in Resolution No. R9-2005-0019, or the Basin Plan amendment promulgated by the Resolution, precludes any person who may be aggrieved by a subsequent determination by the Regional Board to regulate copper discharges to SIYB through the issuance of WDRs that implement NPDES regulations, from seeking review of that determination by the State Board.

IV. DISCHARGERS ACCOUNTABLE FOR COPPER LOAD AND WASTELOAD REDUCTIONS

Persons discharging copper to SIYB (hereafter, dischargers) are accountable for achieving compliance with the copper load and wasteload reductions specified in this TMDL. The Port, SIYB marina owners/operators, persons owning boats moored in SIYB, and underwater hull cleaners operating in SIYB are accountable for the discharge of copper waste from boat hull antifouling paints to SIYB waters. To a much lesser extent, the City also discharges copper from its MS4s.

12. San Diego Unified Port District

The Port is a special government entity, created in 1962 by the San Diego Unified Port District Act, California Harbors and Navigation Code in order to manage San Diego Harbor, and administer the public lands along San Diego Bay. The Port holds the tidelands and the submerged lands occupied by marinas in SIYB in trust for the State of California. Approximately 2,200 boats are congregated by seven marina owners/operators in the semi-enclosed SIYB. Copper leaches, dissolves, ablates, or erodes from the paint on the hulls of these boats into the surrounding water. The high density of boats combined with reduced tidal flushing has resulted in elevated levels of copper in SIYB.

The Port Can Control Discharges

The Regional Board has discretion to hold persons accountable for discharges of waste which occur or occurred on their property based on three criteria: (1) ownership of the land on which an activity occurs that results in a discharge of waste; (2) knowledge of the activity causing the discharge; and (3) the ability to control the activity.[12] The Port meets all three of these criteria.[13] As trustee, the Port exercises the rights and responsibilities of land ownership for the lands occupied by SIYB marina facilities in which residual copper discharges occur. The Port has land use authority on these lands. In exercising this authority, the Port controls decisions regarding the citing and sizing of all marinas in SIYB. The Port has full knowledge of the copper discharges from antifouling paint and the effects of these discharges on the water quality of San Diego Bay. In fact the Port co-sponsored an alternative hull paint demonstration study, is currently investigating the effectiveness of several types of paint that demonstrate innovative antifouling strategies, and is systematically repainting its entire vessel fleet with these new coatings. Finally, the Port has the ability under its lease agreements with the SIYB marina

[12] These principles on the issue of landowner liability under both waste discharge requirements and enforcement orders were established in a series of orders adopted by the State Water Resources Control Board (State Board) and in memoranda issued by the State Board Office of Chief Counsel. (See e.g., State Board Order Nos. WQ 87-6, 87-5, 86-18, 86-16, 86-15, 86-11, 84-6, 90-03; Memorandum dated May 8, 1987 from William R. Attwater to Regional Board Executive Officers entitled "Inclusion of Landowners in Waste Discharge Requirements and Enforcement Orders".)

[13] State Board Order No. WQ 90-3 specifically addressed the Regional Board's authority to hold the Port accountable for discharges of pollutants from its tenant's facility operations. In 1989 the Regional Board adopted an addendum to six NPDES orders previously issued to certain boatyards and shipyards that were tenants of the Port. The Addenda added the Port as a responsible party to those ordered. The Port appealed the Regional Board's action contending that the Port was a "non-operating" landowner and therefore not subject to NPDES order requirements. The State Board upheld the Regional Board's action concluding that the Regional Board has the discretion to name non-operating landowners such as the Port in waste discharge requirements and NPDES orders because landowners may properly be considered "dischargers" under the CWA and CWC.

owners/operators, to impose controls that could prevent or reduce copper discharges.

The Port Can Be Held Accountable for Discharges

These facts establish that the Port is accountable for discharges of copper waste from antifouling paints to SIYB. Therefore, the Regional Board can hold the Port accountable for meeting load reductions specified in this TMDL.

The Port is also in the unique position to eliminate any competitive advantage other marinas, not subject to this TMDL, may gain by their location outside of SIYB. The Port has the ability under its lease agreements to impose the same controls needed for SIYB marinas, on all marinas in San Diego Bay. This would "level the playing field" bay-wide and significantly reduce copper loads from marinas throughout San Diego Bay.

13. Marina Owners/Operators

The Regional Board has the discretion to hold SIYB marina owners/operators accountable for discharges of waste which occur or occurred within the marina leasehold based on three criteria: (1) status as owner or operator of the marina facility on which an activity occurs that results in a discharge of waste; (2) knowledge of the activity causing the discharge; and (3) the ability to control the activity. The SIYB marina owners/operators meet all three of these criteria.

Marina Owners/Operators Congregate Boats

That the marina owners/operators own or operate the SIYB marina facilities where copper discharges from antifouling paints occur is undisputed. The marina owners/operators congregate boats and thereby cause or contribute to the discharge of copper from the large number of boat hulls in SIYB.

Approximately 2,200 boats are congregated by seven major marina owners/operators in the semi-enclosed SIYB. Copper leaches, dissolves, ablates, or erodes from the paint on the hulls of these boats into the surrounding water. The high density of boats combined with reduced tidal flushing has resulted in elevated levels of copper in SIYB. Furthermore, because recreational boats are moored in marinas most of the time, the majority of copper is discharged within the marina environment.

Marina Owners/Operators have Knowledge of Discharges

The SIYB marina owners/operators have knowledge of the copper discharges from antifouling paint and the effects of these discharges on the water quality of San Diego Bay through their participation in various conferences, workshops, studies, and outreach efforts related to antifouling coatings. These include Regional Board public workshops on the SIYB Copper TMDL (May 2000, March 2003, November 17, 2003); the International Congress on Marine Corrosion and Biofouling (San Diego, July 2002); the Alternative Antifouling Strategies for Recreational Boats Conference (San Diego, September 2000); the San Diego Advisory Committee for Environmentally Superior Antifouling Paints and subsequent report to legislature pursuant to Senate Bill 315 (Carson report. 2002); Regional Board and Port Tenants Association workshops related to the tentative Marina NPDES Order No. R9-2003-0215; and participation in other related conferences and workshops.

In addition, for the past several years the University of California's Sea Grant Extension Program (Sea Grant) has been actively involved in educating the San Diego boating community (including SIYB marina owners/operators) about alternative antifouling strategies through numerous outreach efforts, including the conduct of the July 2000 conference mentioned above, the conduct of a "Nontoxics Bottom Paint Demonstration Project", and the development of educational booklets.[14] There are also several efforts and advisory groups dedicated to addressing nonpoint source pollution problems associated with marinas and recreational boating and implementing the State of California's "Nonpoint Source Program Strategy and Implementation Plan" (State Board and CCC, 2000).[15] The California Coastal Commission has published the California Clean Marina Guidebook (2nd Draft). The Boating Clean and Green Campaign and the California Clean Boating Network are examples of other educational programs designed to promote environmentally sound boating practices to marine businesses and boaters in California.

Marina Owner/Operators Can Control Discharges

Finally, the SIYB marina owners/operators have the ability to control discharges of copper to SIYB. Marina owners/operators exercise control and enforcement over boat owners and their discharges by way of conditional lease or license agreements with owners of boats moored within the marina leasehold. The conditions written into these contract agreements are the key to the marina's legal authority to exercise control over residual copper discharges from boat hulls within the marina leasehold. By way of these conditions, the marina owners/operators can control the number of moored boats, the types of hull coatings used, and hull cleaning activities allowed within the leasehold. Marina owners/operators can also require the use of MPs by boat owners and hull cleaners and require boat owners to provide proof of hull coating composition.

Marina Owner/Operators can be Held Accountable for Discharges

Taken together, these facts establish that the Regional Board can hold marina owners/operators accountable for discharges of copper waste from boat hull antifouling paints to SIYB. Therefore, the Regional Board should hold the marina owners/operators accountable for meeting load reductions specified in this TMDL.

Regulating Marina Owners/Operators is Appropriate

The naming of the marina owners/operators as dischargers responsible for residual copper discharges emanating from individual boats moored within their leaseholds is consistent with, and analogous to, the Regional Board's regulation of other dischargers within the Region. Analogous examples include Concentrated Animal Feeding Operations (CAFOs), Municipal Separate Storm Sewer Systems (MS4s), and roads built by Caltrans. Another important analogy involves the regulation of outdoor shooting ranges.

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[14] *What you Need to Know About* Nontoxic Antifouling Strategies *For Boats* (Johnson and Miller, 2002); A Change is in the Wind for Antifouling Strategies - And It's Blowing Your Way (Report No. T-049)

[15] For example, the Statewide Interagency Coordinating Committee and the Marinas and Recreational Boating Workgroup.

In each of the analogous examples discussed below, the facility owner/operator congregates, concentrates, channels and directs waste directly to surface waters. Although the individual users of the facility generate the waste, the owner/operator of the facility is held accountable because it collects, congregates, concentrates, channels, and directs waste to surface waters. Furthermore it is more practicable for the Regional Board to regulate the owner/operator of the facility than to regulate each individual user of the facility. Similarly it is more practicable for the Regional Board to regulate marina owner/operators than to regulate each individual boat owner mooring a boat within the marina leasehold.

Concentrated Animal Feeding Operations (CAFOs) Analogy
Concentrated Animal Feeding Operations (CAFOs) are regulated because they congregate large numbers of animals at a single location resulting in the cumulative and concentrated discharge of significant volumes of animal waste. The CAFO owner/operator is the named discharger accountable for the discharge of animal wastes. As previously described, marina owners/operators similarly congregate large numbers of boat hulls in a single leasehold resulting in the cumulative and concentrated discharge of significant amounts of residual copper. A small number of boats, like a small number of animals, may not necessarily result in a water quality problem. However a large number of boats, like a large number of animals, when congregated in a single location such as SIYB has resulted in a significant water quality problem.

MS4 Analogy
The concept of holding marina owners/operators accountable for discharges from boat hulls in their leaseholds is also analogous to the Regional Board holding municipal MS4 copermittees responsible for all discharges resulting from all land uses within their jurisdiction. Although other persons in the land use areas generate the pollutants, the municipal copermittees are held responsible because they own or operate the MS4, which collects, congregates, concentrates and conveys the waste to receiving waters. Municipal copermittees have ample legal authority to control waste discharges from land uses and to enforce these controls. It would be impracticable for the Regional Board to directly regulate individual persons contributing waste to the discharges from each land use area. Similarly although the residual copper discharges originate from boats owned by other persons, the marina owner/operators can be held accountable because they own or operate the marina that congregates and concentrates large numbers of boat hulls continuously discharging copper. Marina owners/operators have ample legal authority to control residual copper discharges from boats moored within their leasehold and to enforce these controls. It would be impracticable for the Regional Board to directly regulate individual persons owning the approximate 2,200 boats moored in SIYB.

Caltrans MS4 Highway Analogy
In the statewide MS4 Caltrans NPDES Permit, the SWRCB names Caltrans as the discharger responsible for waste discharges from roads and highways owned or controlled by Caltrans. Caltrans is held responsible despite the fact that the majority of waste discharges originate from vehicles owned by persons other than Caltrans. Waste discharges include oil, gas, and metals resulting from tire, brake and engine wear. The road or highway is an MS4 point source, which collects, congregates, and concentrates large numbers of vehicles and conveys the vehicle pollutants to receiving waters. Similarly marina owners/operators congregate and concentrate large numbers of boat hulls, which continuously discharge copper as described above.

Outdoor Shooting Ranges Analogy
In the 1994 case, New York Coastal Fisherman's Association v. New York Athletic Club, the United States District Court for the Southern District of New York specifically found that shooting ranges act to systematically channel pollutants into waters of the United States and that mechanized target throwers convey pollutants directly into waters of the United States. Individuals at the shooting range stand on concrete platforms, facing Long Island Sound, from which they fire lead and steel shot at clay targets launched over the water. The Court determined that the concrete shooting platforms could either be seen as separate point sources under the Clean Water Act or as one facet of the shooting range that systematically delivers pollutants into waters of the United States. The Court concluded that the shooting range operated by Defendant which is designed to concentrate shooting activity from a few specific points and systematically direct it in a single direction over Long Island Sound is an identifiable source from which spent shot and target fragments are conveyed into waters of the United States. As such, the shooting range constitutes a point source within the meaning of the Clean Water Act. The Court found that the owner/operator of the shooting range, rather than the individual club members firing shot over Long Island Sound, is responsible for the discharge of pollutants to waters of the United States. The owner/operator of the shooting range, rather than the individual club members, was required to obtain an NPDES permit under the Clean Water Act.

The holdings of the Court in New York Coastal Fisherman's Association v. New York Athletic Club are directly analogous to the SIYB marinas and residual copper discharges. The marinas are analogous to the shooting range and the individual boat owners are analogous to the individual club members firing shot from individual concrete shooting platforms within the shooting range. The individual boat hulls, like individual concrete shooting platforms, are individual sources of waste to surface waters. The marinas, like the shooting range, concentrate and congregate the individual sources of waste (boat hulls) and direct the discharges (residual copper) into surface waters (SIYB). The marina leaseholds themselves are an identifiable cumulative source from which residual copper discharges are conveyed into surface waters. The marina owner/operators like the shooting range owner/operator are responsible for the cumulative discharge of waste. Thus, these discharges are appropriately regulated through the Regional Board's administrative tools.

14. Individual Boat Owners

Persons owning boats moored in SIYB are responsible for discharges of copper waste because hull coating leachate containing copper is continuously generated whenever a vessel hull is exposed to water. Some individual boat owners also engage in underwater hull cleaning activities which result in the additional release of dissolved copper into the surrounding waters from copper antifouling paints applied to boat hulls. Therefore, the Regional Board can hold each individual person owning a boat moored in SIYB accountable for meeting load reductions specified in this TMDL.[16]

[16] It is more practicable for the Regional Board to appropriately regulate individual boat owners indirectly via prohibitions, or WDRs or waivers issued to the Port of San Diego and/or the SIYB marina owners/operators.

15. Underwater Hull Cleaners

Underwater hull cleaners cleaning boat hulls coated with copper antifouling paint in SIYB are responsible for discharges of copper waste. Underwater hull cleaning is performed by divers using various manual and mechanical means to remove fouling organisms that have adhered to a vessel and its appendages. The physical process of removing fouling organisms from a vessel's hull painted with copper-based antifouling paints while underwater, results in the release of dissolved copper into surrounding SIYB waters. Therefore, the Regional Board can hold persons engaged in underwater hull cleaning activities in SIYB accountable for meeting load reductions specified in this TMDL.

16. City of San Diego

Because urban runoff is a source of dissolved copper to SIYB, the City is responsible for these discharges from its storm water conveyance system into SIYB under NPDES Order No. 2001-01, "Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems." The City is responsible for meeting the WDRs. For this reason, the Regional Board can hold the City responsible for meeting wasteload reductions specified in this TMDL. However, the source analysis showed that discharges of copper from urban runoff account for less than one percent of the total loading into SIYB.

V. TMDL IMPLEMENTATION PLAN FOR SHELTER ISLAND YACHT BASIN

This Implementation Plan describes the strategies and management practices available to dischargers to reduce copper loading to SIYB. The Implementation Plan also describes the regulatory options available to ensure the dischargers comply with the copper reductions. The Implementation Plan describes:

- Alternative strategies and management practices that can be developed and implemented by the dischargers to reduce dissolved copper loading into SIYB;
- Regional Board coordination with governmental agencies having legal authority over the use of copper-based antifouling paints; and
- Regulation by the Regional Board.

The Implementation Plan also includes a schedule to achieve compliance with the copper reductions specified in the TMDL over a 17-year period. This section also describes how dischargers can participate in compliance monitoring of SIYB waters to measure the effectiveness of the TMDL and Implementation Plan in attaining water quality objectives over time.

17. Discharger Strategies to Reduce Dissolved Copper Loading to SIYB

The following strategies and management practices (MPs) can be developed and implemented by the dischargers to achieve compliance with the copper reductions specified in this TMDL.

Transition to Nontoxic and Less Toxic Hull Coatings

Given the fact that copper-based antifouling paints have been approved by the USEPA for nationwide use under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), and are relied upon throughout the state and region by boaters and boat maintenance enterprises, the ultimate resolution for the copper pollution associated with such use depends on review of registration for toxic antifouling paints by the USEPA and radical restriction or prohibition of the use of such paints. Meanwhile, the most reasonable foreseeable strategy to promote compliance with the required load reductions for copper in SIYB is promotion of a gradual transition to the use of nontoxic or less toxic antifouling coatings and maintenance strategies.

A transition to nontoxic coatings could be accomplished in 15 years without substantial economic hardship because nontoxic antifouling coatings are more cost-effective than copper-based antifouling paints over the long term. While it is currently less expensive to re-apply copper-based paint to existing boats when the paint must be replaced, nontoxic epoxy antifouling coatings last longer, which makes them more cost-effective over the life of a boat (Carson *et al.*, 2002). Additionally, some nontoxic coatings may provide other benefits, such as reduced fuel consumption due to the lower friction associated with some silicon-based coatings. The success of the transition would depend on a clear deadline for the elimination of copper-based antifouling

paints that would compel boat owners and boat maintenance enterprises to promote the use of nontoxic or less toxic alternatives.

Subsequent to the release of the Carson report, the University of California Sea Grant Extension Program conducted a poll of 10 boat repair yards in San Diego and Orange Counties in fall 2003 (comment letter to Regional Board, dated 1/21/04). These boatyards reported a range of 8-20 years before stripping is required, although one (Driscoll Boatworks) mentioned 30 years. Thus, the Sea Grant poll supports the Carson report conclusion that boats are stripped on average every 15 years. Nonetheless, for owners who never strip their boats, the conversion to non-toxic epoxy coatings would cost an additional $5,200 to $6,000 compared to a boat owner who includes stripping as part of routine boat maintenance (assuming an average boat length of 40 feet and a stripping cost between $130 to $150 per foot).

Most of the measures involved in this transition would take place at the level of the most direct discharge of copper: boat owners and hull cleaners, and would require vigorous outreach by governmental and non-governmental organizations involved in the implementation of the TMDL for SIYB.

Measures that SIYB boat owners could take include:

- Replacement of copper-based paints with nontoxic or less toxic coatings during routine hull bottom stripping and coating replacement; and

- Selection of new boats that are "factory-equipped" with a nontoxic or less toxic hull coating.

Several features of this Implementation Plan are based on the recommendations of an important investigation and report entitled "Transitioning to Non-Metal Antifouling Paints On Marine Recreational Boats in San Diego Bay," prepared by Dr. Richard Carson, Ph.D., et al., of the University of California, San Diego in response to Section 13366 of the Water Code (added by Chapter 469, Statutes of 2001, also known as Senate Bill 315). The Carson report identified nontoxic alternatives to toxic metal-based antifouling paints, compared the costs of using these alternatives to the cost of using traditional copper-based antifouling paints, and identified economic incentives for a transition to the use of alternatives.

The key findings of the Carson report are summarized below:

- Converting all boats in San Diego Bay from copper-based paints to nontoxic coatings in 15 years is possible without substantial economic hardship to the boating community. This finding assumes that all newly manufactured boats are sold with nontoxic coatings and that all existing boats are converted to nontoxic coatings at the time of routine stripping, i.e., every 15 years;

- To effect this conversion to nontoxic coatings, policy makers must announce a future ban on copper paints and set a specific compliance date;

- Copper paint is more cost effective over the short term but nontoxic epoxy coatings are more cost effective over the long-term life of the boat;

- Boater education, commercial demonstrations and scientific studies should be conducted to support the conversion from copper paints to nontoxic coatings; and

To determine factors that would be useful to policy makers in creating incentives for boat owners to convert from copper-based paints to nontoxic coatings, a survey was conducted of San Diego Bay boaters (Carson *et al*., 2002). The top four factors rated by the boaters surveyed as extremely or very important in deciding whether to convert were: (1) the greater longevity of nontoxic paint (77 percent surveyed); (2) laws requiring nontoxic paint (76 percent surveyed); (3) nontoxic paints will make San Diego Bay cleaner (71 percent surveyed); and (4) marina requires nontoxic paint (62 percent surveyed).

In summary, the Carson report established that converting to nontoxic strategies is possible and economically feasible if sufficient time is provided. For this reason, the Regional Board has established a 15-year timeframe to accommodate such a conversion, as discussed in the TMDL staged compliance schedule.

Appendix 9 provides a description of some of the nontoxic antifouling strategies available on the market, including durable epoxy and ceramic-epoxy, easy-clean silicone and siloxane, fiber-epoxy, polymer, water-based urethane, and bottom wax.[17]

Appendix 10 provides an overview of other important global and regional efforts to address the water quality problems resulting from copper antifouling paints and describes current laws, restrictions and recommendations pertaining to the gradual phase-out of copper-based antifouling paint.

Reduce Effects of Copper-Based Paints through Management Practices

Efforts should be made to reduce the amount of copper discharged from boat hulls with copper-based paints by implementing the MPs listed below.

- Boat owners could use slip liners to isolate boat hulls from SIYB waters;

- Boat owners could use dry storage (e.g., hoists, lifts) or landside boat storage facilities for smaller boats;

- Hull cleaners could use less abrasive hull cleaning methods and materials on boats with copper-based antifouling paints; and

- Hull cleaners could train in the maintenance of nontoxic and less toxic hull coatings and purchase the necessary special equipment.

[17] This information was provided from a brochure published by Sea Grant, in: Johnson, Leigh T. and Jamie A. Miller. 2002. Nontoxic Antifouling Strategies Sampler. What You Need to Know about Nontoxic Antifouling Strategies for Boats. California Sea Grant College Program Technical Report T-049:6-7.

Conduct Boater Education Programs

In order to build a consensus supporting the need and rationale for the transition from traditional toxic antifouling paints to nontoxic alternatives that will entail higher costs for initial application, the Port and the marina owner/operators should conduct boater education programs. The education programs would be designed to educate the SIYB boating community about the water quality problem associated with copper leaching in SIYB and the nontoxic or less toxic coatings and strategies that can be implemented by individual boaters to resolve the problem. The education programs should include information on the economics and tradeoffs between the use of copper-based paints and nontoxic or less toxic alternatives.

Commercial Demonstrations and Scientific Studies

The Port and marina owners/operators in SIYB could coordinate and oversee commercial and scientific studies to confirm and demonstrate the efficacy and longevity of available nontoxic and less toxic boat hull coating products. The demonstrations and studies would also allow boat repair yards and underwater hull cleaners the opportunity to develop expertise and acquire special equipment needed for the application and maintenance of nontoxic and less toxic boat hull coatings. The Regional Board may support efforts by the Port to seek grant funding for the commercial demonstrations and scientific studies from a variety of sources including the State Board, the USEPA, and the California Department of Boating and Waterways (DBW). Scientific research work should be conducted by qualified scientific or academic organizations.

Impose Controls on SIYB Boat Owners

Marina owners/operators in SIYB could impose and enforce controls on boat owners via conditions in lease or license agreements. For example: restrictions on the use of copper-based paints, such as a requirement that all new boats have nontoxic or less toxic coatings, or a requirement that boat owners convert to nontoxic or less toxic coatings during routine stripping; proof of hull coating composition; restrictions on hull cleaning; restrictions on number of boats; and requirements that hull cleaners use MPs.

Implement Financial Incentives

Marina owners and operators in SIYB could implement financial incentives to encourage the use of nontoxic and less toxic hull coatings. For example, the marina owner/operators could impose differential lease fees for individual boat owners which consider the hull coating composition of boats within the marina leaseholds with higher fees for traditional copper-based antifouling paints and lower fees for less toxic hull bottom coatings.

Impose Controls on SIYB Marina Owners and Operators to Limit Use of Copper-Based Hull Paints

The Port could impose and enforce controls on SIYB marinas via conditions in lease agreements and ordinances. For example, the Port could require restrictions on the use of copper-based paints, such as requiring that all new boats have nontoxic or less toxic coatings and requiring conversion to nontoxic or less toxic coatings during routine stripping; proof of hull coating composition; restrictions on hull cleaning; and/or restrictions on the number of boats.

Implement Financial Incentives to Encourage the Use of Alternative Antifouling Strategies

The Port could implement financial incentives to encourage the use of nontoxic and less toxic hull coatings. For example, the Port may impose differential lease fees for SIYB marina owners/operators which control the hull coating composition of boats within the marina leaseholds: higher fees for traditional copper-based antifouling paints and lower fees for less toxic hull bottom coatings. Additionally, the Port could impose the same types of controls and financial incentives on marinas throughout San Diego Bay to "level the economic playing field."

18. Coordination with Governmental Agencies Having Legal Authority Over the Use of Copper-Based Antifouling Paints

Copper-based antifouling paints are legally registered pesticides subject to registration and regulation by the USEPA pursuant to the FIFRA (7 U.S.C. 136) and by the California Department of Pesticide Regulation (DPR) pursuant to Division 7, commencing with section 12500, of the California Food and Agriculture Code (CDFA). The Regional Board, in conjunction with the State Board, will pursue regulatory solutions with these and other agencies having legal authority over the registration, sale, and use of copper-based antifouling paints in California to address the problem in SIYB. These agencies have authority to take direct regulatory actions that could include the imposition of additional restrictions on the sale and use of copper-based antifouling paints in SIYB, up to, and including cancellation of particular uses or registration. A relevant example of regulatory action related to water quality concerns is discussed in Appendix 9 pertaining to legislative and regulatory restrictions that were imposed on the use of tributyltin antifouling paints.

United States Environmental Protection Agency

The Regional Board will formally ask the State Board to use its legal authority over the registration, sale, and use of copper-based antifouling paints in California to address the violations of copper water quality objectives in SIYB. Potential actions that the USEPA may consider include amendments to label language, cancellation of uses, pesticide re-registration, and cancellation of registration. The USEPA is scheduled to review registration for all copper-based pesticides beginning in 2007.

California Department of Pesticide Regulation

Section 13247 of the California Water Code requires state agencies to comply with water quality control plans (basin plans) "in carrying out activities which may affect water quality." Under this provision, the DPR has an obligation to ensure that registration and use conditions for copper-based antifouling paints would not violate the TMDL for SIYB.

The Regional Board will continue to coordinate with the DPR pursuant to the 1997 Management Agency Agreement (MAA) between the State Board and the DPR. Under the MAA, the State Board, Regional Boards and the DPR are committed to working together to use their respective authorities to resolve water quality problems that are related to pesticide use. The Regional Board will formally ask the State Board to request that the DPR use its legal authority over the registration, sale, and use of copper antifouling paints in California to address the violations of copper water quality objectives in SIYB. Potential actions that the DPR may consider include

pesticide re-evaluation (requirements for additional data from registrants), adoption of regulations, designation of a pesticide as a restricted material, refusal to register, cancellation of registration, and suspension of registration.

San Diego County Agricultural Commissioner

The San Diego County Agricultural Commissioner (CAC) serves as the DPR's primary enforcement agent for State pesticide laws and regulations in San Diego County. The Regional Board will continue to coordinate with the CAC pursuant to the MAA between the State Board and the DPR. The Regional Board will request that the CAC use its legal authority over the use of copper antifouling paints in San Diego County to address the violations of copper water quality objectives in SIYB. Potential actions that the CAC may consider include the issuance of conditional use permits, adoption of local regulations and additional, more stringent local use restrictions.

California Coastal Commission

The California Coastal Commission (CCC) is a State regulatory agency responsible for protecting, conserving and restoring California's coastal and ocean resources. Under a Memorandum of Understanding (MOU) between the CCC and the State Board, the CCC is committed to implementing the jointly authored Plan for California's Nonpoint Source Pollution Control Program (Nonpoint Source Program Plan) (State Board and CCC, 2000). The Nonpoint Source Program Plan presents a 15-year strategy for dealing with nonpoint source pollution, including pollution from marinas and recreational boating, through implementation of management measures. Management measures for marinas and recreational boating include boater education, training and certification for underwater hull cleaners, promotion of nontoxic and less toxic products, and development of legislation that prohibits the sale and use of toxic hull paints as necessary after a thorough analysis. The CCC also supports a number of outreach programs and projects that work to promote clean boating and decrease boating-related pollution, including the Boating Clean and Green Campaign and the California Clean Boating Network. The Regional Board could coordinate with the CCC to address the violations of water quality objectives in SIYB through their education and outreach programs.

California Department of Boating and Waterways

The mission of the DBW is to provide access to navigable waterways for recreational boaters and to protect the public's right to safe and enjoyable boating. The DBW plays an important role in boater safety and education and in funding public projects related to boating including the Carson study and resulting report (Carson *et al.*, 2002). The Regional Board could coordinate with the DBW to educate boaters on the environmental impacts of copper-based antifouling paints and the nontoxic and less toxic available alternatives.

Legislative Initiatives

The Regional Board will consult with the State Board regarding the need to consider legislative solutions to address water quality problems caused by copper antifouling paints. Following this determination, the State Board could solicit legislation to address this issue. Potential legislative solutions would be developed in coordination with the USEPA and the DPR. A two-stage process would be appropriate: (1) a statewide investigation of water quality problems associated with copper antifouling paint to develop an action plan; and (2) subsequent phase-out of copper-

based paints. If the State Board agrees with the need for the legislation, the State Board may draft proposed legislation and forward it to the California Environmental Protection Agency (CalEPA) for consideration. If CalEPA agrees with the need, the proposed legislation may be forwarded to the Governor's Office for approval. If approved by the Governor's Office, the State Board may seek a sponsor to introduce the legislation. No State agency can take a position on, support, or promote a bill unless it has been approved by the Governor's office.

19. Regulation by the Regional Board

The Porter-Cologne Water Quality Control Act provides that "All discharges of waste into the waters of the State are privileges, not rights."[18] Furthermore, all discharges are subject to regulation under the Porter-Cologne Act including both point and nonpoint source discharges.[19] In obligating the State Board and Regional Boards to address all discharges of waste that can affect water quality, the legislature provided the State Board and Regional Boards with authority in the form of administrative tools (waste discharge requirements (WDRs), waivers of WDRs, and Basin Plan waste discharge prohibitions) to address ongoing and proposed waste discharges. Hence, all current and proposed discharges must be regulated under WDRs, waivers of WDRs, or a prohibition, or some combination of these administrative tools.

With the exception of persons discharging into community sewer systems, any person discharging or proposing to discharge waste that could affect water quality must file a report of waste discharge (RoWD) with the appropriate Regional Board, unless the Regional Board waives the filing.[20] A RoWD also is required if a discharger proposes a material change in the character, volume, or location of a discharge.[21] The Regional Board must then determine the appropriate action to take, either issuing WDRs to the discharger, or conditionally waiving the requirements.[22] WDRs can prohibit the discharge of waste or certain types of waste, either under specific conditions or in specified areas. As an alternative, the Regional Board may prohibit the discharge of waste or certain types of waste in a water quality control plan.[23]

The residual copper passively leached from antifouling paints is a waste pursuant to CWC section 13050(d), as discussed in Chapter III, Section 11. The Regional Board is responsible for regulating the discharge of residual copper waste through the issuance of WDRs,[24] waivers, or

[18] See CWC section 13263(g).

[19] See CWC sections 13260 and 13376.

[20] See CWC sections 13260 and 13269.

[21] See CWC section 13264.

[22] See CWC section 13263 and 13269.

[23] See CWC section 13243.

[24] Discharges of pollutants from point sources to waters of the United States are regulated under WDRs that implement National Pollutant Discharge Elimination System (NPDES) regulations. There are plausible arguments that passive leaching of copper from copper-based antifouling paints on boats in marinas constitutes a discharge of pollutants from point sources to navigable waters of the United States, and should be regulated under waste discharge requirements that implement NPDES regulations. However, to develop and apply appropriate numeric effluent limits and other conditions needed for NPDES requirements for passive leaching of copper to marinas or individual boat owners would be complex and controversial. Regardless of whether the copper discharge comes from a point source or nonpoint source, the WDRs would essentially be the same.

prohibitions. All three can be structured upon third party pollution control programs developed by the dischargers.

Issuance of Waste Discharge Requirements

The Regional Board could issue individual or general WDRs that would require that the dischargers meet the copper reductions specified in the TMDL. Since numeric effluent limits for dissolved copper from boat hulls would be difficult to achieve through conventional treatment methods without derogating from the antifouling effectiveness of copper-based paints, WDRs would emphasize the development and implementation of MPs to reduce the impact of copper leaching on waters of the State. WDRs may be used during an interim transition period to nontoxic or less toxic antifouling coatings. WDRs for discharges of copper from antifouling paints could require the following MPs:

- *Boater Education Programs*
  The Port and the marina owner/operators could conduct boater education programs. The purpose of the education programs would be to educate the SIYB boating community about the copper water quality problem in SIYB and the nontoxic or less toxic coatings and strategies that can be implemented by individual boaters to resolve the problem. The education programs could also include information on the economics and tradeoffs between the use of copper-based coatings and nontoxic or less toxic alternatives.

- *Coordinate and Oversee Commercial Demonstrations and Scientific Studies Investigating Alternative Antifouling Strategies*
  The Port could coordinate and oversee the conduct of commercial demonstrations and scientific studies. The purpose of the demonstrations and studies would be to confirm the efficacy and longevity of available nontoxic and less toxic boat hull coating products. The demonstrations and studies could also allow boat repair yards and underwater hull cleaners the opportunity to develop expertise and acquire special equipment needed for the application and maintenance of nontoxic and less toxic boat hull coatings.

- *Coordinate and Oversee Scientific Studies Investigating the Movement of Copper in Water Column / Sediment Dynamic Equilibrium*
  The Port and the marina owners/operators could oversee the conduct of scientific studies designed to investigate the movement of copper in the water column / sediment equilibrium. As discussed in the source analysis, there is limited data indicating that under current equilibrium conditions, the sediment acts as a net sink for dissolved copper in the water column. Further studies are probably necessary to better understand this phenomenon. If studies demonstrate that sediment is, or could become a significant source once primary sources, such as copper-based antifouling paints have been reduced, then the TMDL and allocations could be amended at a later date. An allocation for sediment loading could be assigned to the dischargers responsible for the sediment

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Nothing in Resolution No. R9-2005-0019, or the Basin Plan amendment promulgated by the Resolution, precludes any person who may be aggrieved by a subsequent determination by the Regional Board to regulate copper discharges to SIYB through the issuance of WDRs that implement NPDES regulations, from seeking review of that determination by the State Board.

contamination. Depending on the severity of the contamination, sediment cleanup could be necessary.

The WDRs also could build upon third party pollution control programs, which are discussed below under the section entitled *Third Party Agreements*. These WDRs could, for example, require that the dischargers either participate in a third party program capable of achieving the required copper load reductions or, alternatively, require the dischargers to submit individual pollution control plans that detail how the discharger will comply with the WDRs.

Issuance of Conditional Waiver of Waste Discharge Requirements

The Regional Board could waive regulation of copper discharges based on the implementation of an adequate third party program that addresses the source of pollution, provided that certain conditions were met. An MOU or MAA between the Regional Board and discharger organizations/Port would be an appropriate mechanism to ensure implementation of the program and compliance with conditions of the waiver.

Adoption of Conditional Waste Discharge Prohibition

The Regional Board could adopt waste discharge prohibitions in the Basin Plan, which could include exceptions based on the implementation of an adequate third-party program that addresses the source of pollution. For example, the Regional Board could except from the discharge prohibition those discharges that are adequately addressed in a third-party pollution control program. An MOU or MAA between the Regional Board and discharger organizations/Port would be required to ensure implementation of the program.

Third Party Agreements

The dischargers could formulate and implement their own pollution control programs under third party agreements with the Regional Board. Under this alternative, an organization[25] of the marina owners/operators, an organization of the hull cleaners, an organization of boat owners, and/or the Port would formulate and submit pollution control programs to the Regional Board. The pollution control programs would be developed to comply with WDRs, waivers of WDRs, or basin plan prohibitions. If a pollution control program is likely to achieve the necessary copper load reductions, the Regional Board could enter into a MOU with the marina or hull cleaner organizations or an MAA with the Port to ensure implementation of the pollution control program. Pollution control programs should include some or all of the MPs described in section 15, *Discharger Strategies to Control Dissolved Copper Loading to SIYB*.

The Regional Board is responsible for regulating the discharge of residual copper with WDRs, waivers of WDRs, or basin plan prohibitions whether or not a third party agreement is in place. However, under third-party agreements the Regional Board can conditionally waive regulation of a particular pollution source based on the existence of an adequate pollution control program that addresses this source. Similarly, the Regional Board can adopt individual or general WDRs for discharges that build upon third-party programs. These WDRs can, for example, require that the dischargers either participate in an acceptable third party program or, alternatively, submit

[25] Though marina owners/operators and hull cleaners would participate in pollution control programs, organizationally, someone other than a discharger must manage the programs.

individual pollution control plans that detail how they will comply with the WDRs. Likewise, the Regional Board can adopt discharge prohibitions, which include exceptions based on third-party programs. For example, the Regional Board can except from the discharge prohibition those discharges that are adequately addressed in an acceptable third-party pollution control program.

Failure by any single discharger to participate in their respective organization/agency program could result in more stringent regulation of that discharger by the Regional Board through enforcement of WDRs, a conditional waiver of WDRs, or waste discharge prohibitions.

Copper Discharges Regulated Under Requirements for the Municipal Separate Storm/Sewer Systems

The Regional Board will amend Order No. 2001-01, "Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm /Sewer Systems" to require that discharges of copper into SIYB waters not increase from existing loadings. Since the source analysis showed that discharges of copper from urban runoff account for less than one percent of the total loading into SIYB, an amendment to Order No. 2001-01 would not contain required copper load reductions, but rather require that discharges of copper into SIYB not increase from existing loadings. The order could also be amended to require MPs designed to reduce copper loading into SIYB, and/or monitoring for copper in the runoff management plan pertinent to SIYB.

Issuance of Investigative Order Requiring Monitoring and Reporting

Pursuant to CWC section 13267, the Regional Board could issue an investigative order to any person who "discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge waste within its region," or has discharged waste to waters of the State that could affect the quality of the waters within its region. Section 13267 states that the discharger(s) shall furnish, under penalty of perjury, technical or monitoring program reports that the Regional Board requires in investigating the quality of waters of the State within its region.

The Regional Board could require any or all persons responsible for discharges of copper to SIYB, including those accountable for load reductions under the TMDL, to monitor and report on the status of the water column in SIYB to ensure that the required load reductions for copper discharges are met. At a minimum the monitoring would measure copper levels in SIYB water column and assess water column toxicity. Monitoring would use appropriate low detection methods of analysis to detect copper concentrations at or below the water quality objectives for copper. The Regional Board could require sediment monitoring in addition to water column monitoring.

The Port is participating in the development and implementation of a single coordinated Regional Harbor Monitoring Program covering all of the harbors in the San Diego Region, including San Diego Bay. The Regional Board could require that this program include compliance monitoring and reporting in SIYB. Alternatively, the Regional Board could submit a separate directive to the Port and/or other dischargers for monitoring and reporting specific to SIYB.

Issuance of Order to Investigate, Report and Enforce Water Quality in SIYB

Pursuant to CWC section 13225, the Regional Board can require as necessary any State or local agency to investigate and report on any technical factors involved in water quality control, or to obtain and submit analyses of the water column. The Regional Board can also request enforcement by appropriate federal, State and local agencies of their respective water quality control laws.

20. TMDL Staged Compliance Schedule

As with all TMDL projects, monitoring is a necessary component to ensure that water quality standards are gradually being met. Pursuant to CWC section 13225 and by letter dated July 24, 2003, the Regional Board directed the Port to participate in the development of a single coordinated Regional Harbor Monitoring Program covering all of the harbors in the San Diego Region, including San Diego Bay. A portion of the monitoring required under this program could be used to assess compliance in SIYB with the copper load reductions specified in this TMDL and with copper water quality objectives. At a minimum, the TMDL monitoring will measure copper levels in SIYB water column and will assess water column toxicity. Monitoring should use appropriate low detection methods of analysis to detect copper concentrations at or below the water quality objectives for copper. The Regional Board shall direct the Port, and may direct the SIYB marina owners/operators, to participate in TMDL monitoring in SIYB. This monitoring must show the effectiveness of the applied MPs.

The compliance schedule presented below is based on a timeline that will minimize the economic impact of the transition and has the following key features:

- Copper load reductions are required over a 17-year staged compliance schedule period. The first stage consists of an initial 2-year orientation period during which no copper load reductions are required. The subsequent 15-year reduction period is comprised of three stages during which incremental copper load reductions are required;[26]

- The schedule assumes that: (1) all new boats entering SIYB are provided with nontoxic or less toxic coatings; and (2) the copper coating on all existing boats is replaced by a nontoxic

[26] The Carson report (2002) found that all 7,000 boats in San Diego Bay could be converted from copper-based paints to alternative coatings over a 15-year period without economic hardship to the boating community. This finding assumed that (1) all new boats entering San Diego Bay are painted with nontoxic and less toxic coatings; and (2) the copper coating on all existing boats is replaced by a nontoxic or less toxic coating at the time routine hull stripping is required.

or less toxic coating at the next time routine hull stripping is scheduled;

- The schedule includes the conduct of education programs for the SIYB boating community and commercial demonstrations and scientific studies. These efforts will be initiated during the first two years and continued throughout the 17-year schedule as appropriate; and

- The formal mandate for copper load reductions will, in and of itself, increase the market demand for nontoxic and less toxic hull coating products. The gradual 17-year transition period will allow for the development and testing of these products.

2-Year Orientation Period

During Stage 1 of the schedule (Table 16.1), no reductions in dissolved copper emissions are required. This orientation period has two purposes:

- Initiation of an educational effort for boat owners and boating industries on the copper pollution problem, nontoxic and less toxic antifouling strategies, and short versus long-term costs of nontoxic and less toxic coatings relative to copper-based paints; and

- Initiation of commercial demonstration and scientific studies to confirm the efficacy and longevity of available nontoxic and less toxic boat hull coating products. The demonstrations and studies will also allow boat repair yards and underwater hull cleaners the opportunity to develop expertise and acquire special equipment needed for the application and maintenance of nontoxic and less toxic boat hull coatings.

15-Year Load Reductions (Conversion to Non Copper-based Coatings)

Stages 2-4 of the schedule (Table 20.1) require reductions in source loading of dissolved copper to SIYB. Each stage has an associated interim target loading.

The TMDL requires a final target loading of 567 kg/year, which represents a 76 percent overall reduction in copper loading to SIYB over 17 years. Table 20.1 shows the incremental percent reductions and interim loading targets. As discussed above, during Stage 1 (years 1-2), no reductions in loading are required. In Stage 2 (years 2-7), a ten percent reduction in current loading is required at the end of the seventh year. Greater reductions in copper loading are required during Stages 3 and 4 (years 7-12 and 12-17, respectively).

Table 20.1. Interim Loading Targets for Attainment of the TMDL.

Stage	Time Period	Percent Reduction from Current Estimated Loading	Reduction to be Attained by End of Year	Estimated Interim Target Loading (kg/year of dissolved copper)
Stage 1	Years 1-2	0%	N/A	N/A
Stage 2	Years 2-7	10%	7	1,900
Stage 3	Years 7-12	40%	12	1,300
Stage 4	Years 12-17	76%	17	567

Figure 20.1 shows the required reductions in copper loading as a function of time. The schedule commences upon final the USEPA adoption of this TMDL Basin Plan amendment.

21. Necessity Standard

The Office of Administrative Law (OAL) is responsible for reviewing administrative regulations proposed by state agencies for compliance with standards set forth in California's Administrative Procedure Act, Government Code §11340 et seq., for transmitting these regulations to the Secretary of State and for publishing regulations in the California Code of Regulations. Following State Board approval of this TMDL Basin Plan amendment, any regulatory portions of the amendment must be approved by OAL (Government Code §11352). The State Board must include in its submittal to OAL a summary of the necessity[27] for the regulatory provision.

This TMDL Basin Plan amendment meets the "necessity standard" of Government Code §11353(b). Amendment of the Basin Plan to establish and implement a TMDL for SIYB is necessary because the existing water quality does not meet applicable water quality objectives for copper. Applicable State and federal laws require the adoption of this Basin Plan amendment and regulations as provided below.

The State Board and Regional Boards are delegated the responsibility for implementing California's Porter Cologne Water Quality Control Act and the federal CWA. Pursuant to relevant provisions of both of those Acts, the State and Regional Boards establish water quality standards, including designated (beneficial) uses and criteria or objectives to protect those uses.

Section 303(d) of the CWA (33 USC § 1313(d)) requires the states to identify certain waters within their borders that are not attaining water quality standards and to establish the TMDL for certain pollutants impairing those waters. USEPA regulations in 40 CFR 130.2 provide that a TMDL is a numerical calculation of the amount of a pollutant that a water body can assimilate and still meet standards. A TMDL includes one or more numeric targets that represent attainment of the applicable standards, considering seasonal variations and a margin of safety, in addition to the allocation of the target or load among the various sources of the pollutant. These include wasteload allocations (WLAs) for point sources, and load allocations (LAs) for nonpoint sources and natural background. TMDLs established for impaired waters must be submitted to the USEPA for approval.

CWA § 303(e) requires that TMDLs, upon the USEPA approval, be incorporated into the state's water quality management plans (Basin Plan). State law in turn, CWC §§ 13050(j) and 13242 require that Basin Plans have a program of implementation to achieve water quality objectives. The implementation program must include a description of actions that are necessary to achieve the objectives, a time schedule for these actions, and a description of surveillance to determine compliance with the objectives. State law requires that a TMDL include an implementation plan because the TMDL normally is, in essence, an interpretation or refinement of an existing water quality objective. The TMDL has to be incorporated into the Basin Plan under CWA § 303(e),

[27] "Necessity" means the record of the rulemaking proceeding demonstrates by substantial evidence the need for a regulation to effectuate the purpose of the statute, court decision, provision of law that the regulation implements, interprets, or makes, taking into account the totality of the record. For purposes of this standard, evidence includes, but is not limited to, facts, studies, and expert opinion. (Government Code §11349(a)).

and, because the TMDL supplements, interprets, or refines an existing objective, State law requires a program of implementation.

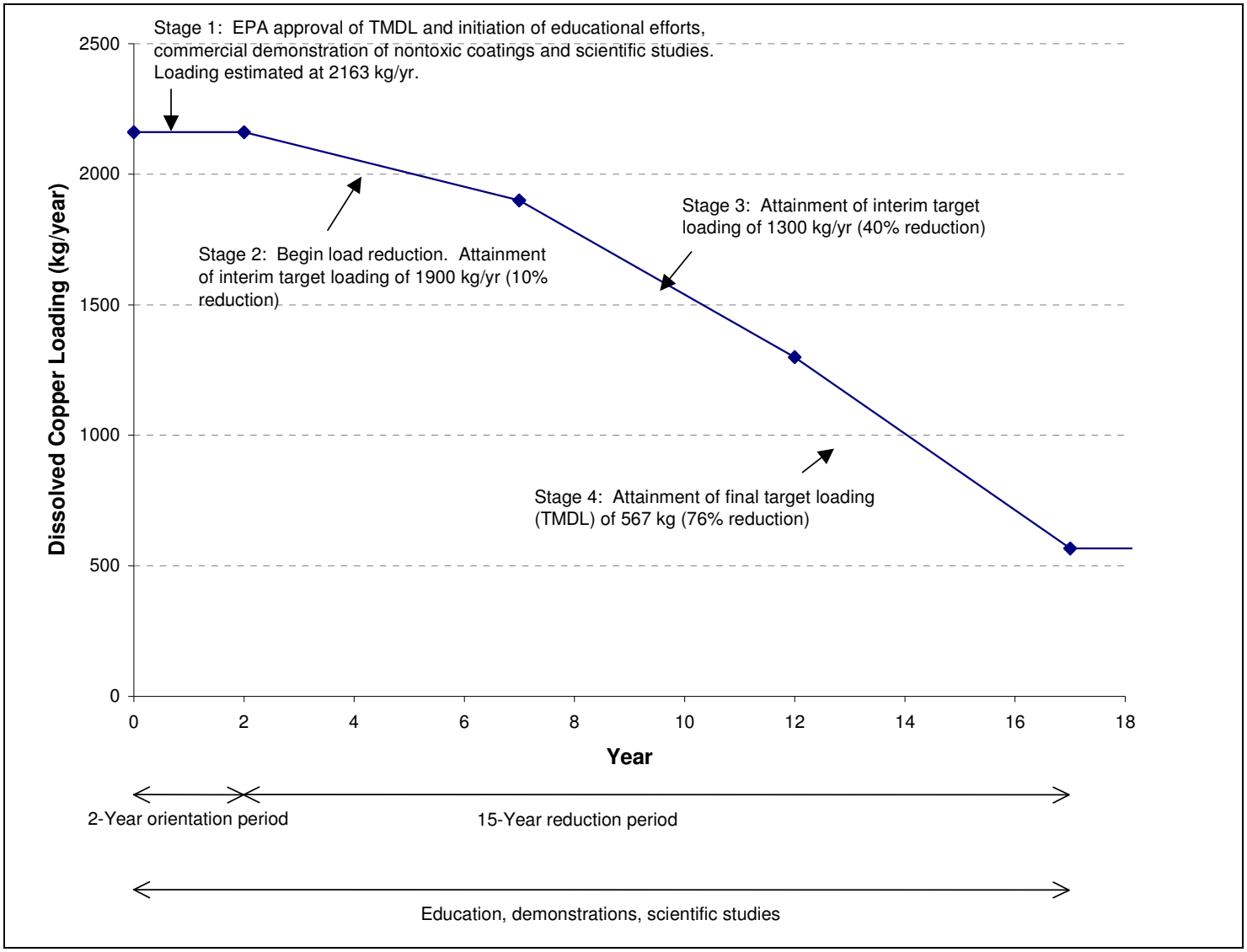

Figure 20.1. Compliance Schedule.

VI. ENVIRONMENTAL REVIEW

22. Introduction

This proposed amendment to the Basin Plan to incorporate a TMDL for dissolved copper in the SIYB is a "project" as defined by the California Environmental Quality Act (CEQA). The Regional Board is the Lead Agency for evaluating the environmental impacts of this Basin Plan amendment pursuant to CEQA. Although subject to CEQA, the Regional Board's basin planning process is certified by the Secretary for Resources as "functionally equivalent to," and therefore exempt from, CEQA's requirement for preparation of an environmental impact report or negative declaration and initial study [California Code of Regulations (CCR) Title 14, section 15251 (g)]. State Board regulations, "Implementation of the Environmental Quality Act of 1970" [23 CCR 3720 et seq.] describe the environmental documents required for Regional Board basin planning actions. These documents include a written report, an initial draft of the Basin Plan amendment, and an Environmental Checklist Form [23 CCR 3776]. Pursuant to 23 CCR 3777(a) the Regional Board must:

- Describe the proposed TMDL Basin Plan amendment;
- Identify reasonable alternatives to the proposed TMDL Basin Plan amendment;
- Identify the environmental impacts of the TMDL Basin Plan Amendment in the Environmental Checklist Form [23 CCR 3777]. Specifically, the Regional Board must identify the environmental impacts of the reasonably foreseeable methods to comply with the TMDL Basin Plan amendment; and
- Identify mitigation measures to minimize any significant adverse environmental impacts of the proposed Basin Plan amendment.

23. Description of Proposed TMDL Basin Plan Amendment

As required by section 303(d) of the CWA, the Regional Board has prepared a TMDL for dissolved copper in the SIYB portion of San Diego Bay. The purpose of the TMDL is to mandate copper mass load reductions to attain applicable water quality objectives for copper, toxicity and pesticides and to protect the wildlife and marine habitat beneficial uses. The major copper sources to SIYB are assigned numeric load and wasteload allocations, which translates to a percent reduction of current copper loading from each source. The Regional Board will amend the Basin Plan to include a TMDL for dissolved copper, an Implementation Plan, and a schedule for achieving compliance with the copper load and wasteload reductions.

The Regional Board could use its administrative tools to regulate the Port, SIYB marina owners/operators, persons owning boats moored in SIYB and underwater hull cleaners operating in SIYB to reduce the discharges of copper to SIYB. These parties are referred to as dischargers.

The copper discharges are a result of passive leaching from boat hulls painted with copper-based antifouling paints and underwater hull cleaning operations. Upon approval of the TMDL by the USEPA, the Regional Board will mandate compliance with copper load and wasteload reductions using its regulatory authority. The Regional Board will coordinate with other governmental agencies having regulatory authority to protect water quality from the adverse effects of copper-based antifouling paints in SIYB. The Regional Board will request that the USEPA, DPR, and CAC use their legal authorities to address the violations of water quality standards in SIYB caused by copper-based antifouling paints. Coordination with the DPR will be accomplished thorough the 1997 MAA between the State Board and the DPR. The Regional Board will also coordinate with CCC and DBW. These agencies may consider regulatory actions to restrict the use of copper antifouling paints in SIYB and encourage the use of nontoxic hull coatings.

The Regional Board will regulate discharges of copper to SIYB waters through the issuance of WDRs, waivers, or adoption of Waste Discharge Prohibitions. WDRs could build upon pollution control programs developed by discharger organizations or the Port. Likewise, waivers or prohibitions could be conditioned on implementation of pollution control programs through third party agreements between the Regional Board and discharger organizations, and/or the Port. The Regional Board also will amend Order No. 2001-01, “Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm /Sewer Systems” to require that discharges of copper into SIYB waters not increase from existing loadings.

The dischargers will be required to monitor SIYB waters and provide monitoring reports to the Regional Board for the purpose of assessing the effectiveness of the alternatives implemented.

24. Reasonable Alternatives to TMDL Basin Plan Amendment

This section describes reasonable alternatives to the proposed TMDL Basin Plan amendment and evaluates the comparative merits of the alternatives. The alternatives include:

- No action;
- Actions by other Agencies; and
- Actions by Regional Board;

No Action

Under the "no action" alternative the Regional Board would not adopt the proposed TMDL Basin Plan amendment and copper loading would likely continue at current levels. The no action alternative (1) does not comply with the CWA; (2) is inconsistent with the mission of the Regional Board; and (3) does not meet the purpose of the proposed TMDL Basin Plan amendment. Under CWA section 303(d), the Regional Board is obligated to adopt a TMDL for waters such as SIYB, which are not meeting water quality standards. The mission of the Regional Board is to ensure the protection of receiving water beneficial uses through attainment of applicable water quality objectives. Consistent with the Regional Board's mission, the

purpose of the proposed TMDL Basin Plan amendment is to attain water quality objectives for copper, toxicity and pesticides and to restore and protect the wildlife and marine habitat beneficial uses of SIYB.

The proposed Basin Plan amendment mandates an overall 76 percent reduction of copper loading from current levels to SIYB in order to attain water quality standards. Water quality standards are comprised of designated beneficial uses, the applicable numeric and/or narrative water quality objectives to protect those uses, and the State Board's anti-degradation policy provisions (Resolution No. 68-16, Statement of Policy with Respect to Maintaining High Quality of Waters in California). In the absence of mandatory copper load reductions, violations of the copper water quality objective and impairment of beneficial uses will likely continue in SIYB.

Actions by Other Agencies

California Department of Pesticide Regulation

The DPR is the lead state agency, with local administration by San Diego County Agricultural Commissioners (CAC), for regulating the registration, sales and use of pesticides in California. The DPR is required by law to protect the environment, including surface waters, from environmentally harmful pesticides by prohibiting, regulating, or controlling the uses of such pesticides. Copper-based antifouling paints are legally registered pesticides subject to the DPR regulation pursuant to the California Food and Agriculture Code (CDFA).

In order to promote cooperation to protect water quality from the adverse effects of pesticides, the DPR and the State Board signed a MAA in 1997. The MAA, and its companion document, "*The California Pesticide Management Plan for Water Quality*," strives to coordinate interaction, facilitate communication, promote problem solving, and ultimately assure the protection of water quality.

Under the MAA, the State Board, Regional Board, and the DPR will work cooperatively to investigate copper-based antifouling paints and develop recommended use practices or restrictions designed to reduce or eliminate the impact of copper-based paints on surface water quality. This cooperative effort is not dependent on Regional Board adoption of the proposed TMDL Basin Plan amendment. However, an effort to address the issue solely through the MAA, without a TMDL Basin Plan amendment, would likely prolong the impaired state of SIYB waters.

Addressing excessive levels of copper in SIYB solely through the MAA (between State Board and the DPR) without a TMDL Basin Plan amendment is a viable alternative. However, proceeding with adoption TMDL Basin Plan amendment in conjunction with cooperative efforts through the MAA is a superior alternative. The TMDL Basin Plan amendment formally documents the significance and magnitude of the SIYB water quality problem and quantifies the specific copper loading reductions needed to attain water quality standards. This is accomplished by the Regional Board through a formal scientific peer review, and public review, comment and hearing process prior to Board adoption of the TMDL Basin Plan amendment. The

TMDL will serve as a catalyst to initiate action by the State Board and the DPR to address the water quality impacts from the legally applied copper-based antifouling paints. The TMDL also provides a sound technical basis for future actions by the DPR to consider restrictions on the use of copper based antifouling paints. The formal mandate for copper load reduction will increase the market demand for innovative solutions including nontoxic hull coatings. This in turn will create market incentives for the development of new products. Taken together these factors support the Regional Board's adoption of the TMDL Basin Plan amendment with concurrent coordination among the DPR, State Board and the Regional Board. The TMDL Basin Plan amendment will facilitate and expedite the DPR's consideration of solutions to the copper water quality problem in SIYB through the MAA.

United States Environmental Protection Agency
The USEPA is the federal government agency responsible for registering pesticides for sale or distribution within the United States pursuant to FIFRA. Under FIFRA, the USEPA has the authority to control the distribution and sale of pesticides, and to ensure that pesticides will not cause unreasonable harm to the environment when used in accordance with label specifications. Copper-based antifouling paints are legally registered pesticides subject to regulation by the USEPA pursuant to FIFRA.

The Regional Board will request that the USEPA investigate the environmental impacts associated with copper-based antifouling paints and develop recommended use practices or restrictions designed to reduce or eliminate the impact of copper-based paints on surface water quality. The State Board, Regional Board, and the DPR will work cooperatively with the USEPA towards this goal. This cooperative effort is not dependent on Regional Board adoption of the proposed TMDL Basin Plan amendment. However, a cooperative effort in the absence of the TMDL Basin Plan amendment would likely prolong the impaired state of SIYB waters. Proceeding with adoption of the TMDL Basin Plan amendment in conjunction with cooperative efforts with the USEPA is a superior alternative.

Other Actions by Regional Board

Discharge Prohibition

CWC section 13243 provides that the Regional Board, in a water quality control plan or in waste discharge requirements, may specify certain conditions or areas where the discharge of waste, or certain types of waste, will not be permitted. Accordingly the Regional Board could elect to amend the Basin Plan to prohibit the discharge of waste of copper at any concentration or load into SIYB waters.

Under this alternative, the dischargers (i.e., the Port, the SIYB marina owners/operators, SIYB individual boat owners and SIYB underwater hull cleaners) would need to take immediate action to eliminate all copper discharges to SIYB, including the passive leaching of copper from hull bottom paints.

Compliance with the prohibition would require the dischargers to achieve an immediate 100 percent copper load reduction. In contrast, the proposed TMDL Basin Plan amendment requires a 76 percent copper load reduction over a 17-year time frame. Both the copper discharge prohibition and the proposed TMDL Basin Plan amendment would result in attainment of the copper water quality objective and protection of beneficial uses in SIYB. Both alternatives require the same copper reduction activities which may include replacement of copper-based hull bottom paints with nontoxic or less toxic alternatives, use of vessel slip liners, increased use of land side boat storage facilities and other boat owner and hull cleaner MPs. As discussed in the economic study evaluating the long-term costs of both copper-based and nontoxic antifouling paints (Carson *et al*., 2002), a compressed compliance schedule would be cost prohibitive and present an unacceptable financial burden to the boating community.

In addition, recreational boating is a popular leisure time activity that is an integral part of life in San Diego, contributing many millions of dollars to the local economy annually. Implementation of an outright prohibition on copper discharges to SIYB would be unwarranted and extremely disruptive to the boating community. For these reasons, establishment of a copper discharge prohibition is not acceptable.

Development of Site-Specific Objectives

Developing a modified copper water quality objective for SIYB based on site-specific environmental conditions may be appropriate. A modified water quality objective is referred to as a site-specific objective (SSO).

The legally applicable water quality objective for copper in SIYB is 3.1 µg/L. Scientific studies could be conducted to examine the appropriateness of establishing a less stringent copper water quality objective (i.e., an SSO). A TMDL based on an SSO that is less stringent than 3.1 µg/L, would require a smaller reduction in copper loading than the 76 percent reduction required under the proposed Basin Plan amendment. An SSO for copper in SIYB could potentially eliminate the need for a TMDL, if the SSO is currently attained in the receiving waters. The SSO would need to (1) be based on sound scientific rationale; (2) protect the designated beneficial uses of SIYB waters; and (3) be adopted by the Regional Board in a Basin Plan amendment.

The 3.1 µg/L and 4.8 µg/L copper water quality objectives currently applicable in SIYB are based on the USEPA's numeric water quality criteria. The USEPA's California Toxics Rule (CTR) water quality criteria for copper are based on national criteria designed to be protective of aquatic organisms in all inland surface waters, enclosed bays, and estuarine waters in the United States.

The CTR criteria are based on the toxicity results of a large number of nationally representative species to a single pollutant in clean controlled laboratory waters. The physical and chemical characteristics of ambient water at a particular site may result in an increase or decrease in the bioavailability and/or toxicity of a given pollutant. Examples of potentially confounding water chemistry characteristics may include dissolved organic matter, particulate matter, other

contaminants, pH, and hardness. Similarly the aquatic life community at a particular site may be more or less sensitive to a pollutant than the aquatic organisms used to develop the CTR criteria. Because (1) ambient water chemistry, and/or (2) the biological communities at SIYB may be different than the chemistry and biological communities upon which the CTR criteria were based, the CTR criteria may be over- or under- protective for SIYB.

If scientific studies demonstrate that the ambient water chemistry and/or biological communities at SIYB are significantly different from the chemistry and biological communities upon which the CTR criterion were based, an SSO for copper may be appropriate. However, the development of a copper SSO for SIYB waters, including the scientific studies necessary to support it, would be costly, time consuming and resource intensive. Dischargers or other interested parties would need to fund and initiate the scientific studies to develop the SSO.

Accounting for site-specific environmental conditions usually results in SSOs that are higher (less restrictive) than CTR criteria. However, the studies could reveal the presence of previously untested species and/or unusual water chemistry requiring the need for a more stringent copper water quality objective. The State Board's 2000 *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (SIP) provides further guidance on when SSOs may be used.

In 1998, the City of San Jose, in conjunction with the Santa Clara Basin Watershed Management Initiative, funded studies to investigate the toxic effects of copper and nickel in the Lower South San Francisco Bay. The studies demonstrated that the chemical features of Lower South San Francisco Bay reduce the toxicity and bioavailability of copper and nickel through a variety of mechanisms. Additionally, an impairment assessment demonstrated that the CTR water quality objectives for copper and nickel for Lower South San Francisco Bay could be relaxed while still fully protecting beneficial uses. As a result, in May 2002, the California Regional Water Quality Control Board, San Francisco Bay Region, adopted SSOs for dissolved copper and nickel for Lower South San Francisco Bay. The copper water quality objective for Lower South San Francisco Bay was relaxed from 3.1 µg/L to 6.9 µg/L (4-day average) and from 4.8 µg/L to 10.8 µg/L (one-hour average).

Maximum copper concentrations measured in SIYB range from approximately 8 µg/L to 12 µg/L. Current copper concentrations in SIYB would violate a copper SSO similar to the SSOs developed for Lower South San Francisco Bay. Under this scenario, the Regional Board would still be required to adopt a TMDL mandating copper load reductions in SIYB - although the copper load reductions needed would be smaller than those required under the proposed TMDL Basin Plan amendment.

25.Environmental Impacts of TMDL Basin Plan Amendment

The mission of the Regional Board is to preserve and enhance the quality of water resources in the San Diego Region for the benefit of present and future generations. All of the Regional Board's regulatory actions to implement its water quality protection programs are directed towards this end. The adoption of this TMDL and subsequent implementing actions by the Regional Board, other governmental agencies and dischargers are all designed to protect and restore beneficial uses currently impaired by elevated concentrations of copper in the SIYB portion of San Diego Bay.

Specifically, adoption of a Basin Plan amendment will require dischargers to meet copper load and wasteload reductions by implementing MPs, such as the use of nontoxic or less toxic hull bottom coatings. Although nontoxic or less toxic coatings are not widely used at this time, converting to such coatings is anticipated to be a viable solution to the copper pollution in SIYB. Should this eventually occur, the most significant environmental impact of this Basin Plan amendment would be the reduction of dissolved copper concentrations in SIYB and subsequent attainment of water quality standards. The implementation of the TMDL Basin Plan amendment will lead to an overall improvement in the water quality of SIYB and therefore the quality of the environment.

Since copper-based antifouling paints are currently the most widely used antifouling coatings, a decrease in usage and subsequent conversion to alternative coatings could lead to unforeseen adverse environmental impacts. However, the Regional Board intends that alternative coatings be used to both (1) allow for continued boating activities with minimal disruption, and (2) minimize possible adverse environmental impacts. The potential adverse impacts are described below, as well identified in and discussed following the Environmental Checklist form.

The most significant potential adverse impact resulting from the use of alternative antifouling coatings is that the alternative coatings could prove as toxic or more toxic than copper-based paints. This occurred in the late 1980s when copper paints replaced tributyltin paints on most recreational vessels following a legislative ban in the United States on the use of tributyltin on boat hulls less than 25 meters except for aluminum vessels. The universe of alternative coatings currently available consists of both "nontoxic" and "less toxic" coatings. In order to accurately evaluate the potential environmental impacts of these coatings, scientific studies are needed to accurately characterize the toxicity of the coatings. There are effective nontoxic alternatives to copper-based antifouling paints currently available, although not widely used (See "What you Need to Know about Nontoxic Antifouling Strategies for Boats", Johnson and Miller, 2002).

A less likely adverse environmental impact could occur if alternative coatings prove less effective than copper based paint. A less effective antifouling coating may lead to an increased growth of fouling organisms on vessel hulls; and the potential introduction of invasive species. The introduction of invasive species could have a significant adverse impact on indigenous ecosystems. The potential adverse impacts can be mitigated through more frequent underwater

hull cleaning, particularly on vessels prior to leaving an area known or suspected to support species that could become invasive if brought into SIYB.

Another potential adverse impact of increased air pollution could occur if less effective alternative coating strategies are applied to vessel bottoms. As with all coatings, if an appropriate maintenance program is not followed for boat hulls painted with non-copper based paints, drag will increase, and consequently so will fuel consumption. In general, less toxic and non-toxic alternative coatings require more frequent cleaning in order to remove the buildup of fouling growth and prevent increased fuel consumption. If increased frequency of hull cleaning isn't adequate to prevent significant air pollution, additional measures such as putting pollution control devices on engines may be necessary.

26. Environmental Checklist Form

The proposed Basin Plan amendment does not prescribe any particular changes in watershed management. The analysis of potential environmental impacts is therefore based on the reduced use of copper-based antifouling paints, and the subsequent use of available alternatives.

1. ***Project title***
   Resolution R9-2005-0019, AMENDMENT TO THE WATER QUALITY CONTROL PLAN FOR THE SAN DIEGO REGION (9) TO INCORPORATE A TOTAL MAXIMUM DAILY LOAD FOR DISSOLVED COPPER IN THE SHELTER ISLAND YACHT BASIN

2. ***Lead agency name and address***
   California Regional Water Quality Control Board, San Diego Region 9174 Sky Park Court, Suite 100, San Diego, CA 92123-4340

3. ***Contact person and phone number***
   Lesley Dobalian, Environmental Scientist
   (858) 637-7139

4. ***Project location***
   Shelter Island Yacht Basin, San Diego Bay, California

5. ***Project sponsor's name and address***
   California Regional Water Quality Control Board, San Diego Region 9174 Sky Park Court, Suite 100, San Diego, CA 92123-4340

6. ***General plan designation***
   Not applicable

7. *Zoning*
Not applicable

8. *Description of project*
As required by section 303(d) of the federal Clean Water Act, the Regional Board has prepared a Total Maximum Daily Load (TMDL) for dissolved copper in the Shelter Island Yacht Basin (SIYB) portion of San Diego Bay. The purpose of the TMDL is to mandate copper mass load reductions to attain applicable water quality objectives for copper, toxicity and pesticides and to protect the wildlife and marine habitat beneficial uses. The major copper sources to SIYB are assigned a numeric load and wasteload allocation, which translates to a percent reduction of current copper loading from each source. The Regional Board will amend the Basin Plan to include a TMDL for dissolved copper, an Implementation Plan, and a schedule for achieving compliance with the copper load and wasteload reductions. The Implementation Plan will require dischargers to comply with the copper load and wasteload reductions pursuant to the TMDL Basin Plan amendment.

9. *Surrounding land uses and setting*
Urban.

10. *Other public agencies whose approval is required*
State Water Resources Control Board
Office of Administrative Law
U.S. Environmental Protection Agency

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

The environmental resource categories identified below are analyzed herein to determine whether the proposed TMDL Basin Plan amendment would result in adverse impacts to any of these resources. None of the categories below are checked because the proposed TMDL Basin Plan amendment is not expected to result in "potentially significant impacts" to any of these resources.

Aesthetics	Mineral Resources
Public Services	Utilities/Service Systems
Agriculture Resources	Biological Resources
Hazards & Hazardous Materials	Cultural Resources
Hydrology/Water Quality	Noise
Recreation	Mandatory Findings of Significance
Air Quality	Geology/Soils
Land Use Planning	Transportation/Traffic

On the basis of this initial evaluation:

☐ I find that the Proposed Project COULD NOT have a significant effect on the environment,

☒ I find that although the Proposed Project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the Project have been made by or agreed to by the Project proponent.

☐ I find that the Proposed Project MAY have a significant effect on the environment.

☐ I find that the Proposed Project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect: (1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and (2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the Proposed Project could have a significant effect on the environment because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the Proposed Project, nothing further is required.

Original Signed by Art Coe for John H. Robertus January 27, 2005

John H. Robertus *Date*
Executive Officer

EVALUATION OF ENVIRONMENTAL IMPACTS

IMPACT	POTENTIALLY SIGNIFICANT IMPACT	POTENTIALLY SIGNIFICANT UNLESS MITIGATION INCORPORATION	LESS THAN SIGNIFICANT IMPACT	NO IMPACT
I. AESTHETICS Would the Project:				
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☒
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☒
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☐	☒
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☐	☒
II. AGRICULTURE RESOURCES: In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. Would the Project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
c) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?	☐	☐	☐	☒
III. AIR QUALITY – Where available, the significance criteria established by the applicable air quality management or air pollution control the District may be relied upon to make the following determinations. Would the Project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	☒
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☒		☐
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	☐	☐	☐	☒

IMPACT	POTENTIALLY SIGNIFICANT IMPACT	POTENTIALLY SIGNIFICANT UNLESS MITIGATION INCORPORATION	LESS THAN SIGNIFICANT IMPACT	NO IMPACT
d) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☐	☒
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☐	☒
IV. BIOLOGICAL RESOURCES – Would the Project:				
a) Have a substantial adverse effect, either directly, or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulators, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☐	☐	☒
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?	☐	☒	☐	☐
c) Have a substantial adverse effect on federally protected wetlands as defined by section 404 of the Clean Water Act (including, but not limited to, marsh vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☐	☒
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☐	☒
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☒
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒
V. CULTURAL RESOURCES – Would the Project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in section 15064.5?	☐	☐	☐	☒
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to section 15064.5?	☐	☐	☐	☒
c) Directly or indirectly destroy a unique paleontological resource of site or unique geological feature?	☐	☐	☐	☒
d) Disturb any human remains, including those	☐	☐	☐	☒

IMPACT	POTENTIALLY SIGNIFICANT IMPACT	POTENTIALLY SIGNIFICANT UNLESS MITIGATION INCORPORATION	LESS THAN SIGNIFICANT IMPACT	NO IMPACT
interred outside of formal cemeteries?				
VI. GEOLOGY AND SOILS – Would the Project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:	☐	☐	☐	☒
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☐	☒
ii) Strong seismic ground shaking?	☐	☐	☐	☒
Iii) Seismic-related ground failure,, including liquefaction?	☐	☐	☐	☒
iv) Landslides?	☐	☐	☐	☒
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☐	☒
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☐	☒
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform building Code (1994), creating substantial risks to life or property?	☐	☐	☐	☒
VII. HAZARDS AND HAZARDOUS MATERIALS – Would the Project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☐	☒
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☐	☒
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒
e) For a Project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the Project result in a safety hazard	☐	☐	☐	☒

Impact	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporation	Less Than Significant Impact	No Impact
for people residing or working in the Project area?				
f) For a Project within the vicinity of a private airstrip, would the Project result in a safety hazard for people residing or working in the Project area?	☐	☐	☐	☒
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☐	☒
VIII. HYDROLOGY AND WATER QUALITY – Would the Project:				
a) Violate any water quality standards or waste discharge requirements?	☐	☒	☐	☐
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of preexisting nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted?	☐	☐	☐	☒
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	☐	☐	☐	☒
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which results in flooding on- or off-site?	☐	☐	☐	☒
e) Create or contribute runoff water which exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☐	☒
f) Otherwise substantially degrade water quality?	☐	☐	☐	☒
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☒
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☐	☐	☐	☒
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a	☐	☐	☐	☒

IMPACT	POTENTIALLY SIGNIFICANT IMPACT	POTENTIALLY SIGNIFICANT UNLESS MITIGATION INCORPORATION	LESS THAN SIGNIFICANT IMPACT	NO IMPACT
levee or dam?				
j) Inundation by seiche, tsunami, or mudflow?	☐	☐	☐	☒
IX. LAND USE AND PLANNING – Would the Project:				
a) Physically divide an established community?	☐	☐	☐	☒
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the Project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☒
X. MINERAL RESOURCES – Would the Project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒
XI. NOISE – Would the Project result in:				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☐	☒
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☐	☒
c) A substantial permanent increase in ambient noise levels in the Project vicinity above levels existing without the Project?	☐	☐	☐	☒
d) A substantial temporary or periodic increase in ambient noise levels in the Project vicinity above levels existing without the Project?	☐	☐	☐	☒
e) For a Project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the Project expose people residing or working in the Project area to excessive noise levels?	☐	☐	☐	☒
f) For a Project within the vicinity of a private airstrip, would the Project expose people residing or working in the Project area to excessive noise levels?	☐	☐	☐	☒
XII. POPULATION AND HOUSING – Would the Project?				

IMPACT	POTENTIALLY SIGNIFICANT IMPACT	POTENTIALLY SIGNIFICANT UNLESS MITIGATION INCORPORATION	LESS THAN SIGNIFICANT IMPACT	NO IMPACT
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☒
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
XIII. PUBLIC SERVICES				
a) Would the Project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
Fire protection?	☐	☐	☐	☒
Police protection?	☐	☐	☐	☒
Schools?	☐	☐	☐	☒
Parks?	☐	☐	☐	☒
Other public facilities?	☐	☐	☐	☒
XIV. RECREATION				
a) Would the Project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒
b) Does the Project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	☒
XV. TRANSPORTATION/TRAFFIC – Would the Project:				
a) Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio to roads, or congestion at intersections?	☐	☐	☐	☒
b) Exceed, either individually or cumulatively, a level of service standard established by the county congestion/management agency for designated roads or highways?	☐	☐	☐	☒
c) Result in a change in air traffic patterns,	☐	☐	☐	☒

IMPACT	POTENTIALLY SIGNIFICANT IMPACT	POTENTIALLY SIGNIFICANT UNLESS MITIGATION INCORPORATION	LESS THAN SIGNIFICANT IMPACT	NO IMPACT
including either an increase in traffic levels or a change in location that results in substantial safety risks?				
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☒
e) Result in inadequate emergency access?	☐	☐	☐	☒
f) Result in inadequate parking capacity?	☐	☐	☐	☒
g) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?	☐	☐	☐	☒
XVI. UTILITIES AND SERVICE SYSTEMS – Would the Project?				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☒
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒
d) Have sufficient water supplies available to serve the Project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☐	☒
e) Result in a determination by the wastewater treatment provider which serves or may serve the Project that it has adequate capacity to serve the Project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒
f) Be served by a landfill with sufficient permitted capacity to accommodate the Project's solid waste disposal needs?	☐	☐	☐	☒
g) Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☐	☒
XVII. MANDATORY FINDINGS OF SIGNIFICANCE				
a) Does the Project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number of restrict the range of a rare or endangered plant or animal or	☐	☐	☐	☒

IMPACT	POTENTIALLY SIGNIFICANT IMPACT	POTENTIALLY SIGNIFICANT UNLESS MITIGATION INCORPORATION	LESS THAN SIGNIFICANT IMPACT	NO IMPACT
eliminate important examples of the major periods of California history or prehistory?				
b) Does the Project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probably future projects)?	☐	☐	☐	☒
c) Does the Project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☐	☒

Discussion of Possible Environmental Impacts and Appropriate Mitigation Measures

Part III, b) - Question: Would the project violate any air quality standard or contribute substantially to an existing or projected air quality violation?
Answered "Potentially Significant Unless Mitigation Incorporation "

Increased growth of fouling organisms could occur as a result of boat owners converting from copper-based antifouling paints to alternative coatings and strategies which may prove to be less effective. Less effective antifoulant coatings may result in increased fouling community growth on boat hulls. Increased fouling community growth will resulted in increased hull bottom drag and corrosion, and a subsequent decrease in safety, maneuverability, and fuel efficiency. A decrease in fuel efficiency would lead to an increase in gasoline consumption for motorized boats, which in turn could have adverse effects on air quality because of increased gasoline combustion.

To avoid this potentially significant impact, effective alternatives to copper-based antifouling paints should be considered. At present, there are a number of available alternatives that have been demonstrated to be both nontoxic in nature and effective at reducing fouling growth. Examples include silicone hull coatings and hard smooth epoxy hull coatings, combined with more frequent underwater hull cleaning. In general, less toxic and non-toxic alternative coatings require more frequent cleaning in order to remove the buildup of fouling growth and prevent increased fuel consumption. If increased frequency of hull cleaning isn't adequate to prevent significant air pollution, additional measures such as putting pollution control devices on engines may be necessary.

Part IV, b) - Question: Would the project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?
Answered "Potentially Significant Unless Mitigation Incorporation"

Increased growth of fouling organisms could occur as a result of boat owners switching from copper-based antifouling paints to alternative coatings, which may prove to be less effective. An increase in abundance and species diversity of fouling organisms on a boat previously moored in a different location could lead to the transport of invasive species into SIYB. In a recent study of this concept entitled "Fouling and Ship's Hulls: How Changing Circumstances and Spawning Events may Result in the Spread of Exotic Species" (Minchin and Goliasch, 2003), the authors propose that vessels having mature attached exotic biota can result in spawning and eventual development of invasive populations of organisms. Certain invasive species have been known to cause disruptions in ecosystems by a variety of mechanisms, such as through competition with native biota for food and resources. The natural community, if one exists in SIYB, could be negatively affected by the introduction and establishment of invasive species.

To avoid this potentially significant impact, effective alternatives to copper-based antifouling paints should be considered. At present, there are a number of available alternatives that have

been demonstrated to be both nontoxic in nature and effective at reducing fouling growth. Examples include silicone hull coatings and hard smooth epoxy hull coatings, combined with more frequent underwater hull cleaning. Furthermore, underwater hull cleaning should be performed particularly on vessels prior to leaving an area known or suspected to support species that could become invasive if brought into SIYB.

Additionally, the formal mandate for copper load reduction in this TMDL Basin Plan amendment will in and of itself, increase the market demand for innovative solutions including nontoxic, effective hull coatings. This in turn will create greater market demand for the development of new products.

Part VIII, a) - Would the project violate any water quality standards or waste discharge requirements?
Answered "Potentially Significant Unless Mitigation Incorporation"

An increase in the use of alternatives coatings to copper-based antifouling paints is anticipated because of the required reduction in emissions of dissolved copper to SIYB. The alternative coatings could prove as toxic or more toxic than copper-based paints. This could potentially lead to violations of the water quality standards for the antifouling agent in the alternative coating. One example of this is the phase-out of tributyltin (TBT) that took place as a result of regulations and legislation passed in 1988 that prohibited the use of antifouling paint containing this agent in 1988. TBT is a highly toxic chemical to aquatic life that accumulates in sediment, bioaccumulates in shellfish, fish and sea otters and is extremely toxic to various aquatic invertebrates, fish, and plants (SWRCB 1998). Since prohibitions were imposed on the use of TBT in antifouling paints, copper has replaced its use as the toxic ingredient in antifouling paints on recreational vessels in the United States. Essentially one toxic antifouling coating was replaced by another toxic coating, both of which impair water quality.

Alternative coatings currently available consist of both “nontoxic” and “less toxic” coatings. In order to accurately evaluate the potential environmental impacts of these coatings, scientific studies are needed to accurately characterize the toxicity of the coatings. There are effective nontoxic alternatives to copper based antifouling paints currently available although not widely used (See “What you Need to Know About Nontoxic Antifouling Strategies for Boats”; Johnson and Miller, 2002).

Because of these potential implications, caution should be exercised when alternatives to copper-based antifouling paints are selected. At present, there are a number of available alternatives that have been demonstrated to be nontoxic in nature. Additionally, an increase in the demand for alternatives to copper-based antifouling paints will probably result. Copper pollution has been identified as a problem of concern in marinas and harbors across the nation, including California, Maryland, Washington and Florida, and is also of concern in countries in Europe, including Sweden and Denmark (Johnson and Miller, 2002). Furthermore, the formal mandate for copper load and wasteload reductions in the TMDL Basin Plan amendment will increase the market

demand for innovative solutions including nontoxic hull coatings. This in turn will create market incentives for the development of new products.

If load and wasteload reductions required in SIYB are not required in other San Diego Bay marinas SIYB boaters owners may move relocate their boats from SIYB to other marinas. This may result in the copper loading from copper-based antifouling paint found in SIYB to be re-located to other marina areas. However, since copper-based antifouling paints are widely used, water quality impairments already potentially exist in other marinas. Movement of boats out of SIYB to other marinas would probably not increase the existing problem to a large degree.

In addition, there is a potential for the future transport of dissolved copper from sediment to the water column as a result of TMDL implementation. Although sediment may currently act as a net sink for copper in the water column, it has the potential to act as a net source in the future. During a period of low external loading, sediment that once acted as a net sink for copper can become a long-term net source through exchange with historically contaminated sediment that are re-suspended in the water column. As copper in sediment is re-suspended, it may act as a buffer to slow down the reductions in copper concentrations in the water column that would be expected from decreased loading of other sources to SIYB. However, the overall result of decreasing copper loading to SIYB should result in reductions in copper concentrations in both the water column and the sediment over time.

VII. ECONOMICS ANALYSIS

The California Environmental Quality Act (CEQA) has specific provisions governing the Regional Boards' adoption of regulations, such as the regulatory provisions of the Basin Plan that establish performance standards or treatment requirements. CEQA provides that the Regional Board must do an environmental analysis of the reasonably foreseeable methods of compliance with those standards or requirements.[28] The Regional Board must consider economic factors in this analysis.

CEQA does not define "performance standard"; however, the term is defined in the rulemaking provisions of the Administrative Procedure Act.[29] A "performance standard" is a regulation that describes an objective with the criteria stated for achieving the objective.[30] TMDLs will typically include performance standards. TMDLs normally contain a quantifiable numeric target that interprets the applicable water quality standard. They also include wasteload[31] allocations for point sources, and load allocations[32] for nonpoint sources and natural background to achieve the target.[33] The quantifiable numeric target together with the allocations may be considered a performance standard.

In summary, the economic analysis that is required for a TMDL consists of an estimate of the cost of the reasonably foreseeable methods of compliance with the load and wasteload and load reductions. The Regional Board can adopt TMDLs despite significant economic consequences. The Regional Board is not required to do a formal cost-benefit analysis.

This TMDL specifies an overall 76 percent reduction in copper loading from copper-based antifouling paints to SIYB. The most reasonably foreseeable method of compliance involves phasing out the use of copper-based antifouling paints and increasing the use of nontoxic and less toxic alternative coatings.

27. The Carson Report

An investigation mandated under California Water Code (CWC) section 13366 was recently completed for the purpose of identifying incentives necessary to ensure that nontoxic alternatives to metal-based antifouling hull coatings are used on recreational vessels in San Diego Bay. The investigation and resulting report, "Transitioning to Non-Metal Antifouling Paints On Marine

[28] Pub. Resources Code section 21159.

[29] Gov. Code section section 11340-11359.

[30] *Id.* section 11342(d).

[31] See 40 C.F.R. section 130.2(g). A wasteload allocation is the portion of the receiving water's loading capacity that is allocated to one of its existing or future point sources of pollution.

[32] See *id*. section 130.2(g). A load allocation is the portion of the receiving water's loading capacity that is attributed either to one of its existing or future nonpoint sources of pollution or to natural background sources.

[33] See *id*. section 130.2(i). A TMDL is the sum of the individual wasteload and load allocations.

Recreational Boats in San Diego Bay" was conducted by the University of California, San Diego, in conjunction with the California Department of Boating and Waterways (DBW) (Carson *et al.*, 2002). This report was prepared in response to CWC section 13366 created by California Senate Bill 315 (Alpert, 2001), which established the San Diego Advisory Committee for Environmentally Superior Antifouling Paints for the purpose of making recommendations and advising in the preparation of the report. The Carson report identified nontoxic alternatives, compared the costs of using these alternatives to the cost of using traditional copper-based antifouling paint and identified economic incentives for transitioning to the use of alternatives. This report considered economic impacts and incentives from a San Diego Bay-wide perspective.

Major Report Findings on Economic Factors Relating to Phase-In of Nontoxic Antifouling Coatings

The Carson report includes a rigorous cost comparison between the use of nontoxic hard epoxy and the use of traditional copper-based antifouling paint, including several findings concerning the economic impacts of transitioning paint types in all of San Diego Bay. Because the characteristics of copper paints differ from those of nontoxic epoxy coatings, the report found that cost comparisons should be based on costs over the entire life span of the boat. Important characteristics of each hull coating type including longevity, application and maintenance requirements are compared in the table below.

Table 27.1. Comparison of Copper-Based Antifouling Paints to Nontoxic Epoxy Coatings.[34]

Copper-Based Antifouling Paints	Nontoxic Epoxy Coatings
Initially less expensive to apply ($30 per foot)	Initially more expensive to apply ($30 - $50 per foot)
Do not need to be cleaned as often (14 times per year)	Need to be cleaned more often (22 times per year)
Need to be re-applied more often (every 2.5 years)	Do not need to be re-applied very often (every 5 years to 10 years)
Need to be stripped about every 6th application (every 15 years assuming paint is reapplied every 2.5 years)	Do not need to be stripped in first 30 – 60 years

The major findings of the report are summarized below and are based on the assumptions in the table above.

- Copper-based antifouling paints are more cost effective over the short-term, but nontoxic epoxy coatings are more cost effective over the long-term life of the boat.

- Although initial costs are greater, boat owners will likely realize small cost savings on nontoxic hull coatings and maintenance over the life of the boat compared to the costs

[34] Comparison is based on a typical "stylized" 40-foot long boat, 11-foot beam width, and 375 square feet of wetted hull surface.

associated with copper paint.

- To be cost effective, nontoxic epoxy coatings must be applied to new boat hulls or existing boat hulls that are in need of stripping. This is because of the high costs associated with labor-intensive hull stripping. New boats do not require hull stripping and existing boats are only required to convert to nontoxic coatings at the point in time when routine stripping will be required in any event (i.e. every 15 years).

- As shown in Figure 27.1 below, 100 percent reduction of boats painted with copper can be achieved in San Diego Bay with minimal economic impacts in approximately 15 years. This assumes that all new boats are painted with nontoxic coatings and that existing boats are converted to nontoxic coatings when they undergo routine stripping. (In 15 years all existing boats in San Diego Bay will have been stripped and repainted with nontoxic coatings and all new boats will have initially been painted with nontoxic coatings.) The report also found that a 66 percent reduction could likely be achieved in approximately 10 years.[35]

[35] The Carson report. examined a 66 percent copper reduction level because an earlier draft version of this TMDL called for a 66 percent reduction of copper loading to SIYB. The current draft TMDL requires a 76 percent reduction.

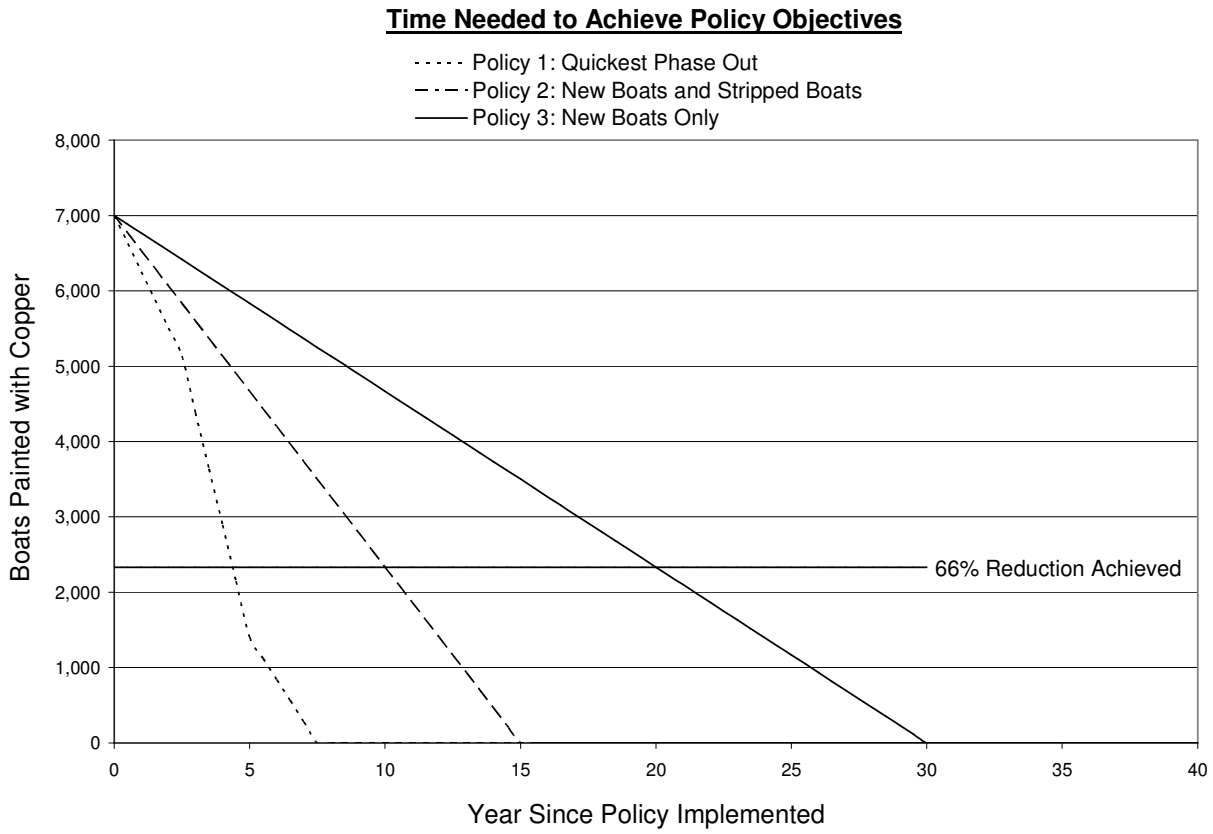

Figure 27.1. Time Needed to Achieve Policy Objectives.[36]

The report authors acknowledge variability in cost assumptions and that different conclusions result from different assumptions. For example under "best case" assumptions believed to be the most likely by the report authors, boat owners will save small amounts of money on nontoxic hull coatings and maintenance over the life of the boat. Under "worst case" assumptions, individual boat owners could spend slightly more money on nontoxic coating maintenance but the amount will be small compared to hull maintenance cost over the life of the boat. The variability in cost assumptions is further discussed below.

[36] The Carson. report evaluated three distinct policy options for phasing out the use of copper-based antifouling paints. Policy 1 looked at a "quickest phase out," with all boats converting to nontoxic coatings immediately. Under this policy, complete conversion to nontoxic coatings in San Diego Bay could take place in seven years and was estimated to cost approximately $15 million. Policy 2 looked at paint conversions for new and stripped boats (boats currently in need of new paint) and found that this could take place in San Diego Bay in 15 years at a cost of approximately $1.5 million. Policy 3 looked at converting new boats only to nontoxic coatings. Complete conversion in the Bay would take approximately 30 years and was discarded as not being a viable option due to the long time frame.

Report Findings on Cost Variability to Different Aged Boats

Boat hull maintenance costs vary significantly depending on the age of a boat. This is because stripping is required for boats older than a certain age, and the associated costs are significantly more expensive than other routine maintenance costs. For example, stripping costs can be approximated at $150/foot versus $30-$50/foot for a paint application. For the following analysis, all existing boats (not new) are assumed to be currently painted with copper-based paints.

In terms of comparing the costs associated with copper-based and nontoxic hard epoxy coatings, the need for stripping is key, since this is required for nontoxic hard epoxy application if copper-based paints were previously used. In the case of a new, unpainted boat, stripping costs are not a consideration. In the case of an older boat (approximately 15 years old), the effects of stripping on cost comparisons are identical since stripping is required for both application of nontoxic hard epoxy coatings, or continued application of copper-based paints. However, for boats that are in between these two age groups, the costs associated with stripping are much more pivotal. For example, a boat aged 2.5 years, if the costs of copper-based paints are considered, will not require stripping immediately. On the other hand, if a boat aged 2.5 years is currently painted with copper-based paints, and the owner is transitioning to nontoxic hard epoxy coatings, then stripping is required and the associated costs are much higher. Table 27.2 demonstrates the costs associated with hull maintenance for different aged boats, for both types of coatings. For each boat age considered, the remaining lifetime hull maintenance costs for both types of coatings are given. The remaining lifetime maintenance cost differentials between nontoxic hard epoxy coatings and copper-based paints are also given. For example, for a new boat with 30 years of service remaining, lifetime hull maintenance costs for nontoxic hard epoxy coatings would be $1,726 over that of copper-based paints. For a boat aged 2.5 years, lifetime hull maintenance costs for nontoxic hard epoxy coatings would be $6,251 over that of copper-based paints. Finally, for a boat aged 15 years, lifetime hull maintenance costs for nontoxic hard epoxy coatings would be $2,303 over that of copper-based paints.

Table 27.2. Lifetime Hull Maintenance Cost Difference between Nontoxic Hard Epoxy and Copper: Worst Case Scenario for Nontoxic Hard Epoxy Expenditures.

Age of Boat	Years of Service Remaining	Lifetime Hull Maintenance Cost for Service Remaining: Copper	Lifetime Hull Maintenance Cost for Service Remaining: Nontoxic Hard Epoxy	Cost of Remaining Life Hull Maintenance (Differential, Nontoxic Hard Epoxy-Copper)
New	30	$11,922	$13,648	$1,726
2.5 Years	27.5	$12,060	$18,312	$6,251
15 Years (hull currently needs stripping)	15	$13,580	$15,884	$2,303

(Standardized boat; 40-foot length, 11-foot width)

It must be emphasized that the cost differentials described in Table 27.2 are associated with worst-case assumptions in terms of transitioning from copper-based paints to nontoxic hard epoxy coatings. In other words, the nontoxic hard epoxy paint duration was assumed to be on the low end of the range, and the price of paint application was assumed to be at the high end of the range.

If different parameters are assumed, then the results shown in Table 27.2 are significantly different. For example, if more optimistic assumptions are made about the price and duration of nontoxic hard epoxy coatings, then it becomes less expensive to apply nontoxic hard epoxy paint to a new boat, or to a boat that is currently in need of stripping. Table 27.3 demonstrates the costs associated with hull maintenance for different aged boats, for both types of coatings for best-case assumptions regarding nontoxic hard epoxy coatings. Under these assumptions, for a new boat with 30 years of service remaining, lifetime hull maintenance costs for nontoxic hard epoxy coatings would be $1,354 less than that of copper-based paints. For a boat aged 2.5 years, lifetime hull maintenance costs for nontoxic hard epoxy coatings would be $3,171 over that of copper-based paints. Finally, for a boat aged 15 years, lifetime hull maintenance costs for nontoxic hard epoxy coatings would be $26 less than that of copper-based paints.

Table 27.3. Lifetime Hull Maintenance Cost Difference between Nontoxic Hard Epoxy and Copper: Best Case Scenario for Nontoxic Hard Epoxy Expenditures.

Age of Boat	Years of Service Remaining	Lifetime Hull Maintenance Cost for Service Remaining: Copper	Lifetime Hull Maintenance Cost for Service Remaining: Nontoxic Hard Epoxy	Cost of Remaining Life Hull Maintenance (Differential, Nontoxic Hard Epoxy-Copper)
New	30	$11,922	$10,568	-$1,354
2.5 Years	27.5	$12,060	$15,231	$3,171
15 Years (hull currently needs stripping)	15	$13,580	$13,554	-$26

(Standardized boat; 40 foot length, 11 foot width)

As stated earlier, the parameters associated with the costs of nontoxic hard epoxy paint application are not precisely known. In terms of identifying the costs to boat owners of TMDL implementation, the conservative approach would be to assume the cost estimates presented in Table 27.2. However, it must be kept in mind that the variables associated with nontoxic alternatives are most likely affected by several factors. These include greater boater demand for nontoxic alternatives, and improving paint technology and resulting increase in number of available alternatives.

Report Findings on Incentives to Convert to Nontoxic Coatings

In conformance with a legislative mandate (CWC section 13366), the Carson report identified several important factors that create incentives for boat owners to convert from copper-based antifouling paints to nontoxic alternative coatings. In order to identify the incentives, a random survey of 200 San Diego Bay boat owners was conducted in 2002. The two most significant

incentives cited in the Carson report were greater longevity of nontoxic coatings and a law requiring the phase-out of copper-based antifouling paint and the use of nontoxic coatings. Seven factors were rated extremely important or very important by boat owners in making a decision to convert to nontoxic coatings:

- The greater longevity of nontoxic paint (77 percent)
- A law requiring nontoxic coatings (76 percent)
- That San Diego Bay would be cleaner with nontoxic paint (71 percent)
- Marina or mooring requires nontoxic paint (62 percent)
- Hull must be cleaned more often with nontoxic paint (57 percent)
- Boat would be easier to resell with nontoxic paint (45 percent)
- Cost to remove old copper paint (39 percent)

Boat owners in the survey were willing to pay about $500 more to apply a nontoxic coating. The survey found that 63 percent of the participating boat owners knew that there was a copper pollution problem in San Diego Bay. However most of those boat owners were not aware that their boats were the cause of the copper problem. Of those surveyed, 80 percent were not familiar with any specific nontoxic hull coating. In summary, the survey demonstrated a significant need for boater education to highlight the considerations behind the need to replace traditional copper-based antifouling paints with nontoxic alternatives.

Report Findings on Policy Instruments

The Carson report recommended two important policy instruments that policy makers may wish to consider in resolving the copper pollution problem in San Diego Bay while still maintaining the economic viability of boating:

1. Announce a future ban on the use of copper-based antifouling paints and set a specific date by which copper-based antifouling paints will no longer be allowed in San Diego Bay; and

2. Require that all new boats be coated with nontoxic coatings and that existing boats convert to nontoxic alternatives when routine stripping is required.

The Regional Board recognizes that such policies could be instrumental in decreasing copper loading into SIYB. However, the identified dischargers, regardless of method, must meet the copper reductions identified in this report. A thorough discussion of the responsibilities of the dischargers is discussed in the Implementation Plan of this document.

28. SIYB TMDL Implementation Costs

Based on the policy recommendations of the Carson report, the Regional Board has determined that the most reasonably foreseeable method to attain compliance with the copper reductions specified for SIYB is a phased conversion from copper-based antifouling paints to nontoxic or less toxic alternatives over a 15-year period (following a 2-year orientation period). Therefore

the following cost analysis focuses on such an effort. In accordance with the Carson report, the transition to nontoxic or less toxic alternatives may be accomplished by requiring all new boats to be coated with nontoxic or less toxic coatings and requiring existing boats to convert at the time when routine hull stripping is required.

Boater education and encouragement of the use of nontoxic and less toxic alternative coatings will help to ensure success of TMDL implementation. In the Carson report, it was found that few boaters in San Diego Bay were aware of the water quality problems caused by copper-based paints. However, there was a willingness to convert to nontoxic coatings if there was a suitable economic incentive, or a future ban was put in place.

According to the Carson report, two types of educational programs are necessary for a successful, sustainable, and smooth phase-in of nontoxic antifouling coatings:

- A 2-year educational effort for boat owners and boating industries on the copper pollution problem to increase awareness that (1) copper is a significant problem in San Diego Bay; (2) copper-based antifouling paints are a significant source of the problem; and (3) there are cost effective alternatives to copper-based antifouling paints when costs are considered over the life of the boats;

- A 2-year commercial demonstration for boat repair yards and underwater hull cleaning companies to acquire special equipment and develop expertise needed for applying and maintaining nontoxic boat bottom coatings.

It is assumed that marina owners/operators and the Port will incur the costs of these educational efforts. The marina owners/operators and the Port may choose to apply for grants to help fund such efforts. Estimates of the costs for this transition in SIYB for these agencies, as well as all identified dischargers of copper are shown below. Unless otherwise stated, the cost assumptions for TMDL implementation in SIYB are based on the Carson report.

Implementation Costs to Persons Owning Boats Moored in SIYB

The costs associated with a transition to nontoxic and less toxic coatings are variable based on factors such as: the age of each individual boat, initial application costs, repainting frequency, hull cleaning frequency, and hull stripping frequency.

Implementation of the requirements associated with this TMDL is assumed to occur by a transition to non-copper based antifouling coatings. The costs associated with such a transition are highly variable, as discussed earlier. Despite this variability, costs can be conservatively estimated and are represented in Table 27.2. Table 27.2 describes the costs associated with different-aged boats, and these costs are directly applicable to individual boat owners. If more optimistic assumptions are made regarding expenditures associated with nontoxic hard epoxy coatings, then cost comparisons to copper-based paints are more closely displayed in Table 27.3.

According to the Carson report, this transition could take place with minimal economic impact (~ $1.5 million) to the boating community in San Diego Bay over 15 years.

In addition, companion strategies for controlling fouling growth that can be used with nontoxic coatings include: using the vessel more often; using it at high speed; storing it on land or hoisting it above the water at the slip; surrounding it with a plastic liner and adding 10-15 percent fresh water to reduce salinity. Slip liners are available from a variety of manufacturers and cost $940 for a 25-foot vessel (manufacturer Bottom Liner) or $815 for a 28-foot vessel (manufacturer Armored Hull) (Johnson and Miller, 2002b).

Implementation Costs to Underwater Hull Cleaners

Since compliance with the required reduction in copper emissions is assumed to occur by a transition to non-copper based antifouling coatings, the implementation costs on the hull cleaning industry should be greatest in the early stages of conversion. Since nontoxic hard epoxy coatings are currently not widely used, there will be initial added costs because of the need to purchase new equipment, as well as the need for education and/or training to ensure the use of proper techniques. However, the investments required for a hull industry educational program should be offset by the increase in business from the application of these coatings. Specifically, the economic study (Carson *et al.*, 2002) found that hulls with nontoxic hard epoxy coatings require cleaning about 22 times per year, whereas hulls with copper-based paints require cleaning about 14 times per year. This reflects an approximate 57 percent increase in business for the hull cleaning industry.

Implementation Costs to Marina Owners/Operators

As a result of TMDL implementation, it will be necessary for marina operators located in SIYB to administer programs to encourage the phase-out of copper-based paints and introduction of nontoxic alternatives. As stated earlier, a 2-year educational program and commercial demonstration should help facilitate a smooth transition to nontoxic alternatives. Work in these areas has been ongoing by the University of California Sea Grant Extension Program (Sea Grant), a program based on a partnership between the nation's universities and National Oceanic and Atmospheric Administration (NOAA) with the purpose of providing science-based information regarding coastal resources. Specifically, Sea Grant has been involved with extensive public outreach and education pertaining to copper pollution in the San Diego area and demonstrations involving the use of nontoxic and less toxic coatings and strategies. Sea Grant has been extensively involved with these issues since 2000 and to date has spent approximately $450,000-$500,000 for these efforts (Johnson, 2003). Continuation and initiation of these types of programs in response to TMDL implementation shall be the responsibility of both the marina owners/operators and the Port District. The marina owners/operators and yacht clubs may chose to apply for grants to help fund these efforts.

In addition to imposing new programs, subsequent enforcement and reporting to the Regional Board will incur additional costs.

Implementation Costs to the San Diego Unified Port District

As with the marina owners and operators, the Port will be jointly responsible for implementation of a 2-year educational program/commercial demonstration. Costs for these programs are not precisely known but are probably comparable to what has been spent by Sea Grant, or approximately $450,000-$500,000 over a 3-year period. The Port as with the marina owners/operators and yacht clubs, may chose to apply for grants to help fund these efforts.

In addition, TMDL implementation requires monitoring to assess the concentration of dissolved copper. That the Port will play a major role in coordinating and completing this effort is anticipated.

In July 2003, the Regional Board issued a directive to all harbor authorities in the San Diego Region pursuant to section 13225 of the CWC. All harbor authorities are required to monitor and report the ambient water quality in Dana Point Harbor, Del Mar Boat Basin at the Marine Corps Base Camp Pendleton, Oceanside Harbor, Mission Bay, and San Diego Bay. Measurements of dissolved copper, amongst other pollutants, are required. Since compliance with this section 13225 directive is expected to satisfy the monitoring and reporting requirements of this TMDL, it follows that implementation of these requirements through TMDL adoption will add little to no further economic burden to the Port.

TMDL implementation could also result in potential cost savings to the Port in terms of costs associated with routine dredging. Harbors need regular dredging to maintain water depth. Sediment disposal costs are significantly higher if the material is classified as toxic or hazardous. For example, the cost to dredge/dispose of sediment on the beach or in the ocean is roughly $5-$10/cubic yard (McCoy and Johnson, 1995). In contrast, the cost to dredge and dispose of hazardous waste is roughly $40-$60/cubic yard (McCoy and Johnson, 1995). Since TMDL implementation will ultimately decrease the copper loading into SIYB, this will result in a decreased amount of copper reaching the sediments. The sediments, which are currently not classified as hazardous material, will continue to be free of added costs associated with disposal.

Implementation Costs to Boatyards

As with the hull cleaning industry described above, implementation costs will likely be greatest, although relatively minor, to the boatyard industry in the early stages of conversion. Since nontoxic alternatives are currently not widely used, there will probably be greater costs associated with the need for personnel training to ensure proper paint application. In terms of costs for the purchase of new equipment, TMDL implementation will not result in added economic burden, since application equipment for nontoxic coatings is the same as that used for copper-based paints (Roberts, 2003). Boats painted with alternative antifouling paints may not need to be painted as frequently as with copper antifouling paints, depending on the type of paint used. Overall, the boatyards should incur minor expenses as a result of transitioning to nontoxic alternative coatings.

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IX. APPENDICES

Appendix 1: Source Analysis Assumptions

The calculations to determine the loading from each significant source of copper are detailed in Appendix 2. The assumptions used in these calculations are provided below. Assumptions involving the calculation of the loading capacity of SIYB are documented in Appendix 3.

1. The San Diego Unified Port District's (Port) Harbor Police conduct an annual pleasure craft survey that documents the number of slips or buoys and their confirmed occupancy in San Diego Bay marinas. In 1999, San Diego Bay had approximately 9,001 slips or buoys, with confirmed occupancy of 7,295 boats. Furthermore, there were 2,363 slips at SIYB, with confirmed occupancy of 2,242 boats. The number of available slips in SIYB was used in the passive leaching and hull cleaning calculations of dissolved copper loading because it represents the maximum possible number of moored vessels.

2. The number of recreational vessels in SIYB is always constant.

3. All recreational vessels in SIYB are painted with hard, copper-based antifouling paints. Half (50 percent) of the vessels in SIYB are painted with epoxy copper-based antifouling paints and half are painted with copper-based antifouling vinyl paints. This assumption was based on a survey conducted by Sea Grant in the San Diego Region on boatyards and their usage of the most common types of antifouling paints for recreational boats (Johnson and Miller, 2002).

4. The majority of recreational vessels throughout San Diego Bay are sailboats between 30 to 40 feet in length (Conway and Locke, 1994). According to the Port Captain of Southwestern Yacht Club, of the boats moored in their marina approximately 75 percent are sailboats and 25 percent are powerboats (Wachtler, 2000). The average size of recreational vessels in the SIYB is 40 feet in length (12.2 meters), with an average beam width of 11 feet (3.4 meters) (Wachtler, 2000; Miller, 2000).

5. Hull surface area was estimated using the following equation: Hull Surface Area = Boat Length*Beam*0.85 (Interlux, 1999).

6. Recreational vessels in San Diego Bay are painted on average every two years (Conway and Locke, 1994).

7. The behavior of copper-based antifouling paint on fiberglass panels used in the study "Copper Emissions from Antifouling Paint on Recreational Vessels" (Schiff *et al*., 2003) is sufficiently similar to the behavior of copper-based antifouling paint on pleasure craft.

8. Physical seawater parameters such as pH, temperature, and salinity are negligible in terms of affecting the behavior of copper-based antifouling paint on either fiberglass panels or boat hulls.

9. In this analysis, the passive leaching rate for recreational vessels was calculated to be 6.5 $\mu g/cm^2$/day of copper. See explanation in Appendix 2.

10. Half (50 percent) of the underwater hull cleaners use Management Practices (MPs) to perform cleanings.

11. All of the vessels in the SIYB are regularly maintained. Each recreational vessel in the SIYB undergoes underwater hull cleaning 14 times a year (Carson *et al*., 2002).

12. In this analysis, the underwater hull cleaning copper emissions rate for recreational vessels was calculated to be 8.5 $\mu g/cm^2$/event. See explanation in Appendix 2.

13. It was conservatively assumed that all storms result in some runoff that is expressed as an annual average (Pj equal to one) (See Section C of Appendix 2).

14. In order to convert from total copper to dissolved copper in freshwater, it was assumed that hardness was equal to 100 mg/L. Ninety six percent of the total copper in freshwater at a hardness of 100 mg/L is dissolved copper, based on the USEPA's default conversion factor (USEPA, 1996; USEPA, 2000) was also assumed.

15. Eighty-three percent of the total copper in saltwater is dissolved copper, based on the USEPA's default conversion factor (USEPA, 1996; USEPA, 2000).

16. Direct atmospheric deposition rates determined for Santa Monica Bay, Santa Monica, CA and its watershed are comparable to rates for SIYB.

17. The surface area of SIYB was based on estimates derived at mean lower low water (MLLW) (Moore, 2000). This estimate may under-represent the average surface area at SIYB over a yearly cycle.

18. In this analysis, it was assumed that sediment in SIYB does not act as a net source of dissolved copper.

19. There were no other significant sources of dissolved copper to the SIYB other than those identified in the source analysis.

Appendix 2: Source Analysis Calculations

a) Passive Leaching Calculations (Section 4, Passive Leaching)

Passive leaching rates from copper antifouling paints are dependent on a number of factors, including the type of paint, copper content, age of the paint, time since last hull cleaning, and frequency of painting. Leaching rates also vary with environmental conditions such as pH, temperature and existing slime layer.

Passive Leaching Rate Determination

The passive leaching rates from two separate studies were used to determine loading of dissolved copper into SIYB. One study was conducted by the US Navy and quantified rates of dissolved copper *in situ* from seven recreational vessels in San Diego Bay (Valkirs *et al.*, 2003). The other study was conducted by the Southern California Coastal Waters Research Project (SCCWRP) and looked at leaching rates of dissolved copper from fiberglass panels painted with both epoxy and hard vinyl paints (Schiff *et al*., 2003). In the SCCWRP study, the rate of passive leaching was measured several times over a one-month time period, beginning one day after hull cleaning. Over the course of the month, the passive leaching rate was defined by integrating the area under the curve generated from all the data points. For epoxy paints, the passive leaching rate was reported as 4.3 $\mu g/cm^2/day$. For vinyl paints, the passive leaching rate was reported as 3.7 $\mu g/cm^2/day$. In contrast, the US Navy study looked at a "snapshot" of passive leaching rates for epoxy paints. An average leaching rate was estimated by averaging the instantaneous rates measured on seven different boats. This value was reported as 8.2 $\mu g/cm^2/day$. In the US Navy study, time since hull cleaning was not known.

In order to estimate loading of dissolved copper into SIYB, a passive leaching rate must first be established. After consultation with the principal authors of both studies, it was decided to use the results of both studies (Schiff, 2003a and Valkirs, 2003a). Combining study results assumes, however, that the behavior of epoxy paints is similar on both the fiberglass panels and the boat hulls. This also assumes that the effects of physical parameters in the surrounding seawater such as pH, temperature, and salinity, have negligible effects on the paint behavior since both studies were conducted under varying environmental conditions. The methodology for determining a passive leaching rate is described below.

Passive Leaching Rate for Epoxy Paints

In this analysis, a leaching rate for epoxy paints was estimated by taking the average of the data points from both the SCCWRP and Navy studies. Data point values for leaching rates were obtained from the figures provided in the publications. The average leaching rate for epoxy paints was estimated to be 7.1 $\mu g/cm^2/day$.

Passive Leaching Rate for Hard Vinyl Paints

A leaching rate for hard vinyl paints was estimated by taking the average of the data points for the SCCWRP study, only. This is because the US Navy study did not look at the effects of hard vinyl paints. The average leaching rate for hard vinyl paints was determined to be 5.9 $\mu g/cm^2/day$. Note that this number differs from what is reported by the authors, which is

3.7 $\mu g/cm^2/day$. That is because the rate reported by the authors was determined by integrating the area under the curve for the one-month experiments, whereas in this technical report the rate is determined by averaging the values of the individual data points. This was done to be consistent with the methodology used for determination of a leaching rate for epoxy paints.

Overall Leaching Rate for Copper-Based Paints

This analysis assumed that 50 percent of the boats in SIYB are painted with epoxy paints and the other 50 percent painted with hard vinyl paints. For this reason, the average leaching rates from both paints is needed to determine an overall passive leaching rate of dissolved copper. The rate is then used to determine overall loading of dissolved copper into SIYB from passive leaching.

Average passive leaching rate = (7.1 $\mu g/cm^2/day$ + 5.9 $\mu g/cm^2/day$)/2
= 6.5 $\mu g/cm^2/day$

Determination of Source Loading Using Leaching Rate

In San Diego Bay, the majority of recreational vessels are sailboats ranging in length from 30 to 40 feet (9.1 to 12.2 meters) (Wachtler, 2000; Conway and Locke, 1994). In SIYB, the average size recreational vessel is 40 feet in length (12.2 meters), with a beam width of 11 feet (3.4 meters) (Miller, 2000; Conway and Locke, 1994; Wachtler, 2000). The average wetted hull surface area for vessels at SIYB was calculated according to the following equation (Interlux, 1999):

Wetted hull surface area = (Boat length)*(Beam)*(0.85).

The term "beam" refers to the boat width. Once the wetted hull surface area was determined, passive leaching over time per vessel was then calculated.

Dissolved copper loading from passive leaching for all of the recreational vessels in the SIYB was calculated based on the number of available slips in the marina. This number was obtained from the Port's Harbor Police annual pleasure craft survey, which documents the number of vessel slips and their confirmed occupancy throughout San Diego Bay (Harbor Police, 1999). In 1999, there were 2,363 slips or buoys at SIYB, with a confirmed occupancy of 2,242 boats. In order to be conservative, the total number of slips was used to represent the number of vessels in SIYB. Copper loading from passive leaching was calculated as follows:

Annual copper load (kg/year) = $P*S*N_v$, and $S = L*B*0.85$

Where:

- P = Passive leaching rate
- N_v = Number of vessels
- S = Wetted hull surface area = Overall length*Beam*0.85
- L = Average boat length
- B = Average beam width

Given:

$P = 6.5\ \mu g/cm^2/day$
$N_v = 2{,}363$ (maximum number of vessels)
$L = 12.2$ meters (m)
$B = 3.4$ m

Wetted hull surface area = L*B*(0.85)
Wetted hull surface area = (12.2 m)*(3.4 m)*(0.85) = 35.3 square meters (m^2)
Annual load = (6.5 $\mu g/cm^2/day$)*(35 m^2)*(2,363 vessels)*(10,000 cm^2/m^2)*(kg Cu/10^9 μg)(365 days/yr.)
= 1,962 kg/year of copper.

<u>Copper load from passive leaching to SIYB ≈ 2,000 kg/year of copper.</u>

b) Underwater Hull Cleaning Calculations (Section 4, Underwater Hull Cleaning)
In order to determine the load from underwater hull cleaning, it was assumed that approximately half of the vessels in SIYB are painted with epoxy paints and half with vinyl paints, and that MPs are used to clean hulls on approximately half of the vessels. For epoxy paints, cleaning without MPs doubled the dissolved copper flux, from 8.6 $\mu g/cm^2$/event to 17.4 $\mu g/cm^2$/event (Schiff *et al*., 2003). The response from hard vinyl paints remained similar whether or not MPs were used (3.8 versus 4.2 $\mu g/cm^2$/event) (Schiff *et al*., 2003). Using these assumptions, the rates for the epoxy and vinyl paints were averaged to arrive at an emissions rate for underwater hull cleaning at SIYB:

<u>Determination of Hull Cleaning Rate</u>

Average dissolved copper emissions rate from epoxy paints	= (8.6 $\mu g/cm^2$/event + 17.4 $\mu g/cm^2$/event)/2 = 13 $\mu g/cm^2$/event
Average dissolved copper emissions rate from vinyl paints	= (3.8 $\mu g/cm^2$/event + 4.2 $\mu g/cm^2$/event)/2 = 4 $\mu g/cm^2$/event
Average dissolved copper emissions rate (both paint types)	= (13 $\mu g/cm^2$/event + 4 $\mu g/cm^2$/event)/2 = 8.5 $\mu g/cm^2$/event

<u>Determination of Source Loading Using Hull Cleaning Rate</u>
Annual copper load (kg/year) = $P*S*N_v$, and S = L*B*0.85

Where:

P = Underwater hull cleaning rate
N_v = Number of vessels
S = Wetted hull surface area = Overall length*Beam*0.85
L = Average boat length

B = Average beam width
Cu = Copper

Given:
P = 8.5 μg/cm^2/event
N_v =2,363 (maximum number of vessels)
L = 12.2 m
B = 3.4 m
N_h = 14 events/year

Wetted hull surface area = L*B*(0.85)
Wetted hull surface area = (12.2 m)*(3.4 m)*(0.85) = 35.3 m^2

Annual load = (8.5 μg/cm^2/day)*(35 m^2)*(2,363 vessels)*(10,000 cm^2/m^2)*(kg Cu/10^9 μg)*(142 events/year)
= 98.4 kg/year

<u>Copper load from underwater hull cleaning to SIYB ≈ 100 kg/year.</u>

c) Urban Runoff Calculations (Section 4, Urban Runoff)

Copper loading from urban runoff is dependent on several factors including perviousness (represented by a runoff coefficient), flow-weighted mean pollutant concentration (also known as the Event Mean Concentration, or EMC), and area under consideration. Both the runoff coefficient and EMC are functions of land-use types.

The Simple Method was used to calculate wet weather storm drain runoff to SIYB (Schueler, 1987). The equation used to determine dissolved copper loading follows (Schueler, 1987):

Pollutant Loading = P*Pj*Rv*C*A

Where:
P = Average annual rainfall
Pj = Unitless correction factor to account for storms with no rainfall
Rv = Runoff coefficient (dimensionless)
C = Flow-weighted mean pollutant concentration = EMC
A = Area under consideration

Statistics for the San Diego International Airport show an average annual rainfall of 26.5 cm from 1927 through 1998 (City of San Diego, 2000a). Conservatively, it was assumed that all storms result in some runoff that is expressed as an annual average, i.e. Pj is equal to one. These two values (P and Pj) are the same regardless of land-use type.

Land-use in the watershed draining to SIYB is comprised almost entirely of single-family residential land-use. This was determined by studying a land-use distribution of the watershed drainage area (City of San Diego, 2003). Land-use composition is roughly 95 percent single family residential, with the remaining types consisting of commercial, education, transportation, and others. The runoff coefficient corresponding to residential land-use is 0.55, the EMC for total copper is 34 µg/L, and the area associated with this land-use type (in the SIYB watershed) is 3.04 km^2.

Since the EMC is given in terms of total copper, this value must be converted to dissolved copper in order to calculate the contribution of dissolved copper from urban runoff into SIYB. USEPA (2000b, 1996) provides an equation for the calculation of dissolved copper from total copper in both freshwater or saltwater:

Dissolved copper = Total copper * Conversion factor.

The conversion factor for freshwater with an average hardness of 100 mg/L is 0.96. The average five-year EMC for residential land use in San Diego was determined to be 34 µg/L for total copper, which converts to 32.6 µg/L for dissolved copper, after applying the conversion factor of 0.96 (City of San Diego, 2000a).

Given:

P = 26.5 cm/year
Pj = 1.0
Rv = 0.55
C = EMC = 32.6 µg/L of dissolved copper
A = 3.04 km^2 = Area of SIYB watershed

Pollutant Loading = P*Pj*Rv*C*A
Pollutant Loading = (26.5 cm/year)*(1.0)*(0.55)*(32.6 µg Cu/L)*(3.04 km^2)*(kg Cu/10^9 µg)*(10^{10} cm^2/km^2)*(L/10^3 cm^3)
Pollutant Loading = 14.44 kg Cu/year

Similar calculations were performed for all other types of land-uses comprising the watershed drainage to SIYB. Each land-use type had a unique value for Rv, C, and A, resulting in various pollutant loadings. The pollutant loadings from each land-use type are shown below.

Table A2.1. Pollutant Loading into SIYB from Various Land-Uses.

Land-Use Type	Rv	C (µg Cu/L)	A (km^2)	Pollutant Loading (kg Cu/yr)
Single Family Residential	0.55	32.6	3.04	14.44
Commercial and Office	0.85	25.9	0.01	0.06
Education	0.85	25.9	0.03	0.15
Transportation	0.85	26.0	0.01	0.06
Institutions	0.85	25.9	0.02	0.12
Commercial Recreation	0.85	25.9	0.03	0.16
Undeveloped	0.55	27.84	0.01	0.05
Total			3.15	15.04

Total wet weather loading from all land-uses comprising watershed drainage to SIYB was calculated to be 15.0 kg/year of copper. Dry weather loading was conservatively estimated to be equal to wet weather loading. Therefore, the combined load from wet and dry weather flows (urban runoff) is approximately 30 kg/year of copper.

Copper load from urban runoff to SIYB ≈ 30 kg/year.

d) Background Calculations (Section 4, Background)
See Appendix 3: Linkage Analysis and Calculation of Background Loading for an analysis of loading from ambient seawater ("background") into SIYB.

e) Atmospheric Deposition Calculations (Section 4, Direct Atmospheric Deposition)
In a southern California study, the atmospheric deposition of copper was investigated for the Santa Monica Bay and the Santa Monica Bay watershed (Stolzenbach *et al.,* 2001). Contaminant loading from atmospheric deposition was determined through a combination of direct and indirect methods combining data collection, analysis and modeling. The results of this study were used to estimate direct atmospheric copper loading to SIYB. Direct atmospheric deposition results from wet and dry deposition directly to the surface of the waterbody. Indirect atmospheric deposition occurs when dissolved copper enters the watershed that drains to SIYB. Indirect deposition is a component of urban runoff to SIYB, and is accounted for in the urban runoff source analysis. This analysis addresses only direct atmospheric deposition.

Rainfall statistics from the San Diego area were used to estimate the amount of rainfall and the number of wet and dry days for SIYB. Statistics for the San Diego International Airport show an average annual rainfall of 26.5 cm from 1927 through 1998 (City of San Diego, 2000a). In addition, from 1948 to 1986 there was an average rain event duration of 9.24 hours, an average event depth of 0.97 cm, and 18.33 number of events per year (City of San Diego, 2000a). After subtracting out the number of rain days, it was determined that there are approximately 358 dry weather days per year:

Number of dry weather days = 365 days - Number of rain days

= [365 days – (9.24 hours)]*(18.33 events/year)*(day/24 hours)
= 358 days/year

The surface area of SIYB at MLLW was derived by the Port using bathymetry, and was determined to be 8,054,000 square feet (ft^2) (Moore, 2000).

Direct atmospheric deposition to SIYB during wet and dry weather was calculated separately below.

Wet weather deposition:
In the Santa Monica Bay study, the rain weighted mean copper concentration was determined to be 2.16 µg/L (Stolzenbach *et al.,* 2001). This value was converted to a dissolved copper concentration of 2.07 µg/L using a conversion factor of 0.96 for freshwater, assuming an average hardness of 100 mg/L (USEPA, 2000b; USEPA, 1996):

Dissolved copper = Total copper * Conversion factor
Dissolved copper = 2.07 µg/L

Wet weather atmospheric deposition was calculated using the following equation:

Aw = P* Cr*A

Where:
Aw = Wet weather atmospheric deposition
P = Average annual rainfall
Cr = Rain weighted mean copper concentration
A = Area under consideration

Aw = (2.07 µg Cu/L)* (26.5 cm/year)*(8,054,000 ft^2)*(1 ft/30.48 cm)*(28.32 L/ft^3)*(kg/10^9 µg)

Aw = 0.410 kg Cu/year

Dry weather deposition:
In the Santa Monica Bay study, dry deposition flux of copper was estimated to be approximately 11.6 µg/m^2/day (Stolzenbach *et al.,* 2001). This rate was converted from total to dissolved copper using a conversion factor of 0.96 for freshwater, assuming an average hardness of 100 mg/L (USEPA 2000b, USEPA 1996):

Dissolved copper = Total copper * Conversion factor.

Dry weather loading was calculated using the following equation:

Ad = Dr*(0.96)*Nd*A

Where:

Ad = Dry weather loading
Dr = Dry deposition flux rate
0.96 = Conversion factor
Nd = Number of dry weather days
A = Area under consideration

Ad = (11.6 μg Cu/m^2/day)*(0.96)*(8,054,000 ft^2)*(m^2/10.76 ft^2)*(358 days/year)*(kg/10^9 μg)

Ad = 2.98 kg Cu/year

Direct atmospheric deposition:
Direct atmospheric deposition = Wet weather deposition + Dry weather deposition

Direct atmospheric deposition = 0.410 kg Cu/year + 2.98 kg Cu/year = 3.39 kg Cu/yr.

Copper load from direct air deposition to SIYB ≈ 3 kg/year.

f) Copper Loading Summary (Section 4, Summary of Loading Estimates)
Total Load = Load [(Passive leaching) + (Hull cleaning) + (Background) + (Urban runoff) + (Direct atmospheric deposition) + (Sediment)]

Total Load = (2000 + 100 + 30 + 30 + 3 + 0) kg Cu/year = 2,163 kg Cu/year

Total Load into SIYB ≈ 2,163 kg Cu/year

Appendix 3: Linkage Analysis and Calculation of Background Loading

The linkage analysis describes the relationship between the numeric target and the attainment of water quality standards by defining the waterbody's total assimilative capacity, or loading capacity, for the pollutant. The loading capacity represents the maximum amount of pollutant loading the waterbody can support and still attain water quality standards. This number, when adjusted by a margin of safety, defines the TMDL for a particular waterbody and pollutant.

A "box model" based on mass-balance principles was used to calculate the loading capacity of SIYB. This theoretical model, which was tailored to SIYB, describes copper fate and transport in and out of the Basin. This model was developed by Space and Naval Warfare Systems Command (SPAWAR) for use by the Regional Board (Chadwick, 2000).

Copper mass balance in SIYB was derived using general mass balance principles. In order to do so, a control volume must be defined. In this case, the control volume was defined as the volume of water in the entire Basin, where the only open boundary for tidal flushing occurs at the interface between the Basin and the rest of San Diego Bay, herein referred to as the "Basin entrance." This control volume was chosen for two reasons: (1) the entire Basin is listed as impaired on the State's Section 303(d) List, and (2) the geometry of the Basin as a whole is known, which results in increased confidence in the analysis.

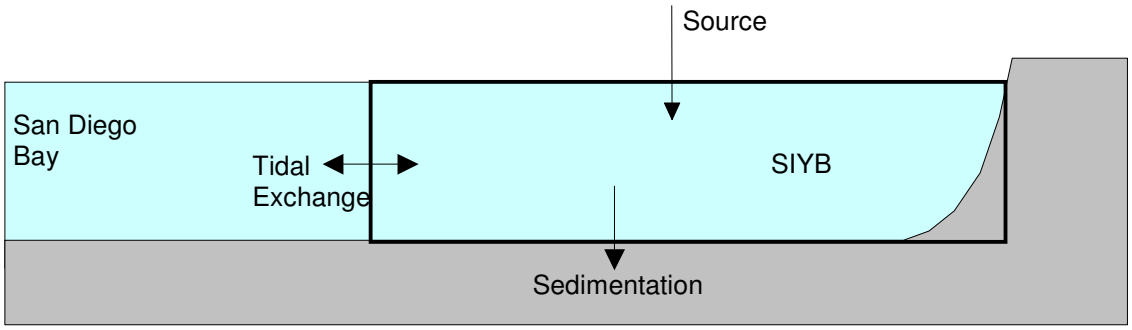

Figure A3.1. Schematic Profile of the Control Volume.

Movement of a constituent in and out of the defined control volume is described by conservation of mass. In conceptual form, this can be written as:

$$(a) \quad \begin{bmatrix} \textit{Rate of mass increase} \\ \textit{in control volume} \end{bmatrix} = \begin{bmatrix} \textit{Rate of mass entering} \\ \textit{control volume} \end{bmatrix} - \begin{bmatrix} \textit{Rate of mass leaving} \\ \textit{control volume} \end{bmatrix}$$

For this analysis, total copper (as opposed to dissolved copper) was analyzed as the constituent. By using total copper, this ensured that partitioning, or copper distribution among various chemical and biological forms, did not need to be accounted for in the analysis since total copper includes all forms. By not considering partitioning in the analysis, the mass generated and lost within the control volume is zero.

Although the analysis was performed for total copper, the loading capacity must be expressed in terms of dissolved copper, since the numeric target for this TMDL is expressed as dissolved copper. To account for this, the load reduction required to meet the numeric target was first calculated in terms of total copper, and then converted into a value for dissolved copper using a conversion factor.

General Equation for Conservation of Mass (Mass Balance)

There are two basic transport processes across the boundaries of the control volume: (1) advection, or transport of a constituent resulting from the flow of water in which the constituent is dissolved or suspended; and (2) dispersion, or transport due to turbulence, or mixing in the water. Dispersion is often driven by concentration gradients. For example, tidal flow reversals as well as secondary currents driven by salinity gradients tend to increase dispersion (Metcalf and Eddy, 1991).

Advection and dispersion take place in three dimensions; however, a one-dimensional simplification was used for this analysis because SIYB is much longer than it is wide or deep. This is a useful simplification that is often made in characterizing enclosed embayments (Metcalf and Eddy, 1991, Fischer *et al.*, 1979). Thus, constituent transport is governed by tidal flushing, or movement of water across the cross-sectional area of the Basin entrance.

Combining the effects of advection and dispersion, and also accounting for sources and sinks of the constituent, results in the general conservation of mass equation. This serves as the basis for practically all water quality modeling (Metcalf and Eddy, 1991):

$$(b) \quad \frac{\partial C}{\partial t} = \underbrace{-U\frac{\partial C}{\partial x}}_{\text{Advection term}} + \underbrace{\frac{\partial}{\partial x}\left[K\frac{\partial C}{\partial x}\right]}_{\text{Dispersion term}} + \sum sources + \sum sinks$$

where C = the average concentration of the constituent within the control volume. The units are expressed as (mass/volume).
U = water velocity in the x- direction. (length/time).
K = dispersion coefficient. (length^2/time).

For purposes of analyzing an enclosed embayment, the time derivative term describes the change per tidal cycle, and K expresses the result of all the mixing processes that occur within the tidal cycle. Source terms include external inputs into the control volume, including various non-point sources. The effects of these sources are additive, and the rates of input can simply be summed in the conservation of mass equation. A discussion of source terms specific to SIYB is contained in the text, Section 4, Summary of Loading Estimates. The sink terms can likewise be summed in the equation. The dominant sink is the loss of copper to sediment, as discussed further later.

Conservation of Mass to Describe "Salt Balance"

The unique dispersion coefficient K for the SIYB system can be calculated by analyzing the "salt balance" within the Basin. This is done by modifying the conservation of mass equation to describe the movement of salt across the boundary of the control volume, or the Basin entrance. Assuming tidally averaged conditions, the salt balance for an evaporative Basin with a single entrance can be described as Equation 3 (Chadwick, 2002).

(c) $u_e A_c = eA_s$

where u_e = average advective velocity, (length/time)
A_c = cross sectional area of Basin entrance, (length^2)
e = rate of evaporation within the Basin, (length/time)
A_s = surface area of the Basin, (length^2).

This equation states that loss of water due to evaporation within the Basin must be balanced by the average advective flow through the entrance of the Basin. This is depicted in Figure A3.2.

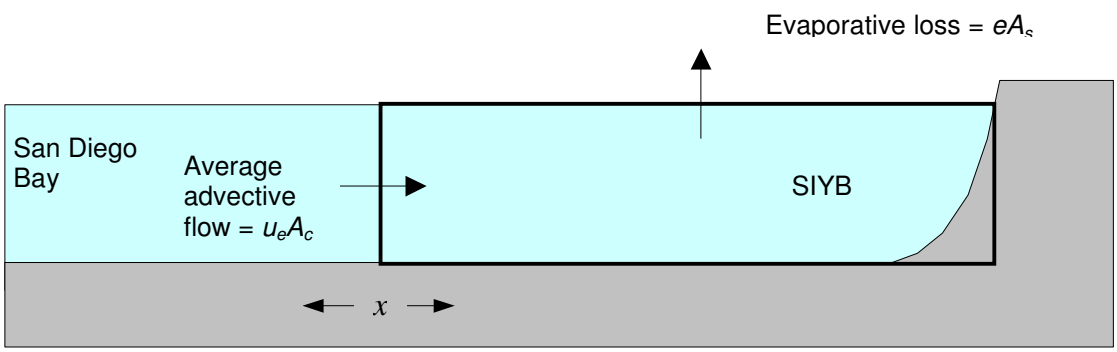

Figure A3.2. Salt Balance in SIYB.

Note that in this specific example, u_e replaces U in Equation *(b)* as the average cross-sectional velocity. Rearranging Equation *(c)* and solving for u_e,

(d) $$u_e = \frac{eA_s}{A_c}$$

Next, the conservation of mass equation is used to describe the salt balance. Since salt is the constituent under analysis, the variable C in Equation *(b)* now represents the concentration of salt within the Basin, denoted by the variable S. Assuming that the concentration of salt does not change over time, or steady state conditions:

(e) $$\frac{\partial S}{\partial t} = 0$$

The assumption of steady state conditions is useful in describing changes over long-term time frames, as opposed to describing transient effects caused by storms. This assumption is appropriate in this analysis because of the relatively low level of rainfall occurring in the watershed (Largier *et al*., 1997). After taking steady state conditions under consideration, Equation *(b)* becomes:

$$(f) \quad u_e \frac{dS}{dx} = \frac{d}{dx}\left[K \frac{dS}{dx}\right] + \sum sources + \sum sinks$$

Assuming that there are no sources of salt except for the seawater entering the Basin entrance causes the source term to become zero. Also, at equilibrium, there is no sink and the Basin becomes hypersaline (Largier *et al.*, 1997):

$$(g) \quad u_e \frac{dS}{dx} = \frac{d}{dx}\left[K \frac{dS}{dx}\right]$$

Multiplying both sides of the equation by the cross-sectional area A_c,

$$(h) \quad u_e A_c \frac{dS}{dx} = \frac{d}{dx}\left[KA_c \frac{dS}{dx}\right]$$

Integrating both sides of the equation with respect to dx, the equation describing the long-term salt balance between evaporative advection (u_e), and tidal dispersion (K) is

$$(i) \quad u_e A_c S_1 = KA_c \frac{dS}{dx} \cong KA_c \frac{(S_2 - S_1)}{\Delta x}$$

where S_1 and S_2 = data describing the salinity gradient in SIYB. Salinity is measured in practical salinity units (psu).
Δx = a "typical" mixing length corresponding to the salinity gradient in SIYB.

S_1 and S_2 were obtained from salinity data in San Diego Bay in late summer when evaporation is dominant and the bay is near steady state. Figure A3.3 depicts the salt balance in SIYB.

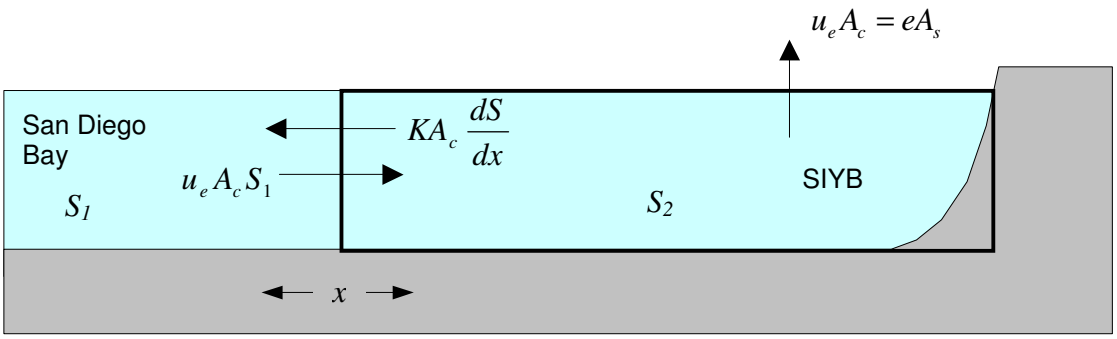

Figure A3.3. Salt Balance for K Determination.

Salinity Measurements and K Determination

Salinity measurements for S_1 and S_2 were made by SPAWAR in a series of surveys from August 2000 through September 2001 to provide distribution data for salinity and copper in San Diego Bay (Chadwick *et al.*, 2002b). Sampling occurred across several portions of San Diego Bay in the form of "boat transects." For this study, San Diego Bay was split into 27 distinct regions, or boxes shown in Figure A3.4. SIYB was included in this survey, and is identified as Box 6.

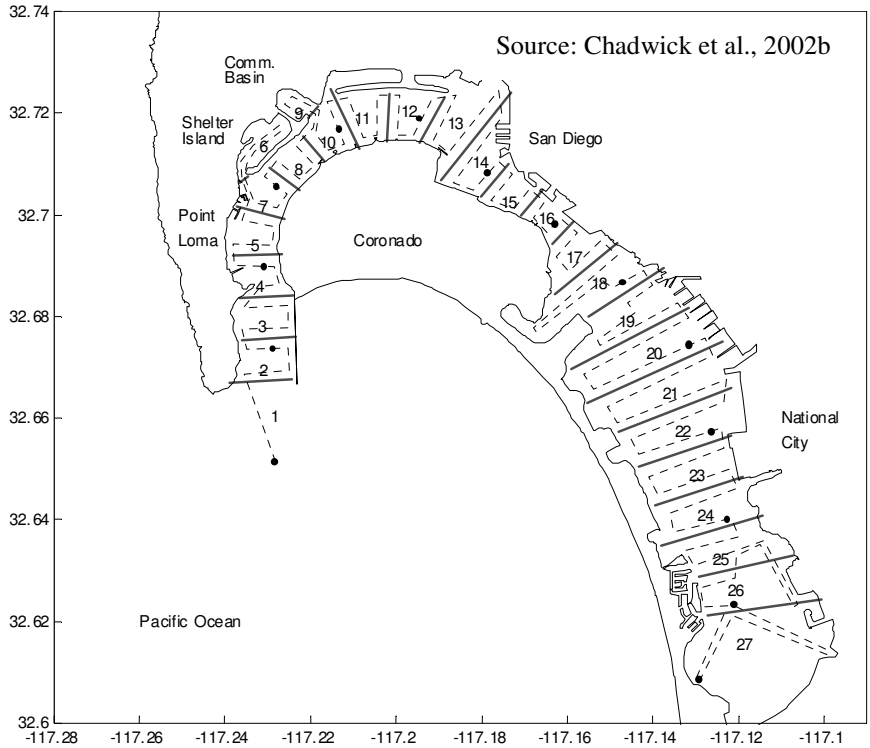

Sampling boxes = solid lines with numbers,

Survey transect = dashed line,

Vertical profile locations = solid circles.

Figure A3.4. Map of San Diego Bay Showing Sampling Boxes.

For each survey, each transect layout was developed to include two transverse legs within each of the 27 regions. During the transect, continuous measurements and composite samples were collected for salinity and copper, as well as several other parameters including temperature, depth, pH, and dissolved oxygen. The details of these surveys and a discussion of the findings will be available in the near future (Chadwick *et al.*, 2002b).

Data from the boat survey in September 2001 was used as input parameters for the box model. Specifically, salinity data from Box 7 was used to describe S_1, and salinity data from Box 6 was used to describe S_2. In addition, a "typical" mixing length (Δx) was estimated to represent the length of the salinity gradient. This value corresponds to an estimated distance between the endpoints for S_1 and S_2. This mixing length (Δx) corresponds to an average mixing length, which follows the natural contours of the shape of the Basin and surrounding area. In other words, this is not a straight-line distance. A rough schematic of the length of the salinity gradient (Δx) is provided in Figure A3.5.

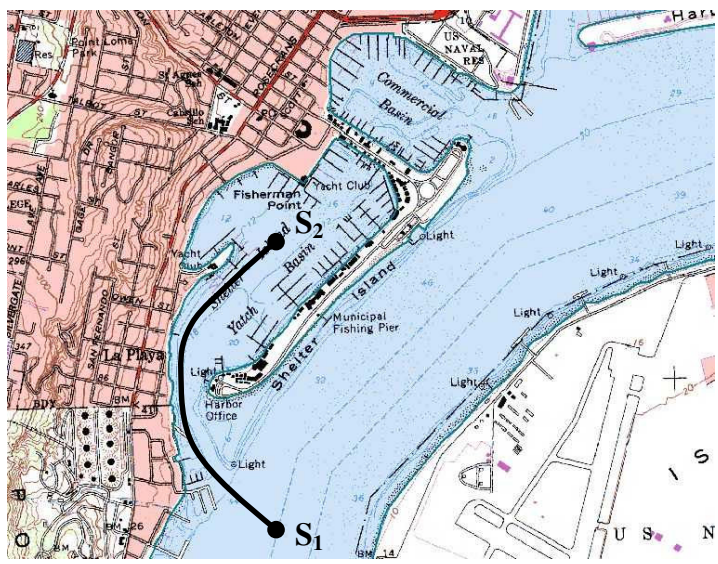

Figure A3.5. Salinity Gradient for SIYB.

Once (Δx) is estimated, the dispersion coefficient for this system can be approximated. Solving Equation *(i)* for K,

$$(j) \quad K \cong \frac{u_e S_1 \Delta x}{S_2 - S_1}$$

Combining Equations *(d)* and *(j)*,

$$(k) \quad K \cong \frac{e A_s S_1 \Delta x}{A_c (S_2 - S_1)}$$

Conservation of Mass to Describe Copper Fate and Transport

Now that the dispersion term *K* has been calculated for this particular system, the conservation of mass equation can be solved for total copper. Equation *(i)* is re-written to reflect the analysis of copper, denoted by the variable *C*. The source and sink terms are once again present since the analysis is for copper and not salt.

$$(l) \quad u_e A_c C_1 = KA_c \frac{dC}{dx} + \sum sources + \sum sinks$$

The additive effects of both sources and sinks can be incorporated into the equation by assigning one variable for each parameter. Copper loading to the Basin is represented by R_S. This describes the additive rates from all point and nonpoint sources discussed in the text, Section 4.7. Sources include contributions from boat hull cleaning, passive leaching, urban runoff, and others. The sink term is represented by R_L, or loss rate of copper from the Basin. Equation *(l)* now becomes:

$$(m) \quad u_e A_c C_1 = KA_c \frac{dC}{dx} + R_L - R_S$$

In addition to tidal flushing, movement of copper out of the Basin is dominated by loss to sediment (Chadwick, 2002). The loss to sediment is a first- order reaction with respect to the concentration of copper in the water column was assumed. This means that the loss rate of copper is directly proportional to the concentration of copper in the water column. This loss rate of copper is represented by:

$$(n) \quad R_L = k_L V_2 C_2$$

where k_L = rate constant describing total copper loss to sediment in SIYB. This is expressed as (percent/time).
V_2 = volume of the Basin (control volume)
C_2 = the average concentration of copper within the Basin, (mass/volume).

The mass balance for total copper is depicted in Figure A3.6. Note that the sign convention for the source and sink terms corresponds with the direction of copper movement specified by the arrows.

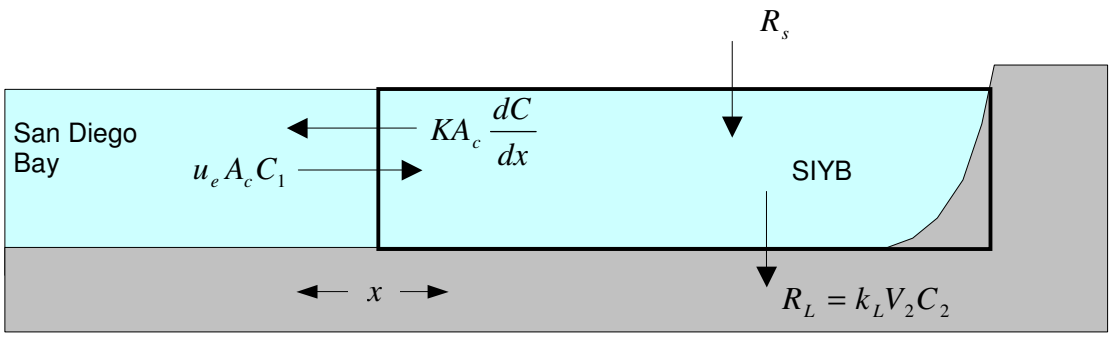

Figure A3.6. Mass Balance for Total Copper in SIYB.

Results for calculating dissolved copper concentrations using the approximation described by Equation *(n)* have been in close agreement with copper concentrations measured throughout San Diego Bay in a study conducted by SPAWAR. The range of values that were calculated for the rate constant k_L was four to seven percent/day for San Diego Bay (Chadwick *et al*., 2002b). However, a rate constant k_L was not calculated specifically for SIYB in the study.

Combining Equations *(m)* and *(n)*, the modified conservation of mass equation describes SIYB specifically. The final version becomes:

$$(o) \quad u_e A_c C_1 = KA_c \frac{(C_2 - C_1)}{\Delta x} + k_L V_2 C_2 - R_S$$

The maximum rate of copper loading into the Basin can now be determined by solving Equation *(o)* for R_S. Thus the maximum rate of copper loading, or loading capacity, is:

$$(p) \quad R_S = C_2\left(\frac{KA_c}{\Delta x} + k_L V_2\right) - A_c C_1\left(u_e + \frac{K}{\Delta x}\right)$$

Finally, Equation *(p)* is combined with Equation *(d)* to yield an expression for R_S where all the input variables can be supplied. Each variable, and the corresponding unit expressions, is described below.

$$(q) \quad R_S = C_2\left(\frac{KA_c}{\Delta x} + k_L V_2\right) - A_c C_1\left(\frac{eA_s}{A_c} + \frac{K}{\Delta x}\right)$$

where C_1 = average background concentration of copper (measured in the area of San Diego Bay adjacent to SIYB, expressed as total copper), (mass/volume).

C_2 = average target concentration for copper in the Basin (expressed as total copper), (mass/volume)
K = dispersion coefficient calculated from salinity measurements and mixing length approximation (length^2/time)
A_c = cross-sectional area of entrance to Basin (length^2)
A_s = surface area of Basin (length^2)
Δx = average mixing length between SIYB and adjacent area (length)
V_2 = volume of Basin (volume)
e = evaporation rate (length/time)
R_S = rate of all point and nonpoint sources of copper to Basin, expressed as total copper (mass/time).

Measured values and other calculated parameters can be substituted into Equation *(q)*. The model solves this mass balance equation for R_S, or the value describing the loading rate that results in a target value of C_2. In other words, when C_2 is set equal to the numeric target for copper, the model calculates the maximum loading rate R_S that the Basin can receive and still achieve the numeric target. *Rs* is calculated by way of an iterative process, as described below. The numeric target was set at a level to ensure attainment of water quality standards. Determination of C_2 is further discussed under the description of output variables below.

Input Variables for Box Model

Input variables are entered into the model by the user and affect the determination of each output variable, which are discussed in the next section. As discussed above, the loading capacity, R_S, was determined from Equation *(q)* using the model. Since the target copper concentration within the Basin, C_2, is an output variable that depends on the loading capacity, R_S, the value for R_S can be determined by iteration. Various values for R_S were input into the model until the maximum allowable loading rate was found that did not exceed the numeric target for copper in the Basin. The means of determining the value of each input variable necessary for the analysis is discussed below.

S_1, S_2 -- Salinity data was obtained from a SPAWAR sampling survey in September 2001. Data from the composite sampling of sampling Box 6 (SIYB) and sampling Box 7 (Bay adjoining SIYB) was used in the box model analysis (Figure A3.4). These values were 33.62 practical salinity units (psu) and 33.46 psu, respectively.

C_1 -- This represents the concentration of total copper in ambient seawater, or background concentration levels outside the control volume. Background copper concentrations in San Diego Bay were also measured by composite sampling by SPAWAR on two occasions, August 2000 and September 2001. Composite measurements for total copper were 0.69 µg/L and 0.39 µg/L, respectively, for sampling Box 7 (Bay adjoining SIYB). For the input variable C_1, the average of the two values, 0.5 µg/L, was used.

A_c -- This represents the cross-sectional area of the control volume at the boundary (Basin entrance), which is tidally dependent. This area was determined by using nautical charts to estimate cross-sectional width and average depth at mean lower low water. Multiplying the two results in a cross-sectional area of roughly 1,000 square meters (m^2).

A_s -- This represents the surface area of the control volume, which is tidally dependent. Using bathymetry, a value measured at mean lower low water provided by the Port District was used (Moore, 2000). This area was determined to be roughly 740,000 m^2.

e -- This represents the evaporation rate within the control volume, which was stated to be about 0.43 centimeter/day (cm/day) for San Diego Bay (Chadwick *et al*., 2002b).

Δx – This represents a "typical" mixing length, or approximate length of the salinity gradient. This value corresponds to an estimated distance between the endpoints for S_1 and S_2, which was 2,000 meters (s). A rough schematic of the length of the salinity gradient (Δx) is provided in Figure A3.5.

V_2 -- This represents the control volume, which is tidally-dependent. This volume was provided by the Port, and was measured using bathymetry at mean lower low water to be approximately 31,000,000 cube meters (m^3) (Moore, 2000).

k_L -- This represents the rate constant describing the total copper loss to sediment, which is the dominating sink mechanism. A Bay-wide study found this rate to be about four to seven percent/day, depending on the area measured. A value of seven percent/day was chosen for the input parameter, since loading of copper into SIYB is probably high compared to most areas in the Bay due to elevated concentrations in the water column. That the drive towards equilibrium would cause this rate to likewise be high was assumed.

R_S -- This represents the maximum allowable copper input rate, or loading capacity, into SIYB. This input rate was determined by iteration to yield the maximum possible value without exceeding the numeric target, expressed as C_2 under "output variables" (see below). This value is expressed in kilograms/day (kg/day).

Output Variables from Box Model

The box model generates output variables based in part on input variables entered into the model by the user.

K -- This represents the dispersion coefficient, specifically describing mixing characteristics of SIYB, described by Equation *(k)*. For SIYB, this was found to be 15.3 square meters/second (m^2/sec).

u_e -- This represents the average evaporative advective velocity, given in Equation *(d)*. This was found to be 3.68 x 10^{-5} meters/second (m/s).

dS/dx -- This represents the salinity gradient, or difference in salinity measurements over an approximate measured distance. This is expressed as:

(r) $$\frac{S_2 - S_1}{\Delta x}$$ This was found to be 8.04 x10^{-5} psu/m.

C_2 -- This represents the "target" concentration of total copper within SIYB. "Target" concentration means the concentration equal to the numeric target established in this TMDL. By definition, the attainment of the numeric target will result in the attainment of water quality standards in the Basin. The value for C_2 was determined by expressing the numeric target for dissolved copper as total copper for use in the box model. The chronic water quality objective for dissolved copper is 3.1 µg/L. Since this concentration is a maximum level that cannot be exceeded, it must be adjusted to represent an average concentration. This is because the model relies on average values for most measured parameters. The average concentration was calculated using the ratio of average to maximum dissolved copper concentrations measured during a sampling survey by the Regional Board (Appendix 6). As shown below, the average concentration of dissolved copper measured by the Regional Board in SIYB was 5.45 µg/L, and the maximum concentration measured was 8 µg/L. Therefore the target average concentration for dissolved copper inside the Basin was determined by this ratio:

(s) $$\left[\frac{5.45\,\mu g/L}{8\,\mu g/L}\right]_{measured} = \left[\frac{average\ concentration, dissolved\ copper}{3.1\,\mu g/L}\right]_{target}$$

Solving for Equation *(s)*, the average target concentration of dissolved copper in the Basin was found to be 2.11 µg/L. Finally, this number was adjusted to represent a value for total copper to be used in the box model. This was done by assuming that the ratio of dissolved copper to total copper in seawater is 0.83 (USEPA 2000). Therefore the target concentration of total copper, C_2, was determined to be 2.54 µg/L. This value was used to determine the Basin's maximum loading capacity, Rs, through the process of iteration. Various values for Rs were input into the model, until the maximum value was found that did not cause C_2 to exceed 2.54 µg/L. The value for R_S represents the maximum loading

rate of copper that the Basin can receive and still attain the numeric target.

R_L -- This represents the rate of copper loading to sediment, given in Equation *(n)*. This is the same as the rate of copper loss from the water column in SIYB to the sediment. This was found to be 0.55 kg/day.

Assumptions and Limitations of Box Model

1. The model provides only an estimate of average concentration for the entire Basin. Some areas of the Basin, particularly the back portions where copper loading is high and flushing rates are low, are more impacted with copper than areas close to the entrance to San Diego Bay. This was verified by sampling by the Regional Board in 2000 and 2001 (Appendix 6). This shortcoming of the box model could be improved by dissecting the Basin into components and analyzing them individually. However, this would require knowledge of the geometry of the individual segments, as opposed to the geometry of the Basin as a whole. This is not readily available information at this time.

2. The model assumes tidally averaged conditions. The model does not resolve fluctuations that occur over tides, but rather averages them out.

3. The model assumes steady state conditions. The model does not resolve changes associated with transient sources, loss and mixing fluctuations on time scales shorter than the time to establish steady state.

4. The model does not represent the actual individual processes that lead to loss of copper from the water column such as complexation, sorption, and settling. Rather, settling, or loss to sediment, is treated as the dominant mechanism and assumed to behave as a first-order reaction. This means that loss to sediment is directly proportional to the concentration of copper in the surrounding water column.

5. The calibration of the dispersion coefficient depends on an adequate salinity gradient, (i.e. measurable difference), assumption of a steady-state salt balance, and knowledge of the evaporation rate.

6. A Bay-wide study found the rate constant k_L rate to be about four to seven percent/day, depending on the area measured. A value for the rate constant k_L is not specifically known for SIYB. The value for k_L was assumed to be seven percent/day for reasons discussed earlier.

7. The model assumes a constant background concentration, C_1. In reality, the background concentration may fluctuate because of general variations in San Diego Bay. Also, San Diego Bay is treated as "background" when in reality, levels of copper in the Bay are probably elevated over true ambient seawater conditions due to numerous point and nonpoint source discharges.

8. The values for A_c and Δx were roughly estimated from nautical charts.

9. The values of salinity and copper concentrations used in the analysis were based on limited sampling.

Results from Analysis Using Box Model

Using the input parameters described above, the model results are as follows:

R_S = loading capacity = 1.87 kg/day total copper
= 683 kg/year total copper
= 567 kg/year dissolved copper (using a ratio of dissolved copper/total copper of 0.83 in seawater)

The loading capacity defines the TMDL for SIYB. The margin of safety (MOS) calculation is provided in Appendix 4.

Calculation of Background Loading Using Box Model

In addition to using the box model to calculate the loading capacity for SIYB, the model was also used to calculate a loading rate of copper into the Basin from ambient seawater. This information is included in Tables 4.2 and 7.1 of the text. Copper loading from ambient seawater is expressed as "background" loading.

Because the box model is specific to SIYB (i.e., uses information such as geometry and unique dispersion coefficient), various parameters can be calculated if all others are known. For purposes of calculating background loading, the input value for R_S was set at zero. In other words, analysis of copper movement was performed as if all input sources such as hull cleaning, passive leaching, urban runoff and atmospheric deposition were nonexistent.

At steady state, net copper loading into SIYB from ambient seawater is assumed to be deposited in the sediment at the rate described by R_L. This is because at steady state, the net background copper loading is equal to the loss of copper to the sediment. Therefore all excess copper loading from ambient seawater (which has not been flushed back to San Diego Bay) must be deposited into a sink.

Using the same input parameters described previously, the model results are as follows:

R_L = loading from ambient seawater (background) = 0.09 kg/day total copper
= 33 kg/year total copper
= 27 kg/year dissolved copper (using a ratio of dissolved copper/total copper of 0.83)

Copper loading from ambient seawater (background) ≈ 30 kg/year.

Additional Capabilities of Box Model

In addition to the output variables previously described, the box model supplied by SPAWAR also has the capability to calculate two additional parameters, the flushing rate of copper to San Diego Bay, and the average residence time of water within SIYB. These two parameters were not used by the Regional Board for analysis of the loading capacity.

F -- This represents the flushing rate of total copper to San Diego Bay, i.e. the rate of copper loss from SIYB to San Diego Bay. Since tidal flushing and loading to sediment are almost entirely responsible for movement of copper out of the control volume, the rate of copper loss from SIYB to San Diego Bay is described by Equation *(t)*. This was found to be 1.32 kg/day.

(t) $$F = R_S - R_L$$

T_{res} -- This represents the average residence time of water in SIYB. This was found to be 4.7 days.

Determination of SIYB Loading Capacity Using Copper Box Model

Model based on advection dispersion equation

	$U_eA_cC_1 = KA_c(dC/dx) + k_LV_2C_2 - R_S$
Assumes:	tidally averaged steady state first order loss to sediment

Various values for R_S were input into the model. From iteration, a value was reached describing the maximum loading (loading capacity) that SIYB can receive and still attain the numeric target (C_2).

Inputs:	S_1: background salinity	S_1=	33.46	psu
	S_2: box salinity	S_2=	33.62	psu
	C_1: background concentration	C_1=	0.5	µg/L
	A_c: cross sectional area at boundary	A_c=	1,000	m^2
	A_s: surface area of box	A_s=	740,000	m^2
	e: evaporation rate	e=	0.43	cm/d
	dx: gradient length scale	dx=	2000	m
	V_2: box volume	V_2=	3,100,000	m^3
	k_L: loss rate coefficient	k_L=	7	%/d
	R_S: loading capacity (target loading)	**R_S=**	**1.87**	**kg/d**

Outputs:	K: dispersion coefficient	K=	15.3	m^2/s	
	dS/dx: salinity gradient	dS/dx=	8.04E-05	psu/m	
	U_e: evaporative advective velocity	U_e=	3.68E-05	m/s	
	T_{res}: residence time	T_{res}=	4.7	d	
	C_2: box concentration	C_2=	2.54	µg/L	Numeric target C_2 = 2.54 µg/L (expressed as average total copper)
	F: flushing rate to bay	F=	1.32	kg/d	
	R_L: sediment loading	R_L =	0.55	kg/d	

Determination of Background Copper Loading for SIYB Using Copper

Model based on advection dispersion equation

$$U_e A_c C_1 = K A_c (dC/dx) + k_L V_2 C_2 - R_S$$

Assumes:	tidally averaged steady state first order loss to sediment

Inputs:	S_1: background salinity	S_1=	33.46 psu
	S_2: box salinity	S_2=	33.62 psu
	C_1: background concentration	C_1=	0.5 µg/L
	A_c: cross sectional area at boundary	A_c=	1,000 m^2
	A_s: surface area of box	A_s=	740,000 m^2
	e: evaporation rate	e=	0.43 cm/d
	dx: gradient length scale	dx=	2,000 m
	V_2: box volume	V_2=	3,100,000 m^3
	k_L: loss rate coefficient	k_L=	7 %/d
	R_S: external loading	R_S=	0 kg/d

Outputs:	K: dispersion coefficient	K=	15.3 m^2/s
	dS/dx: salinity gradient	dS/dx=	8.04E-05 psu/m
	U_e: evaporative advective velocity	U_e=	3.68E-05 m/s
	T_{res}: residence time	T_{res}=	4.7 d
	C_2: box concentration	C_2=	0.41 µg/L
	F: flushing rate to bay	F=	-0.09 kg/d
	R_L: sediment loading	**R_L =**	**0.09 kg/d**

To determine loading from ambient seawater, i.e., "background," the value for R_S was set to zero (this assumes there are no external sources of copper). Then, at steady state, the net background copper loading is equal to the loss of copper to the sediment, R_L. The resulting R_L value was used as "background" in the TMDL analysis and resulting load allocations.

Appendix 4: Margin of Safety Calculations

Ten percent of the loading capacity was reserved as the MOS. The loading capacity (TMDL) was determined using a "box model" based on mass balance principles (Appendix 3). The loading capacity (TMDL) was expressed in terms of dissolved copper. The calculations below demonstrate how the MOS was determined.

MOS = 0.10*(Loading Capacity)
MOS = 0.10*(567 kg/year of copper)
MOS = 57 kg/year of copper

Appendix 5: Allocations

The TMDL is equal to 567 kg/year of copper, as determined in Appendix 3.

Reductions in discharges will not be required from urban runoff, sediment, background, and direct atmospheric deposition. Compared to emissions from antifouling paints, contributions of dissolved copper from these sources are relatively insignificant. All of the required load reductions come from passive leaching and hull cleaning and were assigned as follows.

TMDL = Wasteload Allocations + Load Allocations + MOS

TMDL = Ap + Ah + Au + As + Ab + Aa + MOS
567 kg Cu/year = (Ap + Ah + 30 + 0 + 30 + 3) kg Cu/year + 57 kg Cu/year

Given:
Ap = Allocation for passive leaching
Ah = Allocation for hull cleaning
Au = Allocation for urban runoff
As = Allocation for sediment = Load from sediment
Ab = Allocation for background = Load from background
Aa = Allocation for direct atmospheric deposition = Load from direct atmospheric deposition

The only two unknown variables are for hull cleaning and for passive leaching. The calculation of these allocations is contained below.

<u>Hull Cleaning Allocation</u>
There are two main mechanisms identified in this analysis to achieve reductions in dissolved copper discharges from underwater hull cleaning. The first mechanism involves increasing the use of Management Practices (MPs) by hull cleaners. Approximately half of the underwater hull cleaners at SIYB were assumed to be currently using MPs (Appendix 1). Assuming an increase to 100 percent usage of MPs for hull cleaning results in an approximate 28 percent reduction in copper emissions, as shown in the calculations below.

The second way to achieve reductions in dissolved copper discharges from hull cleaning is to switch to nontoxic and less toxic antifouling paints. This scenario will likely result from the need to meet reductions from passive leaching. Therefore, assuming that both of these measures are implemented, then the reductions achieved from underwater hull cleaning will actually be much greater than the required reduction of 28 percent discussed in this technical report.

Current estimations of 50 percent MP usage result in a copper discharge rate of P = 8.5 $\mu g/cm^2$/event (See Appendix 2b for these calculations). Increasing the usage of MPs from 50 percent to 100 percent results in a lowered copper discharge rate of P = 6.2 $\mu g/cm^2$/event. This results in a loading of approximately 72 kg/year of copper, which is used as the assigned allocation for hull cleaning, Ah. This amounts to a 28 percent reduction in current loading.

Average dissolved copper emissions rate = (13 μg Cu/cm^2/event + 4 μg Cu/cm^2/event)/2
(both paint types, 50 percent MPs) = 8.5 μg Cu/cm^2/event
Load from hull cleaning
(both paint types, 50 percent MPs) = 98.4 kg/year

Average dissolved copper emissions rate = (8.6 μg Cu/cm^2/event + 3.8 μg Cu/cm^2/event)/2
(both paint types, 100 percent MPs) = 6.2 μg Cu/cm^2/event
Allocation for hull cleaning = 72 kg/year
(both paint types, 100 percent MPs)

Hull cleaning reduction = (100 percent)*[(100-72)/(100)] kg Cu/year = 28 percent

Passive Leaching Allocation
The remainder of the TMDL allocation is allotted to passive leaching. Returning to the TMDL equation,

TMDL = Wasteload Allocations + Load Allocations + MOS
TMDL = Ap + Ah + Au + As + Ab + Aa + MOS

The only unknown in the calculation above is the allocation for passive leaching, Ap.

567 kg Cu/year = Ap + 72 + 30 + 0 + 30 + 3) kg Cu/year + MOS
Ap = 375 kg Cu/year

Passive leaching will be required to make significant reductions from current estimated loading necessary to reach the TMDL.

Passive leaching reduction = (100 percent)*[(2,000 –375)/(2,000)] kg Cu/year = 81 percent

Summary of Allocations
TMDL = 567 kg Cu/year
Ap = Allocation for passive leaching = 375 kg Cu/year
Ah = Allocation for hull cleaning = 72 kg Cu/year
Au = Allocation for urban runoff = 30 kg Cu/year
As = Allocation for sediment = Load from sediment = 0 kg Cu/year
Ab = Allocation for background = Load from background = 30 kg Cu/year
Aa = Allocation for direct atmospheric deposition = Load from direct atmospheric deposition = 3 kg Cu/year

Appendix 6: Sampling Survey

The Regional Board conducted a Sampling Survey in 2000 to assist in TMDL development by confirming concentration levels for dissolved copper at the Shelter Island Yacht Basin. These measurements were not used to quantify ambient background concentration described in Appendix 3.

Sample station locations were chosen to characterize levels throughout the Basin and to verify the existence of a copper gradient. A total of seven stations were sampled for concentrations on two separate occasions in April and June 2000 using a grab technique. Samples were analyzed using a low detection method of analysis. Results from both sampling days were averaged and are presented in Table A6.1. Station locations are represented by dots on the map in Figure A6.1. The relative size of the "dots" correlate with the concentration of dissolved copper at the sample station. Figure A6.2 presents the change in dissolved copper concentration as a function of distance into the Yacht Basin.

Table A6.1. Results of Sampling Survey for the SIYB.

Station	Average dissolved [Cu] (µg Cu/L)	Latitude (North)	Longitude (West)	Distance from Station G (meters)
A	8.0	32.71797	117.22569	2,007
B	7.7	32.71386	117.22831	1,510
C	5.0	32.71550	117.22989	1,549
D	5.9	32.71683	117.23203	1,607
E	3.5	32.71217	117.23297	1,080
F	2.6	32.70858	117.23514	635
G	1.5	32.70386	117.23131	0

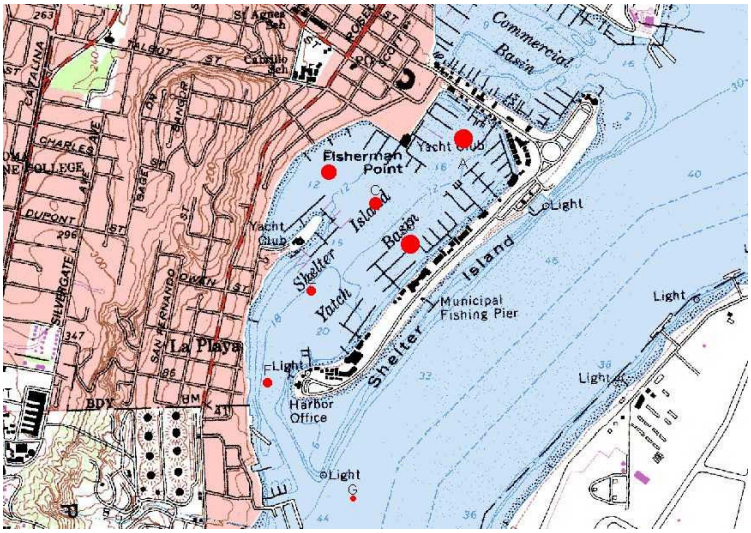

Figure A6.1. Map of the Shelter Island Yacht Basin Sampling Locations.

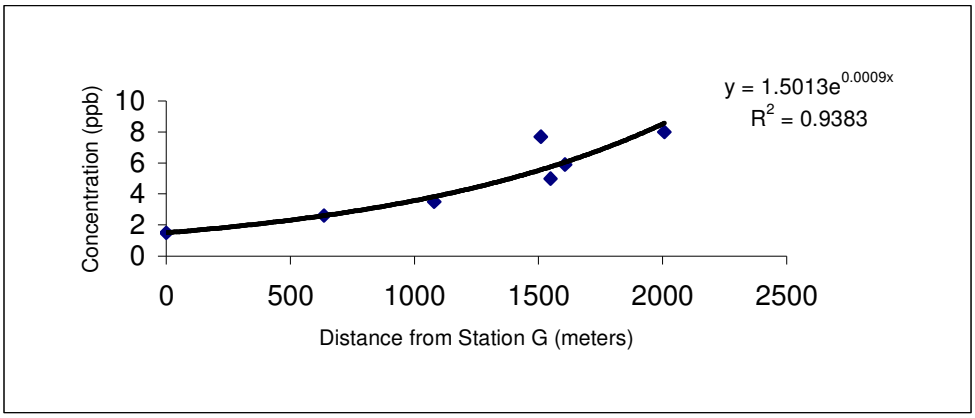

Figure A6.2. Dissolved Copper Concentration versus Distance into the Yacht Basin.

Appendix 7: Peer Review Comments and Responses to Comments

The scientific basis of the SIYB TMDL for dissolved copper underwent external scientific peer review, as required under Health and Safety Code section 57004. Professor Kenneth W. Bruland with the Ocean Sciences Department at University of California, Santa Cruz, reviewed the draft technical TMDL report, dated January 31, 2003.

As a result of peer review comments, modifications were made and incorporated into the technical TMDL analysis. These changes were made primarily to the source analysis discussion on sediment (Section 4, Sediment) and to the critical conditions (Section 8, Critical Conditions). While these modifications are believed to strengthen the technical analysis, they did not result in changes to the source loading estimates, calculation of the TMDL, or determination of the allocations.

Peer Review Comments

The SIYB TMDL for dissolved copper underwent external scientific peer review, as required under Health and Safety Code section 57004. Professor Kenneth W. Bruland, with the Ocean Sciences Department at University of California, Santa Cruz, reviewed the draft technical TMDL report, dated January 31, 2003. Dr. Bruland's comments are contained below in their entirety as provided to the Regional Board on March 14, 2003:

> I have carefully read the technical report for "Total maximum daily load for dissolved copper in the Shelter Island yacht basin." Much of the report is reasonable and appropriate. However, the rationale used to determine a zero mass loading rate associated with sediments is seriously flawed and, as a result, the whole report is flawed and is not reasonable in terms of its water quality objectives. In addition, it is difficult to defend reducing the copper loading from boat paint by 90 percent without data on Water Effect Ratios (WER's) and/or determination and evaluation of free [Cu^{2+}].
>
> It appears that based upon personal communication with Chadwick (2002), the authors of the technical report concluded that sediments are a sink for Cu and the source from sediments is, and will continue to be, zero. The rationale for this is apparently that studies using benthic flux chambers showed that, on average, the net loss of copper from the water column to the sediment is approximately four-seven percent per day throughout the Bay.
>
> There are two processes in which sediments can be a source for dissolved Cu in the overlying water column. First is a simple diffusive flux of pore waters out of the sediments that can be assessed with benthic flux chambers. The second process involves resuspension of sediments by turbulence (due to winds, tidal currents, boat propellers, etc.) and desorption of Cu from the particles to the water. Both processes are dynamic with exchanges in both directions (that undoubtedly vary temporally and spatially). The diffusive fluxes are both into and out of the sediments and adsorption and desorption reactions occur both ways between Cu dissolved in the water and adsorbed on the resuspended sediments.

Studies in the South San Francisco Bay, a system somewhat analogous to San Diego Bay, provide some insight into how important these processes are. Over the last three decades the sewage treatment plants have done a remarkable job of lowering the discharge rate of dissolved Cu into the Bay. However, contaminated sediments remain in the Bay and continue to be a significant source. These contaminated sediments, that once served as a sink for copper when the sources to the Bay were high, now can serve as a source of copper to the dissolved phase when the external loadings have been decreased. Recent estimates of Cu loadings to the South San Francisco Bay found in Gee and Bruland (Geochimica et Cosmochimica Acta, vol. 66, pp. 3063-3083, 2002) include external fluxes from the atmosphere (3,700 kg/year), tributaries (5,000 kg/year) and combined point sources (16,800 kg/year). The diffusive benthic flux is estimated at 860 kg/year. The adsorption and desorption exchange rates between Cu associated with resuspended sediments and dissolved Cu in the water column are estimated to be 20,000 to 44,000 kg/year. Thus, the resuspended sediments are not inert, but are dynamically exchanging Cu with the water column. This sorption exchange rate is far greater than the diffusive benthic flux and is roughly equivalent to the external loadings. What this means is that if the external loading is decreased markedly, there will still continue to be exchange with the historically contaminated sediments as they are resuspended in the water column and that what was a net sink during a period of high loading can become a long-term net source during a period of low loading. It acts to buffer the dissolved Cu concentration and modulate the response to changes in external loading.

What this means to this report dealing with the Shelter Island yacht basin is that Table i and ii are seriously flawed. The sediment source is not zero. The net source today in a time of high Cu loading may be zero, however there is likely to be a high level of exchange between Cu associated with resuspended contaminated sediments and the dissolved Cu in the water. If the South San Francisco Bay study is relevant, this exchange may be on the order of 5,000 kg/year being adsorbed to the particles and 5,000 kg/year being desorbed from the particles – note that in this case the net source or sink would be zero. If however, the external loading of Cu in the SIYB is decreased by 90 percent, then the adsorption term would be decreased, but the desorption term from the historically contaminated sediments would still be high and the resuspension of these sediments would become a net source of easily a few thousand kg/year. The sediments will act as a buffer to slow down the response of the dissolved Cu in the SIYB to lowering the external sources.

Another factor of concern in this report is the lack of any Cu speciation data or WER studies. The report acknowledges that the toxicity of copper is related to the free [Cu^{2+}] or [Cu′], and not the total dissolved Cu concentration ([Cu′] is the sum of the kinetically labile inorganic forms of Cu). Copper bound or chelated with organic ligands is not toxic. Without any data on the extent of organic chelation of dissolved Cu and the levels of free [Cu^{2+}], it is difficult to ascertain whether these extreme steps are necessary. An approach that many estuarine systems are using involves the use of a Water Effects Ratio or WER as a method to evaluate a reasonable numeric target concentration from the water quality criteria. For example, a WER of 2.2 combined with the water quality criteria of 3.1 μg Cu/L would yield a numeric target of 6.8 μg Cu/L. This might be a

more reasonable numeric target for the Shelter Island Yacht Harbor, particularly since the only way to reduce the Cu sources from passive leaching and in-water hull cleaning by 90 percent would be to ban all the boats from the yacht harbor. A cost effective and reasonable alternative would be to carry out studies to assess the WER for this basin and complement this with some Cu speciation studies to determine the concentration of Cu-binding ligands and the free [Cu^{2+}]. With this knowledge you would be in a position to arrive at a reasonable and justifiable numeric target concentration of dissolved Cu.

The Regional Board presented a number of specific questions regarding scientific issues to the peer reviewer. The questions and the peer reviewer's comments follow:

<u>Scientific issues that require peer review:</u>

1. *[Regional Board question] Is the fate and transport of dissolved Cu, including physical and chemical processes, and biological uptake and assimilation adequately and correctly addressed?* [Peer Review comment] I would argue that they are not adequately addressed. Phytoplankton and bivalve larvae are the most sensitive organisms to copper toxicity and the copper toxicity is most closely related to the concentration of [Cu^{2+}], rather than dissolved Cu. This report, however, does not address these issues. It is missing WER studies and missing any copper speciation studies or measurements of [Cu^{2+}]. Data that is critical to arrive at rational and justifiable action.

2. *[Regional Board question] Are the sources of dissolved copper in the watershed adequately and correctly addressed?* [Peer Review comment] I am not convinced that they have adequately addressed the issue of the first street runoff of the year when the copper accumulated from the wear of vehicle brake pads, etc., is washed off into the storm runoff drains and into the basin. This first "rinse" and runoff can be the major input for the year.

3. *[Regional Board question] Are the calculations used to determine dissolved Cu mass loading associated with the sources reasonable and accurate?* [Peer Review comment] Reasonable assumptions were used for most of the sources. Unreasonable assumptions were used with respect to the sediments being a source. Desorption of Cu from resuspended historically contaminated sediments is ignored. Accuracy of any of the source estimates is difficult to assess. Various assumptions were required to come to these estimates. Although the estimates are presented with 4 significant figures (I am shocked that 4 significant figures are used in Table i and ii), none of the estimates are known better than a factor of 2, at best!

4. *[Regional Board question] Is the rationale used to determine a zero mass loading rate associated with sediment reasonable?* [Peer Review comment] No. This is based upon a lack of understanding of the processes involved.

5. *[Regional Board question] Based on the physical and hydrological characteristics of Shelter Island Yacht Basin, is the estimated loading capacity reasonable?* [Peer Review comment] No, because they neglect the sediment sources.

6. *[Regional Board question] Have the correct data gaps been identified in the analysis, particularly in the Source Analysis and in the Linkage Analysis sections?* [Peer Review comment] In most cases – yes. In other cases already discussed – no.

7. *[Regional Board question] Is the margin of safety incorporated into the TMDL of a reasonable magnitude to account for uncertainty?* [Peer Review comment] I think it was unreasonable. It was not based upon the relevant science issues – measurements of WER's and free [Cu^{2+}].

8. *[Regional Board question] Are data used in the report reliable and appropriate, and is the treatment of the data defensible?* [Peer Review comment] The data used appeared reliable and appropriate. Some critical data is missing. I think the sediment source data was misinterpreted and the interpretation of the sediments as being a zero source term is not defensible.

Responses to Peer Review Comments
A summary of Dr. Bruland's comments and the Regional Board's responses to his comments are contained below:

1. Comment on Sediment
Summary of Peer Review Comment
Sediment is not a zero source of copper to SIYB. Although sediment may currently act as a net *sink* for copper in the water column, it has the potential to act as a net *source* in the future. During a period of low external loading, sediment that once acted as a net sink for copper can become a long-term net source through exchange with historically contaminated sediments that are resuspended in the water column. As copper in sediments is resuspended, it may act as a buffer to slow down the reductions in copper concentrations in the water column that would be expected from decreased loading of other sources to SIYB.

In the Implementation Plan of this report, the Regional Board recognizes that the contribution of sediment to copper concentrations in the water column should be reassessed in the future to determine if sediment acts as a more significant source, as primary sources, such as copper-based antifouling paints, have been decreased. . Further studies are probably necessary to better understand this phenomenon. If studies demonstrate that sediment is, or could become a significant source once primary sources are decreased, then the TMDL and allocations could be amended at a later date. An allocation for sediment loading could be assigned to the dischargers responsible for the sediment contamination.

2. Comment on Water Effects Ratio (WER)
Summary of Peer Review Comment
An evaluation of the Water Effect Ratio (WER) and/or the free copper ion at SIYB should be conducted to determine a reasonable numeric target concentration.

Regional Board Response
Numeric targets in the TMDL are set equal to numeric water quality criteria (WQC) for dissolved copper as contained in the California Toxics Rule (CTR). The CTR's numeric criteria

serve as legally applicable water quality standards in the State of California for inland surface waters, enclosed bays and estuaries for all purposes and programs under the Clean Water Act (CWA). Criteria are derived based on a rigorous set of guidelines to provide both short-term and long-term protection to aquatic life. In the absence of site-specific objectives, the CTR's water quality criteria represent the most appropriate water quality objectives and therefore numeric targets for dissolved copper at SIYB.

The Regional Board recognizes that there are situations where site-specific conditions affect the toxicity of a pollutant, which results in a criterion that is over- or under-protective. WQC are primarily based on studies conducted using laboratory water in which organisms are exposed to one pollutant. Site-specific objectives (SSOs) adjust water quality objectives to account for differences in toxicity among sites based on site-specific information and scientific studies. SSOs must protect the beneficial uses of a waterbody and be developed in accordance with federal and State laws and regulations based on sound scientific rationale.

There are a number of the USEPA approved procedures that can be used to establish site-specific objectives, including the water effect ratio (WER) procedure. The WER procedure adjusts WQC to account for a site's water chemistry based on the ratio of the toxicity of a chemical in site water to the chemical's toxicity in laboratory water. This procedure is commonly used to determine whether chemical or physical conditions of a waterbody will cause a pollutant to be less bioavailable and therefore less toxic.

The toxicity of copper to aquatic life is influenced by the species and complexes that copper forms in seawater. Copper toxicity is most closely related to the concentration of free ions and weak inorganic complexes, as compared to the total or dissolved copper concentration. WQC have been developed and approved by the USEPA for the dissolved copper concentration, but not yet for the free ion concentration.

The Regional Board agrees that investigating the relevance of SSOs for copper at SIYB may be appropriate. At a public hearing on June 10, 2004, marina owners and operators residing in SIYB requested that the Regional Board include a Basin Plan issue on developing SSOs as part of the Triennial Review of the Basin Plan. This group announced that they had initiated scientific studies necessary for development of site-specific objectives for dissolved copper in SIYB. As a result, the Regional Board prepared a Triennial Review issue titled "Water Quality Objectives for Copper at Shelter Island Yacht Basin." This issue was assigned a technical ranking and score relative to other Triennial Review issues. This issue was ranked 31st on the prioritized issue list. The Triennial Review was completed on September 8, 2004. As the 31st ranked issue, it is not slated to receive basin planning resources for investigation over the next three years. However, developing a site specific objective for copper in SIYB waters may be feasible over the 17-year compliance period. Therefore, the draft Basin Plan amendment has been revised to include provisions for recalculating the TMDL, allocations, and reductions in the event that the water quality objective for copper in SIYB is changed.

Since it could take years for SSOs to be adopted into the Basin Plan, the appropriate strategy is for the Regional Board to proceed with adoption of the TMDL at this time mandating copper load reductions. When site-specific copper water quality objectives are developed for SIYB, this

TMDL will be modified accordingly. The Regional Board will not delay adoption of this TMDL mandating copper load reductions on the premise that a site-specific copper water quality objective must first be developed. Studies by interested parties supporting the development and adoption of SSOs may occur concurrently with actions by dischargers to meet compliance with this TMDL. Development of site-specific objectives is discussed in more detail in the State's *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed bays, and Estuaries of California* (State Board, 2000).

3. Comment on Ways to Reduce Copper Loading to SIYB

Summary of Peer Review Comment

The only way to significantly reduce copper loading from passive leaching and underwater hull cleaning would be to ban all the boats from the yacht harbor.

Regional Board Response

The Regional Board believes that there are alternative ways to meet load allocations from passive leaching and underwater hull cleaning that do not rely on banning boats from the Yacht Basin. Implementation of MPs to address passive leaching and hull cleaning will reduce copper loading from antifouling paints. MPs include switching to nontoxic or less toxic antifouling paint that does not contain copper, the use of slip-liners filled with freshwater to contain a vessel hull when it is not in use, the use of nonabrasive techniques when cleaning copper paints on vessel hulls underwater, and storage of boats out of the water when not in use. The most effective means to meet reductions involves switching to nontoxic and less toxic antifouling paints on vessel hulls. Copper antifouling paints are registered as pesticides through the regulatory authority of the California Department of Pesticide Regulation (DPR). The Regional Board is working with the DPR through a Memorandum of Understanding (MOU) to help resolve water quality problems caused by copper-based antifouling paints. The DPR has the authority to impose restrictions on, or cancel the registration of, pesticides in California. The Implementation Plan of this report includes a discussion on the coordination between the Regional Board and the DPR on this issue.

4. Comment on Urban Runoff

Summary of Peer Review Comment

Urban runoff can be a major input of copper through the "first flush" effect of a storm, and should be adequately addressed as a source in the source analysis. Copper accumulates through numerous sources in the urban environment including the wear of vehicle brake pads. This accumulation is washed off into the storm drains during storm events, particularly during the "first flush" of the year.

Regional Board Response

Urban runoff can be a significant source of heavy metals to a watershed. The contribution of urban runoff as a source of copper to SIYB was determined in the TMDL analysis to account for less than one percent of total loading. Urban runoff was found to be an insignificant source of copper, probably due in large part to the small size of the subwatershed that drains to SIYB. In a receiving waterbody with a larger watershed drainage area, or one with fewer sources that contribute such high loads of copper (as in the case of recreational vessels at SIYB), the

proportional contribution of copper loading coming from urban runoff could be expected to be much greater.

In order to calculate the dissolved copper contribution from urban runoff to SIYB during wet weather, information was compiled from the San Diego County MS4 Copermittees' annual Wet Weather Monitoring Reports (City of San Diego, 2000a). Data was compiled and averaged from five years of monitoring data collected during storm events from 1994/95 to 1998/99. During storm events, direct measurements of pollutant concentrations in flow-weighted composite samples were collected using automatic samplers from three residential land use monitoring stations in the county of San Diego. Each station was sampled annually during three storm events, which included the first two storm events of the wet weather season, as defined by the USEPA's storm event criteria [40 CFR 122.21(g) (7)]. Automatic samplers were used to collect flow-weighted samples over the storm's entire hydrograph. Thus, the copper load from urban runoff during wet weather to SIYB was estimated based on direct sampling of three storm events over five years.

Data was not available in San Diego County to estimate copper loading to SIYB from urban runoff during dry weather. Dry weather loading of copper was assumed to be equal to wet weather loading of copper to SIYB. However, this is a source of uncertainty that should be reassessed in the future as more data becomes available. More information on urban runoff is provided in the source analysis (Section 4, Urban Runoff). Source estimate calculations are shown in Appendix 2.

5. Comment on Significant Figures

Summary of Peer Review Comment

Although the source analysis estimates are presented with four significant figures, none of the estimates are known better than a factor of two.

Regional Board Response

The Regional Board agrees with the peer review comment about significant figures, and the tables were adjusted accordingly.

6. Comment on Loading Capacity

Summary of Peer Review Comment

The estimated loading capacity is not reasonable because sediment was neglected as a source.

Regional Board Response

Sediment was appropriately addressed as a potential source of copper to SIYB at this time, and the tendency of sediment to act as a sink for copper was incorporated into the calculation of the loading capacity.

The loading capacity for copper at SIYB is the maximum amount of dissolved copper that can enter the Basin and remain in the water column without exceeding the numeric target. The loading capacity is a function of the different hydrodynamic processes, such as circulation, tidal flushing, and sediment flux, that affect the environmental fate and transport of dissolved copper. The loading capacity was determined through the use of a "box model" based on general mass-

balance principles. The determination of the loading capacity was dependent on input parameters, including the numeric target, natural background copper concentration, salinity measurements to quantify local dispersion, and sediment flux. The net flux of copper from the sediment to the water column was incorporated into the model to estimate the loading capacity. Greater discussion of the model is presented in the source analysis and in Appendix 3.

7. Comment on Margin of Safety

Summary of Peer Review Comment

The margin of safety incorporated into the TMDL to account for uncertainty was unreasonable since it was not based upon measurements of the WER and free copper ion.

Regional Board Response

A ten percent explicit Margin of Safety (MOS) was incorporated into the TMDL to account for uncertainty in the source analysis and analysis of the loading capacity. In addition, an implicit MOS was incorporated into the TMDL through conservative assumptions made in the source analysis. The MOS was not based on data on the WER and free copper ion concentration since this information was not available.

Appendix 8: Public Participation

Public participation is an important component of TMDL development and effective implementation. Public participation has been provided for through two public workshops, numerous stakeholder group meetings and communications, and public presentations and participation at relevant conferences. In addition, staff contact information has been provided on the Regional Board's web site, along with periodically updated drafts of TMDL documents throughout the development process. Public participation will also be provided for through the Regional Board's Basin Plan amendment process, which includes a public workshop (bringing the total number of workshops to three) and formal public comment period. A chronology of public participation and major milestones is provided below:

Date	Event
05/00 - Ongoing	Web Site – Information including drafts of the technical report and contact information were made available on the Regional Board's web site.
05/17/00	Public Workshop – The Regional Board conducted a public workshop about the TMDL project.
06/28/00	Stakeholder Meeting – The Regional Board met with representatives from the San Diego Unified Port District (Port) about the TMDL project.
09/05/00	Marine Recreation Committee – The Regional Board attended and provided an update on the project at a stakeholder meeting of the San Diego Port Tenants Association.
09/06/00	Stakeholder Meeting – The Regional Board met with representatives from the Port about the TMDL.
09/21/00- 09/22/00	Alternative Antifouling Strategies for Recreation Boats: A Working Conference – The Regional Board participated in a conference on alternative antifouling strategies, and made a presentation on the TMDL project. Attendees included representatives from the boating and antifouling industries, boat owners, and environmental agencies and universities.
11/09/00	Stakeholder Meeting – The Regional Board met with representatives from the DPR about the TMDL project.
12/01/00	Stakeholder Meeting – The Regional Board met with representatives from the San Diego Port Tenants Association about the TMDL project.
12/11/00	Stakeholder Meeting – The Regional Board met with representatives from the Port about the TMDL project.

01/09/01	Stakeholder Meeting – The Regional Board met with representatives from the San Diego Port Tenants Association about the TMDL project.
03/01/01	Project Advisory Committee – The Regional Board served on a joint advisory committee for two projects related to recreational boating and water quality. The projects were the "Demonstration of Nontoxic Boat Bottom Paints in San Diego Bay" conducted by University of California Sea Grant Extension Program (Sea Grant), and "Assessing Effectiveness of Various Management Practices for Underwater Hull Cleaning" conducted by SCCWRP. These projects were funded in part by CWA section 319(h) grants.
03/23/01	Quarterly Commissioner's Pesticide Meeting – The Regional Board presented an update on the TMDL project at the San Diego County Department of Agriculture, Weights and Measures.
04/17/02	San Diego Advisory Committee for Antifouling Paints – The Regional Board served on the San Diego Advisory Committee for Superior Antifouling Paints. The purpose of the committee was to advise in the preparation of an economics report on the cost associated with transitioning to nontoxic antifouling paints in San Diego Bay. The formation of this committee was mandate through Senate Bill 315 (Alpert). Members of the committee included representatives from the Regional Board, DPR, Sea Grant, Port Tenants Association, Port, Environmental Health Coalition, US Navy, a marina, a boater, and a boatyard. (First of three meetings)
06/14/02	San Diego Advisory Committee for Antifouling Paints – The Regional Board participated in the advisory committee. (Second of three meetings)
07/21/02-07/26/02	11th International Congress on Marine Corrosion and Biofouling-The Regional Board participated in an international conference on marine biofouling, and made a presentation on the TMDL project.
09/19/02	San Diego Advisory Committee for Antifouling Paints – The Regional Board participated in the advisory committee. (Third of three meetings)
10/02/02	Stakeholder Meeting – The Regional Board met with representatives from the San Diego Advisory Committee for Antifouling Paints.
03/19/03	Public Workshop and CEQA Scoping Meeting
07/31/03	Stakeholder Meeting – The Regional Board met with the DPR, USEPA, CAC, and State Board to discuss the TMDL project.

09/6/03	Copper Summit – The Regional Board participated in a meeting coordinated by the DPR and the State Bard to discuss copper pollution throughout California and the SIYB TMDL for dissolved copper. Attendees included the California Coastal Commission (CCC), State Board and various California Regional Water Quality Control Boards, the DPR, USEPA, and Sea Grant
10/20/03	Stakeholder Meeting – The Regional Board met with the Port to discuss the TMDL project.
10/21/03	Stakeholder Meeting – The Regional Board met with marina operators to discuss the TMDL project.
10/21/03	Stakeholder Meeting – The Regional Board met with underwater hull cleaners and boat owners to discuss the TMDL project.
10/23/03	Stakeholder Meeting – The Regional Board met with members of the environmental community to discuss the TMDL project. Attendees included representatives from the Environmental Health Coalition, San Diego Bay Keeper, Surfrider and the Audubon Society.
10/24/03	Draft TMDL Technical Report and Implementation Plan released for formal public review and comment period.
11/17/03	Public Workshop
12/10/03	Public Hearing
9/07/04	Stakeholder Meeting – The Regional Board met with representatives of boat and paint manufacturers' organizations, along with representatives of marina operators at SIYB to discuss the Implementation Plan.
10/14/04	Revised Draft TMDL Technical Report and Implementation Plan released for formal public review and comment period.
12/03/05	Stakeholder Meeting - The Regional Board met with representatives from paint manufacturing companies to discuss the TMDL project.
01/19/05	Stakeholder Meeting – The Regional Board met with representatives from marinas/yacht clubs in SIYB to discuss development of site-specific objectives for dissolved copper in SIYB.
[02/09/05]	Regional Board Deliberates

Appendix 9: Nontoxic Antifouling Strategies Sampler[37]

Although nontoxic coatings will not slow fouling growth, they can be effective when used in a strategic combination with other methods. Nontoxic antifouling strategies may combine nontoxic coatings with slip liners, boat lifts, mechanical hull cleaning and/or frequent use. The following table describes several alternatives, their benefits and challenges. Information is compiled from manufacturer's data and experience of San Diego area boat repair yards and underwater hull cleaners. These products are relatively new, experience with them is limited and independent evaluation of long-term costs, benefits and performance is needed. The table is intended for educational purposes and does not constitute an endorsement or recommendation of any product. Investigate products carefully! Ask local boat repair yards and hull cleaning services about which nontoxic coatings have performed well in that area. Ask manufacturers for copies of independent tests of their products and references to others who have purchased them.

Antifouling Strategy Product Examples [2]	Manufacturers' Comments on Benefits [1]	Manufacturers' Comments on Challenges [1]
Silicone Coatings Interlux Veridian* ($405/gallon covers 200 square feet (ft^2)) Protect Associates Water Shield (formerly Miracle Cover)* ($29/gallon covers 150 ft^2) Kiss-Cote MegaGuard* ($175/4 oz. covers 4000 ft^2) CSL Silicones Si-Cote 579* ($72/gallon covers 50 ft^2) Eccotech Wearlon* ($224/gallon covers 300 ft^2)	✓ Maintenance: Fouling easily removed if cleaned regularly/can be self-cleaning if vessel is used regularly ✓ Performance Capabilities: Can be used in variety of environments ✓ Slick Surface: Decreases drag and fuel consumption, improves speed, reduces engine load ✓ Creates slippery surface difficult for marine organisms to grow on ✓ Durability: Some products can last several years	o Hull preparations vary for each coating o Boatyard needs dedicated application area and equipment[5] o Safety Consideration: Boat bottom may become slippery o Must use craft often to decrease fouling o Coating is easily nicked or abraded o Requires regular cleaning to retain performance benefits: Frequency dependent on water temperature and boat use
Siloxane Coatings Adsil AD-100 ($240/3 pints covers 200 ft^2) NewCoat Technology Sea-Speed ($350/gallon covers 144 ft^2)	✓ Hard, smooth, slippery surface to which organisms have difficulty attaching ✓ Drag reduction decreases fuel consumption ✓ Can be applied to all surfaces including aluminum	o Clean and sand surface before application o New products; contact manufacturers about cleaning schedule
Epoxy Coatings Sound Specialty Coatings Corporation AquaPlyM* ($280/2 gallons covers 450 ft^2)	✓ Maintenance: Early stages of marine growth can be removed with high pressure washing or scrubbing ✓ Provides fast, hard, and slippery surface for vessel ✓ Durability: Manufacturer reports some boats have had coating for ten years	o Remove old coating before application o Bottom cleaning may be needed twice monthly in warmer waters[3]

37 Johnson, Leigh T. and Jamie A. Miller. 2002. Nontoxic Antifouling Strategies Sampler. In: What You Need to Know about Nontoxic Antifouling Strategies for Boats. California Sea Grant College Program Technical Report T-049: 6-7. This information is taken primarily from manufacturer's reports.

Ceramic-Epoxy Coatings Freecom, Inc. CeRam-Kote 54* ($150/gallon covers 128 ft^2)	✓ Maintenance: Early stages of marine growth can be removed with high pressure washing or scrubbing ✓ Protection: Against corrosion, abrasion, blisters ✓ Durability: Manufacturer reports some boats have had coating for six years	○ Remove old copper paint, clean and sand hull ○ Spray on for best results ○ Requires regular cleaning depending on boat use to maintain performance benefits; bottom cleaning may be needed twice monthly in warmer waters[3]
Fiber-Epoxy Coatings Sealcoat ($50/gallon epoxy and $15/pound fibers)	✓ Maintenance: Organisms that attach should fall off eventually due to their weight ✓ Movement of fibers expected to help prevent attachment of organisms ✓ Protection: Against corrosion and condensation	○ Fibers can be damaged from rough scraping or close contact with chemicals ○ Remove old paint and apply barrier coat ○ Bottom cleaning may be needed twice monthly in warmer waters[3]
Polymer Coatings Performance Marine Corporation Marine Skin ($199.95/gallon covers 200-300 ft^2)	✓ Slick Surface: Reduces drag, cuts fuel costs, increases speed ✓ Creates slippery surface difficult for marine organisms to grow on ✓ Designed to replace standard antifouling paints	○ Recommended as a seasonal coating ○ Bottom cleaning may be needed twice monthly in warmer waters[3]

Water-Based Urethane Interpolymer Dispersion American Marine Coatings Sea-Slide ($169.95/gallon covers 700-900 ft^2)	✓ Drag-reducing overcoating (can also be used as primary coating): Reduces friction between boat hulls and surrounding water	○ Once cured, the coating should not be scrubbed or sanded
Bottom Wax Boat Armor EasyOn Bottom Coating ($20.70/15 oz treats 24 foot vessel) Aurora High Performance Bottom Wax ($29.99/15 oz treats 24 foot vessel)	✓ Barrier coat that applies with a soft cloth or damp sponge over existing bottom paint or new surfaces ✓ Slick surface: Reduces hull drag, increasing speed and reducing fuel consumption	○ Seasonal coating (4-6 months) ○ Must be cleaned often to reduce fouling growth; bottom cleaning may be needed twice monthly in warmer waters[3]
Slip Liners Bottom Liner ($940 for 25 foot vessel) Armored Hull ($815 for 28 foot vessel)	✓ Eliminates need for antifouling paint and underwater hull cleaning (if boat is always returned to liner[5])	○ Add 10-15 percent freshwater into slip enclosure to reduce fouling (check local regulations[5]) ○ Outside of liner will foul ○ Lines that suspend it may stretch and sag[4]
Boat Lifts (Prices depend on dock, water depth, boat model and size) AirBerth, Galva-Lift, HydroHoist	✓ Eliminates need for antifouling paint and underwater hull cleaning (if boat is always returned to lift[5]) ✓ Wide range of models available to fit variety of boats and docks	○ Some models can be expensive for boaters who go out daily ○ May not be allowed or feasible in some marinas[5]
Mechanical Cleaning (Contact vendors for prices) Diving Service: Hand or Power Tools	✓ Works together with bottom paint to remove fouling growth ✓ Allows growth to be removed in early stages before it becomes firmly established	○ Recommended to clean at regular intervals appropriate to water temperature and frequency of use of boat

Scrubbing Stations: Boat Scrubber, Marina-Tec, (and others)	✓ Cleaning frequency and type of cleaning tool for divers depend on water temperature, type of paint, frequency and speed of boat use ✓ Water and metals can be contained in tank recovery systems at scrubbing stations	o Owner must schedule and pay for diving service to visit boat o Boat must be taken to scrubbing station

1 ***Independent evaluation of long-term performance on recreational boats is needed for all products***
2 ***Disclaimer:*** *These examples are provided for purposes of illustration and do not constitute an endorsement or recommendation.*
Prices listed were effective in June 2002. Ask your marine supply dealer or boat repair yard for current prices of each product of interest. (References for pricing are listed). Ask local boat repair yards and underwater hull cleaning services how each product has performed in your area. Ask manufacturers for product data and reports of independent testing.
3 ***San Diego area experience***
4 ***Author's observation***
5 ***Reviewer's comments***

Special Notes:
Check with individual product labels for special considerations. Alternative hull coatings require a clean, smooth surface for best adherence. This varies with the type of nontoxic coating, the condition of the existing antifouling and undercoatings, and the condition of the hull.

* Epoxy and silicone based coatings generally require that dissimilar antifouling coatings be removed and an epoxy undercoat be applied (Wilson 2002; Roberts 2002).

Appendix 10: Global and Regional Efforts to Address Copper-Based Antifouling Paints

This appendix describes the global and regional efforts that are ongoing to address water quality problems resulting from copper antifouling paints. It also describes current laws, restrictions and recommendations pertaining to the gradual phase-out of copper antifouling paints.

Extent of the Problem: Statewide, National and Global Focus

Copper-based antifouling paints are recognized as a problem of statewide, national and global concern due to the potential for pollution in areas of heavy boating. Copper has been identified as a problem on the CWA section 303(d) list of impaired waterbodies in areas of California that include San Diego Bay (SIYB), Newport Bay and Marina del Rey. As part of the Southern California Bight 1998 regional monitoring study, sediments from marinas throughout southern California had consistently elevated copper levels and demonstrated frequent toxicity. Other areas throughout California are expected to have elevated copper levels in marinas. However, more studies are needed to document the extent of the problem.

Copper has also been identified as a problem of concern in the nation and worldwide. According to the USEPA, copper is the most common pollutant found in U.S. marinas at toxic levels (USEPA, 1993). Elevated levels of copper have been documented in areas in Florida, Washington and Maryland (Johnson and Miller, 2002). In 1999, the State of Washington banned underwater hull cleaning of ablative copper-based antifouling paints due to environmental concerns (Washington State Department of Ecology, 1999b). Copper pollution associated with antifouling paints has also been identified as a problem in areas throughout Europe, including Sweden, Denmark, and the Netherlands (Johnson and Miller, 2002).

Other TMDLs in California

In order to address these impairments, a TMDL and implementation plan has been developed for SIYB in San Diego Bay. In addition, a technical TMDL was developed by the USEPA, and the California Regional Water Quality Control Board, Santa Ana Region, will develop an implementation plan for Newport Bay. In the technical TMDL for Newport Bay, copper coatings on boat hulls in marinas were identified as a significant source of the copper problem. A TMDL and implementation plan will be developed for Marina del Rey in the near future, and copper paints on boat hulls are expected to be a significant contributor to the copper problem.

Copper Summit

On September 16, 2003, a Copper Summit interagency meeting was held in Sacramento to discuss the extent of the problem statewide, and the availability and need for data concerning copper antifouling paints and water quality. The interagency meeting was coordinated through the Management Agency Agreement (MAA) coordinators at the State Board and the DPR. Attendees included representatives from the State Board, various California Regional Water Quality Control Boards, the DPR, CCC, San Francisco Bay Conservation and Development Commission, Santa Monica Bay Restoration Project and State Parks and Recreation. The meeting's participants concluded that while copper is recognized as a problem in many areas of high boating activity, more data is needed to characterize the extent of the problem in California.

Bans on the Use of Copper Paints
Copper-based antifouling paints have been restricted or banned on recreational vessels in Europe in Sweden, the Netherlands, and in Denmark (Johnson and Miller, 2002). Furthermore, the European Union has asked the International Maritime Organization to ban all antifouling paints that are known to be toxic (Johnson and Miller, 2004).

California's Nonpoint Source Program
Section 319 of the CWA established the Nonpoint Source Management Program to help address nonpoint source pollution at the State and local levels. In California, the CCC and the State Board developed the Plan for California's Nonpoint Source Pollution Control Program (Program Plan) to respond to nonpoint source pollution (State Board and CCC, 2000). The Program Plan describes categories of Management Measures (MM) that serve as goals for dealing with nonpoint source pollution, and presents a 15-year strategy for fully implementing the MMs. The primary goal of the program is to measurably improve water quality through the implementation of MPs. MMs are organized according to six categories, including a category on marinas and recreational boating. Actions described in the marinas and recreational boating MMs include minimizing the use of toxic bottom paints, prohibiting discharges of these substances to State waters, and increasing the availability and use of less toxic and nontoxic recreational antifouling paints. Other actions identified to achieve the MMs include the phase out of the use of toxic hull paints on State and local agency-owned vessels. Another action identified in the Program Plan includes the consideration of the development of legislation to prohibit the sale and use of toxic hull paints, as necessary after a thorough analysis of situation. Lastly, MM actions include public education, outreach, and training programs to prevent and control the discharge of pollutants into State waters.

The USEPA's Management Measures for Marinas and Recreational Boating
The USEPA has produced a technical guidance and reference document, *National Management Measures to Control Nonpoint Source Pollution from Marinas and Recreational Boating*, to assist in implementing nonpoint source pollution management programs, including TMDLs (USEPA 2001). The document identified specific practices that relate to marinas and recreational boating to minimize the release of paint into marinas, and are described below:

- Prevent in-water hull scraping or other abrasive techniques that release paint into the environment;
- Switch to long-lasting and low-toxicity or nontoxic antifouling paints; and
- Apply antifouling paints in ways that will help reduce the impact to the environment.

2002 Carson Report on Economic Incentives (SB 315)
California Senate Bill 315 (Alpert), chaptered in October 2001, created a state-mandated local program to develop a report on the economic incentives necessary to ensure that nontoxic alternatives to metal-based antifouling hull coatings are used for recreational vessels. Funds were authorized from the California Department of Boating and Waterways (DBW), and the report was developed by an economics professor at University of California, San Diego, Dr. Richard Carson, in conjunction with Sea Grant. The report, which was made avaliable to the

State legislature, focused on the economics associated with a transition to nontoxic antifouling paints in San Diego Bay. According to the report, every major paint company is studying biocide-free antifouling paints (Carson *et al*., 2002). Representatives from the Regional Board served on an advisory committee for the developemnt of this report, the San Diego Advisory Committee for Environmentally Superior Antifouling Paints (see below). Greater discussion of the Carson report is contained in the Economics Analysis.

San Diego Advisory Committee for Environmentally Superior Antifouling Paints
California Senate Bill 315 (Alpert), chaptered in October 2001, established the San Diego Advisory Committee for Environmentally Superior Antifouling Paints. The purpose of the committee was to make recommendations and advise in the preparation of a report that identified incentives necessary to ensure that nontoxic alternatives to metal-based antifouling hull coatings are used for recreational vessels. Members of the committee included representatives from the Regional Board, DPR, Sea Grant, Port Tenants Association, Port, Environmental Health Coalition, US Navy, DBW, a marina, an underwater hull cleaner, a boater, and a boatyard.

Alternative Antifouling Strategies for Recreational Boats: A Working Conference
A conference on alternative antifouling strategies, "Alternative Antifouling Strategies for Recreational Boats: A Working Conference", was held on September 21-22, 2000, and was sponsored by Sea Grant, San Diego Port Tenants Association and the Port. Attendees included representatives from the Regional Board, boating and antifouling industries, boat owners, policy makers, and environmental agencies and universities. Draft recommendations that came out of the conference included a need for a legislative hearing on copper pollution to help assess the extent of the problem and current knowledge (Johnson, 2000). Also identified were research needs, including an economic analysis, demonstration projects of alternative antifouling strategies, and basic research (Johnson, 2000).

Public Education Materials and Efforts
A number of public education and outreach efforts are ongoing in California to address copper pollution from antifouling paints. Sea Grant has been actively involved in educating the boating community in southern California about alternative antifouling strategies. For example, Sea Grant is conducting a demonstration project of nontoxic hull coatings on recreational vessels as part of a CWA 319(h) grant to promote the use of nontoxic antifouling paints for recreational vessels in San Diego Bay. They have also coordinated and participated in conferences related to copper pollution from antifouling paints such as "Alternative Antifouling Strategies for Recreation Boats: A Working Conference", and the "11th International Congress on Marine Corrosion and Biofouling." Sea Grant has developed numerous outreach materials and brochures, including:

- Making Dollars and Sense of Nontoxic Antifouling Strategies for Boats" (Johnson and Miller, 2003)
- What you Need to Know About Nontoxic Antifouling Strategies For Boats (Johnson and Miller, 2002)
- Transitioning to Non-Metal Antifouling Paints on Recreational Boats in San Diego Bay (Carson et al., 2002)

- Staying Afloat with Nontoxic Antifouling Strategies for Boats (Johnson and Miller, 2004)
- Clean Boating Tips (Johnson and Clifton, 1995)
- Clean Boating Guide (Johnson et al., 1995)

Other agencies and groups are also conducting additional outreach and educational efforts to address pollution from marinas and recreational boating. For example, the CCC has published the California Clean Marina Guidebook (2nd Draft) and coordinates the Boating Clean and Green Campaign and the California Clean Boating Network. The Boating Clean and Green Campaign and the California Clean Boating Network are examples of educational programs designed to promote environmentally sound boating practices to marine business and boaters in California. In addition, the Santa Monica Bay Restoration Project, a coalition of environmentalists, government, scientists, business and the public is working on a diver certification program to certify underwater hull cleaners in the use of MPs. The program, funded through a CWA 319(h) grant, is designed to educate divers about the use of MPs to reduce copper loading to the environment. Currently in southern California, the California Professional Divers Association is coordinating a voluntary diver certification program in the use of MPs for underwater hull cleaning. Education and outreach to the boating community and the public is extremely important to increase awareness about copper pollution in marine waters and ways to prevent it.

Appendix 11: Restrictions on Tributyltin (TBT) Antifouling Paints

Tributyltin (TBT) is an extremely toxic chemical that was a common component of antifouling paints used on recreational vessels prior to restrictions on its use that took place in 1988. TBT is very effective as a component of antifouling paint, more effective than copper-based antifouling paints and longer lasting. Its use on vessels increased in the 1970s and 1980s, replacing in popularity antifouling paints that relied solely on copper as the toxic agent. However, TBT is highly toxic to marine and freshwater aquatic organisms, and accumulates in water and sediment. TBT bioaccumulates in oysters and mussels, fish and in sea otters, and is especially toxic to bivalves (State Board, 1988). Over time, TBT naturally breaks down in the environment though biodegradation (unlike copper), adsorption onto sediment and bioconcentration.

In the 1980s, researchers began to recognize the environmental problems associated with TBT coatings. Elevated levels of TBT were found throughout the nation in California, Virginia, Maryland, Canada, and in areas of Europe. Monitoring in the late 1980's in California by the State Board and other agencies found that TBT concentrations in the water column were elevated one to two orders of magnitude over acceptable levels in areas of heavy boating activity (State Board, 1988).

In 1986, the State Board requested that the California Department of Food and Agriculture (CDFA) reevaluate the registration of pesticides containing TBT (State Board, 1988).[38] In March 1987, CDFA placed TBT under reevaluation. Concurrently, the California legislature enacted a bill (AB 637) that took effect in January 1, 1988 that made it illegal to sell or use TBT coatings, except on vessels 25 meters (82 feet) or greater or on aluminum vessels or parts. On January 2, 1988, CDFA adopted regulations that superseded AB 637 making TBT coatings restricted materials and imposed similar restrictions on its use. In June 1988, the federal Organotin Antifouling Paint Control Act went into effect that prohibited the use of TBT coatings on vessels less than 25 meters in length, and limited the release rates on larger vessels. Also in September 1988, the USEPA released final TBT regulations that contain the same restrictions as the federal act (State Board, 1988). In summary, restrictions on the use of TBT for recreational vessels in the United States were imposed through state regulations through CDFA, federal regulations through the USEPA, and state and federal legislation. Since these restrictions were imposed, levels of TBT have decreased in areas that were elevated, including San Diego Bay.

Restrictions have also been imposed on the use of TBT antifouling paints on vessels worldwide. For example, in 1982 France prohibited the use of TBT coatings on vessels less than 25 meters in length (State Board, 1988). Furthermore, in November 1999, the International Maritime Organization adopted a resolution that calls for a global ban on the application of tributyltin antifouling paints on all vessels (regardless of size) by January 1, 2003, and a complete prohibition on its use on vessels by January 1, 2008.

[38] At this time, CDFA regulated the registration of pesticides in California. Today, pesticides are regulated in California by DPR.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

RESOLUTION NO. R9-2005-0036

A RESOLUTION ADOPTING AN AMENDMENT TO THE WATER QUALITY CONTROL PLAN FOR THE SAN DIEGO REGION (9) TO INCORPORATE TOTAL MAXIMUM DAILY LOADS (TMDLs) FOR TOTAL NITROGEN AND TOTAL PHOSPHORUS IN THE RAINBOW CREEK WATERSHED, SAN DIEGO COUNTY

WHEREAS, The California Regional Water Quality Control Board, San Diego Region (hereinafter, Regional Board), finds that:

1. **BASIN PLAN AMENDMENT:** The proposed amendment of the Water Quality Control Plan for the San Diego Region (Basin Plan) described in the recitals below was developed in accordance with California Water Code §13240 et seq.

2. **NECESSITY STANDARD [Government Code §11353(b)]:** This regulatory action meets the "Necessity" standard of the Administrative Procedures Act, Government Code, §11353, subdivision (b). Amendment of the Basin Plan to establish and implement total maximum daily loads (TMDLs) for Rainbow Creek is necessary because water quality in Rainbow Creek does not meet applicable water quality objectives for total nitrogen and total phosphorus (hereinafter nutrients) even with implementation of waste discharge requirements containing technology based effluent limits or water quality based effluent limits for discharges of pollutants to Rainbow Creek and its tributaries. These TMDLs for nutrients are necessary to ensure attainment of applicable water quality objectives and restoration of beneficial uses designated for Rainbow Creek.

3. **CLEAN WATER ACT SECTION 303(d):** Rainbow Creek is identified on the Clean Water Act Section 303(d) list of impaired waters due to excessive nutrient concentrations. Section 303(d) requires the Regional Board to develop and implement TMDLs under the conditions that exist in Rainbow Creek.

4. **BENEFICIAL USE IMPAIRMENTS**: Rainbow Creek supports a multitude of beneficial uses. The most sensitive beneficial uses are those designated for protection of aquatic life as described in the Basin Plan definition of the COLD and WARM beneficial uses. The municipal supply (MUN), warm freshwater habitat (WARM), cold freshwater habitat (COLD), wildlife habitat (WILD), contact water recreation (REC-1), and non-contact water recreation (REC-2) are threatened or impaired due to excessive levels of nutrients.

5. **WATER QUALITY OBJECTIVES**: The Basin Plan establishes that inland surface waters shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. The Basin Plan establishes the following numerical water quality objective for biostimulatory substances for the protection of the COLD and WARM beneficial uses:

   Total Nitrogen 1.0 mg/L
   Total Phosphorus 0.1 mg/L

   These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board.

   The Basin Plan establishes that waters designated for use as domestic or municipal supply shall not contain concentrations of nitrate in excess of the maximum contaminant levels set forth in California Code of Regulations, Title 22. The maximum contaminant level (MCL) for nitrate (as nitrogen) is 10 mg/L.

6. **WATER QUALITY OBJECTIVE VIOLATIONS:** Concentrations for nutrients in Rainbow Creek routinely exceed applicable water quality objectives for nutrients and nitrate. Sampling surveys conducted by the Regional Board in Rainbow Creek in Year 2000 documented water column concentrations as high as 21 mg/L of nitrate as nitrogen, 23 mg/L of total nitrogen and 1.7 mg/L of total phosphorus.

7. **ADVERSE EFFECTS OF NUTRIENTS:** An overload of nutrients can result in an imbalance of the natural cycling processes and can lead to problems ranging from annoyance due to an overabundance of algae and emergent vegetation to human health problems and adverse ecological effects. Nutrient concentrations in Rainbow Creek appear to be contributing to excessive algal growth. Excessive algae present a nuisance that threatens to impair aesthetic and recreational uses (REC1 and REC2). Excessive algae can create conditions that are harmful to aquatic life and degrade water quality, and threaten to impair warm water (WARM), cold water (COLD), and wildlife (WILD) beneficial uses.

8. **NUMERIC TARGETS:** TMDL Numeric Targets interpret and implement water quality standards (i.e., numeric and narrative water quality objectives and beneficial uses) and are established at levels necessary to achieve water quality standards. The Regional Board has set the total nitrogen and total phosphorus TMDL Numeric Targets for both the numeric and narrative water quality objectives equal to the numeric water quality objectives cited in Finding 5. The numeric targets for nitrate (as nitrogen) is 10 mg/L, total nitrogen is 1.0 mg/L and total phosphorus is 0.1 mg/L. Attainment of the TMDL numeric targets will result in attainment of water quality standards in Rainbow Creek.

9. **TOTAL MAXIMUM DAILY LOADS [40 CFR 130.2(i)]:** The Total Maximum Daily Loads (TMDLs) for total nitrogen and total phosphorus discharges into Rainbow Creek are calculated to be 1,658 kilograms of nitrogen per year (kg N/yr) and 165 kilograms of phosphorus per year (kg P/yr). The TMDLs are equal to the assimilative or Loading Capacity (LC) of Rainbow Creek for total nitrogen and total phosphorus and are defined as the maximum amount of total nitrogen and total phosphorus that Rainbow Creek can receive and still attain water quality objectives and protection of designated beneficial uses. The TMDLs are comprised of the sum of all individual Wasteload Allocations (WLAs) for point source discharges of nutrients, the sum of all Load Allocations (LAs) for nonpoint source discharges of nutrients, and natural background. The TMDLs include a margin of safety (MOS) that takes into account any uncertainties in the TMDL calculation. (i.e. TMDL = LC = $\sum$ WLAs + $\sum$ LAs + MOS). The TMDL calculations also account for seasonal variations and critical conditions.

10. **ALLOCATIONS AND REDUCTIONS:** A 74 percent (74%) overall reduction of total nitrogen loading and an 85 percent (85%) overall reduction of total phosphorus to Rainbow Creek are required to meet the TMDLs of 1,658 kg N/yr and 165 kg P/yr. The assigned allocations from each source translate into a percent reduction of nutrients from current loading.

Percent Reduction by Source	Total Nitrogen	Total Phosphorus
Point Sources		
Caltrans	68%	64%
Nonpoint Sources		
Commercial Nurseries	77%	90%
Agricultural Fields	77%	90%
Orchards	77%	90%
Park	50%	50%
Residential Areas	77%	90%
Urban Areas	50%	50%
Septic Tank Disposal Systems	77%	Not Applicable

11. **DISCHARGERS:** The Regional Board has identified Caltrans, County of San Diego, commercial nurseries, agricultural fields, orchards, parks, residential areas, urban areas, and septic tank disposal systems as causing or permitting the discharge of total nitrogen and total phosphorus to Rainbow Creek.

12. **IMPLEMENTATION ACTIONS**: Strategies that the Regional Board could take to implement the TMDL are described in the *Basin Plan Amendment and Technical Report for Total Nitrogen and Total Phosphorus Total Maximum Daily Loads For Rainbow Creek, dated February 9, 2005*.

13. **IMPLEMENTATION MONITORING:** Water quality monitoring will be required to evaluate the overall TMDL implementation effectiveness and success in attaining nutrient water quality objectives in Rainbow Creek and its tributaries.

14. **COMPLIANCE SCHEDULE:** Nutrient wasteload and load reductions are required over a 16-year phased compliance schedule period. The first four-year phase consists of nutrient reductions to attain the nitrate water quality objective and reduced phosphorus concentrations in Rainbow Creek. Incremental reductions of nutrient load are required throughout the subsequent 12-year period.

15. **SCIENTIFIC PEER REVIEW:** The scientific basis of this Basin Plan amendment has undergone external peer review pursuant to Health and Safety Code Section 57004. The Regional Board has considered and responded to all comments submitted by the peer review panel.

16. **STAKEHOLDER PARTICIPATION:** Interested persons and the public have had reasonable opportunity to participate in the development of this amendment to the Basin Plan. Efforts to solicit public review and comment include four (4) public workshops held between April 1999 and December 2004; two (2) public review and comment periods of at least 45 days preceding the Regional Board public hearing; and written responses from the Regional Board to oral and written comments received from the public.

17. **ECONOMIC ANALYSIS:** The Regional Board has considered the costs of implementing this Basin Plan amendment, and finds these costs to be reasonable relative to the water quality benefits derived from implementing the amendment.

18. **CEQA REQUIREMENTS:** The Basin Planning process has been certified as functionally equivalent to the California Environmental Quality Act (CEQA) requirements for preparing environmental documents and is, therefore, exempt from those requirements (Public Resources Code Section 21000 et seq.). The required environmental documents (Basin Plan amendment, staff report, and environmental checklist) have been prepared.

19. **DE MINIMIS ENVIRONMENTAL EFFECTS**: This Basin Plan amendment results in no potential for adverse effect, either individually or cumulatively, on fish and wildlife resources or the habitat upon which they depend. Any and all effects on the environment are expected to be beneficial.

20. **PUBLIC NOTICE**: The Regional Board has notified all known interested parties and the public of its intent to consider adoption of this Basin Plan amendment in accordance with Water Code Section 13244.

21. **PUBLIC HEARING:** The Regional Board has, at public meetings on May 8, 2002 and December 8, 2004, held public hearings and heard and considered all comments

pertaining to this Basin Plan amendment.

NOW, THEREFORE, BE IT RESOLVED that

1. **AMENDMENT ADOPTION**: The Regional Board hereby adopts this amendment to the Basin Plan to incorporate the Rainbow Creek Total Nitrogen and Total Phosphorus TMDLs as set forth in Attachment A hereto.

2. The Regional Board hereby approves the report *Basin Plan Amendment and Technical Report for Total Nitrogen and Total Phosphorus Total Maximum Daily Loads For Rainbow Creek, dated February 9, 2005*.

3. **CERTIFICATE OF FEE EXEMPTION**: The Executive Officer is authorized to sign a Certificate of Fee Exemption.

4. **AGENCY APPROVALS:** The Executive Officer is directed to submit the Basin Plan amendment to the State Water Resources Control Board (State Board) in accordance with California Water Code Section 13245. The Regional Board requests that the State Board approve the Basin Plan amendment and forward it to Office of Administrative Law (OAL) and the United States Environmental Protection Agency for approval.

5. **NON-SUBSTANTIVE CORRECTIONS:** If, during the approval process for this amendment, the State Board or OAL determines that minor, non-substantive corrections to the language of the amendment are needed for clarity or consistency, the Executive Officer may make such changes, and shall inform the Regional Board of any such changes.

I, John H. Robertus, Executive Officer, do hereby certify the foregoing is a full, true and correct copy of a Resolution adopted by the California Regional Water Quality Control Board, San Diego Region, on February 9, 2005.

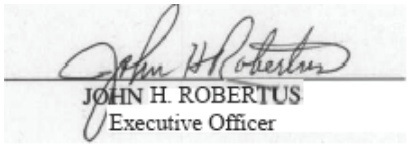

JOHN H. ROBERTUS
Executive Officer

ATTACHMENT A
TO RESOLUTION NO. R9-2005-0036
BASIN PLAN AMENDMENT

This Basin Plan Amendment establishes Total Maximum Daily Loads (TMDLs) and associated wasteload and load reductions for nutrients in Rainbow Creek, a tributary of the Santa Margarita River. This Amendment includes a program to implement the TMDLs and to monitor their effectiveness. Chapters 2, 3, and 4 of the Basin Plan are amended as follows:

1. **Chapter 2, Beneficial Uses**
   Table 2-2. ***Beneficial Uses of Inland Surface Waters, Santa Margarita River Watershed, Rainbow Creek, Hydrologic Unit Basin Numbers 2.23 and 2.22.***

Add the following footnote 3 to Rainbow Creek, Hydrologic Unit Basin Numbers 2.23 and 2.22:

> [3]Rainbow Creek is designated as an impaired water body for total nitrogen and total phosphorus pursuant to Clean Water Act Section 303(d). Total Maximum Daily Loads (TMDLs) have been adopted to address these impairments. See Chapter 3, Water Quality Objectives for Biostimulatory Substances and Chapter 4, Total Maximum Daily Loads.

2. **Chapter 3, Water Quality Objectives**
   Inland Surface Waters, Enclosed Bays and Estuaries, Coastal Lagoons, and Ground Waters

   Water Quality Objectives for Biostimulatory Substances:

Insert the following as new paragraph 5:

> Rainbow Creek is designated as an impaired water body for total nitrogen and total phosphorus pursuant to Clean Water Act Section 303(d). Total Maximum Daily Loads (TMDLs) have been adopted to address these impairments. See Chapter 2, Beneficial Uses Table 2-2. Beneficial Uses of Inland Surface Waters, Santa Margarita River Watershed, Rainbow Creek, Hydrologic Unit Basin Numbers 2.23 and 2.22, Footnote 3 and Chapter 4, Total Maximum Daily Loads.

3. **Chapter 4, Implementation**

Add the following new section to Chapter 4:

TOTAL MAXIMUM DAILY LOADS

Total Maximum Daily Loads (TMDLs) for Total Nitrogen and Total Phosphorus in the Rainbow Creek Watershed

On February 9, 2005, the Regional Board adopted Resolution No. R9-2005-0036, A Resolution Adopting An *Amendment To The Water Quality Control Plan For The San Diego Region (9) To Incorporate Total Maximum Daily Loads (TMDLs) For Total Nitrogen and Total Phosphorus In The Rainbow Creek Watershed, San Diego County*. The Basin Plan Amendment was subsequently approved by the State Water Resources Control Board on November 16, 2005, the Office of Administrative Law on February 1, 2006, and the United States Environmental Protection Agency on March 22, 2006.

The TMDL is described in the Basin Plan Amendment and Technical Report for Total Nitrogen and Total Phosphorus Total Maximum Daily Loads For Rainbow Creek, dated February 9, 2005.

Problem Statement

Nitrate, total nitrogen, and total phosphorus concentrations in Rainbow Creek exceed the Inorganic Chemicals nitrate and Biostimulatory Substances water quality objectives. These exceedances threaten to unreasonably impair the municipal supply (MUN), warm freshwater habitat (WARM), cold freshwater habitat (COLD), and wildlife habitat (WILD) beneficial uses of Rainbow Creek. Excessive nutrient levels in Rainbow Creek promote the growth of algae in localized areas, creating a nuisance condition, that unreasonably interferes with aesthetics and contact and non-contact water recreation (REC1, REC2) and threatens to impair WARM, COLD and WILD beneficial uses. State highways, agricultural fields and orchards, commercial nurseries, residential and urban areas, and septic tank disposal systems contribute to increased nutrient levels in Rainbow Creek as a result of storm water runoff, irrigation return flows, and ground water contributions to the creek.

Numeric Targets

The Numeric Targets for nitrate, total nitrogen, and total phosphorus are set equal to the Inorganic Chemicals nitrate water quality objective for municipal water supply and the numeric goals of the Biostimulatory Substances water quality objective as defined in the Basin Plan and shown below.

Table 4 - A. Rainbow Creek Nitrate, Total Nitrogen, and Total Phosphorus Numeric Targets

Constituent	Water Quality Objective	Numeric Target
Nitrate (as nitrogen)	10 mg NO_3-N/L	10 mg NO_3-N/L
Total Nitrogen	1.0 mg N/L	1.0 mg N/L
Total Phosphorus	0.1 mg P/L	0.1 mg P/L

If the Inorganic Chemicals nitrate and Biostimulatory Substances water quality objectives in Rainbow Creek are modified in the future then the TMDL will be recalculated and the numeric targets will be set equal to the new water quality objectives.

Source Assessment

Seventy-nine percent (79%) and seventy percent (70%) of total nitrogen and total phosphorus mass loading, respectively, are attributable to controllable sources, which include certain land use activities, septic tank disposal systems (total nitrogen only), and Interstate 15 (I-15). The land use activities include commercial nurseries, agricultural fields, orchards, residential areas, urban areas, and park areas. Background and direct atmospheric deposition are not considered to be controllable sources.

Table 4 - B. Summary of Total Nitrogen and Total Phosphorus Sources to Rainbow Creek

Source	Total Nitrogen Mass Load (kg N/yr)	Percent Contribution (% N)	Total Phosphorus Mass Load (kg P/yr)	Percent Contribution (% P)
Land Uses Runoff	2,662	69	262	66
Background	779	20	116	29
Septic Tank Disposal Systems	200	5	0	0
I-15 Runoff (Caltrans)	153	4	14	4
Direct Atmospheric Deposition	40	1	2	1
Combined Sources	**3,834**	**100**	**394**	**100**

Total Maximum Daily Loads or Loading Capacity

The TMDLs for nutrients in Rainbow Creek are 1,658 kg N/yr for total nitrogen and 165 kg P/yr for total phosphorus in order to attain and maintain the Inorganic Chemicals – Nitrate and Biostimulatory Substances water quality objective in Rainbow Creek waters.

The annual loading limit of total nitrogen and total phosphorus to Rainbow Creek shall be reduced incrementally from the current load of 3,834 kg/yr and 394 kg/yr, respectively, to 1,658 kg/yr and 165 kg/yr, respectively, by no later than December 31, 2021. The annual nutrient loading limits to be attained by December 31, 2021 is listed in Table 4-C.

Table 4 - C. Annual Nutrient Loading Capacity and Compliance Date

TMDL	December 31, 2021[1]	
Total Nitrogen – Annual Load	1,658 kg/yr	3,648 lbs./yr
Total Phosphorus – Annual Load	165 kg/yr	365 lbs./yr

[1] Compliance to be achieved no later than this date. The Regional Board may require earlier compliance with these targets when it is reasonable and feasible.

Margin of Safety

Explicit and implicit margins of safety (MOS) were considered for these TMDLs. An explicit MOS of 5% is reserved to account for uncertainties and calculated to be 83 kg/year total nitrogen and 8 kg/year total phosphorus. An implicit MOS has been incorporated through conservative assumptions in the analysis.

Load Allocations and Wasteload Allocations

A seventy-four percent (74%) and an eighty-five percent (85%) overall reduction of total nitrogen and total phosphorus loading, respectively, to Rainbow Creek is required to meet the TMDLs described in Table 4 – C.

The load allocations for the initial annual loading are provided in Table 4 – D.1. and D.2., below. A margin of safety (MOS) of 5% is subtracted from this nutrient TMDL to account for unknowns, errors in assumptions, and potential future development in the watershed. This 5% is reserved for unknowns and is not allocated to any source. Allocations (other than for background and margin of safety) will be further reduced by 20% every 4 years until the biostimulatory targets for nitrogen and phosphorus are met. In the event that a nonpoint source becomes a permitted discharge, the portion of the load allocation that is associated with the source can become a wasteload allocation.

Table 4 – D.1. Annual Total Nitrogen Allocations for Rainbow Creek

Source	Annual Total Nitrogen Load Allocations			
	2009 kg/yr[1]	2013 kg/yr[1]	2017 kg/yr[1]	2021 kg/yr[1]
Load Allocations (LA)				
Commercial nurseries	390	299	196	116
Agricultural fields	504	386	253	151
Orchards	607	465	305	182
Park	5	3	3	3
Residential areas	507	390	260	149
Urban areas	40	27	27	27
Septic tank disposal systems	200	100	46	46
Air deposition	40	40	40	40
Wasteload Allocations (WLA)				
Caltrans highway runoff	118	90	59	49
Unidentified & future point sources	33	33	33	33
Total LA & WLA	**2,444**	**1,833**	**1,222**	**796**
Background[2]	779	779	779	779
MOS (not allocated)	83	83	83	83
Total	**3,306**	**2,695**	**2,084**	**1,658**

[1] To calculate pounds per year, multiply by 2.2.
[2] Background is calculated based on reference concentrations in San Diego streams and Rainbow Creek annual flow volumes.

Table 4 – D.2. Annual Total Phosphorus Allocations for Rainbow Creek

Source	Annual Total Phosphorus Load Allocations			
	2009 kg/yr[1]	2013 kg/yr[1]	2017 kg/yr[1]	2021 kg/yr[1]
Load Allocations (LA)				
Commercial nurseries	20	16	10	3
Agricultural fields	28	21	14	4
Orchards	50	37	24	6
Park	0.15	0.10	0.10	0.10
Residential areas	99	74	47	12
Urban areas	9	6	6	6
Air deposition	2	2	2	2
Wasteload Allocations (WLA)				
Caltrans highway runoff	11	8	5	5
Unidentified & future point sources	3	3	3	3
Total LA & WLA	**223**	**167**	**111**	**41**
Background[2]	116	116	116	116
Margin of Safety (not allocated)	8	8	8	8
Total	**346**	**291**	**235**	**165**

[1] To calculate pounds per year, multiply by 2.2.
[2] Background is calculated based on reference concentrations in San Diego streams and Rainbow Creek annual flow volumes.

Recalculations if Water Quality Objectives Change

If the water quality objectives for Biostimulatory Substances are changed in the future, then the MOS, TMDL and allocations and reductions will be recalculated using the method shown in Appendix D of the Basin Plan.

TMDL Implementation Action Plan

The necessary actions to implement the TMDLs are described in Section 9 of the *Technical Report for Total Nitrogen and Total Phosphorus Total Maximum Daily Loads (TMDLs) in Rainbow Creek*, dated February 9, 2005 and listed below.

A. Regional Board Actions

1. **Caltrans – Incorporate Wasteload Allocations in NPDES Storm Water Permit**
   The Regional Board shall request that the State Water Resources Control Board

amend the Caltrans statewide NPDES storm water permit[1] to include the following requirements:

a. MS4 discharges to Rainbow Creek shall not exceed the following wasteloads for nitrogen and phosphorus:

Nitrogen Wasteload	Phosphorus Wasteload	Compliance Due Date
118 kg N/yr[1]	11 kg P/yr[1]	December 31, 2009
90 kg N/yr[1]	8 kg P/yr[1]	December 31, 2013
59 kg N/yr[1]	5 kg P/yr[1]	December 31, 2017
49 kg N/yr[1]	5 kg P/yr[1]	December 31, 2021

b. A directive to submit annual progress reports to the Regional Board detailing progress made on attaining the nutrient wasteload reductions in Rainbow Creek. The report shall be due on April 1 of each year shall be incorporated within Section 2, Program Management of Caltrans MS4 Order No. 99-06-DWQ, NPDES No. CAS000003. Reporting shall continue on an annual basis until the nutrient water quality objective is attained in Rainbow Creek.

2. **County of San Diego – Issue Water Code Governmental Water Quality Investigation Request Order for Nutrient Reduction and Management Plan**
The Regional Board shall issue an Order under CWC §13225 requiring the County of San Diego to investigate excessive levels of nutrients in Rainbow Creek and feasible management strategies to reduce nutrient loading in Rainbow Creek. A Nutrient Reduction and Management Plan (NRMP) for the Rainbow Creek watershed containing the elements described below in Section C, County of San Diego Nutrient Reduction Management Plan Elements, would satisfy such an Order. The County may submit alternative or additional elements equivalent to those described in Section C that would result in equivalent protection from, or prevention of, nutrient discharges to Rainbow Creek.

3. **County of San Diego – Establish Management Agency Agreement (MAA)**
The Regional Board shall consider, following concurrence with the County of San Diego's Nutrient Reduction and Management Plan (NRMP) for Rainbow Creek, entering into a Management Agency Agreement (MAA) with the County of San Diego. The MAA shall set forth the commitment of both parties to undertake various oversight responsibilities for the nonpoint source nutrient load reduction component of this TMDL, and the County's commitments to implement the NRMP.

[1] The term "statewide NPDES storm water permit " refers to Order No. 99-06-DWQ, NPDES No. CAS000003, National Pollutant Discharge Elimination System Permit, Statewide Storm Water Permit, and Waste Discharge Requirements for the State of California, Department of Transportation (Caltrans) or subsequent superceding NPDES renewal Orders.

4. **County of San Diego – Issue Water Code Governmental Water Quality Investigation Request for Groundwater Investigation and Characterization Report**
   The Regional Board could issue an Order under CWC §13225 directing the County of San Diego to prepare and submit a workplan and report described below in Section B, County of San Diego Actions, Item 3 Submit Groundwater Investigation and Characterization Workplan and Item 4 Groundwater Investigation and Characterization Report.

5. **CA Dept. of Forestry and Fire Protection – Issue Water Code Section 13267 Order**
   The Regional Board shall issue a CWC §13267 order directing the California Department of Forestry and Fire Protection, Rainbow Conservation Camp (CDFFP) to submit any additional technical information needed to 1) evaluate whether CDFFP's discharge is surfacing and/or contributing to the impairment of Rainbow Creek; and 2) estimate the actual nutrient load originating from the septic tank and percolation ponds to Rainbow Creek via groundwater flow. Based on the review of this information the Regional Board may further direct the CDFFP to implement an alternate means of wastewater disposal or additional treatment necessary to attain and maintain nutrient water quality objectives in Rainbow Creek.

6. **Establish Memorandum of Understanding (MOU) with Agencies or Organizations**
   The Regional Board shall consider entering into a memorandum of understanding (MOU) to document cooperative agreements with other agencies or organizations that are able to provide information, technical assistance, or financial assistance to dischargers to support the Regional Board's goals of attaining the nutrient load reductions required under this TMDL and compliance with the nutrient water quality objective. These agencies and organizations include, but are not limited to, the United States Department of Agriculture, Natural Resources Conservation Service (NRCS), Mission Resource Conservation District (MRCD), and the University Of California Cooperative Extension (UCCE).

7. **Adopt Waste Discharge Requirements (WDRs), Waivers, and Discharge Prohibitions**
   In conjunction with an MAA or MOU with another third-party representative, organization, or government agency describing an adequate NPS pollution control implementation program, the Regional Board shall adopt individual or general waivers or waste discharge requirements (WDRs) for NPS discharges in the Rainbow Creek watershed. The waivers or WDRs shall require NPS dischargers to either participate in the third party NPS program or, alternatively, submit individual pollution prevention plans that detail how they will comply with the waivers and WDRs. Alternatively, the Regional Board may adopt a discharge prohibition, which includes exceptions for those discharges that are adequately addressed in an acceptable third-party MAA or MOU NPS pollution control

implementation program.

8. **Take Enforcement Actions**
The Regional Board shall take enforcement action[2], as necessary, against any discharger failing to comply with applicable waiver conditions, waste discharge requirements (WDRs), discharge prohibitions, or take enforcement action, as necessary, to control the discharge of nutrients to Rainbow Creek, to attain compliance with the nutrient wasteload and load reductions specified in this TMDL, or to attain compliance with the nutrient water quality objectives. The Regional Board may also terminate the applicability of waivers and issue waste discharge requirements or take other appropriate action against any discharger(s) failing to comply with the waiver conditions.

9. **Review and Revise Existing Waste Discharge Requirements**
The Regional Board shall review and, if necessary, update existing waste discharge requirements for discharges to land as well as groundwater in the Rainbow Creek watershed to incorporate effluent limitations for nutrients consistent with applicable nutrient groundwater quality objectives and surface water quality objectives.[3]

10. **Recommend High Priority for Grant Funds**
The Regional Board shall recommend that the State Board assign a high priority to awarding grant funding[4] for projects to implement the Rainbow Creek nutrient TMDLs. Special emphasis will be given to projects that can achieve quantifiable nutrient load reductions consistent with the specific nutrient TMDL load allocations.

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[2] An enforcement action is any formal or informal action taken to address an incidence of actual or threatened noncompliance with existing regulations or provisions designed to protect water quality. Potential enforcement actions include a notice of violation (NOV), notices to comply (NTC), imposition of time schedules (TSO), issuance of cease and desist orders (CDOs) and cleanup and abatement orders (CAOs), administrative civil liability (ACL), and referral to the attorney general (AG) or district attorney (DA). The Regional Board generally implements enforcement through an escalating series of actions to: (1) assist cooperative dischargers in achieving compliance; (2) compel compliance for repeat violations and recalcitrant violators; and (3) provide a disincentive for noncompliance.

[3] There are currently three dischargers in the Rainbow Creek watershed regulated under waste discharge requirements for the discharge of waste to land or groundwaters: Oak Crest Mobile Estates (Order No. 1993-69), Rainbow Conservation Camp (Order No. 1995-20), and Temecula Truck Inspection Facility (Order No. 1992-56). The Rainbow Truck Weigh and Inspection Facility, discharges under the terms of a waiver of waste discharge requirements (Order No. 2000-235)

[4] The State Water Resources Control Board administers the awarding of grants funded from Proposition 13, Proposition 50, Clean Water Act 319(h) and other federal appropriations to projects that can result in measurable improvements in water quality, watershed condition, and/or capacity for effective watershed management. Many of these grant fund programs have specific set-asides for expenditures in the areas of watershed management and TMDL implementation for NPS pollution.

11. **Incorporate Water Code Section 13291 Regulations in Basin Plan**
The Regional Board shall incorporate regulations currently under development by the State Water Resources Control Board pertaining to onsite wastewater treatment systems[5] into the Water Quality Control Plan for the San Diego Basin (Basin Plan) as soon as practicable upon their adoption by the State Board.[6]

B. County of San Diego Actions

1. **Control MS4 Discharges to Rainbow Creek**
For nutrient discharges to or from Municipal Separate Storm Sewer Systems (MS4) within the Rainbow Creek watershed, the County has an existing obligation under the NPDES requirements for MS4s in San Diego County [7] to require increasingly stringent best management practices, pursuant to the iterative process described in Receiving Water Limitation C.2.a.[8] of the MS4 Requirements, to reduce nutrients discharges in the Rainbow Creek watershed to the maximum extent practicable and restore compliance with the nutrient water quality objective.

2. **Submit Nutrient Reduction and Management Plan (NRMP)**
The County of San Diego shall, upon request by the Regional Board pursuant to CWC §13225, prepare and submit a NRMP for the Rainbow Creek watershed, consistent with the SWRCB NPS Implementation and Enforcement Policy and containing the elements described in Section C, County of San Diego Nutrient Reduction and Management Plan or their equivalent. The County may submit alternative or additional elements equivalent to those described in Section C that would result in equivalent protection from, or prevention of, nutrient discharges to Rainbow Creek.

3. **Submit and Implement Groundwater Investigation and Characterization Workplan**
The County of San Diego shall, upon request by the Regional Board pursuant to CWC §13225, undertake an investigation of groundwater quality within the Rainbow Creek watershed, and shall prepare and submit a workplan designed to guide the collection of information to produce the technical report described in Item 4, Groundwater Investigation and Characterization Report below. The workplan shall

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[5] "Onsite wastewater treatment system(s)" (OWTS) is any individual or community onsite wastewater treatment, pretreatment and dispersal system including, but not limited to, a conventional, alternative, or experimental sewage dispersal system such a septic tanks having a subsurface discharge.

[6] CWC §13291 directs the Regional Board to incorporate the regulations in the Basin Plan upon their adoption by the State Water Resources Control Board.

[7] The term "MS4 NPDES Storm Water Permit" refers to Order No.2001-001, NPDES No. CAS0108758, *Waste Discharge Requirements For Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of San Diego, the Incorporated Cities Of San Diego County, and the San Diego Unified Port District* or subsequent superceding NPDES renewal Orders.

include the following:

a. A schedule for completion of all activities and submission of a final Groundwater Investigation and Characterization Report.
b. A description of proposed actions including drilling methods, analytical methods, sampling locations, and purging and sampling methods.
c. The location of existing monitoring wells and the proposed location of additional monitoring wells needed to characterize nutrient concentrations and their lateral and vertical extent in groundwater.
d. Contingencies for collection of additional samples.
e. Sufficient scope to meet the objectives of assessing nutrient loading from surface sources to groundwater and the contribution of groundwater to the nutrient loading and nutrient concentrations in Rainbow Creek
f. Consideration of the following elements or factors:
    i. Nutrient mass loading to groundwater in the fractured rock aquifer and the alluvial deposits aquifer[8] from septic systems, deep percolation of applied irrigation water, and any other sources.
    ii. Base flow contribution to Rainbow Creek from the fractured rock aquifer and the alluvial deposits aquifer.
    iii. Mass balance of nutrients in the fractured rock aquifer and alluvial deposits aquifer (nutrient mass loading to groundwater, removals from the groundwater system including denitrification, plant uptake, and groundwater discharge, and change in the load and concentration of nutrients in groundwater.

The County of San Diego shall implement the workplan within sixty (60) days after submission of the workplan, unless otherwise directed in writing by the Regional Board. Before beginning these activities the County shall notify the Regional Board of the intent to initiate the proposed actions included in the workplan submitted; and comply with any conditions set by the Regional Board.

4. **Submit Groundwater Investigation and Characterization Report**
The County of San Diego shall, on a schedule agreed to in writing by the Regional Board, submit a Groundwater Investigation and Characterization Report containing a technical analysis and interpretation of the data to assess the contribution of groundwater to the nutrient loading and concentrations in Rainbow Creek. The report shall meet the objectives and address the considerations described in the Groundwater Investigation and Characterization Workplan. The report shall also present recommendations to refine assumptions, resolve uncertainties, and improve the scientific foundation of the TMDL with regard to quantifying groundwater nutrient loading to Rainbow Creek.

[8] Groundwater beneath the Rainbow Creek watershed is interpreted to occur in both the alluvial deposits where present and in the fractured rock. The groundwater investigation report shall assess the relative contribution from each aquifer

5. **Establish Management Agency Agreement (MAA)**
   The County of San Diego is requested to enter into a MAA with the Regional Board setting forth the commitment of both parties to undertake various implementation oversight responsibilities for the nonpoint source nutrient load reduction component of this TMDL and the County's commitments to implement the NRMP.

C. County Of San Diego Nutrient Reduction And Management Plan

1. **NPS Nutrient Reduction and Management Plan (NRMP)**
   A NRMP for the Rainbow Creek watershed shall describe the activities the County of San Diego could undertake to oversee discharger efforts to reduce nutrients in the runoff or groundwater discharges from new and existing (1) commercial nurseries; (2) agricultural fields; (3) orchards; (4) parks; (5) residential area; (6) urban areas; and; (7) septic tank disposal system land uses (hereinafter referred to as key nutrient sources). A NRMP should include the following elements as provided in items 2 through 17 below or alternative or additional elements equivalent to those described that would result in equivalent protection from, or prevention of, nutrient discharges to Rainbow Creek.

2. **Legal Authority**
   The County of San Diego should review its legal authority and evaluate its adequacy to mandate compliance with the nutrient load reductions specified in this TMDL through ordinance, statue, permit, contract or similar means. The County, at a minimum, should evaluate its authority to:

   a. Control the discharge of nutrients from nonpoint sources; and
   b. Prohibit discharges of nutrients which cause or contribute to exceedances of the nutrient load reductions specified in this TMDL or nutrient water quality objectives.

   Alternatively the County of San Diego may certify that its existing legal authority is adequate to mandate compliance with the nutrient load reductions specified in this TMDL and prevent increases in nutrient loading to Rainbow Creek.

3. **General Plan Modification**
   The County of San Diego should evaluate the adequacy of its General Plan to ensure that future land use and zoning decisions do not result in an increase in the nutrient loading to Rainbow Creek. The County should also describe the steps it will take to modify the General Plan as necessary. Alternatively the County of San Diego may certify that its existing General Plan is adequate to prevent an increase in nutrient loading to Rainbow Creek.

4. **Modify Development Project Approval Process**
   The County of San Diego should evaluate the adequacy of its development project approval / permitting process as necessary to ensure that discharges from proposed developments in the Rainbow Creek watershed will comply with the nutrient load reductions specified in this TMDL and ensure that nutrient water quality objectives are not exceeded. The County's evaluation should consider the need to ensure that all development in Rainbow Creek watershed will be in compliance with County's storm water ordinances, permits, and all other applicable ordinances and requirements. The County should also describe the steps it will take to modify the development project approval / permitting process as necessary. Alternatively the County of San Diego may certify that its project approval / permitting process is adequate to ensure that discharges from proposed developments in the Rainbow Creek watershed will comply with the nutrients load reductions specified in this TMDL and ensure that nutrient water quality objectives are not exceeded.

5. **CEQA Reviews**
   The County of San Diego should evaluate the adequacy of its environmental review process pursuant to CEQA to ensure that new development in the Rainbow Creek watershed does not contribute to exceedances of the nutrient load allocations specified in this TMDL or violations of the nutrient water quality objective. For example, diligent performance of environmental review under CEQA and requirements for mitigation of the adverse environmental consequences to water quality of new development and detrimental agricultural practices can significantly reduce nutrient loading to Rainbow Creek. The County's evaluation should consider the need to aggressively review proposed projects that have the potential to contribute nitrogen and phosphorus to the Rainbow Creek watershed and require appropriate mitigation. The County should also describe the steps it will take to revise the development project approval / permitting process as necessary. Alternatively the County of San Diego may certify that its environmental review process pursuant to CEQA is adequate to ensure that new development in the Rainbow Creek watershed does not contribute to exceedances of the nutrient load allocations specified in this TMDL or violations of the nutrient water quality objective.

6. **Pollution Prevention (Nutrients)**
   The County of San Diego should describe the steps it will take to implement pollution prevention[9] methods for nutrients at sites owned by the County and require its use by owners or operators of nutrient sources, where appropriate.

7. **Source Identification (Nutrients)**
   The County of San Diego should describe the steps it will take to develop and update annually an inventory of the individual nutrient sources within the residential, urban, commercial nursery, agricultural field, orchard, park, and septic tank disposal system category of land uses. The use of an automated database system, such as

[9] Pollution Prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control, treatment, or disposal.

Geographical Information System (GIS) is highly recommended.

8. **Threat to Water Quality Prioritization (Nutrients)**
   The County of San Diego should describe the steps it will take to establish priorities for inspection and oversight activities. Each individual nutrient source in each nonpoint source category should be classified as high, medium, or low threat to water quality. The inventory should include the following minimum information for each site: name; address; SIC codes as appropriate which best reflects the type of site; a narrative description characterizing the nutrient waste generated; and the potential for nutrient discharges to Rainbow Creek.

9. **MP Implementation (Nutrients)**
   The County of San Diego should describe the steps it will take to:
   a. Designate a set of minimum MMs / MPs [10] for the high, medium, and low threat to water quality nutrient sources identified in item 7 above. The designated minimum MPs for the high threat to water quality nutrient sources should be site and source specific as appropriate.
   a. Establish a time line for installation of the designated minimum MPs at each nutrient source within its jurisdiction. If particular minimum MPs are infeasible for any specific site/source the county of San Diego should describe the steps it will take to require the implementation of other equivalent MPs.

10. **Inspection of Sites and Sources (Nutrients)**
    The County of San Diego should describe the steps it will take to inspect high priority sites and sources for compliance with its ordinances and permits as well as nutrient load reductions required under this TMDL. Inspections should include review of MP implementation plans and effectiveness. The County should also describe the steps it will take to implement all inspection follow-up actions, including enforcement actions, as necessary to obtain discharger compliance in implementing MPs.

11. **Enforcement of Sites and Sources (Nutrients)**
    The County of San Diego should describe the steps it will take to enforce its ordinances, statues, permits, and contracts as necessary to attain compliance with the nutrient load reductions specified in this TMDL.

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[10] In determining appropriate MPs the County of San Diego is encouraged to consult the State Water Resources Control Board's California Nonpoint Source Encyclopedia (2004) (http://www.waterboards.ca.gov/nps/encyclopedia.html). This publication contains extensive information on nutrient reduction management measures (MMs) and management practices (MPs) applicable to the NPS land use activities in the Rainbow Creek watershed. The County is also encouraged to consult the Regional Board's Watershed Management Approach for the San Diego Region, Nonpoint Source (http://www.waterboards.ca.gov/sandiego/programs/wmc.html) for additional information on management measures.

12. **Reporting of Non-compliant Sites (Nutrients)**
The County of San Diego should describe the steps it will take to provide oral notification to the Regional Board of non-compliant sites that are determined to be recalcitrant in implementing MPs or attaining compliance with nutrient load reductions required under this TMDL within 24 hours of the discovery of noncompliance. The notification process should also include procedures for a follow-up written report to be submitted to the Regional Board within 5 days of the incidence of non-compliance.

13. **Monitoring to Assess Compliance With Nutrient Load Reductions**
The County of San Diego should describe the steps it will take to conduct, or require nutrient sites or sources to conduct, a monitoring program to assess compliance of runoff or groundwater discharges with the load reductions from each of the land use categories assigned a load reduction. This can be accomplished by placing sampling stations at strategic nodes that would monitor nutrient discharges from individual sources of a common land use category.

14. **Community Education and Outreach**
The County of San Diego should describe the steps it will take to develop a focused educational program to raise community awareness of the nutrient impairment problem, promote pollution prevention, and increase the use of applicable management measures and practices where needed to control and reduce nutrient discharges to Rainbow Creek. Public education, outreach, and training programs should involve applicable user groups and the community[11].

15. **Seek Financial Assistance**
The County of San Diego is encouraged to seek grant funding[12] for projects to implement the Rainbow Creek nutrient TMDLs, particularly those that can achieve quantifiable nutrient load reductions consistent with the specific nutrient TMDL load allocations.

16. **Nutrient Reduction and Management Plan (NRMP) Effectiveness**
The County of San Diego should describe the steps it will take to develop a long-term strategy for assessing the effectiveness of the NRMP. The long-term assessment strategy should identify specific direct and indirect measurements that the County will use to track the long-term progress towards achieving the nutrient load reductions

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[11] Consideration should be given to expanding the County of San Diego's ongoing community and education outreach program under the County's MS4 NPDES Storm Water Permit to address the Rainbow Creek nutrient impairment problem. Additional suggestions for the information to be included in pollution prevention and education programs is contained in the State Water Resources Control Board's *California Nonpoint Source Encyclopedia* (2004) (http://www.waterboards.ca.gov/nps/encyclopedia.html).

[12] Information on available grant funds is contained in the in the State Water Resources Control Board's *California Nonpoint Source Encyclopedia* (2004) (http://www.waterboards.ca.gov/nps/encyclopedia.html).

required under this TMDL. Methods used for assessing effectiveness should include the following or their equivalent: surveys, pollutant loading estimations, and receiving water quality monitoring. The long-term strategy shall also discuss the role of monitoring data in substantiating or refining the assessment.

17. **Nutrient Reduction and Management Plan (NRMP) Annual Report**
The County of San Diego should describe the steps it will take to submit an annual NRMP report to the Regional Board by January 31 of each year following USEPA approval of this TMDL. The reporting period for this annual report should be the previous fiscal year. For example, the report submitted January 31, 2006 would cover the reporting period July 1, 2004 to June 30, 2005. The report should be incorporated in the annual Jurisdictional URMP Annual Report and the Watershed Specific URMP Annual Reports under the County's MS4 NPDES Permit and include the following information:

    a. Comprehensive description of all activities conducted by the County of San Diego to oversee implementation of the NRMP.
    b. An accounting of all: inspections conducted; enforcement actions taken; and education efforts conducted.
    c. An assessment of whether actions to implement designated minimum MPs at each nutrient source were actually carried out by dischargers.
    d. An assessment of the compliance of runoff or groundwater discharges with the load reductions from each of the land use categories assigned a load reduction.
    e. Identification of water quality improvements or degradation in Rainbow Creek with regard to attainment of the nutrient water quality objectives.
    f. An evaluation of the effectiveness of the NRMP in achieving the nutrient load reductions required under this TMDL.

D. Discharger Actions

1. **State of California, Department of Transportation (Caltrans) Actions**
Caltrans shall take all actions necessary to meet the nutrient wasteload reductions assigned to Caltrans. These nutrient wasteload reductions will eventually be incorporated into Caltrans statewide NPDES storm water permit. It is assumed that compliance with the nutrient wasteload reductions will be accomplished through the development and implementation of best management practices (BMPs). Caltrans shall also prepare and submit progress reports in accordance with the Caltrans statewide NPDES storm water permit or as otherwise directed by the Regional Board in a CWC §13383 order.

2. **State of California Department of Forestry and Fire Protection (CDFFP) Actions**
CDFFP shall, upon direction by the Regional Board in a CWC §13267 order, undertake an investigation to 1) evaluate whether CDFFP's discharge is surfacing and/or contributing to the impairment of Rainbow Creek; and 2) estimate the actual nutrient load to Rainbow Creek from groundwater flow originating from the septic

tank and percolation ponds.

3. **Nonpoint Source Dischargers (NPS Dischargers) Actions**
NPS discharges of nutrients in the Rainbow Creek watershed result from (1) commercial nurseries; (2) agricultural fields; (3) orchards; (4) parks; (5) residential areas; (6) urban areas; and (7) septic tank disposal system land use activities. Individual landowners and other persons (NPS Dischargers) engaged in these land use activities shall implement pollution prevention[13] methods and increase the use of applicable management measures and practices[14] where needed to control and reduce nutrient discharges to Rainbow Creek and attain nutrient load reductions. Individual landowners and other persons are encouraged to seek grant funding[15] for projects to implement the Rainbow Creek nutrient TMDLs, particularly those that can achieve quantifiable nutrient load reductions consistent with the specific nutrient TMDL load allocations. NPS dischargers will be subject to Regional Board enforcement action for failing to: comply with applicable waiver conditions, waste discharge requirements (WDRs), discharge prohibitions; attain compliance with the nutrient load reductions specified in this TMDL; or attain compliance with the nutrient water quality objectives. The Regional Board may also terminate the applicability of waivers and issue waste discharge requirements to any NPS dischargers failing to comply with waiver conditions.

[13] Pollution Prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control, treatment, or disposal.

[14] In determining appropriate management methods and practices to control nutrient discharges interested persons are encouraged to consult the State Water Resources Control Board's *California Nonpoint Source Encyclopedia* (2004) (http://www.waterboards.ca.gov/nps/encyclopedia.html. This publication contains extensive information on nutrient reduction management measures (MMs) and management practices (MPs) applicable to the NPS land use activities in the Rainbow Creek watershed. Interested persons are also encouraged to consult the Regional Board's Watershed Management Approach for the San Diego Region, Nonpoint Source (http://www.waterboards.ca.gov/sandiego/programs/wmc.html) for additional information on management measures.

[15] Information on available grant funds is contained in the in the State Water Resources Control Board's *California Nonpoint Source Encyclopedia* (2004) (http://www.waterboards.ca.gov/nps/encyclopedia.html).

TMDL Implementation Monitoring Plan
The necessary actions to monitor TMDL implementation are described in Section 10 of the *Technical Report for Total Nitrogen and Total Phosphorus Total Maximum Daily Loads (TMDLs) in Rainbow Creek*, dated February 9, 2005 and listed below.

A. Regional Board Actions

1. **Issue Order to Submit Monitoring Plan to Caltrans and County of San Diego**
   The Regional Board shall issue an Order to Caltrans under CWC §13383 and a Governmental Water Quality Investigation Request Order to the County of San Diego under CWC §13225, to prepare and submit an Implementation Monitoring Plan containing the elements described in **Section C. Implementation Monitoring Plan Elements** below. The Regional Board may amend this order at any time to include other nutrient dischargers in the Rainbow Creek watershed on a case-by case basis.

2. **Issue Order to Implement Monitoring Plan to Caltrans and County of San Diego**
   Upon concurrence with the County of San Diego's and Caltrans' Implementation Monitoring Plan the Regional Board shall issue an Order to Caltrans under CWC § 13383 and a Governmental Water Quality Investigation Request Order to the County of San Diego under CWC § 13225, to implement monitoring. The Regional Board may amend this order at any time to include other nutrient dischargers in the Rainbow Creek watershed on a case-by case basis.

B. County of San Diego and Caltrans Actions

1. **Prepare and Submit Monitoring Plan**
   The County of San Diego and Caltrans shall collaborate to prepare and submit an Implementation Monitoring Plan for the Rainbow Creek watershed containing the elements described in **Section C. Implementation Monitoring Plan Elements** below, upon direction by the Regional Board in a CWC §13225 / CWC §13383 Order. The number of monitoring stations in Rainbow Creek assigned to Caltrans should be based on the number of stations needed by Caltrans to demonstrate compliance with the nutrient wasteload allocation and the success of the TMDL in attaining the nutrient water quality objective in the portion of Rainbow Creek affected by its discharge. The Implementation Monitoring Plan shall be modified as requested by the Regional Board.

2. **Implement Monitoring Plan**
   The County of San Diego and Caltrans shall implement the Implementation Monitoring Plan upon direction by the Regional Board pursuant to a CWC §13225 / §13383 Order. The Regional Board may amend this order at any time to include other nutrient dischargers in the Rainbow Creek watershed on a case-by case basis.

C. Implementation Monitoring Plan Elements

The Implementation Monitoring Plan shall contain the following elements:

1. **Surface Water Monitoring Stations**
   Monitoring stations shall be proposed that best serve the monitoring objectives described above in Section 10.2 Monitoring Objectives. Previously monitored locations that shall be considered include Jubilee, Hines Nursery, Oak Crest, Rainbow Glen Tributary, Margarita Glen Tributary, Willow Glen-4, Willow Glen Tributary, Riverhouse, Via Milpas Tributary, and Stage Coach (See Figure A-3, in Appendix A). An additional sampling location between Oak Crest and Willow Glen-4 should also be considered. For instance, a monitoring location might be placed downstream of Oak Crest Mobile Estates to assess nutrient loading from this property. Monitoring stations shall also be considered at strategic nodes in Rainbow Creek and its tributaries that would monitor nutrient discharges from individual sources of a common land use category.

2. **Groundwater Monitoring Stations**
   The location of existing wells and the proposed location of additional monitoring wells needed to define nutrient concentration trends in groundwater. Methods for purging and sampling monitoring wells to provide representative samples for the waste constituents of interest should be described.

3. **Surface Water Monitoring Frequency**.
   Monitoring frequencies of the various monitoring parameters shall be proposed that best serve the monitoring objectives described above in Section 10.2 Monitoring Objectives. The frequencies should be adequate to evaluate ambient conditions and address any impact from low dissolved oxygen concentrations and algal growth.

4. **Groundwater Monitoring Frequency**
   Monitoring frequencies of the various monitoring parameters shall be proposed that best serve the monitoring objectives described above Section 10.2 Monitoring Objectives. The magnitude and timing of nutrient variability may vary significantly in monitoring wells that are located varying distances from nutrient sources. Sampling these wells will likely obtain water from varying depths in the aquifer. To define the nitrate variability at each well, the network will be sampled quarterly for two years. The observed variability will serve as a basis for determining the long-term sampling frequency for the network.

5. **Surface Water Quality Parameters**
   Surface Water Quality Parameters shall include nitrogen (including nitrate, nitrite, ammonia and total Kjeldahl nitrogen (TKN)), phosphorus (including orthophosphate and total), dissolved oxygen, pH, turbidity, and temperature.

6. **Groundwater Quality Parameters**
   Groundwater Quality Parameters shall include total nitrogen, nitrate, ammonia, nitrites, TKN, orthophosphate, total phosphorus, pH, dissolved Oxygen and TDS.

7. **Hydrology**
   Flow rate measurements shall be taken to calculate nutrient loading, to provide additional information about the hydrology of the watershed, and to identify patterns in algal growth.

8. **Algal Biomass**
   Characterization of algal species composition is needed to provide a more reliable indicator of trophic status and evidence of nutrient condition (USEPA 2000a). The growth of algae is stimulated principally by nutrients such as nitrogen and phosphorus, but also requires adequate water temperature, light, flow, and dissolved oxygen. It is assumed at this time that both factors are co-limiting. Characterization of algal species composition may give a better understanding of the relationships between all the factors that affect algal growth, including sunlight, nitrogen, phosphorus, temperature, and dissolved oxygen. Algal biomass should be quantified by mass and/or by % cover of bottom. Collection and measurement of algal biomass should be performed uniformly or by a standardized method.

9. **Biological Assessment Monitoring**
   It is recommended that biological assessment monitoring of benthic macroinvertebrates be performed at a minimum of three stations on Rainbow Creek and a reference stream. Biological assessment monitoring should be performed in accordance with the California Stream Bioassessment Methods Manual (Harrington and Born 2000). Changes in the stream's biological integrity (e.g., an increase or decrease in diversity and abundance of sensitive species) could be used as an indicator of changes in the health of the creek. Sampling done in 1998-99 for the San Diego Ambient Bioassessment Program (CDFG 2000a) indicates that benthic macroinvertebrate communities vary seasonally. The seasonal trend could be due in part to rainfall and consequent stream flow conditions (e.g., scouring). Thus, sites should be sampled for benthic macroinvertebrates at least twice each year: once during the spring (i.e., May), and again in the fall (preferably in October).

10. **Monitoring Reports**
    Monitoring reports shall be submitted in both electronic and paper formats and include the following information:

    a. An executive summary addressing all sections of the monitoring report, comprehensive interpretations and conclusions, and recommendations for future actions.
    b. A description of monitoring station locations by latitude and longitude coordinates, frequency of sampling, quality assurance/quality control procedures and sampling and analysis protocols.

c. The data/results, methods of evaluating the data, graphical summaries of the data, and an explanation/discussion of the data.
d. An assessment of the compliance of runoff characteristics with the required load reductions from each of the land use categories assigned a load reduction.
e. Identification and analysis of trends in surface and groundwater quality and assessment of compliance with nutrient water quality objectives.
f. An evaluation of the effectiveness of the TMDL implementation actions and the need for revisions to improve the implementation action plan.

Table 4-D.3. Required Monitoring Parameters

Parameter	Type of sample[1]
Surface Water Monitoring	
Total nitrogen, nitrate, ammonia[2], nitrites, TKN, orthophosphate, and total phosphorus concentrations	Grab
Temperature	In Situ
pH	In Situ
Dissolved Oxygen	In Situ
Turbidity	In Situ
TDS	Grab
Flow rate	Field Measurement
Algal biomass (% cover of bottom and/or Chl a/ash free dry weight (AFDM))	In Situ and/or Grab
Benthic macroinvertebrate community analysis (recommended)	Grab
Groundwater Monitoring	
Total nitrogen, nitrate, ammonia[2], nitrites, TKN, orthophosphate, and total phosphorus concentrations	Grab
pH	Grab or In Situ
Dissolved Oxygen	Grab or In Situ
TDS	Grab or In Situ

[1] A California certified laboratory should be used with an approved QA/QC plan.
[2] All laboratory detection limits should be sufficient to determine compliance with the water quality objective. For example, un-ionized ammonia in surface waters (25 µg/L).

11. **Quality Assurance / Quality Control Plan**
The monitoring program shall develop and implement a QA/QC plan for field and laboratory operations to ensure that data collected are of adequate quality given the monitoring objectives[16]. The QA/QC plan for field operations shall cover the following, at a minimum:
    a. Quality assurance objectives;
    b. Sample container preparation, labeling and storage;
    c. Chain-of-custody tracking;
    d. Field setup;
    e. Sampler equipment check and setup;
    f. Sample collection;
    g. Use of field blanks to assess field contamination;
    h. Use of field duplicate samples;
    i. Transportation to the laboratory;
    j. Training of field personnel; and
    k. Evaluation, and enhancement if needed of the QA/QC plan.

    The QA/QC plan for laboratory operations shall cover the following, at a minimum:
    a. Quality assurance objectives;
    b. Organization of laboratory personnel, their education, experience, and duties;
    c. Sample procedures;
    d. Sample custody;
    e. Calibration procedures and frequency;
    f. Analytical procedures;
    g. Data reduction, validation, and reporting;
    h. Internal quality control procedures;
    i. Performance and system audits;
    j. Preventive maintenance;
    k. Assessment of accuracy and precision;
    l. Correction actions; and
    m. Quality assurance report.

12. **Reporting Period**
Annual reports should cover the period of October 1 through September 30. The reports should be submitted to the Regional Board by January 31 of the following year and should be incorporated within the annual receiving water monitoring reports required under the County of San Diego's MS4 NPDES Permit Receiving Waters Monitoring and Reporting Program.[17]

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[16] For more information on QA/QC activities, including guidelines and example QA/QC documents, refer to http://www.waterboards.ca.gov/swamp/qapp.html

[17] The term "MS4 NPDES Storm Water Permit" currently refers to Order No.2001-001, NPDES No. CAS0108758, Waste Discharge Requirements For Discharges Of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of San Diego, the Incorporated Cities Of San Diego County, and the San Diego Unified Port District or subsequent superceding NPDES renewal Orders. Attachment B to this Order contains the Receiving Waters

13. **Reporting Frequency**
    The first report shall be due in the first January following initiation of the monitoring program. Reporting shall continue on an annual basis until the nutrient water quality objective has been attained and maintained in Rainbow Creek.

Compliance Schedule

Total nitrogen and total phosphorus reductions are required over a 16-year phased compliance schedule period during which incremental load and wasteload reductions are required as shown in Table 4 – E, below. Twenty percent (20%) reductions are required every fourth year for the first three phases (by the end of year 12). The last (fourth) phase requires the remaining 14% total nitrogen reduction and 25% total phosphorus reduction needed to meet the TMDLs.

Table 4 - E. Total Nitrogen and Total Phosphorus Phased Load Reduction Compliance Schedule

Compliance Date	Total Nitrogen		Total Phosphorus	
	Current Load & Annual Loads (LA + WLA) kg N/yr	Cumulative % Reduction	Current Load & Annual Loads (LA + WLA) kg P/yr	Cumulative % Reduction
	3,055[1]		278[1]	
12/31/2009	2,444	20	222	20
12/31/2013	1,833	40	167	40
12/31/2017	1,222	60	111	60
12/31/2021	796	74	41	85

[1] Current annual nutrient loads from identified point and nonpoint sources (See Tables 4 - B). This value does not include the contribution for background.

Regardless of what actions are taken to achieve load and wasteload reductions, there may not be an immediate response in the water quality or biological condition of Rainbow Creek. For example, there may be significant time lags between when actions are taken to reduce nutrient loads and resulting changes in nutrient concentrations in Rainbow Creek. This is especially likely if nutrients from past activities are tightly bound to sediments or if nutrient-contaminated groundwater has a long residence time before its release to Rainbow Creek waters. A three-year response time is projected for Rainbow Creek to attain compliance with nutrient water quality objectives after reaching the desired nutrient wasteload and load reductions in 2021. Accordingly the projected date when Rainbow Creek will attain and maintain compliance with nutrient water quality objectives is December 31, 2024.

Monitoring and Reporting Program for Order No. 2001-01. The annual receiving water monitoring report is described in Table 6, Item 28, page 51 of Order No. 2001-01.

Agricultural Program Costs and Potential Sources of Financing

Pursuant to CWC § 13141 the Regional Board has estimated the TMDL Implementation Program cost for agricultural water quality control in Table 4 - F.

Table 4 - F. Cost of Implementing Agricultural Water Quality Control

	Initial Capital Costs $ per Operation		Annual Operational Costs $ per Operation	
	Low	High	Low	High
Commercial Nurseries	$26	$41,075	$3	$4,108
Orchards	$26	$57,705	$3	$5,771
Agricultural Fields	$26	$57,705	$3	$5,771

Potential sources of financing include:

- Federal Clean Water Act Section 319(h) grants.
- Federal Clean Water Act Section 205(j) grants.
- State of California Proposition 13 funded grants.
- Small Communities Grants for Water Reclamation and Wastewater Treatment Facilities
- Other state, federal and business loans, grants, and other assistance programs. These may include assistance from U.S. Small Business Administration and from conservation programs through various agencies such as the U.S. Department of Agriculture and Natural Resource Conservation Service
- Various secured and unsecured loans, including home equity loans and business loans.

Recalculation Procedures

At the end of the Basin Plan, add the following Appendix D:

APPENDIX D
METHOD FOR RECALCULATION OF THE TOTAL MAXIMUM DAILY LOADS FOR NITOGEN AND PHOSPHORUS IN RAINBOW CREEK

This appendix describes the method for recalculating Rainbow Creek TMDLs for nitrogen and phosphorus if the water quality objectives are modified in the future.

Numeric Target
The numeric targets are set equal to the new water quality objectives.

Margin of Safety
The explicit margin of safety (MOS) equals five percent of the loading capacity. The equation to calculate the loading capacity is given below.

Loading Capacity
The annual total nitrogen loading capacity is determined by multiplying the flow volume (in ft^3/yr) by the new water quality objective (in mg N/L) that will allow the creek to attain water quality standards. The equations below also use terms to convert milligrams to kilograms and cubic feet to liters. The loading capacity for nitrogen is as follows:

Low Flow (0-2.9 cfs)
17,764 * 1 e–3 ft^3/yr * **new water quality objective** in mg N/L * 28.32 L/ft3 * 1 e –6 kg/mg
= **new low flow loading capacity** in kg N/yr

Moderate – High Flow (3 – 39 cfs)
40,775 * 1 e–3 ft^3/yr * **new water quality objective** in mg N/L * 28.32 L/ft3 * 1 e –6 kg/mg
= **new moderate - high flow loading capacity** in kg N/yr

Total Annual Nitrogen Loading Capacity = sum of low flow and moderate - high flow loading capacity

Similarly, the annual total loading capacity for phosphorus is as follows:

Low Flow (0-2.9 cfs)
17,764 * 1 e–3 ft^3/yr * **new water quality objective** in mg P/L * 28.32 L/ft3 * 1 e –6 kg/mg
= **new low flow loading capacity** in kg P/yr

Moderate – High Flow (3 – 39 cfs)
40,775 * 1e–3 ft^3/yr * **new water quality objective** in mg P/L * 28.32 L/ft3 * 1 e –6 kg/mg
= **new moderate-high flow loading capacity** in kg P/yr

Total Annual Phosphorus Loading Capacity = sum of low flow and moderate - high flow loading capacity

Total Maximum Daily Load
The TMDLs for nitrogen and phosphorous are set equal to the total annual loading capacity for each pollutant. The allocations in Table D-1 below use the following equation to determine the total load allocations for nonpoint sources (LA) by subtracting background, the margin of safety (MOS), and the point source waste load allocations (WLA) from the TMDL.

$$TMDL = \sum(WLA) + \sum(LA) + Background + MOS$$

Allocations

The allocations of the total annual nitrogen and phosphorous loading capacities to the margin of safety, background, and various point and non-point sources are presented in Table D-1.

Table D-1. Total Nitrogen and Phosphorus Allocations for Rainbow Creek TMDL

Source	Nitrogen Allocation	Phosphorus Allocation
Margin of Safety (MOS)	5%[1]	5%[1]
Background	779 kg	116 kg
Caltrans (WLA)	New WQO * volume of Caltrans runoff	New WQO * volume of Caltrans runoff
Unidentified and Future Point Sources (WLA)	2%[1]	2%[1]

Total Allocation for Nonpoint Sources (LA) = Total Annual Loading Capacity – MOS – Background – Caltrans – Unidentified and Future Point Sources

Commercial nurseries	16%[2]	9%[2]
Agricultural fields	21%[2]	12%[2]
Orchards	25%[2]	18%[2]
Park	0.4%	0.3%
Residential areas	21%[2]	36%[2]
Urban areas	4%[2]	18%[2]
Septic tank disposal systems	6%[2]	0%[2]
Air deposition	6%[2]	6%[2]

[1] percent of the total annual nitrogen and phosphorous loading capacity
[2] percent of the total allocation for nonpoint sources

California Regional Water Quality Control Board
San Diego Region

Basin Plan Amendment and Final Technical Report for
Total Nitrogen and Total Phosphorus
Total Maximum Daily Loads
For Rainbow Creek

Rainbow Valley

Resolution No. R9-2005-0036
Basin Plan Amendment and Technical Report

March 22, 2006

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
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To request copies of the Basin Plan Amendment and Technical Report for Total Nitrogen and Total Phosphorus Total Maximum Daily Loads For Rainbow Creek please contact Alan Monji, Environmental Scientist at (858) 637-7140, Amonji@waterboards.ca.gov, or Benjamin Tobler, Water Resource Control Engineer at (858) 467-2736, Btobler@waterboards.ca.gov.

Documents also are available at: http://www.waterboards.ca.gov/sandiego/.

BASIN PLAN AMENDMENT AND FINAL TECHNICAL REPORT FOR TOTAL NITROGEN AND TOTAL PHOSPHORUS TOTAL MAXIMUM DAILY LOADS FOR RAINBOW CREEK

Resolution No. R9-2005-0036
Basin Plan Amendment and Final Technical Report

Adopted by the
California Regional Water Quality Control Board
San Diego Region
on February 9, 2005

Approved by the
State Water Resources Control Board
on November 16, 2005
and the
Office of Administrative Law
on February 1, 2006
and the
United States Environmental Protection Agency
on March 22, 2006

Cover Photograph: Rainbow Valley, California (2004) by John Phillips

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Acronyms and Abbreviations

1988 Plan – Nonpoint Source Management Plan, November 1988
ACL – Administrative Civil Liability
AG – Attorney General
Basin Plan – Water Quality Control Plan for the San Diego Basin – Region 9
BMP – Best Management Practices
CalEPA – California Environmental Protection Agency
CalTrans – California Department of Transportation
CAMMPR – Volume II: California Management Measures for Polluted Runoff
CAO – Cleanup and Abatement Orders
CARCD – California Association of Resource Conservation Districts
CCR – California Code of Regulations
CDFFP – California Department of Forestry and Fire Protection
CDO – Cease and Desist order
CEQA – California Environmental Quality Act
CESA – California Endangered Species Act
CFB – California Farm Bureau
CFR – Code of Federal Regulations
County – County of San Diego
CTR – California Toxics Rule
CWA – Clean Water Act
CWC – California Water Code
DA – District Attorney
DPR - Department of Parks and Recreation
EIR – Environmental Impact Report
FY – Fiscal Year
GIS – Geographic Information System
LA – Load Allocation
LC – Loading Capacity

MAA – Management Agency Agreement
MCRD – Mission Resource Conservation District
MM – management measure
MOA - Memorandum of Agreement
MOS – Margin of Safety
MOU – Memorandum of Understanding
MP – management practice
MS4 – Municipal Separate Storm Sewer Systems
N – total nitrogen
N:P – Nitrogen to Phosphorus Ratio
NGO – non-governmental organization
NO_3 – nitrate
NOV – Notice of violation
NPDES – National Pollutant Discharge Elimination System
NPS – nonpoint source
NRCS – Natural Resources Conservation Service
NRMP – Nutrient Reduction and Management Plan
NRPI – Natural Resources Project Inventory
OAL – State Office of Administrative Law
OSDS – Onsite Disposal System
P – Total phosphorus
Porter-Cologne Act - Porter Cologne Water Quality Control Act
PRC – Public Resources Code
Program – NPS Pollution Control Program
Program Plan – *Plan for California's Nonpoint Source Pollution Control Program 1998-2013*
QA/QC – Quality Assessment/Quality Control
Regional Board – California Regional Water Quality Control Board, San Diego Region
State Board – State Water Resources Control Board
RCDs –Resource Conservation Districts
RWQCB – Regional Water Quality Control Board
SbMA – Subdivision Map Act
Section – §
SSO – Site Specific Objective
SWPPP – Storm Water Pollution Prevention Program
SWRCB – State Water Resources Control Board
TAC – Technical Advisory Committee
TMDL – Total Maximum Daily Load
UC – University of California
UCCE University of California Cooperative Extension
USC – United States Code
USDA – U. S. Department of Agriculture
USEPA – U. S. Environmental Protection Agency
WDR – Waste Discharge Requirements
WLA – Wasteload Allocation

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

RESOLUTION NO. R9-2005-0036

A RESOLUTION ADOPTING AN AMENDMENT TO THE WATER QUALITY CONTROL PLAN FOR THE SAN DIEGO REGION (9) TO INCORPORATE TOTAL MAXIMUM DAILY LOADS (TMDLs) FOR TOTAL NITROGEN AND TOTAL PHOSPHORUS IN THE RAINBOW CREEK WATERSHED, SAN DIEGO COUNTY

WHEREAS, The California Regional Water Quality Control Board, San Diego Region (hereinafter, Regional Board), finds that:

1. **BASIN PLAN AMENDMENT:** The proposed amendment of the Water Quality Control Plan for the San Diego Region (Basin Plan) described in the recitals below was developed in accordance with California Water Code §13240 et seq.

2. **NECESSITY STANDARD [Government Code §11353(b)]:** This regulatory action meets the "Necessity" standard of the Administrative Procedures Act, Government Code, §11353, subdivision (b). Amendment of the Basin Plan to establish and implement total maximum daily loads (TMDLs) for Rainbow Creek is necessary because water quality in Rainbow Creek does not meet applicable water quality objectives for total nitrogen and total phosphorus (hereinafter nutrients) even with implementation of waste discharge requirements containing technology based effluent limits or water quality based effluent limits for discharges of pollutants to Rainbow Creek and its tributaries. These TMDLs for nutrients are necessary to ensure attainment of applicable water quality objectives and restoration of beneficial uses designated for Rainbow Creek.

3. **CLEAN WATER ACT SECTION 303(d):** Rainbow Creek is identified on the Clean Water Act Section 303(d) list of impaired waters due to excessive nutrient concentrations. Section 303(d) requires the Regional Board to develop and implement TMDLs under the conditions that exist in Rainbow Creek.

4. **BENEFICIAL USE IMPAIRMENTS**: Rainbow Creek supports a multitude of beneficial uses. The most sensitive beneficial uses are those designated for protection of aquatic life as described in the Basin Plan definition of the COLD and WARM beneficial uses. The municipal supply (MUN), warm freshwater habitat (WARM), cold freshwater habitat (COLD), wildlife habitat (WILD), contact water recreation (REC-1), and non-contact water recreation (REC-2) are threatened or impaired due to excessive levels of nutrients.

5. **WATER QUALITY OBJECTIVES**: The Basin Plan establishes that inland surface waters shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. The Basin Plan establishes the following numerical water quality objective for biostimulatory substances for the protection of the COLD and WARM beneficial uses:

   Total Nitrogen 1.0 mg/L
   Total Phosphorus 0.1 mg/L

   These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board.

   The Basin Plan establishes that waters designated for use as domestic or municipal supply shall not contain concentrations of nitrate in excess of the maximum contaminant levels set forth in California Code of Regulations, Title 22. The maximum contaminant level (MCL) for nitrate (as nitrogen) is 10 mg/L.

6. **WATER QUALITY OBJECTIVE VIOLATIONS:** Concentrations for nutrients in Rainbow Creek routinely exceed applicable water quality objectives for nutrients and nitrate. Sampling surveys conducted by the Regional Board in Rainbow Creek in Year 2000 documented water column concentrations as high as 21 mg/L of nitrate as nitrogen, 23 mg/L of total nitrogen and 1.7 mg/L of total phosphorus.

7. **ADVERSE EFFECTS OF NUTRIENTS:** An overload of nutrients can result in an imbalance of the natural cycling processes and can lead to problems ranging from annoyance due to an overabundance of algae and emergent vegetation to human health problems and adverse ecological effects. Nutrient concentrations in Rainbow Creek appear to be contributing to excessive algal growth. Excessive algae present a nuisance that threatens to impair aesthetic and recreational uses (REC1 and REC2). Excessive algae can create conditions that are harmful to aquatic life and degrade water quality, and threaten to impair warm water (WARM), cold water (COLD), and wildlife (WILD) beneficial uses.

8. **NUMERIC TARGETS:** TMDL Numeric Targets interpret and implement water quality standards (i.e., numeric and narrative water quality objectives and beneficial uses) and are established at levels necessary to achieve water quality standards. The Regional Board has set the total nitrogen and total phosphorus TMDL Numeric Targets for both the numeric and narrative water quality objectives equal to the numeric water quality objectives cited in Finding 5. The numeric targets for nitrate (as nitrogen) is 10 mg/L, total nitrogen is 1.0 mg/L and total phosphorus is 0.1 mg/L. Attainment of the TMDL numeric targets will result in attainment of water quality standards in Rainbow Creek.

9. **TOTAL MAXIMUM DAILY LOADS [40 CFR 130.2(i)]:** The Total Maximum Daily Loads (TMDLs) for total nitrogen and total phosphorus discharges into Rainbow Creek are calculated to be 1,658 kilograms of nitrogen per year (kg N/yr) and 165 kilograms of phosphorus per year (kg P/yr). The TMDLs are equal to the assimilative or Loading Capacity (LC) of Rainbow Creek for total nitrogen and total phosphorus and are defined as the maximum amount of total nitrogen and total phosphorus that Rainbow Creek can receive and still attain water quality objectives and protection of designated beneficial uses. The TMDLs are comprised of the sum of all individual Wasteload Allocations (WLAs) for point source discharges of nutrients, the sum of all Load Allocations (LAs) for nonpoint source discharges of nutrients, and natural background. The TMDLs include a margin of safety (MOS) that takes into account any uncertainties in the TMDL calculation. (i.e. TMDL = LC =

∑ WLAs + ∑ LAs + MOS). The TMDL calculations also account for seasonal variations and critical conditions.

10. **ALLOCATIONS AND REDUCTIONS:** A 74 percent (74%) overall reduction of total nitrogen loading and an 85 percent (85%) overall reduction of total phosphorus to Rainbow Creek are required to meet the TMDLs of 1,658 kg N/yr and 165 kg P/yr. The assigned allocations from each source translate into a percent reduction of nutrients from current loading.

Percent Reduction by Source	Total Nitrogen	Total Phosphorus
Point Sources		
Caltrans	68%	64%
Nonpoint Sources		
Commercial Nurseries	77%	90%
Agricultural Fields	77%	90%
Orchards	77%	90%
Park	50%	50%
Residential Areas	77%	90%
Urban Areas	50%	50%
Septic Tank Disposal Systems	77%	Not Applicable

11. **DISCHARGERS:** The Regional Board has identified Caltrans, County of San Diego, commercial nurseries, agricultural fields, orchards, parks, residential areas, urban areas, and septic tank disposal systems as causing or permitting the discharge of total nitrogen and total phosphorus to Rainbow Creek.

12. **IMPLEMENTATION ACTIONS**: Strategies that the Regional Board could take to implement the TMDL are described in the *Basin Plan Amendment and Technical Report for Total Nitrogen and Total Phosphorus Total Maximum Daily Loads For Rainbow Creek, dated February 9, 2005*.

13. **IMPLEMENTATION MONITORING:** Water quality monitoring will be required to evaluate the overall TMDL implementation effectiveness and success in attaining nutrient water quality objectives in Rainbow Creek and its tributaries.

14. **COMPLIANCE SCHEDULE:** Nutrient wasteload and load reductions are required over a 16-year phased compliance schedule period. The first four-year phase consists of nutrient reductions to attain the nitrate water quality objective and reduced phosphorus concentrations in Rainbow Creek. Incremental reductions of nutrient load are required throughout the subsequent 12-year period.

15. **SCIENTIFIC PEER REVIEW:** The scientific basis of this Basin Plan amendment has undergone external peer review pursuant to Health and Safety Code Section 57004. The Regional Board has considered and responded to all comments submitted by the peer review panel.

16. **STAKEHOLDER PARTICIPATION:** Interested persons and the public have had reasonable opportunity to participate in the development of this amendment to the Basin Plan. Efforts to solicit public review and comment include four (4) public workshops held between April 1999 and December 2004; two (2) public review and comment periods of at least 45 days preceding the Regional Board public hearing; and written responses from the Regional Board to oral and written comments received from the public.

17. **ECONOMIC ANALYSIS:** The Regional Board has considered the costs of implementing this Basin Plan amendment, and finds these costs to be reasonable relative to the water quality benefits derived from implementing the amendment.

18. **CEQA REQUIREMENTS:** The Basin Planning process has been certified as functionally equivalent to the California Environmental Quality Act (CEQA) requirements for preparing environmental documents and is, therefore, exempt from those requirements (Public Resources Code Section 21000 et seq.). The required environmental documents (Basin Plan amendment, staff report, and environmental checklist) have been prepared.

19. **DE MINIMIS ENVIRONMENTAL EFFECTS**: This Basin Plan amendment results in no potential for adverse effect, either individually or cumulatively, on fish and wildlife resources or the habitat upon which they depend. Any and all effects on the environment are expected to be beneficial.

20. **PUBLIC NOTICE**: The Regional Board has notified all known interested parties and the public of its intent to consider adoption of this Basin Plan amendment in accordance with Water Code Section 13244.

21. **PUBLIC HEARING:** The Regional Board has, at public meetings on May 8, 2002 and December 8, 2004, held public hearings and heard and considered all comments pertaining to this Basin Plan amendment.

NOW, THEREFORE, BE IT RESOLVED that

1. **AMENDMENT ADOPTION**: The Regional Board hereby adopts this amendment to the Basin Plan to incorporate the Rainbow Creek Total Nitrogen and Total Phosphorus TMDLs as set forth in Attachment A hereto.

2. The Regional Board hereby approves the report *Basin Plan Amendment and Technical Report for Total Nitrogen and Total Phosphorus Total Maximum Daily Loads For Rainbow Creek, dated February 9, 2005*.

3. **CERTIFICATE OF FEE EXEMPTION**: The Executive Officer is authorized to sign a Certificate of Fee Exemption.

4. **AGENCY APPROVALS:** The Executive Officer is directed to submit the Basin Plan amendment to the State Water Resources Control Board (State Board) in accordance with California Water Code Section 13245. The Regional Board requests that the State Board approve the Basin Plan amendment and forward it to Office of Administrative Law (OAL) and the United States Environmental Protection Agency for approval.

5. **NON-SUBSTANTIVE CORRECTIONS:** If, during the approval process for this amendment, the State Board or OAL determines that minor, non-substantive corrections to the language of the amendment are needed for clarity or consistency, the Executive Officer may make such changes, and shall inform the Regional Board of any such changes.

I, John H. Robertus, Executive Officer, do hereby certify the foregoing is a full, true and correct copy of a Resolution adopted by the California Regional Water Quality Control Board, San Diego Region, on February 9, 2005.

_____

JOHN H. ROBERTUS
Executive Officer

ATTACHMENT A
TO RESOLUTION NO. R9-2005-0036
BASIN PLAN AMENDMENT

This Basin Plan Amendment establishes Total Maximum Daily Loads (TMDLs) and associated wasteload and load reductions for nutrients in Rainbow Creek, a tributary of the Santa Margarita River. This Amendment includes a program to implement the TMDLs and to monitor their effectiveness. Chapters 2, 3, and 4 of the Basin Plan are amended as follows:

1. **Chapter 2, Beneficial Uses**
   Table 2-2. ***Beneficial Uses of Inland Surface Waters, Santa Margarita River Watershed, Rainbow Creek, Hydrologic Unit Basin Numbers 2.23 and 2.22.***

Add the following footnote 3 to Rainbow Creek, Hydrologic Unit Basin Numbers 2.23 and 2.22:

> [3]Rainbow Creek is designated as an impaired water body for total nitrogen and total phosphorus pursuant to Clean Water Act Section 303(d). Total Maximum Daily Loads (TMDLs) have been adopted to address these impairments. See Chapter 3, Water Quality Objectives for Biostimulatory Substances and Chapter 4, Total Maximum Daily Loads.

2. **Chapter 3, Water Quality Objectives**
   Inland Surface Waters, Enclosed Bays and Estuaries, Coastal Lagoons, and Ground Waters

   Water Quality Objectives for Biostimulatory Substances:

Insert the following as new paragraph 5:

> Rainbow Creek is designated as an impaired water body for total nitrogen and total phosphorus pursuant to Clean Water Act Section 303(d). Total Maximum Daily Loads (TMDLs) have been adopted to address these impairments. See Chapter 2, Beneficial Uses Table 2-2. Beneficial Uses of Inland Surface Waters, Santa Margarita River Watershed, Rainbow Creek, Hydrologic Unit Basin Numbers 2.23 and 2.22, Footnote 3 and Chapter 4, Total Maximum Daily Loads.

3. **Chapter 4, Implementation**

Add the following new section to Chapter 4:

TOTAL MAXIMUM DAILY LOADS

Total Maximum Daily Loads (TMDLs) for Total Nitrogen and Total Phosphorus in the Rainbow Creek Watershed

On February 9, 2005, the Regional Board adopted Resolution No. R9-2005-0036, A Resolution Adopting An *Amendment To The Water Quality Control Plan For The San Diego Region (9) To Incorporate Total Maximum Daily Loads (TMDLs) For Total Nitrogen and Total Phosphorus In The Rainbow Creek Watershed, San Diego County*. The Basin Plan Amendment was subsequently approved by the State Water Resources Control Board on November 16, 2005, the Office of Administrative Law on February 1, 2006, and the United States Environmental Protection Agency on March 22, 2006.

The TMDL is described in the Basin Plan Amendment and Technical Report for Total Nitrogen and Total Phosphorus Total Maximum Daily Loads For Rainbow Creek, dated February 9, 2005.

Problem Statement

Nitrate, total nitrogen, and total phosphorus concentrations in Rainbow Creek exceed the Inorganic Chemicals nitrate and Biostimulatory Substances water quality objectives. These exceedances threaten to unreasonably impair the municipal supply (MUN), warm freshwater habitat (WARM), cold freshwater habitat (COLD), and wildlife habitat (WILD) beneficial uses of Rainbow Creek. Excessive nutrient levels in Rainbow Creek promote the growth of algae in localized areas, creating a nuisance condition, that unreasonably interferes with aesthetics and contact and non-contact water recreation (REC1, REC2) and threatens to impair WARM, COLD and WILD beneficial uses. State highways, agricultural fields and orchards, commercial nurseries, residential and urban areas, and septic tank disposal systems contribute to increased nutrient levels in Rainbow Creek as a result of storm water runoff, irrigation return flows, and ground water contributions to the creek.

Numeric Targets

The Numeric Targets for nitrate, total nitrogen, and total phosphorus are set equal to the Inorganic Chemicals nitrate water quality objective for municipal water supply and the numeric goals of the Biostimulatory Substances water quality objective as defined in the Basin Plan and shown below.

Table 4 - A. Rainbow Creek Nitrate, Total Nitrogen, and Total Phosphorus Numeric Targets

Constituent	Water Quality Objective	Numeric Target
Nitrate (as nitrogen)	10 mg NO_3-N/L	10 mg NO_3-N/L
Total Nitrogen	1.0 mg N/L	1.0 mg N/L
Total Phosphorus	0.1 mg P/L	0.1 mg P/L

If the Inorganic Chemicals nitrate and Biostimulatory Substances water quality objectives in Rainbow Creek are modified in the future then the TMDL will be recalculated and the numeric targets will be set equal to the new water quality objectives.

Source Assessment

Seventy-nine percent (79%) and seventy percent (70%) of total nitrogen and total phosphorus mass loading, respectively, are attributable to controllable sources, which include certain land use activities, septic tank disposal systems (total nitrogen only), and Interstate 15 (I-15). The land use activities include commercial nurseries, agricultural fields, orchards, residential areas, urban areas, and park areas. Background and direct atmospheric deposition are not considered to be controllable sources.

Table 4 - B. Summary of Total Nitrogen and Total Phosphorus Sources to Rainbow Creek

Source	Total Nitrogen Mass Load (kg N/yr)	Percent Contribution (% N)	Total Phosphorus Mass Load (kg P/yr)	Percent Contribution (% P)
Land Uses Runoff	2,662	69	262	66
Background	779	20	116	29
Septic Tank Disposal Systems	200	5	0	0
I-15 Runoff (Caltrans)	153	4	14	4
Direct Atmospheric Deposition	40	1	2	1
Combined Sources	**3,834**	**100**	**394**	**100**

Total Maximum Daily Loads or Loading Capacity

The TMDLs for nutrients in Rainbow Creek are 1,658 kg N/yr for total nitrogen and 165 kg P/yr for total phosphorus in order to attain and maintain the Inorganic Chemicals – Nitrate and Biostimulatory Substances water quality objective in Rainbow Creek waters.

The annual loading limit of total nitrogen and total phosphorus to Rainbow Creek shall be reduced incrementally from the current load of 3,834 kg/yr and 394 kg/yr, respectively, to 1,658 kg/yr and 165 kg/yr, respectively, by no later than December 31, 2021. The annual nutrient loading limits to be attained by December 31, 2021 is listed in Table 4-C.

Table 4 - C. Annual Nutrient Loading Capacity and Compliance Date

TMDL	December 31, 2021[1]	
Total Nitrogen – Annual Load	1,658 kg/yr	3,648 lbs./yr
Total Phosphorus – Annual Load	165 kg/yr	365 lbs./yr

[1] Compliance to be achieved no later than this date. The Regional Board may require earlier compliance with these targets when it is reasonable and feasible.

Margin of Safety

Explicit and implicit margins of safety (MOS) were considered for these TMDLs. An explicit MOS of 5% is reserved to account for uncertainties and calculated to be 83 kg/year total nitrogen and 8 kg/year total phosphorus. An implicit MOS has been incorporated through conservative assumptions in the analysis.

Load Allocations and Wasteload Allocations

A seventy-four percent (74%) and an eighty-five percent (85%) overall reduction of total nitrogen and total phosphorus loading, respectively, to Rainbow Creek is required to meet the TMDLs described in Table 4 – C.

The load allocations for the initial annual loading are provided in Table 4 – D.1. and D.2., below. A margin of safety (MOS) of 5% is subtracted from this nutrient TMDL to account for unknowns, errors in assumptions, and potential future development in the watershed. This 5% is reserved for unknowns and is not allocated to any source. Allocations (other than for background and margin of safety) will be further reduced by 20% every 4 years until the biostimulatory targets for nitrogen and phosphorus are met. In the event that a nonpoint source becomes a permitted discharge, the portion of the load allocation that is associated with the source can become a wasteload allocation.

Table 4 – D.1. Annual Total Nitrogen Allocations for Rainbow Creek

Source	Annual Total Nitrogen Load Allocations			
	2009 kg/yr[1]	2013 kg/yr[1]	2017 kg/yr[1]	2021 kg/yr[1]
Load Allocations (LA)				
Commercial nurseries	390	299	196	116
Agricultural fields	504	386	253	151
Orchards	607	465	305	182
Park	5	3	3	3
Residential areas	507	390	260	149
Urban areas	40	27	27	27
Septic tank disposal systems	200	100	46	46
Air deposition	40	40	40	40
Wasteload Allocations (WLA)				
Caltrans highway runoff	118	90	59	49
Unidentified & future point sources	33	33	33	33
Total LA & WLA	**2,444**	**1,833**	**1,222**	**796**
Background[2]	779	779	779	779
MOS (not allocated)	83	83	83	83
Total	**3,306**	**2,695**	**2,084**	**1,658**

[1] To calculate pounds per year, multiply by 2.2.
[2] Background is calculated based on reference concentrations in San Diego streams and Rainbow Creek annual flow volumes.

Table 4 – D.2. Annual Total Phosphorus Allocations for Rainbow Creek

Source	Annual Total Phosphorus Load Allocations			
	2009 kg/yr[1]	2013 kg/yr[1]	2017 kg/yr[1]	2021 kg/yr[1]
Load Allocations (LA)				
Commercial nurseries	20	16	10	3
Agricultural fields	28	21	14	4
Orchards	50	37	24	6
Park	0.15	0.10	0.10	0.10
Residential areas	99	74	47	12
Urban areas	9	6	6	6
Air deposition	2	2	2	2
Wasteload Allocations (WLA)				
Caltrans highway runoff	11	8	5	5
Unidentified & future point sources	3	3	3	3
Total LA & WLA	**223**	**167**	**111**	**41**
Background[2]	116	116	116	116
Margin of Safety (not allocated)	8	8	8	8
Total	**346**	**291**	**235**	**165**

[1] To calculate pounds per year, multiply by 2.2.
[2] Background is calculated based on reference concentrations in San Diego streams and Rainbow Creek annual flow volumes.

Recalculations if Water Quality Objectives Change

If the water quality objectives for Biostimulatory Substances are changed in the future, then the MOS, TMDL and allocations and reductions will be recalculated using the method shown in Appendix D of the Basin Plan.

TMDL Implementation Action Plan

The necessary actions to implement the TMDLs are described in Section 9 of the *Technical Report for Total Nitrogen and Total Phosphorus Total Maximum Daily Loads (TMDLs) in Rainbow Creek*, dated February 9, 2005 and listed below.

A. Regional Board Actions

1. **Caltrans – Incorporate Wasteload Allocations in NPDES Storm Water Permit**
   The Regional Board shall request that the State Water Resources Control Board amend the Caltrans statewide NPDES storm water permit[1] to include the following

[1] The term "statewide NPDES storm water permit " refers to Order No. 99-06-DWQ, NPDES No. CAS000003, National Pollutant Discharge Elimination System Permit, Statewide Storm Water Permit, and Waste Discharge Requirements for the State of California, Department of Transportation (Caltrans) or subsequent superceding

requirements:

a. MS4 discharges to Rainbow Creek shall not exceed the following wasteloads for nitrogen and phosphorus:

Nitrogen Wasteload	Phosphorus Wasteload	Compliance Due Date
118 kg N/yr[1]	11 kg P/yr[1]	December 31, 2009
90 kg N/yr[1]	8 kg P/yr[1]	December 31, 2013
59 kg N/yr[1]	5 kg P/yr[1]	December 31, 2017
49 kg N/yr[1]	5 kg P/yr[1]	December 31, 2021

b. A directive to submit annual progress reports to the Regional Board detailing progress made on attaining the nutrient wasteload reductions in Rainbow Creek. The report shall be due on April 1 of each year shall be incorporated within Section 2, Program Management of Caltrans MS4 Order No. 99-06-DWQ, NPDES No. CAS000003. Reporting shall continue on an annual basis until the nutrient water quality objective is attained in Rainbow Creek.

2. **County of San Diego – Issue Water Code Governmental Water Quality Investigation Request Order for Nutrient Reduction and Management Plan**
The Regional Board shall issue an Order under CWC §13225 requiring the County of San Diego to investigate excessive levels of nutrients in Rainbow Creek and feasible management strategies to reduce nutrient loading in Rainbow Creek. A Nutrient Reduction and Management Plan (NRMP) for the Rainbow Creek watershed containing the elements described below in Section C, County of San Diego Nutrient Reduction Management Plan Elements, would satisfy such an Order. The County may submit alternative or additional elements equivalent to those described in Section C that would result in equivalent protection from, or prevention of, nutrient discharges to Rainbow Creek.

3. **County of San Diego – Establish Management Agency Agreement (MAA)**
The Regional Board shall consider, following concurrence with the County of San Diego's Nutrient Reduction and Management Plan (NRMP) for Rainbow Creek, entering into a Management Agency Agreement (MAA) with the County of San Diego. The MAA shall set forth the commitment of both parties to undertake various oversight responsibilities for the nonpoint source nutrient load reduction component of this TMDL, and the County's commitments to implement the NRMP.

4. **County of San Diego – Issue Water Code Governmental Water Quality Investigation Request for Groundwater Investigation and Characterization Report**
The Regional Board could issue an Order under CWC §13225 directing the County of San Diego to prepare and submit a workplan and report described below in Section B, County of San Diego Actions, Item 3 Submit Groundwater Investigation and

NPDES renewal Orders.

Characterization Workplan and Item 4 Groundwater Investigation and Characterization Report.

5. **CA Dept. of Forestry and Fire Protection – Issue Water Code Section 13267 Order**
   The Regional Board shall issue a CWC §13267 order directing the California Department of Forestry and Fire Protection, Rainbow Conservation Camp (CDFFP) to submit any additional technical information needed to 1) evaluate whether CDFFP's discharge is surfacing and/or contributing to the impairment of Rainbow Creek; and 2) estimate the actual nutrient load originating from the septic tank and percolation ponds to Rainbow Creek via groundwater flow. Based on the review of this information the Regional Board may further direct the CDFFP to implement an alternate means of wastewater disposal or additional treatment necessary to attain and maintain nutrient water quality objectives in Rainbow Creek.

6. **Establish Memorandum of Understanding (MOU) with Agencies or Organizations**
   The Regional Board shall consider entering into a memorandum of understanding (MOU) to document cooperative agreements with other agencies or organizations that are able to provide information, technical assistance, or financial assistance to dischargers to support the Regional Board's goals of attaining the nutrient load reductions required under this TMDL and compliance with the nutrient water quality objective. These agencies and organizations include, but are not limited to, the United States Department of Agriculture, Natural Resources Conservation Service (NRCS), Mission Resource Conservation District (MRCD), and the University Of California Cooperative Extension (UCCE).

7. **Adopt Waste Discharge Requirements (WDRs), Waivers, and Discharge Prohibitions**
   In conjunction with an MAA or MOU with another third-party representative, organization, or government agency describing an adequate NPS pollution control implementation program, the Regional Board shall adopt individual or general waivers or waste discharge requirements (WDRs) for NPS discharges in the Rainbow Creek watershed. The waivers or WDRs shall require NPS dischargers to either participate in the third party NPS program or, alternatively, submit individual pollution prevention plans that detail how they will comply with the waivers and WDRs. Alternatively, the Regional Board may adopt a discharge prohibition, which includes exceptions for those discharges that are adequately addressed in an acceptable third-party MAA or MOU NPS pollution control implementation program.

8. **Take Enforcement Actions**
The Regional Board shall take enforcement action[2], as necessary, against any discharger failing to comply with applicable waiver conditions, waste discharge requirements (WDRs), discharge prohibitions, or take enforcement action, as necessary, to control the discharge of nutrients to Rainbow Creek, to attain compliance with the nutrient wasteload and load reductions specified in this TMDL, or to attain compliance with the nutrient water quality objectives. The Regional Board may also terminate the applicability of waivers and issue waste discharge requirements or take other appropriate action against any discharger(s) failing to comply with the waiver conditions.

9. **Review and Revise Existing Waste Discharge Requirements**
The Regional Board shall review and, if necessary, update existing waste discharge requirements for discharges to land as well as groundwater in the Rainbow Creek watershed to incorporate effluent limitations for nutrients consistent with applicable nutrient groundwater quality objectives and surface water quality objectives.[3]

10. **Recommend High Priority for Grant Funds**
The Regional Board shall recommend that the State Board assign a high priority to awarding grant funding[4] for projects to implement the Rainbow Creek nutrient TMDLs. Special emphasis will be given to projects that can achieve quantifiable nutrient load reductions consistent with the specific nutrient TMDL load allocations.

11. **Incorporate Water Code Section 13291 Regulations in Basin Plan**
The Regional Board shall incorporate regulations currently under development by the State Water Resources Control Board pertaining to onsite wastewater treatment systems[5] into the Water Quality Control Plan for the San Diego Basin (Basin Plan) as soon as

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[2] An enforcement action is any formal or informal action taken to address an incidence of actual or threatened noncompliance with existing regulations or provisions designed to protect water quality. Potential enforcement actions include a notice of violation (NOV), notices to comply (NTC), imposition of time schedules (TSO), issuance of cease and desist orders (CDOs) and cleanup and abatement orders (CAOs), administrative civil liability (ACL), and referral to the attorney general (AG) or district attorney (DA). The Regional Board generally implements enforcement through an escalating series of actions to: (1) assist cooperative dischargers in achieving compliance; (2) compel compliance for repeat violations and recalcitrant violators; and (3) provide a disincentive for noncompliance.

[3] There are currently three dischargers in the Rainbow Creek watershed regulated under waste discharge requirements for the discharge of waste to land or groundwaters: Oak Crest Mobile Estates (Order No. 1993-69), Rainbow Conservation Camp (Order No. 1995-20), and Temecula Truck Inspection Facility (Order No. 1992-56). The Rainbow Truck Weigh and Inspection Facility, discharges under the terms of a waiver of waste discharge requirements (Order No. 2000-235)

[4] The State Water Resources Control Board administers the awarding of grants funded from Proposition 13, Proposition 50, Clean Water Act 319(h) and other federal appropriations to projects that can result in measurable improvements in water quality, watershed condition, and/or capacity for effective watershed management. Many of these grant fund programs have specific set-asides for expenditures in the areas of watershed management and TMDL implementation for NPS pollution.

[5] "Onsite wastewater treatment system(s)" (OWTS) is any individual or community onsite wastewater treatment, pretreatment and dispersal system including, but not limited to, a conventional, alternative, or experimental sewage dispersal system such a septic tanks having a subsurface discharge.

practicable upon their adoption by the State Board.[6]

B. County of San Diego Actions

1. **Control MS4 Discharges to Rainbow Creek**
   For nutrient discharges to or from Municipal Separate Storm Sewer Systems (MS4) within the Rainbow Creek watershed, the County has an existing obligation under the NPDES requirements for MS4s in San Diego County [7] to require increasingly stringent best management practices, pursuant to the iterative process described in Receiving Water Limitation C.2.a.[8] of the MS4 Requirements, to reduce nutrients discharges in the Rainbow Creek watershed to the maximum extent practicable and restore compliance with the nutrient water quality objective.

2. **Submit Nutrient Reduction and Management Plan (NRMP)**
   The County of San Diego shall, upon request by the Regional Board pursuant to CWC §13225, prepare and submit a NRMP for the Rainbow Creek watershed, consistent with the SWRCB NPS Implementation and Enforcement Policy and containing the elements described in Section C, County of San Diego Nutrient Reduction and Management Plan or their equivalent. The County may submit alternative or additional elements equivalent to those described in Section C that would result in equivalent protection from, or prevention of, nutrient discharges to Rainbow Creek.

3. **Submit and Implement Groundwater Investigation and Characterization Workplan**
   The County of San Diego shall, upon request by the Regional Board pursuant to CWC §13225, undertake an investigation of groundwater quality within the Rainbow Creek watershed, and shall prepare and submit a workplan designed to guide the collection of information to produce the technical report described in Item 4, Groundwater Investigation and Characterization Report below. The workplan shall include the following:

   a. A schedule for completion of all activities and submission of a final Groundwater Investigation and Characterization Report.
   b. A description of proposed actions including drilling methods, analytical methods, sampling locations, and purging and sampling methods.
   c. The location of existing monitoring wells and the proposed location of additional monitoring wells needed to characterize nutrient concentrations and their lateral and vertical extent in groundwater.
   d. Contingencies for collection of additional samples.

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[6] CWC §13291 directs the Regional Board to incorporate the regulations in the Basin Plan upon their adoption by the State Water Resources Control Board.

[7] The term "MS4 NPDES Storm Water Permit" refers to Order No.2001-001, NPDES No. CAS0108758, *Waste Discharge Requirements For Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of San Diego, the Incorporated Cities Of San Diego County, and the San Diego Unified Port District* or subsequent superceding NPDES renewal Orders.

e. Sufficient scope to meet the objectives of assessing nutrient loading from surface sources to groundwater and the contribution of groundwater to the nutrient loading and nutrient concentrations in Rainbow Creek
f. Consideration of the following elements or factors:
    i. Nutrient mass loading to groundwater in the fractured rock aquifer and the alluvial deposits aquifer[8] from septic systems, deep percolation of applied irrigation water, and any other sources.
    ii. Base flow contribution to Rainbow Creek from the fractured rock aquifer and the alluvial deposits aquifer.
    iii. Mass balance of nutrients in the fractured rock aquifer and alluvial deposits aquifer (nutrient mass loading to groundwater, removals from the groundwater system including denitrification, plant uptake, and groundwater discharge, and change in the load and concentration of nutrients in groundwater.

The County of San Diego shall implement the workplan within sixty (60) days after submission of the workplan, unless otherwise directed in writing by the Regional Board. Before beginning these activities the County shall notify the Regional Board of the intent to initiate the proposed actions included in the workplan submitted; and comply with any conditions set by the Regional Board.

4. **Submit Groundwater Investigation and Characterization Report**
   The County of San Diego shall, on a schedule agreed to in writing by the Regional Board, submit a Groundwater Investigation and Characterization Report containing a technical analysis and interpretation of the data to assess the contribution of groundwater to the nutrient loading and concentrations in Rainbow Creek. The report shall meet the objectives and address the considerations described in the Groundwater Investigation and Characterization Workplan. The report shall also present recommendations to refine assumptions, resolve uncertainties, and improve the scientific foundation of the TMDL with regard to quantifying groundwater nutrient loading to Rainbow Creek.

5. **Establish Management Agency Agreement (MAA)**
   The County of San Diego is requested to enter into a MAA with the Regional Board setting forth the commitment of both parties to undertake various implementation oversight responsibilities for the nonpoint source nutrient load reduction component of this TMDL and the County's commitments to implement the NRMP.

C. County Of San Diego Nutrient Reduction And Management Plan

1. **NPS Nutrient Reduction and Management Plan (NRMP)**
   A NRMP for the Rainbow Creek watershed shall describe the activities the County of San Diego could undertake to oversee discharger efforts to reduce nutrients in the runoff or groundwater discharges from new and existing (1) commercial nurseries; (2) agricultural fields; (3) orchards; (4) parks; (5) residential area; (6) urban areas; and; (7) septic tank

[8] Groundwater beneath the Rainbow Creek watershed is interpreted to occur in both the alluvial deposits where present and in the fractured rock. The groundwater investigation report shall assess the relative contribution from each aquifer

disposal system land uses (hereinafter referred to as key nutrient sources). A NRMP should include the following elements as provided in items 2 through 17 below or alternative or additional elements equivalent to those described that would result in equivalent protection from, or prevention of, nutrient discharges to Rainbow Creek.

2. **Legal Authority**
   The County of San Diego should review its legal authority and evaluate its adequacy to mandate compliance with the nutrient load reductions specified in this TMDL through ordinance, statue, permit, contract or similar means. The County, at a minimum, should evaluate its authority to:

   a. Control the discharge of nutrients from nonpoint sources; and
   b. Prohibit discharges of nutrients which cause or contribute to exceedances of the nutrient load reductions specified in this TMDL or nutrient water quality objectives.

   Alternatively the County of San Diego may certify that its existing legal authority is adequate to mandate compliance with the nutrient load reductions specified in this TMDL and prevent increases in nutrient loading to Rainbow Creek.

3. **General Plan Modification**
   The County of San Diego should evaluate the adequacy of its General Plan to ensure that future land use and zoning decisions do not result in an increase in the nutrient loading to Rainbow Creek. The County should also describe the steps it will take to modify the General Plan as necessary. Alternatively the County of San Diego may certify that its existing General Plan is adequate to prevent an increase in nutrient loading to Rainbow Creek.

4. **Modify Development Project Approval Process**
   The County of San Diego should evaluate the adequacy of its development project approval / permitting process as necessary to ensure that discharges from proposed developments in the Rainbow Creek watershed will comply with the nutrient load reductions specified in this TMDL and ensure that nutrient water quality objectives are not exceeded. The County's evaluation should consider the need to ensure that all development in Rainbow Creek watershed will be in compliance with County's storm water ordinances, permits, and all other applicable ordinances and requirements. The County should also describe the steps it will take to modify the development project approval / permitting process as necessary. Alternatively the County of San Diego may certify that its project approval / permitting process is adequate to ensure that discharges from proposed developments in the Rainbow Creek watershed will comply with the nutrients load reductions specified in this TMDL and ensure that nutrient water quality objectives are not exceeded.

5. **CEQA Reviews**
   The County of San Diego should evaluate the adequacy of its environmental review process pursuant to CEQA to ensure that new development in the Rainbow Creek watershed does not contribute to exceedances of the nutrient load allocations specified in this TMDL or violations of the nutrient water quality objective. For example, diligent performance of

environmental review under CEQA and requirements for mitigation of the adverse environmental consequences to water quality of new development and detrimental agricultural practices can significantly reduce nutrient loading to Rainbow Creek. The County's evaluation should consider the need to aggressively review proposed projects that have the potential to contribute nitrogen and phosphorus to the Rainbow Creek watershed and require appropriate mitigation. The County should also describe the steps it will take to revise the development project approval / permitting process as necessary. Alternatively the County of San Diego may certify that its environmental review process pursuant to CEQA is adequate to ensure that new development in the Rainbow Creek watershed does not contribute to exceedances of the nutrient load allocations specified in this TMDL or violations of the nutrient water quality objective.

6. **Pollution Prevention (Nutrients)**
   The County of San Diego should describe the steps it will take to implement pollution prevention[9] methods for nutrients at sites owned by the County and require its use by owners or operators of nutrient sources, where appropriate.

7. **Source Identification (Nutrients)**
   The County of San Diego should describe the steps it will take to develop and update annually an inventory of the individual nutrient sources within the residential, urban, commercial nursery, agricultural field, orchard, park, and septic tank disposal system category of land uses. The use of an automated database system, such as Geographical Information System (GIS) is highly recommended.

8. **Threat to Water Quality Prioritization (Nutrients)**
   The County of San Diego should describe the steps it will take to establish priorities for inspection and oversight activities. Each individual nutrient source in each nonpoint source category should be classified as high, medium, or low threat to water quality. The inventory should include the following minimum information for each site: name; address; SIC codes as appropriate which best reflects the type of site; a narrative description characterizing the nutrient waste generated; and the potential for nutrient discharges to Rainbow Creek.

9. **MP Implementation (Nutrients)**
   The County of San Diego should describe the steps it will take to:
   a. Designate a set of minimum MMs / MPs [10] for the high, medium, and low threat to water quality nutrient sources identified in item 7 above. The designated minimum

[9] Pollution Prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control, treatment, or disposal.

[10] In determining appropriate MPs the County of San Diego is encouraged to consult the State Water Resources Control Board's California Nonpoint Source Encyclopedia (2004) (http://www.waterboards.ca.gov/nps/encyclopedia.html). This publication contains extensive information on nutrient reduction management measures (MMs) and management practices (MPs) applicable to the NPS land use activities in the Rainbow Creek watershed. The County is also encouraged to consult the Regional Board's Watershed Management Approach for the San Diego Region, Nonpoint Source (http://www.waterboards.ca.gov/sandiego/programs/wmc.html) for additional information on management measures.

MPs for the high threat to water quality nutrient sources should be site and source specific as appropriate.

a. Establish a time line for installation of the designated minimum MPs at each nutrient source within its jurisdiction. If particular minimum MPs are infeasible for any specific site/source the county of San Diego should describe the steps it will take to require the implementation of other equivalent MPs.

10. **Inspection of Sites and Sources (Nutrients)**
The County of San Diego should describe the steps it will take to inspect high priority sites and sources for compliance with its ordinances and permits as well as nutrient load reductions required under this TMDL. Inspections should include review of MP implementation plans and effectiveness. The County should also describe the steps it will take to implement all inspection follow-up actions, including enforcement actions, as necessary to obtain discharger compliance in implementing MPs.

11. **Enforcement of Sites and Sources (Nutrients)**
The County of San Diego should describe the steps it will take to enforce its ordinances, statues, permits, and contracts as necessary to attain compliance with the nutrient load reductions specified in this TMDL.

12. **Reporting of Non-compliant Sites (Nutrients)**
The County of San Diego should describe the steps it will take to provide oral notification to the Regional Board of non-compliant sites that are determined to be recalcitrant in implementing MPs or attaining compliance with nutrient load reductions required under this TMDL within 24 hours of the discovery of noncompliance. The notification process should also include procedures for a follow-up written report to be submitted to the Regional Board within 5 days of the incidence of non-compliance.

13. **Monitoring to Assess Compliance With Nutrient Load Reductions**
The County of San Diego should describe the steps it will take to conduct, or require nutrient sites or sources to conduct, a monitoring program to assess compliance of runoff or groundwater discharges with the load reductions from each of the land use categories assigned a load reduction. This can be accomplished by placing sampling stations at strategic nodes that would monitor nutrient discharges from individual sources of a common land use category.

14. **Community Education and Outreach**
The County of San Diego should describe the steps it will take to develop a focused educational program to raise community awareness of the nutrient impairment problem, promote pollution prevention, and increase the use of applicable management measures and practices where needed to control and reduce nutrient discharges to Rainbow Creek. Public education, outreach, and training programs should involve applicable user groups and the community[11].

[11] Consideration should be given to expanding the County of San Diego's ongoing community and education outreach program under the County's MS4 NPDES Storm Water Permit to address the Rainbow Creek nutrient

15. **Seek Financial Assistance**
The County of San Diego is encouraged to seek grant funding[12] for projects to implement the Rainbow Creek nutrient TMDLs, particularly those that can achieve quantifiable nutrient load reductions consistent with the specific nutrient TMDL load allocations.

16. **Nutrient Reduction and Management Plan (NRMP) Effectiveness**
The County of San Diego should describe the steps it will take to develop a long-term strategy for assessing the effectiveness of the NRMP. The long-term assessment strategy should identify specific direct and indirect measurements that the County will use to track the long-term progress towards achieving the nutrient load reductions required under this TMDL. Methods used for assessing effectiveness should include the following or their equivalent: surveys, pollutant loading estimations, and receiving water quality monitoring. The long-term strategy shall also discuss the role of monitoring data in substantiating or refining the assessment.

17. **Nutrient Reduction and Management Plan (NRMP) Annual Report**
The County of San Diego should describe the steps it will take to submit an annual NRMP report to the Regional Board by January 31 of each year following USEPA approval of this TMDL. The reporting period for this annual report should be the previous fiscal year. For example, the report submitted January 31, 2006 would cover the reporting period July 1, 2004 to June 30, 2005. The report should be incorporated in the annual Jurisdictional URMP Annual Report and the Watershed Specific URMP Annual Reports under the County's MS4 NPDES Permit and include the following information:

    a. Comprehensive description of all activities conducted by the County of San Diego to oversee implementation of the NRMP.
    b. An accounting of all: inspections conducted; enforcement actions taken; and education efforts conducted.
    c. An assessment of whether actions to implement designated minimum MPs at each nutrient source were actually carried out by dischargers.
    d. An assessment of the compliance of runoff or groundwater discharges with the load reductions from each of the land use categories assigned a load reduction.
    e. Identification of water quality improvements or degradation in Rainbow Creek with regard to attainment of the nutrient water quality objectives.
    f. An evaluation of the effectiveness of the NRMP in achieving the nutrient load reductions required under this TMDL.

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impairment problem. Additional suggestions for the information to be included in pollution prevention and education programs is contained in the State Water Resources Control Board's *California Nonpoint Source Encyclopedia* (2004) (http://www.waterboards.ca.gov/nps/encyclopedia.html).

[12] Information on available grant funds is contained in the in the State Water Resources Control Board's *California Nonpoint Source Encyclopedia* (2004) (http://www.waterboards.ca.gov/nps/encyclopedia.html).

D. Discharger Actions

1. **State of California, Department of Transportation (Caltrans) Actions**
   Caltrans shall take all actions necessary to meet the nutrient wasteload reductions assigned to Caltrans. These nutrient wasteload reductions will eventually be incorporated into Caltrans statewide NPDES storm water permit. It is assumed that compliance with the nutrient wasteload reductions will be accomplished through the development and implementation of best management practices (BMPs). Caltrans shall also prepare and submit progress reports in accordance with the Caltrans statewide NPDES storm water permit or as otherwise directed by the Regional Board in a CWC §13383 order.

2. **State of California Department of Forestry and Fire Protection (CDFFP) Actions**
   CDFFP shall, upon direction by the Regional Board in a CWC §13267 order, undertake an investigation to 1) evaluate whether CDFFP's discharge is surfacing and/or contributing to the impairment of Rainbow Creek; and 2) estimate the actual nutrient load to Rainbow Creek from groundwater flow originating from the septic tank and percolation ponds.

3. **Nonpoint Source Dischargers (NPS Dischargers) Actions**
   NPS discharges of nutrients in the Rainbow Creek watershed result from (1) commercial nurseries; (2) agricultural fields; (3) orchards; (4) parks; (5) residential areas; (6) urban areas; and (7) septic tank disposal system land use activities. Individual landowners and other persons (NPS Dischargers) engaged in these land use activities shall implement pollution prevention[13] methods and increase the use of applicable management measures and practices[14] where needed to control and reduce nutrient discharges to Rainbow Creek and attain nutrient load reductions. Individual landowners and other persons are encouraged to seek grant funding[15] for projects to implement the Rainbow Creek nutrient TMDLs, particularly those that can achieve quantifiable nutrient load reductions consistent with the specific nutrient TMDL load allocations. NPS dischargers will be subject to Regional Board enforcement action for failing to: comply with applicable waiver conditions, waste discharge requirements (WDRs), discharge prohibitions; attain compliance with the nutrient load reductions specified in this TMDL; or attain compliance with the nutrient water quality objectives. The Regional Board may also terminate the applicability of waivers and issue

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[13] Pollution Prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control, treatment, or disposal.

[14] In determining appropriate management methods and practices to control nutrient discharges interested persons are encouraged to consult the State Water Resources Control Board's *California Nonpoint Source Encyclopedia* (2004) (http://www.waterboards.ca.gov/nps/encyclopedia.html. This publication contains extensive information on nutrient reduction management measures (MMs) and management practices (MPs) applicable to the NPS land use activities in the Rainbow Creek watershed. Interested persons are also encouraged to consult the Regional Board's Watershed Management Approach for the San Diego Region, Nonpoint Source (http://www.waterboards.ca.gov/sandiego/programs/wmc.html) for additional information on management measures.

[15] Information on available grant funds is contained in the in the State Water Resources Control Board's *California Nonpoint Source Encyclopedia* (2004) (http://www.waterboards.ca.gov/nps/encyclopedia.html).

waste discharge requirements to any NPS dischargers failing to comply with waiver conditions.

TMDL Implementation Monitoring Plan
The necessary actions to monitor TMDL implementation are described in Section 10 of the *Technical Report for Total Nitrogen and Total Phosphorus Total Maximum Daily Loads (TMDLs) in Rainbow Creek*, dated February 9, 2005 and listed below.

A. Regional Board Actions

1. **Issue Order to Submit Monitoring Plan to Caltrans and County of San Diego**
   The Regional Board shall issue an Order to Caltrans under CWC §13383 and a Governmental Water Quality Investigation Request Order to the County of San Diego under CWC §13225, to prepare and submit an Implementation Monitoring Plan containing the elements described in **Section C. Implementation Monitoring Plan Elements** below. The Regional Board may amend this order at any time to include other nutrient dischargers in the Rainbow Creek watershed on a case-by case basis.

2. **Issue Order to Implement Monitoring Plan to Caltrans and County of San Diego**
   Upon concurrence with the County of San Diego's and Caltrans' Implementation Monitoring Plan the Regional Board shall issue an Order to Caltrans under CWC § 13383 and a Governmental Water Quality Investigation Request Order to the County of San Diego under CWC § 13225, to implement monitoring. The Regional Board may amend this order at any time to include other nutrient dischargers in the Rainbow Creek watershed on a case-by case basis.

B. County of San Diego and Caltrans Actions

1. **Prepare and Submit Monitoring Plan**
   The County of San Diego and Caltrans shall collaborate to prepare and submit an Implementation Monitoring Plan for the Rainbow Creek watershed containing the elements described in **Section C. Implementation Monitoring Plan Elements** below, upon direction by the Regional Board in a CWC §13225 / CWC §13383 Order. The number of monitoring stations in Rainbow Creek assigned to Caltrans should be based on the number of stations needed by Caltrans to demonstrate compliance with the nutrient wasteload allocation and the success of the TMDL in attaining the nutrient water quality objective in the portion of Rainbow Creek affected by its discharge. The Implementation Monitoring Plan shall be modified as requested by the Regional Board.

2. **Implement Monitoring Plan**
   The County of San Diego and Caltrans shall implement the Implementation Monitoring Plan upon direction by the Regional Board pursuant to a CWC §13225 / §13383 Order. The Regional Board may amend this order at any time to include other nutrient dischargers in the Rainbow Creek watershed on a case-by case basis.

C. Implementation Monitoring Plan Elements

The Implementation Monitoring Plan shall contain the following elements:

1. **Surface Water Monitoring Stations**
   Monitoring stations shall be proposed that best serve the monitoring objectives described above in Section 10.2 Monitoring Objectives. Previously monitored locations that shall be considered include Jubilee, Hines Nursery, Oak Crest, Rainbow Glen Tributary, Margarita Glen Tributary, Willow Glen-4, Willow Glen Tributary, Riverhouse, Via Milpas Tributary, and Stage Coach (See Figure A-3, in Appendix A). An additional sampling location between Oak Crest and Willow Glen-4 should also be considered. For instance, a monitoring location might be placed downstream of Oak Crest Mobile Estates to assess nutrient loading from this property. Monitoring stations shall also be considered at strategic nodes in Rainbow Creek and its tributaries that would monitor nutrient discharges from individual sources of a common land use category.

2. **Groundwater Monitoring Stations**
   The location of existing wells and the proposed location of additional monitoring wells needed to define nutrient concentration trends in groundwater. Methods for purging and sampling monitoring wells to provide representative samples for the waste constituents of interest should be described.

3. **Surface Water Monitoring Frequency**.
   Monitoring frequencies of the various monitoring parameters shall be proposed that best serve the monitoring objectives described above in Section 10.2 Monitoring Objectives. The frequencies should be adequate to evaluate ambient conditions and address any impact from low dissolved oxygen concentrations and algal growth.

4. **Groundwater Monitoring Frequency**
   Monitoring frequencies of the various monitoring parameters shall be proposed that best serve the monitoring objectives described above Section 10.2 Monitoring Objectives. The magnitude and timing of nutrient variability may vary significantly in monitoring wells that are located varying distances from nutrient sources. Sampling these wells will likely obtain water from varying depths in the aquifer. To define the nitrate variability at each well, the network will be sampled quarterly for two years. The observed variability will serve as a basis for determining the long-term sampling frequency for the network.

5. **Surface Water Quality Parameters**
   Surface Water Quality Parameters shall include nitrogen (including nitrate, nitrite, ammonia and total Kjeldahl nitrogen (TKN)), phosphorus (including orthophosphate and total), dissolved oxygen, pH, turbidity, and temperature.

6. **Groundwater Quality Parameters**
   Groundwater Quality Parameters shall include total nitrogen, nitrate, ammonia, nitrites, TKN, orthophosphate, total phosphorus, pH, dissolved Oxygen and TDS.

7. **Hydrology**
   Flow rate measurements shall be taken to calculate nutrient loading, to provide additional information about the hydrology of the watershed, and to identify patterns in algal growth.

8. **Algal Biomass**
   Characterization of algal species composition is needed to provide a more reliable indicator of trophic status and evidence of nutrient condition (USEPA 2000a). The growth of algae is stimulated principally by nutrients such as nitrogen and phosphorus, but also requires adequate water temperature, light, flow, and dissolved oxygen. It is assumed at this time that both factors are co-limiting. Characterization of algal species composition may give a better understanding of the relationships between all the factors that affect algal growth, including sunlight, nitrogen, phosphorus, temperature, and dissolved oxygen. Algal biomass should be quantified by mass and/or by % cover of bottom. Collection and measurement of algal biomass should be performed uniformly or by a standardized method.

9. **Biological Assessment Monitoring**
   It is recommended that biological assessment monitoring of benthic microinvertebrates be performed at a minimum of three stations on Rainbow Creek and a reference stream. Biological assessment monitoring should be performed in accordance with the California Stream Bioassessment Methods Manual (Harrington and Born 2000). Changes in the stream's biological integrity (e.g., an increase or decrease in diversity and abundance of sensitive species) could be used as an indicator of changes in the health of the creek. Sampling done in 1998-99 for the San Diego Ambient Bioassessment Program (CDFG 2000a) indicates that benthic macroinvertebrate communities vary seasonally. The seasonal trend could be due in part to rainfall and consequent streamflow conditions (e.g., scouring). Thus, sites should be sampled for benthic macroinvertebrates at least twice each year: once during the spring (i.e., May), and again in the fall (preferably in October).

10. **Monitoring Reports**
    Monitoring reports shall be submitted in both electronic and paper formats and include the following information:

    a. An executive summary addressing all sections of the monitoring report, comprehensive interpretations and conclusions, and recommendations for future actions.
    b. A description of monitoring station locations by latitude and longitude coordinates, frequency of sampling, quality assurance/quality control procedures and sampling and analysis protocols.
    c. The data/results, methods of evaluating the data, graphical summaries of the data, and an explanation/discussion of the data.
    d. An assessment of the compliance of runoff characteristics with the required load reductions from each of the land use categories assigned a load reduction.
    e. Identification and analysis of trends in surface and groundwater quality and assessment of compliance with nutrient water quality objectives.
    f. An evaluation of the effectiveness of the TMDL implementation actions and the need for revisions to improve the implementation action plan.

Table 4-D.3. Required Monitoring Parameters

Parameter	Type of sample[1]
Surface Water Monitoring	
Total nitrogen, nitrate, ammonia[2], nitrites, TKN, orthophosphate, and total phosphorus concentrations	Grab
Temperature	In Situ
pH	In Situ
Dissolved Oxygen	In Situ
Turbidity	In Situ
TDS	Grab
Flow rate	Field Measurement
Algal biomass (% cover of bottom and/or Chl a/ash free dry weight (AFDM))	In Situ and/or Grab
Benthic macroinvertebrate community analysis (recommended)	Grab
Groundwater Monitoring	
Total nitrogen, nitrate, ammonia[2], nitrites, TKN, orthophosphate, and total phosphorus concentrations	Grab
pH	Grab or In Situ
Dissolved Oxygen	Grab or In Situ
TDS	Grab or In Situ

[1] A California certified laboratory should be used with an approved QA/QC plan.
[2] All laboratory detection limits should be sufficient to determine compliance with the water quality objective. For example, un-ionized ammonia in surface waters (25 µg/L).

11. **Quality Assurance / Quality Control Plan**
The monitoring program shall develop and implement a QA/QC plan for field and laboratory operations to ensure that data collected are of adequate quality given the monitoring objectives[16]. The QA/QC plan for field operations shall cover the following, at a minimum:
a. Quality assurance objectives;
b. Sample container preparation, labeling and storage;
c. Chain-of-custody tracking;
d. Field setup;
e. Sampler equipment check and setup;
f. Sample collection;
g. Use of field blanks to assess field contamination;
h. Use of field duplicate samples;
i. Transportation to the laboratory;
j. Training of field personnel; and
k. Evaluation, and enhancement if needed of the QA/QC plan.

The QA/QC plan for laboratory operations shall cover the following, at a minimum:
a. Quality assurance objectives;
b. Organization of laboratory personnel, their education, experience, and duties;
c. Sample procedures;
d. Sample custody;
e. Calibration procedures and frequency;
f. Analytical procedures;
g. Data reduction, validation, and reporting;
h. Internal quality control procedures;
i. Performance and system audits;
j. Preventive maintenance;
k. Assessment of accuracy and precision;
l. Correction actions; and
m. Quality assurance report.

12. **Reporting Period**
Annual reports should cover the period of October 1 through September 30. The reports should be submitted to the Regional Board by January 31 of the following year and should be incorporated within the annual receiving water monitoring reports required under the County of San Diego's MS4 NPDES Permit Receiving Waters Monitoring and Reporting Program.[17]

[16] For more information on QA/QC activities, including guidelines and example QA/QC documents, refer to http://www.waterboards.ca.gov/swamp/qapp.html

[17] The term "MS4 NPDES Storm Water Permit" currently refers to Order No.2001-001, NPDES No. CAS0108758, Waste Discharge Requirements For Discharges Of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of San Diego, the Incorporated Cities Of San Diego County, and the San Diego Unified Port District or subsequent superceding NPDES renewal Orders. Attachment B to this Order contains the Receiving Waters Monitoring and Reporting Program for Order No. 2001-01. The annual receiving water monitoring report is described in Table 6, Item 28, page 51 of Order No. 2001-01.

13. **Reporting Frequency**
    The first report shall be due in the first January following initiation of the monitoring program. Reporting shall continue on an annual basis until the nutrient water quality objective has been attained and maintained in Rainbow Creek.

Compliance Schedule

Total nitrogen and total phosphorus reductions are required over a 16-year phased compliance schedule period during which incremental load and wasteload reductions are required as shown in Table 4 – E, below. Twenty percent (20%) reductions are required every fourth year for the first three phases (by the end of year 12). The last (fourth) phase requires the remaining 14% total nitrogen reduction and 25% total phosphorus reduction needed to meet the TMDLs.

Table 4 - E. Total Nitrogen and Total Phosphorus Phased Load Reduction Compliance Schedule

Compliance Date	Total Nitrogen		Total Phosphorus	
	Current Load & Annual Loads (LA + WLA) kg N/yr	Cumulative % Reduction	Current Load & Annual Loads (LA + WLA) kg P/yr	Cumulative % Reduction
	3,055[1]		278[1]	
12/31/2009	2,444	20	222	20
12/31/2013	1,833	40	167	40
12/31/2017	1,222	60	111	60
12/31/2021	796	74	41	85

[1] Current annual nutrient loads from identified point and nonpoint sources (See Tables 4 - B). This value does not include the contribution for background.

Regardless of what actions are taken to achieve load and wasteload reductions, there may not be an immediate response in the water quality or biological condition of Rainbow Creek. For example, there may be significant time lags between when actions are taken to reduce nutrient loads and resulting changes in nutrient concentrations in Rainbow Creek. This is especially likely if nutrients from past activities are tightly bound to sediments or if nutrient-contaminated groundwater has a long residence time before its release to Rainbow Creek waters. A three-year response time is projected for Rainbow Creek to attain compliance with nutrient water quality objectives after reaching the desired nutrient wasteload and load reductions in 2021. Accordingly the projected date when Rainbow Creek will attain and maintain compliance with nutrient water quality objectives is December 31, 2024.

Agricultural Program Costs and Potential Sources of Financing

Pursuant to CWC § 13141 the Regional Board has estimated the TMDL Implementation Program cost for agricultural water quality control in Table 4 - F.

Table 4 - F. Cost of Implementing Agricultural Water Quality Control

	Initial Capital Costs $ per Operation		Annual Operational Costs $ per Operation	
	Low	High	Low	High
Commercial Nurseries	$26	$41,075	$3	$4,108
Orchards	$26	$57,705	$3	$5,771
Agricultural Fields	$26	$57,705	$3	$5,771

Potential sources of financing include:

- Federal Clean Water Act Section 319(h) grants.
- Federal Clean Water Act Section 205(j) grants.
- State of California Proposition 13 funded grants.
- Small Communities Grants for Water Reclamation and Wastewater Treatment Facilities
- Other state, federal and business loans, grants, and other assistance programs. These may include assistance from U.S. Small Business Administration and from conservation programs through various agencies such as the U.S. Department of Agriculture and Natural Resource Conservation Service
- Various secured and unsecured loans, including home equity loans and business loans.

Recalculation Procedures

At the end of the Basin Plan, add the following Appendix D:

APPENDIX D
METHOD FOR RECALCULATION OF THE TOTAL MAXIMUM DAILY LOADS FOR NITOGEN AND PHOSPHORUS IN RAINBOW CREEK

This appendix describes the method for recalculating Rainbow Creek TMDLs for nitrogen and phosphorus if the water quality objectives are modified in the future.

Numeric Target
The numeric targets are set equal to the new water quality objectives.

Margin of Safety
The explicit margin of safety (MOS) equals five percent of the loading capacity. The equation to calculate the loading capacity is given below.

Loading Capacity

The annual total nitrogen loading capacity is determined by multiplying the flow volume (in ft^3/yr) by the new water quality objective (in mg N/L) that will allow the creek to attain water quality standards. The equations below also use terms to convert milligrams to kilograms and cubic feet to liters. The loading capacity for nitrogen is as follows:

Low Flow (0-2.9 cfs)

17,764 * 1 e–3 ft^3/yr * **new water quality objective** in mg N/L * 28.32 L/ft3 * 1 e –6 kg/mg
= **new low flow loading capacity** in kg N/yr

Moderate – High Flow (3 – 39 cfs)

40,775 * 1 e–3 ft^3/yr * **new water quality objective** in mg N/L * 28.32 L/ft3 * 1 e –6 kg/mg
= **new moderate - high flow loading capacity** in kg N/yr

Total Annual Nitrogen Loading Capacity = sum of low flow and moderate - high flow loading capacity

Similarly, the annual total loading capacity for phosphorus is as follows:

Low Flow (0-2.9 cfs)

17,764 * 1 e–3 ft^3/yr * **new water quality objective** in mg P/L * 28.32 L/ft3 * 1 e –6 kg/mg
= **new low flow loading capacity** in kg P/yr

Moderate – High Flow (3 – 39 cfs)

40,775 * 1e–3 ft^3/yr * **new water quality objective** in mg P/L * 28.32 L/ft3 * 1 e –6 kg/mg
= **new moderate-high flow loading capacity** in kg P/yr

Total Annual Phosphorus Loading Capacity = sum of low flow and moderate - high flow loading capacity

Total Maximum Daily Load

The TMDLs for nitrogen and phosphorous are set equal to the total annual loading capacity for each pollutant. The allocations in Table D-1 below use the following equation to determine the total load allocations for nonpoint sources (LA) by subtracting background, the margin of safety (MOS), and the point source waste load allocations (WLA) from the TMDL.

$$TMDL = \sum(WLA) + \sum(LA) + Background + MOS$$

Allocations

The allocations of the total annual nitrogen and phosphorous loading capacities to the margin of safety, background, and various point and non-point sources are presented in Table D-1.

Table D-1. Total Nitrogen and Phosphorus Allocations for Rainbow Creek TMDL

Source	Nitrogen Allocation	Phosphorus Allocation
Margin of Safety (MOS)	5%[1]	5%[1]
Background	779 kg	116 kg
Caltrans (WLA)	New WQO * volume of Caltrans runoff	New WQO * volume of Caltrans runoff
Unidentified and Future Point Sources (WLA)	2%[1]	2%[1]
Total Allocation for Nonpoint Sources (LA) = Total Annual Loading Capacity – MOS – Background – Caltrans – Unidentified and Future Point Sources		
Commercial nurseries	16%[2]	9%[2]
Agricultural fields	21%[2]	12%[2]
Orchards	25%[2]	18%[2]
Park	0.4%	0.3%
Residential areas	21%[2]	36%[2]
Urban areas	4%[2]	18%[2]
Septic tank disposal systems	6%[2]	0%[2]
Air deposition	6%[2]	6%[2]

[1] percent of the total annual nitrogen and phosphorous loading capacity
[2] percent of the total allocation for nonpoint sources

Executive Summary

Rainbow Creek, a tributary to the Santa Margarita River, is approximately eight miles in length and located in northern San Diego County near the community of Fallbrook. (See Attachment A for Rainbow Creek vicinity and watershed maps.) The Rainbow Creek watershed encompasses 7,085 acres and is primarily rural, with sixty five percent of the watershed undeveloped. Rainbow Creek provides habitat to vegetation, and terrestrial and aquatic wildlife. The creek has a resident fish population of native arroyo chubs (*Gila orcutti*) that are listed as a "California Species of Special Concern," native amphibians that may be impacted by excessive nutrients, and an impaired aquatic insect population. The creek also has numerous trails that are frequented by hikers and horseback riders as well as residents that live along the riparian corridor.

Water Quality Impairments

Rainbow Creek waters currently violate the Inorganic Chemicals - Nitrate (as NO_3) and the Biostimulatory Substances nitrogen and phosphorus water quality objectives contained in the Water Quality Control Plan for the San Diego Region (Basin Plan). The exceedance of these water quality objectives in Rainbow Creek waters represents an actual or threatened impairment of the municipal supply, aquatic and terrestrial habitat, and recreational beneficial uses designated for Rainbow Creek in the Basin Plan.

Nitrate, nitrogen, and phosphorus are jointly referred to as nutrients in this document[18]. The introduction of excessive nutrients into the Rainbow Creek ecosystem is referred to as "nutrient enrichment" and can have a number of adverse water quality effects. One of the most common effects is acceleration of a natural process called eutrophication[19] which can lead to eutrophic conditions where prolonged blooms of algae deprive light and oxygen from other organisms while turning waterways green and foul smelling. The excessive nutrient concentrations in Rainbow Creek waters appear to be contributing to excessive algal growth, which can lead to eutrophic conditions resulting in decreased water clarity, loss of aquatic habitat, and a decrease in dissolved oxygen (DO) that is detrimental to aquatic life. While eutrophic conditions have not been observed in Rainbow Creek, the Regional Board found several areas susceptible to excessive algal growth during the spring, summer and fall that threaten to cause eutrophic conditions. Elevated nitrate levels in Rainbow Creek can also adversely affect the drinking water supplies of the downstream United States Marine Corps Base Camp Pendleton (Camp Pendleton).

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[18] Nutrients are chemical elements and compounds found in the environment that plants and animals need to grow and survive. In this document the various forms of nitrogen and phosphorus are the nutrients of interest. The forms include nitrate, nitrite, ammonia, organic nitrogen (in the form of plant material or other organic compounds), and phosphates (orthophosphate and others). Nitrate is the most common form of nitrogen and phosphates are the most common forms of phosphorus found in natural waters.

[19] Eutrophication is a process whereby water bodies, such as lakes, estuaries, or slow-moving streams receive excess nutrients that stimulate excessive plant growth (algae, periphyton attached algae, and nuisance plants weeds). This enhanced plant growth, often called an algal bloom, reduces dissolved oxygen in the water when dead plant material decomposes and can cause other organisms to die.

Clean Water Act Section 303(d) List and TMDLs

The federal Clean Water Act section 303(d) requires that each State establish a process to systematically identify impaired or threatened waterbodies and the pollutant(s) causing the impairment. The Clean Water Act also requires States to establish a scientifically-based strategy—a Total Maximum Daily Load (TMDL)—for correcting the impairment or eliminating the threat and restoring the waterbody. A TMDL defines the amount of a pollutant that a waterbody can receive without violating applicable water quality standards. It is the sum of the allowable loads of a pollutant from all contributing point and nonpoint sources plus a margin of safety. Once this amount or load is determined, the State allocates a portion to each source of that pollutant within a particular watershed. The portion allocated to point sources is known as a "wasteload allocation" or WLA, and is typically enforced through conditions inserted into NPDES permits. The portion allocated to nonpoint sources and naturally-occurring pollutants is known as a "load allocation" or LA, and is enforced through the state's nonpoint source management program.

Rainbow Creek is listed on the State of California's 2002 Clean Water Act section 303(d) list as an impaired water body due to excessive nitrogen and total phosphorus concentrations. The Clean Water Act provides that the Regional Board must establish TMDLs for nitrogen and phosphorus designed to attain the applicable Biostimulatory Substances water quality objective and restore municipal supply, aquatic and terrestrial habitat, and recreational beneficial uses in the Basin Plan. Pursuant to this mandate, the goal of the nitrogen and phosphorus TMDLs described in this document is to attain and maintain the Biostimulatory Substances water quality objective and restore beneficial uses in Rainbow Creek through nutrient wasteload and load reductions implemented over the next 16 years.

Nutrient Sources

The primary point source discharge of nutrients in Rainbow Creek is from Caltrans owned right-of-ways (state highways) in the Rainbow Creek watershed. The primary nonpoint source discharge of nutrients is from agricultural fields and orchards, commercial nurseries, residential and urban areas, septic tank disposal systems, and atmospheric deposition. Nutrients enter the creek by way of overland surface runoff during storm events and dry weather flows, through groundwater gains to the creek of groundwater containing elevated levels of nutrients from septic tank wastewater and irrigation water discharges, through springs of irrigation tailwater flows that feed tributaries, through atmospheric dry deposition, and from background sources.

Nutrient Wasteload and Load Allocations

Annual wasteloads and loads for nitrogen and phosphorus are calculated for the point source and nonpoint source discharges described above. A nitrogen load allocation of 714 kg N/yr is established for nonpoint sources and includes a 77% reduction of loading from commercial nurseries, agricultural fields, orchards, residential land uses, and septic tank disposal systems, and a 50% reduction from urban and park land uses. A wasteload allocation of 82 kg N/yr is established for point sources and includes a 68% reduction for Caltrans' NPDES discharges and a 2% placeholder for unknown and future point sources. A phosphorus load allocation of 33 kg P/yr was established for nonpoint source discharges and includes a 90% reduction of loading from residential, commercial nursery, agricultural fields, and orchard land uses, and a 50%

reduction from urban and park land uses. A wasteload allocation of 8 kg P/yr was established for point sources and includes a 64% reduction for Caltrans' discharges and a 2% placeholder for unknown and future sources.

Based on current nutrient loading calculations from point and nonpoint sources, the Basin Plan amendment requires a 20% reduction of the current annual load of both nitrogen and phosphorus by the end of fourth year following U.S. Environmental Protection Agency approval of the TMDL Basin Plan amendment. This reduction will result in the attainment of the "drinking water " nitrate water quality objective in Rainbow Creek waters. The Basin Plan Amendment requires subsequent reductions in nitrogen and phosphorus loading of 3,834 kg N/yr and 394 kg P/yr, respectively, to 1,658 kg N/yr and 165 kg P/yr respectively over a period of 16 years until the biostimulatory targets, total nitrogen of 1.0 mg N/L and total phosphorus of 0.1 mg P/L, have been achieved. An explicit margin of safety of 5% was selected to account for unknowns, errors in assumptions, and potential future development in the watershed. An implicit margin of safety was also included because of conservative assumptions made in developing load allocations.

TMDL Implementation

Sources of nutrients to Rainbow Creek include both point sources and nonpoint sources. Caltrans is a point source discharger of nutrients and will be responsible for meeting nutrient wasteload reductions to be incorporated in the MS4 NPDES Storm Water Permit. For nutrient discharges in the Rainbow Creek watershed subject to the County of San Diego's MS4 NPDES Storm Water Permit, the County will be directed to implement increasingly stringent best management practices to reduce nutrients discharges in the Rainbow Creek watershed to the maximum extent practicable and restore compliance with the nutrient water quality objective. The California Department of Forestry and Fire Protection (CDFFP) will be required to evaluate whether the Rainbow Conservation Camp discharge is surfacing and/or contributing nutrients to Rainbow Creek.

Controlling and reducing nutrient discharges in the Rainbow Creek watershed to meet the TMDL nutrient load reductions for nonpoint sources will be a long term and complicated undertaking. The Regional Board proposes to use a Third Party regulatory-based approach to mandate compliance with the nonpoint source (NPS) nutrient load reductions of this TMDL. The Regional Board will accomplish this by negotiating a Management Agency Agreement (MAA) between the Regional Board and the County of San Diego setting forth the commitments of both parties to undertake various implementation responsibilities for the NPS nutrient load reductions of this TMDL.

Under the terms of the proposed MAA, the County of San Diego will take the lead in establishing management measures (MMs) and management practices (MPs) and overseeing MP implementation by NPS dischargers to attain TMDL nutrient load reductions in the Rainbow Creek watershed. This will be accomplished through the County of San Diego's development of a Nutrient Reduction and Management Program (NRMP) for the watershed that incorporates nutrient management measures and a public outreach program to achieve the reductions. Additionally, the County of San Diego could be directed to investigate groundwater quality and

contribution to the creek to fill data gaps. Findings from the investigations will be used in the development of further implementation measures to attain subsequent nutrient load reductions.

The Regional Board will adopt, in conjunction with the MAA, individual or general waivers or waste discharge requirements (WDRs) for NPS discharges in the Rainbow Creek watershed. The waivers or WDRs may require NPS dischargers to either participate in the third party NPS program or, alternatively, submit individual pollution prevention plans that detail how they will comply with the waivers and WDRs. The Regional Board may also adopt a discharge prohibition, which includes exceptions for those discharges that are adequately addressed in an acceptable third-party MAA or MOU NPS pollution control implementation program.

The County of San Diego and Caltrans are directed to develop and implement a Rainbow Creek watershed monitoring program to:

- Evaluate progress toward meeting nutrient water quality objectives in Rainbow Creek
- Check attainment of numeric targets and TMDL allocations
- Verify or refine assumptions, resolve uncertainties, and improve scientific understanding; and
- Evaluate the effectiveness of the TMDL implementation actions over time and determine the need for revisions to improve the implementation action plan

Scientific Peer Review

Health and Safety Code section 57004 provides that the scientific basis of any TMDL Basin Plan amendment must undergo external peer review before adoption by the Regional Board. The "scientific basis" and "scientific portions" of the TMDL are those foundations of the TMDL that are premised upon, or derived from, empirical data or other scientific findings, conclusions, or assumptions establishing a regulatory level, standard, or other requirement for the protection of public health or the environment.

An earlier version of the Rainbow Creek TMDL was submitted in November 2001 for external scientific peer review pursuant to Health and Safety Code section 57004. Three reviewers with expertise in the area of nutrients were selected by the State Water Resources Control Board to review the Regional Board's Rainbow Creek TMDL 2001 report: two professors from the Department of Civil and Environmental Engineering at the University of California in Berkeley and one from the Department of Civil and Environmental Engineering at San Jose State University. The comments provided by the peer reviewers and the responses to those comments are provided Appendices J and K of this document.

On May 8, 2002, the Regional Board considered adoption of Tentative Resolution No. R9-2002-0108 to amend the Basin Plan to incorporate the Rainbow Creek Nutrients TMDLs. Based on public testimony at the hearing the Regional Board elected to revise the proposed Basin Plan amendment and to reconsider the amendment following adoption of the 2002 Clean Water Act section 303(d) List Update by the State Water Resources Control Board and the US Environmental Protection Agency (USEPA). This document constitutes the revised Rainbow Creek TMDL. The scientific basis of this revised TMDL has undergone a second external scientific peer review pursuant to Health and Safety Code Section 57004 in July 2004. The

comments provided by the peer reviewer and the responses to those comments are provided with this staff report in Appendix N.

Basin Plan Amendment Adoption

The Regional Board adopted Resolution No. R9-2005-0036 Amendment to the Water Quality Control Plan for the San Diego Region (9) to incorporate TMDLs for nitrogen and phosphorus in the Rainbow Creek Watershed, San Diego County on February 9, 2005.

As with any Basin Plan amendment involving surface waters, once adopted by the Regional Board, this TMDL will not take effect until it has undergone subsequent agency approvals by the State Water Resources Control Board (SWRCB), the Office of Administrative Law (OAL), and USEPA.

1.0 Introduction

In accordance with Section 303(d) of the Clean Water Act (CWA), the State must identify waterbodies that are not able to meet water quality standards based on available pollution controls. The CWA also requires States to establish a priority ranking for waters on the Section 303(d) list of impaired waters and establish Total Maximum Daily Loads (TMDLs) for such waters. A TMDL represents a strategy for meeting water quality objectives by allocating quantitative limits for point and non-point pollution sources.

The purpose of a TMDL is to attain water quality objectives and restore and protect the beneficial uses of an impaired water body. A TMDL is defined as "the sum of the individual wasteload allocations for point sources and load allocations for nonpoint sources and natural background (40 CFR 130.2) such that the capacity of the water body to assimilate pollutant loadings (i.e., loading capacity) is not exceeded."

The TMDL process begins with the development of a technical TMDL which includes the following 8 components: (1) A **Problem Statement** describing which water quality objectives are not being attained and which beneficial uses are impaired; (2) identification of **Numeric Targets** which will result in attainment of the water quality objectives and protection of beneficial uses; (3) A **Source Assessment** to identify all of the point and nonpoint sources in the watershed and estimate the current pollutant loading from each; (4) a calculation of the maximum **Loading Capacity**, or TMDL, of the waterbody for the pollutant; i.e., the maximum amount of the pollutant that may be discharged to the water body without causing exceedances of water quality objectives and impairment of beneficial uses; (5) a **Linkage Analysis** to confirm that the TMDL, or Loading Capacity, will result in the attainment of the water quality objectives; (6) the division and **Allocation** of the total Loading Capacity amongst each of the contributing sources in the watershed, wasteload allocations (WLA) for point sources and load allocations (LA) for non point sources; (7) a **Margin of Safety** (MOS) to account for uncertainties in the TMDL analysis; and (8) a description of how **Seasonal Variation and Critical Conditions** are accounted for in the TMDL. The document containing the above components is generally referred to as the Technical TMDL Report.

Upon completion of the Technical TMDL, a plan to implement the TMDL is developed along with a plan to monitor the results. The **Implementation Plan** describes the actions needed by each of the point and nonpoint source dischargers in the watershed to meet the load reductions specified in the TMDL and a time schedule for taking such actions. The Implementation Plan also identifies agencies with authority to take pollutant-reducing actions and describes such actions. The purpose of the Monitoring Plan is to assess the effectiveness of the load reduction activities in attaining water quality objectives and restoring beneficial uses.

Once the TMDL and Implementation Plan are completed, the regulatory provisions are incorporated into the *Water Quality Control Plan for the San Diego Basin (9)* (Basin Plan) of the California Regional Water Quality Control Board, San Diego Region (hereinafter, Regional Board) as a Basin Plan amendment. Additional requirements of the basin plan amendment process are the evaluation of economic and environmental considerations. As with any Basin Plan amendment involving surface waters, a TMDL adopted by the Regional Board will not take effect until it has undergone subsequent agency approvals by the State Water Resources Control

Board (SWRCB), the Office of Administrative Law (OAL), and the United States Environmental Protection Agency (USEPA).

TMDLs are not self-implementing; nor are they enforceable simply by incorporation into the Basin Plan. Rather a TMDL must be made enforceable by the Regional Board in one of two ways: (1) the TMDL and load allocations are incorporated into waste discharge requirements, conditional waivers pursuant to California Water Code §13269, or NPDES permits; or (2) a formal prohibition against a particular discharge of waste is established in the Basin Plan. The responsible point and nonpoint source dischargers of the pollutant within the watershed must then implement the TMDL. In other words, each responsible party must take any load reduction actions necessary to comply with its assigned load or wasteload allocation as specified in the TMDL.

2.0 Problem Statement

Nitrate concentrations in Rainbow Creek exceed the water quality objective for municipal supply (MUN) and total nitrogen and total phosphorus concentrations exceed the water quality objective for biostimulatory substances, and threaten to unreasonably impair the water quality necessary for warm freshwater habitat (WARM), cold freshwater habitat (COLD), and wildlife habitat (WILD) beneficial uses of Rainbow Creek. Excessive nutrient levels in Rainbow Creek promote the growth of algae in localized areas, creating a nuisance condition, that unreasonably interferes with aesthetics and contact and non-contact water recreation (REC1, REC2) and threatens to impair WARM, COLD and WILD beneficial uses. Runoff from agriculture, nursery, and residential land uses contribute to increased pollutant nutrients in Rainbow Creek as a result of storm water runoff, irrigation return flows, and ground water contributions to the creek.

2.1 Nutrients and Nutrient Cycling

This section provides information about the nutrients that are discussed in this staff report, how they cycle through the environment, and how they are transported. The term nutrient refers to any organic or inorganic material that is necessary for life. In this staff report, nutrients refer to nitrogen and phosphorus. These nutrients occur naturally in the environment but are also contributed by human activities including, but not limited to, the use of fertilizers and the disposal of waste effluents. These human activities often result in excessive quantities of nutrients reaching freshwater systems. An overload of nutrients can result in an imbalance of the natural cycling processes and can lead to problems ranging from annoyance due to an overabundance of algae and emergent vegetation to human health problems and adverse ecological effects. Excessive nutrients can first promote algal growth followed by a cascade of ecological impacts that ultimately impair benthic invertebrates and fish species. There are several chemical, physical, and biological processes that govern the fate and transport of these nutrients from their sources to a waterbody.

Plants and animals require nitrogen in mineral form such as ammonium ions (NH_4^+) or nitrate ions (NO_3^-) for uptake. Conversion into usable forms, both in the terrestrial and aquatic environments, occurs through the four processes of the nitrogen cycle. Three processes convert gaseous nitrogen into usable chemical forms: biological nitrogen fixation, ammonification, and nitrification. The fourth process, denitrification, converts fixed nitrogen-to-nitrogen gas. Nitrification takes place under aerobic conditions, and denitrification takes place under anaerobic conditions. In the aquatic environment, organisms incorporate available dissolved inorganic nitrogen into plant and algae tissue, binding it as organic nitrogen. Dead organisms decompose, and organically bound nitrogen is released as ammonia ions and then converted to nitrite and nitrate, where the process begins again (USEPA 1999, 2000a).

Rocks and natural phosphate deposits are the main reservoirs of natural phosphorus. Release of these deposits occurs through weathering, leaching, erosion, and mining. Through these processes, phosphate mineral deposits dissolve producing inorganic phosphate ions (PO_4^{3-}), the biologically available form, that can be absorbed by plants from the soil or water. Phosphorus moves through the food web primarily as organic phosphorus, once it has been incorporated into plant or algal tissue. After organisms consume plant matter, phosphate may be released as urine or other waste product excreted by organisms where it may then be reabsorbed by plants or algae

to start another cycle. Additionally, phosphorus readily sorbs to clay particles in the water column and sediments, reducing its availability for uptake by algae, bacteria and macrophytes (USEPA 1999, 2000a). Sorption occurs under aerobic conditions and desorption under anaerobic conditions (Allan 1995).

Both nitrogen and phosphorus are transported to receiving waterbodies from rain, overland runoff, ground water, drainage networks, and industrial and residential waste effluents. Phosphorus, because of its tendency to sorb to soil particles and organic matter, is primarily transported in surface runoff with eroded sediments. Inorganic nitrogen, on the other hand, does not sorb as strongly and can be transported in both particulate and dissolved phases in surface runoff. Dissolved inorganic nitrogen also can be transported through the unsaturated zone and ground water. Phosphorus associated with fine-grained particulate matter also exists in the atmosphere. This sorbed phosphorus can enter natural waters by both dry fall and rainfall. Finally, nutrients can be directly discharged to a waterbody by point and nonpoint discharges such as residential runoff, or untreated wastewater (USEPA 1999, 2000a).

2.2 Watershed Description

Rainbow Creek is a small tributary to the Santa Margarita River located in northern San Diego County, near the community of Fallbrook (Figure A-1 in Appendix A). The Rainbow Creek watershed is designated in the Basin Plan as hydrologic unit subareas (HSAs) 902.22 and 902.23, and encompasses 7,085 acres (Figure A-2 in Appendix A). The watershed is primarily rural, with sixty five percent of the watershed undeveloped. Development within the watershed includes rural residential units (8.7%), agricultural field uses (6.1%), orchards (11.0%), commercial nurseries (4.8%), and a mix of other uses (5%) (MRCD 1999b).

Rainbow Creek headwaters begin in the hilly and sparsely developed area east of Rainbow Valley. The creek traverses the relatively flat Rainbow Valley Basin, located about 1.5 miles west of the headwaters and then enters another sparsely populated area with hilly terrain. Rainbow Creek eventually flows into the Santa Margarita River, approximately eight miles from the headwaters. For the purposes of this staff report, the creek is described as the upper, middle and lower reaches. The upper reaches include the creek and tributaries above Oak Crest sampling station, the middle reaches are the creek and tributaries between Willow Glen-4 and Oak Crest stations, and the lower reaches are the creek and tributaries between Stage Coach and Willow Glen-4 stations.

Rainbow Creek is an intermittent stream and is considered a gaining stream. The geology of Rainbow Valley Basin is much like a bowl, which has a restricted outlet. This condition limits ground water flowing from the basin (Peterson 1989). Ground water surfaces in the creek at the downstream edge of Rainbow Valley, in the vicinity of the Interstate 15 overpass (I-15). Ground water also surfaces in the lower reaches of the creek beginning approximately 1 mile below I-15. Additionally, several tributaries join the creek in the lower reaches of the watershed.

Rainbow Creek runs through the middle of Rainbow Valley and the community of Rainbow. Rainbow is the most developed part of the watershed, containing residential units, commercial and private nurseries, and other agricultural operations. In Rainbow Valley, the majority of the

length of the creek runs through nursery property, currently owned and operated by Hines Nurseries. The creek has been channelized on the nursery property and is currently being used as part of an irrigation water recovery system. Flynn Rainbow Nurseries, a previous owner, originally put in the recovery system as a best management practice (BMP) in 1989 to reduce downstream nursery discharges and to enable recycling of irrigation water.

According to Hines Nurseries, irrigation runoff is discharged directly into Rainbow Creek and one of its tributaries at numerous locations within the boundaries of the nursery site. An earthen dam located in the creek near the point of discharge from the site restricts water from leaving the site during normal operations. The runoff water is stored in the creek and in an adjacent storage pond within the boundaries of the nursery site. The stored runoff water is recycled back into the irrigation system. Periodic exceedances of the system capacity, either by increased storm water runoff or by allowing too much water into the system, causes the discharge of irrigation waters downstream of the nursery (Biernacka 2001).

The streambed has been altered over the years (Summers 2002). The creek has been channelized with un-engineered riprap and much of the riparian vegetation has been removed. The County and the U.S. Army Corps. of Engineers modified the creek, in cooperation with Flynn Rainbow Nurseries, to address flooding concerns raised by a severe flood in 1992. An adjacent nursery removed riparian vegetation and made channel modifications in connection with the construction of a greenhouse. Flynn Rainbow Nurseries made modifications in connection with the installation of the irrigation recycle system. Hines Nursery currently maintains the earthen dam, which is prone to occasional wash out during high storm flows, and performs occasional slope stabilization of the walls of the creek as needed to avoid subsidence problems. The Regional Board has not authorized these modifications to the creek.

Nursery representatives are currently working with the Regional Board to correct the discharge. In a letter dated July 28, 1999 (Taylor), nursery representatives stated their intention to install a new recycle system by mid-2000, once they acquire the land the nursery occupies. The land was successfully acquired on May 24, 2001. The system is expected to capture approximately 90% of the runoff through utilization of a system of canals, pipes and lift pumps, and an above ground storage pond. During storm conditions, storm water will be allowed to enter the creek, but only after a “first flush” (0.5 inches of rain) has been captured in the reservoir (Summers 2002). System installation is expected to take 3 years to complete.

All development in the Rainbow Creek Watershed, except the Oak Crest Mobile Estates and the Rainbow Conservation Camp, use sub-surface sewage disposal systems (e.g., septic tank – leach field disposal systems). Since 1970, the County of San Diego has prohibited the installation of new or replacement septic tank disposal systems in areas of Rainbow Valley impacted by a high ground water table. The prohibition was implemented because the high ground water table prevented systems from being installed in compliance with the requirements at the time (Whitman 1970). In 1989, a ground water evaluation of Rainbow Valley identified that the basin has a historically high ground water table due to the geology, which has been worsened by in-basin use of imported water that provides recharge through irrigation return flows and septic tank disposal tanks, and the lack of ground water production (Peterson 1989). Many of these septic

tank disposal systems have leachfields close to or submerged in the ground water table during all or part of the year (Lambert 2001).

The Oak Crest Mobile Estates utilizes a small wastewater treatment plant with two concrete-lined evaporation ponds. The treatment facility is operated by Oak Crest Estates and Rainbow Municipal Water District and serves 112 residential units. The wastewater is discharged by spray irrigation on an area of about 5 acres. It does not appear that this facility is contributing to the nutrient load of Rainbow Creek (Dorsey 2003a)

The Rainbow Conservation Camp utilizes an onsite sewage treatment and disposal system. The Rainbow Conservation Camp is operated by the Department of Forestry and Fire Protection under Waste Discharge Requirements (Order No. 95-20) and is located near the headwaters of Rainbow Creek. The Camp is a correctional facility that houses a maximum of 111 people. The treatment system consists of a 15,000-gallon septic tank and three evaporation/percolation ponds for disposal. The ponds have earthen fill side slopes, bottoms and containment berms. Evaporation and percolation from the ponds is the primary means of effluent disposal; however, for several days during the year, effluent from the ponds may be pumped to a spray irrigation field covering approximately 2 acres of the facility. The ponds are suspected to not have the proper separation from ground water and/or bedrock and the percolated effluent appears to be surfacing downslope of the ponds toward Rainbow Creek. Effluent from the percolation ponds likely contributes recharge to the shallow ground water table in this area, and could be contributing flow, and therefore, nitrates to Rainbow Creek (Dorsey 2003b).

2.3 Historical Information

Nitrogen and phosphorus loading to Rainbow Creek were not a concern until the 1980's, when agricultural practices used in Rainbow Valley resulted in significant increases of nitrate concentrations in Rainbow Creek (Leedshill-Herkenhoff 1988). Prior to the early 1980s, the concentration in the creek was fairly constant, with an average of 4.4 milligrams of nitrate per liter (mg NO_3/L), which is equivalent to 0.99 mg NO_3-N/L (Table B-1, Appendix B). Total nitrogen is a measure of all forms of nitrogen (i.e., ammonia, nitrite, nitrate, and organic nitrogen). Current nitrate data is also reported as nitrogen (Table B-2, Appendix B).

The historic nitrate concentration steadily increased through the early 1980's, peaking in 1986 with an average concentration of 215.8 mg NO_3/L (48.7 mg NO_3-N/L) and on several occasions in 1985 and 1986, exceeding 300 mg NO_3/L (68 mg NO_3-N/L). These elevated nitrate concentrations exceeded drinking water standards for nitrate of 45 mg NO_3/L (10 mg NO_3-N/L) and threatened drinking water supplies downstream in the Santa Margarita River. Although fieldwork was not conducted to verify actual stream conditions, nutrient concentrations in Rainbow Creek were elevated to a degree that eutrophic conditions were expected to occur in the creek and may also have contributed to known eutrophic conditions in the Santa Margarita Lagoon. Based upon those assumptions and because of the elevated nitrate levels, Rainbow Creek was listed as an impaired waterbody due to eutrophication and given a high priority on the Clean Water Act (CWA), Section 303(d) list in 1996. In 2002, the Regional Board recommended that the impairment listing be modified from the impairment condition of eutrophication to the causal pollutants of nitrogen and phosphorus in the 2002 303(d) List

Update. The State Water Resources Control Board approved the update on February 4, 2003. The U.S. Environmental Protection Agency approved the update on June 6, 2003.

Following the 1996 listing, nitrate concentrations have decreased significantly. The United States Marine Corps Base Camp Pendleton (Camp Pendleton) was concerned that the elevated nitrate concentrations in Rainbow Creek could impact Camp Pendleton's drinking water supplies. To address this concern, the Mission Resource Conservation District (MRCD), in cooperation with Camp Pendleton, investigated the sources of the elevated nitrates in the early 1990's. MRCD conducted two CWA Section 319(h) studies (MRCD 1997a, 1999) to educate homeowners and nurseries regarding nutrient problems in Rainbow Creek and provide them with best management practices to reduce discharges of nitrates. The programs developed by MRCD resulted in significant reductions of nitrate concentrations in Rainbow Creek. Monitoring performed during the latter study period shows the 1998-99 average (12 month average) nitrate concentration was 7.7 mg NO_3/L, or 1.7 mg NO_3-N/L at the Willow Glen-4 Station. This is an approximate 96% reduction from the 1986 average value (MRCD 1999b). Although the MRCD study did not include the reporting of the presence of algae, field investigations conducted by Regional Board staff in July 1999, at the end of the MRCD monitoring period, identified two areas in the lower reaches (downstream of Willow Glen-4) affected by excessive algal growth.

In addition to elevated nitrate concentrations, phosphorus was thought to be elevated (MRCD 1997a). However, no historic data for phosphorus have been found. This conclusion was likely based on the assumption that nutrient sources such as fertilizer use from urban and agricultural sources may also contribute phosphorus, and to the eutrophic conditions observed downstream of Rainbow Creek. In response to this assumption, MRCD collected phosphate data as part of the above referenced studies. The 1999 Report indicated a 12-month average orthophosphate, as phosphorus (PO_4-P), or phosphate, concentration of 0.6 mg PO_4-P/L.

2.4 Water Quality Objectives

The Basin Plan has several water quality objectives that address nutrient concentrations in inland surface waters. The numeric water quality objectives applicable to Rainbow Creek are presented in Table 2-1 below.

Table 2-1. Applicable Water Quality Objectives

Water Quality Objective	Constituent	Established Level[1]
Inorganic Chemicals in Municipal Supply:		
Nitrate	Nitrate, as N	**10 mg NO_3-N/L**
Nitrate + Nitrite	Nitrate + Nitrite, summed as N	10 mg N/L
Nitrite	Nitrite, As N	1 mg NO_2-N/L
Un-Ionized Ammonia	Ammonia, As N	0.025 NH_3-N/L
Biostimulatory Substances	Total Nitrogen	**1.0 mg N/L**
	Total Phosphorus	**0.1 mg P/L**

[1] Levels in bold are addressed by the proposed TMDLs.

The water quality objective for inorganic chemicals in municipal supplies states that nitrate in domestic or municipal supply water should not exceed 10 mg NO_3-N/L, nitrate plus nitrite summed as nitrogen should not exceed 10 mg N/L, and nitrite should not exceed 1 mg NO_2-N/L. This water quality objective is based on the maximum contaminant levels (MCLs) set forth in California Code of Regulations, Title 22. The nitrate and nitrite MCLs are based on human health toxicity in infants and are applicable to surface waters designated as domestic water supplies.

The water quality objective for un-ionized ammonia states that the discharge of wastes is not to result in concentrations of un-ionized ammonia in excess of 0.025 mg N/L. The fraction of ammonia present as un-ionized ammonia depends on temperature and pH. Un-ionized ammonia is toxic to fish and other aquatic organisms. Ammonia data was reported in quantities that were less than the laboratory detection limit of 0.1 NH_4-N/L in Rainbow Creek during the 2000 monitoring period. The data is not adequate to determine if un-ionized ammonia exceeds the water quality objective.

The water quality objective for biostimulatory substances is narrative and addresses tolerance levels for algal and emergent plant growth. It contains numeric goals for total nitrogen and total phosphorus. The biostimulatory substances water quality objective states in part:

> *"Inland surface waters, … shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses."*
>
> *Concentrations of nitrogen and phosphorus, by themselves or in combination with other nutrients, shall be maintained at levels below those which stimulate algae and emergent plant growth. Threshold total phosphorus (P) concentrations shall not exceed 0.05 mg/l in any stream at the point where it enters any standing body of water, nor 0.025 mg/l in any standing body of water. A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/l total P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1 , on a weight to weight basis shall be used.*

The biostimulatory substances water quality objective provides that "*a desired goal for total phosphorus appears to be 0.1 mg/L total P*" in order to prevent plant nuisance in streams and other flowing waters. This 0.1 mg/l total phosphorus value is not to be exceeded more than 10% of the time unless site-specific studies of the waterbody clearly show that water quality objective changes are permissible. Analogous threshold values are not set for nitrogen in the Basin Plan. The biostimulatory substances water quality objective provides that, if data are lacking on the natural ratios of nitrogen to phosphorus (N:P), a weight-to-weight ratio of 10:1 (N:P) shall be used for the determination of an analogous threshold value for total nitrogen of 1.0 mg N/L. The

use of a 10:1 ratio is a reasonable assumption and is supported by Allan (1995) who states that most estimates of the ratio of N:P in freshwaters are above 7:1 (by mass).

The Regional Board uses the 0.1 mg/l goal for phosphorus stated in the Biostimulatory Substances water quality objective as a phosphorus water quality objective unless site specific scientific studies demonstrate that a modified phosphorus objective is appropriate for a particular waterbody. (A modified water quality objective is referred to as a site-specific water quality objective (SSO).) Similarly the Regional Board uses the N:P ratio of 10:1 cited in the in the Biostimulatory Substances water quality objective as a basis for establishing a nitrogen water quality objective of 1.0 mg/l unless site specific scientific studies are conducted to establish a nitrogen site specific water quality objective based on different N:P ratios. SSOs must be approved by the Regional Board and incorporated into the Basin Plan.

USEPA's Recommended Ecoregional Nutrient Criteria

USEPA (2000b) has published recommended nutrient criteria for causal (total nitrogen and total phosphorus) and response (chlorophyll and turbidity) variables associated with the prevention and assessment of eutrophic conditions. The criteria are empirically derived from data in USEPA's STORET database to represent conditions of surface waters that are minimally impacted by human activities and protective of aquatic life and recreational uses. Ideally, USEPA wanted to base these criteria on actual reference conditions. The criteria would have been based on the 75th percentile of reference condition data. However, much of USEPA's data could not be considered to be reference conditions. Consequently, USEPA performed a statistical analysis of the entire body of non-reference data. The 25th percentile of each season (winter, spring, summer, fall) was calculated, and then the median of these four values was calculated. This approach assumes that the lower 25th percentile of all data overlaps with the 75th percentile of reference condition data, so therefore the 25th percentile data can be used to represent reference conditions.

Rainbow Creek watershed is located in subecoregion 6, the southern and central California chaparral and oak woodland of the Xeric West Ecoregion (Ecoregion III). USEPA's recommended criteria for total nitrogen and total phosphorus in streams in this subecoregion are presented in Table 2-2 below.

Table 2-2. USEPA's Recommended Nutrient Criteria for Subecoregion 6, Xeric West Ecoregion

Nutrient Parameter	Recommended Value
Total Nitrogen	0.5 mg N/L
Total Phosphorus	0.03 mg P/L

This Regional Board is mandated to adopt numeric nutrient water quality standards. The Regional Board has the option to adopt USEPA's recommended values or develop alternative criteria based on another scientifically defensible approach in establishing numeric nutrient water

quality objectives for the Region. This Regional Board is participating with the USEPA's Regional Technical Advisory Group (RTAG) and the State and Regional Technical Advisory Group (STRTAG) to develop alternative region-specific criteria. The RTAG is a federal agency advisory body consisting of a subset of federal and state scientists and natural resources managers, university scientists and natural resources specialists, and interest groups (e.g., environmental groups, industry groups). The STRTAG is a subset of the RTAG, which consists of State Board and Regional Board RTAG members. The RTAG/STRTAG have drafted a work plan for criteria development that will use empirical data analysis and watershed modeling analysis. Once region-specific criteria are developed, they will be adopted as water quality objectives through the Basin Plan amendment process. New numeric nutrient water quality objectives may be available by 2007.

Scientific Support of Biostimulatory Substances Water Quality Objective

The numeric goals cited in the biostimulatory substances water quality objective of 1.0 mg N/L and 0.1 mg P/L are consistent with published scientific studies. Using the distribution of nutrient data from more than 1000 temperate streams (primarily located in North America and New Zealand), Dodds et al. (1998) defined the lowest third of the distribution as representing the oligotrophic category, the middle third the mesotrophic category, and the top third the eutrophic category. The cumulative frequency distributions suggest that total nitrogen and total phosphorus levels between 0.7 – 1.5 mg/L and 0.02 – 0.07 mg/L, respectively, define streams that are mesotrophic. Mesotrophic is a trophic state that has moderate concentrations of nutrients and plant growth. Oligotrophic is a trophic state that is deficient in plant nutrients, and does not support the development of extensive aquatic plant and animal communities. Eutrophic waters are characterized by high nutrient concentrations, resulting in high productivity of plant growth. Such waters have algal blooms and periods of oxygen deficiency.

Comparison of the numeric goals with the Dodds et al. (1998) distributions in Figure 2-1, show that total nitrogen is within the mesotrophic range and total phosphorus is near the lower end of the eutrophic range. This indicates that 75% of representative systems have less nutrient enrichment than a stream with 0.1 mg P/L. Presently, nutrient concentrations in Rainbow Creek are both on the plateau of the distribution curve in the eutrophic range.

Figure 2-1. Nutrient Cumulative Frequency Diagrams

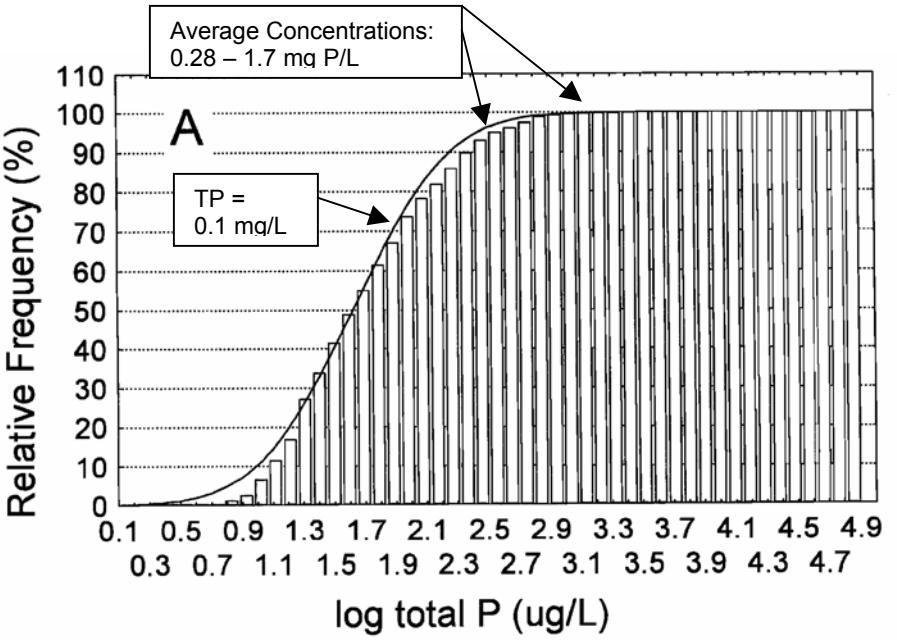

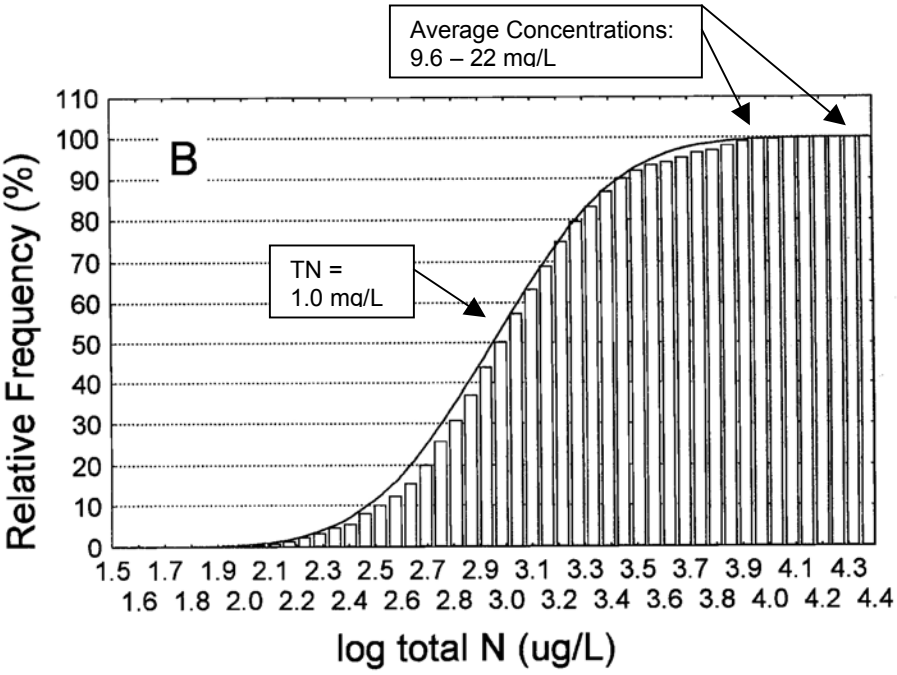

Cumulative frequency diagram of TP (A, n=1366) and TN (B, n=1070) for temperate streams. The line indicates the log-normal distribution. (Dodds et al. 1998)

Allan (1995) reported that natural levels of dissolved inorganic nitrogen (DIN) are around 0.12 mg N/L and orthophosphate are around 0.01 mg PO_4-P/L (0.025 mg P/L for total dissolved phosphate) in minimally impacted small streams in the temperate zone and major rivers of the tropics and subarctic. In another paper, Dodds and Welch (2000) surveyed studies for the purpose of defining potential nutrient criteria that would address the concern of eutrophication. One study showed that total nitrogen should remain below 3 mg N/L and total phosphorus below 0.4 mg P/L for benthic chlorophyll to remain below what is considered to be not aesthetically pleasing or have compromised recreational uses. Levels of total nitrogen of 0.9 mg N/L and total phosphorus of 0.04 mg P/L were recommended based on the study by Dodds et al. (1998). Set at the median of the cumulative frequency distributions of nutrients, these recommended levels assume that approximately half the systems are impaired by excessive nutrients. Another study found that total nitrogen should be 0.47 mg N/L and total phosphorus should be 0.06 mg/L to ensure that chlorophyll is < 100 mg/m^2 most of the time.

Even with the nitrogen reductions made since the 1990s, both nitrogen and phosphorus concentrations in the creek exceed the numeric goals identified in the water quality objective for biostimulatory substances, and the numeric water quality objective of 10 mg NO_3-N/L for nitrate in drinking water. These nutrient concentrations also appear to be contributing to excessive algal and emergent plant growth during certain times of the year. As mentioned above, field investigations conducted by Regional Board staff on the lower reaches of Rainbow Creek (downstream of Willow Glen-4) in July 1999 identified two locations in the creek that were affected by excessive algal growth. The locations were at the Riverhouse monitoring station and at the property located at 2068 Willow Glen Road (2068WG) approximately 500 to 600 ft upstream of Riverhouse. In 2000, these two locations, as well as the Oak Crest and Willow Glen-4 monitoring stations, were determined to be affected by excessive algae growth. The Riverhouse station also exhibited excess emergent plant growth. Appendix C presents pictures illustrating the condition of the creek at these locations.

The University of California Cooperative Extension collected samples from the creek in Fall 2000 for algae identification. The following four green algae species were identified: *Cladophora*, *Enteromorpha*, *Odegonium* and *Chaetophora* (Mellano 2000). The sampling reflected the species that were present on the date of collection and does not reflect seasonal changes in species composition. The concentrations of nutrients are likely contributing to the observed excessive algal and emergent plant growth. There was at most limited or no riparian canopy at the sampled locations, allowing for maximum light availability and water temperature increase. A dense canopy of riparian vegetation exists along much of Rainbow Creek. The canopy can limit the availability of sunlight to aquatic plants, effectively limiting their development. Consequently, despite the presence of elevated nutrient concentrations, excessive quantities of green algae have not been observed to the same degree in the shady areas of Rainbow Creek.

2.5 Monitoring Data for Year 2000

From January through October 2000, Regional Board staff and Hines Nurseries monitored water quality to determine whether nutrient concentrations were still being maintained at 1998-99 levels, whether those levels were effectively limiting excessive algal growth and whether they were adequate for maintaining beneficial uses. The 1998-99 levels reported by the MRCD (MRCD 1999b) were not maintained in 2000 and the presence of algal growth at those levels could not be determined.

The 2000 monitoring data are presented in Table B-2 and a map of the monitoring locations can be found in Figure A-3 (in Appendix A). The monitoring was performed in accordance with protocols described in the respective monitoring plans (SDRWQCB 2000 and Hines Horticulture Inc. 2000).

The following observations are made about the data:

- The average nitrate concentrations were 9.2 mg NO_3-N/L and the average total nitrogen was 11.0 mg N/L between August and October 2000 at the Oak Crest station. Five (5) of nine (9) water samples exceeded the nitrate water quality objective (10 mg NO_3-N/L). All nine water samples exceeded the biostimulatory substances water quality objective for total nitrogen (1.0 mg N/L).

- The average orthophosphate concentration was 0.85 mg PO_4-P/L and the average total phosphorus (organic and inorganic) was 1.13 mg P/L between August and October 2000 at the Oak Crest station. All nine (9) water samples exceeded the biostimulatory substances water quality objective to total phosphorus (0.1 mg P/L).

- The average nitrate concentration was 9.0 mg NO_3-N/L and the average total nitrogen was 9.6 mg N/L from January through October 2000 at the Willow Glen-4 station. Ten (10) of 25 water samples exceeded the nitrate water quality objective during this period. All 25 water samples exceeded the biostimulatory substances water quality objective for total nitrogen.

- The average nitrate concentration at the Willow Glen-4 station was 13.4 mg NO_3-N/L February through July. Ten (10) of 13 water samples exceeded the nitrate water quality objective during this period. Concentrations during this time are assumed to be attributable to polluted runoff and irrigation return flows from orchards, commercial nurseries, and septic tank disposal systems. Erosion events leading to increased turbidity may also be a cause. (See Section 4.0 Source Assessment).

- The average phosphate concentration at the Willow Glen-4 station from January through October 2000 was 0.37 mg PO_4-P/L and the average total phosphorus was 0.43 mg P/L. All 25 water samples exceeded the biostimulatory substances water quality objective for total phosphorus.

- Concentrations of nitrate, total nitrogen, and total phosphorus in the lower reaches, illustrated in Figure A-3 (in Appendix A), exceeded the water quality objective for nitrates in drinking

water throughout the entire sampling period and appear to be influenced by the two tributaries, below the Willow Glen-4 location. The two tributaries, Willow Glen Tributary (WGT1) and Via Milpas Tributary (VMT1), provide natural drainage of irrigation return flows from orchard and residential land uses.

- At the 2068WG station, the average nitrate concentration was 14.1 mg NO_3-N/L and the average total nitrogen was 14.7 mg N/L. The average total phosphorus concentration was 0.29 mg P/L. Twenty-three (23) of 24 water quality samples exceeded the nitrate water quality objective and all samples exceeded the biostimulatory substances water quality objectives for total nitrogen and total phosphorus.

- At the River House station, the average nitrate concentration was 14.2 mg NO_3-N/L and the average total nitrogen was 14.5 mg N/L. The average total phosphorus concentration was 0.28 mg P/L. Twenty-four (24) of 25 water quality samples exceeded the nitrate water quality objective and all samples exceeded the biostimulatory substances water quality objectives for total nitrogen and total phosphorus.

- At Stage Coach station, the average nitrate concentration was 12.9 mg NO_3-N/L and the average total nitrogen was 13.7 mg N/L. The average total phosphorus concentration was 0.3 mg P/L. All nine (9) samples exceeded the nitrate and biostimulatory substances water quality objectives for total nitrogen and total phosphorus.

- At WGT1 station, the average nitrate concentration was 18.4 mg NO_3-N/L and the average total nitrogen was 18.6 mg N/L. The average total phosphorus concentration was 0.17 mg P/L. All nine (9) samples exceeded the nitrate and biostimulatory substances water quality objectives for total nitrogen. Of the nine (9) samples, six (6) total phosphorus samples were below the detection of 0.05 mg P/L, and one (1) sample met and two (2) samples exceeded the biostimulatory substances water quality objectives for total phosphorus.

- At VMT1 station, the average nitrate concentration was 15.0 mg NO_3-N/L and the average total nitrogen was 15.3 mg N/L. The average total phosphorus concentration was 0.16 mg P/L. All nine (9) samples exceeded the nitrate and biostimulatory substances water quality objectives for total nitrogen. Of the nine (9) samples, five (5) total phosphorus samples were below the detection of 0.05 mg P/L, and three (3) samples met and one (1) sample exceeded the biostimulatory substances water quality objectives for total phosphorus.

- Concentrations of both nitrogen and phosphorus appear to fluctuate considerably over the course of the monitoring period and indicate seasonal variation.

2.6 Beneficial Uses

The Basin Plan identifies the beneficial uses of Rainbow Creek. They include contact and non-contact water recreation, municipal, industrial and process supply, and warm water, cold water and wildlife habitats. The beneficial use designations for the Rainbow Creek segments of Santa Margarita River hydrologic area are presented in Table 2-3. The Basin Plan provides detailed descriptions of the various beneficial uses.

Table 2-3. Beneficial Uses for the Rainbow Creek Hydrologic Subareas

HYDROLOGIC AREAS AND SUBAREAS	BENEFICIAL USE																			
	MUN	AGR	IND	PROC	GWR	FRSH	NAV	POW	REC1	REC2	COMM	WARM	COLD	SAL	WILD	RARE	MAR	MIGR	SPWN	SHEL
HA 902.00 – Santa Margarita River																				
HSA 902.22 Rainbow Creek	●	●	●						●	●		●	●		●					
HSA 902.23 Rainbow Creek	●	●	●						●	●		●	●		●					

HA = Hydrologic Area
HSA = Hydrologic Subarea
● = Existing Beneficial Use (Basin Plan, 1994)

Excess nutrients can adversely impact the following beneficial uses: municipal supply (MUN), habitat (WARM, COLD, and WILD) and recreation uses (REC1, REC2). Elevated nitrate concentrations exceed the limits for municipal water supply. Camp Pendleton relies entirely on local ground water resources for its drinking water. Surface waters from the San Mateo, the San Onofre, the Las Flores, and the Santa Margarita River basins recharge the ground water system beneath Camp Pendleton, making municipal supply a concern.

Elevated nutrient concentrations also contribute to excessive algal growth, which can lead to eutrophic conditions. Eutrophic conditions can result in decreased water clarity, loss of aquatic habitat, an increase in pH that can result in the dissociation of ammonium to form un-ionized ammonia, and a decrease in dissolved oxygen (DO) that is detrimental to aquatic life (USEPA 2000a). Water flow, sunlight, and temperature are additional factors, which can either contribute to or limit the development of excessive algal growth even when nutrients are available in sufficient quantities (USEPA 2000a). Eutrophication is the aging process by which a body of water becomes enriched in dissolved nutrients that stimulate the growth of aquatic plant life. Eutrophic conditions are characterized by algal blooms, excessive plant growth, large unsightly algal mats, decomposing plant matter, offensive odors, stagnation and low DO concentrations.

Eutrophic conditions can impact aquatic life and habitat, resulting in a skewed benthic community composition that lacks diversity in aquatic macroinvertebrates (USEPA 2000a). Recreational and aesthetic values include numerous trails that are utilized by hikers, horseback riders and residential development. The development of large unsightly algal mats and offensive odors associated with eutrophic conditions can impact both recreation and habitat-related beneficial uses and can constitute a nuisance. The depletion of DO concentrations and the production of un-ionized ammonia by plant matter decomposition can cause fish kills and other adverse effects on aquatic life; thereby impacting habitat related beneficial uses (USEPA 1999).

While the creek does have several areas susceptible to excessive algal growth during the spring, summer and fall, eutrophic conditions were not observed during the monitoring period. Fish kills or water quality degradation from decomposition of plant matter were also not observed during the monitoring period. This may be due to the shade provided by the riparian canopy of the creek. Shading reduces the temperature of the water and limits the amount of light available for photosynthesis.

On June 4 and 5,1997, Regional Board staff conducted DO monitoring. The study measured temperature and DO concentrations from 1:00 p.m. in the afternoon until 6:00 a.m. the following morning at locations on the Santa Margarita River, Rainbow Creek, Sandia Creek, and De Luz Creek. The purpose was to identify the DO diel cycle (24-hour cycle) and to determine if the concentrations dropped below the DO water quality objective. The study looked at measurements in pool and riffle areas of the stream and in backwater areas with less flow. The monitoring showed concentrations above 5 mg DO/L in flowing waters and concentrations that dipped below 5 mg DO/L in backwater areas. The Basin Plan states that DO shall not be less than 5 mg/L for inland waters designated for warm water beneficial uses. Backwater areas that exhibited low DO were uninhabitable by fish because of dense algal mats or very shallow water. The study found that DO concentrations remained at levels above the DO water quality objective in flowing water, even just before dawn when DO depletion is most likely to occur (SDRWQCB 1997). DO depletion occurs when oxygen is used up through respiration of biological organisms and biodegradation of organic material at a time when it is not being produced through the photosynthesis of algae. This condition is most likely to occur just before sunrise when the absence of sunlight is the longest. At the time of the 1997 monitoring, DO concentrations were not low enough to cause adverse effects on aquatic life. DO is not expected to be depressed below the water quality standard; however, there are no current DO results to support the assumption. Additional DO monitoring will be required in the Implementation Plan.

Rainbow Creek provides habitat to vegetation, birds, fish and wildlife, including amphibians and benthic invertebrates. A survey performed by staff on December 8, 1998 described the creek as having a riparian canopy consisting of sycamores, willows and coast live oaks with an understory of a variety of low scrubs and herbaceous plants (Pardy 1998). Invasive exotic plants were also identified in the survey and included giant reed, castor bean, cockleburr, eucalyptus, palms, iceplant, tree tobacco, and tamarisk. The Least Bell's Vireo (*Vireo bellii pusillus*), a federally and state listed endangered species, is known to inhabit the riparian woodland of the Santa Margarita Watershed (Hunsacker II 1992).

Pardy (1998) also identified the presence of a resident population of arroyo chubs (*Gila orcutti*). These small minnows are omnivorous grazers that feed on algae and other plants as well as on small crustaceans and aquatic insect larvae (Moyle 1976). Arroyo chubs are native to the Santa Margarita River watershed and are listed as a "California Species of Special Concern" by the California Department of Fish and Game (2000b). This listing requires that special consideration be taken in addressing issues to secure long-term viability for the species, with an emphasis on their susceptibility to predation.

Amphibians are known to inhabit the Santa Margarita River (Hunsacker II 1992). Pacific treefrogs (*Hyla regilla*) and California treefrogs (*Hyla cadavarina*) were observed at the Rainbow Glen Tributary monitoring location as well as at locations in the lower reaches of the creek (below Willow Glen-4) during the 2000 monitoring period. Rouse et al. (1999) reviewed a number of studies on the effects of nitrate concentrations on amphibians (primarily tadpoles). Lethal nitrate concentrations for several species were in the range of 13-40 mg NO_3-N/L. Chronic effects occurred at concentrations below 10 mg NO_3-N/L. Lethal effects for fish egg and fry were below 10 mg NO_3-N/L. The paper concluded that it is highly probable that amphibian survival is adversely affected by nitrate levels of 2.5 mg NO_3-N/L and greater. Therefore, aquatic life habitat may be potentially affected by nitrate at current concentrations; however, it is important to recognize that the species tested do not include those present in the creek.

Rainbow Creek has an impaired aquatic insect population, which may be related to its elevated nutrient concentrations. The creek's benthic macroinvertebrate community may be sensitive, in varying degrees, to temperature, DO, sedimentation, scouring, nutrient enrichment and chemical and organic pollution (Giller and Malmqvist 1998, Johnson et al. 1993). Elevated concentrations of nutrients and other pollutants, such as herbicides and pesticides, may cause changes in the aquatic insect community. These changes can include loss of species diversity, loss of pollutant sensitive species, and an increase in pollutant tolerant species (Waters 1995).

Benthic macroinvertebrate surveys conducted in 1991-92 (Hunsaker II 1992) and in 1998-99 (CDFG 2000a) found an abundance of pollutant tolerant insects and a lack of pollutant sensitive insects. Hunsaker II (1992) found that benthic community indicators in Rainbow Creek were poor compared to other tributaries and the Santa Margarita River. The 1998-99 California Department of Fish and Game surveys indicate that Rainbow Creek was "below average" compared to other tributaries in the watershed in both the May 1998 and May 1999 surveys. Low species diversity, an absence of sensitive species, and a skewed benthic community, with one or two functional feeding groups dominating were observed during these two sampling periods. The creek was "average" in both the September 1998 and November 1998 monitoring events, showing improved species diversity and a more well-distributed community structure with four of five functional feeding groups represented, although it continued to show an absence of sensitive species. Shredding insects, which feed mostly on decomposing coarse particulate organic matter, were completely absent from all four sampling events. Their absence is notable because shedders are usually associated with streams that have an intact riparian canopy, such as exists along most of Rainbow Creek.

2.7 Summary

In summary, the nitrate concentration exceeds the water quality objective for municipal water supply (MUN) and total nitrogen and total phosphorus exceed the biostimulatory substances water quality objective. In addition, nitrate, total nitrogen, and total phosphorus may impair warm water (WARM), cold water (COLD), and wildlife (WILD) beneficial uses. Excessive algae also present a nuisance, and impair aesthetic and recreational uses (REC1 and REC2) in localized areas where shading by the riparian canopy is not sufficient to limit algal growth. Excessive algae may also impair warm water (WARM), cold water (COLD), and wildlife (WILD) beneficial uses by creating conditions that are harmful to aquatic life and degrade water quality. Runoff from agriculture, nursery and residential land uses contribute to increased nutrient concentrations in Rainbow Creek as a result of storm water runoff, irrigation return flows and ground water. Existing benthic community impairment is likely a result of nutrient-enriched runoff or other pollutants associated with these same land uses. The proposed TMDLs are intended to improve water quality, restore and protect the beneficial uses of the creek impacted by nutrient enrichment, and prevent the occurrence of future eutrophic conditions.

3.0 Numeric Targets

TMDL Numeric Targets interpret and implement water quality standards (i.e., numeric and narrative water quality objectives and beneficial uses) and are established at levels necessary to achieve water quality standards. Numeric targets are established at levels that will ensure attainment of water quality objectives and the protection of beneficial uses. The numeric targets for nutrients are intended to achieve the numeric water quality objective for nitrates in municipal water supply and ultimately the narrative water quality objective for stimulation of algal and emergent plant growth by nutrients. Water quality objectives are established for nitrates, total nitrogen, and total phosphorus to meet drinking water standards in the short-term, and to reduce existing periodic algal blooms and prevent future eutrophic conditions.

Lacking a quantitative method, ratios of nitrogen to phosphorus (N:P) concentrations are used to indicate which nutrient is limiting. Allan (1995) states that it has been shown that nitrogen and phosphorus occur in algal tissue in a remarkably consistent mole ratio of 16N:1P and that the N:P ratio indicates which nutrient is likely to be the limiting factor in algal growth. For example, ratios higher than the natural ratio of 16:1 indicate a surplus supply of nitrogen and suggest that the availability of phosphorus is more likely to limit algal growth. Conversely, ratios below 16:1 indicate a nitrogen limitation (Allan 1995). Allan (1995) states that joint limitation by both nutrients is likely where N:P ratios are between 10:1 and 20:1. Assuming the N:P ratio of 16:1, or 7:1 by mass, ratios can be calculated from the empirical data presented in Appendix B, Table B-2. Primarily, phosphorus appears to be the limiting nutrient during the spring and summer; however, there are occurrences where nitrogen or both may be limiting. Therefore, targets for both nitrogen and phosphorus are appropriate to provide greater assurance that eutrophic conditions and excessive algal growth are prevented, and beneficial uses are protected. Table 3-1 presents the numeric targets.

Table 3-1. Numeric Targets

Constituent or Factor	TMDL Targets
NITRATE, As N	10 mg NO_3-N/L
TOTAL NITROGEN	1.0 mg N/L
TOTAL PHOSPHORUS	0.1 mg P/L

If the Inorganic Chemicals nitrate and Biostimulatory Substances water quality objectives in Rainbow Creek are modified in the future, then the TMDL will be recalculated and the numeric targets will be set equal to the new water quality objectives.

3.1 Target for Nitrates

The purpose of this target is to meet the water quality objective for nitrates in municipal water sources. The numeric target for nitrates is set at 10 mg NO_3-N/L to ensure that these surface waters are protected as drinking water sources and to assure compliance with the numeric water quality objective at all times.

3.2 Targets for Biostimulatory Substances: Total Nitrogen and Total Phosphorus

The Basin Plan states that inland waters are not to contain concentrations of nitrogen and phosphorus that stimulate aquatic growth to the extent that they cause a nuisance or adversely affect beneficial uses. The targets for total nitrogen and total phosphorus are water quality objectives set forth in the Basin Plan, which are intended to prevent nuisance algae and emergent plant growth in flowing waters. The water quality objectives are 1.0 mg N/L and 0.1 mg P/L, respectively, and are not to be exceeded more than 10% of the time. These targets are established as final endpoints and are to be implemented by incremental load reductions over time. It is fully expected that reductions in nutrient concentrations will result in a reduction of algal biomass and emergent plant growth. The final goal is to eliminate algae-related nuisance and impairment of beneficial uses, and to improve aquatic life beneficial uses. Currently, no site-specific data are available that correlates in-stream nutrient concentrations with abundance of algae. Therefore, monitoring of algal biomass will be included in the monitoring strategy, but is not established as a target at this time.

4.0 Source Assessment

The source assessment phase of TMDL development identifies all known sources of nutrients that may contribute to both elevated nutrient concentrations and the stimulation of algal growth in Rainbow Creek. The source assessment phase also determines nutrient inputs, measured as loads, whose magnitude evaluation supports the formulation of the load allocation and wasteload allocation of the TMDL (USEPA 1999). The following load estimates are determined using the best available methods that were known at the time of calculation, and may be revised in the future. Nutrient sources in the Rainbow Creek watershed are:

- Agricultural fields
- Orchards
- Commercial nurseries
- Residential areas
  - Landscape maintenance
  - Septic tank disposal systems
  - Backyard livestock/pets
- Atmospheric deposition
- Undeveloped land
- Interstate 15

Agricultural fields around Rainbow Creek are largely used to raise row crops, such as pumpkin and aloe. Orchards in the watershed are mostly tree-crop orchards, such as citrus (oranges, lemons, limes) and avocado. Agricultural fields, orchards, and commercial nurseries all contribute nutrients to the watershed by fertilizer application. Residential areas contribute nutrients from septic tank disposal systems, landscape maintenance, and/or backyard livestock (e.g. horses) and pet wastes. Atmospheric deposition contributes nutrients directly to the waterbody through dryfall and rainfall. Undeveloped land contributes nutrients from decaying plant material, soil erosion, air deposition, and wild animal waste. These contributions are small and generally considered to represent background levels.

Nutrients from these sources reach Rainbow Creek primarily by two routes: directly in overland flow (storm water runoff and dry weather flows) and indirectly in ground water. Nutrients applied directly to land (e.g. fertilizers, pet wastes) can be carried overland in storm water runoff and irrigation or can percolate through the soil to reach ground water. Septic tank disposal systems contribute nutrients primarily into ground water.

Nutrient loads from both runoff and ground water have been evaluated for all of the identified nutrient sources in Rainbow Creek. Surface runoff pollutant loads from various land uses were calculated by applying appropriate coefficients from published literature to the corresponding land use areas. Numerous studies have derived land use based loading coefficients characteristic of various watershed conditions for estimating nonpoint source pollutant yields (Boynton et al. 1993). Best professional estimates of probable values for nutrient export coefficients were determined for each pollutant using a hierarchical approach. First, coefficients from a variety of studies and publications were accumulated. From these, values from Southern California watersheds were selected. In the absence of these data, median national values from Boynton et

al. (1993) were selected. Because there are no export coefficients for some land use types (e.g., commercial nursery and park), areas with these land uses were assigned export coefficients for similar land use types (e.g., agriculture and idle land).

Surface runoff pollutant loads from the I-15 corridor resulting from vehicle exhaust and air deposition were estimated based on information provided by Caltrans' Internet Water Quality Planning Tool (Caltrans 2002). Caltrans maintenance operations along the I-15 corridor were evaluated as nutrient sources from roadways and parkway/median maintenance, but were not significant (Tesoro 2001).

Natural or undeveloped lands also contribute surface water loads through natural processes (e.g., leaf litter decay or soil erosion). Background loads were estimated using reference water quality concentration data and streamflow data.

Ground water loads were estimated using both site-specific monitoring data and per-capita septic disposal system nutrient load calculations. Air deposition load was calculated using a literature value deposition rate, which accounts for the amount of nutrients that deposit on the surface of the water. These source-specific load estimates account for the differences in magnitudes between sources and provide a basis for allocating loads in Section 6.0 Margin of Safety and Pollutant Load Allocations.

4.1 Nitrate/Total Nitrogen

4.1.1 Surface Water Loads

Land use, storm water discharges from the I-15 corridor, and natural sources were identified as potential sources of nitrogen to Rainbow Creek. This section provides discussion and estimates of the surface water loads from each of these sources.

Land Uses

Several land uses in the Rainbow Creek watershed were identified as potential sources of nitrogen (see Table 4-1)(MRCD 1999b). Specifically, the land uses of concern are characterized by human influence. Nutrients from these various land use activities can reach Rainbow Creek in storm water and in dry weather runoff.

Nitrogen loads from these land uses were calculated by multiplying the nitrogen export coefficient for the land use by the area. Table 4-1 contains nitrogen export coefficients and the corresponding annual nitrogen loads for the various land uses in the watershed.

Table 4-1. Calculated Annual Total Nitrogen Surface Water Loads to Rainbow Creek from Various Land Uses

Land Use	Nitrogen Export Coefficient kg/ha/yr	Area acres (ha)	Annual Total Nitrogen Load kg/yr
Commercial nurseries	3.7[1]	339 (137)	507
Agricultural fields	3.7[1]	436 (177)	655
Orchards	2.5[2]	781 (316)	790
Park	3.4[3]	5 (2)	7
Residential	2.6[1]	618 (250)	650
Urban	3.8[1]	34 (14)	53
Total		6,591 (2,668)	**2,662**

1. Source: SCCWRP 2000
2. Source: Boynton et al. 1993
3. Source: North Carolina State University 2001

Nutrient export coefficients were obtained from literature values since no site-specific values existed for Rainbow Creek. Efforts were made to select export coefficients that most appropriately represented the land use types in Rainbow Creek, and that best represented the environmental conditions in Southern California.

Caltrans I-15

Rainbow Creek receives storm water runoff from both highway surfaces and adjacent land areas via a storm drain system with outfalls discharging from both the north and south at the Rainbow Creek Bridge. Storm water from highways can contain pollutants from vehicle exhaust and atmospheric deposition. Storm water discharges from I-15 are considered point source discharges.

Rainfall runoff from I-15 can be calculated using the equation provided by Horner (1994):

$$Rv = 0.007\ IMP + 0.10$$

The runoff coefficient (Rv) is the ratio of runoff volume to rainfall volume, or the amount of rainfall that becomes runoff, and IMP is the percent impervious area. The total approximate drainage area is 120 acres, consisting of approximately 23 acres of impervious roadway and median, and 98 acres of vegetated land area (Tesoro 2001). Using the equation and converting the results to percentages, a 19% impervious catchment would deliver 23% in rainfall as runoff to Rainbow Creek.

The average annual rainfall in the vicinity of I-15 in the Rainbow Creek Watershed is 18 inches (Allan 2002). The estimated total annual volume of annual rainfall discharged as storm water runoff to Rainbow Creek is calculated by multiplying the surface area (in acres), amount of

rainfall (in inches/yr), and the percentage of rainfall that would run off of impervious surfaces (23%). The calculation is as follows:

120 acres * 18 in/yr * 43,560 ft^2/acre * 0.08 ft/in = 7.53 E +6 ft^3/yr * 0.23 = 1.73 E +6 ft^3/yr

The estimated storm water runoff load can be calculated using the representative concentrations of total nitrogen in freeway runoff in California (Caltrans 2003 CTSW-RT-03-065, in mg N/L) and volume of runoff discharged to Rainbow Creek (in ft^3/yr).

3.13 mg N/L * 1.73 E +6 ft^3/yr * 28.32 L/ft3 * 1 E –6 kg/mg = 153 kg N/yr

Background

Soil erosion and the decay of plant material and wild animal waste contribute background nitrogen and phosphorus loads from undeveloped land to Rainbow Creek. Available water quality concentrations from local streams similar to Rainbow Creek are used to determine background concentrations. Reference sites are relatively undisturbed by human influences. The definition of a reference condition ranges from a pristine, undisturbed stream, to merely the "best available" or "best attainable" conditions. In the case of the San Diego streams used in this study, least and minimally impacted sites have been identified and used to determine background water quality (See Appendix D).

The background load to Rainbow Creek is calculated by multiplying the representative flow volume (ft^3/yr) determined in Appendix E using United States Geological Survey (USGS) flow gage data and the background concentration (in mg N/L) determined in Appendix D. The flow volume from the first two flow tiers (low and moderate-high) represents approximately 98% of the flows in Rainbow Creek and it is this quantity that is used to represent Rainbow Creek's flow volume. The third, or "very high", flow tier represents less than 2%, thus it will not be used in TMDL calculations because it is due to extreme weather conditions.

Low Flow (0-2.9 cfs)
17,764 e 3 ft^3/yr * 0.47 mg N/L * 28.32 L/ft3 * 1 e –6 kg/mg = 236 kg N/yr

Moderate – High Flow (3 – 39 cfs)
40,775 e 3 ft^3/yr * 0.47 mg N/L * 28.32 L/ft3 * 1 e –6 kg/mg = 543 kg N/yr

Total Nitrogen Load Attributable to Background Sources = 779 kg N/yr

Figure 4-1 shows a visual representation of the percentage of the total nitrogen contribution to the watershed for each of the identified surface water sources.

Figure 4-1. Land Use Contributions to Annual Total Nitrogen Surface Water Loads in Rainbow Creek

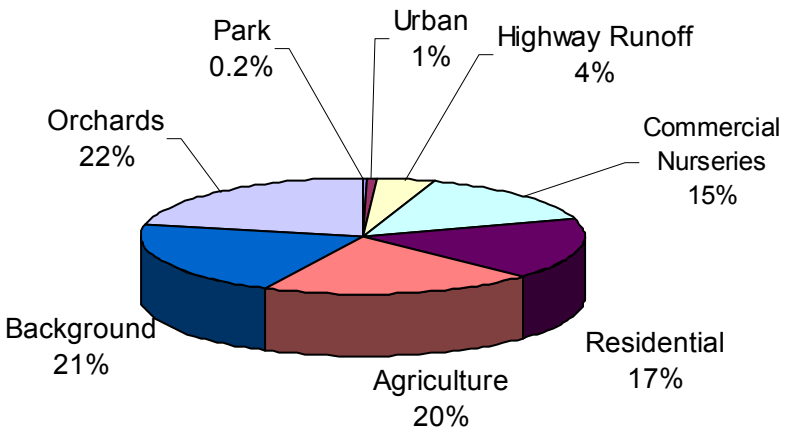

4.1.2 Ground Water Loads

Overview

Ground water that surfaces in Rainbow Creek also contributes to the nitrogen load. Nitrogen in ground water comes from two main sources: wastewater disposal systems and fertilizers that migrate to ground water via infiltration of rain or irrigation water. The total nitrogen load to Rainbow Creek from ground water is estimated to be 200 kg N/yr. This number is calculated using flow and nitrogen concentration data from Rainbow Creek during dry weather conditions.

Two different aquifer types underlie the channels of Rainbow Creek and its tributaries: alluvial deposits in the Rainbow Valley area, and crystalline bedrock everywhere else. The fact that Rainbow Creek is a gaining stream in both the Rainbow Valley area and bedrock areas of the watershed during dry weather conditions indicates that both the alluvial deposits and bedrock contribute baseflow to Rainbow Creek. However, because of the concentration of agricultural operations, population, and therefore septic tank disposal systems and because a high number of these are non-functioning systems, only baseflow discharged from the alluvial deposits is likely to contribute significant loads of nitrogen to Rainbow Creek.

Calculations

The total annual nitrogen load from ground water to Rainbow Creek was calculated using nitrogen concentration and flow data during dry weather conditions from the Oak Crest-3 Station. This station is located near the downstream (western) end of Rainbow Valley, near the point where the alluvial deposits pinch out against the bedrock. During the dry weather it is assumed that the flow measured at Oak Crest-3 Station is from ground water (i.e. baseflow).

Because the creek channel upstream of the Oak Crest-3 Station is dammed by an earthen berm at the Hines Nursery that captures all of the streamflow in the creek, only the baseflow entering the channel of Rainbow Creek below the berm is measured at the Oak Crest-3 Station. Because of this berm and because the baseflow may be higher outside of the dry season, the total nitrogen load calculated using the Oak Crest-3 Station dry season data may underestimate the total ground water load.

Total nitrogen concentrations at Oak Crest-3 Station were averaged for samples taken between August 22 and October 17, 2000 (during low flow conditions). The average total nitrogen concentration was 11 mg N/L. The average flow rate at Oak Crest-3 Station from August 22 to October 17, 2000, was 0.02 cfs (ft^3/s). Assuming the flow at Oak Crest-3 Station is comprised entirely of baseflow during this time period, and assuming that the average flow rate of 0.02 cfs represents the average year-round base flow component of stream flow in Rainbow Creek, the calculated total annual nitrogen load is:

$0.02\ ft^3/s * 11\ mg\ N/L * 28.3185\ L/ft^3 * 3{,}600\ s/hr * 24\ hr/d * 365\ d/yr * kg/10^6\ mg \approx 200\ kg\ N/yr$

<u>Nitrogen Sources</u>

The total annual nitrogen load to ground water in Rainbow Creek watershed has two possible sources: waste water disposal systems and fertilizer application in agricultural areas. Data on fertilizer application rates, volumes of applied water, and consumptive use of water and nitrogen uptake by plants in agricultural areas are not available, thus, the annual nitrogen load to ground water from fertilizer application could not be calculated. Total nitrogen contributions to ground water from fertilizer application will be evaluated further under the Implementation Plan and Monitoring Strategy.

The total annual nitrogen load to ground water from wastewater systems in the watershed is estimated to be 3,830 kg N/yr. The estimate does not account for plant uptake removal. With few exceptions, all wastewater disposal systems in the watershed are septic tank systems. For San Diego County, the estimated mass nitrogen loading from a typical septic tank system is 10.4 g/capita/day (San Diego County 1994). The estimated number of functioning septic tank systems in the watershed is roughly 237 units and the average number of people per household (and per septic tank disposal system) is 2.91 (Van Rhyn 2001). The estimated number of non-functioning septic tank disposal systems, defined as systems that are a threat to water quality because they are located in areas of high ground water, is 170 units (Rainbow Municipal Water District 2002). The total annual nitrogen load to ground water from functioning septic tank systems in the watershed therefore would be:

$10.4\ g/capita/day * 237\ units * 2.91\ capita/unit * 365\ days/yr * 1\ e{-3}\ kg/g \approx 2{,}600\ kg\ N/yr$

This nitrogen load should be reduced by denitrification in the leach fields of a functioning system. Typically, denitrification in the leach field removes 30 percent of the total nitrogen by loss to the atmosphere as nitrogen gas (N_2) (Oakley 1999). Therefore, the nitrogen load to ground water from the functioning leach fields would be 1,800 kg N/yr.

Because the non-functioning systems do not have adequate separation from ground water to allow denitrification to occur, a reasonable assumption is that all of the nitrogen from a septic tank system discharge reaches ground water and the 30 percent reduction does not occur. Therefore, the total annual nitrogen load to ground water from non-functioning septic tank systems in the watershed would be:

10.4 g/capita/day * 170 units * 2.91 capita/unit * 365 days/yr * 1 E –3 kg/g ≈ 1,900 kg N/yr

The total nitrogen load to ground water from septic tank system leach fields would be the sum of the functioning and nonfunctioning septic tank system loads, or 3,700 kg N/yr.

In addition to the small septic systems in the watershed, the Rainbow Conservation Camp, identified as "prison" on Figure A-2, is located in the eastern end of the watershed and has evaporation/percolation ponds that contribute nitrogen to the ground water and may be contributing nitrogen to Rainbow Creek. Wastewater from the camp is discharged to the onsite sewage treatment and disposal system. The treatment system effluent is transferred to one of three evaporation/percolation ponds. Evaporation and percolation from the ponds is the primary means of effluent disposal; however, for several days during the year, effluent from the ponds may be pumped to a spray irrigation field located on approximately 2 acres of the facility.

The estimated nitrogen load to ground water is calculated using the average pond inflow minus evaporation losses, which is then multiplied by the average pond concentrations. Since the waste discharge requirements (WDRs) for the facility only require annual monitoring, the wastewater nitrogen concentration value was averaged from data provided for the years 2000 to the present. The evaporation losses were estimated using the same approach required by the Camp's WDRs. However, the calculation was revised to account for only one pond instead of two, due to that fact that only one pond is operating at any given time. This approach used surface area of the ponds and the average mean evaporation rate reported from the USGS Vail Lake Station by the California Department of Water Resources (CDWR 1979). The annual nitrogen load from the percolation ponds to ground water is as follows (Dorsey 2003b):

(11,353,529 L inflow/yr – 3,400,962 L evap./yr) * 16.5 mg N/L * 1 E –6 kg/mg ≈ 130 kg N/yr

Implementation measures will be taken to determine the impacts of the Camp treatment system on Rainbow Creek.

The estimated total annual nitrogen load to ground water from wastewater disposal systems is the sum of the annual nitrogen load from functioning septic systems, non-functioning septic systems, and the Camp treatment system, or 3,830 kg N/yr. The total nitrogen load to Rainbow Creek from ground water was calculated to be 200 kg N/yr. A comparison of these two numbers suggest that only a small fraction of the total annual nitrogen load to ground water is discharged to Rainbow Creek each year. In addition to discharge to the creek, some of the nitrogen load will be removed through plant uptake. Site-specific uptake rates are not known. The actual removal rates will vary seasonally, with higher removal rates occurring in the spring and summer months, but an annual average removal rate for nitrogen will be accounted for when site-specific uptake rates are determined. Nonetheless, the plant uptake of nitrogen from ground water and the

discharge of nitrogen laden ground water to the creek is not expected to be high enough to prevent nitrogen concentrations in ground water from rising over time because of the high annual nitrogen load to ground water from the disposal systems. Consequently, the nitrogen concentration in the ground water that discharges into Rainbow Creek may increase over time, increasing the total annual nitrogen load from ground water to Rainbow Creek over time.

4.1.3 Atmospheric Deposition

Air pollutants are deposited to the earth, in most cases directly to a water body or to a land area that drains into a water body. These pollutants are deposited by wet or dry deposition. In wet deposition, pollutants are removed from the air by a precipitation event such as rain. Dry deposition occurs when particles settle out of the air and onto surfaces. Total nitrogen loads from atmospheric deposition are most significant in large lakes or reservoirs when the waterbody is large compared to the total watershed area (USEPA 1999). In the Rainbow Creek watershed, nutrient loads from atmospheric deposition are not likely to be significant as compared to other sources, because the surface area of the creek is small compared to the area of the watershed. Atmospheric deposition is calculated using water surface area only, since total nitrogen depositions on land are included in the nutrient export coefficients. Atmospheric deposition loads to Rainbow Creek were estimated using established atmospheric deposition rates.

The length of the creek, including tributaries, is approximately 15 miles, and the average width of the creek is approximately 5 feet. The surface area of the creek is approximately 0.01 square miles, or 4 hectares. With an atmospheric deposition rate of 10 kg N/ha/yr (USEPA 1994), the load from air deposition would be approximately 40 kg N/yr.

4.1.4 Summary of Current Annual Total Nitrogen Load by Source

The annual load based on the calculations from the identified sources described in this section is 3,868 kg N/yr, and is summarized below in Table 4-2.

Table 4-2. Summary of Annual Total Nitrogen Load by Source Type in Rainbow Creek Watershed

Source Type	Annual Total Nitrogen Load Estimate kg N/yr
Land Uses (surface runoff)	2,662
Caltrans I-15 (storm water runoff)	153
Background (surface runoff)	779
Septic Tank Disposal Systems (ground water)	200
Air Deposition (surface water)	40
Total	3,834

Figure 4-2 shows the percentage of total nitrogen load contributions to the Rainbow Creek watershed from the five sources listed in Table 4-2.

Figure 4-2. Annual Total Nitrogen Load by Source Type in the Rainbow Creek Watershed

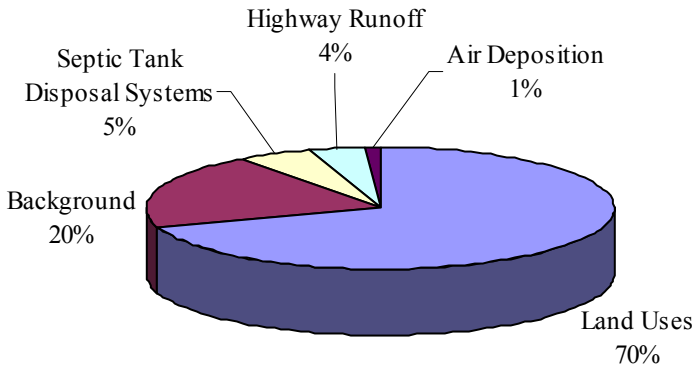

4.2 Total Phosphorus

4.2.1 Surface Water Flows

Land use, storm water discharges from I-15, and natural sources were identified as potential sources of phosphorus to Rainbow Creek. This section provides discussion and estimates of the surface water loads from each of these sources.

Land Uses

It is assumed that the sources of total phosphorus in runoff from various land uses are the same as those identified for total nitrogen. To estimate total phosphorus loads from different land uses, phosphorus export coefficients can be used. Land uses in the Rainbow Creek watershed identified as potential sources of phosphorus are listed in Table 4-3, with corresponding export coefficients and annual loads.

Table 4-3. Calculated Annual Total Phosphorus Loads to Rainbow Creek from Various Land Uses

Land Use	Phosphorus Export Coefficient kg/ha/yr	Area Acres (ha)	Annual Total Phosphorus Load kg P/yr
Commercial nurseries	0.2[1]	339 (137)	27.4
Agricultural fields	0.2[1]	436 (177)	35.4
Orchards	0.2[2]	781 (316)	63.2
Park	0.1[3]	5 (2)	0.2
Residential areas	0.5[1]	618 (250)	125
Urban areas	0.8[1]	34 (14)	11.2
Land Uses Total		6,591 (2,668)	**262**[4]

1. Source: SCCWRP 2000
2. Source: Boynton et al. 1993
3. Source: North Carolina State University 2001
4. Rounded to three significant figures

Caltrans I-15

As with nitrogen, the estimated storm water runoff load is calculated using the representative concentration of total phosphorus in freeway runoff in California (Caltrans 2003 CTSW-RT-03-065) and the volume of runoff discharged to Rainbow Creek (see Section 4.1.1 for calculation).

0.29 mg P/L * 1.7 E +6 cfs/yr * 28.32 L/ft3 * 1 E –6 kg/mg = 14 kg P/yr

Background

Soil erosion and the decay of plant material and wild animal waste contribute background nitrogen and phosphorus loads from undeveloped land to Rainbow Creek. Available water quality concentrations from local streams similar to Rainbow Creek are used to determine background concentrations. Reference sites are relatively undisturbed by human influences. The definition of a reference condition ranges from a pristine, undisturbed stream, to merely the "best available" or "best attainable" conditions. In the case of the San Diego streams used in this study, least and minimally impacted sites have been identified and used to determine background water quality (See Appendix D).

As with nitrogen, the background load for phosphorus to Rainbow Creek is calculated by multiplying the representative flow volume (tiers 1 and 2, in ft^3/yr) determined in Appendix E using USGS flow gage data and the background concentration (in mg P/L) determined in Appendix D.

Low Flow (0-2.9 cfs)

17,764 e 3 ft^3/yr * 0.07 mg P/L * 28.32 L/ft3 * 1 e –6 kg/mg = 35 kg P/yr

Moderate – High Flow (3 – 39 cfs)

40,775 e 3 ft^3/yr * 0.07 mg P/L * 28.32 L/ft3 * 1 e –6 kg/mg = 81 kg P/yr

Total Phosphorus Load Attributable to Background Sources = 116 kg P/yr

Figure 4-3 is a visual representation of the percentage of the total phosphorus contribution to the watershed for each of the identified land uses.

Figure 4-3. Land Use Contributions to Annual Total Phosphorus Surface Water Loads in the Rainbow Creek Watershed

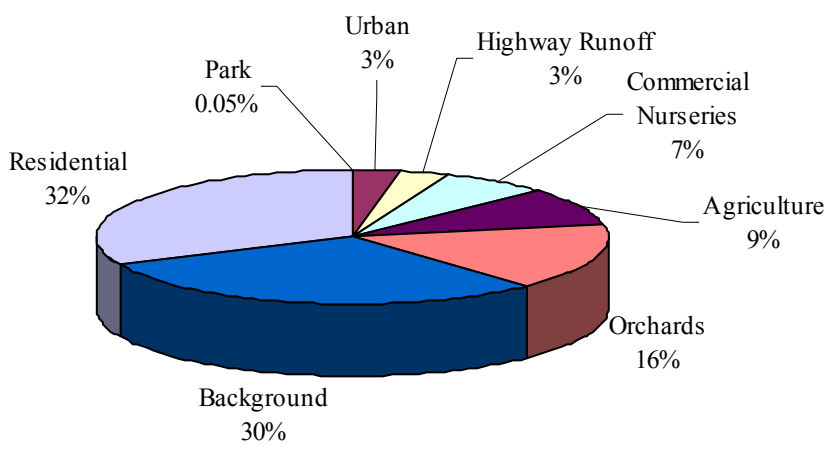

Total phosphorus can be released into the surface water from sediment. Total phosphorus releases from sediment in Rainbow Creek are not known at this time. They will be determined during the implementation phase.

4.2.2 Ground Water Loads

Septic tank disposal systems are not considered to be significant total phosphorus sources in ground water. Phosphates readily adsorb to soil particles; consequently, phosphates do not travel far with ground water. Existing data for total phosphorus concentrations in soil below leach fields demonstrate this phenomenon. Phosphate concentrations 1 ft below a leach field were 10 mg P/L, while at 3 ft below the leach field they were 1 mg P/L (Oakley 1999). Infiltration of phosphate from land applications is not considered significant for the same reason. Therefore, ground water loads of total phosphorus are not considered significant in Rainbow Creek. Total phosphorus contributions to ground water from septic tank disposal systems will be further investigated and is discussed in the Implementation Plan and Monitoring Strategy.

4.2.3 Atmospheric Deposition

Atmospheric phosphorus can be found in both organic and inorganic dust particles. Particles of organic origin, such as pollen, will contain phosphorus, as do all living organisms. Mineral dust will contain varying levels of phosphorus depending on its source. The general atmospheric deposition rate for total phosphorus is 0.6 kg P/ha/yr (USEPA 1994). With a creek surface area of 4 hectares, this source would contribute approximately 2 kg/year.

4.2.4 Summary of Current Annual Total Phosphorus Load by Source

The current annual load based on the calculations from the identified sources described in this section is 393 kg P/yr, and is summarized below in Table 4-4.

Table 4-4. Summary of Annual Total Phosphorus Load by Source Type in Rainbow Creek Watershed

Source Type	Annual Total Phosphorus Load Estimate (kg P/yr)
Land Uses (surface runoff)	262
Caltrans I-15 (storm water runoff)	14
Background (surface runoff)	116
Septic Tank Disposal Systems (Ground water)	0
Air Deposition (surface water)	2
Total	**394**

Figure 4-4. Annual Total Phosphorus Load by Source Type in the Rainbow Creek Watershed

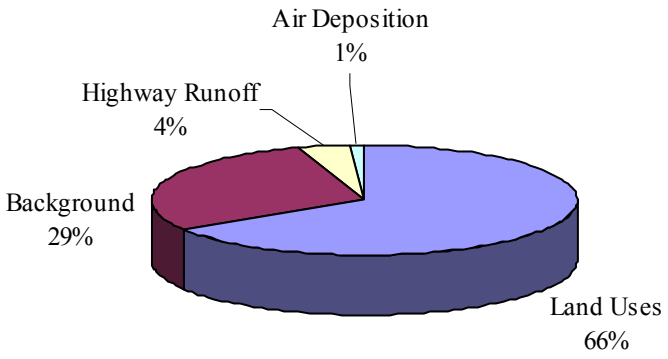

5.0 Loading Capacity and Linkage Analysis

The Linkage Analysis describes the relationship between the numeric target and the allowable pollutant-level by determining the waterbody's total assimilative capacity, or loading capacity, for the pollutant. The loading capacity is the maximum amount of pollutant loading that a waterbody can receive while meeting its water quality objectives. The Linkage Analysis therefore represents the critical quantitative link between the TMDL and attainment of the water quality standards.

The proposed TMDLs will result in the attainment of the Biostimulatory Substances water quality objective and the restoration of beneficial uses in Rainbow Creek watershed. This is because the numeric targets are set equal to the nutrient water quality objectives as concentrations of nutrients that will prevent plant nuisance in flowing waters. The numeric targets are used directly to calculate the loading capacity (TMDLs).

If the Biostimulatory Substances water quality objectives change in the future, the numeric targets would be equal to the new water quality objectives, and a new loading capacity would be calculated to meet the new numeric targets.

5.1 Total Nitrogen

For Rainbow Creek, the total nitrogen loading capacity is the maximum amount of total nitrogen that can enter the water column without exceeding the numeric target, in this case the biostimulatory target. The Regional Board reviewed daily streamflow-gage data from the U.S. Geological Survey's gaging station located near the Willow Glen-4 station for the period of November 11, 1989 to September 30, 2000 for Rainbow Creek and selected daily flow records from 8 years of records (USGS 2002). The daily streamflow data was evaluated for seasonal flow variations and to determine the annual flow volume for Rainbow Creek (See Appendix E).

The flow data was divided into three flow tiers, which were determined based on frequency of flow rates and consideration of the time of year of occurrence. The first two flow tiers (low and moderate-high) represent approximately 98% of the flows in Rainbow Creek and will be used to calculate the TMDL. The third, or "very high", flow tier represents less than 2% of the total flow and will not be used in the TMDL calculation because it is due to extreme weather conditions. It is believed that very high flows would produce a mass load with a short residence time that would not create a nutrient-related problem within the watershed. In other words, compliance with the TMDL is required during flows with a magnitude of less than 40 cfs.

The annual total nitrogen loading capacity is determined by multiplying the flow volume (in ft^3/yr) and the water quality concentration (in mg N/L) that will allow the creek to attain water quality standards. The loading capacity is as follows:

Low Flow (0-2.9 cfs)
17,764 e 3 ft^3/yr * 1 mg N/L * 28.32 L/ft3 * 1 e –6 kg/mg = 503 kg N/yr

Moderate – High Flow (3 – 39 cfs)
40,775 e 3 ft^3/yr * 1 mg N/L * 28.32 L/ft3 * 1 e –6 kg/mg = 1,155 kg N/yr

Total Annual Loading Capacity = 1,658 kg N/yr

5.2 Total Phosphorus

Using the same approach as for total nitrogen, the annual flow volume for the low and moderate-high flow tiers and the biostimulatory numeric target of 0.1 mg P/L are used to calculate the total phosphorus loads for Rainbow Creek. The annual total phosphorus loading capacity is presented below:

Low Flow (0-2.9 cfs)
17,764 e 3 ft^3/yr * 0.1 mg P/L * 28.32 L/ft3 * 1 e –6 kg/mg = 50 kg P/yr

Moderate – High Flow (3 – 39 cfs)
40,775 e 3 ft^3/yr * 0.1 mg P/L * 28.32 L/ft3 * 1 e –6 kg/mg = 115 kg P/yr

Total Annual Loading Capacity = 165 kg P/yr

Table 5-1 summarizes the initial loading capacities of Rainbow Creek for total nitrogen and total phosphorus.

Table 5-1. Rainbow Creek Loading Capacities for Total Nitrogen and Total Phosphorus

Numeric Target	Load Capacity	
	kg/yr	lbs/yr
Total Nitrogen	1,658	3,648
Total Phosphorus	165	365

For convenience, the initial load capacity has been provided in the units of kilograms per year and pounds per year.

6.0 Margin of Safety and Pollutant Load Allocations

A TMDL is less than or equivalent to the loading capacity after taking into account the allocations for all sources and a margin of safety. A TMDL can be divided into a wasteload allocation (WLA) for point sources subject to an NPDES permit, and a load allocation (LA) for all other sources including nonpoint and natural background. Presently, only one point source was found to be a contributing source, e.g., Caltrans. Additionally, 2% of the TMDLs will be set aside to account for unknown or future point sources. If, in the future, a source that is considered a nonpoint source in this document becomes a point source (i.e., a permitted discharge), then the portion of the load allocation that is associated with that source can be become a WLA. The TMDL must also contain an explicit and/or implicit margin of safety (MOS), which accounts for unknowns and uncertainties in the analysis. The TMDL is represented by the following equation:

$$TMDL = \sum(WLA) + \sum(LA) + MOS$$

6.1 Margin of Safety

TMDLs are required to include an MOS that accounts for limitations in the accuracy of the modeling used to develop the TMDL and for the uncertainty in the relationship between pollutant loads and receiving water quality. The MOS can be expressed either implicitly or explicitly. An implicit MOS is incorporated through making conservative assumptions in the TMDL analysis. An explicit MOS can be applied by reserving a portion of the TMDL and not allocating it to any other sources. These nutrient TMDLs utilize both an implicit and an explicit MOS. An explicit MOS of 5% is reserved to account for uncertainties. An implicit MOS has been incorporated through conservative assumptions in the analysis by treating nutrients as conservative pollutants (i.e., did not consider nutrient cycling within the environment).

If the water quality objectives for Biostimulatory Substances change in the future, then the TMDL would be recalculated and the new explicit MOS would be equal to 5 percent of the recalculated loading capacity.

Uncertainties in the source analysis and linkage analysis of the total nitrogen and total phosphorus TMDLs are:

For total nitrogen:

- Actual site-specific nutrient export coefficients and air deposition rates
- Actual condition and maintenance status of septic tank disposal systems
- Actual effect of rising ground water table on septic tank disposal systems
- Actual contribution of nutrients from the Conservation Camp percolation ponds to surface water
- Actual data on ground water contributions to surface water
- Actual loading of nutrients to ground water from irrigation
- The relationship between nutrient loads and corresponding creek concentrations
- Future watershed development

For total phosphorus:

- Actual site-specific nutrient export coefficients and air deposition rates
- Actual loading from overland surface runoff during storm events
- Actual loading from stream sediment
- The relationship between nutrient loads and creek concentrations
- Future watershed development

6.2 Total Nitrogen Load Allocations

The Linkage Analysis (see Table 5-1) determined that the allowable total nitrogen mass load in Rainbow Creek is 1,658 kg N/year.

In determining the load allocations for the total nitrogen TMDL, the allowable pollutant load of 1,658 kg N/yr is divided between the MOS, background, point and nonpoint source discharges. As described above, an explicit MOS of 5% is reserved to account for uncertainties. The MOS is 83 kg N for the year.

For the purposes of this TMDL, background total nitrogen loads are subtracted separately from the load allocations. Background loads of nitrogen occur naturally through decaying plant material (such as leaf litter), soil erosion, and wild animal waste. The background load was determined in Section 4.1.1 to be 779 kg N/yr and is based on the San Diego reference stream concentration and Rainbow Creek annual flow.

Based on available information, highway runoff is the only identified point source of total nitrogen to Rainbow Creek. Using the same method as used in Section 4.1.1 to calculate the load from highway runoff, the wasteload allocation is determined to be 49 kg N/yr if Caltrans' discharge is at the water quality standard of 1.0 mg N/L. In addition, 2% of the TMDL, or 33 kg N/L, will be set aside as a placeholder for unknown or future point sources. The total wasteload allocation (WLA) for the creek is 82 kg N/yr. The remaining allocation for nonpoint sources (LAs) is therefore:

Total Maximum Daily Load – Margin of Safety – Background Load – Point Source Allocation = Remaining Allocation for Nonpoint Sources

1,658 kg N/yr – 83 kg N/yr – 779 kg N/yr – 82 kg N/yr = 714 kg N/yr

The total LAs do not include an allocation for undeveloped land or preserve, because they are considered as part of background loads.

In summary, the nitrogen TMDL equation is:

TMDL = ∑(WLA) + ∑(LA) + Background + MOS

∑ WLA	82 kg N/yr
∑ LA	714 kg N/yr
Background	779 kg N/yr
MOS	83 kg N/yr
TMDL	1,658 kg N/yr

The allocations to the various sources are shown in Table 6-1, below. Appendix F provides additional information, which is summarized here:

1. The largest contributors to the current load are required to make the largest reductions. Commercial nurseries, agricultural fields, orchards, residential, and septic tanks are required to make a 77% reduction

2. Parks and urban areas are required to make a 50% reduction since their relative contribution is very small, less than 2% of the current load.

3. The Caltrans allocation, as discussed above, is based on multiplying their estimated discharge times the numeric target of 1.0 mg N/L.

4. Air deposition on the water surface receives no reduction because it is least practical to achieve.

5. Future point sources are allocated 33 kg N per year.

Table 6-1 lists the load allocations for the identified point and nonpoint nitrogen sources. For convenience to the reader, the allocations are provided in the units of kilograms per year and pounds per year.

Table 6-1. Total Nitrogen Wasteload and Load Allocations for Rainbow Creek Nitrogen TMDL

Source	Current Annual Load kg N/yr	Reduction %	Annual Load Allocations	
			kg N/yr	lbs. N/yr
Caltrans highway runoff	153	68	49	108
Unidentified and future point source discharge			33	72
	Point Source (WLA) Subtotal		**82**	**180**
Commercial nurseries	507	77	116	255
Agricultural fields	655	77	151	332
Orchards	790	77	182	400
Park	7	50	3	7
Residential areas	650	77	149	328
Urban areas	53	50	27	60
Septic tank disposal systems	200	77	46	101
Air deposition	40	0	40	88
	Non-Point Source (LA) Subtotal		**714**	**1,571**
Total	**3,055**	**74**	**796**	**1,751**

6.3 Total Phosphorus Load Allocations

The Linkage Analysis (Table 5-1) determined that the total phosphorus mass loading capacity of Rainbow Creek required to attain the biostimulatory numeric target is 165 kg P/yr.

In determining the load allocations for the total phosphorus TMDL, the allowable pollutant load of 165 kg P/yr is divided between MOS, background, point and nonpoint source discharges. As described above, a 5% MOS is set aside to account for uncertainties. The MOS is 8 kg P/yr.

For the purposes of this TMDL, background total phosphorus sources are subtracted separately from the load allocations. The background load was determined in Section 4.2.1 to be 116 kg P/yr and is based on San Diego reference stream concentration for total phosphorus and Rainbow Creek annual flow.

Based on available information, highway runoff is the only identified total phosphorus point sources to Rainbow Creek. Using the same method as used in Section 4.2.1 to calculate the load from highway runoff, the wasteload allocation is determined to be 5 kg P/yr if Caltrans' discharge is at the water quality standard of 0.1 mg P/L. In addition, 2% of the TMDL, or 3 kg

P/L, will be set aside as a placeholder for unknown or future point sources. The total wasteload allocation (WLA) for the creek is 8 kg P/yr. The remaining allocations for nonpoint sources (LAs) are therefore:

Total Maximum Daily Load – Margin of Safety – Background Load – Point Source Allocation = Remaining Allocation for Nonpoint Sources

165 kg P/yr – 8 kg P/yr – 116 kg P/yr – 8 kg P/yr = 33 kg P/yr

These total LAs do not include an allocation for undeveloped land or preserve, since they are considered as part of background loads.

In summary, the phosphorus TMDL equation is:

TMDL = ∑(WLA) + ∑(LA) + Background + MOS

∑ WLA	8 kg P/yr
∑ LA	33 kg P/yr
Background	116 kg P/yr
MOS	8 kg P/yr
TMDL	165 kg P/yr

The allocation to the various sources are presented in Table 6-2 and are based on the following (Appendix F provides additional information):

1. The largest contributors to the current load are required to make the largest reductions. Commercial nurseries, agricultural fields, orchards, and residential are required to make a 90% reduction.

2. Parks and urban areas are required to make a 50% reduction since their relative contribution is very small, less than 3% of the current load.

3. The Caltrans allocation, as discussed above, is based on multiplying their estimated discharge times the numeric target of 0.1 mg P/L.

4. Air deposition on the water surface receives no reduction because it is least practical to achieve.

5. Future point sources are allocated 3 kg P per year.

Table 6-2 lists the load allocations for the identified point and nonpoint total phosphorus sources. For convenience to the reader, the allocations are provided in the units of kilograms per year and pounds per year.

Table 6-2. Total Phosphorus Wasteload and Load Allocations for Rainbow Creek Phosphorus TMDL

Source	Current Annual Load Kg P/yr	Reduction %	Annual Load Allocations	
			Kg P/yr	lbs. P/yr
Caltrans highway runoff	14	64	5	11
Unidentified and future point source discharge			3	7
	Point Source (WLA) Subtotal		**8**	**18**
Commercial nurseries	27.4	90	3	7
Agricultural fields	35.4	90	4	9
Orchards	63	90	6	13
Park	0.2	50	0.1	0.2
Residential areas	125	90	12	26
Urban areas	11	50	6	13
Air deposition	2	0	2	4
	Non-Point Source (LA) Subtotal		**33.1**	**73**
Total	**279**	**85**	**41.1**	**91**

7.0 Seasonal Variations and Critical Conditions

Defining and calculating the TMDLs using site-specific flow data addresses seasonal variation. Stream flow data includes the variability of discharge rates and receiving water flows. It assumes that the higher flows during the winter months will provide a shorter residence time. Summer is the critical time period for eutrophic conditions because of available nutrients, low flows, warmer temperatures, and longer daylight hours. The loads are expected to be protective of beneficial uses because the TMDLs are based on the water quality objective.

There are essentially two weather seasons in Southern California, a dry season, which makes up most of the year and intermittent wet weather events that primarily occur between November and March, and averaging about 16 inches annually for inland North County (Escondido)(WRCC 2003). The Fallbrook area has a temperate climate with the warmest daytime temperatures (> 90°F) occurring in August and September and the coolest daytime temperatures (< 60°F) occurring between November and March. Winter is the least critical time of year for algal growth because its growth is limited as a result of cooler temperatures, less available light, and generally higher flows. Field surveys performed in December 1999 and January 2000 did not find algae in excessive quantities.

Although late summer is the critical time period for the development of eutrophic conditions, the critical time period for algal growth begins much earlier. Algal growth, illustrated in a sample of photographs presented in Appendix C (additional photographs are available in the Administrative Record), begins flourishing in February, is well established by May, and is present through the summer months. Emergent plants and additional localized algal blooms were found to be present in June, and continue to grow into October. When optimum conditions of adequate light, stream flow, water temperature and substrate exist, adequate nutrient quantities are needed for algal growth. Figure 7-1 shows the nitrate concentrations (Appendix B, Table B-2) at monitoring locations on Rainbow Creek and its tributaries (see Appendix A, Figure A-3 for map). Data in Figure 7-1 reveals the impact of land uses on nitrate nitrogen concentrations in the creek. Jubilee and RGT1 are both mostly surrounded by vacant lands, and are less impacted by irrigated fields and orchards. Levels at these sites are relatively low. Concentrations at Oak Crest Mobile Estates range from 1.2 to 17 mg NO_3-N/L. In the lower reaches of the creek, below Willow Glen-4, nitrate levels are above 10 mg NO_3-N/L in February, and average 14 mg NO_3-N/L through mid-October. WGT1 and VMT1 receive orchard drainage and nitrate levels are quite high. Riverhouse and Stagecoach are similarly heavily impacted by orchards. Riverhouse levels are high year round, possibly a result of tributary effects and orchard input. Willow Glen-4 has seasonally elevated winter concentrations, followed by a reduction in the late summer months. This is possibly because of lower flows, and assimilation during the longer flow through time between Rainbow Valley and this station.

Figure 7-1. Rainbow Creek Nitrate Concentrations During 2000

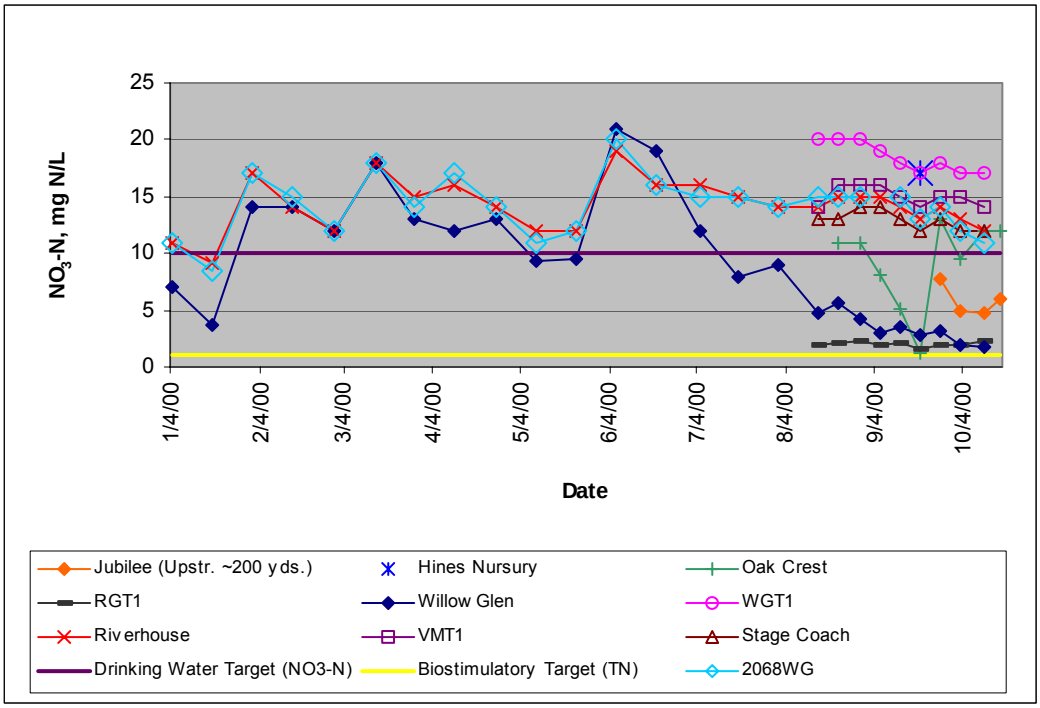

Orthophosphate concentrations in Rainbow Creek average 0.33 mg PO_4-P/L (range 0.12 to 1.4 mg PO_4-P/L). Creek concentrations (Appendix B, Table B-2) are illustrated in Figure 7-2. Levels in all tributaries and the most upstream location (Jubilee) were below the detection limit of 0.05 mg P/L, and do not appear in the figure. Orthophosphate concentrations at Oak Crest Mobile Estates vary more (range 0.52 to 1.4 mg PO_4-P/L). Concentrations in the lower reaches range from 0.12 to 0.55 mg PO_4-P/L. In the lower reaches of the creek, concentrations may increase during the period of January through March and decline between March and April. This appears to coincide with the 2002 wet season and with field observations that found an increase in algal biomass.

Figure 7-2. Rainbow Creek Orthophosphate Phosphorus Concentrations During 2000

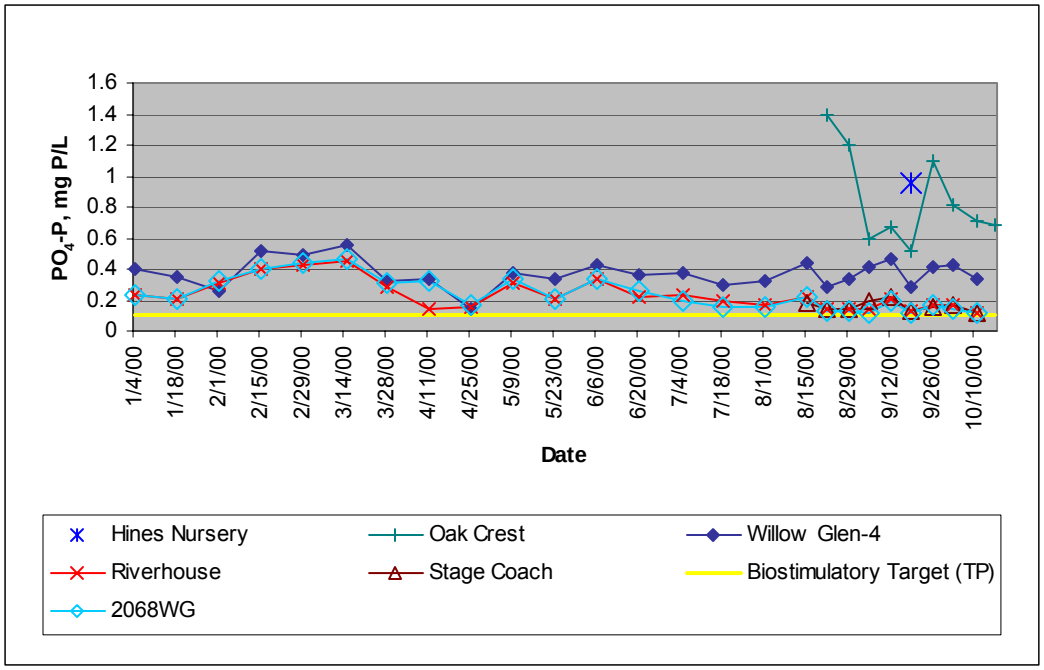

Based on observations of seasonal variation and critical conditions (development of excessive algae) during the 2000 monitoring period, nutrient loading controls appear to be needed between February and September. Because sediments act as a sink for nutrients, availability of plentiful nutrients during the initial growth period can result in accumulations of algae later in the year. The target for nitrates is also applicable to the entire year because it is health-related and is not to be exceeded at any time. Therefore, controls on nutrient loading should be implemented all year long. Water quality monitoring will be required to demonstrate compliance with targets and will be discussed in the Implementation Plan (Section 9).

8.0 Legal Authority and Regulatory Framework

This Section presents the legal authority and regulatory framework used as a basis for assigning specific responsibilities to implement and monitor the Rainbow Creek TMDL. The laws and policies governing point source[20] and nonpoint source[21] discharges are described. Discharger accountability for attaining nutrient wasteload and load reductions is established. An approach for providing the necessary regulatory oversight of the nonpoint source nutrient load reduction is proposed. The legal authority and regulatory framework is described in terms of the following:

- Controllable Water Quality Factors
- Point Source Discharges
- Nonpoint Source Discharges
- Third Party Regulatory Based Approach

8.1 Controllable Water Quality Factors

The Rainbow Creek watershed lies within an unincorporated portion of the County of San Diego. Sources of nutrients to Rainbow Creek that result from human habitation and land use practices include wet and dry weather runoff, agricultural, orchard, and nursery irrigation return flows, septic wastewater discharges, and atmospheric deposition. Construction, maintenance, and operation of State-owned highways are also sources of nutrient discharges to Rainbow Creek. These nutrient discharges result from controllable water quality factors which are defined as those actions, conditions, or circumstances resulting from man's activities that may influence the quality of the waters of the State and that may be reasonably controlled. This TMDL establishes wasteload and load allocations for these controllable discharges. This TMDL does not require reduction of uncontrollable discharges of nutrients such as those resulting from wildlife and natural sources.

[20] The term ‘‘point source’’ is defined in Clean Water Act section 502(6) to mean any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged. This term does not include agricultural storm water discharges and return flows from irrigated agriculture.

[21] The term ‘‘nonpoint source’’ refers to diffuse, widespread sources of pollution. The major sources of nonpoint source pollution in California are related to land use activities that occur throughout watersheds and include: (1) agriculture, (2) forestry (silviculture), (3) urban runoff, (e.g., from construction sites, roads and highways, septic systems), (4) marinas and boats, (5) hydromodification activities, and (6) resource extraction. As rainfall, snowmelt, irrigation water or any other type of water moves over or through the ground, it picks up and transports natural pollutants and pollutants resulting from human activity, ultimately depositing them into rivers, lakes, wetlands, coastal waters, and groundwater.

8.2 Point Source Discharges

Dischargers responsible for actual or potential point source discharges of nutrients to Rainbow Creek are discussed in this subsection. These dischargers have specific roles and responsibilities assigned to them for achieving compliance with the total nitrogen and total phosphorus wasteload described in Section 10.0 Implementation Action Plan.

8.2.1 Regulatory Background

Clean Water Act § 402 establishes the National Pollutant Discharge Elimination System (NPDES Program) to regulate the ''discharge of a pollutant,'' other than dredged or fill materials, from a ''point source'' into ''waters of the United States[22].'' Under Clean Water Act § 402, discharges of pollutants to waters of the United States are authorized by obtaining and complying with the terms of an NPDES permit. NPDES permits commonly contain numerical discharge limits for specified pollutants and required best management practices[23] (BMPs) designed to minimize water quality impacts. These numerical effluent limitations and BMPs (or other non-numerical effluent limitations) implement both technology-based and water quality based requirements of the Clean Water Act. Technology-based limitations represent the degree of control that can be achieved by point sources using various levels of pollution control technology. If necessary to achieve compliance with applicable water quality standards, NPDES permits must contain water quality-based limitations more stringent than the applicable technology-based standards.

Within each TMDL a "wasteload allocation[24]" is determined which is the maximum amount of a pollutant that may be contributed to a waterbody by "point source" discharges of the pollutant in order to attain and maintain water quality objectives. NPDES permits must include water quality-based effluent limits or conditions that are consistent with the assumptions and requirements of the wasteload allocation. The principle regulatory means of implementing TMDLs for point source discharges regulated under NPDES permit are:

1. Allocate the total wasteload allocation calculated for point source facilities regulated under NPDES permits among each individual NPDES point source facility that is discharging the pollutant that needs to be controlled;

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[22] See 40 CFR §122.2(c)(e). The USEPA has interpreted "waters of the United States" to include "intrastate lakes, rivers, streams (including intermittent streams) . . . the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce," and "tributaries of [those] waters". Rainbow Creek, a tributary of the Santa Margarita River, is a water of the United States.

[23] See 40 CFR §122.2 Best management practices ("BMPs") means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of "waters of the United States." BMPs also include treatment requirements, operating procedures, and practices to control site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. The term BMP is extensively used in the point source program in connection with NPDES permits where implementation of BMPs is enforceable.

[24] See 40 CFR 130.2(h). A wasteload allocation is the portion of the receiving water's loading capacity that is allocated to one of its existing or future point sources of pollution.

2. Evaluate whether the effluent limitations or conditions within the NPDES permit are consistent with the wasteload allocation. If not, incorporate effluent limitations that are consistent with the wasteload allocation into the NPDES permit[25] or otherwise revise the NPDES permit to make it consistent with the assumptions and requirements of the TMDL wasteload allocation.[26] A time schedule to achieve compliance should also be incorporated into the NPDES permit in instances where the discharger is unable to immediately comply with the required wasteload reduction;

3. Mandate discharger compliance with the wasteload allocation in accordance with the terms and conditions of the revised NPDES permit;

4. Implement a monitoring and/or modeling plan designed to measure the effectiveness of the controls implementing the wasteload allocations and the progress the waterbody is making toward attaining water quality objectives; and

5. Establish criteria to determine that substantial progress toward attaining water quality standards is being made and if not, the criteria for determining whether the TMDL or wasteload allocation needs to be revised.

8.2.2 California Department of Transportation

The California Department of Transportation (Caltrans) is responsible for the design, construction, maintenance, and operation of the California State Highway System, including the portion of the Interstate Highway System within the State's boundaries. The roads and highways operated by Caltrans are legally defined as municipal separate storm sewer systems (MS4s) and discharges of pollutants from Caltrans MS4s to waters of the United States, such as Rainbow Creek, constitute a point source discharge that is subject to regulation under an NPDES permit.

Discharges of storm water from the Caltrans owned right-of-ways, properties, facilities, and activities, including storm water management activities in construction, maintenance, and operation of State-owned highways are regulated under Order No. 99-06-DWQ, *National Pollutant Discharge Elimination System Permit, Statewide Storm Water Permit, and Waste Discharge Requirements for the State of California, Department of Transportation (Caltrans)* (Caltrans MS4 NPDES Storm Water Permit). Caltrans is responsible, under the terms and conditions of the MS4 NPDES Storm Water Permit for ensuring that their operations do not contribute to violations of water quality objectives in Rainbow Creek.

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[25] In the case of NPDES storm water permits, effluent limitations may include best management practices that evidence shows are consistent with the wasteload allocation.

[26] See 40 CFR §122.44(d)(1)(vii)(B). NPDES water quality-based limits must be consistent with the assumptions and requirements of any available TMDL wasteload allocation. The regulations do not require the effluent limits to be identical to the wasteload allocation. The regulations leave open the possibility that the Regional Board could determine that fact-specific circumstances render something other than literal incorporation of the wasteload allocation to be consistent with the TMDL assumptions and requirements. The rationale for such a finding could include a trade amongst dischargers of portions of their load or wasteload allocations, performance of an offset program that is approved by the Regional Board, or any number of other considerations bearing on facts applicable to the circumstances of the specific discharger.

Caltrans is a point source discharger of nutrients to Rainbow Creek. Caltrans discharges storm water runoff containing nutrients from both Interstate-15 freeway surfaces and adjacent land areas via a storm drain system with outfalls discharging from both the north and south at the Rainbow Creek Bridge. Storm water runoff from highways can contain pollutants, including nutrients, from vehicle exhaust and atmospheric deposition. These discharges are contributing to the exceedances of the nitrate and biostimulatory substances water quality objectives in Rainbow Creek.

8.2.3 CA Department of Forestry and Fire Protection

The California Department of Forestry and Fire Protection (CDFFP) owns and operates a wastewater treatment plant (septic tank and percolation ponds) that receives sewage wastewater flows from the Rainbow Conservation Camp. The treatment system consists of a 15,000-gallon septic tank and effluent evaporation/percolation ponds. The septic tank effluent is transferred to one of three evaporation/percolation ponds for disposal. The ponds have earthen fill side-slopes, bottoms and containment berms. Evaporation and percolation from the ponds is the primary means of effluent disposal; however, for several days during the year, effluent from the ponds may be pumped to a spray irrigation field covering approximately 2 acres of the facility. The nutrients in the wastewater are introduced directly into the groundwater as the result of percolation pond infiltration.

CDFFP's discharge from the treatment plant is regulated under Order No. 95-20, *Waste Discharge Requirements for the California Department of Forestry and Fire Protection, Rainbow Conservation Camp*. Order No. 95-20 requires that CDFFP prevent surfacing of wastes on their property. Order No. 95-20 also requires that surface runoff of any wastes that surfaces on property not owned or controlled by the CDFFP must be prevented. The CDFFP is required to evaluate, monitor, and take measures necessary to ensure that their current and future waste water disposal operations do not contribute to the impairment of Rainbow Creek.

The percolation ponds are suspected of not having the proper separation from groundwater and/or bedrock and the percolated effluent appears to be surfacing down gradient of the ponds and flowing into Rainbow Creek[27]. Surfacing groundwater that is recognizable as sewage from the Rainbow Conservation Camp facility constitutes a potential point source discharge of nutrients to Rainbow Creek. The Regional Board has directed CDFFP, pursuant to Water Code section 13267, to conduct an investigation of the possible impacts from the Camp's wastewater discharge to the Creek, and the results of the investigation are currently under review by the Regional Board for additional follow-up actions. The discharge of waste to Rainbow Creek resulting from the CDFFP discharge is not allowed under the terms and conditions of Order No. 95-20. Accordingly no wasteload allocation will be assigned to the CDFFP Rainbow Creek facility for the discharge of nutrients to Rainbow Creek.

[27] Further details are contained in Regional Board letters to CDFFP dated March 8, 2002 and June 4, 2002. Regional Board observations of these conditions during a January 28, 2003 inspection of the facility are described in a February 26, 2003 memorandum (Dorsey 2003b).

8.2.4 County of San Diego

The County of San Diego's discharge of urban runoff from Municipal Separate Storm Sewer Systems (MS4) is subject to Order No. 2001-01, *Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego County, and the San Diego Unified Port District*, NPDES No. CAS0108758. Under the terms and conditions of Order No. 2001-01 the County is responsible for controlling all storm and non-storm water flows (i.e., urban runoff) that is transported through an MS4 conveyance system to surface waters.

Nutrients are present in runoff from commercial nurseries, orchards, parks, residential areas, urban areas, and septic tank disposal system land use activities[28] in the Rainbow Creek watershed. Discharges from these land use activities to an MS4 operated by the County of San Diego are regulated under the NPDES Storm Water Permit. The County's NPDES Storm Water Permit prohibits discharges from municipal storm water MS4s that cause or contribute to violations of water quality objectives. To the extent that there is an MS4 discharge in the Rainbow Creek watershed from these land use activities, it is contributing to the exceedance of the nutrient water quality objective in Rainbow Creek waters.

8.3 Nonpoint Source Discharges

Nonpoint source discharges of nutrients to Rainbow Creek are discussed in this subsection. Specific roles and responsibilities assigned to nonpoint source dischargers for achieving compliance with the total nitrogen and total phosphorus load allocations are described in Section 9.0 Implementation Action Plan.

8.3.1 Regulatory Background

While point source discharges are controlled directly by the federal Clean Water Act's NPDES permit program, direct control of nonpoint source pollution is left to state programs developed under state law. Within each TMDL a " load allocation[29]" is determined which is the maximum amount of a pollutant that may be contributed to a waterbody by "nonpoint source" discharges of the pollutant in order to attain and maintain water quality objectives. Load allocations for nonpoint sources are not directly enforceable under the Clean Water Act and are only enforceable to the extent they are made so by state laws and regulations. California's Porter-Cologne Water Quality Control Act[30] applies to both point and nonpoint sources of pollution and serves as the principle legal authority in California for the application and enforcement of TMDL load allocations for nonpoint sources.

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[28] Agricultural storm water discharges and return flows from irrigated agriculture in the Rainbow Creek watershed are exempt form NPDES Permit regulation under Clean Water Act §402(k)(1)(1).

[29] See 40 CFR 130.2(g). A load allocation is the portion of a receiving water's loading capacity that is attributed either to one of its existing or future nonpoint sources of pollution or to natural background sources.

[30] CWC §13000 et seq.

California's Nonpoint Source Pollution Control Program

In December 1999, the State Water Resources Control Board (SWRCB), in its continuing efforts to control nonpoint source (NPS) pollution in California, adopted the Plan for California's Nonpoint Source Pollution Control Program (NPS Program Plan) (SWRCB, 1999). The NPS Program Plan upgraded the State's first Nonpoint Source Management Plan adopted by the SWRCB in 1988 (1988 Plan). The primary objective of the NPS Program Plan is to reduce and prevent NPS pollution so that the waters of California support a diversity of biological, educational, recreational, and other beneficial uses. Towards this end, the NPS Program Plan focuses on implementation of 61 management measures[31] (MMs) and related management practices[32] (MPs) in six land use categories by the year 2013.[33]

The success of the NPS Program Plan depends upon individual discharger implementation of MPs. Pollutants can be effectively reduced in NPS discharges by the application of a combination of pollution prevention,[34] source control, and treatment control MPs. Source control MPs (both structural and non-structural) minimize the contact between pollutants and flows (e.g., rerouting run-on around pollutant sources or keeping pollutants on-site and out of receiving waters). Treatment control (or structural) MPs remove pollutants from NPS discharges. MPs can be applied before, during, and after pollution producing activities to reduce or eliminate the introduction of pollutants into receiving waters.

California's NPS Implementation and Enforcement Policy

In May 2004, pursuant to CWC §13369 the SWRCB adopted the *Policy for the Implementation and Enforcement of the Nonpoint Source Pollution Control Program* (NPS Implementation and Enforcement Policy), setting forth how the NPS Program Plan should be implemented and enforced to control NPS pollution. The NPS Implementation and Enforcement Policy provides guidance on the statutory and regulatory authorities of the SWRCB and the RWQCBs to prevent and control NPS pollution. The policy also provides guidance on the structure of NPS source

[31] MMs serve as general goals for the control and prevention of nonpoint source polluted runoff.

[32] MPs are the implementation actions taken by nonpoint source dischargers to achieve the management measure goals. USEPA and the SWRCB have dropped the word 'best' when describing the implementation actions taken by nonpoint source dischargers to control NPS pollution because "best" is considered too subjective. The "best" management practice in one area or situation might be entirely inappropriate in another area or situation. In this document the term "best management practices (BMPs)" is used exclusively in reference to schedules of activities, prohibitions of practices, maintenance procedures, and other management practices taken by NPDES permit dischargers.

[33] MMs are identified in Volume II of the *Plan for California's Nonpoint Source Pollution Control Program* (NPS Program Plan) 1999 Program Plan: *California's Management Measures for Polluted Runoff* (CAMMPR) (http://www.waterboards.ca.gov/nps/cammpr.html). The State Water Resources Control Board's California Nonpoint Source Encyclopedia (2004) (http://www.waterboards.ca.gov/nps/encyclopedia.html) also contains extensive information on nutrient reduction MMs and MPs applicable to the NPS land use activities in the Rainbow Creek watershed.

[34] Pollution prevention, the initial reduction/elimination of pollutant generation at its source should be used in conjunction with source control and treatment control MPs. Pollutants that are never generated do not have to be controlled or treated.

control implementation programs, including third-party implementation programs, and the mandatory five key elements applicable to all NPS implementation programs.

The NPS Implementation and Enforcement Policy emphasizes the fact that the RWQCBs have primary responsibility for ensuring that appropriate NPS control implementation programs are in place throughout the State. RWQCB responsibilities include, but are not limited to regulating all current and proposed NPS discharges under Waste Discharge Requirements (WDRs), waivers of WDRs, or a basin plan prohibition, or some combination of these administrative tools.

Third-party NPS Implementation Programs

Under the NPS Implementation and Enforcement Policy, RWQCBs continue to have primary responsibility for ensuring that there are appropriate NPS control implementation programs in place to meet water quality objectives and to protect the beneficial uses of the waters of the State. A NPS pollution control implementation program is a program developed to comply with SWRCB or RWQCB Waste Discharge Requirements (WDRs), waivers of WDRs, or basin plan prohibitions. Implementation programs for NPS pollution control may be developed by a RWQCB, the SWRCB, an individual discharger or by or for a coalition of dischargers in cooperation with a third-party representative, organization, or government agency. The latter programs are collectively known as "third-party" programs and the third-party role is restricted to entities that are not actual dischargers under RWQCB/SWRCB permitting and enforcement jurisdiction. These may include NGOs, citizen groups, industry groups (including discharger groups represented by entities that are not dischargers), watershed coalitions, government agencies (e.g. cites or counties), or any mix of the above.

Under existing law, there are various ways in which the RWQCBs can use third-party programs in their NPS pollution control programs. For example, the RWQCBs can conditionally waive regulation of a particular nonpoint pollution source based on the existence of an adequate third-party program that addresses this source. Similarly, the RWQCBs can adopt individual or general WDRs for NPS discharges that build upon third-party programs. These WDRs can, for example, require that the dischargers either participate in an acceptable third party NPS program or, alternatively, submit individual pollution prevention plans that detail how they will comply with the WDRs. Likewise, the RWQCBs can adopt discharge prohibitions, which include exceptions based on third-party programs. For example, a RWQCB can except from the discharge prohibition those discharges that are adequately addressed in an acceptable third-party NPS pollution control program.

Given the extent and diversity of NPS pollution discharges, the Regional Board needs to be as creative and efficient as possible in devising approaches to prevent or control NPS pollution. Third-party programs can enhance the Regional Board's ability to reach multiple numbers of NPS dischargers who individually may be unknown to the Regional Board. Under this approach, oversight of discharger NPS pollution control efforts can be achieved more efficiently and with less impact on the Regional Board's limited NPS program staffing and financial resources.

Key Elements of an NPS Implementation Programs

Under the NPS Implementation and Enforcement Policy the Regional Board is required to ensure that NPS implementation programs developed by dischargers or third parties meet the

requirements of the five key structural elements described below:

Key Element 1: The objectives of an NPS control implementation program shall be explicitly stated and must, at a minimum, address NPS pollution in a manner designed to achieve State and regional water quality standards, including whatever higher level of water quality the RWQCB determines is appropriate in accordance with antidegradation principles.

Key Element 2: The NPS control implementation program shall include a discussion of the MPs that are expected to be implemented to ensure attainment of program objectives, and a discussion of the process to be used to verify proper MP implementation.

Key Element 3: Where a RWQCB determines it is necessary to allow time to achieve water quality standards, the NPS control implementation program shall include a specific time schedule and corresponding quantifiable milestones designed to measure progress toward reaching the program's objectives.

Key Element 4: The NPS control implementation program shall include sufficient feedback mechanisms so that the RWQCB, dischargers, and the public can determine if the program is achieving its stated objectives or if further MPs or other measures are needed.

Key Element 5: The Regional Board shall make clear, in advance, the potential consequences for failure to achieve a NPS control implementation program's stated purposes.

8.3.2 Rainbow Creek Nonpoint Source Discharges

The major NPS nutrient discharges in the Rainbow Creek watershed result from (1) commercial nurseries, (2) agricultural fields, (3) orchards, (4) parks, (5) residential areas, (6) urban areas, and (7) septic tank disposal system land use activities, as described below. Some of these discharges are regulated under the terms and conditions of the Regional Board's Basin Plan waiver policy.[35] Individual landowners and other persons (e.g. homeowners, nurseries, businesses) engaged in these land use activities are required to be held accountable for attaining nutrient load reductions in Rainbow Creek.

Commercial Nurseries

Greenhouses and container crop industries apply nutrients in the form of chemical fertilizers (e.g., liquid or time release) to optimize production. When fertilizer applications exceed plant needs, the excess can wash into Rainbow Creek during rain events or through irrigation runoff. Excessive irrigation can affect water quality by causing erosion, and transporting nutrients, pesticides, and heavy metals to nearby waterways and groundwater. Commercial nursery impacts on surface water and groundwater can be minimized by properly managing nutrient applications and irrigation practices, and by controlling sediment erosion and runoff.

[35] The Regional Board may waive issuance of waste discharge requirements for a specific discharge or types of discharge pursuant to CWC §13269 if such waiver is determined to be in the public interest. The waiver of waste discharge requirements is conditional and may be terminated at any time by the Regional Board for any specific discharge or any specific type of discharge.

Nursery Irrigation Return Water Waiver
Discharges of irrigation return water from nurseries[36] in the San Diego Region currently are regulated under the terms and conditions of the Regional Board's Basin Plan waiver policy.[37] Under the terms of this policy the Regional Board waives the obligation of nursery owners and operators to obtain waste discharge requirements for discharges of irrigation return water from nurseries subject to the following conditions:

- There is no discharge to waters of the United States;
- Management practices are implemented for the discharge as described in the NPS Program Plan (SWRCB, 1999);
- The discharge shall not create a nuisance as defined in the California Water Code;
- The discharge shall not cause a violation of any applicable water quality standard; and
- The discharge of any substance in concentrations toxic to animal or plant life is prohibited.

Agricultural Fields
Agricultural activities that cause nonpoint source pollution include plowing, fertilizing, irrigation, pesticide spraying, planting, and harvesting. The major agricultural nonpoint source pollutants that result from these activities are nutrients, sediment, pathogens, pesticides, herbicides, and salts. Agricultural producers apply nutrients in the form of chemical fertilizers, manure, or sludge to optimize production. Excess fertilizers and irrigation runoff, as well as rainfall runoff, can wash nutrients and sediments off of properties into nearby waterways. Agricultural impacts on surface water and groundwater can be minimized by properly managing nutrient applications and irrigation practices, and by controlling sediment erosion and runoff.

Agricultural Irrigation Return Water Discharge Waiver
Discharges of irrigation return water from agriculture [38] fields in the San Diego Region are regulated under terms and conditions of the Regional Board's Basin Plan waiver policy. Under the terms of this policy the Regional Board waives the obligation of agricultural field owners and operators to obtain waste discharge requirements for agricultural irrigation return water discharges to waters of the state subject to the following conditions:

- Management practices are implemented for the discharge as described in the NPS Program Plan (SWRCB, 1999);

[36] For the purposes of the waiver, a "nursery" is defined as a facility engaged in growing plants (shrubs, trees, vines, etc.) for sale.

[37] The Regional Board may waive issuance of waste discharge requirements for a specific discharge or types of discharge pursuant to California Water Code §13269 if such waiver is determined to be in the public interest. The waiver of waste discharge requirements is conditional and may be terminated at any time by the Regional Board for any specific discharge or any specific type of discharge.

[38] For the purposes of the waiver , "agriculture" is defined as the production of fiber and/or food (including food for animal consumption, e.g., alfalfa).

- The discharge shall not create a nuisance as defined in the California Water Code;
- The discharge shall not cause a violation of any applicable water quality standard; and
- The discharge of any substance in concentrations toxic to animal or plant life is prohibited.

Orchards

Agricultural activities that cause nonpoint source pollution include fertilizing, irrigation, pesticide spraying, planting, and harvesting. The major agricultural nonpoint source pollutants that result from these activities are nutrients, sediment, pathogens, pesticides, herbicides, and salts. Agricultural producers apply nutrients in the form of chemical fertilizers and irrigate to optimize production. Excess fertilizers and irrigation runoff, as well as rainfall runoff, can wash or leach nutrients and sediments off of properties into nearby waterways and groundwater. Agricultural impacts on surface water and groundwater can be minimized by properly managing nutrient applications and irrigation practices, and by controlling sediment erosion and runoff.

Agricultural Orchard Irrigation Return Water Discharge Waiver

Discharges of irrigation return water from orchards in the San Diego Region are regulated under terms and conditions of the Regional Board's Basin Plan waiver policy for agricultural irrigation return water. (See above discussion on *Agricultural Irrigation Return Water Discharge Waiver*.)

Park

The San Diego County Parks and Recreation Department perform landscape maintenance of the community park (Rainbow Park). The park includes a children's playground, restroom facilities, a parking lot and a large grassy area with some landscaped areas. Sources of nutrients are organic matter such as fertilizer usage, leaves, lawn clippings, pet wastes, street dirt, and automobile exhaust. The restroom facilities utilize an on-site holding tank that is regularly pumped for disposal at a wastewater treatment facility outside of the watershed rather than a septic tank disposal system.

Residential Areas

In residential areas, sources of nutrients are organic matter such as leaves, lawn clippings, pet and domestic livestock wastes, and faulty septic tank disposal systems (see discussion below), as well as, fertilizer usage, street dirt, and automobile exhaust.

Urban Areas

In the Rainbow Creek watershed, the urban land use category includes commercial and public establishments (e.g., market, restaurant, gas station, school, and fire station). Sources of nutrients from these areas can be organic matter (lawn clippings and leaves) as well as street dirt, automobile exhaust, and excessive use of fertilizers.

Septic Tank Disposal Systems

All properties in the Rainbow Creek Watershed utilize septic tank disposal systems for sewage disposal. By design, septic tank disposal systems use bacteria to digest organic matter and chemically break down ammonia and organic nitrogen into nitrate, and organic phosphorus into

orthophosphate (Huntley 1987). Septic tank disposal systems can contaminate groundwater with nitrate. Since orthophosphate tends to bind to soils, its mobility is considered to be minimal (Huntley 1987). These systems can potentially impact Rainbow Creek when contaminated groundwater surfaces in the Creek (Rainbow Creek is a gaining stream).

Additionally, landowners in Rainbow Valley have been prohibited by the County of San Diego from installing or replacing septic tank disposal systems since 1970 because of a high groundwater table (Whitman 1970). Septic tank disposal systems in the Rainbow Creek watershed do not have the required separation to provide adequate treatment to wastewater. The high groundwater condition can cause septic tank disposal systems to malfunction and release bacteria, pathogens, and nutrients into the environment, contaminating groundwater and nearby streams.

Conventional Septic Tank Discharges / Subsurface Disposal Systems for Residential Units Waivers

Discharges of wastewater from conventional septic tank/subsurface disposal systems for residential units in the San Diego Region are regulated under the terms and conditions of the Regional Board's Basin Plan waiver policy. Under the terms[39] of this policy the Regional Board waives the obligation of residential septic tank owners and operators to obtain waste discharge requirements for discharges to groundwater subject to the following conditions:

- The design of the system is approved by the county health agency having jurisdiction where the system is located to the conditions set forth in the *Basin Plan, Chapter 4, (Implementation)* section entitled *Guidelines for New Community and Individual Sewerage Facilities*, and where systems are not constructed within areas designated as Zone A as defined by the California Department of Health Services' *Drinking Water Source Assessment and Protection Program*.

- The discharge shall not create a nuisance as defined in the California Water Code;

- The discharge shall not cause a violation of any applicable water quality standard; and

- The discharge of any substance in concentrations toxic to animal or plant life is prohibited.

Proposed Regulations for Onsite Wastewater Treatment Systems

California Water Code §13291 requires the State Water Resources Control Board to develop and adopt regulations for the permitting and operation of onsite wastewater treatment systems[40] (OWTS) in the State and further directs the Regional Board to incorporate the regulations into the Basin Plan. These regulations are currently under development and will include mandated nitrogen reduction performance requirements for OWTS, including septic tanks that are

[39] This waiver is applicable until six months after the State Water Resources Control Board adopts statewide criteria for on-site disposal systems pursuant to the CWC §13291 regulations for onsite sewage treatment systems.

[40] "Onsite wastewater treatment system(s)" (OWTS) is any individual or community onsite wastewater treatment, pretreatment and dispersal system including, but not limited to, a conventional, alternative, or experimental sewage dispersal system such a septic tanks having a subsurface discharge.

identified as contributing to the impairment of surface water bodies listed as impaired pursuant to Section 303(d) of the Clean Water Act. As currently drafted, the new regulations would also require the Regional Board to issue waste discharge requirements for all OWTS beginning in January 1, 2009, unless the County of San Diego assumes responsibility for enforcement of the regulations through a Memorandum of Understanding (MOU) with the Regional Board. The implementation of these new regulations on septic tank disposal systems in the Rainbow Creek watershed will be an important vehicle for attaining the required nutrient load reductions for septic tank disposal systems.

8.4 Third Party Regulatory Based Approach

The Regional Board supports a Third-Party regulatory-based approach[41] to implement the nutrient load reductions assigned to nonpoint sources in the Rainbow Creek watershed. The purpose of this section is to provide the rationale for that recommendation and to present some additional features of this approach that would be beneficial to implementing this TMDL.

As previously discussed, the State Water Board has adopted a *Plan for California's Nonpoint Source Pollution Control Program* (NPS Program Plan) (1999) and a *Policy for the Implementation and Enforcement of the Nonpoint Source Pollution Control Program* (2004). These documents describe alternative strategies that can be employed to control NPS pollution. In general, the approach that is used depends on four key factors:

- Discharger compliance in implementing MPs and other strategies that effectively prevent or control NPS discharges;
- The progress being made toward reducing NPS polluted runoff;
- The complexity and persistence of the water quality problem; and
- The need for increased regulatory oversight to attain water quality objectives.

8.4.1 Persistence and Complexity of Water Quality Problem

Excessive nutrient concentrations in Rainbow Creek have persisted since the 1980s, when agricultural practices used in Rainbow Valley resulted in significant increases of nitrate concentrations in Rainbow Creek. Although voluntary implementation of MP in the watershed resulted in significant reductions of nutrient concentrations in Rainbow creek since 1996, nutrient concentrations in the creek still exceed the applicable nutrient water quality objectives.[42]

Controlling and reducing nutrient discharges in the Rainbow Creek watershed to meet the TMDL nutrient load reductions for nonpoint sources will be a long term, complicated undertaking.

[41] The term "third party regulatory based approach" refers to an approach where a local governmental agency can oversee and enforce a NPS implementation program in the Rainbow Creek watershed.

[42] The term nutrient water quality objectives as used in this document refers to both the inorganic nitrate and biostimulatory nutrient water quality objectives described in Chapter 3 of the Water Quality Control Plan for the San Diego Basin (9) (Basin Plan) September 8, 1994.

There are multiple sources of nutrients in the watershed in seven different land use categories with an array of agencies and dischargers whose actions need to be coordinated. MMs and MPs need to be identified and implementation tracked and monitored. Water quality levels in Rainbow Creek need to be monitored and accessed to determine the effectiveness of the nutrient load reduction efforts, water quality trends, and success in attaining water quality objectives. A responsible regulatory agency is needed to lead and coordinate the effort.

8.4.2 Management Agency Agreement (MAA) with Local Land Use Agency

In light of the persistence of the nutrient water quality impairment conditions and the need for increased regulatory oversight, the Regional Board proposes to use a Third Party regulatory based approach to mandate compliance with the NPS nutrient load reductions of this TMDL. The Regional Board will accomplish this under the authority of CWC §13225[43] by negotiating a MAA[44] between the Regional Board and the County of San Diego setting forth the commitments of both parties to undertake various implementation responsibilities for the NPS nutrient load reductions of this TMDL.

Under the terms of the proposed MAA, the County of San Diego will take the lead in establishing MMs and overseeing MPs implementation by NPS dischargers to attain TMDL nutrient load reductions in the Rainbow Creek watershed. The County of San Diego's actions to implement the MAA will be taken under the County's own legal authority and using the County's own regulatory processes. The fundamental purpose in applying the MAA approach is to employ the capabilities of the County of San Diego to achieve at least the same degree of control over NPS pollution in the Rainbow Creek watershed as could be attained through direct regulation under Regional Board authority. Under this approach, regulatory oversight of the Rainbow Creek TMDL implementation can be achieved more efficiently and with less impact on the Regional Board's limited NPS program staffing and financial resources. While a cooperative partnership between the Regional Board and the County of San Diego is possible without a formal agreement, an MAA will enhance the effectiveness of the partnership by documenting commitments and clarifying roles and responsibilities of each party over the next 20 years until compliance with the nutrient water quality objectives is attained.

The Regional Board cannot delegate its NPS authorities and responsibilities to the County of San Diego. The Regional Board will not defer taking necessary action if the County of San Diego

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[43] CWC §13225 provides authority for the Regional Board to enter into a Management Agency Agreement (MAA) with local agencies to encourage development of appropriate planning or regulatory programs to control nonpoint source pollution. CWC §13225 also provides authority for the Regional Board to require local agencies such as the County of San Diego to submit technical reports on water quality control, even though those entities may not be waste dischargers. Local agencies can be required to investigate the scope, causes, and sources of nonpoint source pollution, and potential practices or control measures to prevent it. The only restriction is that the burden of preparing the reports bear a reasonable relationship to the need for and the benefits to be obtained from the reports.

[44] Management Agency Agreement (MAA) refers to an agreement between the Regional Board and federal or state agencies or local land use agencies having either 1) enforcement authority over nonpoint sources or 2) management responsibility for publicly owned or controlled land and the ability to control NPS discharges from activities on that land. The actions taken by these agencies under the MAA are taken under their own authorities and using their own regulatory processes.

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does not properly implement the MAA or if the nutrient water quality problem persists. Any Regional Board enforcement action taken will be against individual dischargers and not the County of San Diego. The Regional Board will also provide assistance to the County of San Diego as necessary to enforce implementation of MPs and the nutrient load reductions specified in this TMDL.

8.4.3 County of San Diego Legal Authority

The success of the MAA approach is contingent on the County of San Diego's willingness to undertake the role of a lead NPS management agency for the Rainbow Creek watershed and its ability to act effectively in that role. The County of San Diego's capability of acting effectively as a lead NPS control agency stems from its role as the principal land use planning authority governing land use practices in the Rainbow Creek watershed.

The legal framework within which the County exercises local planning and land use functions plays a critical pivotal role in controlling NPS nutrient pollution in the Rainbow Creek watershed. The County of San Diego performs land use planning in order to identify important community issues (such as new growth, housing needs, and environmental protection), project future demand for services (such as sewer, water, roads, etc.), anticipate potential problems (such as overloaded sewer facilities or crowded roads), and establish goals and policies for directing and managing growth. The County uses a variety of tools in the planning process including the general plan, specific plans, zoning, and the subdivision ordinance. The following is a review of the County of San Diego's local planning and land use functions which could be used to support implementation of NPS load reductions in this TMDL.

<u>State Law And Local Planning</u>

State law is the foundation for local planning in California. The California Government Code (Sections 65000 et seq.) contains many of the laws pertaining to the regulation of land uses by local governments including: the general plan requirement, specific plans, subdivisions, and zoning. This framework is provided in California Planning Law (Government Code §§ 65000 et seq.), the California Zoning Law (Government Code §§ 68000 et seq.), the Subdivision Map Act (Government Code §§ 66410 et seq.), and the California Environmental Quality Act (Public Resources Code §§ 21000 et seq.).

<u>The County of San Diego General Plan</u>

Under California's Planning Law (Government Code §§65000 et seq.), the County of San Diego must adopt a comprehensive, long-term general plan for the physical development of the county and any land outside its jurisdiction that bears relation to its planning. This general plan is the official County policy regarding the location of housing, business, industry, roads, parks, and other land uses, protection of the public from noise and other environmental hazards, and for the conservation of natural resources.

The general plan is the County's basic planning document and serves as the blue print for future development throughout the County including the Rainbow Creek watershed. It represents the County's view of its future; a constitution made up of the goals and policies upon which the County Board of Supervisors bases their land use decisions. The general plan and its diagrams have a long-term outlook, identifying the types of development that will be allowed, the spatial relationships among land uses, and the general pattern of future development. Following the

adoption of a general plan, the County may also prepare specific plans and community plans that have a finer level of detail than that provided by the general plan for particular geographic areas.

State law establishes a set of basic issues for consideration in local general plans and the County of San Diego determines the relative importance of each issue to local planning and decides how they are to be addressed in its general plan. Pursuant to Government Code § 65302, general plans must contain seven elements: (1) land use, (2) circulation, (3) housing, (4) conservation, (5) open space, (6) noise, and (7) safety[45]. The County of San Diego is free to adopt a wide variety of additional elements as necessary covering subjects of particular interest to local jurisdictions, such as the need to control NPS nutrient discharges in the Rainbow Creek watershed.

All subdivisions, public works projects, and zoning decisions must be consistent with the general plan. The County's corporate and police powers, and zoning and subdivision ordinances (see below) are the primary tools used to implement the general plan.

Zoning

Government Code §§65800 et seq. provides that San Diego County can adopt and administer zoning laws, ordinances (including pollution control ordinances), and rules and regulations to implement the general plan. A zoning ordinance is the local law that spells out the immediate, allowable uses for each piece of property within the community. The purpose of zoning is to implement the policies of the general plan. Each property in the community is assigned a "zone" listing the kinds of uses that will be allowed on that land (e.g., single family residential, multi-family residential, neighborhood commercial, agricultural, etc.) and setting development standards (e.g., minimum lot size, maximum building height, minimum front-yard depth). The distribution of agricultural, residential, commercial and other zones is based on the pattern of land uses established in the community's general plan.

Zoning is adopted by ordinance and is basically a "permit" type of land use control. Land may be put only to those uses listed in the zone assigned to it. The permit is issued for a specific project, such as building construction, grading projects for roads and bridges, new septic tank disposal system installations as well as repairs. These permits can be conditioned based on conformance with the zoning ordinance or other applicable authorities.

Subdivision Map Act

In general, land cannot be divided in California without local government approval. Dividing land for sale, lease, or financing is regulated by local ordinances based on the State Subdivision Map Act (commencing with Government Code § 66410). This Act vests in the County of San Diego the power to regulate and control the design of subdivisions within its jurisdiction.

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[45] Land use, conservation, open space and circulation are the elements most relevant to NPS pollution prevention and control: The conservation element addresses the identification, conservation, development and use of natural resources including water, forests, soils, waterways, wildlife and mineral deposits. The conservation element of the County's general plan may establish controls to deal with water pollution issues such as the nutrient impairment of Rainbow Creek.

There are basically two types of subdivisions: (1) parcel maps, which are limited to divisions resulting in fewer than five lots (with certain exceptions), and (2) final map subdivisions (also called tract maps), which apply to divisions resulting in five or more lots.

Applications for both types of subdivisions must be submitted to the County of San Diego for consideration in accordance with the its subdivision ordinance and the Subdivision Map Act. Subdivision regulation, like zoning, is another enforcement tool that the County uses for implementing its general plan. The County can deny a subdivision if it finds that the design of the subdivision or the proposed improvements will likely cause substantial environmental damage or substantially injure fish, wildlife, or their habitats.

Other Ordinances and Regulations

The County of San Diego adopts other ordinances besides zoning and subdivision to protect the general health, safety, and welfare of their inhabitants. Common types include flood protection, historic preservation, design review, hillside development control, growth management, impact fees, traffic management, and sign control.

Local ordinances may also be adopted in response to state requirements. Examples include local coastal programs (California Coastal Act), surface mining regulations (Surface Mining and Reclamation Act), earthquake hazard standards (Alquist-Priolo Special Studies Zone Act), and hazardous material disclosure requirements. These regulations are generally based on applicable state law.

California Environmental Quality Act

The California Environmental Quality Act (CEQA) (Public Resources Code §§21000 et seq.) requires local and state governments to consider the potential environmental effects of a project before deciding whether to approve it or not. CEQA's purpose is to disclose the potential impacts of a project, suggest methods to minimize those impacts, and discuss alternatives to the project so that decision makers will have full information upon which to base their decision. CEQA is a complex law with a great deal of subtlety and local variation.

The County of San Diego serves as the lead agency[46] in practically all local planning matters (such as rezoning, conditional use permits, and specific plans) for lands within its jurisdiction. CEQA also provides that the County of San Diego, in its role as lead agency, prepare an Environmental Impact Report (EIR)[47] before it approves a public or private project[48] having a

[46] CEQA provides for the assignment of a "lead agency" responsible for seeing that environmental review of projects is done in accordance with CEQA and that environmental analyses are prepared when necessary. The agency with the principal responsibility for issuing permits to a project (or for carrying out the project) is deemed to be the "lead agency." As lead agency, it may prepare the environmental analysis itself or it may contract for the work to be done under its direction.

[47] An EIR discusses the proposed project, its environmental setting, its probable impacts, realistic means of reducing or eliminating those impacts, its cumulative effects, and alternatives to the project.

[48] See Public Resources Code § 21065. The term “project” is defined as any activity undertaken, supported or authorized by a public agency which may cause a direct physical change, or reasonably foreseeable indirect physical change in the environment, including activities involving the issuance of permits and entitlements.

significant effect[49] on the environment if the County has the discretion to approve or disapprove the project. The EIR must describe feasible mitigation measures to minimize the project's significant environmental impacts. The County can impose conditions to mitigate significant environmental impacts. The County can also impose a reporting or monitoring program to ensure that mitigation measures are implemented.

8.4.4 Memorandum of Understanding (MOU) with Assistance Agencies

Another proposed action of the Third Party regulatory based approach is for the Regional Board to seek less formal agreements with federal, state, and local agencies, and special districts that can provide technical or financial assistance to support implementation of MPs. These agreements are referred to as memoranda of understanding (MOUs).[50] Agencies and organizations such as Natural Resources Conservation Service, Mission Resource Conservation District (MRCD), and the University Of California Cooperative Extension can provide valuable assistance in defining appropriate management measures (MMs) and helping NPS dischargers implement MPs. Formalizing these arrangements in a MOU with the Regional Board would assist the various agencies and districts in targeting technical and financial resources for Rainbow Creek nutrient NPS problems.

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[49] See Public Resources Code § 21068. A " significant effect" is an effect that has a substantial or potentially substantial adverse effect on the environment.

[50] There are two general types of MOUs: (1) cooperative agreements made with other agencies or organizations that are able to provide information or technical or financial assistance to further the State's goal of preventing or controlling NPS pollution; and (2) cooperative agreements made with land management agencies with authority to control NPS discharges through inclusion of MPs in their land lease agreements.

9.0 Implementation Action Plan

This Chapter describes the actions necessary to implement the TMDL to attain and maintain nutrient water quality objectives[51] in Rainbow Creek. The plan describes implementation responsibilities assigned to cooperating agencies and dischargers and describes the schedule and key milestones for the actions to be taken. A monitoring strategy to assess the success of this implementation action plan is presented in Section 10 Implementation Monitoring Plan.

9.1 Regulatory Authority

Basin Plans must have a program of implementation to achieve water quality objectives.[52] The implementation program must include a description of actions that are necessary to achieve the objectives, a time schedule for these actions, and a description of surveillance to determine compliance with the water quality objectives.[53] State law requires that a TMDL include an implementation action plan because the TMDL normally is, in essence, an interpretation or refinement of an existing water quality objective. The TMDL must be incorporated into the Basin Plan[54], and, because the TMDL supplements, interprets, or refines an existing water quality objective, state law requires a program of implementation.

9.2 Implementation Action Plan Objectives

The specific objectives of this Implementation Action Plan are as follows:

1. Mandate nutrient wasteload reductions in NPDES permits in the Rainbow Creek watershed for the point source component of this TMDL;

2. Mandate nutrient load reductions for seven critical Rainbow Creek watershed land use areas[55] for the non point source component of this TMDL;

3. Promote establishment of a Management Agency Agreement (MAA) between the Regional Board and the County of San Diego setting forth each party's commitment to undertake various implementation oversight responsibilities for the nonpoint source component of this

[51] The term nutrient water quality objectives as used in this document refers to both the inorganic nitrate and biostimulatory nutrient water quality objectives described in Chapter 3 of the Water Quality Control Plan for the San Diego Basin (9) (Basin Plan) dated September 8, 1994.

[52] See CWC § 13050(j). A "Water quality control plan" or "Basin Plan" consists of a designation or establishment for the waters within a specified area of all of the following: (1) Beneficial uses to be protected, (2) Water quality objectives and (3) A program of implementation needed for achieving water quality objectives.

[53] See CWC § 13242

[54] See Clean Water Act § 303(e).

[55] These land use activities are commercial nurseries; agricultural fields; orchards; parks; residential areas; urban areas, and septic tank disposal systems.

TMDL;

4. Promote establishment of a Memorandum of Understanding (MOU) to document cooperative agreements between the Regional Board and other agencies or organizations (e.g. Natural Resources Conservation Service, Mission Resource Conservation District, and the University of California Cooperative Extension) that are able to provide technical or financial assistance to dischargers in the Rainbow Creek watershed; and

5. Establish mechanisms to track management measures (MMs), and management practices (MPs) / best management practices (BMPs) implementation, monitor MM/MP/BMP effectiveness in controlling nutrient pollution, assess success in achieving TMDL objectives and milestones, and report on TMDL program effectiveness in attaining the nitrate and nutrient water quality objectives.

9.3 Phased Nutrient Load Reduction Approach

The nutrient TMDLs shall be implemented in a phased approach with a monitoring component to determine the effectiveness and guide the selection of MPs / BMPs of each phase. Load allocations shall be reduced by approximately 20% every four years until the TMDLs have been achieved. Table 9-1 provides the schedule for total nitrogen and total phosphorus reductions. The initial reductions will achieve the nitrate target of 10 mg NO_3-N/L and begin the first phase of reductions for the total nitrogen and total phosphorus targets. The subsequent phases target loading reductions in incremental steps towards the ultimate goal of attaining and maintaining compliance with nutrient water quality objectives.

Table 9-1. Total Nitrogen and Total Phosphorus Phased Load Reduction Schedule

Compliance Date	Total Nitrogen		Total Phosphorus	
	Target Annual Loads (LA + WLA) kg N/yr	Cumulative % Reduction	Target Annual Loads (LA + WLA) kg P/yr	Cumulative % Reduction
2005[1]	3,055[2]		278[2]	
2009	2,444	20	223	20
2013	1,833	40	167	40
2017	1,222	60	111	60
2021	796	74	41	85

[1] Estimated effective date begins upon approval by USEPA. Compliance dates follow every fourth year until TMDL is achieved.
[2] Current annual nutrient load from identified point and nonpoint sources (See Tables 4-2 and 4-4). This value does not include the contribution for background.

The target load and wasteload allocations for total nitrogen and total phosphorus are presented in Table 9-2 and 9-3.

Table 9-2. Total Nitrogen Wasteload and Load Allocations

Source	Total Nitrogen Allocations			
	2009 kg N/yr[1]	2013 kg N/yr[1]	2017 kg N/yr[1]	2021 kg N/yr[1]
Caltrans highway runoff	118	90	59	49
Unidentified and future point source discharge	33	33	33	33
Point Source (WLA) Subtotal	**151**	**123**	**92**	**82**
Commercial nurseries	390	299	196	116
Agricultural fields	504	386	253	151
Orchards	607	465	305	182
Park	5	3	3	3
Residential areas	507	390	260	149
Urban areas	40	27	27	27
Septic tank disposal systems	200	100	46	46
Air deposition	40	40	40	40
Non-Point Source (LA) Subtotal	**2,293**	**1,710**	**1,130**	**714**
Total WLA & LA[2]	**2,444**	**1,833**	**1,222**	**796**
Background	**779**	**779**	**779**	**779**
Margin of Safety	**83**	**83**	**83**	**83**
Total Allocations for Total Nitrogen TMDL	**3,306**	**2,695**	**2,084**	**1,658**

[1] To calculate pounds per year, multiply by 2.2
[2] From Table 9-1

Table 9-3. Total Phosphorus Wasteload and Load Allocations

Source	Total Phosphorus Allocations			
	2009 kg P/yr[1]	2013 kg P/yr[1]	2017 kg P/yr[1]	2021 kg P/yr[1]
Caltrans highway runoff	11	8	5	5
Unidentified and future point source discharge	3	3	3	3
Point Source (WLA) Subtotal	**14**	**11**	**8**	**8**
Commercial nurseries	20	16	10	3
Agricultural fields	28	21	14	4
Orchards	50	37	24	6
Park	0.15	0.10	0.10	0.10
Residential areas	99	74	47	12
Urban areas	9	6	6	6
Air deposition	2	2	2	2
Non-Point Source (LA) Subtotal	**208**	**156**	**103**	**33**
Total WLA & LA[2]	**222**	**167**	**111**	**41**
Background	**116**	**116**	**116**	**116**
Margin of Safety	**8**	**8**	**8**	**8**
Total Allocations for Total Phosphorus TMDL	**346**	**291**	**235**	**165**

[1] To calculate pounds per year, multiply by 2.2
[2] From Table 11-1

9.4 Milestone Dates For Attainment Of Nutrient Water Quality Objective

Tables 9-1, 9-2, and 9-3 describe the general time schedule for nutrient sources to achieve compliance with wasteload and load reductions and allocations. Point source discharges in the Rainbow Creek watershed are projected to achieve compliance with wasteload reductions by December 31, 2013. Nonpoint sources are projected to implement nutrient reduction strategies by December 31, 2009 with all resultant nutrient load reductions being achieved by December 31, 2021. Regardless of what actions are taken to achieve load and wasteload reductions, there may not be an immediate response in the water quality or biological condition of Rainbow Creek. For example, there may be significant time lags between when actions are taken to reduce nutrient loads and resulting changes in nutrient concentrations in Rainbow Creek. This is especially likely if nutrients from past activities are tightly bound to sediments or if nutrient-contaminated groundwater has a long residence time before its release to Rainbow Creek waters. A three-year response time is projected for Rainbow Creek to attain compliance with nutrient

water quality objectives after reaching the desired nutrient wasteload and load reductions in 2021. Accordingly the projected date when Rainbow Creek will attain and maintain compliance with nutrient water quality objectives is December 31, 2024.

9.5 Regional Board Actions

This section describes the actions the Regional Board shall take to mandate compliance with the nutrient wasteload and load reductions specified in this TMDL.

1. **Caltrans – Incorporate Wasteload Allocations in NPDES Storm Water Permit**
   The Regional Board shall request that the State Water Resources Control Board amend Caltrans statewide NPDES storm water permit[56] to include the following requirements:

   a. MS4 discharges to Rainbow Creek shall not exceed the following wasteloads for nitrogen and phosphorus:

Nitrogen Wasteload	Phosphorus Wasteload	Compliance Due Date
118 kg N/yr[1]	11 kg P/yr[1]	December 31, 2009
90 kg N/yr[1]	8 kg P/yr[1]	December 31, 2013
59 kg N/yr[1]	5 kg P/yr[1]	December 31, 2017
49 kg N/yr[1]	5 kg P/yr[1]	December 31, 2021

[1] To calculate pounds per year, multiply by 2.2

   b. A directive to submit annual progress reports to the Regional Board on the progress in attaining the nutrient wasteload reductions in Rainbow Creek. The report shall be due on April 1 of each year and shall be incorporated within Section 2, Program Management of Caltrans MS4 Order No. 99-06-DWQ, NPDES No. CAS000003. Reporting shall continue on an annual basis until the nutrient water quality objective is attained in Rainbow Creek.

2. **County of San Diego – Issue Water Code Governmental Water Quality Investigation Request Order for Nutrient Reduction and Management Plan**
   The Regional Board shall issue an Order under CWC §13225 requiring the County of San Diego to investigate excessive levels of nutrients in Rainbow Creek and feasible management strategies to reduce nutrient loading in Rainbow Creek. A Nutrient Reduction and Management Plan (NRMP) for the Rainbow Creek watershed, containing the elements described below in Section 9.7 - County of San Diego Nutrient Reduction Management Plan Elements, would satisfy such an Order. The County may submit alternative or additional elements equivalent to those described in Section 9.7 that would result in equivalent

[56] The term "statewide NPDES storm water permit "refers to Order No. 99-06-DWQ, NPDES No. CAS000003, National Pollutant Discharge Elimination System Permit, Statewide Storm Water Permit, and Waste Discharge Requirements for the State of California, Department of Transportation (Caltrans) or subsequent superceding NPDES renewal Orders.

protection from, or prevention of, nutrient discharges to Rainbow Creek.

3. **County of San Diego – Establish Management Agency Agreement (MAA)**
   The Regional Board shall consider, following concurrence with the County of San Diego's Nutrient Reduction and Management Plan (NRMP) for Rainbow Creek, entering into a Management Agency Agreement (MAA) with the County of San Diego. The MAA shall set forth the commitment of both parties to undertake various oversight responsibilities for the nonpoint source nutrient load reduction component of this TMDL and the County's commitments to implement the NRMP.

4. **County of San Diego – Issue Water Code Governmental Water Quality Investigation Request for Groundwater Investigation and Characterization Report**
   The Regional Board could issue an Order under CWC §13225 directing the County of San Diego to prepare and submit a workplan and report described below in Section 9.6 - County of San Diego Actions, Item 3 - Submit Groundwater Investigation and Characterization Workplan and Item 4 - Groundwater Investigation and Characterization Report.

5. **CA Dept. of Forestry and Fire Protection – Issue Water Code Section 13267 Order**
   The Regional Board shall issue a CWC §13267[57] order directing the California Department of Forestry and Fire Protection, Rainbow Conservation Camp (CDFFP) to submit any additional technical information needed to 1) evaluate whether CDFFP's discharge is surfacing and/or contributing to the impairment of Rainbow Creek; and 2) estimate the actual nutrient load originating from the septic tank and percolation ponds to Rainbow Creek via groundwater flow. Based on the review of this information the Regional Board may further direct the CDFFP to implement an alternate means of wastewater disposal or additional treatment necessary to attain and maintain nutrient water quality objectives in Rainbow Creek.

6. **Establish Memorandum of Understanding (MOU) with Agencies or Organizations**
   The Regional Board shall consider entering into a MOU to document cooperative agreements with other agencies or organizations that are able to provide information, technical assistance, or financial assistance to dischargers to support the Regional Board's goals of attaining the nutrient load reductions required under this TMDL and compliance with the nutrient water quality objective. These agencies and organizations include, but are not limited to, the United States Department of Agriculture, Natural Resources Conservation Service , Mission Resource Conservation District, and the University Of California Cooperative Extension.

7. **Adopt Waste Discharge Requirements (WDRs), Waivers, and Discharge Prohibitions**
   In conjunction with an MAA or MOU with another third-party representative, organization, or government agency describing an adequate NPS pollution control implementation

[57] CWC §13267 provides that the Regional Board can require any person who has discharged, discharges, proposes to discharge or is suspected of discharging waste to investigate, monitor, and report information. The only restriction is that the burden of preparing the reports bear a reasonable relationship to the need for and the benefits to be obtained from the reports.

program, the Regional Board shall adopt individual or general waivers or WDRs for NPS discharges in the Rainbow Creek watershed. The waivers or WDRs shall require NPS dischargers to either participate in the third party NPS program or, alternatively, submit individual pollution prevention plans that detail how they will comply with the waivers and WDRs. Alternatively, the Regional Board may adopt a discharge prohibition, which includes exceptions for those discharges that are adequately addressed in an acceptable third-party MAA or MOU NPS pollution control implementation program.

8. **Take Enforcement Actions**
   The Regional Board shall consider enforcement action[58], as necessary, against any discharger failing to comply with applicable waiver conditions, WDRs, discharge prohibitions, or take enforcement action, as necessary, to control the discharge of nutrients to Rainbow Creek, to attain compliance with the nutrient wasteload and load reductions specified in this TMDL, or to attain compliance with the nutrient water quality objectives. The Regional Board may also terminate the applicability of waivers and issue waste discharge requirements or take other appropriate action against any discharger(s) failing to comply with the waiver conditions.

9. **Review and Revise Existing Waste Discharge Requirements**
   The Regional Board shall review and, if necessary, update existing waste discharge requirements for discharges to land as well as groundwater in the Rainbow Creek watershed to incorporate effluent limitations for nutrients consistent with applicable nutrient groundwater quality objectives and surface water quality objectives.[59]

10. **Recommend High Priority for Grant Funds**
    The Regional Board shall recommend that the State Board assign a high priority to awarding grant funding[60] for projects to implement the Rainbow Creek nutrient TMDLs. Special emphasis will be given to projects that can achieve quantifiable nutrient load reductions

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[58] An enforcement action is any formal or informal action taken to address an incidence of actual or threatened noncompliance with existing regulations or provisions designed to protect water quality. Potential enforcement actions including notices of violation (NOVs), notices to comply (NTCs), imposition of time schedules (TSO), issuance of cease and desist orders (CDOs) and cleanup and abatement orders (CAOs), administrative civil liability (ACL), and referral to the attorney general (AG) or district attorney (DA). The Regional Board generally implements enforcement through an escalating series of actions to: (1) assist cooperative dischargers in achieving compliance; (2) compel compliance for repeat violations and recalcitrant violators; and (3) provide a disincentive for noncompliance.

[59] There are three dischargers in the Rainbow Creek watershed currently regulated under waste discharge requirements for the discharge of waste to land or groundwaters: Oak Crest Mobile Estates (Order No. 1993-69), Rainbow Conservation Camp (Order No. 1995-20), and Temecula Truck Inspection Facility (Order No. 1992-56). The Rainbow Truck Weigh and Inspection Facility, discharges under the terms of a waiver of waste discharge requirements (Order No. 2000-235)

[60] The State Water Resources Control Board administers the awarding of grants funded from Proposition 13, Proposition 50, Clean Water Act 319(h) and other federal appropriations to projects that can result in measurable improvements in water quality, watershed condition, and/or capacity for effective watershed management. Many of these grant fund programs have specific set-asides for expenditures in the areas of watershed management and TMDL implementation for NPS pollution.

consistent with the specific nutrient TMDL load allocations.

11. **Incorporate Water Code Section 13291 Regulations in Basin Plan**
The Regional Board shall incorporate regulations currently under development by the State Water Resources Control Board pertaining to onsite wastewater treatment systems[61] into the Water Quality Control Plan for the San Diego Basin (Basin Plan) as soon as practicable upon their adoption by the State Board.[62]

9.6 County Of San Diego Actions

1. **Control MS4 Discharges to Rainbow Creek**
For nutrient discharges to or from Municipal Separate Storm Sewer Systems (MS4) within the Rainbow Creek watershed, the County has an existing obligation under the NPDES requirements for MS4s in San Diego County[63] to require increasingly stringent best management practices, pursuant to the iterative process described in Receiving Water Limitation C.2.a.[64] of the MS4 Requirements, to reduce nutrient discharges in the Rainbow Creek watershed to the maximum extent practicable and to restore compliance with the nutrient water quality objective.

2. **Submit Nutrient Reduction and Management Plan (NRMP)**
The County of San Diego shall, upon request by the Regional Board pursuant to CWC §13225, prepare and submit a NRMP for the Rainbow Creek watershed, consistent with the SWRCB NPS Implementation and Enforcement Policy and containing the elements described in Section 9.7, County of San Diego Nutrient Reduction and Management Plan. The County may submit alternative or additional elements equivalent to those described in Section 9.7 that would result in equivalent protection from, or prevention of, nutrient discharges to Rainbow Creek.

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[61] "Onsite wastewater treatment system(s)" (OWTS) is any individual or community onsite wastewater treatment, pretreatment and dispersal system including, but not limited to, a conventional, alternative, or experimental sewage dispersal system such a septic tanks having a subsurface discharge.

[62] CWC §13291 directs the Regional Board to incorporate the regulations in the Basin Plan upon their adoption by the State Water Resources Control Board.

[63] The term "MS4 NPDES Storm Water Permit" refers to Order No.2001-001, NPDES No. CAS0108758, *Waste Discharge Requirements For Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of San Diego, the Incorporated Cities Of San Diego County, and the San Diego Unified Port* District or subsequent superceding NPDES renewal Orders.

[64] Receiving Water Limitation C.2.a provides that... "Upon a determination by either the Copermittee or the SDRWQCB that MS4 discharges are causing or contributing to an exceedance of an applicable water quality standard, the Copermittee shall promptly notify and thereafter submit a report to the SDRWQCB that describes BMPs that are currently being implemented and additional BMPs that will be implemented to prevent or reduce any pollutants that are causing or contributing to the exceedance of water quality standards…"

3. **Submit and Implement Groundwater Investigation and Characterization Workplan**
The County of San Diego shall, upon request by the Regional Board pursuant to CWC §13225, undertake an investigation of groundwater quality within the Rainbow Creek watershed, and shall prepare and submit a workplan designed to guide the collection of information to produce the technical report described in Item 4, Groundwater Investigation and Characterization Report below. The workplan shall include the following:

    a. A schedule for completion of all activities and submission of a final Groundwater Investigation and Characterization Report.
    b. A description of proposed actions including drilling methods, analytical methods, sampling locations, and purging and sampling methods.
    c. The location of existing monitoring wells and the proposed location of additional monitoring wells needed to characterize nutrient concentrations and their lateral and vertical extent in groundwater.
    d. Contingencies for collection of additional samples.
    e. Sufficient scope to meet the objectives of assessing nutrient loading from surface sources to groundwater and the contribution of groundwater to the nutrient loading and nutrient concentrations in Rainbow Creek.
    f. Consideration of the following elements or factors:
        i. Nutrient mass loading to groundwater in the fractured rock aquifer and the alluvial deposits aquifer[65] from septic systems, deep percolation of applied irrigation water, and any other sources.
        ii. Base flow contribution to Rainbow Creek from the fractured rock aquifer and the alluvial deposits aquifer.
        iii. Mass balance of nutrients in the fractured rock aquifer and alluvial deposits aquifer (nutrient mass loading to groundwater, removals from the groundwater system including denitrification, plant uptake, and groundwater discharge, and change in the load and concentration of nutrients in groundwater.

The County of San Diego shall implement the workplan within sixty (60) days after submission of the workplan, unless otherwise directed in writing by the Regional Board. Before beginning these activities the County shall notify the Regional Board of the intent to initiate the proposed actions included in the workplan submitted; and comply with any conditions set by the Regional Board.

4. **Submit Groundwater Investigation and Characterization Report**
The County of San Diego shall, on a schedule agreed to in writing by the Regional Board, submit a Groundwater Investigation and Characterization Report containing a technical analysis and interpretation of the data to assess the contribution of groundwater to the nutrient loading and concentrations in Rainbow Creek. The report shall meet the objectives and address the considerations described in the Groundwater Investigation and Characterization Workplan**.** The report shall also present recommendations to refine

[65] Groundwater beneath the Rainbow Creek watershed is interpreted to occur in both the alluvial deposits where present and in the fractured rock. The groundwater investigation report shall assess the relative contribution from each aquifer.

assumptions, resolve uncertainties, and improve the scientific foundation of the TMDL with regard to quantifying groundwater nutrient loading to Rainbow Creek.

5. **Establish Management Agency Agreement (MAA)**
   The County of San Diego is requested to enter into a MAA with the Regional Board setting forth the commitment of both parties to undertake various implementation oversight responsibilities for the nonpoint source nutrient load reduction component of this TMDL and the County's commitments to implement the NRMP.

9.7 County Of San Diego Nutrient Reduction And Management Plan

1. **NPS Nutrient Reduction and Management Plan (NRMP)**
   A NRMP for the Rainbow Creek watershed shall describe the activities the County of San Diego could undertake to oversee discharger efforts to reduce nutrients in the runoff or groundwater discharges from new and existing (1) commercial nurseries; (2) agricultural fields; (3) orchards; (4) parks; (5) residential area; (6) urban areas; and; (7) septic tank disposal system land uses (hereinafter referred to as key nutrient sources). A NRMP should include the following elements as provided in items 2 through 17 below or alternative or additional elements equivalent to those described that would result in equivalent protection from, or prevention of, nutrient discharges to Rainbow Creek.

2. **Legal Authority**
   The County of San Diego should review its legal authority and evaluate its adequacy to mandate compliance with the nutrient load reductions specified in this TMDL through ordinance, statue, permit, contract or similar means. The County, at a minimum, should evaluate its authority to:

   a. Control the discharge of nutrients from nonpoint sources; and
   b. Prohibit discharges of nutrients which cause or contribute to exceedances of the nutrient load reductions specified in this TMDL or nutrient water quality objectives.

   Alternatively the County of San Diego may certify that its existing legal authority is adequate to mandate compliance with the nutrient load reductions specified in this TMDL and prevent increases in nutrient loading to Rainbow Creek.

3. **General Plan Modification**
   The County of San Diego should evaluate the adequacy of its General Plan to ensure that future land use and zoning decisions do not result in an increase in the nutrient loading to Rainbow Creek. The County should also describe the steps it will take to modify the General Plan as necessary. Alternatively the County of San Diego may certify that its existing General Plan is adequate to prevent an increase in nutrient loading to Rainbow Creek.

4. **Modify Development Project Approval Process**
   The County of San Diego should evaluate the adequacy of its development project approval / permitting process as necessary to ensure that discharges from proposed development in the Rainbow Creek watershed will comply with the nutrients load reductions specified in this TMDL and ensure that nutrient water quality objectives are not exceeded. The County's evaluation should consider the need to ensure that all development in Rainbow Creek watershed will be in compliance with County storm water ordinances, permits, and all other applicable ordinances and requirements. The County should also describe the steps it will take to modify the development project approval / permitting process as necessary. Alternatively the County of San Diego may certify that its project approval / permitting process is adequate to ensure that discharges from proposed developments in the Rainbow Creek watershed will comply with the nutrients load reductions specified in this TMDL and ensure that nutrient water quality objectives are not exceeded.

5. **CEQA Reviews**
   The County of San Diego should evaluate the adequacy of its environmental review process pursuant to CEQA to ensure that new development in the Rainbow Creek watershed does not contribute to exceedances of the nutrient load allocations specified in this TMDL or violations of the nutrient water quality objective. For example, diligent performance of environmental review under CEQA and requirements for mitigation of the adverse environmental consequences to water quality of new development and detrimental agricultural practices can significantly reduce nutrient loading to Rainbow Creek. The County's evaluation should consider the need to aggressively review proposed projects that have the potential to contribute nitrogen and phosphorus to the Rainbow Creek watershed and require appropriate mitigation. The County should also describe the steps it will take to revise the development project approval / permitting process as necessary. Alternatively the County of San Diego may certify that its environmental review process pursuant to CEQA is adequate to ensure that new development in the Rainbow Creek watershed does not contribute to exceedances of the nutrient load allocations specified in this TMDL or violations of the nutrient water quality objective.

6. **Pollution Prevention (Nutrients)**
   The County of San Diego should describe the steps it will take to implement pollution prevention[66] methods for nutrients at sites owned by the County and require its use by owners or operators of nutrient sources, where appropriate.

7. **Source Identification (Nutrients)**
   The County of San Diego should describe the steps it will take to develop and update annually an inventory of the individual nutrient sources within the residential, urban, commercial nursery; agricultural field, orchard, park, and septic tank disposal system category of land uses. The use of an automated database system, such as Geographical

[66] Pollution Prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control, treatment, or disposal.

Information System (GIS) is highly recommended.

8. **Threat to Water Quality Prioritization (Nutrients)**
   The County of San Diego should describe the steps it will take to establish priorities for inspection and oversight activities. Each individual nutrient source in each nonpoint source category should be classified as high, medium, or low threat to water quality. The inventory should include the following minimum information for each site: name, address, SIC codes as appropriate which best reflects the type of site, a narrative description characterizing the nutrient waste generated, and the potential for nutrient discharges to Rainbow Creek.

9. **MP Implementation (Nutrients)**
   The County of San Diego should describe the steps it will take to:
   a. Designate a set of minimum MMs / MPs [67] for the high, medium, and low threat to water quality nutrient sources identified in item 7 above. The designated minimum MPs for the high threat to water quality nutrient sources should be site and source specific as appropriate.
   b. Establish a time line for installation of the designated minimum MPs at each nutrient source within its jurisdiction. If particular minimum MPs are infeasible for any specific site/source the county of San Diego should describe the steps it will take to require the implementation of other equivalent MPs.

10. **Inspection of Sites and Sources (Nutrients)**
    The County of San Diego should describe the steps it will take to inspect high priority sites and sources for compliance with its ordinances and permits as well as nutrient load reductions required under this TMDL. Inspections should include review of MP implementation plans and effectiveness. The County should also describe the steps it will take to implement all inspection follow-up actions, including enforcement actions, as necessary to obtain discharger compliance in implementing MPs.

11. **Enforcement of Sites and Sources (Nutrients)**
    The County of San Diego should describe the steps it will take to enforce its ordinances, statues, permits, and contracts as necessary to attain compliance with the nutrient load reductions specified in this TMDL.

12. **Reporting of Non-compliant Sites (Nutrients)**
    The County of San Diego should describe the steps it will take to provide oral notification to the Regional Board of non-compliant sites that are determined to be

[67] In determining appropriate MPs the County of San Diego is encouraged to consult the State Water Resources Control Board's California Nonpoint Source Encyclopedia (2004) (http://www.waterboards.ca.gov/nps/encyclopedia.html). This publication contains extensive information on nutrient reduction management measures (MMs) and management practices (MPs) applicable to the NPS land use activities in the Rainbow Creek watershed. The County is also encouraged to consult the Regional Board's Watershed Management Approach for the San Diego Region, Nonpoint Source (http://www.waterboards.ca.gov/sandiego/programs/wmc.html) for additional information on management measures.

recalcitrant in implementing MPs or attaining compliance with nutrient load reductions required under this TMDL within 24 hours of the discovery of noncompliance. The notification process should also include procedures for a follow-up written report to be submitted to the Regional Board within 5 days of the incidence of non-compliance.

13. **Monitoring to Assess Compliance With Nutrient Load Reductions**
The County of San Diego should describe the steps it will take to conduct, or require nutrient sites or sources to conduct, a monitoring program to assess compliance of runoff or groundwater discharges with the load reductions from each of the land use categories assigned a load reduction. This can be accomplished by placing sampling stations at strategic nodes that would monitor nutrient discharges from individual sources of a common land use category.

14. **Community Education and Outreach**
The County of San Diego should describe the steps it will take to develop a focused educational programs to raise community awareness of the nutrient impairment problem, promote pollution prevention, and increase the use of applicable management measures and practices where needed to control and reduce nutrient discharges to Rainbow Creek. Public education, outreach, and training programs should involve applicable user groups and the community.[68]

15. **Seek Financial Assistance**
The County of San Diego is encouraged to seek grant funding[69] for projects to implement the Rainbow Creek nutrient TMDLs, particularly those that can achieve quantifiable nutrient load reductions consistent with the specific nutrient TMDL load allocations.

16. **Nutrient Reduction and Management Plan (NRMP) Effectiveness**
The County of San Diego should describe the steps it will take to develop a long-term strategy for assessing the effectiveness of the NRMP. The long-term assessment strategy should identify specific direct and indirect measurements that the County will use to track the long-term progress towards achieving the nutrient load reductions required under this TMDL. Methods used for assessing effectiveness should include the following or their equivalent: surveys, pollutant loading estimations, and receiving water quality monitoring. The long-term strategy shall also discuss the role of monitoring data in substantiating or refining the assessment.

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[68] Consideration should be given to expanding the County of San Diego's ongoing community and education outreach program under the County's MS4 NPDES Storm Water Permit to address the Rainbow Creek nutrient impairment problem. Additional suggestions for the information to be included in pollution prevention and education programs is contained in the State Water Resources Control Board's *California Nonpoint Source Encyclopedia* (2004) (http://www.waterboards.ca.gov/nps/encyclopedia.html).

[69] Information on available grant funds is contained in the in the State Water Resources Control Board's *California Nonpoint Source Encyclopedia* (2004) (http://www.waterboards.ca.gov/nps/encyclopedia.html).

17. **Nutrient Reduction and Management Plan (NRMP) Annual Report**
The County of San Diego should describe the steps it will take to submit an annual NRMP report to the Regional Board by January 31 of each year following USEPA approval of this TMDL. The reporting period for this annual report should be the previous fiscal year. For example, the report submitted January 31, 2006 would cover the reporting period July 1, 2004 to June 30, 2005. The report should be incorporated in the annual Jurisdictional URMP Annual Report and the Watershed Specific URMP Annual Reports under the County's MS4 NPDES Permit and include the following information:

    a. Comprehensive description of all activities conducted by the County of San Diego to oversee implementation of the NRMP.
    b. An accounting of all: inspections conducted; enforcement actions taken; and education efforts conducted.
    c. An assessment of whether actions to implement designated minimum MPs at each nutrient source were actually carried out by dischargers.
    d. An assessment of the compliance of runoff or groundwater discharges with the load reductions from each of the land use categories assigned a load reduction.
    e. Identification of water quality improvements or degradation in Rainbow Creek with regard to attainment of the nutrient water quality objectives.
    f. An evaluation of the effectiveness of the NRMP in achieving the nutrient load reductions required under this TMDL.

9.8 Discharger Actions

State of California, Department of Transportation (Caltrans) Actions
Caltrans shall take all actions necessary to meet the nutrient wasteload reductions assigned to Caltrans. These nutrient wasteload reductions will eventually be incorporated into the Caltrans statewide NPDES storm water permit. It is assumed that compliance with the nutrient wasteload reductions will be accomplished through the development and implementation of best management practices (BMPs). Caltrans shall also prepare and submit progress reports in accordance with the Caltrans statewide NPDES storm water permit or as otherwise directed by the Regional Board in a CWC §13383[70] order.

State of California Department of Forestry and Fire Protection (CDFFP) Actions
CDFFP shall, upon direction by the Regional Board in a CWC §13267 order, undertake an investigation to 1) evaluate whether CDFFP's discharge is surfacing and/or contributing to the impairment of Rainbow Creek; and 2) estimate the actual nutrient load to Rainbow Creek from groundwater flow originating from the septic tank and percolation ponds.

[70] CWC §13383 provides that the Regional Board may establish monitoring requirements for any person who discharges pollutants or dredged or fill material or proposes to discharge pollutants to navigable waters of the United States.

Nonpoint Source Dischargers (NPS Dischargers) Actions
NPS discharges of nutrients in the Rainbow Creek watershed result from (1) commercial nurseries; (2) agricultural fields; (3) orchards; (4) parks; (5) residential areas; (6) urban areas; and (7) septic tank disposal system land use activities. Individual landowners and other persons (NPS Dischargers) engaged in these land use activities shall implement pollution prevention[71] methods and increase the use of applicable management measures and practices[72] where needed to control and reduce nutrient discharges to Rainbow Creek and attain nutrient load reductions. Individual landowners and other persons are encouraged to seek grant funding[73] for projects to implement the Rainbow Creek nutrient TMDLs, particularly those that can achieve quantifiable nutrient load reductions consistent with the specific nutrient TMDL load allocations. NPS dischargers will be subject to Regional Board enforcement action for failing to: comply with applicable waiver conditions, waste discharge requirements (WDRs), or discharge prohibitions; attain compliance with the nutrient load reductions specified in this TMDL; or attain compliance with the nutrient water quality objectives. The Regional Board may also terminate the applicability of waivers and issue waste discharge requirements to any NPS dischargers failing to comply with waiver conditions.

9.9 Implementation Action Plan Summary

The following table is provided to summarize the County of San Diego's and discharger's implementation of the TMDLs.

[71] Pollution Prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control, treatment, or disposal.

[72] In determining appropriate management methods and practices to control nutrient discharges interested persons are encouraged to consult the State Water Resources Control Board's *California Nonpoint Source Encyclopedia* (2004) (http://www.waterboards.ca.gov/nps/encyclopedia.html. This publication contains extensive information on nutrient reduction management measures (MMs) and management practices (MPs) applicable to the NPS land use activities in the Rainbow Creek watershed. Interested persons are also encouraged to consult the Regional Board's Watershed Management Approach for the San Diego Region, Nonpoint Source (http://www.waterboards.ca.gov/sandiego/programs/wmc.html) for additional information on management measures.

[73] Information on available grant funds is contained in the in the State Water Resources Control Board's *California Nonpoint Source Encyclopedia* (2004) (http://www.waterboards.ca.gov/nps/encyclopedia.html).

Table 9-4. Summary of Implementation Actions

Action	Description	Regional Board Authority
County of San Diego Actions		
1. Control MS4 Discharges to Rainbow Creek	• Implement the requirements of Order No. 2001-01 where the permit applies	San Diego RWQCB Order No. 2001-01
2. Submit a Nutrient Reduction and Management Plan	• Develop a NRMP • Review Legal Authority • Review and revise Land Use and Planning policies and practices • Review and revise environmental review process (CEQA) • Implement pollution prevention • Inventory and prioritize nutrient sources • Designate MMs and MPs for nutrient sources • Inspect priority nutrient sites and sources • Enforce existing ordinances and adopt new ordinances as necessary • Report non-compliant sites • Monitor to Assess Compliance with Load Reductions • Provide community outreach and assistance • Seek financial assistance • Assess Effectiveness of NRMP • Review and/or revise plan annually • Submit plan and subsequent revisions to Regional Board • Develop and implement a monitoring program • Submit a monitoring and reporting program plan to Regional Board • Submit monitoring reports annually to the Regional Board	CWC § 13225
3. Submit and Implement Groundwater Investigation and Characterization Workplan	• Submit investigative workplan to Regional Board • Investigate nutrient loads to groundwater and the groundwater contribution to Rainbow Creek	CWC § 13225
4. Submit Groundwater Investigation and Characterization Report	• Submit Report to Regional Board on a schedule to be agreed to in writing by the Regional Board.	CWC § 13225
5. Establish MAA	• Enter into MAA with the Regional Board	CWC § 13225
State of California, Department of Transportation (Caltrans) Actions		
1. Meet Wasteload Allocations	• Implement the requirements of Order No. 99-06-DWQ • Submit a report on the determination of water quality exceedances and BMP implementation • Meet wasteload allocations by 2021	CWC § 13377
2. Perform Water Quality Monitoring	• Perform water quality monitoring • Submit reports annually to Regional Board	CWC § 13383
State of California, Department of Forestry and Fire Protection (CDFFP) Actions		
1. Investigate Impact of Percolation Ponds and Remediate if necessary	• Comply with the requirements of Order No. 95-20 • Investigate, monitor, and take necessary measures to ensure operations do not contribute to impairment	CWC § 13267

Action	Description	Regional Board Authority
	• Submit technical report to Regional Board	
Nonpoint Source Dischargers (NPS Dischargers) Actions		
1. Meet Load Allocations with MAA oversight	• Participate in load reductions with MAA direction and oversight • Iterative evaluation and implementation of MPs • Meet load allocations in compliance with schedule in Table 9-1	CWC § 13260 & § 13269 & § 13243

10.0 Implementation Monitoring Plan

This section describes an Implementation Monitoring Plan to assess the success of the implementation action plan presented in Section 9 in 1) achieving the nutrient wasteload and load reductions and 2) attaining nutrient water quality objectives in Rainbow Creek. The plan assigns monitoring responsibilities and describes a schedule and key milestones.

10.1 Regulatory Authority

10.1.1 Implementation Monitoring Plan as Part of a TMDL Basin Plan Amendment

Basin Plans must have a program of implementation to achieve water quality objectives.[74] The implementation program must include a description of actions that are necessary to achieve water quality objectives, a time schedule for these actions, and a description of "surveillance" to determine compliance with the water quality objectives[75]. The term "surveillance " in a TMDL context refers to an implementation monitoring plan designed to measure the effectiveness of the TMDL point and nonpoint source control measures and the progress the waterbody is making toward attaining water quality objectives. Such a plan would necessarily include collection of water quality data. State law requires that a TMDL include an implementation monitoring plan because the TMDL normally is, in essence, an interpretation or refinement of an existing water quality objective. The TMDL must be incorporated into the Basin Plan,[76] and because the TMDL supplements, interprets, or refines an existing water quality objective, state law requires an implementation monitoring plan be included to determine the success of the implementation action plan measures.

10.1.2 Local Agency Monitoring

CWC §13225 provides authority for the Regional Board to require local agencies such as the County of San Diego to submit technical reports on water quality control, even though those entities may not be waste dischargers. The only restriction is that the burden of preparing the reports bears a reasonable relationship to the need for, and the benefits to be obtained from, the reports.

[74] See CWC § 13050(j) A "Water Quality Control Plan" or "Basin Plan" consists of a designation or establishment for the waters within a specified area of all of the following: (1) Beneficial uses to be protected, (2) Water quality objectives and (3) A program of implementation needed for achieving water quality objectives.

[75] See CWC § 13242.

[76] See Clean Water Act § 303(e)

10.1.3 Discharger Monitoring

CWC §13267 provides that the Regional Board can require any person who has discharged, discharges, proposes to discharge or is suspected of discharging waste to investigate, monitor, and report information. The only restriction is that the burden of preparing the reports bear a reasonable relationship to the need for, and the benefits to be obtained from, the reports.

CWC § 13283 provides that the Regional Board may establish monitoring requirements for any person who discharges pollutants or dredged or fill material or proposes to discharge pollutants to navigable waters of the United States.

10.2 Monitoring Objectives

The specific objectives of this Implementation Monitoring Plan are as follows:

1. Establish a monitoring program for Rainbow Creek and its tributaries using monitoring, sampling and analytical methods consistent with the SWRCB Surface Water Ambient Monitoring Program (SWAMP); SWAMP data quality assurance protocols; and SWAMP data management;

2. Characterize baseline conditions in Rainbow Creek and its tributaries with respect to nutrients to place future monitoring data into perspective and document progress towards cleaner water;

3. Establish a groundwater monitoring network in the Rainbow Creek watershed to define nutrient concentration trends. Results from the network will be used to document whether implementation of MPs /BMPs by dischargers translate to decreased nutrient concentrations in groundwater and reduced nutrient loading to Rainbow Creek from groundwater.

4. Track changes in water quality over time in Rainbow Creek and its tributaries with respect to nutrients and enable comparison of baseline data and TMDL target values with conditions. Determine whether the "trajectory" of the measured water quality values points toward attainment of the nutrient water quality objectives;

5. Evaluate the effectiveness of the TMDL implementation actions over time and determine the need for revisions to improve the implementation action plan;

6. Provide the monitoring data needed to verify or refine assumptions, resolve uncertainties, and improve the scientific foundation of the TMDL; and

7. Provide the monitoring data needed to evaluate the overall TMDL implementation effectiveness and success in attaining nutrient water quality objectives in Rainbow Creek and its tributaries.

10.3 Regional Board Actions

1. **Issue Order to Submit Monitoring Plan to Caltrans and County of San Diego**
   The Regional Board shall issue an Order to Caltrans under CWC §13383 and a Governmental Water Quality Investigation Request Order to the County of San Diego under CWC §13225, to prepare and submit an Implementation Monitoring Plan containing the elements described in **Section 10.5 Implementation Monitoring Plan Elements** below. The Regional Board may amend this order at any time to include other nutrient dischargers in the Rainbow Creek watershed on a case-by case basis.

2. **Issue Order to Implement Monitoring Plan to Caltrans and County of San Diego**
   Upon concurrence with the County of San Diego's and Caltrans' Implementation Monitoring Plan the Regional Board shall issue an Order to Caltrans under CWC § 13383 and a Governmental Water Quality Investigation Request Order to the County of San Diego under CWC § 13225, to implement monitoring. The Regional Board may amend this order at any time to include other nutrient dischargers in the Rainbow Creek watershed on a case-by case basis.

10.4 County of San Diego and Caltrans Actions

1. **Prepare and Submit Monitoring Plan**
   The County of San Diego and Caltrans shall collaborate to prepare and submit an Implementation Monitoring Plan for the Rainbow Creek watershed containing the elements described in **Section 10.5 Implementation Monitoring Plan Elements** below, upon direction by the Regional Board in a CWC §13225 / CWC §13383 Order. The number of monitoring stations in Rainbow Creek assigned to Caltrans should be based on the number of stations needed by Caltrans to demonstrate compliance with the nutrient wasteload allocation and the success of the TMDL in attaining the nutrient water quality objective in the portion of Rainbow Creek affected by its discharge. The Implementation Monitoring Plan shall be modified as requested by the Regional Board.

2. **Implement Monitoring Plan**
   The County of San Diego and Caltrans shall implement the Implementation Monitoring Plan upon direction by the Regional Board pursuant to a CWC §13225 / §13383 Order. The Regional Board may amend this order at any time to include other nutrient dischargers in the Rainbow Creek watershed on a case-by case basis.

10.5 Implementation Monitoring Plan Elements

The Implementation Monitoring Plan shall contain the following elements:

1. **Surface Water Monitoring Stations**
   Monitoring stations shall be proposed that best serve the monitoring objectives described above in Section 10.2 Monitoring Objectives. Previously monitored locations that shall be considered include Jubilee, Hines Nursery, Oak Crest, Rainbow Glen Tributary, Margarita Glen Tributary, Willow Glen-4, Willow Glen Tributary, Riverhouse, Via Milpas Tributary, and Stage Coach (See Figure A-3, in Appendix A). An additional sampling location between Oak Crest and Willow Glen-4 should also be considered. For instance, a monitoring location might be placed downstream of Oak Crest Mobile Estates to assess nutrient loading from this property. Monitoring stations shall also be considered at strategic nodes in Rainbow Creek and its tributaries that would monitor nutrient discharges from individual sources of a common land use category.

2. **Groundwater Monitoring Stations**
   The location of existing wells and the proposed location of additional monitoring wells needed to define nutrient concentration trends in groundwater. Methods for purging and sampling monitoring wells to provide representative samples for the waste constituents of interest should be described.

3. **Surface Water Monitoring Frequency**.
   Monitoring frequencies of the various monitoring parameters shall be proposed that best serve the monitoring objectives described above in Section 10.2 Monitoring Objectives. The frequencies should be adequate to evaluate ambient conditions and address any impact from low dissolved oxygen concentrations and algal growth.

4. **Groundwater Monitoring Frequency**
   Monitoring frequencies of the various monitoring parameters shall be proposed that best serve the monitoring objectives described above Section 10.2 Monitoring Objectives. The magnitude and timing of nutrient variability may vary significantly in monitoring wells that are located varying distances from nutrient sources. Sampling these wells will likely obtain water from varying depths in the aquifer. To define the nitrate variability at each well, the network will be sampled quarterly for two years. The observed variability will serve as a basis for determining the long-term sampling frequency for the network.

5. **Surface Water Quality Parameters**
   Surface Water Quality Parameters shall include nitrogen (including nitrate, nitrite, ammonia and total Kjeldahl nitrogen (TKN)), phosphorus (including orthophosphate and total), dissolved oxygen, pH, turbidity, and temperature.

6. **Groundwater Quality Parameters**
   Groundwater Quality Parameters shall include total nitrogen, nitrate, ammonia, nitrites, TKN, orthophosphate, total phosphorus, pH, dissolved Oxygen and TDS.

7. **Hydrology**
   Flow rate measurements shall be taken to calculate nutrient loading, to provide additional information about the hydrology of the watershed, and to identify patterns in algal growth.

8. **Algal Biomass**
   Characterization of algal species composition is needed to provide a more reliable indicator of trophic status and evidence of nutrient condition (USEPA 2000a). The growth of algae is stimulated principally by nutrients such as nitrogen and phosphorus, but also requires adequate water temperature, light, flow, and dissolved oxygen. It is assumed at this time that both factors are co-limiting. Characterization of algal species composition may give a better understanding of the relationships between all the factors that affect algal growth, including sunlight, nitrogen, phosphorus, temperature, and dissolved oxygen. Algal biomass should be quantified by mass and/or by % cover of bottom (USEPA 2000a). Collection and measurement of algal biomass should be performed uniformly or by a standardized method (see USEPA 2000a).

9. **Biological Assessment Monitoring**
   It is recommended that biological assessment monitoring of benthic microinvertebrates be performed at a minimum of three stations on Rainbow Creek and a reference stream. Biological assessment monitoring should be performed in accordance with the California Stream Bioassessment Methods Manual (Harrington and Born 2000). Changes in the stream's biological integrity (e.g., an increase or decrease in diversity and abundance of sensitive species) could be used as an indicator of changes in the health of the creek. Sampling done in 1998-99 for the San Diego Ambient Bioassessment Program (CDFG 2000a) indicates that benthic macroinvertebrate communities vary seasonally. The seasonal trend could be due in part to rainfall and consequent streamflow conditions (e.g., scouring). Thus, sites should be sampled for benthic macroinvertebrates at least twice each year: once during the spring (i.e., May), and again in the fall (preferably in October).

10. **Monitoring Reports**
    Monitoring reports shall be submitted in both electronic and paper formats and include the following information:

    a) An executive summary addressing all sections of the monitoring report, comprehensive interpretations and conclusions, and recommendations for future actions;
    b) A description of monitoring station locations by latitude and longitude coordinates, frequency of sampling, quality assurance/quality control procedures and sampling and analysis protocols;
    c) The data/results, methods of evaluating the data, graphical summaries of the data, and an explanation/discussion of the data;
    d) An assessment of the compliance of runoff characteristics with the required load reductions from each of the land use categories assigned a load reduction;
    e) Identification and analysis of trends in surface and groundwater quality and assessment of compliance with nutrient water quality objectives; and

f) An evaluation of the effectiveness of the TMDL implementation actions and the need for revisions to improve the implementation action plan.

Table 10-1. Required Monitoring Parameters

Parameter	Type of sample[1]
Surface Water Monitoring	
Total nitrogen, nitrate, ammonia[2], nitrites, TKN, orthophosphate, and total phosphorus concentrations	Grab
Temperature	In Situ
pH	In Situ
Dissolved Oxygen	In Situ
Turbidity	In Situ
TDS	Grab
Flow rate	Field Measurement
Algal biomass (% cover of bottom and/or Chl a/ash free dry weight (AFDM))	In Situ and/or Grab
Benthic macroinvertebrate community analysis (recommended)	Grab
Groundwater Monitoring	
Total nitrogen, nitrate, ammonia[2], nitrites, TKN, orthophosphate, and total phosphorus concentrations	Grab
pH	Grab or In Situ
Dissolved Oxygen	Grab or In Situ
TDS	Grab or In Situ

[1] A California certified laboratory should be used with an approved QA/QC plan.
[2] All laboratory detection limits should be sufficient to determine compliance with the water quality objective. For example, un-ionized ammonia in surface waters (25 µg/L).

11. **Quality Assurance / Quality Control Plan**

The monitoring program shall develop and implement a QA/QC plan for field and laboratory operations to ensure that data collected are of adequate quality given the monitoring objectives.[77] The QA/QC plan for field operations shall cover the following, at a minimum:

a. Quality assurance objectives;
b. Sample container preparation, labeling and storage;
c. Chain-of-custody tracking;
d. Field setup;
e. Sampler equipment check and setup;
f. Sample collection;
g. Use of field blanks to assess field contamination;
h. Use of field duplicate samples;
i. Transportation to the laboratory;
j. Training of field personnel; and
k. Evaluation, and enhancement if needed of the QA/QC plan.

The QA/QC plan for laboratory operations shall cover the following, at a minimum:

a. Quality assurance objectives;
b. Organization of laboratory personnel, their education, experience, and duties;
c. Sample procedures;
d. Sample custody;
e. Calibration procedures and frequency;
f. Analytical procedures;
g. Data reduction, validation, and reporting;
h. Internal quality control procedures;
i. Performance and system audits;
j. Preventive maintenance;
k. Assessment of accuracy and precision;
l. Correction actions; and
m. Quality assurance report.

12. **Reporting Period**

Annual reports should cover the period of October 1 through September 30. The reports should be submitted to the Regional Board by January 31 of the following year and should be incorporated within the annual receiving water monitoring reports required under the County of San Diego's MS4 NPDES Permit Receiving Waters Monitoring and Reporting Program.[78]

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[77] For more information on QA/QC activities, including guidelines and example QA/QC documents, refer to http://www.waterboards.ca.gov/swamp/qapp.html

[78] The term "MS4 NPDES Storm Water Permit" currently refers to Order No.2001-001, NPDES No. CAS0108758, Waste Discharge Requirements For Discharges Of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of San Diego, the Incorporated Cities Of San Diego County, and the San Diego Unified Port District or subsequent superceding NPDES renewal Orders. Attachment B

13. **Reporting Frequency**
The first report shall be due in the first January following initiation of the monitoring program. Reporting shall continue on an annual basis until the nutrient water quality objective has been attained and maintained in Rainbow Creek.

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to this Order contains the Receiving Waters Monitoring and Reporting Program for Order No. 2001-01. The annual receiving water monitoring report is described in Table 6, Item 28, page 51 of Order No. 2001-01.

11.0 Environmental Review

This Section presents the Regional Board's environmental analysis of the amendment to the "Water Quality Control Plan for the San Diego Basin (9)" (Basin Plan) to incorporate a Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek.

11.1 Legal Authority

The Regional Board must comply with the California Environmental Quality Act (CEQA) when the Board amends the Basin Plan[79]. The CEQA process requires the Regional Board to analyze and disclose the potential adverse environmental impacts of a Basin Plan amendment it is initiating or approving. The Regional Board's Basin Plan amendment process must consider alternatives, develop proposals to mitigate or avoid environmental impacts to the extent feasible, and involve the public and other public agencies in the evaluation process.

11.1.1 CEQA Requirements Exemption

CEQA authorizes the Secretary of the Resources Agency to certify state regulatory programs, designed to meet the goals of CEQA, as exempt from CEQA's requirements to prepare an Environmental Impact Report (EIR), Negative Declaration, or Initial Study. These programs are often referred to as being "functionally equivalent" to the CEQA process

The State Resources Agency has certified the Regional Board's basin plan amendment process as "functionally equivalent" to the CEQA process.[80] State Water Resources Control Board (SWRCB) regulations[81] describe the environmental documents required for Basin Plan Amendment actions. These documents are: a written report, a Basin Plan Amendment and an Environmental Checklist Form.[82] This report, *Basin Plan Amendment and Technical Report for Total Nitrogen and Total Phosphorus, Total Maximum Daily Loads For Rainbow Creek,* fulfills the requirements of CEQA for preparation of an environmental document for this Basin Plan amendment.

11.1.2 Scope of Environmental Analysis

TMDL Basin Plan amendments typically include "performance standards."[83] TMDLs normally contain a quantifiable numeric target that interprets the applicable water quality objective. TMDLs also include wasteload allocations for point sources, load allocations for nonpoint sources and natural background. The quantifiable target together with the allocations may be

[79] See Public Resources Code § 21080

[80] See CCR, Title 14, § 15251(g).

[81] See 23 CCR 3720 et seq, "Implementation of the Environmental Quality Act of 1970"

[82] See 23 CCR 3776

[83] The term "performance standard" is defined in the rulemaking provisions of the Administrative Procedure Act (Government Code §§ 11340-l 1359). A "performance standard" is a regulation that describes an objective with the criteria stated for achieving the objective. (Government Code §11342(d)).

considered a performance standard.

CEQA has specific provisions governing the Regional Board's adoption of regulations such as the regulatory provisions of Basin Plans that establish "performance standards" or treatment requirements.[84] These provisions require that the Regional Board perform an environmental analysis of the reasonably foreseeable methods of compliance with the wasteload and load allocations prior to the adoption of the TMDL Basin Plan amendment. Specifically the Regional Board must provide an environmental analysis including at least the following:

1. A summary of the proposed TMDL Basin Plan amendment including an analysis of issues voiced by the public during the course of the TMDL Basin Plan development;

2. An analysis of the reasonably foreseeable environmental impacts of the implementation methods that may be employed to comply with the TMDL Basin Plan Amendment. The Environmental Checklist Form[85] should be used to identify any environmental impacts;

3. An analysis of the reasonably foreseeable feasible mitigation measures relating to those environmental impacts; and

4. An analysis of reasonably foreseeable alternatives to the proposed TMDL Basin Plan amendment.

The Regional Board's method of analysis to identify environmental impacts associated with the Rainbow Creek TMDLs is based on a "tiering"[86] approach to provide increased efficiency in the CEQA process. Tiering allows the Regional Board to limit its analysis in this document to the broad environmental issues at the Basin Plan amendment "performance standard" adoption stage which are ripe for decision. The Regional Board is not required, at the Basin Plan amendment adoption stage, to evaluate environmental issues associated with specific projects to be undertaken later to comply with the performance standard.[87] CEQA provisions allow for project level environmental considerations to be deferred so that more detailed examination of the effects of these projects in subsequent second tier CEQA environmental documents can be made by the appropriate lead agency.[88]

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[84] See Public Resources Code §§ 21159 and 21159.4

[85] 23 CCR § 3777

[86] See Public Resources Code § 21068.5

[87] See Public Resources Code (PRC) §§ 21159 through 21159.4 and CCR 14 § 15187. See also the legislative intent in PRC § 21156, and the statutes regarding "tiered" environmental review in PRC §§ 21068.5, and 21093-21094.

[88] See Public Resources Code § 21067. "Lead Agency" means the public agency which has the principal responsibility for carrying out or approving a project. The Lead Agency will decide whether an EIR or Negative Declaration will be required for the project and will cause the document to be prepared.

11.2 Project Description

The purpose of this project is to amend the Basin Plan to incorporate total maximum daily loads (TMDLs) for nitrogen and phosphorus and to assign wasteload and load allocations in order to attain and maintain water quality objectives in Rainbow Creek. A wasteload allocation is assigned to a point source discharger (Caltrans) and load allocations are assigned to commercial nursery, agricultural field, orchard, park, residential area, urban area, and septic tank disposal system land use activities to reduce nutrient loading to Rainbow Creek.

The Basin Plan amendment contains an Implementation Action Plan describing:

1. Actions that are specific to the pollutant and waterbody for which the TMDLs are being established;
2. Persons responsible for implementing specified control actions;
3. A timeline description of when activities necessary to implement the TMDL will occur;
4. A description of the legal authorities under which implementation will occur;
5. A description of milestones that will be used to measure progress; and
6. The time required to attain water quality objectives.

The Basin Plan amendment also contains an Implementation Monitoring Plan to evaluate the overall TMDL implementation effectiveness and success in attaining nutrient water quality objectives in Rainbow Creek and its tributaries.

The Basin Plan amendment establishes nutrient wasteload and load reductions over a 16-year period. During the first four years, nutrient wasteload and load reductions are projected to attain the nitrates water quality objective and reduced total nitrogen and total phosphorus concentrations in Rainbow Creek. Additional incremental nutrient wasteload and load reductions are required throughout the subsequent 12-year reduction period until December 31, 2021. A three-year response time is projected for Rainbow Creek to attain compliance with nutrient water quality objectives after reaching the desired nutrient wasteload and load reductions in 2021. Accordingly, the projected date when Rainbow Creek will attain and maintain compliance with nutrient water quality objectives is December 31, 2024.

11.3 Analysis of Public Comment on Technical Issues

This section summarizes the Regional Board's analysis of issues associated with the project that were identified by commenters in meetings with the Regional Board during the development of the Rainbow Creek TMDLs. This section also summarizes the Regional Board's analysis of issues presented at a Board public hearing on May 8, 2002 to consider the adoption of an earlier draft nutrient TMDL version for Rainbow Creek.

11.3.1 Issue: Are the Rainbow Creek Nutrient TMDLs Necessary?

Comment Summary: Over the course of the development of the TMDL, some commenters noted that current nutrient concentrations in Rainbow Creek are substantially less than the concentrations observed in the mid-1980s, and that evidence regarding actual beneficial use impairment is lacking. These commenters suggested that no TMDLs are necessary for Rainbow

Creek.

Analysis: The Regional Board carefully considered these comments but is proceeding with amending the Basin Plan to establish nutrient TMDLs for Rainbow Creek. Clean Water Act § 303(d) requires the states to identify waters within their borders that are not attaining water quality standards and to establish the total maximum daily load (TMDL) for pollutants impairing those waters. Amendment of the Basin Plan to establish and implement Total Maximum Daily Loads (TMDLs) for Rainbow Creek is necessary because the existing water quality does not meet applicable numeric water quality objectives for nitrate, total nitrogen, and total phosphorus. Applicable state and federal laws require the adoption of this Basin Plan amendment. The discussion in the problem statement section of this report provides additional detailed information on the need for TMDLs to address the nutrient water quality impairment conditions in Rainbow Creek.

11.3.2 Issue: Are the TMDL Targets and Load Reductions Feasible?

Comment Summary: Over the course of the development of the TMDL, some commenters expressed concern that it will not be technically feasible to attain the TMDL biostimulatory targets or reduce loading to the levels required to meet the proposed TMDLs. These commenters indicated that the Rainbow Creek watershed agricultural community would not be able to completely reduce nutrient loads to the very low quantities necessary to attain the load allocations for irrigated agriculture and nurseries.

Analysis: The Regional Board recognizes that it is difficult to ensure with precision that agricultural operations implementing nonpoint source management practices (MPs) controls will achieve the required nutrient load reductions. Nutrient MPs for agricultural operations may not perform according to expectations to achieve expected pollutant load reductions despite best efforts. The TMDL Implementation Action Plan provides for interim, measurable, milestones for determining whether nutrient MPs are being implemented, and a process for implementing stronger and more effective management measures if necessary. This type of approach might involve very long time frames before the nutrient water quality objectives are attained. The Regional Board is currently projecting that attainment of the nutrient water quality objectives may not occur until December 2024.

There is extensive information available to the agricultural community in the Rainbow Creek watershed to assist them in identifying and implementing proven practices to reduce nutrient discharges and restore the impaired waters of Rainbow Creek. One such source of information is the SWRCB's California Nonpoint Source Encyclopedia (2004) (http://www.waterboards.ca.gov/nps/encyclopedia.html). This publication contains extensive information on seven management measures designed to address agricultural nonpoint source (NPS) pollution of state waters.

The management measures referenced in California Nonpoint Source Encyclopedia were developed by the SWRCB, California Coastal Commission (CCC), and other state agencies and consist of a suite of plans, practices, technologies, operating methods, or other alternatives that may be used in combination to control NPS pollution. Associated with each management

measure are management practices designed to reduce the quantities of pollutants entering receiving waters. Many of the agricultural management practices listed under each management measure were approved for use on agricultural lands by the California Natural Resources Conservation Service (NRCS). Some practices are recommended by the U.S. Department of Agriculture (USDA) NRCS as components of Resource Management Systems (RMSs). RMSs, also known as conservation planning, are whole-farm plans that incorporate economic, social, and ecological considerations to meet the demands of crop and animal production and long-term environmental sustainability. RMSs contain pollution control criteria for soil, air, water, plant, animal, and human resources, which are described in the USDA NRCS *Field Office Technical Guide*. These organizations can also provide technical assistance to increase the ability of agricultural professionals and landowners in making sustainable nutrient management decisions to minimize or eliminate NPS pollution attributable to nutrient discharges.

Management Measure 1C in the California Nonpoint Source Encyclopedia addresses the development and implementation of comprehensive nutrient management plans for areas where nutrient runoff is a problem affecting coastal waters and/or water bodies listed as impaired by nutrients. The purpose of this management measure is to reduce the nutrient loss from agricultural lands, which occurs through edge-of-field runoff or leaching from the root zone.

Nutrients can be effectively managed to markedly reduce the potential for NPS pollution through development of a nutrient management plan (NMP) in accordance with USDA NRCS Standard 590. NMPs should be updated at least once every 5 years or once per crop rotation period. Such plans would include a plant tissue analysis to determine crop nutrient needs; crop nutrient budget; identification of the types, amounts, and timing of nutrients necessary to produce a crop based on realistic crop yield expectations; identification of hazards to the site and adjacent environment; soil sampling and tests to determine crop nutrient needs; and proper calibration of nutrient equipment. When manure from confined animal facilities that are not confined animal feeding operation (CAFOs) is to be used as a soil amendment and/or is disposed of on land, the plan should discuss steps to ensure that subsequent irrigation of that land does not leach excess nutrients to surface or groundwater. Components of an NMP include the following:

1. Farm and field maps showing acreage, crops, soils, and water bodies;

2. Realistic yield expectations for the crop(s) to be grown based primarily on the producer's yield history, State Land Grant University yield expectations for the soil series, or USDA NRCS Soils-5 information for the soil series;

3. A summary of the nutrient resources available to the producer, which at a minimum include (a) soil test results for pH, phosphorus, nitrogen, and potassium; (b) nutrient analysis of manure, sludge, mortality compost (birds, pigs, etc.), or effluent (if applicable); (c) nitrogen contribution to the soil from legumes grown in rotation (if applicable); and (d) other significant nutrient sources (e.g., irrigation water);

4. An evaluation of the field limitations based on environmental hazards or concerns such as (a) sinkholes, shallow soils over fractured bedrock, and soils with high leaching potential; (b) lands near surface water; (c) highly erodible soils; and (d) shallow aquifers;

5. Use of the limiting nutrient concept to establish a mix of nutrient sources and requirements for the crop based on realistic yield expectations;

6. Identification of timing and application methods for nutrients to (a) provide nutrients at rates necessary to achieve realistic yields, (b) reduce losses to the environment, and (c) avoid applications as much as possible to frozen soil and during periods of leaching or runoff;

7. Provisions for the proper calibration and operation of nutrient application equipment; and

8. Provisions to ensure that, when manure from confined animal facilities (excluding CAFOs) is to be used as a soil amendment or is disposed of on land, subsequent irrigation of the land does not leach excess nutrient to surface or groundwater.

11.3.3 Issue: Is the Methodology for Estimating Nutrient Loading from Land Use Activities Accurate?

Comment Summary: Commenters expressed concerns that the nutrient export coefficients the Regional Board used to estimate nutrient loading from various land use activities are not site-specific or tailored to the local topography, soil and vegetation types. The use of the export coefficients could introduce unacceptable errors in the loading estimates and overestimate load reduction

***Analysis*:** The calculation methodology is reasonable and consistent with approaches used in scientific literature and EPA guidance documents for estimating NPS loading rates for use in TMDLs. The current nutrient loadings were estimated using peer reviewed literature values of nutrient export rates for particular land use types. The Regional Board recognizes it is difficult to calculate nutrient loading from nonpoint sources with precision and acknowledges that the development of the nutrient loads from NPS discharges is characterized by uncertainties. The Regional Board has structured an adaptive implementation action plan that simultaneously makes progress toward achieving nutrient water quality objectives while relying on monitoring data to reduce uncertainty and fill data as time progresses. This monitoring data can be used to revise and improve the initial TMDL forecast for nutrient loading from non point sources over time if necessary.

11.3.4 Issue: Are the Nutrient TMDLs Consistent With the Clean Water Act § 303(d) List?

Comment Summary: Commenters objected at the May 8, 2002 public hearing to establishing total nitrogen and total phosphorus TMDLs because the proposed TMDLs did not explicitly match the "eutrophic conditions" impairment condition for Rainbow Creek contained in the Clean Water Act (CWA) § 303(d) listing that was in effect at that time.

***Analysis*:** The Regional Board's consideration of Nutrient TMDLs for Rainbow Creek in 2002 was entirely appropriate even though Rainbow Creek waters were not at that time explicitly listed as impaired due to nitrogen and phosphorus concentrations. Clean Water Act (CWA) §

303(d)(1)(A) requires each state to identify the waters within its jurisdiction that are not attaining water quality standards. The result of that process is commonly known as the CWA § 303(d) list. The federal regulations additionally require the 303(d) list to include an identification of the pollutants causing or expected to cause violations of standards.[89]

For the waters on the CWA § 303(d) list, CWA § 303(d) (1)(C) requires the state to develop TMDLs for the pollutants that are impairing those waters. In many instances waters on the CWA § 303(d) list are not identified as impaired by a specific pollutant, but by conditions that are caused in whole or in part by pollutants. Examples of these stressors include accelerated eutrophication (typically associated with excessive nutrients), toxicity (miscellaneous toxic constituents), and temperature (thermal discharges and sediment). CWA § 303(d)(1)(A) does not prohibit identifying waters as impaired by such conditions, and the United States Environmental Protection Agency (USEPA) has approved this approach, for example, by approving the 1998 and 2002 303(d) lists. Such listings, however, do not impact the state's obligation under CWA § 303(d) (1)(C) to develop TMDLs for the pollutants impairing those waters. Accordingly, where waters are listed as impaired for conditions commonly associated with pollutants, the Regional Board must identify the pollutants underlying or contributing to the conditions, and either establish TMDLs for those pollutants, or establish TMDLs that otherwise correct the conditions leading to the impairment.

In any event, the latest listing of impaired waters in the CWA § 303(d) List for 2002 renders the issue moot. During the public comment period on the CWA § 303(d) List for 2002, the Regional Board recommended that the SWRCB and USEPA change the Rainbow Creek impairment listing from "eutrophic conditions" to a pollutant-based listing based on exceedances of nitrogen and phosphorus water quality objectives. The SWRCB and USEPA concurred with this recommendation and the current CWA § 303(d) List for 2002 describes Rainbow Creek's pollutant impairment as "nitrogen and phosphorus."

11.3.5 Issue: Do Eutrophic Conditions Exist in Rainbow Creek?

Comment Summary: Some commenters at the May 8, 2002 public hearing also expressed the view that the Regional Board did not observe severe eutrophic conditions during the TMDLs development, and therefore, no impairment existed in Rainbow Creek.

Regional Board Analysis: As documented in Section 2.4 and 2.5 of this technical report, Rainbow Creek monitoring performed by the Regional Board in January through October 2000 found nitrogen and phosphorus enrichment, localized excessive filamentous algae, and exceedance of the Biostimulatory Substances water quality objective numeric values, strongly indicating impairment of the waterbody.

[89] See 40 C.F.R. § 130.7(b)(1)(4)

11.3.6 Issue: Is the Regional Board Interpreting the Biostimulatory Substances Water Quality Objective Properly?

Comment Summary: Several commenters asserted at the May 8, 2002 public hearing that the Regional Board is misinterpreting the Biostimulatory Substances water quality objective and that the water quality objective does not contain numeric values.

Analysis: The Biostimulatory Substances water quality objective is stated in Section 2.4 of this report. The Regional Board uses the 0.1 mg/l goal for phosphorus stated in the Biostimulatory Substances water quality objective as a phosphorus water quality objective unless site specific scientific studies demonstrate that a modified phosphorus objective is appropriate for a particular waterbody. (A modified water quality objective is referred to as a site-specific water quality objective (SSO).) Similarly the Regional Board uses the N:P ratio of 10:1 cited in the in the Biostimulatory Substances water quality objective as a basis for establishing a nitrogen water quality objective of 1.0 mg/l unless site specific scientific studies are conducted to establish a nitrogen site specific water quality objective based on different N:P ratios. SSOs must be approved by the Regional Board and incorporated into the Basin Plan. The Regional Board's use and interpretation of the Biostimulatory Substances water quality objective in this manner is well established and consistent with applicable laws and regulations.

The 0.1 mg/l goal for phosphorus stated in the Biostimulatory Substances water quality objective is the phosphorus water quality objective applicable to Rainbow Creek. Simarly the N:P ratio of 10:1 stated in the Biostimulatory Substances water quality objective serves as the basis for determining allowable concentrations of nitrogen in Rainbow Creek. Applying the the N:P ratio of 10:1 to a phosphorus water quality objective of 0.1 mg/l yields 1.0 mg/l total nitrogen as the applicable nitrogen water quality objectives for Rainbow Creek

The Biostimulatory Substances water quality objective requires the use of 0.1 mg/l phosphorus and 1.0 mg/l nitrogen as water quality objectives unless scientific studies show that alternative site specifc water quality objectives (SSOs) for nitrogen and phosphorus are appropriate for Rainbow Creek. The SSOs would need to (1) be based on sound scientific rationale; (2) protect the designated beneficial uses of Rainbow Creek waters; and (3) be adopted by the Regional Board in a Basin Plan amendment. Dischargers or other interested parties would need to fund and initiate the scientific studies to develop the SSO. It is possible the studies could reveal the need for more stringent nutrient water quality objectives.

In Section 2.4, an expanded discussion of academic literature and currently proposed USEPA numeric nutrient criteria are presented to support the reasonableness of the Biostimulatory Substances water quality objective numeric values. This issue is also addressed in Appendix M – Response to Public Comments, Public Hearing on May 8, 2002 under comments related to Water Quality Standards. It should be noted that USEPA's recommended water quality criteria for the subecoregion that includes Rainbow Creek are 0.5 mg N/L for total nitrogen and 0.03 mg P/L for total phosphorus which is even more stingent than the Regional Board's 1.0 mg/l nitrogen and 0.1 mg/l phosphorus that the Regional Board is using as the basis for the Rainbow Creek TMDL.

The Regional Board is currently participating in the development of new numeric nutrient water quality objecitves in an effort underway in California by the USEPA Region IX Regional Technical Advisory Group (RTAG). The RTAG group is currently working on developing alternative regional nutrient water quality criteria for the Southern and Central California due to the number of nutrient TMDLs being completed in this region. Basin Plan resources are assigned to continue participation in the RTAG effort over the next three years. Information on the National Nutrient Strategy, the status of the RTAG effort, and technical guidance can be found at http://www.epa.gov/ost/standards/nutrient.html.

11.3.7 Issue: Is the TMDL Overburdened with Data Gaps?

***Comment Summary*:** Several commenters asserted at the May 8, 2002 public hearing that the technical basis of the Rainbow Creek TMDLs under consideration at that time, was overburdened with data gaps and numerous mentions of having a lack of data, filling data gaps, re-evaluating the TMDLs, and adjusting allocations.

***Analysis*:** The Regional Board acknowledges that the technical basis of the Rainbow Creek TMDL is characterized by data gaps and uncertainties. Scientific uncertainty is a reality within all water quality programs, including the TMDL program, and it cannot be entirely eliminated. The TMDL program must move forward in the face of these uncertainties if progress in establishing TMDLs and attaining water quality objectives in impaired waters is to be made.

The National Research Council addressed this issue in their report for the US Congress entitled *Assessing the TMDL Approach to Water Quality Management* (2000) and concluded that

> "… the ultimate way to improve the scientific foundation of TMDLs is to incorporate the scientific method, and not simply the results from analysis of particular data sets or models, into TMDL planning. The scientific method starts with limited data and information from which a tentatively held hypothesis about cause and effect is formed. The hypothesis is tested, and new understanding and new hypotheses can be stated and tested. By definition, science is this process of continuing inquiry. Thus, calls to make policy decisions based on the "the science," or calls to wait until "the science is complete," reflect a misunderstanding of science. Decisions to pursue some actions must be made, based on a preponderance of evidence, but there may be a need to continue to apply science as a process (data collection and tools of analysis) in order to minimize the likelihood of future errors."

In accordance with this approach the Regional Board has structured an adaptive implementation action plan in the revised Rainbow Creek TMDL that simultaneously makes progress towards achieving nutrient water quality objectives while relying on monitoring data to reduce uncertainty and fill data gaps as time progresses. This monitoring data can be used to revise and improve the initial TMDL forecast over time. This type of approach will help ensure that the Rainbow Creek TMDL program is not halted because of a lack of data and information, but rather progresses while better data are collected to verify or refine assumptions, resolve uncertainties, and improve the scientific foundation of the TMDL.

The Regional Board has extensively modified the Rainbow Creek TMDL to improve the scientific basis and validity of the wasteload and load allocations. The revised Rainbow Creek TMDL report now includes eight years of site-specific flow data to calculate the TMDLs, and City of San Diego water quality data from 12 minimally impacted streams within the County to calculate the background load. (See Sections 4.1.1, and 5 and Appendix D)

11.3.8 Issue: Is the Nutrient Load Defining Background Conditions Calculated Properly?

***Comment Summary*:** Several commenters expressed the view at the May 8, 2002 public hearing that it was unreasonable and unobtainable to achieve a TMDL below background conditions, and that the TMDL proposed at that time was scientifically flawed. These comments were directed towards the Regional Board's March 22, 2002 report on Rainbow Creek TMDLs where the background nutrient load to Rainbow Creek was estimated by multiplying the export coefficient for open space and the acreage of undeveloped land. This method resulted in a background load estimate that was higher than the total nitrogen TMDL. Using this methodology, Rainbow Creek would have no assimilative capacity for additional nutrient loading from anthropogenic sources.

***Analysis*:** The Regional Board agreed with these commenters and has recalculated the background nutrient loading from natural sources. The Regional Board reviewed and considered additional data from minimally impacted streams in the San Diego region to better define background nutrient concentrations from natural sources and eight years of site-specific Rainbow Creek flow data to calculate a background load for Rainbow Creek (See Section 4.1.1 and Appendix D of this report). The revised background loads for total nitrogen and total phosphorus in the revised TMDL described in this report are less than the nutrient water quality objective. Using this methodology, Rainbow Creek does have some limited assimilative capacity for additional nutrient loading from anthropogenic sources.

This issue was also addressed in Appendix M – Response to Public Comments, Public Hearing on May 8, 2002 under comments related to Technical Issues.

11.3.9 Issue: Should Site Specific Flow Data be Used?

Comment Summary: USEPA commented that the Regional Board should use site-specific stream flow records from the USGS Gaging Station located on Rainbow Creek for use in determining the nutrient loading capacity.

***Analysis*:** The TMDLs are now based on the site-specific flow records from the USGS Gaging Station located on Rainbow Creek. (Section 5.0 and Appendix E).

11.3.10 Issue: Did the Regional Board Properly Address Economic Considerations?

Comment Summary: Several commenters raised the issue at the May 8, 2002 public hearing that the Regional Board did not adequately address implementation costs and effectiveness of MPs to landowners and land users.

***Analysis*:** Section 12.0 and Appendix H now provides a more expanded analysis of MPs as they may be utilized by various land uses. Irrigation MPs, nutrient reduction MPs, and runoff/erosion control management MPs are evaluated at low, medium, and high levels of effort for each land use.

11.4 Analysis of Reasonably Foreseeable Environmental Impacts

This section identifies the reasonably foreseeable methods of compliance with the Rainbow Creek TMDL Basin Plan amendment and describes the environmental impacts of those methods.

Point source discharges of nutrients in the Rainbow Creek watershed result from storm water runoff of nutrients from both Interstate-15 freeway surfaces and adjacent land areas. Nonpoint source discharges occur from commercial nursery, agricultural field, orchard, park, residential area, urban area, and septic tank disposal system land use activities. Attainment of the nutrient wasteload and load reductions to comply with the requirements of the Rainbow Creek TMDL Basin Plan amendment depends upon discharger implementation of best management practices (BMPs) for point source discharges and management practices (MPs) for nonpoint source discharges to control these nutrient sources.

Controlling and reducing nutrient discharges in the Rainbow Creek watershed to meet the TMDL nutrient load reductions for nonpoint sources will be a long term, complicated undertaking. The Regional Board proposes to use a Third Party regulatory-based approach to mandate compliance with the nonpoint source (NPS) nutrient load reductions of this TMDL.

Reasonably foreseeable compliance methods for implementing the third party agreement and the BMPs and MPs that may be employed by dischargers to comply with the nutrient wasteload and load reductions of the Rainbow Creek TMDL are summarized below.

11.4.1 Reasonably Foreseeable Compliance Methods

County Of San Diego

The Regional Board proposes to use a Third Party regulatory based approach to mandate compliance with the nonpoint source (NPS) nutrient load reductions of this TMDL. The Regional Board will accomplish this by negotiating a Management Agency Agreement (MAA) between the Regional Board and the County of San Diego setting forth the commitments of both parties to undertake various implementation responsibilities for the NPS nutrient load reductions of this TMDL.

Under the terms of the proposed MAA, the County of San Diego will take the lead in establishing management measures (MMs) and management practices (MPs) and overseeing MP

implementation by NPS dischargers to attain TMDL nutrient load reductions in the Rainbow Creek watershed. This will be accomplished through the County of San Diego's development of a Nutrient Reduction and Management Program (NRMP) for the watershed that incorporates nutrient management measures and a public outreach program to achieve these reductions. Additionally, the County of San Diego may be directed to investigate ground water quality and contribution to the creek to fill data gaps. Findings from the investigations will be used in the development of further implementation measures to attain subsequent nutrient load reductions.

In conjunction with an MAA or MOU with another third-party representative, organization, or government agency describing an adequate NPS pollution control implementation program, the Regional Board may adopt individual or general waivers or waste discharge requirements (WDRs) for NPS discharges in the Rainbow Creek watershed. The waivers or WDRs may require NPS dischargers to either participate in the third party NPS program or, alternatively, submit individual pollution prevention plans that detail how they will comply with the waivers and WDRs. Alternatively, the Regional Board may adopt a discharge prohibition, which includes exceptions for those discharges that are adequately addressed in an acceptable third-party MAA or MOU NPS pollution control implementation program.

Agricultural, Parks and Commercial Nursery Sources

Nutrient reduction management measures for agricultural sources are directed towards reducing the nutrient loss from agricultural lands, which occurs through edge-of-field runoff or leaching from the root zone. Management practices to achieve this goal might include:

- Developing, implementing, and periodically updating a nutrient management plan to (1) apply nutrients at rates necessary to achieve realistic crop yields, (2) improve the timing of nutrient application, and (3) use agronomic crop production technology to increase nutrient use efficiency.

- Operating irrigation systems so that the timing and amount of irrigation water applied match crop water needs. This requires, as a minimum, (a) the accurate measurement of soil-water depletion volume and the volume of irrigation water applied, and (b) uniform application of water.

- Controlling the manner and application of water to minimize water runoff and soil erosion. USDA NRCS-recommended irrigation systems include microirrigation, sprinklers, surface and subsurface systems, and tailwater recovery.

- Managing the drainage water from the irrigation system to control deep percolation, to move tailwater to the reuse system, and to control erosion and adverse impacts on surface and ground.

- Preventing or reducing the amount of soil entering surface water by installing filter strips, field borders, fiber mats, and buffers to filter and trap sediment. Grassed waterways can be installed to prevent gullies and to filter and trap sediment, and sediment ponds, basins, and traps can be used to treat sediment-laden runoff.

- Maintaining soil quality through crop rotation which involves planting crops in a recurring sequence on the same field, and by using conservation tillage to improve soil properties and improve water infiltration.

- Reducing or prevented soil erosion by leaving crop residues on the field, planting cover crops or other vegetative cover, and applying mulch to bare fields. In addition, fields can be graded to reduce slope length, steepness, or unsheltered distance (i.e., contour farming), and terraces and diversions can be used to reduce slope length. Finally, cross-wind strips can be installed and hedgerows, trees, and shrubs can be maintained along edges of fields or against prevailing winds to prevent wind erosion.

Septic Tank Sources

Management measures for septic tanks are directed towards ensuring that existing septic tank systems prevent the discharge of pollutants to the surface of the ground and, to the extent practicable, reduce the discharge of pollutants into ground water. Meeting these objectives may involve the reduced use of garbage disposals, the use of low-volume plumbing fixtures, use of low-level phosphate detergents, and establishment and implementation of policies that require a septic tank system to be repaired, replaced, or modified when the septic tank system fails or threatens or impairs surface waters.

Management practices may entail development of an effective operation and maintenance program for septic tanks that can be directed by regulatory agencies, wastewater utilities or districts, or voluntary programs. Operation and maintenance programs might include system inventories; management, operation, and maintenance policies; inspection and monitoring requirements; guidelines for the disposal or reuse of residuals; and public education. Public education and outreach are important to improve homeowner and industry awareness of the importance of operation and maintenance procedures. Typical public outreach and education programs address the benefits of the onsite management program, water conservation, and household and commercial/industrial hazardous waste discharge prevention.

Management practices may also entail retrofitting existing septic tank systems to provide for denitrification to reduce nitrogen loadings. For instance, whereas conventional septic systems remove 10 to 45 percent of total nitrogen, anaerobic up-flow filters remove 40 to 75 percent, and recirculating sand filters remove 60 to 85 percent. These options typically involve circulation loop or tanks in series, and it is possible to retrofit conventional, systems to improve denitrification performance. Other factors that affect the degree of nitrogen removal include temperature and the density of the soil in the septic tank fields.

State Highway Sources

Caltrans is the agency responsible for managing California's highway system. Caltrans implements a storm water management program pursuant to its MS4 NPDES storm water permit to reduce the discharge of pollutants, such as nutrients, to receiving waters through implementation of BMPs such as:

- Runoff treatment facilities located within existing rights-of-way, medians, or interchange loops, or on adjacent lands. Where no additional land is available, underground runoff

storage and treatment (e.g., sand filters) can be used.

- Vegetative filter strips along roadsides and in medians to slow runoff velocities and increase storm water infiltration.

- Elimination of curbs to allow highway and road runoff to be filtered through vegetated shoulders and medians. Eliminating curbs also increases infiltration to ground water.

- Designing curbs with breaks and energy dissipaters to direct sheet flow to vegetated surfaces. These infiltration areas require periodic inspection for damage, rilling, ponding, and trash accumulation, and will also require mowing or cropping of vegetation to prevent nuisance.

Residential Area Sources

Management measures to reduce or eliminate nutrient discharges from residential areas typically involves implementation of educational programs to provide greater understanding of watersheds and to raise awareness and increase the use of applicable urban management practices where needed to control and prevent adverse impacts on surface and ground waters. Outreach campaigns would inform both commercial lawn care specialists and residents of the importance of proper application of lawn fertilizers and timing of fertilizer application to provide citizens with the tools to use these fertilizers efficiently and reduce overall fertilizer use.

11.4.2 Environmental Impacts of Reasonably Foreseeable Compliance Methods

The environmental checklist, found in Appendix G, describes the potential for environmental impacts associated with the reasonably foreseeable compliance methods discussed above. The environmental checklist indicates that the TMDL Basin Plan amendment will not have any direct adverse environmental impacts. The implementation of TMDLs will lead to an overall improvement in the quality of water and therefore the quality of the environment.

The environmental checklist does indicate that potential, or indirect, environmental impacts could arise from BMP or MP projects implemented to comply with the Rainbow Creek TMDL. However these projects and their impacts are speculative at this time. The precise nature, location, and significance of the environmental impacts cannot be determined at this time, since the TMDL implementation action plan establishes a process for identifying subsequent projects rather than specifying particular remedial projects at specific locations. Accordingly, an analysis of the reasonably foreseeable feasible mitigation measures relating to those speculative environmental impacts is not presented. Future CEQA documents prepared for specific BMP or MP implementation projects will identify site-specific environmental impacts and the need for feasible mitigation measures.

11.5 Reasonable Alternatives to the TMDL Basin Plan Amendment

This section describes the Regional Board's analysis of reasonable alternatives to the proposed project. The purpose of this analysis is to determine if the alternatives would feasibly attain the basic objective of the TMDL Basin Plan amendment but would avoid or substantially lessen any potential significant effects of the proposed amendment. The four alternatives include taking "no action", using a regulatory approach to TMDL implementation, and deferring adoption of the TMDLs until either site-specific water quality objectives are developed or new nutrient criteria are established.

11.5.1 No Action Alternative

Under the "no action" alternative the Regional Board would not adopt the proposed TMDL Basin Plan amendment and nutrient loading would likely continue at current levels. The no action alternative 1) does not comply with the Clean Water Act (CWA); 2) is inconsistent with the mission of the Regional Board; and 3) does not meet the purpose of the proposed TMDL Basin Plan Amendment. Under CWA § 303(d), the Regional Board is obligated to adopt a TMDL for waters such as Rainbow Creek that are not meeting water quality standards.[90] The mission of the Regional Board is to ensure the protection of receiving water beneficial uses through attaining and maintaining applicable water quality objectives. Consistent with the Regional Board's mission, the purpose of the proposed TMDL Basin Plan Amendment is to attain water quality objectives for biostimulatory substance and to restore and protect the wildlife and aquatic habitat beneficial uses of Rainbow Creek.

The proposed Basin Plan Amendment mandates an overall 74% reduction of total nitrogen loading and 85% reduction of total phosphorus loading from current levels to Rainbow Creek in order to attain water quality standards. Implementation of MPs will eventually be required for control of surface runoff under the statewide Nonpoint Source Plan, which could lead to some improvement in the water quality of the creek. However in the absence of the TMDL wasteload and load allocations needed to achieve the steep nutrient load reductions, violations of the biostimulatory substances water quality objective and impairment of beneficial uses will continue in Rainbow Creek.

Ultimately, the USEPA is required to develop and adopt TMDLs pursuant to CWA § 303(d) if the State does not adopt the proposed TMDLs and implementation plan. It is possible that the USEPA would adopt TMDLs based on their recommended nutrient criteria of 0.5 mg/L total nitrogen and 0.03 mg/L total phosphorus for streams in the subecoregion 6, Xeric West Ecoregion (USEPA 2000b). The use of this nutrient criteria as the TMDL Numeric Targets would result in wasteload and load allocations in the Rainbow Creek watershed that are more restrictive than those proposed by the Regional Board.

[90] Water quality standards are comprised of designated beneficial uses, the applicable numeric and/or narrative water quality objectives to protect those uses, and the SWRCB's anti-degradation policy provisions (Resolution No. 68-16, Statement of Policy with Respect to Maintaining High Quality of Waters in California).

11.5.2 Develop Site Specific Nutrient Water Quality Objectives

It may be appropriate to develop a modified biostimulatory substances water quality objective for Rainbow Creek based on site-specific environmental conditions in Rainbow Creek. A modified water quality objective is referred to as a site-specific water quality objective (SSO).

The legally applicable water quality objective for biostimulatory substances in Rainbow Creek is 1.0 mg N/L of total nitrogen and 0.1 mg P/L of total phosphorus. Scientific studies could be conducted to examine the appropriateness of establishing a less stringent biostimulatory substances (i.e. nutrients) water quality objective (i.e., an SSO). A TMDL based on an SSO that is less stringent than 1.0 mg N/L and 0.1 mg P/L, would require a smaller reduction in nutrient loading than the 74% point source wasteload and 85% nonpoint source load reduction required under the proposed Basin Plan Amendment. An SSO for nutrients in Rainbow Creek could potentially eliminate the need for a TMDL, if the SSO is currently attained in the receiving waters. The SSO would need to (1) be based on sound scientific rationale; (2) protect the designated beneficial uses of Rainbow Creek waters; and (3) be adopted by the Regional Board in a Basin Plan amendment.

The language for the Biostimulatory Substances (nutrients) water quality objective for total phosphorus in the Basin Plan originates from the rationale for phosphate phosphorus included in USEPA's Quality Criteria for Water (USEPA 1976). A total phosphorus criterion to control nuisance aquatic growths was not presented; however, a rationale to support such a criterion was included for consideration. The rationale included limits for the entry point of streams into a standing body of water and for standing bodies of water, as well as a desired goal of 0.1 mg P/L in flowing waters for the prevention of plant nuisance. While the scientific data appear to be more specific with regard to lakes and reservoirs, the rationale indicated that establishing a phosphorus criterion for flowing waters is important to protect downstream receiving waters, such as lakes and estuaries. The rationale also provides that streams and rivers exist that may need either more stringent or less stringent nutrient limits and that other factors (i.e., turbidity, other limiting nutrient) may influence whether phosphorus is a contributor to eutrophy. Thus the Basin Plan's current nutrients objective may be over protective or under protective for Rainbow Creek.

If scientific studies demonstrate that the ambient water chemistry and/or biological communities at Rainbow Creek are significantly different from the chemistry and biological communities upon which the current limits were based, an SSO for nutrients may be appropriate. However, the development of a nutrient SSO for Rainbow Creek waters, including the scientific studies necessary to support it, would be costly, time consuming and resource intensive. Dischargers or other interested parties would need to fund and initiate the scientific studies to develop the SSO. It is possible that the studies could reveal the need for more stringent nutrient water quality objectives.

There is no effort currently underway or planned by interested persons to fund the scientific studies needed to develop SSOs for nutrients in Rainbow Creek. Even in the event that scientific studies were initiated and SSOs for nutrients were developed and adopted by the Regional Board, it would likely not obviate the need for a TMDL. Accordingly, the appropriate strategy for addressing the nutrient water quality problem in Rainbow Creek is for the Regional Board to

proceed with adoption of the proposed TMDL Basin Plan amendment at this time. If SSOs for nutrients are developed in the future and adopted by the Regional Board, this TMDL Basin Plan Amendment would be modified accordingly. If interested parties are willing to fund and oversee development of scientific studies to investigate SSOs, the most effective and expeditious means to improve water quality would be to conduct these studies concurrent with actions necessary to achieve compliance with the current TMDL.

11.5.3 Develop Region-Wide Nutrient Water Quality Objectives

The Regional Board is currently participating in a statewide joint U.S. EPA Regional Technical Advisory Group (RTAG) that is overseeing nutrient water quality objective development for California. This group is currently working on developing proposed regional nutrient water quality criteria for the Southern and Central California as a priority target due to the number of nutrient TMDLs being completed in this region of the state. Under this alternative the adoption of the nutrient TMDLs for Rainbow Creek would be delayed until after the RTAG effort is completed and an updated nutrient water quality objective is incorporated into the Basin Plan.

U.S. EPA has developed stringent new nutrient water quality criteria under Clean Water Act § 304 of 0.5 mg/L total nitrogen and 0.03 mg/L total phosphorus for streams in the subecoregion 6, Xeric West Ecoregion (USEPA 2000b). Rainbow Creek is located in the Xeric West Ecoregion defined by USEPA and would be subject to this nutrient water quality criteria if it is promulgated as water quality standards. In addition, USEPA guidance documents are available that detail methods for developing alternative site specific criteria for nutrients. California currently has three options: 1) employ methods outlined in USEPAs guidance documents to develop nutrient water quality objectives; 2) directly adopt USEPAs CWA §304(a) criteria of 0.5 mg/L total nitrogen and 0.03 mg/L total phosphorus into Basin Plans as water quality objectives or 3) use other scientifically defensible methods to develop nutrient water quality objectives.

It is not known at this time with any definition when or if an updated nutrient water quality objective will come out of the RTAG effort. If a nutrient water quality objective does emerge from the RTAG effort it will probably be more stringent than the Regional Board's current Biostimulatory Substances (nutrient) water quality objectives. If California fails to adopt an updated water quality objective for nutrients, USEPA will eventually begin to promulgate its nutrient criteria of 0.5 mg/L total nitrogen and 0.03 mg/L total phosphorus as water quality standards that would be applicable to Rainbow Creek waters. Based on these considerations, a delay in the adoption of the TMDL until after the RTAG effort is completed, is not warranted.

11.5.4 Regional Board Adoption of a Nutrient Discharge Prohibition

California Water Code § 13243 provides that the Regional Board, in a water quality control plan or in waste discharge requirements, may specify certain conditions or areas where the discharge of waste, or certain types of waste, will not be permitted. Accordingly the Regional Board could elect to amend the Basin Plan to prohibit the discharge of waste of nutrients at any concentration or load into Rainbow Creek waters. Under this alternative, nutrient dischargers in the Rainbow Creek watershed (i.e. Caltrans and commercial nurseries, agricultural field, orchard, park, residential area, urban area, and septic tank disposal system land use activities) would need to

take immediate action to eliminate all nutrient discharges to Rainbow Creek waters.

Compliance with the prohibition would require the dischargers to achieve an immediate 100% nutrient load reduction. In contrast the proposed TMDL Basin Plan Amendment requires a 74% point source nutrient wasteload reduction and an 85% nonpoint source nutrient load reduction over a 21 year time frame. Both the nutrient discharge prohibition and the proposed TMDL Basin Plan Amendment would result in attainment of the nutrient water quality objectives and protection of beneficial uses in Rainbow Creek. Both alternatives would require the same types of nutrient reduction management practices (MP) activities. However implementation of an outright prohibition on nutrient discharges to Rainbow Creek would be unwarranted, cost prohibitive and extremely disruptive to the community. For these reasons, establishment of a nutrient discharge prohibition in lieu of a TMDL is not an acceptable alternative.

12.0 Economic Considerations

This section presents the Regional Board's economic analysis of the amendment to the "Water Quality Control Plan for the San Diego Basin (9)" (Basin Plan) to incorporate a Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek.

12.1 Legal Authority

Under state law, there are two triggers that require Regional Board consideration of economics or costs when considering adoption of a TMDL Basin Plan amendment. These triggers are:

- Adoption of a treatment requirement or performance standard (CEQA)
- Adoption of an agricultural water quality control program

Each of these categories is briefly discussed below.

12.1.1 CEQA Requirement for Consideration of Economic Analysis

The Regional Board must comply with the California Environmental Quality Act (CEQA) when the Board amends the Basin Plan.[91] The CEQA process requires the Regional Board to analyze and disclose the potential adverse environmental impacts of a Basin Plan amendment that it is initiating or approving. The Regional Board's Basin Plan amendment process must consider alternatives, develop proposals to mitigate or avoid environmental impacts to the extent feasible, and involve the public and other public agencies in the evaluation process.

TMDL Basin Plan amendments typically include "performance standards."[92] TMDLs normally contain a quantifiable numeric target that interprets the applicable water quality objective. TMDLs also include wasteload allocations for point sources and load allocations for nonpoint sources and natural background. The quantifiable target together with the allocations may be considered a performance standard.

CEQA has specific provisions governing the Regional Board's adoption of regulations such as the regulatory provisions of Basin Plans that establish "performance standards" or treatment requirements.[93] These provisions require that the Regional Board perform an environmental analysis of the reasonably foreseeable methods of compliance with the wasteload and load allocations prior to the adoption of the TMDL Basin Plan amendment. The Regional Board must consider the economic costs of the methods of compliance in this analysis.[94] The Regional Board is not required to do a formal cost-benefit analysis.

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[91] See Public Resources Code § 21080

[92] The term "performance standard" is defined in the rulemaking provisions of the Administrative Procedure Act (Government Code §§ 11340-l 1359). A "performance standard" is a regulation that describes an objective with the criteria stated for achieving the objective. (Government Code §11342(d)).

[93] See Public Resources Code §§ 21159 and 21159.4

[94] See Public Resources Code § 21159(c)

12.1.2 Agricultural Water Quality Control Program

Agricultural activities are significant sources of nutrient pollution in the Rainbow Creek watershed. As a result, the Rainbow Creek TMDL Basin Plan amendment includes nutrient load allocations applicable to agricultural activities and mandates nutrient load reductions from these activities as part of the TMDL implementation action plan. Under the Porter-Cologne Water Quality Control Act,[95] before a Regional Board implements an agricultural water quality control program, it must identify the total cost of the program and potential sources of financing.[96] This information must be included in the basin plan. The statute does not require the Regional Boards to do, for example, a cost-benefit analysis or an economic analysis.

12.2 TMDL Implementation Costs

The Rainbow Creek TMDLs specify an overall 74% reduction of total nitrogen loading and 85% reduction of total phosphorus loading from current levels to Rainbow Creek in order to attain water quality standards. The most reasonably foreseeable method of compliance involves reducing nutrient use and controlling the discharge of nutrients to surface or groundwater by applying best management practices (BMPs) for nutrient point source discharges and management practices (MPs) for nutrient nonpoint source discharges.

Section 12.2.1 below provides the estimated costs for the County of San Diego to develop a Nutrient Reduction Management Plan (NRMP) and to implement the monitoring, investigation, and outreach elements. The estimated implementation costs for potential MPs that may be implemented by landowners and land users are provided in Section 12.2.2. Potential sources of funding are listed in Section 12.3.

12.2.1 Investigation, Monitoring, and NRMP Costs

Under the terms of the TMDL Implementation Action Plan and Implementation Monitoring Plan, the County of San Diego will be directed, upon request by the Regional Board, to develop a NRMP, investigate groundwater nutrient contributions to Rainbow Creek, regularly monitor ground and surface water quality and act as program coordinator to work with the community and provide assistance in accordance with a Management Agency Agreement (MAA) entered into with the Regional Board for nonpoint source discharges. The County has provided preliminary cost estimates for monitoring and program elements expected to be included in this program. These costs are estimates and the actual costs may be lower depending upon the actual scope of the work. A summary of these estimated costs is provided in Table 12-1.

[95] See Water Code §§ 13000 et seq.
[96] See Water Code § 13141 et seq.

Table 12-1. Summary of First Year and Subsequent Annual Cost for Conducting Rainbow Creek TMDL Studies

Item	First Year Cost[1]	Subsequent Annual Cost[1]
Develop/Revise NRMP	$10,000 - $50,000	$2,000 - $10,000
Surface Water Monitoring Program[2]	$70,600 - $125,000	$70,600 - $125,000
Groundwater Investigation Program[3]	$54,000 - $104,400	$31,400 - $59,400
Equipment and Outreach[4]	$45,500 - $66,000	$9,000 - $20,000
Total	$180,100 - $345,400	$113,000 - $214,400

1. Estimates provided by the County and ranges added by the Regional Board. Actual costs may be lower. For example annual costs for sampling may be significantly lower if the initial results indicate that a reduction in number of samples and analyses are appropriate.
2. See Table 12-2
3. See Table 12-3
4. See Table 12-4

Costs to Develop Nutrient Reduction and Management Plan (NRMP)

The estimated cost to prepare the initial Draft and Final NRMP is $10,000 to $50,000. It is anticipated that revisions will be made to the NRMP based on the results of investigations, and to incorporate lessons learned regarding MP effectiveness and community responsiveness. The revisions to the NRMP in subsequent years may cost $2,000 to $10,000 per year. The costs to develop and implement the NRMP are presented in Table 12-1.

Surface Water Monitoring Program Costs

Consistent with the Implementation Monitoring Plan described in Section 10.5, the surface water monitoring program could include bimonthly monitoring for nutrients, physical parameters, and flow, monthly monitoring of chlorophyll a (water column), and algal biomass monitoring (algae sample) every other month, at 11 stations on Rainbow Creek and its tributaries. Bioassessment could also be performed at 4 locations on Rainbow Creek and at 1 reference station twice per year. Staff time to perform monitoring, data management, and report preparation have also been estimated. Table 12-2 presents the estimated annual costs associated with a surface water monitoring program.

Table 12-2. Total Annual Cost Estimates for Surface Water Monitoring Program

Monitoring Parameters	Total Number of Samples	Cost per sample	Total Estimated Annual Cost
Nutrients	132 - 264	$140	$18,480 - $36,960
Physical	132 - 264	$30	$3,960 - $7,920
Chlorophyll a	66 - 132	$50	$3,300 - $6,600
Algal Biomass	33 - 66	$15	$495 - $990
Bioassessment	18 - 30	$500	$9,000 - $15,000
Staff Time	**Hours**	**Rate**	
Field Staff Time (field preparation, equip. maintenance, water sampling, field measurements, sample submission, etc.)	240 - 480	$50	$12,000 - $24,000
Data Management	120 - 160	$60	$7,200 - $9,600
Data Analysis	90 - 120	$60	$5,400 - $7,200
Report Preparation	120 - 160	$60	$7,200 - $9,600
Other	60 - 120	$60	$3,600 - $7,200
Total			**$70,635 - $125,070**

Groundwater Investigation Program Costs

The groundwater investigations could likely include the quarterly monitoring of 6 to 10 wells or hydropunch locations. Other costs may include soil characterization, well drilling and hydropunch, and tracer studies. County of San Diego staff time to perform such monitoring, data management, and report preparation has also been estimated. The equipment costs (i.e., well installations) are assumed to be incurred in the first year only. Costs for continued groundwater monitoring and additional studies could be up to $58,000 per year in subsequent years. The Groundwater Investigations should be concluded at the end of the first two years. Table 12-3 presents the estimated annual costs associated with groundwater monitoring.

Table 12-3. Total Annual Cost Estimates for Groundwater Investigation Program

Monitoring Parameters	Total Number of Samples	Cost per sample	Total Estimated Annual Cost	
			First Year	Subsequent Years
Nutrients	12 - 30	$140	$1,680 - $4,200	$1,680 - $4,200
Physical	12 - 30	$30	$360 - $900	$360 - $900
General Mineral	12 - 30	$150	$1,800 - $4,500	$1,800 - $4,500
Other Costs				
Well Drilling/Hydropunch			$10,000 - $20,000	N/A
Consultant Services			$10,000 - $20,000	N/A
Soil Characterizations			$2,500 - $5,000	N/A
Special Studies (tracer, other)			$10,000 - $20,000	$10,000 - $20,000
Additional Sampling Equipment (steel tape, chalk, gloves, disposable bailers, buckets, 55-gallon drums, disposal, etc.)			$1,000 - $5,000	$1,000 - $5,000
Staff Time	**Hours**	**Rate**		
Field Staff Time (transportation time, manual well purging, sampling, equipment, etc.)	80 - 160	$50	$4,000 - $8,000	$4,000 - $8,000
Data Management	30 - 40	$60	$1,800 - $2,400	$1,800 - $2,400
Data Analysis	90 - 120	$60	$5,400 - $7,200	$5,400 - $7,200
Report Preparation	60 - 80	$60	$3,600 - $4,800	$3,600 - $4,800
Other	30 - 40	$60	$1,800 - $2,400	$1,800 - $2,400
		Total	**$53,940 - $104400**	**$31,440 – 59,400**

Equipment and Outreach Costs

The majority of equipment and installation costs are expected to be incurred in the first year. Costs between $9,000 to $20,000 per year for rain gauge maintenance, follow-up rainfall chemistry, miscellaneous field equipment, and public outreach is anticipated in subsequent years. Potential equipment and outreach costs were identified and are presented in Table 12-4.

Table 12-4. Estimated Equipment and Outreach Costs

Item	Total Estimated Costs	
	First Year	Subsequent Years
Flow monitoring equipment and installation	$25,000 - $30,000	N/A
Multi-parameter probe	$4,000 - $5,000	N/A
Rain gauge installation and maintenance	$5,000 - $6,000	$1,000 - $2,500
Rainfall Chemistry	$5,000 - $10,000	$2,000 - $5,000
Miscellaneous field equipment	$2,500 - $5,000	$1,000 - $2,500
Public Outreach	$5,000 - $10,000	$5,000 - $10,000
Total	$45,500 - $66,000	$9,000 - $20,000

12.2.2 Management Practices and Other Implementation Costs

Nonpoint source discharges occur from commercial nursery, agricultural field, orchard, park, residential area, urban area, and septic tank disposal system land use activities. Persons conducting these land use activities (e.g. landowners, homeowners, nursery operators, farmers, etc) are responsible for implementing management practices (MPs) to reduce and/or control nutrient discharges (e.g., surface runoff, or septic tank discharge) from their properties to assure compliance with the TMDLs described in this report. It is expected that management practices (MPs) will include, but are not limited to, the practical management of wet and dry weather runoff, fertilizer usage, and irrigation practices. The cost of implementing these TMDLs will range widely, depending on which MPs the responsible parties select to meet the load allocations.

Table 12-5 summarizes the range of costs for implementing potential MPs for each land use category. For each land use category, three scenarios were evaluated corresponding to low, medium, and high levels of effort. Within each scenario a low to high range of costs are presented. The MPs considered fall into three general categories: Nutrient, Irrigation, and Runoff/Erosion Management. A low level of effort consists solely of Nutrient Management MPs, a medium level of effort consists of Nutrient and Irrigation Management MPs, and a high level of effort includes all three MP categories. Caltrans is the exception because Irrigation Management MPs are less likely along the Interstate 15 corridor than Nutrient and Runoff/Erosion Management. The capital costs are the initial costs of implementing a BMP, assuming that the BMP does not currently exist on the property. The annual operation and maintenance costs are assumed to be 10% of the capital cost. Additional details regarding the MPs are provided in Appendix H.

Table 12-5 provides estimated costs for selected MPs.

Table 12-5. Estimated Management Practice Costs[1]

Land Use Category	BMP Level of Effort	Capital Costs Range		Annual Operation and Maintenance[2] Range	
Commercial Nurseries	Low	$26	$10,105	$3	$1,011
	Medium	$4,926	$39,455	$493	$3,946
	High	$5,508	$41,075	$551	$4,108
Agriculture	Low	$26	$10,105	$3	$1,011
	Medium	$4,926	$39,455	$493	$3,946
	High	$9,296	$57,705	$930	$5,771
Orchard	Low	$26	$10,105	$3	$1,011
	Medium	$4,926	$39,455	$493	$3,946
	High	$9,296	$57,705	$930	$5,771
Park	Low	$0	$0	$0	$0
	Medium	$50	$750	$5	$75
	High	$950	$27,250	$95	$2,725
Residential	Low	$0	$0	$0	$0
	Medium	$50	$750	$5	$75
	High	$833	$14,186	$83	$1,419
Urban	Low	$0	$0	$0	$0
	Medium	$50	$750	$5	$75
	High	$3,369	$26,175	$337	$2,618
Septic Tank Disposal Systems	Low	$18,000	$46,000	$1,800	$4,600
	Medium	$22,500	$57,500	$2,250	$5,750
	High	$3,490,000	$7,030,000	$349,000	$703,000
Caltrans	Low	$105	$10,150	$11	$1,015
	Medium	$77,880	$401,850	$7,788	$40,185
	High[3]	$78,768	$1,408,100	$7,877	$140,810

[1] This table is a summary. See Appendix H for more detail.
[2] Operation and Maintenance cost assumed to be 10% of total cost estimate.
[3] Caltrans 2004 BMP Retrofit Program Final Report CTSW-RT-01-050 found that the cost for sediment basins in a retrofit situation range from $303 to $1,307 per WQVm^3. This would be a cost of $602,000 to $2,586,000 to treat the 1,986m^3 of WQV for the 4.1 miles of I-15 in this watershed. Cost for sand filters range from $748 to $2,118 per WQVm^3 ($1,486,000 to $4,206,000 to treat 1,986m^3 of WQV).

Centralized Sewer Treatment Disposal Facility

The high groundwater table in Rainbow Valley has resulted in septic tank disposal systems that no longer function properly. Table H-7 (Appendix H) includes costs for replacing these conventional systems with enhanced systems that are designed to provide for nitrification/denitrification to reduce nitrogen loadings.

Another potential solution is to construct a centralized sewage treatment disposal facility for the community that would replace failing septic tank systems in the area defined by the County of

San Diego's moratorium and reduce the nutrient loading to the groundwater. A preliminary cost estimate for a secondary treatment facility that might be considered for Rainbow Valley is approximately $11 million. This cost estimate is based on a facility that provides secondary treatment and utilizes land disposal to an irrigated crop (e.g., alfalfa) that is harvested and removed from the watershed to eliminate the nutrient loading. This cost estimate includes a secondary sewage treatment facility with the design capacity to treat wastewater from 170 to 306 connections, the purchase of 40 acres of land for the facility and spray irrigation area, construction of 8.5 miles of sewage collection system pipe, and administrative costs. The lower number (170) of connections is the number of septic tank disposal systems in the moratorium area that would be replaced by the sewer treatment facility. The higher number (306) is the number of systems that generate a total nitrogen load that is equal to the amount of source load reduction identified to achieve the load allocation in Table 6-1 (Honma 2004).

Table 12-6 presents the assumptions and calculations that were used to make the estimates. The potential monthly costs to the community, including operation and maintenance (O & M), and connection to the system are also presented. This estimate assumes that the community will bear the complete cost of the facility. Grant funding may offset some of the community's cost.

Table 12-6. Cost Estimates Associated with Construction of a Sewer Treatment Disposal Facility

Facility Costs	Description[1]	Cost Estimate
Facility	170 connections * 250 gal/con. * $20/gal = 306 connections * 250 gal/con. * $20/gal =	$850,000 – $1,530,000
Facility Land Acquisition	40 acres * $75,000/acre =	$3,000,000
Sewer Main Pipe Construction	57,200 feet (10.8 miles) * $100/foot =	$5,720,000
Administrative Costs	Engineering, Environmental Impact Review, Construction Administration, etc.	$1,000,000
	Total Cost of Facility Construction	**$10,570,000 - $11,250,000**
Potential Monthly Costs		
Cost of Facility per connection over 20 years	$10.6 E +6 * 170^{-1} connections * 20^{-1} $years^{-1}$ * 12^{-1} year/month = $11 E +6 * 306^{-1} connections * 20^{-1} $years^{-1}$ * 12^{-1} year/month =	$150 - $259/month
O & M	Operation and Maintenance Cost	$30/month
	Total Monthly Cost to Property Owner	**$180 - $289/month**
Connection Fee		
Connection Fee	One-time fee for each connection to system (i.e., lateral).	**$10,000 - $15,000**

[1] Supporting information for assumptions (Honma 2004)

12.3 Potential Sources of Funding

Potential sources of funding include:

1. Federal Clean Water Action Section 319(h) grants.
2. Federal Clean Water Action Section 205(j) grants.
3. State of California Proposition 13 funded grants.
4. Small Communities Grants for Water Reclamation and Wastewater Treatment Facilities
5. Other state, federal and other business loans, grants, and other assistance programs. These may include assistance from U.S. Small Business Administration and from conservation programs through various agencies such as the U.S. Department of Agriculture and Natural Resource Conservation Service.
6. Various secured and unsecured loans, including home equity loans and business loans.

13.0 Public Participation

40 CFR 130.7 requires that TMDLs be subject to public review. Public participation has been provided for through public workshops and by a Technical Advisory Committee (TAC). The Regional Board conducted three public workshops. The first was held in April 1999, the second in November 1999, the third in November 2004. The TAC was formed in November 1999 and has met on an as needed basis. The TAC provided review, technical and local input and comments on both the draft TMDL staff report (submitted to EPA in April 2000) and drafts of the technical sections of this TMDL staff report. Participants on the TAC included representatives from: Camp Pendleton, Mission Resource Conservation District, Fallbrook Public Utility District, Hines Nurseries, Inc., County of San Diego, San Diego State University/Santa Margarita Ecological Reserve, the Santa Margarita River Watermaster, UC Cooperative Extension, Farm Bureau – San Diego County, and Caltrans (District 11). Public participation will also be provided through the Regional Board's Basin Plan amendment process. A chronological list of events, including dates of workshops and meetings, is provided in Appendix I.

14.0 Necessity of Regulatory Provisions

The Office of Administrative Law (OAL) is responsible for reviewing administrative regulations proposed by state agencies for compliance with standards set forth in California's Administrative Procedure Act, Government Code §11340 et seq., for transmitting these regulations to the Secretary of State and for publishing regulations in the California Code of Regulations. Following State Water Resources Control Board approval of this TMDL Basin Plan amendment, any regulatory portions of the amendment must be approved by OAL (Government Code §11352). The State Water Resources Control Board must include in its submittal to OAL a summary of the necessity[97] for the regulatory provision.

This TMDL Basin Plan Amendment for Rainbow Creek meets the "necessity standard" of Government Code §11353(b). Amendment of the Basin Plan to establish and implement TMDLs for Rainbow Creek is necessary because the existing water quality does not meet applicable numeric water quality objectives for nitrate, total nitrogen, and total phosphorus. Applicable state and federal laws require the adoption of this Basin Plan amendment and regulations as provided below.

The State Water Resources Control Board (State Board) and Regional Water Quality Control Boards (Regional Boards) are delegated the responsibility for implementing California's Porter Cologne Water Quality Control Act and the federal Clean Water Act (CWA). Pursuant to relevant provisions of both of these Acts, the State and Regional Boards establish water quality standards, including designated (beneficial) uses and criteria or objectives to protect those uses.

Section 303(d) of the CWA (33 USC § 1313(d)) requires the states to identify certain waters within their borders that are not attaining water quality standards and to establish the TMDL for certain pollutants impairing those waters. USEPA regulations in 40 CFR 130.2 provide that a TMDL is a numerical calculation of the amount of a pollutant that a water body can assimilate and still meet standards. A TMDL includes one or more numerical targets that represent attainment of the applicable standards, considering seasonal variations and a margin of safety, in addition to the allocation of the target or load among the various sources of the pollutant. These include wasteload allocations (WLAs) for point sources, and load allocations (LAs) for nonpoint sources and natural background. TMDLs established for impaired waters must be submitted to the USEPA for approval.

CWA § 303(e) requires that TMDLs, upon USEPA approval, be incorporated into the state's water quality management plans (Basin Plan). State law (CWC § 13050(j) and 13242) in turn requires that basin plans have a program of implementation to achieve water quality objectives. The implementation program must include a description of actions that are necessary to achieve the objectives, a time schedule for these actions, and a description of surveillance to determine compliance with the objectives. State law requires that a TMDL include an implementation plan because the TMDL normally is an interpretation or refinement of an existing water quality objective. The TMDL has to be incorporated into the basin plan under CWA § 303(e), and,

[97] "Necessity" means that the record of the rulemaking proceeding demonstrates by substantial evidence the need for a regulation to effectuate the purpose of the statute, court decision, provision of law that the regulation implements, interprets, or makes, taking into account the totality of the record. For purposes of this standard, evidence includes, but is not limited to, facts, studies, and expert opinion. (Government Code §11349(a)).

because the TMDL supplements, interprets, or refines an existing objective, state law requires a program of implementation.

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Appendix A – Figures

Figure A-1 Location Map

Figure A-2 Rainbow Creek Watershed Land Use

Figure A-3 Rainbow Creek Sampling Sites with Topography and Water Courses

Figure A-1
Location Map

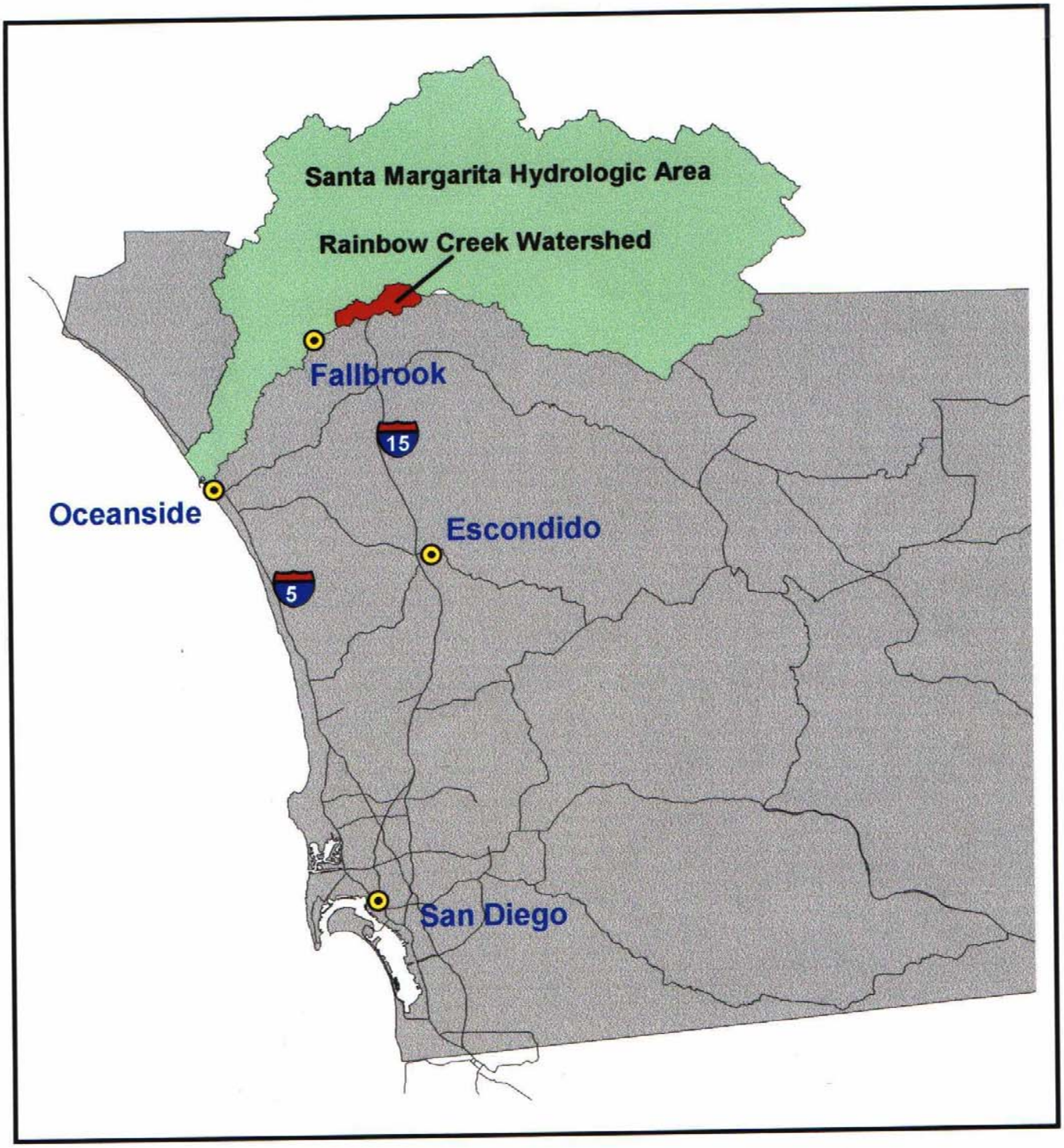

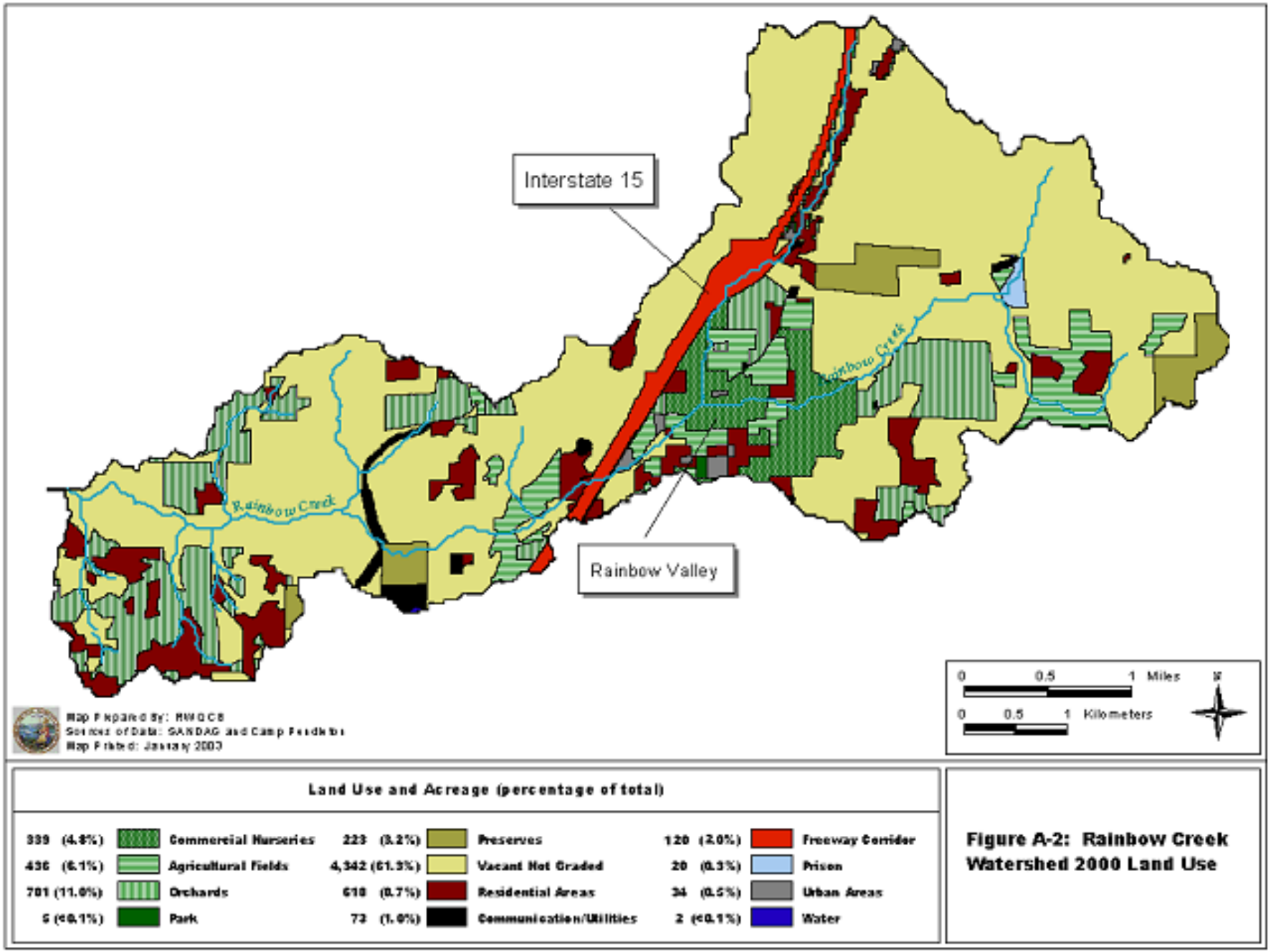

Figure A-2: Rainbow Creek Watershed 2000 Land Use

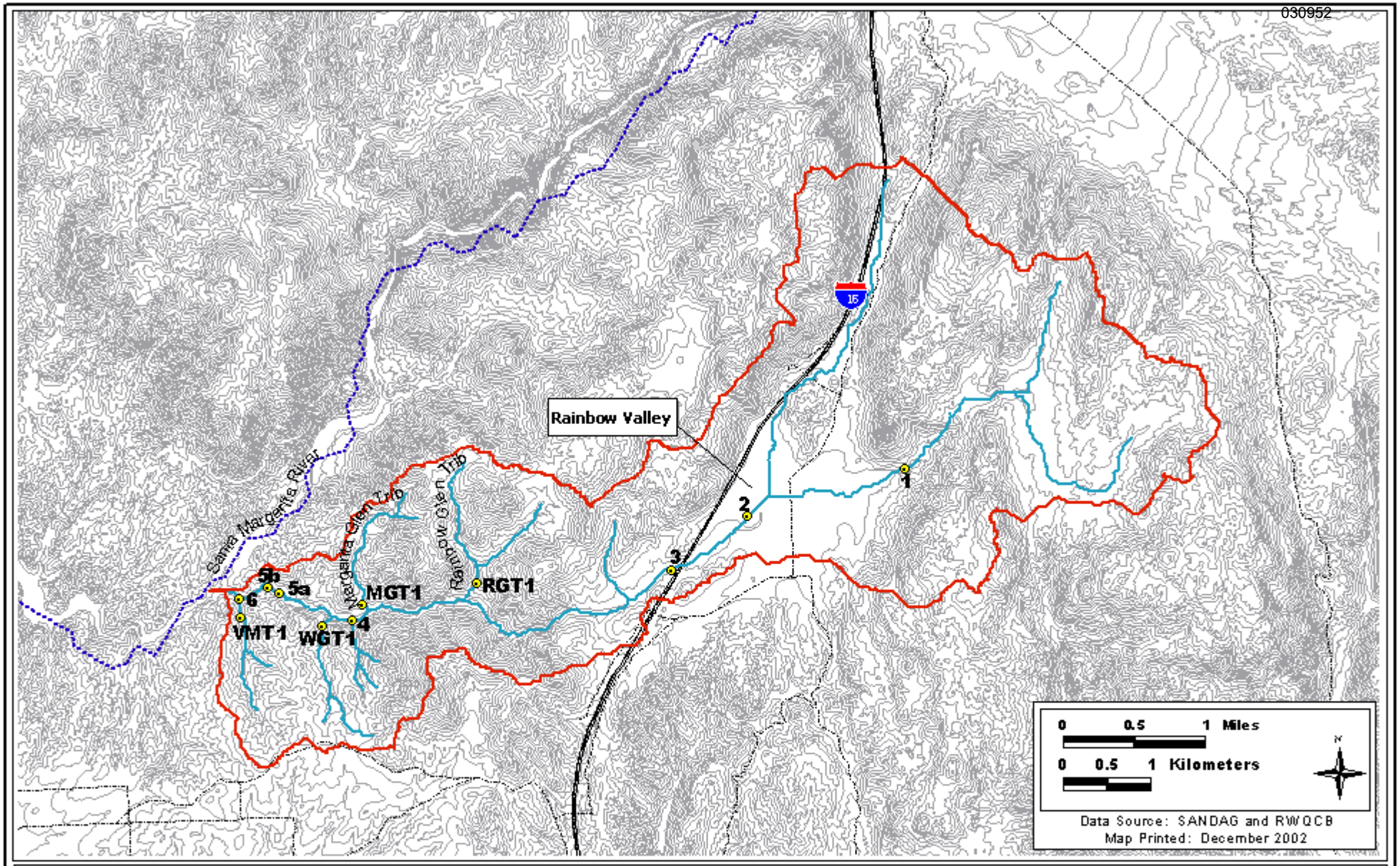

Water Sampling Sites

1	Jubilee Way	6	Stagecoach
2	Hines Nursery	RGT1	Rainbow Glen
3	Oak Crest	MGT1	Margarita Glen
4	Willow Glen-4	WGT1	Willow Glen
5a	2068WG	VMT1	Via Milpas
5b	River House		

Legend

- Rainbow Creek
- Tributaries of Rainbow Creek
- Santa Margarita River
- 40-foot Elevation Contours
- Interstate 15
- Major Roads
- Rainbow Creek Watershed Boundary
- Water Sampling Sites

Figure A-3: Rainbow Creek sampling sites with topography and water courses

Appendix B – Tables

B-1 Historical Annual Averages for Nitrate, 1970 -87

B-2 Water Quality Monitoring Results, 2000

Table B-1. Historic Annual Averages for Nitrate, 1970-87

Historic Annual Averages
Station: Willow Glen **All Values In mg/L Nitrate**

	NO_3 ave.	# of samples	max	min	median
1970	3.74	10	7.50	0.00	3.90
1971	3.69	11	6.20	0.90	3.50
1972	4.22	11	12.00	0.50	3.50
1973	4.23	12	21.20	0.00	1.05
1974	0.92	12	2.30	0.00	0.60
1975	4.03	12	16.00	0.40	2.65
1976	6.27	12	21.00	3.00	4.60
1977	8.78	9	25.00	3.50	6.50
1978	5.71	11	13.00	2.40	5.00
1979	3.20	11	8.00	1.00	2.40
1980	3.50	11	6.60	1.70	3.10
1981	10.19	12	40.00	0.50	8.10
1982	25.94	12	72.00	1.70	19.00
1983	55.82	11	177.00	0.30	25.00
1984	50.97	7	180.00	14.00	35.00
1986	215.83	11	338.00	22.80	242.50
1987	185.09	8	256.00	77.00	208.50

1970-1980 NO_3 ave.	**4.4**
NO_3 as N ave.	0.99
1981-1987 NO_3 ave.	**90.6**
NO_3 as N ave.	20.5

Drinking Water Standard
NO_3 = 45 mg/L
as N = 10 mg/L

Maximum NO_3 Values

Date	Result
Oct-85	319.3
Jun-86	310.3
Jun-86	338

Note: 1985 only contained one sample point, therefore it was included with the 1986 data
Source: Leedshill-Herkenhoff, Inc., 1988

Table B-2. Water Quality Monitoring Results, 2000
San Diego Regional Water Quality Control Board

Date	Willow Glen - 4 (Station 4)							Date	Riverhouse (Station 5b)						
	Flow[1]	Temp	NO_3-N	Total N	PO_4-P	Total P	TDS		Flow[2]	Temp	NO_3-N	Total N	PO_4-P	Total P	TDS
	cfs	°F	mg/L	mg/L	mg/L	mg/L	mg/L		cfs	°F	mg/L	mg/L	mg/L	mg/L	mg/L
1/4/00	0.42	52	7.1	7.7	0.40	0.38		1/4/00		53	11	11	0.23	0.21	
1/18/00	0.38	55	3.7	4	0.35	0.37		1/18/00		58	9.1	9.2	0.21	0.21	
2/1/00	0.5	54	14	15	0.26	0.47		2/1/00		56	17	17	0.31	0.34	
2/15/00	0.85	56	14	15	0.51	0.52		2/15/00		58	14	15	0.40	0.40	
2/29/00	1.4	52	12	12	0.49	0.55		2/29/00		54	12	12	0.42	0.46	
3/15/00	0.85	54	18	19	0.55	0.52	1140	3/15/00		56	18	18	0.45	0.44	1070
3/28/00	0.4	55	13	14	0.32	0.37	1110	3/28/00		58	15	15	0.28	0.36	1140
4/11/00	0.53	54	12	13	0.33	0.34	1130	4/11/00		58	16	17	0.14	0.32	1200
4/25/00	0.56	62	13	13	0.14	0.32	1110	4/25/00		63	14	15	0.15	0.34	1110
5/9/00	0.53	62	9.4	9.8	0.37	0.46	1090	5/9/00		63	12	13	0.31	0.31	1140
5/23/00	0.53	NR	9.5	9.9	0.33	0.35	1120	5/23/00		63	12	12	0.21	0.26	1180
6/6/00	0.59	60	21	23	0.43	0.51	1240	6/6/00		61	19	19	0.33	0.41	1210
6/20/00	0.27	64	19	20	0.36	0.38	1190	6/20/00		66	16	17	0.22	0.23	1200
7/5/00	0.1	63	12	12	0.37	0.36	1120	7/5/00		65	16	16	0.23	0.23	1190
7/18/00	0.07	68	7.9	8.6	0.30	0.39	1090	7/18/00		68	15	15	0.19	0.24	1140
8/1/00	0.09	68	8.9	9.4	0.32	0.43	1310	8/1/00		68	14	14	0.17	0.25	1230
8/15/00	0.06	71	4.7	5.3	0.44	0.49	1100	8/15/00	0.13	71	14	15	0.22	0.22	1240
8/22/00	0.07	66	5.6	6.1	0.29	0.39	1000	8/22/00	0.18	68	15	16	0.14	0.27	1180
8/29/00	0.06	66	4.3	5	0.33	0.52	1020	8/29/00	0.15	67	15	15	0.14	0.36	1190
9/5/00	0.05	66	3	3.6	0.41	0.39	1010	9/5/00	0.15	65	15	15	0.14	0.23	1150
9/12/00	0.05	68	3.5	4.1	0.47	0.45	1010	9/12/00	0.16	67	14	14	0.21	0.20	1180
9/19/00	0.05	66	2.8	3.4	0.29	0.49	980	9/19/00	0.15	66	13	14	0.13	0.16	1190
9/26/00	0.06	67	3.2	3.5	0.41	0.44	1060	9/26/00	0.13	68	14	14	0.17	0.20	1240
10/3/00	0.07	NR	2	2.3	0.42	0.46	1070	10/3/00	0.21	NR	13	13	0.17	0.18	1240
10/10/00	0.07	64	1.7	2.1	0.33	0.45	1020	10/10/00	0.18	64	12	12	0.12	0.20	1100
mean	0.3	61	9.0	9.6	0.37	0.43	1096	mean	0.16	63	14.2	14.5	0.23	0.28	1176
st. dev	0.3	6	5.6	5.9	0.09	0.07	83	st. dev	0.03	5	2.2	2.3	0.09	0.09	48
st. error	0.07	1	1.13	1.17	0.02	0.01	19	st. error	0.01	1	0.44	0.45	0.02	0.02	11

Note: These stations include data collected as part of the Algae Presence Survey, January 4 - August 1, 2000. NR not reported

[1] Flow measurements are from USGS Gaging Station (#11044250)

[2] Flow based on USGS measurements, adding calculated flow from WGT1

Table B-2. Water Quality Monitoring Results, 2000 – Cont.
San Diego Regional Water Quality Control Board

Date	2068 Willow Glen (Station 5a)						
	Flow[2]	Temp	NO_3-N	Total N	PO_4-P	Total P	TDS
	cfs	°F	mg/L	mg/L	mg/L	mg/L	mg/L
1/4/00		52	11	11	0.23	0.22	
1/18/00		58	8.5	8.5	0.21	0.22	
2/1/00		54	17	18	0.32	0.34	
2/15/00		56	15	16	0.4	0.4	
2/29/00		54	12	13	0.44	0.49	
3/15/00		56	18	19	0.47	0.47	1140
3/28/00		56	14	15	0.31	0.38	1140
4/11/00		59	17	17	0.32	0.33	1210
4/25/00		63	14	14	0.17	0.36	1180
5/9/00		63	11	12	0.33	0.34	1120
5/23/00		62	12	12	0.21	0.27	1160
6/6/00		62	20	21	0.33	0.77	1210
6/20/00		65	16	16	0.26	0.29	1170
7/5/00		66	15	15	0.2	0.22	1170
7/18/00		68	15	15	0.16	0.2	1210
8/1/00		68	14	14	0.16	0.25	1220
8/15/00	0.13	70	15	15	0.22	0.24	1250
8/22/00	0.18	68	15	18	0.13	0.21	1360
8/29/00	0.15	67	15	15	0.13	0.21	1170
9/5/00	0.15	65	ND[3]	ND[3]	0.11	0.18	1120
9/12/00	0.16	66	15	15	0.19	0.19	1190
9/19/00	0.15	66	13	14	0.11	0.18	1230
9/26/00	0.13	66	14	15	0.17	0.2	1250
10/3/00	0.21	NR	12	12	0.14	0.18	1250
10/10/00	0.18	64	11	12	0.12	0.17	1120
mean	0.16	62	14.1	14.7	0.23	0.29	1194
st. dev	0.03	5	2.6	2.8	0.10	0.14	59
st. error	0.01	1	0.52	0.56	0.02	0.03	13.08

NR not reported

[2] Flow based on USGS measurements, adding calculated flow from WGT1

[3] Sample result was deemed an outlier. Assumed to be laboratory error.

Table B-2. Water Quality Monitoring Results, 2000 – Cont.

San Diego Regional Water Quality Control Board

Date	Oak Crest (Station 3)							Date	Willow Glen Tributary (WGT1)						
	Flow[4]	Temp	NO_3-N	Total N	PO_4-P	Total P	TDS		Flow[5]	Temp	NO_3-N	Total N	PO_4-P	Total P	TDS
	cfs	°F	mg/L	mg/L	mg/L	mg/L	mg/L		cfs	°F	mg/L	mg/L	mg/L	mg/L	mg/L
8/22/00	0.03	70	11	14	1.4	1.5	1590	8/15/00	0.07	70	20	20	< 0.05	< 0.05	1420
8/29/00	0.03	68	11	12	1.2	1.3	1680	8/22/00	0.11	66	20	20	< 0.05	< 0.05	1370
9/5/00	0.06	70	8.1	9.4	0.59	0.93	1580	8/29/00	0.09	66	20	20	< 0.05	0.16	1360
9/12/00	0.03	67	5.1	7.6	0.67	0.78	1800	9/5/00	0.10	63	19	19	< 0.05	< 0.05	1250
9/19/00	0.01	67	1.2	3.1	0.52	0.93	1580	9/12/00	0.11	67	18	18	< 0.05	0.06	1370
9/26/00	0.00	68	13	15	1.1	1.3	1940	9/19/00	0.10	64	17	17	< 0.05	0.28	1370
10/3/00	0.00	66	9.5	11	0.81	0.99	1830	9/26/00	0.07	66	18	18	< 0.05	< 0.05	1430
10/10/00	0.03	63	12	14	0.71	0.88	1640	10/3/00	0.14	NR	17	18	< 0.05	< 0.05	1440
10/17/01	0.03	61	12	13	0.68	1.6	1760	10/10/00	0.11	63	17	17	< 0.05	< 0.05	1290
mean	0.02	67	9.2	11.0	0.85	1.13	1711	mean	0.10	66	18.4	18.6		0.17	1367
st. dev	0.02	3	3.9	3.8	0.31	0.30	128	st. dev	0.02	2	1.3	1.2		0.11	64
st. error	0.01	1.0	1.28	1.27	0.10	0.10	45	st. error	0.01	0.6	0.45	0.42		0.06	23

Date	Via Milpas Tributary (VMT1)							Date	Stage Coach (Station 6)						
	Flow[5]	Temp	NO_3-N	Total N	PO_4-P	Total P	TDS		Flow[6]	Temp	NO_3-N	Total N	PO_4-P	Total P	TDS
	cfs	°F	mg/L	mg/L	mg/L	mg/L	mg/L		cfs	°F	mg/L	mg/L	mg/L	mg/L	mg/L
8/15/00	0.11	67	14	14	< 0.05	0.08	1330	8/15/00	0.24	68	13	13	0.18	0.20	1200
8/22/00	0.10	66	16	17	< 0.05	0.1	1320	8/22/00	0.23	68	13	14	0.14	0.21	1210
8/29/00	0.11	66	16	17	< 0.05	0.38	1370	8/29/00	0.26	66	14	14	0.14	0.79	1240
9/5/00	0.16	62	16	16	< 0.05	0.08	1170	9/5/00	0.31	62	14	16	0.20	0.43	1110
9/12/00	0.12	64	15	15	< 0.05	< 0.05	1390	9/12/00	0.28	64	13	14	0.22	0.36	1260
9/19/00	0.14	62	14	15	< 0.05	< 0.05	1360	9/19/00	0.29	63	12	14	0.13	0.19	1200
9/26/00	0.12	64	15	15	< 0.05	< 0.05	1090	9/26/00	0.25	65	13	13	0.16	0.19	1260
10/3/00	0.14	NR	15	15	< 0.05	< 0.05	1460	10/3/00	0.35	NR	12	12	0.17	0.17	990
10/10/00	0.17	62	14	14	< 0.05	< 0.05	1440	10/10/00	0.35	63	12	13	0.12	0.18	1170
mean	0.13	64	15.0	15.3		0.16	1326	mean	0.28	65	12.9	13.7	0.16	0.30	1182
st. dev	0.02	2	0.9	1.1		0.15	122	st. dev	0.04	2	0.8	1.1	0.03	0.20	86
st. error	0.01	0.7	0.29	0.37		0.07	41	st. error	0.01	0.8	0.26	0.37	0.01	0.07	29

[4] Flow measured by Hines Nursery staff using 24-hr water level recorder and Parshall flume installation. Flume installation was damaged during a storm event and was out of commission 9/24 through 10/4/00.

[6] Flow calculated in the field using the float method (leaf).

[6] Flow based on USGS measurements, adding calculated flow from WGT1 and VMT1

NR not reported

Table B-2. Water Quality Monitoring Results, 2000 – Cont.

San Diego Regional Water Quality Control Board

Date	Rainbow Glen Tributary (RGT1)						
	Flow[4]	Temp	NO_3-N	Total N	PO_4-P	Total P	TDS
	cfs	°F	mg/L	mg/L	mg/L	mg/L	mg/L
8/15/00	0.10	68	2	2.4	< 0.05	< 0.05	890
8/22/00	0.10	64	2.1	2.5	< 0.05	< 0.05	1210
8/29/00	0.10	68	2.3	2.7	< 0.05	0.12	890
9/5/00	0.08	60	1.9	2.1	< 0.05	< 0.05	710
9/12/00	0.05	62	2.2	2.6	< 0.05	0.08	880
9/19/00	0.09	62	1.6	2	< 0.05	< 0.05	790
9/26/00	0.10	62	2	2.3	< 0.05	< 0.05	870
10/3/00	0.09	NR	2	2.2	< 0.05	< 0.05	900
10/10/00	0.11	62	2.3	2.6	< 0.05	< 0.05	820
mean	0.09	64	2.0	2.4		0.10	884
st. dev	0.02	3	0.2	0.2		0.03	137
st. error	0.01	1.1	0.07	0.08		0.02	46

Date	Flow[7]	Temp	NO_3-N	Total N	PO_4-P	Total P	TDS
	cfs	°F	mg/L	mg/L	mg/L	mg/L	mg/L
	Margarita Glen Tributary (MGT1)[8]						
8/29/00	0.01	66	20	21	< 0.05	0.32	1340
	Jubilee (Upstream ~200 yards)[9]						
9/26/00	< 0.01	NR	7.8	8.5	< 0.05	< 0.05	1160
10/3/00	< 0.01	66	5	5.3	< 0.05	< 0.05	1200
10/11/00	< 0.01	64	4.8	5.2	< 0.05	< 0.05	1160
10/17/00	< 0.01	63	5.9	6.5	< 0.05	< 0.05	1170
		64	6	6			1173
		2	1	2			19
		1	1	1			9

[4] Flow calculated in the field using the float method (leaf).

NR not reported

[7] Flow calculated in the field using a timed-volume (bucket) method.

[8] The monitoring location was dry and was not sampled. Surface water was found upstream of this location and was sampled on 8/29/00. It was located on the property at the base of the drainage area.

[9] Jubilee Station was found to be dry. Groundwater was found surfacing upstream on 9/26/00 by RB staff. The location was sampled for the remainder of the monitoring period by Hines Nursery.

Date	Hines Nurseries (Station 2)							
	Flow[10]	ADF[11]	Temp	NO_3-N	Total N	PO_4-P	Total P	TDS
	cfs	cfs	°F	mg/L	mg/L	mg/L	mg/L	mg/L
8/15/00								
8/22/00	0	0						
8/29/00	0	0.003						
9/5/00	0	0						
9/12/00	0	0						
9/19/00	0.41	0.279	67	17	22	0.96	1.7	1510
9/26/00	0	0						
10/3/00	0	0						
10/11/00	0	0						
10/17/00	0	0.025						
mean	0.05	0.03						
st. dev	0.14	0.09						
st. error	0.05	0.03						

[10] Flow measurement recorded at time of sampling. Flow measured by Hines Nursery staff using 24-hr water level recorder and Parshall flume installation. Only one sample was collected from flowing water being discharged from the Hines Property at the time of sample collection.

[11] ADF is average daily flow measured by water level recorder.

Appendix C – Photos Illustrating Algal Growth in Rainbow Creek

Photos Illustrating Algal Growth in Rainbow Creek

Upstream view from Station 3 and the Oak Crest Mobile Estates, under I-15 overpass on July 17, 2000 (left) and September 5, 2000 (right).

Oak Crest Station 3 on May 22, 2000 (left) and September 5, 2000 (right)

Riverhouse Station 5 on July 7, 1999 (left) and June 6, 2000 (right)- Pictures show extensive algal growth.

Photos Illustrating Algal Growth in Rainbow Creek – Cont.

Illustration of emergent plant growth.

Two views looking downstream of Riverhouse station on March 15, 2000 (top) and August 15, 2000 (bottom)

Photos Illustrating Algal Growth in Rainbow Creek – Cont.

Chronological Series at Riverhouse Station

February 1, 2000

April 11, 2000

May 23, 2000

June 20, 2000

September 12, 2000

October 10, 2000

Appendix D – Background Concentrations

Appendix D — Background Concentrations

This Technical Support Document (TSD) provides an analysis of reference stream data that is used to calculate the background load contribution to Rainbow Creek. This TSD presents local data sets from the City of San Diego's Monitoring Network for the determination of background concentrations. Evaluation of reference water quality provides a baseline for establishing background concentrations.

Overview

Soil erosion, the decay of plant material, and the decay of wild animal waste contribute background nitrogen and phosphorus loads from undeveloped land to Rainbow Creek. There is insufficient data to determine site-specific background concentrations in Rainbow Creek. A review of historic monitoring data for Rainbow Creek revealed only two nitrate samples from 1954 (CDWR 1975). Since agricultural irrigation and citrus and avocado orchards were present in the Fallbrook area in the early 1940's (CDWR 1975), this data is considered insufficient to determine background concentrations.

Water quality concentrations from local streams similar to Rainbow Creek will therefore be used as an alternative to site-specific background concentrations. Reference sites are relatively undisturbed by human influences. The definition of a reference condition ranges from a pristine, undisturbed state of a stream, to merely the "best available" or "best attainable" conditions. In the case of the San Diego streams used in this TSD, the "least" and "minimally" impacted sites have been identified to be reference.

Reference Data from City of San Diego's Monitoring Network

The City of San Diego (City) monitors streams that drain into the drinking water reservoirs for the purpose of maintaining the quality of the supply. The City performs monthly monitoring for ammonia, nitrite, nitrate, total Kjeldahl nitrogen, and ortho-phosphate. In 2003, the City began monitoring for total nitrogen and total phosphorus.

For this analysis, each monitoring location was characterized to determine its potential to be a reference site (see Attachment D-1). The locations were reviewed for stream order and proximity to land use. The stream order and existing land use as shown on the San Diego Association of Governments' Regional Economic Development Information (REDI) interactive mapping application was reviewed and noted (SANDAG 2003).

Each monitoring site was scored using an a priori classification system for ranking streams according to intensity of human influence (Karr and Chu 1999). This classification system has been modified for application to San Diego streams and is referred to as the Gibson Score. It is a measure developed by David Gibson, Environmental Scientist, Regional Board that integrates multiple aspects of land use impairment. The score, which ranges from 1 to 72, takes into account the presence of effluent discharges, availability of sources of stressors (e.g., presence of land uses), riparian condition, and instream habitat. Scores of 1 to 9 are considered to be "least"

impacted and scores of 10 to 18 are “minimally” impacted. Both of these categories identify streams with very little or no effluent from land use, and have no identified nearby sources of sediment or wastes. Sites with a score of 1 to 18 are considered to represent reference. Scores higher than 18 are impacted by effluent and are not considered reference. Attachment D-1 presents the evaluation results of each monitoring location in the City of San Diego Monitoring Network.

Using a score of 18 as the threshold value, 19 out of a pool of 47 streams were identified as candidate reference sites. After the reference sites were identified, the City's monitoring data were reviewed for available data. Seven from the 19 streams had insufficient data and could not be used in this analysis. Data sets with at least two sampling events and reported results for nitrate, nitrite, and total Kjeldahl nitrogen (needed for the total nitrogen calculation) were considered for the analysis. The monitoring data consists of samples collected in 2001 through mid-2003, and from a study performed at San Vicente Reservoir in 1997 and 1998. Total nitrogen was calculated by adding nitrate, nitrite, and total Kjeldahl nitrogen for data collected prior to 2003. For the 2003 data, the total nitrogen and total phosphorus results were used in this analysis. Half the detection limit is used for those samples reported as less than the detection limit.

Table D-1 summarizes the reference stream results and provides the reference concentrations for total nitrogen and total phosphorus in San Diego streams. Attachment D-2 presents the reference stream data sets that is used to calculate the average values presented in the summary table. Although the detection limits are not low enough to measure actual values, the concentrations are reasonable when compared with other reference concentrations (see discussion of Alternative Data Sets).

Table D-1. Average Nutrient Concentrations for Reference Streams in San Diego

Monitoring Station	Average Total Nitrogen[1] (mg/L)	No. of Positive Results (No. of NDs)[1]	Average Total Phosphorus (mg/L)	No. of Positive Results (No. of NDs)
WLC4	0.36	10 (7)	0.09	1 (1)
PVC5	0.26	7 (10)	0.06	1 (1)
KTC7	0.1	0 (6)	NM	0 (0)
TOL2	0.67	13 (5)	NM	0 (0)
CWD9	1.14	62 (24)	0.04	1 (1)
AQA3	0.85	20 (5)	NC	1 (0)
CON3	0.3	11 (21)	0.12	2 (0)
BDC3	0.22	6 (11)	0.04	0 (2)
SDR2b	0.3	6 (8)	0.08	1 (1)
CED3	0.31	5 (6)	0.06	1 (1)
BMD1	0.6	5 (2)	NC	1 (0)
WCH1	0.54	14 (11)	NC	1 (0)
Average	0.47		0.07	
St. Deviation	0.30		0.03	
St. Error	0.09		0.01	

ND – Non detection, sample result was less than the detection limit.
NM – Not measured
NC – Not considered for analysis because only one sampling event was available.
[1]Except for data collected in 2003, total nitrogen was calculated by adding nitrate, nitrite, and total Kjeldahl nitrogen. Therefore, the number of positive results and non detections for each parameter is used.

Alternative Data Sets

For comparison purposes, USEPA proposed nutrient criteria and USGS undeveloped stream basins in the United States were reviewed. Table D-2 summarizes reference concentrations from these alternative data sources. The background reference concentration for San Diego of 0.47 mg N/L is nearly the same as the USEPA result and somewhat higher than the USGS results. The San Diego value for total phosphorus is slightly higher than both the USEPA and the USGS results. Information on both alternative data sets is provided below.

Table D-2. Comparison of San Diego Reference Stream Concentrations with Alternative Data Sources

Data Set/Study	Total N mg/L	Total P mg/L
USEPA, Ecoregion III, Subecoregion 6[a]	0.50	0.03
USGS, Undeveloped Stream Basins[b]	0.26	0.02
San Diego Reference Streams	0.47	0.07

[a] Source: USEPA Ambient Water Quality Criteria Recommendations 2000

[b] Source: Clark et al. 2000

USEPA Nutrient Criteria

USEPA developed criteria recommendations for nutrients using data from the STORET Database for each ecoregion and subecoregion. San Diego County is in Ecoregion III (Xeric West) and Subecoregion 6 (Southern and Central California Chaparral and Oak Woodlands). Ecoregions are defined as regions with relatively similar characteristics, such as, soils, vegetation, climate, geology, land cover, and physiology.

USGS Data from Undeveloped Stream Basins

Nutrient data collected as part of three USGS programs were used to evaluate nutrient concentrations in 85 streams draining relatively undeveloped basins across the nation (Clark et al. 2000). The three programs are the Hydrologic Benchmark Network (HBN), the National Water Quality Assessment (NAWQA), and the Research Program. The HBN program was initiated in 1958 to track water quality trends in streams draining basins free from anthropogenic influence. The NAWQA program, initiated in 1990, was designed to identify and describe major factors that affect observed water quality conditions over large spatial and temporal scales. Research basins were selected that studied the affects of atmospheric deposition on biogeochemical cycling within small, undisturbed watersheds were used in the evaluation.

References

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Attachment D-1. Evaluation of Station Locations for the City of San Diego Monitoring Network

Watershed	Site	Steam Order	Land Uses[1]	Gibson Score[2]	Scoring Considerations
Otay/ Dulzura	UOR1	1	Open Space, Agriculture	54	Ephemeral drainage with major construction throughout its drainage area.
	JAM4	3	Open, w/ Industrial and Agriculture Use Upstream	28	Agricultural areas and rural residential areas upstream. Major campground and road crossings. Evidence of instream erosion and channel incision on Dulzura Creek.
	DUL1a	2*	Agriculture & Residential *surrounding, water from Barrett	NS	Not Scored. Reservoir discharge point into Dulzura Creek.
	PVR2	1	Open, Park	18	Proctor Valley has been heavily grazed and is the site for frequent trash dumping and illegal activities.
	HOL3	2	Sample location in Agriculture dominated area	31	Intermittent stream in previously grazed area. Rural residential and agricultural activities in drainage area.
Barrett/ Dulzura	WLC4	2	Open	10	Minor rural residential area upstream (<10 units). Historic grazing on tributary ceased in 1999.
	BHC3	2	Public Facility, Open	50	Located below Barrett Honor Camp and site of historic accidental waste water discharges. Area is heavily grazed.
	NPC3a	2	Open	10	Located above Pine Valley Recreational Cabin area in the Cleveland National Forest. Minor grazing activities and recreation in drainage area.
	NPC3b	2	Open	13	Located in the Pine Valley Recreational Cabin area.
	NPC3c	2	Open	13	Located in the Pine Valley Recreational Cabin area.
	NPC3d	2	Open	13	Located below the Pine Valley Recreational Cabin area and above the community of Pine Valley.
	PVC1	2	Agriculture & Residential immediately upstream, then Open	28	Located below Pine Valley at the Pine Creek Trailhead. Significant septic drainage fields, a wastewater treatment facility and two major horse stables.
	PVC1A	2	Agriculture & Residential immediately upstream, then Open	28	Located below Pine Valley at the Pine Creek Trailhead. Significant septic drainage fields, a wastewater treatment facility and two major horse stables.
	PVC5	2	Open	10	Located at the mouth of Pine Creek at Barrett Reservoir. Most of the upstream drainage area lies in the Pine Creek Wilderness area. Located approximately 15 river miles below PVC1(a).

[1] Source: Regional Economic Development Information, SANDAG
[2] Source: A measure developed by SDRWQCB staff, David Gibson, using the scoring system developed by Karr and Chu (1999).

Attachment D-1. Evaluation of Station Locations for the City of San Diego Monitoring Network Continued

Watershed	Site	Steam Order	Land Uses[1]	Gibson Score[2]	Scoring Considerations
Barrett/ Dulzura	SKY1	2	Open	28	Located in a remote area above Barrett Reservoir. Some light dry land agriculture. The Corral Canyon Offroad Vehicle recreational area is at the top of the watershed approximately 7 river miles away. Two impoundments approximately 1 mile upstream.
	CWD9	3	Open but downstream of illegal immigrant camp	13	Located approximately 5 miles downstream of Morena Reservoir. A major undocumented immigrant encampment is located in Salazar Canyon approximately 2 miles upstream. Historic grazing in Hauser Canyon.
	DUL0	*	*Reservoir Tailwater	NS	Not scored.
Morena/ Dulzura	MOR3	2	Open	13	Located in a largely undisturbed drainage above Morena Reservoir. Some light grazing and recently constructed rural residences (2).
	KTC7	2	Open	10	Located in Kitchen Creek Canyon approximately 2 river miles downstream of Cibbets Flats campground. Minimal grazing activity in upper watershed approximately 5 river miles upstream.
	CWD4	2	Agriculture	32	Low gradient site in alluvial valley. Significant impacts upstream including intensive grazing, plowed field agriculture, community high school, freeway and road crossings, and rural residences.
	LAP4	2	Agriculture	33	Significant grazing pressure onsite and immediately upstream. Also, freeway and road crossings and rural residential areas.
San Vicente	TOL2	2	Park, Open	5	Mostly undeveloped unincorporated county area with natural park reserve areas.
	KIM4	2	Park, Open, Res.(Fernbrook)	53	Heavily developed rural residential, road crossings, and upstream agriculture.
	AQA3	1	Park, Small amount of Residential	10	Small intermittent stream with minor agriculture and rural residential. Some road runoff from Hwy 67 and driveway roads.

[1] Source: Regional Economic Development Information, SANDAG
[2] Source: A measure developed by SDRWQCB staff, David Gibson, to integrate multiple aspects of land use impairment.

Attachment D-1. Evaluation of Station Locations for the City of San Diego Monitoring Network Continued

Watershed	Site	Steam Order	Land Uses[1]	Gibson Score[2]	Scoring Considerations
San Vicente	SNC4	3*	Park, Open, Residential, Agriculture, * receives raw water from Sutherland	53	Major developments and golf course immediately upstream. Historic waste water runoff less than 0.5 miles upstream. Road crossings, horse stables, and trash.
	SNC5	2	Residential, Park, Commercial, Agriculture (Barona)	53	Major developments and golf course immediately upstream. Historic waste water runoff upstream. Agriculture, road crossings, horse stables, and trash.
	BAR4	2	Park, Open, Agriculture, Residential (Barona)	54	Historically overgrazed valley. Rural residential area. Major site of new development associated with Tribal Casino including golf course and wastewater treatment and land application areas.
El Capitan	CON3	3	Open	1	Very undeveloped watershed, but benthic habitat limited by bedrock bottom canyon. Some tribal grazing historically in upper canyons.
	PZC3	2	Open, Residential (Alpine)	32	Rural residential with septic and numerous road crossings.
	CHC3	2	Open, Residential (Alpine)	50	Rural residential and dense subdivision residential with numerous road crossings, freeway crossing, agriculture, and septic fields.
	BDC3	2*	Open, Park, small amount of Residential & Agriculture *Bottom of Lake Cuyamaca Drainage,	10	Located approximately 12 miles downstream of Lake Cuyamaca. Flows regulated by water transfers from Cuyamaca to El Capitan Reservoirs. Some agriculture and rural residential areas approximately 5 river miles upstream.
	SDR2b	3*	Open, *Julian near headwaters	1	Located approximately 15 miles downstream of Julian. Rural residential and agricultural areas in Julian, but almost none between Julian (Coleman Creek) and this site. Some potential agricultural and rural residential impacts from Ritchie Creek drainage
	CED3	2	Open, Residential & Agriculture (Pine Hills) may or may not effect	1	Located approximately10 miles downstream from Sandy Creek rural residential area and approximately 12 miles downstream from the Harrison and Pine Hills rural residential areas.
	CUY2	*	Park, Some Residential, *drains from Lake Cuyamaca	14	Reservoir discharge point into Boulder Creek. Minor natural flows, mostly regulated flows. Rural residential and recreational activities.

[1] Source: Regional Economic Development Information, SANDAG
[2] Source: A measure developed by SDRWQCB staff, David Gibson, to integrate multiple aspects of land use impairment.

Attachment D-1. Evaluation of Station Locations for the City of San Diego Monitoring Network Continued

Watershed	Site	Steam Order	Land Uses[1]	Gibson Score[2]	Scoring Considerations
Hodges	DDC3	1	Residential	72	Potentially significant pollutant sources present.
	FEL3	2	Escondido	68	Potentially significant pollutant sources present.
	KCC3	2	Escondido	71	Potentially significant pollutant sources present.
	MON2	1	Open, Adjacent Residential Surrounding	68	Potentially significant pollutant sources present.
	GVC2	2	Open, Adjacent Residential Surrounding	64	Potentially significant pollutant sources present.
	SYC2	2	Agriculture, Residential	23	Potentially significant pollutant sources present.
	CDC4	2	Agriculture & Residential Surrounding	50	Potentially significant pollutant sources present.
	SMC4	3	Adjacent Agriculture, Open, Ramona	36	Potentially significant pollutant sources present.
	GJC4	2	Adjacent Agriculture, Open	36	Potentially significant pollutant sources present.
	YSA8	3*	Adjacent Agriculture, Park, Open, *Sutherland tailwater	36	Potentially significant pollutant sources present.
	TEM1	3	Agriculture along corridor, Open at headwaters	33	Site is actually Santa Ysabel Creek below confluence with Temescal Creek. Significant agriculture (grazing and plowed field) immediately upstream. Fair to poor riparian and instream habitat.
Sutherland	BMD1	2	Open, Agriculture near headwaters	11	Grazing activities upstream of sample site approximately 4 river miles upstream. Minor mining activities without drainage problems. Instream habitat is fair and riparian habitat is excellent.
	WCH1	2	Open, large area of Agriculture near headwaters which may not be maintained. No plowed fields.	18	Site is actually Santa Ysabel Creek below the Witch Creek confluence and above high water line of Sutherland Reservoir. Rural residential, road crossings and septic fields approximately 4 river miles upstream. Extensive local grazing pressure historically. Riparian condition is depressed and instream condition is fair to poor.

[1] Source: Regional Economic Development Information, SANDAG
[2] Source: A measure developed by SDRWQCB staff, David Gibson, to integrate multiple aspects of land use impairment.

Attachment D-2. City of San Diego Monitoring Network Data Set

Station	Date	Ammonia-N mg/L	Nitrate-N mg/L	Nitrite – N mg/L	TKN mg/L	TN[a] mg/L	PO_4-P mg/L	TP mg/L
Wilson Creek (WLC4)	1/17/01	< 0.02	< 0.05	< 0.002	0.17	0.20	< 0.07	NM
	2/6/01	< 0.02	< 0.05	< 0.002	0.16	0.18	< 0.07	NM
	2/27/01	< 0.02	< 0.05	0.004	0.31	0.34	< 0.07	NM
	3/20/01	< 0.02	< 0.05	< 0.002	0.21	0.23	< 0.07	NM
	4/10/01	0.09	0.33	0.061	0.74	1.12	< 0.07	NM
	3/4/03	< 0.04	< 0.05	< 0.003	NM	0.38[b]	< 0.07	0.14[b]
	4/8/03	< 0.04	< 0.05	< 0.003	NM	< 0.16[b]	< 0.07	< 0.08[b]
Average[c]		**0.02**	**0.07**	**0.01**	**0.32**	**0.36**	**0.04**	**0.09**
St. Deviation		**0.03**	**0.12**	**0.02**	**0.24**	**0.35**	**0.00**	**0.07**
St. Error		**0.01**	**0.04**	**0.01**	**0.11**	**0.13**	**0.00**	**0.05**
Pine Valley Creek (PVC5)								
	1/17/01	< 0.02	< 0.05	< 0.002	0.19	0.21	< 0.07	NM
	2/6/01	< 0.02	< 0.05	< 0.002	0.17	0.19	< 0.07	NM
	2/27/01	< 0.02	< 0.05	< 0.002	0.28	0.30	< 0.07	NM
	3/20/01	< 0.02	< 0.05	< 0.002	0.23	0.25	< 0.07	NM
	4/10/01	< 0.02	< 0.05	< 0.002	0.28	0.30	< 0.07	NM
	3/4/03	< 0.04	< 0.05	< 0.003	NM	0.35[b]	< 0.07	< 0.08[b]
	4/8/03	< 0.04	< 0.05	< 0.003	NM	0.19[b]	< 0.07	0.07[b]
Average[c]		**0.01**	**0.02**	**0.001**	**0.23**	**0.26**	**0.04**	**0.06**
St. Deviation		**0.005**	**0.00**	**0.000**	**0.05**	**0.06**	**0.00**	**0.02**
St. Error		**0.002**	**0.00**	**0.000**	**0.02**	**0.02**	**0.00**	**0.02**
Kitchen Creek (KTC7)								
	1/18/01	< 0.02	< 0.05	< 0.002	< 0.15	0.10	< 0.07	NM
	2/7/01	< 0.02	< 0.05	< 0.002	< 0.15	0.10	< 0.07	NM
Average[c]		**0.01**	**0.02**	**0.001**	**0.08**	**0.10**	**0.03**	
St. Deviation		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	
St. Error		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	
San Vicente Reservoir, above high water line (TOL2)								
	1/27/97	< 0.02	1.70	0.005	0.68	2.39	< 0.003	NM
	2/10/97	< 0.02	0.03	0.002	0.35	0.39	< 0.003	NM
	3/24/98	< 0.02	< 0.05	< 0.002	0.20	0.23	< 0.065	NM
	4/27/98	0.02	< 0.002	0.002	0.41	0.41	< 0.007	NM
	3/26/98	0.02	< 0.05	< 0.002	0.30	0.33	< 0.065	NM
	6/22/98	< 0.02	0.01	0.002	0.30	0.31	< 0.007	NM
Average[c]		**0.02**	**0.30**	**0.002**	**0.37**	**0.67**	**0.01**	
St. Deviation		**0.0005**	**0.69**	**0.002**	**0.17**	**0.8**	**0.02**	
St. Error		**0.0002**	**0.28**	**0.001**	**0.07**	**0.3**	**0.01**	

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[a] Except for data collected in 2003, Total N calculated by adding nitrate, nitrite, and TKN and using half the reported minimum detection limit (MDL) as a surrogate value for non detections.
[b] In 2003, the City began reporting Total Nitrogen and Total Phosphorus, and discontinued reporting TKN.
[c] Averages calculated using half the reported MDL as a surrogate value for non detections.

Attachment D-2. City of San Diego Monitoring Network Data Set - Continued

Station	Date	Ammonia -N mg/L	Nitrate-N mg/L	Nitrite – N mg/L	TKN mg/L	TN[a] mg/L	PO_4-P mg/L	TP mg/L
Cottonwood Creek (CWD9)	1/17/01	0.09	< 0.05	0.003	0.59	0.61	< 0.07	NM
	2/6/01	0.03	< 0.05	< 0.002	0.52	0.54	< 0.07	NM
	2/27/01	0.83	< 0.05	0.013	1.52	1.56	< 0.07	NM
	3/14/01	< 0.02	< 0.05	< 0.002	0.33	0.35	< 0.07	NM
	3/20/01	< 0.02	2.48	0.024	0.93	3.44	< 0.07	NM
	3/28/01	0.10	0.33	0.036	0.93	1.29	< 0.07	NM
	4/4/01	0.15	0.36	0.054	1.15	1.56	< 0.07	NM
	4/10/01	0.10	0.50	0.054	1.07	1.63	< 0.07	NM
	4/18/01	< 0.02	0.63	0.024	0.80	1.46	< 0.07	NM
	4/25/01	< 0.02	0.66	0.013	0.95	1.63	0.05	NM
	5/9/01	< 0.02	0.71	0.013	0.80	1.52	< 0.07	NM
	5/16/01	< 0.02	0.75	0.014	0.85	1.61	< 0.07	NM
	5/22/01	< 0.02	0.77	0.017	0.78	1.57	< 0.07	NM
	6/6/01	< 0.02	0.87	0.023	0.92	1.81	0.09	NM
	6/20/01	< 0.02	0.96	0.019	0.85	1.83	0.11	NM
	6/27/01	< 0.02	0.84	0.014	1.06	1.91	0.11	NM
	7/5/01	< 0.02	0.71	0.007	1.02	1.73	0.10	NM
	7/11/01	< 0.02	0.63	0.005	0.70	1.34	0.09	NM
	7/17/01	< 0.02	0.26	< 0.002	1.38	1.64	0.03	NM
	7/25/01	< 0.02	0.12	< 0.002	1.38	1.51	0.03	NM
	7/31/01	< 0.02	0.19	< 0.002	0.99	1.18	0.08	NM
	8/8/01	< 0.02	0.02	< 0.002	0.42	0.45	< 0.07	NM
	12/4/01	< 0.02	< 0.05	< 0.002	0.28	0.30	< 0.07	NM
	1/2/02	< 0.02	< 0.05	< 0.002	< 0.10	0.07	< 0.07	NM
	2/5/02	< 0.02	< 0.05	< 0.002	< 0.10	0.07	< 0.07	NM
	4/3/02	< 0.02	< 0.05	< 0.002	0.25	0.28	< 0.07	NM
	5/7/02	< 0.02	< 0.05	< 0.002	0.38	0.40	< 0.07	NM
	11/5/02	< 0.04	< 0.05	0.008	< 0.16	0.11	0.14	NM
	3/4/03	< 0.04	< 0.05	< 0.003	NM	0.23[b]	< 0.07	0.04[b]
	4/8/03	< 0.04	0.36	< 0.003	NM	0.51[b]	< 0.07	< 0.08[b]
Average[c]		**0.05**	**0.41**	**0.01**	**0.75**	**1.14**	**0.05**	**0.04**
St. Deviation		**0.15**	**0.51**	**0.01**	**0.41**	**0.77**	**0.03**	**0.00**
St. Error		**0.03**	**0.09**	**0.00**	**0.08**	**0.14**	**0.01**	**0.00**

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[a] Except for data collected in 2003, Total N calculated by adding nitrate, nitrite, and TKN and using half the reported minimum detection limit (MDL) as a surrogate value for non detections.
[b] In 2003, the City began reporting Total Nitrogen and Total Phosphorus, and discontinued reporting TKN.
[c] Averages calculated using half the reported MDL as a surrogate value for non detections.

Attachment D-2. City of San Diego Monitoring Network Data Set - Continued

Station	Date	Ammonia-N mg/L	Nitrate-N mg/L	Nitrite – N mg/L	TKN mg/L	TN[a] mg/L	PO_4-P mg/L	TP mg/L
San Vicente Reservoir, above high water line (AQA3)								
	1/27/97	< 0.02	2.84	0.013	0.73	3.59	0.01	NM
	2/10/97	< 0.02	0.03	0.002	0.43	0.47	< 0.08	NM
	2/24/97	< 0.02	< 0.02	< 0.002	0.62	0.63	< 0.08	NM
	3/24/98	< 0.02	0.20	0.005	0.29	0.50	< 0.07	NM
	4/27/98	0.02	0.22	0.003	0.45	0.67	< 0.07	NM
	5/26/98	0.02	< 0.05	< 0.002	0.32	0.35	< 0.07	NM
	6/22/98	< 0.02	< 0.002	0.002	0.34	0.34	0.01	NM
	3/26/01	< 0.02	0.18	0.002	0.25	0.43	< 0.07	NM
	3/10/03	< 0.04	0.15	< 0.003	NM	0.65 [b]	< 0.07	0.17 [b]
Average[c]		**0.01**	**0.41**	**0.003**	**0.43**	**0.85**	**0.03**	
St. Deviation		**0.005**	**0.918**	**0.004**	**0.169**	**1.036**	**0.012**	
St. Error		**0.002**	**0.306**	**0.001**	**0.060**	**0.345**	**0.004**	
Conejos Creek (CON3)								
	1/22/01	< 0.02	< 0.05	< 0.002	0.30	0.32	< 0.07	NM
	2/12/01	< 0.02	< 0.05	< 0.002	0.20	0.22	< 0.07	NM
	3/5/01	< 0.02	< 0.05	< 0.002	0.48	0.51	0.04	NM
	3/26/01	< 0.02	< 0.05	< 0.002	0.36	0.38	< 0.07	NM
	4/16/01	< 0.02	< 0.05	< 0.002	0.15	0.18	< 0.07	NM
	5/7/01	< 0.02	< 0.05	< 0.002	0.46	0.48	< 0.07	NM
	5/29/01	< 0.02	< 0.05	< 0.002	0.16	0.18	< 0.07	NM
	2/11/02	< 0.02	< 0.05	< 0.002	< 0.10	0.07	< 0.07	NM
	3/11/02	< 0.02	< 0.05	< 0.002	0.18	0.20	< 0.07	NM
	4/8/02	< 0.02	< 0.05	< 0.002	0.24	0.26	< 0.07	NM
	3/10/03	< 0.04	< 0.05	< 0.003	NM	0.49 [b]	< 0.07	0.09 [b]
	4/14/03	< 0.04	< 0.05	< 0.003	NM	0.26 [b]	< 0.07	0.16 [b]
Average[c]		**0.01**	**0.02**	**0.001**	**0.26**	**0.30**	**0.03**	**0.12**
St. Deviation		**0.004**	**0.00**	**0.00**	**0.14**	**0.14**	**0.002**	**0.047**
St. Error		**0.001**	**0.00**	**0.00**	**0.04**	**0.04**	**0.001**	**0.033**
Boulder Creek (BDC3)								
	3/6/01	< 0.02	< 0.05	< 0.002	0.24	0.28	< 0.07	NM
	3/27/01	< 0.02	< 0.05	< 0.002	0.22	0.26	< 0.07	NM
	4/17/01	< 0.02	< 0.05	< 0.002	0.31	0.36	< 0.07	NM
	5/8/01	< 0.02	< 0.05	< 0.002	0.27	0.32	< 0.07	NM
	5/30/01	< 0.02	< 0.05	< 0.002	< 0.10	0.15	< 0.07	NM
	3/11/03	< 0.04	< 0.05	< 0.003	NM	0.16 [b]	< 0.07	< 0.08 [b]
	4/15/03	< 0.04	< 0.05	0.024	NM	0.25 [b]	< 0.07	< 0.08 [b]
Average[c]		**0.01**	**0.02**	**0.005**	**0.22**	**0.22**	**0.03**	**0.04**
St. Deviation		**0.005**	**0.00**	**0.01**	**0.10**	**0.10**	**0.00**	**0.00**
St. Error		**0.002**	**0.00**	**0.003**	**0.04**	**0.04**	**0.00**	**0.00**

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[b] In 2003, the City began reporting Total Nitrogen and Total Phosphorus, and discontinued reporting TKN.
[c] Averages calculated using half the reported MDL as a surrogate value for non detections.

Attachment D-2. City of San Diego Monitoring Network Data Set - Continued

Station	Date	Ammonia-N mg/L	Nitrate-N mg/L	Nitrite – N mg/L	TKN mg/L	TN[a] mg/L	PO_4-P mg/L	TP mg/L
San Diego River (SDR2b)	3/6/01	< 0.02	< 0.05	< 0.002	0.41	0.44	< 0.07	NM
	3/27/01	< 0.02	< 0.05	< 0.002	0.23	0.26	< 0.07	NM
	4/17/01	< 0.02	< 0.05	< 0.002	0.17	0.20	< 0.07	NM
	5/8/01	< 0.02	< 0.05	< 0.002	0.24	0.26	< 0.07	NM
	3/11/03	< 0.04	< 0.05	< 0.003	NM	0.38[b]	< 0.07	0.12[b]
	4/15/03	< 0.04	< 0.05	< 0.003	NM	0.29[b]	< 0.07	< 0.08[b]
Average[c]		**0.01**	**0.02**	**0.001**	**0.26**	**0.30**	**0.03**	**0.08**
St. Deviation		**0.01**	**0.00**	**0.000**	**0.10**	**0.09**	**0.00**	**0.06**
St. Error		**0.002**	**0.00**	**0.000**	**0.05**	**0.04**	**0.00**	**0.04**
Cedar Creek (CED3)								
	3/6/01	< 0.02	< 0.05	< 0.002	0.43	0.45	< 0.07	NM
	3/27/01	0.02	< 0.05	< 0.002	0.20	0.23	< 0.07	NM
	4/17/01	< 0.02	< 0.05	< 0.002	0.13	0.15	< 0.07	NM
	3/11/03	< 0.04	< 0.05	< 0.003	NM	0.46[b]	< 0.07	< 0.08[b]
	4/15/03	< 0.04	< 0.05	0.003	NM	0.27[b]	< 0.07	0.08[b]
Average[c]		**0.02**	**0.02**	**0.002**	**0.25**	**0.31**	**0.03**	**0.06**
St. Deviation		**0.006**	**0.00**	**0.001**	**0.155**	**0.138**	**0.00**	**0.03**
St. Error		**0.003**	**0.00**	**0.000**	**0.089**	**0.062**	**0.00**	**0.02**
Bloomdale Creek (BMD1)								
	3/13/01	< 0.02	0.35	0.004	0.77	1.12	< 0.07	NM
	4/24/01	< 0.02	< 0.05	< 0.002	0.35	0.36	< 0.07	NM
	3/25/03	< 0.04	< 0.05	0.003	NM	0.31[b]	< 0.07	0.09[b]
Average[c]		**0.01**	**0.12**	**0.003**	**0.56**	**0.60**	**0.03**	
St. Deviation		**0.01**	**0.20**	**0.002**	**0.29**	**0.46**	**0.00**	
St. Error		**0.003**	**0.12**	**0.001**	**0.21**	**0.26**	**0.00**	
Santa Ysabel Creek (WCH1)								
	6/30/01	< 0.02	< 0.05	< 0.002	0.38	0.40	< 0.07	NM
	3/13/01	0.11	0.53	0.012	1.20	1.74	< 0.07	NM
	4/3/01	0.17	< 0.05	0.005	0.55	0.58	< 0.07	NM
	4/24/01	0.09	< 0.05	0.004	0.35	0.38	< 0.07	NM
	6/5/01	< 0.02	< 0.05	< 0.002	0.36	0.38	< 0.07	NM
	1/23/02	< 0.02	0.20	< 0.002	0.12	0.32	< 0.07	NM
	3/26/02	< 0.02	< 0.05	< 0.002	0.26	0.28	< 0.07	NM
	4/23/02	< 0.02	< 0.05	< 0.002	0.47	0.49	< 0.07	NM
	3/25/03	< 0.04	< 0.05	0.003	NM	0.30[b]	< 0.07	0.11[b]
Average[c]		**0.05**	**0.10**	**0.003**	**0.46**	**0.54**	**0.03**	
St. Deviation		**0.06**	**0.17**	**0.003**	**0.33**	**0.46**	**0.00**	
St. Error		**0.02**	**0.06**	**0.001**	**0.12**	**0.15**	**0.00**	

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[b] In 2003, the City began reporting Total Nitrogen and Total Phosphorus, and discontinued reporting TKN.
[c] Averages calculated using half the reported MDL as a surrogate value for non detections.

Appendix E – Streamflow, Seasonal Variation, and Flow Tiers

Appendix E—Streamflow, Seasonal Variation, and Flow Tiers

This appendix is a Technical Support Document (TSD) that provides additional analysis of streamflow in Rainbow Creek. This TSD examines rainfall patterns, daily streamflow rates and their frequency of occurrence, and flow-based tiers and their associated flow volumes.

Overview

In the semi-arid climate of Southern California there are two seasons—dry weather occurs during most of the year and intermittent wet weather events occur typically between November and March. This two-season climate creates significant differences in freshwater flow through the creeks and streams. In general, storm events yield both high flow rates and high flow volumes; the vast majority of flow volume occurs during the months of January, February, and March. Nonetheless, some storms occur in other months of the year.

The Regional Board has evaluated the merits of developing TMDLs for each pollutant (or group of pollutants) by using the seasonal variation approach (i.e., loading determined for wet versus dry weather seasons) and by using a flow-based approach. The flow-based approach divides stream flow into ranges or tiers. This method incorporates high flows that may occur outside of the wet season as well as low flows that happen in between rain events. Thus the applicable loading capacity and total allocation for a given pollutant does not depend on the time of year, but on the actual stream flow.

The following discussion concentrates on establishing flow tiers for Rainbow Creek. The flow-based approach is applied to total nitrogen and total phosphorus TMDLs in Section 5.0 Loading Capacity and Linkage Analysis. Three flow tiers have been identified: low flows, moderate to high flows, and very high flows. The flow data used in this analysis is from U.S. Geological Service (USGS) records (1989 – 2000) for Rainbow Creek near sampling station Willow Glen-4 (Gage No. 11044250).

Annual Precipitation

Precipitation during a water year (defined from July 1 to June 30) will influence the total flow volume within each freshwater system. Average annual rainfall is approximately 15 inches annually for inland North County (Escondido). During water year 1998, 29.86 inches of rain fell (El Nino conditions), whereas in 1999, 8.57 inches of rain fell. Table E-1 summarizes rainfall records at Escondido from 1980 to 2002.

Table E-1. Annual Precipitation Records at Escondido 2 (42863)

Water Year*	Annual Rainfall (inches)	Water Year*	Annual Rainfall (inches)	Comment
1980	30.4	1994	14.08	
1981	10.96	1995	26	
1982	15.74	1996	9.84	
1983	24.63	1997	10.84	
1984	8.16	1998	29.86	
1985	13.14	1999	8.57	
1986	20.89	2000	7.76	
1987	12.98	2001	10.3	
1988	17.02	2002	5.89	
1989	8.15			
1990	9.83	Summary		
1991	15.24	1980--2002	15.27	Annual average
1992	11.54	2002	5.89	Minimum value
1993	29.31	1980	30.4	Maximum value

Source: Western Regional Climate Center (2003), Southern California Climate Summaries, Monthly Total Precipitation

*For example, the 1998 water year is defined from June 30, 1997 to July 1, 1998.

Annual Flow Volume

The Regional Board reviewed daily flow records from the USGS record for the period of November 11, 1989 to September 30, 2000 for Rainbow Creek. We selected daily flow records corresponding to water year records (USGS, 2002). For example, July 1, 1990 to June 30, 1991 is water year 1991. This approach yielded 8 water year records for Rainbow Creek. Incomplete USGS data for the period 1989/90, 1992-93, and 1993-94 were not used because only partial records were available for each year.

USGS reports the daily median flow rate for each day of the record. This information is used to determine the annual flow volume of Rainbow Creek. This is accomplished by calculating and summing the daily volume for each day of the record. Table E-2 shows the annual flow volume for each year of the reviewed record.

Table E-2. Annual Flow Volumes and Rainfall Totals for Rainbow Creek

Water Year	Avg. Flow Rate (cfs)	Annual Flow Volume (cubic feet)	Annual Rainfall (inches)
91	2.4	69,465,600	15.24
92	1.93	61,031,232	11.54
95	9.58	298,804,032	26
96	1.22	38,579,328	9.84
97	2.19	69,063,840	10.84
98	7.87	240,028,704	29.86
99	1	31,536,000	8.57
2000	0.68	21,503,232	7.76

As can be expected, total flow volumes are directly related to annual precipitation. For example, the total flow volumes recorded for Rainbow Creek were 240,028,704 ft^3 (5,510 acre-ft) in 1998 (due to El Niño conditions) and 31,536,000 ft^3 (724 acre-ft) in 1999 (due to slightly below normal annual rainfall).

Daily Flow Records

The Regional Board's review of the daily flow records for Rainbow Creek revealed a wide range of flow rates. In dry weather, low flows are less than 3 cubic feet per second (cfs) and can occur year around. Flows of 3 cfs and above occur with less frequency by comparison and appear to be related to rainfall. However, it is reasonable to assume that some of the flows can be attributed to irrigation. Flows of 40 cfs or greater occur during the months with the highest rainfall and occur less than five days a year (averaged over 8 years). These very high flows are considered to be due to extreme weather conditions.

Figure E-1 presents the frequency of occurrence of flow rates in Rainbow Creek for the 8-water years evaluated. This figure also illustrates the month of the year that the flows occur. Figure E-2 provides another graphical representation of the frequency of occurrence.

Figure E-1 Annual Distribution of Flow Rate Frequency of Occurrence

Flow Rate (cfs)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	No. Days (in 8 yrs)
0.04 - 0.09							●	●					141
0.1					●	●	●	●	●	●	●	●	386
0.2	●				●	●	●	●	●	●	●	●	205
0.3	●	●	●	●	●	●	●	●	●	●	●	●	228
0.4	●	●	●	●	●	●	●	●	●	●	●	●	261
0.5	●	●	●	●	●	●	●	●	●	●	●	●	268
0.6	●	●	●	●	●	●	●	●	●	●	●	●	164
0.7	●	●	●	●	●	●	●	●	●	●	●	●	120
0.8	●	●	●	●	●	●	●	●	●	●	●	●	122
0.9	●	●	●	●	●	●	●		●	●	●	●	103
1	●	●	●	●	●	●	●	●	●	●	●	●	355
2	●	●	●	●	●	●			●		●	●	122
3	●	●	●	●	●	●			●		●		58
4	●	●	●	●	●	●				●	●	●	45
5	●	●	●	●	●						●	●	42
6	●	●	●	●					●			●	34
7	●	●	●	●	●							●	19
8		●	●								●	●	18
9	●	●	●	●	●							●	18
10	●		●	●									7
11	●	●	●	●							●	●	13
12	●	●	●	●									10
13	●	●	●	●									14
14	●	●	●	●									7
15	●	●	●	●									11
16	●		●	●									6
17	●	●	●	●									9
18	●	●	●	●									4
19	●		●										6
20	●	●	●	●	●						●		28
30	●	●	●	●	●							●	16
40	●	●	●										10
50		●	●										4
60	●	●	●								●	●	5
70		●											1
90		●	●										2
100		●	●										2
120	●		●										2
130	●	●											2
140	●												1
150		●											1
180	●												1
220			●										1
242		●											1
293		●	●										2
333		●											1
442			●										1

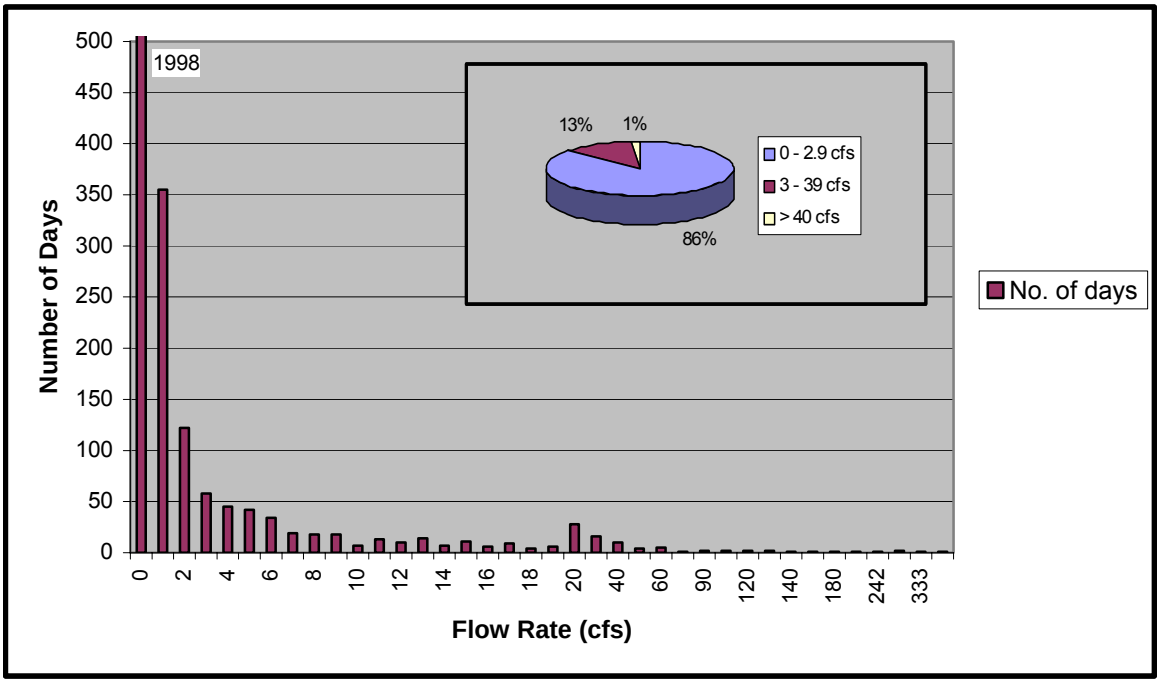

Figure E-2 Flow Rate Frequency of Occurrence During 8-Year Record

Flow Tiers for TN and TP TMDLs

Based on the flow data discussed above, flow tiers and their corresponding annual flow volumes are used to calculate the loading capacity for the total nitrogen and total phosphorus TMDLs in the Technical Report. Three flow tiers were defined for the complete range of flows (Table E-3). The three flow tiers are low flow (0 to 2.9 cfs), moderate to high flows (3 to 39 cfs), and very high flows (> 40 cfs). A comparison of the frequency of occurrences of flow rates and the distribution of the flows over the course of the eight years determined the flow tiers. To determine the total flow volume associated with each tier, the daily flow volume was calculated and summed for each tier.

$$\textbf{Total Flow Volume}_{(\text{tier } 1, 2, 3)} = \Sigma_{(t=1, 2, 3)} \ \textbf{Daily Flow Volume}$$

Next the total flow volume is divided by the number of days in the flow tier to determine the mean daily flow volume.

$$\textbf{Mean Daily Flow}_{(\text{tier } 1, 2, 3)} = \frac{\textbf{Total Flow Volume}_{(\text{tier } 1, 2, 3)}}{\textbf{No. Days}_{(\text{tier } 1, 2, 3)}}$$

Then the mean daily flow volume for each tier is annualized by multiplying by the percentage of days that the flow rate occurs during the eight years of data.

$$\textbf{Annual Flow Volume}_{(\text{tier } 1, 2, 3)} = \textbf{Mean Daily Flow}_{(\text{tier } 1, 2, 3)} * (\textbf{\% of Total Days}_{(\text{tier } 1, 2, 3)} * \textbf{365 Days})$$

Table E-4 presents the annual flow volume for Rainbow Creek for a typical year.

Table E-3. Flow-based Tiers and Corresponding Mean Daily Flow Volume in Rainbow Creek

Flow Tier	Corresponding Flow Rate (cfs)	Total Flow Volume Associated with Tier (cubic feet)	Total No. days (for 8 yrs)	% of Total Days	Mean Daily Flow Volume for Tier (cfd)
Low flow	0 – 2.9	140,024,160	2475	86	56,575
Mod – High flows	3 – 39	321,399,360	365	12.7	880,546
Very High flows	> 40	368,928,000	37	1.3	9,971,027

Table E-4. Flow-based Tiers and Corresponding Annual Flow Volume in Rainbow Creek

Flow Tier	Corresponding Flow Rate (cfs)	Mean Daily Volume for Tier (cfd)	Avg. No. of Days for Year #	Annual Flow Volume (cubic feet)
Low flow	0 – 2.9	56,575	314	17,764,622
Mod – High flows	3 – 39	880,546	46	40,775,379
Very High flows	> 40	9,971,027	5	46,805,255

Calculate by multiplying percentage of total days for each tier and 365 days

References

U.S. Geological Survey (USGS), 2002. Daily mean streamflow data for USGS 11044250 RAINBOW C NR FALLBROOK CA, November 7, 1989 through September 30, 2000. USGS National Water Information System, http://water.usgs.gov/realtime.html, queried on April 4, 2002.

Western Regional Climate Center (WRCC), 2003. Southern California Climate Summaries: Monthly Total Precipitation at Escondido 2, California, (042863). http://www.wrcc.dri.edu/cgi-bin/cliMONtpre.pl?caesc2, queried on April 16, 2003.

Appendix F – Load Allocation Analysis

Nitrogen Load Allocation Analysis

2009

	current annual load	% Reduction	Annual load Allocation	Rounded
nurseries	507	23.1%	389.9	390
ag fields	655	23.1%	503.7	504
orchards	790	23.1%	607.5	607
park	7	25.0%	5.3	5
residential	650	22.0%	507.0	507
urban	53	25.0%	39.8	40
septic disposal	200	0.0%	200.0	200
air depo.	40	0.0%	40.0	40
Caltrans	153	23.1%	117.7	118
UnID'd/Future PS			33	33
Total NPS & PS loads	3055	20.0%	2443.7	2444
			Target WLA & Load Allocation	2444

2013

	current annual load	% Reduction	Annual load Allocation	Rounded
nurseries	507	41.1%	298.6	299
ag fields	655	41.1%	385.8	386
orchards	790	41.1%	465.3	465
park	7	50.0%	3.5	3
residential	650	40.0%	390.0	390
urban	53	50.0%	26.5	27
septic disposal	200	50.0%	100.0	100
air depo.	40	0.0%	40.0	40
Caltrans	153	41.1%	90	90
Unid'd/Future PS			33.0	33
Total NPS & PS loads	3055	40.0%	1832.8	1833
			Target WLA & Load Allocation	1833

2017

	current annual load	% Reduction	Annual load Allocation	Rounded
nurseries	507	61.4%	195.7	196
ag fields	655	61.4%	252.8	253
orchards	790	61.4%	304.9	305
park	7	50.0%	3.5	3
residential	650	60.0%	260	260
urban	53	50.0%	27	27
septic disposal	200	77.0%	46	46
air depo.	40	0.0%	40	40
Caltrans	153	61.4%	59	59
Unid'd/Future PS			33	33
Total NPS & PS loads	3055	60.0%	1221.5	1222
			Target WLA & Load Allocation	1222

Nitrogen Load Allocation Analysis

Final Target (1.0 mg/L) Load Reduction				
2021	current annual load	% Reduction	Annual load Allocation	Rounded
nurseries	507	77.0%	116.6	116
ag fields	655	77.0%	150.7	151
orchards	790	77.0%	181.7	182
park	7	50.0%	3.5	3
residential	650	77.0%	149.5	149
urban	53	50.0%	26.5	27
septic disposal	200	77.0%	46.0	46
air depo.	40	0.0%	40.0	40
Caltrans	153	68.0%	49	49
UnID'd/Future PS			33	33
Total NPS & PS loads	3055	74.0%	796.4	796
Background	779		Target WLA & Load Allocation	796
Total RC Load Estimate	3834			

Shading indicates that the load reduction is at its maximum reduction/allocation.

Rationale for Allocation Decisions for Final Target TMDLs

1. The Source's ability to generate a load. This is based on coefficients/deposition rates and the land area. See Tables 1 and 2 below.

2. Proximity of Land Uses with high phosphorus concentrations in the creek. Monitoring data (Table B-2, Figure 7-2) and land use map (Figure A-2) were used.

3. The concentrations are high for the most part throughout the watershed. All tributaries in the lower watershed, draining off of residential and orchard land uses are high. The high concentrations in the lower reaches are likely influenced by the tributaries. WG-4 is high in the winter and spring months. The sources above WG-4 are agricultural fields and Rainbow Valley. Rainbow Glen Tributary does not appear to be influencing RC. Jubilee has moderate concentrations (6 ppm) and appears to be influenced by the orchard immediately upstream of it and potentially the Conservation Camp and other uses in the upper watershed.

4. Ag, Orch, Nurs., and Res. - have highest potential to generate load based on (coefficients * area), and are identified as sources in high concentration areas.

5. Ag, Orch, Nurs. - fertilizer use and irrigation inherent to the type of business. However, it is feasible to exercise effective control over fertilizer and irrigation application and runoff.

6. Residential areas are expected to have landscaping, private orchards, and large animals (e.g., horses, llamas).

7. Urban: small in area with highest coefficient. Large reductions will show small returns. However, urban uses can feasibly take measures to better manage and reduce runoff from properties.

8. Air Deposition is very small and not easily controllable from within watershed.

9. Load from non-functioning septic tank disposal systems (representing 42% of all systems) are responsible for approx. half of the total load to groundwater from septic tank disposal systems. While only 200 kg/yr is estimated to get into the creek, they will continue to be sources to groundwater and therefore the creek. Reduction of load will be phased in over 3 phase-in period and the issue of non-functioning systems should be completely resolved by the end of the TMDL compliance.

10. Park (assume to be a maintained park): actions can be taken to reduce nutrients and over-irrigation and control runoff and erosion. Total reductions should be made at first compliance point because more than 4 years of phasing is unnecessary.

11. Urban and Caltrans load reductions are phased in over the first two phase periods.

12. A placeholder of 2% of the TMDL (1,658 kg N/yr) is in place for unidentified and future point sources.

13. Land designated as "Preserve" is undeveloped/open land.

Nitrogen Reduction Time Schedule			Final WLA + LA Target:	796 kg/yr
completion date	load (kg/yr)	Percent reduction		compliance time
current[1]	3055			
2009	2444	0.2	20 percent	4 years
2013	1833	0.4	20 percent	4 years
2017	1222	0.6	20 percent	4 years
2021	796	0.74	14 percent	4 years
				16 years

[1] Current load estimate of nonpoint and point sources in the watershed (exludes background).

Table 1 - Current TN Load Estimates

	rank (lo - hi)	original loads
park	1	7
urban	2	53
air depo.	3	40
septic	8	200
nurseries	4	507
residential	5	650
ag fields	6	655
orchards	7	790

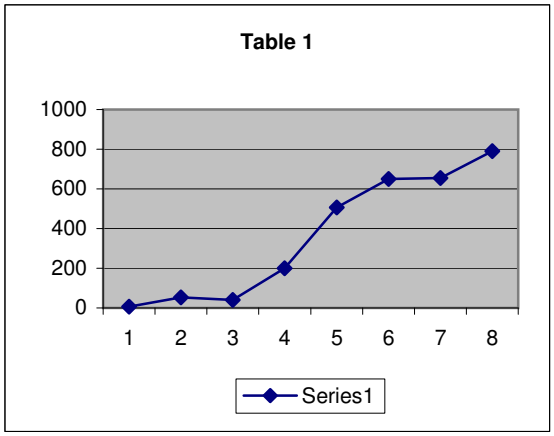

Table 2 - TN Land Use Coefficients

LU (hectares)	low to high	N coefficient
orchards (316)	1	2.5
residential (250)	2	2.6
park (2)	3	3.4
nurseries (137)	4	3.7
ag fields (177)	5	3.7
urban (14)	6	3.8

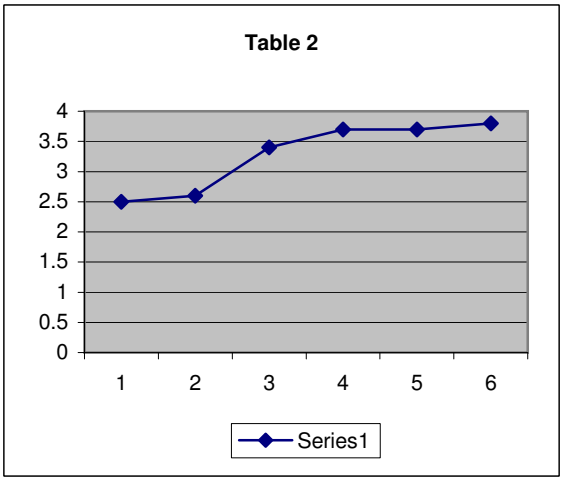

Phosphorus Load Reductions

2009

	current annual load	% Reduction	Annual load Allocation	Rounded
nurseries	27.4	21.0%	21.6	20
ag fields	35.4	21.0%	28.0	28
orchards	63.2	21.0%	49.9	50
park	0.2	25.0%	0.15	0.15
residential	125	21.0%	98.8	99
urban	11.2	24.5%	8.5	9
septic	0	0.0%	0	0
air depo.	2	0.0%	2.0	2
Caltrans	14	21.0%	11.1	11
UnID'd/Future PS			3.0	3
	278.4	20.0%	223.0	222.15
			Target WLA & Load Allocation	223

2013

	current annual load	% Reduction	Annual load Allocation	Rounded
nurseries	27.4	42.0%	15.9	16
ag fields	35.4	42.0%	20.5	21
orchards	63.2	42.0%	36.7	37
park	0.2	50.0%	0.1	0.1
residential	125	41.0%	73.8	74
urban	11.2	50.0%	5.6	6
septic	0	0.0%	0	0
air depo.	2	0.0%	2.0	2
Caltrans	14	42.0%	8.1	8
UnID'd/Future PS			3.0	3
	278.4	40.0%	165.7	167.1
			Target WLA & Load Allocation	167

2017

	current annual load	% Reduction	Annual load Allocation	Rounded
nurseries	27.4	62.0%	10.4	10
ag fields	35.4	62.0%	13.5	14
orchards	63.2	62.0%	24.0	24
park	0.2	50.0%	0.1	0.1
residential	125	62.0%	47.5	47
urban	11.2	50.0%	5.6	6
septic	0	0.0%	0	0
air depo.	2	0.0%	2.0	2
Caltrans	14	62.0%	5.3	5
UnID'd/Future PS			3.0	3
	278.4	60.0%	111.4	111.1
			Target WLA & Load Allocation	111

Phosphorus Load Allocations

Final Target (0.1 mg/L) Load Reduction				
2021	current annual load	% Reduction	Annual load Allocation	Rounded
nurseries	27.4	90.0%	2.7	3
ag fields	35.4	90.0%	3.5	4
orchards	63.2	90.0%	6.3	6
park	0.2	50.0%	0.1	0.1
residential	125	90.0%	12.5	12
urban	11.2	50.0%	5.6	6
septic	0	0.0%	0	0
air depo.	2	0.0%	2	2
Caltrans	14	64.0%	5	5
UnID'd/Future PS			3	3
Total NPS & PS loads	278.4	85.0%	40.8	41.1
Background	116		Target WLA & Load Allocation	41
	394			

Shading indicates that the load reduction is at its maximum reduction/allocation.

Rationale for Allocation Decisions for Final Target TMDLs

1. The Source's ability to generate a load. This is based on coefficients/deposition rates and the land area. See Tables 3 and 4 below.

2. Proximity of Land Uses with high phosphorus concentrations in the creek. Monitoring data (Table B-2, Figure 7-2) and land use map (Figure A-2) were used.

3. The concentrations are highest in Rainbow Valley and decrease as one goes downstream indicating that land uses in the valley are primary sources. The tributaries are predominantly non-detect results with some positive results ranging from 0.06 - 0.38 mg/L. The elevated, positive results in WGT1, VMT1, and MGT1 indicate that the surrounding land uses are sources. It also indicates that sediment erosion and overland surface runoff are important factors in linking these sources to the creek.

4. Residential - has highest potential to generate load, followed by Ag, Orchards, & Nursuries based on load (coefficients * area). These land uses are also indicated based on monitoring data.

5. Residential areas are expected to have landscaping, private orchards, and large animals (e.g., horses, llamas).

6. Ag, Orch, Nurs. - fertilizer use and irrigation are inherent to the type of business. However, it should be feasible to exercise effective control over fertilizer and irrigation application and runoff.

7. Urban - is small in area with the highest coefficient. Large reductions will show small returns. However, urban uses can feasibly take measures to better manage and reduce runoff from properties.

8. Air Deposition is very small and not easily controllable from within watershed. No reductions are expected.

9. Septic tank disposal systems are assumed to not contribute P to creek.

10. Park - actions can be taken to reduce fertilizer use and over-irrigation of landscape, and to control runoff and erosion. Total reductions should be made at first compliance point because more than 4 years of phasing is unnecessary.

11. Urban and Caltrans are phased over the first two phase periods.

12. A placeholder of 2% of the TMDL (165 kg P/yr) is in place for unidentified and future point sources.

13. Land designated as "Preserve" is undeveloped/open land and is part of background.

Phosphorus Reduction Time Schedule		Final WLA + LA Target:		41 kg/yr
completion date	load (kg/yr)	Percent reduction		compliance time
current[1]	278.4			
2009	223	0.2	20 percent	4 years
2013	167	0.4	20 percent	4 years
2017	111	0.6	20 percent	4 years
2021	41	0.85	25 percent	4 years
				16 years

[1] Current load estimate of nonpoint and point sources in the watershed (exludes background).

Table 3 Current TP Load Estimates*

	rank (lo - hi)	original loads
park	1	0.2
air dep.	2	3
urban	3	11.2
nurseries	4	27.4
ag fields	5	35.4
orchards	6	63.2
res.	7	125

* calculated by multiplying area and coefficient.

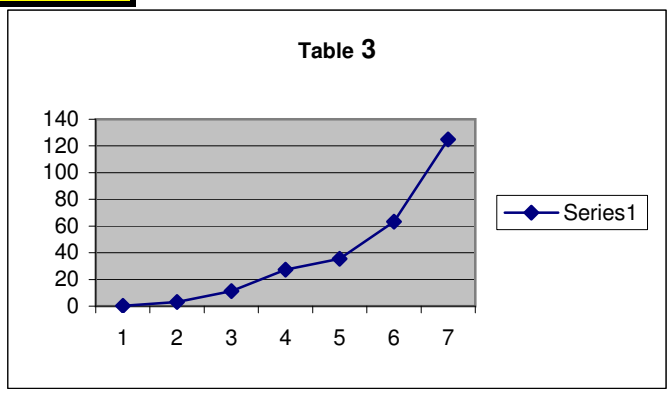

Table 4 - TP Land Use Coefficients

LU (hectares)	rank (lo - hi)	N coefficient
park (2)	1	0.1
nurseries (137)	2	0.2
ag fields (177)	3	0.2
orchards (316)	4	0.2
residential (250)	5	0.5
urban (14)	6	0.8

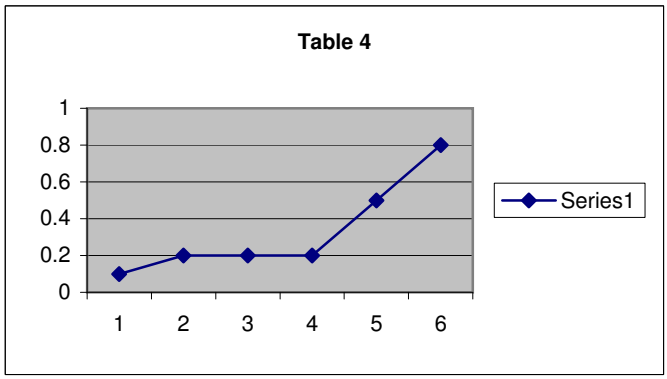

Appendix G – Environmental Checklist and Certificate of Fee Exemption

Basin Plan Amendment for
Total Nitrogen and Total Phosphorus
Total Maximum Daily Loads

For Rainbow Creek

Environmental Checklist and Certificate of Fee Exemption

Resolution No. R9-2005-0036
Basin Plan Amendment and Technical Report

January 27, 2005

California Environmental Quality Act (CEQA) Requirements

The attached checklist and the "Technical Report for Total Nitrogen and Total Phosphorus TMDLs for Rainbow Creek" fulfill the requirements specified under section 3777 [California Code of Regulations, Title 23].

The adoption of a Basin Plan amendment to incorporate TMDLs and a TMDL implementation plan for Rainbow Creek will not in itself have a significant adverse effect on the environment. A significant effect on the environment is defined under CEQA as a substantial, or potentially substantial, adverse change in the environment (Public Resources Code §21000 et seq.). The implementation of TMDLs will in effect lead to an overall improvement in the quality of water and therefore the quality of the environment. However, implementation of the TMDLs will involve projects, which may have environmental impacts. The precise nature, location, and significance of these impacts cannot be determined at this time, since the implementation program establishes a process for identifying subsequent projects rather than specifying particular remedial projects at specific locations. Separate environmental review and mitigation may be required for such implementation projects depending on the projects that are selected. Therefore, impacts from such projects are considered indirect to this action. Possible implementation projects are discussed in general for the purpose of providing insight to the potential effects that may result from TMDL implementation.

I. Aesthetics – Would the proposal:	**Impact**	**Maybe**	**No Impact**
a. Adversely affect a scenic vista?			X
b. Adversely affect a scenic highway, including but not limited to trees, rock outcroppings, and historic buildings?			X
c. Substantially degrade the existing visual character or quality of the site and its surroundings?		X	
d. Create a new source of substantial light or glare?			X

Comment: There may be a potential for the installation of structural or vegetative best management practices (BMPs) or management practices (MPs) that may change views in the watershed from the local community. However, it is not expected that such changes will be significantly adverse. For example, stabilization of eroding areas or increases in riparian vegetation (e.g., riparian restoration such as the creation of a buffer zone in Rainbow Valley) would be an aesthetic improvement.

II. Agricultural Resources – Would the proposal:	**Impact**	**Maybe**	**No Impact**
a. Convert Prime Farmland, unique farmland, or farmland of statewide importance (farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?		X	
b. Conflict with existing zoning for agricultural use, or a Williamson Act contract?			X
c. Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?			X

Comment: This TMDL Basin Plan amendment will make necessary the changing of residents/businesses behavior or operation and possibly the expenditure for the installation and maintenance of BMPs or MPs. Since the precise nature, location, and significance of these impacts cannot be determined at this time, it is unknown whether the needed changes or expenditure will lead to the conversion of farmland to non agricultural uses. The current prohibition on installation of new septic tank systems in Rainbow Valley and the lack of a sewage collection system in the area to accommodate new housing developments may prevent agricultural lands from being converted to other non agricultural uses, such as housing. However, if the septic issues in Rainbow Valley are resolved, for instance by placing residents and businesses on a sewer system, there could be a potential for increased development and conversion of nursery lands to residential. Potential solutions to septic tank contributions are pending further investigation, as required by this proposed action, and will likely be subject to more in-depth environmental review at that time.

Information provided by the Mission Resource Conservation District indicated that costs associated with water, pumping, and pests are more significant than costs for implementation of TMDLs. For example, reduction in fertilizers and better irrigation management would provide cost savings. Additionally, the UC Cooperative Extension provides farmers with alternatives to selling their property.

III. Air Quality – Would the proposal:	**Impact**	**Maybe**	**No Impact**
a. Conflict with or obstruct implementation of the applicable air quality plan?			X
b. Violate any air quality standard or contribute to an existing or protected air quality violation?			X
c. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions, which exceed quantitative thresholds for ozone precursors)?			X
d. Expose sensitive receptors to substantial pollutant concentrations?			X
e. Create objectionable odors affecting a substantial number of people?			X

Comment: It is not expected at this time that any projects arising from TMDL implementation will involve air emissions, thereby affecting air quality.

IV. Biological Resources – Would the proposal result in:	**Impact**	**Maybe**	**No Impact**
a. Adversely affect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?		X	
b. Adversely affect any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?		X	
c. Adversely affect federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?			X
d. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?			X
e. Conflict with local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?			X
f. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional or state habitat conservation plan?			X

Comment: The California Department of Fish and Game has identified the arroyo chub (*Gila orcutti*) as a species of special concern. Implementation of BMPs / MPs and/or changes in irrigation practices to reduce/control wet and dry season overland surface runoff may reduce flows in the creek, which may impact aquatic and terrestrial life. In regard to the arroyo chub, reduced flows are expected to be beneficial, as they are adapted to survive in slow-moving water with warm temperature fluctuations (Moyle 1976).

Installation of BMPs / MPs or stream restoration activities, which may result from this proposal, may temporarily disturb aquatic or terrestrial habitat. However, the overall purpose of the TMDL is to provide for long-term improvements in water quality and aquatic habitat. To the extent that they may increase amounts of riparian vegetation in the watershed, nonpoint source controls are expected to be beneficial to wildlife. Additionally, TMDL implementation may modify riparian habitat that could support Least Bell's Vireo (*Vireo bellii pusillus*) – a federally listed species.

V. Cultural Resources – Would the proposal:	**Impact**	**Maybe**	**No Impact**
a. Cause a substantial adverse change in the significance of a historical resource as defined in § 15064.5?			X
b. Cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5?			X
c. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?			X
d. Disturb any human remains, including those interred outside of formal cemeteries?			X

Comment: Significant excavation or disturbance of cultural resources is not expected to result from this proposal or from projects that result from this proposal.

VI. Geology and Soils – Would the proposal:	**Impact**	**Maybe**	**No Impact**
a. Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving fault rupture, strong seismic ground shaking, seismic-related ground failure (e.g. liquefaction), and landslides?			X
b. Result in substantial soil erosion or the loss of topsoil?			X
c. Be located on a geologic unit or soil that is unstable or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?			X
d. Be located on expansive soil, as defined in Table 19-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?			X
e. Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?			X

Comment: The implementation of BMPs / MPs to reduce wet and dry season overland surface runoff would be expected to reduce the potential for soil erosion. Additionally this proposal identifies the need for further investigation to determine if existing septic tanks are contributing to the impairment of Rainbow Creek and if alternative wastewater disposal systems or a sewer system is needed to replace any septic tanks.

VII. Hazards and Hazardous Materials – Would the proposal:	**Impact**	**Maybe**	**No Impact**
a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?			X
b. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?			X
c. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?			X
d. Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?			X
e. For a project located within an airport land use plan or where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?			X
f. For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?			X
g. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?			X
h. Expose people or structures to a significant risk of loss, injury or death involving wildlands fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?			X

VIII. Hydrology and Water Quality – Would the proposal:	**Impact**	**Maybe**	**No Impact**
a. Violate any water quality standards or waste discharge requirements?			X
b. Substantially deplete ground water supplies or interfere substantially with ground water recharge such that there would be a net deficit in aquifer volume or a lowering of the local ground water table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?		X	
c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?		X	
d. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner, which would result in flooding on- or off-site?			X
e. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?			X
f. Otherwise substantially degrade water quality?			X
g. Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?			X
h. Place within a 100-year flood hazard area, structures that would impede or redirect flood flows?		X	
i. Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?			X
j. Inundation by seiche, tsunami, or mudflow?			X

Comment: The purpose of the TMDL Basin Plan amendment is to provide for attainment of water quality standards and restoration of beneficial uses. This proposal identifies the need for further investigation to determine ground water management needs in Rainbow Valley to address septic tank issues and the issue of ground water as a source to the surface waters of Rainbow Creek. One possibility is to utilize ground water resources and draw down the high ground water table in order to minimize septic system source contributions by alleviating ground water interference with septic systems and to possibly reduce contaminated ground water contribution from Rainbow Valley basin to the creek. This option could affect the local hydrology and present water quantity issues. Further environmental review would be needed before this option could be selected.

Existing drainage will need to be altered to remove structures, which discharge to the creek and cause the damming of the creek for the purpose of irrigation return flows capture and storage at the Hines Nursery facility. Removal of these structures would restore the natural drainage and would be a beneficial impact.

There may be a potential for the installation of structural or vegetative best management practices (BMPs) / management practices (MPs) that may be located within a 100-year flood hazard area and may impede or redirect flood flows. The precise location and significance of these impacts cannot be determined at this time. Specific structural BMPs and MPs should be evaluated for site-specific environmental impacts prior to installation.

IX. Land Use and Planning – Would the proposal:	Impact	Maybe	No Impact
a. Physically divide an established community?			X
b. Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?			X
c. Conflict with any applicable habitat conservation plan or natural community conservation plan?			X

Comment: The purpose of the TMDL Basin Plan amendment is to provide for long-term improvements in water quality and aquatic habitat. To the extent that they increase amounts of riparian vegetation in the watershed, nonpoint source controls will be beneficial to wildlife.

X. Mineral Resources – Would the proposal:	Impact	Maybe	No Impact
a. Result in the loss of availability of a known mineral resource that would be a value to the region and the residents of the state?			X
b. Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?			X

XI. Noise – Would the proposal:	Impact	Maybe	No Impact
a. Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?			X
b. Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?		X	
c. A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?			X
d. A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?			X
e. For projects located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?			X
f. For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?			X

Comment: Although this TMDL Basin Plan amendment does not identify the use of specific BMPs / MPs, the construction/installation of structural BMPs / MPs may cause a temporary increase in ambient noise levels in the vicinity of the activity. The ground water investigation may involve activities, such as the installation or testing of monitoring wells, may also cause a temporary increase in ambient noise levels in the vicinity of the activity. Neither of which is expected to be substantial in nature.

XII. Population and Housing – Would the proposal:	**Impact**	**Maybe**	**No Impact**
a. Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, thorough extension of roads or other infrastructure)?		X	
b. Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?		X	
c. Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?		X	

Comment: This TMDL Basin Plan amendment identifies the need for further investigation to determine if existing septic tanks are contributing to the impairment of Rainbow Creek and if alternative wastewater disposal systems, a sewer system, or ground water production could be used to decrease septic tanks as nutrient sources. The result of this investigation may identify these or additional actions that could be used to remedy the problem of inundation of septic tanks and leach lines with ground water. Resolution of this issue may result in an increase or a decrease in the allowable housing currently in existence in Rainbow Valley depending on the actions that are taken. Such actions would require separate environmental review.

XIII. Public Services –	**Impact**	**Maybe**	**No Impact**
Will the proposal have an effect upon, or result in a need for new or altered governmental services in any of the following areas:			
a. Fire protection?			X
b. Police protection?			X
c. Schools?			X
d. Parks or other recreational facilities?			X
e. Maintenance of public facilities, including roads?		X	
f. Other governmental services?		X	

Comment: Although this TMDL Basin Plan amendment does not identify the use of specific BMPs / MPs , should structural or vegetative BMPs / MPs need to be installed and maintained on public lands or easements, local government services could be impacted. Additionally, local government will need to expend resources to perform the investigation of ground water and septic tank issues, and to develop and implement a watershed management plan. Since the purpose of the TMDLs is to provide for attainment of water quality standards and restoration of beneficial uses, such expenditure of resources could be considered to be for the public good.

XIV. Recreation – Would the proposal:	**Impact**	**Maybe**	**No Impact**
a. Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?		X	
b. Does the project include recreational facilities or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment?			X

Comment: The purpose of the TMDL Basin Plan amendment is to provide for attainment of water quality standards and restoration of beneficial uses, including contact and non-contact recreation. Such improvements in water quality may cause an increase in the number of people who recreate along the creek because the creek will become more aesthetically pleasing. The area is more commonly used by the local community and is not expected to draw large numbers of the general public or require expansion of existing trails. Additional maintenance of the trails may be needed.

XV. Transportation/Traffic – Would the proposal:	**Impact**	**Maybe**	**No Impact**
a. Cause an increase in traffic, which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?			X
b. Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?			X
c. Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?			X
d. Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?			X
e. Result in inadequate emergency access?			X
f. Result in inadequate parking capacity?			X
g. Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?			X

XVI. Utilities and Service Systems – Would the proposal:	**Impact**	**Maybe**	**No Impact**
a. Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?			X
b. Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?		X	
c. Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?		X	
d. Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?			X
e. Result in a determination by the wastewater treatment provider, which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?			X
f. Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?			X
g. Comply with federal, state, and local statutes and regulations related to solid waste?			X

Comment: This TMDL Basin Plan amendment identifies the need for further investigation to determine if existing septic tanks are contributing to the impairment of Rainbow Creek and if alternative wastewater disposal systems or a sewer system is needed. The result of this investigation may necessitate that further action is necessary to remedy further inundation of septic tanks with ground water, to ultimately achieve water quality objectives in the surface waters. Additionally, the County of San Diego is expected to evaluate the need for stormwater control of urban and residential areas during the development of the watershed management plan. These evaluations may potentially result in new water or wastewater facilities, or new stormwater conveyance depending on the actions that are needed. Such actions would require separate environmental review.

XVII. Mandatory Findings of Significance – Would the proposal:	Impact	Maybe	No Impact
a. Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?			X
b. Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?			X
c. Does the project have environmental effects, which will cause substantial adverse effects on human beings, either directly or indirectly?		X	

Comment: The purpose of the TMDL Basin Plan amendment is to provide for attainment of water quality standards and restoration of beneficial uses. Residents of the watershed will be impacted in that they will have to take actions to reduce their nutrient contributions to Rainbow Creek. However, they will benefit as a result of improved quality of the environment that will come from restoration of beneficial uses.

Determination: On the basis of this initial evaluation,

☒ I find that the Proposed Project COULD NOT have a significant effect on the environment

☐ I find that although the Proposed Project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the Project have been made by or agreed to by the Project proponent

☐ I find that the Proposed Project MAY have a significant effect on the environment.

☐ I find that the Proposed Project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect: (1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and (2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the Proposed Project could have a significant effect on the environment because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the Proposed Project, nothing further is required.

for John H. Robertus
Executive Officer

1/27/05
Date

CALIFORNIA DEPARTMENT OF FISH AND GAME
CERTIFICATE OF FEE EXEMPTION

De Minimis Impact Finding

Project Title/Location Name and Address of Project Proponent:

AMENDMENT TO THE 'WATER QUALITY CONTROL PLAN FOR THE SAN DIEGO REGION (9)' TO INCORPORATE TOTAL MAXIMUM DAILY LOADS (TMDLs) FOR TOTAL NITROGEN AND TOTAL PHOSPHORUS AND A TMDL IMPLEMENTATION ACTION PLAN AND AN IMPLMENTATION MONITORING PLAN FOR THE RAINBOW CREEK WATERSHED, SAN DIEGO COUNTY

The project proponent is:
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

The contact person is:
Lisa Honma
(858) 467-2960
Lhonma@waterboards.ca.gov

Project Description:

Total Maximum Daily Loads (TMDLs) for nitrogen and phosphorus are described and quantified to attain water quality objectives and restore beneficial uses in Rainbow Creek. A wasteload allocation is assigned to a point source discharger (Caltrans) and load allocations are assigned to nonpoint source dischargers (commercial nursery, agricultural field, orchard, park, residential area, urban area, and septic tank disposal system land use activities) to reduce nutrient loading to Rainbow Creek.

Caltrans is a point source discharger of nutrients and will be responsible for meeting nutrient wasteload reductions to be incorporated in the MS4 NPDES Storm Water Permit. For nutrient discharges in the Rainbow Creek watershed subject to the County of San Diego's MS4 NPDES Storm Water Permit, the County is directed to implement increasingly stringent best management practices to reduce nutrients discharges in the Rainbow Creek watershed to the maximum extent practicable and restore compliance with the nutrient water quality objective.

The Regional Board will use a Third Party regulatory-based approach to mandate compliance with the nonpoint source (NPS) nutrient load reductions of this TMDL. The Regional Board will accomplish this by negotiating a Management Agency Agreement (MAA) between the Regional Board and the County of San Diego setting forth the commitments of both parties to undertake

various implementation responsibilities to oversee actions by dischargers to attain NPS nutrient load reductions.

The Regional Board may adopt, in conjunction with an MAA or MOU with another third-party representative, organization, or government agency describing an adequate NPS pollution control implementation program, individual or general waivers and WDRs for NPS discharges in the Rainbow Creek watershed. The waivers and WDRs may require NPS dischargers to either participate in the third party NPS program or, alternatively, submit individual pollution prevention plans that detail how they will comply with the waivers and WDRs. The Regional Board may also adopt a discharge prohibition, which include exceptions for those discharges that are adequately addressed in an acceptable third-party MAA or MOU NPS pollution control implementation program.

The County of San Diego and Caltrans are directed to develop a Rainbow Creek watershed monitoring program to evaluate the overall TMDL implementation effectiveness and success in attaining nutrient water quality objectives in Rainbow Creek and its tributaries.

Findings of Exemption:

1. A written report and environmental checklist have been prepared by the California Regional Water Quality Control Board, San Diego Region (SDRWQCB) in order to evaluate the potential for an adverse environmental impact from this project.

2. Considering the record as a whole, there is no evidence before the SDRWQCB that the proposed project could have any potential for an adverse effect on fish and wildlife resources or the habitat upon which they depend.

3. The CEQA Checklist documents that there may be changes to components of the environment as a result of this project. The SDRWQCB rebuts the presumption that the proposed project will have an adverse effect on the environment for each situation that may be impacted. As determined in SDRWQCB Resolution No. 2005-0036 and CEQA Checklist (copies attached), there will be no significant adverse effects on the environment, and, therefore, no mitigation is necessary. Any and all effects on the environment are expected to be beneficial.

Certification:

I hereby certify that the California Regional Water Quality Control Board, San Diego Region, has made the above findings of fact and that based upon the Environmental Checklist, written report and hearing record the project will not individually or cumulatively have an adverse effect on wildlife resources, as defined in Section 711.2 of the Fish and Game Code.

John H. Robertus

John H. Robertus
Executive Officer
San Diego Regional Water Quality Control Board

22 February 2005
Date

Appendix H – Economic Consideration Tables

ESTIMATED COSTS FOR IMPLEMENTING MPs / BMPs

divided into eight sections, one for each of the following land use categories: commercial nurseries, agriculture, orchards, parks, residential, urban, septic tank disposal systems, and Caltrans.

For each land use category, three scenarios were evaluated, corresponding to low, medium, and high levels of effort. Within each scenario a low to high range of costs are presented. The MPs / BMPs considered fall into 3 general categories: Nutrient Management, Irrigation Management, and Runoff/Erosion Management. A low level of effort consists solely of Nutrient Management MPs / BMPs, a medium level of effort consists of Nutrient and Irrigation Management MPs / BMPs, and a high level of effort includes all three MP / BMP categories. Caltrans is the exception because Irrigation Management BMPs are less likely along the Interstate 15 corridor than Nutrient and Runoff/Erosion Control Management.

The capital costs are the initial costs of implementing a MP / BMP, assuming that the MP / BMP does not currently exist on the property. Therefore the actual costs may be lower depending upon the level of existing MPs / BMPs. The annual operation and maintenance costs are assumed to be 10 percent of the capital cost.

While the table implies that Nutrient Management MPs / BMPs will be implemented before Irrigation and Runoff/Erosion Control Management MPs / BMPs, this is done solely for developing a range of costs. The most appropriate and cost effective MPs / BMPs will vary for each land user/owner based on their operations and existing improvements. MPs / BMPs are typically most effective when a combination of Nutrient, Irrigation, and Runoff/Erosion Control Management MPs / BMPs are considered. Moreover, it is also possible that MPs / BMPs not presented herein would be identified and implemented.

Appendix H
Cost Estimates For Implementing Best Management Practices (BMPs)

Table H-1. Commercial Nurseries

LAND USE CATEGORY	BMP LEVEL OF EFFORT	POTENTIAL MPs / BMPs	Nutrient Management Effectiveness (percent)	Water Management Effectiveness (percent)	Components				Capital Costs		Annual Operation and Maintenance	
COMMERCIAL NURSERIES 339 Acres	LOW				Unit	Number of Units	Cost per unit (low)	Cost per unit (high)	Low	High	Low	High
		Nutrient Management										
		Facility nutrient reduction management plan			each	1	$ -	$ 10,000	$ -	$ 10,000		
		Soil nutrient analysis 1			each	3	$ 7	$ 25	$ 21	$ 75		
		Irrigation water analysis2			each	1	$ 5	$ 30	$ 5	$ 30		
		Subtotal							$ 26	$ 10,105		
		Irrigation Management										
		None										
		Runoff/Erosion Management										
		None										
								TOTAL	**$ 26**	**$ 10,105**	**$ 3**	**$ 1,011**

LAND USE CATEGORY	BMP LEVEL OF EFFORT	POTENTIAL MPs / BMPs							Capital Costs		Annual Operation and Maintenance	
COMMERCIAL NURSERIES 339 Acres	MEDIUM				Unit	Number of Units	Cost per unit (low)	Cost per unit (high)	Low	High	Low	High
		Nutrient Management										
		Facility nutrient reduction management plan			each	1	$ -	$ 10,000	$ -	$ 10,000		
		Soil nutrient analysis [1]			each	3	$ 7	$ 25	$ 21	$ 75		
		Irrigation water analysis[2]			each	1	$ 5	$ 30	$ 5	$ 30		
		Subtotal							$ 26	$ 10,105		
		Irrigation Management										
		Irrigation system upgrades (441, 442)[3 4 5]	5-35	40-85	each	1	$ 350	$ 3,600	$ 350	$ 3,600		
		Irrigation system - tailwater recovery (447)[3 5]	5-15	40-45	each	1	$ 4,500	$ 25,000	$ 4,500	$ 25,000		
		Irrigation water management (449)[3 5]	20-35	45-60	each	1	$ 50	$ 750	$ 50	$ 750		
		Subtotal							$ 4,900	$ 29,350		
		Runoff/Erosion Management										
		None										
								TOTAL	**$ 4,926**	**$ 39,455**	**$ 493**	**$ 3,946**

LAND USE CATEGORY	BMP LEVEL OF EFFORT	POTENTIAL MPs / BMPs							Capital Costs		Annual Operation and Maintenance	
COMMERCIAL NURSERIES 339 Acres	HIGH				Unit	Number of Units	Cost per unit (low)	Cost per unit (high)	Low	High	Low	High
		Nutrient Management										
		Facility nutrient reduction management plan			each	1	$ -	$ 10,000	$ -	$ 10,000		
		Soil nutrient analysis [1]			each	3	$ 7	$ 25	$ 21	$ 75		
		Irrigation water analysis[2]			each	1	$ 5	$ 30	$ 5	$ 30		
		Subtotal							$ 26	$ 10,105		
		Irrigation Management										
		Irrigation system upgrades (441, 442)[3 4 5]	5-35	40-85	each	1	$ 350	$ 3,600	$ 350	$ 3,600		
		Irrigation system - tailwater recovery (447)[3 5]	5-15	40-45	each	1	$ 4,500	$ 25,000	$ 4,500	$ 25,000		
		Irrigation water management (449)[3 5]	20-35	45-60	each	1	$ 50	$ 750	$ 50	$ 750		
		Subtotal							$ 4,550	$ 25,750		
		Runoff/Erosion Management										
		Access road management (560)[3 5]										
		Paved Drives		55-60	square yard	480	$ 2	$ 4	$ 816	$ 1,920		
		Runoff management system (570)[3 5]							$ -	$ -		
		Filter Trap	10-25		acre	0.25	$ 375	$ 12,500	$ 94	$ 3,125		
		Filter Strips (393)[3 5]							$ -	$ -		
		Landscaping		5-15	acre	0.05	$ 450	$ 3,500	$ 23	$ 175		
		Subtotal							$ 932	$ 5,220		
								TOTAL	**$ 5,508**	**$ 41,075**	**$ 551**	**$ 4,108**

Appendix H
Cost Estimates For Implementing Best Management Practices (BMPs)

Table H-2. Agriculture

LAND USE CATEGORY	BMP LEVEL OF EFFORT	POTENTIAL MPs / BMPs	Nutrient Management Effectiveness (percent)	Water Management Effectiveness (percent)	Components				Capital Costs		Annual Operation and Maintenance	
AGRICULTURE					Unit	Number of Units	Cost per unit (low)	Cost per unit (high)	Low	High	Low	High
436 Acres	LOW	**Nutrient Management**										
		Facility nutrient reduction management plan			each	1	$ -	$ 10,000	$ -	$ 10,000		
		Soil nutrient analysis 1			each	3	$ 7	$ 25	$ 21	$ 75		
		Irrigation water analysis2			each	1	$ 5	$ 30	$ 5	$ 30		
		Subtotal							$ 26	$ 10,105		
		Irrigation Management										
		None										
		Runoff/Erosion Management										
		None										
								TOTAL	**$ 26**	**$ 10,105**	**$ 3**	**$ 1,011**

LAND USE CATEGORY	BMP LEVEL OF EFFORT	POTENTIAL MPs / BMPs							Capital Costs		Annual Operation and Maintenance	
AGRICULTURE					Unit	Number of Units	Cost per unit (low)	Cost per unit (high)	Low	High	Low	High
436 Acres	MEDIUM	**Nutrient Management**										
		Facility nutrient reduction management plan			each	1	$ -	$ 10,000	$ -	$ 10,000		
		Soil nutrient analysis [1]			each	3	$ 7	$ 25	$ 21	$ 75		
		Irrigation water analysis[2]			each	1	$ 5	$ 30	$ 5	$ 30		
		Subtotal							$ 26	$ 10,105		
		Irrigation Management										
		Irrigation system upgrades (441, 442)[3 4 5]	5-35	40-85	each	1	$ 350	$ 3,600	$ 350	$ 3,600		
		Irrigation system - tailwater recovery (447)[3 5]	5-15	40-45	each	1	$ 4,500	$ 25,000	$ 4,500	$ 25,000		
		Irrigation water management (449)[3 5]	20-35	45-60	each	1	$ 50	$ 750	$ 50	$ 750		
		Subtotal							$ 4,900	$ 29,350		
		Runoff/Erosion Management										
		None										
								TOTAL	**$ 4,926**	**$ 39,455**	**$ 493**	**$ 3,946**

LAND USE CATEGORY	BMP LEVEL OF EFFORT	POTENTIAL MPs / BMPs							Capital Costs		Annual Operation and Maintenance	
AGRICULTURE					Unit	Number of Units	Cost per unit (low)	Cost per unit (high)	Low	High	Low	High
436 Acres	HIGH	**Nutrient Management**										
		Facility nutrient reduction management plan			each	1	$ -	$ 10,000	$ -	$ 10,000		
		Soil nutrient analysis [1]			each	3	$ 7	$ 25	$ 21	$ 75		
		Irrigation water analysis[2]			each	1	$ 5	$ 30	$ 5	$ 30		
		Subtotal							$ 26	$ 10,105		
		Irrigation Management										
		Irrigation system upgrades (441, 442)[3 4 5]	5-35	40-85	each	1	$ 350	$ 3,600	$ 350	$ 3,600		
		Irrigation system - tailwater recovery (447)[3 5]	5-15	40-45	each	1	$ 4,500	$ 25,000	$ 4,500	$ 25,000		
		Irrigation water management (449)[3 5]	20-35	45-60	each	1	$ 50	$ 750	$ 50	$ 750		
		Subtotal							$ 4,900	$ 29,350		
		Runoff/Erosion Management										
		Access road management (560)[3 5]										
		Pave Roads		85-90	square yard	1000	$ 2	$ 4	$ 2,150	$ 4,300		
		Pave Drives		55-60	square yard	1000	$ 2	$ 4	$ 1,700	$ 4,000		
		Runoff management system (570)[3 5]										
		Filter Trap	10-25		acre	0.2	$ 375	$ 12,500	$ 75	$ 2,500		
		Filter Strips (393)[5]										
		Filter strip (10-20 ft wide)	2-10		acre	0.5	$ 375	$ 12,500	$ 188	$ 6,250		
		Buffer strip (20-30 ft wide)	10-20		acre	0.5	$ 425	$ 1,700	$ 213	$ 850		
		Landscaping	5-15		acre	0.1	$ 450	$ 3,500	$ 45	$ 350		
		Subtotal							$ 4,370	$ 18,250		
								TOTAL	**$ 9,296**	**$ 57,705**	**$ 930**	**$ 5,771**

Appendix H
Cost Estimates For Implementing Best Management Practices (BMPs)

Table H-3. Orchards

LAND USE CATEGORY	BMP LEVEL OF EFFORT	POTENTIAL MPs / BMPs	Nutrient Management Effectiveness (percent)	Water Management Effectiveness (percent)	Components				Capital Costs		Annual Operation and Maintenance	
ORCHARDS					Unit	Number of Units	Cost per unit (low)	Cost per unit (high)	Low	High	Low	High
781 Acres	LOW	**Nutrient Management**										
		Facility nutrient reduction management plan			each	1	$ -	$ 10,000	$ -	$ 10,000		
		Soil nutrient analysis 1			each	3	$ 7	$ 25	$ 21	$ 75		
		Irrigation water analysis2			each	1	$ 5	$ 30	$ 5	$ 30		
		Subtotal							$ 26	$ 10,105		
		Irrigation Management										
		None										
		Runoff/Erosion Management										
		None										
								TOTAL	**$ 26**	**$ 10,105**	**$ 3**	**$ 1,011**

LAND USE CATEGORY	BMP LEVEL OF EFFORT	POTENTIAL MPs / BMPs							Capital Costs		Annual Operation and Maintenance	
ORCHARDS					Unit	Number of Units	Cost per unit (low)	Cost per unit (high)	Low	High	Low	High
781 Acres	MEDIUM	**Nutrient Management**										
		Facility nutrient reduction management plan			each	1	$ -	$ 10,000	$ -	$ 10,000		
		Soil nutrient analysis [1]			each	3	$ 7	$ 25	$ 21	$ 75		
		Irrigation water analysis[2]			each	1	$ 5	$ 30	$ 5	$ 30		
		Subtotal							$ 26	$ 10,105		
		Irrigation Management										
		Irrigation system upgrades (441, 442)[3 4 5]	5-35	40-85	each	1	$ 350	$ 3,600	$ 350	$ 3,600		
		Irrigation system - tailwater recovery (447)[3 5]	5-15	40-45	each	1	$ 4,500	$ 25,000	$ 4,500	$ 25,000		
		Irrigation water management (449)[3 5]	20-35	45-60	each	1	$ 50	$ 750	$ 50	$ 750		
		Subtotal							$ 4,900	$ 29,350		
		Runoff/Erosion Management										
		None										
								TOTAL	**$ 4,926**	**$ 39,455**	**$ 493**	**$ 3,946**

LAND USE CATEGORY	BMP LEVEL OF EFFORT	POTENTIAL MPs / BMPs							Capital Costs		Annual Operation and Maintenance	
ORCHARDS					Unit	Number of Units	Cost per unit (low)	Cost per unit (high)	Low	High	Low	High
781 Acres	HIGH	**Nutrient Management**										
		Facility nutrient reduction management plan			each	1	$ -	$ 10,000	$ -	$ 10,000		
		Soil nutrient analysis [1]			each	3	$ 7	$ 25	$ 21	$ 75		
		Irrigation water analysis[2]			each	1	$ 5	$ 30	$ 5	$ 30		
		Subtotal							$ 26	$ 10,105		
		Irrigation Management										
		Irrigation system upgrades (441, 442)[3 4 5]	5-35	40-85	each	1	$ 350	$ 3,600	$ 350	$ 3,600		
		Irrigation system - tailwater recovery (447)[3 5]	5-15	40-45	each	1	$ 4,500	$ 25,000	$ 4,500	$ 25,000		
		Irrigation water management (449)[3 5]	20-35	45-60	each	1	$ 50	$ 750	$ 50	$ 750		
		Subtotal							$ 4,900	$ 29,350		
		Runoff/Erosion Management										
		Access road management (560)[3 5]								$ -		
		Pave roads		85-90	square yard	1000	$ 2	$ 4	$ 2,150	$ 4,300		
		Pave drives		55-60	square yard	1000	$ 2	$ 4	$ 1,700	$ 4,000		
		Runoff management system (570)[3 5]								$ -		
		Filter trap	10-25		acre	0.2	$ 375	$ 12,500	$ 75	$ 2,500		
		Filter Strips (393)[5]							$ -	$ -		
		Filter strip (10-20 ft wide)	2-10		acre	0.5	$ 375	$ 12,500	$ 188	$ 6,250		
		Buffer strip (20-30 ft wide)	10-20		acre	0.5	$ 425	$ 1,700	$ 213	$ 850		
		Landscaping	5-15		acre	0.1	$ 450	$ 3,500	$ 45	$ 350		
		Subtotal							$ 4,370	$ 18,250		
								TOTAL	**$ 9,296**	**$ 57,705**	**$ 930**	**$ 5,771**

Appendix H
Cost Estimates For Implementing Best Management Practices (BMPs)

Table H-4. Parks

LAND USE CATEGORY	BMP LEVEL OF EFFORT	POTENTIAL MPs / BMPs	Nutrient Management Effectiveness (percent)	Water Management Effectiveness (percent)	Components				Capital Costs		Annual Operation and Maintenance	
PARKS					Unit	Number of Units	Cost per unit (low)	Cost per unit (high)	Low	High	Low	High
5 Acres	LOW	**Nutrient Management**										
		Facility nutrient reduction management plan			each	0	$ -	$ -	$ -	$ -		
		Subtotal							$ -	$ -	$ -	$ -
		Irrigation Management										
		None										
		Runoff/Erosion Management										
		None										
								TOTAL	**$ -**	**$ -**	**$ -**	**$ -**

LAND USE CATEGORY	BMP LEVEL OF EFFORT	POTENTIAL MPs / BMPs							Capital Costs		Annual Operation and Maintenance	
PARKS					Unit	Number of Units	Cost per unit (low)	Cost per unit (high)	Low	High	Low	High
5 Acres	MEDIUM	**Nutrient Management**										
		Facility nutrient reduction management plan			each	0	$ -	$ -	$ -	$ -		
		Subtotal							$ -	$ -		
		Irrigation Management										
		Irrigation water management (449)[5]	20-35	45-60	each	1	$ 50	$ 750	$ 50	$ 750		
		Subtotal							$ 50	$ 750		
		Runoff/Erosion Management										
		None										
								TOTAL	**$ 50**	**$ 750**	**$ 5**	**$ 75**

LAND USE CATEGORY	BMP LEVEL OF EFFORT	POTENTIAL MPs / BMPs							Capital Costs		Annual Operation and Maintenance	
PARKS					Unit	Number of Units	Cost per unit (low)	Cost per unit (high)	Low	High	Low	High
5 Acres	HIGH	**Nutrient Management**										
		Facility nutrient reduction management plan			each	0	$ -	$ -	$ -	$ -		
		Subtotal							$ -	$ -		
		Irrigation Management							$ -	$ -		
		Irrigation water management (449)[5]	20-35	45-60	each	1	$ 50	$ 750	$ 50	$ 750		
		Subtotal							$ 50	$ 750		
		Runoff/Erosion Management							$ -	$ -		
		Runoff management system (570)[3 5]							$ -	$ -		
		Parking lot water retention		5-10	each	1	$ 150	$ 1,500	$ 150	$ 1,500		
		Filter strips	5-15		acre	1	$ 375	$ 12,500	$ 375	$ 12,500		
		Filter trap	10-25		acre	1	$ 375	$ 12,500	$ 375	$ 12,500		
		Subtotal							$ 900	$ 26,500		
								TOTAL	**$ 950**	**$ 27,250**	**$ 95**	**$ 2,725**

Appendix H
Cost Estimates For Implementing Best Management Practices (BMPs)

Table H-5. Residential

LAND USE CATEGORY	BMP LEVEL OF EFFORT	POTENTIAL MPs / BMPs	Nutrient Management Effectiveness (percent)	Water Management Effectiveness (percent)	Components				Capital Costs		Annual Operation and Maintenance	
RESIDENTIAL					Unit	Number of Units	Cost per unit (low)	Cost per unit (high)	Low	High	Low	High
618 Acres	LOW	**Nutrient Management**										
		Facility nutrient reduction management plan			each	1	$ -	$ -	$ -	$ -		
		Subtotal							$ -	$ -		
		Irrigation Management										
		None										
		Runoff/Erosion Management										
		None										
								TOTAL	**$ -**	**$ -**	**$ -**	**$ -**

LAND USE CATEGORY	BMP LEVEL OF EFFORT	POTENTIAL MPs / BMPs							Capital Costs		Annual Operation and Maintenance	
RESIDENTIAL					Unit	Number of Units	Cost per unit (low)	Cost per unit (high)	Low	High	Low	High
618 Acres	MEDIUM	**Nutrient Management**										
		Facility nutrient reduction management plan			each	1	$ -	$ -	$ -	$ -		
		Subtotal							$ -	$ -		
		Irrigation Management										
		Irrigation water management (449)[5]	20-35	45-60	each	1	$ 50	$ 750	$ 50	$ 750		
		Subtotal							$ 50	$ 750		
		Runoff/Erosion Management										
		None										
								TOTAL	**$ 50**	**$ 750**	**$ 5**	**$ 75**

LAND USE CATEGORY	BMP LEVEL OF EFFORT	POTENTIAL MPs / BMPs							Capital Costs		Annual Operation and Maintenance	
RESIDENTIAL					Unit	Number of Units	Cost per unit (low)	Cost per unit (high)	Low	High	Low	High
618 Acres	HIGH	**Nutrient Management**										
		Facility nutrient reduction management plan			each	1	$ -	$ -	$ -	$ -		
		Subtotal							$ -	$ -		
		Irrigation Management										
		Irrigation water management (449)[5]	20-35	45-60	each	1	$ 50	$ 750	$ 50	$ 750		
		Subtotal							$ 50	$ 750		
		Runoff/Erosion Management										
		Runoff management system (570)[3 5]										
		Paved parking	80-85		square yard	480	$ 1	$ 2	$ 408	$ 936		
		Filter trap	10-25		acre	1	$ 375	$ 12,500	$ 375	$ 12,500		
		Subtotal							$ 783	$ 13,436		
								TOTAL	**$ 833**	**$ 14,186**	**$ 83**	**$ 1,419**

Appendix H
Cost Estimates For Implementing Best Management Practices (BMPs)

Table H-6. Urban

LAND USE CATEGORY	BMP LEVEL OF EFFORT	POTENTIAL MPs / BMPs	Nutrient Management Effectiveness (percent)	Water Management Effectiveness (percent)	Components				Capital Costs		Annual Operation and Maintenance	
URBAN					Unit	Number of Units	Cost per unit (low)	Cost per unit (high)	Low	High	Low	High
34 Acres	LOW	**Nutrient Management**										
		Facility nutrient reduction management plan			each	1	$ -	$ -	$ -	$ -		
		Subtotal							$ -	$ -		
		Irrigation Management										
		None										
		Runoff/Erosion Management										
		None										
								TOTAL	**$ -**	**$ -**	**$ -**	**$ -**

LAND USE CATEGORY	BMP LEVEL OF EFFORT	POTENTIAL MPs / BMPs							Capital Costs		Annual Operation and Maintenance	
URBAN					Unit	Number of Units	Cost per unit (low)	Cost per unit (high)	Low	High	Low	High
34 Acres	MEDIUM	**Nutrient Management**										
		Facility nutrient reduction management plan			each	1	$ -	$ -	$ -	$ -		
		Subtotal							$ -	$ -		
		Irrigation Management										
		Irrigation water management (449)[5]	20-35	45-60	each	1	$ 50	$ 750	$ 50	$ 750		
		Subtotal							$ 50	$ 750		
		Runoff/Erosion Management										
		None										
								TOTAL	**$ 50**	**$ 750**	**$ 5**	**$ 75**

LAND USE CATEGORY	BMP LEVEL OF EFFORT	POTENTIAL MPs / BMPs							Capital Costs		Annual Operation and Maintenance	
URBAN					Unit	Number of Units	Cost per unit (low)	Cost per unit (high)	Low	High	Low	High
34 Acres	HIGH	**Nutrient Management**										
		Facility nutrient reduction management plan			each	1	$ -	$ -	$ -	$ -		
		Subtotal							$ -	$ -		
		Irrigation Management										
		Irrigation water management (449)[5]	20-35	45-60	each	1	$ 50	$ 750	$ 50	$ 750		
									$ -	$ -		
		Subtotal							$ 50	$ 750		
		Runoff/Erosion Management										
		Access road management (560)[3 5]										
		Pave roads		85-90	square yard	1000	$ 2	$ 4	$ 2,150	$ 4,300		
		Runoff management system (570)[3 5]							$ -	$ -		
		Filter strips	5-15		acre	1	$ 375	$ 12,500	$ 375	$ 12,500		
		Filter trap	10-25		acre	0.25	$ 375	$ 12,500	$ 94	$ 3,125		
		Stream corridor improvement (204)[3]		60-75	acre	1	$ 700	$ 5,500	$ 700	$ 5,500		
		Subtotal							$ 3,319	$ 25,425		
								TOTAL	**$ 3,369**	**$ 26,175**	**$ 337**	**$ 2,618**

Appendix H
Cost Estimates For Implementing Best Management Practices (BMPs)

Table H-7. Septic Tank Disposal Systems

LAND USE CATEGORY	BMP LEVEL OF EFFORT	POTENTIAL MPs / BMPs	Nutrient Management Effectiveness (percent)	Water Management Effectiveness (percent)	Components				Capital Costs		Annual Operation and Maintenance	
SEPTIC TANK DISPOSAL SYSTEMS					Unit	Number of Units	Cost per unit (low)	Cost per unit (high)	Low	High	Low	High
407 Units	LOW	Facility nutrient reduction management plan			each	1	$ -	$ -	$ -	$ -		
		Septic tank inspection[6]			each	160	$ 75	$ 200	$ 12,000	$ 32,000		
		Septic system pumping[6]			each	40	$ 150	$ 350	$ 6,000	$ 14,000		
		Subtotal							$ 18,000	$ 46,000		
								TOTAL	**$ 18,000**	**$ 46,000**	**$ 1,800**	**$ 4,600**

LAND USE CATEGORY	BMP LEVEL OF EFFORT	POTENTIAL MPs / BMPs							Capital Costs		Annual Operation and Maintenance	
SEPTIC TANK DISPOSAL SYSTEMS					Unit	Number of Units	Cost per unit (low)	Cost per unit (high)	Low	High	Low	High
407 Units	MEDIUM	Facility nutrient reduction management plan			each	1	$ -	$ -	$ -	$ -		
		Septic tank inspection[6]			each	200	$ 75	$ 200	$ 15,000	$ 40,000		
		Septic system pumping[6]			each	50	$ 150	$ 350	$ 7,500	$ 17,500		
		Subtotal							$ 22,500	$ 57,500		
								TOTAL	**$ 22,500**	**$ 57,500**	**$ 2,250**	**$ 5,750**

LAND USE CATEGORY	BMP LEVEL OF EFFORT	POTENTIAL MPs / BMPs							Capital Costs		Annual Operation and Maintenance	
SEPTIC TANK DISPOSAL SYSTEMS					Unit	Number of Units	Cost per unit (low)	Cost per unit (high)	Low	High	Low	High
407 Units	HIGH	Facility nutrient reduction management plan			each	1	$ -	$ -	$ -	$ -		
		Septic tank inspection[6]			each	400	$ 75	$ 200	$ 30,000	$ 80,000		
		Septic system pumping[6]			each	100	$ 150	$ 350	$ 15,000	$ 35,000		
		Replace Conventional Systems with Enhanced System[7]			each	170	$ 10,000	$ 20,000	$ 1,700,000	$ 3,400,000		
									$ -	$ -		
									$ -	$ -		
									$ -	$ -		
		Subtotal							$ 1,745,000	$ 3,515,000		
								TOTAL	**$ 3,490,000**	**$ 7,030,000**	**$ 349,000**	**$ 703,000**

Appendix H
Cost Estimates For Implementing Best Management Practices (BMPs)

Table H-8. Caltrans - (See note below)

LAND USE CATEGORY	BMP LEVEL OF EFFORT	POTENTIAL MPs / BMPs	Nutrient Management Effectiveness (percent)	Water Management Effectiveness (percent)	Components				Capital Costs		Annual Operation and Maintenance	
CALTRANS					Unit	Number of Units	Cost per unit (low)	Cost per unit (high)	Low	High	Low	High
120 Acres	LOW	**Nutrient Management**										
		Stormwater Chemical Analysis (nitrogen and phosphorous only)			each	3	$ 35	$ 50	$ 105	$ 150		
		Facility nutrient reduction management plan			each	1	$ -	$ 10,000	$ -	$ 10,000		
		Subtotal							$ 105	$ 10,150		
		Irrigation Management										
		None7										
		Runoff/Erosion Management										
		None										
								TOTAL	**$ 105**	**$ 10,150**	**$ 11**	**$ 1,015**

LAND USE CATEGORY	BMP LEVEL OF EFFORT	POTENTIAL MPs / BMPs							Capital Costs		Annual Operation and Maintenance	
CALTRANS					Unit	Number of Units	Cost per unit (low)	Cost per unit (high)	Low	High	Low	High
120 Acres	MEDIUM	**Nutrient Management**										
		Stormwater Chemical Analysis (nitrogen and phosphorous only)			each	3	$ 35	$ 50	$ 105	$ 150		
		Stormwater Chemical Analysis (Metals, Organics, Pesticides, and PCBs)			each	3	$ 800	$ 1,400	$ 2,400	$ 4,200		
		Facility nutrient reduction management plan			each	1	$ -	$ 10,000	$ -	$ 10,000		
		Subtotal							$ 2,505	$ 14,350	$ 251	$ 1,435
		Irrigation Management										
		None[7]							$ -	$ -		
		Runoff/Erosion Management										
		Runoff management system (570)[3 5]										
		Filter strips	5-15		acre	1	$ 375	$ 12,500	$ 375	$ 12,500		
		Infiltration Trench	5-10		per foot	5000	$ 15	$ 75	$ 75,000	$ 375,000		
		Subtotal							$ 75,375	$ 387,500	$ 7,538	$ 38,750
								TOTAL	**$ 77,880**	**$ 401,850**	**$ 7,788**	**$ 40,185**

LAND USE CATEGORY	BMP LEVEL OF EFFORT	POTENTIAL MPs / BMPs							Capital Costs		Annual Operation and Maintenance	
CALTRANS					Unit	Number of Units	Cost per unit (low)	Cost per unit (high)	Low	High	Low	High
120 Acres	HIGH	**Nutrient Management**										
		Stormwater Chemical Analysis (nitrogen and phosphorous only)			each	3	$ 35	$ 50	$ 105	$ 150		
		Stormwater Chemical Analysis (Metals, Organics, Pesticides, and PCBs)			each	3	$ 800	$ 1,400	$ 2,400	$ 4,200		
		Facility nutrient reduction management plan			each	1	$ -	$ 10,000	$ -	$ 10,000		
		Subtotal							$ 2,505	$ 14,350		
		Irrigation Management										
		None[8]							$ -	$ -		
		Runoff/Erosion Management										
		Runoff management system (570)[3 5]							$ -	$ -		
		Filter strips	5-15		acre	1	$ 375	$ 12,500	$ 375	$ 12,500		
		Filter trap	10-25		acre	0.5	$ 375	$ 12,500	$ 188	$ 6,250		
		Infiltration Trench	5-10		per foot	5000	$ 15	$ 75	$ 75,000	$ 375,000		
		Sediment Basin (350)[3]			each	1	$ 700	$ 1,000,000	$ 700	$ 1,000,000		
		Subtotal							$ 76,263	$ 1,393,750		
								TOTAL	**$ 78,768**	**$ 1,408,100**	**$ 7,877**	**$ 140,810**

Appendix H
Cost Estimates For Implementing Best Management Practices (BMPs)

Footnotes for Table:

1. Mission Resource Conservation District (MRCD) 1997. Brochure: Mission Resource Conservation District - Soil Nutrient Analysis. Fallbrook, CA. Printed May 1997.
2. MRCD 1997. Brochure: Irrigation Water Management - Water Quality Analysis. Fallbrook, CA. Printed May 1997.
3. Soil Conservation Practice Numbers from U.S. Department of Agriculture (USDA), May 1995. Calleguas Creek Watershed Erosion and Sediment Control Plan for Mugu Lagoon. USDA Natural Resources Conservation Service, in cooperation with Ventura County Resource Conservation District and the California State Coastal Conservancy. Davis, CA, May 1995.
4. Upgrades include sprinkler, drip irrigation, and microspray systems
5. BMP practices, cost estimates, and percent effectiveness from U.S. Department of Agriculture (USDA), May 1995. Calleguas Creek Watershed Erosion and Sediment Control Plan for Mugu Lagoon. USDA Natural Resources Conservation Service, in cooperation with Ventura County Resource Conservation District and the California State Coastal Conservancy. Davis, CA, May 1995. Table 4-b.
6. MRCD 1999. Focus on Resource Conservation: Septic System Operation, Inspection, and Maintenance - The Homeowner's Guide. Fallbrook, CA. Summer 1999.
7. Enhanced septic tank disposal systems can provide additional treatment to household wastewater, such as reduction of waste strength, removal of pathogens, and/or removal of nitrate-nitrogen, by adding components that utilize a combination of aerobic and anaerobic treatment before effluent is released to the environment. University of Rhode Island (URI) Cooperative Extension, 2001. Septic System Information for Rhode Islanders, Frequently Asked Questions Fact Sheet. Rhode Island Regional Water Quality Program, University of Rhode Island College of Env. & Life Sciences, Dept.of Natural Resources Science, Cooperative Extension On-Site Wastewater Training Center. May 2001.
8. Assumed no significant irrigation by Caltrans occurs along the Interstate 15 corridor

Assumptions:

For Commercial Nurseries, Agriculture, Orchards, and Caltrans land use categories, the Facility NRMP is estimated to range from $0 to $10,000.

For Parks, Residential, Septic Tank Disposal Systems, and Urban land use categories, the County of San Diego NRMP is assumed to cover this issue.

Average commercial nursery size in Fallbrook is approximately 12 acres. Based on personal communication with Paul Davy, Supervising Agricultural Inspector, Stormwater Management, County of San Diego, Department of Agricultural, Weights & Measures on May 21, 2003.

Average agricultural operation size in San Diego County is approximately 13 acres. Based on USDA, 1997. 1997 Census of Agriculture Highlights for San Diego County, California. USDA, National Agricultural Statistic Service, 1997 Census of Agriculture, Volume 1 Geographic Area Series, “Table 1. County Summary Highlights: 1997,” http://www.nass.usda.gov/census/census97/highlights/ca/cac037.txt, printed on December 17, 2003.

Appendix I – List of Events

Appendix I – List of Events

Technical Report February 9, 2005
Rainbow Creek TMDL

	Item or Event	Date
1.	Draft Problem Statement – Released for public review	8/2/99
2.	Draft Numeric Targets – Released for public review	8/2/99
3.	EPA letter: Comments on Draft TMDL	10/6/99
4.	Public Workshop	4/20/99
5.	Stakeholders Group	4/26/99
6.	Form Public Participation Group	11/1/99
7.	Public Workshop	11/18/00
8.	Draft Source Analysis – Released for public review	11/30/99
9.	Technical Advisory Committee (TAC) Meeting	12/15/99
10.	TAC Meeting	1/13/00
11.	Draft Technical TMDL submitted to TAC for review	2/18/00
12.	TAC Meeting (note: a meeting was scheduled; no attendance log found)	3/1/00
13.	Draft Pollutant Load Allocation – Released for public review	3/31/00
14.	Draft Technical TMDL Submitted	4/25/00
15.	Hines Nurseries submits draft implementation plan (deliverable due on 6/18/00; deemed incomplete and sent back for revision)	6/12/00
16.	TAC Meeting	6/28/00
17.	Santa Margarita River Water Quality Monitoring Group (SMRWQMG) Meeting, Report update on TMDL progress	7/19/00
18.	Draft Water Quality Monitoring Plan 2000-2001, Rev. 0	8/14/00
19.	Year 2000 water quality and flow monitoring begins (9 weeks)	8/15/00
20.	Algae Sample Collection w/ UC Coop. Extension (Valerie Melano)	9/20/00
21.	SMRWQMG Meeting, Report on TMDL progress	11/1/00
22.	TAC Meeting	11/1/00
23.	Biological Assessment Monitoring (2 R.C. & 1 Sandia Cr.)(Samples given to San Diego Stream Team)	11/16/00
24.	Draft Summary Report for 2000 TMDL Monitoring	1/17/01
25.	TAC Meeting: Working Session (Discuss Summary Report)	2/1/01
26.	Attend SMRWQMG Meeting	12/20/00
27.	TAC Meeting, Working Session (Discuss Summary Report)	2/1/01
28.	Attend SMRWQMG Meeting	2/7/01
29.	Technical staff met with CalTrans to discuss TMDL and the potential for nutrient sources from I-15.	2/9/01
30.	TAC Meeting, Working Session (Discuss Summary Report)	2/14/01
31.	Submit Draft Problem Statement to TAC	3/21/01
32.	TAC Meeting, (Discuss Draft Problem Statement)	3/29/01
33.	Submit Drafts, Numeric Targets, Source Analysis, Linkage Analysis to TAC	4/30/01
34.	TAC Meeting (Discuss Draft TMDL Sections)	5/8/01
35.	E-mail – informal peer review request to Gerald Bowes	6/19/01
36.	Meet with County of San Diego Environmental Health staff to discuss septic issues	6/21/01

Appendix I – List of Events

	Item or Event	Date
37.	Technical TMDL Review – sent out for review (2 weeks) to TAC Participants, State Board, and in-house review.	6/25/01
38.	Technical staff met with County Environmental Health staff to discuss County's comments to technical TMDL	7/31/01
39.	Submit formal request letter to initiate scientific peer review to Gerald Bowes	8/1/01
40.	Technical staff met with County Environmental Health, and Planning and Land Use staff to discuss ground water issues.	8/8/01
41.	Technical staff met with County Environmental Health staff to discuss implementation plan and monitoring strategy	8/13/01
42.	Meet with in-house staff for technical support re: septic loading calculations	8/28-29/01
43.	Submit draft staff report (including technical TMDL, Implementation Plan and Monitoring Strategy) and draft amendment language for management review.	8/30/01
44.	Receive notice of peer review selection. Three reviewers selected: Professors David Jenkins, Rhea Williams, and John A. Dracup	8/31/01
45.	Send peer reviewers the request letter and TMDL package for review via e-mail and overnight mail.	11/20/01
46.	TAC Meeting, discuss implementation plan, environmental impacts, and economic considerations	12/13/01
47.	Meet with County Environmental Health staff to discuss economic considerations	12/18/01
48.	Peer reviewer comments received	1/1/02-2/14/02
49.	Draft Technical TMDL posted on RWQCB website	3/22/02
50.	Notice of Filing published in newspaper	3/23/02
51.	Draft Technical TMDL mailed to the public for 45 day comment period	3/23/02
52.	Public Workshop	4/11/02
53.	Meeting with County (Conference Call)	4/16/02
54.	Public Hearing	5/8/02
55.	Conference call with USEPA (Peter Kozelka); discuss revisions to source analysis	6/28/02
56.	Site Visit/Field Trip: County, Hines Nursery, SDSU, MRCD, and Dept. of Agriculture representatives attended	9/11/02
57.	Meeting with County staff to discuss revisions to Implementation Plan	11/4/02
58.	Convene RC TAC to discuss economic considerations	12/18/02
59.	Meeting with Corey Binns of Caltrans to discuss Source Loads	12/30/02
60.	Meeting with Corey Binns of Caltrans to discuss Source Loads and Implementation	3/19/03
61.	Meeting with County staff to discuss Implementation Plan	9/3/03
62.	Received Comments of Implementation Plan from County of San Diego	12/31/03
63.	Submit formal request letter to initiate additional scientific peer review to Gerald Bowes	5/7/04
64.	Submit Technical Report for scientific peer review to Dr. David Jenkins	7/14/04
65	Notice of Filing sent to Interested Parties list electronically	10/14/04

Appendix I – List of Events

	Item or Event	Date
66	Notice of Filing published in newspaper	10/14/04
67	Draft Technical TMDL posted on RWQCB website	10/22/04
68	Meeting with County	10/21/04
69	Meeting with County	10/27/04
70	Meeting with County	11/09/04
71	Public Workshop	11/17/04
72	Public Hearing	12/08/04
73	Additional public notice sent to Rainbow Valley landowners	12/15/04
74	Article published in Village News (Fallbrook) paper	12/16/04
75	Public notice published in Village News (Fallbrook) paper	12/16/04
76	Written public comment period closed	12/29/04
77	Revised Basin Plan Amendment, revised Technical Report and Appendices, and Response to Comments document posted on Regional Board website	1/27/05
78	Adoption of Resolution R9-2005-0036	2/09/05

Appendix J – Scientific Peer Review No. 1
November 2001 – February 2002

J-1 Dr. John A. Dracup

J-2 Dr. Rhea Williamson

J-3 Dr. David Jenkins

Appendix J – Scientific Peer Review No. 1

J-1 Dr. John A. Dracup

MEMORANDUM 14 February 2002

To: John H. Robertus

From: John A. Dracup

Subject: Scientific peer review for the Draft Staff Report of the Rainbow Creek Total Maximum Daily Loads for (TMDL) for Nutrients

---

In your letter dated 20 November 2001, you asked that I answer the following questions in my review of the Draft Staff Report of the Rainbow Creek TMDL for Nutrients:

1. *Does the staff report adequately and correctly address the effects of nutrients in the freshwater stream?*

Yes.

2. *Are nutrient dynamics, including physical and chemical processes, and biological uptake and assimilation adequately and correctly addressed?*

Yes.

3. *Is the role of algae and its response to nutrients and other limiting factors adequately and correctly addressed?*

The role of algae and its response to nutrients and other limiting factors is explained well. However, how to distinguish between "eutrophic conditions" and "excessive algal growth" was not clear. Does "excessive algal growth" have to be recurrent before "eutrophic conditions" can be declared? Or do fish kills, excess decomposition of plant matter, and/or DO depletion to below 5.0 mg/L have to be observed to warrant a declaration that the creek is "eutrophic"?

4. *Based on existing information, has the hydrology of the watershed been adequately and correctly addressed?*

The hydrology of the watershed seems adequately and correctly addressed.

5. *Does the staff report adequately and correctly address the sources of nutrients in the watershed?*

The staff's report on nutrient sources in the watershed appears to be adequate and correctly addressed.

6. *Are data used in the report reliable and appropriate, and is the treatment of the data defensible?*

The data appear to be reliable and appropriate. The staff has sufficiently treated the data in a defensible manner.

7. *Please comment on the general validity of the approach used to calculate nutrient loading to the creek.*

The approach presented in Sections 4.0 and 5.0 on the calculation of nutrient loading to the creek seems valid and reasonable given the available data. It is clear and easy to follow. The uncertainties about linking the mass loading throughout the watershed to observed concentrations of nitrogen and phosphorus in the creek are explained well. The decision to implement an iterative approach to determine appropriate load reductions of nitrogen and phosphorus seems reasonable.

8. *Is the approach used to assign load allocations reasonable?*

The approach sets the TMDL = ΣWLA + ΣLA + Background + MOS. The reservation of 10 percent of the TMDL to MOS seems reasonable. The approach for computing background versus ΣLA raises question. Why were developed land areas included in the background computation? This method implies a 0.9 (0.1) kg/ha/yr nitrogen (phosphorous) load reduction for developed lands, even though these background loads can theoretically never occur while the lands remain developed (i.e. other loading factors for developed lands apply to these lands, as reported in Tables 4-1 and 4-3). For each nutrient constituent, it seems more reasonable to base the background load on the present area of undeveloped land. If you followed this approach, the background load allocation would decrease and the ΣLA would increase. The result is a more flexible load allocation for developed landowners without reducing the total TMDL goals.

9. *Have the correct data gaps been identified for groundwater and septic system issues?*

The set of data gaps presented in Section 9.5.1.1 seems comprehensive and should provide sufficient information to clarify groundwater and septic system issues. It is also a reasonable set of gaps to investigate during Tier I of the Nutrient Reduction and Management Plan (NRMP).

10. *Overall, is the submitted material scientifically sound and thorough, and does it support the Regional Board's proposed action?*

The material is scientifically sound and thorough and will provide good support for the Regional Board's proposed actions. Toward this end, it is recommended that the following comments be addressed during preparation of the Final Report.

(a) The biostimulatory objective (Section 2.5) is more restrictive than the drinking water objective, in terms of NO_3-N concentration allowed in the creek. It is clear that the drinking water objective is mandated by the MCL set forth in California Code of Regulations, Title 22. However, it is not clear what regulation mandates the biostimulatory objective set forth in this TMDL. If there is no regulation, you should state this in the report. Also, if there is no regulation, it is not made clear what would legally compel responsible parties that are existing land users with non-point-source loads to modify their activities to meet the biostimulatory objectives.

(b) Are Sections 3.2 and 2.5 consistent when discussing the total nitrogen objective? Section 2.5 says that the Basin Plan does not state a threshold value for nitrogen and that a weight-to-weight ratio of 10:1 between total-N:total-

P was adopted during the preparation of this draft TMDL to set the total-N threshold. Section 3.2 says that the total nitrogen target is a "numeric goal set forth in the Basin Plan." Which is correct?

(c) At the end of the last paragraph before Section 4.1, you might list all potential sources "not found to be a significant source of either nitrogen or phosphorous," just to be complete. Currently you only mention CalTrans operations as one of those potential sources determined to not be significant.

(d) On p. 36, 2nd paragraph, you state that landowners/land users (such as homeowners, nurseries, businesses, etc.) are identified as responsible parties and are required to comply with all local, state, and federal laws and regulations. From the report, it is not clear which laws would force existing land owners in unincorporated areas to change their management practices if their nutrient loads were non-point-sources. Could they be taxed or fined? Could they have land-use permits revoked? The preceding discussion in Section 9.4 was helpful, but it seemed to address control over land use changes rather than static development.

(e) In the Draft Amendment (20 November 2001), under "Total Maximum Daily Loads for Rainbow Creek," the TMDL for biostimulatory nutrients in Rainbow Creek is set equal to 1,507 kg/yr for total nitrogen. In footnote 1, you say that this value equals the present annual load estimate from undeveloped land, leaving zero load allocation for developed land uses. However, based on the reasoning for load allocation present in Section 6.0 of the Draft Report, even if the entire watershed were undeveloped, the background load to the creek would still be 2,403 kg/yr. How is it reasonable to set the TMDL for biostimulatory nutrients equal to 1,507 kg/yr when it doesn't seem to be theoretically possible based on your loading factor assumptions?

Appendix J – Scientific Peer Review No. 1

J-2 Dr. Rhea Williamson

21 January 2002

Lisa Brown
Environmental Scientist
Regional Water Quality Control Board: San Diego Region
9771 Clairemont Mesa Blvd, Suite A.
San Diego, CA 92124-1324

Please find attached my comments on nutrients in Rainbow Creek located in San Diego County, California. Concerns about the draft staff report and attachments are summarized in general, followed by page/paragraph specific comments. Comments are meant to be constructive. The documents reviewed were as follows:

- Draft Staff Report for Nutrient Total Maximum Daily Load for Rainbow Creek. November 20, 2001. Prepared by Lisa Brown and Kyle Olewnik.
- Miscellaneous attachments.

General Comments: Draft Staff Report: Total Maximum Daily Load for Nutrients.

In general, the document provides a good review of the problem, the regulatory compliance issues, data summary, assumptions used, load calculations and areas of uncertainty. There are, however, considerable data gaps, assumptions and omissions that need correction or clarification. Many of the references cited are not provided in the reference list, or are incomplete. These are identified as noted. In general, the scientific issues identified in Attachment 2 (effects of nutrients in freshwater stream systems, nutrient dynamics, role of algae, watershed hydrology, sources of nutrients in the watershed, reliability and treatment of the data, validity of approach to nutrient loading calculations, assignment of load allocations, and data gaps) are addressed, but not always adequately: These are noted in the specific comments section that follows.

Specific Comments: Attachment 1: page 2.

Discussions related to second tier load reductions should indicate that nutrients will be reduced to concentrations **less than** the biostimulatory substances targets.

Specific Comments: Draft Staff Report: Total Maximum Daily Load for Nutrients.

Page	Comment
2	Section 2.1. The description of sources of nitrogen is incomplete. Organic nitrogen is omitted from discussion. Nitrogen fixation by actinomycetes (soil bacteria) and cyanobacteria (blue-green algae) results in the utilization of nitrogen in the form of nitrogen gas. Discussion of the required oxygen environments is not addressed.
3	Section 2.2. Paragraph 3. The reaches of the creek (described as upper and lower portions) are inconsistent with Figure A-3. MGT1 and RGT1 are not in either reach. The entire "middle reach of the creek is not assessed.
4	Section 2.3. Paragraph 1. The annual average for 1986 includes the single 1985 data point, which was one of the highest recorded values recorded (Table B-1). This will artificially elevate the 1986 annual average.
5	Top paragraph. Two areas are identified as having excessive algae growth in the lower reached. Was this assessment determined visually or was it based on water quality data such as pH and dissolved oxygen? The former can be misleading.
	Paragraph 2. The assumption of elevated historic phosphorus concentrations should be avoided unless knowledge of the fertilizer types is available. The presence of eutrophic downstream conditions does not mean that phosphorus levels are elevated. The assumption being made is that the creek is a phosphorus limited system. In addition, data (*e.g.,* diel dissolved oxygen, pH values; evidence of fish kills) are needed to support the statement that eutrophic conditions exist.
	Section 2.4. Paragraph 1. Table B-2 does not include data for Station 1 (Jubilee Way). This station is important in that it is lthe most upstream site and includes land uses that are different (*e.g.,* the prison) from the other stations.
	Section 2.4. Paragraph 2. Data for 1998-1999 are compared to 2000, however the historical data table does not include the 1998-1999 data for review. It is difficult, as a result, to know how different the values in these two data sets are. Movement of the Oak Crest station 0.2 miles more downstream may or may not place it below the unnamed tributary on Figure A-2.
	There is also no attempt to address the precipitation effect (assumed to be insignificant?) on a seasonal or annual basis, or when comparing different years. Details of this type are important when assessing the validity of the decision to use 2000 data for determination of load allocations.

Section 2.4. Paragraph 3. The average nitrate nitrogen concentration is based on data collected between August and October from the Oak Crest location; this means that the peak months of February to July are not assessed. Data from this site are "expected to be representative" of water quality throughout the Rainbow Valley Basin, yet this site has the lowest nitrate nitrogen concentrations and the highest ortho-phosphate concentrations of all the creek stations (Table B-2). In addition, groundwater surfaces at this location, making it non-representative of stations above the site.

6 Paragraph 2. The statement that there does not appear to be the same degree of seasonal variation in nutrients may be premature. Seasonal variation (based on percent difference) of nitrate nitrogen (97%) and phosphate phosphorus (75%) is quite high at Willow Glen-4. Both nutrient parameters fluctuate considerably. Reasons may also include erosion events leading to increased turbidity.

Section 2.5. Bottom Paragraph. The allowable levels of un-ionized ammonia have been amended (CFR, 1999) such that allowable levels are now based on the presence and/or absence of salmonid fish. This section should be updated to reflect the amendments.

7 Top. It is stated that ammonia has not been found in reportable quanitities. What were the reporting limits used? Levels less than 25 μg/L are considered toxic. If reporting limits are set at 0.1 mg/L, as is often the case, then ammonia will never be found at reportable levels.

8 Last paragraph. Unclear. Does Camp Pendleton rely entirely in groundwater, or on surface waters for its drinking water supply.

9 Paragraph 1. Add to this section that eutropic conditions can result in an increase in pH that can result in the dissociation of ammonium to form the toxic ammonia species.

Paragraph 1. Last sentence. The formation of un-ionized ammonia is not restricted to the decomposition of organic matter. In addition, such decompostion yields ammonium; the transformation to ammonia requires a pH increase.

Paragraph 2. It is stated that eutrophic conditions in Rainbow Creek have not been observed and that dissolved oxygen concentrations are not expected to fall below 5 mg/L. This statement is based on limited data and on assumptions. What time period is included in this assessment? Were the dissolved oxygen concentrations taken to assess oxygen sag conditions measured at several locations? in pool and riffle areas? in locations with and without flow, algae, light, substrate for attachment? Data for 1997 are not included in Table B-1, which should include all historic data for the creek. These data may answer some of the questions above. Importantly, the lack of a fish kill DOES NOT indicate that dissolved oxygen levels are above 5 mg/L. Dissolved oxygen concentrations can vary spatially; the fish will

migrate from areas with low dissolved oxygen. ADDITIONAL DISSOLVED OXYGEN DATA ARE NEEDED.

10 Paragraph 2. In the discussion of the insect population, inpacts of nutrients, herbicides, and pesticides are mentioned. Have there been any analyses of other pollutants, sedimentation, scouring, and other impacts in the Creek?

12 Section 3.2. Paragraph 1. Add substrate for attachment to the criteria that affect the growth of algae in creeks. The targets SHOULD include dissolved oxygen. This document does not provide the data needed to substantiate the claim that "DO concentrations exist below tolerance levels for the designated beneficial use".

14 Table 4-1. The reference should be for Boynton, *et.al.,* 1993.
Nitrogen export coefficients are for coastal regions in California. Were more appropriate values available from the Natural Conservation and Resources Service (NCRS) specific to the area?

15 References. San Diego County, 1994; San Diego County, 2001; SANDAG, 2001, Dames and Moore, 1996 are all missing from the reference list.

Paragraph 2. Are the numbers for nitrogen loss via denitrification specific to the soil types in the region? This is very important, particularly given the fact that the area is not conducive to septic systems and leach fields as a means of waste treatment and that losses may be much lower. Also note that for denitrification to occur, anaerobic conditions must exist.

16 Paragraph 1. Use of 3150 kg/yr may be an underestimate. Information on the prison impacts should be included. Thousands of percolation pond systems exist (as well as design equations) from which estimates of nitrogen loading can be made.

Paragraph 2. Nitrogen in ground water is not removed via transpiration. It is removed via active transport and uptake by the plants. Uptake rates are specific to a plant species. In addition, uptake does not result in a loss from the system, but rather a transformation of form (unless the plant is harvested and removed from the site).

Paragraph 3. Groundwater reaching the creek is not limited to that that surfaces at Oak Crest 3. The estimated load to the creek from groundwater is potentially an underestimate. What about irrigation return flows, inputs from upstream and other contributing sources to Oak Crest 3 during dry weather?

Last paragraph. The assumption that flows at Willow Glen are the same as at Oak Crest ignores the

impacts of several tributaries, of groundwater intrusion between the two sites and other sources of water. This may result in an overestimate of the load.

17 Paragraph 2. The use of the mean to estimate the nitrogen load from groundwater to Rainbow Creek does not make sense. Dry weather conditions exist for 3-4 months. A weighted average using this information could be determined.

References. Chesapeake Bay Program is missing from the reference list.

20 Section 4.2.2. What is the concentration of phosphorus in Rainbow Creek at Oak Crest in the summer?. Summer data of this type for nitrogen were used to estimate groundwater loads of nitrogen. The assumption that all phosphorus is adsorbed to soil particles is erroneous. Note that the highest levels of P were during the early part of the monitoring period.

Table 4-4. Disagree that the load from groundwater is 0.

21 Paragraph 3. The iterative approach can be difficult to apply with parameters that vary temporally (seasonal and diel) and spatially (depth, location). This approach needs to be considered carefully in that reliable data can take years to collect.

Section 5.1. Paragraph 1. The current estimated load of 5,740 kg/yr may be an underestimate. Using Willow Glen-4 station data, the estimated load would be 11,815 kg/yr based on the mean of 9.1 mg/L and the flow of 0.3 cfs.

The estimate of a 28% reduction of nitrate nitrogen assumes that the load, which is based on total nitrogen, consistently results in the same proportion of nitrate nitrogen. This is not likely. Contributions to the total nitrogen load from organic decomposition, runoff and other sources will vary seasonally and spatially.

22 Section 5.2. Paragraph 1. The phosphorus mass load reduction should be 573 not 576 kg/yr. The statement that the reduction is near zero should be corrected. The allowable load is 22 kg/yr.

Table 5-1. The last column should be labeled the Interim Load Capacity.

24 Paragraph 3. The number for background loads for undeveloped land needs a reference. In addition,the calculation for background sources assumes that there is a background load for the areas of the watershed that are already developed. Approximately 62% of the watershed is undeveloped (Figure A-2) resulting in a background of 1560 kg/yr and not of 2403 kg/yr. This change effectively increases the

allocation for nonpoint sources (LAs) to 2157 kg/yr. All of these numbers assume the the TMDL of 4,130 kg/yr is properly estimated.

25 Top paragraph. It is stated that nitrogen contributions from parks, urban areas, and preserves are relatively insignificant. These land uses represent an insignificant percentage of the total watershed, however loads from these areas have not been assessed.

Table 6-1. If the annual load allocations are increased to 2157 kg/yr for the reasons stated above, then the percent reduction is reduced to 52%.

28 Figure 7-1. Data in Figure 7-1 reveal the impact of land uses on nitrate nitrogen concentrations in the creek. Jubilee and RGT-1 are both surrounded by mostly vacant lands, and are least impacted by irrigated fields and orchards. Levels at these sites are relatively low. WGT-1 and VMT-1 receive orchard drainage; nitrate levels are quite high. Riverhouse and Stagecoach are similarly impacted heavily by orchards. Riverhouse levels are high year round, possibly a result of tributary effects and orchard input. Willow Glen has seasonally elevated winter concentrations, followed by a reduction in the late summer months. Sources, loads and seasonal variations at these sites are needed.

29 Paragraph 1. Controls on nutrient loading should be implemented all year long. The sediments act as a sink for phosphorus, so controls that reduce P-loading are essential. Sediments can also act as a sink for nitrogen compounds. In addition, algae growth is year round in Rainbow Creek. Availability of plentiful nutrients during the initial growth period can result in accumulations of algae later in the year.

37 Paragraph 3. Add the sentence to the end of the paragraph: If monitoring data indicate that load reductions are not adequate to result in the nutrient target concentrations, then load allocations will be reevaluated and reduced.

Section 9.5.1. The numbered measures or alternatives are stated as being equally effective in meeting the 28% reduction. The items help assess, plan, develop regulations and the like, but none of the items actually reduce the nitrogen or phosphorus load.

38 Bullet 2nd from the bottom. Transpiration rates are not used to describe nitrogen removal.

44 Table 9-1. Tier I (A) should require interim reports 2 years after USEPA approval.

45 Section 9.7.1. Paragraph 1. Targets for biostimulatory substances should be collected year round for the reasons stated above.

Paragraph 2. The Margarita Glen Tributary should be retained as a site. This site has very high total nitrogen and nitrate nitrogen (Table B-2). A long reach of the creek getween Oak Crest-3 and Willow Glen-4 is not assessed. Major differences in nutrient concentrations exist between these two sites

(Based on the averages for 8/22/00-10/10/00, TN and nitrate are 10.8 and 8.9 mg/L at Oak Crest and are 3.8 and .3. at Willow Glen. Phosphate was always less than 0.5 mg/L at Oak Crest, but was 0.37 at Willow Glen per Table B-2). For this reason, a station should be added on Rainbow Creek between these two stations and below the agricultural fields.

47 Table 9-2. Add turbidity to the surface water monitoring. Change the type of sample from grab to field for pH, dissolved oxygen, and conductivity for both surface and groundwater monitoring. Investigate use of chlorophyll (planktonic and attached) for the algae growth quantification.

Appendix J – Scientific Peer Review No. 1

J-3 Dr. David Jenkins

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Mr. John H. Robertus
Executive Office
San Diego RWQCB
9771 Clairemont Mesa Blvd, Suite A
San Diego, CA 92124-1324

2001 DEC 31 A 11: 32
SAN DIEGO REGIONAL
WATER QUALITY
CONTROL BOARD

December 23, 2001

Dear Mr. Robertus,

Enclosed please find a marked up copy of the Draft Staff Report on the Rainbow Creek Nutrient TMDL. I have made many handwritten comments. Those marked with asterisks are substantive and are summarized later. The others are to improve the readability of the report. In addition to these extensive comments I would like to make the following general comments that impact on the approach taken in the TMDL.

1. Nowhere in the report is there any proof or data showing whether N, P or both are limiting to algal growth.

2. The approach to meeting the municipal water supply NO_3-N limit of 10 mg N/L in the initial step of the TMDL is reasonable.

3. An arbitrary assumption that the P limit should be one-tenth of the N limit is absolutely insupportable, bordering on the ridiculous! Reductions in P and further reductions in NO_3-N must be justified on the basis of determining which limits algal growth in the Creek.

4. The report should show historic trends of all nutrient forms being addressed (NO_3-N, total N, ortho P, total P).

5. The report confuses NO_3-N and total N in many places. This confusion seems to stem from an inadequate initial definition of terms.

Summary of asterisked comments

p.2	•	nutrients are both organic and inorganic
	•	most ammonification and nitrification does not involve, or follow from, N fixation
	•	P in rocks is already PO_4
	•	N_2 gas is an insignificant part of the N cycle issue
p.3	•	"wastewater effluents", not "untreated wastewater"
p.5	•	confusion between NO_3-N and total N. Please define each clearly and use the correct terms throughout
p.6	•	give "less than" values
p.7	•	give "less than" values
p.8	•	where are the data on emergent plant and algal numbers to support your statement that these are both "excessive"
p.11	•	Total N/ NO_3-N confusion and inconsistency
	•	repetition "ad nauseum"
p.12	•	logic is unclear
	•	nothing said about emergent plant growth
	•	otherwise from what?
p.16	•	N is not lost by transpiration - just water
p.20-2	•	5.0 Linkage Analysis… entire section needs a rewrite in plain non-repetitive english
p.21	•	NO_3-N/total N confusion throughout
p.25	•	"balancing the equation" is indefensible
p.26	•	last sentence is unintelligible (to me)
p.28-9	•	make symbols consistent between Figures 7-1 and 7-2
p.38	•	vague sentence
p.39	•	vague sentence again
p.43	•	meaning unclear

p.45
- be specific about which "biostimulatory substances"
- what is "quantified algae abundance"

p.46
- key statement about not knowing what nutrient limits algae (?plant) growth is hidden away here. You must be up-front, loud and clear about this or you will lose all credibility
- what is a "biodynamic analysis" - please provide a method so that it can be done by the County of San Diego

p.47
- several comments in Table 9-2

Appendix K. Response to Peer Review No. 1 Comments

Section: **Subsection:**

Commentor: Professor John Dracup

Comment: The approach presented in Sections 4.0 and 5.0 on the calculation of nutrient loading to the creek seems valid and reasonable given the available data. It is clear and easy to follow. The uncertainties about linking the mass loading throughout the watershed to observed concentrations of nitrogen and phosphorus in the creek are explained well. The decision to implement an iterative approach to determine appropriate load reductions of nitrogen and phosphorus seems reasonable.

Response: Comment noted.

Section: **Subsection:**

Commentor: Professor David Jenkins

Comment: The report should show historic trends of all nutrient forms being addressed (NO3-N, total N, ortho P, total P).

Response: While it would be optimum to include historic data for total N, ortho P, and total P, this information is not available.

Section: **Subsection:**

Commentor: Professor David Jenkins

Comment: Assuming an N:P ratio of 10:1 is unfounded. Rather than making across-the-board reductions of both, the TMDL targets (and associated load reductions) should be set based on whichever nutrient is determined to limit algal growth in the Creek.

Response: Federal regulations require that TMDLs shall be established at levels necessary to attain and maintain the applicable narrative and numerical water quality standards [40 CFR 130.7(c)(1)]. As stated in the staff report (Section 2.5 Water Quality Objectives) the Basin Plan's water quality objective for Biostimulatory Substances allows for the use of a weight to weight ratio of 10:1 (N:P) for determination of a threshold value for total nitrogen, in absence of data to determine the natural ratio. Since historic values of P were not available to calculate the natural ratio, the ratio of 10:1 is assumed.

Section: **Subsection:**

Commentor: Professor David Jenkins

Comment: The approach to meeting the municipal water supply NO_3-N limit of 10 mg N/L in the initial step of the TMDL is reasonable.

Response: Comment noted.

Section: **Subsection:**

Commentor: Professor David Jenkins

Comment: The report does not adequately establish that either N, P or both, affect the growth of algae.

Response: Language has been added to clarify this issue in two sections of the report. The discussion in Section 2.1 Nutrients and Nutrient Cycling has been clarified to explicitly state that algal growth is related to nutrient concentrations in water.

The discussion in Section 3.0 Numeric Targets includes a more descriptive explanation of the use of nitrogen to phosphorus ratios as an indication of which nutrient is likely to limit algal growth. Although targets for both N and P are essentially required by regulation (i.e., the Basin Plan), N:P ratios of the empirical data presented in the report are discussed for the purpose of providing an indication that both nutrients may be limiting and add further support to setting TMDL targets for both nutrients. The ratios are not presented but can be easily calculated by the reader.

Section: **Subsection:**

Commentor: Professor John Dracup

Comment: In the Draft Amendment (20 November 2001), under "Total Maximum Daily Loads for Rainbow Creek," the TMDL for biostimulatory nutrients in Rainbow Creek is set equal to 1,507 kg/yr for total nitrogen. In footnote 1, you say that this value equals the present annual load estimate from undeveloped land, leaving zero load allocation for developed land uses. However, based on the reasoning for load allocation present in Section 6.0 of the Draft Report, even if the entire watershed were undeveloped, the background load to the creek would still be 2,403 kg/yr. How is it reasonable to set the TMDL for biostimulatory nutrients equal to 1,507 kg/yr when it doesn't seem to be theoretically possible based on your loading factor assumptions?

Response: This inconsistency has been resolved. Background allocations in Section 6.0 were revised and calculated based on undeveloped land area.

Section: **Subsection:**

Commentor: Professor John Dracup

Comment: The material is scientifically sound and thorough and will provide good support for the Regional Board's proposed actions.

Response: Comment noted.

Section: **Subsection:**

Commentor: Professor David Jenkins

Comment: The report confuses NO_3-N and total N in many places. This confusion seems to stem from an inadequate initial definition of terms.

Response: Comment noted. Clarifications have been made to the document as appropriate.

Section: **Subsection:**

Commentor: Professor John Dracup

Comment: In evaluating the approach, the reservation of 10 percent of the TMDL to MOS seems reasonable. The approach for computing background versus the load allocations raises question. Why were developed land areas included in the background computation? This method implies a 0.9 (0.1) kg/ha/yr nitrogen (phosphorous) load reduction for developed lands, even though these background loads can theoretically never occur while the lands remain developed (i.e. other loading factors for developed lands apply to these lands, as reported in Tables 4-1 and 4-3). For each nutrient constituent, it seems more reasonable to base the background load on the present area of undeveloped land. If you followed this approach, the background load allocation would decrease and the load allocations would increase. The result is a more flexible load allocation for developed landowners without reducing the total TMDL goals.

Response: The recommended change has been incorporated into the draft. Background allocations in Section 6.0 were revised and calculated based on undeveloped land area, as all other land uses were assigned load allocations.

Section: **Subsection:**

Commentor: Professor David Jenkins

Comment: Numerous handwritten comments were made throughout the document.

Response: Handwritten comments were considered while revising the draft staff report.

Section: **Subsection:**

Commentor: Professor John Dracup

Comment: The data appear to be reliable and appropriate. The staff has sufficiently treated the data in a defensible manner.

Response: Comment noted.

Section: **Subsection:**

Commentor: Professor John Dracup

Comment: The staff's report on nutrient sources in the watershed appears to be adequate and correctly addressed.

Response: Comment noted.

Section: **Subsection:**

Commentor: Professor John Dracup

Comment: The hydrology of the watershed seems adequately and correctly addressed.

Response: Comment noted.

Section: **Subsection:**

Commentor: Professor John Dracup

Comment: The role of algae and its response to nutrients and other limiting factors is explained well. However, how to distinguish between "eutrophic conditions" and "excessive algal growth" was not clear. Does "excessive algal growth" have to be recurrent before "eutrophic conditions" can be declared? Or do fish kills, excess decomposition of plant matter, and/or DO depletion to below 5.0 mg/L have to be observed to warrant a declaration that the creek is "eutrophic"?

Response: The latter statement is correct, fish kills, excess decomposition of plant matter, and/or low DO would be need to be observed to warrant a declaration that a waterbody is eutrophic. These signs of eutrophication has not been observed or documented to date; however, excess algal growth has been documented. Excess algal growth is considered to not only pose an problem of nuissance but can also create a potential for eutrophic conditions to develop.

Section: **Subsection:**

Commentor: Professor John Dracup

Comment: Nutrient dynamics, including physical and chemical processes, and biological uptake and assimilation are adequately and correctly addressed.

Response: Comment noted.

Section: **Subsection:**

Commentor: Professor John Dracup

Comment: The staff report adequately and correctly addresses the effects of nutrients in the freshwater stream.

Response: Comment noted.

Section: **Subsection:**

Technical Report February 9, 2005
Rainbow Creek TMDL
Commentor: Professor Rhea Williamson

Comment: In general, the document provides a good review of the problem, the regulatory compliance issues, data summary, assumptions used, load calculations and areas of uncertainty. There are, however, considerable data gaps, assumptions and omissions that need correction or clarification. Many of the references cited are not provided in the reference list, or are incomplete. These are identified as noted. In general, the scientific issues identified in Attachment 2 to the "Request for Scientific Peer Review" (effects of nutrients in freshwater stream systems, nutrient dynamics, role of algae, watershed hydrology, sources of nutrients in the watershed, reliability and treatment of the data, validity of approach to nutrient loading calculations, assignment of load allocations, and data gaps) are addressed, but not always adequately: These are noted in the specific comments section that follows.

Response: Comment noted.

Section: **Subsection:**

Commentor: Professor John Dracup

Comment: The set of data gaps presented in Section 9.5.1.1 seems comprehensive and should provide sufficient information to clarify ground water and septic system issues. It is also a reasonable set of gaps to investigate during Tier I of the Nutrient Reduction and Management Plan (NRMP).

Response: Comment noted.

Section: 2.1 **Subsection:**

Commentor: Professor Rhea Williamson

Comment: The description of sources of nitrogen is incomplete. Organic nitrogen is omitted from discussion. Nitrogen fixation by actinomycetes (soil bacteria) and cyanobacteria (blue-green algae) results in the utilization of nitrogen in the form of nitrogen gas. Discussion of the required oxygen environments is not addressed.

Response: Organic nitrogen has been added to the discussion. Nitrogen fixation is already included in the list of processes that convert gaseous nitrogen into usable chemical forms. Information about the required oxygen environments has been added.

Section: 2.1 **Subsection:** Paragraph 1

Commentor: Professor David Jenkins

Comment: The sentence should reflect that the term nutrient refers to any organic or inorganic material that is necessary for life.

Response: The recommended change has been incorporated into the draft.

Section: 2.1 **Subsection:** Paragraph 2

Commentor: Professor David Jenkins

Comment: Most ammonification and nitrification does not involve, or follow from, N fixation.

Response: The referenced statement provides a list of three of the processes of the nitrogen cycle. There was no intent to imply that one cycle followed the other. The language has been rewritten to be more clear.

Section: 2.1 **Subsection:** Paragraph 3

Commentor: Professor David Jenkins

Comment: The phosphorus in rocks is already in the form of PO_4.

Response: Comment noted. The statement refers to decomposition, or "breakdown", of rock containing phosphate through weathering, leaching, etc., and not chemical breakdown. The sentence has been modified to be more clear.

Section: 2.1 **Subsection:** Paragraph 4

Commentor: Professor David Jenkins

Comment: Omit statement, "Because nitrogen has a gaseous phase, it can be transported to surface water via atmospheric deposition", because nitrogen gas is an insignificant part of the nitrogen cycle.

Response: Comment noted. The sentence was removed.

Section: 2.1 **Subsection:** Paragraph 4

Commentor: Professor David Jenkins

Comment: It is better to say "wastewater effluents", rather than "untreated wastewater".

Response: The recommended change was incorporated into the draft.

Section: 2.2 **Subsection:** Paragraph 3

Commentor: Professor Rhea Williamson

Comment: The reaches of the creek (described as upper and lower portions) are inconsistent with Figure A-3. MGT1 and RGT1 are not in either reach. The entire “middle" reach of the creek is not assessed.

Response: Language has been added to clarify the reach descriptions in Section 2.2. The middle reach is characterized by Willow Glen-4. MGT1 and RGT1 are part of the middle reach. Furthermore, there is little development in much of the middle reach and results show that RGT1 contributes low nutrient concentrations (see Table B-2).

Section: 2.3 **Subsection:** Paragraph 2

Commentor: Professor Rhea Williamson

Comment: The annual average for 1986 includes the single 1985 data point, which was one of the highest recorded values recorded (Table B-1). This will artificially elevate the 1986 annual average.

Response: Comment noted. The average for 1986 (without the 1985 data point) is 205.48 mg NO_3/L. A difference of 10.35 mg NO_3/L between the two calculated averages.

Section: 2.3 **Subsection:** Paragraph 3

Commentor: Professor Rhea Williamson

Comment: Two areas are identified as having excessive algae growth in the lower reaches. Was this assessment determined visually or was it based on water quality data such as pH and dissolved oxygen? The former can be misleading.

Response: The assessment was visually determined. The proposed monitoring in the Implementation Plan includes provisions to gather such data in the future.

Section: 2.3 **Subsection:** Paragraph 4

Commentor: Professor Rhea Williamson

Comment: The assumption of elevated historic phosphorus concentrations should be avoided unless knowledge of the fertilizer types is available. The presence of eutrophic downstream conditions does not mean that phosphorus levels are elevated. The assumption being made is that the creek is a phosphorus limited system. In addition, data (e.g., diel dissolved oxygen, pH values; evidence of fish kills) are needed to support the statement that eutrophic conditions exist.

Response: This paragraph summarizes the basis used to introduce the potential for elevated phosphorus in the absence of historic data. This was established by the Mission Resource Conservation District during the Nitrate Reduction Program in 1997, which provided data demonstrating that phosphorus was present in concentrations above the biostimulatory substances objective. The language has been modified to clarify this point and the reference to the 1997 report has been added.

Additionally, the statement that eutrophic conditions were found downstream of Rainbow Creek is based on the fact that the Santa Margarita Lagoon was listed for eutrophication on Region 9's Clean Water Section 303(d) List of Impaired Waterbodies.

Section: 2.4 **Subsection:**

Commentor: Professor David Jenkins

Comment: The appears to be confusion between NO_3-N and total N in the report. Terms should be defined clearly and used correctly through the report.

Response: Terms have been defined and clarified throughout the report.

Section: 2.4 **Subsection:** Paragraph 1

Commentor: Professor Rhea Williamson

Comment: Table B-2 does not include data for Station 1 (Jubilee Way). This station is important in that it is the most upstream site and includes land uses that are different (e.g., the prison) from the other stations.

Response: Data collected for the Jubilee Station is included in Table B-2. As noted in the footnote of Table B-2, the Jubilee monitoring location was found to be dry and was not sampled. Ground water was found surfacing approximately 200 yards upstream of the station and was monitored for the remainder of the monitoring period.

Section: 2.4 **Subsection:** Paragraph 2

Commentor: Professor Rhea Williamson

Comment: There is also no attempt to address the precipitation effect (assumed to be insignificant?) on a seasonal or annual basis, or when comparing different years. Details of this type are important when assessing the validity of the decision to use 2000 data for determination of load allocations.

Response: No conclusions were made based on the one year of rainfall data. The annual total rainfall for 2000 in Rainbow Valley and Fallbrook was 11 and 9 inches, respectively. The 2000 rainfall data was reviewed and did not correlate well with flow data. No conclusions could be drawn from one year of data. Some observations about trends in nutrient concentrations relating to the rainy season is discussed in Section 7.0 Seasonal Variations. Additional data will be collected and evaluated during the implementation phase of the TMDL.

Section: 2.4 **Subsection:** Paragraph 2

Commentor: Professor Rhea Williamson

Comment: Data for 1998-1999 are compared to 2000, however the historical data table does not include the 1998-1999 data for review. It is difficult, as a result, to know how different the values in these two data sets are. Movement of the Oak Crest station 0.2 miles more downstream may or may not place it below the unnamed tributary on Figure A-2.

Response: The 1998-1999 data, reported by the Mission Resource Conservation District, is introduced, discussed, and referenced in Section 2.3. The comparison between the two data sets has been deleted as a result of differences in analytical methods and quality control measures used between the two monitoring programs suggest a greater uncertainty associated with the MRCD data sets. MRCD used an ion specific electrode method performed in-house whereas the Regional Board used an ion chromatography method performed by a California certified analytical laboratory.

Another difference between the two data sets was that the physical location of the Oak Crest station is different. The MRCD station is at the downstream edge of the mobile home park and the Regional Board station is at the upstream edge of the mobile home park. The MRCD station was not below the unnamed tributary.

Section: 2.4 **Subsection:** Paragraph 3

Commentor: Professor Rhea Williamson

Comment: The average nitrate nitrogen concentration is based on data collected between August and October from the Oak Crest location; this means that the peak months of February to July are not assessed. Data from this site are "expected to be representative" of water quality throughout the Rainbow Valley Basin, yet this site has the lowest nitrate nitrogen concentrations and the highest ortho-phosphate concentrations of all the creek stations (Table B-2). In addition, ground water surfaces at this location, making it non-representative of stations above the site.

Response: The commentor has correctly identified that the data used to determine average concentrations does not cover peak flow months. In fact, the original monitoring plan only evaluated the critical time of year for eutrophic conditions to occur - the time of lowest flowlonger daylight hours, and warmest temperatures. Due to the limits of the data, monitoring during peak flow months is included in the implementation plan.

Section 2.4 was bulletized to improve readability and the reference to the representativeness of the concentrations found at Oak Crest to concentrations in Rainbow Valley is no longer contained in this section.

Section: 2.4 **Subsection:** Paragraph 5

Commentor: Professor Rhea Williamson

Comment: The statement that there does not appear to be the same degree of seasonal variation in nutrients may be premature. Seasonal variation (based on percent difference) of nitrate nitrogen (97%) and phosphate phosphorus (75%) is quite high at Willow Glen-4. Both nutrient parameters fluctuate considerably. Reasons may also include erosion events leading to increased turbidity.

Response: The referenced statement has been removed and the information provided has been added to the text.

Section: 2.5 **Subsection:**

Commentor: Professor John Dracup

Comment: The biostimulatory objective is more restrictive than the drinking water objective, in terms of NO_3-N concentration allowed in the creek. It is clear that the drinking water objective is mandated by the MCL set forth in California Code of Regulations, Title 22. However, it is not clear what regulation mandates the biostimulatory objective set forth in this TMDL. If there is no regulation, you should state this in the report. Also, if there is no regulation, it is not made clear what would legally compel responsible parties that are existing land users with non-point-source loads to modify their activities to meet the biostimulatory objectives.

Response: Pursuant to the Federal Clean Water Act and the California Water Code, the Water Quality Control Plan for the San Diego Region (Basin Plan) is the regulatory basis which mandates limits for biostimulatory substances. The Basin Plan contains the water quality objectives and beneficial uses that have been established for the San Diego Region. Both objectives, nitrates in drinking water and biostimulatory substances, are designated in the Basin Plan.

Section: 2.5 **Subsection:** Paragraph 2

Commentor: Professor David Jenkins

Comment: Use "less than" values when discussing nitrite data.

Response: The recommended change has been incorporated into the draft.

Section: 2.5 **Subsection:** Paragraph 3

Commentor: Professor David Jenkins

Comment: Use "less than" values when discussing ammonia data.

Response: The recommended change has been incorporated into the draft.

Section: 2.5 **Subsection:** Paragraph 3

Commentor: Professor Rhea Williamson

Comment: It is stated that ammonia has not been found in reportable quanitities. What were the reporting limits used? Levels less than 25 ug/L are considered toxic. If reporting limits are set at 0.1 mg/L, as is often the case, then ammonia will never be found at reportable levels.

Response: The commentor has correctly identified that the laboratory detection limit is not low enough to determine if concentrations are below the objective. Language has been added to clarify this point.

Additionally, lower detection limits will be required for future monitoring.

Section: 2.5 **Subsection:** Paragraph 3

Commentor: Professor Rhea Williamson

Comment: The allowable levels of un-ionized ammonia have been amended (CFR, 1999) such that allowable levels are now based on the presence and/or absence of salmonid fish. This section should be updated to reflect the amendments.

Response: This comment applies to the potential need to re-assess the Basin Plan's water quality objective for un-ionized ammonia for consistency with updated federal regulations.

Section: 2.5 **Subsection:** Paragraph 6

Commentor: Professor David Jenkins

Comment: Where are the data on emergent plant and algal numbers to support your statement that these are both "excessive"?

Response: Excessive algae and emergent plant growth was evaluted qualitatively. Photographs illustrating the amount of algae and emergent plant growth are in Attachment C, as referenced.

Section: 2.6 **Subsection:** Paragraph 2

Commentor: Professor Rhea Williamson

Comment: Unclear. Does Camp Pendleton rely entirely on ground water, or on surface waters for its drinking water supply.

Response: Camp Pendleton relies entirely on ground water, which is recharged by the surface waters of the Santa Margarita Watershed. The language has been rewritten to be more clear.

Section: 2.6 **Subsection:** Paragraph 3

Commentor: Professor Rhea Williamson

Comment: Add to this section that eutropic conditions can result in an increase in pH that can result in the dissociation of ammonium to form the toxic ammonia species.

Response: The recommended change has been incorporated into the draft.

Section: 2.6 **Subsection:** Paragraph 3

Commentor: Professor Rhea Williamson

Comment: The formation of un-ionized ammonia is not restricted to the decomposition of organic matter. In addition, such decompostion yields ammonium; the transformation to ammonia requires a pH increase.

Response: Comment noted.

Section: 2.6 **Subsection:** Paragraph 4

Commentor: Professor Rhea Williamson

Comment: It is stated that eutrophic conditions in Rainbow Creek have not been observed and that dissolved oxygen concentrations are not expected to fall below 5 mg/L. This statement is based on limited data and on assumptions. What time period is included in this assessment? Were the dissolved oxygen concentrations taken to assess oxygen sag conditions measured at several locations? in pool and riffle areas? in locations with and without flow, algae, light, substrate for attachment? Data for 1997 are not included in Table B-1, which should include all historic data for the creek. These data may answer some of the questions above. Importantly, the lack of a fish kill DOES NOT indicate that dissolved oxygen levels are above 5 mg/L. Dissolved oxygen concentrations can vary spatially; the fish will migrate from areas with low dissolved oxygen. ADDITIONAL DISSOLVED OXYGEN DATA ARE NEEDED.

Response: The commentor has correctly identified that statements about the presence of eutrophic conditions and DO concentrations are based on limited data and assumptions. In response to this comment, the reference to fish kills has been deleted. Additionally, the implementation plan will require more monitoring, including monitoring for DO.

To answer your questions, the following information has been added to the draft:

On June 4-5,1997, Regional Board staff conducted DO monitoring. The study measured temperature and DO concentrations from 1:00 p.m. in the afternoon until 6:00 a.m. the following morning at locations on the Santa Margarita River, Rainbow Creek, Sandia Creek, and De Luz Creek. The purpose was to identify the DO diel cycle and to determine if the concentrations dropped below the DO objective. The study looked at measurements in pool and riffle areas of the stream and in backwater areas with less flow. The monitoring showed concentrations above 5 mg DO/L in flowing waters and concentrations that dipped below 5 mg DO/L in backwater areas. Backwater areas that exhibited low DO were uninhabitable by fish because of dense algal mats or very shallow water.

Section: 2.6 **Subsection:** Paragraph 8

Commentor: Professor Rhea Williamson

Comment: In the discussion of the insect population, inpacts of nutrients, herbicides, and pesticides are mentioned. Have there been any analyses of other pollutants, sedimentation, scouring, and other impacts in the Creek?

Response: Data of other pollutants, sedimentation, scouring, and other impacts in the Creek are not available.

Section: 3.0 **Subsection:**

Commentor: Professor David Jenkins

Comment: Again, the report appears to show a confusion between NO_3-N and total N. Concurrent numeric targets for both nitrate and total nitrogen are inconsistent. Total N is a measure that includes NO_3-N, yet NO_3-N is set at a higher limit than total N.

Response: Section 3.0 identifies the three numeric targets that will be used to evaluate compliance during TMDL implementation. The numeric targets will be implemented consecutively rather than concurrently. The nitrate target is proposed as an interim goal and the total N target is the final goal. Language has been added to clarify this point.

Section: 3.1 **Subsection:**

Commentor: Professor David Jenkins

Comment: Stating the water quality objective and numeric target for nitrates in municipal water supply is 10 mg NO_3-N/L is redundant.

Response: Comment noted. According to requirements set out by the U.S. EPA, numeric targets must be clearly identified and an adequate basis for why they were selected provided.

Section: 3.2 **Subsection:**

Commentor: Professor John Dracup

Comment: Are Sections 3.2 and 2.5 consistent when discussing the total nitrogen objective? Section 2.5 says that the Basin Plan does not state a threshold value for nitrogen and that a weight-to-weight ratio of 10:1 between total-N:total-P was adopted during the preparation of this draft TMDL to set the total-N threshold. Section 3.2 says that the total nitrogen target is a "numeric goal set forth in the Basin Plan." Which is correct?

Response: Section 2.5 presents the objectives that apply to Rainbow Creek in accordance with the Basin Plan. In the absence of site-specific data to determine natural ratios, the objective allows for the use of a weight to weight ratio of 10:1 (N:P) for the determination of an analogous threshold value for total nitrogen. Since the objective for total phosphorus in flowing waters is 0.1 mg P/L, then total nitrogen objective is 1.0 mg N/L. Section 3.2 establishes the numeric targets for the TMDLs, which are set equivalent to the objectives designated by the Basin Plan.

Section: 3.2 **Subsection:**

Commentor: Professor David Jenkins

Comment: It is not clear what the exception to exceeding the biostimulatory targets more than 10% of the time is.

Response: Site-specific studies may be used to demonstrate that the N and P limits may be exceeded more than 10% of the time. Since this requirement is discussed in section 2.5, the referenced phrase has been deleted.

Section: 3.2 **Subsection:**

Commentor: Professor David Jenkins

Comment: The report states that a reduction in N and P concentrations is expected result in a reduction in emergent plant growth. The link between the numeric targets and emergent plant growth should be clearly established.

Response: The recommended change has been incorporated into the draft.

Section: 3.2 **Subsection:**

Commentor: Professor David Jenkins

Comment: It is unclear how the statement, "Nuisance levels of algae can develop as a result of nutrient enrichment when factors, such as sunlight, temperature and flow are not limiting", supports the selection of total N and total P targets.

Response: The discussion for biostimulatory substances targets has been revised.

Section: 3.2 **Subsection:** Paragraph 1

Commentor: Professor Rhea Williamson

Comment: Add substrate for attachment to the criteria that affect the growth of algae in creeks. The targets SHOULD include dissolved oxygen. This document does not provide the data needed to substantiate the claim that “DO concentrations exist below tolerance levels for the designated beneficial use”.

Response: The recommended change has been incorporated into the draft.

DO will not be considered as a numeric target at this time. Current data do not indicate that potential oxygen depletion would be a direct result of discharge (e.g., discharge of sewer wastewater effluent) but rather a secondary response from algal growth resulting from the availability of elevated nutrients. Monitoring data collected during TMDL implementation will be used to evaluate the need for modification of the TMDLs, including addition of numeric targets, if necessary.

Section: 4.0 **Subsection:** Paragraph 4

Commentor: Professor John Dracup

Comment: In the last paragraph of Section 4.0, you might list all potential sources “not found to be a significant source of either nitrogen or phosphorous,” just to be complete. Currently CalTrans operations is only mentioned as one of those potential sources determined to not be significant.

Response: CalTrans was the only nutrient source identified as a potential source but found to be insignificant. The language in the paragraph has been changed to reflect this.

Section: 4.1.1 **Subsection:** Table 4-1

Commentor: Professor Rhea Williamson

Comment: The reference should be for Boynton, et.al., 1993.
Nitrogen export coefficients are for coastal regions in California. Were more appropriate values available from the Natural Conservation and Resources Service (NCRS) specific to the area?

Response: The recommended change has been incorporated into the draft. Inquiries to the local office of the Natural Resources Conservation Service and UC Cooperative Extension were made. Local nutrient export coefficients were not found to be available.

Section: 4.1.2 **Subsection:**

Commentor: Professor Rhea Williamson

Comment: References. San Diego County, 1994; San Diego County, 2001; SANDAG, 2001, Dames and Moore, 1996 are all missing from the reference list.

Response: The appropriate references have been added to Section 10.0 References.

Section: 4.1.2 **Subsection:** Paragraph 2

Commentor: Professor Rhea Williamson

Comment: Are the numbers for nitrogen loss via denitrification specific to the soil types in the region? This is very important, particularly given the fact that the area is not conducive to septic systems and leach fields as a means of waste treatment and that losses may be much lower. Also note that for denitrification to occur, anaerobic conditions must exist.

Response: The denitrification estimates are not specific to soil types in the region. Reasonable estimates were used because the site-specific information was not available. The Implementation Plan includes measures to acquire such information, which will be used to re-evaluate the loading estimates in the future.

Section: 4.1.2 **Subsection:** Paragraph 4

Commentor: Professor Rhea Williamson

Comment: Use of 3,150 kg/yr may be an underestimate. Information on the prison impacts should be included. Thousands of percolation pond systems exist (as well as design equations) from which estimates of nitrogen loading can be made.

Response: The commentor correctly identifies that the estimated total nitrogen load from ground water may be underestimated. As stated in the report, the total nitrogen load to ground water should be higher than the estimated annual load of 3,150 kg N/yr, but there is currently no data available to calculate the actual value. The influence of the Rainbow Conservation Camp on the ground water in the Rainbow Valley Basin is not known at this time. However, the facility is a permitted facility with this agency and the additional information is being requested. This information will be used in future evaluations of the TMDLs and allocations.

Section: 4.1.2 **Subsection:** Paragraph 5

Commentor: Professor Rhea Williamson

Comment: Nitrogen in ground water is not removed via transpiration. It is removed through active transport and uptake by plants. Uptake rates are specific to a plant species. In addition, uptake does not result in a loss from the system, but rather a transformation of form (unless the plant is harvested and removed from the site).

Response: The referenced paragraph intended to introduce nutrient removal by plants during the process of transpiration. The language has been changed to clearly reflect "plant uptake".

Section: 4.1.2 **Subsection:** Paragraph 6

Commentor: Professor David Jenkins

Comment: The report appears to claim that N is lost by transpiration, which is incorrect.

Response: The referenced paragraph intended to introduce nutrient removal by plants during the process of transpiration. The language has been changed to clearly reflect "plant uptake".

Section: 4.1.2 **Subsection:** Paragraph 6

Commentor: Professor Rhea Williamson

Comment: Ground water reaching the creek is not limited to that that surfaces at Oak Crest 3. The estimated load to the creek from ground water is potentially an underestimate. What about irrigation return flows, inputs from upstream and other contributing sources to Oak Crest 3 during dry weather?

Response: The commentor correctly identified that the estimated load to the creek from ground water based on Oak Crest 3 data is potentially an underestimate. As stated in the report in Section 2.2 Watershed Description, the ground water basin below Rainbow Valley is semi-confined and that the more than 30 years of imported water use for irrigation and domestic water use has caused a condition of high ground water. Because of this, the assumption was made that the concentrations in ground water surfacing at the Oak Crest Location would be indicative of ground water concentrations that may exist in Rainbow Valley. Unfortunately, no monitoring well nutrient data was available. The Implementation plan includes ground water monitoring to address this issue.

Section: 4.1.2 **Subsection:** Paragraph 7

Commentor: Professor Rhea Williamson

Comment: The assumption that flows at Willow Glen are the same as at Oak Crest ignores the impacts of several tributaries, of ground water intrusion between the two sites and other sources of water. This may result in an overestimate of the load.

Response: The commentor correctly identifies that the use of flow rates recorded at Willow Glen-4 station instead of those at Oak Crest potentially overestimate the calculated load. However, as stated in the report, sufficient flow rate data at Oak Crest-3 were not collected. A Parshall flume was installed at the Oak Crest station for 10 weeks of monitoring, but was compromised when a small rainstorm undermined the installation. Several weeks of flow data were lost as a result. The Willow Glen-4 flow data has a USGS gauging station and was determined to be more reliable.

Section: 4.1.2 **Subsection:** Paragraph 9

Commentor: Professor Rhea Williamson

Comment: The use of the mean to estimate the nitrogen load from ground water to Rainbow Creek does not make sense. Dry weather conditions exist for 3-4 months. A weighted average using this information could be determined.

Response: The two approaches provide approximations of nitrogen loads from ground water. It was determined to be reasonable to select a ground water loading within the range of the approximations because of the substantial uncertainty that exists in the calculations. However, in addressing your comment, the use of the term "mean" has been changed to "simple average". Additionally, the "dry weather" data set is not complete and can not be used to effectively determine a weighted average.

Section: 4.1.3 **Subsection:** Paragraph 2

Commentor: Professor Rhea Williamson

Comment: References. Chesapeake Bay Program is missing from the reference list.

Response: The Chesapeake Bay Program reference was erroneously cited in the document. It can be found in Section 10.0 References as "USEPA 1996". The citation has been corrected.

Section: 4.2.2 **Subsection:**

Commentor: Professor Rhea Williamson

Comment: What is the concentration of phosphorus in Rainbow Creek at Oak Crest in the summer?. Summer data of this type for nitrogen were used to estimate ground water loads of nitrogen. The assumption that all phosphorus is adsorbed to soil particles is erroneous. Note that the highest levels of P were during the early part of the monitoring period.

Response: The average concentration of total phosphorus is 1.13 mg/L, and orthophosphate is 0.85 mg/L. The assumption that all phophorus is adsorbed to soil particles is specifically used in the case with ground water loading. This assumption was necessary because ground water monitoring data was not available. Surface water samples taken at Oak Crest, although assumed to be surfacing ground water, would be influenced by phosphorus in sediments that were deposited during surface flows. We could not, with any certainty, distinguish how much phosphorus is being contributed by either source. Therefore, similar treatment as with the nitrogen ground water loading calculations was not determined to be appropriate. Phosphorus loading pertaining to surface water has been calculated.

Section: 4.2.3 **Subsection:** Table 4-4

Commentor: Professor Rhea Williamson

Comment: Disagree that the load from ground water is 0.

Response: The commentor has correctly identified that the ground water load is not likely 0 mg/L. Actual ground water concentrations were not available and could not be determined therefore the assumption that phophorus easily adsorbs to soil particles and does not move as readily in subsurface flows was accepted. Ground water data will be collected during implementation and will be used to revaluate the TMDLs and load allocations.

Section: 5.0 **Subsection:**

Commentor: Professor David Jenkins

Comment: Section 5.0 Linkage Analysis is overcomplicated. Rewrite the section so that it is more clear.

Response: The recommended changes have been incorporated into the draft.

Section: 5.0 **Subsection:** Paragraph 4

Commentor: Professor Rhea Williamson

Comment: The iterative approach can be difficult to apply with parameters that vary temporally (seasonal and diel) and spatially (depth, location). This approach needs to be considered carefully in that reliable data can take years to collect.

Response: The commentor has correctly identified that ecological data vary temporally and spatially and can make an iterative approach difficult to implement. In the Implementation Plan, the TMDLs are to be re-evaluated after four years of data have been gathered and then every four years following. This schedule should be adequate to assess temporal and spatial variations.

Section: 5.1 **Subsection:**

Commentor: Professor David Jenkins

Comment: The use of NO_3-N and total N in this section is confusing to the reader.

Response: The section has been clarified.

Section: 5.1 **Subsection:** Paragraph 1

Commentor: Professor Rhea Williamson

Comment: The current estimated load of 5,740 kg/yr may be an underestimate. Using Willow Glen-4 station data, the estimated load would be 11,815 kg/yr based on the mean of 9.1 mg/L and the flow of 0.3 cfs.

Response: The calculation showing the estimated nitrogen load as 11,815 kg/yr was not provided and could not be replicated. Our calculation of the load using average concentration and flow from Willow Glen-4 indicated a nitrogen load of 2,437 kg/yr. This indicates that the estimated load of 5,740 kg/yr is more than likely an overestimate, which is a conservative approach. This calculation appears consistent with the expectation that a load estimate using site-specific data would account for assimilative capacity.

Section: 5.1 **Subsection:** Paragraph 1

Commentor: Professor Rhea Williamson

Comment: The estimate of a 28% reduction of nitrate nitrogen assumes that the load, which is based on total nitrogen, consistently results in the same proportion of nitrate nitrogen. This is not likely. Contributions to the total nitrogen load from organic decomposition, runoff and other sources will vary seasonally and spatially.

Response: In Section 5.0 Linkage Analysis, it is acknowledged that it is unlikely that a directly proportional relationship exists between mass loading and observed concentrations because of biological and chemical processes, which uptake and release nutrients at varying rates. The implementation monitoring will provide data needed to better understand the relationship between mass loading reduction and the reduction in concentrations in the creek.

Section: 5.2 **Subsection:** Paragraph 1

Commentor: Professor Rhea Williamson

Comment: The phosphorus mass load reduction should be 573 not 576 kg/yr. The statement that the reduction is near zero should be corrected. The allowable load is 22 kg/yr.

Response: As determined in Section 4.2, the phosphorus mass load is correctly stated as 576 kg/yr. The load includes 573 kg/yr from land uses and 3 kg/yr from air deposition.

The commentor correctly identifies that the allowable load for meeting the biostimulatory numeric target of 0.1 mg/L is 22 kg/yr. However, setting aside a 10% margin of safety would result in a load of only 3 kg/yr that would be allocated to existing sources. The statement that the reduction is near zero has been replaced with 3 kg/yr.

Section: 5.2 **Subsection:** Table 5-1

Commentor: Professor Rhea Williamson

Comment: The last column should be labeled the Interim Load Capacity.

Response: The recommended change has been incorporated into the draft.

Section: 6.2 **Subsection:**

Commentor: Professor David Jenkins

Comment: In regards to basis for determination of septic system load allocations, the argument given "to balance the equation" is indefensible.

Response: The referenced phrase has been deleted. As discussed in Section 6.2, reductions in septic system loads will be more significant in the long-term. For the purpose of the short-term target, emphasis is placed on the remaining land-uses because they directly contribute to surface water.

Section: 6.2 **Subsection:**

Commentor: Professor David Jenkins

Comment: There is no justification to have a lower initial % N reduction for septic systems (70%) than for agriculture and residential (75%) … especially since the septic system N estimated contribution is the largest of these. The argument given "to balance the equation" is indefensible.

Response: The septic system load reduction of 70% is less than the 75% reduction for the other four land uses because reductions in septic system loads will be less significant in the short-term, as a result of the residence time in the ground water. In the context of meeting a short-term target, the emphasis is being placed on land-uses such as agriculture and residential, which directly contribute to surface water and are therefore more easily controlled. Additionally, investigation and monitoring data will be collected and used to reassess load allocations. On the second statement, the referenced phrase has been deleted.

Section: 6.2 **Subsection:** Paragraph 4

Commentor: Professor Rhea Williamson

Comment: The number for background loads for undeveloped land needs a reference. In addition, the calculation for background sources assumes that there is a background load for the areas of the watershed that are already developed. Approximately 62% of the watershed is undeveloped (Figure A-2) resulting in a background of 1,560 kg/yr and not of 2,403 kg/yr. This change effectively increases the allocation for nonpoint sources (LAs) to 2,157 kg/yr. All of these numbers assume that the TMDL of 4,130 kg/yr is properly estimated.

Response: A reference has been provided for background loads. Additionally, background allocations in Section 6.0 have been revised and calculated based on the undeveloped land area. Park and preserve was not included because these land uses are assigned load allocations.

Section: 6.2 **Subsection:** Paragraph 7

Commentor: Professor Rhea Williamson

Comment: It is stated that nitrogen contributions from parks, urban areas, and preserves are relatively insignificant. These land uses represent an insignificant percentage of the total watershed, however loads from these areas have not been assessed.

Response: The commentor correctly identified that contributions from parks, urban areas, and preserves represent an insignificant percentage of the total watershed; however, the loads for these areas are presented in Table 4-1.

Section: 6.2 **Subsection:** Table 6-1

Commentor: Professor Rhea Williamson

Comment: If the annual load allocations are increased to 2,157 kg/yr for the reasons stated above, then the percent reduction is reduced to 52%.

Response: The annual load allocation has been changed to 2,210 kg N/yr (total nitrogen) and 206 kg P/yr (total phosphorus), as a result of basing the background load on the undeveloped land area.

Section: 6.3 **Subsection:**

Commentor: Professor David Jenkins

Comment: The last sentence of the section does not make sense.

Response: The referenced sentence states that the allocated load is the portion of the total P load that is above background. In other words, the amount that is in excess of what would be generated if all of the watershed were undeveloped land. This is consistent with the background load calculation, which was conservatively calculated by applying the export coefficient to the acreage of the watershed. The sentence has been rewritten to be more clear.

Section: 7.0 **Subsection:**

Commentor: Professor David Jenkins

Comment: It is recommended that the symbols used in Figures 7-1 and 7-2 be consistent.

Response: The recommendation has been incorporated into the draft.

Section: 7.0 **Subsection:** Figure 7-1

Commentor: Professor Rhea Williamson

Comment: Data in Figure 7-1 reveal the impact of land uses on nitrate nitrogen concentrations in the creek. Jubilee and RGT-1 are both surrounded by mostly vacant lands, and are least impacted by irrigated fields and orchards. Levels at these sites are relatively low. WGT-1 and VMT-1 receive orchard drainage; nitrate levels are quite high. Riverhouse and Stagecoach are similarly impacted heavily by orchards. Riverhouse levels are high year round, possibly a result of tributary effects and orchard input. Willow Glen has seasonally elevated winter concentrations, followed by a reduction in the late summer months. Sources, loads and seasonal variations at these sites are needed.

Response: The commentor's assessment of Figure 7-1 is in agreement with staff's and the text offered by the commentor has been incorporated. In response to the suggestion to identify sources, loads and seasonal variations at each site, the decision was made to develop two TMDLs that would be generally applied over the entire watershed instead of creating multiple TMDLs for each reach and tributary. Data collected during implementation will fill data gaps and provide additional information that will be used to determine if the TMDLs and load allocations should be revised or if localized TMDLs are needed.

Section: 7.0 **Subsection:** Paragraph 5

Commentor: Professor Rhea Williamson

Comment: Controls on nutrient loading should be implemented all year long. The sediments act as a sink for phosphorus, so controls that reduce P-loading are essential. Sediments can also act as a sink for nitrogen compounds. In addition, algae growth is year round in Rainbow Creek. Availability of plentiful nutrients during the initial growth period can result in accumulations of algae later in the year.

Response: The recommendation has been incorporated into the draft.

Section: 9.4 **Subsection:**

Commentor: Professor John Dracup

Comment: The report states that landowners/land users (such as homeowners, nurseries, businesses, etc.) are identified as responsible parties and are required to comply with all local, state, and federal laws and regulations. From the report, it is not clear which laws

would force existing land owners in unincorporated areas to change their management practices if their nutrient loads were non-point-sources. Could they be taxed or fined? Could they have land-use permits revoked? The preceding discussion in Section 9.4 was helpful, but it seemed to address control over land use changes rather than static development.

Response: To the extent that laws apply to the land users in the watershed, land users could be subject to permits and fines. As stated in Section 9.2.3 Porter-Cologne Water Quality Control Act, the Regional Board has the authority to specify certain conditions or areas where the discharge of waste, or certain types of waste, will not be permitted. The Regional Board may issue permits (e.g., waste discharge requirements) or waivers of waste discharge. Enforcement actions include cease and desist orders, cleanup and abatement orders, administrative civil liability orders, civil court actions, and criminal prosecutions.

Section: 9.5 **Subsection:** Paragraph 5

Commentor: Professor Rhea Williamson

Comment: Add the sentence to the end of the paragraph: If monitoring data indicate that load reductions are not adequate to result in the nutrient target concentrations, then load allocations will be reevaluated and reduced.

Response: The recommended change has been incorporated into the draft.

Section: 9.5.1 **Subsection:**

Commentor: Professor Rhea Williamson

Comment: The numbered measures or alternatives are stated as being equally effective in meeting the 28% reduction. The items help assess, plan, develop regulations and the like, but none of the items actually reduce the nitrogen or phosphorus load.

Response: The commentor has correctly identified that the implementation actions do not directly reduce the nutrient loading. The proposed implementation actions describe a range of potential actions that could be taken to correct the nutrient loading problem. These actions are regulatory mechanisms that provide a framework for reductions to be made. In essence, implementing the recommended actions will lead to reductions in nutrient loading.

Section: 9.5.1.1 **Subsection:**

Commentor: Professor David Jenkins

Comment: The statement identifying hydrologic study monitoring parameters is vague and does not specify what chemical and physical parameters are to be monitored.

Response: The monitoring parameters are discussed and presented in Section 9.7 Monitoring Strategy for TMDL Implementation and Refinement of Source Analysis. A reference to the information has been added.

Section: 9.5.1.1 **Subsection:**

Commentor: Professor David Jenkins

Comment: The bullet refering to the feasibility of establishing a "Septic System Mangement District" is vague.

Response: Creating an entity that can evaluate, manage, and resolve the sewage disposal issues that are unique to this community needs to be evaluated. Language has been added to clarify this point.

Section: 9.5.1.1 **Subsection:** Ground Water

Commentor: Professor Rhea Williamson

Comment: In the bullet discussing transpiration rates and nutrient removal, transpiration rates are not used to describe nitrogen removal.

Response: The language has been changed to clearly reflect "plant uptake".

Section: 9.5.1.4 **Subsection:** Paragraph 6

Commentor: Professor David Jenkins

Comment: It is not clear to the reader what "is considered to be inadequate" in addressing the concerns of the TMDL.

Response: As a result of recent correspondence with Hines Nursery, the referenced statement is no longer applicable and has been deleted.

Section: 9.6 **Subsection:** Table 9-1

Commentor: Professor Rhea Williamson

Comment: Tier I (A) should require interim reports 2 years after USEPA approval.

Response: The recommended change has been incorporated into the draft.

Section: 9.7.1 **Subsection:** Paragraph 1

Commentor: Professor Rhea Williamson

Comment: Targets for biostimulatory substances should be collected year round for the reasons stated above.

Response: The recommended change has been incorporated into the draft.

Section: 9.7.1 **Subsection:** Paragraph 1

Commentor: Professor David Jenkins

Comment: The sentence should specifically state which biostimulatory substances are being refered to.

Response: The recommendation has been incorporated into the draft.

Section: 9.7.1 **Subsection:** Paragraph 2

Commentor: Professor Rhea Williamson

Comment: The Margarita Glen Tributary should be retained as a site. This site has very high total nitrogen and nitrate nitrogen (Table B-2). A long reach of the creek between Oak Crest-3 and Willow Glen-4 is not assessed. Major differences in nutrient concentrations exist between these two sites (Based on the averages for 8/22/00-10/10/00, TN and nitrate are 10.8 and 8.9 mg/L at Oak Crest and are 3.8 and .3. at Willow Glen. Phosphate was always less than 0.5 mg/L at Oak Crest, but was 0.37 at Willow Glen per

Table B-2). For this reason, a station should be added on Rainbow Creek between these two stations and below the agricultural fields.

Response: The recommended changes have been incorporated into the draft.

Section: 9.7.1 **Subsection:** Paragraph 3

Commentor: Professor David Jenkins

Comment: What is "quantified algae abundance"?

Response: The language has been changed to "algal biomass".

Section: 9.7.1 **Subsection:** Paragraph 4

Commentor: Professor David Jenkins

Comment: The statement that "it is not known at this time which factor is the limiting factor" is a key statement and is hidden away here. This statement should be made in an up-front way and be loud and clear or the report will loose all credibility. Additionally, how can N and P be regulated for biostimulatory substances without knowing which limits growth?

Response: A discussion is provided in Section 3.0 Numeric Targets regarding using the ratio of nitrogen to phosphorus (N:P) to indicate which nutrient is expected to limit algal growth. The referenced statement has been modified to state that it is assumed that N and P are co-limiting.

Section: 9.7.1 **Subsection:** Paragraph 4

Commentor: Professor David Jenkins

Comment: What is a "biodynamic analysis"? Please provide a method so that it can be done by the County of San Diego.

Response: The language has been changed to "algal species composition" and a reference has been provided.

Section: 9.7.1 **Subsection:** Table 9-2

Commentor: Professor Rhea Williamson

Comment: Add turbidity to the surface water monitoring. Change the type of sample from grab to field for pH, dissolved oxygen, and conductivity for both surface and ground water monitoring. Investigate use of chlorophyll (planktonic and attached) for the algae growth quantification.

Response: The recommended changes have been incorporated into the draft. The comment regarding chlorophyll as a method for quantifying algal growth is noted.

Section: 9.7.1 **Subsection:** Table 9-2

Commentor: Professor David Jenkins

Comment: Comments in Table 9-2 include:
What is total nitrogen?
What is the difference between total nitrogen and TKN?
Change "grab" to "in situ" for pH and dissolved oxygen.
Why perform both conductivity and TDS?
What type of sample is required for "Quantification of algae growth"?

Response: Total nitrogen is a measure of all forms of nitrogen (i.e., ammonia, nitrite, nitrate, and organic nitrogen). Total Kjeldahl Nitrogen, or TKN, is a measure of ammonia nitrogen and organic nitrogen. "Grab" sample was changed to "in situ" for pH and dissolved oxygen. Since previous monitoring data has been collected, TDS only will be required. "Quantification of algae growth" has been changed to read "Algal biomass (% cover of bottom and/or collection of algal samples)" and can be sampled using in situ or grab sample methods described in USEPA (2000).

Section: Peer Review Request Letter **Subsection:** Attachment 1, page 2

Commentor: Professor Rhea Williamson

Comment: Discussions related to second tier load reductions should indicate that nutrients will be reduced to concentrations "less than" the biostimulatory substances targets.

Response: Comment noted.

Appendix L – Public Comment Letters For Public Hearing on May 8, 2002

L-1 County of San Diego

L-2 Hines Nurseries

L-3 U.S. Environmental Protection Agency

L-4 San Diego County Farm Bureau

Appendix L – Public Comment Letters

L-1 Gary Erbeck, Director
Department of Environmental Health
County of San Diego
Letter dated April 23, 2002

031072

County of San Diego

GARY W. ERBECK
DIRECTOR

DEPARTMENT OF ENVIRONMENTAL HEALTH
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RICHARD HAAS
ASSISTANT DIRECTOR

April 23, 2002

SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD
2002 APR 24 P 1:02

Mr. John H. Robertus, Executive Officer
California Regional Water Quality Control Board
San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123

Dear Mr. Robertus:

WRITTEN COMMENTS ON PROPOSED BASIN PLAN AMENDMENT MODIFYING PORTIONS OF CHAPTER 4, IMPLEMENTATION TO INCLUDE RAINBOW CREEK NUTRIENT TMDLS AND IMPLEMENTATION PLAN

Attached are the County of San Diego's written comments on the proposed Basin Plan Amendment, modifying portions of Chapter 4, Implementation, to include Rainbow Creek Nutrient TMDLs and Implementation. The County welcomes any comments on its submission and encourages the California Regional Water Quality Control Board, San Diego Region, to consider a meeting to discuss our response prior to the Public Hearing and Notice of Filing Scheduled on May 8, 2002.

Please contact Jack Miller at (619) 338-2201, if you have any questions concerning our comments or would like to establish a meeting time.

Sincerely,

GARY W. ERBECK, Director
Department of Environmental Health

cc: Lisa Brown, SDRWQCB
Don Steuer, Land Use & Environment Group
Rod Lorang, County Counsel
Jack Miller, DEH
Jon Van Rhyn, DEH

County of San Diego Comments on
Proposed RWQCB Resolution R9-2002-0108
Rainbow Creek TMDL and WLA
(Submitted April 23, 2002)

Introduction

The Rainbow Creek Total Maximum Daily Load (TMDL) proposal addresses Nitrogen (N) and Phosphorus (P) loadings to Rainbow Creek from point source discharges to surface water, non-point source discharges to surface water, and from groundwater discharges into the creek. The current 303(d) listing for Rainbow Creek was put in place in 1996, and is for eutrophic conditions. However, Regional Water Quality Control Board (RWQCB) staff have acknowledged in their draft reports and in response to peer reviewer comments that there is presently no evidence of eutrophic conditions in Rainbow creek. A revised proposed 303(d) listing for Rainbow Creek is scheduled for a hearing before the State Water Resources Control Board (State Board) in late May of this year.

Based on the draft RWQCB staff report that supports this TMDL proposal, the most significant sources of N (in descending order) are undeveloped land, residential septic systems, orchards, agricultural fields, and commercial nurseries. Septic systems are not a significant source of P. The RWQCB proposal includes a Waste Load Allocation (WLA) for N and P for each of these categories of sources.

None of these identified categories of significant sources involves discharges by the County.

Despite the fact that it is not a significant discharger, the County should play a significant part in regional efforts to address water quality in Rainbow Creek. The County is the principle land use authority for this watershed. The County issues or denies permits to install most conventional septic systems County-wide under an existing RWQCB delegation.[1] The County also responds when sewage from septic systems surfaces and poses a health threat. Finally, the County has established working relations with the agricultural community that are

[1] The RWQCB remains the principle agency regulating wastewater system discharges to groundwater; the County's delegated authority is limited. For example, the County cannot issue permits for or require installation of advanced domestic wastewater systems. The RWQCB and the County will need to review their programs for onsite sewage treatment systems to implement A.B. 885, enacted last year. This could results in significant program changes sometime after 2004.

likely to be helpful in seeking to reduce N and P loadings from nurseries, orchards and crops.

The County also has a role to play in this process as a "local agency" subject to Water Code section 13225(c). The County acknowledges that the RWQCB has authority pursuant to that subsection "to require as necessary [the County] to investigate and report on any technical factors involved in water quality control or to obtain and submit analyses of water . . . ." The County notes however that this authority is subject to conditions.[2]

While the County is not a significant discharger in this watershed, the County intends to continue to work with the RWQCB to address water quality issues in this watershed (and County-wide) on a coordinated and cooperative basis. The County has recently demonstrated its resolve to cooperate with the RWQCB in many ways—e.g., by accepting the municipal stormwater permit;[3] by stepping forward as principle copermittee under that permit without seeking reimbursement for coordination costs; by developing model ordinances and program elements that were adapted and used by other copermittees; and by continuing its support for and leadership of Project Clean Water (also without reimbursement). The County is also cooperating with other local governments and state and federal agencies to ensure that appropriate watershed planning is undertaken throughout the County.

Summary of County Position on the Proposed TMDL and WLA

The County as a governmental entity hopes and intends to work with the RWQCB to address water quality issues affecting Rainbow Creek. However, the County will not be able to support the implementation of this TMDL and WLA as currently proposed by RWQCB staff. Significant changes are needed to gain the County's support and to allow effective RWQCB/County cooperation.

County staff have worked with RWQCB staff during the development of this proposal. The County agrees with RWQCB staff on many fundamental points, e.g., that any strategy for improving water quality in Rainbow Creek should

[2] Conditions imposed by the Water Code are included in subsection 13225(c). First, the requirement must be "necessary." Necessary reports can be required "provided that the burden including costs, of such reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained therefrom." State laws concerning unfunded mandates may also require that the state provide funding to the County to carry out any directives issued pursuant to subsection 13225(c). The County does not waive its right to assert in the appropriate forum that directions issued to the County pursuant to this subsection are unfunded state mandates.

[3] The County's decision not to petition or appeal this permit was made only after significant modifications were made to the permit in response to comments by the County and others.

include phased implementation of a TMDL and WLA; that more study is needed to define problems, to track progress and to better inform key decisions; and that an appropriate opportunity should be provided to achieve "voluntary" reductions in loadings before drastic regulatory measures are applied to septic systems, orchards and crops. The County also agrees with RWQCB staff that the County should play a substantial role both in conducting further studies where needed, and in securing load reductions from septic systems and agricultural activities.

The County acknowledges that some of the most significant comments it provided during the development of this proposal were accepted and implemented by RWQCB staff and/or legal counsel. In particular, the County wants to acknowledge that the proposal calls for "requests" that the County take action in many areas where RWQCB staff had formerly proposed to attempt to compel County action.

These areas of agreement are significant and provide a good foundation for cooperation. However, many other significant County concerns were not resolved by RWQCB staff. This TMDL/WLA proposal remains fundamentally flawed for the following reasons:

1. The proposal has not been peer reviewed. (A less stringent proposal was peer reviewed.)

2. The proposal is not consistent with the law or with the available data.

3. The proposal is not realistic in seeking a 50% reduction in releases of N from residential septic systems.

4. The proposal sets policy precedents that are unacceptable to the County, and that are likely to be unacceptable to the San Diego community generally once those policies are understood.

These concerns are addressed further in the text that follows.

We appreciate the opportunities for dialog that RWQCB staff and mid-level managers have provided to County staff and legal counsel. The County offers these written comments in the same spirit of cooperation as its prior comments. Many of these comments were offered to RWQCB staff orally after the release of the proposed resolution package. We understand that RWQCB staff are still considering some of those comments, and we do not mean by repeating a comment here to imply that RWQCB staff have finally and firmly determined to oppose the County's position on the point addressed.

While the County will continue to work with RWQCB staff, these formal comments are direct and specific. The County believes that at this stage in the TMDL promulgation process, a clear written statement of its concerns and positions may assist RWQCB senior managers, legal counsel, and Board members. We hope to resolve the issues raised in these comments in a manner that would make continued County / RWQCB cooperation possible. We hope that RWQCB managers and Board members will accept the offer of cooperation that the County is extending with these comments. The County does of course welcome further discussion of its proposals—before, during, or after any public hearing or RWQCB action on this proposal.

The County's efforts to resolve these issues are not based solely on the effects this TMDL would have on the County or on Rainbow Creek. This TMDL will be one of the first TMDLs implemented in this region, and it will be closely watched. Therefore, this TMDL should be crafted and implemented in a manner that will lay a strong foundation for public and stakeholder acceptance of TMDLs in San Diego. As proposed, however, this TMDL would likely have the opposite effect: it is likely to undermine public confidence in the RWQCB's TMDL process, to the ultimate detriment of water quality in the San Diego region.

The specific comments that follow address timing, scientific flaws in the proposed TMDL, and cost sharing and other changes to this proposal that would facilitate continued RWQCB/County cooperation.

This TMDL Should Be Delayed Until a Revised 303(d) Listing is in Place

The current 303(d) listing for Rainbow Creek was put in place in 1996, and is for eutrophic conditions. But, RWQCB staff have acknowledged in their draft reports and in response to peer reviewer comments that there is presently no evidence of eutrophic conditions in Rainbow creek. This may be due in part to reductions in nutrient loadings achieved since 1996.

In response to changed conditions, the RWQCB has proposed to revise the impairment listing for Rainbow Creek. That proposed revision is set for review by the State Board in late May of this year. The revised listing would directly address loadings of N and P that (1) are causing violations of the drinking water standard for nitrate; and (2) are believed to be causing N and P levels in the creek in excess of the Basin Plan's narrative objective for biostimulatory substances. That narrative objective states: "Inland surface waters, . . . shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses."

As a matter of law, TMDLs must be promulgated after and must be based on impairment listings. Peer reviewers have noted and RWQCB staff have acknowledged that the current impairment listing for Rainbow Creek no longer has a basis in fact. Moreover, it is clear that RWQCB staff are not proposing a TMDL to address the eutrophication-based impairment listing for Rainbow Creek, but are instead proposing a TMDL that *anticipates* the modifications to the Rainbow Creek impairment listing that are now pending at the State Water Resources Control Board. This sequencing is backwards, legally and scientifically. It is an abuse of the public participation processes the law mandates for 303(d) listings and for TMDLs. No TMDL for Rainbow Creek should go forward until a revised impairment listing for Rainbow Creek is in place.

The County recognizes that the RWQCB is committed to promulgating a TMDL for Rainbow Creek in the very near future. This appears to be achievable. Rainbow Creek is assigned an MUN beneficial use in the basin plan, and available data show directly that parts of Rainbow Creek sometimes contain nitrates in excess of the applicable drinking water standard. Therefore, there is little doubt that a revised 303(d) listing will support a TMDL for nitrates based on this drinking water standard. The March 2002 staff report would support this TMDL. Therefore, it should be feasible to promulgate an appropriate TMDL to address this drinking water standard with virtually no delay, once a revised 303(d) listing is in place.

A TMDL for Rainbow Creek should be delayed briefly, and should be limited in its initial scope, for two additional reasons.

First, this basin has not yet reaped the full benefits that can be expected when appropriate technology-based controls have been in place at all commercial nurseries for a reasonable period of time. These nurseries are discrete and significant sources of contamination, and they are still in the process of developing and implementing nutrient control and irrigation control BMPs to limit N and P in their discharges. In addition, the draft Staff Report notes (at pp. 3-4) that one commercial nursery in the watershed has actually placed a dam in Rainbow Creek, and uses the creek to impound and recirculate irrigation water. Restoring the natural flow of the creek may have significant effects. Whether the controls put in place at these sources are "voluntary" or "mandatory" is not the key issue here.[4]

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[4] RWQCB staff have asserted to County staff and legal counsel that discharges from these nurseries are "agricultural return flows" and therefore are not point source discharges subject to the federal Clean Water Act. If this were correct, then the Clean Water Act would not require that these nurseries be placed under permit before a TMDL was developed. Without commenting on the assertion that nurseries may be exempt from *federal* discharge permits, the County notes that state Water Code section 13260(a) allows the RWQCB to issue and enforce WDRs to "any person discharging waste," and that Water Code section 13050 defines "waste" to

In either case, it is clear there are further reductions in pollutant discharges that can be attained using cost-effective technology-based measures. It will take some time to see what further effects these reductions in N and P loadings will have on Rainbow Creek. The interim reductions already achieved have had a significant beneficial effect on the creek.

A second reason to limit the scope of an intial TMDL is that the state has just established and is in the process of implementing a new program, complete with financial incentives, that may allow some properly functioning conventional septic systems in this watershed to be replaced with advanced systems, that would discharge less N. TMDL implementation in this watershed should be tied to the phased implementation of AB 885, but those new programs will not be in place until 2004.

The short delay and initial limitations proposed here are consistent with the federal Clean Water Act and the state Water Code. TMDLs are intended to be "second-step" programs, deployed to address water quality problems that persist after technology-based controls have been implemented. TMDLs that are promulgated before reasonable technology-based controls are in place may be unnecessary or poorly calibrated.

It is important to note that the initial TMDL that the County proposes here need not interfere with progress on water quality improvement in Rainbow Creek, in comparison to the TMDL proposed by RWQCB staff. The TMDL proposed by RWQCB staff would allow four years to achieve this drinking water standard. Before these initial efforts to attain the drinking water standard were completed, a revised 303(d) listing would be in place, more would be known about the creek, and the AB 885 program would be taking shape. A revised TMDL for N and P could take this new information into account, and still be promulgated before implementation of an initial TMDL had been completed.

<u>The Proposed TMDL is Scientifically Flawed</u>

The proposed TMDL has not been peer reviewed. The RWQCB's peer reviewers examined a November, 2001 draft staff report. That report proposed a TMDL for N of 3,400 kg/yr, plus a 2,400 kg/yr allowance for undeveloped land and margin of safety. (November, 2001 draft staff report at pp. 25-27.) No peer

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include discharges from "any producing operation." Commercial nurseries that discharge polluted water from a pipe into a creek could therefore be required under state law to obtain WDRs, whether or not the nurseries are required to have permits under the federal Clean Water Act.

reviewer has endorsed the much more stringent TMDLs actually proposed in the draft Basin Plan Amendment.

A TMDL program for Rainbow Creek is also subject to two special complications that increase the importance of basing the TMDL on sound science.

First, because this is one of the first TMDLs in San Diego, it will receive extra scrutiny as an indicator of RWQCB's intentions and standards for the TMDL program in San Diego generally. Stakeholders with no interest in Rainbow Creek itself will review this TMDL looking for flaws in the RWQCB's use of data, adherence to the law, scientific process, and decision-making process. If this TMDL is to advance the cause of water quality region-wide, it should merit the support of stakeholders broadly as a model for future TMDLs. It must have a strong scientific foundation, must set reasonable goals that will be broadly acknowledged to be appropriate and important, and must allocate costs and other pain in a manner that is generally acknowledged to be fair. It must be capable of being implemented at a reasonable cost, i.e., at a cost that can be justified by the benefits that will be obtained.

Second, a Rainbow Creek TMDL is unlikely to be limited to imposing more stringent numerical limits on effluent discharges by significant point sources. Instead, people will be affected where they live, and agriculture will be affected. Success in reducing loading of pollutants from existing septic systems, from agricultural activities, and from land uses such as parks and preserves is not merely a matter of governments wanting to do the right thing and having the political will to impose necessary regulations. Success in these areas will ultimately depend on the consent of the governed. Therefore, a Rainbow Creek TMDL must also be a tool for building consensus among those directly affected.

These aspects of this process increase the importance of proposing a TMDL that is both well founded scientifically, and well calibrated. The TMDL proposed by staff does not appear to be calibrated to fit the available science, or fundamental policies for TMDLs.

<u>The Proposed TMDL Is Not Realistic in Seeking a 50% Reduction in Releases of N from Residential Septic Systems</u>

Achieving a 50% reduction in septic system-derived loadings of N to Rainbow Creek is almost certainly not feasible, and is probably physically impossible under the most ideal of soil conditions, unless significant numbers of properly functioning conventional septic systems are replaced with very costly alternative systems. Properly functioning conventional septic systems are not designed to remove large quantities of N. They are designed to convert organic N and

ammonia to nitrate, to remove some N altogether through denitrification, and to remove all pathogens. Additional N is removed by plant assimilation in the septic system leach field. While failing septic systems would undoubtedly add more N to the subsurface than functioning systems, most of the systems in the Rainbow Creek watershed are functioning properly.

The AB 885 program will provide new tools to address releases of N from septic systems, where those releases impair beneficial uses. Those tools may include a revolving, low-interest loan fund. The determination of a realistic WLA for septic systems should be deferred until further progress is made in defining and implementing programs based on AB 885.

If reduction in loadings from onsite wastewater treatment systems must be achieved more quickly than would be the case under AB 885, or if ultimate reductions must exceed what AB 885 programs would achieve, then the RWQCB must take the responsibility to secure those reductions. As noted above, the regulation of discharges to ground water from onsite wastewater treatment systems is primarily an RWQCB responsibility, and the delegation that County has accepted (i.e., to administer a permit program for new conventional septic systems) is limited in scope. The County should not be asked to accept responsibility to secure greater reductions in septic system loadings of N than AB 885 programs will achieve.

The Proposed TMDL Is Not Internally Consistent

The proposed TMDL is scientifically and mathematically flawed. In recent discussions with County staff and legal counsel, RWQCB staff were unable to explain how the allowable loadings proposed in this TMDL are related to estimated natural loadings to Rainbow Creek, or to estimated loadings required to reach the staff's numerical water quality targets.

A simple table that is not contained in the draft staff report or the proposed Resolution or Basin Plan Amendment, but which is based entirely on the numbers included in those documents, is enlightening:

How Much Nitrogen?

Item	Value	Source
N loading from remaining undeveloped land	1,507 kg/yr	Staff Report, p. 13
% of land in the basin that is still undeveloped	63 %	Staff Report, p. 13
Total N loading if all land was undeveloped	2,403 kg/yr	calculated[5]
Total N nominally[6] allowed by the TMDL	≤1,507 kg/yr	Plan, p. 2
Total N to achieve target of 1.0 mg N/L	≤402 kg/yr	Plan, p. 2, note 1
Total N actually allowed by the Resolution	≤402 kg/yr	Plan, pp. 2-3

Even though pre-human nitrogen loadings to Rainbow Creek were likely to have been about 2,400 kg/yr, this TMDL package proposes a nominal TMDL for N that would require total N loadings to be reduced to less than two-thirds that level. Under this scenario, undeveloped land could be left to nature and could continue to release N to the creek, but all N discharges from land touched by man (even if only touched by designation as a "preserve") would eventually have to be eliminated. It would *not* be sufficient merely to reduce discharges back to natural levels.

Moreover, RWQCB staff's proposed approach to actually implementing this TMDL would not treat the TMDL itself as a stopping point. Instead, the draft Basin Plan Amendment proposes that incremental reductions in N loading must continue to be achieved somehow until the numerical objective of 1.0 mg N/L is met in the creek. (See draft Amendment at pp. 2-3.) If RWQCB staff are correct that meeting these targets will require reducing loadings to 402 kg N/yr as stated in footnote 1 to the Resolution, then the effective TMDL for N is 402 kg/yr, not

[5] Calculated at 1507 kg/yr divided by 0.627. This applies the loading rate for remaining undeveloped land to the entire land area of the basin, to approximate the "natural" or "baseline" load of N to Rainbow Creek prior to any human intervention. The calculation is potentially inaccurate to the extent already developed land would have had a different natural loading factor than remaining undeveloped lands.

[6] The draft Resolution nominally sets a Nitrogen TMDL of 1,507 kg/yr. (Resolution, p. 2.) However, the Resolution also states that incremental reductions of 10% every four years will be required "*until the biostimulatory targets for nitrogen and phosphorus are met.*" (Resolution, pp. 2-3.) In other words, it is these numeric targets for water quality, not the nominal TMDL that would define the stopping point for further controls.

1,507 kg/yr. This would require total loadings of nitrogen to be reduced to 402 kg/yr—*less than one fifth of estimated natural levels.*

Efforts to reduce N to these levels would themselves have environmental consequences for the lands affected. Reducing loadings of N and P to Rainbow Creek to below the level of natural loadings could also have environmental impacts on Rainbow Creek—under the plan proposed by RWQCB staff, Rainbow Creek would receive less N and P than it did in its natural condition. The environmental effects of driving nutrient loadings down to these unnatural levels were not disclosed or addressed in the environmental checklists and analyses prepared for this project.

None of these numbers are certain, of course. But it is nonetheless clear that the RWQCB should not launch the TMDL process in San Diego by proposing to set TMDLs for Rainbow Creek at levels that are two-thirds to one-fifth of natural loadings, based on an impairment listing that staff concedes has no basis in fact. To do so would be scientifically unsupportable, inconsistent with the Water Code, and politically unwise. Any such proposal would be damaging to the successful implementation of TMDLs in San Diego and elsewhere.

<u>Whether the Basin Plan Water Quality Objective for Biostimulatory Substances in Rainbow Creek is Exceeded or Not is Still Uncertain</u>

The Basin Plan's narrative water quality objective for biostimulatory substances prohibits substances in concentrations that promote growth "to the extent such growths cause nuisance or adversely affect beneficial uses."

RWQCB staff consider the algal and emergent plant growth they have visually observed in Rainbow Creek to be excessive. (See draft Staff Report, p. 7.) This observed condition is not creek-wide. Rainbow Creek is about five to six miles long. Much of it is shaded by a plant canopy, and no excess algae have been observed in shaded areas. The growth of algae was visually judged by staff to be excessive at only two locations in 1999, and at only four locations in 2000. All of these areas have shallow slow moving water and no overhanging canopy. (Draft Staff Report at p. 7-8, and attached photos.)

Moreover, these visual characterizations may not be reliable even as to the locations called out by staff. Two of the RWQCB's three peer reviewers have questioned the use of visual observations alone to determine whether algae and plant growth is "excessive." Dr. Rhea Williamson notes that determining visually whether there is excessive algae growth "can be misleading." (Attachment F.2, at second [unnumbered] page, first comment re page 5 of the staff report.) Dr. David Jenkins asks, "where are the data on emergent plant and algal numbers to support

your statement that both are 'excessive'." RWQCB staff were unable to respond with data, as no data are available yet to make this showing. (Attachment F. 3 at "Summary of asterisked comments" for page 8 of the staff report).

Another factor not explicitly considered in the draft Staff Report is that the Basin Plan water quality objective is not violated merely by accelerated or "excessive" growth of algae or emergent plants. The plan narrative objective is violated only if growth is so excessive it is a nuisance, or so excessive it adversely affects beneficial uses.

A principle reason RWQCB staff have not made a convincing scientific case for impairment by biostimulatory substances may be that staff misconstrue the Basin Plan as also setting numerical Water Quality Objectives for N and P. The Basin Plan states that "a desired goal for total phosphorus appears to be 0.1 mg/L total P." Staff would style this as creating a Water Quality Objective. Staff admit that no "analogous threshold value" for N is set in the Basin Plan. (Staff Report at p.7.) They nevertheless derive a limit of 1.0 mg/L for N from a discussion in the Basin Plan of natural ratios of N to P that should be used as default values in the absence of any water-body-specific data. Staff characterize even this constructed number, which is derived from rather than called out in the Basin Plan, as a "Water Quality Objective." (Draft Staff Report p.6, and draft Resolution p.1, Finding No. 5).

The scientific basis for both of these targets is weak. Dr. David Jenkins of U.C. Berkeley, one of the RWQCB's peer reviewers for the draft staff report, addressed these targets as follows: "An arbitrary assumption that the P limit should be one-tenth of the N limit is absolutely insupportable, bordering on the ridiculous! Reductions in P and further reductions in NO_3-N must be justified on the basis of determining which limits algal growth in the Creek." (Attachment F.3, transmittal letter at page 1.)

In the RWQCB staff's response to this comment, "absolutely insupportable, bordering on the ridiculous" becomes merely "unfounded." Staff's more substantive response is essentially that the Basin Plan allows the use of a 0.1 mg/L target for P, and a ratio-based 1.0 mg/L target for N, when no data are available. (Response to comments at page 2.) RWQCB staff have chosen to respond to a stinging scientific objection by a designated peer reviewer by (1) softening the true force of that comment in their summary, and (2) by offering up a legal rather than a scientific response to the comment.

But, RWQCB staff are also incorrect on the application of the law. The "apparent" or "desired" "goal" for phosphorus that staff would rely on was not identified during the Basin Plan amendment process as a numerical Water Quality

Objective, for informed public comment and RWQCB adoption. It is therefore not a Water Quality Objective, but is only what the Basin Plan says it is: a number that appears to be a desirable goal. Similarly, the limit of 1.0 mg/L total N that staff derive by applying a 10:1 ratio to this apparent desirable goal is also not legally a Water Quality Objective, or even an identified "desirable goal." It is a default in the absence of any data. The RWQCB should be gathering the data to avoid a resort to such defaults, rather than proclaiming default values to be Water Quality Objectives that should drive the TMDL process.

Any TMDL for biostimulatory substances in inland surface waters in San Diego must be based on the Basin Plan narrative standard as the applicable Water Quality Objective. Staff's targets of 0.1 and 1.0 mg/L for P and N respectively should be properly identified as interim numerical targets, rather than as Water Quality Objectives. Basic studies should be completed in the near future to allow replacement of these default values with numerical targets that reflect actually going on in Rainbow Creek.

The evidence currently available to the RWQCB to establish and characterize a biostimulatory impairment of Rainbow Creek is weak and equivocal. It does not provide an adequate basis for the public to accept the very stringent TMDL that RWQCB staff have proposed.

County Proposals for TMDL Amendments and Inter-Agency Cooperation

TMDL programs for Rainbow Creek should be implemented on a phased basis, both to sequence regulatory actions properly and to ensure that appropriate science is in place to support policy decisions.

Phase one of this process is underway, and should continue with promulgation of an interim TMDL for nitrates based on the applicable drinking water standard for nitrates. This interim TMDL should be put in place after completion of the 303(d) listing amendment process for Rainbow Creek.

During the early stages of implementing this interim TMDL, appropriate studies should be pursued on a cooperative and shared-cost basis to determine whether and if so where Rainbow Creek is actually impaired for biostimulatory substances based on the narrative standard in the Basin Plan. These studies should also determine the actual levels of N and P that are limiting for biostimulatory effects in the potentially impaired portions of this creek. The studies should confirm or refine estimates of natural N and P loadings to Rainbow Creek, and should determine the characteristics the creek would have if only natural loadings entered the creek.

During this period the County and the RWQCB should also cooperate to pursue the best available opportunities to reduce incremental man-made loadings of N and P to Rainbow Creek. This should include securing all appropriate additional reductions at commercial nurseries.

The County and RWQCB should also cooperate to implement AB 885 programs for onsite wastewater treatment systems.

A second phase of TMDL implementation should be based on a revised 303(d) listing and on the results of phase one studies. This could mean that more stringent TMDLs for N and P would be put in place. However, because the numbers in the draft Staff Report do not add up, the RWQCB should also be open to revising the designated beneficial uses of Rainbow creek, or numerical targets for N and P to support those uses, to reflect conditions in the creek that would be consistent with natural loadings. Any numerical targets for N and P concentrations in the creek, and any revised TMDLs, should be set at levels that will allow N and P loadings to remain at levels at least equal to base-line or natural loadings. Higher loadings should be tolerated if those existing loadings do not cause a nuisance or impair valid beneficial uses. Unless the RWQCB agrees that the results of future studies will be used appropriately during the regulatory process, the County would have little interest in coordinating and in helping to fund such studies.

Some specific actions that would be needed to implement this two-phased strategy are as follows:

1. Respect the Basin Plan. Staff's numeric targets for N and P should not be characterized anywhere in the Resolution, Basin Plan Amendment, or Staff Report as Water Quality Objectives. Only the narrative standard for biostimulatory substances actually established by the Basin Plan, after clear public notice and an opportunity to comment, has this status.

2. Cooperate to practice good science. The RWQCB must progress beyond invocations of the Basin Plan in ways that peer reviewers can characterize as scientifically "absolutely insupportable, bordering on the ridiculous," to solid science. Impairments must be verified and localized. The RWQCB must determine how N and P interact to stimulate algal growth in specific parts of the creek. TMDL implementation must be focused on these specific problems. The County is prepared to participate in this study process.

3. Set realistic TMDLs. In phase two, TMDLs must not be set lower than estimated natural loadings for the basin, and should be set higher if that is consistent with protecting the beneficial uses of Rainbow Creek that are identified as being achievable after further study.

4. Give the County more flexibility re study designs, monitoring, and reporting. The County remains willing to *coordinate and to contribute* to the cost of the studies and monitoring that are needed in this watershed.[7] However, read together, the draft Basin Plan amendment and draft Staff Report set very specific mandatory parameters for this work. Those specifications would lock in future research for a four-year period, and would require the County (or the County and others) to spend more than $1.0 million for studies, monitoring and reports. Much more flexibility is needed for the County to willingly undertake this work.[8]

5. Do not characterize the County as a "responsible party" or as a "discharger" for this watershed. The County acknowledges that is a "local agency" that is subject to RWQCB direction related to studies and monitoring, under certain conditions, pursuant to Water Code section 13225(c). The County also acknowledges that it has a significant role to play in this watershed as a land use authority, a public health agency, and a permitting agency for some new septic system installations. However, these various roles do not make the County a "discharger" or a "responsible party" for N and P loadings to Rainbow Creek.

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[7] The draft Resolution (at page 2, item 8.a) proposes to direct the County to "undertake an investigation to access [sic] nutrient loadings to Rainbow Creek from groundwater and septic systems." This section further states that the County "has indicated a willingness to undertake this investigation." That statement is incorrect. The County indicated a willingness to coordinate this study effort. County staff also provided basic study parameters and a cost estimate for an "ideal" study effort, including not only a study of loadings from septic systems but also other research. RWQCB staff have proposed to transform these study parameters and cost estimates into mandatory requirements—including a requirement that the County in fact spend the amounts it estimated would be needed for an ideal study of all issues. The County did not state that it was willing to do this work in exactly the manner postulated in its cost estimate, and thereafter specified in the draft Staff Report. The County did not indicate that it was willing to pay the entire cost of this work. The County is not willing to be locked into an inflexible four-year research plan, and is not willing to bear the entire cost of any studies of Rainbow Creek by itself.

[8] In the absence of an agreement concerning this work, the County would consider whether to challenge directives based on Water Code section 13225(c) as being inconsistent with the Water Code, and as unfunded state mandates. See footnote 2.

6. Make and support required findings before imposing investigation, reporting or analysis requirements on the County. Water Code section 13225(c) allows the RWQCB to impose these requirements on a local agency only if the requirements are "necessary" and only provided the burdens of the imposition including costs are reasonable in comparison to the need for the report and the benefits to be obtained therefrom. RWQCB staff have not done the work required to support the imposition of study requirements on the County under these standards. They have reported the costs of an ideal study as reported to them by County staff, but analysis and findings concerning necessity, burden, and benefits are lacking. The draft Resolution includes proposed Finding No. 17, but that is a general finding concerning all benefits and all costs of the TMDL, not a finding that addresses the requirements of section 13225(c).

7. Share study costs equitably, including a substantial state contribution. The County is not a significant discharger in this watershed, and is not the principle governmental agency with responsibility for promulgating and implementing TMDLs. The studies the RWQCB is seeking would provide basic data and science that should underlie any TMDL. This work should be the RWQCB's job. The County is willing to contribute to needed study efforts, but will not bear the entire cost of needed studies, plans and monitoring. The RWQCB or state, and major dischargers in the watershed, must also provide significant funding. The County's obligations to do work pursuant to section 13225(c) must be contingent on receipt of funds from those sources.

8. Set realistic load reduction targets for onsite wastewater treatment systems, tied to AB 885 program implementation. As discussed above, achieving a 50% reduction in septic system loadings watershed-wide is almost certainly not feasible and is probably physically impossible under the most ideal of soil conditions, unless properly functioning systems are replaced. Replacement are only likely to be achievable to the extent state financial subsidies are provided under the AB 885 program. Waste load allocations and implementation schedules must reflect these limitations.

9. Don't require reduced discharges of N or P from preserves. Discharges from preserves are natural, background discharges. They cannot be reduced without interfering with preservation of the land in its natural state. Yet, the proposed TMDL would require the same

proportional reductions in N and P loadings from these lands as from agriculture and septic systems.

10. Take reasonable technology-based reductions in loadings from nurseries into account. The RWQCB should secure reasonable further reductions in loadings from commercial nurseries (by voluntary means or through regulation) and should observe the effects of those reductions on Rainbow Creek, before promulgating a TMDL to address biostimulatory impairment of Rainbow Creek. When TMDLs are promulgated, waste loads allocated to these nurseries should begin from their discharges after reasonable technology-based controls are in place.

11. Evaluate alternatives to "proportional" waste load allocations. RWQCB staff have proposed to reduce allowable loads from significant categories of sources in proportion to baseline loads. That approach does not take into account the feasibility, costs, or cost-effectiveness of further controls, and does not address fairness issues. The resulting WLA for septic systems is infeasible, as discussed above. The resulting allocation for other categories of sources may not take advantage of opportunities to secure further reductions in loadings at modest cost.

Appendix L – Public Comment Letters

L-2 E. G. (Bud) Summers Ph.D.
Hines Nurseries
Letter dated April 23, 2002

Testimony of E.G. (Bud) Summers, Ph.D.
Hines Nurseries
Before the SDRWQCB on May 8, 2002

Testimony of Richard A. Watson
For Hines Nurseries
Before the SDRWQCB on May 8, 2002

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Hines Nurseries
A Hines Horticulture, Inc. Company

SAN DIEGO REGIONAL
WATER QUALITY
CONTROL BOARD

2002 APR 24 A 10: 11

April 23, 2002

VIA FACSIMILE AND
FIRST CLASS MAIL

Ms. Lisa Brown
California Regional Water Quality Control
Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92124-1324

Re: March 22, 2002, Nutrient Total TMDL for Rainbow Creek

Dear Ms. Brown:

On behalf of Hines Nurseries, I want to thank you for the opportunity to comment on the Nutrient Total Maximum Daily Load (TMDL) for Rainbow Creek. We also appreciate your consideration of our prior comments submitted in connection with the TMDL, including those forwarded to you by letter dated January 24, 2002, along with the comments provided on behalf of Hines at the workshop on April 11, 2002. Hines recognizes that in response to our January 24, 2002 letter, certain factual issues have already been addressed and that additional factual information has been included in the TMDL. These changes provide a more accurate explanation of the background involving Rainbow Creek and the modifications made previously to the Creek in the area in and around what is now the Hines Nursery. Our prior correspondence also confirmed Hines' commitment to voluntarily cooperate with the Regional Board in achieving its nutrient goals for Rainbow Creek, particularly through Hines' commitment to implement a new recycling system at a cost to Hines of $1.5 to $2 million or more, to be expended over the next approximately 3 years. A comprehensive set of plans has already been provided to your office for review and consideration, and Hines is working with the County of San Diego to obtain their approval of the plans and to obtain all other necessary approvals.

The following comments are designed to follow up on our prior comments to the Regional Board, including the comments submitted at the recent workshop, and to emphasize some of the more significant concerns that Hines has with the draft TMDL. Hines respectfully requests that the comments that follow be considered in the Regional

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Board's evaluation and adoption of any TMDL for Rainbow Creek, along with all previous comments submitted on behalf of Hines.

1. Certain Statements Referencing Hines in the TMDL Should Be Deleted.

Initially, Hines requests that the language on page 47 of the Draft TMDL in connection with Hines purportedly being in violation of waste discharge prohibitions for discharges of waste to waters of the State in a manner causing a condition of pollution, contamination or nuisance, be deleted for the reasons previously set forth in our prior correspondence of January 24, 2002, and for reasons previously raised with Board staff in discussions involving Hines' involvement with the Site (only since 1996) and its operations. Hines has continued to operate the tailwater recovery system that was originally installed by Flynn-Rainbow Nurseries. This recovery system was discussed in the Final Report of the Rainbow Creek Non-Point Source Nitrate Reduction Program dated January 31, 1997 (a Report funded through the Regional Board), as a demonstration of the "potential for reducing nursery runoff with an irrigation system retrofit". In fact, the Report concludes that Flynn-Rainbow Nurseries was one of three major nurseries (along with Hines' Irvine Nursery) with "very successful tailwater recovery and recycling programs." (See Report, p. 44.) Moreover, now that Hines owns the subject property, it has moved ahead with design of an improved recycling system, and plans for such system have already been submitted to and reviewed with the Regional Board.[1]

In short, Hines firmly believes that the evidence shows that Hines has not caused or in any way contributed to a condition of pollution, contamination, or nuisance, and that to the contrary, its actions, and those of its predecessor have significantly improved the condition of Rainbow Creek. These improvements are also evidenced by the Regional Board's report entitled "Total Maximum Daily Load for Nutrients, Rainbow Creek, San Diego County," dated April 2000. This report concludes that tests conducted in 1998-1999 have shown a reduction in average nitrate concentrations in Rainbow Creek at Willow Glen Road from the 1986 maximum annual average of 215.8 mg/l down to 7.7 mg/l. This monitoring report, combined with the existing recycling system Hines has been implementing for several years in connection with its irrigation waters, and the fact that a large majority (up to 80% or more) of its irrigation waters are

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[1] The current tailwater recovery system captures and recycles nutrients discharged to the creek by other nurseries as well as other land uses upstream of the temporary berm used to deflect water into Hines' recovery pond. Hines is currently removing constituents contributed by others, but these will not be removed by its new recycling system which, when completed, will avoid the creek.

already recycled, is strong evidence that Hines has not taken any action that has created a condition of pollution, contamination, or nuisance.

In discussions with your office over the language on page 47, Regional Board staff have indicated that this language would be deleted from the TMDL, in light of the actions of Hines over the years, and the lack of evidence to justify such statements.

2. Rainbow Creek Is Not Listed As Being Impaired For Nutrients, and the TMDL Shows There Is No Visible Eutrophication.

The TMDL in issue is entitled a "Nutrient TMDL" for Rainbow Creek. Yet, language in the TMDL itself shows that Rainbow Creek is presently only listed on the Clean Water Act's Section 303(d) list for "eutrophication." There is no present listing of Rainbow Creek for nutrients. Hines is aware that the issue of whether Rainbow Creek should be listed as being impaired for nutrients is being addressed by State Board staff, in its review of the 2002 303(d) list. However, as of this date Rainbow Creek has ***not*** been listed as an impaired water body because of nutrients.

Thus, the "Nutrient" TMDL in issue is being proposed to address "eutrophication," not nutrients. Yet, the TMDL itself provides, in very clear terms, that "***eutrophic conditions have not been observed in the creek*** . . . ." Accordingly, as eutrophic conditions have not been observed in the creek, and as Rainbow Creek has not been listed as being impaired as a result of "nutrients," until such time as Rainbow Creek is identified on an adopted 303(d) list as impaired for nutrients, or at least until eutrophication has been identified, it is inappropriate to establish a TMDL for Rainbow Creek.

3. A Nutrient TMDL is Not Yet Suitable for Calculation.

An additional concern created by the premature establishment of a Nutrient TMDL for Rainbow Creek, is the requirement within the Clean Water Act that only those TMDLs that are "suitable for such calculation" are to be developed. (See 33 U.S.C. § 1313(d)(1)(c).) In the regulations to the Clean Water Act, EPA defined when TMDLs are "suitable for calculation" by finding that all pollutants are suitable for calculation under "proper technical conditions" in which to base the development of the TMDL. (See 43 Fed. Reg. 60662). The phrase "Proper Technical Conditions" was explained by EPA as referring to "the availability of the analytical methods, modeling techniques and a data base necessary to develop a technically defensible TMDL." EPA went on to conclude that "these elements were to vary in their level of sophistication depending on the nature of the pollutant and characteristics of the segment in question. It must be determined on a case-by-case basis." (Id.)

As further discussed herein, at this time, it does not appear that sufficient proper technical conditions exist in which to develop a TMDL for nutrients. Accordingly, as sufficient proper technical conditions do not exist, a Nutrient TMDL for Rainbow Creek is not at this time "suitable for such calculation." (33 U.S.C. § 1313(d)(1)(c).)

4. An Assimilative Capacity Study Must Be Prepared Prior to Establishing Any TMDL.

In developing a TMDL for any impaired water body, an assimilative capacity study should first be conducted in order to determine the pollutant load the water body can assimilate before becoming impaired. That is, the TMDL "load allocations" and "waste load allocations" which may be discharged into a water body without impairing the beneficial uses, can only be developed ***after*** the assimilative capacity of the water body has first been identified. There is thus no basis to determine a load allocation or a waste load allocation (i.e., there is no basis to develop a TMDL), where the assimilative capacity of the water body has not been established. Hines would thus recommend that additional monitoring and a study of the assimilative capacity of the various reaches of the creek be conducted ***before*** adopting the subject TMDL, as the assimilative capacity of the water body is the cornerstone of any properly developed TMDL.

5. The Translator For The Numeric Objectives Has Not Been Developed.

In the instant case, the Basin Plan includes a narrative objective that inland surface waters are not to "contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses." It also indicates that "[a] desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/l total P." The Basin Plan clearly states that "[a]nalogous thresholds have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld."

The TMDL then proceeds to assert a numeric objective of 1.0 mg for total nitrogen and .1 mg for total phosphorus, in part based on the fact that "data are lacking," and that the objective allows for the use of a weight to weight ratio. Yet, no data or analysis is included in the TMDL to support the translation of the narrative objective "to the numeric objectives," i.e., there has been no translator established to translate the narrative objective that inland surface waters shall not contain biostimulatory substances that promote aquatic growth which "cause nuisance or adversely affect beneficial uses," into the numeric objectives of 1.0 mg. and .1 mg. for total nitrogen and total phosphorus, respectively. In fact, at one point the TMDL provides that: "currently, no site-specific data are available that correlates in-stream nutrient concentrations with

abundance of algae." (TMDL, p. 12.) In effect, no "translator" has been developed for the TMDL to translate the narrative objective of not causing a nuisance or adversely affecting beneficial uses, into the 1.0 mg. and .1 mg. numeric objectives.

6. The TMDLs Should Be Properly Developed, Not Modeled.

Throughout the TMDL, there are references to data gaps and the lack of data necessary to develop numeric objectives. In addition, there are various statements that the data collected during implementation will be used to fill such data gaps and to provide additional information needed to be used to determine if the TMDL and load allocations should thereafter be revised or if localized TMDLs are needed. For example, on page 22 of the draft TMDL, the TMDL provides that: "The total nitrogen and total phosphorus load capacities will be adjusted as necessary once additional data have been obtained from the Implementation Plan and Monitoring Strategy." As a result of the lack of data at this juncture, the draft TMDLs established for nutrients for Rainbow Creek are merely modeled using "simple models and assumptions. TMDLs based on "the lack of data." They are, therefore, not "technically defensible TMDLs" based on the availability of analytical methods, modeling techniques and a data base. (See 43 Fed. Reg. 60662).

One significant data gap recognized in the TMDL itself is the lack of data on releases from septic tank disposal systems in the area. In fact, the TMDL identifies these septic systems as an area requiring further study. Releases from septic tanks must be evaluated to determine the amount of nutrients released to groundwater from such disposal systems, and furthermore, to then determine the impact of groundwater on surface waters at various locations within Rainbow Creek. Septic tank releases may play a significant role in the release of nutrients and possibly other contaminants to Rainbow Creek. The TMDL identifies and recognizes the need for a groundwater investigation to, at a minimum, "identify the contribution of groundwater discharge to surface flow," as well as a number of other items worthy of groundwater investigation.

In short, the use of a "modeled" TMDL without proper technical conditions and sufficient monitoring data has resulted in the development of a TMDL that is unsupported and unobtainable.[2]

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[2] Another example of the data gap in developing the TMDL is the lack of any flow analysis to convert the concentrations detected from monitoring into load allocations for the nutrients in issue. The monitoring data which has identified concentrations in samples at various points along the Creek, is only relevant if the total flow or quantity of water that would contain such concentrations is also determined. Without this information, insufficient data exists to develop a "load" allocation for the TMDL.

7. The Annual Load Allocation for Commercial Nurseries is Unsupported and Unobtainable.

The TMDL also establishes annual load allocations for commercial nurseries for both nitrogen and phosphorus (see Tables 6-1 and 6-2) that are both unrealistic and unobtainable. The data and analysis in the TMDL simply do not support the load allocations developed thereunder, specifically for commercial nurseries. For example, under Table 4-1 of the TMDL, the TMDL assumes an annual total nitrogen load of 611 kilograms per year for commercial nurseries. The reference to 611 kilograms per year is apparently based on a figure of 4.1 kilograms per hector per year as an export co-efficient, which, according to the reference, was derived from a 2000 report from the SCCWRP. Yet, a review of the SCCWRP 2000 report shows that it does ***not*** contain any co-efficients for commercial ***nurseries***. Rather, and to the contrary, it only contains co-efficients for general commercial facilities (e.g., shopping centers, restaurants and the like), and for agriculture.

Futhermore, the SCCWRP study indicates that the co-efficient for agriculture was based on one site located in Ventura County. For the subject TMDL, co-efficients should be developed for inland San Diego County commercial nurseries, field agriculture and orchards. The co-efficients used in the SCCWRP study may have been appropriate for a regional study of coastal waters, however, they are not appropriate for a regulatory document such as a TMDL. Additional research is required to develop appropriate co-efficients.

8. The Economic Consideration Section Should Be Revised.

The economic consideration section of the TMDL includes a Section discussing BMPs and the incursion of other implementation costs for landowners and land uses, including for commercial nurseries. The estimated best management practice costs identified in this Section, although acknowledging Hines' new recycling system in the narrative in Section 11.2, do not incorporate into the costs described in Table 11-5, the $1.5 to $2 million recycling system that Hines Nurseries has voluntarily committed to undertake to further reduce the amount of runoff entering Rainbow Creek. Nor does the discussion on economics in this Section scale up these costs to the commercial nursery industry as a whole.

Please also recognize that the costs of this recycling system are in addition to other costs for best management practices incurred by Hines and others in implementing other BMPs to reduce the discharge of nutrients to Rainbow Creek. For example, in addition to its regular monitoring of irrigation waters and ongoing adjustment of irrigation, Hines primarily uses dry slow release fertilizers in its nursery's

operations and rarely uses liquid fertilizers, even though liquid feed fertilizers would allow the nursery to vary the quantity of fertilizer according to the needs of the plants. Dry slow release fertilizers are used even though liquid fertilizers can better improve plant growth, and make certain plants more resistant to diseases and pests.

The primary reason Hines has decided to use dry slow release fertilizers at its Fallbrook facility as the predominant means of fertilizing its plants, is because of its desire to minimize the discharge of nutrients into Rainbow Creek. (It should be recognized that adjacent and nearby nurseries, to the best of Hines' knowledge, continue to regularly use liquid fertilizers in their operations).[3]

In conclusion, Hines appreciates the efforts of the Regional Board in developing a Nutrient TMDL for Rainbow Creek, and is committed to continuing to work with the Regional Board to reduce the discharge of nutrients to the Creek, and to developing a TMDL that is based on sound data and analysis. Hines thanks the Regional Board for its cooperation to date, and looks forward to assisting the Regional Board in developing proper technical conditions, and appropriate load reductions to remove Rainbow Creek as a 303(d) listed water body for eutrophication and/or nutrients.

Please do not hesitate to contact the undersigned should you have any questions with respect to the above or need any additional information in connection with any of the comments provided herein.

Sincerely,

HINES HORTICULTURE

E.G. (Bud) Summers, Ph.D.
Vice President, General Manager

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[3] Another important best management practice adopted by Hines is the use of a drip irrigation system in areas around the perimeter of the nursery and along those areas requiring heavier fertilization. The drip irrigation system has resulted in a significant reduction in water usage as well as a reduction in fertilizer usage, and is one of several BMPs that Hines has already installed to reduce the discharge of nutrients in its runoff.

Hines Nurseries
A Hines Horticulture, Inc. Company

Testimony of E.G. (Bud) Summers, Ph.D.
Hines Nurseries

Before the

California Regional Water Quality Control Board, San Diego Region

8 May 2002 (06 May Draft)

Good morning, Chairman Minan and members of the Board. My name is Bud Summers. I am Hines Nurseries' Vice President of the Nursery Division and General Manager of the Fallbrook and Irvine, California nurseries. I have both Ph.D. and Masters degrees in Horticulture, as well as a Bachelor of Science degree in Biology. I have over 25 years' experience in horticulture, including teaching horticulture at the university level and serving as a Statistical Analyst and Consultant for the U.S. Department of Agriculture. I am here today to comment on the Draft Nutrient Total Maximum Daily Load for Rainbow Creek.

Hines Nurseries

First, I would like to briefly review our relation to Rainbow Creek and the proposed TMDL. Last May we closed the purchase of a 256-acre nursery that straddles Rainbow Creek in the Rainbow Valley area upstream from I-15. We have managed the site since 1996, but were only able to secure title to the property last year.

Barbara Biernacka, our Propagation Manager in Fallbrook, has participated on the TMDL Technical Advisory Committee since 1999, although that committee has not met since December 2001. Earlier, other staff members also attended TAC meetings. We also participated in the supplemental monitoring program during the year 2000.

Hines Nurseries has been commended for our efforts with respect to our tailwater recovery and recycling systems, and we continue to do more. Through the existing recycling system, we currently recycle up to 80% or more of our irrigation waters. This system was originally installed by Flynn-Rainbow Nurseries to help reduce nutrients in Rainbow Creek, and Hines Nurseries continues to operate this tailwater recovery system today. The effectiveness of this system was discussed in the Regional Board-funded Final Report of the Rainbow Creek Non-Point Source Nitrate Reduction Program dated January 31, 1997. This system was noted as a demonstration of the "potential for reducing nursery runoff with an irrigation system retrofit." We presently utilize the Creek as part of the recycling system, but have no dry-weather discharges off site.

However, we agree that we now need to discontinue discharging into the creek, and we are proceeding to do so. Hines has now committed to implementing a new recycling system that will be completed in the next two to three years at a cost of between $ 1.5 and 2 million. The new recycling system, the plans for which have been already reviewed with your staff and County staff, will recycle more than 95% of our irrigation waters. We are currently working with the County of San Diego in order to expedite implementation of the system. Hines Nurseries is committed to working with

the Regional Board to achieve its nutrient goals for Rainbow Creek, and continues taking responsible action toward those goals.

Statements Regarding Hines Nursery are Inaccurate

I would like thank the Board for steps it has already taken to improve the factual content of the document. We appreciate the efforts Staff has made to address our concerns. Some of the required changes have been addressed in the circulated draft, and staff has informed us that they propose to make others.

The two most important statements about Hines that remain to be corrected are in Section 9.5.1.4. Specifically, the first sentence of the third paragraph regarding a condition of pollution and nuisance should be deleted as it is inaccurate. We firmly believe that Hines Nurseries has not caused or contributed to a condition of pollution, contamination, or nuisance. To the contrary, Hines' actions, and those of its predecessor, have significantly improved the condition of Rainbow Creek downstream from the nursery.

In addition, the last sentence in the same paragraph should be deleted because it also is inaccurate. We have reviewed the plans with staff and they indicated their support for the project. However, as a regulatory agency, I do not believe the Regional Board would normally approve specific construction plans. We have addressed these issues with staff, and understand that they intend to correct these sentences in the next draft.

General Comments on the Proposed TMDL

Further, we firmly believe it would have been more appropriate to have deferred this hearing until we and the other members of the regulated community were able to see how staff proposed to respond to both the comments made at the workshop and the written comments received by the date specified in the hearing notice. We were under the impression that this hearing would focus on a revised draft – not a draft that is in the process of being revised.

In addition, there are numerous problems inherent in this TMDL that make it inappropriate for adoption . Today, I will review only a few key points concerning the proposed TMDL. Additional comments are in our previous written statement that I have attached and distributed for your review.

The Board is clearly under pressure to do something, and considering the lack of data, this constitutes a valiant attempt – however, it is not what we understand to be a valid TMDL. What this document succeeds in demonstrating is the lack of any need for a TMDL and the lack of sufficient technically valid data to establish a TMDL.

We are particularly concerned with the unreasonably restrictive load allocations. For example, Table 4–Y specifies a daily load allocation of 1.8 pounds of nitrogen for all commercial nurseries in the watershed. Using the municipal drinking water criterion of 10 mg Nitrate as N per liter, a discharge of approximately 21,580 gallons of potable water would exceed the total daily nitrogen allocation for all commercial nurseries in the watershed. That is only about 1.7 per cent of Hines' average daily water use. A small malfunction in the irrigation system or even a small storm event could put us over the

allocation for all commercial nurseries in the watershed if you assume drinking water standard levels of nitrogen in the discharges. The TMDL needs to be more flexible to permit us to comply in a manageable way.

I will conclude my statement today with a few suggestions for making the TMDL more workable, if there is going to be one adopted in the near future, but first I want to briefly review some of our concerns with the draft.

Inappropriateness of the TMDL

The proposed TMDL is billed as a draft "Nutrient TMDL" in the Staff Report and in the Draft Resolution, but Rainbow Creek is not listed as impaired for nutrients. The assertion in Attachment A to Resolution No. R9-2002-0108 that "Rainbow Creek is currently identified on the Clean Water Act Section 303(d) list of impaired waters due to excessive nutrient concentrations" is incorrect. The Staff Report itself notes in the very first sentence of the Executive Summary that Rainbow Creek's listing is for "eutrophication." A paragraph later it is noted that, "eutrophic conditions have not been observed in the creek . . ." This fact is repeated in the last paragraph of page 9, where it is also noted that "Rainbow Creek is not stagnant or experiencing fish kills or excess decomposition of plant matter and their related adverse impacts."

A "Nutrient TMDL" is being proposed to address "eutrophication," not nutrient load, and "eutrophic conditions have not been observed in the creek." On what grounds, then, could the Board propose adoption of any TMDL – either for nutrients or eutrophication? TMDLs must be based on impairment listings -- they should not anticipate listings. Only if the State Water Resources Control Board revises the listing

for Rainbow Creek following its hearing currently scheduled for September should a Nutrient TMDL for Rainbow Creek be considered. Since there is no eutrophication, and nutrient concentrations have been greatly reduced since the 1980s, it would be more appropriate to delist the Creek for eutrophication and put it on a watch list for nutrients.

Scientific/Technical Problems with the Draft TMDL

The Staff Report is rife with scientific and technical problems. From the first page of the Executive Summary, Staff attempts to substitute assumptions for data: "nutrient concentrations appear to be contributing to excessive algal growth which can lead to eutrophic conditions that may result in decreased water clarity…" Speculation does not amount to science. We have been told that staff is going to revise the methodology to reduce the emphasis on nutrient concentrations through the use of flow data that was brought to their attention by EPA Region IX, however we have not seen the revised methodology. Any new methodology should moreover be peer reviewed. In fact, as the County has pointed out in their written comments, the current draft has yet to be peer reviewed.

The revised draft that staff proposes should be distributed for peer review and then re-circulated for public comment. When it is peer reviewed, we recommend that the aerial deposition assumptions and estimates also be reviewed. We understand that Dr. Keith Stolzenbach at UCLA is currently doing work on aerial deposition of nutrients in the Santa Monica Bay watershed and has indicated a willingness to review the aerial deposition aspects of this proposed Nutrient TMDL.

There are additional technical and regulatory problems with the TMDL as proposed by staff. I will ask our consultant, Mr. Richard Watson, to address these. However, before I do, I want to make a few recommendations to make the TMDL more workable should you decide to proceed with the TMDL despite the technical deficiencies with the draft.

Recommended Revisions to the TMDL

1. The initial target should be the drinking water standard, for which there is a more solid scientific basis. At a specified review date, numeric biostimulatory criteria could be added, if required.

2. The first phase of the TMDL should last for five years to allow the results of the new Hines Nursery recycling system and septic tank improvements made with AB 885 funds to become apparent.

3. If the stated or inferred desired goals taken from the explanation of the narrative water quality objective in the Basin plan for biostimulatory substances are to be used as numeric targets in a nutrient TMDL, another part of the explanatory material should also be included. The TMDL should specify that the defined "values are not to be exceeded more than 10% of the time unless studies of [Rainbow Creek] clearly show that water quality objective changes are permissible and changes are approved by the Regional Board." This would be consistent with the Basin Plan and provided needed flexibility in the proposed TMDL.

4. The daily load allocations specified in Table 4 – Y should be enforced based on running 30-day averages. This would provide an allowance for irrigation system malfunctions or other problems while meeting the objectives of the TMDL. Since the proposed biostimulatory criteria are so low and there is no actual nutrient impairment, this should more that protect beneficial uses.

5. The two incorrect references to Hines should be deleted from the TMDL.

Thank you for this opportunity to comment on the proposed TMDL. Hines Nurseries recognizes its responsibilities and has committed to spend more than $1.5 million to replace the tailwater system that we inherited with a state-of-the-art recycling system.

I would be pleased to answer any questions you might have concerning the operation of our nursery facility, but before I do, I would like to ask Mr. Watson to address other technical and regulatory concerns that we have with the TMDL as proposed.

Testimony of Richard A. Watson

For Hines Nurseries

Before the

California Regional Water Quality Control Board, San Diego Region

8 May 2002

Good Morning Chairman Minan and Members of the Board. My name is Richard Watson. I am a planning consultant with over eleven years' experience in analyzing and implementing storm water quality regulations. I have been an active participant on the California Stormwater Quality Task Force since 1991 and currently chair its Impaired Waters/TMDL/Watershed Management Work Group. Today, I am before you representing Hines Nurseries. I will address the situation facing the Board through a series of questions and answers. Then I will suggest some actions, in addition to those mentioned by Dr. Summers, that we recommend you take to properly address water quality in Rainbow Creek.

When is a TMDL required?

The State Board staff points out in Volume I of the Staff Report entitled *Revisions of the Clean Water Act Section 303(d) List of Water Quality Limited Segments* that, "CWA section 303(d) requires states to identify waters that do not meet applicable water quality standards with technology-based controls alone." Once a waterbody is listed, Section 303(d) mandates development of a Total Maximum Daily Load (TMDL). In other words, a TMDL is required if a waterbody is

determined to be impaired and the application of technology-based controls cannot bring it into compliance with water quality objectives.

How Should a TMDL be Prepared?

A properly developed TMDL must be based on *data* with respect to exceedances of "load allocations" and "waste load allocations" for a given waterbody. Allocations can only be developed after the assimilative capacity (also called loading capacity) of the water body has been identified. No such identification has been made for Rainbow Creek. We do not know its assimilative capacity; the necessary studies have not been performed. We, therefore, cannot know what pollutant load the waterbody can assimilate before impairment. Staff has attempted to guess at the assimilative capacity of Rainbow Creek. Without the necessary background studies about this specific waterbody, there really is no valid basis to determine a load allocation or a waste load allocation.

In fact, EPA Region 9 in its draft comments on the draft TMDL, has said that the "Regional Board must change its approach to defining the loading capacity and TMDL for nitrogen." EPA urged Regional Board staff to directly determine the loading capacity by starting with the desired water quality objective(s) and use stream flow records to calculate loading capacity and TMDLs for total nitrogen and total phosphorus. This requested change presents an opportunity to institute adaptive management as recommended by the National Research Council.

What is the Correct 303(d) Listing for Rainbow Creek at this Time?

The State Board's staff report on the 2002 revision to the 303(d) list identifies the following assumptions on which the report was based:

> "1. The 1998 section 303(d) list forms the basis for the 2002 list submittal.
>
> "2. RWQCB recommendations to change existing listings would be considered by the SWRCB."

State Board Staff understands that although they may make recommendations, only the State Board can make changes to the 303(d) list in 2002. In the past, the 303(d) listing process has been inconsistent. This year the State Board has implemented a more structured program.

However, review of the 1998 California 303(d) List and your staff's *Final Draft Clean Water Act 303(d) List of Impaired Waters, 2002 Update* reveals that Regional Board Staff has misunderstood the process and consequently has made two mistakes. First, Rainbow Creek is currently listed for eutrophic conditions, not for nutrient pollution. Staff has either written the wrong TMDL or submitted a draft TMDL prematurely. Second, Regional Board Staff has exceeded its authority by attempting to make changes to the 303(d) list without recommending the changes to the State Board or even obtaining a formal approval by your Board.

On page 17 of the 2002 Update, Regional Board staff explains that; "*The impairment for Rainbow Creek has been changed from 'eutrophication' to 'nitrate and phosphorus.' The original designation was based on a faulty assumption that eutrophic conditions existed because of the elevated levels of nutrients.*" It appears that Regional Board Staff, in noting that the current designation was "faulty" have simply changed it themselves. They argue on page 1 of the 2002 Update that, "*...changes were minor and primarily add clarity.*" The wholesale change of a 303(d) listing is not minor. The State's 303(d) List is the determiner of impairment. What is the correct listing? The answer is the one in the approved 1998 303(d) list.

What Are the Applicable Water Quality Objectives?

Tentative Resolution No. R9-2002-0108 Finding No. 5, states that the Basin Plan establishes the following numerical water quality objectives for biostimulatory substances: Total Nitrogen of 1.0 mg/l and Total Phosphorus of 0.1 mg/l. This is inaccurate. Numerical biostimulatory water quality objectives have not been set for either nitrogen or phosphorus in the Basin Plan. The Basin Plan includes a narrative objective that inland surface waters are not to "contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses." However, there is a numeric water quality objective for Nitrate in drinking water.

The erroneously asserted numeric objectives of 1.0 mg for total nitrogen and .1 mg for total phosphorus are, in part, based on the fact that "data are lacking," and that the Basin Plan includes an explanation of the narrative water quality objectives. The explanation includes the statement that "A desired goal in order to prevent plant nuisance in flowing waters appears to be 0.1 mg/L total P" and allows the use of a weight-to-weight ratio in estimating a nitrogen threshold. One of the scientists charged with peer review of the November draft of this document called this assumption "arbitrary" and "unsupportable."

No data or analysis is included in the Basin Plan or the Staff Report to support the translation of the narrative objective to the proposed numeric objectives for Rainbow Creek. In fact, in Section 3.2 of their Report, Staff concedes, "currently, no site-specific data are available that correlates in-stream nutrient concentrations with abundance of algae." (Staff Report, p. 12.) What are the applicable water quality objectives? The answer for Rainbow Creek is the nitrate objective for drinking water; there is no numeric water quality objective for biostimulatory substances.

Furthermore, EPA has identified a critical water quality objective problem. The issue of naturally occurring pollutant levels that exceed applicable water quality objectives must be addressed. A site-specific water quality objective for Rainbow Creek may be needed. Alternatively, an exclusion from meeting water quality

objectives due to naturally occurring sources could be defined. If this issue is not addressed, Rainbow Creek will never meet water quality objectives.

What are the Data Problems with the Draft TMDL?

Throughout the Staff Report there are numerous references to data gaps. In addition, there are various statements that the data collected during *implementation* will be used to fill such data gaps and to provide additional information to determine the need for revision. For example, on page 22, it is noted that: "The total nitrogen and total phosphorus load capacities will be adjusted as necessary once additional data have been obtained from the Implementation Plan and Monitoring Strategy." The implementation phase is not the time to gather the vital data upon which to base a TMDL. Due to lack of data, this draft TMDL is merely modeled using "simple models and assumptions." TMDLs based on "assumptions" are, by definition, not "technically defensible TMDLs," which require the availability of analytical methods, modeling techniques and a database. (See 43 Fed. Reg. 60662).

The Clean Water Act requires that only those TMDLs "suitable for such calculation" be developed. (See 33 U.S.C. § 1313(d)(1)(c).) In the regulations to the Clean Water Act, EPA states that such suitability can be met under "proper technical conditions." (See 43 Fed. Reg. 60662.) This phrase refers to "the availability of the analytical methods, modeling techniques and a data base necessary to develop a technically defensible TMDL." Those requirements are

not met in the case of Rainbow Creek. Theoretical susceptibility does not constitute the basis for establishing a TMDL. The scientific basis of the TMDL program must be strengthened, and your Board has an opportunity to contribute to that effort.

We note that in the scientific peer review of the draft Rainbow Creek TMDL, all three scientists questioned recognized the need for additional data and/or for clarification of contradictory statements. The draft TMDL before you today should be rejected. Unfortunately, this TMDL has been rushed to meet a promised time schedule. Under Federal Regulations, establishing proper technical conditions for calculating a TMDL takes priority over meeting an arbitrary time schedule.

The draft TMDL establishes load allocations for commercial nurseries and indicates that the figures are derived from a 2000 report from the Southern California Coastal Water Research Project (SCCWRP). Review of the referenced report, however, shows that it does not, in fact, contain any co-efficients for commercial nurseries. It contains only co-efficients for general commercial facilities, such as shopping centers and restaurants, and for agriculture. (See Tables 6-1 and 6-2, Staff Report)

Further, the SCCWRP study indicates that the co-efficient for agriculture was based on one site located in Ventura County. Clearly, such a co-efficient has little, if any, application for a commercial nursery located adjacent to a creek near

an interstate highway in inland San Diego County. For a regulatory document such as a TMDL, specific regional co-efficients should be developed.

Why is This TMDL Before You?

The Regional Board is under pressure to do something to improve water quality in the region. This Regional Board, together with others, was criticized by EPA and environmental groups for not preparing TMDLs in a timely manner. The Board committed to develop two initial TMDLs. This is one of them. However, the difficulty of establishing a coherent and acceptable nutrient TMDL for Rainbow Creek has been greater than anticipated. Despite the lack of data and the statement from EPA Region 9 that, "As presented, EPA cannot approve the Rainbow Creek TMDL," Staff apparently feels the need to move ahead to meet their current schedule.

What Should the Regional Board Do?

The Regional Board should defer taking action at least until after the State Board has adopted the 2002 303(d) listings. This will allow any future TMDL to accurately reflect the listing status of the waterbody. Adoption of the new 303(d) list is scheduled for September. After that time, should a change in listing be made, your Board can proceed to take action toward any required TMDL. This hearing should be continued, not closed. The regulated community deserves a chance to comment on Staff's final recommendations.

Your Board should provide adequate opportunity for additional voluntary reductions. We respectfully disagree that the waterbody is not able to meet water quality standards using available pollution controls. We agree in this instance with the County of San Diego, whose Director of the Department of Environmental Health, Gary W. Erbeck, noted in a letter to your Board dated April 23, 2002 that, "...an appropriate opportunity should be provided to achieve 'voluntary' reductions in loadings before drastic regulatory measures are applied..."

Furthermore, your Board should take the opportunity to develop a TMDL in accordance with the recommendations of the National Research Council in their report *Assessing the TMDL Approach to Water Quality Management*, prepared at the request of Congress. Specifically, your Board should follow the adaptive management approach advocated by the National Research Council once a TMDL is adopted. The initial target should be the drinking water standard, for which there is solid scientific basis. The first phase of the TMDL should last for five years to allow the results of the new Hines Nursery recycling system and septic tank improvements made with AB 885 funds to become apparent.

The Regional Board should establish scientifically valid numeric objectives for biostimulatory substances and strengthen the scientific foundations on which a TMDL can be properly established. We recognize that your Board is under

pressure to act, and encourage you to demonstrate your commitment to improving the region's storm water quality by promoting a science-based approach.

Thank you for the opportunity to comment on the proposed TMDL on behalf of Hines Nurseries. As Dr. Summers noted, Hines is a responsible corporate citizen and has committed to making further improvements to its storm water program. The proposed TMDL, however, is not flexible enough to allow Hines and others in the region to carry out their activities while remaining in compliance. If the Regional Board defers taking further action until after the State Board's review of the 303(d) list, and then makes critical changes with respect to its application of science, it may be able to craft a workable, defensible TMDL. Until that time, no TMDL should be adopted.

Appendix L – Public Comment Letters

L-3 Peter Kozelka, Ph.D.
U.S. Environmental Protection Agency
Letter dated May 7, 2002

031116

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD
2002 MAY 13 P 12: 42

MAY 07 2002

David Barker, Supervising Engineer
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123

EPA Region 9 has received the *Draft* staff report for Nutrient Total Maximum Daily Loads (TMDL) for Rainbow Creek and *Draft* Basin Plan Amendment, dated March 22, 2002. These documents address impairment to Rainbow Creek, which is currently on the 303(d) list. This TMDL is designed to ensure attainment of water quality objectives and restore designated beneficial uses.

Here are some specific comments or other areas for revision.

1. The *Draft TMDL*, in section 5.1, states the biostimulatory TMDL for total nitrogen is set at 1507 kg/yr, based on this current load from undeveloped [or background sources] land.

   The Regional Board must change its approach to defining the loading capacity and TMDL for total nitrogen. As presented, EPA cannot approve the Rainbow Creek Nutrient TMDL since it has not utilized water quality objectives to establish the loading capacity which ultimately affects the allowable allocations. (See future actions outlined in #5 below.) Therefore the proposed TMDL will not result in attainment of all applicable water quality objectives.

2. Also, the *Draft TMDL*, in section 5.1, utilizes an indirect approach to calculating the loading capacity for total nitrogen. This indirect approach relies on interpretation of the current loading estimate and proportional reduction to define the biostimulatory loading capacity.

   EPA Region 9 urges Regional Board staff to *directly* determine the loading capacity by starting with the desired water quality objective(s) and using stream flow records to calculate the loading capacity and TMDLs for total nitrogen and total phosphorus.

3. As a consequence to modifying the loading capacity, the Draft TMDL will also need to modify the allocations and margin of safety. These values are dependent on the quantity defined as the assimilative or loading capacity.

   EPA Region 9 would support interim allocation levels as part of implementation, as long as the TMDL clearly documents quantitative performance levels associated with desired water quality conditions and potential responses to achieving these interim levels. The attainment of all applicable water quality objectives must be clearly presented in the document.

4. The *Draft TMDL* needs some written revisions. As presented, section 5 does not clearly define the loading capacity for total nitrogen and total phosphorus and present these bottom line values in a

table. Section 5 should be titled "Loading Capacity and Linkage Analysis" to clarify its contents. Also, Table 5-1 should be modified to remove information about current load and interim loading capacity or postpone this table until a later section of the document. Instead Table 5-1 shall define the loading capacity for biostimulatory total nitrogen and total phosphorus.

The first sentence of Section 6.0 is misleading. It could be changed to.....A TMDL is less than or equivalent to the loading capacity after taking into account "allocations for all sources and a margin of safety."

5. The *Draft TMDL* implies the quantity of nutrients from undeveloped land is sufficient to determine the loading capacity and to interpret applicable water quality objectives. This assumption conflicts with 40 CFR 130.2(f) which defines loading capacity as "the greatest amount of loading that a water can receive without violating water quality standards." TMDLs are based on the existing water quality standards. We do not believe the Basin Plan provides an exemption from application of water quality objectives based on the idea that naturally occurring pollutant levels exceed other applicable objectives.

   In the future, the Regional Board could address this issue via two options; both would require a Basin Plan amendment:
   a) adopt a different water quality objective for Rainbow Creek, presumably a site-specific value based on credible data, or
   b) define an exclusion for Rainbow Creek from meeting water quality objectives due to naturally occurring sources; again with sufficient rationale.

EPA recognizes the complexity of establishing TMDLs and the desired expediency for developing such strategies for improving water quality in freshwater systems like Rainbow Creek. We anticipate working collectively to produce a coherent and acceptable nutrient TMDL, both to Regional Board members and staff and for EPA approval.

Our most recent discussions (on May 2nd) with you and Lisa Brown, regarding modifications outlined above, provide more confidence that San Diego Regional Board will produce a TMDL that meets requirements outlined in the Clean Water Act and will be approved by EPA Region 9. Please keep us informed with subsequent revisions of the TMDL and appropriate attachments sent to Regional Board members.

Sincerely,

Peter Kozelka

Peter Kozelka, Ph.D.
TMDL Liaison, Water Division

Appendix L – Public Comment Letters

L-4 Eric Larson
San Diego County Farm Bureau
Letter dated May 8, 2002

FARM BUREAU SAN DIEGO COUNTY

1670 East Valley Parkway, Escondido, CA 92027-2409
Phone: (760) 745-3023 • Fax: (760) 489-6348 • E-mail: sdcfb@sdfarmbureau.org

May 8, 2002

Mr. John Minan, Chair
California Regional Water Quality Control Regional Board San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123

Dear Chairman Minan:

The Farm Bureau of San Diego County has had an opportunity to review the Staff Report for Nutrient Total Maximum Daily Loads for Rainbow Creek (TMDL) under consideration by your Regional Water Quality Control Regional Board (Regional Board). That review has generated a number of questions and concerns regarding content, assumptions, policies, and methodology. Our comments follow, corresponding to the sections of the draft TMDL.

Executive Summary

Page two of the executive summary indicates that there are no wasteload allocations made for this TMDL, however, there are urban areas within the watershed. If the urban areas are served by publicly (or privately) owned treatment facilities (i.e. Oak Crest Mobile Estates, Rainbow Conservation Camp) then there are point sources within the watershed that must be considered.

2.0 Problem Statement

We are unclear as to whether the listed beneficial uses are specifically designated to Rainbow Creek or are they designated by the Regional Board pursuant to the tributary rule because the Santa Margarita River is so designated. If designated pursuant to the tributary rule, we would ask for evidence as to the appropriateness of the listed beneficial uses within the watershed.

2.3 Historical Information

Monitoring data clearly shows significant decreases in nutrient levels following the 1996 303(d) listing. This improvement calls into question the need to make Rainbow Creek a priority TMDL. Because a 96% reduction was achieved through the program of education administered by the Mission Resource

Conservation District we question why the Regional Board did not pursue a similar approach before choosing to pursue a TMDL.

2.5 Water Quality Objectives

The document states that nutrients are likely contributing to the excessive algal and emergent plant growth. The next sentence then recognizes that where the growth occurred there was no riparian canopy yet where there was riparian canopy there was no algal growth. The Regional Board must be able to make the easy assumption based on actual observation that sunlight has a direct effect on the algal growth. Perhaps the easier solution to the problem is to increase the riparian canopy throughout the watershed and should be addressed.

2.6 Beneficial Uses

Page nine discusses how Dissolved Oxygen (DO) concentrations were not low enough to cause an adverse effect and that DO is not expected to be depressed below the water quality standard. Yet, it then states that there are no results to support that assumption. However, there are clearly no results to not support the assumption either. Since there is not reason to suspect DO problems, then DO monitoring is not necessary. The TMDL is specific to nutrients and algal growth and should therefore stay focused on the problem statement and not go looking for other issues.

Also, it appears that the arroyo chubs need algae. If this TMDL has a detrimental effect on the chubs there is a risk of environmental law conflicts.

4.0 Source Identification

The source identification incorrectly characterizes undeveloped land contributions as small when in fact Figure 4-1 identifies undeveloped land as the single biggest contributor at 33%. Also, the draft TMDL is relying on a CalTrans document to state that their contribution was not significant. Perhaps there should be further review on CalTrans' actual contribution. Individual farmers may have insignificant contributions but they will be subject to the provisions of the TMDL. No one should be exempt in that cumulative impacts do add up.

6.2 Initial Total Nitrogen Load Allocations

The stated inability to reduce loads from parks, preserves, and urban areas places an additional burden on agricultural uses, among others. Any load generated by human activity can be reduced and should carry its fair share, even if its contribution is small.

8.0 Public Review

In reviewing the fifty-two listed events on Attachment D preceding today's public hearing, three involved public participation. Two in 1999, and one on April 11th of

this year. While technically meeting the letter of the law, it is our hope that the Regional Board feels that every means available has been used to notify and engage the residents, property owners, farmers and nurserymen of the Rainbow Creek Watershed.

9.0 Implementation Plan and Monitoring Strategy

The primary implementation component for this TMDL is a county prepared Nutrient Reduction and Management Plan (NRMP). It is our belief that this is a new implementation approach, not seen in other TMDLs. We would like assurances that agriculture will have a place at the table when the County prepares the plan, but see no such mention in the TMDL. We also believe it would be appropriate to have participation by the University of California Cooperative Extension Service. There should also be assurances that the plan will be subject to public review and Regional Board approval.

Page 39, Land Use Planning, indicates the Regional Board's desire to direct and evaluate county land use ordinances and their provisions. We must state our concern with the Regional Board injecting itself into land use decision making. It is one thing for the Regional Board to make the County the lead agency for the NRMP, but quite another to have the County answer to the Regional Board on land use matters. We can think of no other regulatory agency that assumes such a role.

Page 40, CEQA Responsibilities Section, also raises concerns about Regional Board participation in local land use decisions. A reading of this paragraph implies that the Regional Board is asking the County to apply CEQA requirements and mitigation measures on agricultural operations, a condition that does not currently exist. As in the preceding paragraph, the Regional Board's concern should be meeting water quality objectives, not influencing land use decision making.

11.0 Economic Considerations

This section fails to adequately address the costs that may be incurred by agricultural operations to implement Best Management Practices (BMPs). For example, the Table 11-5 statement that BMPs may offer costs savings as a result of lower fertilizer and water usage is contrary to the fact that the Hines Nursery investment may be as much as $2 million.

When the document discusses the cost of BMPs, it does not consider whether the BMPs will actually help to meet the load allocations given. There must be some evaluation of the suggested BMPs and their effectiveness.

General Comments

We are unclear whether this document is the Regional Board's basin plan amendment or just the TMDL that is to be submitted to the U.S. Environmental

Protection Agency. This must be clear. The U.S. Environmental Protection Agency (U.S. EPA) has no implementation authority over nonpoint sources of pollution. Therefore, it is not necessary for the state to submit the implementation components of a TMDL to U.S. EPA. We suggest that the Regional Board not submit such implementation components to U.S. EPA in that the U.S. EPA has no authority or jurisdiction and there is no reason to give them the opportunity to review and comment on such implementation plans.

Finally, we have found that this TMDL is overburdened with data gaps. In many instances data is incomplete, leading to numerous comments about re-evaluating the TMDLs, adjusting allocations, and the need for better data. These data gaps create a situation where the Regional Board is considering a TMDL that sets an unachievable allocation of zero nutrient loads and explains it away by stating better data will be collected at a future date. Successful implementation of any plan needing the cooperation of stakeholders must show that the goals and remedies are reasonable, achievable, and based on reliable information.

Sincerely,

Eric Larson
Executive Director

Appendix M - Response to Public Comments, Public Hearing on May 8, 2002

1. Comment Code: 303(d) Listing

Agency ID: County of San Diego

Commenter: Gary Erbeck

Comment:

As a matter of law, TMDLs must be promulgated after and must be based on impairment listings. Peer reviewers have noted and the Regional Board has acknowledged that the current impairment listing for Rainbow Creek no longer has a basis in fact. Moreover, it is clear that the Regional Board is not proposing a TMDL to address the eutrophication-based impairment listing for Rainbow Creek, but are instead proposing a TMDL that anticipates the modifications to the Rainbow Creek impairment listing that are now pending at the State Water Resources Control Board. This sequencing is backwards, legally and scientifically. It is an abuse of the public participation processes the law mandates for 303(d) listings and for TMDLs. No TMDL for Rainbow Creek should go forward until a revised impairment listing for Rainbow Creek is in place.

Response:

The 2002 303(d) List was adopted by the State Water Resources Control Board on February 4, 2003 and was approved by the USEPA on June 6, 2003. In the updated list, the impairment for Rainbow Creek was revised from "eutrophic" to "nitrogen and phosphorus".

The fact remains that even with the nutrient reduction observed in Rainbow Creek, water quality standards are still being exceeded and action is needed to bring the water quality to acceptable levels that support all beneficial uses.

The stream monitoring data collected from Rainbow Creek by the Regional Board from January 2000 to October 2000 indicates that:

1. Water quality standards for nitrogen are still not being met.
2. The exceedence of water quality standards for TN generally increases the farther downstream the sampling locations are in the watershed.
3. Total P also exceeds water quality standards throughout Rainbow and appears at the highest concentrations downstream from Station 2.
4. Nitrogen and phosphorus results for 2000 are higher than levels reported for the 1996-1998 Mission Resource Conservation District (MRCD) monitoring.

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2. Comment Code: 303(d) Listing

Agency ID: Hines Nurseries

Commenter: Bud Summers

Comment:

The TMDL in issue is entitled a "Nutrient TMDL" for Rainbow Creek. Yet, language in the TMDL Staff Report dated March 22, 2002 shows that Rainbow Creek is presently only listed on the Clean Water Act's Section 303(d) list for "eutrophication." There is no present listing of Rainbow Creek for nutrients. Hines is aware that the issue of whether Rainbow Creek should be listed as being impaired for nutrients is being addressed by State Board staff, in its review of the 2002 303(d) list. However, as of April 23, 2002 Rainbow Creek has not been listed as an impaired water body because of nutrients.

Response:

The Regional Board's consideration of Nutrient TMDLs for Rainbow Creek in May 2002 was entirely appropriate even though Rainbow Creek waters were not at that time explicitly listed as impaired due to nitrogen and phosphorus concentrations. Clean Water Act (CWA) § 303(d)(1)(A) requires each state to identify the waters within its jurisdiction that are not attaining water quality standards. The result of that process is commonly known as the CWA § 303(d) list. The federal regulations additionally require the 303(d) list to include an identification of the pollutants causing or expected to cause violations of standards[1].

For the waters on the CWA § 303(d) list, CWA § 303(d) (1)(C), requires the state to develop TMDLs for the pollutants that are impairing those waters. In many instances waters on the CWA § 303(d) list are not identified as impaired by a specific pollutant, but by conditions that are caused in whole or in part by pollutants. Examples of these stressors include accelerated eutrophication (typically associated with excessive nitrogen and phosphorus concentrations), toxicity (miscellaneous toxic constituents), and temperature (thermal discharges and sediment). CWA § 303(d)(1)(A) does not prohibit identifying waters as impaired by such conditions, and the United States Environmental Protection Agency (USEPA) has approved this approach, for example, by approving the State of California's 1998 and 2002 303(d) lists. Such listings, however, do not impact the state's obligation under CWA § 303(d) (1)(C) to develop TMDLs for the pollutants impairing those waters. Accordingly, where waters are listed as impaired for conditions commonly associated with pollutants, the Regional Board must identify the pollutants underlying or contributing to the conditions, and either establish TMDLs for those pollutants, or establish TMDLs that otherwise correct the conditions leading to the impairment.

[1] See 40 C.F.R. § 130.7(b)(1)(4)

In any event the latest listing of impaired waters in the CWA § 303(d) List for 2002 renders the issue moot. The 2002 303(d) List was adopted by the State Water Resources Control Board on February 4, 2003 and was approved by the USEPA on June 6, 2003. In the updated list, the impairment for Rainbow Creek was revised from "eutrophic" to "nitrogen and phosphorus".

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3. Comment Code: 303(d) Listing

Agency ID: San Diego County Farm Bureau

Commenter: Eric Larson

Comment:

Monitoring data clearly show significant decreases in nutrient levels following the 1996 303(d) listing. This improvement calls into question the need to make Rainbow Creek a priority TMDL. Because a 96% reduction was achieved through the program of education administered by the Mission Resource Conservation District, we question why the Regional Board did not pursue a similar approach before choosing to pursue a TMDL.

Response:

In 1996 Rainbow Creek was listed as impaired for Clean Water Act's Section 303(d) list for "eutrophication" . The current CWA § 303(d) List for 2002 describes Rainbow Creek's pollutant impairment as "nitrogen and phosphorus". The Regional Board is obligated under CWA § 303(d) (1)(C) to develop TMDLs for pollutants impairing Rainbow Creek because Rainbow Creek is an impaired waterbody listed on the CWA § 303(d) list.

The fact remains that even with the nutrient reduction observed in Rainbow Creek, nutrient water quality standards are still being exceeded and action is needed to bring the water quality to acceptable levels that support all beneficial uses.

The stream monitoring data collected from Rainbow Creek by the Regional Board from January 2000 to October 2000 indicates that:

1. Water quality standards for nitrogen are still not being met.
2. The exceedence of water quality standards for total nitrogen generally increases the farther downstream the sampling locations are in the watershed.
3. Total phosphorus also exceeds water quality standards throughout Rainbow Creek and appears at the highest concentrations downstream from Station 2.
4. Nitrogen and phosphorus results for 2000 are higher than levels reported for the 1996-1998 Mission Resource Conservation District (MRCD) monitoring.

The Regional Board recognizes and appreciates the reductions accomplished by the work of the MRCD (through their public outreach efforts and their work to cease the downstream discharge from the nursery formerly known as Rainbow-Flynn Nursery). Encouragement of voluntary implementation of management practices through a public outreach campaign is the ideal place to begin the implementation of the TMDLs. The implementation plan includes the public outreach program pioneered in the watershed by the MRCD. However, that success is not a reason to delay development of the TMDLs, which are needed to establish and allocate pollutant loads that will allow attainment of water quality standards.

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4. Comment Code: Beneficial Uses

Agency ID: San Diego County Farm Bureau

Commenter: Eric Larson

Comment:

It appears that the arroyo chubs need algae. If the implementation of these TMDLs have a detrimental effect on the chubs, there is a risk of environmental law conflicts.

Response:

The Regional Board disagrees with this statement. As stated in the Technical Report, the arroyo chub is an omnivorous grazer and feeds on aquatic plants, algae, aquatic insects, and small crustaceans. It is thought that most of the nutrition derived from the ingestion of plant material comes from the invertebrates associated with the algae or plant material. Thus, the chubs use algae as one substrate to feed upon. This TMDL will reduce the nutrient rich induced algae growth in the water but will not limit other naturally occurring aquatic plants from growing or plant material from entering into the creek.

Preservation of suitable habitat is probably the most important factor in maintaining arroyo chub populations in Rainbow Creek. The chub prefers slow moving water with sand or mud bottoms and will move into large pools for breeding. If algae growth is not controlled, it is possible the chubs may lose their ideal habitat by being displaced by algal mats and reduced dissolved oxygen.

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5. Comment Code: Beneficial Uses

Agency ID: San Diego County Farm Bureau

Commenter: Eric Larson

Comment:

We are unclear as to whether the listed beneficial uses are specifically designated to Rainbow Creek or are they designated by the Regional Board pursuant to the tributary rule because the Santa Margarita River is so designated. If designated pursuant to the tributary rule, we would ask for evidence as to the appropriateness of the listed beneficial uses within the watershed.

Response:

The beneficial uses of Rainbow Creek are specifically designated in Chapter 2, Table 2-2 of the Regional Board's Basin Plan. The eight designated beneficial uses are: MUN, AGR, IND, REC1, REC2, WARM, COLD, and WILD. The Santa Margarita River has the same beneficial uses with the addition of RARE. The appropriatess of the beneficial uses designated for Rainbow Creek is not a relevant issue in the Regional Board's deliberations on adopting the Rainbow Creek TMDL Basin Plan amendment.

The appropiateness of beneficial use designations for Rainbow Creek is an issue that should be raised in the context of the Regional Board's triennial review of Basin Plan water quality standards. The Water Quality Control Plan for the San Diego Basin (Basin Plan) designates beneficial uses for water bodies in the San Diego Region, and establishes water quality objectives and implementation plans to protect those beneficial uses. The Regional Board reviews the appropriateness of beneficial uses, water quality objectives and implementation plans designated in the Basin Plan every three years pursuant to federal and state law. The most recent 2004 Basin Plan Triennial Review was completed in June 2004. Based on that review no changes in the beneficial use designations for Rainbow Creek are currently being considered.

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6. Comment Code: Data Gaps

Agency ID: County of San Diego

Commenter: Gary Erbeck

Comment:

Cooperate to practice good science. The Regional Board must progress beyond invocations of the Basin Plan in ways that peer reviewers can characterize as scientifically "absolutely insupportable, bordering on the ridiculous," to solid science. Impairments must be verified and localized. The Regional Board must determine how nitrogen and phosphorus interact to stimulate algal growth in specific parts of the creek.

TMDL implementation must be focused on these specific problems. The County is prepared to participate in this study process.

Response:

The Regional Board uses the 0.1 mg/l goal for phosphorus stated in the Biostimulatory Substances water quality objective as a phosphorus water quality objective unless site specific scientific studies demonstrate that a modified phosphorus objective is appropriate for a particular waterbody. (A modified water quality objective is referred to as a site-specific water quality objective (SSO).) Similarly the Regional Board uses the N:P ratio of 10:1 cited in the in the Biostimulatory Substances water quality objective as a basis for establishing a nitrogen water quality objective of 1.0 mg/l unless site specific scientific studies are conducted to establish a nitrogen site specific water quality objective based on different N:P ratios. SSOs must be approved by the Regional Board and incorporated into the Basin Plan. The Regional Board's use and interpretation of the Biostimulatory Substances water quality objective is well established and consistent with applicable laws and regulations.

The Biostimulatory Substances water quality objective requires the use of 0.1 mg/l phosphorus and 1.0 mg/l nitrogen as water quality objectives unless scientific studies show that alternative site specifc water quality objectives (SSOs) for nitrogen and phosphorus are appropriate for Rainbow Creek. The SSOs would need to (1) be based on sound scientific rationale; (2) protect the designated beneficial uses of Rainbow Creek waters; and (3) be adopted by the Regional Board in a Basin Plan amendment. Dischargers or other interested parties would need to fund and initiate the scientific studies to develop the SSO. It is possible the studies could reveal the need for more stringent nutrient water quality objectives.

There is no effort currently underway or planned by interested persons to fund the scientific studies needed to develop SSOs for nutrients in Rainbow Creek. Even in the event that scientific studies were initiated and SSOs for nutrients were developed and adopted by the Regional Board, it would likely not obviate the need for a TMDL. Accordingly, the appropriate strategy for addressing the nutrient water quality problem in Rainbow Creek is for the Regional Board to proceed with adoption of the proposed TMDL Basin Plan amendment at this time. If SSOs for nutrients are developed in the future and adopted by the Regional Board, this TMDL Basin Plan Amendment would be modified accordingly. If interested parties are willing to fund and oversee development of scientific studies to investigate SSOs, the most effective and expeditious means to improve water quality would be to conduct these studies concurrent with actions necessary to achieve compliance with the current TMDL.

Development of new numeric nutrient criteria are currently underway in California by the USEPA Region IX Regional Technical Advisory Group. USEPA's recommended criteria for the subecoregion that includes Rainbow Creek are 0.5 mg total N/L and 0.03 mg total P/L, which are significantly lower than the Basin Plan objectives. Unless USEPA formally adopts these nutrient criteria or the Regional Board adopts alternative

nutrient criteria, the biostimulatory substances water quality objective currently in the Basin Plan is the applicable water quality objective the TMDL should be based on.

Research into the appropriateness of numeric goals of 1.0 mg total N/L and 0.1 mg total P/L indicates that these values are consistent with published scientific studies. Dodds et al. (1998), using the cumulative frequency distributions of nutrient data from more than 1000 temperate streams primarily in North America and New Zealand, suggest total nitrogen and total phosphorus levels between 0.7 to 1.5 mg N/L and 0.02 to 0.07 mg/PL, respectively, define streams that are mesotrophic. Eutrophic is a trophic state that has an abundance of nutrients and plant growth, and mesotrophic is a trophic state that has moderate concentrations of nutrients and plant growth.

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7. Comment Code: Data Gaps

Agency ID: Hines Nurseries

Commenter: Bud Summers

Comment:

In short, the use of a "modeled" TMDL without proper technical conditions and sufficient monitoring data has resulted in the development of a TMDL that is unsupported and unobtainable.2

2Another example of the data gap in developing the TMDL is the lack of any flow analysis to convert the concentrations detected from monitoring into load allocations for the nutrients in issue. The monitoring data which has identified concentrations in samples at various points along the Creek, is only relevant if the total flow or quantity of water that would contain such concentrations is also determined. Without this information, insufficient data exists to develop a "load" allocation for the TMDL.

Response:

The Regional Board has modified the TMDL to include 8 years worth of site-specific flow data collected by USGS and water quality data collected by Regional Board staff in 2000. Furthermore, water quality information from minimally impacted streams within the region has been incorporated into the document to establish background nutrient conditions (see Section 4.0 and Appendix D of the Technical Report). The Regional Board has adequate analytical information and has used accepted calculation methods to estimate the nutrient loading to Rainbow Creek and to develop a TMDL.

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8. Comment Code: Data Gaps

Agency ID: San Diego County Farm Bureau

Commenter: Eric Larson

Comment:

We have found that this Staff Report is overburdened with data gaps. In many instances data is incomplete, leading to numerous comments about re-evaluating the TMDLs, adjusting allocations, and the need for better data. These data gaps create a situation where the Regional Board is considering TMDLs that set an unachievable allocation of zero nutrient loads and explains it away by stating better data will be collected at a future date. Successful implementaiton of any plan needing the cooperation of stakeholders must show that the goals and remedies are reasonable, achievable, and based on reliable information.

Response:

The Regional Board has extensively revamped the Rainbow Creek TMDL to improve the scientific basis and validity of the wasteload and load allocations. The revised Rainbow Creek TMDL report now includes eight years of site-specific flow data to calculate the TMDLs, and City of San Diego water quality data from a number of minimally impacted streams within the County to calculate the background load. (See Section 4, and Appendix D and E.).

The TMDL implementation action plan is designed to include evaluations by the Regional Board to determine if the TMDLs, allocations, or implementation strategy need to be changed or modified. The Regional Board has structured an adaptive implementation action plan in the revised Rainbow Creek TMDL that simultaneously makes progress towards achieving nutrient water quality objectives while relying on monitoring data to reduce uncertainty and fill data gaps as time progresses. This monitoring data can be used to revise and improve the initial TMDL forecast over time. This type of approach will help ensure that the Rainbow Creek TMDL program is not halted because of a lack of data and information, but rather progresses while better data are collected to verify or refine assumptions, resolve uncertainties, and improve the scientific foundation of the TMDL.

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9. Comment Code: Data Gaps

Agency ID: County of San Diego

Commenter: Gary Erbeck

Comment:

During the early stages of implementing an interim TMDL, appropriate studies could be pursued on a cooperative and shared-cost basis to determine whether and if Rainbow Creek is actually impaired for biostimulatory substances based on the narrative standard in the Basin Plan. These studies could also determine the actual levels of nitrogen and phosphorus that are limiting for biostimulatory effects in the potentially impaired portions of this creek. The studies could confirm or refine estimates of natural nitrogen and phosphorus loadings to Rainbow Creek, and could determine the characteristics the creek would have if only natural loadings entered the creek.

During this period the County and the RWQCB could also cooperate to pursue the best available opportunities to reduce incremental man-made loadings of nitrogen and phosphorus to Rainbow Creek. This could include securing all appropriate additional reductions at commercial nurseries.

Response:

The federal Clean Water Act requires that TMDLs be developed to attain water quality standards through wasteload and load reduction actions taken during implementation. The Clean Water Act precludes the Regional Board from adopting an “interim TMDL” that does not require sufficient nutrient wasteload and load reduction actions to attain the Biostimulatory Substances water quality objecitve.

The Regional Board acknowledges that the technical basis of the Rainbow Creek TMDL is characterized by data gaps and uncertainties. Scientific uncertainty is a reality within all water quality programs, including the TMDL program, and it cannot be entirely eliminated. The TMDL program must move forward in the face of these uncertainties if progress in establishing TMDLs and attaining water quality objectives in impaired waters is to be made.

In accordance with this approach the Regional Board has structured an adaptive implementation action plan in the revised Rainbow Creek TMDL that simultaneously makes progress towards achieving nutrient water quality objectives while relying on monitoring data to reduce uncertainty and fill data gaps as time progresses. This monitoring data can be used to revise and improve the initial TMDL forecast over time. This type of approach will help ensure that the Rainbow Creek TMDL program is not halted because of a lack of data and information, but rather progresses while better data are collected to verify or refine assumptions, resolve uncertainties, and improve the scientific foundation of the TMDL.

The Regional Board appreciates the County's willingness to work cooperatively. Pursuit of opportunities to reduce incremental man-made loading of total nitrogen and total phosphorus to Rainbow Creek, including all appropriate nutrient load reductions at commercial nurseries, is consistent with the proposed Implementation Plan.

10. Comment Code: Data Gaps

Agency ID: Hines Nurseries

Commenter: Bud Summers

Comment:

One significant data gap recognized in the Staff Report itself is the lack of data on releases from septic tank disposal systems in the area. In fact, the Staff Report identifies these septic systems as an area requiring further study. Releases from septic tanks must be evaluated to determine the amount of nutrients released to groundwater from such disposal systems, and furthermore, to then determine the impact of groundwater on surface waters at various locations within Rainbow Creek. Septic tank releases may play a significant role in the release of nutrients and possibly other contaminants to Rainbow Creek. The Staff Report identifies and recognizes the need for a groundwater investigation to, at a minimum, "identify the contribution of groundwater discharge to surface flow," as well as a number of other items worthy of groundwater investigation.

Response:

The Regional Board agrees that a groundwater and septic tank investigation are important components to assessing the nutrient loading to Rainbow Creek.

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11. Comment Code: Data Gaps

Agency ID: Hines Nurseries

Commenter: Bud Summers

Comment:

Throughout the Staff Report, there are references to data gaps and the lack of data necessary to develop numeric objectives. In addition, there are various statements that the data collected during implementation will be used to fill such data gaps and to provide additional information needed to be used to determine if the TMDL and load allocations should thereafter be revised or if localized TMDLs are needed. For example, on page 22 the draft Staff Report dated March 22, 2002 provides that: "The total nitrogen and total phosphorus load capacities will be adjusted as necessary once additional data have been obtained from the Implementation Plan and Monitoring Strategy." As a result of the lack of data at this juncture, the draft TMDLs established for nutrients for Rainbow Creek are merely modeled using "simple models and assumptions. TMDLs based on "the lack of data" are therefore, not "technically defensible TMDLs"

based on the availability of analytical methods, modeling techniques, and a database (See 43 Fed. Reg. 60662).

Response:
The Regional Board acknowledges that the technical basis of the Rainbow Creek TMDL is characterized by data gaps and uncertainties. Scientific uncertainty is a reality within all water quality programs, including the TMDL program, and it cannot be entirely eliminated. However the TMDL program must move forward in the face of these uncertainties if progress in establishing TMDLs and attaining water quality objectives in impaired waters is to be made.

The Regional Board has revised the TMDL based on the comments received on the earlier 2002 proposed TMDL document. The Regional Board has extensively revamped the Rainbow Creek TMDL to improve the scientific basis and validity of the wasteload and load allocations. In establishing the nutrient TMDLs and load allocations, the Regional Board has incorporated the following sources of data and information into the Technical Report:

- Eight years of site-specific USGS stream flow data.
- Site-specific water quality data collected by the Regional Board in 2000.
- Published nutrient export coefficients.
- City of San Diego water quality data from minimally impacted streams within the County.

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12. Comment Code: Economic Considerations

Agency ID: Hines Nurseries

Commenter: Bud Summers

Comment:

The economic consideration section of the Staff Report includes a Section discussing BMPs and the incursion of other implementation costs for landowners and land uses, including for commercial nurseries. The estimated best management practice costs identified in this Section, although acknowledging Hines' new recycling system in the narrative in Section 11.2, do not incorporate into the costs described in Table 11-5, the $1.5 to $2 million recycling system that Hines Nurseries has voluntarily committed to undertake to further reduce the amount of runoff entering Rainbow Creek. Nor does the discussion on economics in this Section scale up these costs to the commercial nursery industry as a whole.

Response:

The Economic Considerations section (Section 12) has been revised and expanded to address this comment and the comments received at the May 8, 2002 Regional Board hearing. Specifically, text and tables have been added that outline a range of likely best management practices (BMPs) and management practices (MPs) with cost and efficiency estimates of each BMP / MP based on literature sources.

The Regional Board appreciates the measures Hine Nursery is undertaking to reduce nutrient discharges to Rainbow Creek. A brief discussion of the Hines Nursery operation is presented in Section 2.2 of the Technical Report. However, the Hine Nursery's water recycling system is not considered a typical or likely BMP / MP for commercial nurseries. The Hines Nursery system altered the streambed and discharges irrigation water directly to Rainbow Creek. The proposed new recycling system is an effort to remove their current irrigation recycling system and earthen dam from the streambed. It is unlikely that others will incur similar expenses.

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13. Comment Code: Economic Considerations

Agency ID: San Diego County Farm Bureau

Commenter: Eric Larson

Comment:

The Economic Considerations section fails to adequately address the costs that may be incurred by agricultural operations to implement Best Management Practices (BMPs). For example, Table 11-5 of the Staff Report dated March 22, 2002, states that BMPs may offer costs savings as a result of lower fertilizer and water usage is contrary to the fact that the Hines Nursery investment may be as much as $2 million.

Response:

The Economic Considerations section (now Section 12.0) has been revised and expanded to address this comment and the comments received at the May 8, 2002 Regional Board hearing. Specifically, text and tables have been added that outline a range of likely MPs, provide cost estimates, and efficiency of each MP based on literature sources.

The Regional Board appreciates the measures Hine Nursery is undertaking to reduce nutrient discharges to Rainbow Creek. A brief discussion of Hines Nursery operation is presented in Section 2.2 of the Technical Report. However, Hines Nursery's water recycling system is not considered a typical or likely MP for commercial nurseries. The current Hines Nursery system altered the streambed and discharged irrigation water directly to Rainbow Creek. The new recycling system is an effort to remove their current irrigation recycling system and earthen dam from the streambed.

14. Comment Code: Economic Considerations

Agency ID: San Diego County Farm Bureau

Commenter: Eric Larson

Comment:

When the document discusses the cost of BMPs, it does not consider whether the BMPs will actually help to meet the load allocations given. There must be some evaluation of the suggested BMPs and their effectiveness.

Response:

It is expected that the MPs used in Rainbow Creek will fall into three general categories: Irrigation MPs, Nutrient Reduction MPs, and Run off/Erosion Control MPs. The estimated effectiveness and cost of each MP are presented in Appendix H of the Technical Report. Flexibility has been intentionally incorporated into the implementation plan to accommodate modifications and changes to the MPs as new water quality monitoring data and information on the effectiveness of the MPs becomes available during implementation.

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15. Comment Code: Economic Considerations

Agency ID: County of San Diego

Commenter: Gary Erbeck

Comment:

Share study costs equitably, including a substantial State contribution. The County is not a significant discharger in this watershed, and is not the principle governmental agency with responsibility for promulgating and implementing TMDLs. The studies the Regional Board is seeking would provide basic data and science that should underlie any TMDL. This work should be the Regional Board's job. The County is willing to contribute to needed study efforts, but will not bear the entire cost of needed studies, plans and monitoring. The Regional Board or state, and major dischargers in the watershed, must also provide significant funding. The County’s obligations to do work pursuant to CWC Section 13225(c) must be contingent on receipt of funds from those sources.

Response:

The State Water Resources Control Board administers the awarding of grants funded from Proposition 13, Proposition 50, Clean Water Act 319(h) and other federal appropriations to projects that can result in measurable improvements in water quality, watershed condition, and/or capacity for effective watershed management. Many of these grant fund programs have specific set-asides for expenditures in the areas of watershed management and TMDL implementation for NPS pollution.

The Regional Board understands that the County of San Diego has recently been awarded a Federal Clean Water Act Section 319(h) Nonpoint Source Implementation Grant Program in the amount of $321,436 for the development of a Nutrient Reduction Management Plan for the Rainbow Creek watershed. The Regional Board will continue to recommend that the State Board assign a high priority to awarding grant funding for projects to implement the Rainbow Creek nutrient TMDLs. Special emphasis for grant funding will be given to projects that can achieve quantifiable nutrient load reductions consistent with the specific nutrient TMDL load allocations.

In conjunction with an MAA or MOU with the County of San Diego describing an adequate NPS pollution control implementation program, the Regional Board will adopt individual or general waivers or waste discharge requirements (WDRs) for NPS discharges in the Rainbow Creek watershed. The waivers or WDRs will require NPS dischargers to either participate in the third party NPS program or, alternatively, submit individual pollution prevention plans that detail how they will comply with the waivers and WDRs. Alternatively, the Regional Board may adopt a discharge prohibition, which includes exceptions for those dischargers who participate in the County's non point source pollution control implementation.

CWC §13225 provides authority for the Regional Board to enter into a Management Agency Agreement (MAA) with the County of San Diego to encourage development of appropriate planning or regulatory programs to control nonpoint source pollution. CWC §13225 also provides authority for the Regional Board to require local agencies such as the County of San Diego to submit technical reports on water quality control, even though those entities may not be waste dischargers. Local agencies can be required to investigate the scope, causes, and sources of nonpoint source pollution, and potential practices or control measures to prevent it. The only restriction is that the burden of preparing the reports bear a reasonable relationship to the need for and the benefits to be obtained from the reports. The Regional Board will provide a rationale relating the need for reports to the projected cost of the reports in CWC §13225 Orders it issues to the County requesting the submission of technical reports.

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16. Comment Code: Economic Considerations

Agency ID: County of San Diego

Commenter: Gary Erbeck

Comment:

Evaluate alternatives to "proportional" load allocations. The Regional Board has proposed to reduce allowable loads from significant categories of sources in proportion to baseline loads. That approach does not take into account the feasibility, costs, or cost-effectiveness of further controls, and does not address fairness issues. The resulting load allocation (LA) for septic tank disposal systems is infeasible, as discussed in this letter. The resulting allocation for other categories of sources may not take advantage of opportunities to secure further reductions in loadings at modest cost.

Response:

The TMDL has been modified from using proportional load allocations to equal load allocations with the exception of Parks and Urban areas. See Table 6-1 in the Technical Report for the new allocations. Appendix F provides additional information about the rationale that was used in assigning load allocations. The Regional Board will consider any specific information submitted by the public that address the concerns of fairness, feasibility, costs, and cost effectiveness.

The Regional Board recognizes that significant nutrient reductions in Rainbow Creek will be a long-term project. As Management Practices (MPs) are considered by dischargers for nutrient reduction, it is expected that their effectiveness and cost will be taken into consideration.

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17. Comment Code: Implemenation Language

Agency ID: County of San Diego

Commenter: Gary Erbeck

Comment:

Give the County more flexibility regarding study designs, monitoring, and reporting. The County remains willing to coordinate and to contribute to the cost of the studies and monitoring that are needed in this watershed.[7] However, read together, the draft Basin Plan amendment and draft Staff Report set very specific mandatory parameters for this work. Those specifications would lock in future research for a four-year period, and would require the County (or the County and others) to spend more than $1.0 million for studies, monitoring, and reports. Much more flexibility is needed for the County to willingly undertake this work.[8]

[7]The draft Resolution (at page 2, item 8.a) proposes to direct the County to "undertake an investigation to access [sic] nutrient loadings to Rainbow Creek from groundwater and

septic systems." This section further states that the County "has indicated a willingness to undertake this investigation." That statement is incorrect. The County indicated a willingness to coordinate this study effort. County staff also provided basic study parameters and a cost estimate for an "ideal" study effort, including not only a study of loadings from septic systems but also other research. The Regional Board has proposed to transform these study parameters and cost estimates into mandatory requirements—including a requirement that the County in fact spend the amounts it estimated would be needed for an ideal study of all issues. The County did not state that it was willing to do this work in exactly the manner postulated in its cost estimate, and thereafter specified in the draft Staff Report. The County did not indicate that it was willing to pay the entire cost of this work. The County is not willing to be locked into an inflexible four-year research plan, and is not willing to bear the entire cost of any studies of Rainbow Creek by itself.

[8]In the absence of an agreement concerning this work, the County would consider whether to challenge directives based on Water Code section 13225(c) as being inconsistent with the Water Code, and as unfunded state mandates. See footnote 2.

Footnote 2: Conditions imposed by the Water Code are included in subsection 13225(c). First, the requirement must be "necessary." Necessary reports can be required "provided that the burden including costs, of such reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained therefrom." State laws concerning unfunded mandates may also require that the state provide funding to the County to carry out any directives issued pursuant to subsection 13225(c). The County does not waive its right to assert in the appropriate forum that directions issued to the County pursuant to this subsection are unfunded state mandates.

Response:

CWC §13225 provides authority for the Regional Board to enter into a Management Agency Agreement (MAA) with the County of San Diego to encourage development of appropriate planning or regulatory programs to control nonpoint source pollution. CWC §13225 also provides authority for the Regional Board to require local agencies such as the County of San Diego to submit technical reports on water quality control, even though those entities may not be waste dischargers. Local agencies can be required to investigate the scope, causes, and sources of nonpoint source pollution, and potential practices or control measures to prevent it. The only restriction is that the burden of preparing the reports bear a reasonable relationship to the need for and the benefits to be obtained from the reports.

The revised Rainbow Creek TMDL provides that the Regional Board will direct the County of San Diego to submit the following three major technical reports:

1. Nutrient Reduction Management Plan

2. Groundwater Investigation and Characterization Report; and a

3 Implementation Monitoring Plan

The Regional Board will provide a rationale relating the need for these reports to the projected cost of the reports in CWC §13225 Orders it issues to the County requesting the submission of technical reports. These reports have required elements that are explained in further detail in Sections 9 and 10 of the revised TMDL technical report. The Regional Board has detailed the elements to be included in the reports to ensure that the County understands the information the Board is seeking. The Basin Plan amendment language provides for the submittal of alternative or additional elements equivalent to the elements prescribed by the Regional Board that would result in equivalent protection from, or prevention of, nutrient discharges to Rainbow Creek. The Basin Plan amendment does not indicate exactly how the studies or required elements are to be accomplished and provides the County with sufficient latitude to structure a report that meets the Board's needs. The County is encouraged to submit comments on the proposed Basin Plan amendment as to what elements should be required in these reports.

The language in regard to the County's willingness to undertake the investigation has been removed from the draft Basin Plan amendment. As a part of Section 12.0 Economic Considerations, the cost estimates of water quality monitoring and studies were provided as information for the TMDL. The costs are clearly characterized in the text as "estimates" and "preliminary."

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18. Comment Code: Implementation

Agency ID: San Diego County Farm Bureau

Commenter: Eric Larson

Comment:

We are unclear whether this document is the Regional Board's basin plan amendment or just the TMDLs that are to be submitted to the U.S. Environmental Protection Agency (USEPA). This must be clear. The USEPA has no implementation authority over nonpoint sources of pollution. Therefore, it is not necessary for the state to submit the implementation components of a TMDL to USEPA. We suggest that the Regional Board not submit such implementation components to USEPA in that the USEPA has no authority or jurisdiction and there is no reason to give them the opportunity to review and comment on such implementation plans.

Response:

The Regional Board's proposed action in the revised TMDL is a Basin Plan amendment incorporating the language described in Attachment A to tentative Resolution No. 2004-

0401 into the Basin Plan. The Basin Plan amendment includes language describing all elements of the Rainbow Creek TMDL including problem statement, numeric targets, source assessment, total maximum daily loads, load allocations, wasteload allocations, implementation action plan and implementation monitoring plan.

The Regioanl Board agrees that USEPA has no direct authority under the Clean Water Act to implement or enforce nonpoint source controls.

TMDL implementaiton plans are not currently required under federal law; however, it is USEPA policy that TMDLs should include implementation plans. TMDL implementation plans are required under state law.

CWA § 303(e) requires that TMDLs, upon USEPA approval, be incorporated into the state's water quality management plans (Basin Plan). State law in turn, CWC §§ 13050(j) and 13242 require that basin plans have a program of implementation to achieve water quality objectives. The implementation program must include a description of actions that are necessary to achieve the objectives, a time schedule for these actions, and a description of surveillance to determine compliance with the objectives. State law requires that a TMDL include an implementation plan because the TMDL normally is, in essence, an interpretation or refinement of an existing water quality objective. The TMDL has to be incorporated into the basin plan under CWA § 303(e), and, because the TMDL supplements, interprets, or refines an existing objective, state law requires a program of implementation.

The revised Rainbow Creek TMDL is a Basin Plan amendment that must be approved by the USEPA in its entirety pursuant to Clean Water Act § 303(d)(2), and federal regulations in 40 CFR 130.6, and 40 CFR 130.10. Accordingly, the Regional Board will be seeking USEPA approval of the Rainbow Creek TMDL Basin Plan amendment in its entirety, including the implementation plan component, following adoption by the Regional Board and approval by the State Water Resources Control Board.

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19. Comment Code: Implementation

Agency ID: Hines Nurseries

Commenter: Bud Summers

Comment:

The first phase of the TMDL implementation should last for five years to allow the results of the new Hines Nursery recycling system and septic tank improvements made with AB 885 funds to become apparent.

Response:

The revised Rainbow Creek TMDL requires that the first phase of nutrient load reductions be achieved by December 31, 2009. This provides an appropriate amount of time to implement MPs to attain the nutrient load reductions. The timing of the implementation and funding provisions of AB 885 is uncertain and the Regional Board in not willing to further delay or extend the first phase of implementation beyond 2009.

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20. Comment Code: Implementation

Agency ID: San Diego County Farm Bureau

Commenter: Eric Larson

Comment:

Section 9.5.1.1(C) Land Use Planning of the Staff Report dated March 22, 2002, indicates the Regional Board's desire to direct and evaluate county land use ordinances and their provisions. We must state our concern with the Regional Board injecting itself into land use decision making. It is one thing for the Regional Board to make the County the lead agency for the NRMP, but quite another to have the County answer to the Regional Board on land use matters. We can think of no other regulatory agency that assumes such a role.

Section 9.5.1.1(D) CEQA Responsibilities, also raises concerns about Regional Board participation in local land use decisions. A reading of this paragraph implies that the Regional Board is asking the County to apply CEQA requirements and mitigation measures on agricultural operations, a condition that does not currently exist. As in the preceding paragraph, the Regional Board's concern should be meeting water quality objectives, not influencing land use decision making.

Response:

The Regional Board has authority to regulate discharges of waste that could affect the quality of the waters of the state by issuance and enforcement of waste discharge requirements that will ensure the attainment of water quality consistent with the water quality objectives established in the basin plan. While the Regional Board should not interfere in land use planning by local governments, it may properly require municipalities to consider the water quality consequences of land use planning decisions involving development projects and construction, and to exercise local government authority to ensure that the consequence of land use planning decisions will not cause or contribute to the threat of pollution in waters of the state associated with discharges of pollutants.

The revised Rainbow Creek TMDL does not specifically limit or restrict land use or CEQA in the Rainbow Creek Watershed. In light of the persistence of the nutrient water quality impairment conditions in the Rainbow Creek watershed and the need for

increased regulatory oversight, the Regional Board proposes to use a Third Party regulatory based approach to mandate compliance with the nonpoint source (NPS) nutrient load reductions of this TMDL. The Regional Board proposes to accomplish this by negotiating a Management Agency Agreement (MAA) between the Regional Board and the County of San Diego setting forth the commitments of both parties to undertake various implementation responsibilities for the NPS nutrient load reductions of this TMDL. The success of the MAA approach is contingent on the County of San Diego's willingness to undertake the role of a lead NPS management and use its principal land use planning authority governing land use practices in the Rainbow Creek watershed to control NPS nutrient pollution in the Rainbow Creek watershed.

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21. Comment Code: Implementation

Agency ID: San Diego County Farm Bureau

Commenter: Eric Larson

Comment:

The primary implementation component for these TMDLs is a County prepared Nutrient Reduction and Management Plan (NRMP). It is our belief that this is a new implementation approach, not seen in other TMDLs. We would like assurances that agriculture will have a place at the table when the County prepares the plan, but see no such mention in the TMDL. We also believe it would be appropriate to have participation by the University of California Cooperative Extension Service. There should also be assurances that the plan will be subject to public review and Regional Board approval.

Response:

Under the terms of revised Rainbow Creek TMDL ,the County of San Diego will be the lead agency in developing the Nutrient Reduction and Management Plan (NRMP). It is anticipated that all interested parties and stakeholders will have a chance to review and comment on the NRMP. The Regional Board will consider, following concurrence with the County of San Diego's (NRMP) for Rainbow Creek, entering into a Management Agency Agreement (MAA) with the County of San Diego. The MAA would set forth the commitment of both parties to undertake various oversight responsibilities for the nonpoint source nutrient load reduction component of this TMDL, and the County's commitments to implement the NRMP.

In conjunction with an MAA or MOU with the County of San Diego describing an adequate NPS pollution control implementation program, the Regional Board will adopt individual or general waivers or waste discharge requirements (WDRs) for NPS discharges in the Rainbow Creek watershed. The waivers or WDRs will require NPS

dischargers to either participate in the third party NPS program or, alternatively, submit individual pollution prevention plans that detail how they will comply with the waivers and WDRs. Alternatively, the Regional Board may adopt a discharge prohibition, which includes exceptions for those dischargers who participate in the County's non point source pollution control implementation.

The Regional Board shall will also consider entering into a memorandum of understanding (MOU) to document cooperative agreements with other agencies or organizations that are able to provide information, technical assistance, or financial assistance to dischargers to support the Regional Board's goals of attaining the nutrient load reductions required under this TMDL and compliance with the nutrient water quality objective. These agencies and organizations would include, but are not limited to, the United States Department of Agriculture, Natural Resources Conservation Service (NRCD), Mission Resource Conservation District (MRCD), and the University Of California Cooperative Extension (UCCE).

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22. Comment Code: Implementation

Agency ID: County of San Diego

Commenter: Gary Erbeck

Comment:

TMDL programs for Rainbow Creek should be implemented on a phased basis, both to sequence regulatory actions properly and to ensure that appropriate science is in place to support policy decisions.

Response:

The Regional Board has structured an adaptive implementation action plan in the revised Rainbow Creek TMDL that simultaneously makes progress towards achieving nutrient water quality objectives while relying on monitoring data to reduce uncertainty and fill data gaps as time progresses. This monitoring data can be used to revise and improve the initial TMDL forecast over time. This type of approach will help ensure that the Rainbow Creek TMDL program is not halted because of a lack of data and information, but rather progresses while better data are collected to verify or refine assumptions, resolve uncertainties, and improve the scientific foundation of the TMDL.

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23. Comment Code: Legal Issues

Agency ID: County of San Diego

Commenter: Gary Erbeck

Comment:

Make and support required findings before imposing investigation, reporting or analysis requirements on the County. Water Code section 13225(c) allows the Regional Board to impose these requirements on a local agency only if the requirements are "necessary" and only provided the burdens of the imposition including costs are reasonable in comparison to the need for the report and the benefits to be obtained therefrom. The Regional Board has not done the work required to support the imposition of study requirements on the County under these standards. They have reported the costs of an ideal study as reported to them by County staff, but analysis and findings concerning necessity, burden, and benefits are lacking. The draft Resolution includes proposed Finding No. 17, but that is a general finding concerning all benefits and all costs of TMDL implementation, not a finding that addresses the requirements of section 13225(c).

Response:

CWC §13225 provides authority for the Regional Board to require local agencies such as the County of San Diego to submit technical reports on water quality control, even though those entities may not be waste dischargers. Local agencies can be required to investigate the scope, causes, and sources of nonpoint source pollution, and potential practices or control measures to prevent it. The only restriction is that the burden of preparing the reports bear a reasonable relationship to the need for and the benefits to be obtained from the reports. The Regional Board will provide a rationale relating the need for these reports to the projected cost of the reports in CWC §13225 Orders it issues to the County requesting the submission of technical reports.

In the Economic Considerations Section of the Regional Board's Rainbow Creek TMDL Report, cost estimates are provided for monitoring and implementation of selected BMPs.

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24. Comment Code: Legal Issues

Agency ID: San Diego County Farm Bureau

Commenter: Eric Larson

Comment:

In reviewing the fifty-two listed events on Attachment D of the Staff Report dated March 22, 2002 preceding today's public hearing, three involved public participation. Two in 1999, and one on April 11th of this year. While technically meeting the letter of the law, it is our hope that the Regional Board feels that every means available has been used to notify and engage the residents, property owners, farmers and nurserymen of the Rainbow Creek Watershed.

Response:

The Regional Board has provided adequate opportunities for public participation. In addition to the events listed in Appendix I of the revised Rainbow Creek TMDL, the Regional Board has posted the draft documents, public presentations, and other relevant documents on Regional Board's website as they became available.

Since the release of the draft Staff Report in 2002, the Regional Board has met with the TAC on December 18, 2002 to discuss the Economic Considerations. Furthermore, the Regional Board met with Caltrans on December 30, 2002 and again on March 19, 2003 to discuss Caltrans specific issues.

In 2004, the revised Rainbow Creek TMDL will be released for another public review in mid October 2004. Notice of the release of the revised Rainbow Creek TMDL documents has been circulated to all known interested parties. The revised Rainbow Creek TMDL documents will be posted on the Regional Board website during this public review period which ends December 8, 2004. The Regional Board will be holding a workshop to consider public comments on November 17, 2004. It is the Regional Board's intent to continue with meetings, public participation, and solicitation of comments during throughout the comment period until the public hearing on December 8, 2004. At any time during this period, public comments may be submitted to the Regional Board.

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25. Comment Code: Legal Issues

Agency ID: Hines Nurseries

Commenter: Bud Summers

Comment:

An additional concern created by the premature establishment of a Nutrient TMDL for Rainbow Creek, is the requirement within the Clean Water Act that only those TMDLs that are “suitable for such calculation” are to be developed. (See 33 U.S.C. § 1313(d)(1)(c).) In the regulations to the Clean Water Act, EPA defined when TMDLs are “suitable for calculation” by finding that all pollutants are suitable for calculation under “proper technical conditions” in which to base the development of the TMDL. (See 43 Fed. Reg. 60662). The phrase “Proper Technical Conditions” was explained by EPA as referring to “the availability of the analytical methods, modeling techniques and a data base necessary to develop a technically defensible TMDL.” USEPA went on to conclude that “these elements were to vary in their level of sophistication depending on the nature of the pollutant and characteristics of the segment in question. It must be determined on a case-by-case basis.” (Id.)

Response:

The Regional Board has adequate analytical information to calculate and establish technically defensible TMDLs. In establishing the nutrient TMDL and load allocations, the Regional Board incorporated the following sources of data and information into the Technical Report:

- 8 years of site specific USGS stream flow data.
- Site specific water quality data collected by the Regional Board in 2000.
- Published nutrient export coefficients.
- City of San Diego water quality data from selected streams within the County.

The Rainbow Creek TMDLs have been peer reviewed twice by technical experts and none of the peer review comments suggested that the TMDLs were not "suitable for calculation." It is worth noting that if a high level of scientific certainty was required regarding every TMDL, a margin of safety would not be included in the TMDL equation.

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26. Comment Code: Rainbow Creek Draft Document

Agency ID: Hines Nurseries

Commenter: Bud Summers

Comment:

The two incorrect references to Hines should be deleted from the Staff Report.

Response:

The two statements referred to in this comment have been deleted from the revised Rainbow Creek TMDL. The two statements were the first and last sentences of the fourth paragraph of Section 9.5.1.4 if the Staff Report dated March 22, 2002. This paragraph is now located in Section 2.2.

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27. Comment Code: Rainbow Creek Draft Document

Agency ID: US EPA- Region 9

Commenter: Peter Kozelka

Comment:

The first sentence of Section 6.0 is misleading. It could be changed to…..A TMDL is less than or equivalent to the loading capacity after taking into account "allocations for all sources and a margin of safety."

Response:

The recommended change has been made.

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28. Comment Code: Rainbow Creek Draft Document

Agency ID: US EPA- Region 9

Commenter: Peter Kozelka

Comment:

Section 5.0 should be titled "Loading Capacity and Linkage Analysis" to clarify its contents.

Response:

The recommended change has been made.

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29. Comment Code: Responsible Parties/Dischargers

Agency ID: County of San Diego

Commenter: Gary Erbeck

Comment:

Do not characterize the County as a "responsible party" or as a "discharger" for this watershed. The County acknowledges that it is a "local agency" that is subject to Regional Board direction related to studies and monitoring, under certain conditions, pursuant to California Water Code section 13225(c). The County also acknowledges that it has a significant role to play in this watershed as a land use authority, a public health agency, and a permitting agency for some new septic system installations. However, these various roles do not make the County a "discharger" or a "responsible party" for nitrogen and phosphorus loadings to Rainbow Creek.

Response:

The revised Rainbow Creek TMDL documents does not refer to the County of San Diego as a responsible party for NPS discharges that are not under the County's direct control. Under the terms of revised Rainbow Creek TMDL , the County of San Diego will be the lead agency in developing the Nutrient Reduction and Management Plan (NRMP). The Regional Board will consider, following concurrence with the County of San Diego's (NRMP) for Rainbow Creek, entering into a Management Agency Agreement (MAA) with the County of San Diego. The MAA would set forth the commitment of both parties to undertake various oversight responsibilities for the nonpoint source nutrient load reduction component of this TMDL, and the County's commitments to implement the NRMP.

In conjunction with an MAA or MOU with the County of San Diego describing an adequate NPS pollution control implementation program, the Regional Board will adopt individual or general waivers or waste discharge requirements (WDRs) for NPS discharges in the Rainbow Creek watershed. The waivers or WDRs will require NPS dischargers to either participate in the third party NPS program or, alternatively, submit individual pollution prevention plans that detail how they will comply with the waivers and WDRs. Alternatively, the Regional Board may adopt a discharge prohibition, which includes exceptions for those dischargers who participate in the County's non point source pollution control implementation.

Any Regional Board enforcement action taken will be against individual dischargers and not the County of San Diego (unless the waste discharge is directly caused or permitted by the County). The Regional Board will also provide assistance to the County of San Diego as necessary to enforce implementation of MPs and the nutrient load reductions specified in this TMDL.

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30. Comment Code: Responsible Parties/Dischargers

Agency ID: Hines Nurseries

Commenter: Bud Summers

Comment:

In short, Hines firmly believes that the evidence shows that Hines has not caused or in any way contributed to a condition of pollution, contamination, or nuisance, and that to the contrary, its actions, and those of its predecessor have significantly improved the condition of Rainbow Creek. The evidence of the benefit of these improvements are supported by the Regional Board's report entitled "Total Maximum Daily Load for Nutrients, Rainbow Creek, San Diego County," dated April 2000. This report concluded that monitoring conducted in 1998-1999 reported a reduction in average nitrate concentrations in Rainbow Creek at Willow Glen Road from the 1986 annual average of 48.7 mg NO3-N/L down to 1.73 mg NO3-N/L. This monitoring report, combined with the existing recycling system Hines has been implementing for several years in

connection with its irrigation waters, and the fact that a large majority (up to 80% or more) of its irrigation waters are already recycled, is strong evidence that Hines has not taken any action that has created a condition of pollution, contamination, or nuisance.

Response:

The Regional Board is aware that Hines Nursery has taken actions to reduce impact of their discharge to Rainbow Creek downstream of their facility. Significant reductions to the nitrogen (N) and phosphorus (P) concentrations in the Creek have been noted. Unfortunately, the nutrient concentrations downstream from Hines Nursery are still above desired levels. Most notable is the total phosphorus levels recorded in 2000 at Oak Crest which is just downstream from Hines Nursery. The average recorded total phosphorus was 1.13 mg/L based on 9 samples. Further downstream at Willow Glen and Riverhouse sampling stations, the total phophorus ranged from 0.39 to 0.49 mg P/L and 0.12 to 0.21 mgP/L respectively, during the same sampling period. Hines Nursery is still discharging irrigation water into Rainbow Creek and the Regional Board believes this unpermitted discharge is contributing to the nutrient loading of Rainbow Creek. The assertion that "Hines has not taken any action that has created a condition of pollution, contamination, or nuisance" is contrary to past and present irrigation practices at the nursery.

The sentence in Section 9.5.1.6 in the Rainbow Creek TMDL document dated March 22, 2002, which states "Hines Nursery is in violation of the waste discharge prohibition for discharge of waste to waters of the state in a manner causing a condition of pollution, contamination, or nuisance" has been deleted.

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31. Comment Code: Septic Tank Disposal Systems

Agency ID: County of San Diego

Commenter: Gary Erbeck

Comment:

Properly functioning conventional septic systems are not designed to remove large quantities of nitrogen. They are designed to convert organic nitrogen and ammonia to nitrate, to remove some nitrogen altogether through denitrification, and to remove all pathogens. Additional nitrogen is removed by plant assimilation in the septic system leach field. While failing septic disposal systems would undoubtedly add more nitrogen to the subsurface than functioning systems, most of the systems in the Rainbow Creek watershed are functioning properly.

Response:

Although most of the septic tank systems in the watershed may be functioning proprerly, the majority of the failing septic tank systems are located in the alluvial valley, where the

groundwater has the highest potential to discharge to Rainbow Creek. The failing systems are discharging nitrogen (N) directly to groundwater because there is minimal or no separation between the leach field discharge point and the water table. Without the proper separation between the leach field and the groundwater, reduction of the N from the effluent does not occur. While no septic system removes all N before the effluent reaches groundwater, ensuring that all systems in the watershed are working and constructed properly will reduce the N load to groundwater and Rainbow Creek.

The Environmental Considerations Section 8.4.1 of the revised Rainbow Creek TMDL describes management measures and practices that can be used to reduce nitrogen loadings from septic tanks.

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32. Comment Code: Septic Tank Disposal Systems

Agency ID: County of San Diego

Commenter: Gary Erbeck

Comment:

Set realistic load reduction targets for onsite wastewater treatment systems that are tied to AB 885 program implementation. As previously discussed in this letter, achieving a 50% reduction in septic tank disposal system loadings watershed-wide is almost certainly not feasible and is probably physically impossible under the most ideal of soil conditions, unless properly functioning systems are replaced. Replacements are only likely to be achievable to the extent state financial subsidies are provided under the provisions of AB 885. Load allocations and implementation schedules must reflect these limitations.

Response:

The Regional Board agrees that replacing existing septic systems may be very costly. The revised Rainbow Creek TMDL implementation plan provides a 16 year time period to attain the spetic tank nutrient load reductions.

Assembly Bill 885, now adopted as Chapter 4.5 of the Porter-Cologne Act, requires the State Water Resources Control Board to promulgate regulations and standards for the permitting and operation of prescribed onsite sewage treatment systems and for the Regional Boards to incorporate those regulations into their Basin Plans. The State Board is in the process of promulgating the regulations. The Regional Board will incorporate the regulations into Basin Plan as soon as practicable upon their adoption by the State Board. The regulations currently under development include mandated nitrogen reduction performance requirements for septic tank systems that are identified as contributing to the impairment of surface water bodies listed as impaired pursuant to Section 303(d) of the Clean Water Act. As currently drafted, the new regulations require

the Regional Board to issue waste discharge requirements for all septic tanks systems beginning in January 1, 2009, unless the County of San Diego assumes responsibility for enforcement of the regulations through a Memorandum of Understanding (MOU) with the Regional Board.

The implementation of these new regulations on septic tank disposal systems in the Rainbow Creek watershed will be an important vehicle for attaining the required nutrient load reductions for septic tank disposal systems. At this time it is not known how new programs developed through AB 885 will impact the implementation of the TMDLs for septic tank systems.

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33. Comment Code: Septic Tank Disposal Systems

Agency ID: County of San Diego

Commenter: Gary Erbeck

Comment:

The scope of an initial TMDL should be limited because the State has just established and is in the process of implementing a new program, complete with financial incentives, that may allow some properly functioning conventional septic systems in this watershed to be replaced with advanced systems, that would discharge less nitrogen. TMDL implementation in this watershed should be tied to the phased implementation of AB 885, but those new programs will not be in place until 2004.

Response:

Assembly Bill 885, now adopted as Chapter 4.5, Sections 13290 et seq. of the Porter-Cologne Act requires that the State Board promulgate regulations and standards for the permitting and operation of prescribed onsite sewage treatment systems and for the Regional Boards to incorporate those regulations into their Basin Plans. Among other requirements, section 13291(b) requires that the regulations shall include new requirements for systems adjacent to impaired waters.

The State Board is in the process of promulgating regulations. It is not known how new programs developed through AB 885 will impact implementation of the TMDLs at this time.

The Regional Board has a legal obligation under the Clean Water Act to adopt a TMDL for all water bodies, such as Rainbow Creek, identified as not meeting water quality standards under Section 303(d). The revised Rainbow Creek TMDL implementation plan provides a 16 year time period to attain the spetic tank nutrient load reductions. It is inappropriate to delay TMDL development on the basis of future programs, whose specific content and timing are unknown at this time. The 16 year time period allowed

for in the implementaion plan should provide a sufficent flexibility to deal with issues arising from the new regulations.

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34. Comment Code: Septic Tank Disposal Systems

Agency ID: County of San Diego

Commenter: Gary Erbeck

Comment:

The County and the Regional Board should also cooperate to implement AB 885 programs for onsite wastewater treatment systems.

Response:

The Regional Board concurs and appreciates the County's willingness to cooperate. Assembly Bill 885, adopted as Chapter 4.5, Sections 13290 et seq. of the Porter-Cologne Act, requires the State Board to promulgate regulations and standards for the permitting and operation of prescribed onsite sewage treatment systems and for the Regional Boards to incorporate those regulations into their Basin Plans. Following that the Regional Board will likely pursue negotiating a Memorandum of Understanding (MOU) with the County of San Diego to assume responsibility for enforcement of the regulations.

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35. Comment Code: Septic Tank Disposal Systems

Agency ID: County of San Diego

Commenter: Gary Erbeck

Comment:

Achieving a 50% reduction in septic system-derived loadings of nitrogen to Rainbow Creek is almost certainly not feasible, and is probably physically impossible under the most ideal of soil conditions, unless significant numbers of properly functioning conventional septic tank disposal systems are replaced with very costly alternative systems.

Response:

The Regional Board agrees that replacing existing septic systems may be very costly. The schedule of the implementation plan is intentionally written to allow incremental reductions towards achieving the N and P water quality objectives. The revised Rainbow

Creek TMDL implementation plan provides a 16 year time period to attain the septic tank nutrient load reductions.

Assembly Bill 885, now adopted as Chapter 4.5 of the Porter-Cologne Act requires the State Board to promulgate regulations and standards for the permitting and operation of prescribed onsite sewage treatment systems and for the Regional Boards to incorporate those regulations into their Basin Plans. The regulations currently under development include mandated nitrogen reduction performance requirements for septic tank systems that are identified as contributing to the impairment of surface water bodies listed as impaired pursuant to Section 303(d) of the Clean Water Act. As currently drafted, the new regulations require the Regional Board to issue waste discharge requirements for all septic tanks systems beginning in January 1, 2009, unless the County of San Diego assumes responsibility for enforcement of the regulations through a Memorandum of Understanding (MOU) with the Regional Board.

The implementation of these new regulations on septic tank disposal systems in the Rainbow Creek watershed will be an important vehicle for attaining the required nutrient load reductions for septic tank disposal systems. At this time it is not known how new programs developed through AB 885 will impact the implementation of the TMDLs for septic tank systems.

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36. Comment Code: Technical Issues

Agency ID: County of San Diego

Commenter: Gary Erbeck

Comment:

The proposed TMDL calculations are scientifically and mathematically flawed. In discussions with County staff and legal counsel at a meeting on April 16, 2002, the Regional Board was unable to explain how the allowable loadings proposed in this Technical Report are related to estimated natural loadings to Rainbow Creek, or to estimated loadings required to reach the numerical water quality targets.

Response:

The Regional Board has revised the TMDL and background load calculations. Both of these calculations now utilize Rainbow Creek flow data collected by the USGS gaging station (See Appendix E - Technical Support Document: Streamflow, Seasonal Variation, and Flow Tiers). In the case of the TMDL calculations, the total nitrogen and total phosphorus TMDLs are now calculated by multiplying the numeric targets (1.0 mg N/L and 0.1 mg P/L) with the annual flow volume of Rainbow Creek. Similarly, a background load is calculated by multiplying representative background concentrations

with the annual flow volume. Nutrient water quality data collected from minimally impaired streams in San Diego County have been assessed to establish nutrient background concentrations for San Diego County. The approach and data used in the background assessment can be found in Appendix D - Technical Support Document: Background Concentrations. The remainder of the TMDLs, after background and a margin of safety are subtracted, are then allocated to point and nonpoint sources based on considerations of the various sources (See Appendix F - Load Allocation Analysis).

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37. Comment Code: Technical Issues

Agency ID: Hines Nurseries

Commenter: Bud Summers

Comment:

The daily load allocations specified in Table 4-Y of the draft Basin Plan Amendment (Attachment A to Resolution No. R9-2002-0108) should be enforced based on a running 30-day average. This would provide an allowance for irrigation system malfunctions or other problems while meeting the objectives of the TMDLs. Since the proposed biostimulatory criteria are so low and there is no actual nutrient impairment, this should more than protect beneficial uses.

Response:

The TMDLs' allocations are based on a total annual load, rather than a daily load, and this load is not to be exceeded. If load requirements are incorporated into a permit, the method of enforcement will be determined at that time.

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38. Comment Code: Technical Issues

Agency ID: County of San Diego

Commenter: Gary Erbeck

Comment:

The visual characterizations of algal growth may not be reliable even as to the locations called out by staff. Two of the Regional Board's three peer reviewers have questioned the use of visual observations alone to determine whether algae and plant growth is “excessive.” Dr. Rhea Williamson notes that determining visually whether there is excessive algae growth “can be misleading.” (Appendix J, page 2 of J-2, first comment

regarding page 5 of the staff report) Dr. David Jenkins asks, "where are the data on emergent plant and algal numbers to support your statement that both are 'excessive'." The Regional Board was unable to respond with data, as no data are available yet to make this showing. (Attachment J, J-3 at "Summary of asterisked comments" for page 8 of the staff report).

Response:

Regardless of the presence or absence of algae, nitrogen and phosphorus levels are exceeding the Biostimulatory Substances water quality objective. Water quality data collected in 2000 support the designation of Rainbow Creek as an impaired waterbody. The 2002 303(d) List of impaired waterbodies was updated to reflect that nitrogen and phosphorus are the cause of impairment and the TMDL must be developed to address these impairments.

The Regional Board noted abundant algal growth at monitoring locations in Rainbow Creek during regular site observations and sampling events conducted during 1999-2000. It was noted as a qualitative assessment/observation that lends support to the assumption that increased nutrient concentration promotes increased algal growth when other factors present favorable conditions. The discussion about excess algae within the revised Rainbow Creek TMDL document and the color photographs in Appendix C, are used as supporting information.

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39. Comment Code: Technical Issues

Agency ID: County of San Diego

Commenter: Gary Erbeck

Comment:

The Regional Board considers the algal and emergent plant growth they have visually observed in Rainbow Creek to be excessive. (See draft Staff Report, p. 7.) This observed condition is not creek-wide. Rainbow Creek is about five to six miles long. Much of it is shaded by a plant canopy, and no excess algae have been observed in shaded areas. The growth of algae was visually judged by staff to be excessive at only two locations in 1999, and at only four locations in 2000. All of these areas have shallow slow moving water and no overhanging canopy. (Draft Staff Report at p. 7-8, and attached photos.)

Response:

It was not the intent of Regional Board to imply that excessive emergent plant growth extends along the entire length of Rainbow Creek. The Regional Board noted algae growth at certain locations in Rainbow Creek during regular site observations and

sampling events conducted during 1999-2000. It was noted as a qualitative assessment/observation that lends support to the assumption that increased nutrient concentration promotes increased algal growth. The mention of excess algae within the revised Rainbow Creek TMDL document, along with the color photographs in the appendix, are used as supporting information.

The 2002 Clean Water Act section 303(d) list describes Rainbow Creek as impaired for elevated levels of nitrogen and phophorus. Therefore, the focus of the Rainbow Creek TMDL is the nitrogen and phophorus concentrations in the Creek. Water quality data collected along the length of the Creek show strong indication that the nutrient water quality standards are being exceeded on a regular basis, and that the listing as an impaired water body and the development of a TMDL is warranted.

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40. Comment Code: Technical Issues

Agency ID: County of San Diego

Commenter: Gary Erbeck

Comment:

Even though pre-human nitrogen loadings to Rainbow Creek were likely to have been about 2,400 kg/yr, this TMDL package proposes a nominal TMDL for nitrogen that would require total nitrogen loadings to be reduced to less than two-thirds that level. Under this scenario, undeveloped land could be left to nature and could continue to release nitrogen to the creek, but all nitrogen discharges from land touched by man (even if only touched by designation as a “preserve”) would eventually have to be eliminated. It would not be sufficient merely to reduce discharges back to natural levels.

Response:

New methods for determining background nutrient loads and nutrient loading to Rainbow Creek have been incorporated into the revised TMDL report. The revised Technical Report now uses the water quality data from several minimally-impacted streams within San Diego County and flow data to calculate the background loads (see Appendix D). Therefore, the method used to arrive at 2,400 kg/yr for nitrogen loading no longer applies.

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41. Comment Code: Technical Issues

Agency ID: County of San Diego

Commenter: Gary Erbeck

Comment:

None of these numbers are certain, of course. But it is nonetheless clear that the Regional Board should not launch a TMDL development process in San Diego by proposing to set TMDLs for Rainbow Creek at levels that are two-thirds to one-fifth of natural loadings, based on an impairment listing that staff concedes has no basis in fact. To do so would be scientifically unsupportable, inconsistent with the Water Code, and politically unwise. Any such proposal would be damaging to the successful implementation of TMDLs in San Diego and elsewhere.

Response:

The Regional Board has modified the approach for calculating nutrient background loads by utilizing actual background data for San Diego County. The new approach uses nitrogen and phosphorus data from relatively clean streams in San Diego County to estimate the nutrient background loads for Rainbow Creek (see Appendix D). This method replaces the use of export coefficients for estimating nutrient background loads. The revised background loads are less than the proposed TMDLs and no longer support the statement that the TMDLs "are two-thirds to one-fifth of natural loadings".

In regard to the impairment listing, the original listing for Rainbow Creek was based on excessive nitrate concentrations documented during the mid-1980s, but listed for the pollution condition of "eutrophic". As a result of further monitoring and evaluation during the development of this Technical Report, a recommendation was made that the impairment listing be clarified and revised from "eutrophic" to "nitrogen and phosphorus" for exceedance of the Biostimulatory Substances Objective. The 2002 303(d) List Update, which included this revision of the impairment listing for Rainbow Creek, was approved by the USEPA in July 2003.

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42. Comment Code: Technical Issues

Agency ID: County of San Diego

Commenter: Gary Erbeck

Comment:

Efforts to reduce nitrogen to these levels would themselves have environmental consequences for the lands affected. Reducing loadings of nitrogen and phosphorus to Rainbow Creek to below the level of natural loadings could also have environmental impacts on Rainbow Creek—under the plan proposed by the Regional Board, Rainbow Creek would receive less nitrogen and phosphorus than it did in its natural condition.

The environmental effects of driving nutrient loadings down to these unnatural levels were not disclosed or addressed in the environmental checklists and analyses prepared for this project.

Response:

The Regional Board has modified the approach for calculating nutrient background loads by utilizing actual background data for San Diego County. The new approach uses nitrogen and phosphorus data from relatively clean streams in San Diego County to estimate the nutrient background loads for Rainbow Creek. This method replaces the use of export coefficients for estimating nutrient background loads. The revised background loads are less than the proposed TMDLs and no longer support the statement that the proposed TMDLs will reduce nitrogen and phosphorus loading below natural levels.

The approach and data used in the background calculations can be found in Appendix D - Technical Support Document: Background Concentrations and Appendix E - Technical Support Document: Streamflow, Seasonal Variation, and Flow Tiers.

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43. Comment Code: Technical Issues

Agency ID: San Diego County Farm Bureau

Commenter: Eric Larson

Comment:

Section 2.6 discusses how dissolved oxygen (DO) concentrations were not low enough to cause an adverse effect and that DO is not expected to be depressed below the water quality standard. Yet, it then states that there are no results to support that assumption. However, there are clearly no results to not support the assumption either. Since there is not reason to suspect DO problems, then DO monitoring is not necessary. The Staff Report is specific to nutrients and algal growth and should therefore stay focused on the problem statement and not go looking for other issues.

Response:

The Regional Board agrees that the focus of the TMDL should be on nutrient related issues. However, monitoring for dissolved oxygen, in conjunction with temperature, conductivity, and pH, is a standard measurement of water quality and will be used as one of several indicators of water quality conditions that may impact beneficial uses to Rainbow Creek. Dissolved oxygen data may also be useful if a site-specific water quality objective is proposed.

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44. Comment Code: Technical Issues

Agency ID: Hines Nurseries

Commenter: Bud Summers

Comment:

The Southern California Coastal Water Research Project (SCCWRP) study referenced in the Staff Report indicates that the coefficient for agriculture was based on one site located in Ventura County. For the subject TMDLs, coefficients should be developed for inland San Diego County commercial nurseries, field agriculture, and orchards. The coefficients used in the SCCWRP study may have been appropriate for a regional study of coastal waters, however, they are not appropriate for a regulatory document, such as a TMDL Staff Report. Additional research is required to develop appropriate coefficients.

Response:

The Regional Board agrees that site-specific land use coefficients would have been ideal for this TMDL. Unfortunately, to our knowledge, none exist for Rainbow Creek or San Diego County. A brief discussion has been added to Section 4.0 Source Assessment of the revised Technical Report that discusses the selection process for the nutrient export coefficients.

The Regional Board is willing to consider other export coefficients and load calculation methods. With the exception of USEPA, no comments were made by the stakeholders or the peer review panel with suggestions or modifications to the use of export coefficients. USEPA submitted information on load calculations and that information was incorporated into the revised TMDL Report.

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45. Comment Code: Technical Issues

Agency ID: County of San Diego

Commenter: Gary Erbeck

Comment:

Don’t require reduced discharges of nitrogen or phosphorus from preserves. Discharges from preserves are natural, background discharges. They cannot be reduced without interfering with preservation of the land in its natural state. Yet, the proposed Staff Report would require the same proportional reductions in nitrogen and phosphorus loadings from these lands as from agriculture and septic tank disposal systems.

Response:

The Technical Report has been modified and load reductions are no longer specified for preserve lands.

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46. Comment Code: Technical Issues

Agency ID: San Diego County Farm Bureau

Commenter: Eric Larson

Comment:

Page two of the executive summary indicates that there are no wasteload allocations made for these TMDLs; however, there are urban areas within the watershed. If the urban areas are served by publicly (or privately owned treatment facilities, such as Oak Crest Mobile Estates and Rainbow Conservation Camp) then there are point sources within the watershed that must be considered.

Response:

Oak Crest Mobile Estates uses concrete lined evaporation ponds at their facility. The Regional Board does not consider the Oak Crest Mobile Estates waste water treatment facility a point source dischagre within th e meaning of the Clean Water Act.

The California Department of Forestry and Fire Protection (CDFFP) is responsible for operating Rainbow Conservation Camp and is named as a responsible party in the revised TMDL Report. CDFFP will be directed to undertake an investigation on possible impacts from their septic tanks and percolation ponds on Rainbow Creek. See Section 9.7, CA Department of Forestry and Fire Protection, in the revised TMDL Report.

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47. Comment Code: Technical Issues

Agency ID: Hines Nurseries

Commenter: Bud Summers

Comment:

The Staff Report also establishes annual load allocations for commercial nurseries for both nitrogen and phosphorus (see Tables 6-1 and 6-2) that are both unrealistic and

unobtainable. The data and analysis in the Staff Report simply do not support the load allocations developed thereunder, specifically for commercial nurseries. For example, in Table 4-1, the Staff Report assumes an annual total nitrogen load of 611 kilograms per year for commercial nurseries. The reference to 611 kilograms per year is apparently based on a figure of 4.1 kilograms per hector per year as an export coefficient, which, according to the reference, was derived from a 2000 report from the Sourthern California Coastal Water Research Project (SCCWRP). Yet, a review of the SCCWRP 2000 report shows that it does not contain any coefficient for commercial nurseries. Rather, and to the contrary, it only contains co-efficients for general commercial facilities (e.g., shopping centers, restaurants and the like), and for agriculture.

Response:

The Technical Report has been revised to use the export coefficient for agriculture from the SCCWRP 2000 report.

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48. Comment Code: Technical Issues

Agency ID: San Diego County Farm Bureau

Commenter: Eric Larson

Comment:

The stated inability to reduce loads from parks, preserves, and urban areas places an additional burden on agricultural uses, among others. Any load generated by human activity can be reduced and should carry its fair share, even if its contribution is small.

Response:

The total nitrogen and total phosphorus allocations have been revised to include parks and urban areas in Rainbow Valley. Preserves, which are natural lands, are considered to contribute to the background load.

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49. Comment Code: Technical Issues

Agency ID: Hines Nurseries

Commenter: Bud Summers

Comment:

In developing a TMDL for any impaired water body, an assimilative capacity study should first be conducted in order to determine the pollutant load the water body can assimilate before becoming impaired. That is, the TMDL "load allocations" and "waste load allocations" which may be discharged into a water body without impairing the beneficial uses, can only be developed after the assimilative capacity of the water body has first been identified. There is thus no basis to determine a load allocation or a waste load allocation (i.e., there is no basis to develop a TMDL), where the assimilative capacity of the water body has not been established. Hines would thus recommend that additional monitoring and a study of the assimilative capacity of the various reaches of the creek be conducted before adopting the subject TMDL, as the assimilative capacity of the water body is the cornerstone of any properly developed TMDL.

Response:

The assimilative capacity or loading capacity is the maximum amount of nutrients that can enter into the water column without exceeding the water quality standards. In this case, the biostimulatory target concentration for total nitrogen and total phosphorus are the applicable water quality standard. For this TMDL, nitrogen and phosphorus loading capacities were calculated by multiplying the desired water quality concentrations, 1.0 mg N/L and 0.1 mg P/L, times the annual flow volume of Rainbow Creek. Using the Biostimulatory Substances water quality objectives for nitrogen and phosphorus in conjunction with site-specific flow data is an appropriate basis for establishing load capacity that incorporate the best available information. A detailed description of the annual load capacity calculations are included in Section 5.0 of the Technical Report.

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50. Comment Code: Technical Issues

Agency ID: US EPA- Region 9

Commenter: Peter Kozelka

Comment:

Table 5-1 of the Staff Report should be modified to remove information about current load and interim loading capacity or postpone this table until a later section of the document. Instead, Table 5-1 shall define the loading capacity for biostimulatory total nitrogen and total phosphorus.

Response:

Table 5-1 has been modified to only present the loading capacity for total nitrogen and total phosphorus.

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52. Comment Code: Technical Issues

Agency ID: County of San Diego

Commenter: Gary Erbeck

Comment:

The Regional Board's proposed approach to actually implementing these TMDLs would not treat the TMDLs themselves as stopping points. Instead, the draft Basin Plan Amendment proposes that incremental reductions in nitrogen loading must continue to be achieved somehow until the numerical objective of 1.0 mg N/L is met in the creek. (See draft Amendment at pp. 2-3.) If the Regional Board is correct that meeting these targets will require reducing loadings to 402 kg N/yr as stated in footnote 1 of the draft Basin Plan Amendment, then the effective TMDL for total nitrogen is 402 kg/yr, not 1,507 kg/yr. This would require total loadings of nitrogen to be reduced to 402 kg/yr—less than one fifth of estimated natural levels.

Response:

The draft Basin Plan Amendment has been revised to establish TMDLs for total nitrogen and total phosphorus for Rainbow Creek that are equal to the load that would bring attainment of the water quality objective (1.0 mg N/L and 0.1 mg P/L, respectively). The TMDLs are required by federal regualtions to be set at loads that attain water quality standards.

The Technical Report has been revised to incorporate Rainbow Creek flow data and water quality concentrations in calculating total nitrogen and total phosphorus loads to the Creek. Refer to Sections 4.0, 5.0, and 6.0 in the revised Technical Report for detailed load calculations and allocations.

Furthermore, reference concentrations for San Diego County for total nitrogen and total phosphorus have been established for these TMDLs by using data from several relatively clean streams within the region and calculating mean concentrations. The findings from the reference water quality information for these streams show that reference conditions for total nitrogen and total phosphorus below the above stated water quality objective do exist in San Diego County. Therefore the target loads are not below the estimated natural levels. Section 4.0 and Appendix D of the revised Technical Report have the methodology and descriptive statistics used in establishing reference conditions for similar streams in San Diego County.

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53. Comment Code: Technical Issues

Agency ID: County of San Diego

Commenter: Gary Erbeck

Comment:

Set realistic TMDLs. TMDLs must not be set lower than estimated natural loadings for the basin, and should be set higher if that is consistent with protecting the beneficial uses of Rainbow Creek that are identified as being achievable after further study.

Response:

The Regional Board has a legal obligation under Section 303(d) of the Clean Water Act to adopt TMDLs that attain current water quality standards. It is not inconceivable that a water quality standard may be lower than natural loadings - a situation that would not allow for any additional assimilative capacity to be allocated to other sources.

In any event the Regional Board's revision of the background source estimate methodology renders the issue moot. Data collected from streams in San Diego County that are relatively free of anthropogenic sources were used to determine a background concentration and calculate a background load. This approach replaces the one referenced in the comment, which used a literature value (export coefficient) and undeveloped land area to make the estimate. Section 4.0 and Appendix D of the revised Technical Report have the methodology and descriptive statistics used in establishing reference conditions for similar streams in San Diego County.

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54. Comment Code: Technical Issues

Agency ID: US EPA- Region 9

Commenter: Peter Kozelka

Comment:

The Staff Report needs some written revisions. As presented, Section 5.0 does not clearly define the loading capacity for total nitrogen and total phosphorus and present these bottom line values in a table.

Response:

The recommended change has been incorporated into the revised Technical Report. Section 5.0 now only includes the bottom line values for the total nitrogen and total phosphorus loading capacities.

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55. Comment Code: Technical Issues

Agency ID: US EPA- Region 9

Commenter: Peter Kozelka

Comment:

As a consequence to modifying the loading capacity, the allocations and margin of safety will also need to be modified. These values are dependent on the quantity defined as the assimilative or loading capacity.

USEPA Region IX would support interim allocation levels as part of implementation, as long as the Staff Report clearly documents quantitative performance levels associated with desired water quality conditions and potential responses to achieving these interim levels. The attainment of all applicable water quality objectives must be clearly presented in the document.

Response:

As recommended, the interim allocations have been removed from Section 6.0, Loading Capacity and Linkage Analysis, and the allocations and margin of safety have been modified accordingly. The interim step reductions are presented and discussed in the Implementation Action Plan (Section 9.3).

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56. Comment Code: Technical Issues

Agency ID: US EPA- Region 9

Commenter: Peter Kozelka

Comment:

The Draft TMDL, in section 5.1 of the Staff Report dated March 22, 2002, utilizes an indirect approach to calculating the loading capacity for total nitrogen. This indirect approach relies on interpretation of the current loading estimate and proportional reduction to define the biostimulatory loading capacity.

USEPA Region IX urges the Regional Board to directly determine the loading capacity by starting with the desired water quality objective(s) and using stream flow records to calculate the loading capacity and TMDLs for total nitrogen and total phosphorus.

Response:

The recommended change has been incorporated into the revised Technical Report. Eight years of USGS streamflow-gage data is now used to directly determine the loading capacity.

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57. Comment Code: Technical Issues

Agency ID: US EPA- Region 9

Commenter: Peter Kozelka

Comment:

The Draft TMDL, in Section 5.1 of the Staff Report dated March 22, 2002, states that the biostimulatory TMDL for total nitrogen is set at 1,507 kg/yr, based on this current load from undeveloped [or background sources] land.

The Regional Board must change its approach to defining the loading capacity and TMDL for total nitrogen. As presented, USEPA cannot approve the Rainbow Creek Nutrient TMDL since it has not utilized water quality objectives to establish the loading capacity, which ultimately affects the allowable allocations. Therefore, the proposed TMDL will not result in attainment of all applicable water quality objectives.

Response:

As recommended, the approach has been changed so that the loading capacity is based on water quality objective and Rainbow Creek flow data. The TMDL load capacity is now defined as the nutrient water quality objective multiplied by the stream flow rate.

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58. Comment Code: Technical Issues

Agency ID: US EPA- Region 9

Commenter: Peter Kozelka

Comment:

The proposed TMDL implies that the quantity of nutrients from undeveloped land is sufficient to determine the loading capacity and to interpret applicable water quality objectives. This assumption conflicts with 40 CFR 130.2(f) which defines loading capacity as “the greatest amount of loading that a water can receive without violating water quality standards.” TMDLs are based on the existing water quality standards. We

do not believe the Basin Plan provides an exemption from application of water quality objectives based on the idea that naturally occurring pollutant levels exceed other applicable objectives.

In the future, the Regional Board could address this issue via two options; both would require a Basin Plan amendment:
a) adopt a different water quality objective for Rainbow Creek, presumably a site-specific value based on credible data, or
b) define an exclusion for Rainbow Creek from meeting water quality objectives due to naturally occurring sources; again with sufficient rationale.

Response:

The approach used to calculate the TMDLs for total nitrogen and total phosphorus has been changed. The revised TMDL is now based on existing water quality standards for total nitrogen and total phosphorus and is now in compliance with 40 CFR 130.2(f).

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59. Comment Code: Technical Issues

Agency ID: San Diego County Farm Bureau

Commenter: Eric Larson

Comment:

The Staff Report states that nutrients are likely contributing to the excessive algal and emergent plant growth. The next sentence then recognizes that where the growth occurred there was no riparian canopy yet where there was riparian canopy there was no algal growth. The Regional Board must be able to make the easy assumption based on actual observation that sunlight has a direct effect on the algal growth. Perhaps the easier solution to the problem is to increase the riparian canopy throughout the watershed and should be addressed.

Response:

The observations recorded only apply to small areas where samples were collected for water quality analyses. No study has been conducted on Rainbow Creek that directly correlates riparian growth, sunlight exposure, and algal density. The field observations should only be used in the context of supporting data for Rainbow Creek TMDL.

Increasing riparian growth may reduce the presence of algae; however, it will not directly address the elevated nitrogen and phosphorus levels found in the creek.

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60. Comment Code: Technical Issues

Agency ID: San Diego County Farm Bureau

Commenter: Eric Larson

Comment:

The source identification incorrectly characterizes undeveloped land contributions as small when in fact Figure 4-1 identifies undeveloped land as the single biggest contributor at 33%.

Response:

Figure 4-1 graphically represents the land use contributions to surface water. It does not include groundwater or air deposition contributions. Note that "undeveloped land" is now referred to as "background" in the revised TMDL Report.

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61. Comment Code: Technical Issues

Agency ID: San Diego County Farm Bureau

Commenter: Eric Larson

Comment:

The Staff Report is relying on a Caltrans document to state that their contribution was not significant. Perhaps there should be further review on CalTrans' actual contribution. Individual farmers may have insignificant contributions but they will be subject to the TMDLs and provisions of the Implementation Plan. No one should be exempt in that cumulative impacts do add up.

Response:

Caltrans contribution to the nutrient problem in Rainbow Creek has been re-evaluated and a wasteload allocation has been established for Caltrans state highway nutrient discharges in the revised TMDL report.

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62. Comment Code: Technology-Based Controls

Agency ID: County of San Diego

Commenter: Gary Erbeck

Comment:

This basin has not yet reaped the full benefits that can be expected when appropriate technology-based controls have been in place at all commercial nurseries for a reasonable period of time. These nurseries are discrete and significant sources of contamination, and they are still in the process of developing and implementing nutrient control and irrigation control best management practices (BMPs) to limit nitrogen and phosphorus in their discharges. In addition, the draft Staff Report notes (at pp. 3-4) that one commercial nursery in the watershed has actually placed a dam in Rainbow Creek, and uses the creek to impound and recirculate irrigation water. Restoring the natural flow of the creek may have significant effects. Whether the controls put in place at these sources are "voluntary" or "mandatory" is not the key issue here.4 In either case, it is clear there are further reductions in pollutant discharges that can be attained using cost-effective technology-based measures. It will take some time to see what further effects these reductions in nitrogen and phosphorus loadings will have on Rainbow Creek. The interim reductions already achieved have had a significant beneficial effect on the creek.

4The Regional Board has asserted to County staff and legal counsel that discharges from these nurseries are "agricultural return flows" and therefore are not point source discharges subject to the federal Clean Water Act. If this were correct, then the Clean Water Act would not require that these nurseries be placed under permit before a TMDL was developed. Without commenting on the assertion that nurseries may be exempt from federal discharge permits, the County notes that state Water Code section 13260(a) allows the Regional Board to issue and enforce WDRs to "any person discharging waste," and that Water Code section 13050 defines "waste" to include discharges from "any producing operation." Commercial nurseries that discharge polluted water from a pipe into a creek could therefore be required under state law to obtain WDRs, whether or not the nurseries are required to have permits under the federal Clean Water Act.

Response:

The Regional Board agrees with the comment that implementation of appropriate management practices at all nurseries in the Rainbow Creek watershed may result in significant reductions in nitrogen and phosphorus concentrations in Rainbow Creek.

Discharges of irrigation return water from nurseries in the San Diego Region currently are regulated under the terms and conditions of the Regional Board's Basin Plan waiver policy. For the purposes of the waiver, a "nursery" is defined as a facility engaged in growing plants (shrubs, trees, vines, etc.) for sale. Under the terms of this policy the Regional Board waives the obligation of nursery owners and operators to obtain waste discharge requirements for discharges of irrigation return water from nurseries subject to the following conditions:

- There is no discharge to waters of the United States;
- Management practices are implemented for the discharge as described in the NPS Program Plan (SWRCB, 1999);
- The discharge shall not create a nuisance as defined in the California Water Code;
- The discharge shall not cause a violation of any applicable water quality standard; and
- The discharge of any substance in concentrations toxic to animal or plant life is prohibited.

The direct discharge of irrigation return water from a commercial nursery to Rainbow Creek would be a violation of the waiver conditions. The Regional Board may terminate the applicability of waivers and issue waste discharge requirements or take other appropriate enforcement action against any commercial nursery failing to comply with the waiver conditions.

The implementation of technology based controls is one strategy that commercial nurseries can implement that will reduce a point and non point source discharges that may impact Rainbow Creek. Commercial nurseries account for 368 acres in Rainbow Valley and play a significant role in the nutrient problem found in the Creek. However, agricultural fields (502 acres) and orchards (811 acres) also have a significant presence in the valley and cannot be overlooked as sources of nutrients. A watershed management approach which takes into account all major sources is needed to control the nutrient surface water problem.

Under the revised TMDL implementation plan, the Regional Board will adopt, in conjunction with an MAA or MOU with the County of San Diego, individual or general waivers or waste discharge requirements (WDRs) for NPS discharges in the Rainbow Creek watershed. The waivers or WDRs shall require NPS dischargers to either participate in the third party NPS program or, alternatively, submit individual pollution prevention plans that detail how they will comply with the waivers and WDRs. Alternatively, the Regional Board may adopt a discharge prohibition, which includes exceptions for those discharges that adequately participate in the proposed County of San Diego Nutrient Resource Management Plan program.

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63. Comment Code: Technology-Based Controls

Agency ID: County of San Diego

Commenter: Gary Erbeck

Comment:

Take reasonable technology-based reductions in loadings from nurseries into account. The Regional Board should secure reasonable further reductions in loadings from commercial nurseries (by voluntary means or through regulation) and should observe the effects of those reductions on Rainbow Creek, before promulgating a TMDL to address biostimulatory impairment of Rainbow Creek. When TMDLs are promulgated, loads allocated to these nurseries should begin from their discharges after reasonable technology-based controls are in place.

Response:

The Regional Board has a legal obligation under the Clean Water Act to adopt a TMDL for all water bodies, such as Rainbow Creek, identified as not meeting water quality standards under Section 303(d) of the Act. The Regional Board has identified both point sources and nonpoint sources to be contributing to excessive nutrient concentrations in Rainbow Creek. The revised TMDL requires nutrient wasteload and load reductions from these sources.

The Regional Board agrees with the comment that implementation of appropriate management practices at all nurseries in the Rainbow Creek watershed may result in significant reductions in nitrogen and phosphorus concentrations in Rainbow Creek. The Regional Board has structured an adaptive implementation action plan in the revised Rainbow Creek TMDL that simultaneously makes progress towards achieving nutrient water quality objectives while relying on monitoring data to reduce uncertainty and fill data gaps as time progresses. This monitoring data can be used to revise and improve the TMDL wasteload and load allocations over time.

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64. Comment Code: Water Quality Standards

Agency ID: County of San Diego

Commenter: Gary Erbeck

Comment:

The draft Staff Report does not explicitly consider that the Basin Plan water quality objective is not violated merely by accelerated or “excessive” growth of algae or emergent plants. The Basin Plan's narrative objective is violated only if growth is so excessive it is a nuisance, or so excessive it adversely affects beneficial uses.

Response:

Regardless of the presence or absence of algae, nitrogen and phosphorus levels in Rainbow Creek are exceeding the Biostimulatory Substances water quality objective. The 0.1 mg/l goal for phosphorus stated in the Biostimulatory Substances water quality objective is the phosphorus water quality objective applicable to Rainbow Creek. Simarly the N:P ratio of 10:1 stated in the Biostimulatory Substances water quality objective serves as the basis for determining allowable concentrations of nitrogen in Rainbow Creek. Applying the the N:P ratio of 10:1 to a phosphorus water quality objective of 0.1 mg/l yields 1.0 mg/l total nitrogen as the applicable nitrogen water quality objecitve for Rainbow Creek.

Rainbow Creek waters routinely exceed the 1.0 mg TN/L and 0.1 mg TP/L Biostimulatory Substances water quality objectives of the Basin Plan. Rainbow Creek is listed on the State of California's 2002 Clean Water Act section 303(d) list as an impaired water body due to excessive nitrogen and total phosphorus concentrations. The Clean Water Act provides that the Regional Board must establish TMDLs for nitrogen and phosphorus designed to attain the applicable Biostimulatory Substances water quality objectives of 1.0 mg TN/L and 0.1 mg TP/L.

The Biostimulatory Substances water quality objective requires the use of 0.1 mg/l phosphorus and 1.0 mg/l nitrogen as water quality objectives unless scientific studies show that altenrative site specifc water quality objectives (SSOs) for nitrogen and phosphorus are appropriate for Rainbow Creek. The SSOs would need to (1) be based on sound scientific rationale; (2) protect the designated beneficial uses of Rainbow Creek waters; and (3) be adopted by the Regional Board in a Basin Plan amendment.

Monitoring data collected in 2000 support that nutrient concentrations in the Creek are at levels that can promote nuisance algal growth, which was observed at monitoring stations that had optimal conditions (e.g., low flow, available substrate, and adequate water temperatures).

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65. Comment Code: Water Quality Standards

Agency ID: County of San Diego

Commenter: Gary Erbeck

Comment:

Any TMDL for biostimulatory substances in inland surface waters in San Diego must be based on the Basin Plan narrative standard as the applicable Water Quality Objective. The Regional Board's targets of 0.1 and 1.0 mg/L for total phosphorus and total nitrogen, respectively, should be properly identified as interim numeric targets, rather than as Water Quality Objectives. Basic studies should be completed in the near future to allow

replacement of these default values with numeric targets that reflect what is actually going on in Rainbow Creek.

Response:

The TMDL numeric targets are required by federal regulations to be based on the Basin Plan's existing water quality objective for Biostimulatory Substances [see 40 CFR 130.7(c)(1)].

The 0.1 mg/l goal for phosphorus stated in the Biostimulatory Substances water quality objective is the phosphorus water quality objective applicable to Rainbow Creek. Simarly the N:P ratio of 10:1 stated in the Biostimulatory Substances water quality objective serves as the basis for determining allowable concentrations of nitrogen in Rainbow Creek. Applying the the N:P ratio of 10:1 to a phosphorus water quality objective of 0.1 mg/l yields 1.0 mg/l total nitrogen as the applicable nitrogen water quality objecitve for Rainbow Creek.

The Biostimulatory Substances water quality objective requires the use of 0.1 mg/l phosphorus and 1.0 mg/l nitrogen as water quality objectives unless scientific studies show that altenrative site specifc water quality objectives (SSOs) for nitrogen and phosphorus are appropriate for Rainbow Creek. The SSOs would need to (1) be based on sound scientific rationale; (2) protect the designated beneficial uses of Rainbow Creek waters; and (3) be adopted by the Regional Board in a Basin Plan amendment. Dischargers or other interested parties would need to fund and initiate the scientific studies to develop the SSO. It is possible the studies could reveal the need for more stringent nutrient water quality objectives.

The Regional Board is currently participating in the development of new numeric nutrient water qua;ity objecitves in an effort underway in California by the USEPA Region IX Regional Technical Advisory Group (RTAG). USEPA's recommended water quality criteria for the subecoregion that includes Rainbow Creek are 0.5 mg N/L for total nitrogen and 0.03 mg P/L for total phosphorus. The RTAG group is currently working on developing alternative regional nutrient water quality criteria for the Southern and Central California due to the number of nutrient TMDLs being completed in this region. Basin Plan resources are assigned to continue participation in the RTAG effort over the next three years. Information on the National Nutrient Strategy, the status of the RTAG effort, and technical guidance can be found at http://www.epa.gov/ost/standards/nutrient.html.

If the RTAG effort results in a new nutrient water quality objective applicable to the Southern California area, the Rainbow Creek TMDL will be revised in accordance with the procedures described in the draft Basin Plan amendment presented in Attachment A of the proposed Resolution 2004-0401.

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66. Comment Code: Water Quality Standards

Agency ID: County of San Diego

Commenter: Gary Erbeck

Comment:

In the Regional Board's response to this comment, “absolutely insupportable, bordering on the ridiculous” becomes merely “unfounded.” Staff’s more substantive response is essentially that the Basin Plan allows the use of a 0.1 mg/L target for P, and a ratio-based 1.0 mg/L target for N, when no data are available. (Response to Peer Review No. 1 Comments, page 1.) The Regional Board has chosen to respond to a stinging scientific objection by a designated peer reviewer by (1) softening the true force of that comment in their summary, and (2) by offering up a legal rather than a scientific response to the comment.

Response:

The Regional Board disagrees that paraphrasing the comment by using the word "unfounded" softens “the true force of that comment." The use of the word "unfounded" was intended to be consistent with the comment “absolutely insupportable.” The Regional Board did leave out the commentor’s phrase “bordering on the ridiculous” simply because it did not add any useful information beyond “absolutely insupportable” and “unfounded.”

The Regional Board is required by law to base the TMDLs on the Basin Plan's existing water quality objective for Biostimulatory Substances [40 CFR 130.7(c)(1)].

The Biostimulatory Substances water quality objective requires the use of 0.1 mg/l phosphorus and 1.0 mg/l nitrogen as water quality oibjectives unless scientific studies show that altenrative site specifc water quality objectives (SSOs) for nitrogen and phosphorus are appropriate for Rainbow Creek. The SSOs would need to (1) be based on sound scientific rationale; (2) protect the designated beneficial uses of Rainbow Creek waters; and (3) be adopted by the Regional Board in a Basin Plan amendment. Dischargers or other interested parties would need to fund and initiate the scientific studies to develop the SSO. It is possible the studies could reveal the need for more stringent nutrient water quality objectives.

The Regional Board has revised Section 2.4 to include supporting information regarding the use of the 10:1 nitrogen to phosphorus ratio as a translator and the appropriateness of the Basin Plan objectives for total nitrogen and total phosphorus based on comparisons with the USEPA's recommended nutrient criteria and published scientific studies.

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67. Comment Code: Water Quality Standards

Agency ID: Hines Nurseries

Commenter: Bud Summers

Comment:

The initial target should be the drinking water standard, for which there is a more solid scientific basis. At a specified review date, numeric biostimulatory cirteria could be added, if required.

Response:

TMDLs are required to be established at levels necessary to attain and maintain the applicable water quality standards for all pollutants preventing such attainment [40 CFR 130.7(c)(1)]. By law, the Rainbow Creek nutrient TMDLs must be based on the Basin Plan's existing water quality objective for Biostimulatory Substances.

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68. Comment Code: Water Quality Standards

Agency ID: Hines Nurseries

Commenter: Bud Summers

Comment:

If the stated or inferred desired goals taken from the explanation of the narrative water quality objective in the Basin plan for biostimulatory substances are to be used as numeric targets for the nutrient TMDLs, another part of the explanatory material should also be included. The TMDL should specify that the defined "values are not to be exceeded more than 10% of the time unless studies of [Rainbow Creek] clearly show that water quality objective changes are permissible and changes are approved by the Regional Board." This would be consistent with the Basin Plan and provide the needed flexibility in the proposed TMDLs.

Response:

The reference to "values are not to be exceeded more than 10 percent of the time…" refers to the water quality of Rainbow Creek. The success of this TMDL will be judged on the basis of Rainbow Creek meeting the Water Quality Objectives for Biostimulatory Substances 90 percent of the time in the receiving waters.

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69. Comment Code: Water Quality Standards

Agency ID: County of San Diego

Commenter: Gary Erbeck

Comment:

The Regional Board is incorrect on the application of the law. The "apparent" or "desired goal" for phosphorus that staff would rely on was not identified during the Basin Plan amendment process as a numerical Water Quality Objective, for informed public comment and Regional Board adoption. It is therefore not a Water Quality Objective, but is only what the Basin Plan says it is: a number that appears to be a desirable goal. Similarly, the limit of 1.0 mg/L total nitrogen that staff derive by applying a 10:1 ratio to this apparent desirable goal is also not legally a Water Quality Objective, or even an identified "desired goal." It is a default in the absence of any data. The Regional Board should be gathering the data to avoid a resort to such defaults, rather than proclaiming default values to be Water Quality Objectives that should drive the TMDL development process.

Response:

The Regional Board uses the 0.1 mg/l goal for phosphorus stated in the Biostimulatory Substances water quality objective as a phosphorus water quality objective unless site specific scientific studies demonstrate that a modified phosphorus objective is appropriate for a particular waterbody. (A modified water quality objective is referred to as a site-specific water quality objective (SSO).) Similarly the Regional Board uses the N:P ratio of 10:1 cited in the in the Biostimulatory Substances water quality objective as a basis for establishing a nitrogen water quality objective of 1.0 mg/l unless site specific scientific studies are conducted to establish a nitrogen site specific water quality objective based on different N:P ratios. SSOs must be approved by the Regional Board and incorporated into the Basin Plan. The Regional Board's use and interpretation of the Biostimulatory Substances water quality objective in this manner is well established and consistent with applicable laws and regulations.

The Biostimulatory Substances water quality objective requires the use of 0.1 mg/l phosphorus and 1.0 mg/l nitrogen as water quality objectives unless scientific studies show that altenrative site specifc water quality objectives (SSOs) for nitrogen and phosphorus are appropriate for Rainbow Creek. The SSOs would need to (1) be based on sound scientific rationale; (2) protect the designated beneficial uses of Rainbow Creek waters; and (3) be adopted by the Regional Board in a Basin Plan amendment. Dischargers or other interested parties would need to fund and initiate the scientific studies to develop the SSO. It is possible the studies could reveal the need for more stringent nutrient water quality objectives.

Further research into the appropriateness of the Basin Plan objectives for total nitrogen and total phosphorus shows that the numeric goals of 1.0 mg N/L and 0.1 mg P/L are consistent with published scientific studies. Dodds et al. (1998), using the cumulative frequency distributions of nutrient data from more than 1000 temperate streams primarily in North America and New Zealand, suggest total nitrogen and total phosphorus levels between 0.7 to 1.5 mg N/L and 0.02 to 0.07 mg P/L, respectively, to define streams that are mesotrophic. Eutrophic is a trophic state that has an abundance of nutrients and plant growth, and mesotrophic is a trophic state that has moderate concentrations of nutrients and plant growth.

In another paper, Dodds and Welch (2000) reviewed studies for the purpose of defining potential nutrient criteria that would address the concern of eutrophication. One study showed that total nitrogen should remain below 3 mg N/L and total phosphorus below 0.4 mg P/L for benthic chlorophyll to remain below a target level of 200 mg/m2 (below what is considered to be not aesthetically pleasing or have compromised recreational uses). Levels of 0.9 mg N/L and 0.04 mg P/L were recommend based on the above referenced study using cumulative frequency distributions of nutrients. Another study found that total nitrogen should be 0.47 mg N/L and total phosphorus be 0.06 mg P/L to ensure that chlorophyll is less than 100 mg/m2 most of the time.

The Regional Board is currently participating in the development of new numeric nutrient water qua;ity objecitves in an effort underway in California by the USEPA Region IX Regional Technical Advisory Group (RTAG). USEPA's recommended water quality criteria for the subecoregion that includes Rainbow Creek are 0.5 mg N/L for total nitrogen and 0.03 mg P/L for total phosphorus. The RTAG group is currently working on developing alternative regional nutrient water quality criteria for the Southern and Central California due to the number of nutrient TMDLs being completed in this region. Basin Plan resources are assigned to continue participation in the RTAG effort over the next three years. Information on the National Nutrient Strategy, the status of the RTAG effort, and technical guidance can be found at http://www.epa.gov/ost/standards/nutrient.html.

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70. Comment Code: Water Quality Standards

Agency ID: County of San Diego

Commenter: Gary Erbeck

Comment:

Respect the Basin Plan. The Regional Board's numeric targets for total nitrogen and total phosphorus should not be characterized anywhere in the Resolution, Basin Plan Amendment, or Staff Report as Water Quality Objectives. Only the narrative standard for biostimulatory substances actually established by the Basin Plan, after clear public notice and an opportunity to comment, has this status.

Response:

The Regional Board uses the 0.1 mg/l goal for phosphorus stated in the Biostimulatory Substances water quality objective as a phosphorus water quality objective unless site specific scientific studies demonstrate that a modified phosphorus objective is appropriate for a particular waterbody. (A modified water quality objective is referred to as a site-specific water quality objective (SSO).) Similarly the Regional Board uses the N:P ratio of 10:1 cited in the in the Biostimulatory Substances water quality objective as a basis for establishing a nitrogen water quality objective of 1.0 mg/l unless site specific scientific studies are conducted to establish a nitrogen site specific water quality objective based on different N:P ratios. SSOs must be approved by the Regional Board and incorporated into the Basin Plan. The Regional Board's use and interpretation of the Biostimulatory Substances water quality objective is well established and consistent with applicable laws and regulations.

The Biostimulatory Substances water quality objective requires the use of 0.1 mg/l phosphorus and 1.0 mg/l nitrogen as water quality objectives unless scientific studies show that altenrative site specifc water quality objectives (SSOs) for nitrogen and phosphorus are appropriate for Rainbow Creek. The SSOs would need to (1) be based on sound scientific rationale; (2) protect the designated beneficial uses of Rainbow Creek waters; and (3) be adopted by the Regional Board in a Basin Plan amendment. Dischargers or other interested parties would need to fund and initiate the scientific studies to develop the SSO. It is possible the studies could reveal the need for more stringent nutrient water quality objectives.

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71. Comment Code: Water Quality Standards

Agency ID: Hines Nurseries

Commenter: Bud Summers

Comment:

The Staff Report then proceeds to assert a numeric objective of 1.0 mgN/L for total nitrogen and 0.1 mg P/L for total phosphorus, in part based on the fact that "data are lacking," and that the objective allows for the use of a weight to weight ratio. Yet, no data or analysis is included in the Staff Report to support the translation of the narrative objective "to the numeric objectives," i.e., there has been no translator established to translate the narrative objective that inland surface waters shall not contain biostimulatory substances that promote aquatic growth which "cause nuisance or adversely affect beneficial uses," into the numeric objectives of 1.0 mg N/L and 0.1 mgP/L for total nitrogen and total phosphorus, respectively. In fact, at one point the Staff Report provides that: "currently, no site-specific data are available that correlates in-stream nutrient concentrations with abundance of algae." (TMDL, p. 12.). In effect, no

"translator" has been developed for the TMDL to translate the narrative objective of not causing a nuisance or adversely affecting beneficial uses, into the 1.0 mg N/L and 0.1 mgP/L numeric objectives.

Response:

The TMDL targets are required by federal regulation to be based on the Basin Plan's existing water quality objective for Biostimulatory Substances.[see 40 CFR 130.7(c)(1)].

The 0.1 mg/l goal for phosphorus stated in the Biostimulatory Substances water quality objective is the phosphorus water quality objective applicable to Rainbow Creek. Simarly the N:P ratio of 10:1 stated in the Biostimulatory Substances water quality objective serves as the basis for determining allowable concentrations of nitrogen in Rainbow Creek. Applying the the N:P ratio of 10:1 to a phosphorus water quality objective of 0.1 mg/l yields 1.0 mg/l total nitrogen as the applicable nitrogen water quality objecitve for Rainbow Creek.

The Biostimulatory Substances water quality objective requires the use of 0.1 mg/l phosphorus and 1.0 mg/l nitrogen as water quality objectives unless scientific studies show that alternative site specifc water quality objectives (SSOs) for nitrogen and phosphorus are appropriate for Rainbow Creek. The SSOs would need to (1) be based on sound scientific rationale; (2) protect the designated beneficial uses of Rainbow Creek waters; and (3) be adopted by the Regional Board in a Basin Plan amendment. Dischargers or other interested parties would need to fund and initiate the scientific studies to develop the SSO. It is possible the studies could reveal the need for more stringent nutrient water quality objectives.

Further research into the appropriateness of the Basin Plan objectives for total nitrogen and total phosphorus supported that the numeric goals of 1.0 mg N/L and 0.1 mg P/L are consistent with published scientific studies. Dodds et al. (1998), using the cumulative frequency distributions of nutrient data from more than 1000 temperate streams primarily in North America and New Zealand, suggest total nitrogen and total phosphorus levels between 0.7 to 1.5 mg N/L and 0.02 to 0.07 mg P/L, respectively, define streams that are mesotrophic. Eutrophic is a trophic state that has an abundance of nutrients and plant growth, and mesotrophic is a trophic state that has moderate concentrations of nutrients and plant growth.

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72. Comment Code: Water Quality Standards

Agency ID: County of San Diego

Commenter: Gary Erbeck

Comment:

The scientific basis for both of these targets is weak. Dr. David Jenkins of U.C. Berkeley, one of the Regional Board's peer reviewers for the draft staff report, addressed these targets as follows: "An arbitrary assumption that the P limit should be one-tenth of the N limit is absolutely insupportable, bordering on the ridiculous! Reductions in P and further reductions in NO3-N must be justified on the basis of determining which limits algal growth in the Creek." (Attachment F-3 of the Staff Report dated March 22, 2002, page 1 of transmittal letter.)

Response:

The Regional Board uses the 0.1 mg/l goal for phosphorus stated in the Biostimulatory Substances water quality objective as a phosphorus water quality objective unless site specific scientific studies demonstrate that a modified phosphorus objective is appropriate for a particular waterbody. (A modified water quality objective is referred to as a site-specific water quality objective (SSO).) Similarly the Regional Board uses the N:P ratio of 10:1 cited in the in the Biostimulatory Substances water quality objective as a basis for establishing a nitrogen water quality objective of 1.0 mg/l unless site specific scientific studies are conducted to establish a nitrogen site specific water quality objective based on different N:P ratios. SSOs must be approved by the Regional Board and incorporated into the Basin Plan. The Regional Board's use and interpretation of the Biostimulatory Substances water quality objective is well established and consistent with applicable laws and regulations.

The Biostimulatory Substances water quality objective requires the use of 0.1 mg/l phosphorus and 1.0 mg/l nitrogen as water quality objectives unless scientific studies show that alternative site specifc water quality objectives (SSOs) for nitrogen and phosphorus are appropriate for Rainbow Creek. The SSOs would need to (1) be based on sound scientific rationale; (2) protect the designated beneficial uses of Rainbow Creek waters; and (3) be adopted by the Regional Board in a Basin Plan amendment. Dischargers or other interested parties would need to fund and initiate the scientific studies to develop the SSO. It is possible the studies could reveal the need for more stringent nutrient water quality objectives.

Further research into the appropriateness of the Basin Plan objectives for total nitrogen and total phosphorus supported that the numeric goals of 1.0 mg TN/L and 0.1 mg TP/L are consistent with published scientific studies. Dodds et al. (1998), using the cumulative frequency distributions of nutrient data from more than 1000 temperate streams primarily in North America and New Zealand, suggest total nitrogen and total phosphorus levels between 0.7 to 1.5 mg TN/L and 0.02 to 0.07 mg TP/L, respectively, define streams that are mesotrophic. Where eutrophic is a trophic state that has an abundance of nutrients and plant growth, mesotrophic is a trophic state that has moderate concentrations of nutrients and plant growth.

In another paper, Dodds and Welch (2000) reviewed studies for the purpose of defining potential nutrient criteria that would address the concern of eutrophication. One study showed that total nitrogen should remain below 3 mg/L and total phosphorus below 0.4

mg/L for benthic chlorophyll to remain below a target level of 200 mg/m2 (below what is considered to be not aesthetically pleasing or have compromised recreational uses). Levels of 0.9 mg TN/L and 0.04 mg TP/L were recommend based on the above referenced study using cumulative frequency distributions of nutrients. Another study found that total nitrogen should be 0.47 mg TN/L and total phosphorus 0.06 mg TP/L to ensure that chlorophyll is less than 100 mg/m2 most of the time.

The Regional Board is currently participating in the development of new numeric nutrient water qua;ity objecitves in an effort underway in California by the USEPA Region IX Regional Technical Advisory Group (RTAG). USEPA's recommended water quality criteria for the subecoregion that includes Rainbow Creek are 0.5 mg N/L for total nitrogen and 0.03 mg P/L for total phosphorus. The RTAG group is currently working on developing alternative regional nutrient water quality criteria for the Southern and Central California due to the number of nutrient TMDLs being completed in this region. Basin Plan resources are assigned to continue participation in the RTAG effort over the next three years. Information on the National Nutrient Strategy, the status of the RTAG effort, and technical guidance can be found at http://www.epa.gov/ost/standards/nutrient.html.

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73. Comment Code: Water Quality Standards

Agency ID: County of San Diego

Commenter: Gary Erbeck

Comment:

A principle reason that the Regional Board has not made a convincing scientific case for impairment by biostimulatory substances may be that it misconstrues the Basin Plan as also setting numerical Water Quality Objectives for N and P. The Basin Plan states that "a desired goal for total phosphorus appears to be 0.1 mg/L total phosphorus." The Regional Board would style this as creating a Water Quality Objective. While the Regional Board admits that no "analogous threshold value" for nitrogen is set in the Basin Plan (Staff Report at p.7), it nevertheless derives a limit of 1.0 mg/L for nitrogen from a discussion in the Basin Plan of natural ratios of nitrogen to phosphorus (N:P) that should be used as default values in the absence of any water-body-specific data. The Regional Board characterizes even this constructed number, which is derived from rather than called out in the Basin Plan, as a "Water Quality Objective." (Draft Staff Report p.6, and draft Resolution p.1, Finding No. 5).

Response:

The Regional Board uses the 0.1 mg/l goal for phosphorus stated in the Biostimulatory Substances water quality objective as a phosphorus water quality objective unless site

specific scientific studies demonstrate that a modified phosphorus objective is appropriate for a particular waterbody. (A modified water quality objective is referred to as a site-specific water quality objective (SSO).) Similarly the Regional Board uses the N:P ratio of 10:1 cited in the in the Biostimulatory Substances water quality objective as a basis for establishing a nitrogen water quality objective of 1.0 mg/l unless site specific scientific studies are conducted to establish a nitrogen site specific water quality objective based on different N:P ratios. SSOs must be approved by the Regional Board and incorporated into the Basin Plan. The Regional Board's use and interpretation of the Biostimulatory Substances water quality objective is well established and consistent with applicable laws and regulations.

The Biostimulatory Substances water quality objective requires the use of 0.1 mg/l phosphorus and 1.0 mg/l nitrogen as water quality objectives unless scientific studies show that alternative site specifc water quality objectives (SSOs) for nitrogen and phosphorus are appropriate for Rainbow Creek. The SSOs would need to (1) be based on sound scientific rationale; (2) protect the designated beneficial uses of Rainbow Creek waters; and (3) be adopted by the Regional Board in a Basin Plan amendment. Dischargers or other interested parties would need to fund and initiate the scientific studies to develop the SSO. It is possible the studies could reveal the need for more stringent nutrient water quality objectives.

The Regional Board is currently participating in the development of new numeric nutrient water qua;ity objecitves in an effort underway in California by the USEPA Region IX Regional Technical Advisory Group (RTAG). USEPA's recommended water quality criteria for the subecoregion that includes Rainbow Creek are 0.5 mg N/L for total nitrogen and 0.03 mg P/L for total phosphorus. The RTAG group is currently working on developing alternative regional nutrient water quality criteria for the Southern and Central California due to the number of nutrient TMDLs being completed in this region. Basin Plan resources are assigned to continue participation in the RTAG effort over the next three years. Information on the National Nutrient Strategy, the status of the RTAG effort, and technical guidance can be found at http://www.epa.gov/ost/standards/nutrient.html.

Literature Cited

Dodds, W. K., J. R. Jones, and E. B. Welch, 1998. Suggested Classification of Stream Trophic State: Distributions of Temperate Stream Types by Chlorophyll, Total Nitrogen, and Phosphorus. Water Research, Journal of the International Water Association, Volume 32:5, pp. 1455-1462.

Dodds, W. K., and E. B. Welch, 2000. Establishing Nutrient Criteria in Streams. Journal of North American Benthological Society, Volume 19:1, pp. 186-196.

Appendix N – Scientific Peer Review No. 2
Dr. David Jenkins
July 2004

N-1 Dr. Jenkins' Peer Review Comment Letter

N-2 Response to Peer Review No. 2 Comments

Appendix N – Scientific Peer Review No. 2
Dr. David Jenkins
July 2004

N-1 Dr. Jenkins' Peer Review Comment Letter

Lisa E.B. Honma
Environmental Scientist
San Diego Water Quality Control Board
9174 Sky Park Court
Suite 100
San Diego, CA 92123-4340

July 19, 2004

Answers to Review Questions

1. Does the staff report adequately and correctly address the effects of nutrients in a freshwater stream system?

   Yes, in general….but you have not really made a very strong case relating the current N & P levels to any conditions that impair water quality and adversely effect any beneficial use except municipal water supply.

2. Are nutrient dynamics, including physical and chemical processes, and biological uptake and assimilation adequately and correctly addressed?

   Yes

3. Is the role of algae and its response to nutrients and other limiting factors adequately and correctly addressed?

   Yes (but see 1. above)

4. Based on existing information, has the hydrology of the watershed been adequately and correctly addressed?

   No comment, not in my area of expertise

5. Does the staff report adequately and correctly address the sources of nutrients in the watershed?

   Yes

6. Are data used in this report reliable and appropriate, and is the treatment of the data defensible?

   Yes

7. Please comment on the general validity of the approach used to calculate nutrient loading to the creek.

It is valid

8. Is the approach used to assign the load allocation reasonable?

   It is fair to reasonable to start with. However the Board should be open to future changes in allocations should it be shown far more economical to reduce nutrients from one sector than another

9. Have the correct data gaps been identified for ground water and septic system issues?

   Yes

10. Overall, is the submitted material scientifically sound and thorough, and does it support the Regional Board's proposed action?

    Yes and No (see 1 above)

Other specific comments (by page (p.), paragraph (¶) and line (l).

Executive Summary

p.iv ¶4, l 9	How do you define/measure that a water has a "susceptibility to excessive algae growth"?
p.iv ¶5	In ¶4 you stated that eutrophic conditions "have not been observed" yet here you state that resulting algae growth occurs.
p.iv-v last and first ¶'s	"Septic wastewater" is not discharged…it is domestic septic tank effluent.
p.v ¶3	Second sentence implies that there is a Drinking Water Standard for Total P!
p.v ¶4	1st sentence. State the current loads to which the N & P reductions are being made i.e. from ???? to ????
p.vi ¶1 l 2	I thought that there were 4 stages of implementation, yet here you state "second phase of implementation".
Ix point 8 l 6	How can the numeric target for total N = 1.0 mg/L while for NO_3-N (a component of total N) is 10 mg N/L??
xi point 14	The last sentence is hard to follow. Suggest rewrite as follows: Incremental reductions of the nutrient waste load are required throughout the subsequent 12-year period".

xv last ¶-xvi first ¶ is hard to understand. Suggest rewrite as follows " The annual loading of total nitrogen and total phosphorus to Rainbow Creek shall be reduced incrementally from the current loads of 3,868 kg/yr and 392 kg/yr respectively to ???? kg/yr and ??? kg/yr respectively by no later than [the end of the 16th year after USEPA approval] or until the applicable water quality objectives of 1 mg/L for total nitrogen and 0.1 mg/L for total phosphorus have been met.

p.2 ¶3 Only nitrate exceeds MUN, total P and total N do not. Reword to make this clear.

p.2 ¶4 l 5 "wastewater" not "waste".

p.2 ¶5 Remove the text concerning N_2 gas. It is unnecessary when discussing dissolved N and P forms. Confine your discussion to organic, ammonia, nitrite and nitrate N. I recommended that you do this in my first review of this TMDL.

p.3 ¶2 l 2,3 Phosphate minerals do not break down, they dissolve.

p.3 ¶2 l 6 Plants and algae do not urinate!

p.3 ¶3 l 2 "wastewater" not waste.

p.3 ¶3 l 7 Omit the 4th sentence. It is flat WRONG.

p.4 ¶2 last sentence Delete, it is repetition.

p.5 last ¶ last sentence and p.6 1st ¶, 1st sentence. Omit sentence, it is not needed and it is awkwardly stated.

p.6 ¶1 sentence 2 Omit it.

p.8 ¶2 This ¶ is unintelligible (to me)!

p.10 Fig 2-1 On both graphs show existing creek levels and target creek levels after TMDL has become fully effective.

p.11 You state that the 2000 monitoring data were taken to see whether the 1998-9 levels were being maintained and whether these levels were effectively limiting excessive algae growth. However nowhere in the next 2 pages of discussion of the monitoring results do you say a word concerning these objectives.

p.17 ¶1 l 2 You have absolutely no evidence of impairment of benthic communities by pesticides. Delete reference to pesticides.

p.17 ¶3 l 3 What does a “ratio of atomic weights” mean? I have never seen this term before. Do you mean mole ratio? If so use “mole ratio” because it is well-understood!

p.17 ¶3 l 10 All collections of data have high and low values. This is an utterly meaningless statement. Delete it.

p.26 Table 4-2 and Figure 4-2 It would be useful to try and estimate the individual contributions of the various land use categories in this table and figure.

p.29 ¶2 l 2 The statement “Phosphates are less soluble in water than total nitrogen components…” is wrong and irrelevant. Delete it.

pp 29 and 30 Table 4-4 and Figure 4-4. It would be useful to try and estimate the individual contributions of the various land use categories in this table and figure.

cc. G. Bowes
State Board\commentsLisa

Appendix N – Scientific Peer Review No. 2
N-2 Response to Peer Review No. 2 Comments

Part 1: Answers to Review Questions

A list of scientific issues was provided to the Peer the Reviewer in the Request for Additional Peer Review Letter. This list of scientific issues was the same as the list that was provided in the first request in November 2001. Not all of the issues necessarily applied to the revisions that were made since the first review. The peer reviewer was asked to consider these questions again in performing this additional review of the Technical Report as appropriate.

Comment:

1. Does the staff report adequately and correctly address the effects of nutrients in a freshwater stream system?

Yes, in general….but you have not really made a very strong case relating the current N & P levels to any conditions that impair water quality and adversely effect any beneficial use except municipal water supply.

Response:

Water quality objective exceedances of nitrate, total nitrogen, and total phosphorus concentrations provide a sufficiently strong case for water quality impairment of Rainbow Creek and the need for TMDL establishment. The case remains as follows:

1. Nitrate concentrations in Rainbow Creek exceed the water quality objective for municipal supply (MUN);
2. Total nitrogen and total phosphorus concentrations exceed the water quality objective for biostimulatory substances, and threaten to unreasonably impair the water quality necessary for warm freshwater habitat (WARM), cold freshwater habitat (COLD), and wildlife habitat (WILD) beneficial uses of Rainbow Creek; and
3. Excessive nutrient levels in Rainbow Creek promote the growth of algae in localized areas, creating a nuisance condition, that unreasonably interferes with aesthetics and contact and non-contact water recreation (REC1, REC2) and threatens to impair WARM, COLD and WILD beneficial uses.

Sufficient water quality data is presented to support these points. Photographic documentation is presented and supports the existence of nuisance algal growth. Reference water quality data of San Diego streams are presented and support that target nutrient levels are realistic. Scientific literature support that the proposed numeric targets are in the same range as nutrient levels that have been found to prevent excess algal growth. Biological surveys show that the aquatic insect population is impaired and scientific literature indicates nutrient enrichment as a possible cause of such changes in aquatic insect communities.

Comment:
2. Are nutrient dynamics, including physical and chemical processes, and biological uptake and assimilation adequately and correctly addressed?

Yes

Response:
Comment noted.

Comment:
3. Is the role of algae and its response to nutrients and other limiting factors adequately and correctly addressed?

Yes (but see 1. above)

Response:
Comment noted. Refer to comment response 1.

Comment:
4. Based on existing information, has the hydrology of the watershed been adequately and correctly addressed?

No comment, not in my area of expertise

Response:
No response necessary.

Comment:
5. Does the staff report adequately and correctly address the sources of nutrients in the watershed?

Yes

Response:
Comment noted.

Comment:
6. Are data used in this report reliable and appropriate, and is the treatment of the data defensible?

Yes

Response:
Comment noted.

Comment:
7. Please comment on the general validity of the approach used to calculate nutrient loading to the creek.

It is valid

Response:
Comment noted.

Comment:
8. Is the approach used to assign the load allocation reasonable?

It is fair to reasonable to start with. However the Board should be open to future changes in allocations should it be shown far more economical to reduce nutrients from one sector than another

Response:

The Regional Board agrees and the Implementation Plan has been written to include opportunities for evaluation of and revisions to the TMDLs, allocations, and implementation.

Comment:
9. Have the correct data gaps been identified for ground water and septic system issues?

Yes

Response:
Comment noted.

Comment:

10. Overall, is the submitted material scientifically sound and thorough, and does it support the Regional Board's proposed action?

Yes and No (see 1 above)

Response:

Comment noted. Refer to comment response 1.

Part 2: Other specific comments (by page (p.), paragraph (¶), and line (l)).

Executive Summary	
p.iv, ¶4, l 9	**Comment:** How do you define/measure that a water has a "susceptibility to excessive algae growth"? **Response:** "Susceptibility" is the term used to describe the segments of the creek that were observed to be prone to large quantities of algae, primarily filamentous green algae in the water column and/or attached to the substrate.
p.iv, ¶5	**Comment:** In ¶4 you stated that eutrophic conditions "have not been observed" yet here you state that resulting algae growth occurs. **Response:** Large quantities of filamentous green algae were observed attached to the substrate and in the water column, while eutrophic conditions, such as offensive odors and fish kills, were not observed.
p.iv-v last and first ¶'s	**Comment:** "Septic wastewater" is not discharged…it is domestic septic tank effluent. **Response:** Under the Porter-Cologne Water Quality Control Act (Porter-Cologne) [California Water Code §13000 et seq.], wastewater from septic tanks is considered to be a "waste" that is "discharged".

Executive Summary	
p.v, ¶3	**Comment:** Second sentence implies that there is a Drinking Water Standard for Total P! **Response:** The word "similarly" has been replaced with "also". The sentence now reads as follows: "The initial reductions will be implemented to meet the nitrates in the drinking water quality objective and also reduce phosphorus concentrations."
p.v, ¶4	**Comment:** 1st sentence. State the current loads to which the N & P reductions are being made i.e. from ???? to ???? **Response:** The current load estimates have been added to the sentence.
p.vi, ¶1, l 2	**Comment:** I thought that there were 4 stages of implementation, yet here you state "second phase of implementation". **Response:** The revised implementation plan specifies a phased-reduction schedule, of which there are four phases. The statement regarding a "second phase of implementation" has been corrected.
Resolution	
p.ix, point 8, l 6	**Comment:** How can the numeric target for total N = 1.0 mg/L while for NO_3-N (a component of total N) is 10 mg N/L?? **Response:** The two numeric targets identified in the comment are based on two water quality objectives that have different purposes. The water quality objective for inorganic chemicals in municipal supplies states that nitrate in domestic or municipal water supplies should not exceed 10 mg NO_3-N/L and is based on human health toxicity in infants. The water quality objective for biostimulatory substances addresses tolerance levels for algal and emergent plant growth by limiting total nitrogen and total phosphorus. The purpose of this water quality objective is to prevent nuisance or adverse effects on beneficial uses (i.e., recreation, aquatic life, and wildlife).

Resolution	
p.xi, point 14	**Comment:** The last sentence is hard to follow. Suggest rewrite as follows: Incremental reductions of the nutrient waste load are required throughout the subsequent 12-year period". **Response:** The recommended change has been incorporated.
Basin Plan Amendment	
p. xv, last ¶ - p. xvi, first ¶	**Comment:** is hard to understand. Suggest rewrite as follows " The annual loading of total nitrogen and total phosphorus to Rainbow Creek shall be reduced incrementally from the current loads of 3,868 kg/yr and 392 kg/yr respectively to ???? kg/yr and ??? kg/yr respectively by no later than [the end of the 16th year after USEPA approval] or until the applicable water quality objectives of 1 mg/L for total nitrogen and 0.1 mg/L for total phosphorus have been met. **Response:** The recommended change has been incorporated.
2.0 Problem Statement	
p.2, ¶3	**Comment:** Only nitrate exceeds MUN, total P and total N do not. Reword to make this clear. **Response:** The first paragraph of the Problem Statement has been reworded.
p.2, ¶4, l 5	**Comment:** "wastewater" not "waste". **Response:** The use of the term "waste" is appropriate in accordance with Porter-Cologne Water Quality Control Act that defines "waste" as … "sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation" [CWC § 13050(d)].

2.0 Problem Statement	
p.2, ¶5	**Comment:** Remove the text concerning N_2 gas. It is unnecessary when discussing dissolved N and P forms. Confine your discussion to organic, ammonia, nitrite and nitrate N. I recommended that you do this in my first review of this TMDL. **Response:** The recommended change has been incorporated into Section 2.1.
p.3, ¶2, l 2,3	**Comment:** Phosphate minerals do not break down, they dissolve. **Response:** The sentence in the third paragraph of Section 2.1 has been reworded.
p.3, ¶2, l 6	**Comment:** Plants and algae do not urinate! **Response:** Urinating plants and animals is not implied in this sentence. Rather, the sentence states that organic phosphorus moves through the food web when organisms ingest plants and algae (which contain organic phosphorus) and then excrete phosphate (e.g., urine or other waste) making it once again available for plant and algae uptake. The third paragraph of Section 2.1 has been reworded to clarify this point.
p.3, ¶3, l 2	**Comment:** "wastewater" not waste. **Response:** The use of the term "waste" is consistent with the definitions of the Porter-Cologne Water Quality Control Act [CWC § 13050(d)].
p.3, ¶3, l 7	**Comment:** Omit the 4th sentence. It is flat WRONG. **Response:** The sentence in the last paragraph of Section 2.1 has been deleted.

2.0 Problem Statement	
p.4, ¶2, last sentence	**Comment:** Delete, it is repetition. **Response:** The last sentence of the third paragraph of Section 2.2 has been deleted.
p.5, last ¶, last sentence and p.6, 1st ¶, 1st sentence.	**Comment:** Omit sentence, it is not needed and it is awkwardly stated. **Response:** The sentence in the first paragraph of Section 2.3 has been deleted.
p.6, ¶1, sentence 2	**Comment:** Omit it. **Response:** The sentence in the first paragraph of Section 2.3 has been deleted.
p.8, ¶2	**Comment:** This ¶ is unintelligible (to me)! **Response:** The paragraph titled "USEPA's Recommended Ecoregional Nutrient Criteria" in Section 2.4 was added in response to public comments that the numeric goals set in the water quality objective for biostimulatory substances were unreasonably low and had no basis in science. The referenced paragraph is a summary of the empirically derived nutrient criteria recommended by the USEPA for the San Diego Region to address the prevention and assessment of eutrophic conditions. The paragraph summarizes the statistical analyses performed on the data used to derive the criteria.
p.10, Fig 2-1	**Comment:** On both graphs show existing creek levels and target creek levels after TMDL has become fully effective. **Response:** The recommended change has been incorporated.

2.0 Problem Statement	
p.11	**Comment:** You state that the 2000 monitoring data were taken to see whether the 1998-9 levels were being maintained and whether these levels were effectively limiting excessive algae growth. However nowhere in the next 2 pages of discussion of the monitoring results do you say a word concerning these objectives. **Response:** A sentence has been added to Section 2.5 to address this issue.
p.17, ¶1, l 2	**Comment:** You have absolutely no evidence of impairment of benthic communities by pesticides. Delete reference to pesticides. **Response:** The reference to pesticides has been deleted from Section 2.7.
3.0 Numeric Targets	
p.17, ¶3, l 3	**Comment:** What does a "ratio of atomic weights" mean? I have never seen this term before. Do you mean mole ratio? If so use "mole ratio" because it is well-understood! **Response:** The recommended change has been incorporated into the second paragraph of Section 3.0.
p.17, ¶3, l 10	**Comment:** All collections of data have high and low values. This is an utterly meaningless statement. Delete it. **Response:** The recommended change has been incorporated into the second paragraph of Section 3.0.

4.0 Source Assessment	
p.26, Table 4-2 and Figure 4-2	**Comment:** It would be useful to try and estimate the individual contributions of the various land use categories in this table and figure. **Response:** Table 4-2 and Figure 4-2 provide summary information for the section. The individual contribution estimates of each land use category are provided in Table 4-1 and Figure 4-1.
p.29, ¶2, l 2	**Comment:** The statement "Phosphates are less soluble in water than total nitrogen components…" is wrong and irrelevant. Delete it. **Response:** The statement in Section 4.2.2 has been deleted.
pp. 29 and 30, Table 4-4 and Figure 4-4.	**Comment:** It would be useful to try and estimate the individual contributions of the various land use categories in this table and figure. **Response:** Table 4-4 and Figure 4-4 provide summary information for the section. The individual contribution estimates of each land use category are provided in Table 4-3 and Figure 4-3.

Appendix O - Response to Public Comments from Public Hearing on December 8, 2004 and Written Comments Submitted on/before December 29, 2004.

California Regional Water Quality Control Board

San Diego Region

Total Nitrogen and Total Phosphorus TMDL for Rainbow Creek

Response to Public Comments from Public Hearing on December 8, 2004 and Written Comments Submitted on/before December 29, 2004.

January 27, 2005

1) ALGAE GROWTH

a) *Comment from the California Avocado Commission 12/01/04:*
It also appears that an alternative strategy of providing riparian cover in areas now affected by algal blooms may almost entirely solve the problem. These alternatives should be fully explored by the Board.

Regional Board Response:
This comment was addressed in the Technical Report, Appendix M, Response to Public Comments, Public Hearing on May 8, 2002. See response #39.

b) *Comment from the California Avocado Commission 12/01/04:*
In areas where Rainbow Creek is open to sunlight, re-vegetation efforts should be made. Development of a new, vegetative canopy would retard algal growth, the driving force behind the establishment of the numeric water quality objectives in the TMDL. As noted above, without the presence of an algal bloom the development of a numerical objective for nutrient levels is unjustified.

Regional Board Response:
This comment was addressed in Appendix M of the Technical Report, Response to Public Comments, Public Hearing on May 8, 2002. See response #64.

c) *Comment from the California Avocado Commission 12/01/04:*
The TMDL draws a clear link between existing levels of total nitrogen and total phosphorus (biostimulatory substances) in surface waters and algal growth. Without the latter, the Board lacks justification for the TMDL. Yet the evidence from recent water quality sampling, on which the TMDL is based, fails to make a convincing case that the numerical levels actually result in algal blooms that constitute a “nuisance" or "adversely affect beneficial uses" (see pages 21-23).

Regional Board Response:
The Regional Board disagrees with this comment. The justification for the Rainbow Creek TMDL is that the nitrogen and phosphorus concentrations are above the water quality objective for Municipal Water Supply and Biostimulatory Substances.

The Regional Board’s most recent water quality sampling (December 2004) from Rainbow Creek shows nitrogen concentrations nearly double of any sample collected in 2000. Water quality objectives are developed for the protection of beneficial uses. Therefore any exceedance of the water quality objectives is considered to be an adverse affect on the designated beneficial uses.

d) *Comment from the California Avocado Commission 12/01/04:*

If algae, at the peak of its growth, does not create a nuisance or affect beneficial uses (thereby calling into question the validity of the entire TMDL), then rejection of a seasonal nutrient differential is even more unfathomable.

Regional Board Response:
The water quality objectives, and hence the numeric targets, do not have seasonal differential. Seasonal variation was accounted for by the use of flow tiers in examining the Creek flow data in calculating the nutrient loading and background capacity. See Appendix F of the Technical Report.

2) ATMOSPHERIC DEPOSITION

a) *Comment from the California Avocado Commission 12/01/04:*
In the Source Assessment of the TMDL, the Board determined that atmospheric deposition of nutrients should be constrained to the creek surface area (see Section 4.0). By constraining the calculation to the creek area, the estimate of nutrient loading from atmospheric deposition is artificially low.

Regional Board Response:
Atmospheric deposition is accounted for in two ways: Section 4.1.3 calculates the portion that is deposited directly into the creek and Section 4.1.1 calculates the portion that is deposited to land. This is explained in Section 4.1.3 of the Technical Report as quoted below (underline added for emphasis):

> "*Air pollutants are deposited to the earth, in most cases directly to a water body or to a land area that drains into a water body. These pollutants are deposited by wet or dry deposition. In wet deposition, pollutants are removed from the air by a precipitation event such as rain. Dry deposition occurs when particles settle out of the air and onto surfaces. Total nitrogen loads from atmospheric deposition are most significant in large lakes or reservoirs when the waterbody is large compared to the total watershed area (USEPA 1999). In the Rainbow Creek watershed, nutrient loads from atmospheric deposition are not likely to be significant as compared to other sources, because the surface area of the creek is small compared to the area of the watershed. Atmospheric deposition is calculated using water surface area only, since total nitrogen depositions on land are included in the nutrient export coefficients. Atmospheric deposition loads to Rainbow Creek were estimated using established atmospheric deposition rates.*"

b) *Comment from the California Avocado Commission 12/01/04:*
Remarkably, the draft TMDL omits any discussion of those reports in the scientific literature that speak to the significance of atmospheric deposition and whether land use export coefficients adequately address the calculation of loadings.

Regional Board Response:
The Rainbow Creek TMDL Technical Report has undergone 2 formal peer reviews and also been reviewed by the USEPA and at no time did any of the reviewers recommend export coefficients they deemed more accurate. Several comments were submitted by the public that was critical of the Regional Board's

selection of export coefficients but, again, no alternative export coefficients were specifically recommended.

Furthermore, the USEPA submitted the following statement in a letter dated December 3, 2004:

> "*The proposed TMDLs meet all federal regulatory requirements and will be approvable when they are submitted to EPA. The TMDLs are based on sound analytical methods that identify reasonable pollutant reductions necessary to attain the existing Basin Plan numeric water quality objectives.*"

c) *Comment from the California Avocado Commission 12/01/04:*
It is our concern that a potentially significant source—one beyond the control of any entity within the Rainbow Creek watershed—could possibly explain a significant portion of the nutrient loading in Rainbow Creek.

Regional Board Response:
See Regional Board Comment Response 2a of this document

d) *Comment from Hines Nurseries 12/01/04:*
Unfortunately, the source assessment for the proposed Total Nitrogen and Total Phosphorus TMDL for Rainbow Creek is incomplete and inadequate. It all but ignores indirect atmospheric deposition.

Regional Board Response:
See Regional Board Comment Response 2a of this document.

e) *Comment from Hines Nurseries 12/01/04:*
Hines recommends that the Regional Board invite researchers from SCCWRP and UCLA to conduct a workshop for Board members, Board staff, and the regulated community on the relationship of atmospheric deposition to water quality, with emphasis on atmospheric deposition of nutrients.

Regional Board Response:
Comment noted.

3) ECONOMICS

a) *Comment from Caltrans 12/07/04*:
In addition, since the necessary controls have not been identified, the TMDL cannot show how the benefits justify the cost.

Regional Board Response:
The Implementation Action Plan section is intentionally written to give the stakeholders the flexibility to develop what they feel as cost effective nutrient management measures to address the impairment of Rainbow Creek. Under Water

Code Section 13360, the Regional Board may not specify the design, location, type of construction, or particular manner of compliance with waste discharge requirements or other orders, and dischargers can comply "in any lawful manner." This restriction is a shield against unwarranted interference with the ingenuity of the party subject to waste discharge requirements, who can elect between available strategies to comply with the standard.

CEQA's provisions require that the Regional Board perform an environmental analysis of the reasonably foreseeable methods of compliance with the wasteload and load allocations. The Regional Board must consider the economic costs of the methods of compliance in this analysis; however, the Regional Board is not required to do a formal cost-benefit analysis. The Regional Board did perform an environmental analysis of the reasonably foreseeable methods of compliance in Section 11.4 of the Technical Report of typical BMPs to reduce nutrient discharges from state highways. Estimated costs for implementing these BMPs are provided in Section 12 of the Technical Report.

b) *Comment from Caltrans 12/07/04*:
Table 4-2 in the report shows the total annual nitrogen load for the watershed to be 3,868 kg N/yr. The total volume of flow in the creek is 58,539 $x10^6$ cf /yr. This is equivalent to an average annual concentration of 2.33 mg/L within the creek. The monitoring data in Appendix B shows average concentrations with the creek to be 9.6 mg/L, 14.5 mg/L and 14.7 mg/L for 2000 monitoring. This means that the sources for between 75% and 85% of the nitrogen load to the creek have not been identified. This discrepancy casts doubt on the load allocation as well as the likelihood that the proposed measures will result in significant improvement to water quality in Rainbow Creek.

Regional Board Response:
This comparison is inappropriate because the total load in Table 4-2 is based in part on export coefficients while the data in Appendix B is actual monitoring data. Therefore the difference between the two methods of calculation suggests that the additional data collection planned during implementation will be useful to refine the current loading estimates. In addition, the analysis in the comment, a comparison of averages, does not take into account the fact that the infrequent but significant high flow periods account for much of the total load.

c) *Comment from Caltrans 12/07/04*:
The costs presented in Appendix H uses a Caltrans drainage area of 214 acres rather than the 120 acres used in the TMDL report. The cost suggests the use of sediment basins for treatment at a cost as low as $700. The Caltrans BMP Retrofit Pilot Program Final Report (http://www.dot.ca.gov/hq/env/stormwater/special/newsetup/_pdfs/new_technology/CTSW-RT-01-050.pdf) found that the cost for sediment basins in a retrofit situation range from $303 to $1,307 per WQV m^3. This would be a cost of $602,000 to $2,586,000 to treat the 1,986 m^3 of WQV for the 4.1 miles of I-15 in this watershed. Cost for

sand filters range from $748 to $2,118 per WQV m^3. ($1,486,000 to $4,206,000 to treat 1,986 m^3 of WQV)

Regional Board Response:
The cost estimates submitted by Caltrans have been incorporated into Section 12 and Appendix H.

The acreage for the Interstate 15 corridor has been corrected in the revised Technical Report. The correct value is 120 acres.

d) *Comment from the California Avocado Commission 12/01/04:*
Compliance with the TMDL is estimated to cost from a low of $18,565,000 to a high estimate of $41,772,000 not including costs associated with individual agricultural operations. Assuming a high cost of $57,705 for each orchard, avocado production in the Rainbow Creek watershed could be rendered economically infeasible.

Regional Board Response:
The Implementation Action Plan section is intentionally written to give the stakeholders the flexibility to develop what they feel as cost effective nutrient management measures to address the impairment of Rainbow Creek. Under Water Code Section 13360, the Regional Board may not specify the design, location, type of construction, or particular manner of compliance with waste discharge requirements or other orders, and dischargers can comply "in any lawful manner." This restriction is a shield against unwarranted interference with the ingenuity of the party subject to waste discharge requirements, who can elect between available strategies to comply with the standard.

CEQA's provisions require that the Regional Board perform an environmental analysis of the reasonably foreseeable methods of compliance with the wasteload and load allocations. The Regional Board must consider the economic costs of the methods of compliance in this analysis; however, the Regional Board is not required to do a formal cost-benefit analysis.

The Regional Board can adopt TMDLs and other types of Basin Plan amendments despite significant economic consequences. In the Rainbow Creek Technical Report the Regional Board has clearly explained why the TMDL is necessary and provided extensive information on the sensitivity of the receiving waterbody, water quality problems caused by excessive nutrient loading and public health implications.

The estimated capital costs for orchards ranges from $10,105 to $57,705. The implementation actions are to be implemented over a period of 16 years. This should allow ample time to implement needed nutrient reduction measures in a phased approach, monitor effectiveness, and adjust the program as necessary to maximize efficiency and minimize costs.

Sources of potential funding for Rainbow Creek TMDL projects are listed in Section 12.3 of the Technical Report.

e) *Comment from Richard Watson 12/08/04:*
Tentative Finding 17 claims that the Regional Board has considered costs of implementing the amendment. However, the costs for commercial nurseries are understated, and the economics analysis does not comply with California Water Code Section 13241.

Regional Board Response:
Water Code Section 13241 establishes the requirements attendant to the Regional Boards' adoption of water quality objectives. A TMDL normally is, in essence, an interpretation or refinement of an existing water quality objective. TMDLs are designed to attain water quality objectives and are not intended to re-balance the policy interests defined by Water Code Section 13241 that underlie the water quality objective. A TMDL implements existing water quality objectives; it does not create new objectives. Therefore, section 13241 does not apply to development of a TMDL.

The Regional Board documented the estimated costs to commercial nurseries for implementation of the "reasonably foreseeable methods of compliance" as required by CEQA and provided the information in Section 12 of the Technical Report. The cost data was based primarily on information contained in "Calleguas Creek Watershed and Erosion Control Plan for Mugu Lagoon. USDA, May 1995." and is a reasonable estimate of the cost impacts of the Rainbow Creek TMDL on commercial nurseries.

f) *Comment from the County of San Diego 12/28/04:*
Consequently, waiting until after the TMDL is approved to develop the required costs/benefits analyses will only guarantee that such analyses amount to little more than post hoc rationalizations in support of orders that are, in fact, a fait accompli.

Regional Board Response:
This comment was in reference to the Regional Board's issuance of a CWC §13225(c) order for a Nutrient Reduction Management Plan.

CEQA's provisions require that the Regional Board perform an environmental analysis of the reasonably foreseeable methods of compliance with the wasteload and load allocations prior to adopting a TMDL Basin Plan amendment. The Regional Board must consider the economic costs of the reasonable foreseeable methods of compliance in this analysis; however, the Regional Board is not required to do a formal cost/benefit analysis for the adoption of a TMDL. The Regional Board has provided the results of this analysis, including an estimate of the costs that might be incurred by the County of San Diego in preparing reports

and overseeing nutrient reduction efforts described in the TMDL in Section 12 of the Technical Report.

The Regional Board is required under CWC §13225 to provide a written justification showing that the burden, including costs of preparing a report required under CWC §13225 bears a reasonable relationship to the need for the report. However the requirement to produce the written justification is not triggered until the CWC §13225 order requiring the report is issued to the County of San Diego at some time subsequent to the adoption of the TMDL.
The details of the MAA and NRMP are scheduled to be worked out after TMDL adoption. The Regional Board will provide a written justification addressing the issue of the burden of the reports bearing a reasonable relationship to the benefits attained at the time the CWC §13225(c) order is issued.

4) EXPORT COEFFICIENTS

a) *Comment from the California Avocado Commission 12/01/04:*
It is clear from Dr. Boynton's comments above that he has serious doubts about the applicability of the export coefficients identified in the study to local conditions in a completely different geographic area, here Rainbow Creek. There is no valid scientific basis, therefore, for the Board's use of 2.5 kg/ha/yr for Total Nitrogen and 0.2 kg/ha/yr for Total Phosphorus for the orchard land use category in the TMDL.

Regional Board Response:
This comment was addressed in Section 11.3 of Technical Report, Analysis of Public Comments on Technical Issues. See Section 11.3.3 and 11.3.7.

The USEPA submitted the following statement in a letter dated December 3, 2004:

> *"The proposed TMDLs meet all federal regulatory requirements and will be approvable when they are submitted to EPA. The TMDLs are based on sound analytical methods that identify reasonable pollutant reductions necessary to attain the existing Basin Plan numeric water quality objectives."*

Furthermore, in the development of this nutrient TMDL, local experts were a part of the Technical Advisory Committee and reviewed sections of the Technical Report as it was drafted. See Section 13.0, Public Participation, for a list of participants and Appendix I, List Events, for a list of meeting dates and topics. In addition to the TAC members, other local scientists, such as scientists from the Southern California Coastal Water Research Project (SCCWRP) and other Regional and State Water Board staff, were also consulted on specific nutrient issues, including the use of export coefficients and nutrient water quality objectives.

b) *Comment from the California Avocado Commission 12/01/04:*
There is no specific export coefficient value for avocados. Avocado nutrient load allocations should be based on specific information that takes into account grower practices and resulting contributions to the TMDL. Otherwise, avocado growers are unfairly burdened with an allocation that is excessive or beyond their ability to control.

Regional Board Response:
This comment was addressed in Appendix M of the Technical Report, Response to Public Comments, Public Hearing on May 8, 2002. See response #44. Also see Section 11.3.7 of the Technical Report. .

c) *Comment from the California Avocado Commission 12/01/04:*
Section 11.3.3 of the TMDL purports that the export coefficient selected for the orchard land use category (among others) is appropriate (see page 101). This claim is unsubstantiated, however, as evident from the following statement in the TMDL:

> "The Regional Board recognizes it is difficult to calculate nutrient loadings from non-point sources with precision and acknowledges that *the development of nutrient loads from NPS discharges is characterized by uncertainties*" (emphasis added).

Regional Board Response:
The Regional Board agrees with the above quote – that it is difficult to calculate non-point source nutrient loading and that there are uncertainties. However that does not preclude moving forward with development and adoption of a TMDL using the available data. Also see Response #44 in Appendix M and Section 11.3.7 of the Technical Report.

The USEPA submitted the following statement in a letter dated December 3, 2004:

> *"The proposed TMDLs meet all federal regulatory requirements and will be approvable when they are submitted to EPA. The TMDLs are based on sound analytical methods that identify reasonable pollutant reductions necessary to attain the existing Basin Plan numeric water quality objectives. The TMDLs are consistent with numerous nutrient TMDLs developed elsewhere in California, including the TMDLs for Los Angeles River, Laguna de Santa Rosa, and Malibu Creek. We are pleased that the TMDLs include waste load allocations to account for future growth in the watershed."*

d) *Comment from Richard Watson 12/08/04:*
Instead, staff attempted to use inappropriate export coefficients to estimate loads.

Regional Board Response:
See Regional Board Comment Responses 4a, 4b, and 4c of this document.

e) *Comment from Richard Watson 12/08/04:*

Furthermore, the allocations for commercial nurseries and other nonpoint sources were based on misapplication of export coefficients.

Regional Board Response:
See Regional Board Comment Responses 4a, 4b, and 4c of this document.

f) *Comment from Hines Nurseries 12/01/04:*
The export coefficients for agriculture were based on mass emissions monitoring of one field in Ventura County. The crude estimate is not an appropriate basis to estimate loads to be used in a regulatory document such as a TMDL.

Regional Board Response:
See Regional Board Comment Response 4a, 4b, and 4c of this document.

g) *Comment from Hines Nurseries 12/01/04:*
For the subject TMDL, coefficients should be developed for inland San Diego County commercial nurseries, field agriculture, and orchards. The coefficients used in the SCCWRP study may have been appropriate for a regional study or coastal waters. However, they are not appropriate for a regulatory document such as a TMDL. Additional research is required to develop appropriate coefficients.

Regional Board Response:
See Regional Board Comment Response 4a, 4b, and 4c of this document.

5) IMPLEMENTATION PLAN

a) *Comment from the County of San Diego 12/08/04:*
The County very much appreciates the fact that since May 2002 Regional Board staff has demonstrated a willingness to work with the County in moving this TMDL forward, but we are also extremely concerned that the proposed schedule of February 2005 adoption does not provide sufficient time to fully resolve many of the outstanding issues raised by the County and others. We are therefore requesting you not close the public testimony on this matter at the conclusion of your December 8, 2004 meeting, and that you direct staff to work within a more realistic schedule for final adoption.

Regional Board Response:
The Regional Board held a public hearing on December 8, 2004, to consider public comment and testimony on the proposed TMDL. At the conclusion of the hearing the Board left the record open for submission of additional written comments for three weeks until December 29, 2004. The Regional Board has provided an ample period for the County of San Diego to review and comment on the proposed TMDL and will be considering adoption of the TMDL at the February 9, 2005 Regional Board meeting.

b) *Comment from Hines Nurseries 12/01/04:*

We, and the other members of the regulated community, deserve to see any revised Implementation Plan and have a chance to comment on it before the public hearing on the proposed TMDLs is closed.

Regional Board Response:
The Regional Board held a public hearing on December 8, 2004 to consider public testimony and comment on the Rainbow Creek TMDL following a reasonable period for review of the tentative proposal. In the course of the public review period prior to the hearing the Regional Board also conducted a workshop on November 17, 2004 to stimulate public understanding and discussion of potential issues that might be considered in the TMDL public review process. At the conclusion of the December 8 hearing, the Regional Board left the record open for submission of additional written comments for three weeks until December 29, 2004. The Regional Board has clearly provided an ample period for the public to review and comment on the proposed TMDL. Based on these considerations it would not be unreasonable for the Regional Board to restrict additional public commentary on the proposed TMDL Basin Plan Amendment when the Board considers its adoption on February 9, 2005.

On February 9 the Regional Board will be considering 1) the written responses to public comments document developed by Board staff; 2) revisions to the proposed TMDL Basin Plan amendment made as a logical outgrowth of the record developed at the December 8 hearing and the subsequent December 29, 2004 public comment period and 3) adoption of the TMDL Basin Plan Amendment. On February 9 the Board will evaluate if any revisions to the Basin Plan Amendment might qualify as sufficiently significant to merit an additional opportunity for public review and comment. Based on this evaluation the Board may, at their discretion, allow interested persons to make oral comment on the proposed changes and proceed with adoption on February 9 or circulate the modified proposal and any additional documentation for an additional structured period of public review.

The revised Technical Report will be made available to the public by posting the edited version on the Regional Board's website.

c) *Comment from Hines Nurseries 12/01/04:*
As presented in the Public Review Draft, the Implementation Plan is extremely prescriptive and inflexible.

Regional Board Response:
This comment was addressed in Appendix M of the Technical Report, Response to Public Comments, Public Hearing on May 8, 2002. See response #17 and #22.

Flexibility is provided in the TMDL Implementation Plan, for dischargers to either participate in an acceptable third party Nonpoint Source control programs

or, alternatively, submit individual pollution prevention plans that detail how they will comply with the WDRs.

d) *Comment from Hines Nurseries 12/01/04:*
The Implementation Plan could either be delayed or revised to be an adaptive management plans to be reassessed periodically based on a monitoring program to assess progress in achieving the water quality objectives in the Basin Plan.

Regional Board Response:
This comment was addressed in both Responses #22 of Appendix M and Section 11.3.7 of the Technical Report, Response to Public Comments, Public Hearing on May 8, 2002

e) *Comment from the California Avocado Commission 12/27/04:*
In light of that reality, the Commission proposes that the Board allow for direct participation in the implementation process by a team consisting of representatives from the Commission, University of California Cooperative Extension (UCCE), the Mission Resource Conservation District (MRCD), the San Diego County Farm Bureau, the County, and RWQCB Staff.

Regional Board Response:
The UCCE, MRCD, Farm Bureau, and the County are already members of the Technical Advisory Committee for this TMDL and have been participants in the development process. See Section 13.0, Public Participation, from the Technical Report for a complete list of committee members. We look forward to those entities, along with the California Avocado Commission, participating in the implementation process.

Section 9.5, item 6 of the TMDL Implementation Action Plan provides for the Regional Board to consider entering into a Memorandum of Understanding (MOU) to document cooperative agreements with agencies or organizations, such as those cited by the commenter, that are able to provide information, technical assistance, or financial assistance to dischargers to support the Regional Board's goals of attaining the nutrient load reductions required under this TMDL. Formalizing these arrangements in a MOU with the Regional Board would also assist the various agencies and districts in targeting technical and financial resources for Rainbow Creek nutrient NPS problems.

f) *Comment from the California Avocado Commission 12/27/04:*
We would be extremely pleased if the RWQCB staff would conduct a field tour of the watershed with representatives of affected parities in the watershed so that we can share ideas before we undertake mitigation measures to address any adopted TMDL.

Regional Board Response:

Comment noted. The Regional Board conducted a site visit in 2002 with representatives from the County, Hines Nursery, SDSU, MRCD, and the Dept. of Agriculture. The Regional Board would be willing to participate in other such events as the TMDL moves into the implementation phase.

g) *Comment from the Farm Bureau 12/24/04:*
We see the County of San Diego, the University of California Cooperative Extension Service, the Mission Resource Conservation District, and trade groups such as the California Avocado Commission as important partners in this effort.

Regional Board Response:
The Regional Board agrees. See Regional Board Comment Response 5e above.

6) LEGAL ISSUES

a) *Comment from the County of San Diego 12/08/04:*
The County is also concerned about staff's proposed use of Water Code Section 13225(c) to require activities we consider to be beyond investigating or reporting on "technical factors involved in water quality control". In particular, the County maintains that Section 13225(c) cannot and should not be used to require submission by the County of a Nutrient Reduction Management Plan.

Regional Board Response:
The Nutrient Reduction Management Plan is clearly within the scope of reports that the Regional Board can require the County to submit under the authority of CWC §13225. CWC §13225 provides authority for the Regional Board to require local agencies such as the County of San Diego to submit draft technical reports on water quality control, even though those entities may not be waste dischargers. Local agencies can be required to investigate the scope, causes, and sources of nonpoint source pollution, and potential practices or control measures to prevent it. The only restriction is that the burden of preparing the reports bears a reasonable relationship to the need for and the benefits to be obtained from the reports.

Section 9.7, which describes the development of the NRMP, has been revised to clarify that the County will review its legal authority and evaluate its adequacy to mandate compliance with nutrient load reductions specified in this TMDL through ordinance, statute, permit, contract, or similar means. Section 9.7 was also revised to clarify that, for the various elements listed for the NRMP, the County will evaluate the necessity of modifying, and their willingness to modify, the activities listed therein.

The Regional Board understands its obligation under CWC §13225 to provide a written justification to the County of San Diego showing that the burden, including costs of preparing the NRMP report bears a reasonable relationship to the need for the report. The Regional Board will provide the written justification

when the CWC §13225 order requiring the NRMP report is issued to the County of San Diego following adoption of the TMDL.

Further discussion on CWC §13225(c) can be found in Appendix M of the Technical Report, Response to Public Comments, Public Hearing on May 8, 2002. See response #17.

b) *Comment from the County of San Diego 12/08/04:*
Regional Board staff must demonstrate that the burden, including costs, of required investigations or reports bears a reasonable relationship to the need for them and the benefits to be obtained. Staff has indicated that this burden will be met not in the TMDL, but instead in the 13225(c) letter requiring such activities. This is problematic to the extent that detailed water quality investigations or monitoring are currently required within the TMDL document.

Regional Board Response:
The Regional Board has described in some detail in the Implementation Action Plan, Sections 9.6 and 9.7, and the Implementation Monitoring Plan, Section 10.5, the various elements, or additional or alternative elements, and technical information that the Regional Board will require the County of San Diego to include in the NRMP, the Groundwater Investigation and Characterization Report and the Implementation Monitoring Plan. CEQA's provisions require that the Regional Board perform an environmental analysis of the reasonably foreseeable methods of compliance which would include the Regional Board's requirement for the County to submit an NRMP, a Groundwater Investigation and Characterization Report and an Implementation Monitoring Plan. The Regional Board has provided the results of this analysis, including an estimate of the costs that might be incurred by the County of San Diego in preparing the reports in Section 12, Economic Considerations, of the TMDL Technical Report.

The Regional Board is not required to provide the CWC §13225 justification (that the burden, including cost, of the reports requested bears a reasonable relationship to the need for the report) in the Basin Plan Amendment itself for CWC §13225 orders the Board plans to issue in the future. As described in previous responses the Regional Board will provide the written justification - that the burden, including cost, of the report requested bears a reasonable relationship to the need for the report – when the CWC §13225 order requiring the reports is issued to the County of San Diego following adoption of the TMDL.

c) *Comment from Hines Nurseries 12/01/04:*
In addition to the misstatement from the Basin Plan, the listing was based on erroneous interpretation of Section 303(d)(1)(A) of the CWA. Both the Regional Board and the State Board appear to have thought that all impaired waters must be included on the 303(d) list. Actually, only water "for which the effluent limitations required by Section 301(b)(1)(A) and Section 301(b)(1)(B) of this title

are not stringent enough to implement any water quality standards..." are required to be included on the 303(d) list.

Regional Board Response:
Rainbow Creek has been included on the State's current list of impaired water bodies that was promulgated following the requisite hearings and opportunities for public participation, and has been approved by U.S. EPA as the list required to be prepared by CWA 303(d). Whether or not Rainbow Creek falls within the requirements of CWA 303(d) does not alter the fact that the state has determined that the quality of the waters of Rainbow Creek have been impaired, and has elected to develop a TMDL in order mitigate or alleviate the impairment. The TMDL process is not the correct forum to challenge the listing criteria that has placed Rainbow Creek on the list of impaired water bodies.

Sections 303(d)(1)(C) and (d)(1)(D) require the states to establish TMDLs for listed waters. Section 303(d)(2) requires states to submit the 303(d) list and TMDLs for listed waters to EPA for approval. Even if Rainbow Creek were not on the 303(d) list, Section 303(d)(3) requires states, for information purposes, to establish TMDLs for all waters that are not listed on the 303(d) list. Thus, under the federal statute, all waters must have TMDLs for all pollutants being discharged into them.

d) *Comment from Hines Nurseries 12/01/04:*
USEPA's regulations clearly state that a water quality limited segment is one where water quality standards are not expected to be met "even after the application of technology-based effluent limitations required by section 301(b) and 306 of the Act." Technology-based solutions had already greatly reduced nitrogen and phosphorus loads by 2002 and continued application of best management practices could be expected to bring Rainbow Creek into compliance with the numeric nitrate water quality objective and the narrative biostimulatory substances water quality objective in the Basin Plan.

Regional Board Response:
This comment was addressed in Appendix M of the Technical Report, Response to Public Comments, Public Hearing on May 8, 2002. See response #62.

e) *Comment from the County of San Diego 12/28/04:*
First, as described further below (comment A.6), we believe that the RWQCB has exceeded the authority granted it under CWC §13225(c) by imposing a requirement for the County to submit and implement a NRMP.

Regional Board Response:
Section 9.6 County of San Diego Actions, has been revised to clarify that the County, pursuant to CWC §13225(c), will be required to submit a NRMP. However the County's commitment and level of effort to implement the NRMP will be voluntary and addressed within the proposed Management Agency

Agreement (MAA) described in Section 9.5, Item 3 of the Implementation Action Plan.

f) *Comment from the County of San Diego 12/28/04:*
As stated in its December 8 letter, the County has consistently maintained its willingness to voluntarily submit a NRMP. However, we respectfully disagree that CWC §13225(c) can reasonably be interpreted to authorize the RWQCB to compel the County to do so.

Regional Board Response:
See Regional Board Response 6a, b, and e of this document.

g) *Comment from the County of San Diego 12/28/04:*
The statute authorizes the RWQCB to require the County to investigate, report on and analyze water quality factors, but those terms do not describe the NRMP.

Regional Board Response:
See Regional Board Response 6a, b, and e of this document.

h) *Comment from the County of San Diego 12/28/04:*
As this language demonstrates, the NRMP does not consist of investigation and analysis; it consists almost entirely of policing, oversight and management. In short, the NRMP is precisely what its name implies - a plan for the reduction and management of nutrients. CWC §13225(c) does not authorize the imposition of such a plan.

Regional Board Response:
See Regional Board Response 6a, b, and e of this document.

i) *Comment from the County of San Diego 12/28/04:*
On a related note, even in those instances where §13225(c) authorizes the RWQCB to require certain investigations or analyses, e.g., for water quality investigations or monitoring, the statute requires that the burden, including costs, of those investigations or analyses bear a reasonable relationship to the benefits to be obtained. The County submits that such a costs/benefits analysis must be provided in writing, and must identify the evidence supporting the analysis, before the identified investigations or analyses may be required.

Regional Board Response:
The Regional Board will provide a written justification that the burden of the reports, including cost, of the report requested, bears a reasonable relationship to the to the need for the report when the CWC §13225(c) order requiring the reports is issued to the County of San Diego following adoption of the TMDL. CWC §13225(c) does not require a detailed cost/benefit analysis.

j) *Comment from the County of San Diego 12/28/04:*

The County believes the written, evidence-supported costs/benefits analysis for the §13225(c) orders referenced in the TMDL should be included in the text of the TMDL. While TMDL Section 12.2 does provide some very basic information on implementation costs, this analysis is clearly not sufficient to meet these § 13225(c) obligations.

Regional Board Response:
See Regional Board Responses 6a, b, e, and i of this document.

k) *Comment from the County of San Diego 12/28/04:*
Section 13225(c) orders should only be issued with a clear understanding of how the benefits of the required investigations justify their costs.

Regional Board Response:
Controlling and reducing nutrient discharges in the Rainbow Creek watershed to meet the TMDL nutrient load reductions for nonpoint sources will be a long term and complicated undertaking. There are multiple sources of nutrients in the watershed in seven different land use categories with an array of agencies and dischargers whose actions need to be coordinated. MMs and MPs need to be identified and implementation tracked and monitored. Water quality levels in Rainbow Creek need to be monitored and accessed to determine the effectiveness of the nutrient load reduction efforts, water quality trends, and success in attaining water quality objectives. See Sections 8.3.1, 8.4.1,10.1, and 10.2 of the TMDL Technical Report and Regional Board Responses 6a, b, e, and i of this document.

7) LOAD ALLOCATIONS

a) *Comment from the California Avocado Commission 12/01/04:*
Our analysis of the draft TMDL leads us to conclude that the allocation of nutrient loads to orchards (and avocado production in particular) is not founded on sound science.

Regional Board Response:
See Regional Board Response 4c of this document.

b) *Comment from the California Avocado Commission:*
Prior to the establishment of target nutrient levels for avocado growers, stream monitoring should occur to identify all sources contributing to the nutrient load.

Regional Board Response:
Source identification from all the potential nutrient sources is part of the NRMP. See Section 9.7, item 7 of the Technical Report.

c) *Comment from Caltrans 12/07/04*:

The TMDL has a schedule of 16 years to meet the load allocations, however the Department is expected to meet the waste load allocations in 8 years. The Department requests 20% waste load reduction every 4 years as is shown for load allocations due to the fact there is currently no BMP technology that will reduce nitrogen and phosphorus concentrations to the proposed levels.

Regional Board Response:
The schedule for Caltrans has been revised and extended to 16 years.

d) *Comment from Caltrans 12/07/04*:
Why is Caltrans assigned 74% (N) and 58% (P) reductions when "urban areas" with similar or possibly more heavily loaded runoff are assigned only 50% reductions.

Regional Board Response:
The current annual nutrient load from Urban Areas is small in comparison to the other land use categories therefore the potential of significant nutrient reductions is also small in comparison to the other land use categories.

The rationale for the load and wasteload allocations can be found in Appendix F of the Technical Report.

e) *Comment from Hines Nurseries 12/01/04:*
There is no basis to determine a load allocation or a waste load allocation (i.e., there is no basis to develop a TMDL) where the assimilative capacity of the water body has not been established. Hines would thus recommend that additional monitoring and a study of the assimilative capacity of the various reaches of the creek be conducted before adopting the subject TMDL, as the assimilative capacity of the water body is the cornerstone of any properly developed TMDL.

Regional Board Response:
This comment is addressed in Appendix M of the Technical Report, Response to Public Comments, Public Hearing on May 8, 2002. See response #49.

f) *Comment from Hines Nurseries 12/01/04:*
The TMDL continues to establish annual load allocations for commercial nurseries for both nitrogen and phosphorus (see Table 6-1 and 6-2) that are both unrealistic and unobtainable. The data and analysis in the TMDL simply do not support the load allocations developed for commercial nurseries.

Regional Board Response:
This comment was addressed in Section 11.3 of Technical Report, Analysis of Public Comments on Technical Issues. See Issue 11.3.2.

g) *Comment from the County of San Diego:*

The County has no specific objection to the assignment of a WLA for those portions of the Rainbow Creek Watershed tributary to its MS4. However, as is evidenced in the attached maps, the presence of an MS4 in this Watershed is limited and often not continuous.

Regional Board Response:
Comment noted.

8) MANAGEMENT AGENCY AGREEMENTS

a) *Comment from the County of San Diego 12/08/04:*
While the County agrees in principle that a negotiated agreement such as a MAA may be a useful means of achieving this objective, we have not had sufficient time to fully consider the implications of such an agreement, or to discuss the specifics of what both agencies envision the document containing.

Regional Board Response:
Sections 8, 9, and 10 of the TMDL Technical Report provide specifics on the actions and tasks the Regional Board believes will address nutrient control and reduction in Rainbow Creek. The overall purpose of the Management Agency Agreement (MAA) is to document commitments and clarify roles and responsibilities of the Regional Board and the County of San Diego over the next 20 years in overseeing implementation of the TMDL until compliance with the nutrient water quality objectives is attained. The MAA will enhance the effectiveness of the proposed partnership of the County of San Diego and the Regional Board; however the TMDL Basin Plan Amendment does not require the County to enter into a MAA with the Regional Board. The proposed MAA would be a voluntary agreement between the Regional Board and the County.

b) *Comment from the County of San Diego 12/08/04:*
We appreciate the willingness of your staff to work with the County in developing a draft, but must insist that we be given sufficient time to complete this process or the County may decline to enter in to the MAA.

Regional Board Response:
The proposed MAA between the Regional Board and the County for nutrient reduction in Rainbow Creek will be voluntary. The Regional Board recognizes that the County may ultimately decline to enter into a MAA. In that event the Regional Board will need to move forward with overseeing implementation of the TMDL using its own regulatory authority.

c) *Comment from the County of San Diego 12/08/04:*
We also believe that the TMDL must be amended to clarify that the County's compliance obligations will be defined in the MAA as agreed by both parties. As such, except for those obligations relating solely to the County's role as a

municipal stormwater discharger, detailed descriptions of required County actions should be removed from the TMDL.

Regional Board Response:
The proposed MAA between the Regional Board and the County for nutrient reduction in Rainbow Creek will be voluntary. The Regional Board recognizes that the County may decline to enter into a MAA if they do not agree with the various oversight responsibilities for the nonpoint source nutrient load reduction component of this TMDL defined in the MAA once it is developed.

Section 9.6, County of San Diego Actions, of the Technical Report has been revised to clarify that the County, pursuant to CWC §13225(c), will be required to submit a NRMP. However, the County's commitment and level of effort to implement the NRMP will be voluntary and addressed within the proposed Management Agency Agreement (MAA) described in Section 9.5, Item 3 of the Implementation Action Plan.

d) *Comment from the County of San Diego 12/08/04:*
It is important to recognize that, should the County and the Regional Board fail to come to agreement in the execution of a MAA, the Board's ability to properly exercise its legal authority in requiring specific County actions at a later date would not be affected.

Regional Board Response:
Comment noted.

e) *Comment from the County of San Diego 12/28/04:*
While this may be technically correct, it fails to recognize the central role of this agreement in ensuring successful implementation of the TMDL, or to consider how this and other key milestones in this process might best be sequenced (i.e., MMA drafting, TMDL adoption, MAA adoption, Nutrient Reduction and Management Plan [NRMP] submittal and implementation, etc.).

Regional Board Response:
The Regional Board envisions the following sequencing: TMDL adoption then TMDL implementation. During implementation, the sequence will likely be MAA development then MAA adoption, during which NRMP development and submittal may occur concurrently. It is anticipated that NRMP implementation will occur after MAA adoption.

f) *Comment from the County of San Diego 12/28/04:*
The County considers the MAA the primary vehicle for defining the roles, responsibilities, and specific commitments of both parties in implementing this TMDL. Until such a document exists, at least in draft form, we cannot be sure that either party understands the expectations or likely commitments of the other.

Regional Board Response:
See Regional Board Response 8a of this document.

g) *Comment from the County of San Diego 12/28/04:*
With respect to MAA content and purpose, it is worth noting that the apparent position of RWQCB staff is that the MAA should define additional commitments by the County over and above the prescriptive compliance assurances already written into Section 9.7 (County of San Diego Nutrient Reduction and Management Plan). The County maintains that such an approach would be unsupported by statute (see specific comments on the limitations of the RWQCB's California Water Code [CWC] §13225(c) authority below), and would negate the stated purpose of the MAA.

Regional Board Response:
See Regional Board Response 6a and e of this document.

h) *Comment from the County of San Diego 12/28/04:*
The County is willing to consider drafting the MAA after TMDL adoption, but will have no reason to consider entering into a MAA or any other agreement should the prescriptive language currently contained in Section 9.7 remain as is.

Regional Board Response:
See Regional Board Response 6a and e of this document.

i) *Comment from the County of San Diego 12/28/04:*
Our second concern relates to the intended purpose and specific content of the MAA. Although RWQCB Counsel correctly indicated in his response to Dr. Wright that voluntary actions would be included in the MAA, and that these would be negotiated after the TMDL is adopted, Mr. Richards failed to note that this would occur only after prescriptive requirements are imposed in the TMDL document pursuant to §13225(c). In the County's view, any commitments in excess of our strict legal obligations must be negotiated during the development of the MAA.

Regional Board Response:
See Regional Board Response 6a and e of this document.

9) MANAGEMENT PRACTICES

a) *Comment from Caltrans 12/07/04*:
Our main concern is this TMDL would require the construction of treatment controls, not yet developed, so that the basic feasibility is unknown.

Regional Board Response:

The Implementation Action Plan section is intentionally written to give the stakeholders the flexibility to develop cost effective nutrient management measures to address the impairment of Rainbow Creek. The 16-year nutrient reduction schedule allows for implementation of needed controls, monitoring of effectiveness of implementation measures, and implementing stronger and more effective controls if necessary.

Delaying the development and implementation of this TMDL until a time when technological treatments are developed is unreasonable when other control measures, such controlling irrigation water discharge to the creek, consultation with agriculture advisors, and public education, are certainly measures are available and can be implemented in a relatively short time period.

b) *Comment from Caltrans 12/07/04*:
TMDL proposes uses of sand filters to be used in existing rights-of-ways, medians or interchange loops to provide treatment. Sand filters are not an appropriate BMP for treatment of nitrogen. Sand filters convert TKN into Nitrate, so they provide a reduction in TKN and an increase in nitrate.

Regional Board Response:
Although the commenter cites no specific section of the Technical Report, the Regional Board is assuming the comment is based on the contents of Economic Consideration Tables in Appendix H.

The narrative on Appendix H of the Technical Reports states:

> "While the table implies that Nutrient Management MPs / BMPs will be Implemented before Irrigation and Runoff/Erosion Control Management MPs / BMPs, this is done solely for developing a range of costs. The most appropriate and cost effective MPs / BMPs will vary for each land user/owner based on their operations and existing improvements. MPs / BMPs are typically most effective when a combination of Nutrient, Irrigation, and Runoff/Erosion Control Management MPs / BMPs are considered. Moreover, it is also possible that MPs / BMPs not presented herein would be identified and implemented."

The purpose of the tables in Appendix H is to show potential actions and associated costs that may be incurred by a property owner. It is not meant to be a prescriptive list of MPs or BMPs that must be a part of the implementation action plan or NRMP.

10) NUMERIC STANDARDS

a) *Comment from the California Avocado Commission 12/01/04:*
Prior to 2002, the Board did not have specific numerical standards that defined conditions in a stream that promoted algal impairments.

Regional Board Response:

The Regional Board disagrees with this statement. This comment was addressed in Section 11.3 of Technical Report and again in Appendix M. In Section 11.3, Analysis of Public Comments on Technical Issues, see Issue 11.3.6. In Appendix M, Response to Public Comments, Public Hearing on May 8, 2002, see Response #6.

b) *Comment from the California Avocado Commission 12/01/04:*
A recent revision to the Basin Plan, however, added numerical reference points against which total phosphorus and (based on the application of a ratio) total nitrogen levels would be gauged, to determine if water quality objectives were exceeded for purposes of enforcement.

Regional Board Response:
The Regional Board disagrees with this statement. This comment was addressed in Section 11.3 of Technical Report and again in Appendix M. In Section 11.3, Analysis of Public Comments on Technical Issues, see Issue 11.3.6. In Appendix M, Response to Public Comments, Public Hearing on May 8, 2002, see Response #6.

c) *Comment from the California Avocado Commission 12/01/04:*
In other words, in the absence of a verified condition of nuisance or a demonstrable adverse effect on beneficial uses, the numerical values should not drive a listing for purposes of a finding of impairment.

Regional Board Response:
The total nitrogen and total phosphorus numeric targets are the biostimulatory water quality objectives. Any exceedance of the water quality objective is considered an impairment to beneficial uses. Water quality monitoring in Rainbow Creek in 2000 showed regular exceedances of the water quality objectives for TN and TP. Moreover, water quality sampling conducted in December 2004 in the creek re-affirm the need for nutrient reduction measures in Rainbow Creek.

d) *Comment from the California Avocado Commission 12/01/04:*
The Rainbow Creek TMDL provides very little evidence of actual documented impairments other than the presence of excessive algae in some limited areas. Of course, the modification of the Basin Plan to include numerical objectives for total phosphorus and a calculated ratio for N:P provides the principal basis for the TMDL. These values must be interpreted in the context of how they result in nuisance conditions or affect beneficial uses. As noted above, the evidence of impact provided in the TMDL is profoundly weak.

Regional Board Response:
See Regional Board Comment Response in 10a and 10c of this document.

e) *Comment from Richard Watson 12/08/04:*

Tentative Finding 1 claims that the proposed amendment to the Basin Plan was developed in accordance with California Water Code Section 13240 et seq. However, the proposed amendment adds new numeric water quality objectives for biostimulatory substances without complying with all elements of Section 13241 which are applicable when the Regional Board establishes new water quality objectives.

Regional Board Response:
The Regional Board disagrees with this comment. The Rainbow Creek Nutrients TMDL does not establish a new nutrient water quality objective. The biostimulatory water quality objectives are already part of the existing Basin Plan.

See Regional Board Comment Response 3e of this document.

f) *Comment from Richard Watson 12/08/04:*
Tentative Finding 5 claims that the Basin Plan established two numeric objectives for biostimulatory substances when, in fact, it establishes a narrative water quality objective for biostimulatory substances.

Regional Board Response:
See Regional Board Comment Responses 10a and 10c of this document.

g) *Comment from Richard Watson 12/08/04:*
Tentative Finding 6 claims that concentrations for nutrients in Rainbow Creek routinely exceed applicable water quality objectives for nutrients and nitrate. However, as explained above, there are no numeric water quality objectives for biostimulatory substances in the Basin Plan.

Regional Board Response:
See Regional Board Comment Responses 10a and 10c of this document.

h) *Comment from Richard Watson 12/08/04:*
Furthermore, there is no definitive evidence that the narrative water quality objectives have been routinely exceeded.

Regional Board Response:
The TMDL is based on the numeric nitrate and biostimulatory substances water quality objectives which are being exceeded. Excessive nutrient concentrations in Rainbow Creek have persisted since the 1980s, when agricultural practices used in Rainbow Valley resulted in significant increases of nitrate concentrations in Rainbow Creek. Although voluntary implementation of MP in the watershed resulted in significant reductions of nutrient concentrations in Rainbow Creek since 1996, nutrient concentrations in the creek still exceed the applicable nutrient water quality objectives.

i) *Comment from Richard Watson 12/08/04:*
Tentative Finding 8 claims that numeric targets in the proposed TMDL have been set equal to the numeric water quality objectives cited in Finding 5. However, as explained above, the Basin Plan does not actually establish numeric water quality objectives for water quality objectives.

Regional Board Response:
See Regional Board Comment Responses in 10a and 10c of this document.

j) *Comment from Hines Nurseries 12/01/04:*
These numbers are excessively conservative, especially when there was no evidence of actual impairments to beneficial uses in 1998-1999 when the average nitrate concentrations was 7.7 mg NO_3/l or 1.7 mg NO_3-N/l and the average organophosphate as phosphorus concentration was 0.6 mg PO_4-P/l.

Regional Board Response:
The water quality objectives are meant to be conservative in order to protect all beneficial uses of a waterbody, including those of waterbodies downstream. In the case of Rainbow Creek, not only is the protection of the Creek important but also the Santa Margarita River, which is a source of drinking water supply for Camp Pendleton, and the Santa Margarita Lagoon, which is on the 303(d) list of impaired waterbodies for eutrophication.

k) *Comment from Hines Nurseries 12/01/04:*
If the Regional Board concludes that it must adopt a TMDL to meet its obligations to EPA Region 9, it should adopt a TMDL based on adaptive management as recommended by the National Research Council. To do this, the Board could adopt a TMDL with the initial numeric target equal to the numeric nitrate water quality objective in the Basin Plan, define interim numeric targets for biostimulatory substances equal to the average water quality conditions in 1998-1999 as specified on page 12 of the Technical Report, and provide for a reopener to adopt final numeric targets for biostimulatory substances after USEPA Region 9 and the State Water Resources Control Board have completed the Development of Nutrient Criteria in California.

Regional Board Response:
This comment was addressed in Appendix M, Response to Public Comments, Public Hearing on May 8, 2002. See Response #65. Also see the Basin Plan Amendment, Attachment A, Section C which provides a method of recalculation of the TMDL if a new biostimularoy substances water quality objective is designated in the future.

11) NUTRIENT REDUCTION

a) *Comment from the California Avocado Commission 12/01/04:*
By any measure, this level of pollutant reduction should be considered a major victory and highlights the direction that the Regional Board should pursue in seeking further reductions by embracing the pre-eminent principle of the State's Non-Point Source Plan which emphasizes the value and priority of voluntary efforts.

Regional Board Response:
This comment was addressed in Appendix M, Response to Public Comments, Public Hearing on May 8, 2002. See Response #3.

12) PUBLIC NOTIFICATION

a) *Comment from the California Avocado Commission 12/01/04:*
With regard to the Rainbow Creek TMDL, while it appears that the minimal legal and technical notice requirements were met by the San Diego Regional Water Quality Control Board (Board), few growers in the watershed have received actual notice of the Board's pending action.

Regional Board Response:
This comment was addressed in Appendix M of the Technical Report, Response to Public Comment, Public Hearing on May 8, 2002. See response #24.

The Regional Board extended the public comment period 3 weeks from the December 8, 2004 Board Hearing to allow additional time for submittal of written comments. During this extension period, the Regional Board mailed out an additional 370 notifications to property owners in the Rainbow Valley watershed, notified interested parties, published an article and public notification in a North county community paper (Village News, Fallbrook, CA), and made a copy of the Draft Technical Report available at the San Diego County Public Library in Fallbrook, CA.

The extended public comment period closed December 29, 2004 and produced a total of 5 additional comment letters from concerned citizens and stakeholders. The following parties submitted comments:

1. Bert Hayden (12/22/04)
2. Farm Bureau San Diego County (12/24/04)
3. California Avocado Commission (12/27/04)
4. Hines Nursery (12/29/04)
5. County of San Diego (12/29/04)

From the above list of letters submitted, only one letter is from a party that had not previously participated in this TMDL project.

b) *Comment from the California Avocado Commission 12/01/04:*
The lack of effective notice has caused the Rainbow Creek TMDL to be considered in a vacuum devoid of stakeholder participation. This situation must be rectified prior to the Board's formal adoption of the TMDL.

Regional Board Response:

See Regional Board Comment Response 12a above describing the Regional Board's additional public notification activities.

c) *Comment from the Farm Bureau 11/24/04:*
Throughout the Rainbow Creek TMDL process it has been our concern that the directly affected parties – particularly farmers and property owners – be given ample notice and opportunity to be fully aware of the ramifications of your pending action.

Regional Board Response:
See Regional Board Comment Response 12a above.

d) *Comment from the Farm Bureau 11/24/04:*
Do not close public testimony at the conclusion of your December 8, 2004 public hearing.

Regional Board Response:
The Regional Board closed public testimony at the December 8, 2004 Board Hearing but left the record open for submission of additional written comments for three weeks until December 29, 2004. On February 9, 2005 the Regional Board will be considering 1) the written responses to public comments document developed by Board staff; 2) revisions to the proposed TMDL Basin Plan Amendment made as a logical outgrowth of the record developed at the December 8 hearing and the subsequent December 29 public comment period and 3) adoption of the TMDL Basin Plan amendment. On February 9 the Board will evaluate if any revisions to the Basin Plan Amendment might qualify as sufficiently significant to merit an additional opportunity for public review and comment. Based on this evaluation the Board may, at their discretion, allow interested persons to make oral comment on the proposed changes and proceed with adoption on February 9 or circulate the modified proposal and any additional documentation for an additional structured period of public review.

e) *Comment from the Farm Bureau 11/24/04:*
Notify directly every affected property owner and farmer in the Rainbow Creek area of the pending action.

Regional Board Response:
See Regional Board Comment Response 12a above.

f) *Comment from the Farm Bureau 11/24/04:*
Conduct at lease one well-noticed public workshop in a location convenient to the Rainbow Creek area.

Regional Board Response:

Additional workshops will not take place before the February 2005 Board Meeting. However see Regional Board Response 12a above for the additional public notification activities.

g) *Comment from the Farm Bureau 11/24/04:*
Conclude public testimony and take action on the Rainbow Creek TMDL only after you are secure in the knowledge that the public has had adequate notice and opportunity to participate.

Regional Board Response:
See Regional Board Comment Response from 12a and 12d above.

13) RESPONSIBLE PARTIES

a) *Comment from Caltrans 12/07/04*:
Our second major concern is that much of the focus of the TMDL, including responsibility for developing and implementing the monitoring program, is placed on the Department even though the Department's contributes to less than 2% of the tributary drainage area.

Regional Board Response:
Caltrans is responsible, under the terms and conditions of their MS4 Storm Water Permit, for ensuring that their operations do not contribute to violations of water quality objectives in Rainbow Creek. Under the terms of the TMDL Implementation Monitoring Plan the Regional Board will direct the County of San Diego and Caltrans to provide a single monitoring plan for Rainbow Creek containing the elements described in Section 10.5 Implementation Monitoring Plan Elements. The Regional Board agrees that the level of Caltrans participation in the monitoring program should be related to the volume and significance of its discharge. The number of monitoring stations in Rainbow Creek assigned to Caltrans should be based on the number of stations needed by Caltrans to demonstrate compliance with the nutrient wasteload allocation and the success of the TMDL in attaining the nutrient water quality objective in the portion of Rainbow Creek affected by its discharge. The Regional Board will provide some guidance to both the County of San Diego and Caltrans on the level of effort each should contribute to the monitoring program in the CWC § 13225 and 13383 investigative orders. The Regional Board may amend these orders at any time to require other nutrient dischargers in the Rainbow Creek watershed to participate in the monitoring program as they are identified on a case-by-case basis.

b) *Comment from Caltrans 12/07/04*:
In view of this, we do not understand why this TMDL appears to be directed at Caltrans as the only named source rather than at the major contributors of nutrients in the watershed.

Regional Board Response:

The Technical Report is not directed exclusively at Caltrans but is directed at all known point source and nonpoint source dischargers of nutrients in the Rainbow Creek watershed. Construction, maintenance, and operation of State-owned highways are activities classified as point sources of nutrient discharges to Rainbow Creek. Caltrans is the only primary point source discharger in the Rainbow Creek watershed and is assigned a specific nutrient waste load allocation.

The major nonpoint source (NPS) nutrient discharges in the Rainbow Creek watershed result from (1) commercial nurseries, (2) agricultural fields, (3) orchards, (4) parks, (5) residential areas, (6) urban areas, and (7) septic tank disposal system land use activities. These nonpoint sources are assigned a nutrient load allocation.

c) *Comment from Caltrans 12/07/04*:
Why is Caltrans specifically identified as a source when "urban areas" and "residential areas" which also have discrete discharge points are not identified? If these areas are contributing to water quality problems, the Board certainly can address these areas via the County of San Diego MS4 permit and Phase II permit program. Similarly, the nurseries and other major sources can be identified and assigned specific reductions and allocations.

Regional Board Response:
Caltrans is identified as a point source of nutrients in the Rainbow Valley watershed with nutrient load reductions. Urban and Residential areas are not subject to a NPDES permit and therefore considered a non-point source of nutrients.

The seven land use categories, which include Urban, Residential, and Commercial Nurseries, have been assigned nutrient load reductions and allocations. See Table 6-1 and 6-2 and Appendix F from the Technical Report.

14) TECHNICAL BASIS

a) *Comment from Caltrans 12/07/04*:
It is premature to issue the TMDL before control technologies are identified. Otherwise, there can be no assurance that the allocations will be attained.

Regional Board Response:
See Regional Board Comment Response 9a of this document.

b) *Comment from Caltrans 12/07/04*:
The letter indicated District 11 owns 120.3 acres. This value was used for wasteload allocations however the map in Appendix A shows I-15 right of way as 214 acres and 3% of watershed, greater than the 120 acres used for TMDL load allocations.

Regional Board Response:
The correct acreage is 120 acres. The Technical Report has been revised.

c) *Comment from Caltrans 12/07/04*:
The Departments report CTSW-RT-03-065 has the latest monitoring data for Caltrans highway runoff. These numbers are different than the 1997-1998 data used in the WQPT that was used to determine Caltrans loads. The more appropriate total Nitrogen concentration is 3.13 mg/L and total phosphorus concentration is 0.29 mg/L

Regional Board Response:
The Technical Report has been revised to incorporate the latest monitoring data.

d) *Comment from the California Avocado Commission 12/01/04:*
The Commission also believes that the Board has chosen the wrong way to address a problem that falls short of constituting a serious nuisance.

Regional Board Response:
The Regional Board disagrees with this statement. This comment was addressed in Section 11.3 of Technical Report. In Section 11.3, Analysis of Public Comments on Technical Issues, see Issue 11.3.4.

e) *Comment from the California Avocado Commission:*
It is also known that nutrients released during wet weather conditions have a dramatically different biostimulatory effect than during other periods. The nutrient loading at certain periods of the year is not clearly defined in the TMDL. It may be that the nutrient load during wet weather is relatively greater than during dry weather, but has a far less significant effect.

Regional Board Response:
The Regional Board used stream flow data divided into flow tiers to account for the seasonal changes of nutrients carried down the stream. A discussion of the steam flow, seasonal variations, and flow tiers is in Appendix E of the Technical Report.

f) *Comment from Richard Watson 12/08/04:*
Understanding whether or not Rainbow Creek is over-enriched with nitrogen and/or phosphorus is very complex; a TMDL is not yet suitable for calculation as required by federal regulations.

Regional Board Response:
The Regional Board disagrees with this statement. This comment was addressed in Appendix M, Response to Public Comments, Public Hearing on May 8, 2002. See Response #25.

Also see Regional Board Comment Response 4c of this document.

g) *Comment from Richard Watson 12/08/04:*
The current draft TMDL has introduced flow data as we requested in 2002, but the sampling used to support the need for the TMDL was not flow weighted. In

fact, sampling was not used to estimate total loadings of nitrogen and phosphorus to the creek.

Regional Board Response:
The purpose of the water quality sampling conducted by the Regional Board was to assess the water quality of the creek. It was not initially designed to estimate the nutrient contribution from the various land use categories. Export coefficients were used to estimate the nutrient contribution from the land use categories.

Background and loading capacity nutrient calculations of the creek did use flow data in estimating nutrient loads.

h) *Comment from Richard Watson 12/08/04:*
Tentative Finding 9 cites TMDLs for total nitrogen and phosphorus that are incorrectly calculated in the Draft Technical Report.

Regional Board Response:
See Regional Board Comment Responses 4a of this document

i) *Comment from Richard Watson 12/08/04:*
This finding also claims that the TMDLs are equal to the assimilative or loading capacity of Rainbow Creek. However, a scientific assimilative capacity study was not actually conducted.

Regional Board Response:
This comment was addressed in Appendix M of the Technical Report, Response to Public Comment, Public Hearing on May 8, 2002. See response #49.

j) *Comment from Hines Nurseries 12/01/04:*
Review of the October 15 Public Review Draft indicates that the proposed TMDLs still do not meet the requirements within the Clean Water Act that only those TMDLs that are "suitable for such calculation" are to be developed.

Regional Board Response:
The Regional Board disagrees with this statement. This comment was addressed in Appendix M, Response to Public Comments, Public Hearing on May 8, 2002. See Response #25.

Furthermore, the USEPA submitted the following statement in a letter dated December 3, 2004:

> "*The proposed TMDLs meet all federal regulatory requirements and will be approvable when they are submitted to EPA. The TMDLs are based on sound analytical methods that identify reasonable pollutant reductions necessary to attain the existing Basin Plan numeric water quality objectives. The TMDLs are consistent with numerous nutrient TMDLs developed elsewhere in California, including the TMDLs for Los Angeles River, Laguna de Santa Rosa, and Malibu Creek. We are pleased that the TMDLs include waste load allocations to account for future growth in the watershed.*"

k) *Comment from Hines Nurseries 12/01/04:*
As noted in our April 23, 2002 letter, in developing a TMDL for any impaired water body, an assimilative capacity study should first be conduced in order to determine the pollutant load the water body can assimilate before becoming impaired.

Regional Board Response:
This comment was addressed in Appendix M of the Technical Report, Response to Public Comments, Public Hearing on May 8, 2002. See response #49.

15) TECHNICAL REPORT

a) *Comment from the County of San Diego 12/08/04:*
However, during this period only the County was involved in discussions with your staff, and that interaction ended in October 2003. Between October 2003 and November 2004, significant changes were made to this TMDL; it's only appropriate the County and other parties have adequate time to ensure review of this document is sufficient to adequately consider those changes.

Regional Board Response:
From the period of May 2002 through October 2004, the Regional Board was considering comments submitted by the stakeholders, including input from the County, and incorporating the suggested changes as necessary into the revised draft technical TMDL report. The revised draft report was not ready for public review until October 2004.

As a courtesy to the County, the Regional Board sent revised sections of the draft Rainbow Creek TMDL Technical Report (Chapters 8, 9, and 10) for their review prior to the October 2004 public release.

b) *Comment from the California Avocado Commission 12/01/04:*
It is inappropriate to suggest that nutrients have caused the "impairment" when no evidence is provided in support of the assertion and when other causes are likely.

Regional Board Response:
The Regional Board already recognized and acknowledged other potential factors in the Technical Report concerning aquatic insects. Section 2.6 of the Technical Report reads:

> "*Rainbow Creek has an impaired aquatic insect population, which may be related to its elevated nutrient concentrations. The creek's benthic macroinvertebrate community may be sensitive, in varying degrees, to temperature, DO, sedimentation, scouring, nutrient enrichment and chemical and organic pollution (Giller and Malmqvist 1998, Johnson et al. 1993). Elevated concentrations of nutrients and other pollutants, such as herbicides and pesticides, may cause changes in the aquatic insect community. These changes can include loss of species diversity, loss of pollutant sensitive species, and an increase in pollutant tolerant species (Waters 1995).*"

Referring to Rainbow Creek as impaired for nutrients is appropriate since there exists both historical and recent water quality data from certified analytical laboratories which demonstrates the water quality objectives for both nitrogen and phosphorus are frequently exceeded.

c) *Comment from the California Avocado Commission 12/01/04:*
Also, the use of the term "impairment" to describe the insect community suggests that there is a formal listing for impairment of insects, which is inaccurate and misleading.

Regional Board Response:
Comment noted.

d) *Comment from the California Avocado Commission 12/01/04:*
The TMDL also cites a condition of low species diversity as supportive of a degraded ecosystem. There is not mention of a causative factor for this condition, however. Additionally, recent information cited in the TMDL suggests a mixed picture and improvement:

> "The creek was "average" in both the September 1998 and November 1998 monitoring events, showing improved species diversity and a more well-distributed community structure with four of five functional feeding groups represented, although it continued to show an absence of sensitive species."

This suggests that the reductions in nutrients resulting from the Mission Resource Conservation District's voluntary program are yielding ecological dividends.

Regional Board Response:
The complete paragraph from Section 2.6 of the revised Technical Report reads as follows:

> *"Benthic macroinvertebrate surveys conducted in 1991-92 (Hunsaker II 1992) and in 1998-99 (CDFG 2000a) found an abundance of pollutant tolerant insects and a lack of pollutant sensitive insects. Hunsaker II (1992) found that benthic community indicators in Rainbow Creek were poor compared to other tributaries and the Santa Margarita River. The 1998-99 California Department of Fish and Game surveys indicate that Rainbow Creek was "below average" compared to other tributaries in the watershed in both the May 1998 and May 1999 surveys. Low species diversity, an absence of sensitive species, and a skewed benthic community, with one or two functional feeding groups dominating were observed during these two sampling periods. The creek was "average" in both the September 1998 and November 1998 monitoring events, showing improved species diversity and a more well-distributed community structure with four of five functional feeding groups represented, although it continued to show an absence of sensitive species. Shredding insects, which feed mostly on decomposing coarse particulate organic matter, were completely absent from all four sampling events. Their absence is notable because shedders are usually associated with streams that have an intact riparian canopy, such as exists along most of Rainbow Creek".*

The dominance of pollutant tolerant aquatic insect species in conjunction with the lack of pollution sensitive aquatic insects is an indication that the water quality of

the stream is having adverse affects on the benthic communities. The Regional Board agrees that the nutrient water quality in Rainbow Creek has improved since the 1980s; however, recent samples collected by the Regional Board in December 2004 raise questions on the trend of the TN and TP concentrations.

e) *Comment from Richard Watson 12/08/04:*
Tentative Finding 10 presents allocations and reductions that were erroneously calculated in the Technical Report. Waste load allocations were not assigned to two point sources, a load allocation was not assigned to the largest contribution of nitrogen and phosphorus atmospheric deposition.

Regional Board Response:
For the calculation comment, see Regional Board Comment Response 4a above.

Caltrans is the only identified point source with nutrient waste load allocations. For nutrient discharges in the Rainbow Creek watershed subject to the County of San Diego's MS4 NPDES Storm Water Permit, the County will be directed to require increasingly stringent best management practices, pursuant to the iterative process described in Receiving Water Limitation C.2.a. of the permit, to reduce nutrients discharges in the Rainbow Creek watershed to the maximum extent practicable and restore compliance with the nutrient water quality objective.

The California Department of Forestry and Fire Protection (CDFFP) – Rainbow Conservation Camp does not have an NPDES permit and is not authorized to discharge waste to Rainbow Creek. Accordingly no wasteload allocation is assigned to this discharge. As discussed in Section 8.2.3 of the Technical Report, the percolation ponds at the Camp are suspected of not having the proper separation from groundwater and/or bedrock and the percolated effluent appears to be surfacing down gradient of the ponds and flowing into Rainbow Creek. The Regional Board has previously directed CDDF, to conduct an investigation of the possible impacts from the Camp's wastewater discharge to the Creek and the results of the investigation are currently under review by the Regional Board for additional follow-up action.

The comment on atmospheric deposition issue is addressed in Regional Board Comment Responses 2a of this document.

f) *Comment from Richard Watson 12/08/04:*
Tentative Finding 11 does not clearly distinguish between point and nonpoint discharges. Furthermore, two point sources that were identified at the November 17, 2004 staff workshop are not listed.

Regional Board Response:
Section 8.2 and 8.3 of the Technical Report describe in detail the point and non point source dischargers. See Regional Board Comment Response 15e above.

g) *Comment from Hines Nurseries 12/01/04:*

Section 5.0 of the October 15, 2004 Public Review Draft does not describe a true assimilative capacity analysis, which should include a detailed analysis of chlorophyll and dissolved oxygen in relation to nitrogen and phosphorus content of the water.

Regional Board Response:
Chlorophyll and dissolved oxygen measurement are part of the Implementation Monitoring Plan Elements, Section 10.5 of the Technical Report. See Element #5, Surface Water Quality Parameters and #8, Algal Biomass.

h) *Comment from Hines Nurseries 12/01/04:*
At the 17 November 2004 workshop, staff made a Powerpoint presentation that indicated that two major changes will be made to the October 15, 2004 Public Review Draft. The first major change was a slide that indicated that staff now recognizes that there are three point sources in the watershed; the Public Review Draft only recognized one.

Regional Board Response:
The Technical Report recognizes all three point source dischargers. Section 8.2, Point Source Dischargers, from the October 15, 2004 Technical Report, lists Caltrans, California Department of Forestry and Fire Protection, and the County of San Diego as point sources. Of the three point sources, only Caltrans has a specified waste load allocation. Regarding the California Department of Forestry and Fire Protection (CDFFP), the Regional Board will issue a CWC § 13267 investigative order to CDFFP requiring them to evaluate if their discharge is contributing to the impairment of Rainbow Creek. Regarding the County as a point source discharger, they will be required to reduce nutrient discharges in accordance with Receiving Water Limitation C.2.a of their MS4 NPDES Storm Water Permit.

i) *Comment from Hines Nurseries 12/01/04:*
The second major change was a slide that acknowledged that the Basin Plan contain only a narrative water quality objective for biostimulatory substances. The Public Review Draft in one or two places does recognize that the only water quality objective for biostimulatory substances is narrative. However, in other locations the draft asserts that there are numeric water quality objectives for biostimulatory substances. This confusion in the current draft must be eliminated.

Regional Board Response:
The Technical Report has been revised to clarify that there are numeric water quality objectives for biostimulatory substances.

j) *Comment from the County of San Diego 12/28/04:*
The County has focused its comments on the three draft TMDL sections it believes to be most crucial for addressing its concerns: Sections 8, 9, and 10. Because these suggested changes are extensive, we have not attempted to make

parallel edits in earlier sections of the TMDL. To maintain consistency with changes that are made to TMDL Sections 8, 9, and 10, the RWQCB will therefore need to make corresponding edits to Resolution No. R9-2004-0401 and other TMDL sections as applicable.

Regional Board Response:
Corresponding edits and revisions were made to the draft Resolution R9-2005-0036 (formerly R9-2004-0401), Basin Plan Amendment, and sections of the Technical Report, based on edits to Sections 8, 9, and 10. However the Regional Board did not accept all edits suggested by the County.

The revisions to the October 15, 2004 version of the Basin Plan Amendment, Resolution, and Technical Report will be made in strikeout mode so that the edits to the document will be apparent. Once revisions are complete, the edited documents will be posted on the Regional Board website for public review.

Comment Letters Submitted on or Before December 8, 2004 Board Hearing.

Bellamore, Tom. 2004. Letter to John Robertus regarding "Comments of the California Avocado Commission on Draft Basin Plan Amendment and Technical Report for Total Nitrogen and Total Phosphorus Total Maximum Daily Loads for Rainbow Creek." California Avocado Commission, Irvine, CA. December 1, 2004.

Larson, Eric. 2004. Letter to John Minan. Farm Bureau San Diego County, Escondido, CA. November 24, 2004.

Strauss, Alexis. 2004. Letter to John Robertus from US EPA on the Rainbow Creek TMDL. USEPA 9, San Francisco, CA. December 3, 2004.

Van Rhyn, Jon. 2004. Letter to John Minan. County of San Diego Department of Public Works, San Diego, CA. December 8, 2004.

Vargas, Jesus. 2004. Letter to Ben Tobler regarding "Total Maximum Daily Loads (TMDLs) for Total Nitrogen and Total Phosphorus for Rainbow Creek (Technical Report dated 10/15/04). Department of Transportation, District 11. San Diego, CA. December 7, 2004.

Watson, Richard. 2004. Letter to Ben Tobler regarding "Public Review Draft Basin Plan Amendment and Technical Report for Total Nitrogen and Total Phosphorus Total Maximum Daily Loads for Rainbow Creek." Richard Watson and Associates, Mission Viejo, CA. December 8, 2004.

Westrup, Jesse. 2004. Letter to Ben Tobler regarding "October 15, 2004 Rainbow Creek Nutrients TMDL." Hines Horticulture, Fallbrook, CA. December 1, 2004

Comment Letters Submitted Before the Written Comment Period Closed on December 29, 2004.

Bellamore, Tom. 2004. Letter to John Robertus regarding "Supplemental Comments of the California Avocado Commission on Draft Basin Plan Amendment and Technical Report for Total Nitrogen and Total Phosphorus Total Maximum Daily Loads for Rainbow Creek." California Avocado Commission, Irvine, CA. December 27, 2004.

Hayden, Bert[1]. 2004. Electronic mail sent to Ben Tobler regarding "Rainbow Creek." Fallbrook, CA. December 22, 2004.

Larson, Eric. 2004. Letter to John Minan regarding "Rainbow Creek Total Maximum Daily Load Plan." Farm Bureau San Diego County, Escondido, CA. December 24, 2004.

Van Rhyn, Jon. 2004. Letter to John Minan. County of San Diego Department of Public Works, San Diego, CA. December 28, 2004.

Westrup, Jesse. 2004. Letter to John Minan regarding "Additional Comments on October 15, 2004 Rainbow Creek Nutrients TMDL." Hines Horticulture, Fallbrook, CA. December 29, 2004

[1]The letter from Mr. Hayden did not directly comment on Rainbow Creek TMDL issues. The letter was forwarded to the Watershed Protection Unit to investigate his complaint.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

RESOLUTION NO. R9-2007-0043

A RESOLUTION ADOPTING AN AMENDMENT TO THE WATER QUALITY CONTROL PLAN FOR THE SAN DIEGO BASIN (9) TO INCORPORATE TOTAL MAXIMUM DAILY LOADS FOR DISSOLVED COPPER, LEAD, AND ZINC IN CHOLLAS CREEK, TRIBUTARY TO SAN DIEGO BAY,

AND TO REVISE THE TOXIC POLLUTANTS SECTION OF CHAPTER 3 TO REFERENCE THE CALIFORNIA TOXICS RULE

WHEREAS, The San Diego Regional Water Quality Control Board (hereinafter, San Diego Water Board), finds that:

1. **BASIN PLAN AMENDMENT**: Total Maximum Daily Loads (TMDLs) and allocations for pollutants that exceed water quality objectives in waterbodies that do not meet water quality standards under the conditions set forth in section 303(d) of the Clean Water Act [33 U.S.C. 1250, *et seq*., at 1313(d)] ("Water Quality Limited Segments") should be incorporated into the *Water Quality Control Plan for the San Diego Basin (9)* (Basin Plan) pursuant to Article 3, commencing with section 13240, of Chapter 4 of the Porter-Cologne Water Quality Control Act, as amended, codified in Division 7, commencing with section 13000, of the Water Code.

2. **CLEAN WATER ACT SECTION 303(d)**: The lowest 1.2 miles of Chollas Creek (from the mouth of Chollas Creek at San Diego Bay to 1.2 miles inland) were placed on the List of Water Quality Limited Segments in 1996 due to levels of dissolved copper, lead, and zinc (metals) in the water column that exceeded numeric water quality objectives for copper, lead, and zinc, and narrative water quality objectives for toxicity, as required by Clean Water Act (CWA) section 303(d).

3. **BENEFICIAL USE IMPAIRMENTS**: Two beneficial uses exist in Chollas Creek that are sensitive to, and subject to impairment by elevated concentrations of dissolved metals in the water column. Warm Freshwater Habitat (WARM) and Wildlife Habitat (WILD) require water quality suitable for the protection of aquatic life and aquatic dependent wildlife. Dissolved metals are toxic to aquatic life and aquatic dependent wildlife at relatively low concentrations. Concentrations of dissolved metals in Chollas Creek exceed the water quality necessary to support the WARM and WILD beneficial uses of Chollas Creek.

4. **NECESSITY STANDARD** [Government Code section 11353(b)]: Amendment of the Basin Plan to establish and implement TMDLs for Chollas Creek is necessary because the existing water quality in the lowest 1.2 miles of Chollas Creek does not meet applicable water quality objectives for copper, lead, zinc, or toxicity. CWA section 303(d) requires the establishment and implementation of TMDLs under the conditions that exist in Chollas

Creek. TMDLs for copper, lead, and zinc are necessary to ensure attainment of applicable water quality objectives and restoration of water quality needed to support the beneficial uses designated for Chollas Creek.

5. **WATER QUALITY OBJECTIVES**: The United States Environmental Protection Agency (USEPA) has established numeric criteria for toxic pollutants which are applicable water quality objectives for dissolved copper, lead, and zinc in the inland surface waters, enclosed bays, and estuaries of California through promulgation of the California Toxics Rule (CTR). [40 CFR 131.38]. These water quality criteria, presented below, are applicable to Chollas Creek.

Water Quality Criteria for dissolved metals in Chollas Creek.

Metal	Numeric Target for Acute Conditions: Criteria Maximum Concentration	Numeric Target for Chronic Conditions: Criteria Continuous Concentration
Copper	(1) * (0.96) * {e^ [0.9422 * ln (hardness) - 1.700]}	(1) * (0.96) * {e^[0.8545 * ln (hardness) - 1.702]}
Lead	(1) * {1.46203 – [0.145712 * ln (hardness)]} * {e^ [1.273 * ln (hardness) - 1.460]}	(1) * {1.46203 – [0.145712 * ln (hardness)]} * {e^[1.273 * ln (hardness) - 4.705]}
Zinc	(1) * (0.978) * {e^ [0.8473 * ln (hardness) + 0.884]}	(1) * (0.986) * {e^[0.8473 * ln (hardness) + 0.884]}

Hardness is expressed as milligrams per liter.
Calculated concentrations should have two significant figures [40 CFR 131.38(b)(2)].
The natural log and exponential functions are represented as "ln" and "e," respectively.

In addition, the Basin Plan establishes the following narrative water quality objective for "toxicity" to ensure the protection of the WARM and WILD beneficial uses.

> **Toxicity Objective**: *All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the San Diego Water Board.*
>
> *The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water factors, shall not be less than that for the same water body in areas unaffected by the waste discharge or, when necessary, for other control water that is consistent with requirements specified in USEPA, State Water Resources Control Board (State Board) or other protocol authorized by the San Diego Water Board. As a minimum, compliance with this objective as stated in the previous sentence shall be evaluated with a 96-hour acute bioassay.*
>
> *In addition, effluent limits based upon acute bioassays of effluents will be prescribed where appropriate, additional numerical receiving water objectives for specific toxicants will be established as sufficient data become available, and source control of*

toxic substances will be encouraged.

6. **NUMERIC TARGETS**: Numeric targets are established for the purposes of calculating TMDLs. Since the numeric targets are equal to the water quality criteria in the CTR for dissolved copper, lead, and zinc cited in finding 5, attainment of TMDLs will ensure attainment of these water quality criteria.

7. **SOURCES OF DISSOLVED METALS**: Many land uses and activities associated with urbanization are sources of copper, lead, and zinc to Chollas Creek. Freeways and commercial/ industrial land uses are major contributors. Automobiles are a significant source of all three metals. Water supply systems, pesticides, industrial metal recyclers and other industrial activities also contribute to levels of copper, lead, and zinc in excess of water quality criteria for Chollas Creek. Metals released to the environment by different land uses and activities are washed off of the land surface by urban runoff and storm flows and conveyed to Chollas Creek through municipal separate storm sewer systems. Quantification of bacteria loading in all watersheds is necessary to calculate the load reductions required to meet TMDLs.

8. **WATER QUALITY OBJECTIVE VIOLATIONS**: Concentrations of dissolved copper, lead, and zinc have frequently exceeded numeric water quality criteria contained in the CTR. Furthermore, in a Toxicity Identification Evaluation performed in 1999, Chollas Creek stormwater concentrations of zinc and to a lesser extent copper, were identified as causing or contributing to reduced fertility in the purple sea urchin.

9. **ADVERSE EFFECTS OF COPPER, LEAD, AND ZINC**: Concentrations of copper, lead, and zinc in excess of CTR criteria entail increased risk of adverse toxic effects in aquatic organisms exposed to them. Copper, lead, and zinc may bioaccumulate within lower organisms, however they do not biomagnify up the food chain. Of these three metals, copper is considered the most potent toxin at environmentally relevant aqueous concentrations.

10. **TOTAL MAXIMUM DAILY LOADS AND ALLOCTIONS**: TMDLs for dissolved copper, lead, and zinc are equal to the total assimilative or loading capacity of Chollas Creek for dissolved copper, lead, and zinc. The loading capacities are defined as the maximum amount of each dissolved metal that Chollas Creek can assimilate and still attain water quality criteria needed for the protection of designated beneficial uses. Each TMDLS must accommodate all known sources of a pollutant, whether from natural background, nonpoint sources, or point sources, and must include a margin of safety (MOS) to preclude pollutant loading from exceeding the actual assimilative capacities of Chollas Creek. The TMDL calculations also account for seasonal variations and critical conditions and were developed in a manner consistent with guidelines published by the USEPA. The TMDLs are concentration based, therefore, the allocations are not additive. The TMDLs for dissolved copper, lead, and zinc are equal to the Waste Load Allocations (WLAs) which are 90 percent of the CTR Criteria Continuous Concentration (CCC) and Criteria Maximum Concentration (CMC) equations. Discharges of dissolved copper, lead, and zinc require significant reductions from current levels to meet the allocations.

11. **IMPLEMENTATION PLAN**: The technical report entitled *Total Maximum Daily Loads for Dissolved Copper, Lead and Zinc in Chollas Creek, Tributary to San Diego Bay* dated June 13, 2007, presents a summary of measures that, if adopted by the San Diego Water Board, the State Water Resources Control Board (State Water Board), and local governmental agencies, will promote attainment of the load reductions needed to keep discharges of metals at or below the TMDLs calculated for Chollas Creek. Section 303 of the CWA and the federal National Pollutant Discharge Elimination System (NPDES) regulations direct the USEPA and authorized states to impose requirements consistent with TMDLs for point source discharges to "impaired" waterbodies. When the San Diego Water Board and the State Water Board re-issue or revise NPDES requirements for municipal, construction, and industrial stormwater discharges, and groundwater extraction discharges in the Chollas Creek watershed, including discharges of "small MS4s," they will have to include requirements that will implement all TMDLs applicable to waters affected by the regulated discharges.

12. **COMPLIANCE MONITORING**: Water quality monitoring will be necessary to assess progress in achieving WLAs and compliance in Chollas Creek with the water quality objectives for dissolved copper, lead, and zinc.

13. **COMPLIANCE SCHEDULE**: Full implementation of the TMDLs for dissolved copper, lead, and zinc shall be completed within 20 years from the effective date of the Basin Plan amendment. The compliance schedule for implementing the wasteload reductions required under these TMDLs is structured in a phased manner, with 80 percent of reductions required in 10 years, and 100 percent of reductions required within 20 years. The 20-year compliance schedule is contingent upon the dischargers implementing integrated controls to achieve required copper, lead, zinc, indicator bacteria, diazinon, and trash reductions.

14. **SCIENTIFIC PEER REVIEW**: The scientific basis of this TMDL has undergone external peer review pursuant to Health and Safety Code section 57004. The San Diego Water Board has considered and responded to all comments submitted by the peer review panel and has enhanced the Technical Report appropriately. No change to the fundamental approach to TMDL calculations was necessary as a result of this process.

15. **STAKEHOLDER AND PUBLIC PARTICIPATION**: Interested persons and the public have had reasonable opportunity to participate in review of the proposed TMDL. Efforts to solicit public review and comment included five public workshops held between April 1999 and April 2005, including a CEQA scoping meeting held on March 21, 2003; a public review and comment period of 45 days preceding the San Diego Water Board public hearing in May 2005; a two week extension of the comment period after the public hearing in May 2005; a second public review and comment period of 45 days commencing in July 2006; a third public review and comment period of 45 days commencing on March 9, 2007; and a public hearing on April 25, 2007. Notices for all meetings were sent to interested parties including cities and San Diego County with jurisdiction in Chollas Creek. All of the written comments submitted to the San Diego Water Board during the review and comment periods have been considered, and written responses provided in Appendix M to the Technical Report.

16. **CEQA REQUIREMENTS:** Pursuant to Public Resources Code section 21080.5, the Resources Agency has approved the Regional Water Boards' basin planning process as a "certified regulatory program" that adequately satisfies the California Environmental Quality Act (CEQA) (Public Resources Code, section 21000 et seq.) requirements for preparing environmental documents. [14 CCR section 15251(g); 23 CCR section 3782] As such, the San Diego Water Board's basin planning documents together with an Environmental Checklist are the "substitute documents" that contain the required environmental documentation under CEQA. [23 CCR section 3777] The substitute documents for this project include the Environmental Checklist, the detailed technical report entitled Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek, Tributary to San Diego Bay, responses to comments raised during the development of the TMDL, and this resolution. The project itself is the establishment of TMDLs for toxic metals in Chollas Creek where water quality has been listed as "impaired" by the State Water Board pursuant to section 303(d) of the CWA, as required by that section. While the San Diego Water Board has no discretion to not establish a TMDL (the TMDL is required by federal law) the San Diego Water Board does exercise discretion in assigning wasteload allocations, determining the program of implementation, and setting various milestones in achieving the water quality objectives for Chollas Creek.

17. **PROJECT IMPACTS:** The accompanying CEQA substitute documents satisfy the requirements of substitute documents for a Tier 1 environmental review under CEQA, pursuant to Public Resources Code section 21159 and CCR Title 14, section 15187. Nearly all of the compliance obligations anticipated to be necessary to implement the TMDLs for copper, lead, and zinc in Chollas Creek will be undertaken by public agencies that will have their own obligations under CEQA for implementation projects that could have significant environmental impacts (*e.g.*, installation and operation of structural best management practices). Project level impacts will need to be considered in any subsequent environmental analysis performed by other public agencies pursuant to Public Resources Code section 21159.2.

    If not properly mitigated at the project level, implementation and compliance measures undertaken could have significant adverse environmental impacts. The substitute documents for this TMDL, and in particular the environmental checklist and responses to comments, identify broad mitigation approaches that should be considered at the project level. The San Diego Water Board does not engage in speculation or conjecture regarding the projects that may be used to implement the TMDLs and only considers the reasonably foreseeable alternative methods of compliance, the reasonably foreseeable feasible environmental impacts of the these methods of compliance, and the reasonably foreseeable mitigation measures which would avoid or eliminate the identified impacts, all from a broad general perspective consistent with the uncertainty regarding how the TMDLs, ultimately, will be implemented. The lengthy implementation period allowed by the TMDLs will allow persons responsible for compliance with wasteload allocations to develop and pursue many compliance approaches and mitigation measures.

18. **PROJECT MITIGATION:** The proposed amendment to the Basin Plan to establish TMDLs for copper, lead, and zinc in Chollas Creek could have a significant adverse effect on the environment. However, there are feasible alternatives, feasible mitigation measures, or both, that would substantially lessen any significant adverse impact. The public agencies responsible for implementation measures needed to comply with the TMDLs can and should incorporate such alternatives and mitigation into any projects or project approvals that they undertake for the impaired creek. Possible alternatives and mitigation are described in the CEQA substitute documents, specifically the Technical Report and the environmental checklist. To the extent the alternatives, mitigation measures, or both, are not deemed feasible by those agencies, the necessity of implementing the TMDLs that is mandated by the federal Clean Water Act and removing the copper, lead, and zinc impairments in Chollas Creek (an action required to achieve the express, national policy of the Clean Water Act) outweigh the unavoidable adverse environmental effects identified in the substitute documents.

19. **ECONOMIC ANALYSIS**: The San Diego Water Board has considered the costs of the reasonably foreseeable methods of compliance with the wasteload reductions specified in these TMDLs. The most reasonably foreseeable methods of compliance involve implementation of structural and non-structural controls. Surface water monitoring to evaluate the effectiveness of these controls will be necessary.

20. **NO ADVERSE ENVIRONMENTAL EFFECTS**: This Basin Plan amendment will result in no adverse effect, either individually or cumulatively, on wildlife.

21. **REVISION TO BASIN PLAN**: The USEPA promulgated a final rule prescribing water quality criteria for toxic pollutants in inland surface waters, enclosed bays, and estuaries in California in 2000 (The California Toxics Rule or "CTR;" [40 CFR 131.38]). CTR criteria constitute applicable water quality objectives in California. In addition to the CTR, certain criteria for toxic pollutants in the National Toxics Rule [40 CFR 131.36] constitute applicable water quality objectives in California as well. The section in Chapter 3 of the Basin Plan titled "Toxic Pollutants" should be revised to be consistent with the current federal rules. The subsection entitled "Water Quality Objectives for Toxic Pollutants" in Chapter 3 of the Basin Plan needs to be deleted. This subsection is redundant since the CTR and certain NTR criteria constitute applicable water quality objectives in California.

NOW, THEREFORE, BE IT RESOLVED that

1. **AMENDMENT ADOPTION**: The San Diego Water Board hereby adopts the amendment to the Basin Plan to incorporate the TMDLs for dissolved copper, lead, and zinc in Chollas Creek and to revise the Basin Plan to reference the California Toxics Rule as set forth in Attachment A hereto.

2. **TECHNICAL REPORT APPROVAL**: The San Diego Water Board hereby approves the Technical Report entitled *Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek, Tributary to San Diego Bay*, dated May 30, 2007.

3. **CERTIFICATE OF FEE EXEMPTION**: The Executive Officer is authorized to sign a Certificate of Fee Exemption.

4. **AGENCY APPROVALS**: The Executive Officer is directed to submit this Basin Plan amendment to the State Water Board for approval in accordance with Water Code section 13245.

5. **NON-SUBSTANTIVE CORRECTIONS**: If, during the approval process for this amendment, the State Water Board, San Diego Water Board, or OAL determines that minor, non-substantive corrections to the language of the amendment are needed for clarity or consistency, the Executive Officer may make such changes, and shall inform the San Diego Water Board of any such changes.

6. **ENVIRONMENTAL DOCUMENT CERTIFICATION**: The substitute environmental documents prepared pursuant to Public Resources Code section 21080.5 are hereby certified, and the Executive Officer is directed to file a Notice of Decision with the Resources Agency after State Water Board and OAL approval of the Basin Plan Amendment, in accordance with section 21080.5(d)(2)(E) of the Public Resources Code and the California Code of Regulations, title 23, section 3781.

I, John H. Robertus, Executive Officer, do hereby certify the foregoing is a full, true and correct copy of a Resolution adopted by the California Regional Water Quality Control Board, San Diego Region, on June 13, 2007.

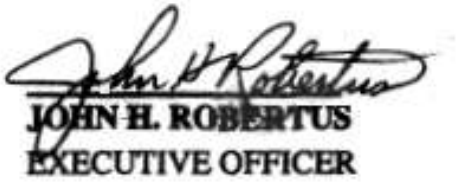

JOHN H. ROBERTUS
EXECUTIVE OFFICER

ATTACHMENT A
TO RESOLUTION NO. R9-2007-0043

AMENDMENT TO THE WATER QUALITY CONTROL PLAN FOR THE SAN DIEGO BASIN (9) TO INCORPORATE TOTAL MAXIMUM DAILY LOADS FOR DISSOLVED COPPER, LEAD, AND ZINC IN CHOLLAS CREEK, TRIBUTARY TO SAN DIEGO BAY,

AND TO REVISE THE TOXIC POLLUTANTS SECTION OF CHAPTER 3 TO REFERENCE THE CALIFORNIA TOXICS RULE

This Basin Plan amendment establishes a Total Maximum Daily Load (TMDL) and associated load and wasteload allocations for copper, lead and zinc in Chollas Creek, and revises the Toxic Pollutants section of Chapter 3 to reference the California Toxics Rule. This amendment includes a program to implement the TMDL and monitor its effectiveness. Chapters 2, 3, and 4 of the Basin Plan are amended as follows:

Chapter 2, Beneficial Uses
Table 2-2. ***Beneficial Uses of Inland Surface Waters***

Add the following footnote 3 to Chollas Creek

> [3]Chollas Creek is designated as an impaired water body for copper, lead and zinc pursuant to Clean Water Act section 303(d). A Total Maximum Daily Load (TMDL) has been adopted to address this impairment. See Chapter 3, Water Quality Objectives for Toxicity and Toxic Pollutants and Chapter 4, Total Maximum Daily Loads.

Chapter 3, Water Quality Objectives
Inland Surface Waters, Enclosed Bays and Estuaries, Coastal Lagoons, and Ground Waters

Water Quality Objectives for Toxicity*:*
Add a fifth paragraph as follows:

> Chollas Creek is designated as a water quality limited segment for dissolved copper, lead, and zinc pursuant to Clean Water Act section 303(d). Total Maximum Daily Loads have been adopted to address these impairments. See Chapters 2, Table 2-2, *Beneficial Uses of Inland Surface Waters, Footnote 3* and Chapter 4, Total Maximum Daily Loads.

TOXIC POLLUTANTS:
Revise as follows:

> The USEPA promulgated a final rule prescribing water quality criteria for toxic pollutants in inland surface waters, enclosed bays, and estuaries in California on May 18, 2000 (The California Toxics Rule or "CTR;" [40 CFR 131.38]). CTR criteria constitute applicable water quality criteria in California. In addition to the CTR,

certain criteria for toxic pollutants in the National Toxics Rule [40 CFR 131.36] constitute applicable water quality criteria in California as well.

Chollas Creek is designated as a water quality limited segment for dissolved copper, lead, and zinc pursuant to Clean Water Act section 303(d). Total Maximum Daily Loads have been adopted to address these impairments. See Chapters 2, Table 2-2, *Beneficial Uses of Inland Surface Waters*, *Footnote 3* and Chapter 4, Total Maximum Daily Loads.

~~Federal Register, Volume 57, Number 246 amended Title 40, Code of Federal Regulations, Part 131.36 (40 CFR 131.36) and established numeric criteria for a limited number of priority toxic pollutant for inland surface waters and estuaries in California. USEPA promulgated these criteria on December 22, 1992, to bring California into full compliance with section 303(c)(2)(B) of the Clean Water Act. California is not currently in full compliance with this section of the Clean Water Act due to the invalidation of the Water Quality Control Plan for Inland Surface Waters of California and the Water Quality Control Plan for Bays and Estuaries of California. However, the criteria established in 57 FR 60848 (December 22, 1992) (specifically pages 60920-60921) are still applicable to surface waters in the Region.~~

~~Water Quality Objectives for Toxic Pollutants:~~

~~Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (§131.36 revised at 57 FR 60848, December 22, 1992).~~

Chapter 4, Implementation

After the subsection on the TMDL for Dissolved Copper, Shelter Island Yacht Basin, San Diego Bay add the following subsection:

Total Maximum Daily Loads for Copper, Lead, and Zinc in Chollas Creek

On *June 13, 2007,* the Regional Board adopted Resolution No. R9-2007-0043*, Amendment to the Water Quality Control Plan for the San Diego Region to Incorporate Total Maximum Daily Loads for Dissolved Copper, Lead and Zinc in Chollas Creek, Tributary to San Diego Bay.* The TMDL Basin Plan Amendment was subsequently approved by the State Water Resources Control Board on *[Insert Date]*, the Office of Administrative Law on *[Insert Date]*, and the USEPA on *[Insert Date]*.

Problem Statement

Dissolved copper, lead and zinc concentrations in Chollas Creek violate numeric water quality criteria for copper, lead, and zinc promulgated in the California Toxics Rule, and the narrative objective for toxicity. Concentrations of these metals in Chollas Creek threaten and impair the designated beneficial uses of warm freshwater habitat (WARM), and wildlife habitat (WILD).

Numeric Targets

The TMDL numeric targets for copper, lead, and zinc are set equal to the numeric water quality criteria as defined in the California Toxics Rule (CTR) and shown below. Because the concentration of a dissolved metal causing a toxic effect varies significantly with hardness, the water quality criteria are expressed in the CTR as hardness based equations. The numeric targets are equal to the loading capacity of these metals in Chollas Creek.

Table 4 *[insert number]* Water Quality Criteria /Numeric Targets for dissolved metals in Chollas Creek.

Metal	Numeric Target for Acute Conditions: Criteria Maximum Concentration	Numeric Target for Chronic Conditions: Criteria Continuous Concentration
Copper	(1) * (0.96) * {e^ [0.9422 * ln (hardness) - 1.700]}	(1) * (0.96) * {e^[0.8545 * ln (hardness) - 1.702]}
Lead	(1) * {1.46203 – [0.145712 * ln (hardness)]} * {e^ [1.273 * ln (hardness) - 1.460]}	(1) * {1.46203 – [0.145712 * ln (hardness)]} * {e^[1.273 * ln (hardness) - 4.705]}
Zinc	(1) * (0.978) * {e^ [0.8473 * ln (hardness) + 0.884]}	(1) * (0.986) * {e^[0.8473 * ln (hardness) + 0.884]}

Hardness is expressed as milligrams per liter.
Calculated concentrations should have two significant figures [40 CFR 131.38(b)(2)].
The natural log and exponential functions are represented as "ln" and "e," respectively.

Source Analysis

The vast majority of metals loading to Chollas Creek are believed to come through the storm water conveyance system. An analysis of source contributions reveals many land uses and activities associated with urbanization to be potential sources of copper, lead and zinc to Chollas Creek. Modeling efforts point toward freeways and commercial/industrial land uses as the major contributors

Total Maximum Daily Loads

The TMDLs for dissolved copper, lead and zinc in Chollas Creek are concentration-based and set equal to 90 percent of the numeric targets/loading capacity.

Margin of Safety

The TMDL includes an explicit margin of safety (MOS). Ten percent of the loading capacity was reserved as an explicit MOS.

Allocations and Reductions

The source analysis showed that nonpoint sources and background concentrations of metals are insignificant, and thus, were set equal to zero in the TMDL calculations. The wasteload allocations are set equal to 90 percent of the numeric targets/loading capacity. Concentrations of

dissolved copper, lead and zinc require significant reductions from current concentrations to meet the loading capacity.

TMDL Implementation Plan

Persons whose point source discharges contribute to exceedance of Water Quality Criteria (WQC) for copper, lead, and zinc in Chollas Creek will be required to meet the WLA hardness dependant concentrations in their urban runoff discharges before it is discharged to Chollas Creek. Actions to meet the WLAs in discharges to Chollas Creek will be required in WDRs that regulate MS4 discharges, industrial facility and construction activity stormwater discharges, and groundwater extraction discharges in the Chollas Creek watershed. The following orders may be reissued or revised by the Regional Board to include requirements to meet the WLAs. Alternatively, the Regional Board may issue new WDRs to meet the WLAs.

Order No. 2007-0001, NPDES No. CAS0108758, *Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego County, and the San Diego Unified Port District*, or subsequent superceding NPDES renewal orders.

Order No. 2000-90, NPDES No. CAG19001, *General Waste Discharge Requirements for Temporary Groundwater Extraction and Similar Waste Discharges to San Diego Bay and Storm Drains or other Conveyance Systems Tributary Thereto,* or subsequent superceding NPDES renewal orders.

Order No. 2001-96, NPDES No. CAG 919002, *General Waste Discharge Requirements for Groundwater Extraction Waste Discharges from Construction, Remediation and Permanent Groundwater Extraction Projects to Surface Waters within the San Diego Region Except for San Diego Bay* or subsequent superceding NPDES renewal orders.

Order No. 97-11, *General Waste Discharge Requirements for Post-Closure Maintenance of Inactive Nonhazardous Waste Landfills within the San Diego Region* or subsequent superceding NPDES renewal orders.

The Regional Board shall request the State Water Resources Control Board amend the following statewide orders:

Order No. 99-06-DWQ, NPDES No. CAS000003, *National Pollutant Discharge Elimination System (NPDES) Permit, Statewide Storm Water Permit, and Waste Discharge Requirements (WDRs) for the State of California, Department of Transportation (Caltrans),* or subsequent superceding NPDES renewal orders.

Order No. 97-03-DWQ, NPDES No. CAS 000001, *Waste Discharge Requirements for Discharges of Storm Water Associated with Industrial Activities Excluding Construction Activities,* or subsequent superceding NPDES renewal orders.

Order No. 2003-0005-DWQ, NPDES No. CAS000004, *Waste Discharge Requirements for Storm Water Discharges from Small Municipal Separate Storm Sewer Systems,* or subsequent superceding NPDES renewal orders.

Order No. 99-08-DWQ, NPDES No. CAS000002, *General Permit for Storm Water Discharges Associated with Construction Activity,* or subsequent superceding NPDES renewal orders.

The Regional Board shall require the U.S. Navy to submit a Notice of Intent to enroll the Naval Base San Diego facility under statewide Order No. 2003-005-DWQ or subsequent superseding NPDES renewal orders .

Implementation Monitoring Plan

The dischargers will be required to monitor Chollas Creek and provide monitoring reports to the Regional Board for the purpose of assessing the effectiveness of the management practices implemented to meet the TMDL allocations. The Regional Board shall amend the following order to include a requirement that the cities of San Diego, Lemon Grove, and La Mesa, the County of San Diego, the San Diego Unified Port District, and CalTrans investigate excessive levels of metals in Chollas Creek and feasible management strategies to reduce metal loadings in Chollas Creek, and conduct additional monitoring to collect the data necessary to refine the watershed wash-off model to provide a more accurate estimate of the mass loads of copper, lead and zinc leaving Chollas Creek each year.

Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed, San Diego, California*.

Schedule of Compliance

Concentrations of metals in urban runoff shall only be allowed to exceed the WLAs by a certain percentage for the first nineteen years after initiation of this TMDL. Allowable concentrations shall decrease as shown in Table 4 *[insert number]*. For example, if the measured hardness in year ten dictates the WLA for copper in urban runoff is 10 µg/l, the maximum allowable measured copper concentration would be 12.0 µg/L. By the end of the twentieth year of this TMDL, the WLAs of this TMDL shall be met. This will ensure that copper, lead and zinc water quality objectives are being met at all locations in the creek during all times of the year.

Table 4 *[insert number]* Interim goals for achieving Wasteload Allocations

	Allowable Exceedance of the WLAs (allowable percentage above)		
Compliance Year	**Copper**	**Lead**	**Zinc**
1	100%	100%	100%
10	20%	20%	20%
20	0%	0%	0%

Compliance with the interim goal~~s~~ in this schedule can be assessed by showing that dissolved metals concentrations in the receiving water exceed the WQC for copper, lead, and zinc by no

more than the allowable exceedances for WLAs shown in the table above. Regulated groundwater discharges to Chollas Creek must meet the WLAs at the initiation of the discharge. No schedule to meet interim goals will be allowed in the case of groundwater discharges.

The compliance schedule for implementation of the TMDLs shall be as follows in Table 4 *[insert number]*.

Table 4 *[insert number]* Compliance Schedule

Item	Implementation Action	Responsible Parties	Date
1	Effective date of Chollas Creek Metals TMDL Waste Load Allocations.	San Diego Water Board, Municipal Dischargers, Caltrans, Navy, Industrial Stormwater Dischargers, Construction Stormwater Dischargers, Landfill Stormwater Dischargers	October 22, 2008[1]
2	Recommend High Priority for grant funds.	San Diego Water Board	Immediately after effective date
3	Submit annual Progress Report to San Diego Water Board due January 1 of each year.	Municipal Dischargers	Annually after reissue of NPDES WDRs.
4	Submit annual Progress Report to San Diego Water Board due April 1 of each year.	Caltrans	Annually after reissue of NPDES WDRs.
5	Submit annual Progress Report to San Diego Water Board due July 1 of each year.	Industrial Stormwater Dischargers	Annually after reissue of NPDES WDRs.
6	Submit annual Progress Report to San Diego Water Board due July 1 of each year.	Construction Stormwater Dischargers	Annually after reissue of NPDES WDRs.
7	Municipal NPDES WDRs shall be issued, reissued, or revised to include WQBELs consistent with the assumptions and requirements of the Chollas Creek WLAs.	San Diego Water Board	Within 5 years of effective date
8	Caltrans NPDES WDRs shall be issued, reissued, or revised to include WQBELs consistent with the assumptions and requirements of the Chollas Creek WLAs.	State Water Board	Within 5 years of effective date
9	Construction NPDES WDRs shall be issued, reissued, or revised to include WQBELs consistent with the assumptions and requirements of the Chollas Creek WLAs.	State Water Board	Within 5 years of effective date
10	Industrial NPDES WDRs shall be issued, reissued, or revised to include WQBELs consistent with the assumptions and requirements of the Chollas Creek WLAs.	State Water Board	Within 5 years of effective date

[1] Upon approval of by Office of Administrative Law.

Item	Implementation Action	Responsible Parties	Date
11	Amend Orders No. 2000-90, and No. 2001-96 (or superseding renewal orders) which regulates temporary groundwater extraction discharges to San Diego Bay and its tributaries to include WQBELs consistent with the assumptions and requirements of the Chollas Creek WLAs.	San Diego Water Board	Within 5 years of effective date
12	Municipal and Navy WDR Order No. R9-2004-0277 shall amended to require additional monitoring for metals and hardness.	San Diego Water Board	Within 5 years of effective date
13	Landfill NPDES WDR Order No. 97-11 (or superseding renewal orders) shall be issued, reissued, or revised to monitor for metals and hardness.	San Diego Water Board	Within 5 years of effective date
14	Navy and all other Phase II small MS4 permittees in the Chollas Creek watershed shall be enrolled in Order No. 2003-0005-DWQ (or superseding renewal orders).	San Diego Water Board	Immediately after effective date.
15	Take enforcement actions	San Diego Water Board	As needed after effective date.
16	Meet 80% Chollas Creek Metals TMDL WLA reductions.	Municipal Dischargers, Caltrans, Navy, Industrial Stormwater Dischargers, Construction Stormwater Dischargers, Landfill Stormwater Dischargers	10 years after effective date.
17	Meet 100% Chollas Creek Metals TMDL WLA reductions.	Municipal Dischargers, Caltrans, Navy, Industrial Stormwater Dischargers, Construction Stormwater Dischargers, Landfill Stormwater Dischargers	20 years after effective date.

California Regional Water Quality Control Board
San Diego Region

Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek, Tributary to San Diego Bay

Chollas Creek Watershed

Technical Report
May 30, 2007

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
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To request copies of the Basin Plan Amendment and Technical Report for Copper, Lead, and Zinc Total Maximum Daily Loads for Chollas Creek, Tributary to San Diego Bay, please contact Benjamin Tobler, Water Resources Control Engineer at (858) 467 – 2736, btobler@waterboards.ca.gov.

Documents also are available at: http://www.waterboards.ca.gov/sandiego.

TOTAL MAXIMUM DAILY LOADS FOR DISSOLVED COPPER, LEAD, AND ZINC IN CHOLLAS CREEK, TRIBUTARY TO SAN DIEGO BAY

Technical Report

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California Regional Water Quality Control Board
San Diego Region
on June 17, 2007
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on July 15, 2008
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Office of Administrative Law
on October 22, 2008
and the
United States Environmental Protection Agency
on December 18, 2008

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LIST OF ACRONYMS AND ABBREVIATIONS

ACQOP	Daily pollutant accumulation rate
ALERT	Automatic Local Evaluation in Real Time
BMPs	Best Management Practices
BASINS	Better Assessment Science Integrating Point and Nonpoint Sources
Basin Plan	Water Quality Control Plan for the San Diego Basin – Region 9
BIOL	Preservation of biological habitats of special significance
BLM	Biotic Ligand Model
$CaCO_3$	Calcium carbonate
Caltrans	California Department of Transportation
CCC	Criteria continuous concentration
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
CF	Conversion factor
CFR	Code of Federal Regulations
Cfs	Cubic feet per second
CIMIS	California Irrigation Management Information System
CMC	Criteria maximum concentration
COMM	Commercial and sport fishing
CTR	California Toxics Rule
CWA	Clean Water Act
CWC	California Water Code
DEEPFR	Fraction of infiltrating water lost to inactive groundwater
DEM	Digital Elevation Model
DPR	California Department of Pesticide Regulation
EIR	Environmental Impact Report
EMC	Event mean concentration
EST	Estuarine habitat
GIS	Geographic Information System
HSPF	Hydrological Simulation Program - FORTRAN
IND	Industrial service supply
IMPLND	Impervious land
INFILT	Index to mean soil infiltration rate
IQUAL	Simulation of quality constituents for impervious land segments
IWATER	Water simulation for impervious land segments
LA	Load allocations
LACDPW	Los Angeles County Department of Public Works
LSPC	Load Simulation Program written in C++
LZETP	Lower zone evapotranspiration
LZSN	Lower zone nominal soil moisture storage
MAR	Marine habitat
METCMP	Computation of Meterological Time Series
MIGR	Migration of aquatic organisms
MOS	Margin of safety
MS4	Municipal Separate Storm Sewer Systems

Municipal Dischargers	Cities of San Diego, Lemon Grove, and La Mesa, County of San Diego, and the San Diego Unified Port District
NAV	Navigation
Navy	U.S. Navy
NCDC	National Climatic Data Center
NHD	National Hydrography Dataset
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge and Elimination System
NTR	National Toxics Rule
OAL	Office of Administrative Law
PEC	Probable Effects Concentration
PEL	Probable Effects Level
PERLND	Pervious land
Port	San Diego Unified Port District
PQUAL	Simulation of quality constituents for pervious land segments
PWATER	Water simulation for pervious land segments
RARE	Rare, threatened, or endangered species
RCHRES	Stream reach
REC1	Water contact recreation
REC2	Non-contact water recreation
ROWD	Report of Waste Discharge
SANDAG	San Diego Association of Governments
San Diego Water Board	California Regional Water Quality Control Board, San Diego Region
SCCWRP	Southern California Coastal Water Research Project
SHELL	Shellfish harvesting
SIYB	Shelter Island Yacht Basin
SQOLIM	Maximum storage level parameter
SSO	Site-specific objective
STATSGO	Natural Resources Conservation Services State Soil Geographic
SWAMP	Surface Water Ambient Monitoring Program
SWRCB	State Water Resources Control Board
TMDL	Total Maximum Daily Load
USDA	U.S. Department of Agriculture
USEPA	United States Environmental Protection Agency
USGS	U.S. Geological Survey
WARM	Warm fresh water habitat
WDR	Waste discharge requirements
WER	Water effects ratio
WILD	Wildlife habitat
WLA	Wasteload allocation
WSQOP	Rate of surface runoff that will remove 90 percent of the stored constituent per hour
WQO	Water quality objective
WQS	Water quality standard

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EXECUTIVE SUMMARY

Chollas Creek[1] is an urban coastal stream in southern San Diego County, tributary to San Diego Bay. Chollas Creek was placed on the Clean Water Act (CWA) section 303(d) List of Water Quality Limited Segments (List of Water Quality Limited Segments) in 1996 for the metals copper, lead, and zinc. Storm water samples from Chollas Creek collected between 1994 and 2003 periodically exceeded California Toxics Rule (CTR) water quality criteria for copper, lead, and zinc. The existing and potential beneficial uses of Chollas Creek and San Diego Bay described in the Water Quality Control Plan for the San Diego Basin (9) (Basin Plan) are adversely affected by these exceedances. Additionally, toxicity tests show that water quality objectives (WQOs) for toxicity are also violated.

E.1. Problem Statement

While only the lowest 3.5 miles of Chollas Creek comprise the actual listed segment of the water body, all upstream tributaries to this section are considered in this TMDL project. The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) has established Total Maximum Daily Loads (TMDLs) for copper, lead, and zinc as required by the CWA for water quality limited segments.

Chollas Creek is also listed as impaired for the metal cadmium. The available data suggest that concentrations of dissolved cadmium in Chollas Creek exceed neither acute nor chronic CTR water quality criteria. Consequently, the San Diego Water Board has recommended Chollas Creek for delisting with respect to cadmium to the State Water Resources Control Board (State Water Board). The State Water Board is preparing the latest update of the List of Water Quality Limited Segments.

The purpose of this TMDL project is to attain WQOs for copper, lead, and zinc, and restore and protect the beneficial uses of Chollas Creek. TMDLs represent a strategy for meeting WQOs by allocating quantitative limits for point and nonpoint pollution sources. A TMDL is defined as the sum of the individual wasteload allocations (WLAs) for point sources and load allocations (LAs) for nonpoint sources and natural background [40 CFR section 130.2] such that the capacity of the waterbody to assimilate pollutant loading (i.e., the loading capacity) is not exceeded. In order to achieve the TMDLs, an Implementation Action Plan is also developed that describes the pollutant reduction actions that must be taken by various responsible persons to meet the wasteload and load allocations. The Implementation Action Plan includes a time schedule for meeting the required allocations and requirements for monitoring to assess the effectiveness of the load reduction activities in attaining water quality objectives and restoring beneficial uses.

Once established, the regulatory provisions of this TMDL project are incorporated into the Basin Plan. Additional requirements of the Basin Plan amendment process also include an evaluation of environmental and economic considerations. As with any Basin

[1] The Chollas Creek Watershed comprises Hydrologic Unit number 908.22.

Plan amendment involving surface waters, a TMDL project will not take effect until it has undergone subsequent agency approvals by the State Water Board, and the Office of Administrative Law (OAL). The U.S. Environmental Protection Agency (USEPA) must also approve the TMDL.

E.2. Numeric Targets

When calculating TMDLs, numeric targets are established to ensure that WQOs are met and beneficial uses are protected. The CTR is the basis of the numeric targets. Specifically, the numeric targets for the Chollas Creek TMDLs were set equal to the CTR's WQOs, which are comprised of hardness-based equations for dissolved copper, lead, and zinc. Equations, rather than numbers comprise the WQOs because the toxicity of dissolved copper, lead, and zinc varies significantly depending on hardness.[2] The CTR was chosen as the basis for these numeric targets because it has the most current, defendable WQOs for dissolved copper, lead, and zinc concentrations in fresh water (USEPA, 2000a). Additionally, the CTR is legally applicable in inland surface waters (e.g., Chollas Creek), enclosed bays and estuaries of California for all purposes and programs under the CWA (USEPA, 2000a).

E.3. Source Analysis

For Chollas Creek, essentially all metals sources (point and nonpoint) are discharged through municipal separate storm sewer systems (MS4) that are regulated under waste discharge requirements (WDRs) prescribed in Order No. R9-2007-0001.[3] Metals sources are thus collectively considered point sources due to their release from channelized, discrete conveyance pipe systems and outfalls. Known point source discharges to the MS4s include stormwater discharges from industrial facilities, construction sites, underground utility vaults, and groundwater discharges from de-watering sites. These discharges are regulated under different statewide and San Diego Water Board orders prescribing general WDRs. Because there are no other known point sources, urban runoff is considered the most significant source of metals to Chollas Creek.

Watershed models were developed by Tetra Tech, Inc. to estimate the magnitude of land uses that generate existing annual metal loadings to the Chollas Creek Watershed during both wet and dry weather conditions of a typical year. Modeling results based on land use category parameters, hydrological characteristics and observed metal concentrations provided estimates of the magnitude of metal loadings. The top two land use categories in Chollas Creek, freeways and commercial/institutional, contribute over 75 percent of the total load for each metal. Significant sources of all three metals to urban runoff are thought to include automobile operation (especially brake pads and tires) and industries with practices that may expose metals to stormwater. Water supply infrastructure

[2] As hardness increases, it competes with metals for binding sites on animals and effectively reduces the toxicity of metals. Therefore, as hardness increases the CTR metals criteria also increase to maintain the same allowable amount of toxicity.

[3] Order No. R9- 2007-0001, *Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego County, and the San Diego Unified Port District*, NPDES No. CAS0108758 or subsequent superseding NPDES renewal Orders.

corrosion, and pesticide application are also among the identified potential sources. Additionally, another potential source of metals in urban runoff from activities outside and inside of the Chollas Creek Watershed boundaries is atmospheric deposition.

Nonpoint sources are washed into and conveyed to Chollas Creek through the MS4 systems and thus, are accounted for in the point source MS4 discharges. Because of this, and the lack of data to prove otherwise, any nonpoint source that discharges directly into Chollas Creek is assumed to be comparatively insignificant.

E.4. Linkage Analysis

The TMDL technical report must estimate total assimilative capacity (loading capacity) of Chollas Creek for the metals and describe the relationship between Numeric Targets and identified metal sources. Collectively, these requirements are termed the linkage analysis and provide the necessary quantitative link between the TMDL and attainment of water quality standards.

The total assimilative capacity, or loading capacity, is the maximum amount of pollutant that a water body can assimilate while maintaining WQSs. The loading capacity is also a function of different hydrodynamic processes that affect the environmental fate and transport of dissolved metals as they move through the system. At Chollas Creek, the loading capacity for each metal is estimated to be equal to its respective Numeric Target. The Numeric Targets are to be protective of aquatic life and are thus conservatively considered the total loading capacity for Chollas Creek. These loading capacities will attain WQSs because they are set equal to the CTR equations that are protective of aquatic life. Table E.1 presents the loading capacities for metals copper, lead, and zinc.

TABLE E.1 Dissolved metals loading capacities for acute and chronic conditions.

Metal	Loading Capacity for Acute Conditions – One-Hour Average[1]	Loading Capacity for Chronic Conditions – Four-Day Average[1]
Copper	(0.96) * {e^ [0.9422 * ln (hardness) - 1.700]}	(0.96) * {e^[0.8545 * ln (hardness) - 1.702]}
Lead	[1.46203 – 0.145712 * ln (hardness)] * {e^ [1.273 * ln (hardness) - 1.460]}	[1.46203 – 0.145712 * ln (hardness)] * {e^[{1.273 * ln (hardness)} - 4.705]}
Zinc	(0.978) * {e^ [0.8473 * ln (hardness) + 0.884]}	(0.986) * {e^[0.8473 * ln (hardness) + 0.884]}

The natural log and exponential functions are represented as "ln" and "e", respectively.
[1] Loading capacities equal numeric targets that equal the CTR WQOs.

These loading capacities, which are equal to the Numeric Targets, will apply to the entirety of Chollas Creek and during all times of the year. Regulated discharges from each of the land uses identified in the Source Analysis portion of this TMDL will not be allowed to have dissolved metals concentrations that causes in-stream waters to exceed the loading capacities. Furthermore, all other sources of copper, lead, and zinc to Chollas

Creek will be expected to not cause the creek to exceed these loading capacities. Once these capacities are achieved, Chollas Creek copper, lead, and zinc concentrations will be protective of the creek's beneficial uses.

A concentration-based approach was chosen to link the Numeric Targets with the largest identified metal source -- urban runoff. This approach is considered more appropriate than a mass-based approach, because not only does it take into account the dynamic nature of urban runoff, which is greatly affected by stormwater, but it also accommodates the dynamic nature of freshwater systems that have a myriad of flow and hardness conditions.

In addition, a mass-based approach would be more sensitive to concerns of accumulated bottom sediment in fresh water bodies and down stream sediment toxicity. However, sediment is not considered a source of metals due to the nature of Chollas Creek and due to low sediment toxicity results. In addition, downstream sediment toxicity is to be addressed in a separate TMDL for San Diego Bay at the mouth of Chollas Creek once adequate data are collected and applicable models are developed for the Chollas Creek Watershed.

E.5. Margin of Safety

The TMDLs must contain a margin of safety (MOS) to account for uncertainty in the analysis. The MOS for Chollas Creek is explicit as well as implicit. The explicit MOS was incorporated by setting the wasteload allocations equal to 90 percent of the total loading capacity as generated from the CTR equations, using the sampled hardness concentrations. The use of actual hardness values in the CTR equation in order to calculate TMDLs established an implicit MOS.

E.6. TMDLs and Allocations

The TMDLs must be less than or equal to the loading capacities after taking into account allocations to all sources. A TMDL is the combination of a total wasteload allocation (WLA) that allocates loadings for point sources, a total load allocation (LA) that allocates loadings for nonpoint sources and background sources and a MOS that may either explicitly reserve an allocation for or implicitly account for the uncertainty in the relationship between pollutant loads and the quality of the receiving waterbody. In this TMDL, 10 percent of the load is reserved for an MOS, or not allocated to sources, in order to account for identified uncertainties in the TMDL in addition to conservative assumptions made in the TMDL analysis (Margin of Safety Section).

In TMDL development, allowable WLA and LA from pollutant sources that cumulatively amount to no more than the TMDL must be established; this provides the basis to establish water quality-based controls. For Chollas Creek, the WLAs and LAs and consequently the TMDLs, are expressed as concentrations derived from the CTR acute and chronic WQO equations for dissolved copper, lead, and zinc. In addition, the concentration-based TMDLs will account for any future point or nonpoint sources, because any future sources will also be required to be below the same concentration.

Mass-based TMDLs typically are described by the following equation:

$TMDL_{mass} = \Sigma\ WLAs + \Sigma\ LAs + MOS$

However, in concentration-based TMDLs, the allocations are not additive. Additionally, the allocation concentrations for point sources (WLAs), and nonpoint and background sources (LAs) will be equivalent for each metal. Thus, only one term is needed in the equation for the allocations. Because significant nonpoint sources and background sources were not identified in the Chollas Creek watershed, the WLA term was retained in the equation and the LA term dropped. The MOS also is not additive in concentration-based TMDLs. As described previously, the MOS is incorporated into the WLAs, rather than added to them. This reduces the equation to:

$$TMDLs_{conc} = WLAs$$

The explicit MOS reserves 10 percent of the allocation and is incorporated into the WLAs by setting them equal to 90 percent of the loading capacity. Because the loading capacities are equal to the numeric targets, which are equal to the CTR WQOs, the TMDLs are equal to 90 percent of the CTR WQO concentrations. In other words:

CTR WQOs = Numeric Targets
Numeric Targets = Loading Capacities
WLAs = Loading Capacities * 0.9

Substituting CTR WQOs for Loading Capacity results in:

$$TMDLs = WLAs = CTR\ WQOs * 0.9$$

The hardness-based equations for calculating TMDL concentrations are shown in Table E.3.

If all copper, lead, and zinc concentrations in urban runoff to Chollas Creek meet their respective TMDL concentrations, the loading capacity of the creek should not be exceeded.

TABLE E.2 Dissolved metals loading capacities for acute and chronic conditions, as determined by sampling requirements in TABLE 4.2.

Metal	Loading Capacity for Acute Conditions – One-Hour Average	Loading Capacity for Chronic Conditions – Four-Day Average
Copper	(0.96) * {e^ [0.9422 * ln (hardness) - 1.700]}	(0.96) * {e^[0.8545 * ln (hardness) - 1.702]}
Lead	[1.46203 – 0.145712 * ln (hardness)] * {e^ [1.273 * ln (hardness) - 1.460]}	[1.46203 – 0.145712 * ln (hardness)] * {e^[{1.273 * ln (hardness)} - 4.705]}
Zinc	(0.978) * {e^ [0.8473 * ln (hardness) + 0.884]}	(0.986) * {e^[0.8473 * ln (hardness) + 0.884]}

The natural log and exponential functions are represented as "ln" and "e", respectively.

TABLE E.3 Total Maximum Daily Loads for dissolved copper, lead, and zinc for acute and chronic conditions

Metal	TMDL for Acute Conditions – One-Hour Average	TMDL for Chronic Conditions – Four-Day Average
Copper	(0.96) * {e^ [0.9422 * ln (hardness) - 1.700]}*0.9	(0.96) * {e^[0.8545 * ln (hardness) - 1.702]}*0.9
Lead	[1.46203 – 0.145712 * ln (hardness)] * {e^ [1.273 * ln (hardness) - 1.460]} * 0.9	[1.46203 – 0.145712 * ln (hardness)] * {e^[{1.273 * ln (hardness)} - 4.705]} * 0.9
Zinc	(0.978) * {e^ [0.8473 * ln (hardness) + 0.884]} * 0.9	(0.986) * {e^[0.8473 * ln (hardness) + 0.884]} * 0.9

The natural log and exponential functions are represented as "ln" and "e", respectively.

E.7. Wasteload Allocations

The Chollas Creek metals WLAs are expressed as concentrations equal to 90 percent of the loading capacities for the three metals. Federal regulations require TMDLs to include individual WLAs for each point source discharge. The point source discharges that could affect Chollas Creek are the MS4 discharges, stormwater discharges from industrial sites, and discharges of extracted groundwater. All point source discharges to Chollas Creek will be required to achieve this WLA.

Modeling results demonstrate the possible land use specific and sub-watershed specific contributions of copper, lead, and zinc. However because this WLA is concentration-based it will apply to each land use and each sub-watershed at all times and will not be specific to any land use or sub-watershed. Therefore, the model predictions of the relative

metal contribution from each category will be useful in targeting problem areas during implementation.

E.8. Load Allocations

The LAs are assigned to nonpoint sources and natural background sources in the watershed. Background sources can include air deposition of metals in the watershed and any groundwater contributions. Because of the regulatory definition of the MS4 system, all source (point and nonpoint sources) contributions of metals to Chollas Creek come via the MS4s and are therefore accounted for when an allocation is made for the MS4. The only other possible sources that may end up directly in Chollas Creek would be direct air deposition and groundwater, which may or may not include anthropogenic sources. These two sources are not considered significant at this time. These sources may be re-evaluated at a future date if any additional data become available. Currently, the point sources not already accounted for in the WLAs to the MS4s are considered to be relatively insignificant. Thus, the LAs are equal to zero in these TMDLs, and the TMDL calculations are equal to the WLAs.

E.9. Seasonal Variations and Critical Conditions

In accordance with federal regulations, a TMDL must consider seasonal variations and critical conditions (e.g. stream flows, pollutant loadings and other water quality parameters). A flow-based approach was used for the Chollas Creek Metals TMDL, and defines critical conditions solely based on freshwater flow rates regardless of season. No matter the time of year or situation, toxicity allocations that are based on the CTR equations will be required throughout all segments of Chollas Creek and therefore, by definition, will always be protective of aquatic life.

Furthermore, the flow-based approach is appropriate because the main sources of metal accumulation in the Chollas Creek Watershed are non-seasonal (e.g. automobile wear, exhaust emissions, industry contributions). Urban runoff, which is the main mechanism by which these accumulated metals reach Chollas Creek, can occur in both dry and wet weather.

The allowable concentrations will be determined with hardness values measured at the time of compliance. These data will provide a direct measure of any seasonal variations and/or critical conditions effects on hardness. Since hardness is an essential component of the WLAs, seasonal variations and/or critical conditions will be covered by this TMDL. This method of using sampled hardness as the variable instead of an estimated hardness, will account for these effects because it is an absolute representation of current conditions and thus will account for any effects that may be caused by seasonal variations or extreme conditions. Other stream chemistry, which may or may not be a function of seasonal variations and critical conditions, were not taken into consideration as an implicit MOS and will therefore not have a bearing, with respect to seasonal variations and critical conditions, on the TMDL.

E.10. Implementation Plan

Following TMDL project initiation, the San Diego Water Board is required to incorporate the regulatory provisions of the TMDL into all applicable orders prescribing WDRs, or other regulatory mechanisms. Water quality based effluent limitations (WQBELs) for the impairing pollutant in the subject watershed must be added to the appropriate WDRs to implement and make the TMDL enforceable. WQBELs can be either numeric or non-numeric. Non-numeric effluent limitations typically are a program of expanded or better-tailored BMPs. The CWA requires that WDRs that implement federal NPDES regulations be consistent with all applicable TMDLs. The San Diego Water Board can issue new NPDES WDRs for all discharges in the Chollas Creek watershed, can issue new NPDES WDRs in a region-wide TMDL order, or reissue or revise existing NPDES WDRs.

The purpose of these TMDLs is to attain and maintain the applicable WQOs in Chollas Creek through mandated wasteload reductions of pollutants in point sources discharging to the creek. The TMDL requires dischargers to improve water quality conditions in the Chollas Creek receiving water by achieving wasteload reductions in their discharges. The copper, lead, and zinc TMDLs shall be implemented with a monitoring component to determine the effectiveness of each phase and guide the selection of BMPs.

Concentrations of metals in urban runoff shall only be allowed to exceed the WLAs by a certain percentage for the first nineteen years after adoption of this TMDL. Allowable concentrations shall decrease to the amounts indicated below (Table E.4). For example, if the measured hardness ten years after initiation of this TMDL project dictates the WLA for copper in urban runoff is 10 µg/l, the maximum allowable measured copper concentration would be 12.0 µg/L. The phases require loading reductions in steps through the use of expanded or better tailored BMPs to achieve the ultimate goal of attaining and maintaining compliance with copper, lead, and zinc water quality objectives. By the end of the twentieth year after initiation of this TMDL, the WLAs of this TMDL shall be met. This will ensure that copper, lead, and zinc water quality objectives are being met at all locations in the creek during all times of the year.

Compliance with the interim goals in this schedule can be assessed by showing that dissolved metals concentrations in the receiving water exceed the WQOs for copper, lead, and zinc by no more than the allowable exceedances for WLAs shown in Table E.4. The first ten years will require the bulk of the metal load reduction, while the remaining ten years provide for adequate construction and implementation time for potential structural BMPs, to achieve the full (100 percent) metal load reduction. As described in Appendix I section 8.4, this compliance schedule of 20 years requires comprehensive BMP planning for all pollutants impairing Chollas Creek, including coordination with all TMDLs and all other water quality project requirements within the Chollas Creek watershed.

The cities of San Diego, Lemon Grove, and La Mesa, the County of San Diego and the San Diego Unified Port District (Municipal Dischargers) are all in the Chollas Creek

Watershed and should be involved in addressing water quality concerns for the MS4 in the Chollas Creek Watershed. Specifically, the San Diego Water Board shall issue new WDRs or amend Order No. R9-2007-0001 to require that MS4 discharges to Chollas Creek not exceed the WLAs for copper, lead, and zinc as established in this TMDL in accordance with a 20-year time schedule to reduce metal concentrations in urban runoff to achieve the WLAs. The San Diego Water Board shall also issue new WDRs or amend Order No. R9-2004-0277, pursuant to CWC section 13383, requiring the Municipal Dischargers and the California Department of Transportation (Caltrans) to investigate excessive levels of metals in Chollas Creek and feasible management strategies to reduce metal loadings in Chollas Creek. Annual reporting on the progress and efficacy of implementation elements will be required.

Caltrans is responsible for the design, construction, maintenance, and operation of the California State Highway System, including the portion of the Interstate Highway System within the state's boundaries. The roads and highways operated by Caltrans are legally defined as MS4s and discharges of pollutants from Caltrans MS4s to waters of the U.S., such as Chollas Creek, constitute a point source discharge that is subject to regulation under WDRs implementing federal NPDES regulations. Discharges of storm water from the Caltrans owned right-of-ways, properties, facilities, and activities, including stormwater management activities in construction, maintenance, and operation of state-owned highways are regulated under Order No. 99-06-DWQ.[4] Caltrans is responsible, under the terms and conditions of these WDRs, for ensuring that their operations do not contribute to violations of water quality objectives in Chollas Creek. The San Diego Water Board can issue new WDRs to Caltrans, or request that the State Water Board amend Order No. 99-06-DWQ to implement the WLA and other requirements established in this TMDL project, including the requirement to submit annual reports on Caltrans' progress in achieving the WLAs in discharges from its MS4s.

The U.S. Navy (Navy) generates urban runoff at Naval Station San Diego near the mouth of Chollas Creek Watershed. Upon submittal of a complete Report of Waste Discharge (ROWD), these MS4 discharges can be regulated by the State Water Board via their general order prescribing WDRs for small MS4s.[5] These WDRs regulate MS4 discharges not covered by the San Diego Water Board's Order No. R9-2007-0001, including those from MS4s on military bases. The San Diego Water Board will require the Navy to submit a ROWD.

Stormwater from certain industrial sites and construction sites can contribute metals to Chollas Creek. The San Diego Water Board shall request the State Water Board amend Order No. 97-03-DWQ, the statewide general WDRs that regulate stormwater discharges from industrial sites, and Order No. 97-03-DWQ, the statewide general WDRs that regulate stormwater discharges from construction sites to implement the WLAs.

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[4] Order No. 99-06-DWQ *National Pollutant Discharge Elimination System Permit, Statewide Storm Water Permit, and Waste Discharge Requirements for the State of California, Department of Transportation (Caltrans)* or subsequent superseding NPDES renewal orders.

[5] State Water Resources Control Board Water Quality Order No. 2003-0005-DWQ, NPDES General Permit No. CAS000004, *Waste Discharge Requirements for Storm Water Discharges from Small Municipal Separate Storm Sewer Systems* or subsequent superseding NPDES renewal Orders.

The San Diego Water Board will amend Orders No. 2000-90,[6] and No. 2001-96[7] which regulate temporary groundwater extraction discharges to San Diego Bay and its tributaries, and to surface waters throughout the region. The existing effluent limitations for copper, lead, and zinc for extracted groundwater discharges to MS4s in the Chollas Creek watershed, and directly to Chollas Creek, shall be revised to equal the WLAs of this TMDL. Regulated groundwater discharges to Chollas Creek must meet the WLAs at the initiation of the discharge. No compliance schedule to meet interim and final goals will be allowed in the case of groundwater discharges.

There is only one landfill in the Chollas Creek Watershed and it was closed in 1981. Order No. 97-11[8] and Addendum No. 4 require monitoring of groundwater below and near the South Chollas Landfill. The San Diego Water Board will revise this WDR to re-institute analysis for metals and begin analysis for hardness as part of the monitoring requirements. Furthermore, if the data indicate that metal concentrations are in excess of the WLAs of this TMDL, the San Diego Water Board may require additional actions. Since the landfill is down gradient from Chollas Reservoir and is up gradient from Chollas Creek, the possibility exists that groundwater recharge from the reservoir may be transporting landfill pollutants to the creek. The WDR may be revised or the San Diego Water Board may issue an investigative order (under the authority of the California Water Code section 13267) to require a technical report examining this potential metals pathway to Chollas Creek.

The first few years after initiation of this TMDL project are not likely to realize a reduction from current concentrations of all three metals. These years will provide the dischargers time to develop plans, and implement enhanced and expanded Best Management Practices (BMPs) that should result in immediate decreases of metal concentrations in the Chollas Creek water column. Year ten will see a maximum of 20 percent in the allowable percentage exceedance of the water quality objectives for copper, lead, and zinc. Finally, at year twenty, dischargers will be expected to meet the WLAs in their effluent discharges and WQOs for metals in Chollas Creek.

The Compliance Schedule, which includes the implementation actions of the San Diego Water Board and the dischargers, the due dates, and the interim and final allowable exceedances of the WLAs is shown in Table E. 4.

TABLE E.4 Compliance Schedule.

[6] Order No. 2000-90, NPDES Permit No. CAG919001, *General Waste Discharge Requirements for Temporary Groundwater Extraction and Similar Waste Discharges to San Diego Bay and Storm Drains or Other Conveyance Systems Tributary Thereto* or subsequent superseding NPDES renewal orders.
[7] Order No. 2001-96, NPDES Permit No. CAG919002, *General Waste Discharge Requirements for Groundwater Extraction Waste Discharges from Construction, Remediation and Permanent Groundwater Extractioi Projects to Surface Waters within the San Diego Region Except for San Diego Bay* or subsequent superseding NPDES renewal orders.
[8] Order No. R9-97-11, *General Waste Discharge Requirements for Post-Closure Maintenance of Inactive Nonhazardous Waste Landfills within the San Diego Region* or subsequent superseding NPDES renewal orders.

Item	Implementation Action	Responsible Parties	Date
1	Effective date of Chollas Creek Metals TMDL Waste Load Allocations.	San Diego Water Board, Municipal Dischargers, Caltrans, Navy, Industrial Stormwater Dischargers, Construction Stormwater Dischargers, Landfill Stormwater Dischargers	October 22, 2008[9]
2	Recommend High Priority for grant funds.	San Diego Water Board	Immediately after effective date
3	Submit annual Progress Report to San Diego Water Board due January 1 of each year.	Municipal Dischargers	Annually after reissue of NPDES WDRs.
4	Submit annual Progress Report to San Diego Water Board due April 1 of each year.	Caltrans	Annually after reissue of NPDES WDRs.
5	Submit annual Progress Report to San Diego Water Board due July 1 of each year.	Industrial Stormwater Dischargers	Annually after reissue of NPDES WDRs.
6	Submit annual Progress Report to San Diego Water Board due July 1 of each year.	Construction Stormwater Dischargers	Annually after reissue of NPDES WDRs.
7	Municipal NPDES WDRs shall be issued, reissued, or revised to include WQBELs consistent with the assumptions and requirements of the Chollas Creek WLAs.	San Diego Water Board	Within 5 years of effective date
8	Caltrans NPDES WDRs shall be issued, reissued, or revised to include WQBELs consistent with the assumptions and requirements of the Chollas Creek WLAs.	State Water Board	Within 5 years of effective date
9	Construction NPDES WDRs shall be issued, reissued, or revised to include WQBELs consistent with the assumptions and requirements of the Chollas Creek WLAs.	State Water Board	Within 5 years of effective date
10	Industrial NPDES WDRs shall be issued, reissued, or revised to include WQBELs consistent with the assumptions and requirements of the Chollas Creek WLAs.	State Water Board	Within 5 years of effective date
11	Amend Orders No. 2000-90, and No. 2001-96 (or superseding renewal orders) which regulates temporary groundwater extraction discharges to San Diego Bay and its tributaries to include WQBELs consistent with the assumptions and requirements of the Chollas Creek WLAs.	San Diego Water Board	Within 5 years of effective date
12	Municipal and Navy WDR Order No. R9-2004-0277 shall amended to require additional monitoring for metals and hardness.	San Diego Water Board	Within 5 years of effective date
13	Landfill NPDES WDR Order No. 97-11 (or superseding renewal orders) shall be issued, reissued, or revised to monitor for metals and hardness.	San Diego Water Board	Within 5 years of effective date

[9] Upon approval of by OAL.

Item	Implementation Action	Responsible Parties	Date
14	Navy and all other Phase II small MS4 permittees in the Chollas Creek watershed shall be enrolled in Order No. 2003-0005-DWQ (or superseding renewal orders).	San Diego Water Board	Immediately after effective date.
15	Take enforcement actions	San Diego Water Board	As needed after effective date.
16	Meet 80% Chollas Creek Metals TMDL WLA reductions.	Municipal Dischargers, Caltrans, Navy, Industrial Stormwater Dischargers, Construction Stormwater Dischargers, Landfill Stormwater Dischargers	10 years after effective date.
17	Meet 100% Chollas Creek Metals TMDL WLA reductions.	Municipal Dischargers, Caltrans, Navy, Industrial Stormwater Dischargers, Construction Stormwater Dischargers, Landfill Stormwater Dischargers	20 years after effective date.

E.11. Implementation Monitoring Plan

Compliance monitoring will be required in the creek itself to measure the progress of BMP implementation effectiveness and finally to ensure that the water quality objectives for copper, lead, and zinc are being achieved. Order No. R9-2004-0277 (the Chollas Creek Investigation Order for Diazinon and Metals) will be reviewed by the San Diego Water Board, and if needed, amended to require the dischargers to collect the data necessary to refine the watershed model so that mass loads of copper, lead, and zinc leaving the Chollas Creek watershed can be more accurately estimated. This information will be used to refine the TMDLs and in the development of the TMDL for Metals in San Diego Bay at the mouth of Chollas Creek. The San Diego Water Board has considered the costs of the reasonably foreseeable methods of compliance with the load and wasteload reductions specified in this TMDL.

E.12. Environmental Review and Economic Analysis

The San Diego Water Board is the lead agency for evaluating the environmental impacts of this Basin Plan amendment pursuant to the California Environmental Quality Act (CEQA). The Basin Planning process has been certified as functionally equivalent to CEQA requirements for preparing environmental documents and is, therefore, exempt from those requirements (Public Resources Code section 21000 et seq.). The required environmental documentation (Basin Plan amendment, Technical Report, and Environmental Checklist) has been prepared. The San Diego Water Board has identified environmental impacts, reasonable alternatives, and mitigation measures to minimize any significant adverse environmental impacts of the proposed Basin Plan amendment.

Attainment of the WLAs will be achieved through discharger implementation of structural and nonstructural BMPs designed to reduce metals concentrations in urban runoff and stormwater. The environmental analysis contains examples of BMPs that might reasonably be implemented by the dischargers to comply with the TMDLs. Nonstructural BMPs identified included, among others, education and outreach, road and street maintenance, elimination of illicit discharges, and inspections of commercial and industrial facilities. Structural BMPs included, among others, construction of vegetated swales and buffer strips, bioretention, detention basins, retention ponds, sand filters, and diversion systems.

The CEQA checklist identified potential adverse environmental impacts that might result from implementation of the identified BMPs unless mitigation is incorporated into the projects. Potential adverse impacts to the environment were identified for earth, air, water, plant life, animal life, transportation/circulation, public services, human health, aesthetics, recreation, archeological, overall potential to degrade, cumulative impacts, and substantial adverse impacts categories of the CEQA checklist. The environmental analysis included discussion regarding mitigation measures that could be implemented to minimize these potential impacts.

The San Diego Water Board must also consider the economic costs of the reasonably foreseeable methods of compliance with this Basin Plan amendment to reduce copper, lead, and zinc loads to surface waters through implementation of BMPs. The economic analysis discloses the costs of implementing typical stormwater BMPs for reduction of metals. Monitoring and reporting costs are not disclosed in this report since monitoring and reporting is a requirement of existing orders and the need for additional monitoring is unknown at this time.

The specific BMPs to be implemented will be chosen by the dischargers after adoption of this TMDL project. All costs are preliminary estimates only, since particular elements of a BMP, such as type, size, and location, would need to be developed to provide a basis for more accurate cost estimations. Typical costs of conventional stormwater BMPs are provided in the following two tables (Tables E.5 and E.6). Costs for structural BMPs were estimated for treatment of ten percent of urbanized watershed area (approximately 1,370 acres) with the exception of diversion structures, which are costs per unit.

TABLE E.5: Summary of Cost Estimates for Non-Structural BMPs

Non-Structural BMPs	Estimated Cost*	Estimated Cost Adjusted For Inflation 2006 Dollars**
Education and Outreach	$1,000 - $200,000 per program	$1,210 - $242,000 per program
Street Sweeping	$ 60,000 - $180,000 per unit	$ 72,600 - $218,000 per unit
Illicit Discharges	$0 to $1,750	$0 to $2,120

*The costs were obtained from USEPA, 1999. Preliminary Data Summary of Urban Storm Water Best Management Practices. (EPA-821-R-99-012). August 1999.
** Sahr, R.C. 2007. Consumer Price Index (CPI) Conversion Factors 1800 to Estimated 2016 to Convert to Dollars of 2006. Oregon State University, Political Science Department, Corvallis, OR. Revised January 18, 2006.

TABLE E.6: Summary of Cost Estimates for Structural BMPs

Structural BMPs	Estimated Cost to treat 10% of Urbanized Area (ECUA 10%)	ECUA 10% Adjusted For Inflation 2006 Dollars*****	Estimated Yearly Maintenance Cost (EYMC)	EYMC Adjusted For Inflation 2006 Dollars*****
Vegetated Swale	$960,000*	$1.2 million	$67,000	$81,000
Vegetated Buffer Strip	$1.2 million*	$1.45 million	$120,000	$145,000
Infiltration Trench	$60 Million	$64 Million	$5.8 Million	$6.2 Million
Bioretention	$16.4 million*	$19.9 million	$1.1 million	$1.3 million
Detention Basins and Retention Ponds	$2.7million*	$3.3 million	$27,000	$33,000
Sand Filters	$15 million*	$18.2 million	$2 million	$2.4 million
Austin Sand Filters	$119 million**	$127 million	$6.4 Million	$6.8 Million
Porous Pavement	$490 Million***	$593 Million	$274,000	$332,000
Diversion	$1 million****	$1.03 million	$10,000	$10,300

* Based on USEPA, 1999. Preliminary Data Summary of Urban Storm Water Best Management Practices. [EPA-821-R-99-012. August 1999].
** Based on Caltrans, 2004. Report ID CTSW-RT-01-050.
*** Based on USEPA, 1999 Storm Water Technology Fact Sheet Porous Pavement [EPA 823-F-023]
**** Cost per unit. Based on personal communication with Ruth Kolb, City of San Diego, March 14, 2005.
***** Sahr, R.C. 2007. Consumer Price Index (CPI) Conversion Factors 1800 to Estimated 2016 to Convert to Dollars of 2006. Oregon State University, Political Science Department, Corvallis, OR. Revised January 18, 2006.

E.13. Peer Review

The scientific basis of this TMDL has undergone external peer review pursuant to Health and Safety Code section 57-004. The San Diego Water Board has considered and responded to all comments submitted by the peer review panel. Interested persons and the public have had reasonable opportunity to participate in review of the amendment to the Basin Plan. Efforts to solicit public review and comment include five public workshops held between April 1999 and April 2005; a public review and comment period of 45 days preceding the San Diego Water Board public hearing; and written responses from the San Diego Water Board to oral and written comments received from the public. The San Diego Water Board has notified all known interested parties and the public of its intent to consider adoption of this Basin Plan amendment in accordance with CWC section 13244.

TECHNICAL ANALYSIS

1 Background

Chollas Creek[10] is an urban coastal stream in southern San Diego County, and a tributary to San Diego Bay. Portions of the cities of San Diego, Lemon Grove, and La Mesa are located within the Chollas Creek Watershed. Chollas Creek was placed on the Clean Water Act (CWA) section 303(d) List of Water Quality Limited Segments (List of Water Quality Limited Segments) in 1996 for the metals cadmium,[11] copper, lead, and zinc. The San Diego Water Board has established Total Maximum Daily Loads (TMDLs) for copper, lead, and zinc as required by the CWA for water quality limited segments.

Chollas Creek is an urban creek with highly variable flows. The highest flow rates are associated with storm events. Extended periods with no surface flows occur during dry weather, although pools of standing water may be present. Much of the creek has been channelized and concrete lined, but some sections of earthen creek bed remain. The mouth of the creek is located on the eastern shoreline of the central portion of San Diego Bay. San Diego Bay at the mouth of Chollas Creek is also on the List of Water Quality Limited Segments; being impaired for sediment toxicity and degraded benthic community.

The watershed of Chollas Creek encompasses 16,273 acres. The area of the north fork of the watershed (9,276 acres) is larger than that of the south fork (6,997 acres) (URS Greiner Woodward Clyde 1999). Land use is predominantly residential, with some commercial/institutional and industrial use. A significant portion of the remainder of the watershed consists of roadways, while the rest is open space. Portions of the cities of San Diego, Lemon Grove, and La Mesa are located within the watershed. A small portion of the watershed consists of "tidelands" immediately adjacent to San Diego Bay. Some of this tideland area is under the jurisdiction of the San Diego Unified Port District (Port); the remainder is under the jurisdiction of the U.S. Navy (Navy). San Diego County also holds jurisdiction over a small portion of the watershed.

The Introduction section of this report describes the TMDL process in general. Sections 3 through 9 comprise the seven required components of a TMDL technical report.

[10] The Chollas Creek Watershed comprises Hydrologic Unit number 908.22.
[11] Cadmium was delisted in 2006. See Appendix B.

2 Introduction

Section 303(d)(1)(A) of the CWA requires that "Each state shall identify those waters within its boundaries for which the effluent limitations…are not stringent enough to implement any water quality standard (WQS) applicable to such waters." The CWA also requires states to establish a priority ranking of Water Quality Limited Segments and to establish TMDLs for such waters.

The purpose of a TMDL is to attain water quality objectives (WQOs) and restore and protect the beneficial uses of an impaired waterbody. TMDLs represent a strategy for meeting WQOs by allocating quantitative limits for point and nonpoint pollution sources. A TMDL is defined as the sum of the individual waste load allocations (WLAs) for point sources and load allocations (LAs) for nonpoint sources and natural background [40 CFR 130.2] such that the capacity of the waterbody to assimilate pollutant loading (i.e., the loading capacity) is not exceeded.

The TMDL process begins with the development of a technical report which includes the following 7 components: (1) a **Problem Statement** describing which WQOs are not being attained and which beneficial uses are impaired; (2) identification of **Numeric Targets** which will result in attainment of the WQOs and protection of beneficial uses; (3) a **Source Analysis** to identify all of the point and nonpoint sources of the impairing pollutant in the watershed and to estimate the current pollutant loading for each source; (4) a **Linkage Analysis** to calculate the **Loading Capacity** of the waterbody for the pollutant; which is the maximum amount of the pollutant that may be discharged to the waterbody without causing exceedances of WQOs and impairment of beneficial uses; (5) a **Margin of Safety** (MOS) to account for uncertainties in the analysis; (6) the division and **Allocation** of the TMDL among each of the contributing sources in the watershed, WLAs for point sources and LAs for nonpoint and background sources; and (7) a description of how **Seasonal Variation and Critical Conditions** are accounted for in the TMDL determination. A document, like this report, containing the above components is generally referred to as the technical report.

The report also includes an **Implementation Plan** that describes the pollutant reduction actions that must be taken by various persons accountable for taking actions to meet the allocations specified in the technical report. A time schedule for meeting the required pollutant allocations is included in the Implementation Plan. In addition, the Implementation Plan also includes requirements for an Implementation Monitoring Plan that must be implemented to assess the effectiveness of the load reduction activities in attaining allocations and WQOs in Chollas Creek and restoring beneficial uses. Public participation is a key element of the TMDL process and stakeholder involvement is encouraged and required.

Once established, the regulatory provisions of the TMDL, Implementation Plan and Implementation Monitoring Plan are incorporated into the Water Quality Control Plan for the San Diego Basin (9) (Basin Plan; San Diego Water Board, 1994). The San Diego Water Board, following a public comment period and hearing process, adopts a resolution that amends the Basin Plan to incorporate the TMDL. Additional requirements of the

Basin Plan amendment process also include an evaluation of economic and environmental considerations. As with any Basin Plan amendment involving surface waters, a TMDL amendment will not take effect until it has undergone subsequent agency approvals by the State Water Resources Control Board (State Water Board), the Office of Administrative Law (OAL). The United States Environmental Protection Agency (USEPA) must also approve the Amendment; however, it will take effect following approval by OAL.

Following these approvals, the San Diego Water Board is required to incorporate the regulatory provisions of the TMDL into all applicable orders prescribing waste discharge requirements (WDRs), or other regulatory mechanisms. Water Quality Based Effluent Limits (WQBELs) for the impairing pollutant in the subject watershed are incorporated in the appropriate WDRs to implement and make the TMDL enforceable. WQBELs can consist of either numeric effluent limitations, or an iterative Best Management Practice (BMP) approach of expanded or better tailored BMPs. The CWA requires that WDRs issued pursuant to the National Pollutant Discharge Elimination System (NPDES) provisions of the CWA be consistent with all applicable TMDLs.

The final and most important step in the process is the implementation of the TMDL by dischargers. Per the governing WDR order (or other regulatory mechanism), each discharger must reduce its current loading of the pollutant to its assigned allocation of the pollutant in accordance with the time schedule specified in the technical report (and implementing WDR order). When each responsible party has achieved its required load reduction, water quality standards for the impairing pollutants are expected to be restored in the receiving water.

3 Problem Statement

The lowest 1.2 miles of Chollas Creek were placed on the List of Water Quality Limited Segments in 1996 for stormwater toxicity, coliform[12] and the metals cadmium[13] copper, lead, and zinc. While only the lowest 3.5 miles of Chollas Creek comprise the actual impaired and listed segment of the water body, all upstream tributaries to this section are considered in this TMDL because they deliver metals loads to the lower segments. Samples collected at station SD8(1) (Figure 3.1) pursuant to Order No. R9-2001-01,[14] repeatedly showed toxicity to the water flea, *Ceriodaphnia dubia*. A subsequent Toxicity Identification Evaluation (SCCWRP, 1999) for three storm events identified copper and the pesticide diazinon[15] as the principal causes of toxicity to *C. dubia* and zinc as the cause of toxicity to the purple sea urchin, *Strongylocentrotus purpuratus*.

Since 1994, stormwater samples from Chollas Creek have frequently exceeded both chronic and acute water quality criteria established in the National Toxics Rule (NTR) in federal regulations [40 CFR 131.36 (d)(10)(ii)] for copper, lead, zinc and cadmium. In the NTR, both 1-hour acute and 4-day chronic water quality criteria are calculated as a function of hardness and the criteria are then compared against measured event mean concentrations (EMC). The EMC is defined as the total pollutant load divided by the total runoff volume. If the measured EMC was equal to or greater than acute or chronic criteria, the result was considered to exceed water quality criteria. Comparisons against NTR criteria were partially responsible for the original listing of Chollas Creek in 1996 for cadmium, copper, lead, and zinc.

In April 2000, the USEPA promulgated the California Toxics Rule (CTR) [40 CFR 131.38] that established new water quality criteria for waters in California, including water quality criteria for copper, lead, zinc and cadmium. As in the NTR, both 1-hour acute and 4-day chronic water quality criteria are calculated as a function of hardness.

The criteria are compared against measured concentrations of the dissolved metal (NTR assessed total metal concentration). Storm water samples from Chollas Creek collected between 1994 and 2003 periodically exceeded CTR water quality criteria for only copper, lead, and zinc (Table 3.1 and Appendix A). For each concentration that exceeded criteria, an exceedance factor was calculated. For example, if a concentration was two times greater than criteria, the exceedance factor was 2.0. Analysis of the exceedance factors showed that many concentrations of copper, lead, and zinc were more than double

[12] This section 303(d) listing for coliform has since been changed to "Bacterial Indicators." A separate TMDL is currently under development that addresses several Bacterial Indicator listings throughout the region.
[13] Cadmium is recommended for de-listing. See Appendix B.
[14] Order No. 2001-01, *Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego County, and the San Diego Unified Port District*, NPDES No. CAS0108758.
[15] A separate TMDL for diazinon was developed by the San Diego Water Board and adopted by the USEPA in November 2003. Order No. R9-2001-01 was superseded by Order No. R9-2007-0001 in January 2007.

their allowable limit. California must comply with the more stringent criteria of CTR rather than NTR.

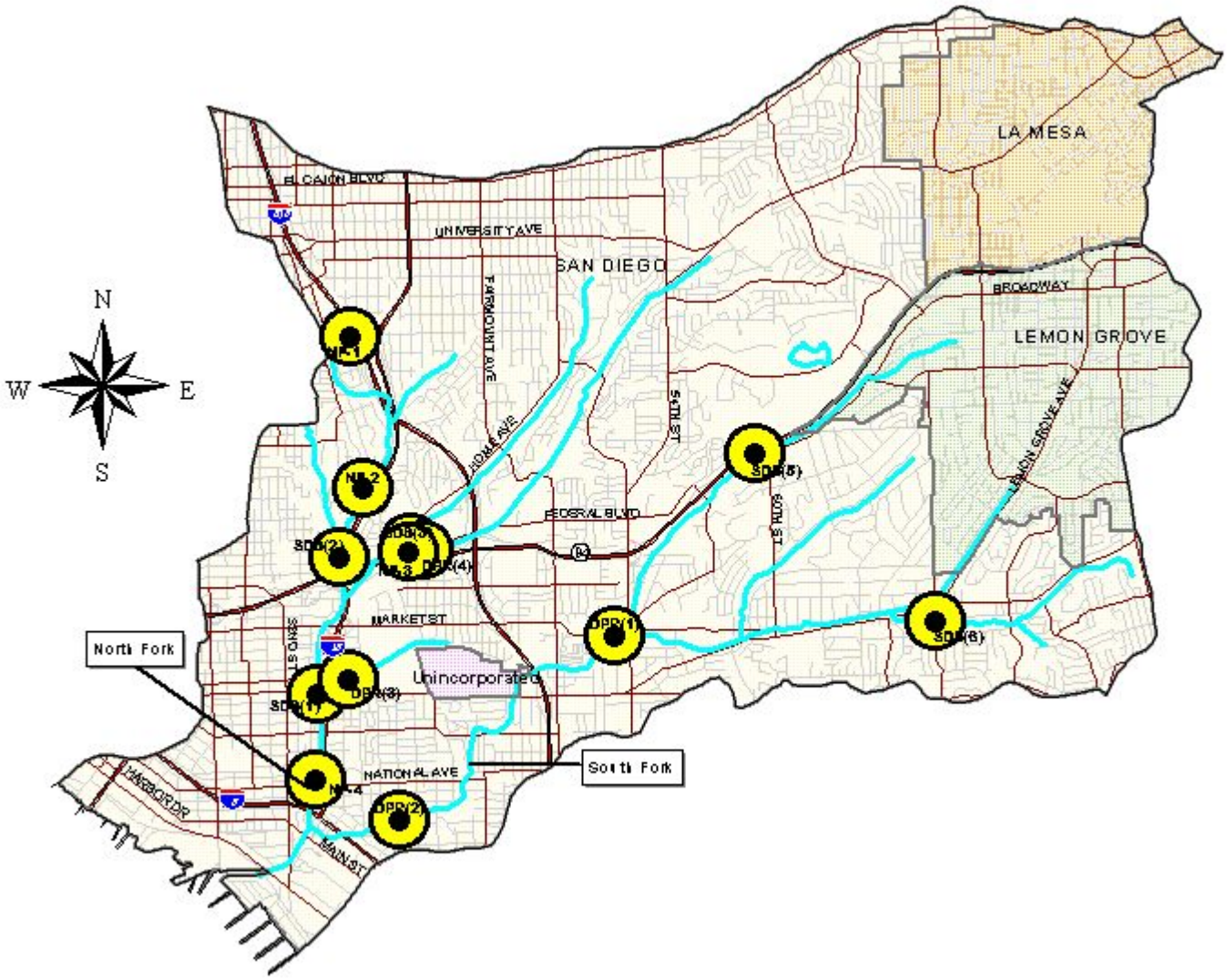

FIGURE 3.1. Chollas Creek Watershed.

3.1 De-listing of Cadmium

The available data suggest that concentrations of dissolved cadmium in Chollas Creek exceed neither acute nor chronic CTR water quality criteria. Most samples were below DLs, though some of the DL concentrations exceed CTR acute and chronic criteria. Since cadmium did not appear to exceed dissolved CTR criteria and was not found to cause toxicity in test organisms, a TMDL for cadmium was not established in this project. Based on this evidence, the San Diego Water Board recommended that cadmium be removed from the List of Water Quality Limited Segments in the 2006 listing update undertaken by the State and Regional Water Boards. The State Water Board removed the Cadmium listing from the 2006 list. The USEPA has yet to approve the delisting. The USEPA has recommended (USEPA, 2001) a more stringent dissolved cadmium criteria

that it plans to incorporate in to the CTR by 2008. These criteria are approximately ten-fold more stringent than current CTR criteria; and would warrant listing for exceedances of the chronic criteria (see Table 3.1 below). However, these criteria are only proposed and have not been promulgated by the USEPA.

When and if the CTR is updated to incorporate these criteria, the San Diego Water Board will re-evaluate the potential listing of cadmium for Chollas Creek. Appendix B contains the details supporting the cadmium delisting recommendation.

3.2 Watershed Characteristics

Chollas Creek is an urban creek with highly variable flows. The highest flow rates are associated with storm events. Extended periods with no surface flows occur during dry weather, although pools of standing water may be present. The annual average rainfall in the Chollas Creek Watershed is approximately 9 inches (URS Greiner Woodward Clyde 1999). The average annual rainfall in the watershed (from October 1948 through February 2002) measured at La Mesa, CA is approximately 12.6 inches (Western Regional Climate Center, 2003). Rainfall statistics for the San Diego International Airport (Lindbergh Field, located approximately 4 miles northwest of Chollas Creek, near San Diego Bay) indicate that an average of 18 storms occur each year (URS Greiner Woodward Clyde 1999).

Much of the creek has been channelized and concrete lined, but some sections of earthen creek bed remain. The mouth of the creek is located on the eastern shoreline of the central portion of San Diego Bay. San Diego Bay at the mouth of Chollas Creek is also on the List of Water Quality Limited Segments; being impaired for sediment toxicity and degraded benthic community.

The watershed of Chollas Creek encompasses 16,273 acres. The area of the north fork of the watershed (9,276 acres) is larger than that of the south fork (6,997 acres) (URS Greiner Woodward Clyde 1999). However, a 2000 report by the San Diego Association of Governments reported the Chollas Creek Watershed to contain 28.52 square miles (18,253 acres). As Table 3.2 indicates, the watershed is highly urbanized. Land use is predominantly residential, with some commercial/institutional and industrial use. A significant portion of the remainder of the watershed consists of roadways, while the rest is open space. Portions of the cities of San Diego, Lemon Grove, and La Mesa are located within the watershed. A small portion of the watershed consists of “tidelands” immediately adjacent to San Diego Bay. Some of this tideland area is under the jurisdiction of the San Diego Unified Port District (Port); the remainder is under the jurisdiction of the U.S. Navy (Navy). San Diego County also holds jurisdiction over a small portion of the watershed (<1.0 percent) as shown in Figure 3.1.

CADMIUM Collection Dates	Organization	n	Concentrations reported in ug / L min	max	mean	median	# of exceedances (CTR) [D] CMC	CCC	# of exceedances (USEPA, 2001) [D] CMC	CCC
Feb 94 - Feb 03	MS4 Copermittees	42	0.2 [A]	3.93 [B]	0.8 [C]	0.5 [C]	0 of 4	0 of 4	0 of 4	3 of 4
Feb 00 - Apr 00	CalTrans	4	0.2 [A]	0.3	0.2 [C]	0.2 [C]	NA [E]	NA [E]	NA [E]	NA [E]
Mar 99 - Apr 99	SCCWRP	3	< 0.3	< 2.0	< 2.0	< 2.0	NA [F]	NA [F]	NA [F]	NA [F]
Jun 91 & Mar 92	Regional Board	5	1.0 [A]	< 1.0	0.5 [C]	0.5 [C]	NA [F]	NA [F]	NA [F]	NA [F]

COPPER Collection Dates	Organization	n	Concentrations reported in ug / L min	max	mean	median	# of exceedances (CTR) [D] CMC	CCC
Feb 94 - Feb 03	MS4 Copermittees	58	2.5 [A]	81.6 [B]	16.4 [C]	11.0 [C]	16 of 32	20 of 32
Feb - Apr, 00	CalTrans	4	5.1	11	7.8	7.5	NA [E]	NA [E]
Feb - Mar, 00	SCCWRP	2	51.2	63	57.1	57.1	NA [E]	NA [E]
Jan , Feb & Nov, 01	DPR	14	5	34	11.7	9.8	5 of 12	7 of 12
Sep-00	ES Babcock	4	1.92	28.8	9.8	4.3	NA [G]	NA [G]
Mar - Apr 99	SCCWRP (TIE)	3	10	30	18.3	15	2 of 3	3 of 3
Jun 91 & Mar 92	Regional Board	5	3	8	6.4	7	0 of 5	0 of 5

LEAD Collection Dates	Organization	n	Concentrations reported in ug / L min	max	mean	median	# of exceedances (CTR) [D] CMC	CCC
Feb 94 - Feb 03	MS4 Copermittees	57	1.0 [A]	118 [B]	16.4 [C]	3.0 [C]	0 of 19	10 of 19
Feb - Apr, 00	CalTrans	4	2.9	11	5.5	4	NA [E]	NA [E]
Jan , Feb & Nov, 01	DPR	14	1..0 [A]	46	7.3	2	1 of 12	6 of 12
Sep-00	ES Babcock	4	2.0 [A]	4.1	1.9	1.2	NA [G]	NA [G]
Mar - Apr 99	SCCWRP (TIE)	3	10.0 [A]	82	39	30	1 of 2	2 of 2
Jun 91 & Mar 92	Regional Board	5	5.0 [A]	29	12.2	11	0 of 3	1 of 3

ZINC Collection Dates	Organization	n	Concentrations reported in ug / L min	max	mean	median	# of exceedances (CTR) [D] CMC	CCC
Feb 94 - Feb 03	MS4 Copermittees	57	8	548 [B]	105.6 [C]	73 [C]	12 of 42	12 of 42
Feb - Apr, 00	CalTrans	4	17	42	28.8	28	NA [E]	NA [E]
Feb - Mar, 00	SCCWRP	2	146	150.8	148.4	148.4	NA [E]	NA [E]
Jan , Feb & Nov, 01	DPR	14	16.8	370	137.6	105	7 of 12	7 of 12
Sep-00	ES Babcock/RB	4	10.0 [A]	45	21.3	17.5	NA [G]	NA [G]
Mar - Apr 99	SCCWRP (TIE)	3	90	220	173.3	210	2 of 3	2 of 3
Jun 91 & Mar 92	Regional Board	5	3	188	45	11	0 of 5	1 of 5

[A] sample below Reporting Limit [B] calculated from total concentration
[C] using all samples (measured dissolved and calculated from total). Samples below detection limit entered as 1/2 detection limit for calculations
[D] considering only measured dissolved concentrations and samples not below DL or RL. (number in parenthesis represents available sample pool under these criteria)
[E] no associated hardness values available [F] all samples reported as "less than"
[G] all dissolved samples calculated from total.

TABLE 3.1. Metal data summaries.

TABLE 3.2. Land use in the Chollas Creek Watershed. (URS Greiner Woodward Clyde 1999)

Land Use	Percent of Total Area (Entire Watershed)
Residential	67%
Commercial/Institutional	5%
Industrial	7%
Roadways	4%
Open Space	16%

3.3 Applicable Water Quality Standards

WQSs consist of beneficial uses, WQOs and an anti-degradation policy. The Basin Plan (San Diego Water Board, 1994) specifies WQSs for all waters in the San Diego region, including Chollas Creek and San Diego Bay. The WQSs that apply to this TMDL are the existing and potential beneficial uses in Chollas Creek that could be adversely affected by toxicity, combined with the Basin Plan narrative WQOs for toxicity, and the numeric criteria for toxic pollutants found in the federal California Toxics Rule. The beneficial uses for Chollas Creek and San Diego Bay are listed in Table 3.3. Chollas Creek is also subject to State Water Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality of Waters in California*, which establishes a general principle of non-degradation.

TABLE 3.3. Beneficial uses in the Chollas Creek Watershed and San Diego Bay.

Beneficial Use	Chollas Creek	San Diego Bay
Industrial service supply		•
Navigation		•
Contact water recreation	o	•
Non-contact water recreation	•	•
Commercial and sport fishing		•
Preservation of biological habitats of special significance		•
Estuarine habitat		•
Warm freshwater habitat	•	
Wildlife habitat	•	•
Rare, threatened, or endangered species		•
Marine habitat		•
Migration of aquatic organisms		•
Shellfish harvesting		•

• Existing Beneficial Use
o Potential Beneficial Use

The following Basin Plan narrative WQO (Basin Plan p. 3.15) for toxicity is applicable to all inland surface waters (including Chollas Creek), enclosed bays (including San Diego Bay) and estuaries, coastal lagoons and ground waters of the San Diego region.

Water Quality Objective for Toxicity
All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Testing of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the San Diego Water Board will be used to determine compliance with this objective.

The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge or, when necessary, for other control water that is consistent with requirements specified in USEPA, State Water Resources Control Board or other protocol authorized by the San Diego Water Board. As a minimum, compliance with this objective as stated in the previous sentence shall be evaluated with a 96-hour acute bioassay.

In addition, effluent limits based upon acute bioassays of effluents will be prescribed where appropriate, additional numerical receiving water objectives for specific toxicants will be established as sufficient data become available and source control of toxic substances will be encouraged.

In addition to Basin Plan objectives, the CTR also establishes numeric water quality criteria legally applicable in the state of California as WQOs for inland surface waters and enclosed bays and estuaries. These criteria are discussed in full in section 4 of this chapter.

3.4 Metals Chemistry

Copper and zinc are essential elements for all living organisms, but elevated levels may cause adverse effects in all biological species. Lead is presumed to be a non-essential element for life; more importantly, even at extremely low environmental concentrations this element may create adverse impacts on biota. Dissolved forms of these metals are directly taken up by bacteria, algae, plants and planktonic and benthic organisms. Dissolved metals can also adsorb to particulate matter in the water column and enter aquatic organisms through various routes. Copper, lead, and zinc may bioaccumulate within lower organisms, yet they are not expected to biomagnify up the food chain as do mercury and selenium (Moore and Ramamoorthy, 1984). The issue of biomagnification is still being debated among the scientific community (Besser, et al, 200) and cannot be assessed in Chollas Creek with the available information. Of all of these metals, copper is considered the most potent toxicant at environmentally relevant aqueous concentrations. Copper is more commonly found at higher concentrations in herbivorous fish than carnivorous fish from the same location (USF&W, 1998). Copper is used as an aquatic herbicide to reduce algae growth in reservoirs and is applied (via antifouling paints) to boat hulls in marinas.

The fate and transport of metals in natural waters is influenced by the physical state and chemical complexation of each element. Physical separation methods (i.e., filters) define metals associated with the particulate, colloidal, or dissolved phases. Unfiltered or "total" metal samples represent the sum of all size fractions; whereas filtered or "dissolved" samples yield metals in solution. As a general rule, particulate metal concentrations are higher than those in dissolved phase for all metals in this TMDL. This is based in part on the inherent reactivity of negatively charged particulate matter and positively charged metal ions (Buffle, 1989). As outlined in the CTR, the USEPA has defined aquatic life water quality criteria for these metals based on the dissolved fraction of aqueous samples (USEPA 2000a). These water quality criteria serve as numeric targets for the copper, lead, and zinc TMDLs.

Exposure to two or more chemicals may result in toxicity that is additive or a simple summation of the toxicity of the individual chemicals. Likewise, the presence of two or more chemicals may result in a synergistic effect, or toxicity that is greater than would be expected based on a simple summation of the individual toxicities of the chemicals. Copper and zinc have been shown to have an additive toxic effect on aquatic life (Taylor and Francis, 1995). However, there is insufficient data to determine if these effects are found in Chollas Creek. This will be addressed as part of the monitoring required in the implementation (sections 11 and 12) phase of the TMDL.

3.5 Sediment Metals

Sediment samples have been collected for chemical analysis in Chollas Creek since 1994 (Appendix C), generally as a single sampling event every late spring and early fall. Extensive sampling occurred during June 1998 at several stations within the creek. All samples were analyzed for total cadmium, copper, lead, and zinc (Table 3.4). With few exceptions, all four metals were below their applicable Probable Effects Level (PEL) (MacDonald et al., 1996). The PEL or Probable Effects Concentration (PEC) (MacDonald et al., 2000) is an empirical approach to determine what concentration of a chemical is likely to have an environmental impact. In the PEL approach, the chemical concentrations of the samples are ranked from high to low toxicity. The PEL is the geometric mean of the 50th percentile of the effects data and the 85th percentile of the no effects data. The PEL represents the concentration above which adverse effects are expected to occur frequently (Smith et al., 1996). Freshwater sediment chemistry regulations to protect aquatic life in California have not been promulgated. However, PELs were used to screen sediment chemistry data from San Diego Creek in a TMDL written by USEPA (2002) and are therefore appropriate to use as screening values in this TMDL.

TABLE 3.4. Summary of total metal concentrations in Chollas Creek sediments.

Metal	no. of detections / no. of samples analyzed	Average[1] (mg/kg, dry wt.)	Median[1] (mg/kg, dry wt.)	Std Dev[1] (mg/kg, dry wt.)	PEL [2] (mg/kg, dry wt.)	no. of samples > PEL[2]	no. of samples > PEL[2]
Cadmium	11 of 81	2.10	2.50	2.54	3.53	1	1.2%
Copper	45 of 81	10.2	3.6	17.9	197	0	0.0%
Lead	37 of 81	18.7	6.3	27.4	91.3	3	3.7%
Zinc	81 of 81	61.6	42.2	62.4	315	1	1.2%

[1] Non-detects are considered as 1/2 of the Reporting Limit for calculations of average, median and standard deviation.

[2] PEL = Probable Effects Level

A review of the available sediment metal chemistry data indicate that accumulation of metals above potentially harmful concentrations is unlikely. Additionally, metals are expected to continuously partition out of the dissolved phase and settle out of the water column with particulate organic matter. Residence time in the creek is likely less than one year because each season's major storms will effectively remove any metals accumulated in the creek sediment and transport them downstream to San Diego Bay.[16] Therefore, this TMDL will focus on water column concentrations of dissolved metals.

3.6 Sampling History in the Watershed

Stormwater monitoring of Chollas Creek began in the 1993-94 rainy season under the MS4 stormwater order in effect at that time. Each rainy season, stormwater samples are collected from two or three storms at a station located on the north fork of Chollas Creek near the intersection of 33rd and Durant Streets. To avoid tidal influence, the monitoring station is installed on the north fork above the north and south fork confluence. Runoff from approximately 57 percent of the entire watershed is sampled at the monitoring site (URS Greiner Woodward Clyde 1999). This station samples run-off that is representative of the entire watershed because the land use distribution in the north fork portion of the watershed is nearly identical to the land use distribution of the entire watershed as shown in Table 3.5 below.

TABLE 3.5. Land use distribution for Chollas Creek Watershed. (URS Greiner Woodward Clyde 1999)

Land Use	Percent of Total Acreage (Entire Watershed)	Percent of Sampled Acreage (North Fork Watershed)
Residential	67%	62%
Commercial/Institutional	5%	9%
Industrial	7%	10%
Open Space	16%	14%
Roadways	4%	5%

[16] The sediment deposited in San Diego Bay will be addressed in the "San Diego Bay Shoreline, near Chollas Creek" TMDL currently under development.

Since the 1993-94 rainy season, stormwater samples have been analyzed for general physical constituents, nutrients, biochemical oxygen demand, chemical oxygen demand, bacteriological constituents, organic constituents and total recoverable metals. Since 2000, samples have also been analyzed for dissolved metals. Toxicity testing began with the 1994-95 rainy season and is conducted using the water flea *Ceriodaphnia dubia* and the fish commonly known as a fathead minnow (*Pimephales promelas*). Toxicity as indicated by mortality was found in every test run on the water flea for the municipal stormwater program. Reproduction of the water flea was generally not impaired. Toxicity was generally not found in tests run on the fathead minnow, but frequently some inhibition of growth was found.

The San Diego Water Board, the California Department of Transportation (Caltrans), the Southern California Coastal Water Research Project (SCCWRP) and the Department of Pesticide Regulation (DPR) have also conducted metals sampling and analysis in the Chollas Creek Watershed. Appendix A has a summary of the data used in this TMDL. Currently, dischargers in the watershed are under order to file monitoring program reports for dissolved metals and diazinon.[17] Monitoring results are filed in the Watershed Urban Runoff Management Plans required in the San Diego County stormwater WDRs.[18]

[17] Order No. R9-2004-0277
[18] Order No. R9-2007-0001

4 Numeric Targets

When calculating TMDLs, numeric targets are established to ensure that WQOs are met and beneficial uses are protected. The CTR criteria for metals are the basis of the numeric targets. However, because dissolved metals toxicity is a function of hardness, the CTR criteria for copper lead, and zinc are expressed as hardness-based equations. The numeric target equations are shown in Table 4.1. This section will discuss why CTR was chosen as the basis for the numeric targets in this TMDL and will discuss the following different factors/variables of the numeric target equations: continuous and maximum criteria concentrations (CCC and CMC), Water-effect Ratios (WER), total-to-dissolved metal conversion factor (CF), hardness, and correlation coefficients (m and b, respectively). Newly proposed copper criteria will also be mentioned at the end of this section.

TABLE 4.1. Numeric targets for dissolved metals in Chollas Creek.

Metal	Numeric Target for Acute Conditions: Criteria Maximum Concentration	Numeric Target for Chronic Conditions: Criteria Continuous Concentration
Copper	(1) * (0.96) * {e^ [0.9422 * ln (hardness) - 1.700]}	(1) * (0.96) * {e^[0.8545 * ln (hardness) - 1.702]}
Lead	(1) * {1.46203 – [0.145712 * ln (hardness)]} * {e^ [1.273 * ln (hardness) - 1.460]}	(1) * {1.46203 – [0.145712 * ln (hardness)]} * {e^[1.273 * ln (hardness) - 4.705]}
Zinc	(1) * (0.978) * {e^ [0.8473 * ln (hardness) + 0.884]}	(1) * (0.986) * {e^[0.8473 * ln (hardness) + 0.884]}

Hardness is expressed as milligrams per liter.
Calculated concentrations should have two significant figures [40 CFR 131.38(b)(2)].
The natural log and exponential functions are represented as “ln” and “e,” respectively.

The CTR criteria were chosen as the basis for these numeric targets, because they are the most current, defendable WQOs for dissolved copper, lead, and zinc concentrations in fresh water (USEPA, 2000a). The Basin Plan (San Diego Water Board, 1994) provides only narrative WQOs for determining allowable concentrations of copper, lead, and zinc in Chollas Creek. CTR criteria are legally applicable as WQOs in inland surface waters (e.g., Chollas Creek), enclosed bays and estuaries of California for all purposes and programs under the CWA (USEPA, 2000a).

Specifically, the numeric targets for the Chollas Creek TMDLs were set equal to the CTR’s hardness-based equations criteria for dissolved copper, lead, and zinc (Table 3.1) and are shown below in their simplified forms (Equations 4.1 and 4.2). These equations were derived by USEPA in order to calculate the criteria that a metal concentration must be below in order to protect freshwater aquatic life from toxicity. Therefore by this definition, setting the numeric targets equal to the CTR equations will also ensure that the narrative water quality objectives for toxicity are met in the water column for copper, lead, and zinc. In addition, because they are equations, the numeric targets for Chollas

Creek do not vary spatially or temporally and thus apply throughout all freshwater portions of Chollas Creek at all times.

EQUATION 4.1: General Criteria Continuous Concentration (CCC)

$$CCC = (WER) * (CF_C) * \{e^{[(m_C * \ln hardness) + b_C]}\}$$

Where: CCC = Criteria Continuous Concentration
WER = Water-effect Ratio
CF_C = Conversion Factor for freshwater chronic criteria
m_C = correlation coefficient
b_C = correlation coefficient

The subscript "c" stands for "chronic" and designates a variable in the CCC equation. The natural log and exponential functions are represented as "ln" and "e," respectively [40 CFR 131.38(b)(2)].

EQUATION 4.2: General Criteria Maximum Concentration (CMC)

$$CMC = (WER) * (CF_A) * \{e^{[(m_A * \ln hardness) + b_A]}\}$$

Where: CCC = Criteria Continuous Concentration
WER = Water-effect Ratio
CF_A = Conversion Factor for freshwater chronic criteria
m_A = correlation coefficient
b_A = correlation coefficient

The subscript "A" stands for "acute" and designates a variable in the CMC equation. The natural log and exponential functions are represented as "ln" and "e," respectively [40 CFR 131.38(b)(2)].

4.1 Criteria for Maximum and Continuous Concentration

Table 4.1 (above) identifies targets for both chronic and acute conditions: the CCC equation (Equation 4.1) and the CMC equation (Equation 4.2), respectively. The CMC is the highest concentration that will protect aquatic life from acute or short-term effects, such as mortality. In order to protect aquatic life, the one-hour average water column concentration must be below the CMC. Similarly, the CCC is the highest concentration that will protect aquatic life from chronic or long-term effects, such as reduced birth rates. In order to protect aquatic life, the four-day average water column concentration must be below the CCC. Neither the CCC nor the CMC can be exceeded more than once every three years [40 CFR 131.38 (c)(2)]. For purposes of evaluating if the Numeric Targets have been attained, sample results should be used according to the requirements in Table 4.2.

TABLE 4.2. Requirements for using sample results to evaluate CCCs and CMCs.

1. If only one sample is collected during the time period associated with the Numeric Target (e.g., one-hour average), the single measurement shall be used to determine attainment of the numeric target for the entire time period.
2. The one-hour average shall be the moving arithmetic mean of grab samples over the specified one-hour period.
3. The four-day average shall apply to flow-weighted composite samples for the duration of a storm, or shall be the moving arithmetic mean of flow weighted 24-hour composite samples or grab samples.

4.2 Water-effect Ratio

The WER is a mechanism for developing site-specific criteria by comparing bioavailability and toxicity of a specific pollutant in receiving waters and laboratory waters and is provided as a variable in the concentration criteria equations (Equations 4.1 and 4.2; USEPA, 2000a). A site-specific WER has not been developed for Chollas Creek. In such circumstances, a WER of unity is assumed and used in the equations. Site-specific criteria are discussed in further detail in Appendix H.

4.3 Total-To-Dissolved Metal Conversion Factor

Prior to 2000, metal criteria for the protection of aquatic life were based on total metal concentrations, that is, the concentration of all sized metal fractions in the water column. Since then the USEPA recommends dissolved metal concentrations, or metals in solution, be used for metal criteria, because dissolved metals more closely represent the fraction of metals bioavailable to aquatic organisms than do total metals (USEPA, 2000a). The CTR criteria equations (Equations 4.1 and 4.2) incorporate total-to-dissolved conversion factors (CFs) to account for that fact [40 CFR 131.38 (b)(2)(iv)]. The CFs for each metal, with respect to acute and chronic conditions, are listed in Table 4.3. The CF for lead is a function of hardness. Concern has arisen in the past that non-dissolved metal in the water column, such as particulate metal, could become bioavailable. Although the Federal Register provides good reasons why this should not be a concern, an explicit MOS was applied in this TMDL to address this possibility.

TABLE 4.3. Metal acute and chronic freshwater conversion factors for copper, lead, and zinc.

Metal	CF_A	CF_C
Copper	0.960	0.960
Lead	1.46203 – [0.145712 * ln (hardness)]	1.46203 – [0.145712 * ln (hardness)]
Zinc	0.978	0.986

Reference: [40 CFR 131.38(b)(2)].

4.4 Hardness

As discussed above, CTR criteria are based on empirical relationships of toxicity (metal concentrations) to water hardness (Table 4.1). Hardness is defined as the concentration

of calcium carbonate ($CaCO_3$) in the water column and has the units of milligram per liter (mg/L). Freshwater aquatic life criteria for certain metals are expressed as a function of hardness because hardness and/or water quality characteristics that are usually correlated with hardness can reduce or increase the toxicities of some metals. Hardness is used as a surrogate for a number of water quality characteristics that affect the toxicity of metals in a variety of ways. Increasing hardness has the effect of decreasing the toxicity of metals. Water quality criteria to protect aquatic life may be calculated at different concentrations of hardness, measured in milligrams per liter as calcium carbonate.

Like many flowing freshwater bodies, Chollas Creek waters exhibit a wide range of hardness levels. Because hardness data to accurately assess this range were limited, hardness was set as a variable in the numeric targets. Consequently, hardness concentrations must be measured at the time of compliance and the criteria subsequently determined using the equations in Table 4.1. Further, because hardness will be determined at the time of compliance and included as a variable in the CTR equation, a more site-specific and temporal-specific numeric target is achieved.

At times when the hardness concentration exceeds 400 mg/L, a value of 400 mg/L will be used for hardness no matter what the extent of the exceedance. This is because the CTR caps the allowable hardness value that can be used to calculate the resulting water quality criteria. As hardness increases, so do the numeric targets. Conversely, decreasing hardness results in decreasing the numeric targets. Without the use of a WER, the maximum hardness value for associated use with the numeric targets is 400 mg/L $CaCO_3$. The available data suggests that few metal concentrations will exceed CTR criteria at a hardness of 400 mg/L $CaCO_3$.

4.5 Correlation Coefficients

The last variables are the correlation coefficients (m and b) shown in Equations 4.1 and 4.2. These coefficients are the result of fitting acute freshwater toxicity metal concentration data to hardness in a log-log relationship and are specified for each metal in Table 4.4 below (USEPA, 1985).

TABLE 4.4. Criteria correlation coefficients.

Metal	m_A	b_A	m_C	b_C
Copper	0.9422	-1.700	0.8545	-1.702
Lead	1.273	-1.460	1.273	-4.705
Zinc	0.8473	0.884	0.8473	0.884

Reference: [40 CFR 131.38(b)(2)]

4.6 Newly Proposed Copper Criteria

The USEPA has published a document, *2003 Draft Update of Ambient Water Quality Criteria for Copper* (EPA-822-R-03-026), containing updated freshwater and saltwater aquatic life criteria for copper. These criteria revisions are based in part on new data that have become available since the USEPA's last comprehensive criteria updates for copper.

In addition to incorporating new data, the freshwater criteria also incorporate the use of the biotic ligand model (BLM) in the criteria derivation procedures (USEPA, 2003).

The newly recommended freshwater criteria (the CMC and CCC is 2.1 micrograms per liter (µg/L) and 1.3 µg/L, respectively) differ from CTR's current metals criteria primarily with regard to how metal availability to organisms is addressed. As mentioned above, CTR criteria were based on empirical relationships of toxicity to water hardness. The newly recommended criteria use a BLM instead (Di Toro et al. 2001). The BLM is based on the premise that toxicity is related to metal bound to a biotic site (the biotic ligand) and that binding is related to dissolved metal concentrations and complexing ligands in the water.

The newly recommended criteria do not supersede the CTR criteria. At this time, the San Diego Water Board will continue to use CTR as the basis for the metals TMDLs numeric targets. When the TMDLs are revisited in the future, the San Diego Water Board may re-evaluate the numeric targets set forth here, based on the newly recommended criteria.

5 Source Analysis

The source analysis summarizes the major suspected sources of dissolved copper, lead, and zinc to the Chollas Creek Watershed. This includes consideration of point sources and nonpoint sources (which include background) and an estimate of their magnitude and location. Metals, such as copper, lead, and zinc, enter surface waters from point and nonpoint sources. Point sources typically discharge at specific locations from pipes, outfalls and conveyance channels from municipal wastewater treatment plants, industrial waste treatment facilities and stormwater conveyance systems. Nonpoint sources are diffuse sources that reach receiving waters from different routes of entry and originate from multiple land uses.

Essentially all sources (point and nonpoint) enter Chollas Creek through the stormwater conveyance system that is regulated by WDRs prescribed in Order No. R9-2007-0001. This order regulates discharges to surface waters from municipal separate storm sewer systems (MS4s) in San Diego County. MS4 discharges are collectively considered to be point sources of urban runoff discharges due to their release from channelized, discrete conveyance pipe systems and outfalls. Because there are currently no other known point sources, urban runoff is considered the most significant source of metals to Chollas Creek and will be the main focus of this analysis. In addition, this analysis will detail potential sources of urban runoff from activities outside and inside of the Chollas Creek Watershed boundaries, including atmospheric deposition. Estimates are drawn from several studies conducted outside the watershed as well as modeling results based on land use classifications within the watershed. Broad classes of sources (for example, urban runoff, atmospheric deposition, etc.) and specific individual sources (for example, land uses, cars, etc.) will be discussed.

Specifically, modeling results based on land use category parameters, hydrological characteristics and observed metal concentrations provided estimates of the magnitude of metal loadings (Appendix D). The top two land use categories in Chollas Creek, freeways and commercial/institutional, contribute over 75 percent of the total load for each metal (Figures 5.4, 5.5 and 5.6). Significant sources of all three metals to urban runoff are thought to include automobile operation (especially brake pads and tires) and industries with practices that may expose metals to stormwater. Water supply infrastructure corrosion, pesticide application and atmospheric deposition are also among the identified potential sources.

5.1 Urban Runoff Regulation in Chollas Creek Watershed

Urban runoff discharges from MS4s are a leading cause of receiving water quality impairments in the Chollas Creek Watershed. In addition, a direct linkage has been established between toxicity and stormwater discharges in the watershed (Schiff, 2001). According to Order No. R9-2007-0001 requirements, all entities that share a particular stormwater system are responsible for urban runoff discharges both (1) into their stormwater conveyance system and (2) from their stormwater conveyance system. Order No. R9-2007-0001 for San Diego County names 20 different entities responsible for stormwater discharges in the San Diego Region. Other than the MS4, there are no known direct point source discharges of metals to water bodies in the Chollas Creek Watershed.

The small size of the creek's riparian zone and the encroachment of development along the creek make the amount of run-off directly to the creek much smaller than that entering from storm drains. Furthermore, under Order No. R9-2007-0001, the creek itself is considered part of the storm drain system. Therefore, parties named in Order No. R9-2007-0001 are responsible for not only the run-off entering the creek, but also for the water in the creek itself.

Other responsible persons are those that hold general or individual Waste Discharge Requirements applicable in Chollas Creek. Some of the other major dischargers include Caltrans and the Navy. Caltrans is regulated under statewide Order No. 99-06-DWQ. Storm water runoff from the U.S. Navy's MS4 system, as discussed in Section 5.1.1, will also be regulated.

5.1.1 San Diego Water Board Order No. R9-2007-0001

In 1990, the USEPA developed rules establishing Phase I of the NPDES stormwater program, designed to prevent harmful pollutants from being washed by urban runoff into MS4s or from being dumped directly into MS4s and then subsequently into local water bodies. Phase I of the program required operators of medium and large MS4s (those generally serving populations of 100,000 or more) to implement an urban runoff management program as a means to control polluted discharges from MS4s. Approved urban runoff management programs for medium and large MS4s are required to address a variety of water quality-related issues, including roadway runoff management, municipally owned operations and hazardous waste treatment. More specifically, large and medium operators are required to develop and implement Urban Runoff Management Plans that address, at a minimum, the following elements:

- Structural control maintenance;
- Areas of significant development or redevelopment;
- Roadway runoff management;
- Flood control related to water quality issues;
- Municipally owned operations such as landfills, wastewater treatment plants, etc.;
- Hazardous waste treatment, storage, or disposal sites, etc.;
- Application of pesticides, herbicides and fertilizers;
- Illicit discharge detection and elimination;
- Regulation of sites classified as associated with industrial activity;
- Construction site and post-construction site runoff control; and
- Public education and outreach.

Of the 20 entities identified in Order R9-2007-0001, the cities of San Diego, Lemon Grove, and La Mesa, the County of San Diego, and the Port (Municipal Dischargers) are all in the Chollas Creek Watershed and are responsible for addressing metal water quality concerns for the MS4 in the Chollas Creek Watershed, as applicable. One exception to note is that the Navy has runoff from its community facilities (Naval Base San Diego) in the Chollas Creek Watershed regulated under its industrial discharge WDRs prescribe in

Order No. 2002-0169.[19] Order No. 2002-0169 does regulate urban runoff discharges from MS4s, and the facility is not currently regulated under the MS4 WDRs prescribed in Order No. R9-2007-0001. The Navy is expected to be enrolled in the statewide general WDRs prescribed for small MS4s in Order No. 2003-0005-DWQ.[20]

5.1.2 Other Applicable Orders and Regulations

Table 5.1 lists other applicable WDR orders in the Chollas Creek Watershed. With respect to the source analysis, these orders regulate activities that may be contributing metals to Chollas Creek through urban runoff. All applicable orders must be made

TABLE 5.1. Other applicable orders for land use practices in the Chollas Creek Watershed.

Order General Name	Order Number	NPDES Permit Number	Sections[1]
Statewide Caltrans MS4, industrial, construction Stormwater WDRs	99-06-DWQ	CAS 000003	5.5.1, 5.5.3 and 5.5.6
Statewide General Industrial Stormwater WDRs	97-03-DWQ	CAS 000001	5.5.6
Statewide General Construction Stormwater WDRs	99-08-DWQ	CAS 000002	5.5.3
Landfill, burn sites - South Chollas Creek WDRs			
Temporary Groundwater Extraction and Discharge to San Diego Bay and Its Tributaries (Dewatering) WDRs	R9-97-11, Addendum No. 4		5.5.9
Groundwater Extraction Waste Discharges From Construction, Remediation, and Permanent Groundwater Extraction Projects to Surface Waters within the San Diego Region except for San Diego Bay	R9-2000-90	CAG 919001	N/A
	R9-2001-96	CAG 919002	N/A

[1] The section in this analysis of which the respective land use practice is discussed is listed beside the order.

[19] Order No. R9-2002-0169 NPDES Permit No. CA0109169, *Waste Discharge Requirements for U.S. Navy Naval Base San Diego, San Diego County*.
[20] State Water Board Order No. 2003-0005-DWQ, NPDES General Permit No. CAS000004, *Waste Discharge Requirements for Storm Water Discharges from Small Municipal Separate Storm Sewer Systems*.

consistent with the load and waste load allocations of this TMDL. In addition, other regulatory agencies may regulate other urban runoff sources, such as atmospheric deposition from industry and auto emissions, domestic water supply and various pesticide applications (sections 5.4.2, 5.4.5 and 5.5.4). Other sources, such as sewage spills and disposal of particular household products (section 5.5.2) are prohibited by law.

5.2 Estimation of Metal Magnitude and Location from Urban Runoff

Multiple sources of copper, lead, and zinc contribute to the accumulated metal on the surfaces of the Chollas Creek Watershed. Rainfall events and dry-weather urban runoff transfer these accumulated metals to Chollas Creek via the MS4 system. Because the relative loads entering Chollas Creek depend on wet or dry weather conditions, an assessment of existing loads requires separate analyses.

5.2.1 Land-use Modeling

Watershed models were developed by Tetra Tech, Inc. (Appendix D) to estimate the magnitude and source land uses of existing annual metal loadings to the Chollas Creek Watershed during both wet and dry weather conditions of a typical year. In addition, loads for a critical year, a year in which extraordinary rain volumes result in a higher mass load contribution, were also estimated. Table 5.2 shows the total estimate (wet and dry weather condition loads added together) for dissolved metal loading for both a typical and a critical year. All concentrations reported in this section are dissolved metals.

TABLE 5.2. Estimated existing total loads for Chollas Creek for both wet and dry weather conditions during a typical and critical year.

	Copper (dissolved) (g/yr)	Lead (dissolved) (g/yr)	Zinc (dissolved) (g/yr)
Typical Year	232,829	194,175	1,327,393
Critical Year	985,241	705,310	5,994,241

Unfortunately, limited data prevented complete utilization of the watershed models. Because the dry weather model simulation of metal concentration could not be properly calibrated and validated, the dry weather portion of the total estimate was calculated based only on the average observed concentrations. In addition, further refinement of both models is needed before results could be used in calculating a mass load allocation for a TMDL. Regardless, the model results quantify land use metal contributions and will be helpful in targeting higher priority subwatersheds and land uses for implementation of the TMDL during wet weather conditions. Further, the data to be collected as part of compliance monitoring for this TMDL will be used to complete the dry weather model as well as further refine the wet weather model. If modeling results warrant, the TMDL estimates could be adjusted as necessary at that time.

5.2.1.1 Urban Runoff from Wet Weather

Estimating wash-off from various land uses is an appropriate way to quantify the primary sources of copper, lead, and zinc loading during wet conditions. Runoff volume and

metal concentrations from each subwatershed are therefore dependent on build-up and wash-off rates, which differ depending on the subwatershed's land uses (Figures 5.1 and 5.2). The land uses incorporated into the wet weather watershed model are described in Appendix E.

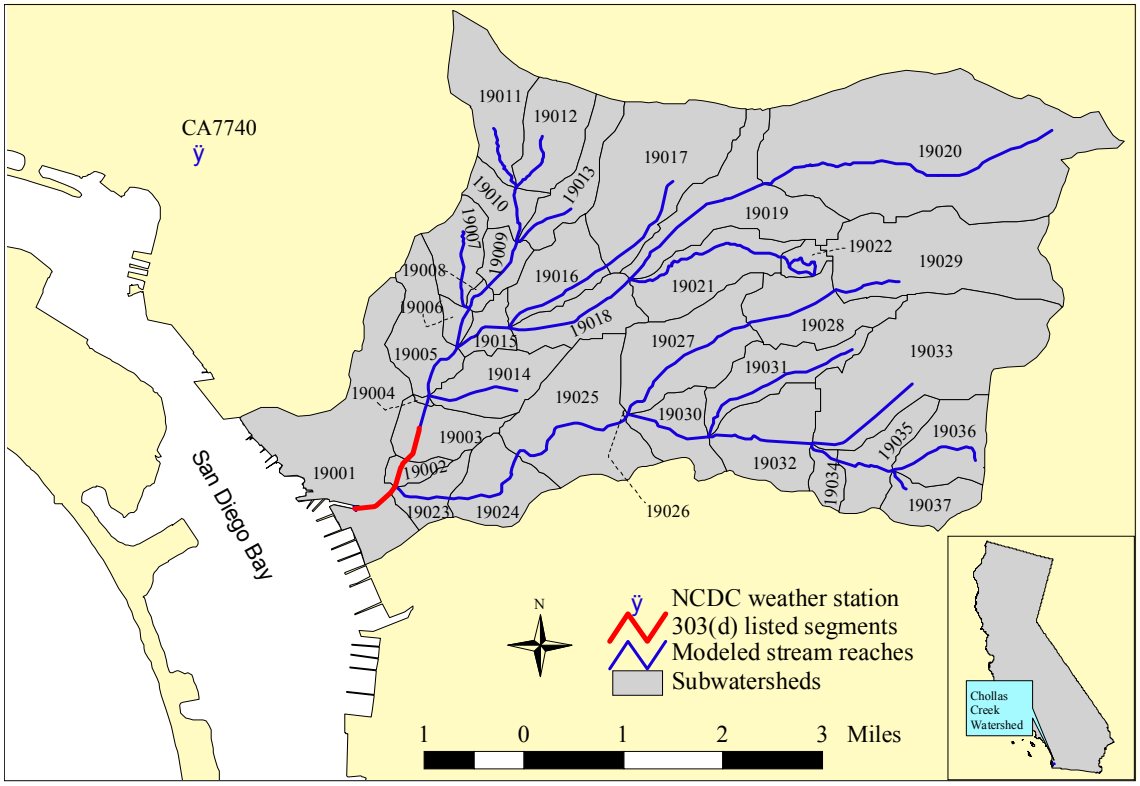

FIGURE 5.1. Chollas Creek Watershed divided into subwatersheds. (referenced by number)

To estimate total copper, lead, and zinc loadings during wet weather events, a watershed model was developed (Appendix D). Hydrology and water quality simulations were performed for 1990 through 2003. Data collected from the San Diego County stormwater programs and other special studies were used to calibrate model outputs (metal loadings) in the watershed. Table 5.3 presents the average annual wet weather load to Chollas Creek (based on model results from 1990-2003) for a typical and critical year. In comparison to the total estimate (Table 5.2), wet weather comprises at least 99.7 percent of the total load for each metal. A critical year was selected in order to understand conditions during maximum flow conditions. For the time period of 1990 through 2003, 1993 was selected as the critical year. This critical wet condition was selected based on the identification of the 93rd percentile of annual rainfall observed at multiple rainfall gages in the San Diego Region during this time period.

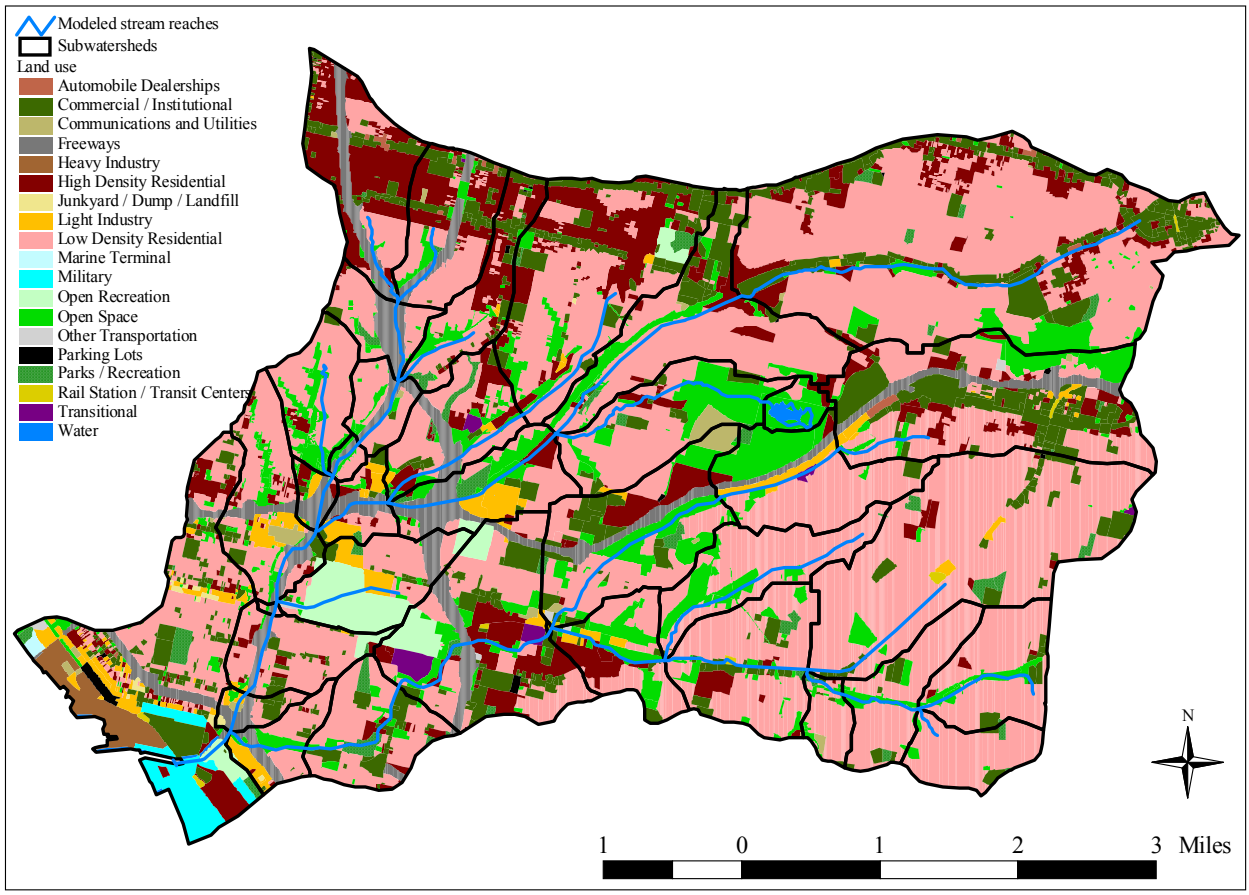

FIGURE 5.2. Land use distribution in the Chollas Creek Watershed.

TABLE 5.3. Estimated existing wet weather total loads for Chollas Creek during a typical and critical year.

	Copper (dissolved) (g/yr)	Lead (dissolved) (g/yr)	Zinc (dissolved) (g/yr)
Typical	232,137	194,007	1,326,407
Critical	984,549	705,142	5,993,255

Because the model estimated loads based on subwatershed characteristics (and hence associated land uses), the location of areas with relatively higher loading can be identified. Figure 5.3 shows annual wet weather loads from the North and South Forks of Chollas Creek. The North Fork contributes a greater pollutant load than the South Fork. These differences are most likely due to the different size and land use distribution of the two drainage areas. For another perspective, Table 5.4 summarizes the top 10 watershed mass load contributors in Chollas Creek for each subwatershed (Figure 5.1).

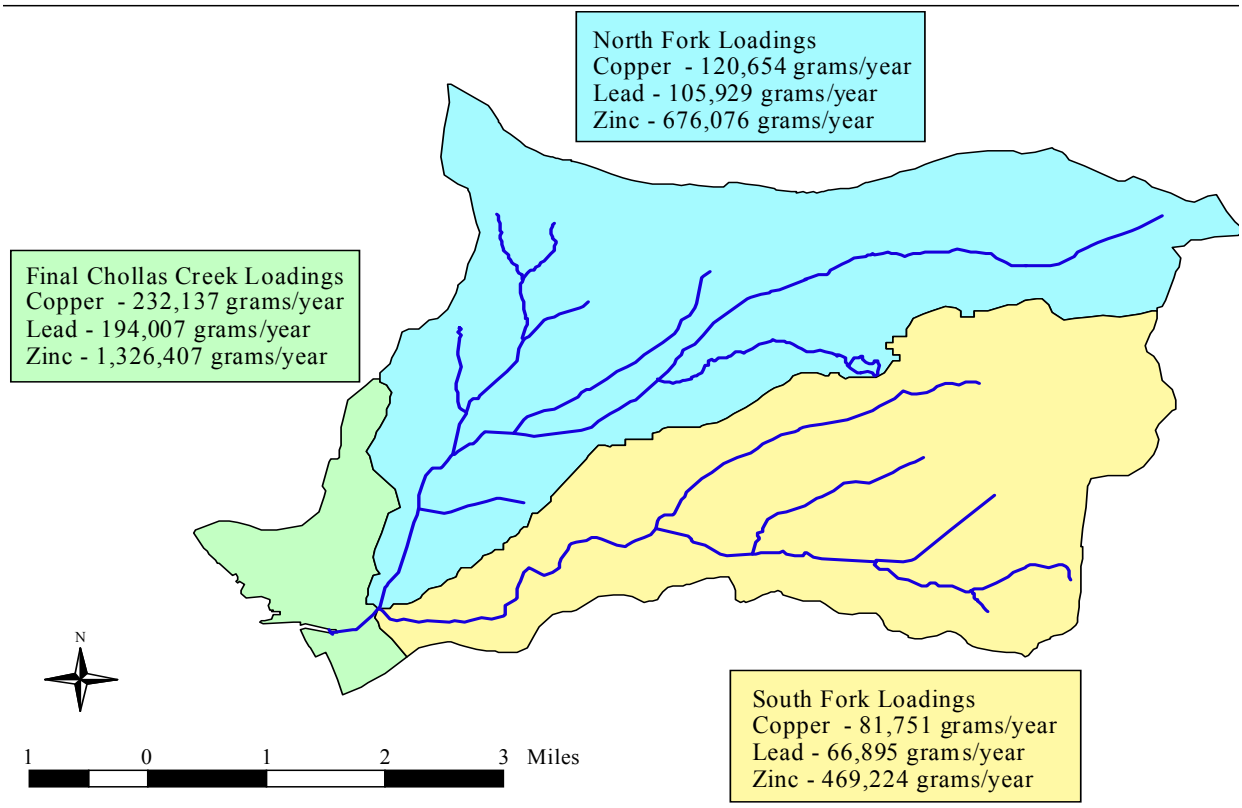

FIGURE 5.3. Average annual wet weather loads for the main branches of the Chollas Creek Watershed.

TABLE 5.4. For each metal, the top ten contributing subwatershed of mass loads relative to all thirty-seven subwatersheds.

Rank	Copper	Lead	Zinc
1	19001*	19001*	19001*
2	19020	19029	19020
3	19029	19020	19029
4	19025	19025	19027
5	19011	19011	19025
6	19027	19027	19011
7	19017	19018	19017
8	19012	19012	19012
9	19018	19017	19018
10	19005	19005	19005

**Subwatershed 19001 was assumed to drain entirely to Chollas Creek, however, portions of the watershed drain to San Diego Bay. Due to the limitations of model set-up, the watershed could only drain either to the Bay or Chollas Creek. The conservative decision was made that all drainage was to Chollas Creek.*

Relative basin-wide contributions from each land use are illustrated in Figures 5.4 through 5.6. For all three metals, freeways and commercial/institutional land uses have the highest relative loading contributions; together, these two land uses account for over 75 percent of the metal loadings. Appendix E gives average annual loadings for dissolved copper, lead, and zinc (1990 to 2003) with respect to subwatersheds and land uses and also gives subwatershed areas.

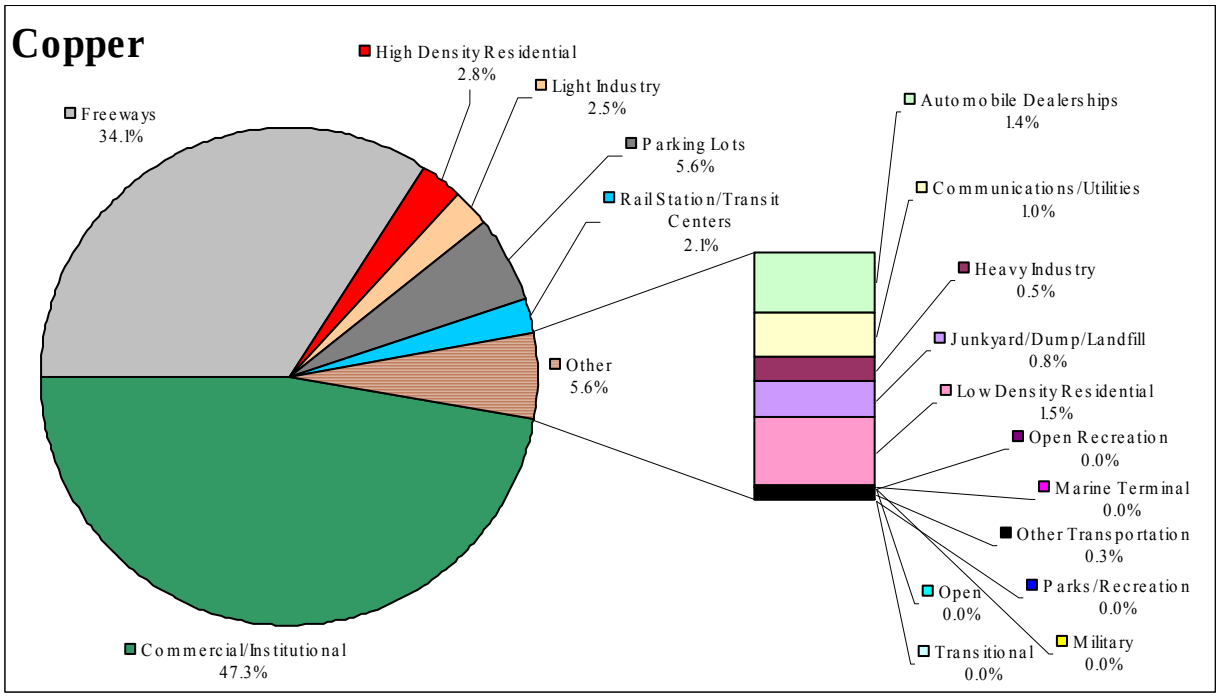

FIGURE 5.4. Basin-wide wet weather copper contributions by land use in the Chollas Creek Watershed.

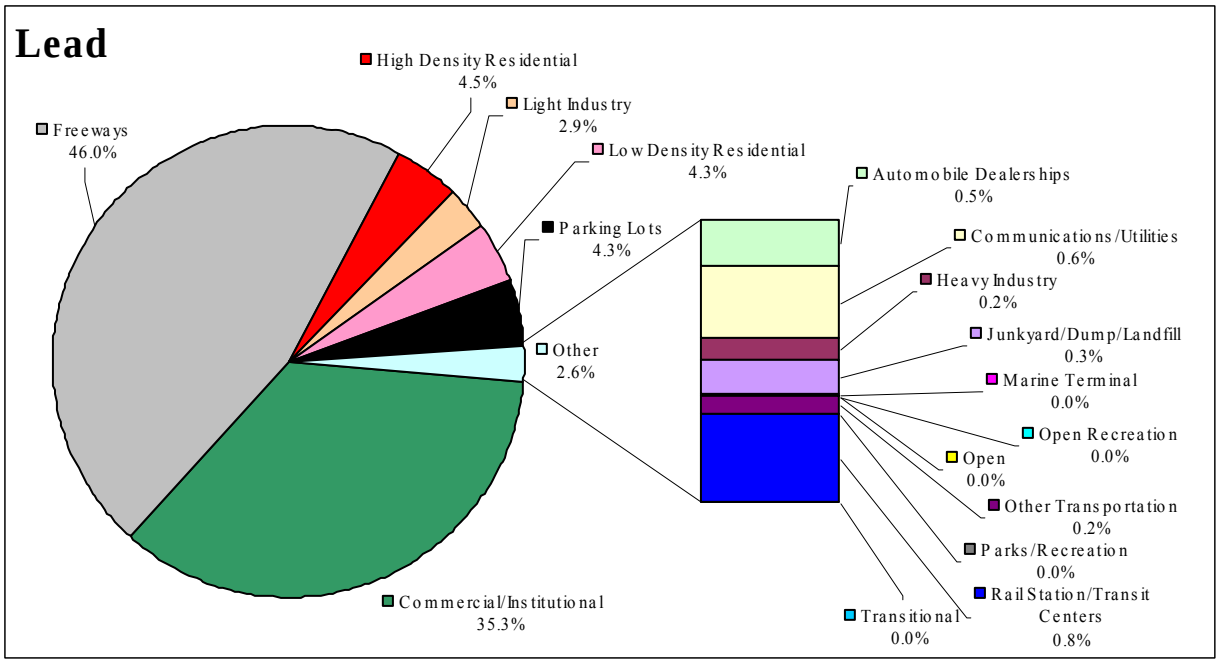

FIGURE 5.5. Basin-wide wet weather lead contributions by land use in the Chollas Creek Watershed.

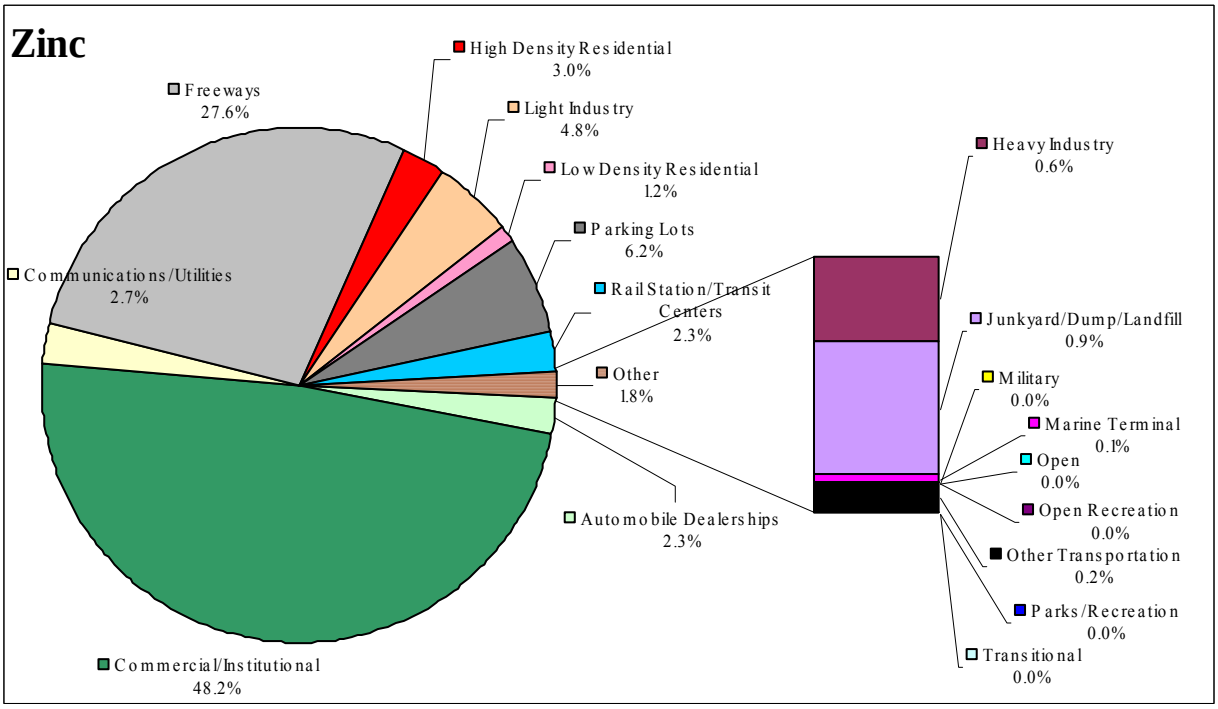

FIGURE 5.6. Basin-wide wet weather zinc contributions by land use in the Chollas Creek Watershed.

5.2.1.2 Urban Runoff from Dry Weather

During dry weather conditions, impaired streams can exhibit a sustained flow even if no rainfall has occurred for a significant period to provide runoff or groundwater flows. These flows are generally understood to result from various urban land use practices that cause water to enter storm drains and inland surface waters. Sources of urban flow in Chollas Creek include lawn irrigation runoff, car washing and sidewalk washing. Not only can these urban flows initially contain metals, they may accumulate metals as they travel across lawns and urban surfaces, transporting them to the MS4 system and thus, into Chollas Creek.

To quantify sources from runoff during dry weather, a steady state spreadsheet model was developed to estimate dry weather flow in the watershed (Appendix D). As mentioned before, because limited in-stream dry weather data were available for model calibration and validation, copper, lead, and zinc concentrations could not be simulated. Therefore, the simulated flow value was combined with average in-stream dry weather concentrations for dissolved copper, lead, and zinc to calculate estimated basin-wide existing loads for each metal (Table 5.5). Since dry weather days were selected based on the criterion that less than 0.2 inches of rain fell during the previous 72 hours, Table 5.5 values also represent the maximum loading (critical condition) during dry weather. Data limitations prohibited the calculation of land use specific loadings and more detailed analyses. Again, the dry weather contributions for each metal comprise at most 0.3 percent of the total estimated existing annual load (Table 5.2).

TABLE 5.5. Existing dry weather load (grams per year) for both typical and critical years.

Copper (dissolved)	Lead (dissolved)	Zinc (dissolved)
692	168	986

5.2.1.3 Discrepancies from Stormwater Monitoring Reports

The San Diego County dischargers regulated under Order No. R-2007-0001 (Stormwater WDR Order) are required to send in annual Stormwater Monitoring Reports containing estimates of existing metal loads from watersheds through out San Diego County, including the Chollas Creek Watershed. The method used to estimate existing metal loads in these annual monitoring reports is different than the modeling method used by Tetra Tech, Inc. for this Chollas Creek Metals TMDL project; thus, different existing metal loads are estimated from each method.

The modeling method used by Tetra Tech, Inc. incorporates a dynamic calculation of loads based on accumulated pollutants during antecedent dry conditions, amount of pollutants washed off during a rainfall event and the flow resulting from rainfall events. The Stormwater Monitoring Reports currently uses a spreadsheet to calculate loads by first estimating flow volumes based on precipitation and estimating EMCs from local monitoring and literature values. Comparatively, the modeling included a more detailed representation of the Chollas Creek Watershed, including current land use coverage,

delineated subwatersheds, soil layers and 14 years of local rainfall data, which captured a wide range of meteorological conditions.

The most likely significant difference between the approaches is the land use coverage. For instance, determining how land use impacted the loads in the spreadsheet model was difficult, because specifics were not provided in Annual Reports on the land uses draining to the mass emissions stations or how this influenced the EMC calculation. Furthermore, in order to take into account recent changes in regional land uses, the most current data were needed to populate the model (LSPC used the 2000 SANDAG coverage; Stormwater Monitoring Reports used 1990 SANDAG coverage). For these reasons, the Stormwater Monitoring Report estimates are considered less robust than the modeling estimates.

5.3 Urban Runoff Studies in Other Watersheds

Many studies have been done worldwide to identify the sources of metals in urban runoff, including several studies in California, although there is minimal information available specifically for San Diego. In this section, the general conclusions of some of these studies, applicable to Chollas Creek, are presented. The main purpose is to provide information regarding potential individual sources of metals in urban runoff and the relative contribution of each of the potential sources. This information is not intended to quantify existing loads. In later sections these studies will be referred to as support of more specific metal contributions to urban runoff from outside and inside the Chollas Creek Watershed.

5.3.1 Santa Clara Valley Study

The various sources of metals in an urban watershed were detailed in a 1992 study in Santa Clara Valley (SCV study; Woodward Clyde, 1994), an urban center located in the San Jose area near San Francisco, California. In 1997 the SCV study results were largely modified to include several more years of water quality data (Woodward-Clyde, 1997). Specifically the SCV study was performed to identify major sources of metals found in the South San Francisco Bay. Major sources of several metals, including copper, lead, and zinc, were identified and a percentage of the total annual load for each metal was attributed to each major source.

An investigation of similar detail to the SCV study has not been performed in the San Diego area. However, since both San Diego and Santa Clara are large urban centers on the west coast, some general knowledge from the SCV study can be applied to Chollas Creek. Furthermore, the SCV study estimated the nearly same magnitude of metal load per acre as did the Chollas Creek Watershed model: copper was 0.030 and 0.033 pounds per acre (lb/acre), respectively; lead was 0.026 and 0.032 lb/acre, respectively; and zinc was 0.155 and 0.186, respectively.[21] Table 5.6 list sources that comprised the top five sources of loading to South San Francisco Bay for each metal.

[21] Chollas Creek has an estimated 16,000 acres. The area draining to South San Francisco Bay has an estimated 298,000 acres. The estimate from Chollas Creek was converted to total metal concentrations by conversion factors 0.96, 0.791 and 0.978, for copper, lead and zinc, respectively.

TABLE 5.6. Top five metal sources in urban runoff, in decreasing order (SCV, 1997)

Constituent	Top Metal Sources
Copper	Brake pads, POTWs*, Natural erosion, Reservoir releases, Water supply/corrosion
Lead	Tailpipe emissions, Natural erosion, Brake pads, Reservoir releases, POTWs
Zinc	POTWs, Tires, Natural erosion, Industry with metal processes, Brake pads

*POTWs – publicly owned treatment works.

Publicly owned treatment works (POTWs) were the only identified point sources in the SCV study. All other sources were considered nonpoint sources. It is important to emphasize that POTWs, or any other point sources besides the MS4, are not present in the Chollas Creek Watershed. The Chollas Creek source analysis and the SCV study also differ in that there are no reservoirs used for potable water in the Chollas Creek Watershed. Figures 5.7 through 5.9 show the relative amounts of copper, lead, and zinc contributions for the SCV study when sources from POTWs and reservoir releases are not considered. Automotive sources are thought to be a significant source of all three metals, including brake pads, tailpipe emissions and tire-wear. Industries that have processes that expose metal to stormwater, water supply and corrosion and illegal dumping, especially of motor oil, are also sources that should be mitigated to help lower metal sources to Chollas Creek.

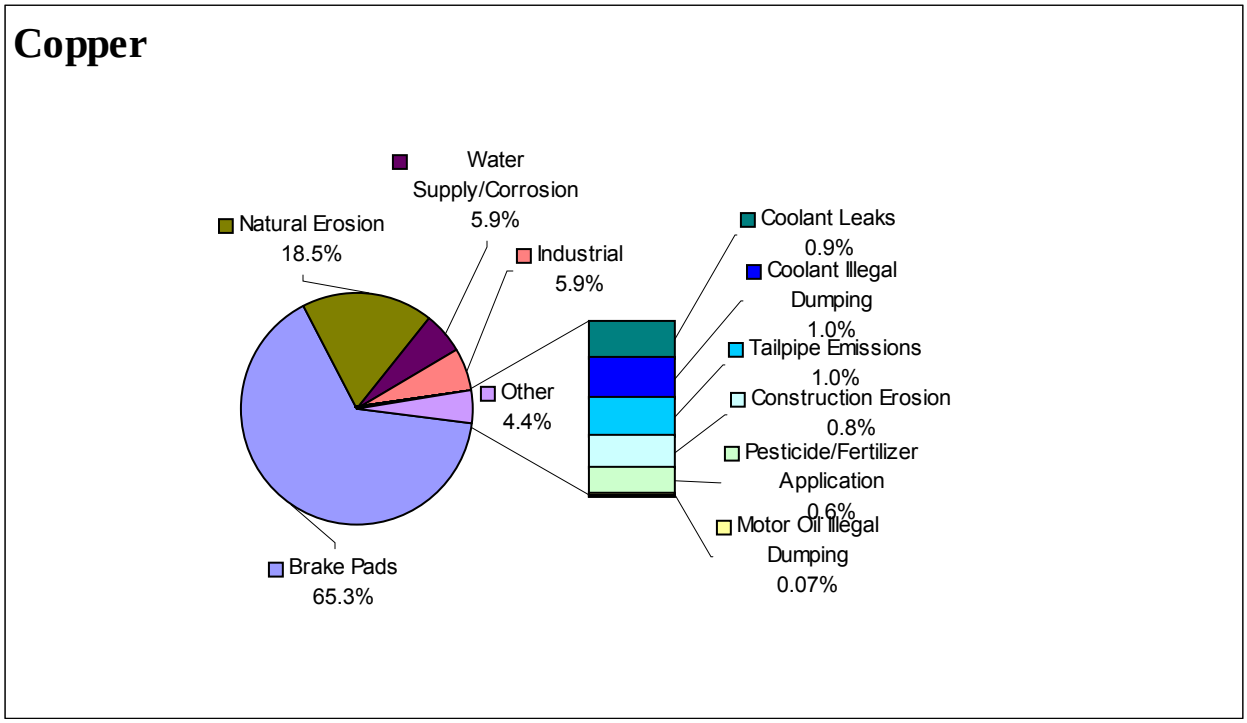

FIGURE 5.7. Relative amounts of copper loading in SCV, adjusted to omit sources from POTWs, reservoir releases and natural erosion. (Woodward Clyde, 1997)

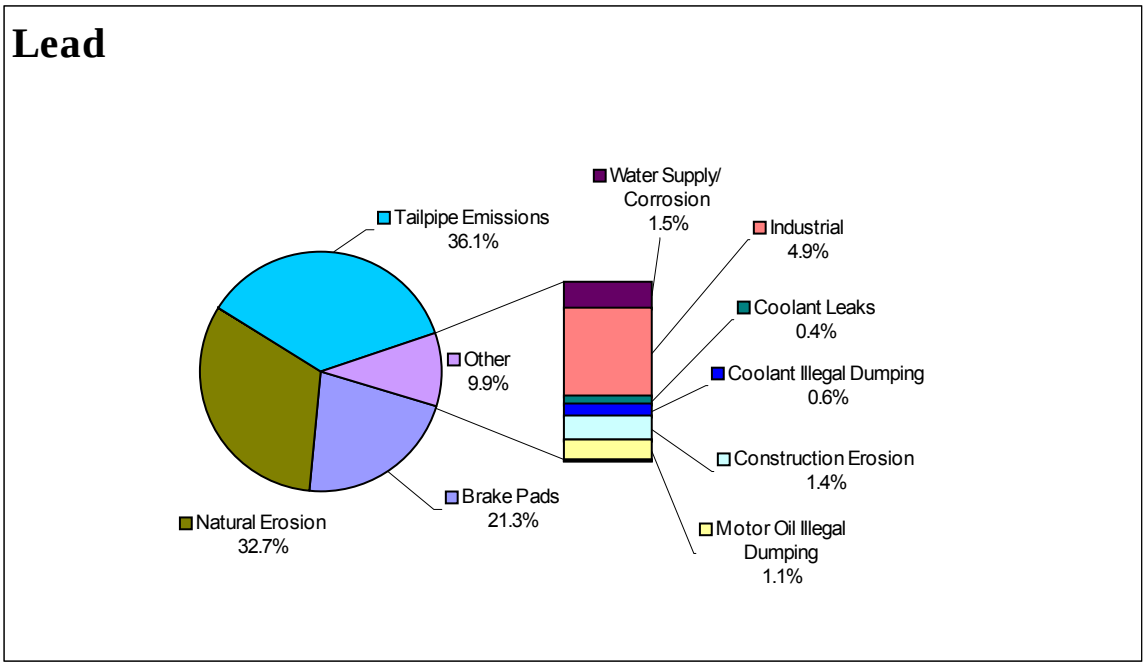

FIGURE 5.8. Relative amounts of lead loading in SCV, adjusted to omit sources from POTWs, reservoir releases and natural erosion. (Woodward Clyde, 1997)

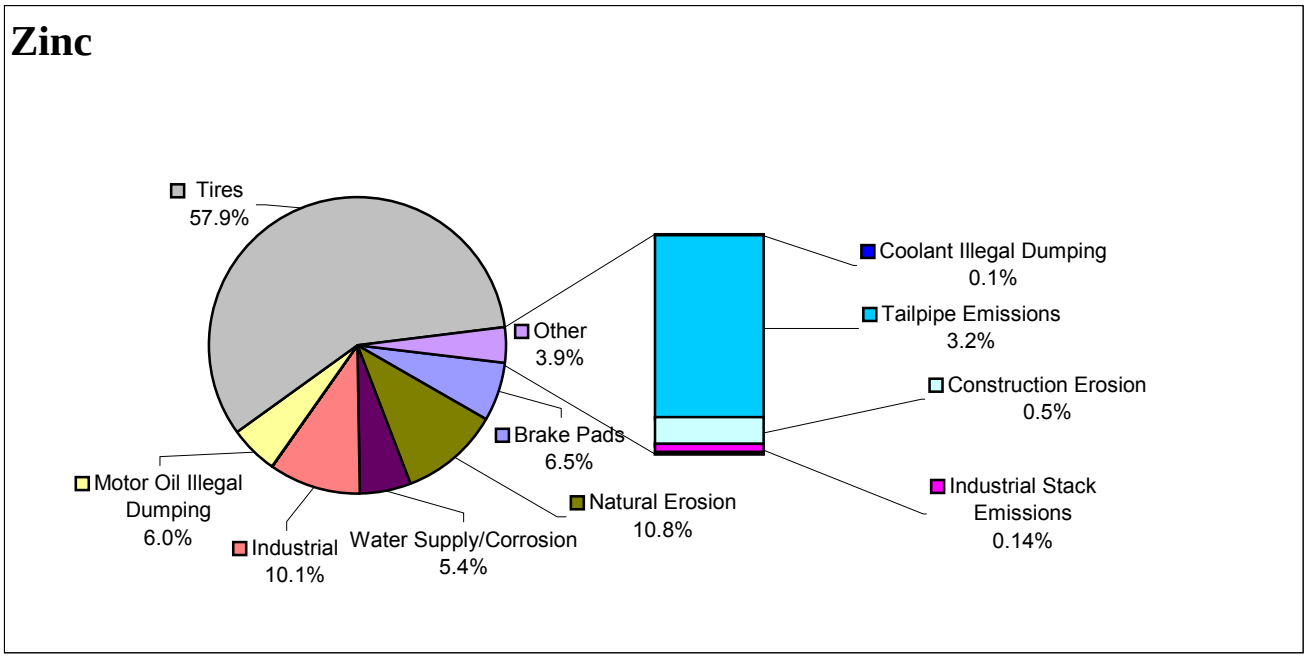

FIGURE 5.9. Relative amounts of zinc loading in SCV, adjusted to omit sources from POTWs, reservoir releases and natural erosion. (Woodward Clyde, 1997)

5.3.2 Other Studies

In addition to the SCV study, other studies in urban areas, although less extensive, have also identified many of the same sources of metals in urban runoff, further confirming them as potential sources in Chollas Creek. The USEPA (1993) and Sansalone, et al. (1997) listed many of the sources identified in the SCV study as well as new ones. Table 5.7 summarizes the following sources of copper, lead, and zinc in urban runoff (USEPA 1993; Sansalone, et al. 1997). Furthermore, Muschack (1990) identified metal sources in urban runoff from Germany that included automotive exhaust gases, tire abrasion particles, brake lining abrasion dust, lubricating oils and greases and abrasion of roadways. Also, investigations in Fresno (Brown and Caldwell, 1984) and in Santa Monica (Stolzenbach, et al. 2001), California, researched the deposition rates of atmospheric metal loads from industrial and tailpipe emissions as sources.

TABLE 5.7. Anthropogenic constituents in runoff from urban pavement. (modified from USEPA 1993)

Constituent	Primary Source
Copper	Metal plating, bearing and bushing wear, moving engine parts, brake lining wear, fungicides, insecticides
Lead	Automotive emissions, tire wear (lead oxide filler material), lubricating oil and grease, bearing wear, brake lining wear, engine wear
Zinc	Tire wear (filler material and accelerator in vulcanization process as zinc oxide 0.73%), motor oil (stabilizing additive), grease, metal plating erosion, engine wear

Source: (USEPA, 1993)

Again, general conclusions about metal sources in Chollas Creek can be made based on the similarity of the identified sources of metals in urban runoff from different areas as shown in the studies discussed above: if the major sources of metals in urban runoff were similar for different urban areas a reasonable assumption is that the same sources are present in the Chollas Creek Watershed as well. More information is needed to confirm this assumption or to quantify the amount of contributions from the different sources. The next two sections discuss potential sources from both outside and inside the Chollas Creek Watershed and confirm that many of the sources of metals in urban runoff seen in other urban areas are present in the Chollas Creek Watershed.

5.4 General Urban Runoff Sources: Background, Anthropogenic and Water Supply

The previous section identified various sources that can contribute metals[22] to urban runoff. Obviously, most of these sources cannot be pinpointed to a specific model land use category found in Section 4.2. Most sources can be ascribed to numerous land use practices and even to activity found throughout the area that encompasses a watershed. For example, atmospheric deposition may be from cars driving throughout the Chollas Creek Watershed, from equipment operating at industrial facilities within the Chollas Creek Watershed and from industrial stack emissions from facilities outside of the Chollas Creek Watershed. The sources that are found throughout the regional area are

[22] All measurements are of total metals, unless otherwise denoted as dissolved metals. TABLE 4.3 provides appropriate total to dissolved conversion factors.

addressed in this section: background, atmospheric deposition, groundwater, sediment and water supply. Background, as defined in this report, is solely the natural level of metals that would go to Chollas Creek without any influence from humans and because of this, background can also be considered a portion of the four other categories. Anthropogenic sources, as defined in this report, are from human activities throughout an area that cannot be pinpointed to a certain area, or in this case the Chollas Creek Watershed. Also, water supply is addressed in this section, because the water supply for the Chollas Creek Watershed comes from outside sources.

These categorized sources most likely enter Chollas Creek directly or indirectly through the MS4 system. As mentioned before, nonpoint sources to Chollas Creek would most likely enter through the MS4 system and thus, would become a point source. Because of this and lack of data to prove otherwise, any nonpoint source that goes directly into Chollas Creek is assumed to be comparatively insignificant. Data limitation also prevents any specific estimation of loading from these sources. Direct atmospheric deposition may be revealed as a significant source once data become available. However, other urban runoff studies have made some estimates that may provide insight into these potential nonpoint sources. The model-estimates, in a general way, capture these sources because initial land use parameters were developed from other urban studies with similar anthropogenic sources. Furthermore, the model was calibrated to observed metal concentrations in Chollas Creek, which would inherently account for all anthropogenic sources.

5.4.1 Background

Metals occur naturally and cycle by biogeochemical processes throughout the environment. Consequently, of the total metals that may be present in Chollas Creek, a fraction are likely to be from natural sources. There are no background data available for Chollas Creek and an actual quantification of background is not possible given the currently available data. However, model estimates and local reservoir data were examined in order to try to get some insight on natural background sources in the Chollas Creek Watershed.

Generally speaking, open space land uses are assumed to represent natural states of slope and vegetative cover and surface runoff from open space could account for background sources of metals. Approximately 9.73 percent of the Chollas Creek Watershed is designated as open space; however, this area likely does not represent a pristine land use. Surrounding development, urban-sourced atmospheric deposition, prior grading and non-native and invasive species all are likely to effect metal build-up and wash-off rates and surface water infiltration rates in these open spaces. Influences like these should increase metal export rates by increasing metal build-up and surface water velocity and thus, would result in higher metal concentrations than natural background. However, even with these influences, the model estimated the potential load of each metal from the open space land use to be 0.0 percent of the total existing load for each metal. According to the model, the relative contribution of metals from open space land use and thus from background, appears to be insignificant in comparison to loadings from other land uses.

Because data do not exist to determine actual background metal concentrations in Chollas Creek, data from a local reservoir were reviewed. Depending on their location and the source of water, reservoirs should theoretically contain close to background concentrations of heavy metals, because they collect surface runoff. Total metal concentrations were obtained from the City of San Diego Water Department for the Morena Reservoir between 1997 and 2003. The Morena Reservoir was chosen because it does not receive imported water and its watershed, the Cottonwood watershed, is a mainly undeveloped watershed: approximately 90 percent is undeveloped, 1 percent is residential and 8% is the Cleveland National Forest (City of San Diego, 2003). The average concentration for copper, lead, and zinc was 4.0 µg/L, 1.3 µg/L and 3.1 µg/L, respectively. Further, removing an outlier of 61.7 µg/L in the year 2000 from the data set, the average copper concentration is 1.65 µg/L.[23] These concentrations represent the initial metal load available to a treatment plant and subsequently to the Chollas Creek Watershed.

5.4.2 Atmospheric Deposition

Atmospheric deposition is another potential source of metals to Chollas Creek. Atmospheric emissions from both stationary point sources (e.g. industrial) and mobile sources, including emissions from both diesel-fueled and unleaded-fueled vehicles, enter the water bodies via direct and indirect deposition. These emissions affect rainfall and also cause settling of particulates during dry weather (Woodward-Clyde, 1992). Direct atmospheric deposition results from both wet and dry deposition directly to the surface of the water body. Indirect atmospheric deposition occurs when dissolved metals enter the watershed that drains to Chollas Creek and is therefore a component of urban runoff carried by the MS4. Topographic characteristics make indirect deposition the major component of atmospheric sources, relative to the direct deposition that may land on the surface area of Chollas Creek. Some information on atmospheric deposition follows from other urban studies. However, more site-specific information is needed to properly quantify either the direct or indirect deposition. If data are available at a future time, they may be used to further refine this analysis.

Atmospheric deposition rates of trace metals have been investigated in limited studies in California. In one Southern California study, atmospheric deposition of metals was calculated for Santa Monica Bay and the Santa Monica Bay watershed (Stolzenbach et al., 2001). Copper, lead, and zinc atmospheric deposition rates were determined through a combination of direct and indirect methods to determine contaminant loading. Researchers found that atmospheric deposition, primarily through daily dry deposition, was a significant contributor of nonpoint source pollutant loading to Santa Monica Bay.

The SCV study, previously discussed, also evaluated contributions of copper, lead, and zinc due to atmospheric emissions of particulates both from stationary and mobile sources. The study found that atmospheric emissions of copper from vehicle exhaust was largely due to diesel-fueled vehicles (Woodward-Clyde 1992) and was approximately 1 percent of the total copper load. Also, the SCV study found the largest source of lead was from tailpipe emissions and that, although it was not a top zinc source, atmospheric

[23] Nondetects were considered as on half of the DL for statistical purposes.

emissions of zinc in SCV from vehicle exhaust were largely due to both diesel fuel and unleaded fuel exhaust (Woodward-Clyde 1992). Zinc was also the only metal of the three that had industrial stack emissions as a source.

Deposition rates determined for Fresno, California may give a rough understanding of atmospheric lead loads to Chollas Creek. The dry weather lead deposition rate for Fresno was obtained from studies by the National Urban Runoff Program (NURP) and determined to be 2.22 milligrams per meter squared per month for lead (Brown and Caldwell 1984). If these results were directly applied to the Chollas Creek Watershed[24] roughly 1,740,000 g/year total metals would be the estimated load. However, this value should only be used for an illustrative purpose: Fresno and San Diego differ in climate, population, etc. Also, the reformulated gasoline (RFG) program and the Clean Air Act as amended in 1990 have since prohibited the introduction of gasoline containing lead or lead additives for commercial use as a motor vehicle fuel. The latter point suggests the lead deposition is less now than in 1984.

In fact, since the SCV and Fresno studies were performed, the USEPA has implemented the RFG program in 17 cities across the country, including San Diego, to reduce emissions of toxic pollutants (including metals) and smog forming pollutants from automobiles. Phase I of the RFG program was implemented in 1995 and Phase II began January 1, 2000. The state of California implemented its own RFG program effective in 1996 that met USEPA's Phase II requirements. Therefore, metal emissions from automobiles are expected to be less than those determined in the SCV and Fresno studies, but emissions will not decrease further with the recent implementation of Phase II since California has been meeting the Phase II requirements since 1996. Although the RFG program does not impact diesel fuel, which contributes the largest amount of metals, the effects of the program may still be measurable.

Again, because information on atmospheric deposition of metals to the San Diego Region is not currently available, more research is needed to characterize this source of loading. Perhaps in the future the model developed for Santa Monica Bay (Stolzenbach *et al.,* 2001) could be adapted to local conditions and combined with atmospheric concentrations of metals for San Diego County. At this time however, a reasonable assumption is that Chollas Creek receives significant amounts of copper, lead, and zinc from indirect deposition. These sources must travel through the MS4 to reach Chollas Creek and thus have already been accounted for. On the other hand, direct atmospheric deposition of metals is assumed to be relatively insignificant to Chollas Creek compared to other sources, in part due to the small surface area of the creek.

5.4.3 Sediment

Chollas Creek sediment likely contains metals that could become a source in a more static system. However, Chollas Creek is a highly dynamic system that ranges from low flow (dry) during the summer to high velocity and high volume flows during and shortly after storm conditions. This leads to short residence times for any sediment and associated metals within the creek. The available data support this idea (see Problem

[24] The Chollas Creek Watershed is estimated to be 6.59×10^7 meters squared.

Statement). Therefore, sediment is assumed to not reside in Chollas Creek long enough to allow metal concentrations to build to high enough levels that the sediment becomes a source to the creek.

5.4.4 Groundwater

Groundwater flows may be another source of metals to Chollas Creek. Subterranean flows may seep directly through the creek bed or surface at other points within the watershed. There are portions of Chollas Creek that are lined with concrete that forms a barrier to groundwater flow into the creek. Also there are portions of Chollas Creek were water is present even during long periods of dry weather. However, groundwater flows and their contribution to Chollas Creek are poorly characterized. Groundwater may contain naturally occurring dissolved metals concentrations, or enriched concentrations from overlying metals contaminated soils that contribute to exceedances of metals water quality objectives in Chollas Creek. Groundwater discharges to storm drains or directly to the creek provide an uninterrupted pathway for dissolved metals to reach Chollas Creek. Therefore, any discharges of groundwater in the Chollas Creek watershed are considered a source of metals and will need to be regulated.

5.4.5 Water Supply

In the San Diego Region sparse rainfall requires that approximately 90 percent of water demand be met with imported water, mostly from the Colorado River. The remainder of the water supply comes from treated runoff that is collected in reservoirs (City of San Diego, 2004). In the Chollas Creek Watershed, supply water is transported in from two treatment plants (Alvarado and Otay), which process water directly from reservoirs Murray, San Vicente, El Capitan and Otay. (None of which are located in the Chollas Creek Watershed.) The SCV study concluded that water supply was a metal source for copper, lead, and zinc, which included corrosion inhibitors, algae inhibitors and corrosion of distribution infrastructure. These sources will be discussed in this subsection as they apply to Chollas Creek.

To summarize the SCV study, several pathways were found through which tap water can eventually reach surface and ground waters, including car washing, irrigation, building and sidewalk cleaning, system overflows and hydrant flushing (Woodward-Clyde 1997). The study also estimated the amount of tap water that potentially reaches surface and ground waters and multiplied that amount by the estimated concentration of metal in tap water. Copper in the water supply was attributed to both the amount found in the source water (largely influenced by algaecide application) as well as the amount that leached into the potable water from corrosion of copper piping. Also, a large portion of the zinc loading from water was attributed to the addition of zinc orthophosphate, a corrosion inhibitor, to potable water. Other sources of zinc from the water supply included corrosion of plumbing and source water. Reservoir releases were also a significant source of all three metals in the SCV study.

5.4.5.1 Reservoir Contributions – Releases and Algaecide

There are no drinking water reservoirs within the Chollas Creek Watershed. The Chollas Reservoir is no longer an active drinking supply and drains such a small watershed that

overflows seem unlikely. Furthermore, the lake is maintained at a level to prevent spills; only normal leakage from the dam into a nearby canyon occurs to prevent the dam from breaking. No spills have been recorded since the concrete dam was built several decades ago (Chaffin pers. comm., January 2005). Therefore, reservoir releases are not considered a significant source of copper in Chollas Creek.

The algaecide copper sulfate, a potential source of copper, is applied infrequently and in small, strategic amounts in Metropolitan Water District (MWD) reservoirs (Wang pers. comm., January 2005), minimizing the amount of copper in the potable water supply from the MWD. In San Diego, no copper sulfate has been added to any of the reservoirs in the last five years except for the Miramar Reservoir, which is not located in the Chollas Creek Watershed and does not supply the plant that services the Chollas Creek Watershed population. Further, either the Alvarado or Otay Treatment Plants would treat the reservoir water before it would reach the Chollas Creek Watershed. Therefore algaecides used in the potable water supply in San Diego are assumed not to be a significant source of copper.

5.4.5.2 Treatment Plant Contributions and Corrosion Inhibitors

The San Diego Water Department does not add any corrosion inhibitors that contain heavy metals to the water supply; only sodium hydroxide is added for pH control (Chaffin pers. comm., January 2005). The pH is maintained at 8.2, which results in the water being slightly scale forming, thus reducing the amount of heavy metal corrosion in the piping. Therefore corrosion inhibitors used in the potable water supply in San Diego are assumed not to be a significant source of zinc.

The MWD, which manages the three San Diego plants including Alvarado and Otay, indicated that its effluent water generally has copper concentrations below the detection limit of 10 micrograms per liter (µg/L) (Wang pers. comm., January 2005). In addition, in 2003 the City of San Diego reported (City of San Diego, 2003) low average concentrations of copper, lead, and zinc (Table 5.8).

TABLE 5.8. Average metal concentration of treatment plant effluent in 2003.

Treatment Plant	Copper (µg/L)	Lead (µg/L)	Zinc (µg/L)
Alvarado	3.9	<2	<8
Otay	ND	<2	<8

Because the treatment plants' effluents have little detectable copper, lead, and zinc, it is concluded that water supply, up to the time it leaves the plant as effluent, is an insignificant contributor of these metals to the Chollas Creek Watershed.

5.4.5.3 Infrastructure Contributors – Water Supply from "Tap"

Corrosion of copper piping in San Diego, however, is considered a significant source of copper. In 1999 the City of San Diego performed a lead and copper household monitoring study on more than fifty homes, to measure copper and lead concentrations in household tap water (Brannian, pers. comm., July 2000). The first liter of tap water collected was after six to twelve hours of non-use of household water. The average

copper concentration for the homes was 180.7 μg/L and the average lead concentration from household taps was 2.6 μg/L. Since the copper concentrations coming from the three plants are below 50 μg/L and more likely near 10 μg/L since MWD effluent is at that level, copper plumbing corrosion in residential homes seems to add a relatively significant amount of copper, 130 μg/L to 170 μg/L, to the potable water supply. Conversely, lead concentrations coming from the three plants are below 5 μg/L and lead sources due to plumbing corrosion, seem to be very insignificant if any at all. Also, the City of San Diego does not use lead piping in its utilities, except for plumbing fixtures (City of San Diego, 2004). No results from the 1999 household monitoring study are currently available for zinc. However, more recently the 2002 City of San Diego Water Department Consumer Confidence Report (City of San Diego, 2002) reported copper sampling results at 0.346 milligrams per liter (mg/L) or 346 μg/L, lead sampling results at less that 5 μg/L and zinc sampling results at less than 50 μg/L. The 346 μg/L copper level was reported as the 90th percentile concentration.

For illustrative purposes, consider typical per capita water usage to be 65 gallons per day (Metcalf and Eddy 1991). If the population of the watershed was roughly 300,000 (SANDAG, 1999), the total water usage in the watershed would be about 20 million gallons per day (MGD). Approximately 50 percent (10 MGD) of water used will reach the wastewater system and of the remaining amount, 10 percent will reach the creek (1.0 MGD) (Woodward Clyde 1992). Since corrosion of copper piping contributes roughly 170 μg/L of copper (the more conservative estimate) and 2.6 μg/L of lead to the water supply, this source contributes approximately 235,000 g/year (100 percent of the modeled typical year) and 3,600 g/year (2 percent of the modeled typical year) to the Chollas Creek Watershed, respectively.

Although this estimate does not exactly match model estimates (likely due to differences in time, inherent uncertainties in methodology and physical interactions when potable water travels across the watershed), it does highlight the fact that a significant amount of copper may be entering Chollas Creek as urban runoff simply from the drinking water supply, which most likely results from piping infrastructure.

5.5 Urban Runoff Sources from Chollas Creek Land Use Activities

This section supplies additional detail on the land use practices that may contribute metals to Chollas Creek. The information here is gathered from the studies mentioned in section 5.3 and can be applicable to different land uses. For example, residential land use sources include application and disposal of household products such as pesticides, fertilizers, paints and maintenance and construction activities, such as remodeling, building and cleaning roofs and gutters. Some of these sources may also result from land uses such as commercial/institutional and open recreation (golf courses/cemeteries). At this time, quantitative data are not readily available to support an estimate of the loads potentially contributed by each of these sources. In the future, if data are available, adjustments to this source analysis could be made. Also, the sources of metals are not limited those listed here. These are sources that, because of other studies, are known to commonly contribute metals to urban runoff.

5.5.1 Operating Automobiles

Automotive sources (other than emissions, which were discussed in section 5.4.2) include maintenance and operation activities for automobiles and trucks, such as wear and tear on tires and brake pads and spills and leaks of fluids such as motor oil, coolants, etc. Copper and zinc are also released through the abrasion of roadways (Muschack 1990).

Brake pad wear is likely a significant urban nonpoint source of copper in Chollas Creek and to a lesser extent a source of lead and zinc. The SCV study calculated that the typical amount of copper released from a single car due to break-pad wear was 7.23 g/26,000 miles (Woodward-Clyde 1992). Brake pad wear may also be a significant source of lead and zinc in urban runoff (Sansalone 1997). Supporting information on how much copper is contained in brakes and brake equipment is also available from the Brake Pad Partnership Program's Brake Manufacturers Council Product Environmental Committee Report. Information on how much copper (or lead and zinc) ends up on the roadways and into stormwater sewers is currently not available (Connick, 2004).

Tire wear was the second largest contributor of zinc in the 1997 SCV study. Woodward-Clyde (1992) also estimated that the typical amount of zinc released per vehicle due to tire wear was 43.04 g/40,000 miles. In addition, Sansalone, et al, also found that tire wear is a potential source of copper and lead in urban runoff (1997). There are currently very limited data on how tire wear affects urban runoff, however the Rubber Manufacturer's Association is currently assisting in the data search for tire-wear emissions.

Also according to the SCV study, copper, lead, and zinc are all found in motor oil and coolants for automobiles and can potentially affect urban runoff as leaks, spills or illegal dumping. Motor oil accounts for a larger percentage of zinc's total estimated load than for copper or lead, and although relatively less significant compared to other sources, coolant was an identified source for all three metals. Coolant contains an approximate copper concentration of 76 µg/g and motor oil contains a zinc concentration of 1,060 µg/g (Shaheen 1975). In San Diego, contributions from automotive coolant leaks, coolant dumping, oil dumping and oil leaks were assumed to be less significant relative to other sources since the San Diego and the Santa Clara Valley are similar in demographics.

5.5.2 Illegal Sources

As mentioned above copper, lead, and zinc contributions from automotive coolant dumping and oil dumping are possible in the Chollas Creek Watershed. However, this TMDL will not consider allocations for dumping of coolants and motor oil into the MS4 system because dumping is illegal. Similarly, copper, lead, and zinc loads periodically occur as a result of sewage spills. All loads from sewage spills (also illegal) are assumed to receive a 100 percent reduction for implementation of the TMDL through the enforcement of existing permits.

5.5.3 Industrial Facilities

Industrial sources may also be a significant source of copper, lead, and zinc in Chollas Creek, especially facilities that handle, process, or store metals that may be exposed to rainfall. These facilities would be included in both the heavy industry and light industry land use model categories. WDRs for San Diego County municipal dischargers require municipalities, including the City of San Diego, to identify industries that threaten water quality and to require these facilities to test for and manage pollutants that are likely to reach stormwater. Further, the Industrial Storm Water General NPDES WDRs Order 97-0003-DWQ (General Industrial NPDES Requirements) is an order that regulates discharges in Chollas Creek that are associated with ten broad categories of industrial activities.

The 1992 SCV study identified industries with potential to allow metals to enter stormwater discharges and was based on professional knowledge of processes that result in metals being exposed to stormwater. Table 5.9 shows the industries that were prioritized as having the highest likelihood to discharge quantities of metals in stormwater. Because of the similarities between Santa Clara and San Diego, any of the same industries in the Chollas Creek Watershed are likely to be potential metal contributors.

TABLE 5.9. Industries with highest likelihood to discharge metals to stormwater. (SCV, 1992)

Industry	Standard Industrial Classification (SIC) Code
Mining of Miscellaneous Metal Ores	1099
Metal Plating	3471
Boat Building and Repairing	373
Industrial Machinery	355 and 356
Trucking	4212, 4213 and 4214
Metal Scrap Industry	5093
Metal Scrap Industry Combined With Used Auto Parts Sales	5015
Automotive Repair, Include Automobile Renting And Leasing	751, 7538 and 7539
Galvanizing And Metal Coating	3479

Particular industries in the Chollas Creek Watershed that may be contributing a significant amount of metals is the auto wrecking/dismantling facilities and scrap metal recycling facilities (Standard Industrial Classification [SIC] 5015 and 5093, respectively). A report completed by Sustainable Conservation in San Francisco has also identified auto wrecking/dismantling facilities and scrap metal recycling facilities as two industries that contribute metals to stormwater runoff (O'Brien, 2000). A review of discharge reports was conducted for auto wrecking/dismantling shops and scrap metal recycling facilities in the Chollas Creek Watershed and only three of approximately twenty-two facilities tested for copper, lead, and zinc in their stormwater runoff. Notably, all three facilities had fairly high concentrations of metals in their discharge. Among the three facilities, copper ranged from 72 to 500 μg/L, lead ranged from 42 to 690 μg/L and zinc ranged from 260 to 1,000 μg/L in runoff from the facilities.

5.5.4 Pesticides

Pesticides were also identified as a potential source of copper and zinc in Chollas Creek, although the SCV study only discussed copper as a source. The 2002 DPR annual report was reviewed for pesticide use in San Diego County. All applications of pesticides that contain copper or zinc are identified and listed in Table 5.10, except for applications that would not correspond with the land uses at Chollas Creek. For example, agricultural pesticide application was not given. Moreover, DPR does not report residential, or nonprofessional, use of pesticides (DPR, 2002) and according to a survey most residents in the Chollas Creek Watershed apply pesticides themselves, as opposed to hiring a professional (Willen, 2002). Only a percentage of the pesticide amount shown in Table 5.10 is actually copper or zinc and there is not enough information to quantify the actual amount of copper or zinc that would reach a water body in the San Diego County. (Chollas Creek is approximately 0.6 percent of the total area in San Diego County)[25]

TABLE 5.10. Pounds of chemicals containing copper and zinc applied in San Diego County in 2002 as reported to DPR.

Active Ingredient of Pesticide	Pounds of Chemical Applied in San Diego County	Active Ingredient of Pesticide	Pounds of Chemical Applied in San Diego County
Copper	5693	Copper 8-Quinolinoleate	10
Copper Ammonium Complex	304	Copper Sulfate (Anhydrous)	0.3
Copper Carbonate, Basic	819	Copper Sulfate (Basic)	20
Copper Ethanolamine Complexes, Mixed	182	Copper Sulfate (Pentahydrate)	2904
Copper Ethlenediamine Complex	14	Zinc Oxide	3366
Copper Hydroxide	6	Zinc Phosphide	66
Copper Naphthenate	1394	Zinc Sulfate	3
Copper Oxide (ous)	376		

Reference: (DPR Website, 2002 Report)
The chart excludes copper and zinc pesticides used in nurseries.

5.5.5 Wood Preservatives

Wood preservatives are actually pesticides that protect wood against attack by fungi, bacteria, or insects. The active ingredients found in wood preservatives may include copper or zinc. Preservatives of this sort are injected into the wood before purchase (pressure-treated wood) or applied by the user. If wood-preservative chemicals are incorporated into a paint or stain, that product is considered a pesticide and is regulated under the DPR. Wood preservatives in residential, commercial and industrial areas could also be a contributor of copper to Chollas Creek

5.5.6 Construction

Construction erosion is a potential source of metals in Chollas Creek. In California, dischargers whose projects disturb one or more acres of soil or whose projects disturb less than one acre but are part of a larger common plan of development that in total

[25] The Chollas Creek Watershed is estimated to be about 6.59 x 10^7 meters squared. According to California State Association of Counties in 2002 San Diego County is estimated to be 4,281 square miles.

disturbs one or more acres, are required to obtain coverage under the General NPDES WDRs for Discharges of Stormwater Associated with Construction Activity (Construction General NPDES WDRs, Order No. 99-08-DWQ). Construction activities regulated under these WDRs include clearing, grading and disturbances to the ground such as stockpiling or excavation. The Storm Water Construction Notice of Intent (NOI) database can be reviewed at any time to identify current construction projects underway, according to zip code, city and waste disposal identification (WDID) number. The land use percentage of land under development is estimated to be about 0.33 percent of the Chollas Creek Watershed.

5.5.7 Galvanized Metals

Galvanized chain-link fences may also contribute zinc to urban runoff. There are extensive stretches of chain-link fencing along roadways in the Chollas Creek Watershed. However, there are no known studies on the amount of zinc contributed by fencing. Zinc loads from this potential source would be estimated if relevant data become available at a later date. Also galvanized roofing materials and gutters have been found to contribute 153 µg/L and 363 µg/L of zinc to urban runoff, respectively (Woodward-Clyde, 1992).

5.5.8 Paint

A study conducted in Kentucky by the U.S. Department of Energy (Kszos, et. al., 2004) found that paint used on metal cylinders was causing toxicity to C*eriodaphnia dubia* in stormwater. Further investigation revealed that zinc was the causative agent. Similar paints are likely to be used in the Chollas Creek Watershed and should be considered as a likely source of zinc. Data are currently unavailable to quantify this potential load in the Chollas Creek Watershed. However, the SCV study estimated that residential paints contributed less than 1 percent of the total zinc load. In San Diego, contributions from residential paints are also assumed to be relatively less significant compared to other potential sources since the cities are similar in demographics.

5.5.9 Landfill

Special consideration must be paid to groundwater flows through former and active landfills and any former burn ash areas because of the increased likelihood that these areas may contribute significant amounts of metals to groundwater. There are currently no active landfills in the Chollas Creek Watershed, as indicated by the land use model results, or former burn sites. There is however a closed landfill, South Chollas Landfill, which sits adjacent to and apparently down gradient of, the Chollas Creek Reservoir in subwatershed 19022. The landfill is regulated under General WDR Order No. 97-11[26] and is required to address groundwater contamination concerns.

The landfill was closed in 1981 and annual monitoring data have been available since 1987. Samples were analyzed for copper, lead, and zinc, however, only until January 1997. The San Diego Basin Plan does not designate any beneficial uses for the groundwater in the 908.20 hydrologic area. Subsequently, the Basin Plan does not list WQSs applicable to the groundwater under the South Chollas Landfill. Furthermore,

[26] Order No. 97-11, *General Waste Discharge Requirements for Post-Closure Maintenance of Inactive Nonhazardous Waste Landfills within the San Diego Region.*

since hardness analyses were not performed, comparison of metal concentrations to surface water CTR criteria is not possible. The ultimate fate of groundwater at the most down gradient well at the landfill is unknown. Local geology may bring the water to the surface such that leachate would reach Chollas Creek as surface flow and come under the jurisdiction of the MS4. Also, the Chollas Creek Reservoir may be impacting groundwater through artificial recharge, which has caused higher groundwater levels in the vicinity of the landfill site. Reservoir leakage could be passing through the closed landfill and carrying metals and other pollutants down to the creek. However, the available data do not allow for reservoir leakage to be quantified.

Until further information is available, the South Chollas Landfill and the Chollas Reservoir are considered only as potential sources of metals to Chollas Creek. This designation has no bearing on the load and waste load allocations of this TMDL but is useful information when considering metal loading reduction scenarios. If the landfill is determined to be a source of metals, appropriate corrective actions will be required of the discharger responsible for the landfill to be consistent with the allocations of this TMDL.

5.6 Summary of Sources

Modeling efforts (Appendix D) have identified freeways and commercial/ institutional land uses as having the highest relative loading contributions of copper, lead, and zinc to Chollas Creek. Together, these two land uses account for over 75 percent of the predicted metal loadings. The model gives an estimate of the magnitude and location of copper, lead, and zinc in the Chollas Creek watered. Additionally, other watershed studies outside Chollas Creek have identified individual sources of copper, lead, and zinc likely to be present in the Chollas Creek Watershed, including many aspects of automobile operations, water supply systems, pesticides, industrial metal recyclers and other suspected significant sources to Chollas Creek.

More data are needed to better understand the impacts these suspected sources have on concentrations of copper, lead, and zinc in Chollas Creek. Additional information is needed to properly populate the watershed model to more accurately describe dry weather loadings. Local data are also needed to quantify other sources and should be collected under Order No. R9-2007-0001 (as amended) to be consistent with the load and wasteload allocations of this TMDL. The San Diego Water Board may also use its authority under the California Water Code to require the collection and reporting of the necessary information. However, the current modeling efforts effectively quantify and identify the land uses that are considered to be the biggest contributors of copper, lead, and zinc to Chollas Creek. The land uses and subwatersheds that contribute more than the others may be targeted during implementation planning and load reduction scenarios. Furthermore, the specific suspected sources of metals, as identified in watershed studies from other regions, will be helpful in targeting practices that may be amenable to load reduction scenarios.

6 Linkage Analysis

The TMDL technical report must estimate total assimilative capacity (loading capacity) of Chollas Creek for the metals and describe the relationship between Numeric Targets and identified metal sources [40 CFR 130.7 (d) and 40 CFR 130.2 (i) and (f)]. Collectively, these requirements are termed the linkage analysis and provide the necessary quantitative link between the TMDL and attainment of WQSs.

The total assimilative capacity, or loading capacity, is the maximum amount of pollutant that a water body can assimilate while maintaining WQSs. The loading capacity is also a function of different hydrodynamic processes that affect the environmental fate and transport of dissolved metals as they move through the system. At Chollas Creek, the loading capacity for each metal is estimated to be equal to its respective Numeric Target. Per the Numeric Target's basis on CTR (see Numeric Target section), these loading capacities will attain WQSs, because the Numeric Targets are at a minimum to be protective of aquatic life and are thus conservatively considered the total loading capacity for Chollas Creek. Also, because the loading capacity is equated to the Numeric Target, the hydrodynamic processes are not quantified. In-stream processes, such as binding to organic material, are thought to only decrease the dissolved metals' concentration in Chollas Creek and are, thus, considered an implicit MOS. Table 6.1 presents the loading capacities for the dissolved metals copper, lead, and zinc.

TABLE 6.1. Dissolved metals loading capacities for acute and chronic conditions.

Metal	Loading Capacity for Acute Conditions – One-Hour Average[1]	Loading Capacity for Chronic Conditions – Four-Day Average[1]
Copper	(0.96) * {e^ [0.9422 * ln (hardness) - 1.700]}	(0.96) * {e^[0.8545 * ln (hardness) - 1.702]}
Lead	[1.46203 – 0.145712 * ln (hardness)] * {e^ [1.273 * ln (hardness) - 1.460]}	[1.46203 – 0.145712 * ln (hardness)] * {e^[{1.273 * ln (hardness)} - 4.705]}
Zinc	(0.978) * {e^ [0.8473 * ln (hardness) + 0.884]}	(0.986) * {e^[0.8473 * ln (hardness) + 0.884]}

The natural log and exponential functions are represented as "ln" and "e", respectively.
[1] These equations are also the numeric targets and CTR WQOs.

These loading capacities, which are equal to the Numeric Targets, will apply to the entirety of Chollas Creek and during all times of the year. Each of the land uses identified in the Source Analysis portion of this TMDL will not be allowed to have runoff that causes in-stream waters to exceed these concentrations. Further more, all other sources of copper, lead, and zinc to Chollas Creek will be expected to not cause the creek to exceed these loading capacities. Once these capacities are achieved, it is expected that Chollas Creek copper, lead, and zinc concentrations will be protective of the creek's beneficial uses.

A concentration-based approach was chosen to link the Numeric Targets with the largest identified metal source -- urban runoff. This approach is considered more appropriate

than a mass-based approach, because not only does it take into account the dynamic nature of urban runoff, which is greatly affected by stormwater, but it also accommodates the dynamic nature of freshwater systems that have a myriad of flow and hardness conditions. Metals concentrations are also generally easier to monitor; however, hardness measurements will also be needed and sampling will need to be done in accordance with Table 4.2.

In addition, a mass-based approach would be more sensitive to concerns of accumulated bottom sediment in fresh water bodies and down stream sediment toxicity. However, as discussed in the Source Analysis (section 5), sediment is not considered a source of metals due to the nature of Chollas Creek and due to low sediment toxicity results. In addition, downstream sediment toxicity is to be addressed in a separate TMDL once adequate data are collected and applicable models are developed for the Chollas Creek Watershed.

7 Margin of Safety

The TMDL must contain a MOS to account for uncertainty in the analysis. The MOS for Chollas Creek is explicit as well as implicit. The explicit MOS was calculated by taking 10 percent of the total loading capacity as generated from the CTR equation, using the currently sampled hardness concentration. This 10 percent amount is essentially reserved: It is not available for waste load allocation or load allocation and therefore makes these allocations smaller and thus, more protective. For example, if the CTR equation, using the currently sampled hardness concentration, calculated a loading capacity of 106 kg Cu/L, then 10 percent or 11 (kg Cu/L) would be allocated to the MOS. Therefore, the waste load allocation and load allocation together would have to be equal to 95 kg Cu/L/year (106 kg Cu/L minus 11 kg Cu/L). This reservation is to account for (1) uncertainty associated with the calculations in the source analysis and linkage analysis, (2) any difference between total metal concentrations and dissolved[27] or assumed bioavailable, metal concentrations and (3) the uncertain effects that default, or non site-specific, CTR values had on the TMDL loading capacity.[28]

Using actual hardness values in the CTR equation in order to calculate TMDLs is an implicit MOS. The other alternative was to use an estimated hardness value from a model, a flow-correlation, or an average from past data. Because past data were very limited, an estimated hardness would in itself have a great amount of uncertainty and this uncertainty would be incorporated into the TMDL concentration if an estimated hardness would be used in the CTR equation. Also, although not an MOS by definition, the derivation of the CTR's criteria maximum concentration (CMC) takes safety into account, because it divides the Final Acute Value, determined from laboratory acute toxicity concentrations, by a safety factor of two (Stephan, 1985). In summary, staying as close as possible to the CTR definition gives assurance that the TMDL is a conservative, defendable value.

Another implicit MOS is not allowing for metal interactions with anions and negatively charged sites on particulates when calculating the loading capacity and allocations. Theoretically, an increase in bioavailability from these types of chemical interactions in water would only take place in waters with low pH levels. The increased aqueous acidity (low pH levels) would yield higher levels of free metal ions and thereby increase bioavailability to aquatic organisms. Such low pH levels in ambient waters are more likely to be observed in areas of high acid rain; these low pH conditions are not likely in San Diego. Therefore, metal interactions with negatively charged anions and particles within the water are assumed to only decrease bioavailability. Not allowing for this interaction makes the TMDL concentration more conservative.

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[27] Although dissolved concentration is the most appropriate value to use for metals [40 CFR 131], any additional concern is addressed by the 10 percent MOS.

[28] The 10 percent MOS helps account for any additional uncertainties in calculating the Load and Waste Load Calculations due to use of the CTR default conversion factors and water effect ratio. Although CTR's guidance was strictly followed (when there is not enough site-specific data default values are used) there may remain a chance that if the data were available, these site-specific values would result in a more stringent TMDL concentration than the default values. Additional studies may also be preformed in the future to create site-specific values (Appendix H).

8 TMDL and Allocations

The TMDL must be less than or equal to the loading capacity after taking into account allocations to all sources. The TMDL is the combination of a total wasteload allocation (WLA) that allocates loadings for point sources, a total load allocation (LA) that allocates loadings for nonpoint sources and background sources and a MOS that may either explicitly reserve an allocation for or implicitly account for the uncertainty in the relationship between pollutant loads and the quality of the receiving waterbody. In this TMDL, 10 percent of the load is reserved for an MOS, or not allocated to sources, in order to account for identified uncertainties in the TMDL in addition to conservative assumptions made in the TMDL analysis (Margin of Safety Section).

In TMDL development, allowable WLA and LA from pollutant sources that cumulatively amount to no more than the TMDL must be established; this provides the basis to establish water quality-based controls. TMDLs can be expressed on a mass loading basis (e.g., grams of pollutant per year) or as a concentration in accordance with provisions in federal regulations [40 CFR 130.2(l)]. In addition, TMDLs and associated WLA and LA must be expressed in quantitative terms [40 CFR 130.2 (e-i) and 40 CFR 130.7 (c)]. For Chollas Creek, the WLAs and LAs and consequently the TMDL, are expressed as a concentration. This decision was made based on the concentration-based approach and quantitative linkage analysis. (See section 6.0, Linkage Analysis) In addition, the concentration-based TMDL will account for any future point or nonpoint sources, because any future sources will also be required to be below the same concentration.

Mass-based TMDLs typically are described by the following equation:

$$TMDL_{mass} = \Sigma\ WLAs + \Sigma\ LAs + MOS$$

However, in concentration-based TMDLs, the allocations are not additive. Additionally, the allocation concentrations for point sources (WLAs), and nonpoint and background sources (LAs) will be equivalent for each metal. Thus, only one term is needed in the equation for the allocations. Because significant nonpoint sources and background sources were not identified in the Chollas Creek watershed, the WLA term was retained in the equation and the LA term dropped. The MOS also is not additive in concentration-based TMDLs. As described previously, the MOS is incorporated into the WLAs, rather than added to them. This reduces the equation to:

$$TMDLs_{conc} = WLAs$$

The explicit MOS reserves 10 percent of the allocation and is incorporated into the WLAs by setting them equal to 90 percent of the loading capacity. Because the loading capacities are equal to the numeric targets, which are equal to the CTR WQOs, the TMDLs are equal to 90 percent of the CTR WQO concentrations. In other words:

CTR WQOs = Numeric Targets
Numeric Targets = Loading Capacities
WLAs = Loading Capacities * 0.9

Substituting CTR WQOs for Loading Capacity results in:

TMDLs = WLAs = CTR WQOs * 0.9

The hardness-based equations for calculating TMDL concentrations are shown in Table 8.1. The sampling requirements for calculating TMDL concentrations are given in Table 4.2.

TABLE 8.1. The Total Maximum Daily Load (TMDL) for dissolved copper, lead, and zinc for acute and chronic conditions

Metal	TMDL for Acute Conditions – One-Hour Average	TMDL for Chronic Conditions – Four-Day Average
Copper	(0.96) * {e^ [0.9422 * ln (hardness) - 1.700]}*0.9	(0.96) * {e^[0.8545 * ln (hardness) - 1.702]}*0.9
Lead	[1.46203 – 0.145712 * ln (hardness)] * {e^ [1.273 * ln (hardness) - 1.460]} * 0.9	[1.46203 – 0.145712 * ln (hardness)] * {e^[{1.273 * ln (hardness)} - 4.705]} * 0.9
Zinc	(0.978) * {e^ [0.8473 * ln (hardness) + 0.884]} * 0.9	(0.986) * {e^[0.8473 * ln (hardness) + 0.884]} * 0.9

If all copper, lead, and zinc concentrations in urban runoff to Chollas Creek meet their respective TMDL concentrations, the loading capacity of the creek should not be exceeded.

8.1 Wasteload Allocations

Federal regulations [40 CFR 130.7] require TMDLs to include individual WLAs for each point source discharge. The point sources that could affect Chollas Creek are the MS4 discharges, stormwater discharges from industrial sites, and discharges of extracted groundwater. Order No. R9-2007-0001 for San Diego County covers the entire Chollas Creek Watershed, including the creek itself and regulates all wet and dry weather runoff that enters the creek through the stormwater conveyance system. All other existing WDR orders applicable to regulating metal sources regulate discharges that reach Chollas Creek directly through the MS4 system. For example, the stormwater WDR order for Caltrans (Order No. 99-06-DWQ) regulates freeway runoff that flows into the MS4 system. A full list of the existing WDR orders applicable to this TMDL is discussed in the Source Analysis section (section 5.0). All point source discharges to Chollas Creek are expected to achieve this WLA.

Modeling results, also discussed in the Source Analysis section, demonstrate the possible land use specific and sub-watershed specific contributions of copper, lead, and zinc. However because this WLA is concentration-based it will apply to each land use and each sub-watershed at all times and will not be specific to any land use or sub-watershed.

Therefore, the model predictions of the relative metal contribution from each category will be useful in targeting problem areas during implementation.

8.2 Load Allocations

The LAs are assigned to nonpoint sources and natural background sources in the watershed. Background sources can include air deposition of metals in the watershed and any groundwater contributions. Because of the regulatory definition of the MS4 system, all source (point and nonpoint sources) contributions of metals to Chollas Creek come via the MS4 and are therefore accounted for in the allocation assigned to the MS4s. The only other possible sources that may end up directly in Chollas Creek would be direct air deposition and groundwater, which may or may not include anthropogenic sources. As discussed in the Source Analysis section, these two sources are not considered significant at this time. These sources may be re-evaluated at a future date if any additional data become available. Currently, the sources contributing to the LAs not accounted for in the WLA assigned to the MS4s are considered to be relatively insignificant. Thus, in the TMDL calculation, the LAs are equal to zero, and the TMDL calculations are equal to the WLAs.

9 Seasonal Variations and Critical Conditions

In accordance with federal regulations [40 CFR 130.7(c)], a TMDL must consider seasonal variations and critical conditions (e.g. stream flows, pollutant loadings and other water quality parameters). A flow-based approach was used for the Chollas Creek Metals TMDL, and defines critical conditions solely based on freshwater flow rates regardless of season. No matter the time of year or situation, toxicity allocations that are based on the CTR equations will be required throughout all segments of Chollas Creek and therefore, by definition, will always be protective of aquatic life.

Furthermore, the flow-based approach is appropriate because the main sources of metal accumulation in the Chollas Creek Watershed are non-seasonal (e.g. automobile wear, exhaust emissions, industry contributions). Urban runoff, which is the main mechanism by which these accumulated metals reach Chollas Creek, can occur in both dry and wet weather. As explained previously, urban runoff is a combination of non-stormwater flows (e.g. car washing, lawn watering) during dry weather and stormwater flows during wet weather. Because the climate in southern California can be described as dry weather most of the year and intermittent wet weather events throughout the year, wet weather and dry weather are also most easily characterized by precipitation flow rates as opposed to being characterized by season. To further address these differences, both the CMC and CCC equations are used for determining a metal's allocation in order to be protective for both acute and chronic conditions.

The allowable concentration will be determined with hardness values measured at the time of compliance. These data will provide a direct measure of any seasonal variations and/or critical conditions effects on hardness. Since hardness is an essential component of the LA and WLAs, seasonal variations and/or critical conditions will be covered by this TMDL. This method of using sampled hardness as the variable instead of an estimated hardness, will account for these effects because it is an absolute representation of current conditions and thus will account for any effects that may be caused by seasonal variations or extreme conditions. Other stream chemistry, which may or may not be a function of seasonal variations and critical conditions, were not taken into consideration as an implicit MOS and will therefore not have a bearing, with respect to seasonal variations and critical conditions, on the TMDL.

10 Legal Authority

This section presents the legal authority and regulatory framework used as a basis for assigning responsibilities to dischargers to implement and monitor compliance with the Chollas Creek Metals TMDL. The laws and policies governing point source[29] discharges are described below. Non-point source discharges are not discussed because these discharges are negligible in the Chollas Creek watershed, and did not receive load allocations or reductions. Discharger accountability for attaining metals wasteload allocations is established. The legal authority and regulatory framework is described in terms of the following:

- Controllable water quality factors;
- Regulatory background; and
- Persons accountable for point source discharges

10.1 Controllable Water Quality Factors

The Chollas Creek watershed lies within the Pueblo 908.00 Hydrologic Unit. The vast majority of metals are transported from sources to Chollas Creek from wet and dry weather runoff generated from human habitation and land use practices, and to a lesser extent, direct atmospheric deposition. Construction, maintenance, and operation of state-owned highways are also sources of metal discharges to Chollas Creek. These metal discharges result from controllable water quality factors which are defined as those actions, conditions, or circumstances resulting from man's activities that may influence the quality of the waters of the state and that may be reasonably controlled. This TMDL project establishes wasteload allocations for these controllable discharges.

10.2 Regulatory Background

CWA section 402 establishes the NPDES Program to regulate the ‘‘discharge of a pollutant,’’ other than dredged or fill materials, from a ‘‘point source’’ into ‘‘waters of the U.S.”[30] Under section 402, discharges of pollutants to waters of the U.S. are authorized by obtaining and complying with NPDES permits. These permits commonly contain effluent limitations consisting of either Technology Based Effluent Limitations (TBELs) or Water Quality Based Effluent Limitation (WQBELs). TBELs represent the degree of control that can be achieved by point sources using various levels of pollution control technology that are defined by the USEPA for various categories of discharges and implemented on a nation-wide basis.

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[29] The term ‘‘point source’’ is defined in Clean Water Act section 502(6) to mean any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged. This term does not include agricultural storm water discharges and return flows from irrigated agriculture.

[30] See federal regulations [40 CFR section 122.2(c)(e)]. The USEPA has interpreted “waters of the United States” to include “intrastate lakes, rivers, streams (including intermittent streams) . . . the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce,” and “tributaries of [those] waters.” Chollas Creek is a water of the United States.

TBELs may not be sufficient to ensure that water quality standards will be attained in receiving waters. In such cases, NPDES regulations require the San Diego Water Board to develop WQBELs that derive from and comply with all applicable WQSs. If necessary to achieve compliance with the applicable WQSs, NPDES requirements must contain WQBELs more stringent than the applicable TBELs [CWA 303 (b)(1)(c)] [40 CFR 122.44(d)(1)]. WQBELs may be expressed as numeric effluent limitations or as BMP development, implementation and revision requirements. Numeric effluent limitations require monitoring to assess load reductions while non-numeric s provisions, such as BMP programs, require progress reports on BMP implementation and efficacy.

In California, state Waste Discharge Requirements (WDRs) for discharges of pollutants from point sources to navigable waters of the U.S. that implement federal NPDES regulations serve in lieu of federal NPDES permits. Such WDRs are issued by the state pursuant to independent state authority (not authority delegated by the USEPA or derived from the Clean Water Act).[31]

Within each TMDL, a "wasteload allocation"[32] is determined which is the maximum amount of a pollutant that may be contributed to a waterbody by "point source" discharges of the pollutant in order to attain and maintain WQOs. WDRs implementing NPDES regulations must include conditions that are consistent with the assumptions and requirements of the wasteload allocation. The principle regulatory means of implementing TMDLs for point source discharges regulated under these types of WDRs are:

- Allocate the total wasteload allocation calculated for point source facilities among each individual NPDES point source facility that is discharging the pollutant that needs to be controlled;

- Evaluate whether the effluent limitations or conditions within the WDRs implementing NPDES regulations are consistent with the wasteload allocations. If not, incorporate WQBELs that are consistent with the wasteload allocations into the WDRs[33] or otherwise revise the WDRs to make them consistent with the assumptions and requirements of the TMDL wasteload allocations.[34] A time schedule to achieve

[31] Pursuant to Chapter 5.5 of the Porter-Cologne Act, in order to avoid the issuance by the USEPA of separate and duplicative NPDES permits for discharges in California that would be subject to the Clean Water Act, the State's WDRs for such discharges implement the NPDES regulations and entail enforcement provisions that reflect the penalties imposed by the Clean Water Act for violation of NPDES permits issued by the USEPA.

[32] See federal regulations [40 CFR section 130.2(h)]. A wasteload allocation is the portion of the receiving water's loading capacity that is allocated to one of its existing or future point sources of pollution.

[33] In the case of WDRs implementing NPDES regulations, WQBELs may include best management practices that evidence shows are consistent with the wasteload allocation.

[34] See federal regulations [40 CFR section 122.44(d)(1)(vii)(B)]. NPDES water quality-based effluent limitations must be consistent with the assumptions and requirements of any available TMDL wasteload allocation. The regulations do not require the WQBELs to be identical to the wasteload allocation. The regulations leave open the possibility that the San Diego Water Board could determine that fact-specific circumstances render something other than literal incorporation of the wasteload allocation to be consistent

compliance should also be incorporated into the WDRs in instances where the discharger is unable to immediately comply with the required wasteload reductions;

- Mandate discharger compliance with the wasteload allocations in accordance with the terms and conditions of the revised WDRs;

- Implement a monitoring and/or modeling plan designed to measure the effectiveness of the controls implementing the wasteload allocations and the progress the waterbody is making toward attaining WQOs; and

- Establish criteria to determine that substantial progress toward attaining water quality standards is being made and if not, the criteria for determining whether the TMDLs or wasteload allocations need to be revised.

10.3 Persons Responsible for Point Source Discharges

For Chollas Creek, all metal loading essentially comes to the creek through the MS4s within the watershed. MS4 discharges are point source discharges because they are released from channelized, discrete conveyance pipe systems and outfalls. Background loads and loads from air deposition are negligible compared to the loads delivered from the MS4s as discussed in section 5. Discharges from MS4s to navigable waters of the U.S. are considered to be point source discharges and are regulated in California through the issuance of WDRs that implement NPDES regulations. Persons owning and/or operating MS4s tributary to Chollas Creek include Caltrans, the cities of San Diego, Lemon Grove, and La Mesa, San Diego County, the San Diego Unified Port District, and the Navy.

The following discussion describes the persons responsible for actual or potential MS4 point source discharges of metals to the Chollas Creek watershed. These dischargers have specific roles and responsibilities assigned to them for achieving compliance with the metals wasteload allocations described in section 11.0, Implementation Plan.

10.4 California Department of Transportation

Caltrans is responsible for the design, construction, maintenance, and operation of the California State Highway System, including the portion of the Interstate Highway System within the state's boundaries. The roads and highways operated by Caltrans are legally defined as MS4s and discharges of pollutants from Caltrans MS4s to waters of the U.S., such as Chollas Creek, constitute a point source discharge that is subject to regulation under WDRs implementing federal NPDES regulations.

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with the TMDL assumptions and requirements. The rationale for such a finding could include a trade amongst dischargers of portions of their load or wasteload allocations, performance of an offset program that is approved by the San Diego Water Board, or any number of other considerations bearing on facts applicable to the circumstances of the specific discharger.

Discharges of storm water from the Caltrans owned right-of-ways, properties, facilities, and activities, including storm water management activities in construction, maintenance, and operation of state-owned highways are regulated under Order No. 99-06-DWQ.[35] Caltrans is responsible, under the terms and conditions of these WDRs, for ensuring that its operations do not contribute to violations of water quality objectives in Chollas Creek.

Caltrans is a point source discharger of metals to Chollas Creek. Caltrans discharges storm water runoff containing metals from Interstates-5, 15 and 805 freeway surfaces, and State Highway 94 freeway surfaces and adjacent land areas via a storm drain system. Stormwater runoff from highways can contain pollutants, including metals, from vehicle exhaust and atmospheric deposition. These discharges are contributing to the exceedances of the metals water quality objectives in Chollas Creek.

10.5 Cities of San Diego, Lemon Grove, and La Mesa, San Diego County, and the San Diego Unified Port District

The Municipal Dischargers discharge urban runoff to Chollas Creek via MS4s that are regulated under WDRs prescribed in Order No. R9-2007-0001.[36] Under the terms and conditions of this Order, the Municipal Dischargers are responsible for controlling all storm and non-storm water flows (i.e., urban runoff) that are transported through their respective MS4s to surface waters.

The Municipal Dischargers are point source dischargers of metals to Chollas Creek. Metals are present in stormwater and urban runoff from commercial/industrial and transportation land use activities within these jurisdictions. Metal-laden stormwater and urban runoff are discharged to Chollas Creek via the MS4s. These discharges are contributing to the exceedances of the metals water quality objectives in Chollas Creek.

10.6 U.S. Navy

There is a small portion of the Chollas Creek watershed, immediately adjacent to San Diego Bay, which is under the jurisdiction of the Navy. Naval Station San Diego west of Harbor Drive[37] appears to drain directly to San Diego Bay, and if so, does not contribute metals to Chollas Creek. However, east of Harbor Drive, facility MS4s discharge into Chollas Creek.

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[35] *Order No. 99-06-DWQ, NPDES No. CAS000003, National Pollutant Discharge Elimination System (NPDES) Permit Statewide Storm Water Permit and Waste Discharge Requirements (WDRs) for the State of California, Department of Transportation (Caltrans).*

[36] Order No. R9-2007-0001, *Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego County, and the San Diego Unified Port District*, NPDES No. CAS0108758

[37] These lands are regulated under Order No. R9-2003-0265, NPDES Permit No. CA0107867, *Waste Discharge Requirements for U.S. Navy Graving Dock Located at Naval Station San Diego* and Order No. R9-2002-0169, NPDES Permit No. CA0109169, *Waste Discharge Requirements for U.S. Navy Base San Diego*.

A statewide order prescribing general WDRs for discharges from small MS4s[38] regulates urban runoff not covered by the San Diego Water Board's phase I MS4 WDRs (Order No. R9-2007-0001), including discharges from MS4s on military bases. The Navy's discharge from its MS4 into Chollas Creek can be regulated by enrolling this facility under the statewide order.

10.7 Persons Discharging Stormwater Regulated Under Statewide General NPDES WDRs

Industrial facilities, construction sites, and utility vaults generate stormwater that can be discharged to Chollas Creek via the MS4s. Stormwater discharges from industrial facilities, construction sites, and utility vaults in the Chollas Creek watershed are regulated under statewide general NPDES WDRs prescribed in Order No. 99-08-DWQ, Order No. 99-08-DWQ, and Order No. 2001-11-DWQ, respectively.[39]

Stormwater discharges from industrial sites in Chollas Creek watershed may contain dissolved metals concentrations that contribute to exceedances of metals water quality objectives in Chollas Creek. Therefore, Chollas Creek watershed enrollees under the Industrial Stormwater WDRs are responsible for potential MS4 point source discharges of metals to Chollas Creek.

The principal pollutants of concern for construction site stormwater discharges are sediment and total suspended solids, however, air-deposited metals, and metals deposited from equipment operation can wash off construction sites in stormwater and be discharged to the MS4s. Therefore, Chollas Creek watershed enrollees under the Construction Stormwater WDRs are responsible for potential MS4 point source discharges of metals to Chollas Creek

For utility vault discharges, the principal pollutants of concern are total suspended solids, oil and grease. Utility vaults are typically located beneath sidewalks rather than roads. Storm water leaking into a utility vault from a sidewalk is not likely to contain significant metals concentrations because of the lack of contact between sidewalks and cars. However, air deposited metals can be washed off into utility vaults and groundwater seeping into a utility vault may contain elevated levels of metals. Nonetheless, a WLA is not assigned to these discharges because they make up an extremely small volume of

[38] State Water Board Water Quality Order No. 2003-0005-DWQ, NPDES General Permit No. CAS000004, *Waste Discharge Requirements for Storm Water Discharges from Small Municipal Separate Storm Sewer Systems*.

[39] Order No. 97-03-DWQ NPDES No. CAS 000001, *Waste Discharge Requirements for Discharges of Storm Water Associated with Industrial Activities Excluding Construction Activities*. Active enrollees in the Chollas Creek watershed include A to Z Auto Dismantling, IMS Recycling Services, Mini Trucks and Cars, Trolley Auto Parts, Able Auto Wrecking, Pacific Coast Recycling- Always Recycling.
Order No. 99-08-DWQ NPDES No. CAS 000002 General Construction Storm Water WDRs.
Order No. 2001-11-DWQ NPDES No. CAG 99002 General Utility Vault WDRs.

water discharged, and the WDRs regulating these discharges prohibit the discharges from violating water quality objectives in the receiving water.

10.8 Persons Discharging Groundwater Regulated Under San Diego Water Board General NPDES WDRs

Groundwater discharges from dewatering sites can be discharged to Chollas Creek via the MS4s. These discharges are regulated under San Diego Water Board general NPDES WDRs prescribed in Order No. 2000-90[40] and Order No. 2001-96.[41] Groundwater discharges may contain naturally occurring dissolved metals concentrations, or enriched concentrations from overlying metals contaminated soils that contribute to exceedances of metals water quality objectives in Chollas Creek. Both orders contain numeric effluent limitations for copper, lead, and zinc that are equivalent to the CTR WQOs. At this time, there are no enrollees discharging extracted groundwater to MS4s in the Chollas Creek watershed. However, copper, lead, and zinc wasteload reductions for groundwater dewatering will be required in the event that future groundwater dewatering dischargers apply for coverage under Orders No. 2000-90 and No. 2001-96 to ensure that water quality standards are attained and maintained in Chollas Creek.

10.9 Persons Discharging Hydrostatic Test Water Regulated under San Diego Water Board General NPDES WDRs

Hydrostatic test water discharges to the MS4s can contain dissolved copper, lead, and zinc. These discharges are regulated under San Diego Water Board general NPDES WDRs prescribed in Order No. R9-2002-0020. A WLA is not assigned to these discharges because they make up an extremely small volume of water discharged, and the WDRs regulating these discharges contain a requirement that the discharger provide data and information to be used by the San Diego Water Board to determine whether the proposed discharge may cause, have a reasonable potential to cause, or contribute to an excursion above any applicable priority pollutant, criterion or objective. If so, an effluent limitation may be required for the pollutant.

10.10 School Districts

In addition to the Navy, other owners and operators of small MS4s in the Chollas Creek Watershed include the school districts of Lemon Grove, La Mesa, and San Diego. These facilities are classified under the institutional land use category, which is associated with the highest copper and lead loading, and second highest zinc loading of all the land uses in the Chollas Creek Watershed. The correlation between institutional land uses and high

[40] Order No. 2000-90, NPDES Permit No. CAG919001, *General Waste Discharge Requirements for Temporary Groundwater Extraction and Similar Waste Discharges to San Diego Bay and Storm Drains or Other Conveyance Systems Tributary Thereto* or subsequent superceding NPDES renewal orders.
[41] Order No. 2001-90, NPDES No. CAG19001, *General Waste Discharge Requirements for Temporary Groundwater Extraction and Similar Waste Discharges to San Diego Bay and Storm Drains or other Conveyance Systems Tributary Thereto.*

metals loading may be because parking lots constitute a significant portion of this land use. A statewide order prescribing general WDRs for discharges from small MS4s[42] regulates urban runoff not covered by the San Diego Water Board's phase I MS4 WDRs (Order No. R9-2007-0001), including discharges from MS4s on school property. The school districts' discharges from their MS4 into Chollas Creek can be regulated by enrolling these facilities under the statewide order.

[42] State Water Board Water Quality Order No. 2003-0005-DWQ, NPDES General Permit No. CAS000004, *Waste Discharge Requirements for Storm Water Discharges from Small Municipal Separate Storm Sewer Systems*.

11 Implementation Plan

This Chapter describes the actions necessary to implement the TMDL to attain and maintain copper, lead, and zinc WQOs in Chollas Creek. The plan describes implementation responsibilities assigned to cooperating agencies and dischargers and describes the schedule and key milestones for the actions to be taken. A monitoring strategy to assess the success of this implementation plan is presented in section 12, Implementation Monitoring Plan.

The goal of the Implementation Plan is to ensure that Chollas Creek does not exceed CTR WQOs[43] for copper, lead, and zinc at all times and in all points of the creek. Since nonpoint source discharges to the creek are considered negligible, compliance with the TMDL will be accomplished by ensuring that all point source discharges meet the WLAs as set forth in section 8 of this Technical Report. Applicable WDRs will be revised to incorporate WLAs to ensure that the discharges comply with the WLAs and do not contribute to an exceedance of the WQOs in Chollas Creek

11.1 Regulatory Authority for Implementation Plans

TMDL implementation plans are not directly required under federal law; however federal policy is that TMDLs should include implementation plans. CWA section 303 [40 CFR 130] authorizes USEPA to require implementation plans for TMDLs. Although current USEPA regulations implementing section 303 do not now require states to include implementation plans for TMDLs, regulations are likely to be revised in the future to do so. USEPA regulations [40 CFR 130.6] do require states to incorporate TMDLs in the State Water Quality Management Plans (Basin Plans) along with adequate implementation measures to implement all aspects of the plan (including the TMDLs). USEPA policy is that states must include implementation plans as an element of TMDL Basin Plan amendments submitted to EPA for approval.[44]

TMDL implementation plans are required under state law. Basin plans must have a program of implementation to achieve WQOs.[45] The implementation program must include a description of actions that are necessary to achieve the objectives, a time schedule for these actions, and a description of surveillance to determine compliance with the WQOs.[46] State law requires that a TMDL include an implementation plan because the TMDL normally is, in essence, an interpretation or refinement of an existing water quality objective. The TMDLs and WLAs must be incorporated into the Basin Plan.[47] Because the TMDL supplements, interprets, or refines existing WQOs, state law requires a program of implementation.

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[43] [40 CFR 131.38(b)(2)]
[44] See *Guidance for Developing TMDLs in California,* USEPA Region 9, (January 7, 2000), Page 11.
[45] See Water Code section 13050(j). A "Water quality control plan" or "Basin Plan" consists of a designation or establishment for the waters within a specified area of all of the following: (1) Beneficial uses to be protected, (2) Water quality objectives and (3) A program of implementation needed for achieving water quality objectives.
[46] See Water Code section 13242.
[47] See Clean Water Act section 303(e).

11.2 Implementation Plan Objectives

The specific objectives of this Implementation Plan are as follows:

1. Amend the different statewide and San Diego Water Board orders that regulate point source discharges to Chollas Creek to require that urban runoff discharges from MS4s achieve the WLAs set forth in section 11.3 below;

2. Establish mechanisms to track BMP implementation, monitor BMP effectiveness in achieving the WLAs in urban runoff discharges to and from MS4s, assess success in achieving TMDL objectives and milestones, and report on TMDL program effectiveness in attaining the copper, lead, and zinc water quality objectives in Chollas Creek.

3. Establish a time schedule for meeting the WLAs of this TMDL project. The schedule will establish an interim milestone that is to be achieved until the WLAs are achieved.

4. Identify the regulatory authority under which the San Diego Water Board will direct the NPDES dischargers to initiate the elements of the implementation plan. This will only be required if the relevant WDRs are not modified to incorporate wasteload allocations in a timely manner.

5. Identify the persons responsible for meeting the WLAs in urban runoff discharged to Chollas Creek.

11.3 Waste Load Allocations and Responsible Persons

The WLAs must be met in specified point source waste discharges, which are or can be subject to regulation through NPDES WDRs, and which drain to Chollas Creek. The Chollas Creek metals WLAs are expressed as concentrations equal to 90 percent of the loading capacities for the three metals. The loading capacities are equal to the hardness based CTR maximum (acute) and continuous (chronic) criteria for copper, lead, and zinc. Setting the WLAs equal to ninety percent of the loading capacity provides the explicit MOS. Because the toxicity of dissolved metals varies with hardness, the CTR criteria are expressed as the equations in Table 11.1 below. Background sources and nonpoint sources of metals were insignificant. Therefore, this TMDL has no LAs.

TABLE 11.1 The Wasteload Allocations for dissolved copper, lead, and zinc for acute and chronic conditions

Metal	WLA for Acute Conditions – One-Hour Average = Loading Capacity* MOS	WLA for Chronic Conditions – Four-Day Average =Loading Capacity*MOS
Copper	(0.96) * {e^ [0.9422 * ln (hardness) - 1.700]}*0.9	(0.96) * {e^[0.8545 * ln (hardness) - 1.702]}*0.9
Lead	[1.46203 – 0.145712 * ln (hardness)] * {e^ [1.273 * ln (hardness) - 1.460]} * 0.9	[1.46203 – 0.145712 * ln (hardness)] * {e^[{1.273 * ln (hardness)} - 4.705]} * 0.9
Zinc	(0.978) * {e^ [0.8473 * ln (hardness) + 0.884]} * 0.9	(0.986) * {e^[0.8473 * ln (hardness) + 0.884]} * 0.9

Persons whose discharges contribute to the exceedance of WQOs for copper, lead, and zinc in Chollas Creek (as discussed in section 10) will be required to meet the WLA hardness dependant concentrations. The Municipal Dischargers and Caltrans are responsible for meeting the WLAs in their urban runoff because they own or operate MS4s that discharge copper, lead, and zinc to Chollas Creek. The Navy facility, Naval Station San Diego, has MS4s that drain directly to Chollas Creek. The Navy is responsible for meeting the WLAs in its MS4 urban runoff discharges to Chollas Creek.

Persons enrolled in the statewide General Industrial WDRs (State Water Board Order No. 99-08-DWQ) will be also be required to meet the WLAs in their regulated discharges to Chollas Creek. At this time, there are no persons enrolled in the general WDRs for Groundwater Extraction Discharges to San Diego Bay and Tributaries (San Diego Water Board Order No. 2001-90).

11.4 Interim Goals for Achieving Wasteload Allocations

The purpose of these TMDLs is to attain and maintain the applicable WQOs in Chollas Creek through mandated wasteload reductions of pollutants in point sources discharging to the creek. The TMDL requires dischargers to improve water quality conditions in the Chollas Creek receiving water by achieving wasteload reductions in their discharges. The copper, lead, and zinc TMDLs shall be implemented with a monitoring component to determine the effectiveness of each phase and guide the selection of BMPs.

Concentrations of metals in urban runoff shall only be allowed to exceed the WLAs by a certain percentage for the first nineteen years after initiation of this TMDL. Allowable concentrations shall decrease to the amounts indicated in Table 11.2 by the times indicated. For example, if the measured hardness ten years after initiation of this TMDL project dictates the WLA for copper in urban runoff is 10 µg/l, the maximum allowable measured copper concentration would be 12.0 µg/L. The phases require loading reductions in two steps through the use of expanded or better tailored BMPs to achieve the ultimate goal of attaining and maintaining compliance with copper, lead, and zinc water quality objectives. By the end of the twentieth year after initiation of this TMDL, the WLAs of this TMDL shall be met. This will ensure that copper, lead, and zinc water quality objectives are being met at all locations in the creek during all times of the year.

TABLE 11.2 Interim goals for achieving Wasteload Allocations

	Allowable Exceedance of the WLAs (allowable percentage above)		
Compliance Year	**Copper**	**Lead**	**Zinc**
1	100%	100%	100%
10	20%	20%	20%
20	0%	0%	0%

Compliance with the interim goals in this schedule can be assessed by showing that dissolved metals concentrations in the receiving water exceed the WQOs for copper, lead, and zinc by no more than the allowable exceedances for WLAs shown in Table 11.2. Regulated groundwater discharges to Chollas Creek must meet the WLAs at the initiation of the discharge. No schedule to meet interim goals will be allowed in the case of groundwater discharges.

Dischargers are expected to implement metal reduction BMPs during the first year of this TMDL, with all necessary metal load reductions being achieved within twenty years. The first ten years will require the bulk of the metal load reduction, while the remaining ten years provide for adequate construction and implementation time for potential structural BMPs, to achieve the full (100 percent) metal load reduction. As described in Appendix I section 8.4, this compliance schedule of 20 years requires comprehensive BMP planning for all pollutants impairing Chollas Creek, including coordination with all TMDLs and all other water quality project requirements within the Chollas Creek watershed.

11.5 San Diego Water Board Actions

This section describes the actions that the San Diego Water Board will take to implement the TMDL. WDRs that implement federal NPDES regulations must be made consistent with the assumptions and requirements of the WLA. NPDES WDRs must contain water quality based effluent limitations (WQBELs) consistent with the WLAs but not necessarily the strict equivalent of the WLAs. WQBELs can be numeric, non-numeric, or both. Non-numeric effluent limitations typically are a program of expanded or better-tailored BMPs. USEPA expects that most WQBELs for NPDES-regulated municipal discharges will be in the form of BMPs, and that numeric limitations will be used only in rare instances.[48] WQBELs can be incorporated into new WDRs, or into existing WDRs by reissuing or revising these WDRs. The following paragraphs describe regulatory actions that are appropriate for regulating discharges of metals and ensuring compliance with TMDL provisions.

NPDES requirements (individual and general requirements) should be issued, revised, or reissued "as expeditiously as practicable" to incorporate WQBELs derived from the TMDL wasteload allocation. As "expeditiously as practicable" means the following:

[48] EPA Memorandum entitled “Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs,” dated November 22, 2002.

(1) New Facilities. For facilities receiving a NPDES WDRs for the first time, "as expeditiously as practicable" means that the San Diego Water Board issues the NPDES WDRs that implements the WLA upon the initiation of the discharge.

(2) Facilities Currently Regulated. For facilities currently regulated under NPDES WDRs, "as expeditiously as practicable" means that:

(i)The San Diego Water Board should consider revision of the NPDES WDRs during its 5 year term, prior to expiration, in accordance with the applicable NPDES reopening provisions, taking into account factors such as available NPDES resources, staff and budget constraints, and other competing priorities.

(ii) In the event the San Diego Water Board cannot consider modification following the five-year term expiration of the NPDES WDRs, the San Diego Water Board will reissue the NPDES WDRs implementing the WLA at the end of its five-year term. Please see Table 11.3 for more details.

1. Caltrans MS4 Discharges

This point source discharge is subject to NPDES WDRs under statewide Order No. 99-06-DWQ.[49] NPDES WDRs shall be issued, reissued, or revised to include WQBELs consistent with the assumptions and requirements of the WLAs described in Table 11.1. The WQBELs may include 1) numeric effluent limitations consistent with the WLAs; 2) a program of expanded or better tailored BMPs consistent with the WLAs; or 3) some combination of both. The WDRs shall also include:

a. The schedule of compliance applicable to MS4 discharges into Chollas Creek described in Table 11.2.

b. A requirement to implement an iterative BMP approach of expanded or better-tailored BMPs to attain the WLAs in Table 11.1 in accordance with the compliance schedule in Table 11.2 of this Technical Report.

c. A requirement to submit annual progress reports to the San Diego Water Board on the progress in attaining the WLAs in urban runoff discharges and WQOs in Chollas Creek. The reports shall be due on April 1 of each year and shall be incorporated within the report required by section 2, Program Management of Order No. 99-06. Reporting shall continue on an annual basis until the metals WQOs are attained and maintained in Chollas Creek. Please see Table 11.3 for more details.

[49] Order No. 99-06-DWQ, NPDES No. CAS000003, *National Pollutant Discharge Elimination System (NPDES) Permit, Statewide Storm Water Permit, and Waste Discharge Requirements (WDRs) for the State of California, Department of Transportation (Caltrans)*, or subsequent superceding NPDES renewal Orders.

The reports should describe the BMPs being implemented by Caltrans in the Chollas Creek watershed and additional BMPs that will be implemented. The reports should describe the steps Caltrans will take to develop a long-term strategy for assessing the effectiveness of its BMPs. The long-term assessment strategy should identify specific direct and indirect measurements that it will use to track the long-term progress towards achieving the copper, lead, and zinc load reductions required under this TMDL. Methods used for assessing effectiveness should include the following or their equivalent: surveys, pollutant loading estimations, and receiving water quality monitoring. The long-term strategy should also discuss the role of monitoring data in substantiating or refining the assessment.

2. Discharges from MS4s Owned by the Cities, the County, and the Port

These point source discharges are subject to NPDES WDRs under Order No. R9-2007-0001.[50] NPDES WDRs shall be issued, reissued, or revised to include WQBELs consistent with the assumptions and requirements of the WLAs described in Table 11.1. The WQBELs may include 1) numeric effluent limitations consistent with the WLAs; 2) a program of expanded or better tailored BMPs consistent with the WLAs; or 3) some combination of both. The WDRs shall also include:

a. The schedule of compliance applicable to MS4 discharges into Chollas Creek described in Table 11.2.

b. A requirement to implement an iterative BMP approach of expanded or better-tailored BMPs to attain the WLAs in Table 11.1 in accordance with the compliance schedule in Table 11.2 of this Technical Report.

c. A requirement that the Municipal Dischargers submit annual progress reports to the San Diego Water Board on the progress in attaining the WLAs in effluent discharges and WQOs in Chollas Creek. Annual reports shall cover the period of July 1 through June 30. The reports shall be submitted to the San Diego Water Board by January 31 of the following year and shall be incorporated within the annual receiving water monitoring reports required in the Receiving Waters and Urban Runoff Monitoring Annual Report Requirements outlined in the Receiving Waters and Urban Runoff Monitoring and Report Program of Order No. R9-2007-0001. Reporting shall continue on an annual basis until the metal water quality objectives are attained and maintained in Chollas Creek. Please see Table 11.3 for more details.

The reports should describe the BMPs being implemented by the Municipal Dischargers in the Chollas Creek watershed and additional BMPs that will be

[50] Order No. 99-06-DWQ, NPDES No. CAS000003, *National Pollutant Discharge Elimination System (NPDES) Permit, Statewide Storm Water Permit, and Waste Discharge Requirements (WDRs) for the State of California, Department of Transportation (Caltrans)*, or subsequent superceding NPDES renewal Orders.

implemented. The reports should describe the steps the Municipal Dischargers will take to develop a long-term strategy for assessing the effectiveness of their BMPs. The long-term assessment strategy should identify specific direct and indirect measurements that they will use to track the long-term progress towards achieving the copper, lead, and zinc WLAs required under this TMDL Project. Methods used for assessing effectiveness should include the following or their equivalent: surveys, pollutant loading estimations, and receiving water quality monitoring. The long-term strategy should also discuss the role of monitoring data in substantiating or refining the assessment.

For copper, lead, and zinc discharges in urban runoff to or from MS4s within the Chollas Creek watershed, the Municipal Dischargers have an existing obligation under Order No. R9-2007-0001 to require increasingly stringent BMPs, pursuant to the iterative process described in Prohibitions and Receiving Water Limitation A.3.a.(1)[51] of the Order, to reduce metal discharges in the Chollas Creek watershed to the maximum extent practicable and to restore compliance with the copper, lead, and zinc components of the toxic pollutants water quality objectives.

3. Municipal Dischargers and the Navy – Amend Order No. R9-2004-0277, Chollas Creek Investigation and Monitoring Program for Diazinon and Metals

   The San Diego Water Board shall amend Order No. R9-2004-0277 (or subsequent superseding renewal orders) to include the following:

   A requirement that the Municipal Dischargers and Caltrans investigate excessive levels of metals in Chollas Creek and feasible management strategies to reduce metal loadings in Chollas Creek. The amendment will require additional monitoring to collect the data necessary to refine the watershed wash-off model to provide a more accurate estimate of the mass loads of copper, lead, and zinc leaving Chollas Creek each year. The Navy will be added to this order when it is amended to include the requirements of this TMDL Project. Please see Table 11.3 for more details.

4. Amend Orders No. 2000-90 and No. 2001-96 General WDRs for Groundwater Extraction Discharges

[51] Receiving Water Limitation A.3.a (1) provides that "[u]pon a determination by either the Copermittee or the San Diego Water Board that MS4 discharges are causing or contributing to an exceedance of an applicable water quality standard, the Copermittee shall promptly notify and thereafter submit a report to the San Diego Water Board that describes BMPs that are currently being implemented and additional BMPs that will be implemented to prevent or reduce any pollutants that are causing or contributing to the exceedance of water quality standards…"

The San Diego Water Board will amend Orders No. 2000-90,[52] and No. 2001-96[53] which regulates temporary groundwater extraction discharges to San Diego Bay and its tributaries. The existing effluent limitations for copper, lead, and zinc for extracted groundwater discharges to MS4s in the Chollas Creek watershed, and directly to Chollas Creek, will be revised to equal the WLAs of this TMDL. Regulated groundwater discharges to Chollas Creek must meet the WLAs at the initiation of the discharge. No schedule to meet interim goals will be allowed in the case of groundwater discharges. A revision of the receiving water limitations is not required since they are equal to the WQOs for metals in Chollas Creek.

5. Stormwater Discharges from Industrial Facilities

These point source discharges are subject to NPDES WDRs under Order No. 97-03-DWQ.[54] NPDES WDRs shall be issued, reissued, or revised to include requirements of the WLAs described in Table 11.1. The WQBELs may include 1) numeric effluent limitations consistent with the WLAs; 2) a program of expanded or increasing BMPs consistent with the WLAs; or 3) some combination of both. The WDRs shall also include:

a. The schedule of compliance applicable to industrial facility stormwater discharges into Chollas Creek described in Table 11.2.

b. A requirement to implement an iterative BMP approach of expanded or better-tailored BMPs to attain the WLAs in Table 11.1 in accordance with the compliance schedule in Table 11.2 of this Technical Report.

c. A requirement to submit annual progress reports to the San Diego Water Board on the progress in attaining the WLAs in effluent discharges. The reports shall be due on July 1 of each year and shall be incorporated within the annual report required by section A.14 of Order No. 97-03-DWQ. Reporting shall continue on an annual basis until the metals WQOs are attained and maintained in Chollas Creek. Please see Table 11.3 for more details.

   The report should describe the steps industrial dischargers will take to develop a long-term strategy for assessing the effectiveness of its BMPs. The long-term assessment strategy should identify specific direct and indirect measurements that it will use to track the long-term progress towards

[52] Order No. 2000-90, NPDES Permit No. CAG919001, *General Waste Discharge Requirements for Temporary Groundwater Extraction and Similar Waste Discharges to San Diego Bay and Storm Drains or Other Conveyance Systems Tributary Thereto* or subsequent superseding NPDES renewal orders.
[53] Order No. 2001-96, NPDES Permit No. CAG919002, *General Waste Discharge Requirements for Groundwater Extraction Waste Discharges from Construction, Remediation and Permanent Groundwater Extractioi Projects to Surface Waters within the San Diego Region Except for San Diego Bay* or subsequent superseding NPDES renewal orders.
[54] Order No. 97-03-DWQ, NPDES Permit No. CAS000001, *Waste Discharge Requirements for Discharges of Storm Water Associated with Industrial Activities Excluding Construction Activities* or subsequent superseding NPDES renewal orders.

achieving the copper, lead, and zinc load reductions required by this TMDL. Methods used for assessing effectiveness should include the following or their equivalent: surveys, pollutant loading estimations, and receiving water quality monitoring. The long-term strategy should also discuss the role of monitoring data in substantiating or refining the assessment.

6. Take Enforcement Actions

   The San Diego Water Board shall consider enforcement action,[55] as necessary, against any discharger failing to comply with applicable waiver conditions, WDRs, discharge prohibitions, or take enforcement action, as necessary, to control the discharge of metals to Chollas Creek, to attain compliance with the metals WLAs specified in this Technical Report, or to attain compliance with the metals WQOs. The San Diego Water Board may also terminate the applicability of waivers and issue WDRs or take other appropriate action against any discharger(s) failing to comply with the waiver conditions. Please see Table 11.3 for more details.

7. Recommend High Priority for Grant Funds

   The San Diego Water Board shall recommend that the State Water Board assign a high priority to awarding grant funding[56] for projects to implement the Chollas Creek metal TMDLs. Special emphasis will be given to projects that can achieve quantifiable metal load reductions consistent with the specific metal TMDL WLAs. Please see Table 11.3 for more details.

8. Enroll the Navy in Order No. 2003-0005-DWQ, Statewide general WDRs for Discharges from Small MS4s

   The San Diego Water Board shall require the Navy to submit a complete Report of Waste Discharge (ROWD), and shall enroll the Navy community facilities of Naval Base San Diego under Order No. 2003-0005-DWQ.[57] Alternatively, the San Diego

[55] An enforcement action is any formal or informal action taken to address an incidence of actual or threatened noncompliance with existing regulations or provisions designed to protect water quality. Potential enforcement actions include notices of violations (NOVs), notices to comply (NTCs), imposition of time schedules (TSO), issuance of cease and desist orders (CDOs) and cleanup and abatement orders (CAOs), administrative civil liability (ACL), and referral to the attorney general (AG) or district attorney (DA). The San Diego Water Board generally implements enforcement through an escalating series of actions to: (1) assist cooperative dischargers in achieving compliance; (2) compel compliance for repeat violations and recalcitrant violators; and (3) provide a disincentive for noncompliance.

[56] Order No. 99-06-DWQ, NPDES No. CAS000003, *National Pollutant Discharge Elimination System (NPDES) Permit, Statewide Storm Water Permit, and Waste Discharge Requirements (WDRs) for the State of California, Department of Transportation (Caltrans)*, or subsequent superceding NPDES renewal Orders.

[57] Order No. 99-06-DWQ, NPDES No. CAS000003, *National Pollutant Discharge Elimination System (NPDES) Permit, Statewide Storm Water Permit, and Waste Discharge Requirements (WDRs) for the State of California, Department of Transportation (Caltrans)*, or subsequent superceding NPDES renewal Orders.

Water Board could issue new WDRs to the Navy. Please see Table 11.3 for more details.

9. Construction Stormwater Discharges

These point source discharges are subject to NPDES WDRs under statewide Order No. 97-03-DWQ.[58] NPDES WDRs shall be issued, reissued, or revised to include WQBELs consistent with the assumptions and requirements of the WLAs described in Table 11.1. The WQBELs may include 1) numeric effluent limitations consistent with the WLAs; 2) a program of expanded or better tailored BMPs consistent with the WLAs; or 3) some combination of both. The WDRs shall also include:

d. The schedule of compliance applicable to industrial facility stormwater discharges into Chollas Creek described in Table 11.2.

e. A requirement to implement an iterative BMP approach of expanded or better-tailored BMPs to attain the WLAs in Table 11.1 in accordance with the compliance schedule in Table 11.2 of this Technical Report.

f. A requirement to submit annual progress reports to the San Diego Water Board on the progress in attaining the WLAs in effluent discharges. The reports shall be due on July 1 of each year and shall be incorporated within the annual report required by section A.14 of Order No. 97-03-DWQ. Reporting shall continue on an annual basis until the metals WQOs are attained and maintained in Chollas Creek. Please see Table 11.3 for more details.

   The report should describe the steps industrial dischargers will take to develop a long-term strategy for assessing the effectiveness of its BMPs. The long-term assessment strategy should identify specific direct and indirect measurements that it will use to track the long-term progress towards achieving the copper, lead, and zinc load reductions required by this TMDL. Methods used for assessing effectiveness should include the following or their equivalent: surveys, pollutant loading estimations, and receiving water quality monitoring. The long-term strategy should also discuss the role of monitoring data in substantiating or refining the assessment.

10. South Chollas Landfill

There is only one landfill in the Chollas Creek Watershed and it was closed in 1981. Order No. 97-11[59] and Addendum No. 4 require monitoring of groundwater below and near the South Chollas Landfill. The San Diego Water Board will revise this WDR to re-institute analysis for metals and begin analysis for hardness as part of the

[58] Order No. 99-08-DWQ NPDES No. CAS 000002 General Construction Storm Water WDRs or subsequent superseding NPDES renewal orders.
[59] Order No. R9-97-11, *General Waste Discharge Requirements for Post-Closure Maintenance of Inactive Nonhazardous Waste Landfills within the San Diego Region* or subsequent superseding NPDES renewal orders.

monitoring requirements. Furthermore, if the data indicate that metal concentrations are in excess of the WLAs of this TMDL, the San Diego Water Board may require additional actions. Since the landfill is down gradient from Chollas Reservoir and is up gradient from Chollas Creek, the possibility exists that groundwater recharge from the reservoir may be transporting landfill pollutants to the creek. The WDR may be revised or the San Diego Water Board may issue an investigative order (under the authority of the Water Code section 13267) to require a technical report examining this potential metals pathway to Chollas Creek. Please see Table 11.3 for more details.

11. School Districts

Order No. 2003-0005-DWQ (or superseding renewal order) identifies Phase II small MS4 dischargers and requires them to develop and implement a Stormwater Management Plan/Program with the goal of reducing the discharge of pollutants to the maximum extent practicable (MEP). In addition to the Navy, the Phase II small MS4 dischargers identified in the Chollas Creek watershed include the Lemon Grove, La Mesa, and San Diego School Districts. Currently, none of the school districts are enrolled under the general NPDES requirements.

MEP is the performance standard specified in section 402(p) of the CWA. The management programs specify what BMPs will be used to address certain program areas. The program areas include public education and outreach; illicit discharge detection and elimination; construction and post-construction; and good housekeeping for municipal operations. In general, medium and large municipalities are required to conduct chemical monitoring, though small municipalities are not.

The San Diego Water Board shall require the school districts in the Chollas Creek watershed, subject to these TMDLs, to submit Notices of Intent[60] to comply with the requirements of Order No. 2003-0005-DWQ, immediately upon adoption of these TMDLs. Once enrolled under the order, the school districts will be required to comply with the provisions of the order to reduce the discharge of copper, lead and zinc to the MEP as specified in their Stormwater Management Plans/Programs. Please see Table 11.3 for more details.

12. New Facilities

All new facilities in the Chollas Creek watershed enrolling for regulation under existing NPDES WDRs for the first time, will not be given a compliance schedule for their discharge to meet the WQBELs that implement the WLAs of this TMDL. Upon initiation of enrollment, their discharge must be in compliance with the WQBELs.

[60] The Notice of Intent, or NOI, is attachment 7 to Order No. 2003-0005-DWQ.

11.6 Compliance Schedule

The Compliance Schedule is shown in Table 11.3. This schedule includes the implementation actions of the San Diego Water Board and the dischargers discussed in the preceeding sections, the due dates for those actions, and the interim and final allowable exceedances of the WLAs.

TABLE 11.3 Compliance schedule.

Item	Implementation Action	Responsible Parties	Date
1	Effective date of Chollas Creek Metals TMDL Waste Load Allocations.	San Diego Water Board, Municipal Dischargers, Caltrans, Navy, Industrial Stormwater Dischargers, Construction Stormwater Dischargers, Landfill Stormwater Dischargers	October 22, 2008[61]
2	Recommend High Priority for grant funds.	San Diego Water Board	Immediately after effective date
3	Submit annual Progress Report to San Diego Water Board due January 1 of each year.	Municipal Dischargers	Annually after reissue of NPDES WDRs.
4	Submit annual Progress Report to San Diego Water Board due April 1 of each year.	Caltrans	Annually after reissue of NPDES WDRs.
5	Submit annual Progress Report to San Diego Water Board due July 1 of each year.	Industrial Stormwater Dischargers	Annually after reissue of NPDES WDRs.
6	Submit annual Progress Report to San Diego Water Board due July 1 of each year.	Construction Stormwater Dischargers	Annually after reissue of NPDES WDRs.
7	Municipal NPDES WDRs shall be issued, reissued, or revised to include WQBELs consistent with the assumptions and requirements of the Chollas Creek WLAs.	San Diego Water Board	Within 5 years of effective date
8	Caltrans NPDES WDRs shall be issued, reissued, or revised to include WQBELs consistent with the assumptions and requirements of the Chollas Creek WLAs.	State Water Board	Within 5 years of effective date
9	Construction NPDES WDRs shall be issued, reissued, or revised to include WQBELs consistent with the assumptions and requirements of the Chollas Creek WLAs.	State Water Board	Within 5 years of effective date
10	Industrial NPDES WDRs shall be issued, reissued, or revised to include WQBELs consistent with the assumptions and requirements of the Chollas Creek WLAs.	State Water Board	Within 5 years of effective date
11	Amend Orders No. 2000-90, and No. 2001-96 (or superseding renewal orders) which regulates temporary groundwater extraction discharges to San Diego Bay and its tributaries to include WQBELs consistent with the assumptions and requirements of the Chollas Creek WLAs.	San Diego Water Board	Within 5 years of effective date

[61] Upon approval of by OAL.

Item	Implementation Action	Responsible Parties	Date
12	Municipal and Navy WDR Order No. R9-2004-0277 shall amended to require additional monitoring for metals and hardness.	San Diego Water Board	Within 5 years of effective date
13	Landfill NPDES WDR Order No. 97-11 (or superseding renewal orders) shall be issued, reissued, or revised to monitor for metals and hardness.	San Diego Water Board	Within 5 years of effective date
14	Navy and all other Phase II small MS4 permittees in the Chollas Creek watershed shall be enrolled in Order No. 2003-0005-DWQ (or superseding renewal orders).	San Diego Water Board	Immediately after effective date.
15	Take enforcement actions	San Diego Water Board	As needed after effective date.
16	Meet 80% Chollas Creek Metals TMDL WLA reductions.	Municipal Dischargers, Caltrans, Navy, Industrial Stormwater Dischargers, Construction Stormwater Dischargers, Landfill Stormwater Dischargers	10 years after effective date.
17	Meet 100% Chollas Creek Metals TMDL WLA reductions.	Municipal Dischargers, Caltrans, Navy, Industrial Stormwater Dischargers, Construction Stormwater Dischargers, Landfill Stormwater Dischargers	20 years after effective date.

12 Implementation Monitoring Plan

This section describes an Implementation Monitoring Plan to assess the success of the implementation plan presented in section 10 in 1) achieving the copper, lead, and zinc wasteload allocations and 2) attaining copper, lead, and zinc water quality objectives in Chollas Creek. The plan assigns monitoring responsibilities and describes key milestones.

12.1 Regulatory Authority for Implementation Monitoring Plan

Basin Plans must have a program of implementation to achieve WQOs.[62] The implementation program must include a description of actions that are necessary to achieve WQOs, a time schedule for these actions, and a description of "surveillance" to determine compliance with the water quality objectives.[63] The term "surveillance" in a TMDL context refers to an implementation monitoring plan designed to measure the effectiveness of the TMDL point and nonpoint source control measures and the progress the waterbody is making toward attaining WQOs. Such a plan would necessarily include collection of water quality data. State law requires that a TMDL include an implementation monitoring plan because the TMDL normally is, in essence, an interpretation or refinement of an existing WQO. The TMDL must be incorporated into the Basin Plan,[64] and, because the TMDL supplements, interprets, or refines an existing WQO, state law requires an implementation monitoring plan be included to determine the success of the implementation plan measures

Water Code section 13267 provides that the San Diego Water Board can require any person who has discharged, discharges, proposes to discharge or is suspected of discharging waste to investigate, monitor, and report information. The only restriction is that the burden of preparing the reports bears a reasonable relationship to the need for and the benefits to be obtained from the reports.

Water Code section 13383 provides that the San Diego Water Board may establish monitoring requirements for any person who discharges, or proposes to discharge, pollutants to navigable waters of the U.S. Order No. R9-2004-0277, issued by the San Diego Water Board pursuant to section 13383, requires the Municipal Dischargers and Caltrans to conduct an investigation and monitoring program for diazinon, copper, lead, and zinc in Chollas Creek.

12.2 Monitoring Objectives

The specific objectives of this Implementation Monitoring Plan are as follows:

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[62] See CWC section 13050(j). A "Water Quality Control Plan" or "Basin Plan" consists of a designation or establishment for the waters within a specified area of all of the following: (1) Beneficial uses to be protected, (2) WQOs and (3) A program of implementation needed for achieving water quality objectives.

[63] See CWC section 13242.

[64] See CWA section 303(e).

1. Establish a monitoring program for Chollas Creek and its tributaries using monitoring, sampling and analytical methods consistent with the State Water Board Surface Water Ambient Monitoring Program (SWAMP); SWAMP data quality assurance protocols; and SWAMP data management;

2. Characterize baseline conditions in Chollas Creek and its tributaries with respect to metals to place future monitoring data into perspective and document progress towards cleaner water;

3. Track changes in water quality over time in Chollas Creek and its tributaries with respect to metals and enable comparison of baseline data and TMDL project target values with conditions. Determine whether the "trajectory" of the measured water quality values points toward attainment of the copper, lead, and zinc WQOs;

4. Evaluate the effectiveness of the TMDL implementation actions over time and determine the need for revisions to improve the implementation plan;

5. Provide the monitoring data needed to verify or refine assumptions, resolve uncertainties, and improve the scientific foundation of the TMDL. This includes the metals, hardness, and flow data necessary to refine land use wash-off models to more accurately estimate copper, lead, and zinc mass loads from the Chollas Creek watershed; and

6. Provide the monitoring data needed to evaluate the overall TMDL implementation effectiveness and success in attaining copper, lead, and zinc WQOs in Chollas Creek and its tributaries.

12.3 San Diego Water Board Actions

1. Review Order No. R9-2004-0277[65] - This Order requires the Municipal Dischargers to submit monitoring program reports for copper, lead, zinc, calcium carbonate, and diazinon monitoring in Chollas Creek. The San Diego Water Board will review the Order to ensure that all elements of the Implementation Monitoring Plan for this TMDL Project are being addressed in the Order. Furthermore, the San Diego Water Board will research the data requirements to refine the watershed wash-off models to provide more accurate estimates of the mass loads of copper, lead, and zinc leaving the Chollas Creek Watershed on an annual basis. If necessary, Order No. R9-2004-0277 will be amended to include additional monitoring.

2. Amend Order No. R9-2004-0277, if Necessary, to Require Submission of Revised Monitoring and Reporting Program Plan - If the monitoring and reporting

[65] Order No. R9-2004-0277, Investigation Order issued to California Department Of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge Of Diazinon into the Chollas Creek Watershed, San Diego, California

program ongoing in Chollas Creek is inadequate to fulfill the monitoring objectives listed is section 12.2, Order No. R9-2004-0277 shall be amended to require Caltrans and the Municipal Dischargers to prepare and submit a revised Implementation Monitoring and Reporting Program Plan containing the additional elements described in section 12.5 Implementation Monitoring Plan Elements below. Caltrans and the Municipal Dischargers shall be required to implement the revised Implementation Monitoring Plan in accordance with the revised order. The San Diego Water Board may further amend this order at any time.

12.4 Municipal Dischargers and Caltrans Actions

1. Prepare and Submit Monitoring Plan, if Required - The Municipal Dischargers and Caltrans shall collaborate to prepare and submit a revised Implementation Monitoring Plan for the Chollas Creek watershed containing the elements described in section 12.5 Implementation Monitoring Plan Elements below, upon order of the San Diego Water Board pursuant to CWC section 13383. The revised Implementation Monitoring Plan shall be modified as required by the San Diego Water Board.

2. Implement Monitoring Plan - The Municipal Dischargers and Caltrans shall implement the revised Implementation Monitoring Plan upon order of the San Diego Water Board pursuant to CWC section 13383. The San Diego Water Board may amend this order at any time.

12.5 Revised Implementation Monitoring Plan Elements

The revised Implementation Monitoring Plan shall contain the following elements:

1. The data necessary to refine the watershed wash-off models, to provide more accurate estimates of the mass loads of copper, lead, and zinc leaving the Chollas Creek Watershed on an annual basis. This is likely to include, at a minimum, measurements of calcium carbonate, copper, lead, zinc and flow during dry weather.

2. Additional dry and wet weather monitoring. The San Diego Water Board has worked with SCCWRP to identify data gaps and has collected samples as part of the development of the TMDL for metals in San Diego Bay at the mouth of Chollas Creek.

3. All monitoring shall concurrently sample for both hardness and metals. Hardness analysis will be conducted on unfiltered samples according to Standard Method 2340-B at a detection level 1 mg/L $CaCO_3$. Analysis for dissolved metals will be conducted on filtered samples using trace metal clean analytical and sampling methods. To ensure detection limits are low enough to compare to the wasteload allocations, USEPA methods 1638 and 1669 shall be used. Equivalent

methods with equal or lower detection limits may be used after approval by the San Diego Water Board.

Until Order No. R9-2004-0277 is amended, all monitoring and reporting requirements are in full force and effect. Most, if not all, of the existing requirements will be unchanged if the order is amended.

13 Environmental Analysis, Checklist, and Economic Factors

The San Diego Water Board must comply with the California Environmental Quality Act (CEQA) when amending the Basin Plan as proposed in this project to adopt TMDLs for copper, lead, and zinc in Chollas Creek. Under the CEQA, the San Diego Water Board is the Lead Agency for evaluating the environmental impacts of the reasonably foreseeable methods of compliance with the proposed TMDLs. The following section summarizes the environmental analysis conducted to fulfill the CEQA requirements. The complete Environmental Analysis, Checklist and Economic Factors are discussed in detail in Appendix I.

13.1 California Environmental Quality Act Requirements

The CEQA authorizes the Secretary of the Resources Agency to certify state regulatory programs, designed to meet the goals of the CEQA, as exempt from its requirements to prepare an Environmental Impact Report (EIR), Negative Declaration, or Initial Study. The State Water Board's and San Diego Water Board's Basin Plan amendment process is a certified regulatory program and is therefore exempt from the CEQA's requirements to prepare such documents.[66]

The State Water Board's CEQA implementation regulations[67] describe the environmental documents required for Basin Plan amendment actions. These documents consist of a written report that includes a description of the proposed activity, alternatives to the proposed activity to lesson or eliminate potentially significant environmental impacts, and identification of mitigation measures to minimize any significant adverse impacts.

The CEQA and CEQA Guidelines limit the scope to an environmental analysis of the reasonably foreseeable methods of compliance with the WLAs and LAs. The State Water Board CEQA Implementation Regulations for Certified Regulatory Programs[68] require the environmental analysis to include at least the following:

1. A brief description of the proposed activity. In this case, the proposed activity is the TMDL Basin Plan amendment.

2. Reasonable alternatives to the proposed activity.

3. Mitigation measures to minimize any significant adverse environmental impacts of the proposed activity.

Additionally, the CEQA[69] and CEQA Guidelines[70] require the following components, some of which are repetitive of the list above:

[66] 14 CCR section 15251(g) and Public Resources Code section 21080.5.
[67] 23 CCR section 3720 et seq. "Implementation of the Environmental Quality Act of 1970."
[68] Ibid.
[69] Public Resources Code section 21159(a)
[70] 14 CCR section 15187(c)

1. An analysis of the reasonably foreseeable environmental impacts of the methods of compliance.

2. An analysis of the reasonably foreseeable feasible mitigation measures relating to those impacts.

3. An analysis of reasonably foreseeable alternative means of compliance with the rule or regulation, which would avoid or eliminate the identified impacts.

Additionally, the CEQA Guidelines require the environmental analysis take into account a reasonable range of:[71]

1. Environmental factors
2. Economic factors
3. Technical factors
4. Population
5. Geographic areas
6. Specific sites

13.2 Analysis of Reasonably Foreseeable Methods of Compliance

The analysis of potential environmental impacts is based on the numerous alternative means of compliance available for controlling copper, lead, and zinc loading to Chollas Creek. The majority of metals discharged into the Chollas Creek watershed result from stormwater runoff of metals from freeway surfaces and commercial/institutional land uses. Attainment of the WLAs will be achieved through discharger implementation of structural and nonstructural control strategies designed to reduce metals loading in urban runoff. The controls evaluated in Appendix I include:

1. Education and Outreach
2. Road and Street Maintenance
3. Illicit Discharges
4. Inspections
5. Development/Enforcement of Local Ordinances
6. Vegetated Swales and Buffer Strips
7. Bioretention
8. Detention Basins
9. Retention Ponds
10. Sand Filters
11. Diversion Systems
12. Porous Pavement
13. Infiltration Systems

Structural and non-structural control strategies can be based on specific land uses, sources, or periods of a storm event. In order to comply with these TMDLs, emphasis

[71] 14 CCR section 15187(d) and Public Resources Code section 21159(c)

should be placed on Best Management Practices (BMPs) that control the sources of pollutants and on the maintenance of BMPs that remove pollutants from runoff.

13.3 Possible Environmental Impacts

The CEQA[72] and CEQA Guidelines [73] require an analysis of the reasonably foreseeable environmental impacts of the methods of compliance with the TMDL Basin Plan amendment. The Environmental Checklist identifies the potential environmental impacts associated with these methods with respect to earth, air, water, plant life, animal life, noise, light, land use, natural resources, risk of upset, population, housing, transportation, public services, energy, utilities and services systems, human health, aesthetics, recreation, and archeological/historical concerns.

From the 61 reasonably foreseeable environmental impacts identified in the checklist none were considered to be "Potentially Significant." Forty nine were considered either "Less Than Significant with Mitigation" or "Less Than Significant." Twelve were considered to have "No Impact" on the environment. See sections 4 and 5 in Appendix I for a complete discussion of the potential environmental impacts.

In addition to the potential impacts mentioned above, mandatory finding of significance regarding short-term, long-term, cumulative, and substantial impacts were evaluated. Based on this review, the San Diego Water Board concluded that the potentially significant cumulative impacts can be mitigated to less than significant levels as discussed in Appendix I.

13.4 Alternative Means of Compliance

The CEQA requires an analysis of reasonably foreseeable alternative means of compliance with the rule or regulation, which would avoid or eliminate the identified impacts.[74] The dischargers can use the structural and non-structural BMPs described in Appendix I or other structural and non-structural BMPs, to control and prevent pollution, and meet the TMDLs' required load reductions. The alternative means of compliance with the TMDLs consist of the different combinations of structural and non-structural BMPs that the dischargers might use. Since most of the adverse environmental effects are associated with the construction and installation of large scale structural BMPs, to avoid or eliminate impacts, compliance alternatives should minimize structural BMPs, maximize non-structural BMPs, and site, size, and design structural BMPs in ways to minimize environmental effects.

13.5 Reasonably Foreseeable Methods of Compliance at Specific Sites

The most reasonably foreseeable method of compliance with this Basin Plan amendment establishing TMDLs for copper, lead, and zinc is through the implementation of BMPs. The types of BMPs suitable for different specific sites in the watershed depend on the

[72] Public Resources Code section 21159(a)
[73] 14 CCR section 15187(c)
[74] 14 CCR section 15187 (c) (3)

land use at the site, particularly as it relates to population density and the amount of vehicular traffic. In open space areas, and residential areas, where vehicular traffic is lower than other land uses, non-structural BMPs alone may be adequate to reduce metals loading. Appropriate non-structural BMPs include street sweeping, development and enforcement of municipal ordinances prohibiting exposure of copper, lead, and zinc materials to stormwater, and development and enforcement of municipal ordinances prohibiting nuisance flows. However, in commercial/institutional and roadways land use areas, both structural and non-structural BMPs likely will be needed. Appropriate structural BMPs include vegetated swales and buffer strips, detention basins and retention ponds, sand filters, diversion systems, porous pavement/infiltration systems, and bioretention.

13.6 Economic Factors

The environmental analysis required by the CEQA must take into account a reasonable range of economic factors. This section contains estimates of the costs of implementing the reasonably foreseeable methods of compliance with the TMDL Basin Plan amendment. Specifically, this analysis estimates the costs of implementing the structural and non-structural BMPs which the dischargers could use to reduce copper, lead, and zinc loading to Chollas Creek in 10 percent of the watershed.

As discussed in section 7 in Appendix I, the cost estimates for non-structural BMPs ranged from $0 to $200,000. The cost estimates for treating 10 percent of the watershed with structural BMPs ranged from $960,000 to $490 million with yearly maintenance costs estimated from $10,000 to $2 million.

Implementation of these TMDLs will also entail water quality monitoring which has associated costs. Assuming that a two-person sampling team can collect samples at 5 sites per day, the total cost for one day of sampling would be $1,907.

The specific BMPs to be implemented will be chosen by the dischargers after adoption of these TMDLs. All costs are preliminary estimates since particular elements of a BMP, such as type, size, and location, would need to be developed to provide a basis for more accurate cost estimations.

13.7 Reasonable Alternatives to the Proposed Activity

The environmental analysis must include an analysis of reasonable alternatives to the proposed activity.[75] The proposed activity is a Basin Plan Amendment to incorporate TMDLs for copper, lead, and zinc in Chollas Creek. The purpose of this analysis was to determine if there is an alternative that would feasibly attain the basic objective of the rule or regulation (the proposed activity), but would lessen, avoid, or eliminate any identified impacts. The alternatives analyzed included taking no action and modifying water quality standards in Chollas Creek. In addition, two alternative time schedules for implementing load reductions to meet the TMDL were analyzed.

[75] 23 CCR section 3777

Taking no action and modifying water quality standards in Chollas Creek do not meet the objective of the TMDLs and are therefore, not feasible. Of the two compliance schedule alternatives, the longer 20-year schedule is the preferred alternative because it allows the dischargers time to choose cost effective and low-impact BMPs that are designed to remove a comprehensive suite of pollutants, not just copper, lead, and zinc. These alternative actions and time schedules are discussed in section 8 of Appendix I.

14 Necessity of Regulatory Provisions

The OAL is responsible for reviewing administrative regulations proposed by state agencies for compliance with standards set forth in California's Administrative Procedure Act, Government Code section 11340 et seq., for transmitting these regulations to the Secretary of State and for publishing regulations in the California Code of Regulations (CCR). Following State Water Board approval of this Basin Plan amendment establishing TMDLs, any regulatory portions of the amendment must be approved by OAL per Government Code section 11352. The State Water Board must include in its submittal to OAL a summary of the necessity[76] for the regulatory provision.

This Basin Plan amendment for Chollas Creek meets the "necessity standard" of Government Code section 11353(b). Amendment of the Basin Plan to establish and implement copper, lead, and zinc TMDLs in Chollas Creek is necessary because the existing water quality does not meet applicable numeric WQOs for these metals. Applicable state and federal laws require the adoption of this Basin Plan amendment and regulations as provided below.

The State and Regional Water Boards are delegated the responsibility for implementing California's Porter Cologne Water Quality Control Act and the federal CWA. Pursuant to relevant provisions of both of those acts the State and Regional Water Boards establish WQSs, including designated (beneficial) uses and criteria or objectives to protect those uses.

Section 303(d) of the CWA [33 USC section 1313(d)] requires the states to identify certain waters within their borders that are not attaining WQSs and to establish TMDLs for certain pollutants impairing those waters. USEPA regulations in Title 40 of the CFR section 130.2 provide that a TMDL is a numerical calculation of the amount of a pollutant that a water body can assimilate and still meet standards. A TMDL includes one or more numeric targets that represent attainment of the applicable standards, considering seasonal variations and a MOS, in addition to the allocation of the target or load among the various sources of the pollutant. These include WLAs for point sources and LAs for nonpoint sources and natural background. TMDLs established for impaired waters must be submitted to the USEPA for approval.

CWA section 303(e) requires that TMDLs, upon USEPA approval, be incorporated into the State's Water Quality Management Plans, along with adequate measures to implement all aspects of the TMDL. In California, these are the basin plans for the nine regions. CWC sections 13050(j) and 13242 require that basin plans have a program of implementation to achieve WQOs. The implementation program must include a description of actions that are necessary to achieve the objectives, a time schedule for these actions, and a description of surveillance to determine compliance with the

[76] "Necessity" means the record of the rulemaking proceeding demonstrates by substantial evidence the need for a regulation to effectuate the purpose of the statute, court decision, provision of law that the regulation implements, interprets, or makes, taking into account the totality of the record. For purposes of this standard, evidence includes, but is not limited to, facts, studies, and expert opinion. [Government Code section 11349(a)].

objectives. State law requires that a TMDL project include an implementation plan because TMDLs normally are, in essence, interpretations or refinements of existing WQOs. The TMDLs have to be incorporated into the Basin Plan [CWA section 303(e)], and, because the TMDLs supplement, interpret, or refine existing objectives, state law requires a program of implementation.

15 Public Participation

Public participation is an important component of TMDL development. The federal regulations [40 CFR 130.7] require that TMDL projects be subject to public review. All public hearings and public meetings have been conducted as stipulated in the regulations [40 CFR 25.5 and 40 CFR 25.6, respectively], for all programs under the CWA. Public participation was provided through four public workshops, numerous stakeholder group meetings and communications, and public presentations and participation at relevant conferences. In addition, staff contact information was provided on the San Diego Water Board's web site, along with periodically updated drafts of TMDL project documents throughout the development process. Public participation will also occur through the San Diego Water Board's Basin Plan amendment process, which includes a public workshop and formal public comment period. A chronology of public participation and major milestones is provided in Table 16.1 below:

TABLE 16.1. Public Participation Milestones

Date	Event
May 2000–Ongoing	Web Site – Information including drafts of the technical report and contact information were made available on the San Diego Water Board's web site.
August 1999	Public Workshop
December 1999	Public Workshop
May 2000	Public Workshop
March 2003	Public Workshop and CEQA Scoping Meeting
March 17, 2005	Informal Public Review
March 28, 2005	Release draft for formal Public Review
April 28, 2005	Public Workshop
May 11, 2005	Public Hearing
May 18, 2005	Informal meeting with interested parties to discuss the compliance schedule
June 29, 2005	Deliberation and adoption
July 25, 2006	Re-release draft for formal Public Review
March 9, 2007	Re-release draft for formal Public Review
April 25, 2007	Public Hearing
June 13, 2007	Public Hearing, deliberation, and adoption

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Appendix A
Data

Used in the Chollas Creek Metals Total Maximum Daily Load

California Regional Water Quality Control Board, San Diego Region

May 30, 2007

Appendix A: Chollas Creek Metals (Cd) Data

031366

Station ID	Sample Date	Total Hardness as $CaCO_3$ (mg/L)		Conc. (ug/L)	actual conc. or 1/2 RL	Reporting Limit (ug/L)	CMC Freshwater CF	CCC Freshwater CF	EMC (ug/L)	Reporting Limit (ug/L)	Reference
				Dissolved Cadmium (ug/L)			Acute Dissolved Cadmium	Chronic Dissolved Cadmium	Total Cadmium		
11-87	2/12/2000	-	<	0.2	0.1	0.20	#VALUE!	#VALUE!	1.3	0.20	v
11-87	2/23/2000	-	=	0.3	0.3	0.20	#VALUE!	#VALUE!	0.7	0.20	v
11-87	3/5/2000	-	<	0.2	0.1	0.20	#VALUE!	#VALUE!	<.2 U	0.20	v
11-87	4/17/2000	-	=	0.3	0.3	0.20	#VALUE!	#VALUE!	1	0.20	v
Allways Recycling	4/12/1999	NA					#VALUE!	#VALUE!	9		s
north fork	3/15/1999	90.8	<	0.30	1.00	2.00	0.948	0.913038713	NA	-	o
north fork	3/25/1999	68	<	2.00	1.00	2.00	0.960	0.925136237	NA	-	o
north fork	4/6/1999	110	<	2.00	1.00	2.00	0.940	0.905013302	NA	-	o
SD8(1)	2/17/1994	120	=	1.40	1.40	0.20	0.936	0.90137292	1.5	0.2	k
SD8(1)	3/24/1994	71	=	1.63	1.63	0.20	0.958	0.923329999	1.7	0.2	k
SD8(1)	4/24/1994	110	=	1.13	1.13	0.20	0.940	0.905013302	1.2	0.2	k
SD8(1)	11/10/1994	150	=	0.46	0.46	0.20	0.927	0.892037041	0.5	0.2	a
SD8(1)	1/11/1995	58	=	0.77	0.77	0.20	0.967	0.931791185	0.8	0.2	a
SD8(1)	2/14/1995	100	=	1.60	1.60	0.20	0.944	0.90900089	1.7	0.2	a
SD8(1)	4/16/1995	120	=	2.34	2.34	0.20	0.936	0.90137292	2.5	0.2	a
SD8(1)	11/1/1995	91	=	0.57	0.57	0.25	0.948	0.91294666	0.6	0.25	b
SD8(1)	1/22/1996	74.5	<	0.25	0.125	0.25	0.956	0.921316786	NA	-	b
SD8(1)	1/31/1996	52.2	<	0.25	0.125	0.25	0.971	0.936199259	NA	-	b
SD8(1)	3/5/1996	78.6	=	0.44	0.44	0.25	0.954	0.919075417	NA	-	b
SD8(1)	12/9/1996	57.4	=	0.5	0.5	0.50	0.967	0.932226246	0.6	0.5	i
SD8(1)	1/16/1997	61.5	=	1.2	1.2	0.50	0.964	0.929339723	0.7	0.5	i
SD8(1)	11/10/1997	116	=	0.28	0.28	0.25	0.938	0.902791294	0.3	0.25	c
SD8(1)	12/6/1997	39.0	<	3.93	2.00	4.00	0.983	0.948395908	<4.0	4	c
SD8(1)	3/14/1998	96.4	<	3.78	2.00	4.00	0.946	0.910534838	<4.0	4	c
SD8(1)	11/8/1998	77	=	1.91	1.91	0.25	0.955	0.919935869	2	0.25	d
SD8(1)	1/25/1999	42.5	<	0.24	0.13	0.25	0.980	0.944800248	<0.25	0.25	d
SD8(1)	3/15/1999	90.8	<	0.24	0.13	0.25	0.948	0.913038713	<0.25	0.25	d
SD8(1)	3/15/1999	85	<	0.24	0.13	0.25	0.951	0.915800357	<0.25	0.25	d
SD8(1)	2/12/2000	40.9	<	0.25	0.13	0.25	0.981	0.94640574	<.25	0.25	e
SD8(1)	2/20/2000	35.1	<	0.25	0.00		0.988	0.952803981	2		h
SD8(1)	3/5/2000	45.5	<	0.25	0.13	0.25	0.977	0.941946552	<0.25	0.25	e
SD8(1)	10/27/2000	85	<	1	0.13	0.25	0.951	0.915800357	<1	0.25	f
SD8(1)	1/8/2001	78	<	1	0.13	0.25	0.954	0.919396016	<1	0.25	f
SD8(1)	2/13/2001	59	<	1	0.13	0.25	0.966	0.931075988	<1	0.25	f
SD8(1)	11/29/2001	68	<	1	0.50	1.00	0.960	0.925136237	1	1	j
SD8(1)	2/17/2002	111	<	1	0.50	1.00	0.940	0.904634675	1	1	j
SD8(1)	3/8/2002	148	<	1	0.50	1.00	0.928	0.892598633	1	1	j
SD8(1)	11/8/2002	69.1	<	1	0.50		0.959	0.924464861	<1		w
SD8(1)	2/11/2003	78	<	1	0.50		0.954	0.919396016	<1		w
SD8(1)	2/25/2003	44	<	1	0.50		0.978	0.943349074	<1		w
SD8(2)	2/12/2000	58	<	2	1.00	2.00	0.967	0.931791185	<2	2	h
SD8(2)	2/21/2000	47	<	2	1.00	2.00	0.976	0.940589525	<2	2	h
SD8(3)	2/12/2000	54	<	2	1.00	2.00	0.970	0.934780885	<2	2	h
SD8(3)	2/21/2000	36	<	2	1.00	2.00	0.987	0.951744735	<2	2	h
SD8(4)	2/12/2000	190	<	0.2	0.10	0.20	0.917	0.882147007	1.3	0.2	h [1]
SD8(4)	2/23/2000	232	=	0.3	0.30	0.20	0.909	0.873791402	0.7	0.2	h [1]
SD8(5)	2/12/2000	100	<	2	1.00	2.00	0.944	0.90900089	<2	2	h
SD8(5)	2/21/2000	63	<	2	1.00	2.00	0.963	0.928331529	<2	2	h
SD8(6)	2/12/2000	120	<	2	1.00	2.00	0.936	0.90137292	<2	2	h
SD8(6)	2/21/2000	100	<	2	1.00	2.00	0.944	0.90900089	<2	2	h
unknown	6/4/1991	484	<	1.0	0.50		0.878	0.843025932	<1		l
unknown	3/12/1992	472	<	1.0	0.50		0.879	0.844076313	<1		m

Station ID	Sample Date	Total Hardness as $CaCO_3$ (mg/L)		Conc. (ug/L)	actual conc. or 1/2 RL	Reporting Limit (ug/L)	CMC Freshwater CF	CCC Freshwater CF	EMC (ug/L)	Reporting Limit (ug/L)	Reference
				Dissolved Cadmium (ug/L)			Acute Dissolved Cadmium	Chronic Dissolved Cadmium	Total Cadmium		
unknown	3/19/1992	1050	<	1.0	0.50		0.846	0.810624052	<1		n
unknown	3/19/1992	1040	<	1.0	0.50		0.846	0.811024418	<1		n
unknown	3/19/1992	1050	<	1.0	0.50		0.846	0.810624052	<1		n
	Mean =	**158.35**		**1.11**	**0.69**						
	Median =	**81.80**		**1.00**	**0.50**						

[1] Reference h cites N/A for Total Hardness.

Acronyms:
CF- conversion factor
CMC - Criteria Maximum Concentration
CCC - Criteria Continuous Concentration
RL = Reporting Limit
WQO- water quality objective
EMC- event mean concentration
NA- not analyzed

unverified
dissolved [ ] calculated from total [ ]
Reporting limit not known, concentration is 1/2 reported estimate

Station ID	Sample Date	Total Hardness as $CaCO_3$ (mg/L)		Conc. (ug/L)	actual conc. or 1/2 RL	Reporting Limit (ug/L)	CMC Freshwater CF	CCC Freshwater CF	EMC (ug/L)	Reporting Limit (ug/L)	Reference
				Dissolved Copper			Acute Dissolved Copper	Chronic Dissolved Copper	Total Copper		
11-87	2/12/2000	-	=	5.3	5.3	1	0.960	0.960	33	1	v
11-87	2/23/2000	-	=	9.6	9.6	1	0.960	0.960	19	1	v
11-87	3/5/2000	-	=	5.1	5.1	1	0.960	0.960	12	1	v
11-87	4/17/2000	-	=	11	11	1	0.960	0.960	13	1	v
Able Auto Wrecking	3/15/1999	NA					0.960	0.960	81		r
Allways Recycling	4/12/1999	NA					0.960	0.960	72		s
CREEK	2/12/2000	-	=	51.2	51.2	-	0.96	0.960	-	-	u
CREEK	3/5/2000	-	=	63	63	-	0.96	0.960	-	-	u
DPR(1)	1/8/2001	210	=	13	13	1	0.960	0.960	32	2	g
DPR(1)	2/13/2001	48	=	8	8	1	0.960	0.960	17	2	g
DPR(1)	11/12/2001	370	=	6	6		0.96	0.960	170		g
DPR(2)	2/12/2000	NA	=	5.3	5.3		0.96	0.960	33		g
DPR(2)	2/21/2000	NA	=	9.6	9.6		0.960	0.960	19		g
DPR(2)	1/8/2001	150	=	13	13	1	0.960	0.960	56	2	g
DPR(2)	2/13/2001	110	=	5	5	1	0.96	0.960	41	2	g
DPR(2)	11/12/2001	100	=	11	11		0.96	0.960	32		g
DPR(3)	1/8/2001	73	=	17	17	1	0.960	0.960	36	2	g
DPR(3)	2/13/2001	35	=	34	34	1	0.960	0.960	19	2	g
DPR(3)	11/12/2001	73	=	19	19		0.96	0.960	37		g
DPR(4)	1/8/2001	160	=	8	8	1	0.96	0.960	70	2	g
DPR(4)	2/13/2001	69	=	5	5	1	0.960	0.960	38	2	g
DPR(4)	11/12/2001	72	=	10	10		0.960	0.960	42		g
Mini Trucks & Cars	1/25/1999	NA	=	172.8	172.8		0.96	0.960	180		q
NF-1	9/1/2000	230		ND	na		0.96	0.960	ND	2	t
NF-2	9/1/2000	220	=	4.8	4.8		0.960	0.960	5	2	t
NF-3	9/1/2000	280	=	3.84	3.84		0.960	0.960	4	2	t
NF-4	9/1/2000	3200	=	28.8	28.8		0.96	0.960	30	2	t
north fork	3/15/1999	90.8	=	15.0	15.0	10	0.96	0.960	NA	-	o
north fork	3/25/1999	68	=	30.0	30.0	10	0.960	0.960	NA	-	o
north fork	4/6/1999	110	=	10.0	10.0	10	0.960	0.960	NA	-	o
SD8(1)	2/17/1994	120	=	32.6	32.6	5	0.96	0.960	34	5	k
SD8(1)	3/24/1994	71	=	27.8	27.8	5	0.96	0.960	29	5	k
SD8(1)	4/24/1994	110	=	42.2	42.2	5	0.960	0.960	44	5	k
SD8(1)	11/10/1994	150	=	34.6	34.6	5	0.960	0.960	36	5	a
SD8(1)	1/11/1995	58	=	16.3	16.3	5	0.96	0.960	17	5	a
SD8(1)	2/14/1995	100	=	38.4	38.4	5	0.96	0.960	40	5	a
SD8(1)	4/16/1995	120	=	81.6	81.6	5	0.960	0.960	85	5	a
SD8(1)	11/1/1995	91	=	44.2	44.2	5	0.960	0.960	46	5	b
SD8(1)	1/22/1996	74.5	=	12	12	5	0.96	0.960	NA	-	b
SD8(1)	1/31/1996	52.2	=	8	8	5	0.96	0.960	NA	-	b
SD8(1)	3/5/1996	78.6	=	34	34	5	0.960	0.960	NA	-	b
SD8(1)	12/9/1996	57.4	=	10	10	10	0.960	0.960	20	10	i
SD8(1)	1/16/1997	61.5	=	20	20	10	0.96	0.960	10	10	i
SD8(1)	11/10/1997	116	=	16.3	16.3	5.0	0.96	0.960	17	5	c
SD8(1)	12/6/1997	39.0	=	26.9	26.9	6.0	0.960	0.960	28	6	c
SD8(1)	3/14/1998	96.4	=	26.9	26.9	6.0	0.960	0.960	28	6	c
SD8(1)	11/8/1998	77.0	=	5.8	5.8	5	0.96	0.960	6	5	d
SD8(1)	1/25/1999	42.5	<	4.8	2.5	5	0.96	0.960	5	5	d
SD8(1)	3/15/1999	90.8	=	14.4	14.4	5	0.960	0.960	15	5	d
SD8(1)	3/15/1999	85.0	=	14.4	14.4	5	0.960	0.960	15	5	d
SD8(1)	2/12/2000	40.9	<	5	2.5	5	0.96	0.960	29	5	e, g
SD8(1)	2/20/2000	35.1	<	5	2.5	5	0.96	0.960	16	5	
SD8(1)	3/5/2000	45.5	<	5	2.5	5	0.960	0.960	14	5	e

Appendix A: Chollas Creek Metals (Cu) Data

Station ID	Sample Date	Total Hardness as $CaCO_3$ (mg/L)		Conc. (ug/L)	actual conc. or 1/2 RL	Reporting Limit (ug/L)	CMC Freshwater CF	CCC Freshwater CF	EMC (ug/L)	Reporting Limit (ug/L)	Reference
				Dissolved Copper			Acute Dissolved Copper	Chronic Dissolved Copper	Total Copper		
SD8(1)	10/27/2000	85	=	17	17	5	0.960	0.960	27	5	f
SD8(1)	1/8/2001	78	=	13	13	5	0.96	0.960	49	5	f
SD8(1)	1/8/2001	170	=	11	11	5	0.96	0.960	65	2	g
SD8(1)	2/13/2001	45	=	4	4	5	0.960	0.960	15	2	g
SD8(1)	2/13/2001	59	<	5	2.5	5	0.960	0.960	16	5	f
SD8(1)	11/12/2001	200	=	5	5	5	0.96	0.960	97		g
SD8(1)	11/29/2001	68	=	9	9	5	0.96	0.960	27	5	j
SD8(1)	2/17/2002	111	=	24	24	5	0.960	0.960	53	5	j
SD8(1)	3/8/2002	148	=	18	18	5	0.960	0.960	56	5	j
SD8(1)	11/8/2002	69.1	=	22	22		0.96	0.960	28		w
SD8(1)	2/11/2003	78	=	52	52		0.96	0.960	33		w
SD8(1)	2/25/2003	44	=	8.8	8.8		0.960	0.960	16		w
SD8(1)	2/20/00 [1]	35.1	<	5	2.5	5	0.960	0.960	16	5	e
SD8(2)	2/12/2000	58	=	37	37	5	0.96	0.960	68	10	g
SD8(2)	2/21/2000	47	=	11	11	5	0.96	0.960	23	10	g
SD8(2)	1/8/2001	68	=	12	12	5	0.960	0.960	52	2	g
SD8(2)	2/13/2001	37	=	5	5	5	0.960	0.960	16	2	g
SD8(2)	11/12/2001	58	=	18	18		0.96	0.960	49		g
SD8(3)	2/12/2000	54	<	10	2.5	5	0.96	0.960	68	10	g
SD8(3)	2/21/2000	36	<	10	2.5	5	0.960	0.960	19	10	g
SD8(3)	1/8/2001	87	=	19	19	5	0.960	0.960	65	2	g
SD8(3)	2/13/2001	40	=	5	5	5	0.96	0.960	15	2	g
SD8(3)	11/12/2001	300	=	5	5		0.96	0.960	45		g
SD8(4)	2/12/2000	190	=	5.3	5.3	5	0.960	0.960	33	1	h [2]
SD8(4)	2/23/2000	232	=	9.6	9.6	5	0.960	0.960	19	1	h [2]
SD8(5)	2/12/2000	100	<	10	2.5	5	0.96	0.960	43	10	g
SD8(5)	2/21/2000	63	<	10	2.5	5	0.96	0.960	27	10	g
SD8(5)	1/8/2001	200	=	13	13	5	0.960	0.960	37	2	g
SD8(5)	2/13/2001	52	=	5	5	5	0.960	0.960	33	2	g
SD8(5)	11/12/2001	310	=	4	4		0.96	0.960	180		g
SD8(6)	2/12/2000	120	<	10	2.5	5	0.96	0.960	23	10	g
SD8(6)	2/21/2000	100	<	10	2.5	5	0.960	0.960	10	10	g
SD8(6)	1/8/2001	640	=	13	13	5	0.960	0.960	32	2	g
SD8(6)	2/13/2001	91	=	3	3	5	0.96	0.960	10	2	g
SD8(6)	11/12/2001	280	=	6	6		0.96	0.960	49		g
SF-1	9/1/2000	520					0.960	0.960	5	2	t
Trolley Auto Parts	5/5/1998	NA					0.960	0.960	500	200	p
unknown	6/4/1991	484	=	3	3		0.96	0.960	5		l
unknown	3/12/1992	472	=	7	7		0.96	0.960	7		m
unknown	3/19/1992	1050	=	7	7		0.960	0.960	36		n
unknown	3/19/1992	1040	=	7	7		0.960	0.960	6		n
unknown	3/19/1992	1050	=	8	8		0.96	0.960	7		n
	Mean =	**198.20**		**17.30**	**16.64**						
	Median =	**90.80**		**10.00**	**10.00**						

[1] Reference g cites date as 2/21/00.
[2] Reference h cites N/A for Total Hardness.
Acronyms:
CF- conversion factor
WQO- water quality objective
CMC-
CCC-
EMC- event mean concentration

NA- not analyzed
unverified
data may be duplicative
dissolved [ ] calculated from total [ ]

Station ID	Sampling Date	Total Hardness as $CaCO_3$ (mg/L)		Conc. (ug/L)	actual conc. or 1/2 RL	Reporting Limit (ug/L)	CMC Freshwater CF	CCC Freshwater CF	EMC (ug/L)	Reporting Limit (ug/L)	Reference
				Dissolved Lead (ug/L)			Acute Dissolved Lead	Chronic Dissolved Lead	Total Lead		
Able Auto Wrecking	3/15/1999	NA		NA			#VALUE!	#VALUE!	30		r
Allways Recycling	4/12/1999	NA		NA			#VALUE!	#VALUE!	42		s
DPR(1)	1/8/2001	210	=	1	1.0	1.0	0.683	0.683	27	2	g
DPR(1)	2/13/2001	48	=	27	27.0	1.0	0.898	0.898	23	2	g
DPR(1)	11/12/2001	370	<	1	0.5		0.600	0.600	270		g
DPR(2)	2/12/2000	NS	=	3.6	3.6		#VALUE!	#VALUE!	83		g, h
DPR(2)	2/21/2000	NS	=	10.5	10.5		#VALUE!	#VALUE!	25.9		
DPR(2)	1/8/2001	150	=	1	1.0	1.0	0.732	0.732	59	2	g
DPR(2)	2/13/2001	110	=	1	1.0	1.0	0.777	0.777	61	2	g
DPR(2)	11/12/2001	100	<	1	0.5		0.791	0.791	19		g
DPR(3)	1/8/2001	73	=	2	2.0	1.0	0.837	0.837	21	2	g
DPR(3)	2/13/2001	35	=	46	46.0	1.0	0.944	0.944	18	2	g
DPR(3)	11/12/2001	73	=	2	2.0		0.837	0.837	12		g
DPR(4)	1/8/2001	160	=	1	1.0	1.0	0.723	0.723	68	2	g
DPR(4)	2/13/2001	69	=	4	4.0	1.0	0.845	0.845	53	2	g
DPR(4)	11/12/2001	72	=	2	2.0		0.839	0.839	29		g
Mini Trucks & Cars	1/25/1999	NA					#VALUE!	#VALUE!	160		q
NF-1	9/1/2000	230	<	2	1.0	2.0	0.670	0.670	ND	2.0	t
NF-2	9/1/2000	220	=	4.1	4.1	2.0	0.676	0.676	6	2.0	t
NF-3	9/1/2000	280	=	1.3	1.3	2.0	0.641	0.641	2	2.0	t
NF-4	9/1/2000	3200	<	2	1.0	2.0	0.286	0.286	ND	2.0	t
north fork	3/15/1999	90.8	=	82	82.0	10.0	0.805	0.805	NA	-	o
north fork	3/25/1999	68	=	30	30.0	10.0	0.847	0.847	NA	-	o
north fork	4/6/1999	110	<	10	5.0	10.0	0.777	0.777	NA	-	o
SD8(1)	2/17/1994	120	=	84	84.0		0.764	0.764	110	1	k
SD8(1)	3/24/1994	71	=	118	118.0		0.841	0.841	140	1	k
SD8(1)	4/24/1994	110	=	54	54.0		0.777	0.777	70	1	k
SD8(1)	11/10/1994	150	=	26	26.0		0.732	0.732	35	1	a
SD8(1)	1/11/1995	58	=	38	38.0		0.870	0.870	44	1	a
SD8(1)	2/14/1995	100	=	87	87.0		0.791	0.791	110	1	a
SD8(1)	4/16/1995	120	=	107	107.0		0.764	0.764	140	1	a
SD8(1)	11/1/1995	91	=	18	18.0		0.805	0.805	22.9	1	b
SD8(1)	1/22/1996	74.5	<	2	0.5	1.0	0.834	0.834	NA	-	b
SD8(1)	1/31/1996	52.2	<	2	0.5	1.0	0.886	0.886	NA	-	b
SD8(1)	3/5/1996	78.6	=	18	18.0	1.0	0.826	0.826	NA	-	b
SD8(1)	12/9/1996	57.4	=	15	15.0	2.0	0.872	0.872	16	2	i
SD8(1)	1/16/1997	61.5	=	7	7.0	2.0	0.862	0.862	58	2	i
SD8(1)	11/10/1997	116	=	2	2.0		0.769	0.769	3	1	c
SD8(1)	12/6/1997	39.0	=	39	39.0		0.928	0.928	<42	42	c
SD8(1)	3/14/1998	96.4	=	76	76.0		0.796	0.796	95	42	c
SD8(1)	11/8/1998	77	<	1	0.5	-	0.829	0.829	<1	1	d
SD8(1)	1/25/1999	42.5	=	6	6.0	-	0.916	0.916	7	1	d
SD8(1)	3/15/1999	90.8	=	66	66.0	-	0.805	0.805	82	1	d
SD8(1)	3/15/1999	85	=	67	67.0	-	0.815	0.815	82	1	d
SD8(1)	2/12/2000	40.9	<	1	0.5	1.0	0.921	0.921	15	1	e
SD8(1)	2/21/2000	35.1	<	1	0.5	1.0	0.944	0.944	<1	1	e, g, h
SD8(1)	3/5/2000	45.5	<	1	0.5	1.0	0.906	0.906	<1	1	e
SD8(1)	10/27/2000	85	=	3	3.0	1.0	0.815	0.815	22	1	f
SD8(1)	1/8/2001	78	=	2	2.0	1.0	0.827	0.827	55	1	f
SD8(1)	1/8/2001	170	=	3	3.0	1.0	0.714	0.714	83	2	g
SD8(1)	2/13/2001	45	<	1	0.5	1.0	0.907	0.907	22	2	g
SD8(1)	2/13/2001	59	=	14	14.0	1.0	0.868	0.868	27	1	f
SD8(1)	11/12/2001	200	<	1	0.5		0.690	0.690	94		g

Appendix A: Chollas Creek Metals (Pb) Data

031371

Station ID	Sampling Date	Total Hardness as $CaCO_3$ (mg/L)		Conc. (ug/L)	actual conc. or 1/2 RL	Reporting Limit (ug/L)	CMC Freshwater CF	CCC Freshwater CF	EMC (ug/L)	Reporting Limit (ug/L)	Reference
				Dissolved Lead (ug/L)			Acute Dissolved Lead	Chronic Dissolved Lead	Total Lead		
SD8(1)	11/29/2001	68	<	2	1.0	2.0	0.847	0.847	28	2	j
SD8(1)	2/17/2002	111	<	2	1.0	2.0	0.776	0.776	32	2	j
SD8(1)	3/8/2002	148	=	2	2.0	2.0	0.734	0.734	61	2	j
SD8(1)	11/8/2002	69.1	=	6	6.0		0.845	0.845	17		w
SD8(1)	2/11/2003	78	<	2	1.0		0.827	0.827	29		w
SD8(1)	2/25/2003	44	<	2	1.0		0.911	0.911	23		w
SD8(2)	2/12/2000	58	<	10	5.0	10.0	0.870	0.870	34	10	g, h
SD8(2)	2/21/2000	47	<	10	5.0	10.0	0.901	0.901	23	10	g, h
SD8(2)	1/8/2001	68	=	1	1.0	1.0	0.847	0.847	91	2	g
SD8(2)	2/13/2001	37	=	1	1.0	1.0	0.936	0.936	29	2	g
SD8(2)	11/12/2001	58	<	1	0.5		0.870	0.870	39		g
SD8(3)	2/12/2000	54	<	10	5.0	10.0	0.881	0.881	52	10	g, h
SD8(3)	2/21/2000	36	<	10	5.0	10.0	0.940	0.940	19	10	g, h
SD8(3)	1/8/2001	87	=	1	1.0	1.0	0.811	0.811	90	2	g
SD8(3)	2/13/2001	40	=	2	2.0	1.0	0.925	0.925	21	2	g
SD8(3)	11/12/2001	300	=	3	3.0		0.631	0.631	52		g
SD8(4)	2/12/2000	NA	=	3.6	3.6	1.0	#VALUE!	#VALUE!	83	1	h [1]
SD8(4)	2/23/2000	NA	=	10.5	10.5	1.0	#VALUE!	#VALUE!	25.9J	1	h [1]
SD8(5)	2/12/2000	100	<	10	5.0	10.0	0.791	0.791	76	10	g, h
SD8(5)	2/21/2000	63	<	10	5.0	10.0	0.858	0.858	35	10	g, h
SD8(5)	1/8/2001	200	=	1	1.0	1.0	0.690	0.690	29	2	g
SD8(5)	2/13/2001	52	=	2	2.0	1.0	0.886	0.886	59	2	g
SD8(5)	11/12/2001	310	<	1	0.5		0.626	0.626	170		g
SD8(6)	2/12/2000	120	<	10	5.0	10.0	0.764	0.764	16	10	g, h
SD8(6)	2/21/2000	100	<	10	5.0	10.0	0.791	0.791	<10	10	g, h
SD8(6)	1/8/2001	640	=	1	1.0	1.0	0.521	0.521	19	2	g
SD8(6)	2/13/2001	91	<	1	0.5	1.0	0.805	0.805	9	2	g
SD8(6)	11/12/2001	280	<	1	0.5		0.641	0.641	36		g
SF-1	9/1/2000	520					0.551	0.551	ND	2.0	t
Trolley Auto Parts	5/5/1998	NA					#VALUE!	#VALUE!	500	200	p
unknown	6/4/1991	484	<	5	2.5		0.561	0.561	5		l
unknown	3/12/1992	472	<	5	2.5		0.565	0.565	7		m
unknown	3/19/1992	1050	=	29	29.0		0.448	0.448	5		n
unknown	3/19/1992	1040	=	16	16.0		0.450	0.450	5		n
unknown	3/19/1992	1040	=	11	11.0		0.450	0.450	5		n
11-87	4/17/2000	-	=	2.9	2.9	1.0	#VALUE!	#VALUE!	7.6	1	v
11-87	2/12/2000	-	=	3.6	3.6	1.0	#VALUE!	#VALUE!	83	1	v
11-87	3/5/2000	-	=	4.3	4.3	1.0	#VALUE!	#VALUE!	14	1	v
11-87	2/23/2000	-	=	11	11.0	1.0	#VALUE!	#VALUE!	26	1	v
	Mean =	**199.79**		**15.05**	**14.29**						
	Median =	**88.90**		**3.60**	**3.00**						

[1] Reference h cites N/A for Total Hardness.

Acronyms:
CF- conversion factor
WQO- water quality objective
CMC- criteria maximum concentration
CCC- criteria continuous criteria
EMC- event mean concentration
NA- not analyzed

unverified
dissolved [ ] calculated from total [ ]
data may be duplicative
Reporting limit not known, concentration is 1/2 reported estimate

Station ID	Sampling Date	Total Hardness as $CaCO_3$ (mg/L)		Conc. (ug/L)	actual conc. or 1/2 RL	Reporting Limit (ug/L)	CMC Freshwater CF	CCC Freshwater CF	EMC (ug/L)	Reporting Limit (ug/L)	Reference
				Dissolved Zinc (ug/L)			Acute Dissolved Zinc	Chronic Dissolved Zinc	Total Zinc		
11-87	2/12/2000	-	=	17	17	1			330	1	v
11-87	2/23/2000	-	=	42	42	1			81	1	v
11-87	3/5/2000	-	=	25	25	1			49	1	v
11-87	4/17/2000	-	=	31	31	1			47	1	v
Able Auto Wrecking	3/15/1999	NA							190		r
Allways Recycling	4/12/1999	NA							260		s
CREEK	2/12/2000	-	=	150.8	150.8						u
CREEK	3/5/2000	-	=	146	146						u
DPR(1)	1/8/2001	210	=	200	200	10	0.978	0.986	190	10	g
DPR(1)	2/13/2001	48	=	250	250	10	0.978	0.986	120	10	g
DPR(1)	11/12/2001	370	=	40	40		0.978	0.986	1400		g
DPR(2)	2/12/2000	NS	=	16.8	16.8		0.978	0.986	327		g
DPR(2)	2/21/2000	NS	=	42	42		0.978	0.986	81		g
DPR(2)	1/8/2001	150	=	180	180	10	0.978	0.986	360	10	g
DPR(2)	2/13/2001	110	=	66	66	10	0.978	0.986	280	10	g
DPR(2)	11/12/2001	100	=	55	55		0.978	0.986	180		g
DPR(3)	1/8/2001	73	=	220	220	10	0.978	0.986	230	10	g
DPR(3)	2/13/2001	35	=	370	370	10	0.978	0.986	110	10	g
DPR(3)	11/12/2001	73	=	100	100		0.978	0.986	200		g
DPR(4)	1/8/2001	160	=	230	230	10	0.978	0.986	660	10	g
DPR(4)	2/13/2001	69	=	46	46	10	0.978	0.986	280	10	g
DPR(4)	11/12/2001	72	=	110	110		0.978	0.986	340		g
Mini Trucks & Cars	1/25/1999	NA					0.978	0.986	690		q
NF-1	9/1/2000	230	<	10	5	10.0	0.978	0.986	ND	10	t
NF-2	9/1/2000	220	=	45	45	10.0	0.978	0.986	46	10	t
NF-3	9/1/2000	280	=	15	15	10.0	0.978	0.986	15	10	t
NF-4	9/1/2000	3200	=	20	20	10.0	0.978	0.986	20	10	t
north fork	3/15/1999	90.8	=	210	210	10.0	0.978	0.986	NA	-	o
north fork	3/25/1999	68	=	220	220	10.0	0.978	0.986	NA	-	o
north fork	4/6/1999	110	=	90	90	10.0	0.978	0.986	NA	-	o
SD8(1)	2/17/1994	120	=	254	254		0.978	0.986	260	5	k
SD8(1)	3/24/1994	71	=	235	235		0.978	0.986	240	5	k
SD8(1)	4/24/1994	110	=	313	313		0.978	0.986	320	5	k
SD8(1)	11/10/1994	150	=	176	176		0.978	0.986	180	5	a
SD8(1)	1/11/1995	58	=	147	147		0.978	0.986	150	5	a
SD8(1)	2/14/1995	100	=	352	352		0.978	0.986	360	5	a
SD8(1)	4/16/1995	120	=	548	548		0.978	0.986	560	5	a
SD8(1)	11/1/1995	91	=	181	181		0.978	0.986	185	25	b
SD8(1)	1/22/1996	74.5	=	25	25	25	0.978	0.986	NA	-	b
SD8(1)	1/31/1996	52.2	=	32	32	25	0.978	0.986	NA	-	b
SD8(1)	3/5/1996	78.6	=	141	141	25	0.978	0.986	NA	-	b
SD8(1)	12/9/1996	57.4	=	80	80	50	0.978	0.986	70	50	i
SD8(1)	1/16/1997	61.5	=	40	40	50	0.978	0.986	200	50	i
SD8(1)	11/10/1997	116	=	172	172		0.978	0.986	176	25	c
SD8(1)	12/6/1997	39.0	=	108	108		0.978	0.986	110	2	c
SD8(1)	3/14/1998	96.4	=	90	90		0.978	0.986	92	2	c
SD8(1)	11/8/1998	77	=	30	30	25.0	0.978	0.986	30	25	d
SD8(1)	1/25/1999	42.5	=	48	48	25.0	0.978	0.986	48	25	d
SD8(1)	3/15/1999	90.8	=	210	210	25.0	0.978	0.986	210	25	d
SD8(1)	3/15/1999	85	=	210	210	25.0	0.978	0.986	210	25	d
SD8(1)	2/12/2000	40.9	=	19	19	25.0	0.978	0.986	96	25	e, g, h
SD8(1)	2/20/2000	35.1	=	28	28	25.0	0.978	0.986	50	25	e
SD8(1)	3/5/2000	45.5	=	8	8	25.0	0.978	0.986	80	25	e

Station ID	Sampling Date	Total Hardness as $CaCO_3$ (mg/L)		Conc. (ug/L)	actual conc. or 1/2 RL	Reporting Limit (ug/L)	CMC Freshwater CF	CCC Freshwater CF	EMC (ug/L)	Reporting Limit (ug/L)	Reference
				Dissolved Zinc (ug/L)			Acute Dissolved Zinc	Chronic Dissolved Zinc	Total Zinc		
SD8(1)	10/27/2000	85	=	90	90	25	0.978	0.986	150	25	f
SD8(1)	1/8/2001	78	=	110	110	25	0.978	0.986	29	25	f
SD8(1)	1/8/2001	170	=	87	87	10	0.978	0.986	480	10	g
SD8(1)	2/13/2001	45	=	32	32	10	0.978	0.986	100	10	g
SD8(1)	2/13/2001	59	=	30	30	25	0.978	0.986	120	25	f
SD8(1)	11/12/2001	200	=	62	62		0.978	0.986	740		g
SD8(1)	11/29/2001	68	=	53	53	20	0.978	0.986	162	20	j
SD8(1)	2/17/2002	111	=	118	118	20	0.978	0.986	314	20	j
SD8(1)	3/8/2002	148	=	79	79	20	0.978	0.986	430	20	j
SD8(1)	11/8/2002	69.1	=	152	152		0.978	0.986	118		w
SD8(1)	2/11/2003	78	=	139	139		0.978	0.986	230		w
SD8(1)	2/25/2003	44	=	18	18		0.978	0.986	154		w
SD8(2)	2/12/2000	58	=	45	45	10	0.978	0.986	160	10	g, h
SD8(2)	2/21/2000	47	=	67	67	10	0.978	0.986	180	10	g
SD8(2)	1/8/2001	68	=	160	160	10	0.978	0.986	420	10	g
SD8(2)	2/13/2001	37	=	36	36	10	0.978	0.986	100	10	g
SD8(2)	11/12/2001	58	=	130	130		0.978	0.986	370		g
SD8(3)	2/12/2000	54	=	20	20	10	0.978	0.986	300	10	g, h
SD8(3)	2/21/2000	36	=	57	57	10	0.978	0.986	160	10	g
SD8(3)	1/8/2001	87	=	130	130	10	0.978	0.986	480	10	g
SD8(3)	2/13/2001	40	=	36	36	10	0.978	0.986	110	10	g
SD8(3)	11/12/2001	300	=	47	47		0.978	0.986	300		g
SD8(4)	2/12/2000	190	=	16.8	16.8	1	0.978	0.986	327	1	h [2]
SD8(4)	2/23/2000	232	=	42	42	1	0.978	0.986	81	1	h [2]
SD8(5)	2/12/2000	100	=	45	45	10	0.978	0.986	370	10	g, h
SD8(5)	2/21/2000	63	=	10	10	10	0.978	0.986	10	10	g
SD8(5)	1/8/2001	200	=	290	290	10	0.978	0.986	260	10	g
SD8(5)	2/13/2001	52	=	68	68	10	0.978	0.986	270	10	g
SD8(5)	11/12/2001	310	=	73	73		0.978	0.986	1900		g
SD8(6)	2/12/2000	120	=	20	20	10	0.978	0.986	100	10	g, h
SD8(6)	2/21/2000	100	=	30	30	10	0.978	0.986	54	10	g
SD8(6)	1/8/2001	640	=	170	170	10	0.978	0.986	160	10	g
SD8(6)	2/13/2001	91	=	33	33	10	0.978	0.986	55	10	g
SD8(6)	11/12/2001	280	=	76	76		0.978	0.986	290		g
SF-1	9/1/2000	520	=	12	12		0.978	0.986	12	10	t
Trolley Auto Parts	5/5/1998	NA					0.978	0.986	1000	50	p
unknown	6/4/1991	484	=	3	3		0.978	0.986	6		l
unknown	3/12/1992	472	=	188	188		0.978	0.986	224		m
unknown	3/19/1992	1050	=	11	11		0.978	0.986	59		n
unknown	3/19/1992	1040	=	11	11		0.978	0.986	29		n
unknown	3/19/1992	1050	=	12	12		0.978	0.986	21		n
	Mean =	**200.19**		**102.24**	**102.20**						
	Median =	**90.80**		**66.50**	**66.50**						

[2] Reference h cites N/A for Total Hardness.

Acronyms:
CF- conversion factor
WQO- water quality objective
CMC-
CCC-
EMC- event mean concentration
NA- not analyzed

unverified
dissolved [ ] calculated from total [ ]
data may be duplicative

Appendix B
Cadmium Delisting

Used in the Chollas Creek Metals Total Maximum Daily Loads

California Regional Water Quality Control Board, San Diego Region

Chollas Creek – Cadmium Delisting
Hydrologic Subarea 908.22

SUMMARY OF ACTIONS

Non-consideration of dissolved cadmium for Total Maximum Daily Load (TMDL) and subsequent removal from the list of Water Quality Limited Segments [Clean Water Act (CWA) section 303(d)].

TMDL PRIORITY

Non-consideration.

LIST Of WATER QUALITY LIMITED SEGMENTS

Proposed delisting.

WATERSHED CHARACTERISTICS

Chollas Creek is an urban creek that runs through portions of San Diego, La Mesa, and Lemon Grove before emptying into San Diego Bay. Chollas Creek is designated with water contact recreation (REC-1) as a potential beneficial use as well as the following existing beneficial uses: non-contact water recreation (REC-2), warm freshwater habitat (WARM), and wildlife habitat (WILD). San Diego Bay is designated with the following beneficial uses: industrial service supply (IND), navigation (NAV), REC-1, REC-2, commercial and sport fishing (COMM), preservation for biological habitats of special significance (BIOL), estuarine habitat (EST), wildlife habitat (WILD), rare, threatened, or endangered species (RARE), marine habitat (MAR), migration of aquatic organisms (MIGR), and shellfish harvesting (SHELL) (Regional Board, 1994).

EVIDENCE OF NON-IMPAIRMENT

The available data suggests that concentrations of dissolved cadmium in Chollas Creek do not exceed acute or chronic California Toxics Rule (CTR) water quality criteria. Most samples were below detection limits, though some of the detection limit concentrations exceed CTR acute and chronic criteria. Since cadmium does not appear to exceed dissolved CTR criteria, and was not found to cause toxicity in test organisms, it is not considered an agent for the impairment of designated beneficial uses. Based on this evidence, removal of the pollutant/water body combination of cadmium and Chollas Creek from the List of Water Quality Limited Segments will be recommended by the California Regional Water Quality Control Board, San Diego Region (Regional Board).

The United States Environmental Protection Agency (USEPA) has recommended a more stringent dissolved cadmium criteria (USEPA, 2001) that it hopes California will incorporate in to the CTR by 2008. These criteria are approximately ten-fold more stringent than current CTR criteria, and may be exceeded in Chollas Creek. The available cadmium data appears to support inclusion on subsequent Water Quality Limited Segments lists based on this more stringent recommended criteria. When CTR is updated to incorporate these criteria, the Regional Board will re-evaluate the potential listing of Chollas Creek for cadmium.

As shown in the Table D.1 below, with a total of 54 samples collected and analyzed between February 2000 and February 2004, no (0 percent) exceedances of the CTR for dissolved cadmium were recorded.

Table D.1 - Summary of Sampling Evidence for Delisting

CADMIUM Collection Dates	Organization	n	min	max	mean	median	No. of exceedances (CTR) CMC	No. of exceedances (CTR) CCC	No. of exceedances (USEPA, 2001) CMC	No. of exceedances (USEPA, 2001) CCC
Feb 94 - Feb 03	MS4 Copermittees	42	0.2 [a]	3.93 [b]	0.8 [c]	0.5 [c]	0 [d] (4)	0 [d] (4)	0 [d] (4)	3 [d] (4)
Feb 00 - Apr 00	CalTrans	4	0.2 [a]	0.3	0.2 [c]	0.2 [c]	NA [e]	NA [e]	NA [e]	NA [e]
Mar 99 - Apr 99	SCCWRP	3	< 0.3	< 2.0	< 2.0	< 2.0	NA [f]	NA [f]	NA [f]	NA [f]
Jun 91 & Mar 92	Regional Board	5	1.0 [a]	< 1.0	0.5 [c]	0.5 [c]	NA [f]	NA [f]	NA [f]	NA [f]

a. Sample below Reporting Limit.
b. Calculated from total concentration.
c. Using all samples (measured dissolved and calculated from total). Samples below detection limit entered as 1/2 detection limit for calculations.
d. Considering only measured dissolved concentrations and samples not below DL or RL. (Number in parenthesis represents available sample pool under these criteria).
e. No associated hardness values available.
f. All samples reported as "less than."

Applying the listing policy (SWRCB, 2004) to the available cadmium data confirms that cadmium should be delisted (Table D.2). In applying the policy, total metal data and metals data without associated hardness were not considered. As seen in the table, when and if the CTR is updated to include the new cadmium criteria from the USEPA, it may be necessary to re-list cadmium. At that future time, additional data should be available to evaluate the concentrations of cadmium in the creek. Until then and in accordance with the listing policy, cadmium should be removed from the current list of water quality limited segments during the next list update.

Table D.2 - 303(d) Listing Summary

	CTR		USEPA, 2001	
	CMC	CCC	CMC	CCC
No. of samples appropriate for 303(d) listing consideration	47	42	41	19
No. of exceedances	0	1	3	13
List Decision	delist	delist	delist	list

EXTENT OF NON-IMPAIRMENT

Major branches of the contributing watershed were sampled as well as the main channel. The exact locations and descriptions are as follows:

A. **Main Chollas Channel** - Station Name SD8(1). (Longitude: 117 07.2995 Latitude: 32 42.2914) North Fork, south of Imperial Avenue. This station is located in a concrete-lined

section of the creek at the end of the 3300 block of Durant Street, near the intersection of 33rd Street, in the City of San Diego.

B. **Wabash Avenue Branch of the Main Chollas Channel** - Station Name SD8(2). (Longitude: 117 07.1140 Latitude: 32 43.0917) North Fork, located just north of the State Highway 94 and Interstate-15 Interchange.

C. **Home Avenue Branch of Main Chollas Channel** - Station Name SD8(3). (Longitude: 117 06.6055 Latitude: 32 43.1619) Located next to the San Diego Police Department canine training field and the Police Pistol Range and is downstream from residential areas. This area tends to remain wet year-round as a result of irrigation runoff from upstream residential areas. This portion of the creek is channelized, but has a natural bottom.

D. **South Chollas Creek at 38th Street** - Station Name SD8(4). Located in Chollas Creek at the 38th Street Bridge, just north of Beta Street and several blocks east of Interstate 5. The station is located in a channelized portion of the creek and has a natural bottom. It is approximately 4 blocks upstream of the confluence with the north fork of Chollas Creek. This station is located within a designated open space area and the wetland water quality study area for the Chollas Creek Enhancement Project.

E. **Federal Boulevard Branch of South Chollas Creek** - Station Name SD8(5). (Longitude: 117 04.1844 Latitude: 32 43.6324) Located in Chollas Creek at the 38th Street Bridge, just north of Beta Street and several blocks east of Interstate 5. The station is located in a channelized portion of the creek and has a natural bottom. It is approximately 4 blocks upstream of the confluence with the north fork of Chollas Creek. This station is located within a designated open space area and the wetland water quality study area for the Chollas Creek Enhancement Project.

F. **Jamacha Road Branch of South Chollas Creek** - Station Name SD8(6). (Longitude: 117 02.9650 Latitude: 32 42.6029) Located just south of Jamacha Road at the 69th Street crossing of South Chollas Creek. The station is located just downstream from Lemon Grove and upstream of designated open space. The station is along a natural portion of the creek within a residential area and is typically wet all year long.

Based on the locations and results of the samples, non-impairment of dissolved cadmium can be determined. Data from all stations indicates that the entire watershed is free from dissolved cadmium impairment.

INFORMATION SOURCES

Regional Board, 1994. *Water Quality Control Plan for the San Diego Basin (9), 1994*. California Regional Water Quality Control Board, San Diego Region.

USEPA, 2001. *2001 Update of Ambient Water Quality Criteria for Cadmium, 2001*. United States Environmental Protection Agency, EPA-822-R-01-001.

SWRCB, 2004. *Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List, 2004*. State Water Resources Control Board, September2004.

Appendix C

Chollas Creek Sediment Metals

Used in the Chollas Creek Metals Total Maximum Daily Load

California Regional Water Quality Control Board, San Diego Region

May 30, 2007

Appendix C: Chollas Creek Sediment Metals (Cd, Cu, Pb and Zn)

Sample Date	Station ID	Cadmium Result mg/kg	Cadmium Method	Cadmium Limit mg/kg	Copper Result mg/kg	Copper Method	Copper Limit mg/kg	Lead Result mg/kg	Lead Method	Lead Limit mg/kg	Zinc Result mg/kg	Zinc Method	Zinc Limit mg/kg	Comments	Reference
23-Sep-94	PREBAY1	0.5	EPA/SW-846 6017	5 (MDL)	33.0	EPA/SW-846 6017	0.2 (MDL)	57.0	EPA/SW-846 6017	1 (MDL)	120	EPA/SW-846 6017	5 (MDL)	dry weight	City of San Diego and Co-Permittee NPDES Stormwater Monitoring Program Report 1994-1995
23-Sep-94	PREBAY2	ND	EPA/SW-846 6017	5 (MDL)	42.0	EPA/SW-846 6017	0.2 (MDL)	50.0	EPA/SW-846 6017	1 (MDL)	140	EPA/SW-846 6017	5 (MDL)	dry weight	
23-Sep-94	PREBAY3	0.6	EPA/SW-846 6017	5 (MDL)	430.0	EPA/SW-846 6017	0.2 (MDL)	64.0	EPA/SW-846 6017	1 (MDL)	170	EPA/SW-846 6017	5 (MDL)	dry weight	
25-Sep-94	PRECREEK1	ND	EPA/SW-846 6017	0.5 (MDL)	9.6	EPA/SW-846 6017	0.5 (MDL)	10.0	EPA/SW-846 6017	0.5 (MDL)	27	EPA/SW-846 6017	0.2 (MDL)	dry weight	
09-May-95	POSTCREEK1	0.1	EPA/SW-846 6017	0.5 (MDL)	6.4	EPA/SW-846 6017	0.5 (MDL)	14.0	EPA/SW-846 6017	0.5 (MDL)	29	EPA/SW-846 6017	0.2 (MDL)	dry weight	
10-May-95	POSTBAY1	1.2	EPA/SW-846 6017	5 (MDL)	67.0	EPA/SW-846 6017	0.2 (MDL)	150.0	EPA/SW-846 6017	1 (MDL)	190	EPA/SW-846 6017	5 (MDL)	dry weight	
10-May-95	POSTBAY2	0.8	EPA/SW-846 6017	5 (MDL)	59.0	EPA/SW-846 6017	0.2 (MDL)	71.0	EPA/SW-846 6017	1 (MDL)	160	EPA/SW-846 6017	5 (MDL)	dry weight	
10-May-95	POSTBAY3	1.4	EPA/SW-846 6017	5 (MDL)	76.0	EPA/SW-846 6017	0.2 (MDL)	120.0	EPA/SW-846 6017	1 (MDL)	220	EPA/SW-846 6017	5 (MDL)	dry weight	
28-Sep-96	1A/1B	<0.080	EPA/SW-846 6010	.5 (LDL)	186.0	EPA/SW-846 6010	.5 (LDL)	54.5	EPA/SW-846 7471	.5 (LDL)	137	EPA/SW-846 6010	2 (LDL)	dry weight	City of San Diego and Co-Permittee NPDES Stormwater Monitoring Program 1995-1996
28-Sep-96	2A/2B	<0.080	EPA/SW-846 6010	.5 (LDL)	38.6	EPA/SW-846 6010	.5 (LDL)	55.5	EPA/SW-846 7471	.5 (LDL)	118	EPA/SW-846 6010	2 (LDL)	dry weight	
28-Sep-96	3A/3B	<0.080	EPA/SW-846 6010	.5 (LDL)	37.8	EPA/SW-846 6010	.5 (LDL)	36.8	EPA/SW-846 7471	.5 (LDL)	97.2	EPA/SW-846 6010	2 (LDL)	dry weight	
28-Sep-96	Chollas	<0.080	EPA/SW-846 6010	.5 (LDL)	3.7	EPA/SW-846 6010	.5 (LDL)	23.2	EPA/SW-846 7471	.5 (LDL)	24.2	EPA/SW-846 6010	2 (LDL)	dry weight	
02-May-96	1A/1B	<0.5	EPA/SW-846 6010	.5 (LDL)	32.7	EPA/SW-846 6010	.5 (LDL)	46.3	EPA/SW-846 7471	.5 (LDL)	141	EPA/SW-846 6010	2 (LDL)	dry weight	
02-May-96	2A/2B	<0.5	EPA/SW-846 6010	.5 (LDL)	35.7	EPA/SW-846 6010	.5 (LDL)	36.7	EPA/SW-846 7471	.5 (LDL)	102	EPA/SW-846 6010	2 (LDL)	dry weight	
02-May-96	3A/3B	<0.5	EPA/SW-846 6010	.5 (LDL)	40.0	EPA/SW-846 6010	.5 (LDL)	38.2	EPA/SW-846 7471	.5 (LDL)	105	EPA/SW-846 6010	2 (LDL)	dry weight	
02-May-96	Chollas	<0.5	EPA/SW-846 6010	.5 (LDL)	3.1	EPA/SW-846 6010	.5 (LDL)	54.1	EPA/SW-846 7471	.5 (LDL)	21.6	EPA/SW-846 6010	2 (LDL)	dry weight	
19-Sep-96	1A/1B	<1.0	EPA/SW-846 6010	0.5 (RL)	47.3	EPA/SW-846 6010	0.5 (RL)	47.3	EPA/SW-846 7471	0.5 (RL)	134	EPA/SW-846 6010	2 (RL)	dry weight	City of San Diego and Co-Permittee NPDES Stormwater Monitoring Program Report 1996-1997
19-Sep-96	2A/2B	<1.0	EPA/SW-846 6010	0.5 (RL)	54.2	EPA/SW-846 6010	0.5 (RL)	32.0	EPA/SW-846 7471	0.5 (RL)	107	EPA/SW-846 6010	2 (RL)	dry weight	
19-Sep-96	3A/3B	<1.0	EPA/SW-846 6010	0.5 (RL)	58.6	EPA/SW-846 6010	0.5 (RL)	37.3	EPA/SW-846 7471	0.5 (RL)	111	EPA/SW-846 6010	2 (RL)	dry weight	
19-Sep-96	Chollas	<0.5	EPA/SW-846 6010	0.5 (RL)	3.6	EPA/SW-846 6010	0.5 (RL)	9.0	EPA/SW-846 7471	0.5 (RL)	28.8	EPA/SW-846 6010	2 (RL)	dry weight	
01-May-97	1A/1B	0.6	EPA/SW-846 6010	0.5 (RL)	51.5	EPA/SW-846 6010	0.5 (RL)	31.6	EPA/SW-846 7471	0.5 (RL)	132	EPA/SW-846 6010	2 (RL)	dry weight	
01-May-97	2A/2B	<0.4	EPA/SW-846 6010	0.5 (RL)	55.3	EPA/SW-846 6010	0.5 (RL)	48.5	EPA/SW-846 7471	0.5 (RL)	139	EPA/SW-846 6010	2 (RL)	dry weight	
01-May-97	3A/3B	<0.4	EPA/SW-846 6010	0.5 (RL)	58.4	EPA/SW-846 6010	0.5 (RL)	45.7	EPA/SW-846 7471	0.5 (RL)	156	EPA/SW-846 6010	2 (RL)	dry weight	
01-May-97	Chollas	<0.4	EPA/SW-846 6010	0.5 (RL)	3.1	EPA/SW-846 6010	0.5 (RL)	5.3	EPA/SW-846 7471	0.5 (RL)	27.4	EPA/SW-846 6010	2 (RL)	dry weight	
29-Sep-97	1A/1B	<0.5	EPA 6010	0.25 (DL)	67.9	EPA 6010	5 (DL)	53.9	EPA 6010	1 (DL)	179	EPA 6010	25 (DL)	assume dry weight	
29-Sep-97	2A/2B	<0.5	EPA 6010	0.25 (DL)	60.7	EPA 6010	5 (DL)	39.2	EPA 6010	1 (DL)	144	EPA 6010	25 (DL)	assume dry weight	

Appendix C: Chollas Creek Sediment Metals (Cd, Cu, Pb and Zn)

Sample Date	Station ID	Cadmium Result mg/kg	Cadmium Method	Cadmium Limit mg/kg	Copper Result mg/kg	Copper Method	Copper Limit mg/kg	Lead Result mg/kg	Lead Method	Lead Limit mg/kg	Zinc Result mg/kg	Zinc Method	Zinc Limit mg/kg	Comments	Reference
29-Sep-97	3A/3B	<0.5	EPA 6010	0.25 (DL)	69.6	EPA 6010	5 (DL)	76.0	EPA 6010	1 (DL)	157	EPA 6010	25 (DL)	assume dry weight	City of San Diego and Co-Permittee NPDES Stormwater Monitoring Program Report 1997-1998
30-Sep-97	Chollas	<0.5	EPA 6010	0.25 (DL)	7.9	EPA 6010	5 (DL)	9.0	EPA 6010	1 (DL)	29	EPA 6010	25 (DL)	assume dry weight	
05-May-98	1A/1B	<0.5	EPA 213.1	0.05 (DL)	59.0	EPA 220.1	0.05 (DL)	110.0	EPA 239.1	0.05 (DL)	202	EPA 289.1	0.05 (DL)	assume dry weight	
05-May-98	2A/2B	<0.5	EPA 213.1	0.05 (DL)	72.0	EPA 220.1	0.05 (DL)	130.0	EPA 239.1	0.05 (DL)	190	EPA 289.1	0.05 (DL)	assume dry weight	
05-May-98	3A/3B	<0.5	EPA 213.1	0.05 (DL)	40.0	EPA 220.1	0.05 (DL)	67.0	EPA 239.1	0.05 (DL)	102	EPA 289.1	0.05 (DL)	assume dry weight	
15-May-98	Chollas	<0.5	EPA 213.1	0.05 (DL)	<0.5	EPA 220.1	0.05 (DL)	0.8	EPA 239.1	0.05 (DL)	16.2	EPA 289.1	0.05 (DL)	assume dry weight	
18-Jun-98	978-270	ND	EPA 6010	5.0 (DL)	ND	EPA 6010	5.0 (DL)	ND	EPA 6010	12.5 (DL)	26.8	EPA 6010	5.0 (DL)	wet weight	Lab Results. 18 June 98. Sampling by R. Kolb (P of SD) Truesdail Laboratories, Inc.
18-Jun-98	978-271	ND	EPA 6010	5.0 (DL)	ND	EPA 6010	5.0 (DL)	ND	EPA 6010	12.5 (DL)	18.5	EPA 6010	5.0 (DL)	wet weight. Duplicate	
18-Jun-98	978-272	ND	EPA 6010	5.0 (DL)	ND	EPA 6010	5.0 (DL)	ND	EPA 6010	12.5 (DL)	30.1	EPA 6010	5.0 (DL)	wet weight	
18-Jun-98	978-273	ND	EPA 6010	5.0 (DL)	6.2	EPA 6010	5.0 (DL)	ND	EPA 6010	12.5 (DL)	45.6	EPA 6010	5.0 (DL)	wet weight. Duplicate	
18-Jun-98	978-274	ND	EPA 6010	5.0 (DL)	9.1	EPA 6010	5.0 (DL)	29.9	EPA 6010	12.5 (DL)	35.8	EPA 6010	5.0 (DL)	wet weight	
18-Jun-98	978-275	ND	EPA 6010	5.0 (DL)	32.7	EPA 6010	5.0 (DL)	ND	EPA 6010	12.5 (DL)	33.6	EPA 6010	5.0 (DL)	wet weight. Duplicate	
18-Jun-98	978-276	ND	EPA 6010	5.0 (DL)	35.8	EPA 6010	5.0 (DL)	ND	EPA 6010	12.5 (DL)	28.6	EPA 6010	5.0 (DL)	wet weight	
18-Jun-98	978-278	ND	EPA 6010	5.0 (DL)	ND	EPA 6010	5.0 (DL)	ND	EPA 6010	12.5 (DL)	25.0	EPA 6010	5.0 (DL)	wet weight	
18-Jun-98	978-279	ND	EPA 6010	5.0 (DL)	ND	EPA 6010	5.0 (DL)	ND	EPA 6010	12.5 (DL)	73.5	EPA 6010	5.0 (DL)	wet weight	
18-Jun-98	978-280	ND	EPA 6010	5.0 (DL)	ND	EPA 6010	5.0 (DL)	ND	EPA 6010	12.5 (DL)	55.1	EPA 6010	5.0 (DL)	wet weight	
18-Jun-98	978-281	ND	EPA 6010	5.0 (DL)	ND	EPA 6010	5.0 (DL)	ND	EPA 6010	12.5 (DL)	67.2	EPA 6010	5.0 (DL)	wet weight	
18-Jun-98	978-282	ND	EPA 6010	5.0 (DL)	ND	EPA 6010	5.0 (DL)	ND	EPA 6010	12.5 (DL)	53.9	EPA 6010	5.0 (DL)	wet weight. Duplicate	
18-Jun-98	978-283	ND	EPA 6010	5.0 (DL)	10.7	EPA 6010	5.0 (DL)	ND	EPA 6010	12.5 (DL)	95.9	EPA 6010	5.0 (DL)	wet weight	
18-Jun-98	978-284	ND	EPA 6010	5.0 (DL)	ND	EPA 6010	5.0 (DL)	ND	EPA 6010	12.5 (DL)	50.9	EPA 6010	5.0 (DL)	wet weight	
18-Jun-98	278-285	ND	EPA 6010	5.0 (DL)	25.4	EPA 6010	5.0 (DL)	ND	EPA 6010	12.5 (DL)	69.9	EPA 6010	5.0 (DL)	wet weight	
18-Jun-98	978-286	ND	EPA 6010	5.0 (DL)	5.6	EPA 6010	5.0 (DL)	ND	EPA 6010	12.5 (DL)	125.0	EPA 6010	5.0 (DL)	wet weight. Duplicate	
18-Jun-98	978-287	ND	EPA 6010	5.0 (DL)	5.6	EPA 6010	5.0 (DL)	12.5	EPA 6010	12.5 (DL)	75.1	EPA 6010	5.0 (DL)	wet weight	
18-Jun-98	978-288	ND	EPA 6010	5.0 (DL)	9.1	EPA 6010	5.0 (DL)	25.3	EPA 6010	12.5 (DL)	88.9	EPA 6010	5.0 (DL)	wet weight. Duplicate	
18-Jun-98	978-289	ND	EPA 6010	5.0 (DL)	ND	EPA 6010	5.0 (DL)	ND	EPA 6010	12.5 (DL)	36.0	EPA 6010	5.0 (DL)	wet weight	
18-Jun-98	978-290	ND	EPA 6010	5.0 (DL)	13.5	EPA 6010	5.0 (DL)	ND	EPA 6010	12.5 (DL)	44.9	EPA 6010	5.0 (DL)	wet weight. Duplicate	

Appendix C: Chollas Creek Sediment Metals (Cd, Cu, Pb and Zn)

Sample Date	Station ID	Cadmium Result mg/kg	Cadmium Method	Cadmium Limit mg/kg	Copper Result mg/kg	Copper Method	Copper Limit mg/kg	Lead Result mg/kg	Lead Method	Lead Limit mg/kg	Zinc Result mg/kg	Zinc Method	Zinc Limit mg/kg	Comments	Reference
18-Jun-98	978-291	ND	EPA 6010	5.0 (DL)	ND	EPA 6010	5.0 (DL)	27.9	EPA 6010	12.5 (DL)	61.8	EPA 6010	5.0 (DL)	wet weight	
18-Jun-98	978-292	ND	EPA 6010	5.0 (DL)	7.0	EPA 6010	5.0 (DL)	ND	EPA 6010	12.5 (DL)	40.1	EPA 6010	5.0 (DL)	wet weight	
18-Jun-98	978-293	ND	EPA 6010	5.0 (DL)	ND	EPA 6010	5.0 (DL)	ND	EPA 6010	12.5 (DL)	42.2	EPA 6010	5.0 (DL)	wet weight	
18-Jun-98	978-294	ND	EPA 6010	5.0 (DL)	ND	EPA 6010	5.0 (DL)	ND	EPA 6010	12.5 (DL)	24.8	EPA 6010	5.0 (DL)	wet weight	
18-Jun-98	978-295	ND	EPA 6010	5.0 (DL)	6.2	EPA 6010	5.0 (DL)	ND	EPA 6010	12.5 (DL)	45.0	EPA 6010	5.0 (DL)	wet weight	
19-Jun-98	978-296	ND	EPA 6010	5.0 (DL)	5.1	EPA 6010	5.0 (DL)	23.0	EPA 6010	12.5 (DL)	56.9	EPA 6010	5.0 (DL)	wet weight	Lab Results. 19 June 98. Sampling by R. Kolb (P of SD) Truesdail Laboratories, Inc.
19-Jun-98	978-297	ND	EPA 6010	5.0 (DL)	ND	EPA 6010	5.0 (DL)	ND	EPA 6010	12.5 (DL)	42.6	EPA 6010	5.0 (DL)	wet weight	
19-Jun-98	978-298	ND	EPA 6010	5.0 (DL)	5.4	EPA 6010	5.0 (DL)	53.5	EPA 6010	12.5 (DL)	67.9	EPA 6010	5.0 (DL)	wet weight	
19-Jun-98	978-299	ND	EPA 6010	5.0 (DL)	ND	EPA 6010	5.0 (DL)	13.8	EPA 6010	12.5 (DL)	56.2	EPA 6010	5.0 (DL)	wet weight	
19-Jun-98	978-300	ND	EPA 6010	5.0 (DL)	ND	EPA 6010	5.0 (DL)	ND	EPA 6010	12.5 (DL)	51.4	EPA 6010	5.0 (DL)	wet weight	
19-Jun-98	978-301	ND	EPA 6010	5.0 (DL)	ND	EPA 6010	5.0 (DL)	ND	EPA 6010	12.5 (DL)	26.0	EPA 6010	5.0 (DL)	wet weight	
19-Jun-98	978-302	ND	EPA 6010	5.0 (DL)	ND	EPA 6010	5.0 (DL)	ND	EPA 6010	12.5 (DL)	44.3	EPA 6010	5.0 (DL)	wet weight	
19-Jun-98	978-303	ND	EPA 6010	5.0 (DL)	5.9	EPA 6010	5.0 (DL)	ND	EPA 6010	12.5 (DL)	43.2	EPA 6010	5.0 (DL)	wet weight	
19-Jun-98	978-304	ND	EPA 6010	5.0 (DL)	ND	EPA 6010	5.0 (DL)	ND	EPA 6010	12.5 (DL)	32.2	EPA 6010	5.0 (DL)	wet weight	
19-Jun-98	978-305	ND	EPA 6010	5.0 (DL)	9.7	EPA 6010	5.0 (DL)	20.8	EPA 6010	12.5 (DL)	112.0	EPA 6010	5.0 (DL)	wet weight	
19-Jun-98	978-306	ND	EPA 6010	5.0 (DL)	17.9	EPA 6010	5.0 (DL)	129.0	EPA 6010	12.5 (DL)	203.0	EPA 6010	5.0 (DL)	wet weight	
19-Jun-98	978-307	ND	EPA 6010	5.0 (DL)	ND	EPA 6010	5.0 (DL)	ND	EPA 6010	12.5 (DL)	44.2	EPA 6010	5.0 (DL)	wet weight	
19-Jun-98	978-308	ND	EPA 6010	5.0 (DL)	ND	EPA 6010	5.0 (DL)	ND	EPA 6010	12.5 (DL)	32.1	EPA 6010	5.0 (DL)	wet weight	
19-Jun-98	978-309	ND	EPA 6010	5.0 (DL)	ND	EPA 6010	5.0 (DL)	ND	EPA 6010	12.5 (DL)	18.8	EPA 6010	5.0 (DL)	wet weight	
19-Jun-98	978-310	ND	EPA 6010	5.0 (DL)	ND	EPA 6010	5.0 (DL)	ND	EPA 6010	12.5 (DL)	23.0	EPA 6010	5.0 (DL)	wet weight	
19-Jun-98	978-311	ND	EPA 6010	5.0 (DL)	ND	EPA 6010	5.0 (DL)	ND	EPA 6010	12.5 (DL)	44.5	EPA 6010	5.0 (DL)	wet weight	
19-Jun-98	978-312	ND	EPA 6010	5.0 (DL)	ND	EPA 6010	5.0 (DL)	ND	EPA 6010	12.5 (DL)	25.8	EPA 6010	5.0 (DL)	wet weight	
19-Jun-98	978-313	ND	EPA 6010	5.0 (DL)	9.0	EPA 6010	5.0 (DL)	ND	EPA 6010	12.5 (DL)	42.6	EPA 6010	5.0 (DL)	wet weight	
26-Jun-98	978-314	ND	EPA 6010	0.4	13.7	EPA 6010	0.4	150.0	EPA 6010	1.0	72.8	EPA 6010	0.4	wet weight. analyzed on 28 Sep 98	
26-Jun-98	978-315	ND	EPA 6010	5.0 (DL)	8.2	EPA 6010	5.0 (DL)	ND	EPA 6010	12.5 (DL)	88.8	EPA 6010	5.0 (DL)	wet weight	
26-Jun-98	978-316	?	EPA 6010	5.0 (DL)	?	EPA 6010	5.0 (DL)	?	EPA 6010	12.5 (DL)	?	EPA 6010	5.0 (DL)	wet weight. metals analysis requested, data report missing	

Appendix C: Chollas Creek Sediment Metals (Cd, Cu, Pb and Zn)

Sample Date	Station ID	Cadmium Result mg/kg	Cadmium Method	Cadmium Limit mg/kg	Copper Result mg/kg	Copper Method	Copper Limit mg/kg	Lead Result mg/kg	Lead Method	Lead Limit mg/kg	Zinc Result mg/kg	Zinc Method	Zinc Limit mg/kg	Comments	Reference
26-Jun-98	978-317	ND	EPA 6010	5.0 (DL)	ND	EPA 6010	5.0 (DL)	ND	EPA 6010	12.5 (DL)	34.2	EPA 6010	5.0 (DL)	wet weight	Lab Results. 26 June 98. Sampling by R. Kolb (P of SD) Truesdail Laboratories, Inc.
26-Jun-98	978-318	1.1	EPA 6010	0.4	26.3	EPA 6010	0.4	36.7	EPA 6010	1.0	182.0	EPA 6010	0.4	wet weight. analyzed on 28 Sep 98	
26-Jun-98	978-319	ND	EPA 6010	0.4	6.1	EPA 6010	0.4	9.2	EPA 6010	1.0	53.8	EPA 6010	0.4	wet weight. analyzed on 28 Sep 98	
26-Jun-98	978-320	ND	EPA 6010	5.0 (DL)	ND	EPA 6010	5.0 (DL)	ND	EPA 6010	12.5 (DL)	25.9	EPA 6010	5.0 (DL)	wet weight	
26-Jun-98	978-321	ND	EPA 6010	5.0 (DL)	ND	EPA 6010	5.0 (DL)	ND	EPA 6010	12.5 (DL)	34.2	EPA 6010	5.0 (DL)	wet weight	
26-Jun-98	978-322	ND	EPA 6010	5.0 (DL)	ND	EPA 6010	5.0 (DL)	ND	EPA 6010	12.5 (DL)	17.6	EPA 6010	5.0 (DL)	wet weight	
26-Jun-98	978-323	ND	EPA 6010	5.0 (DL)	ND	EPA 6010	5.0 (DL)	5.8	EPA 6010	12.5 (DL)	30.9	EPA 6010	5.0 (DL)	wet weight	
26-Jun-98	978-324	ND	EPA 6010	0.4	20.0	EPA 6010	0.4	1.7	EPA 6010	1.0	26.2	EPA 6010	0.4	wet weight. analyzed on 28 Sep 98	
26-Jun-98	978-325	ND	EPA 6010	0.4	4.0	EPA 6010	0.4	6.7	EPA 6010	1.0	24.3	EPA 6010	0.4	wet weight. analyzed on 28 Sep 98	
26-Jun-98	978-326	0.44	EPA 6010	0.4	9.1	EPA 6010	0.4	12.3	EPA 6010	1.0	81.1	EPA 6010	0.4	wet weight. analyzed on 28 Sep 98	
26-Jun-98	978-327	?	EPA 6010	5.0 (DL)	?	EPA 6010	5.0 (DL)	?	EPA 6010	12.5 (DL)	?	EPA 6010	5.0 (DL)	wet weight. metals analysis requested, data report missing	
26-Jun-98	978-328	?	EPA 6010	5.0 (DL)	?	EPA 6010	5.0 (DL)	?	EPA 6010	12.5 (DL)	?	EPA 6010	5.0 (DL)	wet weight. metals analysis requested, data report missing	
26-Jun-98	978-329	ND	EPA 6010	5.0 (DL)	ND	EPA 6010	5.0 (DL)	ND	EPA 6010	12.5 (DL)	26.2	EPA 6010	5.0 (DL)	wet weight	
26-Jun-98	978-330	ND	EPA 6010	0.4	2.2	EPA 6010	0.4	ND	EPA 6010	1.0	16.0	EPA 6010	0.4	wet weight. analyzed on 28 Sep 98	
26-Jun-98	978-331	?	EPA 6010	5.0 (DL)	?	EPA 6010	5.0 (DL)	?	EPA 6010	12.5 (DL)	?	EPA 6010	5.0 (DL)	wet weight. metals analysis requested, data report missing	
26-Jun-98	978-332	ND	EPA 6010	5.0 (DL)	ND	EPA 6010	5.0 (DL)	5.7	EPA 6010	12.5 (DL)	21.9	EPA 6010	5.0 (DL)	wet weight	
26-Jun-98	978-333	ND	EPA 6010	5.0 (DL)	ND	EPA 6010	5.0 (DL)	ND	EPA 6010	12.5 (DL)	20.2	EPA 6010	5.0 (DL)	wet weight	
26-Jun-98	978-334	ND	EPA 6010	5.0 (DL)	23.9	EPA 6010	5.0 (DL)	52.9	EPA 6010	12.5 (DL)	72.9	EPA 6010	5.0 (DL)	wet weight	
26-Jun-98	978-335	ND	EPA 6010	5.0 (DL)	ND	EPA 6010	5.0 (DL)	ND	EPA 6010	12.5 (DL)	32.3	EPA 6010	5.0 (DL)	wet weight	
26-Jun-98	978-336	ND	EPA 6010	5.0 (DL)	7.1	EPA 6010	5.0 (DL)	34.7	EPA 6010	12.5 (DL)	52.9	EPA 6010	5.0 (DL)	wet weight	
26-Jun-98	978-337	22.9	EPA 6010	5.0 (DL)	ND	EPA 6010	5.0 (DL)	ND	EPA 6010	12.5 (DL)	20.9	EPA 6010	5.0 (DL)	wet weight	
28-Sep-98	1A/1B	<0.5	EPA 6010A	0.5	51.7	EPA 6010A	0.5	27.0	EPA 6010	0.5	143.0	EPA 6010A	0.5	assume dry weight	City of San Diego and Co-Permittee NPDES Stormwater Monitoring Program Report 1998-1999
28-Sep-98	2A/2B	<0.5	EPA 6010A	0.5	83.6	EPA 6010A	0.5	34.8	EPA 6010	0.5	172.0	EPA 6010A	0.5	assume dry weight	
28-Sep-98	3A/3B	<0.5	EPA 6010A	0.5	57.9	EPA 6010A	0.5	31.8	EPA 6010	0.5	117.0	EPA 6010A	0.5	assume dry weight	
29-Sep-98	Chollas	<0.5	EPA 6010A	0.5	3.3	EPA 6010A	0.5	8.2	EPA 6010	0.5	260.0	EPA 6010A	0.5	assume dry weight	
10-May-99	1A/1B	2.5	EPA 6010A	0.5	103.0	EPA 6010A	0.5	52.0	EPA 6010	0.5	211.0	EPA 6010A	0.5	assume dry weight	
10-May-99	2A/2B	2.4	EPA 6010A	0.5	86.0	EPA 6010A	0.5	56.0	EPA 6010	0.5	205.0	EPA 6010A	0.5	assume dry weight	
10-May-99	3A/3B	1.8	EPA 6010A	0.5	84.0	EPA 6010A	0.5	46.0	EPA 6010	0.5	221.0	EPA 6010A	0.5	assume dry weight	
11-May-99	Chollas	0.5	EPA 6010A	0.5	22.0	EPA 6010A	0.5	73.0	EPA 6010	0.5	75.0	EPA 6010A	0.5	assume dry weight	

Appendix C: Chollas Creek Sediment Metals (Cd, Cu, Pb and Zn)

Sample Date	Station ID	Cadmium Result mg/kg	Cadmium Method	Cadmium Limit mg/kg	Copper Result mg/kg	Copper Method	Copper Limit mg/kg	Lead Result mg/kg	Lead Method	Lead Limit mg/kg	Zinc Result mg/kg	Zinc Method	Zinc Limit mg/kg	Comments	Reference
27-Sep-98	1A/1B	<0.5	EPA 6010A	0.5 (RL)	89.1	EPA 6010A	0.5 (RL)	52.4	EPA 6010	0.5 (RL)	172.0	EPA 6010A	0.5 (RL)	assume dry weight	City of San Diego and Co-Permittee NPDES Stormwater Monitoring Program Report 1999-2000
27-Sep-98	2A/2B	<0.5	EPA 6010A	0.5 (RL)	90.4	EPA 6010A	0.5 (RL)	68.0	EPA 6010	0.5 (RL)	166.0	EPA 6010A	0.5 (RL)	assume dry weight	
27-Sep-98	3A/3B	<0.5	EPA 6010A	0.5 (RL)	99.5	EPA 6010A	0.5 (RL)	76.8	EPA 6010	0.5 (RL)	173.0	EPA 6010A	0.5 (RL)	assume dry weight	
27-Sep-98	Chollas	0.8	EPA 6010A	0.5 (RL)	4.7	EPA 6010A	0.5 (RL)	23.2	EPA 6010	0.5 (RL)	32.7	EPA 6010A	0.5 (RL)	assume dry weight	
3-May-00	1A/1B	<0.5	EPA 6010A	0.5 (RL)	77.4	EPA 6010A	0.5 (RL)	82.4	EPA 6010	0.5 (RL)	186.0	EPA 6010A	0.5 (RL)	assume dry weight	
3-May-00	2A/2B	<0.5	EPA 6010A	0.5 (RL)	168.0	EPA 6010A	0.5 (RL)	79.5	EPA 6010	0.5 (RL)	253.0	EPA 6010A	0.5 (RL)	assume dry weight	
3-May-00	3A/3B	<0.5	EPA 6010A	0.5 (RL)	108.0	EPA 6010A	0.5 (RL)	76.3	EPA 6010	0.5 (RL)	261.0	EPA 6010A	0.5 (RL)	assume dry weight	
3-May-00	Chollas	<0.5	EPA 6010A	0.5 (RL)	26.0	EPA 6010A	0.5 (RL)	32.5	EPA 6010	0.5 (RL)	108.0	EPA 6010A	0.5 (RL)	assume dry weight	
2-Oct-00	1A/1B	<0.1	EPA 3050/6020	no info	4.6	EPA 3050/6020	no info	10.3	EPA 3050/6020	no info	33.0	EPA 3050/6020	no info	dry weight; 03-Oct-00 is before first rain; no post-rain data	City of San Diego and Co-Permittee NPDES Stormwater Monitoring Program Draft Report 2000-2001
2-Oct-00	2A/2B	0.3	EPA 3050/6020	no info	76.0	EPA 3050/6020	no info	46.5	EPA 3050/6020	no info	99.0	EPA 3050/6020	no info	dry weight; 03-Oct-00 is before first rain; no post-rain data	
2-Oct-00	3A/3B	0.4	EPA 3050/6020	no info	126.0	EPA 3050/6020	no info	68.4	EPA 3050/6020	no info	172.0	EPA 3050/6020	no info	dry weight; 03-Oct-00 is before first rain; no post-rain data	
3-Oct-00	Chollas	0.5	EPA 3050/6020	no info	116.0	EPA 3050/6020	no info	65.7	EPA 3050/6020	no info	172.0	EPA 3050/6020	no info	dry weight; 03-Oct-00 is before first rain; no post-rain data	
17 and 18 Jul 01	C14	1.4	-	-	94.9	-	-	103.0	-	-	347.0	-	-		Characterization of Sediment Toxicity in Chollas and Paleta Creek Toxic Hot Spot Sediments, San Diego Bay Summary Report, SCCWRP. 23 Apr 2003.
12-Sep-01	Chollas Creek North Fork	<0.1	EPA 3050/6020	0.1 (RL)	5.5	EPA 3050/6020	0.5 (RL)	7.9	EPA 3050/6020	0.5 (RL)	37.0	EPA 3050/6021	5 (RL)	dry weight; report also contains wet weight values (see Excel Comments)	City of San Diego and Co-Permittees NPDES Storm Water Monitoring Program Addendum 2000-2001
12-Sep-01	Chollas Creek South Fork	0.8	EPA 3050/6020	0.2 (RL)	41.6	EPA 3050/6020	0.8 (RL)	68.9	EPA 3050/6020	7.9 (RL)	252.0	EPA 3050/6022	79 (RL)	dry weight; report also contains wet weight values (see Excel Comments)	
12-Sep-01	Chollas Creek South Fork (Dup)	0.8	EPA 3050/6020	0.2 (RL)	40.9	EPA 3050/6020	0.8 (RL)	67.0	EPA 3050/6020	7.9 (RL)	269.0	EPA 3050/6023	79 (RL)	dry weight; report also contains wet weight values (see Excel Comments); duplicate	
12-Sep-01	Chollas Creek Downstream	0.2	EPA 3050/6020	0.1 (RL)	8.5	EPA 3050/6020	0.5 (RL)	17.4	EPA 3050/6020	0.5 (RL)	37.0	EPA 3050/6024	5 (RL)	dry weight; report also contains wet weight values (see Excel Comments)	

Appendix C: Sediment Sampling Stations in Chollas Creek

Date of Sampling	Station ID	Location	Sampler	Comments
18-Jun-98	978-270	S. Chollas u/s of confluence	RK	
18-Jun-98	978-271	S. Chollas u/s of confluence	BC	Duplicate
18-Jun-98	978-272	N. Chollas u/s of confluence	BC	
18-Jun-98	978-273	N. Chollas u/s of confluence	BC	Duplicate
18-Jun-98	978-274	Main Chollas d/s of confluence	BC	
18-Jun-98	978-275	Main Chollas d/s of confluence	BC	Duplicate
18-Jun-98	978-276	S. Chollas u/s of National Ave	RK	
18-Jun-98	978-278	S. Chollas d/s of National Ave	BC	
18-Jun-98	978-279	S. Chollas d/s of Imperial Ave	BC	
18-Jun-98	978-280	S. Chollas d/s of Imperial Ave in ditch	RK	
18-Jun-98	978-281	S. Chollas u/s of Imperial Ave	BC	
18-Jun-98	978-282	S. Chollas u/s of Imperial Ave	RK	Duplicate
18-Jun-98	978-283	S. Chollas u/s of 47th Street	BC	
18-Jun-98	978-284	S. Chollas d/s of 47th Street	RK	
18-Jun-98	278-285	S. Chollas Encanto Branch u/s of confluence	BC	
18-Jun-98	978-286	S. Chollas Encanto Branch u/s of confluence	RK	Duplicate
18-Jun-98	978-287	S. Chollas u/s of Encanto confluence	RK	
18-Jun-98	978-288	S. Chollas u/s of Encanto confluence	RK	Duplicate
18-Jun-98	978-289	S. Chollas d/s of Encanto confluence	BC	
18-Jun-98	978-290	S. Chollas d/s of Encanto confluence	RK	Duplicate
18-Jun-98	978-291	S. Chollas w/in Radio Canyon Branch	BC	
18-Jun-98	978-292	S. Chollas u/s of Radio Cnyn Branch confluence	BC	
18-Jun-98	978-293	S. Chollas d/s of Radio Cnyn Branch confluence	RK	
18-Jun-98	978-294	S. Chollas Jamacha Branch u/s of confluence w/Encanto Branch west of 68th St	BC	
18-Jun-98	978-295	S. Chollas Jamacha Branch u/s of confluence w/Encanto Branch at 69th St	RK	
19-Jun-98	978-296	S. Chollas Main Branch at Lenox	BC	
19-Jun-98	978-297	S. Chollas Main Branch at Lenox	RK	Duplicate
19-Jun-98	978-298	S. Chollas Main Branch at Kelton	BC	
19-Jun-98	978-299	S. Chollas Main Branch 600' E of Kelton	RK	
19-Jun-98	978-300	S. Chollas Main Branch at Federal	RK	
19-Jun-98	978-301	S. Chollas Main Branch at 6700 Central	RK	
19-Jun-98	978-302	Main Chollas at Logan/Gregory	BC	
19-Jun-98	978-303	Main Chollas at National Ave-north side	RK	
19-Jun-98	978-304	Main Chollas at National Ave - south side	RK	
19-Jun-98	978-305	Main Chollas at National Ave - north side in storm drain	BC	
19-Jun-98	978-306	Main Chollas at 35th & Martin	RK	
19-Jun-98	978-307	Main Chollas in the Greenwood Cemetary Tributary	RK	
19-Jun-98	978-308	Main Chollas at Market (1 block west)	BC	
19-Jun-98	978-309	Main Chollas at Market (east)	RK	

Appendix C: Sediment Sampling Stations in Chollas Creek

Date of Sampling	Station ID	Location	Sampler	Comments
19-Jun-98	978-310	Main Wabash Branch (north of 94)	RK	
19-Jun-98	978-311	Home Ave Branch u/s of Main Chollas in storm drain	RK	
19-Jun-98	978-312	Home Ave Branch u/s of Main Chollas u/s of storm drain	BC	
19-Jun-98	978-313	Home Ave Branch u/s of Main Chollas d/s of storm drain	RK	
26-Jun-98	978-314	Main Chollas at Home Ave above pipe	DL	
26-Jun-98	978-315	Main Chollas at Home Ave below pipe	BC	
26-Jun-98	978-316	Main Chollas at Home Ave at pipe	BC	
26-Jun-98	978-317	Main Chollas at Home Ave E of Menlo d/s of pipe	BC	
26-Jun-98	978-318	Main Chollas at Home Ave E of Menlo in side ditch	BC	
26-Jun-98	978-319	Main Chollas at Home Ave E of Menlo u/s of pipe	DL	
26-Jun-98	978-320	Main Chollas at Home Ave E of Euclid	DL	
26-Jun-98	978-321	Main Chollas at Home Ave d/s of Auburn Dr	DL	
26-Jun-98	978-322	Main Chollas at Home Ave u/s of Auburn Dr	DL	
26-Jun-98	978-323	Main Chollas at Home Ave 1000' E of Auburn / Ontario	BC	
26-Jun-98	978-324	Main Chollas u/s of Federal / 805 u/s of side drainage	DL	
26-Jun-98	978-325	Main Chollas u/s of Federal / 805 in side drainage	DL	
26-Jun-98	978-326	Main Chollas u/s of Federal / 805 d/s of drainage	BC	
26-Jun-98	978-327	Main Chollas u/s of Chollas Lake drain	BC	Samples 327-329 and 330-332 were taken from u/s to d/s according to the time entry on the COC.
26-Jun-98	978-328	Main Chollas in Chollas Lake drain	DL	
26-Jun-98	978-329	Main Chollas d/s of Chollas Lake drain	DL	
26-Jun-98	978-330	Main Chollas u/s of Trailer Park Drain	BC	
26-Jun-98	978-331	Main Chollas in Trailer Park Drain	DL	
26-Jun-98	978-332	Main Chollas d/s of Trailer Park Drain	BC	
26-Jun-98	978-333	Main Chollas east of Euclid	DL	
26-Jun-98	978-334	Main Chollas east of 54th Street		
26-Jun-98	978-335	Main Chollas, deep and just u/s of S. Chollas		sampled from u/s to d/s according to the time entries on the COC.
26-Jun-98	978-336	S. Chollas, deep, just u/s of Main Chollas		
26-Jun-98	978-337	Main Chollas, deep and just d/s of S. Chollas		
23-Sep-94	PREBAY1	composite from stations 1A and 1B pre-wet season		
23-Sep-94	PREBAY2	composite from stations 2A and 2B pre-wet season		
23-Sep-94	PREBAY3	composite from stations 3A and 3B pre-wet season		
25-Sep-94	PRECREEK1	approximately .25 miles upstream from SD8(1), pre-wet season		
09-May-95	POSTCREEK1	approximately .25 miles upstream from SD8(1), post-wet season		
10-May-95	POSTBAY1	composite from stations 1A and 1B post-wet season		
10-May-95	POSTBAY2	composite from stations 2A and 2B post-wet season		
10-May-95	POSTBAY3	composite from stations 3A and 3B post-wet season		
	1A (SD Bay)	lat 32 deg 41.251"/ long 117 deg 07.938"		
	1B (SD Bay)	lat 32 deg 41.238"/ long 117 deg 07.935"		
	2A (SD Bay)	lat 32 deg 41.248"/ long 117 deg 07.953"		

Appendix C: Sediment Sampling Stations in Chollas Creek

Date of Sampling	Station ID	Location	Sampler	Comments
	2B (SD Bay)	lat 32 deg 41.233"/ long 117 deg 07.941"		
	3A (SD Bay)	lat 32 deg 41.241"/ long 117 deg 07.955"		
	3B (SD Bay)	lat 32 deg 41.222"/ long 117 deg 09.954"		
	chollas			
12-Sep-01	Chollas Crk North Fork			GPS coordinates mentioned, but not supplied
12-Sep-01	Chollas Crk South Fork			
12-Sep-01	Chollas Crk South Fork (Dup)			
12-Sep-01	Chollas Creek Downstream			

Appendix D

Wet and Dry Weather Models

Used in the Chollas Creek Metals Total Maximum Daily Load

California Regional Water Quality Control Board, San Diego Region

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1. Watershed Modeling and General Considerations

Models are developed as tools to perform experiments on watersheds that would otherwise be impractical or impossible due to cost, personnel, or time constraints (Nix, 1994). A significant advantage of watershed modeling is the ability to process and effectively present copious amounts of spatial and time-series data. Additionally, models can prove beneficial in data-limited environments; they can estimate values for unavailable or incomplete data sets by utilizing available preexisting data in the model calibration process. These functionalities allow users to determine the impacts of different parameters on the natural processes occurring in a watershed.

Watershed-scale models range from simple to complex. Simple models are used to rapidly identify critical areas in the environment and are often utilized when data limitations and financial constraints prohibit the use of more complex models. Simple models describe a limited number of hydrologic and water quality processes and are used to estimate pollutant loadings, thus acting as a screening tool. More complex models depend on deterministic algorithms that closely simulate the physical processes in the watershed. Additionally, such models are data intensive and require substantial model calibration to accurately depict the natural system.

In selecting an appropriate approach to support the Total Maximum Daily Load (TMDL) for Chollas Creek, technical and regulatory criteria were considered. Technical criteria include the physical system in question, including the constituents of interest and watershed or stream characteristics and processes (physical domain, source contributions, critical conditions, and constituents). Consideration of each topic was critical in selecting the most appropriate modeling system to address the types of sources associated with the listed waters.

Representation of the physical domain is perhaps the most important consideration in model selection. The physical domain is the focus of the modeling effort—typically, either the receiving water itself or a combination of the contributing watershed and the receiving water. Selection of the appropriate modeling domain depends on the constituents and the conditions under which the stream exhibits impairment. For streams affected additionally or solely by nonpoint sources or primarily rainfall-driven flow and pollutant contributions, a dynamic approach is recommended. Dynamic watershed models consider time-variable nonpoint source contributions from a watershed surface or subsurface. Some models consider monthly or seasonal variability, while others enable assessment of conditions immediately before, during, and after individual rainfall events. Dynamic models require a substantial amount of information regarding input parameters and data for calibration purposes.

1.1. Source Contributions of Metal Loads

The primary sources contributions of metal loads to Chollas Creek had to be considered in the model selection process. Accurately representing contributions from nonpoint sources and regulated point sources is critical in properly representing the system and ultimately evaluating potential load reduction scenarios.

Water quality monitoring data were not sufficient to fully characterize all sources of metals in the Chollas Creek watershed. However, analyses of the available data indicate that the

main sources are associated with surface runoff. As a result, the models selected to develop copper, lead, and zinc TMDLs for the Chollas Creek watershed need to address the major source categories during dry and wet weather conditions.

1.2. Critical Conditions

The critical condition is the set of natural conditions, including flow rates and critical points that identifies when and where a water body exhibits the most vulnerability. In the Chollas Creek Metals TMDL project, separate critical flow conditions were identified for dry and wet weather conditions. This allowed for a better characterization of the critical condition than only addressing a single critical flow condition. Additionally for the Chollas Creek Metals TMDL project, a critical point was selected at the mouth of the Chollas Creek watershed. A critical point is a location in an impaired water body that is selected based on high pollutant loads predicted at that location. Not only does the Clean Water Act (CWA) require that critical conditions be taken into account [40 CFR 130.7(c)], but both the identification of dry and wet weather critical flow conditions and the Chollas Creek watershed's critical point are useful in conservatively assessing impairments to Water Quality Objectives (WQOs) and in directing implementation of load reduction strategies. However, although this critical point for water quality assessment is utilized for TMDL analysis, compliance to WQOs must be assessed and maintained for all segments in the Chollas Creek watershed to ensure that beneficial uses are protected.

1.3. Constituents

Another important consideration in model selection and application is the constituent(s) to be assessed. Choice of state variables is a critical part of model implementation. The more state variables included, the more difficult the model will be to apply and calibrate. However, if key state variables are omitted from the simulation, the model might not simulate all necessary aspects of the system and might produce unrealistic results. A delicate balance must be met between minimal constituent simulation and maximum applicability.

The focuses of the Chollas Creek Metals TMDL project is assessing the copper, lead, and zinc loads that cause impairment to the beneficial uses of the Chollas Creek watershed. These metal loads can be estimated by combining the flow rates and concentration. Factors affecting the concentration of metals include hardness, pH, and available sediment. Metal concentrations in the water column are also influenced by in-stream losses and settling. In-stream metal dynamics can be extremely complex, and accurate estimation of concentrations relies on a host of interrelated environmental factors. The available data provided few insights into which other factors might be most influential on metal behavior for the model.

1.4. Regulatory Criteria

A properly designed and applied model provides the source analysis component of the Chollas Creek Metals TMDL project. The Regional Water Quality Control Board, San Diego Region's (Regional Board) Basin Plan establishes, for all waters in the San Diego region, the beneficial uses to be protected, the WQOs that those uses, and an implementation plan that achieves those objectives (Regional Board, 1994). For the watershed source analysis and the

implementation plan, it is also important that the modeling platform enable examination of gross land use loading as well as in-stream concentration.

1.5. Application of San Diego Regional Hydrologic Model for both Dry and Wet Weather Models

The San Diego regional hydrologic model described in this appendix was originally designed to simulate dry weather bacteria concentrations in the San Diego region, as described in *Bacteria TMDLs for Beaches and Inland Surface Waters of the San Diego Region – DRAFT* (Tetra Tech, Inc., 2004). Because the flow model was based on data from the San Diego region and has robustly calibrated and validated measured parameters for the San Diego region, it is appropriate to use for the Chollas Creek Metals TMDL project. This single set of parameters was calibrated and validated over a diverse geographic (includes mountainous and coastal regions as well as highly urbanized and open areas) and temporal scale (includes extreme dry and wet weather periods), and can therefore be applied to many of the ungaged streams within the San Diego region, including Chollas Creek.

Without this regional set of parameter values, a watershed model would be unfeasible for the source analysis support needed for the Chollas Creek Metals TMDL project. By applying the regionally calibrated hydrology parameter values to the updated watershed delineations and land use reclassifications for the Chollas Creek watershed, flow was simulated for the watershed. Current analyses utilize the calibrated flow parameters from the San Diego regional hydrologic model, while considering additional local information. This appendix describes model set-up, calibration, and validation of the San Diego regional hydrologic model, emphasizes why this regional model is applicable to the Chollas Creek watershed, and notes the modifications that were made to adapt the model for the Chollas Creek watershed.

1.6. Model Calibration and Validation

After any model is configured, model calibration and validation must be performed to ensure the natural environment is represented as accurately as possible. For watershed modeling, this is generally a two-phase process, with hydrology (flow rate) calibration and validation completed before repeating the process for water quality (pollutant concentration). Upon completion of the calibration and validation at selected locations, a calibrated dataset containing parameter values for each modeled land use and pollutant was developed.

2. Estimated Existing Loads for Dry and Wet Weather Conditions

2.1. Explanation of Dry and Wet Weather Conditions

A distinction is made between dry and wet weather conditions because the sources and amounts of metals vary between the two scenarios and implementation measures will be specific to these conditions. Existing copper, lead, and zinc loads were estimated for both dry and wet weather conditions to provide year-round representation of the Chollas Creek watershed.

Utilizing separate approaches for dry and wet weather conditions ensured that the Chollas Creek Metals TMDL project addressed the variable flow patterns in the Chollas Creek watershed with an appropriate methodology. A flow-based cutoff to separate dry and wet weather conditions, as opposed to a dry and wet weather season approach, was applied to accurately capture rainfall events and sustained dry periods throughout the year. The dry weather flow approach uses a steady-state model to estimate existing loads during dry periods that are not addressed through the wet weather flow rate approach.

Before existing loads for dry and wet weather conditions could be estimated, the two conditions need finite definitions. Dry weather conditions are based on dry weather days that were selected based on the criterion that less than 0.2 inch of rainfall was observed on each of the previous three days[1]. A wet weather condition was characterized as any flow greater than the dry weather condition criteria as predicted by the dry weather model based on the definition above.

2.2. Dry and Wet Weather Critical Flow Conditions

The dry weather critical flow condition was based on predictions of steady-state flows, which were derived through modeling analysis of average dry weather flows observed in the San Diego region. The dry weather critical condition was based on the prediction of steady-state flows. As described in section 3, regionally calibrated model parameters were developed through a modeling analysis of average dry weather flows observed in Aliso Creek (2001), Rose Creek (2001-2002), and Tecolote Creek (2001-2002). These parameters were applied to the Chollas Creek watershed to determine the watershed-specific critical dry weather flow condition.

To ensure protection of the Chollas Creek watershed during wet weather conditions, a critical flow condition was selected based on identification of the 93rd percentile of annual rainfall observed over the past 14 years (1990 through 2003) at multiple rainfall gages in the San Diego region. Essentially the critical flow condition was based on the wettest year of the past 14 years. This resulted in selection of 1993 as the critical wet year for assessment of wet weather conditions. This critical flow condition was consistent with studies performed by the Southern California Coastal Research Project (SCCWRP), where a 90th percentile year was selected based on rainfall data for the Los Angeles Airport from 1947 to 2000, also resulting in selection of 1993 as the critical wet year (Regional Water Quality Control Board, Los Angeles Region (LARWQCB), 2002).

2.3. Estimated Existing Annual Loads from Dry and Wet Weather Models

According to the CWA [40 CFR 130.2 (i) and 40 CFR 130.7 © (1)] a TMDL document must analyze all sources, and the magnitude and location of the sources. In order to comply with

[1] This definition comes from the California Department of Environmental Health's general advisory that is issued to alert the public of ocean and bay water contamination by urban runoff. It is also supported by CFR section 122.21 and section 122.26.

the CWA, both the dry and wet weather models were used to estimate existing annual loads of copper, lead, and zinc. In addition the mass loadings estimated from the model outputs also offer support for the implementation plan. Relative amounts of mass loadings for dry and wet weather conditions can identify where more serious problems occur and on which subwatersheds or land uses efforts should be concentrated. For example, for all three metals, freeways and commercial/institutional land uses have the highest relative loading contributions. Responsible parties may want to concentrate efforts on controlling metal sources in these areas.

The simulated flow rate was combined with average in-stream dry weather concentrations for dissolved copper, lead, and zinc in order to estimate basin-wide existing loads for each metal (Table 1). The estimated loads for the dry weather critical flow conditions were the same as the average estimated loads for the dry weather typical condition because the dry weather metal concentration could not be simulated due to limited observed data for calibration. The estimated existing loads for the wet weather critical flow rate condition and the average estimated existing loads (1990-2003) for the wet typical weather condition are provided in Table 2 and Table 3 for each metal. All estimated existing loads are calculated at the mouth of the Chollas Creek watershed, which is the critical point.

Table 1. Estimated existing loads (grams per year) for the dry weather critical flow condition and average estimated existing loads for the dry weather typical condition at the critical point.

Copper (dissolved)	Lead (dissolved)	Zinc (dissolved)
692	168	986

Table 2. Estimated existing loads (grams per year) for the wet weather critical flow rate condition at the mouth of the Chollas Creek watershed.

Copper (dissolved)	Lead (dissolved)	Zinc (dissolved)
984,549	705,142	5,993,255

Table 3. Average estimated existing loads (grams per year) for the average wet weather condition for 1990 through 2003 at the critical point.

Copper (dissolved)	Lead (dissolved)	Zinc (dissolved)
232,137	194,007	1,326,407

2.4. Model Assumptions/Limitations

While highly beneficial tools for analyzing surface runoff pollution problems, all mathematical models are based on assumptions or inferences made about the processes and systems being simulated, which must be considered (Charbeneau & Barrett, 1998; Loague, Corwin, & Ellsworth, 1998; Nix, 1994; Tim & Jolly, 1994). These limitations include the steep learning curve for model use, the accuracy of the mathematical equations, and

inadequacies and assumptions of the input data (Charbeneau & Barrett, 1998; Nix, 1994; Tim & Jolly, 1994). Model users must keep in mind that a model is a tool; and while it can extract information, it cannot overcome data inadequacies or assumptions. The specific assumptions made with the modeling approach used for in the Chollas Creek Metals TMDL project include but are not limited to the following:

2.4.1. General Model Assumptions

- The critical point was assumed to be at the mouth of the Chollas Creek watershed.
- Water quality monitoring data were not sufficient to fully characterize all sources of metals in the Chollas Creek watershed.
- The limited data available provide few insights into which other factors might be most influential on metal behavior for the model

2.4.2. Wet Weather Model Assumptions

The following assumptions are relevant to the Loading Simulation Program written in C++ (LSPC) model developed to simulate wet-weather sources of metals in Chollas Creek.

- *Source Representation* - All sources can be represented through build-up/wash-off of metals from specific land use types.
- *Flow* - Because modeled and observed flow ranges are similar, a simulation program hydrology model flow rate results were considered representative of flow in the Chollas Creek watershed. Differences can be explained by localized events, and until additional flow data become available, further calibration is not possible, nor warranted.
- *Water Quality Data* - Observed water quality data, unlike stream flow data, are usually not continuous; thus making time-series comparisons difficult and reducing the accuracy of the water quality model calibration.
- *General LSPC/HSPF Model Assumptions* - Many model assumptions are inherent in the algorithms used by the LSPC watershed model and are reported extensively in Bicknell et al. (1996).
- *Land Use* - The San Diego Association of Governments (SANDAG) land use GIS dataset is assumed representative of the current land use areas. For areas where significant changes in land use have occurred since the creation of these datasets, model predictions may not be representative of observed conditions.
- *Stream Representation* - Each delineated subwatershed was represented with a single stream assumed to be a completely mixed, one-dimensional segment with a trapezoidal cross-section.
- *Hydrologic Modeling Parameters* - Hydrologic modeling parameters were developed during previous modeling studies in Southern California (e.g., LA River, San Jacinto River) and refined through calibration to stream flow data collected in the San Diego region. Through the calibration and validation process (reported in the Bacteria TMDLs for the San Diego Region), a set of modeling parameters were obtained specific to land use and hydrologic soil groups. These parameters are assumed to be representative of the hydrology of the Chollas Creek watershed, which is presently ungaged and therefore unverified.

- *Water Quality Modeling Parameters* - Dynamic models require a substantial amount of information regarding input parameters and data for calibration purposes. All sources of metals from watersheds are represented in the LSPC model as build-up/wash-off from specific land use types. Limited data are currently available in the San Diego region to allow development of unique modeling parameters for simulation of build-up/wash-off, so initial parameters values were obtained from land use-specific storm water data in the Los Angeles region. These build-up/wash-off modeling parameters were refined during the calibration and validation process in which observed data from Chollas Creek were compared with the model predicted values.
- *Lumped Parameter Model Characteristic* - LSPC is a lumped-parameter model and is assumed to be sufficient for modeling transport of flows and metal loads from watersheds in the region. For lumped parameter models, transport of flows and metal loads to the streams within a given model subwatershed cannot consider relative distances of land use activities and topography that may enhance or impede time of travel over the land surface.
- *First-order Losses* - Each stream is modeled assuming first-order loss of metals.
- *Wet-weather Critical Condition* – The critical wet-weather condition was selected based on identification of the 93rd percentile of annual rainfalls observed over the past 12 years (1990 through 2002) at multiple rainfall gages in the San Diego region. This resulted in selection of 1993 as the critical wet year for assessment of wet weather loading conditions. This condition was consistent with studies performed by SCCWRP, where a 90th percentile year was selected based on rainfall data for the Los Angeles Airport (LAX) from 1947 to 2000, also resulting in selection of 1993 as the critical year (LARWQCB, 2002).

2.4.3. Dry Weather Model Assumptions

The following assumptions are relevant to the watershed modeling system developed for simulation of steady-state dry-weather flows and sources of metals.

- *Limited Dry Weather Data* - Because there were only seven in-stream dry weather metal concentration data points in the Chollas Creek watershed, copper, lead, and zinc concentrations could not be simulated. Therefore, land use specific loadings and more detailed analyses could not be calculated.
- *Stream Representation* - This predictive model represents the stream network as a series of plug-flow reactors, with each reactor having a constant, steady state flow and pollutant load.
- *Flow Condition* - These constant flows were assumed representative of the average flow caused by various urban land use practices (e.g., runoff from lawn irrigation or sidewalk washing).
- *Channel Geometry* - Channel geometry during low-flow, dry-weather conditions is assumed to be represented appropriately using equations derived from flows and physical data collected at 53 U.S. Geological Survey (USGS) stream gages in Southern California.

- *Steady-state Model Configuration* - Although dry-weather flows vary over time for any given stream, for prediction of average conditions in the stream, flows were assumed to be steady state.
- *Plug Flow Model Configuration* - Plug flow reaction kinetics were assumed sufficient in modeling dry-weather, steady state stream routing.
- *Sources for Characterization of Dry-weather Conditions* - Data used for characterization of dry-weather flows were assumed representative of conditions throughout the region.
- *Methods for Characterization of Dry-weather Conditions* - The equations derived through multivariable regression analyses were assumed sufficient to represent the dry-weather flows as a function of land use and watershed size. This assumption was verified through model calibration and validation reported.
- *Stream Infiltration* - Losses of volume through stream infiltration were modeled assuming infiltration rates were constant for each of the four hydrologic soil groups (A, B, C, and D[2]). Infiltration rates were based on literature vales and refined through model calibration and validation. The resulting infiltration rates were 1.368 inches per hour (in/hr) (Soil Group A), 0.698 in/hr (Soil Group B), 0.209 in/hr (Soil Group C), and 0.084 in/hr (Soil Group D). These infiltration rates are within the range of values found in literature (Wanielisata et al., 1997). These infiltration rates are assumed representative for all streams studied in the region within each hydrologic soil group.
- *Dry-weather Critical Condition* - The critical dry period was based on predictions of steady-state flows based on results of analysis of average dry-weather flows observed in Aliso Creek, Rose Creek, and Tecolote Creek. Dry-weather days were selected based on the criterion that less than 0.2 inch of rainfall was observed on each of the previous 3 days.

3. Dry Weather Model

During dry weather conditions, many streams exhibit a sustained base flow even if no rainfall has occurred for a significant period to provide storm water runoff or groundwater flows. These sustained flows are generally understood to result from various urban land use practices (e.g. lawn irrigation runoff, car washing, and sidewalk washing) and are referred to as urban runoff. As these urban runoffs travel across land areas (e.g. lawns and other urban surfaces), accumulated metal loads are carried from these areas to receiving waterbodies.

[2] Group A Soils have low runoff potential and high infiltration rates even when wet. They consist chiefly of sand and gravel and are well drained to excessively-drained. Group B Soils have moderate infiltration rates when wet and consist chiefly of soils that are moderately-deep to deep, moderately- to well-drained, and moderately course textures. Group C Soils have low infiltration rates when wet and consist chiefly of soils having a layer that impedes downward movement of water with moderately-fine to fine texture. Group D Soils have high runoff potential, very low infiltration rates and consist chiefly of clay soils. These soils also include urban areas (USDA, 1986).

The dry weather model was used to estimate the flow rates of urban runoff in the Chollas Creek watershed. The average metal concentrations were used to estimate the existing metal concentrations that end up in Chollas Creek from urban runoff transportation of metal loads. Figure 1 is a visual representation of how the model outputs were used. Because there were only seven in-stream dry weather metal concentration data points in the Chollas Creek watershed, copper, lead, and zinc concentrations could not be simulated. The simulated flow values from a San Diego regional hydrologic model were instead combined with average in-stream dry weather metal concentrations for dissolved copper, lead, and zinc to calculate estimated basin-wide loads for each metal (Table 1).

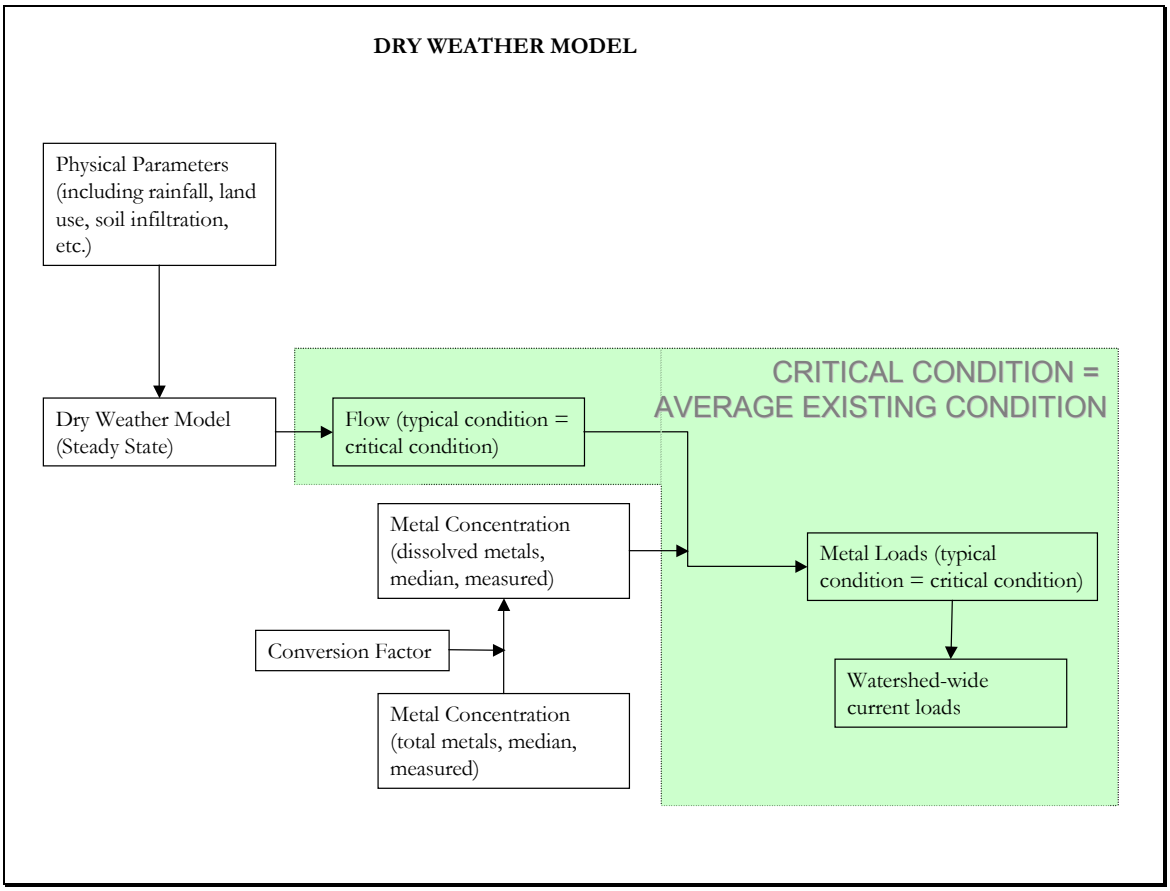

Figure 1. Dry weather model outputs.

3.1 Dry Weather Modeling Details

To estimate sources from dry weather urban runoff, a steady-state spreadsheet was developed for the San Diego region to model dry weather flow in the watershed. However, because limited in-stream dry weather metal concentration data were available for model calibration and validation, copper, lead, and zinc concentrations could not be simulated and average values from available data were used. The calibrated, low flow, steady-state model was used to estimate flows during dry weather conditions. These constant flows were assumed

representative of the average flow caused by various urban land use practices (e.g., runoff from lawn irrigation or sidewalk washing).

3.1.1 Dry Weather Model Use of the Chollas Creek Watershed Representation
The initial step in this watershed-based analysis was to clearly define the watershed boundary. Therefore, before the model could be configured, an appropriate scale for analysis was determined. Model subwatersheds were delineated based on CALWTR 2.2, a standard nested watershed delineation scheme, watersheds, stream networks, locations of flow and water quality monitoring stations, consistency of hydrologic factors, and land use uniformity. The subwatersheds, soil types, and stream lengths used in the dry weather model were identical to those described in the wet weather model. Figure 2 provides a schematic of the stream network for the Chollas Creek watershed, which includes model segment connectivity, used for the Chollas Creek Metals TMDL project. Section 4.2 also provides a more detailed discussion of the watershed representation used for the wet weather model.

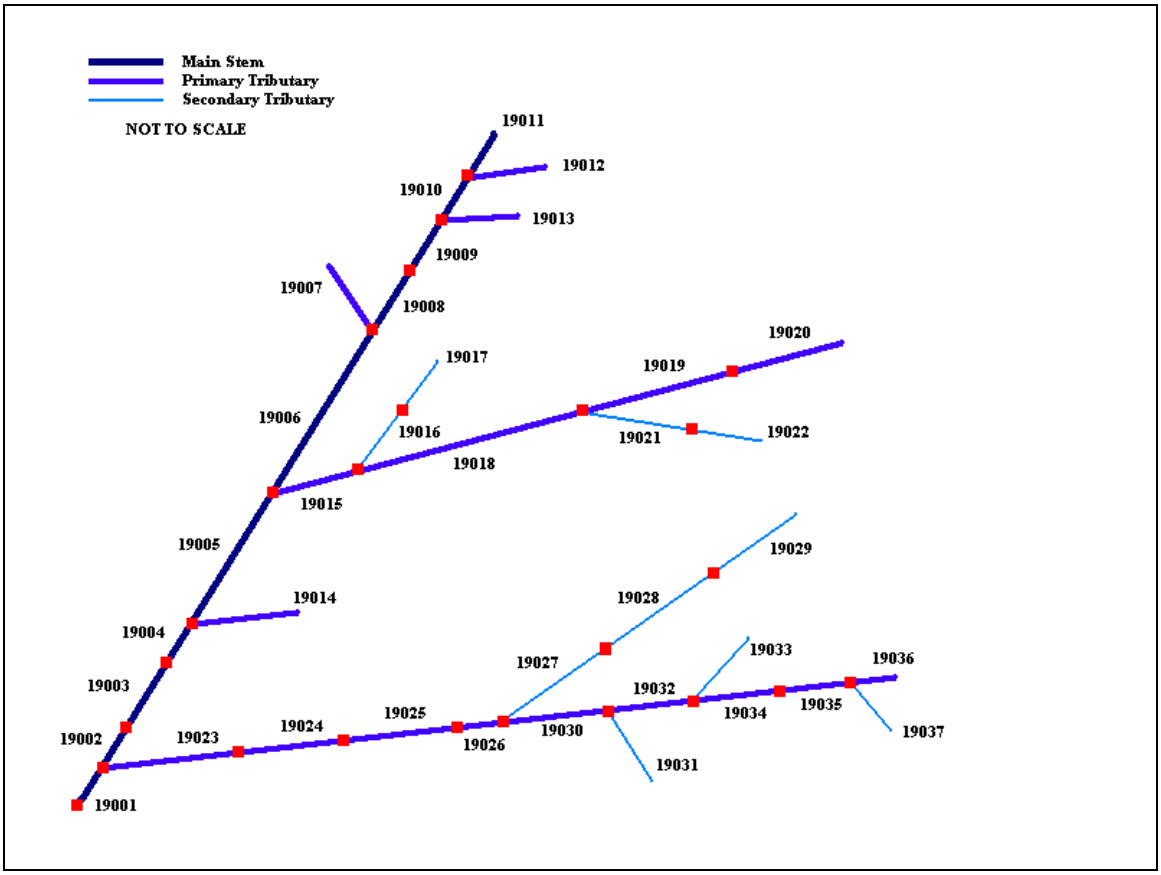

Figure 2. Schematic of model segments (indicated by subwatershed identification numbers) for Chollas Creek and its tributaries. Each segment is identified with a model number.[3]

[3] See Figure 11 for the segments as they appear on a map of the Chollas Creek watershed.

3.1.2. Channel Geometry

Precise channel geometry data were not available for the modeled stream segments; therefore, stream dimensions were estimated from analysis of observed data from other areas. Analyses were performed on flow data and associated stream dimension data from 53 USGS gages throughout Southern California. For this analysis, all flow less than 15 cubic feet per second (ft^3/s) was assumed to represent dry weather flow conditions. Using these dry weather flow data, the relationship between flow and cross-sectional area was estimated ($R^2 = 0.51$). The following regression equation describes the relationship between flow and cross-sectional area:

$$A = e^{0.2253 \times Q}$$

where:

A = cross-sectional area, feet squared (ft^2)
Q = flow, cubic feet per second (ft^3/s)

In addition, data from the USGS gages were used to determine the width of each segment based on a regression between cross-sectional area and width. The relationship with the greatest correlation ($R^2 = 0.75$) was based on the natural logarithms of each parameter. The following regression equation describes the relationship between cross-sectional area and width:

$$LN(W) = (0.6296 \times LN(A)) + 1.3003 \quad \text{or} \quad W = e^{((0.6296 \times LN(A)) + 1.3003)}$$

where:

W = width of model segment (ft)
A = cross-sectional area (ft^2)

3.1.3. Steady-State Mass Balance Overview

To represent the linkage between dry weather source contributions and in-stream response, a steady-state mass balance model was developed to simulate transport of pollutants in the impaired stream segment. This predictive model represents the stream network as a series of plug-flow reactors, with each reactor having a constant, steady state flow and pollutant load. A plug-flow reactor can be thought of as an elongated rectangular basin with a constant level in which advection (unidirectional transport) dominates (Figure 3).

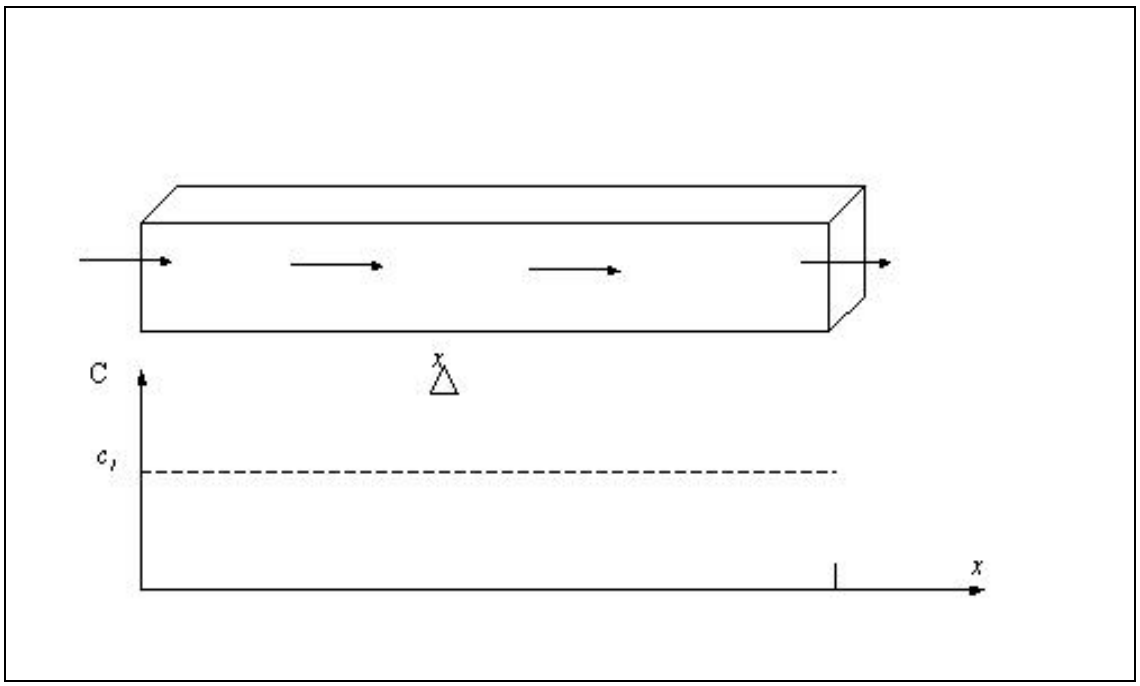

Figure 3. Theoretical plug-flow reactor. See dry weather model equations for definition of variables.

This modeling approach relies on basic segment characteristics, which include flow, width, and cross-sectional area. Model segments are assumed to be well-mixed laterally and vertically at a steady-state condition (constant flow input). Variations in the longitudinal dimension determine changes in flow and pollutant concentrations. A "plug" of a conservative substance introduced at one end of the reactor will remain intact as it passes through the reactor. The initial concentration of a pollutant from multiple sources can be represented based on empirically derived inflows as a single input at the injection point. Each reactor defines the mass balance for the pollutant and flow. At points further downstream, the concentration can be estimated based on first-order loss and mass balance.

3.1.4. Dry Weather Model Equations

There are two core equations used in the dry model, one to represent the mass balance and one to represent the loss of concentration downstream.

A mass-balance of the watershed load and, if applicable, of the load from the upstream tributary were performed to determine the change in concentration. This is represented by the following equation:

$$C_0 = \frac{Q_r C_r + Q_t C_t}{Q_r + Q_t}$$

where:

Q = flow (ft^3/s)
C = concentration

In the previous equation, Q_r and C_r refer to the flow and concentration from the receiving watershed and Q_t and C_t refer to the flow and concentration from the upstream tributary. The concentration estimated from this equation was then used as the initial concentration (C_0) in the loss equation for the receiving segment.

To describe instream losses, a first order rate equation was derived. An initial concentration (C_0) for inflow was set as an upstream boundary condition. The final water column concentration (C) in a segment can be estimated using the loss equation given below:

$$\frac{dc}{dt} = -kc \quad \text{or} \quad C = C_0 e^{-kt} = C_0 e^{-\left(k\frac{x}{u}\right)}$$

where:

C_0 = initial concentration
C = final concentration
k = loss rate (1/day)
χ = segment length (miles)
u = stream velocity (miles per day)

3.2. Dry Weather Model Use of a San Diego Regional Hydrologic model

The San Diego regional hydrologic model used estimates of subwatershed inflows obtained through analysis of available data. Data collected as part of detailed monitoring efforts of Aliso Creek (performed by the Orange County Pubic Facilities and Resources Department and the Orange County Public Health Laboratory) and of Rose Creek and Tecolote Creek (performed by the City of San Diego) were analyzed to estimate dry weather flow data. Information from these studies was assumed sufficient for use in characterizing dry weather flow conditions for the entire study area.

For each of the detailed studies, flow data were collected throughout the year at stations within the watersheds (27 stations for Aliso Creek, 3 stations for Rose Creek, and 2 stations for Tecolote Creek). The watersheds were delineated to each sampling location. Analyses were performed to determine whether there is a correlation between the respective land use types and average dry weather flow data collected at the mouth of each subwatershed.

The results of the analyses showed good correlation between flow and commercial/institutional, open space, and industrial/transportation land uses ($R^2 = 0.78$). The following equation was derived from the analysis:

$$Q = (A_{1400} \times 0.00168) + (A_{4000} \times 0.000256) - (A_{1500} \times 0.00141)$$

where:

Q = flow (ft^3/s)
A_{1400} = area of commercial/institutional (acres)
A_{4000} = area of open space, including military operations (acres)
A_{1500} = area of industrial/transportation (acres)

The empirical equation presented above that represented water quantity associated with dry weather urban runoff from various land uses can be used to predict flow. Figure 4 shows the flow predicted by the above equation compared to observed data for Aliso Creek, Rose Creek, and Tecolote Creek.

Overall, the statistical relationship established between each land use area and flow showed good correlation with the observed flow data. To improve model fit, model calibration and validation were conducted.

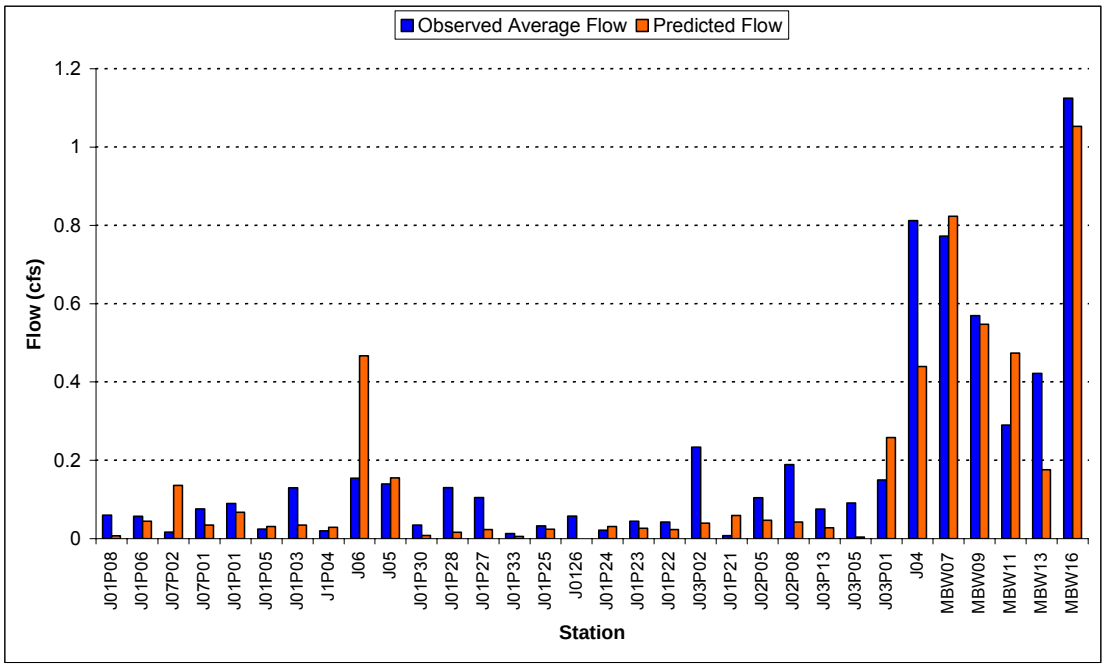

Figure 4. Predicted and observed flows in Aliso Creek, Rose Creek, and Tecolote Creek indicated by station numbers (Tetra Tech, Inc., 2004).

3.2.1. Calibration and Validation of the San Diego Regional Hydrologic model

Model calibration was performed using data from Aliso Creek and Rose Creek. Calibration involved the adjustment of infiltration rates to reflect observed in-stream flow conditions. Following model calibration, a separate validation process was undertaken to verify the predictive capability of the model in other watersheds. Table 4 lists the sampling locations used in calibration and validation, along with their corresponding watershed identification number from the San Diego regional hydrologic model. Figure 5 shows the sampling locations and their proximity to the Chollas Creek watershed. The model results presented in the next sections, especially the model calibration and validation, directly apply to the Chollas Creek watershed modeling effort because the Chollas Creek watershed is within the San Diego region.

Table 4. Sampling location for calibration and validation. (Tetra Tech, Inc., 2004)

Calibration – Flow						Validation – Flow	
Watershed	Sampling Location	Watershed	Sampling Location	Watershed	Sampling Location	Watershed	Sampling Location

208	J01P22	214	J01P01	1602	MBW17
209	J01P23	215	J01TBN8	1603	MBW15
210	J01P28	219	J04	1605	MBW11
211	J01P27	220	J03P13	1606	MBW13
212	J06	221	J03P01	1607	MBW24
213	J01P05	1601	MBW20		

1701	MBW06
1702	MBW07
1703	MBW10
1704	MBW08
1705	MBW09
403	USGS 11047300

Watersheds beginning with a "2" are located in Aliso Creek, with a "4" are in San Juan Creek, with a "16" are in Rose Creek and with a "17" are in Tecolote Creek.

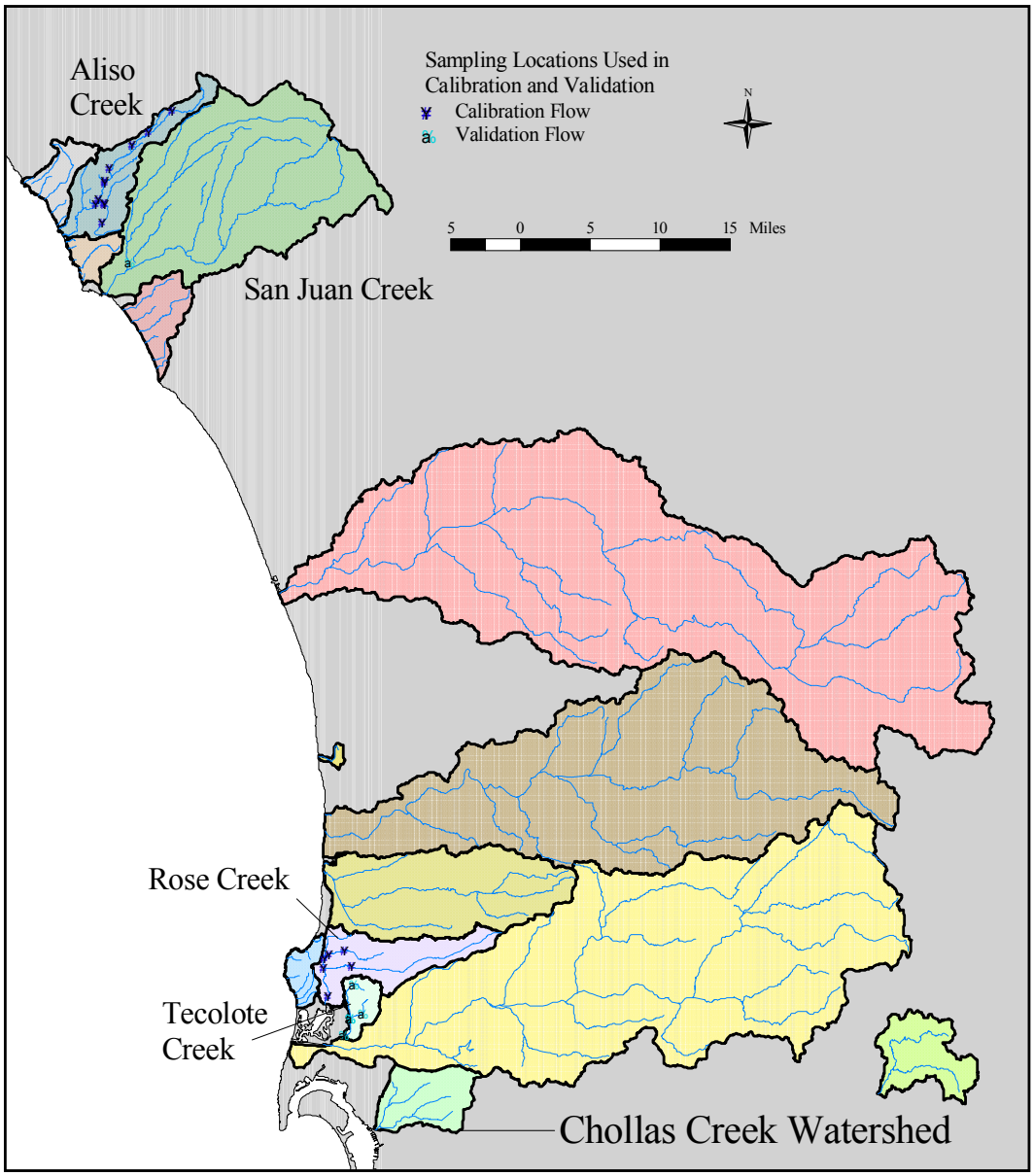

Figure 5. Sampling locations used for San Diego regional hydrologic model calibration and validation. (Tetra Tech, Inc., 2004)

3.2.2. San Diego Regional Hydrologic Model Calibration and Validation Results
Infiltration rates vary by soil type and model configuration included identifying a soil type for each subwatershed. Stream infiltration was calibrated by adjusting the infiltration rate. This rate was adjusted for each soil type within ranges identified from literature values (USEPA, 2000a). The goal of calibration was to minimize the difference between average observed flow and modeled flow at each calibration station location (Table 4). The model closely predicted observed flows and the calibration results are graphically presented in Figure 6.

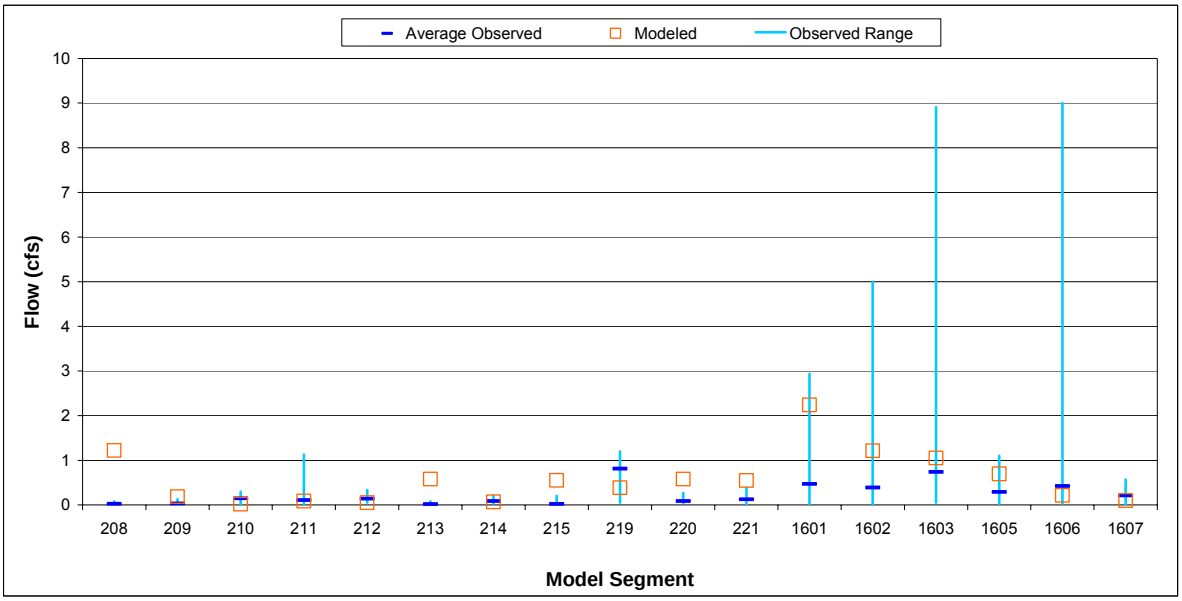

Figure 6. Calibration results of modeled versus observed flow. Model segment numbers are from the San Diego regional hydrologic model. (Tetra Tech, Inc., 2004)

The calibrated infiltration rates were 1.368 in/hr for Soil Group A, 0.698 in/hr for Soil Group B, 0.209 in/hr for Soil Group C, and 0.084 in/hr for Soil Group D. The infiltration rates for Soil Groups B, C, and D fall within the range of values described in the literature. The calibrated rate for Soil Group A is below the range identified in Wanielisata et al. (1997); however, Soil Group A is not present in the Chollas Creek watershed, which is dominated by Soil Groups C and D.

Subsequent to model calibration, the model was validated using six stations in the San Juan Creek and Tecolote Creek Watersheds. (Table 4) The model-predicted flows were within the observed ranges of dry weather flows (Figure 7), demonstrating very good overall model fit.

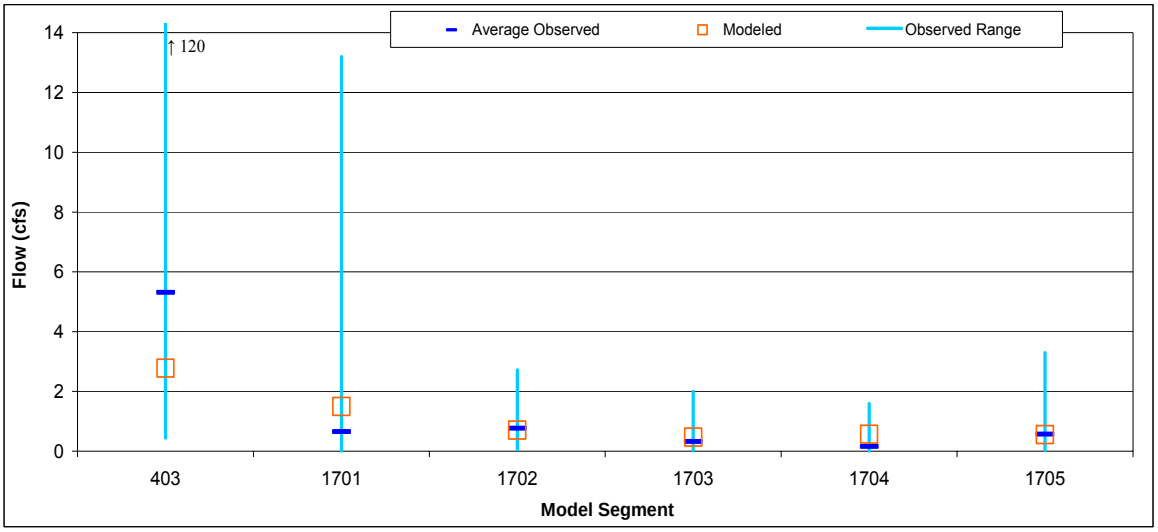

Figure 7. Validation results of modeled versus observed flow. Model segment numbers are from the San Diego regional hydrologic model. (Tetra Tech, Inc., 2004)

3.3. Summary of the Dry Weather Model Results

The steady-state model is calibrated for flow; however, data were not adequate to model dry weather metal loads from specific sources. At a future time, additional water quality data could be readily incorporated into the model and then be used to estimate pollutant concentrations in Chollas Creek or to support load allocations for another TMDL project. At that time, the pollutant concentrations in each segment could be estimated using metals concentration data, an in-stream loss rate, stream infiltration, basic channel geometry, and flow rate data.

3.3.1. San Diego Regional Hydrologic Model Application

Per the equation in section 3.1.4, for each model segment in the Chollas Creek watershed mass balances were performed on the following: inflows from upstream segments, input from local surface runoff, stream infiltration and evaporation, and outflow. The resulting overall dry weather model flow rate for Chollas Creek was 2.28 cubic feet per second (cfs). There is currently only one observed flow value available for comparison with the San Diego regional hydrologic model flow results: a flow measurement of 1.0 cfs was recorded at the in-stream dry weather flow data sampling location DW298. The corresponding model output for this location was 1.33 cfs indicating that the model is consistent with the magnitude of the measured dry weather flow rate datum.

3.3.2. Use of Average In-Stream Metals Concentration

As mentioned before, the model is currently configured to simulate steady-state pollutant concentrations through a mechanism similar to that for flow. Specifically, concentrations can be estimated in each reactor, or segment, using water quality data, a loss rate, basic channel geometry, and flow. Loss rates, which can be attributed to settling and other environmental conditions, were modeled as first-order. Model calibration and validation can be performed

by adjusting the rate of in-stream loss so that the predicted concentrations more closely match the observed data.

The amount of available dry weather metal concentration data currently prohibits the full utilization of the water quality, or concentration, component of this model, which has only been calibrated for bacteria to date. If sufficient data become available to establish a relationship between land use and metal concentrations during dry weather conditions, this feature of the model could be used to simulate source loadings and transport of pollutants in the Chollas Creek watershed and to help support other TMDL projects. Therefore, only the average observed concentrations were used to calculate the dry weather portion of the total estimates (Table 1).

4. Wet Weather Model

Wet weather source contributions of metal loads are generally associated with the wash-off of metal loads that have accumulated on the land surface. During rainfall events, these metal loads are delivered to the water body through creeks and storm water collection systems. Often, source contributions of metal, such as copper, lead, and zinc, loads can be linked to specific land use types that have higher relative accumulation rates, or are more likely to deliver metals to water bodies due to delivery through storm water collection systems. To assess the link between sources of metals and the impaired waters, a modeling system may be utilized that simulates the build-up and wash-off of metals and the hydrologic and hydraulic processes that affect delivery.

In order to model these processes for the Chollas Creek watershed, the watershed itself had to be delineated and categorized as subwatersheds with certain land uses. The land uses incorporated into the watershed model are described and illustrated in Appendix E, along with a table that identifies the subwatershed area associated with each land use. Next, observed rainfall data collected from the San Diego County storm water programs and other special studies were used to calibrate land use and soil-specific parameters in the watershed. Hydrology and water quality simulations were then performed for 1990 through 2003 to obtain modeled flow rates and concentrations, respectively. Transport processes of metal loads from the source to the impaired waterbodies were also simulated in the model with a first-order in-stream loss rate based on literature values. The model execution provided two outputs: estimated water quality concentration and estimated flows. These two outputs, in turn, can be used to estimate existing land use specific and subwatershed specific mass loads.

These estimated daily loads, which are based on model-predicted flows and metal concentrations, allowed for assessment of existing loading to the Chollas Creek watershed. To estimate the existing loads, first the maximum hourly total metal concentration was determined for each wet weather day predicted during the critical wet year. These maximum concentrations were then calculated as maximum daily values and then converted to the dissolved metal fraction by applying the appropriate acute conversion factor provided in the California Toxic Rule (CTR). Next, these dissolved metal values were multiplied by their respective average daily flow to estimate the existing dissolved metal load (Figure 8).

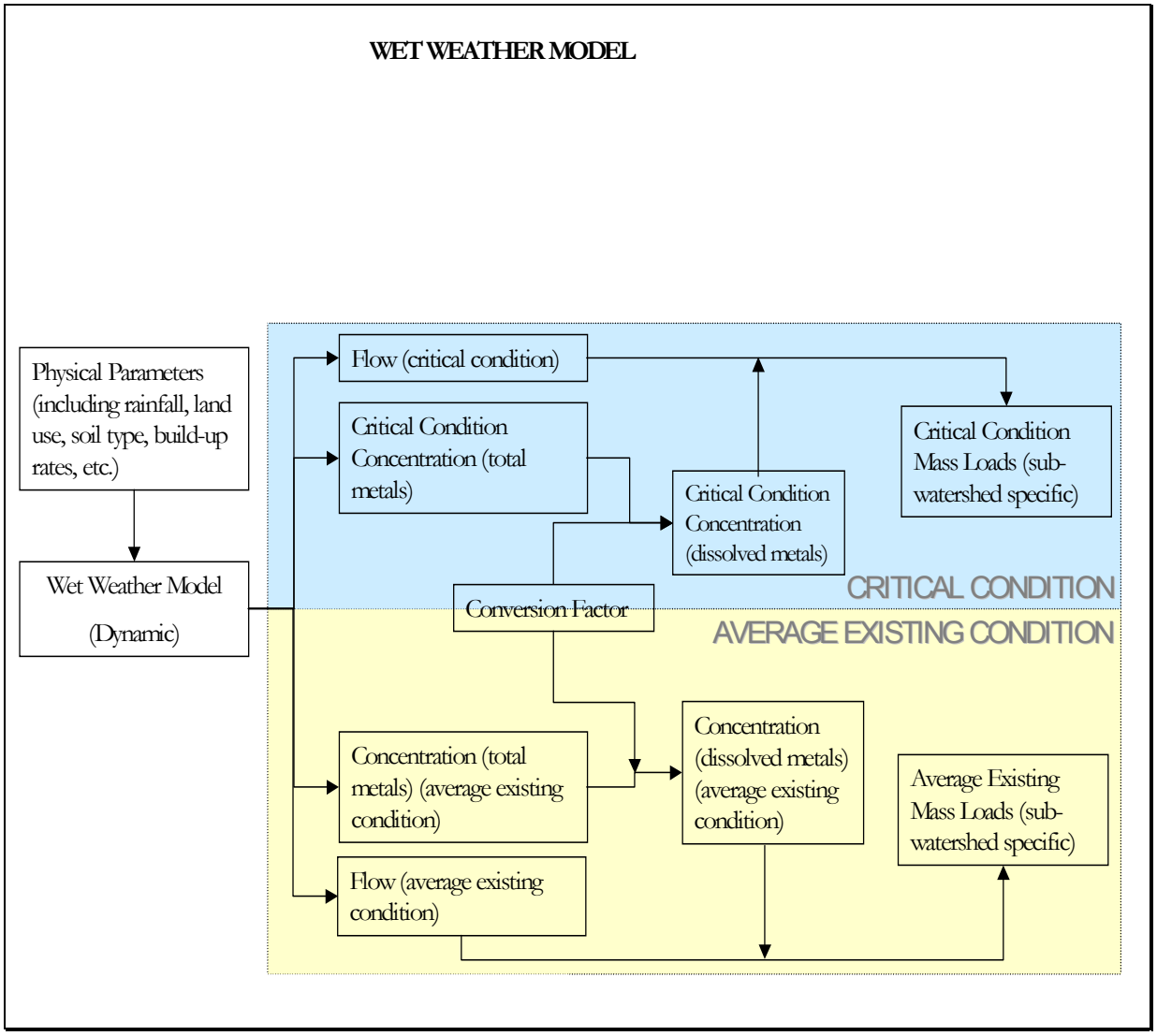

Figure 8. Wet weather model outputs.

4.1. Wet Weather Model Programs

Due to the complex nature of analyzing storm water contributions by drainage area associated with the Chollas Creek watershed, the source analysis for the Chollas Creek Metals TMDL project is based partly on a complex watershed model for wet weather conditions. This type of watershed analysis approach is a strategy for comprehensively addressing land management and water quality and quantity issues over an entire watershed. This approach is applicable to watersheds throughout the world because local information is taken into consideration. Such information includes the local geography and meteorological conditions.

The watershed model chosen to support the source analysis, which will in turn be used in the implementation plan, was the USEPA LSPC, a re-coded version of USEPA's Hydrological Simulation Program -FORTRAN (HSPF), which simulated the hydrologic processes and the metal loading to receiving waterbodies in the Chollas Creek watershed. A description of the model programs and the basic process of modeling used to support the Chollas Creek Metals TMDL project follows

4.1.1. HSPF Program

HSPF, an adaptation of the Stanford Watershed Model, was primarily developed to evaluate the effect of land use changes on water, sediment, and pollutant movement (Donigian, Imhoff, Bicknell, & Kittle, 1984). This model uses geographic and continuous meteorological data to compute stream flow and can then simulate both point and nonpoint source pollution through a wide range of complex mathematical equations. These equations represent surface and subsurface hydrologic conditions, including interflow and evapotranspiration, as well as water quality processes (Bicknell, Imhoff, Kittle, Jobes, & Donigian, 2001). Coefficients for these conditions and processes are manipulated during model calibration. HSPF is over 30 years old and has been extensively applied, despite its substantial learning curve (Whittemore, 1998). There have been hundreds of applications of HSPF all over the world, ranging from the 62,000 square mile Chesapeake Bay tributary area to a few-acre plot near Watkinsville, Georgia (USGS, 2002).

4.1.2. LSPC Program

LSPC is a program for dynamically modeling watersheds and is essentially a re-coded version of HSPF, which has further been integrated with a geographic information system (GIS), comprehensive data storage and management capabilities, and a data analysis/post-processing system into a convenient PC-based windows interface that dictates no software requirements. LSPC has been applied and calibrated in many Southern California waterbodies including the Los Angeles, San Gabriel, and San Jacinto Rivers and 20 watersheds in the San Diego region.

4.1.3. General Simulation Process

Understanding and modeling hydrologic and hydraulic processes provides the necessary decision support for TMDL development and implementation. A basic function of the model can be described in several steps:

(1) **LSPC Execution**. This process involved launching LSPC, inputting necessary data, and performing initial model simulations.
(2) **Comparison of Results**. Upon successful execution of LSPC, model results were compared with observed data and analyzed for accuracy and applicability.
(3) **Parameter Adjustments for Model Calibration**. The analyses performed in step 2 determine which parameters, if any, should be altered in this step to more accurately predict the observed data.
(4) **Simulation Runs for Model Calibration**. This step involved performing additional model runs with the adjusted parameter values.
(5) **Model Validation**. This step involved testing the calibrated parameters using independent date ranges and gage locations.

Steps 2, 3, and 4 described above are an iterative process and were performed in order, but eventually terminated with an analysis of the model results. These intermediate steps were conducted until the model results achieved satisfactory agreement with the natural system. See Figures 9 and 10 for a visual representation.

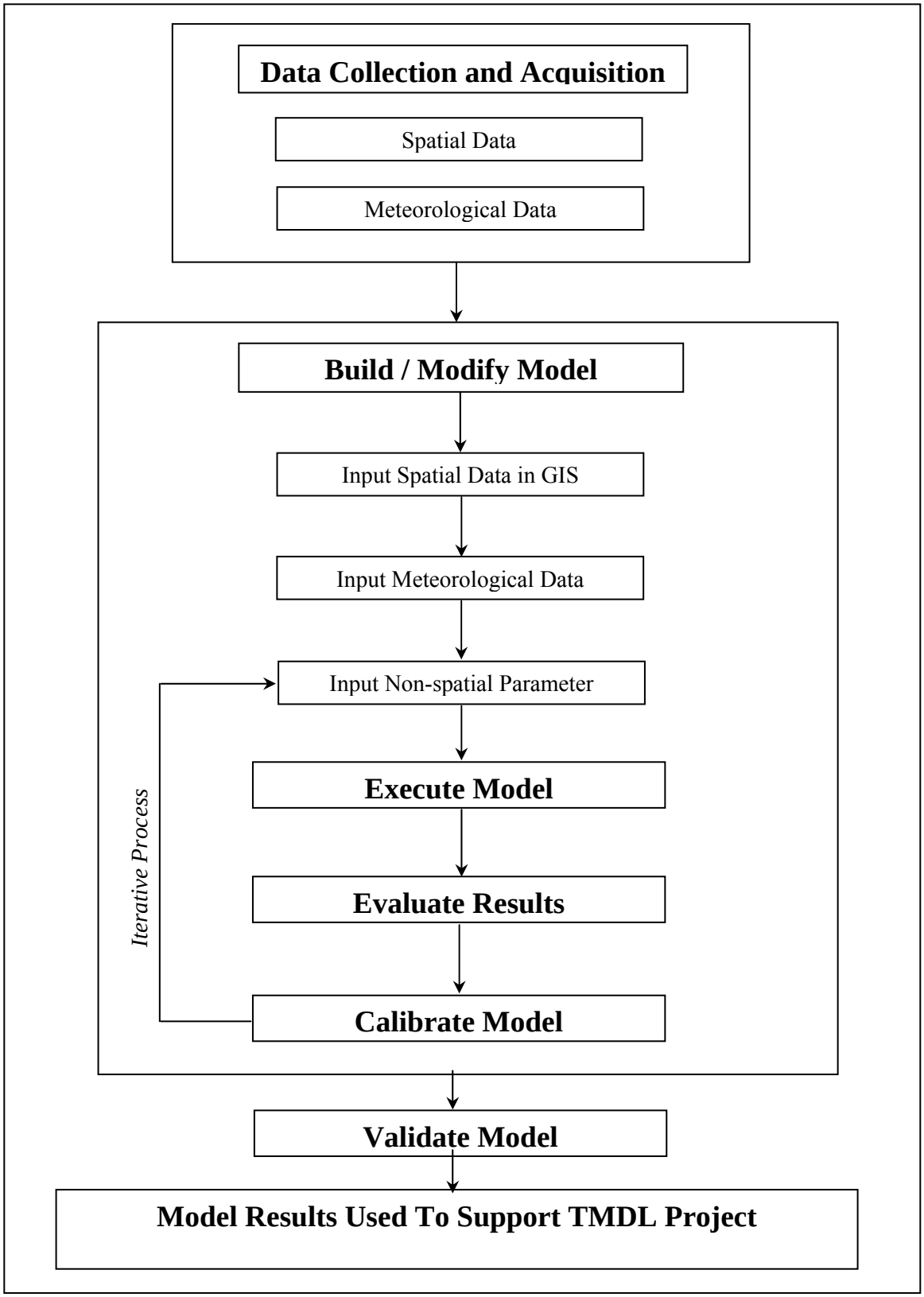

Figure 9. Overview of the methodology used.

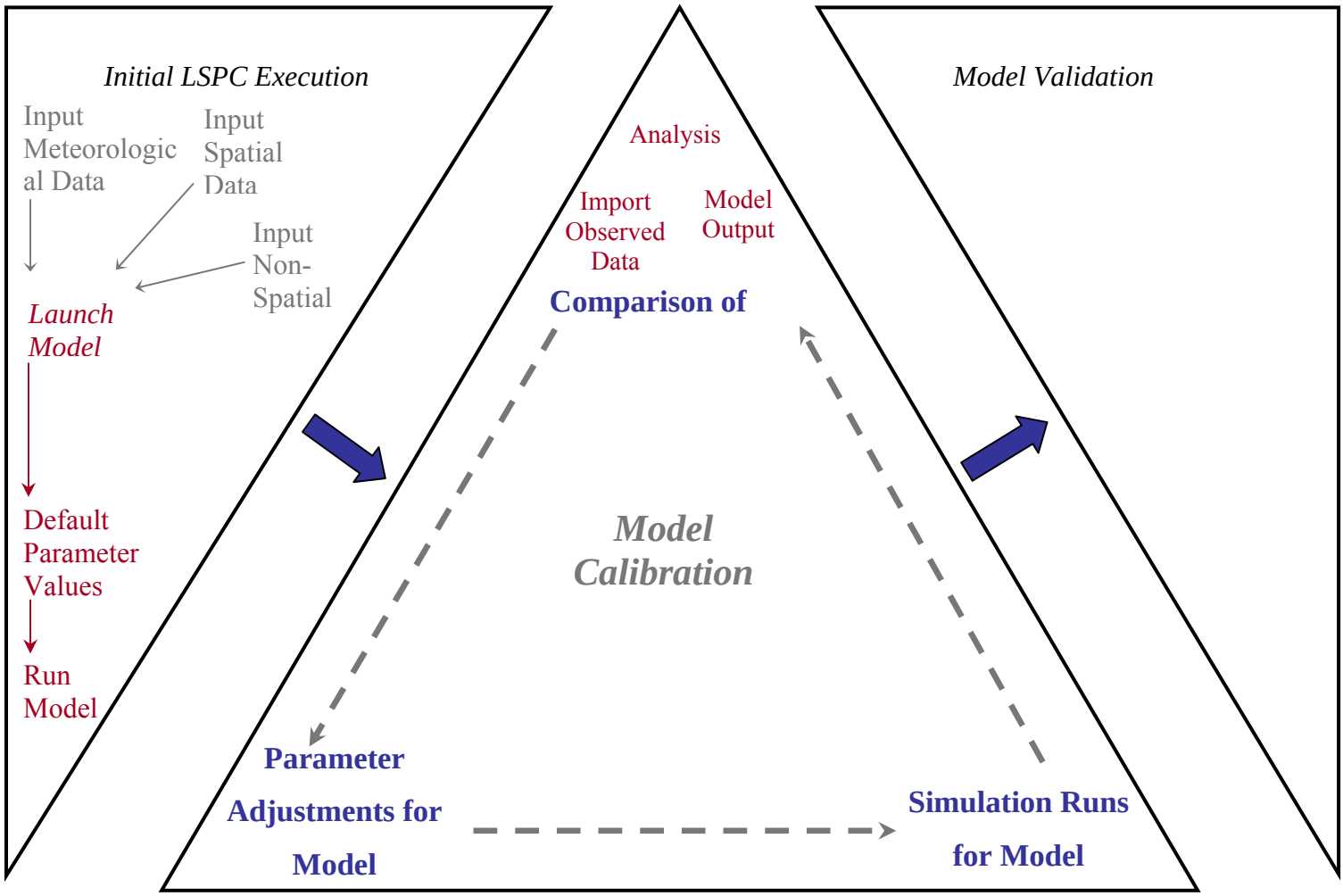

Figure 10. Hydrologic Simulation Program – Fortran (HSPF) modeling process

4.2. Wet Weather Model Details

Configuration of the watershed model involved consideration of four major components: water body representation, land use representation, meteorological data, hydrologic, and pollutant representation. These components provided the basis for the model's ability to estimate flow and pollutant loadings. Water body representation refers to LSPC modules or algorithms used to simulate flow and pollutant transport through streams and rivers. The land use representation provides the basis for distributing soils and pollutant loading characteristics throughout the basin. In addition to these components, meteorological data, hydrological representation and pollutants representation is very important. Meteorological data essentially drive the watershed model. Rainfall and other parameters are key inputs to LSPC's hydrologic algorithms. Hydrologic and pollutant representation refers to the LSPC modules or algorithms used to simulate hydrologic processes (e.g., surface runoff, evapotranspiration, and infiltration) and pollutant loading processes (primarily accumulation and wash-off). This section describes more of the specific details that were used in modeling the Chollas Creek watershed.

4.2.1. Wet Weather Model Water Body Representation

Each delineated subwatershed was represented with a single stream assumed to be completely mixed, one-dimensional segments with a trapezoidal cross-section. The National Hydrography Dataset (NHD) stream reach network for USGS hydrologic units 18070301 through 18070305 were used to determine the representative stream reach for each subwatershed. The Chollas Creek watershed is in the 18070304 USGS hydrologic unit.

Once the representative reach was identified, slopes were estimated based on digital elevation models (DEM) data and stream lengths measured from the original NHD stream coverage. In addition to stream slope and length, mean depths and channel widths are required to route flow and pollutants through the hydrologically connected subwatersheds. Mean stream depth and channel width were estimated using regression curves that relate upstream drainage area to stream dimensions. An estimated Manning's roughness coefficient of 0.2 was also applied to each representative stream reach.

4.2.2. Wet Weather Model Watershed Segmentation

As mentioned in section 3.1.1, the initial step in any watershed-based analysis is to clearly define the watershed boundary. A watershed is defined as a drainage basin, or an area of land in which all waters drain to a single river system (Heathcote, 1998). Watershed segmentation refers to the subdivision of watersheds into smaller, discrete subwatersheds for modeling and analysis. This subdivision was primarily based on the stream networks and topographic variability, and secondarily on the locations of flow and water quality monitoring stations, consistency of hydrologic factors, land use consistency, and existing watershed boundaries (based on CALWTR 2.2 watershed boundaries).

For this current model application, the Chollas Creek watershed was divided into thirty-seven separate sub-basins (Figure 11). These subwatersheds were based on the stream network and topographic data and were further delineated to each station where wet weather metal concentration data was collected. Delineation to the water quality stations allows for direct

comparison between model output and observed water quality data in order to evaluate what subwatersheds were sources of metal loads to The Chollas Creek watershed.

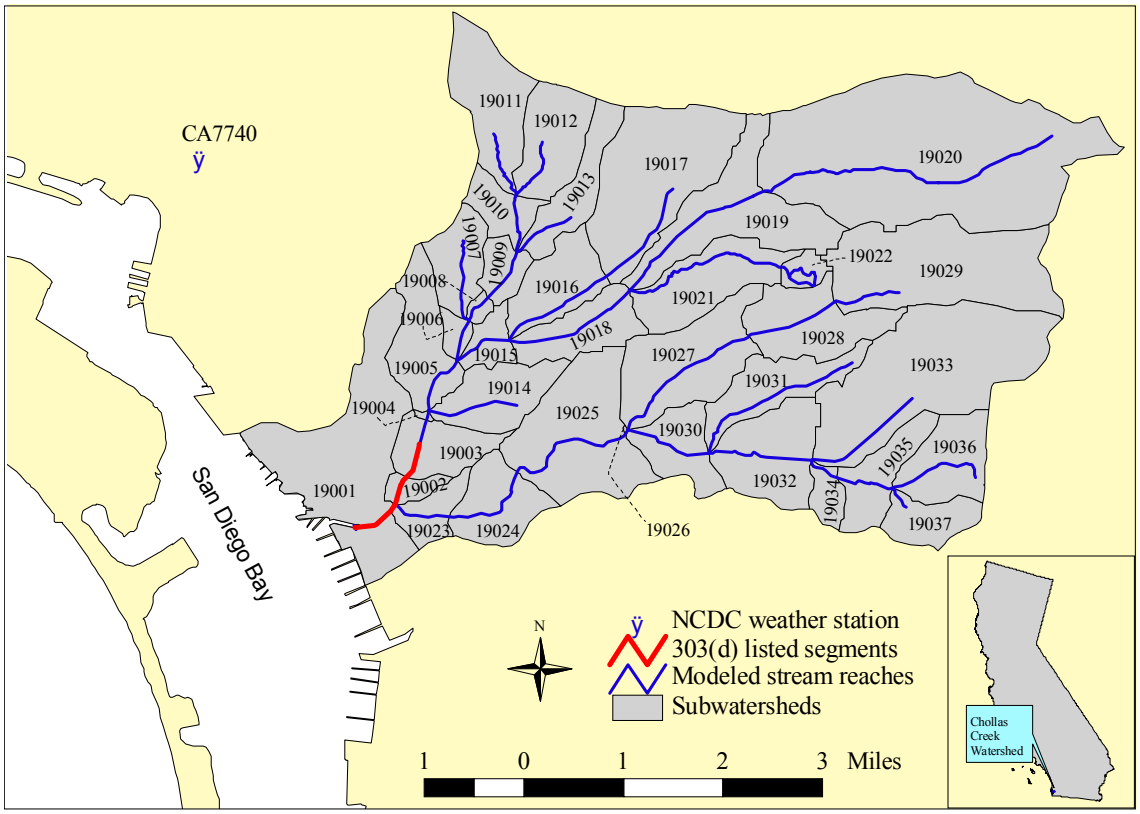

Figure 11. The Chollas Creek watershed. The numbers refer to the segment identifications used in the models.

The Chollas Creek watershed boundary was based primarily on the Cal Water GIS coverage. The only exception is the western-northwestern border. This border was refined from the Cal Water boundary based on the shape file provided by the Regional Board. This border was further refined using the topography lines on the USGS quadrangle maps. See Figure 12 for an illustration of the final watershed boundary, the Regional Board boundary, and the Cal Water boundary. The three boundaries overlap around the entire watershed except for the western-northwestern edge.

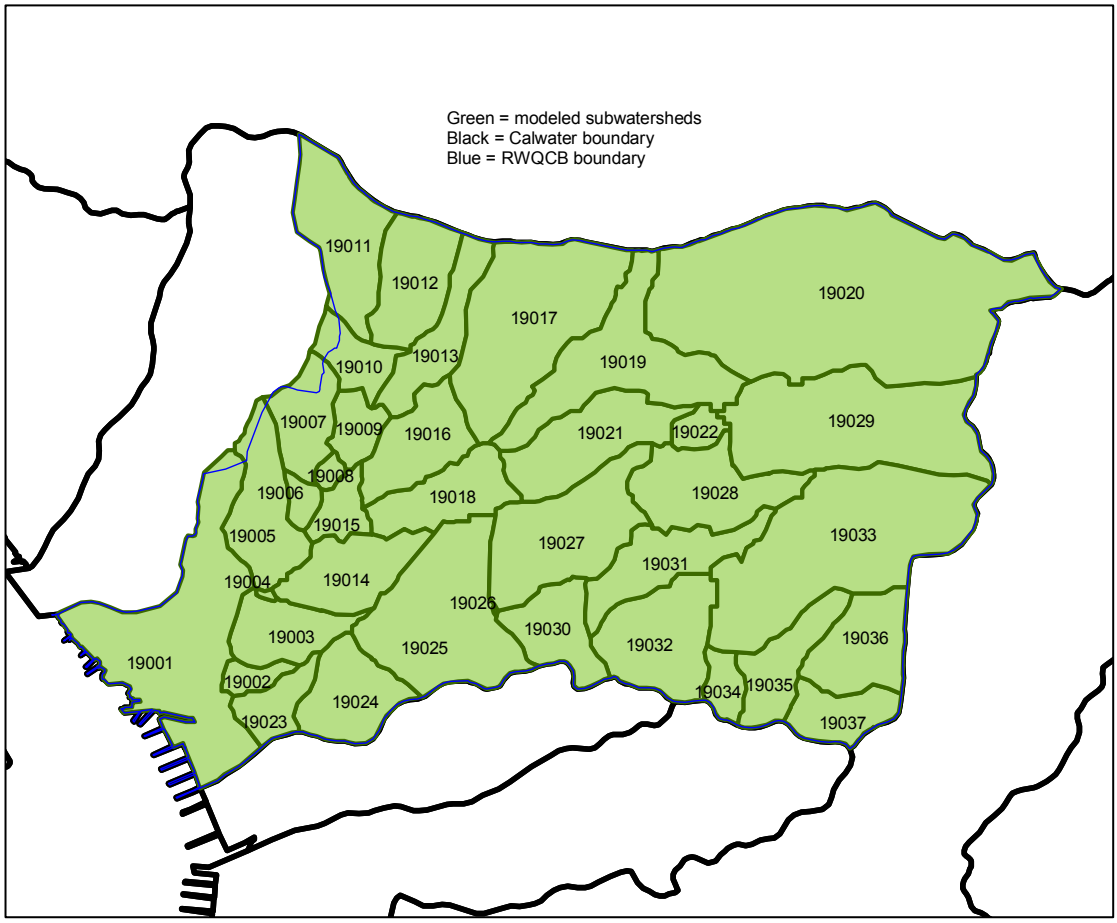

Figure 12. Three boundaries comprising the watershed boundary for Chollas Creek with model segment identification numbers.

4.2.3. Wet Weather Model Land Use Representation

The watershed model requires a basis for distributing hydrologic and pollutant loading parameters. This is necessary to appropriately represent hydrologic variability throughout the basin, which is influenced by land surface and subsurface characteristics. Representing variability in pollutant loading, which is highly correlated to land practices, also is necessary. The basis for this distribution was provided by land use coverage of the entire modeled area.

Three sources of land use data were used in the San Diego regional hydrologic model modeling effort. The primary source of data was the SANDAG 2000 land use dataset that covers San Diego County. This dataset was supplemented with land use data from the Southern California Association of Governments (SCAG) for Orange County and portions of Riverside County. A small area in Riverside County was not covered by either land use dataset. To obtain complete coverage, the 1993 USGS Multi-Resolution Land Characteristic data were used to fill this remaining data gap.

Although the multiple categories in the land use coverage provide much detail regarding spatial representation of land practices in the watershed, such resolution is unnecessary for watershed modeling if many of the categories share hydrologic or pollutant loading characteristics. Therefore, many land use categories were grouped into similar classifications, resulting in a subset of 13 categories for the San Diego region (Tetra Tech, 2004).

For the current modeling effort, land use reclassification was also performed. SANDAG was the only source necessary for land use data in the Chollas Creek watershed. The original SANDAG land uses were grouped into categories that share hydrologic and metal loading characteristics. For example, many urban categories were represented independently (e.g., high density residential, low density residential, industrial, and commercial/ institutional) because they have different levels of impervious cover and their associated metal-contributing practices (and thus, accumulation rates) vary. During the reclassification process, land uses were kept hydrologically consistent with the land use classifications for the San Diego regional hydrologic model so that the regionally calibrated land use-specific hydrology parameters could be applied to the current modeling effort. Appendix E provides descriptions of the land uses used and the areas associated with each land use grouping for the Chollas Creek Metals TMDL project.

LSPC algorithms require that land use categories be divided into separate pervious and impervious land units for modeling. This division was made for the appropriate land uses (primarily urban) to represent impervious and pervious areas separately. The division was based on typical impervious percentages associated with different land use types from the Soil Conservation Service's TR-55 Manual (Soil Conservation Service, 1986).

In addition, soil data were obtained from the U.S. Department of Agriculture (USDA) Natural Resources Conservation Services State Soil Geographic (STATSGO) database. Topographic data, or DEM, were obtained from USEPA's Better Assessment Science Integrating Point and Nonpoint Sources (BASINS) system (USEPA, 1998).

4.2.4. Wet Weather Model Meteorology

Meteorological data are a critical component of the watershed model. LSPC requires appropriate representation of precipitation and potential evapotranspiration. In general, hourly precipitation (or finer resolution) data are recommended for nonpoint source modeling. Therefore, only weather stations with hourly-recorded data were considered in the precipitation data selection process. Storm water runoff processes for each subwatershed were driven by precipitation data from the most representative station. These data provide necessary input to LSPC algorithms for hydrologic and water quality representation.

Meteorological data were accessed from a number of sources in an effort to develop the most representative dataset for the San Diego region. Hourly rainfall data were obtained from the National Climatic Data Center (NCDC) of the National Oceanic and Atmospheric Administration (NOAA), the Automatic Local Evaluation in Real Time (ALERT) Flood Warning System managed by the County of San Diego, and the California Irrigation Management Information System (CIMIS). The above data were reviewed based on geographic location, period of record, and missing data to determine the most appropriate meteorological stations. Ultimately, meteorological data were utilized from 16 area weather stations for January 1990 to September 2002 (Figure 13) for the San Diego regional hydrologic model. The spatial variability captured by these weather stations greatly enhanced the hydrology calibration and validation and development of the regionally calibrated parameters, which were utilized for the Chollas Creek Metals TMDL project.

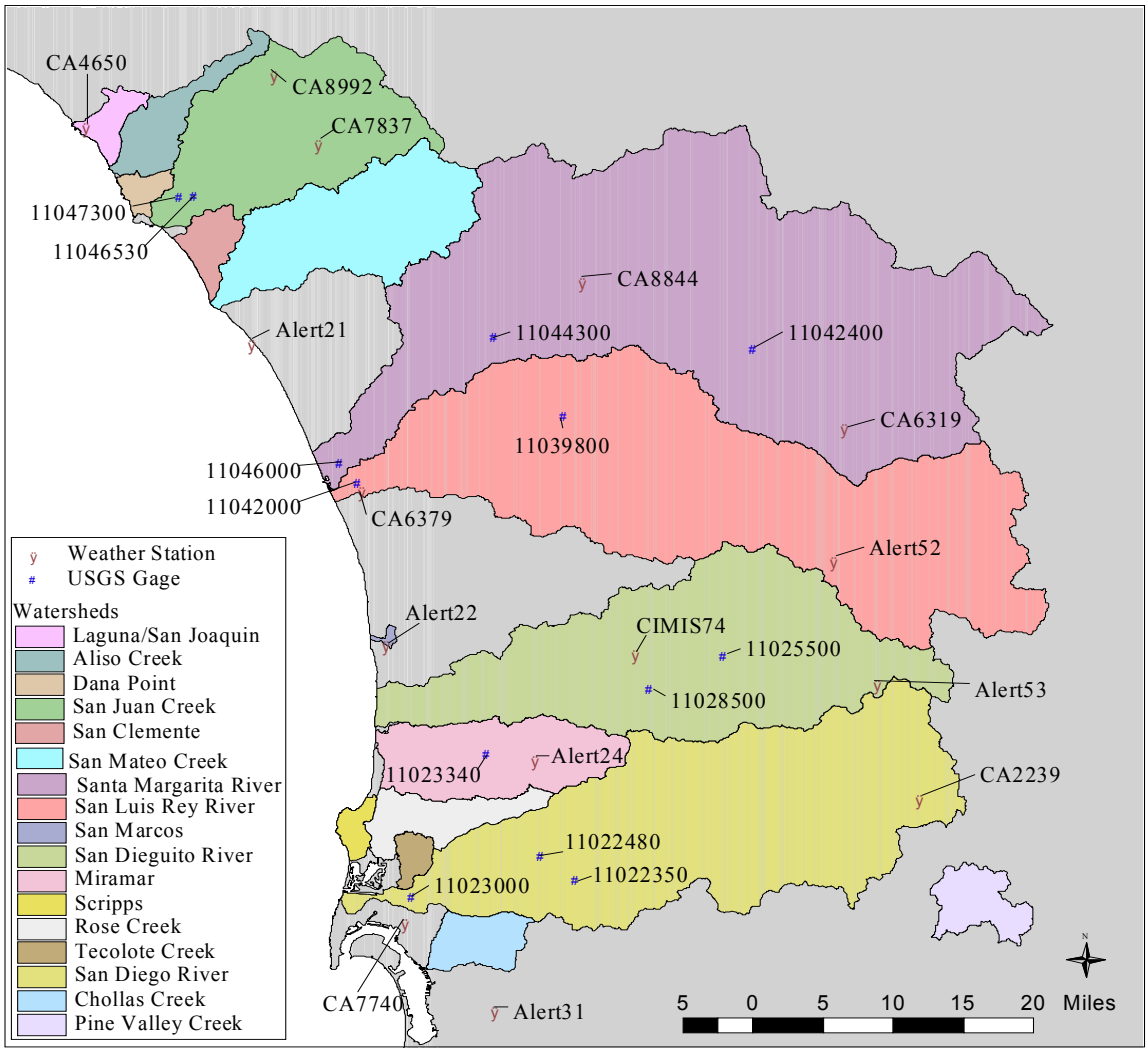

Figure 13. Weather stations and flow gages utilized for the San Diego regional hydrological model.[4]

Long-term hourly wind speed, cloud cover, temperature, and dew point data are available for a number of weather stations in the San Diego region. Data from San Diego Airport, Lindbergh Field, (#CA7740 on Figure 13) were obtained from NCDC for characterization of meteorology of the modeled watersheds. Using these data, the METCMP (Computation of Meterological Time Series) utility, available from USGS, was employed to estimate hourly potential evapotranspiration.

Lindbergh Field is the most representative weather station for the Chollas Creek watershed with hourly data. In order to utilize the most current data possible for the Chollas Creek Metals TMDL project, the period of record for Lindbergh Field meteorological data was extended through 2003.

[4] Table 5 gives more information on data collected at each station.

4.2.5. Wet Weather Model Hydrology Representation
Generally, LSPC hydrologic simulations combine the observed meteorological data and the physical characteristics of the watershed. Surface runoff in a watershed was simulated in four components: surface runoff from impervious surfaces, surface runoff from pervious surfaces, interflow from pervious areas, and groundwater flow (Donigian et al., 1984). Parameter values within LSPC represented different characteristics of these components.

Here, the LSPC PWATER (water simulation for pervious land segments) and IWATER (water simulation for impervious land segments) modules, which are identical to those in HSPF, were used to represent hydrology for all pervious and impervious land units (Bicknell et al., 1996). Designation of key hydrologic parameters in the PWATER and IWATER modules of LSPC were required. As discussed previously, in order to satisfy this requirement, the regionally calibrated hydrologic parameter values from the San Diego regional hydrologic model were used. Model calibration and validation of the San Diego regional hydrologic model is discussed the next section, thus describing the applicability of these parameter values to the Chollas Creek watershed.

In some watersheds, in addition to the streams which route flow and transport pollutants through the watersheds, there are several reservoirs that are large enough to impound a significant portion of flow during wet weather periods. There is one small reservoir in the Chollas Creek watershed; however, it drains an extremely small land area and is not hydrologically connected to the main stream network in the watershed. Therefore, the Chollas Reservoir was not simulated as an impoundment in the LSPC model.

4.2.6. Wet Weather Model Metals Water Quality Representation
For the San Diego regional hydrologic modeling efforts, six major inland dischargers were incorporated into the LSPC model as point sources of flow and bacteria concentration. Each point source was located in the Santa Margarita River watershed – five at Camp Pendleton and one along Murrieta Creek (Santa Rosa Water Reclamation Facility). Although the Santa Margarita River watershed had no waterbodies impaired from bacteria loads, it was simulated in the wet weather model due to the availability of flow rates and bacteria concentration monitoring data, which were used for hydrologic and water quality calibration and validation. There are no inland dischargers impacting flow in the Chollas Creek watershed. However, discussion of the facilities in the Santa Margarita River Watershed is important because they were incorporated into the flow model calibration and validation for the San Diego regional hydrologic model, which was utilized during this current LPSC application.

Loading processes for copper, lead, and zinc loads were represented for each land unit using the LSPC PQUAL (simulation of quality constituents for pervious land segments) and IQUAL (simulation of quality constituents for impervious land segments) modules, which are identical to those in HSPF. These modules simulate the accumulation of pollutants during dry periods and the wash-off of pollutants during storm events. Starting values for parameters relating to land use-specific accumulation rates and buildup limits, were derived from 1997 through 1999 storm water program data from the County of Los Angeles (LACDPW, 1998, 1999). These starting values served as baseline conditions for water quality calibration. Although atmospheric deposition may be an issue in the watersheds, it

was not explicitly simulated in the watershed model. It was, however, represented implicitly in the model through use of the land use- and pollutant-specific accumulation rates.

4.3. Wet Weather Model Calibration and Validation

As described above, model calibration is an iterative process, because it involves the adjustment or fine-tuning of modeling parameters to reproduce observations. After modifying individual parameters, a new simulation was performed for different LSPC modules, at multiple locations throughout the San Diego region, and for the same time periods. The resultant simulated and observed stream flows were then compared. This process was repeated until the best agreement between the modeled and observed flows was achieved. This method provides the most accurate prediction possible for the hydrologic functions by ensuring that heterogeneities were represented.

Subsequently, model validation was performed to test the calibrated parameters at different locations or for different time periods, without further adjustment. Model validation consisted of re-running the model for a different date range using the same parameter values as the calibrated model. The results of this simulation were then compared to applicable observed data. This process performs a similar function to that of a control test subject, in which the model validation results indicate if selected parameter values are representative of the hydrologic functions of the watershed over time. If model validation indicates that the model results are not representative of the watershed over a certain time period, model calibration may be repeated or the model user may evaluate the watershed-specific functions responsible for the differences.

4.3.1. General Hydrologic Calibration and Validation for Wet Weather Conditions

Hydrology is the first model component calibrated because estimation of pollutant loading relies heavily on flow prediction. The hydrology calibration involves a comparison of model results to in-stream flow observations at selected locations. After comparing the results, key hydrologic parameters were adjusted and additional model simulations were performed. This iterative process was repeated until the simulated results closely represented the system and reproduced observed flow patterns and magnitudes. The last step is to validate the hydrologic model output with observed flow data.

The first step in hydrologic calibration is to establish an annual water balance between modeled and actual flow rates. The following water balance can estimate surface runoff: precipitation minus actual evapotranspiration, deep percolation, and change in soil moisture. Parameters in the PWATER and IWATER sub-modules had the greatest impact on these hydrologic functions. Specifically, LZSN, INFILT, LZETP, and DEEPFR were the key parameters that govern the water balance. (Figure 14)

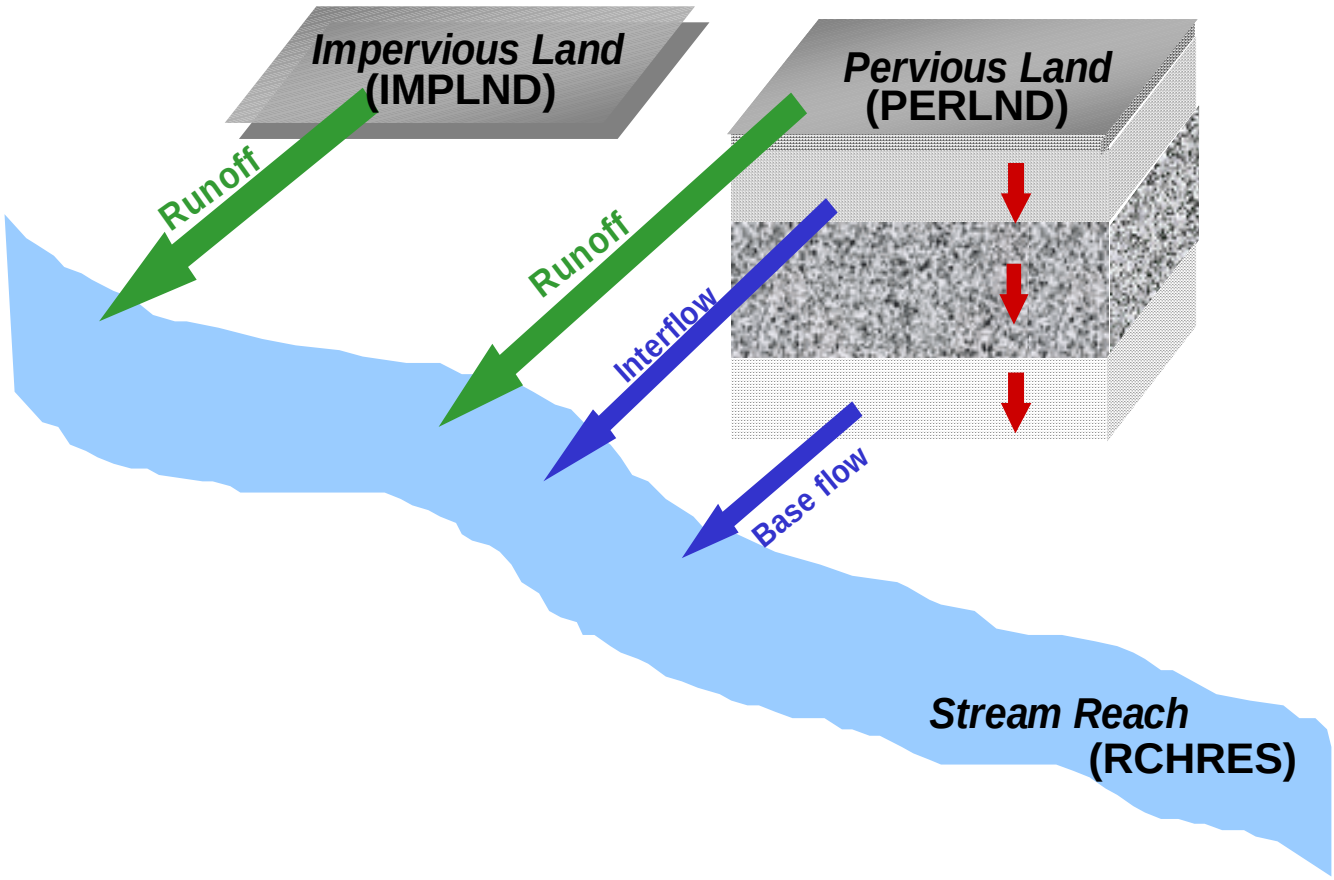

Figure 14. Physical representation of the three LSPC modules (USEPA, 1998).

The LZSN parameter is the lower zone nominal soil moisture storage. It is related to the precipitation patterns and soil characteristics in the subwatershed. Specifically, increasing LZSN will increase actual evapotranspiration, thus decreasing annual surface runoff (USEPA, 2000). The index to mean soil infiltration rate is represented by INFILT. This parameter controls the overall distribution of the available moisture from precipitation that has been intercepted into the ground. This parameter is usually utilized to represent seasonal surface runoff distributions. Increasing the value of INFILT will ultimately decrease surface runoff since it increases the transfer of water to the lower zone and groundwater. The LZETP parameter is a coefficient that represents the lower zone evapotranspiration and as values of LZETP increase, evapotranspiration increases thereby decreasing annual surface runoff. The last key parameter to effect annual water balance is DEEPFR, or the fraction of infiltrating water lost to inactive groundwater. Decreasing DEEPFR results in higher base flow and an increase in annual water balance (Donigian et al., 1984).

Subsequent to establishing an annual water balance, hydrographs for selected storm events can be adjusted to better agree with observed values. There are a variety of parameters that can be altered to effectively calibrate such hydrographs. However, continuous flow data over individual storms are necessary to create the desired hydrographs. These data were not available for The Chollas Creek watershed; therefore, stream flow calibration was limited to the annual water balance.

In addition to hydrologic calibration of the surface water, performed by adjusting parameters in the PWATER and IWATER sub-modules, hydraulic calibration was conducted using the RCHRES sub-module. The overall flows simulated in the RCHRES sub-module are a result of the overland hydrology from pervious and impervious lands and the stream characteristics contained in the hydrologic function tables (Donigian et al., 1984).

The rest of this discussion is divided into two sections: one on regional hydrological simulations and one on the application of these regional hydrology simulations to the Chollas Creek watershed. The hydrology simulations conducted for the San Diego region resulted in a regionally calibrated set of parameter values. These parameters were applied to the Chollas Creek watershed in order to make flow predictions.

4.3.2. Wet Weather Model Use of the San Diego Region Hydrologic Model

Gaging stations representing diverse hydrologic regions of the San Diego region were used for calibration, including eleven USGS flow gage stations (Table 5 and Figure 13). These gaging stations were selected because they either had a robust historical record or they were in a strategic location (i.e. along a listed water quality limited segment, downstream of a reservoir, or along an otherwise unmonitored reach).

Table 5. USGS Stations Used For Hydrology Calibration and Validation

Station Number	Station Name	Historical Record	Selected Calibration Period	Selected Validation Period	Watershed and Model Subwatershed
11022480	San Diego River at Mast Road near Santee, CA	5/1/1912 - 9/30/2002	1/1/1991 - 12/31/1996	1/1/1997 - 12/31/2001	San Diego River (1805)
11023000	San Diego River at Fashion Valley at San Diego, CA	1/18/1982 - 9/30/2002	1/1/1991 - 12/31/1996	1/1/1997 - 12/31/2001	San Diego River (1801)
11023340	Los Penasquitos Creek near Poway, CA	10/1/1964 - 9/30/2002	1/1/1991 - 12/31/1996	1/1/1997 - 12/31/2001	Miramar (1406)
11025500	Santa Ysabel Creek near Ramona, CA	2/1/1912 - 9/30/2002	1/1/1991 - 12/31/1996	1/1/1997 - 12/31/2001	San Dieguito (1316)
11028500	Santa Maria Creek near Ramona, CA	12/1/1912 - 9/30/2002	1/1/1991 - 12/31/1996	1/1/1997 - 12/31/2001	San Dieguito (1324)
11042000	San Luis Rey River at Oceanside, CA	10/1/1912 - 11/10/1997; 4/29/1998 - 9/30/2002	9/1/1993 - 8/31/1997	5/1/1998 - 4/30/0202	San Luis Rey (702)
11042400	Temecula Creek near Aguanga, CA	8/1/1957 - 9/30/2002	1/1/1991 - 12/31/1996	1/1/1997 - 12/31/2001	Santa Margarita (658)
11044300	Santa Margarita River at FPUD Sump near Fallbrook, CA	10/1/1989 - 9/30/2002	1/1/1991 - 12/31/1996	1/1/1997 - 12/31/2001	Santa Margarita (615)
11046000	Santa Margarita River at Ysidora, CA	3/1/1923 - 2/25/1999; 10/1/2001 - 9/30/2002	1/1/1991 - 12/31/1995	1/1/1996 - 12/31/1998	Santa Margarita (602)
11046530	San Juan Creek at La Novia Street Bridge near San Juan Capistrano, CA	10/1/1985 - 9/30/2002	1/1/1991 - 12/31/1996	1/1/1997 - 12/31/2001	San Juan (411)
11047300	Arroyo Trabuco near San Juan Capistrano, CA	10/1/1970 - 9/30/1989; 10/1/1995 - 9/30/2002	10/1/1995 - 4/30/1999	5/1/1999 - 4/30/2002	San Juan (403)
11022350	Forester Creek near El Cajon, CA	10/1/1993 - 9/30/2002	none (insufficient period of record)	1/1/1991 - 9/30/1993	San Diego River (1843)
11039800	San Luis Rey River at Couser Canyon Bridge near Pala, CA	10/1/1986 - 1/4/1993	none (insufficient period of record)	1/1/1991 - 12/31/1992	San Luis Rey (711)

January 1991 through September 2002 was selected as the time period for the regional simulation.[5] The calibration years were selected based on annual precipitation variability and the availability of observation data to represent a continuum of hydrologic conditions: low,

[5] The range was expanded for the Chollas Creek metals TMDL (January 1991 through December 2003) because newer meteorological data was available at the time of simulation.

mean, and high flow. Calibration for these conditions was necessary to ensure that the model would accurately predict a range of conditions over a longer period of time.

Key considerations in the hydrology calibration included the overall water balance, the high-flow/low-flow distribution, storm-flows, and seasonal variation. At least two criteria for goodness of fit were used for calibration: graphical comparison and the relative error method. Graphical comparisons were extremely useful for judging the results of model calibration; time-variable plots of observed versus modeled flow provided insight into the model's representation of storm hydrographs, base flow recession, time distributions, and other pertinent factors often overlooked by statistical comparisons. The model's accuracy was primarily assessed through interpretation of the time-variable plots. The relative error method was used to support the goodness of fit evaluation through a quantitative comparison.

After calibrating hydrology at the eleven locations, a validation of these hydrologic parameters was made through a comparison of model output to different time periods at the same gages as well as two additional gages (Table 1). The validation essentially confirmed the applicability of the regional hydrologic parameters derived during the calibration process. Validation results were assessed similar to calibration: via graphical comparison and the relative error method.

Hydrology calibration and validation results, including time series plots and relative error tables, are presented for each gage in Appendix E of the draft TMDL report for bacteria impairment in the San Diego region (Tetra Tech, Inc., 2004). The calibration results, which are presented first, include graphs to represent overall model fit, seasonal trends, and two time series plots. A table that quantifies the model results and observed gage data follows these graphs. This table also provides relative errors between the modeled and observed values in the storm volumes and highest flows. The presentation of model validation results follows the calibration tables and graphs for each gage. Two additional gages that had a relatively less historical record were used as additional validation. Validation was assessed through a time series plot and a relative error table identical to the calibration table.

To ensure that the watershed delineation and land use reclassification processes performed for the Chollas Creek watershed did not significantly alter the predicted hydrology, the current model output was compared with the regional model output specifically for the Chollas Creek watershed. Although the Chollas Creek watershed does not have a stream gage collecting daily flow data, data were available for a series of storms (or for a period of time during a storm season) between 2001 and 2003.

4.3.3. Metal Concentration Calibration and Validation for the Chollas Creek Watershed
Once the stream flow was calibrated and validated, other hydrologically-dependent functions, including metal concentration, were simulated in order to calibrate the remaining model parameters. Regionally calibrated land use-specific accumulation and maximum build up rates for metals are not available in Southern California;[6] therefore, a more traditional water quality calibration and validation process was performed. In addition, observed water quality

[6] Ideally these rates would be available and could be used with water quality simulations to further validate their accuracy

data, unlike stream flow data, are usually not continuous; thus making time-series comparisons difficult and reducing the accuracy of the water quality model calibration.

The available wet weather metal concentration data (Appendix A) was separated into calibration and validation groups based on sampling stations. Station SD(8)-1 was used for calibration, because it had the most data (approximately 35 metal concentrations). Because the rest of the water quality monitoring stations had only three to five metal concentration data points, the remaining data were separated into two groups with similar spatial representation of land uses and of watersheds (Figure 15).

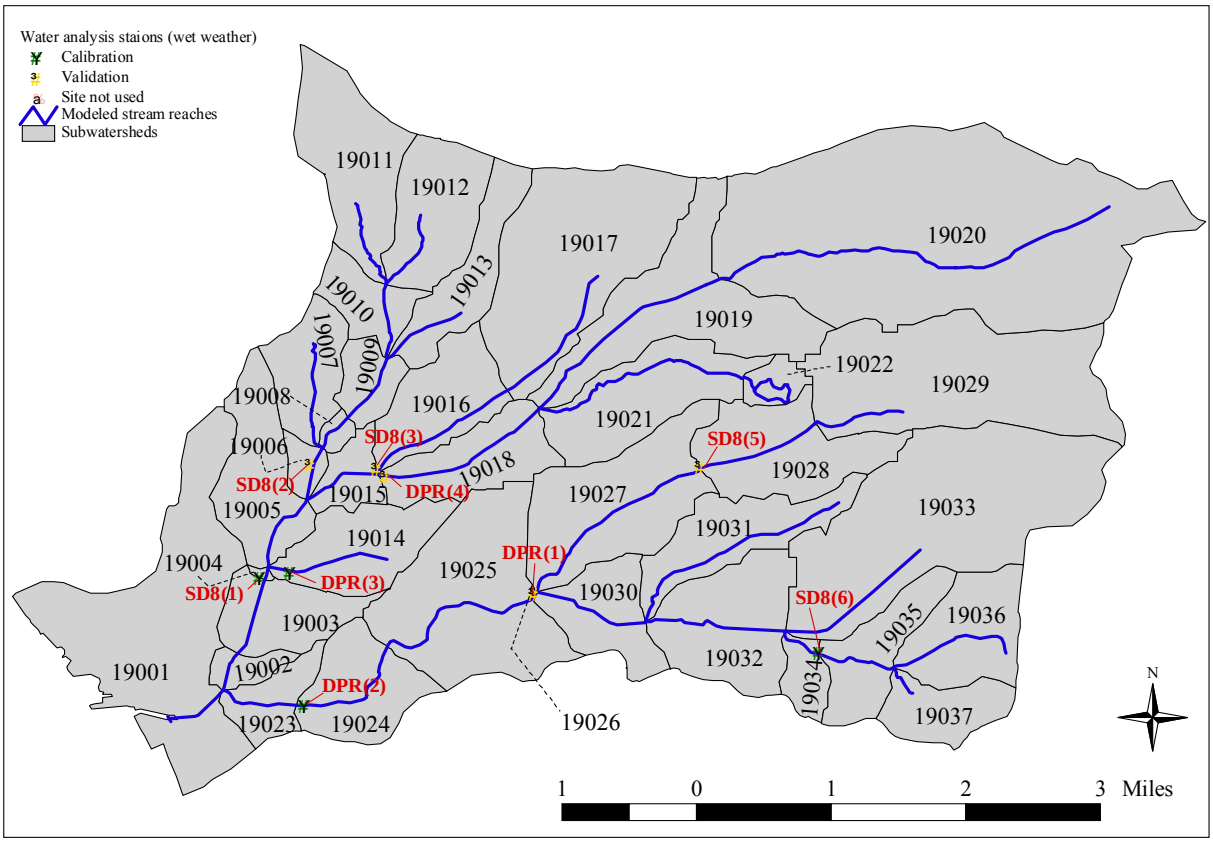

Figure 15. Map of monitoring locations used for model calibration and validation of the wet weather model.

After the appropriate calibration and validation groups were defined, the starting values for parameters relating to land use-specific accumulation rates (ACQOP) and buildup limits (SQOLIM) were defined. Their values were input for each stream reach and land use in the surrounding subwatershed. The ACQOP parameter is the daily pollutant accumulation rate. Based on this value, the concentration of a constituent accumulates until it reaches the maximum storage level, represented by SQOLIM. Additionally, the WSQOP[7] parameter is the rate of surface runoff that will remove 90 percent of the stored constituent per hour. This

[7] WQSOP is the rate of surface runoff that results in 90 percent wash off of fecal coliform bacteria in one hour (in/hr).

parameter, along with the modeled surface runoff, controls the overall pollutant loading to the stream (Bicknell, Imhoff, Kittle, Donigian, & Johanson, 1996). The initial accumulation rates used for this model were derived from land use specific metals data collected for the County of Los Angeles storm water program (LACDPW, 1998, 1999). Initial maximum build up rates were obtained from literature values (Butcher, 2003). These starting values served as initial conditions for water quality calibration.

Once model setup was complete, baseline simulations were performed. After entering the accumulation rate and wash-off data for each stream reach and its associated land uses, simulations were performed during time periods that overlapped the hydrology simulations. The modeled results were then compared with observed concentration data for copper, lead, and zinc. To assess model fit with available data, the time series model output was statistically and graphically compared to the observed data. Similar to the hydrology calibration process, the key parameter values (ACQOP and SQOLIM) were adjusted based on these differences and the simulations were performed again.

Once the water quality model calibration was complete, model validation was performed. This process is identical to the model validation procedures described above for hydrology validation. Namely, the model was run again using the calibrated parameter values for different monitoring locations. The results of this simulation were then compared to applicable observed metal concentration data to determine the predictive value of the model. Depending on the results of the water quality validation, the model can be considered complete, or model calibration may be repeated. (Figure 9)

4.4. Summary of Wet Weather Model Calibration and Validation

The observed flow hydrographs were on a sub-hourly time scale; however, the simulations were performed at an hourly timescale. For a comparison of the modeled and observed results, the data were summarized into average daily values and general statistical comparisons were made between the two sets of values (Appendix F). Because of the differences in time scale, the comparison is not entirely accurate.

4.4.1. Wet Weather Model Flow Rate Results

Overall, during calibration, the model predicted increased flow rates during dates when storm events had occurred. This is because the wet weather condition and surface runoff flow rate are dependent on rainfall. Occasional storms were over-predicted or under-predicted depending on the spatiality of the meteorologic and gage stations compared to the location of storms that did not cover the entire Chollas Creek watershed. The validation results also showed a good fit between modeled flow rates and observed flow rates, thus confirming the applicability of the calibrated hydrologic parameters to the San Diego region.

Minor differences were observed (the current model predicted flows approximately 8 percent higher than those from the San Diego regional hydrologic model) which resulted from the changes to the stream network and subwatershed boundaries in the current application. Specifically for the Chollas Creek Metals TMDL project, the total stream lengths increased while the total watershed area was nearly the same. This resulted in less opportunity for infiltration, because as water passed over the land surface it had to travel a shorter distance to

reach a stream than it did in the simulation initially ran for the San Diego region hydrologic model (i.e. overland flow was reduced). This small difference between the hydrology results was considered acceptable, especially when compared to the significant benefit of using the more detailed stream network for the Chollas Creek Metals TMDL project.

Figure 16 compares the predicted flow with these average daily observed flows. Model predictions generally fell within the range of observed data; however, some peaks were observed that were not predicted by the model. These differences are likely due to localized storms that impacted the Chollas Creek watershed, but were not detected at the modeled weather station, Lindbergh Field. In addition, the shortest time step simulated was one hour, while the observed data were on a five or fifteen minute time step. The model output and observed data were both summarized to obtain average daily flow for comparative purposes. Therefore, the storm hydrographs, including maximum storm peaks, are not represented in Figure 16. Because modeled and observed flow ranges are similar, the LSPC hydrology model flow rate results were considered representative of flow in the Chollas Creek watershed. Differences can be explained by localized events, and until additional flow data become available, further calibration is not possible, nor warranted.

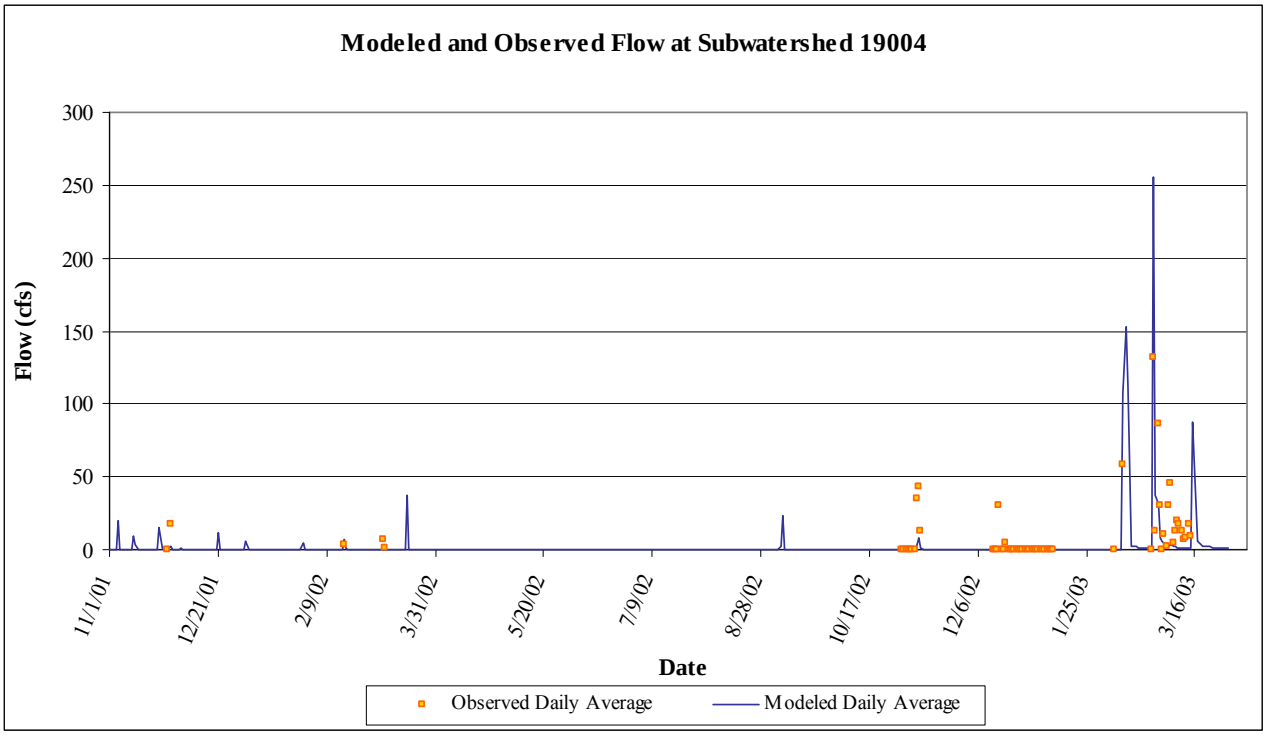

Figure 16. Modeled and observed flow at the Chollas Creek watershed Mass Loading Station

4.4.2. Wet Weather Model Metal Concentration Results

Figures 17, 19, 21, and 23 present time series graphs of modeled and observed data for the calibrated subwatersheds. Figures 18, 20, 22, and 24 are box plot graphs showing the minimum, mean, and maximum modeled values for the dates with corresponding observed data. These plots indicate that the model predicts copper, lead, and zinc concentrations well within the range of observed data and following similar patterns and magnitudes. This is

especially evident in subwatersheds where there are data across a wide temporal range (Figures 17 and 18).

Using the same parameter values, model simulations were performed for validation of the calibrated parameters. Figures 25 through 34 present time series graphs and box plots for the validation subwatersheds. These results confirm the previous conclusion that the model closely predicts the observed data for copper, lead, and zinc concentrations.

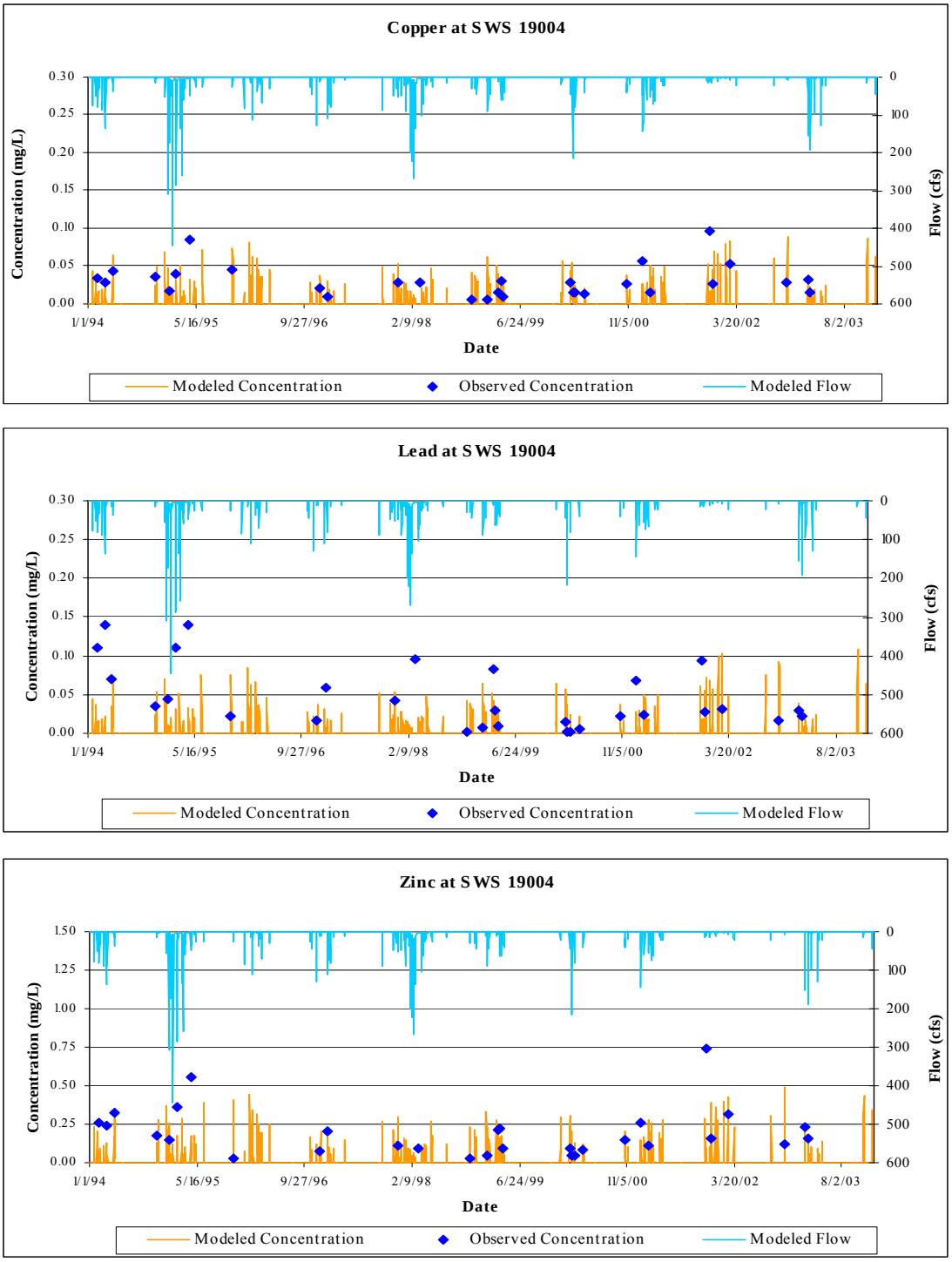

Figure 17. Time-series comparison of modeled and observed wet weather metals concentrations at sampling location SD8(1) (model calibration)

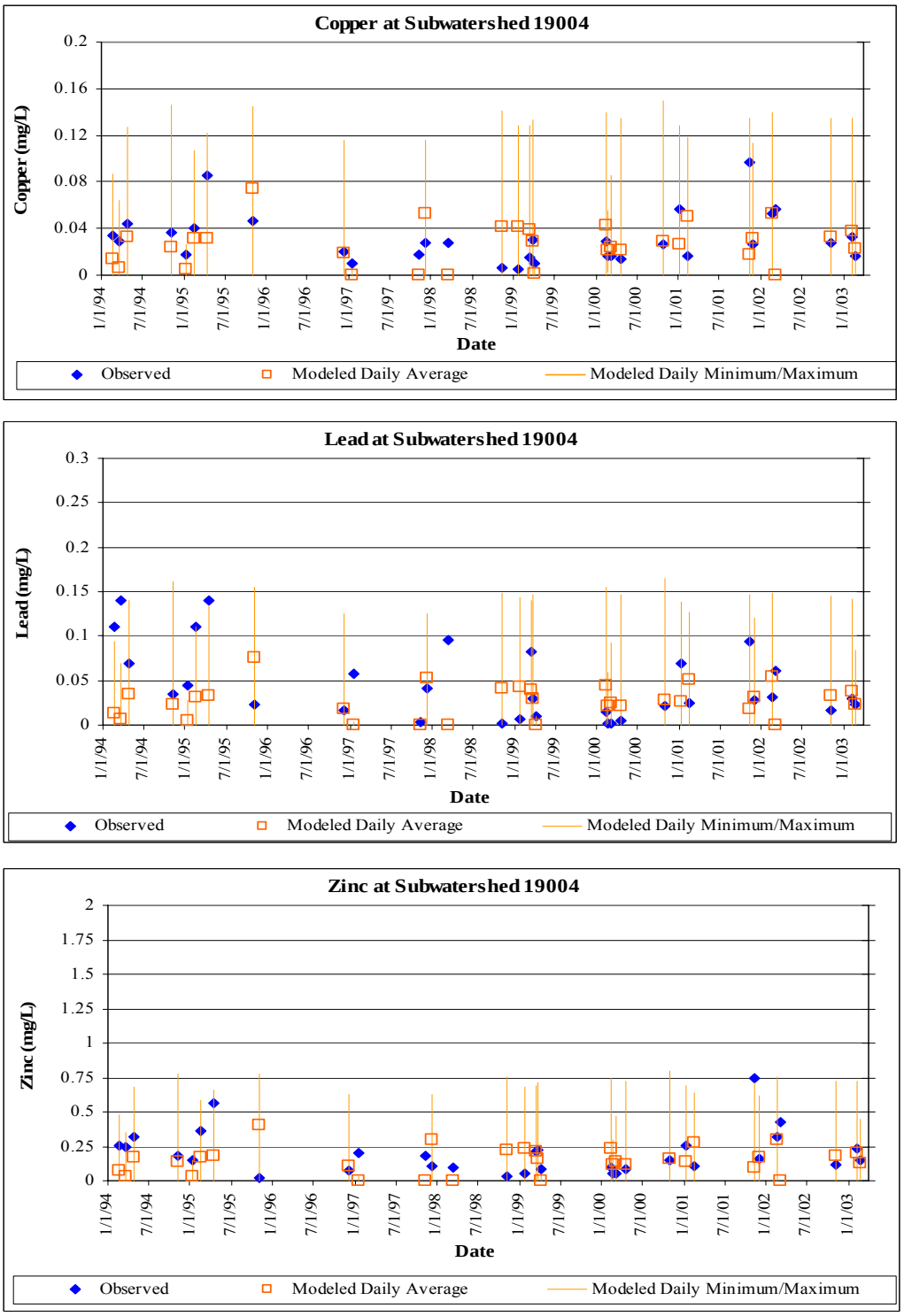

Figure 18. LSPC model results and corresponding observed metals data at sampling location SD8(1) (model calibration)

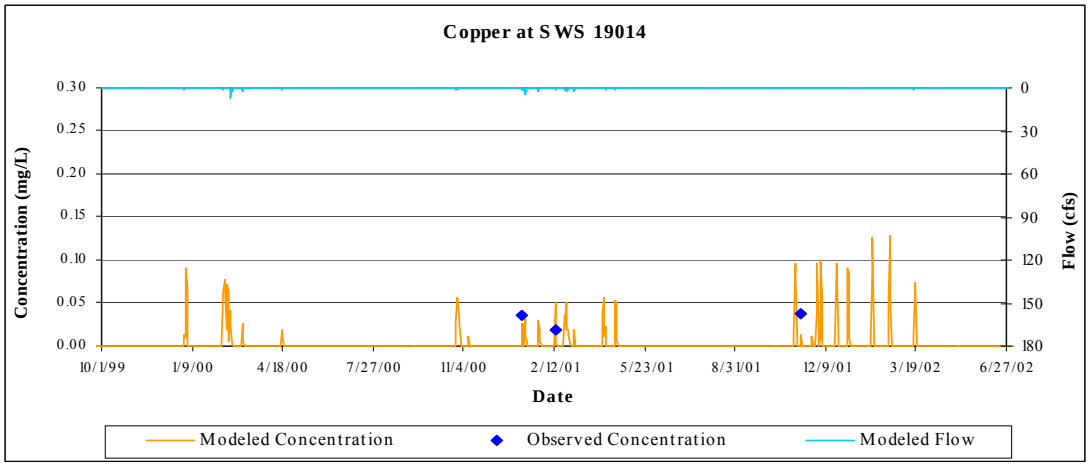

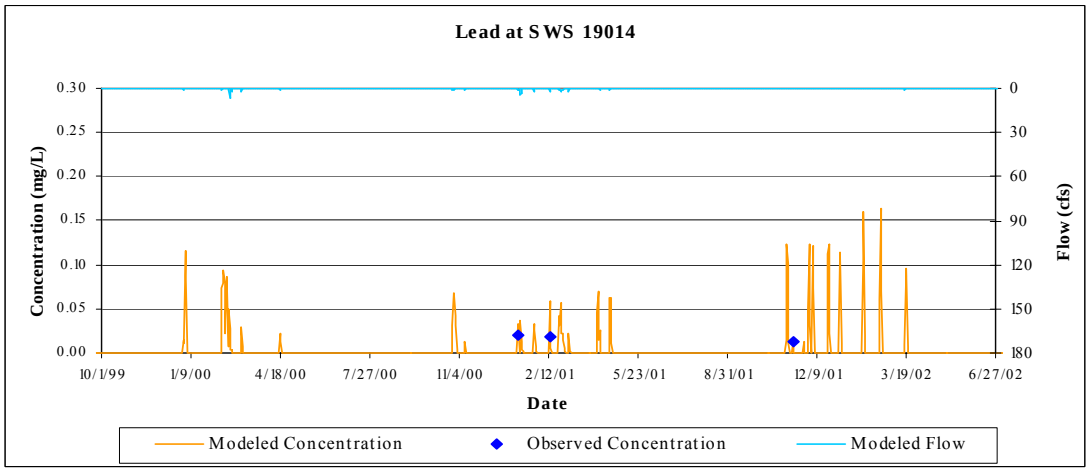

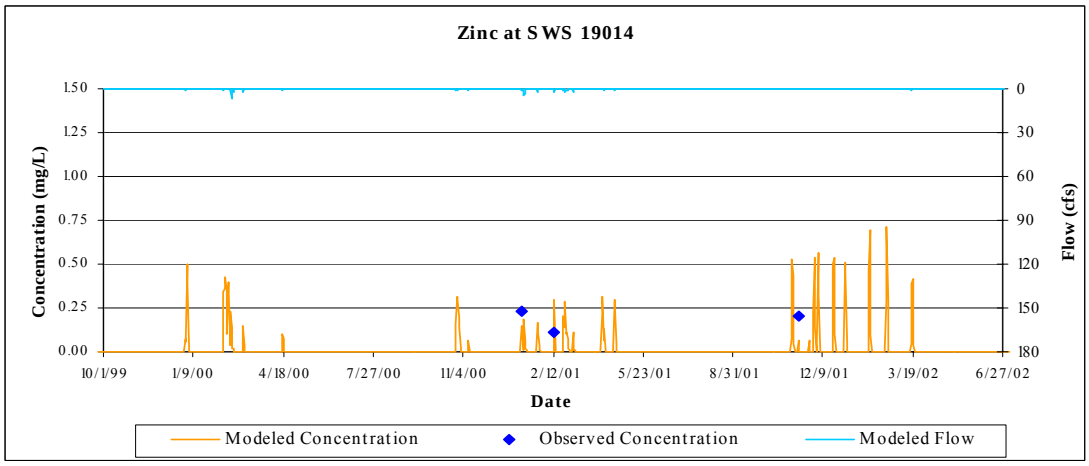

Figure 19. Time-series comparison of modeled and observed wet weather metals concentrations at sampling location DPR(3) (model calibration).

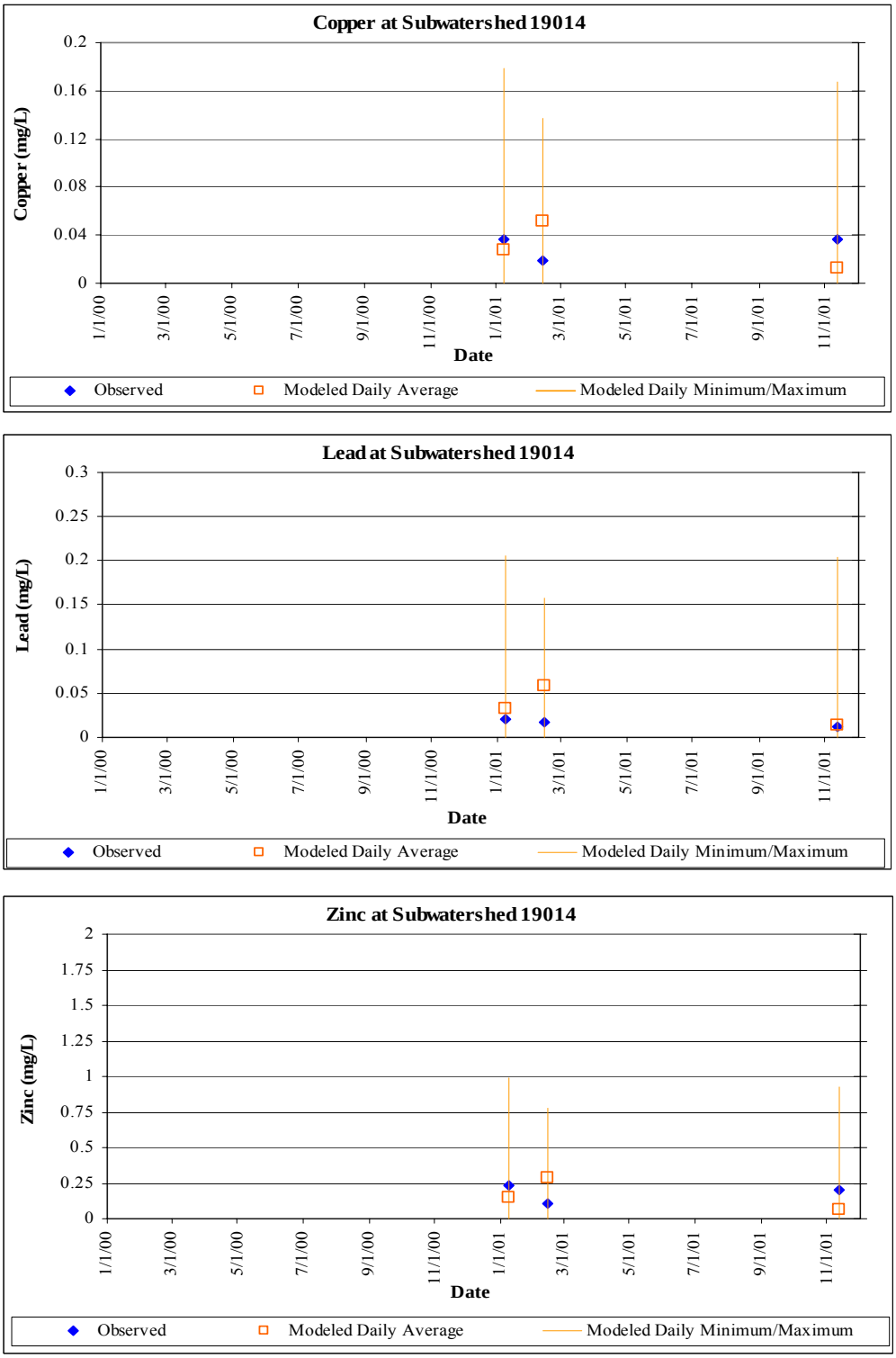

Figure 20. LSPC model results and corresponding observed metals data at sampling location DPR(3) (model calibration)

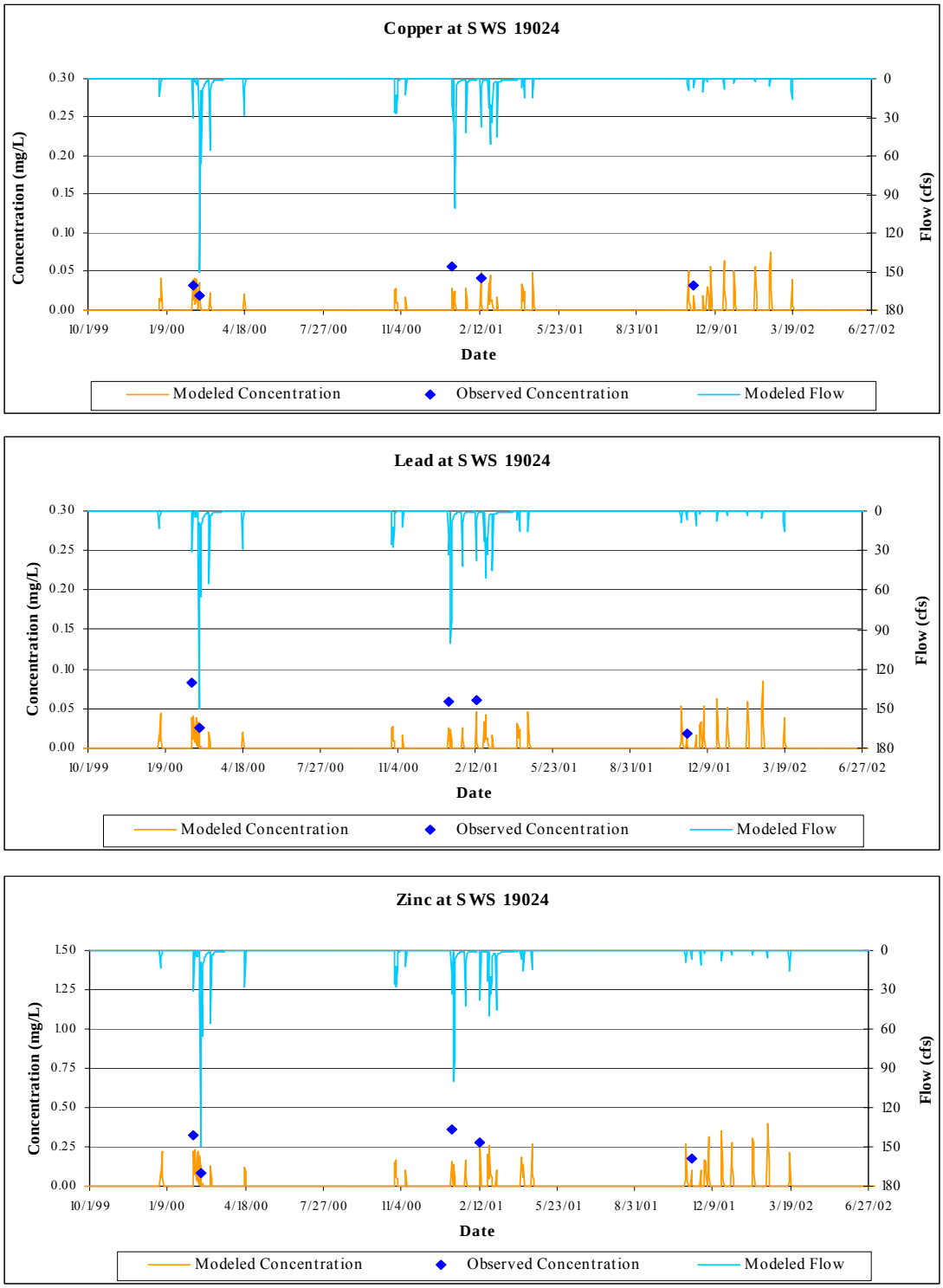

Figure 21. Time-series comparison of modeled and observed wet weather metals concentrations at sampling location DPR(2) (model calibration)

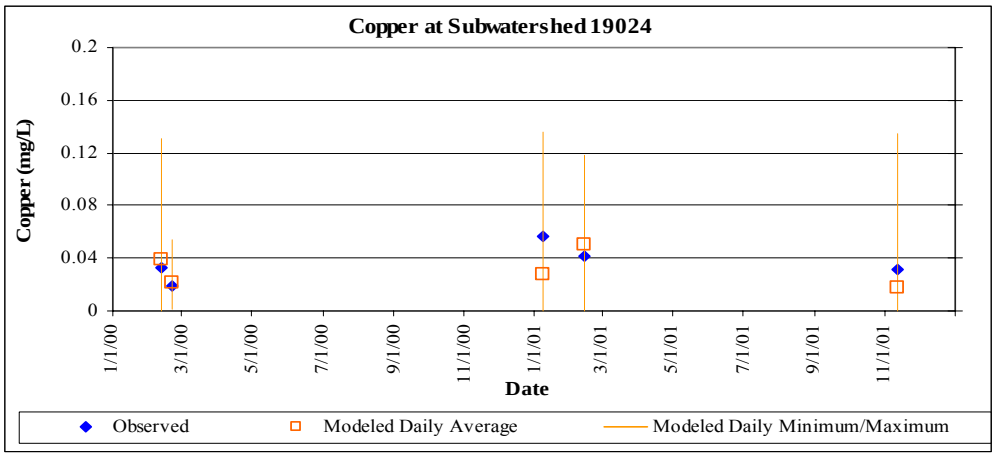

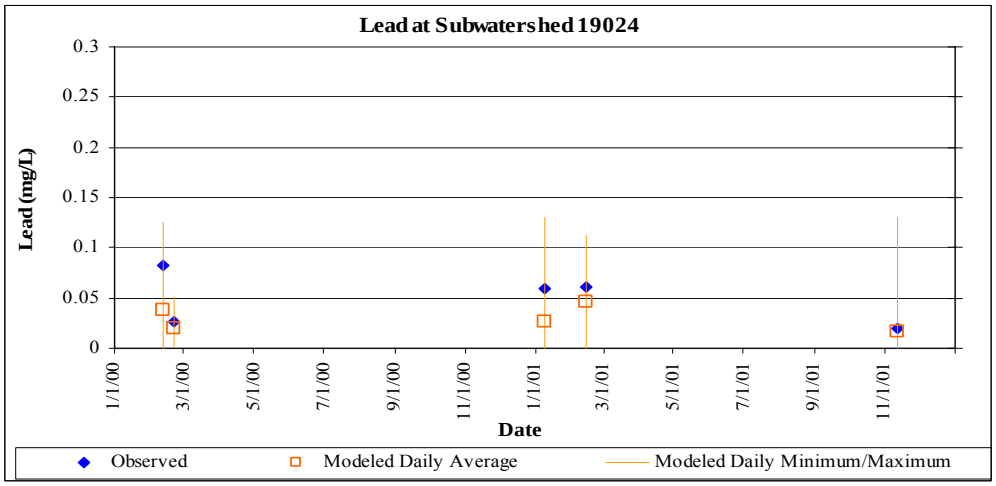

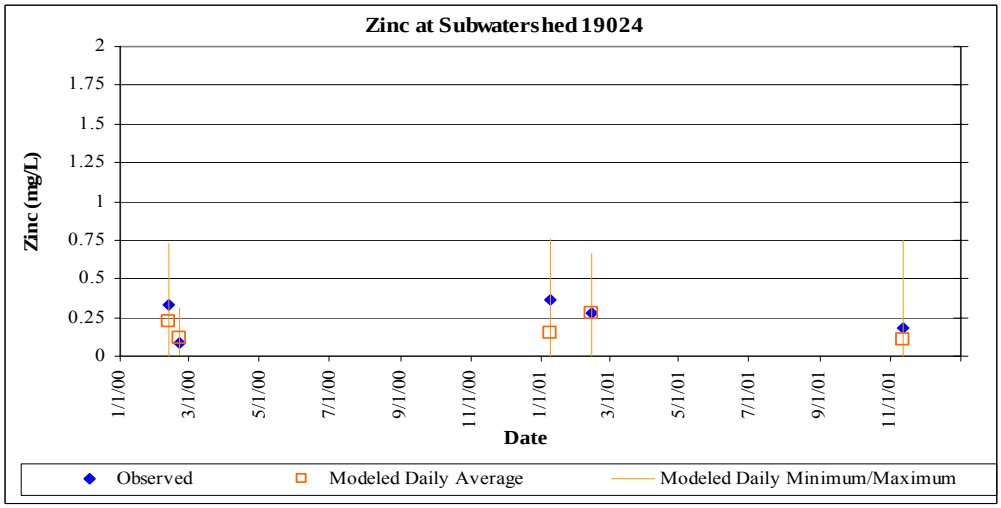

Figure 22. LSPC model results and corresponding observed metals data at sampling location DPR(2) (model calibration)

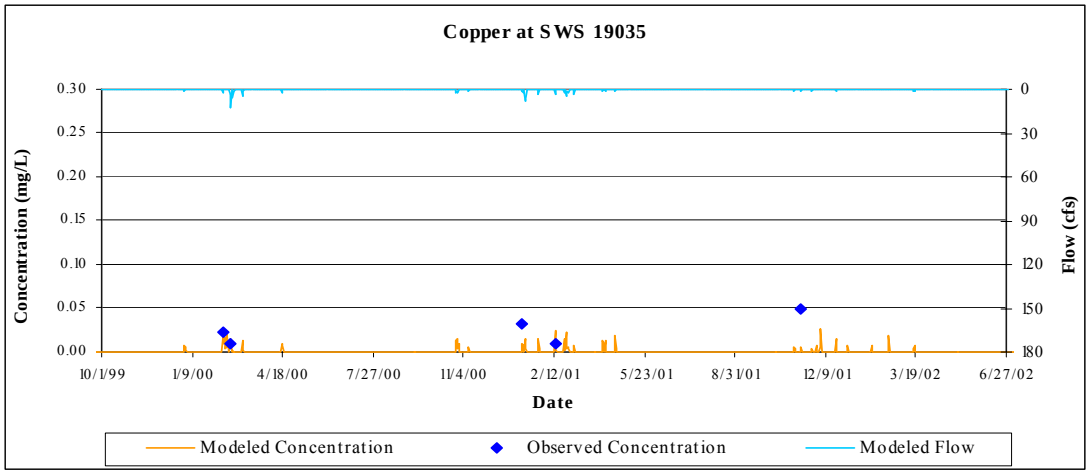

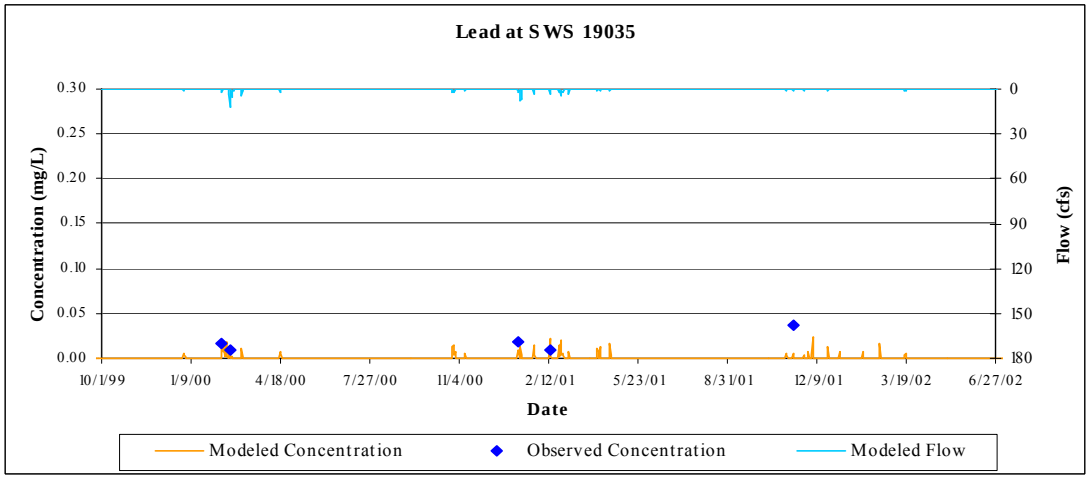

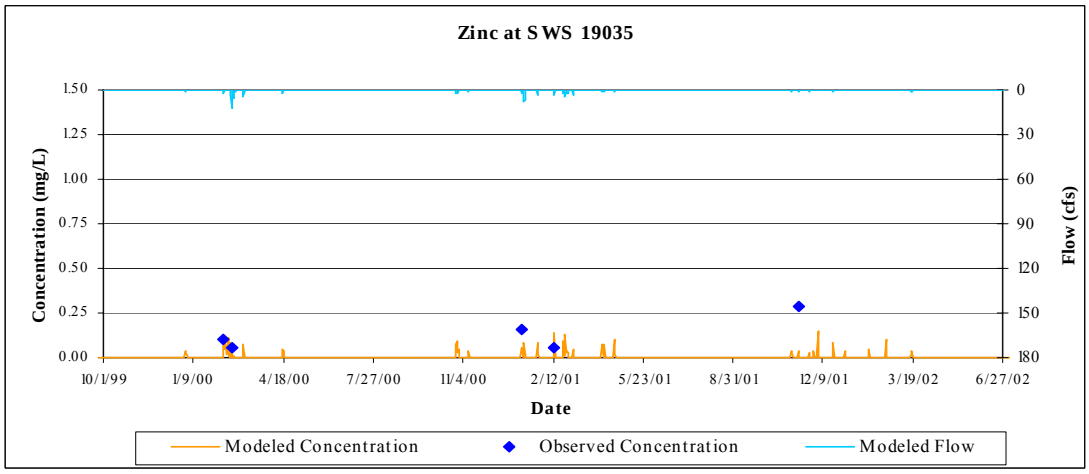

Figure 23. Time-series comparison of modeled and observed wet weather metals concentrations at sampling location SD8(6) (model calibration)

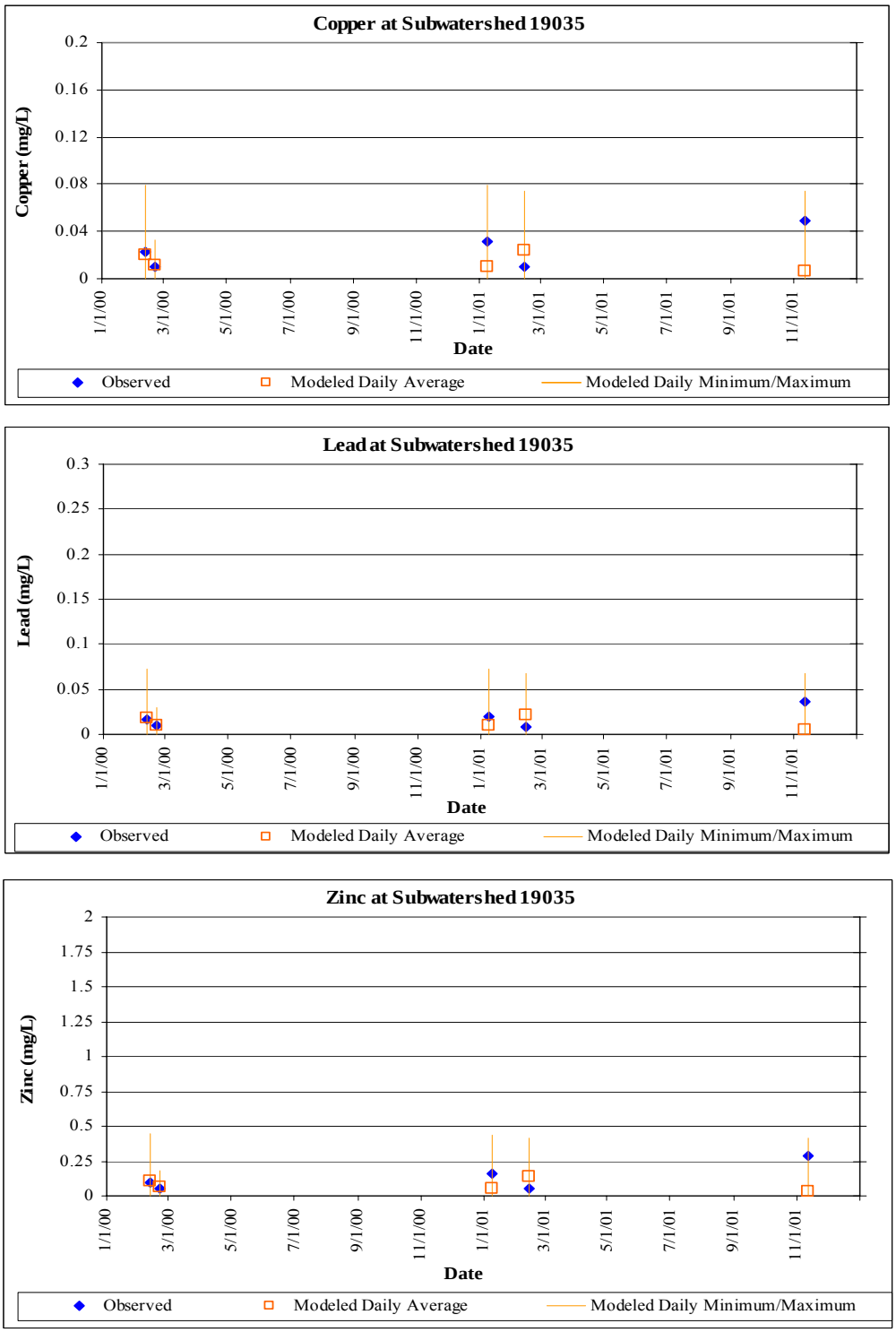

Figure 24. LSPC model results and corresponding observed metals data at sampling location SD8(6) (model calibration)

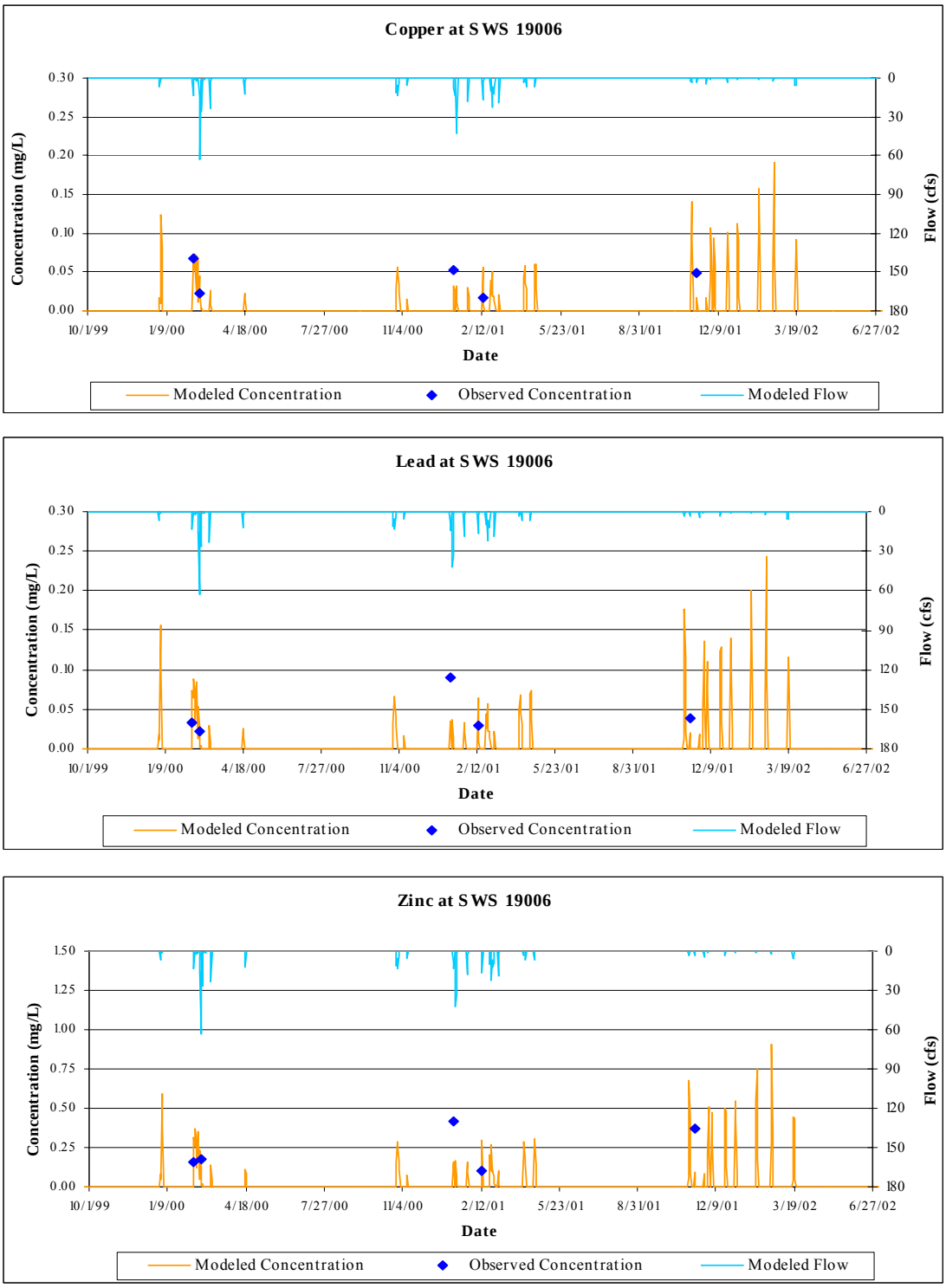

Figure 25. Time-series comparison of modeled and observed wet weather metals concentrations at sampling location SD8(2) (model validation)

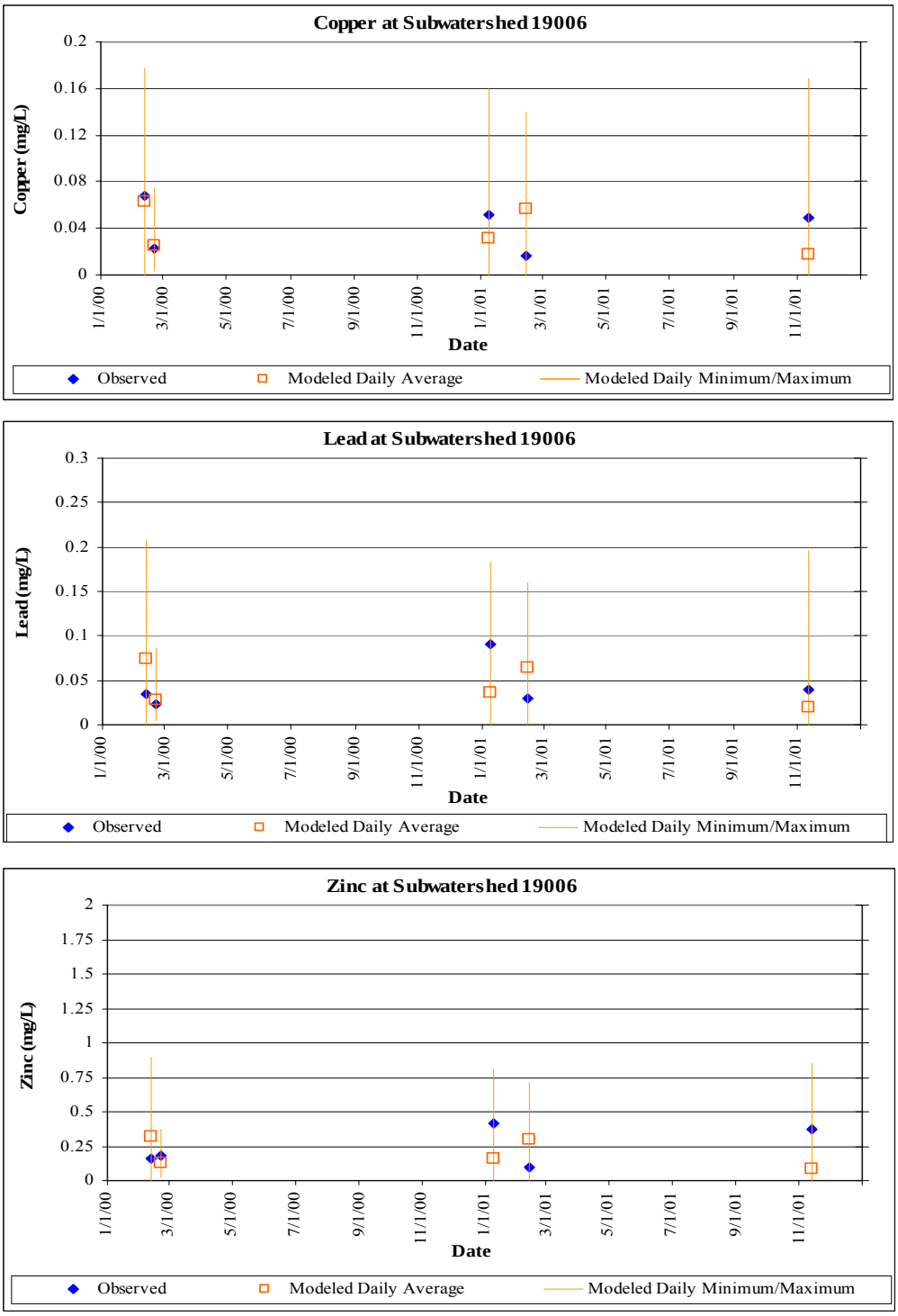

Figure 26. LSPC model results and corresponding observed metals data at sampling location SD8(2) (model validation)

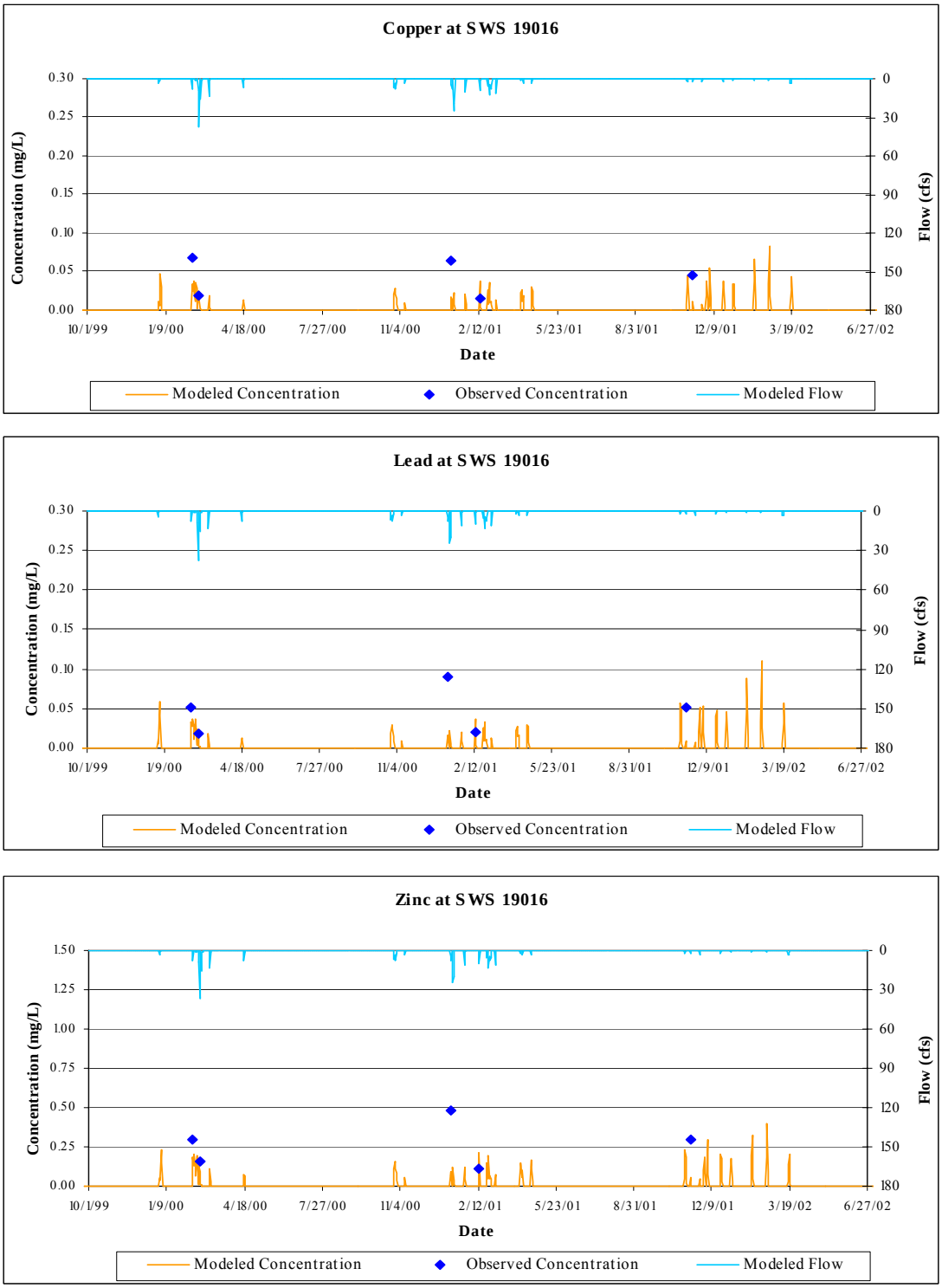

Figure 27. Time-series comparison of modeled and observed wet weather metals concentrations at sampling location SD8(3) (model validation)

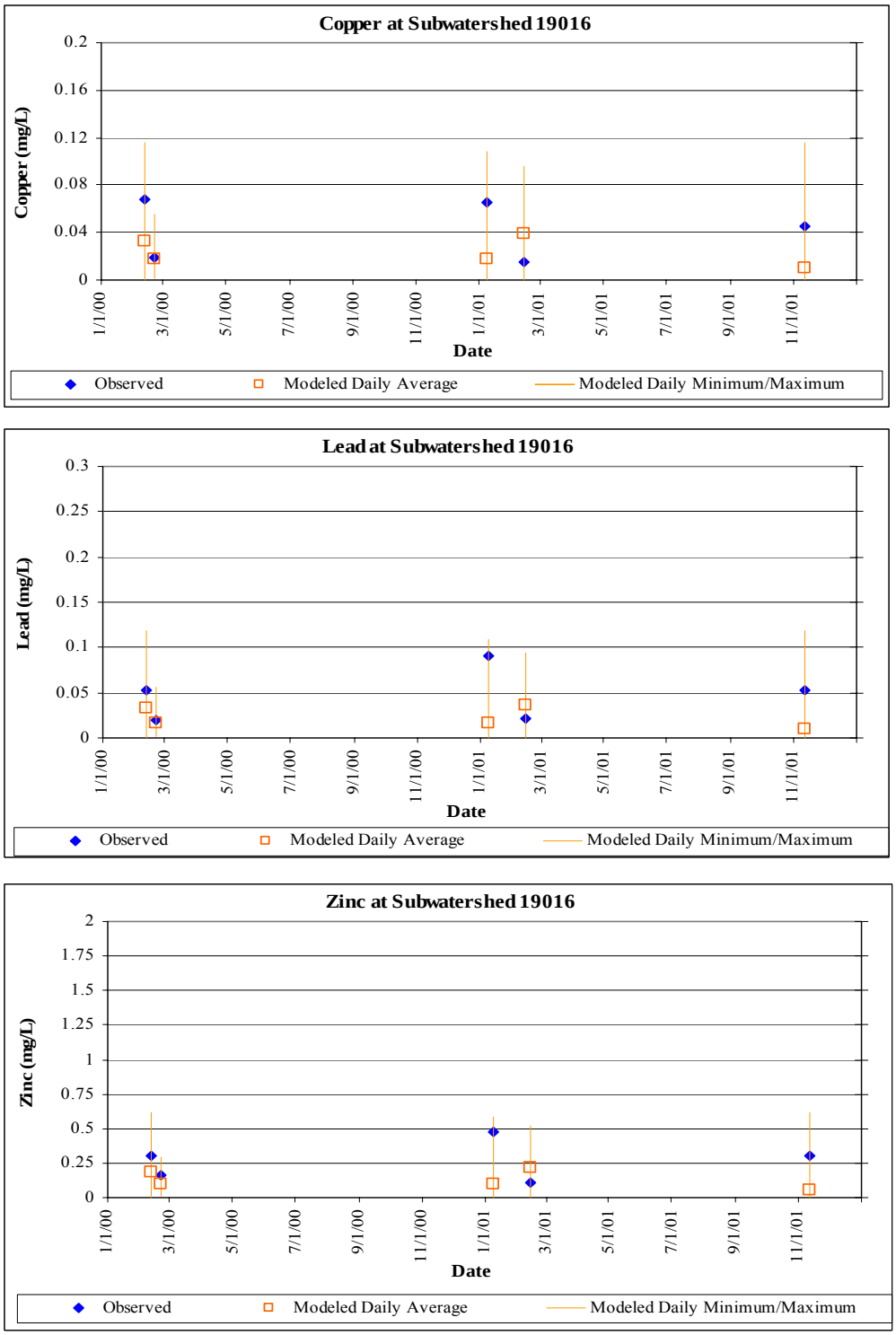

Figure 28. LSPC model results and corresponding observed metals data at sampling location SD8(3) (model validation)

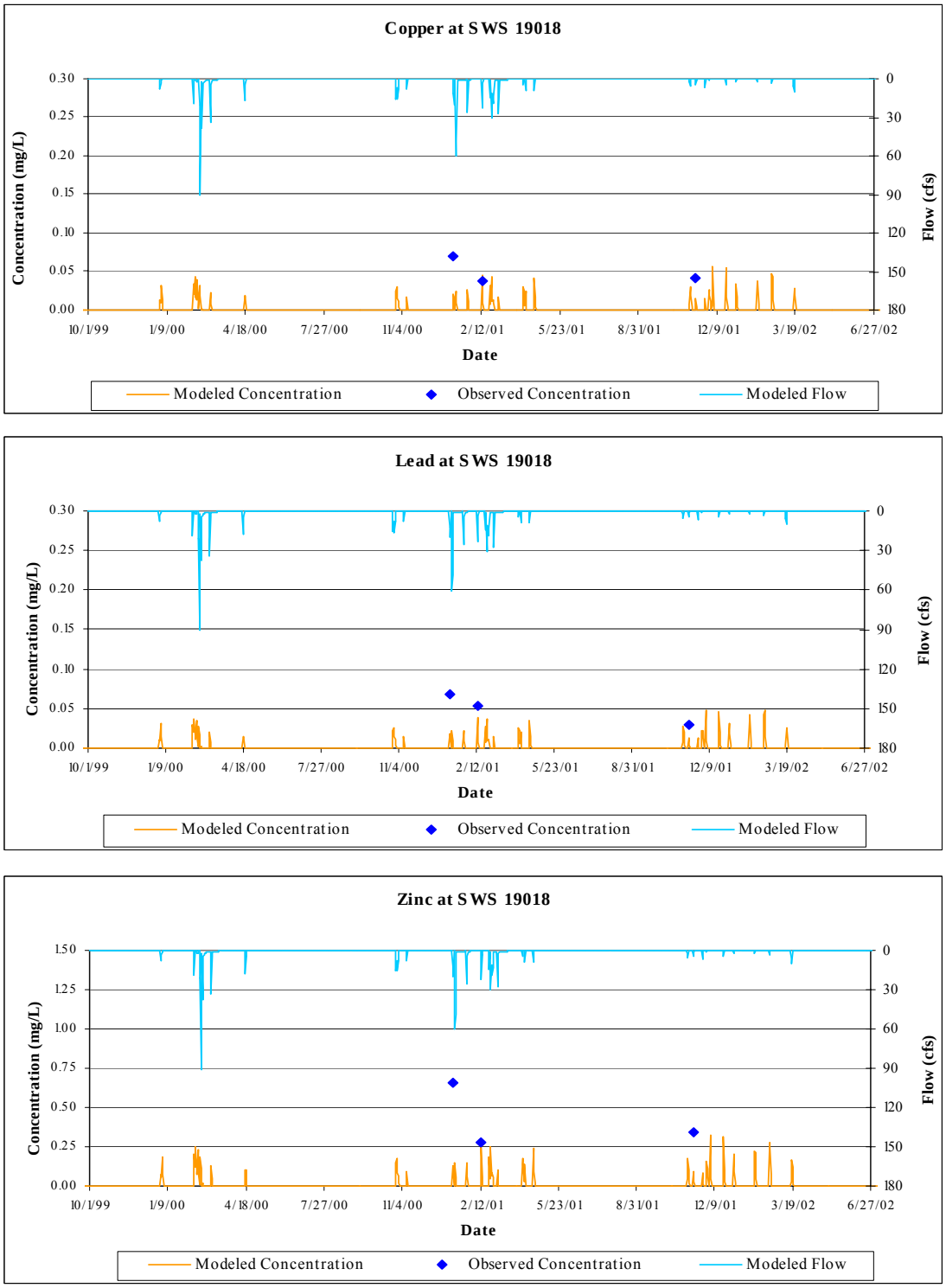

Figure 29. Time-series comparison of modeled and observed wet weather metals concentrations at sampling location DPR(4) (model validation)

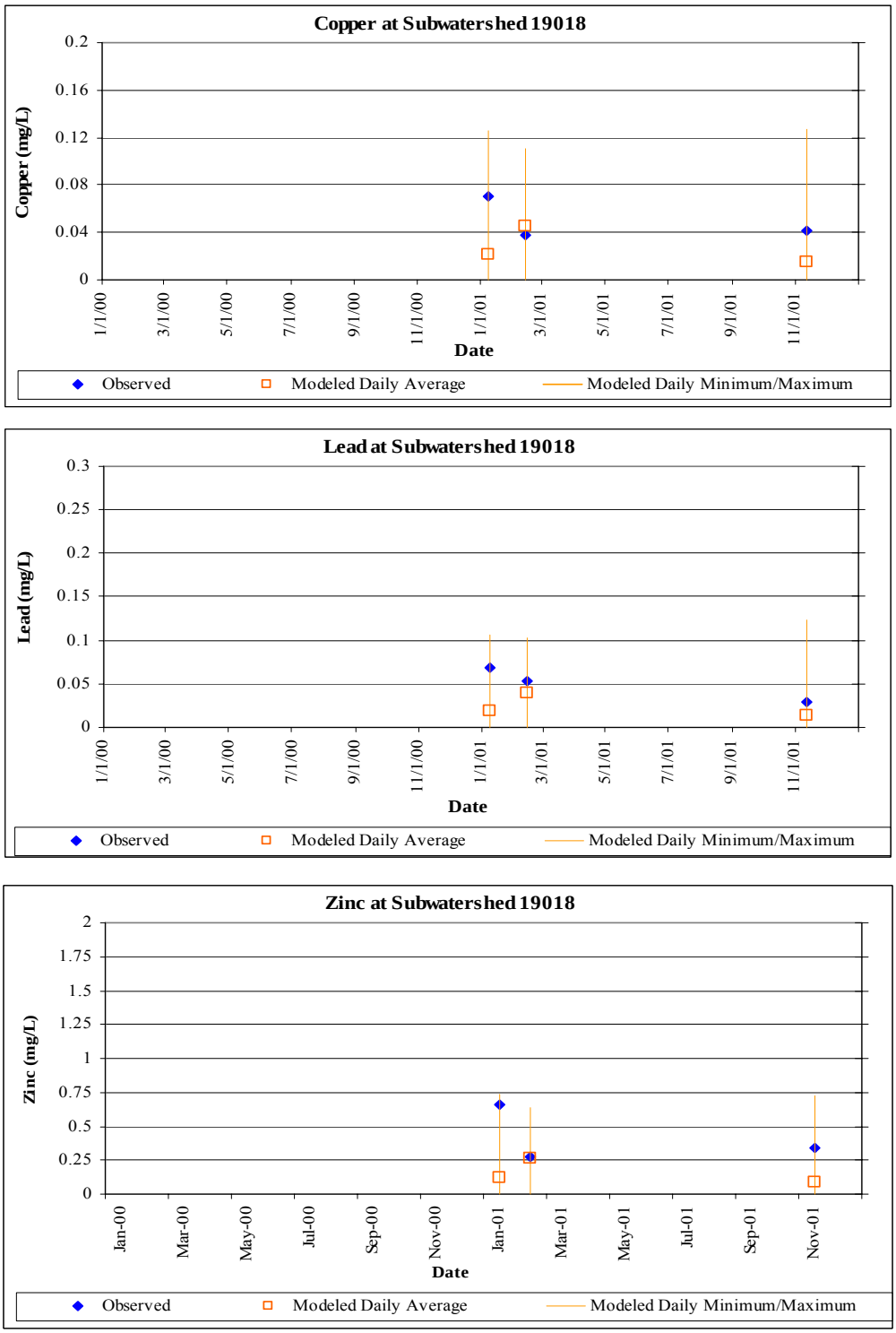

Figure 30. LSPC model results and corresponding observed metals data at sampling location DPR(4) (model validation)

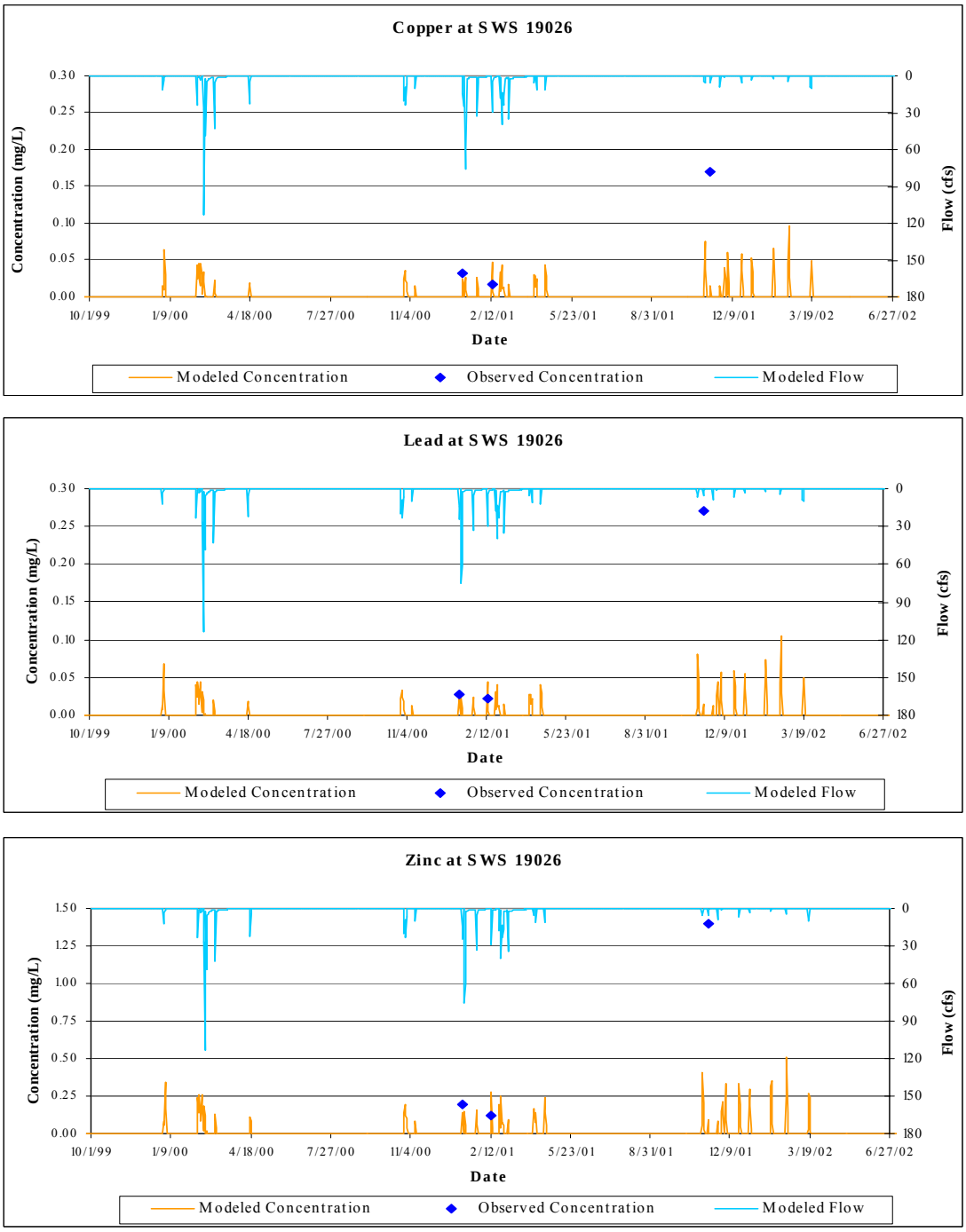

Figure 31. Time-series comparison of modeled and observed wet weather metals concentrations at sampling location DPR(1) (model validation)

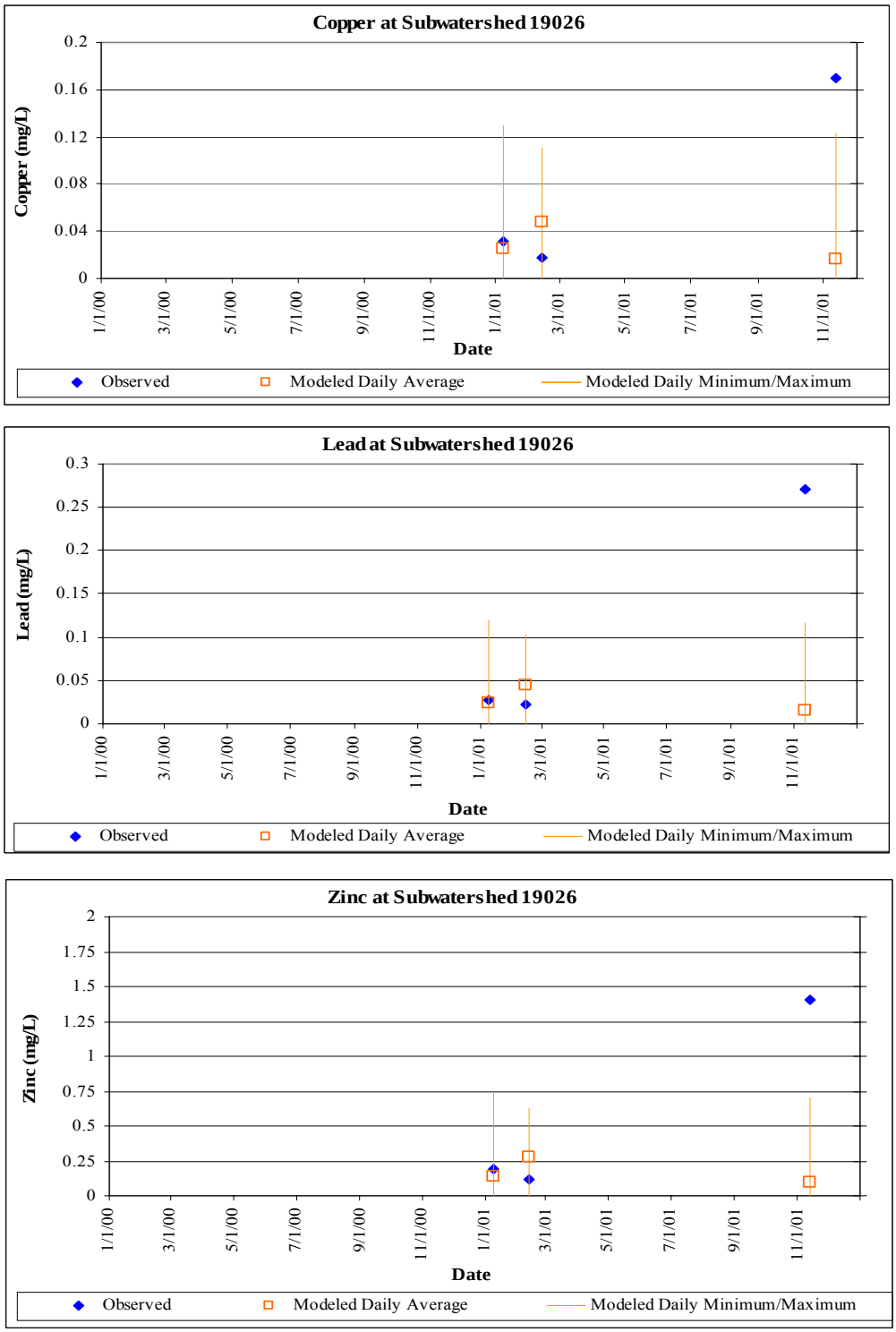

Figure 32. LSPC model results and corresponding observed metals data at sampling location DPR(1) (model validation)

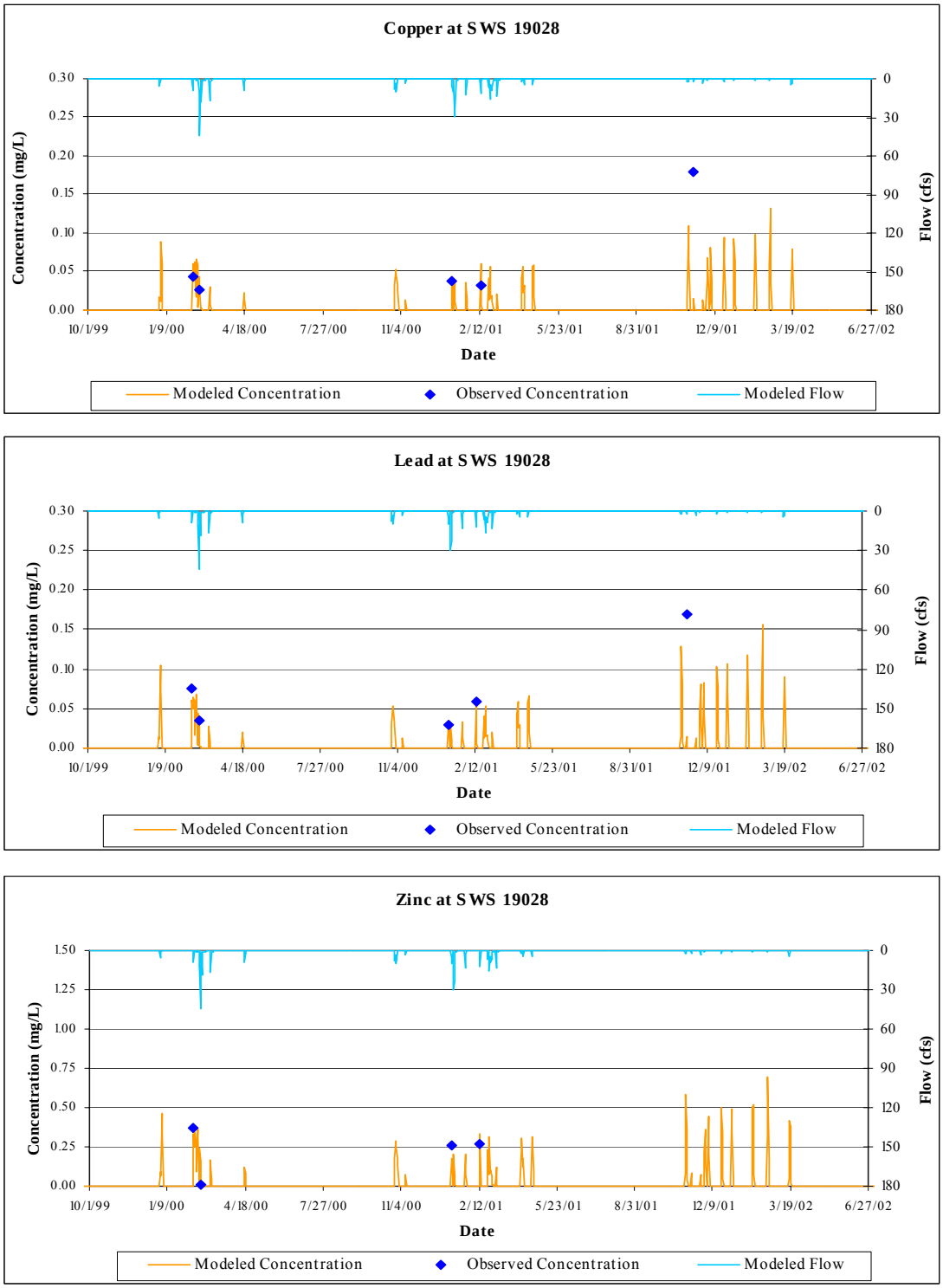

Figure 33. Time-series comparison of modeled and observed wet weather metals concentrations at sampling location SD8(5) (model validation)

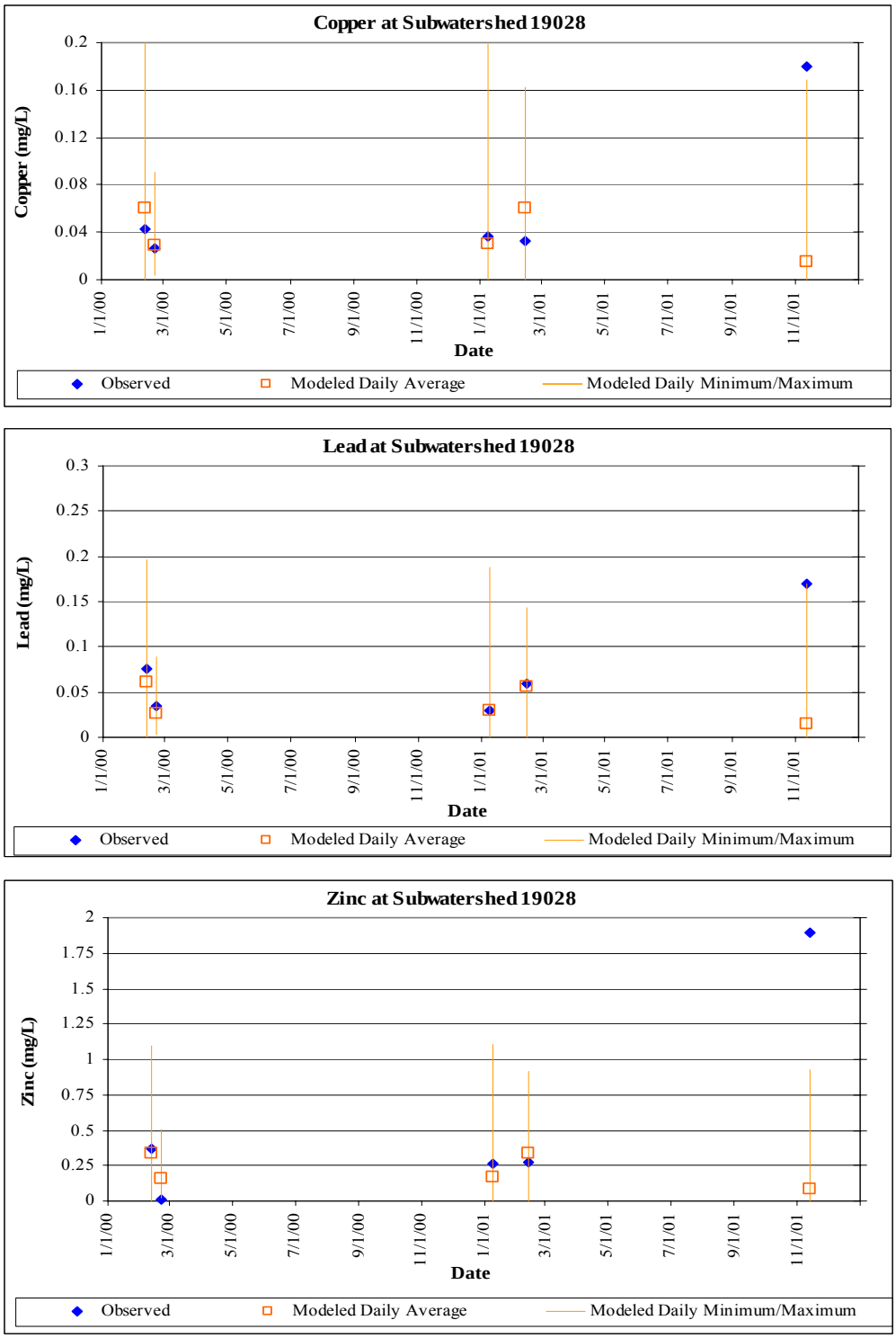

Figure 34. LSPC model results and corresponding observed metals data at sampling location SD8(5) (model validation)

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Appendix E

Land Use Loading Analyses

Used in the Chollas Creek Metals Total Maximum Daily Load

California Regional Water Quality Control Board, San Diego Region

Table 1 presents descriptions of the land uses present in the Chollas Creek watershed. The original land uses categories were developed by the San Diego Association of Governments (SANDAG, 2000) and were reclassified for use in the water quality models.

Table 1. Description of land uses in the Chollas Creek Watershed

Model Land Use Code	SANDAG Land Use Code	Land Use Description
1100	1000	Spaced Rural Residential - Homes in rural areas with lot sizes of approximately 1 to 10 acres
	1100	Single Family Residential - Single family detached housing units with lot sizes less than 1 acre
1200	1200	Multi-Family Residential - Attached housing units, two or more units per structure
	1300	Mobile Home Parks- 10 or more spaces that are primarily for residential use
	1403	Military Barracks
	1409	Other Group Quarters - Convalescent or retirement homes
	1501	Hotels, motels, and other transient accommodations with three or less floors
1400	5001	Wholesale Trade - Examples are clothing and supply, includes Swap meet areas
	5002	Regional Shopping Centers - Typically larger than 40 acres
	5003	Community Commercial - Smaller in size (8 to 20 acres) than the regional shopping centers
	5004	Neighborhood Shopping Centers- Usually less than 10 acres in size with on-site parking
	5007	Store-front Commercial - Commercial activities along major streets, with limited on-site parking
	5009	Other Retail - Other retail land uses not classified above
	6002	Office (Low Rise) - Buildings with less than 5 stories
	6003	Government/Civic Centers - Large government office buildings or centers; and civic centers
	6102	Churches
	6103	Libraries
	6104	Post Offices
	6105	Fire/Police/Ranger Stations
	6109	Other Public Services - Museums, art galleries, social service agencies, historic sites
	6502	Hospitals-General
	6509	Other Health Care - Medical centers, health care services, and other health care facilities
	6802	Universities and Colleges
	6803-6805	High Schools - Senior High Schools, Junior High Schools, Middle Schools
	6806	Elementary Schools
	6807	School District Offices
	6809	Other Schools - Includes adult schools, non-residential day care and nursery schools
	7205	Golf Course Clubhouses - Clubhouses, swimming and tennis facilities, and parking lots
1401	5006	Auto dealerships
1501	4113	Communications and Utilities - Broadcasting stations, relay towers, electrical generating plants, water and sewage treatment facilities
1502	4112	Freeway - Divided roadways with 4 or more lanes, and right-of-way widths greater than 200 ft.
1503	2001	Heavy Industry - Shipbuilding, airframe, and aircraft manufacturing
1505	2101	Industrial Parks - Office/Industrial Uses Clustered Into A Center
	2103	Light Industry, General - Includes manufacturing uses such as lumber, furniture, paper, rubber, stone, clay, and glass; auto repair services, and recycling centers
	2104	Warehousing/Public storage
1506	4120	Marine Terminals
1507	4119	Other Transportation - Maintenance yards, transit yards and walking bridges
1508	4114	Parking, Surface - All surface parking lots not associated with another land use
	4116	Park and Ride Lots- Stand-alone parking areas that are not associated with any land use
1509	4111	Rail Stations/Transit Centers/Seaports- Parking areas are included

Table 1. Continued

Model Land Use Code	SANDAG Land Use Code	Land Use Description
1600	6701	Military Use
1700	7210	Other Recreation - RV parks, campgrounds, swim clubs, and Stand-alone movie theaters
	7601	Parks, Active- Tennis or basketball courts, baseball diamonds, soccer fields, or swings
	7606	Landscape, Open Space - Actively landscaped areas within residential neighborhoods
1800	6101	Cemetery
	7204	Golf Courses
2301	2301	Junkyard/Dumps/Landfills - Include auto wrecking/dismantling and recycling centers
4000	7603	Open Space Parks & Preserves
	9101	Vacant
5000	9201	Bays, Lagoons
	9202	Inland Water
7000	9501	Residential Under Construction
	9502	Commercial Under Construction
	9507	Freeway Under Construction

A land use distribution map is provided in Figure 1.

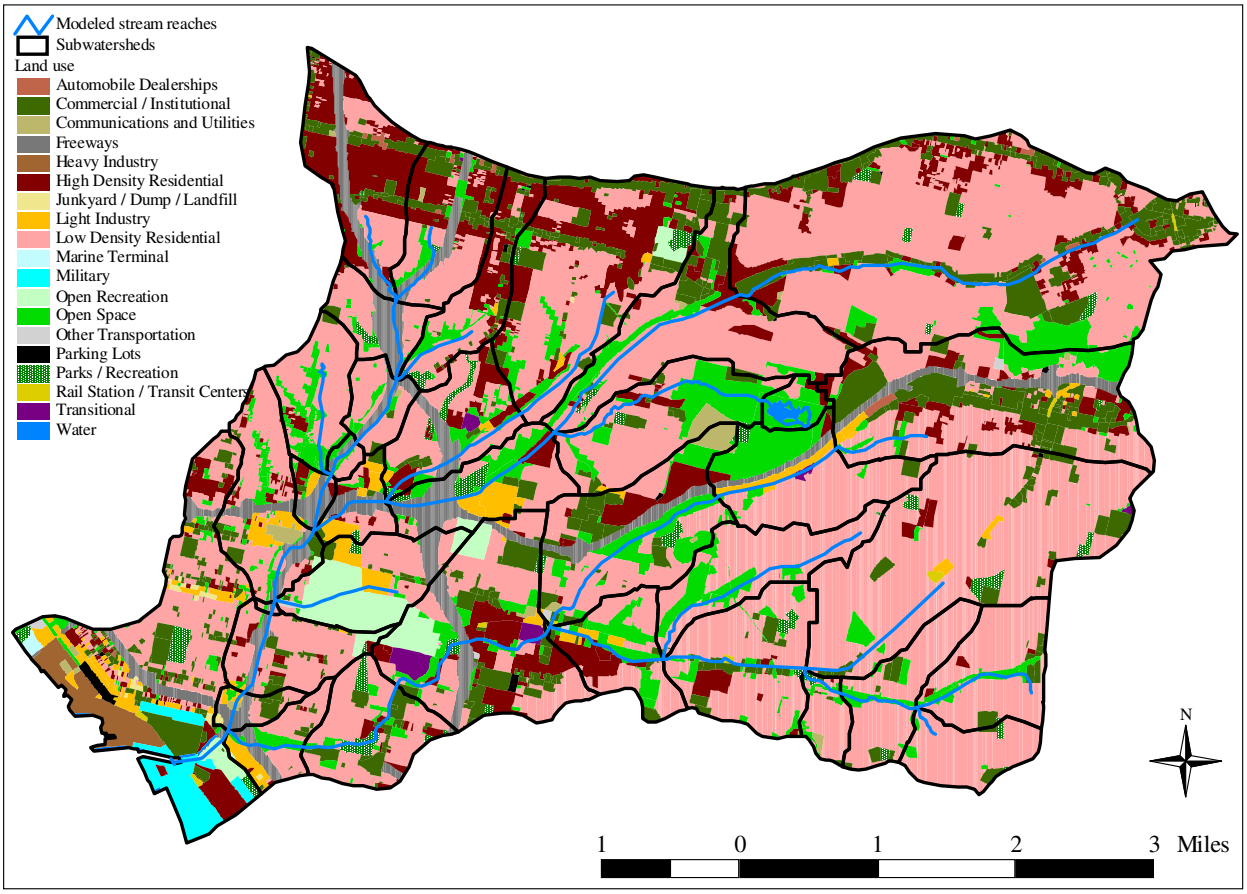

Figure 1. Land uses in the Chollas Creek Watershed

To supplement Figure 1, the land use areas (in square miles) associated with each subwatershed are presented in Table 2. This table also presents the total area for each subwatershed, the total area for each land use, and the percent of total area associated with each land use.

Tables 3 through 5 present the average annual wet weather loadings of copper, lead, and zinc for each land use by subwatershed (average of 1990-2003 simulation results). Similarly, Tables 6 through 8 present the average relative copper, lead, and zinc load by land use for each subwatershed. These six tables will provide useful information for development of a TMDL implementation strategy by identifying areas and land uses that contribute the greatest copper, lead, and/or zinc loads.

Table 2. Land use area (square miles) of each subwatershed

Sub-watershed Number	Low Density Residential (1100)	High Density Residential (1200)	Commercial / Institutional (1400)	Automobile Dealerships (1401)	Commun-ications and Utilities (1501)	Freeways (1502)	Heavy Industry (1503)	Junkyard / Dump / Landfill (1504)	Light Industry (1505)	Marine Terminal (1506)	Other Trans-portation (1507)	Parking Lots (1508)	Rail Station / Transit Centers (1509)	Military (1600)	Parks / Recreation (1700)	Open Recreation (1800)	Open Space (4000)	Water (5000)	Transitional (7000)	**Total Area**
19001	0.56	0.20	0.29	0.00	0.01	0.11	0.21	0.03	0.14	0.02	0.01	0.03	0.01	0.24	0.05	0.05	0.06	0.02	0.00	**2.01**
19002	0.04	0.00	0.03	0.00	0.01	0.04	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	**0.13**
19003	0.33	0.03	0.05	0.00	0.00	0.04	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.01	0.00	0.00	**0.49**
19004	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.01**
19005	0.36	0.04	0.05	0.00	0.03	0.09	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00	**0.70**
19006	0.01	0.02	0.00	0.00	0.00	0.06	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	**0.11**
19007	0.31	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.00	0.00	**0.46**
19008	0.03	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	**0.06**
19009	0.16	0.00	0.01	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	**0.25**
19010	0.18	0.01	0.01	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.02	0.00	0.00	**0.32**
19011	0.17	0.42	0.11	0.01	0.00	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	**0.86**
19012	0.23	0.20	0.11	0.01	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	**0.68**
19013	0.19	0.17	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.05	0.00	0.00	**0.52**
19014	0.19	0.00	0.03	0.00	0.00	0.05	0.00	0.00	0.06	0.00	0.01	0.00	0.00	0.00	0.01	0.28	0.01	0.00	0.00	**0.63**
19015	0.06	0.02	0.02	0.00	0.00	0.06	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	**0.23**
19016	0.28	0.10	0.03	0.00	0.00	0.07	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.06	0.00	0.01	**0.61**
19017	0.70	0.45	0.29	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.02	0.03	0.11	0.00	0.00	**1.62**
19018	0.16	0.05	0.03	0.00	0.00	0.13	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.03	0.01	0.10	0.00	0.00	**0.58**
19019	0.77	0.12	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.14	0.00	0.00	**1.22**
19020	2.63	0.44	0.74	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.20	0.00	0.00	**4.07**
19021	0.43	0.03	0.06	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.24	0.00	0.00	**0.82**
19022	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.02	0.00	**0.14**
19023	0.15	0.00	0.01	0.00	0.00	0.04	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	**0.29**
19024	0.36	0.04	0.10	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.05	0.00	0.00	**0.61**
19025	0.47	0.25	0.23	0.00	0.01	0.13	0.00	0.00	0.02	0.00	0.00	0.01	0.00	0.00	0.02	0.13	0.11	0.00	0.07	**1.43**
19026	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
19027	0.41	0.13	0.15	0.00	0.05	0.09	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.25	0.00	0.00	**1.11**
19028	0.46	0.02	0.02	0.00	0.00	0.04	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.21	0.00	0.01	**0.82**
19029	0.69	0.21	0.48	0.01	0.00	0.15	0.00	0.00	0.03	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.18	0.00	0.00	**1.78**
19030	0.23	0.09	0.03	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.00	0.00	**0.51**
19031	0.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.00	0.00	**0.66**
19032	0.64	0.05	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.06	0.00	0.00	**0.86**
19033	1.90	0.04	0.15	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.01	0.00	0.05	0.00	0.04	0.00	0.00	**2.21**
19034	0.14	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.02	0.00	0.00	**0.18**
19035	0.42	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.05	0.00	0.00	**0.51**
19036	0.51	0.01	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	**0.63**
19037	0.35	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	**0.39**
Total Area	**15.06**	**3.15**	**3.45**	**0.04**	**0.17**	**1.52**	**0.21**	**0.03**	**0.65**	**0.02**	**0.03**	**0.04**	**0.03**	**0.24**	**0.43**	**0.53**	**2.78**	**0.04**	**0.09**	**28.52**
Relative Area	**52.81%**	**11.04%**	**12.08%**	**0.15%**	**0.60%**	**5.34%**	**0.73%**	**0.11%**	**2.28%**	**0.05%**	**0.10%**	**0.15%**	**0.12%**	**0.84%**	**1.52%**	**1.87%**	**9.73%**	**0.14%**	**0.33%**	

Table E. Average annual wet weather loadings by land use for copper (grams per year)

Sub-watershed Number	Low Density Residential (1100)	High Density Residential (1200)	Commercial / Institutional (1400)	Automobile Dealerships (1401)	Commun-ications and Utilities (1501)	Freeways (1502)	Heavy Industry (1503)	Junkyard / Dump / Landfill (1504)	Light Industry (1505)	Marine Terminal (1506)	Other Trans-portation (1507)	Parking Lots (1508)	Rail Station / Transit Centers (1509)	Military (1600)	Parks / Recreation (1700)	Open Recreation (1800)	Open Space (4000)	Transitional (7000)	**Total Load**
19001	116.91	413.23	9,125.79	98.74	158.55	5,559.78	1,258.60	1,493.39	1,231.38	116.06	183.73	8,733.47	1,242.39	0.00	0.35	0.00	0.00	0.00	29,732.37
19002	7.74	0.00	908.13	0.00	79.29	2,112.00	0.00	290.43	79.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3,477.04
19003	69.12	59.44	1,517.27	0.00	0.00	2,328.64	0.00	0.00	51.95	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	4,026.43
19004	1.74	0.00	0.00	0.00	0.00	180.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	182.26
19005	85.57	83.51	1,673.39	0.00	345.10	4,729.43	0.00	0.00	453.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	7,370.01
19006	1.49	38.87	110.83	0.00	0.00	3,032.61	0.00	0.00	107.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3,290.93
19007	75.12	32.40	199.48	0.00	0.00	36.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	343.12
19008	6.80	0.00	0.00	0.00	0.00	758.19	0.00	0.00	3.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	768.05
19009	38.14	0.00	232.71	0.00	32.65	2,689.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2,993.18
19010	42.37	11.52	288.13	0.00	0.00	5,180.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	5,522.81
19011	40.55	876.08	3,435.48	646.64	23.32	7,491.26	0.00	0.00	3.06	0.00	0.00	94.60	0.00	0.00	0.01	0.00	0.00	0.00	12,610.99
19012	54.64	411.76	3,369.01	517.31	46.64	4,296.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	8,695.62
19013	45.93	354.18	2,559.99	77.57	0.00	180.52	0.00	0.00	30.61	0.00	0.00	663.45	0.00	0.00	0.11	0.00	0.00	0.00	3,912.37
19014	45.52	2.16	820.08	0.00	0.00	2,364.76	0.00	0.00	547.90	0.00	138.73	0.00	0.00	0.00	0.04	0.25	0.00	0.00	3,919.43
19015	14.34	43.91	609.54	0.00	0.00	3,140.97	0.00	0.00	483.61	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	4,292.41
19016	67.74	214.52	953.08	0.00	0.00	3,664.42	0.00	0.00	104.06	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.01	0.00	5,004.08
19017	167.16	925.03	9,353.37	0.00	0.00	0.00	0.00	41.50	82.65	0.00	0.00	0.00	0.00	0.00	0.18	0.03	0.01	0.00	10,569.93
19018	37.56	94.30	875.49	0.00	0.00	6,588.75	0.00	0.00	740.72	0.00	0.00	0.00	0.00	0.00	0.24	0.01	0.01	0.00	8,337.08
19019	184.32	246.20	5,385.94	0.00	41.98	0.00	0.00	0.00	0.00	0.00	0.00	94.60	0.00	0.00	0.07	0.00	0.01	0.00	5,953.11
19020	628.00	902.71	23,693.79	931.12	37.31	0.00	0.00	0.00	36.73	0.00	0.00	94.60	329.96	0.00	0.25	0.00	0.02	0.00	26,654.48
19021	103.73	69.11	1,917.22	0.00	545.63	0.00	0.00	0.00	33.66	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.02	0.00	2,669.42
19022	3.23	24.47	33.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	60.96
19023	30.69	8.59	387.63	0.00	0.00	2,256.40	0.00	83.01	375.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3,142.15
19024	76.28	78.78	3,123.14	0.00	0.00	667.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.34	0.00	0.00	0.00	3,946.47
19025	112.60	515.43	7,181.27	0.00	107.26	6,805.39	0.00	0.00	140.80	0.00	33.03	2,084.95	329.96	0.00	0.13	0.11	0.01	0.01	17,310.94
19026	0.00	0.00	22.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	188.61	0.00	0.00	0.00	0.00	0.00	210.78
19027	98.50	261.31	4,632.39	0.00	671.56	4,855.81	0.00	0.00	48.97	0.00	72.66	473.83	424.26	0.00	0.16	0.00	0.02	0.00	11,539.48
19028	109.12	39.59	609.54	0.00	37.31	2,310.54	0.00	0.00	474.43	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.02	0.00	3,580.61
19029	165.83	426.16	15,260.20	1,008.69	41.98	7,906.52	0.00	0.00	296.90	0.00	99.10	473.83	471.31	0.00	0.02	0.00	0.02	0.00	26,150.56
19030	53.73	179.25	941.97	0.00	0.00	0.00	0.00	0.00	226.50	0.00	66.07	0.00	141.35	0.00	0.00	0.00	0.01	0.00	1,608.87
19031	123.46	0.00	55.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	178.89
19032	152.31	105.82	2,615.41	0.00	18.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	565.61	0.00	0.15	0.00	0.01	0.00	3,457.97
19033	453.96	77.75	4,831.86	0.00	0.00	0.00	0.00	0.00	168.35	0.00	0.00	284.21	1,178.27	0.00	0.33	0.00	0.00	0.00	6,994.74
19034	32.50	2.16	221.65	0.00	97.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	354.29
19035	99.08	0.00	1,019.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	1,118.68
19036	122.55	21.60	1,418.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	1,562.66
19037	84.08	0.00	509.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	593.90

Table 4. Average annual wet weather loadings by land use for lead (grams per year)

Sub-watershed Number	Low Density Residential (1100)	High Density Residential (1200)	Commercial / Institutional (1400)	Automobile Dealerships (1401)	Commun-ications and Utilities (1501)	Freeways (1502)	Heavy Industry (1503)	Junkyard / Dump / Landfill (1504)	Light Industry (1505)	Marine Terminal (1506)	Other Trans-portation (1507)	Parking Lots (1508)	Rail Station / Transit Centers (1509)	Military (1600)	Parks / Recreation (1700)	Open Recreation (1800)	Open Space (4000)	Transitional (7000)	**Total Load**
19001	291.73	559.84	5,689.73	26.38	86.99	6,273.81	404.30	479.69	1,216.23	37.28	106.22	5,610.64	399.07	0.00	0.06	0.00	0.00	0.00	21,181.97
19002	19.33	0.00	566.20	0.00	43.50	2,383.24	0.00	93.29	78.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3,184.02
19003	172.49	80.53	945.99	0.00	0.00	2,627.70	0.00	0.00	51.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3,878.01
19004	4.05	0.00	0.00	0.00	0.00	203.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	207.75
19005	199.03	112.80	1,042.93	0.00	189.34	5,336.82	0.00	0.00	447.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7,328.01
19006	3.47	52.51	69.07	0.00	0.00	3,422.08	0.00	0.00	105.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3,652.86
19007	174.73	43.76	124.32	0.00	0.00	40.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	383.57
19008	15.81	0.00	0.00	0.00	0.00	855.57	0.00	0.00	3.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	874.39
19009	88.71	0.00	145.04	0.00	17.91	3,035.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3,286.77
19010	98.55	15.56	179.57	0.00	0.00	5,846.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	6,139.77
19011	94.31	1,183.41	2,141.15	172.76	12.79	8,453.34	0.00	0.00	3.02	0.00	0.00	60.76	0.00	0.00	0.00	0.00	0.00	0.00	12,121.55
19012	127.09	556.21	2,099.72	138.21	25.59	4,847.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7,794.81
19013	106.84	478.42	1,595.50	20.73	0.00	203.70	0.00	0.00	30.21	0.00	0.00	426.17	0.00	0.00	0.02	0.00	0.00	0.00	2,861.59
19014	105.88	2.92	511.11	0.00	0.00	2,668.46	0.00	0.00	540.74	0.00	80.09	0.00	0.00	0.00	0.01	0.04	0.00	0.00	3,909.23
19015	33.36	59.32	379.89	0.00	0.00	3,544.35	0.00	0.00	477.29	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	4,494.22
19016	157.56	289.77	594.00	0.00	0.00	4,135.03	0.00	0.00	102.70	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	5,279.12
19017	388.80	1,249.54	5,829.44	0.00	0.00	0.00	0.00	13.33	81.57	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	7,562.71
19018	87.36	127.39	545.64	0.00	0.00	7,434.93	0.00	0.00	731.04	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	8,926.41
19019	428.72	332.56	3,356.76	0.00	23.03	0.00	0.00	0.00	0.00	0.00	0.00	60.76	0.00	0.00	0.01	0.00	0.00	0.00	4,201.85
19020	1,460.70	1,219.39	14,767.02	248.76	20.47	0.00	0.00	0.00	36.25	0.00	0.00	60.76	105.99	0.00	0.04	0.00	0.00	0.00	17,919.40
19021	241.26	93.35	1,194.90	0.00	299.37	0.00	0.00	0.00	33.23	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	1,862.11
19022	7.52	33.06	20.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	61.30
19023	76.58	11.64	241.68	0.00	0.00	2,546.18	0.00	26.66	371.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3,273.95
19024	190.35	106.73	1,947.21	0.00	0.00	753.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	2,998.06
19025	261.90	696.24	4,475.69	0.00	58.85	7,679.39	0.00	0.00	138.96	0.00	19.07	1,339.28	105.99	0.00	0.02	0.02	0.00	0.00	14,775.40
19026	0.00	0.00	13.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	60.58	0.00	0.00	0.00	0.00	0.00	74.40
19027	229.11	352.98	2,887.11	0.00	368.45	5,479.43	0.00	0.00	48.33	0.00	41.95	304.37	136.28	0.00	0.03	0.00	0.00	0.00	9,848.04
19028	253.80	53.48	379.89	0.00	20.47	2,607.27	0.00	0.00	468.23	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	3,783.16
19029	385.71	575.66	9,510.84	269.49	23.03	8,921.93	0.00	0.00	293.02	0.00	57.21	304.37	151.39	0.00	0.00	0.00	0.00	0.00	20,492.66
19030	124.97	242.13	587.07	0.00	0.00	0.00	0.00	0.00	223.54	0.00	38.14	0.00	45.40	0.00	0.00	0.00	0.00	0.00	1,261.26
19031	287.17	0.00	34.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	321.70
19032	354.28	142.94	1,630.04	0.00	10.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	181.68	0.00	0.02	0.00	0.00	0.00	2,319.21
19033	1,055.89	105.02	3,011.43	0.00	0.00	0.00	0.00	0.00	166.15	0.00	0.00	182.57	378.48	0.00	0.05	0.00	0.00	0.00	4,899.60
19034	75.60	2.92	138.14	0.00	53.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	270.40
19035	230.46	0.00	635.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	865.90
19036	285.04	29.17	884.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1,198.29
19037	195.56	0.00	317.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	513.28

Table 5. Average annual wet weather loadings by land use for zinc (grams per year)

Sub-watershed Number	Low Density Residential (1100)	High Density Residential (1200)	Commercial / Institutional (1400)	Auto-mobile Dealer-ships (1401)	Commun-ications and Utilities (1501)	Freeways (1502)	Heavy Industry (1503)	Junkyard / Dump / Landfill (1504)	Light Industry (1505)	Marine Term-inal (1506)	Other Trans-portation (1507)	Parking Lots (1508)	Rail Station / Transit Centers (1509)	Military (1600)	Parks / Recreation (1700)	Open Recre-ation (1800)	Open Space (4000)	Trans-itional (7000)	**Total Load**
19001	488.77	2,475.28	53,126.96	903.19	2,454.80	25,697.50	7,975.51	9,463.58	13,728.43	735.44	838.21	55,343.97	7,873.01	0.01	2.59	0.00	0.04	0.00	181,107.29
19002	32.38	0.00	5,286.81	0.00	1,227.56	9,761.73	0.00	1,840.47	885.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	19,034.62
19003	288.99	356.07	8,832.99	0.00	0.00	10,763.04	0.00	0.00	579.16	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00	20,820.35
19004	7.65	0.00	0.00	0.00	0.00	834.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	842.01
19005	375.89	501.67	9,745.51	0.00	5,343.02	21,859.59	0.00	0.00	5,053.83	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.05	0.00	42,879.59
19006	6.56	233.53	645.42	0.00	0.00	14,016.82	0.00	0.00	1,195.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	16,097.55
19007	330.00	194.62	1,161.71	0.00	0.00	166.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.00	1,853.35
19008	29.87	0.00	0.00	0.00	0.00	3,504.39	0.00	0.00	34.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	3,568.36
19009	167.55	0.00	1,355.28	0.00	505.50	12,431.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.02	0.00	14,460.12
19010	186.12	69.19	1,677.99	0.00	0.00	23,945.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.00	0.01	0.00	25,879.37
19011	178.11	5,263.19	20,007.59	5,915.23	361.03	34,624.87	0.00	0.00	34.09	0.00	0.00	599.45	0.00	0.00	0.07	0.00	0.00	0.00	66,983.63
19012	240.03	2,473.74	19,620.45	4,732.18	722.06	19,857.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.00	0.03	0.00	47,645.99
19013	201.79	2,127.77	14,908.91	709.61	0.00	834.36	0.00	0.00	341.49	0.00	0.00	4,204.28	0.00	0.00	0.84	0.00	0.03	0.00	23,329.09
19014	199.96	12.97	4,775.97	0.00	0.00	10,929.98	0.00	0.00	6,112.53	0.00	633.76	0.00	0.00	0.00	0.30	1.81	0.01	0.00	22,667.29
19015	63.01	263.81	3,549.84	0.00	0.00	14,517.66	0.00	0.00	5,395.32	0.00	0.00	0.00	0.00	0.00	0.30	0.00	0.01	0.00	23,789.94
19016	297.58	1,288.76	5,550.54	0.00	0.00	16,937.09	0.00	0.00	1,160.97	0.00	0.00	0.00	0.00	0.00	1.84	0.00	0.04	0.01	25,236.82
19017	734.30	5,557.27	54,472.23	0.00	0.00	0.00	0.00	263.01	922.05	0.00	0.00	0.00	0.00	0.00	1.31	0.22	0.07	0.00	61,950.45
19018	165.00	566.55	5,098.68	0.00	0.00	30,453.44	0.00	0.00	8,263.72	0.00	0.00	0.00	0.00	0.00	1.82	0.07	0.06	0.00	44,549.34
19019	809.69	1,479.06	31,366.66	0.00	649.98	0.00	0.00	0.00	0.00	0.00	0.00	599.45	0.00	0.00	0.53	0.00	0.09	0.00	34,905.46
19020	2,758.71	5,423.21	137,987.99	8,517.50	577.58	0.00	0.00	0.00	409.82	0.00	0.00	599.45	2,090.95	0.00	1.89	0.00	0.13	0.00	158,367.23
19021	455.66	415.18	11,165.50	0.00	8,447.80	0.00	0.00	0.00	375.57	0.00	0.00	0.00	0.00	0.00	0.39	0.00	0.15	0.00	20,860.26
19022	14.20	147.03	193.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.06	0.00	354.90
19023	128.30	51.48	2,256.66	0.00	0.00	10,429.14	0.00	526.02	4,189.99	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.02	0.00	17,581.64
19024	318.92	471.89	18,181.74	0.00	0.00	3,087.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.52	0.00	0.03	0.00	22,062.30
19025	494.63	3,096.51	41,822.31	0.00	1,660.66	31,454.75	0.00	0.00	1,570.78	0.00	150.91	13,212.30	2,090.95	0.00	0.99	0.82	0.07	0.05	95,555.73
19026	0.00	0.00	129.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1,195.21	0.00	0.00	0.00	0.00	0.00	1,324.35
19027	432.71	1,569.88	26,978.12	0.00	10,397.42	22,443.72	0.00	0.00	546.32	0.00	331.94	3,002.67	2,688.55	0.00	1.20	0.00	0.16	0.00	68,392.69
19028	479.33	237.87	3,549.84	0.00	577.58	10,679.38	0.00	0.00	5,292.90	0.00	0.00	0.00	0.00	0.00	0.54	0.00	0.13	0.01	20,817.57
19029	728.47	2,560.24	88,872.44	9,227.12	649.98	36,544.20	0.00	0.00	3,312.31	0.00	452.72	3,002.67	2,986.68	0.00	0.11	0.00	0.11	0.00	148,337.05
19030	236.02	1,076.86	5,485.82	0.00	0.00	0.00	0.00	0.00	2,526.91	0.00	301.82	0.00	895.74	0.00	0.00	0.00	0.09	0.00	10,523.25
19031	542.35	0.00	322.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.09	0.00	865.18
19032	669.10	635.74	15,231.62	0.00	288.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3,584.29	0.00	1.09	0.00	0.04	0.00	20,410.82
19033	1,994.18	467.08	28,139.82	0.00	0.00	0.00	0.00	0.00	1,878.18	0.00	0.00	1,801.06	7,466.71	0.00	2.48	0.00	0.03	0.00	41,749.54
19034	142.78	12.97	1,290.85	0.00	1,516.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.00	0.01	0.00	2,963.12
19035	435.26	0.00	5,937.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.00	0.03	0.00	6,373.29
19036	538.34	129.75	8,261.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.04	0.00	8,929.28
19037	369.33	0.00	2,968.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.38	0.00	0.01	0.00	3,338.55

Table 6. Relative copper loadings for each land use by subwatershed (percent)

Sub-watershed Number	Low Density Residential (1100)	High Density Residential (1200)	Commercial / Institutional (1400)	Automobile Dealerships (1401)	Commun-ications and Utilities (1501)	Freeways (1502)	Heavy Industry (1503)	Junkyard / Dump / Landfill (1504)	Light Industry (1505)	Marine Terminal (1506)	Other Trans-portation (1507)	Parking Lots (1508)	Rail Station / Transit Centers (1509)	Military (1600)	Parks / Recreation (1700)	Open Recreation (1800)	Open Space (4000)	Transitional (7000)	**Total Relative Subwatershed Loading**
19001	0.33	30.69	0.53	18.70	4.23	1.39	5.02	4.14	0.39	0.39	0.00	0.00	0.00	0.62	29.37	0.00	4.18	0.00	12.81
19002	0.00	26.12	2.28	60.74	0.00	0.00	8.35	2.28	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50
19003	0.00	37.68	0.00	57.83	0.00	1.48	0.00	1.29	1.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.73
19004	0.00	0.00	0.00	99.04	0.00	0.00	0.00	0.00	0.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08
19005	0.00	22.71	4.68	64.17	0.00	1.13	0.00	6.15	1.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.17
19006	0.00	3.37	0.00	92.15	0.00	1.18	0.00	3.26	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.42
19007	0.00	58.14	0.00	10.53	0.00	9.44	0.00	0.00	21.89	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15
19008	0.00	0.00	0.00	98.72	0.00	0.00	0.00	0.40	0.89	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33
19009	0.00	7.77	1.09	89.86	0.00	0.00	0.00	0.00	1.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.29
19010	0.00	5.22	0.00	93.81	0.00	0.21	0.00	0.00	0.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.38
19011	5.13	27.24	0.18	59.40	0.00	6.95	0.00	0.02	0.32	0.00	0.00	0.00	0.00	0.00	0.75	0.00	0.00	0.00	5.43
19012	5.95	38.74	0.54	49.41	0.00	4.74	0.00	0.00	0.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.75
19013	1.98	65.43	0.00	4.61	0.00	9.05	0.00	0.78	1.17	0.00	0.00	0.00	0.00	0.00	16.96	0.00	0.00	0.00	1.69
19014	0.00	20.92	0.00	60.33	0.00	0.06	0.00	13.98	1.16	0.00	0.00	0.00	0.01	3.54	0.00	0.00	0.00	0.00	1.69
19015	0.00	14.20	0.00	73.17	0.00	1.02	0.00	11.27	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.85
19016	0.00	19.05	0.00	73.23	0.00	4.29	0.00	2.08	1.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.16
19017	0.00	88.49	0.00	0.00	0.00	8.75	0.39	0.78	1.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.55
19018	0.00	10.50	0.00	79.03	0.00	1.13	0.00	8.88	0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.59
19019	0.00	90.47	0.71	0.00	0.00	4.14	0.00	0.00	3.10	0.00	0.00	0.00	0.00	0.00	1.59	0.00	0.00	0.00	2.56
19020	3.49	88.89	0.14	0.00	0.00	3.39	0.00	0.14	2.36	0.00	0.00	0.00	0.00	0.00	0.35	0.00	1.24	0.00	11.48
19021	0.00	71.82	20.44	0.00	0.00	2.59	0.00	1.26	3.89	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.15
19022	0.00	54.53	0.00	0.00	0.00	40.15	0.00	0.00	5.30	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.03
19023	0.00	12.34	0.00	71.81	0.00	0.27	2.64	11.96	0.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.35
19024	0.00	79.14	0.00	16.92	0.00	2.00	0.00	0.00	1.93	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	1.70
19025	0.00	41.48	0.62	39.31	0.00	2.98	0.00	0.81	0.65	0.00	0.00	0.00	0.00	0.19	12.04	0.00	1.91	0.00	7.46
19026	0.00	10.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	89.48	0.00	0.09
19027	0.00	40.14	5.82	42.08	0.00	2.26	0.00	0.42	0.85	0.00	0.00	0.00	0.00	0.63	4.11	0.00	3.68	0.00	4.97
19028	0.00	17.02	1.04	64.53	0.00	1.11	0.00	13.25	3.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.54
19029	3.86	58.36	0.16	30.23	0.00	1.63	0.00	1.14	0.63	0.00	0.00	0.00	0.00	0.38	1.81	0.00	1.80	0.00	11.27
19030	0.00	58.55	0.00	0.00	0.00	11.14	0.00	14.08	3.34	0.00	0.00	0.00	0.00	4.11	0.00	0.00	8.79	0.00	0.69
19031	0.00	30.98	0.00	0.00	0.00	0.00	0.00	0.00	69.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.08
19032	0.00	75.63	0.54	0.00	0.00	3.06	0.00	0.00	4.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.36	0.00	1.49
19033	0.00	69.08	0.00	0.00	0.00	1.11	0.00	2.41	6.49	0.00	0.00	0.00	0.00	0.00	4.06	0.00	16.85	0.00	3.01
19034	0.00	62.56	27.64	0.00	0.00	0.61	0.00	0.00	9.17	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.15
19035	0.00	91.14	0.00	0.00	0.00	0.00	0.00	0.00	8.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.48
19036	0.00	90.77	0.00	0.00	0.00	1.38	0.00	0.00	7.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67
19037	0.00	85.83	0.00	0.00	0.00	0.00	0.00	0.00	14.16	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.26

Table 7. Relative lead loadings for each land use by subwatershed (percent)

Sub-watershed Number	Low Density Residential (1100)	High Density Residential (1200)	Commercial / Institutional (1400)	Automobile Dealerships (1401)	Commun-ications and Utilities (1501)	Freeways (1502)	Heavy Industry (1503)	Junkyard / Dump / Landfill (1504)	Light Industry (1505)	Marine Terminal (1506)	Other Trans-portation (1507)	Parking Lots (1508)	Rail Station / Transit Centers (1509)	Military (1600)	Parks / Recreation (1700)	Open Recreation (1800)	Open Space (4000)	Transitional (7000)	**Total Relative Subwatershed Loading**
19001	0.12	26.86	0.41	29.62	1.91	2.64	2.26	5.74	1.38	0.18	0.00	0.00	0.00	0.50	26.49	0.00	1.88	0.00	10.92
19002	0.00	17.78	1.37	74.85	0.00	0.00	2.93	2.46	0.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.64
19003	0.00	24.39	0.00	67.76	0.00	2.08	0.00	1.32	4.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00
19004	0.00	0.00	0.00	98.05	0.00	0.00	0.00	0.00	1.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11
19005	0.00	14.23	2.58	72.83	0.00	1.54	0.00	6.10	2.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.78
19006	0.00	1.89	0.00	93.68	0.00	1.44	0.00	2.89	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.88
19007	0.00	32.41	0.00	10.63	0.00	11.41	0.00	0.00	45.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20
19008	0.00	0.00	0.00	97.85	0.00	0.00	0.00	0.34	1.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.45
19009	0.00	4.41	0.55	92.34	0.00	0.00	0.00	0.00	2.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.69
19010	0.00	2.92	0.00	95.22	0.00	0.25	0.00	0.00	1.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.16
19011	1.43	17.66	0.11	69.74	0.00	9.76	0.00	0.02	0.78	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00	6.25
19012	1.77	26.94	0.33	62.20	0.00	7.14	0.00	0.00	1.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.02
19013	0.72	55.76	0.00	7.12	0.00	16.72	0.00	1.06	3.73	0.00	0.00	0.00	0.00	0.00	14.89	0.00	0.00	0.00	1.47
19014	0.00	13.07	0.00	68.26	0.00	0.07	0.00	13.83	2.71	0.00	0.00	0.00	0.00	2.05	0.00	0.00	0.00	0.00	2.01
19015	0.00	8.45	0.00	78.86	0.00	1.32	0.00	10.62	0.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.32
19016	0.00	11.25	0.00	78.33	0.00	5.49	0.00	1.95	2.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.72
19017	0.00	77.08	0.00	0.00	0.00	16.52	0.18	1.08	5.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.90
19018	0.00	6.11	0.00	83.29	0.00	1.43	0.00	8.19	0.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.60
19019	0.00	79.89	0.55	0.00	0.00	7.91	0.00	0.00	10.20	0.00	0.00	0.00	0.00	0.00	1.45	0.00	0.00	0.00	2.17
19020	1.39	82.41	0.11	0.00	0.00	6.80	0.00	0.20	8.15	0.00	0.00	0.00	0.00	0.00	0.34	0.00	0.59	0.00	9.24
19021	0.00	64.17	16.08	0.00	0.00	5.01	0.00	1.78	12.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.96
19022	0.00	33.79	0.00	0.00	0.00	53.93	0.00	0.00	12.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
19023	0.00	7.38	0.00	77.77	0.00	0.36	0.81	11.34	2.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.69
19024	0.00	64.95	0.00	25.14	0.00	3.56	0.00	0.00	6.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.55
19025	0.00	30.29	0.40	51.97	0.00	4.71	0.00	0.94	1.77	0.00	0.00	0.00	0.00	0.13	9.06	0.00	0.72	0.00	7.62
19026	0.00	18.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	81.43	0.00	0.04
19027	0.00	29.32	3.74	55.64	0.00	3.58	0.00	0.49	2.33	0.00	0.00	0.00	0.00	0.43	3.09	0.00	1.38	0.00	5.08
19028	0.00	10.04	0.54	68.92	0.00	1.41	0.00	12.38	6.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.95
19029	1.32	46.41	0.11	43.54	0.00	2.81	0.00	1.43	1.88	0.00	0.00	0.00	0.00	0.28	1.49	0.00	0.74	0.00	10.56
19030	0.00	46.55	0.00	0.00	0.00	19.20	0.00	17.72	9.91	0.00	0.00	0.00	0.00	3.02	0.00	0.00	3.60	0.00	0.65
19031	0.00	10.74	0.00	0.00	0.00	0.00	0.00	0.00	89.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17
19032	0.00	70.28	0.44	0.00	0.00	6.16	0.00	0.00	15.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.83	0.00	1.20
19033	0.00	61.46	0.00	0.00	0.00	2.14	0.00	3.39	21.55	0.00	0.00	0.00	0.00	0.00	3.73	0.00	7.72	0.00	2.53
19034	0.00	51.09	19.87	0.00	0.00	1.08	0.00	0.00	27.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14
19035	0.00	73.38	0.00	0.00	0.00	0.00	0.00	0.00	26.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.45
19036	0.00	73.78	0.00	0.00	0.00	2.43	0.00	0.00	23.79	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.62
19037	0.00	61.90	0.00	0.00	0.00	0.00	0.00	0.00	38.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.26

Table 8. Relative zinc loadings for each land use by subwatershed (percent)

Sub-watershed Number	Low Density Residential (1100)	High Density Residential (1200)	Commercial / Institutional (1400)	Automobile Dealerships (1401)	Commun-ications and Utilities (1501)	Freeways (1502)	Heavy Industry (1503)	Junkyard / Dump / Landfill (1504)	Light Industry (1505)	Marine Terminal (1506)	Other Trans-portation (1507)	Parking Lots (1508)	Rail Station / Transit Centers (1509)	Military (1600)	Parks / Recreation (1700)	Open Recreation (1800)	Open Space (4000)	Transitional (7000)	**Total Relative Subwatershed Loading**
19001	0.50	29.33	1.36	14.19	4.40	1.37	5.23	7.58	0.27	0.41	0.00	0.00	0.00	0.46	30.56	0.00	4.35	0.00	13.65
19002	0.00	27.77	6.45	51.28	0.00	0.00	9.67	4.65	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.44
19003	0.00	42.42	0.00	51.69	0.00	1.71	0.00	2.78	1.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.57
19004	0.00	0.00	0.00	99.09	0.00	0.00	0.00	0.00	0.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06
19005	0.00	22.73	12.46	50.98	0.00	1.17	0.00	11.79	0.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.23
19006	0.00	4.01	0.00	87.07	0.00	1.45	0.00	7.42	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.21
19007	0.00	62.68	0.00	9.01	0.00	10.50	0.00	0.00	17.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14
19008	0.00	0.00	0.00	98.21	0.00	0.00	0.00	0.96	0.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.27
19009	0.00	9.37	3.50	85.97	0.00	0.00	0.00	0.00	1.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.09
19010	0.00	6.48	0.00	92.53	0.00	0.27	0.00	0.00	0.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.95
19011	8.83	29.87	0.54	51.69	0.00	7.86	0.00	0.05	0.27	0.00	0.00	0.00	0.00	0.00	0.89	0.00	0.00	0.00	5.05
19012	9.93	41.18	1.52	41.68	0.00	5.19	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.59
19013	3.04	63.91	0.00	3.58	0.00	9.12	0.00	1.46	0.86	0.00	0.00	0.00	0.00	0.00	18.02	0.00	0.00	0.00	1.76
19014	0.00	21.07	0.00	48.22	0.00	0.06	0.00	26.97	0.88	0.00	0.00	0.00	0.01	2.80	0.00	0.00	0.00	0.00	1.71
19015	0.00	14.92	0.00	61.02	0.00	1.11	0.00	22.68	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.79
19016	0.00	21.99	0.00	67.11	0.00	5.11	0.00	4.60	1.18	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	1.90
19017	0.00	87.93	0.00	0.00	0.00	8.97	0.42	1.49	1.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.67
19018	0.00	11.45	0.00	68.36	0.00	1.27	0.00	18.55	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.36
19019	0.00	89.86	1.86	0.00	0.00	4.24	0.00	0.00	2.32	0.00	0.00	0.00	0.00	0.00	1.72	0.00	0.00	0.00	2.63
19020	5.38	87.13	0.36	0.00	0.00	3.42	0.00	0.26	1.74	0.00	0.00	0.00	0.00	0.00	0.38	0.00	1.32	0.00	11.94
19021	0.00	53.53	40.50	0.00	0.00	1.99	0.00	1.80	2.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.57
19022	0.00	54.54	0.00	0.00	0.00	41.43	0.00	0.00	4.00	0.00	0.00	0.02	0.00	0.00	0.00	0.01	0.00	0.00	0.03
19023	0.00	12.84	0.00	59.32	0.00	0.29	2.99	23.83	0.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.33
19024	0.00	82.41	0.00	13.99	0.00	2.14	0.00	0.00	1.45	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	1.66
19025	0.00	43.77	1.74	32.92	0.00	3.24	0.00	1.64	0.52	0.00	0.00	0.00	0.00	0.16	13.83	0.00	2.19	0.00	7.20
19026	0.00	9.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	90.25	0.00	0.10
19027	0.00	39.45	15.20	32.82	0.00	2.30	0.00	0.80	0.63	0.00	0.00	0.00	0.00	0.49	4.39	0.00	3.93	0.00	5.16
19028	0.00	17.05	2.77	51.30	0.00	1.14	0.00	25.43	2.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.57
19029	6.22	59.91	0.44	24.64	0.00	1.73	0.00	2.23	0.49	0.00	0.00	0.00	0.00	0.31	2.02	0.00	2.01	0.00	11.18
19030	0.00	52.13	0.00	0.00	0.00	10.23	0.00	24.01	2.24	0.00	0.00	0.00	0.00	2.87	0.00	0.00	8.51	0.00	0.79
19031	0.00	37.30	0.00	0.00	0.00	0.00	0.00	0.00	62.69	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.07
19032	0.00	74.63	1.42	0.00	0.00	3.11	0.00	0.00	3.28	0.00	0.00	0.00	0.00	0.00	0.00	0.01	17.56	0.00	1.54
19033	0.00	67.40	0.00	0.00	0.00	1.12	0.00	4.50	4.78	0.00	0.00	0.00	0.00	0.00	4.31	0.01	17.88	0.00	3.15
19034	0.00	43.56	51.17	0.00	0.00	0.44	0.00	0.00	4.82	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.22
19035	0.00	93.17	0.00	0.00	0.00	0.00	0.00	0.00	6.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.48
19036	0.00	92.52	0.00	0.00	0.00	1.45	0.00	0.00	6.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67
19037	0.00	88.93	0.00	0.00	0.00	0.00	0.00	0.00	11.06	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.25

Appendix F

Statistical Comparison of Measured Values and Modeled Values for Flow and Water Quality

Used in the Chollas Creek Metals Total Maximum Daily Load

California Regional Water Quality Control Board, San Diego Region

Introduction

This appendix compares measured flow and water quality values against those generated from model runs. Data are presented side-by-side for direct comparison. Simple statistical comparisons are also offered.

Flow

Table 1 lists all modeled and measured values from November 1, 2001 to December 30, 2003 for the Chollas Creek Watershed. Table 2 shows all observed values above 2.28 cubic feet per second (cfs), which is the definition of wet weather conditions, and the corresponding modeled average flows. Also in Table 2 are the percent and actual differences. Table 3 gives the total volume per day in cubic feet (cf) for corresponding dates in Table 2. Figure 1 plots volume per day from the model versus volume per day from the observed values. The R^2 value is 0.7035 for 26 data pairs. Table 4 gives the total volume for the 28 days in liters for modeled and observed values and the percent differences and actual differences between the two. Table 5 gives summary statistics of the 26 values in both the modeled and observed value data sets and from the percent differences and actual differences.

Water Quality

Tables 6 and 7 show the measured water quality data and the corresponding model results. Tables 8 and 9 show the percent and actual differences of the water quality data that corresponds with flows over 2.28 cfs. Tables 10 and 11 show the five dates that both measured flow and water quality data were available. The loads per day were calculated and compared, by percent and actual difference, with the model values for the same days.

Table 1. All modeled and measured values. Observed values have approximately the same significant figures as the original values in copermittees reports.

Year	Month	Day	Date	Model Daily Average Flow	Measured Daily Average Flow
Units				cfs	cfs
2001	11	1	11/1/01	0.000	
2001	11	2	11/2/01	0.000	
2001	11	3	11/3/01	0.000	
2001	11	4	11/4/01	6.723	
2001	11	5	11/5/01	13.326	
2001	11	6	11/6/01	0.082	
2001	11	7	11/7/01	0.080	
2001	11	8	11/8/01	0.059	
2001	11	9	11/9/01	0.060	
2001	11	10	11/10/01	0.069	
2001	11	11	11/11/01	0.059	
2001	11	12	11/12/01	10.591	
2001	11	13	11/13/01	1.907	
2001	11	14	11/14/01	0.099	
2001	11	15	11/15/01	0.088	
2001	11	16	11/16/01	0.090	
2001	11	17	11/17/01	0.091	
2001	11	18	11/18/01	0.087	
2001	11	19	11/19/01	0.074	
2001	11	20	11/20/01	0.075	
2001	11	21	11/21/01	0.076	
2001	11	22	11/22/01	0.077	
2001	11	23	11/23/01	0.074	
2001	11	24	11/24/01	15.867	
2001	11	25	11/25/01	0.791	
2001	11	26	11/26/01	0.133	
2001	11	27	11/27/01	0.106	
2001	11	28	11/28/01	0.114	0
2001	11	29	11/29/01	2.801	18
2001	11	30	11/30/01	0.207	
2001	12	1	12/1/01	0.126	
2001	12	2	12/2/01	0.112	
2001	12	3	12/3/01	0.183	
2001	12	4	12/4/01	0.570	
2001	12	5	12/5/01	0.115	
2001	12	6	12/6/01	0.086	
2001	12	7	12/7/01	0.047	
2001	12	8	12/8/01	0.005	
2001	12	9	12/9/01	0.070	
2001	12	10	12/10/01	0.085	
2001	12	11	12/11/01	0.073	
2001	12	12	12/12/01	0.073	
2001	12	13	12/13/01	0.070	

Year	Month	Day	Date	Model Daily Average Flow	Measured Daily Average Flow
Units				cfs	cfs
2001	12	14	12/14/01	0.082	
2001	12	15	12/15/01	0.061	
2001	12	16	12/16/01	0.058	
2001	12	17	12/17/01	0.052	
2001	12	18	12/18/01	0.053	
2001	12	19	12/19/01	0.048	
2001	12	20	12/20/01	0.054	
2001	12	21	12/21/01	11.824	
2001	12	22	12/22/01	0.134	
2001	12	23	12/23/01	0.108	
2001	12	24	12/24/01	0.081	
2001	12	25	12/25/01	0.082	
2001	12	26	12/26/01	0.078	
2001	12	27	12/27/01	0.079	
2001	12	28	12/28/01	0.084	
2001	12	29	12/29/01	0.080	
2001	12	30	12/30/01	0.073	
2001	12	31	12/31/01	0.084	
2002	1	1	1/1/02	0.070	
2002	1	2	1/2/02	0.064	
2002	1	3	1/3/02	5.539	
2002	1	4	1/4/02	0.084	
2002	1	5	1/5/02	0.077	
2002	1	6	1/6/02	0.068	
2002	1	7	1/7/02	0.054	
2002	1	8	1/8/02	0.055	
2002	1	9	1/9/02	0.067	
2002	1	10	1/10/02	0.054	
2002	1	11	1/11/02	0.047	
2002	1	12	1/12/02	0.031	
2002	1	13	1/13/02	0.044	
2002	1	14	1/14/02	0.048	
2002	1	15	1/15/02	0.054	
2002	1	16	1/16/02	0.044	
2002	1	17	1/17/02	0.042	
2002	1	18	1/18/02	0.040	
2002	1	19	1/19/02	0.036	
2002	1	20	1/20/02	0.037	
2002	1	21	1/21/02	0.033	
2002	1	22	1/22/02	0.034	
2002	1	23	1/23/02	0.027	
2002	1	24	1/24/02	0.024	
2002	1	25	1/25/02	0.026	
2002	1	26	1/26/02	0.028	
2002	1	27	1/27/02	0.027	

Year	Month	Day	Date	Model Daily Average Flow	Measured Daily Average Flow
Units				cfs	cfs
2002	1	28	1/28/02	0.026	
2002	1	29	1/29/02	4.119	
2002	1	30	1/30/02	0.057	
2002	1	31	1/31/02	0.043	
2002	2	1	2/1/02	0.035	
2002	2	2	2/2/02	0.032	
2002	2	3	2/3/02	0.032	
2002	2	4	2/4/02	0.029	
2002	2	5	2/5/02	0.026	
2002	2	6	2/6/02	0.028	
2002	2	7	2/7/02	0.027	
2002	2	8	2/8/02	0.028	
2002	2	9	2/9/02	0.013	
2002	2	10	2/10/02	0.000	
2002	2	11	2/11/02	0.013	
2002	2	12	2/12/02	0.017	
2002	2	13	2/13/02	0.020	
2002	2	14	2/14/02	0.020	
2002	2	15	2/15/02	0.019	
2002	2	16	2/16/02	0.021	
2002	2	17	2/17/02	7.614	3
2002	2	18	2/18/02	0.401	
2002	2	19	2/19/02	0.055	
2002	2	20	2/20/02	0.041	
2002	2	21	2/21/02	0.021	
2002	2	22	2/22/02	0.012	
2002	2	23	2/23/02	0.036	
2002	2	24	2/24/02	0.034	
2002	2	25	2/25/02	0.032	
2002	2	26	2/26/02	0.015	
2002	2	27	2/27/02	0.024	
2002	2	28	2/28/02	0.029	
2002	3	1	3/1/02	0.028	
2002	3	2	3/2/02	0.023	
2002	3	3	3/3/02	0.021	
2002	3	4	3/4/02	0.021	
2002	3	5	3/5/02	0.023	
2002	3	6	3/6/02	0.024	
2002	3	7	3/7/02	0.023	7
2002	3	8	3/8/02	0.021	1
2002	3	9	3/9/02	0.018	
2002	3	10	3/10/02	0.018	
2002	3	11	3/11/02	0.018	
2002	3	12	3/12/02	0.016	
2002	3	13	3/13/02	0.018	

Year	Month	Day	Date	Model Daily Average Flow	Measured Daily Average Flow
Units				cfs	cfs
2002	3	14	3/14/02	0.016	
2002	3	15	3/15/02	0.014	
2002	3	16	3/16/02	0.014	
2002	3	17	3/17/02	14.441	
2002	3	18	3/18/02	22.644	
2002	3	19	3/19/02	0.136	
2002	3	20	3/20/02	0.124	
2002	3	21	3/21/02	0.113	
2002	3	22	3/22/02	0.107	
2002	3	23	3/23/02	0.110	
2002	3	24	3/24/02	0.098	
2002	3	25	3/25/02	0.093	
2002	3	26	3/26/02	0.089	
2002	3	27	3/27/02	0.097	
2002	3	28	3/28/02	0.122	
2002	3	29	3/29/02	0.083	
2002	3	30	3/30/02	0.085	
2002	3	31	3/31/02	0.071	
2002	4	1	4/1/02	0.068	
2002	4	2	4/2/02	0.069	
2002	4	3	4/3/02	0.071	
2002	4	4	4/4/02	0.063	
2002	4	5	4/5/02	0.069	
2002	4	6	4/6/02	0.058	
2002	4	7	4/7/02	0.052	
2002	4	8	4/8/02	0.053	
2002	4	9	4/9/02	0.051	
2002	4	10	4/10/02	0.045	
2002	4	11	4/11/02	0.043	
2002	4	12	4/12/02	0.039	
2002	4	13	4/13/02	0.039	
2002	4	14	4/14/02	0.035	
2002	4	15	4/15/02	0.039	
2002	4	16	4/16/02	0.035	
2002	4	17	4/17/02	0.036	
2002	4	18	4/18/02	0.032	
2002	4	19	4/19/02	0.030	
2002	4	20	4/20/02	0.027	
2002	4	21	4/21/02	0.026	
2002	4	22	4/22/02	0.023	
2002	4	23	4/23/02	0.024	
2002	4	24	4/24/02	0.031	
2002	4	25	4/25/02	0.022	
2002	4	26	4/26/02	0.026	
2002	4	27	4/27/02	0.022	

Year	Month	Day	Date	Model Daily Average Flow	Measured Daily Average Flow
Units				cfs	cfs
2002	4	28	4/28/02	0.019	
2002	4	29	4/29/02	0.017	
2002	4	30	4/30/02	0.018	
2002	5	1	5/1/02	0.017	
2002	5	2	5/2/02	0.015	
2002	5	3	5/3/02	0.015	
2002	5	4	5/4/02	0.015	
2002	5	5	5/5/02	0.015	
2002	5	6	5/6/02	0.015	
2002	5	7	5/7/02	0.017	
2002	5	8	5/8/02	0.013	
2002	5	9	5/9/02	0.012	
2002	5	10	5/10/02	0.012	
2002	5	11	5/11/02	0.011	
2002	5	12	5/12/02	0.009	
2002	5	13	5/13/02	0.007	
2002	5	14	5/14/02	0.009	
2002	5	15	5/15/02	0.010	
2002	5	16	5/16/02	0.010	
2002	5	17	5/17/02	0.009	
2002	5	18	5/18/02	0.010	
2002	5	19	5/19/02	0.009	
2002	5	20	5/20/02	0.007	
2002	5	21	5/21/02	0.007	
2002	5	22	5/22/02	0.006	
2002	5	23	5/23/02	0.006	
2002	5	24	5/24/02	0.006	
2002	5	25	5/25/02	0.007	
2002	5	26	5/26/02	0.006	
2002	5	27	5/27/02	0.006	
2002	5	28	5/28/02	0.005	
2002	5	29	5/29/02	0.005	
2002	5	30	5/30/02	0.005	
2002	5	31	5/31/02	0.004	
2002	6	1	6/1/02	0.005	
2002	6	2	6/2/02	0.004	
2002	6	3	6/3/02	0.004	
2002	6	4	6/4/02	0.004	
2002	6	5	6/5/02	0.004	
2002	6	6	6/6/02	0.003	
2002	6	7	6/7/02	0.003	
2002	6	8	6/8/02	0.003	
2002	6	9	6/9/02	0.004	
2002	6	10	6/10/02	0.004	
2002	6	11	6/11/02	0.003	

Year	Month	Day	Date	Model Daily Average Flow	Measured Daily Average Flow
Units				cfs	cfs
2002	6	12	6/12/02	0.003	
2002	6	13	6/13/02	0.003	
2002	6	14	6/14/02	0.002	
2002	6	15	6/15/02	0.002	
2002	6	16	6/16/02	0.002	
2002	6	17	6/17/02	0.002	
2002	6	18	6/18/02	0.002	
2002	6	19	6/19/02	0.002	
2002	6	20	6/20/02	0.002	
2002	6	21	6/21/02	0.002	
2002	6	22	6/22/02	0.002	
2002	6	23	6/23/02	0.002	
2002	6	24	6/24/02	0.002	
2002	6	25	6/25/02	0.002	
2002	6	26	6/26/02	0.002	
2002	6	27	6/27/02	0.001	
2002	6	28	6/28/02	0.001	
2002	6	29	6/29/02	0.001	
2002	6	30	6/30/02	0.001	
2002	7	1	7/1/02	0.001	
2002	7	2	7/2/02	0.001	
2002	7	3	7/3/02	0.001	
2002	7	4	7/4/02	0.001	
2002	7	5	7/5/02	0.001	
2002	7	6	7/6/02	0.001	
2002	7	7	7/7/02	0.001	
2002	7	8	7/8/02	0.001	
2002	7	9	7/9/02	0.001	
2002	7	10	7/10/02	0.001	
2002	7	11	7/11/02	0.001	
2002	7	12	7/12/02	0.001	
2002	7	13	7/13/02	0.001	
2002	7	14	7/14/02	0.001	
2002	7	15	7/15/02	0.001	
2002	7	16	7/16/02	0.001	
2002	7	17	7/17/02	0.001	
2002	7	18	7/18/02	0.001	
2002	7	19	7/19/02	0.001	
2002	7	20	7/20/02	0.001	
2002	7	21	7/21/02	0.001	
2002	7	22	7/22/02	0.001	
2002	7	23	7/23/02	0.000	
2002	7	24	7/24/02	0.000	
2002	7	25	7/25/02	0.000	
2002	7	26	7/26/02	0.000	

Year	Month	Day	Date	Model Daily Average Flow	Measured Daily Average Flow
Units				cfs	cfs
2002	7	27	7/27/02	0.000	
2002	7	28	7/28/02	0.000	
2002	7	29	7/29/02	0.000	
2002	7	30	7/30/02	0.000	
2002	7	31	7/31/02	0.000	
2002	8	1	8/1/02	0.000	
2002	8	2	8/2/02	0.000	
2002	8	3	8/3/02	0.000	
2002	8	4	8/4/02	0.000	
2002	8	5	8/5/02	0.000	
2002	8	6	8/6/02	0.000	
2002	8	7	8/7/02	0.000	
2002	8	8	8/8/02	0.000	
2002	8	9	8/9/02	0.000	
2002	8	10	8/10/02	0.000	
2002	8	11	8/11/02	0.000	
2002	8	12	8/12/02	0.000	
2002	8	13	8/13/02	0.000	
2002	8	14	8/14/02	0.000	
2002	8	15	8/15/02	0.000	
2002	8	16	8/16/02	0.000	
2002	8	17	8/17/02	0.000	
2002	8	18	8/18/02	0.000	
2002	8	19	8/19/02	0.000	
2002	8	20	8/20/02	0.000	
2002	8	21	8/21/02	0.000	
2002	8	22	8/22/02	0.000	
2002	8	23	8/23/02	0.000	
2002	8	24	8/24/02	0.000	
2002	8	25	8/25/02	0.000	
2002	8	26	8/26/02	0.000	
2002	8	27	8/27/02	0.000	
2002	8	28	8/28/02	0.000	
2002	8	29	8/29/02	0.000	
2002	8	30	8/30/02	0.000	
2002	8	31	8/31/02	0.000	
2002	9	1	9/1/02	0.000	
2002	9	2	9/2/02	0.000	
2002	9	3	9/3/02	0.000	
2002	9	4	9/4/02	0.000	
2002	9	5	9/5/02	0.000	
2002	9	6	9/6/02	2.065	
2002	9	7	9/7/02	23.162	
2002	9	8	9/8/02	0.069	
2002	9	9	9/9/02	0.062	

Year	Month	Day	Date	Model Daily Average Flow	Measured Daily Average Flow
Units				cfs	cfs
2002	9	10	9/10/02	0.055	
2002	9	11	9/11/02	0.057	
2002	9	12	9/12/02	0.054	
2002	9	13	9/13/02	0.048	
2002	9	14	9/14/02	0.046	
2002	9	15	9/15/02	0.044	
2002	9	16	9/16/02	0.045	
2002	9	17	9/17/02	0.044	
2002	9	18	9/18/02	0.045	
2002	9	19	9/19/02	0.037	
2002	9	20	9/20/02	0.038	
2002	9	21	9/21/02	0.037	
2002	9	22	9/22/02	0.033	
2002	9	23	9/23/02	0.031	
2002	9	24	9/24/02	0.030	
2002	9	25	9/25/02	0.031	
2002	9	26	9/26/02	0.029	
2002	9	27	9/27/02	0.030	
2002	9	28	9/28/02	0.033	
2002	9	29	9/29/02	0.030	
2002	9	30	9/30/02	0.028	
2002	10	1	10/1/02	0.027	
2002	10	2	10/2/02	0.023	
2002	10	3	10/3/02	0.022	
2002	10	4	10/4/02	0.021	
2002	10	5	10/5/02	0.019	
2002	10	6	10/6/02	0.019	
2002	10	7	10/7/02	0.017	
2002	10	8	10/8/02	0.018	
2002	10	9	10/9/02	0.017	
2002	10	10	10/10/02	0.017	
2002	10	11	10/11/02	0.017	
2002	10	12	10/12/02	0.019	
2002	10	13	10/13/02	0.015	
2002	10	14	10/14/02	0.016	
2002	10	15	10/15/02	0.016	
2002	10	16	10/16/02	0.016	
2002	10	17	10/17/02	0.016	
2002	10	18	10/18/02	0.015	
2002	10	19	10/19/02	0.014	
2002	10	20	10/20/02	0.012	
2002	10	21	10/21/02	0.013	
2002	10	22	10/22/02	0.012	
2002	10	23	10/23/02	0.011	
2002	10	24	10/24/02	0.011	

Year	Month	Day	Date	Model Daily Average Flow	Measured Daily Average Flow
Units				cfs	cfs
2002	10	25	10/25/02	0.011	
2002	10	26	10/26/02	0.010	
2002	10	27	10/27/02	0.009	
2002	10	28	10/28/02	0.009	
2002	10	29	10/29/02	0.009	
2002	10	30	10/30/02	0.008	
2002	10	31	10/31/02	0.008	
2002	11	1	11/1/02	0.008	0
2002	11	2	11/2/02	0.007	0
2002	11	3	11/3/02	0.006	0
2002	11	4	11/4/02	0.007	0
2002	11	5	11/5/02	0.006	0
2002	11	6	11/6/02	0.006	0
2002	11	7	11/7/02	0.006	0
2002	11	8	11/8/02	3.241	35
2002	11	9	11/9/02	8.193	43
2002	11	10	11/10/02	0.967	13
2002	11	11	11/11/02	0.048	
2002	11	12	11/12/02	0.017	
2002	11	13	11/13/02	0.035	
2002	11	14	11/14/02	0.032	
2002	11	15	11/15/02	0.010	
2002	11	16	11/16/02	0.010	
2002	11	17	11/17/02	0.030	
2002	11	18	11/18/02	0.021	
2002	11	19	11/19/02	0.019	
2002	11	20	11/20/02	0.014	
2002	11	21	11/21/02	0.011	
2002	11	22	11/22/02	0.023	
2002	11	23	11/23/02	0.026	
2002	11	24	11/24/02	0.024	
2002	11	25	11/25/02	0.016	
2002	11	26	11/26/02	0.013	
2002	11	27	11/27/02	0.009	
2002	11	28	11/28/02	0.009	
2002	11	29	11/29/02	0.020	
2002	11	30	11/30/02	0.018	
2002	12	1	12/1/02	0.019	
2002	12	2	12/2/02	0.017	
2002	12	3	12/3/02	0.017	
2002	12	4	12/4/02	0.015	
2002	12	5	12/5/02	0.014	
2002	12	6	12/6/02	0.013	
2002	12	7	12/7/02	0.014	
2002	12	8	12/8/02	0.013	

Year	Month	Day	Date	Model Daily Average Flow	Measured Daily Average Flow
Units				cfs	cfs
2002	12	9	12/9/02	0.013	
2002	12	10	12/10/02	0.013	
2002	12	11	12/11/02	0.012	
2002	12	12	12/12/02	0.011	
2002	12	13	12/13/02	0.011	0
2002	12	14	12/14/02	0.011	0
2002	12	15	12/15/02	0.010	0
2002	12	16	12/16/02	0.010	30
2002	12	17	12/17/02	0.010	0
2002	12	18	12/18/02	0.009	0
2002	12	19	12/19/02	0.008	5
2002	12	20	12/20/02	0.010	0
2002	12	21	12/21/02	0.009	0
2002	12	22	12/22/02	0.008	0
2002	12	23	12/23/02	0.007	0
2002	12	24	12/24/02	0.008	0
2002	12	25	12/25/02	0.007	0
2002	12	26	12/26/02	0.007	0
2002	12	27	12/27/02	0.006	0
2002	12	28	12/28/02	0.006	0
2002	12	29	12/29/02	0.006	0
2002	12	30	12/30/02	0.006	0
2002	12	31	12/31/02	0.005	0
2003	1	1	1/1/03	0.004	0
2003	1	2	1/2/03	0.004	0
2003	1	3	1/3/03	0.004	0
2003	1	4	1/4/03	0.004	0
2003	1	5	1/5/03	0.004	0
2003	1	6	1/6/03	0.003	0
2003	1	7	1/7/03	0.003	0
2003	1	8	1/8/03	0.003	0
2003	1	9	1/9/03	0.003	0
2003	1	10	1/10/03	0.003	0
2003	1	11	1/11/03	0.003	
2003	1	12	1/12/03	0.003	
2003	1	13	1/13/03	0.003	
2003	1	14	1/14/03	0.002	
2003	1	15	1/15/03	0.002	
2003	1	16	1/16/03	0.002	
2003	1	17	1/17/03	0.002	
2003	1	18	1/18/03	0.002	
2003	1	19	1/19/03	0.002	
2003	1	20	1/20/03	0.002	
2003	1	21	1/21/03	0.002	
2003	1	22	1/22/03	0.002	

Year	Month	Day	Date	Model Daily Average Flow	Measured Daily Average Flow
Units				cfs	cfs
2003	1	23	1/23/03	0.001	
2003	1	24	1/24/03	0.001	
2003	1	25	1/25/03	0.001	
2003	1	26	1/26/03	0.001	
2003	1	27	1/27/03	0.001	
2003	1	28	1/28/03	0.001	
2003	1	29	1/29/03	0.001	
2003	1	30	1/30/03	0.001	
2003	1	31	1/31/03	0.001	
2003	2	1	2/1/03	0.001	
2003	2	2	2/2/03	0.001	
2003	2	3	2/3/03	0.001	
2003	2	4	2/4/03	0.001	
2003	2	5	2/5/03	0.001	
2003	2	6	2/6/03	0.001	
2003	2	7	2/7/03	0.001	0
2003	2	8	2/8/03	0.001	
2003	2	9	2/9/03	0.001	
2003	2	10	2/10/03	0.001	
2003	2	11	2/11/03	50.308	59
2003	2	12	2/12/03	153.553	
2003	2	13	2/13/03	116.327	
2003	2	14	2/14/03	55.564	
2003	2	15	2/15/03	2.439	
2003	2	16	2/16/03	2.031	
2003	2	17	2/17/03	1.739	
2003	2	18	2/18/03	1.538	
2003	2	19	2/19/03	1.410	
2003	2	20	2/20/03	1.244	
2003	2	21	2/21/03	1.120	
2003	2	22	2/22/03	1.042	
2003	2	23	2/23/03	0.943	
2003	2	24	2/24/03	0.866	0
2003	2	25	2/25/03	190.710	132
2003	2	26	2/26/03	28.383	13
2003	2	27	2/27/03	31.744	86
2003	2	28	2/28/03	8.011	31
2003	3	1	3/1/03	5.550	0
2003	3	2	3/2/03	4.193	10
2003	3	3	3/3/03	3.367	2
2003	3	4	3/4/03	2.781	31
2003	3	5	3/5/03	2.912	45
2003	3	6	3/6/03	2.097	5
2003	3	7	3/7/03	1.839	12
2003	3	8	3/8/03	1.629	20

Year	Month	Day	Date	Model Daily Average Flow	Measured Daily Average Flow
Units				cfs	cfs
2003	3	9	3/9/03	1.481	17
2003	3	10	3/10/03	1.373	12
2003	3	11	3/11/03	1.279	8
2003	3	12	3/12/03	1.164	8
2003	3	13	3/13/03	1.088	18
2003	3	14	3/14/03	1.018	10
2003	3	15	3/15/03	96.332	
2003	3	16	3/16/03	51.539	
2003	3	17	3/17/03	5.526	
2003	3	18	3/18/03	4.174	
2003	3	19	3/19/03	3.297	
2003	3	20	3/20/03	2.713	
2003	3	21	3/21/03	2.300	
2003	3	22	3/22/03	1.996	
2003	3	23	3/23/03	1.824	
2003	3	24	3/24/03	1.650	
2003	3	25	3/25/03	1.493	
2003	3	26	3/26/03	1.389	
2003	3	27	3/27/03	1.301	
2003	3	28	3/28/03	1.188	
2003	3	29	3/29/03	1.114	
2003	3	30	3/30/03	1.040	
2003	3	31	3/31/03	1.141	
2003	4	1	4/1/03	0.974	
2003	4	2	4/2/03	0.920	
2003	4	3	4/3/03	0.886	
2003	4	4	4/4/03	0.849	
2003	4	5	4/5/03	0.805	
2003	4	6	4/6/03	0.765	
2003	4	7	4/7/03	0.705	
2003	4	8	4/8/03	0.636	
2003	4	9	4/9/03	0.612	
2003	4	10	4/10/03	0.603	
2003	4	11	4/11/03	0.567	
2003	4	12	4/12/03	0.523	
2003	4	13	4/13/03	0.504	
2003	4	14	4/14/03	127.782	
2003	4	15	4/15/03	6.659	
2003	4	16	4/16/03	1.486	
2003	4	17	4/17/03	23.888	
2003	4	18	4/18/03	1.572	
2003	4	19	4/19/03	1.378	
2003	4	20	4/20/03	1.250	
2003	4	21	4/21/03	1.163	
2003	4	22	4/22/03	1.095	

Year	Month	Day	Date	Model Daily Average Flow	Measured Daily Average Flow
Units				cfs	cfs
2003	4	23	4/23/03	1.018	
2003	4	24	4/24/03	0.941	
2003	4	25	4/25/03	0.882	
2003	4	26	4/26/03	0.836	
2003	4	27	4/27/03	0.793	
2003	4	28	4/28/03	0.738	
2003	4	29	4/29/03	0.704	
2003	4	30	4/30/03	0.799	
2003	5	1	5/1/03	0.639	
2003	5	2	5/2/03	0.601	
2003	5	3	5/3/03	21.329	
2003	5	4	5/4/03	0.717	
2003	5	5	5/5/03	0.634	
2003	5	6	5/6/03	0.602	
2003	5	7	5/7/03	0.564	
2003	5	8	5/8/03	0.534	
2003	5	9	5/9/03	0.506	
2003	5	10	5/10/03	0.479	
2003	5	11	5/11/03	0.442	
2003	5	12	5/12/03	0.416	
2003	5	13	5/13/03	0.390	
2003	5	14	5/14/03	0.378	
2003	5	15	5/15/03	0.360	
2003	5	16	5/16/03	0.338	
2003	5	17	5/17/03	0.322	
2003	5	18	5/18/03	0.306	
2003	5	19	5/19/03	0.289	
2003	5	20	5/20/03	0.272	
2003	5	21	5/21/03	0.255	
2003	5	22	5/22/03	0.245	
2003	5	23	5/23/03	0.236	
2003	5	24	5/24/03	0.225	
2003	5	25	5/25/03	0.212	
2003	5	26	5/26/03	0.201	
2003	5	27	5/27/03	0.189	
2003	5	28	5/28/03	0.179	
2003	5	29	5/29/03	0.172	
2003	5	30	5/30/03	0.164	
2003	5	31	5/31/03	0.197	
2003	6	1	6/1/03	0.152	
2003	6	2	6/2/03	0.145	
2003	6	3	6/3/03	0.136	
2003	6	4	6/4/03	0.129	
2003	6	5	6/5/03	0.122	
2003	6	6	6/6/03	0.116	

Year	Month	Day	Date	Model Daily Average Flow	Measured Daily Average Flow
Units				cfs	cfs
2003	6	7	6/7/03	0.110	
2003	6	8	6/8/03	0.104	
2003	6	9	6/9/03	0.099	
2003	6	10	6/10/03	0.090	
2003	6	11	6/11/03	0.085	
2003	6	12	6/12/03	0.080	
2003	6	13	6/13/03	0.075	
2003	6	14	6/14/03	0.070	
2003	6	15	6/15/03	0.066	
2003	6	16	6/16/03	0.061	
2003	6	17	6/17/03	0.057	
2003	6	18	6/18/03	0.053	
2003	6	19	6/19/03	0.050	
2003	6	20	6/20/03	0.046	
2003	6	21	6/21/03	0.042	
2003	6	22	6/22/03	0.039	
2003	6	23	6/23/03	0.035	
2003	6	24	6/24/03	0.032	
2003	6	25	6/25/03	0.028	
2003	6	26	6/26/03	0.025	
2003	6	27	6/27/03	0.021	
2003	6	28	6/28/03	0.018	
2003	6	29	6/29/03	0.014	
2003	6	30	6/30/03	0.012	
2003	7	1	7/1/03	0.010	
2003	7	2	7/2/03	0.009	
2003	7	3	7/3/03	0.008	
2003	7	4	7/4/03	0.008	
2003	7	5	7/5/03	0.007	
2003	7	6	7/6/03	0.007	
2003	7	7	7/7/03	0.007	
2003	7	8	7/8/03	0.007	
2003	7	9	7/9/03	0.006	
2003	7	10	7/10/03	0.007	
2003	7	11	7/11/03	0.007	
2003	7	12	7/12/03	0.007	
2003	7	13	7/13/03	0.006	
2003	7	14	7/14/03	0.006	
2003	7	15	7/15/03	0.006	
2003	7	16	7/16/03	0.006	
2003	7	17	7/17/03	0.005	
2003	7	18	7/18/03	0.005	
2003	7	19	7/19/03	0.005	
2003	7	20	7/20/03	0.005	
2003	7	21	7/21/03	0.004	

Year	Month	Day	Date	Model Daily Average Flow	Measured Daily Average Flow
Units				cfs	cfs
2003	7	22	7/22/03	0.004	
2003	7	23	7/23/03	0.004	
2003	7	24	7/24/03	0.004	
2003	7	25	7/25/03	0.004	
2003	7	26	7/26/03	0.004	
2003	7	27	7/27/03	0.003	
2003	7	28	7/28/03	0.003	
2003	7	29	7/29/03	0.003	
2003	7	30	7/30/03	0.003	
2003	7	31	7/31/03	0.003	
2003	8	1	8/1/03	0.003	
2003	8	2	8/2/03	0.003	
2003	8	3	8/3/03	0.003	
2003	8	4	8/4/03	0.002	
2003	8	5	8/5/03	0.002	
2003	8	6	8/6/03	0.002	
2003	8	7	8/7/03	0.002	
2003	8	8	8/8/03	0.002	
2003	8	9	8/9/03	0.002	
2003	8	10	8/10/03	0.002	
2003	8	11	8/11/03	0.002	
2003	8	12	8/12/03	0.002	
2003	8	13	8/13/03	0.002	
2003	8	14	8/14/03	0.002	
2003	8	15	8/15/03	0.002	
2003	8	16	8/16/03	0.001	
2003	8	17	8/17/03	0.001	
2003	8	18	8/18/03	0.001	
2003	8	19	8/19/03	0.001	
2003	8	20	8/20/03	0.001	
2003	8	21	8/21/03	0.001	
2003	8	22	8/22/03	0.001	
2003	8	23	8/23/03	0.001	
2003	8	24	8/24/03	0.001	
2003	8	25	8/25/03	0.001	
2003	8	26	8/26/03	0.001	
2003	8	27	8/27/03	0.001	
2003	8	28	8/28/03	0.001	
2003	8	29	8/29/03	0.001	
2003	8	30	8/30/03	0.001	
2003	8	31	8/31/03	0.001	
2003	9	1	9/1/03	0.001	
2003	9	2	9/2/03	0.001	
2003	9	3	9/3/03	0.001	
2003	9	4	9/4/03	0.001	

Year	Month	Day	Date	Model Daily Average Flow	Measured Daily Average Flow
Units				cfs	cfs
2003	9	5	9/5/03	0.001	
2003	9	6	9/6/03	0.001	
2003	9	7	9/7/03	0.001	
2003	9	8	9/8/03	0.001	
2003	9	9	9/9/03	0.001	
2003	9	10	9/10/03	0.001	
2003	9	11	9/11/03	0.000	
2003	9	12	9/12/03	0.000	
2003	9	13	9/13/03	0.000	
2003	9	14	9/14/03	0.000	
2003	9	15	9/15/03	0.000	
2003	9	16	9/16/03	0.000	
2003	9	17	9/17/03	0.000	
2003	9	18	9/18/03	0.000	
2003	9	19	9/19/03	0.000	
2003	9	20	9/20/03	0.000	
2003	9	21	9/21/03	0.000	
2003	9	22	9/22/03	0.000	
2003	9	23	9/23/03	0.000	
2003	9	24	9/24/03	0.000	
2003	9	25	9/25/03	0.000	
2003	9	26	9/26/03	0.000	
2003	9	27	9/27/03	0.000	
2003	9	28	9/28/03	0.000	
2003	9	29	9/29/03	0.000	
2003	9	30	9/30/03	0.000	
2003	10	1	10/1/03	0.000	
2003	10	2	10/2/03	0.000	
2003	10	3	10/3/03	0.000	
2003	10	4	10/4/03	0.000	
2003	10	5	10/5/03	0.000	
2003	10	6	10/6/03	0.000	
2003	10	7	10/7/03	0.000	
2003	10	8	10/8/03	0.000	
2003	10	9	10/9/03	0.000	
2003	10	10	10/10/03	0.000	
2003	10	11	10/11/03	0.000	
2003	10	12	10/12/03	0.000	
2003	10	13	10/13/03	0.000	
2003	10	14	10/14/03	0.000	
2003	10	15	10/15/03	0.000	
2003	10	16	10/16/03	0.000	
2003	10	17	10/17/03	0.000	
2003	10	18	10/18/03	0.000	
2003	10	19	10/19/03	0.000	

Year	Month	Day	Date	Model Daily Average Flow	Measured Daily Average Flow
Units				cfs	cfs
2003	10	20	10/20/03	0.000	
2003	10	21	10/21/03	0.000	
2003	10	22	10/22/03	0.000	
2003	10	23	10/23/03	0.000	
2003	10	24	10/24/03	0.000	
2003	10	25	10/25/03	0.000	
2003	10	26	10/26/03	0.000	
2003	10	27	10/27/03	0.000	
2003	10	28	10/28/03	0.000	
2003	10	29	10/29/03	0.000	
2003	10	30	10/30/03	0.000	
2003	10	31	10/31/03	0.000	
2003	11	1	11/1/03	0.000	
2003	11	2	11/2/03	0.000	
2003	11	3	11/3/03	0.000	
2003	11	4	11/4/03	0.000	
2003	11	5	11/5/03	0.000	
2003	11	6	11/6/03	0.000	
2003	11	7	11/7/03	0.000	
2003	11	8	11/8/03	0.000	
2003	11	9	11/9/03	0.000	
2003	11	10	11/10/03	0.000	
2003	11	11	11/11/03	0.000	
2003	11	12	11/12/03	15.002	
2003	11	13	11/13/03	0.056	
2003	11	14	11/14/03	0.047	
2003	11	15	11/15/03	0.039	
2003	11	16	11/16/03	0.038	
2003	11	17	11/17/03	0.036	
2003	11	18	11/18/03	0.035	
2003	11	19	11/19/03	0.033	
2003	11	20	11/20/03	0.033	
2003	11	21	11/21/03	0.031	
2003	11	22	11/22/03	0.030	
2003	11	23	11/23/03	0.030	
2003	11	24	11/24/03	0.029	
2003	11	25	11/25/03	0.028	
2003	11	26	11/26/03	0.026	
2003	11	27	11/27/03	0.025	
2003	11	28	11/28/03	0.026	
2003	11	29	11/29/03	0.025	
2003	11	30	11/30/03	0.024	
2003	12	1	12/1/03	0.023	
2003	12	2	12/2/03	0.022	
2003	12	3	12/3/03	0.021	

Year	Month	Day	Date	Model Daily Average Flow	Measured Daily Average Flow
Units				cfs	cfs
2003	12	4	12/4/03	0.020	
2003	12	5	12/5/03	0.019	
2003	12	6	12/6/03	0.019	
2003	12	7	12/7/03	0.018	
2003	12	8	12/8/03	0.017	
2003	12	9	12/9/03	0.016	
2003	12	10	12/10/03	0.016	
2003	12	11	12/11/03	0.015	
2003	12	12	12/12/03	0.014	
2003	12	13	12/13/03	0.014	
2003	12	14	12/14/03	0.013	
2003	12	15	12/15/03	0.013	
2003	12	16	12/16/03	0.012	
2003	12	17	12/17/03	0.012	
2003	12	18	12/18/03	0.011	
2003	12	19	12/19/03	0.011	
2003	12	20	12/20/03	0.010	
2003	12	21	12/21/03	0.010	
2003	12	22	12/22/03	0.009	
2003	12	23	12/23/03	0.009	
2003	12	24	12/24/03	0.278	
2003	12	25	12/25/03	43.532	
2003	12	26	12/26/03	0.878	
2003	12	27	12/27/03	0.154	
2003	12	28	12/28/03	0.146	
2003	12	29	12/29/03	0.139	
2003	12	30	12/30/03	0.133	

Table 2. Modeled Flow vs Measured Flows

Date	Model Daily Average Flow -cfs	Observed Daily Average Flow - cfs	Percent Difference -%, difference of observed from model over observed	Actual Difference -cfs, observed from model
11/29/01	2.801	18	-84.4%	-15.20
2/17/02	7.614	3	153.8%	4.61
3/7/02	0.023	7	-99.7%	-6.98
11/8/02	3.241	35	-90.7%	-31.76
11/9/02	8.193	43	-80.9%	-34.81
11/10/02	0.967	13	-92.6%	-12.03
12/16/02	0.010	30	-99.97%	-29.99
12/19/02	0.008	5	-99.8%	-4.99
2/11/03	50.308	59	-14.7%	-8.69
2/25/03	190.710	132	44.5%	58.71
2/26/03	28.383	13	118.3%	15.38
2/27/03	31.744	86	-63.1%	-54.26
2/28/03	8.011	31	-74.2%	-22.99
3/2/03	4.193	10	-58.1%	-5.81
3/3/03	3.367	2	68.4%	1.37
3/4/03	2.781	31	-91.0%	-28.22
3/5/03	2.912	45	-93.5%	-42.09
3/6/03	2.097	5	-58.1%	-2.90
3/7/03	1.839	12	-84.7%	-10.16
3/8/03	1.629	20	-91.9%	-18.37
3/9/03	1.481	17	-91.3%	-15.52
3/10/03	1.373	12	-88.6%	-10.63
3/11/03	1.279	8	-84.0%	-6.72
3/12/03	1.164	8	-85.5%	-6.84
3/13/03	1.088	18	-94.0%	-16.91
3/14/03	1.018	10	-89.8%	-8.98

Table 3. Modeled Volume vs. Measured Volume

Date	Changing Model Values to Daily Volume, cf	Changing Observed Values to Daily Volume, cf
11/29/01	241996	1555200
2/17/02	657867	259200
3/7/02	1982	604800
11/8/02	280035	3024000
11/9/02	707867	3715200
11/10/02	83510	1123200
12/16/02	904	2592000
12/19/02	715	432000
2/11/03	4346577	5097600
2/25/03	16477344	11404800
2/26/03	2452326	1123200
2/27/03	2742682	7430400
2/28/03	692118	2678400
3/2/03	362239	864000
3/3/03	290940	172800
3/4/03	240244	2678400
3/5/03	251590	3888000
3/6/03	181142	432000
3/7/03	158903	1036800
3/8/03	140781	1728000
3/9/03	127993	1468800
3/10/03	118657	1036800
3/11/03	110532	691200
3/12/03	100566	691200
3/13/03	94005	1555200
3/14/03	87948	864000

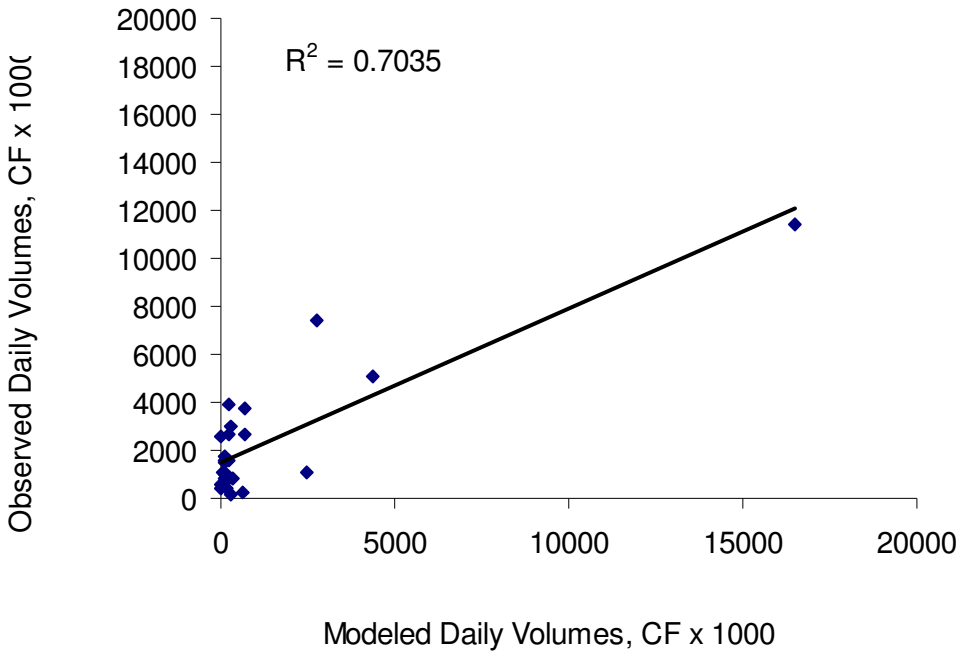

Figure 1. Measured Daily Volumes vs Modeled Daily Volumes

Table 4. Modeled Total Volume vs Measured Total Volume

Total Modeled Volumes for 26 days, L	Total Observed Volumes for 26 days, L	Percent Difference -%, difference of observed from model over observed	Actual Difference -L, observed from model
876421612	1646496115	47%	-770074503

Table 5. Comparison of Modeled and Measured Flows

Statistics of Directly Comparable Model Values to Observed Values Above CFS of 2.28 (26 Values)		Statistics of Observed Values Above CFS of 2.28 (26 Values)	
Mean	14	Mean	26
Median	2	Median	15
25th	1	25th	9
75th	7	75th	31
STDEV	38	STDEV	29
Statistics of Percent Differences		**Statistics of Actual Differences**	
Mean	-55%	Mean	-12
Median	-85%	Median	-10
25th	-92%	25th	-22
75th	-59%	75th	-6
STDEV	0.70	STDEV	21

Table 6. Modeled Water Quality, All Values.

Number	Date	Flow	Total Copper	Total Lead	Total Zinc
			µg/L	µg/L	µg/L
19004	2/17/94	80.6874	14	14	78
19004	3/24/94	77.9417	6	6	35
19004	4/24/94	15.4465	32	34	175
19004	11/10/94	14.4909	24	24	134
19004	1/11/95	47.9248	5	5	30
19004	2/14/95	285.361	31	31	173
19004	4/16/95	47.6048	32	32	176
19004	11/1/95	24.6359	74	76	408
19004	12/9/96	10.7718	19	18	106
19004	1/16/97	1.78252	1	0	4
19004	12/6/97	51.7472	53	53	294
19004	3/14/98	2.98883	0	0	0
19004	11/8/98	28.7118	41	42	228
19004	1/25/99	88.7292	42	43	231
19004	3/15/99	8.14882	39	39	216
19004	2/12/00	45.11	43	44	237
19004	2/21/00	216.509	22	22	121
19004	3/5/00	79.8623	24	24	134
19004	4/17/00	41.7563	21	22	118
19004	10/27/00	37.9718	28	28	157
19004	1/8/01	28.0362	26	26	142
19004	2/13/01	54.4753	50	50	280
19004	11/12/01	10.5909	17	18	95
19004	11/29/01	2.80088	32	32	175
19004	2/17/02	7.6142	53	54	293
19004	11/8/02	3.24115	33	34	183
19004	2/11/03	50.3076	38	38	206
19004	2/25/03	190.71	23	23	129
19006	2/12/00	13.2766	63	74	316
19006	2/21/00	63.4845	25	28	128
19006	1/8/01	8.38546	31	36	157
19006	2/13/01	16.4391	57	64	293
19006	11/12/01	3.47155	17	20	89
19014	1/8/01	0.866875	27	32	151
19014	2/13/01	1.68843	51	59	292
19014	11/12/01	0.362798	12	14	69
19016	2/12/00	7.75739	33	33	181
19016	2/21/00	37.1424	17	16	93
19016	1/8/01	4.87796	17	17	96
19016	2/13/01	9.55507	38	36	212
19016	11/12/01	1.94136	11	10	58
19018	1/8/01	11.6857	22	19	125
19018	2/13/01	22.7255	46	40	267
19018	11/12/01	4.22921	16	14	91
19024	2/12/00	30.7277	40	38	221

Number	Date	Flow	Total Copper	Total Lead	Total Zinc
			µg/L	µg/L	µg/L
19024	2/21/00	150.342	21	20	120
19024	1/8/01	18.9028	28	26	154
19024	2/13/01	37.2259	50	47	282
19024	11/12/01	7.10023	18	17	102
19026	1/8/01	14.8463	25	23	140
19026	2/13/01	29.3028	48	44	275
19026	11/12/01	5.99581	16	15	91
19028	2/12/00	9.20883	60	60	332
19028	2/21/00	44.0897	28	27	159
19028	1/8/01	5.8327	31	30	169
19028	2/13/01	11.6731	60	56	334
19028	11/12/01	2.49796	15	15	85
19035	2/12/00	2.48031	20	18	110
19035	2/21/00	11.9094	11	10	64
19035	1/8/01	1.57353	10	9	58
19035	2/13/01	3.18453	24	22	134
19035	11/12/01	0.668691	6	6	35

Table 7. Observed Water Quality, All Values.

Subwatershed Number	Date	Total Copper	Total Lead	Total Zinc
		µg/L	µg/L	µg/L
19004	2/17/94	34	110	260
19004	3/24/94	29	140	240
19004	4/24/94	44	70	320
19004	11/10/94	36	35	180
19004	1/11/95	17	44	150
19004	2/14/95	40	110	360
19004	4/16/95	85	140	560
19004	11/1/95	46	23	25
19004	12/9/96	20	16	70
19004	1/16/97	10	58	200
19004	12/6/97	28	42	110
19004	3/14/98	28	95	92
19004	11/8/98	6	1	30
19004	1/25/99	5	7	48
19004	3/15/99	15	82	210
19004	2/12/00	29	15	96
19004	2/21/00	16	1	50
19004	3/5/00	16	1	50
19004	4/17/00	14	5	80
19004	10/27/00	27	22	150
19004	1/8/01	57	69	255
19004	2/13/01	16	25	110
19004	11/12/01	97	94	740
19004	11/29/01	27	28	162
19004	2/17/02	53	32	314

Subwatershed Number	Date	Total Copper	Total Lead	Total Zinc
		µg/L	µg/L	µg/L
19004	11/8/02	28	17	118
19004	2/11/03	33	29	230
19004	2/25/03	16	23	154
19006	2/12/00	68	34	160
19006	2/21/00	23	23	180
19006	1/8/01	52	91	420
19006	2/13/01	16	29	100
19006	11/12/01	49	39	370
19014	1/8/01	36	21	230
19014	2/13/01	19	18	110
19014	11/12/01	37	12	200
19016	2/12/00	68	52	300
19016	2/21/00	19	19	160
19016	1/8/01	65	90	480
19016	2/13/01	15	21	110
19016	11/12/01	45	52	300
19018	1/8/01	70	68	660
19018	2/13/01	38	53	280
19018	11/12/01	42	29	340
19024	2/12/00	33	83	327
19024	2/21/00	19	26	81
19024	1/8/01	56	59	360
19024	2/13/01	41	61	280
19024	11/12/01	32	19	180
19026	1/8/01	32	27	190
19026	2/13/01	17	23	120
19026	11/12/01	170	270	1400
19028	2/12/00	43	76	370
19028	2/21/00	27	35	10
19028	1/8/01	37	29	260
19028	2/13/01	33	59	270
19028	11/12/01	180	170	1900
19035	2/12/00	23	16	100
19035	2/21/00	10	10	54
19035	1/8/01	32	19	160
19035	2/13/01	10	9	55
19035	11/12/01	49	36	290

Table 8. Percent Differences for Water Qualities with Flows Over 2.28 cfs.

Subwatershed Number	Date	Total Copper	Total Lead	Total Zinc
		%	%	%
19004	2/17/94	-59%	-87%	-70%
19004	3/24/94	-78%	-95%	-85%
19004	4/24/94	-27%	-51%	-45%
19004	11/10/94	-33%	-32%	-25%
19004	1/11/95	-68%	-88%	-80%
19004	2/14/95	-22%	-72%	-52%
19004	4/16/95	-63%	-77%	-69%
19004	11/1/95	62%	231%	1534%
19004	12/9/96	-6%	15%	51%
19004	12/6/97	89%	26%	167%
19004	3/14/98	-100%	-100%	-100%
19004	11/8/98	591%	4097%	660%
19004	1/25/99	741%	513%	381%
19004	3/15/99	161%	-52%	3%
19004	2/12/00	49%	195%	147%
19004	2/21/00	37%	2105%	142%
19004	3/5/00	50%	2292%	168%
19004	4/17/00	53%	335%	47%
19004	10/27/00	5%	28%	4%
19004	1/8/01	-54%	-62%	-44%
19004	2/13/01	215%	106%	154%
19004	11/12/01	-82%	-81%	-87%
19004	11/29/01	18%	14%	8%
19004	2/17/02	1%	68%	-7%
19004	11/8/02	19%	99%	55%
19004	2/11/03	14%	32%	-10%
19004	2/25/03	45%	1%	-16%
19006	2/12/00	-8%	116%	97%
19006	2/21/00	8%	22%	-29%
19006	1/8/01	-40%	-61%	-63%
19006	2/13/01	255%	119%	193%
19006	11/12/01	-64%	-49%	-76%
19016	2/12/00	-51%	-37%	-40%
19016	2/21/00	-10%	-14%	-42%
19016	1/8/01	-73%	-81%	-80%
19016	2/13/01	156%	73%	93%
19018	1/8/01	-69%	-73%	-81%
19018	2/13/01	21%	-25%	-5%
19018	11/12/01	-63%	-53%	-73%
19024	2/12/00	20%	-54%	-32%
19024	2/21/00	12%	-23%	49%
19024	1/8/01	-51%	-56%	-57%
19024	2/13/01	22%	-24%	1%
19024	11/12/01	-43%	-10%	-43%
19026	1/8/01	-23%	-14%	-26%

Subwatershed Number	Date	Total Copper	Total Lead	Total Zinc
		%	%	%
19026	2/13/01	183%	92%	129%
19026	11/12/01	-91%	-95%	-94%
19028	2/12/00	41%	-21%	-10%
19028	2/21/00	5%	-24%	1489%
19028	1/8/01	-17%	4%	-35%
19028	2/13/01	81%	-5%	24%
19028	11/12/01	-91%	-91%	-96%
19035	2/12/00	-14%	12%	10%
19035	2/21/00	15%	4%	19%
19035	2/13/01	141%	143%	145%

Table 9. Actual Differences for Water Qualities with Flows Over 2.28 cfs.

Subwatershed Number	Date	Total Copper	Total Lead	Total Zinc
		µg/L	µg/L	µg/L
19004	2/17/94	-20	-96	-182
19004	3/24/94	-23	-134	-205
19004	4/24/94	-12	-36	-145
19004	11/10/94	-12	-11	-46
19004	1/11/95	-12	-39	-120
19004	2/14/95	-9	-79	-187
19004	4/16/95	-53	-108	-384
19004	11/1/95	28	53	383
19004	12/9/96	-1	2	36
19004	12/6/97	25	11	184
19004	3/14/98	-28	-95	-92
19004	11/8/98	35	41	198
19004	1/25/99	37	36	183
19004	3/15/99	24	-43	6
19004	2/12/00	14	29	141
19004	2/21/00	6	21	71
19004	3/5/00	8	23	84
19004	4/17/00	7	17	38
19004	10/27/00	1	6	7
19004	1/8/01	-31	-43	-113
19004	2/13/01	34	26	170
19004	11/12/01	-80	-76	-645
19004	11/29/01	5	4	13
19004	2/17/02	0	22	-21
19004	11/8/02	5	17	65
19004	2/11/03	5	9	-24
19004	2/25/03	7	0	-25
19006	2/12/00	-5	40	156
19006	2/21/00	2	5	-52
19006	1/8/01	-21	-55	-263
19006	2/13/01	41	35	193
19006	11/12/01	-32	-19	-281
19016	2/12/00	-35	-19	-119
19016	2/21/00	-2	-3	-67
19016	1/8/01	-48	-73	-384
19016	2/13/01	23	15	102
19018	1/8/01	-48	-49	-535
19018	2/13/01	8	-13	-13
19018	11/12/01	-26	-15	-249
19024	2/12/00	7	-45	-106
19024	2/21/00	2	-6	39
19024	1/8/01	-28	-33	-206
19024	2/13/01	9	-14	2
19024	11/12/01	-14	-2	-78
19026	1/8/01	-7	-4	-50

Subwatershed Number	Date	Total Copper	Total Lead	Total Zinc
		µg/L	µg/L	µg/L
19026	2/13/01	31	21	155
19026	11/12/01	-154	-255	-1309
19028	2/12/00	17	-16	-38
19028	2/21/00	1	-8	149
19028	1/8/01	-6	1	-91
19028	2/13/01	27	-3	64
19028	11/12/01	-165	-155	-1815
19035	2/12/00	-3	2	10
19035	2/21/00	1	0	10
19035	2/13/01	14	13	79

Table 10. Water Quality Statistical Summary of Modeled and Observed Data Sets and Percent and Actual Differences.

Statistics of Modeled Values (55 values)	Copper - ug/L	Lead -ug/L	Zinc -ug/L	**Statistics of Modeled Values that directly compared to Observed Values (55 values)**	Copper -ug/L	Lead -ug/L	Zinc -ug/L
Mean	31	31	170	Mean	39	51	270
Median	28	28	157	Median	32	32	180
25th	19	18	100	25th	18	22	100
75th	40	45	317	75th	45	70	320
Statistics of Percent Differences (55 Values)	Copper -%	Lead -%	Zinc -%	**Statistics of Actual Differences (55 Values)**	Copper -ug/L	Lead -ug/L	Zinc -ug/L
Mean	33%	166%	76%	Mean	-8.1	-20.0	-96.5
Median	5%	-14%	-10%	Median	1.3	-3.1	-23.9
25th	-51%	-55%	-55%	25th	-21	-41	-132
75th	47%	71%	74%	75th	8.5	14.1	68.0

Table 11. Calculated Loads for Modeled and Observed Values.

Sub watershed Number	**Date**	**Flow Volume**	**Total Copper**	**Total Lead**	**Total Zinc**	**Total Copper**	**Total Lead**	**Total Zinc**
			Modeled	**Modeled**	**Modeled**	**Observed**	**Observed**	**Observed**
Units		**L**	**g**	**g**	**g**	**g**	**g**	**g**
19004	11/29/01	6,852,360	217	219	1197	185	192	1110
19004	2/17/02	18,628,159	992	1003	5452	987	596	5849
19004	11/8/02	7,929,481	264	268	1451	222	135	936
19004	2/11/03	123,077,664	4629	4724	25361	4062	3569	28308
19004	2/25/03	466,572,473	10789	10856	60216	7465	10731	71852

Table 12. Percent and Actual Differences Between Model and Observed Values in Table B-11.

Subwatershed Number	**Date**	**Total Copper**	**Total Lead**	**Total Zinc**	**Total Copper**	**Total Lead**	**Total Zinc**
		Percent Difference	**Percent Difference**	**Percent Difference**	**Actual Difference**	**Actual Difference**	**Actual Difference**
Units		**%**	**%**	**%**	**g**	**g**	**g**
19004	11/29/01	18%	14%	8%	32.48	27	87
19004	2/17/02	0.5%	68%	-7%	5.0	407	(397)
19004	11/8/02	19%	99%	55%	42.27	132.8	515
19004	2/11/03	14%	32%	-10%	567	1,154	(2,947)
19004	2/25/03	45%	1.2%	-16%	3,324	125	(11,636)

Appendix G

Metals Concentration Reduction Percentages

Required to Meet the Chollas Creek Metals Total Maximum Daily Loads

California Regional Water Quality Control Board, San Diego Region

Metals Concentration Reduction Percentages Required to Meet the Total Maximum Daily Load for Metals in Chollas Creek

The load allocation (LA) and waste load allocations (WLA) of the copper, lead, and zinc Total Maximum Daily Loads (TMDL) for Chollas Creek establish concentrations of copper, lead, and zinc that are protective of aquatic life beneficial uses in Chollas Creek.[1] Because the concentrations protective of aquatic life vary with hardness, the allocations in this TMDL are expressed as formulas that incorporate a hardness term, rather than as a constant concentration. To achieve Water Quality Objectives (WQOs) in the creek, concentrations of copper, lead and zinc must be significantly lower than presently measured. The potential ranges of the reductions should be thoroughly considered, as they will have practical implications on the feasibility and nature of implementation scenarios. Using concentration and hardness data from Chollas Creek, the likely range of metals concentration reduction percentages needed to meet the WQOs for copper, lead and zinc were calculated.

The Numeric Targets for copper, lead and zinc are presented in Table G.1 and are discussed in detail in the Technical Report. Concentrations of metals in Chollas Creek will be compared against the WQOs to assess compliance with this TMDL Project. The TMDLs (equal to the WLA and LA) for copper, lead, and zinc are listed in Table G.2. All discharges to Chollas Creek will be expected to meet this WLA and LA. Average and median concentrations of copper, lead and zinc currently exceed the proposed load and waste load allocations (Table G.3). The data used to calculate the mean and median concentrations can be found in Appendix A. To calculate the percent reductions required to meet the allocations, the following formula was applied:

$$\text{Percent Reduction} = \frac{(\text{Measured Concentration - WQO})}{\text{Measured Concentration}} \times 100$$

The loading capacity of Chollas Creek is equal to the Numeric Targets that are equal to either the Criteria Maximum Concentration (CMC) or Criteria Continuous Concentration (CCC) calculated from the hardness that is associated with the measured concentration of metal.

Example:

Mean Measured Copper Concentration = 16.6 µg/L
Mean Measured Hardness = 198.2 mg/L
At this hardness;
CCC = 16.1 µg/L
Percent Reduction = [(16.64 – 16.1) / 16.64] * 100 = 3.4%
CMC = 25.6 µg/L
Percent Reduction = [(16.64 – 25.6) / 16.64] * 100 = -54.2%

Therefore, if water quality conditions are equal to the mean copper concentration and mean hardness, the ambient copper concentration would need to be decreased by 3.4 percent to achieve the allowable chronic concentration and would not exceed the allowable maximum

[1] In this concentration based TMDL, the LAs and WLAs are equal to the same concentration, and can vary depending on hardness. The LAs and WLAs are not additive.

concentration. Negative percent reductions in Table G.2 indicate that the proposed WQOs are met and a reduction is not needed.

TABLE G.1. Numeric Targets for dissolved copper, lead and zinc for acute and chronic conditions

Metal	**Numeric Target for Acute Conditions: Criteria Maximum Concentration**	**Numeric Target for Chronic Conditions: Criteria Continuous Concentration**
Copper	(0.96) * {e^ [0.9422 * ln (hardness) - 1.700]}	(0.96) * {e^[0.8545 * ln (hardness) - 1.702]}
Lead	(1) * {1.46203 – [0.145712 * ln (hardness)]} * {e^ [1.273 * ln (hardness) - 1.460]}	{1.46203 – [0.145712 * ln (hardness)]} * {e^[1.273 * ln (hardness) - 4.705]}
Zinc	(0.978) * {e^ [0.8473 * ln (hardness) + 0.884]}	(0.986) * {e^[0.8473 * ln (hardness) + 0.884]}

TABLE G.2. The Wasteload and Load Allcoations for dissolved copper, lead and zinc for acute and chronic conditions

Metal	**Allocations for Acute Conditions – One-Hour Average (LA = WLA = 0.9 * Numeric Target)**	**Allocations for Chronic Conditions – Four-Day Average (LA = WLA = 0.9 * Numeric Target)**
Copper	(0.96) * {e^ [0.9422 * ln (hardness) - 1.700]}*0.9	(0.96) * {e^[0.8545 * ln (hardness) - 1.702]}*0.9
Lead	[1.46203 – 0.145712 * ln (hardness)] * {e^ [1.273 * ln (hardness) - 1.460]} * 0.9	[1.46203 – 0.145712 * ln (hardness)] * {e^[{1.273 * ln (hardness)} - 4.705]} * 0.9
Zinc	(0.978) * {e^ [0.8473 * ln (hardness) + 0.884]} * 0.9	(0.986) * {e^[0.8473 * ln (hardness) + 0.884]} * 0.9

WLA = Waste Load Allocation LA = Load Allocation

Table G.3 is for illustrative purposes to frame the potential ranges of reductions in metal concentrations required to meet the proposed WQOs. Many of the scenarios presented do not result in a required reduction.

Table G.3. Average metal concentrations, hardness, associated allocations and percent reductions required

Metal	Total Hardness as $CaCO_3$ (mg/L)	CMC Freshwater CF (Acute Dissolved)	WQO (ug/L) (Acute Dissolved)	LA and WLA (Acute Dissolved)	CCC Freshwater CF (Chronic Dissolved)	WQO (ug/L) (Chronic Dissolved)	LA and WLA (Chronic Dissolved)	Measured Concentration Dissolved (ug/L)	Percent Reduction Required to meet WQO CMC	Percent Reduction Required to meet WQO CCC
Copper										
Minimum*	42.5	0.96	6.0	5.4	0.96	4.3	3.9	2.4	-150.1%	-79.6%
Median^	90.8	0.96	12.3	11.0	0.96	8.2	7.4	10.0	-22.7%	**17.5%**
Mean^	198.2	0.96	25.6	23.0	0.96	16.1	14.5	16.6	-53.9%	**3.4%**
Maximum*	120.0	0.96	16.0	14.4	0.96	10.5	9.4	81.6	**80.4%**	**87.2%**
Lead										
Minimum*	35.1	0.944	20.32	18.3	0.944	0.79	0.7	0.50	-3963.5%	-58.4%
Median^	88.9	0.808	56.80	51.1	0.808	2.21	2.0	3.00	-1793.4%	**26.2%**
Mean^	199.8	0.690	135.99	122.4	0.690	5.30	4.8	14.29	-851.6%	**62.9%**
Maximum*	71.0	0.841	44.39	40.0	0.841	1.73	1.6	118.00	**62.4%**	**98.5%**
Zinc										
Minimum*	484.0	0.978	446	401.2	0.986	449	404.5	3.0	-14759.5%	-14881.0%
Median^	90.8	0.978	108	97.2	0.986	109	98.0	66.5	-62.4%	-63.7%
Mean^	200.2	0.978	211	189.9	0.986	213	191.4	102.2	-106.5%	-108.1%
Maximum*	120.0	0.978	137	123.1	0.986	138	124.1	548.0	**75.0%**	**74.8%**

* Uses measured hardness that corresponds to max and min measured metal concentrations
^ Hardness listed is the statistical median or mean, respectively.
CCC = Criteria Continuous Concentration
CMC = Criteria Maximum Concentration
CF = Conversion Factor
LA = Load Allocation
WLA = Waste Load Allocation
WQO = Water Quality Objective

Figures G.1 through G.3 present the available metals data plotted against the associated hardness. The graphs also show CMC and CCC WQOs required at hardness concentrations from 25 to 400 mg/L.[2] These views of the data better illustrate that the majority of the metals concentration reductions need to occur at the lower hardness concentrations. Both the CMC (acute) and CCC (chronic) WQOs for all metals are exceeded within the lower range of measured hardness.

Thirty-six of eighty-one (39.5 percent) measured copper samples exceed the proposed acute WQO and forty-four (50.5 percent) exceed the proposed chronic WQO. The vast majority of the exceedances occur at or below a hardness of 150 mg/L. The maximum percent reduction required is approximately 90 percent for both the acute and chronic WQOs. The average reduction required is approximately 50 percent to meet the chronic WQO and 40 percent to meet the acute WQO. There is some good news in that almost half of the measured copper samples would not require a reduction under the proposed WQOs.

Eleven of seventy-nine (13.9 percent) measured lead samples exceed the proposed acute WQO and forty-three (54.4 percent) exceed the proposed chronic WQO. The vast majority of the exceedances occur at or below a hardness of 120 mg/L. The maximum percent reduction required is approximately 99 percent for the chronic WQO and 62 percent for the acute WQO. The average reduction required is approximately 66 percent to meet the chronic WQO and 25 percent to meet the acute WQO. Almost half of the measured lead samples

[2] This is the range of hardness that is appropriate for use in the California Toxics Rule (40 CFR 131.38).

would not require a reduction to meet the proposed chronic WQO and over 85 percent would already meet the proposed acute WQO.

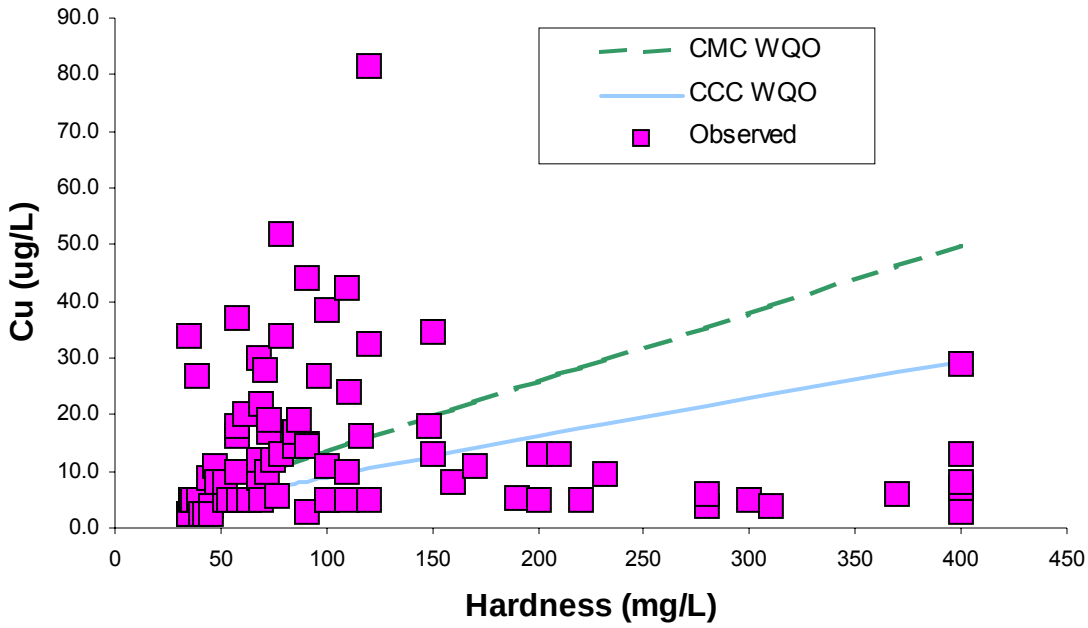

Figure G.1. Copper concentrations in Chollas Creek

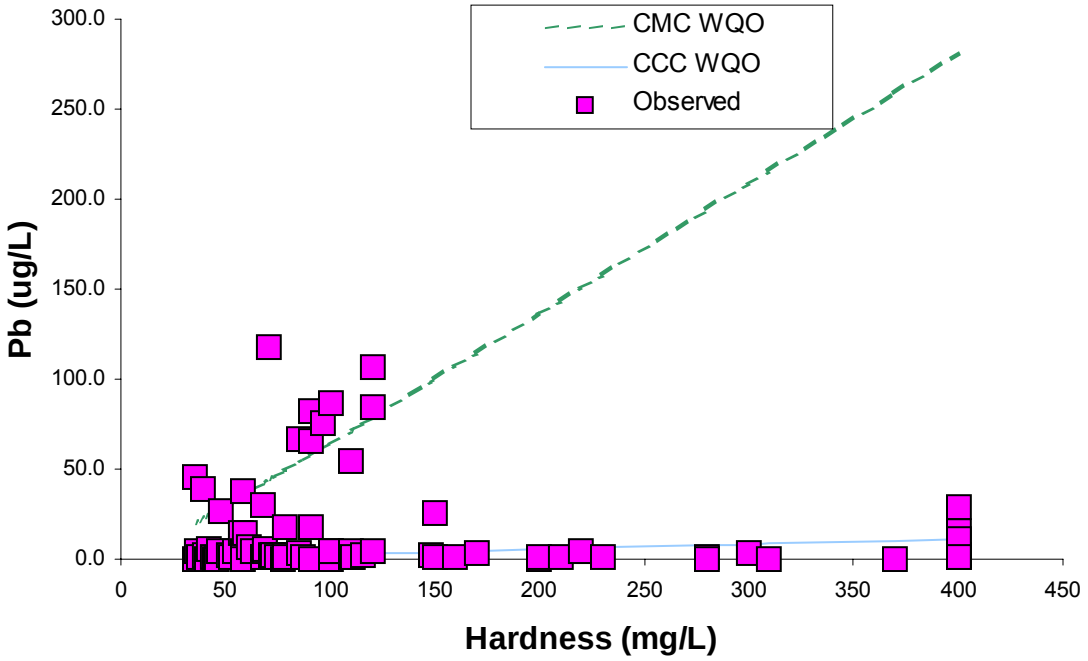

Figure G.2. Lead concentrations in Chollas Creek

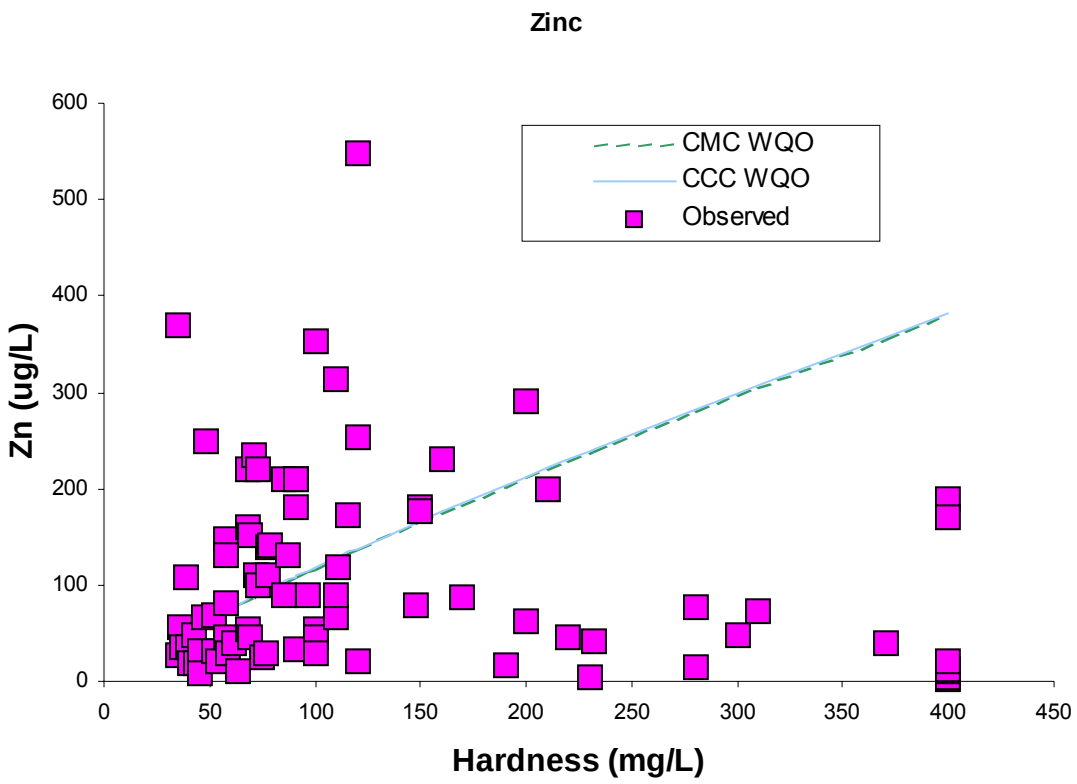

Figure G.3. Zinc concentrations in Chollas Creek

Thirty-three of eighty-two (40 percent) measured zinc samples exceed both the proposed acute and chronic WQOs. All of the exceedances occur at or below a hardness of 210 mg/L. The maximum percent reduction required is approximately 87 percent for both the acute and chronic WQOs, while the average reduction required is approximately 35 percent. For zinc, well over half of the measured samples would not require a reduction under the proposed WQOs.

All three metals require significant reductions from current concentrations to meet the WQOs. Most reductions are required at the lower range of the measured hardness and represent up to a 98 percent reduction. However, the average reduction required is closer to 50 percent and a significant number of previously measured metal concentrations would not require a reduction. This data should be investigated further when implementing best management practices and considering load reduction scenarios.

Appendix H
Site-Specific Objectives

Chollas Creek Metals Total Maximum Daily Loads

California Regional Water Quality Control Board, San Diego Region

Site-Specific Objectives

Currently, there are no site-specific objectives (SSOs) for the Chollas Creek Metals Total Maximum Daily Load (TMDL) project. The following is the San Diego Regional Water Quality Control Board general comment about developing site-specific objectives with respect to TMDLs.

In the TMDL, the numeric targets are set equal to numeric water quality criteria for dissolved copper, lead, and zinc, as defined in the California Toxics Rule (CTR). The CTR's numeric criteria serve as legally applicable water quality standards in the State of California for inland surface waters, enclosed bays and estuaries for all purposes and programs under the Clean Water Act. Criteria are derived based on a rigorous set of guidelines to provide both short-term and long-term protection to aquatic life. In the absence of site-specific objectives, the CTR's water quality criteria represent the most appropriate water quality objectives and therefore numeric targets for dissolved copper, lead, and zinc at Chollas Creek.

The CTR criteria are based on the toxicity results of a large number of nationally representative species to a single pollutant in clean controlled laboratory waters. The physical and chemical characteristics of ambient water at a particular site may result in an increase or decrease in the bioavailability and/or toxicity of a given pollutant. Examples of potentially confounding water chemistry characteristics may include dissolved organic matter, particulate matter, other contaminants, pH, and hardness. Similarly, the aquatic life community at a particular site may be more or less sensitive to a pollutant than the aquatic organisms used to develop the CTR criteria. Because (1) ambient water chemistry, and/or (2) the biological communities at Chollas Creek may be different than the chemistry and biological communities upon which the CTR criteria were based, the CTR criteria may be over - or under- protective for Chollas Creek.

Differences in bioavailability and toxicity may exist for several reasons, including the presence of dissolved organic matter, particulate matter, other contaminants, pH, and hardness. Additionally, the aquatic organisms that live in the receiving waters may be more or less sensitive than the organisms used in the controlled laboratory waters. Therefore, by definition, site-specific criteria may be more or less stringent than the criteria presented in the CTR.

The Regional Board recognizes that there are situations where site-specific conditions affect the toxicity of a pollutant, which results in a criterion that is over- or under-protective. Water quality criteria are primarily based on studies conducted using laboratory water in which organisms are exposed to one pollutant. Site-specific objectives adjust water quality objectives to account for differences in toxicity among sites based on site-specific information and scientific studies. Site-specific objectives must protect the beneficial uses of a water body, must be developed in accordance with federal and State laws and regulations based on sound scientific rationale and must be adopted by the Regional Board in a Basin Plan amendment..

The Regional Board agrees that it may be appropriate to investigate the relevance of site-specific objectives for copper, lead, and zinc in the Chollas Creek watershed. However, the Regional Board does not plan to initiate or fund studies to develop site-specific objectives. Typically, such studies are initiated by dischargers or other interested parties under the regulatory oversight of the Regional Board. There is no effort currently underway or planned by interested persons to fund the scientific studies needed to develop SSOs for copper, lead, and zinc in Chollas Creek. The development of a copper, lead, and zinc SSOs for Chollas Creek waters, including the scientific studies necessary to support it, would be costly, time consuming and resource intensive. Dischargers or other interested parties would need to fund and initiate the scientific studies to develop SSOs.

The appropriate strategy is for the Regional Board to proceed with adoption of the TMDL at this time, which will mandate copper, lead, and zinc load reductions. If scientific studies demonstrate that the ambient water chemistry and/or biological communities at Chollas Creek are significantly different from the chemistry and biological communities upon which the CTR criterion were based, a site specific objective for copper, lead, and zinc may be appropriate. If and when site-specific copper, lead, and zinc water quality objectives are developed for Chollas Creek, this TMDL will be modified accordingly. The Regional Board will not delay adoption of this TMDL mandating copper, lead, and zinc load reductions on the premise that it is necessary to first develop site-specific copper, lead, and zinc water quality objectives. Studies by interested parties supporting the development and adoption of site-specific objectives may occur concurrently with actions by dischargers to meet compliance with this TMDL. Development of site-specific objectives is discussed in more detail in the State's *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed bays, and Estuaries of California* (State Board, 2000). The State Board's 2000 Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP) provides further guidance on when SSOs may be used.

Appendix I

Environmental Analysis, Checklist, and Economic Factors

For the Chollas Creek Metals Total Maximum Daily Loads

California Regional Water Quality Control Board
San Diego Region

May 30, 2007

1 California Environmental Quality Act Requirements

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) must comply with the California Environmental Quality Act (CEQA) when amending the Water Quality Control Plan for the San Diego Basin 9 (Basin Plan) as proposed in this project to adopt total maximum daily loads (TMDLs) for copper, lead, and zinc in Chollas Creek. Under the CEQA, the San Diego Water Board is the Lead Agency for evaluating the environmental impacts of the reasonably foreseeable methods of compliance with the proposed TMDLs.

The adoption of a Basin Plan amendment is an activity subject to CEQA requirements because Basin Plan amendments constitute rules or regulations requiring the installation of pollution control equipment, establishing a performance standard, or establishing a treatment requirement.[1] TMDL Basin Plan amendments normally contain a quantifiable numeric target that interprets the applicable water quality objective. TMDLs also include wasteload allocations (WLAs) for point sources, and load allocations (LAs) for nonpoint sources and natural background. The quantifiable target together with the allocations may be considered a performance standard.[2] Sections 1.1 and 1.2 below describe in detail the statutory requirements and scope of this environmental analysis required by the CEQA for Basin Plan amendments.

1.1 Exemption from Requirement to Prepare Standard CEQA Documents

The CEQA authorizes the Secretary of the Resources Agency to certify state regulatory programs, designed to meet the goals of the CEQA, as exempt from its requirements to prepare an Environmental Impact Report (EIR), Negative Declaration, or Initial Study. The State Water Resources Control Board's (State Water Board) and the San Diego Water Board's Basin Plan amendment process is a certified regulatory program and is therefore exempt from the CEQA's requirements to prepare such documents. [3]

The State Water Board's CEQA implementation regulations[4] describe the environmental documents required for Basin Plan amendment actions. These documents consist of a written report that includes a description of the proposed activity, alternatives to the proposed activity to lesson or eliminate potentially significant environmental impacts, and identification of mitigation measures to minimize any significant adverse impacts. For this project, these documents are the Technical Report entitled *Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek, Tributary to San Diego Bay* (Technical Report), an initial draft of the Basin Plan amendment (Appendix J) and an environmental checklist (section 4 below). These components fulfill the requirements of the CEQA for preparation of environmental documents for this Basin Plan amendment.[5]

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[1] 14 CCR section 15187 (a).
[2] The term "performance standard" is defined in the rulemaking provisions of the Administrative Procedure Act [Government Code sections 11340-l 1359]. A "performance standard" is a regulation that describes an objective with the criteria stated for achieving the objective [Government Code section 11342(d)].
[3] 14 CCR section 15251(g) and Public Resources Code section 21080.5.
[4] 23 CCR section 3720 et seq. "Implementation of the Environmental Quality Act of 1970."
[5] 23 CCR section 3777

1.2 Scope of Environmental Analysis

The CEQA has specific provisions that establish the scope of the environmental analysis required for the adoption of this metals TMDLs Basin Plan amendment. The CEQA limits the scope to an environmental analysis of the reasonably foreseeable methods of compliance with the WLAs and LAs. The State Water Board CEQA Implementation Regulations for Certified Regulatory Programs[6] require the environmental analysis to include at least the following:

1. A brief description of the proposed activity. In this case, the proposed activity is the metals TMDLs Basin Plan amendment. This amendment is described in section 2 of this appendix.

2. Reasonable alternatives to the proposed activity (discussed in section 8).

3. Mitigation measures to minimize any significant adverse environmental impacts of the proposed activity (discussed in section 5).

Additionally, the CEQA[7] and CEQA Guidelines[8] require the following components, some of which are repetitive of the list above:

1. An analysis of the reasonably foreseeable environmental impacts of the methods of compliance. These methods may be employed to comply with the metals TMDLs Basin Plan amendment. Reasonably foreseeable methods of compliance are described in section 3. Sections 4 and 5 identify the environmental impacts associated with the methods of compliance.

2. An analysis of the reasonably foreseeable feasible mitigation measures relating to those impacts. This discussion is also in section 5.

3. An analysis of reasonably foreseeable alternative means of compliance with the rule or regulation, which would avoid or eliminate the identified impacts. This discussion is in section 5.1.

Additionally, the CEQA Guidelines require the environmental analysis take into account a reasonable range of:[9]

1. Environmental factors (section 5).
2. Economic factors (section 7).
3. Technical factors (section 6).
4. Population (section 6).

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[6] Ibid.
[7] Public Resources Code section 21159 (a)
[8] 14 CCR section 15187(c)
[9] 14 CCR section 15187(d),Public Resources Code section 21159 (c)

5. Geographic areas (section 6).
6. Specific sites. (section 6)

A "reasonable range" does not require an examination of every site, but a reasonably representative sample of them. The statute specifically states that the agency shall not conduct a "project level analysis."[10] Rather, a project level analysis must be performed by the dischargers that are required to implement the TMDLs.[11] Notably, the San Diego Water Board is prohibited from specifying the manner of compliance with its regulations,[12] and accordingly, the actual environmental impacts will necessarily depend upon the compliance strategy selected by the dischargers. In preparing this environmental analysis, the San Diego Water Board has considered the pertinent requirements of state law,[13] and intends this analysis to serve as a tier 1 environmental review.

Any potential environmental impacts associated with the TMDLs depend upon the specific compliance projects selected by the dischargers, most of whom are public agencies subject to their own CEQA obligations. If not properly implemented or mitigated at the project level, there could be adverse environmental impacts from implementing the Chollas Creek metals TMDLs. The substitute CEQA documents identify broad mitigation approaches that could be considered at the project level. Consistent with the CEQA, the substitute documents do not engage in speculation or conjecture, but rather consider the reasonably foreseeable environmental impacts of the reasonably foreseeable methods of compliance, the reasonably foreseeable mitigation measures, and the reasonably foreseeable alternative means of compliance, which would avoid, eliminate, or reduce the identified impacts.

2 Description of the Proposed Activity

The Basin Plan designates beneficial uses of waterbodies, establishes water quality objectives for the protection of these beneficial uses, and outlines a plan of implementation for maintaining and enhancing water quality. The proposed amendment would incorporate into the Basin Plan TMDLs for copper, lead, and zinc in the Chollas Creek Watershed.

Two beneficial uses exist in Chollas Creek that are sensitive to, and subject to impairment by elevated concentrations of dissolved metals in the water column. Warm Freshwater Habitat (WARM) and Wildlife Habitat (WILD) require water quality suitable for the protection of aquatic life and aquatic dependent wildlife. The water quality in Chollas Creek does not support the WARM and WILD beneficial uses of the creek because of elevated levels of dissolved copper, lead, and zinc.

[10] Public Resources Code section 21159(d)
[11] Public Resources Code section 21159.2
[12] Water Code section 13360
[13] Public Resources Code section 21159 and 14 CCR section 15187

The San Diego Water Board's goal in adopting the TMDLs is to eliminate the water quality problems caused by copper, lead, and zinc in Chollas Creek. Dissolved copper, lead, and zinc can inhibit the growth of aquatic vegetation, decreasing spawning areas and habitats for fish and other living organisms. Wildlife living in rivers and in riparian areas can be harmed by ingesting or coming into contact with dissolved copper, lead, and zinc. The adoption of a TMDL is not discretionary; rather, it is compelled by section 303(d) of the federal Clean Water Act.

The TMDLs for copper lead and zinc, and their derivation are discussed in the Technical Report, section 6. The TMDLs will be implemented primarily through regulation of urban runoff with waste discharge requirements (WDRs) that implement federal National Pollutant Discharge Elimination System (NPDES) regulations. The primary dischargers are municipalities located in the Chollas Creek watershed, the California Department of Transportation (Caltrans), and the U.S. Navy Dischargers will receive wasteload allocations that can be met over a phased compliance schedule that should result in attainment of water quality standards. The wasteload allocations and their derivation are discussed in the Technical Report, section 8. The Implementation Plan and compliance schedule are discussed in the Technical Report, section 11.

2.1 Surrounding Land Uses and Setting

Chollas Creek is a highly urbanized watershed. Flow in Chollas Creek is highly variable with the highest flow rates associated with storm events. During the summer, the creek has only standing pools of water with no surface flow for extended periods of time. Much of the creek has been channelized and concrete lined, but some sections of natural creek bed remain. Many plant communities within Chollas Creek have been replaced by non-native and/or invasive species (such as *Arundo donax*). These types of plants can produce habitats that are much less desirable than the native plant species with regard not only to providing a structure to hide or perch, but also as a food source. Non-native and/ or invasive species also may grow so abundantly that they reduce the capacity of the stream channel, which may lead to more frequent or more severe flooding. Neither the surface water nor groundwater resources in the watershed are used for municipal or domestic drinking water supplies. In fact, the San Diego Water Board has exempted the groundwater from the MUN beneficial use designation under the terms and conditions of the State Water Board's *Sources of Drinking Water Policy*.[14] The predominant land use in the watershed is residential, followed by open space, industrial, commercial/institutional and roadways land uses. More information on the watershed characteristics is found in the Technical Report, section 3.2.

3 Analysis of Reasonably Foreseeable Methods of Compliance

The analysis of potential environmental impacts is based on the numerous alternative methods of compliance available for controlling copper, lead, and zinc loading in Chollas Creek. The majority of metals discharged into the Chollas Creek watershed result from stormwater runoff of metals from freeway surfaces and commercial/industrial land uses. Attainment of the WLAs will be achieved through discharger implementation of

[14] State Water Board Resolution No. 88-63

structural and nonstructural control strategies designed to reduce metals loading in urban runoff. Structural and non-structural control strategies can be based on specific land uses, sources, or periods of a storm event, and are described in general below. Nonstructural BMPs are generally designed to control or eliminate the sources of pollutants to a watershed. Structural BMPs include source control as well as treatment control BMPs designed to remove pollutants from runoff. In order to comply with these TMDLs, emphasis should be placed on BMPs that control the sources of pollutants and on the maintenance of BMPs that remove pollutants from runoff. Some examples of BMPs that may be implemented by the dischargers to meet the WLAs are described below. These examples are general, (not specific to metals treatment and not specific to Chollas Creek), and are not meant to be exhaustive of the suitable suit of appropriate BMPs.

The City of San Diego, in its comments, suggested that large areas of private property would need to be condemned and demolished in order to build large detention basins and treatment works as a BMP option. This BMP option was not considered in the analysis because significantly cheaper and smaller BMPs are available to meet the WLAs of these TMDLs.

Nonstructural Controls

1. **Education and Outreach**: Conduct education and outreach to residents and businesses to discourage over-watering. Conduct education and outreach to residents, businesses, and municipal fleets to encourage vehicle and equipment practices that minimize the potential for contamination of stormwater runoff.

2. **Road and Street Maintenance**: Increase the frequency of street sweeping to maintain clean sidewalks, streets, and gutters. Street sweeping reduces non-point source pollution by five to 30 percent when a conventional mechanical broom and vacuum-assisted wet sweeper is used. The USEPA reported that the new vacuum assisted dry sweepers can achieve a 50 to 88 percent overall reduction in the annual sediment loading for a residential street, depending on sweeping frequency. A reduction in sediment load may lead to a reduction in metals being carried to the MS4, and ultimately to Chollas Creek, since sediment, or road dust, has been found to adsorb metals (Birch and Scollen, 2003). Researchers have found that the metals concentrations in road dust increases with traffic volume. High traffic areas should be given a priority when scheduling street sweepings.

3. **Illicit Discharges**: Identify and eliminate illicit discharges to the storm drain system.

4. **Inspections**: Conduct inspections of commercial and industrial facilities for compliance with local ordinances and permits, as well as copper, lead, and zinc load reductions required under these TMDLs. Conduct inspections of treatment control BMPs to ensure their adequacy of design and proper function.

5. **Development/Enforcement of Local Ordinances**: Develop and enforce municipal ordinances prohibiting exposure of copper, lead, and zinc materials to stormwater and stormwater drainage pathways, or eliminating dry weather nuisance flows.

Structural Controls

1. **Vegetated Swales and Buffer Strips**: Construct and maintain vegetative buffer strips along roadsides and in medians to slow runoff velocities and increase stormwater infiltration. Replace curbs with vegetated swales to allow highway and road runoff to be filtered through vegetated shoulders and medians. Eliminate constructed curbs to increase infiltration to ground water.

2. **Bioretention**: Construct and maintain bioretention BMPs to provide on-site removal of metals from storm water runoff through landscaping features. Field and laboratory analysis of bio-retention facilities shows high removal rates of copper (43 to 97 percent), lead (70 to 95 percent), and zinc (64 to 95 percent).

3. **Detention Basins**: Construct and maintain detention basins designed to capture and treat stormwater runoff.

4. **Retention Ponds**: Construct and maintain retention/irrigation ponds to capture stormwater runoff for later irrigation of landscape.

5. **Sand Filters:** Install and maintain sand filters, in some instances including pumps, which are effective for pollutant removal from stormwater. Sand filters may be a good option in densely developed urban areas with little pervious surface since the filters occupy minimal space.

6. **Diversion Systems**: Install diversion systems to capture non-stormwater runoff. During low flow conditions, runoff may be diverted from storm drain outlets to an on-site treatment system and released back to the creek, or it may be diverted to wastewater collection plants for treatment.

7. **Porous Pavement**: Install and maintain pavement systems that allow storm water to infiltrate into ground water, and come into contact with biological systems in the soil. Storm water coming into contact with soil as overland flow can benefit from metals reductions.

8. **Infiltration Systems**: Install and maintain pavement systems that allow storm water to infiltrate into ground water, and come into contact with biological systems in the soil. Storm water coming into contact with soil as groundwater can benefit from metals reductions.

4 Environmental Checklist

	ENVIRONMENTAL CHECKLIST	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant	No Impact
1.	**Earth. Will the proposal result in:**				
	a. Unstable earth conditions or in changes in geologic substructures?		X		
	b. Disruptions, displacements, compaction or overcoming of the soil?			X	
	c. Change in topography or ground surface relief features?		X		
	d. The destruction, covering or modification of any unique geologic or physical features?				X
	e. Any increase in wind or water erosion of soils, either on or off the site?			X	
	f. Changes in deposition or erosion of beach sands, or changes in siltation, deposition or erosion which may modify the channel of a river or stream or the bed of the ocean or any bay, inlet or lake?			X	
	g. Exposure of people or property to geologic hazards, such as earthquakes, landslides, mudslides, ground failure, or similar hazards?		X		
2.	**Air. Will the proposal result in:**				
	a. Substantial air emissions or deterioration of ambient air quality?		X		
	b. The creation of objectionable odors?		X		
	c. Alteration of air movement, moisture or temperature, or any change in climate, either locally or regionally?				X

	ENVIRONMENTAL CHECKLIST	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant	No Impact
3.	**Water. Will the proposal result in:**				
	a. Changes in currents, or the course of direction or water movements, in either marine or fresh waters?			X	
	b. Changes in absorption rates, drainage patterns, or the rate and amount of surface water runoff?			X	
	c. Alterations to the course of flow of flood waters?		X		
	d. Change in the amount of surface water in any water body?		X		
	e. Discharge into surface waters, or in any alteration of surface water quality, including but not limited to temperature, dissolved oxygen, or turbidity?			X	
	f. Alteration of the direction or rate of flow of ground waters?		X		
	g. Change in the quantity or quality of ground waters, either through direct additions or withdrawals, or through interception of an aquifer by cuts or excavations?		X		
	h. Substantial reduction in the amount of water otherwise available for public water supplies?				X
	i. Exposure of people or property to water related hazards such as flooding or tidal waves?		X		
4.	**Plant Life. Will the proposal result in:**				
	a. Change in the diversity of species, or number of any species of plants (including trees, shrubs, grass, crops, microflora and aquatic plants)?		X		
	b. Reduction of the numbers of any unique, rare or endangered species of plants?		X		

	ENVIRONMENTAL CHECKLIST	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant	No Impact
	c. Introduction of new species of plants into an area, or in a barrier to the normal replenishment of existing species?		X		
	d. Reduction in acreage of any agricultural crop?				X
	e. Toxic conditions that effect plant growth?		X		
5.	**Animal Life. Will the proposal result in:**				
	a. Change in the diversity of species, or numbers of any species of animals (birds, land animals including reptiles, fish and shellfish, benthic organisms, insects or microfauna)?		X		
	b. Reduction of the numbers of any unique, rare or endangered species of animals?		X		
	c. Introduction of new species of animals into an area, or result in a barrier to the migration or movement of animals?		X		
	d. Deterioration to existing fish or wildlife habitat?		X		
6.	**Noise. Will the proposal result in:**				
	a. Increases in existing noise levels?		X		
	b. Exposure of people to severe noise levels?		X		
7.	**Light and Glare. Will the proposal:**				
	a. Produce new light or glare?		X		
8.	**Land Use. Will the proposal result in:**				
	a. Substantial alteration of the present or planned land use of an area?			X	
9.	**Natural Resources. Will the proposal result in:**				
	a. Increase in the rate of use of any natural resources?				X
	b. Substantial depletion of any nonrenewable natural resource?				X

	ENVIRONMENTAL CHECKLIST	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant	No Impact
10.	**Risk of Upset. Will the proposal involve:**				
	a. A risk of an explosion or the release of hazardous substances (including, but not limited to: oil, pesticides, chemicals or radiation) in the event of an accident or upset conditions?			X	
11.	**Population. Will the proposal:**				
	a. Alter the location, distribution, density, or growth rate of the human population of an area?			X	
12.	**Housing. Will the proposal:**				
	a. Affect existing housing, or create a demand for additional housing?			X	
13.	**Transportation/Circulation. Will the proposal result in:**				
	a. Generation of substantial additional vehicular movement?			X	
	b. Effects on existing parking facilities, or demand for new parking?		X		
	c. Substantial impact upon existing transportation systems?			X	
	d. Alterations to present patterns of circulation or movement of people and/or goods?			X	
	e. Alterations to waterborne, rail or air traffic?			X	
	f. Increase in traffic hazards to motor vehicles, bicyclists or pedestrians?			X	
14.	**Public Service. Will the proposal have an effect upon, or result in a need for new or altered governmental services in any of the following areas:**				
	a. Fire protection?			X	
	b. Police protection?			X	

	ENVIRONMENTAL CHECKLIST	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant	No Impact
	c. Schools?				X
	d. Parks or other recreational facilities?			X	
	e. Maintenance of public facilities, including roads?		X		
	f. Other governmental services?		X		
15.	**Energy. Will the proposal result in:**				
	a. Use of substantial amounts of fuel or energy?				X
	b. Substantial increase in demand upon existing sources of energy, or require the development of new sources of energy?				X
16.	**Utilities and Service Systems. Will the proposal result in a need for new systems, or substantial alterations to the following utilities:**				
	a. Power or natural gas?			X	
	b. Communications systems?				X
	c. Water?				X
	d. Sewer or septic tanks?			X	
	e. Storm water drainage?			X	
	f. Solid waste and disposal?				X
17.	**Human Health. Will the proposal result in:**				
	a. Creation of, and exposure of people to, any health hazard or potential health hazard (excluding mental health)?		X		
18.	**Aesthetics. Will the proposal result in:**				
	a. The obstruction of any scenic vista or view open to the public?		X		

	ENVIRONMENTAL CHECKLIST	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant	No Impact
	b. The creation of an aesthetically offensive site open to public view?		X		
19.	**Recreation. Will the proposal result in:**				
	a. Impact upon the quality or quantity of existing recreational opportunities?		X		
20.	**Archeological/Historical. Will the proposal:**				
	a. Result in the alteration of a significant archeological or historical site, structure, object or building?		X		
21.	**Mandatory Findings of Significance**				
	Potential to degrade: Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?		X		
	Short-term: Does the project have the potential to achieve short-term, to the disadvantage of long-term, environmental goals? (A short-term impact on the environment is one which occurs in a relatively brief, definitive period of time, while long-term impacts will endure well into the future.)				X
	Cumulative: Does the project have impacts which are individually limited, but cumulatively considerable? (A project may impact on two or more separate resources where the impact on each resource is relatively small, but where the effect of the total of those impacts on the environment is significant.)		X		
	Substantial adverse: Does the project have environmental effects which will cause		X		

	ENVIRONMENTAL CHECKLIST	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant	No Impact
	substantial adverse effects on human beings, either directly or indirectly?				

5 Discussion of Possible Environmental Impacts of Reasonably Foreseeable Compliance Methods and Mitigation Measures

As stated previously, the environmental analysis must include an analysis of the reasonably foreseeable environmental impacts of the methods of compliance and the reasonably foreseeable feasible mitigation measures relating to those impacts. This section, consisting of answers to the questions in the checklist, discusses compliance methods and mitigation measures as they pertain to the checklist.

In formulating these answers, the impacts of implementing in the Chollas Creek watershed the non-structural and structural BMPs listed in section 3 were evaluated. At this time, the exact type, size, and location of BMPs that might be implemented to comply with the TMDLs is unknown. This analysis considers a range of non-structural and structural BMPs that might be used, but is by no means an exhaustive list of available BMPs. When BMPs are selected for implementation, a project-level and site-specific CEQA analysis must be performed by the responsible agency.

Potential reasonably foreseeable impacts were evaluated with respect to earth, air, water, plant life, animal life, noise, light, land use, natural resources, risk of upset, population, housing, transportation, public services, energy, utilities and services systems, human health, aesthetics, recreation, and archeological/historical concerns. Additionally, mandatory finding of significance regarding short-term, long-term, cumulative and substantial impacts were evaluated. Based on this review, we concluded that the potentially significant impacts can be mitigated to less than significant levels. The evaluation considered whether the construction or implementation of the BMPs would cause a substantial, adverse change in any of the physical conditions within the area affected by the BMP. In addition, the evaluation considered environmental effects in proportion to their severity and probability of occurrence.

A significant effect on the environment is defined in regulation as "*a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project, including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance. A social or economic change by itself shall not be considered a significant effect on the environment. A social or economic change related to a physical change may be considered in determining whether the physical change is significant*."[15]

[15] 14 CCR section 15382

A significant effect on the environment is defined in statute as "*a substantial, or potentially substantial, adverse change in the environment*" where "*Environment*" is defined by Public Resources Code section 21060.5 as "*the physical conditions which exist within the area which will be affected by a proposed project, including air, water, minerals, flora, fauna, noise, objects of historic or aesthetic significance*."[16]

In this analysis, the level of significance was based on baseline conditions (i.e., current conditions). Short-term impacts associated with the construction of structural BMPs were considered less than significant because the impacts due to construction activities are temporary and similar to typical capital improvement projects and maintenance activities currently performed by municipalities. The long-term impacts associated with structural BMPs were considered potentially significant, but only if they could have an adverse, or potentially adverse, impact on the environment.

Social or economic changes related to a physical change of the environment were also considered in determining whether there would be a significant effect on the environment. However, adverse social and economic impacts alone are not significant effects on the environment.

1. Earth. a. Will the proposal result in unstable earth conditions or in changes in geologic substructure?

Answer: Less than significant with mitigation

Discussion: Non-structural BMPs would not create unstable earth conditions or changes in geologic substructure because none of these BMPs include earth moving activities.

For structural BMPs, infiltration of collected stormwater could potentially result in unstable earth conditions if loose or compressible soils are present, or if such BMPs were to be located where infiltrated stormwater flowing as groundwater could destabilize existing slopes. These impacts can be avoided by siting infiltration type BMPs away from areas with loose or compressible soils, and away from slopes that could become destabilized by an increase in groundwater flow. Infiltration type BMPs can also be built on a small enough scale to avoid these types of impacts. In the unlikely event that municipalities might install facilities on a scale that could result in unstable earth conditions or in changes in geologic substructures, potential impacts could be avoided through proper geotechnical investigations, siting, design, and ground and groundwater level monitoring to ensure that structural BMPs are not employed in areas subject to unstable soil conditions.

[16] Public Resources Code section 21068

1. Earth. b. Will the proposal result in disruptions, displacements, compaction or overcoming of the soil?

Answer: Less than significant

Discussion: Non-structural BMPs would not result in disruptions, displacements, compaction or overcoming of the soil because none of these BMPs include earth moving activities.

Depending on the structural BMPs selected, the proposal may result in minor surface soil excavation or grading during construction of structural BMPs resulting in increased disturbance of the soil. However, most of the relevant areas are already urbanized, and have already suffered soil compaction and hardscaping. Standard construction techniques, including but not limited to, shoring, piling and soil stabilization can mitigate any potential short-term impacts. In addition, structural BMPs can be designed and sited in areas where the risk of new soil disruption is minimal. Soil disruptions, displacements, compaction or overcoming during construction activities would be similar to typical temporary capital improvement construction and maintenance activities currently performed by municipalities, and no long-term impacts to the soil are expected.

1. Earth. c. Will the proposal result in change in topography or ground surface relief features?

Answer: Less than significant with mitigation

Discussion: Non-structural BMPs would not affect topography or ground relief features because none of the non-structural BMPs would result in earth moving activities.

Implementation of structural BMPs could result in some change in topography or ground surface relief features, however, most of the potential BMPs are so small that changes to topography will not be noticeable. If the municipalities implement BMPs on a scale large enough to change topography or ground relief features, then potential adverse impacts could be avoided or mitigated through siting such topographic alterations in geologically stable areas, or by installing or designing structural BMPs with the least amount of impact to the topography. Additionally, any structural BMPs can, if necessary, be constructed underground to minimize topographic or ground surface relief issues.

1. Earth d. Will the proposal result in the destruction, covering or modification of any unique geologic or physical features?

Answer: No impact

Discussion: Non-structural BMPs would not cause the destruction, covering or modification of any unique geologic or physical features because none of these BMPs would result in earth moving activities.

Complying with these TMDLs using structural BMPs in areas where doing so would result in the destruction, covering or modification of a unique geologic or physical features is not a reasonably foreseeable alternative that responsible agencies would choose. Furthermore, no impact is expected because foreseeable methods of compliance, including implementation of structural BMPs to control metals, would not be of the size or scale to result in the destruction, covering or modification of any unique geologic or physical features. In the unlikely event that municipalities might install facilities on a scale that could result in the destruction, covering or modification of any unique geologic or physical features, potential impacts could be mitigated by mapping these features to avoid siting facilities in these areas. Additionally, any structural BMPs can, if necessary, be constructed underground to minimize destruction, covering or modification of any unique geologic or physical features.

1. Earth. e. Will the proposal result in any increase in wind or water erosion of soils, either on or off the site?

Answer: Less than significant

Discussion: Non-structural BMPs would not result in increase in wind or water erosion of soils, either on or off site because none of the non-structural BMPs would result in increased storm water discharge to the MS4 system, or in exposing soils to erosion by wind and water.

Depending on the structural BMPs selected, the proposal may result in minor soil excavation during construction of structural BMPs. However, construction related erosion impacts will cease with the cessation of construction. Wind or water erosion of soils may occur as a potential short-term impact. On site soil erosion during construction activities will be similar to typical temporary capital improvement projects and maintenance activities currently performed by the municipalities. Typical established best management practices should be used during implementation to minimize offsite sediment runoff or deposition. Construction sites are required to retain sediments on site, both under general construction stormwater WDRs and through the construction program of the applicable MS4 WDRs; both of which are already designed to minimize or eliminate erosion impacts on receiving water. Over the long

term, off-site erosion of canyons and natural channels could potentially be reduced if the structural BMPs divert stormwater from entering the canyons and channels, or reduce the runoff flow velocity, which may be considered a beneficial impact.

1. **Earth. f.** Will the proposal result in changes in deposition or erosion of beach sands, or changes in siltation, deposition or erosion which may modify the channel of a river or stream or the bed of the ocean or any bay, inlet or lake?

   Answer: Less than significant

Discussion: No impact to beach sands is expected because no downstream beaches exist at the mouth of Chollas Creek. Chollas Creek empties into San Diego Bay between two deep water industrial facilities. These facilities maintain a dredging schedule as part of their ship birthing operations.

Non-structural BMPs would not result in erosion of beach sands, or increases in siltation, deposition or erosion which may modify the channel of a river or stream or the bed of the ocean or any bay, inlet or lake; however, non-structural BMPs, such as increased street sweeping, may reduce siltation and sediment deposition in canyons and natural channels. Reduction in siltation and sediment deposition in the creek is beneficial as fine sediments may contain toxic pollutants.

Depending on the structural BMPs selected, the proposal may result in a reduction of siltation or sediment deposition in the Chollas Creek channels. This may result because certain BMPs, such as detention basins, may change the time and volume of stormwater released to the creek. Reduction in siltation and sediment deposition in the creek is beneficial as fine sediments may contain toxic pollutants.

Little or no impact is expected for creek bed erosion, since the flow rate in the creek is not expected to increase using foreseeable methods of compliance and much of the creek channel is concrete lined.

BMPs that reduce or eliminate dry weather flows are not expected to impact Chollas Creek because of the small flow volumes involved. Additionally, a potential reduction of pollutant laden silt is considered a benefit.

1. **Earth. g.** Will the proposal result in exposure of people or property to geologic hazards, such as earthquakes, landslides, mudslides, ground failure, or similar hazards?

   Answer: Less than significant with mitigation

Discussion: Non-structural BMPs would not result in exposure of people or property to geologic hazards because none of these BMPs would result in earth moving activities.

For structural BMPs, infiltration of collected stormwater could possibly result in ground failure if loose or compressible soils are present, or if such BMPs were to be located where introduced groundwater movements could destabilize existing slopes. This may result in landslides, mudslides, ground failure, or similar hazards. However, complying with these TMDLs using structural BMPs in areas where doing so, or of a size or scale that would result in exposure of people or property to such geologic hazards is unlikely when other alternatives exist. In the unlikely event that municipalities might install facilities on a scale that could result in exposure of people or property to geologic hazards, a geotechnical investigation should be prepared at the project level to ensure that structural BMPs are not employed in areas subject to potential geologic hazards.

2. Air. a. Will the proposal result in substantial air emissions or deterioration of ambient air quality?

Answer: Less than significant with mitigation

Discussion: Short term increases in traffic during the construction and installation of structural BMPs and long-term increases in traffic caused by non-structural BMPs and maintenance of structural BMPs are potential sources of air emissions that may adversely affect ambient air quality. Several mitigation measures are available to reduce potential impacts to ambient air quality due to increased traffic during short-term construction and long-term maintenance activities. Mitigation measures could include, but are not limited to, the following: 1) use of construction, maintenance, and street sweeper vehicles with lower-emission engines, 2) use of soot reduction traps or diesel particulate filters, 3) use of emulsified diesel fuel, 4) use of vacuum-assisted street sweepers to eliminate potential re-suspension of sediments during sweeping activity, 5) the design of structural devices to minimize the frequency of maintenance trips, and/or 6) proper maintanance of vehicles so they operate cleanly and efficiently.

The generation of fugitive dust and particulate matter during construction or maintenance activities could also impact ambient air quality. An operations plan for the specific construction and/or maintenance activities could be completed to address the variety of available measures to limit the ambient air quality impacts. These could include vapor barriers and moisture control to reduce transfer of particulates and dust to air.

The emission of air pollutants during short-term construction activities associated with reasonably foreseeable methods of compliance would not likely change ambient

air conditions, because long-term ambient air quality would not change after short-term construction activities are completed.

Ambient air quality may change as a result of increased traffic due to an increase in street sweeping and/or structural BMP maintenance activities. However, the impact to ambient air quality can be reduced by using the mitigation measures described above for street sweepers and maintenance vehicles. The potential impact to ambient air quality can be further reduced if street sweeping and/or maintenance activities are scheduled to be performed at the same time as other maintenance activities performed by the municipalities, or at times when these activities have lower impact, such as periods of low traffic activity. In any case, the number of additional vehicles expected in the watershed due to non-structural and structural BMPs is not expected to increase the level of pollutants in the air compared to current conditions, because various common managerial practices are available to mitigate the adverse effects. In fact, additional street sweeping could potentially reduce the amount of dust and particulates that may be available on the streets.

2. Air. b. Will the proposal result in creation of objectionable odors?

Answer: Less than significant with mitigation

Discussion: Non-structural BMPs could result in the creation of objectionable odors caused by exhaust from street sweepers or maintenance vehicles. Objectionable odors due to engine exhaust would be temporary and dissipate once the vehicle has passed through the area. Objectionable odors from exhaust could be reduced if gasoline or propane engines were used instead of diesel engines. Additionally, street sweepers and maintenance vehicles could be scheduled to be performed at the same time as other maintenance activities performed by the municipalities, or at times when these activities have lower impact, such as periods when there are fewer people in the area.

Construction and installation of structural BMPs may result in objectionable odors in the short-term due to exhaust from construction equipment and vehicles, but no more so than during typical infrastructure construction and maintenance activities currently performed by the municipalities. However, structural BMPs may be a source of objectionable odors if BMP designs allow for water stagnation or collection of water with sulfur-containing compounds. Stormwater runoff is not likely to contain sulfur-containing compounds, but stagnant water could create objectionable odors. Mitigation measures to eliminate odors caused by stagnation could include proper BMP design to eliminate standing water, covers, aeration, filters, barriers, and/or odor suppressing chemical additives. Structural BMPs should be inspected regularly to ensure that treatment devices are not clogged, pooling water, or odorous. During maintenance, odorous sources should be uncovered for as short of a time period as possible. Structural BMPs should be designed to minimize stagnation of water and

installed in such a way so as to increase the distance to sensitive receptors in the event of any stagnation.

2. Air. c. Will the proposal result in alteration of air movement, moisture or temperature, or any change in climate, either locally or regionally?

Answer: No impact

Discussion: Non-structural and/or structural BMPs would not be of the size or scale to result in alteration of air movement, moisture or temperature, or any change in climate, either locally or regionally.

3. Water. a. Will the proposal result in changes in currents, or the course of direction or water movements, in either marine or fresh waters?

Answer: Less than significant

Discussion: Most non-structural BMPs will not cause changes in currents, or the course of direction or water movements, in either marine or fresh waters because most of these BMPs would not introduce any physical effects that could impact these characteristics. Reduction of dry weather nuisance flows is the only foreseeable non-structural BMP that could have a physical impact in Chollas. However, any reduction of dry weather flows would bring Chollas Creek to a more natural, pre-development condition with respect to currents, which is beneficial to the environment, as discussed in the answer to question 4a.

Structural BMPs may change the currents in Chollas Creek. However, streamflow in the lower watershed is highly channelized, therefore none of the reasonably foreseeable structural BMPs would alter the direction or slope of the stream channels in the lower watershed. The roughness coefficient may be reduced as sediment is kept out of the channels, which could increase the flow rate in the channel but would not change the direction of flow. The increase in flow rate in the channels could be offset by the reduction of peak flow, as a result of the installation of structural BMPs such as detention basins, porous pavement, sand filters or infiltration basins. Overland flow in the urbanized portion of the watershed is directed primarily to storm drains. This overland flow may change depending on the structural BMPs installed such as porous pavement or infiltration basins. If stormwater runoff flow is reduced, or is diverted to wastewater treatment plants, these changes would reduce the potential for erosion, which is beneficial to the environment. Unchannelized portions of Chollas Creek could also be subject to a reduction of peak flow resulting in a reduction of channel scour. This would return Chollas Creek to a more natural, pre-development condition with respect to currents or the course of direction or water movements, which is beneficial to the environment.

3. Water. b. Will the proposal result in changes in absorption rates, drainage patterns, or the rate and amount of surface water runoff?

Answer: Less than significant

Discussion: Non-structural BMPs would not result in changes in absorption rates, drainage patterns, or the rate and amount of surface water runoff because none of these BMPs would introduce any physical effects that could impact these characteristics.

Depending on the structural BMPs selected, absorption rates, drainage patterns, and surface water runoff may change. Grading and excavation during construction and installation of structural BMPs could result in alterations in absorption rates, drainage patterns, and surface water runoff. However this is less than significant because these effects will not persist after construction has ceased. Several types of structural BMPs collect and/or inhibit stormwater runoff flow, which would likely alter drainage patterns and surface runoff. For example, structural BMPs such as buffer strips would change drainage patterns by increasing absorption rates, which would reduce the amount of surface runoff. If stormwater runoff is diverted to wastewater treatment facilities, drainage patterns would be altered and surface runoff to the canyons would be reduced. If stormwater is diverted to wastewater treatment facilities, thereby reducing the overall flow, the erosion and scour that would normally be caused in the canyons by stormwater runoff would be reduced. The amount of flow within the stream channel may change, however, the channelized drainage pattern would remain essentially unchanged.

In general, reducing stormwater runoff due to non-structural and structural BMPs would be beneficial to the environment because peak flows would be attenuated, reducing erosion and channel scour. Reduction in the amount of water in the stream channel may affect the ecology of the stream, however, all of these affects can be mitigated to less than significant levels as discussed below in the answers to questions 4 and 5 on Plant Life and Animal Life.

3. Water. c. Will the proposal result in alterations to the course of flow of flood waters?

Answer: Less than significant with mitigation

Discussion: Non-structural BMPs are unlikely to alter the course of flow of flood waters because none of the BMPs would introduce any physical effects that could impact these characteristics.

The course of flow of flood waters may change depending on the structural BMPs selected. Structural BMPs, such as sand filters, could reduce a storm drain's ability to convey flood waters. This can be mitigated through proper design (including flood water bypass systems), sizing, and maintenance of these types of structural BMPs. Other structural BMPs, such as sewer diversions, detention basins or infiltration basins, could alter the course of flood waters by diverting a portion of the flood waters. If these types of structural BMPs are used, then Chollas Creek flood waters would likely return to a more natural, pre-development condition with respect the volume of flood waters in the channel, which is beneficial to the environment.

3. Water. d. Will the proposal result in change in the amount of surface water in any water body?

Answer: Less than significant with mitigation

Discussion: Non-structural BMPs such as ordinances that prohibit nuisance flows would result in a reduction in the amount of dry weather surface water in Chollas Creek. This would decrease the water which is available to in-channel wetlands. However, dry weather wetlands did not exist in Chollas Creek under predevelopment conditions. Today's dry weather wetlands in Chollas Creek are not high value wetlands because of the predominance of *Arundo donax*, and invasive plant species. Reduction of nuisance flows would return Chollas Creek to predevelopment conditions, i.e., a seasonal, ephemeral stream which does no support dry season wetlands. Therefore, this impact is not significant.
Depending on the structural BMPs selected, stormwater runoff may be retained and/or diverted for groundwater infiltration and/or to wastewater treatment facilities. Water that is retained or diverted would not flow into the canyons and the Chollas Creek stream channel. Because the surface water runoff to the canyons would be reduced, the adverse effects of channel scour and erosion of the canyons would also be reduced. Reduction in the amount of water in the stream channel may affect the ecology of the stream, however, all of these affects can be mitigated to less than significant levels as discussed below in the answers to questions 4 and 5 on Plant Life and Animal Life.

3. Water. e. Will the proposal result in discharge to surface waters, or in any alteration of surface water quality, including but not limited to temperature, dissolved oxygen, or turbidity?

Answer: Less than significant

Discussion: Non-structural and/or structural BMPs would not result in any additional discharge to surface waters. Depending on the structural BMPs selected, the current amount of runoff discharged to surface waters may actually be reduced if diverted for groundwater infiltration or to wastewater treatment facilities.

If non-structural and/or structural BMPs are implemented, the level of pollutants discharged to Chollas Creek would be reduced. The purpose of these TMDLs is to improve the surface water quality to meet water quality objectives and beneficial uses. When municipalities comply with these TMDLs, water quality will be improved, which is beneficial to the environment.

During wet weather discharges, certain structural BMPs (including detention basins, infiltration basins, and sand filters) would reduce turbidity and increase dissolved oxygen, because these BMPs would remove sediment and bioavailable oxygen demanding substances from the surface water. Reduced turbidity, and increased dissolved oxygen is beneficial to the environment.

A reduction of dry weather discharges (i.e., a cessation or reduction in nuisance flows) would result in a reduction of overall water in Chollas Creek during the dry season. This would result in a water temperature increase, and a decrease of dissolved oxygen in dry weather pools in Chollas Creek. Reduction in the amount of water in the stream channel may affect the ecology of the stream, however, all of these affects can be mitigated to less than significant levels as discussed below in the answers to questions 4 and 5 on Plant Life and Animal Life.

3. Water. f. Will the proposal result in alteration of the direction or rate of flow of groundwaters?

Answer: Less than significant with mitigation

Discussion: Non-structural BMPs would not result in alteration of the direction or rate of flow of groundwaters because none of the BMPs would introduce any physical effects that could impact these characteristics.

Over the long term, infiltration of stormwater runoff via infiltration type BMPs such as porous pavement, and infiltration trenches, could significantly alter the direction or rate of flow of groundwaters. This could result in unstable earth conditions if such BMPs were to be located where infiltrated stormwater flowing as groundwater could destabilize existing slopes. As discussed in the answer to question 1.a, these impacts can be avoided by siting infiltration type BMPs away from areas with loose or compressible soils, and away from slopes that could become destabilized by an increase in groundwater flow. Infiltration type BMPs can also be built on a small enough scale to avoid these types of impacts. In the unlikely event that municipalities might install facilities on a scale that could result in unstable earth conditions, potential impacts could be avoided through proper groundwater investigations, siting,

design, and groundwater level monitoring to ensure that structural BMPs are not employed in areas where slopes could become destabilized.

3. Water. g. Change in the quantity or quality of groundwaters, either through direct additions or withdrawals, or through interception of an aquifer by cuts or excavations?

Answer: Less than significant with mitigation

Discussion: Non-structural BMPs will not change the quantity or quality of groundwaters because none of these BMPs would introduce any physical effects that could impact these characteristics.

Infiltration type BMPs such as porous pavement and infiltration trenches may increase the quantity and degrade the quality of ground waters. The increase in quantity is unlikely to have any adverse effects since, under pre-development conditions, infiltration rates of stormwater runoff to groundwater were most likely much higher than they are today due to the absence of hardscapes. However, as discussed in question 3.f above, increased infiltration of stormwater near steep slopes, such as canyon walls, could potentially destabilize these slopes by saturating the soils making them more prone to sliding. Mitigation would include not siting large infiltration BMPs near canyon walls or other steep slopes.

Stormwater also contains dissolved pollutants such as nutrients, metals, pesticides, hydrocarbons, oil and grease. However, infiltration BMPs are not expected to degrade groundwater with respect to these pollutants for the following reasons.

Ambient nitrogen and phosphorus concentrations in groundwater are likely higher than nutrient concentrations in stormwater due to decades of over application of fertilizers on domestic and commercial landscapes and deep percolation of applied irrigation water. Nonetheless, if stormwater nutrient concentrations are higher than ambient concentrations in the groundwater, mitigation could include education and outreach to homes and business to better manage fertilizer use. Phytoremediation can also be used to remove nutrients from stormwater runoff.

Metals in stormwater runoff are not expected to degrade groundwater quality since metals tend to adsorb to clay and organic particles in the soil. Likewise, oil and grease would become bound up in the soil and remain nearer to the surface due to lower densities. Pesticides and hydrocarbons are not expected to degrade groundwater quality because natural bacteria in the soil and groundwater tend to break pesticides down.

3. Water. h. Will the proposal result in substantial reduction in the amount of water otherwise available for public water supplies?

Answer: No impact.

Discussion: Non-structural and/or structural BMPs would not result in substantial reduction in the amount of water otherwise available for public water supplies because the Chollas Creek watershed provides no public water supplies. None of the surface water or groundwater in the Chollas Creek watershed is used for public water supply In fact, the groundwater has no designated beneficial uses and has been exempted, along with the surface waters, by the San Diego Water Board from the MUN use designation under the terms and conditions of the State Water Board's *Sources of Drinking Water Policy*.[17]

3. Water. i. Will the proposal result in exposure of people or property to water related hazards such as flooding or tidal waves?

Answer: Less than significant with mitigation

Discussion: Non-structural BMPs will not result in exposure of people or property to water related hazards such as flooding or tidal waves because none of these BMPs would introduce any physical effects that could impact these characteristics.

Installation of structural BMPs that are not properly designed and constructed to allow for bypass of stormwater during storms that exceed design capacity can cause flooding. However, this potential impact can be mitigated through proper design and maintenance of structural BMPs. Any modifications to the watershed hydrology should be modeled and accounted for in the design of BMPs.

4. Plant Life. a. Will the proposal result in change in the diversity of species, or number of any species of plants (including trees, shrubs, grass, crops, microflora and aquatic plants)?

Answer: Less than significant with mitigation

Discussion: Most non-structural BMPs will not result in change in the diversity of species, or number of any species of plants (including trees, shrubs, grass, crops, microflora and aquatic plants) because most of these BMPs would not introduce any physical effects that could impact these characteristics. However, the creation and

[17] State Water Board Resolution No. 88-63.

enforcement of ordinances to eliminate nuisance flows could result in a change in the diversity of species, or number of any species of plants (including trees, shrubs, grass, crops, microflora and aquatic plants), especially in the dry weather season. However, this would return Chollas Creek's dry weather flows to a more natural, pre-development condition, returning the stream's plant community to a more natural, dry weather condition.

These flow reductions could lead to a reduction in total plant biomass along the Chollas Creek corridor. The reduced plant biomass could very well represent a significant decrease in the area of invasive and non-native plant species (such as *Arundo donax*) within the watershed. A reduction in invasive species is necessary before the native plant populations could be restored to pre-development conditions.

The decrease in flow may result in an increase in native plant species. Native plant species that previously thrived in the Chollas Creek corridor may naturally repopulate the areas that are currently occupied by invasive species. Increased diversity or area of native plant cover also could be accomplished through restoration/mitigation projects within the Chollas Creek corridor. Regardless of the method, the opportunity for restoration/enhancement of the stream corridor to pre-development conditions is realistic.

Conversely, a decrease in flow may decrease plant diversity by reducing the number of species that require a more constant water supply. However, these plant species are likely non-natives to Southern California and would not be present in the watershed absent the nuisance dry weather flows. Impeding the propagation of invasive species is not a negative impact.

During the wet weather season, the installation of structural BMPs such as vegetated swales, buffer strips, engineered (bioretention) wetlands, or retention ponds could increase the diversity or number of plant species by increasing available habitat, which is beneficial to the environment. However, during storm events, structural BMPs could also divert, reduce, and/or eliminate surface water runoff discharge, which may reduce the number and/or diversity of plant species within the canyons and stream channel, by modifying the hydrology of the creek, which could be adverse. This can be mitigated through proper project modeling, siting and design so that the resulting creek hydrology mimics natural conditions.

Construction activities could result in the elimination of plant cover in the construction zone. The number or diversity of plant species could be maintained by preserving them prior, during, and after the construction of structural BMPs, or by re-establishing and maintaining the plant communities post construction. Or, municipalities may choose to implement non-structural BMPs and/or structural BMPs that do not divert or reduce the surface water runoff that would be discharged to the canyons and stream channel.

Should a large impermeable detention basin be required, this could be constructed underground so as not to impact the diversity of species, or number of any species of plants (including trees, shrubs, grass, crops, microflora and aquatic plants).

4. Plant life. b. Will the proposal result in reduction of the numbers of any unique, rare or endangered species of plants?

Answer: Less than significant with mitigation

Discussion: Non-structural BMPs will not result in reduction of the numbers of any unique, rare, or endangered species of plants because these BMPs will not affect the habitat of any unique, rare, or endangered species of plants.

Depending on the structural BMPs selected, direct or indirect impacts to special-status plant species may occur. However, the installation of structural BMPs would likely be implemented in highly urbanized areas and would not likely result in a change or reduction in the number of unique, rare or endangered species of plants in the immediate area of the installation.

Mitigation measures could be implemented to ensure that potential impacts to unique, rare or endangered plant species are eliminated. When the specific projects are developed and sites identified, a focused protocol plant survey and/or a search of the California Natural Diversity Database should be performed to confirm that any potentially sensitive or special status plant species in the site area are properly identified and protected as necessary. If sensitive plant species occur on the project site, mitigation is required in accordance with the Endangered Species Act. Mitigation measures should be developed in consultation with the California Department of Fish and Game (CDFG) and the United States Fish and Wildlife Service (USFWS).

Responsible agencies should endeavor to avoid installing structural BMPs that could result in reduction of the numbers of unique, rare or endangered species of plants, and instead opt for non-structural BMPs and/or identify and install structural BMPs in areas that will not reduce the numbers o such plants.

Should an impermeable detention basin be required, this could be constructed underground so as not to result in reduction of the numbers of any unique, rare or endangered species of plants.

4. Plant life. c. Will the proposal result in introduction of new species of plants into an area, or in a barrier to the normal replenishment of existing species?

Answer: Less than significant with mitigation

Discussion: Most non-structural BMPs will not result in introduction of new species of plants into an area, or in a barrier to the normal replenishment of existing species because most of the BMPs would not introduce any physical effects that could impact these characteristics. However, the creation and enforcement of ordinances to eliminate nuisance flows could result in the introduction of new species of plants into an area, or in a barrier to the normal replenishment of existing species especially in the dry weather season. However, this would cause Chollas Creek's dry weather flows to return to a more natural, pre-development condition, facilitating a return to a more natural, dry weather habitat. As discussed in the answer to question 4.a., impeding the propagation of invasive species is not a negative impact.

For structural BMPs that may include the use of plants, such as vegetated swales or engineered (bioretention) wetlands, new species of plants may possibly be introduced into the area. However, in cases where plants or landscaping is incorporated into the specific project design, the possibility of disruption of resident native species could be avoided or minimized by using only plants native to the area. The use of exotic invasive species or other plants listed in the Exotic Pest Plant of Greatest Ecological Concern in California (1999, California Invasive Plant Council, as amended) should be prohibited.

4. Plant life. d. Will the proposal result in reduction in acreage of any agricultural crop?

Answer: No impact

Discussion: Non-structural and/or structural BMPs will not result in reduction in acreage of any agricultural crop. Based on the California Department of Conservation Division of Land Resources Protection Farmland Mapping and Monitoring Program Important Farmland in California, 2002, there is no Prime Farmland, Farmland of Statewide Importance, Unique Farmland or Farmland of Local Importance in the Chollas Creek watershed. Structural BMPs are not expected to be placed in any area currently engaged in crop production. If structural BMPs are installed, they would likely be located in already highly urbanized areas and would not impact the acreage of any agricultural crop.

4. Plant life. e. Will the proposal result in toxic conditions that effect plant growth?

Answer: Less than significant impact with mitigation.

Discussion: Non-structural BMPs will not result in toxic conditions that effect plant growth because non of the BMP would include physical effects that could lead to the accumulation of toxicity.

Structural BMPs such as infiltration basins may accumulate metal to level that are toxic to certain plants. Metals that are removed by infiltration BMPs typically are retained in the upper 2 to 5 inches of soil or sediment. Typically, metals levels returned to background levels or non-detectable levels below about 5 inches depth.

There is a potential (given enough time) that metals may accumulate in the upper 2 to 5 inches of soil to levels that might be toxic to plants. The mitigation measures could include replanting with metals resistant plants, or covering with gravel or cobblestones, or covering with compost as a mulch. The added benefit that compost might have is a higher affinity to bind with metals (due to its high organic content), and that placement of compost on the soil surface will capture the metals before they bind with the soil As metals concentrations build, the mulch could be removed and replaced. Other options for minimizing exposure to soil could include putting the infiltration BMP underground or indoors, and/or restricting access. Finally, the metals-laden, top 2 to 5 inches of soil could be removed, disposed of and replaced.

5. Animal Life. a. Will the proposal result in change in the diversity of species, or numbers of any species of animals (birds, land animals including reptiles, fish and shellfish, benthic organisms, insects or microfauna)?

Answer: Less than significant with mitigation

Discussion: Non-structural BMPs, such as the creation and enforcement of ordinances to eliminate nuisance flows, could result in change in the diversity of species, or numbers of any species of animals (birds, land animals including reptiles, fish and shellfish, benthic organisms, insects or microfauna) due to a reduction of dry weather flows that could eliminate instream habitats dependant on those flows. However, this would return Chollas Creek's dry weather flows to a more natural, pre-development condition, facilitating a return to a more natural, dry weather habitat, as discussed in the answer to question 4.a.

Stream riffle and run habitat would decrease in duration during dry weather conditions, thereby limiting aquatic-dependent species to pools during that time period. While migration of aquatic species would be limited during dry weather, migration would be possible during wet weather flows. Furthermore, aquatic species that would naturally occur in Chollas Creek would not have a life cycle that would be dependent upon riffle and run habitat during dry weather since none existed under pre-development conditions. Note that Chollas Creek is not considered potential habitat for species that may require a comparatively higher volume of flow for migration upstream, which is required for species such as Steelhead Trout. Therefore, such consideration is not necessary.

The installation of structural BMPs such as vegetated swales, buffer strips, engineered (bioretention) wetlands, or retention ponds could increase the diversity or number of animal species, which is beneficial by creating habitat for those species. However, these types of structural BMPs could also increase the likelihood of vectors and pests. For example, constructed basins and vegetated swales may develop locations of pooled standing water that would increase the likelihood of mosquito breeding. Mitigation includes the prevention of standing water through the construction and maintenance of appropriate drainage slopes and through the use of aeration pumps.[18] Mitigation for vectors and pests should involve the use of appropriate vector and pest control strategies, maintenance, and frequent inspections.

Installation of non-vector producing structural BMPs can help mitigate vector production from standing water. Netting can be installed over structural BMPs to further mitigate vector production. Structural BMPs can be designed and sites can be properly protected to prevent accidental vector production. Vector control agencies may also be employed as another source of mitigation. Structural BMPs prone to standing water can be selectively installed away from high-density areas and away from residential housing and/or by requiring oversight and treatment of those systems by vector control agencies.

Structural BMPs could also divert, or reduce stormwater runoff discharge, which could decrease the number and/or diversity of animal species within the canyons and stream channel by eliminating habitat dependant on those flows. Because the Chollas Creek watershed is heavily developed with significant areas of impermeable surfaces, stormflow generated streamflow in Chollas Creek is very likely higher today than under pre-development conditions. Therefore, native communities of animals and the habitats they depend upon likely can thrive under lower streamflow conditions than what currently exist in Chollas Creek. Hydrologic modeling could be used to estimate the rate and volume of pre-development stormwater runoff to, and flow in Chollas Creek. Using this information, BMPs could be selected and sized to not reduce streamflows in Chollas Creek below pre-development levels. BMPs that completely eliminate stormwater runoff are not reasonably foreseeable because of their cost and the availability of other feasible and less costly alternatives. Furthermore, the removal of toxic metals from Chollas Creek water will increase the number and/or diversity of benthic organisms, insects or microfauna in the sediment in the stream channel.

The current number or diversity of animal species could be maintained by minimizing the size of structural BMPs and limiting the encroachment and/or removal of animal habitat. Additionally, municipalities may choose to implement non-structural BMPs and/or structural BMPs that do not divert or reduce the stormwater runoff that would be discharged to the canyons and stream channel. Additionally, should an impermeable detention basin be required, it could be constructed underground so as not remove habitat leading to a change in the diversity of species, or numbers of any

[18] http://www.cabmphandbooks.com/Muncipal.asp

species of animals (birds, land animals including reptiles, fish and shellfish, benthic organisms, insects or microfauna).

5. Animal Life. b. Will the proposal result in reduction of the numbers of any unique, rare or endangered species of animals?

Answer: Less than significant with mitigation

Discussion: Non-structural BMPs will not result in reduction of the numbers of unique, rare or endangered species of animals because these BMPs will not cause a reduction in habitat for unique, rare, or endangered animals.

Depending on the structural BMPs selected, direct or indirect impacts to special-status animal species may possibly occur. The installation of structural BMPs would likely be implemented in highly urbanized areas, which are not likely to be inhabited by special-status species. However, there is the possibility for special-status species (such as the gnat catcher) to be present. If special status species are present during activities such as, ground disturbance, construction, operation and maintenance activities associated with the potential projects, it could conceivably result in direct impacts to special status species including the following:

- Direct loss of a special status species
- Increased human disturbance in previously undisturbed habitats
- Mortality by construction or other human-related activity
- Impairing essential behavioral activities, such as breeding, feeding or shelter/refuge
- Destruction or abandonment of active nest(s)/den sites
- Direct loss of occupied habitat

In addition, potential indirect impacts may include but are not limited to, the following:

- Displacement of wildlife by construction activities
- Disturbance in essential behavioral activities due to an increase in ambient noise levels and/or artificial light from outdoor lighting around facilities

Mitigation measures, however, could be implemented to ensure that special status animals are not negatively impacted, nor their habitats diminished. For example, when the specific projects are developed and sites identified, a focus protocol animal survey and/or a search of the California Natural Diversity Database should be performed to confirm that any potentially special-status animal species in the site area are properly identified and protected as necessary.

If special-status animal species are potentially near the project site area, as required by the Endangered Species Act (ESA), two weeks prior to grading or the construction of facilities and per applicable USFWS and/or CDFG protocols, pre-construction surveys to determine the presence or absence of special-status species should be conducted. The surveys should extend an appropriate distance (buffer area) off site in accordance with USFWS and/or CDFG protocols to determine the presence or absence of any special-status species adjacent to the project site. If special-status species are present on the project site or within the buffer area, mitigation would be required under the ESA. To this extent, mitigation measures shall be developed with the USFWS and CDFG to reduce potential impacts.

In sensitive habitat areas with unique, rare or endangered species, responsible agencies should endeavor to avoid implementing structural BMPs and instead opt for implementing non-structural BMPs, such as developing and enforcing ordinances, and/or low impact structural BMPs that can be retrofitted into existing facilities that will not divert or reduce surface water runoff discharge to the canyons and stream channel.

Additionally, should an impermeable detention basin be required, this could be constructed underground so as not to result in reduction of the numbers of any unique, rare or endangered species of animals through the destruction of habitat.

5. Animal Life. c. Will the proposal result in introduction of new species of animals into an area, or in a barrier to the migration or movement of animals?

Answer: Less than significant with mitigation

Discussion: Most non-structural BMPs will not result in introduction of new species of animal into an area, or in a barrier to the migration or movement of animals because most of the BMPs would not introduce any physical effects that could impact these characteristics. However, the creation and enforcement of ordinances to eliminate nuisance flows could result in a barrier to the migration or movement of animals especially in the dry weather season by eliminating habitat dependant on those flows. However, this would cause Chollas Creek's dry weather flows to return to a more natural, pre-development condition, facilitating a return to a more natural, dry weather habitat, as discussed in the answer to question 5a.

Structural BMPs would not foreseeably introduce new species. In addition, because structural BMPs would likely be installed in urbanized areas, the potential installation sites would not act as a travel route or regional wildlife corridor. However, BMPs could potentially be constructed in open space where travel routs or regional wildlife corridors exist. A travel route is generally described as a landscape feature (such as a ridgeline, canyon, or riparian strip) within a larger natural habitat area that is used frequently by animals to facilitate movement and provide access to necessary resources such as water, food, or den sites). Wildlife corridors are generally an area of habitat, usually linear in nature, which connect two or more habitat patches that

would otherwise be fragmented or isolated from one another. Construction of reasonably foreseeable structural BMPs should not restrict wildlife movement because the size of BMPs are generally too small to obstruct a corridor.

A corridor for terrestrial animals would be maintained regardless of flow since reduced flows would not provide physical barriers for these animals. In the event that any structural BMPs built would hinder animals from moving throughout the stream corridor, a pathway around the BMPs could be constructed.

A net loss of native animal species habitat in the stream corridor due to BMP installation should be mitigated. Initially, avoidance and minimization of habitat loss should be considered. In some cases, BMPs may actually provide important habitat for animals in the stream corridor. Examples of such BMPs include detention/ retention ponds, vegetated swales, and buffer strips.

Responsible agencies should endeavor to avoid compliance measures that could result in significant barriers to the migration or movement of animals, and instead opt for non-structural BMPs and/or structural BMPs that would not change the migration or movement of animals. Potential project sites in open space areas that might be used to install structural BMPs should be evaluated in consultation with CDFG to identify potential wildlife travel routes. If a wildlife travel route is identified that could be impacted by the installation of structural BMPs, then the project should be designed to include a new wildlife travel route in the same general location.

Some migratory avian species may use portions of potential project sites, including ornamental vegetation, during breeding season and may be protected under the Migratory Bird Treaty Act (MBTA) while nesting. The MBTA includes provisions for protection of migratory birds under the authority of the USFWS and CDFG. The MBTA protects over 800 species including, geese, ducks, shorebirds, raptors, songbirds, and many other relatively common species. If construction occurs during the avian breeding season for special status species and/or MBTA-covered species, generally February through August, then prior (within 2 weeks) to the onset of construction activities, surveys for nesting migratory avian species should be conducted on the project site following USFWS and/or CDFG guidelines. If no active avian nests are identified on or within the appropriate distance of construction areas, further mitigation may not be necessary.

Alternatively, to avoid impacts, the agencies implementing the TMDLs may begin construction after the previous breeding season for covered avian species and before the next breeding season begins. If a protected avian species was to establish an active nest after construction was initiated and outside of the typical breeding season (February – August), the project sponsor, would be required to establish a buffer as required by USFWS between the construction activities and the nest site.

If active nest for protected avian species are found within the construction footprint or within the proscribed buffer zone, construction would be required to be delayed

within the construction footprint and buffer zone until the young have fledged or appropriate mitigation measures responding to the specific situation are developed in consultation with USFWS or CDFG. These impacts are highly site specific, and assuming they are foreseeable, they would require a project-level analysis and mitigation plan.

5. Animal Life. d. Will the proposal result in deterioration to existing fish or wildlife habitat?

Answer: Less than significant with mitigation

Discussion: Non-structural BMPs will not result in deterioration to existing fish or wildlife habitat. The creation and enforcement of ordinances to eliminate nuisance flows could result in improved water quality to existing fish or wildlife habitat. In addition, this would return Chollas Creek's dry weather flows to a more natural, pre-development condition, which is a significant improvement to the environment as discussed in the answer to question 5a.

Depending on the structural BMPs selected, direct or indirect impacts to existing fish or wildlife habitat may occur. However, the installation of structural BMPs would likely be implemented in highly urbanized areas; therefore, the installation of structural BMPs would not likely result in the deterioration of existing fish and or wildlife habitat in the immediate area of a project. Nonetheless, potential effects on fish or wildlife habitat can be reduced by minimizing the size of structural BMPs and limiting the encroachment and/or removal of animal habitat.

Structural BMPs could also divert, reduce, and/or eliminate stormwater runoff discharge, which could potentially change the fish and wildlife habitat within the canyons and stream channels by changing the flow regime of the creek. Because the Chollas Creek watershed is heavily developed with significant areas of impermeable surfaces, stormflow generated streamflow in Chollas Creek is very likely higher today than under pre-development conditions. Therefore, native communities of animals and the habitats they depend on likely can thrive under lower stormflow generated streamflow conditions than what currently exist in Chollas Creek. Hydrologic modeling could be used to estimate the rate and volume of pre-development stormwater runoff to, and flow in Chollas Creek. Using this information, BMPs could be selected and sized to not reduce streamflows in Chollas Creek below pre-development levels. BMPs that completely eliminate stormwater runoff are not reasonably foreseeable because of their cost and the availability of other feasible and less costly alternatives. The return to more natural, pre-development flow regimes in Chollas Creek could be beneficial to restoring native habitats in the creek. Furthermore, the removal of toxic metals from the water could also improve the fish and wildlife habitat in the canyons and stream channels.

Dischargers may also choose to implement non-structural BMPs and/or structural BMPs that do not divert or reduce the surface water runoff that would be discharged to the canyons and stream channel. Additionally, should an impermeable detention basin be required, this could be constructed underground so as not to result in deterioration to existing fish or wildlife habitat at the project site.

Additionally, metals that are removed by infiltration BMPs typically are retained in the upper 2 to 5 inches of soil or sediment. Typically, metals levels returned to background levels or non-detectable levels below about 5 inches depth.

There is a potential (given enough time) that metals may accumulate in the upper 2 to 5 inches of soil to levels that might be toxic to animals. The mitigation measures that could be implemented would include proper and adequate cover materials that would limit the access to the soil that is being affected by metals in stormwater. Options could include planting grass or iceplant, covering with gravel or cobblestones, or covering with compost as a mulch. Any of these cover options would reduce the potential for exposure to soils with elevated metals concentrations. The added benefit that compost might have is a higher affinity to bind with metals (due to its high organic content), and that placement of compost on the soil surface will capture the metals before they bind with the soil As metals concentrations build, the mulch could be removed and replaced. Other options for minimizing exposure to soil could include putting the infiltration BMP underground or indoors, and/or restricting access. Finally, the metals-laden, top 2 to 5 inches of soil could be removed, disposed of and replaced.

6. Noise. a. Will the proposal result in increases in existing noise levels?

Answer: Less than significant with mitigation

Discussion: Non-structural BMPs could result in increases in existing noise levels due to increased traffic from street sweepers and/or maintenance vehicles which may increase the noise level temporarily as the vehicles pass through an area. However, the increase in noise levels would be no greater than typical infrastructure maintenance activities currently performed by municipalities and is therefore, less than significant.

The construction and installation of structural BMPs would result in temporary increases in existing noise levels, but this would be short term and only exist until construction is completed. Therefore, this noise impact is less than significant. The noise associated with the construction and installation of structural BMPs would be the same as typical construction activities in urbanized areas, such as ordinary road and infrastructure maintenance and building activities. Contractors and equipment manufacturers have been addressing noise problems for many years and through design improvements, technological advances, and a better understanding of how to

minimize exposures to noise, noise effects can be minimized. An operations plan for the specific construction and/or maintenance activities could be prepared to identify the variety of available measures to limit the impacts from noise to adjacent homes and businesses.

Severe noise levels could be mitigated by implementing commonly-used noise abatement procedures, such as sound barriers, mufflers, and limiting construction and maintenance activities to times when these activities have lower impact, such as periods when there are fewer people near the construction area. Applicable and appropriate mitigation measures could be evaluated when specific projects are determined, depending upon proximity of construction activities to receptors.

6. Noise. b. Will the proposal result in exposure of people to severe noise levels?

Answer: Less than significant with mitigation

Discussion: Non-structural BMPs would not result in increases in exposure of people to severe noise levels because none of these BMPs would introduce any physical effects that could impact this characteristic. Increased traffic from street sweepers and/or maintenance vehicles may increase the noise level temporarily as the vehicles pass through an area, but these levels will not be severe.

There is the possibility that severe noise levels could be emitted during construction activities. The increase in noise levels could be mitigated by implementing commonly-used noise abatement procedures, such as sound barriers, mufflers, and limiting construction and maintenance activities to times when these activities have lower impact, such as periods when there are fewer people in the area. Applicable and appropriate mitigation measures should be evaluated when specific projects are determined, depending upon proximity of construction activities to receptors.

7. Light and Glare. Will the proposal produce new light or glare?

Answer: Less than significant with mitigation

Discussion: Non-structural BMPs will not produce new light or glare because none of the BMPs would introduce any physical effects that could impact light and glare.

The construction and installation of structural BMPs could potentially be performed during evening or night time hours. If this scenario were to occur, night time lighting would be required to perform the work. Also, lighting could possibly be used to increase safety around structural BMPs.

In the unlikely event that construction is performed during night time hours, a lighting plan should be prepared to include mitigation measures. Mitigation measures can include shielding on all light fixtures, and limiting light trespass and glare through the use of directional lighting methods. Other potential mitigation measures may include using screening and low-impact lighting, performing construction during daylight hours, or designing security measures for installed structural BMPs that do not require night lighting.

8. Land Use. Will the proposal result in substantial alteration of the present or planned land use of an area?

Answer: Less than significant

Discussion: Non-structural BMPs will not result in alteration of the present or planned land use of an area because none of the BMPs would introduce any physical effects that could impact land uses.

Implementation of structural BMPs may potentially cause minor alterations in present or planned land use of an area. However, municipalities are not required or expected to change present or planned land uses to comply with the TMDLs, and are encouraged to seek alternatives that would have the lowest impact on the land use and the environment. Potential conflicts between complying with the TMDLs and other land uses can be resolved by standard planning efforts under which specific projects are reviewed by local planning agencies. Applicable and appropriate mitigation measures could be evaluated when specific projects are determined, and a cost-benefit analysis of proposed compliance alternatives should be performed.

More reasonable alternatives should be evaluated and implemented, such as non-structural BMPs and low impact and/or small scale structural BMPs, before considering an alternative that would create considerable hardship for the community in the area.

9. Natural Resources. a. Will the proposal result in increase in the rate of use of any natural resources?

Answer: No impact

Discussion: Non-structural and/or structural BMPs will not increase the rate of use of any natural resources. Implementation of non-structural and/or structural BMPs should not require quarrying, mining, dredging, or extraction of locally important mineral resources. Operation of street sweepers, construction, and maintenance vehicles could increase the use of fossil fuels, and some types of equipment used in structural BMPs may consume electricity to operate pumps, etc. However, the

relative amounts of additional fossil fuel and electricity that might be used would fall well within the capacity and expectations of normal city maintenance. The additional use of fossil fuels and electricity could be mitigated and reduced if municipalities used alternative fuels and/or renewable energies to power their vehicles and equipment.

9. Natural Resources. b. Will the proposal result in substantial depletion of any non-renewable natural resource?

Answer: No impact

Discussion: Non-structural and/or structural BMPs will not substantially deplete any non-renewable natural resource. Operation of street sweepers, construction, and maintenance vehicles could increase the use of fossil fuels, and some types equipment used in structural BMPs may consume electricity to operate pumps, etc. However, the relative amounts of additional fossil fuel and electricity that might be used would fall well within the capacity and expectations of normal city maintenance. The additional use of fossil fuels and electricity could be mitigated and reduced if municipalities used alternative fuels and/or renewable energies to power their vehicles and equipment.

10. Risk of Upset. Will the proposal involve a risk of an explosion or the release of hazardous substances (including, but not limited to: oil, pesticides, chemicals or radiation) in the event of an accident or upset conditions?

Answer: Less than significant

Discussion: Non-structural and structural BMPs will not involve a risk of an explosion or the release of hazardous substances (including, but not limited to: oil, pesticides, chemicals or radiation) in the event of an accident or upset conditions. The reasonably foreseeable non-structural and structural BMPs included in this evaluation would not be subject to explosion or the release of hazardous substances in the event of an accident because these types of substances would not be present. There is the possibility that hazardous materials (e.g., paint, oil, gasoline) may be present during construction and installation activities, but potential risks of exposure can be mitigated with proper handling and storage procedures. All risks of exposure would be short term and would be eliminated with the completion of construction and installation activities.

11. Population. Will the proposal alter the location, distribution, density, or growth rate of the human population of an area?

Answer: Less than significant

Discussion: Non-structural BMPs will not alter the location, distribution, density, or growth rate of the human population of an area because none of the BMPs would introduce any physical effects that could impact these characteristics.

Implementation of structural BMPs may potentially alter the location, distribution, density, or growth rate of the human population of an area. However, municipalities are not required or expected to change present or planned land uses to comply with the TMDLs, and municipalities are encouraged to seek alternatives that would have the lowest impact on the existing and planned population of an area. Potential conflicts between complying with the TMDLs and planned growth can be resolved by standard planning efforts under which specific projects are reviewed by local planning agencies. Applicable and appropriate mitigation measures could be evaluated when specific projects are determined.

More reasonable alternatives should be evaluated and implemented, such as non-structural BMPs and low impact and/or small scale structural BMPs, before considering an alternative that would create the need to relocate the population of parts of the watershed..

12. Housing. Will the proposal affect existing housing, or create a demand for additional housing?

Answer: Less than significant

Discussion: Non-structural BMPs will not affect existing housing, or create a demand for additional housing because none of these BMPs would introduce any physical effects that could impact housing.

Implementation of structural BMPs may potentially affect existing housing. However, municipalities are not required or expected to change present or planned land uses to comply with the TMDLs, and municipalities are encouraged to seek alternatives that would have the lowest impact on land use and the environment. Potential conflicts between complying with the TMDLs and other land uses can be resolved by standard planning efforts under which specific projects are reviewed by local planning agencies. Applicable and appropriate mitigation measures could be evaluated when specific projects are determined.

More reasonable alternatives should be evaluated and implemented, such as non-structural BMPs and low impact and/or small scale structural BMPs, before considering an alternative that would create considerable hardship for the community in the area.

13. Transportation/Circulation. a. Will the proposal result in generation of substantial additional vehicular movement?

Answer: Less than significant

Discussion: Non-structural and/or structural BMPs will not result in generation of substantial additional long-term vehicular movement. There may be additional vehicular movement during construction of structural BMPs and during street sweeping and/or maintenance activities. However, vehicular movement during construction would be temporary, and vehicular movement during street sweeping and/or maintenance activities would be periodic and only as the vehicle passes through the area. This may generate minor additional vehicular movement.

In order to reduce the impact of construction traffic, a construction traffic management plan could be prepared for traffic control during any street closure, detour, or other disruption to traffic circulation. The plan could identify the routes that construction vehicles would use to access the site, hours of construction traffic, and traffic controls and detours. The plan could also include plans for temporary traffic control, temporary signage and stripping, location points for ingress and egress of construction vehicles, staging areas, and timing of construction activity which appropriately limits hours during which large construction equipment may be brought on or off site.

The potential impact to vehicular movement can be reduced if street sweeping and/or maintenance activities are scheduled to be performed at the same time as other maintenance activities performed by municipalities, or at times when these activities have lower impact, such as periods of low traffic activity.

13. Transportation/Circulation. b. Effects on existing parking facilities, or demand for new parking?

Answer: Less than significant with mitigation.

Discussion: Non-structural BMPs may affect existing parking facilities, or create demand for new parking structural, if increased street sweeping and/or maintenance is implemented in areas with parking along roadsides. Available parking in an area could be reduced during certain times of the day, week, and/or month, depending on frequency of street sweeping and/or maintenance events. Street sweeping and maintenance events should be scheduled to be performed at the same time as other maintenance activities performed by the municipalities, and/or at times when these activities have lower impact, such as periods of low traffic activity and parking demand.

Depending on the structural BMPs selected, alterations to existing parking facilities may occur to incorporate structural BMPs. This could reduce available parking in an area. However, structural BMPs can be designed to accommodate space constraints or be placed under parking spaces and do not have to occupy space in existing parking facilities. Available parking spaces can be reconfigured to provide equivalent number of spaces or provide functionally similar parcels for use as offsite parking to reduce potential impacts.

13. Transportation/Circulation. c. Will the proposal result in substantial impacts upon existing transportation systems?

Answer: Less than significant

Discussion: Non-structural BMPs will not result in significant impacts upon existing transportation systems. The only foreseeable impact would come from increased street sweeping, however long-term impacts are unlikely because any increase in maintenance vehicular activities would fall well within the present day activities in any municipality, and would therefore not qualify as substantial.

Depending on the structural BMPs selected, temporary alterations to existing transportation systems may be required during construction and installation activities. The potential impacts would be limited and short-term. Potential impacts could be reduced by limiting or restricting hours of construction so as to avoid peak traffic times and by providing temporary traffic signals and flagging to facilitate traffic movement.

13. Transportation/Circulation. d. Will the proposal result in alterations to present patterns of circulation or movement of people and/or goods?

Answer: Less than significant

Discussion: Non-structural BMPs will not result in alterations to present patterns of circulation or movement of people and/or goods, because none of the BMPs, including increased street sweeping, would introduce any physical effects that could impact these characteristics. No long-term impacts are expected because any increase in maintenance vehicular activities would fall well within the present day activities in any municipality.

Depending on the structural BMPs selected, temporary alterations to present patterns of circulation or movement of people and/or goods may be required during construction and installation activities. The potential impacts would be limited and short-term. Potential impacts could be reduced by limiting or restricting hours of

construction so as to avoid peak traffic times and by providing temporary traffic signals and flagging to facilitate traffic movement.

13. Transportation/Circulation. e. Will the proposal result in alterations to waterborne, rail or air traffic?

Answer: Less than significant

Discussion: Non-structural and/or structural BMPs are not expected to result in alterations to waterborne, rail or air traffic because none of the BMPs would introduce any physical effects that could impact these characteristics.

Depending on the structural BMPs selected, temporary alterations to rail transportation could potentially occur during construction and installation activities. However those potential impacts would limited and short-term and could be avoided through proper siting and design, and scheduling of construction activities

13. Transportation/Circulation. f. Will the proposal result in increase in traffic hazards to motor vehicles, bicyclists or pedestrians?

Answer: Less than significant

Discussion: Non-structural BMPs could result in an increase in traffic hazards to motor vehicles, bicyclists or pedestrians due, for example, to increased street sweeping. However, any foreseeable impact from increased street sweeping would fall well within the present day conditions in any municipality, and would therefore not present new safety concerns.

Depending on the structural BMPs selected, a temporary increase in traffic hazards may occur during construction and installation activities. The specific project impacts can be reduced and mitigated by marking, barricading, and controlling traffic flow with signals or traffic control personnel in compliance with authorized local police or California Highway Patrol requirements. These methods would be selected and implemented by responsible local agencies considering project level concerns. Standard safety measures should be employed including fencing, other physical safety structures, signage, and other physical impediments designed to promote safety and minimize pedestrian/bicyclists accidents.

14. Public Service. a. Will the proposal have an effect upon, or result in a need for new or altered governmental services in any of the following areas: Fire protection?

Answer: Less than significant

Discussion: Non-structural BMPs will not have an effect upon, or result in a need for new or altered fire protection services because none of the BMPs would introduce any physical effects that could impact this characteristic.

During construction and installation of structural BMPs, temporary delays in response time of fire vehicles due to road closure/traffic congestion during construction activities may occur. However, any construction activities would be subject to applicable building and safety and fire prevention regulations and codes. The responsible agencies could notify local emergency service providers of construction activities and road closures and could coordinate with local providers to establish alternative routes and appropriate signage. In addition, an Emergency Preparedness Plan could be developed for the construction of proposed new facilities in consultation with local emergency providers to ensure that the proposed project's contribution to cumulative demand on emergency response services would not result in a need for new or altered fire protection services. Most jurisdictions have in place established procedures to ensure safe passage of emergency vehicles during periods of road maintenance, construction, or other attention to physical infrastructure. In any case, the installation of structural devices would not create any more significant impediments than such other ordinary activities.

14. Public Service. b. Will the proposal have an effect upon, or result in a need for new or altered governmental services in any of the following areas: Police protection?

Answer: Less than significant

Discussion: Non-structural BMPs will not have an effect upon, or result in a need for new or altered fire protection services because none of the BMPs would introduce any physical effects that could impact this characteristic.

During construction and installation of structural BMPs, temporary delays in response time of police vehicles due to road closure/traffic congestion during construction activities may occur. The responsible agencies could notify local police service providers of construction activities and road closures and could coordinate with local police to establish alternative routes and traffic control during construction projects. In addition, an Emergency Preparedness Plan could be developed for the proposed new facilities in consultation with local emergency providers to ensure that the proposed project's contribution to cumulative demand on emergency response services would not result in a need for new or altered police protection services. Most jurisdictions have in place established procedures to ensure safe passage of emergency vehicles during periods of road maintenance, construction, or other attention to physical infrastructure. In any case, the installation of structural devices would not create any more significant impediments than such other ordinary activities.

14. Public Service. c. Will the proposal have an effect upon, or result in a need for new or altered governmental services in any of the following areas: Schools?

Answer: No impact.

Discussion: Non-structural and structural BMPs will not have an effect upon, or result in a need for new or altered schools or school services because none of the BMPs would introduce any physical effects that could impact this characteristic.

14. Public Service. d. Will the proposal have an effect upon, or result in a need for new or altered governmental services in any of the following areas: Parks or other recreational facilities?

Answer: Less than significant.

Discussion: Non-structural BMPs will not have an effect upon, or result in a need for new or altered parks or other recreational facilities because none of the BMPs would introduce any physical effects that could impact parks or recreational facilities.

During construction and installation of structural BMPs, parks or other recreational facilities could be temporarily affected. Construction activities could potentially be performed near or within a park or recreational facilities. Potential impacts would be limited and short-term and could be avoided through siting, designing, and scheduling of construction activities.

In the unlikely event that the municipalities might install facilities on a scale that could alter a park or recreational facility, the structural BMPs could be designed in such a way as to be incorporated into the park or recreational facility. Additionally, should an impermeable detention basin be required, this could be constructed underground so as not to result in need for new or altered parks or other recreational facilities.

14. Public Service. e. Will the proposal have an effect upon, or result in a need for new or altered governmental services in any of the following areas: maintenance of public facilities, including roads?

Answer: Less than significant with mitigation

Discussion: Non-structural BMPs may include additional road maintenance such as additional and/or increased street sweeping. Structural BMPs may require additional maintenance by municipalities to ensure proper operation. As discussed above for

Questions 2, 6, and 13, additional or increased street sweeping and maintenance activities could affect air, noise, and transportation/circulation. The increase in air pollutants and noise levels would be no greater than typical street sweeping and maintenance activities currently performed by the municipalities. Street sweeping and maintenance events could be scheduled to be performed at the same time as other maintenance activities performed by the municipalities, or at times when these activities have lower impact, such as periods of low traffic activity and parking demand.

14. Public Service. f. Will the proposal have an effect upon, or result in a need for new or altered governmental services in any of the following areas: other government services?

Answer: Less than significant with mitigation

Discussion: As discussed above, non-structural and/or structural BMPs may include increased street sweeping and/or additional maintenance by dischargers to ensure proper operation of newly installed structural BMPs. However, the potential impacts to air, noise, and transportation/circulation would be no greater than typical street sweeping and maintenance activities currently performed by municipalities. Street sweeping and maintenance events could be scheduled to be performed at the same time as other maintenance activities performed by the municipalities, or at times when these activities have lower impact, such as periods of low traffic activity and parking demand.

Implementation of the TMDLs will result in the need for increased monitoring in Chollas Creek and its tributaries to track compliance with the TMDLs. However, no effects to the environment would be expected from these monitoring activities.

15. Energy. a. Will the proposal result in use of substantial amounts of fuel or energy?

Answer: No impact

Discussion: Non-structural and/or structural BMPs will not use substantial amounts of fuel or energy. As discussed above for Question 9, operation of street sweepers, construction, and maintenance vehicles could increase the use of fossil fuels, and some types equipment used in structural BMPs may consume electricity to operate pumps, etc. However, the relative amounts of additional fossil fuel and electricity that might be used would fall well within the capacity and expectations of normal city maintenance. The additional use of fossil fuels and electricity could be reduced if the municipalities used alternative fuels and/or renewable energies to power their vehicles and equipment.

15. Energy. b. Will the proposal result in a substantial increase in demand upon existing sources of energy, or require the development of new sources of energy?

Answer: No impact

Discussion: Non-structural and/or structural BMPs will not result in a substantial increase in demand upon existing sources of energy, or require the development of new sources of energy. As discussed for Questions 9 and 15a above, operation of street sweepers, construction, and maintenance vehicles could increase the use of fossil fuels, and some types equipment used in structural BMPs may consume electricity to operate pumps, etc. However, the relative amounts of additional fossil fuel and electricity that might be used would fall well within the capacity and expectations of normal city maintenance. The additional use of fossil fuels and electricity could be reduced if the municipalities used alternative fuels and/or renewable energies to power their vehicles and equipment.

If alternative sources of energy are used, sources of alternative energy and fuel may be needed. Equipment and components for renewable sources of energy such as solar or wind are readily available. Alternative fuels such as ethanol or biodiesel are commercially available and can be used. Sources of new energy are not required to be developed.

16. Utilities and Service Systems. a. Will the proposal result in a need for new systems, or substantial alterations to the following utilities: power or natural gas?

Answer: Less than significant

Discussion: Non-structural BMPs will not result in a need for new systems or alterations to power or natural gas utilities because none of the BMPs would introduce any physical effects that could impact this characteristic.

Installation of structural BMPs may require alterations or installation of new power or natural gas lines. Power, and natural gas lines might need to be rerouted to accommodate the addition of structural BMPs. The degree of alteration depends upon local system layouts which careful placement and design can minimize. However, that the installation of structural BMPs will result in a substantial increased need for new systems, or substantial alterations to power or natural gas utilities, is not reasonably foreseeable, because none of these BMPs are large enough to substantially tax current power or natural gas sources. No long term effects on the environment are expected if alterations to power or natural gas utilities are required.

16. Utilities and Service Systems. b. Will the proposal result in a need for new systems, or substantial alterations to the following utilities: communications systems?

Answer: No impact

Discussion: Non-structural BMPs will not result in a need for new systems or alterations to communications systems because none of the BMPs would introduce any physical effects that could impact this characteristic. Current forms of communications used in street sweeping and maintenance vehicles could still be used.

New systems or alterations to communications systems are not necessarily required for structural BMPs. Structural BMPs can be manually inspected and maintained without any communications system required. However, that municipalities could install a remote monitoring system, which could include a new communications system, is possible. A telephone line or wireless communications system could be installed, which would not be a substantial alteration.

16. Utilities and Service Systems. c. Will the proposal result in a need for new systems, or substantial alterations to the following utilities: water?

Answer: No impact

Discussion: Non-structural and/or structural BMPs will not result in a need for new systems or alterations to water lines. The need for new municipal or recycled water to implement these TMDLs, is not foreseeable.

16. Utilities and Service Systems. d. Will the proposal result in a need for new systems, or substantial alterations to the following utilities: Sewer or septic tanks?

Answer: Less than significant

Discussion: Non-structural and/or structural BMPs will not result in a need for new systems or alterations to sewer or septic tanks because none of the BMPs would introduce any physical effects that could impact this characteristic.

Depending on the structural BMPs selected, a portion or all of the surface water runoff may be diverted to wastewater treatment facilities. If stormwater is diverted for treatment at a wastewater treatment facility, new connections to existing sanitary sewer lines may be required, but no new major sewer trunks or substantial alterations to sewer system would be expected because BMPs utilizing the sewer would likely contribute small amounts of first flush storm water. Any environmental affects from

associated construction activities would be small scale and short-term and similar to typical municipal capital improvement projects.

16. Utilities and Service Systems. e. Will the proposal result in a need for new systems, or substantial alterations to the following utilities: stormwater drainage?

Answer: Less than significant with mitigation.

Discussion: Non-structural BMPs will not result in a need for new systems, or substantial alterations to stormwater drainage systems because none of the BMPs would introduce any physical effects that could impact this characteristic.

In order to achieve compliance with the TMDLs, the stormwater drainage systems may need to be reconfigured and/or retrofitted with structural BMPs to capture and/or treat a portion or all of the stormwater runoff. The alterations and/or additions to stormwater drainage systems will depend on the compliance strategy selected by each municipality at each location where structural BMPs might be installed. Impacts from construction activities to retrofit or reconfigure the storm drain system as part of BMP installation, and mitigation measures have been considered and discussed in the previous responses to the questions.

16. Utilities and Service Systems. f. Will the proposal result in a need for new systems, or substantial alterations to the following utilities: solid waste and disposal?

Answer: No impact

Discussion: Most non-structural BMPs will not result in a need for new systems, or substantial alterations to the solid waste and disposal systems because none of the BMPs would introduce any physical effects that could impact this characteristic. However, increased street sweeping would generate additional solid waste, but this additional waste is not expected to exceed the maintenance capacity of normal city operations. No new solid waste or disposal systems would be expected.

Structural BMPs may generate solid wastes requiring disposal. The installation of structural BMPs may generate construction debris. Installed structural BMPs may collect sediment and solid wastes that will require disposal. Structural BMPs may require disposal of construction debris and collected sediment and solid waste material, but no new solid waste or disposal systems would be needed to handle the relatively small volume generated by these projects. Construction debris may be recycled at aggregate recycling centers or disposed of at landfills. Sediment and solid wastes that may be collected can be disposed of at appropriate landfill and/or disposal facilities.

17. Human Health. a. Will the proposal result in creation of, and exposure of people to, any health hazard or potential health hazard (excluding mental health)?

Answer: Less than significant with mitigation

Discussion: As discussed above for Questions 2 and 13, non-structural BMPs such as street sweeping and maintenance vehicles could have an effect on air and transportation/circulation. Non-structural BMPs could increase the amount of pollutants emitted into the atmosphere above ambient conditions. Non-structural BMPs could also increase traffic, which could potentially decrease the safety of pedestrians. In both cases, potential impacts can be reduced or eliminated if street sweeping and/or maintenance activities are scheduled to be performed at the same time as other maintenance activities performed by the municipalities, or at times when these activities have lower impact, such as periods of low traffic activity.

As discussed above for questions 1, 2, 3, 5, and 13, the installation of structural BMPs could have an effect on earth, air, water, animal life, and transportation/circulation. Structural BMPs could increase the risk of unstable earth conditions, which could pose a physical risk to persons in the area should a slope fail. Construction, installation, and maintenance of structural BMPs could increase the amount of pollutants the air, which could have an effect on health. Structural BMPs could potentially result in additional habitat and/or standing water which can attract pests, such as flies, mosquitoes and/or rodents, which can be carriers of disease. Maintenance of structural BMPs could also increase traffic, which could potentially decrease the safety of pedestrians. Additionally, heavy machinery and materials that may be used during construction and installation of structural BMPs could pose physical and/or chemical risks to human health.

Potential impacts to earth could be avoided or mitigated through proper geotechnical investigations, siting, design, and ground and groundwater level monitoring to ensure that structural BMPs are not employed in areas subject to unstable soil conditions. Potential health hazards attributed to installation and maintenance of structural BMPs can be mitigated by use of OSHA construction and maintenance health and safety guidelines. Potential health hazards attributed to BMP maintenance can be mitigated through OSHA industrial hygiene guidelines. Installation of non-vector producing structural BMPs can help mitigate vector production from standing water. Netting can be installed over structural BMPs to further mitigate vector production. Structural BMPs can be designed and sites can be properly protected to prevent accidental health hazards as well as prevent vector production. Vector control agencies may also be employed as another source of mitigation. Structural BMPs prone to standing water can be selectively installed away from high-density areas and away from residential housing and/or by requiring oversight and treatment of those systems by vector control agencies. Potential impacts to transportation/circulation can be reduced or eliminated if maintenance activities are scheduled to be performed at the same time as other maintenance activities performed by the municipalities, or at

times when these activities have lower impact, such as periods of low traffic activity. Appropriate planning, design, siting, and implementation can reduce or eliminate potential health hazards due to the installation of structural BMPs.

Additionally, potential benefits will include a reduction in the rate of bioaccumulation of lead, copper and zinc, because of the result reduction of exposure to people eating fish caught at the mouth of Chollas Creek or otherwise in San Diego Bay.

Finally, metals that are removed by infiltration BMPs typically are retained in the upper 2 to 5 inches of soil or sediment. Typically, metals levels returned to background levels or non-detectable levels below about 5 inches depth.

There is a potential (given enough time) that metals may accumulate in the upper 2 to 5 inches of soil to levels that might be toxic to humans, plants, and/or animals. The mitigation measures that could be implemented would include proper and adequate cover materials that would limit the access to the soil that is being affected by metals in stormwater. Options could include planting grass or iceplant, covering with gravel or cobblestones, or covering with compost as a mulch. Any of these cover options would reduce the potential for exposure to soils with elevated metals concentrations. The added benefit that compost might have is a higher affinity to bind with metals (due to its high organic content), and that placement of compost on the soil surface will capture the metals before they bind with the soil As metals concentrations build, the mulch could be removed and replaced. Other options for minimizing exposure to soil could include putting the infiltration BMP underground or indoors, and/or restricting access. Finally, the metals-laden, top 2 to 5 inches of soil could be removed, disposed of and replaced.

18. Aesthetics. a. Will the proposal result in the obstruction of any scenic vista or view open to the public?

Answer: Less than significant with mitigation.

Discussion: Non-structural BMPs will not result in the obstruction of any scenic vista or view open to the public because none of the BMPs would introduce any physical effects that could impact this characteristic.

That municipalities would comply with these TMDLs by installing structural BMPs that would adversely affect a scenic vista or view open to the public, is not reasonably foreseeable. Most structural BMPs, which will likely be used, are subsurface devices such as sand filters. Once completed, structural BMPs would not foreseeably obstruct scenic vistas or open views to the public. In the unlikely event that the municipalities might install facilities on a scale that could obstruct scenic views, such impacts could be reduced or eliminated with appropriate planning, design, and siting of the structural BMPs. Additionally, any structural BMPs can, if necessary, be constructed underground to eliminate aesthetic issues.

18. Aesthetics. b. Will the proposal result in the creation of an aesthetically offensive site open to public view?

Answer: Less than significant with mitigation

Discussion: Non-structural BMPs will not result in the creation of an aesthetically offensive site open to public view because none of the BMPs would introduce any physical effects that could impact this characteristic.

The installation of structural BMPs could potentially create an aesthetically offensive site open to public view. Structural BMPs may create an aesthetically offensive site to the public during construction and installation, but this would be temporary until construction is completed. Once installation of the structural BMPs is complete, the site may continue to be aesthetically offensive to the public. However, many structural BMPs can be designed to provide wildlife habitat, recreational areas, and green spaces in addition to improving stormwater quality. Appropriate architectural and landscape design practices can be implemented to reduce adverse aesthetic effects. Screening and landscaping may also be used to mitigate adverse aesthetic effects. The adverse aesthetic effects could be reduced or eliminated and possibly improved with appropriate planning and design of the structural BMPs. Additionally, any structural BMPs can, if necessary, be constructed underground to eliminate aesthetic issues.

Above-ground structural BMPs may also become targets of vandalism. Vandalized structures may become aesthetically offensive. Vandalism, however, already exists to some degree in most, if not all, urbanized areas. Adding several new structures is not of itself likely to have any impact upon current vandalism trends. Improved lighting and enforcement of current vandalism ordinances may decrease vandalism of structural BMPs.

19. Recreation. Will the proposal result in impact on the quality or quantity of existing recreational opportunities?

Answer: Less than significant with mitigation

Discussion: Non-structural BMPs will not result in impact on the quality or quantity of existing recreational opportunities because none of the BMPs would introduce any physical effects that could impact these characteristics.

During construction and installation of structural BMPs, parks or other recreational areas could be temporarily affected. Construction activities could potentially be performed near or within a park or recreational area. Potential impacts would be

limited and short-term and could be avoided through proper siting, design, and scheduling of construction activities.

In the event that the municipalities might install facilities on a scale that could alter a park or recreational area, the structural BMPs could be designed in such a way as to be incorporated into the park or recreational area. Additionally, any structural BMPs can, if necessary, be constructed underground to minimize impacts on the quality or quantity of existing recreational opportunities. Mitigation to replace lost areas may include the creation of new open space recreation areas and/or improved access to existing open space recreation areas.

Additionally, improvement of water quality could create new recreation opportunities in Chollas Creek by providing the opportunity to recreate in and near a clean water body with a robust and diverse population of plants and animals.

20. Archeological/Historical a. Will the proposal result in the alteration of a significant archeological or historical site, structure, object or building?

Answer: Less than significant with mitigation

Discussion: Non-structural BMPs will not result in the alteration of a significant archeological or historical site, structure, object or building because none of the BMPs would introduce any physical effects that could impact these characteristics.

In the unlikely event that municipalities might install facilities on a scale that could result in significant adverse effects on a significant archeological or historical site, structure, object or building, a project level, site-specific environmental assessment should be performed to identify the mitigation measures that could be employed to minimize the potential effects on archeological or historical sites and identify alternatives that could potentially be used that would have less impact. The agencies responsible for implementing these TMDLs could consult the relevant local archeological or historical commissions or authorities to identify these types of sites and determine ways to avoid significant adverse impacts. The potentially adverse effects on archeological or historical sites that might be present could be reduced or eliminated with appropriate planning, design, and siting of the structural BMPs.

Additionally, if during ground-disturbing activities paleontological resources are identified within the project area, all work within 50 feet of the discovery should be halted and a qualified paleontologist contacted to evaluate the finds and make recommendations. If the paleontological resources are not significant as determined by a qualified paleontologist, no further protection is necessary. If such paleontological resources are found to be significant, they should be avoided by project activities. If avoidance is not feasible, adverse effects to such paleontological resources should be mitigated. Upon completion of the paleontological assessment, a report should be prepared documenting the methods and results, as well as

recommendations. The City should require implementation of the recommendations of the report. The report should be submitted to the appropriate City agencies.

21. Mandatory Findings of Significance - Potential to degrade: Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?

Answer: Less than significant with mitigation

Discussion: Non-structural BMPs will not result in the substantial degradation of the environment for plant and animal species because none of the BMPs would introduce any physical effects that could impact these characteristics.

As discussed above in Questions 4 and 5, plant and animal species could potentially be adversely affected by the installation and operation of structural BMPs. Mitigation measures could be implemented to ensure that unique, rare or endangered plant and/or animal species and their habitats are not taken or destroyed. When specific projects are developed and sites identified, a focused protocol plant and/or animal survey and/or a search of the California Natural Diversity Database should be performed to confirm that any potentially sensitive or special status plant and/or animal species in the site area are properly identified and protected as necessary. If sensitive plant and/or animal species occur on the project site, mitigation is required in accordance with the Endangered Species Act. Mitigation measures should be developed in consultation with the CDFG and the USFWS. Responsible agencies should endeavor to avoid installing structural BMPs that could adversely affect any unique, rare or endangered species of plants and/or animals, and instead opt for non-structural BMPs and/or identify and install structural BMPs that will have little or no impact such as underground BMPs.

Taken all together, the potential impacts of the project will not cause a significant cumulative impact in the environment. In any case, the implementation of these TMDLs will result in improved water quality in the waters of the Region and will have significant beneficial impacts to the environment over the long term.

21. Mandatory Findings of Significance - Short-term: Does the project have the potential to achieve short-term, to the disadvantage of long-term, environmental goals? (A short-term impact on the environment is one which occurs in a relatively brief, definitive period of time, while long-term impacts will endure well into the future.)

Answer: No impact

Discussion: There are no short-term beneficial effects on the environment from the implementation of non-structural and/or structural BMPs that would be at the expense of long-term beneficial effects on the environment. The implementation and compliance with these TMDLs will result in improved water quality in the waters of the Region and will have significant beneficial impacts to the environment over the long term.

21. Mandatory Findings of Significance - Cumulative: Does the project have impacts which are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)

Answer: Less than significant with mitigation

Discussion: Cumulative impacts, defined in section 15355 of the CEQA Guidelines, refer to two or more individual effects, that when considered together, are considerable or that increase other environmental impacts. Cumulative impact assessment must consider not only the impacts of the proposed metals TMDLs, but also the impacts from other TMDL, municipal, and private projects, which have occurred in the past, are presently occurring, and may occur in the future, in the watershed during the period of implementation.

Past and present projects may be regarded as the general construction (development and maintenance) which has brought the Chollas Creek watershed from a natural, pristine condition, to the urban, developed setting which is present today. This provides a baseline level of construction with which to compare all water quality project requirements. The past and present baseline of construction in the Chollas Creek watershed are typical of any fully developed urban area, and will probably remain constant in the future. The increment of increase proposed by the cumulative requirements of all water quality requirements can be mitigated through scheduling, and is insignificant compared to the past and on-going baseline of typical municipal construction.

Present and future impacts will come from all of the water quality control programs and pollutant load reduction projects being implemented in the watershed or planned for the near future. For Chollas Creek, these include TMDLs for Diazinon, Indicator Bacteria TMDLs, the mouth of Chollas Creek toxic sediment TMDLs, toxic pollutants in sediment in San Diego Bay near Chollas Creek, and projects to comply with the WDRs in Order No. R9-2007-0001 (the San Diego County municipal stormwater requirements).

The San Diego Water Board adopted a diazinon TMDL for Chollas Creek in 2002, and will likely adopt TMDLs for indicator bacteria in 2007. The San Diego Water Board has also required the cities of La Mesa, Lemon Grove, and San Diego to initiate trash reduction programs in an iterative BMP implementation process, under section C of Order No. 2001-01,[19] (the previous San Diego County municipal stormwater requirements) and section A.3.a.(1) of Order No. R9-2007-01. In assessing cumulative impacts from multiple water quality control requirements, this CEQA analysis considers the nature, source and transport of impairing compounds, the pollutant loading mechanisms and the reasonably foreseeable methods of compliance.

Cumulative impacts are not expected to be significant because effective non-structural BMPs, that have no adverse impacts, are available to implement the Diazinon TMDL, Indicator Bacteria TMDLs, and trash reduction program. The principal implementation provision for the Diazinon TMDL was federal legislation banning the sale and use of the pesticide in the United States.[20] Other BMPs for Diazinon reduction include education and outreach to discourage homeowners and businesses from using stockpiled Diazinon, and encourage integrated pest management practices, none of which will have adverse effects on the physical environment, and therefore no significant cumulative impact.

The Indicator Bacteria TMDLs can be implemented through education and outreach, and enforcement of ordinances requiring pet owners to properly dispose of pet waste, ordinances prohibiting disposal of grease, food products, and other bacteria-laden waste products into the storm drain, and ordinances banning nuisance flows into the stormdrain system. Another important bacteria load reduction program is to find and fix illegal cross-connections between the sanitary sewer system and the stormdrain system, such as the recently discover cross-connection and large sewage spill at Naval Station San Diego, at the mouth of Chollas Creek. Fixing cross connections between the stormdrain and sanitary sewer systems may increase the overall number of construction projects needed in the watershed to implement TMDLs. However, estimating the number of cross connections that might exist is purely speculative. Further, these types of construction projects are on a small scale and fall well within typical municipal capital improvement and maintenance activities. Therefore the cumulative effects will not be considerable, and can be mitigated, if necessary, through scheduling.

The mouth of Chollas Creek toxic sediment TMDL is currently in the initial stages of development. The San Diego Water Board identified the 1-10 acres near the mouth of Chollas Creek in San Diego Bay as one of five priority toxic hotspots in San Diego Bay. The San Diego Water Board listed the same areas on the 1998 List of Water Quality Limited Segments as a priority for establishing a TMDL that addresses benthic community degradation and toxicity in the marine sediment of Chollas Creek channel in San Diego bay. The likely contaminants of concern that cause the benthic

[19] Order No. 2001-01 was superseded by Order No. R9-2007-0001 adopted on January 24, 2007.
[20] Diazinon Revised Risk Assessment And Agreement With Registrants; Prevention, Pesticides And Toxic Substances (7506C)

community degradation are: chlordane and non-polar organics (including polychlorinated biphenyls (PCBs)) and polycyclic aromatic hydrocarbons (PAHs) in sediment. However, cumulative effects are not expected since the likely implementation action will result in some form of dredging and cleanup. Therefore the cumulative effects will not be considerable, and can be mitigated, if necessary, through scheduling.

Trash reduction can be achieved through education and outreach, and enforcement of ordinances against littering. For the most part, these activities will not have adverse environmental impacts, and therefore no significant cumulative impact.

Ordinances prohibiting nuisance flows will reduce both bacteria and metals loading to Chollas Creek. The effects of eliminating nuisance flows may be attributable to several water quality control projects, but the effects of each will not be cumulative because they are not additive, i.e., once flows are reduced for any project, other projects won't result in further reductions.

The dischargers may opt to use structural BMPs to reduce bacteria and metals loading to Chollas Creek which would increase the likelihood of environmental effects that are cumulatively considerable. The City of San Diego funded an assessment of BMP strategies that would lessen the anticipated impacts and allow an integrated TMDL strategy that address both current and anticipated TMDLs. In this study,[21] the authors recommended a strategy that used a tiered approach that reduces the impact to the environment, and allows for more cost effective implementation of lower-impact BMPs. The tiered approach consists of three major components:

- Tier 1 – Control of Pollutants at the Source and Prevent Pollutants from Entering Runoff
- Tier 2 – Conduct Design Studies and Implement Aggressive Street Sweeping and Runoff and Treatment Volume Reduction BMPs
- Tier 3 – Infrastructure Intensive Treatment BMPs

Implementation of this BMP strategy, because it emphasizes BMPs with the least adverse impacts to the environment, should reduce cumulative impacts to less than significant levels.

However, present and future specific TMDL projects may include structural BMP construction which must be environmentally evaluated for potential cumulative impacts by the implementing municipality. Present and future specific TMDL projects and other construction activities may result in short-term cumulative impacts as described below. However, appropriate and available mitigation measures, including scheduling, are available to reduce adverse environmental impacts associated with construction to less than significant levels.

Noise and Vibration - Local residents in the near vicinity of installation and

[21] Weston Solutions, 2006. *Chollas Creek TMDL Source Loading, Best Management Practices, and Monitoring Strategy Assessment,* September, 2006.

maintenance activities may be exposed to noise and possible vibration. The cumulative effects, both in terms of added noise and vibration at multiple metals TMDL installation sites, and in the context of other related projects, are not likely to be cumulatively considerable due to the temporary nature of noise increases and the small scale of the projects. Noise mitigation methods including scheduling of construction are discussed above, and should be used to keep cumulative noise and vibration affects to acceptable levels.

Air Quality - Implementation of the metals TMDLs program may cause additional emissions of air pollutants and slightly elevated levels of carbon monoxide during construction activities. Emission of air pollutants resulting from installation of TMDL compliance devices may exceed certain regulatory thresholds, and therefore the TMDLs, in conjunction with all other construction activity, may contribute to the region's overall exceedance of certain regulatory thresholds during the installation period. However, because these installation-related emissions are temporary, compliance with the TMDLs would not result in long-term cumulatively considerable air quality impacts. Short-term impacts can be avoided through scheduling.

Transportation and Circulation - Compliance with the metals TMDLs could involve installation activities occurring simultaneously at a number of sites along Chollas Creek and tributaries to the creek. Installation of metals reduction BMPs may occur in the same general time and space as other related or unrelated projects. In these instances, construction activities from all projects could produce cumulative traffic effects depending upon a range of factors including the specific location involved and the precise nature of the conditions created by the numerous construction activities. Special coordination efforts may be necessary to reduce the combined effects to an acceptable level. Overall, cumulatively considerable impacts are not anticipated because coordination can occur and because transportation mitigation methods are available.

Public Services - The cumulative effects on public services due to the metals TMDLs would be limited to traffic inconveniences. These effects are not likely to be cumulatively considerable as long as alternative traffic route are available around construction sites.

Aesthetics - Construction activities associated with other related projects may be ongoing in the vicinity of one or more metals TMDL construction sites. To the extent that combined construction activities do occur, there would be temporary elevated adverse visual effects. However, these effects are not cumulatively considerable in the long-term because the effects will cease with the completion of construction. Short-term impacts can be avoided through scheduling.

As analyzed above, the construction of structural BMP, along with other construction and maintenance projects, could have short-term cumulative effects; however, these effects can be mitigated through proper construction scheduling. In addition, these effects are not cumulatively considerable in the long-term because the effects will cease with the completion of construction. In summary, appropriate and available mitigation measures, including scheduling, are available to reduce adverse

environmental impacts associated with construction to less than significant levels.

21. Mandatory Findings of Significance - Substantial adverse: Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?

Answer: Less than significant with mitigation

Discussion: All of the potentially significant impacts to human beings, such as air quality, noise, aesthetics, alterations to utilities, fire protection, police protections etc., are either short-term in nature, or can be mitigated to acceptable levels as previously discussed.

5.1 Alternative Means of Compliance

The CEQA requires an analysis of reasonably foreseeable alternative means of compliance with the rule or regulation, which would avoid or eliminate the identified impacts.[22] The dischargers can use the structural and non-structural BMPs described in section 3, or other structural and non-structural BMPs, to control and prevent pollution, and meet the TMDLs' required load reductions. The alternative means of compliance with the TMDLs consist of the different combinations of structural and non-structural BMPs that the dischargers might use. Because there are innumerable ways to combine BMPs, all of the possible alternative means of compliance cannot be discussed here. However, because most of the adverse environmental effects are associated with the construction and installation of large scale structural BMPs, to avoid or eliminate impacts, compliance alternatives should minimize structural BMPs, maximize non-structural BMPs, and site, size, and design structural BMPs in ways to minimize environmental effects.

For example, in a residential area where metals loading is not as high as in commercial or roadways areas, the dischargers might be able to reduce metals loading through nonstructural BMPs like increased street sweeping, development and enforcement of municipal ordinances prohibiting exposure of copper, lead and zinc materials to stormwater and stormwater drainage pathways, and development and enforcement of municipal ordinances prohibiting nuisance flows. This compliance alternative would be environmentally superior to constructing detention basins and treatment works in residential areas.

As an additional example, in a commercial area where metals loading is typically as high or higher than all other areas including, residential, roadways, open space, and industrial, the dischargers might be able to reduce metals loading through nonstructural and structural BMPs. Non-structural BMPs may include increased street sweeping, development and enforcement of municipal ordinances prohibiting exposure of copper, lead and zinc materials to stormwater and stormwater drainage pathways, and

[22] 14 CCR section 15187 (c) (3)

development and enforcement of municipal ordinances prohibiting nuisance flows. Structural BMPs may include small storm drain sand filters. This compliance alternative would be environmentally superior to constructing large detention basins and treatment works in commercial areas.

6 Reasonably Foreseeable Methods of Compliance at Specific Sites

The most reasonably foreseeable method of compliance with this Basin Plan amendment establishing TMDLs for copper, lead, and zinc is through the implementation of BMPs. The Chollas Creek watershed is highly urbanized and includes the following land uses; residential, commercial/institutional, industrial, roadways, and open space. These land uses have varying geographic settings and population densities, however, generalization is possible. For example, the residential land use has a suburban developed geographical setting with a relatively high population density, while the open space land use has a more natural, undeveloped geographical setting with a relatively low population density. Potential site specific BMPs (both structural and non-structural), or combinations of BMPs, that will likely be employed to reduce copper, lead, and zinc will vary from site to site. However, specific land uses will probably require BMPs that reflect the typical copper, lead, and zinc loading associated with that land use. For example, major traffic intersections in the commercial/institutional land use areas will likely generate higher copper waste (due to automobile braking) than the residential land use where vehicular traffic is much lower. Therefore, a more intensive combination of BMPs may be required in the commercial/institutional land use areas compared to the residential land use areas.

Following is a discussion of reasonably foreseeable BMP combinations that could potentially be implemented in the land use areas listed above based on conditions at specific sites in the Chollas Creek watershed. Also included is an analysis of the possible impacts to the environment. Keep in mind that in the Environmental Checklist (section 4) and Discussion of Possible Environmental Impacts of Reasonably Foreseeable Compliance Methods and Mitigation Measures (section 5) above, all short term environmental impacts, as a result of BMP implementation, were found to be less than significant with mitigation, less than significant, or of no impact. However, three possible long term impacts were consider potentially significant, including implementing BMPs which could change the amount of surface waters, alter the flow rate of groundwaters, or alter the quantity or quality of groundwaters.

The dischargers are in no way limited to the following BMP combinations, and may choose not to implement BMPs at the specific sites discussed below. The actual BMPs to be implemented will be determined by the dischargers, after careful analysis of the site specific characteristics of the locations where the dischargers intend to implement the BMPs.

6.1 Potential BMPs for Residential Land Use Areas

The site specific BMPs to be implemented in the Residential land use areas will be chosen by the dischargers after adoption of these TMDLs. The residential land use has a suburban developed geographical setting marked by both high and low building and

population densities depending on the neighborhood. Vehicular traffic, which is correlated with higher metals concentrations, is higher than in open space areas but lower than in commercial/institutional, industrial, and roadway land use areas. The source analysis indicates that residential land use areas account for less than 10 percent of the wet weather loading of copper, lead, and zinc to Chollas Creek (Technical Report Figures 5.4, 5.5, and 5.6). Therefore, residential land use areas, like the area shown in Figure I.1, may only require non-structural BMPs.

Figure I.1. Residential land use in Chollas Creek watershed located at the intersection of N. Thorn Street and S. Thorn Street.

Potential non-structural BMPs at this specific site could include (1) increased street sweeping, and (2) development and enforcement of municipal ordinances prohibiting exposure of copper, lead and zinc materials to stormwater and stormwater drainage pathways, and (3) development and enforcement of municipal ordinances prohibiting nuisance flows.

Non-structural BMPs

Increasing street sweeping and the development and enforcement of municipal ordinances prohibiting exposure of copper, lead, and zinc materials to stormwater and stormwater drainage pathways, have no foreseeable potentially significant impacts. However, the development and enforcement of municipal ordinances prohibiting

nuisance flows may change the amount of surface water in Chollas Creek. This would impact the water which is available to in-channel wetlands. However, it was noted that wetlands in Chollas Creek are not high value wetlands because of the predominance of *Arundo donax*, and invasive plant species, and that the reduction of nuisance flows would return Chollas Creek to predevelopment conditions, i.e., a seasonal, ephemeral stream which does not support dry season wetlands. Additional benefits of nuisance flow reductions include elimination of non-targeted pollutants (such as lawn fertilizers and pesticides) in Chollas Creek. For a more thorough discussion of potential impacts, please see the Environmental Checklist (section 4) and Discussion of Possible Environmental Impacts of Reasonably Foreseeable Compliance Methods and Mitigation Measures (section 5) above.

6.2 Potential BMPs for Commercial/Institutional Land Use Areas

The potential site specific BMPs to be implemented in the commercial/institutional land use areas will be chosen by the dischargers after adoption of these TMDLs. The commercial/institutional land use has an urban developed geographical setting marked by high building and population densities. Vehicular traffic, which is correlated with higher metals concentrations, is higher than in open space, residential, and industrial areas but lower than in the roadway land use area. The source analysis indicates that commercial/institutional land use areas account for more than 35 percent of the wet weather loading of copper, lead, and zinc to Chollas Creek (Technical Report Figures 5.4, 5.5, and 5.6). Therefore, commercial/institutional land use areas, like the one shown in Figure I.2, likely will require both structural and non-structural BMPs due to higher building densities and vehicular traffic.

Figure I.2. Commercial land use in Chollas Creek watershed located at the intersection of 54th Street and Redwood Street.

Potential non-structural BMPs at this specific site could include (1) increased street sweeping, and (2) development and enforcement of municipal ordinances prohibiting exposure of copper, lead and zinc materials to stormwater and stormwater drainage pathways, and (3) development and enforcement of municipal ordinances prohibiting nuisance flows. Potential structural BMPs for this specific site could include sand filter storm drain retrofits and porous pavements.

Non-structural BMPs

Increasing street sweeping and the development and enforcement of municipal ordinances prohibiting exposure of copper, lead and zinc materials to stormwater and stormwater drainage pathways, have no foreseeable potentially significant impacts. However, the development and enforcement of municipal ordinances prohibiting nuisance flows may change the amount of surface water in Chollas Creek. This would impact the water which is available to in-channel wetlands. However, it was noted that wetlands in Chollas Creek are not high value wetlands because of the predominance of *Arundo donax*, and invasive plant species, and that the reduction of nuisance flows would return Chollas Creek to predevelopment conditions, i.e., a seasonal, ephemeral stream which does not support dry season wetlands. Additional benefits of nuisance flow reductions include elimination of non-targeted pollutants (such as lawn fertilizers and pesticides) in Chollas Creek.

Structural BMPs

Sand filter storm drain retrofit BMPs that are well maintained by municipal agencies have the advantage of high metals treatment effectiveness and no foreseeable potentially significant adverse environmental impacts. Sand filter storm drain retrofit BMPs are not expected to change the amount of surface waters, alter the flow rate of groundwaters, or alter the quantity or quality of groundwaters. Additionally, the impermeable hardscape in the area dividing the roadways shown in the picture above could be replaced with porous pavement. Installing and maintaining porous pavement systems that allow storm water to infiltrate into groundwater and come into contact with organic material in the soil, are effective metals BMPs. Storm water coming into contact with soil as overland flow can benefit from metals reductions. However, porous pavement BMPs may change the amount of surface waters, may alter the flow rate of groundwaters, and/or may alter the quantity or quality of groundwaters. None of these changes will result in adverse impacts to the environment. For a more thorough discussion of potential impacts, please see the Environmental Checklist (section 4) and Discussion of Possible Environmental Impacts of Reasonably Foreseeable Compliance Methods and Mitigation Measures (section 5) above.

6.3 Potential BMPs for Industrial Land Use Areas

The potential site specific BMPs to be implemented in the industrial land use areas will be chosen by the dischargers after adoption of these TMDLs. The industrial land use has an urban developed geographical setting marked by high building density but low population density. Vehicular traffic, which is correlated with higher metals concentrations, is higher than in open space and residential areas but lower than in the commercial and roadway land use areas. The source analysis indicates that industrial land use areas account for less than 5 percent of the wet weather loading of copper, lead, and zinc to Chollas Creek (Technical Report Figures 5.4, 5.5, and 5.6). However, because of the relatively higher concentration of vehicular traffic, higher concentrations of metals are expected in these areas. Therefore, industrial land use areas, like the one shown in Figure I.3, likely will require both structural and non-structural BMPs due to higher building densities and vehicular traffic.

Figure I.3. Industrial land use in Chollas Creek watershed located near the intersection of 30th Street and Market Street.

Potential non-structural BMPs at this specific site could include (1) increased street sweeping, and (2) development and enforcement of municipal ordinances prohibiting exposure of copper, lead and zinc materials to stormwater and stormwater drainage pathways, and (3) development and enforcement of municipal ordinances prohibiting nuisance flows. Potential structural BMPs for this specific site could include sand filter storm drain retrofits and porous pavements.

Non-structural BMPs

Increasing street sweeping and the development and enforcement of municipal ordinances prohibiting exposure of copper, lead and zinc materials to stormwater and stormwater drainage pathways, have no foreseeable potentially significant impacts. However, the development and enforcement of municipal ordinances prohibiting nuisance flows may change the amount of surface water in Chollas Creek. This would impact the water which is available to in-channel wetlands. However, it was noted that wetlands in Chollas Creek are not high value wetlands because of the predominance of *Arundo donax*, and invasive plant species, and that the reduction of nuisance flows would return Chollas Creek to predevelopment conditions, i.e., a seasonal, ephemeral stream which does not support dry season wetlands. Additional benefits of nuisance flow

reductions include elimination of non-targeted pollutants (such as lawn fertilizers and pesticides) in Chollas Creek.

Structural BMPs

Sand filter storm drain retrofit BMPs that are well maintained by municipal agencies have the advantage of high metals treatment effectiveness and no foreseeable potentially significant adverse environmental impacts. Sand filter storm drain retrofit BMPs are not expected to change the amount of surface waters, alter the flow rate of groundwaters, or alter the quantity or quality of groundwaters. Additionally, parking lots and other hardscape areas could be converted to porous pavement. Installing and maintaining porous pavement systems that allow storm water to infiltrate into groundwater and come into contact with biological systems in the soil, are effective metals BMPs. Storm water coming into contact with soil as overland flow can benefit from metals reductions. However, porous pavement BMPs may change the amount of surface waters, may alter the flow rate of groundwaters, and/or may alter the quantity or quality of groundwaters. None of these changes will result in adverse impacts to the environment. For a more thorough discussion of potential impacts, please see the Environmental Checklist (section 4) and Discussion of Possible Environmental Impacts of Reasonably Foreseeable Compliance Methods and Mitigation Measures (section 5) above.

6.4 Potential BMPs for Roadways Land Use Areas

The site specific BMPs to be implemented in the roadways land use areas will be chosen by the dischargers after adoption of these TMDLs. The roadways land use has an urban developed geographical setting marked by both high and low building and population densities depending on the neighborhood. Vehicular traffic, which is correlated with higher metals concentrations, is higher than that all other areas, including open space areas, commercial/institutional, industrial, and residential land use areas. The source analysis indicates that roadways land use areas account for more than 27 percent of the wet weather loading of copper, lead, and zinc to Chollas Creek (Technical Report Figures 5.4, 5.5, and 5.6). Therefore, roadways land use areas, like the one shown in Figure I.4, likely will require both structural and non-structural BMPs due to higher vehicular traffic.

Figure I.4. Roadways land use in Chollas Creek watershed located at the intersection of Quince Street and Chollas Parkway.

Potential non-structural BMPs at this specific site could include (1) increased street sweeping, and (2) development and enforcement of municipal ordinances prohibiting exposure of copper, lead and zinc materials to stormwater and stormwater drainage pathways, and (3) development and enforcement of municipal ordinances prohibiting nuisance flows. Potential structural BMPs for this specific site could include sand filter storm drain retrofits.

Non-structural BMPs

Increasing street sweeping and the development and enforcement of municipal ordinances prohibiting exposure of copper, lead and zinc materials to stormwater and stormwater drainage pathways, have no foreseeable potentially significant impacts. However, the development and enforcement of municipal ordinances prohibiting nuisance flows may change the amount of surface water in Chollas Creek. This would impact the water which is available to in-channel wetlands. However, it was noted that wetlands in Chollas Creek are not high value wetlands because of the predominance of *Arundo donax*, and invasive plant species, and that the reduction of nuisance flows would return Chollas Creek to predevelopment conditions, i.e., a seasonal, ephemeral stream which does not support dry season wetlands. Additional benefits of nuisance flow

reductions include elimination of non-targeted pollutants (such as lawn fertilizers and pesticides) in Chollas Creek.

Structural BMPs

Sand filter storm drain retrofit BMPs that are well maintained by municipal agencies have the advantage of high metals treatment effectiveness and no foreseeable potentially significant adverse environmental impacts. Sand filter storm drain retrofit BMPs are not expected to change the amount of surface waters, alter the flow rate of groundwaters, or alter the quantity or quality of groundwaters. For a more thorough discussion of potential impacts, please see the Environmental Checklist (section 4) and Discussion of Possible Environmental Impacts of Reasonably Foreseeable Compliance Methods and Mitigation Measures (section 5) above.

6.5 Potential Site Specific BMPs for Open Space Land Use Areas

The site specific BMPs to be implemented in the open space land use areas will be chosen by the dischargers after adoption of these TMDLs. The open space land use has a natural, undeveloped geographical setting with a relatively low population density. Vehicular traffic, which is correlated with higher metals concentrations, is lower than all other areas, including residential, commercial/institutional, industrial, and roadway land use areas. The source analysis indicates that open space land use areas account for less than 1 percent of the wet weather loading of copper, lead, and zinc to Chollas Creek (Technical Report Figures 5.4, 5.5, and 5.6). Therefore, open space land use areas, like the one shown in Figure I.5, may require no BMPs, or may require non-structural BMPs only, due to lower vehicular traffic. However, because of the availability of undeveloped space, the dischargers might choose open space areas to construct detention basins.

Figure I.5. Open Space land use in Chollas Creek watershed located at the intersection of Quince Street and Chollas Parkway.

Potential non-structural BMPs at this specific site could include (1) increased street sweeping, and (2) development and enforcement of municipal ordinances prohibiting exposure of copper, lead and zinc materials to stormwater and stormwater drainage pathways, and (3) development and enforcement of municipal ordinances prohibiting nuisance flows.

Non-structural BMPs

Increasing street sweeping and the development and enforcement of municipal ordinances prohibiting exposure of copper, lead and zinc materials to stormwater and stormwater drainage pathways, have no foreseeable potentially significant impacts. However, the development and enforcement of municipal ordinances prohibiting nuisance flows may change the amount of surface water in Chollas Creek. This would impact the water which is available to in-channel wetlands. However, it was noted that wetlands in Chollas Creek are not high value wetlands because of the predominance of *Arundo donax*, and invasive plant species, and that the reduction of nuisance flows would return Chollas Creek to predevelopment conditions, i.e., a seasonal, ephemeral stream which does not support dry season wetlands. Additional benefits of nuisance flow reductions include elimination of non-targeted pollutants (such as lawn fertilizers and pesticides) in Chollas Creek.

Structural BMPs

Open spaces shown in the picture above could be seen as an opportunity for detention basin BMPs. Installing and maintaining detention basin systems that allow storm water to infiltrate into groundwater and come into contact with biological systems in the soil, are effect metals BMPs. However, detention basin BMPs may alter the flow rate of groundwaters, and/or may alter the quantity or quality of groundwaters. In both cases, appropriate mitigation measures have been identified in section 5 above. For a more thorough discussion of potential impacts, please see the Environmental Checklist (section 4) and Discussion of Possible Environmental Impacts of Reasonably Foreseeable Compliance Methods and Mitigation Measures (section 5) above.

7 Economic Factors

As stated in section 1.2, the environmental analysis required by the CEQA must take into account a reasonable range of economic factors. This section on economic factors contains an estimate of the costs of implementing the reasonably foreseeable methods of compliance with the metals TMDLs Basin Plan amendment. Specifically, this analysis estimates the costs of implementing the structural and non-structural BMPs, discussed in section 3, which could be used to reduce copper, lead, and zinc loading to Chollas Creek. Implementation of these TMDLs will also entail water quality monitoring. This section provides information on the costs of collecting, transporting, and analyzing a water sample for copper, lead, and zinc.

The specific BMPs to be implemented will be chosen by the dischargers after adoption of these TMDLs. All costs are preliminary estimates only, since particular elements of a BMP, such as type, size, and location, would need to be developed to provide a basis for more accurate cost estimations. Identifying the specific BMPs that dischargers will choose to implement is speculative at this time. Therefore, this section discloses typical costs of conventional stormwater BMPs, as discussed above.

7.1 Cost Estimates of Typical BMPs for Stormwater and Urban Runoff Discharges

Approximate costs associated with typical non-structural and structural BMPs that might be implemented in order to comply with the requirements of these TMDLs are provided below. The BMPs are divided into non-structural and structural classes. Some BMPs may already be implemented in Chollas Creek in compliance with San Diego Water Board Order No. R9-2006-0011.

Non-Structural BMPs

Education and Outreach: Education and outreach to residents, businesses and industries can be a very effective tool. These efforts might be focused on the reduction of metal releases from the activities associated with the normal operation of automobiles. The cost of producing educational materials, organizing field trips, holding meetings, etc. will

vary with the scope of efforts and are estimated to be between $1,000 to $200,000.[23] Because education and outreach is a component of Order No. R9-2006-0011, which regulates urban runoff discharges, costs to develop and conduct outreach and educational programs to comply with the TMDLs' requirements are expected to be minimal.

Road and Street Maintenance: Another effective BMP to prevent pollutants from entering the MS4 is to maintain clean sidewalks, streets, and gutters. The largest expenditures for street sweeping programs are in staffing and equipment. The capital cost for a street sweeper is approximately $60,000 for a mechanical street sweeper and $180,000 for a vacuum-assisted street sweeper. The average useful life of a sweeper is about four to eight years. Operation and maintenance costs for street sweeper were estimated at $30/curb mile for mechanical street sweepers and $15/curb mile for vacuum-assisted street sweepers.[24] Increased street sweeping could lead to faster wear and tear of the road surface, which would add additional costs for road repair work. This particular BMP may prove to be more cost-effective than certain structural controls, especially in more urbanized areas with greater areas of pavement.

Illicit Discharges: Illicit discharges to the stormwater system can be identified through visual inspections during dry weather or through the use of smoke or dye tests. The costs of smoke and dye tests vary from $1,250 to $1,750. The overall costs associated with compliance with the TMDLs are expected to be relatively minor since the identification of illicit discharges is an important component of compliance with Order No. 2001-0001 regulating urban runoff discharges.

Inspections/Enforcement of Ordinances: The costs associated with inspections and enforcement of local ordinances include staffing, travel and administrative costs. The costs to comply with the TMDLs' requirements are expected to be relatively minor since inspections are an important component of compliance with Order No. R9-2006-0011 (municipal dischargers) and Order No. 99-06-DWQ (Caltrans).

Structural BMPs

Vegetated Swales and Buffer Strips: The costs associated with vegetated swales and vegetated buffer strips vary and are dependent of the costs associated with establishing the vegetation.[25] The USEPA estimated costs ranging from $3,500 for vegetated swales, to $0 to $9,000 for buffer strips to treat a 5-acre residential site.[26] Caltrans reported that the actual costs for installation of an infiltration trench that treats a 2-acre site (100 percent impervious area) was between $203,000 and $294,000.[27]

Bioretention: Bioretention areas are landscaping features adapted to provide on-site treatment of storm water runoff (USEPA, 1999, National Menu of Best Management

[23] USEPA. 1999. Preliminary Data Summary of Urban Storm Water Best Management Practices. [EPA-821-R-99-012. August 1999].
[24] Ibid.
[25] Ibid
[26] Ibid.
[27] Caltrans. 2004. Report ID CTSW-RT-01-050

Practices for Stormwater-Phase II).[28] Field and laboratory analysis of bioretention facilities show high removal rates of copper (43 to 97 percent), lead (70 to 95 percent), and zinc (64 to 95 percent). Bioretention facilities are relatively expensive. The USEPA reported the following cost equation to estimate this storm water management practice, adjusting for inflation:

$$\mathbf{C = 7.30\ V^{0.99}}$$

where:

C = Construction, design, and permitting cost ($); and

V = Volume of water treated by the facility (ft^3).

Consideration should be made when evaluating the costs of bioretention that the practice replaces areas that most likely would have been landscaped. The true cost of the practice is therefore less than the construction cost reported. Maintenance activities conducted on bioretention facilities were also not found to be very different from maintenance of a landscaped area. The USEPA estimated the cost around $60,000 for a bioretention area that treats a 5-acre commercial site.[29] Caltrans reported actual costs of a bio-swale that treats a 3-acre site at Interstate 5 and Palomar to be $136,000.

Detention Basins and Retention Ponds: The costs vary depending on the volume of the basin. Costs for retention and detention basins are estimated at approximately $100,000 for a 50-acre residential site.[30]

Sand Filters: The USEPA reported that the typical cost of installation of sand filters, of various designs (in some instances including pumps), ranged between $2.50 and $7.50 per cubic foot of stormwater treated, with an average cost of about $5 per cubic foot (USEPA, 1999). The cost to treat a 5-acre commercial site was estimated between $35,000 and $70,000.[31] The cost per impervious acre treated varied considerably depending on the region and design used. The observed volume of stormwater in the Chollas Creek watershed from Table F-4 in Appendix F of this report for the 2001 through 2003 storm years[32] is 1,646,496,115 liters. Dividing this number by two and converting to cubic feet gives an average of 29,072,731 cubic feet of stormwater per year. Therefore, the maximum cost of using sand filters to treat all Chollas Creek stormwater could range from approximately $70 to $220 million. The average expected costs would be $145 million.

[28] http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm
[29] USEPA. 1999. Preliminary Data Summary of Urban Storm Water Best Management Practices. [EPA-821-R-99-012]. August 1999.
[30] Ibid.
[31] Ibid.
[32] These estimates come from only two years of storm flow observations. These years may or may not represent the average flow volume experienced in Chollas Creek.

Additionally, Caltrans reported that the mean cost for the Austin Sand Filter is $1,447 per cubic meter of stormwater treated.[33] Therefore, using the same average volume of yearly stormwater (29,072,731 cubic feet = 823,284 cubic meters), the average cost for treating all of Chollas Creek's stormwater would be $1.19 billion.

Porous Pavement / Infiltration Systems: The USEPA reported that the typical cost of installation of porous pavement systems was $8.20 per square foot of pavement installed (USEPA, 1999). Maintenance cost were estimated at $200 per acre per year.

Diversion Systems: If no other on-site treatment options are available, diverting the polluted runoff to the sanitary sewer systems treatment plant may be considered. An individual diversion structure was estimated to cost about one million dollars, which does not include maintenance costs. The maintenance costs could be significant due to the need for regular inspections and maintenance of the diversion structures (Ruth Kolb, City of San Diego, personal communication, March 14, 2005).

7.2 Cost Estimate Summary for Non-Structural and Structural BMPs

Table I.1 summarizes the estimated costs for the specific BMPs that were evaluated. Costs for structural BMPs were estimated for treatment of ten percent of the urbanized watershed area (approximately 1,370 acres) with the exception of diversion structures, which are costs per unit. Cost estimates are provided in increments of 10 percent to allow for upward scaling of costs since the exact combination, size, and siting of structural BMPs is not known. For example, using the 10 percent cost estimates provided in Table I.2 below, a cost estimate for treatment of 100 percent of the watershed could easily be calculated by multiplying the 10 percent cost estimate by 10. The cost of treating 50 percent of the watershed could be calculated by multiplying the 10 percent cost estimate by five and so on.

TABLE I.1: Summary of Cost Estimates for Non-Structural BMPs

Non-Structural BMPs	Estimated Cost*	Estimated Cost Adjusted For Inflation 2006 Dollars**
Education and Outreach	$1,000 - $200,000 per program	$1,210 - $242,000 per program
Street Sweeping	$ 60,000 - $180,000 per unit	$ 72,600 - $218,000 per unit
Illicit Discharges	$0 to $1,750	$0 to $2,120

*The costs were obtained from USEPA, 1999. Preliminary Data Summary of Urban Storm Water Best Management Practices. (EPA-821-R-99-012). August 1999.
** Sahr, R.C. 2007. Consumer Price Index (CPI) Conversion Factors 1800 to Estimated 2016 to Convert to Dollars of 2006. Oregon State University, Political Science Department, Corvallis, OR. Revised January 18, 2006.

[33] Caltrans. 2004. Report ID CTSW-RT-01-050

TABLE I.2: Summary of Cost Estimates for Structural BMPs

Structural BMPs	Estimated Cost to treat 10% of Urbanized Area (ECUA 10%)	ECUA 10% Adjusted For Inflation 2006 Dollars*****	Estimated Yearly Maintenance Cost (EYMC)	EYMC Adjusted For Inflation 2006 Dollars*****
Vegetated Swale	$960,000*	$1.2 million	$67,000	$81,000
Vegetated Buffer Strip	$1.2 million*	$1.45 million	$120,000	$145,000
Infiltration Trench	$60 Million	$64 Million	$5.8 Million	$6.2 Million
Bioretention	$16.4 million*	$19.9 million	$1.1 million	$1.3 million
Detention Basins and Retention Ponds	$2.7million*	$3.3 million	$27,000	$33,000
Sand Filters	$15 million*	$18.2 million	$2 million	$2.4 million
Austin Sand Filters	$119 million**	$127 million	$6.4 Million	$6.8 Million
Porous Pavement	$490 Million***	$593 Million	$274,000	$332,000
Diversion	$1 million****	$1.03 million	$10,000	$10,300

* Based on USEPA, 1999. Preliminary Data Summary of Urban Storm Water Best Management Practices. [EPA-821-R-99-012. August 1999].
** Based on Caltrans, 2004. Report ID CTSW-RT-01-050.
*** Based on USEPA, 1999 Storm Water Technology Fact Sheet Porous Pavement [EPA 823-F-023]
**** Cost per unit. Based on personal communication with Ruth Kolb, City of San Diego, March 14, 2005.
***** Sahr, R.C. 2007. Consumer Price Index (CPI) Conversion Factors 1800 to Estimated 2016 to Convert to Dollars of 2006. Oregon State University, Political Science Department, Corvallis, OR. Revised January 18, 2006.

7.3 Cost Estimates for Surface Water Monitoring

Investigation Order No. R9-2004-0227[34] already includes a monitoring and reporting program for dissolved metals in Chollas Creek. Whether or not TMDL implementation will require an expansion of this monitoring program is not known at this time, but will be evaluated by the San Diego Water Board following adoption of these TMDLs. In the event that additional monitoring locations or frequencies are needed beyond the requirements of the Investigation Order, the costs of collecting, transporting, and analyzing a water sample for copper, lead, and zinc is estimated below.

The costs disclosed are that of a two-person team, day-long sampling effort. The laboratory analytical costs were taken from the San Diego Water Board's Laboratory Services Contract cost tables. Where different analytical methods were available, the more expensive method was used in the estimate. Staff costs were estimated based on a two person sampling team in the field for an 8-hour day. The staff costs were estimated based on a billing rate of $110 per hour, the rate used for billing San Diego Water Board staff costs in the Cost Recovery Programs. This rate includes overhead costs. The vehicle costs were estimated assuming a distance traveled of 25 miles per day, and a vehicle cost of $0.48 per mile, the per diem reimbursement rate for San Diego Water

[34] Investigative Order No. R9-2004-0227 [CWC section 13383], *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed, San Diego, California*

Board staff when they use their own cars for State business. This analysis assumes that the dischargers possess basic field monitoring equipment, including meters to measure temperature, conductivity, and pH, and equipment to measure flow in the field. No additional costs were computed for these items. Surface water monitoring costs are summarized in the table below. Assuming that a two-person sampling team can collect samples at 5 sites per day, the total cost for one day of sampling would be $1,907.

Table I.3: Cost Estimates for Surface Water Monitoring

Expenditure	Cost per Unit
Laboratory Analyses	
Copper (total)	$9 per sample
Lead	$9 per sample
Zinc	$9 per sample
Staff Costs	$220 per hr
Vehicle Costs	$12 per 25 mi

8 Reasonable Alternatives to the Proposed Activity

The environmental analysis must include an analysis of reasonable alternatives to the proposed activity.[35] The proposed activity is a Basin Plan Amendment to incorporate TMDLs for copper, lead, and zinc in Chollas Creek. The purpose of this analysis is to determine if there is an alternative that would feasibly attain the basic objective of the rule or regulation (the proposed activity), but would lessen, avoid, or eliminate any identified impacts. The alternatives analyzed include taking no action, and modifying water quality standards in Chollas Creek. In addition, two alternative time schedules for implementing load reductions to meet the TMDLs were analyzed. These alternatives are discussed in the subsections below.

8.1 No Action Alternative

Under the “no action” alternative, the San Diego Water Board would not adopt the proposed metals TMDLs Basin Plan amendment, and metals loading would likely continue at current levels. The “no action” alternative 1) does not comply with the Clean Water Act; 2) is inconsistent with the mission of the San Diego Water Board; and 3) does not meet the purpose of the proposed metals TMDLs Basin Plan Amendment. Under CWA section 303(d), TMDL development is not discretionary; the San Diego Water Board is obligated to adopt TMDL projects for waters that do not meet water quality standards.[36] Therefore the “no action” alternative is not viable and cannot be considered an acceptable alternative.

[35] 23 CCR section 3777

[36] Water quality standards are comprised of designated beneficial uses, the applicable numeric and/or narrative WQOs to protect those uses, and the State Water Board’s anti-degradation policy provisions (Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality of Waters in California*).

8.2 Water Quality Standards Action

Another alternative to adopting the metals TMDLs Basin Plan amendment is the modification of water quality standards. If the applicable standards are not appropriate, a plausible regulatory response may be to correct the standards through mechanisms such as a use attainability analysis (UAA) or a site-specific objective (SSO). If the WARM and WILD beneficial uses are improperly designated for Chollas Creek, or if SSOs for copper, lead, and zinc would be less stringent than the current California Toxic Rule water quality objectives, the TMDLs might not be necessary, or the required pollutant load reductions might be lower. This alternative might lessen or eliminate the adverse impacts associated with constructing structural BMPs by eliminating the need for structural BMPs or reducing the number of structural BMPs necessary. This alternative should not be construed as implying that standards may be changed as a convenient means of "restoring" waterbodies. To the contrary, federal and state law contain numerous detailed requirements that in many cases would prevent modifications of the standards, especially if modifications would result in less stringent waste discharge requirements. However, modification of standards may be appropriate to make uses more specific, to manage conflicting uses, to address site-specific conditions, and for other such reasons.[37]

As a first step in developing TMDLs, the San Diego Water Board confirmed the impairment status of Chollas Creek and determined, from the available evidence, that concentrations of dissolved copper, lead, and zinc in Chollas Creek exceeded water quality objectives that support WARM and WILD beneficial uses. At this time, the San Diego Water Board has no evidence that WARM and WILD beneficial uses were inappropriately designated for Chollas Creek. Therefore based on the available information, an action to de-designate these beneficial uses may be harmful to the environment, and this option is not preferred.

Developing SSOs for dissolved copper, lead, and/or zinc in Chollas Creek may be appropriate if scientific studies demonstrate that the ambient water chemistry and/or biological communities at Chollas Creek are significantly different from the chemistry and biological communities upon which the current objectives are based. SSOs should be (1) based on sound scientific rationale; (2) protect the designated beneficial uses of Chollas Creek waters; and (3) be adopted by the San Diego Water Board in a Basin Plan amendment.

There are no efforts currently underway or planned by interested persons to fund the scientific studies needed to develop SSOs for metals in Chollas Creek. Furthermore, the development of SSOs for metals in Chollas Creek, including the scientific studies necessary to support them, would be costly, time consuming, and resource intensive.

Even in the event that scientific studies were initiated and SSOs developed and adopted, the need for TMDLs likely would not be eliminated. If SSOs for metals were developed in the future and adopted, this metals TMDLs Basin Plan Amendment would be modified

[37] State Water Board 2005. *A Process for Addressing Impaired Waters in California*, June 2005

accordingly. If interested parties were willing to fund and oversee development of scientific studies to investigate SSOs, the most effective and expeditious means to improve water quality would be to conduct these studies concurrent with actions necessary to achieve compliance with these current TMDLs.

8.3 10-Year Compliance Schedule for Metals Load Reductions Only

The compliance schedule is part of the TMDLs' Implementation Plan and describes the pollutant load reduction milestones that dischargers must achieve to meet interim goals and the final TMDLs. The first version of the proposed Chollas Creek Metals TMDLs (June 2005), called for an aggressive 10-year compliance schedule for dischargers to implement structural and non-structural BMPs to reduce loading of dissolved copper, lead, and zinc. This compliance schedule has the environmental advantage of restoring water quality in Chollas Creek in a relatively short time frame, but may not provide enough time for dischargers to integrate BMP planning, design, and implementation to reduce bacteria, diazinon, and trash loading which also contribute to water quality problems in the watershed.

8.4 20-Year Compliance Schedule for Metals, Bacteria, Diazinon, and Trash Reductions

As opposed to the previous alternative, this approach allows the dischargers to engage in comprehensive BMP planning for all pollutants impairing water quality in Chollas Creek. Instead of meeting the requirements of these metals TMDLs independently, dischargers would utilize a longer compliance schedule (20 years) to address multiple pollutants.

Due to the environmental impacts anticipated from constructing BMPs in the aggressive schedule described in the previous alternative, the City of San Diego funded an assessment of BMP strategies that would lessen the anticipated impacts. In this study,[38] the authors recommend an alternative strategy that used a tiered or phased approach that reduces the impact to the environment, and allows for more cost effective implementation of lower-impact BMPs. The tiered approach consists of three major components:

- Tier 1 – Control of Pollutants at the Source and Prevent Pollutants from Entering Runoff
- Tier 2 – Conduct Design Studies and Implement Aggressive Street Sweeping and Runoff and Treatment Volume Reduction BMPs
- Tier 3 – Infrastructure Intensive Treatment BMPs

To address additional time requirements to implement a lower-impact and cost effective program that will meet the integrated TMDL goals, the authors recommend a compliance time schedule of 20 years. Tier 1 and 2 activities would be implemented on an aggressive timetable in targeted areas. Effective assessment monitoring would then be implemented to determine if these BMPs should be extended to other areas or modified to

[38] Weston Solutions, 2006. *Chollas Creek TMDL Source Loading, Best Management Practices, and Monitoring Strategy Assessment,* September, 2006.

improve effectiveness. The approach is therefore an iterative process of implementation, assessment, and further implementation or improvement.

The authors of this study assert that a 20-year compliance schedule is necessary in order to:

- Meet an integrated TMDL strategy that address both current and anticipated TMDLs;
- Assess the effectiveness of the aggressive implementation of source control and pollution prevention BMPs in targeted areas to identify which techniques are more effective and to modify approaches and/or extend aggressive activities to other sub-watersheds in a cost effective manner;
- Collect needed data on the soils and hydrological conditions within the watershed to identify where lower-impact development techniques are best suited and what engineering modifications are needed to make these systems most effective;
- Assess the effectiveness of aggressive street sweeping in targeted areas to confirm that the integrated reduction goals are being met or if additional BMPs are needed along with other Tier 1 and Tier 2 activities;
- Work with communities in which these activities will be taking place and changes occurring within their neighborhood; and
- Acquire property and easements for sub-watersheds that will require retention of storm flows prior to treatment where Tier 1 and Tier 2 activities do not achieve the reduction goals.

In short, this alternative allows dischargers to choose low-impact BMPs that are designed to remove a comprehensive suite of common pollutants found in urban runoff. Using this approach, fewer structural BMPs will probably be needed compared to addressing each pollutant individually on a different compliance schedule. This approach should minimize the adverse environmental effects from installing such structures. Although the compliance schedule is longer, this approach addressed multiple pollutants, not just metals. Because of the efficiency and minimal adverse effects expected from this approach, this is the preferred alternative.

9 CEQA Determination

The implementation of these TMDLs will result in improved water quality in Chollas Creek, but it may result in temporary or permanent localized significant adverse impacts to the environment. Specific projects employed to implement the TMDLs may have significant impacts, but these impacts are expected to be limited, short-term, or may be mitigated through careful design and scheduling. The Technical Report, the draft Basin Plan amendment, and the Environmental Checklist and associated analysis provide the necessary information pursuant to state law[39] to conclude that properly designed and implemented structural or non-structural methods of compliance will not have a significant adverse effect on the environment, and all agencies responsible for implementing the TMDLs should ensure that their projects are properly designed and implemented. Any of the potential impacts need to be mitigated at a subsequent project

[39] Public Resources Code, section 21159

level because they involve specific sites and designs not specified or specifically required by the Basin Plan amendment to implement the TMDLs. At this stage, any more particularized conclusions would be speculative.

Specific projects that may have a significant impact would be subject to a separate environmental review. The lead agency for subsequent projects would be obligated to mitigate any impacts they identify, for example, by mitigating potential flooding impacts by designing the BMPs with adequate margins of safety.

Furthermore, implementation of the TMDLs is both necessary and beneficial. If at some time, it is determined that the alternatives, mitigation measures, or both, are not deemed feasible by those local agencies, the necessity of implementing the federally required TMDLs and removing the metals impairment from Chollas Creek (an action required to achieve the express, national policy of the Clean Water Act) remains.

The benefits of meeting water quality standards to achieve the expressed, national policy of the Clean Water Act far outweigh the potential adverse environmental impacts that may be associated with the projects undertaken by persons responsible for reducing discharges of copper, lead, and zinc pollutants to Chollas Creek. Meeting water quality standards and the national policy of the Clean Water Act is a benefit to the people of the state because of their paramount interest in the conservation, control, and utilization of the water resources of the state for beneficial use and enjoyment (Water Code section 13000). Furthermore, the health, safety and welfare of the people of the state requires that the state be prepared to exercise its full power and jurisdiction to protect the quality of waters in the state from degradation, particularly including degradation that unreasonably impairs the water quality necessary for beneficial uses.

Water quality that supports the beneficial uses of water are necessary for the survival and well being of people, plants, and animals. Warm Freshwater Habitat (WARM) and Wildlife Habitat (WILD) are beneficial uses of water that serve to promote the social and environmental goals of the people of the San Diego Region and require water quality suitable for the protection of aquatic life and aquatic dependent wildlife.

In addition, implementation of the TMDLs will have substantial benefits to water quality and will enhance beneficial uses. Enhancement of the WARM and WILD beneficial uses will have positive, indirect social and economic effects by increasing the natural habitat and aesthetic value of the Chollas Creek watershed. These substantial benefits outweigh any unavoidable temporary adverse environmental effects.

In accordance with state law,[40] the San Diego Water Board finds that, although the proposed project could have significant effect on the environment, revisions in the project to avoid or substantially lessen the impacts, can and should be made or agreed to by the project proponents. This finding is supported by the evidence provided in the impact evaluation section of this document, which indicates that all foreseeable impacts are either short-term or can be readily mitigated.

[40] Public Resources Code, section 15091

On the basis of the initial environmental review checklist and analysis, and Technical Report for these TMDLs, which collectively provide the required information;

☐ I find the proposed Basin Plan amendment could not have a significant effect on the environment.

☒ I find that the proposed Basin Plan amendment could have a significant adverse effect on the environment, but that those impacts should be mitigated. This substitute environmental documentation constitutes a program-level analysis. The Water Boards cannot specify manner of compliance. Any impacts that might occur as a result of specific implementation projects can and should be mitigated by the entity carrying out or permitting that project. However, there are feasible mitigation measures that would substantially lessen any significant adverse impacts. These mitigation measures are discussed above and in the Technical Report for the TMDLs.

☐ I find the proposed Basin Plan amendment may have a significant effect on the environment. There are no feasible alternatives and/or feasible mitigation measures available which would substantially lessen any significant adverse impacts. See the attached written report for a discussion of this determination.

_____ June 13, 2007

John H. Robertus Date
Executive Officer

Appendix J

RESOLUTION NO. R9-2007-0043

AND

ATTACHMENT A

AMENDMENT TO THE WATER QUALITY CONTROL PLAN FOR THE SAN DIEGO BASIN (9) TO INCORPORATE TOTAL MAXIMUM DAILY LOADS FOR DISSOLVED COPPER, LEAD, AND ZINC IN CHOLLAS CREEK, TRIBUTARY TO SAN DIEGO BAY,

AND TO REVISE THE TOXIC POLLUTANTS SECTION OF CHAPTER 3 TO REFERENCE THE CALIFORNIA TOXICS RULE

May 30, 2007

California Regional Water Quality Control Board
San Diego Region

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

RESOLUTION NO. R9-2007-0043

A RESOLUTION ADOPTING AN AMENDMENT TO THE WATER QUALITY CONTROL PLAN FOR THE SAN DIEGO BASIN (9) TO INCORPORATE TOTAL MAXIMUM DAILY LOADS FOR DISSOLVED COPPER, LEAD, AND ZINC IN CHOLLAS CREEK, TRIBUTARY TO SAN DIEGO BAY,

AND TO REVISE THE TOXIC POLLUTANTS SECTION OF CHAPTER 3 TO REFERENCE THE CALIFORNIA TOXICS RULE

WHEREAS, The San Diego Regional Water Quality Control Board (hereinafter, San Diego Water Board), finds that:

1. **BASIN PLAN AMENDMENT**: Total Maximum Daily Loads (TMDLs) and allocations for pollutants that exceed water quality objectives in waterbodies that do not meet water quality standards under the conditions set forth in section 303(d) of the Clean Water Act [33 U.S.C. 1250, *et seq*., at 1313(d)] ("Water Quality Limited Segments") should be incorporated into the *Water Quality Control Plan for the San DiegoBasin (9)* (Basin Plan) pursuant to Article 3, commencing with section 13240, of Chapter 4 of the Porter-Cologne Water Quality Control Act, as amended, codified in Division 7, commencing with section 13000, of the Water Code.

2. **CLEAN WATER ACT SECTION 303(d)**: The lowest 1.2 miles of Chollas Creek (from the mouth of Chollas Creek at San Diego Bay to 1.2 miles inland) were placed on the List of Water Quality Limited Segments in 1996 due to levels of dissolved copper, lead, and zinc (metals) in the water column that exceeded numeric water quality objectives for copper, lead, and zinc, and narrative water quality objectives for toxicity, as required by Clean Water Act (CWA) section 303(d).

3. **BENEFICIAL USE IMPAIRMENTS**: Two beneficial uses exist in Chollas Creek that are sensitive to, and subject to impairment by elevated concentrations of dissolved metals in the water column. Warm Freshwater Habitat (WARM) and Wildlife Habitat (WILD) require water quality suitable for the protection of aquatic life and aquatic dependent wildlife. Dissolved metals are toxic to aquatic life and aquatic dependent wildlife at relatively low concentrations. Concentrations of dissolved metals in Chollas Creek exceed the water quality necessary to support the WARM and WILD beneficial uses of Chollas Creek.

4. **NECESSITY STANDARD** [Government Code section 11353(b)]: Amendment of the Basin Plan to establish and implement TMDLs for Chollas Creek is necessary because the existing water quality in the lowest 1.2 miles of Chollas Creek does not meet applicable

water quality objectives for copper, lead, zinc, or toxicity. CWA section 303(d) requires the establishment and implementation of TMDLs under the conditions that exist in Chollas Creek. TMDLs for copper, lead, and zinc are necessary to ensure attainment of applicable water quality objectives and restoration of water quality needed to support the beneficial uses designated for Chollas Creek.

5. **WATER QUALITY OBJECTIVES**: The United States Environmental Protection Agency (USEPA) has established numeric criteria for toxic pollutants which are applicable water quality objectives for dissolved copper, lead, and zinc in the inland surface waters, enclosed bays, and estuaries of California through promulgation of the California Toxics Rule (CTR). [40 CFR 131.38]. These water quality objectives, presented below, are applicable to Chollas Creek.

Water Quality Objectives for dissolved metals in Chollas Creek.

Metal	Numeric Target for Acute Conditions: Criteria Maximum Concentration	Numeric Target for Chronic Conditions: Criteria Continuous Concentration
Copper	(1) * (0.96) * {e^ [0.9422 * ln (hardness) - 1.700]}	(1) * (0.96) * {e^[0.8545 * ln (hardness) - 1.702]}
Lead	(1) * {1.46203 – [0.145712 * ln (hardness)]} * {e^ [1.273 * ln (hardness) - 1.460]}	(1) * {1.46203 – [0.145712 * ln (hardness)]} * {e^[1.273 * ln (hardness) - 4.705]}
Zinc	(1) * (0.978) * {e^ [0.8473 * ln (hardness) + 0.884]}	(1) * (0.986) * {e^[0.8473 * ln (hardness) + 0.884]}

Hardness is expressed as milligrams per liter.
Calculated concentrations should have two significant figures [40 CFR 131.38(b)(2)].
The natural log and exponential functions are represented as "ln" and "e," respectively.

In addition, the Basin Plan establishes the following narrative water quality objective for "toxicity" to ensure the protection of the WARM and WILD beneficial uses.

> **Toxicity Objective**: *All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the San Diego Water Board.*
>
> *The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water factors, shall not be less than that for the same water body in areas unaffected by the waste discharge or, when necessary, for other control water that is consistent with requirements specified in USEPA, State Water Resources Control Board (State Board) or other protocol authorized by the San Diego Water Board. As*

a minimum, compliance with this objective as stated in the previous sentence shall be evaluated with a 96-hour acute bioassay.

In addition, effluent limits based upon acute bioassays of effluents will be prescribed where appropriate, additional numerical receiving water objectives for specific toxicants will be established as sufficient data become available, and source control of toxic substances will be encouraged.

6. **NUMERIC TARGETS**: Numeric targets are established for the purposes of calculating TMDLs. Since the numeric targets are equal to the water quality objectives in the CTR for dissolved copper, lead, and zinc cited in finding 5, attainment of TMDLs will ensure attainment of these water quality objectives.

7. **SOURCES OF DISSOLVED METALS**: Many land uses and activities associated with urbanization are sources of copper, lead, and zinc to Chollas Creek. Freeways and commercial/ industrial land uses are major contributors. Automobiles are a significant source of all three metals. Water supply systems, pesticides, industrial metal recyclers and other industrial activities also contribute to levels of copper, lead, and zinc in excess of water quality objectives for Chollas Creek. Metals released to the environment by different land uses and activities are washed off of the land surface by urban runoff and storm flows and conveyed to Chollas Creek through municipal separate storm sewer systems. Quantification of bacteria loading in all watersheds is necessary to calculate the load reductions required to meet TMDLs.

8. **WATER QUALITY OBJECTIVE VIOLATIONS**: Concentrations of dissolved copper, lead, and zinc have frequently exceeded numeric water quality objectives contained in the CTR. Furthermore, in a Toxicity Identification Evaluation performed in 1999, Chollas Creek stormwater concentrations of zinc and to a lesser extent copper, were identified as causing or contributing to reduced fertility in the purple sea urchin.

9. **ADVERSE EFFECTS OF COPPER, LEAD, AND ZINC**: Concentrations of copper, lead, and zinc in excess of CTR criteria entail increased risk of adverse toxic effects in aquatic organisms exposed to them. Copper, lead, and zinc may bioaccumulate within lower organisms, however they do not biomagnify up the food chain. Of these three metals, copper is considered the most potent toxin at environmentally relevant aqueous concentrations.

10. **TOTAL MAXIMUM DAILY LOADS AND ALLOCTIONS**: TMDLs for dissolved copper, lead, and zinc are equal to the total assimilative or loading capacity of Chollas Creek for dissolved copper, lead, and zinc. The loading capacities are defined as the maximum amount of each dissolved metal that Chollas Creek can assimilate and still attain water quality objectives needed for the protection of designated beneficial uses. Each TMDLS must accommodate all known sources of a pollutant, whether from natural background, nonpoint sources, or point sources, and must include a margin of safety (MOS) to preclude pollutant loading from exceeding the actual assimilative capacities of Chollas Creek. The TMDL calculations also account for seasonal variations and critical conditions and were developed in a manner consistent with guidelines published by the USEPA. The TMDLs are

concentration based, therefore, the allocations are not additive. The TMDLs for dissolved copper, lead, and zinc are equal to the Waste Load Allocations (WLAs) which are 90 percent of the CTR Criteria Continuous Concentration (CCC) and Criteria Maximum Concentration (CMC) equations. Discharges of dissolved copper, lead, and zinc require significant reductions from current levels to meet the allocations.

11. **IMPLEMENTATION PLAN**: The technical report entitled *Total Maximum Daily Loads for Dissolved Copper, Lead and Zinc in Chollas Creek, Tributary to San Diego Bay* dated May 30, 2007, presents a summary of measures that, if adopted by the San Diego Water Board, the State Water Resources Control Board (State Water Board), and local governmental agencies, will promote attainment of the load reductions needed to keep discharges of metals at or below the TMDLs calculated for Chollas Creek. Section 303 of the CWA and the federal National Pollutant Discharge Elimination System (NPDES) regulations direct the USEPA and authorized states to impose requirements consistent with TMDLs for point source discharges to "impaired" waterbodies. When the San Diego Water Board and the State Water Board re-issue or revise NPDES requirements for municipal, construction, and industrial stormwater discharges, and groundwater extraction discharges in the Chollas Creek watershed, including discharges of "small MS4s," they will have to include requirements that will implement all TMDLs applicable to waters affected by the regulated discharges.

12. **COMPLIANCE MONITORING**: Water quality monitoring will be necessary to assess progress in achieving WLAs and compliance in Chollas Creek with the water quality objectives for dissolved copper, lead, and zinc.

13. **COMPLIANCE SCHEDULE**: Full implementation of the TMDLs for dissolved copper, lead, and zinc shall be completed within 20 years from the effective date of the Basin Plan amendment. The compliance schedule for implementing the wasteload reductions required under these TMDLs is structured in a phased manner, with 80 percent of reductions required in 10 years, and 100 percent of reductions required within 20 years. The 20-year compliance schedule is contingent upon the dischargers implementing integrated controls to achieve required copper, lead, zinc, indicator bacteria, diazinon, and trash reductions.

14. **SCIENTIFIC PEER REVIEW**: The scientific basis of this TMDL has undergone external peer review pursuant to Health and Safety Code section 57004. The San Diego Water Board has considered and responded to all comments submitted by the peer review panel and has enhanced the Technical Report appropriately. No change to the fundamental approach to TMDL calculations was necessary as a result of this process.

15. **STAKEHOLDER AND PUBLIC PARTICIPATION**: Interested persons and the public have had reasonable opportunity to participate in review of the proposed TMDL. Efforts to solicit public review and comment included five public workshops held between April 1999 and April 2005, including a CEQA scoping meeting held on March 21, 2003; a public review and comment period of 45 days preceding the San Diego Water Board public hearing in May 2005; a two week extension of the comment period after the public hearing in May 2005; a second public review and comment period of 45 days commencing in July 2006; a third

public review and comment period of 45 days commencing on March 9, 2007; and a public hearing on April 25, 2007. Notices for all meetings were sent to interested parties including cities and San Diego County with jurisdiction in Chollas Creek. All of the written comments submitted to the San Diego Water Board during the review and comment periods have been considered, and written responses provided in Appendix M to the Technical Report.

16. **CEQA REQUIREMENTS**: Pursuant to Public Resources Code section 21080.5, the Resources Agency has approved the Regional Water Boards' basin planning process as a "certified regulatory program" that adequately satisfies the California Environmental Quality Act (CEQA) (Public Resources Code, section 21000 et seq.) requirements for preparing environmental documents. [14 CCR section 15251(g); 23 CCR section 3782] As such, the San Diego Water Board's basin planning documents together with an Environmental Checklist are the "substitute documents" that contain the required environmental documentation under CEQA. [23 CCR section 3777] The substitute documents for this project include the Environmental Checklist, the detailed technical report entitled *Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek, Tributary to San Diego Bay*, responses to comments raised during the development of the TMDL, and this resolution. The project itself is the establishment of TMDLs for toxic metals in Chollas Creek where water quality has been listed as "impaired" by the State Water Board pursuant to section 303(d) of the CWA, as required by that section. While the San Diego Water Board has no discretion to not establish a TMDL (the TMDL is required by federal law) the San Diego Water Board does exercise discretion in assigning wasteload allocations, determining the program of implementation, and setting various milestones in achieving the water quality objectives for Chollas Creek.

17. **PROJECT IMPACTS:** The accompanying CEQA substitute documents satisfy the requirements of substitute documents for a Tier 1 environmental review under CEQA, pursuant to Public Resources Code section 21159 and CCR Title 14, section 15187. Nearly all of the compliance obligations anticipated to be necessary to implement the TMDLs for copper, lead, and zinc in Chollas Creek will be undertaken by public agencies that will have their own obligations under CEQA for implementation projects that could have significant environmental impacts (*e.g.*, installation and operation of structural best management practices). Project level impacts will need to be considered in any subsequent environmental analysis performed by other public agencies pursuant to Public Resources Code section 21159.2.

    If not properly mitigated at the project level, implementation and compliance measures undertaken could have significant adverse environmental impacts. The substitute documents for this TMDL, and in particular the environmental checklist and responses to comments, identify broad mitigation approaches that should be considered at the project level. The San Diego Water Board does not engage in speculation or conjecture regarding the projects that may be used to implement the TMDLs and only considers the reasonably foreseeable alternative methods of compliance, the reasonably foreseeable feasible environmental impacts of the these methods of compliance, and the reasonably foreseeable mitigation measures which would avoid or eliminate the identified impacts, all from a broad general perspective consistent with the uncertainty regarding how the TMDLs, ultimately, will be

implemented. The lengthy implementation period allowed by the TMDLs will allow persons responsible for compliance with wasteload allocations to develop and pursue many compliance approaches and mitigation measures.

18. **PROJECT MITIGATION:** The proposed amendment to the Basin Plan to establish TMDLs for copper, lead, and zinc in Chollas Creek could have a significant adverse effect on the environment. However, there are feasible alternatives, feasible mitigation measures, or both, that would substantially lessen any significant adverse impact. The public agencies responsible for implementation measures needed to comply with the TMDLs can and should incorporate such alternatives and mitigation into any projects or project approvals that they undertake for the impaired creek. Possible alternatives and mitigation are described in the CEQA substitute documents, specifically the Technical Report and the environmental checklist. To the extent the alternatives, mitigation measures, or both, are not deemed feasible by those agencies, the necessity of implementing the TMDLs that is mandated by the federal Clean Water Act and removing the copper, lead, and zinc impairments in Chollas Creek (an action required to achieve the express, national policy of the Clean Water Act) outweigh the unavoidable adverse environmental effects identified in the substitute documents.

19. **ECONOMIC ANALYSIS**: The San Diego Water Board has considered the costs of the reasonably foreseeable methods of compliance with the wasteload reductions specified in these TMDLs. The most reasonably foreseeable methods of compliance involve implementation of structural and non-structural controls. Surface water monitoring to evaluate the effectiveness of these controls will be necessary.

20. **NO ADVERSE ENVIRONMENTAL EFFECTS**: This Basin Plan amendment will result in no adverse effect, either individually or cumulatively, on wildlife.

21. **REVISION TO BASIN PLAN**: The USEPA promulgated a final rule prescribing water quality criteria for toxic pollutants in inland surface waters, enclosed bays, and estuaries in California in 2000 (The California Toxics Rule or "CTR;" [40 CFR 131.38]). CTR criteria constitute applicable water quality objectives in California. In addition to the CTR, certain criteria for toxic pollutants in the National Toxics Rule [40 CFR 131.36] constitute applicable water quality objectives in California as well. The section in Chapter 3 of the Basin Plan titled "Toxic Pollutants" should be revised to be consistent with the current federal rules. The subsection entitled "Water Quality Objectives for Toxic Pollutants" in Chapter 3 of the Basin Plan needs to be deleted. This subsection is redundant since the CTR and certain NTR criteria constitute applicable water quality objectives in California.

NOW, THEREFORE, BE IT RESOLVED that

1. **AMENDMENT ADOPTION**: The San Diego Water Board hereby adopts the amendment to the Basin Plan to incorporate the TMDLs for dissolved copper, lead, and zinc in Chollas Creek and to revise the Basin Plan to reference the California Toxics Rule as set forth in Attachment A hereto.

2. **TECHNICAL REPORT APPROVAL**: The San Diego Water Board hereby approves the Technical Report entitled *Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek, Tributary to San Diego Bay*, dated May 30, 2007.

3. **CERTIFICATE OF FEE EXEMPTION**: The Executive Officer is authorized to sign a Certificate of Fee Exemption.

4. **AGENCY APPROVALS**: The Executive Officer is directed to submit this Basin Plan amendment to the State Water Board for approval in accordance with Water Code section 13245.

5. **NON-SUBSTANTIVE CORRECTIONS**: If, during the approval process for this amendment, the State Water Board, San Diego Water Board, or OAL determines that minor, non-substantive corrections to the language of the amendment are needed for clarity or consistency, the Executive Officer may make such changes, and shall inform the San Diego Water Board of any such changes.

6. **ENVIRONMENTAL DOCUMENT CERTIFICATION**: The substitute environmental documents prepared pursuant to Public Resources Code section 21080.5 are hereby certified, and the Executive Officer is directed to file a Notice of Decision with the Resources Agency after State Water Board and OAL approval of the Basin Plan Amendment, in accordance with section 21080.5(d)(2)(E) of the Public Resources Code and the California Code of Regulations, title 23, section 3781.

   I, John H. Robertus, Executive Officer, do hereby certify the foregoing is a full, true and correct copy of a Resolution adopted by the California Regional Water Quality Control Board, San Diego Region, on June 13, 2007.

_____
JOHN H. ROBERTUS
EXECUTIVE OFFICER

ATTACHMENT A
TO RESOLUTION NO. R9-2007-0043

AMENDMENT TO THE WATER QUALITY CONTROL PLAN FOR THE SAN DIEGO BASIN (9) TO INCORPORATE TOTAL MAXIMUM DAILY LOADS FOR DISSOLVED COPPER, LEAD, AND ZINC IN CHOLLAS CREEK, TRIBUTARY TO SAN DIEGO BAY,

AND TO REVISE THE TOXIC POLLUTANTS SECTION OF CHAPTER 3 TO REFERENCE THE CALIFORNIA TOXICS RULE

This Basin Plan amendment establishes a Total Maximum Daily Load (TMDL) and associated load and wasteload allocations for copper, lead and zinc in Chollas Creek, and revises the Toxic Pollutants section of Chapter 3 to reference the California Toxics Rule. This amendment includes a program to implement the TMDL and monitor its effectiveness. Chapters 2, 3, and 4 of the Basin Plan are amended as follows:

Chapter 2, Beneficial Uses
Table 2-2. ***Beneficial Uses of Inland Surface Waters***

Add the following footnote 3 to Chollas Creek

> [3]Chollas Creek is designated as an impaired water body for copper, lead and zinc pursuant to Clean Water Act section 303(d). A Total Maximum Daily Load (TMDL) has been adopted to address this impairment. See Chapter 3, Water Quality Objectives for Toxicity and Toxic Pollutants and Chapter 4, Total Maximum Daily Loads.

Chapter 3, Water Quality Objectives
Inland Surface Waters, Enclosed Bays and Estuaries, Coastal Lagoons, and Ground Waters

Water Quality Objectives for Toxicity*:*
Add a fifth paragraph as follows:

> Chollas Creek is designated as a water quality limited segment for dissolved copper, lead, and zinc pursuant to Clean Water Act section 303(d). Total Maximum Daily Loads have been adopted to address these impairments. See Chapters 2, Table 2-2, *Beneficial Uses of Inland Surface Waters, Footnote 3* and Chapter 4, Total Maximum Daily Loads.

TOXIC POLLUTANTS:
Revise as follows:

> The USEPA promulgated a final rule prescribing water quality criteria for toxic pollutants in inland surface waters, enclosed bays, and estuaries in California on May 18, 2000 (The California Toxics Rule or "CTR;" [40 CFR 131.38]). CTR criteria constitute applicable water quality objectives in California. In addition to the CTR,

certain criteria for toxic pollutants in the National Toxics Rule [40 CFR 131.36] constitute applicable water quality objectives in California as well.

Chollas Creek is designated as a water quality limited segment for dissolved copper, lead, and zinc pursuant to Clean Water Act section 303(d). Total Maximum Daily Loads have been adopted to address these impairments. See Chapters 2, Table 2-2, *Beneficial Uses of Inland Surface Waters, Footnote 3* and Chapter 4, Total Maximum Daily Loads.

~~Federal Register, Volume 57, Number 246 amended Title 40, Code of Federal Regulations, Part 131.36 (40 CFR 131.36) and established numeric criteria for a limited number of priority toxic pollutant for inland surface waters and estuaries in California. USEPA promulgated these criteria on December 22, 1992, to bring California into full compliance with section 303(c)(2)(B) of the Clean Water Act. California is not currently in full compliance with this section of the Clean Water Act due to the invalidation of the Water Quality Control Plan for Inland Surface Waters of California and the Water Quality Control Plan for Bays and Estuaries of California. However, the criteria established in 57 FR 60848 (December 22, 1992) (specifically pages 60920-60921) are still applicable to surface waters in the Region.~~

~~Water Quality Objectives for Toxic Pollutants:~~

~~Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (§131.36 revised at 57 FR 60848, December 22, 1992).~~

Chapter 4, Implementation

After the subsection on the TMDL for Dissolved Copper, Shelter Island Yacht Basin, San Diego Bay add the following subsection:

Total Maximum Daily Loads for Copper, Lead, and Zinc in Chollas Creek

On June 13, 2007, the Regional Board adopted Resolution No. R9-2007-0043, *Amendment to the Water Quality Control Plan for the San Diego Region to Incorporate Total Maximum Daily Loads for Dissolved Copper, Lead and Zinc in Chollas Creek, Tributary to San Diego Bay.* The TMDL Basin Plan Amendment was subsequently approved by the State Water Resources Control Board on *[Insert Date]*, the Office of Administrative Law on *[Insert Date]*, and the USEPA on *[Insert Date]*.

Problem Statement

Dissolved copper, lead and zinc concentrations in Chollas Creek violate numeric water quality objectives for copper, lead, and zinc promulgated in the California Toxics Rule, and the narrative objective for toxicity. Concentrations of these metals in Chollas Creek threaten and impair the designated beneficial uses of warm freshwater habitat (WARM), and wildlife habitat (WILD).

Numeric Targets

The TMDL numeric targets for copper, lead, and zinc are set equal to the numeric water quality objectives as defined in the California Toxics Rule (CTR) and shown below. Because the concentration of a dissolved metal causing a toxic effect varies significantly with hardness, the water quality objectives are expressed in the CTR as hardness based equations. The numeric targets are equal to the loading capacity of these metals in Chollas Creek.

Table 4 *[insert number]* Water Quality Objectives/Numeric Targets for dissolved metals in Chollas Creek.

Metal	Numeric Target for Acute Conditions: Criteria Maximum Concentration	Numeric Target for Chronic Conditions: Criteria Continuous Concentration
Copper	(1) * (0.96) * {e^ [0.9422 * ln (hardness) - 1.700]}	(1) * (0.96) * {e^[0.8545 * ln (hardness) - 1.702]}
Lead	(1) * {1.46203 – [0.145712 * ln (hardness)]} * {e^ [1.273 * ln (hardness) - 1.460]}	(1) * {1.46203 – [0.145712 * ln (hardness)]} * {e^[1.273 * ln (hardness) - 4.705]}
Zinc	(1) * (0.978) * {e^ [0.8473 * ln (hardness) + 0.884]}	(1) * (0.986) * {e^[0.8473 * ln (hardness) + 0.884]}

Hardness is expressed as milligrams per liter.
Calculated concentrations should have two significant figures [40 CFR 131.38(b)(2)].
The natural log and exponential functions are represented as "ln" and "e," respectively.

Source Analysis

The vast majority of metals loading to Chollas Creek are believed to come through the storm water conveyance system. An analysis of source contributions reveals many land uses and activities associated with urbanization to be potential sources of copper, lead and zinc to Chollas Creek. Modeling efforts point toward freeways and commercial/industrial land uses as the major contributors

Total Maximum Daily Loads

The TMDLs for dissolved copper, lead and zinc in Chollas Creek are concentration-based and set equal to 90 percent of the numeric targets/loading capacity.

Margin of Safety

The TMDL includes an explicit margin of safety (MOS). Ten percent of the loading capacity was reserved as an explicit MOS.

Allocations and Reductions

The source analysis showed that nonpoint sources and background concentrations of metals are insignificant, and thus, were set equal to zero in the TMDL calculations. The wasteload allocations are set equal to 90 percent of the numeric targets/loading capacity. Concentrations of

dissolved copper, lead and zinc require significant reductions from current concentrations to meet the loading capacity.

TMDL Implementation Plan

Persons whose point source discharges contribute to exceedance of WQOs for copper, lead, and zinc in Chollas Creek will be required to meet the WLA hardness dependant concentrations in their urban runoff discharges before it is discharged to Chollas Creek. Actions to meet the WLAs in discharges to Chollas Creek will be required in WDRs that regulate MS4 discharges, industrial facility and construction activity stormwater discharges, and groundwater extraction discharges in the Chollas Creek watershed. The following orders may be reissued or revised by the Regional Board to include requirements to meet the WLAs. Alternatively, the Regional Board may issue new WDRs to meet the WLAs.

Order No. 2007-0001, NPDES No. CAS0108758, *Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego County, and the San Diego Unified Port District*, or subsequent superceding NPDES renewal orders.

Order No. 2000-90, NPDES No. CAG19001, *General Waste Discharge Requirements for Temporary Groundwater Extraction and Similar Waste Discharges to San Diego Bay and Storm Drains or other Conveyance Systems Tributary Thereto,* or subsequent superceding NPDES renewal orders.

Order No. 2001-96, NPDES No. CAG 919002, *General Waste Discharge Requirements for Groundwater Extraction Waste Discharges from Construction, Remediation and Permanent Groundwater Extractioi Projects to Surface Waters within the San Diego Region Except for San Diego Bay* or subsequent superceding NPDES renewal orders.

Order No. 97-11, *General Waste Discharge Requirements for Post-Closure Maintenance of Inactive Nonhazardous Waste Landfills within the San Diego Region* or subsequent superceding NPDES renewal orders.

The Regional Board shall request the State Water Resources Control Board amend the following statewide orders:

Order No. 99-06-DWQ, NPDES No. CAS000003, *National Pollutant Discharge Elimination System (NPDES) Permit, Statewide Storm Water Permit, and Waste Discharge Requirements (WDRs) for the State of California, Department of Transportation (Caltrans),* or subsequent superceding NPDES renewal orders.

Order No. 97-03-DWQ, NPDES No. CAS 000001, *Waste Discharge Requirements for Discharges of Storm Water Associated with Industrial Activities Excluding Construction Activities,* or subsequent superceding NPDES renewal orders.

Order No. 2003-0005-DWQ, NPDES No. CAS000004, *Waste Discharge Requirements for Storm Water Discharges from Small Municipal Separate Storm Sewer Systems*, or subsequent superceding NPDES renewal orders.

Order No. 99-08-DWQ, NPDES No. CAS000002, *General Permit for Storm Water Discharges Associated with Construction Activity*, or subsequent superceding NPDES renewal orders.

The Regional Board shall require the U.S. Navy to submit a Notice of Intent to enroll the Naval Base San Diego facility under statewide Order No. 2003-005-DWQ or subsequent superseding NPDES renewal orders .

Implementation Monitoring Plan

The dischargers will be required to monitor Chollas Creek and provide monitoring reports to the Regional Board for the purpose of assessing the effectiveness of the management practices implemented to meet the TMDL allocations. The Regional Board shall amend the following order to include a requirement that the cities of San Diego, Lemon Grove, and La Mesa, the County of San Diego, the San Diego Unified Port District, and CalTrans investigate excessive levels of metals in Chollas Creek and feasible management strategies to reduce metal loadings in Chollas Creek, and conduct additional monitoring to collect the data necessary to refine the watershed wash-off model to provide a more accurate estimate of the mass loads of copper, lead and zinc leaving Chollas Creek each year.

Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed, San Diego, California.*

Schedule of Compliance

Concentrations of metals in urban runoff shall only be allowed to exceed the WLAs by a certain percentage for the first nineteen years after initiation of this TMDL. Allowable concentrations shall decrease as shown in Table 4 *[insert number]*. For example, if the measured hardness in year ten dictates the WLA for copper in urban runoff is 10 µg/l, the maximum allowable measured copper concentration would be 12.0 µg/L. By the end of the twentieth year of this TMDL, the WLAs of this TMDL shall be met. This will ensure that copper, lead and zinc water quality objectives are being met at all locations in the creek during all times of the year.

Table 4 *[insert number]* Interim goals for achieving Wasteload Allocations

	Allowable Exceedance of the WLAs (allowable percentage above)		
Compliance Year	**Copper**	**Lead**	**Zinc**
1	100%	100%	100%
10	20%	20%	20%
20	0%	0%	0%

Compliance with the interim goal~~s~~ in this schedule can be assessed by showing that dissolved metals concentrations in the receiving water exceed the WQOs for copper, lead, and zinc by no

more than the allowable exceedances for WLAs shown in the table above. Regulated groundwater discharges to Chollas Creek must meet the WLAs at the initiation of the discharge. No schedule to meet interim goals will be allowed in the case of groundwater discharges.

The compliance schedule for implementation of the TMDLs shall be as follows in Table 4 *[insert number]*.

Table 4 *[insert number]* Compliance Schedule

Item	Implementation Action	Responsible Parties	Date
1	Effective date of Chollas Creek Metals TMDL Waste Load Allocations.	San Diego Water Board, Municipal Dischargers, Caltrans, Navy, Industrial Stormwater Dischargers, Construction Stormwater Dischargers, Landfill Stormwater Dischargers	Effective date[1]
2	Recommend High Priority for grant funds.	San Diego Water Board	Immediately after effective date
3	Submit annual Progress Report to San Diego Water Board due January 1 of each year.	Municipal Dischargers	Annually after reissue of NPDES WDRs.
4	Submit annual Progress Report to San Diego Water Board due April 1 of each year.	Caltrans	Annually after reissue of NPDES WDRs.
5	Submit annual Progress Report to San Diego Water Board due July 1 of each year.	Industrial Stormwater Dischargers	Annually after reissue of NPDES WDRs.
6	Submit annual Progress Report to San Diego Water Board due July 1 of each year.	Construction Stormwater Dischargers	Annually after reissue of NPDES WDRs.
7	Municipal NPDES WDRs shall be issued, reissued, or revised to include WQBELs consistent with the assumptions and requirements of the Chollas Creek WLAs.	San Diego Water Board	Within 5 years of effective date
8	Caltrans NPDES WDRs shall be issued, reissued, or revised to include WQBELs consistent with the assumptions and requirements of the Chollas Creek WLAs.	State Water Board	Within 5 years of effective date
9	Construction NPDES WDRs shall be issued, reissued, or revised to include WQBELs consistent with the assumptions and requirements of the Chollas Creek WLAs.	State Water Board	Within 5 years of effective date
10	Industrial NPDES WDRs shall be issued, reissued, or revised to include WQBELs consistent with the assumptions and requirements of the Chollas Creek WLAs.	State Water Board	Within 5 years of effective date

[1] Upon approval of by Office of Administrative Law.

Item	Implementation Action	Responsible Parties	Date
11	Amend Orders No. 2000-90, and No. 2001-96 (or superseding renewal orders) which regulates temporary groundwater extraction discharges to San Diego Bay and its tributaries to include WQBELs consistent with the assumptions and requirements of the Chollas Creek WLAs.	San Diego Water Board	Within 5 years of effective date
12	Municipal and Navy WDR Order No. R9-2004-0277 shall amended to require additional monitoring for metals and hardness.	San Diego Water Board	Within 5 years of effective date
13	Landfill NPDES WDR Order No. 97-11 (or superseding renewal orders) shall be issued, reissued, or revised to monitor for metals and hardness.	San Diego Water Board	Within 5 years of effective date
14	Navy and all other Phase II small MS4 permittees in the Chollas Creek watershed shall be enrolled in Order No. 2003-0005-DWQ (or superseding renewal orders).	San Diego Water Board	Immediately after effective date.
15	Take enforcement actions	San Diego Water Board	As needed after effective date.
16	Meet 80% Chollas Creek Metals TMDL WLA reductions.	Municipal Dischargers, Caltrans, Navy, Industrial Stormwater Dischargers, Construction Stormwater Dischargers, Landfill Stormwater Dischargers	10 years after effective date.
17	Meet 100% Chollas Creek Metals TMDL WLA reductions.	Municipal Dischargers, Caltrans, Navy, Industrial Stormwater Dischargers, Construction Stormwater Dischargers, Landfill Stormwater Dischargers	20 years after effective date.

Appendix K
Scientific Peer Review

Chollas Creek Metals Total Maximum Daily Load

California Regional Water Quality Control Board, San Diego Region

May 30, 2007

Scientific Peer Review:
"Technical Report for Copper, Lead and Zinc Total Maximum Daily Loads for Chollas Creek, San Diego, Tributary to San Diego Bay"

Garrison Sposito and Jasquelin Peña
Department of Civil and Environmental Engineering
University of California at Berkeley

The draft report under review provides technical information related to the establishment of Total Maximum Daily Loads (TMDLs) for Chollas Creek, an intermittent stream that drains a highly urbanized watershed through two major tributaries in the San Diego area. Outflow from the creek, whose lower reach (see photo of the North Fork, below, taken by J. Peña, March 2005) has impaired water quality, is into San Diego Bay. (Note, however, that the introductory statements on page 4 of the draft report appear to be contradictory in respect to the documentation of impaired water quality, implying that National Toxics Rule criteria are more often exceeded than California Toxics Rule criteria, while calling the latter "more stringent".) The TMDLs discussed in the report are for the metals, copper, lead, and zinc. As noted in the Introduction of the draft report, TMDLs are load allocations (mass per day) of pollutants to a waterbody, considering both point sources and nonpoint sources, such that the assimilative capacity of the waterbody in respect to applicable water quality objectives is not exceeded.

The methodology followed in the draft report for the three metals of concern is to apply the USEPA- California Toxics Rule (USEPA-CTR) to obtain numeric targets for dissolved metals in Chollas Creek. The dissolved mconcentrations are calculated for both acute (one-hour average) and chronic (four-day average) conditions from USEPA-CTR statistical regression equations that include factors for site-specific toxicity effects, total-to-dissolved metal concentrations, and direct hardness effects (Table 3.1 in the draft report). Hardness data for the waterbody will be required in order to implement these equations. It is possible to include direct effects of temperature and pH in the equations, but this was not done in the draft report. Site-specific toxicity effects also were not

considered [i.e. Water Effects Ratio (WER) = 1.0 in the regression equations] and the total-to-dissolved metal concentrations ratio for each metal was set equal to a fixed constant for all conditions using the default USEPA-CTR values.

Although the draft report states that the numeric targets set by using the USEPA-CTR equations are a function of hardness, it does not justify why this choice is appropriate for Chollas Creek, other than its legal applicability in California for inland surface waters (draft report, page 11). Reference to CFR 40 Part 131 provides the following guiding commentary on the toxicological significance of hardness-based USEPA-CTR equations:

f. Hardness
Freshwater aquatic life criteria for certain metals are expressed as a function of hardness because hardness and/or water quality characteristics that are usually correlated with hardness can reduce or increase the toxicities of some metals. Hardness is used as a surrogate for a number of water quality characteristics which affect the toxicity of metals in a variety of ways. Increasing hardness has the effect of decreasing the toxicity of metals. Water quality criteria to protect aquatic life may be calculated at different concentrations of hardness, measured in milligrams per liter as calcium carbonate.

Given the importance accorded in the draft report (page 14) to hardness sampling as part of compliance testing, it would be very useful to have more detailed discussion on the relevance of the above paragraph to water quality criteria for the three metals of concern in Chollas Creek.

Although the choice of WER = 1.0 in the draft report is a conservative one, procedures are available from USEPA for evaluating site-specific toxicity effects and modifying the Water Effects Ratio accordingly. This additional information may be of special value in respect to copper because of its strong tendency to form toxicity-reducing soluble complexes with dissolved organic matter. Similarly, the use of a constant total-to-dissolved metal concentrations ratio as given by USEPA is problematic, since the chemical forms of copper, lead, and zinc are likely to vary both spatially and temporally depending on streamflow variation and the changing composition of streamwaters, including suspended load. In the draft report, the assumption is made that the USEPA-CTR default values for the three metals are upper limits of the actual values in Chollas Creek, the implication being that actual total-to-dissolved metal concentrations are always larger than the default values used in the USEPA-CTR regression equations. Since toxicity effect should vary inversely with total-to-dissolved metal concentration, this assumption amounts to an implicit Margin of Safety imposed on the recommended dissolved metal concentrations. An alternative approach would be to evaluate total-to-dissolved metal concentrations as a function of turbidity and include turbidity sampling as a part of compliance testing.

In the usual development of TMDLs for a waterbody, hydrologic data and pollutant source analyses are combined with the numeric targets to calculate waste load and load allocations. However, in the draft report under review, although spatial hydrologic modeling and a very thorough metal source analysis are presented, they are used only to

determine TMDL Critical Conditions (Appendix D, Section 2.2). It appears that most of the data used to develop the TMDLs was collected during stormflows. Additional monitoring during low flow should be implemented since pools of slow-moving or standing water (see photo of Chollas Creek, below, taken by J. Peña) will have very different dynamics—and metal sources—from those associated with high-flow storm events. It is also possible that dissolved metal concentrations during low flow are greater than in the wet season because metal inputs are not diluted by large volumes of rainwater. Also, standing water can undergo evaporation, leading to the concentration of metals in sediments. Some additional minor points to consider in respect to the discussion of metal sources:

Page 32, Section 4.4.5. In the last sentence, the reader should be reminded that this summary applies strictly to the Santa Clara Valley study.

Page 33, Section 4.4.5.2. Quantify the difference between the "back of the envelope calculation" given here and the model results.

Page 37, Section 4.5.4. The percentage of copper contained in each pesticide should be included in Table 4.10.

Because waste load and load allocations were not made, the linkage analysis in the draft report (page 39) consists of identification of the most important metal sources and streamflows to be considered when sampling metal concentration and hardness for assessing compliance with the recommended dissolved metal concentrations. The final recommendations for the three metals are dissolved concentrations equal to 90 % of the dissolved concentrations (i.e. 10 % Margin of Safety) calculated using the USEPA-CTR hardness-based regression equations. These recommended concentrations are compared illustratively to measured concentrations in Appendix G of the draft report. The results in this appendix indicate that maximum observed concentrations of the three metals are significantly greater than the concentrations required to meet water quality objectives, with the discrepancies being much larger at lower hardness values.

The use of dissolved metal concentrations as numeric targets presupposes that the metals do not increase in concentration at higher trophic levels (i.e. no biomagnification) and that they do not accumulate in sediments. Biomagnification of copper, lead, and zinc in test organisms (e.g. daphnia) has not been observed in laboratory studies, insofar as the reviewers are aware, nor is it expected. Biomagnification is associated with hydrophobic pollutants and hydrophobic chemical forms of pollutants (e.g. methyl mercury), whereas most toxic metals have hydrophilic chemical forms in aquatic ecosystems. It is possible that lead could take on a hydrophobic chemical form under anaerobic conditions because it can be methylated by microorganisms, but this is very unlikely in well-aerated waterbodies. Accumulation in freshwater sediments is well established for the three metals of concern, which have strong sorption affinities for natural particles, especially those with organic matter content. The case is made in the draft report that metal concentrations in the creek sediments are typically below levels of probable toxic effect and that particle-bound metals are flushed from the creek within one year by winter flows. These conjectures are not unreasonable, but no database currently exists with which to evaluate them, bringing to mind the important possibility that particle-bound metals transported to San Diego Bay may pose a potential toxicity threat, thus making Chollas Creek a source of this threat.

In summary, the principal points made in this peer review of the draft report are:

Dissolved concentrations of copper, lead, and zinc for acute and chronic conditions calculated from USEPA-CTR regression equations dependent on water hardness are promulgated with a 10 % Margin of Safety instead of TMDLs, which typically combine allowable dissolved metal concentrations with hydrologic and metal source analyses to prescribe mass loadings that meet applicable water quality objectives.

Detailed scientific justification of the USEPA-CTR hardness-based equations for applicability to Chollas Creek waters in determining allowable metal concentrations is not provided. However, assumptions of no metal biomagnification or accumulation in sediments, which underlie the use of numeric targets based on dissolved concentrations, seem justified.

Compliance testing guided by TMDL Critical Conditions will require measurements of both metal concentrations and hardness (as calcium carbonate) for use with USEPA-CTR regression equations that, along with the 10 % Margin of Safety, define the numeric targets. Preliminary calculations indicate that current metal concentrations in Chollas Creek are in excess of these targets, particularly at low hardness values.

Hydrologic modeling and metal source analyses are used to select TMDL Critical Conditions for compliance testing. Hydrologic modeling is not explicitly used in metal load and wasteload allocations. All hydrologic and metal source effects are implicit in these allocations.

The current database for Chollas Creek can be improved by additional monitoring of both metal concentrations during lowflow periods and metal accumulation in creek sediments that may serve as a source of contamination for San Diego Bay. Additional laboratory toxicity testing using Chollas Creek waters would be useful in order to justify the Water Effects Ratio and to evaluate the accuracy of the default total-to-dissolved metal concentration factor assumed in the USEPA-CTR regression equations.

Peer Review Comments from Dr. Joseph Shaw
Dartmouth College

Response to: **Request for scientific peer review of the technical portion of the amendment incorporating the *copper, lead, and zinc total maximum daily loads for Chollas Creek* into the water control plan for the San Diego basin.**

I commend the California Regional Water Quality Control Board, San Diego Region for their efforts to reduce the loads of copper, lead, and zinc entering the Chollas Creek Watershed by ~50-70% (e.g., depending on metal). The technical report presents a conservative approach to establishing Total Maximum Daily Loads (TMDL) for the three metals that are required to meet the established water quality standards. Given the paucity of data in certain instances this conservative approach, which was based on concentrations derived from California Toxic Rule requirements (U.S. EPA, 2000) for these metals and source/land use models to predict load, was warranted. It should be noted that cautionary/critical statements in this review are provided as an aid to strengthen the scientific portion of the proposed rule. It is my opinion that the current draft of the technical plan far surpasses the status quo (i.e., not implementing the TMDL). Comments to specific questions are given below.

1) Biomagnification potential for copper, lead and zinc:

"Copper, lead and zinc may biomagnify in aquatic life in Chollas Creek. The California Regional Water Quality Board, San Diego Region (Regional Board) believes that these metals do not biomagnify. We would like to know if we have sufficiently justified this position and if there are substantive arguments to the contrary."

As stated in the TMDL, there is little evidence that copper, lead and zinc biomagnify in top-level feeders. However, I question whether one sentence in Section 2.4 (p.8) that cites a single 20 year old reference (Moore and Ramamoorthy, 1984) from a book on organic chemicals sufficiently justifies this position. Appropriate citations would include Timmermans et al., 1989; Suedel et al., 1994; Jarvinen and Ankley, 1999; and Besser et al., 2001. Also, there is growing evidence that zinc and to some extent copper can biomagnify within aquatic food webs (Quinn et al., 2003; Chen et al., 2000; Timmermans et al., 1989). However, these studies focused on lower food chain levels (i.e., phytoplankton, zooplankton, macro-invertebrates) and evidence extending these findings to higher trophic-level consumers (e.g., birds and mammals) is unfounded.

2) Copper, lead, and zinc accumulation in creek sediments:

"The Regional Board has reviewed the available data and concluded that copper, lead, and zinc are not a problem in the sediments of Chollas Creek. We would like to know if we have scientifically and sufficiently supported this claim."

Sediment accumulation of metals in Chollas Creek appears to be minor (Table 2.4; Appendix C). The PEL (probable effect level; more recently termed PEC, probable effects concentration, MacDonald et al., 2000) approach has been successfully used to screen sediments on both a regional and national basis (Ingersoll et al., 2001). However, there are a couple of points of caution to be made with interpreting data provided (Table 2.4, Appendix C). As indicated in the text, PELs represent concentrations where toxicity (adverse effects) is expected to occur frequently. The water quality objective *("All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.")* is more strict, seeking to protect against toxicity, not just frequent toxicity. With this in mind, cadmium although rarely detected (11 of 81

samples) and detected in excess of PEL (1.2%), has an average concentration that approaches PEL. Also, the one time it exceeded PELs it did so by over 6.5 fold. However, it is difficult to draw conclusions about this site, since it was only sampled once. In fact, the bulk of the sampling within the creek (sampling designated 978-270 to 978-337) occurred at a single time point and no temporal replication of these sites is shown. The data set that includes temporal replication contains three sites within San Diego Bay and only one site within the creek (location not provided). Given the short residence time of the sediments within the creek (~1 year as given in Section 2.5), a single grab from 1998 could be dramatically different from 2005. For the PEL screening approach to be successful the data being screened needs to adequately reflect that of the creek. Also, as pointed out in this document (section 2.4), metal toxicity has a strong relationship with speciation. Total sediment metal concentrations (just as measurements of total metal in the water column) have proven problematic in assessing toxicity. Typically sediment metal concentrations are discussed in context of sediment characteristics such as grain size, organic carbon, simultaneously extracted metal:acid volatile sulfides ratio, pH, etc.

3) Selection of Numeric Targets:

"Numeric Targets must be appropriately chosen to ensure the attainment of the Water Quality Standards (Water Quality Objectives, Beneficial Uses and Anti-degradation Policy) of the Creek. It is expected that the used of the CTR objectives as Numeric Targets will lead to the protection of the WARM and WILD beneficial uses of the creek. However, CTR may not be protective of all species protected under these two beneficial uses. The Regional Board would like to know if the choice of Numeric Targets to protect the beneficial uses is bases upon sound scientific knowledge, methods, and practices. The regional Board would also like to know if there are other objectives that are also/more appropriate."

CTR criteria are set to protect aquatic-life in California water bodies against both acute and chronic exposures to harmful contaminants. These include hardness corrections for ambient copper, lead, and zinc standards, an approach that has been incorporated in U.S. EPA ambient water quality criteria for the protection of aquatic-life for over 20 years (including updates). The hardness corrections account for the (generally) protective effect of the two components of hardness (i.e., calcium, magnesium) on the toxicity of these metals. In the absence of site specific water quality parameters and species inventory lists for Chollas Creek, such an approach represents the most conservative and scientifically defensible action. However, there are some points of caution with their application. Criteria are designed to protect 95% of the species that fall within the range of sensitivities of those that were tested as part of the criteria development process. For acute criteria, these are generally robust and although a species inventory is not provided for Chollas Creek such targets would be expected to be protective of most species present. However, chronic criteria are established using a much smaller range of species through the development of acute to chronic ratios that are more broadly applied. For these reasons, chronic criteria would stand to be more impacted by site specific parameters. If data are present on the species residing in Chollas Creek it could really benefit application of CTR standards. Also, it is surprising that hardness data, while admittedly variable, are not provided. I agree that because of the temporal/seasonal variability of Chollas Creek that it is appropriate to present hardness dependent standards. However, information on hardness would be a useful addition to the Technical Report as a means of determining the current status of Chollas Creek. Also, these standards are less predictive at the lower and higher extremes for hardness (Gensemer et al., 2002), where other water quality parameters can have a greater influence on toxicity. Finally, I would like to compliment the authors of this report for their inclusion of the newly proposed Biotic Ligand Model (Paquin et al., 2002) for copper and support their position of revisiting Numerical Targets if/when these are adopted. The BLM represents a fundamental change in the way metals criteria are calculated that models metal binding to critical biotic ligands, such as the fish gill, and relates this metal burden to detrimental effects on the organism. While they are more inclusive of mitigating water quality parameters, they are more data intensive (e.g., requiring simultaneous measurements of copper and many

complexing anions and competing cations).

4) Sampling requirements to assess Loads and Waste Load Allocations:

"The Regional Board has designated sampling requirements to evaluate the Load and Waste Load Allocations and would like to know if they are sufficient, appropriate, and based upon sound scientific knowledge, methods, and practices. The question really deals with spatial and temporal scales. Given the size of the creek and the seasonal variability of its flow, it will be key to select measurement sites and frequencies that will allow assessment of the attainment of the Load and Waste Load Allocations through the year and throughout the entire creek system."

There is insufficient material available regarding the spatial and temporal aspects of the monitoring/sampling plan to comment on its usefulness in assessing Load and Waste Load allocations for the Chollas Creek Watershed. In the absence of designating sampling requirements, it would be appropriate and necessary at a minimum to provide guidance on the development of such a plan in the Technical Report.

5) Water Effects Ratio:

"A Water Effects Ratio (WER) is part of the CTR Equation for establishing water quality criteria for copper, lead, and zinc. However, sufficient data are not available to modify the default WER value of unity (with the proposed Numerical Target). The Regional Board would like the reviewer to comment on the state of use of WERs in the freshwater systems."

Water effects ratios provide a way to calibrate numerical targets to site-specific conditions. These include endogenous species and/or water quality parameters that may vary from those used to develop the standard in sensitivity and influence on toxicity, respectively. These are typically derived after extensive on-site testing and are usually initiated by regulated parties. This approach (*i.e., making unity the WER default and letting the regulated community establish site-specific conditions under the guidance of the Regional Board*) is reasonable, especially given that WER are often implemented to make conservative Numerical Targets less restrictive. As discussed above for numerical targets, acute criteria are influenced less by site specific conditions (i.e., WER close to unity; Cherry et al., 2002). Cherry et al. (2002) established a site specific CMC for copper in the Clinch River, VA. This required a battery of toxicity tests conducted using 17 genera native to or currently residing in the river that were not part of the derivation of the Final Acute Value (FAV) used in the current U.S. EPA regulations. They concluded that the site specific CMC was not substantially different than the national copper criteria. They suggested site-specific adjustments would be most meaningful for criteria developed to protect against chronic exposures and low-level impact. I could find no published reports detailing successful integration of site-specific numerical targets using a WER approach.

It should be noted that one additional source of site-specific variability could easily be incorporated into the TMDL. Direct measurements of dissolved metals can be influenced by a number of parameters and the use of conversion factors to translate total metal concentrations into dissolved is somewhat arbitrary and likely not reflective of the specific chemistries found within the watershed. It would seem reasonable to require that the monitoring plan require dissolved metals to be measured.

6) Source Analysis:

"The Regional Board must adequately estimate the sources of the metals to the creek. The Regional Board would like the reviewer to comment on the science, methods, and practices used to estimate the

sources of copper, lead and zinc. The analysis of the sources is key to successful implementation of reduction schemes. Therefore, it is critical to address all sources of metals and to make some type of estimate of their total load to the creek. This was accomplished through a model based upon land uses and build-up/wash-off coefficients. Other sources were identified by reference to available literature that identify metal sources in other urban areas."

The methods or literature used to determine that the majority of run-off entering Chollas Creek is via the storm water conveyance system (MS4s, Section 4, introduction, p. 15) are not clearly stated. It makes sense given that there are no other point sources, but the reader is left to make the assumption that direct run-off into the creek is negligible (i.e., both volume and source). This is a crucial point as it identifies/acknowledges the jurisdiction of NPDES WDR and I think a citation or further explanation of this determination is warranted, especially since it places the load responsibility on 20 sources identified through NPDES permit requirements (Section 4.1, pp. 15-16). It would seem a mass accounting of volume entering via storm water conveyances and exciting the creek was used, but this was not mentioned. This conclusion also makes since empirically because a direct link between stormwater discharges and creek toxicity has already been established (Schiff, 2001). Given that stormwater is the major source of load input for Chollas Creek, the paradigm of identifying sources and modeling land-use specific loads for MS4s is reasonable. Additional comments on load estimates and source identification are given below (Questions 7-10).

7) Land Use Model:

"The Regional Board would like the reviewer to comment on the adequacy of the Source Analysis model description found in Appendix D. The model provides the basis of the Source analysis and was run by Tetra Tech, Inc. The Regional Board merged the Tetra Tech document with literature from the U.S. EPA (BASINs manual) and other sources in an effort to create a document (Appendix D) more accessible to the layperson. Please comment on the adequacy of Appendix E in its description of the model."

As a non-modeler I found the model description in Appendix D accessible. It did a great job explaining the process of data acquisition, populating model parameters, calibration, and independent validation, which are critical for model development. It also was effective in conveying the strengths, weaknesses, and limitations of the models, especially with regards to data gaps/needs and appropriate/inappropriate applications.

8) Model Interpretation:

"The Regional Board would like the reviewer to comment on the scientific basis of the interpretation of the model results and deficiencies. Since the model was produced by an outside consultant, the Regional Board would appreciate the reviewer's opinion on the findings and limitations of the model used as the basis for the Source Analysis."

The immediate deficiencies are obvious; lack of input data (especially water quality measurements during dry weather conditions). Given these limitations it is difficult to assess the models performance. While it has potential to estimate metal concentrations in the Creek or support load allocations across varying condition, these identified deficiencies limited its application to identifying potential sources to target for load reductions. While this is useful it has less direct bearing on the derivation of the TMDL. As noted in Section 4, when data are sufficient they could be readily incorporated into the model.

9) Source Analysis Literature:

"The Regional Board would like the reviewer to comment on the scientific basis of applying results from studies of other urban areas to the Chollas Creek watershed. There are no known peer-reviewed studies describing sources of metals to Chollas Creek, nor is there much information about metal sources in the greater Sand Diego area. Therefore, studies detailing metals sources in other urban areas served as the basis for part of the Source Analysis discussion. Some of the studies come from other highly populated cities in California, while others come from urban centers in other pars of the world. While certain land use practices are similar between all these areas, other controlling factors (climate, geology, local ordinances, social attitudes, etc) are likely to be much different. Therefore, these studies must be referenced in a conservative manner and not over extrapolated. Please comment on whether or not this boundary has not been breached."

The application of results from other studies to Chollas Creek is no different than most any discussion section found in a peer-reviewed article where the objective is to discuss results (strengths and weaknesses) in context of the body of existing literature. In this sense, such an approach seems not only warranted, but also mandated. I found the literature selections for comparisons justified in terms of similarities (i.e., the most similar studies were selected). Similarities included geographical proximity, population size, land-use, policy, etc. However, in all cases differences and their potential to influence interpretations were highlighted. The only reference I question is the inclusion of Brown and Caldwell, (1984), which was used in section 4.4.2, p. 31. While its limits were clearly noted, the inclusion of lead loading data prior to the CAA ban of lead and lead additives in gasoline provides little area for comparison.

10) Data Deficiencies:

"The available data for Chollas Creek is not as complete as desired. The Regional Board would like the reviewer to comment on whether or not data gaps have been adequately identified, particularly in the Source Analysis and in the Linkage Analysis sections. In particular, the model lacked site-specific flow data for validation and sufficient dry weather information for even a model run. These data gaps must be thoroughly discussed to ensure transparency of the document and to identify necessary monitoring areas under the Implementation Plan. Additionally, data gaps may weaken the connection between the allocations and the attainment of the Water Quality Standards."

The largest data gap I have found for the entire document deals with the lack of information pertaining to a monitoring plan. This is critical to fulfill one of the necessary requirements of Linkage Analysis (i.e., providing the quantitative link between the TMDL and attainment of WQSs) and does not seem to be appropriately identified (SEE RESPONSE TO QUESTION 4). Another unidentified gap appears in Section 5 (Linkage Analysis, p. 39) which states that the technical report is required to "estimate the total assimilative capacity (loading capacity) of Chollas Creek for the metals and *describe the relationship between Numeric Targets and identified metal sources*." I found no description of the later in this section. Also, as stated above it is a little unclear the role the model is serving (i.e., how it will be applied) in the TMDL development. Perhaps, I'm missing something, but it seems a little anticlimactic after reading section 4 and Appendix D that describe the model to get to the Linkage Analysis Section only to discover it has little application to TMDL development.

11) Synergistic Toxicity:

"The Regional Board is not aware of any synergistic toxicity effects associates with dissolved copper, lead, and zinc in the water column and has written this TMDL accordingly. Please comment on the scientific basis for this approach. If all three metals are present at just under their allowable CTR

concentration, the water may still not be safe for aquatic life. It is possible that these three metals could work together to form a toxic condition…The Regional Board would like the reviewer to comment on the scientific basis for the potential for a synergistic effect with another chemical pollutant. If an interaction is likely, please comment on the scientific impacts to the Load and Waste Load Allocations. If the metals Cu, Pb, and Zn are synergistic in their toxic effect on freshwater organisms, perhaps an additional margin of safety should be considered."

There is evidence for synergistic (i.e., greater than additive) and additive (which could also produce scenarios described above) effects of binary mixtures of copper and zinc and lead and zinc (Kraak et al., 1993; Franklin et al., 2002; Utgikar et al., 2004). However, published reports include laboratory studies that have focused on lower trophic levels (i.e., bacteria, phytoplankton, zooplankton). None of these studies investigated concentration ranges applicable to chronic effects and for the most part they focused on binary rather than more complex mixtures. It should be noted that mixture toxicity can be difficult to assess even in the laboratory as results (i.e., antagonism, additive effects, synergism) can vary with species, strain, concentration, and other parameters (Franklin et al., 2002, Borgmann et al., 2003, and numerous others). For example, Martinez et al. (2004) in studies with *Chironomous tentans* found lead and zinc to interact antagonistically to produce sub-chronic/population level effects (i.e., mouth part deformities), which is opposite from the studies cited above. This question could be pertinent, but does not appear to have been addressed in the de-listing of cadmium. There are numerous studies detailing interactive effects of cadmium combined with zinc, lead, and copper. Again, observed effects range from synergism to antagonism, but evidence exists for the scenario raised above where metals are present below the CTR concentrations and interact in a synergeistic (or depending on concentration in an additive) manner to produce toxicity (Beisenger et al., 1986; Kraak et al., 1993; Jak et al., 1996; Barata et al., 2002; Franklin et al., 2002). The CTR Numerical Targets are derived for individual chemicals and do not account for mixtures. However, given the variability in the nature of interactions reported for these metals, interactions would be difficult to regulate in the absence of site-specific data. In summary, I would conclude that while some evidence for metal interactions exists, appropriate determinations of effects would need to include site specific variables in order to be scientifically defensible. The BLM if/when it is adopted could eventually provide a means of dealing with metal mixtures (Paquin et al., 2002; Niyogi and Wood, 2004; Playle, 2004).

12) Linkage Analysis:

"The Linkage Analysis must adequately establish the link between the Load and Waste Load Allocations and the attainment of Water Quality Standards. Please comment on the scientific basis for the linkage provided in this TMDL. This is similar to number 3 above. The ultimate goal of the TMDL is to restore and protect the Water Quality Standards of Chollas Creek that are being degraded by Cu, Pb, and Zn. The Load and Waste Load Allocations must be calculated to achieve this goal. Therefore, they are the critical component of the technical discussion and must be thoroughly scrutinized. Furthermore, the Linkage Analysis must sufficiently establish this connection."

The Waste Load and Load allocations are directly linked to Water Quality Standards defined by the numerical limits, as they are identical. The decision was made by the Board to take a conservative (i.e., from the protection standpoint) approach and set load allocations based on concentration rather than mass. In other words, it is not the relative amounts (i.e., mass) of metals, but rather their respective concentrations that determine load and load reductions will be based on maintaining concentrations of metals at or below these concentration based targets (the exact concentration is fluid and depends on the water hardness). This approach seems reasonable given the dynamic nature of the system. There is one peer-reviewed study and at least one technical report that link effects of storm water drainage and more specifically the metal component of this drainage to toxicity in aquatic-life in Chollas Creek and the

portions of San Diego Bay it enters (Schiff et al, 2001; 2003). Since the load allocations are identical to the numerical limits my response to question 3 is also applicable here.

13) Margin of Safety:

"The Margin of Safety (MOS), both implicit and explicit, incorporated in the TMDL should be of a reasonable magnitude to account for uncertainty. Please comment on the scientific foundations and adequacy of the Margin of Safety incorporated into this TMSL. A MOS is a required component of the allocations. It is designed to account for any uncertainty in the calculations supporting the Load and Waste Load allocations. Please comment on the scientific foundations and adequacy of the Margin of Safety incorporated into this TMDL."

The explicit 10% MOS incorporated into the TMDL represents a commonly employed safety factor. The 10% load correction is to guard against the uncertainty inherent in the Source Analysis and Linkage Analysis; differences between total and converted dissolved metal concentrations; and site-specific differences in CTR derived Numerical Targets. It is difficult to comment on the appropriateness (or scientific validity) of the 10% correction. There was greater than 10% variability in measured metal concentrations (Table 2.1). Some explanation for the rationale behind the 10% MOS would be helpful. In addition, there are implicit MOS that stem from using measured rather than estimated hardness values to calculate the TMDL. Likewise, as discussed below, the CTR values incorporate 50% correction.

I didn't understand the argument provided in the last paragraph of section 6 (p. 41). Metal interactions were discussed in question 11 above. There are numerous explanations for interactive effects, which have been observed for copper, lead, and zinc. For example, common uptake routes (e.g., calcium channels for cadmium and zinc) or distributions and detoxications could account for interactive effects. While speciation affects toxicity, biological processes have also been shown to influence interactions during laboratory tests conducted under identical water chemistries. Perhaps chemical interactions refers to complexation with anions and negatively charged sites on particulates, which would reduce bioavailability. Anyway, this paragraph/point could use clarification.

14) California Toxics Rule Inherent Margin of Safety:

"The California Toxics Rule formulas provide conservative water quality criteria that are protective of aquatic life. However, since the equations are based upon available laboratory data, they may not be protective of all aquatic life in Chollas Creek and an additional MOS has been added to the TMDL. Please Comment on the scientific basis of this approach…Criteria are based only upon available toxicity testing that may not be available for all taxonomic groups. Does this danger warrant the need for an additional10% MOS as addressed in number 12 above?

As stated above, the one peer-reviewed manuscript that described formulating site-specific CMC for copper concluded that including over 17 sensitive site-specific species to calculate the FAV did not significantly lower the CMC (Cherry et al., 2002). Also, the CTR are based on national ambient water quality criteria, for which the science has been validated through several updates over 20 years. It wasn't

until recently that new approaches (i.e., BLM) gained favor. Given the defensibility and robustness of this approach coupled with the lack of evidence for extreme site-specific sensitivities another 10% MOS does not seem warranted.

15) Critical Conditions:

"The Regional Board has addressed seasonal variations and critical conditions by the use of the CTR formulas that incorporate site and time-specific hardness and metal concentration data. Please comment on the scientific basis and adequacy of this approach. This TMDL is designed to be protective of the creek in all weather and flow conditions during all times of the year. It is believed that the use of the CTR equations will adequately apply the Load and Waste Load Allocations on a temporal and spatial specificity to ensure this protection at all times. By comparing each instream metal concentration against it's appropriate criteria calculated from the hardness measured at the same time and location, the Load and Waste Load Allocations will be a moving target that accounts for ecosystem variability."

The use of a concentration (mass/volume) based TMDL negates effects of variable flow on load allocations, since regardless of the amount (mass) of metals that are present, it is the CTR derived concentrations that must be maintained. Concentration based criteria have a long history of use and even the newly proposed BLM, which relate an amount of metal bound to a critical biotic ligand to toxicity, are still expressed as concentrations. The use of concentrations is an appropriate approach for Chollas Creek given the limited data available for Land Use Models and other methods used to estimate the metal load entering during wet and dry periods. Likewise, the use of CMC and CCC targets ensure critical exposure conditions (acute, chronic) are incorporated. Furthermore, the inclusion of measured rather than estimated hardness concentrations reduce seasonal variability, especially during critical conditions. Provisions are also made to revisit other stream chemistry parameters that were not included in this TMDL if/when the BLM for copper is adopted. Collectively, these measures stabilize the TMDL even over extreme/critical conditions that could be occurred within the basin.

16) Overarching issues:

"Reviewers are not limited to addressing only the specific issues presented above, and are asked to contemplate the following "big picture" concerns.

a. In regarding the staff technical report and proposed implementation language, there may be additional scientific issues that are part of the scientific basis of the proposed rule that are not described above. If so, please comment with respect to the statute language given above.

B. Taken as a whole, please comment on the scientific knowledge, methods, and practices that constitute the scientific portion of the proposed rule.

Reviewers should also note that some proposed actions may rely significantly on professional judgment where available scientific data are not as extensive as desired to support the statue requirements for absolute scientific rigor. In these situations, the proposed course of action is favored over no action."

With regards to additional scientific issues relating to the Technical Report, there was little mention of specific methods, especially for metal sampling and analysis. Most every question in this reviews asked

the reviewer to comment on the scientific methods, so it would appear to be information useful this review. Inclusion of methods could be done in the form of references, but I think their inclusion in necessary to ensure appropriate sampling/measurement techniques are employed and thus, TMDLs are meaningful.

Specific comments regarding the Technical report are as follows:
Attachment 1, p. 1, second paragraph- There are more appropriate references than More and Ramamoorthy, 1984).

Technical Analysis, p.1, 1st paragraph, 1st sentence- insert 'and a' between County and tributary.

" ", p. 1, 1st paragraph, with regards to de-listing Cd, see question regarding synergistic effects above.

Problem statement, p. 2, in the 1st paragraph inconsistencies with the use of lower and lowest.

" ", same paragraph- Ceriodaphnia is misspelled.

" ", same paragraph- not exactly clear on the use of the sea urchin. I assume this is from test of Bay water? Also, in general toxicity data were not presented in clearly.

Section 2.3, p. 8, 2nd paragraph, last sentence; it states that compliance shall be evaluated using a 96-hr acute bioassay. The Daphnia tests mentioned are 48-h tests.

Section 2.4., p. 8, 1st paragraph, poor reference for biomagnification of metals.

" ", toxins are natural compounds (i.e., snake venom, ammonia); toxicants is the appropriate word here.

" ". Next sentence; …same locations more commonly found at higher concentrations in ….

" ". P. 9, Better references than Buffle, 1989.

" ". P. 9. 2nd paragraph, last sentence, Unclear what is being referred to where the implementation plan is located?

Section 2.6. p. 10. In reference to the monitoring site, it is stated that this sampling station is representative of the entire watershed. How was this determination made?

" ", next paragraph. Replace 1994.95 with 1994-95.

" ". Same paragraph. Provide methods for toxicity tests.

" ". Same paragraph. Sentence that states, "Reproduction of the water fleas was generally note impaired, even in individuals that died later in the test." Is not clear.

Section 3, Numeric Targets, 1st paragraph. Reference the EPAs Metal Translator or whatever the source of the conversion factors was.

“ “. Same page, last paragraph, States that the targets given in table 3.1 were derived to be protective of marine aquatic life from toxicity. Should it read ‘freshwater’ aquatic life?

“ “ p. 12, Equation 3.2; Where: make sure subscripts agree with acute target. I think they should be A instead of C. This also needs correcting in the descriptive sentence to follow.

Section 3.2, Water Effects Ratios. 1st paragraph, 1st sentence, delete more

“ “. Last sentence. I would remove reference to the appendix if it will not be included.

Section 3.6. last sentence. Replace biochemical with biotic. (the gill is not a biochemical stie)

Section 4.2.1.1. add period between next to last and last sentence.

Section 4.3. p. 28. 2nd paragraph. Replace Creeks with Creek

Section 4.3.2. p. 31. 1st paragraph. I don’t think the argument is strengthened with the inclusion of the 1984 lead reference (SEE Comments above.).

Section 4.4.3. p. 31. second sentence. Replace do with low.
In addition, there are a number of mis-labelings in the appendices

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Appendix L

Response to Peer Review Comments

Chollas Creek Metals Total Maximum Daily Load

California Regional Water Quality Control Board, San Diego Region

May 30, 2007

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RESPONSE TO PEER REVIEW COMMENTS

Response to Peer Review Comments from Dr. Joseph Shaw

Overall Assessment by Dr. Shaw

Comment

It should be noted that cautionary/critical statements in this review are provided as an aid to strengthen the scientific portion of the proposed rule. It is my opinion that the current draft of the technical plan far surpasses the status quo (i.e., not implementing the TMDL).

Response

Comment noted.

Biomagnification of Metals

Comment

As *stated in the TMDL, there is little evidence that copper, lead and zinc biomagnify in top-level feeders. However, I question whether one sentence in Section 2.4 (p.8) that cites a single 20 year old reference (Moore and Ramamoorthy, 1984) from a book on organic chemicals sufficiently justifies this position. Appropriate citations would include Timmermans et al., 1989; Suedel et al., 1994; Jarvinen and Ankley, 1999; and Besser et al., 2001. Also, there is growing evidence that zinc and to some extent copper can biomagnify within aquatic food webs (Quinn et al., 2003; Chen et al., 2000; Timmermans et al., 1989). However, these studies focused on lower food chain levels (i.e., phytoplankton, zooplankton, macro-invertebrates) and evidence extending these findings to higher trophic-level consumers (e.g., birds and mammals) is unfounded.*

Response

Our intention was not to justify the conclusion that copper lead and zinc do not bioaccumulate in Chollas Creek based on the Moore and Ramamoorthy reference. Section 3.4 (formerly 2.4) of the Technical Report states: *"Copper, lead and zinc may bioaccumulate within lower organisms, yet they do not biomagnify up the food chain as do mercury and selenium …"*. This sentence implies that mercury and selenium have a higher potential for biomagnification over copper, lead, or zinc. The technical report does not state that copper, lead, or zinc will not bioaccumulate but rather the potential for biomagnification is more likely for mercury and selenium when compared against the other three metals.

There are no site-specific studies on Chollas Creek to verify whether metals are bioaccumulating into higher trophic level consumers. However, studies have been completed on marine sediments at the mouths of Chollas and Paleta Creek where they enter into San Diego Bay. Laboratory bioaccumulation sediment studies were

conducted at 7 locations in the Chollas Creek channel and 7 locations in the Paleta Creek channel using the clam *Macoma nasuta*. The results from the 28-day bioaccumulation tests indicate a slightly higher bioaccumulation potential for copper and lead when compared to the reference mean tissue concentrations (RWQCB 2004).[1] Mean tissue concentrations for mercury and zinc were comparable to the tissue levels observed in the reference tissue.

Assuming Chollas Creek discharge contributes to the metals found in the sediment in the Chollas Creek channel, the preliminary study indicates a potential might exist for some metals that originated in the creek to reach higher trophic level consumers.

An additional reference has been included in the Technical Report to further support the position that copper, lead and zinc are not expected to biomagnify. Furthermore, the first paragraph of section 3.4 has been changed to:

> Copper and zinc are essential elements for all living organisms, but elevated levels may cause adverse effects in all biological species. Lead is presumed to be a non-essential element for life; more importantly, even at extremely low environmental concentrations this element may create adverse impacts on biota. Dissolved forms of these metals are directly taken up by bacteria, algae, plants and planktonic and benthic organisms. Dissolved metals can also adsorb to particulate matter in the water column and enter aquatic organisms through various routes. Copper, lead and zinc may bioaccumulate within lower organisms, yet they are not expected to biomagnify up the food chain as do mercury and selenium (Moore and Ramamoorthy, 1984). The issue of biomagnification is still being debated among the scientific community (Besser, et al, 200) and cannot be assessed in Chollas Creek with the available information. Of all of these metals, copper is considered the most potent toxicant at environmentally relevant aqueous concentrations. Copper is more commonly found at higher concentrations in herbivorous fish than carnivorous fish from the same location (USF&W, 1998). Copper is used as an aquatic herbicide to reduce algae growth in reservoirs and also applied (via antifouling paints) to boat hulls in marinas.

Creek Sediment

Comment

Sediment accumulation of metals in Chollas Creek appears to be minor (Table 2.4; Appendix C). The PEL (probable effect level; more recently termed PEC, probable effects concentration, MacDonald et al., 2000) approach has been successfully used to screen sediments on both a regional and national basis (Ingersoll et al., 2001). However, there are a couple of points of caution to be made with interpreting data provided (Table 2.4, Appendix C). As indicated in the text, PELs represent concentrations where toxicity (adverse effects) is expected to occur frequently. The water quality objective ("All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses

[1] RWQCB 2004. Sediment Assessment Study for the Mouths of Chollas and Paleta Creek, San Diego. Phase 1 Draft Report. Southern California Coastal Water Research Project and Space and Naval Warfare Systems Center San Diego, United States Navy – San Diego. September 2004.

in human, plant, animal, or aquatic life.") is more strict, seeking to protect against toxicity, not just frequent toxicity. With this in mind, cadmium although rarely detected (11 of 81 samples) and detected in excess of PEL (1.2%), has an average concentration that approaches PEL. Also, the one time it exceeded PELs it did so by over 6.5 fold. However, it is difficult to draw conclusions about this site, since it was only sampled once. In fact, the bulk of the sampling within the creek (sampling designated 978-270 to 978-337) occurred at a single time point and no temporal replication of these sites is shown. The data set that includes temporal replication contains three sites within San Diego Bay and only one site within the creek (location not provided). Given the short residence time of the sediments within the creek (~1 year as given in Section 2.5), a single grab from 1998 could be dramatically different from 2005. For the PEL screening approach to be successful the data being screened needs to adequately reflect that of the creek. Also, as pointed out in this document (section 2.4), metal toxicity has a strong relationship with speciation. Total sediment metal concentrations (just as measurements of total metal in the water column) have proven problematic in assessing toxicity. Typically sediment metal concentrations are discussed in context of sediment characteristics such as grain size, organic carbon, simultaneously extracted metal: acid volatile sulfides ratio, pH, etc.

Response

The text in section 3.5 has been updated to include the Probable Effect Concentration (PEC) and references the 2000 paper by MacDonald et al.

The Regional Board agrees with Dr. Shaw that a sediment metal concentration at or below the PEL or PEC could be interpreted to be in violation of the more stringent water quality objective for toxicity (see Section 3.3). However, the toxicity objective is more appropriately applied to the water column. Unfortunately, neither the State of California nor the United Sates Environmental Protection Agency (USEPA) have objectives nor standards that are directly applicable to freshwater sediment metal concentrations. Until such criteria are promulgated, the interpretation of sediment metal concentrations must rely on screening values or some statistically based threshold, such at the PEL or PEC.

The average sediment concentration of cadmium in Chollas Creek is approximately 2.1 mg/kg (dry weight). This is approximately 40 percent below the PEL of 3.53 kg/mg (dry weight). Furthermore, cadmium sediment concentrations only exceeded the PEL in one out of 81 samples over a 7-year period and only 11 of those 81 samples even had detectable cadmium concentrations. While mean and median sediment cadmium concentrations are much closer to the PEL than copper, lead or zinc, cadmium still warrants removal from the Clean Water Act 303(d) List of Water Quality Limited Segments (see the response to Comment 12 for further discussion on the delisting).

If subsequent information indicates that sediment may be a contributor to water column toxicity, the Regional Board will consider revising the monitoring

requirements to include cadmium, grain size, organic carbon, simultaneously extracted metal to volatile sulfide ratios and pH.

Numeric Targets

Comment

CTR criteria are set to protect aquatic-life in California water bodies against both acute and chronic exposures to harmful contaminants. These include hardness corrections for ambient copper, lead, and zinc standards, an approach that has been incorporated in U.S. EPA ambient water quality criteria for the protection of aquatic-life for over 20 years (including updates). The hardness corrections account for the (generally) protective effect of the two components of hardness (i.e., calcium, magnesium) on the toxicity of these metals. In the absence of site-specific water quality parameters and species inventory lists for Chollas Creek, such an approach represents the most conservative and scientifically defensible action. However, there are some points of caution with their application. Criteria are designed to protect 95% of the species that fall within the range of sensitivities of those that were tested as part of the criteria development process. For acute criteria, these are generally robust and although a species inventory is not provided for Chollas Creek such targets would be expected to be protective of most species present. However, chronic criteria are established using a much smaller range of species through the development of acute to chronic ratios that are more broadly applied. For these reasons, chronic criteria would stand to be more impacted by site-specific parameters. If data are present on the species residing in Chollas Creek it could really benefit application of CTR standards. Also, it is surprising that hardness data, while admittedly variable, are not provided. I agree that because of the temporal/seasonal variability of Chollas Creek that it is appropriate to present hardness dependent standards. However, information on hardness would be a useful addition to the Technical Report as a means of determining the current status of Chollas Creek. Also, these standards are less predictive at the lower and higher extremes for hardness (Gensemer et al., 2002), where other water quality parameters can have a greater influence on toxicity. Finally, I would like to compliment the authors of this report for their inclusion of the newly proposed Biotic Ligand Model (Paquin et al., 2002) for copper and support their position of revisiting Numerical Targets if/when these are adopted. The BLM represents a fundamental change in the way metals criteria are calculated that models metal binding to critical biotic ligands, such as the fish gill, and relates this metal burden to detrimental effects on the organism. While they are more inclusive of mitigating water quality parameters, they are more data intensive (e.g., requiring simultaneous measurements of copper and many complexing anions and competing cations).

Response

A comprehensive study to determine the species living in the riparian zone of Chollas Creek has not been conducted. When and if such information becomes available, it will be reviewed to ensure that the most sensitive and/or endangered and threatened species are being protected by this TMDL.

Hardness data is presented in Appendix A. Hardness ranges from 35 to 3,200 mg/L $CaCO_3$, with an average of 198 and a median of 91 mg/L $CaCO_3$. These higher hardness concentrations certainly represent the extreme upper end. However, for all applications of CTR formulas, hardness will be capped at 400 mg/L $CaCO_3$. As additional toxicity information becomes available, the protective ability of this TMDL at extreme low and high hardness concentrations will be reviewed. We hope that this additional information will include the data necessary to populate the Biotic Ligand Model.

Sampling Requirements

Comment

There is insufficient material available regarding the spatial and temporal aspects of the monitoring/sampling plan to comment on its usefulness in assessing Load and Waste Load allocations for the Chollas Creek Watershed. In the absence of designating sampling requirements, it would be appropriate and necessary at a minimum to provide guidance on the development of such a plan in the Technical Report.

Response

The cities of San Diego, Lemon Grove, and La Mesa, the County of San Diego, and the San Diego Unified Port District are conducting a metals monitoring and reporting program under order of the Regional Board (Order No. R9-2004-0227). The order stipulates that all sampling will be conducted using appropriate methods and that analyses will use approved techniques and meet minimum detection levels. Sections 11 and 12 of the draft Technical Report provide further details and sufficient guidance for the responsible parties to develop a revised monitoring and reporting program as part of the TMDL Implementation Plan if required by the Regional Board.

Water-effect Ratio

Comment

Water-effect ratios provide a way to calibrate numerical targets to site-specific conditions. These include endogenous species and/or water quality parameters that may vary from those used to develop the standard in sensitivity and influence on toxicity, respectively. These are typically derived after extensive on-site testing and are usually initiated by regulated parties. This approach (i.e., making unity the WER default and letting the regulated community establish site-specific conditions under the guidance of the Regional Board) is reasonable, especially given that WER are often implemented to make conservative Numerical Targets less restrictive. As discussed above for numerical targets, acute criteria are influenced less by site-specific conditions (i.e., WER close to unity; Cherry et al., 2002). Cherry et al. (2002) established a site specific CMC for copper in the Clinch River, VA. This required a battery of toxicity tests conducted using 17 genera native to or currently residing in the river that were not part of the derivation of the Final Acute Value (FAV) used in

the current U.S. EPA regulations. They concluded that the site specific CMC was not substantially different than the national copper criteria. They suggested site-specific adjustments would be most meaningful for criteria developed to protect against chronic exposures and low-level impact. I could find no published reports detailing successful integration of site-specific numerical targets using a WER approach.

It should be noted that one additional source of site-specific variability could easily be incorporated into the TMDL. Direct measurements of dissolved metals can be influenced by a number of parameters and the use of conversion factors to translate total metal concentrations into dissolved is somewhat arbitrary and likely not reflective of the specific chemistries found within the watershed. It would seem reasonable to require that the monitoring plan require dissolved metals to be measured.

Response

The Regional Board appreciates Dr. Shaw's insights on the application of the water-effect ratio (WER) to freshwater systems. If and when a WER study is undertaken for Chollas Creek, the Regional Board will ensure that any sight specific chronic conditions are protective of the beneficial uses of the creek. The monitoring plan of Sections 11 and 12 of this report does require the sampling and analysis of dissolved metals. Furthermore, under the ongoing sampling plan, total metals are also being sampled.

Source Analysis

Comment

The methods or literature used to determine that the majority of run-off entering Chollas Creek is via the storm water conveyance system (MS4s, Section 4, introduction, p. 15) are not clearly stated. It makes sense given that there are no other point sources, but the reader is left to make the assumption that direct run-off into the creek is negligible (i.e., both volume and source). This is a crucial point as it identifies/acknowledges the jurisdiction of NPDES WDR and I think a citation or further explanation of this determination is warranted, especially since it places the load responsibility on 20 sources identified through NPDES permit requirements (Section 4.1, pp. 15-16). It would seem a mass accounting of volume entering via storm water conveyances and exciting the creek was used, but this was not mentioned. This conclusion also makes since empirically because a direct link between storm water discharges and creek toxicity has already been established (Schiff, 2001). Given that storm water is the major source of load input for Chollas Creek, the paradigm of identifying sources and modeling land-use specific loads for MS4s is reasonable. Additional comments on load estimates and source identification are given below (Questions 7-10).

Response
The end of the first paragraph of Section 5.1 has been modified to clarify any confusion over the source of water and over the persons responsible for the water in the creek. The following text has been added:

> The small size of the creek's riparian zone and the encroachment of development along the creek make the amount of run-off directly to the creek much smaller than that entering from storm drains. Furthermore, under the current MS4 WDRs, the creek itself is considered part of the storm drain system. Therefore, parties named in the Order are responsible for not only the run-off entering the creek, but also for the water in the creek itself.

Land Use Model

Comment
As a non-modeler I found the model description in Appendix D accessible. It did a great job explaining the process of data acquisition, populating model parameters, calibration, and independent validation, which are critical for model development. It also was effective in conveying the strengths, weaknesses, and limitations of the models, especially with regards to data gaps/needs and appropriate/inappropriate applications.

Response
Comment noted.

Model Interpretation

The immediate deficiencies are obvious; lack of input data (especially water quality measurements during dry weather conditions). Given these limitations it is difficult to assess the models performance. While it has potential to estimate metal concentrations in the Creek or support load allocations across varying condition, these identified deficiencies limited its application to identifying potential sources to target for load reductions. While this is useful it has less direct bearing on the derivation of the TMDL. As noted in Section 4, when data are sufficient they could be readily incorporated into the model.

Response
Comment noted.

Source Analysis Literature

Comment
The application of results from other studies to Chollas Creek is no different than most any discussion section found in a peer-reviewed article where the objective is to discuss results (strengths and weaknesses) in context of the body of existing literature. In this sense, such an approach seems not only warranted, but also

mandated. I found the literature selections for comparisons justified in terms of similarities (i.e., the most similar studies were selected). Similarities included geographical proximity, population size, land-use, policy, etc. However, in all cases differences and their potential to influence interpretations were highlighted. The only reference I question is the inclusion of Brown and Caldwell, (1984), which was used in section 4.4.2, p. 31. While its limits were clearly noted, the inclusion of lead loading data prior to the CAA ban of lead and lead additives in gasoline provides little area for comparison.

Response

The inclusion of deposition rates from Fresno, California in 1984 in the Source Analysis of this TMDL illustrate the upper range of possible lead atmospheric deposition. The Clean Air Act has drastically reduced the amount of lead that can reach the atmosphere. Nevertheless, the depositional rate from Fresno remains in the technical report as an informational item. When and if a local atmospheric deposition study is conducted, a comparison of the lead rates with those estimated from the 1984 study will be interesting. Only then will evidence be available to test the reasonable assumption that a watershed of cars with unleaded fuel will lead to a lower rate of atmospheric lead deposition than that observed in Fresno in 1984.

Data Deficiencies

Comment

The largest data gap I have found for the entire document deals with the lack of information pertaining to a monitoring plan. This is critical to fulfill one of the necessary requirements of Linkage Analysis (i.e., providing the quantitative link between the TMDL and attainment of WQSs) and does not seem to be appropriately identified (SEE RESPONSE TO QUESTION 4). Another unidentified gap appears in Section 5 (Linkage Analysis, p. 39), which states that the technical report is required to "estimate the total assimilative capacity (loading capacity) of Chollas Creek for the metals and describe the relationship between Numeric Targets and identified metal sources." I found no description of the later in this section. Also, as stated above it is a little unclear the role the model is serving (i.e., how it will be applied) in the TMDL development. Perhaps, I'm missing something, but it seems a little anticlimactic after reading section 4 and Appendix D that describe the model to get to the Linkage Analysis Section only to discover it has little application to TMDL development.

Response

The details of the monitoring plan can be found in sections 11 and 12 of the of this report. Please see the response to comment no. 5 above for more information regarding the monitoring requirements of this TMDL.

The Regional Board agrees that the relationship between Numeric Targets and identified metal sources is not clearly explained in the Linkage Analysis Section. Therefore, the following text has been added as the new third paragraph of Section 6:

These loading capacities, which are equal to the Numeric Targets, will apply to the entirety of Chollas Creek and during all times of the year. Each of the land uses identified in the Source Analysis portion of this TMDL will not be allowed to have runoff or in-stream waters in excess of these concentrations. Further more, all other sources of copper, lead and zinc to Chollas Creek will be expected to not cause the creek to exceed these loading capacities. Once these capacities are achieved, it is expected that Chollas Creek copper, lead and zinc concentrations will be protective of the creek's beneficial uses.

The model described in section 5 and in Appendix D was used to identify and quantify the relative sources of copper, lead and zinc to Chollas Creek for the Source Analysis. Once the data deficiencies are overcome, the model will be used to more accurately quantify the mass loads of these metals from the creek to San Diego Bay. At that point, the TMDLs for copper, lead and zinc in Chollas Creek will be revised to contain both a concentration limit applicable at all times and a mass load limit that is not to be exceeded on an annual basis. This model refinement is expected to take place as part of the development of the TMDLs for the Mouths of Chollas and Paleta Creek in San Diego Bay.

Synergistic Toxicity

Comment

There is evidence for synergistic (i.e., greater than additive) and additive (which could also produce scenarios described above) effects of binary mixtures of copper and zinc and lead and zinc (Kraak et al., 1993; Franklin et al., 2002; Utgikar et al., 2004). However, published reports include laboratory studies that have focused on lower trophic levels (i.e., bacteria, phytoplankton, zooplankton). None of these studies investigated concentration ranges applicable to chronic effects and for the most part they focused on binary rather than more complex mixtures. It should be noted that mixture toxicity can be difficult to assess even in the laboratory as results (i.e., antagonism, additive effects, synergism) can vary with species, strain, concentration, and other parameters (Franklin et al., 2002, Borgmann et al., 2003, and numerous others). For example, Martinez et al. (2004) in studies with Chironomous tentans found lead and zinc to interact antagonistically to produce sub-chronic/population level effects (i.e., mouth part deformities), which is opposite from the studies cited above. This question could be pertinent, but does not appear to have been addressed in the de-listing of cadmium. There are numerous studies detailing interactive effects of cadmium combined with zinc, lead, and copper. Again, observed effects range from synergism to antagonism, but evidence exists for the scenario raised above where metals are present below the CTR concentrations and interact in a synergistic (or depending on concentration in an additive) manner to produce toxicity (Beisenger et al., 1986; Kraak et al., 1993; Jak et al., 1996; Barata et al., 2002; Franklin et al., 2002). The CTR Numerical Targets are derived for individual chemicals and do not account for mixtures. However, given the variability in the nature of interactions reported for these metals, interactions would be difficult to regulate in the absence of site-specific data. In summary, I would conclude that while some evidence for metal

interactions exists, appropriate determinations of effects would need to include site-specific variables in order to be scientifically defensible. The BLM if/when it is adopted could eventually provide a means of dealing with metal mixtures (Paquin et al., 2002; Niyogi and Wood, 2004; Playle, 2004).

Response
The Regional Board agrees that synergistic effects among metals that are individually below CTR may produce toxicity and that these interactions would be difficult to regulate in the absence of site-specific data. Should this site-specific data become available at some future date, it could be incorporated into the TMDL.

Chollas Creek samples collected and analyzed between February 2000 and February 2004 indicated no (0 percent) exceedances of the CTR for dissolved cadmium. Applying the listing policy (SWRCB, 2004) to the available cadmium data confirms that cadmium should be delisted. Therefore the Regional Board is recommending that cadmium in Chollas Creek be removed from the Clean Water Act List of Water Quality Limited Segments. The Regional Board would reconsider the listing should data become available indicating that cadmium concentrations have increased above the CTR, or that cadmium in a synergistic interaction, is producing toxicity.

Linkage Analysis

Comment
The Waste Load and Load allocations are directly linked to Water Quality Standards defined by the numerical limits, as they are identical. The decision was made by the Board to take a conservative (i.e., from the protection standpoint) approach and set load allocations based on concentration rather than mass. In other words, it is not the relative amounts (i.e., mass) of metals, but rather their respective concentrations that determine load and load reductions will be based on maintaining concentrations of metals at or below these concentration based targets (the exact concentration is fluid and depends on the water hardness). This approach seems reasonable given the dynamic nature of the system. There is one peer-reviewed study and at least one technical report that link effects of storm water drainage and more specifically the metal component of this drainage to toxicity in aquatic-life in Chollas Creek and the portions of San Diego Bay it enters (Schiff et al, 2001; 2003). Since the load allocations are identical to the numerical limits my response to question 3 is also applicable here.

Response
Comment noted. Please see the response to comment no. 4 for a discussion of the Numeric Targets.

Margin of Safety

Comment

The explicit 10% MOS incorporated into the TMDL represents a commonly employed safety factor. The 10% load correction is to guard against the uncertainty inherent in the Source Analysis and Linkage Analysis; differences between total and converted dissolved metal concentrations; and site-specific differences in CTR derived Numerical Targets. It is difficult to comment on the appropriateness (or scientific validity) of the 10% correction. There was greater than 10% variability in measured metal concentrations (Table 2.1). Some explanation for the rationale behind the 10% MOS would be helpful. In addition, there are implicit MOS that stem from using measured rather than estimated hardness values to calculate the TMDL. Likewise, as discussed below, the CTR values incorporate 50% correction.

I didn't understand the argument provided in the last paragraph of section 6 (p. 41). Metal interactions were discussed in question 11 above. There are numerous explanations for interactive effects, which have been observed for copper, lead, and zinc. For example, common uptake routes (e.g., calcium channels for cadmium and zinc) or distributions and detoxications could account for interactive effects. While speciation affects toxicity, biological processes have also been shown to influence interactions during laboratory tests conducted under identical water chemistries. Perhaps chemical interactions refers to complexation with anions and negatively charged sites on particulates, which would reduce bioavailability. Anyway, this paragraph/point could use clarification.

Response

The explicit 10 percent Margin of Safety (MOS) was incorporated into the TMDL to account for any uncertainties in the analysis of metals. Therefore, an explicit MOS is warranted. The choice of ten percent is not based on the amount of error in the data, nor on any scientific study that establishes that the CTR formulas may have a 10 percent error. Rather, the 10 percent MOS is based upon the size of the MOS found in other similar TMDLs. Please see the TMDL for Selenium in the Lower San Joaquin River in Region 5, the Clear Lake TMDL for Mercury in Region 5 and the TMDL for Toxic Pollutants in San Diego Creek and Newport Bay, California by the USEPA.

The Regional Board agrees that the last paragraph of section 7 needed clarification. The entire paragraph has been changed to the following:

> Another implicit MOS was not allowing for metal interactions with anions and negatively charged sites on particulates when calculating the loading capacity and allocations. Theoretically, an increase in bioavailability from these types of chemical interactions in water would only take place in waters with low pH levels. The increased aqueous acidity (low pH levels) would yield higher levels of free metal ions and thereby increase bioavailability to aquatic organisms. Such low pH levels in ambient waters are more likely to be observed in areas of high acid rain; these low pH conditions are not likely in San Diego. Therefore, metal interactions with negatively charged anions and particles

within the water were assumed to only decrease bioavailability. Not allowing for this interaction makes the TMDL concentration more conservative.

California Toxics Rule Inherent Margin of Safety

Comment

As stated above, the one peer-reviewed manuscript that described formulating site-specific CMC for copper concluded that including over 17 sensitive site-specific species to calculate the FAV did not significantly lower the CMC (Cherry et al., 2002). Also, the CTR are based on national ambient water quality criteria, for which the science has been validated through several updates over 20 years. It wasn't until recently that new approaches (i.e., BLM) gained favor. Given the defensibility and robustness of this approach coupled with the lack of evidence for extreme site-specific sensitivities another 10% MOS does not seem warranted.

Response

The explicit 10 percent Margin of Safety (MOS) was incorporated into the TMDL to account for any uncertainties in the analysis of metals. The CTR formulas provide conservative water quality criteria that are protective of aquatic life. However, since the equations are based upon available laboratory data, they may not be protective of all aquatic life in Chollas Creek. Therefore, the Regional Board believes that an explicit MOS is warranted.

Critical Conditions

Comment

The use of a concentration (mass/volume) based TMDL negates effects of variable flow on load allocations, since regardless of the amount (mass) of metals that are present, it is the CTR derived concentrations that must be maintained. Concentration based criteria have a long history of use and even the newly proposed BLM, which relate an amount of metal bound to a critical biotic ligand to toxicity, are still expressed as concentrations. The use of concentrations is an appropriate approach for Chollas Creek given the limited data available for Land Use Models and other methods used to estimate the metal load entering during wet and dry periods. Likewise, the use of CMC and CCC targets ensure critical exposure conditions (acute, chronic) are incorporated. Furthermore, the inclusion of measured rather than estimated hardness concentrations reduce seasonal variability, especially during critical conditions. Provisions are also made to revisit other stream chemistry parameters that were not included in this TMDL if/when the BLM for copper is adopted. Collectively, these measures stabilize the TMDL even over extreme/critical conditions that could be occurred within the basin.

Response

Comment noted.

Monitoring Details

Comment

With regards to additional scientific issues relating to the Technical Report, there was little mention of specific methods, especially for metal sampling and analysis. Most every question in this reviews asked the reviewer to comment on the scientific methods, so it would appear to be information useful this review. Inclusion of methods could be done in the form of references, but I think their inclusion in necessary to ensure appropriate sampling/measurement techniques are employed and thus, TMDLs are meaningful.

Response

The details of the monitoring plan can be found in sections 11 and 12 of this report. Please see the response to comment no. 5 above for more information regarding the monitoring requirements of this TMDL.

Specific comments regarding the Technical report are as follows

Comment A

Attachment 1, p. 1, second paragraph- There are more appropriate references than More and Ramamoorthy, 1984).

Response

Please see the response to comment no. 2 above for a discussion on biomagnification and for the changes made to this TMDL Report.

Comment B

Technical Analysis, p.1, 1st paragraph, 1st sentence- insert 'and a' between County and tributary.

Response

This correction has been made.

Comment C

" ", p. 1, 1st paragraph, with regards to de-listing Cd, see question regarding synergistic effects above.

Response

The Regional Board still believes that Cd should be removed from the Clean Water Act List of Water Quality Limited Segments. Please see the response to comment no. 12 for a more in-depth discussion.

Comment D

Problem statement, p. 2, in the 1st paragraph inconsistencies with the use of lower and lowest.

Response

Paragraph has been updated to use 'lowest' in both instances.

Comment E

" ", same paragraph- Ceriodaphnia is misspelled.

Response

This correction has been made.

Comment F

" ", same paragraph- not exactly clear on the use of the sea urchin. I assume this is from test of Bay water? Also, in general toxicity data were not presented in clearly.

Response

The sea urchin test was run to see if Chollas Creek stormwater could be negatively impacting San Diego Bay. To avoid any confusion over the details of the Toxicity Identification Evaluation (TIE), the last sentence of the first paragraph of section 3 has been deleted. The full citation for the TIE study can be found in the reference section.

Comment G

Section 2.3, p. 8, 2nd paragraph, last sentence; it states that compliance shall be evaluated using a 96-hr acute bioassay. The Daphnia tests mentioned are 48-h tests.

Response

The italicized text in section 3.3 is taken verbatim from the Basin Plan. Therefore, we do not want to change this quotation as it appears in this TMDL Report. However, this correction will be considered during the drafting of the monitoring plan and during the next revision of the Basin Plan.

Comment H

Section 2.4., p. 8, 1st paragraph, poor reference for biomagnification of metals.

Response

The following reference has been added to that section:

> Besser, J. M., W.G. Brumbaugh, T.W. May, S.E. Church and B.A. Kimball, Bioavailability of metals in stream food webs and hazards to brook trout (*Salvelinus fontinalis*) in the Upper Animas River Watershed, Colorado. *Arch Environ Contam Toxicol* **40** (2001), pp. 48–59.

Please see the response to the Comment A for further discussion.

Comment I

" ", toxins are natural compounds (i.e., snake venom, ammonia); toxicants is the appropriate word here.

Response
This change has been made.

Comment J
“ “. Next sentence; …same locations more commonly found at higher concentrations in ….

Response
This change has been made.

Comment K
“ “. P. 9, Better references than Buffle, 1989.

Response
The Regional Board appreciates the additional support for concepts put forth in section 3.4 and will be working to track down these references.

Comment L
“ “. P. 9. 2nd paragraph, last sentence, Unclear what is being referred to where the implementation plan is located?

Response
A reference to sections 11 and 12 has been added to this paragraph.

Comment M
Section 2.6. p. 10. In reference to the monitoring site, it is stated that this sampling station is representative of the entire watershed. How was this determination made?

Response
This determination was based upon the similarities in land use between the watersheds of the two forks of Chollas Creek. The last sentence of the first paragraph of section 3.6 has been changed to:

> This station samples run-off that is representative of the entire watershed because the land use distribution in the north fork portion of the watershed is nearly identical to the land use distribution of the entire watershed as shown in Table 3.5 below.

Comment N
“ “, next paragraph. Replace 1994.95 with 1994-95.

Response
This change has been made.

Comment O
“ “. Same paragraph. Provide methods for toxicity tests.

Response

The methods for these toxicity tests can be found in the original Stormwater Reports for the various years. These documents can be viewed at the Regional Board office.

Comment P

“ “. Same paragraph. Sentence that states, “Reproduction of the water fleas was generally not impaired, even in individuals that died later in the test.” Is not clear.

Response

The part that reads “*even in individuals that died later in the test”* has been removed from the text. The Stormwater Reports containing these toxicity test results can be reviewed at the Regional Board office.

Comment Q

Section 3, Numeric Targets, 1st paragraph. Reference the EPAs Metal Translator or whatever the source of the conversion factors was.

Response

References for the conversion factors are properly cited in section 4.3, where they are discussed in detail.

Comment R

“ “. Same page, last paragraph, States that the targets given in table 3.1 were derived to be protective of marine aquatic life from toxicity. Should it read ‘freshwater’ aquatic life?

Response

This change has been made.

Comment S

“ “ p. 12, Equation 3.2; Where: make sure subscripts agree with acute target. I think they should be A instead of C. This also needs correcting in the descriptive sentence to follow.

Response

This change has been made.

Comment T

Section 3.2, Water Effects Ratios. 1st paragraph, 1st sentence, delete more

Response

This change has been made.

Comment U

“ “. Last sentence. I would remove reference to the appendix if it will not be included.

Response
The reference has been maintained and the appendix will be included as part of the TMDL report.

Comment V
Section 3.6. last sentence. Replace biochemical with biotic. (the gill is not a biochemical site)

Response
This change has been made.

Comment W
Section 4.2.1.1. add period between next to last and last sentence.

Response
This change has been made.

Comment X
Section 4.3. p. 28. 2nd paragraph. Replace Creeks with Creek

Response
This change has been made.

Comment Y
Section 4.3.2. p. 31. 1st paragraph. I don't think the argument is strengthened with the inclusion of the 1984 lead reference (SEE Comments above.).

Response
Please see response to comment no. 10 above.

Comment Z
Section 4.4.3. p. 31. second sentence. Replace do with low.

Response
This change has been made.

Comment AA
In addition, there are a number of mis-labelings in the appendices.

Response
These corrections have been made.

Additional references provided by Dr. Shaw.

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Response

The Regional Board appreciates these additional supporting references and will consider them as the need arises.

Response to Peer Review Comments from Dr. Garrison Sposito and Ms. Jasquelin Peña

Overall Summary

Comment

The draft report under review provides technical information related to the establishment of Total Maximum Daily Loads (TMDLs) for Chollas Creek, an intermittent stream that drains a highly urbanized watershed through two major tributaries in the San Diego area. Outflow from the creek, whose lower reach (see photo of the North Fork, below, taken by J. Peña, March 2005) has impaired water quality, is into San Diego Bay.

Response

Comment noted.

National Toxics Rule vs California Toxics Rule

Comment

Note, however, that the introductory statements on page 4 of the draft report appear to be contradictory in respect to the documentation of impaired water quality, implying that National Toxics Rule criteria are more often exceeded than California Toxics Rule criteria, while calling the latter "more stringent."

Response

The Regional Board did not intend to imply that the water quality criteria contained in the CTR are more "stringent" or lower than the values contained in the NTR. Water quality criteria in the CTR are based on dissolved metal concentrations for copper, lead and zinc, unlike water quality criteria in the NTR, which are based on total copper concentrations. Therefore, it is possible to exceed values contained in the NTR but not exceed the water quality criteria in the CTR because they are measuring different aspects of a metal. In order to avoid further confusion, the text on page 4 at the beginning of the second sentence, "While exceeding NTR criteria" was deleted.

Definition of TMDL

Comment

The TMDLs discussed in the report are for the metals, copper, lead, and zinc. As noted in the Introduction of the draft report, TMDLs are load allocations (mass per day) of pollutants to a waterbody, considering both point sources and nonpoint sources, such that the assimilative capacity of the waterbody in respect to applicable water quality objectives is not exceeded.

Response
Comment noted. For clarification purposes, in accordance with the applicable federal regulation [40 CFR 130.2(i)]: "TMDLs can be expressed in terms of mass per time, toxicity, or other appropriate measure." The TMDLs for metals in Chollas Creek are concentration-based.

Numeric Targets

Comment
The methodology followed in the draft report for the three metals of concern is to apply the USEPA- California Toxics Rule (USEPA-CTR) to obtain numeric targets for dissolved metals in Chollas Creek. The dissolved metal concentrations are calculated for both acute (one-hour average) and chronic (four-day average) conditions from USEPA-CTR statistical regression equations that include factors for site-specific toxicity effects, total-to-dissolved metal concentrations, and direct hardness effects (Table 3.1 in the draft report). Hardness data for the waterbody will be required in order to implement these equations.

Response
The Regional Board agrees that hardness data will be necessary to monitor for compliance with the TMDLs. Water quality criteria in the CTR are expressed as a function of hardness. The Regional Board will require the dischargers to collect hardness data in addition to metals concentrations as part of the monitoring required to comply with the TMDLs. Please note that Table 3.1 is now labeled as Table 4.1.

Temperature and pH

Comment
It is possible to include direct effects of temperature and pH in the equations, but this was not done in the draft report.

Response
The equations in the CTR do not include the parameters of temperature or pH. The Regional Board will continue to use the equations defined in the CTR with the WER = 1.00 until it can be demonstrated that an alternative approach is appropriate based on further studies or information.

Site-Specific Objectives

Comment
Site-specific toxicity effects also were not considered [i.e. Water Effects Ratio (WER) = 1.0 in the regression equations] and the total-to-dissolved metal concentrations ratio for each metal was set equal to a fixed constant for all conditions using the default USEPA-CTR values.

Response

The passage of the CTR in 2000 by USEPA established legally applicable numeric water quality objectives for priority toxic pollutants including copper, lead and zinc in California. Water quality criteria in the CTR are based on dissolved metal concentrations. In the absence of site-specific data, a WER equals one and a constant total-to-dissolved metal conversion factor set in the CTR is appropriate for use in the equations that define the CTR water quality criteria.

Until sufficient information is available to justify a change, using a WER equal to one in the CTR and a constant total-to-dissolved metal conversion factor will ensure protection of beneficial uses in Chollas Creek. However, the Regional Board supports the collection of data and information necessary to determine if a modified WER value or some other site-specific criteria is appropriate and/or to establish a site-specific conversion factor for total-to-dissolved metal concentrations. Once data are available to change the WER or total-to-dissolved metal conversion factor, the State has the discretion to interpret the CTR water quality criteria and modify the TMDLs based on site-specific studies and information for Chollas Creek

CTR as Numeric Target

Comment

Although the draft report states that the numeric targets set by using the USEPA-CTR equations are a function of hardness, it does not justify why this choice is appropriate for Chollas Creek, other than its legal applicability in California for inland surface waters (draft report, page 11). Reference to CFR 40 Part 131 provides the following guiding commentary on the toxicological significance of hardness-based USEPA-CTR equations:

> *f. Hardness*
> *Freshwater aquatic life criteria for certain metals are expressed as a function of hardness because hardness and/or water quality characteristics that are usually correlated with hardness can reduce or increase the toxicities of some metals. Hardness is used as a surrogate for a number of water quality characteristics which affect the toxicity of metals in a variety of ways. Increasing hardness has the effect of decreasing the toxicity of metals. Water quality criteria to protect aquatic life may be calculated at different concentrations of hardness, measured in milligrams per liter as calcium carbonate.*

Given the importance accorded in the draft report (page 14) to hardness sampling as part of compliance testing, it would be very useful to have more detailed discussion on the relevance of the above paragraph to water quality criteria for the three metals of concern in Chollas Creek.

Response
The Regional Board agrees that a more detailed discussion regarding the role of hardness to the water quality criteria is important. The above text under *"f. Hardness"* was added to the end of the first paragraph of section 4.4.

Site-Specific Toxicity Evaluation

Comment
Although the choice of WER = 1.0 in the draft report is a conservative one, procedures are available from USEPA for evaluating site-specific toxicity effects and modifying the Water Effects Ratio accordingly. This additional information may be of special value in respect to copper because of its strong tendency to form toxicity-reducing soluble complexes with dissolved organic matter. Similarly, the use of a constant total-to-dissolved metal concentrations ratio as given by USEPA is problematic, since the chemical forms of copper, lead, and zinc are likely to vary both spatially and temporally depending on streamflow variation and the changing composition of streamwaters, including suspended load. In the draft report, the assumption is made that the USEPA-CTR default values for the three metals are upper limits of the actual values in Chollas Creek, the implication being that actual total-to-dissolved metal concentrations are always larger than the default values used in the USEPA-CTR regression equations. Since toxicity effect should vary inversely with total-to-dissolved metal concentration, this assumption amounts to an implicit Margin of Safety imposed on the recommended dissolved metal concentrations. An alternative approach would be to evaluate total-to-dissolved metal concentrations as a function of turbidity and include turbidity sampling as a part of compliance testing.

Response
Implicit MOS are an allowable component of the TMDL process. TMDL design allows for limitless methodological and equation refinements that find their reasonable limit via best professional judgement. In this instance, the Regional Board will continue with the "WER = 1.0" approach until it can be demonstrated that an alternative approach significantly alters the final result

In addition, please see the response to comment no. 25 above.

Hydrologic Modeling

Comment
In the usual development of TMDLs for a waterbody, hydrologic data and pollutant source analyses are combined with the numeric targets to calculate waste load and load allocations. However, in the draft report under review, although spatial hydrologic modeling and a very thorough metal source analysis are presented, they are used only to determine TMDL Critical Conditions (Appendix D, Section 2.2).

Response
The model described in section 5 and in Appendix D was used to identify and quantify the relative sources of copper, lead and zinc to Chollas Creek for the Source

Analysis. Once the data deficiencies are overcome, the model will be used to more accurately quantify the mass loads of these metals from the creek to San Diego Bay. At that point, the TMDLs for copper, lead and zinc in Chollas Creek will be revised to contain both a concentration limit applicable at all times and a mass load limit that is not to be exceeded on an annual basis. This model refinement is expected to take place as part of the development of the TMDLs for the Mouths of Chollas and Paleta Creek in San Diego Bay.

Monitoring Needed

Comment

It appears that most of the data used to develop the TMDLs was collected during stormflows. Additional monitoring during low flow should be implemented since pools of slow-moving or standing water (see photo of Chollas Creek, below, taken by J. Peña) will have very different dynamics—and metal sources—from those associated with high-flow storm events. It is also possible that dissolved metal concentrations during low flow are greater than in the wet season because metal inputs are not diluted by large volumes of rainwater. Also, standing water can undergo evaporation, leading to the concentration of metals in sediments.

Response

The Regional Board agrees that additional monitoring should be conducted during low flow periods to more accurately characterize metals loading to Chollas Creek. The Regional Board will require the dischargers to monitor during dry weather metals concentrations to comply with the TMDLs. Information gathered as a result of this monitoring will be incorporated into the TMDLs as appropriate.

Editorial Clarification

Comment

Page 32, Section 4.4.5. In the last sentence, the reader should be reminded that this summary applies strictly to the Santa Clara Valley study.

Response

The draft Technical Report has been updated to reflect this change.

Treatment Plant Effluent

Comment

Page 33, Section 4.4.5.2. Quantify the difference between the "back of the envelope calculation" given here and the model results.

Response

As stated in the text, the quantities associated with the treatment plants have been determined to be insignificant because the treatment plants' effluents have little detectable copper, lead and zinc. Therefore no further analysis is necessary.

Pesticide Copper Concentrations

Comment
Page 37, Section 4.5.4. The percentage of copper contained in each pesticide should be included in Table 4.10.

Response
Comment noted. As stated in the text, only a percentage of the pesticide amount shown in Table 5.10 is actually copper or zinc and there is not enough information to quantify the actual amount of copper or zinc that would reach a water body in San Diego County.

Load and Waste Load Allcoations

Comment
Because waste load and load allocations were not made, the linkage analysis in the draft report (page 39) consists of identification of the most important metal sources and streamflows to be considered when sampling metal concentration and hardness for assessing compliance with the recommended dissolved metal concentrations. The final recommendations for the three metals are dissolved concentrations equal to 90 % of the dissolved concentrations (i.e. 10 % Margin of Safety) calculated using the USEPA-CTR hardness-based regression equations. These recommended concentrations are compared illustratively to measured concentrations in Appendix G of the draft report. The results in this appendix indicate that maximum observed concentrations of the three metals are significantly greater than the concentrations required to meet water quality objectives, with the discrepancies being much larger at lower hardness values.

Response
Comment noted. For clarification, waste load and load allocations were made in the draft Technical Report. These allocations are concentration–based, in accordance with federal regulations [40 CFR 130.2(i)], which state: "TMDLs can be expressed in terms of mass per time, toxicity, or other appropriate measure."

Biomagnification

Comment
The use of dissolved metal concentrations as numeric targets presupposes that the metals do not increase in concentration at higher trophic levels (i.e. no biomagnification) and that they do not accumulate in sediments. Biomagnification of copper, lead, and zinc in test organisms (e.g. daphnia) has not been observed in laboratory studies, insofar as the reviewers are aware, nor is it expected. Biomagnification is associated with hydrophobic pollutants and hydrophobic chemical forms of pollutants (e.g. methyl mercury), whereas most toxic metals have hydrophilic chemical forms in aquatic ecosystems. It is possible that lead could take

on a hydrophobic chemical form under anaerobic conditions because it can be methylated by microorganisms, but this is very unlikely in well-aerated waterbodies. Accumulation in freshwater sediments is well established for the three metals of concern, which have strong sorption affinities for natural particles, especially those with organic matter content. The case is made in the draft report that metal concentrations in the creek sediments are typically below levels of probable toxic effect and that particle-bound metals are flushed from the creek within one year by winter flows. These conjectures are not unreasonable, but no database currently exists with which to evaluate them, bringing to mind the important possibility that particle-bound metals transported to San Diego Bay may pose a potential toxicity threat, thus making Chollas Creek a source of this threat.

Response

The existing data on sediment metals concentrations in Chollas Creek demonstrated that metals in the sediment are most likely not accumulating in Chollas Creek. Instead, metals adsorbed to particles in Chollas Creek are likely flushed out of the creek during wet weather events, acting as a source of metals loading to the mouth of Chollas Creek and San Diego Bay. A TMDL is currently under development for the mouth of Chollas Creek that will address this issue.

Concentration-based TMDL

Comment

Dissolved concentrations of copper, lead, and zinc for acute and chronic conditions calculated from USEPA-CTR regression equations dependent on water hardness are promulgated with a 10 % Margin of Safety instead of TMDLs, which typically combine allowable dissolved metal concentrations with hydrologic and metal source analyses to prescribe mass loadings that meet applicable water quality objectives.

Response

The TMDL is the combination of a total wasteload allocation (WLA) that allocates loadings for point sources, a total load allocation (LA) that allocates loadings for nonpoint sources and background sources and a MOS. For clarification, waste load and load allocations were made in the draft Technical Report. These allocations are concentration–based, in accordance with federal regulations [40 CFR 130.2(i)], which state: “TMDLs can be expressed in terms of mass per time, toxicity, or other appropriate measure.”

Scientific Justification for Using CTR

Comment

Detailed scientific justification of the USEPA-CTR hardness-based equations for applicability to Chollas Creek waters in determining allowable metal concentrations is not provided. However, assumptions of no metal biomagnification or accumulation in sediments, which underlie the use of numeric targets based on dissolved concentrations, seem justified.

Response
The CTR hardness-based equations are legally and scientifically applicable to Chollas Creek. The legal applicability is established by federal regulation [40 CFR 131.38] and is sufficient to warrant the use of the CTR for this TMDL. In addition, Chollas Creek is a freshwater system, with variable physical parameters that make the use of the hardness-based equations to prevent toxic conditions scientifically reasonable.

The comment regarding biomagnification is noted.

Summary of Current Problem

Comment
Compliance testing guided by TMDL Critical Conditions will require measurements of both metal concentrations and hardness (as calcium carbonate) for use with USEPA-CTR regression equations that, along with the 10 % Margin of Safety, define the numeric targets. Preliminary calculations indicate that current metal concentrations in Chollas Creek are in excess of these targets, particularly at low hardness values.

Response
The Regional Board agrees with this comment and is requiring hardness (as calcium carbonate) to be measured.

Hydrologic Modeling

Comment
Hydrologic modeling and metal source analyses are used to select TMDL Critical Conditions for compliance testing. Hydrologic modeling is not explicitly used in metal load and waste load allocations. All hydrologic and metal source effects are implicit in these allocations.

Response
Compliance sampling will not be based upon the critical conditions identified in the hydrologic model used in the Source Analysis. Sampling details can be found in sections 11 and 12 of the draft Technical Report.

Additional Monitoring

Comment
The current database for Chollas Creek can be improved by additional monitoring of both metal concentrations during lowflow periods and metal accumulation in creek sediments that may serve as a source of contamination for San Diego Bay.

Response

The Regional Board agrees that additional data should be collected to fully characterize the contribution of metals during dry weather. Monitoring of metals concentrations during dry weather will be required of the dischargers in order to comply with the TMDLs. Further data would also be useful to characterize the contribution of metals in sediment to metals loading into San Diego Bay. The Regional Board will address this issue in a TMDL currently under development for the mouth of Chollas Creek.

Additional Toxicity Testing

Comment

Additional laboratory toxicity testing using Chollas Creek waters would be useful in order to justify the Water Effects Ratio and to evaluate the accuracy of the default total-to-dissolved metal concentration factor assumed in the USEPA-CTR regression equations.

Response

The Regional Board supports the collection of data and information necessary to determine if a modified WER value or some other site-specific criteria is appropriate and/or to establish a site-specific translator for total-to-dissolved metal concentrations. Unfortunately, the Regional Board does not have the resources to actively engage in these investigations. The current WER value of one is appropriate for use in the equations that define the CTR water quality criteria. Until sufficient information is available to justify a change, the value of one is appropriate for all CWA uses, including the SIYB TMDL. In the meantime, using a WER equal to one in the CTR copper objective will ensure protection of beneficial uses in the water column of SIYB. Once data are available to change the WER, the State has the discretion to interpret the CTR copper criteria based on a site-specific WER for Chollas Creek.

Appendix M

Response to Comments

Chollas Creek Metals Total Maximum Daily Loads

California Regional Water Quality Control Board, San Diego Region

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LIST OF PERSONS SUBMITTING COMMENTS

- Brake Pad Partnership
- California Department of Transportation
- City of San Diego
- San Diego Coastkeeper
- Sierra Club
- John Stump
- Tershia d'Elgin

1. INTRODUCTION

This report provides responses to public comments received on the Total Maximum Daily Loads (TMDLs) for Copper, Lead, and Zinc in Chollas Creek. Draft TMDL documents distributed for public review and comment included the Technical Report, Resolution No. R9-2007-0043, and the Basin Plan Amendment. The draft documents were made available to the public for formal review and comment for two comment periods, through the website of the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) and at the San Diego Water Board office. The first public comment period opened July 25, 2006, and continued for 45 days. The second comment period opened March 9, 2007, and continued until the San Diego Water Board adopted this TMDL. Please note that these comments and responses are only for the Chollas Creek metals TMDLs documents dated July 25, 2006, and March 9, 2007. Comments and responses to the June 2005 Chollas Creek metals TMDLs documents are located in the case file for this project.

The San Diego Water Board received many new comments in testimony, letters, and emails from interested persons on the draft TMDL documents. The letters were not reproduced in this document. Individual comments were excerpted from the letters and testimony, and organized by the commenter. The comments are numbered sequentially in this report. Individual commenters are identified in the "List of Persons Submitting Comments" on page iii of this appendix.

2. COMMENTS ON JULY 25, 2006 TMDL DOCUMENTS

2.1. Comments from the City of San Diego (September 25, 2006)

The San Diego Water Board received comments from the City of San Diego (City) on September 25, 2006. following is the San Diego Water Board's response to those comments. However, because the City's comments were frequently repeated in various parts of the document, we have organized the comments into common groups to provide clarity and to facilitate better comprehension of both the comments and responses. The San Diego Water Board did not respond to comments the City made which concerned only the indicator Bacteria TMDLs Project I, Beaches and Creeks in the San Diego Region, or where the comment did not address the Chollas Creek Metals TMDLs specifically. The common groups include the following:

- Time Schedule and Integrated TMDL Implementation
- Lack of Detail
    - Design Storm
    - Significance Threshold
    - Substantial Evidence
    - Other Lack of Detail Comments
- Tiering

- Alternatives Analysis
- Tributary Rule
- Dry Weather
- Aerial Deposition
- Statement of Overriding Considerations
- Other Specific Comments

2.1.1 Time Schedule and Integrated TMDL Implementation

Comment No. 1: The City's biggest concern regarding the Chollas Creek metals TMDL is with the proposed compliance schedule. The TMDL Technical Report states the following regarding discharger activities to achieve the WLAs:

> Dischargers are expected to implement metal reduction [Best Management Practices or "BMPs"] during the first year after OAL approval of this TMDL, with all necessary metal load reductions being achieved within ten years. The first three years of the compliance schedule do not require a significant decrease from current conditions. These years will provide the dischargers time to develop plans and implement enhanced and expanded BMPs that should result in immediate decreases of metal concentrations in the Chollas Creek water column. Three years are provided for these measures to begin to lower Chollas Creek metal concentrations before the first reduction is required.

This compliance schedule is inconsistent with sound planning, engineering and public policy considerations because: (1) it assumes that non-structural BMPs will achieve a high level of reductions; and (2) it requires the most difficult reductions – the last 50 percent of metal loadings – to be achieved in the last three years of the compliance schedule. The second point is the most critical. If – as contemplated by technical report's compliance schedule and as set forth in detail in staff's April 7, 2006 letter to the State Water Resources Control Board – dischargers deploy the non-structural BMPs first, then the full measure of reductions will be achieved once those BMPs are operational. Hence, the only reason compliance would not be achieved upon implementation of all non-structural BMPs is that those BMPs are not capable of achieving the wasteload allocations [WLAs] on their own. This is implicit in staff's proposed compliance schedule. Hence, the only way the compliance schedule in the Technical Report makes sense is if the dischargers will know sufficiently in advance of the 10-year compliance deadline where structural BMPs will be required such that they can be constructed, operating and achieving the required reductions by Year 10. Based on the City's detailed analysis discussed later, this is unrealistic.

The first critique of staff's proposed compliance schedule is not as intuitive. The available data suggests that non-structural BMPs will reduce pollutant loads between 30 percent and 70 percent. Staff's proposal appears to "shoot for the middle" and requires a

50 percent reduction in WLA exceedences by Year 7. The City believes that this is a little too simplistic. This TMDL targets the ***toxicity*** of ***dissolved*** metals. Compliance with this TMDL is, therefore, affected by two separate factors: (1) the volume of metals that enter both urban runoff and the receiving waters; and (2) the hardness of the urban runoff and receiving waters (which affects the ability of the metals to be absorbed by organisms and hence be toxic). As detailed in the Weston Report, the effectiveness of the available non-structural BMPs cannot be predicted because there is a dearth of data at the subwatershed level regarding Chollas Creek's water hardness and metal loadings. Thus, assuming that – on average – non-structural BMPs will achieve the median level of pollutant reductions is too simplistic to ***mandate*** that level of compliance.

In addition to these flaws inherent in the proposed compliance schedule, there are other extrinsic matters that affect the actual time needed to achieve the WLAs proposed in this TDML:

The TMDL uses a non-integrated, TMDL approach. We recommend integrated watershed based TMDLs to allow for the development and implementation of more holistic, efficient programs to improve water quality.

The TMDL schedule does not allow for maximizing the use of non-capital and non-land intensive BMPs. The TMDL fails to allow sufficient time for the City to identify the most effective combination of BMPs and minimize dislocation of residents and businesses through an iterative approach to BMP implementation.

With these concerns in mind, the City proposes an alternative compliance schedule. As evidence of the City's commitment to improve water quality, the City has already retained a well-respected and experienced water quality consulting firm – Weston Solutions, Inc. – to evaluate the BMPs the City can implement to achieve the WLAs proposed in this TMDL. This consulting firm prepared a report (hereinafter referred to as "the Weston Report"), which the City submits with these comments, setting out the City's options for complying with this TMDL. The Weston Report concludes – consistent with the implication in the Technical Report – that it will be necessary to implement ***some*** treatment facilities to achieve compliance.[1] Based on Regional Board staff's claims that they are not required to analyze the environmental impacts associated with implementing structural BMPs, it is reasonable to conclude that Regional Board staff has not analyzed the planning and construction activities associated with implementing these BMPs. Again, this is reflected in the proposed compliance schedule that requires the last 50 percent of exceedence reductions to be achieved in Years 8 through 10, even though these pollutant reductions require the most resource-intensive BMPs. These types of BMPs require significant time to plan, conduct thorough environmental review, acquire land, let construction contracts, construct the treatment works, and then verify that the treatment works are operating as planned (i.e., achieving

[1] Despite the opportunity in its April 6, 2006 submittal to the State Water Resources Control Board, the San Diego Regional Board, on the other hand, has ***never*** claimed that achieving the reductions necessary to achieve the water quality objectives of the TMDL can be achieved ***solely*** through non-structural BMPs. The City is unaware of data that would support a conclusion that the WQOs can be achieved with only non-structural BMPs.

the required pollutant reductions) – a process the City will need to conduct ***for each treatment work that must be constructed.*** Moreover, this entire process requires adequate funding to be available for constructing new public works, or substantially altering the manner in which existing public works projects (e.g. pavement re-surfacing) are carried out. Based on the City's significant experience with public works projects, it is the opinion of the City of San Diego that accomplishing this in less than 10 years is an unrealistic expectation, short of making wild assumptions on the need for structural BMPs construction and undertaking a massive public works construction campaign that will displace significant numbers of residences and businesses, contrary to sound public policy.

In an effort to minimize the significant adverse impacts associated with such an outlandish compliance scenario, the City requests that the Regional Board consider an alternative compliance schedule to that proposed in the TMDL Technical Report. This alternative compliance schedule is graphically presented in the Weston Report as Figure ES-8 on page xxvi. While the waste-reducing activities employed under both plans are not fundamentally different – both maximize the use of non-structural source controls, such as education, product substitution, street sweeping, and low-impact treatment techniques such bioretenion and passive infiltration prior to implementing more land-intensive treatment trains – the critical difference is that the City's alternative presents a compliance schedule that is based on sound engineering, scientific, and public policy considerations. The foundation of this fundamental difference is that it is necessary to assess the effectiveness of non-structural BMPs with stakeholders before deploying land-intensive treatment trains, which allows the City to carefully implement these measures in a manner that will minimize the condemnation of private property.

As reflected in Figure ES-8 of the Weston Report, the City believes that it can deploy all Tier I BMPs within five years of OAL approval of this TMDL, and will have pilot data available on Tier II BMPs.[2] Based on existing data, the Tier I BMPs should achieve a 30 percent reduction in metal loading. Hence, the City proposes an interim compliance goal of a 30 percent reduction in metal loadings five years after OAL approval. After those BMPs are deployed, the City believes that there should be a one year evaluation period, where the City assesses the synergistic effect of all non-structural BMPs being implemented. During this initial six year period, the City would also use early monitoring data to site targeted structural BMPs, construct these projects, assess their effectiveness and use that data to develop a master plan for structural BMP deployment.

Once the data from targeted structural BMPs and the complete implementation of Tier I BMPs is collected, the City would begin the arduous task of planning, siting, designing, and constructing Tier II and III BMPs – where needed throughout the watershed – followed by monitoring to assess their effectiveness. Based on the City's extensive experience in constructing public works projects, it will take 14 years after the City has

[2] The distinction between the various BMP tiers is the amount of capital investment required. Tier I BMPs are labor intensive, with limited amount of capital required. The Tier II BMPs require significant capital investment; some can also be implemented in existing rights-of-way. Tier III BMPs require land acquisition and development.

all the Tier I data to fully construct and implement the capital and land intensive Tier II and Tier III BMPs. Thus, the City proposes to fully meet the WLAs in Year 20. Despite a desire to show good faith efforts at compliance, because of the dearth of data and the lack of a critical planning point that lies between full deployment of Tier I BMPs and the implementation of Tier II and Tier III BMPs – the City is unable to fashion a logical interim compliance goal – or at least one that is expressed as a percentage reduction in pollutant loading or as a reduction in WLA exceedences – that lies between a 30 percent reduction in metal loadings in Year 5 and full attainment of the WLAs in Year 20. The City is currently evaluating the feasibility of non-numeric interim compliance goals and will provide that information to the Regional Board when it is fully developed, hopefully well in advance of the public hearing on this TMDL.[3]

The compliance schedule, including the interim compliance goals, is inconsistent with the Technical Report's assessment of how dischargers will likely implement this TMDL because it requires the most difficult reductions in pollutant loading to occur in less than one-third of the compliance schedule. Because these pollutant reductions will require the most intensive BMPs, likely structural BMPs, it is unreasonable to expect these reductions to occur within three years after non-structural BMPs have been fully implemented because the data on where these BMPs will be necessary will not be complete.

The compliance schedule has interim compliance goals of a 15 percent reduction in wasteload allocation exceedences in Year 4 and a 50 percent reduction in wasteload allocation exceedences in Year 7. Please identify all considerations that served as the basis for suggesting these percentages and the compliance dates.

The TMDL uses a non-integrated, TMDL approach. We recommend integrated watershed based TMDLs to allow for the development and implementation of more holistic, efficient programs to improve water quality.

The TMDL schedule does not allow for maximizing the use of non-capital and non-land intensive BMPs. The TMDL fails to allow sufficient time for the City to identify the most effective combination of BMPs and minimize dislocation of residents and businesses through an iterative approach to BMP implementation.

The CEQA analysis needs to address all reasonably foreseeable future TMDLs for the Chollas Creek watershed in conjunction with the metals TMDL because the City must address all TMDLs in an integrated fashion. It is not reasonable to expect that the City will build BMPs to address the metals TMDL and then a second, separate set of BMPs to address the bacteria or other future TMDLs. The need to address both TMDLs affects the types of BMP that will lead to compliance and the location of the BMPs. The CEQA analysis should also incorporate City of San Diego plans and policies into its evaluation.

[3] The City notes that, as described in the Technical Report at page 74, that the MS4 permit can be issued with a combination of numeric and non-numeric WQBELs. It is possible that a non-numeric WQBEL could be proposed as an interim compliance goal between Year 5 and Year 20.

Page 6 of the Regional Board's "Discussion Paper" indicates that implementation of TMDLs in Chollas Creek will not result in adverse cumulative impacts to Chollas Creek, in part due to the fact that the Chollas Creek MS4 dischargers are already required to implement BMPs.

When considering BMPs to address the TMDL, the City must consider the effectiveness of a BMP to address both TMDLs. The Regional Board should consider the bacteria and metals TMDL as a single, integrated TMDL with an appropriate implementation schedule similar to the dissolved metals TMDL adopted by the Los Angeles Region for Ballona Creek and the Los Angeles River. As suggested by the Stakeholders' Advisory Group for the Bacti-1 TMDL, the City suggests that a 20-year implementation schedule is more realistic.

Given the magnitude of BMPs that need to be built in order to comply with the TMDL, the proposed 10-year implementation schedule essentially guarantees non-compliance. Additional time is needed to evaluate the feasibility and effectiveness of the complex suite of BMPs that could be built in "treatment train" fashion to achieve TMDL compliance in some parts of the watershed. This "neighborhood friendly" compliance scenario is described in Attachment 3 and is proposed by the City in lieu of a more aggressive "infrastructure intensive" solution that would achieve compliance sooner.

Response: The San Diego Water Board agrees that an integrated BMP approach to encompass the requirements of various TMDLs is a preferable method of action on the part of the dischargers. Since Chollas Creek is impaired for diazinon, metals, bacteria, and trash dischargers should seek non-structural and structural BMPs that are effective at reducing these pollutants collectively. Therefore, the compliance schedule described in the Technical Report has been modified to allow 20 years, rather than 10 years, to achieve full compliance with the TMDLs (no allowable exceedances of the water quality objectives). As an interim milestone, the compliance schedule has an allowance for 20 percent exceedance of the water quality objectives after 10 years. The Technical Report was revised to reflect these changes. Please see section 11 for more details.

The City argued that an appropriate time schedule would extend to 20 years to reach full compliance, based on the recommendations of the *Chollas Creek TMDL Source Loading, Best Management Practices, and Monitoring Strategy Assessment*, or "Weston Report" (Weston Solutions, 2006), and the San Diego Water Board agrees that 20 years is adequate for achieving TMDLs. The City stated that they can deploy Tier 1 BMPs (source control and prevention from entering runoff) *within five years of OAL approval of the TMDLs*, which is the first step in achieving TMDLs within 20 years.

Chollas Creek was placed on the List of Water Quality Limited Segments for impairment due to metals in 1996. Subsequently, the San Diego Water Board has been developing the metals TMDLs, with City involvement, for over 5 years. Additionally, Receiving Water Limitation C.2.a of the City's MS4 NPDES requirements issued in 2001 (Order No. 2001-01) states that dischargers must report BMPs that are currently being

implemented, and additional BMPs that will be implemented, to prevent or reduce any pollutants that are causing or contributing to the exceedances of water quality objectives. Given this information, 20 years is adequate time for achieving compliance with the TMDLs. There is no need for dischargers to delay action that would result in improved water quality until final approval of these TMDLs; action to reduce metals loading should have begun upon issuance of Order No. 2001-01.

2.1.2 Design Storm

Comment No. 2: *The TMDL does not provide adequate guidance for compliance.* Neither the technical report nor the CEQA analyses designate a design storm. Knowing the capacity required of a BMP is critical to designing facilities which will comply with the TMDL while minimizing acreage requirements and capital costs.

The magnitude of the impact associated with building BMPs to comply with the metals and bacteria TMDLs is based upon the amount of storm water that needs to be treated. To date, the Regional Board has declined to establish a "Design Storm" which would provide direction to the City on the size/capacity of BMPs required. Therefore, the City has relied on language in the California Toxics Rule which states, "Neither the Aquatic Life Chronic Criteria nor the Aquatic Life Acute Criteria can be exceeded more than once every three years (40 CFR 131.38 (c)(2)). For engineering purposes, this translates in the need to ensure that runoff from a maximum three-year storm meets to meet the Wasteload Allocations established for the metals TMDL. The bacteria TMDL is silent on the appropriate design storm; therefore, the assumptions in Attachment 3 are very conservative. However, this sizing criterion must be augmented by pollutograph data which shows how actual concentrations of metals and bacteria change during storms and during the storm season. Current data suggest that concentrations of dissolved metals increase through storms and over the storm season.

In order to provide an analysis of the impacts associated with building BMPs to address the metals and bacteria TMDL, the Regional Board must begin with a programmatic evaluation of the size of storm that must meet the Wasteload Allocations. What is the maximum storm size that the Regional Board expects to meet the Wasteload Allocations and how is that storm size factored into the Regional Board's analysis of the impacts of building BMPs? As can be seen in the Weston report, the decision on the size of storm that needs to be treated has a significant effect on the magnitude of public works required.

Response: The CEQA's provisions allow the San Diego Water Board to limit analysis in these substitute environmental documents to broad environmental issues which are ripe for decision at the TMDL adoption stage. At this stage, the San Diego Water Board is not required to evaluate environmental issues associated with specific projects undertaken to comply with the TMDLs. CEQA provisions allow for project level environmental considerations to be deferred so that more detailed examination of the effects of these projects in subsequent CEQA environmental documents can be made by the appropriate lead agency.

The San Diego Water Board does not need to designate the storm size for the design and construction of the BMPs to meet CEQA requirements for the TMDLs. The CEQA requires that the San Diego Water Board provide substitute environmental documents that contain sufficient information and analysis for the public to understand the potential adverse environmental impacts of the project, and to provide the San Diego Water Board with meaningful discussion and comment on these impacts. Our substitute environmental documents do that by describing a range of potential structural and non-structural controls the dischargers could construct or implement to meet the wasteload allocations (WLAs). The documents also discuss the potential adverse environmental impacts associated with those controls. Because the CEQA does not require the San Diego Water Board to speculate on the location or size of specific structural controls that the dischargers might choose to implement, we did not specify any sizing criteria such as a design storm.

The San Diego Water Board appreciates the City's efforts in moving forward with BMP planning, and is willing to discuss potential BMP siting and design issues, and different compliance monitoring approaches that could be used. However, the San Diego Water Board does not have the authority to delegate which methods or BMPs must be used to comply with the metals TMDLs. Additionally, it is not the purpose of the TMDLs to provide complete guidance for compliance. The San Diego Water Board has flexibility in making waste discharge requirements consistent with WLAs and establishing monitoring programs to gage compliance. That being said, for initial BMP planning purposes, the metals CTR criteria for an allowable exceedance every three years can be interpreted as a three year design storm.

However, the link between design storms and likelihood of water quality exceedances is a complicated issue that deserves more-detailed analysis than a simple recurrence interval specified in CTR. We have no evidence indicating a direct correlation between water quality concentrations and storm magnitudes. In other words, larger storms do not mean larger metals concentrations. Smaller storms can also exceed CTR metals objectives, or all storms could exceed CTR metals objectives. Much discussion and modeling analyses have been performed by SCCWRP to support the Los Angeles Water Board and stakeholders in the Los Angeles Region. This analysis has included model simulation of various design storms and comparison to model-predicted water quality and loads of metals and indicator bacteria. SCCWRP has provided additional modeling analysis of BMP implementation scenarios to evaluate practical solutions to provide the required TMDL load reductions. Following over a year and a half of meetings, analyses, and discussions, a design storm has not been determined for the Los Angeles Region. However, much of this information and lessons learned can be provided to the San Diego Region to inform discussions and focus efforts in selection of appropriate design storms. For more information on the Los Angeles Region studies, please contact Xavier Swamikannu of the Los Angeles Water Board.

To support development of TMDLs for the Chollas Creek watershed and the estuary, an LSPC watershed model was developed by Tetra Tech and SCCWRP. This model was used to test possible reduction of metals loads through implementation of various

detention/infiltration BMPs. This analysis, requested by SCCWRP, was performed to provide information similar to that used in Los Angeles Region for discussion of design storms and BMP implementation. Results were presented by SCCWRP at a recent meeting with Chollas Creek stakeholders and the San Diego Water Board, and stakeholders were asked if they were interested in using the model for further analysis to test load reduction scenarios. Stakeholders showed no interest at that meeting, but SCCWRP plans to follow up with the City of San Diego at a later time. For more information, contact Ken Schiff of SCCWRP.

2.1.3 Significance Threshold

Comment No. 3: The CEQA analysis must draw conclusions regarding the "significance" of the impacts evaluated, not just whether they are "adverse".

The City has previously stated that the Regional Board must assess the impacts of building BMPs to comply with the TMDL. As noted above, the Regional Board does apparently concur to some degree with the City's position on this as the Regional Board has considered this impact with respect to aesthetics, air quality, biological resources, and noise. However, as noted in Attachment 1, there are a number of other issue areas that should be addressed because impacts are potentially significant. While the CEQA checklist provides no rationale for why the "no impact" box was checked for these issue areas, Attachment 1 includes substantial evidence that these impacts should be considered significant.

Response: New analysis was added to the March 9, 2007 version of Appendix I Environmental Analysis, Checklist, and Economic Factors. This analysis elaborates on levels of significance. In most cases the level of significance has been set equal to long term, lasting impacts. Short term impacts, such as those related to the construction of BMPs, are not considered significant due to their short durations. The checklist discussion includes potential mitigation for impacts that are determine to be significant, i.e., those impacts that could be long term. Additionally, explanations for the "no-impact" answer were provided in the checklist.

2.1.4 Substantial Evidence

Comment No. 4: PUBLIC RESOURCES CODE § 21080(e)

The following analyses in Chapter 13 and Appendix I are deficient because the conclusions are not supported by substantial evidence:

Aesthetics – Appendix I states that the creation of structural BMPs can create adverse aesthetic impacts. The Regional Board's analysis of this impact states:

> Depending on the controls chosen, the project may result in the installation of urban runoff storage, diversion, or treatment facilities and other structural controls that could be aesthetically offensive if not properly designed, sited, and maintained. Many structural controls can be designed to provide habitat, recreational areas, and green spaces in addition to improving urban runoff water quality. In-creek diversions should not be used as controls, therefore, there should be no adverse impacts on aesthetics resulting from construction of concrete-lined basins or treatment facilities within creeks.

This analysis is legally inadequate because it does not state what constitutes a significant aesthetic impact and how designing the treatment works to serve as habitat, recreational areas, or green spaces mitigates any adverse aesthetic impact, much less mitigating any significant, adverse impact below the level of significance. It addition, the analysis ignores the reasonably foreseeable size and location of the BMPs described above; the works would be too small and subject to too many edge effects to create sustainable habitat. Moreover, regular maintenance would require periodic removal of plant growth and sediments. Topographically, it is reasonable to assume that basins associated with the works will need to be excavated and that significant portions of the basins would consist of manufactured slopes, limiting recreational opportunities. Thus, the "analysis" is merely "speculation, unsubstantiated opinion or narrative" that does not support the conclusion that the listed impact will be reduced below the level of significance, and is not, therefore, supported by substantial evidence, as required by law.

Response: The levels of significance for aesthetic impacts were set at no long term impacts including among other considerations, no long term obstruction of any scenic vistas. New analysis of aesthetics was added to the March 9, 2007 version of Appendix I Environmental Analysis, Checklist, and Economic Factors that expanded the previous discussion and addressed the City of San Diego's concern.

Comment No. 5: Air Quality – Appendix I makes the following statement regarding Air Quality:

> The construction of structural controls might adversely affect air quality because construction might require the use of diesel fuel engines to operate equipment. Potential impacts are likely to be limited and mostly short-term in nature. Impacts may be mitigated through measures such as limiting hours and amount of construction, eliminating excessive idling when vehicles are not in use, limiting construction during periods of poor air quality, and/or using alternative fuel vehicles rather than diesel fuel vehicles. Any impacts to air quality, both short-term and long-term,

> would be subject regulation by the appropriate air pollution control agencies under a separate process.

This analysis is deficient because the analysis does not state what the threshold of significance for impacts to air quality from toxic air pollutants, nor does it have any basis for concluding that the programs implemented by air pollution control agencies will, in fact, reduce any impacts below the unstated threshold of significance. Thus, the "analysis" is merely "speculation, unsubstantiated opinion or narrative" that does not support the conclusion that the listed impact will be reduced below the level of significance, and is not, therefore, supported by substantial evidence, as required by law.

This analysis is also deficient because, to the extent that street sweeping is a reasonably foreseeable means of compliance, Appendix I incorrectly states that there is no impact to the applicable air quality plan.

Response: The levels of significance for air quality impacts were set at no long term impacts including among other considerations, no long term degradation of ambient air quality or long term ongoing problems with odor which can not be remedied. New analysis was added to the March 9, 2007 version of Appendix I Environmental Analysis, Checklist, and Economic Factors that expanded the previous discussion and addressed the City of San Diego's concern. Additionally, an analysis which includes the air quality impacts of street sweepers was added to the Checklist where the impact was determined to be less than significant with mitigation.

Comment No. 6: Biological Resources – Appendix I states that there are potential impacts to riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or US Fish and Wildlife Service, but that those impacts would be reduced below the level of significance through mitigation.

The analysis does not state what sensitive species are located within the project area. It does not mention the San Diego County Multiple Species Conservation Plan – a regional plan that addresses impacts to sensitive species. The cursory analysis seems to assume that the only manner in which habitat or species can be impacted is through urban runoff flow diversion; even though the construction of treatment works could displace non-riparian species. Given the experience with the Aliso Creek bacteria treatment facility, it is reasonable to assume that upland impacts may occur as a result of the need to intercept sheet flow runoff from canyon walls for treatment before these flows enter receiving waters. These interceptors would logically be located near and above the receiving waters - in areas where many canyons support native, upland vegetation and sensitive species. Accordingly, impacts would result not only from construction of the diversions, but also from construction of treatment works and the associated pumps that would be necessary to put the treated water back into the receiving waters at a location near its diversion point.

Once again, the analysis does not contain facts, reasonable assumptions predicated on facts, or expert opinion based on facts; it is merely "speculation, unsubstantiated opinion or narrative" that does not rise to the level of substantial evidence.

Response: Although the analysis does not list the sensitive species in the watershed, this information can be gotten from a search of the California Natural Diversity database or through surveys of the specific location chosen for BMP construction. Thank you for bringing the San Diego County Multiple Species Conservation Plan to our attention. Dischargers should consult this plan if sensitive species are present at BMP construction sites.

That sheet flow from the urban areas flowing over canyon walls will need to be treated is not reasonably foreseeable. First, the volume of this flow will be small compared to flow from storm drain outfalls. Second, the watershed model for Chollas Creek predicts minimal loading from open space areas such as canyon walls. This is because dissolved metals tend to bind to soil particles when stormwater contacts soil.

Comment No. 7: Cultural Resources – Appendix I completely fails to address potential impacts to cultural resources. There is ample evidence available from local land use agencies about the location of cultural resources in San Diego County.

The affected watersheds are located in parts of San Diego that are designated as "Urbanized" or "Urbanizing" by the City's Progress Guide and General Plan because they are fully developed or in the process of being developed. Many structures within the watersheds were built prior to 1960, making them at least 45 years old and thus potentially significant historic resources under the criteria in 14 C.C.R. section 15064.5(a)(3)(C). Thus, with regard to checklist item V(a), the loss of an undetermined number of significant historic structures (located above storm drain outfalls/tributaries) should be considered a potentially significant effect.

With regard to checklist item V(b), it is generally accepted by land use agencies that because many older structures were built prior to or without the benefit of heavy earth-moving equipment, the soils underneath older structures have the potential to contain potentially significant archaeological resources. Therefore, the excavation of soils under potentially significant historic resources should be considered to have a potentially significant effect on archaeological resources.

Response: New analysis on potential impacts to cultural resources was added to the Appendix I Environmental Analysis, Checklist, and Economic Factors in the March 9, 2007 version of the Technical Report, which addresses the concerns in the comment.

Comment No. 8: Hydrology and Water Quality - Appendix I states that the diversion of storm flows and dry weather urban runoff would cause impacts to existing drainage patterns, but concludes that any such impact would be less than significant because "diversion of the entire stormflow of a creek is not required to meet wasteload allocations."

This statement is not supported by facts, reasonable assumptions predicated on facts, or expert opinion based on facts. There is no technical way for an MS4 operator to ascertain what percentage of a storm flow must be diverted for a particular storm to ensure that the pollutant loads do not exceed the wasteload allocations. If treatment is necessary, all storm flow must be detained and treated to ensure that the standards are met. Thus, the conclusion that this impact will be less than significant is ; "speculation, or unsubstantiated opinion" that does not rise to the level of substantial evidence.

Response: New analysis on potential impacts to hydrology and water quality was added to the Appendix I Environmental Analysis, Checklist, and Economic Factors in the March 9, 2007 version of the Technical Report, which addresses the concerns in the comment.

Comment No. 9: Geology and Soils – Appendix I concludes that there will be no impacts to Geology and Soils. This conclusion is no supported by substantial evidence.

Excavating infiltration works in the vicinity of canyon rims has the potential to make canyon walls unstable (only basins serving an equalization purpose could be lined). Increasing infiltration increases instability even if the slope in question is already engineered. For slopes that aren't engineered (and this is the case in older neighborhoods – see above), this instability can lead to failure. Increasing the integrity of slopes downhill of detention works could also result in increased impacts to biological resources or, if retaining walls are used, aesthetic impacts. Therefore, as a result of the project change, checklist item V(c) should indicate that the geology impact from the project is potentially significant.

For purposes of revising the CEQA analysis, we suggest that the Board consider that works which involve any level of infiltration be setback from a canyon rim such that a 45 degree line drawn from the bottom of the basin nearest the canyon rim does not intersect the canyon wall.

Similarly, many formational materials within the watersheds are fossiliferous (Kennedy, 1977). Therefore, given that excavation of detention works could penetrate through surficial soils and into ungraded formational materials, the response to checklist item V(c) should indicate that this impact is potentially significant.[4] Because the environmental analysis does not discuss impacts to these resources or propose mitigation measures, the environmental analysis is inadequate.

[4] The "Kennedy Maps" are maps of geologic formations that may contain specific paleontological resources, and are specifically used by planning and land use agencies to identify the potential for significant paleontolgical resources. Such resources occur within the City of San Diego, and therefore could occur within the Chollas Creek watershed. *See* Geology of the La Jolla, Del Mar, La Mesa, Poway, Point Loma, and Southwest Quarter of the Escondido Quadrangles, San Diego County, California, by Michael P. Kennedy, 1975; and Geology of National City, Imperial Beach, and Otay Mesa Quadrangles, Southern San Diego Metropolitan Area, California, by Michael P. Kennedy and Siang S. Tan, 1977.

Response: New analysis on potential impacts to geology and soils was added to the Appendix I Environmental Analysis, Checklist, and Economic Factors in the March 9, 2007 version of the Technical Report, which addresses the concerns in the comment.

Thank you for the comment concerning potential fossil finds. Additional discussion on impacts and mitigation has been added to explanation of the answer to question 20 (Archeological/Historical).

Comment No. 10: Land Use and Planning – Checklist Item IX(b) indicates that the project would not conflict with any applicable land use plan, policy or regulation of an agency with jurisdiction over the project adopted for purposes of avoiding or mitigating and environmental effect." This conclusion is not supported by substantial evidence; substantial evidence supports the opposite conclusion. The following examples are taken from the Chollas Creek watershed; a similar analysis should be made of all watersheds.

First, while the Regional Board's environmental analysis foresees the need to construct works, because no analysis was done on the required number or location of treatment works, the analysis does not discuss the need for the City to acquire and demolish hundreds of acres of developed land uses in order to construct the works. This is inconsistent with the only listed impact in the draft environmental analysis, where Regional Board staff discusses the impacts from operating a works that detains water – the works has to be constructed before it can be operated. Because the Regional Board did not properly analyze this impact, the Regional Board's analysis incorrectly concludes that the impacts will be less than significant or that they can be mitigated to below the level of significance. This conclusion is incorrect because it does not consider the following:

Housing
The Housing Element of the City's adopted General Plan and the position taken by the City Council when declaring a "Housing State of Emergency" both have as a basic objective an increase in the housing supply. According to Appendix E of the Technical Report, low and high density residential uses account for almost 64% of the land uses within the Chollas Creek Watershed. On average, this means that 64% of the 480-1400 acres if land that would be occupied by treatment works (307 to 896 acres) is currently developed with homes. Assuming an average of 10 dwelling units per acre (4,000 square foot lots are common in the watershed), this equates to the loss of 3,070 to 8,960 units. Removal of this number existing dwelling units would decrease the housing supply and is thus in conflict with adopted City policy.

Industrial Land
The Industrial Element of the City's adopted General Plan states that there is a serious shortage of large parcels suitable for industrial development exists in the City. Related goals and recommendations include:

"Insure that industrial land needs as required for a balanced economy and balanced land use are met consistent with environmental considerations" (p.286)

""Protect a reserve of manufacturing lands from encroachment by non-manufacturing uses." (p. 286)

"As mentioned earlier, in allocating additional land for industrial use it is imperative that sufficient acreage be designated to meet projected needs so that the existing market can operate effectively." (p.287)

The general theme of the existing Industrial element is precisely this shortage of industrial land, high industrial and prices, etc. and how the economy is negatively affected by the non-industrial use of industrial land. The supply increased only slightly since 1979 and has not increased since. In fact it is now at crisis level proportions.

According to Appendix E of Region 9's Technical Report, low and high density residential uses account for 3.12% of the land uses within the Chollas Creek Watershed. On average, this means that 3.12% of the 480-1400 acres of land that would be occupied by treatment works (15 to 43.7 acres) is currently developed with industrial uses.

The removal of housing and industrial acreage from the City's stock in order to build storm water treatment works required to comply with the TMDL would conflict with the City's General Plan and its declared Housing State of Emergency. Therefore, as a result of the project change, checklist item IX(b) should indicate that the Land Use and Planning impact from the project is potentially significant with respect to the loss of residential and industrial lands. The environmental analysis in inadequate because it failed to analyze this impact.

Given that none of the City's land use plans identify storm water treatment works and the nature of detention/infiltration works, the City believes that land use impacts would be significant and suggests that the Regional Board evaluate the City's plans to determine where and the extent to which inconsistencies would result.

Population and Housing – Checklist item XII(c) indicates that there would be no displacement of substantial numbers of people, necessitating the construction of replacement housing elsewhere. Within the Chollas Creek watershed alone, the number of dwellings that would be lost as a result of the project change (3,070 to 8,960) should be considered substantial. According to U.S. Census Data, the average dwelling unit in San Diego houses 2.6 people. The loss of 3,070 to 8,960 dwelling units would therefore result in the displacement of 7,982 to 23,296 people. This number of dwellings that would be lost as a result of the project change should be considered substantial. Therefore, as a result of the project change, checklist items XII (b) and XII (c) should indicate that the Population and Housing impact from the project is potentially significant.

The City believes that this is in and of itself a significant impact and suggests that the Regional Board conduct a similar impact evaluation in all of the watersheds that would be subject to the TMDL.

Response: The City based the sizing of the BMP equalization basins on a 3 foot depth, neglecting to analyze deeper equalization basins in order to avoid securing a dam permit (Weston, 2006).[5] Based on the decision not to secure dam permits, the City then concluded that private property must be condemned and demolished to make room for the large, shallow equalization basins. If equalization basin are required, the City could secure dam permits and design the basins deep enough to avoid condemnation and demolition of private property.

Comment No. 11: Utilities and Service Systems – Checklist item XVI (c) indicates that the project will not require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects. This is directly contradicted by the Technical Report, and given that the project change causes the additional significant impacts cited above, there is even more reason why this item should indicate that the Utilities and Service Systems impact from the project is potentially significant.

Response: New analysis on potential impacts to utilities and service systems was added to the Appendix I Environmental Analysis, Checklist, and Economic Factors in the March 9, 2007 version of the Technical Report. No long term negative changes to the environment are expected as a result of modifications to retrofit or reconfigure the storm water drainage system. However, because short term construction impacts are anticipated, the determination in the substitute environmental documents is "less than significant with mitigation."

Comment No. 12: Given that the project change will result in previously undisclosed significant effects, CEQA compliance to date has deprived interested parties the opportunity to provide meaningful comment. In particular, we suggest that opportunity to comment be provided to historic preservationists, housing advocates, industrial developers, and those interested in public policy as it pertains to preservation of San Diego's shrinking supply of industrial lands.

Response: Although we disagree that TMDL implementation will result in significant environmental impacts from the loss of housing, industrial lands, or cultural resources, two additional 45 day comment periods were provided since the City offered the above comment. All interested persons have had ample time to respond to the changes and new analysis in the Technical Report and Environmental Analysis, Checklist, and Economic Factors documents.

2.1.5 Other Lack of Detail Comments

Comment No. 13: The Regional Board Does Not Fully Comply With Public Resources Code Section 21159. Here, the Regional Board concedes that the provisions of Public Resources Code section 21159 apply. Having made that concession, the Regional Board

[5] Weston Solutions, Inc. Chollas Creek TMDL Source Loading, Best Management Practices, And Monitoring Strategy Assessment, Final Report, September 2006

does not have the option to ignore the other specific requirements of that section. Nevertheless, the Basin Plan Amendment completely ignores the requirements of subdivision (c) of section 21159, which states:

> The environmental analysis ***shall*** take into account a reasonable range of environmental, economic, and technical factors, population and geographic areas, and ***specific sites***.

PUBLIC RESOURCES CODE § 21159(c)(emphasis added)

Looking at each category of analysis specified in Public Resources Code section 21159, subdivision (c), the Regional Board's analysis is deficient because it fails to consider any of these factors. Thus, the record clearly reflects that the analysis does not satisfy all of the statutory requirements of an environmental analysis under Public Resources Code section 21159.

As respects site specific analyses, Public Resources Code section 21159(c) unambiguously states that an analysis shall take into account a reasonable range of specific sites. A contrary contention is simply an incorrect statement of the law.

Response: The analysis in the March 9, 2007 version of Appendix I, Environmental Analysis, Checklist and Environmental Factors was reorganized to make clear where all the section 21159(c) factors are discussed and considered. For example, a specific sites discussion was added and can be found in section 6 of the Appendix I.

Comment No. 14: The Regional Board has made two different contentions regarding the adequacy of the environmental analysis: (1) that treatment controls are not a reasonably foreseeable method of compliance; and (2) that the Regional Board is not required to do a site specific analysis. The first contention is not factually supported; the second is legally incorrect.

As respects treatment controls, the Regional Board ignores three critical facts in that regard:

- There is no evidence that compliance in all watersheds has been achieved in practice during both wet weather and dry weather conditions by using only non-structural controls;
- The Weston Report concludes, with supporting analysis, that treatment controls will be necessary;
- The Regional Board's April 7, 2006 letter to the State Water Resources Control Board implicitly concedes that treatment controls will be necessary because it states that the use of detention facilities is not a reasonably foreseeable means of compliance ***"to the extent suggested by the City."***

This later fact is particularly interesting. The April 7th letter states:

> Detentions facilities located outside of Chollas Creek and existing storm water management features are neither the only means of compliance with the TMDLs nor even a reasonably foreseeable means to the extent suggested by the City. Such facilities are unlikely to be implemented to the degree described by the City due to the associated costs and impacts to housing. Since condemning property is unlikely, the San Diego Water Board was not required to analyze this impact as reasonably foreseeable.

This comment puts the proverbial cart before the horse. The first question in the foreseeability of a means of compliance is whether it is ***necessary to achieve compliance***. The Regional Board's comment does not completely refute the contention that treatment facilities will be employed. Hence, detention facilities or treatment works are a reasonably foreseeable means of compliance. The Regional Board's analysis repeats this error in the next sentence; it concludes that the impacts to land use and other resources are not reasonably foreseeable because of the expense. It states that these means of compliance will not be used because of the impact to housing. That begs the question: what impact to housing? Neither Appendix I or Chapter 12 discuss impacts to housing. The April 7th letter concedes that the impacts will occur the impact is not identified in Appendix I or discussed anywhere in Technical Report. This thwarts one of the basic purposes of CEQA because neither the public nor the Regional Board members know the potential housing impact and is a prima facie prejudicial abuse of discretion. The second error is that, having concluded that the impact will occur, it assumes that it will not be significant. CEQA does not require analysis of only significant impacts, it requires analysis to determine the level of impact – once again something that was not done and is a prejudicial abuse of discretion.

Thus, the only facts that are available undercuts the Regional Board's contention that treatment controls are not a reasonably foreseeable method of compliance, which under Public Resources Code section 21159(a), must have its impacts analyzed.

Response: Treatment controls are a reasonably foreseeable method of compliance. For example, the substitute environmental document discusses BMPs such as Austin type sandfilters. What isn't reasonably foreseeable are detention basins and treatment works (requiring private property condemnation) on the size and scale that the City suggests.

The City based the sizing of the equalization basins on a 3 foot depth, neglecting to analyze deeper equalization basins in order to avoid securing a dam permit. Based on the decision not to secure dam permits, the City then concluded that private property must be condemned and demolished to make room for the large, shallow equalization basins. This option is not reasonably foreseeable, when deeper, smaller, albeit more expensive basins can be constructed to avoid the condemnation of private property.

The San Diego Water Board is not required to speculate about potential site specific impacts, because we do not know where the discharger will choose to construct specific BMPs. However, a "specific sites" analysis was added to the March 9, 2007 version of

Appendix I as required by Public Resources Code section 21159(c). The specific sites analysis describes potential BMPs, potential impacts, and mitigation at a specific site in each of the major land use categories.

Comment No. 15: The project description is also a critical component of an adequate environmental document. *See Santiago County Water District v. County of Orange*, 118 Cal.App.3d 818 (1981) (EIR inadequate because of failure to discuss construction of water delivery facilities in project description). The project description in this case is influenced by Public Resources Code section 21159, which provides the ***minimum*** requirements for an environmental analysis of a rule or regulation that requires the installation of pollution controls.[6] That statute requires certain state agencies to analyze the following:

> (1) An analysis of the reasonably foreseeable environmental impacts of the methods of compliance.
> (2) An analysis of reasonably foreseeable feasible mitigation measures.
> (3) An analysis of reasonably foreseeable alternative means of compliance with the rule or regulation.

Response: Analysis of the reasonably foreseeable environmental impacts of potential BMPs, analysis of reasonably foreseeable feasible mitigation measures, and analysis of reasonably foreseeable alternative means of compliance, were included in all versions of the substitute environmental document. However, we have reorganized and expanded the material in the March 9, 2007 version of Appendix I to make clear where these factors are discussed.

Comment No. 16: Thus, the methods of compliance are part of the project description because the impacts, mitigation measures, and alternatives to the methods of compliance must be analyzed.

With that in mind, it is easy to see that the project description in this case contained only a cursory discussion of the methods of compliance.

Response: This project is a Basin Plan Amendment to incorporate TMDLs for metals in Chollas Creek. Thus, methods of compliance are not a part of the project description, but must be evaluated for their potential environmental impacts. This evaluation can be found in the Appendix I, sections 4 and 5.

Comment No. 17: The TMDL document is devoid of evidence that suggests that the pollutant reductions required to achieve full compliance with the TMDL can be achieved by anything other than: (1) diversion or (2) detention and infiltration.

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[6] The statute clearly states that these topics are the minimum requirements for an adequate environmental analysis; other impacts must be identified if the impacts are a direct result or a reasonably foreseeable indirect result of the project.

Response: The substitute environmental documents indicate that a suit of BMPs will likely be required to achieve WLAs. However, the San Diego Water Board cannot mandate which specific BMPs will be implemented.

Comment No. 18: Having identified the types of facilities that could be constructed to achieve compliance (diversion and detention/infiltration), Public Resources Code section 21159, subdivision (c) kicks in to specify the details of the analysis that is required in terms of environmental, technical, and specific sites. Thus, issues that must be included to properly address these considerations in the scope of this TMDL include:

1. The "tributary rule," which subjects all receiving waters within the affected watersheds to the TMDL. The application of this rule in complying with this TMDL creates an interesting overlay in that the TMDL does not define "receiving waters, yet the San Diego County Municipal Storm Water NPDES permit states that in some instances receiving waters and the MS4 are the same;

2. Topography, which prevents BMP works from being built on canyon walls below storm drain outfalls but above receiving waters that are subject to the WQO in the TMDL;

3. The structural BMPs need to capture and treat a very high percentage of storm water due to the large level of loading reduction required by the TMDL; i.e., it is not reasonable to expect that works located far from the storm drain outfalls would, by themselves, meet the TMDL because significant amounts of storm water run into the conveyance system immediately above the outfalls.

4. Locating works some distance from the receiving waters would be infeasible because it would be necessary to construct a new, separate conveyance system to prevent the treated water from mixing with untreated water.

5. The number of control devices that may be required to achieve compliance is a technical consideration in complying with the TMDL. Because the TMDL defines the WLAs without regard to the size of a rain event, loading must be controlled in all storm events. Accordingly, certain assumptions must be made with respect to the size of the storm in order to design structural BMPs that will provide adequate contaminant reduction. Lacking a "design storm," or information on soil infiltration rates, the Regional Board's CEQA analysis must include assumptions regarding a design storm size and the acreage of detention/infiltration facilities that would be needed (including any manufactured slopes). Information is available from the City of San Diego, the California Department of Conservation, and the United States Soil Conservation Service on soil infiltration rates that would be necessary in this analysis. For purposes of revising the CEQA analysis, the Regional Board should consider that the Chollas Creek watershed has approximately 816 storm drain outfalls within the City of San Diego to determine the effectiveness of infiltration.

The project description in the CEQA analysis is devoid of any discussion or analysis of these issues, and thus is inadequate because the failure to include this information prevented a meaningful analysis of the impacts of compliance.

The City has previously note that it is reasonably foreseeable that the TMDL implementation could require the City to build a large number of relatively smaller sized works in areas immediately behind a geologically-safe setback above all existing storm drain outfalls which have receiving waters immediately below them. In the Chollas Creek watershed, these works could occupy 1,387 acres – almost 10 percent of the 16,273 total acres in the watershed.

Response: The CEQA does not require the San Diego Water Board to designate a design storm or speculate on the number of control devices that the dischargers might construct as discussed in the response to comment No. 2. The CEQA does not require the San Diego Water Board to speculate on the specific locations where the dischargers might construct BMPs. Where BMPs can be constructed with regard to receiving waters is discussed in the response to comment No 36.

Comment No. 19: The environmental analysis does not analyze all the impacts associated with construction of structural BMPs. Only when a meaningful discussion of the environmental setting is set forth and a thorough project description has been prepared can an adequate analysis of impacts and mitigation measures be prepared. *County of Inyo v. City of Los Angeles*, 71 Cal.App.3d 185 (1977). Here, the Regional Board has put itself in an "Catch-22." While the Regional Board contends that it is not reasonably foreseeable that treatment controls will be used as a compliance method, it nevertheless analyzed the impacts – albeit poorly – of diversion structures. Having analyzed some of the impacts to diversion structures, the Regional Board must ensure that the analysis is complete, and supported by substantial evidence. CEQA determinations related to quasi-legislative decisions must be supported by substantial evidence. *See* PUBLIC RESOURCES CODE § 21167.5; *Western States Petroleum Association v. Air Resources Board*, 9 Cal.4th 559 (1995).

Substantial evidence is defined in CEQA as:

> For the purposes of this section and this division, substantial evidence includes fact, a reasonable assumption predicated upon fact, or expert opinion supported by fact.
>
> Substantial evidence is not argument, speculation, unsubstantiated opinion or narrative, evidence that is clearly inaccurate or erroneous, or evidence of social or economic impacts that do not contribute to, or are not caused by, physical impacts on the environment.

Response: New analysis, including mitigation of the construction of treatment controls, was added to the March 9, 2007 version of Appendix I, Environmental Analysis,

Checklist, and Economic Analysis. The expanded analysis addressed the concerns raised in the comment.

Comment No. 20: CEQA requires that cumulative impacts be assessed as part of determining whether a project may have a significant effect on the environment (CEQA Guidelines Section 15064(h)(1). A Lead Agency may determine that a project's incremental contribution to a cumulative effect is not cumulatively considerable if the project will comply with the requirements in a previously approved plan (CEQA Guidelines Section 15064(h)(3). However, Section 15064(h)(3) also requires preparation of an EIR (meaning a finding that the cumulative impact is significant) if there is substantial evidence that the possible effects of a particular project are still cumulatively considerable, notwithstanding that he project complies with the specified plan. Cumulatively considerable means that the incremental effects of a project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects."

The initial study checklist indicates that cumulative impacts from the project will not occur, but no rationale is provided for that conclusion. CEQA Guidelines Section 15130(b) describes alternative lists of projects and projections that an agency is required to consider when evaluating significant impacts. Given that the Regional Board has a mandate to adopt TMDLs for receiving waters on the 303(d) list, the checklist should, at a minimum, consider the impacts of this project in the context of impacts that would result from reasonably foreseeable means of compliance with other TMDLs. One glaring omission in this analysis is the fact that the Regional Board has concluded that the Bacteria Project I TMDL, which affects Chollas Creek, will have individual project impacts. There is no analysis to show support the conclusion that the impacts of the Bacteria I TMDL and the Chollas Creek metals TMDL, though less-than-significant individually, will not be cumulatively considerable. See CEQA Guidelines § 15064(h)(3).

With the exception of a checkmark in the "no" box, the CEQA analysis is silent on cumulative impacts. The bacteria TMDL should be integrated with the metals TMDL for purposes of environmental analysis. To the extent that the watershed is listed as impaired for other pollutants, implementing BMPs for these future TMDLs should also be considered.

Response: New analysis, including a discussion on the cumulative impacts of addressing all TMDLs and other water quality projects such as metals, indicator bacteria, diazinon and trash, was added to the March 9, 2007 version of Appendix I, Environmental Analysis, Checklist, and Economic Factors. The expanded analysis addresses the concerns raised in this comment.

Comment No. 21: In addition, the City believes that the watershed could also be listed for pyrethroids, so implementing BMPs for that pollutant should also be considered. Finally, the CEQA analysis should also include an evaluation of TMDL-related impacts in the context of City plans and policies for the watershed.

Response: Pyrethroids are the likely replacement for the pesticide diazinon which was banned from use by the USEPA. Order No. R9-2004-0277 should be amended to require the dischargers to monitor for pyrethroids in Chollas Creek as part of the Diazinon TMDL Implementation Plan. If sample results show impairment, and if a TMDL is developed, the cumulative impact of implementing pyrethroid BMPs would need to be considered with all other TMDLs and water quality projects and programs. Nonetheless, pyrethroid pollution can be addressed through non-structural controls including implementing integrated pest management practices, education and outreach, or through ordinances which regulate and limit the use of pyrethroids. Therefore, no cumulative effects are likely.

The comments did not articulate specific plans and policies the City might change as a result of implementing the TMDLs, or environmental consequences of those changes. We foresaw that changes to the plans and policies would be in a direction to facilitate low impact redevelopment, or increase enforcement of the stormwater regulations. The environmental impacts of such policy change would be those impacts already described in our substitute environmental documents. In addition, we implicitly evaluated the effects of changes to plans and policies by reviewing the effects BMPs would have on Land Use (Appendix I, 8.a.), Public Services (Appendix I, 14.a-f.) and Utilities and Service Systems (Appendix I, 16.a-f.), Recreation (Appendix I, 19.a.)and the cumulative impact the TMDLS might have together with all construction projects in the Chollas Creek Watershed (Appendix I, 21). The City of San Diego may need to modifying its plans and policies to accommodate these TMDLs. Our substitute environmental documents provide the required discussion on the environmental impacts and potential mitigation of activities resulting from the changes to the City of San Diego's plans and policies as a result of these TMDLs.

Comment No. 22: The CEQA analysis and the Technical Report suggest a number of BMPs that can be used to comply with the TMDL. Regional Board documentation should include data references that documents the efficiency of these BMPs in dry and wet weather with respect to removing dissolved metals and bacteria. For example, the City believes that it is misleading to state that dissolved metals loading can be reduced significantly by increased educational efforts.

Response: The environmental documents state that education and outreach can be a *very effective tool* in reducing metals, and do not mislead, as the City of San Diego suggests, that dissolved metals loading can be reduced significantly by increased educational efforts. Information on BMP implementation and effectiveness is readily available and need not be included here in a discussion of impacts and mitigation. Further, new information for new BMPs is currently being generated. When the time comes for the City to actually implement and maintain BMPs, all new and most up-to-date information should be considered.

Comment No. 23: The CEQA analysis must assess the impacts of installing structural best management practices for both TMDLs, including the impacts to land uses that

would be displaced by such installations. The CEQA document improperly limits its description of these impacts to aesthetics, air quality, biological resources, and noise. In addition to outright displacement of existing development for construction of BMPs, it is reasonably foreseeable that BMPs will be built adjacent to existing development. The CEQA analysis should assess the impacts of building BMPs on adjacent foundations and slopes. In its Discussion Paper, the Regional Board indicates that condemnation of land is unlikely. The Regional Board should programmatically evaluate the suitability of publicly owned land in the watershed for BMP construction. Public lands are mapped in Attachment 3.

Response: New analysis was added to the March 9, 2007 version of Appendix I, Environmental Analysis, Checklist, and Economic Factors. The expanded analysis addresses the impacts of installing structural BMPs to Earth, Water, Light and Glare, Land Use, Natural Resources, Risk of Upset, Population, Housing, Transportation, Public Services, Energy, Utilities and Service Systems, Human Health, Recreation, Archeological/Historical, and Mandatory Findings of Significance, in addition to Aesthetics, Air Quality, Biological Resources (Plant and Animal Life), and Noise. In general, all of the BMPs evaluated in the substitute environmental documents are suitable to incorporate into public lands. Site specific analysis must be done by the City to choose the exact location and suitability of BMPs. Because the size of BMPs can be minimized through the types of BMPs selected, and engineering solutions exist to minimize the footprint of structural BMPs, displacement of existing development is not likely to be on a scale that will cause significant environmental impacts.

Comment No. 24: The Board's CEQA analysis suggests that TMDL compliance may be at least partially achieved by preventing storm water and urban runoff from exiting the storm drains through infiltration. However, Attachment 3 includes substantial evidence, in the form of a map prepared by the Natural Resources Conservation Service, that soils in the watershed are mostly impermeable. Attachment 4 (Bauder) provides additional substantial evidence regarding the impermeability of soils in the watershed in the form of a paper which describes how vernal pools were located in the watershed prior to development.

While the City acknowledges that neither the Bauder map nor the Natural Resources Conservation Service map are site specific and that there may be opportunities for infiltration within the watershed, the CEQA document should state a programmatic basis for concluding that infiltration in areas upstream of receiving waters has wide-spread feasibility and is therefore a reasonably foreseeable means of compliance (see Comment 23 below regarding bacterial regrowth and the section entitled "Tributary Rule" below for a discussion on BMP siting constraints). In fact, the CEQA document should include a rationale or list of references that were used to draw conclusions regarding the potential significance of impacts in all issue areas. As written, the checklist is "naked" with respect to issues with which Board staff has found no potentially significant impact.

Response: At this point, all available BMPs are considered potential candidates for implementation. Clearly, the dischargers will not implement infiltration BMPs where soil

conditions are not suitable. The substitute environmental document did not conclude that infiltration BMPs in areas upstream of recreational waters have wide spread feasibility.

Comment No. 25: As a mitigation measure associated with the potential for metals to accumulate in infiltration facilities and then contaminate groundwater, the CEQA checklist mandates regular maintenance and disposal of waste.

This requirement could limit the construction and/or reconstruction of public and private facilities over the infiltration facility. The CEQA document must assess this impact along with a description of how and for what purpose maintenance is expected to occur, and the limits of building or re-building improvements on top of at-grade and below-grade infiltration facilities.

Response: Minimal maintenance is generally required to keep infiltration systems un-plugged and functioning. Design and construction limitations must be considered on a case by case basis. Whether or not public and private facilities can be built over an infiltration facility is not an environmental impact of the BMP, because choosing not to build would potentially improve the surrounding environment by creating or improving habitat, reducing traffic, etc.

Comment No. 26: The failure of the CEQA analysis to address these issues leaves more questions that answers, including:

What is the potential for pollutants to travel through an infiltration facility and contaminate adjacent native soils or groundwater?

Response: The potential for groundwater contamination is not considered significant as discussed in the response to question 3.g of the Checklist. Metals that are removed from stormwater runoff by infiltration BMPs are typically inorganic and insoluble. They are positively charged and bind to fine and organic particles. Once bound, the metals have very low leachability. Most metals are less than 10 percent leachable. Lead has been typically less than 5 percent leachable. Zinc, in some cases is 20-30 percent leachable.

Metals that are removed by infiltration BMPs typically are retained in the upper 2 to 5 inches of soil or sediment. Typically, metals levels returned to background levels or non-detectable levels below about 5 inches depth.

There is a potential (given enough time) that metals may accumulate in the upper 2 to 5 inches of soil to levels that might be toxic to humans, plants, and/or animals. The mitigation measures that could be implemented would include proper and adequate cover materials that would limit the access to the soil that is being affected by metals in stormwater. Options could include planting grass or iceplant, covering with gravel or cobblestones, or covering with compost as a mulch. Any of these cover options would reduce the potential for exposure to soils with elevated metals concentrations. The added benefit that compost might have is a higher affinity to bind with metals (due to its high organic content), and that placement of compost on the soil surface will capture the

metals before they bind with the soil As metals concentrations build, the mulch could be removed and replaced. Other options for minimizing exposure to soil could include putting the infiltration BMP underground or indoors, and/or restricting access. Finally, the metals-laden, top 2 to 5 inches of soil could be removed, disposed of and replaced.

The information on metals laden soils, above, was added to the discussion of the answers to questions 4.e, 5.d, and 17.a of the Checklist in Appendix I.

Comment No. 27: What is the potential for pollutants which have reached groundwater to reach receiving waters in concentrations in excess of the WLAs?

Response: The potential for groundwater contamination is not considered significant as discussed in Appendix I question 3.g. Therefore, groundwater is not a likely pathway for metals to reach surface water.

Comment No. 28: Will the Regional Board have subsequent regulatory authority over the construction of these facilities?

Response: The San Diego Water Board would have subsequent regulatory authority over facilities only if WDRs (or waivers) are required for discharges from a facility, or if a 401 certification is required to construct the facility.

Comment No. 29: If not, can mitigation be assured?

Response: No. This is the reason for including a statement of overriding considerations in the Determination section of Appendix I.

Comment No. 30: If mitigation cannot be assured, shouldn't this potential impact be considered significant?

Response: No, because mitigation is available for every significant impact.

Comment No. 31: Is there a concentration of any pollutant above which urban runoff cannot be infiltrated? If so, does urban runoff with the Chollas Creek watershed exceed this concentration at any time?

Response: Not that we are aware of. This will need to be addressed on a case by case basis if and when the BMP is designed and implemented.

Comment No. 32: The Regional Board should conduct a programmatic level of environmental analysis for the metals and bacteria TMDLs instead of deferring further analysis to the City. Issues that should be addressed are described in Attachment 1 and should also include impacts to public lands if the Regional Board believes that it is reasonably foreseeable for storm water to be pumped to public lands for infiltration as described in Attachment 3.

Response: The San Diego Water Board has conducted an adequate programmatic level environmental analysis as required by the CEQA. Attachment 1 were addressed by the San Diego Water Board in the Discussion Paper (the City's Attachment 2). Attachment 3 makes the argument for large scale detention and treatment BMPs which would include condemnation of private property. Because the size of BMPs can be minimized through the types of BMPs selected, and engineering solutions exist to minimize the footprint of structural BMPs, we disagree that the condemnation of private property at the scale envisioned by the City is likely. The environmental analysis discusses the potential environmental impacts of a suite of BMPs, whether or not constructed on public land.

Comment No. 33: The Regional Board's CEQA analysis should base its impact analysis on the delta between existing conditions on the ground and future conditions. It is not appropriate to reduce the delta by establishing as the existing conditions baseline an imaginary situation.

Response: The analysis is based on existing conditions as the baseline for assessing change, and cannot, per the CEQA guidelines, include speculation.

2.1.6 Tiering

Comment No. 34: The City maintains its position that the CEQA analysis contained in the technical report is inadequate. The environmental analysis begins with a discussion of the standards that apply to the Basin Plan amendment. The document states that the Regional Board has specific obligations under the Public Resources Code because the TMDL establishes performance standards or treatment requirements, and sets out an abbreviated list of those specific requirements. *See* Technical Report at 85. The document goes on, however, to state that the Regional Board "method of analysis" is similar to "tiering" and "limited its analysis in this document to the broad environmental issues at the Basin Plan amendment "performance standard" adoption stage." The documents then goes on to opine that "the Regional Board is not required, at the Basin Plan amendment adoption stage, to evaluate environmental issues associated with specific projects to be undertaken later to comply with the performance standards." *Id*. The document contains no citation to legal authority for these propositions. This is because these contentions are incorrect statements of the law.

The TMDL and environmental analysis do not satisfy the criteria for tiering. When applying statutes, specific statutes control over general. *See Cavalier Acres, Inc. v. San Simeon Acres Community Services District*, 151 Cal. App. 3d 798 (1984) (Where there is a specific provision requiring community services district to increase rates via ordinance, that specific statute controls over general provision allowing public entities to increase rates via resolution).

Here, the general provisions relate to tiered CEQA documents. *See* PUBLIC RESOURCES CODE § 21093 and 21094. The environmental analysis attempts to justify giving short-shrift to the topics required by Public Resources Code section 21159(c) under the guise of tiering; this violates the rule that specific provisions control over the general. Moreover, there are other problems with the Regional Board's reliance on the tiering provisions.

First, both Public Resources Code section 21093 and 21094 refer to the preparation of an environmental impact report as the first tier document. As the Regional Board readily notes, the environmental analysis for the basin plan amendment is **not** an EIR. *See* Remy, et al, *Guide to the California Environmental Quality Act*, 10th ed., at 495 (The definition of tiering "suggests that tiering must commence with the preparation of an EIR.") Thus, there is no authority for the proposition that the Regional Board may use a substitute document as a first tier CEQA document.

Further complicating this aspect of the Regional Board's environmental analysis are the specific provisions of CEQA Guidelines section 15253, which governs the use of an EIR substitute by a responsible agency. Specifically, subdivision (a) states a substitute document shall be used by another agency "granting an approval ***for the same project*** where the conditions in subdivision (b) have been met." Subdivision (c) of that same Guidelines section amplifies this limitation, stating:

> Where a certified agency does not meet the criteria in subdivision (b), any other agencies granting approvals ***for the project*** shall comply with CEQA in the normal manner.

Hence, the CEQA Guidelines make clear that the only permissible uses of a substitute document are with respect to that project, and not with subsequent related projects. Accordingly, it is inappropriate to treat the Basin Plan Amendment environmental analysis as a "first tier" document because no second tier document can legally flow from a "first tier substitute document."

It is also important to note that under CEQA Guidelines section 15253 subdivision (b), it is a responsible agency that may use the substitute document for subsequent approval of the project. Responsible agencies are "public agencies other than the lead agency which have discretionary approval power over the project." CEQA Guidelines section 15381. The only other California agency that has discretionary approval power over the Basin Plan amendment is the State Water Resources Control Board. Neither the Regional Board nor the State Board will issue subsequent approvals related to this project that will require CEQA compliance. Hence, the authorization in CEQA Guidelines section15253 does not apply to any subsequent activity that will involve site-specific impacts or any of the other analyses the Regional Board contends may be deferred until the second tier projects are implemented. Accordingly, the notion that the TMDL environmental analysis will serve as a first-tier analysis is nonsense.

In the April 7th letter, the Regional Board cites CEQA Guidelines section 15253 for the proposition that it need not change its CEQA processes to meet the needs of other agencies. This comment misses the point: if the analysis cannot be used by other agencies because it is not an adequate document for that purpose, then the Regional Board cannot justify its cursory analysis by contending that these agencies will tier off of the Regional Board's document. If the document is inadequate for use by other agencies,

those agencies have to start from scratch and the Regional Board's document is of no value.

Second, Public Resources Code § 21093 states that the purpose of tiering is to expedite the construction of housing and other development projects by eliminating repetitive environmental review. Here, the project is not a development project; it is the imposition of performance or treatment standards. Thus, this activity does not fall within the type of projects the Legislature sought to expedite through tiering, and accordingly, there is no legal basis for the Regional Board to rely upon these principles in analyzing the impacts of the TMDL.

Regional Board staff has, in the past, stated that it need not conduct a detailed analysis because it contends that the TMDL environmental analysis functions as a "first tier document," or would be speculative These statements are inaccurate because:

- Tiering does not excuse the lead agency from adequately analyzing the reasonably foreseeable significant environmental effects of the project and does not justify deferring such analysis to a later tier EIR or negative declaration." 14 C.C.R. Section 15152(b).
- Lead agencies cannot hide behind an inadequate analysis and leave it to the public to produce the necessary substantial evidence regarding adverse impacts. *Gentry v. City of Murietta*, 36 Cal.App.4th 1359, 1379 (1995). While foreseeing the unforeeable is not possible, the agency must find out and disclose all that it reasonably can. 14 C.C.R. § 15144.
- To claim that an impact is speculative and terminate a discussion requires analysis – it does not excuse a failure to investigate and analyze. *See Marin Municipal Water District v. KG Land California Corporation*, 235 Cal.App.3d 1652 (1991) *and* 14 C.C.R. Section 15145. The record does not support a finding that the Regional Board has conducted this investigation.

Response: Appendix I, as revised in the March 9, 2007 version, does not equate the substitute environmental documents with a Tier I EIR. The appendix states that the San Diego Water Board has considered the pertinent requirements of state law,[7] and intends the analysis to serve as a tier 1 environmental review. The substitute environmental documents are not intended for others to tier off of, however, municipal entities can utilize all information included in the substitute environmental document when developing their own environmental documents.

2.1.7 Alternatives Analysis

Comment No. 35: The alternatives analysis is inadequate. The State Water Resources Control Board regulations for complying with CEQA require a substitute document to contain an analysis of reasonable alternatives to the proposed action. Here the only alternatives analyzed are the "no action" alternative, and the "reference system approach." This is an inadequate range of alternatives. *See Citizens of Goleta Valley v.*

[7] Public Resources Code section 21159 and 14 CCR section 15187

Board of Supervisors, 52 Cal.3d 553 (1990)[Requiring a reasonable range of feasible alternatives.

Here, the Regional Board has failed to explain why to the extent that the implementation plan is part of the project, whether a longer compliance schedule will result in pilot project technology becoming mainstream technology that can be deployed and reduce certain impacts.

The City has previously submitted comments on this proposal, including the Regional Board's efforts at CEQA compliance; this letter and its attachment addresses many of the issues previously raised and includes even more substantial evidence regarding the environmental impacts of the project. The City's most recent correspondence on TMDL was addressed to the State Water Resources Control Board and is dated January 6, 2006. That letter and Board staff's April 7, 2006 responses, a Discussion Paper entitled "Adequacy of the Environmental Review Documents for the Chollas Creek Metals TMDLs", April 6, 2006) are included as Attachments 1 and 2 so as to make them part of the administrative record for the current proceedings. As required by the State Water Resources Control Board's regulations, the City respectfully requests written responses to our January 6, 2006 letter (to the extent responses were not provided in Attachment 2) and this letter.

CEQA requires a discussion of project alternatives if the proposed project would result in potentially significant impacts, and the State Water Resources Board regulations (23 C.C.R. § 3777(a)(2) also requires the Regional Board's substitute documents to contain "reasonable alternatives to the proposed activity." Why does the CEQA analysis for the metals TMDL not include a discussion of project alternatives given that the CEQA analysis for the bacteria TMDL does include the discussion?

If the Regional Board includes a discussion of project alternatives in the metals TMDL, it should use the implementation protocol described as the City's preferred alternative in Attachment 3.

Response: The alternatives analysis was expanded in the March 9, 2007 version of Appendix I. Included in the expanded alternatives analysis are the no action alternative, the water quality standards action alternative, the 10-year compliance schedule for metals load reduction only alternative, and the 20-year compliance schedule for metals, bacteria, diazinon, and trash reductions alternative, the latter of which evaluates the protocol described in attachment 3, (i.e., the Weston Report).

A complete response to the City's January 6, 2006 letter was provided in the San Diego Water Board's Discussion Paper (the City's Attachment 2), which is part of the case file.

2.1.8 Tributary Rule

Comment No. 36: *Inappropriate application of the tributary rule.* The TMDL requires load reductions prior to discharge into any receiving water, including open concrete

channels. Under this interpretation, the Regional Board would no longer provide an incentive to replace concrete channels with vegetation because the vegetation would not address the non-compliance of waters upstream of the revegetation site.

Would compliance with the metals and bacteria TMDLs be achieved if storm water discharged from a storm drain outfall exceeds the WLA if that water is treated to meet the WLA further downstream? In other words, does the WLA need to be met in receiving waters immediately below storm drain outfalls or somewhere further down the watershed? If the latter, how much further down?

The CEQA document should describe the reasonably foreseeable alternative in-stream BMPs that are consistent with the beneficial uses and [representative] natural aquatic ecosystems of the creek and describe the impacts of building and operating such BMPs. The City is unaware of any in-stream BMP that would achieve the WLAs and meet these criteria.

The City believes that the above statement from the "Discussion Paper" is contrary to other statements that have been made by Regional Board staff with regard to the application of the tributary rule and the resultant need to site BMPs upstream of storm drain outfalls. The City has relied on the following statements for its understanding of this issue:

Email from Julie Chan dated March 10, 2006:

> The tributary rule ascribes to a tributary, on which surface water quality standards have not yet been established, the water quality standards applicable to the downstream receiving water…Since the states are required to adopt water quality standards for tributaries, the San Diego Water Board has taken the approach that standards applicable to the downstream receiving water will be applied to the tributary in the absence of site specific standards. The Basin Plan has a footnote which accomplishes this purpose. The footnote states: "Beneficial uses apply to all tributaries to the indicated water body, if not listed separately".

Email from John Robertus dated May 3, 2006:

> I think that you can resolve the matter by considering that the Basin Plan designates both beneficial uses and water quality objectives by hydraulic units, areas and sub-areas. These apply to all waters of the state within each respective HU, HA and HSA. There are no "upstream, downstream or in-between waters".
>
> As for the reduction of pollutants, the industrial stormwater (including construction) discharges must be reduced to BAT/BCT, the MS4 discharges must be reduced to MEP with allowances for an iterative process, and the TMDL pollutant reductions must be accomplished in accordance with the TMDL Basin Plan amendment which is independent of MEP or BAT/BCT. I believe that the Regional Board could also

require that all water quality objectives be met immediately in receiving waters if it were to choose to do so. However, this is not what is expected at this time.

As for BMPs in waters of the state, you are correct that we do not embrace any BMPs located within waters of the state. Rather, we expect that pollutants will be reduced appropriately prior to the discharge into such waters. In some cases we have allowed projects that have "extended" the MS4 infrastructure to collect, divert or treat such discharges. Some of these are sites of CBI projects and others are just local pilot projects. In each case there was a case-by-case decision. With respect to "treatment wetlands", I can make no case for allowing assimilative capacity of waters of the state to be used as "treatment" to remove pollutants discharged from a MS4. Perhaps some day there will be mixing zones or some other construct, but this does not exist today. There can be treatment wetlands constructed to function as a pollutant reduction method anywhere except in the waters of the state.

Chollas Creek Dissolved Metals TMDL Technical Report (July 25, 2006, page 3)

These loading capacities, which are equal to the Numeric Targets, will apply to the entirety of Chollas Creek and during all times of the year. Regulated **discharges** [emphasis added] from each of the land uses identified in the Source Analysis portion of this TMDL will not be allowed to have dissolved metals concentrations that causes [sic] in-stream waters to exceed the loading capacities.

Chollas Creek Dissolved Metals TMDL Appendix M (July 25, 2006, page 21):

The 2002 List of Water Quality Limited Segments lists the lowest 1.2 miles as the estimated size effected [sic]. To ensure restoration of water quality standards in this portion of the creek, all upstream sources need to meet the Wasteload Allocations of this TMDL. This is consistent with the Diazinon TMDL, adopted in 2002. Wasteload Allocations were applied to **discharges** [emphasis added] throughout the entire watershed when only the lowest 1.2 miles was listed as impaired.

Chollas Creek Dissolved Metals TMDL, Appendix I (July 25, 2006, page 15)

The implementation of these TMDLs will result in improved water quality in Chollas Creek **and it** [sic] **tributaries** and will not have significant adverse effects to the environment (emphasis added).

Bacteria-1 TMDL, Technical Report (August 4, 2006)

Persons whose point source discharges contribute to the exceedance of WQOs for indicator bacteria (as discussed in section 10) will be required to meet the WLAs in their urban runoff before it is discharged from MS4s to receiving waters.

The following statements indicate a strong preference against diverting storm water or urban runoff from receiving waters for treatment, again leading to the unavoidable conclusion that Wasteload Allocations must be met in the receiving waters immediately below storm drain outfalls:

Chollas Creek Dissolved Metals TMDL, Appendix I (July 25, 2006, page 13)

> Since in-stream diversions should not be used as BMPs, there should be no adverse impacts on aesthetics resulting from construction of concrete-lined basins or treatment facilities within the creek.

Bacteria-1 TMDL, Appendix R (August 4, 2006)

> In-creek diversions should not be used as controls, therefore, there should be no adverse effects on aesthetics resulting from construction of concrete-lined basins or treatment facilities within the creeks.

Finally, since the CEQA document does not describe biological impacts of building structural BMPs in canyons or receiving waters, it was presumed that such construction would not be allowed.

In order to provide an adequate project description under CEQA, the metals and bacteria TMDL documentation should be explicit about where the Wasteload Allocations must be met. In order to provide an adequate environmental setting under CEQA, the metals and bacteria TMDL documentation should, at a programmatic level, describe where the MS4/receiving water interface is located. Based on the geography and topography of the watershed, the City has concluded that "Waters of the State" and receiving waters generally extend upstream to locations immediately downstream of storm drain outfalls throughout the watershed.

Location of BMPs and Tributary Rule

City comments have previously indicated that the bacteria and metals TMDLs will require the construction of storm water treatment facilities on currently developed private property. In its document entitled "Adequacy of the Environmental Review Documents for the Chollas Creek Metals TMDLs" (April 7, 2006), Regional Board staff writes that:

> "the City [improperly] interprets the tributary rule to require strict attainment of the most stringent downstream water quality objectives throughout Chollas Creek and its tributaries".

Further, above-referenced discussion paper states that,

> [w]hile all waters tributary to Chollas Creek should be of a quality consistent with the attainment in Chollas Creek of the water quality objectives necessary to support the beneficial uses designated for Chollas Creek and San Diego Bay, this policy does not, necessarily, preclude the installation of pollutant reduction BMPs in Chollas Creek or its tributaries. Source control is the preferred means of compliance with the [dissolved metals] TMDLs. However, in-stream structural BMPs may be reasonable, depending on the location and type of BMP, provided that they are

consistent with the beneficial uses of the creek and the natural aquatic ecosystem characteristics of the creek".

Response: TMDLs allocate wasteloads to MS4 discharges, as opposed to receiving waters. For this reason, discharges from MS4s are required to meet WLAs. The WLAs are designed to restore water quality in receiving waters as defined by applicable water quality objectives. Since the San Diego County municipal storm water requirements (Order No. R9-2007-0001 or its successor) will be used to implement the TMDLs at issue, the term "receiving waters" in this case refers to waters of the United States.

The conditions under which MS4s discharge to receiving waters are exceptionally diverse. This makes it difficult to define a precise "bright line" of demarcation for determining when MS4s end and receiving waters begin that will be applicable in every case. In fact, such determinations are often made on a case-by-case basis (such as with the 401 Water Quality Certification Program). While case-by-case determinations will continue to be necessary in many instances, generally speaking, where an outfall exists, receiving waters extend upstream to the outfall location.

The issues of where WLAs must be met and where receiving waters begin are important for determining where to locate BMPs. The San Diego Water Board's typical practice has been to discourage implementation of BMPs in receiving waters. For example, Order No. R9-2007-0001 states that "urban runoff treatment and/or mitigation must occur prior to the discharge of urban runoff into a receiving water" (Finding D.10). However, the issue of BMP location ultimately depends upon site specific circumstances and how compliance with WLAs is to be assessed.

There are many different monitoring approaches that the San Diego Water Board can use to determine compliance with WLAs. For example, the Chollas Creek diazinon TMDL, Order No. R9-2004-0227 requires monitoring two stations in Chollas Creek for compliance with the diazinon WLA. This relatively simple compliance monitoring was justified because the principal control, namely banning the pesticide, had been accomplished, and water quality in Chollas Creek was meeting the interim TMDL milestone at the time the new MS4 requirements were adopted. In the extreme, the San Diego Water Board could require monitoring at every storm drain outfall, and at numerous locations in Chollas Creek and its tributaries. The compliance monitoring the San Diego Water Board likely will require will be something between these two approaches, and may depend on the level of dischargers' efforts to reduce pollutant sources and loading before the San Diego Water Board issues implementing orders.

Another compliance assessment issue to be considered is how monitoring data are analyzed. Again, a wide range of approaches are available to the San Diego

Water Board to determine compliance. For example, a regression approach to analysis of monitoring data can be used, where the monitoring data must exhibit a certain regression slope over time to show compliance with WLA. Other approaches, such as averaging of data, can also be used if appropriate. For example, in making water quality assessments for listing and delisting purposes, the *Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List* states that "samples collected within 200 meters of each other should be considered samples from the same location."

These different monitoring and compliance assessment methods may provide MS4 dischargers with the opportunity to implement a wide range of strategies for complying with TMDL requirements, including strategies that rely on restoration of receiving waters. The methods to be used to determine compliance will be developed following adoption of TMDLs, as municipalities develop urban runoff management plans that will implement MS4 requirements and TMDLs.

Finally, we assumed that structural BMPs could be built anywhere in the watershed, and did not exclude any land type from our analysis of potential impacts.

2.1.9 Dry Weather

Comment No. 37: *The TMDL requires the City to maintain dry weather flows*. This is contrary to Municipal Permit Discharge Prohibition B.2, requires the MS4 operators to "effectively prohibit" these human-generated, flows. The Regional Board should explain how it sees the requirement to maintain dry weather flow in an urbanized area is consistent with the discharge prohibition in the MS4 permit. The City believe that these requirements are inconsistent and is one reason why the conclusion that there will be less-than-significant impacts to biological resources is unsupported by substantial evidence.

The TMDL requires the City to maintain dry weather flows. This is contrary to Municipal Permit requirements which seek to eliminate these human-generated, flows and would force the City to construct costly low-flow treatment systems in addition to parallel systems for wet weather flows.

Either compliance option, diversion via infiltration or treatment, will reduce sediment loading into Chollas Creek. The CEQA document should assess this impact.

The City estimates that dry weather flows exit from approximately 528 of the 800 storm drains outfalls in the watershed (66%). These dry weather flows support wetland vegetation in Chollas Creek and its tributaries that probably would not exist but for the flows and probably did not exist prior to urban development of the watershed. Eliminating these flows by infiltrating them would eliminate certain receiving waters and the associated aquatic and wetland life. Accordingly, the CEQA documents for both TMDLs require as mitigation the return of "treated water into the creek in the same location, and at the temperature and flow velocity to maintain the creek's hydrology (page 89 of the metals TMDL Technical Report, page 14 of the metals TMDL

environmental checklist and page R-14 of the checklist for the bacteria TMDL). Assuming that the intent is not to discharge treated, potable water from the existing drinking water distribution system into receiving waters, the construction of urban runoff treatment facilities is required. Moreover, to prevent bacterial regrowth in the MS4 downstream of the treatment facilities, the treatment facilities must be built immediately above the storm water outfalls.

The mitigation measure which requires maintaining the hydrology of receiving waters and wetlands also necessitates the construction of treatment facilities for dry weather flows (immediately upstream of the storm drain outfalls to minimize the potential for bacterial regrowth above the outfall). Total compliance via infiltration is therefore infeasible. As an alternative to treating all flows, the requirement to maintain dry weather flows in receiving waters sets up another reasonably foreseeable means of compliance: that the City will treat dry weather flows and return them to the creek where they currently flow, that the City will infiltrate wet weather flows where it is practicable, and that the City will treat wet weather flows where it is impracticable. The CEQA document must address the impact of this reasonably foreseeable means of compliance.

Should treatment facilities designed to maintain creek hydrology and wetlands be designed to retain existing hydrology/wetlands (as affected by development) or should treatment facilities be designed to discharge water to mimic pre-development conditions? If the latter, what are the characteristics of pre-development hydrology and wouldn't this have an adverse impact on wetland vegetation that is dependent upon dry weather urban runoff?

The City is unclear as to the Board's overall policy with respect to hydrology and wetlands that are present only because of human-induced dry weather flows. Which does the Board see as more important – the maintenance of post-development hydrology/wetlands or the reduction of [clean] dry weather flows?

Response: As revised in the March 9, 2007 version, the substitute environmental documents make clear that the TMDLs do not require the City to maintain dry weather flows. Nowhere in the Technical Report does it state that TMDL implementation requires maintenance of the current flow regime. Ordinances prohibiting dry weather nuisance flows are evaluated as a reasonably foreseeable method of compliance.

2.1.10 Aerial Deposition

Comment No. 38: Page 57 of the Chollas Creek Dissolved Metals Technical Report states that the Regional Board's model estimated the potential load of each metal from the open space land use (9.73% of the Chollas Creek watershed, or over 1,583 acres) to be 0% of the total existing load for each metal. Contributions of loading from open space land uses in comparison to other sources were found to be insignificant. Page 59 of the Technical Report and the Regional Board's "Discussion Paper" conclude that Chollas Creek receives significant contributions of copper, lead, and zinc but that this source must travel through the MS4 and thus have already been accounted for [in the WLA for

the MS4). The City has recently undertaken an aerial deposition study and interim results are presented in Attachment 4. In general, the amount of aerial deposition in the watershed is significant. Open spaces adjacent to Chollas Creek and its tributaries drain into receiving waters without first entering the MS4. In a future compliance scenario where wet weather flows in the MS4 above storm drain outfalls are diverted for infiltration, the only flows in the creek would be those from the adjacent open spaces. Given that the metals TMDL is concentration-based, this loading could result in non-compliance with the TMDL. The Regional Board's "Discussion Paper" concludes that "a very small percentage of the land area drains directly into Chollas Creek via sheetflow from canyon walls. What is this determination based on?

The City has submitted substantial evidence that concentrations of zinc, lead, and copper in runoff from open space lands will be significant. What is the reasonably foreseeable means for TMDL compliance given that runoff containing aerially deposited pollutants from open space lands that drain directly into receiving waters (never enter the MS4) will exceed the zero WLA for these lands?

Response: The City is not responsible for pollutants that enter receiving waters outside the control of its MS4. The "very small percentage of land area statement" was estimated based on a review of aerial maps.

The TMDL modeling predicted zero percent loading from open space. The canyons and stream banks are open space, and therefore the metal loading coming from storm water draining these areas will likely contribute no loading.

2.1.11 Statement of Overriding Considerations

Comment No. 39: Similar to how the Los Angeles Region revised its CEQA analysis for the Los Angeles River Trash TMDL, the San Diego Regional Board must address all the potentially significant impacts associated with building and maintaining the BMPs needed to comply with the metals and bacteria TMDLs.

In its' Discussion Paper entitled "Adequacy of the Environmental Review Documents for the Chollas Creek Metals TMDLs" (April 6, 2006) Regional Board staff reiterates its' position that it is not obliged to provide any additional level of detail with regard to the impacts associated with building BMPs to comply with the TMDLs. Regional Board staff position is that identifying the specific projects that might be implemented is speculative at this time and that future CEQA documents prepared for specific projects are the responsibility of the City. While the City agrees that it will likely be required to prepare additional CEQA documentation in the future in order to comply with the TMDL, it disagrees that the Regional Board has prepared an adequate analysis of the impacts associated with compliance with the TMDLs

The City believes that the Regional Board has improperly deferred additional environmental analysis. The City believes that the Regional Board has not defined the TMDLs with enough specificity to conduct a "programmatic" level of analysis of the

reasonably foreseeable means of compliance, particularly with respect to required load reductions (which dictate the types of BMPs required), the tributary rule, and prohibitions on in-stream diversions (which dictate the possible locations of the BMPs), and failure to develop a design storm (which leaves open the acreage requirements of the BMPs). In accordance with Section 15187 of the State CEQA Guidelines this analysis could utilize numeric ranges and averages when specific data is not available. Section 15146 of the CEQ Guidelines addresses the level of specificity that is required for projects such as the TMDLs. For CEQA purposes, adoption of the TMDLs by the Regional Board is comparable to adoption of a General Plan or Community Plan by a jurisdiction's legislative body with land use powers. What is required is the production of information sufficient to understand the environmental impacts of the proposed project. The current analysis does not fulfill this requirement. The City further believes that unless mitigation to reduce potentially significant impacts to a level below significance is "guaranteed", the analysis must conclude that the impacts are significant (CEQA Guidelines, Section 15152(f)(3). In that case, "Findings" and a "Statement of Overriding Considerations" must be adopted.

To the extent that the CEQA analysis indicates that "[i]mpacts **may** be mitigated (e.g., Chollas Creek Dissolved Metals TMDL, Appendix I, pages 13 and 15, emphasis added) and not that they **will** be mitigated, the analysis should conclude that the impacts are significant. See also page 6 of the Regional Board's "Discussion Paper" which indicates that it is not clear whether impacts to aesthetics would be mitigated.

If it finds certain impacts to be significant, does the Regional Board intend to adopt "Findings" and a "Statement of Overriding Considerations" for either the metals or bacteria TMDL?

Paragraph 19 of Appendix J, the proposed resolution, contains a section that purports to be a statement of overriding considerations required by CEQA when a project may have a significant, unmitigated impact to the environment. Appendix I does not identify any significant, unmitigated impacts. Why does the resolution contain a statement of overriding considerations if the CEQA analysis does not identify a significant, unmitigated impact?

Response: Although the San Diego Water Board found that all potentially significant impacts could be reduced to less than significant with mitigation, we nonetheless incorporated a finding and statement of overriding consideration in the Technical Report and Resolution. It was incorporated because the San Diego Water Board may not have approval authority over specific implementation projects and therefore, cannot ensure that mitigation will be incorporated when the projects are built.

We disagree that we have improperly deferred environmental analysis. The substitute environmental documents contain adequate information and analysis for the public to understand the potential adverse environmental impacts of the project. The tributary rule and where the BMPs can be located are discussed in the response to comments No. 36. The design storm issue is addressed in the response to comment No. 2.

2.1.12 Other Specific Comments

Comment No. 40: Types of BMPs Attachment 3 to this letter is a report that the City has had prepared by Weston Solutions. This report provides substantial evidence that the City will have to undertake a massive public works program in order to implement the metals and bacteria TMDLs and that the implementation program has the potential to result in significant environmental effects. The Weston report clearly indicates that the only ways that the load reductions for bacteria and metals required by the TMDL in at least portions of the Chollas Creek watershed can be achieved are by 1) preventing urban runoff and storm water from exiting the 800 storm drains outfalls in the watershed or by 2) treating the water using advanced technologies. The Regional Board response to previous City comments on this issue is that the City is wrong with regard to the percent of load reduction required. Since the TMDL is a concentration-based WLA that applies to all waters of the state in the watershed, applying an average concentration to the required load reductions is scientifically correct. If the Regional Board is going to persist with this contention, the Technical Report should contain a detailed analysis as to how a discharger complies with a concentration-based WLA using average reductions. Further the use of chlorine, or other disinfectants, ozone or ultraviolet light will likely be necessary to achieve the Wasteload Allocations proposed in the Bacti-1 TMDL.

Please clarify how compliance with the TMDL will be measured in terms of percent reduction of dissolved metals. The City's understanding is that an "average 50% reduction" would not result in compliance. Expressing compliance as an average 50% reduction is misleading.

Response: The City has misinterpreted the Regional Board's previous response. Ultimately the City needs to meet the CTR criteria in Chollas Creek. That would mean reductions as high as 98 percent and as low as 0 percent depending on location. The concentration data for Chollas Creek do not support the City's assertion and comment that dissolved copper is 88.5 percent, dissolved lead is 98.7 percent, and dissolved zinc is 77.4 percent. Concentrations of these metals are not uniformly high throughout the watershed. Our statement that the average reduction required is closer to 50 percent is not a performance standard for compliance with the metals TMDLs. Our comment was a reasonable characterization of the overall watershed.

Comment No. 41: The City needs to know how exceedances of the TMDL will be evaluated by the Regional Board. Given the above discussion regarding the Tributary Rule, the City is operating under the assumption that a discharge in excess of the Wasteload Allocations at any one of the approximately 800 outfalls in the watershed would warrant a Notice of Violation. The TMDL Technical Report should explicitly state whether a Wasteload Allocation exceedance at any single outfall would warrant a Notice of Violation and, if not, how non-compliance would otherwise be assessed? For example, if monitoring showed concentrations of zinc, copper, or lead in excess of the Wasteload Allocations at 100 outfalls during one storm event would the Board have the basis for issuing 100 Notices of Violation or one Notice of Violation?

Response: A discussion of possible enforcement scenarios is beyond the scope of this TMDL project. Please see the response to comment No. 36 for a general discussion of possible compliance monitoring approaches.

Comment No. 42: The compliance schedule proposed by the Regional Board demands a 50% reduction in exceedances of Wasteload Allocations in Year 7. The City interprets this to mean that either 400 storm drain outfalls must have no exceedances or that none of the 800 outfalls may have exceedances more than 50% of the time (or some combination thereof) by Year 7. Shouldn't the compliance schedule be driven by load reductions rather than the percent reduction in exceedances? Please provide examples how compliance would be assessed.

The City noted in May, 2005 that the TMDL is written such that load reduction of 88.5% for copper, 77.4% for zinc, and 98.7% for lead is required. The City bases this contention on the historical maximum concentrations at the mass loading station. In its response, the Regional Board replied that the City is incorrect and that the "average reduction required is closer to 50%". Since the TMDL uses a concentration-based WLA that applies to all waters of the state in the watershed, applying an average concentration to the required load reduction is not scientifically correct. The historical range of reductions required to meet the WLA, based on mass loading station data, are from 3% to 87% for dissolved copper and from 14% to 92% for dissolved lead. While the reductions needed in different subwatersheds will vary, it is the City's understanding that the WLAs must be met in receiving waters at any time. To meet the concentration-based WLA reductions of greater than 50 percent would, therefore be needed where these maximum concentrations are observed.

Response: Data were inadequate to calculate mass loading of the metals, therefore the compliance schedule could not be based on load reductions. Although compliance assessment is beyond the scope of these TMDLs, either scenario posed by the City of San Diego is plausible for assessing compliance. Please see the response to comment No. 40 concerning our statement regarding an "average 50 percent load reduction."

Comment No. 43: The City believes that the Regional Board has significantly underestimated the cost of implementing the metals TMDL. See Attachment 3 and our previous letter for additional detail. In its discussion paper, Regional Board staff erroneously indicated that the City estimate for compliance is $1 billion for a 50-acre area. The City's estimate was $1 billion for the entire watershed. Please refer to Attachment 3 for more detailed cost estimates.

Response: Correction acknowledged. The San Diego Water Board has include new cost estimates in the economic analysis section of the Environmental Analysis. The San Diego Water Board's previous cost estimate underestimated the number and cost of the Austin (type) sand filters.

Comment No. 44: The California Toxics Rule includes a 10% Margin of Safety (MOS). Regional Board staff proposes to add an additional 10% MOS.

The additional 10% MOS is unnecessary and arbitrary. It is reasonable to assume that the additional load reductions required by this additional MOS will render certain BMPs ineffective in terms of compliance in some portions of the watershed, resulting in the need to build more costly and intensive BMPs. Please describe the need for the additional 10% MOS.

Response: The two margins of safety are for different purposes and are necessary and appropriate. The CTR MOS is included as a matter of CTR protocol to ensure adequate water quality by establishing the recommended limit below the limit of impairment. The TMDLs 10 percent MOS is included to address any potential errors in the methodologies utilized to calculate the TMDLs.

Comment No. 45: Please resolve the apparent inconsistency between the following adjacent sentences in the Chollas Creek Dissolved Metals TMDL, Appendix I (July 25, 2006, page 15):

> The implementation of these TMDLs will result in improved water quality in Chollas Creek and it [sic] tributaries and will not have significant adverse impacts to the environment. Specific projects employed to implement these TMDLs may have significant impacts, but these impacts are expected to be limited, short-term, or may be mitigated through design and scheduling.

The second sentence referenced appears to indicate that certain impacts, although they may be limited or short-term, will be significant. Which impacts are significant?

Response: The inconsistency was resolved in the March 9, 2007 version of the Technical Report.

Comment No. 46: Why is the use of tiering treated differently in the Bact-1 CEQA Checklist (page R-13) than in the "Adequacy of the Environmental Review Documents for the Chollas Creek Metals TMDLs" Discussion Paper dated April 6, 2006?

Response: Both the Bact-1 TMDL and Chollas Metals TMDLs were revised to treat tiering consistently. Please see the March 9, 2007 versions of the two TMDLs.

2.2. Comments from Caltrans (September 11, 2006)

Comment No. 47: General Comments. The purpose of this document is to disclose the types of environmental impacts that may result from the construction and operation of a "representative" example of each Best Management Practice (BMP) that may be chosen for use. The project description provides insufficient information about the types of structural mitigation that may be implemented as part of the metals control program.

While the document mentions the types of mitigation projects that may be implemented by permitted agencies, it does not clearly explain how these projects would be constructed and the actions necessary to install various mitigation projects. The frequency, magnitude and duration of each action are unknown, making it difficult to understand the severity of potential environmental impacts. The project description prepared by RWQCB staff should have provided some graphics showing what these various basins and filters look like and how a typical or representative BMP might be implemented. General descriptions, their construction, and a graphic for each BMP, would greatly enhance the layperson's understanding of how they might impact the environment. While site-specific analysis is beyond the scope of this study and not warranted at this stage of the regulatory program, the San Diego Regional Water Quality Control Board (RWQCB) has at minimum, a duty to disclose, at a programmatic level, the types of impacts that might occur from the construction and operation of various types of BMPs (detention basins, wet basins, infiltration basins, sand filters, and diversions systems) in the Chollas Creek watershed. The RWQCB has primary responsibility to properly disclose, at a programmatic level, the types of impacts that can reasonably be expected to occur from program implementation. Each of these pollution control systems will have potential impacts that should be disclosed. For example, the detention and infiltration of metal-laden storm water runoff could potentially cause shallow groundwater degradation. This issue, and how the RWQCB will deal with indirect impacts to groundwater, should have been addressed more fully in the document. More specificity about the various control devices and how they are constructed and installed will enable meaningful environmental analyses.

Response: New analysis was added to the March 9, 2007 version of Appendix I, Environmental Analysis, Checklist, and Economic Factors. This analysis addresses the concerns expressed in the comment.

Comment No. 48: This document should be functionally equivalent to a programmatic Environmental Impact Report (EIR) with the primary goal of disclosing the cumulative impacts of the regulatory program. As stated in the CEQA guidelines (14 CCR 15168), a programmatic EIR should be for projects that are related geographically, logical parts in a chain of contemplated actions, connected as part of a continuing program and carried out under same authorizing statute or regulatory program and have similar environmental impacts. It is clear this program meets these four tests. In addition, if this document was prepared properly identifying potential impacts and mitigation measures, subsequent projects proposed by the permittees could agree to adopt mitigation recommendations and might rely upon it for their CEQA compliance. In its current state, all BMP implementation projects will require at a minimum an initial study by the various cities and organizations that will be regulated by this program.

Response: Please see response to comment number 34.

Comment No. 49: The RWQCB needs to provide substantial evidence for each determination in the check box response in the initial study. The Board appears to only

prepare responses for significant or potentially significant impacts and no response whatsoever for "No Impact" responses. The Board provides no factual information or substantial evidence to support many of these no impact conclusions. Mitigation measures, when discussed, are addressed only generically and not in a format that provides specificity regarding their timing, responsible party, standards of success and funding information as required by CEQA.

Response: New analysis and explanation for the "no impact" responses were added to the March 9, 2007 version of Appendix I, Environmental Analysis, Checklist, and Economic Factors. This analysis addresses the concerns expressed in the comment.

Comment No. 50: There is no information to support the No Impact claims for three out of four checklist questions [regarding scenic vistas, historic buildings, and scenic resources]. No Impact conclusions regard scenic vistas, historic buildings, or scenic resources. This section needs to provide documentation and evidence to support these conclusions.

Response: In the March 9, 2007 version of Appendix I, new analysis was added to the aesthetics and cultural resources sections of the Environmental Checklist in which the "no impact" designation was changed.

Comment No. 51: There is no information to support the No Impact conclusions regarding agriculture. It may be self-evident to Board staff, but no information is provided to the layperson to support this position.

Response: An explanation for the "no impacts" response was added to the March 9, 2007 version of Appendix I..

Comment No. 52: Construction of these various BMPs will undoubtedly generate short-term construction emissions from heavy equipment needed to grade areas for new basins or construction of sand filters. The RWQCB should disclose numerical estimates of the air emissions from a typical or representative BMP project and provide mitigation measures for those impacts. Various air quality predictive models, e.g., urban emissions (URBEMIS) and others, supported by the California Air Resources Board (CARB) should be used to make reasonable predictions. Again, no information is provided to support these conclusions.

Response: Specific numerical estimates are not discussed because of the variability of the potential BMP locations. Emission limits and tolerances may vary among municipalities and within specific land uses. The substitute environmental documents contain sufficient information and analysis for the public to understand the potential adverse environmental impacts of air pollutants, and to provide the San Diego Water Board with meaningful discussion and comment on these impacts. Site specific air

emission controls and mitigation will have to be considered when the dischargers actually begin designing and constructing BMPs.

Comment No. 53: The mitigation measures discussed in this section do not meet CEQA requirements. Measures should be discussed in detail and describe various details including timing, agency responsible, funding and measures of success. These general concepts for mitigation do not provide guidance to the cities that will comply with the TMDL and CEQA. This section provides little documentation of impacts and provides only a generic discussion of mitigation. The document should have at least presented biological information and results from the California Natural Diversity Database (CNDD), and described where existing rare, threatened or endangered plants and animals are found in the Chollas Creek watershed. Creek diversion systems could have impacts on water resources and aquatic resources in Chollas Creek and should be disclosed as required. To defer this analysis and simply state that this will be done later by the cities and others is improper and presents inadequate disclosure under CEQA. The Board is required to document the potential impacts from this regulatory program at a general level and describe in sufficient detail measures that could be implemented to reduce impacts to less than significant levels. It is a highly urbanized environment, but there is always a possibility that species might be impacted from indirect activities associated with a mitigation project due to timing, proposed laydown, and vehicle parking. The document should have identified these areas within the watershed, as well as the range of mitigation measures that could be employed by project-level permittees.

Vector control, groundwater quality, and hazards are discussed in the biology section and are misplaced. These issues should be discussed in their appropriate sections of the checklist.

Response: The March 9, 2007 version of Appendix I was expanded to include more discussion on mitigation measures. Consequently, the proposed mitigation measures are described in adequate detail for this planning level environmental analysis. More detail with respect to the timing of mitigation was added to the March 9, 2007 version of the analysis. The agency responsible for mitigation depends on the jurisdiction in which the BMPs are implemented or constructed. This analysis did not speculate on the specific locations where agencies might or might not construct BMPs. CEQA does not require the San Diego Water Board to identify funding sources for mitigation measures or measures of success. However, a mitigation is successful if it lowers the impact below the significance threshold.

Additionally, new analysis that addresses the concerns of the comment was added to the March 9, 2007 version of the biological sections, both plant and animal, of the Environmental Checklist. Vector control was appropriately relocated.

Comment No. 54: No substantial evidence or citation of literature is provided to back up the No Impact determinations provided in the document. The explanations to the checklist questions need to be revised accordingly.

Response: New analysis was added to the March 9, 2007 version of the Environmental Checklist, and in many instances the "no impact" designation was changed. Explanation of the remaining "no impact" designations were also provided.

Comment No. 55: In general, the RWQCB should focus on the benefits that will be derived from removing metals from the drainages and tributaries in the Chollas Creek watershed in this section, since it is one of the primary goals of the TMDL. No substantial evidence or citation of literature is provided to backup the No Impact determinations provided in the document for the eight checklist questions. This section needs to be revised accordingly

Response: Although removing metals from the drainages and tributaries will provide an environmental benefit, the purpose of the Checklist is to disclose adverse environmental impacts. Therefore, the benefits of the TMDLs were not discussed. Explanations of the "no impact" designation were provided in the March 9, 2007 version of Appendix I.

Comment No. 56: As previously noted, the document should have presented data from the CNDD with regard to Rare, Threatened, or Endangered (RTE) wildlife within the Chollas Creek watershed and the Estuary. It is inadequate to defer this analysis to subsequent permittee projects.

This section needs to provide better descriptions of mechanisms of potential impacts and recommended mitigation measures that maybe adopted and implemented by Tier 2 permittees to address species protected by the Migratory Bird Treatment Act (MBTA). As currently written, the reader has no idea of the range of impacts to these species.

Response: New analysis that addresses the concerns expressed in this comment was added to the March 9, 2007 version of the animal life section of the Environmental Checklist. Also, please see response to comment number 34.

Comment No. 57: The noise section needs to provide more specificity with regard to potential impact and mitigation measures that would be used by those entities implementing mitigation projects. The document should have presented information about noise ordinances or policies in noise elements of general plans of the various cities in the watershed. Predictions of noise levels from various construction activities should have been estimated to provide the reader with a sense of noise impacts and mitigations.

Response: New analysis that addresses the concerns expressed in this comment was added to the March 9, 2007 version of the noise section of the Environmental Checklist.

However, specific municipal noise ordinances or policies are not discussed because of the variability of the potential BMP locations. Noise ordinances or policies may vary among municipalities and within specific land uses. The substitute environmental documents contain sufficient information and analysis for the public to understand the potential adverse environmental impacts of noise associated with this project, and to provide the San Diego Water Board with meaningful discussion and comment on these impacts. Site specific noise controls and mitigation will have to be considered when the dischargers actually begin designing and constructing BMPs.

Comment No. 58: This section should at least attempt to quantify traffic impacts from the proposed project using various assumptions for maintenance of these devices. No substantial evidence or citation of literature is provided to back up the No Impact determinations provided in the document for the seven checklist questions. This section needs to be revised accordingly

Response: In the March 9, 2007 version of Appendix I, new analysis that addresses the concerns expressed in this comment was added to the discussion of the transportation and circulation question (no. 13.a) in which the "no impact" designations were changed. However, quantifying specific traffic impacts due to assumptions for maintenance of BMPs devices is dependant on speculation on specific BMP implementation program, type and, location, which is beyond the level of detail included in the analysis.

Comment No. 59: This section does not provide any evidence or documentation to support their conclusions and needs to be revised. There are potentially many historical and cultural sites in the Chollas Creek region that could potentially be impacted by a future implementation project. RWQCB should have conducted a records search of the Information Center of the California Historical Resources Information System and presented an analysis of the range of impacts to could occur from implementation of the various devices on these cultural resources in the watershed.

Response: In the March 9, 2007 version of Appendix I, new analysis was added to the discussion of the archeological/historical question (no. 20.a) that expands the discussion of cultural resources. Site specific historical and cultural resources and mitigation will have to be considered when the dischargers actually begin designing and constructing BMPs. At that time, the dischargers should conduct the records search described in the comment.

2.3. Comments from the San Diego Coastkeeper (September 25, 2006)

Comment No. 60: Coastkeeper supported the proposed Basin Plan amendment (BPA) as submitted to the State Water Resources Control Board (State Board) in June 2005. We understand that the State Board remanded the BPA back to the Regional Water Quality Control Board (Regional Board) for recirculation and further public comment on changes

made to the Environmental Checklist after the close of the previous public comment period. The meeting minutes of the State Board meeting on May 2, 2006 state that while "the State Water Board *does not agree* that the San Diego Water Board failed to adequately consider the significant environmental points, the State Water Board remands this Basin Plan amendment so that the San Diego Water Board, in the first instance, can consider the comments of interested persons on the substitute environmental document." (SWRCB Meeting Minutes May 2, 2006 available at http://www.waterboards.ca.gov/agendas/2006/xminutes/mins050206.pdf**,** emphasis added**)**
The remand by the State Board requires the Regional Board to collect public comments only on the portions of the BPA that were unavailable for comment during the previous comment period.

Coastkeeper continues to support the proposed BPA, and strongly agrees with the State Board that further comment should be limited to the revised documents. In our work with the city of San Diego on this matter, we understand the City will be submitting a study on TMDL feasibility. Coastkeeper has commissioned comments on that study from Dr. Richard Horner. Please find Dr. Horner's comments in the attached letter.

Response: The environmental analysis was largely rewritten in September 2006 and again in March 2007. In light of the major rewrite, taking comments on the entire environmental document was prudent. Further, because the entire Technical Report is part of the substitute environmental documents, the San Diego Water Board is obligated to allow comments on the entire substitute environmental document, including the Technical Report.

Comment No. 61: Specifically, Dr. Horner's response to the City includes the usefulness of more hydrology and soil analysis data in assessing all possible strategies for implementing the TMDL. Also, greater geographic analysis would help address some future potential problems that may be encountered in meeting the proposed TMDL. For example, the possibility of using the Low Impact Development (LID) engineering strategies, which the City's report states would reduce metal loading problems by 40 percent, could be further researched. A more detailed analysis is contained in the attached letter by Dr. Horner.

Although Dr. Horner's comment letter expresses a few concerns about the BPA, we believe the BPA should go forward. The timeline set forth in the report is both realistic and proactive. Chollas Creek has been on the EPA's 303(d) list for over ten years. It is important that the application of the TMDL begins as soon as possible.
The State Board also expressed eagerness to begin implementation of the TMDL at the May 2, 2006 meeting at which Chairman Dudoc requested that the Regional Board act upon the TMDL within the next three months. The iterative process for implementing TMDL outlined in the BPA will allow for continuing improvement upon the plan. Delaying the adoption of the BPA in order to create the perfect plan does not promote the objective of the Clean Water Act or the spirit of the TMDL provision.

Coastkeeper recommends that the BPA be approved with the current timeline. The toxicity of metals in Chollas Creek cannot be decreased without the prompt implementation of the TMDL within the schedule proposed.

Response: To allow the discharger to integrate BMP planning for all TMDLs and water quality control programs in the watershed, the San Diego Water Board extended the Compliance Schedule from 10 years to 20 years. Integrated BMP planning and implementation should minimize construction related environmental impacts, while the 80 percent load reduction in 10 years will ensure aggressive load reductions in the first decade of the program.

2.4. Comments from John W. Stump (October 12, 2006)

Comment No. 62: Missing Partners: CALTRANS: In the Chollas Watershed we have many freeways that cross it. The Martin Luther King, I-5, I-15, and I-805 freeways dump road wash directly into Chollas creek. My favorite is the drain spout on the I-805 underpass for Home Avenue. CALTRAN's must be part of the clean up.

Response: Caltrans is included in the Chollas Metals TMDLs and received a WLA along with other MS4 dischargers.

Comment No. 63: COUNTY of SAN DIEGO Most City of San Diego residents forget that their is an incorporated portion of the County in the middle of the City next to Mt. Hope Cemetery and in the Chollas water shed. There is a doughnut hole in watershed. The County controls the Air Pollution Board and Environmental Services and these agencies need to sit with us on this clean up. One of these agencies is located in the watershed. The County should be helping with our clean up efforts.

Response: The County of San Diego is included in the Chollas Metals TMDLs and received a WLA along with other MS4 dischargers.

Comment No. 64: POLICE, FIRE, PARKS and REC. These three (3) Departments must review there procedures in the water shed that may be contributing to storm water pollution. Vehicle parking, equipment draining and washing, and animal exercise and relief. Pool maintenance and draining is a concern as are practices concerning fertilizers and grounds maintenance.

Response: The City of San Diego, including all services and development projects, are included in the Chollas Metals TMDLs.

Comment No. 65: MOUNT HOPE, CHOLLAS LAKE, CHOLLAS LAND FILL and OTHER SITES During yesterdays staff presentation infiltration was dismissed because of soil conditions of vernal pools. What needs Further consideration is use of City sites

like Mount Hope, storage at Chollas Lake, use at Chollas Land Fill, Colina del Sol golf course, and other City sites. I was intrigued when faced with a Billion dollar price tag; by the San Pasqual brackish water project. We could explore a demonstration project of infiltration of brackish water as has been done in LA for downtown to begin to recover that aguafer.

Response: The San Diego Water Board cannot dictate the method of compliance with the TMDLs. The City of San Diego could consider the proposal in the comment, but we cannot compel them to do so.

Comment No. 66: REDEVELOPMENT AGENCIES & HOUSING & WORKFORCE PARTNERSHIP At least four redevelopment areas are involved in the Chollas water shed - City Heights, SEDC, Crossroads, and Barrio Logan. CCDC sends low income housing funds to these areas and is supported by its workers and infrastructure. The Housing Commission has more than 30% of its housing in the Chollas watershed. How much of the Housing Commission' Housing stock is threatened by the Westen study is unknown. These six (3) agencies could contribute to the planning process to a better solution to the water shed. They should also be asked to review their BMP's.

Response: The San Diego Water Board cannot dictate the method of compliance with the TMDLs. The City of San Diego could consider the proposal in the comment, but we cannot compel them to do so.

Comment No. 67: SDG&E , COX CABLE, SBC COMMUNICATION The Chollas watershed has for the most part above ground copper wire utilities on creosol wood poles. The impact of accelerating the schedule of undergrounding these utilities on storm water should be considered. Advancing the schedule for the Cholas community undergrounding would remove thousands of tons of copper and chemicals from Chollas water shed now.

Response: The San Diego Water Board cannot dictate the method of compliance with the TMDLs. The City of San Diego could consider the proposal in the comment, but we cannot compel them to do so.

Comment No. 68: San Diego City Schools, Community Colleges, Private Schools, Churches and Related. Absent from the staff report was the involvement of the San Diego City School representatives. San Diego City Schools may have more facilities and acres Chollas than the City. They and the others listed above should be at the table.

Response: All schools in the Chollas Creek watershed are scheduled to be regulated through the Phase II small municipal stormwater requirement, immediately upon adoption of these TMDLs. Please see the Technical Report section 11.5 for more details.

Comment No. 69: SAN DIEGO MILITARY COMMUNITY Absent from the staff report was the Military community. Most people are unaware the US military have extensive housing projects in the Mid City and City Heights. One project is over Auburn

Creek and several are directly adjacent to the Chollas Creek. The Milliarty needs to be at the table in several roles.

Response: The City US Navy is included in the Chollas Metals TMDLs and received a WLA along with other MS4 dischargers.

2.5. Comments from John W. Stump (October 13, 2006)

Comment No. 70: Chollas Creek Watershed Meetings. I also suggest that meetings regarding the Chollas Creek Watershed occur in the Chollas Creek Watershed. City Heights has several meeting facilities which are larger and better than your agency facilities which I can assist you in booking, This idea will facilitate community attendance and start saving the environment by eliminating road trips.

Response: The San Diego Water Board appreciates the willing assistance. However, at this late stage in the TMDL development, we anticipate only formal hearings and Board deliberations, which are best served by our facility. Implementation meetings could certainly take place in the watershed.

Comment No. 71: Street Sweeping Proposal - Nasty Little Bits of Evil - The City seems to be proposing as an alternate proposal to an more engineered and traditional storm water treatment facility plants demonstration programs of SPECIAL CHOLLAS CREEK STREET SWEEPING PROPOSAL.

The Devil is in the details of this SPECIAL CHOLLAS CREEK STREET SWEEPING PROPOSAL the problem faced in the movie "TIME BANDITS" they had to pick up all the "Nasty Little bits of Evils". In several places in the Chollas Creek watershed the City of San Diego already has signed special Maintenance Assessment Districts (MADs) Special Parking Permit Districts, and other controlled areas to promote regular and frequent street sweeping. The new greater program would have to be measured over this existing base line. Compliance now has been spotty. Investment would be expected to in addition to this effort. A Cost Benefit Analysis of this proposal should be made on this proposal against demonstrated program over its 20 year life for other real programs operated successfully in a comparable climate and watershed. I also suggest that this proposal only be deployed in limited areas and tributaries of this watershed until proven effective. For example, The 38th Street Canyon ,of City Heights, by the Copley YMCA may be ideal for proving up this concept because it has all of the elements discussed above. The SPECIAL CHOLLAS CREEK STREET SWEEPING PROPOSAL needs to be proven before it can delay the schedule for implementation for other proven traditional technologies.

Response: The San Diego Water Board cannot dictate the method of compliance with the TMDLs. The City of San Diego could consider the proposal in the comment, but we cannot compel them to do so.

Comment No. 72: NOTICE TRANSIT AGENCIES My comments yesterday neglected to include the transit agencies that serve the Chollas Creek watershed. As I am sure you are aware, City Heights has some of the highest ridership in the County of San Diego. Please bring the Transit agencies to the table in this matter. One solutions may to increase ridership and remove private automobiles from the roadways. Electric vehicles or trams route around the first mesa may also help.

Response: The City of San Diego, including all services and development projects, are included in the Chollas Metals TMDLs.

2.6. Comments from Brake Pad Partnership (November 3, 2006)

Comment No. 73: As the facilitator of the Brake Pad Partnership, it has come to my attention that the Total Maximum Daily Load (TMDL) for Copper, Lead, and Zinc in Chollas Creek, Tributary to San Diego Bay, which is due to be approved by the San Diego Regional Water Quality Control Board on November 10, has important relevance to the work of the Brake Pad Partnership. I would like to convey two important concerns I have regarding the copper portion of the proposed TMDL. My first concern is that the implementation plan as currently written will encourage San Diego stormwater managers to take actions that would undermine the work of the Brake Pad Partnership, which provides an important benefit to the State of California. My second concern is that the implementation plan as currently written does not allow for adaptive implementation, which would allow Regional Water Quality Control Boards and stormwater managers to respond to new information that the Brake Pad Partnership is currently developing.

The Brake Pad Partnership
The Brake Pad Partnership is a multi-stakeholder effort to understand and address as necessary the impacts on stormwater and surface water quality that may arise from brake pad wear debris generated in the use of passenger vehicles. Since 1997, brake pad manufacturers, water quality regulators, stormwater managers, and environmental groups have been working together to evaluate the potential impacts of copper from brake pads on water quality in the San Francisco Bay.
The collaborative nature of the Partnership is grounded in several key foundational commitments: (1) brake pad manufacturers have committed to introducing new products, which would be available to all of California and the Nation, if the Brake Pad Partnership determines that brake pad wear debris is a significant source of copper to the Bay; (2) regardless of the Partnership's findings with respect to copper, brake pad manufacturers have committed to incorporating the evaluation approach developed by the Partnership into their existing practices for designing products that are safe for the environment while still meeting the performance requirements demanded of these important safety-related products; and (3) all stakeholders have agreed to work collaboratively within the Partnership, and to not simultaneously sponsor, pursue, or promote legislative or legal action relating to brake pads, prior to the completion of the Partnership's technical studies and resultant action plan.

Technical Studies Currently Underway

The Brake Pad Partnership is now conducting the technical studies needed to understand the role of copper from automobile brake pad wear debris on stormwater and surface water quality. These technical studies are supported by a State Water Resources Control Board Coastal Nonpoint Source Pollution Control Program Grant, pursuant to the Costa-Machado Water Act of 2000 (Proposition 13), and a grant that is currently pending from the California Department of Transportation (Caltrans). These grants support the Partnership's effort to carry out a set of interlinked laboratory, environmental monitoring, and environmental modeling studies to understand the fate and transport of copper from automobile brake wear debris in the environment. The Partnership initiated work on these studies in October 2003 and plans to complete them in December 2007, and will be followed immediately by the development and implementation of an action plan in early 2008.

Need for Incorporation of the Brake Pad Partnership into the Proposed TMDL Implementation Plan

As currently written, the implementation plan will encourage San Diego stormwater managers to take actions that could jeopardize the beneficial contributions of the Brake Pad Partnership in developing sound and effective strategies for addressing copper in brake pads as a source of copper in stormwater. Specifically, the pursuit of legislative or legal actions relative to brake pads and stormwater quality prior to the completion of the Brake Pad Partnership's work could likely lead to the collapse of the collaborative effort that has made our successes to date possible.[8] The result would be the abandonment of the current technical effort and loss of critical information, as well as the loss of important copper usage data that is made publicly available from brake pad manufacturers through the Brake Pad Partnership.

As an alternative, I recommend that the TMDL implementation plan be revised to specifically include the Brake Pad Partnership, and to encourage San Diego stormwater agencies to work in partnership with the brake pad manufacturing industry. This is the strategy that the San Francisco Bay RWQCB (Region 2) is taking with its permittees. The Brake Pad Partnership is a component of the implementation plans for addressing copper impairment listings in the San Francisco Bay Area. In June 2002, Region 2 promulgated site-specific objectives for dissolved copper in the San Francisco Bay south of Dumbarton Bridge and established requirements that local stormwater managers and point source dischargers implement a set of actions to prevent increases in dissolved copper concentrations.[9] The implementation actions are contained in the *Copper Action*

[8] Information on the Brake Pad Partnership and its technical results to date are available on our website at: http://www.suscon.org/brakepad/index.asp. The "Documents" page contains all of our most current technical reports and the "Technical Reference Library" contains a compilation of abstracts of scientific and engineering publications relating to the transport and fate of copper from brake pad wear debris in the environment. Hard copies of these publications are available at the US Environmental Protection Library in San Francisco.

[9] San Francisco Bay Regional Water Quality Control Board (SFBRWQCB) 2002. Staff Report on Proposed Site-Specific Water Quality Objectives and Water Quality Attainment Strategy for Copper and Nickel for San Francisco Bay South of the Dumbarton Bridge. Prepared by Richard Looker, May 15, 2002.

Plan,[10] and have subsequently been incorporated into discharge permits as appropriate. With regard to copper from automobile brake wear debris, discharger "support" of the Brake Pad Partnership is included as a baseline action for the copper control strategy. As a part of addressing the impairment listings for copper in the San Francisco Bay North of the Dumbarton Bridge, Region 2 is developing site-specific objectives for copper and a Bay-wide implementation plan supporting those objectives. The implementation plan will contain required actions for wastewater sources, shoreline activities, and for urban runoff management agencies. Region 2 is already developing permit provisions for urban runoff programs that will be consistent with the implementation plan for the copper objectives. These permit provisions address industrial copper sources, architectural and pesticidal uses of copper, and automobile brake pads. It is anticipated that these permit provisions will state that urban runoff management agencies have an affirmative responsibility to avoid or minimize the release of copper by controlling all sources in their program areas. However, it is also anticipated that the provisions will recognize that the Brake Pad Partnership is close to completing its work. Accordingly, the permittees will be encouraged to continue to support the Partnership efforts, and participate in the development and implementation of the resultant action plan for addressing copper from brake pad sources. The permit provisions will likely call for additional control measures for copper, including copper from brake pads, but the need for these additional measures will be determined, at least in part, by the nature and extent of Partnership outcomes. The Bay Area dischargers' participation in and support of the Brake Pad Partnership, in conjunction with the Bay Area Stormwater Management Agencies Association, has been critical to the progress we have made to date.

Need for Adaptive Implementation Provisions
The results of the Brake Pad Partnership's work will provide important information regarding copper control management strategies and timelines for source control actions. I recommend that the proposed TMDL implementation plan be revised to include an adaptive implementation provision that will allow for the incorporation of new information resulting from the Brake Pad Partnership and other sources that will have implications for the most effective means of meeting the TMDL requirements. Through the work of the Brake Pad Partnership, we have learned a tremendous amount about the transport and fate mechanisms for copper from brake pad wear debris in the environment that have important implications for stormwater management, and we are continuing to learn more through the remainder of our planned technical studies. In addition, the Brake Pad Partnership is focusing on understanding brake pad manufacturers' required timelines for technology and new product development and the deployment of new products on new vehicles (through original equipment suppliers) and used vehicles (through replacement pads). Both the technical and timing information will be critical to achieving an effective copper control strategy.

Response: The San Diego Water Board appreciates the efforts put forward by the Brake Pad Partnership, and encourages the Partnership to work together with all identified dischargers to reduce copper loading in the Chollas Creek watershed. The San Diego

[10] Tetra Tech, Inc., Ross & Associates Environmental Consulting, Ltd., and EOA, Inc. 2000. Copper Action Plan, Final Report, June 2000. Prepared for the City of San Jose.

Water Board is optimistic that the 20 year TMDL schedule will work well with the efforts outlined by the Partnership above.

3. COMMENTS FOR MARCH 9, 2007 TMDL DOCUMENTS

3.1. Comments from Tershia d'Elgin (March 30, 2007)

Comment No. 74: As We've been talking with Chris Zirkle about dead-end streets in canyons and what to do about them. I'm a bit fuzzy about the limitations, but as Chris explained to me, the board has discretion on where the TDML applies, but under the current scheme, the City is only motivated to repair above the outflow. I guess the board has put forward language _http://www.waterboards.ca.gov/sandiego/programs/programs.html_ (http://www.waterboards.ca.gov/sandiego/programs/programs.html) that states that killing wetland vegetation by eliminating dry weather flows is a less than significant impact.

I can provide visual and data evidence that the present flows are contributing to sedimentation, headcutting, and pollution. Eliminating dry weather flows will only increase degradation when storms occur. We would like to encouraging BMPs in canyons to treat runoff (not UV filtration facility, obviously).

Response: The environmental documents do not state that "killing wetlands" is a less than significant impact. Habitat conversion which restores natural non-wetland habitat and removes exotic species dependant on pollutant laden nuisance flows is a less than significant impact. Various structural BMPs, such as infiltration, diversion, and equalization basins, will likely be incorporated in the Chollas Creek watershed. A probable long term outcome is the attenuation of peak flows during storm events. This reduction of peak flow will probably result in less sedimentation and headcutting, and pollution will also likely be reduced by the pollution cleaning functions of the structural BMPs. Therefore, any increase of sedimentation, headcutting, and pollution, due to decreases in nuisance flow dependant non-native plant propagation, will likely be offset by the reduction of peak storm flows and the pollution cleaning functions of the structural BMPs.

3.2. Comments from City of San Diego (April 9, 2007)

Comment No. 75: The City of San Diego would like to take this opportunity to express our appreciation to the Regional Board for reviewing our compliance schedule concerns and modifying the compliance schedule. On page 72, the modified compliance schedule is for all pollutants listed in the watershed. The City of San Diego is concerned that new pollutants listed in at the end of the proposed compliance schedule will be required to achieve compliance is a condensed time schedule.

Response: The San Diego Water Board has modified the compliance schedule based on the City's recommendation, which included the strategy to incorporated all water quality

projects under the twenty timeline. Where feasible, new pollutants that are listed during the 20 year implementation schedule should be included within this timeline. Feasibility will have to be determined on a case by case basis.

Comment No. 76: The City has previously submitted substantial evidence documenting expert opinion of this issue. The Regional Board is required to prepare environmental analyses for the TMDLs to assess the impacts of implementing a reasonable range of alternative means of compliance. By understating magnitude of structural treatment facilities needed to comply with the TMDLs, the City believes that the existing environmental analysis does not fulfill the Regional Board's obligation under CEQA.

In summary, construction of hundreds of acres of structural treatment facilities, in conjunction with maximizing infiltration opportunities, will be necessary to comply with the required bacteria and metals load reductions. No evidence has been presented by anyone to suggest that solutions other than infiltration/diversion or treatment of entire rain events can result in compliance. The TMDLs allow no exceedences of load reductions regardless of storm size or duration; therefore, regardless of the treatment mechanism selected (grass swales, retention, biofiltration, sand filters, etc.), treatment facilities will need to incorporate acreage-intensive detention/equalization facilities because storm water cannot be treated as fast as rain falls from the sky – certain contact times are required. The significant impacts to existing development from construction of these treatment and equalization facilities has been previously documented and was calculated based allowing one exceedence every three years. The City suggests that the TMDLs include an exceedence frequency and that the Regional Board's environmental analysis include an analysis of the acreage required for treatment based on the exceedence standard. What storm size or exceedence frequency was used by Regional Board staff to calculate the costs of implementing the TMDLs?

Response: The evidence, in the form of the Weston report, submitted by the City outlines some of the challenges which will be faced in complying with the TMDLs. However, the Weston report presented very few options as solutions to the challenges. Securing dam permits (to increase basin depth and decrease basin size) as discussed in the response to comment No. 14, may be more reasonable than private property demolition to make room for large equalization basins.

No storm size or exceedance frequency was used to estimate the cost of implementing the TMDLS. Estimates in the substitute environmental documents were generated utilizing observed annual stormwater volumes in Chollas Creek. Base on the average volume, a cost to treat the entire annual volume was determined. This annual cost was divide by ten as a broad and convenient tool to aid dischargers in estimating the total required cost based on the 10th portion of the urbanized watershed needing treatment. For example, if the discharger determines that 36 percent of the urbanized watershed will require treatment, then the cost based on the 10th portion can be multiplied by 3.6 to obtain as reasonable cost estimate. Please see section 7 (Economic Factors) of Appendix I of the Technical Report, for additional details. In addition, please see answers to comment numbers 36 and 37.

Comment No. 77: The environmental analysis for both TMDLs states that the construction of treatment BMPs has the potential to displace crops, native biota, and existing land uses but suggests that these impacts can be avoided or minimized by locating treatment BMPs where these things are not present. However, all evidence presented dictates that compliance via treatment requires treatment facilities to be located close to and upstream of storm drain outfalls. Even if treatment facilities are built underground, structures cannot be re-built on top of them. Instead of indicating where treatment BMPs should not be located, the City suggests that the environmental analyses focus on where treatment BMPs may reasonably be located and evaluate the impacts of building treatment BMPs at those locations.

Response: The CEQA requires the San Diego Water Board to consider a reasonable range of specific sites in its analysis, but does not require us to speculate on the specific locations where the dischargers may or may not choose to build BMPs. However, in evaluating potential impacts of BMPs, we considered what those impacts might be in all land use types present in the watershed. We disagree that structures cannot be built on top of underground detention basins. Please also see answers to comment numbers 36 and 37.

Comment No. 78: The environmental analyses for both TMDLs identifies as a reasonably foreseeable means of compliance the diversion of dry weather flows to infiltration or sanitary sewer facilities. The current environmental analyses analyze the effects of this compliance mechanism on native, downstream wetland vegetation which is dependent upon these flows; however, the conclusion regarding the significance of this impact is not clear. Overall, the conclusion seems to be that the loss of wetland vegetation which would occur after dry weather flows are diverted is less than significant because remaining and replacement vegetation would be more similar to that which persisted prior to development (i.e., native, upland vegetation). This conclusion that the loss of wetland vegetation is not significant is inconsistent with State policy and the Regional Board's own 401 certification requirements. Have trustee agencies such as the California Department of Fish and Game were consulted on this conclusion? The City suggests that this issue be clarified in revised environmental analyses.

Response: Wetland vegetation dependant on nuisance flows in Chollas Creek is likely not "native." The San Diego Water Board 401 requirements derive from the Army Corp of Engineer's 404 certification requirements. The San Diego Water Board, as a certifying agency for the 404 program, has broad leeway in certification and mitigation requirements. Ensuring nuisance flow dependant non-native pest species plant propagation is not consistent with the San Diego Water Board 401 requirements.

We requested consultation with the California Department of Fish and Game (DFG) and the Air Resources Board, both trustee agencies with pertinent potential interest in these TMDLS. In discussions with Kelly Fisher at the DFG, she stated that constructing TMDL BMPs could be a possible concern depending on each case, and that the DFG would be involved for streambed alteration agreements and comment during CEQA review when dischargers actually design and site specific BMPs.

Comment No. 79: Page R-5/page 4 of the environmental analysis for the Bacti-1 TMDL/Chollas Dissolved Metals TMDL indicate that the environmental analyses do not require an examination of every site but a reasonably representative sample of them. Please describe the sample set of sites that were examined in the analyses.

Response: The substitute environmental documents evaluated specific sites where BMPs could be located, in each of the major land use types in the watershed, including residential, industrial, commercial, roadways and open space land uses. Please see section 6 (Reasonably Foreseeable Methods of Compliance at Specific Sites) of the Appendix I of the Technical Report, for more details.

Comment No. 80: Page R-10/Page 7 of the environmental analysis for the Bacti-1/Chollas Dissolved Metals TMDL indicate that sand filters are a good options in densely developed urban areas since the filters occupy minimal space. The City has submitted evidence that sand filters and equalization facilities that would be needed to achieve the Chollas Dissolved Metals TMDL would in fact occupy hundreds of acres of space in order to treat a 3-year storm. Please provide a reference for this statement and quantify the meaning of "minimal".

Response: The storm drain sand filters, located at the storm drain inlet occupy minimal space compared to other structural treatment controls at the end of storm drains. For example, the City based the sizing of the equalization basins at the end of storm drains on a 3 foot depth, neglecting to analyze deeper equalization basins in order to avoid securing a dam permit. Deeper equalization basins will decrease the overall BMP footprints.

Comment No. 81: While both environmental analyses note where treatment BMPs should not be built (on Prime Farmland, in special status species habitat, in areas developed with privately-owned land uses), neither analyses identifies where treatment BMPs could reasonably be built. This listing of suitable locations is critical to a determination of whether construction of treatment facilities would result in significant impacts.

Response: Avoidance is a standard mitigation measure, thus the analysis discusses where treatment BMPs should not be built. The San Diego Water Board is not required to speculate on where the discharger may or may not choose to construct BMPs. However, in discussing potential impacts, we considered constructing BMPs in all land use types.

Comment No. 82: Please clarify where compliance would be measured for both TMDLs. How would an evaluation of compliance take into account pollutants such as feral animal excrement and aerially-deposited metals that are allowed into receiving waters downstream of storm drain outlets?

How will compliance take into account the aerial deposition from mobile sources and that has been documented by the City? Some of this deposition occurs and is introduced into the storm water stream below storm drain outfalls. Does the Regional Board intend to establish a Load Allocation for this pollutant source?

Response: Please see answers to comment numbers 36 and 38.

Comment No. 83: Page R-19/page 15 of the environmental analyses for the Bacti-1/Chollas Dissolved Metals TMDLs indicate that short term construction impacts are not considered to be potentially significant. Why are these impacts considered less than significant on these pages and answered "less than significant" in the discussion section when mitigation measures, in the form of mufflers and lighting plans are recommended?

Response: Thank you for the comment. The designation "less than significant" has been changed to "less than significant with mitigation" in the substitute environmental documents.

Comment No. 84: Please clarify the significance determination for changes in native flora and fauna that would result from diverting dry weather flows from storm drain outfalls where the flora and fauna are dependent upon dry weather flows. How would the loss of dry weather flows and the concurrent loss of wetland vegetation affect the habitat-related beneficial uses in the receiving waters? How would the loss of native and vegetation due to diversion of dry weather flows affect temperature in the receiving water?

Response: The significance thresholds used to assess potential impacts to plants and animals are as follows: 1) No net reduction in native or beneficial (high value) plant species. 2) No net loss of number of plant species or area of natural pre-development habitat. 3) No barriers to native or high value plant communities and no introduction of non native species. 4) No net loss of native or beneficial animal species. 5) No deterioration of high value beneficial animal habitat compared to current conditions.

Habitat-related beneficial uses for Chollas Creek include Warm Freshwater Habitat (preservation and enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates), and Wildlife Habitat (preservation and enhancement of terrestrial vegetation, habitat, wildlife, or wildlife water and food sources). A reduction or loss of dry weather flows may affect the present habitats found in and near Chollas Creek. Wildlife use of the creek as a drinking water source may be impacted with flow reduction; however, improvements in the water quality of the remaining water in the stream should be beneficial to wildlife.

A decrease in the flow volume and flow duration during dry weather conditions most likely would return the stream ecosystem to a more natural, pre-development condition,

which may include a reduction in total plant biomass, a change in the plant diversity (increase or decrease), or a decrease in certain non-native or invasive plant species.

The changes in plant species could positively or negatively impact wildlife. Loss of invasive or non-native plant species will allow space for native plant species to grow. The native wildlife species are adapted to the native plant communities which comprise wildlife habitat. They use the plant community for food and shelter for themselves and indirectly as food and shelter for their prey. In addition, the opportunity for restoration/enhancement of native plant species could be developed to benefit wildlife. If native plant communities naturally do not overtake the areas where biomass was lost, then restoration efforts should be considered.

A detailed explanation of how plant and animal species may respond to changes in stream flow during dry weather can be found in Appendix I, in the explanations to questions 4a and 4d.

Summertime dry weather flow in Chollas Creek that existed before extensive urban development in the watershed likely was supported by groundwater seepage into the channel. Since there is no groundwater development in Chollas Creek to lower the water table, dry weather base flow from groundwater seepage is likely to be at or higher than under pre-development conditions, due to a rise in the groundwater table from irrigation water recharge. Eliminating nuisance flows should not alter the dry weather flow in Chollas Creek due to groundwater seepage. Thus, reaches of Chollas Creek with perennial stream flow and riparian or wetland habitats should not diminish below pre-development levels.

Assuming that some flow remains in the stream, loss of vegetation may affect the stream temperature in two ways: by reducing canopy cover (if the vegetation lost is tall enough to shade the stream), or by reduction in flow from evapotranspiration. Vegetation that provides canopy cover will shade the water thereby preventing an increase in water temperature due to direct sunlight. Similarly, the shading will reduce the amount of evaporation in the stream, thereby maintaining a lower water temperature. Conversely, vegetation in and near a stream will absorb water from the stream or water table, which would then reduce the amount of water in a stream and increase water temperatures.

These temperature effects from reduced flows will be less than significant for Chollas Creek because pre-development conditions would not provide aquatic habitat during the dry season, and therefore, instream habitat would naturally be minimal or nonexistent during the dry season. Presently, species native to San Diego County may occur in Chollas Creek, but would not occur without anthropogenic sources. Net loss of native habitats or loss of species diversity will not be tolerated, as defined by the significance thresholds in the first paragraph of this response. Mitigation is expected for any losses that may occur due to this project.

Comment No. 85: Mitigation measures in the environmental analyses for both TMDLs specify maintaining dry weather flows for purposes of maintaining certain animal populations. What is the reasonably foreseeable means for maintaining these flows given that the flows must also comply with the WLAs?

Response: The substitute environmental documents for the Chollas Creek metals TMDLs do not require maintaining dry weather nuisance flow.

Comment No. 86: Both TMDLs provide cost estimates for compliance using a variety of structural and non-structural BMPs based on data from EPA and CASQA. What is the design storm or exceedence frequency assumed in the cost estimates listed? In one example, page 70 of the environmental analysis for the Chollas Creek Dissolved Metals TMDL refers to treating 29,072,731 cubic feet of storm water, referring to this quantity as an annual "average". However, the TMDLs do not limit compliance to an average year. How does the lack of a design storm/allowable exceedence frequency affect the cost calculation?

Response: The cost estimates were based on average annual measured flow volumes for Chollas Creek. Until a design storm is selected, the two approaches cannot be compared. However, the City's high range cost estimate of 900 million dollars in the Weston Report is similar to ours. Please also see the answer to comment No. 76.

Comment No. 87: Both environmental analyses reference the costs and effectiveness of Caltrans' BMPs. What was the storm size that the Caltrans BMPs were designed to and are they effective in wet weather. If they are effective in wet weather, please extrapolate the acreage required for the BMP and its equalization facilities to give a fair representation of the acreage required in the watersheds affected by the TMDL.

Response: The Caltrans BMPs referred to above were not extrapolated into BMP acreage requirement because of the potential variability in BMP design. However, all construction related adverse environmental impacts and mitigation has been provided. Please also see answers to comment numbers 76 and 80.

Comment No. 88: Given known data regarding water quality in the affected watersheds, what approximately is the percentage of a typical storm event that would need to be treated in order to comply with the TMDL? In other words, would "first-flush" treatment likely achieve loading requirements throughout a typical storm?

Response: CEQA does not require this level of detail. For a discussion on design storm please see the answer to comment number 2.

Comment No. 89: In discussing impacts to population and housing, the environmental analysis for both TMDLs recommends evaluating and implementing more reasonable alternatives such as nonstructural BMPs and low impact and/or small scale BMPs before considering an alternative that would create considerable hardship for the community in the area. This is what the City proposed in its September, 2006 correspondence; however, the City concluded that such efforts would most likely not result in compliance. Please expand on how the Regional Board envisions that this means of compliance would roll out given the interim compliance goals.

Response: If the dischargers choose this BMP approach, how it would roll out depends on how quickly the dischargers conduct feasibility studies, select sites for implementation, and secure financing for construction. If this approach does not result in compliance, the City of San Diego would have to combine this approach with other BMP alternatives.

Comment No. 90: Is it possible to increase the WLAs for either TMDL (i.e., as a result of new Site Specific Objectives, change to beneficial uses, results of implementing a tiered approach, completion of the bacteria reference study) after the TMDL is incorporated into the San Diego Municipal permit?

Response: Yes it is possible to increase the WLA after the TMDLs are incorporated into the municipal stormwater requirements as a result of new site specific objectives, or a change to beneficial uses. TMDLs and WLA would be recalculated and incorporated into the Basin Plan, after which, the WQBELs in the municipal stormwater requirements would be revised. NPDES regulations [40 CFR section 122.44(l)(1)] prevent backsliding unless the circumstance upon which the previous permit was based have materially and substantially changed since the time the permit was issued. New site specific objectives, or a change to beneficial uses would qualify as a material and substantial change of circumstance so less stringent WQBELs could be allowed.

Comment No. 91: When is it anticipated that the TMDLs will be incorporated into the San Diego Municipal permit?

Response: No later than the next re-issue of those Waste Discharge Requirements.

Comment No. 92: The City requests that both TMDLs include a re-evaluation provision so that the need for the final WLAs can be formally re-evaluated after non-structural and less-intensive BMPs are evaluated for their maximum effectiveness.

Response: TMDLs are adaptive. Together with compliance monitoring, SCCWRP studies, TetraTech modeling studies, better characterization of hardness, and other new water quality information, we anticipate the need to re-evaluate the TMDLs, including the WLAs and changing from concentration based TMDLs to ones that are load based.

We recognize that it is in the City's best interest to re-evaluate pertinent concerns before capital resources are committed to design and build structural BMPs. However, because we don't know when we will have enough new data to justify re-evaluating the TMDLs, or what our TMDL priorities will be in the future, we do not include a re-evaluation provision in the Implementation Plan.

Comment No. 93: Page R-61/page 57 of environmental analyses for the Bacti-1/Chollas Dissolved Metals TMDLs indicates that the analyses do not analyze all possible means of compliance because alternative means of compliance consist of the different combinations of BMPs that dischargers might use and there are innumerable ways to combine BMPs. The preceding is correct in that the analyses not include combinations of BMPs that are not expected to result in compliance with the WLAs in the TMDLs. However, the analyses unfortunately do not list any single BMP or combinations of BMPs that 1) are documented to result in the required load reductions and 2) will not have significant impacts by displacing existing development. Please list a single combination of non-structural and less-intensive BMPs that will result in compliance with the Bacti-1 TMDL and, for the Chollas Creek watershed, both TMDLs.

Response: The substitute environmental documents contain sufficient information and analysis for the public to understand the potential adverse environmental impacts of the project, including the impacts from any possible combination of BMPs, and to provide the San Diego Water Board with meaningful discussion and comment on these impacts. The CEQA does not require the level of detail requested in the comment for a planning level analysis. The dischargers are responsible for determining the specific BMPs that will be implemented at specific locations, and for evaluating the potential site specific environmental impacts of those BMPs. Because the size of BMPs can be minimized through the types of BMPs selected, and engineering solutions exist to minimize the footprint of BMPs, displacement of existing development will not like be on a scale that will cause significant environmental impacts.

Comment No. 94: Why is there such a large discrepancy between the cost estimates in the Chollas Creek watershed to comply with the two TMDLs (Tables R-3 and I.2)? As suggested previously, the environmental analyses for the TMDLs should address the cumulative effects of both TMDLs (in terms of cost insofar as such an analysis is required, but certainly in terms of environmental impacts).

Response: Cost discrepancy between Tables R-3 and I.2 come from utilizing different sources for cost reference. Cost estimates can differ significantly. For example, a sand filter built by Caltrans is much more robust in design and construction (therefore more costly), compared to a small sand filter retrofit for a city street. Where the same sources were utilized in the two tables (i.e., diversion structures), the cost indicated for Chollas watershed are identical.

Comment No. 95: The City is requesting that San Diego State University and any other universities and colleges be notified to participate in these TMDLs and the Phase II Municipal Storm Water Permit program.

Response: The implementation plan was revised to require the enrollment of all small MS4 owners/operators in the Chollas Creek watershed, immediately upon adoption of these TMDLs. In Chollas Creek, these persons are the La Mesa, Lemon Grove, and San Diego School Districts. Please see section 11.5 of the Technical Report. This section states that the San Diego Water Board shall require the school districts to submit Notices of Intent to comply with the requirements of Order No. 2003-0005-DWQ, the General NPDES requirements for the discharge of stormwater from small MS4s.

Comment No. 96: Page 6 of the environmental analysis for the Chollas Dissolved Metals TMDL states that certain BMPs were not considered as an option because they would require condemnation and demolition of large areas of private property and that cheaper and smaller BMPs are available to meet the WLAs of the TMDL. A number of various BMPs are then listed. Please provide citations showing that the BMPs listed, or combinations of the BMPs listed, will achieve the WLA of the TMDL and the acreage required for their construction.

Response: Please see the response to comment No. 93.

Comment No. 97: Page 7 of the environmental analysis for the Chollas Dissolved Metals TMDL does list removal efficiencies for bioretention facilities that would appear to result in TMDL WLA compliance. City staff followed up with the professor who conducted the experiments referenced by Regional Board staff. In order to achieve metals removal in the range of 95%-97%, the flow rate through the bioretention facility was an order of magnitude slower than the flow rate estimated by the City for sand filters. Please provide the acreage required for bioretention facilities, including the required equalization facilities, to comply with the TMDL.

Response: As discussed in the response to comment no. 2 and elsewhere, specific BMP design features such as acreage requirements are beyond the scope of our analysis. The discharger will be responsible selecting appropriate site specific BMPs and for evaluating site specific environmental impacts.

Comment No. 98: At what point of the approval process does the implementation period (e.g., 20 years for the Chollas Dissolved Metals TMDL) begin?

Response: Upon approval of the metals TMDLs by the Office of Administrative Law.

Comment No. 99: Please resolve the discrepancy in the environmental analysis for the Chollas Creek Dissolved Metals TMDL on page 71 where compliance via sand filters is estimated at $1.19 billion and Table I.2 where compliance via sand filters (assuming 100% treatment) is estimated to cost $150 million.

Response: Cost estimate can vary. We have provided two estimates, for sand filters in Appendix I, one from USEPA, and one from Caltrans for the more expensive Austin sand filter. The actual cost estimates will have to be determined by the discharger based on site specific factors prior to BMPs construction.

Comment No. 100: Page 26 of the environmental analysis for the Chollas Creek Dissolved Metals TMDL describes flood hazards that could occur if BMPs are not properly designed and constructed to allow for bypass of storm water that exceed design capacity. What storm size is it expected that BMPs will be designed to?

Response: Please see the answer to comment No. 2.

Comment No. 101: Based on the City's recently-submitted aerial deposition study, we disagree that, aerial deposition is only a "potential" source of pollution (page 2 of the Chollas Creek Dissolved Metals Technical Report), that aerial deposition is "not considered significant at this time" (Ibid, page 7). The subject study, though not peer-reviewed, constitutes "substantial evidence" that aerial deposition plays a major role in Chollas Creek.

Response: The Technical Report concludes that direct aerial deposition of metals into Chollas Creek is not a significant source of metals because the surface area of Chollas Creek is so small compared to the rest of the watershed. Aerial deposition of metals throughout the watershed is likely a source of metals that are washed off the land surface and conveyed to Chollas Creek via MS4s.

3.3. Comments from Sierra Club (April 9, 2007)

Comment No. 102: We recommend that 10 year alternative compliance schedule be adopted instead of the preferred alternative 20 year compliance schedule for the metals in Chollas Creek for the reasons explained below.

The primary reason is that the extended schedule will conflict with the RWQCB Cleanup and Abatement Order for the shipyard site sediments. These sediments are just north of Chollas Creek and are highly contaminated with copper, zinc and other trace metals. We expect that the shipyard cleanup will be completed before the 20 year Chollas Creek compliance schedule. Cleanup of the shipyard sediment requires that recontamination by additional metals loading must not occur. The 20 year Chollas Creek metals TMDL compliance schedule would allow copper, lead, and zinc to be discharged into the bay, be

transported to the shipyard site well after the shipyard sediments have been cleaned up, and re-contaminate the shipyard site. This is clearly not acceptable.

Response: Achieving 80 percent compliance with the WLAs by year 10 of the compliance schedule should ensure that dissolved copper concentrations in San Diego Bay at the sediment cleanup sites are low enough not to cause dissolved metals to flux from the water column into the sediment. Therefore, the extended compliance schedule likely will not impact sediment cleanup.

Comment No. 103: The second reason is that the 20 year compliance schedule has not been adequately justified. The Reasonable Alternatives to the proposed activity in are presented in Section 8 of Appendix I Environmental Analysis, Checklist, and Economic Factors. Two alternative compliance schedules are given; the ten year schedule alternative for metals load reduction only and the 20 year compliance schedule for metals, bacteria, diazinon, and trash. The reason provided for the longer 20 year compliance schedule is to allow time for the discharger to integrate BMP planning, design and implementation to reduce the bacteria, diazinon and trash loading. Table 16.1 lists the public participation milestones. The first workshop took place in August 1999 almost 8 years ago. The initial draft TMDL was released in March of 2005. We attended the May 18, 2005 informal meeting of interested parties to discuss the compliance schedule and supported the 10 year compliance schedule. We believe that there has been ample time already to begin planning. It does not seem reasonable that the time to implement the diazinon TMDL would justify some of the increased schedule because It EPA has ordered the phase out and stopped retail sales of diazinon effective on December 31, 2004. Just exactly how the trash TMDL justifies the extended compliance schedule is not given.

Response: The diazinon TMDL was included because opportunities may exist to coordinate education and outreach on integrated pest management, trash reduction, pet waste reduction, and elimination of nuisance flows. Likewise, compliance monitoring for all of these water quality programs could be integrated to increase efficiency and effectiveness and lower costs. Trash is a major concern for the Chollas Creek watershed, and coordinating BMP implementation to include trash abatement is consistent with the San Diego Water Board mission. The potential high cost of TMDL implementation estimated in the substitute environmental document, roughly agrees with that estimated in the City of San Diego's Weston report. Based in part on this, and the potential for BMP coordination to eliminate uncertainties, a 20 year compliance schedule is justified.

3.4. Comments from San Diego Coastkeeper (April 18, 2007)

Comment No. 104: Our organization wrote letters of concern dated September 25, 2006 and February 12, 2007 stating our sincere hope that the Regional Water Board would comply with the State Board's request for the Regional Board to comply with the remand for the noticing requirements within three months. Unfortunately the Regional Board has decided to forego our concerns and further postpone the TMDL adoption process by

unexplained delays, creation of substantive changes, and doubling the compliance schedule.

Almost within the same breath of State Board Chair Doduc's request for the Regional Board to comply with the noticing requirements within three months, Boardmember Baggett's suggested amendment that the remand be amended to allow additional TMDL compliance time pursuant to similar TMDL time schedules was voted down. Again, this means that the Regional Board was only required to revise the remanded portions of the TMDL, specifically noticing and re-circulation under CEQA, and not reinvent the provisions or timeline for implementation.

Response: Although we were not required to revise the TMDLs' Technical Report in any way, only recirculate it to cure a deficit in our adoption process, we did so for two reasons. First, we revised Appendix I to be consistent with the Court of Appeals' interpretation of the CEQA requirements for certified regulatory programs in the Court's decision on the City of Arcadia vs. State Water Resources Control Board case. Second, in the fall of 2006, the City of San Diego proposed the 20 year compliance schedule for integrated bacteria and metals BMP planning and integration. Along with the proposal, the City of San Diego provided compelling evidence that integrated planning and implementation would be more effective and efficient, would help keep costs down, and would minimize adverse environmental impacts from construction projects. To minimize the water quality effect of extending the compliance schedule from 10 years to 20 years, the San Diego Water Board added the interim milestone of an 80 percent reduction in 10 years.

Comment No. 105: Coastkeeper is extremely concerned and disappointed as the Regional Board's revisitation and revision of the TMDL doubles the compliance schedule from ten years to twenty. Had the Regional Board adopted the TMDL as per the State Board's request, implementation could be beginning. It is in the interest of all parties to anticipate consistency and certainty of decisions. By revisiting the TMDL and fundamentally changing its temporal effect, the Regional Board's actions are only continuing to delay the cleanup process. We also fear the path this TMDL took will discourage the kind of collaborative process between stakeholders that led to the initial compliance timeline.

Response: Please see response to comment No. 104.

Comment No. 106: While we disagree with the expansion of the compliance schedule and though we still believe the ten year timeline was aggressive yet fair, we do take note of and appreciate that 80% of the implementation will be completed within the first ten years. We are working with the City of San Diego to help them find pilot projects and technical solutions to meet the required reductions. We look forward to the final adoption and implementation of the TMDL at the meeting on April 25th, and will be available to address concerns during the hearing.

Response: Thank you for the endorsement. The San Diego Water Board appreciates all efforts to move the Chollas Metals TMDLs forward.

3.5. Comments from Caltrans (April 24, 2007)

Comment No. 107: The California Department of Transportation (Department) believes that the proposed compliance schedule in the Basin Plan Amendment would be significantly improved if it implemented measures to investigate important issues that are not sufficiently understood. Below is the Department's proposed approach to meet the water quality targets for copper, lead and zinc. We suggest three phases – Investigation, Pilot BMP Research, and Implementation.

Investigation – The first phase is an investigation phase to allow the Department to work with other stakeholders to develop an approach that would achieve the largest impact without duplicating funds and efforts. The Department proposes to work cooperatively with the stakeholders in public education, source control BMPs, and studies to better understand the, source of metals loadings, transport of the loads, effect of aerial deposition, and relationship between the total recoverable and dissolved metals in storm water and within the bay, (and) assimilative capacity of Chollas Creek with respect to the listed metals.

The Department, along with stakeholders, will work cooperatively with the Air Quality Management District (AQMD), Air Resources Board (ARB), and the U.S. Environmental Protection Agency (USEPA) on programs to address atmospheric deposition within the watershed.

Pilot BMP Research – The second phase will consist of piloting new technologies within the watershed to find a technically feasible BMP that will reduce pollutant concentrations to the variable levels required in the TMDL. In this phase, the Department proposes to build upon and refine initial BMP design. Consistent with the Department's BMP evaluation protocol, a minimum of three years of pilot BMP Monitoring will be conducted to obtain sufficient information to evaluate the BMP to ensure effective reduction of metals to concentration levels required in the TMDL.

Implementation – After successful piloting of a technically feasible BMP, the third phase will consist of a three-part implementation plan. Each phase will consist of siting, design, and construction of BMPs to meet the Department's compliance needs. Implementation may begin with installation of BMPs within "hot spot" priority locations within the watershed.

Response: The San Diego Waterboard appreciates Caltrans' willingness to cooperate with the other dischargers in the Chollas Creek watershed. However, the proposal in the comment contains detail more appropriate for the pollution load reduction plan to be submitted by the dischargers following adoption of these TMDLs.

Comment No. 108: Clarification of impaired segments – The Department has concerns with the statement in the March 9, 2007 draft Technical Report that states:

While only the lowest 1.2 miles of Chollas Creeks comprise the actual impaired and listed segment of the waterbody, all upstream tributaries to this section are considered in this TMDL because they deliver metals loads to the lower segments.

The 2002 303(d) identified the lower 1.2 miles, and the 2006 303(d) list identified the lower 3.5 miles of Chollas Creek as impaired for copper, lead, and zinc. Consistent with the TMDL policy and guidance, TMDLs should address waters identified by the State as waters.

…for which the effluent limitations required by Section 1311(b)(1)(A) and Section 1311(b)(1)(B) of this title are not stringent enough to implement any water quality standard applicable to such waters. (Titlte 33, U.S.C.A., Section 1313(d) [Clean Water Act Section 303(d)])

The lower 3.5 miles of the Chollas Creek has been identified on the State's 303(d) list of impaired waters. The TMDL and WLAs for Chollas Creek should therefore only apply to the 3.5 miles in the watershed listed as impaired. In addition, the staff report statement provided above, that refers to the lower 1.2 miles should be revised to the 3.5 miles of Chollas Creek identified in the 2006 303(d) list as impaired.

Response: Thank you for the comment. The Technical Report was revised to include the additional 2.3 miles. However, applying the TMDLs and WLAs watershed wide is appropriate because metals sources causing the impairment in the lower 3.5 miles of Chollas Creek may originate upstream of the reach designated as impaired. If receiving water quality is meeting standards upstream of the segment listed as impaired, then focusing on reducing metals loading in the lower 3.5 miles of Chollas Creek may be appropriate.

Comment No. 109: Numeric Targets – Water Effects Ratio – Water effects ration is a site specific eco-toxicological coefficient. The TMDL assumes a water effects ratio of 1, meaning that all of the measured metals are biologically available and toxic. This assumption may drastically overstate the actual toxicity of the concentrations that are observed onsite. A site-specific eco-toxicological evaluation of the water effects rations at Chollas Creek should be undertaken to ensure the accuracy of the aquatic life criteria. Lee and Jones-Lee (2000) assert a basic problem with use of the USEPA water quality criteria to form discharge limits. The criteria fail to properly incorporate the aquatic chemistry of the constituents. Further, ambient waters and their sediments contain a wide variety of constituents that detoxify or immobilize the available toxic forms of pollutants, such as heavy metals.

Response: A site specific WER has not been developed for Chollas Creek. Until a site specific WER is available, the metals TMDLs must use a factor of 1 as detailed by USEPA. If a site specific WER for Chollas Creek were developed, these TMDLs could be recalculated. A WER for Chollas Creek could be proposed as a Basin Planning Project in the next Triennial Review of the Basin Plan, however, with our limited resources and Regional priorities, this project may not receive funding for some time. Alternatively, the dischargers are free to initiate the studies. Please see the Technical Report section 4.2 and Appendix H for more details.

Comment No. 110: Numeric Targets – Target Concentration – We are also concerned with the target concentration levels that are presented in the staff report. The target concentration levels are a function of the hardness values equating to lower target concentrations. Treatment technologies, however, have not been developed that will achieve the waste load allocations that are required for targets at low hardness values. To clarify our previous comment that the concentrations cannot be met with current technology, we are attaching four graphs to this letter.

Figure 1 – Copper Acute and Chronic Conditions, shows the concentration for copper that must be met for the range of hardness values for both acute and chronic conditions. The horizontal line shows the copper concentration of 10mg/L for the treated highway effluent from the sand filter. The sand filter will not meet the acute concentration when the hardness is less than 82 mg/L and will not meet the chronic condition when the hardness is less than 129 mg/L. For reference, a vertical line at 81 mg/L is shown for the average hardness within Chollas Creek (from Appendix A of the TMDL documents). At that hardness of 81 mg/L, available treatment technology for metals reduction, such as sand filters, will not adequately reduce copper concentrations to either of the TMDL limits.

In Figure 2 – Lead acute conditions, the horizontal line shows the lead concentration of 3 mg/L for sand filter effluent. The sand filter will not meet the lead acute concentration when the hardness is less than 8 mg/L.

Figure 3 – Lead Chronic Conditions, shows the concentration for lead that must be met for given hardness values for the chronic condition. The horizontal line shows the lead concentration of 3 mg/L for sand filter effluent. The sand filter will not meet the lead chronic concentration when the hardness is less than 130 mg/L. At average hardness of 81-mg/L sand filter will adequately reduce lead concentrations below acute conditions but not for chronic conditions.

Figure 4 – Zinc Acute and Chronic Conditions, shows the concentration for zinc that must be meet for given hardness values for both acute and chronic conditions. The horizontal line shows the zinc concentration of 47 mg/L for sand filter effluent. The sand filter will not meet the zinc acute or chronic concentration when the hardness is less than 39 mg/L. At the average hardness of 81-mg/L, sand filters will adequately reduce lead concentrations below both TMDL limits.

Response: The San Diego Water Board can not dictate what BMPs that will eventually be used by the dischargers. Whether or not to use sand filters is a determination at the project level, after the specific site has been fully investigated and evaluated. The potential significant cost estimated in the substitute environmental document roughly agrees with that estimated in the City of San Diego's Weston report. Based in part on this, and the potential for BMP coordination to eliminate uncertainties, the implementation schedule has been doubled from 10 years to 20 years.

Comment No. 111: BMP Cost Estimates – The staff report misrepresents the Department's report ID CTSW-RT-01-050 (2004) estimates of infiltration trench cost. Table E.6 of the staff report estimates that the cost to implement infiltration trenches to treat 10% of the load from Urbanized Areas would be $170 million (capital costs), with O&M costs of the infiltration trenches at $720,000 per year. In addition, the O&M costs for the Austin Sand Filters are estimated at $2,000,000 per year. These estimates are inaccurate. The calculations should be based upon the adjusted cost estimates presented in Table 3 of the Department's report that accounts for "generic retrofit costs that could reasonably applied to other BMP retrofit projects".

Response: Thank you for the comment. Corrections were made to the cost estimates in Appendix I.

3.6. Comments from John W. Stump (April 25, 2007)

Comment No. 112: John Stump, resident of the Chollas Lake area asserted in oral testimony that subsurface water from Chollas Lake is impacting the closed Chollas Landfill area and also potentially impacting Chollas Creek. Mr. Stump stated that staff should investigate this assertion from the available information.

Response: The Chollas Creek metals TMDLs already addresses the South Chollas landfill as a potential metals source and calls for a revision to Order No. 97-11 to require groundwater monitoring for metals below and near the landfill. Please see section E. 10 Implementation Plan, of the Technical Report. If the monitoring results show metals in groundwater in excess of the WLA, the next step would be an investigation to determine potential pathways from groundwater to Chollas Creek, and/or revisions to the WDRs for the landfill.

3.7. Comments from the City of San Diego (April 25, 2007)

Comment No. 113: Type of BMPs Required – Is it expected that compliance with both TMDLs can be achieved without using treatment BMPs or infiltration?

Response: Based on the current information we've reviewed, no.

Comment No. 114: Size of BMPs Needed to Comply – What treatment capacity should be assumed in designing and building treatment BMPs for bacteria and dissolved metals? Is the 85th percentile storm adequate or should both TMDLs provide for a certain frequency of allowable exceedances?

Response: Designating design criteria for structural BMPs is an important consideration, but is beyond the scope of these TMDLs. This important topic should be investigated by the San Diego Water Board and stakeholders as early as possible in the TMDL implementation phase.

Comment No. 115: Potential Locations for BMPs – Where can treatment BMPs can be built – in receiving water or must they be built above storm drain outfalls? Are areas immediately below storm drain outfalls typically considered to be receiving water/Water of the State? If this answer can only be determined on a case-by-case basis, what factors will be analyzed and how will these factors be used?

Response: Please see the response to comment No. 36.

Comment No. 116: How did size and location fit into the Regional Board staff cost estimates for different BMPs identified?

Response: Size of BMPs and location were not considered in our cost estimates. The cost estimates were based on average annual observed flow volumes for Chollas Creek.

Comment No. 117: Compliance – Will compliance be monitored at outfalls, in areas of the watershed listed as impaired, or both?

Response: Designating where TMDL compliance will be measured is beyond the scope of these TMDLs. Please see the response to comment No. 36 for a discussion of some general approaches to compliance assessment that the San Diego Water Board could take.

Comment No. 118: Re-evaluation – Should both TMDLs include a "re-evaluation" provision so that we can evaluate the effectiveness of the City of San Diego's preferred compliance strategy in five years?

Will anti-degradation provisions restrict us from relaxing the final Wasteload Allocations if future re-evaluations, reference studies, or Basin Plan amendments show that the Allocations should be increased. What is the policy for adopting TMDLs before these issues have been resolved?

Response: The San Diego Water Board can increase the WLA after the TMDLs are incorporated into the San Diego Municipal stormwater requirements as a result of new site specific objectives, a change to beneficial uses, or a refinement of the TMDLs based on new data. NPDES regulations [40 CFR section 122.44(l)(1)] prevent backsliding unless the circumstance upon which the previous permit was based have materially and substantially changed since the time the permit was issued. New site specific objectives, a change to beneficial uses, or a refinement of the TMDL based on new information would qualify as a material and substantial change of circumstance. Please also see response to comment No. 92.

3.8. Comments from the City of San Diego (May 29, 2007)

Comment No. 119: 1. The City continues to request that the Regional Board explicitly recognize in its CEQA documentation that treatment and/or diversion (e.g., via infiltration) of storm water will be required to comply with the proposed load reductions given the ubiquitous, legal, and uncontrollable sources of the pollutants. While Board staff has taken a step closer to doing this by listing these strategies as reasonably foreseeable, the impact analysis of this construction is inadequate.

Response: Our level of analysis, in the substitute environmental documents, is sufficient to disclose the level of impacts of the project and provide a forum for meaningful public discussion and comment on those impacts, including the impacts from any possible combination of BMPs. CEQA does not require the level of detail requested in the comment for a planning level analysis. The dischargers are responsible for determining the specific BMPs that will be implemented at specific locations, and for evaluating the potential site specific environmental impacts of those BMPs.

Comment No. 120: 2. The City continues to request that the Regional Board provide specificity on how compliance will be evaluated in terms of the number of Notices of Violation and/or fines that dischargers would be subject to if compliance is not obtained (e.g., one fine per outfall per day, one fine per tributary, one fine per gallon). I am pleased that the compliance issue with regard to where compliance would be measured (e.g., at storm water outfalls and/or locations downstream) as described in number 5 below.

Response: Please see the responses to comment Nos. 36 and 123.

Comment No. 121: 3. The City continues to request that the Regional Board dictate a design storm or allowable number of exceedences in the Bacteria-1 TMDL. Such an allowance is now recognized as at least a planning goal in the Chollas Creek Dissolved Metals TMDL as one exceedence every three years since this frequency is allowed by the California Toxics Rule; however, the Bacteria-1 TMDL provides no such guidance from

the state or federal government. Without this direction, the City is unable to design with certainty towards compliance its treatment and infiltration facilities and the Regional Board is unable to evaluate the environmental impacts of building the facilities. Moreover, since the Technical Report for the Chollas Creek Dissolved Metals TMDL indicates that 99.7% of the metals loading occurs during wet weather (page 35) and since the bacteria TMDL allows for zero anthropogenic-related bacteria, it is clear that treatment and/or infiltration of wet weather flows will be essential to compliance.

Response: Please see response to comment No. 2.

Comment No. 122: 4. The City has prepared a reasonable 'Tiered" approach to implement the TMDLs. The approach entails implementing, as experiments, various combinations of non-structural BMPs, and structural BMPs on public property and voluntary incentive programs for private property owners. The goal of this part of the approach is to 1) determine whether, contrary to existing data, widespread treatment and/or infiltration of storm water is not required to comply with the TMDLs and 2) determine the maximum effectiveness of these Tier I and II in order to minimize the impacts of constructing Tier III (infiltration and treatment) BMPs on developed and privately owned land. The City requests that the Regional Board commit to a formal re-evaluation provision in the TMDL to that final load reductions and compliance strategies can be re-assessed after collecting data from Tier I and Tier II efforts.

Response: Please see response to comment No. 92.

Comment No. 123: 5. Regional Board staff has made a number of statements (referenced in previous comments) which provide a de facto prohibition on building treatment or infiltration works below storm drain outfalls for purposes of complying with the TMDLs. The City asks that the Regional Board formally state its position on where BMPs can be located to comply with these TMDLs.

Response: Please see response to comment No. 36.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

RESOLUTION NO. R9-2008-0027

A RESOLUTION TO ADOPT AN AMENDMENT TO THE *WATER QUALITY CONTROL PLAN FOR THE SAN DIEGO BASIN (9)* TO INCORPORATE TOTAL MAXIMUM DAILY LOADS FOR INDICATOR BACTERIA, BABY BEACH IN DANA POINT HARBOR AND SHELTER ISLAND SHORELINE PARK IN SAN DIEGO BAY

WHEREAS, the California Regional Water Quality Control Board, San Diego Region (hereinafter San Diego Water Board), finds that:

1. **Basin Plan Amendment**: Total Maximum Daily Loads (TMDLs) and allocations for pollutants that exceed water quality objectives in waterbodies that do not meet water quality standards under the conditions set forth in section 303(d) of the Clean Water Act [U.S. Code Title 33 section 1250, *et seq*., at 1313(d)] ("Water Quality Limited Segments") should be incorporated into the *Water Quality Control Plan for the San Diego Basin (9)* (Basin Plan) pursuant to Article 3, commencing with section 13240, of Chapter 4 of the Porter-Cologne Water Quality Control Act, as amended, codified in Division 7, commencing with section 13000, of the Water Code.

2. **Clean Water Act Section 303(d)**: As required by section 303(d) of the Clean Water Act, specific segments of San Diego Bay and Dana Point Harbor in the San Diego Region were placed on the List of Water Quality Limited Segments because levels of total coliform, fecal coliform, and/or *Enterococcus* at those locations exceeded water quality objectives for water-contact recreation (REC-1)[1] beneficial use. (Measurements of total coliform, fecal coliform, and *Enterococcus* are relied on to indicate the presence of disease-causing pathogens.) The shoreline segments of San Diego Bay and Dana Point Harbor for which water quality is impaired by bacterial pollution, and for which TMDLs have been calculated, are shown below.

Waterbody	Segment / Area	Hydrologic Descriptor	Pollutant / Stressor	Extent of Impairment	Year Listed
Dana Point Harbor	Baby Beach	Dana Point HSA (901.14)	Indicator bacteria	0.4 miles	2002
San Diego Bay	Shelter Island Shoreline Park	Point Loma HA (908.10)	Indicator bacteria	0.4 miles	2002

3. **Water Quality Impairments**: The REC-1 beneficial use is particularly sensitive to, and subject to impairment by, pathogens when elevated densities of indicator

[1] The Basin Plan also contains shellfish harvesting (SHELL) beneficial use water quality objectives for total coliform. SHELL impairments for total coliform will be addressed in a separate TMDL and/or standards action.

bacteria exist in the water.[2] Persons who ingest water during recreational activities in waters containing indicator bacteria at densities in excess of water quality objectives for REC-1, are significantly more likely to incur infections or illness caused by pathogens in the water than when indicator bacteria occur at densities consistent with the applicable water quality objectives. REC-1 is a beneficial use of the shorelines of San Diego Bay and Dana Point Harbor where water quality is listed as impaired.

4. **Necessity Standard** [Government Code section 11353(b)]: Amendment of the Basin Plan to establish and implement Total Maximum Daily Loads (TMDLs) for the waters along the impaired shoreline segments of San Diego Bay and Dana Point Harbor is necessary because the existing water quality at the shoreline segments listed in Attachment A does not meet applicable water quality objectives for total coliform, fecal coliform, and/or *Enterococcus* bacteria. Clean Water Act section 303(d) requires the establishment and implementation of TMDLs under the water quality conditions that exist at these shoreline segments. TMDLs for total coliform, fecal coliform, and/or *Enterococcus* bacteria are necessary to promote attainment of applicable water quality objectives and restoration of water quality needed to support the beneficial uses designated for the shorelines of San Diego Bay and Dana Point Harbor.

5. **Water Quality Objectives**: Water quality objectives for bacteria the coastal waters of the Baby Beach and Shelter Island Shoreline Park shorelines, expressed as the most probable number of bacteria colonies per 100 mL of water sample (MPN/100 mL), are contained in the Basin Plan.
   The water quality objectives for indicator bacteria in inland surface waters and enclosed bays and estuaries designated as having the REC-1 beneficial use include:

   i. Total Coliform (Bays and Estuaries): Total coliform bacteria density shall be less than 1,000 per 100 ml (10 per ml); provided that not more than 20 percent of the samples at any station, in any 30-day period, may exceed 1,000 per 100 ml (10 per ml) and provided further that no single sample when verified by a repeat sample taken within 48 hours shall exceed 10,000 per 100 (100 per ml).

   ii. Fecal Coliform (Marine Waters): Based on a minimum of not less than five samples for any 30-day period, fecal coliform bacteria density shall not exceed a log mean of 200 per 100 ml, nor shall more than 10 percent of total samples during any 30-day period exceed 400 per 100 ml.

   iii. *Enterococcus* (Marine Waters): The geometric mean of *Enterococcus* bacteria shall not exceed 35 colonies per 100 ml. The single sample maximum allowable density in designated beach areas is 104 colonies per 100 ml, in moderately or lightly used areas is 276 colonies per 100 ml, in infrequently used areas is 500 colonies per 100 ml.

[2] Water quality objectives for indicator bacteria in waters with non-water-contact recreation (REC-2) are less stringent than the water quality objectives for REC-1, therefore, attainment of REC-1 objectives through the implementation of TMDLs will, *a fortiori,* provide the requisite water quality for REC-2.

6. **Numeric Targets**: Numeric Targets are established for the purposes of calculating TMDLs. The numeric targets for these TMDLs consist of the REC-1 water quality objectives for indicator bacteria contained in the Basin Plan. Since numeric targets are equal to the water quality objectives for total coliform, fecal coliform, and enterococci bacteria cited in finding 5, attainment of TMDLs will ensure attainment of these water quality objectives.

7. **Sources of Bacteria**: Sources of bacteria are the same under both wet weather and dry weather conditions. Bacteria can enter surface waters from both nonpoint and point sources. Nonpoint sources are typically diffuse sources that have multiple routes of entry into surface waters. Point sources typically discharge at a specific location from pipes, outfalls, and conveyance channels. The only nonpoint sources identified were natural or background sources, such as direct inputs from birds, terrestrial and aquatic animals, wrack line and aquatic plants, sediments, or other unidentified and unquantified sources within the receiving waters. The only allowable point source identified was discharges from municipal separate storm sewer systems (MS4s), although other point sources may exist. For both wet weather and dry weather conditions, there are natural and background sources of bacteria within the receiving waters at the impaired shoreline segments. These nonpoint sources of bacteria are generally considered uncontrollable. However, for sources of bacteria that originate from the watersheds draining into the receiving waters, which are located entirely within urbanized areas, the method of transport for the two conditions is very different. Wet weather loading originating from the watersheds is dominated by episodic storm flows that wash off bacteria that build up on the surface of all land use types in a watershed during dry periods. Dry weather loading originating from the watersheds is dominated by nuisance flows from urban land use activities such as car washing, sidewalk washing, and lawn over-irrigation, which pick up bacteria and deposit it into receiving waters. Because the watersheds draining into the receiving waters are located entirely within urbanized areas, and therefore surface runoff is collected and discharged from MS4s, the watershed sources of bacteria are controllable.

8. **Water Quality Objective Violations**: Bacteria densities at the impaired shoreline segments of Baby Beach and Shelter Island Shoreline Park have frequently exceeded water quality objectives.

9. **Relationship Between Bacteria and Pathogens:** Fecal indicator bacteria originate from the intestinal biota of warm-blooded animals, including humans, and their presence in surface water is used as an indicator of the possible presence of human pathogens (*i.e.*, organisms that can cause illness in people exposed through recreational water use and people who harvest and eat filter-feeding shellfish; pathogens include protozoans, bacteria, viruses, and other disease-causing organisms). Bacteria have been historically used as indicators of human pathogens because the probability of disease is directly correlated with the density of indicator bacteria in waters used for recreation and because the indicator bacteria are easier and less costly to measure than the pathogens themselves. If TMDLs for indicator

bacteria are attained, then water quality objectives are met, and health risks associated with pathogens are minimal.

10. **Total Maximum Daily Loads** [Code of Federal Regulations Title 40 section 130.2(i)]: TMDLs for bacteria are equal to the total assimilative or loading capacities of the receiving waters along the shorelines of Baby Beach and Shelter Island Shoreline Park for total coliform, fecal coliform, and *Enterococcus* bacteria. The loading capacities are defined as the maximum amount of fecal coliform, total coliform and *Enterococcus* that the waterbody can receive and still attain water quality objectives necessary for the protection of designated beneficial uses. Each TMDL must accommodate all known sources of a pollutant, whether from natural background, nonpoint sources, or point sources, and must include a margin of safety (MOS) to preclude pollutant loading from exceeding the actual assimilative capacities of the waterbodies. The TMDL calculations also account for seasonal variations and critical conditions and were developed in a manner consistent with guidelines published by USEPA.

11. **Allocations and Reductions**: Discharges of bacteria from all identified sources that are susceptible to control or management must be reduced in order to keep total bacterial loads as close to the TMDLs and actual assimilative capacities of the impaired waters as possible. Discharges from controllable sources were identified as originating from MS4s for urbanized sources. Controllable sources must be reduced by an amount in proportion to the existing loads generated in each watershed, as calculated using a computer model. TMDLs are reported on a watershed basis and must be jointly achieved by all dischargers of bacteria located in the watersheds. Natural sources of bacteria are considered uncontrollable and no load reductions are necessary.

12. **Implementation Plan**: The report entitled *Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay,* (Technical Report) dated June 11, 2008 presents a summary of measures that, if adopted by the San Diego Water Board, the State Water Resources Control Board (State Water Board), and local governmental agencies, will promote attainment of the load reductions needed to keep discharges of bacteria at or below the TMDLs calculated for these waterbodies. Section 303 of the Clean Water Act and the federal NPDES regulations direct USEPA and authorized states to impose requirements consistent with TMDLs for point source discharges to "impaired" waterbodies. When the San Diego Water Board and State Water Board re-issue or revise National Pollutant Discharge Elimination System (NPDES) requirements for municipal storm water discharges, they will have to include requirements that will implement all TMDLs applicable to waters affected by the regulated discharges.

13. **Compliance Monitoring**: Monitoring including pollutant load reductions, changes in urban runoff and discharge water quality, and changes in receiving water quality will be necessary to assess effectiveness in achieving load and wasteload allocations

and compliance with the water quality objectives for total coliform, fecal coliform, and *Enterococcus* bacteria.

14. **Scientific Peer Review**: The scientific basis for these TMDLs has undergone external peer review pursuant to Health and Safety Code section 57004. The San Diego Water Board has considered and responded to all comments submitted by the peer review panel, and has enhanced the Technical Report appropriately. No change to the fundamental approach to TMDL calculation was necessary as a result of this process.

15. **CEQA Requirements:** Pursuant to Public Resources Code section 21080.5, the Resources Agency has approved the Regional Water Boards' basin planning process as a "certified regulatory program" that adequately satisfies the California Environmental Quality Act (CEQA) [Public Resources Code section 21000 et seq.] requirements for preparing environmental documents [California Code of Regulations Title 14 section 15251(g); California Code of Regulations Title 23 section 3782]. As such, the documents supporting the San Diego Water Board's proposed basin planning action contain the required environmental documentation under CEQA and serve as "substitute documents" [California Code of Regulations Title 23 section 3777]. The substitute documents for this project include the environmental checklist, the detailed Technical Report, responses to comments submitted during the public participation phase in the development of the TMDLs, and this resolution. The project itself is the establishment of TMDLs for indicator bacteria for the shoreline segments of San Diego Bay and Dana Point Harbor where water quality has been listed as "impaired" by the State Water Board pursuant to section 303(d) of the Clean Water Act, as required by that section. While the San Diego Water Board has no discretion to not establish the TMDLs (the TMDLs are required by federal law), the Board does exercise discretion in assigning wasteload allocations and load allocations, determining the program of implementation, and setting various milestones in achieving the applicable water quality objectives at the affected shorelines.

16. **Project Impacts:** The accompanying CEQA substitute documents satisfy the requirements of substitute documents for a Tier 1 environmental review under CEQA, pursuant to Public Resources Code section 21159 and California Code of Regulations Title 14 section 15187. Potentially significant impacts were identified that can be mitigated to less than significant levels. Broad mitigation approaches have been identified that if employed, would reduce the potentially significant adverse impacts identified to less than significant. However, nearly all of the compliance obligations anticipated to be necessary to implement the TMDLs for indicator bacteria will be undertaken by public agencies that will have their own obligations under CEQA for implementation projects that could have significant environmental impacts (*e.g.*, installation and operation of structural best management practices). Project level impacts will need to be considered in any subsequent environmental analysis performed by other public agencies pursuant to Public Resources Code section 21159.2.

If not properly mitigated at the project level, implementation and compliance measures undertaken could have significant adverse environmental impacts. The substitute documents for this TMDL identify broad mitigation approaches that if employed, would reduce the potentially significant adverse impacts identified to less than significant. However, such mitigation approaches are within the responsibility and jurisdiction of other public agencies, and not the San Diego Water Board. Water Code section 13360 precludes the San Diego Water Board from dictating the manner in which responsible agencies comply with any of the San Diego Water Board's regulations or orders. The San Diego Water Board does not engage in speculation or conjecture regarding the projects that may be implemented to comply with the TMDLs and only considers the reasonably foreseeable alternative methods of compliance, the reasonably foreseeable feasible environmental impacts of the these methods of compliance, and the reasonably foreseeable mitigation measures which would avoid or eliminate the identified impacts, all from a broad general perspective consistent with the uncertainty regarding how the TMDLs, ultimately, will be implemented. When the agencies responsible for implementing projects to comply with this TMDL determine how they will proceed, the agencies responsible for those parts of the project can and should incorporate such mitigation approaches into any subsequent projects or project approvals. The lengthy implementation period allowed by the TMDLs will allow persons responsible for compliance with wasteload allocations to develop and pursue many compliance approaches and mitigation measures.

17. **Project Mitigation:** The proposed amendment to the Basin Plan to establish TMDLs for indicator bacteria in the receiving waters at the shoreline segments of San Diego Bay and Dana Point Harbor could have a significant adverse effect on the environment. However, there are feasible alternatives, feasible mitigation measures, or both, that would substantially lessen any significant adverse impact. The public agencies responsible for implementation measures needed to comply with the TMDLs can and should incorporate such alternatives and mitigation into any projects or project approvals that they undertake for the impaired shoreline segments. Possible alternatives and mitigation are described in the CEQA substitute documents, specifically the Technical Report and the environmental checklist. To the extent the alternatives, mitigation measures, or both, are not deemed feasible by those agencies, the necessity of implementing the TMDLs that is mandated by the federal Clean Water Act and removing the bacteria impairments within waterbodies in the San Diego Region (an action required to achieve the express, national policy of the Clean Water Act) outweigh the unavoidable adverse environmental effects identified in the substitute documents.

18. **Department of Fish and Game Filing Fee**: Considering the record as a whole, this Basin Plan amendment will result in no effect, either individually or cumulatively, on wildlife resources.

19. **Economic Analysis**: The San Diego Water Board has considered the costs of the reasonably foreseeable methods of compliance with the load and wasteload allocations specified in these TMDLs. The most reasonably foreseeable methods of compliance involve implementation of structural and non-structural controls. Surface water monitoring to evaluate the effectiveness of these controls will also be necessary.

20. **Stakeholder and Public Participation**: Interested persons and the public have had reasonable opportunity to participate in review of the proposed TMDLs. Efforts to solicit public review and comment included a public workshop and CEQA scoping meeting in March 2003, a public workshop in March 2004, three meetings with the Stakeholder Advisory Group, a public review and comment period consisting of 48 days, and a public hearing on April 9, 2008. Notices for all meetings were sent to interested parties including cities and counties with jurisdiction in watersheds draining to the bacteria impaired shoreline segments. All of the written comments submitted to the San Diego Water Board during the review and comment periods have been considered in Appendix N to the Technical Report.

21. **Public Notice**: The San Diego Water Board has notified all known interested parties and the public of its intent to consider adoption of this Basin Plan amendment in accordance with Water Code section 13244.

NOW, THEREFORE, BE IT RESOLVED THAT:

1. **Environmental Documents Certification**: The substitute environmental documents prepared pursuant to Public Resources Code section 21080.5 are hereby certified, and the Executive Officer is directed to file a Notice of Decision with the Resources Agency after State Water Board and Office of Administrative Law (OAL) approval of the Basin Plan Amendment, in accordance with section 21080.5(d)(2)(E) of the Public Resources Code and the California Code of Regulations Title 23 section 3781.

2. **Amendment Adoption**: The San Diego Water Board hereby adopts the attached Basin Plan amendment as set forth in Attachment A hereto to establish TMDLs for indicator bacteria at Baby Beach and Shelter Island Shoreline Park.

3. **Technical Report Approval:** The San Diego Water Board hereby approves the Technical Report entitled *Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay*, dated June 11, 2008.

4. **Department of Fish and Game Filing Fee**: The Executive Officer is authorized to request a "No Effect Determination" from the California Department of Fish and Game, or transmit payment of the applicable fee as may be required by the California Department of Fish and Game.

5. **Agency Approvals**: The Executive Officer is directed to submit this Basin Plan amendment to the State Water Board in accordance with Water Code section 13245.

6. **Non-Substantive Corrections**: If, during the approval process for this amendment, the San Diego Water Board, the State Water Board, or the OAL determines that minor, non-substantive corrections to the language of the amendment are needed for clarity or consistency, the Executive Officer may make such changes, and shall inform the San Diego Water Board of any such changes.

I, John H. Robertus, Executive Officer, do hereby certify that the foregoing is a full, true and correct copy of a resolution adopted by the California Regional Water Quality Control Board, San Diego Region, on June 11, 2008.

JOHN H. ROBERTUS
Executive Officer

ATTACHMENT A
TO RESOLUTION NO. R9-2008-0027

AMENDMENT TO THE *WATER QUALITY CONTROL PLAN FOR THE SAN DIEGO BASIN (9)* TO INCORPORATE TOTAL MAXIMUM DAILY LOADS FOR INDICATOR BACTERIA, BABY BEACH IN DANA POINT HARBOR AND SHELTER ISLAND SHORELINE PARK IN SAN DIEGO BAY

This Basin Plan amendment establishes Total Maximum Daily Loads (TMDLs) and associated load and wasteload allocations for total coliform, fecal coliform, and *Enterococcus* bacteria along the shorelines of Baby Beach, located within Dana Point Harbor, and Shelter Island Shoreline Park, located within San Diego Bay. This amendment includes a program to implement the TMDLs and monitor their effectiveness. Chapters 2, 3, and 4 of the Basin Plan are amended as follows:

CHAPTER 2. BENEFICIAL USES.

Table 2-3. BENEFICIAL USES OF COASTAL WATERS.

Consecutively number and add the following footnote to Dana Point Harbor in Table 2-3:

> The shoreline segment along Baby Beach within Dana Point Harbor is designated as a water quality limited segment for indicator bacteria pursuant to Clean Water Act section 303(d). Total Maximum Daily Loads have been adopted to address these impairments. See Chapter 4, *Implementation, Clean Water Act Section 303(d) Requirements for Impaired Waterbodies, Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay*.

Consecutively number and add the following footnote to San Diego Bay in Table 2-3:

> The shoreline segment along Shelter Island Shoreline Park within San Diego Bay is designated as a water quality limited segment for indicator bacteria pursuant to Clean Water Act section 303(d). Total Maximum Daily Loads have been adopted to address these impairments. See Chapter 4, *Implementation, Clean Water Act Section 303(d) Requirements for Impaired Waterbodies, Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay*.

Renumber any footnotes in Table 2-3 displaced by these new footnotes.

CHAPTER 3. WATER QUALITY OBJECTIVES.

OCEAN WATERS.
OCEAN PLAN AND THERMAL PLAN.
Ocean Plan and Thermal Plan Water Quality Objective.

Add the following paragraph to the end of the introductory text:

> The shoreline segment along Baby Beach within Dana Point Harbor is designated as a water quality limited segment for indicator bacteria pursuant to Clean Water Act section 303(d). Total Maximum Daily Loads have been adopted to address these impairments. See Chapter 2, Table 2-3, *Beneficial Uses of Coastal Waters, Footnote* [*insert footnote number*], and Chapter 4, *Implementation, Clean Water Act Section 303(d) Requirements for Impaired Waterbodies, Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay*.

INLAND SURFACE WATERS, ENCLOSED BAYS AND ESTUARIES, COASTAL LAGOONS, AND GROUND WATERS.
BACTERIA – TOTAL AND FECAL COLIFORM.

Add the following paragraph to the end of the introductory text:

> The shoreline segment along Shelter Island Shoreline Park within San Diego Bay is designated as a water quality limited segment for indicator bacteria pursuant to Clean Water Act section 303(d). Total Maximum Daily Loads have been adopted to address these impairments. See Chapter 2, Table 2-3, *Beneficial Uses of Coastal Waters, Footnote* [*insert footnote number*], and Chapter 4, *Implementation, Clean Water Act Section 303(d) Requirements for Impaired Waterbodies, Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay*.

INLAND SURFACE WATERS, ENCLOSED BAYS AND ESTUARIES, COASTAL LAGOONS, AND GROUND WATERS.
BACTERIA – E. COLI AND ENTEROCOCCI.
(2) Waters Designated for Contact Recreation (REC-1) Beneficial Use

Add the following paragraph to the end of the introductory text:

> The shoreline segment along Shelter Island Shoreline Park within San Diego Bay is designated as a water quality limited segment for indicator bacteria pursuant to Clean Water Act section 303(d). Total Maximum Daily Loads have been adopted to address these impairments. See Chapter 2, Table 2-3, *Beneficial Uses of Coastal Waters, Footnote* [*insert footnote number*], and Chapter 4, *Implementation, Clean Water Act Section 303(d) Requirements for Impaired Waterbodies, Total Maximum*

Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay.

CHAPTER 4. IMPLEMENTATION.

Amend the Table of Contents to Chapter 4 to include the subsection added below.

Consecutively number and renumber footnotes appropriately.

Add the following subsection after the most recently adopted and approved TMDL subsection and before the Other Programs subsection:

TOTAL MAXIMUM DAILY LOADS FOR INDICATOR BACTERIA, BABY BEACH AND SHELTER ISLAND SHORELINE PARK SHORELINES

OnJune 11, 2008, the San Diego Water Board adopted Resolution No. R9-2008-0027, *A Resolution Amending the Water Quality Control Plan for the San Diego Region (9) to Incorporate Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay.* The TMDL Basin Plan Amendment was subsequently approved by the State Water Resources Control Board on [Insert date], the Office of Administrative Law on [Insert date], and the USEPA on [Insert date].

PROBLEM STATEMENT

Bacteria densities along the shoreline segments of Baby Beach within Dana Point Harbor and Shelter Island Shoreline Park within San Diego Bay violate water quality objectives (WQOs) for indicator bacteria. Bacteria densities in waters at these shoreline segments unreasonably impair and threaten to impair the water quality needed to support designated beneficial uses of contact recreation (REC-1)[3].

The federal Clean Water Act requires the establishment of Total Maximum Daily Loads (TMDLs) for pollutants that exceed water quality objectives needed to support designated beneficial uses, *i.e.*, that cause or contribute to violation of state "water quality standards."

[3] Water quality objectives for indicator bacteria in waters with non-water-contact recreation (REC-2) are less stringent than the water quality objectives for REC-1, therefore, attainment of REC-1 objectives through the implementation of TMDLs will, *a fortiori,* provide the requisite water quality for REC-2.

NUMERIC TARGETS

When calculating TMDLs, numeric targets are established to meet WQOs and subsequently ensure the protection of beneficial uses. The numeric targets for these TMDLs consist of the REC-1 WQOs for indicator bacteria contained in the Basin Plan. TMDLs were calculated for each impaired waterbody, for each indicator bacteria, for wet and dry weather. The numeric targets used in the TMDL calculations were equal to the WQOs for bacteria for REC-1.

Different dry weather and wet weather numeric targets were used for load calculations because the bacteria transport mechanisms to receiving waters are different under wet and dry weather conditions.

Single sample maximum WQOs were used as wet weather numeric targets. Dry weather numeric targets are typically best represented by geometric mean WQOs. However, due to extreme diurnal variations in bacteria densities that can result from tidal effects, in some cases the maximum hourly concentration could regularly exceed the single sample maximum WQOs. Therefore, both the REC-1 30-day geometric mean and single sample maximum WQOs were selected as numeric targets for dry weather. The numeric targets were equal to the total coliform, fecal coliform and *Enterococcus* WQOs for REC-1 in all cases.

The numeric targets for the scenarios described above are listed in the following tables:

Table [Insert Table Number]. Wet Weather Numeric Targets

Basis for Numeric Target	Total Coliform (MPN/100mL)	Fecal Coliform (MPN/100mL)	*Enterococcus* (MPN/100mL)
Beneficial Use	**REC-1**	**REC-1**	**REC-1**
Single sample maximum	10,000	400	104

Table [Insert Table Number]. Dry Weather Numeric Targets

Basis for Numeric Target	Total Coliform (MPN/100mL)	Fecal Coliform (MPN/100mL)	*Enterococcus* (MPN/100mL)
Beneficial Use	**REC-1**	**REC-1**	**REC-1**
30-day geometric mean	1,000	200	35
Single sample maximum	10,000	400	104

SOURCE ANALYSIS

Sources of bacteria are the same under both wet weather and dry weather conditions. Bacteria can enter surface waters from both nonpoint and point sources. Nonpoint sources are typically diffuse sources that have multiple routes of entry into surface waters. Point sources typically discharge at a specific location from pipes, outfalls, and conveyance channels.

The only nonpoint sources identified to potentially affect the waterbodies addressed by these TMDLs were natural sources (e.g., direct inputs from birds, terrestrial and aquatic animals, wrack line and aquatic plants, sediments, or other unidentified or unquantified sources within the receiving waters), homeless encampments, or other background sources (e.g., "ambient" bacteria that may be influenced by illegal discharges from boats). Because the homeless encampments are illegal, these loads are not allowed and must be eliminated. Due to lack of data, bacteria loads from natural sources or other background sources could not be specifically identified or quantified for TMDL development. Until more information is obtained through further study to provide identification of the relative loading from each of these potential sources, they were combined into a single natural and background source for each shoreline segment.

The point sources identified to potentially affect the waterbodies addressed in this study were discharges from municipal separate storm sewer systems (MS4s) and illegal discharges from boats and/or wastewater collection systems and treatment plants. Because the Basin Plan includes waste discharge prohibitions specifically for the discharge of treated or untreated sewage from vessels to Dana Point Harbor and San Diego Bay and the unauthroized discharge of treated or untreated sewage to waters of the state, illegal discharges from boats and wastewater collection systems and treatment plants are not allowed must be eliminated. The watersheds that drain into the receiving waters at the impaired shoreline segments are wholly located within urbanized areas. Therefore, the only allowable point source identified was urban runoff discharged from MS4s, although other point sources may exist.

For both wet weather and dry weather conditions, there are natural and background sources of bacteria within the receiving waters at the impaired shoreline segments. However, for sources of bacteria that originate from the watersheds draining into the receiving waters, the method of transport for the two conditions is very different. Wet weather loading originating from the watersheds is dominated by episodic storm flows that wash off bacteria that build up on the surface of all land use types in the watershed during dry periods. Dry weather loading originating from the watersheds is dominated by nuisance flows from urban land use activities such as car washing, sidewalk washing, and lawn over-irrigation, which pick up bacteria and deposit it into receiving waters.

TOTAL MAXIMUM DAILY LOADS AND ALLOCATIONS

The TMDLs are equal to the assimilative or loading capacity of each shoreline segment for each pollutant. TMDLs for each type of indicator bacteria were developed for each impaired waterbody. TMDLs are defined as the maximum amount of a pollutant the waterbody can receive and still attain water quality objectives and protection of designated beneficial uses. Once calculated, a TMDL is set equal to the sum of all individual Waste Load Allocations (WLAs) for point sources and Load Allocations (LAs) for nonpoint sources. The TMDL includes a

margin of safety (MOS) that takes into account any uncertainties in the TMDL calculation, which may be explicit or implicit. For these TMDLs, an implicit margin of safety is included via conservative estimates and assumptions used throughout the TMDL calculations. Separate TMDLs were calculated for wet weather and dry weather conditions to account for seasonal variations, and because the transport mechanism, flow, and bacteria loads from the watersheds draining to the receiving waters are different between dry and wet weather conditions.

Calibrated models were used to simulate flow and bacteria densities from the watersheds draining into the receiving waters and within the receiving waters of the shoreline segments. The models were used to calculate the existing bacteria loads, as well as TMDLs for each impaired shoreline segment. The modeled existing loads were compared to the TMDLs to calculate the necessary load reductions needed to achieve the TMDLs in the waterbodies. The TMDLs were allocated among point sources (WLAs) and nonpoint sources (LAs). The only allowable point source identified was urban runoff discharged from MS4s, which was assigned a WLA for each watershed. The only allowable nonpoint sources identified were natural or background sources, such as direct inputs from birds, terrestrial and aquatic animals, wrack line and aquatic plants, sediments, or other unidentified and unquantified sources within the receiving waters, which were lumped together and assigned a LA. Because only the point sources are considered controllable, a load reduction was only calculated for the bacteria loads from the MS4s. Bacteria loads from sources of illegal discharges were assigned WLAs and LAs of zero. The TMDLs, LAs for natural and background sources, WLAs for municipal MS4s, and load reductions for municipal MS4s are shown below in Tables [Insert table numbers].

MARGIN OF SAFETY

There are two ways to incorporate the MOS (USEPA, 1991): (1) implicitly incorporate the MOS using conservative model assumptions to develop allocations; and/or, (2) explicitly specify a portion of the total TMDL as the MOS and use the remainder for allocations. Throughout the TMDL development process, conservative assumptions were employed. Based on the incorporation of all these conservative assumptions, no explicit MOS was necessary.

Table [Insert table number]. REC-1 Wet Weather TMDLs for Total Coliform for Baby Beach and Shelter Island Shoreline Park Shoreline Segments

Waterbody	Shoreline Segment/Area	Hydrologic Descriptor	Model Sub-watershed	TMDL (Billion MPN/ 30 days)	Load Allocations (LAs)	Wasteload Allocations (WLAs)	Existing Wasteloads	Percent Reduction of Municipal MS4 Existing Wasteload[2]
					Natural/Background (Billion MPN/ 30 days)[1]	Municipal MS4 (Billion MPN/ 30 days)	Municipal MS4 (Billion MPN/ 30 days)	
Dana Point Harbor	Baby Beach	Dana Point HSA (901.14)	2101,2102 2103,2104	166,111	162,857	3,254	3,254	0%
San Diego Bay	Shelter Island Shoreline Park	Point Loma HA (908.10)	2201	482,598	482,400	198	198	0%

Abbreviations/Acronyms:
TMDL: total maximum daily load
LA: load allocation for nonpoint source
WLA: wasteload allocation for point source
MS4: Municipal Separate Storm Sewer System
MPN: most probable number

Notes:
[1] Calculated by dry weather EFDC model analysis (Dry weather LA from Table 8-4 multiplied by 30 days). No reduction required for natural/background sources.
[2] Percent Reduction of Existing Municipal MS4 Wasteload = (Existing Municipal MS4 Wasteload – Municipal MS4 WLA) ÷ (Existing Municipal MS4 Wasteload) x 100%

Table [Insert table number]. REC-1 Wet Weather TMDLs for Fecal Coliform for Baby Beach and Shelter Island Shoreline Park Shoreline Segments

Waterbody	Shoreline Segment/Area	Hydrologic Descriptor	Model Sub-watershed	TMDL (Billion MPN/ 30 days)	Load Allocations (LAs)	Wasteload Allocations (WLAs)	Existing Wasteloads	Percent Reduction of Municipal MS4 Existing Wasteload[2]
					Natural/Background (Billion MPN/ 30 days)[1]	Municipal MS4 (Billion MPN/ 30 days)	Municipal MS4 (Billion MPN/ 30 days)	
Dana Point Harbor	Baby Beach	Dana Point HSA (901.14)	2101,2102 2103,2104	32,585	32,473	112	112	0%
San Diego Bay	Shelter Island Shoreline Park	Point Loma HA (908.10)	2201	41,408	41,400	8	8	0%

Abbreviations/Acronyms:
TMDL: total maximum daily load
LA: load allocation for nonpoint source
WLA: wasteload allocation for point source
MS4: Municipal Separate Storm Sewer System
MPN: most probable number

Notes:
[1] Calculated by dry weather EFDC model analysis (Dry weather LA from Table 8-5 multiplied by 30 days). No reduction required for natural/background sources.
[2] Percent Reduction of Existing Municipal MS4 Wasteload = (Existing Municipal MS4 Wasteload – Municipal MS4 WLA) ÷ (Existing Municipal MS4 Wasteload) x 100%

Table [Insert table number]. REC-1 Wet Weather TMDLs for *Enterococcus* for Baby Beach and Shelter Island Shoreline Park Shoreline Segments

Waterbody	Shoreline Segment/Area	Hydrologic Descriptor	Model Sub-watershed	TMDL (Billion MPN/ 30 days)	Load Allocations (LAs)	Wasteload Allocations (WLAs)	Existing Wasteloads	Percent Reduction of Municipal MS4 Existing Wasteload[2]
					Natural/Background (Billion MPN/ 30 days)[1]	Municipal MS4 (Billion MPN/ 30 days)	Municipal MS4 (Billion MPN/ 30 days)	
Dana Point Harbor	Baby Beach	Dana Point HSA (901.14)	2101,2102 2103,2104	5,730	5,616	114	301	62.2%
San Diego Bay	Shelter Island Shoreline Park	Point Loma HA (908.10)	2201	10,556	10,530	26	26	0%

Abbreviations/Acronyms:
TMDL: total maximum daily load
LA: load allocation for nonpoint source
WLA: wasteload allocation for point source
MS4: Municipal Separate Storm Sewer System
MPN: most probable number

Notes:
[1] Calculated by dry weather EFDC model analysis (Dry weather LA from Table 8-6 multiplied by 30 days). No reduction required for natural/background sources.
[2] Percent Reduction of Existing Municipal MS4 Wasteload = (Existing Municipal MS4 Wasteload – Municipal MS4 WLA) ÷ (Existing Municipal MS4 Wasteload) x 100%

Table [Insert table number]. REC-1 Dry Weather TMDLs for Total Coliform for Baby Beach and Shelter Island Shoreline Park Shoreline Segments

Waterbody	Shoreline Segment/Area	Hydrologic Descriptor	Model Sub-watershed	TMDL (Billion MPN/ day)	Load Allocations (LAs)	Wasteload Allocations (WLAs)	Existing Wasteloads	Percent Reduction of Municipal MS4 Existing Wasteload[2]
					Natural/Background (Billion MPN/ day)[1]	Municipal MS4 (Billion MPN/ day)	Municipal MS4 (Billion MPN/ day)	
Dana Point Harbor	Baby Beach	Dana Point HSA (901.14)	2101,2102 2103,2104	5,430	5,429	0.86	9.0	90.4%
San Diego Bay	Shelter Island Shoreline Park	Point Loma HA (908.10)	2201	16,080	16,080	0	0	0%

Abbreviations/Acronyms:
TMDL: total maximum daily load
LA: load allocation for nonpoint source
WLA: wasteload allocation for point source
MS4: Municipal Separate Storm Sewer System
MPN: most probable number

Notes:
1 Calculated by dry weather EFDC model analysis. No reduction required for natural/background sources.
2 Percent Reduction of Existing Municipal MS4 Wasteload = (Existing Municipal MS4 Wasteload – Municipal MS4 WLA) ÷ (Existing Municipal MS4 Wasteload) x 100%

Table [Insert table number]. REC-1 Dry Weather TMDLs for Fecal Coliform for Baby Beach and Shelter Island Shoreline Park Shoreline Segments

Waterbody	Shoreline Segment/Area	Hydrologic Descriptor	Model Sub-watershed	TMDL (Billion MPN/ day)	Load Allocations (LAs)	Wasteload Allocations (WLAs)	Existing Wasteloads	Percent Reduction of Municipal MS4 Existing Wasteload[2]
					Natural/Background (Billion MPN/ day)[1]	Municipal MS4 (Billion MPN/ day)	Municipal MS4 (Billion MPN/ day)	
Dana Point Harbor	Baby Beach	Dana Point HSA (901.14)	2101,2102 2103,2104	1,083	1,082	0.17	1.0	82.7%
San Diego Bay	Shelter Island Shoreline Park	Point Loma HA (908.10)	2201	1,380	1,380	0	0	0%

Abbreviations/Acronyms:
TMDL: total maximum daily load
LA: load allocation for nonpoint source
WLA: wasteload allocation for point source
MS4: Municipal Separate Storm Sewer System
MPN: most probable number

Notes:
1 Calculated by dry weather EFDC model analysis. No reduction required for natural/background sources.
2 Percent Reduction of Existing Municipal MS4 Wasteload = (Existing Municipal MS4 Wasteload – Municipal MS4 WLA) ÷ (Existing Municipal MS4 Wasteload) x 100%

Table [Insert table number]. REC-1 Dry Weather TMDLs for *Enterococcus* for Baby Beach and Shelter Island Shoreline Park Shoreline Segments

Waterbody	Shoreline Segment/Area	Hydrologic Descriptor	Model Sub-watershed	TMDL (Billion MPN/ day)	Load Allocations (LAs)	Wasteload Allocations (WLAs)	Existing Wasteloads	Percent Reduction of Municipal MS4 Existing Wasteload[2]
					Natural/Background (Billion MPN/ day)[1]	Municipal MS4 (Billion MPN/ day)	Municipal MS4 (Billion MPN/ day)	
Dana Point Harbor	Baby Beach	Dana Point HSA (901.14)	2101,2102 2103,2104	187	187	0.03	0.8	96.2%
San Diego Bay	Shelter Island Shoreline Park	Point Loma HA (908.10)	2201	351	351	0	0	0%

Abbreviations/Acronyms:
TMDL: total maximum daily load
LA: load allocation for nonpoint source
WLA: wasteload allocation for point source
MS4: Municipal Separate Storm Sewer System
MPN: most probable number

Notes:
[1] Calculated by dry weather EFDC model analysis. No reduction required for natural/background sources.
[2] Percent Reduction of Existing Municipal MS4 Wasteload = (Existing Municipal MS4 Wasteload – Municipal MS4 WLA) ÷ (Existing Municipal MS4 Wasteload) x 100%

TMDL IMPLEMENTATION PLAN

By design, waste load allocations and load allocations are established at levels that when met, will result in the full attainment of water quality standards. For this reason, the San Diego Water Board expects that at the end of the TMDL compliance period, applicable load and waste load allocations, as well as the water quality objectives will be met at all times in the receiving water. In the event that water quality objectives are not met at the end of the compliance period, the Board will require the dischargers to conduct an investigation to identify the specific source(s) responsible for the failure to meet water quality objectives. If the source is found to be anthropogenic, the San Diego Water Board will initiate enforcement or other regulatory action as appropriate to correct the problem. If the source is natural, and if all of the conditions for using the natural sources exclusion approach (NSEA) have been met, the Board will consider the application of the NSEA, including the recalculation of the TMDLs to account for the natural sources. The necessary actions to implement the TMDLs are described in section 10 of the Technical Report entitled *Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay*, dated June 11, 2008, and listed below.

(A) Specific Implementation Objectives

Since 2002, the dischargers have implemented several non-structural best management practice (BMP) programs and structural BMPs that have resulted in noticeable improvements in water quality at the impaired shoreline segments. The County of Orange has already conducted numerous studies and implemented a variety of non-structural and structural BMPs in an effort to reduce bacteria levels at Baby Beach since before 2002. These efforts have included installing seasonal plugs in storm drains, increased street sweeping efforts, expedited trash collection to control birds, the installation of bird netting under the pier, public education efforts against bird-feeding at the beach, artificial circulation of water at Baby Beach, a dry weather flow diversion structure and media filter system on the west end of the beach, catch basin filters, and the collection and disposal of bird fecal droppings from the exposed intertidal areas of the beach. The San Diego Unified Port District has also implemented several non-structural BMP programs since 2002. Water quality data from 2002 to 2006 indicate that bacteria levels in the waters at Baby Beach and Shelter Island Shoreline Park have shown significant improvements in water quality since 2002.

As shown in Tables [Inset table numbers here], the modeling results indicate that no load reductions are required for total coliform, fecal coliform, and *Entercoccus* indicator bacteria for Shelter Island Shoreline Park during wet weather or dry weather conditions. Additionally, the modeling results indicate only *Entercoccus* indicator bacteria wet weather load reductions are required for Baby Beach and no wet weather load reductions are required for total coliform and fecal coliform indicator bacteria. For dry weather, Baby Beach requires between approximately 83 percent and 96 percent

wasteload reductions for total coliform, fecal coliform, and *Entercoccus* indicator bacteria. However, based only on the water quality data collected during 2006, the number of samples that exceed the REC-1 water quality objectives are less than the allowable number of exceedances for recommending removal from the 303(d) List. This trend implies that the past and current BMPs that have been implemented are effective in reducing bacteria loads to the receiving waters and that water quality in the impaired shoreline segments already meet REC-1 water quality objectives during dry weather. However, additional monitoring is required to confirm this trend, and additional BMPs may be needed to meet the REC-1 water quality objectives during wet weather.

While the Bacteria Load Reduction Plans (BLRPs), as described below, will still be required from the dischargers, if current trends continue, monitoring and permanent implementation of the current programs and BMPs may be adequate for meeting the wet weather and dry weather TMDLs. If the REC-1 water quality objectives cannot be met in the receiving waters by the end of the compliance schedules, and if natural and background sources appear to be the sole source of continued impairment, application of the natural sources exclusion approach (NSEA) to revise the TMDLs, as described below, may be appropriate.[4]

Therefore, if the water quality data support delisting before the NPDES requirement revisions are considered, specific objectives of this Implementation Plan are as follows:

1. Persons responsible for monitoring the impaired shoreline segments of Baby Beach and Shelter Island Shoreline Park for bacteria will continue with the monitoring program to ensure REC-1 water quality objectives are maintained.
2. If REC-1 water quality objectives are exceeded, actions outlined in Attachment B of Order Nos. R9-2007-0001 and R9-2002-0001 in section II.C, Coastal Storm Drain Outfall Monitoring, and any subsequent amendment or renewal, will be implemented.
3. If sources of bacteria persist at levels that exceed water quality standards, then the persons responsible will take appropriate actions to identify and eliminate the controllable source or sources of the chronic contamination. If natural and background sources appear to be the sole source of the impairment, application of the NSEA to revise the TMDLs may be appropriate.

If the impaired shoreline segments of BB and SISP remain on or are put back on the List during subsequent iterations of the 303(d) listing process due to impacts from controllable sources of bacteria, the San Diego Water Board will revise the current NPDES requirements and/or issue additional waste discharge requirements to be consistent with these TMDLs.

[4] After adoption of a Basin Plan amendment authorizing the use of the Natural Sources Exclusion Approach by the San Diego Water Board and approval by the Office of Administrative Law.

(B) San Diego Water Board Actions

The San Diego Water Board regulates discharges of waste by issuing waste discharge prohibitions, waste discharge requirements, or conditional waivers of waste discharge requirements. Violation of a waste discharge prohibition, waste discharge requirement, or waiver condition is subject to enforcement actions. This section describes the actions that the San Diego Water Board will take to implement the TMDLs.

(1) Process and Schedule for Issuing NPDES Requirements

The TMDLs will be implemented primarily by reissuing or revising the existing NPDES waste discharge requirements for MS4 discharges to include water quality based effluent limitations (WQBELs) that are consistent with the assumptions and requirements of the bacteria WLAs for MS4 discharges, though there may be other or new point sources.

NPDES requirements should be issued, reissued, or revised "as expeditiously as practicable" to incorporate WQBELs derived from the TMDL WLAs. "As expeditiously as practicable" means the following:

1. **New point sources**. "New" point sources previously unregulated by NPDES requirements must obtain their NPDES requirements before they can lawfully discharge pollutants. For point sources receiving NPDES requirements for the first time, "as expeditiously as practicable" means that the San Diego Water Board incorporates WQBELs that are consistent with the assumptions and requirements of the WLAs into the NPDES requirements and requires compliance with the WQBELs upon the commencement of the discharge.

2. **Point Sources Currently Regulated Under NPDES Requirements**. For point sources currently regulated under NPDES requirements, "as expeditiously as practicable" means that:

    a. WQBELs that are consistent with the assumptions and requirements of the WLAs should be incorporated into NPDES requirements during their 5-year term, prior to expiration, in accordance with the applicable NPDES requirement reopening provisions, taking into account factors such as available NPDES resources, staff and budget constraints, and other competing priorities.

    b. In the event the NPDES requirement revisions cannot be considered during the 5-year term, the San Diego Water Board will incorporate WQBELs that are consistent with the assumptions and requirements of the WLAs into the NPDES requirements at the end of the 5-year term.

(2) Actions with Respect to Phase I Municipal Dischargers

The Phase I Municipal Dischargers in San Diego and Orange County are required under Receiving Water Limitations A.3.a.1 and C.2[5] of Orders No. R9-2007-0001 and R9-2002-0001, respectively (San Diego County and Orange County MS4 NPDES requirements), and any subsequent amendment or renewal, to implement additional BMPs to reduce bacteria discharges in impaired watersheds to the maximum extent practicable and to restore compliance with the bacteria water quality objectives. This obligation is triggered when either the discharger or the San Diego Water Board determines that MS4 discharges are causing or contributing to an exceedance of an applicable water quality objective, in this case the REC-1 indicator bacteria water quality objectives. Designation of the shoreline segments in San Diego Bay and Dana Point Harbor as water quality limited segments under Clean Water Act section 303(d) and the TMDL analysis provided sufficient evidence that that MS4 discharges may be causing or contributing to the violation of water quality standards. Thus, the Municipal Dischargers should be, and have been implementing the provisions of Receiving Water Limitation C.2 with respect to bacteria discharges into water quality limited segments.

In addition to enforcing the provisions of Receiving Water Limitation C.2, the San Diego Water Board shall reissue or revise Orders No. R9-2007-0001 and R9-2002-0001, to incorporate WQBELs consistent with the assumptions and requirements of the bacteria WLAs, and requirements for monitoring and reporting. In those orders, the Phase I Municipal Dischargers are referred to as "Copermittees."[6] WQBELs and other requirements implementing the TMDLs can be incorporated into these NPDES requirements upon the normal renewal cycle or sooner, if appropriate. The requirements implementing the TMDLs shall include the following:

a. WQBELs consistent with the requirements and assumptions of the bacteria WLAs described in Tables [Insert table numbers]and a schedule of compliance applicable to the MS4 discharges into the impaired shoreline segments described in Tables [Insert table numbers]. At a minimum, WQBELs shall include a BMP program to attain the WLAs.

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[5] Receiving Water Limitations A.3.a.1 and C.2.a provide that "[u]pon a determination by either the Copermittee or the San Diego Water Board that MS4 discharges are causing or contributing to an exceedance of an applicable water quality standard, the Copermittee shall promptly notify and thereafter submit a report to the San Diego Water Board that describes BMPs that are currently being implemented and additional BMPs that will be implemented to prevent or reduce any pollutants that are causing or contributing to the exceedance of water quality standards. The report may be incorporated in the annual update to the Jurisdictional URMP unless the San Diego Water Board directs an earlier submittal. The report shall include an implementation schedule. The San Diego Water Board may require modification to the report." Additional requirements are included in sections C.2.b-d.

[6] Copermittees own or operate MS4s through which urban runoff discharges into waters of the U.S. within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the United States.

b. If the WQBELs consist of BMP programs, then the reporting requirements shall consist of annual progress reports on BMP planning, implementation, and effectiveness in attaining the WQOs in impaired shoreline segments, and annual water quality monitoring reports. The first progress report shall consist of a Bacteria Load Reduction Plan (BLRP), which may be included as part of the annual NPDES reporting requirements. BLRPs must be specific to each impaired waterbody.

To provide guidance to the dischargers in preparing BLRPs, the following bullets describe components that should be considered for incorporation in the BLRPs.

Comprehensive Watershed Approach

- Dischargers should identify the Lead Watershed Contact for their BLRPs. The Lead Watershed Contact should serve as liaison between all other common watershed dischargers and the San Diego Water Board, where appropriate.

- Dischargers should describe a program for encouraging collaborative, watershed-based, land-use planning in their jurisdictional plans.

- Dischargers should develop and periodically update a map of the BLRP watershed, to facilitate planning, assessment, and collaborative decision-making. As appropriate, the map should include features such as receiving waters; Clean Water Act section 303(d) impaired receiving waters; water quality projects; land uses; MS4s; major highways; jurisdictional boundaries; and inventoried commercial, industrial, and municipal sites.

- Dischargers should annually assess the water quality of the impaired water body in their BLRPs in order to identify all water quality problems within the impaired water body. This assessment should use applicable water quality data, reports, and analysis generated in accordance with the requirements of the applicable NPDES MS4 monitoring and reporting programs, as well as applicable information available from other public and private organizations.

- Dischargers should develop and implement a collective watershed BLRP strategy to meet the bacteria TMDL. The strategy should guide dischargers in developing a Bacteria Compliance Schedule (BCS) which includes BMP planning and scheduling as outlined below.

- Dischargers should collaborate to develop and implement the BLRPs. The BLRP should include a proposal for regularly scheduled meetings among the dischargers in the impaired watershed.

- Because water quality data will ultimately determine if a waterbody will be delisted from the 303(d) List, the BLRP should include a monitoring and reporting program that contains the following elements:
  - Locations of water quality sampling sites that are spatially representative of the waterbody and appropriate for identifying potential sources, including, at a minimum, the monitoring stations currently used to monitor water quality.
  - Schedule of water quality sampling that is temporally representative of both wet weather and dry weather conditions. Wet weather samples are collected during storms of 0.2 inches of rainfall and the 72 hour period after the storm. Dry weather samples are collected from during times when rain has not fallen for the preceding 72 hours.
  - Presentation of past and present water quality data that have been collected.
  - Analysis of water quality data compared to the applicable Basin Plan water quality objectives. Dry weather water quality data are compared to long-term (e.g., geometric mean, mean, or median) water quality objectives, as well as short-term (e.g., single sample maximum) water quality objectives. Wet weather water quality data are compared to short-term (e.g., single sample maximum) water quality objectives.
  - Analysis of water quality data to correlate noticeable improvements in water quality with past and current BMPs that have been implemented and are effective.
  - Analysis of water quality data to correlate elevated bacteria levels with known or suspected sewage spills from wastewater collection systems and treatment plants or boats.
  - Recommendations for increased or decreased water quality sampling based on water quality data analyses.

- Each BLRP and BCS should be reviewed annually to identify needed modifications and improvements. The dischargers should develop and implement a plan and schedule, included in the BCS, to address the identified modifications and improvements. All updates to the BLRP should be documented in the BLRP, and submitted to the San Diego Water Board. Individual dischargers should also review and modify their jurisdictional ordinances and activities as necessary so that they are consistent with the requirements of the BLRP.

Bacteria Compliance Schedule - BMP Planning and Scheduling

The BCS should identify the BMPs/water quality projects that have been implemented or are planned for implementation and provide an implementation schedule for each BMP/water quality project. The BCS should demonstrate how the BMPs/water quality projects will address all the bacteria TMDLs. The BCS, at a minimum, should include scheduling for the following:

Non-structural BMP phasing:

- Completed Non-Structural BMP Analysis – Information should be provided regarding the non-structural BMPs completed and/or currently in practice, a timeline of BMP implementation and maintenance, and an assessment of effectiveness.

If the Completed Non-Structural BMP Analysis indicates additional non-structural BMPs are necessary, the following should be included in the BCS:

- New Non-Structural BMP Analysis - Watershed data should be analyzed to identify new effective non-structural BMPs for implementation. This should be completed and included in the BCS.

- Scheduled Annual Non-structural BMP Implementation - The above analysis should be used to identify BMPs that have and will be implemented and to develop an aggressive non-structural BMP implementation schedule. The BCS should include a schedule of the current BMP staffing for each impaired area, and provide a discussion on adjustments to staff scheduling to meet possible new non-structural BMP demands. Schedules should be realistic and justifiable.

- Scheduled Annual BMP Assessment and Optimizing Adjustments - As the non-structural BMPs are implemented, a scheduled in-depth assessment of the non-structural BMPs' performance should follow. Non-structural BMPs that are found to be ineffective should be modified to incorporate optimizing adjustments to improve performance or be replaced by other effective non-structural BMPs. The results from this assessment should also be used to determine structural BMP selection and the schedule for structural BMP implementation. The BCS should include an annual schedule for in-depth non-structural BMP assessment and optimizing adjustments.

- Scheduled Continuous Budget and Funding Efforts- Securing budget and funding for non-structural BMP staffing and equipment should be scheduled early and continue until the bacteria TMDLs are met. The BCS should include a schedule for staff time, including position and job description, authorized for securing budget and funding for non-structural BMP implementation.

Structural BMP phasing:

- Completed Structural BMP Analysis – Information should be provided regarding the structural BMPs completed and/or currently in practice, a timeline of BMP implementation and maintenance, and an assessment of effectiveness.

If the Completed Structural BMP Analysis indicates additional structural BMPs are necessary, the following should be included in the BCS:

- Scheduled New Structural BMP Analysis– Structural BMP analysis should utilize all available information, including the non-structural BMP assessment and existing structural BMP assessment, to identify, locate, design and build possible new structural BMPs, or a train of BMPs, to meet the these bacteria TMDLs. The BCS should include a schedule for structural BMP analysis.

- Scheduled Annual BMP Construction - The BCS should include a projected general construction schedule with a realistic and justifiable timeline for possible new BMP construction.

- Scheduled Annual BMP Assessment, Optimization Adjustments, and Maintenance - Assessment for structural BMPs should begin immediately upon initial BMP completion, followed by continuously scheduled BMP assessment, optimization adjustments, and maintenance, to both the individual structural BMPs and the structural BMP program as a whole. The BCS should include an annual schedule for in-depth structural BMP assessment.

- Scheduled Continuous Budget and Funding Effort - Securing budget and funding for structural BMPs and additional maintenance staff should be scheduled early and continue until the bacteria TMDLs are met. The BCS should include a schedule for staff time, including position and job description, authorized for securing budget and funding for structural BMP implementation.

Subsequent reports should assess and describe the effectiveness of implementing the Bacteria Load Reduction Plan. Effectiveness assessments should be based on a program effectiveness assessment framework, such as the one developed by the California Stormwater Quality Association (CASQA, 2005). Using the CASQA framework as an example, the assessments should address the framework's outcome levels 1-5 on an annual basis, and outcome level 6 once every five years.[7] Methods used for assessing

[7] Outcome level 1 assesses compliance with activity-based permit requirements. Outcome level 2 assesses changes in attitudes, knowledge, and awareness. Outcome level 3 assesses behavioral

effectiveness should include the following or their equivalent: surveys, pollutant loading estimations, and receiving water quality monitoring. The long-term strategy should also discuss the role of monitoring data in substantiating or refining the assessment. Once water quality objectives have been attained, or the anthropogenic sources have been eliminated and pollutant loads can be attributed to only natural and background sources, a reduced level of monitoring may be appropriate.

In addition to these requirements, if load-based numerical WQBELs are included in the NPDES requirements, the monitoring requirements should include flow and bacteria density measurements to determine if bacteria loads in effluent are in compliance with WQBELs.

The BLRPs are the municipal dischargers' opportunity to propose methods for assessing compliance with WQBELs that implement TMDLs. The monitoring components included in the BLRPs should be formulated according to particular compliance assessment strategies. The monitoring components are expected to be consistent with, and support whichever compliance assessment methods are proposed. The San Diego Water Board will coordinate with the municipal dischargers during the development of their proposed monitoring components and associated compliance assessment methods.

If NPDES requirements are not likely to be issued, reissued or revised within 6 months of Office of Administrative Law approval of these TMDLs, the San Diego Water Board may issue an investigative/monitoring order to dischargers pursuant to sections 13267 or 13383 of the Water Code. This order would require assessment of current BMPs, possible planning for additional BMPs, and receiving water quality monitoring in adherence to performance measures described above.

The BLRPs may be re-evaluated at set intervals (such as 5-year renewal cycles for NPDES requirements, or upon request from named dischargers, as appropriate and in accordance with the San Diego Water Board priorities). Plans may be iterative and adaptive according to assessments and any special studies.

(3) Actions with Respect to Wastewater Collection Systems and Treatment Plants

The San Diego Water Board will conduct surveillance of and enforce the provisions of State Water Board Order No. 2006-0003-DWQ, and San Diego Water Board Order No. R9-2007-0005 as needed to ensure that collection systems for wastewater treatment plants do not overflow, leak, or otherwise discharge into MS4s or surface waters. If necessary, San Diego Water Board Order No. R9-2007-0005 can be revised to require more aggressive collection system monitoring, maintenance, and repair schedules.

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change and BMP implementation. Outcome level 4 assesses pollutant load reductions. Outcome level 5 assesses changes in urban runoff and discharge water quality. Outcome level 6 assesses changes in receiving water quality. See CASQA "An Introduction to Stormwater Program Effectiveness Assessment."

(4) Actions with Respect to Marinas and Boats

If discharges from boats are shown to be a significant source of bacteria contributing to exceedances of water quality objectives, the San Diego Water Board will enforce the waste discharge prohibitions in the Basin Plan to ensure that illegal discharges from boats to surface waters do not occur. This may require issuing enforcement actions, such as Cease and Desist Orders, or issuing NPDES requirements or waste discharge requirements to the marina and harbor operators and/or the muncipalities requiring implementation of BMPs (e.g., public education and outreach, enforcing ordinances, and/or requiring dye tabs in boat sewage holding tanks) to eliminate illegal discharges of sewage, in addition to water quality monitoring and reporting.

(5) Additional Actions

Take Enforcement Actions

The San Diego Water Board shall consider enforcement actions,[8] as necessary and appropriate, against any discharger failing to comply with applicable waste discharge requirements or discharge prohibitions. Enforcement actions may be taken, as necessary and appropriate, to control the discharge of bacteria to impaired shorelines to attain compliance with the bacteria WLAs specified in Tables [Insert table numbers], or to attain compliance with the applicable water quality objectives.

Recommend High Priority for Grant Funds

The San Diego Water Board shall recommend that the State Water Board assign a high priority to awarding grant funding[9] for projects to implement the bacteria TMDLs. Special emphasis will be given to projects that can achieve quantifiable bacteria load reductions consistent with the specific bacteria TMDL WLAs and LAs.

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[8] An enforcement action is any formal or informal action taken to address an incidence of actual or threatened noncompliance with existing regulations or provisions designed to protect water quality. Potential enforcement actions including notices of violation (NOVs), notices to comply (NTCs), imposition of time schedules (TSO), issuance of cease and desist orders (CDOs) and cleanup and abatement orders (CAOs), administrative civil liability (ACL), and referral to the attorney general (AG) or district attorney (DA). The San Diego Water Board generally implements enforcement through an escalating series of actions to: (1) assist cooperative dischargers in achieving compliance; (2) compel compliance for repeat violations and recalcitrant violators; and (3) provide a disincentive for noncompliance.

[9] In most cases, the State Water Board administers the awarding of grants funded from Proposition 13, Proposition 50, Clean Water Act section 319(h) and other federal appropriations to projects that can result in measurable improvements in water quality, watershed condition, and/or capacity for effective watershed management. Many of these grant fund programs have specific set-asides for expenditures in the areas of watershed management and TMDL project implementation for non-point source pollution.

Apply the Natural Sources Exclusion Approach[10]
Under the Natural Sources Exclusion Approach (NSEA), all anthropogenic sources of indicator bacteria to the water bodies subject to an indicator bacteria TMDL must be controlled. Dischargers must also demonstrate that all anthropogenic sources of indicator bacteria to the target water body are controlled and that residual indicator bacteria densities do not indicate a health risk.

Once control of all anthropogenic sources and demonstration of appropriate health risk levels have been achieved, the residual indicator bacteria loads in the waterbodies attributable to uncontrollable sources can be identified and measured. Likewise, the frequency that uncontrollable sources cause exceedances of indicator bacteria water quality objectives in the water body can be identified. The information can be used to establish an allowable indicator bacteria WQO exceedance frequency in the impaired water body based upon the residual exceedance frequency observed. This information can then be used to recalculate the TMDLs, WLAs, and LAs.

The use of the NSEA is contingent upon demonstration of control of all anthropogenic sources of indicator bacteria to the waterbodies subject to an indicator bacteria TMDL. Since this task is likely to be formidable, use of the NSEA is not expected to occur immediately. Rather, the NSEA would be used to recalculate TMDLs at some point after their initial adoption, following demonstration of control of all anthropogenic sources.

The dischargers are responsible for collecting and providing the data to support the application of the NSEA. If the data support the application of the NSEA, the San Diego Water Board will recalculate the TMDLs, WLAs, and LAs to allow for the exceedances of the REC-1 indicator bacteria WQOs due to uncontrollable sources.

(C) Coordination and Execution of Special Studies

The San Diego Water Board recognizes that coordination and execution of special studies by dischargers and other interested persons could result in improved TMDL analyses that more accurately protect beneficial uses. Areas of study that could benefit TMDL analysis include collection of data that can be used to improve model output, improved understanding of bacteria levels and the relationship to health effects, and identification of an appropriate and affordable method(s) to measure pathogens directly. Additionally, studies designed to measure BMP effectiveness and bacteria source identification will be useful for dischargers in identifying appropriate strategies to meet the requirements of this TMDL.

[10] After adoption of a Basin Plan amendment authorizing the use of the Natural Sources Exclusion Approach by the San Diego Water Board and approval by the Office of Administrative Law.

(1) Collect Data Useful for Model Improvement

Calibration and validation of the computer models used for TMDL analysis was based on limited data (water quality and/or flow) and assumed values for input parameters such as rates for bacteria die-off and re-growth. Limited data are available related to fecal bacteria that can be attributed to natural and background sources (e.g., waterfowl, terrestrial and aquatic wildlife, wrack line and aquatic plants, sediments, and other unidentified and unquantified sources within the waters). Studies designed to collect additional data that can be used for model improvement will result in more detailed TMDL results and allocations. Also, actual flow and loading data from each watershed and expanded receiving water data can be used to construct models that can more accurately reflect site-specific conditions.

(2) Improve Understanding Between Bacteria Levels and Health Effects

The San Diego Water Board recognizes that there are potential problems associated with using indicator bacteria WQOs to indicate the presence of human pathogens in receiving waters free of sewage discharges. The indicator bacteria WQOs were developed, in part, based on epidemiological studies in waters with sewage inputs. The risk of contracting a water-born illness from contact with urban runoff devoid of sewage, or human-source bacteria is not known. Some pathogens, such as *giardia* and *cryptosporidium* can be contracted from animal hosts. Likewise, domestic animals can pass on human pathogens through their feces. These and other uncertainties need to be addressed through special studies and, as a result, revisions to the TMDLs may be appropriate.

As information is gathered, initiating special studies to understand the uncertainties between bacteria levels and bacteria sources within the watersheds may be useful. Specifically, continuing research may be helpful to answer the following questions:

- What is the risk of illness from swimming in water contaminated with urban/stormwater runoff devoid of sewage?
- Do exceedances of the bacteria water quality objectives from animal sources (wildlife and domestic) increase the risk of illness?
- Are there other, more appropriate surrogates for measuring the risk of illness than the indicator bacteria WQOs currently used?

Addressing these uncertainties is needed to maximize effectiveness of strategies to reduce the risk of illness, which is currently measured by indicator bacteria densities. Dischargers may work with the San Diego Water Board to determine if such special studies are appropriate.

(3) Identification of Method for Direct Pathogen Measurement

Ultimately, the San Diego Water Board supports the idea of measuring pathogens (the agents causing impairment of beneficial uses) or an acceptable alternative indicator, rather than indicator bacteria (surrogates for pathogens). However, as stated previously, indicator bacteria have been used to measure water quality historically because measurement of pathogens is both difficult and costly. The San Diego Water Board is supportive of any efforts by the scientific community to perform epidemiological studies and/or investigate the feasibility of measuring pathogens directly. The San Diego Water Board further supports subsequent modification of WQOs as a result of such studies. Ultimately, TMDLs will be recalculated if WQOs are modified due to results from future studies.

(D) Compliance Schedule

Baby Beach Compliance Schedule

According to Tables [Insert table numbers], no wet weather wasteload reductions are required for total and fecal coliform indicator bacteria. This means that according to the wet weather models for Baby Beach, REC-1 water quality objectives for total and fecal coliform indicator bacteria are not expected to be exceeded due to discharges from the MS4s. The only wet weather wasteload reductions required for MS4s discharging into the receiving waters along the shoreline at Baby Beach is for *Enterococcus* indicator bacteria. The compliance schedule for Baby Beach to achieve wet weather TMDLs is as shown in [Insert table number].

Table [Insert table number]. Compliance Schedule for Baby Beach to Achieve Wet Weather TMDLs

Year (after OAL Approval)	Required Wasteload Reduction	TMDL Compliance Action
1	No reduction required	▪ Water Quality Monitoring ▪ Implement BMPs
2	Same as above	▪ Water Quality Monitoring ▪ Implement BMPs
3	Same as above	▪ Water Quality Monitoring ▪ Implement BMPs
4	Same as above	▪ Water Quality Monitoring ▪ Implement BMPs
5	Same as above	▪ Water Quality Monitoring ▪ Implement BMPs
6	Same as above	▪ Water Quality Monitoring ▪ Implement BMPs
7	50 percent *Enterococcus* reduction	▪ Water Quality Monitoring ▪ Implement BMPs
8	Same as above	▪ Water Quality Monitoring ▪ Implement BMPs
9	Same as above	▪ Water Quality Monitoring ▪ Implement BMPs
10	100 percent *Enterococcus* reduction	▪ Water Quality Monitoring ▪ Implement BMPs ▪ Submit request for removal from 303(d) List (if not requested and removed earlier)
10+	Same as above	▪ Water Quality Monitoring ▪ Implement BMPs ▪ Submit request for TMDL revisions based on Natural Sources Exclusion Approach if supported by data (if not requested and recalculated earlier) ▪ Submit request for removal from 303(d) List (if not requested and removed earlier)

At this time, control of bacteria loads for MS4s during wet weather is inherently difficult because the MS4 systems are traditionally designed to convey water quickly for flood control purposes. However, new approaches to storm water runoff management and BMP implementation can reduce the storm water runoff flow and associated pollutant loads. The phased compliance schedule to achieve wet weather TMDLs will provide the MS4 dischargers time to identify sources, develop plans and implement enhanced and expanded BMPs capable of achieving the mandated decreases in bacteria densities at the Baby Beach shoreline.

According to Tables [Insert table numbers], dry weather wasteload reductions are required for total coliform, fecal coliform, and *Enterococcus* indicator bacteria. The

trend in the water quality data from Baby Beach indicate that the number of exceedances of the REC-1 water quality objectives have declined significantly beginning in 2006. If the current trend continues, the San Diego Water Board expects that the dry weather TMDLs for Baby Beach can be achieved within the next 5 years. The compliance schedule for Baby Beach to achieve dry weather TMDLs is as shown in Table [Insert table number].

Table [Insert table number]. Compliance Schedule for Baby Beach to Achieve Dry Weather TMDLs

Year (after OAL Approval)	Required Wasteload Reduction	TMDL Compliance Action
1	No reduction required	▪ Water Quality Monitoring ▪ Implement BMPs
2	Same as above	▪ Water Quality Monitoring ▪ Implement BMPs
3	50 percent reduction	▪ Water Quality Monitoring ▪ Implement BMPs
4	Same as above	▪ Water Quality Monitoring ▪ Implement BMPs
5	100 percent reduction	▪ Water Quality Monitoring ▪ Implement BMPs ▪ Submit request for removal from 303(d) List (if not requested and removed earlier)
5+	Same as above	▪ Water Quality Monitoring ▪ Implement BMPs ▪ Submit request for TMDL revisions based on Natural Sources Exclusion Approach if supported by data (if not requested and recalculated earlier) ▪ Submit request for removal from 303(d) List (if not requested and removed earlier)

For both of the Baby Beach compliance schedules, if the REC-1 water quality objectives cannot be met in the receiving waters, and if natural and background sources appear to be the sole source of continued impairment, the natural sources exclusion approach (NSEA) may be applied. However, the Municipal Dischargers are responsible for collecting the data to support the application of the NSEA to recalculate the TMDL.

Shelter Island Shoreline Park Compliance Schedule

According to Tables [Insert table numbers], there are no wasteload reductions required for MS4s discharging into the receiving waters along the shoreline at Shelter Island Shoreline Park under both wet weather and dry weather conditions. This means that according to the wet weather and dry weather models for Shelter Island Shoreline Park, REC-1 water quality objectives are not expected to be exceeded due to discharges from the MS4s.

Given that the modeled wasteload reductions for both wet weather and dry weather conditions for all indicator bacteria are zero percent, no compliance schedules were developed to meet wasteload reductions for Shelter Island Shoreline Park. However the existing wasteload cannot exceed the WLA and Shelter Island Shoreline Park will remain on the 303(d) List until enough data are collected to support removing it from the 303(d) List. Therefore, in order to comply with these TMDLs, the responsible municipalities must continue implementing BMPs and collecting data until there are enough data to support and maintain the removal of SISP from the 303(d) List. In addition, the reporting requirements for the Shelter Island Shoreline Park TMDL must also include a periodic demonstration, no less often than every 2 years, that wasteload allocations and water quality objectives are being met.

The trend in the water quality data from Shelter Island Shoreline Park indicate that the number of REC-1 WQO exceedances have declined significantly since 2003. If the current trend continues, the San Diego Water Board expects that Shelter Island Shoreline Park will have enough data to support removal of Shelter Island Shoreline Park from the 303(d) List by 2010, and no later than 2012. The compliance schedule for SISP to achieve wet weather and dry weather TMDLs is as shown in Table [Insert table number].

Table [Insert table number]. Compliance Schedule for Shelter Island Shoreline Park to Achieve Wet Weather and Dry Weather TMDLs

Year	TMDL Compliance Action
2012	▪ Water Quality Monitoring ▪ Implement BMPs ▪ Submit request for TMDL revisions based on Natural Sources Exclusion Approach if supported by data (if not requested and recalculated earlier) ▪ Submit request for removal from 303(d) List (if not requested and removed earlier)

If the REC-1 water quality objectives cannot be met in the receiving waters by 2012, and if natural and background sources appear to be the source of continued impairment, the NSEA may be applied. However, the Municipal Dischargers are responsible for collecting the data to support the application of the NSEA to recalculate the TMDLs.

(E) TMDL Implementation Milestones

Accomplishing the goals of the implementation plan will be achieved by cooperative participation from all responsible parties, including the San Diego Water Board. Major milestones are described below in Table [Insert table number].

Table [Insert table number]. TMDL Implementation Milestones

Item	Implementation Action	Responsible Parties	Date
1	Effective date of Baby Beach and Shelter Island Shoreline Park Bacteria TMDL Waste Load Allocations (WLAs).	▪ San Diego Water Board ▪ Phase I Municipal Dischargers	Effective date*
2	Issue, reissue, or revise Phase I Municipal NPDES WDRs to include WQBELs consistent with the WLAs.	▪ San Diego Water Board	Within 5 years of effective date
3	Submit annual Progress Report to San Diego Water Board.	▪ Phase I Municipal Dischargers	Annually after reissue of NPDES WDRs
4	Recommend TMDL-related projects as high priority for grant funds.	▪ San Diego Water Board	As needed after effective date
5	Coordination and execution of special studies.	▪ San Diego Water Board ▪ Phase I Municipal Dischargers	As needed after effective date
6	Meet 50% wasteload reductions.	▪ Baby Beach Phase I Municipal Dischargers	3 years after effective date for dry weather 7 years after effective date for wet weather
		▪ Shelter Island Shoreline Park Phase I Municipal Dischargers	No load reductions required. Removal from 303(d) List by 2012.
7	Meet 100% wasteload reductions.	▪ Baby Beach Phase I Municipal Dischargers	5 years after effective date for dry weather 10 years after effective date for wet weather
		▪ Shelter Island Shoreline Park Phase I Municipal Dischargers	No load reductions required. Removal from 303(d) List by 2012.
8	Take enforcement actions to attain compliance with the WLAs.	▪ San Diego Water Board	As needed after effective date
9	Issue NPDES requirements or waste discharge requirements to marina and harbor operators and/or the muncipalities to eliminate sewage discharges from boats	▪ San Diego Water Board	As needed after effective date
10	Apply NSEA and recalculate TMDLs	▪ Baby Beach Phase I Municipal Dischargers	As appropriate after effective date, if data are available to support the action.
		▪ Shelter Island Shoreline Park Phase I Municipal Dischargers	

* Effective date is date of approval of these TMDLs by the Office of Administrative Law

California Regional Water Quality Control Board
San Diego Region

Total Maximum Daily Loads for Indicator Bacteria Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

Technical Report
June 11, 2008

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Documents also are available at: http://www.waterboards.ca.gov/sandiego.

Total Maximum Daily Loads for Indicator Bacteria Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

Technical Report

Adopted by the
California Regional Water Quality Control Board
San Diego Region
on June 11, 2008

Approved by the
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Acronyms and Abbreviations

ALERT	Automatic Local Evaluation in Real-Time
Bacteria TMDL Project I	Total Maximum Daily Loads for Indicator Bacteria Project I - Beaches and Creeks in the San Diego Region
Basin Plan	Water Quality Control Plan for the San Diego Basin (9)
BASINS	Better Assessment Science Integrating Point and Nonpoint Sources
BB	Baby Beach
BCS	Bacteria Compliance Schedule
BLRP	Bacteria Load Reduction Plan
BMP	best management practice
CALWTR	Calwater
CASQA	California Stormwater Quality Association
CEQA	California Environmental Quality Act
CIMIS	California Irrigation Management Information System
COOPS	Center for Operational Oceanographic Products and Services
DPH	Dana Point Harbor
DWR	California Department of Water Resources
E. Coli	*Escherichia coli*
EFDC	Environmental Fluid Dynamics Code model
EIR	Environmental Impact Report
ENT	*Enterococcus* indicator bacteria
FC	fecal coliform indicator bacteria
HA	Hydrologic Area
HSA	Hydrologic Subarea
HSPF	Hydrologic Simulation Program – FORTRAN model
LA	load allocation
$LA_{Homeless}$	load allocation for illegal discharges from homeless encampments
$LA_{Natural/Background}$	load allocation for natural and background sources of bacteria
List	Clean Water Action section 303(d) List of Water Quality Limited Segments
Los Angeles Water Board	Regional Water Quality Control Board, Los Angeles Region
LSPC	Loading Simulation Program in C++ model

Acronyms and Abbreviations (Cont'd)

mL	milliliter
MOS	margin of safety
MPN	most probable number [of bacteria colonies]
MS4	municipal separate storm sewer system
NAVFAC-SW	Naval Facilities Engineering Command, Southwest Division
NCDC	National Climatic Data Center
NHD	National Hydrography Dataset
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NSEA	natural sources exclusion approach
OAL	Office of Administrative Law
POTW	publicly owned treatment works
REC-1	water contact recreation beneficial use
REC-2	non-water contact recreation beneficial use
RoWD	report of waste discharge
RSAA	reference system and antidegradation approach
SAG	Stakeholder Advisory Group
San Diego Water Board	Regional Water Quality Control Board, San Diego Region
SANDAG	San Diego Association of Governments
SANGIS	San Diego Graphical Information Source
SCAG	Southern California Association of Governments
SCCWRP	Southern California Coastal Research Project
SDB	San Diego Bay
SHELL	shellfish harvesting beneficial use
SISP	Shelter Island Shoreline Park
SPAWAR	Space and Naval Warfare Systems
State Water Board	State Water Resource Control Board
STATSGO	State Soil Geographic database
STORET	Storage and Retrieval (USEPA environmental data system)
TBEL	technology based effluent limitation
TC	total coliform indicator bacteria
TMDL	total maximum daily load
USACE	United States Army Corps of Engineers
USDA	United State Department of Agriculture
USEPA	United States Environmental Protection Agency
USGS	United State Geological Survey

Acronyms and Abbreviations (Cont'd)

WDR	waste discharge requirement
WLA	wasteload allocation
WLA_{Boats}	wasteload allocation for illegal sewage discharges from boats
$WLA_{Municipal\ MS4}$	wasteload allocation for discharges from Phase I municipal separate storm sewer systems
WLA_{WWTP}	wasteload allocation for illegal sewage discharges from wastewater collection systems and treatment plants
WQBEL	water quality based effluent limitation
WQO	water quality objective

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Executive Summary

The purpose of this technical report is to present the development of the Total Maximum Daily Loads (TMDLs) for the shorelines of Baby Beach (BB) within Dana Point Harbor (DPH) and Shelter Island Shoreline Park (SISP) within San Diego Bay (SDB) impaired by indicator bacteria. Baby Beach and Dana Point Harbor are located in southern Orange County and Shelter Island Shoreline Park and San Diego Bay are located within San Diego County. Bacteria densities at these locations have historically exceeded the numeric water quality objectives (WQOs) for total coliform (TC), fecal coliform (FC), and/or *Enterococcus* (ENT) indicator bacteria as defined in the San Diego Water Board's *Water Quality Control Plan for the San Diego Basin (9)* (Basin Plan). These exceedances threaten or impair the water contact (REC-1) and non-water contact (REC-2) beneficial uses of these waterbodies.

Fecal bacteria originate from the intestinal biota of warm-blooded animals, and their presence in surface water is currently used as an indicator of human pathogens. Pathogens may cause illness in recreational water users. Bacteria have been historically used as indicators of human pathogens because bacteria are easier and less costly to measure than the pathogens themselves. As required by Clean Water Act section 303(d), TMDLs for indicator bacteria were developed to address the bacteria-impaired shoreline segments of BB and SISP.

A TMDL represents the maximum amount of the pollutant of concern that the waterbody can receive and still attain water quality standards. For this indicator bacteria TMDL analysis, mathematical models were used to calculate the TMDLs and potential bacteria loads from different sources. In this analysis, only the REC-1 beneficial use was evaluated. Waters that can meet the REC-1 WQOs will also meet the REC-2 WQOs.

Because the climate in southern California has two distinct hydrological patterns, for the BB and SISP shoreline segments of this project, separate modeling approaches and TMDLs were developed for wet weather and dry weather conditions. For wet weather TMDL calculations, single sample maximum REC-1 WQOs were used as numeric targets because wet weather conditions, or storm events with precipitation runoff, are episodic and short in duration, and characterized by rapid wash-off and transport of high bacteria loads, with short residence times, from all land use types to receiving waters. For dry weather TMDL calculations, geometric mean or median REC-1 WQOs were used as numeric targets, because dry weather runoff is not generated from precipitation runoff, is not uniformly linked to every land use, and is more uniform than precipitation runoff, with lower flows, lower loads, and slower transport, making die-off and/or amplification processes more important. Once calculated, the TMDL is set equal to the sum of individual wasteload allocations (WLAs) for point sources, and load allocations (LAs) for nonpoint sources and natural or background sources.

The only allowable point sources identified to affect the shoreline segments of BB and SISP were municipal separate storm sewer systems (MS4s), although illegal point

sources of bacteria (e.g., sewage from boats and wastewater collection systems and treatment plants) may exist. The USEPA's stormwater regulations require municipalities to obtain permits for all stormwater discharges from MS4s. The existing loads calculated with the modeling approaches were solely the result of watershed runoff, and did not include other types of point sources. Only MS4s were assigned a WLA for each shoreline segment. Illegal sources and any other unidentified point sources were assigned WLAs of zero.

Nonpoint sources identified were primarily associated with natural or background sources such as direct inputs from birds, terrestrial and aquatic wildlife, wrack line and aquatic plants, sediments, or other unidentified and unquantified sources within the receiving waters. No controllable nonpoint sources were identified within the watersheds contributing to the receiving waters. Until more information is obtained through further study to provide identification of the relative loading from each of these potential nonpoint sources, they were combined into a single existing load and LA for each shoreline segment.

Because loads from nonpoint sources are not controllable, no load reduction is required from nonpoint sources. However, wasteloads from MS4s are considered controllable and therefore a wasteload reduction was calculated for point sources. Wasteload reductions were calculated for each shoreline segment as the difference between the existing wasteload and WLA divided by the existing wasteload. Table E-1 summarizes the percent wasteload reductions calculated for each shoreline segment of BB and SISP.

Table E-1. Percent Wasteload Reductions for Impaired Shoreline Segments at Baby Beach and Shelter Island Shoreline Park

Waterbody	Shoreline Segment	Percent Wasteload Reduction					
		ENT REC-1		FC REC-1		TC REC-1	
		Wet[1]	Dry[2]	Wet[1]	Dry[2]	Wet[1]	Dry[2]
Dana Point Harbor	Baby Beach	62.2%	96.2%	0%	82.7%	0%	90.4%
San Diego Bay	Shelter Island Shoreline Park	0%	0%	0%	0%	0%	0%

Notes:
[1] Percent wasteload reduction for wet weather conditions.
[2] Percent wasteload reduction for dry weather conditions.

Abbreviations:
ENT REC-1: *Enterococcus* reduction for water contact beneficial use
FC REC-1: Fecal coliform reduction for water contact beneficial use
TC REC-1: Total coliform reduction for water contact beneficial use

In order to ensure that the TMDL requirements are met, and as required under state law, an Implementation Plan was developed and describes the regulatory and/or enforcement actions that the San Diego Water Board can take to reduce pollutant loading and monitor effluent and/or receiving water. The TMDLs will be implemented primarily by reissuing or revising the existing NPDES requirements for MS4 discharges to include WQBELs that are consistent with the assumptions and requirements of the bacteria WLAs for MS4 discharges. WQBELs for MS4 stormwater discharges can be either numeric or non-numeric. Non-numeric WQBELs typically are a program of best management practices (BMPs). The USEPA expects that most WQBELs for NPDES-

regulated MS4 discharges will be in the form of BMPs. Additionally, a compliance schedule for meeting the required pollutant reductions is included in the Implementation Plan. The Implementation Plan also identifies several special studies that the dischargers can conduct to fill data gaps, which can be used to refine the TMDLs and required load reductions, and/or modify compliance requirements. The Implementation Plan requires the dischargers to continue monitoring to assess the effectiveness of the implementation measures in achieving the wasteload reductions.

According to the modeling calculations, natural and background sources contribute a significant portion of the bacteria load at both BB and SISP. If the REC-1 WQOs cannot be met in the receiving waters, and if natural and background sources appear to be the sole source of continued impairment, the natural sources exclusion approach (NSEA) may be applied.[1] The NSEA includes guidelines for recalculation of the TMDLs if it can be demonstrated that all anthropogenic sources of indicator bacteria have been controlled and that the remaining indicator bacteria densities do not cause a health risk.

[1] After approval of the Basin Plan amendment (Resolution No. R9-2008-0028) authorizing the use of the Natural Sources Exclusion Approach by the Office of Administrative Law, anticipated by the end of 2008 or early 2009..

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1 Introduction

Fecal bacteria originate from the intestinal biota of warm-blooded animals, and their presence in surface water is currently used as an indicator of human pathogens. Pathogens may cause illness in recreational water users. The purpose of this technical report is to present the development of the Total Maximum Daily Loads (TMDLs) for the shorelines at Baby Beach (BB) within Dana Point Harbor (DPH) and Shelter Island Shoreline Park (SISP) within San Diego Bay (SDB) impaired by indicator bacteria.

Section 303(d) of the Clean Water Act requires that each State identify waterbodies within its boundaries for which the effluent limitations are not stringent enough to meet applicable water quality standards, which are based on beneficial uses and water quality objectives (WQOs). The Clean Water Act also requires states to establish a priority ranking for these impaired waters, known as the *Clean Water Act Section 303(d) List of Water Quality Limited Segments* (List), and to establish TMDLs for the identified waterbodies.

Disease-causing pathogens include bacteria, viruses, and protozoa. Most disease-causing pathogens exist in very small amounts and are very difficult and expensive to detect in water samples. However, the presence of disease-causing pathogens in water can be often be correlated to “indicator organisms.” Therefore, indicator organisms are used to help detect the presence of these disease-causing pathogens in water.

Indicator organisms have been used for more than a century to help identify where disease-causing pathogens may be present. These indicator organisms generally do not cause illness themselves, but they have characteristics that make them good indicators that harmful pathogens may present be in the water. Fecal bacteria are often used as indictors for the presence of pathogens. When fecal bacteria are present in surface water in high quantities, this indicates a higher risk of pathogens being present in the water. Total coliform (TC), fecal coliform (FC), *Enterococcus* (ENT), and *Escherichia coli* (*E. coli)*, which are fecal bacteria indicators, are often used as indicator organisms, or indicator bacteria, when evaluating the quality of water.

To protect the health of human recreational water users, the Basin Plan contains numeric WQOs for indicator bacteria for water contact recreation (REC-1), non-water contact recreation (REC-2), and shellfish harvesting (SHELL) beneficial uses. For coastal waters, including bays and estuaries, the Basin Plan includes numeric WQOs for TC, FC, and ENT. For saline waters, there are no WQOs for *E. coli*. Exceedances of the bacteria WQOs are common in waters throughout the San Diego Region coastal area. For a complete discussion of WQOs for each beneficial use, see Appendix A.

TMDLs are being developed to meet the WQOs and protect recreational beneficial uses in the bacteria-impaired waterbodies for the San Diego Region. In a previous analysis reported in *Total Maximum Daily Loads for Indicator Bacteria Project I - Beaches and Creeks in the San Diego Region* (Bacteria TMDL Project I) (San Diego Water Board,

2007), the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) developed TMDLs to address 19 of the 38 bacteria-impaired waterbodies in the San Diego Region, as identified on the *2002 Clean Water Act Section 303(d) List of Water Quality Limited Segments*. Regional watershed models were developed to calculate of TMDLs for multiple beaches and creeks in the region.

The present analysis, *Total Maximum Daily Loads for Indicator Bacteria, Baby Beach and Shelter Island Shoreline Park Shorelines,* is based on this previous work, and includes an expansion of the regional modeling approach to represent bacteria loads from the watersheds draining to the impaired BB and SISP shorelines. The bacteria loads calculated by the watershed model were used as inputs into a second model used to calculate the assimilative capacity of receiving waters at the impaired BB and SISP shorelines. As in Bacteria TMDLs Project I, TMDLs were calculated for each receiving waterbody included in this report for both wet and dry weather conditions.

The purpose of a TMDL is to attain WQOs that support beneficial uses in the waterbody. A TMDL is defined as the sum of the individual wasteload allocations (WLAs) for point sources and load allocations (LAs) for nonpoint sources and natural background such that the capacity of the waterbody to assimilate pollutant loading (i.e., the loading capacity) is not exceeded.[2] Therefore, a TMDL represents the maximum amount of the pollutant of concern that the waterbody can receive and still attain water quality standards. Additionally, a TMDL represents a strategy for meeting WQOs by allocating quantitative limits for point and nonpoint pollution sources. Once this total maximum pollutant load has been calculated, it is divided up and allocated among all of the contributing sources in the watershed.

The TMDL process begins with the development of a technical analysis which includes the following 7 components:

(1) **Problem Statement** - describes which WQOs are not being attained and which beneficial uses are threatened or impaired (section 2);
(2) **Numeric Targets –** identifies numeric targets for densities of indicator bacteria which will result in attainment of the WQOs and protection of beneficial uses (section 3);
(3) **Source Analysis** - identifies all of the point sources and nonpoint sources of the impairing pollutant (section 5);
(4) **Linkage Analysis -** calculates the **Loading Capacity** (i.e., the maximum load of the pollutant that may be discharged to the waterbody without causing exceedances of WQOs and impairment of beneficial uses) of the waterbody for the pollutant (sections 6 and 7);
(5) **Margin of Safety** (MOS) - accounts for uncertainties in the analysis (section 7);
(6) **Seasonal Variation and Critical Conditions –** describes how these factors are accounted for in the TMDL determination (section 7); and

[2] Code of Federal Regulations Title 40 section 1302.

(7) **Allocation of the TMDL –** division of the TMDL among each of the contributing sources in the watershed; wasteload allocations (WLAs) for point sources and load allocations (LAs) for nonpoint and background sources (sections 7 and 8).

The write-up of the above components is generally referred to as the technical TMDL analysis. The scientific basis of this TMDL has undergone external peer review pursuant to Health and Safety Code section 57-004. The San Diego Water Board has considered and responded to all comments submitted by the peer review panel. The peer reviewer's comments and the San Diego Water Board's responses to comments are contained in Appendix B.

This technical report also includes an **Implementation Plan** (section 10). In order to meet the TMDL, an Implementation Plan is developed that describes the regulatory and/or enforcement actions the San Diego Water Board can take to reduce pollutant loading and monitor effluent and/or receiving water. The TMDLs will be implemented primarily by reissuing or revising the existing NPDES requirements for MS4 discharges to include WQBELs that are consistent with the assumptions and requirements of the bacteria WLAs for MS4 discharges. WQBELs for municipal stormwater discharges can be either numeric or non-numeric. Non-numeric WQBELs typically are a program of expanded or better-tailored BMPs. The USEPA expects that most WQBELs for NPDES-regulated municipal discharges will be in the form of BMPs. Additionally, a compliance schedule for meeting the required pollutant reductions is included in the Implementation Plan. The Implementation Plan also identifies several special studies that the dischargers can conduct to fill data gaps, which can be used to refine the TMDLs and required load reductions, and/or modify compliance requirements. The Implementation Plan requires the dischargers to conduct monitoring to assess the effectiveness of the implementation measures in achieving the load and wasteload reductions.

Once established, the regulatory provisions of the TMDLs are incorporated into the *Water Quality Control Plan for the San Diego Basin (9)* (Basin Plan). Typically, the San Diego Water Board, following a public comment period and hearing process, adopts a resolution amending the Basin Plan to incorporate the TMDLs, allocations, reductions, compliance schedule, and Implementation Plan. Basin Plan amendments, including TMDL amendments, must also undergo an evaluation of the environmental impacts of complying with the amendment, and an evaluation of the costs of complying with the amendment. As with any Basin Plan amendment involving surface waters, a TMDL amendment will not take effect until it has undergone subsequent agency approvals by the State Water Resources Control Board (State Water Board) and the Office of Administrative Law (OAL). The U.S. Environmental Protection Agency (USEPA) must also approve the amendment; however, it will take effect following approval by the OAL. The tentative Resolution and draft Basin Plan amendment associated with this project are contained in Appendix C.

Following these approvals, the San Diego Water Board is required to incorporate the regulatory provisions of the TMDL into all applicable orders prescribing waste discharge requirements (WDRs), or other regulatory or enforcement mechanisms. For point sources, the San Diego Water Board will issue, reissue or amend existing WDRs that implement National Pollutant Discharge Elimination System (NPDES) regulations. For nonpoint sources, the San Diego Water Board will issue, reissue, amend, or enforce WDRs, waivers of WDRs, or adopt discharge prohibitions. Water Quality Based Effluent Limitations (WQBELs) for the impairing pollutant in the applicable watersheds are incorporated in the appropriate WDRs to implement and make the TMDLs enforceable. WQBELs can consist of either numeric effluent limitations, or a Best Management Practice (BMP) approach of expanded or better-tailored BMPs.

The final and most important step in the process is the implementation of the TMDLs by the dischargers. Per the governing WDR order (or other regulatory or enforcement mechanism), each discharger must reduce its current loading of the pollutant to its assigned allocation in accordance with the time schedule specified in the TMDL. When each discharger has achieved its required load reduction, water quality standards for the impairing pollutants should be restored in the receiving waters.

Public participation is a key element of the TMDL process, and stakeholder involvement is encouraged and required. The San Diego Water Board formed a Stakeholder Advisory Group (SAG), made up of key stakeholders to assist in the development of this TMDL report. The SAG was comprised of representatives from Municipal Separate Storm Sewer System (MS4) owners/operators discharging to BB and SISP, environmental groups, and business and industry interests, including Orange County, San Diego County, the City of Dana Point, the City of San Diego, San Diego Coastkeeper, Sierra Club and the San Diego Unified Port District.

1.1 Technical Approach

The San Diego Water Board and the USEPA coordinated a watershed and receiving water assessment and modeling study to support the development of TMDLs. In order to assist the San Diego Water Board in the development of the technical analysis, the USEPA used Clean Water Act section 106 funds to contract the environmental consulting firm, Tetra Tech, Inc. (Tetra Tech). Tetra Tech provided the San Diego Water Board with technical assistance in calculating the TMDLs for the impaired waterbodies through the development of region-wide watershed models.

The general approach utilized a watershed model and a receiving water model. The watershed model simulated the pollutant loads draining from the watersheds into the receiving waters. The receiving water model uses the output of the watershed model as a boundary condition, or bacteria load input into the receiving water. The receiving water model was used to calculate the assimilative capacity of the receiving waters at the impaired shorelines. For these TMDLs, the receiving waters are Dana Point Harbor and San Diego Bay, and the watersheds are the areas of the watershed that are

conservatively assumed to have a potential impact on the impaired shorelines of those receiving waters.

Because the climate in southern California has two distinct hydrological patterns, two watershed models were developed for estimating bacteria loads. One watershed model was developed to specifically quantify loading from a watershed during wet weather conditions (storm events), which tend to be episodic and short in duration, and characterized by rapid wash-off and transport of very high pollutant loads from all land use types. The wet weather modeling approach is consistent with the methodologies used for bacteria TMDL development for impaired coastal areas of the Los Angeles Region, specifically Santa Monica Bay beaches (Los Angeles Water Board, 2002) and also Malibu Creek (Los Angeles Water Board, 2003), as well as for the bacteria impaired beaches and creeks in the San Diego Region (San Diego Water Board, 2007). A dynamic modeling system that simulates the build-up and wash-off of bacteria and the hydrologic and hydraulic processes that affect delivery was used to model bacteria loads from precipitation-based runoff (stormwater runoff) during wet weather events.

A separate dry weather watershed model was developed to quantify bacteria loading from a watershed during dry weather conditions. Dry weather loading is expected to be much smaller in magnitude, does not occur from all land use types, and exhibits less variability over time. A low-flow, steady-state model was used to estimate bacteria loads during dry weather conditions. The steady-state aspect of the model resulted in estimation of a constant bacteria load from each watershed. This load is representative of the average flow and bacteria loading conditions resulting from various urban land use practices (e.g., runoff from lawn irrigation or sidewalk washing).

The modeled wet weather and dry weather runoff flows and bacteria levels from the watersheds were used in a receiving water model that was developed to include the diurnal effects of tidal flushing, and bacterial die-off during wet and dry weather conditions, and ultimately to simulate the assimilative capacity of the receiving waters of the impaired shoreline segments.

The assimilative capacity, or TMDL that was calculated by the receiving water model was allocated to point sources as WLAs and nonpoint sources as LAs.

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2 Problem Statement

The presence of high quantities of bacteria in surface waters can pose a risk to human health. Sources of bacteria under all conditions vary widely and include natural sources such as feces from aquatic and terrestrial wildlife, and anthropogenic sources such as sewer line breaks, illegal sewage disposal from boats along the coastline, trash, and pet waste. Once in the environment, bacteria can also re-grow and multiply.

Of particular concern are disease-causing pathogens. Disease-causing pathogens are a risk to human health in surface waters. When the risk to human health from pathogens in the water is so great that beaches are posted with health advisories or closure signs the quality and beneficial uses of the water are impaired.

At present, analyzing water for specific disease-causing pathogens directly is very difficult and expensive. However, the presence of disease-causing pathogens in water can be often correlated to indicator bacteria, such as TC, FC, and ENT. When these indicator bacteria are present in surface waters in high quantities, this indicates a higher risk of pathogens being present in the water.

Bacteria quantities, written in terms of densities of bacteria colonies (most probable number per 100 milliliters of water [MPN/100 mL]), within specific shoreline segments of BB and SISP reportedly have exceeded the numeric WQOs for TC, FC, and/or ENT indicator bacteria. These exceedances threaten and/or impair the water contact recreation (REC-1), non-water contact recreation (REC-2), and shellfish harvesting (SHELL) beneficial uses of these shorelines. A discussion of WQOs for each beneficial use is provided in Appendix A.

All coastal waters in the Region are designated with REC-1, REC-2, and SHELL beneficial uses. REC-1 includes uses of water for recreational activities involving body contact with water (such as swimming or other water sports) where ingestion of water is reasonably possible. REC-2 includes the uses of water for recreational activities involving proximity to water, but not normally involving body contact with water (such as picnicking and sunbathing), and where ingestion of water is reasonably possible. SHELL includes uses of water that support habitats suitable for the collection of filter-feeding shellfish for human consumption, commercial, or sport purposes.

For this TMDL analysis, only the REC-1 beneficial use was evaluated. Waters that can meet the REC-1 WQOs will also meet the REC-2 WQOs. Waterbodies that are impaired for the SHELL beneficial use will be addressed in a separate SHELL TMDL and/or standards action pending the outcome of the work of the statewide task force involving the Ocean Planning Unit of the State Water Board, the California Department of Public Health, the USEPA, and the coastal Regional Water Boards. The following sub-sections provide additional information about the environmental settings, the beneficial uses and WQOs, and overview of the reported impairments of the waterbodies evaluated in this technical report.

2.1 Project Area Description

When this project was initiated in 2004, there were six bacteria-impaired shoreline segments on the 2002 List which were to be addressed in this TMDL project: Shelter Island Shoreline Park, B Street Pier, G Street, Chula Vista Marina, and Tidelands Park within SDB, and Baby Beach within DPH. However, since then, additional information provided to the San Diego Water Board resulted in the removal of four shoreline segments from this TMDL project.

The shoreline segments at Chula Vista Marina and Tidelands Park were removed from the 2006 List for indicator bacteria. According to the Chula Vista Marina fact sheet for the 2006 List, the area initially placed on the 1998 List was actually south of the Chula Vista Marina, rather than within the marina itself. The area south of the marina was placed on the 1998 List due to posting by the San Diego County Department of Public Health. According to fact sheet, the San Diego County Department of Public Health posted warning signs in the area as a precaution because of a nearby storm drain outlet, not because they had data showing elevated bacteria levels. There are no known data that have been collected to support the listing. Therefore, due to the inaccuracy of the area listed and the lack of data to support the listing, the shoreline segment at Chula Vista Marina within SDB was removed from the 2006 List as impaired for indicator bacteria based on REC-1 beneficial use. The shoreline segment at Chula Vista Marina within SDB was subsequently removed from this TMDL project.

Tidelands Park was also removed from the 2006 List. According to the Tidelands Park fact sheet for the 2006 List, the number of exceedances of the REC-1 WQOs for indicator bacteria from the data collected by the City of San Diego from 1999 to 2003 did not surpass the allowable number of exceedances. Because the available data indicate that the exceedance frequency of the applicable REC-1 WQOs are acceptable, the shoreline segment at Tidelands Park within SDB was removed from the 2006 List as impaired for indicator bacteria based on REC-1 beneficial use. The shoreline segment at Tidelands Park within SDB was subsequently removed from this TMDL project.

In 2007, the San Diego Unified Port District provided analytical data for evaluation to support removing the shoreline segments at B Street Pier and G Street within SDB from the 2008 List based on the WQOs for REC-1 beneficial use. Samples collected from four locations at B Street Pier and four locations at G Street between March 2006 and January 2007 were analyzed. During that sampling period, there were 48 samples collected from each shoreline segment. Of the samples collected between March 2006 and January 2007, the number of exceedances of the REC-1 WQOs for indicator bacteria did not surpass the allowable number of exceedances. Based on these data and findings, the San Diego Water Board will recommend removal of B Street Pier and G Street from the 2008 List for indicator bacteria for REC-1 beneficial use. Therefore, the shoreline segments at B Street Pier and G Street within SDB were removed from this TMDL project.

The remaining two shoreline segments are addressed in this technical report. They are located in Orange and San Diego Counties in southern California. Shelter Island Shoreline Park (SISP) is located within SDB, which is located in southern San Diego County (Figure 2-1). SISP is a mile-long park and promenade that spans the bayside length of Shelter Island within SDB. The beach is owned and operated by the San Diego Unified Port District. Baby Beach (BB) is located within DPH, which is located in southern Orange County, just north of San Diego County (Figure 2-2). BB is a small artificial beach located in the inner northwestern back corner of DPH. The beach is about 700 feet wide and is owned and operated by the County of Orange.

Although a significant portion of the bacteria loads may be attributed to natural and background sources, impairment of these shorelines is likely due to local sources of bacteria such as humans, domestic animals, and urban runoff. However, because these are coastal shorelines, the assimilative capacity of BB and SISP is increased due to tidal flushing and the likelihood of bacteria die-off is increased due to salinity.

The climate in the region is generally mild with annual temperatures averaging around 65 degrees Fahrenheit near the coastal regions. Annual average rainfall ranges from 9 to 11 inches along the coast to more than 30 inches in the eastern mountains. There are two distinct climatic periods: a dry period from late April to mid-October and a wet period from mid-October through late April. The wet period provides 85 to 90 percent of the annual rainfall in the region (County of San Diego, 2000).

The land use of the region is highly variable. Table 2-1 lists the total areas of each modeled watershed draining to the impaired shoreline segments, as well as their distribution of land uses (Appendix D, No. 14).

Table 2-1. Watershed Areas and Land Use

Watershed		Total Area (Acres)	Land Use Percentages (%)												
			Low Density Residential	High Density Residential	Commercial/ Institutional	Industrial/ Transportation	Military	Parks/ Recreation	Open Recreation	Agriculture	Dairy/ Intensive Livestock	Horse Ranches	Open Space	Water	Transitional
Dana Point Harbor	Baby Beach	522.6	37.1	31.7	15.8	0.7	0.0	3.3	5.7	0.0	0.0	0.0	5.8	0.0	0.0
San Diego Bay	Shelter Island Shoreline Park	10.2	0.0	0.0	0.0	0.0	0.0	100	0.0	0.0	0.0	0.0	0.0	0.0	0.0

The area around BB consists primarily of residential and commercial properties. The areas immediately adjacent to the beach are parking lots and grass picnic areas. The area of the watershed that drains directly to the BB shoreline area of DPH, approximately 43 acres, consists of undeveloped hillside, park and recreation facilities, commercial properties, and some residential land uses. Water quality monitoring data and a circulation study suggest that impairment is confined to the BB shoreline and that circulation appears somewhat limited between the waters near BB and the waters further in the harbor channel. However, because DPH is a relatively small and

enclosed harbor and other areas of the harbor may have an influence on bacteria levels at BB, the entire watershed area that drains into DPH (approximately 523 acres) was considered in the models developed for this TMDL project.

In contrast, SISP is a very small shoreline segment in a very large bay. The watershed area that drains to the SISP shoreline area of SDB consists entirely of park and recreational land use. Because exceedances in REC-1 WQOs for indicator bacteria are not observed in the open channel areas of SDB and adjacent to SISP, only the watershed area that drains directly to the impaired beach segment of SISP, confined to 10.2 acres of Shelter Island, was considered in the models developed for this TMDL project.

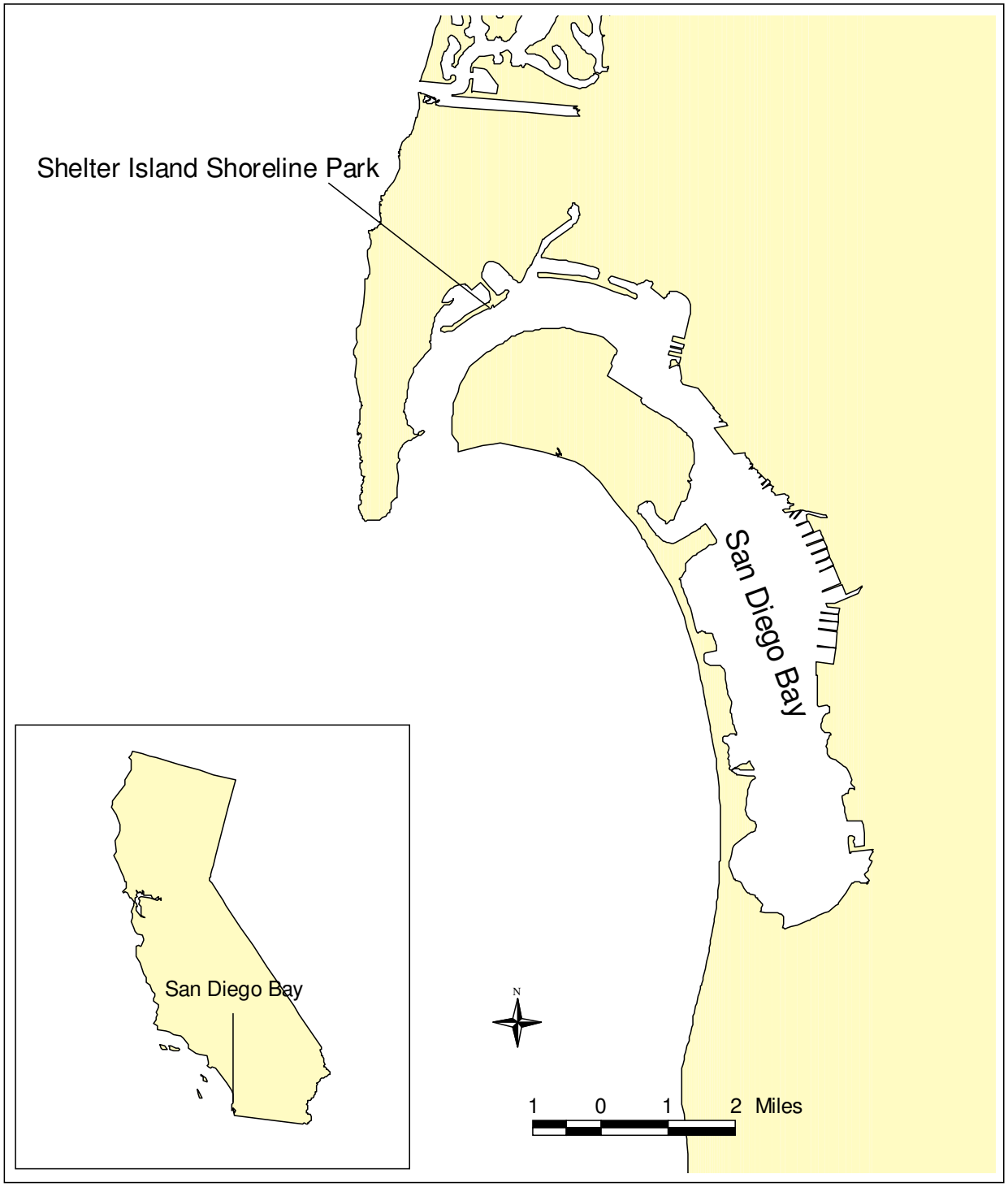

Figure 2-1. Location of Shelter Island Shoreline Park within San Diego Bay

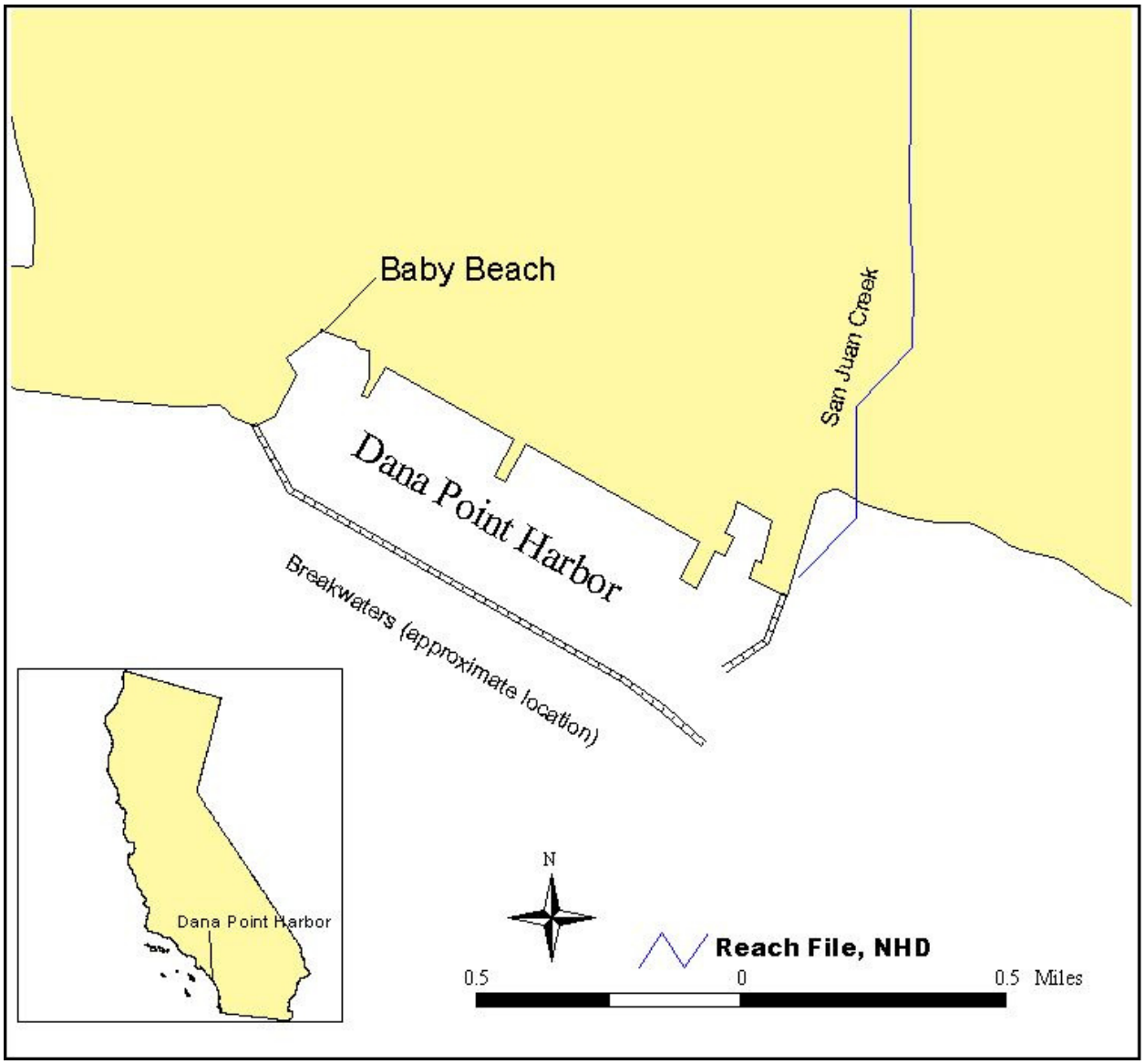

Figure 2-2. Location of Baby Beach within Dana Point Harbor

2.2 Applicable Water Quality Standards

Water quality standards consist of beneficial uses, water quality objectives (WQOs), and an antidegradation policy. WQOs are defined under Water Code section 13050(h) as "limits or levels of water quality constituents or characteristics which are established for the reasonable protection of beneficial uses of water." Under section 304(a)(1) of the Clean Water Act, the USEPA is required to publish water quality criteria that incorporate ecological and human health assessments based on current scientific information. WQOs must be based on scientifically sound water quality criteria, and be at least as stringent as those Clean Water Act criteria.

The Basin Plan identifies beneficial uses and WQOs for each waterbody type. Table 2-2 lists the beneficial uses for each of the shoreline segments evaluated in this technical report.

Table 2-2. Beneficial Uses of Shoreline Segments Evaluated

Waterbody Type	Waterbody	Shoreline Segment Evaluated	Beneficial Uses*
Coastal Water	Dana Point Harbor	Baby Beach	IND, NAV, REC-1, REC-2, COMM, WILD, RARE, MAR, MIGR, SPWN, SHELL
Coastal Water	San Diego Bay	Shelter Island Shoreline Park	IND, NAV, REC-1, REC-2, COMM, BIOL, EST, WILD, RARE, MAR, MIGR, SPWN, SHELL

* Beneficial uses defined in the Basin Plan (San Diego Water Board, 1994)

Only REC-1, REC-2, and SHELL beneficial uses have WQOs for bacteria, which are defined in the Basin Plan. For coastal waters, including bays and estuaries, the Basin Plan contains REC-1 WQOs for TC, FC, and ENT, REC-2 WQOs for FC,[3] and a SHELL WQO for TC. The objectives are derived from water quality criteria promulgated by the USEPA in 1986. Compliance to numeric WQOs must be assessed and maintained throughout a waterbody to protect beneficial uses, including the shorelines. For a complete discussion of WQOs for each beneficial use, see Appendix A.

As discussed previously, only the REC-1 beneficial use is evaluated in this TMDL project. Waters that can meet the REC-1 WQOs will also meet the REC-2 WQOs. Waterbodies that are impaired for the SHELL beneficial use will be addressed in a separate SHELL TMDL and/or standards action pending the outcome of the work of the statewide task force involving the Ocean Planning Unit of the State Water Board, the California Department of Public Health, the USEPA, and the coastal Regional Water Boards. The numeric WQOs selected as numeric targets for TC, FC, and ENT to calculate TMDLs under wet weather and dry weather conditions are discussed further in section 3.

[3] Where REC-1 use is not designated.

2.3 Impairment Overview

As discussed in section 2.1, of the six shoreline segments initially considered for this TMDL project, only two segments are now included. These two segments were initially placed on the 303(d) List in 2002. For the 2002 List, coastal waterbodies were evaluated based on the number of days health advisory and closure postings were placed at coastal areas by county health departments. These postings, based on weekly analytical data collected by the county health departments, indicated when waters along a shoreline segment could not be used for recreational purposes, and were thus impaired for REC-1 beneficial use. Beaches with health advisory and/or beach closure signs posted 10 or more days per year were placed on the 2002 List as impaired for REC-1 beneficial use due to indicator bacteria. The raw analytical data were not evaluated during the assembly of the 2002 List.

For this project, the most recent water quality data provided at the time of model development in 2004 were used to develop the models. However, because a significant amount of time has elapsed since then, more recent water quality data were also evaluated against REC-1 WQOs to confirm that the impairments continue to exist. Guidance provided in the State Water Board's *Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List* was used to confirm impairment of a water body. According to the *Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List* (Listing Policy), a minimum sample size of 26 samples, with no more than 4 exceedances of the applicable WQOs is needed for recommending the removal of a water body from the 303(d) List. Additionally, there must be enough samples to be temporally and spatially representative.

Table 2-3 lists the impaired waterbodies addressed in this report.

Table 2-3. Impaired Waterbodies Addressed in this Analysis

Waterbody	Hydrologic Descriptor	Segment / Area	Pollutant / Stressor	Extent of Impairment	Year Listed
Dana Point Harbor	Dana Point HSA (901.14)	Baby Beach	Indicator bacteria*	0.4 miles	2002
San Diego Bay	Point Loma HA (908.10)	Shelter Island Shoreline Park	Indicator bacteria*	0.4 miles	2002

* Placed on the 2002 Section 303(d) List based on reported exceedances of TC, FC, and/or ENT REC-1 water quality objectives.

An overview of the rationale for confirming each shoreline segment addressed in this technical report as impaired is provided in the following sub-sections.

2.3.1 Baby Beach Overview

In 2000, the Orange County Environmental Health Care Agency reported that beach closure and/or health risk advisory signs were posted at BB for 54 days. Based on this information, the shoreline segment at BB was placed on the 2002 List as impaired by indicator bacteria for REC-1 beneficial use.

In response, the County of Orange conducted numerous studies and implemented a variety of BMPs in an effort to reduce bacteria levels at BB. These efforts have included installing seasonal plugs in storm drains, increased street sweeping efforts, expedited trash collection to control birds, the installation of bird netting under the pier, public education efforts against bird-feeding at the beach, artificial circulation of water at BB, a dry weather flow diversion structure and media filter system on the west end of the beach, catch basin filters, and the collection and disposal of bird fecal droppings from the exposed intertidal areas of the beach.

Analytical data were available from the Orange County Environmental Health Care Agency for evaluation. Samples collected from four locations at BB between January 2002 and December 2006 were analyzed. During that sampling period, there were 1,160 samples collected, of which 1,160 samples were analyzed for TC and ENT, and 1,159 samples were analyzed for FC. According to the Listing Policy, to remove a water body from the 303(d) List based on a sample size of 1,159 or 1,160, the number of exceedances allowed is equal to or less than 193.

Of the samples collected between January 2002 and December 2006, indicator bacteria densities exceeded the single sample maximum numeric WQOs for REC-1 beneficial use in 11 of 1,160 samples analyzed for TC, 131 of 1,159 samples analyzed for FC, and 283 of 1,160 samples analyzed for ENT. The number of exceedances for TC and FC are within the number of allowed exceedances to delist for REC-1 beneficial use. However, the number of exceedances for ENT is greater than the number of allowed exceedances to recommend removal from the 303(d) List. These data indicate that there have been significant improvements in water quality since 2002. This improvement is believed to be attributed to the efforts described above. However, this analysis also confirms that BB is still impaired by indicator bacteria for REC-1 beneficial use and should remain on the 303(d) List.

2.3.2 Shelter Island Shoreline Park Overview

In 2000, the San Diego County Department of Environmental Health reported that beach closure and/or health risk advisory signs were posted at SISP for 24 days. Based on this information, SISP was placed on the 2002 List as impaired for REC-1 by indicator bacteria. In response, the San Diego Unified Port District implemented a variety of BMPs in an effort to reduce bacteria levels at SISP.

Analytical data were available from the San Diego Unified Port District and San Diego County Department of Environmental Health for evaluation. Samples collected at SISP between January 2003 and November 2006 were analyzed. During that sampling period, there were 143 samples collected, of which 143 samples were analyzed for TC and ENT, and 105 samples were analyzed for FC. According to the Listing Policy, to remove a water body from the 303(d) List based on a sample size of 105 or 143, the number of exceedances allowed is equal to or less than 17 or 23, respectively.

Of the samples collected between January 2003 and November 2006, indicator bacteria densities exceeded the single sample maximum numeric WQOs for REC-1 beneficial use in 1 of 143 samples analyzed for TC, 16 of 105 samples analyzed for FC, and 24 of 143 samples analyzed for ENT. The number of exceedances for TC and FC are within the number of allowed exceedances to delist for REC-1 beneficial use; however, the number of exceedances for ENT is greater than the number of allowed exceedances to recommend removal from the 303(d) List. These data indicate that there have been significant improvements in water quality since 2002. However, this analysis also confirms that SISP is still impaired by indicator bacteria for REC-1 beneficial use and should remain on the 303(d) List.

3 Numeric Target Selection

When calculating TMDLs, numeric targets are selected to meet WQOs for a waterbody and subsequently ensure the restoration and/or protection of beneficial uses. TMDLs were calculated for each impaired waterbody. The numeric targets used in the TMDL calculations were selected from the single sample maximum and geometric mean WQOs for REC-1 beneficial uses, as applicable, for TC, FC, and/or ENT indicator bacteria. Because these are coastal (i.e., saline) waterbodies, there are no applicable WQOs for *E. coli* indicator bacteria.

The basis for the indicator bacteria WQOs were developed, in part, with epidemiological studies in waters with sewage inputs. However, urban runoff from the BB and SISP watersheds is not known to include sewage. The San Diego Water Board recognizes that there are potential problems associated with using indicator bacteria WQOs to indicate the presence of human pathogens in receiving waters free of sewage discharges. The risk of contracting a water-born illness from contact with urban runoff devoid of sewage has not been established. Research is currently being conducted examining the relationship between water contact associated illness and recreational waters impacted by urban runoff devoid of sewage. In addition, new methods are being tested to better and more quickly characterize health risks for water contact recreation. Based upon the results of this research, revisions to the indicator bacteria WQOs in the Basin Plan and the TMDLs developed in this project may be appropriate in the future. However, until then, the numeric WQOs for indicator bacteria currently in the Basin Plan are the most appropriate numeric targets for the development of these TMDLs.

The selected numeric targets were different for wet and dry weather[4] because the bacteria transport mechanisms are different under each weather condition. Wet weather runoff, or stormflow runoff, occurs in episodic events that are short in duration, and characterized by rapid wash-off and transport of high bacteria loads, with short residence times, from all land use types to receiving waters. Bacteria densities from a wet weather event are best represented by the single sample maximum WQOs. These WQOs also apply when evaluating shorelines.

During dry weather conditions, dry weather runoff is not generated from stormflows. In contrast, flow during dry weather is typically more uniform than wet weather stormflow, is not uniformly linked to every land use, and has lower flows, lower loads, and slower transport, making bacteria die-off and/or amplification processes more important. Therefore, bacteria densities are usually best represented by the geometric mean WQOs.

[4] Wet weather is defined as any day when rainfall results in stormwater runoff, typically the days that precipitation occurs and the 72 hours following the end of the precipitation event. Dry weather is any day of no rainfall and therefore no stormwater runoff. However, runoff may occur during dry periods as a result of urban runoff resulting from irrigation practices or other water uses (e.g., car or sidewalk washing).

However, the bacteria densities along the impaired shoreline segments of BB and SISP are not influenced solely by bacteria loads from watershed runoff flows. Tidal effects for some shorelines have been observed to result in extreme diurnal variations in bacteria densities that can range by orders of magnitude. So, even if the shoreline bacteria densities are in compliance with the 30-day geometric mean, in some cases the maximum hourly concentration predicted in a model could regularly exceed the single sample maximum WQO. Therefore, the single sample maximum WQOs were used in addition to the geometric mean WQOs to set maximum daily bacteria densities allowed under dry weather conditions.

The selected wet and dry weather numeric targets used for calculating TMDLs for the shoreline segments evaluated in this technical report are discussed in the following sub-sections.

3.1 Wet-Weather Targets

All shorelines of SDB and DPH are designated with the REC-1 and REC-2 beneficial uses. Therefore, the shoreline segments evaluated in this technical report are subject to the applicable REC-1 and REC-2 WQOs for TC, FC, and ENT. Waters that can meet the REC-1 WQOs will also meet the REC-2 WQOs. The REC-1 single sample maximum WQOs were selected as numeric targets for wet weather.

The goal of establishing TMDLs is to restore and/or protect the quality and beneficial uses of a waterbody. For REC-1 beneficial use, WQOs have been established in the Basin Plan for TC, FC, and ENT in saline waters. The numeric targets selected for FC, ENT, and TC to calculate wet weather TMDLs are listed in Table 3-1.

Table 3-1. Wet Weather Numeric Targets

Basis for Numeric Target	Total Coliform (TC) (MPN/100mL)	Fecal Coliform (FC) (MPN/100mL)	*Enterococcus* (ENT) (MPN/100mL)
Beneficial Use	**REC-1**	**REC-1**	**REC-1**
Single sample maximum	10,000	400	104

Abbreviations:
ml: milliliter
MPN: most probable number
REC-1: Contact Water Recreation beneficial use, defined in the Basin Plan (San Diego Water Board, 1994)

3.2 Dry-Weather Targets

As with the numeric targets selected for wet weather, numeric targets for dry weather were selected to be protective of REC-1 and REC-2 beneficial uses. As discussed above, dry weather numeric targets are typically best represented by geometric mean WQOs. However, due to extreme diurnal variations in bacteria densities resulting from tidal effects, in some cases the maximum hourly concentration predicted in the receiving water model could regularly exceed the single sample maximum WQOs. Therefore, both the REC-1 30-day geometric mean and single sample maximum WQOs were selected as numeric targets for dry weather.

The numeric targets selected for FC, ENT, and TC to calculate dry weather TMDLs are listed in Table 3-2.

Table 3-2. Dry Weather Numeric Targets

Basis for Numeric Target	Total Coliform (TC) (MPN/100mL)	Fecal Coliform (FC) (MPN/100mL)	*Enterococcus* (ENT) (MPN/100mL)
Beneficial Use	**REC-1**	**REC-1**	**REC-1**
30-day geometric mean	1,000	200	35
Single sample maximum	10,000	400	104

Abbreviations:
ml: milliliter
MPN: most probable number
REC-1: Contact Water Recreation beneficial use, defined in the Basin Plan (San Diego Water Board, 1994)

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4 Data Inventory and Analysis

For the development of the wet weather and dry weather models, data from numerous sources (Appendix D) were used to characterize the watersheds and water quality conditions, identify sources of bacteria, and support the TMDL calculations. There were no new data collected as part of this data analysis effort. The data analysis provided an understanding of the conditions that resulted in the reported impairments (Appendix E).

4.1 Data Inventory

The categories of data used in developing these TMDLs include physiographic data that describe the physical conditions of the watershed, and environmental monitoring data that support the identification of potential pollutant sources. Table 4-1 presents the various data types and data sources used in the development of these TMDLs. The following sub-sections describe the key data sets used for TMDL development.

Table 4-1. Inventory of Data and Information Used for the Source Assessment of Bacteria

Data Set	Type of Information	Data Source(s)
Watershed physiographic data	Location of dams	USEPA BASINS
	Stream network	USEPA BASINS (Reach File, Versions 1 and 3); USGS NHD reach file; special studies of Aliso Creek, Tecolote Creek, and Rose Creek; SANGIS
	Land use	2000 land use coverage for San Diego County (SANDAG); 1993 land use coverage of Orange and portions of Riverside Counties (SCAG)
	Counties	USEPA BASINS
	Cities/populated places	USEPA BASINS, U.S. Census Bureau's Tiger Data
	Soils	USEPA BASINS (USDA-NRCS STATSGO)
	Watershed boundaries	USEPA BASINS (8-digit hydrologic cataloguing unit); CALWTR 2.2 (1995)
	Topographic and digital elevation models (DEMs)	USEPA BASINS; USGS

Table 4-1. Inventory of Data and Information Used for the Source Assessment of Bacteria (Cont'd)

Data Set	Type of Information	Data Source(s)
Environmental monitoring data	Water quality monitoring data	USEPA STORET; California Department of Environmental Health; County of San Diego Department of Environmental Health; Orange County Pubic Facilities and Resources Department; City of San Diego; Orange County Public Health Laboratory, San Diego Water Board; NAVFAC-SW; SPAWAR; San Diego Unified Port District
	Streamflow data	USGS; Orange County Public Facilities and Resources Department; City of San Diego
	Meteorological station locations	BASINS; NOAA-NCDC; CIMIS; ALERT Flood Warning System; California DWR, Division of Flood Management

Abbreviations/Acronyms:
ALERT: Automatic Local Evaluation in Real-Time
BASINS: Better Assessment Science Integrating Point and Nonpoint Sources System
CALWTR: Calwater
CIMIS: California Irrigation Management Information System
DWR: Department of Water Resources
NAVFAC-SW: Naval Facilities Engineering Command, Southwest Division
NCDC: National Climatic Data Center
NHD: National Hydrography Dataset
NOAA: National Oceanic and Atmospheric Administration
NRCS: Natural Resources Conservation Service
SANDAG: San Diego Association of Governments
SANGIS: San Diego Geographic Information Source
SCAG: Southern California Association of Governments
SPAWAR: Space and Naval Warfare Systems
STATSGO: State Soil Geographic database
STORET: Storage and Retrieval environmental data system
USDA: United States Department of Agriculture
USEPA: United States Environmental Protection Agency
USGS: United States Geological Survey

4.1.1 Water Quality Data

For the development of the wet weather and dry weather models, water quality data provided when the model development was initiated for the shoreline segments of SDB and DPH were obtained from the County of San Diego and the Orange County Public Health Laboratory, respectively (Appendix D, No. 3-4), for use in wet weather and dry weather model calibration and validation processes. At the time the model development was initiated, analytical data were available for SISP (one sampling location) and BB (four sampling locations). See Figures 4-1 and 4-2 for sampling locations. Bacteria data from these shoreline segments (including FC, TC, and ENT) used in the development of the models were collected at various times from 1996 through 2004, and the amount of data varied among sampling locations.

4.1.2 Waterbody Characteristics

The assessment of waterbody characteristics involved the evaluation of physical data such as bathymetry and water surface elevations and hydrodynamic data including currents, tidal velocities, and BB and SISP outflows. This information was used to determine the volume and hydrodynamic features of the waterbodies, which were included in the calculation of the assimilative capacity and identification of the physical processes that affect bacteria loading.

No recorded streamflow data were identified for the watersheds draining to the impaired shorelines. However, regionally calibrated hydrologic models developed in Bacteria TMDL Project I were able to be used to provide much information regarding the hydrologic characteristics in these watersheds.

Bathymetry data for BB and SISP were based on data obtained from the US Army Corp of Engineers (USACE) and Space and Naval Warfare Systems (SPAWAR), respectively (Appendix D, No. 12). A complete discussion of the data is provided in the modeling report in Appendix F.

Hydraulic data, such as water surface elevations, used for the hydrodynamic model were obtained from the National Oceanic and Atmospheric Administration (NOAA) Center for Operational Oceanographic Products and Services (COOPS) (Appendix D, No. 2).

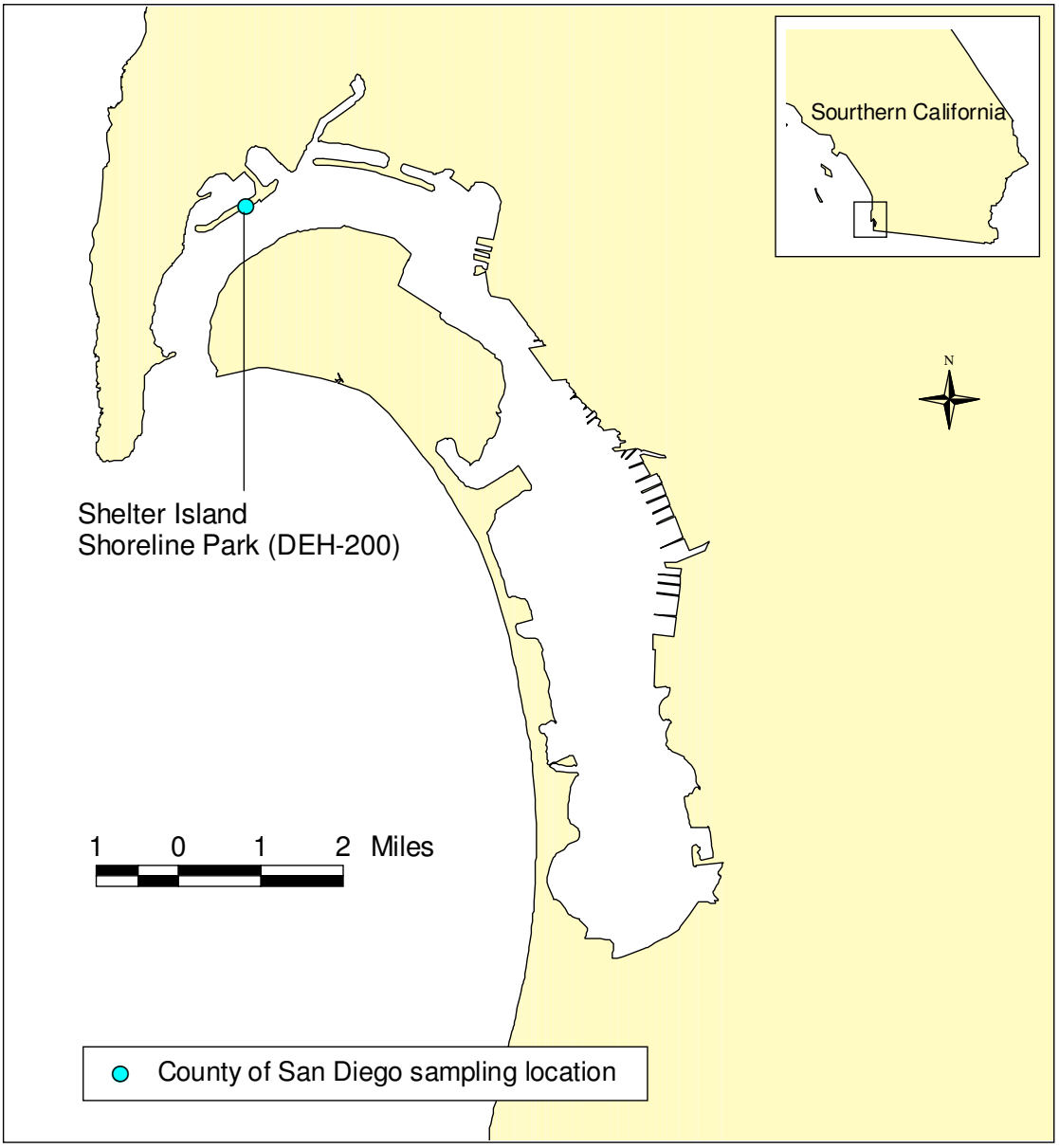

Figure 4-1. Shelter Island Shoreline Park Bacteria Monitoring Station

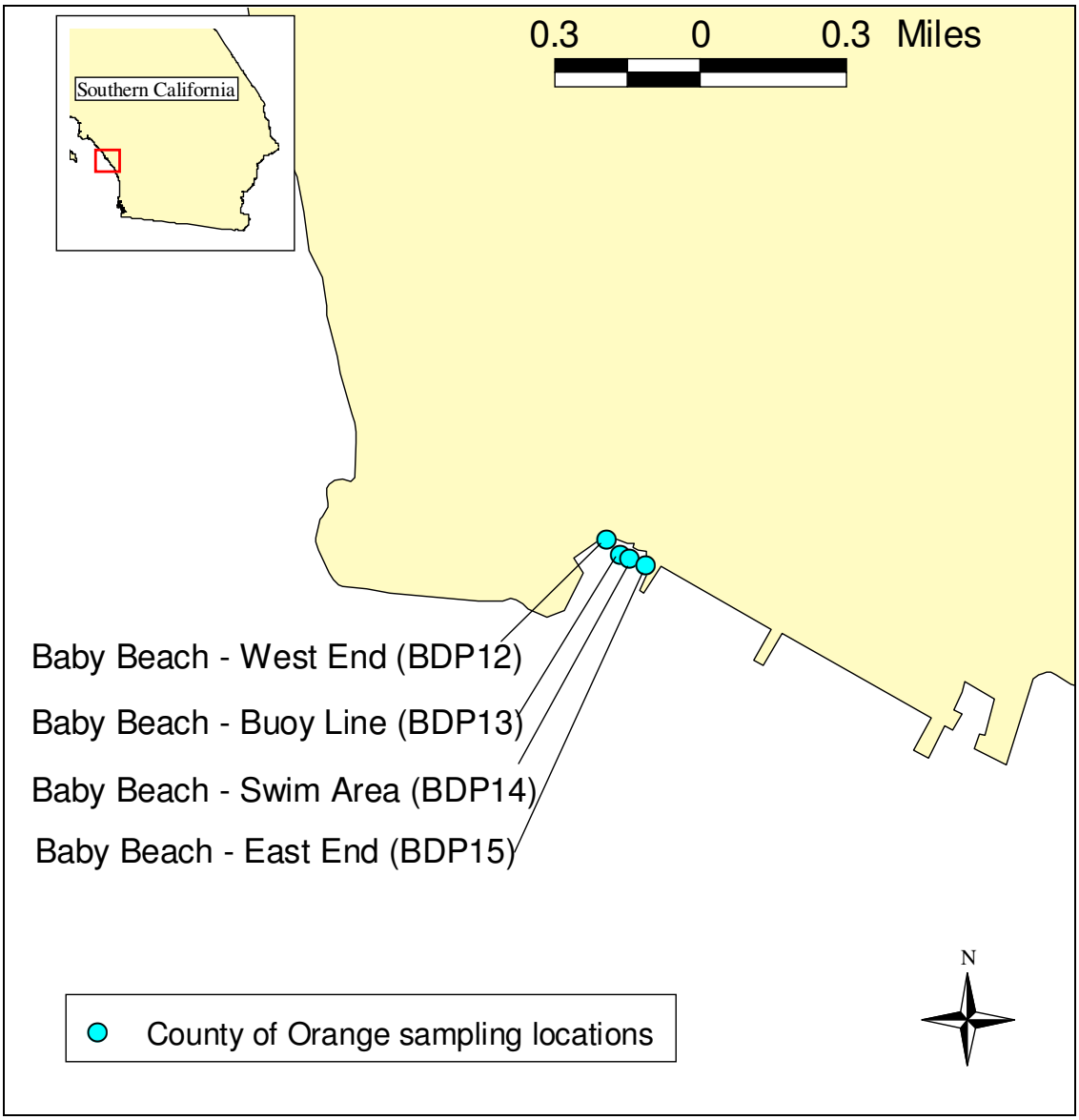

Figure 4-2. Baby Beach Bacteria Monitoring Stations

4.1.3 Meteorological Data

Hourly rainfall data were obtained from the National Climatic Data Center (NCDC) of the NOAA. To augment the NCDC data, hourly rainfall data were obtained from the Automatic Local Evaluation in Real-Time (ALERT) Flood Warning System. In addition, hourly evapotranspiration data were obtained from the California Irrigation Management Information System (CIMIS) (Appendix D, No. 9-11).

Apart from rainfall and evapotranspiration data, other meteorological data such as temperature, humidity, wind speed, wind direction, atmospheric pressure and cloud cover data were obtained from NOAA-NCDC (Appendix D, No. 9). These data were used to drive the hydrodynamic receiving water models.

4.1.4 Land Characteristic Data

Available land use data to support this study included the San Diego Association of Governments (SANDAG) Regional Planning Agency's land use data set that covers San Diego County, and the Southern California Association of Governments (SCAG) land use data set for Orange County. A combination of SANDAG and SCAG data was used to provide the most complete and up-to-date land use representation of the region at the time of model development (Appendix D, No. 14).

In addition, soil data were obtained from the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) State Soil Geographic (STATSGO) database and topographic information was obtained from the USEPA's Better Assessment Science Integrating Point and Nonpoint Sources (BASINS) system (Appendix D, No. 15-16).

4.2 Review of Shoreline Water Quality

Bacteria water quality data for BB and SISP shorelines provided at the time of model development (Appendix D, No. 3-4) were analyzed to provide insight into the spatial extent of impairment and the timing of any exceedances of WQOs. Results of this analysis were also used in the source assessment to identify the proximity of listed coastal segments to tributaries, outfalls, and other potential sources (see section 5).

The timing of exceedances of WQOs and the relationship to wet and dry conditions are important considerations for evaluation of impairments. Monitoring data from both BB and SISP shorelines were reviewed based on their association with wet or dry periods to better understand variability during periods when transport methods differ (wet weather runoff versus dry weather runoff). For each monitoring station, sampling dates were compared to rainfall data collected at the closest rainfall gage to determine whether bacteria water quality samples had been collected during wet or dry weather periods. Once the data for all sampling stations were identified as wet or dry, they were evaluated against the associated single sample maximum and/or 30-day geometric mean WQOs.

Results of analyses at SISP and four locations at BB are illustrated in Appendix E. These results show multiple exceedances of WQOs during both wet and dry weather periods. Typically, higher levels of indicator bacteria appear correlated with wet weather periods, although peak concentrations during dry weather also exceeded WQOs. Specific results of the data analysis for BB and SISP are discussed in the following sub-sections.

4.2.1 Baby Beach Water Quality

At the time of model development, water quality data collected during 1996 to 2002 were provided from four locations along BB (Figure 4-2). Both wet weather and dry weather conditions appeared to be well represented and trends were found for bacteria densities with relation to weather. Exceedances of both the single sample maximum

and 30-day geometric mean REC-1 WQOs were observed at all four sampling locations and for all indicator bacteria.

Results of the water quality data analysis show that, with the exception of geometric means calculated for TC bacteria densities at BB-West End, the percentage of wet weather samples in exceedance of wet weather WQOs was consistently greater than the percentage of dry samples in exceedance at all sampling locations along BB and for all measured indicator bacteria (Appendix E). This was true for indicator bacteria densities compared to both the single sample maximum and the 30-day geometric mean REC-1 WQOs. In addition, spatial trends show that percent exceedances of both the single sample maximum and 30-day geometric mean REC-1 WQOs tend to be higher at the western locations of BB than in the eastern locations.

4.2.2 Shelter Island Shoreline Park Water Quality

At the time of model development, water quality data collected during 1999 to 2004 were provided from one location for SISP (Figure 4-1). Most water quality samples were collected during dry weather conditions at SISP. A small number (approximately 1.5 percent) of the samples were collected during wet weather conditions (Appendix E).

With regards to wet weather, water quality data collected at SISP were limited. Those samples collected during wet weather and the geometric means that were calculated over a wet weather period tended to be higher than many of the dry weather samples and geometric means calculated over a dry weather period (Appendix E). Wet weather bacteria densities were not well represented, making it difficult to document the trends in bacteria densities with regards to wet weather periods at the SISP location.

Exceedances of the single sample maximum REC-1 WQOs were observed for all indicator bacteria under both wet and dry weather conditions. Also for both weather conditions, exceedances of the 30-day geometric mean REC-1 WQOs for TC and/or ENT were observed. However, no exceedances of the 30-day geometric mean REC-1 WQOs were observed for FC under wet or dry weather conditions.

5 Source Analysis

This section presents the approach used to identify and quantify the sources of bacteria that can contribute to the bacteria loading along the BB and SISP shorelines. Bacteria can enter surface waters from both nonpoint and point sources. Nonpoint sources are typically diffuse sources that have multiple routes of entry into surface waters. Nonpoint sources can include encampments of homeless persons, or direct input to waterbodies from birds, terrestrial and aquatic wildlife, wrack line and aquatic plants, sediments, or other unidentified sources within the receiving waters. Point sources typically discharge at a specific location from pipes, outfalls, and conveyance channels from municipal wastewater collection systems and treatment plants, industrial waste treatment facilities, or Municipal Separate Storm Sewer System (MS4) discharges. Point sources can include residential sewage disposal from illicit connections to stormwater conveyance systems and illegal discharge of sewage from boats along the coastline.

Sources of bacteria are the same under both wet weather and dry weather conditions. For both wet weather and dry weather conditions, there are natural and background sources of bacteria within the receiving waters at the impaired shoreline segments. However, for sources of bacteria that originate from the watersheds draining into the receiving waters, the method of transport for the two conditions is very different. Wet weather loading originating from the watersheds is dominated by episodic storm flows that wash off bacteria that build up on the surface of all land use types in a watershed during dry periods. Dry weather loading originating from the watersheds is dominated by nuisance flows from urban land use activities such as car washing, sidewalk washing, and lawn over-irrigation, which pick up bacteria and deposit it into receiving waters. These types of nuisance flows are generally referred to as urban runoff. Because the relative loads from bacteria sources vary significantly between wet weather events and dry weather conditions, load assessment required separate wet and dry weather analyses. For this reason, two distinct modeling approaches were used to assess bacteria loading and TMDLs. These modeling approaches are described in the Linkage Analysis in section 6.

The following sub-sections discuss nonpoint and point sources and their relative significance as contributors of bacteria to surface waters during wet and dry weather conditions as they were incorporated into the TMDL calculations.

5.1 Nonpoint Sources

The primary nonpoint sources identified for the BB and SISP shorelines were associated with natural sources (such as birds, terrestrial and aquatic wildlife, or other sources within the water), as well as the potential contribution from encampments of homeless persons. These nonpoint sources are discussed below.

5.1.1 Natural Sources

Direct input of waste from birds, terrestrial and aquatic wildlife, and other sources within the water to the waterbodies can be a significant source of bacteria during both wet and dry weather conditions. Studies have shown that waterfowl can potentially contribute significant loads of bacteria directly to coastal waters (Fleming and Fraser, 2001; Grant et al., 2001; City of San Diego, 2004). In a study of bacteria levels in Mission Bay during dry weather conditions conducted by the City of San Diego (2004), results of DNA typing showed that waterfowl were the main source of indicator bacteria in the bay and stormwater conveyance system discharge. Although birds were the primary type of wildlife observed in Mission Bay, the results also showed that marine mammals contribute at least 5 percent of indicator bacteria found in the bay. This percentage likely would be higher if the marine mammal population density is higher.

In the San Diego Region, shorelines are frequented by large populations of waterfowl that can contribute fecal matter directly to the shoreline areas. Bacteria loads from this fecal matter can be transported to the coastal waters from tidal fluctuations during dry weather conditions, as well as during wet weather stormflows. In addition, marine mammals (such as seals) have been observed at impaired shorelines in numbers that suggest they could also be a significant source of bacteria.

For dry weather TMDL calculations, when incoming flows from the watershed are relatively low, impacts to the BB and SISP shorelines were considered to be primarily due to direct contribution of fecal bacteria from waterfowl on to the shorelines, which are washed into the shoreline surface water by tidal fluctuations. For wet weather TMDL calculations, in addition to the bacteria that have accumulated in the watershed and are washed off with stormflow runoff, the contribution of fecal bacteria from waterfowl on to the shorelines would also be a relatively significant source.

Other natural sources of bacteria within the water (such as aquatic plants and wildlife, or sediments) may contribute to the bacteria levels within the waterbodies during both wet and dry weather conditions. All of these natural sources of bacteria discussed above can be significant, but are largely uncontrollable.

5.1.2 Encampments (Homeless Persons)

Encampments of homeless persons were identified as a potential nonpoint source of bacteria in the watersheds of BB and SISP. Bacteria loads from homeless encampment populations are usually inland and not right on the shore, where tidal fluctuations can wash human fecal matter into the shoreline surface water. Therefore, this nonpoint source was not included in the dry weather TMDL calculations.

However, during wet weather (storm) periods, wash-off from encampments of homeless persons can potentially contribute elevated bacteria loads to waterbodies due to improper disposal of human waste. Such bacteria contributions are extremely difficult to quantify from analysis of homeless encampment populations. Instead, bacteria loads from homeless encampments were considered to be included within the urban runoff

characterized through the watershed modeling analysis of wet weather conditions (Appendix F). Urban runoff from these areas was considered along with stormwater runoff and was categorized as point source discharges through National Pollutant Discharge Elimination System (NPDES) requirements for MS4 discharges, as discussed in section 5.2.

Direct discharges of fecal matter from homeless encampments were not included explicitly in wet weather TMDL calculations. If bacteria loads from encampments of homeless persons result from direct discharge of human fecal matter to the shoreline waterbodies, a 100 percent reduction would be required for implementation of the dry and wet weather TMDLs.

5.1.3 Other Background Sources

Illegal discharges of sewage from boats and wastewater collection systems and treatment plants were identified as a potential point source of bacteria in the receiving waters of BB and SISP. Illegal discharges from boats and wastewater collection systems and treatment plants do not appear to be occurring in areas directly adjacent to the impaired shorelines, but may contribute to the background levels of bacteria. While these sources are generally considered illegal and should not be occurring, the reality is that they occur frequently enough to potentially influence the “ambient” or background levels of bacteria in the receiving waters.

In addition to influence that illegal discharges from boats and wastewater collection systems and treatment plants may have on background levels of bacteria, there may be other unnatural or anthropogenic sources of bacteria that may also have an influence on background levels of bacteria. For example, shedding of bacteria from human (especially infants and children) can be a source of anthropogenic bacteria.

Anthropogenic sources are generally considered controllable. However, there may be some anthropogenic sources that are infeasible or impractical to control, such as shedding from human bathers. When humans enter water they may shed bacteria from their bodies (e.g., bacteria on clothing, skin and hair, or bacteria in bodily excretions). Shedding from humans may be controllable (e.g., banning infants from swimming or requiring humans to take a shower before entering the water), but implementing such control measures are impractical and infeasible and would take away the beneficial uses (i.e., REC-1) that the TMDL is supposed to restore. However, anthropogenic sources that are feasible to eliminate, such as discharges from boats and wastewater collection systems and treatment plants, should be identified and quantified, and reduction requirements should be calculated and implemented.

At this time, there are not enough data to identify and quantify the exact potential contribution from these other background sources. Direct illegal discharges from boats and wastewater collection systems and treatment plants are considered point sources and discussed below in sections 5.2.1 and 5.2.2, respectively. However, the potential background bacteria loads attributed to these sources and other unidentified

anthropogenic sources, along with the natural sources discussed in section 5.1.1 were lumped together into one “natural and background” nonpoint source that exists in the receiving waters. Until more information is obtained through further study to provide identification and quantification of the relative loading from these potential anthropogenic sources, “natural and background” sources are generally considered uncontrollable.

5.2 Point Sources

A point source, according to federal regulations [Code of Federal Regulations Title 40 section 122.3], is defined as “any discernable, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel, or other floating craft from which pollutants are or may be discharged.” Potential point sources identified for the BB and SISP shorelines are discussed below.

5.2.1 Wastewater Collection Systems and Treatment Plants

There are no direct point source discharges of bacteria from wastewater treatment plants to areas directly adjacent to the BB and SISP shorelines. However, bacteria loads periodically occur as a result of sewage spills, or may be occurring due to illegal cross connections or sanitary sewer leaks. Although these loads potentially result in contamination of the waterbodies and bacterial concentrations that exceed WQOs, the loads attributed to these sources were not quantified for TMDL development. Bacteria loads attributed to sewage spills were not quantified because sewage spills are typically accidental and intermittent. Bacteria loads attributed to sewage from illegal cross connections or sewage leaks were not quantified because no data were available. Because the Basin Plan includes waste discharge prohibitions specifically for the unauthorized discharge of treated or untreated sewage to waters of the state, 100 percent reduction of bacteria loads from sewage spills is required for implementation of the dry and wet weather TMDLs.

5.2.2 Illegal Sewage Discharge from Boats

Illegal discharge of sewage from boats has been identified as a potential point source of bacteria in the receiving waters of the BB and SISP shorelines. While these bacteria loads may potentially be a large source of the existing bacteria in these waterbodies, there were not enough data available to specifically quantify the loads attributed to these sources for TMDL development. Because the Basin Plan includes waste discharge prohibitions specifically for the discharge of treated or untreated sewage from vessels to Dana Point Harbor and San Diego Bay, 100 percent reduction of bacteria loads from boats is required for implementation of the dry and wet weather TMDLs.

5.2.3 Municipal Separate Storm Sewer Systems (Urban Runoff)

Urban runoff discharges from MS4s are a leading cause of receiving water quality impairments in the San Diego Region. The County of Orange confirms that storm

drains are a significant contributor of bacteria in a study performed at Baby Beach in Dana Point Harbor (County of Orange, 2003). A direct linkage has also been established between human illness and recreating near the outfalls of urban stormwater conveyance systems (Haile et al, 1999).

For the San Diego Region, all discharges of urban runoff are covered by MS4 NPDES waste discharge requirements. For the watersheds of San Diego County, the incorporated cities of San Diego County (18 cities), the San Diego Unified Port District, and the San Diego County Regional Airport Authority, Order No. R9-2007-0001 defines the NPDES waste discharge requirements for MS4s. For the watersheds of Orange County, the incorporated cities of Orange County (11 cities), and the Orange County Flood Control District, Order No. R9-2002-0001 defines the NPDES waste discharge requirements for MS4s.

The watersheds draining into the impaired shoreline segments addressed in this TMDL discharge directly from the MS4 storm drain systems into BB and SISP, and not via any streams or creeks. Urban runoff discharged by MS4s is different depending on wet or dry weather conditions. Runoff under these weather conditions are discussed below.

5.2.3.1 Wet Weather Urban Runoff

During wet weather conditions (storm events), wash-off of bacteria from various land uses is considered to be the primary mechanism for transport of bacteria. After bacteria build up on the land surface as a result of various land use sources and associated management practices (e.g., pet waste in residential areas), much of the bacteria is washed off of the land surface during storm events into the MS4 storm drain systems. The amount of runoff and associated bacteria densities are therefore highly dependent on land use.

5.2.3.2 Dry Weather Urban Runoff

During dry weather conditions, many streams in the San Diego Region exhibit a sustained flow even if no rainfall has occurred for a significant period to provide precipitation-based runoff or groundwater flows. These dry weather flows are generally understood to result from various urban land use practices that cause water to enter MS4s. Such land use practices include landscape irrigation, car washing, sidewalk washing, and the like. As these urban runoff flows travel across lawns and urban surfaces, bacteria are carried from these areas to the receiving waterbody.

Studies performed at other waterbodies (Aliso Creek, San Juan Creek, Tecolote Creek, and Rose Creek) for Bacteria TMDLs Project I (San Diego Water Board, 2007) found that urban runoff and associated bacteria levels during dry weather conditions could be estimated from land use information in a given watershed. This observance was validated in Bacteria TMDLs Project I through an analysis of dry weather data collected throughout the San Diego Region that led to development of a regional model for estimation of dry weather flows and bacteria levels.

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6 Linkage Analysis

The analysis of the relationship between bacteria loading and the waterbody response to this loading is referred to as the linkage analysis. The linkage analysis results in the calculation of a numeric value for the total amount of loading of a pollutant that a waterbody can receive and still meet water quality standards. This numeric value becomes the TMDL of a pollutant for a waterbody. The TMDL is typically calculated under critical conditions (i.e., worst case scenario). If the waterbody can meet WQOs under these conditions, it should be able to meet WQOs under any conditions.

Because the TMDL calculations are based on critical conditions and numeric WQOs that support the beneficial uses, attainment of the TMDL numeric values will result in attainment of water quality standards under any conditions. Likewise, attainment of the water quality standards, specifically WQOs that support the beneficial uses, will result in attainment of the TMDL. Ultimately, the goal of a TMDL is to restore the water quality of a waterbody so it can support its beneficial uses by meeting the WQOs at all times.

After the TMDL for a waterbody is calculated, the pollutant loading is allocated among the allowable sources that have been identified as potentially contributing a pollutant load to the waterbody. The TMDL is allocated to nonpoint sources and point sources. The pollutant loads that are attributed and allocated to nonpoint sources are known as load allocations (LAs). The pollutant loads that are attributed and allocated to point sources are known as wasteload allocations (WLAs).

“Existing” pollutant loads from all the identified allowable sources are also calculated under critical conditions. The calculation of the exiting pollutant loads can be used to identify which sources may need to be reduced so the TMDL may be achieved. Existing pollutant loads from each source are compared to the WLAs and LAs of the TMDL. If the existing pollutant loading from a source exceeds the LA or WLA, load reductions are required to meet the water quality standards. Controllable sources of pollutants are identified, and load reductions are calculated in order to meet the LA or WLA for each controllable pollutant source.

Due to the complex interactions that bacteria can have with the environment, a model is typically required to perform the linkage analysis and TMDL calculation. A model mathematically represents environmental processes, which can be used to evaluate the way pollutants interact with the environment.

A model can be very simple or extremely complex, requiring more time and resources as more parameters are included in the model. The simpler a model is the fewer model parameters and the higher the uncertainty in the results, which means a larger explicit margin of safety is required to account for the uncertainties. As more parameters are included in the model, the uncertainty may be reduced and the explicit margin of safety required may be reduced or eliminated. Unfortunately, uncertainty in a model can never be completely removed, just like in reality. However, models can be developed with

enough parameters to approximate a system and provide results that can help in the management of a system. Therefore a model must include enough parameters that can be meaningfully used in the management of a system.

Models require some parameter data to develop a modeling system. For TMDL calculation, the model parameters are used in mathematical equations that provide the instructions for how the pollutants and environmental processes interact with each other. The model is used to simulate reality as well as possible. How well a model simulates reality is assessed by comparing the output the model produces to actual measurements.

Actual measurements are used to calibrate the model, meaning setting up the model to have an output that closely approximates the actual measurements. Then another set of actual measurements is used to validate the model, meaning the results of the calibrated model are examined to see how well the calibrated model output compares to actual measurements. The more actual data available for model calibration and validation, the better a model can be used to predict and represent reality. So, a model can be developed and compared to available hydrologic and water quality data to calibrate and validate it for use in calculating the “existing” loading under critical conditions and a TMDL for a waterbody.

For the BB and SISP shoreline segments, modeling approaches were evaluated for calculating the bacteria loading from nonpoint and point sources, and simulating the effects on the receiving waterbody. As discussed in section 5, the bacteria loading from nonpoint and point sources to the BB and SISP shorelines can vary significantly depending on wet weather or dry weather conditions. Therefore, for the calculation of these TMDLs, a distinction is made between wet weather and dry weather periods, because bacteria density and implementation measures will vary between the two conditions. As a result, separate modeling approaches were used for calculating bacteria loads and TMDLs under each weather condition. The criteria considered for model selection, and the wet weather and dry weather models selected for TMDL calculations are discussed in the following sub-sections.

6.1 Model Selection Criteria

In selecting an appropriate modeling approach for TMDL calculation, technical and regulatory criteria were considered. Technical criteria include the physical system in question (watershed and receiving water characteristics and processes) and the pollutant or constituent of interest (bacteria). Regulatory criteria include water quality standards (beneficial uses and numeric WQOs). Based on these criteria, modeling approaches were identified for both wet weather and dry weather conditions to be used in the TMDL calculations for the BB and SISP shorelines. These criteria are discussed in detail below.

6.1.1 Technical Criteria

There are four main criteria considered when selecting a model for TMDL calculation: 1) physical domain, 2) source contributions, 3) critical conditions, and 4) model variables. Consideration of each criterion is critical in selecting the most appropriate modeling approach to address the types of sources and the numeric targets associated with the listed waters.

6.1.1.1 Physical Domain

Representation of the physical domain is perhaps the most important consideration in model selection. The physical domain is the focus of the modeling effort. The physical domain typically consists of either the receiving water itself or a combination of the contributing watershed and the receiving water. Selection of the appropriate physical domain for modeling depends on the constituents and the conditions under which the waterbody exhibits impairment.

In the environmental setting found in the San Diego Region, two physical domains have been recognized that require specific model requirements to address key physical and environmental conditions. As discussed above, sources of pollutant loading can vary significantly depending on wet weather or dry weather conditions. The physical domain and processes differ significantly between wet weather and dry weather conditions.

Under dry weather conditions, pollutant loads are typically generated by discharges from specific land uses with low-flow conditions. Under this setting, a steady-state approach is typically used, which assumes a constant or average flow and pollutant load. If a system also includes tidal influences, a quasi-steady-state approach may be used, which includes the variability in hydrodynamics due to tidal effects in addition to the steady-state point source inputs. The steady-state and quasi-steady-state modeling approaches primarily focus on receiving water processes during a user-specified condition.

Under wet weather conditions (storm events), most of the pollutant loads are generated by stormwater runoff discharges from all land uses that can vary over the course of a storm. Under this setting, a dynamic modeling approach is typically most appropriate. Dynamic models can consider time-variable pollutant contributions from a watershed surface and/or subsurface, as well as the hydrodynamic response of the receiving water. Some dynamic models consider monthly or seasonal variability, while others enable assessment of conditions immediately before, during, and after individual rainfall events. Dynamic models require a substantial amount of information regarding input parameters and data for calibration and validation processes.

6.1.1.2 Source Contributions

Primary pollutant sources must be considered in the model selection process. Representing contributions from nonpoint and point sources as accurately as possible is critical in properly representing the system and assigning LAs and WLAs.

6.1.1.3 Critical Conditions

The goal of a TMDL analysis is to determine the loading capacity, or assimilative capacity, of a waterbody and to identify potential allocation scenarios that will enable that waterbody to achieve water quality standards (numeric WQOs that support applicable beneficial uses). The TMDL must be conservative enough to be protective of water quality under the most critical conditions. In other words, a TMDL must be protective of the period of time and location in which the waterbody exhibits the most vulnerability.

For dry weather conditions, dry weather models typically are assumed to have a steady-state flow and pollutant load. Therefore, a dry weather model may not have a specific period of time in which a waterbody is most vulnerable. However, there may be a location where the pollutant loading may be expected to be the most concentrated, thus most vulnerable to violating water quality standards. Additionally, with tidally influenced systems, there may be a tidal period when a waterbody is most vulnerable.

For wet weather conditions, critical conditions are typically associated with extreme rainfall conditions, when the highest pollutant loads may be washed off of land surfaces to the receiving water and the receiving water is most vulnerable to violating water quality standards. Critical conditions under wet weather conditions will also have a location where the pollutant loading may be expected to be the most concentrated and most vulnerable to violating water quality standards. Therefore, for our modeling purposes, critical conditions include a critical period of time and a critical location when and where a modeled system is most vulnerable to violating the water quality standards.

6.1.1.4 Model Variables

Another important consideration in model selection and application are the model variables required to assess and simulate the fate and transport of pollutant(s) in the watershed and/or waterbody. Selection of the model state variables is a critical part of developing the model. A state variable is any variable which represents the state of an object or system. The more state variables included, the more complex the model becomes, and the more difficult the model will be to apply and calibrate. However, if key state variables are omitted from the model, the simulation might not include all the necessary aspects of the modeled system and might produce unrealistic results. A delicate balance must be met between minimal number of variables and maximum applicability of the model.

The focus of this TMDL analysis is on indicator bacteria. Receiving water bacteria dynamics can be extremely complex, and accurate estimation of bacteria densities relies on a host of interrelated environmental variables. Environmental variables that can affect the survival of bacteria include soil moisture content, pH, solar radiation, available nutrients, and salinity, among others. Bacteria densities in the water column are also influenced by die-off, regrowth, partitioning of bacteria between water and sediment during transport, as well as bacteria and sediment settling and resuspension of bottom materials.

First-order die-off is likely the most important dynamic to simulate in the watersheds and receiving waters. Salinity in the tidally influenced BB and SISP shoreline segments would also require simulation to represent the impact of salinity on bacterial die-off rates. The impact of temperature on bacterial die-off rates can also be considered. However, the limited available data provide few insights into which of the other environmental variables mentioned above might be most influential on bacterial behavior for the models. To account for these other environmental variables, certain assumptions were made for the model. A description of assumptions regarding these environmental variables is described in Appendix G.

6.1.2 Regulatory Criteria

The Basin Plan establishes, for all waters in the San Diego Region, the beneficial uses for each waterbody to be protected, the numeric WQOs that are considered protective of those beneficial uses, and an implementation plan that accomplishes those objectives. A properly designed and applied model provides the source-response linkage component of the TMDL calculation, and enables an accurate assessment of the assimilative capacity of a waterbody. The assimilative capacity, or TMDL, of a receiving water is based on the assumption that the numeric WQOs are met.

The selected modeling approach must enable direct comparison of model results to actual measurements of receiving water bacteria densities and allow for the analysis of the duration of those densities. For the watershed loading analysis and implementation of measures required to reduce pollutant loads, it is also important that the modeling approach enable examination of gross land use loading as well as urban runoff bacteria densities.

6.2 Receiving Water Modeling Approach

Based on the criteria discussed above, separate modeling systems were selected to simulate pollutant loading to the receiving waters during dry weather and wet weather conditions. Different watershed models were selected and developed to simulate the pollutant loads discharging from the watershed under wet weather and dry weather conditions to the receiving waters of the impaired shorelines. The watershed model outputs were used as inputs to a receiving water model.

For the receiving water model, the Environmental Fluid Dynamics Code (EFDC) model (Hamrick, 1992 and 1996) was selected for both wet weather and dry weather conditions to simulate the assimilative capacity of the receiving waters at the impaired shorelines of BB and SISP. The EFDC model can be used to conduct a dynamic or quasi-steady-state simulation of flushing and intrusion of waters high in salinity resulting from tidal hydrodynamics. The EFDC model can also include assumptions for influence of salinity and temperature on bacteria die-off rate formulations.

Sufficient water quality data were available for BB and SISP to perform model calibration and validation and analyses of loading conditions to the receiving waters. Appendix F provides more details regarding model formulations and assumptions.

For the present study, the EFDC models were used for estimation of the assimilative capacity of the shoreline segments evaluated and the resulting TMDLs based on numeric WQOs, simulation of the response of the receiving waters to varying external loading scenarios, and estimation of loads from sources not associated with watershed runoff. As more hydrology and/or water quality data are collected, the EFDC model formulations for each of the shoreline segments can be refined through additional model calibration and validation. In addition, further study regarding relative sources of bacteria from within the receiving waters (e.g., waterfowl) can be quantified and configured into the EFDC models for simulation of water quality, comparison to observed data, and refined calculation of load allocations and load reductions (discussed in section 7). The wet weather and dry weather watershed modeling approaches selected for simulating the pollutant loads in the receiving waters are discussed in more detail below.

6.2.1 Wet Weather Modeling Approach

During wet weather conditions, sources of bacteria are usually associated with wash-off of bacteria accumulated, or built up, on the land surface. Specifically, during rainy periods, or storm events, the bacteria are washed off the land surface and delivered to the waterbody through creeks and/or stormwater collection systems. Once the bacteria loads reach the receiving waters of the shoreline, tidal flushing and water conditions can influence the die-off rates of the bacteria loads and assimilative capacity of the receiving waters. Therefore, to assess the linkage between sources of bacteria and the effect on receiving waters at BB and SISP, a modeling approach was needed that could simulate the build-up and wash-off of bacteria from land surfaces, the hydrologic and hydraulic processes that affect delivery of the bacteria load to the waterbody, the assimilative capacity of the waterbody, and the effects of tidal flushing.

Understanding and modeling of these processes provided the necessary decision support for the calculated TMDLs and the allocation of the bacteria loads to the identified nonpoint and point sources. The wet weather modeling approach assumed the following:

- All sources can be represented through build-up/wash-off of bacteria from specific land use types.
- The discharge of sewage is zero. Sewage spill information was reserved for use during the calibration process to account for observed spikes in bacteria, as applicable; however, the calibration process did not necessitate removal of any wet weather data considered to be affected by sewage spill information. In other words, data from wet weather conditions used for calibration were not indicative of sewage spills.

- For numeric TMDL target assessment, the critical locations were assumed to be along the length of each shoreline segment.

The wet weather modeling approach selected for use in this project is based on the application of two separate models: 1) the USEPA's Loading Simulation Program in C++ (LSPC) model (USEPA, 2003a) to estimate bacteria loading in the watersheds that are delivered to the receiving waterbodies, and 2) the EFDC model (USEPA, 2003b), to simulate the assimilative capacity of the receiving waterbodies, as described in section 6.2. Both models are included in the USEPA's TMDL Modeling Toolbox recommended by the USEPA for use in development of TMDLs.

LSPC is a recoded C++ version of the USEPA's Hydrological Simulation Program–FORTRAN (HSPF) that relies on fundamental (and USEPA-endorsed) algorithms. Insufficient hydrology and water quality data were available for the BB and SISP watersheds to perform site-specific LSPC model calibration and validation. However, LSPC has been successfully applied and calibrated in multiple watersheds in the San Diego Region for Bacteria TMDL Project I (San Diego Water Board, 2007). These regionally calibrated modeling parameters were transferred and applied to the watersheds that deliver bacteria loads to the BB and SISP shoreline segments. For a complete discussion of the LSPC model configuration, validation, and application refer to Appendix F.

Wet weather watershed flows and bacteria levels based on the LSPC model output from the watersheds of the respective shoreline segments modeled were used as boundary conditions to the receiving waters of the impaired shoreline segments in the EFDC model. Assumptions for the wet weather modeling approach can be found in Appendix G.

6.2.2 Dry Weather Modeling Approach

Bacteria densities during dry weather conditions are extremely variable in nature. For modeling of dry weather watershed sources of bacteria for the shoreline segments of BB and SISP, the approach for Bacteria TMDLs Project I was used. This approach relied on detailed analysis of available data to better identify and characterize sources. Data collected from dry weather samples were used to develop empirical relationships that represent water quantity and water quality associated with dry weather runoff from various land uses. For each monitoring station, a watershed was delineated and the land use was related to flow and bacteria concentrations. A statistical relationship was established between flow, bacteria densities, and area of each land use. A complete discussion of the statistical analysis of data and development of the empirical framework for estimating watershed bacterial loads is provided in Appendix F.

To represent the linkage between source contributions and effect on receiving waters, steady-state mass balance models were developed to simulate transport of bacteria from the watershed to the streams and stormdrains flowing to the BB and SISP

shorelines; and the EFDC model (USEPA, 2003b) was used to simulate the assimilative capacity of the receiving waterbodies, as described in section 6.2.

The steady-state mass balance models were used to represent the streams/stormdrains as a series of plug-flow reactors, with each reactor having a constant, steady-state flow and bacteria load. Bacteria concentrations in each segment were simulated based on regionally calibrated values for a first-order die-off rate and stream infiltration. A complete description of configuration and calibration of the transport modeling network is provided in Appendix F.

Dry weather receiving water models of BB and SISP were consistent with EFDC models developed for wet weather model analyses (section 6.2.1). Dry weather flows and bacteria levels based on the output from the steady-state mass balance models used for the watersheds of the respective shoreline segments modeled were used as boundary conditions to the EFDC model. Assumptions for the dry weather modeling approach can be found in Appendix G.

7 Identification of Load Allocations and Reductions

The models selected for wet and dry weather analysis provided the first step in developing the tools for a framework to assist in regulatory and management decisions for the BB and SISP shoreline segments and their respective watersheds. Estimated current existing loads were compared to the TMDLs. The comparison was used to identify controllable sources requiring load reductions. Methodologies for determining load reductions to the identified controllable nonpoint and point sources are described in the following sub-sections.

7.1 Wet Weather Loading Analysis

After calibrating and validating the LSPC and EFDC models with existing flow and water quality data, the models were used to calculate existing wet weather bacteria loading and TMDLs under critical conditions. The LSPC model was used to calculate existing bacteria loads for each watershed that delivers bacteria loads to the impaired shoreline segments of BB and SISP during critical wet weather conditions. The EFDC model was used to calculate the existing bacteria loads and TMDLs for the receiving waters under critical tidal conditions at a critical location. The difference between the existing wet weather bacteria loads and TMDLs for the impaired shoreline segments was used to determine the load reductions required. The wet weather loading analysis is discussed in the following sub-sections.

7.1.1 Identification of the Critical Wet Weather and Tidal Conditions

To ensure the receiving waters are protected during extremely wet periods of weather, a critical wet weather period associated with extreme wet conditions was selected for loading analysis and TMDL calculations. This extreme wet period, or critical wet weather condition, was selected by reviewing data from multiple rainfall gages in the San Diego Region over a recent 14-year period (1990 through 2004) (Appendix D, No.9).

The wettest year, 1993, was selected as the critical wet year for assessment of wet weather loading conditions. Statistically, 1993 is in the 92nd percentile of annual rainfalls observed from 1990 to 2004. This observation is consistent with studies performed by the Southern California Coastal Research Project (SCCWRP), where a 90th percentile year was selected based on rainfall data for the Los Angeles Airport (LAX) from 1947 to 2000, also resulting in selection of 1993 as the critical wet year (Los Angeles Water Board, 2002).

To assess the response of the receiving waters to variable critical watershed loads, a critical 30-day period of the critical wet year was selected for detailed assessment by the LSPC model to calculate bacteria loads delivered from the watersheds to the shoreline segments of BB and SISP. This shortened period facilitated detailed analyses of the hourly or diurnal conditions that impact the water quality, rather than a longer-term, daily evaluation of loads. January 7 through February 5 was identified as the

30-day critical wet weather period in 1993. During this 30-day critical wet weather period, five to ten of the top 1st percentile of flow magnitudes (daily averages) were observed in the flow data collected between January 1, 1990 and May 31, 2004, depending on location. Additionally, of these higher flows, all the bacteria levels within the top 10th percentile of magnitude were simulated by the LSPC model over that same period.

Besides bacteria loading from the watersheds calculated by the LSPC model during the 30-day critical wet weather period, assessment of the assimilative capacities of the receiving waters at the shoreline segments by the EFDC model was also highly dependent on tidal effects. The degree of variation between high and low tides impacts the amount of flushing that occurs along the shorelines. Lower tides are associated with reduced assimilative capacities, and higher tides, in turn, are associated with increased assimilative capacities. Because the variation of tide elevations are so important to the assimilative capacities of the shorelines, a period of tidal fluctuation dominated by lower tide elevations, which are associated with reduced assimilative capacities, was also considered in the assessment of critical conditions for wet weather TMDL development. Tidal elevation data were available for the period from 2001 to 2002. Within that period, March 7 to April 7, 2001 was identified as the 30-day period with the lowest tide elevation. Therefore, March 7 to April 7, 2001 was selected as the 30-day critical tidal period.

The 30-day critical wet weather period and the 30-day critical tidal period do not fall within the same time period. However, the rainfall and tidal elevation data from these two periods were used together in the wet weather model analysis to represent the most conservative potential critical condition for the wet weather loading conditions and TMDL calculations.

7.1.2 Critical Locations for Wet Weather Load Calculations

Bacteria loading during critical wet weather and tidal conditions is calculated at a critical location in the physical domain of the model. The critical location is the point or area in the waterbody that is most vulnerable to bacteria loading under the critical wet weather and tidal conditions. This critical location is selected based on high bacteria levels predicted at that location and considered to be a conservative assumption for the assessment of water quality conditions. If the water quality at the critical location is protective of beneficial uses under critical conditions, the water quality in the rest of the waterbody is expected to be protective of beneficial uses as well. Although water quality is predicted only at this critical location in the wet weather model, in reality, water quality must be assessed and maintained throughout a waterbody to support beneficial uses.

For the BB and SISP shoreline segments, the critical location is the entire length of each impaired shoreline segment. For the development of the wet weather model, receiving waters at these shoreline segments were represented in the model with multiple grid cells (see Appendix F). For each shoreline segment evaluated, a weighted

average of bacteria density was calculated based on the respective length of shoreline of each model grid cell located adjacent to that shoreline. This resulted in a single representative bacteria density for each shoreline segment addressed in this TMDL. The representative bacteria density is calculated by the following equation:

$$(\text{Avg. Dens.} = \sum [\text{Length}*\text{Dens.}] / \sum \text{Length})$$

Where:	Avg. Dens.	= weighted average bacteria density
	Length	= length of the shoreline segment
	Dens.	= bacteria density of each grid cell

7.1.3 Wet Weather Load Calculations

Calculations of bacteria loading from the watersheds to the receiving shoreline segments under wet weather conditions required the use of the LSPC model to predict watershed flows and bacteria densities. The dynamic model-simulated watershed processes, based on observed rainfall data as model input, provided temporally variable load estimates for the 30-day critical wet weather period. These bacteria loads from the watersheds were simulated using calibrated, land use-specific processes associated with hydrology and build-up and wash-off of bacteria from the land surface. Transport processes of bacteria loads from the watershed sources to the receiving waterbodies were also simulated in the LSPC model with a first-order loss rate based on values taken from literature sources (see Appendix F).

In addition to bacteria loads from the watershed sources delivered to the receiving waterbodies, additional sources within the receiving waters were quantified. Limited data were available for identification of non-urban runoff sources at the receiving waters and their relative load contributions. These non-urban runoff sources include waterfowl or other local sources within the receiving waters and at the shoreline, which will impact water quality during wet and dry weather conditions.

No available data were identified regarding waterfowl populations or other non-urban runoff sources at the BB and SISP shorelines to directly estimate associated bacteria loads. However, if the loads from these sources are assumed to be constant in both wet weather and dry weather conditions, allowable loads attributed to these sources may be inversely-derived, or back-calculated. The EFDC model of the receiving waters developed for the dry weather modeling analysis was used to back-calculate the allowable loads from these non-urban runoff sources, which is discussed in section 7.2.5, and Appendix F.

The total calculated loads to the receiving waters is the sum of the bacteria loads attributed to non-urban runoff sources back-calculated using the dry weather EFDC model and the bacteria loads attributed to the watershed that were calculated based on the LSPC model for the 30-day critical wet weather period.

7.1.4 Application of Wet Weather Numeric Targets

As discussed in section 3, the wet weather numeric targets are based on the single sample maximum WQOs which are given in the Basin Plan. For REC-1 beneficial uses, single sample maximum WQOs were established in the Basin Plan for TC, FC, and ENT. The wet weather numeric targets for the indicator bacteria evaluated for this project are provided in Table 3-1.

7.1.5 Calculation of Existing Wet Weather Bacteria Loads and TMDLs

For each LSPC-modeled watershed discharging to a shoreline segment of BB or SISP (watersheds and proximity to impaired shorelines are shown in Appendix J), wet weather watershed flows and bacteria loads were calculated for the 30-day critical wet weather period. Bacteria from non-urban runoff sources (e.g., waterfowl and other local sources) were back-calculated for the 30-day critical tidal period using the dry weather EFDC model (see section 7.2.5).

Hourly bacteria densities within critical locations of the wet weather model were simulated with the EFDC model over the combined 30-day critical wet weather and tidal period. Using the hourly EFDC model-predicted bacteria densities, daily arithmetic means for existing bacteria loads were calculated and compared to the wet weather numeric targets for each indicator bacteria at each shoreline segment evaluated. Graphical comparisons of the calculated daily arithmetic means for existing bacteria loads under critical conditions with the wet weather numeric target are shown in Appendix H.

As shown in Appendix H, there were some cases where the existing bacteria loads modeled using the combined 30-day critical wet weather and tidal period showed no exceedances of the wet weather numeric targets. For these cases, no load reductions are expected to be required from any allowable sources of bacteria to meet the REC-1 WQOs, and the existing bacteria load was set as the TMDL.

For the other cases, where the model shows that the wet weather numeric targets have been exceeded one or more days under critical conditions, the wet weather model was also used to calculate the loading capacity, or TMDL, of the receiving water. Because the bacteria loads from non-urban runoff sources (e.g., waterfowl and other local sources) back-calculated for the 30-day critical tidal period are assumed to be constant, only the bacteria loads from the watershed could be adjusted. The wet weather LSPC and EFDC models were used to determine the maximum bacteria density that can be discharged in the 30-day critical wet weather period runoff to the receiving water and not result in any exceedances of wet weather numeric targets at the critical locations. This bacteria density was then assigned to all the stormwater runoff flows in the watershed discharging to an impaired shoreline segment over the 30-day critical wet weather period. This analysis resulted in a bacteria load that was added to the bacteria loads from non-urban runoff sources to represent the TMDL of the receiving water. The loading capacities, or TMDLs, calculated for each modeled shoreline segment are graphically shown in Appendix H.

7.1.6 Allocation of Wet Weather TMDLs and Calculation of Load Reductions for WLAs

Because the bacteria loads from non-urban runoff sources (e.g., waterfowl and other local sources within the receiving waters) are assumed uncontrollable nonpoint sources and constant, only the bacteria loads from the watershed, which are assumed to be from controllable point sources, can be reduced. To determine load reductions to meet the TMDLs, analyses were performed for each indicator bacteria and shoreline segment based on the following steps:

1. Calculate the existing wet weather watershed bacteria load for each day of the 30-day critical wet weather period (represented as bars in loading curves in Appendix K);
2. Determine the daily loads attributed to non-urban runoff sources of bacteria (e.g., waterfowl and other local sources within the receiving water) based on dry weather EFDC modeling analyses (see sections 7.2.3 and 7.2.5) and set as load allocation (LA) for uncontrollable natural or background sources;
3. Calculate the wet weather TMDL – the loading capacities of the receiving waters for each day were calculated using the daily flows multiplied by maximum allowable watershed bacteria densities determined through modeling analyses described above (section 7.1.5), plus the daily bacteria load attributed to the non-urban runoff sources (from step 2);
4. Calculate wasteload allocation (WLA) for controllable point sources as the difference between the wet weather TMDL (from step 3) and the LA for uncontrollable natural or background sources (from step 2); and;
5. Calculate load reductions required to meet WLA for controllable point sources, represented by the portion of the bars above loading capacity curves in Appendix K (i.e., the difference between step 1 and step 4). Load reduction calculations are discussed in more detail in section 8.

7.1.7 Margin of Safety

There are two ways to incorporate the margin of safety, or MOS (USEPA, 1991): (1) implicitly incorporate the MOS using conservative model assumptions to develop allocations; and/or, (2) explicitly specify a portion of the total TMDL as the MOS and use the remainder for allocations. For the wet weather bacteria TMDL calculations, only an implicit MOS was incorporated.

Throughout the wet weather TMDL development process, conservative assumptions were employed. For example, the critical conditions included the combination of a critical wet weather period and a critical tidal period that resulted in a scenario that assumes maximum bacteria loading will occur when the assimilative capacity of the receiving waterbody is at its lowest. Also, the critical location for TMDL calculation was at the shallow shoreline within the model's physical domain where volumes are lower

and the resulting assimilative capacities are therefore reduced. Additional conservative assumptions are listed in Appendix G.

Based on the incorporation of all these conservative assumptions, no explicit MOS was necessary.

7.1.8 Seasonality

Seasonal analyses of bacteria levels in the receiving waters at the BB and SISP shorelines were specific to wet and dry seasons, when loadings to the receiving waters can vary considerably. For the wet season, a 30-day critical wet weather period was selected and assessed to determine conditions that can occur for high watershed flows during rainfall events. This 30-day critical wet weather period can occur during any month throughout the wet season (mid-October to early April).

For estimating bacteria loads during dry weather conditions, a separate dry weather modeling approach was used (see section 7.2).

7.2 Dry Weather Loading Analysis

After calibrating and validating the dry weather steady-state watershed model and EFDC receiving water model with existing flow and water quality data, the models were used to calculate existing dry weather bacteria loading and TMDLs under critical conditions. A steady-state model (see Appendix F) was used to calculate existing dry weather bacteria loads for each watershed that delivers bacteria loads to the impaired shoreline segments of BB and SISP during dry weather conditions. As with the wet weather loading analysis, the EFDC model (see Appendix F) was used to calculate the existing bacteria loads and TMDLs for the receiving waters under critical tidal conditions at a critical location. The difference between the existing dry weather bacteria loads and TMDLs for the impaired shoreline segments was used to determine the load reductions required. The dry weather loading analysis is discussed in the following sub-sections.

7.2.1 Identification of the Critical Dry Weather and Tidal Conditions

Because the dry weather watershed model assumes steady-state conditions for bacteria loading to the receiving waterbody, there is no critical dry weather period. However, as with the wet weather modeling approach, assessment of the assimilative capacities of the shoreline segments by the EFDC model was highly dependent on tidal effects (see section 7.1.1). The same 30-day critical tidal period, March 7 to April 7, 2001, was identified. This critical tidal period was used as the 30-day critical tidal period in the dry weather model analysis.

7.2.2 Critical Locations for Dry Weather Load Calculations

As was the case with the wet weather load calculations (see section 7.1.2), the critical location selected is the entire length of each impaired shoreline segment of BB and SISP. For the development of the dry weather model, receiving waters at these

shoreline segments were represented in the model with multiple grid cells (see Appendix F). For each shoreline segment evaluated, a weighted average of bacteria density was calculated as in the wet weather analysis based on respective length of shoreline (Avg. Dens. = ∑ [Length*Dens.] / ∑ Length) of each model grid cell located adjacent to that shoreline. This resulted in a single representative bacteria density for each shoreline segment addressed in this TMDL.

7.2.3 Dry Weather Load Calculations

Calculation of bacteria loading from the watershed to the receiving shoreline segments under dry weather conditions was based on empirical relationships established between both flow and bacteria densities and land use distribution in the watershed. Transport of bacteria loads was simulated using standard plug-flow equations to describe steady-state losses resulting from first-order die-off and stream infiltration (Appendix F). Steady-state estimates of bacteria loads were assumed constant for all dry weather days. Assumptions incorporated in the dry weather loading analysis are described in Appendix G.

In addition to bacteria loads from the watershed sources delivered to the receiving waterbodies, additional sources within the receiving waters needed to be quantified. As discussed in section 7.1.2, no available data were identified regarding waterfowl populations or other non-urban runoff sources at the BB and SISP shorelines to directly estimate associated bacteria loads. However, if the loads from these sources are assumed to be constant in both wet weather and dry weather conditions, allowable loads attributed to these sources may be inversely-derived, or back-calculated.

BB and SISP had sufficient bacteria water quality data collected from the receiving waters for EFDC models to be set up using bacteria loads from the dry weather steady-state watershed model as the only load input to the receiving waterbodies. The EFDC modeling analyses of those receiving waters determined that loads predicted from the dry weather steady-state watershed models were generally too low to result in the observed bacteria levels in the receiving waters without additional non-urban runoff source loads considered.

This discrepancy could be due to the under-prediction of bacteria loading from dry weather urban runoff, or additional non-urban runoff sources at the shoreline, such as waterfowl or other sources within the receiving water. Further analyses using the EFDC models were performed to calculate loads from non-urban runoff sources of bacteria that could have theoretically resulted in the water quality observed in the receiving waters. These analyses determined that such additional non-urban runoff sources varied considerably over time, and this variation could not be predicted with accuracy for other periods when data were not available. A complete discussion of these modeling analyses is provided in Appendix F.

The above analyses were used to try and verify and predict the additional loading from non-urban runoff sources that was not accounted for in the steady-state model-

predicted dry weather urban runoff from the watershed. However, the observed data varied significantly, both temporally and spatially, and the model could not predict the additional loading from non-urban runoff sources with any accuracy. Thus, these estimates were not used directly in TMDL analyses.

Instead, the dry weather EFDC model was used to back-calculate the allowable loads of dry weather non-urban runoff sources that can be assimilated by the receiving waters and still meet dry weather numeric targets. A full discussion of this back-calculation is provided in section 7.2.5.

7.2.4 Application of Dry Weather Numeric Targets

As discussed in section 3, the dry weather numeric targets are based on the 30-day geometric mean as well as the single sample maximum WQOs established in the Basin Plan. The application of both the 30-day geometric mean and single sample maximum WQOs is due to the fact that tidal effects for some shorelines have been observed to result in extreme diurnal variations in bacteria densities that can range by orders of magnitude. So, even if the shoreline bacteria densities are in compliance with the 30-day geometric mean, in some cases the daily arithmetic mean predicted in a model could exceed the single sample maximum WQO. Therefore, the single sample maximum WQOs were also used to set maximum daily bacteria densities allowed under dry weather conditions.

For comparison to the 30-day geometric mean WQOs, the hourly EFDC model-predicted bacteria densities occurring within critical locations (see section 7.2.2) for all days during the 30-day critical period were used to calculate a geometric mean. Including all the hourly EFDC model-predicted bacteria densities in the calculation of the 30-day geometric mean for each shoreline segment allowed consideration of diurnal variations in water quality resulting from tidal fluctuations. For comparison to the single sample maximum WQOs, the hourly EFDC model-predicted bacteria densities occurring within critical locations were used to calculate daily arithmetic averages for each day in the 30-day critical tidal period. Use of the 30-day geometric mean and single sample maximum WQOs in calculating dry weather TMDLs is discussed further is section 7.2.5.

For REC-1 beneficial uses, 30-day geometric mean and single sample maximum WQOs have been established in the Basin Plan for TC, FC, and ENT. The dry weather numeric targets for the indicator bacteria evaluated for this project are provided in Table 3-2.

7.2.5 Calculation of Existing Dry Weather Bacteria Loads and TMDLs

As discussed in section 7.2.3, due to lack of available data, sources of bacteria during dry periods are difficult to quantify and require further study for complete identification. Modeling analyses that were performed and compared to available water quality data indicated that the bacteria loads predicted by the dry weather steady-state watershed model were generally too low to result in the observed bacteria levels in the receiving waters without additional bacteria source loads considered. These additional sources

may include localized inputs such as waterfowl or other sources within the receiving waters, or could result from under-prediction of the watershed model on specific days when loadings are high (dry weather model-predicted loads are steady-state, and assumed constant for each day). Further study is recommended to identify and quantify these other sources that may be contributing to bacteria loads to the receiving waters. In the meantime, steady-state dry weather watershed flows and bacteria densities were used to calculate bacteria loading from the watershed, which are assumed to be from controllable point sources. Bacteria from non-urban runoff sources (e.g., waterfowl and other local sources within the receiving water) were lumped into a single load and assumed to be from natural and background uncontrollable nonpoint sources.

Because bacteria loads predicted by the watershed runoff models were generally too low to result in the observed bacteria levels in the receiving waters without bacteria loads from other sources present, and no information is currently available for quantification of existing loads attributed to non-urban runoff sources (e.g., waterfowl and other local sources), another approach was taken to account for loading from non-urban runoff sources. The receiving waters were modeled using the EFDC model to back-calculate the allowable loading from the nonpoint sources that would still meet the assimilative capacities of those waterbodies, while accounting for the allowable loading calculated using the dry weather steady-state watershed model.

The dry weather steady-state watershed model was used to calculate the allowable loading from dry weather urban runoff by calculating the dry weather flow and multiplying it by the dry weather 30-day geometric mean numeric targets. This allowable bacteria load from the watershed was used as a boundary condition in the receiving water (EFDC) model. Nonpoint, non-urban runoff sources of bacteria that may be attributed to waterfowl or other unidentified sources were added to the allowable load calculated from the dry weather steady-state watershed model. These loads were modeled on an hourly basis during the 30-day critical tidal period by the EFDC model. The hourly model-predicted bacteria densities allowed the consideration of diurnal variations in water quality resulting from tidal fluctuations, which may vary by orders of magnitude.

The hourly EFDC model-predicted bacteria densities were used to calculate a geometric mean bacteria density for the 30-day critical tidal period. Additionally, the hourly EFDC model-predicted bacteria densities were used to calculate daily arithmetic averages for each day of the 30-day critical tidal period. The 30-day critical tidal period geometric mean was compared to the 30-day geometric mean numeric target. The daily arithmetic averages were compared to the single sample maximum numeric target.

Bacteria loads attributed to non-urban runoff sources (e.g., waterfowl or other unidentified sources) were increased until either the 30-day critical tidal period geometric mean was equal to the 30-day geometric mean numeric target, or one or more daily arithmetic means was equal to the single sample maximum numeric target. This was considered the allowable load attributed to non-urban runoff sources that

could still meet the assimilative capacity of the receiving water, while accounting for the allowable loads from urban runoff sources.

Results of these analyses are shown in Appendix L for the dry weather 30-day critical tidal period evaluated. Results show the hourly EFDC model-predicted bacteria densities and the calculated daily arithmetic means compared to dry weather numeric targets. The 30-day critical tidal period geometric means are not shown in Appendix L, but are less than or equal to the 30-day geometric mean numeric targets. For each shoreline segment evaluated, the EFDC model-predicted TC, FC and ENT bacteria densities were compared to REC-1 WQOs for development of TMDLs.

7.2.6 Allocation of Dry Weather TMDLs and Calculation of Load Reductions for WLAs

Because the bacteria loads from non-urban runoff sources (e.g., waterfowl and other local sources) are assumed uncontrollable nonpoint sources and constant, only the bacteria loads from the watershed, which are assumed to be from controllable point sources, can be reduced. To determine load reductions to meet the TMDLs, analyses were performed for each indicator bacteria and shoreline segment based on the following steps:

1. Calculate the existing dry weather watershed bacteria load using the steady-state modeled daily flow multiplied by the average observed bacteria densities;
2. Determine the daily loads attributed to non-urban runoff sources of bacteria (e.g., waterfowl and other local sources) based on dry weather EFDC modeling analyses (see sections 7.2.3 and 7.2.5) and set as LA for uncontrollable natural or background sources;
3. Calculate the dry weather TMDL – the daily loading capacities of the receiving waters were calculated using the steady-state modeled daily flow from the watersheds multiplied by the dry weather 30-day geometric mean numeric targets (section 7.2.5), plus the daily bacteria load attributed to the non-urban runoff sources (from step 2);
4. Calculate WLA for controllable point sources as the difference between the dry weather TMDL (from step 3) and the LA for uncontrollable natural or background sources (from step 2); and;
5. Calculate load reductions required to meet WLA for controllable point sources (i.e., the difference between step 1 and step 4). Load reduction calculations are discussed in more detail in section 8.

7.2.7 Margin of Safety

As was the case for the wet weather bacteria TMDL calculations, an implicit MOS was incorporated through application of conservative assumptions throughout the dry weather TMDL development. An important conservative assumption was the application of both the 30-day geometric mean and single sample maximum WQOs as

numeric targets in the TMDL calculations. Compliance with both numeric targets for the 30-day critical tidal period ensured that diurnal variations of bacteria levels resulting from tidal fluctuations, and resulting impacts on receiving water assimilative capacities, would not result in potential detrimental effects to designated beneficial uses. Additional conservative assumptions are listed in Appendix G.

Based on the incorporation of all these conservative assumptions, no explicit MOS was necessary.

7.2.8 Seasonality

Seasonal analyses of bacteria levels in the receiving waters at the BB and SISP shorelines were specific to wet and dry seasons, when loadings to the receiving waters can vary considerably. The dry weather modeling approach only included non-precipitation-based urban runoff from the watershed, because wet weather storm events are not expected during the dry season. Instead, the urban runoff modeled in the dry weather modeling approach was assumed to be steady-state. The steady-state aspect of the dry weather watershed model resulted in estimation of a constant load from each watershed to the receiving water model.

For estimating bacteria loads during wet weather conditions, a separate wet weather modeling approach was used (see section 7.1).

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8 Total Maximum Daily Loads and Allocations

The TMDL for a given pollutant within a waterbody is the total amount of the pollutant that can be assimilated by the receiving water while still achieving the WQOs for the designated beneficial uses. TMDLs can be expressed on a mass loading basis (e.g., number of bacteria colony forming units per year) or as a concentration in accordance with Code of Federal Regulations Title 40 section 130.2(i). Once calculated, the TMDL is equal to the sum of individual WLAs (for point sources) and LAs (for nonpoint and natural sources). In addition, the TMDL must include a margin of safety (MOS), either implicitly or explicitly, to account for the uncertainty in the relationship between pollutant loads and the quality of the receiving water. Conceptually, the definition of a TMDL is represented by the following equation:

$$TMDL = \sum WLAs + \sum LAs + MOS$$

When developing a TMDL, allowable loadings from pollutant sources must be established that do not cumulatively amount to more than the TMDL. This provides the basis for establishing and recommending water quality-based controls. Based on the source analysis in section 5 and the implicit MOS (i.e., MOS = 0), the TMDL equation is as follows:

$$TMDL = WLA_{WWTP} + WLA_{Boats} + WLA_{Municipal\ MS4} + LA_{Homeless} + LA_{Natural/Background}$$

TMDLs, WLAs, and LAs were developed separately for wet and dry weather conditions. These loads and allocations were reported differently to address the weather conditions used for their determination, as well as to provide guidance for implementation since the numeric targets selected differ between the two weather conditions.

8.1 Wasteload Allocations

Federal regulations[5] require TMDLs to include an individual WLA for each point source identified. The point sources identified to potentially affect the waterbodies addressed in this study were discharges from MS4s and illegal discharges from boats and/or wastewater collection systems and treatment plants, although other point sources may exist. Because the Basin Plan includes waste discharge prohibitions specifically for the discharge of treated or untreated sewage from vessels to Dana Point Harbor and San Diego Bay and the unauthroized discharge of treated or untreated sewage to waters of the state, illegal discharges from boats and wastewater collection systems and treatment plants were assigned WLAs of zero (i.e., $WLA_{WWTP} = 0$ and $WLA_{Boats} = 0$). Assignment of a zero WLA is the most stringent allocation possible and the only allocation that can be assigned to an illegal discharge in the context of a TMDL. Other point sources that may exist and were not identified were also assigned WLAs of zero. Discharges from MS4s were modeled and represented with the wet weather LSPC and

[5] Code of Federal Regulations Title 40 section 130.7

dry weather steady-state watershed models. The watershed and receiving water models were used to calculate and assign the WLAs for discharges from the MS4s.

The USEPA's stormwater regulations require municipalities to obtain permits, or discharge requirements, for all stormwater discharges from MS4s.[6] The discharge requirements that regulate the existing MS4 apply to the watersheds identified as likely to contribute pollutant loads to the shoreline segments addressed in this study.

8.2 Load Allocations

For each nonpoint source identified, an LA is assigned. The only nonpoint sources identified to potentially affect the waterbodies addressed in this study were natural sources (e.g., waterfowl, terrestrial and aquatic animals, wrack line and aquatic plants, sediments), homeless encampments, or other background sources (e.g., "ambient" bacteria that may be a result of illegal discharges from boats). Because the homeless encampments are illegal, discharges from homeless encampments were assigned LAs of zero (i.e., $LA_{Homeless} = 0$). Due to lack of data, bacteria loads from natural sources or other background sources could not be specifically identified or quantified for TMDL development. Until more information is obtained through further study to provide identification of the relative loading from each of these potential sources, they were combined into a single LA for each shoreline segment (see section 7.2.5).

Because the loads from non-urban runoff sources (e.g., waterfowl and other unidentified sources) are attributed to uncontrollable sources, no reduction is required to meet the LA at this time. However, if more information is collected in future studies on non-urban runoff sources that indicate a higher loading can be attributed to these sources, load reductions to meet the LA can be recommended, if controllable.

No nonpoint sources were identified within the watersheds contributing to the receiving waters. Until better information is available that describes the spatial coverage of MS4s in the watersheds, no distinction can be made regarding those areas of the watersheds that are drained by the MS4s. If this information becomes available for the watersheds, the WLA assigned to MS4s can be redistributed to nonpoint source runoff, and LAs can be established for those nonpoint sources. Such nonpoint source runoff includes runoff attributed to natural areas not included within coverage of an MS4. The implementation strategy provides sufficient time for collection of information that better distinguishes areas covered by MS4s so that TMDL allocations can potentially be reassigned from WLAs to LAs for nonpoint source runoff from those natural areas.

[6] In California, to avoid the issuance by the USEPA of separate and duplicative NPDES permits for discharges in California subject to the Clean Water Act, the State's WDRs (Water Code Chapter 5.5) for such discharges implement the NPDES regulations and entail enforcement provisions that reflect the penalties imposed by the Clean Water Act for violation of NPDES permits issued by the USEPA. These State WDRs that implement NPDES regulations serve in lieu of federal NPDES permits.

8.3 Wet Weather Results

TMDLs, LAs, and WLAs for wet weather were developed based on multiple wet days occurring within a 30-day critical wet weather period and compliance to single sample maximum REC-1 WQOs. Thus, the TMDLs, LAs, and WLAs are given in units of billion MPN per 30 days (Billion MPN/30 days). The loading analyses outlined in Appendix K evaluated these wet days to determine the critical loads resulting from the 30-day critical wet weather period.

As discussed in section 8.2, homeless encampments were assigned a LA of zero, and natural or background sources of bacteria were lumped into one LA. The LA for natural or background sources was based on the loads that were back-calculated for non-urban runoff sources by the dry weather load analysis (see section 7.2.5 and Tables 8-4 through 8-6). The remaining portion of the TMDL is allocated to point sources as WLAs. The portion of the TMDL that can be allocated to point sources as WLAs was calculated as the difference between the TMDL and LA for natural sources (i.e., $WLA_{Point\ Sources} = TMDL - LA_{Natural/Background}$).

As discussed in section 8.1 illegal discharges from boats and wastewater collection systems and treatment plants in the receiving water were assigned WLAs of zero. The only known point source identified by the source analysis in section 5 that can be assigned a WLA was urban runoff from MS4s. The principal MS4s contributing bacteria to receiving waters are owned or operated by the municipalities located within the watersheds. Therefore, only the municipal MS4s are assigned wet weather WLAs (i.e., $WLA_{Municipal\ MS4} = TMDL - LA_{Natural/Background}$).

“Existing” wasteloads for point sources and loads for nonpoint sources were calculated with the watershed and receiving water models under the critical conditions discussed in section 7.1. The existing loads calculated for natural and background sources were considered uncontrollable and were therefore assigned as the LA with zero reduction required. Because discharges by homeless persons, boats, and wastewater collection systems and treatment plants are illegal and prohibited, they were not calculated with the watershed and receiving water models and assumed to be zero and assigned LAs/WLAs of zero. Assignment of a zero LA/WLA is the most stringent allocation possible and the only allocation that can be assigned to an illegal discharge in the context of a TMDL. Therefore, if these discharges are occurring, they require 100 percent reduction.

Finally, existing wasteloads from the MS4s were calculated with the watershed model and the allowable wasteload, or MS4 WLA, was calculated at the shoreline with the receiving water model. If the existing municipal MS4 wasteload from the watershed calculated under the critical conditions was less than the WLA calculated for the municipal MS4, the existing municipal MS4 wasteload was set equal to the municipal MS4 WLA. If the existing municipal MS4 wasteload from the watershed calculated under the critical conditions was greater than the WLA calculated for the municipal MS4, a wasteload reduction (i.e., Existing Municipal MS4 Wasteload – Municipal MS4 WLA)

and reduction percentage (i.e., [Existing Municipal MS4 Wasteload – Municipal MS4 WLA] ÷ [Existing Municipal MS4 Wasteload] x 100 percent) were calculated.

TMDLs were developed for the REC-1 beneficial use designation and associated WQOs. According to the Basin Plan, WQOs for TC, FC, and ENT indicator bacteria apply to the REC-1 beneficial use. Appendix K provides a graphical representation of the load reductions required to meet the TMDLs for REC-1 beneficial use for TC, FC, and ENT indicator bacteria. The wet weather TMDLs, WLAs, and LAs for TC, FC, and ENT are listed in Tables 8-1, 8-2, and 8-3, respectively.

Because the models used to calculate the TMDLs, WLAs, LAs, and existing wasteloads and loads were based on critical conditions (i.e., worst case loading scenario), the numbers in Table 8-1, 8-2, and 8-3 only represent conservative estimates and assume illegal discharges are not occurring. While the information in the tables does not provide absolute numeric values that must be met, it does provide a tool for identifying bacteria sources that may need to be controlled.

In some situations, the models predict that existing bacteria loads under critical conditions will not exceed the TMDL. This means that the bacteria loads from the MS4 in addition to the natural and background loads in the receiving water should not cause an exceedance in REC-1 WQOs and may not need to be controlled. However, if there is an exceedance, the cause may be due to an illegal discharge or some other unknown source that may need to be controlled.

However, in situations where a wasteload reduction is calculated for the MS4, this indicates that discharges from the MS4 are a likely source that is causing, or at least significantly contributing, to exceedances in REC-1 WQOs. This means that bacteria loads originating from the MS4 need to be controlled.

Table 8-1. REC-1 Wet Weather TMDLs for Total Coliform for BB and SISP Shoreline Segments

Waterbody	Shoreline Segment/Area	Hydrologic Descriptor	Model Sub-watershed	TMDL (Billion MPN/ 30 days)	Load Allocations (LAs)	Wasteload Allocations (WLAs)	Existing Wasteloads	Percent Reduction of Municipal MS4 Existing Wasteload[2]
					Natural/Background (Billion MPN/ 30 days)[1]	Municipal MS4 (Billion MPN/ 30 days)	Municipal MS4 (Billion MPN/ 30 days)	
Dana Point Harbor	Baby Beach	Dana Point HSA (901.14)	2101,2102 2103,2104	166,111	162,857	3,254	3,254	0%
San Diego Bay	Shelter Island Shoreline Park	Point Loma HA (908.10)	2201	482,598	482,400	198	198	0%

Abbreviations/Acronyms:
TMDL: total maximum daily load
LA: load allocation for nonpoint source
WLA: wasteload allocation for point source
MS4: Municipal Separate Storm Sewer System
MPN: most probable number

Notes:
[1] Calculated by dry weather EFDC model analysis (Dry weather LA from Table 8-4 multiplied by 30 days). No reduction required for natural/background sources.
[2] Percent Reduction of Existing Municipal MS4 Wasteload = (Existing Municipal MS4 Wasteload – Municipal MS4 WLA) ÷ (Existing Municipal MS4 Wasteload) x 100%

Table 8-2. REC-1 Wet Weather TMDLs for Fecal Coliform for BB and SISP Shoreline Segments

Waterbody	Shoreline Segment/Area	Hydrologic Descriptor	Model Sub-watershed	TMDL (Billion MPN/ 30 days)	Load Allocations (LAs)	Wasteload Allocations (WLAs)	Existing Wasteloads	Percent Reduction of Municipal MS4 Existing Wasteload[2]
					Natural/Background (Billion MPN/ 30 days)[1]	Municipal MS4 (Billion MPN/ 30 days)	Municipal MS4 (Billion MPN/ 30 days)	
Dana Point Harbor	Baby Beach	Dana Point HSA (901.14)	2101,2102 2103,2104	32,585	32,473	112	112	0%
San Diego Bay	Shelter Island Shoreline Park	Point Loma HA (908.10)	2201	41,408	41,400	8	8	0%

Abbreviations/Acronyms:
TMDL: total maximum daily load
LA: load allocation for nonpoint source
WLA: wasteload allocation for point source
MS4: Municipal Separate Storm Sewer System
MPN: most probable number

Notes:
[1] Calculated by dry weather EFDC model analysis (Dry weather LA from Table 8-5 multiplied by 30 days). No reduction required for natural/background sources.
[2] Percent Reduction of Existing Municipal MS4 Wasteload = (Existing Municipal MS4 Wasteload – Municipal MS4 WLA) ÷ (Existing Municipal MS4 Wasteload) x 100%

Table 8-3. REC-1 Wet Weather TMDLs for *Enterococcus* for BB and SISP Shoreline Segments

Waterbody	Shoreline Segment/Area	Hydrologic Descriptor	Model Sub-watershed	TMDL (Billion MPN/ 30 days)	Load Allocations (LAs)	Wasteload Allocations (WLAs)	Existing Wasteloads	Percent Reduction of Municipal MS4 Existing Wasteload[2]
					Natural/Background (Billion MPN/ 30 days)[1]	Municipal MS4 (Billion MPN/ 30 days)	Municipal MS4 (Billion MPN/ 30 days)	
Dana Point Harbor	Baby Beach	Dana Point HSA (901.14)	2101,2102 2103,2104	5,730	5,616	114	301	62.2%
San Diego Bay	Shelter Island Shoreline Park	Point Loma HA (908.10)	2201	10,556	10,530	26	26	0%

Abbreviations/Acronyms:
TMDL: total maximum daily load
LA: load allocation for nonpoint source
WLA: wasteload allocation for point source
MS4: Municipal Separate Storm Sewer System
MPN: most probable number

Notes:
[1] Calculated by dry weather EFDC model analysis (Dry weather LA from Table 8-6 multiplied by 30 days). No reduction required for natural/background sources.
[2] Percent Reduction of Existing Municipal MS4 Wasteload = (Existing Municipal MS4 Wasteload – Municipal MS4 WLA) ÷ (Existing Municipal MS4 Wasteload) x 100%

8.4 Dry Weather Results

TMDLs, LAs, and WLAs for dry weather were calculated based on quasi-steady-state conditions and compliance with both the 30-day geometric mean and single sample maximum WQOs. Because the dry weather watershed modeling approach is based on average daily flows and loads, the TMDLs, LAs, and WLAs are given in units of billion MPN per day (Billion MPN/day).

As discussed in section 8.2, homeless encampments were assigned a LA of zero, and natural or background sources of bacteria were lumped into one LA. The LA for natural or background sources was based on the loads that were back-calculated for non-urban runoff sources by the dry weather load analysis (see section 7.2.5). The remaining portion of the TMDL is allocated to point sources as WLAs. The portion of the TMDL that can be allocated to point sources as WLAs was calculated as the difference between the TMDL and LA for natural or background sources (e.g., $WLA_{Point\ Sources} = TMDL - LA_{Natural/Background}$).

As discussed in section 8.1 illegal discharges from boats and wastewater collection systems and treatment plants in the receiving water were assigned WLAs of zero. The only known point source identified by the source analysis in section 5 that can be assigned a WLA was urban runoff from MS4s. The principal MS4s contributing bacteria to receiving waters are owned or operated by the municipalities located within the watersheds. Therefore, only the municipal MS4s are assigned dry weather WLAs (i.e., $WLA_{Municipal\ MS4} = TMDL - LA_{Natural/Background}$).

“Existing” wasteloads for point sources and loads for nonpoint sources were calculated with the watershed and receiving water models under the critical conditions discussed in section 7.2. The existing loads calculated for natural and background sources were considered uncontrollable and were therefore assigned as the LA with zero reduction required. Because discharges by homeless persons, boats, and wastewater collection systems and treatment plants are illegal and prohibited, they were not calculated with the watershed and receiving water models and assumed to be zero and assigned LAs/WLAs of zero. Assignment of a zero LA/WLA is the most stringent allocation possible and the only allocation that can be assigned to an illegal discharge in the context of a TMDL. Therefore, if these discharges are occurring, they require 100 percent reduction.

Finally, existing wasteloads from the MS4s were calculated with the watershed model and the allowable wasteload, or MS4 WLA, was calculated at the shoreline with the receiving water model. If the existing municipal MS4 wasteload from the watershed calculated under the critical conditions was less than the WLA calculated for the municipal MS4, the existing municipal MS4 wasteload was set equal to the municipal MS4 WLA. If the existing municipal MS4 wasteload from the watershed calculated under the critical conditions was greater than the WLA calculated for the municipal MS4, a wasteload reduction (i.e., Existing Municipal MS4 Wasteload – Municipal MS4 WLA)

and reduction percentage (i.e., [Existing Municipal MS4 Wasteload – Municipal MS4 WLA] ÷ [Existing Municipal MS4 Wasteload] x 100 percent) were calculated.

TMDLs were developed for the REC-1 beneficial use designation and associated WQOs. According to the Basin Plan, WQOs for TC, FC, and ENT indicator bacteria apply to the REC-1 beneficial use. The dry weather TMDLs, WLAs, and LAs for TC, FC, and ENT are listed in Tables 8-4, 8-5, and 8-6, respectively.

Because the models used to calculate the TMDLs, WLAs, LAs, and existing wasteloads and loads were based on critical conditions (i.e., worst case loading scenario), the numbers in Table 8-4, 8-5, and 8-6 only represent conservative estimates and assume illegal discharges are not occurring. While the information in the tables does not provide absolute numeric values that must be met, it does provide a tool for identifying bacteria sources that may need to be controlled.

In some situations, the models predict that existing wasteloads and loads will not exceed the TMDL. This means that the bacteria loads from the MS4 in addition to the natural and background loads in the receiving water should not cause an exceedance in REC-1 WQOs and may not need to be controlled. However, if there is an exceedance, the cause may be due to an illegal discharge or some other unknown source that may need to be controlled.

However, in situations where a wasteload reduction is calculated for the MS4, this indicates that discharges from the MS4 are a likely source that is causing, or at least significantly contributing, to exceedances in REC-1 WQOs. This means that bacteria loads originating from the MS4 need to be controlled.

Table 8-4. REC-1 Dry Weather TMDLs for Total Coliform for BB and SISP Shoreline Segments

Waterbody	Shoreline Segment/Area	Hydrologic Descriptor	Model Sub-watershed	TMDL (Billion MPN/ day)	Load Allocations (LAs)	Wasteload Allocations (WLAs)	Existing Wasteloads	Percent Reduction of Municipal MS4 Existing Wasteload[2]
					Natural/Background (Billion MPN/ day)[1]	Municipal MS4 (Billion MPN/ day)	Municipal MS4 (Billion MPN/ day)	
Dana Point Harbor	Baby Beach	Dana Point HSA (901.14)	2101,2102 2103,2104	5,430	5,429	0.86	9.0	90.4%
San Diego Bay	Shelter Island Shoreline Park	Point Loma HA (908.10)	2201	16,080	16,080	0	0	0%

Abbreviations/Acronyms:
TMDL: total maximum daily load
LA: load allocation for nonpoint source
WLA: wasteload allocation for point source
MS4: Municipal Separate Storm Sewer System
MPN: most probable number

Notes:
1 Calculated by dry weather EFDC model analysis. No reduction required for natural/background sources.
2 Percent Reduction of Existing Municipal MS4 Wasteload = (Existing Municipal MS4 Wasteload – Municipal MS4 WLA) ÷ (Existing Municipal MS4 Wasteload) x 100%

Table 8-5. REC-1 Dry Weather TMDLs for Fecal Coliform for BB and SISP Shoreline Segments

Waterbody	Shoreline Segment/Area	Hydrologic Descriptor	Model Sub-watershed	TMDL (Billion MPN/ day)	Load Allocations (LAs)	Wasteload Allocations (WLAs)	Existing Wasteloads	Percent Reduction of Municipal MS4 Existing Wasteload[2]
					Natural/Background (Billion MPN/ day)[1]	Municipal MS4 (Billion MPN/ day)	Municipal MS4 (Billion MPN/ day)	
Dana Point Harbor	Baby Beach	Dana Point HSA (901.14)	2101,2102 2103,2104	1,083	1,082	0.17	1.0	82.7%
San Diego Bay	Shelter Island Shoreline Park	Point Loma HA (908.10)	2201	1,380	1,380	0	0	0%

Abbreviations/Acronyms:
TMDL: total maximum daily load
LA: load allocation for nonpoint source
WLA: wasteload allocation for point source
MS4: Municipal Separate Storm Sewer System
MPN: most probable number

Notes:
1 Calculated by dry weather EFDC model analysis. No reduction required for natural/background sources.
2 Percent Reduction of Existing Municipal MS4 Wasteload = (Existing Municipal MS4 Wasteload – Municipal MS4 WLA) ÷ (Existing Municipal MS4 Wasteload) x 100%

Table 8-6. REC-1 Dry Weather TMDLs for *Enterococcus* for BB and SISP Shoreline Segments

Waterbody	Shoreline Segment/Area	Hydrologic Descriptor	Model Sub-watershed	TMDL (Billion MPN/ day)	Load Allocations (LAs)	Wasteload Allocations (WLAs)	Existing Wasteloads	Percent Reduction of Municipal MS4 Existing Wasteload[2]
					Natural/Background (Billion MPN/ day)[1]	Municipal MS4 (Billion MPN/ day)	Municipal MS4 (Billion MPN/ day)	
Dana Point Harbor	Baby Beach	Dana Point HSA (901.14)	2101,2102 2103,2104	187	187	0.03	0.8	96.2%
San Diego Bay	Shelter Island Shoreline Park	Point Loma HA (908.10)	2201	351	351	0	0	0%

Abbreviations/Acronyms:
TMDL: total maximum daily load
LA: load allocation for nonpoint source
WLA: wasteload allocation for point source
MS4: Municipal Separate Storm Sewer System
MPN: most probable number

Notes:
[1] Calculated by dry weather EFDC model analysis. No reduction required for natural/background sources.
[2] Percent Reduction of Existing Municipal MS4 Wasteload = (Existing Municipal MS4 Wasteload – Municipal MS4 WLA) ÷ (Existing Municipal MS4 Wasteload) x 100%

9 Legal Authority For TMDL Implementation Plan

This section presents the legal authority and regulatory framework used as a basis for assigning responsibilities to dischargers to implement and monitor compliance with the requirements set forth in these TMDLs. The laws and policies governing point source[7] and nonpoint source discharges are described below. A large portion of the bacteria loads generated in the receiving waters of the impaired shorelines comes from natural and background sources. These nonpoint sources are considered largely uncontrollable and therefore cannot be regulated.

Discharger accountability for attaining bacteria allocations is established in this section. The legal authority and regulatory framework are described in terms of the following:

- Controllable water quality factors;
- Regulatory background;
- Persons accountable for point source discharges; and
- Persons accountable for controllable nonpoint source discharges.

9.1 Controllable Water Quality Factors

The source and linkage analyses (sections 5, 6 and 7) found that a significant portion of the bacteria load to the shoreline segments can be attributed to natural and background sources (e.g., birds, terrestrial and aquatic animals, wrack line and aquatic plants, sediments, and other unidentified and unquantified sources within the waters). Natural and background sources of bacteria are most significant during dry weather conditions, though these sources are significant during wet weather conditions as well. Bacteria from these sources are largely considered uncontrollable.

The primary controllable source identified by the source analysis was urban runoff discharged from the watersheds by the MS4s. Illegal discharges from boats and wastewater collection systems and treatment plants, which are controllable sources, were also identified. These bacteria discharges result from controllable water quality factors which are defined as those actions, conditions, or circumstances resulting from human activity that may influence the quality of the waters of the state and that may be reasonably controlled. These TMDLs establish WLAs for controllable point sources and LAs for uncontrollable nonpoint sources.

9.2 Regulatory Framework

The regulatory framework for point sources of pollution differs from the regulatory framework for nonpoint sources. The different regulatory frameworks are described in the subsections below.

[7] The term "point source" is defined in Clean Water Act section 502(14) to mean any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged. This term does not include agricultural stormwater discharges and return flows from irrigated agriculture.

9.2.1 Point Sources

Clean Water Act section 402 establishes the National Pollutant Discharge Elimination System (NPDES) program to regulate the "discharge of a pollutant," other than dredged or fill materials, from a "point source" into "waters of the U.S." Under section 402, discharges of pollutants to waters of the U.S. are authorized by obtaining and complying with NPDES discharge requirements. These discharge requirements commonly contain effluent limitations consisting of either Technology Based Effluent Limitations (TBELs) or Water Quality Based Effluent Limitation (WQBELs). TBELs represent the degree of control that can be achieved by point sources using various levels of pollution control technology that are defined by the USEPA for various categories of discharges and implemented on a nation-wide basis.

TBELs may not be sufficient to ensure that WQOs will be attained in receiving waters. In such cases, NPDES regulations require the San Diego Water Board to develop WQBELs that derive from and comply with all applicable water quality standards. If necessary to achieve compliance with the applicable water quality standards, NPDES requirements must contain WQBELs more stringent than the applicable TBELs.[8] WQBELs may be expressed as numeric effluent limitations or as BMP development, implementation, and revision requirements. Numeric effluent limitations require monitoring to assess load reductions while non-numeric provisions, such as BMP programs, require progress reports on BMP implementation and efficacy, and could also require monitoring of the waste stream for conformance with a numeric wasteload allocation requiring a mass load reduction.

In California, state Waste Discharge Requirements (WDRs) for discharges of pollutants from point sources to navigable waters of the U.S. that implement federal NPDES regulations and Clean Water Act requirements serve in lieu of federal NPDES permits. These are referred to as NPDES requirements. Such requirements are issued by the State pursuant to independent state authority described in California's Porter-Cologne Water Quality Control Act[9] (not authority delegated by the USEPA or derived from the Clean Water Act).

Within each TMDL, a WLA is determined which is the maximum amount of a pollutant that may be contributed to a waterbody by point source discharges of the pollutant in order to attain WQOs that support designated beneficial uses. NPDES requirements must include conditions that are consistent with the assumptions and requirements of the WLAs. The principal regulatory means of implementing TMDLs for point source discharges regulated under these types of NPDES requirements are:

1. Dividing up and distributing the WLAs for the pollutant entering the waterbody among all the point sources that discharge the pollutant;

[8] Clean Water Act section 303(d)(1)(C) and Code of Federal Regulations Title 40 section 122.44(d)(1)
[9] Division 7 of the Water Code, commencing with section 13000

2. Evaluating whether the effluent limitations or conditions within the NPDES requirements are consistent with the WLAs. If not, incorporate WQBELs that are consistent with the WLAs into the NPDES requirements or otherwise revise the requirements[10] to make them consistent with the assumptions and requirements of the TMDL WLAs.[11] A time schedule to achieve compliance should also be incorporated into the NPDES requirements in instances where the discharger is unable to immediately comply with the required wasteload reductions;

3. Mandate discharger compliance with the WLAs in accordance with the terms and conditions of the new or revised NPDES requirements;

4. Implement a monitoring and/or modeling plan designed to measure the effectiveness of the controls implementing the WLAs and the progress the waterbodies are making toward attaining WQOs; and

5. Establish criteria to measure progress toward attaining WQOs and criteria for determining whether the TMDLs or WLAs need to be revised.

The only allowable point sources identified were MS4s, although illegal point sources of bacteria, such as discharges from boats and wastewater collection systems and treatment plants, may exist. Because bacteria loading within urbanized areas were largely determined to be from urban runoff discharged from MS4s, the primary mechanism for TMDL attainment will be regulation of these discharges. For the illegal discharges, the Basin Plan includes waste discharge prohibitions specifically for the discharge of treated or untreated sewage from vessels to Dana Point Harbor and San Diego Bay, and for the unauthorized discharge of treated or untreated sewage to waters of the state. Enforcing the Basin Plan prohibitions and the mechanisms to impose regulations on these point source discharges are discussed in the Implementation Plan, section 10.

9.2.2 Nonpoint Sources

The TMDL analyses found that natural and background sources (e.g., birds, terrestrial and aquatic animals, wrack line and aquatic plants, sediments, and other unidentified and unquantified sources within the waters) are the only allowable and uncontrollable nonpoint sources of bacteria loading to the receiving waters. Bacteria loads from these sources are largely uncontrollable, and therefore cannot be regulated.

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[10] In the case of NPDES requirements, WQBELs may include best management practices that evidence shows are consistent with the WLAs.

[11] See federal regulations [40 CFR section 122.44(d)(1)(vii)(B)]. NPDES water quality-based effluent limitations must be consistent with the assumptions and requirements of any available TMDL wasteload allocation. The regulations do not require the WQBELs to be identical to the WLAs. The regulations leave open the possibility that the San Diego Water Board could determine that fact-specific circumstances render something other than literal incorporation of the wasteload allocation to be consistent with the TMDL assumptions and requirements. The rationale for such a finding could include a trade amongst dischargers of portions of their LAs or WLAs, performance of an offset program that is approved by the San Diego Water Board, or any number of other considerations bearing on facts applicable to the circumstances of the specific discharger.

9.3 Persons Responsible for Point Source Discharges

Persons responsible for point source discharges of bacteria include municipal Phase I urban runoff dischargers, and potentially boat dischargers, and publicly owned treatment works (POTWs). Each class of discharger is described in the following subsections.

9.3.1 Municipal Phase I Dischargers of Urban Runoff

Since the shoreline segments evaluated in this project are in urbanized areas, significant bacteria loads enter these waterbodies through the MS4s within the watersheds. MS4 discharges are point source discharges because they are released from channelized, discrete conveyance pipe systems and outfalls. Discharges from MS4s to navigable waters of the U.S. are considered to be point source discharges and are regulated in California through the issuance of NPDES requirements. Persons owning and/or operating MS4s (herein referred to as Municipal Dischargers) that discharge to shorelines have specific roles and responsibilities assigned to them for achieving compliance with the bacteria WLAs described in section 8.

9.3.2 Illicit Discharges from Boats

Boats that dock along any of the shoreline segments evaluated in this project could potentially discharge sewage waste into the waters. At this time, the San Diego Water Board has not issued NPDES requirements or waste discharge requirements to regulate discharges from boats. Thus, there is no regulatory mechanism in place that can be used by the San Diego Water Board to specifically regulate discharges from boats. However, the Basin Plan includes waste discharge prohibitions specifically for the discharge of treated or untreated sewage from boats to Dana Point Harbor and San Diego Bay. Because of this prohibition, these discharges are expressly prohibited and illegal and should not occur. Therefore, the WLA for this type of discharge is zero. If discharges from boats are shown to be a significant source of bacteria contributing to exceedances of water quality objectives, actions may be taken by marina and harbor operators, the muncipalities, and/or the San Diego Water Board to enforce the prohibition of these types of illegal discharge.

9.3.3 Publicly Owned Treatment Works and Sewage Collection Systems

Wastewater treatment plants, or POTWs are regulated under various San Diego Water Board orders that contain effluent limitations for point source discharges of bacteria from these facilities. Most effluent from these facilities is discharged to the Pacific Ocean through offshore ocean outfalls. All POTWs are subject to NPDES requirements with effluent limits for various pollutants, including bacteria. Since POTW discharges do not pose a known bacteria threat to surface waters, the WLA for POTW discharges is zero.

Sewage discharges to surface and groundwaters are subject to enforcement actions including fines. Typically surface spills are detected and mitigated quickly, however leaking underground sewer pipes, or sewer pipes that become cross-connected with

stormwater pipes, may go undetected for long periods of time. Therefore, both wet and dry weather may bring sewage in contact with MS4s and beaches.

Bacteria levels in sewage spills from sanitary sewer systems are subject to regulation under State Water Board Order No. 2006-0003-DWQ and San Diego Water Board Order No. R9-2007-0005, which establish waste discharge requirements prohibiting sanitary sewer overflows by sewage collection agencies. Order Nos. 2006-0003-DWQ and R9-2007-0005 replace San Diego Water Board Order No. 96-04, which had been successful at reducing the number and volume of spills and protecting water quality, the environment, and public health. While Order No. 2006-0003-DWQ prohibits sanitary overflows to surface or ground waters in general, Order No. R9-2007-0005 is more stringent and prohibits "(t)he discharge of sewage from a sanitary sewer system at any point upstream of a sewage treatment plant…" Together, these orders prohibit most kinds of discharge, including but not limited to sewer overflows and leaking underground sewer pipes. Accordingly, the dry and wet weather WLA for discharges from all sanitary sewer systems is zero.

9.4 Persons Responsible for Controllable Nonpoint Source Discharges

Nonpoint sources identified during the source analysis were natural and background sources such as birds and other unidentified and unquantified sources within the waters. Nonpoint source discharges associated with natural and background sources are largely uncontrollable, and therefore cannot be regulated. Although an LA has been established for these nonpoint source discharges, no reductions are required.

Encampments of homeless persons were also identified during the source analysis as a potential nonpoint source of fecal bacteria. However, bacteria loads from homeless encampments were included within the urban runoff categorized as point source discharges regulated through NPDES requirements for MS4 discharges, as discussed in section 9.3. If an LA were to be assigned to homeless encampments, the LA would be zero.

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10 Implementation Plan

This section describes the actions necessary to implement the TMDLs that have been developed to attain the REC-1 WQOs for indicator bacteria in the shoreline segments evaluated for this project. The plan describes implementation responsibilities assigned to point source dischargers and describes the schedule and key milestones for the actions to be taken.

The goal of the Implementation Plan is to ensure that WQOs[12] for indicator bacteria for the shoreline segments at BB and SISP are attained and maintained throughout the waterbody and in all seasons of the year. WQOs are considered "attained" when the waterbody can be removed from the Clean Water Act Section 303(d) List of Water Quality Limited Segments (List). WQOs are considered "maintained" when, upon subsequent listing cycles, the waterbody has not returned to an impaired condition and been put back on the List. The expectation is that attaining and maintaining WQOs will be accomplished by achieving wasteload allocations (WLAs) for point sources. However, according to the TMDL analysis, natural and background sources contribute a significant portion of the bacteria load at both BB and SISP. If the REC-1 WQOs cannot be met in the receiving waters, and if natural and background sources appear to be the sole source of continued impairment, an allowance for exceedances of the REC-1 WQOs may be appropriate.

The San Diego Water Board strongly encourages the dischargers to identify and eliminate all anthropogenic sources (e.g., illegal sewer cross-connections, sewage leaks, pet waste, boat or recreational vehicle sewage dumping, hosing down restrooms and trash recepticles, homeless wastes, excessive landscape irrigation that can convey anthropogenic sources, etc.) before spending their limited resources on expensive structural treatment systems designed to sterilize and/or remove pollutants from runoff immediately before discharge into receiving waters. Prevention and control of anthropogenic sources are also generally more cost effective than structural treatment systems, which will treat both natural and anthropogenic sources. Generally speaking, natural sources of bacteria (e.g., waterfowl) need not, and should not, be eliminated, since elimination of natural sources may also result in the elimination f important beneficial uses.

The final goals for this plan are somewhat different than what was adopted for the San Diego Region beaches and creeks under *Total Maximum Daily Loads for Indicator Bacteria Project I - Beaches and Creeks in the San Diego Region* (Bacteria TMDL Project I). While many of the actions that may be taken by the San Diego Water Board are similar, the ways the dischargers can account for natural and background or uncontrollable sources and achieve the TMDLs are different.

[12] Code of Federal Regulations Title 40 section 131.38(b)(2)

Under *Total Maximum Daily Loads for Indicator Bacteria Project I - Beaches and Creeks in the San Diego Region* (Bacteria TMDL Project I), allowable exceedances of the REC-1 WQOs are determined by comparing the impaired beach and/or creek to a reference system. A reference system is a water body that is minimally impacted by anthropogenic activities that can affect bacterial densities in the water body. A reference system can be used to determine an allowable exceedance frequency to account for bacteria loads that may be attributed to natural or uncontrollable sources of bacteria. This allowable exceedance frequency is already included in the Bacteria TMDL Project I TMDL calculations and will be applied after approval of the Basin Plan amendment (Resolution No. R9-2008-0028) authorizing the use of the Reference System and Antidegradation Approach (RSAA) by the Office of Administrative Law.[13] However, the RSAA can only be used if there is an appropriate reference system that may be compared to the subject impaired waterbody.

For this project, the impaired waterbodies are the impaired shoreline segments of Dana Point Harbor and San Diego Bay. There are no harbors or bays in the San Diego Region that are of similar size or setting that do not have anthropogenic activities occurring within them. Therefore, there are no harbor or bay reference systems and the RSAA cannot be applied. However, the same Basin Plan amendment discussed above also authorizes the use of the Natural Sources Exclusion Approach (NSEA). Under the NSEA, all anthropogenic sources of indicator bacteria to the subject impaired waterbody must be controlled such that they do not cause or contribute to exceedances of the REC-1 indicator bacteria WQOs. Dischargers must also demonstrate that all anthropogenic sources of indicator bacteria to the target water body are controlled and that residual indicator bacteria densities do not indicate a health risk. After all anthropogenic sources of indicator bacteria have been controlled such that they do not cause exceedances of the REC-1 indicator bacteria WQOs, and natural or uncontrollable sources have been identified and quantified, exceedances of the REC-1 indicator bacteria WQOs may be allowed based on the residual exceedances in the subject impaired waterbody.

In the case for Bacteria TMDL Project I, the RSAA may be applied immediately if an appropriate reference system can be identified. However, for this project, the use of the NSEA is not expected to occur immediately. Rather, the NSEA is used to recalculate TMDLs at some point after their initial adoption, following demonstration of control of all anthropogenic sources.

Additionally, we recognize in this plan that the Municipal Dischargers have been implementing BMP programs prior to and throughout the development of these TMDLs. The water quality at these impaired shorelines has improved significantly in recent years and we believe they can be delisted from the 303(d) List in a relatively short time frame

[13] Approval of the Basin Plan amendment (Resolution No. R9-2008-0028) authorizing the use of the Reference System and Atnidegradation Approach and Natural Sources Exclusion Approach by the Office of Administrative Law is anticipated by the end of 2008 or early 2009

compared to the beaches and creeks in Bacteria TMDL Project I. While these BMP programs have resulted in significant improvements in water quality, additional efforts may be required by the Municipal Dischargers to achieve the MS4 WLAs and the TMDLs. Therefore, this Implementation Plan provides general guidance on remaining issues that should be addressed for compliance with the TMDLs.

10.1 Regulatory Authority for Implementation Plans

TMDL implementation plans are not currently required under federal law; however, federal policy is that TMDLs should include implementation plans. Clean Water Act section 303 [and Code of Federal Regulations Title 40 section 130] authorizes the USEPA to require implementation plans for TMDLs. USEPA regulations implementing section 303 do not currently require states to include implementation plans for TMDLs but are likely to be revised in the future. USEPA regulations require states to incorporate TMDLs in the State Water Quality Management Plans (Basin Plans) along with adequate implementation measures to implement all aspects of the plan.[14] According to USEPA policy, states must include implementation plans as an element of TMDL Basin Plan amendments submitted to USEPA for approval.[15]

TMDL implementation plans are required under State law. Basin plans must have a program of implementation to achieve WQOs.[16] The implementation plan must include a description of actions that are necessary to achieve the objectives, a time schedule for these actions, and a description of surveillance to determine compliance with the WQOs.[17] State law requires that a TMDL include an implementation plan since a TMDL supplements, interprets, and/or refines existing WQOs. The TMDLs, LAs, and WLAs must be incorporated into the Basin Plan.[18]

10.2 Implementation Plan Objectives

The specific objectives of this Implementation Plan are as follows:

1. Identify the persons responsible for meeting the WLAs in discharges of bacteria to the impaired shoreline segments of BB and SISP.

2. Establish a time schedule for meeting the LAs and WLAs. The schedule will establish interim milestones that are to be achieved until the LAs and WLAs are achieved.

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[14] Code of Federal Regulations Title 40 section 130.6
[15] See *Guidance for Developing TMDLs in California,* USEPA Region 9, (January 7, 2000).
[16] See Water Code section 13050(j). A "Water Quality Control Plan" or "Basin Plan" consists of a designation or establishment for the waters within a specified area of all of the following: (1) Beneficial uses to be protected, (2) Water quality objectives and (3) A program of implementation needed for achieving water quality objectives.
[17] See Water Code section 13242.
[18] See Clean Water Act section 303(e).

3. Reissue or revise the various existing statewide and regional NPDES requirements that regulate urban runoff and other point source discharges to the shoreline segments of BB and SISP to implement WLAs set forth in section 8.

4. Establish mechanisms to document and track BMP implementation, monitor BMP effectiveness in achieving the allocations in bacteria discharges, assess success in achieving TMDL objectives and milestones, and report on TMDL program effectiveness in attaining WQOs for indicator bacteria in the receiving waters at the impaired shoreline segments of BB and SISP.

5. Enforce the Basin Plan waste discharge prohibitions for illegal discharges from vessels and wastewater collection systems and treatment plants where these discharges contribute significant bacteria loads to receiving waters.

6. Identify the conditions for applying the Natural Sources Exclusion Approach if the REC-1 WQOs cannot be met in the receiving waters, and if natural and background sources appear to be the sole source of continued impairment.

10.3 Allocations and Identification of Dischargers

Allocations for each watershed are described in Tables 8-1 thru 8-6 and are expressed as “loads” in terms of number of bacteria colonies per 30-day period (billion MPN/30 days) for wet weather loads, and number of bacteria colonies per day (billion MPN/day) for dry weather loads. Allocations are expressed as either WLAs for point sources, or LAs for nonpoint sources. The only persons identified that are responsible for allowable and controllable point source discharges include the owners and operators of Phase I MS4 systems within the affected watersheds. Illegal discharges from boats and wastewater collection systems and treatment plants were also identified as potential point source discharges. Because illegal discharges are not authorized and considered controllable, they are assigned WLAs of zero. Therefore, owners of marinas and harbors and boat owners are not assigned part of the TMDL and must eliminate their loads. There were no controllable nonpoint source discharges identified.

Although allocations are distributed to the identified discharges of bacteria, this is not to say that other potential sources do not exist. Any potential sources in the watersheds not receiving an explicit allocation described in this Technical Report is allowed a zero discharge of bacteria to the impair shoreline segments of BB and SISP.

10.3.1 Point Source Discharges

The point sources identified to potentially affect the waterbodies addressed in this study were discharges from MS4s, and illegal discharges from boats and/or wastewater collection systems and treatment plants. Regulation of these discharges is discussed below.

<u>Municipal Separate Storm Sewer Systems</u>

Bacteria loading within urbanized areas generally originate from urban runoff discharged from MS4s. The primary mechanism for TMDL attainment will be increased regulation of these discharges. The Municipal Dischargers whose point source discharges contribute to the exceedance of WQOs for indicator bacteria (as discussed in section 9) will be required to meet the WLAs in their urban runoff before it is discharged from MS4s to the receiving waters. Municipal Dischargers are responsible for reducing bacteria loads in their urban runoff prior to discharge to impaired receiving waters because they own or operate MS4s that contribute to the impairment of receiving waters. These discharges are identified in and regulated by NPDES requirements prescribed in the San Diego Water Board orders listed in Table 10-1 below.

Table 10-1. San Diego Water Board Orders Regulating Applicable MS4 Discharges

Order Number/Short Name	Order Title
San Diego Water Board Order No. R9-2007-0001 *San Diego County MS4 NPDES Requirements*	*Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego County, the San Diego Unified Port District, and the San Diego County Regional Airport Authority*
San Diego Water Board Order No. R9-2002-0001 *Orange County MS4 NPDES Requirements*	*Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of Orange, the Incorporated Cities of Orange County, and the Orange County Flood Control District within the San Diego Region*

<u>Publicly Owned Treatment Works (Wastewater Collection Systems and Treatment Plants)</u>
There are no publicly owned treatment works (POTWs) or wastewater treatment plants that are known to directly discharge to the BB and SISP shorelines. However, sewage discharges from illegal cross-connections, leaky sanitary sewer pipes, and sanitary sewer overflows and spills may contribute to the bacteria loads that are causing the impairments at these shorelines. The Basin Plan includes waste discharge prohibitions specifically for the unauthorized discharge of treated or untreated sewage to waters of the state, thus these types of discharge are expressly prohibited and illegal.

Additionally, POTWs are subject to regulation under orders issued by the State Water Board and the San Diego Water Board, which also prohibit sanitary sewer overflows and leaking underground sewer pipes. These discharges are regulated by the waste discharge requirements prescribed in the State Water Board and San Diego Water Board orders listed in Table 10-2 below.

Table 10-2. San Diego Water Board Orders Regulating Sanitary Sewage Discharges

Order Number	Order Title
State Water Board Order No. 2006-0003-DWQ	*Statewide General Waste Discharge Requirements for Sanitary Sewer Systems*
San Diego Water Board Order No. R9-2007-0005	*Waste Discharge Requirements for Sewage Collection Agencies in the San Diego Region*

Marinas and Boats

Both BB and SISP have marinas that are located in close proximity to the sites. Dana Point Harbor is owned by the County of Orange, and is occupied by several marinas with slips available for approximately 2,400 boats. SISP has approximately 50 boat mooring locations directly off the shoreline area which are owned and operated by the San Diego Unified Port District. Discharges of sewage from boats may be a significant source of bacteria. However, Basin Plan includes waste discharge prohibitions specifically for the discharge of treated or untreated sewage from vessels to Dana Point Harbor and San Diego Bay. The County of Orange and the San Diego Unified Port District also have ordinances that prohibit the discharge of sewage from a vessel to Dana Point Harbor or San Diego Bay.[19]

At this time, the San Diego Water Board has not issued NPDES requirements or waste discharge requirements to regulate discharges from marinas, which can include discharges from boats. However, the waste discharge prohibitions in the Basin Plan for the discharge of treated or untreated sewage from vessels to Dana Point Harbor and San Diego Bay are directly enforceable. If evidence shows that illegal sewage discharges from marinas and/or are boats a significant contributor to elevated bacteria levels at these shorelines, or other areas of the San Diego Region, the San Diego Water Board can issue enforcement actions, NPDES requirements, or waste discharge requirements to marinas and/or issue enforcement actions against boat owners in the future.

10.3.2 Nonpoint Source Discharges

Nonpoint source discharges from natural and background sources (e.g., birds, terrestrial and aquatic animals, wrack line and aquatic plants, sediments, and other unidentified and unquantified sources in the waters) are largely uncontrollable, and therefore cannot be regulated. Bacteria loads attributed to natural and background sources were back-calculated by the dry weather EFDC model, as discussed in section 7.2.5. A number of assumptions were used in the receiving water model and its calculations for natural and background bacteria loads are estimates only. Until more information is obtained through further study to provide identification of the relative loading from natural and background sources, they were combined into a single existing load and LA for each shoreline segment.

[19] Codified Ordinances County of Orange sections 2-2-163 and 2-2-169 and San Diego Unified Port District Code section 8.50(a)

The land use information provided in Table 2-1 indicates that controllable nonpoint source discharges from agriculture, livestock operations, and horse ranches do not exist in the watersheds draining into BB and SISP. This is also supported by the source analysis presented in section 5 where controllable nonpoint sources from the watershed were not identified as contributors of bacteria. Therefore, no controllable nonpoint sources were identified or assigned an LA.

10.3.3 Responsible Municipal Dischargers

One WLA was assigned collectively to the Municipal Dischargers in each watershed. This WLA was not divided up among the individual jurisdictions in each watershed because MS4s under different jurisdictions are often interconnected. The Municipal Dischargers within each watershed are collectively responsible for meeting the WLA and required reductions in bacteria loads for these watersheds and for meeting all of the TMDL requirements. Responsible municipalities in each affected watershed are listed in Table 10-3 below.

Table 10-3. Responsible Municipalities

Waterbody	Hydrologic Descriptor	Shoreline Segment	Responsible Municipalities
Dana Point Harbor	Dana Point HSA (901.14)	Baby Beach	County of Orange City of Dana Point
San Diego Bay	Point Loma HA (908.10)	Shelter Island Shoreline Park	City of San Diego San Diego Unified Port District

10.4 Compliance Schedule for Achieving Allocations

The purpose of these TMDLs is to attain and maintain the applicable WQOs in impaired shoreline segments through incremental mandated reductions of bacteria from point sources discharging to impaired waters. The requirements of this project mandate that dischargers achieve wasteload reductions in their discharges.

By design, waste load allocations and load allocations are established at levels that when met, will result in the full attainment of water quality standards. For this reason, the San Diego Water Board expects that at the end of the TMDL compliance period, applicable load and waste load allocations, as well as the water quality objectives will be met at all times in the receiving water. In the event that water quality objectives are not met at the end of the compliance period, the Board will require the dischargers to conduct an investigation to identify the specific source(s) responsible for the failure to meet WQOs. If the source is found to be anthropogenic, the San Diego Water Board will initiate enforcement or other regulatory action as appropriate to correct the problem. If the source is natural, and if all of the conditions for using the natural sources exclusion approach (NSEA) have been met, the Board will consider the application of the NSEA, including the recalculation of the TMDLs to account for the natural sources.

10.4.1 Compliance Schedule

In establishing the compliance schedules for achieving the bacteria WLAs, the San Diego Water Board must balance the need of the dischargers for a reasonable amount of time to implement an effective bacteria load reduction program against the broad-based public interest in having water quality standards attained in the waters of the Region as soon as practicable. The public interest is best served when dischargers take all reasonable and immediately feasible actions to reduce pollutant discharges to impaired waters in the shortest possible time. In fact, pursuant to receiving water limitations in the San Diego and Orange County MS4 NPDES requirements (see section 10.5.2), the dischargers are already planning and implementing BMP programs, and monitoring for all MS4 bacteria and other pollutant discharges that cause or contribute to violations of water quality standards in the water quality limited segments within, or receiving pollutant discharges from their jurisdictions.

For example, the County of Orange has already conducted numerous studies and implemented a variety of non-structural and structural BMPs in an effort to reduce bacteria levels at BB since before 2002. These efforts have included installing seasonal plugs in storm drains, increased street sweeping efforts, expedited trash collection to control birds, the installation of bird netting under the pier, public education efforts against bird-feeding at the beach, artificial circulation of water at BB, a dry weather flow diversion structure and media filter system on the west end of the beach, catch basin filters, and the collection and disposal of bird fecal droppings from the exposed intertidal areas of the beach. These actions appear to have resulted in significant improvements in water quality since 2002. The County of Orange should be able to achieve the MS4 WLAs in the near future.

Based on the TMDLs, LAs, WLAs, past and current BMP programs that have been implemented, and water quality monitoring data, compliance schedules were developed for each impaired shoreline segment, as discussed below.

<u>Baby Beach Compliance Schedule</u>
According to Tables 8-1 through 8-3, no wet weather wasteload reductions are required for TC and FC. This means that according to the wet weather models for BB, REC-1 WQOs for TC and FC are not expected to be exceeded due to discharges from the MS4s. The only wet weather wasteload reductions required for MS4s discharging into the receiving waters along the shoreline at BB is for ENT. The compliance schedule for BB to achieve wet weather TMDLs is as shown in Table 10-4.

Table 10-4. Compliance Schedule for Baby Beach to Achieve Wet Weather TMDLs

Year (after OAL Approval)	Required Wasteload Reduction	TMDL Compliance Action
1	No reduction required	▪ Water Quality Monitoring ▪ Implement BMPs
2	Same as above	▪ Water Quality Monitoring ▪ Implement BMPs
3	Same as above	▪ Water Quality Monitoring ▪ Implement BMPs
4	Same as above	▪ Water Quality Monitoring ▪ Implement BMPs
5	Same as above	▪ Water Quality Monitoring ▪ Implement BMPs
6	Same as above	▪ Water Quality Monitoring ▪ Implement BMPs
7	50 percent ENT reduction	▪ Water Quality Monitoring ▪ Implement BMPs
8	Same as above	▪ Water Quality Monitoring ▪ Implement BMPs
9	Same as above	▪ Water Quality Monitoring ▪ Implement BMPs
10	100 percent ENT reduction	▪ Water Quality Monitoring ▪ Implement BMPs ▪ Submit request for removal from 303(d) List (if not requested and removed earlier)
10+	Same as above	▪ Water Quality Monitoring ▪ Implement BMPs ▪ Submit request for TMDL revisions based on Natural Sources Exclusion Approach if supported by data (if not requested and recalculated earlier) ▪ Submit request for removal from 303(d) List (if not requested and removed earlier)

At this time, control of bacteria loads for MS4s during wet weather is inherently difficult because the MS4 systems are traditionally designed to convey water quickly for flood control purposes. However, new approaches to stormwater runoff management and BMP implementation can reduce the stormwater runoff flow and associated pollutant loads. The phased compliance schedule to achieve wet weather TMDLs will provide the MS4 dischargers time to identify sources, develop plans and implement enhanced and expanded BMPs capable of achieving the mandated decreases in bacteria densities at the BB shoreline.

According to Tables 8-4 through 8-6, dry weather wasteload reductions are required for TC, FC, and ENT. Based on the data reviewed in the impairment overview discussed in section 2.3.1, of the samples collected between January 2002 and December 2006, only the number of exceedances for ENT (283 exceedances) are greater than the number of allowed exceedances to recommend removal from the 303(d) List (193 exceedances). However, most of the exceedances for ENT occurred before 2006. The trend in the water quality data from BB indicate that the number of REC-1 WQO exceedances have declined significantly beginning in 2006.

If the current trend continues, the San Diego Water Board believes that the dry weather TMDLs for BB can be achieved within the next 5 years. The compliance schedule for BB to achieve dry weather TMDLs is as shown in Table 10-5.

Table 10-5. Compliance Schedule for Baby Beach to Achieve Dry Weather TMDLs

Year (after OAL Approval)	Required Wasteload Reduction	TMDL Compliance Action
1	No reduction required	▪ Water Quality Monitoring ▪ Implement BMPs
2	Same as above	▪ Water Quality Monitoring ▪ Implement BMPs
3	50 percent reduction	▪ Water Quality Monitoring ▪ Implement BMPs
4	Same as above	▪ Water Quality Monitoring ▪ Implement BMPs
5	100 percent reduction	▪ Water Quality Monitoring ▪ Implement BMPs ▪ Submit request for removal from 303(d) List (if not requested and removed earlier)
5+	Same as above	▪ Water Quality Monitoring ▪ Implement BMPs ▪ Submit request for TMDL revisions based on Natural Sources Exclusion Approach if supported by data (if not requested and recalculated earlier) ▪ Submit request for removal from 303(d) List (if not requested and removed earlier)

For both of the Baby Beach compliance schedules, if the REC-1 WQOs cannot be met in the receiving waters, and if natural and background sources appear to be the sole source of continued impairment, the natural sources exclusion approach (NSEA) may

be applied.[20] However, the Municipal Dischargers are responsible for collecting the data to support the application of the NSEA to recalculate the TMDL.

Shelter Island Shoreline Park Compliance Schedule

According to Tables 8-1 through 8-6, there are no wasteload reductions required for MS4s discharging into the receiving waters along the shoreline at SISP under both wet weather and dry weather conditions. This means that according to the wet weather and dry weather models for SISP, REC-1 WQOs are not expected to be exceeded due to discharges from the MS4s. Additionally, based on the data reviewed in the impairment overview discussed in section 2.3.2, of the samples collected between January 2003 and November 2006, only the number of exceedances for ENT (24 exceedances) are greater than the number of allowed exceedances to recommend removal from the 303(d) List (23 exceedances).

Given that the modeled wasteload reductions for both wet weather and dry weather conditions for all indicator bacteria are zero percent, no compliance schedules were developed to meet wasteload reductions for SISP. However the existing wasteload cannot exceed the WLA and SISP will remain on the 303(d) List until enough data are collected to support removing it from the 303(d) List. Therefore, in order to comply with these TMDLs, the responsible municipalities must continue implementing BMPs and collecting data until there are enough data to support and maintain the removal of SISP from the 303(d) List. In addition, the reporting requirements for the Shelter Island Shoreline Park TMDL must also include a periodic demonstration, no less often than every 2 years, that wasteload allocations and water quality objectives are being met.

The trend in the water quality data from SISP indicate that the number of REC-1 WQO exceedances have declined significantly since 2003 (Brown and Caldwell, 2006). If the current trend continues, the San Diego Water Board expects that SISP will have enough data to support removal of SISP from the 303(d) List by 2010, and no later than 2012. The compliance schedule for SISP to achieve wet weather and dry weather TMDLs is as shown in Table 10-6.

Table 10-6. Compliance Schedule for Shelter Island Shoreline Park to Achieve Wet Weather and Dry Weather TMDLs

Year	TMDL Compliance Action
2012	▪ Water Quality Monitoring ▪ Implement BMPs ▪ Submit request for TMDL revisions based on Natural Sources Exclusion Approach if supported by data (if not requested and recalculated earlier) ▪ Submit request for removal from 303(d) List (if not requested and removed earlier)

[20] After approval of the Basin Plan amendment (Resolution No. R9-2008-0028) authorizing the use of the Natural Sources Exclusion Approach by the Office of Administrative Law, anticipated by the end of 2008 or early 2009.

If the REC-1 WQOs cannot be met in the receiving waters by 2012, and if natural and background sources appear to be the source of continued impairment, the NSEA may be applied.[21] However, the Municipal Dischargers are responsible for collecting the data to support the application of the NSEA to recalculate the TMDLs.

10.5 Specific Implementation Objectives

Since 2002, the dischargers have implemented several non-structural BMP programs and structural BMPs that have resulted in measureable improvements in water quality at the impaired shoreline segments. The County of Orange has already conducted numerous studies and implemented a variety of non-structural and structural BMPs in an effort to reduce bacteria levels at BB since before 2002. These efforts have included installing seasonal plugs in storm drains, increased street sweeping efforts, expedited trash collection to control birds, the installation of bird netting under the pier, public education efforts against bird-feeding at the beach, artificial circulation of water at Baby Beach, a dry weather flow diversion structure and media filter system on the west end of the beach, catch basin filters, and the collection and disposal of bird fecal droppings from the exposed intertidal areas of the beach. The San Diego Unified Port District has also implemented several non-structural BMP programs since 2002. Water quality data recently obtained from the County of Orange and the San Diego Unified Port District indicates that bacteria levels in the waters at BB and SISP have shown significant decreases in the number of exceedances of the REC-1 indicator bacteria WQOs since 2002.

As shown in Tables 8-1 through 8-6, the modeling results indicate that no load reductions are required for TC, FC, and ENT for SISP during wet weather or dry weather conditions. Additionally, the modeling results indicate only ENT wet weather load reductions are required for BB and no wet weather load reductions are required for TC and FC. For dry weather, BB requires between approximately 83 percent and 96 percent wasteload reductions for TC, FC, or ENT. However, based only on the water quality data collected during 2006, the number of samples that exceed the REC-1 WQOs are less than the allowable number of exceedances for recommending removal from the 303(d) List. This trend implies that the past and current BMPs that have been implemented are effective in reducing bacteria loads to the receiving waters and that water quality in the impaired shoreline segments already meet REC-1 WQOs during dry weather. However, additional monitoring is required to confirm this trend, and additional BMPs may be needed to meet the REC-1 WQOs during wet weather.

While submission of the Bacteria Load Reduction Plans (BLRPs), as described in section 10.6.2, will still be required from the dischargers, if current trends continue, monitoring and permanent implementation of the current programs and BMPs may be adequate in meeting the wet weather and dry weather TMDLs. If the REC-1 WQOs

[21] After approval of the Basin Plan amendment (Resolution No. R9-2008-0028) authorizing the use of the Natural Sources Exclusion Approach by the Office of Administrative Law, anticipated by the end of 2008 or early 2009.

cannot be met in the receiving waters by the end of the compliance schedules, and if natural and background sources appear to be the sole source of continued impairment, application of the NSEA to revise the TMDLs, as described in section 10.6.5, may be appropriate.[22]

Therefore, if the water quality data support delisting before the NPDES requirement revisions are considered, specific objectives of this Implementation Plan are as follows:

1. Persons responsible for monitoring the impaired shoreline segments of BB and SISP for bacteria will continue with the monitoring program to ensure REC-1 WQOs are maintained.
2. If REC-1 WQOs are exceeded, actions outlined in Attachment B of Order Nos. R9-2007-0001 and R9-2002-0001 in section II.C, Coastal Storm Drain Outfall Monitoring, will be implemented.
3. If sources of bacteria persist at levels that exceed water quality standards, then the persons responsible will take appropriate actions to identify and eliminate the controllable source or sources of the chronic contamination. If natural and background sources appear to be the sole source of the impairment, application of the NSEA to revise the TMDLs may be appropriate.

If the impaired shoreline segments of BB and SISP remain on or are put back on the List during subsequent iterations of the 303(d) listing process due to impacts from controllable sources of bacteria, the San Diego Water Board will revise the current NPDES requirements and/or issue additional waste discharge requirements to be consistent with these TMDLs, and/or issue enforcement actions to compel the dischargers to comply with these TMDLs.

10.6 San Diego Water Board Actions

The San Diego Water Board regulates discharges of waste by issuing waste discharge prohibitions, waste discharge requirements, or conditional waivers of waste discharge requirements. Violation of a waste discharge prohibition, waste discharge requirement, or waiver condition is subject to enforcement actions. This section describes the actions that the San Diego Water Board will take to implement the TMDLs.

10.6.1 Process and Schedule for Issuing NPDES Requirements

The TMDLs will be implemented primarily by reissuing or revising the existing NPDES waste discharge requirements for MS4 discharges to include WQBELs that are consistent with the assumptions and requirements of the bacteria WLAs for MS4 discharges. The process for issuance of NPDES requirements is distinct from the TMDL process, and is described below. WQBELs for municipal stormwater discharges can be either numeric or non-numeric. Non-numeric WQBELs typically are a program

[22] After approval of the Basin Plan amendment (Resolution No. R9-2008-0028) authorizing the use of the Natural Sources Exclusion Approach by the Office of Administrative Law, anticipated by the end of 2008 or early 2009.

of expanded or better-tailored BMPs. The USEPA expects that most WQBELs for NPDES-regulated municipal discharges will be in the form of BMPs, and that numeric limitations will be used only in rare instances.[23] WQBELs can be incorporated into NPDES requirements for MS4 discharges by reissuing or revising these requirements. The public process for issuing NPDES requirements is distinct from but similar to the process for adopting TMDLs. For NPDES requirements, the process begins when the operator of the facility (discharger) submits a report of waste discharge (RoWD) to the San Diego Water Board for review. After reviewing the RoWD, the San Diego Water Board must make a decision to proceed with the NPDES requirements. Using the information and data in the RoWD, the San Diego Water Board develops draft NPDES requirements and the justification for the conditions (referred to as the fact sheet).

The first major step in the development process is to develop numerical effluent limitations on the amounts of specified pollutants that may be discharged and/or specified BMPs designed to minimize water quality impacts. These numerical effluent limitations and BMPs or other non-numerical effluent limitations must implement both technology-based and water quality-based requirements of the Clean Water Act. TBELs represent the degree of control that can be achieved by point sources using various levels of pollution control technology. If necessary to achieve compliance with applicable water quality standards, NPDES requirements must contain WQBELs, derived from the applicable receiving water quality standards, more stringent than the applicable technology-based standards. In the context of a TMDL, the WQBELs must be consistent with the assumptions and requirements of the WLAs of any applicable TMDL. Following the development of effluent limitations, the San Diego Water Board develops appropriate monitoring and reporting conditions, facility-specific special conditions, and includes standard provisions that are the same for all NPDES requirements.

After the draft NPDES requirements are complete, the San Diego Water Board provides an opportunity for public participation in the process. A public notice announces the availability of the draft requirements, and interested persons may submit comments. Based on the comments, the San Diego Water Board develops the final requirements, documenting the process and decisions in the administrative record. The final NPDES requirements are issued to the facility in an order adopted by the San Diego Water Board.

Although NPDES requirements must contain WQBELs that are consistent with the assumptions and requirements of the TMDL WLAs, the federal regulations[24] do not require the WQBELs to be identical to the WLAs. The regulations leave open the possibility that the San Diego Water Board could determine that fact-specific circumstances render something other than literal incorporation of the WLA into

[23] USEPA memorandum entitled "Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs," dated November 22, 2002.
[24] Code of Federal Regulation Title 40 section 122.44(d)(1)(vii)(B)

discharge requirements to be consistent with the TMDL assumptions and requirements. For example, the WLAs in Tables 8-1 through 8-6 are expressed as billion MPN per 30 days (or per day); however, the WQBELs prescribed in response to the WLAs may or may not be written using the same metric. WQBELs may be expressed as numeric effluent limitations using a different metric, or, more likely, as BMP development, implementation, and revision requirements.

NPDES requirements should be issued, reissued, or revised "as expeditiously as practicable" to incorporate WQBELs derived from the TMDL WLAs. "As expeditiously as practicable" means the following:

1. **New point sources**. "New" point sources previously unregulated by NPDES requirements must obtain their NPDES requirements before they can lawfully discharge pollutants. For point sources receiving NPDES requirements for the first time, "as expeditiously as practicable" means that the San Diego Water Board incorporates WQBELs that are consistent with the assumptions and requirements of the WLAs into the NPDES requirements and requires compliance with the WQBELs upon the commencement of the discharge.

2. **Point Sources Currently Regulated Under NPDES Requirements**. For point sources currently regulated under NPDES requirements, "as expeditiously as practicable" means that:

    a. WQBELs that are consistent with the assumptions and requirements of the WLAs should be incorporated into NPDES requirements during their 5-year term, prior to expiration, in accordance with the applicable NPDES requirement reopening provisions, taking into account factors such as available NPDES resources, staff and budget constraints, and other competing priorities.

    b. In the event the NPDES requirement revisions cannot be considered during the 5-year term, the San Diego Water Board will incorporate WQBELs that are consistent with the assumptions and requirements of the WLAs into the NPDES requirements at the end of the 5-year term.

10.6.2 Actions with Respect to Phase I Municipal Dischargers

California's Municipal Stormwater Program regulates stormwater discharges from MS4s. NPDES requirements for MS4 discharges were issued in two phases. Under Phase I, which began in 1990, the Regional Water Boards adopted NPDES urban runoff requirements for medium (serving between 100,000 and 250,000 people) and large (serving 250,000 people) municipalities. Most of these requirements are issued to a group of municipalities encompassing an entire metropolitan or county area. These requirements are issued for fixed terms of five years and are reissued upon the request of the discharger as they expire.

The Phase I Municipal Dischargers in San Diego and Orange County are required under Receiving Water Limitations A.3.a.1 and C.2[25] of Orders No. R9-2007-0001 and R9-2002-0001, respectively (San Diego County and Orange County MS4 NPDES requirements), and any subsequent amendment or renewal, to implement additional BMPs to reduce bacteria discharges in impaired watersheds to the maximum extent practicable and to restore compliance with the bacteria WQOs. This obligation is triggered when either the discharger or the San Diego Water Board determines that MS4 discharges are causing or contributing to an exceedance of an applicable WQO, in this case the REC-1 indicator bacteria WQOs. Designation of the BB and SISP shoreline segments as water quality limited segments under Clean Water Act section 303(d) and this TMDL project analysis provided sufficient evidence that that MS4 discharges may be causing or contributing to the violation of water quality standards. Thus, the Municipal Dischargers should be, and have been implementing the provisions of Receiving Water Limitation C.2 with respect to bacteria discharges into water quality limited segments.

In addition to enforcing the provisions of Receiving Water Limitation C.2, the San Diego Water Board shall reissue or revise Orders No. R9-2007-0001 and R9-2002-0001, to incorporate WQBELs consistent with the assumptions and requirements of the bacteria WLAs, and requirements for monitoring and reporting. In those orders, the Phase I Municipal Dischargers are referred to as "Copermittees."[26] WQBELs and other requirements implementing the TMDLs can be incorporated into these NPDES requirements upon the normal renewal cycle or sooner, if appropriate. The requirements implementing the TMDLs shall include the following:

a. WQBELs consistent with the requirements and assumptions of the bacteria WLAs described in Tables 8-1 through 8-6 and a schedule of compliance applicable to the MS4 discharges into the impaired shoreline segments described in Tables 10-4 through 10-6. At a minimum, WQBELs shall include a BMP program to attain the WLAs.

[25] Receiving Water Limitations A.3.a.1 and C.2.a provide that "[u]pon a determination by either the Copermittee or the San Diego Water Board that MS4 discharges are causing or contributing to an exceedance of an applicable water quality standard, the Copermittee shall promptly notify and thereafter submit a report to the San Diego Water Board that describes BMPs that are currently being implemented and additional BMPs that will be implemented to prevent or reduce any pollutants that are causing or contributing to the exceedance of water quality standards. The report may be incorporated in the annual update to the Jurisdictional URMP unless the San Diego Water Board directs an earlier submittal. The report shall include an implementation schedule. The San Diego Water Board may require modification to the report." Additional requirements are included in sections C.2.b-d.

[26] Copermittees own or operate MS4s through which urban runoff discharges into waters of the U.S. within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the United States.

b. If the WQBELs consist of BMP programs, then the reporting requirements shall consist of annual progress reports on BMP planning, implementation, and effectiveness in attaining the WQOs in impaired shoreline segments, and annual water quality monitoring reports. The first progress report shall consist of a Bacteria Load Reduction Plan (BLRP), which may be included as part of the annual NPDES reporting requirements. BLRPs must be specific to each impaired waterbody.

To provide guidance to the dischargers in preparing BLRPs, the following bullets describe components that should be considered for incorporation in the BLRPs.

Comprehensive Watershed Approach

- Dischargers should identify the Lead Watershed Contact for their BLRPs. The Lead Watershed Contact should serve as liaison between all other common watershed dischargers and the San Diego Water Board, where appropriate.

- Dischargers should describe a program for encouraging collaborative, watershed-based, land-use planning in their jurisdictional plans.

- Dischargers should develop and periodically update a map of the BLRP watershed, to facilitate planning, assessment, and collaborative decision-making. As appropriate, the map should include features such as receiving waters; Clean Water Act section 303(d) impaired receiving waters; water quality projects; land uses; MS4s; major highways; jurisdictional boundaries; and inventoried commercial, industrial, and municipal sites.

- Dischargers should annually assess the water quality of the impaired water body in their BLRPs in order to identify all water quality problems within the impaired water body. This assessment should use applicable water quality data, reports, and analysis generated in accordance with the requirements of the applicable NPDES MS4 monitoring and reporting programs, as well as applicable information available from other public and private organizations.

- Dischargers should develop and implement a collective watershed BLRP strategy to meet the bacteria TMDL. The strategy should guide dischargers in developing a Bacteria Compliance Schedule (BCS) which includes BMP planning and scheduling as outlined below.

- Dischargers should collaborate to develop and implement the BLRPs. The BLRP should include a proposal for regularly scheduled meetings among the dischargers in the impaired watershed.

- Because water quality data will ultimately determine if a waterbody will be delisted from the 303(d) List, the BLRP should include a monitoring and reporting program that contains the following elements:
  - Locations of water quality sampling sites that are spatially representative of the waterbody and appropriate for identifying potential sources, including, at a minimum, the monitoring stations currently used to monitor water quality.
  - Schedule of water quality sampling that is temporally representative of both wet weather and dry weather conditions. Wet weather samples are collected during storms of 0.2 inches of rainfall and the 72 hour period after the storm. Dry weather samples are collected from during times when rain has not fallen for the preceding 72 hours.
  - Presentation of past and present water quality data that have been collected.
  - Analysis of water quality data compared to the applicable Basin Plan water quality objectives. Dry weather water quality data are compared to long-term (e.g., geometric mean, mean, or median) water quality objectives, as well as short-term (e.g., single sample maximum) water quality objectives. Wet weather water quality data are compared to short-term (e.g., single sample maximum) water quality objectives.
  - Analysis of water quality data to correlate measureable improvements in water quality with past and current BMPs that have been implemented and are effective.
  - Analysis of water quality data to correlate elevated bacteria levels with known or suspected sewage spills from wastewater collection systems and treatment plants or boats.
- Recommendations for increased or decreased water quality sampling based on water quality data analyses.

- Each BLRP and BCS should be reviewed annually to identify needed modifications and improvements. The dischargers should develop and implement a plan and schedule, included in the BCS, to address the identified modifications and improvements. All updates to the BLRP should be documented in the BLRP, and submitted to the San Diego Water Board. Individual dischargers should also review and modify their jurisdictional ordinances and activities as necessary so that they are consistent with the requirements of the BLRP.

Bacteria Compliance Schedule - BMP Planning and Scheduling

The BCS should identify the BMPs/water quality projects that have been implemented or are planned for implementation and provide an implementation schedule for each BMP/water quality project. The BCS should demonstrate how the BMPs/water quality projects will address all the bacteria TMDLs. The BCS, at a minimum, should include scheduling for the following:

Non-structural BMP phasing:

- Completed Non-Structural BMP Analysis – Information should be provided regarding the non-structural BMPs completed and/or currently in practice, a timeline of BMP implementation and maintenance, and an assessment of effectiveness.

If the Completed Non-Structural BMP Analysis indicates additional non-structural BMPs are necessary, the following should be included in the BCS:

- New Non-Structural BMP Analysis - Watershed data should be analyzed to identify new effective non-structural BMPs for implementation. This should be completed and included in the BCS.

- Scheduled Annual Non-structural BMP Implementation - The above analysis should be used to identify BMPs that have and will be implemented and to develop an aggressive non-structural BMP implementation schedule. The BCS should include a schedule of the current BMP staffing for each impaired area, and provide a discussion on adjustments to staff scheduling to meet possible new non-structural BMP demands. Schedules should be realistic and justifiable.

- Scheduled Annual BMP Assessment and Optimizing Adjustments - As the non-structural BMPs are implemented, a scheduled in-depth assessment of the non-structural BMPs' performance should follow. Non-structural BMPs that are found to be ineffective should be modified to incorporate optimizing adjustments to improve performance or be replaced by other effective non-structural BMPs. The results from this assessment should also be used to determine structural BMP selection and the schedule for structural BMP implementation. The BCS should include an annual schedule for in-depth non-structural BMP assessment and optimizing adjustments.

- Scheduled Continuous Budget and Funding Efforts - Securing budget and funding for non-structural BMP staffing and equipment should be scheduled early and continue until the bacteria TMDLs are met. The BCS should include a schedule for staff time, including position and job

description, authorized for securing budget and funding for non-structural BMP implementation.

Structural BMP phasing:

- Completed Structural BMP Analysis – Information should be provided regarding the structural BMPs completed and/or currently in practice, a timeline of BMP implementation and maintenance, and an assessment of effectiveness.

If the Completed Structural BMP Analysis indicates additional structural BMPs are necessary, the following should be included in the BCS:

- Scheduled New Structural BMP Analysis – Structural BMP analysis should utilize all available information, including the non-structural BMP assessment and existing structural BMP assessment, to identify, locate, design and build possible new structural BMPs, or a train of BMPs, to meet the these bacteria TMDLs. The BCS should include a schedule for structural BMP analysis.

- Scheduled Annual BMP Construction - The BCS should include a projected general construction schedule with a realistic and justifiable timeline for possible new BMP construction.

- Scheduled Annual BMP Assessment, Optimization Adjustments, and Maintenance - Assessment for structural BMPs should begin immediately upon initial BMP completion, followed by continuously scheduled BMP assessment, optimization adjustments, and maintenance, to both the individual structural BMPs and the structural BMP program as a whole. The BCS should include an annual schedule for in-depth structural BMP assessment.

- Scheduled Continuous Budget and Funding Effort - Securing budget and funding for structural BMPs and additional maintenance staff should be scheduled early and continue until the bacteria TMDLs are met. The BCS should include a schedule for staff time, including position and job description, authorized for securing budget and funding for structural BMP implementation.

Subsequent reports should assess and describe the effectiveness of implementing the Bacteria Load Reduction Plan. Effectiveness assessments should be based on a program effectiveness assessment framework, such as the one developed by the California Stormwater Quality Association (CASQA, 2005). Using the CASQA framework as an example, the assessments should address the framework's outcome levels 1-5 on an annual basis, and outcome

level 6 once every five years.[27] Methods used for assessing effectiveness should include the following or their equivalent: surveys, pollutant loading estimations, and receiving water quality monitoring. The long-term strategy should also discuss the role of monitoring data in substantiating or refining the assessment. Once WQOs have been attained, or the anthropogenic sources have been eliminated and pollutant loads can be attributed to only natural and background sources, a reduced level of monitoring may be appropriate.

In addition to these requirements, if load-based numerical WQBELs are included in the NPDES requirements, the monitoring requirements should include flow and bacteria density measurements to determine if bacteria loads in effluent are in compliance with WQBELs.

The BLRPs are the municipal dischargers' opportunity to propose methods for assessing compliance with WQBELs that implement TMDLs. The monitoring components included in the BLRPs should be formulated according to particular compliance assessment strategies. The monitoring components are expected to be consistent with, and support whichever compliance assessment methods are proposed. The San Diego Water Board will coordinate with the municipal dischargers during the development of their proposed monitoring components and associated compliance assessment methods.

If NPDES requirements are not likely to be issued, reissued or revised within 6 months of OAL approval of these TMDLs, the San Diego Water Board may issue an investigative/monitoring order to dischargers pursuant to sections 13267 or 13383 of the Water Code. This order would require assessment of current BMPs, possible planning for additional BMPs, and receiving water quality monitoring in adherence to performance measures described above.

The BLRPs may be re-evaluated at set intervals (such as 5-year renewal cycles for NPDES requirements, or upon request from responsible dischargers, as appropriate and in accordance with the San Diego Water Board priorities). Plans may be iterative and adaptive according to assessments and any special studies.

10.6.3 Actions with Respect to Wastewater Collection Systems and Treatment Plants

The San Diego Water Board will conduct surveillance of and enforce the provisions of State Water Board Order No. 2006-0003-DWQ, and San Diego Water Board Order No. R9-2007-0005 as needed to ensure that collection systems for waste water treatment plants do not overflow, leak, or otherwise discharge into MS4s or surface

[27] Outcome level 1 assesses compliance with activity-based permit requirements. Outcome level 2 assesses changes in attitudes, knowledge, and awareness. Outcome level 3 assesses behavioral change and BMP implementation. Outcome level 4 assesses pollutant load reductions. Outcome level 5 assesses changes in urban runoff and discharge water quality. Outcome level 6 assesses changes in receiving water quality. See CASQA "An Introduction to Stormwater Program Effectiveness Assessment."

waters. If necessary, San Diego Water Board Order No. R9-2007-0005 can be revised to require more aggressive collection system monitoring, maintenance, and repair schedules.

10.6.4 Actions with Respect to Marinas and Boats

If discharges from boats are shown to be a significant source of bacteria contributing to exceedances of water quality objectives, the San Diego Water Board will enforce the waste discharge prohibitions in the Basin Plan to ensure that illegal discharges from boats to surface waters do not occur. This may require issuing NPDES requirements or waste discharge requirements to the marina and harbor operators and/or the muncipalities requiring implementation of BMPs (e.g., public education and outreach, enforcing ordinances, and/or requiring dye tabs in boat sewage holding tanks) to eliminate illegal discharges of sewage, in addition to water quality monitoring and reporting.

10.6.5 Additional Actions

Additional actions that the San Diego Water Board can take to ensure implementation of the bacteria TMDLs are to take enforcement actions, and recommend high prioritization of TMDL implementation projects for grant funds. Additionally, if the REC-1 WQOs cannot be met in the receiving waters, and if natural and background sources appear to be the sole source of continued impairment, the San Diego Water Board may allow for exceedances of the REC-1 WQOs using the Natural Sources Exclusion Approach. These actions are described below.

<u>Take Enforcement Actions</u>
The San Diego Water Board shall consider enforcement actions,[28] as necessary and appropriate, against any discharger failing to comply with applicable WDRs or discharge prohibitions. Enforcement actions may be taken, as necessary and appropriate, to control the discharge of bacteria to impaired shorelines to attain compliance with the bacteria WLAs specified in this Technical Report, or to attain compliance with the REC-1 indicator bacteria WQOs.

[28] An enforcement action is any formal or informal action taken to address an incidence of actual or threatened noncompliance with existing regulations or provisions designed to protect water quality. Potential enforcement actions including notices of violation (NOVs), notices to comply (NTCs), imposition of time schedules (TSO), issuance of cease and desist orders (CDOs) and cleanup and abatement orders (CAOs), administrative civil liability (ACL), and referral to the attorney general (AG) or district attorney (DA). The San Diego Water Board generally implements enforcement through an escalating series of actions to: (1) assist cooperative dischargers in achieving compliance; (2) compel compliance for repeat violations and recalcitrant violators; and (3) provide a disincentive for noncompliance.

Recommend High Priority for Grant Funds
The San Diego Water Board shall recommend that the State Water Board assign a high priority to awarding grant funding[29] for projects to implement the bacteria TMDLs. Special emphasis will be given to projects that can achieve quantifiable bacteria load reductions consistent with the specific bacteria TMDL WLAs and LAs.

Apply the Natural Sources Exclusion Approach[30]
Under the Natural Sources Exclusion Approach (NSEA), all anthropogenic sources of indicator bacteria to the water bodies subject to an indicator bacteria TMDL must be controlled. Dischargers must also demonstrate that all anthropogenic sources of indicator bacteria to the target water body are controlled and that residual indicator bacteria densities do not indicate a health risk.

Once control of all anthropogenic sources and demonstration of appropriate health risk levels have been achieved, the residual indicator bacteria loads in the waterbodies attributable to uncontrollable sources can be identified and measured. Likewise, the frequency that uncontrollable sources cause exceedances of indicator bacteria water quality objectives in the water body can be identified. The information can be used to establish an allowable indicator bacteria WQO exceedance frequency in the impaired water body based upon the residual exceedance frequency observed. This information can then be used to recalculate the TMDLs, WLAs, and LAs.

The use of the NSEA is contingent upon demonstration of control of all anthropogenic sources of indicator bacteria to the waterbodies subject to an indicator bacteria TMDL. Since this task is likely to be formidable, use of the NSEA is not expected to occur immediately. Rather, the NSEA would be used to recalculate TMDLs at some point after their initial adoption, following demonstration of control of all anthropogenic sources.

The dischargers are responsible for collecting and providing the data to support the application of the NSEA. If the data support the application of the NSEA, the San Diego Water Board will recalculate the TMDLs, WLAs, and LAs to allow for the exceedances of the REC-1 indicator bacteria WQOs due to uncontrollable sources.

10.7 Coordination and Execution of Special Studies

The San Diego Water Board recognizes that coordination and execution of special studies by dischargers and other interested persons could result in improved TMDL

[29] In most cases, the State Water Board administers the awarding of grants funded from Proposition 13, Proposition 50, Clean Water Act section 319(h) and other federal appropriations to projects that can result in measurable improvements in water quality, watershed condition, and/or capacity for effective watershed management. Many of these grant fund programs have specific set-asides for expenditures in the areas of watershed management and TMDL project implementation for non-point source pollution.

[30] After approval of the Basin Plan amendment (Resolution No. R9-2008-0028) authorizing the use of the Natural Sources Exclusion Approach by the Office of Administrative Law, anticipated by the end of 2008 or early 2009.

analyses that more accurately protect beneficial uses. Areas of study that could benefit TMDL analysis include collection of data that can be used to improve model output, improved understanding of bacteria levels and the relationship to health effects, and identification of an appropriate and affordable method(s) to measure pathogens directly. Additionally, studies designed to measure BMP effectiveness and bacteria source identification (see section 10.5.2) will be useful for dischargers in identifying appropriate strategies to meet the requirements of this TMDL project.

10.7.1 Collect Data Useful for Model Improvement

Calibration and validation of the computer models used for TMDL analysis was based on limited data (water quality and/or flow) and assumed values for input parameters such as rates for bacteria die-off and re-growth. Limited data are available related to fecal bacteria that can be attributed to natural and background sources (e.g., waterfowl, terrestrial and aquatic wildlife, wrack line and aquatic plants, sediments, and other unidentified and unquantified sources within the waters). Studies designed to collect additional data that can be used for model improvement will result in more accurate TMDL results. Also, actual flow and loading data from each watershed and expanded receiving water data can be used to construct models that can more accurately reflect site-specific conditions.

10.7.2 Improve Understanding Between Bacteria Levels and Health Effects

The San Diego Water Board recognizes that there are potential problems associated with using indicator bacteria WQOs to indicate the presence of human pathogens in receiving waters free of sewage discharges. The indicator bacteria WQOs were developed, in part, based on epidemiological studies in waters with sewage inputs. The risk of contracting a water-born illness from contact with urban runoff devoid of sewage, or human-source bacteria is not known. Some pathogens, such as *giardia* and *cryptosporidium* can be contracted from animal hosts. Likewise, domestic animals can pass on human pathogens through their feces. These and other uncertainties need to be addressed through special studies and, as a result, revisions to the TMDLs established in this project may be appropriate.

Indicator bacteria are used to measure the risk of swimmer illness because they have been shown to indicate the presence of human pathogens, such as viruses, when human bacteria sources are present. Indicator bacteria have been historically used because they are easier and less costly to measure than the pathogens themselves (see Appendix A). In recent years, however, questions have been raised regarding the validity of using indicator bacteria to ascertain risk to swimmers in recreational waters, since they appear to be less correlated to viruses when sources are from urban runoff (Jiang et al, 2001). In fact, most epidemiology studies conducted to measure the risk of swimmer illness in the presence of indicator bacteria have taken place in receiving waters containing known sewage impacts.

To date, only two epidemiology studies have been conducted where the bacteria source was primarily urban runoff. The Santa Monica Bay epidemiology study (Haile et al,

1999) reported that there was a direct correlation between swimming related illnesses and densities of indicator bacteria. The sites included in this study were known to contain human sources of fecal contamination. Most recently, the Mission Bay epidemiological study (Colford et al, 2005) showed that there was no correlation between swimmer illness and concentrations of indicator bacteria. Unlike Santa Monica Bay, bacteria sources in Mission Bay were shown to be primarily of nonhuman origin (City of San Diego and MEC/Weston, 2004). The studies caution against extrapolating the results from the Mission Bay study to other locations, since there have been extensive cleanup activities on this waterbody and subsequently bacteria source analyses have shown that human fecal sources are only a minor contributor. The link between bacteria loads from urban runoff containing mostly nonhuman sources, and risk of illness needs to be better understood.

Recent studies have also shown that bacteria regrowth is a significant phenomenon (City of San Diego and MEC/Weston, 2004; City of Laguna Niguel and Kennedy Jenks, 2003). Such regrowth can cause elevations in bacteria levels that do not correspond to an increase in human pathogens and risk of illness. For example, the Mission Bay Source Identification Study found that bacteria multiply in the wrack line on the beach (eel grass and other debris) during low tide, caused exceedances of the water quality objectives during high tide when the wrack is inundated. This same phenomenon likely occurs inside storm drains, where tidal cycles and freshwater input can cause bacteria to multiply. In both these cases, an increase in bacteria densities does not necessarily correlate to an increase in the presence of human pathogens. The regrowth phenomenon is problematic since responsible parties must expend significant resources to reduce the current bacteria loads to receiving waters to meet the required waste load reductions. For example, bacteria regrowth and residence time may be a factor at Baby Beach, where studies have shown high levels of bacteria resident in beach sediments near storm drains.

As information is gathered, initiating special studies to understand the uncertainties between bacteria levels and bacteria sources within the watersheds may be useful. Specifically, continuing research may be helpful to answer the following questions:

- What is the risk of illness from swimming in water contaminated with urban/stormwater runoff devoid of sewage?
- Do exceedances of the bacteria water quality objectives from animal sources (wildlife and domestic) increase the risk of illness?
- Are there other, more appropriate surrogates for measuring the risk of illness than the indicator bacteria WQOs currently used?

Addressing these uncertainties is needed to maximize effectiveness of strategies to reduce the risk of illness, which is currently measured by indicator bacteria densities. Dischargers may work with the San Diego Water Board to determine if such special studies are appropriate.

10.7.3 Identification of Method for Direct Pathogen Measurement

Ultimately, the San Diego Water Board supports the idea of measuring pathogens (the agents causing impairment of beneficial uses) or an acceptable alternative indicator, rather than indicator bacteria (surrogates for pathogens). However, as stated previously, indicator bacteria have been used to measure water quality historically because measurement of pathogens is both difficult and costly. The San Diego Water Board is supportive of any efforts by the scientific community to perform epidemiological studies and/or investigate the feasibility of measuring pathogens directly. The San Diego Water Board further supports subsequent modification of WQOs as a result of such studies. Ultimately, TMDLs will be recalculated if WQOs are modified due to results from future studies.

10.8 TMDL Implementation Milestones

Accomplishing the goals of the implementation plan will be achieved by cooperative participation from all responsible parties, including the San Diego Water Board. Major milestones are described below in Table 10-7.

Table 10-7. TMDL Implementation Milestones

Item	Implementation Action	Responsible Parties	Date
1	Effective date of Baby Beach and Shelter Island Shoreline Park Bacteria TMDL Waste Load Allocations (WLAs).	▪ San Diego Water Board ▪ Phase I Municipal Dischargers	Effective date*
2	Issue, reissue, or revise Phase I Municipal NPDES WDRs to include WQBELs consistent with the WLAs.	▪ San Diego Water Board	Within 5 years of effective date
3	Submit annual Progress Report to San Diego Water Board.	▪ Phase I Municipal Dischargers	Annually after reissue of NPDES WDRs
4	Recommend TMDL-related projects as high priority for grant funds.	▪ San Diego Water Board	As needed after effective date
5	Coordination and execution of special studies.	▪ San Diego Water Board ▪ Phase I Municipal Dischargers	As needed after effective date
6	Meet 50% wasteload reductions.	▪ Baby Beach Phase I Municipal Dischargers	3 years after effective date for dry weather 7 years after effective date for wet weather
		▪ Shelter Island Shoreline Park Phase I Municipal Dischargers	No load reductions required. Removal from 303(d) List by 2012.
7	Meet 100% wasteload reductions.	▪ Baby Beach Phase I Municipal Dischargers	5 years after effective date for dry weather 10 years after effective date for wet weather
		▪ Shelter Island Shoreline Park Phase I Municipal Dischargers	No load reductions required. Removal from 303(d) List by 2012.
8	Take enforcement actions to attain compliance with the WLAs.	▪ San Diego Water Board	As needed after effective date
9	Issue NPDES requirements or waste discharge requirements to marina and harbor operators and/or the muncipalities to eliminate sewage discharges from boats	▪ San Diego Water Board	As needed after effective date
10	Apply NSEA and recalculate TMDLs	▪ Baby Beach Phase I Municipal Dischargers	As appropriate after effective date, if data are available to support the action.
		▪ Shelter Island Shoreline Park Phase I Municipal Dischargers	

* Effective date is date of approval of these TMDLs by the Office of Administrative Law

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11 Environmental Analysis, Environmental Checklist, and Economic Factors

The San Diego Water Board must comply with the California Environmental Quality Act (CEQA) when amending the Basin Plan[31] as proposed in this project to adopt these TMDLs for bacteria at the impaired shorelines of BB and SISP. Under the CEQA, the San Diego Water Board is the Lead Agency[32] for evaluating the environmental impacts of the reasonably foreseeable methods of compliance with the proposed TMDLs. The following section summarizes the environmental analysis conducted to fulfill the CEQA requirements. The complete environmental analysis, including the environmental checklist and discussion of economic factors, are discussed in detail in Appendix M.

11.1 California Environmental Quality Act Requirements

The CEQA authorizes the Secretary of the Resources Agency to certify state regulatory programs, designed to meet the goals of the CEQA, as exempt from its requirements to prepare an Environmental Impact Report (EIR), Negative Declaration, or Initial Study. The State Water Resources Control Board's (State Water Board's) and San Diego Water Board's Basin Plan amendment process is a certified regulatory program and is therefore exempt from the CEQA's requirements to prepare such documents.

The State Water Board's CEQA implementation regulations describe the environmental documents required for Basin Plan amendment actions. These documents consist of a written report that includes a description of the proposed activity, alternatives to the proposed activity to minimize or eliminate potentially significant environmental impacts, and identification of mitigation measures to minimize any significant adverse impacts.

The CEQA and CEQA Guidelines limit the scope to an environmental analysis of the reasonably foreseeable methods of compliance with the WLAs and LAs. The State Water Board CEQA Implementation Regulations for Certified Regulatory Programs require the environmental analysis to include at least the following:

1. A brief description of the proposed activity. In this case, the proposed activity is the TMDL Basin Plan amendment.
2. Reasonable alternatives to the proposed activity.
3. Mitigation measures to minimize any significant adverse environmental impacts of the proposed activity.

Additionally, the CEQA and CEQA Guidelines require the following components, some of which are repetitive of the list above:

[31] Public Resources Code section 21080.
[32] Public Resources Code section 21067. "Lead Agency" means the public agency, which has the principal responsibility for carrying out or approving a project. The Lead Agency will decide whether an EIR or Negative Declaration will be required for the project and will cause the document to be prepared.

1. An analysis of the reasonably foreseeable environmental impacts of the methods of compliance.
2. An analysis of reasonably foreseeable mitigation measures relating to those impacts.
3. An analysis of reasonably foreseeable alternative means of compliance with the rule or regulation, which would avoid or eliminate the identified impacts.

Additionally, the CEQA Guidelines require the environmental analysis take into account a reasonable range of:

1. Environmental factors.
2. Economic factors.
3. Technical factors.
4. Population.
5. Geographic areas.
6. Specific sites.

11.2 Analysis of Reasonably Foreseeable Methods of Compliance

The analysis of potential environmental impacts is based on the numerous alternative means of compliance available for controlling bacteria loading to the impaired shoreline segments of BB and SISP. The only controllable sources of bacteria are attributed to the MS4s that drain the watersheds that drain into the receiving waters. Attainment of the WLAs will be achieved through discharger implementation of structural and non-structural BMPs for point sources. The BMP control strategies should be designed to reduce bacteria loading in urban and stormwater runoff.

The controls evaluated in Appendix M include the following non-structural and structural BMPs:

- Education and outreach;
- Road and street maintenance;
- Storm drain system cleaning;
- BMP inspection and maintenance;
- Enforcement of local ordinances;
- Buffer strips and vegetated swales;
- Bioretention
- Infiltration trenches
- Sand filters
- Diversion/treatment systems.

Structural and non-structural control strategies can be based on specific land uses, sources, or periods of a storm event. In order to comply with these TMDLs, emphasis should be placed on BMPs that control the sources of pollutants and on the maintenance of BMPs that remove pollutants from runoff.

11.3 Possible Environmental Impacts

The CEQA and CEQA Guidelines require an analysis of the reasonably foreseeable environmental impacts of the methods of compliance with the TMDL Basin Plan amendment. The environmental checklist identifies the potential environmental impacts associated with these methods with respect to earth, air, water, plant life, animal life, noise, light, land use, natural resources, risk of upset, population, housing, transportation, public services, energy, utilities and services systems, human health, aesthetics, recreation, and archeological/historical concerns. In addition to the potential impacts evaluated above, mandatory findings of significance regarding potential to degrade, short-term, cumulative, and substantial adverse impacts were evaluated.

The evaluation considered whether the implementation and/or construction or implementation of the non-structural and/or structural controls would cause a substantial, adverse change within the areas affected by the control. Based on this review, the San Diego Water Board concluded that the potentially significant cumulative impacts can be mitigated to less than significant levels as discussed in Appendix M. Broad mitigation approaches have been identified that if employed, would reduce the potentially significant adverse impacts identified to less than significant. However, such mitigation approaches are within the responsibility and jurisdiction of other public agencies, and not the San Diego Water Board. Water Code section 13360 precludes the San Diego Water Board from dictating the manner in which responsible agencies comply with any of the San Diego Water Board's regulations or orders.

The San Diego Water Board does not engage in speculation or conjecture regarding the projects that may be implemented to comply with the TMDLs and only considers the reasonably foreseeable alternative methods of compliance, the reasonably foreseeable feasible environmental impacts of the these methods of compliance, and the reasonably foreseeable mitigation measures which would avoid or eliminate the identified impacts, all from a broad general perspective consistent with the uncertainty regarding how the TMDLs, ultimately, will be implemented. When the agencies responsible for implementing projects to comply with this TMDL determine how they will proceed, the agencies responsible for those parts of the project can and should incorporate such mitigation approaches into any subsequent projects or project approvals to reduce any potentially significant impacts to less than significant. See sections M.4 and M.5 in Appendix M for a complete discussion of the potential environmental impacts and mitigation measures.

11.4 Alternative Means of Compliance

The CEQA requires an analysis of reasonably foreseeable alternative means of compliance with the rule or regulation, which would avoid or eliminate the identified impacts. The dischargers can use the structural and non-structural BMPs described in Appendix M or other structural and non-structural BMPs, to control and prevent pollution, and meet the TMDLs' required load reductions. The alternative means of compliance with the TMDLs consist of the different combinations of structural and non-structural BMPs that the dischargers might use. Since most of the adverse

environmental effects are associated with the construction and installation of large scale structural BMPs, to avoid or eliminate impacts, compliance alternatives should minimize structural BMPs, maximize non-structural BMPs, and site, size, and design structural BMPs in ways to minimize environmental effects.

11.5 Reasonably Foreseeable Methods of Compliance at Specific Sites

The San Diego Water Board analyzed various reasonably foreseeable methods of compliance at specific sites within the subject watersheds. The specific sites analysis was focused on reviewing potential compliance methods within various land uses. The land uses analyzed correspond to the land uses that were utilized for watershed model development (discussed in section 7 above).

In the discussion of potential compliance methods in section M.6 of Appendix M, the San Diego Water Board assumed that, generally speaking, the BMPs suitable for the control of bacteria generated from a specific land use within a given watershed were also suitable for the control of bacteria generated from the same land use category within a different watershed. For example, a BMP used to control the discharge of bacteria from a residential area in the San Diego County watershed is likely suitable to control the discharge of bacteria from a residential area in the Orange County watershed. However, in addition to land use, BMP selection includes considering site-specific geographical factors such as average rainfall, soil type, and the amount of impervious surfaces, and non-geographical factors such as available funding. Such factors vary between watersheds. The most suitable BMP(s) for a particular site must be determined by the dischargers in a detailed, project-specific environmental analysis.

In order to meet TMDL requirements, dischargers will determine and implement the actual compliance method(s) after a thorough analysis of the specific sites suitable for BMP implementation within each watershed. In most cases, the San Diego Water Board anticipates a potential strategy to be the use of non-structural BMPs as a first step in controlling bacteria discharges, followed by structural BMP installation if necessary.

11.6 Economic Factors

The environmental analysis required by the CEQA must take into account a reasonable range of economic factors. This section contains estimates of the costs of implementing the reasonably foreseeable methods of compliance with the TMDL Basin Plan amendment. Specifically, this analysis estimates the costs of implementing the structural and non-structural BMPs which the dischargers could use to reduce bacteria loading.

As discussed in section M.7 in Appendix M, the cost estimates for non-structural BMPs ranged from $0 to $211,000. For SISP, the cost estimates for treating 10 percent of the watershed with structural BMPs ranged from approximately $900 to over $1 million, depending on BMP selection, with yearly maintenance costs estimated from less than $200 to over $10,000. For BB, the cost estimates for treating 10 percent of the

watershed with structural BMPs ranged from approximately $46,000 to approximately $11 million, depending on BMP selection, with yearly maintenance costs estimated from approximately $8,000 to over $760,000. Implementation of these TMDLs will also entail water quality monitoring which has associated costs. Assuming that a two-person sampling team can collect samples from 4 locations in one 8-hour day, the total cost for one day of sampling would be $3,291.

The specific BMPs to be implemented will be chosen by the dischargers after adoption of these TMDLs. All costs are preliminary estimates since particular elements of a BMP, such as type, size, and location, would need to be developed to provide a basis for more accurate cost estimations.

11.7 Reasonable Alternatives to the Proposed Activity

The environmental analysis must include an analysis of reasonable alternatives to the proposed activity. The proposed activity is a Basin Plan Amendment to incorporate bacteria TMDLs for the impaired shoreline segments of BB and SISP. The purpose of this analysis is to determine if there is an alternative that would feasibly attain the basic objective of the rule or regulation (the proposed activity), but would lessen, avoid, or eliminate any identified impacts. The alternatives analyzed include taking no action or modifying water quality standards. These alternative actions are discussed in section M.8 of Appendix M. Because these alternatives are not expected to attain the basic objective of the proposed activity at this point in time, the preferred alternative is the proposed activity itself, which is the Basin Plan amendment incorporating the bacteria TMDLs.

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12 Necessity of Regulatory Provisions

The Office of Administrative Law (OAL) is responsible for reviewing administrative regulations proposed by state agencies for compliance with standards set forth in California's Administrative Procedure Act, Government Code section 11340 *et seq*., for transmitting these regulations to the Secretary of State and for publishing regulations in the California Code of Regulations. Following State Water Board approval of this Basin Plan amendment establishing TMDLs, any regulatory portions of the amendment must be approved by the OAL per Government Code section 11352. The State Water Board must include in its submittal to the OAL a summary of the necessity[33] for the regulatory provision.

This Basin Plan amendment for Bacteria Impaired Waters meets the "necessity standard" of Government Code section 11353(b). Amendment of the Basin Plan to establish and implement bacteria TMDLs in affected watersheds in the San Diego Region is necessary because the existing water quality does not meet applicable numeric WQOs for indicator bacteria. Applicable state and federal laws require the adoption of this Basin Plan amendment and regulations as provided below.

The State Water Board and Regional Water Boards are delegated the responsibility for implementing California's Porter-Cologne Water Quality Control Act and the federal Clean Water Act. Pursuant to relevant provisions of both of those acts the State Water Board and San Diego Water Board establish water quality standards, which include designated beneficial uses and water quality criteria or objectives to protect those uses.

Clean Water Act section 303(d) [United States Code Title 33 section 1313(d)] requires the states to identify certain waters within their borders that are not attaining water quality standards and to establish TMDLs for certain pollutants impairing those waters. USEPA regulations[34] provide that a TMDL is a numerical calculation of the amount of a pollutant that a water body can assimilate and still meet water quality standards. A TMDL includes one or more numeric targets that represent attainment of the applicable standards, considering seasonal variations and a margin of safety (MOS), in addition to the allocation of the target or load among the various sources of the pollutant. These include wasteload allocations (WLAs) for point sources, and load allocations (LAs) for nonpoint sources and background sources. TMDLs established for impaired waters must be submitted to the USEPA for approval.

Clean Water Act section 303(e) requires that TMDLs, upon USEPA approval, be incorporated into the state's Water Quality Management Plans, along with adequate

[33] "Necessity" means the record of the rulemaking proceeding demonstrates by substantial evidence the need for a regulation to effectuate the purpose of the statute, court decision, provision of law that the regulation implements, interprets, or makes, taking into account the totality of the record. For purposes of this standard, evidence includes, but is not limited to, facts, studies, and expert opinion. [Government Code section 11349(a)].

[34] Code of Federal Regulations Title 40 section 130.2

measures to implement all aspects of the TMDL. In California, these are the basin plans for the nine regions. Water Code sections 13050(j) and 13242 require that basin plans have a program of implementation to achieve WQOs. The implementation program must include a description of actions that are necessary to achieve the objectives, a time schedule for these actions, and a description of surveillance to determine compliance with the objectives. State law requires that a TMDL project include an implementation plan because TMDLs normally are, in essence, interpretations or refinements of existing WQOs. The TMDLs have to be incorporated into the Basin Plan,[35] and, because the TMDLs supplement, interpret, or refine existing objectives, State law requires a program of implementation.

[35] Clean Water Act section 303(e)

13 Public Participation

Public participation is an important component of TMDL development. The federal regulations require that TMDL projects be subject to public review.[36] All public hearings and public meetings have been conducted as stipulated in the regulations,[37] for all programs under the Clean Water Act. Public participation was provided through one public workshop, and through the formation and participation of the Stakeholder Advisory Group. In addition, staff contact information was provided on the San Diego Water Board's website, along with periodically updated drafts of the TMDL project documents. Public participation also took place through the San Diego Water Board's Basin Plan amendment process, which included an additional public workshop, a hearing, and a formal public comment period. A chronology of public participation and major milestones is provided in Table 14-1.

Table 14-1. Public Participation Milestones

Date	Event
February 18. 2003	Notice of Public Workshop and CEQA Scoping Meeting
March 27, 2003	Public Workshop and CEQA Scoping Meeting
May 23, 2005	SAG Meeting and Preliminary Draft Technical Report released for SAG review
June 30, 2005	SAG Meeting
January 15, 2008	Draft Documents released for SAG review
February 14, 2008	SAG Meeting
February 19, 2008	Notice of Public Hearing
February 22, 2008	Draft Documents released for public review
April 9, 2008	Public Hearing
June 11, 2008	Adoption Hearing

[36] Code of Federal Regulations Title 40 section 130.7
[37] Code of Federal Regulations Title 40 section 25.5 and 25.6

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Appendix A
Water Quality Objectives
for
Indicator Bacteria

A Water Quality Objectives for Bacteria Indicators

Under section 304(a) of the Clean Water Act, the USEPA is required to publish water quality criteria accurately reflecting the latest scientific knowledge for the protection of human health and aquatic life. Prior to 1986, the USEPA recommended bacteria criteria based on fecal coliforms to protect human health.[1] In 1986, the USEPA recommended the use of criteria based on *Escherichia coli* (*E. coli*) for fresh waters and *Enterococci* for fresh and marine waters rather than the use of criteria based on fecal coliform.[2] The USEPA recommended this change in the use of bacteria indicator organisms because the USEPA studies demonstrated that *E. coli* and *Enteroccocci* are better predictors of the presence of gastrointestinal illness-causing pathogens than fecal and total coliforms and hence provide a better means of protecting human health. Subsequent supporting research led the USEPA to reaffirm these findings in 2002.[3] The USEPA strongly recommends the replacement of water quality objectives based on fecal or total coliforms with objectives based on *Enterococci* and *E. coli*.

In January 2005 the State Water Resources Control Board (State Water Board) adopted an amendment to the *Water Quality Control Plan for Ocean Waters of California* (Ocean Plan) that maintained the total and fecal coliform water quality objectives (WQOs). Additionally, the State Water Board added provisions that required additional monitoring if the single sample maximum water quality objectives are exceeded. Water quality objectives for *Enterococci* were also added to the Ocean Plan at this time.

As described below, the *Water Quality Control Plan for the San Diego Basin (9)* (Basin Plan) contains objectives based on fecal and total coliform as well as *Enterococci* and *E. coli* for inland surface waters, enclosed bays and estuaries and coastal lagoons.

A.1 REC-1 Water Quality Objectives in the San Diego Region

The contact recreation (REC-1) beneficial use water quality objectives for bacterial indicators applicable in the San Diego Region are contained in the Ocean Plan and in the San Diego Water Board's Basin Plan. The objectives contained in both are derived from water quality criteria promulgated by the USEPA in 1976 and 1986. The Ocean Plan currently contains REC-1 objectives for total and fecal coliforms and *Enterococci*. The Basin Plan currently contains REC-1 objectives for total coliform, fecal coliform, *Enterococci* and *E. coli* as shown below.

[1] Quality Criteria for Water. USEPA 1976
[2] Ambient Water Quality Criteria for Bacteria. USEPA 1986
[3] Implementation Guidance for Ambient Water Quality Criteria for Bacteria. May 2002 DRAFT.

REC-1
Ocean Waters (from Ocean Plan)

Within a zone bounded by the shoreline and a distance of 1,000 feet from the shoreline or the 30-foot depth contour, whichever is further from the shoreline, and in areas outside this zone used for water contact sports, as determined by the Regional Board (i.e., waters designated as REC-1), but including all kelp beds, the following bacterial objectives shall be maintained throughout the water column:

30-day Geometic Mean – The following standards are based on the geometric mean of the five most recent samples from each site:

i. **Total coliform** density shall not exceed **1,000** per 100 ml;
ii. **Fecal coliform** density shall not exceed **200** per 100 ml; and
iii. **Enterococcus** density shall not exceed **35** per 100 ml.

Single Sample Maximum:

i. **Total coliform** density shall not exceed **10,000** per 100 ml;
ii. **Fecal coliform** density shall not exceed **400** per 100 ml;
iii. **Enterococcus** density shall not exceed **104** per 100 ml; and
iv. **Total coliform** density shall not exceed **1,000** per 100 ml when the fecal coliform/total coliform ratio exceeds 0.1.

REC-1
Inland Surface Waters, Enclosed Bays and Estuaries and Coastal Lagoons (from Basin Plan)

Fecal Coliform / Fresh or Marine Waters: Fecal coliform concentration, based on a minimum of not less than five samples for any **30-day period**, shall not exceed a **log mean of 200** per 100 ml, nor shall more than **10 percent** of total samples during any **30-day period** exceed **400** per 100 ml.

Total Coliform / Bays and Estuaries only: Coliform organisms shall be less than **1,000** per 100 ml (10 per ml); provided that not more than **20 percent** of the samples at any station, in any **30-day period**, may exceed **1,000** per 100 ml (10 per ml) and provided further that no **single sample** when verified by a repeat sample taken within 48 hours shall exceed **10,000** per 100 (100 per ml).

***Enterococci* / Fresh Waters:** In fresh water, the **geometric mean** of *Enterococci* shall not exceed **33** colonies per 100 ml. The **single sample maximum** allowable density in designated beach areas is **61** colonies per 100 ml, in moderately or lightly used areas is 108 colonies per 100 ml, in infrequently used areas is 151 colonies per 100 ml.

***Enterococci* / Marine Waters:** In marine waters, the **geometric mean** of *Enterococci* shall not exceed **35** colonies per 100 ml. The **single sample maximum** allowable density in designated beach areas is **104** colonies per 100 ml, in moderately or lightly used areas is 276 colonies per 100 ml, in infrequently used areas is 500 colonies per 100 ml.

E. coli / **Fresh Waters:** In fresh water, the **geometric mean** of *E. coli* shall not exceed **126** colonies per 100 ml. The **single sample maximum** allowable density in designated beach areas is **235** colonies per 100 ml, in moderately or lightly used areas is 406 colonies per 100 ml, in infrequently used areas is 576 colonies per 100 ml.

A.2 REC- 2 Water Quality Objectives in the San Diego Region

The non-contact (REC-2) beneficial use water quality objectives for bacterial indicators applicable in the San Diego Region are contained in the Basin Plan and are derived from water quality criteria promulgated by the USEPA in 1976.

REC-2
Inland Surface Waters, Enclosed Bays and Estuaries and Coastal Lagoons (from Basin Plan)

Fecal Coliform / **Fresh or Marine Waters:** In waters designated for non-contact recreation (REC-2) and not designed for contact recreation (REC-1), the average fecal coliform concentrations for any **30-day period**, shall not exceed **2,000** per 100 ml, nor shall more than **10 percent** of total samples collected during any **30-day period** exceed **4,000** per 100 ml.

A.3 Shellfish Harvesting Water Quality Objectives in the San Diego Region

The shellfish harvesting (SHELL) beneficial use water quality objectives for bacterial indicators applicable in the San Diego Region where shellfish may be harvested for human consumption are contained in the Ocean Plan and in the Basin Plan. Both are derived from water quality criteria promulgated by the USEPA in 1976.

SHELL
Ocean Waters (from Ocean Plan)

At all areas where shellfish may be harvested for human consumption, as determined by the Regional Board, the following bacteria objectives shall be maintained throughout the water column:

The median **total coliform** density shall not exceed **70** per 100 ml, and not more than **10 percent** of the samples shall exceed **230** per 100 ml.

SHELL
Enclosed Bays and Estuaries and Coastal Lagoons (from Basin Plan)

Total Coliform / **Marine Waters:** The median total coliform concentration throughout the water column for an **30-day period** shall not exceed **70** per 100 ml nor shall more than **10 percent** of the samples collected during any **30-day period** exceed **230** per 100 ml for a five-tube decimal dilution test or 330 per 100 ml when a three-tube decimal dilution test is used.

Appendix B
Peer Review Comments
And Responses

B Peer Review Comments and Responses

The technical portions of the proposed Basin Plan amendment to incorporate TMDLs for indicator bacteria were peer reviewed by Professor Patricia Holden of the Donald Bren School of Environmental Science & Management, University of California, Santa Barbara, and by Professor Michael Barber of the Washington State Water Research Center, Department of Civil and Environmental Engineering, Washington State University. External scientific peer review of the technical portion of a proposed rule (in this case, the proposed Basin Plan amendment) is mandated by Health and Safety Code section 57004. This statute states that the reviewer's responsibility is to determine whether the scientific portion of the proposed rule is based upon sound scientific knowledge, methods, and practices. The San Diego Water Board provided the peer reviewers with the draft Technical Report, the draft Basin Plan amendment, and a list of key issues with discussion for the peer reviewers to address. The list of key issues with discussion provided to the peer reviewers is given below in the first section of this appendix. The peer reviewers' comments and the San Diego Water Board's responses follow in subsequent sections.

Issues for Peer Review

1. **Use of land use composition to quantify bacteria sources from all watersheds to affected beaches and creeks in the San Diego Region.**

   Bacteria are ubiquitous in the environment, as there are numerous sources including both controllable and non-controllable. Controllable sources include sewage related sources (spills, leaking sewer lines), trash, farm animal waste, and pet waste. Non-controllable sources include aquatic and terrestrial wildlife, decaying matter, and soil. To manage this abundance of sources and quantify them in a useful way, land-use types were identified in the San Diego Region and quantified in terms of bacteria generation.

   Various bacteria sources are present across different land-use categories. For example, wildlife can be present in both urbanized and non-urbanized areas. Despite this source variability, loading can be highly correlated with land use practices. For this reason, it was decided to quantify the bacteria load coming from each land use type rather than quantify the sources directly. This approach was applied to both wet weather and dry weather conditions.

2. **Use of wet weather model to simulate fate and transport of bacteria, and to calculate TMDLs.**

   The wet-weather approach chosen for use in this project is based on the application of USEPA's Loading Simulation Program in C++ (LSPC) to estimate bacteria loading in the watersheds. LSPC is a recoded C++ version of USEPA's Hydrological Simulation Program–FORTRAN (HSPF) that relies on fundamental (and USEPA-endorsed) algorithms. LSPC has been been applied and calibrated in multiple

watersheds in the San Diego Region in the *Draft Bacteria TMDLs for Beaches and Inland Surface Waters of the San Diego Region*, hereafter referred to as Draft Bacteria TMDL Project I (SDRWQCB, 2005). The regionally calibrated modeling parameters from Draft Bacteria TMDLs Project I were transferred to the watersheds of the San Diego Bay (SDB) and Dana Point Harbor (DPH) impaired shorelines. For a complete discussion of LSPC configuration, validation, and application, refer to Appendix G.

Receiving water models of SDB and DPH were developed to simulate the assimilative capacity of the waterbodies, quasi-steady-state effects of tidal flushing, and bacterial die-off. These models were based on the Environmental Fluid Dynamics Code (EFDC) (Hamrick, 1992 and 1996). Wet-weather flows and bacteria levels from the watersheds were based on LSPC output for the respective impaired shorelines modeled, and were therefore used as boundary conditions to the EFDC models. The EFDC models additionally provided quasi-steady-state simulation of flushing and intrusion of waters high in salinity resulting from tidal hydrodynamics. The models also included assumptions for influence of salinity and temperature on bacteria die-off formulations. A complete discussion of EFDC model development of SDB and DPH is provided in Appendix G.

Please comment on the use of this modeling system for the purpose of calculating TMDLs to impaired waters during wet weather.

3. Use of single-sample maximum objectives for wet weather numeric targets.

Bacteria water quality objectives have two temporal components: single sample maximum values and 30-day geometric mean values. As a conservative measure for wet weather analyses, the single sample maximum values were chosen as TMDL numeric targets.

Wet weather events, and subsequent high bacterial counts, are sporadic and episodic. Wet weather runoff and flows contain elevated bacteria densities, but have a quick time of travel. Thus, bacteria densities remain elevated for relatively short time periods following storm flows. Storm events do not typically result in an exceedance of the 30-day geometric mean bacteria densities, even though single sample densities are very high. Therefore, the single sample maximum values were used as numeric targets for the wet weather simulations.

4. Reasonableness of assumptions (described in Appendix L) for wet-weather modeling.

Several assumptions are relevant to the modeling system used to simulate the fate and transport of wet weather sources of bacteria. This model was used to estimate both existing bacteria loads and total maximum daily loads. Please comment on the validity of these assumptions. Assumptions for wet weather modeling can be found in Appendix L.

5. Use of wet weather modeling parameters to simulate build-up/wash-off of bacteria from similar studies in San Diego and Los Angeles (SDRWQCB, 2005 and LARWQCB, 2002).

Sources of bacteria are quantified by correlating land use types to bacteria loading. Land use data was classified into 13 distinct categories. Each category had a unique parameter describing the amount of bacteria loading directly to the *critical point* (defined as the culmination point at the bottom of each affected watershed). These unique parameters were obtained by using those that were previously defined in the TMDL for Santa Monica Bay (LARWQCB, 2002), and used in Draft Bacteria TMDLs Project I. The parameters include land-use-specific accumulation rates and build-up limits. Using these values assumes that land use characteristics for all categories in the San Diego Region are sufficiently similar to characteristics of all land use categories in the Los Angeles Region. This assumption was validated in Draft Bacteria TMDLs Project I through evaluation of model results with local water quality data. Please comment on the application of modeling parameters derived in the Los Angeles Region and validated in Draft Bacteria TMDLs Project I to this project.

6. Use of dry weather and receiving water model to simulate fate and transport of bacteria, and to calculate TMDLs.

The density of bacteria during dry weather is extremely variable in nature. Therefore, to better identify and characterize sources an approach was used that relied on detailed analysis of available data based on statistical relationships between flow, bacteria concentrations, and area of each land use. An approach similar to that used for Draft Bacteria TMDLs Project I was also used to model dry weather watershed sources for the impaired shorelines of SDB and DPH. Also, since dry weather flow data was not available for any of the bay and harbor segments, flow parameters were utilized from the regionally calibrated dry weather model for Draft Bacteria TMDLs Project I.

To represent the linkage between source contributions and receiving waters, steady-state mass balance models were developed to simulate transport of bacteria in the streams and storm drains flowing to impaired SDB and DPH shorelines. These predictive models represent the streams/storm drains as a series of plug-flow reactors, with each reactor having a constant, steady-state flow and bacteria load. Bacteria concentrations in each segment were simulated based on regionally calibrated values for a first-order die-off rate and stream infiltration.

Receiving water models of SDB and DPH were consistent with EFDC models developed for wet-weather analyses, and included linkage to the dry-weather watershed transport model described above. These models simulated the assimilative capacity of the waterbodies, quasi-steady-state effects of tidal flushing,

salinity, and temperature, and effects on bacterial die-off. A complete discussion of the modeling approach for dry weather is provided in Appendix G.

7. Use of data from Aliso, San Juan, Rose, and Tecolote Creeks to characterize dry weather source loading in the entire San Diego Region.

Dry weather flow data was not available for any of the bay and harbor segments. Flow parameters were utilized from the regionally calibrated dry weather model for Draft Bacteria TMDLs Project I. In this approach, data from Aliso Creek, San Juan Creek (Orange County), Rose Creek, and Tecolote Creek (San Diego County) were used for characterization of dry weather flows and water quality because the data sets associated with these creeks are considered sufficient in size. Data from these four creeks were used to generate regression equations describing flow and water quality as functions of land use composition and watershed size. Conditions in these four creeks are assumed representative of conditions throughout the Region. A complete discussion of the approach for dry weather is provided in Appendix G.

8. Use of geometric mean objectives for dry weather numeric targets.

Bacteria water quality objectives have two temporal components: single sample maximum values and 30-day geometric mean values. For dry weather analyses, the geometric mean values were chosen as TMDL numeric targets. This is because the dry weather model simulates steady state flow for predictions of average conditions in the creeks. To compare the conditions of these average flows to water quality objectives, the geometric mean is more appropriate since this value likewise represents average conditions over 30 days.

9. Reasonableness of assumptions (described in Appendix L) for dry weather modeling.

Several assumptions are relevant to the modeling system used to simulate the fate and transport of bacteria during dry weather in the Region. Please comment on the validity of these assumptions. Additional assumptions for dry weather modeling can be found in Appendix L.

10. Assumptions used for modeling the impaired shorelines of SDB (B Street and G Street Pier) that had no data for model verification or loading assessment.

Sufficient bacteria data were available for three impaired shorelines in this study, including Tidelands Park and Shelter Island Shoreline Park of SDB and Baby Beach of DPH. These data were used for model testing and analyses of loading conditions to the receiving waters. These analyses provided information for assumptions for modeling the other impaired shorelines of SDB (B Street and G Street Pier) that had no data for model verification or loading assessment.

11. Location of *critical points* for TMDL calculation.

The *critical point* for loading assessment is defined as the culmination point at the bottom of the watershed, before inter-tidal mixing takes place. Both current loading and total maximum daily loading is calculated at the critical point for each watershed having an impaired waterbody. High bacteria loading is predicted at the critical point, and is therefore considered a conservative location for TMDL calculation. TMDL calculations were determined at the critical point in dry weather.

12. Use of conservative assumptions to comprise an implicit Margin of Safety.

Rather than incorporating an explicit margin of safety (MOS) to TMDL calculation, the conservative assumptions built into both the wet weather, dry weather and receiving water models are considered sufficient to account for any uncertainties. The implicit MOS was thus generated by incorporating a series of conservative assumptions regarding current source loading of bacteria from the watersheds, as well as assumptions regarding the assimilation of bacteria into the waterbodies and surrounding environment.

13. Calculations of wasteload allocations, load allocations and TMDLs during dry weather and wet weather.

Data and model limitations required that assumptions be made to calculate the dry weather wasteload allocations. The models were incapable of predicting the variability in measured receiving water bacteria concentrations, most likely because of the extreme daily variability in bacteria loading from birds and other localized sources. Additionally, there were no data or literature values to accurately estimate the loading to the shorelines from sources external to the MS4s including bird sources, marine mammals, and boat discharges. However, modeling showed that, because of the small size of the watersheds draining to the impaired shorelines, the MS4s are incapable of contributing a significant portion of the bacteria loads to the receiving water based on measured water quality. Thus, the loads contributed by the MS4s during dry weather are likely orders of magnitude lower than those contributed from bird loading, the principal external source.

Because loads from external sources could not be calculated directly due to lack of data and lack appropriate literature values, the dry weather wasteload allocations were calculated by assuming that the MS4 discharges to the receiving water met the 30-day geometric mean numeric targets. The load allocations were then calculated by subtracting the wasteload allocations from the assimilative capacity of the shoreline areas. The dry weather load allocations were assumed to be the same for the wet-weather condition, and the wet weather wasteload allocations were calculated by subtracting the load allocations from the assimilative capacity of the receiving water.

The assumptions used to calculate the dry weather wasteload allocations, and dry and wet weather load allocations are broad considering that bird loading and other localized sources can result in high temporal variability that may at times result in exceedance of the assimilative capacity of the waterbody. However, the assumptions are reasonable considering the fact that the calculated dry weather wasteload allocations are orders of magnitude lower than the calculated external loads as expected based on size of the watersheds and measured receiving water quality.

Overarching Questions
Reviewers were not limited to addressing only the specific issues presented above, and were asked to contemplate the following "big picture" questions.

(a) In reading the staff technical reports and proposed implementation language, are there any additional scientific issues that are part of the scientific basis of the proposed rule (the Basin Plan amendment) not described above? If so, please comment with respect to the statute language given above.

(b) Taken as a whole, is the scientific portion of the proposed rule based upon sound scientific knowledge, methods, and practices?

Reviewers were asked to note that some proposed actions may rely significantly on professional judgment where available scientific data are not as extensive as desired to support the statute requirement for absolute scientific rigor. In these situations, the proposed course of action is favored over no action.

Comments from Professor Holden

1. Use of land use composition to quantify bacteria sources from all watersheds to affected beaches and creeks in the San Diego region.

Comment: Land use composition was used to "estimate" not to "quantify" fecal indicator bacteria. Nonetheless, it appears that there is no other logical and immediate way to approach this. However, the regression equation in Appendix G is based on Los Angeles data. It would be useful to clarify for the reader how closely the land uses are in the Los Angeles dataset to the ones in the San Diego TMDL region. If the land use percentages are similar between the sites studied and the ones modeled, then this approach (across jurisdictions or regions) is additionally justified or should be qualified.

A continuing concern in this TMDL report is the very small degree to which watersheds are predicted to contribute to the wasteload. Since most of the wasteload cannot be attributed to the watersheds, then either the land use composition data or the LA watersheds as sources for regressions are unrealistic for this setting or in fact the birds (or other unidentified sources) are really the majority source. There is a great deal of uncertainty, in other words.

Response: The regression equations 5 and 6, reported in Appendix G (now revised to Appendix F), were based on data collected from San Juan Creek and Aliso Creek of Orange County, and Tecolote Creek and Rose Creek of San Diego. Given these watersheds proximity to the Dana Point Harbor (Orange County) and San Diego Bay (San Diego County) watersheds, their use in basing land use assumptions was considered justified.

The reason that watershed loading constituted a small portion of the total load to the receiving waters was not associated with land use, but rather due to the relatively small size of the watersheds and the likely contribution of localized sources such as waterbowl and other local sources within the receiving waters. Watershed loads of bacteria associated with dry urban runoff, estimated based on the regression equations, were very small compared to direct, localized loads to receiving waters (e.g., birds). Direct loads from birds and other sources within the receiving waters were not included in watershed load estimates and their regression equations. For this reason, we do not believe there is a great deal of uncertainty with land use composition based on the reviewer's comment.

2. Use of wet weather model to simulate fate and transport of bacteria, and to calculate TMDLs.

Comment: The use of a mathematical model is good and appropriate. The model concept, as described in Appendix G, would appear to have appropriate elements (reactor assumption, first order decay coefficients, mixing equation) and the calibration to existing data sets appears successful. This reviewer may have overlooked it, but it would be useful to have some explanation in Appendix G regarding the origin of the "observed range" data in Figures starting with G-7. Over what time frame are ranges depicted?

In Section G.3.2.d, the die-off rates are much higher than stated for the watershed model (ca. 0.6/day for the former versus ca. 0.15 / day for the latter). Assuming this is because of salinity, it would be good to be more explicit about how the salinity adjustment recommended by Chapra (1997) was used.

I agree with the last statement of Appendix G regarding the utility of the model. It strikes me that if this is done well, its continued use and refinement can be used to hone in on "lumped" sources that drive the need for inverse simulation approaches.

In Appendix H, it is rather difficult to assess the goodness of fit of the model to the data, beginning with Figure H-57. Is there a way to represent the fit better in a graphical sense? Could the data be plotted against the simulated values and an R-squared value shown? The simulated 30 day geometric means for Dana Point Harbor (H-63 and H-64) are rather good fits, on the other hand, and are more easily depicted graphically.

Response: The observed ranges shown in Figures G-7 through G-14 of Appendix G (now revised to Figures F-7 through F-14 of Appendix F), specific to dry weather model calibration and validation results, are based on observed flows and bacterial densities corresponding to the monitoring performed for Aliso Creek, San Juan Creek, Tecolote Creek, and Rose Creek. Appendix G (now revised to Appendix F) was updated to provide an improved discussion of data associated with model calibrations and validations, as shown in these Figures.

The commentor is correct that higher die-off rates in the EFDC receiving water model are due to the influence of salt water, compared to lower die-off rates in the freshwater watershed models. It should be noted that all die-off rates in the EFDC model were changed to 0.8/day consistent with a typical value reported in Chapra (1997). Based on salinity concentrations predicted by the model, adjustments to bacteria die-off are automatically performed assuming a relationship of ratio of $0.02 day^{-1} ppt^{-1}$ salinity, as reported in Section G.3.2.d (now revised to Section F.3.2.4).

The challenge with presentation of model results and observed data is the extremely high variability of bacteria data. Since bacteria concentrations vary by orders of magnitude, and the objective of the modeling was to follow the general trend and estimate the order of magnitude present in the observed data, the graphical results provided in Figure H-57 (now revised to Figure I-57) are sufficient for the purpose of presenting agreement between orders of magnitude. Comparison of 30-day geometric means is easier to depict graphically due to the reduced impact of highly variable instantaneous concentrations.

3. Use of single-sample maximum objectives for wet weather numeric targets.

Comment: The single sample basis is appropriately conservative. However, what is going to be a problem is the fact that TC targets have been set lower than FC (Table 3.1). FC are a subset of TC; TC are typically around 10 times higher than FC and thus it is unlikely that the two targets can be met (TC will always be out of compliance even if FC is met). In fact, Equation 7 in Appendix G gives the formula of TC = 5X FC.

Response: Equation 7 in Appendix G (now revised to Appendix F) is based on a regression analysis of the correlation between total coliform (TC) and fecal coliform (FC) derived from observed data. However, this observed correlation is not relevant to the method by which the targets for TC and FC are selected.

The San Diego Water Board recognizes that the numeric targets used in the Technical Report present what seems to be an error in logic: This apparent problem arises because the total coliform numeric objective for the SHELL use is lower than the fecal coliform objective for the REC-1 use. Fecal coliform is a subset of total coliform, yet numeric targets for total coliform are less than numeric targets for fecal coliform. There are no WQOs for fecal coliform for SHELL. Because the WQOs associated

with SHELL are more stringent than the WQOs for REC-1, this results in final numeric targets showing a discrepancy between values for total coliform and fecal coliform.

The result of this discrepancy is that, although the numeric target of 400 MPN/mL is reported for fecal coliform, in practice a lower numeric fecal coliform density will have to be met in order to meet the total coliform target of 230 MPN/mL. This apparent discrepancy is understood when beneficial uses are taken into account.

However, the TMDLs based on the WQOs for SHELL have been removed from this project and technical report and will be addressed in a separate TMDL or water quality standards action. Thus, this comment is no longer relevant.

4. Reasonableness of assumptions (described in Appendix L) for wet-weather modeling.

Comment: As stated below, not all of the parameters could be reviewed in detail, but the assumptions in general and their sources appear to be sound.

Response: The San Diego Water Board agrees that the assumptions and their sources are generally sound.

5. Use of wet weather modeling parameters to simulate build-up/wash-off of bacteria from similar studies in San Diego and Los Angeles (SDRWQCB, 2005 and LARWQCB, 2002).

Comment: It was not possible to review all the modeling parameters as these are found in numerous other studies (as stated in Appendix L) but the sources of the parameters are logical and appear to be sound. The conceptual framework, as described, appears sound for the model. It becomes clear later in Appendix L which die-off rate constants were applied when / where, and it would be useful to ensure that the same clarity is in Appendix G.

Response: Comment noted. Assumptions stated in Appendix L (now revised to Appendix G) are consistent with discussions in Appendix G (now revised to Appendix F).

6. Use of dry weather and receiving water model to simulate fate and transport of bacteria, and to calculate TMDLs.

Comment: A dry weather model is a reasonable idea, and the comments regarding simulation success in my “wet weather” comments apply here. Especially important to recognize in this report is that it appears that the majority sources have been backed out of the models. This is a major concern. If watershed sources don’t account for

much at the shore and birds are suspected as the major source, then either data should be available to back this up or data should be gathered to confirm. Further, birds should be considered as a public health concern.

Response: The dry weather model indicated that a significant amount of the observed bacteria levels in the receiving waters could not be attributed to loads originating from the watershed. Observed bacteria levels in the receiving waters exhibited significant variation temporally as well as spatially. The receiving water (EFDC) models were not able to simulate the observed data in any statistically meaningful way.

Because of the variability and unpredictability of modeled bacteria levels in the receiving water compared to observed data, and lack of data about natural (primarily waterfowl) sources, the dry weather receiving water (EFDC) model was used to back-calculate the maximum allowable bacteria load that could be attributed to natural sources. The allowable load calculated from the watershed (LSPC) model was assumed to originate from controllable point sources, namely the municipal separate storm sewer systems (MS4s).

The back-calculated maximum potential bacteria load attributed to natural sources is not the actual load from natural (waterfowl or other) sources within the receiving waterbody. Instead, it is the maximum allowable bacteria load that can be received from the natural uncontrollable sources and still allow the receiving waterbody to assimilate the bacteria load from the watershed sources (from the LSPC watershed model) without exceeding the numeric targets. So, while the TMDLs may include a relatively large contribution from natural sources, the TMDL is still protective of water quality standards. The point sources (MS4s) from the watersheds, which have a relatively low contribution to the receiving waters, are the only sources that are considered controllable.

The San Diego Water Board recognizes that additional data for the natural sources as well as watershed sources would help to further refine the LAs for nonpoint sources and wasteload allocations (WLAs) for point sources. The San Diego Water Board further agrees that as additional data are collected to further characterize the bacteria loads that can be attributed to natural sources, methods for bacteria load estimation and calculation of TMDLs should be refined in the future. However, until those data are available, the approach taken is believed to be the most conservative and protective approach for calculating the TMDLs.

7. Use of data from Aliso, San Juan, Rose, and Tecolote Creeks to characterize dry weather source loading in the entire San Diego Region.

***Comment*:** It was good that these data were available, and that the SDRWQCB had the insight to use this available data. But as stated above, it is important in this document to explicitly show the similarities or differences between land uses in the LA

watersheds versus the subject San Diego watersheds. If they are very different, then one would think about the value of this exercise in a more critical way. It would also be appropriate for San Diego to start monitoring in its own region. This should begin now, in order to effectively monitor the effectiveness of the TMDL development effort over the long term.

Response: Because the four creeks mentioned in this item are located in the San Diego Region, it is believed that the commenter misunderstood the intent of the item. Data from Aliso Creek, San Juan Creek (Orange County), Rose Creek, and Tecolote Creek (San Diego County) were used for characterization of dry weather flows and water quality because the data sets associated with these creeks are considered sufficient in size. Data from these four creeks were used to generate regression equations describing flow and water quality as functions of land use composition and watershed size. Conditions in these four creeks are assumed representative of conditions throughout the Region. The item was meant to solicit opinion about the application of regression equations developed by these four creeks onto the remaining watersheds.

***Comment cont'd*:** One small comment for G.2.4.b regards the units for the die-off coefficients. The "per day" units are correct and "liters" should not be in the units.

Response: See the response to the comment for item 1. Section G.2.4.b (now revised to Section F.2.4.2) was corrected regarding units of die-off rates.

8. Use of geometric mean objectives for dry weather numeric targets.

***Comment*:** Because bathers are more frequently at the beach during dry weather, it seems that more stringent targets should be set for the dry weather periods. Sustained loading of fecal indicator bacteria to coastal sediments could occur in the summer following wintertime upland erosional processes and deposition of contaminated sediments to coastal zones. Thus, nearshore sediments deposited from winter processes could have a sustained, and perhaps tidally-influenced, effect on coastal water quality. The geometric mean sets a value for the target which could fluctuate around the mean due to tidal cycling. This is suggested in section 3 (page 11, 2nd paragraph) of the draft Technical Report. Given that tidal cycling is natural and incoming flows will be lower, the geometric mean basis for targets is reasonable, but it should also be considered that swimming is occurring mostly during the summer and this is thus when maximum protection of public health is needed. If the latter is taken seriously, then one time numeric targets should be set. This would also protect the health of swimmers when an accident occurs such as a sewer line break, pump failure, etc. Thus, it is good that both one time and geometric mean targets are set (Table 3.2).

Response: The San Diego Water Board agrees that the use of both single sample maximum and geometric mean targets are appropriate for dry weather targets due to

significant fluctuation in bacteria levels that can occur during the tidal cycling in the receiving waterbodies.

***Comment, cont'd*:** As with the wet weather targets (see 4 above), setting the TC target as less than FC is nearly impossible to meet (Table 3.2) because TC is a larger group (by about 10 fold) than FC. Thus, which would be used as the real target: FC or TC?

Response: For the issue about TC and FC targets, please see the response above to the comment for item 3 for the reasons the TC targets are less than the FC targets. However, the TMDLs based on the WQOs for SHELL have been removed from this project and technical report and will be addressed in a separate TMDL or water quality standards action. Thus, this comment is no longer relevant.

Comment cont'd: Lastly, it would be useful in the report to be explicit about why *E. coli* is not included in either Table 3.1 or 3.2. It is clear from Appendix C that there is no WQO for *E. coli* in marine waters, and that FC WQOs do exist. But a statement in Section 3 to that effect would be helpful.

Response: Section 3 has been revised to provide additional explanation for not including *E. coli* targets in Tables 3-1 and 3-2, as in Appendix C (now revised to Appendix A).

9. Reasonableness of assumptions (described in Appendix L) for dry weather modeling.

Comment: The assumptions and sources for assumptions (where not all information is readily available to review) appear reasonable and sound. However, the lack of data regarding the real contributions of birds to the coastal loading of fecal indicator bacteria is problematic.

Response: As discussed in the response to the comment for item 6, the San Diego Water Board agrees additional data would be helpful to further characterize the bacteria loads that can be attributed to natural sources. However, until those data are available, the approach taken in the Technical Report is the most conservative approach for calculating the TMDLs and protecting the designated beneficial uses of the waterbodies.

10. Assumptions used for modeling the impaired shorelines of SDB (B Street and G Street Pier) that had no data for model verification or loading assessment.

Comment: Using data available from other nearby sites appears reasonable under these circumstances.

Response: The San Diego Water Board agrees that the use of data available from other nearby sites is reasonable under these circumstances. Water quality data collected in the future from these shorelines can be used to revisit and refine the LAs, WLAs, and TMDLs, if necessary.

However, the shoreline segments of B Street and G Street have been removed from this project. Thus, this comment is no longer relevant.

11. Location of *critical points* for TMDL calculation.

***Comment*:** It appears that all shorelines are critical points. If they are all frequented to the same degree, then this makes sense. If they are not, then weighting them by visitation frequency of recreational water users makes more sense. The land uses at the different sites imply a possible difference in this regard across sites.

Response: The critical points were selected as the most conservative locations, where the bacteria densities predicted by the receiving water (EFDC) model would be highest. Numeric targets for TMDL calculation are based on the appropriate WQOs. Although the ENT WQOs for REC-1 beneficial use may be different based on swimmer usage, the San Diego Water Board uses the most stringent objective for calculating TMDLs in order to be conservative in protecting public health.

12. Use of conservative assumptions to comprise an implicit Margin of Safety.

***Comment*:** This is fine. Otherwise, an MOS is arbitrary.

The only large issue, and it is not clear where to make it in this list of 12 review issues, is the bird contribution. The documents state that there are no good census data for birds, yet the vast majority of fecal indicator bacteria projected in this study are from birds. The lack of data for the majority projection contributes to a serious amount of uncertainty in this effort. Because the model is constrained by the land use relationships and bacterial die off rates, the majority waste load is predicted to be from a wholly unquantified source: the birds. This is most problematic and leads to a great deal of uncertainty.

Response: The San Diego Water Board agrees there is uncertainty regarding the quantification of bacteria from natural (waterfowl) sources. However, as discussed in the response to the comment for item 6, the TMDL that is calculated includes the maximum allowable bacteria load that can be received from the uncontrollable natural sources and still allow to receiving waterbody to assimilate the bacteria load from the watershed sources without exceeding the numeric targets. Therefore, the TMDL is protective of beneficial uses, even if the bacteria loads attributed to natural (waterfowl) sources are a significant portion of the TMDL. Until a study is performed to quantify the loads from natural sources, the San Diego Water Board believes that the approach

taken in the Technical Report is the most conservative approach for calculating the TMDLs and protecting the designated beneficial uses of the waterbodies.

13. Calculations of wasteload allocations, load allocations and TMDLs during dry and wet weather.

***Comment*:** Ironically, the majority of the fecal bacteria loaded to these sites are predicted (by default) to be from waterfowl. The miniscule amounts to be removed from the watershed will likely do little to protect public health. Why are there no efforts in this TMDL to address the birds as sources? Shouldn't data be collected to determine if birds are indeed the major sources? If this is a major source of fecal bacteria to the coastal ocean beaches, then we should be concerned: we already know well as a society that at least viruses can be transmitted from birds to humans. Can the birds as a source of fecal bacteria really be ignored from a TMDL as such?

Response: The San Diego Water Board disagrees that removing the loads from the watersheds will do little to protect public health, because watershed sources such as leaking sewer lines or feces from domestic animals can contain harmful pathogens. However, we agree that loading from waterfowl is a major source of uncertainty when calculating TMDLs.

As discussed in the responses to the comments for items 6, 9 and 12, the calculated TMDLs are protective of the designated beneficial uses, thus public health, even if the bacteria loads attributed and allocated to natural (waterfowl) nonpoint sources are a significant portion of the TMDL. The fact that there are no data available to quantify the load from natural (waterfowl) sources only emphasizes the need for collecting additional data. The calculated TMDLs do not ignore birds as a source of fecal bacteria. Instead, the TMDLs indicate that natural sources are a significant part of the bacteria loading. At this time, the calculated TMDLs assume that natural sources are uncontrollable and are a significant source of bacteria. However, the San Diego Water Board believes that future studies and data collection may help to determine if identified natural sources can indeed be controlled.

<u>Overarching Questions:</u>

(a) In reading the staff technical reports and proposed implementation language, are there any additional scientific issues that are part of the scientific basis of the proposed rule not described above? If so, please comment with respect to the statute language given above.

Comment: A main issue is the continuing focus on fecal indicator bacteria and the uncertainty of the relationship to human health in these mostly non-point source scenarios. The development of TMDLs and the implementation of them against a backdrop of great uncertainty regarding their effectiveness to protect human health

represents an unwise expenditure of public funds. At the very least, additional scientific understanding needs to be gained regarding the real presence of pathogens, the real incidences of human illness, the real risk to human health, and the probability of animal-to-human disease transmission (particularly in the regions heavily visited by shore birds).

Response: As discussed above, the TMDLs that were developed in the Technical Report are protective of the designated beneficial uses, thus public health, even if the bacteria loads attributed and allocated to natural (waterfowl) nonpoint sources are a significant portion of the TMDL. The water quality standards, which are based on beneficial uses and WQOs, provide the backdrop against which the TMDLs must be developed. The San Diego Water Board recognizes that there is uncertainty in the development of these TMDLs, and agrees that additional information and data are needed to fully evaluate the real risk to human health. However, given the lack of available data, the development of these TMDLs serve as a conservative starting point for restoring and protecting the impaired waterbodies. As additional studies are performed and data collected, additional refinement of these TMDLs and allocations may be conducted.

(b) Taken as a whole, is the scientific portion of the proposed rule based upon sound scientific knowledge, methods, and practices?

Comment: The technical choices of models and model parameters appear to be sound, and their implementation appears to be sound except for the fact that the majority load is from an unquantified source. Also, as stated above, the current scientific opinion in water quality monitoring is that fecal indicator bacterial concentrations do not adequately capture evidence of pollution relatable to human health in a non-point setting. Without truly knowing the sources and also real presence of pathogens, these TMDL efforts to account for fecal indicator bacteria and to simulate their transport and routing from one place to another does little to really inform water quality managers of the true magnitude of the problem and thus real threat to public health. If the main goal is to serve compliance needs, then TMDL development around fecal indicator bacteria is fine but the actual magnitude of sources needs to be established.

Response: The San Diego Water Board is familiar with the issues raised by the reviewer. However, as the reviewer has commented below, the “number of possible pathogens is too great to make it either practical and perhaps even feasible to monitor them directly.” Therefore, bacteria are measured as surrogates for pathogens. Also, given the variability and unpredictability of bacteria levels observed both spatially and temporally in the receiving waters evaluated, a source study would be prohibitively expensive (likely in the millions of dollars) as it would require a significant amount of sampling of over time and in several location for each shoreline segment to establish the potential sources of bacteria. The San Diego Water Board would encourage such studies to be undertaken by the dischargers and other interested parties.

Comment (cont'd): Also, again, as stated above, if birds are related to natural background sources, then a potential threat to human health is being ignored and at least unquantified. Bird fecal material at beaches, especially where it is suspected that this material contributes to the majority of waste load to a beach, really should be addressed.

Response: As discussed above, even though the bacteria loads attributed to natural (waterfowl) sources are a significant portion of the TMDL, the TMDLs that were developed are protective of beneficial uses, as well as public health, because they are based on the WQOs from the Basin Plan. The San Diego Water Board believes that the approach taken in the Technical Report is the most conservative approach for calculating the TMDLs and protecting the designated beneficial uses of the waterbodies evaluated.

Other Specific Comments

Comment:

The language used in this arena of "pathogen TMDLs" is very important to consider. Pathogen TMDLs are rather new and California is newly creating them; many will be templates for elsewhere in the U.S. The concept of indicators and what they can and cannot tell us is confusing, but if we as a society are to improve the indicator system, we must be mindful of describing it accurately so that the public can embrace and understand the need for improvements.

That said, some specific comments regard the use of language from a scientific accuracy standpoint. They include:

1. Executive Summary: "Bacteria have been historically used as indicators of human pathogens because bacteria are easier and less costly to measure than the pathogens themselves". The word "fecal" should precede "bacteria" in both occurrences in this sentence. Also, "easier" and "less costly" are equivalent because "time is money". However, the real reasons for using fecal bacteria as indicators are that: 1) there is historical evidence linking swimmer illness to fecal indicator bacteria, 2) it has been impractical, if not impossible, to monitor all pathogens directly, and 3) indicators, if they are good tracers for pathogens, negate the need for the latter.

Response: The Executive Summary has been revised.

2. Introduction (1st paragraph): Similar comment as above. Additionally, the second paragraph should convey that the number of possible pathogens is too great to make it either practical and perhaps even feasible to monitor them directly. Further, if only a subset of pathogens are monitored, water quality managers risk not detecting others for which they are not assaying. The last two sentences of this paragraph are good.

Response: The Introduction has been revised.

3. Problem Statement (page 4, next to last and last paragraphs): "Fecal indicator" should precede "bacteria" in this statement. There are approximately 10^8 bacteria per gram of surface soil nearly everywhere in the world. Thus, "bacteria" is too general of a work to use in this sentence without the suggested qualifiers. Similarly, in the last paragraph on this page, "fecal" should be added before "bacteria" in every occurrence of the latter.

Response: The suggested revisions were incorporated into the Technical Report.

4. Section 2.1, 1st paragraph: Whether or not the bays's assimilative capacity is indeed "increased" (above what?) due to tidal flushing depends entirely on the amount of mixing and flushing that occurs. With Proposition 40 support, the County of Orange will be testing the use of Oloids off Baby Beach to improve circulation. Given the investment as such, the assimilative capacity must be short of optimal.

Response: The San Diego Water Board agrees that these waterbodies are relatively enclosed bays and flushing may be limited. However, tidal flushing does occur. The mixing and flushing that occurs is greater than if the bays were completely closed. Hence, the assimilative capacity is increased compared to a totally closed waterbody, such as a lake, without the benefit of any tidal flushing whatsoever.

Comments from Professor Barber

1. Use of land use composition to quantify bacteria sources from all watersheds to affected beaches and creeks in the San Diego Region.

Comment: This appears to be a potential source of uncertainty in the TMDL values. While the lack of data forces this approach, attempts to correlate land use to fecal coliform and enterococci generally result in correlations coefficients (R^2) between 0.6 and 0.8. Some studies have shown little to no correlation between coliform and enterococci. This is an acceptable first step but more data is needed.

Response: The San Diego Water Board concurs that more data are needed to refine analysis. The approach was designed in such a way that modifications or further verification can be easily performed as new data become available. It is our hope that the technique will be further refined as new data are collected.

2. Use of wet weather model to simulate fate and transport of bacteria, and to calculate TMDLs.

Comment: LSPC (and its predecessor HSPF) have been used extensively throughout the country to reasonably predict flows and pollutant concentrations for TMDL analysis. It is unclear if the model is capable of handling likely bacteria sources from recreational boats and marinas if those are a potential source in these areas.

Although somewhat less used, EFDC is being touted by EPA as an important tool in their TMDL Toolbox. There is no reason to believe that it would not work in this setting subject to the limitations of any model developed with limited data. Appendix G contains sufficient information on the input parameters used. According to the results shown in Appendix H, the model seems to over estimate temperature during warm (presumably dry) periods. Any impact this may have on fecal coliform die-off or regrowth should be noted.

Response: We concur that LSPC is incapable of simulating bacteria sources from recreational boats and marinas. However, this model was only applied to the watershed for estimation of bacteria loads from stormwater runoff. Since bacteria loads from recreational boats and marinas are within receiving waters, the EFDC model was used to determine loads associated with these source. Additional detail regarding these modeling assumptions are discussed in Section 7.2.2 and Appendix G (now revised to Appendix F).

For some periods, the EFDC model over-predicted temperature during summer months by 3º C or less. As discussed in Section G.3.2.d of Appendix G (now revised to Section F.3.2.4 of Appendix F), bacteria die-off rates included a slight dependency on temperature, with a factor of 1.01 day^{-1} $ºC^{-1}$ multiplied by the die-off rate. This can potentially result in a 0.03 day^{-1} increase in the die-off rate. It should be noted that all die-off rates in the EFDC model were changed (per peer review comments) to 0.8/day consistent with a typical value reported in Chapra (1997). Compared to this base assumption for die-off, the 0.03 day^{-1} discrepancy will have a minor impact on model predictions.

Comment cont'd: For the general public, the phrase 'quasi-steady-state' should be more clearly defined.

Response: Steady-state refers to a system that is in a balanced condition of inputs, outputs, and internal gains and losses. For this case, state-state is used to define dry weather conditions that are assumed to represent a constant, average condition representative of critical dry loads and receiving water volume. The "quasi" aspect refers to conditions under steady state that can vary, including tidal variations that affect receiving water volume and hence the assimilative capacity of pollutants.

Comment cont'd: Meteorological data for wind speed and direction were obtained from 1990 to 2004 but it is unclear how this information was used in the SDB area.

Apparently wind was not included in the Baby Beach model. Given the difference in temperature and salinities between freshwater and ocean water, neglecting wind could impact model results.

Response: Wind speed and direction were used by the San Diego Bay model for simulation of hydrodynamic mixing due to wind effects. As suggested in the comment, wind effects were added to the Dana Point Harbor model and differences were noticed. As a result, wind was added to the model for TMDL calculations. The result is an increase in the load allocation to natural sources. The Technical Report and TMDLs were revised to reflect this change.

Comment cont'd: It is difficult to know if the model domain encompasses the region that would be impacted by the SHELL WQO. The use of SHELL criteria may be overly restrictive if the shellfish beds or areas of potential exposure are some distance from the bay/harbor. It may be that the entire region is restricted by shellfish use but that was not made clear.

Response: Applicable beneficial uses for San Diego Bay and Dana Point Harbor, according to the Basin Plan, are presented in Table 2-3 of the Technical Report. The SHELL beneficial use is applicable to the waters, as well as the shorelines, of San Diego Bay and Dana Point Harbor, so distance from the shellfish beds or areas of potential exposure is not a factor. However, the TMDLs based on the WQOs for SHELL have been removed from this project and technical report and will be addressed in a separate TMDL or water quality standards action. Thus, this comment is no longer relevant.

3. Use of single-sample maximum objectives for wet weather numeric targets.

Comment: Justification for use of single sample maximum exceedance values for wet weather numeric targets is adequate and in line with the USEPA 2000 BEACH Act. These criteria are likely to represent conservative values. States are often left trying to pick whether to regulate based on single-sample maximums or geometric means and there does not appear to be a clear choice.

Response: The San Diego Water Board agrees that the justification for use of single sample maximum exceedance values are adequate for wet weather numeric targets.

4. Reasonableness of assumptions (described in Appendix L) for wet-weather modeling.

Comment: It is not clear that the selection of 1993 as the critical year because it represents the 90th percentile rainfall data is a conservative assumption. The data shown in Appendix E do not appear to be well correlated with rainfall. In fact, often the data seem to decrease during or immediately following rainfall. It seems like the

decision of wet-weather modeling should be based on average 30-day load rather than flow. Furthermore, do the higher flows cause the model to predict higher concentrations at the critical TMDL locations?

Response: Data presented in Appendix E illustrate critical conditions for both dry and wet weather. The fact that most of the data presented in Appendix E appears coincidental with dry conditions is not an indication of lack of correlation with wet conditions, but rather that most data were collected during dry conditions. Also, the criteria for selection of wet and dry days, with wet periods defined by the occurrence of at least 0.2 inches of rainfall (measured at the closest rainfall gage) and the following 72 hours, can potentially lead to identification of wet conditions that were actually more associated with dry, or visa versa. For this reason, results of analyses were qualitative in nature and meant to indicate that both wet and dry conditions result in exceedances of water quality objectives, but not to definitively prove which condition was more critical. Both conditions were considered in separate technical approaches with distinct considerations to pollutant sources and critical conditions. Selection of 1993 as the critical year is specific to wet conditions. Since most wet conditions do not span 30 days and are more episodic in nature, the single sample maximum was considered the most appropriate numeric target, requiring analysis of daily loads and hence daily flows and associated water quality. Dry conditions and associated watershed loads were considered in separate analysis for TMDL calculation. Based on receiving water modeling, higher bacterial densities were observed during wet conditions with higher watershed flows (see Appendix I, now revised to Appendix H).

Comment cont'd: Why wasn't the tidal period chosen to match the period of flow? The criteria for selection of the March-April 2001 observed tidal data was not clear.

Response: The 30-day critical wet weather period, when flow and bacteria were highest, was used for the watershed (LSPC) model. The 30-day critical tidal period, when tidal fluctuation and assimilative capacity of the receiving water was lowest, was used for the receiving water (EFDC) model. The combination of these two 30-day critical periods provide the most conservative possible combination of wet weather flow conditions and low tidal conditions. The Technical Report has been revised to present the criteria for selecting the 30-day critical wet weather period and 30-day critical tidal period more clearly.

Comment cont'd: Appendix L reasonably describes the assumptions that were made in developing the wet-weather model. However, the impacts of these assumptions are not well described. For example, the authors write that the shoreline bacteria die-off rates were 0.6, 0.6 and 0.5/day which were less than Chapra's 0.8/day value. Was any sensitivity done to show how this impacts the results? Why was one of the values less than the other two? It is hard to make the claim later on that the assumptions result in a conservative MOS without understanding the relative impacts of each of the many assumptions.

Response: The original bacteria die-off rate was selected to be slightly lower than Chapra's default 0.8/day value for the consideration of the conservative assumption in the MOS. However, sensitivity analyses were performed and it was noted that the bacteria concentration at the beach area was insensitive to the slight reduction of base die-off rate, indicating that the conservativeness caused from these lower die-off rates is insignificant. As a result, baseline die-off rates for each indicator bacteria were changed to 0.8/day in the model, consistent with the typical value reported by Chapra (1997). The TMDL report was modified to reflect these changes.

5. Use of wet weather modeling parameters to simulate build-up/wash-off of bacteria from similar studies in San Diego and Los Angeles (SDRWQCB, 2005 and LARWQCB, 2002).

Comment: As I am unfamiliar with the similarities and differences between the LA and SD watersheds, it is somewhat difficult for me to assess whether the use of model results for Santa Monica Bay are appropriate. Given the lack of other information and the claim that "..San Diego Region are sufficiently similar to characteristics of …Los Angeles" it would seem like this is a reasonable assumption as a starting point. The variability between watersheds as well as the assumptions underlying the original study should be understood by the authors.

Response: The model developers have been involved in developing LSPC models for both the San Diego and Los Angeles Region (e.g., LA River and San Gabriel River), and differences and similarities between watersheds, associated data, and applicability of modeling parameters are well understood.

6. Use of dry weather and receiving water model to simulate fate and transport of bacteria, and to calculate TMDLs.

Comment: The regression equations used in the plug-flow reactor model for cross-sectional area and width are likely to be wrong. The correlation coefficients were relatively poor to begin with (R^2 = 0.51 for area relationship) and this was for flows up to 15 cfs. The dry weather flows were considerably less than this, with most under 1 cfs. The significance of this in terms of predicted loading to the bays, however, is not clear. At such low flows whether the width is 2 feet or 5 feet may not be significant in terms of load estimates. A sensitivity analysis of the results to this could easily be completed.

Response: The regression equations associated with cross-sectional area and width and the plug flow reactor models were only used in original development of models in Bacteria TMDL Project I to provide verification of model performance at instream monitoring locations (following calibration and validation of stream infiltration and bacterial die-off rates). However, as shown in Appendix F (now revised to Appendix J), all drainage areas modeled in this study consisted of watersheds requiring no routing through downstream subwatersheds. This was due to their small

sizes and lack of need for multiple subwatersheds. Therefore, only equations 6, 7, and 8 of Appendix G (now revised to Appendix F) were used to estimate loadings from watersheds of San Diego Bay and Dana Point Harbor. As a result, impacts of regression equations associated with cross-sectional area and width did not require sensitivity analysis as they were not a factor in load estimates.

Additional discussion was added to Appendix G (now revised to Appendix F) to better explain application of the models from Bacteria TMDL Project I to San Diego Bay and Dana Point Harbor, and the lack of simulation of stream routing. In addition, assumptions associated with the plug flow reactor model were mistakenly listed in Appendix L (now revised to Appendix G) that summarized dry weather modeling assumptions, and were therefore removed.

7. Use of data from Aliso, San Juan, Rose, and Tecolote Creeks to characterize dry weather source loading in the entire San Diego Region.

Comment: The assumptions inherent in this approach have the potential to introduce significant amounts of uncertainty into the TMDL analysis. The assumption that these four creeks are representative of the area does not appear to have been validated. Insufficient information is provided regarding the relative locations, watershed characteristics, land use patterns, bird habitat, and neighborhood preferences regarding water use practices to adequately evaluate this assumption. Moreover, the use of phase "good fit" to describe R^2 values of 0.74 for flow and 0.67 and 0.77 for correlations between FC and TC and ENT is at least debatable. This is especially true because you end up multiplying flow by concentration to get load so the combined variability could be quite large. Several studies have shown a lack of correlation between fecals (*E. Coli*) and ENT but the ability to extrapolate from regional data is difficult. It is hard to know how this uncertainty affects the conservative assumptions used to justify an implicit MOS.

Most of the dry season flows are less than 1.0 cfs. It would be interesting to know how these small discharges were measured or if they were estimated.

Response: San Juan Creek and Aliso Creek watersheds are both within five miles of Dana Point Harbor (San Juan Creek actually discharges adjacent to Dana Point Harbor). Tecolote Creek and Rose Creek watersheds are both within five miles of most San Diego Bay watersheds. Land uses for each watershed included in this TMDL are summarized in Table G-1 of Appendix G (now revised to Table F-1 of Appendix F), which were based on the same land use datasets used in analyses of San Juan, Aliso, Tecolote, and Rose Creeks. The dominant land uses in these watersheds are shown as low-density residential (LDR), high-density residential (HDR), commercial/institutional (COM), industrial/transportation (IND/TRN), parks/recreation (PRK/OPR), and open space (OPS). Equations 6 and 7 of Appendix G (nor revised to Appendix F), which were regression analyses performed on monitoring data and land use in San Juan, Aliso, Tecolote, and Rose Creeks,

showed a correlation based on the following land uses for prediction of dry flows and fecal coliform: COM, OPS, LDR, HDR, PRK, IND, TRN, OPR. These land uses are an exact match to those dominant land uses in the San Diego Bay and Dana Point Harbor watersheds. Data specific to water use practices in the watersheds were not available and though they may have provided some additional evidence of sources of urban runoff, they were not considered in this analysis. Bird habitat information was not considered since such sources are typically very difficult to quantify and correlate with dry urban runoff sources. Although bacteria source identification studies in southern California watersheds typically show a major source of bacteria in runoff to be associated with birds, correlation among watersheds based on bird habitat information is extremely difficult and data intensive, and was not considered productive for this study. Based on the land use and geographical considerations above, as well as previous efforts in Bacteria TMDL Project I, the ability of San Juan, Aliso, Tecolote, and Rose Creeks to characterize conditions of the watersheds of San Diego Bay and Dana Point Harbor were considered justified.

The San Diego Water Board concurs that there is uncertainty for estimation of flows and indicator bacteria based on the regression equations, and although the "good fit" of correlations is debatable, the R^2 values do indicate correlation. In addition to correlations, a general comparison of predicted and observed flows and TC and ENT concentrations are shown in Figures G-3, G-5, and G-6 (now revised to Figures H-3, H-5, and H-6).

The observed and predicted flows in Aliso, Rose, and Tecolote Creeks are shown in Figure G-3 (now revised to Figure H-3) to follow a similar trend, and all are below 1.2 cfs for the watersheds evaluated. Flows from these watersheds were measured and reported by the City of San Diego and the Orange County Public Facilities and Resources Department; specific methods for flow estimation are unknown. Based on the associated equation 6 of Appendix G (now revised to Appendix F), all flows to the San Diego Bay and Dana Point Harbor shorelines were estimated to be less than 0.5 cfs, with flows to Shelter Island Shoreline Park at zero flows. Given these small flows, sensitivities would have varied by insignificant increments of hundredths of a cfs, and were therefore not considered.

We concur that there is much uncertainty in FC, TC, and ENT predictions based on equations 7 and 8 of Appendix G (now revised to Appendix F). However, predicted concentrations for runoff to San Diego Bay and Dana Point Harbor were based strictly on these equations that attempted to provide the best fit to data, and therefore represent typical or average conditions. These predictions did not incorporate additional measures to ensure conservativeness for the implicit MOS.

8. Use of geometric mean objectives for dry weather numeric targets.

Comment: This is the preferred way to compute long-term numeric targets during low flow (dry weather) conditions. It allows for watershed planning activities to address the

big picture issues and reduces the possibility that one aberrant sample will lead to the wrong conclusion.

Response: The San Diego Water Board agrees that the use of geometric means is the preferred way to compute long-term numeric targets during dry weather flow conditions.

9. Reasonableness of assumptions (described in Appendix L) for dry weather modeling.

Comment: The assumptions for dry weather modeling summarized in Appendix L appear justifiable in the current modeling configuration. Given the lack of data, the significant figures associated with several of the calibrated parameters seem interesting and perhaps conveys accuracy that simply isn't present. If the authors believe some or all of these assumptions to be conservative, they could state it in the appendix to strengthen the case for the implicit MOS approach.

Response: The number of significant digits of calibrated parameters, including stream infiltration and bacteria die-off rates, were not meant to convey a degree of accuracy. Rather, these were the actual values used in model predictions and were reported exactly as used. Major assumptions that dominated the conservativeness of the MOS were outlined in section 7.2.6 (now revised to section 7.2.7).

10. Assumptions used for modeling the impaired shorelines of SDB (B Street and G Street Pier) that had no data for model verification or loading assessment.

Comment: There is certainly some uncertainty associated with this assumption as there is no evidence presented to suggest that these two sites should or should not be similar to the other two sites in the SDB. Activities at the G Street Pier may be very different than at Tidelands Park. My lack of familiarity with these locations does not permit me to adequately evaluate this assumption. Given that the model reasonably tracts measured values, it would appear that these assumptions are sufficient for now but likely to cause finger pointing when specific individuals are asked to adopt mitigation practices.

Response: The San Diego Water Board recognizes that uncertainty is associated with the assumptions used for modeling B Street and G Street. However, the shoreline segments of B Street and G Street have been removed from this project. Thus, this comment is no longer relevant.

11. Location of *critical points* for TMDL calculation.

Comment: The use of both SHELL and REC-1 criteria is difficult to follow especially when the concept of interim numeric targets. The locations of SHELL areas were not

discussed. The use of the entire coast line as the monitoring location seems reasonable.

Response: The distinction between interim and final numeric targets has been removed from the Technical Report. Additionally, the TMDLs based on the WQOs for SHELL have been removed from this project and technical report and will be addressed in a separate TMDL or water quality standards action

12. Use of conservative assumptions to comprise an implicit Margin of Safety.

Comment: The section of an implicit versus explicit margin of safety continues to be debated in the scientific community and section criteria are nonexistent. It is easier to understand an explicit MOS but the selection of a value is generally quite arbitrary. The implicit MOS method adopted by this study is extremely difficult to assess in the current document as no sensitivity analysis were performed. Consequently, the relative importance of each assumption is impossible to quantify and the reader is left wondering exactly what the conservative assumptions are.

Response: In the wet and dry weather modeling analyses, conservative assumptions were used whenever possible, meaning that worst-case scenarios are taking place in terms of existing loading to the receiving waters or the ability of the receiving waters to assimilate the pollutants. The San Diego Water Board recognizes that the relative importance of each conservative assumption cannot be quantified exactly. However, the San Diego Water Board believes the conservativeness of the assumptions used (i.e., critical wet weather period, critical tidal period, critical location, etc.), though not quantified, provide an adequate margin of safety in calculating TMDLs.

13. Calculations of wasteload allocations, load allocations and TMDLs during dry weather and wet weather.

Comment: There appears to be considerable scientific rationalization involved at developing estimates of dry weather wasteload allocations. While uncertainty in the approach exist, the rationalization seems reasonable especially considering the relative loading between MS4 and waterfowl sources. Several sections in Chapter 7 appear unnecessarily repetitive. The discussion of critical period in Section 7.1 is essentially a repeat of previous discussions. For clarity, these duplications should be minimized.

Sections 8.3 and 8.4 should be expanded to explain the data shown in the subsequent tables. The results of the entire study are presented without much context.

Response: The Technical Report has been revised to incorporate the recommended changes.

Overarching Questions:

(a) In reading the staff technical reports and proposed implementation language, are there any additional scientific issues that are part of the scientific basis of the proposed rule not described above? If so, please comment with respect to the statute language given above.

(b) Taken as a whole, is the scientific portion of the proposed rule based upon sound scientific knowledge, methods, and practices?

Comment: I must say that in many ways it seems like this TMDL study is putting the cart in front of the horse. There are many data gaps that required assumptions that will eventually need to be proven in order to justify the expected costs associated with the implementation plan. Some of the watershed percent reduction values presented in Tables 8-2, 8-4, 8-5, 8-6, 8-7, 8-8 (note typos in Table numbers on page 40) are astounding and may not be achievable. As mentioned several times in this review, without a better understanding of the sensitivity of the model predictions it is likely that stakeholders will have a hard time comprehending the significance of what will be asked of them. The implementation plan seems extremely vague given the hopes of reaching up to 99.9 % removal. For instance, Table 8-6 proposes a 99.3 % reduction in enterococcus at the B Street Pier even though the existing watershed load of 25 B MPN/day represents only about 1.5% of the 1640 B MPN/day waterfowl load allocation. It seems that this should be specifically explained.

Response: The San Diego Water Board disagrees that the dry weather load reductions required to meet the WLAs assigned to the MS4s are not achievable. Dry weather flows generated in the urban setting and are completely controllable. If the dry weather flows cease, or are significantly reduced, the dry weather bacteria loads from the watersheds will cease or be significantly reduced.

As for the relative contributions of the existing watershed loads compared to the allocation given to natural (waterfowl) sources, this not an appropriate comparison. The loads attributed to the natural sources are assumed to be constant and uncontrollable, and were calculated as the maximum allowable natural load that may be in the receiving water, which is assigned the natural sources LA, and still meet WQOs. This LA for natural sources was back-calculated by modeling the receiving water to be able to assimilate a load from the watershed that can meet the dry weather numeric targets, which is assigned the MS4 WLA. Therefore, the existing load from the watershed must be compared to the MS4 WLA, not the LA for natural sources. An exceedance of the MS4 WLA will exceed the TMDL if the bacteria loads in the receiving waters are equal to the LA.

Comment (cont'd): Although perhaps outside the scope of this document, a discussion of Best Management Practices that could be used to address the reduction targets could be used. Furthermore, although this may be outside the purview of the

Board, it would seem like requiring NPDES holders to participate in public education and awareness campaigns should be included in the implementation plan.

Response: The Implementation Plan in the Technical Report has been revised to include more details about potential structural and non-structural BMP options for implementation.

Comment (cont'd): When examined in its entirety, the approach appears to be consistent with practices typically adopted for TMDL development. There are a number of assumptions involving professional judgment and empirical relationships necessary due to the lack of site-specific data. In the future, it would be advisable to collect this information to verify these assumptions and make adaptations where necessary.

Response: Monitoring and data collection are required in the Implementation Plan. As additional data are made available, the TMDLs may be revisited and revised, if necessary.

Appendix C

Tentative Resolution No. R9-2008-0027
and
Basin Plan Amendment

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TENTATIVE

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD SAN DIEGO REGION

RESOLUTION NO. R9-2008-0027

A RESOLUTION TO ADOPT AN AMENDMENT TO THE *WATER QUALITY CONTROL PLAN FOR THE SAN DIEGO BASIN (9)* TO INCORPORATE TOTAL MAXIMUM DAILY LOADS FOR INDICATOR BACTERIA, BABY BEACH IN DANA POINT HARBOR AND SHELTER ISLAND SHORELINE PARK IN SAN DIEGO BAY

WHEREAS, the California Regional Water Quality Control Board, San Diego Region (hereinafter San Diego Water Board), finds that:

1. **Basin Plan Amendment**: Total Maximum Daily Loads (TMDLs) and allocations for pollutants that exceed water quality objectives in waterbodies that do not meet water quality standards under the conditions set forth in section 303(d) of the Clean Water Act [U.S. Code Title 33 section 1250, *et seq*., at 1313(d)] ("Water Quality Limited Segments") should be incorporated into the *Water Quality Control Plan for the San Diego Basin (9)* (Basin Plan) pursuant to Article 3, commencing with section 13240, of Chapter 4 of the Porter-Cologne Water Quality Control Act, as amended, codified in Division 7, commencing with section 13000, of the Water Code.

2. **Clean Water Act Section 303(d)**: As required by section 303(d) of the Clean Water Act, specific segments of San Diego Bay and Dana Point Harbor in the San Diego Region were placed on the List of Water Quality Limited Segments because levels of total coliform, fecal coliform, and/or *Enterococcus* at those locations exceeded water quality objectives for water-contact recreation (REC-1)[1] beneficial use. (Measurements of total coliform, fecal coliform, and *Enterococcus* are relied on to indicate the presence of disease-causing pathogens.) The shoreline segments of San Diego Bay and Dana Point Harbor for which water quality is impaired by bacterial pollution, and for which TMDLs have been calculated, are shown below.

Waterbody	Segment / Area	Hydrologic Descriptor	Pollutant / Stressor	Extent of Impairment	Year Listed
Dana Point Harbor	Baby Beach	Dana Point HSA (901.14)	Indicator bacteria	0.4 miles	2002
San Diego Bay	Shelter Island Shoreline Park	Point Loma HA (908.10)	Indicator bacteria	0.4 miles	2002

[1] The Basin Plan also contains shellfish harvesting (SHELL) beneficial use water quality objectives for total coliform. SHELL impairments for total coliform will be addressed in a separate TMDL and/or standards action.

3. **Water Quality Impairments**: The REC-1 beneficial use is particularly sensitive to, and subject to impairment by, pathogens when elevated densities of indicator bacteria exist in the water.[2] Persons who ingest water during recreational activities in waters containing indicator bacteria at densities in excess of water quality objectives for REC-1, are significantly more likely to incur infections or illness caused by pathogens in the water than when indicator bacteria occur at densities consistent with the applicable water quality objectives. REC-1 is a beneficial use of the shorelines of San Diego Bay and Dana Point Harbor where water quality is listed as impaired.

4. **Necessity Standard** [Government Code section 11353(b)]: Amendment of the Basin Plan to establish and implement Total Maximum Daily Loads (TMDLs) for the waters along the impaired shoreline segments of San Diego Bay and Dana Point Harbor is necessary because the existing water quality at the shoreline segments listed in Attachment A does not meet applicable water quality objectives for total coliform, fecal coliform, and/or *Enterococcus* bacteria. Clean Water Act section 303(d) requires the establishment and implementation of TMDLs under the water quality conditions that exist at these shoreline segments. TMDLs for total coliform, fecal coliform, and/or *Enterococcus* bacteria are necessary to promote attainment of applicable water quality objectives and restoration of water quality needed to support the beneficial uses designated for the shorelines of San Diego Bay and Dana Point Harbor.

5. **Water Quality Objectives**: Water quality objectives for bacteria the coastal waters of the Baby Beach and Shelter Island Shoreline Park shorelines, expressed as the most probable number of bacteria colonies per 100 mL of water sample (MPN/100 mL), are contained in the Basin Plan.

   The water quality objectives for indicator bacteria in inland surface waters and enclosed bays and estuaries designated as having the REC-1 beneficial use include:

   i. Total Coliform (Bays and Estuaries): Total coliform bacteria density shall be less than 1,000 per 100 ml (10 per ml); provided that not more than 20 percent of the samples at any station, in any 30-day period, may exceed 1,000 per 100 ml (10 per ml) and provided further that no single sample when verified by a repeat sample taken within 48 hours shall exceed 10,000 per 100 (100 per ml).

   ii. Fecal Coliform (Marine Waters): Based on a minimum of not less than five samples for any 30-day period, fecal coliform bacteria density shall not exceed a log mean of 200 per 100 ml, nor shall more than 10 percent of total samples during any 30-day period exceed 400 per 100 ml.

   iii. *Enterococcus* (Marine Waters): The geometric mean of *Enterococcus* bacteria shall not exceed 35 colonies per 100 ml. The single sample maximum allowable density in designated beach areas is 104 colonies per 100 ml, in

[2] Water quality objectives for indicator bacteria in waters with non-water-contact recreation (REC-2) are less stringent than the water quality objectives for REC-1, therefore, attainment of REC-1 objectives through the implementation of TMDLs will, *a fortiori,* provide the requisite water quality for REC-2.

moderately or lightly used areas is 276 colonies per 100 ml, in infrequently used areas is 500 colonies per 100 ml.

6. **Numeric Targets**: Numeric Targets are established for the purposes of calculating TMDLs. The numeric targets for these TMDLs consist of the REC-1 water quality objectives for indicator bacteria contained in the Basin Plan. Since numeric targets are equal to the water quality objectives for total coliform, fecal coliform, and enterococci bacteria cited in finding 5, attainment of TMDLs will ensure attainment of these water quality objectives.

7. **Sources of Bacteria**: Sources of bacteria are the same under both wet weather and dry weather conditions. Bacteria can enter surface waters from both nonpoint and point sources. Nonpoint sources are typically diffuse sources that have multiple routes of entry into surface waters. Point sources typically discharge at a specific location from pipes, outfalls, and conveyance channels. The only nonpoint sources identified were natural or background sources, such as direct inputs from birds, terrestrial and aquatic animals, wrack line and aquatic plants, sediments, or other unidentified and unquantified sources within the receiving waters. The only allowable point source identified was discharges from municipal separate storm sewer systems (MS4s), although other point sources may exist. For both wet weather and dry weather conditions, there are natural and background sources of bacteria within the receiving waters at the impaired shoreline segments. These nonpoint sources of bacteria are generally considered uncontrollable. However, for sources of bacteria that originate from the watersheds draining into the receiving waters, which are located entirely within urbanized areas, the method of transport for the two conditions is very different. Wet weather loading originating from the watersheds is dominated by episodic storm flows that wash off bacteria that build up on the surface of all land use types in a watershed during dry periods. Dry weather loading originating from the watersheds is dominated by nuisance flows from urban land use activities such as car washing, sidewalk washing, and lawn over-irrigation, which pick up bacteria and deposit it into receiving waters. Because the watersheds draining into the receiving waters are located entirely within urbanized areas, and therefore surface runoff is collected and discharged from MS4s, the watershed sources of bacteria are controllable.

8. **Water Quality Objective Violations**: Bacteria densities at the impaired shoreline segments of Baby Beach and Shelter Island Shoreline Park have frequently exceeded water quality objectives.

9. **Relationship Between Bacteria and Pathogens:** Fecal indicator bacteria originate from the intestinal biota of warm-blooded animals, including humans, and their presence in surface water is used as an indicator of the possible presence of human pathogens (*i.e.*, organisms that can cause illness in people exposed through recreational water use and people who harvest and eat filter-feeding shellfish; pathogens include protozoans, bacteria, viruses, and other disease-causing organisms). Bacteria have been historically used as indicators of human pathogens because the probability of disease is directly correlated with the density of indicator

bacteria in waters used for recreation and because the indicator bacteria are easier and less costly to measure than the pathogens themselves. If TMDLs for indicator bacteria are attained, then water quality objectives are met, and health risks associated with pathogens are minimal.

10. **Total Maximum Daily Loads** [Code of Federal Regulations Title 40 section 130.2(i)]: TMDLs for bacteria are equal to the total assimilative or loading capacities of the receiving waters along the shorelines of Baby Beach and Shelter Island Shoreline Park for total coliform, fecal coliform, and *Enterococcus* bacteria. The loading capacities are defined as the maximum amount of fecal coliform, total coliform and *Enterococcus* that the waterbody can receive and still attain water quality objectives necessary for the protection of designated beneficial uses. Each TMDL must accommodate all known sources of a pollutant, whether from natural background, nonpoint sources, or point sources, and must include a margin of safety (MOS) to preclude pollutant loading from exceeding the actual assimilative capacities of the waterbodies. The TMDL calculations also account for seasonal variations and critical conditions and were developed in a manner consistent with guidelines published by USEPA.

11. **Allocations and Reductions**: Discharges of bacteria from all identified sources that are susceptible to control or management must be reduced in order to keep total bacterial loads as close to the TMDLs and actual assimilative capacities of the impaired waters as possible. Discharges from controllable sources were identified as originating from MS4s for urbanized sources. Controllable sources must be reduced by an amount in proportion to the existing loads generated in each watershed, as calculated using a computer model. TMDLs are reported on a watershed basis and must be jointly achieved by all dischargers of bacteria located in the watersheds. Natural sources of bacteria are considered uncontrollable and no load reductions are necessary.

12. **Implementation Plan**: The report entitled *Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay,* (Technical Report) dated June 11, 2008 presents a summary of measures that, if adopted by the San Diego Water Board, the State Water Resources Control Board (State Water Board), and local governmental agencies, will promote attainment of the load reductions needed to keep discharges of bacteria at or below the TMDLs calculated for these waterbodies. Section 303 of the Clean Water Act and the federal NPDES regulations direct USEPA and authorized states to impose requirements consistent with TMDLs for point source discharges to "impaired" waterbodies. When the San Diego Water Board and State Water Board re-issue or revise National Pollutant Discharge Elimination System (NPDES) requirements for municipal storm water discharges, they will have to include requirements that will implement all TMDLs applicable to waters affected by the regulated discharges.

13. **Compliance Monitoring**: Monitoring including pollutant load reductions, changes in urban runoff and discharge water quality, and changes in receiving water quality will

be necessary to assess effectiveness in achieving load and wasteload allocations and compliance with the water quality objectives for total coliform, fecal coliform, and *Enterococcus* bacteria.

14. **Scientific Peer Review**: The scientific basis for these TMDLs has undergone external peer review pursuant to Health and Safety Code section 57004. The San Diego Water Board has considered and responded to all comments submitted by the peer review panel, and has enhanced the Technical Report appropriately. No change to the fundamental approach to TMDL calculation was necessary as a result of this process.

15. **CEQA Requirements:** Pursuant to Public Resources Code section 21080.5, the Resources Agency has approved the Regional Water Boards' basin planning process as a "certified regulatory program" that adequately satisfies the California Environmental Quality Act (CEQA) [Public Resources Code section 21000 et seq.] requirements for preparing environmental documents [California Code of Regulations Title 14 section 15251(g); California Code of Regulations Title 23 section 3782]. As such, the documents supporting the San Diego Water Board's proposed basin planning action contain the required environmental documentation under CEQA and serve as "substitute documents" [California Code of Regulations Title 23 section 3777]. The substitute documents for this project include the environmental checklist, the detailed Technical Report, responses to comments submitted during the public participation phase in the development of the TMDLs, and this resolution. The project itself is the establishment of TMDLs for indicator bacteria for the shoreline segments of San Diego Bay and Dana Point Harbor where water quality has been listed as "impaired" by the State Water Board pursuant to section 303(d) of the Clean Water Act, as required by that section. While the San Diego Water Board has no discretion to not establish the TMDLs (the TMDLs are required by federal law), the Board does exercise discretion in assigning wasteload allocations and load allocations, determining the program of implementation, and setting various milestones in achieving the applicable water quality objectives at the affected shorelines.

16. **Project Impacts:** The accompanying CEQA substitute documents satisfy the requirements of substitute documents for a Tier 1 environmental review under CEQA, pursuant to Public Resources Code section 21159 and California Code of Regulations Title 14 section 15187. Potentially significant impacts were identified that can be mitigated to less than significant levels. Broad mitigation approaches have been identified that if employed, would reduce the potentially significant adverse impacts identified to less than significant. However, nearly all of the compliance obligations anticipated to be necessary to implement the TMDLs for indicator bacteria will be undertaken by public agencies that will have their own obligations under CEQA for implementation projects that could have significant environmental impacts (*e.g.*, installation and operation of structural best management practices). Project level impacts will need to be considered in any subsequent environmental analysis performed by other public agencies pursuant to Public Resources Code section 21159.2.

If not properly mitigated at the project level, implementation and compliance measures undertaken could have significant adverse environmental impacts. The substitute documents for this TMDL identify broad mitigation approaches that if employed, would reduce the potentially significant adverse impacts identified to less than significant. However, such mitigation approaches are within the responsibility and jurisdiction of other public agencies, and not the San Diego Water Board. Water Code section 13360 precludes the San Diego Water Board from dictating the manner in which responsible agencies comply with any of the San Diego Water Board's regulations or orders. The San Diego Water Board does not engage in speculation or conjecture regarding the projects that may be implemented to comply with the TMDLs and only considers the reasonably foreseeable alternative methods of compliance, the reasonably foreseeable feasible environmental impacts of the these methods of compliance, and the reasonably foreseeable mitigation measures which would avoid or eliminate the identified impacts, all from a broad general perspective consistent with the uncertainty regarding how the TMDLs, ultimately, will be implemented. When the agencies responsible for implementing projects to comply with this TMDL determine how they will proceed, the agencies responsible for those parts of the project can and should incorporate such mitigation approaches into any subsequent projects or project approvals. The lengthy implementation period allowed by the TMDLs will allow persons responsible for compliance with wasteload allocations to develop and pursue many compliance approaches and mitigation measures.

17. **Project Mitigation:** The proposed amendment to the Basin Plan to establish TMDLs for indicator bacteria in the receiving waters at the shoreline segments of San Diego Bay and Dana Point Harbor could have a significant adverse effect on the environment. However, there are feasible alternatives, feasible mitigation measures, or both, that would substantially lessen any significant adverse impact. The public agencies responsible for implementation measures needed to comply with the TMDLs can and should incorporate such alternatives and mitigation into any projects or project approvals that they undertake for the impaired shoreline segments. Possible alternatives and mitigation are described in the CEQA substitute documents, specifically the Technical Report and the environmental checklist. To the extent the alternatives, mitigation measures, or both, are not deemed feasible by those agencies, the necessity of implementing the TMDLs that is mandated by the federal Clean Water Act and removing the bacteria impairments within waterbodies in the San Diego Region (an action required to achieve the express, national policy of the Clean Water Act) outweigh the unavoidable adverse environmental effects identified in the substitute documents.

18. **Department of Fish and Game Filing Fee**: Considering the record as a whole, this Basin Plan amendment will result in no effect, either individually or cumulatively, on wildlife resources.

19. **Economic Analysis**: The San Diego Water Board has considered the costs of the reasonably foreseeable methods of compliance with the load and wasteload allocations specified in these TMDLs. The most reasonably foreseeable methods of

compliance involve implementation of structural and non-structural controls. Surface water monitoring to evaluate the effectiveness of these controls will also be necessary.

20. **Stakeholder and Public Participation**: Interested persons and the public have had reasonable opportunity to participate in review of the proposed TMDLs. Efforts to solicit public review and comment included a public workshop and CEQA scoping meeting in March 2003, a public workshop in March 2004, three meetings with the Stakeholder Advisory Group, a public review and comment period consisting of 48 days, and a public hearing on April 9, 2008. Notices for all meetings were sent to interested parties including cities and counties with jurisdiction in watersheds draining to the bacteria impaired shoreline segments. All of the written comments submitted to the San Diego Water Board during the review and comment periods have been considered in Appendix N to the Technical Report.

21. **Public Notice**: The San Diego Water Board has notified all known interested parties and the public of its intent to consider adoption of this Basin Plan amendment in accordance with Water Code section 13244.

NOW, THEREFORE, BE IT RESOLVED THAT:

1. **Environmental Documents Certification**: The substitute environmental documents prepared pursuant to Public Resources Code section 21080.5 are hereby certified, and the Executive Officer is directed to file a Notice of Decision with the Resources Agency after State Water Board and Office of Administrative Law (OAL) approval of the Basin Plan Amendment, in accordance with section 21080.5(d)(2)(E) of the Public Resources Code and the California Code of Regulations Title 23 section 3781.

2. **Amendment Adoption**: The San Diego Water Board hereby adopts the attached Basin Plan amendment as set forth in Attachment A hereto to establish TMDLs for indicator bacteria at Baby Beach and Shelter Island Shoreline Park.

3. **Technical Report Approval:** The San Diego Water Board hereby approves the Technical Report entitled *Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay*, dated June 11, 2008.

4. **Department of Fish and Game Filing Fee**: The Executive Officer is authorized to request a "No Effect Determination" from the California Department of Fish and Game, or transmit payment of the applicable fee as may be required by the California Department of Fish and Game.

5. **Agency Approvals**: The Executive Officer is directed to submit this Basin Plan amendment to the State Water Board in accordance with Water Code section 13245.

6. **Non-Substantive Corrections**: If, during the approval process for this amendment, the San Diego Water Board, the State Water Board, or the OAL determines that

minor, non-substantive corrections to the language of the amendment are needed for clarity or consistency, the Executive Officer may make such changes, and shall inform the San Diego Water Board of any such changes.

I, John H. Robertus, Executive Officer, do hereby certify that the foregoing is a full, true and correct copy of a resolution adopted by the California Regional Water Quality Control Board, San Diego Region, on June 11, 2008.

_____

JOHN H. ROBERTUS
Executive Officer

ATTACHMENT A
TO RESOLUTION NO. R9-2008-0027

AMENDMENT TO THE *WATER QUALITY CONTROL PLAN FOR THE SAN DIEGO BASIN (9)* TO INCORPORATE TOTAL MAXIMUM DAILY LOADS FOR INDICATOR BACTERIA, BABY BEACH IN DANA POINT HARBOR AND SHELTER ISLAND SHORELINE PARK IN SAN DIEGO BAY

This Basin Plan amendment establishes Total Maximum Daily Loads (TMDLs) and associated load and wasteload allocations for total coliform, fecal coliform, and *Enterococcus* bacteria along the shorelines of Baby Beach, located within Dana Point Harbor, and Shelter Island Shoreline Park, located within San Diego Bay. This amendment includes a program to implement the TMDLs and monitor their effectiveness. Chapters 2, 3, and 4 of the Basin Plan are amended as follows:

CHAPTER 2. BENEFICIAL USES.

Table 2-3. BENEFICIAL USES OF COASTAL WATERS.

Consecutively number and add the following footnote to Dana Point Harbor in Table 2-3:

> The shoreline segment along Baby Beach within Dana Point Harbor is designated as a water quality limited segment for indicator bacteria pursuant to Clean Water Act section 303(d). Total Maximum Daily Loads have been adopted to address these impairments. See Chapter 4, *Implementation, Clean Water Act Section 303(d) Requirements for Impaired Waterbodies, Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay*.

Consecutively number and add the following footnote to San Diego Bay in Table 2-3:

> The shoreline segment along Shelter Island Shoreline Park within San Diego Bay is designated as a water quality limited segment for indicator bacteria pursuant to Clean Water Act section 303(d). Total Maximum Daily Loads have been adopted to address these impairments. See Chapter 4, *Implementation, Clean Water Act Section 303(d) Requirements for Impaired Waterbodies, Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay*.

Renumber any footnotes in Table 2-3 displaced by these new footnotes.

ATTACHMENT A TO RESOLUTION NO. R9-2008-0027

CHAPTER 3. WATER QUALITY OBJECTIVES.

OCEAN WATERS.
OCEAN PLAN AND THERMAL PLAN.
Ocean Plan and Thermal Plan Water Quality Objective.

Add the following paragraph to the end of the introductory text:

> The shoreline segment along Baby Beach within Dana Point Harbor is designated as a water quality limited segment for indicator bacteria pursuant to Clean Water Act section 303(d). Total Maximum Daily Loads have been adopted to address these impairments. See Chapter 2, Table 2-3, *Beneficial Uses of Coastal Waters, Footnote* [*insert footnote number*], and Chapter 4, *Implementation, Clean Water Act Section 303(d) Requirements for Impaired Waterbodies, Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay*.

INLAND SURFACE WATERS, ENCLOSED BAYS AND ESTUARIES, COASTAL LAGOONS, AND GROUND WATERS.
BACTERIA – TOTAL AND FECAL COLIFORM.

Add the following paragraph to the end of the introductory text:

> The shoreline segment along Shelter Island Shoreline Park within San Diego Bay is designated as a water quality limited segment for indicator bacteria pursuant to Clean Water Act section 303(d). Total Maximum Daily Loads have been adopted to address these impairments. See Chapter 2, Table 2-3, *Beneficial Uses of Coastal Waters, Footnote* [*insert footnote number*], and Chapter 4, *Implementation, Clean Water Act Section 303(d) Requirements for Impaired Waterbodies, Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay*.

INLAND SURFACE WATERS, ENCLOSED BAYS AND ESTUARIES, COASTAL LAGOONS, AND GROUND WATERS.
BACTERIA – E. COLI AND ENTEROCOCCI.
(2) Waters Designated for Contact Recreation (REC-1) Beneficial Use

Add the following paragraph to the end of the introductory text:

> The shoreline segment along Shelter Island Shoreline Park within San Diego Bay is designated as a water quality limited segment for indicator bacteria pursuant to Clean Water Act section 303(d). Total Maximum Daily Loads have been adopted to address these impairments. See Chapter 2, Table 2-3, *Beneficial Uses of Coastal Waters, Footnote* [*insert footnote number*], and Chapter 4, *Implementation, Clean Water Act Section 303(d) Requirements for Impaired Waterbodies, Total Maximum*

ATTACHMENT A TO RESOLUTION NO. R9-2008-0027

Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay.

CHAPTER 4. IMPLEMENTATION.

Amend the Table of Contents to Chapter 4 to include the subsection added below.

Consecutively number and renumber footnotes appropriately.

Add the following subsection after the most recently adopted and approved TMDL subsection and before the Other Programs subsection:

TOTAL MAXIMUM DAILY LOADS FOR INDICATOR BACTERIA, BABY BEACH AND SHELTER ISLAND SHORELINE PARK SHORELINES

OnJune 11 2008, the San Diego Water Board adopted Resolution No. R9-2008-0027, *A Resolution Amending the Water Quality Control Plan for the San Diego Region (9) to Incorporate Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay.* The TMDL Basin Plan Amendment was subsequently approved by the State Water Resources Control Board on [Insert date], the Office of Administrative Law on [Insert date], and the USEPA on [Insert date].

PROBLEM STATEMENT

Bacteria densities along the shoreline segments of Baby Beach within Dana Point Harbor and Shelter Island Shoreline Park within San Diego Bay violate water quality objectives (WQOs) for indicator bacteria. Bacteria densities in waters at these shoreline segments unreasonably impair and threaten to impair the water quality needed to support designated beneficial uses of contact recreation (REC-1)[3].

The federal Clean Water Act requires the establishment of Total Maximum Daily Loads (TMDLs) for pollutants that exceed water quality objectives needed to support designated beneficial uses, *i.e.*, that cause or contribute to violation of state "water quality standards."

[3] Water quality objectives for indicator bacteria in waters with non-water-contact recreation (REC-2) are less stringent than the water quality objectives for REC-1, therefore, attainment of REC-1 objectives through the implementation of TMDLs will, *a fortiori,* provide the requisite water quality for REC-2.

NUMERIC TARGETS

When calculating TMDLs, numeric targets are established to meet WQOs and subsequently ensure the protection of beneficial uses. The numeric targets for these TMDLs consist of the REC-1 WQOs for indicator bacteria contained in the Basin Plan. TMDLs were calculated for each impaired waterbody, for each indicator bacteria, for wet and dry weather. The numeric targets used in the TMDL calculations were equal to the WQOs for bacteria for REC-1.

Different dry weather and wet weather numeric targets were used for load calculations because the bacteria transport mechanisms to receiving waters are different under wet and dry weather conditions.

Single sample maximum WQOs were used as wet weather numeric targets. Dry weather numeric targets are typically best represented by geometric mean WQOs. However, due to extreme diurnal variations in bacteria densities that can result from tidal effects, in some cases the maximum hourly concentration could regularly exceed the single sample maximum WQOs. Therefore, both the REC-1 30-day geometric mean and single sample maximum WQOs were selected as numeric targets for dry weather. The numeric targets were equal to the total coliform, fecal coliform and *Enterococcus* WQOs for REC-1 in all cases.

The numeric targets for the scenarios described above are listed in the following tables:

Table [Insert Table Number]. Wet Weather Numeric Targets

Basis for Numeric Target	Total Coliform (MPN/100mL)	Fecal Coliform (MPN/100mL)	*Enterococcus* (MPN/100mL)
Beneficial Use	**REC-1**	**REC-1**	**REC-1**
Single sample maximum	10,000	400	104

Table [Insert Table Number]. Dry Weather Numeric Targets

Basis for Numeric Target	Total Coliform (MPN/100mL)	Fecal Coliform (MPN/100mL)	*Enterococcus* (MPN/100mL)
Beneficial Use	**REC-1**	**REC-1**	**REC-1**
30-day geometric mean	1,000	200	35
Single sample maximum	10,000	400	104

SOURCE ANALYSIS

Sources of bacteria are the same under both wet weather and dry weather conditions. Bacteria can enter surface waters from both nonpoint and point sources. Nonpoint sources are typically diffuse sources that have multiple routes of entry into

surface waters. Point sources typically discharge at a specific location from pipes, outfalls, and conveyance channels.

The only nonpoint sources identified to potentially affect the waterbodies addressed by these TMDLs were natural sources (e.g., direct inputs from birds, terrestrial and aquatic animals, wrack line and aquatic plants, sediments, or other unidentified or unquantified sources within the receiving waters), homeless encampments, or other background sources (e.g., "ambient" bacteria that may be influenced by illegal discharges from boats). Because the homeless encampments are illegal, these loads are not allowed and must be eliminated. Due to lack of data, bacteria loads from natural sources or other background sources could not be specifically identified or quantified for TMDL development. Until more information is obtained through further study to provide identification of the relative loading from each of these potential sources, they were combined into a single natural and background source for each shoreline segment.

The point sources identified to potentially affect the waterbodies addressed in this study were discharges from municipal separate storm sewer systems (MS4s) and illegal discharges from boats and/or wastewater collection systems and treatment plants. Because the Basin Plan includes waste discharge prohibitions specifically for the discharge of treated or untreated sewage from vessels to Dana Point Harbor and San Diego Bay and the unauthroized discharge of treated or untreated sewage to waters of the state, illegal discharges from boats and wastewater collection systems and treatment plants are not allowed must be eliminated. The watersheds that drain into the receiving waters at the impaired shoreline segments are wholly located within urbanized areas. Therefore, the only allowable point source identified was urban runoff discharged from MS4s, although other point sources may exist.

For both wet weather and dry weather conditions, there are natural and background sources of bacteria within the receiving waters at the impaired shoreline segments. However, for sources of bacteria that originate from the watersheds draining into the receiving waters, the method of transport for the two conditions is very different. Wet weather loading originating from the watersheds is dominated by episodic storm flows that wash off bacteria that build up on the surface of all land use types in the watershed during dry periods. Dry weather loading originating from the watersheds is dominated by nuisance flows from urban land use activities such as car washing, sidewalk washing, and lawn over-irrigation, which pick up bacteria and deposit it into receiving waters.

TOTAL MAXIMUM DAILY LOADS AND ALLOCATIONS

The TMDLs are equal to the assimilative or loading capacity of each shoreline segment for each pollutant. TMDLs for each type of indicator bacteria were developed for each impaired waterbody. TMDLs are defined as the maximum amount of a pollutant the waterbody can receive and still attain water quality

objectives and protection of designated beneficial uses. Once calculated, a TMDL is set equal to the sum of all individual Waste Load Allocations (WLAs) for point sources and Load Allocations (LAs) for nonpoint sources. The TMDL includes a margin of safety (MOS) that takes into account any uncertainties in the TMDL calculation, which may be explicit or implicit. For these TMDLs, an implicit margin of safety is included via conservative estimates and assumptions used throughout the TMDL calculations. Separate TMDLs were calculated for wet weather and dry weather conditions to account for seasonal variations, and because the transport mechanism, flow, and bacteria loads from the watersheds draining to the receiving waters are different between dry and wet weather conditions.

Calibrated models were used to simulate flow and bacteria densities from the watersheds draining into the receiving waters and within the receiving waters of the shoreline segments. The models were used to calculate the existing bacteria loads, as well as TMDLs for each impaired shoreline segment. The modeled existing loads were compared to the TMDLs to calculate the necessary load reductions needed to achieve the TMDLs in the waterbodies. The TMDLs were allocated among point sources (WLAs) and nonpoint sources (LAs). The only allowable point source identified was urban runoff discharged from MS4s, which was assigned a WLA for each watershed. The only allowable nonpoint sources identified were natural or background sources, such as direct inputs from birds, terrestrial and aquatic animals, wrack line and aquatic plants, sediments, or other unidentified and unquantified sources within the receiving waters, which were lumped together and assigned a LA. Because only the point sources are considered controllable, a load reduction was only calculated for the bacteria loads from the MS4s. Bacteria loads from sources of illegal discharges were assigned WLAs and LAs of zero. The TMDLs, LAs for natural and background sources, WLAs for municipal MS4s, and load reductions for municipal MS4s are shown below in Tables [Insert table numbers].

MARGIN OF SAFETY

There are two ways to incorporate the MOS (USEPA, 1991): (1) implicitly incorporate the MOS using conservative model assumptions to develop allocations; and/or, (2) explicitly specify a portion of the total TMDL as the MOS and use the remainder for allocations. Throughout the TMDL development process, conservative assumptions were employed. Based on the incorporation of all these conservative assumptions, no explicit MOS was necessary.

ATTACHMENT A TO RESOLUTION NO. R9-2008-0027

Table [Insert table number]. REC-1 Wet Weather TMDLs for Total Coliform for Baby Beach and Shelter Island Shoreline Park Shoreline Segments

Waterbody	Shoreline Segment/Area	Hydrologic Descriptor	Model Sub-watershed	TMDL (Billion MPN/ 30 days)	Load Allocations (LAs)	Wasteload Allocations (WLAs)	Existing Wasteloads	Percent Reduction of Municipal MS4 Existing Wasteload[2]
					Natural/Background (Billion MPN/ 30 days)[1]	Municipal MS4 (Billion MPN/ 30 days)	Municipal MS4 (Billion MPN/ 30 days)	
Dana Point Harbor	Baby Beach	Dana Point HSA (901.14)	2101,2102 2103,2104	166,111	162,857	3,254	3,254	0%
San Diego Bay	Shelter Island Shoreline Park	Point Loma HA (908.10)	2201	482,598	482,400	198	198	0%

Abbreviations/Acronyms:
TMDL: total maximum daily load
LA: load allocation for nonpoint source
WLA: wasteload allocation for point source
MS4: Municipal Separate Storm Sewer System
MPN: most probable number

Notes:
[1] Calculated by dry weather EFDC model analysis (Dry weather LA from Table 8-4 multiplied by 30 days). No reduction required for natural/background sources.
[2] Percent Reduction of Existing Municipal MS4 Wasteload = (Existing Municipal MS4 Wasteload – Municipal MS4 WLA) ÷ (Existing Municipal MS4 Wasteload) x 100%

Table [Insert table number]. REC-1 Wet Weather TMDLs for Fecal Coliform for Baby Beach and Shelter Island Shoreline Park Shoreline Segments

Waterbody	Shoreline Segment/Area	Hydrologic Descriptor	Model Sub-watershed	TMDL (Billion MPN/ 30 days)	Load Allocations (LAs)	Wasteload Allocations (WLAs)	Existing Wasteloads	Percent Reduction of Municipal MS4 Existing Wasteload[2]
					Natural/Background (Billion MPN/ 30 days)[1]	Municipal MS4 (Billion MPN/ 30 days)	Municipal MS4 (Billion MPN/ 30 days)	
Dana Point Harbor	Baby Beach	Dana Point HSA (901.14)	2101,2102 2103,2104	32,585	32,473	112	112	0%
San Diego Bay	Shelter Island Shoreline Park	Point Loma HA (908.10)	2201	41,408	41,400	8	8	0%

Abbreviations/Acronyms:
TMDL: total maximum daily load
LA: load allocation for nonpoint source
WLA: wasteload allocation for point source
MS4: Municipal Separate Storm Sewer System
MPN: most probable number

Notes:
[1] Calculated by dry weather EFDC model analysis (Dry weather LA from Table 8-5 multiplied by 30 days). No reduction required for natural/background sources.
[2] Percent Reduction of Existing Municipal MS4 Wasteload = (Existing Municipal MS4 Wasteload – Municipal MS4 WLA) ÷ (Existing Municipal MS4 Wasteload) x 100%

ATTACHMENT A TO RESOLUTION NO. R9-2008-0027

Table [Insert table number]. REC-1 Wet Weather TMDLs for *Enterococcus* for Baby Beach and Shelter Island Shoreline Park Shoreline Segments

Waterbody	Shoreline Segment/Area	Hydrologic Descriptor	Model Sub-watershed	TMDL (Billion MPN/ 30 days)	Load Allocations (LAs)	Wasteload Allocations (WLAs)	Existing Wasteloads	Percent Reduction of Municipal MS4 Existing Wasteload[2]
					Natural/Background (Billion MPN/ 30 days)[1]	Municipal MS4 (Billion MPN/ 30 days)	Municipal MS4 (Billion MPN/ 30 days)	
Dana Point Harbor	Baby Beach	Dana Point HSA (901.14)	2101,2102 2103,2104	5,730	5,616	114	301	62.2%
San Diego Bay	Shelter Island Shoreline Park	Point Loma HA (908.10)	2201	10,556	10,530	26	26	0%

Abbreviations/Acronyms:
TMDL: total maximum daily load
LA: load allocation for nonpoint source
WLA: wasteload allocation for point source
MS4: Municipal Separate Storm Sewer System
MPN: most probable number

Notes:
[1] Calculated by dry weather EFDC model analysis (Dry weather LA from Table 8-6 multiplied by 30 days). No reduction required for natural/background sources.
[2] Percent Reduction of Existing Municipal MS4 Wasteload = (Existing Municipal MS4 Wasteload – Municipal MS4 WLA) ÷ (Existing Municipal MS4 Wasteload) x 100%

ATTACHMENT A TO RESOLUTION NO. R9-2008-0027

Table [Insert table number]. REC-1 Dry Weather TMDLs for Total Coliform for Baby Beach and Shelter Island Shoreline Park Shoreline Segments

Waterbody	Shoreline Segment/Area	Hydrologic Descriptor	Model Sub-watershed	TMDL (Billion MPN/ day)	Load Allocations (LAs)	Wasteload Allocations (WLAs)	Existing Wasteloads	Percent Reduction of Municipal MS4 Existing Wasteload[2]
					Natural/Background (Billion MPN/ day)[1]	Municipal MS4 (Billion MPN/ day)	Municipal MS4 (Billion MPN/ day)	
Dana Point Harbor	Baby Beach	Dana Point HSA (901.14)	2101,2102 2103,2104	5,430	5,429	0.86	9.0	90.4%
San Diego Bay	Shelter Island Shoreline Park	Point Loma HA (908.10)	2201	16,080	16,080	0	0	0%

Abbreviations/Acronyms:
TMDL: total maximum daily load
LA: load allocation for nonpoint source
WLA: wasteload allocation for point source
MS4: Municipal Separate Storm Sewer System
MPN: most probable number

Notes:
[1] Calculated by dry weather EFDC model analysis. No reduction required for natural/background sources.
[2] Percent Reduction of Existing Municipal MS4 Wasteload = (Existing Municipal MS4 Wasteload – Municipal MS4 WLA) ÷ (Existing Municipal MS4 Wasteload) x 100%

Table [Insert table number]. REC-1 Dry Weather TMDLs for Fecal Coliform for Baby Beach and Shelter Island Shoreline Park Shoreline Segments

Waterbody	Shoreline Segment/Area	Hydrologic Descriptor	Model Sub-watershed	TMDL (Billion MPN/ day)	Load Allocations (LAs)	Wasteload Allocations (WLAs)	Existing Wasteloads	Percent Reduction of Municipal MS4 Existing Wasteload[2]
					Natural/Background (Billion MPN/ day)[1]	Municipal MS4 (Billion MPN/ day)	Municipal MS4 (Billion MPN/ day)	
Dana Point Harbor	Baby Beach	Dana Point HSA (901.14)	2101,2102 2103,2104	1,083	1,082	0.17	1.0	82.7%
San Diego Bay	Shelter Island Shoreline Park	Point Loma HA (908.10)	2201	1,380	1,380	0	0	0%

Abbreviations/Acronyms:
TMDL: total maximum daily load
LA: load allocation for nonpoint source
WLA: wasteload allocation for point source
MS4: Municipal Separate Storm Sewer System
MPN: most probable number

Notes:
[1] Calculated by dry weather EFDC model analysis. No reduction required for natural/background sources.
[2] Percent Reduction of Existing Municipal MS4 Wasteload = (Existing Municipal MS4 Wasteload – Municipal MS4 WLA) ÷ (Existing Municipal MS4 Wasteload) x 100%

ATTACHMENT A TO RESOLUTION NO. R9-2008-0027

Table [Insert table number]. REC-1 Dry Weather TMDLs for *Enterococcus* for Baby Beach and Shelter Island Shoreline Park Shoreline Segments

Waterbody	Shoreline Segment/Area	Hydrologic Descriptor	Model Sub-watershed	TMDL (Billion MPN/ day)	Load Allocations (LAs)	Wasteload Allocations (WLAs)	Existing Wasteloads	Percent Reduction of Municipal MS4 Existing Wasteload[2]
					Natural/Background (Billion MPN/ day)[1]	Municipal MS4 (Billion MPN/ day)	Municipal MS4 (Billion MPN/ day)	
Dana Point Harbor	Baby Beach	Dana Point HSA (901.14)	2101,2102 2103,2104	187	187	0.03	0.8	96.2%
San Diego Bay	Shelter Island Shoreline Park	Point Loma HA (908.10)	2201	351	351	0	0	0%

Abbreviations/Acronyms:
TMDL: total maximum daily load
LA: load allocation for nonpoint source
WLA: wasteload allocation for point source
MS4: Municipal Separate Storm Sewer System
MPN: most probable number

Notes:
[1] Calculated by dry weather EFDC model analysis. No reduction required for natural/background sources.
[2] Percent Reduction of Existing Municipal MS4 Wasteload = (Existing Municipal MS4 Wasteload – Municipal MS4 WLA) ÷ (Existing Municipal MS4 Wasteload) x 100%

ATTACHMENT A TO RESOLUTION NO. R9-2008-0027

TMDL IMPLEMENTATION PLAN

By design, waste load allocations and load allocations are established at levels that when met, will result in the full attainment of water quality standards. For this reason, the San Diego Water Board expects that at the end of the TMDL compliance period, applicable load and waste load allocations, as well as the water quality objectives will be met at all times in the receiving water. In the event that water quality objectives are not met at the end of the compliance period, the Board will require the dischargers to conduct an investigation to identify the specific source(s) responsible for the failure to meet water quality onjectives. If the source is found to be anthropogenic, the San Diego Water Board will initiate enforcement or other regulatory action as appropriate to correct the problem. If the source is natural, and if all of the conditions for using the natural sources exclusion approach (NSEA) have been met, the Board will consider the application of the NSEA, including the recalculation of the TMDLs to account for the natural sources. The necessary actions to implement the TMDLs are described in section 10 of the Technical Report entitled *Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay*, dated June 11, 2008, and listed below.

(A) Specific Implementation Objectives

Since 2002, the dischargers have implemented several non-structural best management practice (BMP) programs and structural BMPs that have resulted in noticeable improvements in water quality at the impaired shoreline segments. The County of Orange has already conducted numerous studies and implemented a variety of non-structural and structural BMPs in an effort to reduce bacteria levels at Baby Beach since before 2002. These efforts have included installing seasonal plugs in storm drains, increased street sweeping efforts, expedited trash collection to control birds, the installation of bird netting under the pier, public education efforts against bird-feeding at the beach, artificial circulation of water at Baby Beach, a dry weather flow diversion structure and media filter system on the west end of the beach, catch basin filters, and the collection and disposal of bird fecal droppings from the exposed intertidal areas of the beach. The San Diego Unified Port District has also implemented several non-structural BMP programs since 2002. Water quality data from 2002 to 2006 indicate that bacteria levels in the waters at Baby Beach and Shelter Island Shoreline Park have shown significant improvements in water quality since 2002.

As shown in Tables [Inset table numbers here], the modeling results indicate that no load reductions are require for total coliform, fecal coliform, and *Entercoccus* indicator bacteria for Shelter Island Shoreline Park during wet weather or dry weather conditions. Additionally, the modeling results indicate only *Entercoccus* indicator bacteria wet weather load reductions are required for Baby Beach and no wet weather load reductions are required for total coliform and fecal coliform indicator bacteria. For

dry weather, Baby Beach requires between approximately 83 percent and 96 percent wasteload reductions for total coliform, fecal coliform, and *Entercoccus* indicator bacteria. However, based only on the water quality data collected during 2006, the number of samples that exceed the REC-1 water quality objectives are less than the allowable number of exceedances for recommending removal from the 303(d) List. This trend implies that the past and current BMPs that have been implemented are effective in reducing bacteria loads to the receiving waters and that water quality in the impaired shoreline segments already meet REC-1 water quality objectives during dry weather. However, additional monitoring is required to confirm this trend, and additional BMPs may be needed to meet the REC-1 water quality objectives during wet weather.

While the Bacteria Load Reduction Plans (BLRPs), as described below, will still be required from the dischargers, if current trends continue, monitoring and permanent implementation of the current programs and BMPs may be adequate for meeting the wet weather and dry weather TMDLs. If the REC-1 water quality objectives cannot be met in the receiving waters by the end of the compliance schedules, and if natural and background sources appear to be the sole source of continued impairment, application of the natural sources exclusion approach (NSEA) to revise the TMDLs, as described below, may be appropriate.[4]

Therefore, if the water quality data support delisting before the NPDES requirement revisions are considered, specific objectives of this Implementation Plan are as follows:

1. Persons responsible for monitoring the impaired shoreline segments of Baby Beach and Shelter Island Shoreline Park for bacteria will continue with the monitoring program to ensure REC-1 water quality objectives are maintained.
2. If REC-1 water quality objectives are exceeded, actions outlined in Attachment B of Order Nos. R9-2007-0001 and R9-2002-0001 in section II.C, Coastal Storm Drain Outfall Monitoring, and any subsequent amendment or renewal, will be implemented.
3. If sources of bacteria persist at levels that exceed water quality standards, then the persons responsible will take appropriate actions to identify and eliminate the controllable source or sources of the chronic contamination. If natural and background sources appear to be the sole source of the impairment, application of the NSEA to revise the TMDLs may be appropriate.

If the impaired shoreline segments of BB and SISP remain on or are put back on the List during subsequent iterations of the 303(d) listing process due to impacts from controllable sources of bacteria, the San Diego Water Board will revise the current

[4] After adoption of a Basin Plan amendment authorizing the use of the Natural Sources Exclusion Approach by the San Diego Water Board and approval by the Office of Administrative Law.

NPDES requirements and/or issue additional waste discharge requirements to be consistent with these TMDLs.

(B) San Diego Water Board Actions

The San Diego Water Board regulates discharges of waste by issuing waste discharge prohibitions, waste discharge requirements, or conditional waivers of waste discharge requirements. Violation of a waste discharge prohibition, waste discharge requirement, or waiver condition is subject to enforcement actions. This section describes the actions that the San Diego Water Board will take to implement the TMDLs.

(1) Process and Schedule for Issuing NPDES Requirements

The TMDLs will be implemented primarily by reissuing or revising the existing NPDES waste discharge requirements for MS4 discharges to include water quality based effluent limitations (WQBELs) that are consistent with the assumptions and requirements of the bacteria WLAs for MS4 discharges, though there may be other or new point sources.

NPDES requirements should be issued, reissued, or revised "as expeditiously as practicable" to incorporate WQBELs derived from the TMDL WLAs. "As expeditiously as practicable" means the following:

1. **New point sources**. "New" point sources previously unregulated by NPDES requirements must obtain their NPDES requirements before they can lawfully discharge pollutants. For point sources receiving NPDES requirements for the first time, "as expeditiously as practicable" means that the San Diego Water Board incorporates WQBELs that are consistent with the assumptions and requirements of the WLAs into the NPDES requirements and requires compliance with the WQBELs upon the commencement of the discharge.

2. **Point Sources Currently Regulated Under NPDES Requirements**. For point sources currently regulated under NPDES requirements, "as expeditiously as practicable" means that:

    a. WQBELs that are consistent with the assumptions and requirements of the WLAs should be incorporated into NPDES requirements during their 5-year term, prior to expiration, in accordance with the applicable NPDES requirement reopening provisions, taking into account factors such as available NPDES resources, staff and budget constraints, and other competing priorities.

    b. In the event the NPDES requirement revisions cannot be considered during the 5-year term, the San Diego Water Board will incorporate

WQBELs that are consistent with the assumptions and requirements of the WLAs into the NPDES requirements at the end of the 5-year term.

(2) Actions with Respect to Phase I Municipal Dischargers

The Phase I Municipal Dischargers in San Diego and Orange County are required under Receiving Water Limitations A.3.a.1 and C.2[5] of Orders No. R9-2007-0001 and R9-2002-0001, respectively (San Diego County and Orange County MS4 NPDES requirements), and any subsequent amendment or renewal, to implement additional BMPs to reduce bacteria discharges in impaired watersheds to the maximum extent practicable and to restore compliance with the bacteria water quality objectives. This obligation is triggered when either the discharger or the San Diego Water Board determines that MS4 discharges are causing or contributing to an exceedance of an applicable water quality objective, in this case the REC-1 indicator bacteria water quality objectives. Designation of the shoreline segments in San Diego Bay and Dana Point Harbor as water quality limited segments under Clean Water Act section 303(d) and the TMDL analysis provided sufficient evidence that that MS4 discharges may be causing or contributing to the violation of water quality standards. Thus, the Municipal Dischargers should be, and have been implementing the provisions of Receiving Water Limitation C.2 with respect to bacteria discharges into water quality limited segments.

In addition to enforcing the provisions of Receiving Water Limitation C.2, the San Diego Water Board shall reissue or revise Orders No. R9-2007-0001 and R9-2002-0001, to incorporate WQBELs consistent with the assumptions and requirements of the bacteria WLAs, and requirements for monitoring and reporting. In those orders, the Phase I Municipal Dischargers are referred to as "Copermittees."[6] WQBELs and other requirements implementing the TMDLs can be incorporated into these NPDES requirements upon the normal renewal cycle or sooner, if appropriate. The requirements implementing the TMDLs shall include the following:

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[5] Receiving Water Limitations A.3.a.1 and C.2.a provide that "[u]pon a determination by either the Copermittee or the San Diego Water Board that MS4 discharges are causing or contributing to an exceedance of an applicable water quality standard, the Copermittee shall promptly notify and thereafter submit a report to the San Diego Water Board that describes BMPs that are currently being implemented and additional BMPs that will be implemented to prevent or reduce any pollutants that are causing or contributing to the exceedance of water quality standards. The report may be incorporated in the annual update to the Jurisdictional URMP unless the San Diego Water Board directs an earlier submittal. The report shall include an implementation schedule. The San Diego Water Board may require modification to the report." Additional requirements are included in sections C.2.b-d.

[6] Copermittees own or operate MS4s through which urban runoff discharges into waters of the U.S. within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the United States.

a. WQBELs consistent with the requirements and assumptions of the bacteria WLAs described in Tables [Insert table numbers]and a schedule of compliance applicable to the MS4 discharges into the impaired shoreline segments described in Tables [Insert table numbers]. At a minimum, WQBELs shall include a BMP program to attain the WLAs.

b. If the WQBELs consist of BMP programs, then the reporting requirements shall consist of annual progress reports on BMP planning, implementation, and effectiveness in attaining the WQOs in impaired shoreline segments, and annual water quality monitoring reports. The first progress report shall consist of a Bacteria Load Reduction Plan (BLRP), which may be included as part of the annual NPDES reporting requirements. BLRPs must be specific to each impaired waterbody.

   To provide guidance to the dischargers in preparing BLRPs, the following bullets describe components that should be considered for incorporation in the BLRPs.

   Comprehensive Watershed Approach

   - Dischargers should identify the Lead Watershed Contact for their BLRPs. The Lead Watershed Contact should serve as liaison between all other common watershed dischargers and the San Diego Water Board, where appropriate.

   - Dischargers should describe a program for encouraging collaborative, watershed-based, land-use planning in their jurisdictional plans.

   - Dischargers should develop and periodically update a map of the BLRP watershed, to facilitate planning, assessment, and collaborative decision-making. As appropriate, the map should include features such as receiving waters; Clean Water Act section 303(d) impaired receiving waters; water quality projects; land uses; MS4s; major highways; jurisdictional boundaries; and inventoried commercial, industrial, and municipal sites.

   - Dischargers should annually assess the water quality of the impaired water body in their BLRPs in order to identify all water quality problems within the impaired water body. This assessment should use applicable water quality data, reports, and analysis generated in accordance with the requirements of the applicable NPDES MS4 monitoring and reporting programs, as well as applicable information available from other public and private organizations.

- Dischargers should develop and implement a collective watershed BLRP strategy to meet the bacteria TMDL. The strategy should guide dischargers in developing a Bacteria Compliance Schedule (BCS) which includes BMP planning and scheduling as outlined below.

- Dischargers should collaborate to develop and implement the BLRPs. The BLRP should include a proposal for regularly scheduled meetings among the dischargers in the impaired watershed.

- Because water quality data will ultimately determine if a waterbody will be delisted from the 303(d) List, the BLRP should include a monitoring and reporting program that contains the following elements:
  - Locations of water quality sampling sites that are spatially representative of the waterbody and appropriate for identifying potential sources, including, at a minimum, the monitoring stations currently used to monitor water quality.
  - Schedule of water quality sampling that is temporally representative of both wet weather and dry weather conditions. Wet weather samples are collected during storms of 0.2 inches of rainfall and the 72 hour period after the storm. Dry weather samples are collected from during times when rain has not fallen for the preceding 72 hours.
  - Presentation of past and present water quality data that have been collected.
  - Analysis of water quality data compared to the applicable Basin Plan water quality objectives. Dry weather water quality data are compared to long-term (e.g., geometric mean, mean, or median) water quality objectives, as well as short-term (e.g., single sample maximum) water quality objectives. Wet weather water quality data are compared to short-term (e.g., single sample maximum) water quality objectives.
  - Analysis of water quality data to correlate noticeable improvements in water quality with past and current BMPs that have been implemented and are effective.
  - Analysis of water quality data to correlate elevated bacteria levels with known or suspected sewage spills from wastewater collection systems and treatment plants or boats.
  - Recommendations for increased or decreased water quality sampling based on water quality data analyses.

- Each BLRP and BCS should be reviewed annually to identify needed modifications and improvements. The dischargers should develop and implement a plan and schedule, included in the BCS, to address the identified modifications and improvements. All updates to the BLRP

should be documented in the BLRP, and submitted to the San Diego Water Board. Individual dischargers should also review and modify their jurisdictional ordinances and activities as necessary so that they are consistent with the requirements of the BLRP.

Bacteria Compliance Schedule - BMP Planning and Scheduling

The BCS should identify the BMPs/water quality projects that have been implemented or are planned for implementation and provide an implementation schedule for each BMP/water quality project. The BCS should demonstrate how the BMPs/water quality projects will address all the bacteria TMDLs. The BCS, at a minimum, should include scheduling for the following:

Non-structural BMP phasing:

- Completed Non-Structural BMP Analysis – Information should be provided regarding the non-structural BMPs completed and/or currently in practice, a timeline of BMP implementation and maintenance, and an assessment of effectiveness.

If the Completed Non-Structural BMP Analysis indicates additional non-structural BMPs are necessary, the following should be included in the BCS:

- New Non-Structural BMP Analysis - Watershed data should be analyzed to identify new effective non-structural BMPs for implementation. This should be completed and included in the BCS.

- Scheduled Annual Non-structural BMP Implementation - The above analysis should be used to identify BMPs that have and will be implemented and to develop an aggressive non-structural BMP implementation schedule. The BCS should include a schedule of the current BMP staffing for each impaired area, and provide a discussion on adjustments to staff scheduling to meet possible new non-structural BMP demands. Schedules should be realistic and justifiable.

- Scheduled Annual BMP Assessment and Optimizing Adjustments - As the non-structural BMPs are implemented, a scheduled in-depth assessment of the non-structural BMPs' performance should follow. Non-structural BMPs that are found to be ineffective should be modified to incorporate optimizing adjustments to improve performance or be replaced by other effective non-structural BMPs. The results from this assessment should also be used to determine structural BMP selection and the schedule for structural BMP implementation. The BCS should include an annual

schedule for in-depth non-structural BMP assessment and optimizing adjustments.

- Scheduled Continuous Budget and Funding Efforts- Securing budget and funding for non-structural BMP staffing and equipment should be scheduled early and continue until the bacteria TMDLs are met. The BCS should include a schedule for staff time, including position and job description, authorized for securing budget and funding for non-structural BMP implementation.

Structural BMP phasing:

- Completed Structural BMP Analysis – Information should be provided regarding the structural BMPs completed and/or currently in practice, a timeline of BMP implementation and maintenance, and an assessment of effectiveness.

If the Completed Structural BMP Analysis indicates additional structural BMPs are necessary, the following should be included in the BCS:

- Scheduled New Structural BMP Analysis– Structural BMP analysis should utilize all available information, including the non-structural BMP assessment and existing structural BMP assessment, to identify, locate, design and build possible new structural BMPs, or a train of BMPs, to meet the these bacteria TMDLs. The BCS should include a schedule for structural BMP analysis.

- Scheduled Annual BMP Construction - The BCS should include a projected general construction schedule with a realistic and justifiable timeline for possible new BMP construction.

- Scheduled Annual BMP Assessment, Optimization Adjustments, and Maintenance - Assessment for structural BMPs should begin immediately upon initial BMP completion, followed by continuously scheduled BMP assessment, optimization adjustments, and maintenance, to both the individual structural BMPs and the structural BMP program as a whole. The BCS should include an annual schedule for in-depth structural BMP assessment.

- Scheduled Continuous Budget and Funding Effort - Securing budget and funding for structural BMPs and additional maintenance staff should be scheduled early and continue until the bacteria TMDLs are met. The BCS should include a schedule for staff time, including position and job

description, authorized for securing budget and funding for structural BMP implementation.

Subsequent reports should assess and describe the effectiveness of implementing the Bacteria Load Reduction Plan. Effectiveness assessments should be based on a program effectiveness assessment framework, such as the one developed by the California Stormwater Quality Association (CASQA, 2005). Using the CASQA framework as an example, the assessments should address the framework's outcome levels 1-5 on an annual basis, and outcome level 6 once every five years.[7] Methods used for assessing effectiveness should include the following or their equivalent: surveys, pollutant loading estimations, and receiving water quality monitoring. The long-term strategy should also discuss the role of monitoring data in substantiating or refining the assessment. Once water quality objectives have been attained, or the anthropogenic sources have been eliminated and pollutant loads can be attributed to only natural and background sources, a reduced level of monitoring may be appropriate.

In addition to these requirements, if load-based numerical WQBELs are included in the NPDES requirements, the monitoring requirements should include flow and bacteria density measurements to determine if bacteria loads in effluent are in compliance with WQBELs.

The BLRPs are the municipal dischargers' opportunity to propose methods for assessing compliance with WQBELs that implement TMDLs. The monitoring components included in the BLRPs should be formulated according to particular compliance assessment strategies. The monitoring components are expected to be consistent with, and support whichever compliance assessment methods are proposed. The San Diego Water Board will coordinate with the municipal dischargers during the development of their proposed monitoring components and associated compliance assessment methods.

If NPDES requirements are not likely to be issued, reissued or revised within 6 months of Office of Administrative Law approval of these TMDLs, the San Diego Water Board may issue an investigative/monitoring order to dischargers pursuant to sections 13267 or 13383 of the Water Code. This order would require assessment of current BMPs, possible planning for additional BMPs, and receiving water quality monitoring in adherence to performance measures described above.

[7] Outcome level 1 assesses compliance with activity-based permit requirements. Outcome level 2 assesses changes in attitudes, knowledge, and awareness. Outcome level 3 assesses behavioral change and BMP implementation. Outcome level 4 assesses pollutant load reductions. Outcome level 5 assesses changes in urban runoff and discharge water quality. Outcome level 6 assesses changes in receiving water quality. See CASQA "An Introduction to Stormwater Program Effectiveness Assessment."

The BLRPs may be re-evaluated at set intervals (such as 5-year renewal cycles for NPDES requirements, or upon request from named dischargers, as appropriate and in accordance with the San Diego Water Board priorities). Plans may be iterative and adaptive according to assessments and any special studies.

(3) Actions with Respect to Wastewater Collection Systems and Treatment Plants

The San Diego Water Board will conduct surveillance of and enforce the provisions of State Water Board Order No. 2006-0003-DWQ, and San Diego Water Board Order No. R9-2007-0005 as needed to ensure that collection systems for wastewater treatment plants do not overflow, leak, or otherwise discharge into MS4s or surface waters. If necessary, San Diego Water Board Order No. R9-2007-0005 can be revised to require more aggressive collection system monitoring, maintenance, and repair schedules.

(4) Actions with Respect to Marinas and Boats

If discharges from boats are shown to be a significant source of bacteria contributing to exceedances of water quality objectives, the San Diego Water Board will enforce the waste discharge prohibitions in the Basin Plan to ensure that illegal discharges from boats to surface waters do not occur. This may require issuing enforcement actions, such as Cease and Desist Orders, or issuing NPDES requirements or waste discharge requirements to the marina and harbor operators and/or the muncipalities requiring implementation of BMPs (e.g., public education and outreach, enforcing ordinances, and/or requiring dye tabs in boat sewage holding tanks) to eliminate illegal discharges of sewage, in addition to water quality monitoring and reporting.

(5) Additional Actions

<u>Take Enforcement Actions</u>
The San Diego Water Board shall consider enforcement actions,[8] as necessary and appropriate, against any discharger failing to comply with applicable waste discharge requirements or discharge prohibitions. Enforcement actions may be taken, as necessary and appropriate, to control the discharge of bacteria to impaired shorelines to attain compliance with the bacteria WLAs specified in this

[8] An enforcement action is any formal or informal action taken to address an incidence of actual or threatened noncompliance with existing regulations or provisions designed to protect water quality. Potential enforcement actions including notices of violation (NOVs), notices to comply (NTCs), imposition of time schedules (TSO), issuance of cease and desist orders (CDOs) and cleanup and abatement orders (CAOs), administrative civil liability (ACL), and referral to the attorney general (AG) or district attorney (DA). The San Diego Water Board generally implements enforcement through an escalating series of actions to: (1) assist cooperative dischargers in achieving compliance; (2) compel compliance for repeat violations and recalcitrant violators; and (3) provide a disincentive for noncompliance.

Technical Report, or to attain compliance with the applicable water quality objectives.

Recommend High Priority for Grant Funds

The San Diego Water Board shall recommend that the State Water Board assign a high priority to awarding grant funding[9] for projects to implement the bacteria TMDLs. Special emphasis will be given to projects that can achieve quantifiable bacteria load reductions consistent with the specific bacteria TMDL WLAs and LAs.

Apply the Natural Sources Exclusion Approach[10]

Under the Natural Sources Exclusion Approach (NSEA), all anthropogenic sources of indicator bacteria to the water bodies subject to an indicator bacteria TMDL must be controlled. Dischargers must also demonstrate that all anthropogenic sources of indicator bacteria to the target water body are controlled and that residual indicator bacteria densities do not indicate a health risk.

Once control of all anthropogenic sources and demonstration of appropriate health risk levels have been achieved, the residual indicator bacteria loads in the waterbodies attributable to uncontrollable sources can be identified and measured. Likewise, the frequency that uncontrollable sources cause exceedances of indicator bacteria water quality objectives in the water body can be identified. The information can be used to establish an allowable indicator bacteria WQO exceedance frequency in the impaired water body based upon the residual exceedance frequency observed. This information can then be used to recalculate the TMDLs, WLAs, and LAs.

The use of the NSEA is contingent upon demonstration of control of all anthropogenic sources of indicator bacteria to the waterbodies subject to an indicator bacteria TMDL. Since this task is likely to be formidable, use of the NSEA is not expected to occur immediately. Rather, the NSEA would be used to recalculate TMDLs at some point after their initial adoption, following demonstration of control of all anthropogenic sources.

The dischargers are responsible for collecting and providing the data to support the application of the NSEA. If the data support the application of the NSEA, the San Diego Water Board will recalculate the TMDLs, WLAs, and LAs to allow for the exceedances of the REC-1 indicator bacteria WQOs due to uncontrollable sources.

[9] In most cases, the State Water Board administers the awarding of grants funded from Proposition 13, Proposition 50, Clean Water Act section 319(h) and other federal appropriations to projects that can result in measurable improvements in water quality, watershed condition, and/or capacity for effective watershed management. Many of these grant fund programs have specific set-asides for expenditures in the areas of watershed management and TMDL project implementation for non-point source pollution.

[10] After adoption of a Basin Plan amendment authorizing the use of the Natural Sources Exclusion Approach by the San Diego Water Board and approval by the Office of Administrative Law.

(C) Coordination and Execution of Special Studies

The San Diego Water Board recognizes that coordination and execution of special studies by dischargers and other interested persons could result in improved TMDL analyses that more accurately protect beneficial uses. Areas of study that could benefit TMDL analysis include collection of data that can be used to improve model output, improved understanding of bacteria levels and the relationship to health effects, and identification of an appropriate and affordable method(s) to measure pathogens directly. Additionally, studies designed to measure BMP effectiveness and bacteria source identification will be useful for dischargers in identifying appropriate strategies to meet the requirements of this TMDL.

(1) Collect Data Useful for Model Improvement

Calibration and validation of the computer models used for TMDL analysis was based on limited data (water quality and/or flow) and assumed values for input parameters such as rates for bacteria die-off and re-growth. Limited data are available related to fecal bacteria that can be attributed to natural and background sources (e.g., waterfowl, terrestrial and aquatic wildlife, wrack line and aquatic plants, sediments, and other unidentified and unquantified sources within the waters). Studies designed to collect additional data that can be used for model improvement will result in more detailed TMDL results and allocations. Also, actual flow and loading data from each watershed and expanded receiving water data can be used to construct models that can more accurately reflect site-specific conditions.

(2) Improve Understanding Between Bacteria Levels and Health Effects

The San Diego Water Board recognizes that there are potential problems associated with using indicator bacteria WQOs to indicate the presence of human pathogens in receiving waters free of sewage discharges. The indicator bacteria WQOs were developed, in part, based on epidemiological studies in waters with sewage inputs. The risk of contracting a water-born illness from contact with urban runoff devoid of sewage, or human-source bacteria is not known. Some pathogens, such as *giardia* and *cryptosporidium* can be contracted from animal hosts. Likewise, domestic animals can pass on human pathogens through their feces. These and other uncertainties need to be addressed through special studies and, as a result, revisions to the TMDLs may be appropriate.

As information is gathered, initiating special studies to understand the uncertainties between bacteria levels and bacteria sources within the watersheds may be useful. Specifically, continuing research may be helpful to answer the following questions:

- What is the risk of illness from swimming in water contaminated with urban/stormwater runoff devoid of sewage?
- Do exceedances of the bacteria water quality objectives from animal sources (wildlife and domestic) increase the risk of illness?
- Are there other, more appropriate surrogates for measuring the risk of illness than the indicator bacteria WQOs currently used?

Addressing these uncertainties is needed to maximize effectiveness of strategies to reduce the risk of illness, which is currently measured by indicator bacteria densities. Dischargers may work with the San Diego Water Board to determine if such special studies are appropriate.

(3) Identification of Method for Direct Pathogen Measurement

Ultimately, the San Diego Water Board supports the idea of measuring pathogens (the agents causing impairment of beneficial uses) or an acceptable alternative indicator, rather than indicator bacteria (surrogates for pathogens). However, as stated previously, indicator bacteria have been used to measure water quality historically because measurement of pathogens is both difficult and costly. The San Diego Water Board is supportive of any efforts by the scientific community to perform epidemiological studies and/or investigate the feasibility of measuring pathogens directly. The San Diego Water Board further supports subsequent modification of WQOs as a result of such studies. Ultimately, TMDLs will be recalculated if WQOs are modified due to results from future studies.

(D) Compliance Schedule

<u>Baby Beach Compliance Schedule</u>
According to Tables [Insert table numbers], no wet weather wasteload reductions are required for total and fecal coliform indicator bacteria. This means that according to the wet weather models for Baby Beach, REC-1 water quality objectives for total and fecal coliform indicator bacteria are not expected to be exceeded due to discharges from the MS4s. The only wet weather wasteload reductions required for MS4s discharging into the receiving waters along the shoreline at Baby Beach is for *Enterococcus* indicator bacteria. The compliance schedule for Baby Beach to achieve wet weather TMDLs is as shown in [Insert table number].

Table [Insert table number]. Compliance Schedule for Baby Beach to Achieve Wet Weather TMDLs

Year (after OAL Approval)	Required Wasteload Reduction	TMDL Compliance Action
1	No reduction required	▪ Water Quality Monitoring ▪ Implement BMPs
2	Same as above	▪ Water Quality Monitoring ▪ Implement BMPs
3	Same as above	▪ Water Quality Monitoring ▪ Implement BMPs
4	Same as above	▪ Water Quality Monitoring ▪ Implement BMPs
5	Same as above	▪ Water Quality Monitoring ▪ Implement BMPs
6	Same as above	▪ Water Quality Monitoring ▪ Implement BMPs
7	50 percent *Enterococcus* reduction	▪ Water Quality Monitoring ▪ Implement BMPs
8	Same as above	▪ Water Quality Monitoring ▪ Implement BMPs
9	Same as above	▪ Water Quality Monitoring ▪ Implement BMPs
10	100 percent *Enterococcus* reduction	▪ Water Quality Monitoring ▪ Implement BMPs ▪ Submit request for removal from 303(d) List (if not requested and removed earlier)
10+	Same as above	▪ Water Quality Monitoring ▪ Implement BMPs ▪ Submit request for TMDL revisions based on Natural Sources Exclusion Approach if supported by data (if not requested and recalculated earlier) ▪ Submit request for removal from 303(d) List (if not requested and removed earlier)

At this time, control of bacteria loads for MS4s during wet weather is inherently difficult because the MS4 systems are traditionally designed to convey water quickly for flood control purposes. However, new approaches to storm water runoff management and BMP implementation can reduce the storm water runoff flow and associated pollutant loads. The phased compliance schedule to achieve wet weather TMDLs will provide the MS4 dischargers time to identify sources, develop plans and implement enhanced and expanded BMPs capable of achieving the mandated decreases in bacteria densities at the Baby Beach shoreline.

According to Tables [Insert table numbers], dry weather wasteload reductions are required for total coliform, fecal coliform, and *Enterococcus* indicator bacteria. The trend in the water quality data from Baby Beach indicate that the number of exceedances of the REC-1 water quality objectives have declined significantly beginning in 2006. If the current trend continues, the San Diego Water Board expects that the dry weather TMDLs for Baby Beach can be achieved within the next 5 years. The compliance schedule for Baby Beach to achieve dry weather TMDLs is as shown in Table [Insert table number].

Table [Insert table number]. Compliance Schedule for Baby Beach to Achieve Dry Weather TMDLs

Year (after OAL Approval)	Required Wasteload Reduction	TMDL Compliance Action
1	No reduction required	▪ Water Quality Monitoring ▪ Implement BMPs
2	Same as above	▪ Water Quality Monitoring ▪ Implement BMPs
3	50 percent reduction	▪ Water Quality Monitoring ▪ Implement BMPs
4	Same as above	▪ Water Quality Monitoring ▪ Implement BMPs
5	100 percent reduction	▪ Water Quality Monitoring ▪ Implement BMPs ▪ Submit request for removal from 303(d) List (if not requested and removed earlier)
5+	Same as above	▪ Water Quality Monitoring ▪ Implement BMPs ▪ Submit request for TMDL revisions based on Natural Sources Exclusion Approach if supported by data (if not requested and recalculated earlier) ▪ Submit request for removal from 303(d) List (if not requested and removed earlier)

For both of the Baby Beach compliance schedules, if the REC-1 water quality objectives cannot be met in the receiving waters, and if natural and background sources appear to be the sole source of continued impairment, the natural sources exclusion approach (NSEA) may be applied. However, the Municipal Dischargers are responsible for collecting the data to support the application of the NSEA to recalculate the TMDL.

Shelter Island Shoreline Park Compliance Schedule

According to Tables [Insert table numbers], there are no wasteload reductions required for MS4s discharging into the receiving waters along the shoreline at Shelter Island Shoreline Park under both wet weather and dry weather conditions. This means that according to the wet weather and dry weather models for Shelter Island Shoreline Park, REC-1 water quality objectives are not expected to be exceeded due to discharges from the MS4s.

Given that the modeled wasteload reductions for both wet weather and dry weather conditions for all indicator bacteria are zero percent, no compliance schedules were developed to meet wasteload reductions for Shelter Island Shoreline Park. However, the existing wasteload cannot exceed the WLA and Shelter Island Shoreline Park will remain on the 303(d) List until enough data are collected to support removing it from the 303(d) List. Therefore, in order to comply with these TMDLs, the responsible municipalities must continue implementing BMPs and collecting data until there are enough data to support and maintain the removal of SISP from the 303(d) List. In addition, the reporting requirements for the Shelter Island Shoreline Park TMDL must also include a periodic demonstration, no less often than every 2 years, that wasteload allocations and water quality objectives are being met.

The trend in the water quality data from Shelter Island Shoreline Park indicate that the number of REC-1 WQO exceedances have declined significantly since 2003. If the current trend continues, the San Diego Water Board expects that Shelter Island Shoreline Park will have enough data to support removal of Shelter Island Shoreline Park from the 303(d) List by 2010, and no later than 2012. The compliance schedule for SISP to achieve wet weather and dry weather TMDLs is as shown in Table [Insert table number].

Table [Insert table number]. Compliance Schedule for Shelter Island Shoreline Park to Achieve Wet Weather and Dry Weather TMDLs

Year	TMDL Compliance Action
2012	▪ Water Quality Monitoring ▪ Implement BMPs ▪ Submit request for TMDL revisions based on Natural Sources Exclusion Approach if supported by data (if not requested and recalculated earlier) ▪ Submit request for removal from 303(d) List (if not requested and removed earlier)

If the REC-1 water quality objectives cannot be met in the receiving waters by 2012, and if natural and background sources appear to be the source of continued impairment, the NSEA may be applied. However, the Municipal Dischargers are responsible for collecting the data to support the application of the NSEA to recalculate the TMDLs.

(E) TMDL Implementation Milestones

Accomplishing the goals of the implementation plan will be achieved by cooperative participation from all responsible parties, including the San Diego Water Board. Major milestones are described below in Table [Insert table number].

Table [Insert table number]. TMDL Implementation Milestones

Item	Implementation Action	Responsible Parties	Date
1	Effective date of Baby Beach and Shelter Island Shoreline Park Bacteria TMDL Waste Load Allocations (WLAs).	▪ San Diego Water Board ▪ Phase I Municipal Dischargers	Effective date*
2	Issue, reissue, or revise Phase I Municipal NPDES WDRs to include WQBELs consistent with the WLAs.	▪ San Diego Water Board	Within 5 years of effective date
3	Submit annual Progress Report to San Diego Water Board.	▪ Phase I Municipal Dischargers	Annually after reissue of NPDES WDRs
4	Recommend TMDL-related projects as high priority for grant funds.	▪ San Diego Water Board	As needed after effective date
5	Coordination and execution of special studies.	▪ San Diego Water Board ▪ Phase I Municipal Dischargers	As needed after effective date
6	Meet 50% wasteload reductions.	▪ Baby Beach Phase I Municipal Dischargers	3 years after effective date for dry weather 7 years after effective date for wet weather
		▪ Shelter Island Shoreline Park Phase I Municipal Dischargers	No load reductions required. Removal from 303(d) List by 2012.
7	Meet 100% wasteload reductions.	▪ Baby Beach Phase I Municipal Dischargers	5 years after effective date for dry weather 10 years after effective date for wet weather
		▪ Shelter Island Shoreline Park Phase I Municipal Dischargers	No load reductions required. Removal from 303(d) List by 2012.
8	Take enforcement actions to attain compliance with the WLAs.	▪ San Diego Water Board	As needed after effective date
9	Issue NPDES requirements or waste discharge requirements to marina and harbor operators and/or the muncipalities to eliminate sewage discharges from boats	▪ San Diego Water Board	As needed after effective date
10	Apply NSEA and recalculate TMDLs	▪ Baby Beach Phase I Municipal Dischargers	As appropriate after effective date, if data are available to support the action.
		▪ Shelter Island Shoreline Park Phase I Municipal Dischargers	

* Effective date is date of approval of these TMDLs by the Office of Administrative Law

Appendix D
Data Sources

Table D-1. Monitoring Data Sources

Index	Data Source	Location	Station ID	Years Compiled	Purpose
Hydrology/Hydraulics					
1	United States Geological Survey (USGS)[1]	San Juan Creek	11046530	01/1991-12/2002	Average daily flows on wet days used for calibration and validation of wet-weather modeled streamflows in Bacteria TMDL Project I.
			11047300	10/1995-04/2002	
2	National Oceanic and Atmospheric Administration-Center for Operational Oceanographic Products and Services (NOAA-COOPS)	San Diego Bay	9410230	01/2001-12/2002	Water elevation data used in determination of open ocean boundary conditions for the hydrodynamic model.
		San Diego Bay, Dana Point Harbor	9410170	01/2001-12/2002	Water surface elevation data used in calibration of San Diego bay hydrodynamic model and in determination of open ocean boundary conditions for the Dana point harbor hydrodynamic model.
Water Quality					
3	Orange County Public Health Laboratory (SDRWQCB, 2002)	San Juan Creek	SJ13	4/2001-7/2001	Development of multi-variable regression equations for prediction of dry-weather bacteria levels in Bacteria TMDL Project I.
			SJ14, SJ15, SJ16, SJ19, SJ20, SJ21, SJ29, SJ32	5/2001-7/2001	
			SJ01, SJ04, SJ05, SJ24	4/2001-7/2001	Validation of dry-weather model for bacteria levels in Bacteria TMDL Project I.
			SJ15, SJ17, SJ18, SJ29	5/2001-7/2001	
			SJ02, SJ09, SJ10, SJ12, SJ13, SJ25, SJ30	5/2001-12/2001	Validation of wet weather water quality predictions in Bacteria TMDL Project I.
		Dana Point Harbor – Baby Beach	BDP12, BDP13, BDP14, BDP15	11/1996-10/2002	Calibration and validation of water quality predictions by the hydrodynamic model.
4	County of San Diego (2004)	San Diego Bay - Shelter Island Shoreline Park	EH-200	3/1999-2/2004	Calibration and validation of water quality predictions by the hydrodynamic model.
5	SCRIPPS Institution of Oceanography (SCRIPPS)	San Diego Bay	#091, #095	1/2001-12/2002	Continuous surface temperature data used in determination of open ocean boundary conditions for the hydrodynamic model.
		Dana Point Harbor	#096	1/2001-12/2002	
6	Port of San Diego	San Diego Bay Dana Point Harbor	3	3/2001-12/2001 1/2002-2/2002	Salinity measurements used for determination of open ocean boundary conditions for the hydrodynamic model.

[1] www.usgs.gov

Table D-1. Monitoring Data Sources

Index	Data Source	Location	Station ID	Years Compiled	Purpose
Water Quality (Cont'd)					
7	Space and Naval Warfare Systems (SPAWAR)	San Diego Bay	1 through 27	1/2000-8/2002	Salinity and temperature measurements used for calibration and validation of the hydrodynamic model.
8	National Oceanographic and Atmospheric Administration-Center for Operational Oceanographic Products and Services (NOAA-COOPS)	San Diego Bay Dana Point Harbor	9410170	1/2001-12/2002	Water column temperature data used in calibration of San Diego bay hydrodynamic model and in determination of lateral ocean boundary conditions for the Dana point harbor hydrodynamic model.
Meteorological data					
9	National Oceanographic and Atmospheric Administration-National Climatic Data Center (NOAA-NCDC)	San Diego Bay	CA7740	1/1990-5/2004	Hourly rainfall data used for hydrologic and water quality modeling for wet-weather conditions.
		Dana Point Harbor	CA4650		
		San Diego Bay Dana Point Harbor	COOP ID #047740	1/1990-5/2004	Temperature, humidity, wind speed and direction, atmospheric pressure, and cloud cover data used for setting the initial surface conditions of hydrodynamic model.
10	Automatic Local Evaluation in Real-Time (ALERT) Flood Warning System	San Diego Bay	31	1/1990-5/2004	Hourly rainfall data used for hydrologic and water quality modeling for wet-weather conditions.
11	California Irrigation Management Information System (CIMIS)	San Diego Bay Dana Point Harbor	CIMIS74	1990-2004	Hourly rainfall, evaporation data used for hydrologic and water quality modeling for wet-weather conditions

Table D-1. Monitoring Data Sources

Index	Data Source	Location	Station ID	Years Compiled	Purpose
Bathymetric Data					
12	Space and Naval Warfare Systems (SPAWAR) United States Army Corps of Engineers (USACE)	San Diego Bay	-	-	Bathymetric data used for hydrodynamic and water quality simulation.
		Dana Point Harbor		1999	

Table D-2. GIS Data Sources

Index	Data Type	Data Source	Years Compiled	Purpose
13	Storm Drain network	City of San Diego, City of Chula Vista, City of Coronado	-	To derive streams and watershed boundaries
14	Land Use	San Diego's Regional Planning Agency (SANDAG)	2001	Designation of Land uses in the region.
		Southern California Association of Governments (SCAG)	2000	
15	Soils	USDA-NRCS (STATSGO)	1994	STATSGO soil data used for watershed modeling.
16	Topographic and digital elevation models (DEMs)	USEPA BASINS, USGS[1]	-	To derive streams and watershed boundaries.

[1] www.usgs.gov

Appendix E
Review of Shoreline Bacteria Data

Table E-1. Percent Exceedances of Single Sample and 30-day Water Quality Objectives at Sampling Locations in San Diego Bay

Location	Indicator Bacteria	Percent Exceedance of Single Sample WQOs	Percent Exceedance of 30-day WQOs
Shelter Island Shoreline Park	*Enterococcus*	26	57
	Fecal Coliform	13	0
	Total Coliform	21	51

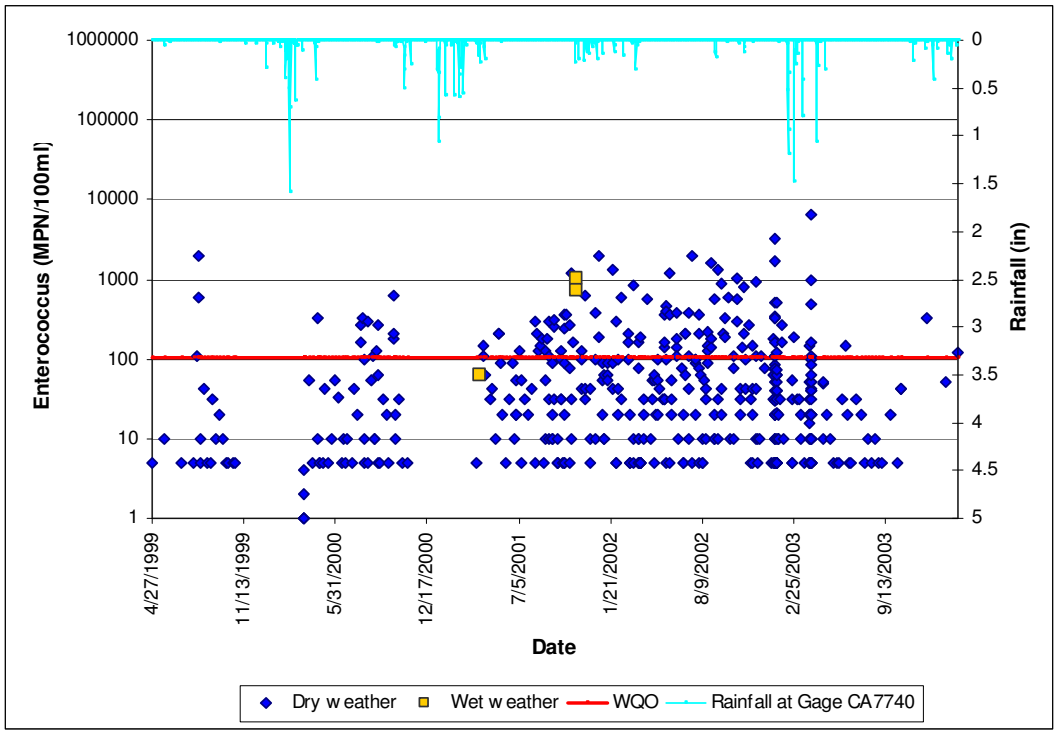

Figure E-1. *Enterococcus* Densities at Shelter Island Shoreline Park

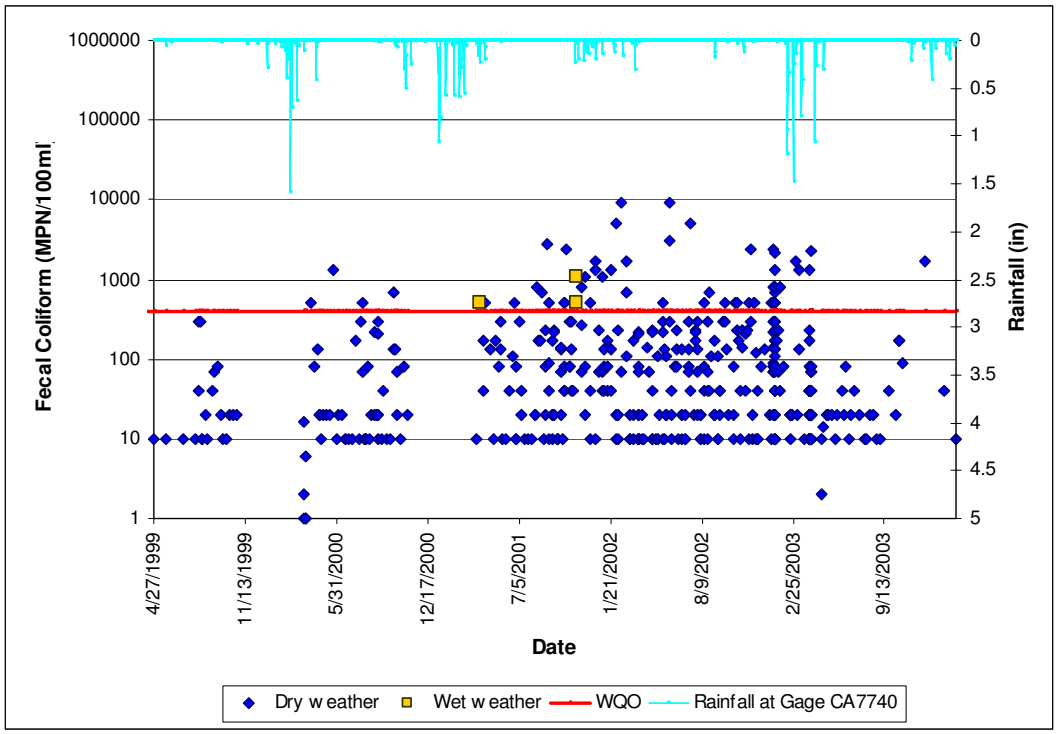

Figure E-2. Fecal Coliform Densities at Shelter Island Shoreline Park

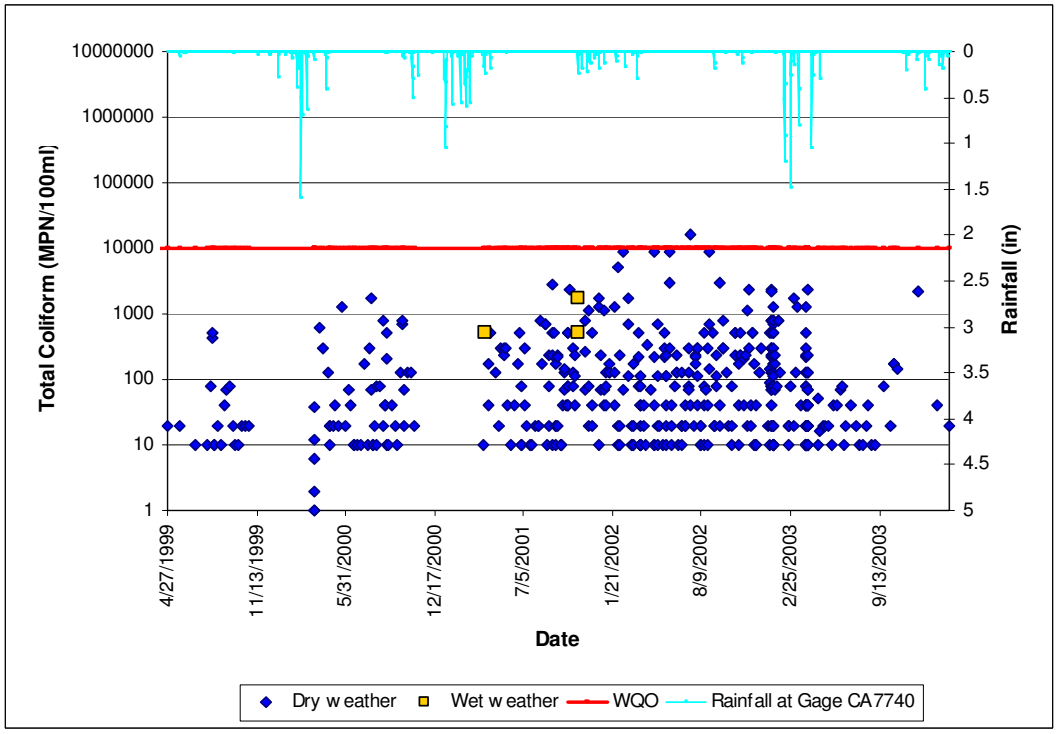

Figure E-3. Total Coliform Densities at Shelter Island Shoreline Park

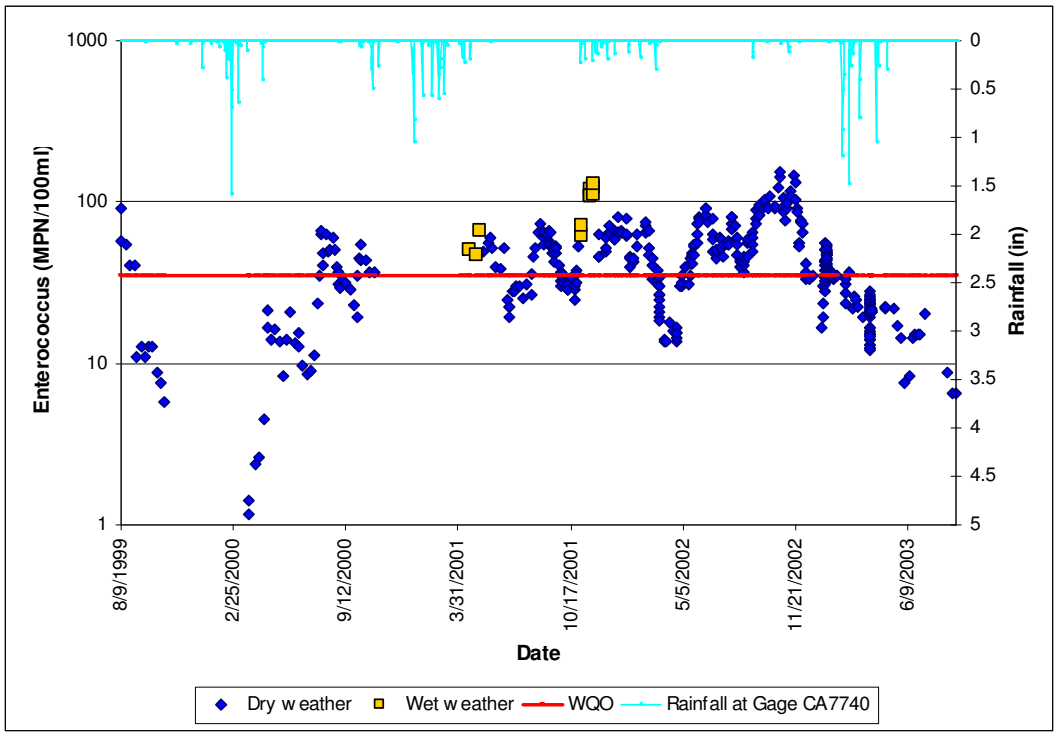

Figure E-4. 30-day Geometric Mean Densities of *Enterococcus* at Shelter Island Shoreline Park

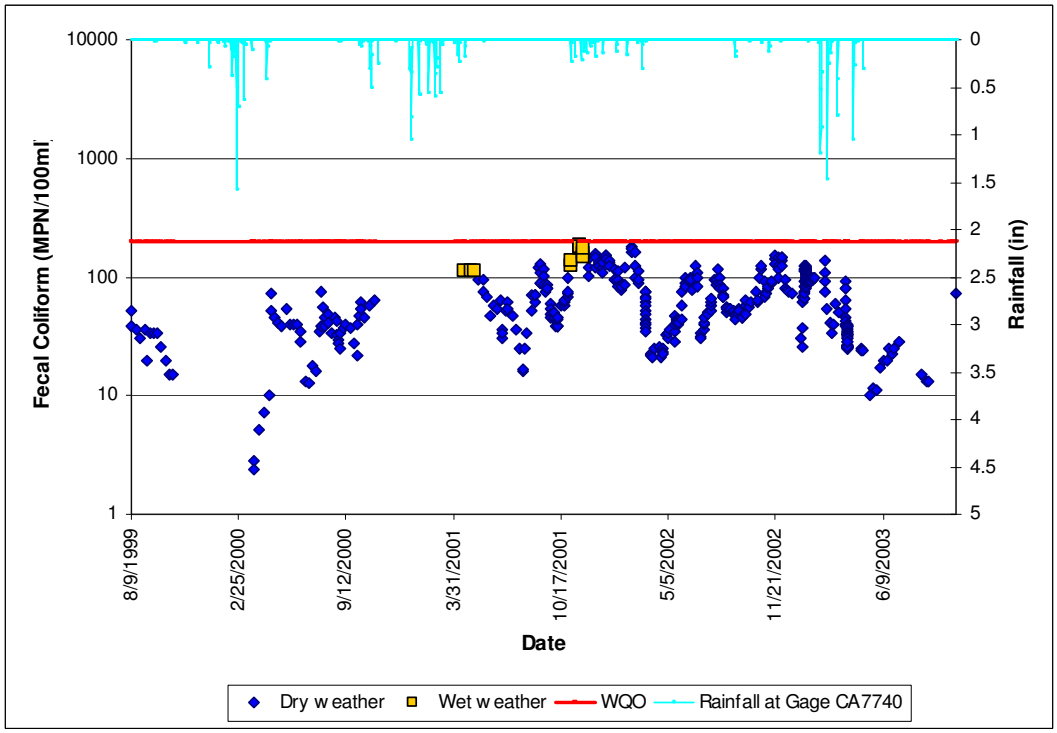

Figure E-5. 30-day Geometric Mean Densities of Fecal Coliform at Shelter Island Shoreline Park

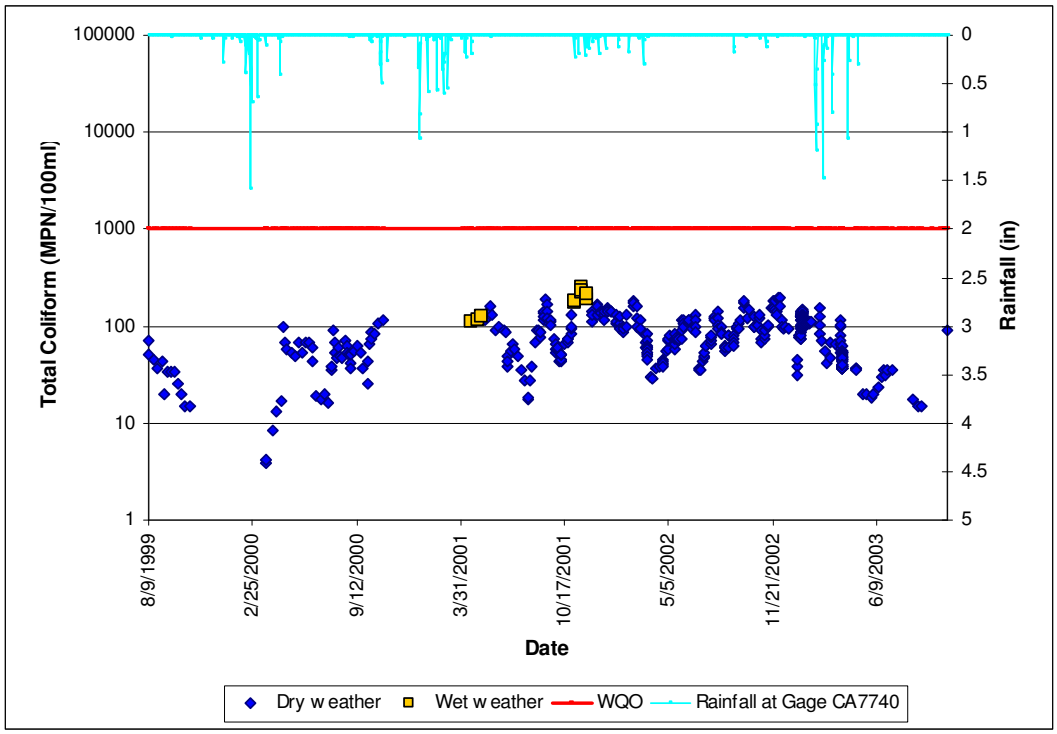

Figure E-6. 30-day Median Densities of Total Coliform at Shelter Island Shoreline Park

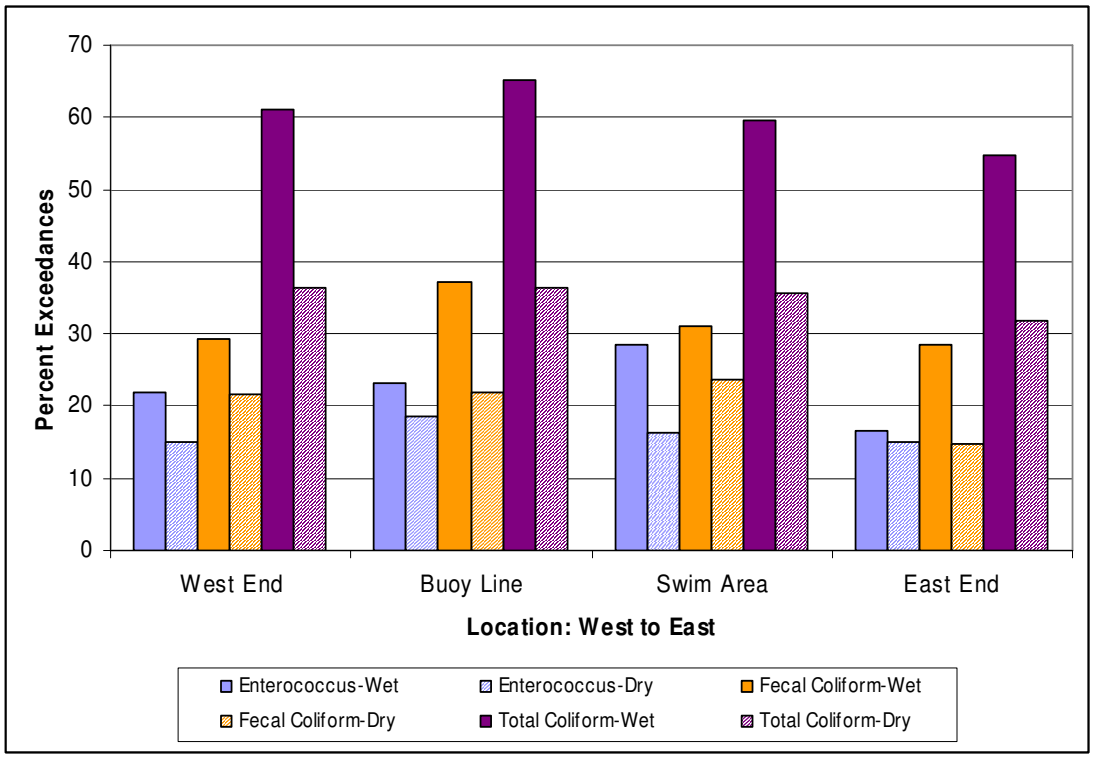

Figure E-7. Percent Exceedances of Single Sample Objectives During Wet and Dry Weather at Baby Beach Locations

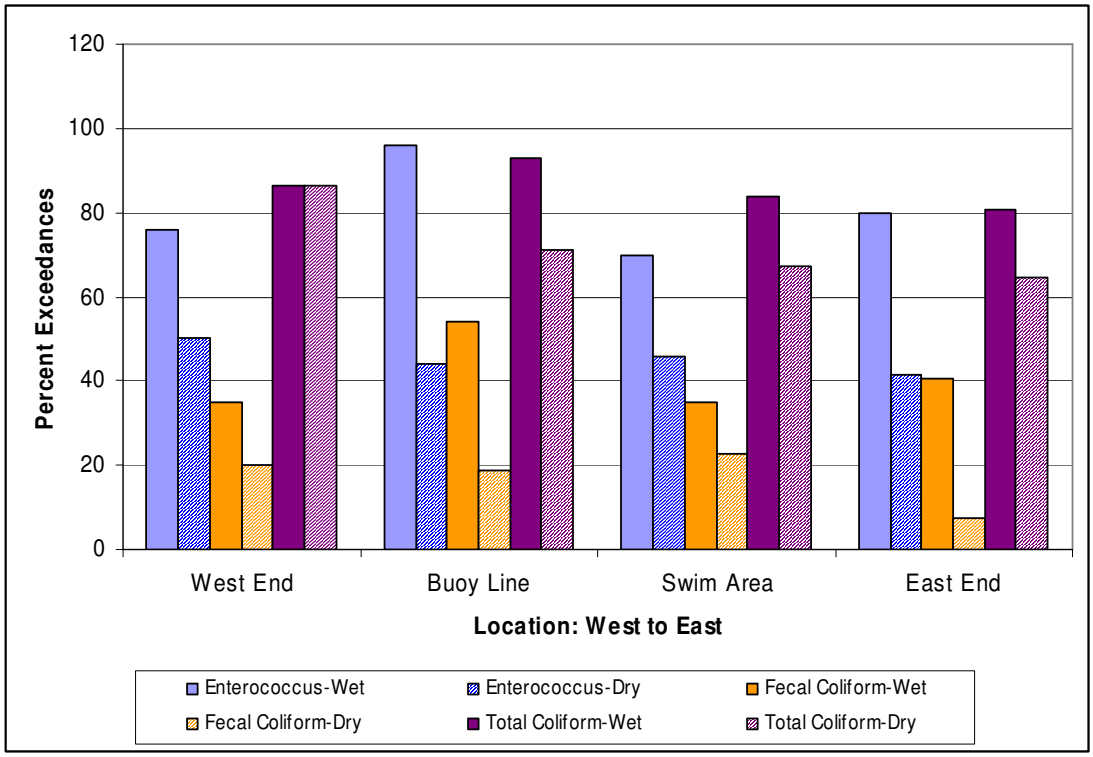

Figure E-8. Percent Exceedances of the 30-day Objectives During Wet and Dry Weather at Baby Beach Locations

Table E-2. Percent Exceedances of the Single Sample Objectives Relative to Weather at Baby Beach Locations at Dana Point Harbor

Location	Indicator Bacteria	Percent Total Exceedances	Percent Wet Period Samples in Exceedance	Percent Dry Period Samples in Exceedance
Baby Beach West End	*Enterococcus*	26	22	15
	Fecal Coliform	23	29	22
	Total Coliform	40	61	36
Baby Beach Buoy Line	*Enterococcus*	32	23	19
	Fecal Coliform	24	37	22
	Total Coliform	40	65	36
Baby Beach Swim Area	*Enterococcus*	30	29	16
	Fecal Coliform	25	31	24
	Total Coliform	39	60	36
Baby Beach East End	*Enterococcus*	25	17	15
	Fecal Coliform	17	29	15
	Total Coliform	10	55	32

Table E-3. Percent Exceedances of the 30-day Water Quality Objectives Relative to Weather at Baby Beach Locations at Dana Point Harbor

Location	Indicator Bacteria	Percent Total Exceedances	Percent Wet Period Samples in Exceedance	Percent Dry Period Samples in Exceedance
Baby Beach West End	*Enterococcus*	28	76	50
	Fecal Coliform	25	35	20
	Total Coliform	87	87	87
Baby Beach Buoy Line	*Enterococcus*	55	96	44
	Fecal Coliform	29	54	19
	Total Coliform	79	93	71
Baby Beach Swim Area	*Enterococcus*	53	70	46
	Fecal Coliform	27	35	23
	Total Coliform	73	84	67
Baby Beach East End	*Enterococc*	60	80	42
	Fecal Coliform	18	40	7
	Total Coliform	70	81	65

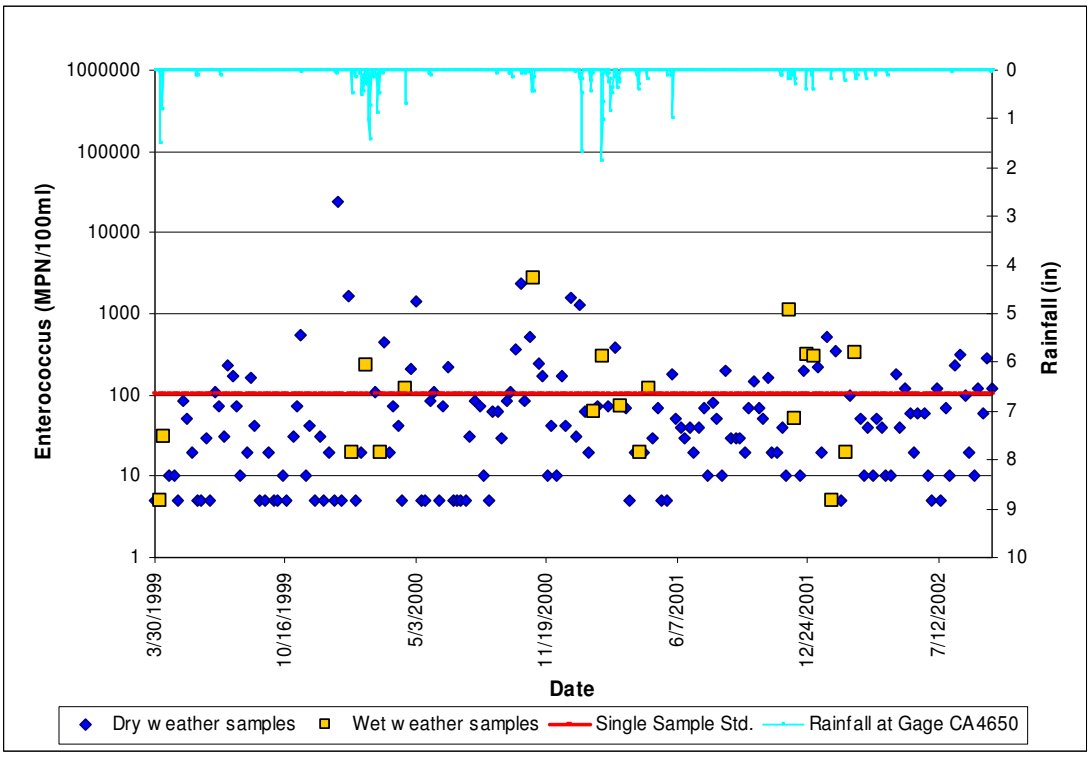

Figure E-9. *Enterococcus* Densities at Baby Beach-West End

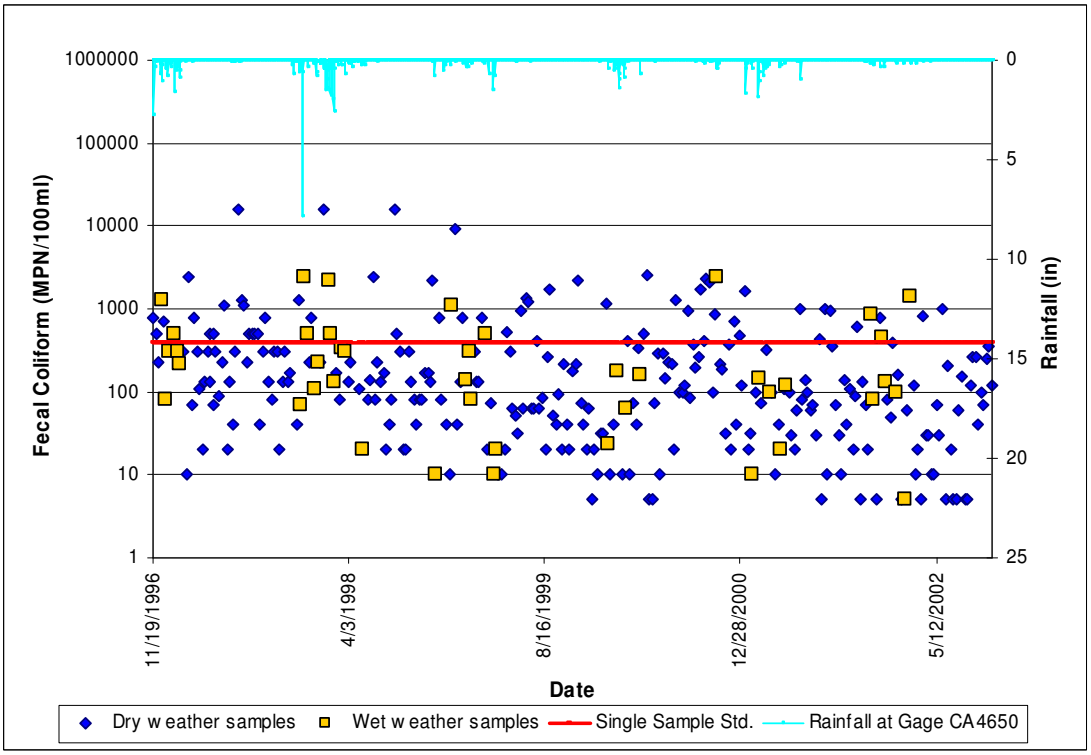

Figure E-10. Fecal Coliform Densities at Baby Beach-West End

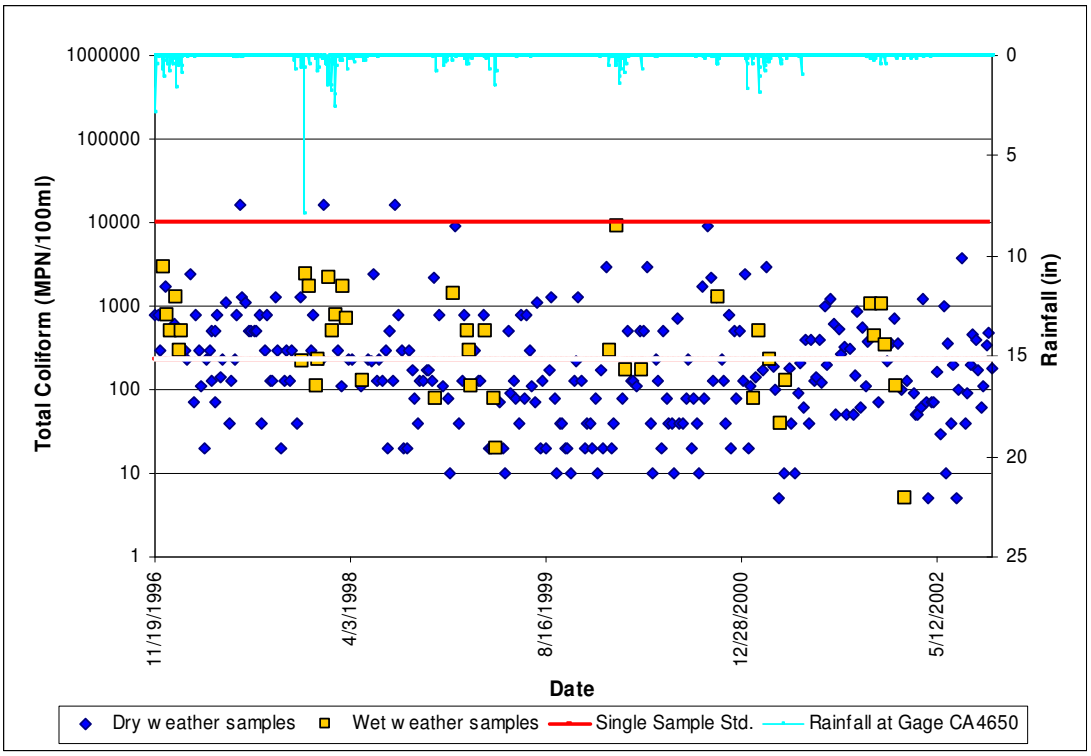

Figure E-11. Total Coliform Densities at Baby Beach-West End

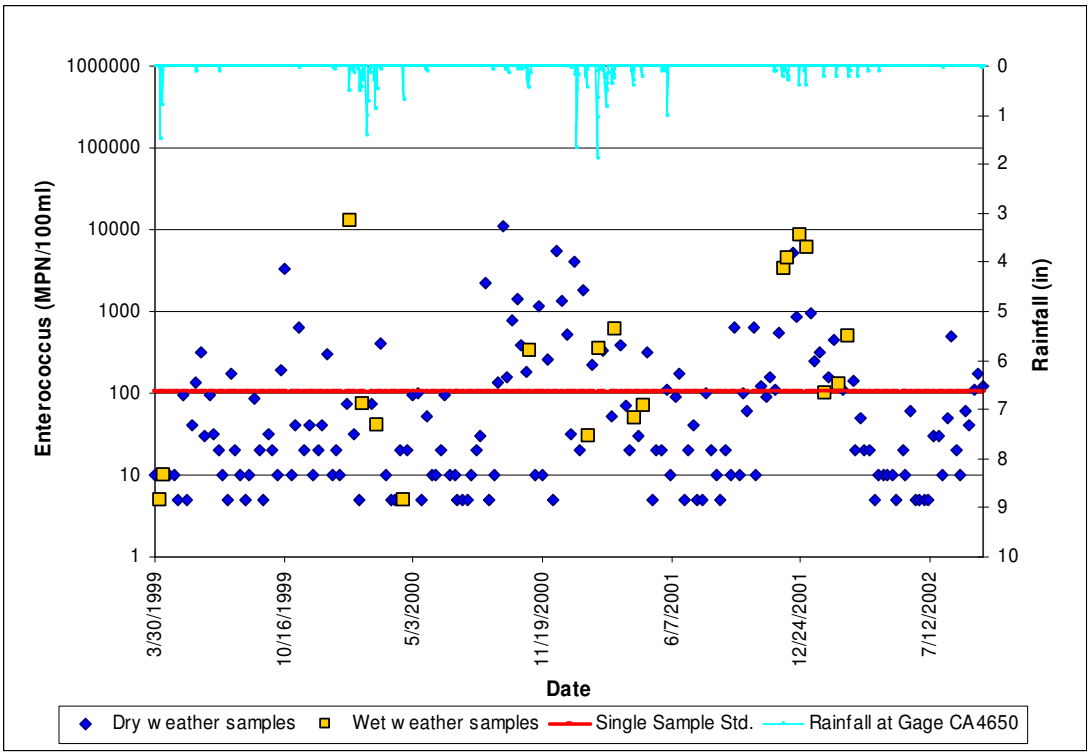

Figure E-12. *Enterococcus* Densities at Baby Beach-Buoy Line

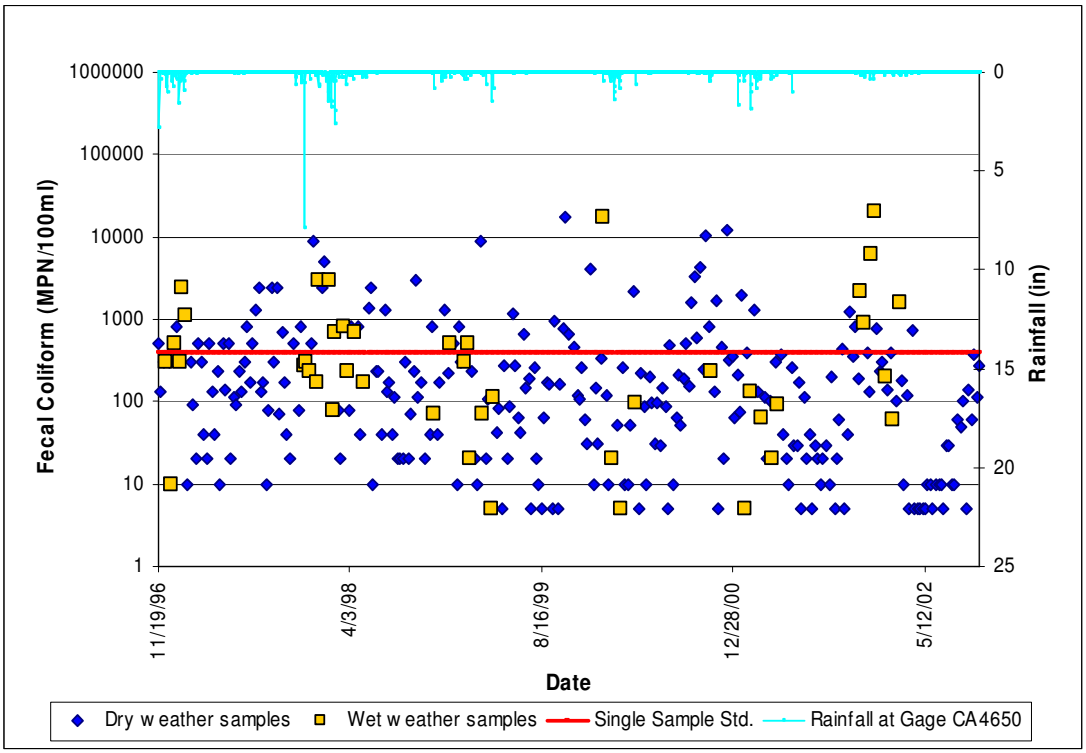

Figure E-13. Fecal Coliform Densities at Baby Beach-Buoy Line

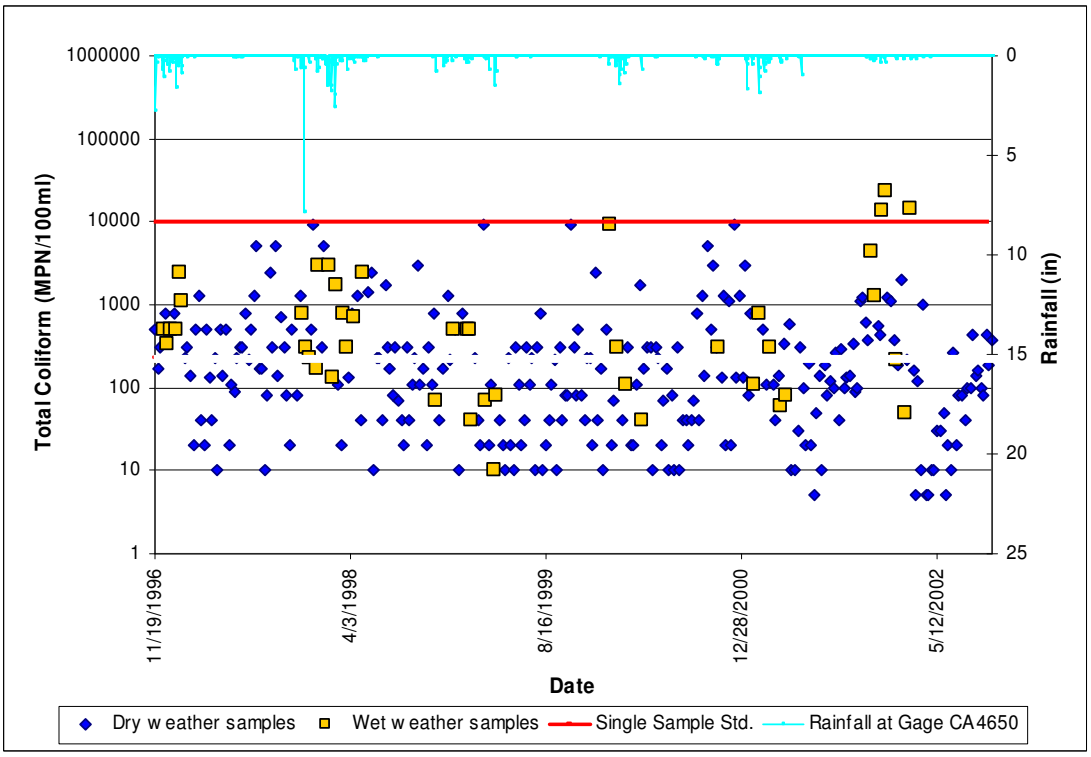

Figure E-14. Total Coliform Densities at Baby Beach-Buoy Line

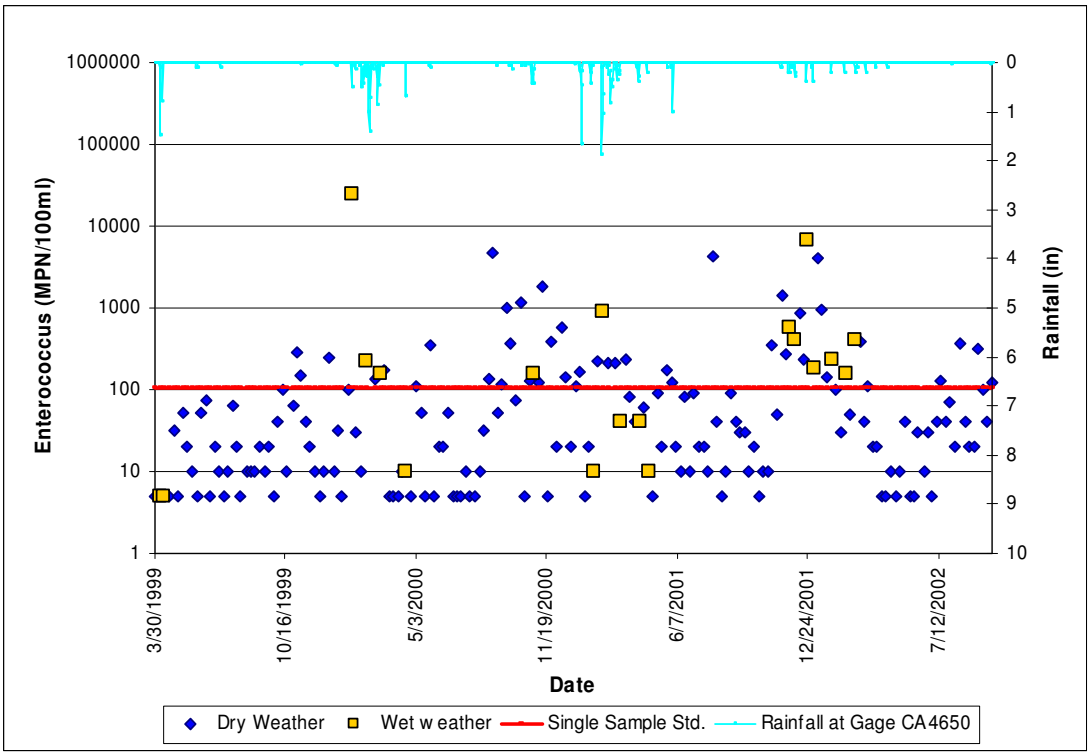

Figure E-15. *Enterococcus* Densities at Baby Beach-Swim Area

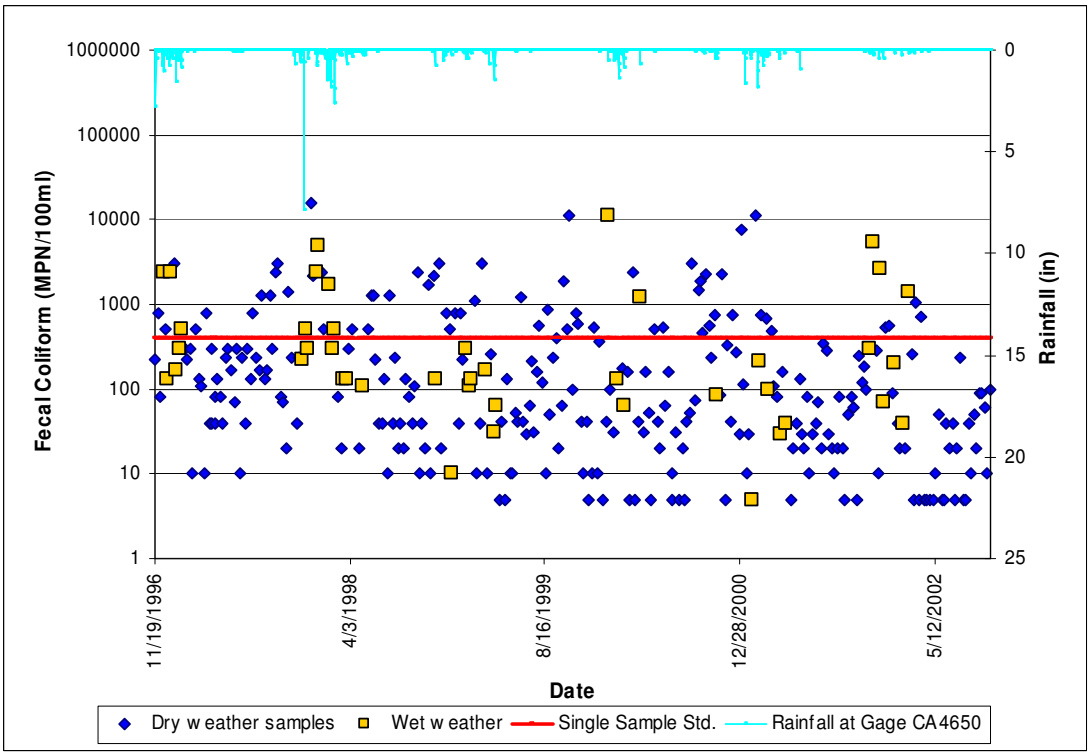

Figure E-16. Fecal Coliform Densities at Baby Beach-Swim Area

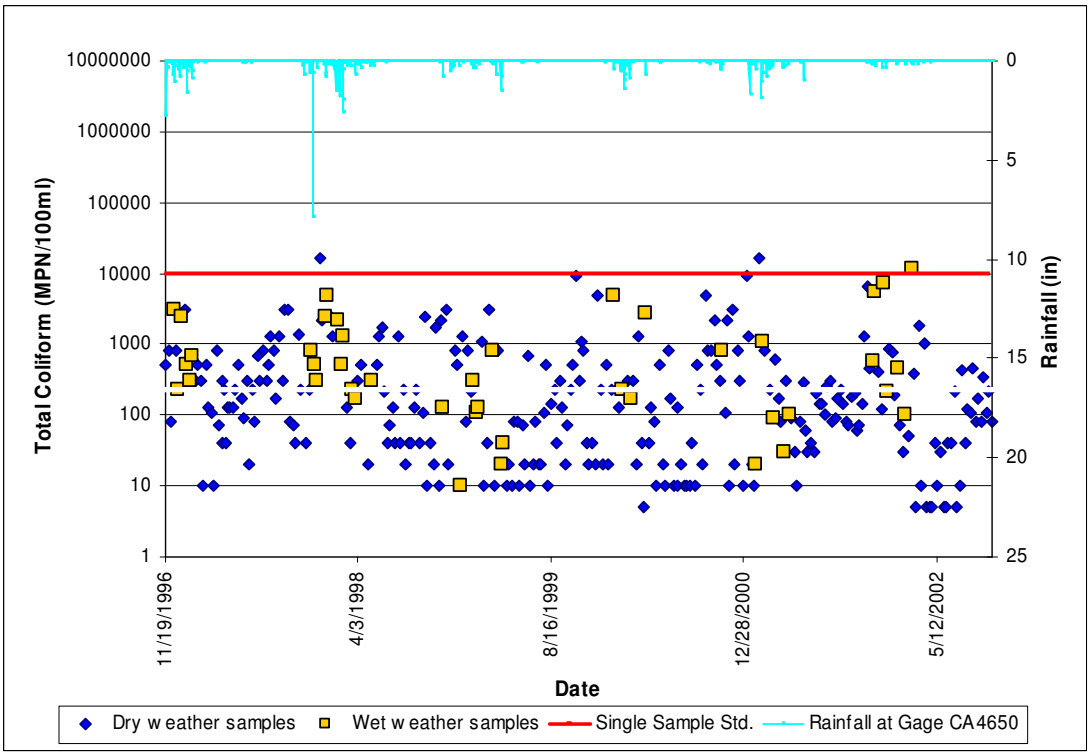

Figure E-17. Total Coliforms Densities at Baby Beach-Swim Area

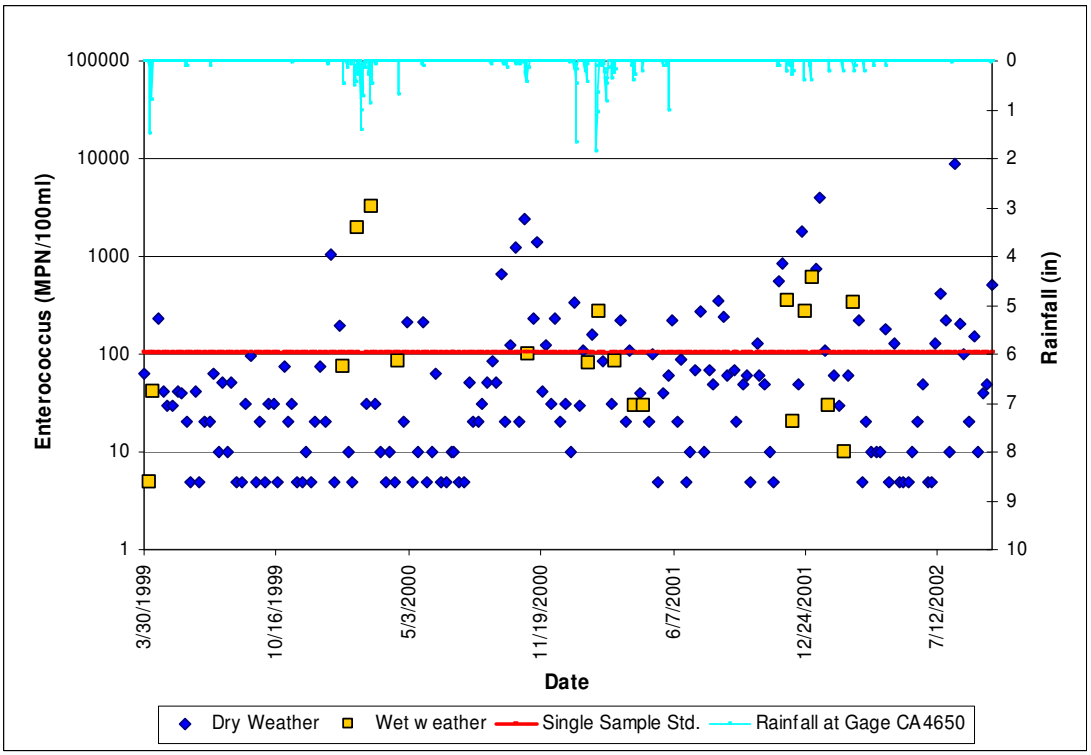

Figure E-18. *Enterococcus* Densities at Baby Beach-East End

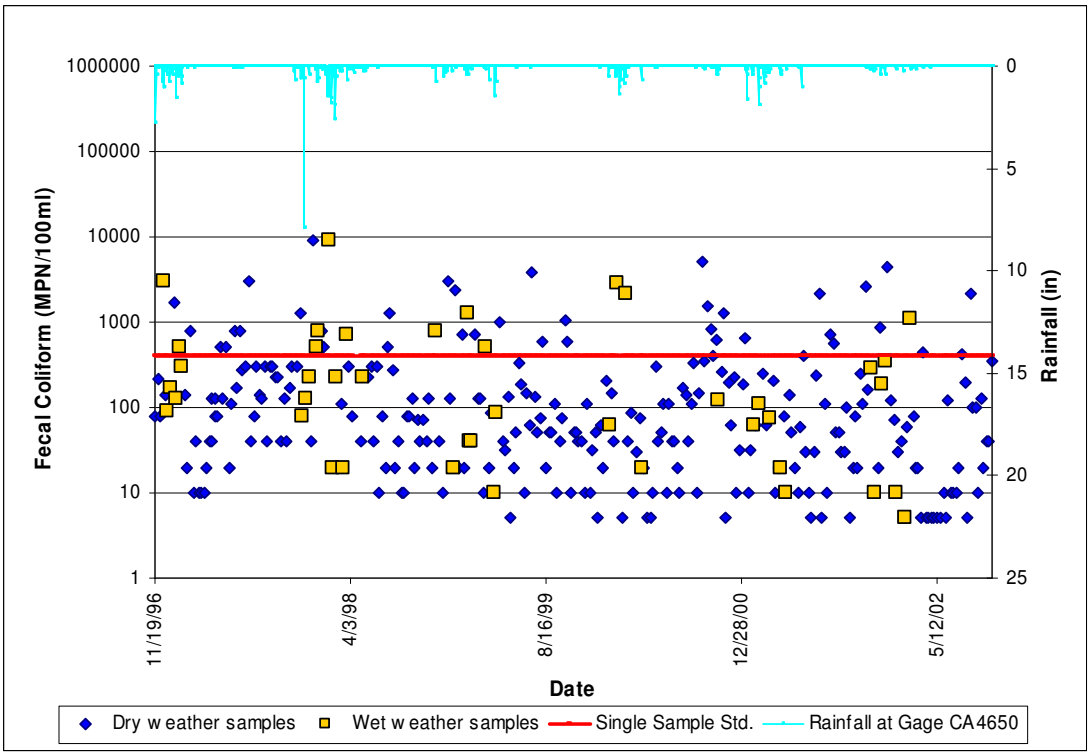

Figure E-19. Fecal Coliform Densities at Baby Beach-East End

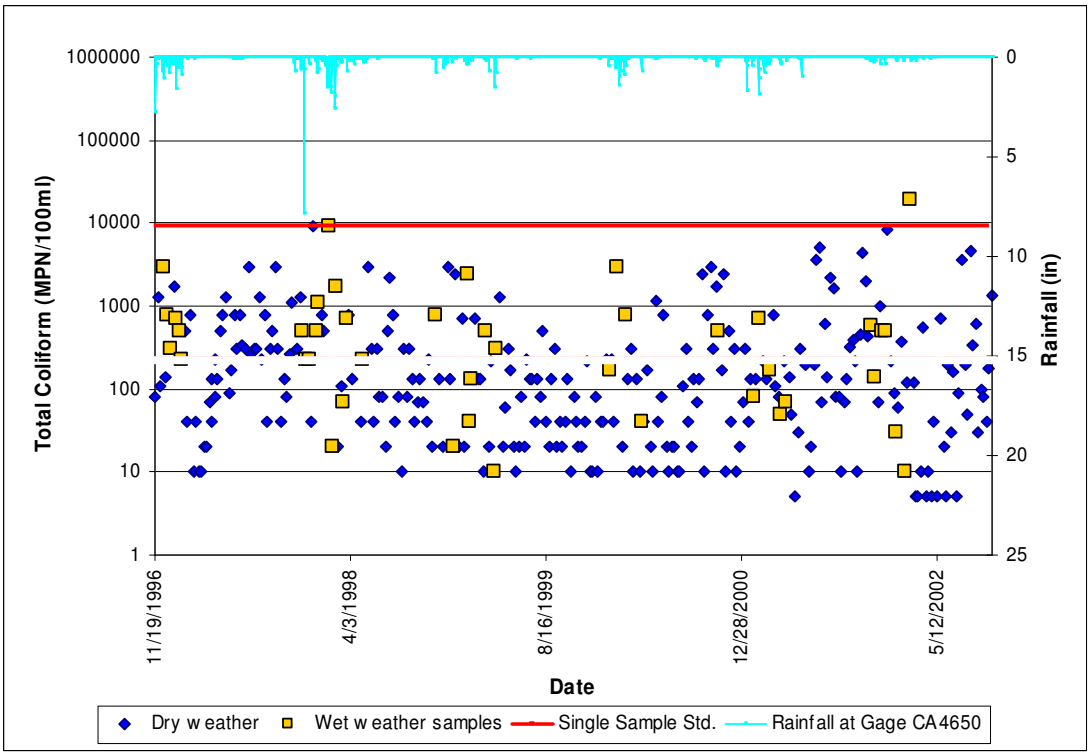

Figure E-20. Total Coliform Densities at Baby Beach-East End

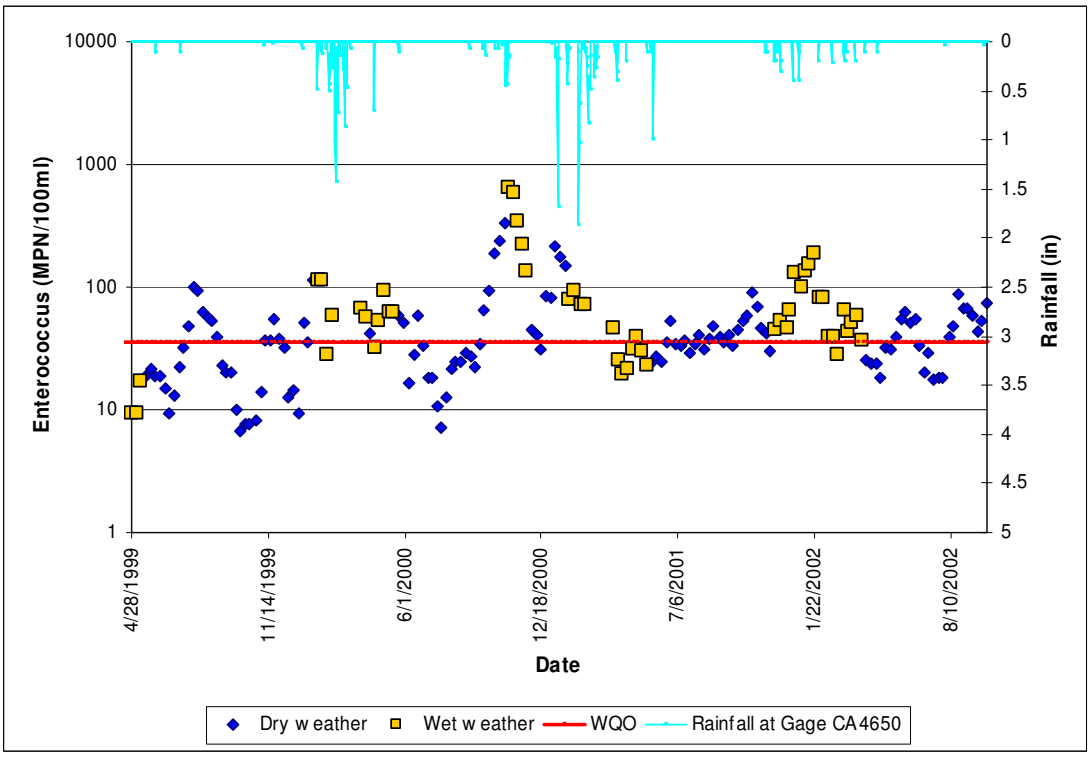

Figure E-21. 30-day Geometric Mean Densities of *Enterococcus* at Baby Beach-West End

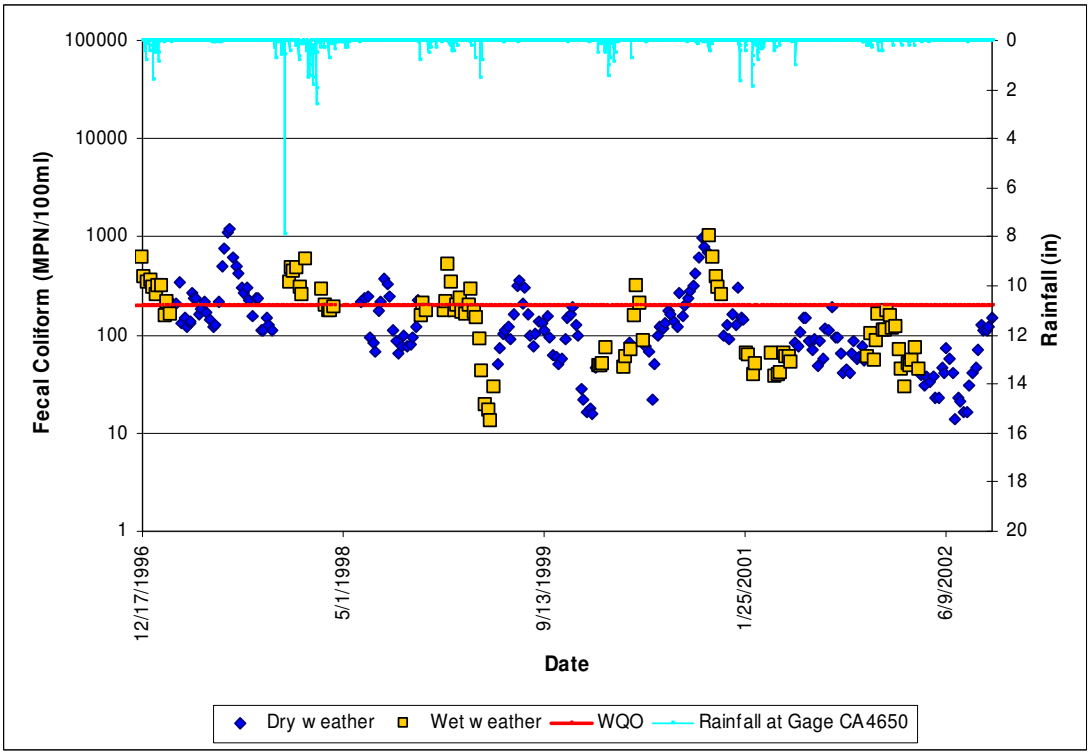

Figure E-22. 30-day Geometric Mean Densities of Fecal Coliform at Baby Beach-West End

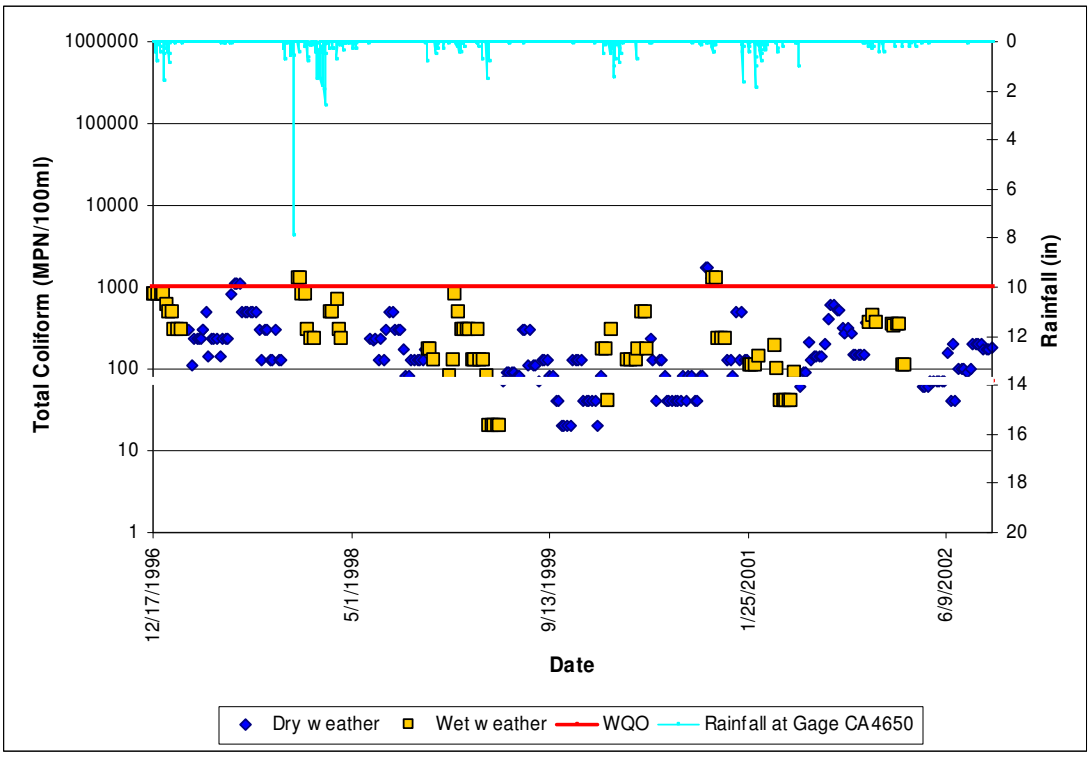

Figure E-23. 30-day Median Densities of Total Coliform at Baby Beach-West End

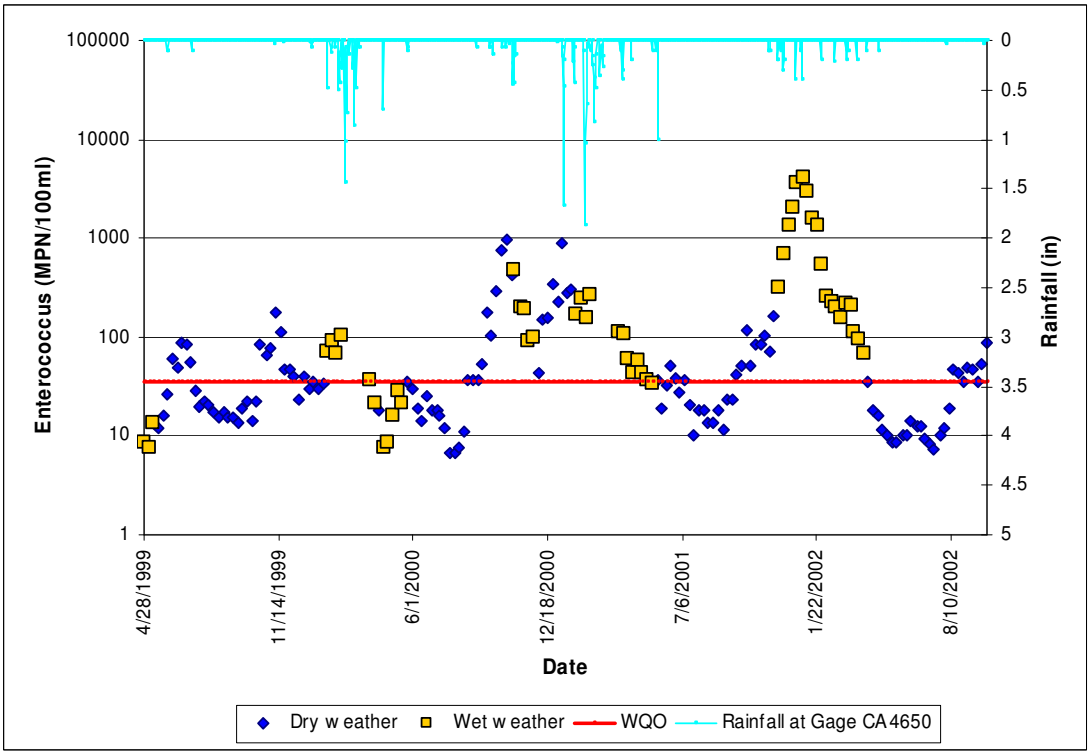

Figure E-24. 30-day Geometric Mean Densities of *Enterococcus* at Baby Beach-Buoy Line

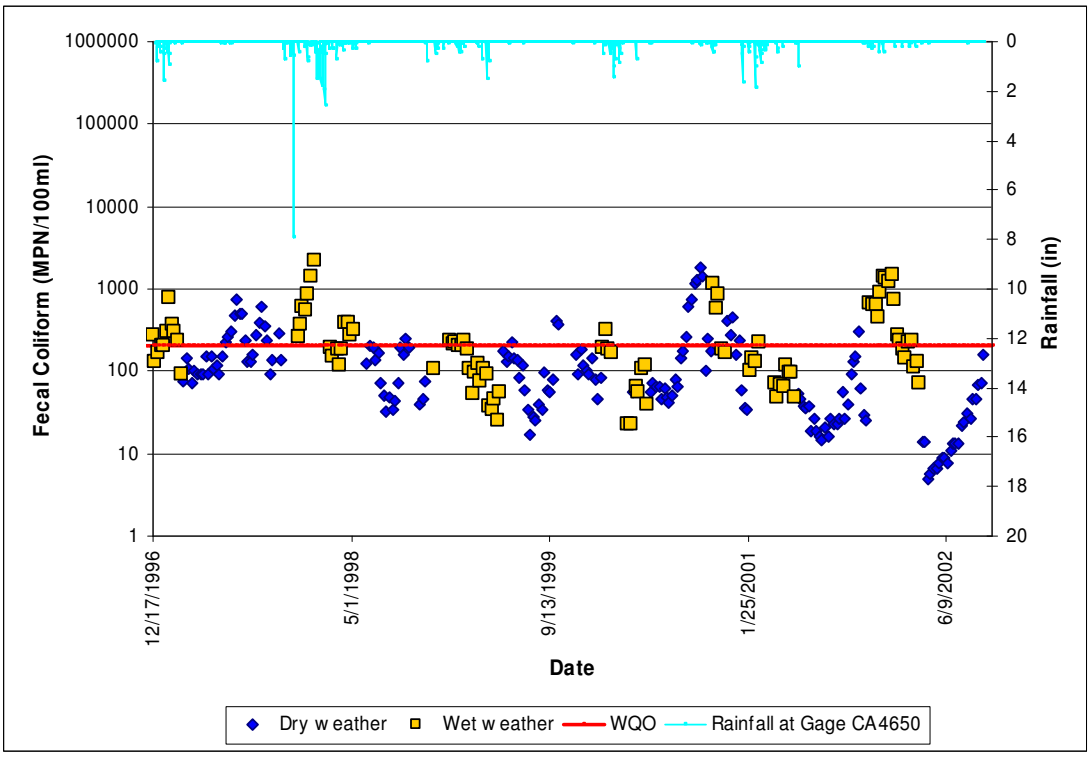

Figure E-25. 30-day Geometric Mean Densities of Fecal Coliforms at Baby Beach- Buoy Line

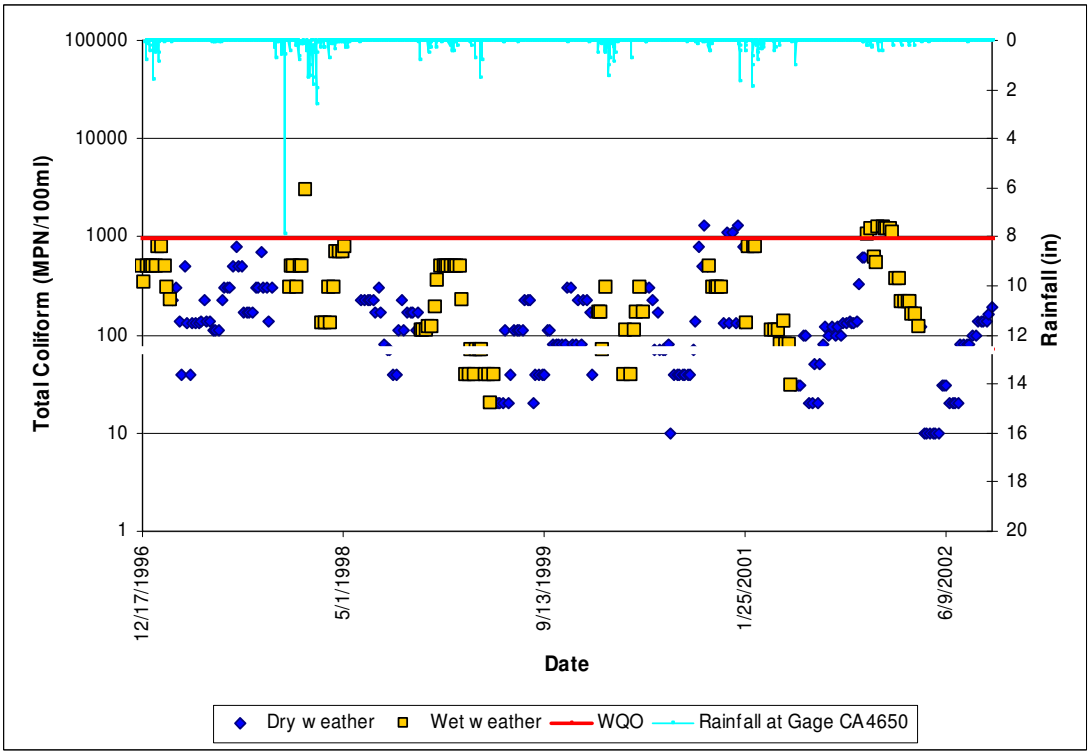

Figure E-26. 30-day Median Densities of Total Coliforms at Baby Beach-Buoy Line

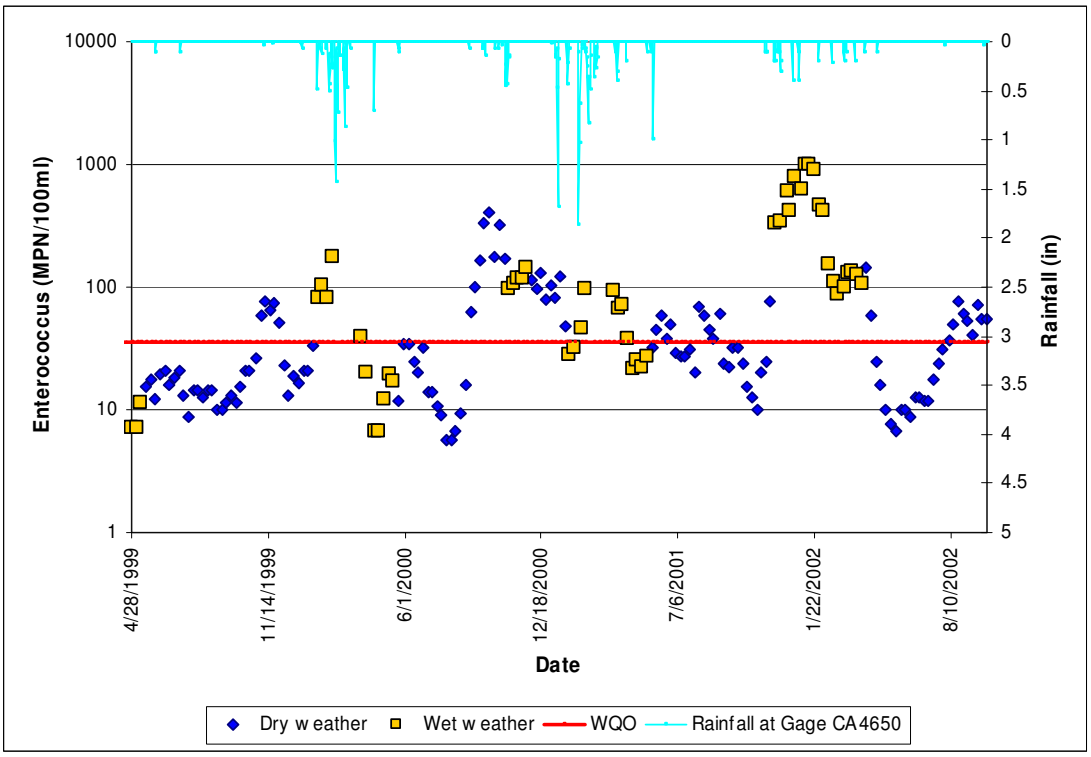

Figure E-27. 30-day Geometric Mean Densities of *Enterococcus* at Baby Beach-Swim Area

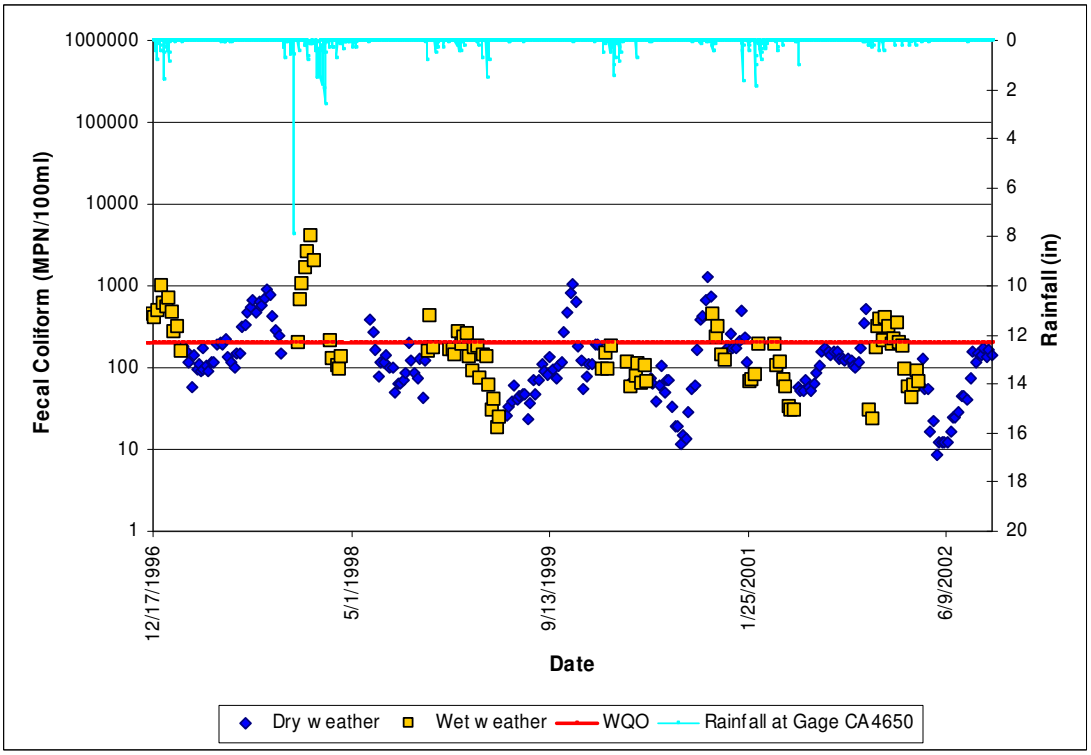

Figure E-28. 30-day Geometric Mean Densities of Fecal Coliforms at Baby Beach-Swim Area

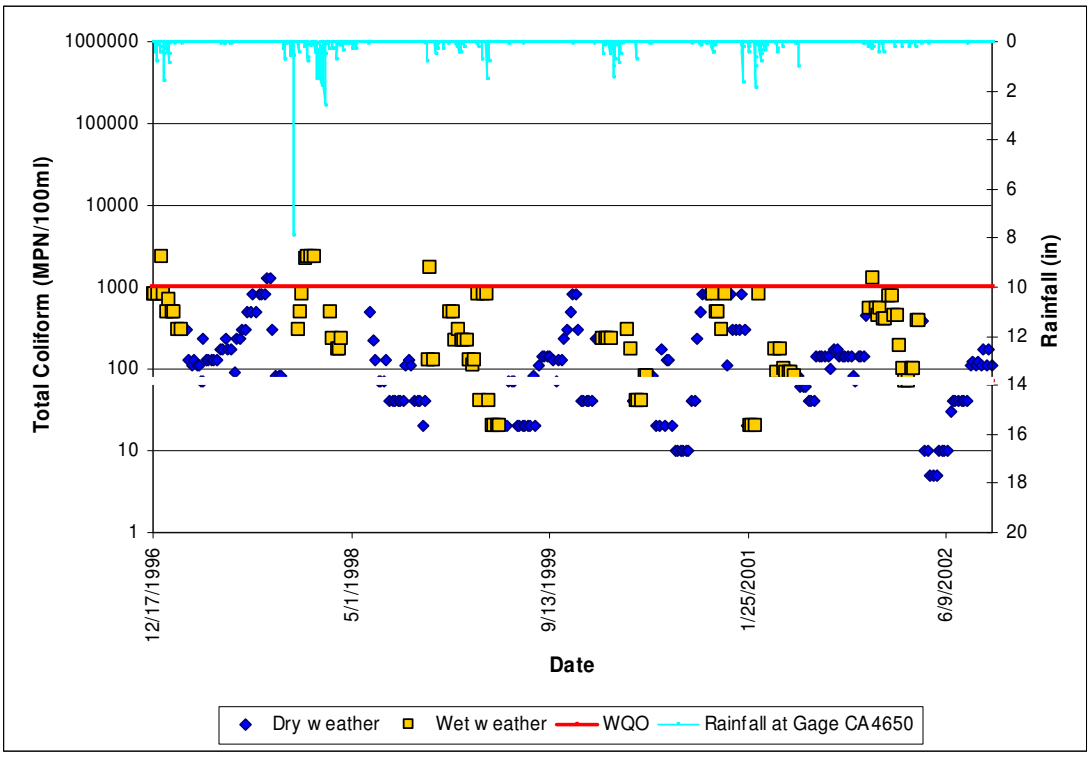

Figure E-29. 30-day Median Densities of Total Coliform at Baby Beach-Swim Area

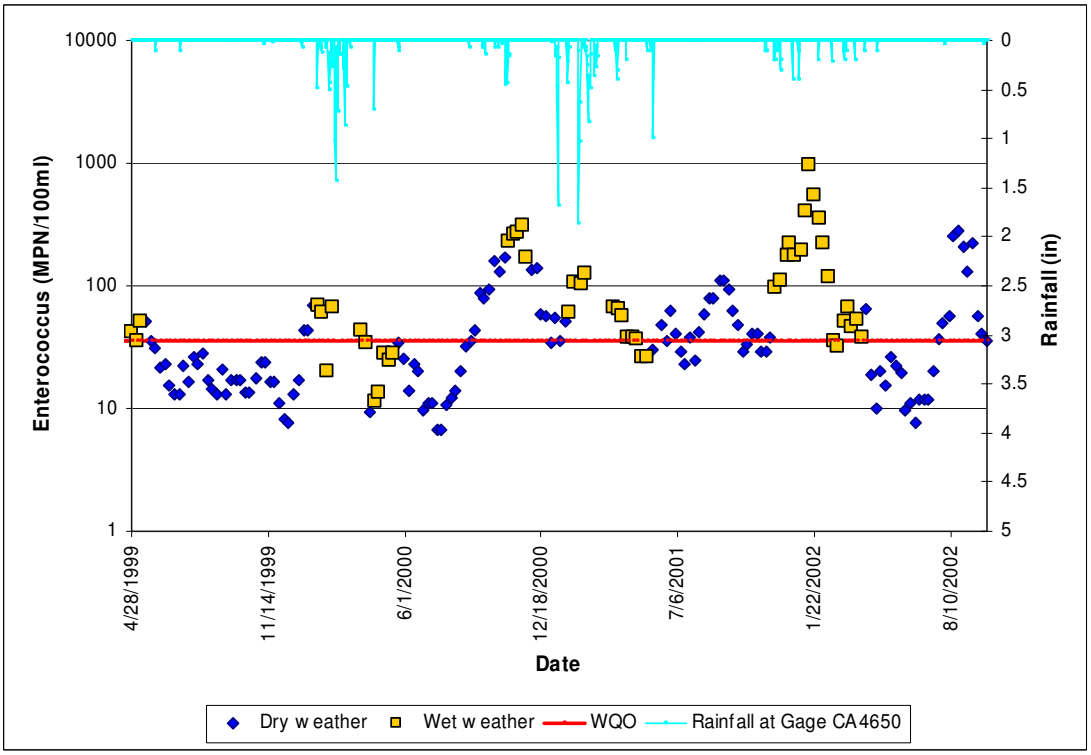

Figure E-30. 30-day Geometric Mean Densities of *Enterococcus* at Baby Beach-East End

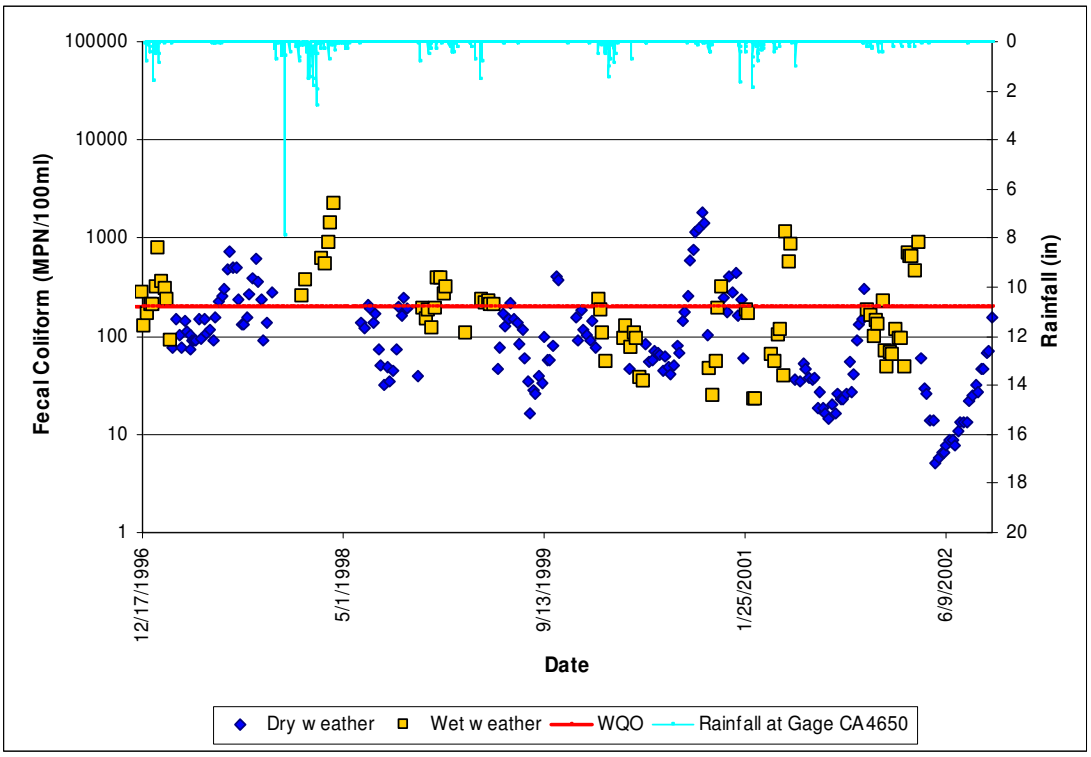

Figure E-31. 30-day Geometric Mean Densities of Fecal Coliform at Baby Beach-East End

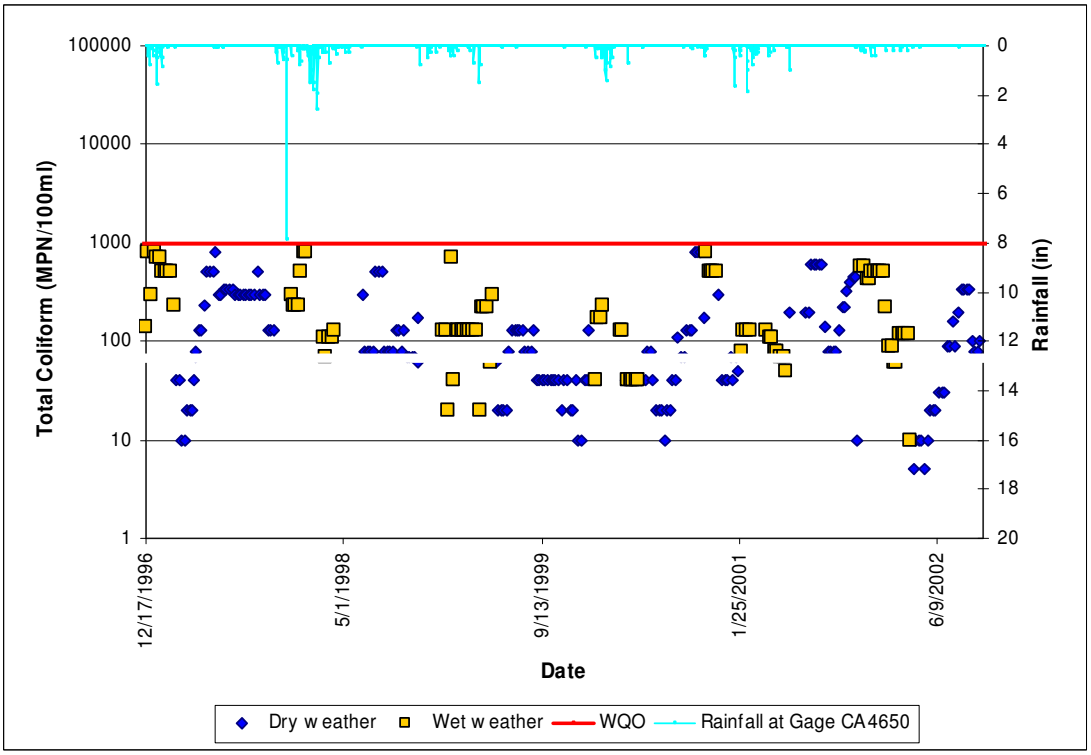

Figure E-32. 30-day Median Densities of Total Coliform at Baby Beach-East End

Appendix F

Wet Weather and Dry Weather Model Configuration, Calibration, and Validation

Appendix F
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F Introduction

Bacteria loading to bay and harbor beaches are generally associated with three main sources, which are described below:

(1) ***Upstream watershed area.*** Bacteria accumulate on the land surface at different rates. These rates vary considerably and are dependent on the activities associated with a land use.

(2) ***Near-shore area.*** Bacteria may also accumulate on the land surface immediately surrounding a receiving waterbody. These near-shore areas can support bird populations, whose feces contain large quantities of bacteria that build up on the land surface.

(3) ***Direct sources.*** Sources within the shoreline waters may contribute bacteria. These sources may include bird populations that deposit feces directly into the water, terrestrial and aquatic wildlife, and other sources within the waters.

During precipitation events and through dry weather transport mechanisms, bacteria loads from the watershed and near-shore areas are delivered to receiving waterbodies through stream networks and stormwater collection systems. Often, watershed-based bacteria sources are associated with land use-specific accumulation rates. There is often a correlation between sources of bacteria and specific land use types. Specific land use types may have higher relative accumulation rates of bacteria, or may be more likely to deliver bacteria to water bodies through stormwater collection systems. Near-shore contributions and direct deposition typically can be linked to the bird population and their dropping rates.

In order to assess the linkage between bacteria sources and impaired waters, a modeling system may be utilized to simulate the build-up and wash-off of bacteria and the hydrologic, hydraulic and hydrodynamic processes that affect delivery to and response of the receiving waters. Understanding and modeling of these processes provides the necessary decision support for TMDL development and allocation of loads to sources.

TMDL calculations were based on comprehensive wet and dry weather modeling systems, which linked watershed hydrology, receiving water hydrodynamics, and their pollutant loading characteristics. The Loading Simulation Program C++ (LSPC) (USEPA, 2003a) was applied to simulate watershed hydrology and pollutant loading during wet weather conditions. LSPC is a recoded C++ version of the USEPA's Hydrological Simulation Program–FORTRAN (HSPF) that relies on fundamental (and USEPA-approved) algorithms. A steady-state spreadsheet model was developed to simulate these processes during dry weather conditions. The Environmental Fluid Dynamic Code (EFDC) (USEPA, 2003b) was used to simulate the complex flow and pollutant transport patterns in the bays during both wet and dry weather.

The watershed component of this TMDL (wet weather and dry weather) is a direct application of the regionally calibrated models from the *Total Maximum Daily Loads for Indicator Bacteria Project I – Beaches and Creeks in the San Diego Region* (hereafter referred to as Bacteria TMDL Project I) (San Diego Water Board, 2007). The EFDC hydrodynamic model incorporates flow and loading from the watershed and subsequently determines their impact on the impaired shorelines as the pollutants are transported through the bays. This document describes the modeling methodologies employed during the development of bacteria TMDLs for the impaired shorelines of San Diego Bay (SDB) and Dana Point Harbor (DPH) (see Appendix J for maps of the areas modeled). Specifically, Section F.1 describes the LSPC wet weather watershed model, Section F.2 describes the dry weather steady-state model of the watershed, and Section F.3 provides details on the wet and dry weather EFDC model. Section F.4 discusses the application and utility of the three individual models as well as their collective role in calculation of the current TMDL and potential future functionality.

F.1 Wet Weather Watershed Model – LSPC

In the present study, an LSPC model was configured for the watersheds contributing to impaired shorelines of SDB and DPH (see Appendix J for watershed maps) and was then used to simulate the flow and loading from a watershed, or a series of hydraulically connected subwatersheds, if applicable. Configuration of the model involved subdividing the watersheds into modeling units, followed by continuous simulation of flow and water quality for these units using meteorological, land use, soils, stream, and bacteria representation data. Development and application of the watershed model to address the project objectives involved a number of important steps:

1. Watershed Segmentation
2. Configuration of Key Wet Weather Watershed Model Components
3. Wet Weather Watershed Model Calibration and Validation

F.1.1 Watershed Segmentation

Watershed segmentation refers to the subdivision of the bay watersheds into smaller, discrete subwatersheds for modeling and analysis. This process determines the land surface area that contributes flows and pollutants to each of the downstream receiving waterbodies. This subdivision was primarily based on topographic variability and storm water conveyance system networks.

A 30-meter Digital Elevation Model (DEM) was the primary source of topography data; however, this resolution was not fine enough to segment the watersheds that have relatively flat contributing areas. The 30-meter DEM was used to delineate the Baby Beach watershed. Storm water conveyance system data were used for the remaining watersheds. The Port of San Diego provided the coastal storm water conveyance system data that were used for delineating the Shelter Island Shoreline Park (SANGIS, 2004). The subwatersheds draining to the impaired shorelines of SDB and DPH identified by the watershed segmentation are presented in Appendix J.

F.1.2 Configuration of Key Wet Weather Watershed Model Components

Configuration of the watershed model involved consideration of five major components:

- Meteorological data;
- Land use representation;
- Hydrologic representation;
- Pollutant representation; and,
- Waterbody representation.

These components provided the basis for the LSPC model's ability to estimate flow and pollutant loadings. Detailed discussions about the development of each component for the LSPC model are provided in the following subsections.

F.1.2.1 Meteorology

Meteorological data are a critical component of the watershed model. Meteorological data essentially drive the watershed model. Rainfall and other parameters are key inputs to LSPC's hydrologic algorithms. The LSPC model requires an appropriate representation of precipitation and potential evapotranspiration.

In general, hourly precipitation (or finer resolution) data are recommended for nonpoint source modeling. Therefore, only weather stations with hourly-recorded (or finer resolution) data were considered in the precipitation data selection process. Rainfall-runoff processes for each subwatershed were driven by precipitation data from the most representative station. These data provide necessary input to LSPC algorithms for hydrologic and water quality representation.

Meteorological data have been accessed from a number of sources in an effort to develop the most representative dataset for the bay and harbor watersheds. Hourly rainfall data were obtained from the National Climatic Data Center (NCDC) of the National Oceanic and Atmospheric Administration (NOAA) and the Automatic Local Evaluation in Real Time (ALERT) Flood Warning System managed by the County of San Diego. The above data were reviewed based on geographic location, period of record, and missing data to determine the most appropriate meteorological stations. In addition, hourly evapotranspiration data were obtained from the California Irrigation Management Information System (CIMIS). Based on the review of the available data, the meteorological data were utilized from three area weather stations for the period of January 1990 to May 2004 (Figure F-1) were selected.

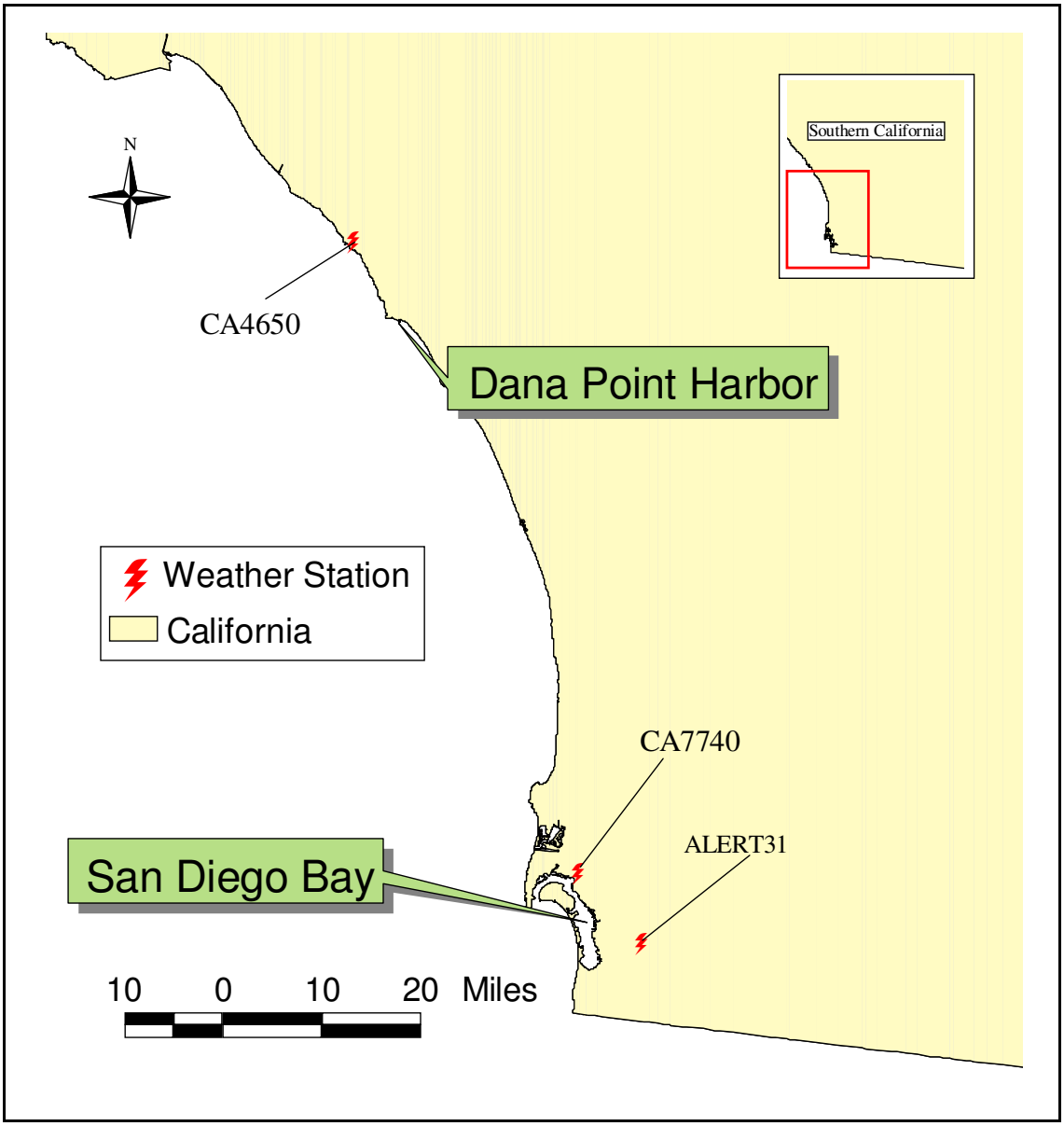

Figure F-1. Weather Stations Utilized for Wet Weather Modeling

F.1.2.2 Land Use Representation

The LSPC watershed model requires a basis for distributing hydrologic and pollutant loading parameters. Hydrologic variability within a watershed is influenced by land surface and subsurface characteristics. Variability in pollutant loading is highly correlated to land use practices. Land use representation provides the basis for distributing soils and pollutant loading characteristics throughout the watershed.

Two sources of land use data were used in this modeling effort. The primary source of data was the San Diego Association of Governments (SANDAG) 2000 land use dataset that covers San Diego County. This dataset was supplemented with land use data from

the Southern California Association of Governments (SCAG) to address the Dana Point Harbor watersheds in Orange County.

Although the multiple categories in the land use coverage provide much detail regarding spatial representation of land practices in the watershed, such resolution is unnecessary for watershed modeling if many of the categories share hydrologic or pollutant loading characteristics. Therefore, many land use categories were grouped into similar classifications, resulting in a subset of thirteen categories for modeling. Selection of these land use categories was based on the availability of monitoring data and literature values that could be used to characterize individual land use contributions and critical bacteria-contributing practices associated with different land uses. For example, multiple urban categories were represented independently (e.g., high density residential, low density residential, and commercial/institutional), whereas forest and other natural categories were grouped. Table F-1 presents the land use distribution in each of the watersheds.

Table F-1. Land Use Areas (Acres) of Each Impaired Shoreline Watershed

Watershed / Land Use	Dana Point Harbor	San Diego Bay
	Baby Beach	Shelter Island Shoreline Park
Low Density Residential (1100)	193.8	0.0
High Density Residential (1200)	165.6	0.0
Commercial/ Institutional (1400)	82.5	0.0
Industrial/ Transportation (1500)	3.6	0.0
Military (1600)	0.0	0.0
Parks/ Recreation (1700)	17.1	100
Open Recreation (1800)	29.7	0.0
Agriculture (2000)	0.0	0.0
Dairy/ Intensive Livestock (2400)	0.0	0.0
Horse Ranches (2700)	0.0	0.0
Open Space (4000)	30.3	0.0
Water (5000)	0.0	0.0
Transitional (7000)	0.0	0.0
Total	**522.6**	**10.2**

LSPC algorithms require that land use categories be divided into separate pervious and impervious land units for modeling. This division was made for the appropriate land uses (primarily urban) to represent impervious and pervious areas separately. The division was based on typical impervious percentages associated with different land use types from the Soil Conservation Service's TR-55 Manual (USDA, 1986) as summarized in Table F-2. The other eight land use categories are assumed to be 100% pervious.

Table F-2. Percent Impervious for Urban Land Uses (based on TR-55)

Land Use	Pervious Percentage	Impervious Percentage
Industrial/Transportation	18%	72%
Low Density Residential	85%	15%
High Density Residential	35%	65%
Commercial/Institutional	15%	85%
Parks/Recreation	88%	12%

F.1.2.3 Hydrology Representation

Hydrologic representation refers to the modules, or algorithms, in the LSPC model used to simulate hydrologic processes (e.g., surface runoff, evapotranspiration, and infiltration). The hydrology in the model was represented with the LSPC PWATER (water budget simulation for pervious land segments) and IWATER (water budget simulation for impervious land segments) hydrology modules, which are identical to those in HSPF model. These hydrology modules were used to simulate the hydrology for all pervious and impervious land units (Bicknell et al., 1996) in the LSPC model.

Designation of key hydrologic parameters in the PWATER and IWATER hydrology modules of LSPC were required. These parameters are associated with infiltration rates, groundwater flow, and overland flow. Robust hydrology calibration and validation were performed previously for gaged watersheds in the San Diego Region Bacteria TMDL Project I (San Diego Water Board, 2007). The parameter values derived from this previous modeling effort were input to the PWATER and IWATER hydrology modules to parameterize the watersheds in this project. None of the SDB or DPH shoreline watersheds have historic recorded streamflow. Therefore, no further hydrology calibration or validation was performed.

F.1.2.4 Pollutant Representation

Pollutant representation refers to the modules, or algorithms, in the LSPC model used to simulate pollutant loading processes (primarily accumulation and wash-off). Pollutant loading processes for total coliform (TC), fecal coliform (FC), and *Enterococcus* (ENT) were represented for each land unit using the LSPC PQUAL (simulation of quality constituents for pervious land segments) and IQUAL (simulation of quality constituents for impervious land segments) water quality modules, which are identical to those in the HSPF model. These modules simulate the accumulation of pollutants during dry

weather conditions and the wash-off of pollutants during wet weather conditions (rainy periods or storm events) for pervious and impervious land units in the LSPC model.

Land-use-specific accumulation rates and buildup limits were initially obtained from a study performed by the Southern California Coastal Water Research Project (SCCWRP) to support bacteria TMDL development for Santa Monica Bay (Los Angeles Water Board, 2002). These initial values from the SCCWRP study served as baseline conditions for water quality calibration; the appropriateness of these values to the San Diego Region was validated through comparison with local water quality data (San Diego Water Board, 2007). Because these buildup limits and accumulation rates have already been validated for the San Diego Region Bacteria TMDL Project I (San Diego Water Board, 2007), they were considered suitable for use in this smaller-scale modeling effort and thus were incorporated into the PQUAL and IQUAL water quality modules.

F.1.2.5 Waterbody Representation

Waterbody representation refers to modules, or algorithms, in the LSPC model used to simulate flow and pollutant transport through streams and rivers. Each delineated subwatershed was represented with a single stream assumed to be completely mixed, one-dimensional segments with a trapezoidal cross-section. The National Hydrography Dataset (NHD) stream reach network is generally used to determine the representative stream reach for each subwatershed. The resolution of the NHD network was not fine enough to capture the streams in the bay and harbor subwatersheds. Instead, a representative reach for each subwatershed was approximated in a geographic information system (GIS) using the DEM and storm water conveyance system network data. Once the representative reach was identified, slopes were calculated based on DEM data and stream lengths measured from the new stream coverage. In addition to stream slope and length, mean depths and channel widths are required to route flow and pollutants through the hydrologically connected subwatersheds. Mean stream depth and channel width were estimated using regression curves that relate upstream drainage area to stream dimensions. An estimated Manning's roughness coefficient of 0.2 was also applied to each representative stream reach.

F.1.3 Wet Weather Watershed Model Calibration and Validation

After the LSPC watershed model was configured, model calibration and validation was performed. Model validation for hydrology and water quality occurs after model calibration. The entire model calibration and validation process is generally a two-phase process, with hydrology calibration and validation completed before repeating the calibration and validation process for water quality. Model calibration refers to the adjustment or fine-tuning of modeling parameters until the model is able to reproduce previous observations from a particular location and time period. Subsequently, model validation is performed to test the calibrated parameters to see if the model can reproduce previous observations at different locations or for different time periods, without further adjustment.

No flow and water quality data were available to further validate the previously calibrated and validated parameters (San Diego Water Board, 2007). The general calibration and validation process is described below and details are provided regarding this current modeling effort, where applicable. To ensure that the model results are as current as possible and to provide for a range of hydrologic conditions, the meteorological data used during the previous study were extended so that the current simulations span from January 1991 through May 2004.

F.1.3.1 Hydrology Calibration and Validation

Hydrology is the first model component of the watershed model to be calibrated because estimation of bacteria loading relies heavily on streamflow prediction. The hydrology calibration involves a comparison of model results to in-stream flow observations at selected locations and time periods. After running the model and comparing results, key hydrologic parameters are adjusted and additional model simulations are performed. This iterative process can be repeated until the simulated model results closely represent the stream system and reproduce previously observed streamflow patterns and magnitudes.

Model validation is then performed to test the calibrated parameters to see if the model can reproduce previous observations at different locations or for different time periods, without further adjustment. These validation results essentially confirm the appropriateness and applicability of the hydrologic parameters derived during the calibration process.

Regionally-calibrated, land use-specific hydrology parameter values were developed while modeling the entire San Diego Region for Bacteria TMDL Project I (San Diego Water Board, 2007). These values were used to parameterize the SDB and DPH shoreline watersheds. This single set of parameters was calibrated and validated over a diverse geographic (includes mountainous and coastal regions as well as highly urbanized and open areas) and temporal scale (includes extreme wet and dry conditions), and can be applied to the ungaged streams within the San Diego Region. Without this regional set of parameter values, a watershed model would be unfeasible for TMDL linkage analysis and the calculation of loading capacities along ungaged streams. A detailed description of this robust calibration, which included thirteen USGS gages throughout the San Diego Region, is described in the Bacteria TMDL Project I (San Diego Water Board, 2007). This report also documents the methods employed to develop, evaluate, and interpret model results.

Key considerations in the hydrology calibration and validation include the overall water balance, the high-flow/low-flow distribution, stormflows, and seasonal variation. Two methods for evaluation of calibration and validation performance are often used: graphical comparison and the relative error method. Graphical comparisons are extremely useful for judging the results of model calibration; time-variable plots of observed versus modeled flow provided insight into the model's representation of storm hydrographs, baseflow recession, time distributions, and other pertinent factors often overlooked by statistical comparisons. The model's accuracy is primarily assessed

through interpretation of the time-variable plots. The relative error method is used to support the goodness of fit evaluation through a quantitative comparison.

F.1.3.2 Water Quality Calibration and Validation

After a model is calibrated and validated for hydrology, water quality model simulations are performed. As described above, previously calibrated, land use specific accumulation and maximum build up rates for TC, FC, and ENT (Los Angeles Water Board, 2002) were used for the water quality model simulations. Since these values have been successfully applied to recent bacteria models in southern California, they were considered to be sufficiently calibrated. These values were validated for the San Diego Region in Bacteria TMDL Project I by comparing the model results with available monitoring data (San Diego Water Board, 2007).

F.2 Dry Weather Watershed Model

The variable nature of bacteria sources from the SDB and DPH shoreline watersheds during dry weather required an approach that relied on detailed analyses of flow and water quality monitoring data to identify and characterize sources. This TMDL utilized empirical equations previously calibrated and validated in the San Diego Region for Bacteria TMDL Project I (San Diego Water Board, 2007) to represent water quantity and water quality associated with dry weather runoff from various land uses.

Characterization of dry-weather flow and indicator bacteria concentrations was based on analyses of data collected during studies of four watersheds in the San Diego Region. Two of these watersheds, Aliso Creek and San Juan Creek, are located in Orange County and are representative of conditions in the northern part of the Region. The remaining two watersheds, Rose Creek and Tecolote Creek, are located in San Diego County and discharge to Mission Bay. Three of these watersheds, Aliso Creek, San Juan Creek, and Tecolote Creek, are associated with water quality impairments due to bacteria and are therefore representative of conditions that may contribute to similar impairments in neighboring watersheds. Land uses for all four watersheds are consistent with other impaired watersheds in this study, with varying amounts of urban/residential land uses and open space in different subwatersheds.

The modeling approach was originally designed to simulate dry weather bacteria concentrations in the San Diego Region, as described in Bacteria TMDL Project I (San Diego Water Board, 2007). Robust model calibration and validation of flow and bacteria were performed for this initial model application. The SDB and DPH shoreline watersheds model utilizes calibrated parameters from the Bacteria TMDL Project I. The remainder of this section describes model set-up, calibration, and validation of the Bacteria TMDL Project I dry weather model, while noting modifications that were made to specify the model for the SDB and DPH shoreline watersheds.

F.2.1 Dry Weather Watershed Model Configuration

This predictive model for Bacteria TMDL Project I represented the streams as a series of plug-flow reactors, with each reactor having a constant source of flow. A plug-flow reactor can be thought of as an elongated rectangular basin with a constant level in which advection (unidirectional transport) dominates (Figure F-2).

Although not used in the SDB and DPH watersheds due to their small size, the plug-flow reactor models were essential in testing of modeling assumptions in Bacteria TMDL Project I, and comparison to instream monitoring data. As a result, a general description of development of the plug flow reactor models is discussed to provide a basis for assessing the successful application of the approach for flow and bacteria density estimation in Bacteria TMDL Project I, and hence the acceptability of the simplified application of the approach for SDB and DPH.

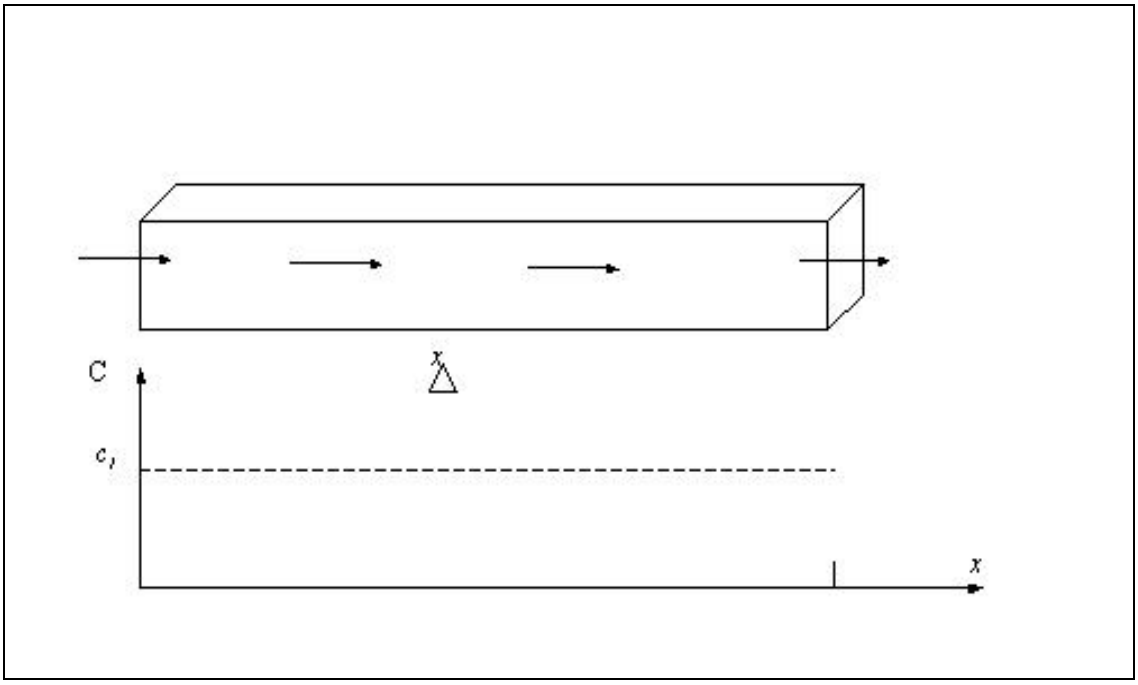

Figure F-2. Theoretical Plug-Flow Reactor

This modeling approach relies on basic segment characteristics, which include flow, width, and cross-sectional area. Model segments are assumed to be well-mixed laterally and vertically at a steady-state condition (constant flow input). Variations in the longitudinal dimension determine changes in flow and pollutant concentrations. A “plug” of a conservative substance introduced at one end of the reactor will remain intact as it passes through the reactor. The initial concentration of a pollutant can be entered and multiple source contributions can be lumped and represented as a single input based on empirically derived inflows for the injection point. Each reactor defines the mass balance for the pollutant and flow. At points further downstream, the concentration can be estimated based on first-order loss and mass balance.

F.2.1.1 Physical Representation

Before the model could be configured, an appropriate scale for analysis was determined. Model subwatersheds were delineated based primarily on topographic variability and storm water conveyance system networks. The subwatersheds, soil types, and stream lengths used in the dry weather model were identical to those described in the wet weather model (see Sections F.1.1 and F.1.2.2 for subwatershed descriptions and Appendix J for watershed maps).

F.2.1.2 Conceptual Representation

Using an upstream boundary condition of initial concentration (C_0) for inflow, the final water column concentration (C) in a segment can be calculated with the loss equation given below:

$$\frac{dc}{dt} = -kc \qquad \text{or} \qquad C_{out} = C_{in}e^{-kt} = C_{in}e^{-\left(k\frac{x}{u}\right)} \qquad (1)$$

where:

C_{in} = initial concentration (MPN/100ml)
C_{out} = final concentration (MPN/100ml)
k = loss rate (1/d)
χ = segment length (mi)
u = stream velocity (mi/d)

At each confluence, a mass balance of the watershed load and, if applicable, the load from the upstream tributary are performed to determine the change in concentration. This is represented by the following equation:

$$C_0 = \frac{Q_r C_r + Q_t C_t}{Q_r + Q_t} \qquad (2)$$

where:

Q = flow (ft^3/s)
C = concentration

In the previous equation, Q_r and C_r refer to the flow and concentration from the receiving watershed and Q_t and C_t refer to the flow and concentration from the upstream tributary. The concentration calculated from this equation is then used as the initial concentration (C_0) in the loss equation for the receiving segment.

For calculation of outflows from the reach, the following equation is used. Infiltration rates for the model were determined through model calibration and comparison to literature ranges (see Section F.2.2), and are dependent on stream length and width.

$$Q = Q_t + Q_r - I \qquad (3)$$

where:

I = infiltration (ft^3/s)

Precise channel geometry data were not available for the modeled stream segments; therefore, stream dimensions were estimated from analysis of observed data. For Bacteria TMDL Project I, analyses were performed on flow data and associated stream dimension data from 53 USGS gages throughout southern California. For this analysis, it was assumed that all flow less than 15 cubic feet per second (ft^3/s) represented dry weather flow conditions. Using these dry weather data, the relationship between flow and cross-sectional area was estimated ($R^2 = 0.51$). The following regression equation describes the relationship between flow and cross-sectional area:

$$A = e^{0.2253 \times Q} \qquad (4)$$

where:

A = cross-sectional area (ft^2)
Q = flow (ft^3/s)

In addition, data from the USGS gages were used to determine the width of each segment based on a regression between cross-sectional area and width. The relationship with the greatest correlation ($R^2 = 0.75$) was based on the natural logarithms of each parameter. The following regression equation describes the relationship between cross-sectional area and width:

$$ln(W) = (0.6296 \times ln(A)) + 1.3003 \quad \text{or} \quad W = e^{((0.6296 \times LN(A)) + 1.3003)} \qquad (5)$$

where:

W = width of model segment (ft)
A = cross-sectional area (ft^2)

F.2.2 Estimation of Dry Weather Runoff

Dry weather runoff flow data were not available for any of the SDB or DPH shoreline watersheds. To overcome this data limitation, flow parameters from the regionally calibrated dry weather watershed model for Bacteria TMDL Project I TMDLs was utilized. The remainder of this section describes the methodology used to predict flow for the Bacteria TMDL Project I model (San Diego Water Board, 2007).

An analysis was performed using dry weather data from the Aliso Creek (27 stations), Rose Creek (3 stations) and Tecolote Creek (2 stations) watersheds to determine whether there is a correlation between the respective land use types and the average of dry weather flow measurements collected at the mouth of each subwatershed. Table F-3 lists the stations and number of flow measurements used in this analysis.

Table F-3. Number of Flow Measurements at Each Station Used in Analyses

Watershed	Station	No. of Flow of Measurements
Aliso Creek	J01P08	35
	J01P06	21
	J07P02	40
	J07P01	38
	J01P01	40
	J01P05	39
	J01P03	40
	J01P04	40
	J06	15
	J05	39
	J01P30	39
	J01P28	39
	J01P27	40
	J01P33	40
	J01P25	40
	J01P26	40
	J01P24	35
	J01P23	40
	J01P22	39
	J03P02	39
	J01P21	32
	J02P05	39
	J02P08	40
	J03P13	38
	J03P05	40
	J03P01	39
	J04	6
Rose Creek	MBW11	7
	MBW13	80
	MBW16	76
Tecolote Creek	MBW7	23
	MBW9	77

Selection of stations used in the analyses considered the number of flow measurements, the size of the watershed, as well as strategic locations of multiple watersheds representative of varied land uses. A linear relationship was established based on land use areas, with coefficients established through a *step-wise* multivariable regression analyses. For this regression, variables (land use areas) were added to the regression in a step-wise approach, and *p*-values were evaluated for each parameter. A *p*-value of less than 0.05 for each variable was used to determine their statistical significance. Some variables added at an early state of the regression analysis became statistically insignificant as additional variables were subsequently added to the model, which verified the necessity for a robust *step-wise* regression analyses over other more simplified methods. The resulting equation showed a good correlation between the flow and the commercial/institutional, open space and industrial/transportation land uses

(R^2 = 0.78). The following is the resulting equation from the analysis (*p*-values for each variable are listed below):

$$Q = (A_{COM} \times 0.00168) + (A_{OPS} \times 0.000256) - (A_{IND} \times 0.00141) \qquad (6)$$

where:

Q = flow (ft^3/s)
A_{COM} = area of commercial/institutional (acres) (p-value = 6E-13)
A_{OPS} = area of open space, including military operations (acres) (p-value= 0.029)
A_{IND} = area of industrial/transportation (acres) (p-value = 0.002)

The empirical equation presented above that represents water quantity associated with dry weather runoff from various land uses can be used to predict flows. Figure F-3 shows the flow predicted by the above equation compared to observed data for Aliso Creek, Rose Creek, and Tecolote Creek.

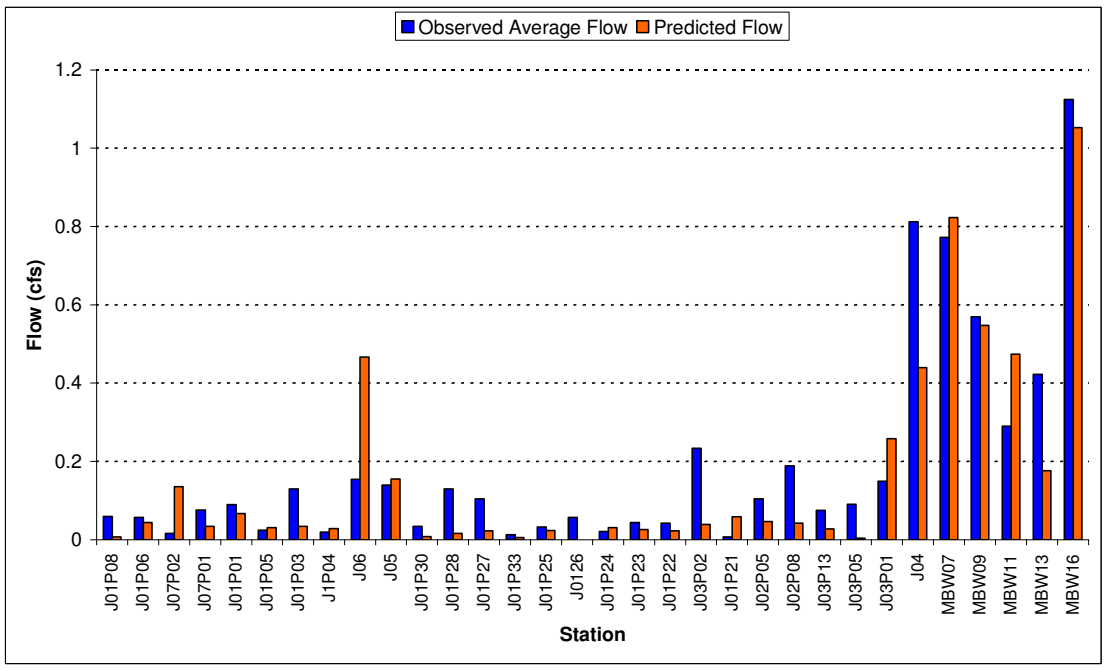

Figure F-3. Predicted and Observed Flows in Aliso Creek, Rose Creek, and Tecolote Creek

Overall, the statistical relationship established between each land use area and flow showed good correlation with the observed flow data. To improve model fit in Bacteria TMDL Project I, model calibration and validation were conducted based on the plug-flow reactor assumptions (see Section F.2.4). The equation presented above was used to estimate inflows from the SDB and DPH shoreline watersheds as part of this current TMDL project.

F.2.3 Estimation of Bacteria Densities

Like dry weather runoff flow data, no bacteria water quality data were available for the SDB and DPH shoreline watersheds. To overcome this data limitation, water quality parameters from the regionally-calibrated dry weather model for Bacteria TMDL Project I were utilized. The remainder of this section describes the methodology used to predict bacteria densities for the Bacteria TMDL Project I dry weather watershed model (San Diego Water Board, 2007).

An analysis was performed using data from subwatersheds tributary to Aliso Creek (27 stations), Tecolote Creek (5 stations), Rose Creek (4 stations) and San Juan Creek (9 stations) to determine the correlation between dry weather FC concentrations, land use distribution and the overall size of the subwatersheds. For comparison, geometric means were calculated for each station using all dry weather data collected. Large data sets were preferred to reduce random error and normalize observations at each site. For example, if a station has 40 dry weather samples, the geometric mean of bacteria concentrations can be used for that station with confidence that they are representative of the range of conditions that normally occur. Likewise, if a station has only two samples, there is less confidence. It was critical that the data were normalized as well as possible before regression analysis so that variability did not propagate error. However, no criteria were developed for selection of stations based on the number of samples for representative geometric mean calculations. Rather, station selection included qualitative evaluation for consideration in the analyses. Specific stations of Rose Creek, Tecolote Creek, and San Juan Creek were selected for analyses even though few samples were available at these locations for geometric mean calculations. These stations were selected based on multiple reasons, including the relatively low indicator bacteria concentrations observed, strategic locations of watersheds to provide an expanded spatial coverage for analyses, size of the watershed, or representation of key land uses.

Table F-4. Number of Water Quality Samples at Each Station Used in Analyses

Watershed	Station	Number of Samples		
		FC	TC	ENT
Aliso Creek	J01P08	40	40	40
	J01P06	39	39	39
	J07P02	40	40	40
	J07P01	40	40	40
	J01P01	40	40	40
	J01P05	40	40	40
	J01P03	40	40	40
	J01P04	40	40	40
	J06	40	40	40
	J05	40	40	40
	J01P30	40	40	40
	J01P28	40	40	40
	J01P27	40	40	40
	J01P33	40	40	40
	J01P25	40	40	40
	J01P26	40	40	40
	J01P24	40	40	40
	J01P23	40	40	40
	J01P22	40	40	40
	J03P02	40	40	40
	J01P21	33	33	33
	J02P05	40	40	40
	J02P08	40	40	40
	J03P13	40	40	40
	J03P05	40	40	40
	J03P01	40	40	40
	J04	40	40	40
Rose Creek	MBW13	55	80	60
	MBW15	22	78	26
	MBW16	18	76	21
	MBW24	3	7	3
Tecolote Creek	MBW6	5	70	8
	MBW7	6	23	11
	MBW8	5	27	15
	MBW9	20	77	25
	MBW10	40	88	54
San Juan Creek	SJ13	11	11	11
	SJ14	10	10	10
	SJ15	11	11	11
	SJ16	11	11	11
	SJ19	3	3	3
	SJ20	11	11	11
	SJ21	11	11	11
	SJ29	2	2	2
	SJ32	11	11	11

As part of the TMDL development for Bacteria TMDL Project I, a regression analysis was performed to determine whether there is correlation between the representative geometric mean of FC data at each station, the percent of each land use category in the subwatershed, and the total watershed area. Coefficients in the equation were established through a *step-wise* multivariable regression analyses. For this regression,

variables (percent of land uses) were added to the regression in a step-wise approach, and *p*-values were evaluated for each parameter. Percentages of land uses were used instead of land use areas since concentrations are not expected to increase with the size of the watershed, but rather due to the density of specific land uses. To include a function for reduction of bacteria concentration due to watershed size and increased potential for bacteria die-off (prior to entering the stream), an additional variable was added for watershed area. A *p*-value of less than 0.05 for each variable was used to determine their statistical significance (although this criterion was relaxed for open recreation which slightly exceeded at 0.067). As with the flow analysis, some variables added at an early state of the regression analysis became statistically insignificant as additional variables were subsequently added to the model, verifying the need for a robust *step-wise* regression analyses over other more simplified methods.

Results showed a good correlation between the natural log of FC concentrations and low-density residential, high-density residential, industrial/transportation, open space, transitional, commercial/institutional, and recreation land uses, as well as subwatershed size (R^2=0.74). The following regression equation describes the correlation between land use, fecal coliform concentration, and watershed area. Figure F-4 illustrates the observed geometric means and predicted concentrations at each sampling station.

$$\ln(FC) = 8.48 \times (\%LU_{LDR}) + 9.81 \times (\%LU_{HDR}) + 8.30 \times (\%LU_{IND}) + 8.46 \times (\%LU_{OPS}) + 10.76 \times (\%LU_{TRN}) + 6.60 \times (\%LU_{COM}) + 17.92 \times (\%LU_{PRK}) + 12.85 \times (\%LU_{OPR}) - 0.000245 \times A \quad (7)$$

where: FC = fecal coliform concentration (MPN/100 ml)

$\%LU_{LDR}$ = percent of low density residential (p-value = 8E-16)
$\%LU_{HDR}$ = percent of high density residential (p-value = 7E-15)
$\%LU_{IND}$ = percent of industrial/transportation (p-value = 0.005)
$\%LU_{OPS}$ = percent of open space, including military operations (p-value = 7E-24)
$\%LU_{TRN}$ = percent of transitional space (p-value = 1E-19)
$\%LU_{COM}$ = percent of commercial/institutional (p-value = 4E-9)
$\%LU_{PRK}$ = percent of park/recreation (p-value = 0.009)
$\%LU_{OPR}$ = percent of open recreation (p-value = 0.067)
A = total area of watershed (acres) (p-value = 1E-7)

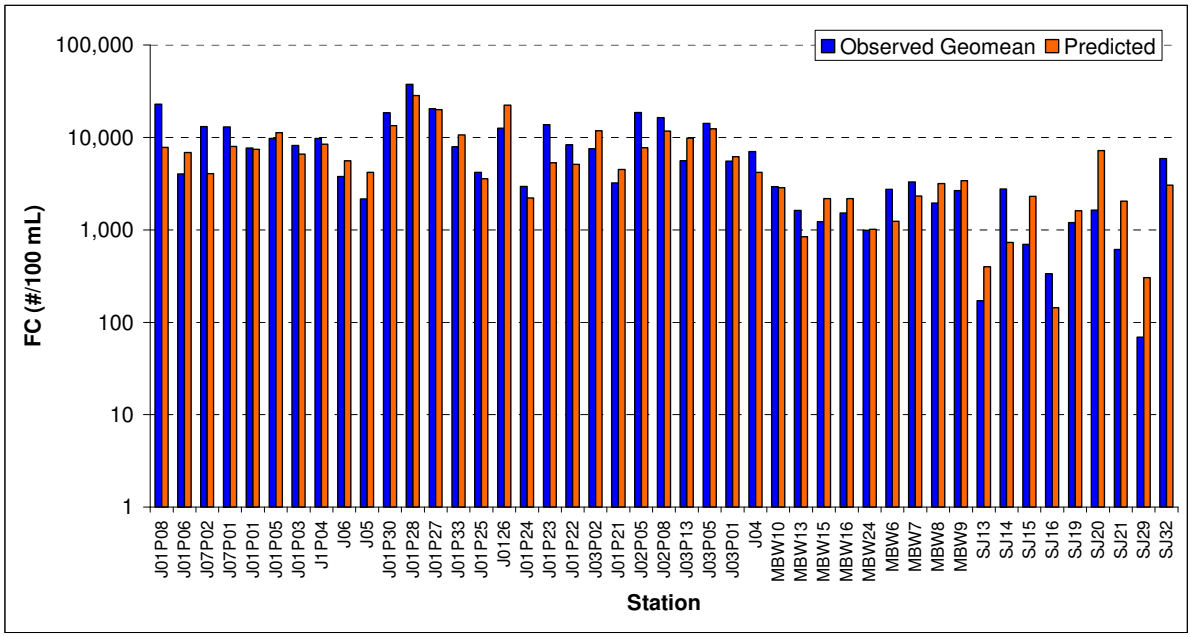

Figure F-4. Predicted Versus Observed Fecal Coliform Concentrations

The methodology for estimating FC concentrations was not as successful for prediction of TC and ENT. For Bacteria TMDL Project I, similar regression analyses were performed to determine whether there were relationships between TC and ENT and land use and subwatershed size, but no acceptable correlations were found. As a result, a separate approach was used for estimating TC and ENT concentrations in dry weather runoff for each watershed.

Analyses of geometric means of FC data collected at each station were performed on similar geometric means of TC and ENT data collected at the same stations. The analyses resulted in a single, normalized value of FC, TC, and ENT at each station. Regression analyses were performed to determine whether there is a correlation between FC and levels of TC and ENT. Results showed a good correlation in predicting TC and ENT as a function of FC (R^2=0.67 and R^2=0.77, respectively). The following equations describe the relationship observed between FC and TC/ENT (units of FC and TC/ENT are consistent):

$$TC = 5.0324 \times FC \quad \text{and} \quad ENT = 0.8466 \times FC \qquad (8)$$

Figures F-5 and F-6 illustrate the observed geometric means and predicted concentrations for TC and ENT, respectively. The TMDL equations for TC, FC, and ENT from Bacteria TMDL Project I were applied to the SDB and DPH shoreline watersheds to estimate bacteria densities impacting the impaired shoreline segments.

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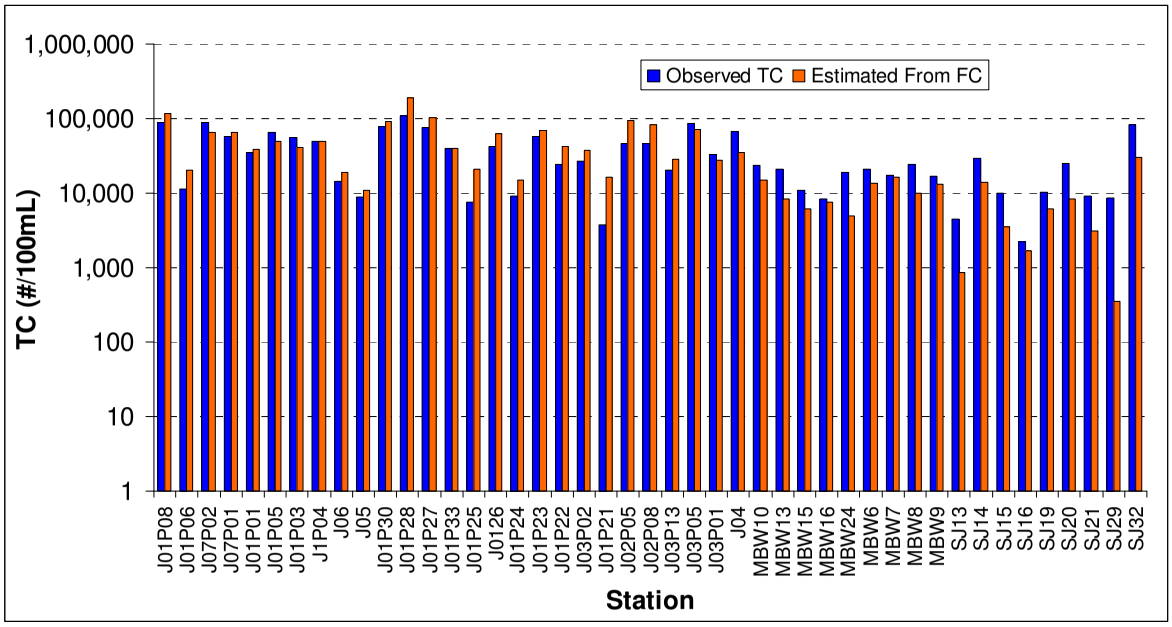

Figure F-5. Predicted Versus Observed Total Coliform Concentrations

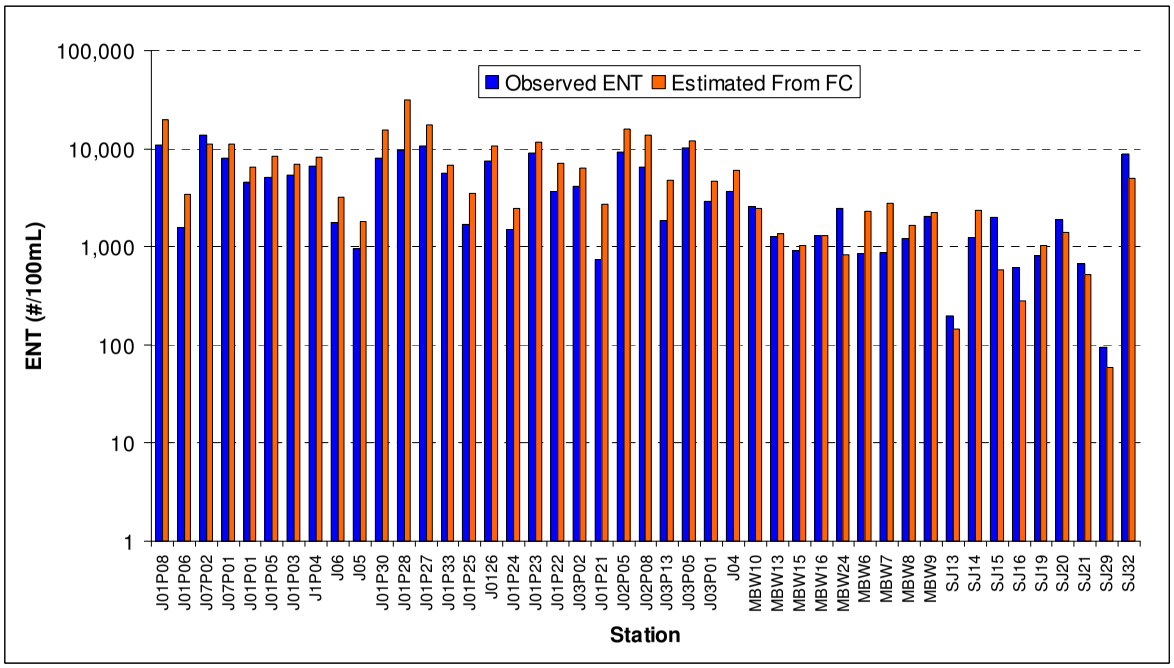

Figure F-6. Predicted Versus Observed Enterococci Concentrations

F.2.4 Dry Weather Watershed Model Calibration and Validation

During the development of TMDLs for Bacteria TMDL Project I, calibration of the plug-flow reactor model was performed using data from Aliso Creek and Rose Creek. Calibration involved the adjustment of infiltration rates to reflect observed in-stream flow conditions. Following model calibration, a separate validation process was undertaken to verify the predictive capability of the model in other watersheds.

Model assumptions for stream reach infiltration and bacterial die-off rates were derived through calibration based on data collected within reaches of Aliso Creek (11 stations) and Rose Creek (6 stations). Some of these stations were also used for development of regression equations for prediction of flow and FC concentrations from watersheds, however, effects of infiltration or bacteria die-off that may be implicitly incorporated in the regression equations (e.g., negative correlation of bacteria concentration to watershed size suggests effects of bacteria die-off in equation 7) were not considered duplicated in the reach assumptions. Model configuration of multiple subwatersheds and reaches differed from single representative watersheds used in regression analyses, and required incorporation of assumptions for reach infiltration and bacterial die-off to account for losses occurring during transport. Each model subwatershed used the regression equations to estimate flow and bacterial concentration that were routed through a network of stream reaches that ultimately met locations corresponding to monitoring stations used for calibration. However, watersheds used for regression analyses represented a single watershed for the same area, with no stream routing. Hence, the infiltration and die-off rates developed for the reaches were not consistent with errors associated with regression equations applied to the entire watershed without reach routing and losses considered. To further prove the independence of the calibration procedure from the regression analyses, data from five additional instream monitoring stations that were not used for regression analyses were also used for calibration. Model validation included nine additional stations not included in the regression analyses.

The calibration was completed by adjusting infiltration rates to reflect observed in-stream flow conditions and adjusting bacteria die-off rates to reflect observed in-stream bacteria concentrations. Following model calibration to in-stream flow and bacteria concentrations, a separate validation process was undertaken to verify the predictive capability of the model in other watersheds. Table F-5 lists the sampling locations used in calibration and validation, along with their corresponding watersheds.

Table F-5. Calibration and Validation Sampling Locations

Calibration – Flow and Bacteria		Validation – Flow		Validation – Bacteria	
Watershed	**Sampling Location**	**Watershed**	**Sampling Location**	**Watershed**	**Sampling Location**
208	J01P22	403	USGS11047300	402	SJ04
209	J01P23	1701	MBW06	403	SJ05
210	J01P28	1702	MBW07	405	SJ18
211	J01P27	1703	MBW10	406	SJ24
212	J06	1704	MBW08	408	SJ1
213	J01P05	1705	MBW09	409	SJ29 & SJ17
214	J01P01			411	SJ06
215	J01TBN8			413	SJ08 & SJ07
219	J04			414	SJ30 & SJ09
220	J03P13			416	SJ15
221	J03P01			1701	MBW06
1601	MBW20			1702	MBW07
1602	MBW17			1703	MBW10
1603	MBW15			1704	MBW08
1605	MBW11			1705	MBW09
1606	MBW13				
1607	MBW24				

F.2.4.1 Dry Weather Watershed Hydrology Model Calibration and Validation

Infiltration rates vary by soil type and, as described in Section F.2.1, the dry weather watershed model configuration included identifying a soil type for each subwatershed. Stream infiltration was calibrated by adjusting the infiltration rate. This rate was adjusted for each soil type within ranges identified from literature values. The goal of calibration was to minimize the difference between average observed flow and modeled flow at each calibration station location. The model closely predicted observed flows and the calibration results are graphically presented in Figure F-7.

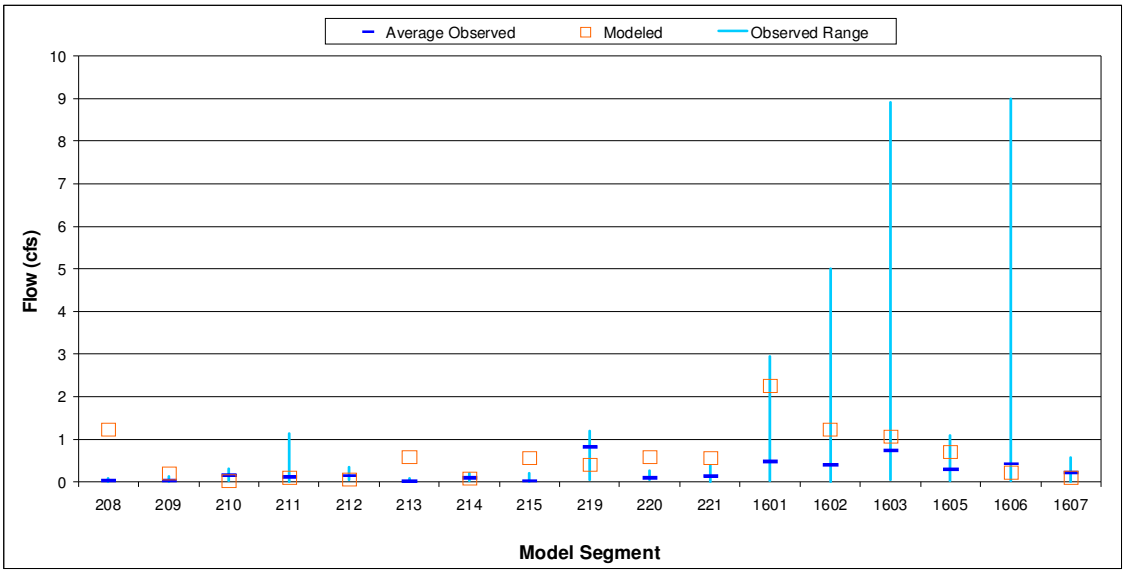

Figure F-7. Calibration Results of Modeled Versus Observed Flow

The calibrated infiltration rates were 1.368 inches per hour (in/hr) for Soil Group A, 0.698 in/hr for Soil Group B, 0.209 in/hr for Soil Group C, and 0.084 in/hr for Soil Group D. The infiltration rates for Soil Groups B, C, and D fall within the range of values described in the literature (Wanielisata et al., 1997). The calibrated rate for Soil Group A is below the range identified in Wanielisata et al. (1997); however, Soil Group A is not present in the modeled watersheds, which is dominated by Soil Group C.

Subsequent to the model calibration, the model was validated using six stations in the San Juan Creek and Tecolote Creek watersheds. The model-predicted flows were within the observed ranges of dry weather flows (Figure F-8), demonstrating very good overall model fit.

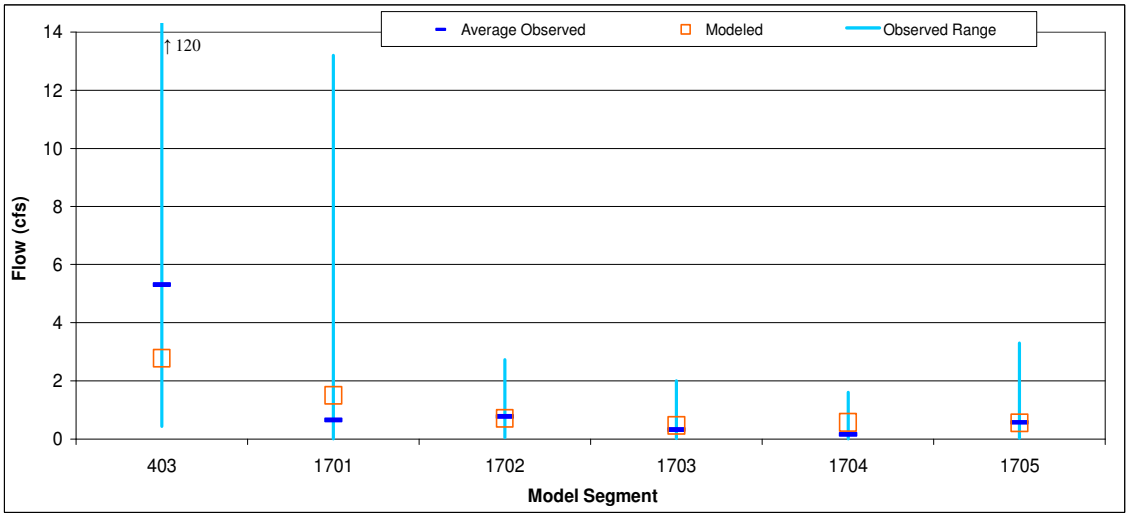

Figure F-8. Validation Results of Modeled Versus Observed Flow

F.2.4.2 Dry Weather Watershed Bacteria Model Calibration and Validation

The modeled first-order die-off rate reflects the net effect on bacteria of various environmental conditions, such as solar radiation, temperature, dissolved oxygen, nutrients, regrowth, deposition, resuspension, and toxins in the water. The die-off rates for TC, FC, and ENT were used as calibration parameters to minimize the difference between observed in-stream bacteria levels and dry weather watershed model predictions. Calibration results for TC, FC, and ENT are presented in Figures F-9 through F-11. Die-off rates were determined TC (0.209 1/d), FC (0.137 1/d), and ENT (0.145 1/d). These values are within the range of die-off rates used in various modeling studies as reported by USEPA (1985). Sixteen stations were used in calibrating die-off rates for Bacteria TMDL Project I.

Model validation to in-stream water quality was conducted using 15 stations on Tecolote Creek and San Juan Creek. The results of the water quality dry weather watershed model validation for Bacteria TMDL Project I are presented in Figures F-12 though F-14.

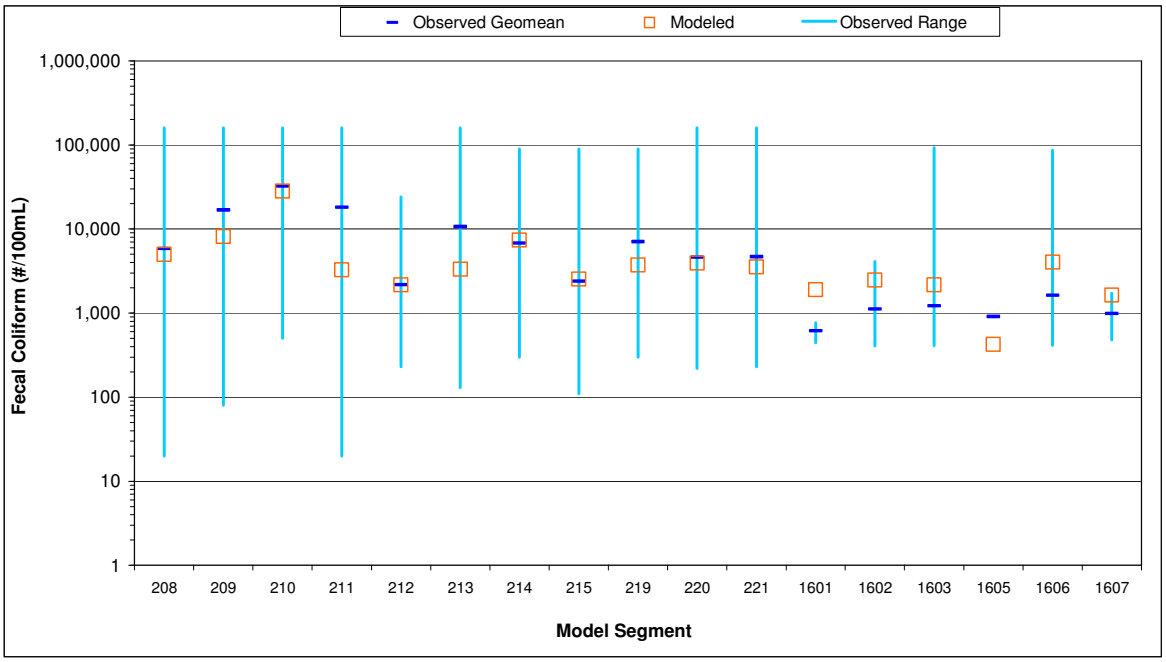

Figure F-9. Calibration Modeled Versus Observed In-Stream Fecal Coliform Concentrations

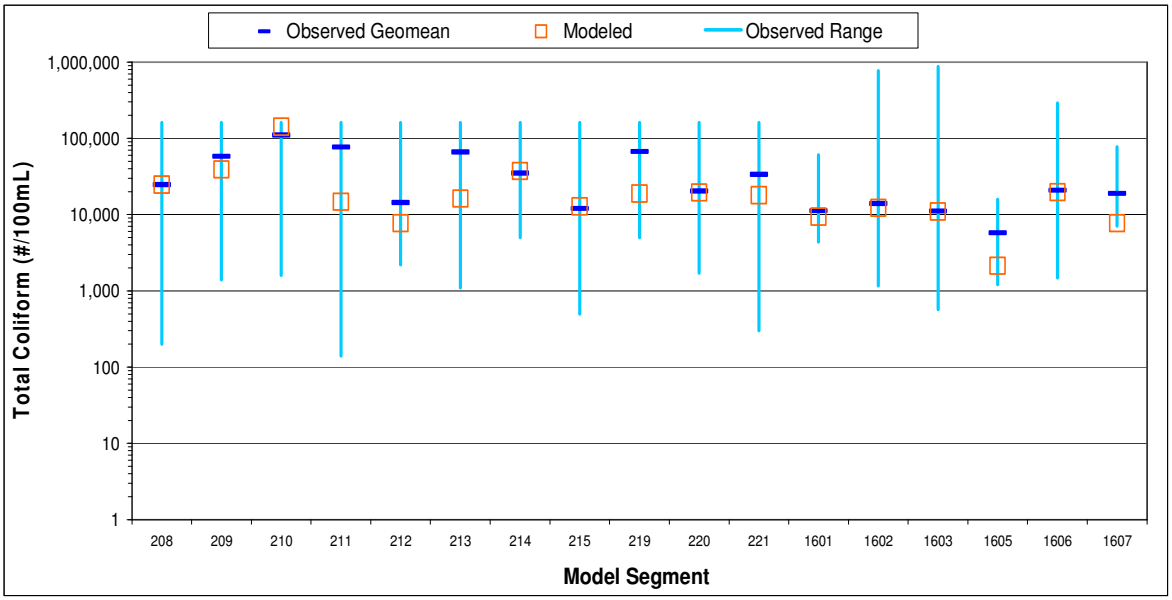

Figure F-10. Calibration Modeled Versus Observed In-Stream Total Coliform Concentrations

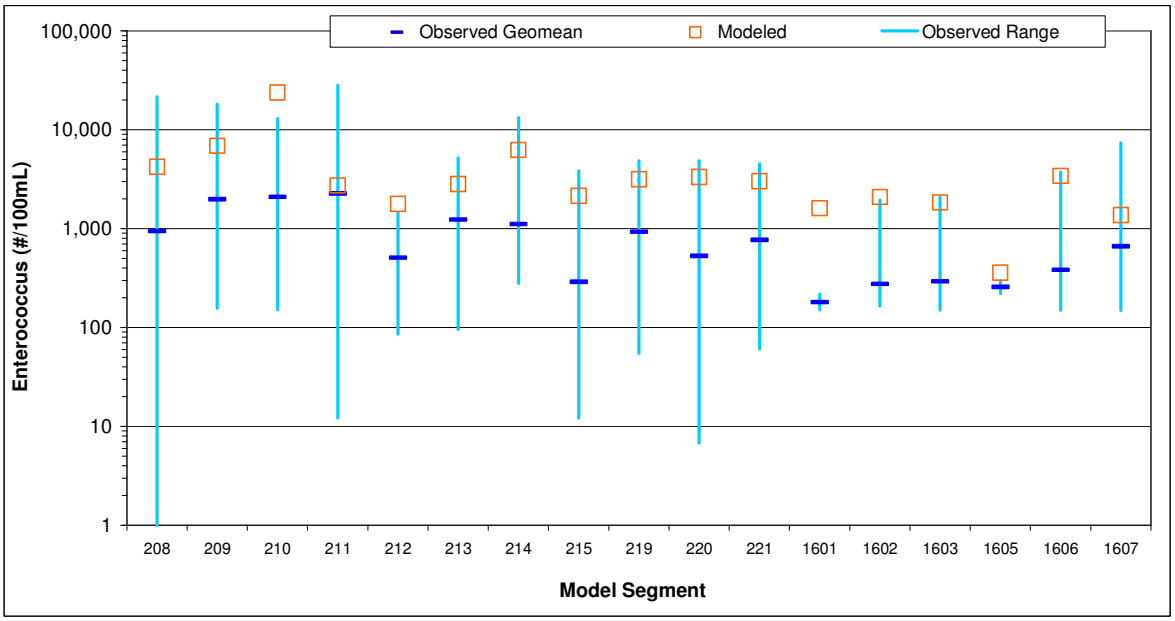

Figure F-11. Calibration Modeled Versus Observed In-Stream Enterococci Concentrations

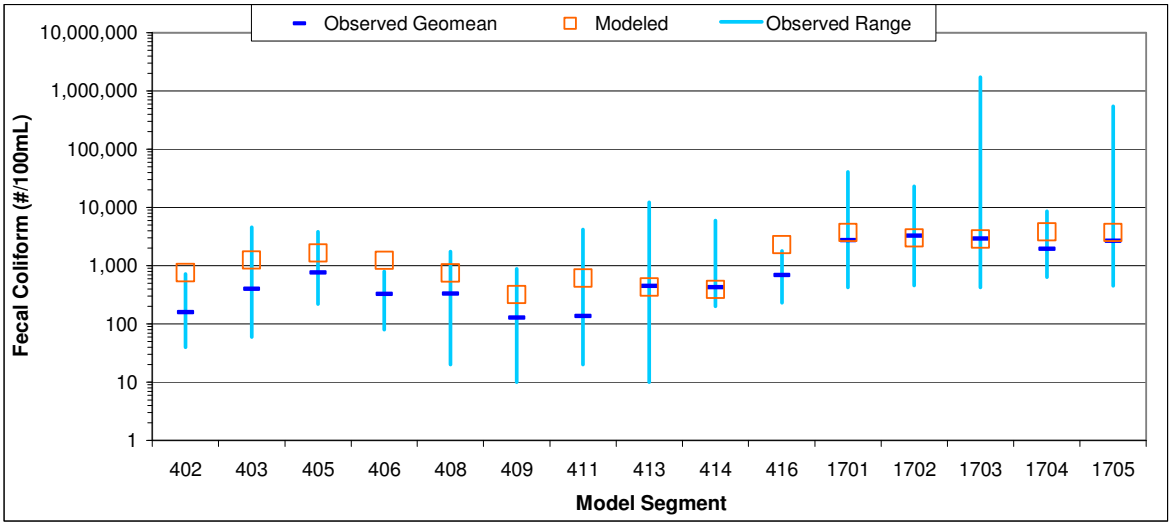

Figure F-12. Validation Modeled Versus Observed In-Stream Fecal Coliform Concentrations

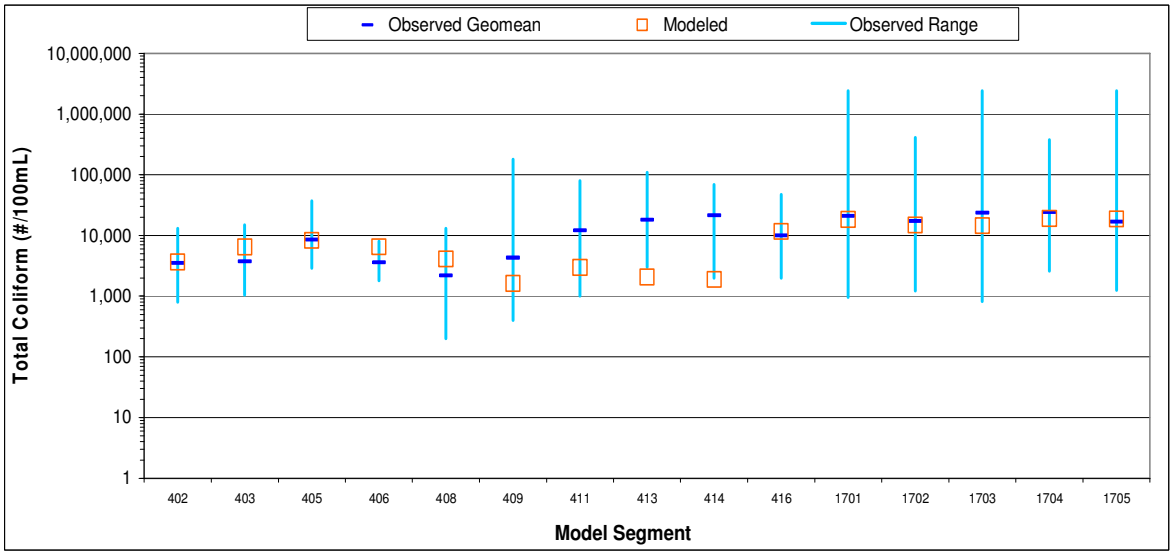

Figure F-13. Validation Modeled Versus Observed In-Stream Total Coliform Concentrations

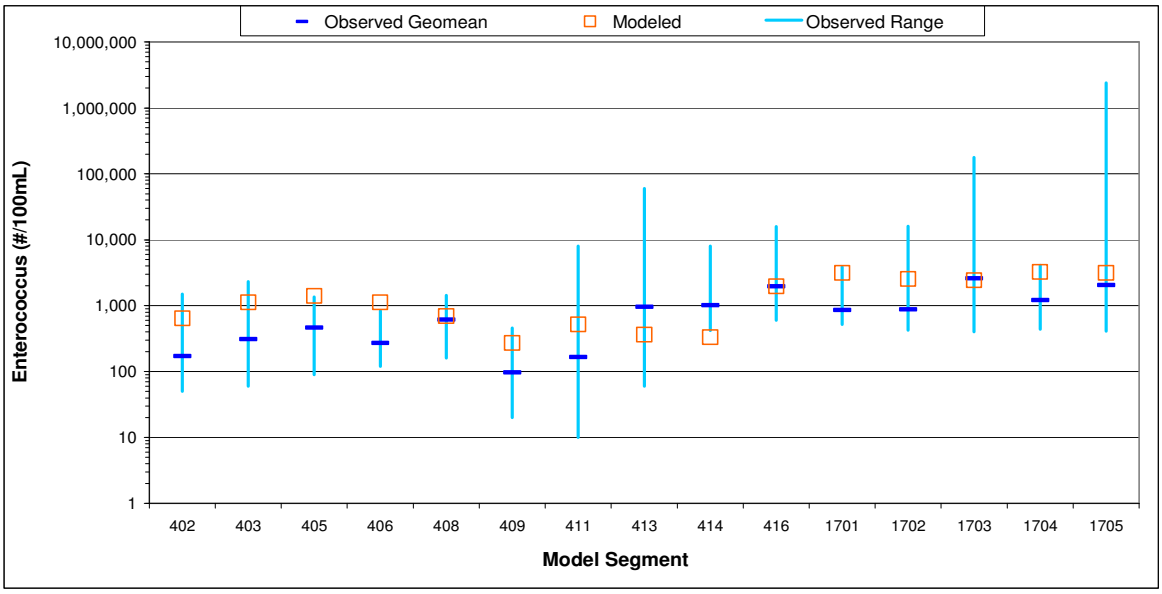

Figure F-14. Validation Modeled Versus Observed In-Stream Enterococci Concentrations

F.2.4.3 Dry Weather Watershed Model Application to San Diego Bay and Dana Point Harbor Watersheds

As described previously, regionally-calibrated parameters and equations were applied to the SDB and DPH shoreline watersheds. However, each of the watersheds draining to the shoreline areas consisted of a single watershed without multiple subwatersheds included for routing purposes (see Appendix J). Only single watersheds were considered necessary for modeling due to the small size of the drainage areas. As a result, only equations 6, 7, and 8 were used in estimating dry weather flows and bacterial densities from these watersheds. The plug-flow reactor models were not required for routing of associated bacterial loads from these areas, as they discharge directly to the shorelines.

Further validation could not be conducted for flow or bacteria due to lack of dry weather monitoring data in the watersheds of interest. The application of the dry weather watershed model and its role in calculation of the SDB and DPH shoreline TMDLs is discussed in Section F.4.

F.3 Wet and Dry Weather Receiving Water Model– EFDC

A hydrodynamic and bacteria transport model was developed to simulate the water budget and the fate and transport of bacteria to the receiving waters of the impaired shoreline segments in SDB and DPH. The computational framework of the receiving water models are based on the EFDC model, a comprehensive three-dimensional model capable of simulating hydrodynamics, salinity, temperature, suspended sediment, water quality, and the fate of toxic metals. The EFDC model is a widely

accepted model (particularly by USEPA) and is capable of simulating 21 water quality parameters, including dissolved oxygen, suspended algae, various components of carbon, nitrogen, phosphorous, and bacteria.

San Diego Bay

The shoreline segment located at Shelter Island Shoreline Park within SDB was included in this receiving water analysis for indicator bacteria. Bacteria usually show strong local source-concentration response patterns (i.e., the concentration of bacteria in a specific location is usually directly caused by sources discharged nearby). Therefore, very high spatial resolution is necessary to accurately represent the source-concentration link.

Although the entire San Diego Bay can be simulated with a sufficiently fine grid to achieve the necessary resolution for each of the shoreline segment areas, a model configured with that level of detail could incur prohibitive computational time. To overcome this limitation, a two-stage approach was adopted, which achieves sufficient resolution for the shoreline segment areas with reasonable computational times. The first stage involved developing a coarse grid, vertically-integrated, two-dimensional hydrodynamic model to simulate water circulation and water elevation fluctuation throughout the bay. The objective of this coarse grid model was to provide open boundary conditions for the fine grid model of the impaired shoreline segment area. The second stage involved developing a separate fine grid model for the impaired shoreline segment of Shelter Island Shoreline Park (see Appendix J for maps). The high-resolution grid was better able to capture the intricate shoreline features of the impaired shoreline segment and near-field variability, which is critical for representing the bacteria source-concentration relationship.

The EFDC model application of Shelter Island Shoreline Park simulated both hydrodynamics and TC, FC, and ENT bacteria densities. The Shelter Island Shoreline Park fine grid model was used to identify potential sources causing the bacteria fluctuations in the observed data.

Dana Point Harbor

The shoreline segment located at Baby Beach within DPH shoreline was included in this receiving water analysis for indicator bacteria. The entire harbor was simulated with a sufficiently fine grid to achieve the necessary resolution at Baby Beach (see Appendix J for a map). The model of the entire harbor was configured to simulate hydrodynamics associated with tidal flushing and TC, FC, and ENT bacteria densities.

Model Configuration

Configuration of the EFDC models for SDB and DPH (sections F.3.1 and F.3.2 and section F.3.3, respectively) involved identifying and processing bathymetric data, developing model grids, defining boundary and initial conditions, and creating a linkage with the wet weather (LSPC) and dry weather (steady-state) watershed models using lateral inputs. Boundary conditions are fixed conditions applied to the modeling system

to drive the hydrodynamic simulation. Three types of boundary conditions were applied to the models: open ocean, lateral flux, and meteorological.

Open ocean boundary conditions consist of time-variable tidal water levels, temperature, and salinity. The lateral flux boundary conditions include the wet weather and dry weather inflow of water from the watershed. The wet weather watershed flows were configured based on the results of the calibrated LSPC watershed model (section F.1). Constant dry weather watershed flows were estimated from the steady-state dry weather watershed model (section F.2), developed and calibrated for Bacteria TMDL Project I. The spatial representation of these inflow boundary conditions was determined by mapping the geographical coordinates of the watershed outlets on the individual model grids. The meteorological boundary condition is represented by time-variable weather conditions including solar radiation, wind speed and direction, air temperature, atmospheric pressure, relative humidity, and cloud cover.

For water quality simulations, bacteria loads associated with the watershed flows were also input as a lateral boundary condition. Time-variable wet weather and constant dry weather concentrations were used to develop the bacteria loading time-series for each watershed inflow location. In addition to the watershed loading, a lumped source of bacteria loading was incorporated into the models. This lumped source characterized all other unquantifiable sources, including the aerial contribution from waterfowl, accumulated waterfowl feces on beaches, and/or other unidentified sources within the receiving waters.

In hydrodynamic modeling, initial conditions provide a starting point for the model to progress through time. Initial temperature, salinity, flow velocity, and water depth values were specified for the entire domain of each model. These data, especially for temperature and salinity, were limited within the bays. Therefore, in the absence of data, reasonable assumptions or extrapolations of data were made.

January 1, 2001 through December 31, 2002 was selected as the model simulation time period. This period corresponds to the two years in which the most comprehensive data were available for model configuration and comparison. It should be noted that for simulation over a long time period, such as over a year or multiple years (as was the case for this simulation), the overall model performance is not sensitive to the initial conditions for velocity and temperature. The remainder of this section provides additional details regarding the configuration and application of the EFDC models of SDB (sections F.3.1 and F.3.2) and DPH (section F.3.3).

F.3.1 Coarse Grid Receiving Water Model for the San Diego Bay

F.3.1.1 Grid Generation

The model domain for SDB includes the entire bay up to the mouth, which encompasses an area of approximately 50 square kilometers. The model is comprised of 138 computation cells (Figure F-15). The maximum and minimum cell widths (I direction) are 354 meters and 1311 meters, respectively, and the maximum and

minimum cell lengths (J direction) are 288 meters and 762 meters, respectively. The grid has dimensions of I=35, J=15 in the horizontal plane and consists of a single layer in the vertical plane.

Bathymetry for the model domain was based on data obtained from from Space and Naval Warfare Systems (SPAWAR). The average depth for the course grid was 7 meters (minimum was 6 meters and maximum was 8 meters).

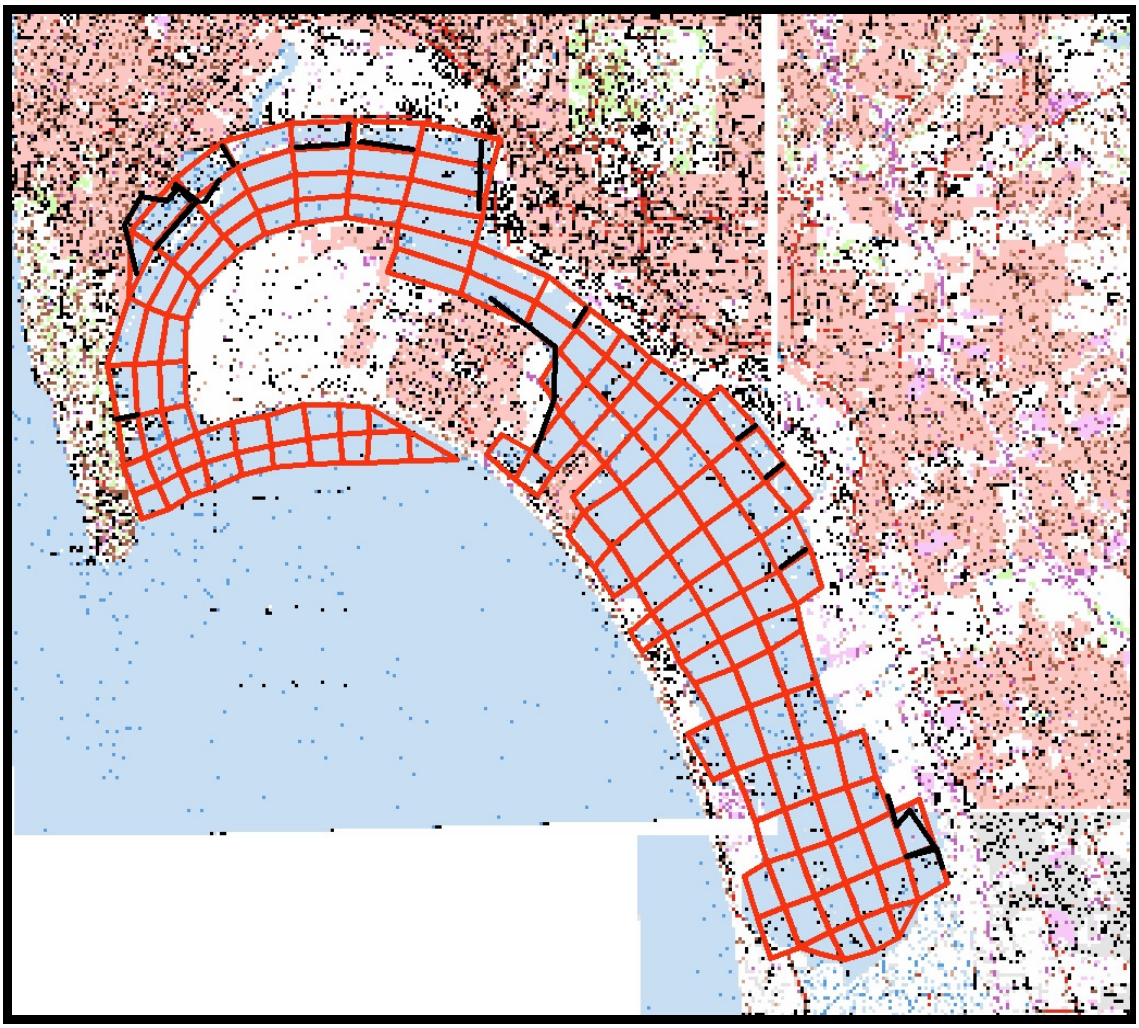

Figure F-15. Coarse Resolution Grid for San Diego Bay

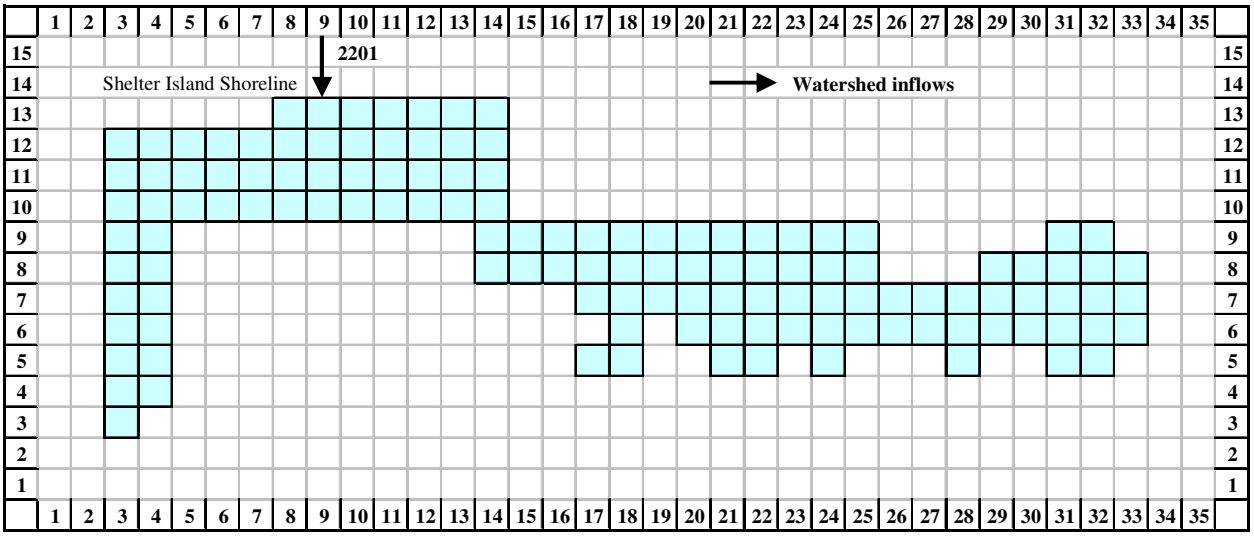

Figure F-16. Open Ocean and Lateral Boundary Locations for San Diego Bay Model

F.3.1.2 Boundary Conditions

F.3.1.2.1 Open ocean boundary conditions

The mouth of SDB opens to the Pacific Ocean. Ten grids in the model (Figure F-16) were configured as the open ocean boundary and were assigned time-variable water levels, temperature, and salinity. Real-time hourly water level data was available from the National Oceanic and Atmospheric Administration Centers for Operational Oceanographic Products and Services (NOAA-COOPS) for station #9410230, located in La Jolla, CA. Data were processed and an EFDC-compatible tidal time series dataset was created.

Two Scripps Institution of Oceanography stations with continuous surface temperature observations were utilized to obtain temperature for the open ocean boundary. The closest station to SDB is station #091, located 8.5 miles west of Point Loma. However, this station is a seasonal buoy and is operated from approximately February to August of each year. Station #095, located 3.8 miles west of La Jolla, operates year-round. Temperature data from these two stations were compared for 180 overlapping days in 2001. The comparison resulted in good correlation between the two stations with an R^2 = 0.92. Therefore, temperature data from La Jolla (station #095) were selected to build the time series at the open ocean boundary. Initially, the hourly data at La Jolla was directly used as the boundary condition. However, this caused model instability at certain times during the simulation period. The suspected cause of this instability is a short-term signal in the time series. Because the temperature at La Jolla is not exactly the same as the mouth of the bay, hourly data were averaged to daily values. This filtered out the impact of any short period temperature signals that may not be representative of conditions at the mouth.

A station operated by the Port of San Diego and located within SDB provided salinity data for the open ocean boundary. Continuous salinity observations were available from March 7, 2001 to December 13, 2001 and January 13, 2002 to February 7, 2002. The January to February 2002 data were used to fill the data gap in 2001 and the March to December 2001 data were used to fill the data gap in 2002. Although not comprehensive, the Port of San Diego data were the only available salinity data at the time the model was configured.

F.3.1.2.2 Lateral boundary conditions

Contributions from one subwatershed (2201) was included as a lateral boundary condition for SDB. Dynamic wet weather and steady-state dry weather flow rates from this subwatershed was applied to the corresponding inflow grid cells in the EFDC model. In total, the model has two lateral inflow boundary conditions (one for wet weather and one for dry weather watershed runoff).

Continuous surface temperature observations from NOAA station #9410170, located within the SDB shoreline, were used to specify the temperature for the watershed inflows. Although temperature of the bay waters can be different from the incoming tributary flows, temperature measurements for incoming streams were not available. Since watershed flows only account for a negligible portion of the total flow balance in the bay, the uncertainty associated with the inflow temperature values has minimal impact on the model results. In addition, salinity data for the inflows were not available and were thus set to zero. This is also expected to have a negligible impact on the model results because the inflows account for such a small portion of the volume of the bay.

F.3.1.2.3 Meteorological boundary conditions

Five airway stations in close proximity to SDB were evaluated for potential inclusion in the model. The stations were evaluated based on their proximity to the model domain, period of record, parameters measured, and completeness of data. Data for 1990 through 2004 were obtained from the National Climatic Data Center (NCDC). The results of the evaluation indicated that the Lindbergh Field Airway Station in San Diego was the most appropriate weather station and was thus used to create the meteorological file. This station had data for most of the required parameters, provided the most complete temporal data record, and is located in close proximity to SDB. Data for dry and wet bulb temperature, dew point temperature, relative humidity, wind speed, wind direction, sea level pressure, and sky conditions for 1990 to 2004 were obtained for the Lindbergh Field station. Sky condition was converted to “percent cloud cover” and solar radiation was estimated by calculating the clear sky solar radiation using latitude and longitude and adjusting the values based on the estimated cloud cover.

F.3.1.3 Initial Conditions

A uniform temperature of 15ºC and a salinity of 33 parts per thousand (ppt) were included as initial conditions throughout in the water column. This temperature was verified using data from Scripps Institution of Oceanography stations #091 and #095

and was determined reasonable considering that the models began on January 1st. The initial water velocity was set to 0.0 meters per second (m/s) and the initial water surface elevation was 0.0 meters above mean sea level.

F.3.1.4 Model Calibration and Validation

The hydrodynamic model of SDB was calibrated using observed surface elevation, temperature, and salinity data from within the bay. Specifically, the model-computed hourly water surface elevations were compared with hourly real-time data from NOAA-COOPS station #9410170, located within the SDB shoreline. Figure I-1 in Appendix I illustrates the model-data comparison for 2001. The model has captured the phase and amplitude of the data well. The mean error[1] for the model-computed hourly water surface elevation for 2001 is -0.008 meters. The root mean square error[2] is 0.1 meters.

The model-predicted hourly water column temperature was compared with hourly observations from NOAA-COOPS station #9410170. Figures I-2 and I-3 of Appendix I show the model-data comparison for 2001 and 2002, respectively. The model simulates the seasonal variation in temperature well. The mean error for the model-predicted hourly temperature for 2001 is 0.39ºC and the root mean square error is 1.03ºC.

Through a sampling effort conducted in the bay by Space and Naval Warfare Systems, salinity and temperature measurements were available for January 30, May 11, and September 19, 2001, and January 27 and May 14, 2002 (see Figure I-4 of Appendix I for a map of sampling locations). Figures I-5 through I-30 of Appendix I illustrate the results of the temperature calibration to the SPAWAR data, while Figures I-31 through I-56 of the same appendix illustrate the salinity calibration. Overall, the model predicts both salinity and temperature very well.

F.3.2 Fine Grid Receiving Water Model for Shelter Island Shoreline Park

F.3.2.1 Grid Generation

The fine resolution grid developed for the Shelter Island Shoreline Park shoreline segment extends 900 meters from Shelter Island across (in J direction) to the opposite side of the bay and spans a length (in I direction) of 1750 meters along SDB (Figure F-17). The grid has dimensions of I=11, J=9 in the horizontal plane and contains a single layers in the vertical plane. The model domain is represented by 35 computation cells. Bathymetry for the model was based on data obtained from SPAWAR. Cell depths throughout most of the fine grid were identical to those in the course grid: 7 meters (minimum was 6 meters and maximum was 8 meters). Very shallow depths were assigned to the grid cells directly along the impaired shoreline to more accurately represent the natural conditions.

[1] *Mean error = Sum (model-data)/n*; *n*=number of model-data points
[2] Root Mean Square Error = square root [{Sum (model-data)^2}/n]

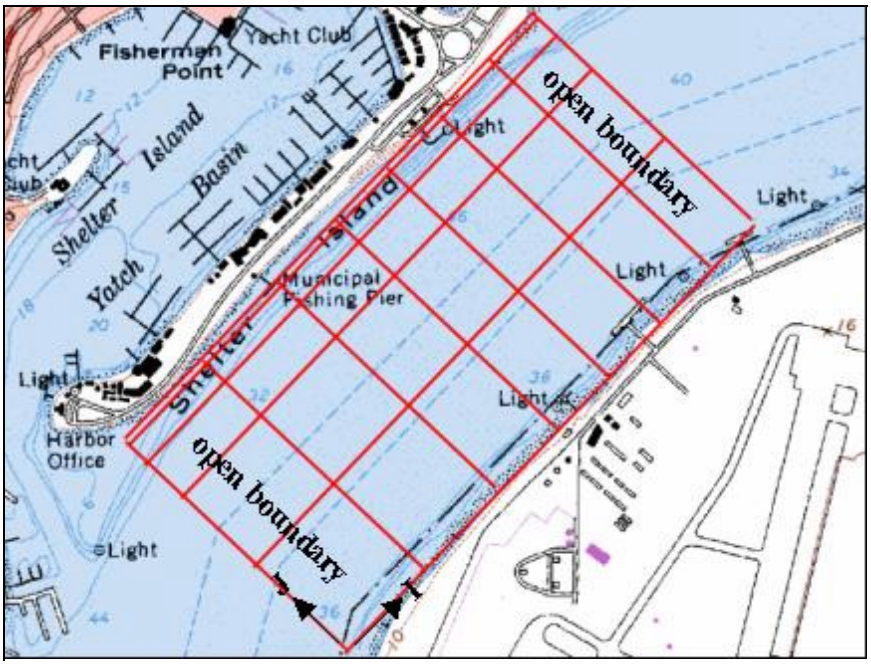

Figure F-17. Fine Resolution Grid for Shelter Island

F.3.2.2 Boundary Conditions

F.3.2.2.1 <u>Open ocean boundary conditions</u>

Two sides of the grid (see Figure F-17) were configured as the open boundary. These were assigned time-variable water levels, temperature, and salinity values. Predicted hourly water levels, daily temperature, and daily salinity from the calibrated coarse grid model were used to develop the open ocean boundary conditions. Predictions were extracted from the appropriate grids in the coarse grid model and then applied to the fine resolution open boundary grids. Available bacteria water quality data collected in the area had minimal TC, FC, and ENT bacteria densities (10 MPN/100ml, 10 MPN/100 ml, and 5 MPN/100 ml, respectively). Assuming that these values represent background bacteria densities from the other large-scale sources, they were incorporated in the model as the open ocean boundary conditions for TC, FC, and ENT.

F.3.2.2.2 <u>Lateral boundary conditions</u>

The contribution from subwatershed 2201was included in the Shelter Island Shoreline Park receiving water model as a lateral boundary condition. Time variable wet weather and constant dry weather flow rates and bacteria loads were applied to the corresponding inflow grid cells. The model had two lateral inflow boundary conditions (one for wet weather and one for dry weather watershed runoff). Bacteria loads were computed based on TC, FC, and ENT bacteria densities output from the wet and dry weather watershed models.

Continuous surface temperature observations from NOAA station #9410170 located within the SDB shoreline were used to specify temperature for the watershed inflows. Salinity of the inflow water was set to zero.

Initially the receiving water model was run only with the wet and dry weather watershed modeled bacteria loading sources. Available water quality data collected from the Shelter Island Shoreline Park shoreline segment indicated that bacteria levels varied significantly, both temporally and spatially. Comparing the initial receiving water model-predicted bacteria densities with observed data (see Figure F-18 for a map of locations with available water quality monitoring data), the results indicated that the wet weather and dry weather watershed sources do not account for the magnitude and variability of bacteria densities observed in this area. The difference in the magnitude of bacteria densities between the initial receiving water model output and observed bacteria levels suggests that additional unquantified sources, other than watershed inflows, may contribute significantly to bacteria loading along the shoreline. Therefore, in addition to the lateral bacteria loading from the wet and dry weather watershed models, an additional loading source was included for each of the fine resolution cells along the shoreline to represent other unquantified bacteria sources such as waterfowl, beach sediment sources, and other unidentified sources within the water. These unquantified sources were lumped together as “lumped sources” and included in the in the receiving water model to account for additional wet and dry weather sources that were not sufficiently captured by the traditional watershed sources.

Additionally, it was assumed that there was a corresponding temporal variability present to generate the observed bacteria density fluctuations. The lowest observed bacteria density was considered as the background bacteria density. The days on which the observed bacteria density was equal to the background bacteria density were considered as “*background days*”. As an initial estimate, the TC and ENT bacteria loadings for *background days* were set to a base value. The base value was determined using the daily loading rate applied in a Malibu Creek Watershed Study (Los Angeles Water Board, 2003). The loading for days other than *background days*, was estimated by scaling the base values using the ratio between the observed bacteria density and the background density. Since the observed FC densities are similar to TC densities, the FC bacteria loading from the lumped sources was set to be equal to the TC bacteria loading from the lumped sources. These initial estimates were then systematically rescaled for the overall magnitude and fine-tuned for certain specific dates through an iterative modeling process to obtain predictions for bacteria densities closer to the observed patterns.

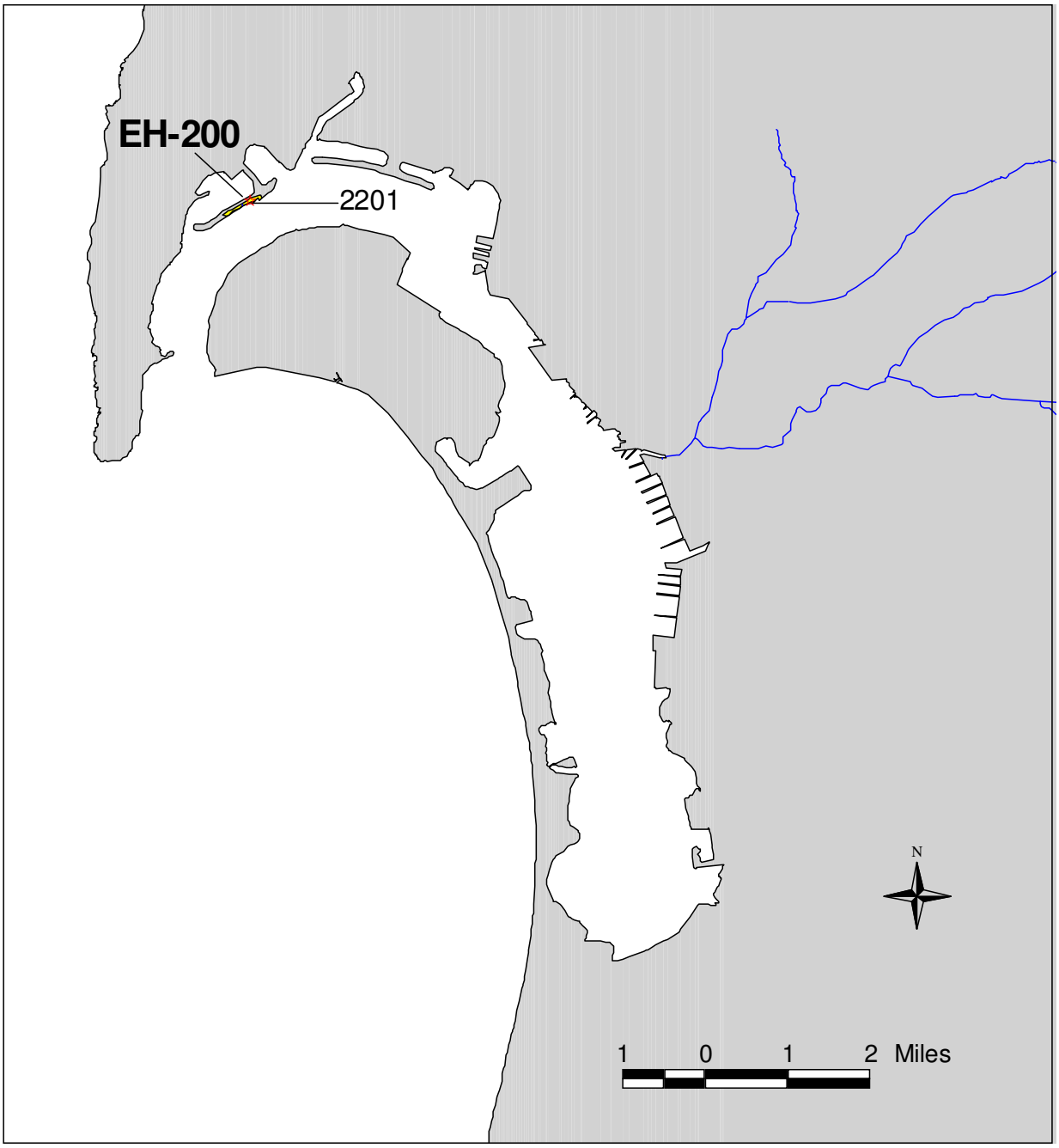

Figure F-18. Bacteria Monitoring Stations Along the San Diego Bay Shoreline

F.3.2.2.3 *Meteorological Boundary Conditions*

Meterological data from the Lindbergh Field Airway Station in San Diego were used to specify the water surface boundary conditions. Section F.3.1.2.3 provides a detailed description on the weather data required to perform the EFDC model simulations and the data processing that was necessary to obtain the appropriate format.

F.3.2.3 Initial Conditions

A uniform temperature of 15ºC and a salinity of 33 ppt were included as the initial conditions throughout the water column. The initial velocity was set to 0.0 m/s and the water surface elevation was set to 0.0 meters above mean low sea level.

F.3.2.4 Inverse Loading Identification

In conventional water quality modeling practices, an important component of model development is the calibration of model parameter values based on observed receiving water quality and well-defined source/sink functions. However, this conceptual framework does not apply to this model since the quantification of major bacteria sources is not available. On the other hand, the kinetics impacting bacteria concentrations in water is relatively simple, where die-off is the dominant process controlling bacteria dynamics. Therefore, among all the major factors impacting bacteria densities in water, the kinetic parameter values contribute significantly less uncertainty than the unquantifiable sources. In other words, it is reasonable to set values commensurate to literature values for the bacteria die-off rate and subsequently use the model to inversely estimate the external sources that produce the observed temporal variability in bacteria concentration. This type of method represents a research field known as “inverse method”, which is widely applied in the areas of air quality modeling, ocean modeling, geo-hydrology, and other environmental research areas. In air quality modeling, the model is configured with reasonable parameter values and then applied to inversely estimate pollutant rates from different sources at different locations. This approach is justified when the key component of model uncertainty is from sources rather than from parameter values.

The receiving water model was used to simulate the fate and transport of TC, FC, and ENT within the near-shore zone. The base die-off rate of the three bacteria indicators were set to 0.8/day consistent with a typical value reported by Chapra (1997). In addition to the base die-off rate, temperature and salinity dependence ratios were applied. Salinity can contribute to the die-off rate at a ratio of $0.02 day^{-1} ppt^{-1}$ (Chapra, 1997). There is no conclusive research to show that the die-off rates of the bacteria indicators are highly temperature dependent. Therefore, a low value of $1.01\ day^{-1}\ ºC^{-1}$ was included and was assumed to represent weak temperature dependence.

Using these parameter settings, the Shelter Island Shoreline Park receiving water model was run for the period from March 25, 2001 through October 30, 2002, and the simulated results were compared with observed data. For the dates that the receiving water model results did not correspond with the order of magnitude or trend of the observed data, the loading rate of the lumped sources (unquantified sources, which are assumed to be composed largely of bird sources) was fined tuned until a reasonable agreement between the receiving water model results and the observed data were achieved. Figure I-57 of Appendix I graphs the simulated bacteria density against the observed data. As shown, with the inversely derived lumped source loading, the receiving water model was able to reproduce the observed bacterial level near the shoreline relatively well. The adjusted lumped source loading for the simulation period is shown in Figure I-58 of Appendix I. No other fine-tuning was performed to further

improve the goodness-of-fit. Since the uncertainty associated with bacteria water quality data can be significant, the objective of the modeling was to follow the general trend and estimate the order of magnitude present in the observed data.

It should be noted that the inversely estimated loading is not fictitious, but rather consistent with reality. Observed data show that there is a peak of TC bacteria density on July 29, 2002 (maximum value of 250,250 MPN/100 ml); however, the wet weather and dry weather watershed bacteria loads did not show significant loading during that time period. The only explanation for such high bacteria levels is the presence of significant additional bacteria loading source(s) during that time period. Two days later on July 31, 2002, it was also observed that the TC bacteria density at the same location was 10 MPN/100 ml. This type of rapid change in bacteria concentrations demonstrates the unique local relationship between bacteria loadings and densities. As shown through the receiving water model results (Figure I-57 of Appendix I), the model was able to predict sharp changes in bacteria concentrations caused by loading rates and tidal conditions within a short period of time.

F.3.3 Dana Point Harbor Receiving Water Model

F.3.3.1 Grid Generation

The DPH receiving water model includes the harbor up to the outer barrier and then extends approximately 5 kilometers in the south-east direction into the open ocean. The grid consists of 62 computation cells in the horizontal plane (Figure F-19) and each cell is represented by a single vertical layer. Six additional barrier features were setup to represent the grid cells that have one or more flow faces blocked from marina breakwaters (Figure F-20). All six barriers were assigned to the western face of each cell. Bathymetry for the model domain was based on data obtained from the US Army Corps of Engineerings (USACE). The average grid depth was 5 meters (minimum was 1 meter and maximum was 9 meters).

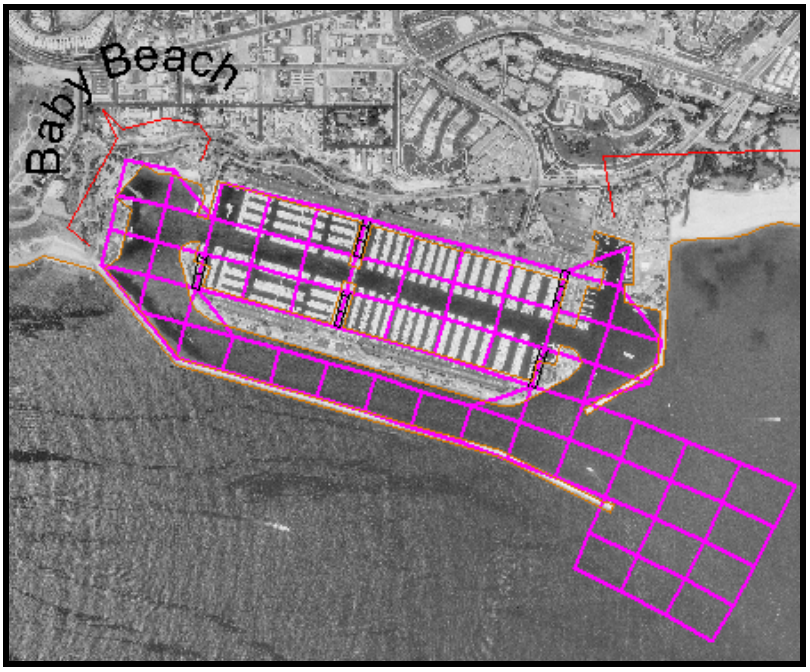

Figure F-19. Grid for the Dana Point Harbor

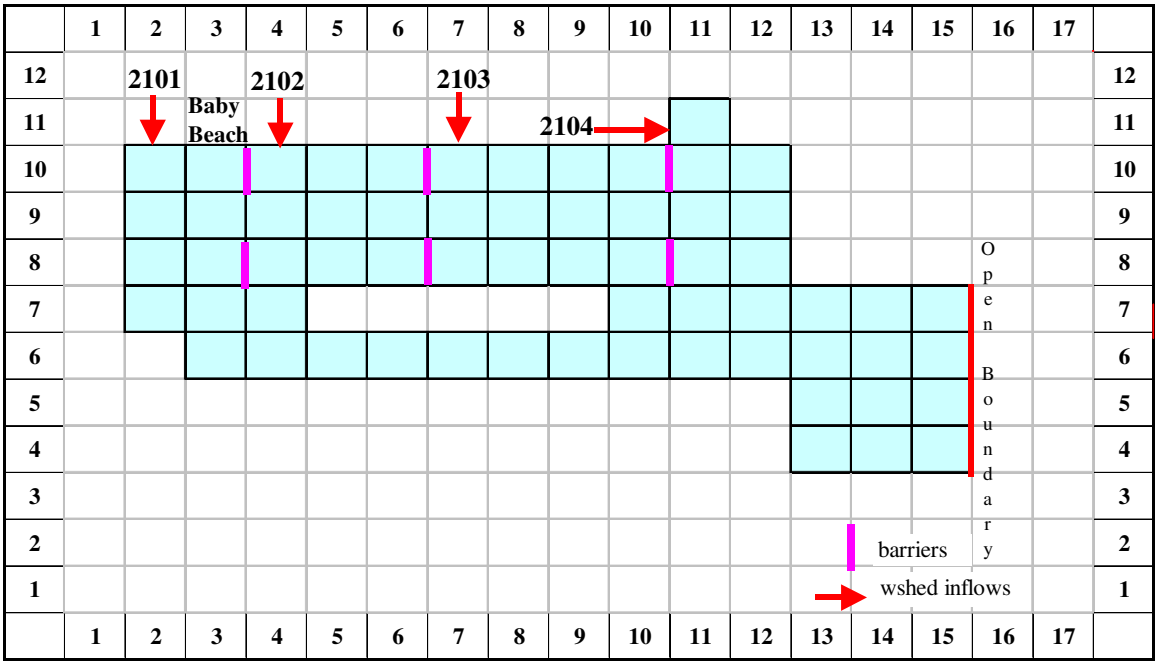

Figure F-20. Open Ocean and Lateral Boundary Locations for Dana Point Harbor Model

F.3.3.2 Boundary Conditions

F.3.3.2.1 Open ocean boundary conditions

Four grids in the eastern boundary of the model were configured as open ocean boundary conditions and were assigned time-variable water levels (Figure F-20). Real-time water level data were available through the NOAA-COOPS website for select locations in southern California. The closest station to DPH was Los Angeles, which is about 80 kilometers away. Therefore, to more accurately portray tidal fluctuations, the tidal predictions for San Clemente were used to develop the open ocean boundary conditions since this location is closer in proximity to DPH.

To predict the time-variable water levels at San Clemente, data were obtained for its assigned reference station, San Diego (Broadway). Specifically, hourly tidal predictions for San Diego (Broadway) for 2000 through 2004 were obtained from NOAA-COOPS. The phase and amplitude of the tide at San Clemente was then calculated based on these reference data. To account for the time difference between tides at San Clemente and San Diego (Broadway), an average lag time of 13 minutes was included in the calculation of the San Clemente phase (actual lag times are 15 minutes for high tide and 11 minutes for low tide). In addition, an amplitude ratio of 0.92 (as specified on the NOAA-COOPS website) was used to convert the tidal height from the San Diego (Broadway) values to corresponding heights at San Clemente. After completing these calculations, the data were processed and an EFDC-compatible tidal time series was created.

Scripps Institution of Oceanography station #096, located 3.7 miles west of Dana Point, provided temperature data for the open ocean boundary. Data with a 30-minute frequency were converted to build the EFDC-compatible temperature time series. Specifically, since temperature data from station #096 is not exactly the same as the temperature at the open ocean boundary, the 30-minute data was averaged to daily values to filter out the impact of any short period temperature signals, which may not be representative of the true condition at the boundary and may result in model instability. There were no salinity data identified for DPH. Therefore, the same salinity time series used for the SDB model (see Section F.3.1.2.1) was used for the DPH open ocean boundary.

F.3.3.2.2 Lateral boundary conditions

Contributions from subwatersheds 2101 and through 21042 were included as lateral boundary conditions for DPH. The wet weather flows and bacteria loads were configured based on simulation results from the LSPC watershed model. Nuisance runoff rates and associated bacteria loads were obtained from the steady-state dry weather watershed spreadsheet model, originally developed and calibrated for Bacteria TMDL Project I. The spatial representation of these inflow boundary conditions was determined by mapping the geographical coordinates of the watershed outlets to the model grid. Flow and bacteria loading output from the wet and dry weather watershed models were processed to build a time series for each tributary in EFDC-compatible

format, which was then applied to the corresponding grid cells. In total, the model has four lateral inflow boundary conditions (two for wet weather and two dry weather watershed runoff).

Available data collected from four locations along the Baby Beach shoreline segment indicated that bacteria levels varied significantly both temporally and spatially. As with the Shelter Island Shoreline Park fine grid receiving water model, in addition to the lateral bacteria loading from the wet weather and dry weather watershed models, an additional loading source was included for each of the cells along the shoreline to represent the contribution from lumped sources (unquantified sources such as waterfowl, unidentified human sources, beach sediment sources, and other unidentified sources within the water).

Uniform bacteria densities (MPN/100ml) for TC, FC, and ENT and associated seasonally-variable surface flow rate (cms/m^2) were used to apply a lumped source loading in units of MPN/day at the computation cells adjacent to the Baby Beach shoreline segment. Seasonal variability in the unit area flow rate takes into account factors such as the seasonal bird population. To estimate the load allocation from lumped sources, the receiving water model was run with and without this lumped source load, as described in Section F.3.6.4.

There were no data identified for the temperatures of tributaries flowing into DPH. Therefore, the same temperature time series used at the open ocean boundary was used to provide temperature for all wet and dry weather watershed inflows. Salinity of the inflow waters was set to zero since no data were available.

F.3.3.2.3 Meteorological boundary conditions

El Toro Marine Corps Air Station is the closest Airway station to DPH; however, records from the El Toro station did not extend through the calibration time period. Therefore, a meteorological file was created using data from Lindbergh Field Airway Station in San Diego. Hourly data for the El Toro and Lindbergh Field stations were compared for January to June of 1997 and were found to be very similar for several meteorological parameters. As a result, the Lindbergh Field station was used to represent dry and wet bulb temperature, relative humidity, wind speed, wind direction, sea level pressure, and sky conditions for 1990 to 2004. Sky conditions were converted to “percent cloud cover” and solar radiation was estimated by calculating the clear sky solar radiation using latitude and longitude and adjusting the values based on the estimated cloud cover.

F.3.3.3 Initial Conditions

A uniform temperature of 15ºC and a salinity of 35 psu were specified as the initial conditions throughout the water column. The initial water velocity was set to 0.0 m/s and water surface elevation was set to 0.0 meters above mean sea level.

F.3.3.4 Inverse Loading Identification

The receiving water model was used to simulate the fate and transport of TC, FC, and ENT within the near-shore zone. Bacteria kinetics (including bacteria die-off rates and the temperature and salinity impact on the die-off rate) were the same as those described for the SDB Shelter Island Shoreline Park fine grid model (see Section F.3.2.4). Bacteria water quality observations were available at four stations along the Baby Beach shoreline segment – BDP 12, 13, 14 and 15 (see Figures I-60 and I-61 of Appendix I); however, BDP 12, 13 and 14 fall within one computation cell of the DPH grid. Therefore, data at those three stations were averaged to obtain a mean value.

Initially the receiving water model was run only with the wet and dry weather watershed modeled bacteria loading sources. Bacteria die-off rates were not considered for this simulation. Comparing the initial receiving water model-predicted bacteria densities with observed data the results indicated that the wet weather and dry weather watershed sources do not account for the magnitude and variability of bacteria densities observed in this area. The difference in the magnitude of bacteria densities between the initial receiving water model output and observed bacteria levels suggests that additional unquantified sources, other than watershed inflows, may contribute significantly to bacteria loading along the shoreline.

Next, as in the SDB fine grid receiving water model for Shelter Island Shoreline Park (see Section F.3.2.2.2), the DPH receiving water model was used to inversely estimate external bacteria loading sources that would produce the observed temporal variability in bacteria densities. However, in the DPH receiving water model, loading from lumped sources was not adjusted to match individual bacteria observations. Instead, the seasonal loading rate was adjusted to match the 30-day geometric mean of the observed data. A higher load was applied between 30 to 90 days and 330 to 390 days (days are relative to the modeling starting time of January 1, 2001) since the observed bacteria densities in the region were high during those time periods. A lower load was applied during other times to correspond with the lower observed bacteria densities.

Figures I-62 through I-64 of Appendix I show the simulated bacteria densities plotted against the 30-day geometric mean for the observed data. As shown with the seasonally-variable lumped source loading, the model was able to reproduce the observed bacterial level near the shoreline relatively well. The adjusted seasonally-variable lumped source loading for the simulation period at the two cells bordering Baby Beach is shown in Figure I-65 of Appendix I.

F.4 Application of the Watershed and Receiving Water Models

The EFDC receiving water models incorporated bacteria loads and flow rates from the wet and dry weather watershed models as lateral boundary conditions. Therefore, all TMDL calculations were based on output from the comprehensive EFDC models for the corresponding impaired shoreline segment. Additional, localized sources of bacteria associated with lumped sources (unquantified sources such as waterfowl, unidentified human sources, beach sediment sources, and other unidentified sources within the water) were simulated for each shoreline segment based on model simulations to

reproduce observed conditions within the waters. These loads from lumped sources, in addition to watershed sources, were used to determine existing conditions and load allocations to sources.

After completing all model simulations, the EFDC model was applied to obtain hourly and average daily output for the critical wet and dry periods described in Section 7 of the Technical Report. The maximum hourly TC, FC, and ENT densities were obtained for a 30-day critical period for each impaired shoreline model zone. These concentrations were used to determine compliance to numeric targets for TMDL calculation. If bacteria densities exceeded the selected numeric targets, bacteria loads to the receiving water from controllable sources were reduced until compliance was reached. The resulting bacteria loads were equivalent to the TMDL and associated load and wasteload allocations.

While this modeling effort was useful in calculating TMDLs for impaired shorelines in SDB and DPH, future expansion of the model can greatly increase its accuracy and utility. If data become available that quantify the bacteria loading from birds and other unknown sources (both directly to the waterbodies and to the near-shore areas), this modeling system can be modified and expanded to capture detail on all available sources. The model can also be expanded to incorporate bacteria simulations if data become available near the segments where bacteria data were unavailable. Adding any additional detail to the model would allow for more specific load and wasteload allocations. In addition, the incorporation of more data would enhance the range of scenarios that can be simulated to assist the San Diego Water Board and stakeholders with implementation of the TMDL.

Appendix G
Assumptions for Model Development and TMDL Calculation

G.1 Wet Weather Modeling Assumptions

The watershed and receiving water modeling system developed to represent wet weather conditions is reported in Appendix F of the Technical Report. The following assumptions are relevant to the LSPC and EFDC models developed to simulate wet weather sources of bacteria and assimilative capacities of receiving waters.

- *General LSPC/HSPF Model Assumptions* - Many model assumptions are inherent in the algorithms used by the LSPC watershed model and are reported extensively in Bicknell et al. (1996).
- *Land Use* - A combination of SCAG, SANDAG, and MRLC land use GIS datasets is assumed representative of the current land use areas. For areas where significant changes in land use have occurred since the creation of these datasets, model predictions may not be representative of observed conditions.
- *Stream Representation* - Each delineated subwatershed was represented with a single stream/storm drain assumed to be a completely mixed, one-dimensional segment with a trapezoidal cross-section.
- *Hydrologic Modeling Parameters* - Hydrologic modeling parameters were developed during previous modeling studies in Southern California (e.g., LA River, San Jacinto River) and refined through calibration to streamflow data collected in the San Diego region. Through the calibration and validation processes (reported in Appendix F of the Technical Report), a set of modeling parameters were obtained specific to land use and hydrologic soil groups. These parameters are assumed to be representative of the hydrology of other watersheds in the San Diego region that are presently ungaged and therefore unverified.
- *Water Quality Modeling Parameters* - Dynamic models require a substantial amount of information regarding input parameters and data for calibration purposes. All sources of indicator bacteria from watersheds are represented in the LSPC model as build-up/wash-off from specific land use types. Limited data are currently available in the San Diego region to allow development of unique modeling parameters for simulation of build-up/wash-off, so parameters were obtained from a similar study performed in the Los Angeles region. These build-up/wash-off modeling parameters were originally developed by SCCWRP for a watershed model of the Santa Monica Bay Beaches (Los Angeles Water Board, 2002), and are assumed representative of land use sources in the San Diego region. This assumption was validated through evaluation of model results with local data in the San Diego Region. Results of model validation were reported in Bacteria TMDL Project I (San Diego Water Board, 2007).

- *Lumped Parameter Model Characteristic* - LSPC is a lumped-parameter model and is assumed to be sufficient for modeling transport of flows and bacteria loads from watersheds in the region. For lumped parameter models, transport of flows and bacteria loads to the streams within a given model subwatershed cannot consider relative distances of land use activities and topography that may enhance or impede time of travel over the land surface. Although this limitation could result in mistiming of peak flows or under-prediction of bacteria die-off because overland losses are not simulated, impacts are assumed minimal.
- *First-order Bacteria Die-off* - Each stream is modeled assuming first-order die-off of bacteria. Bacteria die-off rates for wet weather are assumed as 0.8/day, based on sensitivity analyses performed by SCCWRP (Los Angeles Water Board, 2002).
- *In-stream Bacteria Re-growth* - The LSPC model assumes no in-stream regrowth of bacteria. No data or literature were located to provide indication that such sources are significant during wet weather or could be estimated for model input.
- *SDB and DPH Shoreline Bacteria Die-off* – The base die-off rates of the three species of bacteria were set to 0.8/day, consistent with default literature values reported by Chapra (1997). In addition to the base die-off rate, temperature and salinity dependence ratios were applied. Salinity can contribute to the death rate at a ratio of $0.02 day^{-1} ppt^{-1}$ (Chapra, 1997). There is no conclusive research to show that the die-off rates of the three indicator bacteria species are highly temperature dependent. Therefore, a low value of $1.01\ day^{-1}\ ^{o}C^{-1}$ was included and was assumed to represent weak temperature dependence.
- *Direct Nonpoint Source Loading to SDB and DPH* – Loads from waterfowl and other unquantified nonpoint sources (e.g., other sources within the water) directly to the receiving waters were calculated based on dry weather modeling analyses described in the next section.

G.2 Dry Weather Modeling Assumptions

The watershed and receiving water modeling system developed for simulation of quasi-steady-state dry weather flows and sources of bacteria are reported in Appendix F of the Technical Report. The following assumptions are relevant to that discussion.

- *Steady-state Watershed Model Configuration* - Although it is understood that dry weather flows and bacteria densities vary over time for any given stream, for prediction of average conditions in the stream, flows and concentrations are assumed as steady state.
- *Sources for Characterization of Dry Weather Watershed Loads* - Data used for characterization of dry weather flows and water quality are assumed representative of conditions throughout the region.

- *Methods for Characterization of Dry Weather Watershed Loads* - The equations derived through multivariable regression analyses are assumed sufficient to represent the dry weather flows and water quality as functions of land use and watershed size.
- *Stream Bacteria Re-growth* - The dry weather model assumes no in-stream sources or regrowth of bacteria. No data or literature were located to provide indication that such sources are significant during wet weather or could be estimated for model input
- *SDB and DPH Shoreline Bacteria Die-off* – The base die-off rates of the three species of bacteria were set to 0.8/day, consistent with default literature values reported by Chapra (1997). In addition to the base die-off rate, temperature and salinity dependence ratios were applied. Salinity can contribute to the death rate at a ratio of $0.02 day^{-1} ppt^{-1}$ (Chapra, 1997). There is no conclusive research to show that the die-off rates of the three indicator bacteria species are highly temperature dependent. Therefore, a low value of $1.01\ day^{-1}\ ºC^{-1}$ was included and was assumed to represent weak temperature dependence.
- *Direct Nonpoint Source Loading to SDB and DPH* – Loads from waterfowl and other unidentified nonpoint sources (e.g., other sources within the water) directly to the receiving were calculated using EFDC models to take up the remaining assimilative capacity of the waterbodies after wasteload allocations to dry weather runoff.

G.3 Assumptions for TMDL Calculation

Calculation of TMDLs, load allocations, and recommended load reductions were reported in Section 8 of the Technical Report. The following assumptions are applicable to this discussion.

- *Critical Location for Loading Assessments* - For SDB and DPH shorelines, the critical locations for meeting numeric targets include the entire length of impaired shoreline. For model development, receiving waters at impaired shorelines were represented in the model with multiple grid cells (see Appendix F). Therefore, for each of the impaired shorelines, a weighted average of bacteria concentration was calculated based on respective length of shoreline (Avg. Conc. = ∑ [Length*Conc.] / ∑ Length) of each model grid cell located adjacent to that shoreline. This resulted in a single representative bacteria concentration for each impaired shoreline addressed in this TMDL.
- *TMDL Numeric Targets* – Separate numeric targets are used for wet and dry weather TMDL calculations. For wet weather, the single sample maximum WQOs were used to assess exceedance of the TMDL. For dry weather, both the 30-day geometric mean and the single sample maximum WQOs were used to assess exceedances. For each condition, selection of the applicable numeric

target provides assurance of the protection of beneficial uses in the impaired waterbodies and is consistent with state and federal guidance.

- *Wet Weather Critical Condition* – To assess the response of the receiving waters due to variable critical watershed loads, a specific 30-day period of 1993 was selected for detailed assessment. This shortened period facilitated detailed analyses of the hourly or diurnal conditions that impact the water quality, rather than a longer-term, daily evaluation of loads. A critical wet weather period of 1993 was identified from January 7th through February 5th, which corresponded to five to ten of the top 1st percentile of flow magnitudes (daily averages) simulated by LSPC from January 1, 1990 to May 31, 2004, depending on location. In addition to this 30-day critical wet weather watershed loading period, a 30-day critical tidal period was assumed based on observed data from March 7, 2001 to April 7, 2001. These two critical 30-day periods were combined in the model to provide the most conservative bacteria loading scenario.
- *Dry Weather Critical Condition* – For the EFDC model of receiving waters, the critical period for TMDL calculation assumed tidal variations based on observed data from March 7, 2001 to April 7, 2001. During this period, tidal variations were determined through modeling analyses to have critical impacts on the assimilative capacities of the receiving waters.
- *Reduction of Dry Weather Watershed Loads* - Watershed loads were reduced to bacteria densities consistent with geometric mean WQOs, thus ensuring that controllable sources of bacteria are addressed. Such conservativeness provides a MOS by ensuring that targets are met at increasing distances from the discharge, where dilution and die-off in the receiving waters occur.

Appendix H
Existing and Reduced Concentrations
Wet Weather

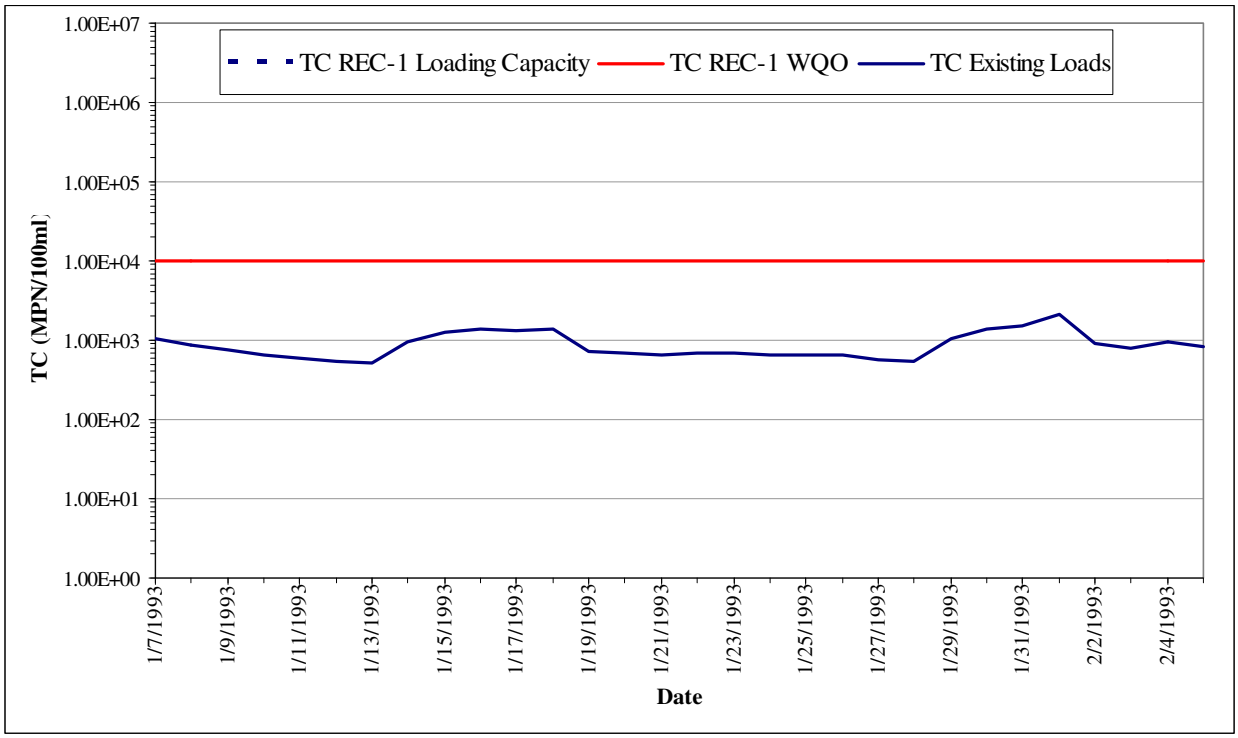

Figure H-1. Existing and Reduced Total Coliform Concentrations at Shelter Island Shoreline Park, San Diego Bay-Wet Weather (Comparison to Single Sample Maximum WQO)

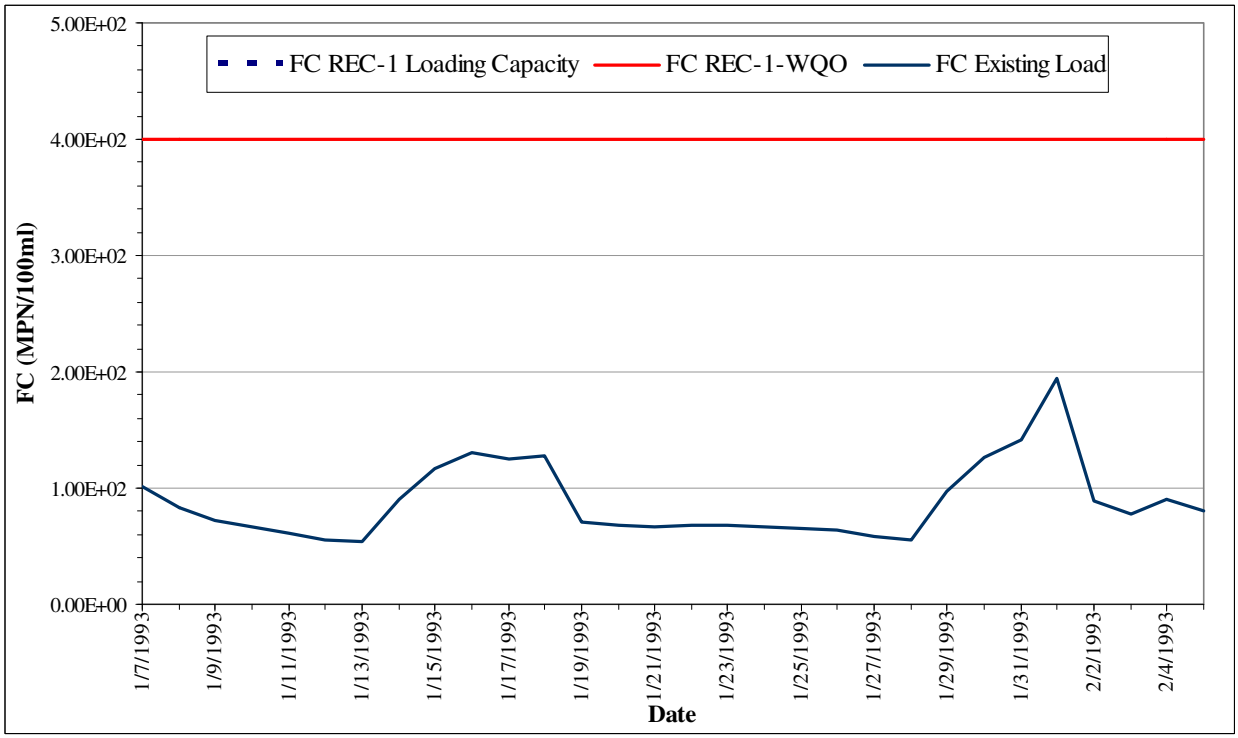

Figure H-2. Existing and Reduced Fecal Coliform Concentrations at Shelter Island Shoreline Park, San Diego Bay-Wet Weather (Comparison to Single Sample Maximum WQO)

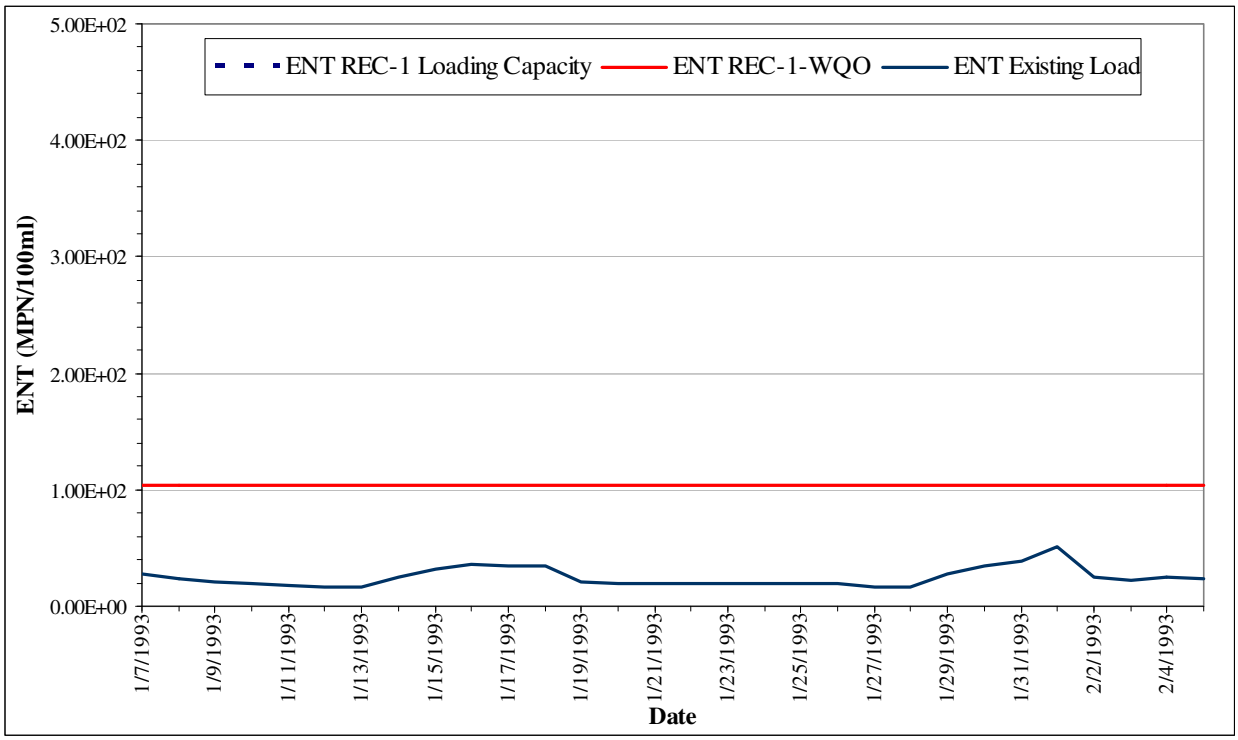

Figure H-3. Existing and Reduced Enterococcus Concentrations at Shelter Island Shoreline Park, San Diego Bay-Wet Weather (Comparison to Single Sample Maximum WQO)

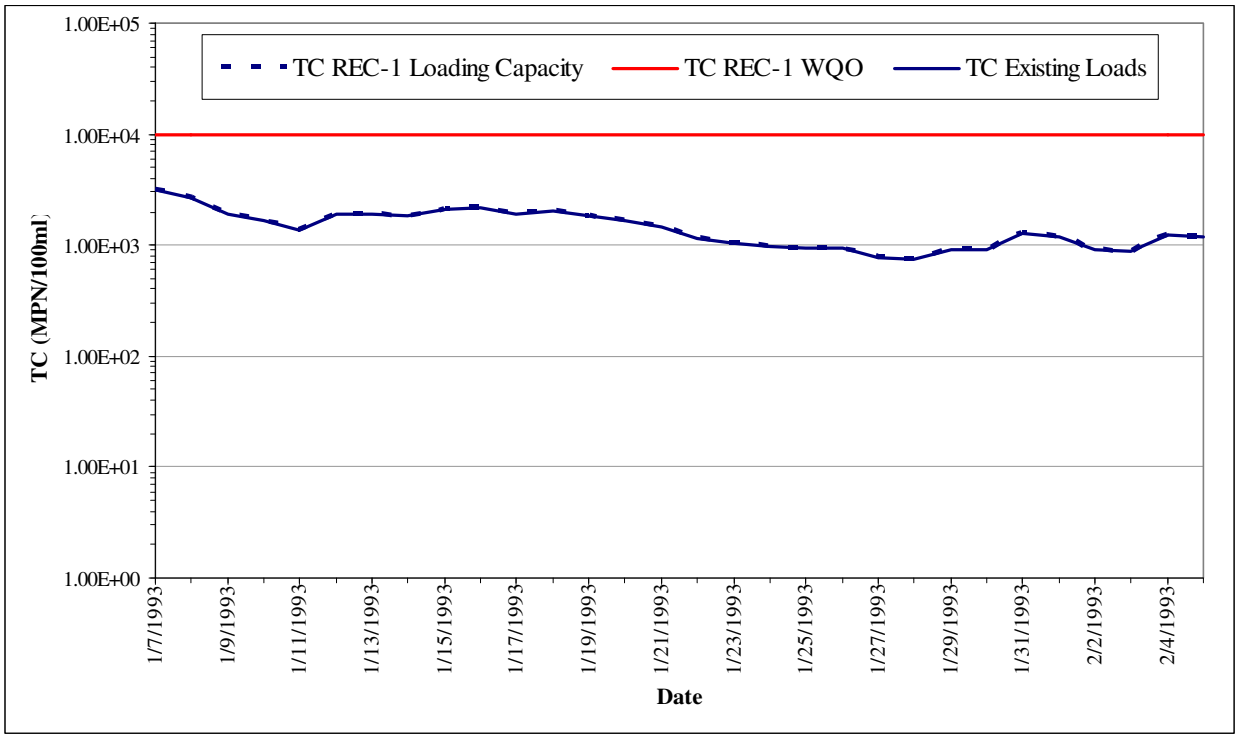

Figure H-4. Existing and Reduced Total Coliform Concentrations at Baby Beach Shoreline, Dana Point Harbor-Wet Weather (Comparison to Single Sample Maximum WQO)

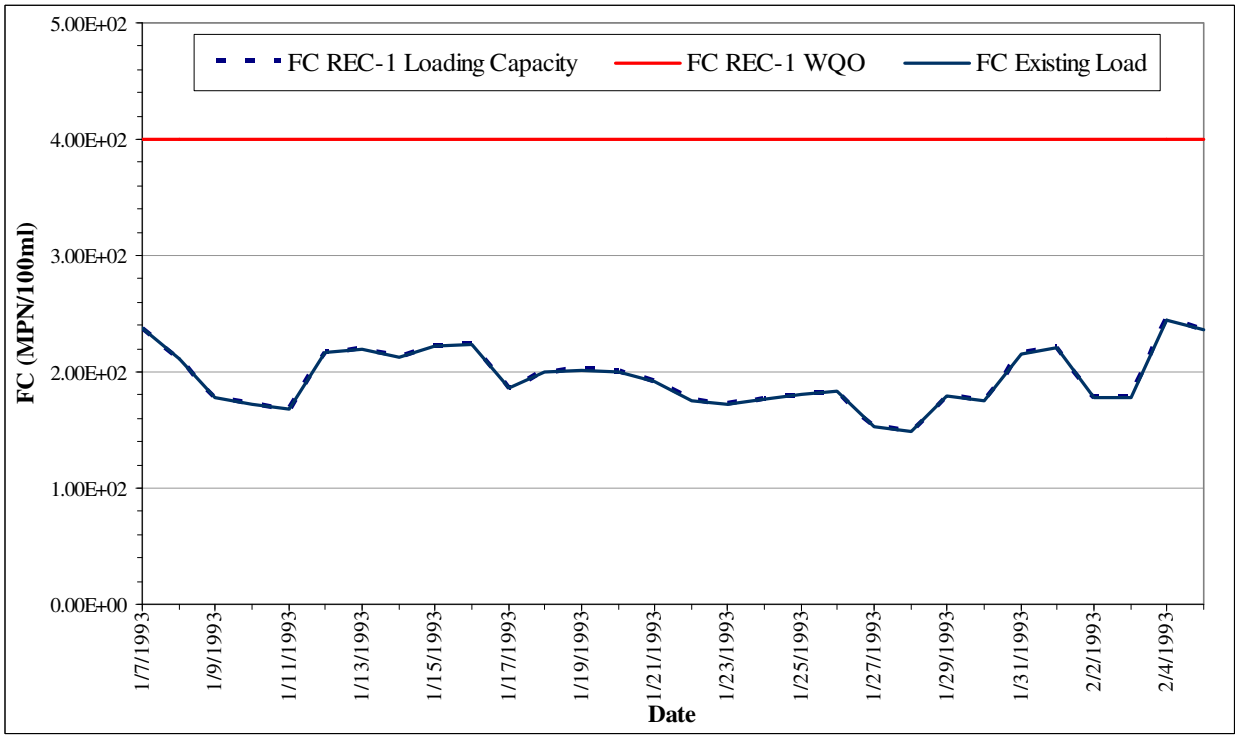

Figure H-5. Existing and Reduced Fecal Coliform Concentrations at Baby Beach Shoreline, Dana Point Harbor-Wet Weather (Comparison to Single Sample Maximum WQO)

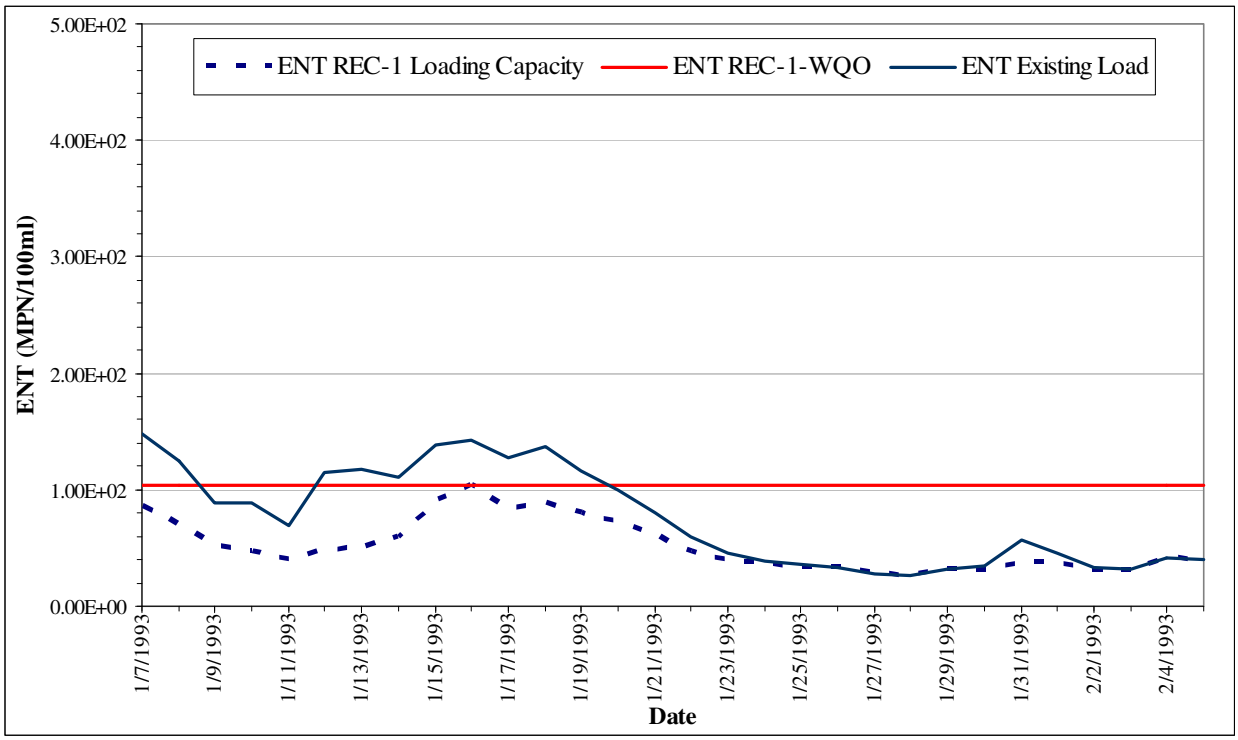

Figure H-6. Existing and Reduced Enterococcus Concentrations at Baby Beach Shoreline, Dana Point Harbor-Wet Weather (Comparison to Single Sample Maximum WQO)

Appendix I
EFDC Calibration and Modeling Results

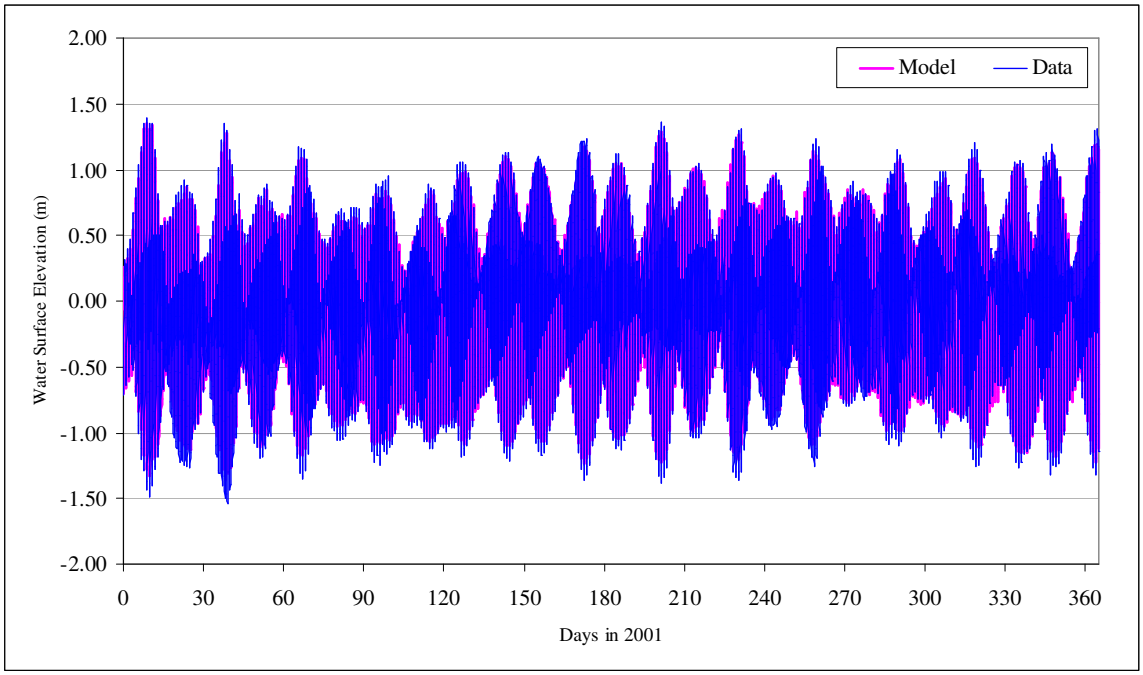

Figure I-1. Comparison of 2001 Model Computed Water Surface Elevations with Data for NOAA-COOPS Station #9410170

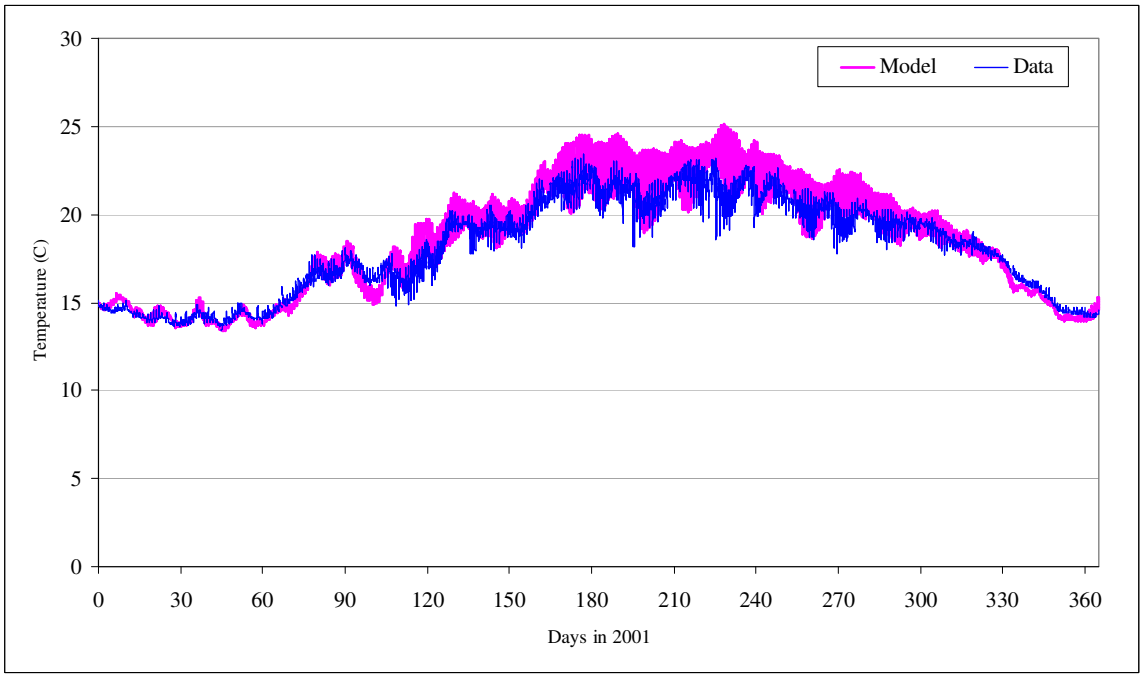

Figure I-2. Comparison of 2001 Model Computed Temperature Results with Data for NOAA-COOPS Station #9410170

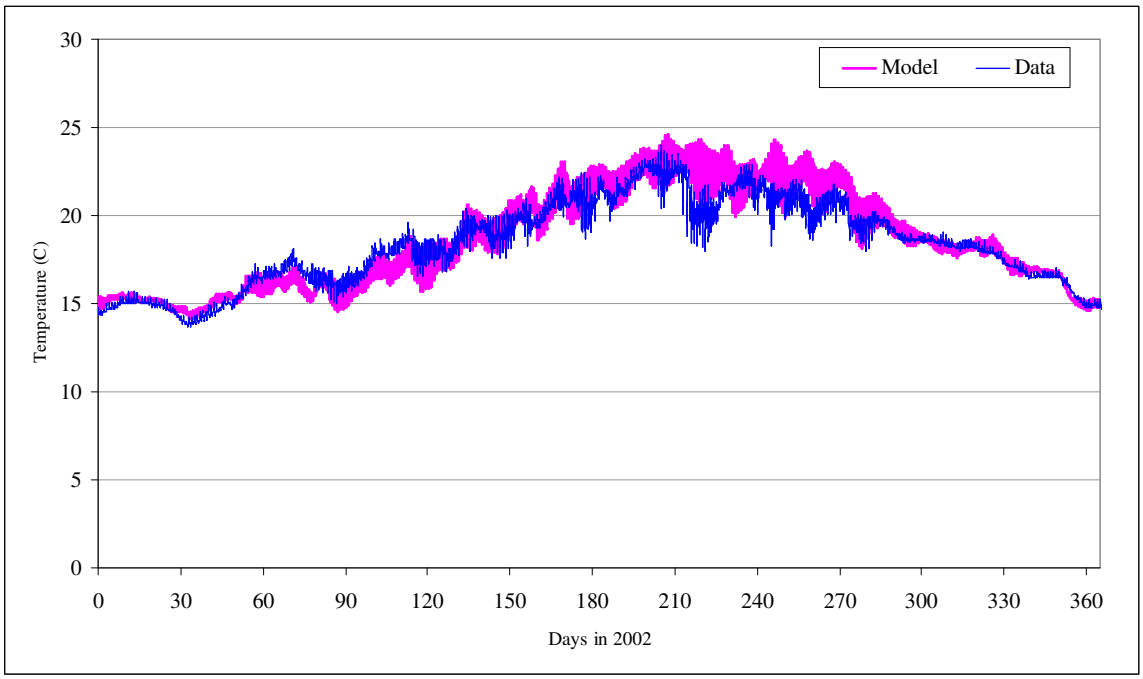

Figure I-3. Comparison of 2002 Model Computed Temperature Results with Data for NOAA-COOPS Station #9410170

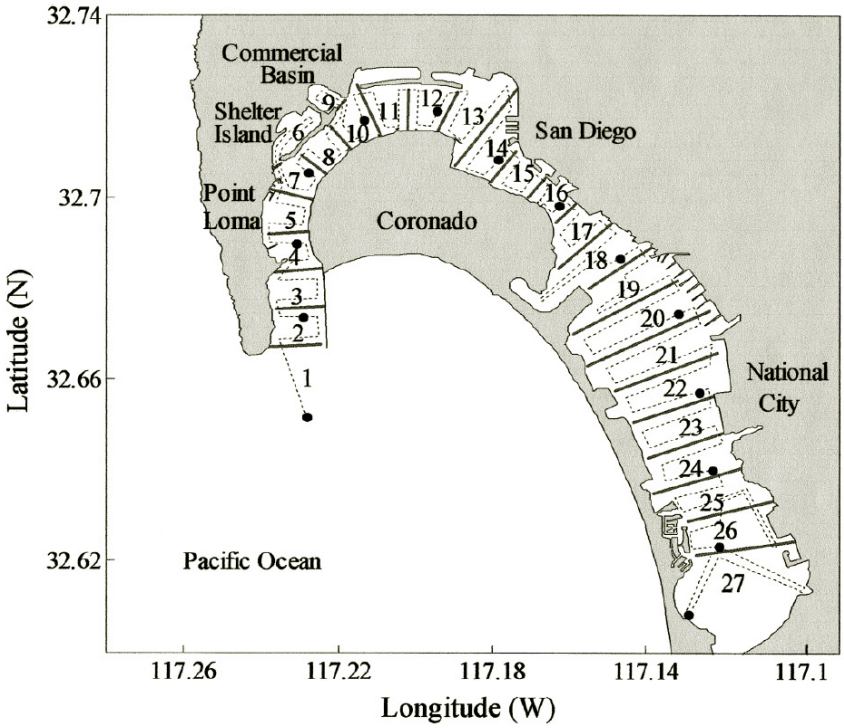

Figure I-4. Map of Temperature and Salinity Sampling Stations in San Diego Bay (SPAWAR, 2005)

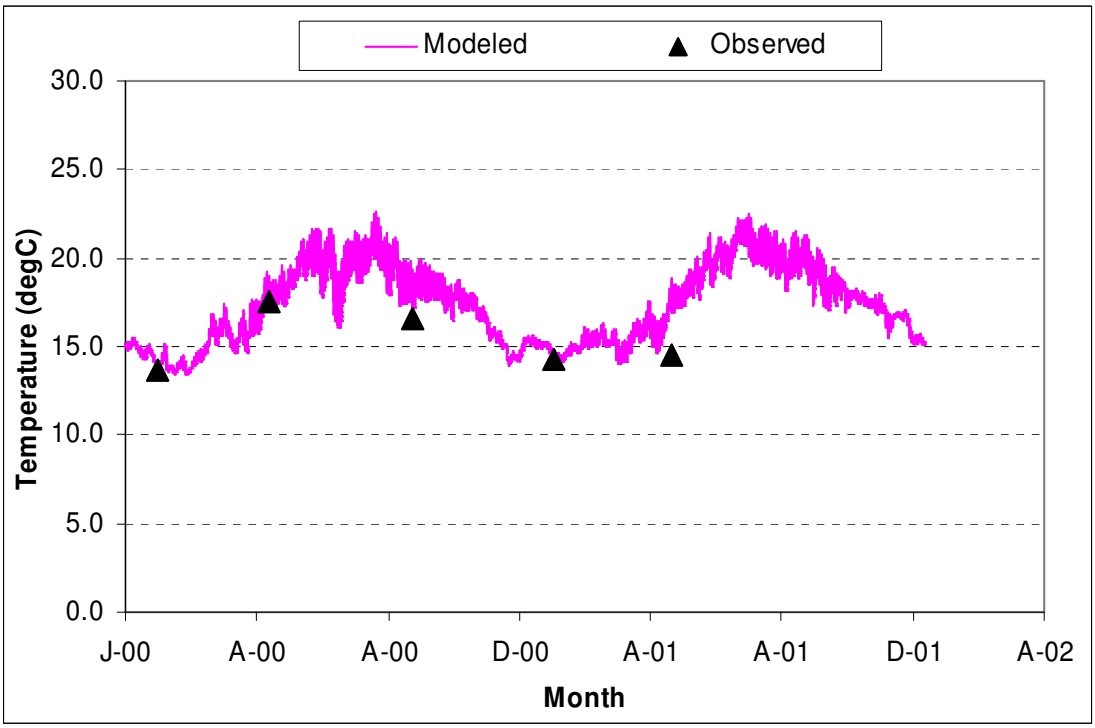

Figure I-5. Comparison of Model Predicted Temperature Results with Observed SPAWAR Results at Station #1

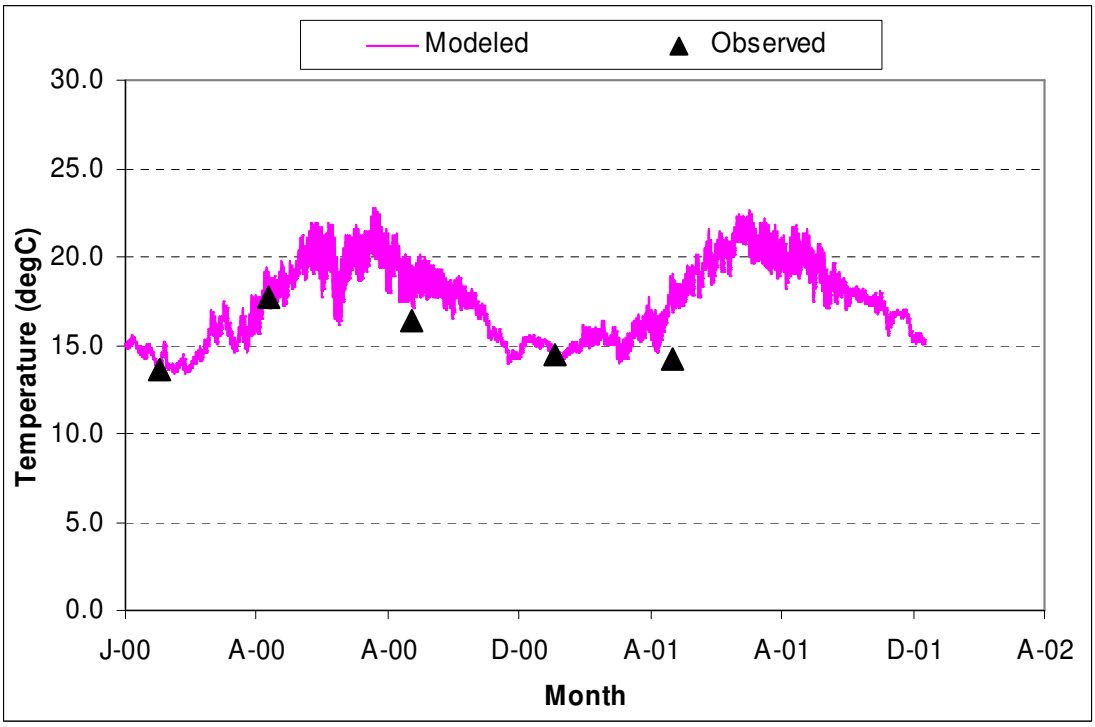

Figure I-6. Comparison of Model Predicted Temperature Results with Observed SPAWAR Results at Station #2

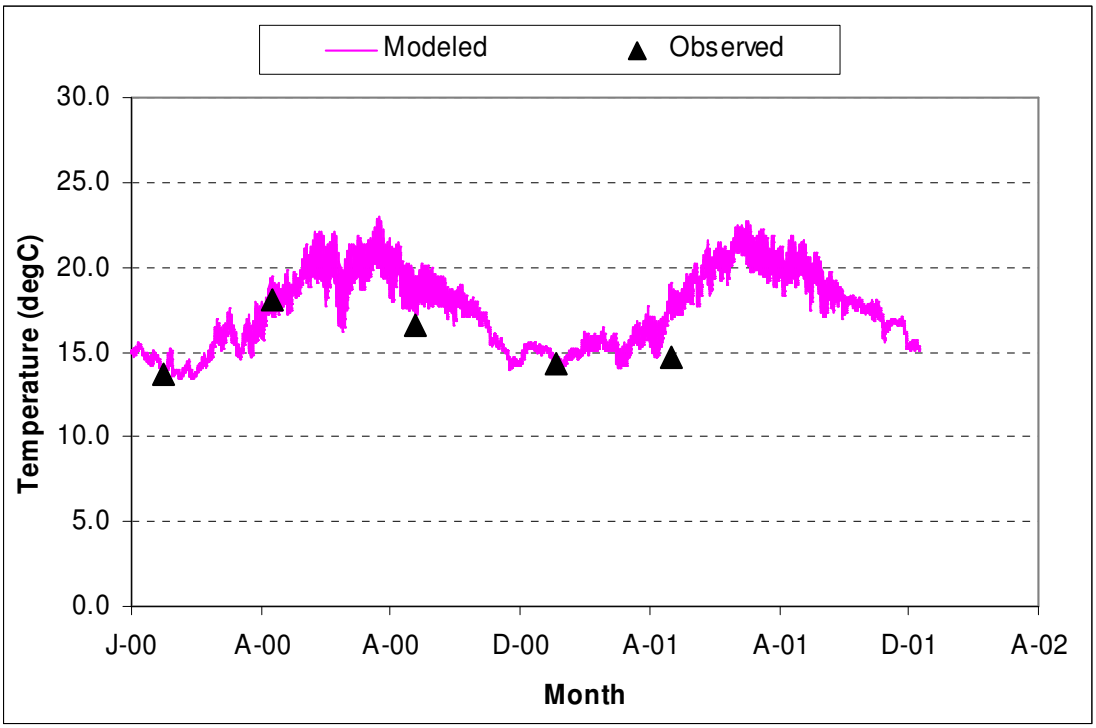

Figure I-7. Comparison of Model Predicted Temperature Results with Observed SPAWAR Results at Station #3

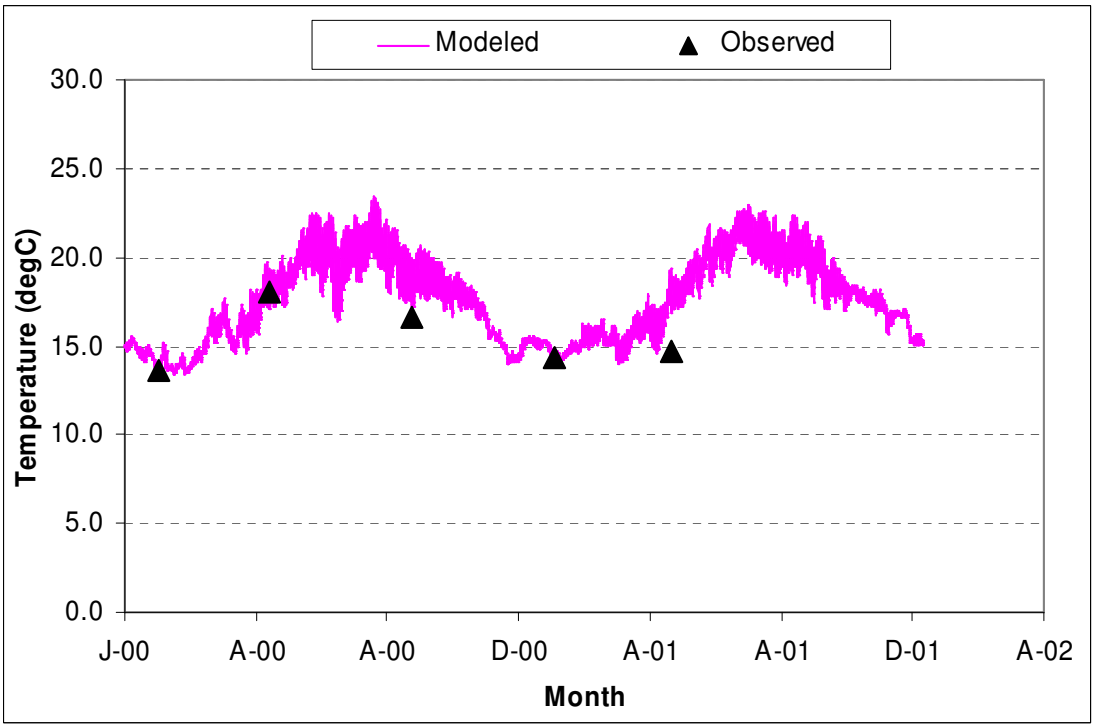

Figure I-8. Comparison of Model Predicted Temperature Results with Observed SPAWAR Results at Station #4

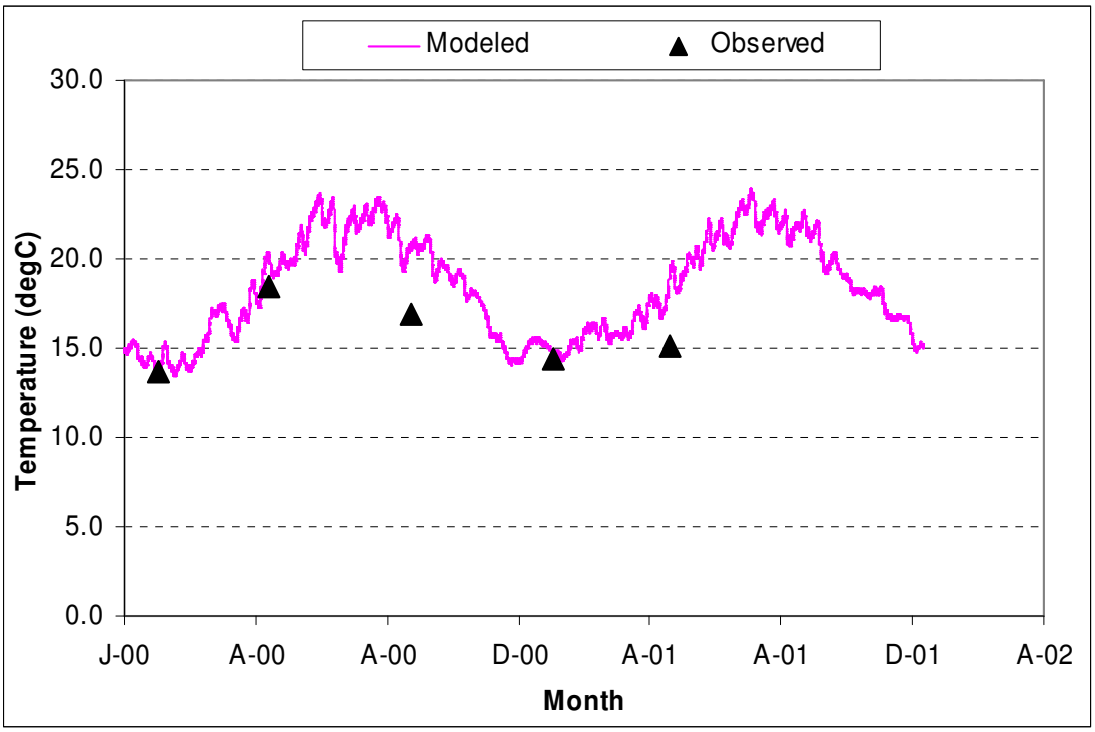

Figure I-9. Comparison of Model Predicted Temperature Results with Observed SPAWAR Results at Station #5

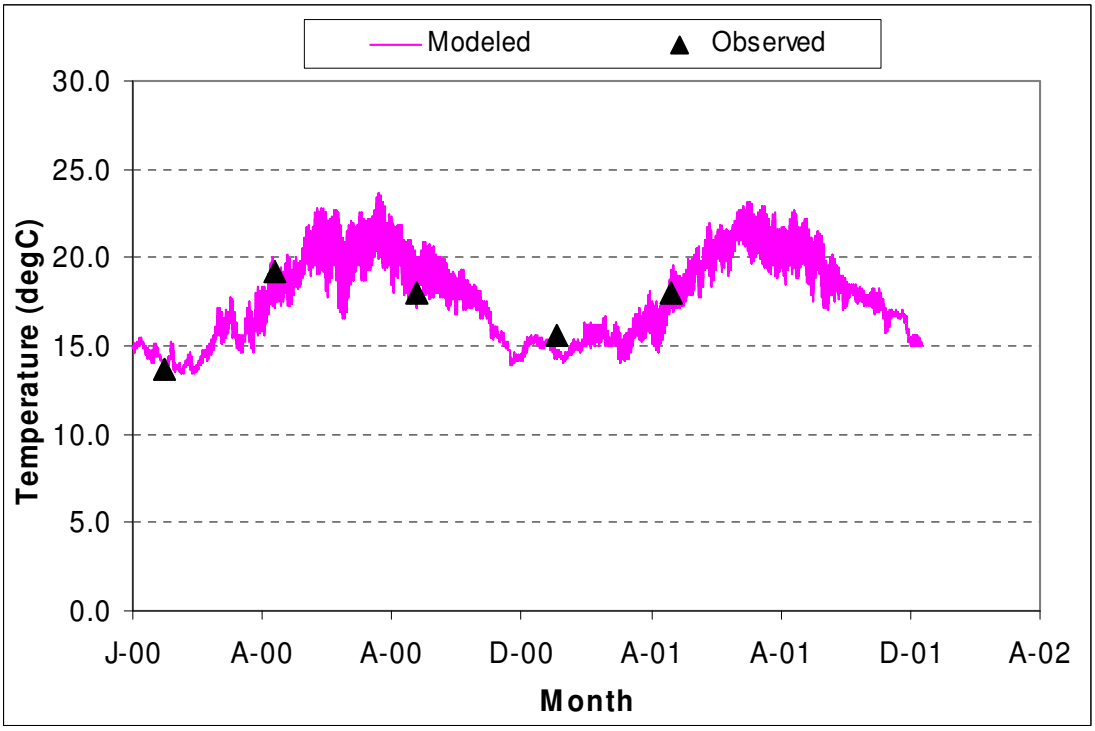

Figure I-10. Comparison of Model Predicted Temperature Results with Observed SPAWAR Results at Station #6

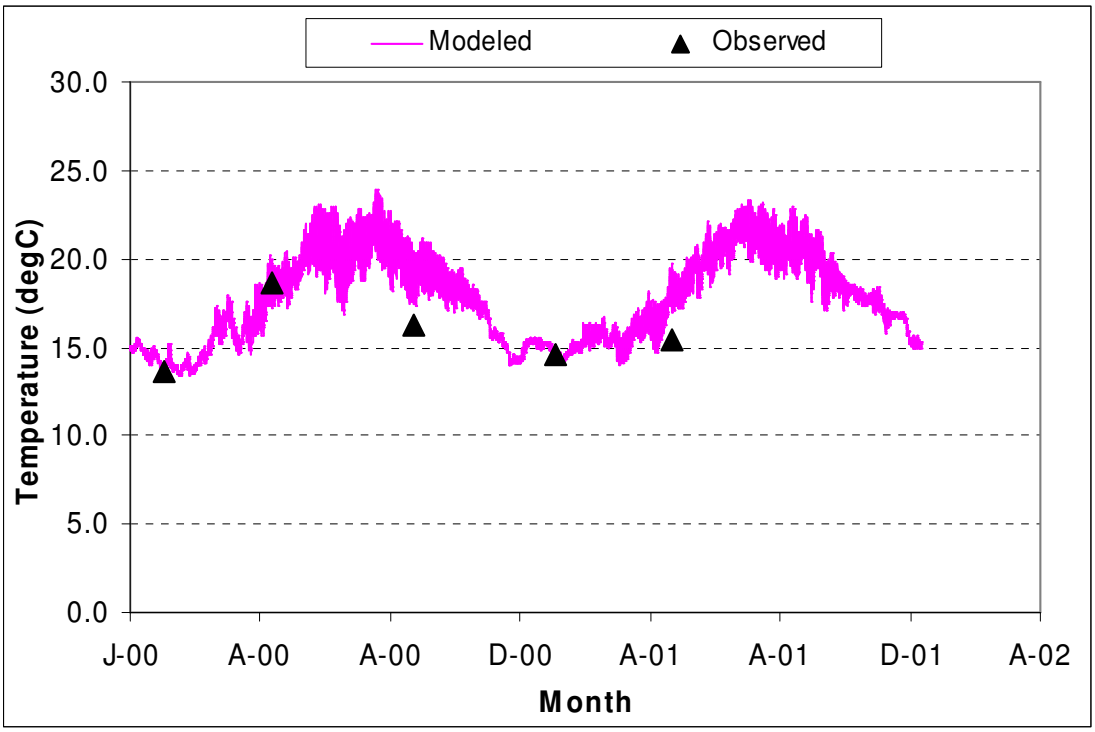

Figure I-11. Comparison of Model Predicted Temperature Results with Observed SPAWAR Results at Station #7

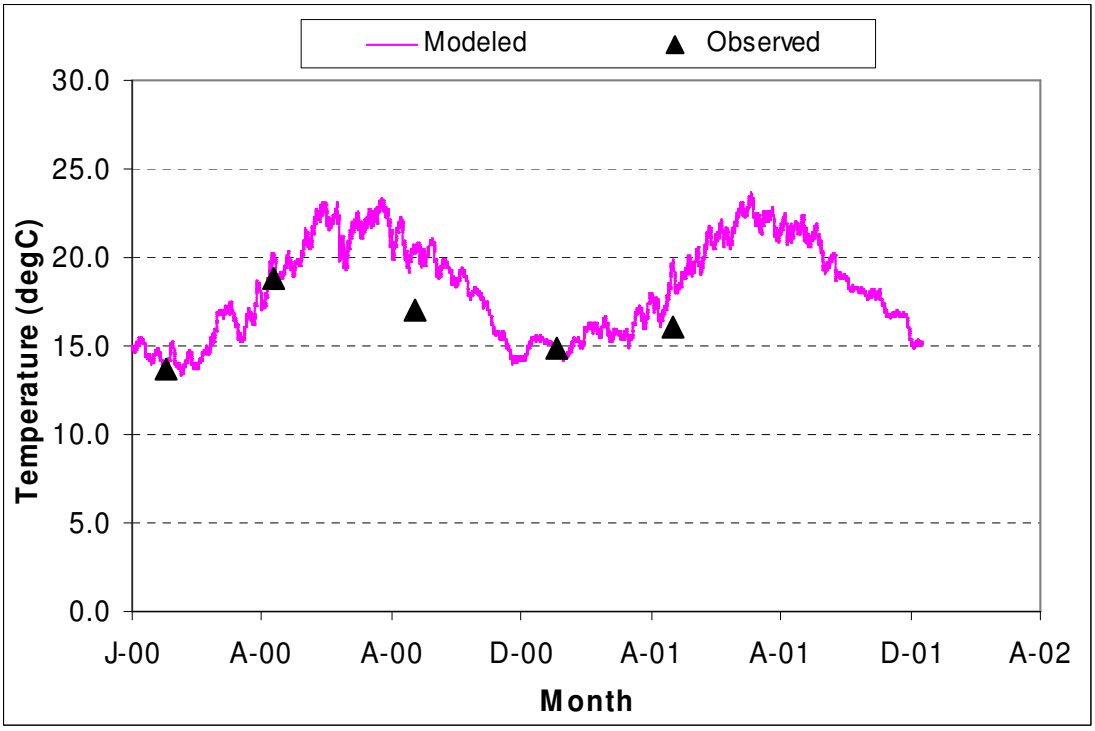

Figure I-12. Comparison of Model Predicted Temperature Results with Observed SPAWAR Results at Station #8

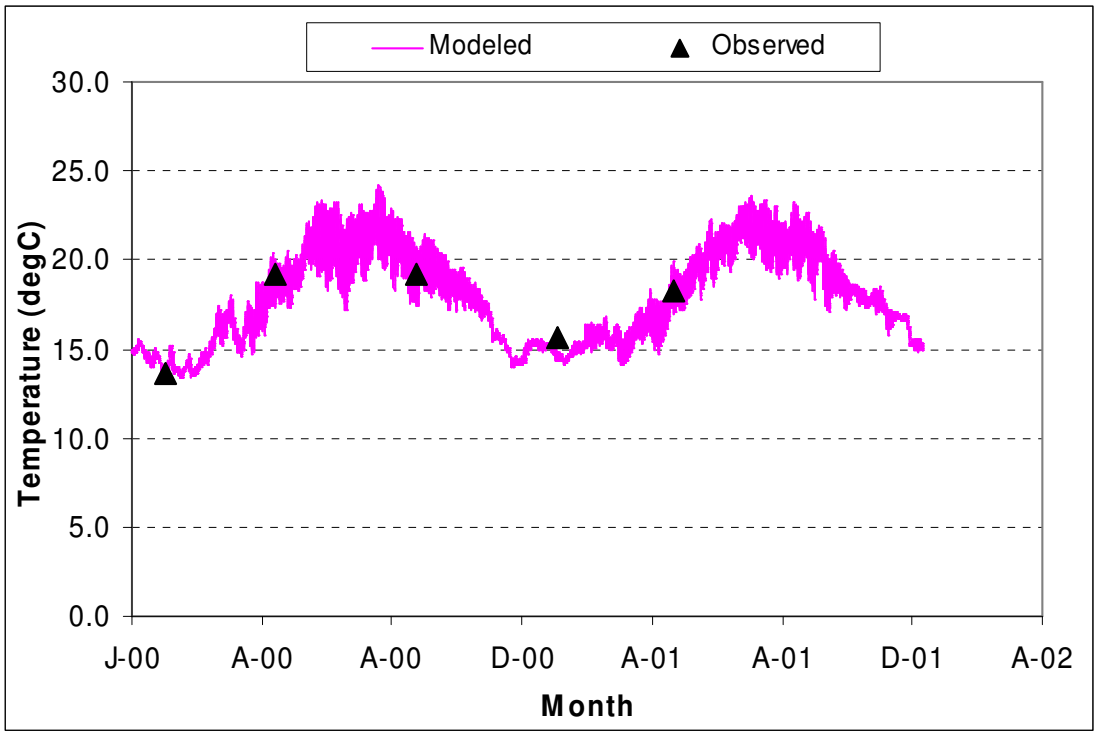

Figure I-13. Comparison of Model Predicted Temperature Results with Observed SPAWAR Results at Station #9

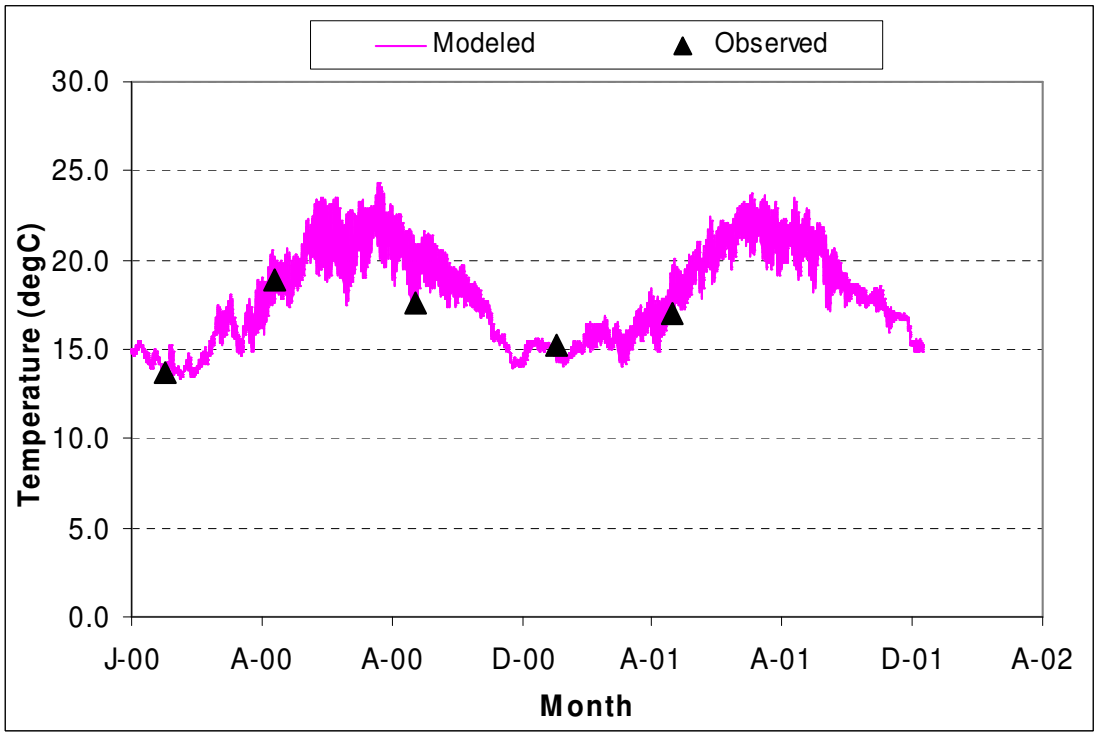

Figure I-14. Comparison of Model Predicted Temperature Results with Observed SPAWAR Results at Station #10

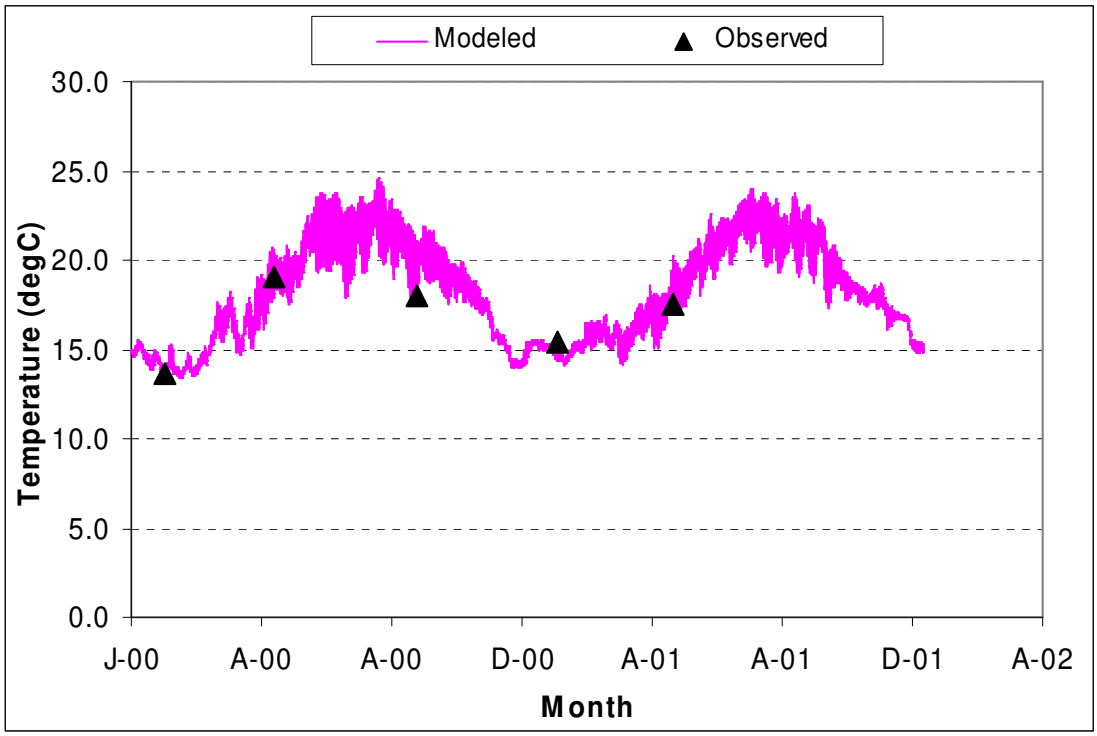

Figure I-15. Comparison of Model Predicted Temperature Results with Observed SPAWAR Results at Station #11

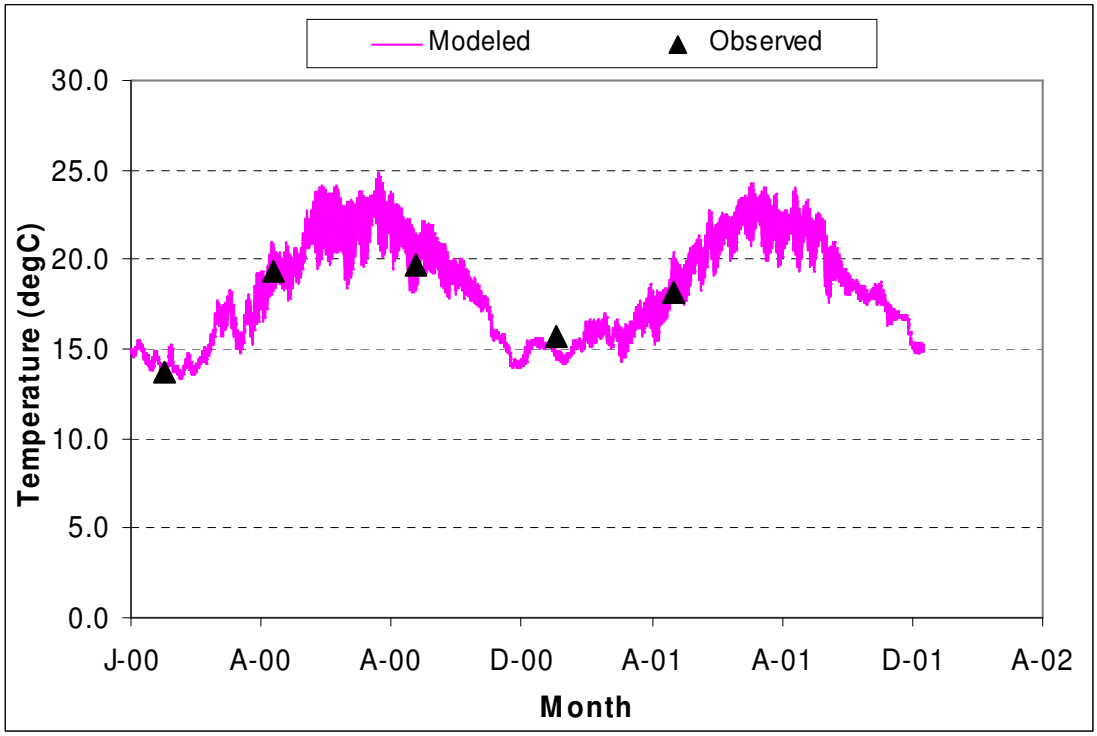

Figure I-16. Comparison of Model Predicted Temperature Results with Observed SPAWAR Results at Station #12

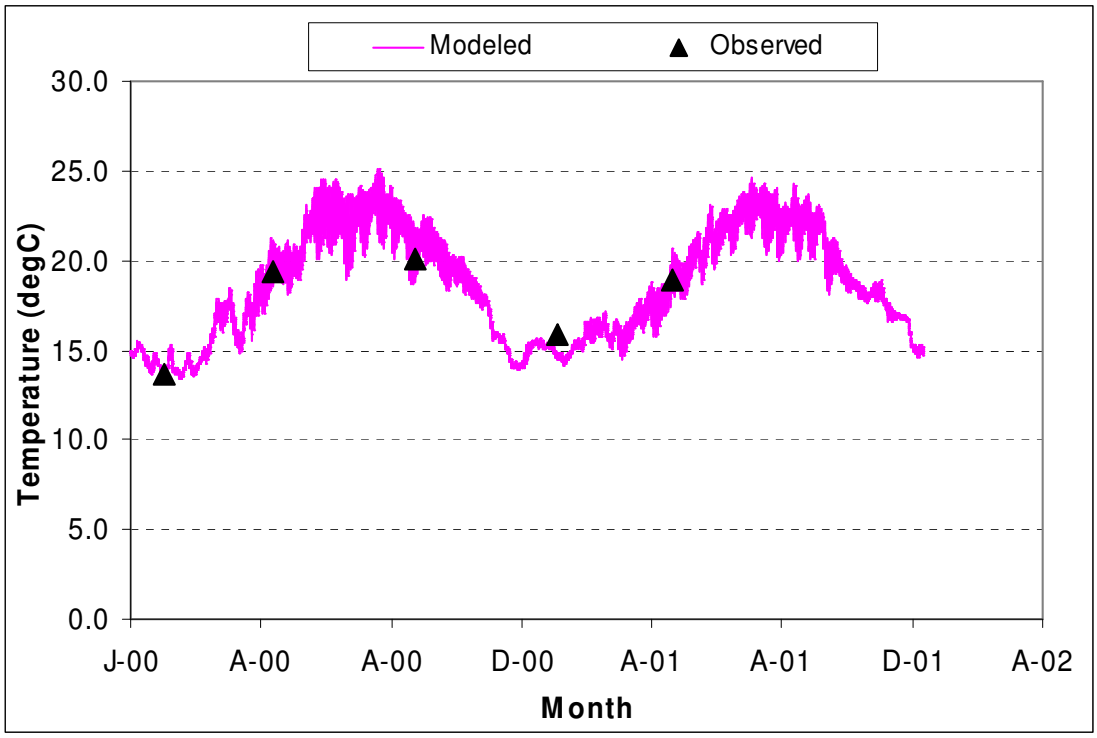

Figure I-17. Comparison of Model Predicted Temperature Results with Observed SPAWAR Results at Station #13

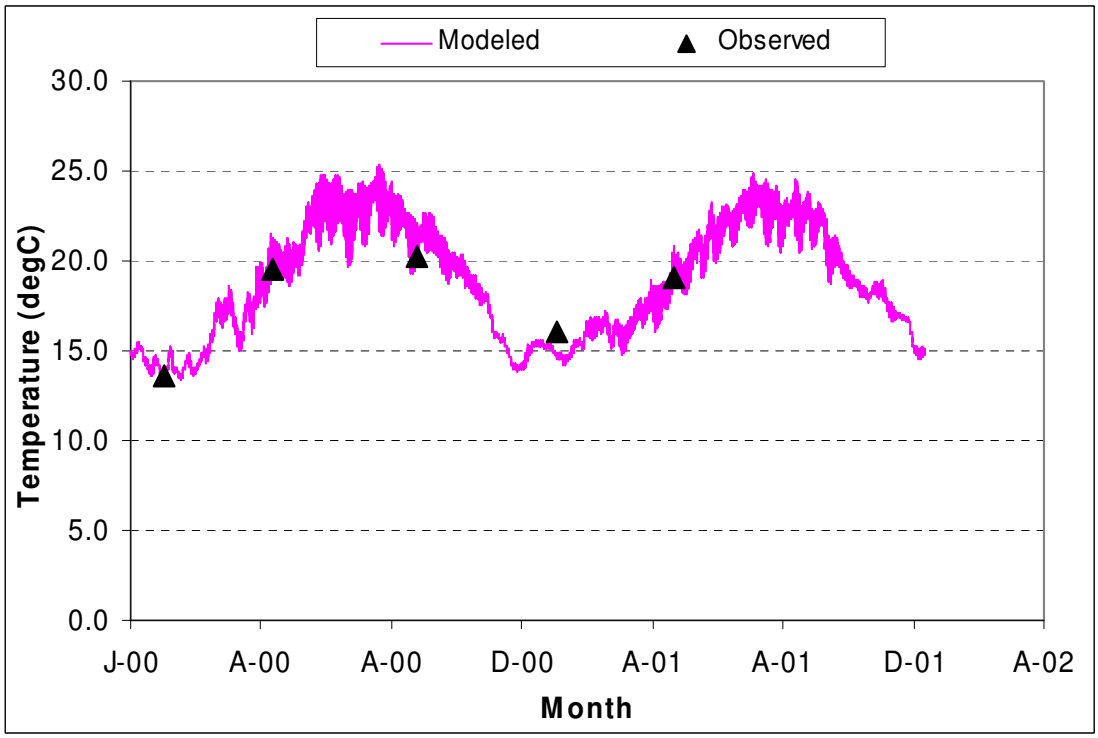

Figure I-18. Comparison of Model Predicted Temperature Results with Observed SPAWAR Results at Station #14

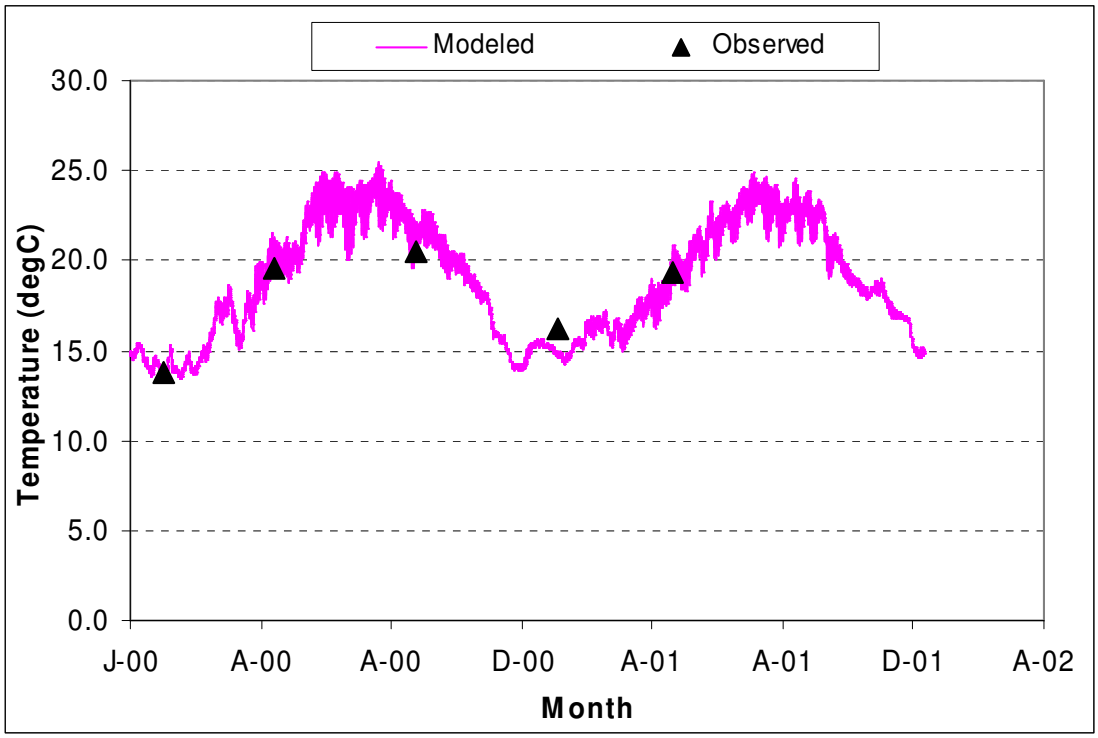

Figure I-19. Comparison of Model Predicted Temperature Results with Observed SPAWAR Results at Station #15

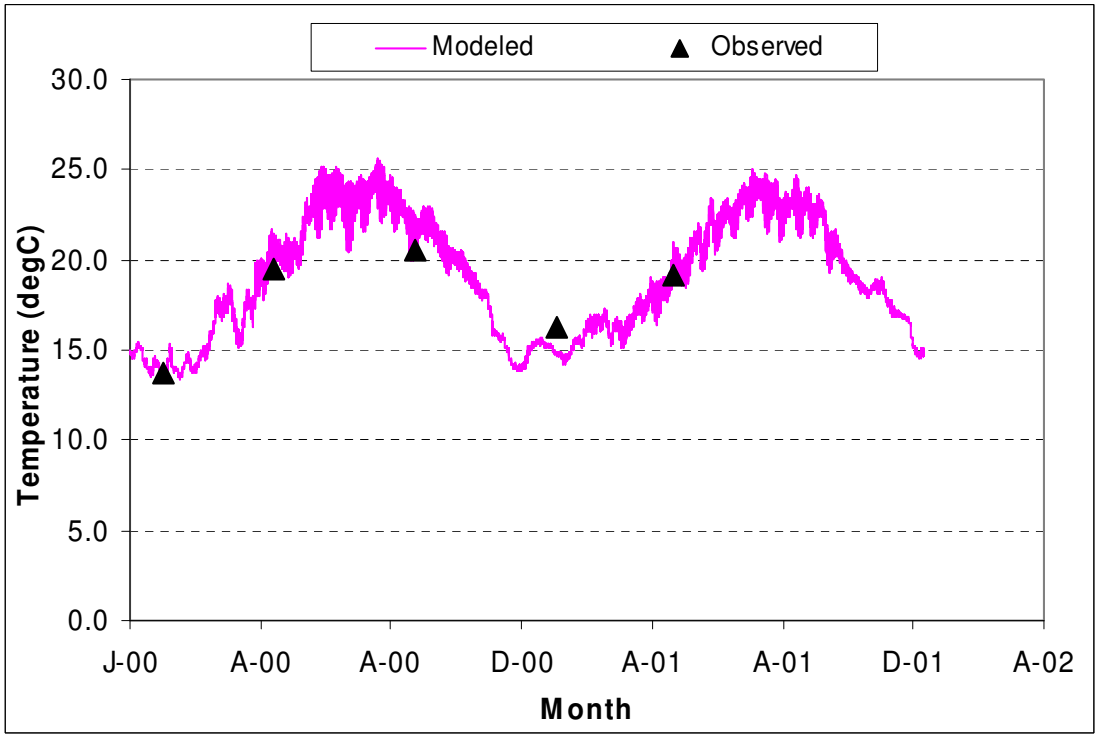

Figure I-20. Comparison of Model Predicted Temperature Results with Observed SPAWAR Results at Station #16

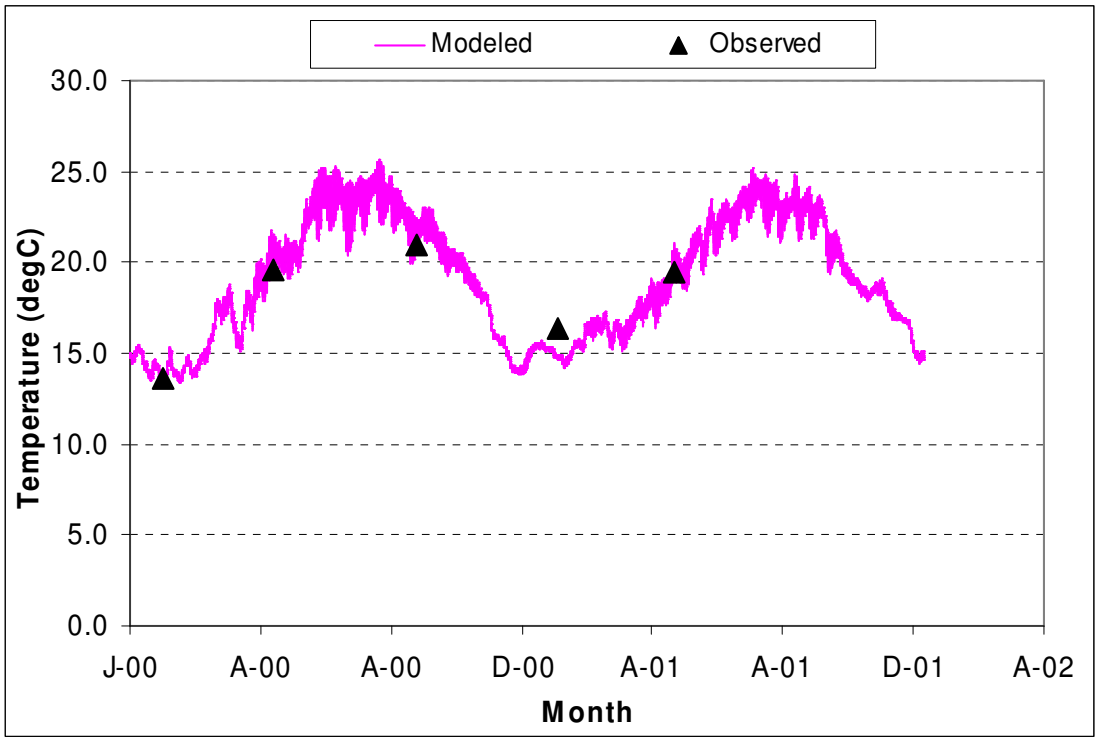

Figure I-21. Comparison of Model Predicted Temperature Results with Observed SPAWAR Results at Station #17

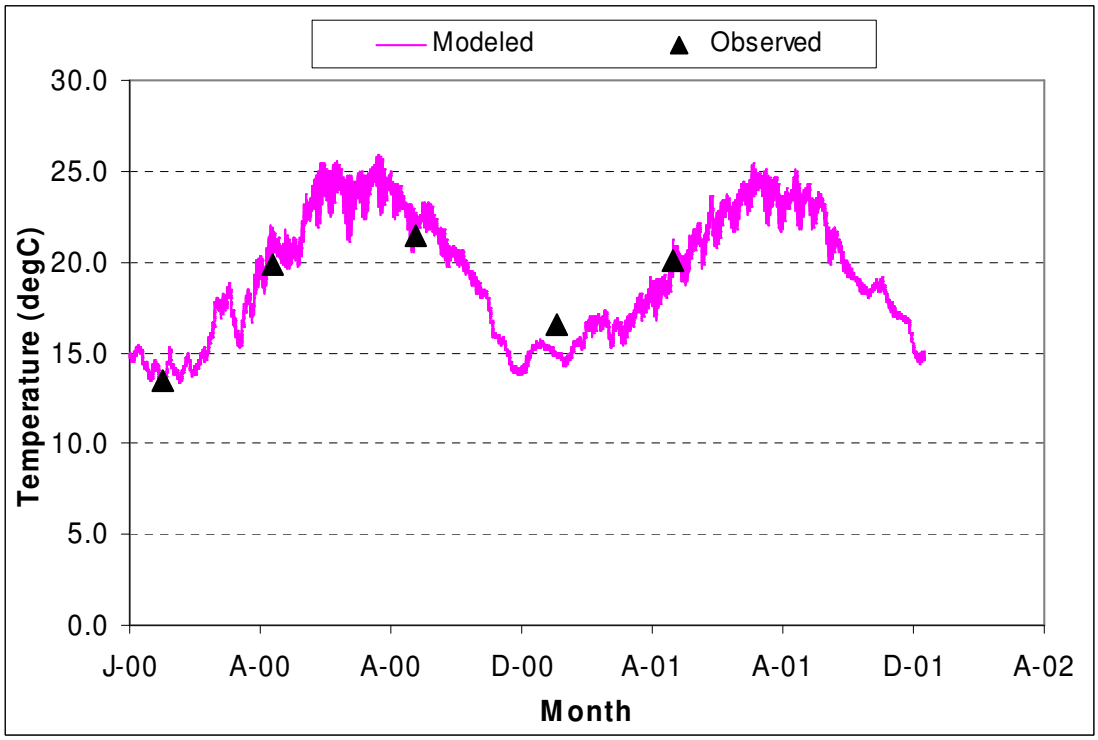

Figure I-22. Comparison of Model Predicted Temperature Results with Observed SPAWAR Results at Station #18

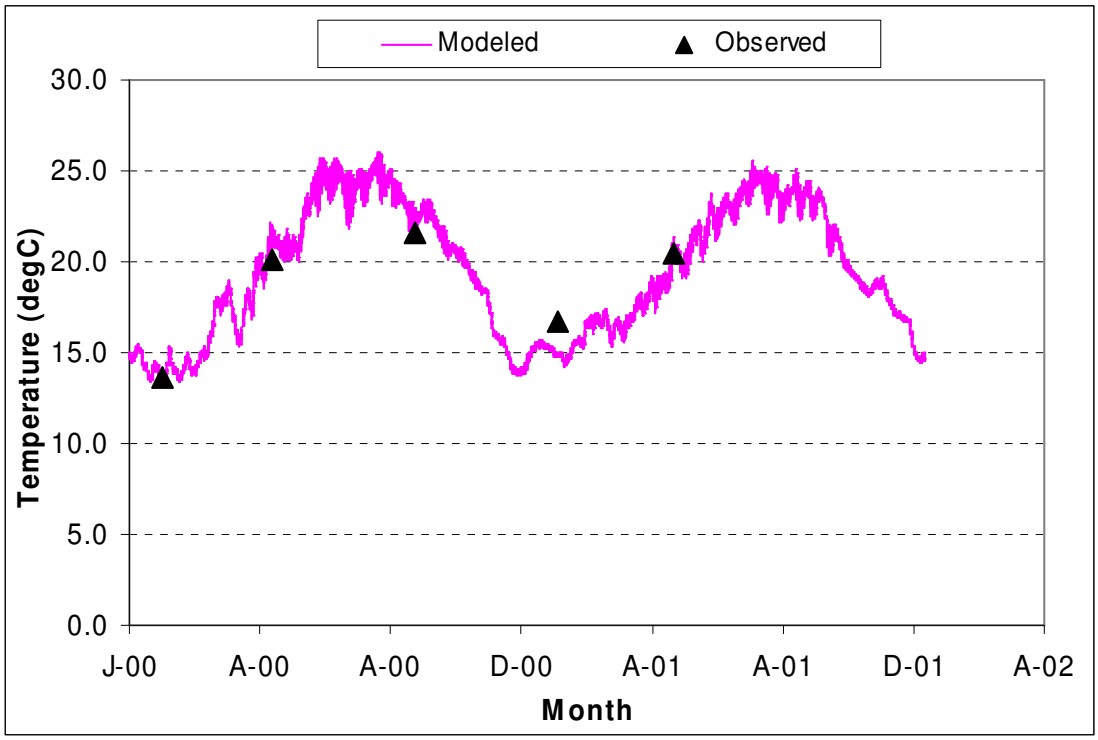

Figure I-23. Comparison of Model Predicted Temperature Results with Observed SPAWAR Results at Station #19

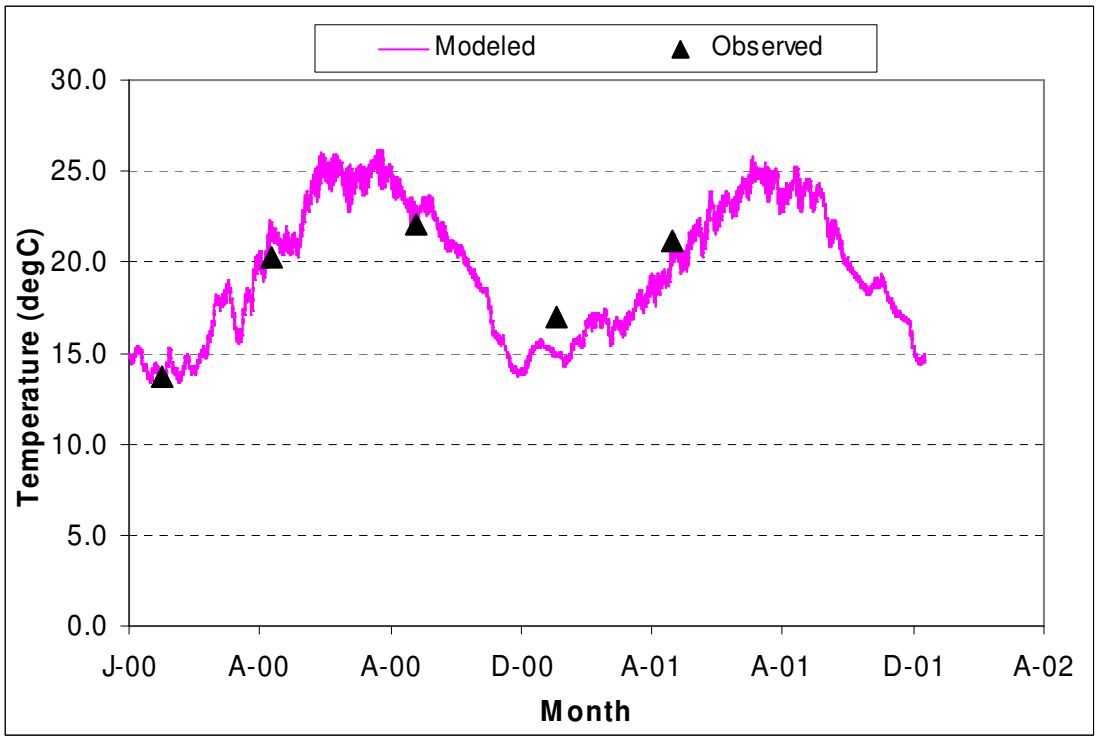

Figure I-24. Comparison of Model Predicted Temperature Results with Observed SPAWAR Results at Station #20

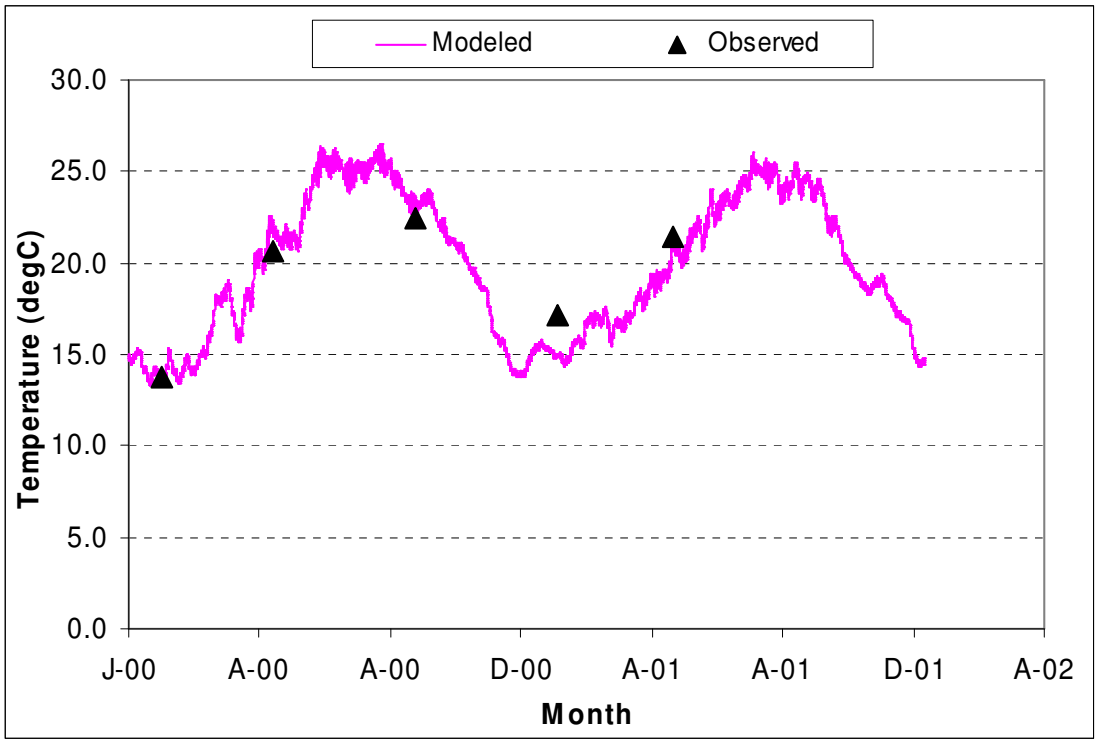

Figure I-25. Comparison of Model Predicted Temperature Results with Observed SPAWAR Results at Station #21

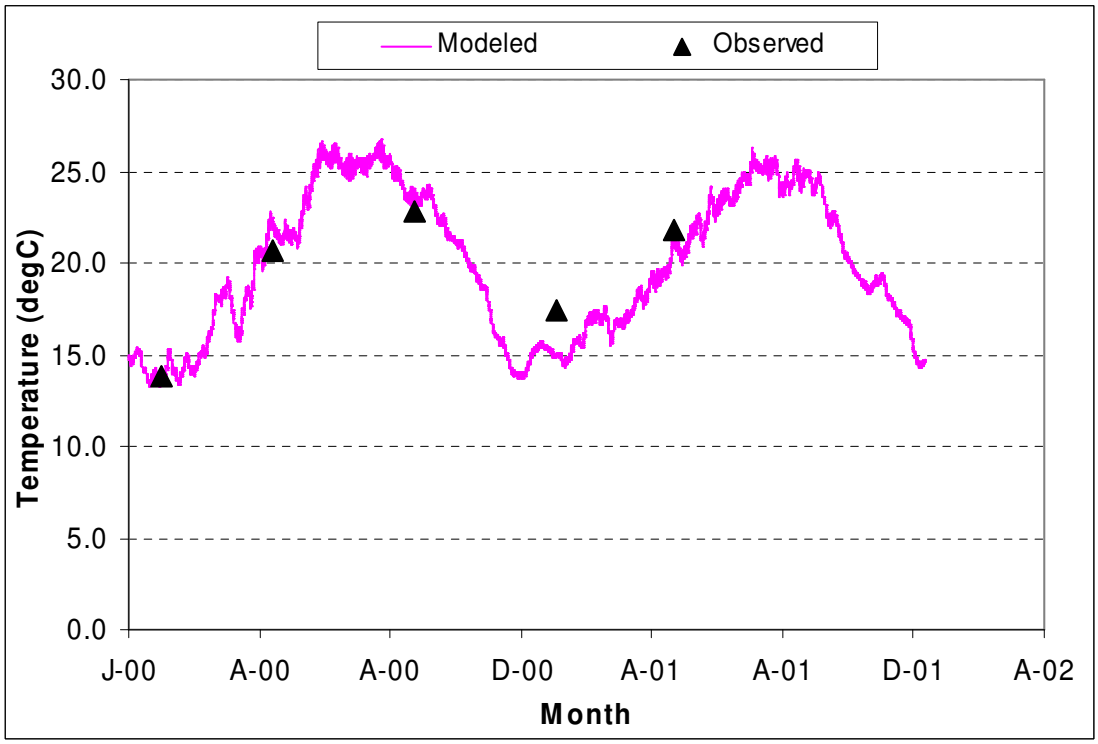

Figure I-26. Comparison of Model Predicted Temperature Results with Observed SPAWAR Results at Station #22

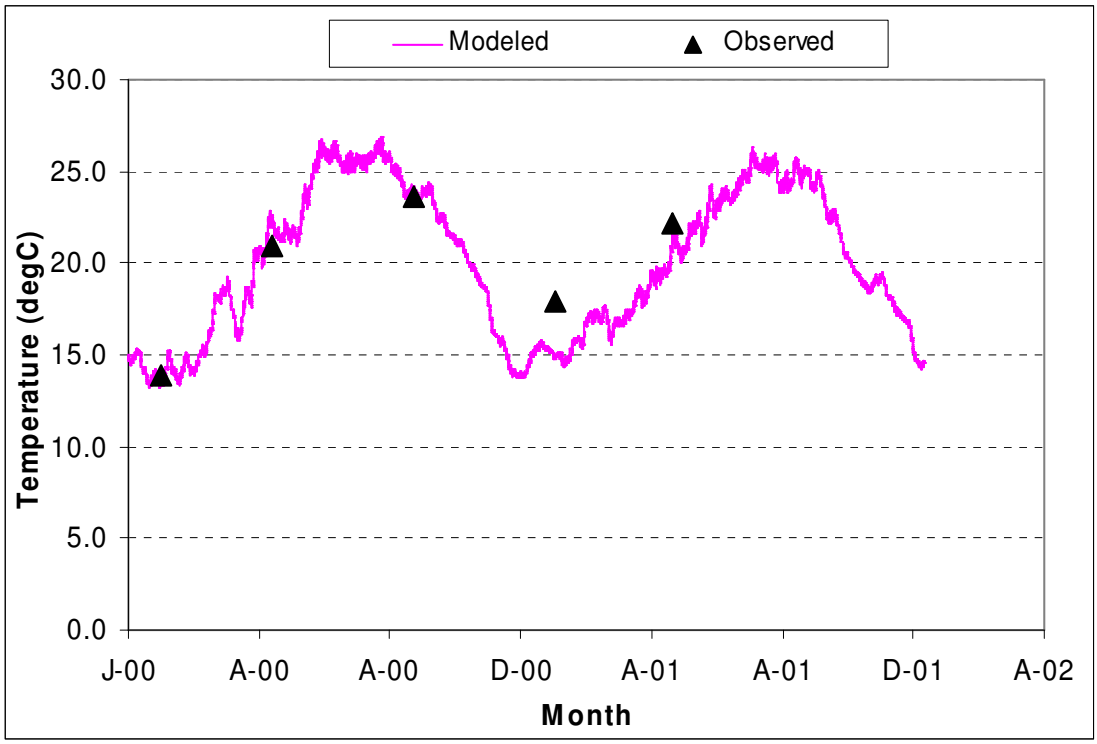

Figure I-27. Comparison of Model Predicted Temperature Results with Observed SPAWAR Results at Station #23

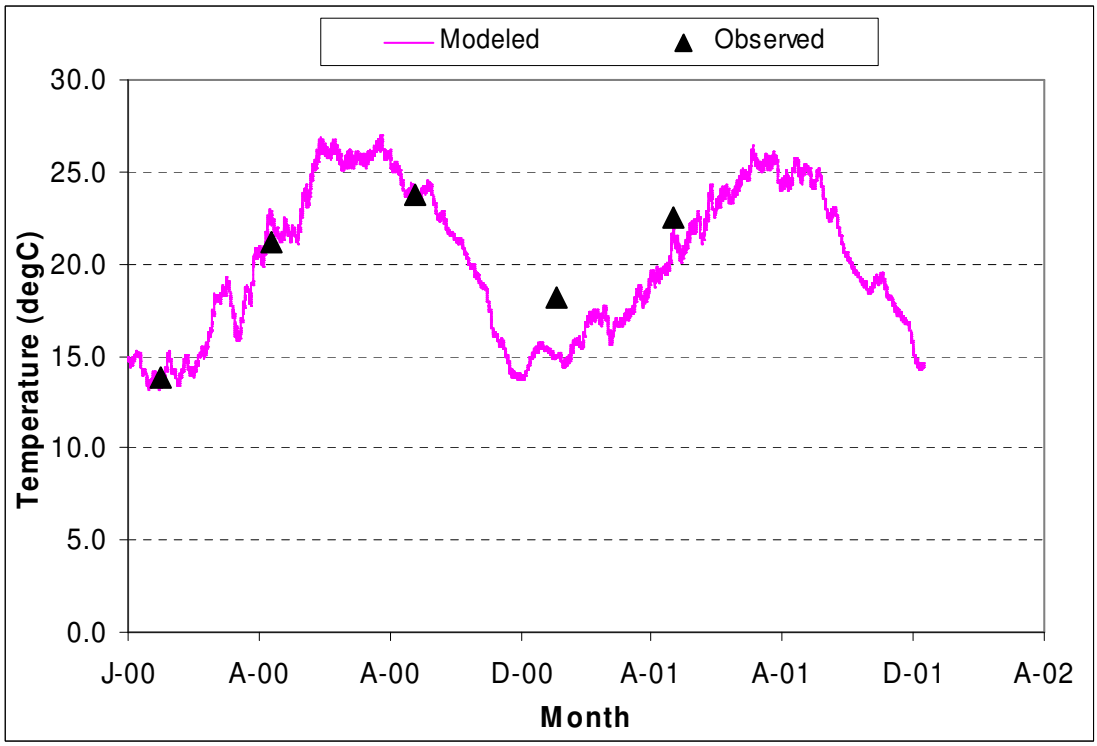

Figure I-28. Comparison of Model Predicted Temperature Results with Observed SPAWAR Results at Station #24

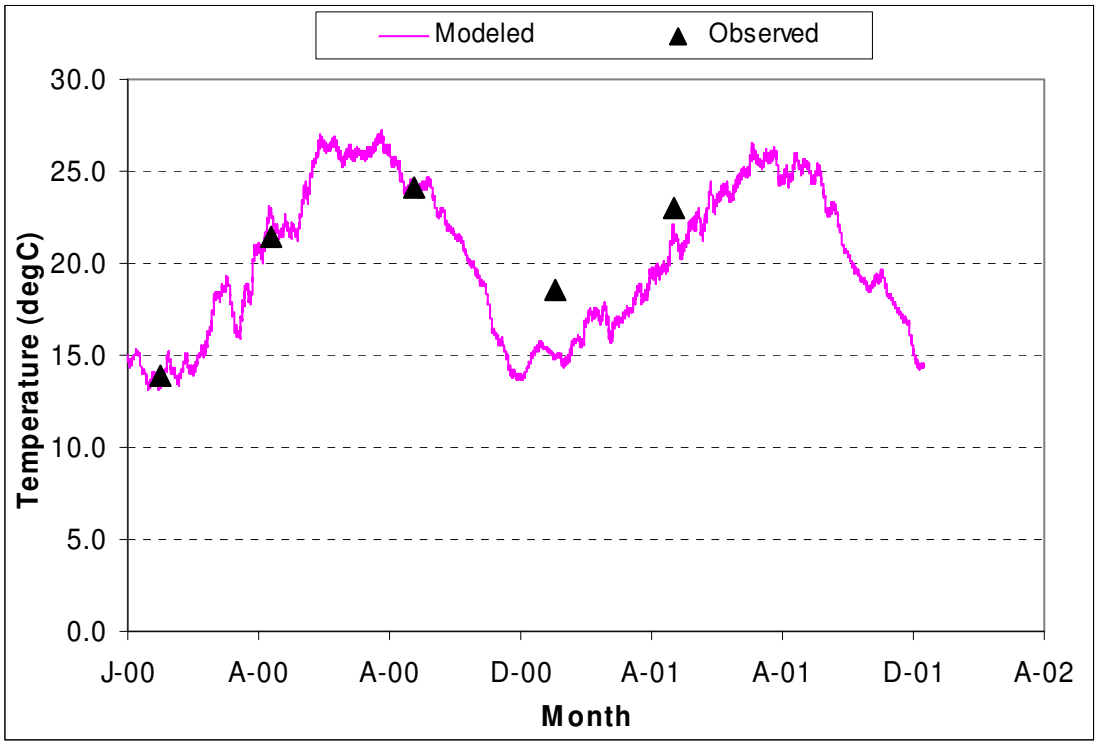

Figure I-29. Comparison of Model Predicted Temperature Results with Observed SPAWAR Results at Station #25

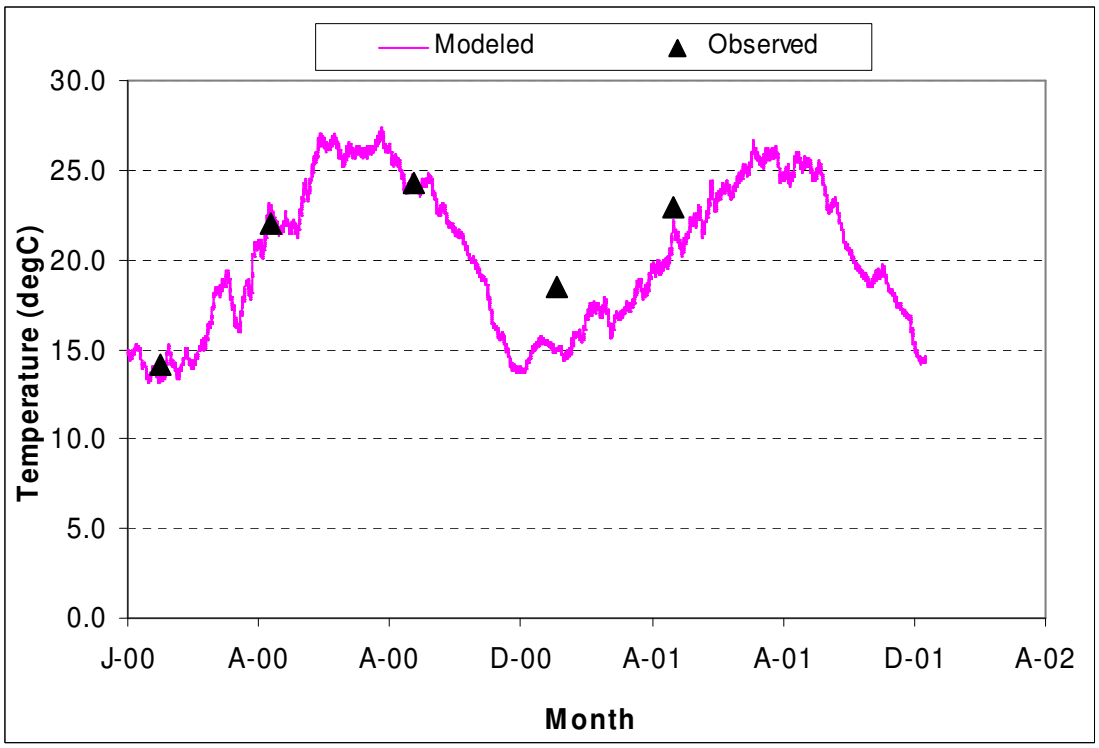

Figure I-30. Comparison of Model Predicted Temperature Results with Observed SPAWAR Results at Station #26

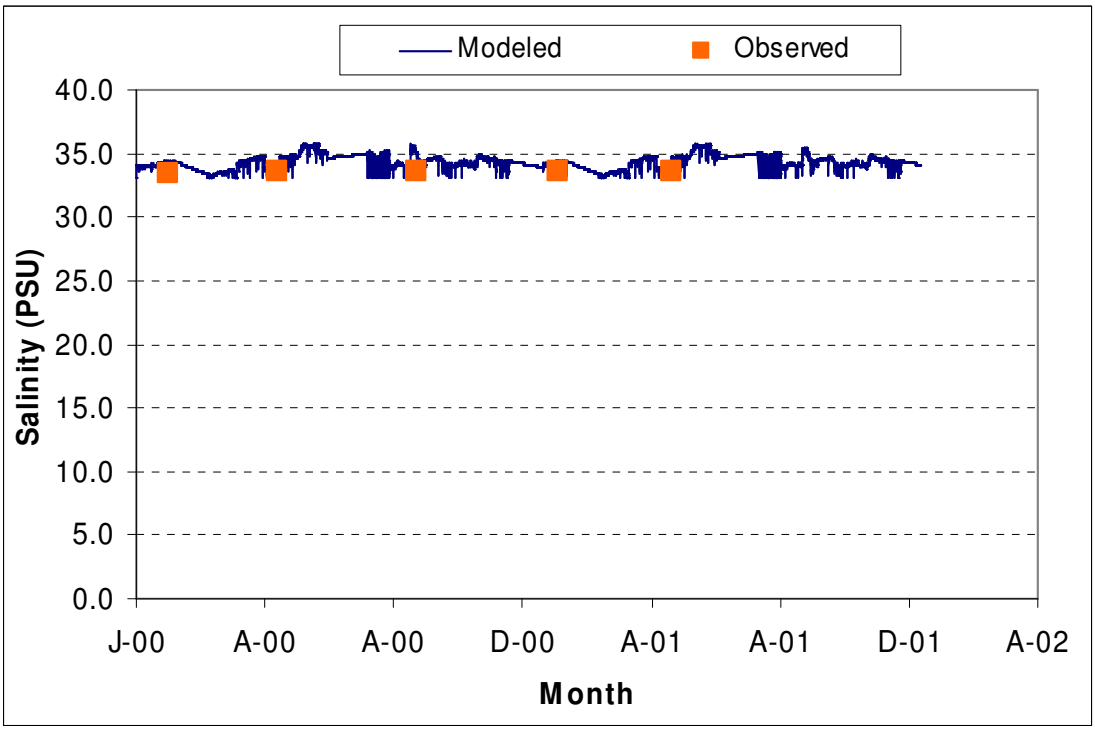

Figure I-31. Comparison of Model Predicted Salinity Results with Observed SPAWAR Results at Station #1

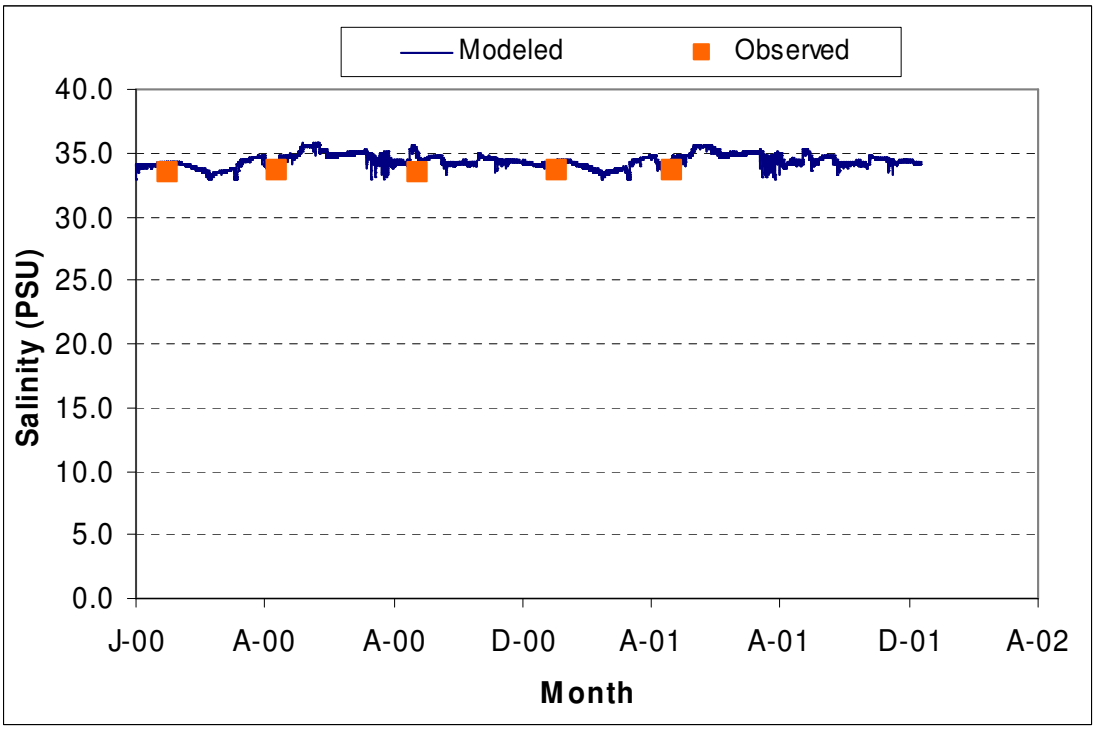

Figure I-32. Comparison of Model Predicted Salinity Results with Observed SPAWAR Results at Station #2

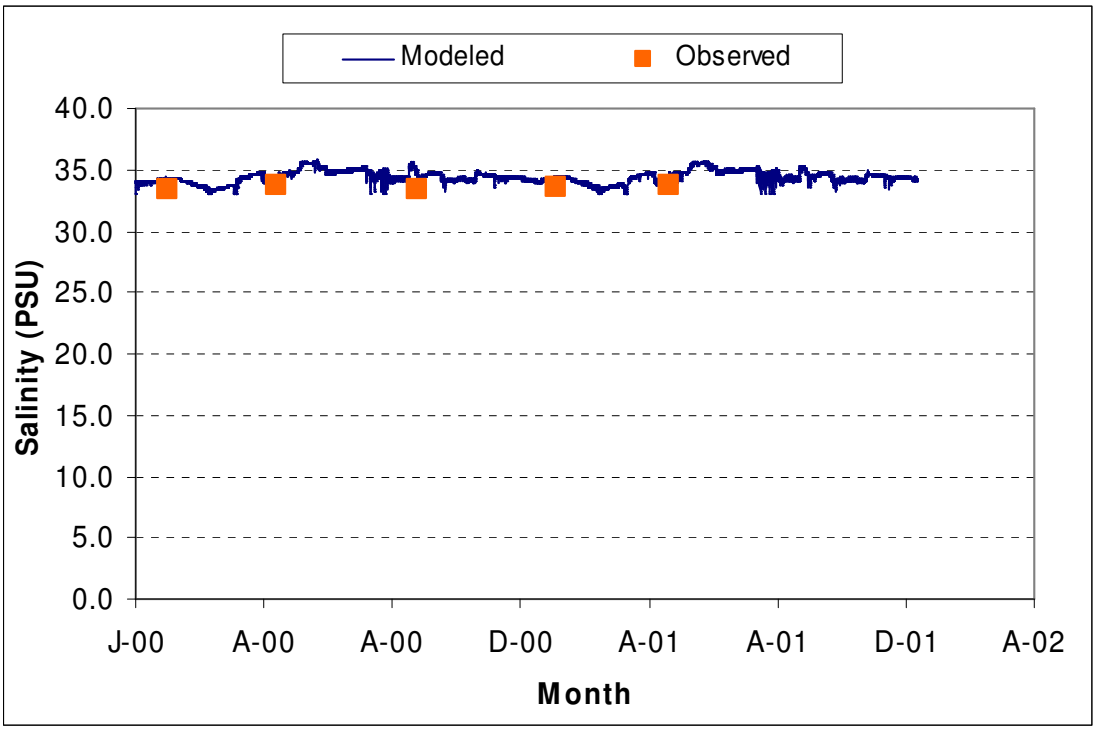

Figure I-33. Comparison of Model Predicted Salinity Results with Observed SPAWAR Results at Station #3

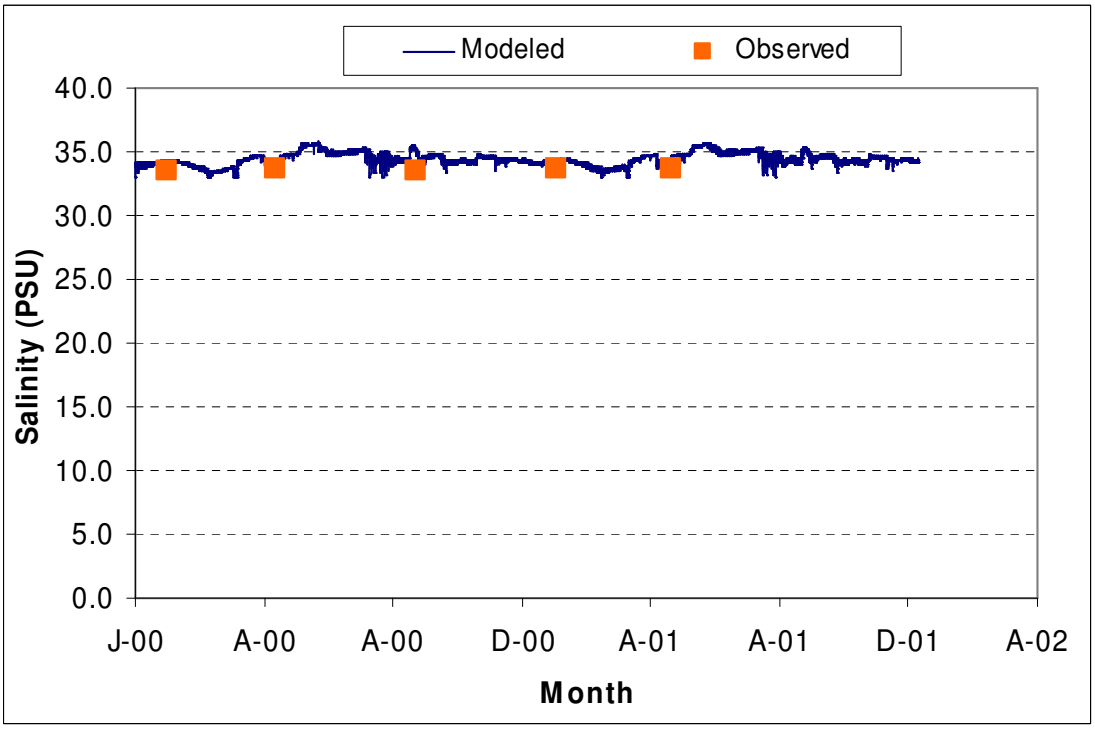

Figure I-34. Comparison of Model Predicted Salinity Results with Observed SPAWAR Results at Station #4

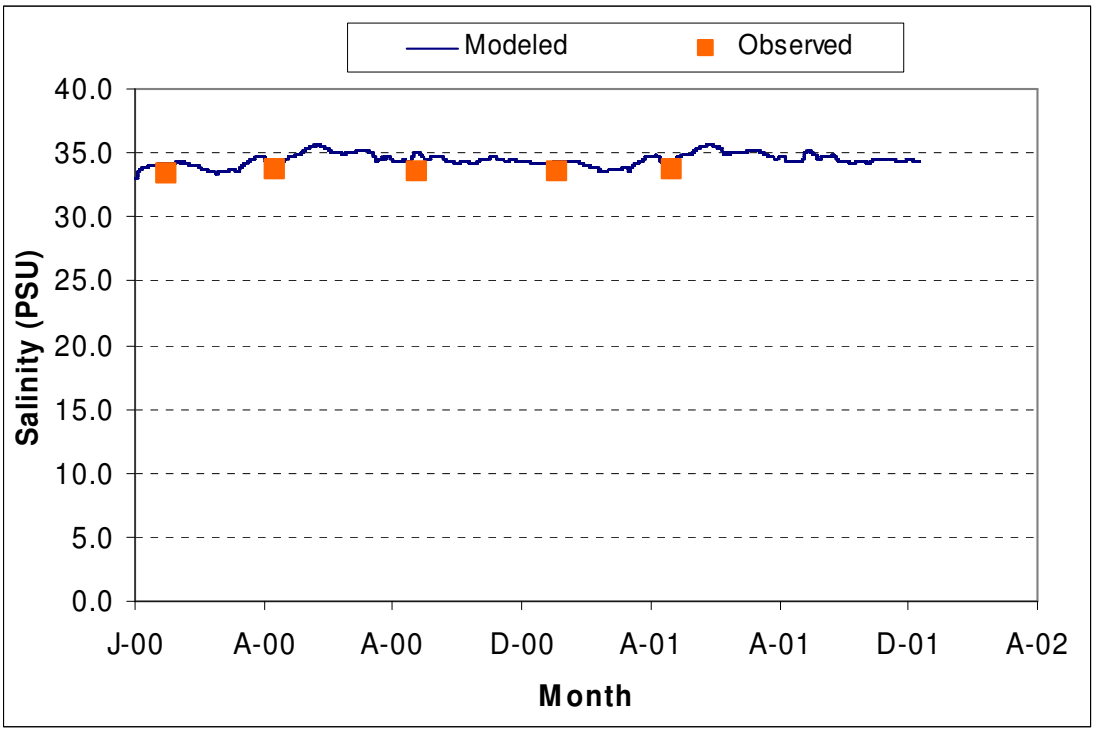

Figure I-35. Comparison of Model Predicted Salinity Results with Observed SPAWAR Results at Station #5

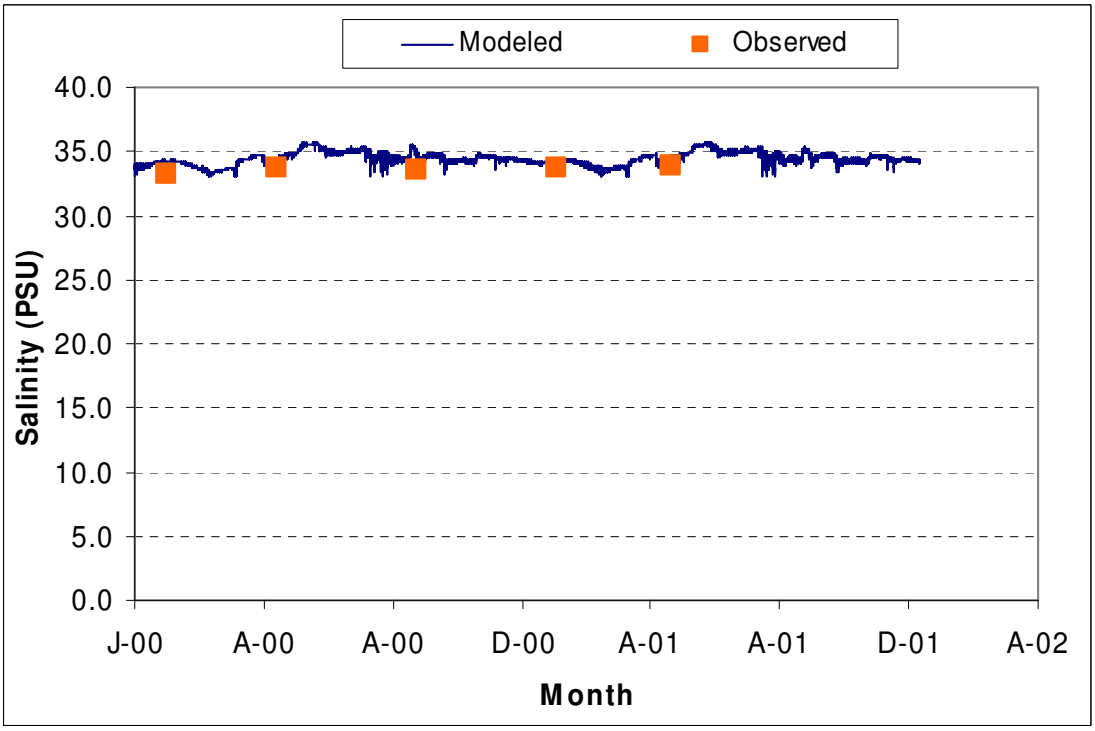

Figure I-36. Comparison of Model Predicted Salinity Results with Observed SPAWAR Results at Station #6

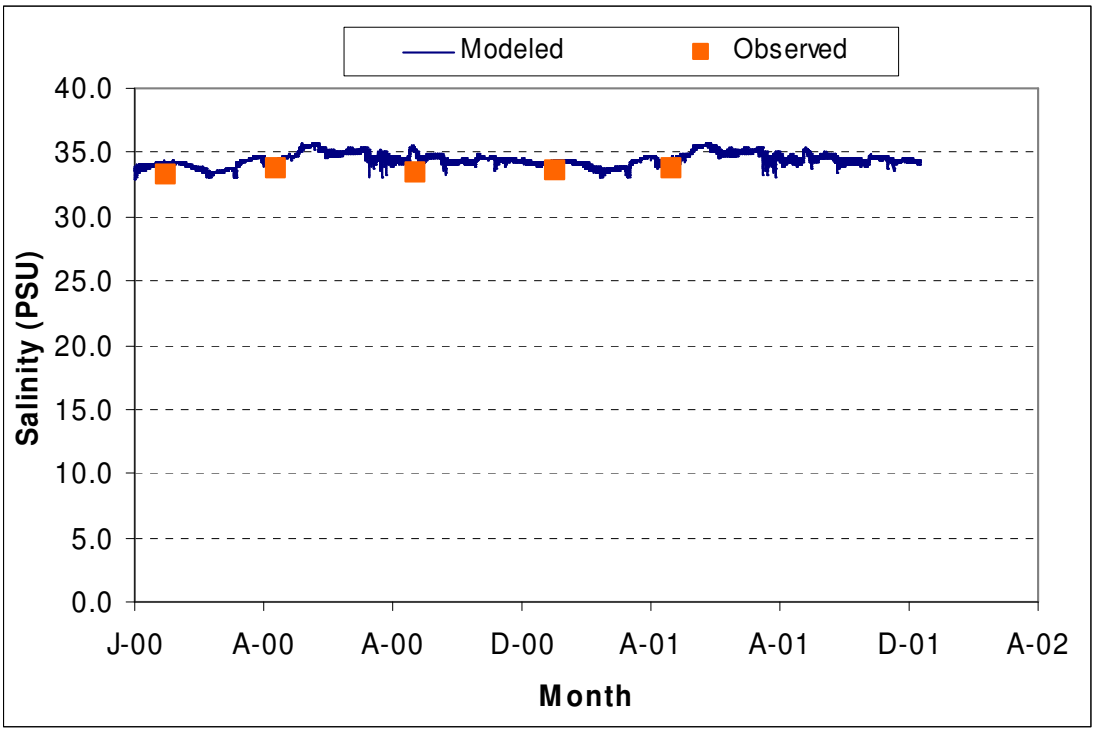

Figure I-37. Comparison of Model Predicted Salinity Results with Observed SPAWAR Results at Station #7

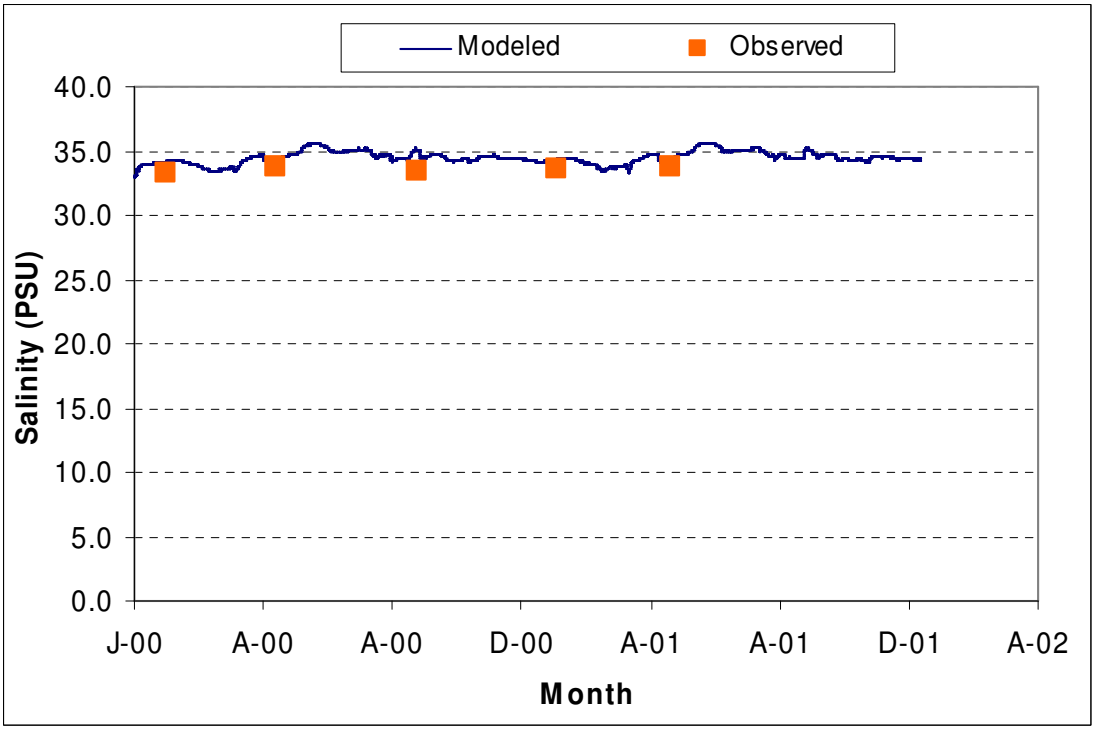

Figure I-38. Comparison of Model Predicted Salinity Results with Observed SPAWAR Results at Station #8

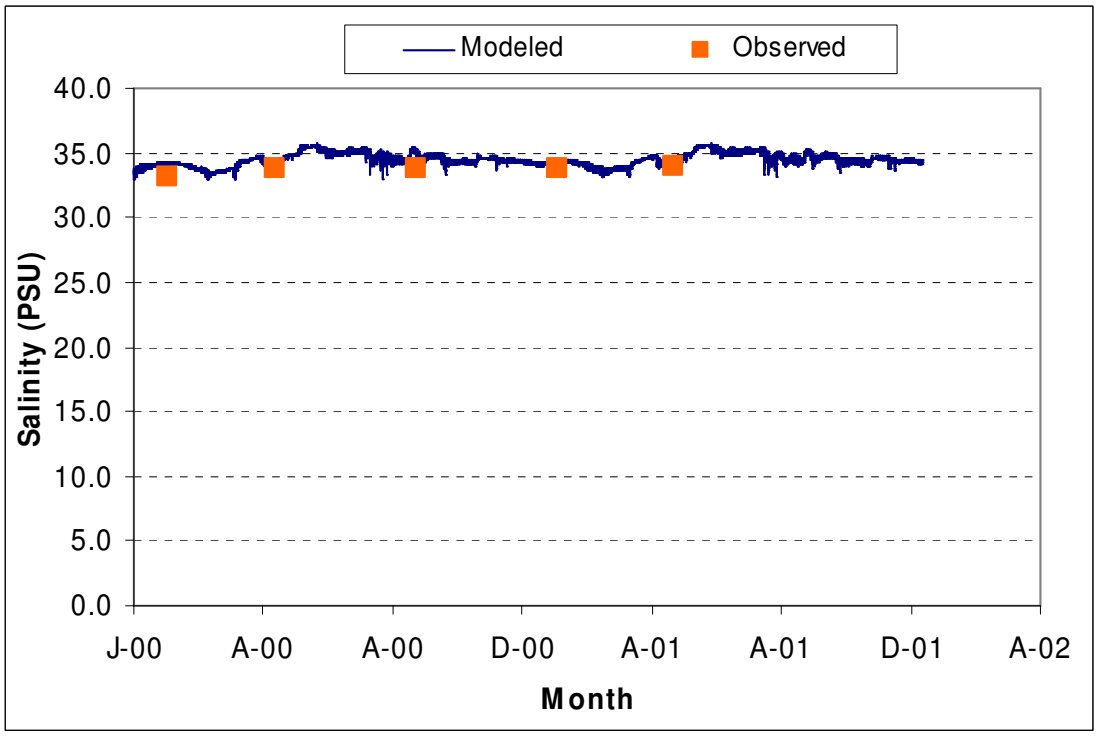

Figure I-39. Comparison of Model Predicted Salinity Results with Observed SPAWAR Results at Station #9

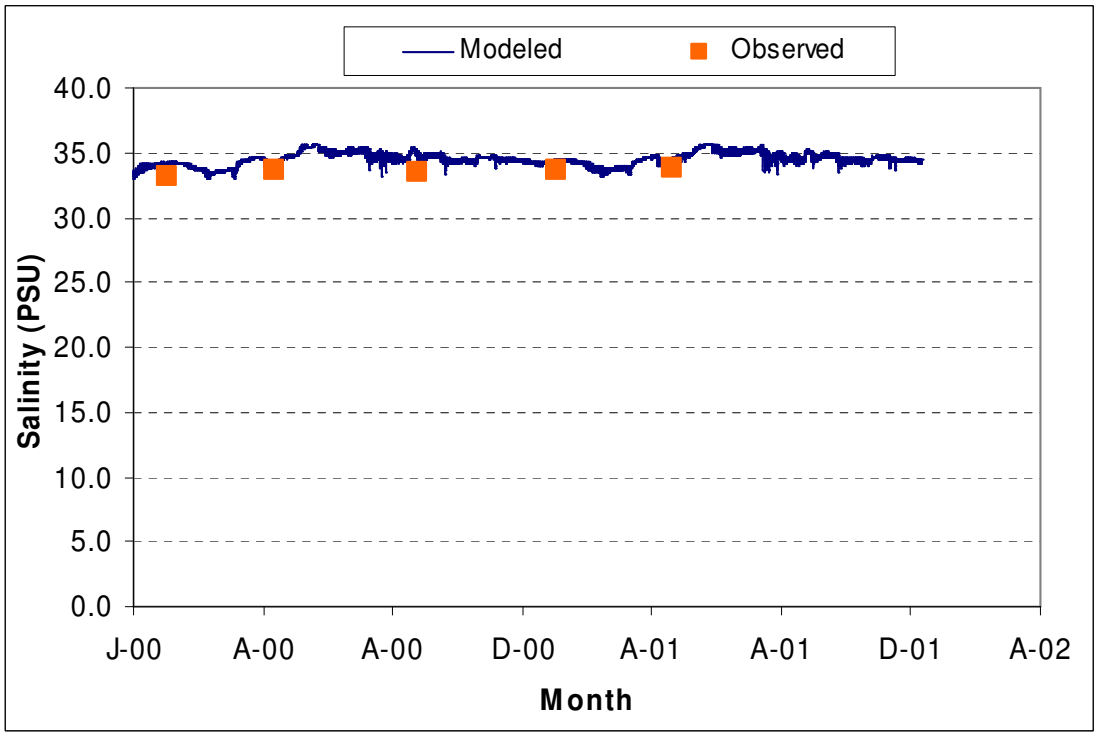

Figure I-40. Comparison of Model Predicted Salinity Results with Observed SPAWAR Results at Station #10

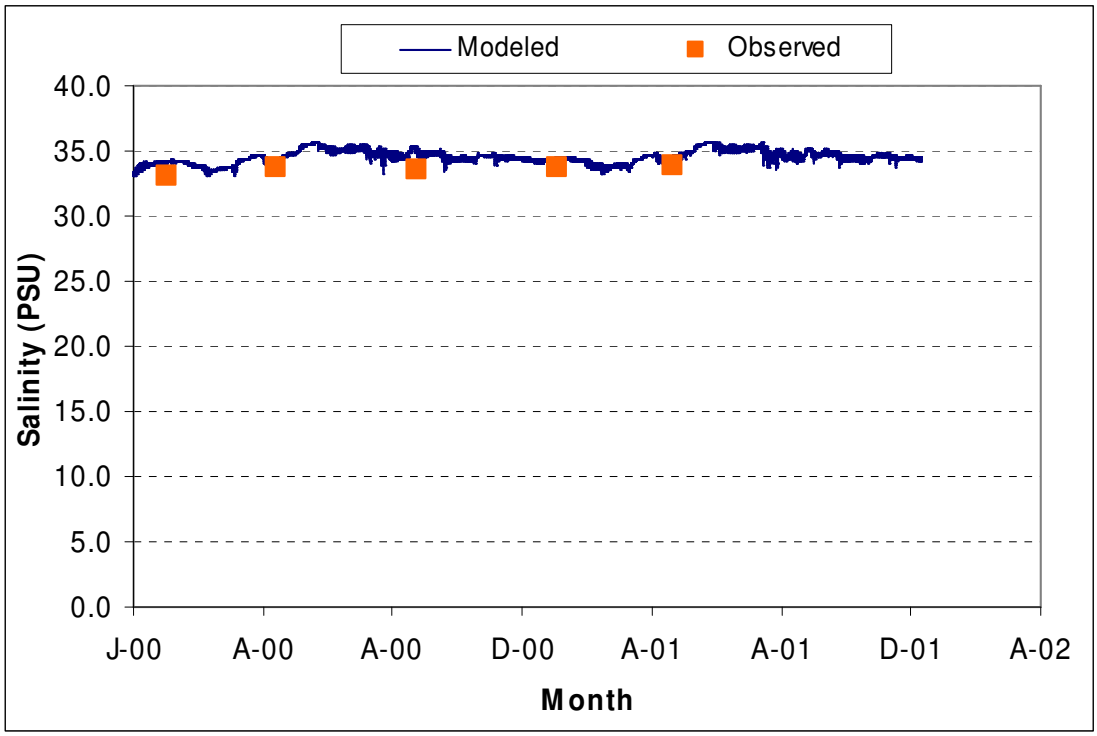

Figure I-41. Comparison of Model Predicted Salinity Results with Observed SPAWAR Results at Station #11

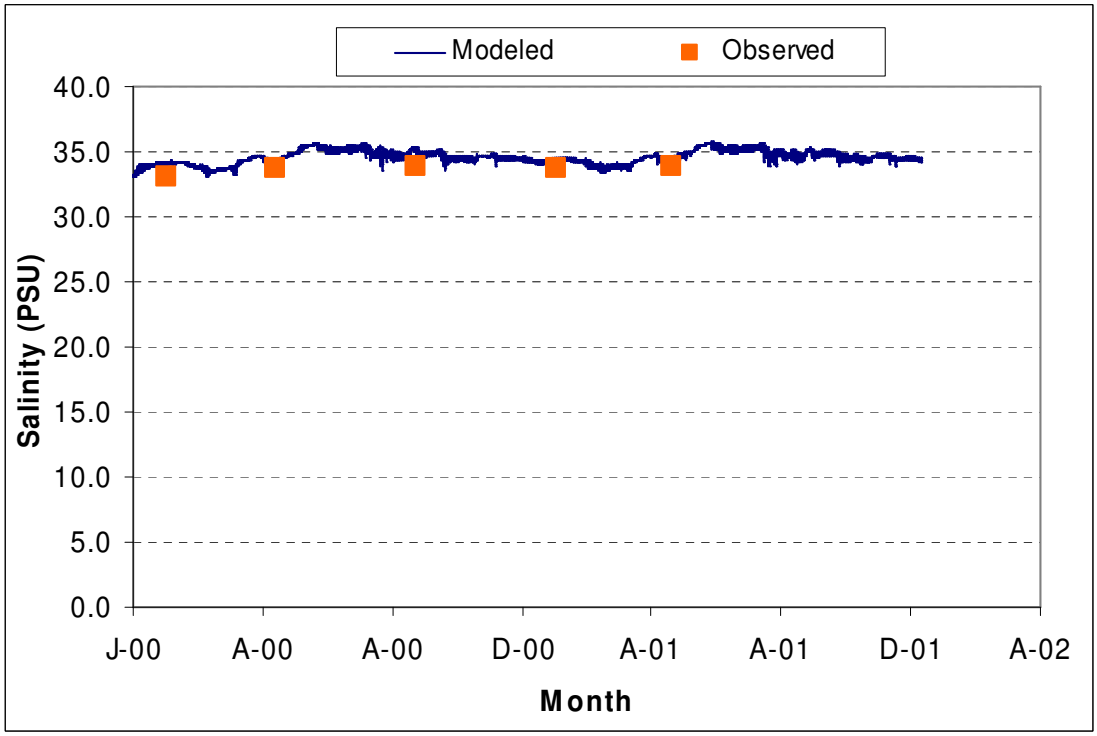

Figure I-42. Comparison of Model Predicted Salinity Results with Observed SPAWAR Results at Station #12

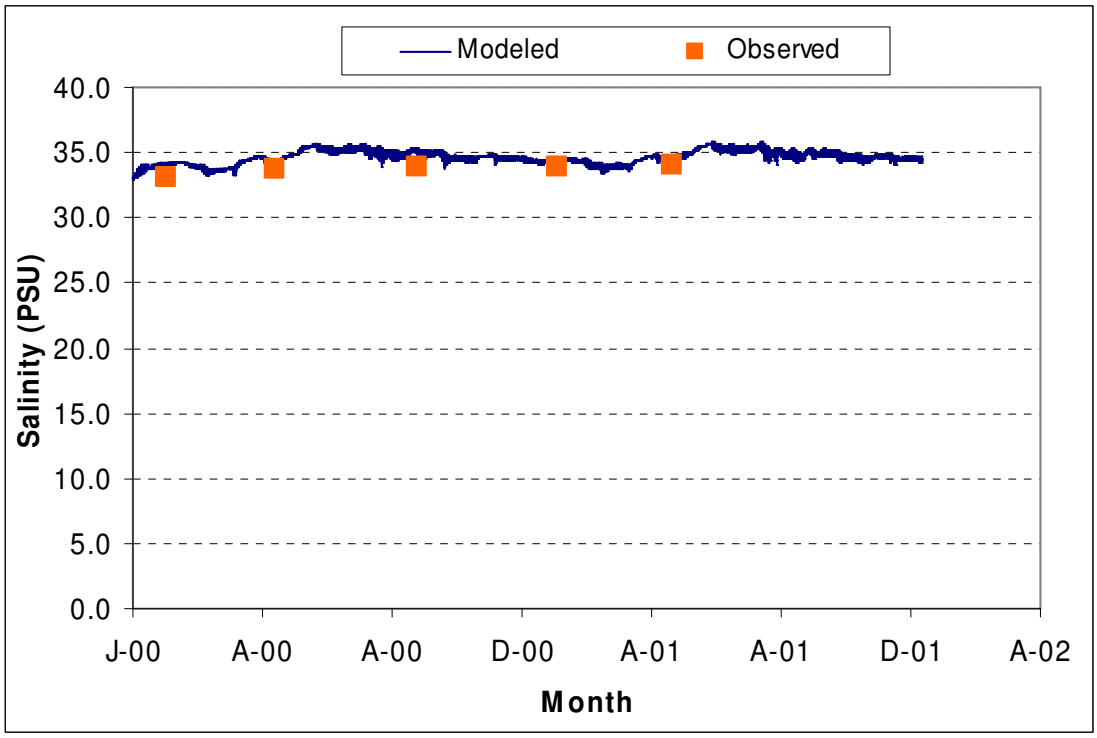

Figure I-43. Comparison of Model Predicted Salinity Results with Observed SPAWAR Results at Station #13

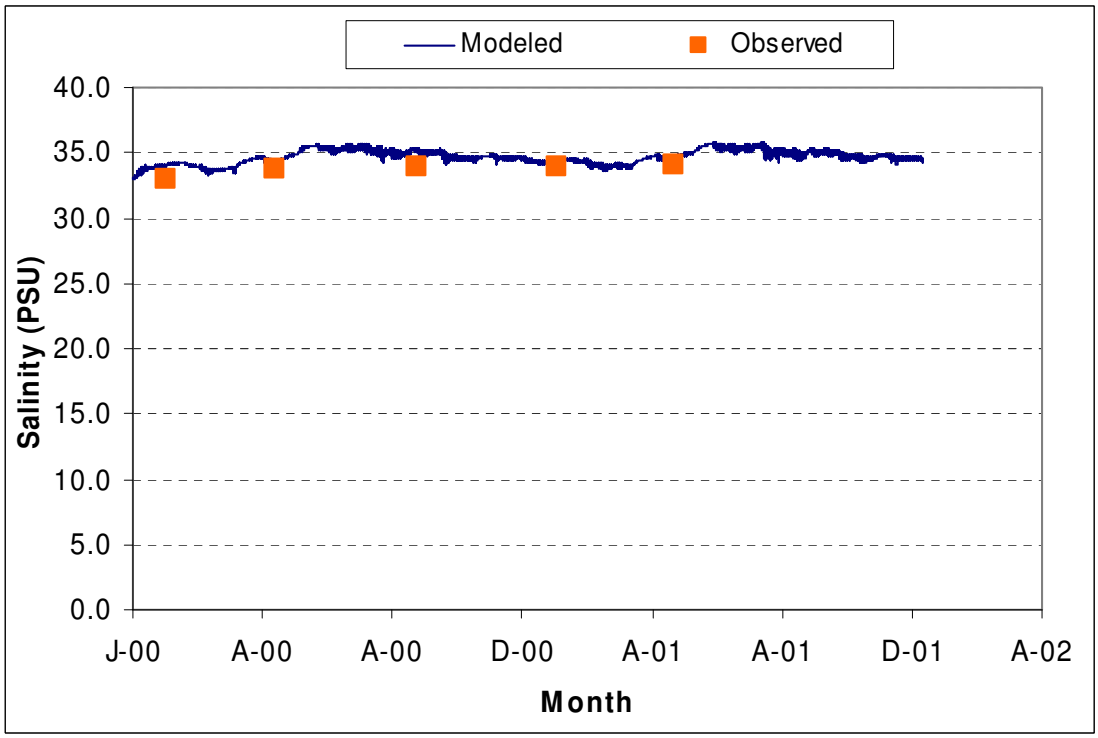

Figure I-44. Comparison of Model Predicted Salinity Results with Observed SPAWAR Results at Station #14

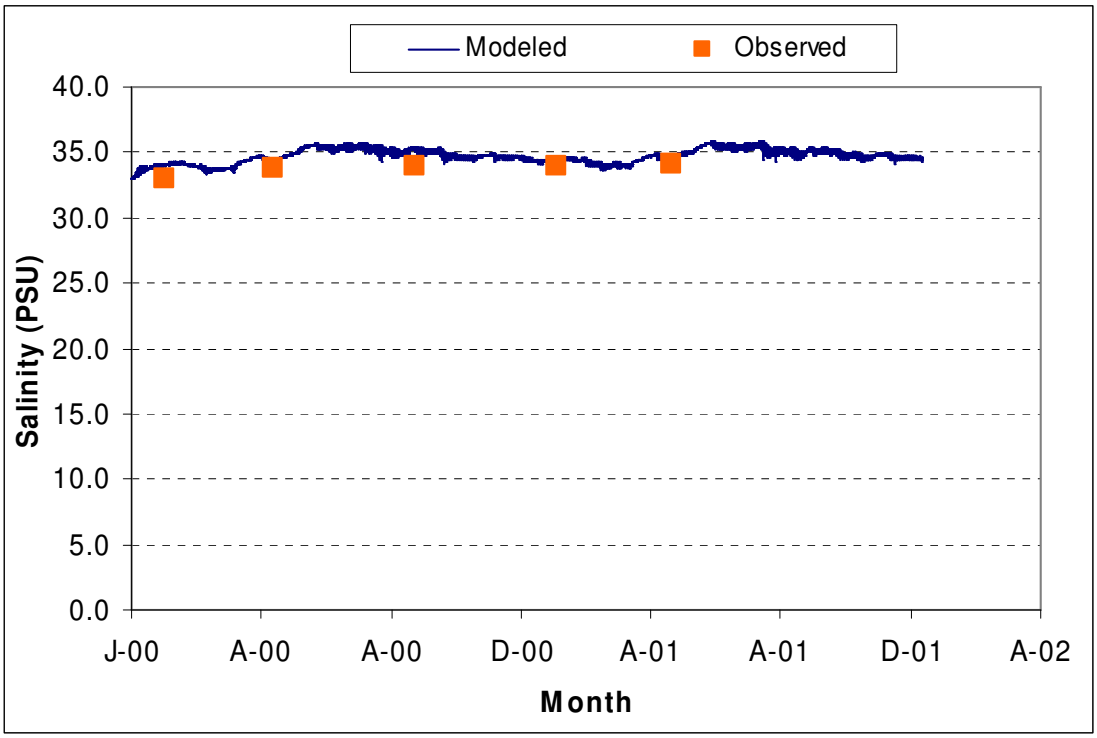

Figure I-45. Comparison of Model Predicted Salinity Results with Observed SPAWAR Results at Station #15

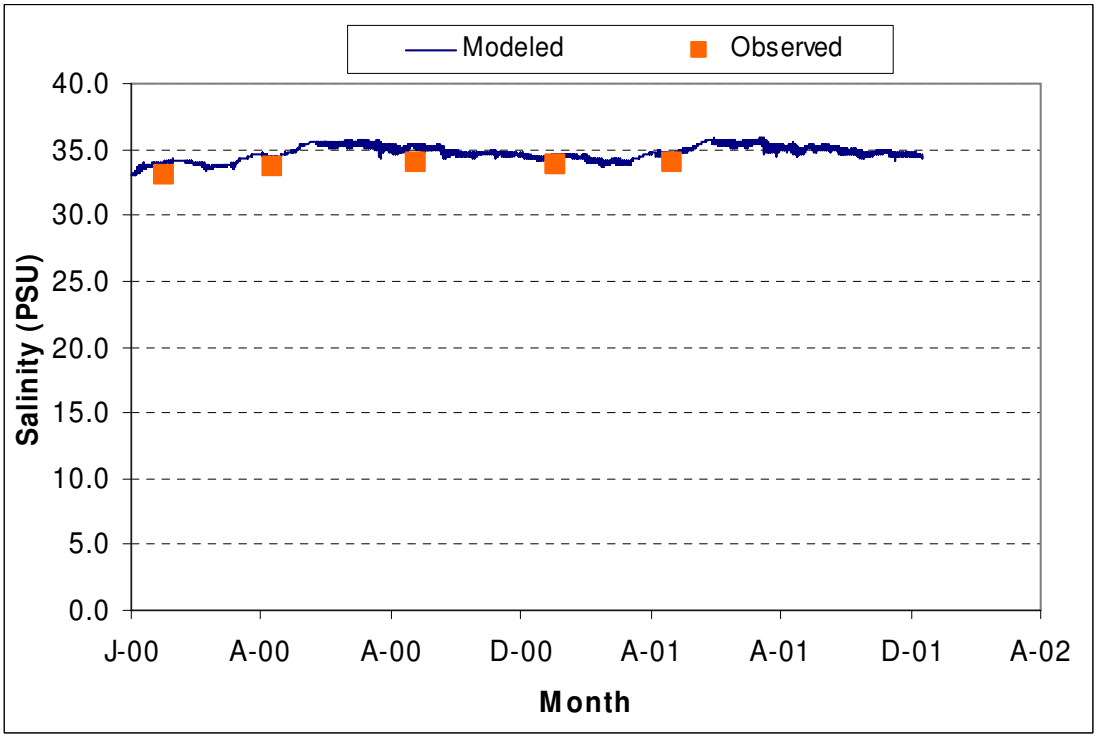

Figure I-46. Comparison of Model Predicted Salinity Results with Observed SPAWAR Results at Station #16

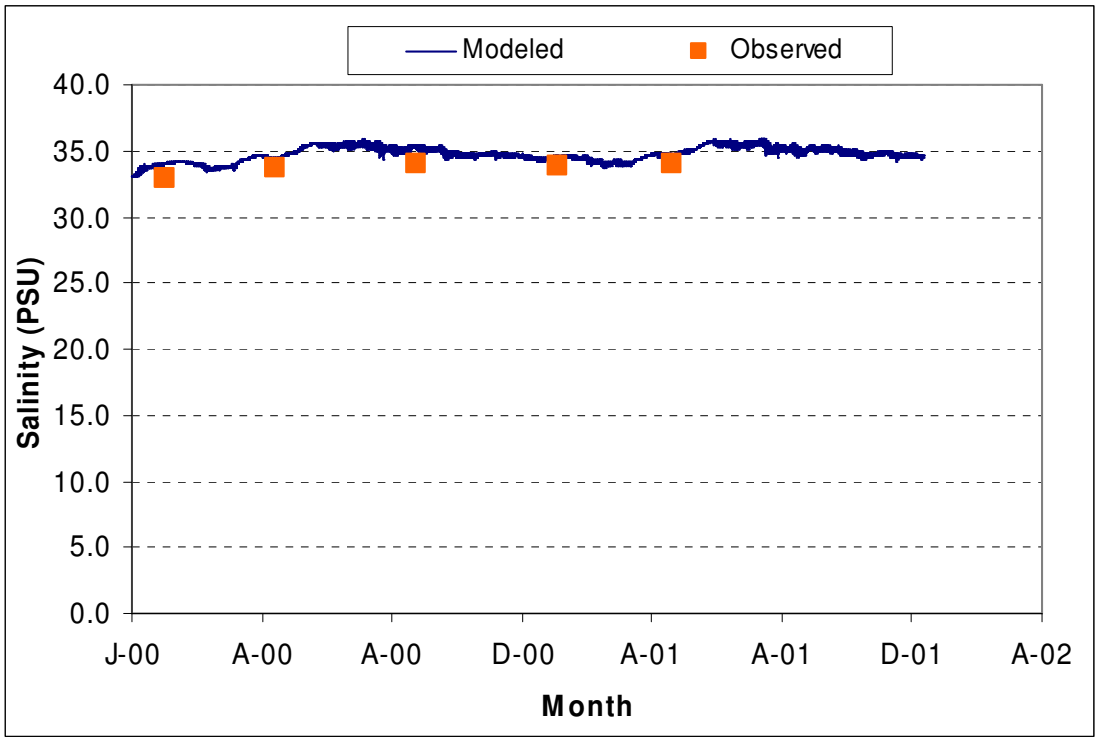

Figure I-47. Comparison of Model Predicted Salinity Results with Observed SPAWAR Results at Station #17

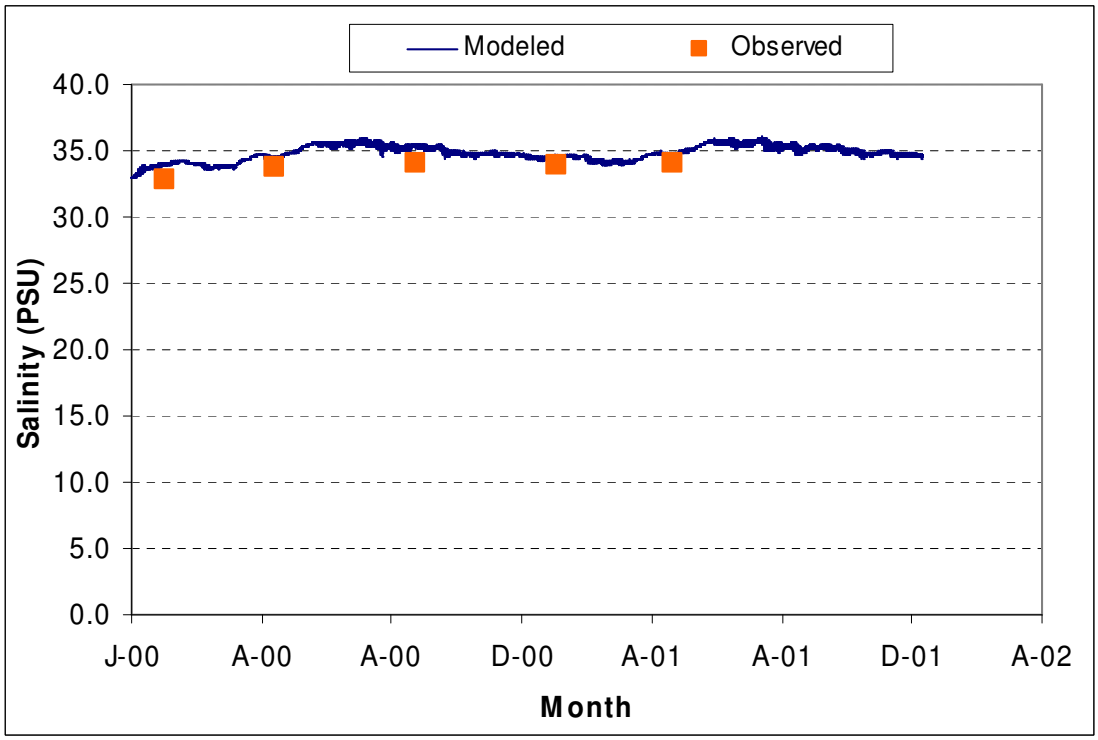

Figure I-48. Comparison of Model Predicted Salinity Results with Observed SPAWAR Results at Station #18

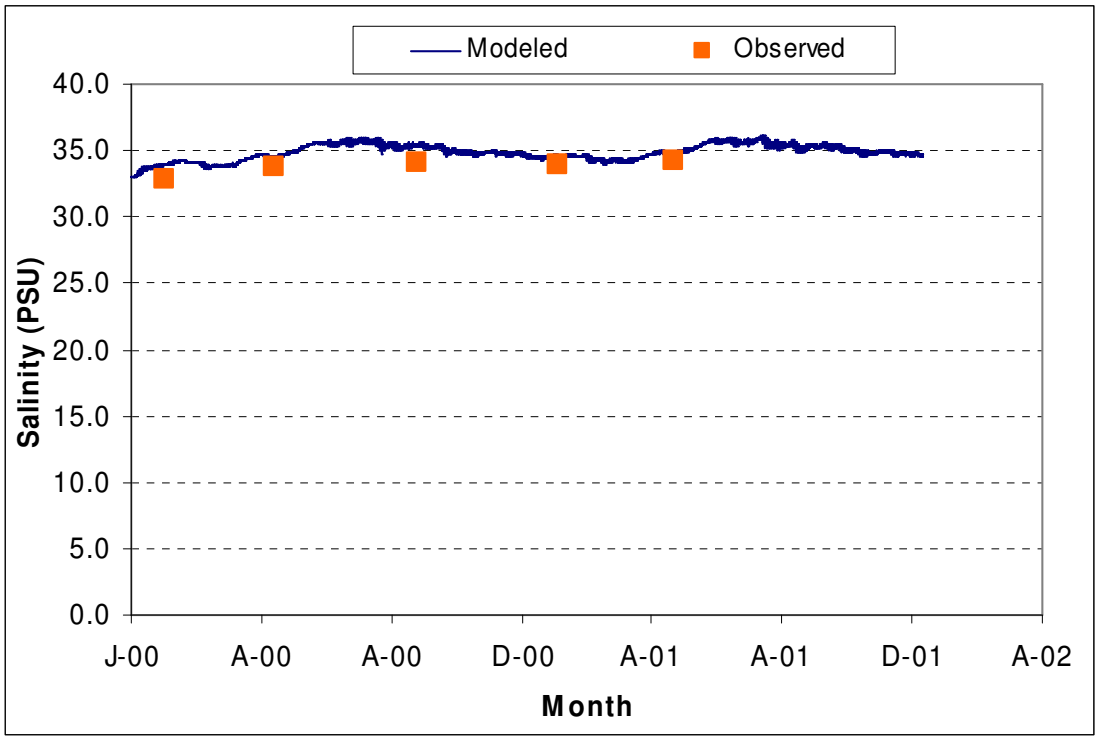

Figure I-49. Comparison of Model Predicted Salinity Results with Observed SPAWAR Results at Station #19

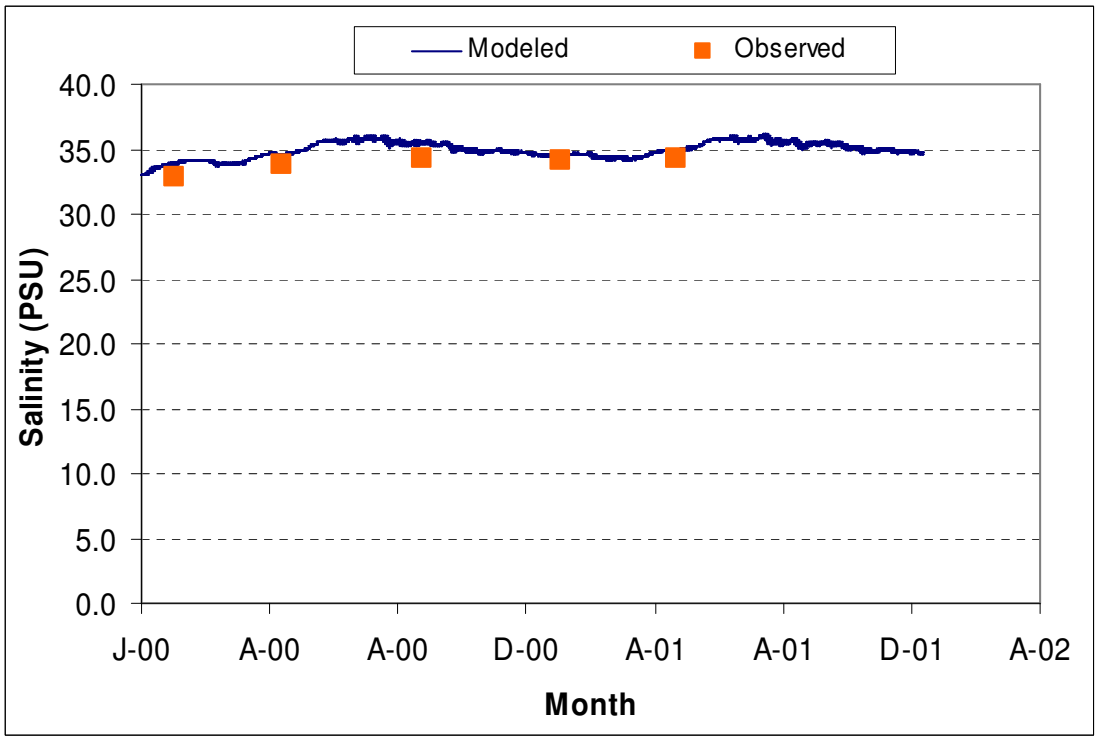

Figure I-50. Comparison of Model Predicted Salinity Results with Observed SPAWAR Results at Station #20

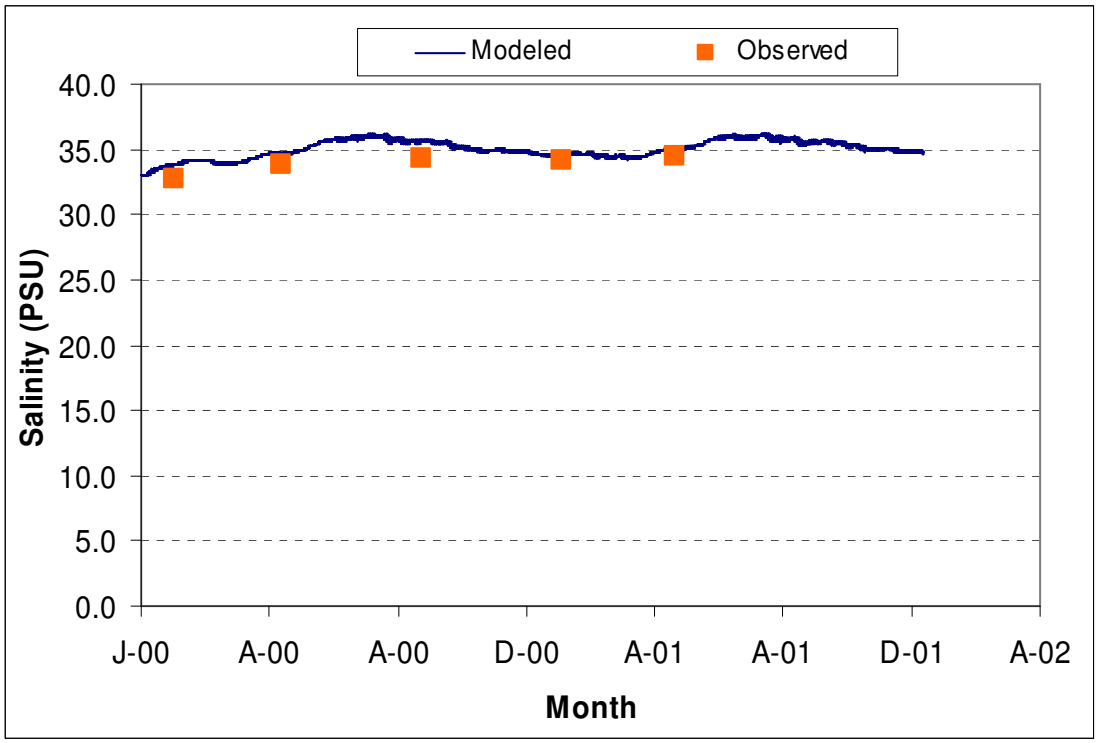

Figure I-51. Comparison of Model Predicted Salinity Results with Observed SPAWAR Results at Station #21

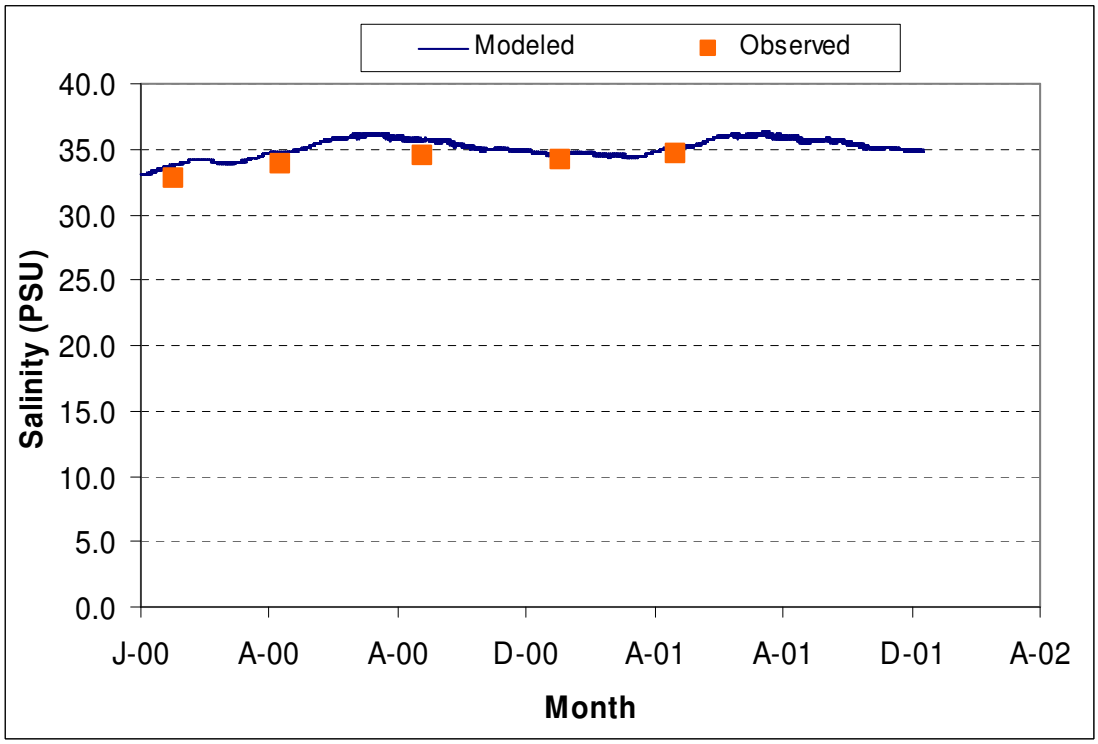

Figure I-52. Comparison of Model Predicted Salinity Results with Observed SPAWAR Results at Station #22

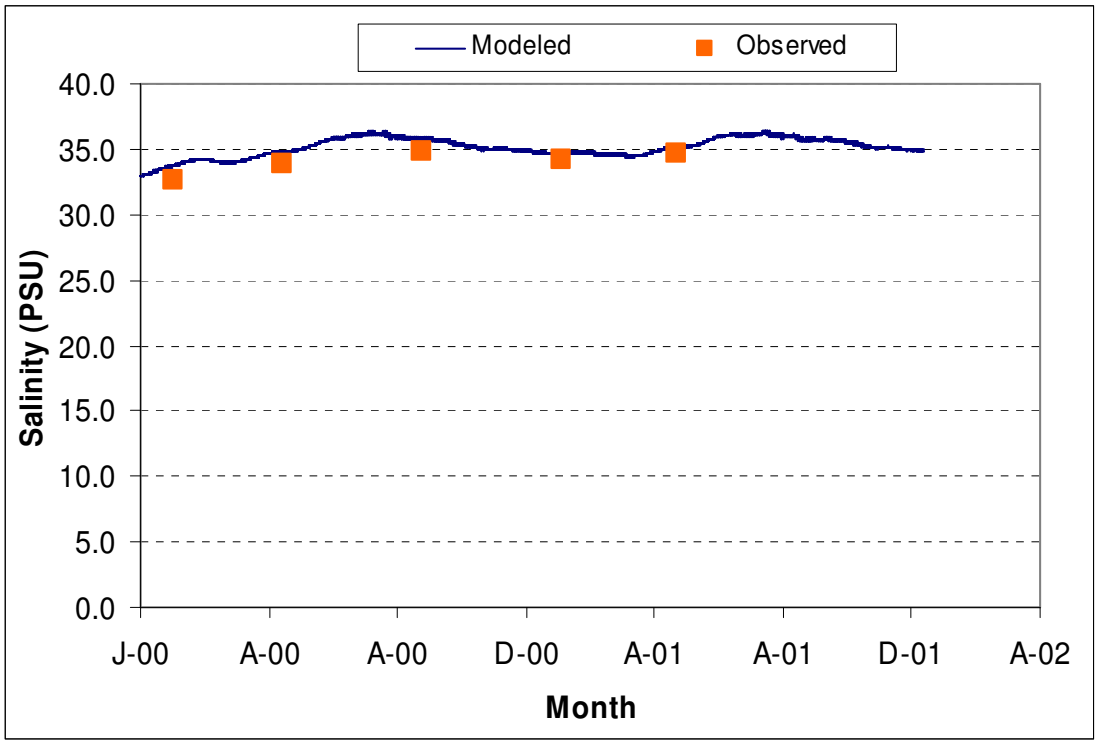

Figure I-53. Comparison of Model Predicted Salinity Results with Observed SPAWAR Results at Station #23

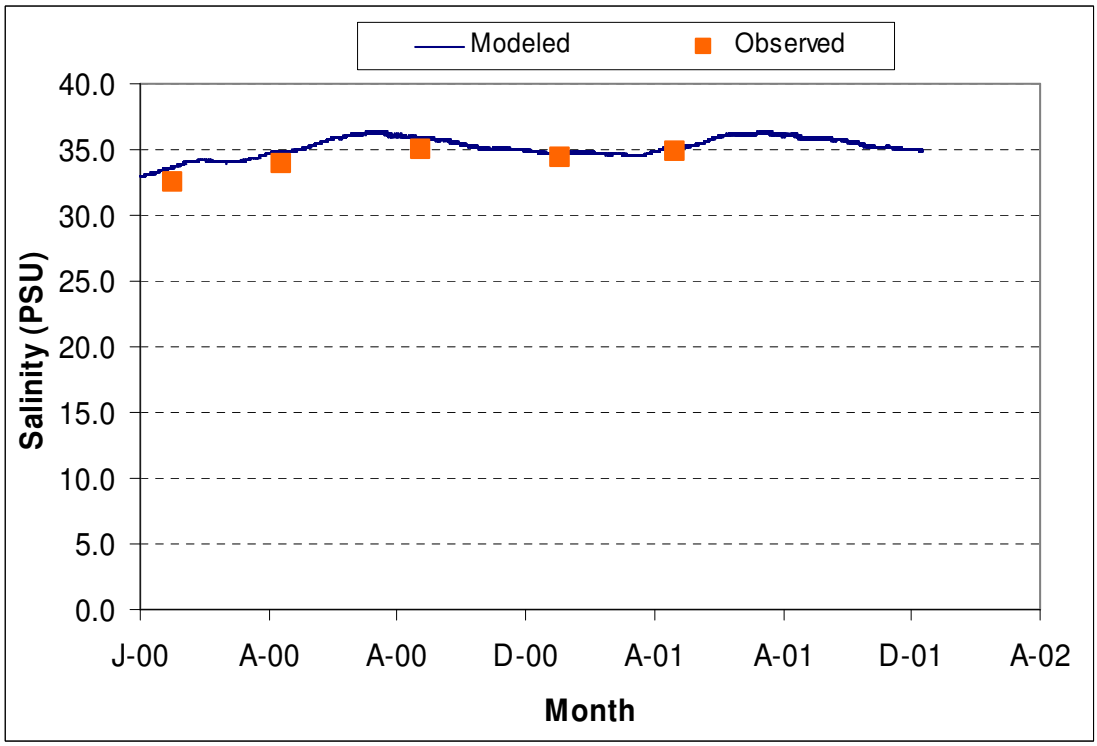

Figure I-54. Comparison of Model Predicted Salinity Results with Observed SPAWAR Results at Station #24

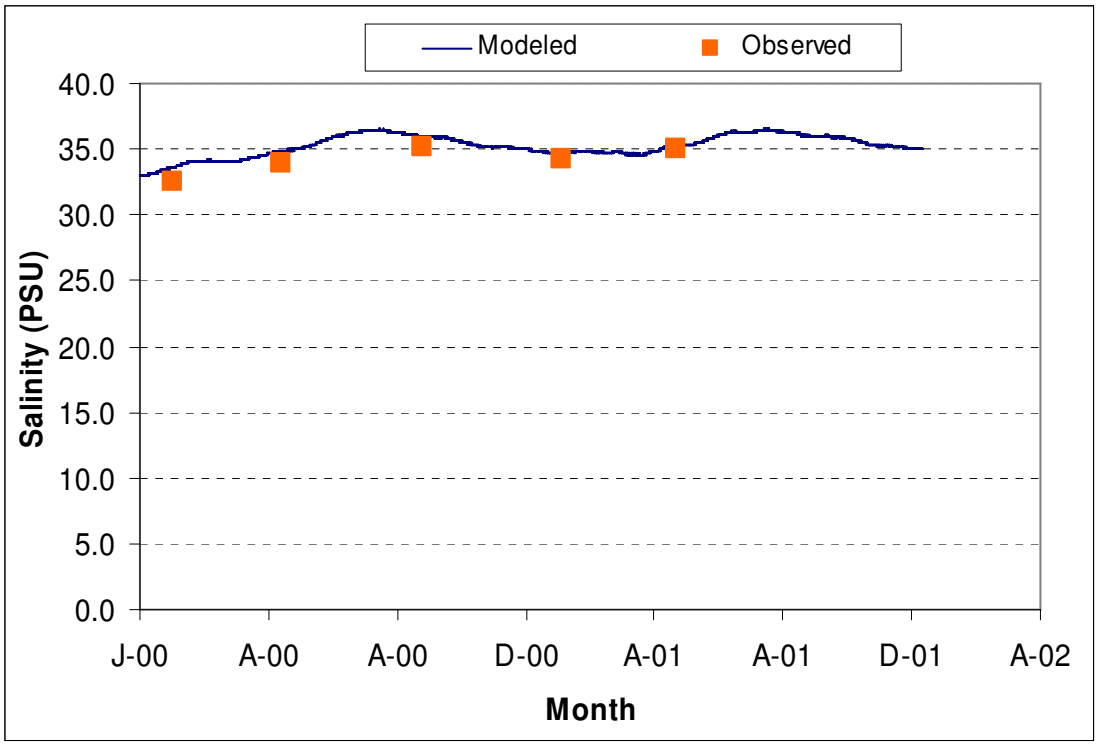

Figure I-55. Comparison of Model Predicted Salinity Results with Observed SPAWAR Results at Station #25

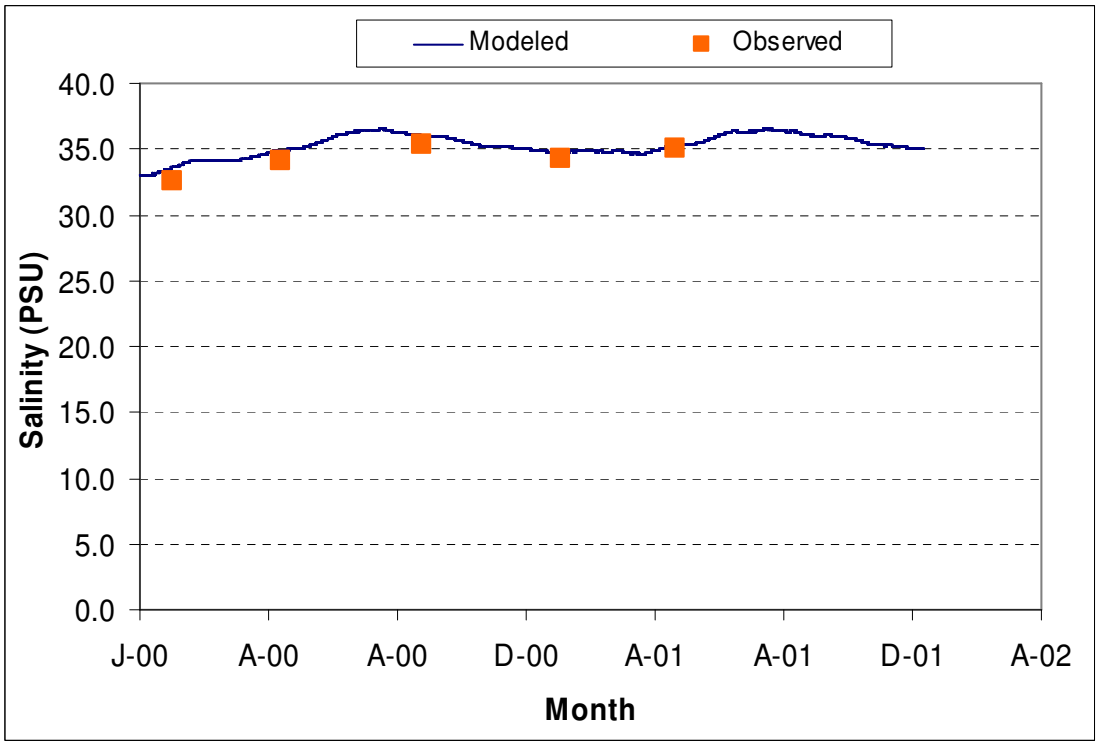

Figure I-56. Comparison of Model Predicted Salinity Results with Observed SPAWAR Results at Station #26

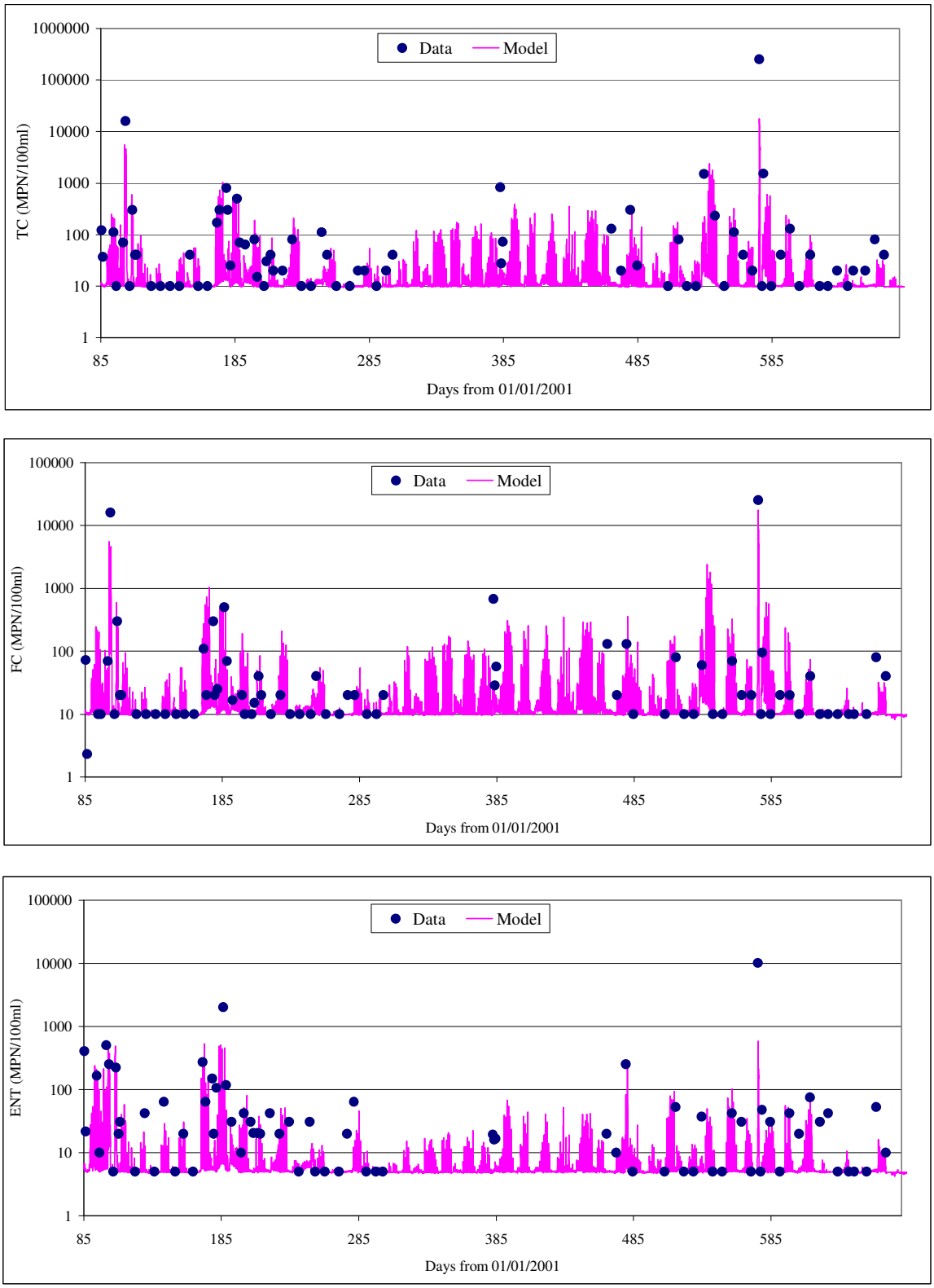

Figure I-57. Comparison of Model Predicted Fecal Coliform, Total Coliform, and Enterococcus Concentrations with

Observed Data for Shelter Island Shoreline Park

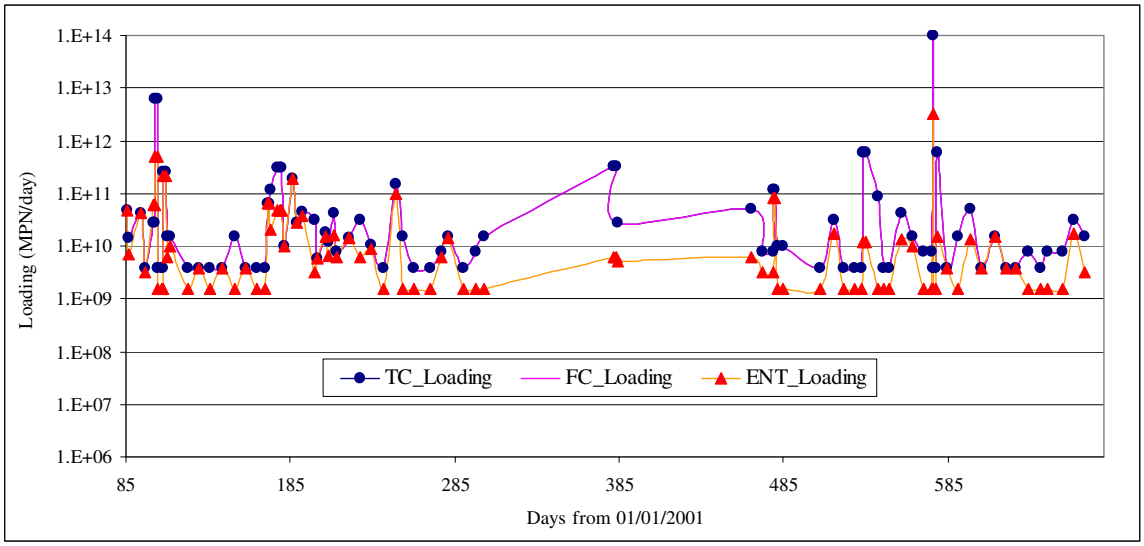

Figure I-58. Inversely Derived Lumped Source Loading for the Simulation Period for Shelter Island Shoreline Park

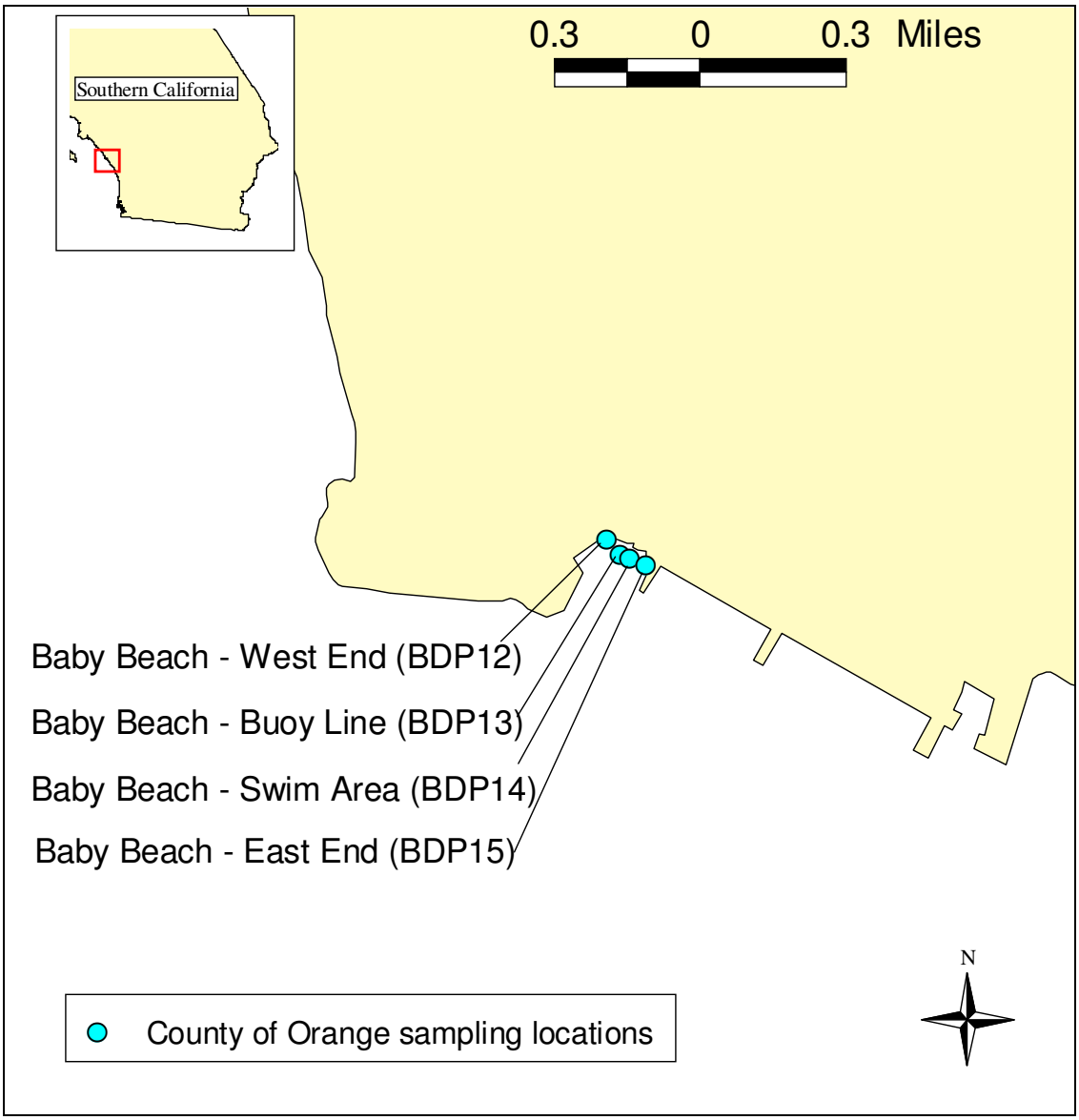

Figure I-59. Sampling Stations Near Baby Beach at Dana Point Harbor

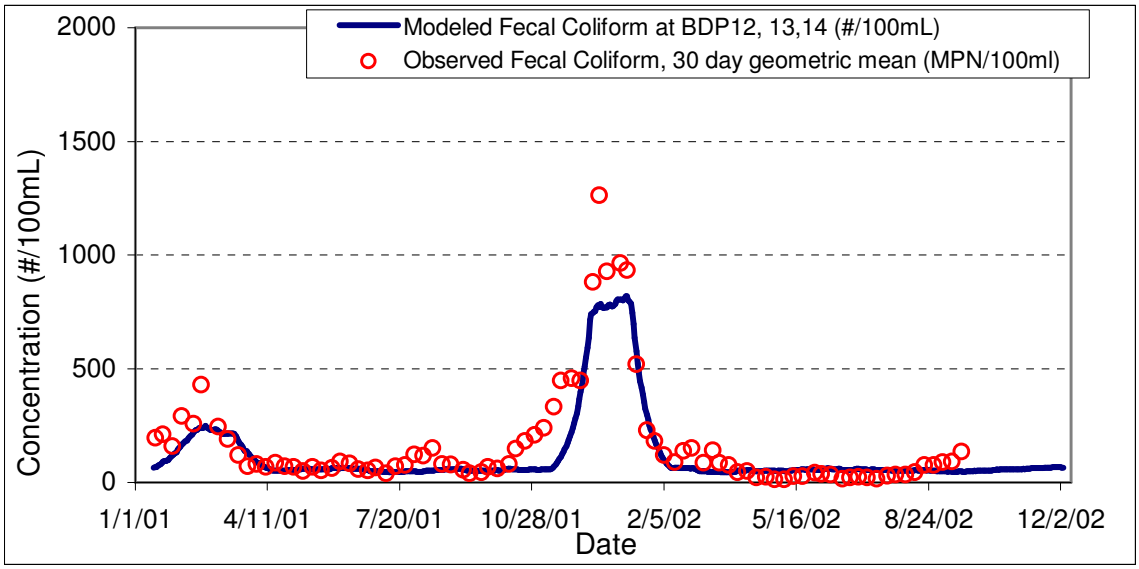

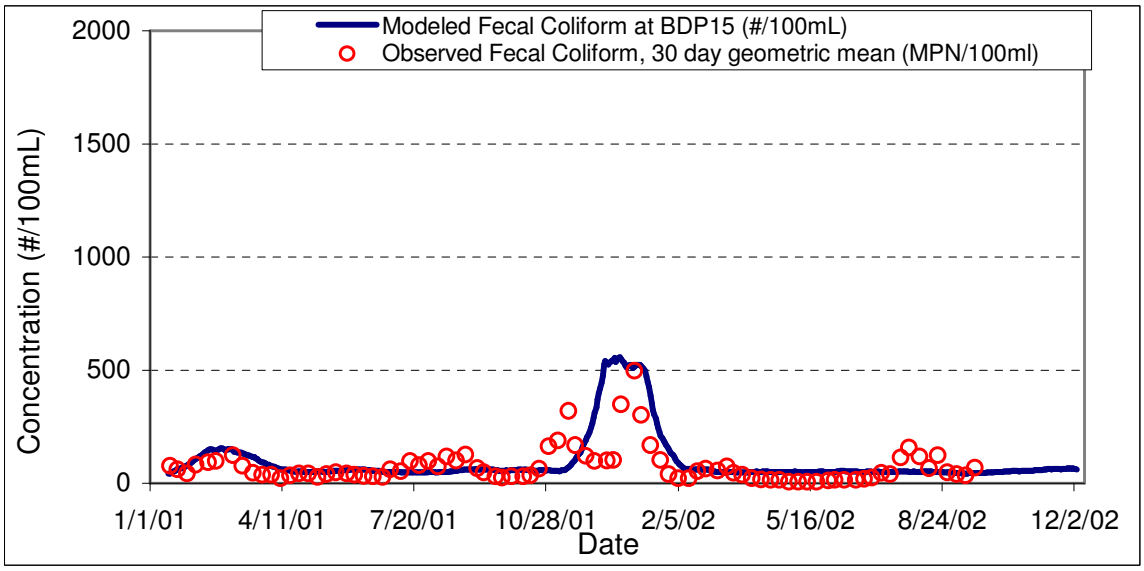

Figure I-60. Simulated Fecal Coliform Concentrations and the Observed 30-day Geometric Mean in Dana Point Harbor

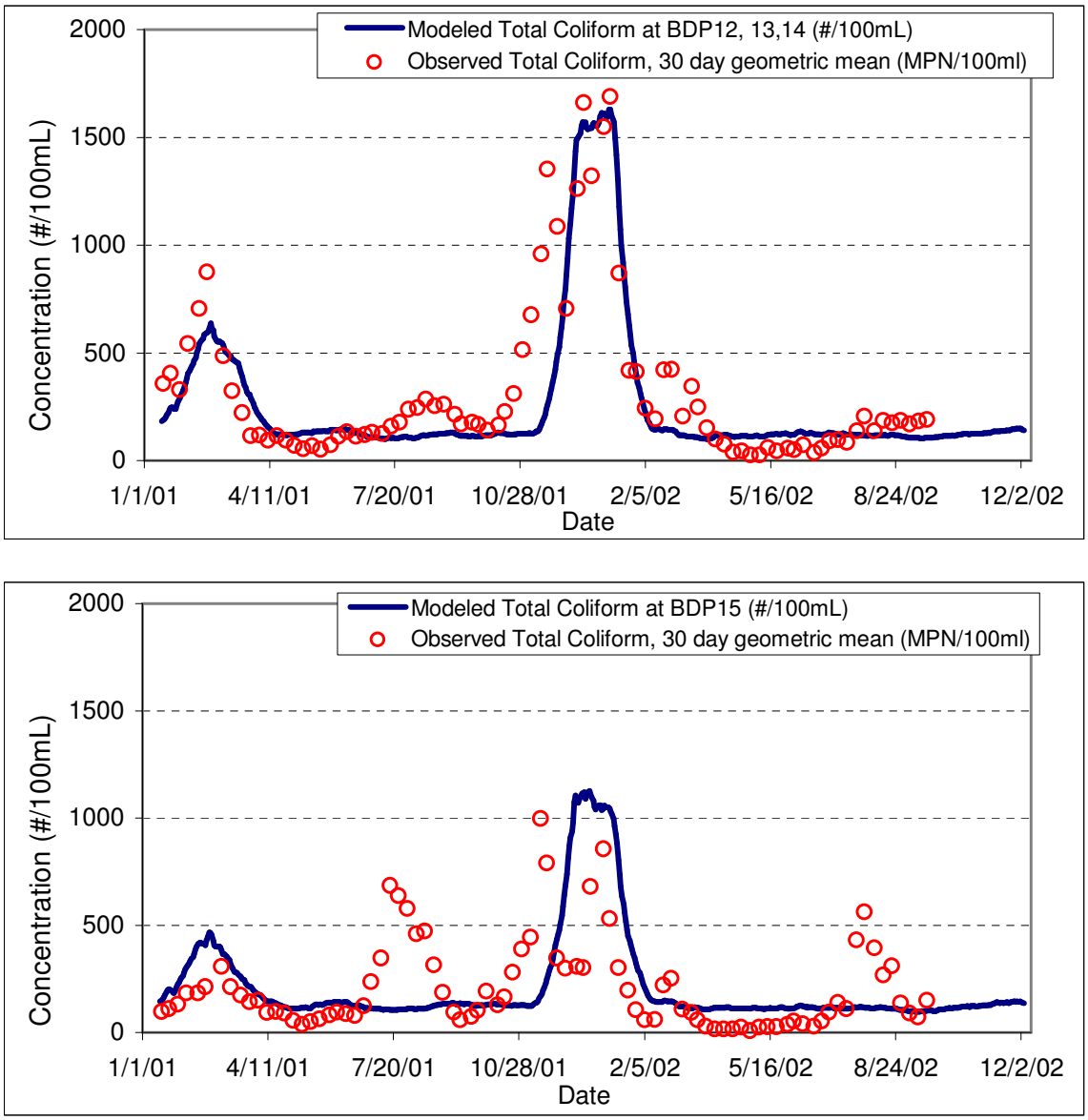

Figure I-61. Simulated Total Coliform Concentrations and the Observed 30-day Geometric Mean in Dana Point Harbor

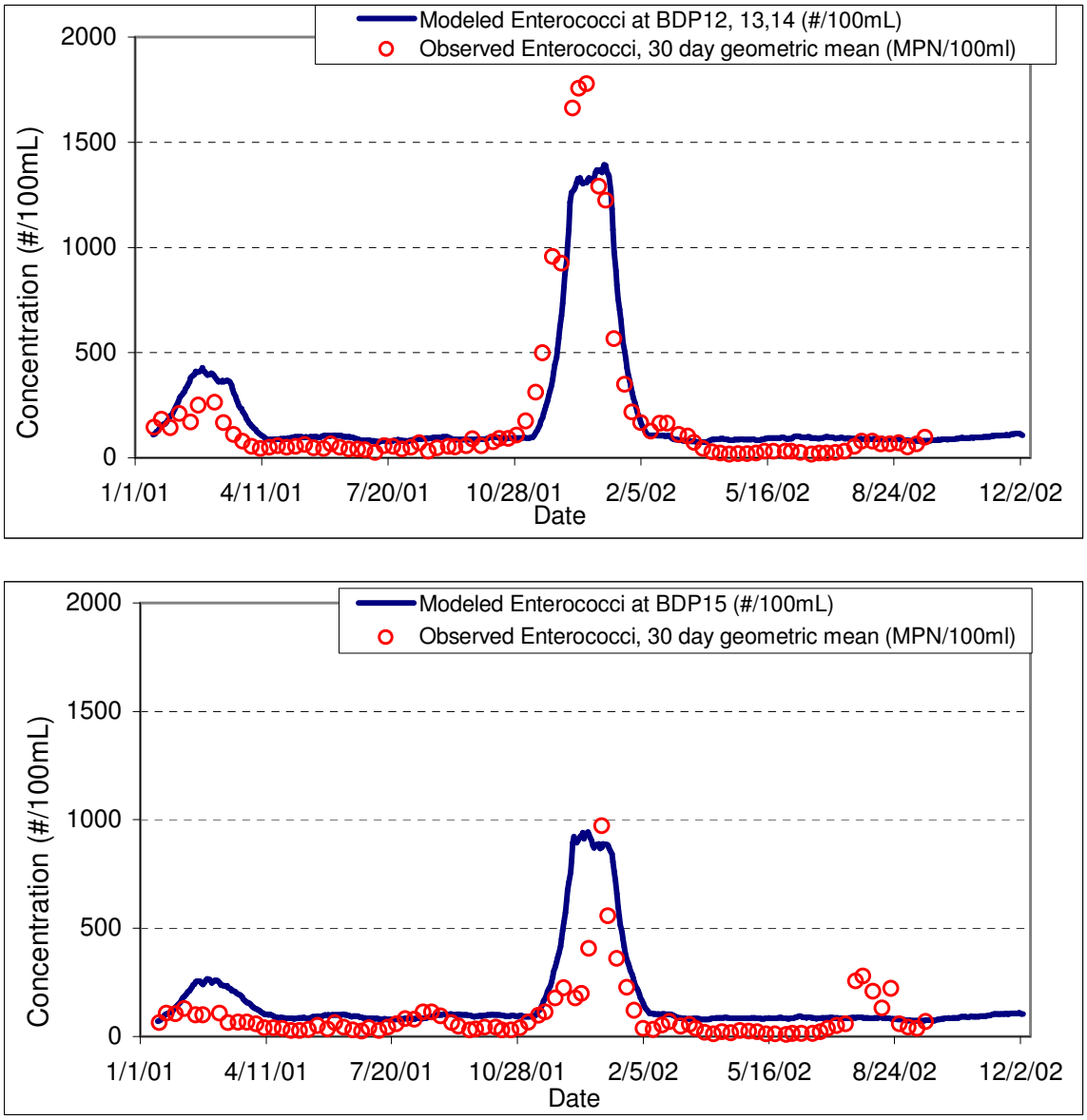

Figure I-62. Simulated Enterococcus Concentrations and the Observed 30-day Geometric Mean in Dana Point Harbor

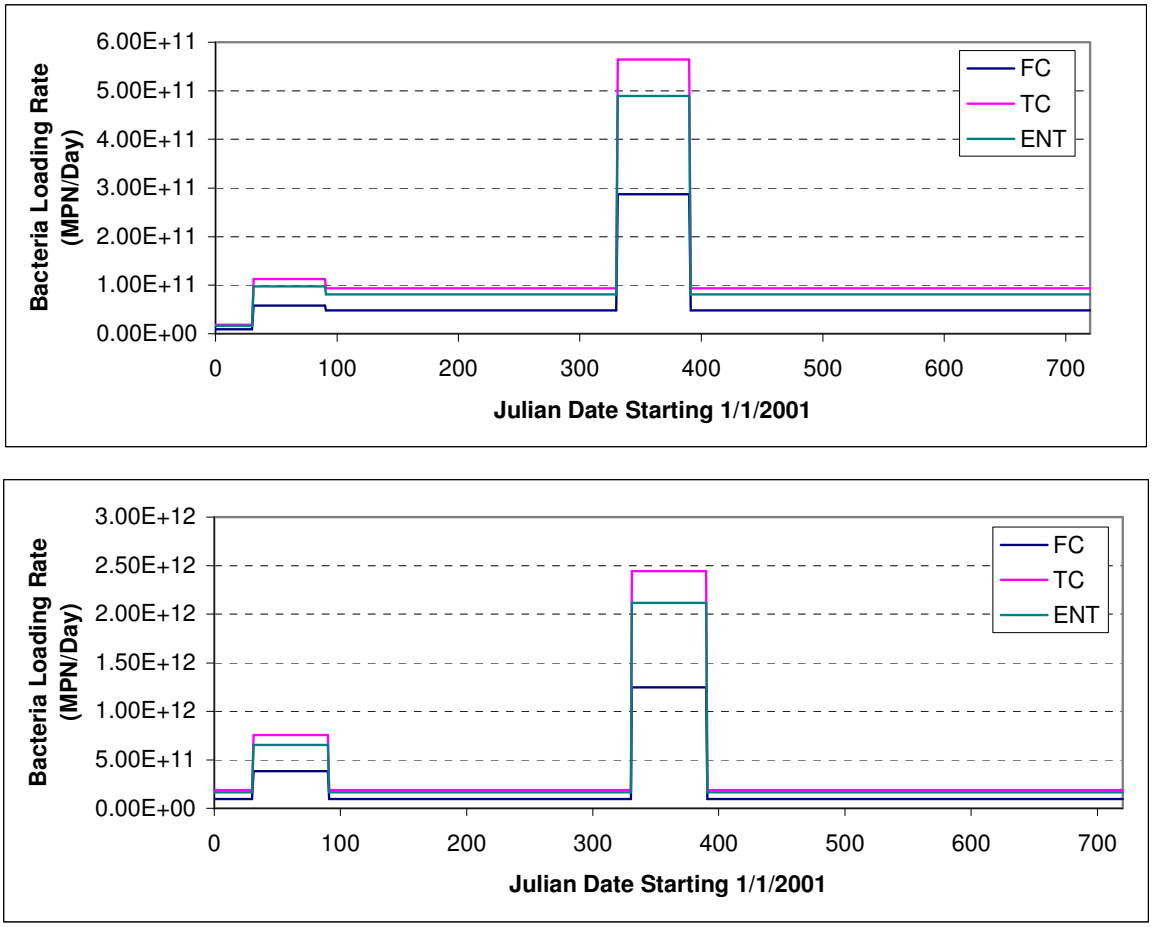

Figure I-63. Inversely-Derived Lumped Sources Loading Applied for the Simulation Period to Two Cells in Baby Beach

Appendix J
Maps of Watersheds
for Shoreline Segments

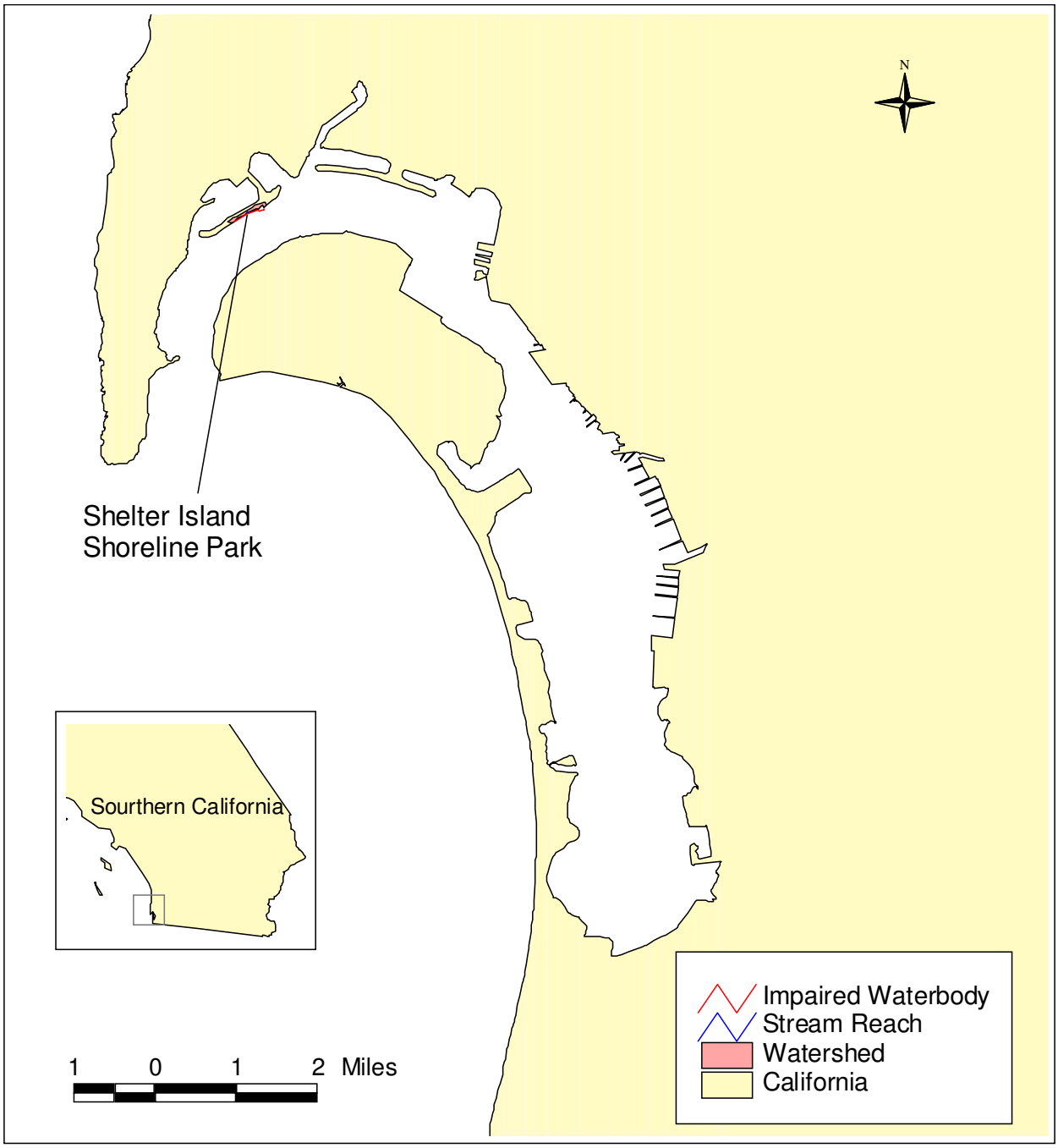

Figure J-1. Shoreline Segments Addressed in San Diego Bay

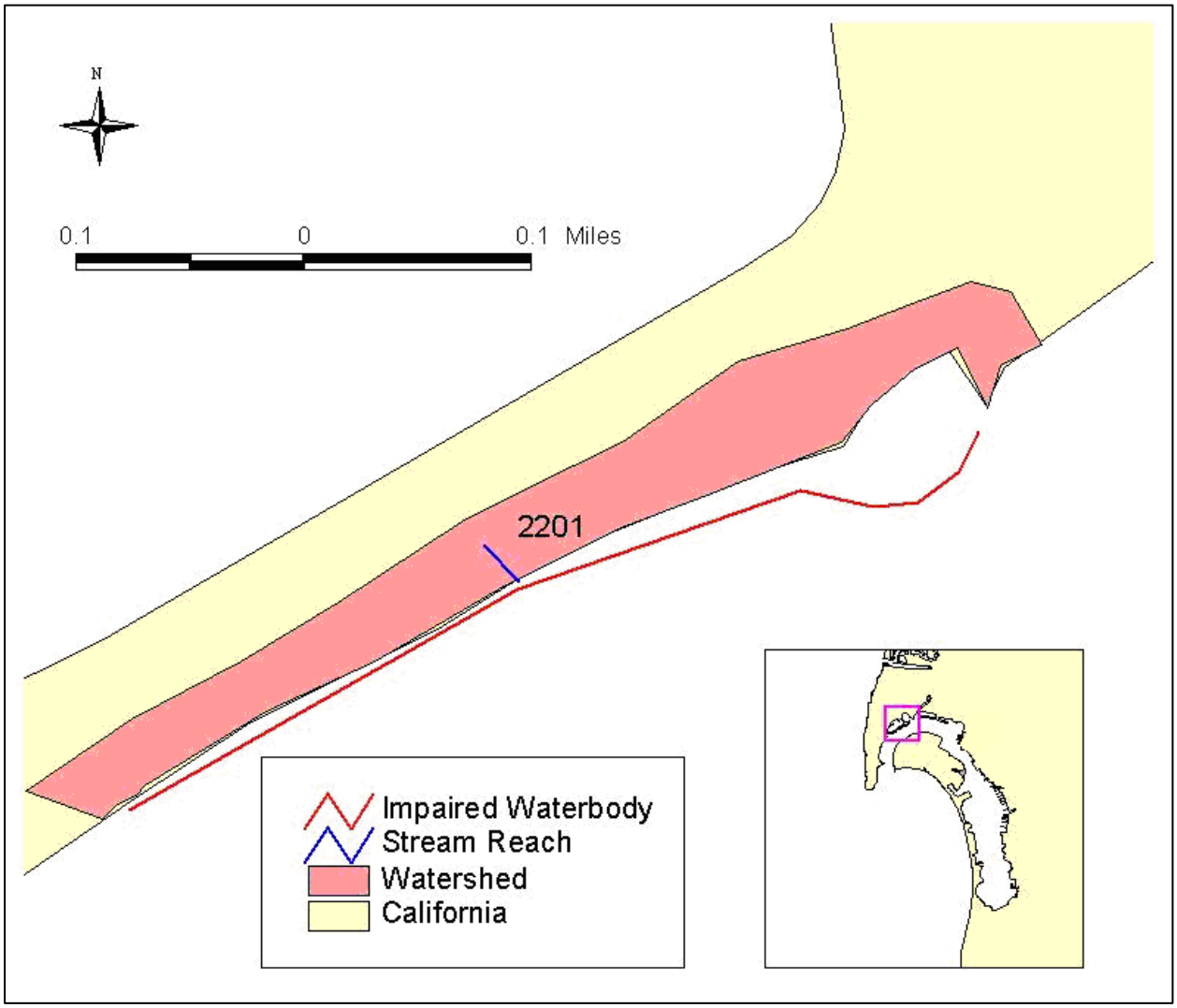

Figure J-2. Shelter Island Shoreline Park Watershed

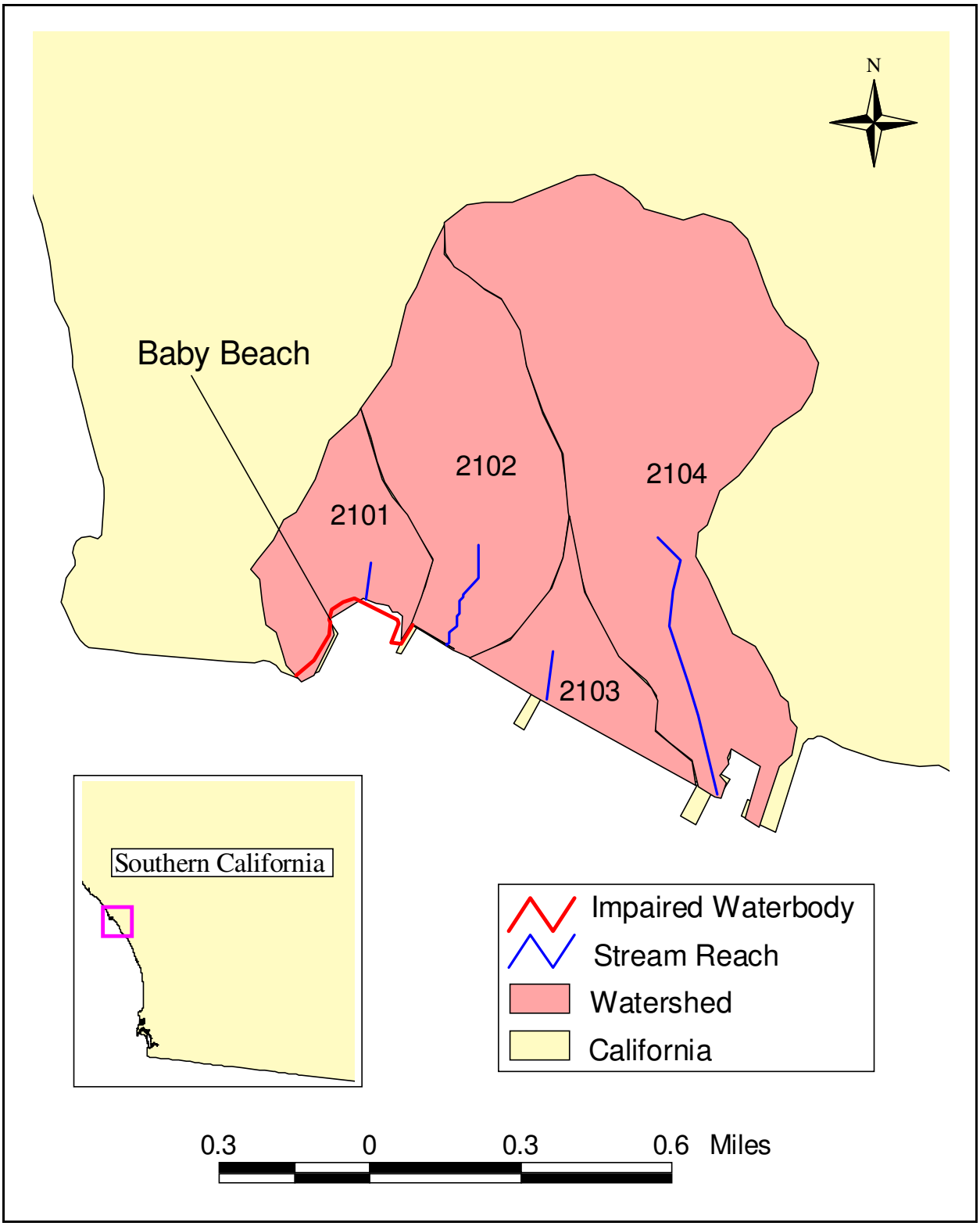

Figure J-3. Dana Point Harbor – Baby Beach Watersheds

Appendix K
Load Reduction Analyses

For determination of the required load reductions to meet wasteload allocations for fecal coliform (FC), total coliform (TC), and *Enterococcus* (ENT), loading analyses were performed for the subwatershed draining to each impaired San Diego Bay (SDB) and Dana Point Harbor (DPH) shoreline segment (see Appendix J for subwatershed maps). These analyses provided a comprehensive assessment of varying storm loads over a 30-day period from January 7, 1993 through February 5, 1993, which represented various critical wet-weather events that impact the loading of bacteria from stormwater runoff.

An LSPC model was used to simulate storm volumes and associated bacteria loads over the 30-day period. Loading capacities for each day were calculated based on separate EFDC models of shoreline receiving waters. Determination of required load reductions assumed that all loads below the load-capacity curve (blue) are allowable and are therefore assigned wasteload allocations. All loads above the load-capacity curve (red) are not allowed and are therefore designated as required load reductions. The percent reduction is calculated by dividing the required load reduction (red) by the total load below the load-capacity curve.

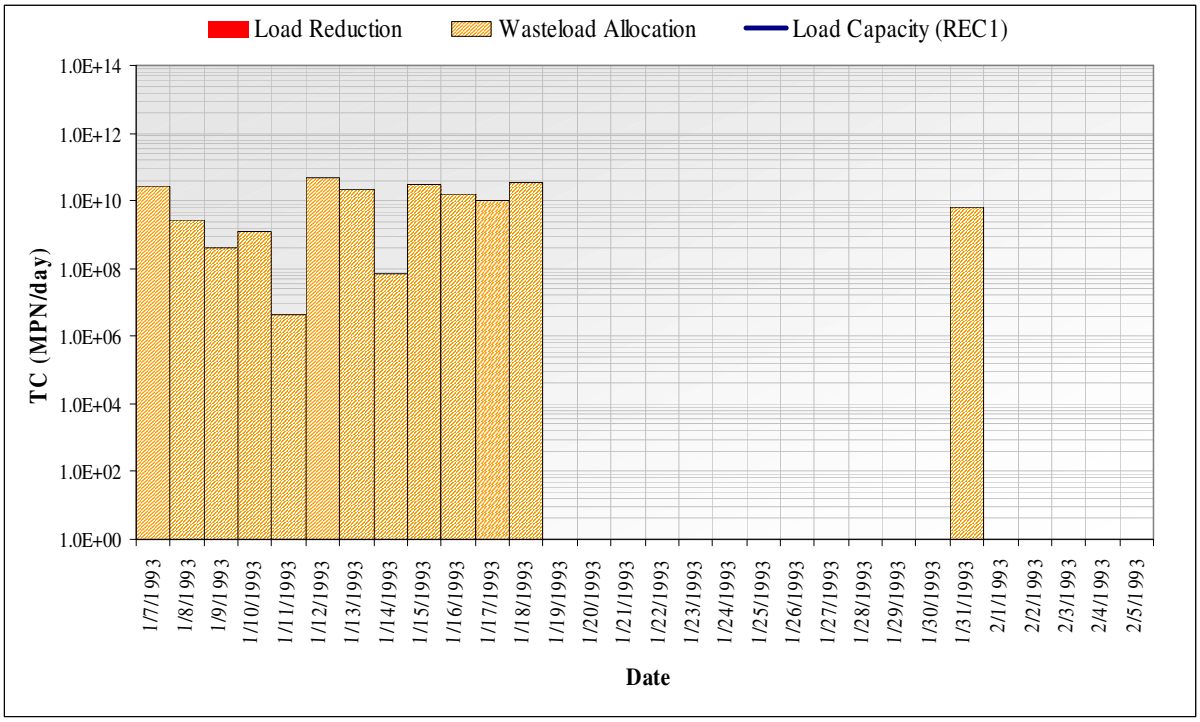

Figure K-1. Load Reduction Analysis at Shelter Island Shoreline Park-TC (REC1) (Subwatershed 2201).

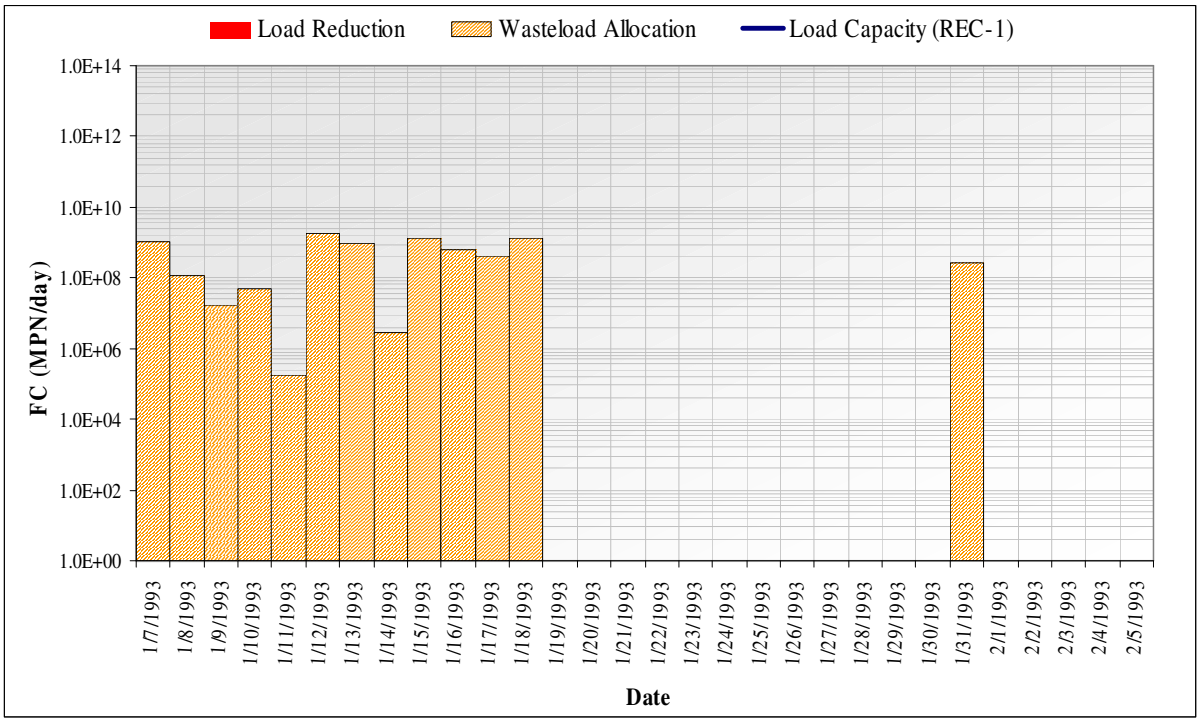

Figure K-2. Load Reduction Analysis at Shelter Island Shoreline Park-FC (REC1) (Subwatershed 2201).

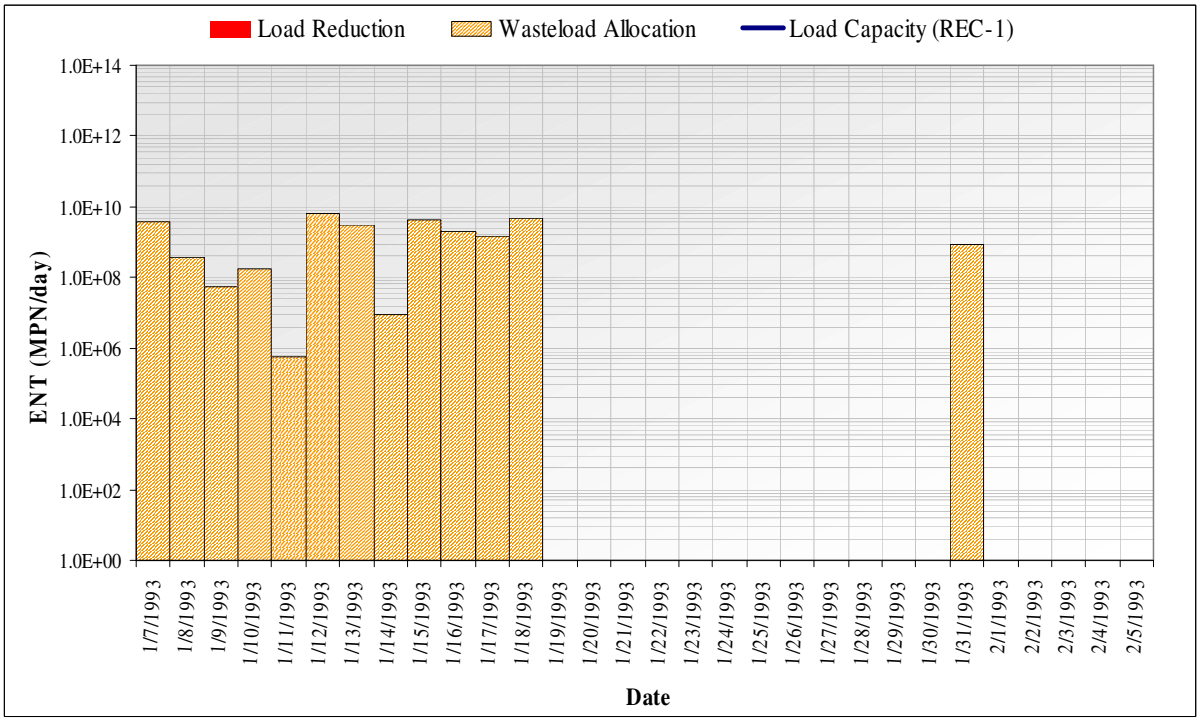

Figure K-3. Load Reduction Analysis at Shelter Island Shoreline Park-ENT (REC1) (Subwatershed 2201).

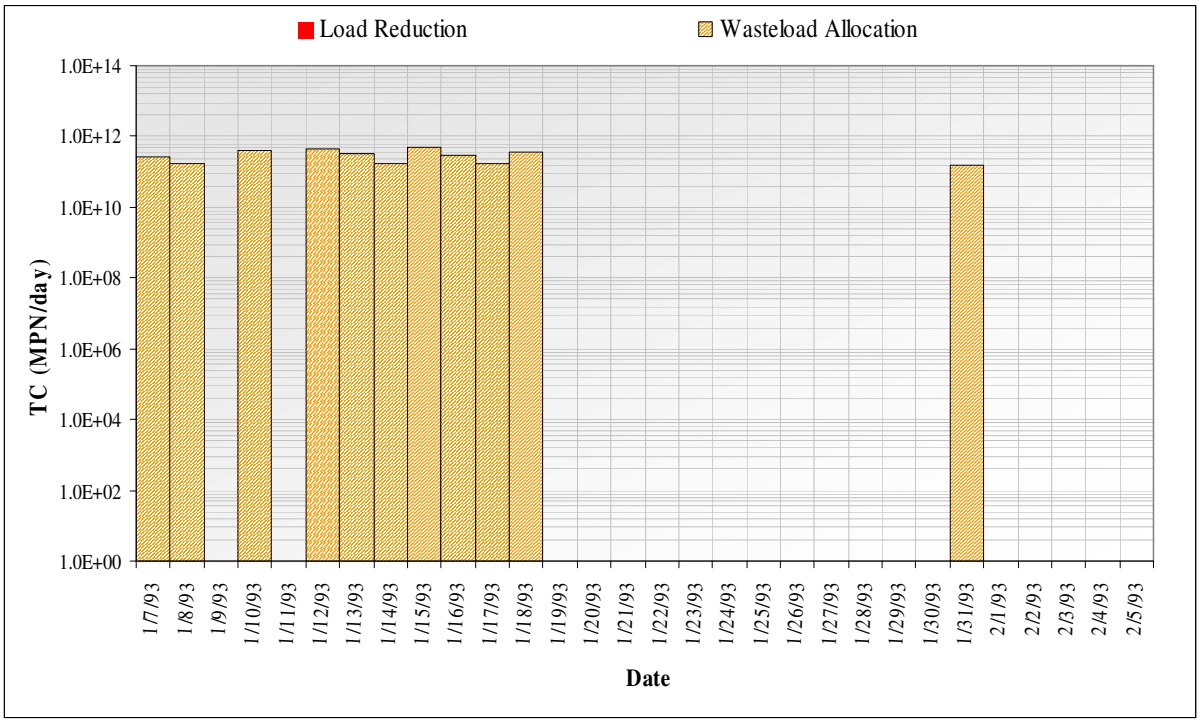

Figure K-4. Load Reduction Analysis at Baby Beach Shoreline-TC (REC1) (Subwatersheds 2101-2104).

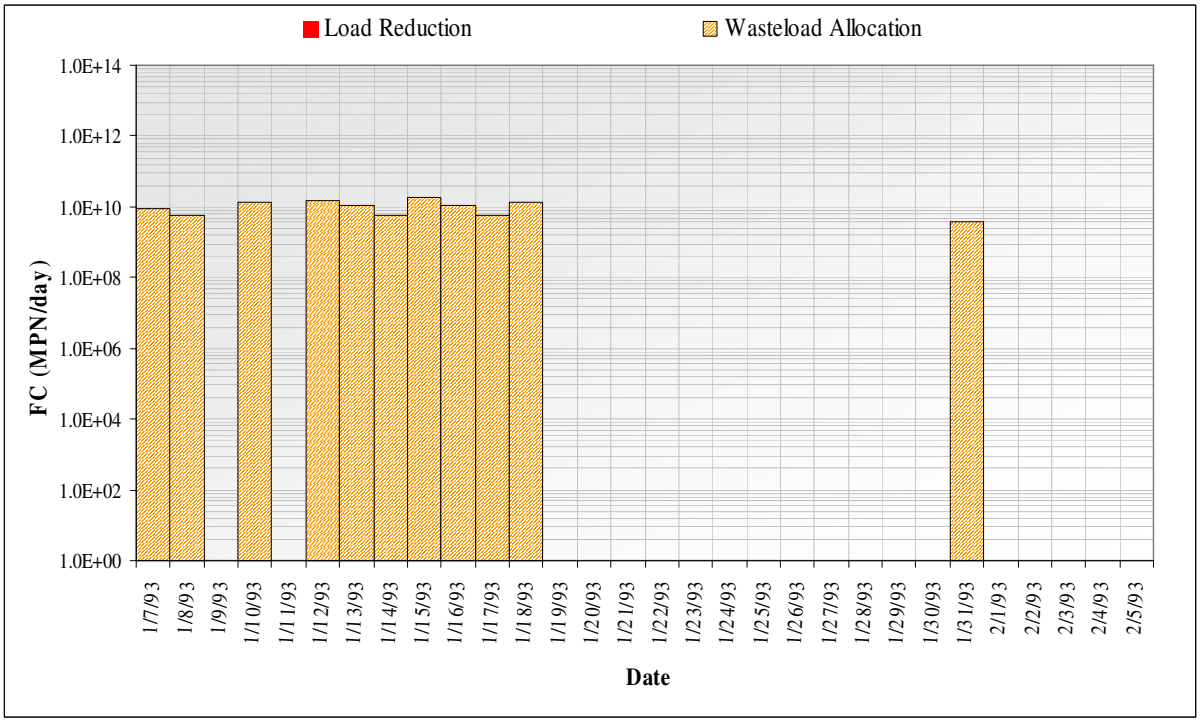

Figure K-5. Load Reduction Analysis at Baby Beach Shoreline-FC (REC1) (Subwatersheds 2101-2104)

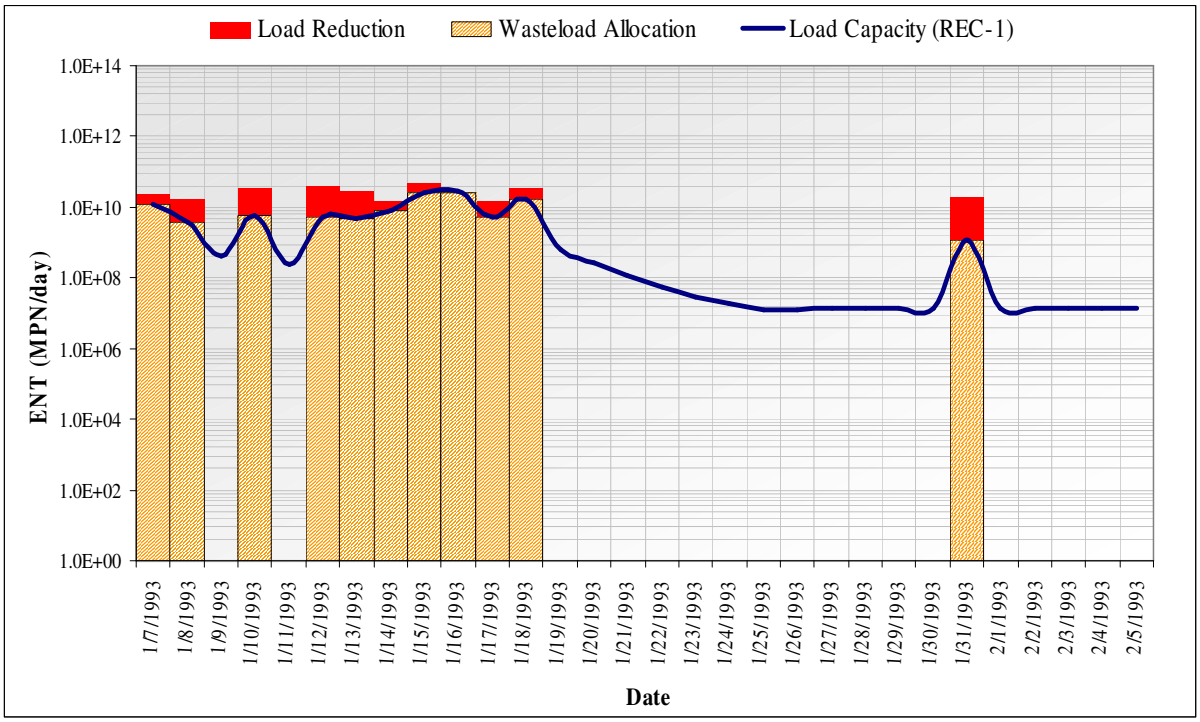

Figure K-6. Load Reduction Analysis at Baby Beach Shoreline-ENT (REC1) (Subwatersheds 2101-2104).

Appendix L
Dry Weather Modeling
Load Estimates

The dry weather steady-state watershed model was used to calculate the allowable loading from dry weather urban runoff by calculating the dry weather flow and multiplying it by the dry weather 30-day geometric mean numeric targets. This allowable bacteria load from the watershed was used as a boundary condition in the receiving water (EFDC) model. Nonpoint, non-urban runoff sources of bacteria that may be attributed to waterfowl or other unidentified sources within the receiving waters were added to the allowable load calculated from the dry weather steady-state watershed model. These loads were modeled on an hourly basis during the 30-day critical tidal period by the EFDC model. The hourly model-predicted bacteria densities allowed the consideration of diurnal variations in water quality resulting from tidal fluctuations, which may vary by orders of magnitude.

The hourly EFDC model-predicted bacteria densities were used to calculate a geometric mean bacteria density for the 30-day critical tidal period. Additionally, the hourly EFDC model-predicted bacteria densities were used to calculate daily arithmetic averages for each day of the 30-day critical tidal period. The 30-day critical tidal period geometric mean was compared to the 30-day geometric mean numeric target. The daily arithmetic averages were compared to the single sample maximum numeric target.

Bacteria loads attributed to non-urban runoff sources (e.g., waterfowl or other unidentified sources) were increased until either the 30-day critical tidal period geometric mean was equal to the 30-day geometric mean numeric target, or one or more daily arithmetic means was equal single sample maximum numeric target. This was considered the allowable load attributed to non-urban runoff sources that could still meet the assimilative capacity of the receiving water, while accounting for the allowable loads from urban runoff sources.

Results of these analyses are shown in the following figures for the dry weather 30-day critical tidal period evaluated. The graphical results show the hourly EFDC model-predicted bacteria densities (blue lines), which are used to calculate the daily arithmetic means (green lines) and 30-day critical tidal period geometric means (not shown). The 30-day critical tidal period geometric means are not shown in the figures, because the 30-day critical tidal period geometric mean is a single point

The daily arithmetic means (green lines) are compared to the single sample maximum numeric targets (dashed red lines). The 30-day critical tidal period geometric means are compared to the 30-day geometric mean numeric targets (solid red lines). As discussed above, the 30-day critical tidal period geometric means are not shown in the figures; however, they are less than or equal to the 30-day geometric mean numeric targets.

For each shoreline segment evaluated, the EFDC model-predicted TC, FC and ENT bacteria densities were compared to REC-1 WQOs for development of TMDLs.

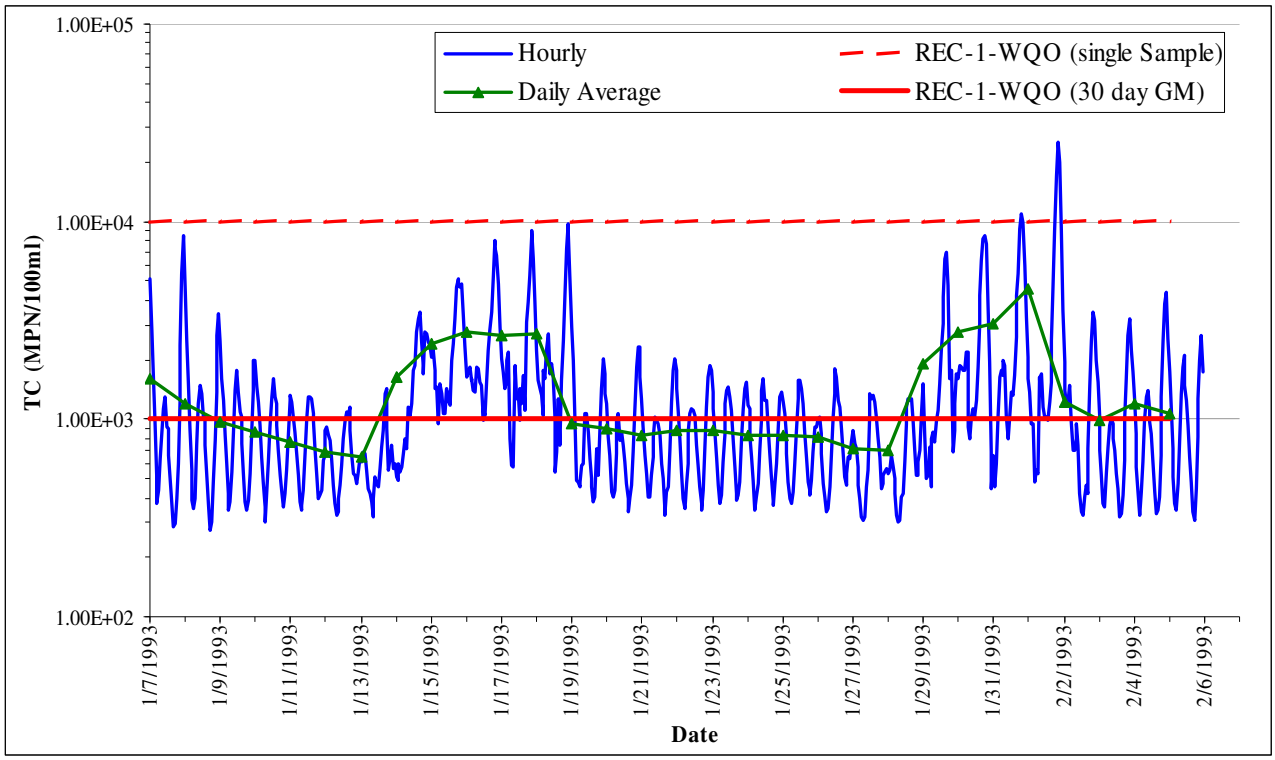

Figure L-1. Model-Predicted Total Coliform Concentration at Shelter Island Shoreline Park, San Diego Bay-Dry Weather

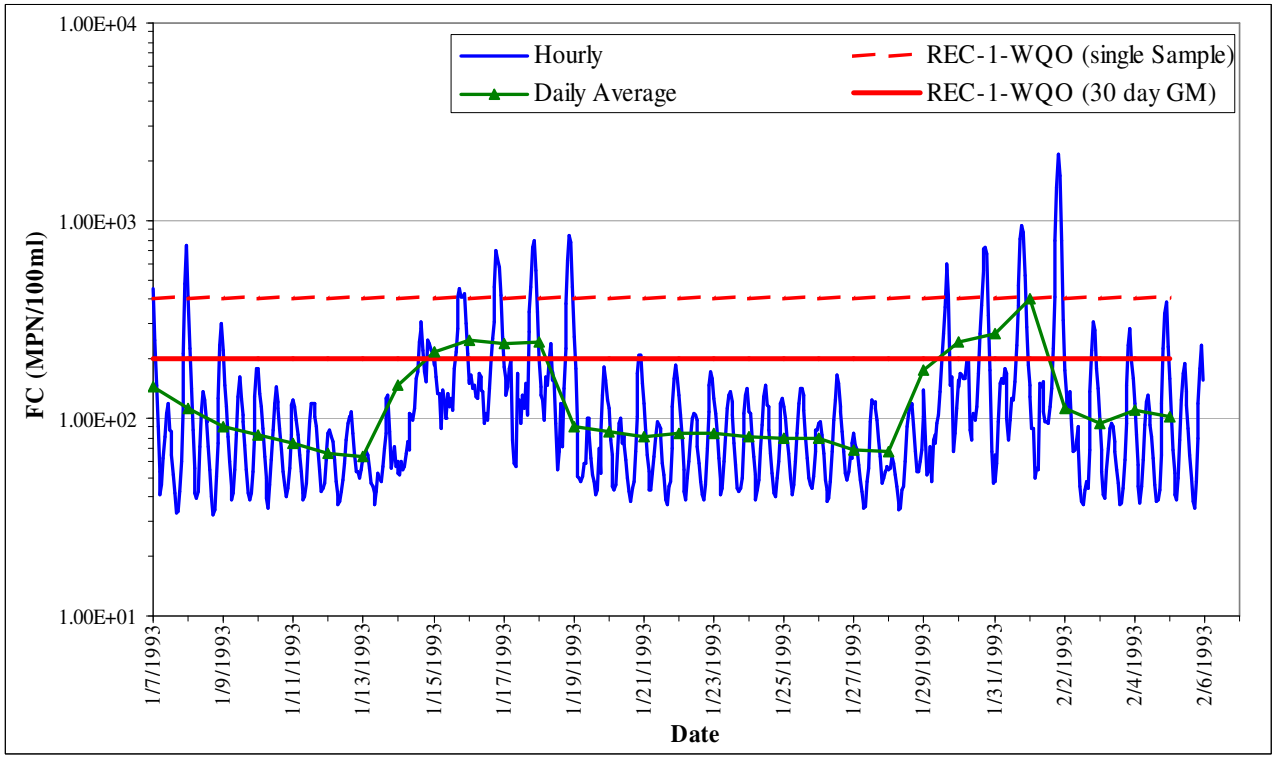

Figure L-2. Model-Predicted Fecal Coliform Concentration at Shelter Island Shoreline Park, San Diego Bay-Dry Weather

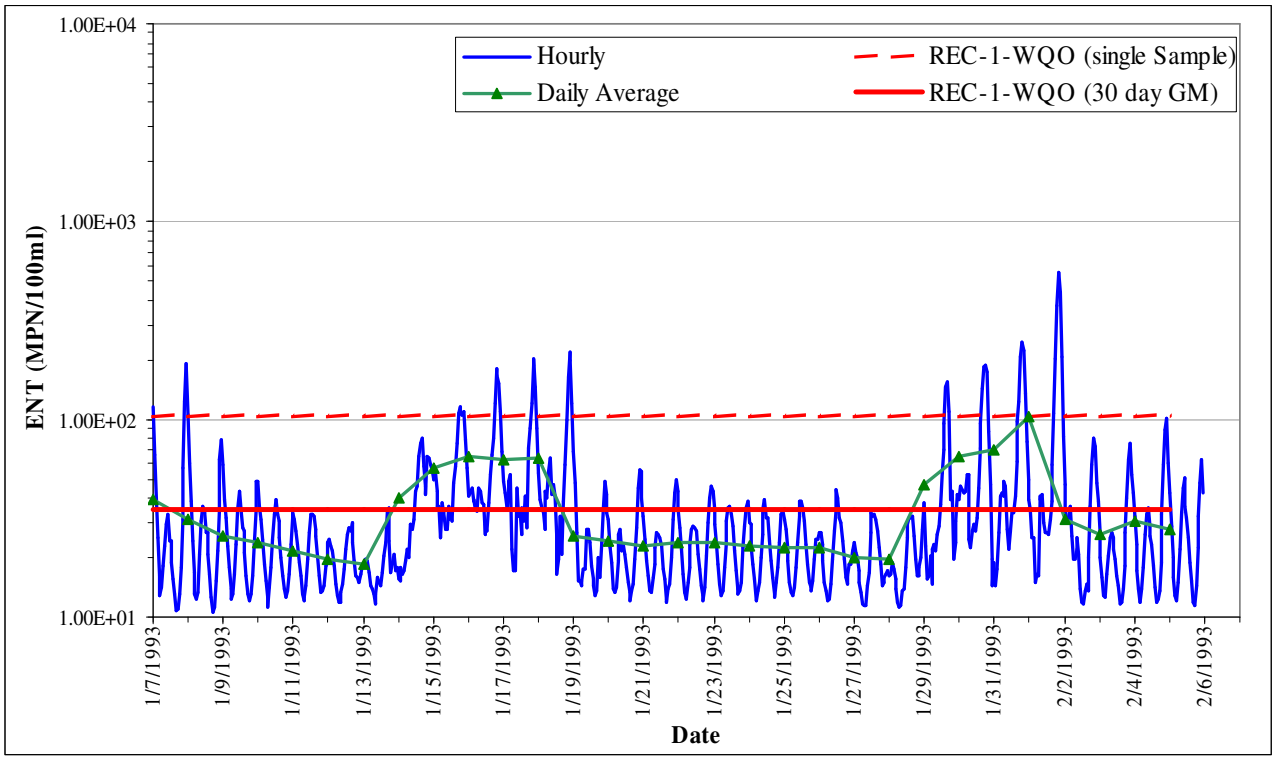

Figure L-3. Model-Predicted *Enterococcus* Concentration at Shelter Island Shoreline Park, San Diego Bay-Dry Weather

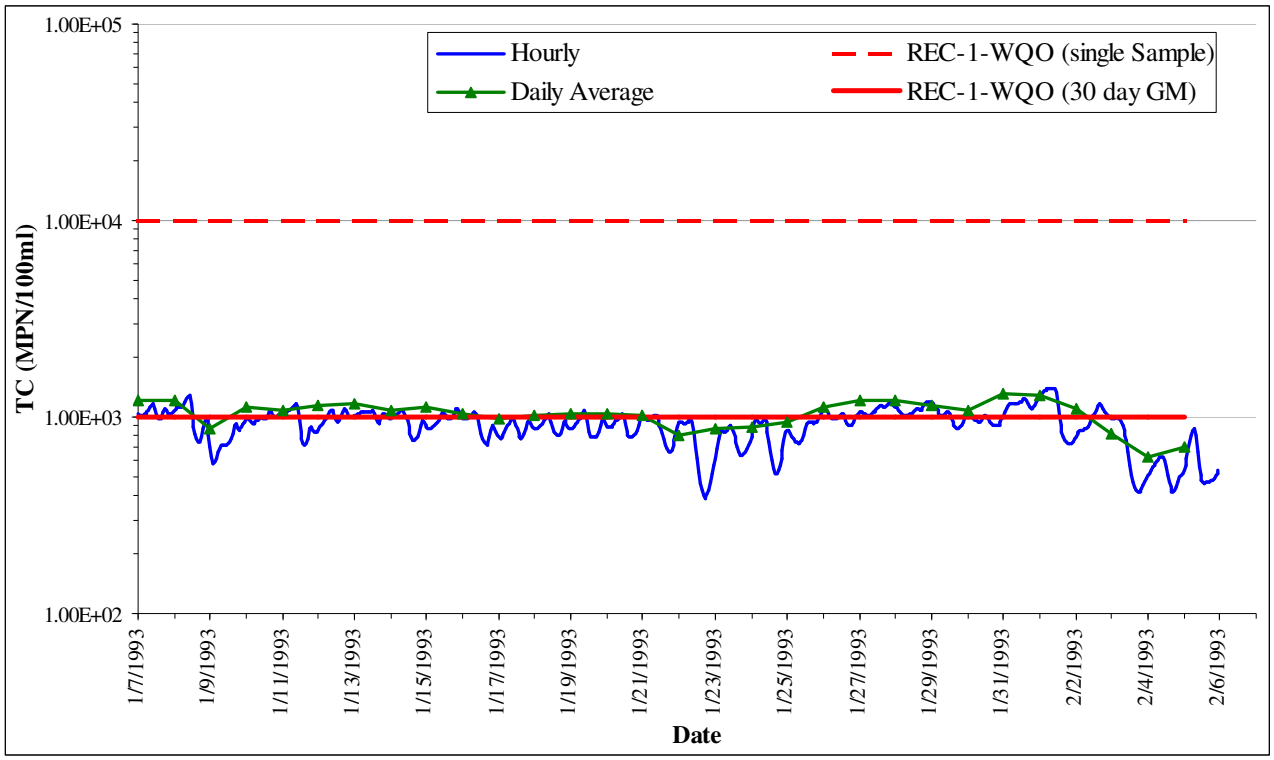

Figure L-4. Model-Predicted Total Coliform Concentration at Baby Beach Shoreline, Dana Point Harbor- Dry Weather

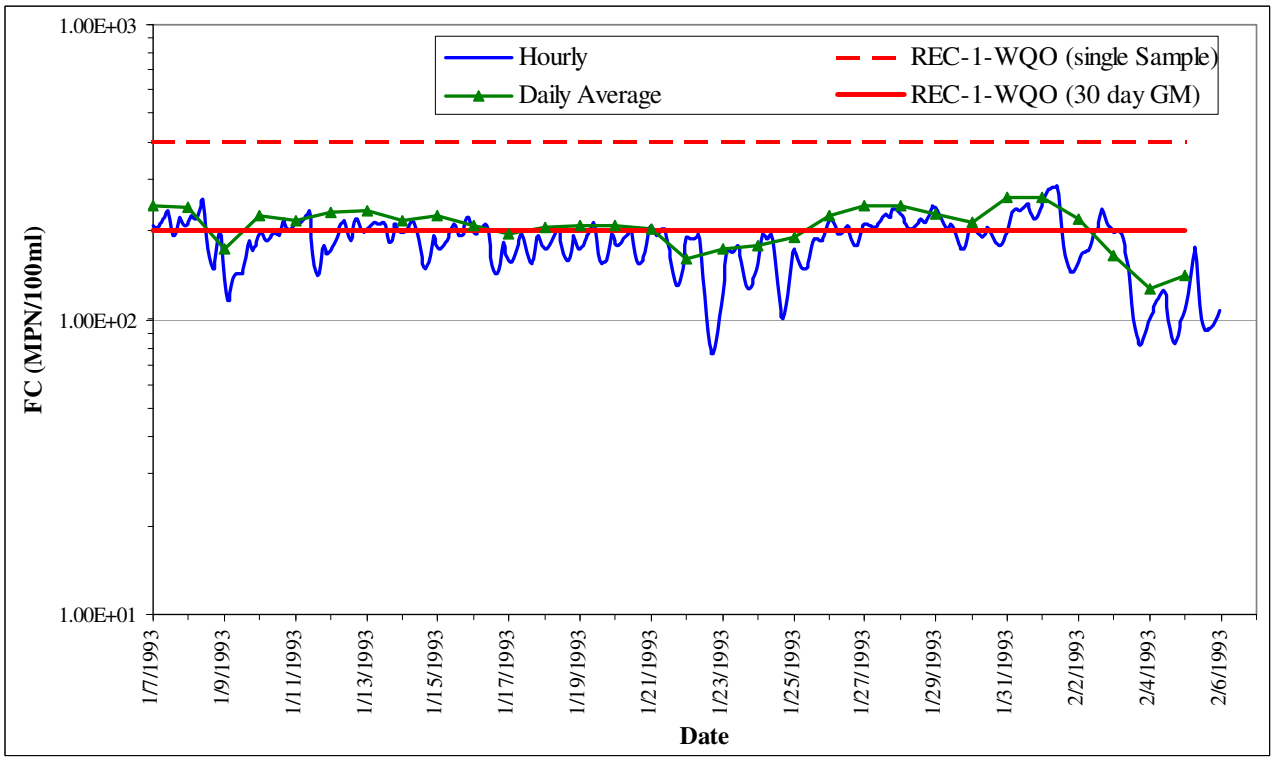

Figure L-5. Model-Predicted Fecal Coliform Concentration at Baby Beach Shoreline, Dana Point Harbor- Dry Weather

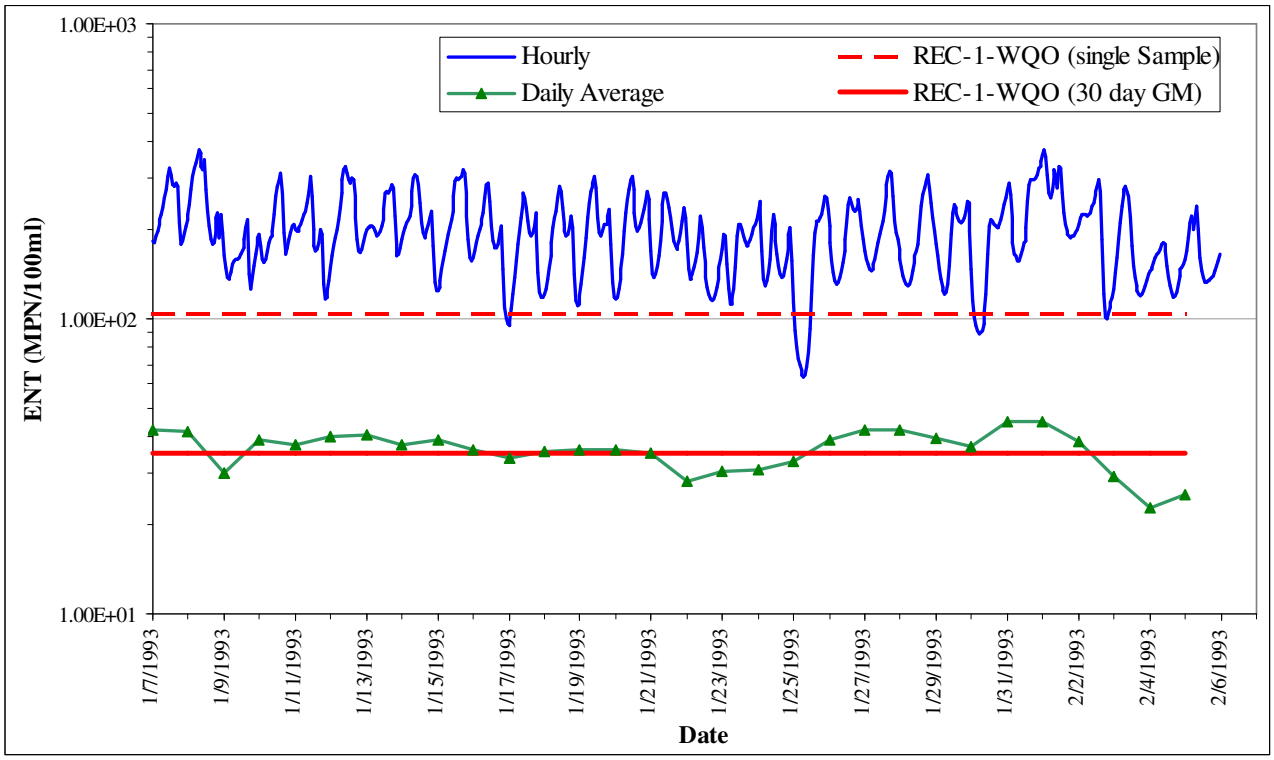

Figure L-6. Model-Predicted *Enterococcus* Concentration at Baby Beach Shoreline, Dana Point Harbor-Dry Weather

Appendix M

Environmental Analysis and Checklist

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Appendix M
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M Environmental Analysis and Checklist

M.1 California Environmental Quality Act Requirements

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) must comply with the California Environmental Quality Act (CEQA) when amending the *Water Quality Control Plan for the San Diego Basin (9)* (Basin Plan) as proposed in this project to adopt total maximum daily loads (TMDLs) for indicator bacteria at the impaired shoreline segments of Baby Beach and Shelter Island Shoreline Park. Under the CEQA, the San Diego Water Board is the Lead Agency for evaluating the environmental impacts of the reasonably foreseeable methods of compliance with the proposed conditional waivers.

The adoption of a Basin Plan amendment is an activity subject to CEQA requirements because Basin Plan amendments constitute rules or regulations requiring the installation of pollution control equipment, establishing a performance standard, or establishing a treatment requirement.[1] TMDL Basin Plan amendments normally contain a quantifiable numeric target that interprets the applicable water quality objective. TMDLs also include wasteload allocations (WLAs) for point sources and load allocations (LAs) for nonpoint sources and natural background. The quantifiable target together with the allocations may be considered a performance standard.[2] Sections M.1.1 and M.1.2 below describe in detail the statutory requirements and scope of this environmental analysis required by the CEQA for Basin Plan amendments.

M.1.1 Exemption from Requirement to Prepare Standard CEQA Documents

The CEQA authorizes the Secretary of the Resources Agency to certify state regulatory programs, designed to meet the goals of the CEQA, as exempt from its requirements to prepare an Environmental Impact Report (EIR), Negative Declaration, or Initial Study. The State Water Resources Control Board's (State Water Board) and the San Diego Water Board's Basin Plan amendment process is a certified regulatory program and is therefore exempt from the CEQA's requirements to prepare such documents.[3]

The State Water Board's CEQA implementation regulations[4] describe the environmental documents required for Basin Plan amendment actions. These documents consist of a written report that includes a description of the proposed activity, alternatives to the proposed activity to reduce or eliminate potentially significant environmental impacts, and identification of mitigation measures to minimize any significant adverse impacts. For this project, these documents are the Technical Report entitled *Total Maximum*

[1] California Code of Regulations Title 14 section 15187(a)
[2] The term "performance standard" is defined in the rulemaking provisions of the Administrative Procedure Act [Government Code sections 11340-11359]. A "performance standard" is a regulation that describes an objective with the criteria stated for achieving the objective [Government Code section 11342(d)].
[3] California Code of Regulations Title 14 section 15251(g) and Public Resources Code section 21080.5
[4] California Code of Regulations Title 23 section 3720 et seq. "Implementation of the Environmental Quality Act of 1970"

Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay (Technical Report), an initial draft of the Basin Plan amendment (Appendix C) and an environmental checklist (section M.4 below). These components fulfill the requirements of the CEQA for preparation of environmental documents for this Basin Plan amendment.[5]

M.1.2 Scope of Environmental Analysis

The CEQA has specific provisions that establish the scope of the environmental analysis required for the adoption of this TMDL Basin Plan amendment. The CEQA limits the scope to an environmental analysis of the reasonably foreseeable methods of compliance with the WLAs and LAs. The State Water Board CEQA Implementation Regulations for Certified Regulatory Programs[6] require the environmental analysis to include at least the following:

1. A brief description of the proposed activity. In this case, the proposed activity is the TMDL Basin Plan amendment. The Basin Plan amendment is described in section M.2 of this appendix.

2. Reasonable alternatives to the proposed activity (discussed in section M.8).

3. Mitigation measures to minimize any significant adverse environmental impacts of the proposed activity (discussed in section M.5).

Additionally, the CEQA[7] and CEQA Guidelines[8] require the following components, some of which are repetitive from the list above:

1. An analysis of the reasonably foreseeable environmental impacts of the methods of compliance. These methods may be employed to comply with the TMDL Basin Plan amendment. Reasonably foreseeable methods of compliance are described in section M.3. Sections M.4 and M.5 identify the environmental impacts associated with the methods of compliance.

2. An analysis of the reasonably foreseeable feasible mitigation measures relating to those impacts. This discussion is also in section M.5.

3. An analysis of reasonably foreseeable alternative means of compliance with the rule or regulation, which would avoid or eliminate the identified impacts. This discussion is in section M.5.1.

Additionally, the CEQA Guidelines require the environmental analysis take into account a reasonable range of:[9]

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[5] California Code of Regulations Title 23 section 3777
[6] California Code of Regulations Title 23 section 3777
[7] Public Resources Code section 21159 (a)
[8] California Code of Regulations Title 14 section 15187(c)

1. Environmental factors (section M.5)
2. Economic factors (section M.7)
3. Technical factors (section M.6)
4. Population (section M.6)
5. Geographic areas (section M.6)
6. Specific sites (section M.6)

A "reasonable range" does not require an examination of every site, but a reasonably representative sample of them. The statute specifically states that the agency shall not conduct a "project level analysis."[10] Rather, a project level analysis must be performed by the dischargers to be eligible for a conditional waiver.[11] Notably, the San Diego Water Board is prohibited from specifying the manner of compliance with its regulations,[12] and accordingly, the actual environmental impacts will necessarily depend upon the compliance strategy selected by the dischargers. In preparing this environmental analysis, the San Diego Water Board has considered the pertinent requirements of state law,[13] and intends this analysis to serve as a tier 1 environmental review.

Any potential environmental impacts associated with the TMDL depend upon the specific compliance projects selected by the dischargers, most of whom are public agencies subject to their own CEQA obligations. If not properly implemented or mitigated at the project level, there could be adverse environmental impacts from implementing these TMDLs.

The substitute CEQA documents identify broad mitigation approaches that could be considered at the project level. Consistent with the CEQA, the substitute documents do not engage in speculation or conjecture, but rather consider the reasonably foreseeable environmental impacts of the reasonably foreseeable methods of compliance, the reasonably foreseeable mitigation measures, and the reasonably foreseeable alternative means of compliance, which would avoid, eliminate, or reduce the identified impacts.

M.2 Description of the Proposed Activity

The Basin Plan designates beneficial uses of water bodies, establishes water quality objectives for the protection of these beneficial uses, and outlines a plan of implementation for maintaining and enhancing water quality. The proposed amendment would incorporate into the Basin Plan TMDLs for indicator bacteria at Baby Beach and Shelter Island Shoreline Park.

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[9] California Code of Regulations Title 14 section 15187(d),Public Resources Code section 21159 (c)
[10] Public Resources Code section 21159(d)
[11] Public Resources Code section 21159.2
[12] Water Code section 13360
[13] Public Resources Code section 21159 and 14 CCR section 15187

The San Diego Water Board's goal in adopting the TMDL is to eliminate the water quality problems caused by bacteria at the impaired shoreline segments of Baby Beach and Shelter Island Shoreline Park. Although the indicator bacteria water quality objectives (WQOs) for are written in terms of density of indicator bacteria colonies (most probable number of colonies per milliliter of water), the actual risk to human health is caused by the presence of disease-causing pathogens. When the risk to human health from pathogens in the water is so great that beaches are posted with health advisories or closure signs the quality and beneficial use of the water are impaired. The adoption of a TMDL is not discretionary; rather, it is compelled by section 303(d) of the federal Clean Water Act.

The TMDLs for indicator bacteria, and their derivation are discussed in the Technical Report, section 8. For point sources, the TMDLs will be implemented primarily through waste discharge requirements (WDRs) for urban runoff that implement federal National Pollutant Discharge Elimination System (NPDES) regulations. The primary dischargers are municipalities located in the watersheds. Dischargers will receive wasteload allocations (WLAs) that must be met over a phased compliance schedule that should result in attainment of water quality standards.

M.2.1 Surrounding Land Uses and Setting

The San Diego Region forms the southwest corner of California and occupies approximately 3,900 square miles. The western boundary of the Region consists of the Pacific Ocean coastline. The northern boundary of the Region is formed by the hydrologic divide starting near Laguna Beach and extending inland through El Toro and easterly along the ridge of the Elsinore Mountains into the Cleveland National Forest. The eastern boundary of the Region is formed by the Laguna Mountains and other lesser known mountains located in the Cleveland National Forest. The southern boundary of the Region is formed by the United States-Mexico international border.

The San Diego Region encompasses most of San Diego County, parts of southwestern Riverside County, and southwestern Orange County. The Region is divided into a coastal plain area, a central mountain-valley area, and an eastern mountain-valley area. It consists of eleven hydrologic units that ultimately drain to the Pacific Ocean. The climate in the San Diego Region is generally mild with annual temperatures averaging around 65 degrees Fahrenheit near the coastal areas. Average annual rainfall ranges from 9 to 11 inches along the coast to more than 30 inches in the eastern mountains. There are two distinct seasons in the Region. Summer dry weather occurs from late April to mid-October. During this period almost no rain falls. The winter season (mid-October through early April) consists of generally dry weather interspersed by occasional rain storms. Eighty-five to ninety percent of the annual rainfall occurs during the winter season.

The land use of the San Diego Region is highly variable. However, the coastline areas are highly concentrated with urban and residential land uses. Most of the watershed areas addressed in this project are occupied by recreational and open space land uses

and low-density and high-density residential land uses. Other major land uses are commercial/institutional and industrial/transportation. More information is provided in section 2 of the Technical Report.

M.3 Analysis of Reasonably Foreseeable Methods of Compliance

This section identifies a range of reasonably foreseeable method(s) of compliance with the Basin Plan amendment. Bacteria generation is linked to different types of land uses, and for these watersheds, bacteria are transported to receiving waters primarily via urban runoff. Therefore, the most significant controllable source of bacteria to receiving waters is urban runoff discharges from MS4s during wet and dry weather. In wet weather, the amount of runoff and associated bacteria densities are highly dependent on land use and associated management practices (e.g., pet waste in residential areas). In dry weather, the amount of runoff and associated bacteria densities result from various land use practices that cause water to enter storm drains, such as lawn irrigation runoff and car washing. Bacteria loads from natural sources are uncontrollable and were not included in the watershed runoff, but included as part of the load existing in the receiving waters of the impaired shoreline segments.

The most reasonably foreseeable methods of compliance with the WLAs of these TMDLs are for dischargers (i.e., owner of MS4) to implement structural and non-structural best management practices (BMPs). Typical BMPs that may be selected by dischargers to comply with WLAs are divided into non-structural and structural controls, and are described below.

Non-structural Controls

Non-structural controls typically are aimed at controlling sources of a pollutant and generally do not involve new construction. Non-structural controls are expected to be the first methods to be utilized by the dischargers. No potentially significant impacts on the environment were identified for these controls.

Education and Outreach: Conduct education and outreach to residents to minimize the potential for contamination of stormwater runoff by cleaning up after their pets, picking up litter, minimizing runoff from agriculture, livestock, and horse ranch facilities, and controlling excessive irrigation. Bacterial source-tracking studies in a watershed in the Seattle, Washington area found that nearly 20 percent of the bacteria isolates that could be matched with host animals were matched with dogs.[14]

Road and Street Maintenance: Increase frequency of street sweeping to maintain clean sidewalks, streets, and gutters. Street sweeping can reduce pollution by 5 to 30 percent when a conventional mechanical broom and vacuum-assisted wet sweeper is used.[15] The U.S. Environmental Protection Agency (USEPA) reports that the new vacuum assisted dry sweepers can achieve 50 to 88 percent overall reductions in the

[14] USEPA, 1999, National Menu of Best Management Practices for Stormwater-Phase II, *http://cfpub.epa.gov/npdes/stormwater/menuofbmps*
[15] ibid

annual sediment loading for a residential street, depending on sweeping frequency. A reduction in sediment load may lead to a reduction in bacteria being carried to the MS4, and ultimately to the impaired shorelines.

Storm Drain System Cleaning: Storm drain systems should be cleaned regularly since flows in the drains are rarely high enough to flush the drains. Cleaning of the storm drain systems will reduce the levels of bacteria as well as reduction of other pollutants, trash, and debris both in the storm drain system and in receiving waters.

BMP Inspection and Maintenance: Conduct regular inspections of treatment control BMPs to ensure their adequacy of design and proper function. Routine inspection and maintenance is an efficient way to prevent potential nuisance situations, such as odors, mosquitoes, weeds, etc., and can reduce the need for repair maintenance and the chance of polluting storm water runoff by finding and correcting problems before the next storm event.[16]

Enforcement of Local Ordinances: Develop and/or enforce municipal ordinances prohibiting the discard of litter, pet cleanup negligence, or lawn over-watering. Enforcement of such ordinances will decrease the likelihood of bacteria from controllable sources reaching storm drains.

Structural Controls

Structural controls may be utilized to divert, store, and/or treat stormwater, or infiltrate stormwater into the ground. Structural controls can involve construction and operation activities that create potentially significant environmental impacts.

Buffer Strips and Vegetated Swales: Construct and/or maintain vegetative buffer strips along roadsides and in medians to slow surface runoff velocity, filter pollutants, and increase stormwater infiltration. Replace curbs with vegetated swales to allow highway and road runoff to percolate into the ground.

Bioretention: Construct and maintain bioretention BMPs to provide on-site removal of pollutants from stormwater runoff through landscaping features.

Infiltration Trenches: Construct and maintain infiltration trenches designed to capture and naturally filter stormwater runoff.

Sand Filters: Install and maintain sand filters, which are effective for pollutant removal from stormwater. Sand filters may be a good option in densely developed urban areas with little pervious surface since the filters occupy minimal space.

Diversion/Treatment Systems: Install diversion and containment systems to capture non-stormwater runoff. During low flow conditions, runoff may be diverted to an on-site

[16] ibid

treatment system and released back to the MS4/receiving water, or it may be diverted to wastewater collection plants for treatment.

M.4 Environmental Checklist

POTENTIAL IMPACT	POTENTIALLY SIGNIFICANT	LESS THAN SIGNIFICANT WITH MITIGATION	LESS THAN SIGNIFICANT	NO IMPACT
1. Earth. Will the proposal result in:				
a. Unstable earth conditions or in changes in geologic substructures?	☐	☒	☐	☐
b. Disruptions, displacements, compaction or overcoming of the soil?	☐	☐	☒	☐
c. Change in topography or ground surface relief features?	☐	☒	☐	☐
d. The destruction, covering or modification of any unique geologic or physical features?	☐	☒	☐	☐
e. Any increase in wind or water erosion of soils either on or off the site?	☐	☐	☒	☐
f. Changes in deposition or erosion of beach sands, or changes in siltation, deposition or erosion which may modify the channel of a river or stream or the bed of the ocean or any bay, inlet or lake?	☐	☐	☒	☐
g. Exposure of people or property to geologic hazards, such as earthquakes, landslides, mudslides, ground failure, or similar hazards?	☐	☒	☐	☐
2. Air. Will the proposal result in:				
a. Substantial air emissions or deterioration of ambient air quality?	☐	☒	☐	☐
b. The creation of objectionable odors?	☐	☒	☐	☐
c. Alteration of air movement, moisture or temperature, or any change in climate, either locally or regionally?	☐	☐	☐	☒
3. Water. Will the proposal result in:				
a. Changes in currents, or the course of direction or water movements, in either marine or fresh waters?	☐	☐	☒	☐
b. Changes in absorption rates, drainage patterns, or the rate and amount of surface water runoff?	☐	☐	☒	☐
c. Alterations to the course of flow of flood waters?	☐	☒	☐	☐

POTENTIAL IMPACT	POTENTIAL SIGNIFICANT IMPACT	LESS THAN SIGNIFICANT IMPACT WITH MITIGATION	LESS THAN SIGNIFICANT IMPACT	NO IMPACT
3. Water. Will the proposal result in (Cont'd):				
d. Change in the amount of surface water in any water body?	☐	☐	☒	☐
e. Discharge into surface waters, or in any alteration of surface water quality, including but not limited to temperature, dissolved oxygen, or turbidity?	☐	☒	☐	☐
f. Alteration of the direction or rate of flow of groundwaters?	☐	☒	☐	☐
g. Change in the quantity or quality of groundwaters, either through direct additions or withdrawals, or through interception of an aquifer by cuts or excavations?	☐	☒	☐	☐
h. Substantial reduction in the amount of water otherwise available for public water supplies?	☐	☐	☐	☒
i. Exposure of people or property to water related hazards such as flooding or tidal waves?	☐	☒	☐	☐
4. Plant Life. Will the proposal result in:				
a. Change in the diversity of species, or number of any species of plants (including trees, shrubs, grass, crops, microflora and aquatic plants)?	☐	☐	☒	☐
b. Reduction of the numbers of any unique, rare or endangered species of plants?	☐	☒	☐	☐
c. Introduction of new species of plants into an area, or in a barrier to the normal replenishment of existing species?	☐	☒	☐	☐
d. Reduction in acreage of any agricultural crop?	☐	☐	☐	☒
5. Animal Life. Will the proposal result in:				
a. Change in the diversity of species, or numbers of any species of animals (birds, land animals including reptiles, fish and shellfish, benthic organisms, insects or microfauna)?	☐	☐	☒	☐

POTENTIAL IMPACT	POTENTIAL SIGNIFICANT IMPACT	LESS THAN SIGNIFICANT IMPACT WITH MITIGATION	LESS THAN SIGNIFICANT IMPACT	NO IMPACT
5. Animal Life. Will the proposal result in (Cont'd):				
b. Reduction of the numbers of any unique, rare or endangered species of animals?	☐	☒	☐	☐
c. Introduction of new species of animals into an area, or result in a barrier to the migration or movement of animals?	☐	☒	☐	☐
d. Deterioration to existing fish or wildlife habitat?	☐	☒	☐	☐
6. Noise. Will the proposal result in:				
a. Increases in existing noise levels?	☐	☒	☐	☐
b. Exposure of people to severe noise levels?	☐	☐	☒	☐
7. Light and Glare. Will the proposal:				
a. Produce new light or glare?	☐	☒	☐	☐
8. Land Use. Will the proposal result in:				
a. Substantial alteration of the present or planned land use of an area?	☐	☐	☒	☐
9. Natural Resources. Will the proposal result in:				
a. Increase in the rate of use of any natural resources?	☐	☐	☐	☒
b. Substantial depletion of any nonrenewable natural resource?	☐	☐	☐	☒
10. Risk of Upset. Will the proposal involve:				
a. A risk of an explosion or the release of hazardous substances (including, but not limited to: oil, pesticides, chemicals or radiation) in the event of an accident or upset conditions?	☐	☐	☒	☐
11. Population. Will the proposal:				
a. Alter the location, distribution, density, or growth rate of the human population of an area?	☐	☐	☒	☐
12. Housing. Will the proposal:				
a. Affect existing housing, or create a demand for additional housing?	☐	☐	☒	☐

POTENTIAL IMPACT	POTENTIAL SIGNIFICANT IMPACT	LESS THAN SIGNIFICANT IMPACT WITH MITIGATION	LESS THAN SIGNIFICANT IMPACT	NO IMPACT
13. Transportation/Circulation. Will the proposal result in:				
a. Generation of substantial additional vehicular movement?	☐	☐	☒	☐
b. Effects on existing parking facilities, or demand for new parking?	☐	☒	☐	☐
c. Substantial impact upon existing transportation systems?	☐	☐	☒	☐
d. Alterations to present patterns of circulation or movement of people and/or goods?	☐	☐	☒	☐
e. Alterations to waterborne, rail or air traffic?	☐	☐	☐	☒
f. Increase in traffic hazards to motor vehicles, bicyclists or pedestrians?	☐	☐	☒	☐
14. Public Service. Will the proposal have an effect upon, or result in a need for new or altered governmental services in an of the following areas:				
a. Fire protection?	☐	☐	☒	☐
b. Police protection?	☐	☐	☒	☐
c. Schools?	☐	☐	☐	☒
d. Parks or other recreational facilities?	☐	☐	☒	☐
e. Maintenance of public facilities, including roads?	☐	☒	☐	☐
f. Other governmental services?	☐	☒	☐	☐
15. Energy. Will the proposal result in:				
a. Use of substantial amounts of fuel or energy?	☐	☐	☐	☒
b. Substantial increase in demand upon existing sources of energy, or require the development of new sources of energy?	☐	☐	☐	☒
16. Utilities and Service Systems. Will the proposal result in a need for new systems, or substantial alterations to the following utilities:				
a. Power or natural gas?	☐	☐	☒	☐
b. Communications systems?	☐	☐	☐	☒
c. Water?	☐	☐	☐	☒
d. Sewer or septic tanks?	☐	☐	☒	☐
e. Storm water drainage?	☐	☐	☒	☐

POTENTIAL IMPACT	POTENTIAL SIGNIFICANT IMPACT	LESS THAN SIGNIFICANT IMPACT WITH MITIGATION	LESS THAN SIGNIFICANT IMPACT	NO IMPACT
16. Utilities and Service Systems. Will the proposal result in a need for new systems, or substantial alterations to the following utilities (Cont'd):				
f. Solid waste and disposal?	☐	☐	☒	☐
17. Human Health. Will the proposal result in:				
a. Creation of any health hazard or potential health hazard (excluding mental health)?	☐	☒	☐	☐
18. Aesthetics. Will the proposal result in:				
a. The obstruction of any scenic vista or view open to the public?	☐	☒	☐	☐
b. The creation of an aesthetically offensive site open to public view?	☐	☒	☐	☐
19. Recreation. Will the proposal result in:				
a. Impact upon the quality or quantity of existing recreational opportunities?	☐	☒	☐	☐
20. Archeological/Historical. Will the proposal:				
a. Result in the alteration of a significant archeological or historical site structure, object or building?	☐	☒	☐	☐
21. Mandatory Findings of Significance				
Potential to degrade: Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☒	☐	☐

POTENTIAL IMPACT	POTENTIAL SIGNIFICANT IMPACT	LESS THAN SIGNIFICANT IMPACT WITH MITIGATION	LESS THAN SIGNIFICANT IMPACT	NO IMPACT
21. Mandatory Findings of Significance				
Short-term: Does the project have the potential to achieve short-term, to the disadvantage of long-term, environmental goals? (A short-term impact on the environment is one which occurs in a relatively brief, definitive period of time, while long-term impacts will endure well into the future.)	☐	☐	☐	☒
Cumulative: Does the project have impacts which are individually limited, but cumulatively considerable? (A project may impact on two or more separate resources where the impact on each resource is relatively small, but where the effect of the total of those impacts on the environment is significant.)	☐	☒	☐	☐
Substantial adverse: Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☒	☐	☐

M.5 Discussion of Possible Environmental Impacts of Reasonably Foreseeable Compliance Methods and Mitigation Measures

As stated previously, the environmental analysis must include an analysis of the reasonably foreseeable environmental impacts of the methods of compliance and the reasonably foreseeable feasible mitigation measures relating to those impacts. This section, consisting of answers to the questions in the checklist, discusses compliance methods and mitigation measures as they pertain to the checklist.

In formulating these answers, the impacts of implementing the non-structural and structural controls listed in section M.3 were evaluated. At this time, the exact type, size, and location of non-structural and/or structural controls that might be implemented to comply with the TMDLs is unknown. This analysis considers a range of non-structural and/or structural controls that might be used, but is by no means an exhaustive list of available controls. When non-structural and/or structural controls are selected for implementation, a project-level and site-specific CEQA analysis must be performed by the responsible agency.

Potential reasonably foreseeable impacts were evaluated with respect to earth, air, water, plant life, animal life, noise, light, land use, natural resources, risk of upset, population, housing, transportation, public services, energy, utilities and services systems, human health, aesthetics, recreation, and archeological/historical concerns. Additionally, mandatory findings of significance regarding short-term, long-term, cumulative and substantial impacts were evaluated.

The evaluation considered whether the implementation and/or construction or implementation of the non-structural and/or structural controls would cause a substantial, adverse change in any of the physical conditions within the areas affected by the control. In addition, the evaluation considered environmental effects in proportion to their severity and probability of occurrence. Based on this review, we concluded that the potentially significant impacts can be mitigated to less than significant levels. Broad mitigation approaches have been identified that if employed, would reduce the potentially significant adverse impacts identified to less than significant. However, such mitigation approaches are within the responsibility and jurisdiction of other public agencies, and not the San Diego Water Board. Water Code section 13360 precludes the San Diego Water Board from dictating the manner in which responsible agencies comply with any of the San Diego Water Board's regulations or orders.

The San Diego Water Board does not engage in speculation or conjecture regarding the projects that may be implemented to comply with the TMDLs and only considers the reasonably foreseeable alternative methods of compliance, the reasonably foreseeable feasible environmental impacts of the these methods of compliance, and the reasonably foreseeable mitigation measures which would avoid or eliminate the identified impacts, all from a broad general perspective consistent with the uncertainty regarding how the TMDLs, ultimately, will be implemented. When the agencies responsible for implementing projects to comply with this TMDL determine how they will proceed, the agencies responsible for those parts of the project can and should incorporate such mitigation approaches into any subsequent projects or project approvals to reduce any potentially significant impacts to less than significant. The potential impacts and mitigation measures were identified in discussions below.

A significant effect on the environment is defined as "*a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project, including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance. A social or economic change by itself shall not be considered a significant effect on the environment. A social or economic change related to a physical change may be considered in determining whether the physical change is significant.*"[17]

A significant effect on the environment is defined in statute as "*a substantial, or potentially substantial, adverse change in the environment*"[18] where "*Environment*" is

[17] California Code of Regulations Title 14 section 15382
[18] Public Resources Code section 21068

defined as "*the physical conditions which exist within the area which will be affected by a proposed project, including air, water, minerals, flora, fauna, noise, objects of historic or aesthetic significance*."[19]

In this analysis, the level of significance was based on baseline conditions (i.e., current conditions). Short-term impacts associated with construction of structural controls were considered less than significant because the impacts due to construction activities are temporary and similar to typical capital improvement projects and maintenance activities currently performed by municipalities or dischargers. The long-term impacts associated with structural controls were considered potentially significant, but only if they could have an adverse, or potentially adverse, impact on the environment even with mitigation.

Social or economic changes related to a physical change of the environment were also considered in determining whether there would be a significant effect on the environment. However, adverse social and economic impacts alone are not significant effects on the environment.

1. Earth. a. Will the proposal result in unstable earth conditions or in changes in geologic substructure?

Answer: Less than significant with mitigation

Discussion: Reasonably foreseeable non-structural controls would not create unstable earth conditions or changes in geologic substructure because none of these controls include earth moving activities.

For structural controls, infiltration of surface runoff could potentially result in unstable earth conditions if loose or compressible soils are present, or if such structural controls were to be located where infiltrated runoff flowing as groundwater could destabilize existing slopes. These impacts can be avoided by siting infiltration type structural controls away from areas with loose or compressible soils, and away from slopes that could become destabilized by an increase in groundwater flow. Infiltration type structural controls can also be built on a small enough scale to avoid these types of impacts.

[19] Public Resources Code section 21060.5

1. Earth. b. Will the proposal result in disruptions, displacements, compaction or overcoming of the soil?

Answer: Less than significant

Discussion: Reasonably foreseeable non-structural controls would not result in disruptions, displacements, compaction or overcoming of the soil because none of these controls include earth moving activities.

Depending on the structural controls selected, the proposal may result in minor surface soil excavation or grading during construction of structural controls resulting in increased disturbance of the soil. However, the subwatersheds draining to the shoreline segments addressed in this project are located primarily within urban areas which have already undergone soil compaction and hardscaping. Standard construction techniques, including but not limited to, shoring, piling and soil stabilization can mitigate any potential short-term impacts. In addition, structural controls can be designed and sited in areas where the risk of new soil disruption is minimal. Soil disruptions, displacements, compaction, or overcoming during construction activities would be similar to typical temporary capital improvement construction and maintenance activities currently performed by municipalities, and no long-term impacts to the soil are expected.

1. Earth. c. Will the proposal result in change in topography or ground surface relief features?

Answer: Less than significant with mitigation

Discussion: Reasonably foreseeable non-structural controls would not result in change in topography or ground relief features because none of these controls include earth moving activities.

Implementation and construction of structural controls could result in some change in topography or ground surface relief features; however, most of the potential structural controls are so small that changes to topography will not be noticeable. If the dischargers construct structural controls on a scale large enough to change topography or ground relief features, then potential adverse impacts could be avoided or mitigated through siting such topographic alterations in geologically stable areas, or by installing or designing structural controls with the least amount of impact to the topography.

1. Earth d. Will the proposal result in the destruction, covering or modification of any unique geologic or physical features?

Answer: Less than significant with mitigation

Discussion: Reasonably foreseeable non-structural controls would not result in the destruction, covering or modification of any unique geologic or physical features because none of these controls include earth moving activities.

Constructing structural controls in areas where doing so would result in the destruction, covering or modification of a unique geologic or physical features is not a reasonably foreseeable alternative that dischargers would choose. Furthermore, no impact is expected because foreseeable methods of compliance, including implementation of structural controls to control bacteria, would not be of the size or scale to result in the destruction, covering or modification of any unique geologic or physical features. In the unlikely event that dischargers might install facilities on a scale that could result in the destruction, covering or modification of any unique geologic or physical features, potential impacts could be mitigated by mapping these features to avoid siting facilities in these areas.

1. Earth. e. Will the proposal result in any increase in wind or water erosion of soils, either on or off the site?

Answer: Less than significant

Discussion: Reasonably foreseeable non-structural controls would not result in increase in wind or water erosion of soils because none of the non-structural controls would result in increased stormwater discharge, or in exposing soils to erosion by wind and water.

Depending on the structural controls selected, the proposal may result in minor soil excavation during construction of structural controls. However, construction related erosion impacts will cease with the cessation of construction. Wind or water erosion of soils may occur as a potential short-term impact. On-site soil erosion during construction activities will be similar to typical temporary capital improvement projects and maintenance activities currently performed by the municipalities in urban areas. Typical established construction BMPs should be used during installation of structural controls to minimize offsite sediment runoff or deposition. Construction sites are required to retain sediment on site, both under general construction storm water WDRs and through the construction program of the applicable MS4 WDRs; both of which are already designed to minimize or eliminate erosion impacts on receiving water.

1. **Earth. f.** Will the proposal result in changes in deposition or erosion of beach sands, or changes in siltation, deposition or erosion which may modify the channel of a river or stream or the bed of the ocean or any bay, inlet or lake?

   Answer: Less than significant

Discussion: Reasonably foreseeable non-structural controls would not result in changes in deposition or erosion of beach sands, or changes in siltation, deposition or erosion which may modify the channel of a river or stream or the bed of the ocean or any bay, inlet or lake. However, non-structural controls, such as increased street sweeping, may reduce the amount of silt and sediment that is transported and deposited to the impaired shorelines.

Deposition of significant volumes of sediment to beaches occurs mostly during wet weather flows. Therefore, structural wet weather diversion and treatment controls that remove the stream's sediment load could impact deposition of sand on beaches. End of stream detention basins that capture sediment, resulting in possible changes in deposition or erosion, can be mitigated through sand replacement and importation.

1. **Earth. g**. Will the proposal result in exposure of people or property to geologic hazards, such as earthquakes, landslides, mudslides, ground failure, or similar hazards?

   Answer: Less than significant with mitigation

Discussion: Reasonably foreseeable non-structural controls would not result in exposure of people or property to geologic hazards because none of these controls would result in earth moving activities.

For structural controls, infiltration of collected stormwater could possibly result in ground failure if loose or compressible soils are present, or if such controls were to be located where introduced groundwater movements could destabilize existing slopes. This may result in landslides, mudslides, ground failure, or similar hazards. However, complying with these TMDLs using structural controls in areas where doing so, or of a size or scale that would result in exposure of people or property to such geologic hazards is unlikely when other alternatives exist. In the unlikely event that dischargers might install facilities on a scale that could result in exposure of people or property to geologic hazards, a geotechnical investigation should be prepared at the project level to ensure that structural controls are not employed in areas subject to potential geologic hazards.

2. Air. a. Will the proposal result in substantial air emissions or deterioration of ambient air quality?

Answer: Less than significant with mitigation

Discussion: Short term increases in traffic during the construction and installation of structural controls and long-term increases in traffic caused by non-structural controls and maintenance of structural controls are potential sources of air emissions that may adversely affect ambient air quality. Several mitigation measures are available to reduce potential impacts to ambient air quality due to increased traffic during short-term construction and long-term maintenance activities. Mitigation measures could include, but are not limited to, the following: 1) use of construction, maintenance, and street sweeper vehicles with lower-emission engines, 2) use of soot reduction traps or diesel particulate filters, 3) use of emulsified diesel fuel, 4) use of vacuum-assisted street sweepers to eliminate potential re-suspension of sediments during sweeping activity, 5) the design of structural devices to minimize the frequency of maintenance trips, and/or 6) proper maintenance of vehicles so they operate cleanly and efficiently.

The generation of fugitive dust and particulate matter during construction or maintenance activities could also impact ambient air quality. An operations plan for the specific construction and/or maintenance activities could be completed to address the variety of available measures to limit the ambient air quality impacts. These could include vapor barriers and moisture control to reduce transfer of particulates and dust to air.

The emission of air pollutants during short-term construction activities associated with reasonably foreseeable methods of compliance would not likely change ambient air conditions, because long-term ambient air quality would not change after short-term construction activities are completed.

Ambient air quality may change as a result of increased traffic due to an increase in street sweeping and/or maintenance activities. However, the impact to ambient air quality can be reduced by using the mitigation measures described above for street sweepers and maintenance vehicles. The potential impact to ambient air quality can be further reduced if street sweeping and/or maintenance activities are scheduled to be performed at the same time as other maintenance activities performed by the municipalities, or at times when these activities have lower impact, such as periods of low traffic activity. In any case, the number of additional vehicles expected in the watersheds due to non-structural and structural controls is not expected to increase the level of pollutants in the air compared to current conditions, because various common managerial practices are available to mitigate the adverse effects. In fact, additional street sweeping could potentially reduce the amount of dust and particulates that may be available on the streets.

2. Air. b. Will the proposal result in creation of objectionable odors?

Answer: Less than significant with mitigation

Discussion: Non-structural controls could result in the creation of objectionable odors in urbanized areas caused by exhaust from street sweepers or maintenance vehicles. Objectionable odors due to engine exhaust would be temporary and dissipate once the vehicle has passed through the area. Objectionable odors from exhaust could be reduced if gasoline or propane engines were used instead of diesel engines. Additionally, street sweepers and maintenance vehicles could be scheduled to be performed at the same time as other maintenance activities performed by the municipalities, or at times when these activities have lower impact, such as periods when there are fewer people in the area.

Construction and installation of structural controls may result in objectionable odors in the short-term due to exhaust from construction equipment and vehicles, but no more so than during typical construction activities currently performed. Structural controls may be a source of objectionable odors if structural control designs allow for water stagnation or collection of water with sulfur-containing compounds. Stormwater runoff is not likely to contain sulfur-containing compounds, but stagnant water could create objectionable odors.

Mitigation measures to eliminate odors caused by stagnation could include proper design to eliminate standing water, covers, aeration, filters, barriers, and/or odor suppressing chemical additives. Structural controls should be inspected regularly to ensure that treatment devices are not clogged, pooling water, or odorous. During maintenance, odorous sources should be uncovered for as short of a time period as possible. Structural controls should be designed to minimize stagnation of water and installed in such a way so as to increase the distance to sensitive receptors in the event of any stagnation.

2. Air. c. Will the proposal result in alteration of air movement, moisture or temperature, or any change in climate, either locally or regionally?

Answer: No impact

Discussion: Reasonably foreseeable non-structural and/or structural controls would not be of the size or scale to result in alteration of air movement, moisture or temperature, or any change in climate, either locally or regionally.

3. Water. a. Will the proposal result in changes in currents, or the course of direction or water movements, in either marine or fresh waters?

Answer: Less than significant

Discussion: Most non-structural controls will not cause changes in currents, or the course of direction or water movements, in either marine or fresh waters because most of these controls would not introduce any physical effects that could impact these characteristics. Reduction or elimination of dry weather flows caused by implementation of non-structural controls could have a physical impact due to a reduction in sediment and refuse discharge.

Structural controls may change the currents in the watersheds by diverting flow. Overland flow in these urbanized watersheds is directed primarily to storm drains. Overland flow may change depending on the structural controls installed such as infiltration trenches. If stormwater runoff flow is reduced, these changes would reduce the potential for erosion.

3. Water. b. Will the proposal result in changes in absorption rates, drainage patterns, or the rate and amount of surface water runoff?

Answer: Less than significant

Discussion: Non-structural controls would not result in changes in absorption rates, drainage patterns, or the rate and amount of surface water runoff because none of these controls would introduce any physical effects that could impact these characteristics.

Depending on the structural controls selected, absorption rates, drainage patterns, and surface water runoff may change. Grading and excavation during construction and installation of structural controls could result in alterations in absorption rates, drainage patterns, and surface water runoff. Several types of structural controls collect and/or inhibit surface runoff flow, which would likely alter drainage patterns, and also decrease the rate and amount of surface runoff. For example, structural controls such as buffer strips would change drainage patterns by increasing absorption rates, which would reduce the amount of surface runoff. If surface runoff is diverted to wastewater collection system and treatment facilities, thereby reducing the overall flow, the erosion and scour that would normally be caused by surface runoff would be reduced. The amount of flow within the stream channel may change; however, the channelized drainage pattern would remain essentially unchanged.

3. Water. c. Will the proposal result in alterations to the course of flow of flood waters?

Answer: Less than significant with mitigation

Discussion: Reasonably foreseeable non-structural controls are unlikely to result in alterations to the course of flow of flood waters because none of the controls would introduce any physical effects that could impact these characteristics.

The course of flow of flood waters may change depending on the structural controls selected. Structural controls, such as sand filters, could reduce a storm drain's ability to convey flood waters. This can be mitigated through proper design (including flood water bypass systems), sizing, and maintenance of these types of structural controls. Other structural controls, such as sewer diversions, detention basins or infiltration basins, could alter the volume of flood waters by diverting a portion of the flood waters, but these controls are unlikely to alter the course of flood waters.

3. Water. d. Will the proposal result in change in the amount of surface water in any water body?

Answer: Less than significant

Discussion: Implementation of non-structural controls could result in a reduction in the amount of dry weather surface water in the watersheds. Because the reduction of nuisance flows would return the watersheds to a more natural, predevelopment condition, this impact is considered less than significant.

Depending on the structural controls selected, surface runoff may be retained and/or diverted for groundwater infiltration and/or reused. Water that is retained or diverted would not flow into creek and stream channels or storm drains. Because the surface water runoff to the creeks would be reduced, the adverse effects of channel scour and erosion of the creeks would also be reduced.

3. Water. e. Will the proposal result in discharge to surface waters, or in any alteration of surface water quality, including but not limited to temperature, dissolved oxygen, or turbidity?

Answer: Less than significant with mitigation

Discussion: Non-structural and/or structural controls would not result in any additional discharge to surface waters. Depending on the structural controls

selected, the current amount of surface runoff discharged to surface waters may actually be reduced if diverted for groundwater infiltration, reuse, or to wastewater collection system and treatment facilities.

During wet weather discharges, certain structural controls (including detention basins, infiltration basins, and sand filters) would reduce turbidity and increase dissolved oxygen, because these controls would remove sediment and bioavailable oxygen demanding substances from the surface water. However, reduced turbidity, and increased dissolved oxygen does not typically result in an adverse effect on the environment.

Onsite facilities may be employed for treatment of dry weather or storm flows that use oxidizing agents such as ozone for disinfection, which can result in decreased bacteria loads. If not used properly, use of these technologies can result in adverse alteration of surface water quality because of the production of disinfection by-products. For example, if a surface water has significant concentrations of bromide, reaction with ozone can cause the formation of brominated by-products that can cause both immediate and delayed toxicity to marine organisms even after relatively short periods of ozonation.[20] Mitigation measures could include removal of bromide before contact with ozone occurs, or not using this treatment method where high concentrations of bromide are present.

A reduction of dry weather discharges (i.e., a cessation or reduction in nuisance flows) would result in a reduction of overall surface runoff flow during the dry season. This could result in a water temperature increase, and a decrease of dissolved oxygen in dry weather pools.

3. Water. f. Will the proposal result in alteration of the direction or rate of flow of groundwaters?

Answer: Less than significant with mitigation

Discussion: Non-structural controls would not result in alteration of the direction or rate of flow of groundwaters because none of the controls would introduce any physical effects that could impact these characteristics.

Over the long term, infiltration of stormwater runoff via infiltration type structural controls such as vegetative strips could significantly alter the direction or rate of flow of groundwater. This could result in unstable earth conditions if such controls were to be located where infiltrated stormwater flowing as groundwater could destabilize existing slopes. As discussed in the answer to question 1.a, these impacts can be

[20] William Cooper et al. 2002. Final Report. *Ozone, seawater, and aquatic nonindigenous species: Testing a full-scale ozone ballast water treatment system on an American oil tanker*.

avoided by siting infiltration type structural controls away from areas with loose or compressible soils, and away from slopes that could become destabilized by an increase in groundwater flow. Infiltration type structural controls can also be built on a small enough scale to avoid these types of impacts. In the unlikely event that dischargers might install facilities on a scale that could result in unstable earth conditions, potential impacts could be avoided through proper groundwater investigations, siting, design, and groundwater level monitoring to ensure that structural controls are not employed in areas where slopes could become destabilized.

3. Water. g. Change in the quantity or quality of groundwaters, either through direct additions or withdrawals, or through interception of an aquifer by cuts or excavations?

Answer: Less than significant with mitigation

Discussion: Non-structural controls will not change the quantity or quality of groundwaters because none of these controls would introduce any physical effects that could impact these characteristics.

Infiltration type structural controls such as infiltration trenches may increase the quantity and degrade the quality of groundwaters. The increase in quantity is unlikely to have any adverse effects since, under pre-development conditions, infiltration rates of stormwater runoff to groundwater were most likely much higher than they are today due to the absence of hardscapes. However, as discussed in question 3.f above, increased infiltration of stormwater near steep slopes, such as canyon walls, could potentially destabilize these slopes by saturating the soils, making them more prone to sliding. Mitigation could include not siting large infiltration structural controls near canyon walls or other steep slopes.

In addition to bacteria, stormwater also contains dissolved pollutants such as nutrients, metals, pesticides, hydrocarbons, oil and grease. However, infiltration based structural controls are not expected to degrade groundwater with respect to these pollutants for the following reasons.

Ambient nitrogen and phosphorus concentrations in groundwater are likely higher than nutrient concentrations in stormwater due to decades of over application of fertilizers on domestic and commercial landscapes, and deep percolation of applied irrigation water. Nonetheless, if stormwater nutrient concentrations are higher than ambient concentrations in the groundwater, mitigation could include education and outreach to homes and business to better manage fertilizer use. Phytoremediation can also be used to remove nutrients from stormwater runoff.

Bacteria and metals in stormwater runoff are not expected to degrade groundwater quality since they tend to adsorb to clay and organic particles in the soil. Likewise,

oil and grease would become bound up in the soil and remain nearer to the surface due to lower densities. Pesticides and hydrocarbons are not expected to degrade groundwater quality because natural bacteria in the soil and groundwater tend to break down pesticides.

3. Water. h. Will the proposal result in substantial reduction in the amount of water otherwise available for public water supplies?

Answer: No impact

Discussion: Reasonably foreseeable non-structural and/or structural controls will not reduce public water supplies because most of the public water supplies for the watersheds included in these TMDLs are imported from outside the region.

3. Water. i. Will the proposal result in exposure of people or property to water related hazards such as flooding or tidal waves?

Answer: Less than significant with mitigation

Discussion: Reasonably foreseeable non-structural controls would not result in exposure of people or property to water related hazards such as flooding or tidal waves because none of these controls would introduce any physical effects that could impact these characteristics.

Installation of structural controls that are not properly designed and constructed to allow for bypass of stormwater during storms that exceed design capacity can cause flooding. However, this potential impact can be mitigated through proper design and maintenance of structural controls. Any modifications to the watershed hydrology should be modeled and accounted for in the design of structural controls.

4. Plant Life. a. Will the proposal result in change in the diversity of species, or number of any species of plants (including trees, shrubs, grass, crops, microflora and aquatic plants)?

Answer: Less than significant

Discussion: Implementing non-structural controls will not directly result in change in the diversity of species, or number of any species of plants (including trees, shrubs, grass, crops, microflora and aquatic plants) because most of these controls would not introduce any physical effects that could impact these characteristics.

However, the reduction or elimination of nuisance flows could result in a change in the diversity of species, or number of any species of plants, especially in the dry weather season. No adverse impacts are expected because the elimination of nuisance flows would return the dry weather flows to a more natural, pre-development condition. This in turn would facilitate the return of the plant community to a more natural, pre-development condition and could impede the propagation of water-loving non-native and invasive plant species. Impeding the propagation of invasive species is not an adverse impact. Additionally, because these watersheds are located within urbanized areas, the diversity of species, or number of any species of plants is more dependent on anthropogenic activities rather than natural propogation.

The installation of structural controls such as vegetated swales or buffer strips could increase the diversity or number of plant species. During storm events, structural controls could also divert, reduce, and/or eliminate surface water runoff discharge, which may reduce the number and/or diversity of plant species dependent on such flows. However, surface runoff rates were most likely much lower than they are today due to the absence of hardscapes, and structural controls such as vegetated swales and buffer strips would likely restore surface runoff flows closer to more natural, pre-development conditions.

4. Plant life. b. Will the proposal result in reduction of the numbers of any unique, rare or endangered species of plants?

Answer: Less than significant with mitigation

Discussion: Implementing non-structural controls will not directly result in a reduction of the numbers of any unique, rare, or endangered species of plants because these controls will not affect the habitat of any unique, rare, or endangered species of plants.

Depending on the type of discharge and/or structural controls selected, direct or indirect impacts to special-status plant species may occur during and after the waste discharge and/or construction of structural controls. However, when the specific projects are developed and sites identified, a focused protocol plant survey and/or a search of the California Natural Diversity Database should be performed to confirm that any potentially sensitive or special status plant species in the site area are properly identified and protected as necessary. If sensitive plant species occur on the project site, mitigation is required in accordance with the Endangered Species Act. Mitigation measures should be developed in consultation with the California Department of Fish and Game (CDFG) and the United States Fish and Wildlife Service (USFWS). Therefore, responsible agencies should avoid installing structural coontrols that could result in reduction of the numbers of unique, rare or endangered

species of plants, and instead opt for non-structural controls and/or identify and install structural controls in areas that will not reduce the numbers of such plants.

4. Plant life. c. Will the proposal result in introduction of new species of plants into an area, or in a barrier to the normal replenishment of existing species?

Answer: Less than significant with mitigation

Discussion: Implementing non-structural controls will not result in introduction of new species of plants into an area, or in a barrier to the normal replenishment of existing species because most of the controls would not introduce any physical effects that could impact these characteristics. However, the reduction or elimination of nuisance flows could result in the introduction of new species of plants into an area, or in a barrier to the normal replenishment of existing species especially in the dry weather season. However, no adverse impacts are expected as discussed in the answer to question 4.a.

For structural controls that may include the use of plants, such as vegetated swales or buffer strips, new species of plants may possibly be introduced into the area. However, in cases where plants or landscaping is incorporated into the specific project design, the possibility of disruption of resident native species could be avoided or minimized by using only plants native to the area. The use of exotic invasive species or other plants listed in the Exotic Pest Plant of Greatest Ecological Concern in California (1999, California Invasive Plant Council, as amended) should be prohibited

4. Plant life. d. Will the proposal result in reduction in acreage of any agricultural crop?

Answer: No impact

Discussion: Reasonably foreseeable non-structural and/or structural controls are not expected to result in a reduction in acreage of agricultural crops because the subwatersheds addressed in these TMDLs do not include agricultural land uses.

5. Animal Life. a. Will the proposal result in change in the diversity of species, or numbers of any species of animals (birds, land animals including reptiles, fish and shellfish, benthic organisms, insects or microfauna)?

Answer: Less than significant

Discussion: Implementing non-structural controls will not directly result in change in the diversity of species, or numbers of any species of animals (birds, land animals including reptiles, fish and shellfish, benthic organisms, insects or microfauna) because the controls would not introduce any physical effects that could impact these characteristics. However, the reduction or elimination of nuisance flows could result in change in the diversity of species, or numbers of any species of animals, due to a reduction of dry weather flows that could eliminate habitats dependant on those flows. However, this would return dry weather flows in the watersheds to a more natural, pre-development condition as discussed in the answer to question 4.a. Animal species that thrive in the absence of nuisance flows should not be adversely impacted by habitat changes if the flows are eliminated. Impeding the propagation of invasive species is not an adverse impact.

The installation of structural controls such as vegetated swales or buffer strips could increase the diversity or number of animal species by providing habitat. Structural controls could also divert, or reduce storm water runoff discharge, which could decrease the number and/or diversity of animal species by eliminating habitat dependant on those flows. However, native communities of animals can thrive under lower streamflow conditions than what currently exist.

5. Animal Life. b. Will the proposal result in reduction of the numbers of any unique, rare or endangered species of animals?

Answer: Less than significant with mitigation

Discussion: Implementing non-structural controls will not result in a reduction of the numbers of unique, rare or endangered species of animals because these controls will not cause a reduction in habitat for unique, rare, or endangered animals.

Depending on the type of discharge and/or structural controls selected, direct or indirect impacts to special-status animal species may occur during and after construction. Special-status species may be present in these watersheds. If special status species are present during activities such as ground disturbance, construction, operation and maintenance activities associated with the potential projects, direct impacts to special status species could result including the following:

- Direct loss of a special status species
- Increased human disturbance in previously undisturbed habitats
- Mortality by construction or other human-related activity
- Impairing essential behavioral activities, such as breeding, feeding or shelter/refuge
- Destruction or abandonment of active nest(s)/den sites
- Direct loss of occupied habitat

In addition, potential indirect impacts may include but are not limited to, the following:

- Displacement of wildlife by construction activities
- Disturbance in essential behavioral activities due to an increase in ambient noise levels and/or artificial light from outdoor lighting around facilities

Mitigation measures, however, could be implemented to ensure that special status animals are not negatively impacted, nor their habitats diminished. For example, when the specific projects are developed and sites identified, a focus protocol animal survey and/or a search of the California Natural Diversity Database should be performed to confirm that any potentially special-status animal species in the site area are properly identified and protected as necessary.

If special-status animal species are potentially near the project site area, as required by the Endangered Species Act (ESA), two weeks prior to grading or the construction of facilities and per applicable USFWS and/or CDFG protocols, pre-construction surveys to determine the presence or absence of special-status species should be conducted. The surveys should extend an appropriate distance (buffer area) off site in accordance with USFWS and/or CDFG protocols to determine the presence or absence of any special-status species adjacent to the project site. If special-status species are present on the project site or within the buffer area, mitigation would be required under the ESA. To this extent, mitigation measures shall be developed with the USFWS and CDFG to reduce potential impacts.

5. Animal Life. c. Will the proposal result in introduction of new species of animals into an area, or in a barrier to the migration or movement of animals?

Answer: Less than significant mitigation

Discussion: Implementing non-structural controls will not result in introduction of new species of animals into an area, or in a barrier to the migration or movement of animals because the controls would not introduce any physical effects that could impact these characteristics. However, the reduction or elimination of nuisance flows could result in a barrier to the migration or movement of animals especially in

the dry weather season by eliminating habitat dependant on those flows. However, this would cause dry weather flows to return to a more natural, pre-development condition, as discussed in the answer to question 4a. Animal species that thrived in the absence of nuisance flows should not be adversely impacted by habitat changes if the flows are eliminated. Impeding the propagation of invasive species is not an adverse impact.

Implementing structural controls would not foreseeably introduce new species. Construction of reasonably foreseeable structural controls likely would not restrict wildlife movement because the sizes of structural controls are generally too small to obstruct a corridor. For terrestrial animals, corridors would be maintained regardless of stream flow since reduced flows would not provide physical barriers for these animals. In the event that any structural controls built, such as animal exclusions, that may impede some wildlife migration, fence gaps large enough to allow migrating wildlife to pass through could be included in the design.

5. Animal Life. d. Will the proposal result in deterioration to existing fish or wildlife habitat?

Answer: Less than significant with mitigation

Discussion: Implementing non-structural controls will not directly result in deterioration to existing fish or wildlife habitat as discussed in the answers to questions 4 and 5.

Depending on the structural controls selected, direct or indirect impacts to existing fish or wildlife habitat may occur. In urbanized areas, the installation of structural controls would not likely result in the deterioration of existing fish and or wildlife habitat in the immediate area of a project. Nonetheless, potential effects on fish or wildlife habitat can be minimized or eliminated by reducing the size of structural controls and limiting the encroachment and/or removal of animal habitat.

Structural controls could also divert, reduce, and/or eliminate stormwater runoff discharge, which would no longer reach the receiving waters at the impaired shoreline segment. These discharges are not expected to change the fish and wildlife habitat at the shorelines due to the relatively insignificant amount of discharge compared to the volume of the receiving waters.

6. Noise. a. Will the proposal result in increases in existing noise levels?

Answer: Less than significant with mitigation

Discussion: Non-structural controls could result in increases in existing noise levels due to increased traffic from street sweepers and/or maintenance vehicles which may increase the noise level temporarily as the vehicles pass through an area. However, the increase in noise levels would be no greater than typical infrastructure maintenance activities currently performed by municipalities and is therefore, less than significant.

The construction and installation of structural controls would result in temporary increases in existing noise levels, but this would be short term and only exist until construction is completed. Therefore, this noise impact is less than significant for humans. For some special status wildlife species, however, even temporary increases in noise levels could result in significant impacts. For example, special status birds might abandon nesting sites in response to the stress of noise impacts. Mitigation measures for increased noise levels that adversely affect rare and endangered species are discussed under question 5 b.

The noise associated with the construction and installation of structural controls would be the same as typical construction activities in urbanized areas, such as ordinary road and infrastructure maintenance and building activities. Contractors and equipment manufacturers have been addressing noise problems for many years and through design improvements, technological advances, and a better understanding of how to minimize exposures to noise, noise effects can be minimized. An operations plan for the specific construction and/or maintenance activities could be prepared to identify the variety of available measures to limit the impacts from noise to adjacent homes and businesses.

Severe noise levels could be mitigated by implementing commonly-used noise abatement procedures, such as sound barriers, mufflers, and limiting construction and maintenance activities to times when these activities have lower impact, such as periods when there are fewer people near the construction area. Applicable and appropriate mitigation measures could be evaluated when specific projects are determined, depending upon proximity of construction activities to receptors.

6. Noise. b. Will the proposal result in exposure of people to severe noise levels?

Answer: Less than significant

Discussion: Non-structural controls would not result in increases in exposure of people to severe noise levels because none of these controls would introduce any physical effects that could impact this characteristic. Increased traffic from street sweepers and/or maintenance vehicles may increase the noise level temporarily as the vehicles pass through an area, but these levels will not be severe.

There is the possibility that severe noise levels could be emitted during construction activities. The increase in noise levels could be mitigated by implementing commonly-used noise abatement procedures, such as sound barriers, mufflers, and limiting construction and maintenance activities to times when these activities have lower impact, such as periods when there are fewer people in the area. Applicable and appropriate mitigation measures should be evaluated when specific projects are determined, depending upon proximity of construction activities to receptors.

7. Light and Glare. Will the proposal produce new light or glare?

Answer: Less than significant with mitigation

Discussion: Non-structural controls will not produce new light or glare because none of the BMPs would introduce any physical effects that could impact light and glare.

The construction and installation of structural controls could potentially be performed during evening or night time hours. If this scenario were to occur, night time lighting would be required to perform the work. Also, lighting could possibly be used to increase safety around structural controls. If temporary artificial lighting is required for construction purposes, this could be stressful for some rare and endangered species. For example, special status birds might abandon nesting sites in response to the stress of light and glare impacts. Mitigation measures for artificial light or glare that adversely affect rare and endangered species are discussed under question 5 b.

In the unlikely event that construction is performed during night time hours, a lighting plan should be prepared to include mitigation measures. Mitigation measures can include shielding on all light fixtures, and limiting light trespass and glare through the use of directional lighting methods. Other potential mitigation measures may include using screening and low-impact lighting, performing construction during daylight

hours, or designing security measures for installed structural controls that do not require night lighting.

8. Land Use. Will the proposal result in substantial alteration of the present or planned land use of an area?

Answer: Less than significant

Discussion: Non-structural controls will not result in alteration of the present or planned land use of an area because none of the controls would introduce any physical effects that could impact land uses.

Implementation of structural controls may potentially cause minor alterations in present or planned land use of an area. However, municipalities are not required or expected to change present or planned land uses to comply with the TMDLs, and are encouraged to seek alternatives that would have the lowest impact on the land use and the environment. Potential conflicts between complying with the TMDLs and other land uses can be resolved by standard planning efforts under which specific projects are reviewed by local planning agencies. Applicable and appropriate mitigation measures could be evaluated when specific projects are determined, and a cost-benefit analysis of proposed compliance alternatives should be performed.

More reasonable alternatives should be evaluated and implemented, such as non-structural controls and low impact and/or small scale structural controls, before considering an alternative that would create considerable hardship for the community in the area.

9. Natural Resources. a. Will the proposal result in increase in the rate of use of any natural resources?

Answer: No impact

Discussion: Non-structural and/or structural controls will not increase the rate of use of any natural resources. Implementation of non-structural and/or structural controls should not require quarrying, mining, dredging, or extraction of locally important mineral resources. Operation of street sweepers, construction, and maintenance vehicles could increase the use of fossil fuels, and some types of equipment used in structural controls may consume electricity to operate pumps, etc. However, the relative amounts of additional fossil fuel and electricity that might be used would fall well within the capacity and expectations of the region's normal rate of use of natural resources. The additional use of fossil fuels and electricity

could be offset and reduced if dischargers used alternative fuels and/or renewable energies to power their vehicles and equipment.

9. Natural Resources. b. Will the proposal result in substantial depletion of any non-renewable natural resource?

Answer: No impact

Discussion Non-structural and/or structural controls will not substantially deplete any non-renewable natural resource. Operation of street sweepers, construction, and maintenance vehicles could increase the use of fossil fuels, and some types equipment used in structural controls may consume electricity to operate pumps, etc. However, the relative amounts of additional fossil fuel and electricity that might be used would fall well within the capacity and expectations of the region's energy supply and natural resources. The additional use of fossil fuels and electricity could be offset and reduced if dischargers used alternative fuels and/or renewable energies to power their vehicles and equipment.

10. Risk of Upset. Will the proposal involve a risk of an explosion or the release of hazardous substances (including, but not limited to: oil, pesticides, chemicals or radiation) in the event of an accident or upset conditions?

Answer: Less than significant

Discussion: Non-structural and structural controls will not involve a risk of an explosion or the release of hazardous substances (including, but not limited to: oil, pesticides, chemicals or radiation) in the event of an accident or upset conditions. The reasonably foreseeable non-structural and structural controls included in this evaluation would not be subject to explosion or the release of hazardous substances in the event of an accident because these types of substances would not be present. There is the possibility that hazardous materials (e.g., paint, oil, gasoline) may be present during construction and installation activities, but potential risks of exposure can be mitigated with proper handling and storage procedures. All risks of exposure would be short term and would be eliminated with the completion of construction and installation activities.

11. Population. Will the proposal alter the location, distribution, density, or growth rate of the human population of an area?

Answer: Less than significant

Discussion: Non-structural controls will not alter the location, distribution, density, or growth rate of the human population of an area because none of the controls would introduce any physical effects that could impact these characteristics.

Implementation of structural controls may potentially alter the location, distribution, density, or growth rate of the human population of an area. However, dischargers are not required or expected to change present or planned land uses to comply with the TMDLs, and dischargers are encouraged to seek alternatives that would have the lowest impact on the existing and planned population of an area. Potential conflicts between complying with the TMDLs and planned growth can be resolved by standard planning efforts under which specific projects are reviewed by local planning agencies. Applicable and appropriate mitigation measures could be evaluated when specific projects are determined.

More reasonable alternatives should be evaluated and implemented, such as non-structural controls and low impact and/or small scale structural controls, before considering an alternative that would create the need to relocate the population of parts of the watersheds.

12. Housing. Will the proposal affect existing housing, or create a demand for additional housing?

Answer: Less than significant

Discussion: Non-structural controls will not affect existing housing, or create a demand for additional housing because none of these controls would introduce any physical effects that could impact housing.

Implementation of structural controls may potentially affect existing housing. However, dischargers are not required or expected to change present or planned land uses to comply with the TMDLs, and dischargers are encouraged to seek alternatives that would have the lowest impact on land use and the environment. Potential conflicts between complying with the TMDLs and other land uses can be resolved by standard planning efforts under which specific projects are reviewed by local planning agencies. Applicable and appropriate mitigation measures could be evaluated when specific projects are determined.

More reasonable alternatives should be evaluated and implemented, such as non-structural controls and low impact and/or small scale structural controls, before considering an alternative that would create considerable hardship for the community in the area.

13. Transportation/Circulation. a. Will the proposal result in generation of substantial additional vehicular movement?

Answer: Less than signficant

Discussion: Non-structural and/or structural controls will not result in generation of substantial additional long-term vehicular movement. There may be additional vehicular movement during construction of structural controls and during street sweeping and/or maintenance activities. However, vehicular movement during construction would be temporary, and vehicular movement during street sweeping and/or maintenance activities would be periodic and only as the vehicle passes through the area. This may generate minor additional vehicular movement. However, no long-term impacts are expected because any increase in maintenance vehicular activities would fall well within the present day activities in any municipality..

In order to reduce the impact of short-term construction traffic, a construction traffic management plan could be prepared for traffic control during any street closure, detour, or other disruption to traffic circulation. The plan could identify the routes that construction vehicles would use to access the site, hours of construction traffic, and traffic controls and detours. The plan could also include plans for temporary traffic control, temporary signage and stripping, location points for ingress and egress of construction vehicles, staging areas, and timing of construction activity which appropriately limits hours during which large construction equipment may be brought on or off site.

The potential impact to vehicular movement can be reduced if street sweeping and/or maintenance activities are scheduled to be performed at the same time as other maintenance activities performed by municipalities, or at times when these activities have lower impact, such as periods of low traffic activity.

13. Transportation/Circulation. b. Effects on existing parking facilities, or demand for new parking?

Answer: Less than significant with mitigation

Discussion: Non-structural controls may affect existing parking facilities, or create demand for new parking structures, if increased street sweeping and/or maintenance is implemented in areas with parking along roadsides. Available parking in an area could be reduced during certain times of the day, week, and/or month, depending on frequency of street sweeping and/or maintenance events. Street sweeping and maintenance events should be scheduled to be performed at the same time as other maintenance activities performed by the municipalities, and/or at times when these activities have lower impact, such as periods of low traffic activity and parking demand.

Depending on the structural controls selected, alterations to existing parking facilities may occur to incorporate structural controls. This could reduce available parking in an area. However, structural controls can be designed to accommodate space constraints or be placed under parking spaces and do not have to occupy space in existing parking facilities. Available parking spaces can be reconfigured to provide equivalent number of spaces or provide functionally similar parcels for use as offsite parking to reduce potential impacts.

13. Transportation/Circulation. c. Will the proposal result in substantial impacts upon existing transportation systems?

Answer: Less than significant

Discussion: Non-structural controls will not result in significant impacts upon existing transportation systems. The only foreseeable impact would come from increased street sweeping, however long-term impacts are unlikely because any increase in maintenance vehicular activities would fall well within the present day activities in any municipality, and would therefore not qualify as substantial.

Depending on the structural controls selected, temporary alterations to existing transportation systems may be required during construction and installation activities. The potential impacts would be limited and short-term. Potential impacts could be reduced by limiting or restricting hours of construction so as to avoid peak traffic times and by providing temporary traffic signals and flagging to facilitate traffic movement.

13. Transportation/Circulation. d. Will the proposal result in alterations to present patterns of circulation or movement of people and/or goods?

Answer: Less than significant

Discussion: Non-structural controls will not result in alterations to present patterns of circulation or movement of people and/or goods, because none of the controls, including increased street sweeping, would introduce any physical effects that could impact these characteristics. No long-term impacts are expected because any increase in maintenance vehicular activities would fall well within the present day activities in any municipality.

Depending on the structural controls selected, temporary alterations to present patterns of circulation or movement of people and/or goods may be required during construction and installation activities. The potential impacts would be limited and short-term. Potential impacts could be reduced by limiting or restricting hours of construction so as to avoid peak traffic times and by providing temporary traffic signals and flagging to facilitate traffic movement.

13. Transportation/Circulation. e. Will the proposal result in alterations to waterborne, rail or air traffic?

Answer: No impact

Discussion: Reasonably foreseeable non-structural and/or structural controls would not be of the size or scale that would result in alterations to waterborne, rail or air traffic.

13. Transportation/Circulation. f. Will the proposal result in increase in traffic hazards to motor vehicles, bicyclists or pedestrians?

Answer: Less than significant

Discussion: Non-structural controls could result in an increase in traffic hazards to motor vehicles, bicyclists or pedestrians due, for example, to increased street sweeping. However, any foreseeable impact from increased street sweeping would fall well within the present day conditions in any municipality, and would therefore not present new safety concerns.

Depending on the structural controls selected, a temporary increase in traffic hazards may occur during construction and installation activities. The specific

project impacts can be reduced and mitigated by marking, barricading, and controlling traffic flow with signals or traffic control personnel in compliance with authorized local police or California Highway Patrol requirements. These methods would be selected and implemented by responsible local agencies considering project level concerns. Standard safety measures should be employed including fencing, other physical safety structures, signage, and other physical impediments designed to promote safety and minimize pedestrian/bicyclists accidents.

14. Public Service. a. Will the proposal have an effect upon, or result in a need for new or altered governmental services in any of the following areas: Fire protection?

Answer: Less than significant

Discussion: Non-structural controls will not have an effect upon, or result in a need for new or altered fire protection services because none of the controls would introduce any physical effects that could impact this service.

During construction and installation of structural controls, temporary delays in response time of fire vehicles due to road closure/traffic congestion during construction activities may occur. However, any construction activities would be subject to applicable building and safety and fire prevention regulations and codes. The responsible agencies could notify local emergency service providers of construction activities and road closures and could coordinate with local providers to establish alternative routes and appropriate signage. In addition, an Emergency Preparedness Plan could be developed for the construction of proposed new facilities in consultation with local emergency providers to ensure that the proposed project's contribution to cumulative demand on emergency response services would not result in a need for new or altered fire protection services. Most jurisdictions have in place established procedures to ensure safe passage of emergency vehicles during periods of road maintenance, construction, or other attention to physical infrastructure. In any case, the installation of structural devices would not create any more significant impediments than such other ordinary activities

14. Public Service. b. Will the proposal have an effect upon, or result in a need for new or altered governmental services in any of the following areas: Police protection?

Answer: Less than significant

Discussion: Non-structural controls will not have an effect upon, or result in a need for new or altered police protection services because none of the controls would introduce any physical effects that could impact this service.

During construction and installation of structural controls, temporary delays in response time of police vehicles due to road closure/traffic congestion during construction activities may occur. The responsible agencies could notify local police service providers of construction activities and road closures and could coordinate with local police to establish alternative routes and traffic control during construction projects. In addition, an Emergency Preparedness Plan could be developed for the proposed new facilities in consultation with local emergency providers to ensure that the proposed project's contribution to cumulative demand on emergency response services would not result in a need for new or altered police protection services. Most jurisdictions have in place established procedures to ensure safe passage of emergency vehicles during periods of road maintenance, construction, or other attention to physical infrastructure. In any case, the installation of structural devices would not create any more significant impediments than such other ordinary activities.

14. Public Service. c. Will the proposal have an effect upon, or result in a need for new or altered governmental services in any of the following areas: Schools?

Answer: No impact

Discussion: Reasonably foreseeable non-structural and/or structural controls will not have an effect upon, or result in a need for new or altered school services because none of the controls would introduce any physical effects that could impact this service.

14. Public Service. d. Will the proposal have an effect upon, or result in a need for new or altered governmental services in any of the following areas: Parks or other recreational facilities?

Answer: No impact

Discussion: Non-structural controls will not have an effect upon, or result in a need for new or altered parks or other recreational facilities because none of the controls would introduce any physical effects that could impact parks or recreational facilities.

During construction and installation of structural controls, parks or other recreational facilities could be temporarily affected. Construction activities could potentially be performed near or within a park or recreational facilities. Potential impacts would be limited and short-term and could be avoided through siting, designing, and scheduling of construction activities.

In the unlikely event that the municipalities might install facilities on a scale that could alter a park or recreational facility, the structural controls could be designed in such a way as to be incorporated into the park or recreational facility. Additionally, should an impermeable detention basin be required, this could be constructed underground to avoid the need for new or altered parks or other recreational facilities.

14. Public Service. e. Will the proposal have an effect upon, or result in a need for new or altered governmental services in any of the following areas: maintenance of public facilities, including roads?

Answer: Less than significant with mitigation

Discussion: Non-structural controls may include additional road maintenance such as additional and/or increased street sweeping. Structural controls may require additional maintenance by dischargers to ensure proper operation. As discussed above for Questions 2, 6, and 13, additional or increased street sweeping and maintenance activities could affect air, noise, and transportation/circulation. The increase in air pollutants and noise levels would be no greater than typical street sweeping and maintenance activities currently performed by the municipalities. Street sweeping and maintenance events could be scheduled to be performed at the same time as other maintenance activities performed by the municipalities, or at times when these activities have lower impact, such as periods of low traffic activity and parking demand.

14. Public Service. f. Will the proposal have an effect upon, or result in a need for new or altered governmental services in any of the following areas: other government services?

Answer: Less than significant with mitigation

Discussion: As discussed above, non-structural and/or structural controls may include increased street sweeping and/or additional maintenance by dischargers to ensure proper operation of newly installed structural controls. However, the potential impacts to air, noise, and transportation/circulation would be no greater than typical street sweeping and maintenance activities currently performed by municipalities. Street sweeping and maintenance events could be scheduled to be performed at the same time as other maintenance activities performed by the municipalities, or at times when these activities have lower impact, such as periods of low traffic activity and parking demand.

Implementation of the TMDLs will result in the need for increased monitoring in the watersheds and to track compliance with the TMDLs. However, no effects to the environment would be expected from these monitoring activities.

15. Energy. a. Will the proposal result in use of substantial amounts of fuel or energy?

Answer: No impact

Discussion: Reasonably foreseeable non-structural and/or structural controls will not result the use of substantial amounts of fuel or energy. As discussed above for Question 9, operation of street sweepers, construction, and maintenance vehicles could increase the use of fossil fuels, and some types equipment used in structural BMPs may consume electricity to operate pumps, etc. The additional use of fossil fuels and electricity could be reduced if the dischargers used alternative fuels and/or renewable energies to power their vehicles and equipment.

15. Energy. b. Will the proposal result in a substantial increase in demand upon existing sources of energy, or require the development of new sources of energy?

Answer: No impact

Discussion: Reasonably foreseeable non-structural and/or structural controls will not result a substantial increase in demand upon existing sources of energy, or require the development of new sources of energy. As discussed for Questions 9 and 15a above, operation of street sweepers, construction, and maintenance vehicles could increase the use of fossil fuels, and some types of equipment used in structural controls may consume electricity to operate pumps, etc. The additional use of fossil fuels and electricity could be reduced if the dischargers used alternative fuels and/or renewable energies to power their vehicles and equipment.

If alternative sources of energy are used, sources of alternative energy and fuel may be needed. Equipment and components for renewable sources of energy such as solar or wind are readily available. Alternative fuels such as ethanol or biodiesel are commercially available and can be used. Sources of new energy are not required to be developed.

16. Utilities and Service Systems. a. Will the proposal result in a need for new systems, or substantial alterations to the following utilities: power or natural gas?

Answer: Less than significant

Discussion: Non-structural controls will not result in a need for new systems or alterations to power or natural gas utilities because none of the controls would introduce any physical effects that could impact these utilities.

Installation of structural controls may require alterations or installation of new power or natural gas lines. Power and natural gas lines might need to be rerouted to accommodate the addition of structural controls. The degree of alteration depends upon local system layouts which careful placement and design can minimize. However, that the installation of structural controls will result in a substantial increased need for new systems, or substantial alterations to power or natural gas utilities, is not reasonably foreseeable, because none of these controls are large enough to substantially tax current power or natural gas sources. No long term effects on the environment are expected if alterations to power or natural gas utilities are required.

16. Utilities and Service Systems. b. Will the proposal result in a need for new systems, or substantial alterations to the following utilities: communications systems?

Answer: No impact

Discussion: Reasonably foreseeable non-structural controls will not result in a need for new or substantial alterations to communications systems because none of the controls would introduce any physical effects that could impact these utilities.

New systems or alterations to communications systems are not necessarily required for structural controls. Structural controls can be manually inspected and maintained without any communications system required. However, that municipalities could install a remote monitoring system, which could include a new communications system, is possible. A telephone line or wireless communications system could be installed, which would not be a substantial alteration.

16. Utilities and Service Systems. c. Will the proposal result in a need for new systems, or substantial alterations to the following utilities: water?

Answer: No impact

Discussion: Reasonably foreseeable non-structural and/or structural controls will not result in a need for new or substantial alterations to water lines. The need for new municipal or recycled water to implement these TMDLs is not foreseeable.

16. Utilities and Service Systems. d. Will the proposal result in a need for new systems, or substantial alterations to the following utilities: Sewer or septic tanks?

Answer: Less than significant

Discussion: Non-structural and/or structural controls will not result in a need for new systems or alterations to sewer or septic tanks because none of the controls would introduce any physical effects that could impact these utilities.

Depending on the structural controls selected, a portion or all of the surface water runoff may be diverted to wastewater collection system and treatment facilities. If stormwater is diverted for treatment at a wastewater collection system and treatment facility, new connections to existing sanitary sewer lines may be required, but no new major sewer trunks or substantial alterations to sewer system would be expected because controls utilizing the sewer would likely contribute small amounts of first flush storm water. Any environmental affects from associated construction activities would be small scale and short-term and similar to typical municipal capital improvement projects.

16. Utilities and Service Systems. e. Will the proposal result in a need for new systems, or substantial alterations to the following utilities: storm water drainage?

Answer: Less than significant

Discussion: Non-structural controls will not result in a need for new systems, or substantial alterations to stormwater drainage systems because none of the controls would introduce any physical effects that could impact these utilities.

In order to achieve compliance with the TMDLs, the stormwater drainage systems may need to be reconfigured and/or retrofitted with structural controls to capture and/or treat a portion or all of the stormwater runoff. The alterations and/or additions

to stormwater drainage systems will depend on the compliance strategy selected by each discharger at each location where structural controls might be installed. Impacts from construction activities to retrofit or reconfigure the storm drain system as part of installation, and mitigation measures have been considered and discussed in the previous responses to the questions.

16. Utilities and Service Systems. f. Will the proposal result in a need for new systems, or substantial alterations to the following utilities: solid waste and disposal?

Answer: Less than significant

Discussion: Most non-structural controls will not result in a need for new systems, or substantial alterations to the solid waste and disposal systems because none of the controls would introduce any physical effects that could impact these utilities. In urbanized areas, increased street sweeping would generate additional solid waste, but this additional waste is not expected to exceed the maintenance capacity of normal city operations. No new solid waste or disposal systems would be expected.

The installation of structural controls may generate construction debris. Additionally, installed structural controls may collect sediment and solid wastes that will require disposal. However, no new solid waste or disposal systems would be needed to handle the relatively small volume generated by these projects. Construction debris may be recycled at aggregate recycling centers or disposed of at landfills. Sediment and solid wastes that may be collected can be disposed of at appropriate landfill and/or disposal facilities.

17. Human Health. a. Will the proposal result in creation of, and exposure of people to, any health hazard or potential health hazard (excluding mental health)?

Answer: Less than significant with mitigation

Discussion: As discussed above for Questions 2 and 13, non-structural controls such as street sweeping and maintenance vehicles could have an effect on air and transportation/circulation. Non-structural controls could increase the amount of pollutants emitted into the atmosphere above ambient conditions. Non-structural controls could also increase traffic, which could potentially decrease the safety of pedestrians. In both cases, potential impacts can be reduced or eliminated if street sweeping and/or maintenance activities are scheduled to be performed at the same time as other maintenance activities performed by the dischargers, or at times when these activities have lower impact, such as periods of low traffic activity.

As discussed above for questions 1, 2, 3, 5, and 13, the installation of structural controls could have an effect on earth, air, water, animal life, and transportation/circulation. Structural controls could increase the risk of unstable earth conditions, which could pose a physical risk to persons in the area should a slope fail. Construction, installation, and maintenance of structural controls could increase the amount of pollutants the air, which could have an effect on health. Structural controls could potentially result in additional habitat and/or standing water which can attract pests, such as flies, mosquitoes and/or rodents, which can be carriers of disease. Maintenance of structural controls could also increase traffic, which could potentially decrease the safety of pedestrians. Additionally, heavy machinery and materials that may be used during construction and installation of structural controls could pose physical and/or chemical risks to human health.

Potential impacts to earth could be avoided or mitigated through proper geotechnical investigations, siting, design, and ground and groundwater level monitoring to ensure that structural controls are not employed in areas subject to unstable soil conditions. Potential health hazards attributed to installation and maintenance of structural controls can be mitigated by use of OSHA construction and maintenance health and safety guidelines. Potential health hazards attributed to maintenance activities can be mitigated through OSHA industrial hygiene guidelines. Installation of non-vector producing structural controls can help mitigate vector production from standing water. Netting can be installed over structural controls to further mitigate vector production. Structural controls can be designed and sites can be properly protected to prevent accidental health hazards as well as prevent vector production. Vector control agencies may also be employed as another source of mitigation. Structural controls prone to standing water can be selectively installed away from high-density areas and away from residential housing and/or by requiring oversight and treatment of those systems by vector control agencies. Potential impacts to transportation/circulation can be reduced or eliminated if maintenance activities are scheduled to be performed at the same time as other maintenance activities performed by the municipalities, or at times when these activities have lower impact, such as periods of low traffic activity. Appropriate planning, design, siting, and implementation can reduce or eliminate potential health hazards due to the installation of structural controls.

18. Aesthetics. a. Will the proposal result in the obstruction of any scenic vista or view open to the public?

Answer: Less than significant with mitigation

Discussion: Non-structural controls will not result in the obstruction of any scenic vista or view open to the public because none of the controls would introduce any physical effects that could impact this characteristic.

That dischargers would comply with this TMDL by installing structural controls that would adversely affect a scenic vista or view open to the public is not reasonably foreseeable. Most structural controls that will likely be used can be constructed as subsurface devices, such as sand filters. Once completed, structural controls would not foreseeably obstruct scenic vistas or open views to the public. In the unlikely event that the dischargers might install facilities on a scale that could obstruct scenic views, such impacts could be reduced or eliminated with appropriate planning, design, and siting of the structural controls. Additionally, many structural controls can, if necessary, be constructed underground to eliminate aesthetic issues

18. Aesthetics. b. Will the proposal result in the creation of an aesthetically offensive site open to public view?

Answer: Less than significant with mitigation

Discussion: Non-structural controls will not result in the creation of an aesthetically offensive site open to public view because none of the controls would introduce any physical effects that could impact this characteristic.

The installation of structural controls could potentially create an aesthetically offensive site open to public view. Structural controls may create an aesthetically offensive site to the public during construction and installation, but this would be temporary until construction is completed. Once installation of the structural controls is complete, the site may continue to be aesthetically offensive to the public. However, many structural controls can be designed to provide wildlife habitat, recreational areas, and green spaces in addition to improving stormwater quality. Appropriate architectural and landscape design practices can be implemented to reduce adverse aesthetic effects. Screening and landscaping may also be used to mitigate adverse aesthetic effects. The adverse aesthetic effects could be reduced or eliminated and possibly improved with appropriate planning and design of the structural controls. Additionally, many structural controls can, if necessary, be constructed underground to eliminate aesthetic issues.

19. Recreation a. Will the proposal result in impact on the quality or quantity of existing recreational opportunities?

Answer: Less than significant with mitigation

Discussion: Non-structural controls will not result in impact on the quality or quantity of existing recreational opportunities because none of the controls would introduce any physical effects that could impact these characteristics.

During construction and installation of structural controls, parks or other recreational areas could be temporarily affected. Construction activities could potentially be performed near or within a park or recreational area. Potential impacts would be limited and short-term, and could be avoided through proper siting, design, and scheduling of construction activities.

In the event that the municipalities might install facilities on a scale that could alter a park or recreational area, the structural controls could be designed in such a way as to be incorporated into the park or recreational area. Additionally, any structural controls can, if necessary, be constructed underground to minimize impacts on the quality or quantity of existing recreational opportunities. Mitigation to replace lost areas may include the creation of new open space recreation areas and/or improved access to existing open space recreation areas.

Additionally, improvement of water quality could create new recreation opportunities in urbanized areas of the watersheds by providing the opportunity to recreate in and near a clean water body with a robust and diverse population of plants and animals.

20. Archeological/Historical a. Will the proposal result in the alteration of a significant archeological or historical site, structure, object or building?

Answer: Less than significant with mitigation

Discussion: Non-structural controls will not result in the alteration of a significant archeological or historical site, structure, object or building because none of the controls would introduce any physical effects that could impact these characteristics.

In the unlikely event that dischargers might install facilities on a scale that could result in significant adverse effects on a significant archeological or historical site, structure, object or building, a project level, site-specific environmental assessment should be performed to identify the mitigation measures that could be employed to minimize the potential effects on archeological or historical sites and identify alternatives that could potentially be used that would have less impact. The agencies responsible for implementing this TMDL could consult the relevant local archeological or historical commissions or authorities to identify these types of sites and determine ways to avoid significant adverse impacts. The potentially adverse effects on archeological or historical sites that might be present could be reduced or eliminated with appropriate planning, design, and siting of the structural controls.

21. Mandatory Findings of Significance - Potential to degrade: Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?

Answer: Less than significant with mitigation

Discussion: Non-structural controls will not result in the substantial degradation of the environment for plant and animal species because none of the controls would introduce any physical effects that could impact these characteristics.

As discussed above in Questions 4 and 5, plant and animal species could potentially be adversely affected by the installation and operation of structural controls. Mitigation measures could be implemented to ensure that unique, rare or endangered plant and/or animal species and their habitats are not taken or destroyed. When specific projects are developed and sites identified, a focused protocol plant and/or animal survey and/or a search of the California Natural Diversity Database should be performed to confirm that any potentially sensitive or special status plant and/or animal species in the site area are properly identified and protected as necessary. If sensitive plant and/or animal species occur on the project site, mitigation is required in accordance with the Endangered Species Act. Mitigation measures should be developed in consultation with the CDFG and the USFWS. Dischargers should avoid installing structural BMPs that could adversely affect any unique, rare or endangered species of plants and/or animals, and instead opt for non-structural controls and/or identify and install structural controls that will have little or no impact such as underground structural controls.

Taken all together, the potential impacts of the project will not cause a significant cumulative impact in the environment. In any case, the implementation of this TMDL will result in improved water quality in the waters of the Region and the environment over the long term.

21. Mandatory Findings of Significance - Short-term: Does the project have the potential to achieve short-term, to the disadvantage of long-term, environmental goals? (A short-term impact on the environment is one which occurs in a relatively brief, definitive period of time, while long-term impacts will endure well into the future.)

Answer: No impact

Discussion: There are no short-term beneficial effects on the environment from the implementation of non-structural and/or structural controls that would be at the expense of long-term beneficial effects on the environment. The implementation of non-structural and/or structural controls to comply with the proposed waiver conditions will result in improved water quality in the waters of the Region and the environment over the long term.

21. Mandatory Findings of Significance - Cumulative: Does the project have impacts which are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)

Answer: Less than significant with mitigation

Discussion: Cumulative impacts, defined in section 15355 of the CEQA Guidelines, refer to two or more individual effects, that when considered together, are considerable or that increase other environmental impacts. Cumulative impact assessment must consider not only the impacts of the proposed bacteria TMDLs, but also the impacts from other TMDL, municipal, and private projects, which have occurred in the past, are presently occurring, and may occur in the future, in the watershed during the period of implementation.

Past and present projects may be regarded as the general construction (development and maintenance) which has brought several regional creeks from a natural, pristine condition, to the urban, developed setting which is present today. This provides a baseline level of construction with which to compare all water quality project requirements. The past and present baseline of construction in the urbanized watersheds will probably remain constant in the future. The increment of increased construction proposed by the cumulative requirements of all water quality requirements can be mitigated through scheduling, and is insignificant compared to the past and on-going baseline of typical municipal construction.

Present and future impacts will come from all of the water quality control programs

and pollutant load reduction projects being implemented in the watershed or planned for the near future. This includes waterbodies for which other TMDLs are to be developed, and projects to comply with the WDRs in Order Nos. R9-2007-0001 and R9-2002-0001 (the San Diego County and Orange County municipal stormwater requirements).

Cumulative impacts of these bacteria TMDLs and other water quality control programs are not expected to be significant because effective non-structural controls, that have no identified significantly adverse impacts, will most likely be an initial strategy for implementation of the bacteria TMDLs. For example, the bacteria TMDLs can be implemented through education and outreach, and enforcement of ordinances requiring pet owners to properly dispose of pet waste, ordinances prohibiting disposal of grease, food products, and other bacteria-laden waste products into the storm drain, and ordinances curbing nuisance flows into the stormdrain system. Another important bacteria load reduction program is to find and fix illegal cross-connections between the sanitary sewer system and the stormdrain system. Fixing cross connections between the storm drain and sanitary sewer systems may increase the overall number of construction projects needed in the watershed to implement TMDLs. However, estimating the number of cross-connections that might exist is purely speculative. Further, these types of construction projects are on a small scale and fall well within typical municipal capital improvement and maintenance activities. Additionally, some of these practices, such as curbing nuisance flows, will be effective at addressing other pollutants in addition to bacteria. Therefore the cumulative effects will not be considerable, and can be mitigated, if necessary, through scheduling.

The dischargers may opt to use structural controls to reduce bacteria and other pollutants to the watersheds, which would increase the likelihood of environmental effects that are cumulatively considerable. The City of San Diego funded an assessment of best management practice (BMP) strategies that would lessen the anticipated impacts and allow an integrated TMDL strategy that address both current and anticipated TMDLs in Chollas Creek. In this study,[21] the authors recommended a strategy that used a tiered approach that reduces the impact to the environment, and allows for more cost effective implementation of lower-impact BMPs. The tiered approach consists of three major components:

- Tier 1 – Control of Pollutants at the Source and Prevent Pollutants from Entering Runoff
- Tier 2 – Conduct Design Studies and Implement Aggressive Street Sweeping and Runoff and Treatment Volume Reduction BMPs
- Tier 3 – Infrastructure Intensive Treatment BMPs

Implementation of this BMP strategy, because it emphasizes BMPs with the least adverse impacts to the environment, should reduce cumulative impacts to less than

[21] Weston Solutions, 2006. *Chollas Creek TMDL Source Loading, Best Management Practices, and Monitoring Strategy Assessment,* September, 2006.

significant levels. Although this study was specific to Chollas Creek, the recommended strategy is applicable to reducing pollutants in all watersheds.

Present and future specific TMDL projects may include construction of structural controls which must be environmentally evaluated for potential cumulative impacts by the implementing municipality. Present and future specific TMDL projects and other construction activities may result in short-term cumulative impacts as described below. However, appropriate and available mitigation measures, including scheduling, are available to reduce adverse environmental impacts associated with construction to less than significant levels.

Noise and Vibration - Local residents in the near vicinity of installation and maintenance activities may be exposed to noise and possible vibration. The cumulative effects, both in terms of added noise and vibration at multiple installation sites, and in the context of other related projects, are not likely to be cumulatively considerable due to the temporary nature of noise increases and the small scale of the projects. Noise mitigation methods including scheduling of construction are discussed above, and should be used to keep cumulative noise and vibration affects to acceptable levels.

Air Quality - Implementation of the bacteria TMDL program may cause additional emissions of air pollutants and slightly elevated levels of carbon monoxide during construction activities. Emission of air pollutants resulting from installation of TMDL compliance devices may exceed certain regulatory thresholds, and therefore the TMDL, in conjunction with all other construction activity, may contribute to the region's overall exceedance of certain regulatory thresholds during the installation period. However, because these installation-related emissions are temporary, compliance with the TMDL would not result in long-term cumulatively considerable air quality impacts. Short-term impacts can be avoided through scheduling.

Transportation and Circulation - Compliance with the bacteria TMDLs could involve installation activities occurring simultaneously at a number of sites within the watersheds included in this project. Installation of bacteria reduction structural controls may occur in the same general time and space as other related or unrelated projects. In these instances, construction activities from all projects could produce cumulative traffic effects depending upon a range of factors including the specific location involved and the precise nature of the conditions created by the numerous construction activities. Special coordination efforts may be necessary to reduce the combined effects to an acceptable level. Overall, cumulatively considerable impacts are not anticipated because coordination can occur and because transportation mitigation methods are available.

Public Services - The cumulative effects on public services due to the bacteria TMDLs would be limited to traffic inconveniences. These effects are not likely to be cumulatively considerable as long as alternative traffic route are available around construction sites.

Aesthetics - Construction activities associated with other related projects may be ongoing in the vicinity of one or more bacteria TMDL construction sites. To the extent that combined construction activities do occur, there would be temporary elevated adverse visual effects. However, these effects are not cumulatively considerable in the long-term because the effects will cease with the completion of construction. Short-term impacts can be avoided through scheduling.

As analyzed above, the construction of structural controls, along with other construction and maintenance projects, could have short-term cumulative effects; however, these effects can be mitigated through proper construction scheduling. In addition, these effects are not cumulatively considerable in the long-term because the effects will cease with the completion of construction. In summary, appropriate and available mitigation measures, including scheduling, are available to reduce adverse environmental impacts associated with construction to less than significant levels.

21. Mandatory Findings of Significance - Substantial adverse: Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?

Answer: Less than significant with mitigation

Discussion: All of the potentially significant impacts to human beings, such as air quality, noise, aesthetics, alterations to utilities, fire protection, police protections etc., are either short-term in nature, or can be mitigated to acceptable levels as previously discussed.

M.5.1 Alternative Means of Compliance

The CEQA requires an analysis of reasonably foreseeable alternative means of compliance with the rule or regulation, which would avoid or eliminate the identified impacts.[22] The dischargers can use the non-structural and/or structural controls described in section D.3, or other non-structural and structural controls, to control and prevent pollution, and meet the TMDLs' required wasteload reductions. However, the non-structural and structural controls provided in section D.3 are by no means a complete and exhaustive list. The controls described in section D.3 simply provide a reasonable range of reasonably foreseeable method of compliance that may be used by the dischargers to meet the TMDLs' required load reductions.

The potential means of compliance with this TMDL Basin Plan amendment may consist of any combination of non-structural and structural controls that the dischargers might select to use. Because there are many additional controls that may be implemented, and innumerable ways to combine non-structural and/or structural controls, there are

[22] California Code of Regulations Title 14 section 15187(c)(3)

also innumerable alternative means on compliance. Therefore, all of the possible alternative means of compliance cannot be discussed here. However, because most of the adverse environmental effects are associated with the construction and installation of structural controls, in order for dischargers to avoid or eliminate potential impacts to the environment, compliance alternatives should minimize the use of structural controls, maximize the use of non-structural controls, and site, size, and design any structural controls that may be used in ways to minimize or eliminate any potential environmental effects.

M.6 Reasonably Foreseeable Methods of Compliance at Specific Sites

The San Diego Water Board analyzed various reasonably foreseeable methods of compliance at specific sites within the subject watersheds. Because this project includes multiple watersheds, the specific sites analysis was focused on reviewing potential compliance methods within various land uses. The land uses cited below correspond to the land uses that were utilized for watershed model development (the watershed models are discussed extensively in section 6 of the Technical Report and Appendix F). Land uses in this analysis include: residential, parks/recreation, commercial/institutional, and industrial/transportation. These land uses represent a range of population densities and geographical settings found in the subject watersheds.

In this discussion of potential compliance methods, the San Diego Water Board assumed that, generally speaking, the methods suitable for the control of bacteria generated from a specific land use within a given watershed are also suitable for the control of bacteria generated from the same land use category within a different watershed. For example, a method used to control the discharge of bacteria from a residential area in the Baby Beach watershed is likely suitable to control the discharge of bacteria from a residential area in the Shelter Island Shoreline Park watershed. However, in addition to land use, selection of control methods includes considering site-specific geographical factors such as average rainfall, soil type, and the amount of impervious surfaces, and non-geographical factors such as available funding. Such factors vary between watersheds. The most suitable controls for a particular site must be determined by the dischargers in a detailed, project-specific environmental analysis.

The following discussion involves a programmatic level review of specific site compliance methods, or combination of compliance methods that have been or may be implemented in the subject watersheds, as well as other BMP examples that could potentially be implemented at additional sites. The dischargers are in no way limited to using the controls included here to comply with achieve TMDL compliance, and may choose not to implement these particular BMPs.

In order to meet TMDL requirements, dischargers will determine and implement the actual compliance method(s) after a thorough analysis of the specific sites suitable for BMP implementation within each watershed. In most cases, the San Diego Water Board anticipates a potential strategy to be the use of management measures, or other

non-structural controls as a first step in controlling bacteria discharges, followed by installation of structural controls if necessary.

M.6.1 Potential Controls for Residential Areas

Residential areas in the San Diego Region tend to have the highest population densities as compared to other land use categories. Thus, residential areas have the highest potential for producing human pathogens that can contaminate surface waters. Most of the residential areas are in urbanized areas.

In order to achieve TMDL compliance, residential land use areas, like the area shown in Figure M-1, may only require non-structural controls; however, structural controls could be retrofitted, if appropriate. Potential non-structural controls at this specific site include increased street sweeping, and development and enforcement of municipal ordinances prohibiting the discharge of bacteria and nuisance flows to stormwater and stormwater drainage pathways. Other potential controls include adoption and enforcement of ordinances to pick up pet waste, and regular inspections of storm drains for cross connections with the sanitary sewers.

Potential structural controls include the installation of storm drain filter sacks, which require routine maintenance. Residential areas should be designed with vegetative strips to control the velocity of runoff, increase infiltration, and prevent pollutants from entering stormwater drainage pathways, as shown in Figure M-1.

For a complete discussion of possible adverse effects of the types of controls discussed above, see section M.5.

Figure M-1. Buffer Strips in Residential Area, Santa Clara Avenue in Dana Point within Baby Beach Watershed

M.6.2 Potential Controls for Park and Recreational Areas

Park and recreational areas typically do not have housing or industrial units, thus population densities in these areas are low. However, parks and recreational areas may have significant use as dog walking areas, and be at risk for accumulating pet wastes.

In order to achieve TMDL compliance, park and recreational areas, may only require non-structural controls to encourage responsible actions by pet owners, and efficient irrigation practices that do not result in runoff leaving the site. Potential non-structural controls at this specific site include the availability of pet waste plastic bags and garbage cans, like the examples shown in Figures M-2 and M-3. Other non-structural controls include the enforcement of pet waste ordinances (see Figure M-3). No adverse environmental effects are expected from such measures.

Many park and recreation areas are used by animals, which can be a significant source of pollution if not properly managed. Another example of non-structural controls includes education of animal owners. Animal owners should be educated about proper management of their animal's wastes. For example, as shown in Figure M-3 a sign has been posted to encourage responsible actions by dog owners. Signs could also be posted so owners of larger pets, such as horses, are educated about how to properly manage their animals and animal wastes.

Figure M-2. Plastic Bag Dispenser at Shelter Island Shoreline Park in San Diego within Shelter Island Shoreline Park Watershed.

Figure M-3. Plastic Bag Dispenser and Sign at Dana Cove Park in Dana Point within Baby Beach Watershed.

Figure M-4. Buffer Strip at Shelter Island Shoreline Park, San Diego, Shelter Island Shoreline Park Watershed.

In some cases, structural controls may be required. Park and recreation areas can also be used to treat pollutants like a vegetated swale or buffer strip, as shown above in Figure M-4. These types of areas can provide wildlife habitat, are visually pleasing, and

are successful at reducing or removing a number of pollutants from surface runoff before reaching creek and stream channels.

For a complete discussion of possible adverse effects of the types of controls discussed above, see section M.5.

M.6.3 Potential Controls for Commercial/Institutional Areas

Population densities in commercial and institutional areas vary on an hourly basis but are relatively high in these areas, compared to other land uses. Commercial and institutional areas are located primarily in urbanized areas.

A potential strategy to achieve TMDL compliance includes non-structural controls, which may be sufficient to limit bacteria discharges. Commercial businesses and keepers of school grounds should use cleaning practices that contain pollutants instead of allowing them to enter conveyance systems. For example, debris and other waste should be swept up and disposed of properly, and trash receptacles should be available and properly maintained so access to trash by people and animals is limited, as shown in Figure M-5.

Figure M-5. Trash Receptacle Storage Area behind Business on Del Prado in Dana Point within Baby Beach Watershed.

Figure M-6. Vegetative Strip around Strip Mall on Del Prado in Dana Point within Baby Beach Watershed.

Potential structural controls include the installation of vegetative strips and grassy areas as part of landscaping to control the velocity of runoff, increase infiltration, and prevent pollutants from entering stormwater drainage pathways, as shown above in Figure M-6. Another potential structural BMP that could be utilized in areas where storm drains discharge directly into receiving waters with high recreational use is a dry weather diversion, which are widely used near popular swimming beaches. Dry weather diversions are effective at reducing or removing urban runoff, or nuisance flows, from reaching receiving waters by directing them into sewer systems. These structural controls are suitable in land use categories where the specific site has similar hydrologic settings (dry weather nuisance flows discharging directly into receiving waters).

For a complete discussion of possible adverse effects of the types of controls discussed above, see section M.5.

M.6.4 Potential Controls for Industrial and Transportation Areas

Population densities in industrial and transportation areas vary depending on time of day and also day of week, but are relatively high in these areas, compared to other land uses. Industrial and transportation areas are located primarily in urbanized areas.

Several industrial parks and roadways have adjacent landscaped areas where both management areas and structural controls could be designed to help reduce bacteria discharges to surface waters. Non-structural controls can include using manure fertilizers sparingly, and efficient irrigation practices that minimize the amount of runoff leaving the site. Landscaping can be designed to capture and control the velocity of runoff, increase infiltration, and prevent pollutants from entering stormwater drainage pathways. Additionally, pervious surfaces near transportation areas often have steep

slopes. To prevent erosion and the transport of sediment and bacteria to stormwater drainage pathways, various structural controls can be used. Some examples are fiber rolls, netting, and compost blankets.

For a complete discussion of possible adverse effects of the types of controls discussed above, see section M.5.

M.7 Economic Factors

This section presents the San Diego Water Board's economic analysis of the most reasonably foreseeable methods of compliance with the Basin Plan amendment to incorporate TMDLs for bacteria indicators at the impaired shoreline segments of Baby Beach and Shelter Island Shoreline Park.

M.7.1 Legal Requirement for Economic Analysis

The San Diego Water Board must comply with CEQA when amending the Basin Plan.[23] The CEQA process requires the San Diego Water Board to analyze and disclose the potential adverse environmental impacts of a Basin Plan amendment that is being considered for approval. TMDL Basin Plan amendments typically include "performance standards."[24] TMDLs normally contain a quantifiable numeric target that interprets the applicable WQO. TMDLs also include WLAs for point sources and LAs for both nonpoint sources and natural background. The quantifiable target together with the allocations may be considered a performance standard.

CEQA has specific provisions governing the San Diego Water Board's adoption of regulations such as the regulatory provisions of Basin Plans that establish "performance standards" or treatment requirements.[25] These provisions require that the San Diego Water Board perform an environmental analysis of the reasonably foreseeable methods of compliance with the WLAs and LAs prior to the adoption of the TMDL Basin Plan amendment. The San Diego Water Board must consider the economic costs of the methods of compliance in this analysis.[26] The proposed Basin Plan amendment does not include new WQOs but implements existing objectives to protect beneficial uses. The San Diego Water Board is therefore not required to consider the factors in Water Code section 13241 (a) through (f).

The most reasonably foreseeable methods of compliance with this Basin Plan amendment is for dischargers to implement structural and non-structural controls to reduce bacteria loads in their discharges to surface waters. Additionally, dischargers

[23] Public Resources Code section 21080
[24] The term "performance standard" is defined in the rulemaking provisions of the Administrative Procedure Act (Government Code sections 11340-l 1359). A "performance standard" is a regulation that describes an objective with the criteria stated for achieving the objective. [Government Code section11342(d)].
[25] Public Resources Code sections 21159 and 21159.4
[26] See Public Resources Code section 21159(c)

will need to conduct surface water monitoring to evaluate the effectiveness of the controls they implement.

M.7.2 Project Implementation Costs

The specific controls to be implemented will be chosen by the dischargers after adoption of this TMDL Basin Plan amendment. All costs are preliminary estimates because particular elements of a control, such as type, size, and location, would need to be developed to provide a basis for more accurate cost estimations. Identifying the specific controls that dischargers will choose to implement is speculative at this time and the controls presented in this section serve only to demonstrate potential costs. Therefore, this section discloses typical costs of conventional controls for urban runoff, as well as monitoring program costs.

M.7.3 Cost Estimates of Typical Controls for Urban Runoff Discharges

Approximate costs associated with reasonably foreseeable non-structural and structural controls that might be implemented in order to comply with the requirements of this TMDL project are provided below. The controls are divided into non-structural and structural BMP classes. Cost estimates for structural BMPs cited from "*Stormwater Best Management Practice Handbook – New Development and Redevelopment. January 2003*" are for new construction costs only (CASQA, 2003). These estimates generally do not take into account retrofit of existing structures or the potential purchase on land needed for the BMP. Cost estimates provided by Caltran's *BMP Pilot Retrofit Pilot Program* were from BMPs retrofitted on existing State owned land (Caltrans, 2004). Annual maintenance costs estimates are based on a percentage of the construction cost estimate (USEPA, 1999).

<u>Non-Structural Controls</u>

Education and Outreach: Education and outreach to residents, businesses and industries can be a very effective tool. These efforts can include methods to reduce sources of pathogens like pet waste in residential areas and methods aimed at reducing excessive irrigation that will flow into the storm drain system. The cost of educational programs will vary with the scope of efforts and are estimated to range up to $210,900. Educations materials can cost from 10¢ per flyer to $1,750 for household surveys (USEPA, 1999). Because education and outreach efforts are typically a component of water quality programs, the cost to develop educational programs and materials to comply with the TMDL project requirements are expected to be less than estimated because the programs and materials addressing storm water and urban runoff related issues may already exist.

Road and Street Maintenance: Another effective BMP to prevent pollutants, trash, and organic material from entering the storm drain is proper maintenance and cleaning of the sidewalks, streets, and gutters. The largest expenditures for street sweeping programs are in staffing and equipment. The capital cost for a street sweeper is between $60,000 and $180,000 and the average useful life of a sweeper is about four to eight years (USEPA, 1999). Operation and maintenance costs are estimated to range

from $15 to $30 per curb mile. This particular BMP may prove to be more cost-effective than certain structural controls, especially in more urbanized areas with greater areas of pavement.

Illicit Connection Identification: Illicit connections of sanitary sewer line and infiltration from leaking sewer lines to the storm water drain system can be a source of pathogens in urban runoff. Identification of illegal connections can be done through visual inspection or through the use of dye and smoke tests. Visual inspection of the storm drain system can cost from $1,250 to $1,750 per square mile (USEPA, 1999).

Land Use Modifications: Land Use Modifications can be used to minimize the degradation of water resources caused by storm water run-off by directing urban growth and development away from environmentally sensitive areas and waterways. Sensitive areas can be protected through open space preservation and rezoning of development rights. Costs for new development will be lower if the site is adjacent to existing urban areas because the infrastructure and public services should already exist. Savings can also be realized if the development site is modified to reduce the impacts from urban run-off caused by impervious surfaces by reducing street widths, clustering housing developments, smaller parking lots, and incorporating vegetative BMPs into the site design. Savings come through the reduction of costs associated with clearing and grading, road paving, and storm water drainage systems. See Table M-1 for an example of capital cost savings (CASQA, 2003).

Table R-1. Summary of Potential Savings by Land Use Modifications

Development Pattern	Capital Costs (2005 Dollars)[4]
Compact Growth[1]	$31,000
Low-Density Growth (3 units/acre)[2]	$60,100
Low-Density Growth, 10 miles from Existing Development[3]	$82,500

[1]Costs include streets (full curb and gutter), central sewage and water supply, storm drainage and school construction.
[2]Assumes housing mix of 30 percent single-family units and townhouses; 70 percent apartments.
[3]Assumes housing is located 10 miles from major concentration of employment, drinking water plant and sewage treatment plant.
[4] Adjusted for inflation from 1987 dollars (Sahr, 2006).

Structural Controls

Vegetated Buffer or Filter Strips: Vegetated buffer strips are vegetated surfaces that are designed to treat sheet flow from adjacent surfaces, such as parking lots, highways, and rooftops (CASQA, 2003). The costs associated with vegetated buffer strips vary and are dependent of the costs associated with establishing the vegetation. Cost estimates range from $13,000 to $30,000 per acre. Additional costs could include the purchase of land for the buffer strip (CASQA, 2003). Maintenance of the buffer strip consists mainly of irrigation, mowing, weeding, and litter removal. Costs are estimated to be $350/acre/year (CASQA, 2003). Caltrans reported actual construction costs of a

buffer strip for Carlsbad Maintenance Station to be $81,000 with average annual maintenance cost of $1,900 (Caltrans, 2004).

Bioretention: Bioretention systems are designed to mimic the functions of a natural ecosystem for treating storm water runoff (USEPA, 1999). Pollutants are removed by a number of processes including adsorption, filtration, volatilization, ion exchange, and decomposition (USEPA, 1999). Bioretention construction costs in residential areas are estimated to be $3 to $4 per square foot depending on the soil conditions and plant selection. Commercial and industrial costs range from $10 to $40 per square foot depending on the design and need for storm drains (CASQA, 2003). Maintenance activities conducted on bioretention facilities were not found to be very different from maintenance of a landscaped area (CASQA, 2003).

Sand Filters: Media filters are commonly used to treat runoff from small sites such as parking lots and small developments, in areas with high pollution potential such as industrial areas, or in highly urbanized areas where land availability or costs preclude the use of other BMP types (USEPA, 1999). An Austin Sedimentation-Filtration System (a type of surface sand filter) is estimated to cost $18,500 (CASQA, 2003). A sand filter constructed at the La Costa Park and Ride for a 2.7-acre watershed area cost $226,000 with an average annual maintenance cost of $870 (Caltrans, 2004).

Infiltration Trench: Infiltration systems are designed to capture a volume of storm water runoff, retain it, and infiltrate that volume into the ground (USEPA, 1999). Infiltration trench is estimated to cost $45,000 for a 5-acre commercial site (USEPA, 1999). An infiltration trench constructed at the Carlsbad Maintenance Station for a 0.7-hectare watershed area cost $180,000 with an average annual maintenance cost of $723 (Caltrans, 2004).

Diversion/Treatment Systems: If no other on-site treatment options are available, diverting the polluted runoff to the sanitary sewer system or other treatment plant may be considered. An individual diversion structure is likely to cost over one million dollars, which does not include maintenance costs.

For example, the City of Dana Point recently put into operation a diversion and ozone treatment system targeting Salt Creek and Monarch Beach. The system has a capacity of 1,000 gallons per minute. According to the Orange County Register (October 18, 2005), the system cost $6.7 million. These costs include $1 million in architectural features, and $1 million for design and administration of the project. Operation and maintenance is contracted out at a cost of $90,000 per year. In another example, the City of Encinitas has constructed a diversion and ultraviolet radiation treatment system to kill bacteria in runoff to Moonlight Beach. The system has a capacity of 150 gallons per minute, and cost $1 million for testing, design and construction. Operation and maintenance costs are $10,000 per year (Jeremy J. Clemmons, PBS&J, personal communication, October 26, 2005).

M.7.4 Cost Estimate Summary for Urban Runoff Controls

Table M-2 summarizes the estimated costs of non-structural urban runoff controls. Tables M-3 summarizes for each watershed the estimated costs of the specific structural urban runoff BMPs that were evaluated for each watershed. The cost estimates for the structural controls are based on sizing the control to treat 10 percent of the urbanized area of each watershed. For example, using the 10 percent cost estimates provided in Table M-3, a cost estimate for 100 percent land treatment could easily be calculated by multiplying the 10 percent cost estimate by 10, or by 5 for 50 percent, or 8 for 80 percent, etc. Additionally, the estimated cost of one diversion structure is provided and can be scaled upward depending on the individual needs in any given watershed.

Table M-2. Summary of Cost Estimates for Non-Structural Controls

BMP	Estimated Cost[1]
Education and Outreach	$0 to $210,900 per program
Road and Street Maintenance	$60,000 to $180,000
Illicit Connection Identification	$1,250 to $1,750 per square mile
Land Use Modifications	Potential cost reduction to developers and local government

[1] USEPA, 1999.

Table M-3. Cost Estimates for Structural Controls for 10 Percent of Urbanized Areas

BMP	Estimated Total Cost to Treat 10 Percent of an Urbanized Area (in acres) [1, 2, 3]	Estimated Yearly Maintenance Cost[2]
Baby Beach Modeled Watershed		
Vegetated Buffer Strip	$339,690 - $783,900	$8,362
Bioretention	$817,978 - $10,906,432	$57,258 - $762,450
Sand Filters	$1,149,720 - $4,546,620	$149,464 - $591,061
Infiltration Trench	$45,989 - $108,701	$9,198 - $21,740
Diversion	> $1 million per diversion structure	> $10,000 per structure
Shelter Island Shoreline Park Modeled Watershed		
Vegetated Buffer Strip	$6,630 - $15,300	$163
Bioretention	$15,965 - $212,870	$1,118 - $14,901
Sand Filters	$22,440 - $88,740	$2,917 - $11,536
Infiltration Trench	$898 - $2,122	$180 - $424
Diversion	> $1 million per diversion structure	> $10,000 per structure

[1] CASQA, 2003.
[2] USEPA, 1999.
[3] Assumes 100 percent of modeled watershed is urbanized area.

M.7.5 *Cost Estimates for Surface Water Monitoring*

The Health and Safety Code already requires a monitoring and reporting program for indicator bacteria at ocean beaches throughout California during dry weather.[27] Thus, the dischargers will incur no additional costs for monitoring water quality at beaches from April 1 through October 31 (the required monitoring period). Water quality and flow monitoring for inland surface water and storm drains will be required to measure the effectiveness of controls implemented by the dischargers to reduce bacteria loads. This additional monitoring will add to the costs of implementing these TMDLs.

The TMDLs do not specify the locations and frequencies of sampling of inland surface waters, storm drains, and beaches outside the Health and Safety Code requirements, to measure the effectiveness of bacteria load reduction controls. Each watershed is different in terms of size, flow, land uses, existing bacteria load, and reductions needed. Thus, a different monitoring plan individually tailored for each watershed must be formulated and implemented by the dischargers.

This analysis discloses the costs of collecting, transporting, and analyzing a water sample for the four indicator bacteria for which there are inland surface water WQOs. The costs disclosed are that of a two-person team, day-long sampling effort. The laboratory analytical costs were taken from the San Diego Water Board's Laboratory Services Contract cost tables. Where different analytical methods were available, the more expensive method was used in the estimate. Staff costs were estimated based on a two person sampling team in the field for an 8-hour day. The staff costs were estimated based on a billing rate of $95 per hour per person, the rate used for billing San Diego Water Board staff costs in the Cost Recovery Programs. This rate includes overhead costs. The vehicle costs were estimated assuming a distance traveled of 100 miles per day, and a vehicle cost of $0.51 per mile, the per diem reimbursement rate for San Diego Water Board staff when they use their own cars for State business. This analysis assumes that the dischargers possess basic field monitoring equipment, including meters to measure temperature, conductivity, and pH, and equipment to measure flow in the field. No additional costs were computed for these items. Surface water monitoring costs are summarized in the Table M-4 below. Assuming that a two-person sampling team can collect samples from 4 locations in one 8-hour day, the total cost for one day of sampling would be $3,291.

[27] Health and Safety Code section 15880 (Assembly Bill 411, Statutes of 1997, Chapter 765).

Table M-4. Cost Estimates for Surface Water Monitoring

Expenditure	Cost per Unit
Laboratory Analyses	
Total Coliform	$95 per sample
Fecal Coliform	$95 per sample
Enterococci	$120 per sample
E. Coli	$120 per sample
Staff Costs	$190 per hr
Vehicle Costs	$51 per 100 mi

M.8 Reasonable Alternatives to the Proposed Activity

The environmental analysis must include an analysis of reasonable alternatives to the proposed activity.[28] The proposed activity is a Basin Plan Amendment to incorporate bacteria TMDLs for the impaired shoreline segments of Baby Beach and Shelter Island Shoreline Park. The purpose of this analysis is to determine if there is an alternative that would feasibly attain the basic objective of the rule or regulation (the proposed activity), but would lessen, avoid, or eliminate any identified impacts. The alternatives analyzed include taking no action and modifying water quality standards. The alternatives are discussed in the subsections below.

M.8.1 No Action

Under the “no action” alternative, the San Diego Water Board would not adopt the proposed TMDL Basin Plan amendment, and bacteria loading would likely continue at current levels. The “no action” alternative 1) does not comply with the Clean Water Act; 2) is inconsistent with the mission of the San Diego Water Board; and 3) does not meet the purpose of the proposed TMDL Basin Plan Amendment. Under Clean Water Act section 303(d), the San Diego Water Board is obligated to adopt a TMDL project for waters that do not meet water quality standards.[29] Therefore the “no action” alternative is not viable and cannot be considered an acceptable alternative.

M.8.2 Water Quality Standards Action

Another alternative to adopting the TMDL Basin Plan amendment is the modification of water quality standards. If the applicable standards are not appropriate, a plausible regulatory response may be to correct the standards through mechanisms such as a use attainability analysis (UAA) or a site-specific objective (SSO). If the REC-1 beneficial use has been improperly designated for any of the shoreline segments included in this project, or if SSOs for total coliform, fecal coliform, and *Enterococcus* would be less stringent than what is reported in the Ocean Plans and Basin Plan, the TMDLs might not be necessary, or the required pollutant load reductions might be

[28] California Code of Regulations Title 23 section 3777
[29] Water quality standards are comprised of designated beneficial uses, the applicable numeric and/or narrative WQOs to protect those uses, and the SWRCB’s anti-degradation policy provisions (Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality of Waters in California*).

lower. This alternative might lessen or eliminate the adverse impacts associated with constructing structural controls by eliminating the need for structural controls or reducing the number of structural controls necessary. This alternative should not be construed as implying that standards may be changed as a convenient means of "restoring" waterbodies. To the contrary, federal and state law contain numerous detailed requirements that in many cases would prevent modifications of the standards, especially if modifications would result in less stringent waste discharge requirements. However, modification of standards may be appropriate to make uses more specific, to manage conflicting uses, to address site-specific conditions, and for other such reasons.[30]

As a first step in developing TMDLs, the San Diego Water Board confirmed the impairment status of the shoreline segments and determined, from the available evidence, that bacteria densities exceeded water quality objectives that support the REC-1 beneficial use. At this time, the San Diego Water Board has no evidence that the REC-1 beneficial use was inappropriately designated for the shoreline segments. Therefore based on the available information, an action to de-designate these beneficial uses may be harmful to the environment, and this option is not preferred.

Developing SSOs for total coliform, fecal coliform, and *Enterococcus* may be appropriate at specific sites if epidemiology or other scientific studies demonstrate that less stringent water quality objectives would still be protective of human health, or if better indicator(s) are identified. SSOs should be (1) based on sound scientific rationale; (2) protective of the designated beneficial uses of the beaches and creeks; and (3) adopted by the San Diego Water Board in a Basin Plan amendment.

There are no efforts currently underway or planned by interested persons to fund the scientific studies needed to develop SSOs for bacteria at the shoreline segments. Furthermore, the development of SSOs for bacteria at the shoreline segments, including the scientific and epidemiological studies necessary to support them, would be costly, time consuming, and resource intensive.

Even in the event that scientific studies were initiated and SSOs developed and adopted, the need for a TMDL likely would not be eliminated. If SSOs for bacteria were developed in the future and adopted, this TMDL Basin Plan Amendment would be modified accordingly. If interested parties were willing to fund and oversee development of scientific studies to investigate SSOs, the most effective and expeditious means to improve water quality would be to conduct these studies concurrent with actions necessary to achieve compliance with the current TMDL.

M.8.3 Preferred Alternative

Because the alternatives discussed above are not expected to attain the basic objective of the proposed activity at this point in time, the preferred alternative is the proposed activity itself, which is the Basin Plan amendment incorporating the bacteria TMDLs.

[30] State Water Board, 2005. *A Process for Addressing Impaired Waters in California*, June 2005

M.9 Preliminary Staff CEQA Determination

The implementation of these TMDLs will result in improved water quality in the San Diego region, but it may result in temporary or permanent localized significant adverse impacts to the environment. Specific projects employed to implement the TMDLs may have significant impacts, but these impacts are expected to be limited, short-term, or may be mitigated through careful design and scheduling. The Technical Report, the draft Basin Plan amendment, and the Environmental Checklist and associated analysis provide the necessary information pursuant to state law[31] to conclude that properly designed and implemented structural or non-structural methods of compliance will not have a significant adverse effect on the environment, and all agencies responsible for implementing the TMDLs should ensure that their projects are properly designed and implemented. Any of the potential impacts need to be mitigated at a subsequent project level because they involve specific sites and designs not specified or specifically required by the Basin Plan amendment to implement the TMDLs. At this stage, any more particularized conclusions would be speculative.

Specific projects that may have a significant impact would be subject to a separate environmental review. The lead agency for subsequent projects would be obligated to mitigate any impacts they identify, for example, by mitigating potential flooding impacts by designing the structural controls with adequate margins of safety.

Furthermore, implementation of the TMDLs is both necessary and beneficial. If at some time, it is determined that the alternatives, mitigation measures, or both, are not deemed feasible by those local agencies, the necessity of implementing the federally required TMDLs and removing the indicator impairment from the San Diego Region (an action required to achieve the express, national policy of the Clean Water Act) remains.

The benefits of meeting water quality standards to achieve the expressed, national policy of the Clean Water Act far outweigh the potential adverse environmental impacts that may be associated with the projects undertaken by persons responsible for reducing discharges of bacteria to beaches and creeks of the San Diego Region. Meeting water quality standards and the national policy of the Clean Water Act is a benefit to the people of the state because of their paramount interest in the conservation, control, and utilization of the water resources of the state for beneficial use and enjoyment (Water Code section 13000). Furthermore, the health, safety and welfare of the people of the state requires that the state be prepared to exercise its full power and jurisdiction to protect the quality of waters in the state from degradation, particularly including degradation that unreasonably impairs the water quality necessary for beneficial uses.

Water quality that supports the beneficial uses of water are necessary for the survival and well being of people, plants, and animals. Water contact recreational use (REC-1) is a beneficial uses of water that serve to promote the social and environmental goals of

[31] Public Resources Code, section 21159

the people of the San Diego Region and require water quality suitable for the protection of human health, aquatic life and aquatic dependent wildlife.

In addition, implementation of the TMDLs will have substantial benefits to water quality and will enhance beneficial uses. Enhancement of the REC-1 beneficial use will have positive, indirect social and economic effects by increasing the natural habitat and aesthetic value of the shoreline segments. These substantial benefits outweigh any unavoidable temporary adverse environmental effects.

In accordance with state law,[32] the San Diego Water Board finds that, although the proposed project could have significant effect on the environment, revisions in the project to avoid or substantially lessen the impacts, can and should be made or agreed to by the project proponents. This finding is supported by the evidence provided in the impact evaluation section of this document, which indicates that all foreseeable impacts are either short-term or can be readily mitigated.

On the basis of the initial environmental review checklist and analysis, and Technical Report for this Basin Plan amendment, which collectively provide the required information:

☐ The proposed project COULD NOT have a significant effect on the environment, and, therefore, no alternatives or mitigation measures are proposed.

☒ The proposed project MAY have a significant or potentially significant effect on the environment, and therefore alternatives and mitigation measures have been evaluated.

John H Robertus
Signature

11 June 2008
Date

JOHN H. ROBERTUS
Printed Name

[32] Public Resources Code section 15091

Appendix N

Responses
to
Public Comments

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N.1 Introduction

This appendix to the Technical Report provides responses to public comments received on the draft documents for the project *Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay*. Draft documents distributed for public review and comment included the draft Technical Report, Tentative Resolution No. R9-2008-0027, and a draft Basin Plan Amendment. The draft documents were made available to the public for formal review and comment on February 22, 2008.

The California Regional Water Quality Control Board, San Diego Region (Regional Board) received written comments in letters and oral testimony given during the public hearing on April 9, 2008 from interested persons on the proposed TMDL. Individuals from the public that provided comments in writing and/or as testimony during the public hearing are listed in section N.2. Responses to comments and questions by members of the Regional Board during the April 9, 2008 public hearing are provided in section N.3. Responses to oral comments and testimony by members of the public during the April 9, 2008 public hearing are provided in section N.4. Written responses to written comments submitted by the public in advance of the April 9, 2008 public hearing are provided in section N.5.

N.2 List of Persons Submitting Comments and Testimony

- San Diego Coastkeeper
- City of Dana Point
- County of Orange
- US Environmental Protection Agency

N.3 Responses to Comments from Regional Board Members

Providing Written Responses to Comments from Stakeholders

Comment: During the April 9, 2008 Board meeting, Board members King and Ritschel expressed concern that the Regional Board was not responding to comments from the stakeholders in a timely manner.

> **Response**: Throughout the development of this TMDL, the Regional Board has responded to the questions and concerns of the stakeholders as soon as possible.
>
> When this project was initiated in 2004, a stakeholder advisory group (SAG) was formed to facilitate communication with stakeholders during the development of the TMDL. The SAG members included representatives from the municipalities, non-governmental organizations, and environmental interest groups. The SAG was involved in this project for several years before the TMDL was formally released to the public for review in February 2008 and given several opportunities to provide comments and feedback throughout the process. In December 2004, a technical memorandum (memo) was sent to all the SAG members informing them of the data

sets that were being used for the development of the models to be used for estimating bacteria loads from the watersheds and in the receiving water (please see Exhibit 1 at the end of this appendix). The memo also requested the SAG members to provide available data to fill identified data gaps or update the data sets listed in the memo, otherwise the gaps would be addressed with "technical assumptions based on literature or regional data analysis."

On May 23, 2005, a meeting was held with the SAG members to present the technical approach and provide the SAG members an opportunity to provide feedback and comments on the preliminary draft technical report, dated April 19, 2005, that was to be sent for scientific peer review. A second SAG meeting was held on June 30, 2005 to respond to the comments provided by the SAG members.

During the June 30, 2005 meeting, the Regional Board verbally addressed and responded to all the written and oral comments provided by the SAG members. At the meeting, the SAG members were informed that any SAG member interested in more detailed responses to comments submitted could set up an appointment or teleconference with the Regional Board. The SAG members were informed that written responses to the June 2005 comments would not be provided; however, SAG members could re-submit comments during the formal comment period to receive written responses if they were not satisfied with the oral responses. This was reiterated in the June 30, 2005 meeting notes, which were sent to all the SAG members soon after the meeting. At the June 30, 2005 meeting, SAG members were also informed that they had another opportunity to provide additional data that could be used to improve the models. Several SAG members provided additional data after the meeting.

Between July 2005 and December 2007, the draft technical report underwent scientific peer review and several revisions based on SAG member comments, on developments resulting from Bacteria TMDL Project I for Beaches and Creeks, and on the removal or delisting of several shoreline segments from the Clean Water Act section 303(d) List of Water Quality Limited Segments (303(d) List). In January 2008, the draft Technical Report was provided to the SAG members for their review and comment prior to releasing it to the public for formal public review and comment. A SAG meeting was held with the stakeholders on February 14, 2008 to discuss their comments. Those attending the SAG meeting were told that they should provide written comments during the formal public review process if they would like to receive written responses. At the time of the February 14, 2008 meeting, the SAG members had been involved with the development of this TMDL for over 3 years.

The draft Technical Report was formally released for public review and comment on February 22, 2008. At this time, the public (including the SAG members) were given an opportunity to formally provide written comments on the draft Technical Report. The public was given 48 days to review the documents before the April 9, 2008 public hearing. Written comments were requested to be submitted by April 3, 2008, six days before the April 9, 2008 Board meeting and public hearing, in order for those comments to be provided to the Board members before the meeting. The

purpose of the April 9, 2008 public hearing was only to hear comments and testimony on the proposed TMDL Basin Plan amendment, and no Board action was expected or taken.

As discussed above, comments that were submitted by the SAG members during the project development were responded to verbally, prior to the formal public comment period. As of April 9, 2008, all the formal public comments and testimony in advance of the public hearing have been submitted. These written responses were prepared for all written comments submitted during the formal public review and comment period to date (see section N.5) and the oral comments and testimony provided during the April 9, 2008 meeting (see section N.4). Throughout this process responses to comments from the stakeholders and the public were provided in a timely manner.

Accounting for Illegal Discharges in TMDL

Comment: During the April 9, 2008 Board meeting, Board members Wright, King and Rayfield expressed an interest in explicitly addressing illegal discharges (e.g., from boats and/or wastewater collection systems and treatment plants) in the TMDL.

Response: There is an apparent concern that illegal discharges of sewage from boats and wastewater collection systems and treatment plants are not being addressed or accounted for in the development of the TMDL. While illegal sewage discharges from boats and wastewater collection systems and treatment plants are likely occurring, these discharges are not authorized or allowed.

The Basin Plan includes waste discharge prohibitions specifically for the discharge of treated or untreated sewage from vessels to Dana Point Harbor and San Diego Bay and the unauthorized discharge of treated or untreated sewage to waters of the state. Adoption of a TMDL cannot include a WLA specifically for illegal discharges. This could potentially be interpreted as an authorization for these types of illegal discharges.

However, this TMDL does take illegal discharges into account in two ways:

As discussed in section 8 of the Technical Report, a TMDL is equal to the sum of the wasteloads allocation (WLAs) plus the sum of the load allocations (LAs) plus a margin of safety (TMDL = $\sum$ WLAs + $\sum$ LAs + MOS), where WLAs are portions of the TMDL that are assigned to point sources, and LAs are assigned to nonpoint sources.

When allocating portions of the TMDL to the known sources of bacteria, portions of the TMDL are assigned to allowable sources or uncontrollable sources. Discharges of sewage from boats and spills from wastewater collection systems and treatment plants are neither legal nor uncontrollable. Assignment of a zero WLA or LA is the most stringent allocation possible and the only allocation that can be assigned to an illegal discharge in the context of a TMDL. So, in the case of the TMDLs for Shelter Island Shoreline Park and Baby Beach, the WLAs for illegal discharges from boats and wastewater collection systems and treatment

plants were set to zero (e.g., $WLA_{Boats} = 0$ and $WLA_{WWTP} = 0$). Bacteria that might originate from homeless persons is also illegal, so the LA for illegal discharges from homeless person was set to zero (e.g., $LA_{Homeless} = 0$). Therefore, the TMDL does account for bacteria originating from boats and wastewater collection systems and treatment plants by assigning them a WLA of zero.

1. The TMDL includes an LA for natural and background sources. According to the text in section 8.2 of the Technical Report, the LA for natural and background sources includes "direct inputs from birds, terrestrial and aquatic animals, or *other unidentified sources* [emphasis added] within the receiving waters."

   Other unidentified sources could potentially include bacteria load contributions originating from illegal discharges from boats or wastewater collection systems and treatment plants. Due to lack of data and resources, sources of "natural and background" bacteria were not quantified. In any case, identifying and quantifying the sources would not change how the TMDL would be allocated. However, potential contributions from boats and wastewater collection systems and treatment plants could be considered accounted for in the LA for natural and background sources.

In the development of these TMDLs, illegal discharges from boats and wastewater collection systems and treatment plants were identified as potential point sources of bacteria and assigned WLAs of zero. To the extent that illegal discharges from boats and wastewater collection systems and treatment plants are occurring in reality, actions must be taken to reduce those discharges to zero. Actions may be taken by marina and harbor operators, the muncipalities, and/or the Regional Board to enforce the regulations that prohibit these types of illegal discharge.

The Technical Report has been revised to provide more information about how illegal discharges were specifically accounted for in the TMDL. Additionally, the Implementation Plan in the Technical Report has been revised to include additional discussion about what actions may be taken to address and eliminate these illegal discharges.

Value of Zero Wasteload Reduction Requirements to Comply with WLAs/TMDLs

Comment: During the April 9, 2008 Board meeting, Board members King and Rayfield questioned the value of developing a TMDL that has zero wasteload reductions required. Developing a TMDL for a waterbody that has a zero wasteload reduction seems to be a misuse of staff time and resources when other impaired waterbodies should have had higher priority.

Response: When the Bacteria TMDL projects were first initiated in 2003, addressing the recreational beneficial uses of the waterbodies that were listed as impaired by indicator bacteria was a high priority for the TMDL Program. At the time, the water quality data indicated that there were frequent exceedances of the indicator bacteria water quality objectives that support the recreational water contact

(REC-1) beneficial uses in many waterbodies. Many beaches up and down the coast of the San Diego Region were frequently closed or had warning signs posted because of elevated bacteria levels. The Regional Board gave direction to develop TMDLs for the bacteria-impaired waterbodies in the Region.

Before the models were developed and completed, the calculation of a zero wasteload reduction for MS4 discharges was not anticipated. In 2003 and 2004, available data indicated that there were elevated bacteria levels in these receiving waters warranting the listing of these waterbodies on the 2002 303(d) List. In most cases, elevated bacteria levels are associated with anthropogenic activities, and urban runoff is often suspected as one of the primary sources contributing to the impairments.

For Baby Beach, zero wasteload reductions were calculated for MS4 discharges for total coliform and fecal coliform bacteria under the wet weather TMDLs. For Shelter Island Shoreline Park, zero wasteload reductions were calculated for MS4 discharges for total coliform, fecal coliform, and *Enterococcus* bacteria under wet weather and dry weather conditions. These zero wasteload reductions mean that the discharges from the MS4s are not expected to cause an exceedance in water quality objectives for the given indicator bacteria and hydrologic regime (i.e., wet weather or dry weather). However, the loads from the MS4s must be the same or less than what was estimated in the load calculations and assigned as WLAs in the TMDLs. Any exceedances in water quality objectives caused by wasteloads originating from the MS4s will mean that the MS4 discharges are no longer in compliance with the WLAs and TMDLs.

The current available data, at least for Shelter Island Shoreline Park, appear to justify the zero wasteload reduction requirements. Based on the watershed loads estimated by the models and the calculated TMDLs under wet and dry weather, no wasteload reductions are required for Shelter Island Shoreline Park under the critical conditions. This is reasonable considering the watershed area that was modeled consists entirely of park/recreation land use and is a very small area relative to the size of the receiving water.

Additionally, the water quality data collected at Shelter Island Shoreline Park since 2003 have shown a strong trend of improved bacteria levels. Prior to 2003, the San Diego Unified Port District suspected illegal sewage discharges from one or more boats moored directly off the Shelter Island Shoreline Park shoreline. The San Diego Unified Port District conducted surveillance to identify any boats that might be discharging illegally. No boats were identified by the surveillance program. However, since the conclusion of that program, indicator bacteria REC-1 water quality objectives have been met consistently. Furthermore, the San Diego Unified Port District has implemented several BMPs such as street sweeping and covering garbage cans to reduce bacteria loading at Shelter Island Shoreline Park. Therefore, assuming there are no longer any illegal boat discharges, the MS4 does not appear to be causing elevated bacteria levels in the receiving water. The modeling approach and its results appear to have correctly predicted the current outcome. Therefore, Shelter Island Shoreline Park MS4 discharges do not appear

to cause elevated bacteria levels and a zero wasteload reduction for MS4 discharges appear to be correct.

A TMDL project that presents zero wasteload reductions may appear as if a TMDL was not required or that limited resources were not spent wisely. These waterbodies, however, have historically had elevated bacteria levels, and measures were needed to correct the problem. This project and process has resulted in significant and measureable improvements in water quality. Originally, this project included 6 bacteria-impaired shoreline segments in Dana Point Harbor and San Diego Bay. Since these waterbodies were listed in 2002 and the bacteria TMDL projects were initiated in 2003, the municipalities have actively implemented several measures and collected data to begin the process for complying with the TMDLs, resulting in the removal or delisting of 4 of the original 6 impaired shorelines from the 303(d) List. For the remaining 2 shorelines, Baby Beach and Shelter Island Shoreline Park, the efforts of the municipalities have resulted in significant improvements in water quality.

N.4 Responses to Oral Public Comments and Testimony

Members of the public were given an opportunity to provide oral comments and testimony during the April 9, 2008 public hearing. Only oral comments that were not duplicated in written comments are presented in this section.

Oral Comment 1
(*US Environmental Protection Agency*)
During the April 9, 2008 Board meeting, the US Environmental Protection Agency requested that the Implementation Plan be revised to include more details about monitoring, actions that would be taken for unexpected loadings, and differences in implementation with Bacteria TMDL Project I for Beaches and Creeks.

Response: The Implementation Plan in the Technical Report has been revised to include more details and discussion about the monitoring that may be expected and actions that may be taken by the Regional Board to address illegal discharges or other unexpected loadings, and a discussion about the differences in implementation between this TMDL project and Bacteria TMDL Project I for Beaches and Creeks.

Oral Comment 2
(*County of Orange*)
During the April 9, 2008 Board meeting, the County of Orange suggested that the Implementation Plan include more recognition of the efforts taken by the County of Orange and City of Dana Point in addressing the elevated bacteria levels at Baby Beach.

Response: The Regional Board requested the County of Orange and City of Dana Point to provide recommendations for revising the Technical Report and

Implementation Plan text to better acknowledge the efforts previously implemented and currently being implemented. The text of the Implementation Plan, as well as other parts of the Technical Report, were revised to incorporate recommended revisions provided by the County of Orange and City of Dana Point determined to be appropriate.

Oral Comment 3
(*City of Dana Point*)
During the April 9, 2008 Board meeting, the City of Dana Point pointed out that there was no discussion of the planned Reference System and Antidegradation Approach / Natural Sources Exclusion Approach (RSAA/NSEA) Basin Plan amendment. The City suggested that the Technical Report should include a reference to this Basin Plan amendment.

Response: If all anthropogenic sources of bacteria are controlled and natural and background sources appear to be the sole source of continued impairment, the NSEA may be applied. A discussion of the RSAA/NSEA Basin Plan amendment was included in the Implementation Plan in the Technical Report and its potential applicability for these TMDLs.

N.5 Responses to Written Public Comments

Written comments were submitted by San Diego Coastkeeper and County of Orange. The comment letters were not reproduced in this document. Written comments are provided verbatim from the letters. Several of these comments were also presented as oral comments and testimony during the April 9, 2008 public hearing. The comments are numbered sequentially below. Under each comment number is the source of the comment and the date of the comment.

Written Comment 1
(*San Diego Coastkeeper letter, dated March 28, 2008*)
Reasoning for Zero Existing Wasteload and Wasteload Allocation for SISP Dry Weather is Unclear
We are uncertain, after reading the Technical Report and the Appendices why the existing wasteload and wasteload allocation for SISP dry weather is zero. The Technical Report states that the model used to calculate bacteria loads from urban runoff did not correctly predict observed loads. As a result, a back-calculation of the allowable loading from nonpoint sources, accounting for allowable dry weather urban runoff loads predicted by the model, was performed. (Technical Report, p. 44-45) However, the justification for such analysis is not given. It is unclear why a model that is inadequate for predicting dry weather urban runoff loads should be relied upon. As stated in the Technical Report, further studies should be conducted to identify and quantify sources that may be contributing to bacteria loads. Attributing all existing bacteria loads to natural sources seems unjustified without further analysis or supporting data. (*Id*. at. 45)

> **Response**: A zero existing wasteload means that the model predicts that no bacteria load is expected under critical conditions. A zero wasteload allocation (WLA) means that no part of the TMDL has been allocated to that particular point source.
>
> In the case of Shelter Island Shoreline Park, the dry weather model predicts that no bacteria load is expected from the watershed under the critical dry weather conditions. This is reasonable considering the watershed area that is modeled consists entirely of park/recreation land use. This land use is not expected to have dry weather nuisance flows associated with human activities, such as over-irrigation or car washing, like residential, commercial or industrial land uses.
>
> If no load is expected from the watershed under dry weather conditions, then there was no basis to assign any part of the dry weather TMDL as a WLA to the MS4. Therefore, the WLA for MS4s is zero in the dry weather TMDLs for Shelter Island Shoreline Park.

Written Comment 2
(*San Diego Coastkeeper letter, dated March 28, 2008*)
Clarification for the Lack of Consideration of Illicit Discharges from Boats in Determining Wasteloads
Because illicit discharges from boats in both SISP and Baby Beach are illegal, they are not quantified in the TMDL. However, the Technical Report acknowledges that such discharges are a potential source of bacteria in receiving waters. (*Id*. at 27) As a significant potential threat, such discharges may not be easily quantified, but it is unclear why they should be wholly discounted. Likewise, sewage spills from wastewater treatment plants should be taken into account. Though sewage spills and illicit discharges from boats should not occur, in reality they do. Coastkeeper suggests incorporating such sources into an explicit margin of safety in order to capture them within the TMDL. In addition, more information about the predicted loading potential from sewage spills and illicit discharges from boats would be helpful in determining how to account for such sources.

Response: The responses for comments from Regional Board members in section N.3 also address this comment.

Written Comment 3
(*San Diego Coastkeeper letter, dated March 28, 2008*)
Unclear why a TMDL that Results in a Zero Percent Decrease is Useful
Coastkeeper would like clarification for the reasoning behind the adoption of the SISP wasteload reductions. All reductions attributable to SISP are zero under the proposed TMDL. Further, incorporation of the TMDL into the NPDES permit will likely be preceded by the removal of SISP from the Clean Water Act 303(d) list, according to the Technical Report. (*Id*. at 66) Therefore, we ask that clarification for adoption of such reductions on the suggested timeline be given.

Response: A zero percent load reduction to meet the WLA for MS4s means that the model predicts that the bacteria loads are not expected to cause an exceedance in the water quality objectives (WQOs) that will support the water contact recreation (REC-1) beneficial use in the receiving water. A zero wasteload reduction does not mean that the municipalities responsible for discharges from MS4s are not required to meet the WLA. If the bacteria load from the Shelter Island Shoreline Park watershed does in fact cause an exceedance of REC-1 WQOs in the receiving water, those loads would require a reduction to comply with the WLA assigned to the MS4. Based on data provided by the San Diego Unified Port District, the water quality appears to have improved significantly since the 2003. If the trend continues, continued collection of water samples should provide enough data to support the delisting of Shelter Island Shoreline Park from the Clean Water Act section 303(d) List of Water Quality Limited Segments (303(d) List).

However, if the water quality begins to degrade, or the data collected do not support delisting Shelter Island Shoreline Park by 2012, the Regional Board may issue an investigative order as authorized under Water Code sections 13267 and 13383 to

require the municipalities to identify the sources of bacteria that are causing the continued exceedances in REC-1 WQOs and recommend and implement measures to eliminate those exceedances. The Implementation Plan in the Technical Report has been revised to provide more information about what actions may be taken to address failures to meet the REC-1 WQOs within the given compliance schedules.

Written Comment 4
(*County of Orange letter, dated April 3, 2008*)
We have attached our prior comments dated June 2, 2005. It should be noted that no response to these comments has been forthcoming.

Response: Responses to these comments were provided verbally during the June 30, 2005 meeting with the Stakeholder Advisory Group (SAG), which was attended by the County of Orange.

The June 2, 2005 comments were submitted after the County of Orange reviewed the April 19, 2005 preliminary draft of the Technical Report that was only provided to members of the SAG. The purpose of the review was to receive input to revise the preliminary draft Technical Report prior to the submittal to the scientific peer reviewers. The SAG members were informed that verbal responses to their comments would be provided at the June 30, 2005 SAG meeting.

During that June 30, 2005 SAG meeting, verbal responses were provided to the June 2005 written comments submitted for the preliminary draft Technical Report. The SAG members were informed at the meeting that any SAG member interested in more detailed responses to comments submitted could set up an appointment or teleconference. The SAG members were also informed that written responses to the June 2005 comments would not be provided; however, SAG members could re-submit comments during the formal comment period to receive written responses. This was reiterated in the June 30, 2005 meeting notes, which were sent to all the SAG members soon after the meeting.

Given the length of time between the June 30, 2005 SAG meeting and the release of the February 22, 2008 draft Technical Report, the County of Orange may not recollect the verbal responses that were provided. Because the June 2, 2005 comments were submitted during the public comment period with the formal April 3, 2008 comments, written responses are provided in this document.

Written Comment 5
(*County of Orange letter, Attachment A, Comment 1, dated April 3, 2008*)
Executive Summary, Page 1, Third Paragraph: The TMDLs established in this technical report relate to water quality objectives for REC-1 and REC-2 beneficial uses not shellfish harvesting. As noted in the third paragraph, SHELL beneficial use will be addressed in a separate TMDL and/or standards action. To prevent confusion to the reader, references to shellfish harvesting beneficial uses should be removed from the document.

Response: The shellfish harvesting (SHELL) beneficial use reference was deleted from the Executive Summary. The SHELL beneficial use references in sections 1 and 2 of the Technical Report were not deleted because the SHELL beneficial use is pertinent to the discussions.

Written Comment 6
(*County of Orange letter, Attachment A, Comment 2, dated April 3, 2008*)
Section 1 Introduction, Page 5, Second Paragraph: The document states, "The bacteria loads from the watershed were used as inputs into a second model used to calculate the assimilative capacity of receiving waters at the impaired BB and SISP shorelines". This text should be revised to reflect that the bacteria loads were modeled based upon land use area and that the actual bacteria loads from the MS4 systems are not known.

Response: The sentence has been revised to state that the bacteria loads *calculated by the watershed model* were used as inputs into the receiving water model.

Written Comment 7
(*County of Orange letter, Attachment A, Comment 3, dated April 3, 2008*)
Section 1.1 Technical Approach, Page 7, Fifth Paragraph: The document states, "For these TMDLs, the receiving waters are the impaired shoreline segments of BB and SISP, and the watersheds are the areas of the watershed that drain directly to those receiving waters." This does not match with text in other parts of the document which define the watershed area for Baby Beach as 522.6 acres or the entire watershed for Dana Point Harbor and not just the watershed area to the impaired shoreline segment of Baby Beach.

Response: The sentence has been revised to state that the receiving waters are Dana Point Harbor and San Diego Bay, and the watersheds are areas of the watershed that are conservatively assumed to have a potential impact on the impaired shorelines of those receiving waters.

Written Comment 8
(*County of Orange letter, Attachment A, Comment 4, dated April 3, 2008*)
Section 2.1 Project Area Description, Page 11, Second Paragraph: The document states, "Impairment of these shorelines is likely due to local sources of bacteria such as human, domestic animals and urban runoff." This statement does not appear to be correct based upon 2003 studies and conflicts with the text in Section 5.1.1 Natural Sources, Page 26, Third Paragraph, which states that for both wet and dry weather fecal bacteria deposited from waterfowl may be the primary source or a relatively significant source of impacts to the shorelines.

Response: There is no conflict between the statements from section 2.1 and section 5.1.1. Natural and background sources (including fecal bacteria deposited by waterfowl) are a significant source of bacteria. Natural and background sources

are not expected to cause exceedances in REC-1 WQOs. For Baby Beach, exceedances in REC-1 WQOs are not expected to occur based solely on natural and background sources without the bacteria loads from the watershed (i.e., MS4s), and assuming no illegal discharges are occurring within the immediate vicinity of the shorelines

According to the June 2003 State of the Beach Report for Baby Beach, "[t]he most significant contributor of bacteria [at Baby Beach] appeared to be the storm drains." The statement that, "Impairment of these shorelines is likely due to local sources of bacteria such as human, domestic animals and urban runoff" is supported by the June 2003 State of the Beach Report.

Written Comment 9
(*County of Orange letter, Attachment A, Comment 5, dated April 3, 2008*)
Section 2.1 Project Area Description, Page 11, Fourth Paragraph: The 522.6 acre watershed described in Table 2-1 includes drainages for all of Dana Point Harbor. This is an incorrect depiction of the drainages to the Baby Beach shoreline. A review of grading and development plans (Dana Point Headlands Project Hydrology Exhibit, Stantec Consultants, Inc. 2/15/2007, Ocean Institute BMP Evaluation Site Plan, RDMD 11/26/2002, Dana Point Harbor Parking Lot No. 2 Grading and Paving Plan, Koebig & Koebig, Inc. September 1971), for the area surrounding Baby Beach defines a drainage area of only 43.4 acres (see Attachment B). In addition, harbor water quality monitoring data and circulation studies indicate that bacteria impairment is confined to the Baby Beach shoreline and that limited circulation exists between the waters near to Baby Beach and the waters further in the harbor channel. The Baby Beach bacteria TMDLs were developed based upon modeling results driven by watershed size and land use. The use of a watershed area representative of the actual inputs that drain to the segment of impaired shoreline is imperative to accurate model TMDL development. The watershed area used in the model should be revised to reflect the actual drainage area to Baby Beach and the TMDLs should be revised accordingly.

Response: The circulation study referred to by the commenter took place over a 2-day period in September 2002. According to the March 2003 Circulation Study Report for Baby Beach, "it appears that there was limited circulation between the waters near to Baby Beach and the waters further in the channel." However, the report also states that the direction of flow at the harbor channel adjacent to Baby Beach (Station 8) "appeared to be strongly influenced by winds and tides with surface flows predominantly in the direction of the tidal flow." Additionally, the report states that wind and wave patterns can vary significantly throughout the year, particularly during seasonal shifts in weather patterns and additional studies would be required to evaluate currents under variable conditions.

All the areas of the watershed that drain into Dana Point Harbor were assumed to potentially have an influence on the bacteria levels along Baby Beach. This is the most conservative assumption and the most accurate way to represent the watershed inputs into the receiving water model.

Written Comment 10
(*County of Orange letter, Attachment A, Comment 6, dated April 3, 2008*)
Section 2.3 Impairment Overview, Page 15, Second Paragraph: The document states, "For this project, the most recent water quality data available at the time of the model development in 2004 were used to develop the models." Based upon the data sources listed in Appendix D only Baby Beach water quality data from 11/1996-10/2002 was used. Therefore, water quality data from 10/2002 to 2004 was not used and neither was the extensive data collected as part of the June 2003 State of Beach Report which included a data mining study, circulation study, and special bacteriological studies conducted at Baby Beach. The document should be revised to reflect what data was actually used for modeling. This comment also applies to document text in Section 4.1.1, Page 20, First Paragraph.

Response: Much of the data from the data mining study included in the June 2003 State of the Beach Report were also used in the model. The data mining study had tidal, rainfall and water quality data from January 1997 to April 2002. These data were collected from the same sources that were used for model development. The circulation study and special bacteriological studies, however, were both inconclusive and could not be used in the model development.

The data collection and model development were initiated in January 2004. The County of Orange was given an opportunity to provide additional data. A memo from the Regional Board was sent to the SAG members, dated December 10, 2004, listing the data sets that were used in the model and requesting additional data if available. The County of Orange was also given an opportunity to provide additional data in June 2005. The County of Orange made a reference to the June 2003 State of the Beach Report, but did not provide any of the raw data.

The data used to develop the watershed and receiving water models are as shown in Appendix D to the Technical Report. Because 2001 and 2002 had the most complete hydrology/hydraulics data, the water quality data collected in 2001 and 2002 were used to calibrate and validate the water quality model. Water quality data collected after 2002 would not have been used in the calibration or validation of the water quality model.

The model was set up, calibrated, and validated assuming that either there were no BMPs in place, or that the BMPs in place were not effective in controlling bacteria loads entering Dana Point Harbor. The use of 2001 and 2002 hydrologic and water quality data is appropriate because the water quality during this time period exhibited high frequencies of REC-1 WQO exceedances. Since Baby Beach was placed on the 2002 303(d) List the municipalities have implemented several structural and non-structural BMPs that have apparently resulted in measureable improvement in water quality at Baby Beach. To use the water quality data from after 2002 and after the effective BMPs had been implemented, the model would have to be set up, calibrated and validated with the new BMPs accounted for in the model. This might reduce the amount of existing bacteria load that may be entering

the receiving water, but it would not reduce the TMDLs for the receiving water which are calculated based on the REC-1 WQOs.

However, as discussed in section 2.3.1, water quality data collected from Baby Beach between January 2002 and December 2006 were evaluated to confirm that the impairment continues to exist. The water quality data from this time period appears to indicate that water quality has improved since 2002, but also confirms that Baby Beach remains impaired by indicator bacteria.

Written Comment 11
(*County of Orange letter, Attachment A, Comment 7, dated April 3, 2008*)
Section 3, Numeric Target Selection, Page 17: Similar to the Bacteria Impaired Waters – Project I Beaches and Creeks TMDL, this section of the document should be revised to include reference to the pending Reference System & Antidegradation Approach (RSAA) and Natural Sources Exclusion Approach (NSEA) Basin Plan Amendment (BPA) and explain its implications to the Baby Beach and Shelter Island Shoreline Park TMDLs. In particular, the NSEA seems appropriate to the situation at Baby Beach were studies point toward birds, sediment resuspension, and other natural sources as the likely source of impairment.

Response: Discussion of the Natural Sources Exclusion Approach (NSEA) would not be appropriate in section 3, which discusses the selection of numeric targets. The NSEA would only apply after evidence can be provided that all anthropogenic sources of bacteria have been controlled and the REC-1 WQOs are still being exceeded.

The Implementation Plan in the Technical Report has been revised to provide more information about the NSEA and when it may be applicable.

Written Comment 12
(*County of Orange letter, Attachment A, Comment 8, dated April 3, 2008*)
Section 4.1.2 Waterbody Characteristics, Page 20, Third Paragraph: The hydrology component of the model developed as part of the Bacteria TMDL Project I and now utilized as part of the San Diego Bay and Dana Point Harbor TMDLs involved a calibration using thirteen USGS gages throughout the San Diego Region for wet weather and a combination of gage data from a tributary to San Juan Creek and instantaneous flow measurements from stations in Aliso Creek and Mission Bay drainages for dry weather. The use of these data sources is inappropriate for determining loading and TMDLs for Baby Beach for the following reasons:

a) The thirteen USGS gage stations are located along much larger drainages (13,632 - 462,720 acres) that have different hydrology than the small storm drain system at Baby Beach (43.4 acres). Factors such as ground water input within a creek and longer wet weather sustained flows are not components of a small, concrete lined, underground MS4 system like the one found at Baby Beach. In addition, many of the USGS gage stations used have upstream reservoirs and lakes that may regulate or

partially regulate flow. This adds another layer of uncertainly to using this data to simulate flows in a small MS4 system.

b) The instantaneous flow data used from the Aliso Creek Watershed was only "estimated" flow. Caution should be taken in using this data because the methods used to determine flow (e.g. the floating leaf method) have inherent error. The fact that these flow approximations were used to develop a regional model and that these models were used to develop TMDLs is a concern.

To address these two issues a better description of the limitations of the flow data used to develop these models should be presented in the document. In addition, some recent flow data is available from the diversion system BMP in place for the Dana Point Headlands area which drains to the west end of Baby Beach. This data could be used to calibrate model derived dry weather flows to those actually observed within the Baby Beach drainage area.

Response: Ideally, calculation of bacteria loads from a watershed would be based entirely on actual site specific data. At the time the modeling approaches were developed in 2004, there were no flow or water quality data available for the storm drains discharging to Dana Point Harbor. The County of Orange was provided several opportunities to provide more site specific data, but never provided any data. Given the lack of site specific flow and water quality data for the storm drains discharging to Dana Point Harbor, a modeling approach was required.

As with any modeling approach, there is inherent uncertainty since no model can fully represent reality. The uncertainty in using a model is acknowledged in section 6 in the Technical Report.

Even though there is a degree of uncertainty in the models, the watershed modeling approaches used have been shown to be able to estimate/simulate flows and bacteria loads well for several different watershed sizes in the San Diego Region for Bacteria TMDL Project I, as well as in the Los Angeles and Santa Ana Regions. The degree of uncertainty appears low. The watershed modeling approaches used in this project are on the high end of complexity and used large data sets from across the San Diego Region in their development. The alternative to the modeling approaches used in this project would be to use simpler models with more assumptions that would result in even higher levels of uncertainty. Given the lack of site specific data and the availability of the regionally calibrated watershed models, the uncertainty that is in the modeling approaches used is less than the alternative of using other simpler modeling approaches with more assumptions.

Written Comment 13

(*County of Orange letter, Attachment A, Comment 9, dated April 3, 2008*)

Section 4.1.2 Waterbody Characteristics, Page 21, First Paragraph: More information should be provided regarding the resolution and the date of the bathymetry data used for Baby Beach. The USGS DRG 7.5 min quadrangle map for Dana Point provides some limited data on depth curves and depth sounding locations for coastal areas, but dates back to 1975 and does not provide detailed bathymetry. The use of this data to

create an accurate receiving water model for Dana Point Harbor does not seem appropriate. In addition, dredging is regularly performed in the harbor every 5-7 years to maintain navigable depths and widths making it uncertain whether the data used reflects the conditions during the time period of the water quality modeling data used. More accurate Dana Point Harbor bathymetry data is and has been available from the County and should be used to update the receiving water model.

Response: The bathymetry data used for the model was provided by the US Army Corps of Engineers (USACE) from 1999. The County of Orange was informed that this is the bathymetry data that would be used in the December 10, 2004 Regional Board memo to the SAG members. The County of Orange failed to object or raise concerns with the bathymetry data in their June 2, 2005 SAG comments. The County of Orange also did not raise any concerns during the February 14, 2008 SAG meeting, and did not provide any objections that the bathymetry data were not acceptable until its April 3, 2008 comment letter.

The 1999 bathymetry data came from a period very close in time to the 2001 and 2002 period of time for which the models were calibrated and validated. The bathymetry data used were adequate for model development. Appendix D has been revised to provide a more specific date and source of the bathymetric data used for Baby Beach.

Written Comment 14
(*County of Orange letter, Attachment A, Comment 10, dated April 3, 2008*)
Section 5 Source Analysis, Page 25, Second Paragraph, Last Line: Remove extra "s" after approaches.

Response: The text has been corrected as recommended. Typographical and grammatical errors throughout the document will be corrected as necessary.

Written Comment 15
(*County of Orange letter, Attachment A, Comment 11, dated April 3, 2008*)
Section 5.1 Nonpoint Sources, Page 25, Fourth Paragraph: Homeless encampments are not believed to be a source of impairment to Baby Beach by either the County or City of Dana Point. Additional justification and information should be provided to support the statement that encampments from homeless persons is a potential nonpoint source of bacteria at Baby Beach or the document should be revised removing homeless encampments as a potential source.

Response: The likelihood that encampments of homeless persons being a source of bacteria contributing to the impairment at Baby Beach is probably low. Open areas and areas open to the public, however, can be frequented by homeless or transient persons. Additionally, this project not only addresses Baby Beach, but includes Shelter Island Shoreline Park as well. Homeless and transient persons have been observed at Shelter Island Shoreline Park on several occasions. Thus,

homeless encampments are a potential source that cannot be completely ignored and shall remain in the source analysis.

Written Comment 16
(*County of Orange letter, Attachment A, Comment 12, dated April 3, 2008*)
Section 5.1.1 Natural Sources, Page 26, Fourth Paragraph: This section of the document does not identify wrack line or sediment regrowth as potential nonpoint sources of bacteria. As noted later in the document, (Section 10.7.2, Page 77, Paragraph 2) studies have found that bacteria multiply in the wrack line on the beach during low tide and this can cause exceedances during high tide when the wrack is inundated. The June 2003 State of the Beach Report for Baby Beach and continued studies by the Orange County Health Care Agency have also identified bacteria resuspension and regrowth in sediments as an important potential source of bacterial contamination at Baby Beach. Descriptions of both these natural sources should be added to this section of the document.

Response: The last paragraph of section 5.1.1 states that other sources of bacteria in the water, such as aquatic plants and wildlife, may contribute to the bacteria levels within the receiving water during both wet and dry weather conditions. Wrack are aquatic plants.

Sediments may also be a potential source, which could be included in the natural sources. In the case of Baby Beach, the June 2003 State of the Beach Report stated that, "Transect studies extending from the west storm drain further confirmed that concentrations of indicator bacteria (particularly enterococci) in sediments and water samples were highest near the drain and decreased with distance from this apparent source area." This statement appears to indicate that the bacteria in the sediment is not naturally occurring, and originates from the storm drain.

Section 5.1.1 has been revised to include sediment as another potential natural source within the receiving water. If the impairment at Baby Beach is caused by re-growth and resuspension of bacteria near the shoreline, this would not be considered a natural source if the bacteria and sediments originated from the storm drain.

Written Comment 17
(*County of Orange letter, Attachment A, Comment 13, dated April 3, 2008*)
Section 5.1.2 Encampments (Homeless Persons), Page 26, Fifth Paragraph: See comment #11.

Response: Please see the response to previous comment 15.

Written Comment 18
(*County of Orange letter, Attachment A, Comment 14, dated April 3, 2008*)
Section 5.2.3 Municipal Separate Storm Sewer Systems (Urban Runoff), Pages 27 & 28, Last Paragraph: Please clarify if the "direct linkage" that has been established

between human illness and recreating near the outfalls of urban stormwater conveyance systems is applicable to the Baby Beach situation where there are no sewage inputs or whether the said study was conducted in areas where sewage inputs were quantified and therefore is not applicable to this area. The reference provided for this are issued permits not scientific studies.

Response: The appropriate reference has been made to be the article entitled "The Health Effects of Swimming in Ocean Water Contaminated by Storm Drain Runoff" (Haile et al, 1999). The article states that there was a direct correlation between swimming related illnesses and densities of indicator bacteria originating from heavy urban runoff discharged from storm drains.

Written Comment 19
(*County of Orange letter, Attachment A, Comment 15, dated April 3, 2008*)
Section 6.1.1.2 Source Contributions, Page 31, Fourth Paragraph: Correct typographical error "poosible".

Response: Please see the response to previous comment 14.

Written Comment 20
(*County of Orange letter, Attachment A, Comment 16, dated April 3, 2008*)
Section 7.2.3 Dry Weather Load Calculations, Page 43, Second Paragraph: The analysis of dry weather load calculations does not take into account that the west end and east end storm drains to Baby Beach were plugged with inflatable seals during the dry season from 1997-2002. The TMDL model utilized Baby Beach water quality data from 11/1996-10/2002 for calibration. This data was collected during the period the plugs were in place, therefore, its use for the calibration of watershed MS4 systems loading into Baby Beach is flawed. Dry weather load calculations should be adjusted to reflect site conditions (no MS4 inputs) during the modeling data period.

Response: According to the June 2003 State of the Beach Report, the plugs were only in place from about April 15 to October 15 of each year from 1997 to 2002. The dry weather model was for all dry weather days, including the dry weather periods from January 1 to April 14 and October 16 to December 31.

Additionally, according to the June 2003 State of the Beach Report, "Bacteria appear to be entering Baby Beach from the storm drains even while the plugs are in place, indicating plug leakage. The most significant contributor of bacteria appeared to be the storm drains." Clearly the plugs were not eliminating the flow from the storm drains during 2001 and 2002, which was the period of time used to calibrate and validate the model.

Written Comment 21
(*County of Orange letter, Attachment A, Comment 17, dated April 3, 2008*)
Section 7.2.5 Calculation of Existing Dry Weather Bacteria Loads and TMDLs, Page 45, Second Paragraph: If modeling indicates that watershed bacteria levels were too low to result in the observed bacteria levels and Baby Beach storm drains were plugged during the model utilized data period (Comment #16), then it would seem uncertain that the required MS4 wasteload reductions would result in meeting the assimilative capacities or WQOs at Baby Beach. As noted in Comment #16, the dry weather model should be adjusted to reflect the site conditions at the time of the water quality monitoring data used and the required dry weather load reductions should be revised accordingly.

Response: The bacteria loads from the watershed runoff models were generally too low to result in the observed bacteria levels in the receiving water, *if those were the only bacteria loads in the receiving waters*. The bacteria loads from the watershed runoff models in addition to bacteria loads from other sources or already within the receiving water would cause an exceedance of REC-1 WQO. The text of the Technical Report has been revised to clarify this point.

Written Comment 22
(*County of Orange letter, Attachment A, Comment 18, dated April 3, 2008*)
Section 8.2 Load Allocations, Page 49, Third Paragraph: Better spatial information is available for the coverage of MS4s in the Baby Beach drainage area. Attachment B depicts the Baby Beach drainage area and MS4 subdrainages within it based upon a review of area grading and development plans. As noted in Comment #5, the watershed area used in the model should be revised to reflect the actual drainage area to Baby Beach. A redistribution of WLAs assigned to MS4s should be calculated to account for natural areas not included within coverage of an MS4.

Response: Please see the response to previous comment 9, which explains how including all the subwatersheds draining into Dana Point Harbor for the receiving water model is appropriate.

The modeling approach used actually provides the MS4s for Baby Beach a larger WLA than what would result from using the smaller watershed area as recommended by the commenter. As noted by the commenter in previous comment 9, the water quality data indicate that the bacteria impairment is limited to the area near Baby Beach. The storm drains near Baby Beach may be the most significant source of bacteria, as reported in the June 2003 State of the Beach Report. That does not preclude the possibility that bacteria from other parts of Dana Point Harbor may also have an impact. In any case, the WLA that is assigned to the MS4s ultimately requires that the REC-1 WQOs are met at Baby Beach.

The Regional Board encourages the phased approach that is currently being taken to correct the problem, by trying to identify and control the main sources of bacteria contributing to the impairment. Control of bacteria loads originating from the storm drains near Baby Beach may be all that is needed to reduce the bacteria levels to

acceptable levels. If control of the bacteria originating from the storm drains near Baby Beach is not enough, control of other sources and other storm drains that may contribute to bacteria loads impacting Baby Beach may be required.

Written Comment 23
(*County of Orange letter, Attachment A, Comment 19, dated April 3, 2008*)
Section 9.4 Persons Responsible for Controllable Nonpoint Source Discharges, Page 60, Second Paragraph: See comment #11 regarding encampments of homeless persons.

Response: Please see the response to previous comment 15.

Written Comment 24
(*County of Orange letter, Attachment A, Comment 20, dated April 3, 2008*)
Section 10.3.1 Point Source Discharges, Page 63, Table 10-1: San Diego Water Board Order No. R-9-2008-0001 has not been adopted. The citation should be revised to reflect the current NPDES permit No. R-9-2002-0001.

Response: References to Order No. R9-2008-0001 were corrected to be R9-2002-0001 as recommended.

Written Comment 25
(*County of Orange letter, Attachment A, Comment 21, dated April 3, 2008*)
Section 10.4.1 Compliance Schedule, Page 65, Second Paragraph: For over ten years the OC Public Works Department (formally RDMD) and the Orange County Health Care Agency have conducted numerous studies and implemented a variety BMPs in an effort to reduce bacteria levels at Baby Beach. These efforts have included seasonal plugs in storm drains, increased street sweeping efforts, the installation of bird netting under the pier, public education efforts against bird-feeding at the beach, artificial circulation of Baby Beach harbor area water, a dry weather flow diversion structure on the west end of the beach, catch basin filter treatment systems, and the disposal of bird fecal droppings from the exposed intertidal areas of the beach. The document should be revised to describe implemented BMPs and to change text indicating that a dry weather flow diversion structure is at the west end storm drain not the east end.

Response: The water quality data indicate that the bacteria levels have improved significantly since 2002, when the municipalities began implementing effective measures. A noticeable change can be seen in the water quality data beginning in mid-2005 when the dry weather flow diversion structure was installed. This confirms the June 2003 State of the Beach Report finding that the storm drains are the most significant source of bacteria. The dry weather diversion structure is likely reducing the dry weather bacteria loads significantly. The significant reduction of dry weather bacteria loads by the diversion structure confirms that the 82-96 percent Baby Beach dry weather wasteload reductions calculated for the MS4 is appropriate.

The Implementation Plan in the Technical Report has been revised to acknowledge the efforts that have been taken at Baby Beach. The text has also been revised to correct the location of the diversion structure.

Written Comment 26
(*County of Orange letter, Attachment A, Comment 22, dated April 3, 2008*)
Section 10.6 Specific Implementation Objectives, Page 75, Third Paragraph. See comment #20.

Response: Please see the response to previous comment 24.

Written Comment 27
(*County of Orange letter, Attachment A, Comment 23, dated April 3, 2008*)
Appendix B, Comment 13, Page B-14: We believe that Professor Holden's comment that, "the miniscule amounts to be removed from the watershed will likely do little to protect public health" defines an underlying problem with the developed TMDLs. Considering that during dry weather the Baby Beach storm drains were plugged during the period of data used for modeling it is difficult to give any validity to the dry weather MS4 TMDLs or the actual assimilative capacity of Dana Point Harbor. The Regional Board's response to professor Holden's comment should be revised to reflect the MS4 conditions during the period of modeling.

Response: In Appendix B to the Technical Report, a response to Professor Holden's comment was provided, which adequately addressed Dr. Holden's concerns. Please see the response to previous comment 20, which discussed the potential impact on the modeling approach by the plugged storm drains.

Written Comment 28
(*County of Orange letter, Attachment A, Comment 24, dated April 3, 2008*)
Appendix B, Overarching Questions, Page B-14: Professor Holden makes a significant comment that, "the development of TMDLs and the implementation of them against a backdrop of great uncertainty regarding their effectiveness to protect human health represents an unwise expenditure of public funds." Although there may currently be limited data evaluating the human health risks associated with bacteria from waterfowl (continuing epidemiological studies this summer at Doheny Beach may shed light on this), there is considerable data regarding the source of bacteria at Baby Beach which can improve the developed TMDLs to more correctly reflect site conditions. As noted previously, the Baby Beach storm drains were plugged during the period of data used for modeling. Therefore, we believe that this creates great uncertainty as to developed TMDL and whether it will do anything to protect public health beyond current ongoing efforts.

Response: In Appendix B to the Technical Report, a response to Professor Holden's comment was provided, which adequately addressed Dr. Holden's concerns.

Please see the response to previous comment 12 regarding the general topic of uncertainty that is involved in using any modeling approach, and the response to previous comment 20 to regarding the plugged storm drains.

Written Comment 29
(*County of Orange letter, Attachment A, Comment 25, dated April 3, 2008*)
Appendix B, Overarching Questions, Page B-26, Comment: Professor Barber makes a significant comment that, "there are many data gaps that required assumptions that will eventually need to be proven in order to justify the expected costs associated with the implementation plan." A "lack of data" is used repeatedly throughout the document as a reason for model assumptions. As noted previously, additional monitoring and study data which could improve these TMDL models is and has been available at Baby Beach. Considering the unknown implementation costs of these TMDLs and the fact that current data has not been used to improve the modeling, her comment clearly points to the need to update the modeling.

Response: In Appendix B to the Technical Report, a response to Professor Barber's comment was provided, which adequately addressed Dr. Barber's concerns.

The Regional Board disagrees that the model needs updating to calculate the TMDLs. The TMDLs are based on REC-1 WQOs. The fact that the bacteria levels in Dana Point Harbor near Baby Beach consistently exceeded REC-1 WQOs prior to 2003 means that there were bacteria loads contributing to and causing the exceedances, and that those bacteria loads were likely originating from the storm drains. This is supported by the findings reported in the June 2003 State of the Beach Report.

The Baby Beach dry weather wasteload reductions calculated to meet the MS4 WLA are supported by the improvement in the water quality after the dry weather diversion structure was installed. The dry weather diversion structure is very likely reducing the dry weather bacteria loads from the MS4 significantly (i.e., possibly up to 100 percent). Therefore, the results of the dry weather model used to calculate the existing loads and TMDLs appear to have been correct in estimating that 82 to 96 percent reduction in the bacteria wasteload from the MS4 would reduce the bacteria levels enough to meet the REC-1 WQOs.

Written Comment 30
(*County of Orange letter, Attachment A, Comment 26, dated April 3, 2008*)
Appendix F, Section F.3.3.2.2, Lateral boundary conditions, Page F-40, Fourth Paragraph: The document states, "Contributions from subwatersheds 2101 and 2102 were included as lateral boundary conditions for DPH." This seems to contradict other information in the document (Table 2-1 and Figure J-3) that describe and depict the

Baby Beach watersheds as being 522.6 acres and subwatersheds 2101, 2102, 2103, and 2104. If only subwatersheds 2101 and 2102 were used for modeling loading, this would include approximately 195.7 acres. This is still over four times larger than the 43.4 acres shown on area grading and development plans as draining directly to Baby Beach (see Comment #5).

Response: Please see the response to previous comment 9, which explains how including all the subwatersheds draining into Dana Point Harbor for the receiving water model is appropriate.

The original text incorrectly states that only contributions from subwatersheds 2101 and 2102 were included as lateral boundary conditions. Subwatersheds 2101 through 2104 are correctly depicted in Figure F-20 as lateral boundary conditions. The text in Appendix F to the Technical Report has been corrected.

Written Comment 31
(*County of Orange letter, Attachment A, Comment 27, dated April 3, 2008*)
Appendix J, Figure J-3, Dana Point Harbor – Baby Beach Watersheds, Page J-3: The map area highlighted as being "impaired waterbody" extends beyond the east end of Baby Beach and around into the west basin of the harbor. This is an incorrect depiction of the impaired area of the harbor. The map should be revised to reflect impaired area being confined to Baby Beach.

Response: According to the 2002 303(d) List, the length of the impaired shoreline at Baby Beach is 0.4 miles. Figure J-3 depicts 0.4 miles of impaired shoreline. If the County of Orange is requesting a revision to the 2008 303(d) List, a request should be made during this next 303(d) listing cycle.

Written Comment 32
(*County of Orange letter, Attachment C, Comment 1, dated June 2, 2005*)
Section 4.1 Data Inventory, page 11: The text should list the specific reports utilized that corresponds to each data source. From the current text it is difficult to determine if the extensive data collected in the June 2003 State of the Beach Report was included in the model. This project was funded through the Clean Beaches Initiative and includes a thorough data mining report, circulation study and special bacteriological studies conducted during the summer and fall of 2002. Without utilizing this data, it is doubtful that the model accurately approximates the bacterial influences at Baby Beach.

Response: The data sources were included in the Technical Report. Appendix D to the Technical Report, listing all the data sources and time periods, was prepared in response to this comment.

Written Comment 33
(*County of Orange letter, Attachment C, Comment 2, dated June 2, 2005*)
Section 5.1 Nonpoint Sources, Page 18: The text does not identify sediments as a potential nonpoint source of bacteria. The June 2003 State of the Beach Report and continued studies by the County of Orange Health Care Agency have identified bacteria resuspension and regrowth in sediments as an important potential source of bacterial contamination at Baby Beach.

Response: Please see the response to previous comment 16.

Written Comment 34
(*County of Orange letter, Attachment C, Comment 3, dated June 2, 2005*)
Section 5.2.2.b Dry Weather Urban Runoff: The analysis of dry weather urban runoff does not take into account the fact that all storm drains leading to Baby Beach are plugged from May through September since 200X [sic], eliminating the influence of urban runoff during this season. Without incorporating this information, it is doubtful that the model accurately approximates the bacterial influences at Baby Beach.

Response: Please see the response to previous comment 20.

Written Comment 35
(*County of Orange letter, Attachment C, Comment 4, dated June 2, 2005*)
Section 6.1.1.d Constituents, Page 23: The text should define the term "state variable."

Response: The text of the February 22, 2008 Technical Report includes the definition of "state variable."

Written Comment 36
(*County of Orange letter, Attachment C, Comment 5, dated June 2, 2005*)
Section 6.2 Wet-weather Modeling Analysis, Page 24: The model does not address re-growth of bacteria within the system. The June 2003 State of the Beach Report and continued studies by the County of Orange Health Care Agency have identified bacteria resuspension and regrowth in sediments as an important potential source of bacterial contamination at Baby Beach

Response: Bacteria re-growth is a complex process that must account for site-specific features of a watershed for estimation (e.g., temperature, organic material). Information for quantification of re-growth is not available. As a result, assumptions were required to provide consideration of potential re-growth in the models.

For the receiving water model, bacteria die-off and re-growth rates were not considered. There were no site-specific data available, and given that natural and background sources are a considerable portion of the potential bacteria loads in the receiving water, no net die-off rate was assumed. However, as discussed in the response to previous comment 16, if the impairment at Baby Beach is caused by re-

growth and resuspension of bacteria near the shoreline, this would not be considered a natural source if the bacteria and sediments originated from the storm drain.

Written Comment 37
(*County of Orange letter, Attachment C, Comment 6, dated June 2, 2005*)
Section 7.2.1 Identification of the Critical Dry-weather Condition, Page 31: The text should clarify whether the tidal regime chosen for both the wet-weather and dry-weather has actually occurred during those periods. It is unclear whether the chosen critical tidal regime would occur during both wet and dry season. The text should also include the rationale for what factors characterize a critical tidal condition.

Response: The critical tidal period is used only in the receiving water model and as a "worst case" assimilative capacity scenario. This "worst case" scenario could occur under wet weather or dry weather conditions. The same 30-day critical tidal period was used for both the wet weather and dry weather models and discussed in more detail the February 22, 2008 Technical Report. The critical tidal period is the period of time when the receiving water is expected to have the lowest assimilative capacity. The 30-day critical tidal period selected for calculating the TMDL and existing loads in the receiving water was from March 7 to April 7, 2001. The bacteria loads from the watershed models were used as an input into the receiving water model. The watershed model simulation dates did not necessarily correspond to the receiving water model simulation dates.

Written Comment 38
(*County of Orange letter, Attachment C, Comment 7, dated June 2, 2005*)
Appendix G, Introduction, Page 1, Second Paragraph: This discussion of near shore contributions of bacteria should include a discussion of bather shedding of bacteria. Nearshore contributions in some cases where there is high-density human use can be due to shedding from humans (especially infants and children). The name of the impaired waterbody in Dana Point Harbor (Baby Beach) suggests there is a high degree of use by children.

Response: The Technical Report has been revised to include bather shedding as a potential background source of bacteria in section 5 of the Technical Report (Source Analysis).

Written Comment 39
(*County of Orange letter, Attachment C, Comment 8, dated June 2, 2005*)
Appendix G, Introduction, Page 1, Third Paragraph: The modeling approach described does not capture the transformations bacteria undergo, i.e., dieoff due to exposure to ultraviolet radiation and saline conditions, and regrowth where conditions are favorable. These dynamics make a simple buildup and washoff model prone to higher degrees of

error and uncertainty. Some recent data suggest that regrowth of bacteria can happen fairly quickly.

Response: Please see the response to previous comment 12 in regard to the general topic of uncertainty associated with models, and the response to previous comment 36 in regards to bacteria die-off and re-growth rates.

Written Comment 40
(*County of Orange letter, Attachment C, Comment 9, dated June 2, 2005*)
Appendix G, Introduction, Page 1, Fifth Paragraph: Substantive concerns were raised about the degree to which these models were calibrated. For example, see comments 19-32 and 35-38 in the County's April 16, 2004 comment letter on TMDL Project 1.

Response: For TMDL and bacteria load calculation purposes, the models were adequately calibrated and validated. For example, the dry weather model predicted that reducing the bacteria loading from the MS4 to Baby Beach by 82 to 96 percent would restore the water quality. The Baby Beach municipalities installed the dry weather diversion structure on the west end of the beach in 2005, which is likely reducing the bacteria loads from the MS4 storm drains to Baby Beach by 80 percent or more during dry weather. The dry weather water quality data collected since the dry weather diversion structure was installed show significant improvement and appear to be meeting water quality objectives consistently. The degree to which these models were calibrated and validated were adequate for calculating TMDLs and identifying sources of bacteria that need control.

The April 16, 2004 comment letter referenced to by the commenter were submitted for a preliminary draft of the Technical Report for Bacteria TMDL Project I that was being prepared for scientific peer review. These comments were addressed when Bacteria TMDL Project I was adopted by the Regional Board in December 2007. Because these comments are not provided in the record, comments 19-32 and 35-38 from the April 16, 2004 comment letter on Bacteria TMDL Project I and responses within the context of this TMDL project are provided below:

Comment 19 - The statement about the dependence of bacteria concentrations on land use is essentially lacking in content, and therefore not useful in evaluating the modeling approach and results. The description of the watershed model in the Appendix refers to a SCCWRP study and a Regional Board publication, but presents no actual data on bacteria loads from different land uses. Because these data are so key to the model results, this paragraph, or the Appendix, should present the estimates of loads from specific land uses and discuss their implications. For example, there should be a logical relationship between the relative magnitude of loads from urbanized and open space land uses, the proportion of each watershed in open space, and the size of the background allowance for each watershed. In general, there is a lack of such internal consistency checks in the validation of the modeling assumptions.

Response to Comment 19 – Please see the response to comment 40 above and comment 41 below.

<u>*Comment 20*</u> - The selection of the baseline year for modeling wet year loads is a critical one, yet there is no readily apparent explanation or justification for this choice. It would be useful to see model runs that show the sensitivity of the TMDL targets to different rainfall years. As it stands, the choice of this particular year seems arbitrary.

Response to Comment 20 – Additional discussion about the critical wet year is included in section 7.1.1 of the Technical Report. Also, please see the response to comment 40 above.

<u>*Comment 21*</u> - It is inappropriate to state that something is "generally understood" in a document of this significance. This section attempts to causally link the observation of high bacteria levels at the shoreline to urban runoff by stating that dry weather flows are "generally understood" to result from urban runoff. This is not a valid statement. The document appears to argue, by inference, that all flow in the absence of rainfall must necessarily stem from urban runoff. Historical records of many streams in southern California indicate this assumption is not as broadly true as this paragraph makes it seem. In general, there are too many technically unsupported statements like this in the document. While it may be challenging, the TMDL targets should include an estimate and an allowance for dry weather base flow where appropriate. The USGS records could provide a starting point for this exercise.

Response to Comment 21 – Additional discussion about dry weather urban runoff is included in section 5.2.3.2 in the Technical Report. Also, please see the response to comment 40 above.

<u>*Comment 22*</u> - This section, which describes the rationale for choosing between the steady-state and dynamic modeling approaches, is internally inconsistent. Steady-state models are described as best suited to streams dominated by point source inputs with impairment only under low-flow conditions. Dynamic models, in contrast, are more suited to streams affected by nonpoint sources or rainfall-driven flow and pollutant contributions. Preceding sections make it clear that the bacteria problem in watersheds in the San Diego Region occurs in both dry and wet weather and the document argues that bacteria loading is driven by the rainfall-mediated washoff of bacteria accumulated on land surfaces, a notably variable process. This would suggest that a steady-state model is not appropriate. However, on the basis of an unsupported assumption that the Region is "dominated by nonpoint sources that are generally constant on an hourly time step and deposit directly to drains," a steady-state modeling approach is chosen. There is no documentation given for this assumption about the behavior of nonpoint sources, nor is there any reference to more detail in an Appendix. In fact, available data show strong variability in flow and bacteria levels over the course of a day. The conclusion that the nonpoint sources can be treated as point sources is thus simply an assertion, and it seems that this decision may have been motivated instead by the availability of data. Given the rather significant management implications of the TMDL targets, which are based on

modeling results, this level of justification for a major technical decision is inadequate. The evidence for the "generally constant" behavior of nonpoint sources should be presented and the sensitivity of the modeling results to different technical approaches should be investigated.

Response to Comment 22 – The discussion about the applicability of a steady-state versus dynamic watershed modeling approach was completely revised, and is included in section 6.1.1.1 of the Technical Report.

Comment 23 - The assertion that "available data indicate that the main sources are dry- and wet-weather urban runoff" is not fully supported by the data and analyses presented. The data do show an association between impairment along the coast and proximity to the mouths of rivers and creeks. In addition, the data show that the frequency of exceedances is higher for creeks and streams whose watersheds contain urbanized land uses than the level seen at the reference watershed in Los Angeles County. However, that does not necessarily equate to a conclusion that the main sources of bacteria are urban runoff, particularly given the flawed "analysis" of the monitoring data off the mouth of San Mateo Creek during the dry season (see comment 11b). For example, no explanation is provided for how urban land uses, which make up only 8% of the area of impaired watersheds (Section 3.1), could be the major source of impairment. This would require that urban land uses produce significantly more bacteria load per unit area than does open space or agriculture, a simple consistency check that is not performed. Nor is there any evaluation of whether and to what extent the Los Angeles reference watershed is applicable to the San Diego Region. It may well be, but this document assumes that this should simply be taken on faith.

Response to Comment 23 – Please see the response to comment 40 above.

Comment 24 - Again, this section tangles a discussion of what is logically the most likely case with what is logistically feasible, and then selects the logistically most feasible choice and pretends it is also the most logically likely (see, for example, comment 21 the choice of a steady state modeling approach). Thus, following a warning (in the 1st paragraph) about the danger of omitting key state variables, the 2nd paragraph goes on to conclude that first-order die-off is the most important variable. This conclusion is based, not on any objective evidence, but simply on the lack of data on the relative importance of other factors. A more objective and thorough modeling approach would have included sensitivity analyses to estimate how large any of these other factors would have to be to substantially change the modeling results. Then, these estimates could be evaluated to determine if any are within the realm of possibility. This might be especially important for regrowth, which some data suggest might be important in determining ambient levels.

Response to Comment 24 – Please see the responses to comments 12 and 40 above.

Comment 25 - The definition of "critical point" is still unclear, even this far into the document. Neither this statement, nor previous ones, clarify how much mixing, if any, has occurred by the time the discharge from the creek, etc. has

reached the critical point. The language used, "the point where the creek/watershed or storm drain initially mixes with ocean water at the surf zone," could be interpreted to mean any one of the following:

a) where initial mixing begins but where the discharge water still maintains its original signature
b) where initial mixing is underway and where the discharge water has started to lose its original signature
c) where initial mixing has been completed and the discharge has lost its original signature.

Each of these definitions has a somewhat different implication for the level of reduction needed to meet the TMDL target, since the greater the degree of mixing the lesser the reduction needed to meet the target. The failure to adequately define, in physical process terms, the nature of the critical point, is significant. It may well be dealt with in the depths of the model algorithms, but this is not accessible to the reader of this document. In addition, despite the lengthy reference in this section to the Appendix, there is no mention of "critical point" in Appendix D, which deals with water quality modeling.

Nor is there any explanation or justification provided, from the policy perspective, for why this particular location was selected as the critical point. The entry point of a discharge, particularly a large one like a creek, into the ocean is not typically a place where recreational body contact use is concentrated. Due to the importance of the location of the critical point for the TMDL, it deserves more explanation.

Response to Comment 25 – This project does not use a watershed model and critical point to calculate the TMDL. The receiving water model is used to calculate the TMDL at the critical location, which is the length of the shoreline. Therefore, this comment is not applicable to this TMDL project.

Comment 26 - The introductory paragraph to this section reflects an incompletely developed conceptual model of background or natural sources of bacteria. The conceptual model implicit here and in other places in the document is that bacteria from natural sources enter receiving waters either directly (e.g., waterfowl) or as the result of runoff directly into receiving waters from open space. The possibility that bacteria from natural sources could enter MS4s is apparently not considered and/or accounted for. The only way the statements in the document can be understood to be logically consistent is as follows:

- Natural sources are uncontrollable.
- Sources from urban runoff associated with MS4s are controllable. Therefore, natural sources do not contribute to urban runoff in MS4s.

However, this does not account for observations that:

- Wildlife (e.g., rabbits, skunks, coyotes, birds) frequent developed areas and bacteria from their droppings enters the MS4 via runoff after rain

- MS4s in many locations drain combinations of urbanized and open space, for example, where development abuts open space and runoff from the open space flows onto streets and then into the MS4
- Portions of the MS4 (e.g., stormdrains and channels) are used as habitat by some species of wildlife.

Assuming that these sources are controllable simply because they end up in the MS4 is simplistic and is unrealistic.

Response to Comment 26 – This comment was addressed with the Reference System and Antidegradation Approach (RSAA) and Natural Sources Exclusion Approach (NSEA) Basin Plan amendment. Municipal Dischargers are responsible for the anthropogenic sources of bacteria that enter their MS4s. However, if natural and background sources appear to be the sole source of continued impairment, the NSEA may be applied. The Implementation Plan in the Technical Report has been revised to provide more information about the NSEA and when it may be applicable

Comment 27 - The justification for the selection of the critical wet-weather condition is not logical. Flows in creeks and rivers in southern California during "extreme wet conditions" are high and rapid, the ocean environment off creek and river mouths is turbulent and dangerous, and REC1 use at these places and times is highly unlikely. In fact, anyone engaging in body contact recreation under these conditions might well run a much higher risk of drowning than of illness from exposure to contaminated water. Standard risk management approaches typically focus on circumstances in which risk is highest, generally assessed as a combined function of the level of hazard and the number of people exposed. While the level of the hazard in the wet-weather critical period is high, the number of people exposed is most probably extremely limited. Therefore, the justification for using this period to set the TMDL targets, with their attendant consequences for management policies and implementation costs, is weak.

Response to Comment 27 – This comment applies to creeks and rivers and is not applicable at the shoreline segments included in this TMDL project.

Comment 28 - Again, there is need for explicit reference to, or inclusion of, loading estimates from each land use type.

Response to Comment 28 – Please see response to comment 41 below.

Comment 29 - The logical process linking all the pieces described to this point is not clear. Data have been presented on bacteria levels, loads, and frequencies of exceedances, without a clear description of how they are being integrated to create the targets. A flow chart would be helpful. In addition, it would be desirable to have more than one reference watershed, given that there will necessarily be natural variability in reference conditions.

Response to Comment 29 – This TMDL project is not incorporating the use of a reference system. Therefore, this comment is not applicable to this TMDL project.

Comment 30 - This table presents a TMDL target for total coliforms that is less than that for fecal coliforms. This does not seem possible. This example highlights the need for explicit consistency checks between various aspects of the data, the process assumptions, and the modeling results.

Response to Comment 30 – This comment refers to a numeric target for total coliform indicator bacteria based on the SHELL beneficial use water quality objective. The SHELL beneficial use is not addressed in this project, thus this comment is not applicable to this TMDL project.

Comment 31 - As mentioned above, it is logically inconsistent to describe natural background sources as uncontrollable and then make no provision for them in the final TMDL targets. Thus, while the text discusses the need to find a reference watershed for the San Diego Region, the targets themselves contradict this by setting the allowable exceedance frequency at zero. The TMDL targets, once adopted, become enforceable regulatory numbers. It would be more logically consistent to defer the TMDL until the reference data are available.

Response to Comment 31 – This comment was addressed with the RSAA/NSEA Basin Plan amendment. If natural and background sources appear to be the sole source of continued impairment, the NSEA may be applied. The Implementation Plan in the Technical Report has been revised to provide more information about the NSEA and when it may be applicable.

Comment 32 -Given the importance of the critical point definition, it should appear much earlier in the document. Alternatively, this section could be referenced at the first mention of critical point.

Response to Comment 32 – This project does not use a watershed model and critical point to calculate the TMDL. The receiving water model is used to calculate the TMDL at the critical location, which is the length of the shoreline. Therefore, this comment is not applicable to this TMDL project.

Comment 35 -As discussed above, there is no justification provided, other than ease of model calculation, for use of a steady-state model for dry weather flows and bacteria loading. Available data certainly do not present a steady-state picture and there is no sensitivity analysis of the impact this assumption has on the modeling results

Response to Comment 35 – The discussion about the applicability of a steady-state versus dynamic watershed modeling approach was completely revised, and is included in section 6.1.1.1 of the Technical Report. Also, please see the response to comment 40 above.

Comment 36 - There is no justification provided for use of the watershed mouth as the critical point for dry weather. The implicit assumption apparent from the language used is that bacteria levels are assumed to be highest at the critical point. However, this is not consistent with available monitoring data. For dry weather, the extensive Aliso Creek monitoring data showed that densities were consistently higher in the upper reaches of the watershed, where the ratio of discharge input to

ambient flow is highest and where dieoff has not yet had much opportunity to affect bacteria populations. Given the Aliso Creek data, it is not logical to assume that compliance with WQOs must be "maintained for all segments of a waterbody to ensure that impairments of beneficial uses are not observed."

Response to Comment 36 – This project does not use a watershed model and critical point to calculate the TMDL. The receiving water model is used to calculate the TMDL at the critical location, which is the length of the shoreline. Therefore, this comment is not applicable to this TMDL project.

Comment 37 - The text states, "The only point sources identified to affect impaired water bodies addressed in this study were MS4s.", yet includes no discussion of the evaluation of other point sources, such as Waste Discharge Requirement permits or NPDES Construction Permits. It is not clear whether any other point sources were evaluated during the development of this TMDL.

Response to Comment 37 – Other point sources, including boats and wastewater collection systems and treatment plants, were identified and discussed in this TMDL project. The discussion about point sources is included in section 5 of the Technical Report (Source Analysis).

Comment 38 - Agricultural runoff is not discussed as a possible source requiring a load allocation assignment. It does not appear that agricultural runoff has been investigated as a source of bacterial contamination in any watershed addressed in this document. Additionally, it is inappropriate to defer the investigation, quantification and designation of Load Allocations until after the TMDL is developed.

Response to Comment 38 – There were no agricultural land use areas identified in the watersheds that drain to the shoreline segments in this TMDL project. Therefore, this comment is not applicable to this TMDL project.

Written Comment 41
(*County of Orange letter, Attachment C, Comment 10, dated June 2, 2005*)
Appendix G, G.1.1 Watershed Segmentation, Second Paragraph: In order to evaluate whether the hydraulic assumptions in the model are accurate, it's important to know whether the streams and channels that input to the impaired areas really behave like pipes. If there are places where there are eddies, backflows, pooling, or other features that do not reflect direct flow, then the hydraulic assumptions of the model will not be representative.

Response: The assumptions used in the models were adequate for calculating TMDLs and identifying sources of bacteria that need to be controlled. Assumptions were made because there were no data available to provide more accurate site specific conditions. Please see the response to previous comment 40.

Written Comment 42
(*County of Orange letter, Attachment C, Comment 11, dated June 2, 2005*)
Appendix G, G.1.2.d Pollutant Representation: See comment #3 above, in particular comments 19-24, 26, 28, and 35 in the April 16 comment letter. The buildup and washoff approach to bacteria loading should be explained more fully to make clear whether the buildup algorithm allows for dieoff of bacteria as they sit on the land surface exposed to sunlight. In addition, the document should clarify whether the buildup algorithm treats all surfaces as impervious, or whether it allow for flushing of coliforms that are naturally resident in soils, a different physical process from washoff of an impervious surface.

Response: Appendix F of the February 22, 2008 draft Technical Report includes information and discussion about impervious and pervious surfaces and references the different algorithms used for each type of surface.

Written Comment 43
(*County of Orange letter, Attachment C, Comment 12, dated June 2, 2005*)
Appendix G, G.1.2.e Waterbody Representation: The document states, "Each delineated subwatershed was represented with a single stream assumed to be completely mixed, on-dimensional segment with a trapezoidal cross-section." That may be a reasonable assumption if all the inputs to the listed areas are in fact concrete lined channels. However, if they are natural streams, or channels with earthen sides or bottoms, there could be major problems with this assumption. In addition, many channels have accumulated sediment and vegetation, and some have dikes to promote infiltration for ground water recharge. Any of these factors could undermine the validity of the modeling results. While models do have to make simplifying assumptions, it's important not to take these to the point where the model is no longer a reasonable representation of the system. It would be useful to validate this assumption by comparing the actual measured flows to modeled flows in a channel that clearly does not meet the assumption that the channel is essentially a well-mixed pipe.

Response: The assumptions used in the models were adequate for calculating TMDLs and identifying sources of bacteria that need to be controlled. Assumptions were made because there were no data available to provide more accurate site specific conditions. Please see the response to previous comment 40.

Written Comment 44
(*County of Orange letter, Attachment C, Comment 13, dated June 2, 2005*)
Appendix G, G.1.2.e Waterbody Representation: The document does not state the criteria for determining representativeness. The document should describe how well the approximated GIS-based reach reflects the actual range of stream and channel characteristics found in the DPH and SDB sub-watersheds. Without this information, a determination whether the reaches were selected because they are representative of actual stream characteristics or because they meet the modeling assumptions cannot be made.

Response: The assumptions used in the models were adequate for calculating TMDLs and identifying sources of bacteria that need to be controlled. Assumptions were made because there were no data available to provide more accurate site specific conditions. The County of Orange was given opportunities to provide more site specific data in December 2004 and June 2005, but did not do so. Please see the response to previous comment 40.

Written Comment 45
(*County of Orange letter, Attachment C, Comment 14, dated June 2, 2005*)
Appendix G, G.1.3.a Hydrology Calibration and Validation: See comment #3 above, in particular comments 19-22 in the April 16 comment letter.

Response: Please see the responses to previous comments 20, 34, and 40.

Written Comment 46
(*County of Orange letter, Attachment C, Comment 15, dated June 2, 2005*)
Appendix G, G.1.3.b Water Quality Calibration and Validation: See comment #3 above, in particular comments 19-24, 26, 28-29, and 31-32 in the April 16 comment letter.

Response: Please see the responses to previous comments 20, 34, and 40.

Written Comment 47
(*County of Orange letter, Attachment C, Comment 16, dated June 2, 2005*)
Appendix G, G.1.3.b Water Quality Calibration and Validation: The document states, "no data are available for the bay and harbor watersheds to further validate the parameters as part of this current modeling effort." This is a serious data gap. These watersheds may well behave differently than the other coastal watersheds that were the focus of TMDL Project 1. As just one example, the mixing dynamics at the mouth of the watershed will be different. Tidal influences and mixing in a bay are going to be very different, as well conditions that determine the dieoff and/or regrowth rates. Human use patterns will also be different, and, to the extent that direct shedding by humans is a significant sources, this could be an important difference. Without watershed specific data to calibrate the parameters of the model, the results of the model are at best questionable and should not be used as the basis of major policy decisions or implementation plans.

Response: The parameters referred to by the commenter are the land use specific accumulation and maximum build up rates for fecal coliform, total coliform, and *Enterococcus* indicator bacteria, which were taken from the Los Angeles Region. San Diego Region specific accumulation and maximum build up rates for fecal coliforms, total coliforms, and *Enterococcus* indicator bacteria are not available. The alternative would be to take values from literature or some other source that would likely be even less representative of accumulation and maximum build up rates for

the San Diego Region. Until San Diego Region specific values are developed, or watershed specific values are provided, the Los Angeles Region values are the most appropriate. Also, please see the response to previous comment 40.

Written Comment 48
(*County of Orange letter, Attachment C, Comment 17, dated June 2, 2005*)
Appendix G, G.2 Dry Weather Watershed Model: See comment #3 above, in particular comments 19, 21-26, 28-32, and 35-38 in the April 16 comment letter.

Response: Please see the responses to previous comments 20, 34, and 40.

Written Comment 49
(*County of Orange letter, Attachment C, Comment 18, dated June 2, 2005*)
Appendix G, G.2 Dry Weather Watershed Model: The document states, "this predictive model represents the streams as a series of plug-flow reactors, with each reactor having a constant, steady-state flow and pollutant load." This representation may not be adequate for dry weather flow. Patterns of bacteria concentrations are not well represented by steady-state mass balance assumptions, as previous work on Aliso Creek has demonstrated.

Response: Please see the responses to previous comments 40, 41, 43, and 44.

Written Comment 50
(*County of Orange letter, Attachment C, Comment 19, dated June 2, 2005*)
Appendix G, G.2.1 Model Configuration: The document should state on what basis are bacteria presumed to be conservative, and how dieoff and regrowth processes are or are not accounted for in the model.

Response: Please see the response to previous comment 36.

Written Comment 51
(*County of Orange letter, Attachment C, Comment 20, dated June 2, 2005*)
Appendix G, G.2.1 b Conceptual Representation: The document should state the loss rate used in the model and the basis for the chosen rate.

Response: The document states the die-off rate used in the model and the basis for the chosen rate in section F.2.4.2 of Appendix F to the Technical Report. The loss rate is the same as the die-off rate.

Written Comment 52
(*County of Orange letter, Attachment C, Comment 21, dated June 2, 2005*)
Appendix G, G.2.1 b Conceptual Representation: The described approach is suitable for dealing with a large number of streams and coming up with a representative, or average, predictions. However, in Dana Point Harbor, there are only a few inputs to the

system and, future BMPs to meet the TMDLs are going to be very site-specific in nature. Further, the degree to which TMDL targets are being met will be assessed on the basis of bacteria concentration monitored at specific locations. This situation will result in site-specific monitoring being compared to TMDL targets generated on the basis of regional characterizations of highly simplified channel morphologies. The TMDL targets should be generated using site-specific information.

Response: Please see the response to previous comment 12.

Written Comment 53
(*County of Orange letter, Attachment C, Comment 22, dated June 2, 2005*)
Appendix G, G.2.2 Estimation of Dry-Weather Runoff: See comment #3 above, in particular comments 19, 21-26, 28-32, and 35-38 in the April 16 comment letter.

Response: Please see the responses to comments 20, 34, and 40.

Written Comment 54
(*County of Orange letter, Attachment C, Comment 23, dated June 2, 2005*)
Appendix G, G.2.2 Estimation of Dry-Weather Runoff: The document identifies 13 land use types and states the statistical relationship established between each land use area and flow showed good correlation. However, there were good correlations between land use type and flow for only three of the identified land uses. The document needs to provide justification for the broad claim that land use area and flow show good correlation.

Response: The document provides the justification in section F.2.2 of Appendix F to the Technical Report. The discussion about the correlation of land use and dry weather flow has been revised and provides more detail in the February 22, 2008 draft Technical Report compared to the April 19, 2005 preliminary draft Technical Report.

Written Comment 55
(*County of Orange letter, Attachment C, Comment 24, dated June 2, 2005*)
Appendix G, G.2.3 Estimation of Bacteria Densities: See comment #3 above, in particular comments 19-24, 35, and 37-38 in the April 16 comment letter.

Response: Please see the responses to comments 20, 34, and 40.

Written Comment 56
(*Heal the Bay letter, dated June 3, 2008*)
A Reference-Based approach is appropriate for setting waste load allocations and load allocations.
Heal the Bay strongly favors the Los Angeles Water Quality Control Board's approach in setting the TMDL targets for the Santa Monica Bay Beaches Bacteria TMDLs, the Marina del Rey Mother's Beach and Back Basins Bacteria TMDL and the Kiddie Beach Bacteria TMDL. Of note, Mother's Beach and Kiddie Beach are enclosed beaches. This approach is based on exceedances of fecal indicator bacteria standards for both interim and final TMDL targets. The most important beneficial use that is impaired by high fecal indicator bacteria densities is recreational water contact. A TMDL based on the total number of fecal bacteria in the water, rather than the numbers of days that exceed beach water quality standards, will not lead to beneficial use attainment and is an insurmountable compliance assurance problem. How will anyone be able to determine compliance with a monthly waste load allocation in terms of billion MPN/month? Further, how will this approach verify that the receiving waterbody is no longer impaired? What happens if the discharger does not exceed the loading but does exceed water quality standards? In this case, the beach would be posted with warning signs yet compliant with the TMDL. A determination of impairment should be based on water quality standards attainment, not the monthly loading.

Every time a beach water quality standard is exceeded, a beach gets closed or warning signs are posted, and this is an impaired beneficial use. An exceedance based approach is more consistent with current risk management procedures, AB 411 requirements, and public health protection.

Also, the San Diego Regional Water Quality Control Board recently adopted this reference approach for the *Project I – Beaches and Creeks in San Diego Region TMDL*. We urge the Board to be consistent and use the reference-based approach. As noted above, this approach has been used for enclosed beaches in Region 4.

Response: A reference-based approach is not appropriate for these TMDLs due to the modeling approach that was used. In addition, an appropriate reference system is not available for these TMDLs.

The Santa Monica Bay Beaches Bacteria TMDLs and the Bacteria Project I – Beaches and Creeks in the San Diego Region TMDLs were developed and calculated using the Hydrologic Simulation Program – FORTRAN (HSPF) or Loading Simulation Program in C++ (LSPC) watershed model. In both cases, a reference system (i.e., watershed and beach) with little or no anthropogenic sources was identified to determine an acceptable exceedance frequency. The exceedance frequency of the reference system may be used to provide an allowable additional load attributable to natural sources of bacteria.

A different approach was used to calculate and develop these TMDLs. For these TMDLs, the Environmental Fluid Dynamics Code (EDFC) receiving water model was used. In this case, the receiving water is Dana Point Harbor or San Diego Bay. In

order for a reference-based approach to be applied, a reference harbor or bay with little or no anthropogenic sources would need to be identified to determine an allowable exceedance frequency. There are no such reference harbors or bays in the San Diego Region that would be applicable.

Restoration of an impaired water body to a condition in which it is once again meeting water quality objectives and fully supporting its beneficial uses is the ultimate goal and purpose of the Regional Board's TMDL program. To clarify this point, the last sentence of the first paragraph will be deleted and the second paragraph of section 10.4 will be replaced with the following:

> By design, waste load allocations and load allocations are established at levels that when met, will result in the full attainment of water quality standards. For this reason, the San Diego Water Board expects that at the end of the TMDL compliance period, applicable load and waste load allocations, as well as the water quality objectives will be met at all times in the receiving water. In the event that water quality objectives are not met at the end of the compliance period, the Board will require the dischargers to conduct an investigation to identify the specific source(s) responsible for the failure to meet WQOs. If the source is found to be anthropogenic, the San Diego Water Board will initiate enforcement or other regulatory action as appropriate to correct the problem. If the source is natural, and if all of the conditions for using the natural sources exclusion approach (NSEA) have been met, the Board will consider the application of the NSEA, including the recalculation of the TMDLs to account for the natural sources.

Written Comment 57
(*Heal the Bay letter, dated June 3, 2008*)
The TMDLs should be based on all of the California Department of Health Services beach bathing water standards.
The Draft TMDL provides wet weather targets based on the single sample maximum water quality objectives and dry weather targets based on the 30-day geometric mean and single sample maximum water quality objectives for total coliform, fecal coliform, and enterococcus. However as outlined below, there are **seven** Ocean Plan water quality standards for indicator bacteria. Thus, all seven indicators should be included as wet weather **and** dry weather targets. As written, the Draft TMDL excludes 30-day geometric mean wet weather targets. If there are not enough samples to calculate the 30-day geometric mean, the standard would not apply. However if there are five samples, which is very possible, the standard must apply. Also, the Draft TMDL is missing single sample limits for a fecal-to-total coliform ratio. The fecal-to-coliform ratio was the indicator that was most strongly correlated to human health risk in the Santa Monica Bay Epidemiological Study. Thus, the wet and dry weather targets in the Draft TMDL should be modified to include a total/fecal ratio.

- TMDL targets are based on allowable exceedances of all seven of the state's beach water quality standards in the California Ocean Plan:

- Single sample
  - Total coliform 10,000 MPN
  - Fecal coliform 400 MPN
  - Enterococcus 104 MPN
  - Total/fecal ratio <= 10
- Geometric mean
  - Total coliform 1,000 MPN
  - Fecal coliform 200 MPN
  - Enterococcus 35 MPN

Response: Dana Point Harbor and San Diego Bay are considered coastal waters that are subject to the Basin Plan for the San Diego Region, not the California Ocean Plan. The Basin Plan does not include total/fecal ratio water quality objectives; therefore, these water quality objectives are not applicable.

Geometric mean water quality objectives are based on samples collected over a 30-day period. There are no storms in recent history in southern California that have lasted 30-days or more. The typical storm in the San Diego region does not last more than 2 to 3 days. Therefore, the geometric mean water quality objective would be difficult to apply in the development of the wet weather TMDLs.

Written Comment 58
(*Heal the Bay letter, dated June 3, 2008*)
The compliance point for final dry weather targets should be moved forward.
The Draft TMDL's compliance schedule requires a "50 percent reduction" in Enterococcus at year seven for wet weather and in total coliform, fecal coliform, and Enterococcus at year 3 for dry weather. Final compliance deadlines are required at 10 and 5 years in wet and dry weather, respectively.

The timeframe appears excessive for meeting final dry weather targets. As you know dry weather targets are much easier to meet than wet weather targets, and the dry weather period is the most critical period from a public health perspective. The Santa Monica Bay, Marina del Rey and San Pedro Bay Beaches Bacteria TMDLs require final dry weather targets to be met three years after adoption for the AB411 time period and 6 years for winter dry weather. Since this deadline has past, we have seen great improvements in beach water quality in Santa Monica Bay. Many municipalities in Los Angeles County have implemented best management practices such as dry weather diversions and treatment facilities to improve beach water quality. Also, Orange County and Dana Point have implemented numerous BMPs at Baby Beach that have sustainably improved water quality. Moving the final compliance dates forward is necessary to protect public health as soon as feasible during the high-use beach period.

Response: The timeframe is not excessive. The wet weather compliance schedule of 10 years for Baby Beach is consistent with the wet weather compliance schedules in Bacteria Project I – Beaches and Creeks in the San Diego Region TMDLs. The

dry weather compliance schedule of 5 years for Baby Beach is actually shorter than the 10-year dry weather compliance schedules in Bacteria Project I – Beaches and Creeks in the San Diego Region TMDLs, and the 6-year compliance schedule cited by the commenter.

Even though these TMDLs have not been adopted yet, the municipalities showed their commitment to meeting water quality objectives during dry weather by implementing several BMPs. Water quality data show that the REC-1 water quality objectives are consistently being met during dry weather. The 10-year wet weather compliance schedule for Baby Beach was developed to allow dischargers as much flexibility as possible to meet the wet weather TMDLs. We are not proposing to shorten the wet or dry weather compliance periods at this time.

Written Comment 59
(*Heal the Bay letter, dated June 3, 2008*)
Birds should not be discounted as a source of bacteria pollution.
Even if birds are deemed a significant source of bacteria pollution as hypothesized, enclosed beach environments do not constitute "natural" conditions, but instead are the unintended consequence of a man-made facility designed for recreational use. Thus, a natural source exclusion is not appropriate in this situation. Further, risk associated with birds is unknown, and this loading can often mask a true human sewage problem. As stated by a peer reviewer, "[i]f watershed sources don't account for much at the shore and birds are suspected as the major source, then either data should be available to back this up or data should be gathered to confirm. Further, birds should be considered as a public health concern." Draft TMDL at B-10. Popular beaches with discarded food and trash from visitors and open trash cans serve as attractive foraging sites for gulls and pigeons. In addition from a public perception standpoint, the public does not want to swim in bird feces.

Response: Birds are not discounted as a source of bacteria. In fact, many of the BMPs that have been implemented by the municipalities, such as bird netting and covering garbage cans, are intended to reduce bird populations and bacteria loads from birds.

Bacteria loads from birds are included in the load allocation for natural and background sources, which also includes potential loads due to other sources such as terrestrial and aquatic animals, wrack line and aquatic plants, sediments, and other unidentified and unquantified sources within the waters. The actual load that can be attributed specifically to birds cannot be quantified at this time.

In the future, if the municipalities can demonstrate that all anthropogenic sources of bacteria are controlled and water quality standards still cannot be met, the natural sources exclusion approach (NSEA) may be applied. For the NSEA to be applied, however, the municipalities must also demonstrate that the residual bacteria load attributed to natural sources does not cause a health risk. Therefore, if birds or some other source is shown to cause a health risk, additional actions may be needed to address these sources to protect public health.

Written Comment 60
(*County of Orange email, dated June 5, 2008*)
One additional comment on the Technical Report: page 35, Section 5.2.3, first paragraph. The sentence citing the State of the Beach report is unnecessary. We have never disputed the fact that stormdrains are a source of bacteria discharges.

Response: This sentence citing the State of the Beach report was included to show that the County's study also supports the finding that "Urban runoff discharges from MS4s are a leading cause of receiving water quality impairments in the San Diego Region." The sentence was also added as a clarification in response to several of the comments in the April 3, 2008 letter from the County that appeared to imply that discharges from the MS4 were not occurring during dry weather, or that impairments may not be caused by discharges from the MS4.

Written Comment 61
(*US EPA letter, dated June 5, 2008*)
This bacterial indicator TMDL is distinct because it does not require wasteload reductions from MS4s for Shelter Island Shoreline Park during wet and dry weather conditions. Data and results from the linkage analysis showed an improvement of the bacterial water quality in recent years. The TMDL appropriately states that the "existing wasteload cannot exceed the WLA" and "in order to comply with these TMDLs, the responsible municipalities must continue implementing best management practices (BMPs) and collecting data". This TMDL describes the Regional Board's plan to remove the waterbody from the 303(d) list when monitoring data show attainment with WQO and sufficient data are collected to meet requirements to meet the state's listing and delisting policy. However, the TMDL should also describe the Regional Board's requirements and/or actions that will be taken when future collected data show exceedences of the WQOs. Furthermore, since bacterial indicators can increase in load in certain environments and WQOs are concentrations based, it would be critical to re-evaluate the modeled existing wasteload to determine if the parameters and conditions used in the model has changed. Specifically, the compliance schedule and monitoring can be further clarified by including more description of the types of information provided in the bacteria load reduction plan (BLRP).

Response: For Shelter Island Shoreline Park, under dry weather conditions the wasteload allocation (WLA) assigned to the MS4 is zero, meaning no wasteload is expected or allowed from the MS4 during dry weather. If there is a wasteload discharged from the MS4 during dry weather conditions, the discharge is out of compliance with the dry weather WLA for Shelter Island Shoreline Park. For wet weather conditions, there is a wet weather WLA assigned to the MS4, and the existing wasteload cannot exceed the wet weather WLAs. The existing wasteloads, TMDLs, and WLAs were calculated under critical conditions, which are expected to account for all potential scenarios.

The Implementation Plan includes a discussion about the actions that the Regional Board can take to enforce compliance with the wasteload allocations. Under the San Diego Water Board Actions section of the Implementation Plan (section (A)(5) of the TMDL Implementation Plan in the Basin Plan amendment and section 10.6.5 of the Technical Report), it states, "The San Diego Water Board shall consider enforcement actions,[1] as necessary and appropriate, against any discharger failing to comply with applicable WDRs or discharge prohibitions. Enforcement actions may be taken, as necessary and appropriate, to control the discharge of bacteria to impaired shorelines to attain compliance with the bacteria WLAs specified in this Technical Report, or to attain compliance with the REC-1 indicator bacteria WQOs."

This is reiterated further in the TMDL Implementation Milestones, which includes an Implementation Action of "Take enforcement actions to attain compliance with the WLAs" as needed after the effective date.

As discussed in the response to previous comment 56, restoration of an impaired water body to a condition in which it is once again meeting water quality objectives and fully supporting its beneficial uses is the ultimate goal and purpose of the Regional Board's TMDL program. If discharges from the MS4 cause or contribute to the exceedance of water quality objectives and impair the beneficial uses after the end of the compliance schedules, the dischargers will be subject to enforcement action. If exceedances continue after the end of the compliance schedules, the Regional Board will require the dischargers to conduct an investigation to identify the specific source(s) responsible for the failure to meet the water quality objectives. If the source is found to be anthropogenic, the San Diego Water Board will initiate enforcement or other regulatory action as appropriate to correct the problem.

In addition the following text will be added to the end of the second paragraph of the Shelter Island Shoreline Park Compliance Schedule discussion (section 10.4 of the Technical Report and the appropriate location in the Basin Plan amendment):

> In addition, the reporting requirements for the Shelter Island Shoreline Park TMDL must also include a periodic demonstration that wasteload allocations and water quality objectives are being met.

Written Comment 62

(*US EPA letter, dated June 5, 2008*)

Currently, this TMDL does not provide the locations of the compliance monitoring stations to meet the numeric water quality objectives and WLAs. In our discussions,

[1] An enforcement action is any formal or informal action taken to address an incidence of actual or threatened noncompliance with existing regulations or provisions designed to protect water quality. Potential enforcement actions including notices of violation (NOVs), notices to comply (NTCs), imposition of time schedules (TSO), issuance of cease and desist orders (CDOs) and cleanup and abatement orders (CAOs), administrative civil liability (ACL), and referral to the attorney general (AG) or district attorney (DA). The San Diego Water Board generally implements enforcement through an escalating series of actions to: (1) assist cooperative dischargers in achieving compliance; (2) compel compliance for repeat violations and recalcitrant violators; and (3) provide a disincentive for noncompliance.

you have indicated the compliance monitoring stations will include the monitoring stations used to determine the impairment status in this TMDL. EPA assumes these include the four Baby Beach Bacteria monitoring stations, one SISP bacteria monitoring station (Figures 4-1 and 4-2 of the draft technical report) and additional stations, if needed, to address potential sources of impairment[2]. An effective monitoring plan, as required in your implementation plan, should include descriptions of the monitoring stations used to meet compliance with the TMDL and implementation plan.

Response: The Basin Plan amendment page A-16 (Supporting Document 2) and Technical Report page 90 (Supporting Document 5), and Appendix C page A-16 (Supporting Document 5) will be revised as follows to provide additional clarification:

- Because water quality data will ultimately determine if a waterbody will be delisted from the 303(d) List, the BLRP should include a monitoring and reporting program that contains the following elements:
  - Locations of water quality sampling sites that are spatially representative of the waterbody <u>and appropriate for identifying potential sources, including, at a minimum, the monitoring stations currently used to monitor water quality</u>.

[2]For instance, a bacterial source identification study of Baby Beach showed four primary sources where BMPs can be implemented; these include storm drains, bacteria resident in sediments, near-beach water circulation and bacteria contamination from pigeons and gulf. Haimann, R., Lissner, A., Moore, D.F., Ferguson, D.M.. <u>Baby Beach Bacteriological Special Studies Report</u>. 2003. County of Orange Resource and Development Management Department. www.ocwatersheds.com/watershed/sanjaun_baby_beach.asp. Santa Ana, CA.

EXHIBIT 1

From: Julie Chan [mailto:JChan@waterboards.ca.gov]
Sent: Monday, December 13, 2004 9:32 AM
To: marilyn.schwartz@amec.com; kweldon@ci.encinitas.ca.us; npalmer@ci.laguna-niguel.ca.us; mlahsaie@ci.oceanside.ca.us; chi.vargas@dot.ca.gov; emkimura@earthlink.net; Rgersberg@mail.sdsu.edu; hbailey@padre.org; khelyer@portofsandiego.org; amanda.carr@rdmd.ocgov.com; alangworthy@sandiego.gov; PVainik@sandiego.gov; RKolb@sandiego.gov; smichel@scwrp.org; gabe@sdbaykeeper.org; Sheri.McPherson@sdcounty.ca.gov; vjmellano@ucdavis.edu; Christina Arias; Sabine Knedlik
Cc: howard.bailey@amec.com; GPennell@ci.oceanside.ca.us; justice@lagunabeachcity.net; linette.lina@pfrd.ocgov.com; jnystrom@portofsandiego.org; rwatson@rwaplanning.com; asonksen@sandiego.gov; bruce@sdbaykeeper.org; joann.weber@sdcounty.ca.gov; steve.carter@tetratech-ffx.com
Subject: Data sets, Data gaps memo from Tetra Tech

Bacteria II SAG,

Attached are memos from Steve Carter of Tetra Tech listing data sets and identifying data gaps for the Lagoons project and Bays project. Please read these memos, and if you have or know of any additional data, please provide it to Steve.

Thanks,
Julie Chan

EXHIBIT 1

TETRA TECH, INC.
1230 Columbia St., Suite 520
San Diego, CA 92101
Telephone (619) 525-7015
FAX (619) 232-2392

MEMORANDUM

DATE: December 10, 2004

TO: Stakeholder Advisory Group of the San Diego Bay and Dana Point Harbor Shoreline Bacteria TMDLs

FROM: Stephen Carter, Tetra Tech

CC: Peter Kozelka, EPA Region 9
John Craig, Tetra Tech
Julie Chan, RWQCB – San Diego Region
Sabine Knedlik, RWQCB – San Diego Region

SUBJECT: Data inventory and data gaps

The present study includes development of technical approaches for calculation of bacteria TMDLs for the following bay/harbor shorelines:

?? Dana Point Harbor at Baby Beach
?? San Diego Bay shoreline at Shelter Island
?? San Diego Bay shoreline at G Street
?? San Diego Bay shoreline at B Street Pier
?? San Diego Bay shoreline at Chula Vista Marina
?? San Diego Bay shoreline at Tidelands Park

To support this effort, models will be developed for the watersheds and shoreline receiving waters to assess bacteria sources and the assimilative capacity of the shoreline areas. A general overview of the technical approach was presented to the Stakeholder Advisory Group (SAG) at a meeting held on November 22, 2004.

Key datasets are necessary to properly parameterize, configure, and calibrate the models. Many of the datasets required for development of watershed models were compiled for development of the *Bacteria-Impaired Waters TMDL Project I for Beaches and Creeks in the San Diego Region - TECHNICAL DRAFT* (Bacti I). These watershed models will be configured for the drainage areas of the impaired shorelines. If additional water quality of flow data are identified within these watershed, these data can be used to refine and further test the watershed models. Much data have been compiled for San Diego Bay and Dana Point Harbor, however additional datasets will help improve the quality of the

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models. The purpose of this memo is to provide the SAG an inventory of data compiled thus far, and invite comment or submission of additional datasets not identified by Tetra Tech or RWQCB staff.

Data types can be separated into the following five categories:

1. Spatial Data – GIS or locational information (e.g., monitoring station coordinates)
2. Hydrologic/Hydraulic Data – Lagoon bathymetry, lagoon hydraulic information (studies of tidal flushing, hydraulic designs, etc.), and tributary flow data
3. Meteorological Data – Relevant historic meteorological records at monitoring stations within the vicinity of the lagoons
4. Water Quality Data – Biological and chemical measurement data collected from beaches adjacent to impaired lagoons
5. Special Studies (e.g., waterfowl census, bacteria die-off studies)

Datasets have been identified within each of these categories and are listed in Tables 1 through 6. Datasets that have not been received by Tetra Tech are labeled *Not Received* in the *Status* columns. Datasets that lack important information, such as location of monitoring sites, are reported in the *Comments* columns. For some categories, no data have been identified for a given waterbody and are labeled *None Identified* in the *Status* columns. For example, no salinity, temperature, or conductivity data have been identified for Dana Point Harbor (see Table 5). All datasets listed as *Not Received* and *None Identified,* or are specified to lack key information in the *Comments* columns, are considered data gaps for this study.

A review of the data inventory by the SAG is essential to ensuring that the technical approach for TMDL development is based on all available data. The SAG is encouraged to review data gaps identified in Tables 1 through 6, and provide any relevant information that can supplement the current inventory. In the absence of key information, these gaps may be addressed through technical assumptions based on literature or regional data analyses. To ensure that all data and information available are included in the analyses, it is important that the data be submitted as soon as possible.

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Table 1. Spatial Data

Data Type	Source of Data	Status	Comments
Storm Drain Network	City of Chula Vista	Received	Data obtained through Port of San Diego
	City of Coronado	Received	
	City of San Diego – available through SANGIS	Not Received	
Stream network	USGS -National Hydrography Dataset (NHD)	Received	
Land Use	USGS - Multi-Resolution Land Characteristics (MRLC)	Received	
	San Diego Association of Governments (SANDAG)	Received	
	Southern California Association of Governments (SCAG)	Received	
Soils	USDA-NRCS (STATSGO)	Received	
Topographic and Digital Elevation Models (DEMs)	USEPA BASINS, USGS	Received	
303(d) GIS	RWQCB	Received	GIS missing for B Street and Broadway piers
Digital Ortho Quarter Quads (DOQQ)	University of California, Davis	Received	

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Table 2. Physical/Hydrodynamic Data

Waterbody	Data	Data Source	Years Collected	Status	Comments
San Diego Bay	Bathymetry	SCRIPPS	2002	Not Received	
		UCSD		Not Received	
		USACE	1999	Not Received	
		NAVY (SPAWAR)		Received	
	Water Surface Elevations	NOAA CO-OPS Station 9410170	1906-Present	Received	
		NAVY (SPAWAR)		Not Received	
		SCRIPPS	1993	Not Received	Data collected at 7 locations inside and immediately outside the bay
	Currents	SCRIPPS	Variable	Not Received	Stations: Imperial Beach Pier, Coronado Island
		SCRIPPS/NDBC /NOAA	1996	Not Received	Station: Point Loma
	Tidal Velocities	SCRIPPS	1993	Not Received	7 Locations inside and immediately outside of the bay
	Bay Outflows	SCRIPPS	1993–1994	Not Received	Mouth of the bay
Dana Point Harbor	Bathymetry	USACE	1999	Received	
	Water Surface Elevations			None Identified	
	Currents			None Identified	
	Tidal Velocities			None Identified	
	Bay Outflows			None Identified	

Table 3. Meteorological Data

Waterbody	Data	Data Source	Station(s)/Spatial Coverage	Years Collected	Status
San Diego Bay	Wind speed, Wind direction, Air temperature, Relative humidity, Barometric Pressure, Solar radiation and Rainfall	SCRIPPS	Imperial Beach Pier, Coronado Islands	Variable depending on parameter	Not Received
	Air temperature, Sea surface temperature, Wind speed, Wind direction	SCRIPPS/NDBC/ NOAA	Point Loma	Variable depending on parameter	Not Received
	Precipitation	NCDC/NOAA	San Diego North Island Nas	1922 – present	Received

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Waterbody	Data	Data Source	Station(s)/Spatial Coverage	Years Collected	Status
			San Diego Lindbergh Field	1929 – Present	Received
			San Diego Miramar Nas	1946 – Present	Received
			San Diego Sea World	1998 – Present	Received
Dana Point Harbor.	Air temperature, Sea surface temperature, Wind speed, Wind direction	SCRIPPS/NDBC/ NOAA	Dana Point	Variable depending on parameter	Received
	Precipitation	NCDC/NOAA	Laguna Beach No2	1948 - Present	Received

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Table 4. Bay Bacteria Data

WATERBODY	Segment / Area	Data Source	Years Collected	Site(s) Identified	Location Description	Water Quality Parameter	Status
San Diego Bay	at Shelter Island Shoreline Park	San Diego County Department of Environmental Health	1997-2003	EH-200	Shelter Island	TC, FC, ENT	Received
	at vicinity of B Street and Broadway Piers						None Identified
	at G Street Pier						None Identified
	at Chula Vista Marina						None Identified
	at Tidelands Park	San Diego County Department of Environmental Health	1997-2003	EH-070	Tidelands Park (bayside)	TC, FC, ENT	Received
Dana Point Harbor	at Baby Beach	Orange County-Health Care Agency	1996-2002	BDP12	Baby Beach - West End	TC, FC, ENT	Received
				BDP13	Baby Beach - Buoy Line	TC, FC, ENT	Received
				BDP14	Baby Beach - Swim Area	TC, FC, ENT	Received
				BDP15	Baby Beach - East End	TC, FC, ENT	Received

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Table 5. Other Water Quality Data

Waterbody	Water Quality Parameter	Data Source	Years Collected	Site(s) Identified	Status
San Diego Bay	Salinity	NAVY (SPAWAR)	2000-2002	Entire Bay	Not Received
		Port Of San Diego	2001	Shelter Island, Laurel Street Anchorage, Bay Bridge Anchorage, Sweetwater Channel, and Chula Vista Marina	Not Received
	Water Temperature	Port Of San Diego	2001	Shelter Island, Laurel Street Anchorage, Bay Bridge Anchorage, Sweetwater Channel, and Chula Vista Marina	Not Received
		NAVY (SPAWAR)	2000-2002	Entire Bay	Not Received
		NOAA CO-OPS	1993-Present	San Diego, CA (# 9410170)	Received
		SCRIPPS	1993	Data collected at 14 different locations	Not Received
	Conductivity	Port Of San Diego	2001	Shelter Island, Laurel Street Anchorage, Bay Bridge Anchorage, Sweetwater Channel, and Chula Vista Marina	Not Received
		SCRIPPS	1993	Data collected at 14 different locations	Not Received
Dana Point Harbor	Salinity				None Identified
	Water Temperature				None Identified
	Conductivity				None Identified

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Table 6. Special Studies

Type of Information	Source	Status
Bird Census	UCSD	Received
	San Elijo Lagoon Conservancy	Not Received
	San Diego Natural History Library – Final report not complete	Not Received
	Southwest Wetland Interpretive Association	Not Received
	UC Davis	Not Received
	Buena Vista Audborn Society	Not Received
Bacteria Die-off Rates	Steets B.M., and P.A. Holden. 2003. A Mechanistic Model of Runoff-associated Fecal Coliform Fate and Transport through a Coastal Lagoon. *Water Research* (2003)37:589-608	Received
	Crane, S.R., and J.A. Moore. 1986. Modeling enteric bacterial die-off: A review. *Journal of Water, Air, and Soil Pollution* (February 1986)27:411–439.	Received
	Easton, J.H., J.J. Gauthier, M. Lalor, and R. Pitt. 1999. Determination of Survival Rates for Selected Bacterial and Protozoan Pathogens From Wet Weather Discharges. In *WEFTEC '99*, Water Environment Federation, New Orleans, LA.	Received
	Noble R.T., I.M. Lee, and K.C. Schiff. 1999. Bacteria and Coliphage Degradation Experiments in Fresh and Seawater (October 1999) (Draft version)	Received
Bird Dropping Rates and Associated Bacteria Concentration	Weiskel, P.K., B.L. Howes and G.R. Heufelder. 1996. Coliform Contamination of a Coastal Embayment: Sources and Transport Pathways. *Environmental Science & Technology* (1996)6:1872-1881	Received
	Haack, S.K., L.R. Fogarty, C.Wright. 2003.Escherichia Coli and Enterococci at Beaches in the Grand Traverse Bay, Lake Michigan: Sources, Characteristics, and Environmental Pathways. *Environmental Science & Technology* (July 2003)37:3275-3282	Received
	Grant, S., B. Sanders, A. Boehm, J. Redman, J. Kim, R. Mrse, A. Chu, M. Gouldin, C. McGee, N. Gardiner, B. Jones, J. Svejkovsky, G. Leipzig, and A. Brown. 2002. Generation of enterococci bacteria in coastal saltwater marsh and its impact on the surf zone water quality. *Environmental Science & Technology* (November 12, 2001)35: 2407-2416.	Received

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CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

RESOLUTION NO. R9-2010-0001

A RESOLUTION AMENDING THE *WATER QUALITY CONTROL PLAN FOR THE SAN DIEGO BASIN (9)* TO INCORPORATE REVISED TOTAL MAXIMUM DAILY LOADS FOR INDICATOR BACTERIA, PROJECT I - TWENTY BEACHES AND CREEKS IN THE SAN DIEGO REGION (INCLUDING TECOLOTE CREEK)

WHEREAS, The California Regional Water Quality Control Board, San Diego Region (hereinafter, San Diego Water Board), finds that:

1. **Water Quality Control Plan**: The federal Clean Water Act[1] and state Porter-Cologne Water Quality Control Act[2] requires the San Diego Water Board to establish water quality standards for each waterbody within its region. The water quality standards for the inland and coastal waters in the San Diego Region are established in the *Water Quality Control Plan for the San Diego Basin (9)* (Basin Plan) and in the *Water Quality Control Plan for Ocean Waters of California* (Ocean Plan). Water quality standards include beneficial uses, water quality objectives (WQOs) that are established at levels sufficient to protect those beneficial uses, and an antidegradation policy to prevent degrading waters that are better than the quality established as WQOs. Waterbodies that do not meet water quality standards are considered impaired.

2. **Clean Water Act Section 303(d) List of Water Quality Limited Segments:** Pursuant to Section 303(d) of the Clean Water Act, each state is required to identify waters within its boundaries that do not meet water quality standards. Specifically, the states must identify those waters for which technology-based effluent limitations are not stringent enough to implement any water quality standard applicable to such waters and establish a priority ranking for such waters.[3] For those waters identified as not meeting water quality standards, each state must establish the total maximum daily load (TMDL) at a level necessary to implement the applicable water quality standards with seasonal variations and a margin of safety.[4] Each state is required to develop a list that identifies and establishes a priority ranking for those waters requiring TMDLs.[5] The list is known as the Clean Water Act Section 303(d) List of Water Quality Limited Segments or more commonly, the 303(d) List. For the specific purpose of developing information, states are also required to estimate TMDLs for all other waters that are not identified on the 303(d) List.[6]

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[1] Clean Water Act section 303; U.S. Code section 1313
[2] California Water Code section 13240
[3] Clean Water Act section 303(d)(1)(A); U.S. Code section 1313(d)(1)(A)
[4] Clean Water Act section 303(d)(1)(C); U.S. Code section 1313(d)(1)(C)
[5] Code of Federal Regulations Title 40 section 130.7(b)(1)
[6] Clean Water Act section 303(d)(3) states that "For the specific purpose of developing information, each State shall identify all waters within its boundaries, which is has not identified under paragraph (1)(A) and (1)(B) of this subsection and estimate for such waters the total maximum daily load with seasonal variations and margin of safety…"

For TMDLs that are developed, USEPA regulations require states to incorporate TMDLs into the Basin Plans along with adequate implementation measures to implement all aspects of the plan.[7] TMDLs that are incorporated into the Basin Plan are required to include implementation plans under State law. Basin Plans must have a program of implementation to achieve WQOs.[8] The implementation plan must include a description of actions that are necessary to achieve the objectives, a time schedule for these actions, and a description of surveillance to determine compliance with the WQOs.[9]

3. **Definition of Total Maximum Daily Load (TMDL)**: A TMDL is defined as the sum of the individual wasteload allocations (WLAs) for point sources and load allocations (LAs) for nonpoint sources and natural background.[10] TMDLs must be established at levels necessary to attain and maintain the applicable narrative and numerical water quality standards with seasonal variations and a margin of safety which takes into account any lack of knowledge between effluent limitations and water quality.[11] TMDLs must be established for waterbodies identified on the 303(d) List.[12] For the purpose of developing information for all waters not identified on the 303(d) List, states are also required to estimate the TMDLs with seasonal variations and margin of safety.[13]

4. **Water Quality Standards Interpreted in TMDLs with Numeric Targets**: One or more numeric targets are typically required to calculate TMDLs at levels necessary to attain and maintain applicable narrative and numerical water quality standards. Numeric targets interpret the existing water quality standards (i.e., beneficial uses and the WQOs established at levels sufficient to support those uses). In California, numeric targets are often based on the WQOs in the Basin Plan. The Basin Plan contains numeric and narrative WQOs. If applicable WQOs are numeric, the numeric WQOs can be used as numeric targets. If applicable WQOs are narrative, one or more quantifiable target values or measurable indicators must be selected to measure progress and evaluate final attainment and maintenance of the narrative WQOs. In impaired waters requiring TMDLs, when numeric targets are met in the waterbody, the water quality standards should be attained and restored. While numeric targets and TMDLs interpret water quality standards, *numeric targets and TMDLs are not water quality standards*. The water quality standards, TMDLs, WLAs, LAs, receiving water limits, numeric targets, and/or WQBELs developed in this project become enforceable requirements after they have been incorporated into the regulatory orders issued by the San Diego Water Board and/or State Water Board (e.g., waste discharge requirements, conditional waivers, etc.).

5. **TMDL Basin Plan Amendment**: Upon establishment of TMDLs by the state or U.S. Environmental Protection Agency (USEPA), the state is required to incorporate TMDLs into

[7] Code of Federal Regulations Title 40 section 130.6 [40CFR130.6]
[8] See Water Code section 13050(j). A "Water Quality Control Plan" or "Basin Plan" consists of a designation or establishment for the waters within a specified area of all of the following: (1) Beneficial uses to be protected, (2) Water quality objectives and (3) A program of implementation needed for achieving water quality objectives.
[9] See Water Code section 13242.
[10] Code of Federal Regulations Title 40 section 130.2(i)
[11] Code of Federal Regulations Title 40 section 130.7(c)(1)
[12] Clean Water Act section 303(d)(1)(C); U.S. Code section 1313(d)(1)(c)
[13] Clean Water Act section 303(d)(3); U.S. Code section 1313(d)(3)

the state water quality management plan.[14] The Basin Plan and applicable statewide plans serve as the water quality management plan for the watersheds under the jurisdiction of the San Diego Water Board. Incorporating TMDLs into the Basin Plan requires an amendment to the Basin Plan.[15] Because TMDLs are established based on numeric targets that interpret existing water quality standards (i.e., beneficial uses and WQOs), and do not constitute the establishment of new water quality objectives, an amendment to the Basin Plan to incorporate TMDLs is not subject to the requirements of Water Code section 13241, which only apply when "establishing water quality objectives". Instead, TMDLs are programs for the implementation of existing water quality standards, and are established in the Basin Plan subject to the requirements of Water Code section 13242, which requires a description of the actions necessary to achieve the objectives, a time schedule for the actions to be taken, and a description of the surveillance to be undertaken to determine compliance with objectives.

6. **Waterbodies with Bacteria Impairments Made Highest Regional Priority for TMDLs**: In late 2003, when this TMDL project was first initiated, the 2002 303(d) List indicated that the greatest cause of waterbody impairments in the San Diego Region was due to elevated bacteria levels. Postings and closures of local beaches due to elevated bacteria levels were regularly making headlines; the State Water Resources Control Board (State Water Board) was convening the Southern California Beach Water Quality Task Force to address the problem; Assembly Bill 411(focused on beach contamination and monitoring) was making its way through the legislature; and the voters had just approved millions of dollars in grant funding for beach cleanups. For all of these reasons, the San Diego Water Board prioritized waterbodies with bacteria impairments as one of its highest regional priorities for the development of TMDLs. The initial bacteria TMDL project attempted to develop a single region-wide set of TMDLs to address all of the bacteria impaired waters in the San Diego Region. As the project developed, however, it became necessary to separate the project by waterbody types due to modeling and resource constraints. The first bacteria TMDL project was developed to address the beaches and creeks listed on the 2002 303(d) List, known as Total Maximum Daily Loads for Indicator Bacteria, Project I – Beaches and Creeks in the San Diego Region, or Bacteria TMDLs Project I.

7. **Relationship Between Bacteria and Pathogens:** Fecal indicator bacteria originate from the intestinal biota of warm-blooded animals, including humans, and their presence in surface water is used as an indicator of the possible presence of human sewage and associated pathogens (*i.e.*, organisms that cause illness, including protozoans, bacteria, and viruses). Humans may be exposed to these waterborne pathogens through recreational water use or by harvesting and consuming filter-feeding shellfish. Bacteria have been historically used as indicators of human sewage and associated pathogens because 1) the presence of pathogens and the probability of disease are directly correlated with the density of indicator bacteria in waters used for recreation or shellfish harvesting,[16] and 2) these indicator bacteria are easier and less costly to measure than the pathogens themselves. When TMDLs for indicator bacteria are attained, the health risks associated with pathogens are expected to be minimal.

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[14] Code of Federal Regulations Title 40 section 130.6(c)(1)
[15] Pursuant to the requirements of Article 3, commencing with section 13240, of Chapter 4 of the Porter-Cologne Water Quality Control Act, as amended, codified in Division 7, commencing with section 13000, of the Water Code
[16] BEACH Act Rule (USEPA 2004); Health effects criteria for fresh recreational waters (USEPA 1984)

8. **Exceedances of the Contact Water Recreation (REC-1) WQOs**:[17] The REC-1 beneficial use is particularly sensitive to, and subject to impairment by, pathogens when elevated densities of indicator bacteria exist in the water. REC-1 is a beneficial use of the Pacific Ocean beaches and in creeks that discharge to those beaches, where several of these waterbodies are listed as impaired by bacteria. Several available studies support the finding that amongst southern California beaches, the highest number of exceedances of the bacteria REC-1 WQOs occurs during wet weather and in the vicinity of major storm water outlets and creek mouths. Persons who ingest water during recreational activities in waters containing indicator bacteria at densities in excess of REC-1 WQOs are significantly more likely to incur infections or illness caused by waterborne pathogens than when indicator bacteria occur at densities consistent with the applicable WQOs.

9. **Adoption of Bacteria TMDLs Project I Basin Plan Amendment (Resolution No. R9-2007-0044):** On December 12, 2007, the San Diego Water Board adopted Resolution No. R9-2007-0044 to amend the Basin Plan to incorporate Bacteria TMDLs Project I. Bacteria TMDLs Project I was developed to establish TMDLs and restore the REC-1 beneficial use for nineteen (19) bacteria impaired beaches and creeks in the San Diego Region that were listed on the 2002 303(d) List. The Administrative Record for Resolution No. R9-2007-0044 was transmitted to the State Water Board on March 21, 2008 to begin the State Water Board, Office of Administrative Law (OAL), and USEPA approval processes.

10. **Adoption of Bacteria TMDLs Project I Basin Plan Amendment Contingent Upon Adoption of Reference System Approach Basin Plan Amendment:** The bacteria TMDLs adopted under Resolution No. R9-2007-0044 included "interim" and "final" wet weather TMDLs. The "interim" wet weather TMDLs were calculated to include an allowance for exceedances of REC-1 WQOs due to bacteria loads from natural sources based on the exceedances in a reference system.[18] The "final" wet weather TMDLs that were calculated did not allow for exceedances of REC-1 WQOs due to bacteria loads from natural sources. At the time Resolution No. R9-2007-0044 was adopted, allowing exceedances of the REC-1 WQOs during wet weather was not authorized by the Basin Plan. The San Diego Water Board, however, recognized that exceedances of the REC-1 WQOs during either wet or dry weather was likely, and may be partially due to bacteria loads contributed from natural sources. Therefore, the San Diego Water Board agreed to develop a Reference System Approach Basin Plan Amendment, which would authorize an allowance for exceedances of the REC-1 WQOs based on the exceedance frequencies observed in a reference system.

    For this reason, adoption of the Bacteria TMDLs Project I Basin Plan amendment was made contingent upon the future consideration of a separate Reference System Approach Basin Plan amendment by the San Diego Water Board. It was assumed that upon the subsequent adoption

[17] The Ocean Plan and Basin Plan also contain Shellfish Harvesting (SHELL) and Non-contact Water Recreation (REC-2) water quality objectives. Waterbodies with SHELL beneficial use impaired by bacteria will be addressed in a separate TMDL project and/or standards action. Water quality objectives for REC-2 are less stringent than the water quality objectives for REC-1, therefore, attainment of REC-1 objectives through the implementation of TMDLs will, *a fortiori,* provide the requisite water quality for REC-2.

[18] A reference system is a watershed and the beach to which the watershed discharges that is minimally impacted by anthropogenic activities that can affect bacterial densities in the waterbody.

of the Reference System Approach Basin Plan amendment, Bacteria TMDLs Project I would be appropriately revised and brought back to the San Diego Water Board for re-adoption. The key revision would include incorporation of the reference system approach into the final wet weather TMDLs. Specifically, the previously established "interim" wet weather TMDLs, which were calculated based on the reference system approach, would become the only wet weather TMDLs. The previously established "final" TMDLs, which did not use the reference system approach, would be removed.

11. **Adoption and Approval of Reference System Approach Basin Plan Amendment (Resolution No. R9-2008-0028):** On May 14, 2008, the San Diego Water Board adopted Resolution No. R9-2008-0028, *Implementation Provisions for Indicator Bacteria Water Quality Objectives to Account for Loading from Natural Uncontrollable Sources Within the Context of a TMDL.* This Basin Plan Amendment contains "implementation provisions" which provide the San Diego Water Board with flexibility in implementing its bacteria WQOs in the context of certain TMDLs. Specifically, it authorizes the San Diego Water Board to develop bacteria TMDLs that allows exceedances of the WQOs for the purpose of accounting for natural, uncontrollable sources of bacteria (e.g., birds, wildlife, soil, etc.). Such sources, by themselves and in the absence of human activities, have been found to cause exceedances of the WQOs. The Administrative Record for Resolution No. R9-2008-0028 was transmitted to the State Water Board on July 25, 2008. Resolution No. R9-2008-0028 was approved by the State Water Board on March 17, 2009, approved by OAL on June 25, 2009, and approved by USEPA on September 16, 2009. Approval of Resolution No. R9-2008-0028 allows the San Diego Water Board to revise the Bacteria TMDLs Project I Basin Plan amendment adopted under Resolution No. R9-2007-0044.

12. **Request to Withdraw Bacteria TMDLs Project I Basin Plan Amendment (Resolution No. R9-2007-0044):** By letter dated December 17, 2008, the San Diego Water Board submitted a request to withdraw the Bacteria TMDLs Project I Basin Plan amendment adopted under Resolution No. R9-2007-0044 from State Water Board consideration for approval. The withdrawal request was made in order to address concerns expressed by the State Water Board that 1) the adoption of Bacteria TMDLs Project I was contingent upon the adoption of a subsequent Basin Plan amendment, and 2) Bacteria TMDLs Project I did not include sufficient guidance on how compliance with the TMDLs, WLAs, and LAs would be evaluated. Additionally, the San Diego Water Board needed to make the revisions that had been committed to upon adoption of the Reference System Approach Basin Plan amendment, as described in finding 10.

13. **Establishment of Bacteria TMDLs for Tecolote Creek:** Bacteria TMDLs were also being developed for Tecolote Creek a part of a separate TMDL project. Bacteria TMDLs Project I and the Bacteria TMDLs for Tecolote Creek are based on the same modeling approaches. Because the same modeling approaches are used, and the resources available for the development of TMDLs have been greatly reduced, the bacteria TMDLs for Tecolote Creek have been included in the revisions to the Bacteria TMDLs Project I Basin Plan amendment.

14. **Revisions Made to the Bacteria TMDLs Project I Basin Plan Amendment:** Revisions to the original Bacteria TMDLs Project I Basin Plan amendment include: 1) finalizing the

TMDLs to include allowable exceedances of the REC-1 WQOs using the reference system approach authorized by the Basin Plan amendment adopted under Resolution No. R9-2008-0028 (see finding 11), 2) providing specific guidance on how compliance with the TMDLs, WLAs, and LAs will be evaluated, and 3) establishing TMDLs for Tecolote Creek. None of the revisions have changed the scientific basis or approach used to calculate the TMDLs, WLAs, and LAs. This TMDL project and its Basin Plan amendment have been revised to establish bacteria TMDLs for a total of twenty (20) bacteria impaired beaches and creeks in the San Diego Region that were listed on the 2002 303(d) List, and will be referred to hereafter as Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creek in the San Diego Region (Including Tecolote Creek), or Revised Bacteria TMDLs Project I.

15. **Bacteria Impaired Waters Included in Revised Bacteria TMDLs Project I** : Twenty (20) waterbodies (12 segments of the Pacific Ocean shoreline,[19] 2 creek mouths, and 6 creeks) in the San Diego Region were placed on the 2002 303(d) List because levels of total coliform, fecal coliform, and/or enterococci at those locations exceeded the REC-1 WQOs.[20]. The bacteria impaired waters listed on the 2002 303(d) List included in Revised Bacteria TMDLs Project I are specified below.

Watershed	Type of Listing	Waterbody Name [a,c]	Number of Listings
San Joaquin Hills HSA (901.11)/ Laguna Beach HSA (901.12)	Shoreline	Pacific Ocean Shoreline, San Joaquin Hills HSA [b]	2
	Shoreline	Pacific Ocean Shoreline, Laguna Beach HSA [b]	
Aliso HSA (901.13)	Creek	Aliso Creek	3
	Estuary	Aliso Creek (mouth)	
	Shoreline	Pacific Ocean Shoreline, Aliso HSA [b]	
Dana Point HSA (901.14)	Shoreline	Pacific Ocean Shoreline, Dana Point HSA [b]	1
Lower San Juan HSA (901.27)	Creek	San Juan Creek	3
	Estuary	San Juan Creek (mouth)	
	Shoreline	Pacific Ocean Shoreline, Lower San Juan HSA [b]	
San Clemente HA (901.30)	Shoreline	Pacific Ocean Shoreline, San Clemente HA [b]	1
San Luis Rey HU (903.00)	Shoreline	Pacific Ocean Shoreline, San Luis Rey HU [b]	1
San Marcos HA (904.50)	Shoreline	Pacific Ocean Shoreline, San Marcos HA [b]	1
San Dieguito HU (905.00)	Shoreline	Pacific Ocean Shoreline, San Dieguito HU [b]	1
Miramar Reservoir HA (906.10)	Shoreline	Pacific Ocean Shoreline, Miramar Reservoir HA [b]	1
Scripps HA (906.30)	Shoreline	Pacific Ocean Shoreline, Scripps HA [b]	1
Tecolote HA (906.50)	Creek	Tecolote Creek	1
Mission San Diego HSA (907.11)/ Santee HSA (907.12)	Creek	Forester Creek	3
	Creek	San Diego River (Lower)	
	Shoreline	Pacific Ocean Shoreline, San Diego HU [b]	
Chollas HSA (908.22)	Creek	Chollas Creek	1

[19] The Pacific Ocean shoreline consists of a zone extending seaward from the shoreline a distance of 1,000 feet or to the 30-foot depth contour, whichever is further from the shoreline.
[20] The Basin Plan and Ocean Plan also contains SHELL objectives for total coliform. SHELL impairments for total coliform are being developed in a separate TMDL and/or standards action.

Watershed	Type of Listing	Waterbody Name [a,c]	Number of Listings
Total Number of Listings on 2002 303(d) LIST in Revised Bacteria TMDLs Project I			**20**

Note: HSA = hydrologic subarea; HA = hydrologic area; HU = hydrologic unit
[a] Listed as impaired due to exceedances of REC-1 WQOs for fecal coliform, and/or total coliform, and/or enterococci.
[b] On the 2002 303(d) List, the Pacific Ocean Shoreline for a HSA, HA, or HU is listed, and specific beaches are noted under the listing. Beginning with the 2008 303(d) List, specific beaches are listed.
[c] Listings on the 2006 and 2008 303(d) List compared to listing shown above are provided in Appendix T to the Technical Report.

Beginning with the 2008 303(d) List, specific beach segments of the Pacific Ocean shoreline are listed individually. The TMDLs that have been developed for the Pacific Ocean shorelines are assumed to be applicable to all the beaches located on the shorelines of the hydrologic subareas (HSAs), hydrologic areas (HAs), and hydrologic units (HUs) listed above.

16. **Bacteria Water Quality Objectives for REC-1 Beneficial Use**:[21] Water quality objectives (WQOs) for bacteria in the waters of the Pacific Ocean shoreline, expressed as the most probable number of bacteria colonies per 100 mL of water sample (MPN/100 mL), are contained in the Ocean Plan. The water quality objectives for bacteria in the inland surface waters are contained in the Basin Plan.

(a) The WQOs, as established in the Ocean Plan,[22] for indicator bacteria in waters of the Pacific Ocean shoreline designated as having REC-1 beneficial use are as follows:

Within a zone bounded by the shoreline and a distance of 1,000 feet from the shoreline or the 30-foot depth contour, whichever is further from the shoreline, and in areas outside this zone used for water contact sports, as determined by the Regional Board (i.e., areas designated as REC-1), but including all kelp beds, the following bacterial objectives shall be maintained throughout the water column:

30-day Geometric Mean – The following standards are based on the geometric mean of the five most recent samples from each site:

i. Total coliform density shall not exceed 1,000 per 100 mL
ii. Fecal coliform density shall not exceed 200 per 100mL; and
iii. Enterococcus density shall not exceed 35 per 100 ml.

Single Sample Maximum:

i. Total coliform density shall not exceed 10,000 per 100 mL
ii. Fecal coliform density shall not exceed 400 per 100mL;
iii. Enterococcus density shall not exceed 104 per 100 mL; and

[21] Water quality objectives for indicator bacteria in waters with non-water-contact recreation (REC-2) are less stringent than the water quality objectives for REC-1, therefore, attainment of REC-1 objectives through the implementation of TMDLs will, *a fortiori,* provide the requisite water quality for REC-2.
[22] As adopted by the State Water Board on January 20, 2005 and April 21, 2005, approved by OAL on October 12, 2005, and approved by USEPA on February 14, 2006.

iv. Total coliform density shall not exceed 1,000 per 100 mL when the fecal coliform/ total coliform ratio exceeds 0.1.

(b) The WQOs, as established in the Basin Plan,[23] for indicator bacteria in inland surface waters, enclosed bays and estuaries, and coastal lagoons designated as having the REC-1 beneficial use are as follows:

Fecal Coliform Water Quality Objective for Contact Recreation:

The fecal coliform concentration, based on a minimum of not less than five samples for any 30-day period, shall not exceed a log mean of 200 organisms per 100 ml.

In addition, the fecal coliform concentration shall not exceed 400 organisms per 100 ml for more than 10 percent of the total samples during any 30-day period.

Enterococci and E. Coli Water Quality Objectives for Contact Recreation:

The USEPA published E. coli and enterococci bacteriological criteria applicable to waters designated for contact recreation (REC-1) in the Federal Register, Vol. 51, No. 45, Friday, March 7, 1986, 8012-8016.

USEPA BACTERIOLOGICAL CRITERIA FOR WATER CONTACT RECREATION (in colonies per 100 ml)

	Freshwater		**Saltwater**
	Enterococci	**E. coli**	**Enterococci**
Steady State			
(all areas)	33	126	35
Maximum			
(designated beach)	61	235	104
(moderately or lightly used area)	108	406	276
(infrequently used area)	151	576	500

Total Coliform Water Quality Objective for Contact Recreation for Bays and Estuaries:

In bays and estuaries, the most probable number of total coliform organisms in the upper 60 feet of the water column shall be less than 1,000 organisms per 100 ml (10 organisms per ml); provided that not more than 20 percent of the samples at any sampling station, in any 30-day period, may exceed 1,000 organisms per 100 ml (10 per ml); and provided further that no single sample as described below is exceeded.

[23] As amended in Resolution No. R9-2008-0028, *Implementation Provisions for Indicator Bacteria Water Quality Objectives to Account for Loading from Natural Uncontrollable Sources Within the Context of a TMDL,* adopted by the San Diego Water Board on May 14, 2008, approved by the State Water Board on March 17, 2009, approved by OAL on June 25, 2009, and approved by USEPA on September 16, 2009.

The most probable number of total coliform organisms in the upper 60 feet of the water column in no single sample when verified by a repeat sample taken within 48 hours shall exceed 10,000 organisms per 100 ml (100 organisms per ml).

17. **Allowable Exceedances of REC-1 Water Quality Objectives:** It is not the intent of these bacteria TMDLs to require treatment or diversion of natural waterbodies or to require treatment of natural sources of indicator bacteria. A Basin Plan amendment was adopted by the San Diego Water Board authorizing the development of indicator bacteria TMDLs that account for exceedances of bacteria REC-1 WQOs due to bacteria loads from natural uncontrollable sources.[24] Exceedances of bacteria REC-1 WQOs may be allowed within the context of bacteria TMDLs using a reference system approach or natural sources exclusion approach.

18. **Numeric Targets Selected for Bacteria TMDLs**: One or more quantitative numeric targets are required to calculate a TMDL. Numeric targets are selected based on the water quality standards (i.e., beneficial uses, WQOs, and the antidegradation policy) that are applicable to the waterbody. The selected numeric target(s) must be able to interpret and implement the water quality standards. When the numeric targets are met in the impaired waterbody, the WQOs will be met and the water quality standards should be restored. The numeric targets selected for these bacteria TMDLs are based primarily on the REC-1 WQOs for indicator bacteria contained in the Ocean Plan and/or Basin Plan (finding 16), and allowable exceedance frequencies using a reference system approach (findings 11 and 17). Because the REC-1 WQOs are numeric, the numeric WQOs were used in the numeric targets. Different numeric targets (i.e., numeric WQOs and allowable exceedance frequencies) were used to calculate dry weather TMDLs and wet weather TMDLs. The numeric targets were selected based on the applicability of the Ocean Plan and/or Basin Plan REC-1 WQOs (i.e., Pacific Ocean shoreline or inland surface water) and the allowable exceedance frequencies of the REC-1 WQOs in available reference systems for the different weather conditions (i.e. wet weather[25] or dry weather[26]).

19. **Sources of Bacteria**: Bacteria build up on the land surface as a result of various anthropogenic land uses (e.g., urban development and agriculture) and natural processes (e.g., birds and wildlife). In urban areas, bacteria are washed off the land surface by dry weather and wet weather flows and transported through pipes and conveyance channels of the municipal separate storm sewer systems (MS4s) to surface waters. Other significant point sources of bacteria include municipal wastewater treatment plants and industrial waste treatment facilities. In rural and undeveloped areas, bacteria are washed off the land surface primarily by wet weather flows directly to surface waters. These diffuse nonpoint sources (e.g., undeveloped land, agriculture, livestock, and horse ranch facilities) have multiple routes of entry into surface waters.

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[24] Resolution No. R9-2008-0028, *Implementation Provisions for Indicator Bacteria Water Quality Objectives to Account for Loading from Natural Uncontrollable Sources Within the Context of a TMDL,* was adopted by the San Diego Water Board on May 14, 2008, approved by the State Water Board on March 17, 2009, approved by OAL on June 25, 2009, and approved by USEPA on September 16, 2009.
[25] Wet weather days defined as days with rainfall events of 0.2 inches or greater and the following 72 hours
[26] Dry weather days defined as days with less than 0.2 inch of rainfall observed on each of the previous 3 days.

In order to quantify bacteria loading from these various sources and transport mechanisms, 13 land-use types were identified in the technical TMDL analysis: Low Density Residential, High Density Residential, Commercial/Institutional, Industrial/Transportation, Military, Parks/Recreation, Open Recreation, Agriculture, Dairy/Intensive Livestock, Horse Ranches, Open Space, Water, and Transitional (Construction Activities). In the technical TMDL analysis for this project, the 13 land use types were grouped into the following four land use categories: 1) owners/operators of municipal separate storm sewers (Municipal MS4s); 2) Caltrans (separated from other Municipal MS4s); 3) Agriculture; and 4) Open Space. Land uses associated with the Municipal MS4s and Caltrans have discharges that are considered point sources. Agriculture and Open Space land uses have discharges that are considered nonpoint sources. Discharges of bacteria from the Municipal MS4s, Caltrans, and Agriculture land use categories are assumed to be anthropogenic in origin and considered controllable. Discharges of bacteria from the Open Space land use category are assumed to be natural, and hence are considered uncontrollable. Quantification of the bacteria loads from these land use categories is used to identify controllable bacteria sources that need to reduce their bacteria loads so the TMDLs can be attained in the receiving waters.

20. **Calculation of Total Maximum Daily Loads (TMDLs)**: These TMDLs for bacteria are equal to the total assimilative or loading capacities of the waterbodies for total coliform, fecal coliform, and enterococci bacteria and represent the maximum amount of each indicator bacteria that each waterbody can receive and still protect the REC-1 beneficial use. As required, each TMDL accounts for all known sources of bacteria (point, nonpoint, and natural background), includes a margin of safety, accounts for seasonal variations, is calculated at critical conditions (worst loading scenario), and was developed in a manner consistent with the guidelines published by USEPA. Separate dry weather and wet weather TMDLs were calculated for each indicator bacteria.

21. **Technical TMDL Analysis**: A Technical Report entitled "Revised Total Maximum Daily Loads for Indicator Bacteria Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)" was prepared with the details of the technical TMDL analysis. The technical TMDL analysis includes a description of the bacteria impairments, selection of numeric targets (interpretation of the existing numeric water quality objectives used to calculate the TMDLs), source analysis, linkage analysis (calculation of "existing" bacteria loads and "allowable" bacteria loads [or TMDLs]), method for allocating the TMDLs to the identified point sources and nonpoint sources, and calculation of load reductions required from identified controllable sources (difference between "existing" and "allowable" bacteria loads for each source).

22. **Allocation of TMDLs to Point Sources and Nonpoint Sources:** A TMDL is divided, or allocated, among the sources that contribute or may contribute pollutant loads to a waterbody. If there are point sources that contribute or may contribute pollutant loads to a waterbody, they are assigned portions of the TMDL as wasteload allocations (WLAs). For nonpoint sources and natural background sources that contribute or may contribute pollutant loads to a waterbody, they are assigned portions of the TMDL as load allocations (LAs). The TMDL is expressed mathematically as the sum of all the WLAs and LAs and margin of safety (i.e., $TMDL = \Sigma WLAs + \Sigma LAs + MOS$). For these bacteria TMDLs, the Municipal MS4s and

Caltrans land use categories are assigned WLAs, and the Agriculture and Open Space land use categories are assigned LAs. Sources that are not identified cannot be assigned a WLA or LA and are assumed to have a zero allowable load (i.e., WLA = 0 or LA = 0). Identified sources may also be assigned a zero allowable load (i.e., WLA = 0 or LA = 0). Sources that are assigned a zero allowable load are not expected or allowed to discharge the specific pollutant to the waterbody as part of the TMDL.

For the dry weather TMDLs, a major underlying assumption is that there is no discharge of surface runoff, thus no discharge of bacteria, expected from land uses associated with the Caltrans, Agriculture, and Open Space land use categories during dry weather. Because no discharge is expected from these land use categories during dry weather, they were assigned dry weather WLAs and LAs of zero. The dry weather TMDLs were assigned entirely to the Municipal MS4s land use category as dry weather WLAs, meaning only discharges of bacteria loads to the receiving waters are expected or allowed from the Municipal MS4s land use category during dry weather.

For the wet weather TMDLs, discharges of surface runoff are expected from all land use types, thus allocations were assigned to each land use category (i.e., Municipal MS4s, Caltrans, Agriculture, Open Space). Allocations were assigned based on discharges of "existing" bacteria loads predicted with a wet weather watershed model. In general, the Caltrans WLAs, Agriculture LAs (in all but 4 of the modeled watersheds), and Open Space LAs were set equal to the "existing" bacteria loads predicted by the wet weather watershed model. The remainder of allowable bacteria load that can be discharged to the receiving waters as part of the TMDL was assigned as the Municipal MS4s WLAs (or proportionally divided between the Municipal MS4s and Agriculture land use categories in 4 of the modeled watersheds).

23. **Load Reductions Required to Attain Dry Weather TMDLs:** According to the dry weather TMDLs, the Municipal MS4s land use category is the only source of bacteria that has been assigned a WLA or LA. Discharges of bacteria loads from any other controllable sources must be reduced to zero. Thus, only Municipal MS4s are expected or allowed to discharge bacteria to the impaired receiving waters. Based on the technical TMDL analysis, bacteria load reductions are required in the discharges from the Municipal MS4s land use category to attain the dry weather TMDLs in the receiving waters.

24. **Load Reductions Required to Attain Wet Weather TMDLs**: According to the wet weather TMDLs, allowable bacteria loads have been assigned to the Municipal MS4s and Caltrans land use categories as WLAs, and the Agriculture and Open Space land use categories as LAs. Based on the technical TMDL analysis, bacteria load reductions are required in the discharges from the Municipal MS4s land use category (and Agriculture land use category in 4 watersheds) to attain the wet weather TMDLs in the receiving waters.

25. **TMDL Implementation Plan:** TMDLs are not self-implementing or directly enforceable for sources in the watershed. Instead, TMDLs must be implemented through the programs or authorities of the San Diego Water Board and/or other entities to compel dischargers responsible for controllable sources to achieve the pollutant load reductions identified by a TMDL analysis to restore and protect the designated beneficial uses of a waterbody. Federal

regulations require TMDLs to be incorporated into the Basin Plan.[27] Because TMDLs must be incorporated into the Basin Plan, and are developed to implement previously established water quality standards (i.e., beneficial uses and WQOs), state statute requires the Basin Plan amendment to include a program of implementation (or Implementation Plan) for achieving water quality objectives.[28]

The amendment of the Basin Plan, in Attachment A, to establish and implement TMDLs for the waters of the beaches and creeks listed in finding 15, includes a TMDL Implementation Plan that contains (1) the actions that the San Diego Water Board and/or other entities can take to implement the TMDLs, (2) a compliance schedule by which the TMDLs, and thereby the restoration of the recreational beneficial uses in the receiving waters, are to be achieved, and (3) a description of the minimum components for a monitoring program that is required to assess compliance with the TMDLs, WLAs, and LAs.

26. **Implementation of TMDLs**: Because the Phase I MS4s are located at the base of the watersheds and have been identified as the most significant controllable source of bacteria discharging to the receiving waters, these TMDLs will be implemented primarily through the revision of the National Pollutant Discharge Elimination System (NPDES) discharge requirements regulating discharges from the Phase I MS4s. The Caltrans NPDES requirements will also be revised. Federal regulations require that NPDES requirements incorporate water quality based effluent limitations (WQBELs) that must be consistent with the requirements and assumptions of any available WLAs.[29] WQBELs may be expressed as numeric effluent limitations, when feasible, and/or as a best management practice (BMP) program of expanded or better-tailored BMPs.[30] The WQBELs will likely need to include a BMP program to achieve the load reductions required to attain the TMDLs in the receiving waters. The Phase I MS4s and Caltrans will be required to submit Bacteria or Comprehensive Load Reduction Plans outlining a proposed BMP program that will be capable of achieving the necessary load reductions required to attain the TMDLs in the receiving water. The Phase I MS4s and Caltrans will be responsible for reducing their bacteria loads and/or demonstrating that their discharges are not causing exceedances of the numeric WQOs and allowable exceedance frequencies in the receiving waters. Other dischargers identified as significant sources of bacteria will also be responsible for reducing their bacteria loads and/or demonstrating that their discharges are not causing exceedances of the numeric WQOs and allowable exceedance frequencies in the receiving waters.

27. **TMDL Compliance Schedule**: Full implementation of the TMDLs for indicator bacteria shall be completed within 10 to 20 years from the effective date[31] of the Basin Plan amendment. The compliance schedule for implementing the load and wasteload reductions required to achieve the wet weather and dry weather TMDLs is phased in over time.

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[27] Code of Federal Regulations Title 40 section 130.6(c)(1)
[28] Water Code section 13242
[29] Code of Federal Regulations Title 40 section 122.44(d)(1)(vii)(B)
[30] Code of Federal Regulations Title 40 section 122.44(k)(2)&(3)
[31] The effective date is the date the Office of Administrative Law approves this Basin Plan amendment.

The dry weather TMDLs must be achieved in the receiving waters as soon as possible, but no later than 10 years from the effective date of the Basin Plan amendment that establishes the TMDLs. For dischargers that undertake wet weather load reduction programs only for bacteria, the wet weather TMDLs must be achieved in the receiving waters as soon as possible, but no later than 10 years from the effective date.

For dischargers in watersheds that undertake concurrent wet weather load reduction programs for other pollutant constituents (e.g. metals, pesticides, trash, nutrients, sediment, etc.) together with the bacteria load reduction requirements in these TMDLs, an alternative compliance schedule may be proposed and incorporated by the San Diego Water Board into the implementing orders. The wet weather TMDL compliance schedules may be extended, but no more than a total of 20 years from the effective date of the Basin Plan amendment. The dry weather TMDL compliance schedule cannot be extended to be more than 10 years from the effective date of the Basin Plan amendment.

28. **TMDL Compliance Monitoring**: An essential component of implementation is water quality monitoring. Monitoring is needed to evaluate the progress toward attainment of the TMDLs and restoring the beneficial uses in the receiving waters. When all discharges from controllable sources meet their assigned WLAs and LAs, and the numeric targets (i.e., numeric WQOs and allowable exceedance frequencies) are also met in the receiving waters, compliance with the TMDLs will be achieved. Compliance with the TMDLs will be assessed by monitoring the receiving waters and comparing the results to the numeric WQOs and allowable exceedance frequencies. At the end of the dry weather TMDL compliance schedule, the 30-day geometric mean REC-1 WQOs for dry weather days must be met 100 percent of the time in the receiving waters. At the end of the wet weather TMDL compliance schedule, the single sample maximum and 30-day geometric mean REC-1 WQOs must not be exceeded in the receiving waters more frequently than the allowable exceedance frequencies.

29. **Compliance with WLAs and LAs**: Ultimately, the TMDLs in the receiving waters will be met when the dischargers responsible for controllable sources meet their assigned WLAs and LAs. When all discharges from controllable sources meet their assigned WLAs and LAs, the beneficial uses in the receiving waters should be restored and compliance with the TMDLs should be achieved. The TMDLs are calculated based on numeric targets consisting of the numeric bacteria REC-1 WQOs and allowable exceedance frequencies. Discharges from controllable sources that can meet the numeric bacteria REC-1 WQOs and allowable exceedance frequencies in their effluent are not expected to cause exceedances of the numeric targets in the receiving waters. If the TMDLs are attained in the receiving waters, the assumption will be that the controllable sources are in compliance with their assigned WLAs and LAs. Otherwise, the dischargers responsible for controllable sources of bacteria must provide evidence and demonstrate to the San Diego Water Board that their discharges are not causing exceedances of the numeric WQOs and allowable exceedance frequencies in the receiving waters.

30. **Scientific Peer Review**: The scientific basis for these TMDLs has undergone external peer review pursuant to Health and Safety Code section 57004. The San Diego Water Board has considered and responded to all comments submitted by the peer review panel, and has

enhanced the Technical Report appropriately. Because the same modeling approaches are used in calculating the bacteria TMDLs for Tecolote Creek, the original Bacteria TMDLs Project I external peer review comments are also applicable. No change to the fundamental approach to TMDL calculation was necessary as a result of this process.

31. **CEQA Requirements:** Pursuant to Public Resources Code section 21080.5, the Resources Agency has approved the Regional Water Boards' basin planning process as a "certified regulatory program" that adequately satisfies the California Environmental Quality Act (CEQA)[32] requirements for preparing environmental documents.[33] As such, the documents supporting the San Diego Water Board's proposed basin planning action contain the required environmental documentation under CEQA and serve as "substitute documents".[34] The substitute documents for this project include the environmental checklist, the detailed Technical Report, responses to comments submitted during the public participation phase in the development of the TMDLs, and this resolution to adopt Basin Plan amendment. The project itself is the establishment of TMDLs for indicator bacteria at beaches and creeks where water quality has been listed as "impaired" by the State Water Board pursuant to Clean Water Act section 303(d), as required by that section. While the San Diego Water Board has no discretion to not establish the TMDLs (the TMDLs are required by federal law), the Board does exercise discretion in assigning WLAs and LAs, and determining the program of implementation, which includes setting monitoring requirements and a compliance schedule with various milestones for restoring the beneficial uses at the affected beaches and creeks.

32. **Project Impacts:** The accompanying CEQA substitute documents satisfy the requirements of substitute documents for a Tier 1 environmental review under CEQA.[35] Nearly all of the compliance measures anticipated to be necessary to implement the TMDLs for indicator bacteria will be undertaken by public agencies that will have their own obligations under CEQA for implementation projects that could have significant environmental impacts (*e.g.*, installation and operation of structural BMPs). Project level impacts will need to be considered in any subsequent environmental analysis performed by other public agencies.[36]

    If not properly mitigated at the project level, implementation and compliance measures undertaken have the potential to result in significant adverse environmental impacts. The substitute documents for this TMDL, and in particular the environmental checklist and responses to comments, identify broad mitigation approaches that should be considered at the project level. The San Diego Water Board does not engage in speculation or conjecture regarding the projects that may be used to implement the TMDLs and only considers the reasonably foreseeable alternative methods of compliance, the reasonably foreseeable feasible environmental impacts of the these methods of compliance, and the reasonably foreseeable mitigation measures which would avoid or eliminate the identified impacts, all from a broad general perspective consistent with the uncertainty regarding how the TMDLs, ultimately, will be implemented. The lengthy implementation period allowed by the TMDLs will allow

[32] Public Resources Code, section 21000 et seq.
[33] California Code of Regulations Title 14 section 15251(g); California Code of Regulations Title 23 section 3782
[34] California Code of Regulations Title 23 section 3777
[35] Pursuant to Public Resources Code section 21159 and California Code of Regulations Title 14 section 15187
[36] Pursuant to Public Resources Code section 21159.2

persons responsible for compliance with TMDLs, WLAs, or LAs to develop and pursue many compliance approaches and mitigation measures.

33. **Project Mitigation:** The proposed amendment to the Basin Plan to establish TMDLs for indicator bacteria in beaches and creeks has the potential to result in significant adverse effects on the environment. However, there are feasible alternatives, feasible mitigation measures, or both, that should substantially reduce those adverse impacts to less than significant. The public agencies responsible for implementation measures needed to comply with the TMDLs can and should incorporate such alternatives and mitigation into any projects or project approvals that they undertake for the impaired beaches and creeks. Possible alternatives and mitigation are described in the CEQA substitute documents, specifically the Technical Report and the environmental checklist. To the extent the alternatives, mitigation measures, or both, are not deemed feasible by those agencies, the necessity of implementing the TMDLs that is mandated by the federal Clean Water Act and removing the bacteria impairments on beaches and creeks in the San Diego Region (an action required to achieve the express, national policy of the Clean Water Act) outweigh the unavoidable adverse environmental effects identified in the substitute documents.

34. **Department of Fish and Game Filing Fee**: Considering the record as a whole, the Department of Fish and Game determined that for purposes of the assessment of CEQA filing fees[37] Bacteria TMDLs Project I adopted under Resolution No. R9-2007-0044 had no potential effect on fish, wildlife, and habitat and the project as described does not require payment of a CEQA filing fee. The environmental analysis and potential project impacts have not changed for the Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creek in the San Diego Region (Including Tecolote Creek).

35. **Economic Analysis**: The San Diego Water Board has considered the costs of the reasonably foreseeable methods of compliance with the load and wasteload allocations specified in these TMDLs. These compliance methods involve implementation of structural and non-structural controls. Surface water monitoring to evaluate the effectiveness of these controls will also be necessary.

36. **Stakeholder & Public Participation**: Interested persons and the public have had reasonable opportunity to participate in review of the proposed bacteria TMDLs. For the bacteria TMDLs adopted under Resolution No. R9-2007-0044, efforts to solicit public review and comment included a public workshop and CEQA scoping meeting in March 2003, a public workshop in March 2004, eleven meetings with the Stakeholder Advisory Group, four public review and comment periods consisting of 62 days, 45 days, 47 days, and 30 days respectively, a public workshop on January 11, 2006, and public hearings on February 8, 2006, April 25, 2007, and December 12, 2007. Notices for all meetings were sent to interested parties including cities and counties with jurisdiction in watersheds draining to the bacteria impaired beaches and creeks. All of the written comments submitted to the San Diego Water Board during the review and comment periods for Resolution No. R9-2007-0044 have been considered were included in Appendix S and Appendix U to the Technical Report.

[37] Fish and Game Code section 711.4(c)

Interested persons and the public have also been provided a reasonable opportunity to participate in the review of Revised Bacteria TMDLs Project I. Efforts to solicit public review and comment included a public review and comment period consisting of 78 days, meetings with the Stakeholder Advisory Group in December 2009 and January 2010, and a public hearing on February 10, 2010. Notices for all meetings were sent to interested parties including cities and counties with jurisdiction in watersheds draining to the bacteria impaired beaches and creeks. All of the written comments submitted to the San Diego Water Board up to January 25, 2010 for the revised bacteria TMDLs have been considered responded to in writing in a response to comments document (Responses to Comments Part III), which has been appended to the Technical Report as Appendix V. Written comments and oral testimony received after January 25, 2010 were considered and responded to during the February 10, 2010 public hearing.

37. **Necessity Standard**:[38] Amendment of the Basin Plan to establish and implement Total Maximum Daily Loads (TMDLs) for the waters of the beaches and creeks listed in finding 15 is necessary because the existing water quality at the beaches and creeks listed in finding 15 does not meet applicable REC-1 WQOs for total coliform, fecal coliform, and/or enterococci bacteria. Clean Water Act section 303(d) requires the establishment and implementation of TMDLs under the water quality conditions that exist at these beaches and creeks. TMDLs for total coliform, fecal coliform, and/or enterococci bacteria are necessary to restore the water quality needed to support the beneficial uses designated for the beaches and creeks.

38. **Public Notice**: The San Diego Water Board has notified all known interested parties and the public of its intent to consider adoption of this Basin Plan amendment in accordance with Water Code section 13244.

NOW, THEREFORE, BE IT RESOLVED THAT

1. **Environmental Documents Certification**: The substitute environmental documents prepared pursuant to Public Resources Code section 21080.5 are hereby certified, and the Executive Officer is directed to file a Notice of Decision with the Resources Agency after State Water Board and Office of Administrative Law (OAL) approval of the Basin Plan Amendment, in accordance with section 21080.5(d)(2)(E) of the Public Resources Code and the California Code of Regulations, Title 23, section 3781.

2. **Amendment Adoption**: The San Diego Water Board hereby adopts the attached Basin Plan amendment as set forth in Attachment A hereto to establish TMDLs for indicator bacteria at twenty impaired beaches and creeks in the San Diego Region.

3. **Technical Report Approval:** The San Diego Water Board hereby approves the Technical Report entitled *Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)*, dated February 10, 2010.

[38] Pursuant to Government Code section 11353(b)

4. **Certificate Of Fee Exemption**: The Executive Officer is authorized to request a "No Effect Determination" *in lieu* of payment of the California Department of Fish and Game filing fee, or transmit payment of the applicable filing fee to the California Department of Fish and Game.

5. **Agency Approvals**: The Executive Officer is directed to submit this Basin Plan amendment to the State Water Board in accordance with Water Code section 13245.

6. **Non-Substantive Corrections**: If, during the approval process for this amendment, the San Diego Water Board, the State Water Board, or the OAL determines that minor, non-substantive corrections to the language of the amendment are needed for clarity or consistency, the Executive Officer may make such changes, and shall inform the San Diego Water Board of any such changes.

I, David W. Gibson, Executive Officer, do hereby certify the foregoing is a full, true and correct copy of a Resolution adopted by the California Regional Water Quality Control Board, San Diego Region, on February 10, 2010.

David W. Gibson
Executive Officer

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ATTACHMENT A
TO RESOLUTION NO. R9-2010-0001

AMENDMENT TO
THE *WATER QUALITY CONTROL PLAN FOR THE SAN DIEGO BASIN (9)* TO INCORPORATE REVISED TOTAL MAXIMUM DAILY LOADS FOR INDICATOR BACTERIA, PROJECT I – TWENTY BEACHES AND CREEKS IN THE SAN DIEGO REGION (INCLUDING TECOLOTE CREEK)

This Basin Plan amendment establishes Total Maximum Daily Loads (TMDLs) and associated load and wasteload allocations for total coliform, fecal coliform, and enterococci bacteria in the 20 beach and creek segments listed in the following table.

Watershed	Type of Listing	Waterbody Name [a,c]	Number of Listings
San Joaquin Hills HSA (901.11)/ Laguna Beach HSA (901.12)	Shoreline	Pacific Ocean Shoreline, San Joaquin Hills HSA [b]	2
	Shoreline	Pacific Ocean Shoreline, Laguna Beach HSA [b]	
Aliso HSA (901.13)	Creek	Aliso Creek	3
	Estuary	Aliso Creek (mouth)	
	Shoreline	Pacific Ocean Shoreline, Aliso HSA [b]	
Dana Point HSA (901.14)	Shoreline	Pacific Ocean Shoreline, Dana Point HSA [b]	1
Lower San Juan HSA (901.27)	Creek	San Juan Creek	3
	Estuary	San Juan Creek (mouth)	
	Shoreline	Pacific Ocean Shoreline, Lower San Juan HSA [b]	
San Clemente HA (901.30)	Shoreline	Pacific Ocean Shoreline, San Clemente HA [b]	1
San Luis Rey HU (903.00)	Shoreline	Pacific Ocean Shoreline, San Luis Rey HU [b]	1
San Marcos HA (904.50)	Shoreline	Pacific Ocean Shoreline, San Marcos HA [b]	1
San Dieguito HU (905.00)	Shoreline	Pacific Ocean Shoreline, San Dieguito HU [b]	1
Miramar Reservoir HA (906.10)	Shoreline	Pacific Ocean Shoreline, Miramar Reservoir HA [b]	1
Scripps HA (906.30)	Shoreline	Pacific Ocean Shoreline, Scripps HA [b]	1
Tecolote HA (906.50)	Creek	Tecolote Creek	1
Mission San Diego HSA (907.11)/ Santee HSA (907.12)	Creek	Forester Creek	3
	Creek	San Diego River (Lower)	
	Shoreline	Pacific Ocean Shoreline, San Diego HU [b]	
Chollas HSA (908.22)	Creek	Chollas Creek	1
Total Number of Listings on 2002 303(d) LIST in Revised Bacteria TMDLs Project I			**20**

Note: HSA = hydrologic subarea; HA = hydrologic area; HU = hydrologic unit
[a] Listed as impaired due to exceedances of REC-1 WQOs for fecal coliform, and/or total coliform, and/or enterococci.
[b] On the 2002 303(d) List, the Pacific Ocean Shoreline for a HSA, HA, or HU is listed, and specific beaches are noted under the listing. Beginning with the 2008 303(d) List, specific beaches are listed.
[c] Listings on the 2006 and 2008 303(d) List compared to listing shown above are provided in Appendix T to the Technical Report.

The TMDLs that have been developed for the Pacific Ocean shorelines are applicable to all the beaches located on the shorelines of the hydrologic subareas (HSAs), hydrologic areas (HAs), and hydrologic units (HUs) listed above. Beginning with the 2008 303(d) List, specific beach

segments of the Pacific Ocean shoreline are listed individually. Specific beach segments from some of the Pacific Ocean shorelines listed in the above table have been delisted from the 2008 303(d) list that was approved by the San Diego Board on December 16, 2009, and therefore are not subject to any further action as long as monitoring data continues to support compliance with water quality standards.

This amendment also includes the TMDL Implementation Plan, which consists of: (1) the actions that can be taken by the San Diego Water Board and/or other entities to implement the TMDLs, (2) a compliance schedule by which the TMDLs, and thereby the restoration of the recreational beneficial uses in the receiving waters, are to be achieved, and (3) a description of the minimum components for a monitoring program that is required to assess compliance with the TMDLs, WLAs, and LAs.

Chapters 2, 3, 4, 6, and 7 and Appendices E and F of the Basin Plan are amended as follows:

Chapter 2, *Beneficial Uses*

Table 2-2. *Beneficial Uses of Inland Surface Waters*
Consecutively number and add the following footnote to Aliso Creek, San Juan Creek, Tecolote Creek, Forrester Creek, San Diego River (lower), and Chollas Creek in Table 2-2:

> Aliso Creek, San Juan Creek, Tecolote Creek, Forrester Creek, San Diego River (lower), and Chollas Creek are designated as water quality limited segments for indicator bacteria pursuant to Clean Water Act section 303(d). Total Maximum Daily Loads have been adopted to address these impairments. See Chapter 3, *Water Quality Objectives*, Bacteria - Total and Fecal Coliform, and Bacteria - *E. Coli* and Enterococci, and Chapter 7, *Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek).*

Renumber any footnotes in Table 2-2 displaced by this new footnote. Revise any other footnotes in Table 2-2 referring to TMDLs in Chapter 4 and change reference to Chapter 7.

Table 2-3. *Beneficial Uses of Coastal Waters.*
Consecutively number and add the following footnote to Pacific Ocean in Table 2-3:

> Certain Pacific Ocean shoreline segments of the following Hydrological Units, Areas, and Subareas are designated as water quality limited segments for indicator bacteria pursuant to Clean Water Act section 303(d): San Joaquin Hills HSA 901.11 and Laguna Beach HSA 901.12, Aliso Creek HSA 901.13, Dana Point HSA 901.14, Lower San Juan HSA 901.27, San Clemente HA 901.30, San Luis Rey HU 903.00, San Marcos HA 904.50, San Dieguito HU 905.00, Miramar Reservoir HA 906.10, Scripps HA 906.30, and Mission San Diego HSA 907.11 and Santee HSA 907.12. Total Maximum Daily Loads have been adopted to address these impairments. See Chapter 3, *Water Quality Objectives*, Bacteria - Total and Fecal Coliform, and Bacteria - *E. Coli* and Enterococci, and Chapter 7, *Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek).*

Consecutively number and add the following footnote to Mouth of San Diego River in Table 2-3:

> The mouth of San Diego River is designated as a water quality limited segment for indicator bacteria pursuant to Clean Water Act section 303(d). Total Maximum Daily Loads have been adopted to address these impairments. See Chapter 3, *Water Quality Objectives*, Bacteria - Total and Fecal Coliform, and Bacteria - *E. Coli* and Enterococci, and Chapter 7, *Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek).*

Consecutively number and add the following footnote to Mouth of San Luis Rey River in Table 2-3:

> The mouth of San Luis Rey River is designated as a water quality limited segment for indicator bacteria pursuant to Clean Water Act section 303(d). Total Maximum Daily Loads have been adopted to address these impairments. See Chapter 3, *Water Quality Objectives*, Bacteria - Total and Fecal Coliform, and Bacteria - *E. Coli* and Enterococci, and Chapter 7, *Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek).*

Consecutively number and add the following footnote to Mouth of San Juan Creek in Table 2-3:

> The mouth of San Juan Creek is designated as a water quality limited segment for indicator bacteria pursuant to Clean Water Act section 303(d). Total Maximum Daily Loads have been adopted to address these impairments. See Chapter 3, *Water Quality Objectives*, Bacteria - Total and Fecal Coliform, and Bacteria - *E. Coli* and Enterococci, and Chapter 7, *Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek).*

Consecutively number and add the following footnote to Mouth of Aliso Creek in Table 2-3:

> The mouth of Aliso Creek is designated as a water quality limited segment for indicator bacteria pursuant to Clean Water Act section 303(d). Total Maximum Daily Loads have been adopted to address these impairments. See Chapter 3, *Water Quality Objectives*, Bacteria - Total and Fecal Coliform, and Bacteria - *E. Coli* and Enterococci, and Chapter 7, *Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek).*

Renumber any footnotes in Table 2-3 displaced by these new footnotes. Revise any other footnotes in Table 2-3 referring to TMDLs in Chapter 4 and change reference to Chapter 7.

<u>Chapter 3, Water Quality Objectives</u>

***Ocean Waters; Ocean Plan and Thermal Plan*:**
Add a second paragraph as follows:

Certain Pacific Ocean shoreline segments of the following Hydrological Units, Areas, and Subareas are designated as water quality limited segments for indicator bacteria pursuant to Clean Water Act section 303(d): San Joaquin Hills HSA 901.11 and Laguna Beach HSA 901.12, Aliso Creek HSA 901.13, Dana Point HSA 901.14, Lower San Juan HSA 901.27, San Clemente HA 901.30, San Luis Rey HU 903.00, San Marcos HA 904.50, San Dieguito HU 905.00, Miramar Reservoir HA 906.10, Scripps HA 906.30, and Mission San Diego HSA 907.11 and Santee HSA 907.12.

Total Maximum Daily Loads have been adopted to address these impairments. See Chapter 2, Table 2-3, *Beneficial uses of Coastal Waters, Footnotes [insert footnote numbers]*, and Chapter 7, *Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek).*

***Inland Surface Waters, Enclosed Bays and Estuaries, Coastal Lagoons, and Ground Waters; Bacteria – Total and Fecal Coliform*:**
Add a second paragraph as follows:

Aliso Creek, San Juan Creek, Tecolote Creek, Forrester Creek, San Diego River (lower), and Chollas Creek are designated as water quality limited segments for indicator bacteria pursuant to Clean Water Act section 303(d). Total Maximum Daily Loads have been adopted to address these impairments. See Chapter 2, Table 2-2, *Beneficial Uses of Inland Surface Waters, Footnote [insert footnote number]* and Chapter 7*, Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek).*

Chapter 4, *Implementation*

Revise Chapter 4 as follows:

Delete the following sections from Chapter 4:

- California Water Quality Assessment
- Clean Water Act Section 303(d) Requirements for Impaired Waterbodies

Replace the sections deleted above with the following:

TOTAL MAXIMUM DAILY LOADS

A total maximum daily load (TMDL) is the amount of a pollutant that can be discharged into a waterbody and still maintain its water quality standards (i.e., the designated beneficial uses and the adopted water quality objectives that support the beneficial uses). A TMDL must account for seasonal variations and include a margin of safety (MOS) to account for any lack of knowledge concerning the relationship between pollutant loadings and receiving water quality.

Pollutant loadings in excess of the TMDL are expected to have an adverse effect on water quality by causing exceedances of the applicable water quality standards. Allowable pollutant loadings are calculated and assigned to all point source and nonpoint source discharges to ensure that the applicable water quality standards are not exceeded in the receiving water.

A portion of the TMDL may be held explicitly in reserve as the MOS (e.g., MOS = 10 percent of TMDL), or the MOS may be implicitly included (i.e., MOS = 0) by incorporating conservative assumptions in the calculation of the TMDL (i.e., assumptions result in a lower calculated TMDL). The portion of the TMDL not in the MOS is assigned to point sources and nonpoint sources.

Point sources are assigned wasteload allocations (WLAs) and nonpoint sources (including natural and background sources) are assigned load allocations (LAs). The WLAs and LAs may differ for each pollutant source, but the TMDL and MOS do not change. The TMDL for a pollutant in the receiving water, and the WLAs and LAs for a pollutant discharged from different sources into a waterbody are calculated at levels that, when each are met, are expected to result in the attainment of the associated water quality objectives for the pollutant and protection of the applicable beneficial uses in the receiving water.

Establishing TMDLs for waters is required under section 303(d) of the Clean Water Act. Clean Water Act section 303(d) requires that the State establish a priority ranking of waters that do not meet water quality standards after application of technology based controls. The USEPA strongly encourages states to include the priority ranking as part of the Biennial Clean Water Act Sections 303(d), 305(b) and 314 Integrated Report, which is discussed in more detail in Chapter 6.

Waters identified under section 303(d) (a.k.a. the 303(d) List) are designated as Water Quality Limited Segments (WQLSs). In accordance with the priority ranking, TMDLs must be established for pollutants suitable for such calculations. For the purpose of developing information for all waters not identified as WQLSs, states are also required to estimate the TMDLs with seasonal variations and margin of safety.

One or more numeric targets are typically required to calculate TMDLs at levels necessary to attain and maintain applicable narrative and numerical water quality standards in WQLSs. Numeric targets interpret the existing water quality standards (i.e., beneficial uses and the water quality objectives established at levels sufficient to support those uses). After identifying the impaired beneficial uses of a waterbody, the numeric targets are often based on the water quality objectives in Chapter 3. Chapter 3 contains numeric and narrative water quality objectives. If applicable water quality objectives are numeric, the numeric water quality objectives can serve as the basis for the numeric targets. If applicable water quality objectives are narrative, one or more quantifiable target values or measurable indicators must be selected to measure progress and evaluate final attainment and maintenance of the narrative water quality objectives. In WQLSs, when numeric targets are met in the waterbody, the water quality standards should be attained and

restored. While numeric targets and TMDLs interpret water quality standards, *numeric targets and TMDLs are not water quality standards*.

TMDLs are not self-implementing or directly enforceable for sources in the watershed. Instead, TMDLs must be implemented through the programs or authorities of the San Diego Water Board and/or other entities to compel dischargers responsible for controllable sources to achieve the pollutant load reductions identified by a TMDL analysis to attain the water quality objectives that will support the designated beneficial uses of a waterbody.

The authorities that are available to the San Diego Water Board to implement TMDLs are given under the Porter-Cologne Water Quality Control Act (Division 7 of the Water Code). The available regulatory authorities include incorporating discharge prohibitions in to the Basin Plan, issuing individual or general waste discharge requirements (WDRs), or issuing individual or general conditional waivers of WDRs. The San Diego Water Board has the authority to enforce Basin Plan prohibitions, WDRs, or conditional waivers of WDRs through the issuance of enforcements actions (e.g., time schedule orders, cleanup and abatement orders, cease and desist orders, administrative civil liabilities). The San Diego Water Board also has the authority to require monitoring and/or technical reports from dischargers, which may be used to support the development, refinement, and/or implementation of TMDLs, WLAs, and/or LAs.

Additionally, the USEPA has delegated responsibility to the State and Regional Boards for implementation of the federal National Pollutant Discharge Elimination System (NPDES) program, which specifically regulates discharges of "pollutants" from point sources to "waters of the United States." The San Diego Water Board regulates discharges from point sources to surface waters with WDRs that implement federal NPDES regulations (NPDES requirements). Federal regulations require that NPDES requirements incorporate water quality based effluent limitations (WQBELs) that must be consistent with the requirements and assumptions of any available WLAs. WQBELs may be expressed as numeric effluent limitations, when feasible, and/or as a best management practice (BMP) program of expanded or better-tailored BMPs.

Upon establishment of TMDLs by the state or U.S. Environmental Protection Agency (USEPA), the state is required to incorporate TMDLs into the state water quality management plan. This Basin Plan and applicable statewide plans serve as the water quality management plan for the watersheds under the jurisdiction of the Regional Board. TMDLs are programs for the implementation of existing water quality standards, and are established in the Basin Plan subject to the requirements of Water Code section 13242. TMDLs incorporated into the Basin Plan, therefore, are required to include 1) a description of the actions (i.e., programs or authorities) of the Regional Board and/or other entities necessary to achieve the TMDLs, 2) a compliance time schedule by which the TMDLs, and thereby the restoration of the beneficial uses in the receiving waters, are to be achieved, and 3) a description of the monitoring program that is required to determine compliance with TMDLs, WLAs, and LAs in the receiving waters. These elements are referred to as the TMDL Implementation Plan.

TMDLs that have been established for the San Diego Region are provided in Chapter 7.

Delete the following sections from Chapter 4 and move to Chapter 7:

- Total Maximum Daily Load for Diazinon, Chollas Creek Watershed, San Diego County
- Total Maximum Daily Load for Dissolved Copper, Shelter Island Yacht Basin, San Diego Bay
- Total Maximum Daily Loads (TMDLs) for Total Nitrogen and Total Phosphorus in the Rainbow Creek Watershed
- Total Maximum Daily Loads for Copper, Lead, and Zinc in Chollas Creek
- Total Maximum Daily Loads for Indicator Bacteria, Baby Beach and Shelter Island Shoreline Park Shorelines

Delete the following section from Chapter 4:

- Other Programs, San Diego Bay Total Maximum Daily Load Worksheets

Revise the Chapter 4 Table of Contents to reflect the changes above.

Chapter 6, *Surveillance, Monitoring, and Assessment*

Revise the section titled "Biennial Water Quality Inventory / Water Quality Assessment Report" from Chapter 6 as follows (blue underline indicates added text and red strikeout indicates deleted text):

BIENNIAL ~~WATER QUALITY INVENTORY / WATER QUALITY ASSESSMENT~~ CLEAN WATER ACT SECTIONS 303(d), 305(b) AND 314 INTEGRATED REPORT

Every two years states are required to provide an assessment of the quality of all their waters and a list of those waters that are impaired or threatened, in accordance with the following sections of the Clean Water Act:

Section 303(d): Requires states to identify waters for which technology based effluent limitation are not stringent enough to meet applicable water quality standards. States must establish a priority ranking for such waters and must establish TMDLs for all such waters in accordance with the priority ranking. Waters identified and prioritized for TMDL development under section 303(d) (a.k.a. the 303(d) List) are designated as Water Quality Limited Segments (WQLSs).

Section 305(b): Requires states to prepare a description of the water quality of all navigable waters of the state; an analysis of the extent to which navigable waters provide protection and propagation of a balanced population of shellfish, fish, and wildlife and allow recreational activities in and on the water; an analysis of the extent to which elimination of the discharge of pollutants has been achieved; an estimate of the environmental impact, the economic, and social costs necessary to achieve the objective of

the Clean Water Act, the economic and social benefits of the achievement, and the date of such achievement; and, a description of the nature and the extent of nonpoint sources of pollutants and recommendations as to the programs which must be taken to control them, with estimates of cost.

Section 314: Requires states to identify and classify all publicly owned lakes in the state according to eutrophic condition. States must list and describe those publicly owned lakes known to be impaired and assess the status and trends of water quality. This information is required to be submitted as part of the section 305(b) report.

~~Section 305(b) of the federal Clean Water Act requires all states to prepare and submit a biennial Water Quality Inventory Report, (commonly referred to as a "305(b) Report"). In California, this report is used by the State Board and the USEPA to prioritize funding for water quality programs. As required by the Clean Water Act, section 305(b), the report must contain:~~

- ~~A description of the water quality of the major navigable water bodies in the state;~~
- ~~An analysis of the extent to which significant navigable waters provide for the protection and propagation of a balanced population of shellfish, fish, and wildlife and allow recreational activities in and on the water;~~
- ~~An analysis of the extent to which elimination of the discharge of pollutants has been achieved;~~
- ~~An estimate of the environmental impact, the economic, and social costs necessary to achieve the objective of the Clean Water Act, the economic and social benefits of the achievement, and the date of such achievement; and~~
- ~~A description of the nature and the extent of nonpoint sources of pollutants and recommendations as to the programs which must be taken to control them, with estimates of cost.~~

The USEPA strongly encourages states to submit a single Integrated Report that satisfies the reporting requirements for each of these sections. Each Regional Board prepares ~~a biennial Water Quality Assessment (WQA) Report~~ an Integrated Report for its Region, using data collected by regional planning, permitting, surveillance, and enforcement programs. The regional ~~reports~~ Integrated Reports contain inventories of the major waterbodies in the region, including rivers and streams, lakes and reservoirs, bays and harbors, estuaries, coastal waters, wetlands, and ground water. ~~For each water body, the report identifies the total size and the extent of the water body classified as having "good", "intermediate", "impaired", or "unknown" water quality. The report describes general problems and sources of water quality impairment. Additionally, the data base also indicates if the water body is included on any of the federal "lists". These lists indicate specific types of water quality impairments and are organized by the appropriate sections of the Clean Water Act as follows:~~

~~Section 131.11: Segments which may be affected by toxic pollutants, or segments with concentrations of toxic pollutants that warrant concern.~~

~~Section 303(d): List of Water Quality Limited Segments where objectives or goals of the Clean Water Act are not attainable with the Best Available Treatment/ Best Control Technology (BAT/BCT).~~

~~Section 304(m): So-called "mini-list" of waters not meeting State adopted numeric water quality objectives due to toxic point sources after implementation of BAT/BCT.~~

~~Section 304(s): So-called "short list" of waters not achieving water quality standards due to point source discharges of toxic pollutants after implementation of BAT/BCT.~~

~~Section 304(l): So-called "long list" of waters not meeting the water quality goals of the Clean Water Act after implementation of BAT/BCT.~~

~~Section 314: A list of lake priorities for restoration.~~

~~Section 319: A list of impaired surface water bodies from nonpoint source problems due to both toxic and nontoxic pollutants.~~

The regional Integrated Report presents the results of the assessment of the waterbodies in the Region, and the waters are categorized as one or more of the following:

Category 1: All designated uses are supported, no use is threatened.

Category 2: Available data and/or information indicate that some, but not all of the designated uses are supported.

Category 3: There are insufficient available data and/or information to make a use support determination.

Category 4: Available data and/or information indicate that at least one designated use is not being supported or is threatened, but a TMDL is not needed.

Category 5: Available data and/or information indicate that at least one designated use is not being supported or is threatened and a TMDL is needed.

Upon adoption of the ~~Regional WQA Reports~~ regional Integrated Reports by respective Regional Boards, the reports are compiled into a statewide report ~~entitled California Water Quality Assessment Report~~. Upon adoption of this statewide report by the State Board, the report is submitted to the USEPA to satisfy ~~section 305(b)~~ the reporting requirements of ~~the~~ Clean Water Act sections 303(d), 305(b) and 314. Subsequently, the USEPA submits the Integrated Reports from the states to the United States Congress, which serves as the

primary vehicle for informing Congress and the public about general water quality conditions in the United States.

Chapter 7, *Total Maximum Daily Loads*

Add Chapter 7, Total Maximum Daily Loads to Basin Plan and include the following.

7. TOTAL MAXIMUM DAILY LOADS

INTRODUCTION

This chapter contains the Total Maximum Daily Loads (TMDLs) that have been adopted by the Regional Water Quality Control Board, San Diego Region (RWQCB), approved by the State Water Resources Control Board (SWRCB) and Office of Administrative Law (OAL), and/or adopted/approved by the United State Environmental Protection Agency (USEPA). Table 7-1 lists the adopted and approved TMDLs that have been incorporated into the Basin Plan.

Table 7-1. Adopted and Approved Total Maximum Daily Loads in the San Diego Region

Total Maximum Daily Load	RWQCB Adoption Date	SWRCB Approval Date	OAL Approval Date	USEPA Approval Date
Total Maximum Daily Load for Diazinon, Chollas Creek Watershed, San Diego County	8/14/02	7/16/03	9/11/03	11/3/03
Total Maximum Daily Load for Dissolved Copper, Shelter Island Yacht Basin, San Diego Bay	2/9/05	9/22/05	12/2/05	2/8/06
Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in the Rainbow Creek Watershed	2/9/05	11/16/05	2/1/06	3/22/06
Total Maximum Daily Loads for Copper, Lead, and Zinc in Chollas Creek	6/13/07	7/15/08	10/22/08	12/18/08
Total Maximum Daily Loads for Indicator Bacteria, Project I – Beaches and Creeks in the San Diego Region	12/17/07	--[a]	--	--
Total Maximum Daily Loads for Indicator Bacteria, Baby Beach and Shelter Island Shoreline Park Shorelines	6/11/08	6/16/09	9/15/09	10/26/09
Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)	2/10/10	TBD	TBD	TBD

[a] Withdrawn by the RWQCB on December 18, 2008 from SWRCB consideration for revision. See Revised Total Maximum Daily Loads for Indicator Bacteria Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek).

The text for the TMDLs removed from Chapter 4, above, as well as all the text deleted from Appendix E and Appendix F will be added to the new Chapter 7, in the following order:

1. Total Maximum Daily Load for Diazinon, Chollas Creek Watershed, San Diego County
2. Total Maximum Daily Load for Dissolved Copper, Shelter Island Yacht Basin, San Diego Bay
3. Append the old Appendix E (Method for Recalculation of the Total Maximum Daily Load for Dissolved Copper in the Shelter Island Yacht Basin, San Diego Bay) to the end of the TMDL above.
4. Total Maximum Daily Loads (TMDLs) for Total Nitrogen and Total Phosphorus in the Rainbow Creek Watershed
5. Append the old Appendix F (Method for Recalculation of the Total Maximum Daily Loads for Nitrogen and Phosphorus in Rainbow Creek) to the end of the TMDL above.
6. Total Maximum Daily Loads for Copper, Lead, and Zinc in Chollas Creek
7. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach and Shelter Island Shoreline Park Shorelines

Number any tables from the text listed above in sequential order following Table 7-1 above.

Future TMDL Basin Plan amendments will be added to the end of Chapter 7, and Table 7-1 will be updated accordingly.

Add the following section to the end of Chapter 7:

Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek).

On February 10, 2010, the San Diego Water Board adopted Resolution No. R9-2010-0001, *A Resolution Amending the Water Quality Control Plan for the San Diego Region (9) to Incorporate Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)* (referred to hereafter as Revised Bacteria TMDLs Project I). The TMDL Basin Plan Amendment was subsequently approved by the State Water Resources Control Board (SWRCB)on [Insert date], the Office of Administrative Law on [Insert date], and the USEPA on [Insert date].

Bacteria TMDLs have been established for the following 20 waterbodies listed on the 2002 Clean Water Act Section 303(d) List of Water Quality Limited Segments:

[Insert Table number]. Beaches and Creeks Addressed by Revised Bacteria TMDLs Project I

Watershed	Type of Listing	Waterbody Name [a,c]	Number of Listings
San Joaquin Hills HSA (901.11)/ Laguna Beach HSA (901.12)	Shoreline	Pacific Ocean Shoreline, San Joaquin Hills HSA [b]	2
	Shoreline	Pacific Ocean Shoreline, Laguna Beach HSA [b]	
Aliso HSA (901.13)	Creek	Aliso Creek	3
	Estuary	Aliso Creek (mouth)	
	Shoreline	Pacific Ocean Shoreline, Aliso HSA [b]	
Dana Point HSA (901.14)	Shoreline	Pacific Ocean Shoreline, Dana Point HSA [b]	1
Lower San Juan HSA (901.27)	Creek	San Juan Creek	3
	Estuary	San Juan Creek (mouth)	
	Shoreline	Pacific Ocean Shoreline, Lower San Juan HSA [b]	
San Clemente HA (901.30)	Shoreline	Pacific Ocean Shoreline, San Clemente HA [b]	1
San Luis Rey HU (903.00)	Shoreline	Pacific Ocean Shoreline, San Luis Rey HU [b]	1
San Marcos HA (904.50)	Shoreline	Pacific Ocean Shoreline, San Marcos HA [b]	1
San Dieguito HU (905.00)	Shoreline	Pacific Ocean Shoreline, San Dieguito HU [b]	1
Miramar Reservoir HA (906.10)	Shoreline	Pacific Ocean Shoreline, Miramar Reservoir HA [b]	1
Scripps HA (906.30)	Shoreline	Pacific Ocean Shoreline, Scripps HA [b]	1
Tecolote HA (906.50)	Creek	Tecolote Creek	1
Mission San Diego HSA (907.11)/ Santee HSA (907.12)	Creek	Forester Creek	3
	Creek	San Diego River (Lower)	
	Shoreline	Pacific Ocean Shoreline, San Diego HU [b]	
Chollas HSA (908.22)	Creek	Chollas Creek.	1
Total Number of Listings on 2002 303(d) List in Revised Bacteria TMDLs Project I			**20**

Note: HSA = hydrologic subarea; HA = hydrologic area; HU = hydrologic unit
[a] Listed as impaired due to exceedances of REC-1 WQOs for fecal coliform, and/or total coliform, and/or enterococci.
[b] On the 2002 303(d) List, the Pacific Ocean Shoreline for a HSA, HA, or HU is listed, and specific beaches are noted under the listing. Beginning with the 2008 303(d) List, specific beaches are listed.
[c] Listings on the 2006 and 2008 303(d) List compared to listing shown above are provided in Appendix T to the Technical Report.

The TMDLs that have been developed for the Pacific Ocean shorelines are applicable to all the beaches located on the shorelines of the hydrologic subareas (HSAs), hydrologic areas (HAs), and hydrologic units (HUs) listed above. Beginning with the 2008 303(d) List, specific beach segments of the Pacific Ocean shoreline are listed individually. Specific beach segments from some of the Pacific Ocean shorelines listed in the above table have been delisted from the 2008 303(d) list that was approved by the San Diego Board on December 16, 2009, and therefore are not subject to any further action as long as monitoring data continues to support compliance with water quality standards.

(a) Problem Statement

Bacteria densities in the Pacific Ocean at various beach and coastal creek mouth segments (referred to hereafter as "beaches") exceed water quality objectives (WQOs) for indicator bacteria. Bacteria densities in ocean water at these beaches unreasonably impair and threaten to impair the water quality needed to support the contact water recreation (REC-1)[1] designated beneficial use.

Bacteria densities in the waters of Aliso Creek, San Juan Creek, Tecolote Creek, Forrester Creek, the (lower) San Diego River, and Chollas Creek exceed WQOs for indicator bacteria. Bacteria densities in these creeks unreasonably impair and threaten to impair the water quality needed to support REC-1.

The federal Clean Water Act requires the establishment of Total Maximum Daily Loads (TMDLs) for pollutants that exceed the WQOs needed to support designated beneficial uses, *i.e.*, that cause or contribute to exceedances of state "water quality standards."

(b) Numeric Target

When calculating TMDLs, one or more numeric targets are required. Numeric targets are typically selected based on water quality standards, which include beneficial uses and the WQOs that are established at levels sufficient to protect those beneficial uses. The numeric targets for these TMDLs are based primarily on the REC-1 WQOs for indicator bacteria contained in the Ocean Plan and/or Basin Plan.

Different REC-1 WQOs were used as the basis for wet weather[2] and dry weather[3] allowable load (i.e., TMDL) calculations because the bacteria transport mechanisms to receiving waters are different under wet and dry weather conditions. Because wet weather conditions, or storm flow, are episodic and short in duration, and characterized by rapid wash-off and transport of high bacteria loads, with short residence times, from all land use types to receiving waters, the single sample maximum WQOs were appropriate for use as wet weather numeric targets. For dry weather conditions, because dry weather runoff is not generated from storm flows, is not uniformly linked to every land use, and is more uniform than stormflow, with lower flows, lower loads, and slower transport, making die-off and/or amplification processes more important, the geometric mean WQOs were appropriate for use as dry weather numeric targets. Wet weather TMDL calculations were based on the REC-1 single sample maximum WQOs while dry weather TMDL calculations were based on REC-1 geometric mean WQOs.

It is not the intent of these TMDLs to require treatment or diversion of natural waterbodies or to require treatment of natural sources of indicator bacteria. The Basin Plan authorizes the use of a reference system and antidegradation approach (RSAA) or natural sources

[1] Water quality objectives for indicator bacteria in waters with non-water-contact recreation (REC-2) are less stringent than the water quality objectives for REC-1, therefore, attainment of REC-1 objectives through the implementation of TMDLs will, *a fortiori,* provide the requisite water quality for REC-2.
[2] Wet weather days defined as days with rainfall events of 0.2 inches or greater and the following 72 hours.
[3] Dry weather days defined as days with less than 0.2 inch of rainfall observed on each of the previous 3 days.

exclusion approach (NSEA) during implementation of indicator bacteria water quality objectives within the context of a TMDL.

For these indicator bacteria TMDLs, the RSAA has been incorporated in the numeric targets as an allowable frequency that the REC-1 WQOs can be exceeded (i.e., allowable exceedance frequency). The purpose of the allowable exceedance frequency is to account for the natural, and largely uncontrollable sources of bacteria (e.g., bird and wildlife feces), which have been shown can, by themselves, cause exceedances of the REC-1 WQOs. The RSAA also incorporates antidegradation principles in that, if water quality is better than that of the reference system in a particular location, no degradation of existing bacteriological water quality is permitted.

Therefore, in addition to the REC-1 WQOs, the numeric targets used to calculate the indicator bacteria TMDLs include an allowable exceedance frequency. The numeric targets used to calculate of the wet weather TMDLs include a 22 percent allowable exceedance frequency of the REC-1 single sample maximum WQOs.[4] The numeric targets used to calculate dry weather TMDLs include a zero percent allowable exceedance frequency of the REC-1 geometric mean WQOs.[5]

The allowable load (i.e., TMDL) that is calculated based on these numeric targets consists of the sum of two parts: 1) the bacteria load that is calculated with the REC-1 WQOs and, 2) the bacteria load that is associated with the allowable exceedance frequency, calculated using the existing load in exceedance of the REC-1 WQOs on the allowable exceedance days. Allowable exceedance days are calculated based on the allowable exceedance frequency and total number of wet days in a year.

Different enterococci REC-1 WQOs were used to calculate TMDLs in watersheds modeled with the inland freshwater creeks (i.e., San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek, (lower) San Diego River, and Chollas Creek) and watersheds modeled only with coastal saltwater beaches. The WQOs applicable to ocean waters are provided in the Ocean Plan. The Ocean Plan is applicable only to ocean waters and does not apply to marine bays, estuaries and lagoons. The WQOs applicable to all other surface waters in the San Diego Region (e.g., marine bays, estuaries and lagoons, and freshwater inland surface waters) are contained in the Basin Plan.

There are different enterococci REC-1 WQOs in the Ocean Plan compared to the Basin Plan. Specifically, the Ocean Plan contains REC-1 single sample maximum and 30-day

[4] In the calculation of the wet weather TMDLs, the San Diego Regional Board chose to apply the 22 percent allowable exceedance frequency as determined for Leo Carillo Beach in Los Angeles County. At the time the wet weather watershed model was developed, the 22 percent exceedance frequency from Los Angeles County was the only reference beach exceedance frequency available. The 22 percent allowable exceedance frequency used to calculate the wet weather TMDLs is justified because the San Diego Region watersheds' exceedance frequencies will likely be close to the value calculated for Leo Carillo Beach, and is consistent with the exceedance frequency that was applied by the Los Angeles Regional Board.

[5] Available water quality data from San Diego Region reference systems indicate that exceedances of the single sample WQOs during dry weather conditions are uncommon. Furthermore, if the exceedance of the single sample WQOs during dry weather is unlikely, exceedances of the geometric mean are even more unlikely.

geometric mean WQOs for ocean waters that do not vary. In the Basin Plan, however, the REC-1 single sample maximum WQOs for enterococci are dependent upon the type (e.g., freshwater or saltwater) and usage frequency (e.g., designated beach, moderately or lightly used area, or infrequently used area) of the waterbody, and the REC-1 geometric mean WQOs are dependent of the type (e.g., freshwater or saltwater) of waterbody. The enterococci saltwater REC-1 WQOs in the Basin Plan, for waters designated with "designated beach" usage frequency, are the same as the enterococci REC-1 WQOs in the Ocean Plan.

For the application of the Basin Plan's enterococci REC-1 WQOs, unless otherwise specified in the Basin Plan, all waterbodies in the San Diego Region designated with REC-1 beneficial use are assumed to have a "designated beach" usage frequency. The "designated beach" usage frequency has the lowest and most stringent enterococci REC-1 WQOs in the Basin Plan. The enterococci REC-1 single sample maximum WQOs in the Basin Plan are more stringent for freshwater (61 MPN/100mL) than for saltwater (104 MPN/100mL) waterbodies. The enterococci REC-1 geometric mean WQOs in the Basin Plan are also more stringent for freshwater (33 MPN/100mL) than for saltwater (35 MPN/100mL) waterbodies. Since coastal saltwater beaches are downstream of inland freshwater creeks, TMDLs for coastal saltwater beaches are calculated using the more conservative enterococci REC-1 WQOs applicable to freshwater creeks (i.e., 61 MPN/100mL and 33 MPN/100mL). The numeric targets used in the calculation of the TMDLs for Tecolote Creek and Chollas Creek are also based on the enterococci REC-1 WQOs applicable to freshwater creeks.

In some cases, the "designated beach" category may be over-protective of water quality because of the infrequent recreational use in the impaired freshwater creeks. The recreational usage frequency in these freshwater creeks may correspond to the "moderately to lightly used areas" category, which has an enterococci freshwater REC-1 single sample maximum WQO of 108 MPN/100mL. In such cases, the "designated beach" enterococci saltwater REC-1 single sample maximum WQO (104 MPN/100mL) would also be protective of the "moderately to lightly used area" freshwater creek.

Before the less stringent enterococci single sample maximum saltwater REC-1 WQO may be applied to a freshwater creek, the Basin Plan must be amended to designate a lower usage frequency (i.e., "moderately to lightly used area") for each freshwater creek. If information and evidence are provided to justify the "moderately to lightly used area" usage frequency for a freshwater creek, and the designated usage frequency of the freshwater creek is amended to "moderately to lightly used area" in the Basin Plan, the wet weather TMDLs that were calculated in a watershed that was modeled with a freshwater creek using the enterococci saltwater REC-1 WQOs can be implemented instead.

The numeric targets for the scenarios described above are summarized in the following tables.

[Insert table number]. Wet Weather Numeric Targets

Indicator Bacteria	Numeric Target (MPN/100mL)	Allowable Exceedance Frequency [a]
Fecal coliform	400 [b]	22%
Total coliform	10,000 [c]	22%
Enterococci	104[d] / 61[e]	22%

a. Percent of wet days (i.e., rainfall events of 0.2 inches or greater and the following 72 hours) allowed to exceed the wet weather numeric targets. Exceedance frequency based on reference system in the Los Angeles Region.
b. Fecal coliform single sample maximum WQO for REC-1 use in creeks and at beaches.
c. Total coliform single sample maximum WQO for REC-1 use at beaches and the point in creeks that discharges to beaches.
d. Enterococci single sample maximum WQO for REC-1 use in creeks established and designated as "moderately or lightly used" in the Basin Plan and at beaches downstream of those creeks, as well as all other beaches.
e. Enterococci single sample maximum WQO for REC-1 use in creeks not established and designated as "moderately or lightly used" in the Basin Plan and at beaches downstream of those creeks ("designated beach" frequency of use; applicable to San Juan Creek and downstream beach, Aliso Creek and downstream beach, Tecolote Creek, Forrester Creek, San Diego River and downstream beach, and Chollas Creek).

[Insert table number]. Dry Weather Numeric Targets

Indicator Bacteria	Numeric Target (MPN/100mL)	Allowable Exceedance Frequency [a]
Fecal coliform	200 [b]	0%
Total coliform	1,000 [c]	0%
Enterococci	35 [d] / 33[e]	0%

a. Percent of dry days (i.e., days with less than 0.2 inch of rainfall observed on each of the previous 3 days) allowed to exceed the dry weather numeric targets.
b. Fecal coliform 30-day geometric mean WQO for REC-1 use in creeks and at beaches.
c. Total coliform 30-day geometric mean WQO for REC-1 at beaches and the point in creeks that discharges to beaches.
d. Enterococci 30-day geometric mean WQO for REC-1 at beaches.
e. Enterococci 30-day geometric mean WQO for REC-1 use in impaired creeks and beaches downstream of those creeks (applicable to San Juan Creek and downstream beach, Aliso Creek and downstream beach, Tecolote Creek, Forrester Creek, San Diego River and downstream beach, and Chollas Creek).

(c) Source Analysis

Sources of bacteria are the same under both wet weather and dry weather conditions. Bacteria build up on the land surface as a result of various anthropogenic land uses (e.g., urban development and agriculture) and natural processes (e.g., birds and wildlife). Bacteria are washed off the land surface by surface runoff. In urban areas, bacteria are washed off the land surface by dry weather and wet weather flows and transported through pipes and conveyance channels of the municipal separate storm sewer systems (MS4s) to surface waters. Other significant point sources of bacteria include municipal wastewater treatment plants and industrial waste treatment facilities. In rural and undeveloped areas, bacteria are washed off the land surface primarily by wet weather flows directly to surface waters. Discharges from rural areas are typically considered nonpoint sources. These diffuse nonpoint sources (e.g., undeveloped land, agriculture, livestock, and horse ranch facilities) have multiple routes of entry into surface waters.

Nonpoint sources were separated into controllable and uncontrollable categories. Controllable nonpoint sources are identified by land use types and coverages. Controllable nonpoint sources include land uses associated with agriculture, dairy/intensive livestock, and horse ranches (collectively referred to as agriculture land uses). These were considered controllable because the land uses are anthropogenic in nature, and load reductions can be reasonably expected with the implementation of suitable management measures. Uncontrollable nonpoint sources include loads from open recreation, open space, and water land uses (collectively referred to as open space land uses). Loads from these areas are considered uncontrollable because they come from mostly natural sources (e.g. bird and wildlife feces).

In order to quantify bacteria loading from these various sources and transport mechanisms, 13 land-use types were identified in the TMDL analysis: Low Density Residential, High Density Residential, Commercial/Institutional, Industrial/Transportation, Military, Parks/Recreation, Open Recreation, Agriculture, Dairy/Intensive Livestock, Horse Ranches, Open Space, Water, and Transitional (Construction Activities). In the technical TMDL analysis, the 13 land use types were grouped into the following four land use categories: 1) owners/operators of municipal separate storm sewers (Municipal MS4s); 2) Caltrans (separated from other Municipal MS4s); 3) Agriculture; and 4) Open Space. Bacteria loads discharged from Low Density Residential, High Density Residential, Commercial/Institutional, Industrial/Transportation, Military, Parks/Recreation, and Transitional land use types are included in the Municipal MS4s category, which is considered a controllable point source. Bacteria loads discharged from the Industrial/Transportation land use type associated with Caltrans were separated into the Caltrans category, which is considered a controllable point source. Bacteria loads discharged from Agriculture, Dairy/Intensive Livestock, and Horse Ranch land use types are included in the Agriculture category, which is considered a controllable nonpoint source. Bacteria loads discharged from Open Recreation, Open Space, and Water land use types are included in the Open Space category, which is associated with natural and undeveloped areas and considered an uncontrollable nonpoint source.

(d) Critical Conditions

The critical conditions are a set of environmental conditions for which controls designed to protect water quality will ensure attainment of the numeric targets for all other conditions. The critical conditions include the location and the period of time in which the waterbody is expected to exhibit the highest vulnerability.

To ensure that numeric targets are met throughout the impaired waterbodies, a critical location consisting of a node at the base of the watershed as it discharges to the ocean or bay was used as the point where the allowable load (i.e., TMDL) is calculated. A critical period associated with extreme rainfall conditions (i.e., critical wet year), and thus the highest potential bacteria load at the critical location, was selected for watershed modeling analysis. The year 1993 was selected as the critical wet period for assessment of extreme wet weather loading conditions because this year was the wettest year of the 12 years of record (1990 through 2002).

(e) Linkage Analysis

The purpose of the linkage analysis is to quantify the "existing" bacteria loads that are currently generated by the pollutant sources in the watershed under the critical conditions, and quantify the maximum allowable bacteria loading to each impaired waterbody that will result in attainment of numeric targets under the same critical conditions. This maximum allowable bacteria loading is, in other words, the TMDL.

The linkage analysis used mathematical modeling approaches to quantify the "existing" and allowable bacteria loadings for each impaired waterbody. Separate modeling approaches were used for the calculation of the wet weather TMDLs and dry weather TMDLs.

For the calculation of the wet weather TMDLs, the wet weather modeling approach chosen for the linkage analysis is based on the application of the USEPA's Loading Simulation Program in C++ (LSPC) model to estimate bacteria loading from streams and assimilation within the waterbodies. LSPC is a recoded C++ version of the USEPA's Hydrological Simulation Program–FORTRAN (HSPF) that relies on fundamental (and USEPA-approved) algorithms. In the wet weather linkage analysis, it is assumed that storm water flows wash off bacteria loads from the surface of all 13 land use types into the receiving waters. The LSPC model was used to predict flows and bacteria densities at the critical location during the wet days of the critical wet year, which were used to calculate the mass-based annual existing wet weather bacteria loads. The LSPC model-predicted wet weather flows at the critical location during the wet days of the critical wet year in combination with the numeric targets were used to calculate the mass-based annual allowable wet weather bacteria loads, or mass-based wet weather TMDLs.

For the calculation of the dry weather TMDLs, the dry weather modeling approach chosen for the linkage analysis consists of a steady-state mass balance model that was developed to simulate transport of bacteria in the impaired creeks and the creeks flowing to impaired shorelines. This predictive model represents the streams as a series of plug-flow reactors, with each reactor having a constant, steady-state flow and bacteria load. In the dry weather linkage analysis, it is assumed that dry weather non-storm water flows generated by anthropogenic activities wash off bacteria loads from the surface of specific land use types into the receiving waters. The dry weather steady-state model was used to predict flows and bacteria densities at the critical location during the dry weather days of the critical wet year, which were used to calculate the mass-based monthly existing dry weather bacteria loads. The dry weather steady-state model-predicted flows at the critical location during the dry days of the critical wet year in combination with the dry weather numeric targets were used to calculate the mass-based monthly allowable dry weather bacteria loads, or mass-based dry weather TMDLs.

(f) Total Maximum Daily Loads and Allocations

TMDLs can be expressed as mass per time (i.e., mass-loading basis), or other appropriate measure (e.g., as a concentration).[6] For these TMDLs, the wet weather and dry weather TMDLs are expressed both in terms of concentration and on a mass loading basis. The

[6] Code of Federal Regulations Title 40 section 130.2(1) [40CFR130.2(i)]

concentration based TMDLs will be used to determine compliance with the TMDLs in the receiving waters. Mass-load based TMDLs were calculated for the impaired waterbodies in each watershed. The mass-load based TMDLs were allocated to the identified point and nonpoint sources and used to identify the controllable sources that need to reduce their bacteria loads in order for the concentration based TMDLs to be met in the receiving waters. The concentration based TMDLs, mass-load based TMDLs, and allocations are discussed below.

(1) Concentration Based TMDLs

The wet weather and dry weather concentration based TMDLs are based on meeting the numeric targets (i.e., numeric WQOs and allowable exceedance frequencies) in the receiving waters. The numeric WQOs for REC-1 beneficial uses are the basis of the numeric targets used to calculate the TMDLs, expressed as number of bacteria colonies per volume. An allowable exceedance frequency is included as part of the numeric target to allow for exceedances that may be caused by natural sources, based on a reference system. Tables [Insert first two table numbers] summarize the concentration based TMDLs, which are expressed as numeric objectives and allowable exceedance frequencies in the receiving waters for each watershed, for wet weather and dry weather, respectively. Meeting the concentration based TMDLs in the receiving waters will be used to determine compliance with the TMDLs.

(2) Mass-Load Based TMDLs

The numeric targets were used to calculate the TMDLs on a mass loading basis under a set of critical conditions. The TMDLs that were calculated in terms of mass loading were used to identify the bacteria loads from controllable sources that need to be reduced in order for the numeric targets to be met in the receiving waters.

On a mass loading basis, TMDLs are defined as the maximum mass of a pollutant the waterbody can receive and still protect the designated beneficial uses. Separate mass-load based TMDLs were calculated for wet weather and dry weather conditions to account for seasonal variations, and because the transport mechanism, flow, and bacteria loads are different between dry and wet weather conditions.

On a mass-loading basis, the TMDLs are expressed as number of bacteria colonies per unit time. The wet weather mass-load based TMDLs are expressed as "annual loads" in terms of number of bacteria colonies per year (billion MPN/yr). The dry weather mass-load based TMDLs are expressed as "monthly loads" in terms of number of bacteria colonies per month (billion MPN/mth). In order for bacteria loading to be calculated, both flow rates and bacteria densities must be measured at a point in time and location. When multiplied together, these two parameters result in bacteria mass loading, or the number of bacteria colonies measured per unit time.

$$Bacteria\ Loading = flow\ rate\,(volume\,/\,time) \times bacteria\ density(number\ of\ colonies\,/\,volume)$$

Calibrated models were used to simulate flow and bacteria densities. This information was used to calculate the "existing" mass of bacteria loads to, and allowable mass of bacteria

loads (i.e., mass-load based TMDLs) for, each impaired segment under critical conditions (i.e., worst case loading conditions). The existing mass loads that were calculated represent the worst case flows and bacteria densities that are expected from the watershed during the critical wet year. The mass-load based TMDLs were calculated with the numeric targets and modeled flows expected during the critical wet year. Existing mass loads were compared to the mass-load based TMDLs. The difference between the existing mass loads and the mass-load based TMDLs is the load reduction required to meet the REC-1 WQOs and allowable exceedance frequencies in the receiving water.

Existing mass loads and mass-load based TMDLs were calculated for wet weather and dry weather. The calculation of the mass-load based TMDLs included the use of an allowable exceedance frequency of the REC-1 WQOs. The purpose of the exceedance frequency is to account for the natural, and largely uncontrollable sources of bacteria (e.g., bird and wildlife feces) generated in the watersheds and at the beaches, which can, by themselves, cause exceedances of WQOs.

All of the wet weather mass-load based TMDLs were calculated using a 22 percent allowable exceedance frequency.[7] All of the dry weather mass-load based TMDLs were calculated using a 0 percent allowable exceedance frequency. These allowable exceedance frequencies were used to calculate the number of wet and dry weather allowable exceedance days during the critical wet year.

The mass-load based TMDLs are calculated as the sum of the allowable load associated with the numeric REC-1 WQO and the allowable load associated with the allowable exceedance frequency during the critical wet year. Tables [Insert first two table numbers] summarize the calculated existing bacteria mass loads, allowable mass loads based on the numeric REC-1 WQOs, allowable exceedance frequencies and days, allowable mass loads based on the allowable exceedance frequencies, and mass-load based TMDLs for each watershed, for wet weather and dry weather, respectively.

(3) Allocation of Mass-Load Based TMDLs

The mass-load based TMDLs were allocated among point sources (WLAs) and nonpoint sources (LAs) in each watershed. WLAs were assigned to discharges originating from urban land use areas (i.e., MS4s and Caltrans), all of which are considered controllable. LAs were assigned to discharges from rural and undeveloped land use areas (i.e., Agriculture and Open Space). Discharges from rural and undeveloped land use areas are separated into controllable and uncontrollable nonpoint sources. Agricultural land uses (e.g., agriculture, horse ranches, and intensive livestock) are considered controllable nonpoint source land use areas. Open space land uses (e.g., open space and open recreation) are considered uncontrollable nonpoint source land use areas.

[7] In the calculation of the wet weather TMDLs, the San Diego Regional Board chose to apply the 22 percent allowable exceedance frequency as determined for Leo Carillo Beach in Los Angeles County. At the time the wet weather watershed model was developed, the 22 percent exceedance frequency from Los Angeles County was the only reference beach exceedance frequency available. The 22 percent allowable exceedance frequency used to calculate the wet weather TMDLs is justified because the San Diego Region watersheds' exceedance frequencies will likely be close to the value calculated for Leo Carillo Beach, and is consistent with the exceedance frequency that was applied by the Los Angeles Regional Board.

Sources that are not identified are assumed to be assigned a zero allowable load as part of the mass-load based TMDL (i.e., WLA = 0 or LA = 0). In other words, discharges of pollutant loads from these sources are not allowed as part of the TMDLs. Sources that are assigned an allowable mass load equal to the existing mass load (i.e., WLA or LA = existing mass load) are not allowed to increase their pollutant loads over time.

Allocations of the mass-load based TMDLs were different for wet weather TMDLs and dry weather TMDLs, as discussed below.

(A) Wet Weather TMDL Allocations

The wet weather mass-load based TMDLs were divided and assigned to point sources as WLAs and nonpoint sources as LAs based on land uses. The portions of the wet weather mass-load based TMDLs assigned to WLAs and LAs were calculated based on the percent of the TMDL mass load generated by the urban, rural, and undeveloped land uses in each watershed as determined by the wet weather models under critical conditions.

The allocation of the wet weather mass-load based TMDLs assumes surface runoff discharge occurs from all land use categories, and allocated according to the following steps:

1) Sources are separated in to controllable and uncontrollable sources. Discharges from Municipal MS4, Caltrans, and Agriculture land use categories are assumed to be controllable (i.e., subject to regulation), and discharges from Open Space land use categories are assumed to be uncontrollable (i.e., not subject to regulation).
2) Because discharges from Open Space land use categories are uncontrollable (i.e., not subject to regulation), the LAs for Open Space land use categories are set equal to the existing mass loads calculated under the critical conditions.
3) For discharges from controllable land use categories that do not contribute more than 5 percent of the total existing mass load for all three indicator bacteria, the WLA or LA is set equal to the existing mass loads from those land uses calculated under the critical conditions.
4) After the WLAs and LAs are assigned based on steps 2 and 3, the remaining portion of the mass-load based TMDL is assigned to discharges from controllable land use categories that contribute more than 5 percent of the total existing mass load for all three indicator bacteria. The allowable mass load for each source (WLA or LA) is calculated based on the ratio of the existing mass loads from those sources relative to each other.

The total watershed wet weather existing mass loads and mass-load based TMDLs, point source existing mass loads and mass-load based WLAs, nonpoint source existing mass loads and mass-load based LAs, and load reductions required to achieve the mass-load based TMDLs, WLAs, and LAs are shown below in [Insert third through fifth table numbers].

In comments, the municipal dischargers pointed out that, for the impaired creeks, the "designated beach" usage frequency WQO for enterococci may be over-protective of water quality because of the infrequent recreational use in the impaired creeks. The dischargers claim that the recreational usage frequency in these inland freshwater creeks more likely corresponds to the "moderately to lightly used area" category in the Basin Plan, which has an enterococci WQO of 108 MPN/100mL. In these cases, using a less stringent numeric target, based on the saltwater enterococci WQO of 104 MPN/100 mL ("designated beaches" usage frequency) would result in wet weather TMDLs protective of REC-1 uses in the inland freshwater creeks and at the downstream coastal saltwater beaches.[8] Therefore, the "moderately to lightly used area" usage frequency may be appropriate for the six impaired creeks, and the enterococci saltwater REC-1 single sample maximum WQO of 104 MPN/100 mL could be used as basis of the numeric target for the enterococci wet weather TMDLs.

The six creeks included in these TMDLs, however, have not been designated in the Basin Plan as "moderately to lightly used area" waterbodies as of the adoption of these TMDLs. If the Basin Plan does not specify the usage frequency of a waterbody, the most stringent and conservative WQOs are appropriate and applicable. For enterococci, the most stringent and conservative WQOs for the freshwater creeks are associated with the "designated beach" usage frequency and freshwater waterbody type. Thus, the enterococci WQOs associated with the freshwater "designated beach" usage frequency are applicable until sufficient evidence is provided to warrant an amendment to the Basin Plan that designates a lower usage frequency to one or more of the six creeks addressed by these TMDLs (San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek, San Diego River, and Chollas Creek).

According to the federal regulations,[9] usage frequencies are defined as follows:

- Designated Beach Area: those recreation waters that, during the recreation season, are heavily used (based upon a comparison of use within the state) and may have a lifeguard, bathhouse facilities, or public parking for beach access. States may include any other waters in this category even if the waters do not meet these criteria.

- Moderate Full Body Contact Recreation: those recreation waters that are not designated bathing beach waters but typically, during the recreation season, are used by at least half of the number of people as at typical designated bathing

[8] The enterococci WQOs in the Basin Plan are structured to reflect the frequency of recreational use. The enterococci freshwater REC-1 single sample maximum WQO for a "designated beach" area is 61 MPN/100 mL. For a "moderately or lightly used area," the REC-1 single sample maximum WQO is 108 MPN/100 mL. The saltwater REC-1 single sample maximum WQO for "designated beach" area is 104 MPN/100 mL. Where the "moderately or lightly used area" designation is appropriate for creeks, the saltwater REC-1 single sample maximum WQO of 104 MPN/100 mL could be used as the numeric target because it is also protective of both the freshwater creek and the downstream marine beach.
[9] Code of Federal Regulations Title 40 section 131.41 [40CFR131.41]

beach waters within the state. States may also include light use or infrequent use coastal recreation waters in this category.

- Lightly Used Full Body Contact Recreation: those recreation waters that are not designated bathing beach waters but typically, during the recreation season, are used by less than half of the number of people as at typical designated bathing beach waters within the state, but are more than infrequently used. States may also include infrequent use coastal recreation waters in this category.

- Infrequently Used Full Body Contact: those recreation waters that are rarely or occasionally used.

If sufficient evidence can be provided to the San Diego Water Board that can demonstrate the usage frequency for one or more of the six impaired creeks falls under the "Lightly Used Full Body Contact Recreation" or "Infrequently Used Full Body Contact" usage frequency, the Basin Plan may be amended to designate one or more of the creeks with the "moderately to lightly used area" usage frequency.

If one or more of the six creeks (San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek, San Diego River, and/or Chollas Creek) are designated in the Basin Plan with the "moderately to lightly used area" usage frequency, the enterococci wet weather TMDLs, WLAs, and LAs based on the 104 MPN/100mL (Table [Insert sixth table number]) can be implemented. Otherwise, the more stringent and conservative enterococci wet weather TMDLs, WLAs, and LAs based on the freshwater "designated beach" usage frequency WQO of 61 MPN/100mL (Table [Insert fifth table number]) must be implemented.

(B) Dry Weather TMDL Allocations

The dry weather mass-load based TMDLs were assigned entirely to discharges from MS4 land uses because the runoff that transports bacteria loads to surface waters during dry weather are expected to occur only in urban areas. The allocation of the dry weather mass-load based TMDLs assumes that no surface runoff discharge to receiving waters occurs from Caltrans, Agriculture, or Open Space land use categories (i.e., $WLA_{Caltrans} = 0$, $LA_{Agriculture} = 0$, and $LA_{OpenSpace} = 0$), meaning the entire dry weather mass-load based TMDL (i.e., allowable mass load) is allocated to Municipal MS4 land use categories (i.e., $WLA_{MS4} = TMDL$).

The total watershed dry weather existing mass loads and mass-load based TMDLs, point source existing mass loads and mass-load based WLAs, nonpoint source existing mass loads and mass-load based LAs, and load reductions required to achieve the mass-load based TMDLs, WLAs, and LAs are shown below in Tables [Insert seventh through ninth table numbers].

Because the wet weather and dry weather modeling approaches used to calculate the mass-load based TMDLs, WLAs, LAs, and existing mass wasteloads and loads were based on critical conditions (i.e., worst case loading scenario), the mass-loading numbers (i.e.,

existing mass loads, and mass-load based TMDLs, WLAs, and LAs expressed in terms of billion MPN/year for wet weather and billion MPN/month for dry weather) presented in Tables [Insert first through ninth table numbers] represent conservative mass-load estimates expected to be protective of the beneficial uses under extreme conditions. The mass-loading numbers also provide a tool for identifying bacteria sources that need to be controlled and existing bacteria loads that need to be reduced to meet the TMDLs in the receiving waters.

Ultimately, controllable point and nonpoint sources must reduce their anthropogenic loads so the concentration based wet weather and dry weather TMDLs, which are based on the numeric REC-1 WQOs in the Basin Plan and allowable exceedance frequencies, can be met during wet weather and dry weather conditions during each year. Meeting the wet weather and dry weather numeric targets in the discharge and/or receiving water will indicate the TMDLs, WLAs, and/or LAs have been met.

(g) Margin of Safety

The numeric targets used for the mass-load based and concentration based TMDLs are assumed to be conservative by utilizing the most stringent REC-1 WQOs contained in the Ocean Plan and/or Basin Plan. Additionally, the mass-load based TMDLs were calculated under a set of critical conditions that assumed the highest potential mass loading would occur at a critical point during a critical wet year, which is expected to be protective of beneficial uses during extreme conditions. The conservative assumptions that were used result in conservative mass-load based and concentration based TMDLs that are expected to restore and protect the beneficial uses of the receiving waters.

Because bacteria in wet weather runoff and streamflows have a quick travel time, and therefore, a short residence time in the waterbodies, the REC-1 single-sample maximum WQOs were determined to be most appropriate for calculating the wet weather TMDLs. The numeric targets used for the wet weather mass-load based and concentration based TMDLs are assumed to be conservative by utilizing the most stringent REC-1 single sample maximum WQOs contained in the Ocean Plan and/or Basin Plan.

Because dry weather conditions have flows and bacteria loads much smaller in magnitude than wet weather conditions, do not occur from all land use types, and are more uniform than stormflow, the REC-1 30-day geometric mean WQOs were determined to be most appropriate for the dry weather TMDLs. The numeric targets used for the dry weather mass-load based and concentration based TMDLs are assumed to be conservative by utilizing the most stringent REC-1 30 day geometric mean WQOs contained in the Ocean Plan and/or Basin Plan.

Because of the numeric targets and critical conditions that were included in the calculation of the TMDLs, there was no explicit margin of safety included. Instead, the TMDLs include an implicit margin of safety (MOS). The implicit MOS is included via conservative estimates and assumptions (meaning worst-case scenarios were assumed in terms of existing bacteria loading) throughout the calculations and not as a separate, additional factor.

[Insert table number]. Summary of Wet Weather Existing and Allowable Indicator Bacteria Loads

Watershed - Impaired Waterbody	Indicator Bacteria	Existing Bacteria Load (Billion MPN/year)	Single Sample Maximum Objective (MPN/100mL)	Allowable Numeric Objective Load (Billion MPN/year)	Total Wet Days in Critical Year	Allowable Exceedance Frequency	Allowable Wet Exceedance Days in Critical Year	Allowable Exceedance Load (Billion MPN/year)	Total Allowable Load [=TMDL] (Billion MPN/year)
San Joaquin Hills HSA (901.11)	Fecal Coliform	705,015	**400**	16,043				648,591	664,634
and Laguna Hills HSA (901.12)	Total Coliform	8,221,901	**10,000**	401,049	69	**22%**	15	7,044,601	7,445,649
- Pacific Ocean Shoreline	Enterococcus	852,649	**104**	4,175				778,624	782,799
Aliso HSA (901.13)	Fecal Coliform	1,752,096	**400**	84,562				1,494,512	1,579,073
- Pacific Ocean Shoreline - Aliso Creek	Total Coliform	23,210,774	**10,000**	2,109,600	69	**22%**	15	18,081,198	20,190,798
- Aliso Creek mouth	Enterococcus	2,230,206	**104***	22,682				1,929,834	1,952,517
		2,230,206	**61**	13,644				1,937,321	1,950,964
Dana Point HSA (901.14)	Fecal Coliform	403,911	**400**	14,894				362,419	377,313
- Pacific Ocean Shoreline	Total Coliform	6,546,962	**10,000**	372,328	69	**22%**	15	5,659,144	6,031,472
	Enterococcus	501,526	**104**	3,875				458,431	462,306
Lower San Juan HSA (901.27)	Fecal Coliform	15,304,790	**400**	358,410				14,356,423	14,714,833
- Pacific Ocean Shoreline - San Juan Creek	Total Coliform	130,258,863	**10,000**	8,947,114	76	**22%**	17	113,932,076	122,879,189
- San Juan Creek mouth	Enterococcus	12,980,098	**104***	95,357				12,063,781	12,159,138
		12,980,098	**61**	56,119				12,096,327	12,152,446
San Clemente HA (901.30)	Fecal Coliform	1,441,723	**400**	36,481				1,342,450	1,378,931
- Pacific Ocean Shoreline	Total Coliform	16,236,606	**10,000**	911,994	73	**22%**	16	14,235,609	15,147,603
	Enterococcus	1,663,100	**104**	9,491				1,553,696	1,563,187
San Luis Rey HU (903.00)	Fecal Coliform	33,120,012	**400**	640,595				31,803,647	32,444,242
- Pacific Ocean Shoreline	Total Coliform	231,598,677	**10,000**	15,993,384	90	**22%**	20	208,157,151	224,150,535
	Enterococcus	18,439,920	**104**	167,152				17,296,466	17,463,618
San Marcos HA (904.50)	Fecal Coliform	20,886	**400**	1,559				15,665	17,224
- Pacific Ocean Shoreline	Total Coliform	515,278	**10,000**	38,984	49	**22%**	11	386,099	425,083
	Enterococcus	40,558	**104**	406				32,559	32,966
San Dieguito HU (905.00)	Fecal Coliform	21,286,910	**400**	425,968				20,675,680	21,101,649
- Pacific Ocean Shoreline	Total Coliform	163,541,133	**10,000**	10,637,225	98	**22%**	22	149,176,959	159,814,184
	Enterococcus	14,796,210	**104**	113,253				14,193,834	14,307,087
Miramar Reservoir HA (906.10)	Fecal Coliform	10,392	**400**	312				9,943	10,256
- Pacific Ocean Shoreline	Total Coliform	212,986	**10,000**	7,809	94	**22%**	21	202,371	210,180
	Enterococcus	11,564	**104**	81				11,323	11,405

[Insert table number]. Summary of Wet Weather Existing and Allowable Indicator Bacteria Loads (Cont'd)

Watershed - Impaired Waterbody	Indicator Bacteria	Existing Bacteria Load (Billion MPN/year)	Single Sample Maximum Objective (MPN/100mL)	Allowable Numeric Objective Load (Billion MPN/year)	Total Wet Days in Critical Year	Allowable Exceedance Frequency	Allowable Wet Exceedance Days in Critical Year	Allowable Exceedance Load (Billion MPN/year)	Total Allowable Load [=TMDL] (Billion MPN/year)
Scripps HA (906.30)	Fecal Coliform	204,057	**400**	10,329				166,578	176,907
- Pacific Ocean Shoreline	Total Coliform	5,029,519	**10,000**	258,228	57	**22%**	13	4,098,745	4,356,973
	Enterococcus	377,839	**104**	2,686				321,347	324,032
Tecolote HA (906.50)	Fecal Coliform	261,966	**400**	25,080				204,241	229,322
- Tecolote Creek	Total Coliform	7,395,789	**10,000**	626,414	57	**22%**	13	5,753,355	6,379,770
	Enterococcus	708,256	**104***	6,522				597,659	604,180
		708,256	**61**	3,825				599,936	603,761
Mission San Diego HSA (907.11)	Fecal Coliform	4,932,380	**400**	310,820				4,370,018	4,680,838
and Santee HSA (907.12)	Total Coliform	72,757,569	**10,000**	7,752,284	86	**22%**	19	58,352,938	66,105,222
- Forrester Creek - San Diego River (lower) - Pacific Ocean Shoreline	Enterococcus	7,255,759	**104***	80,899				6,514,309	6,595,208
		7,255,759	**61**	47,479				6,543,487	6,590,966
Chollas HSA (908.22)	Fecal Coliform	603,863	**400**	55,516				464,924	520,440
- Chollas Creek	Total Coliform	15,390,608	**10,000**	1,386,037	65	**22%**	14	11,861,589	13,247,626
	Enterococcus	1,371,972	**104***	15,008				1,138,590	1,153,599
		1,371,972	**61**	9,073				1,143,572	1,152,645

* Total Maximum Daily Load calculated using a Enterococcus numeric target of 61 MPN/mL that is conservatively protective of the REC-1 "designated beach" usage frequency for freshwater creeks and downstream beaches. If the usage frequency of the freshwater creeks can be established as "moderately to lightly used" in the Basin Plan, alternative Total Maximum Daily Loads calculated using an Enterococcus numeric target of 104 MPN/ml may be used.

Existing Bacteria Load = Predicted existing bacteria load discharged from the watershed calculated by the Loading Simulation Program in C++ (LSPC) model using modeled flows and bacteria densities for all wet days during the critical year 1993

Single Sample Maximum Objective = Target bacteria densities based on numeric single sample maximum water quality objectives that are protective of REC-1 beneficial uses
Allowable Numeric Objective Load = Allowable load from the watershed calculated by the LSPC model using modeled flows and the numeric single sample maximum water quality objective bacteria densities for all wet days during the critical year 1993

Total Wet Days in Critical Year = Number of wet days (i.e., rainfall events of 0.2 inches or greater and the following 72 hours) in the critical year 1993 (i.e., wettest year between 1990 and 2002)
Allowable Exceedance Frequency = Assumed to be 22 percent exceedance frequency. In the calculation of the wet weather TMDLs, the San Diego Regional Board chose to apply the 22 percent allowable exceedance frequency as determined for Leo Carillo Beach in Los Angeles County. At the time the wet weather watershed model was developed, the 22 percent exceedance frequency from Los Angeles County was the only reference beach exceedance frequency available. The 22 percent allowable exceedance frequency used to calculate the wet weather TMDLs is justified because the San Diego Region watersheds' exceedance frequencies will likely be close to the value calculated for Leo Carillo Beach, and is consistent with the exceedance frequency that was applied by the Los Angeles Regional Board.
Allowable Wet Exceedance Days = (Total Wet days in Critical Year) X (Allowable Exceedance Frequency)
Allowable Exceedance Load = Sum of exceedance loads from the allowable exceedance days with the highest exceedance loads calculated by the LSPC model using modeled flows and bacteria densities for all wet days during the critical year 1993

Total Allowable Load [i.e. TMDL] = (Allowable Numeric Objective Load) + (Allowable Exceedance Load)

[Insert table number]. Summary of Dry Weather Existing and Allowable Indicator Bacteria Loads

Watershed - Impaired Waterbody	Indicator Bacteria	Existing Bacteria Load (Billion MPN/mth)	30-Day Geometric Mean Objective (MPN/100mL)	Allowable Numeric Objective Load (Billion MPN/mth)	Total Dry Days in Critical Year	Allowable Exceedance Frequency	Allowable Dry Exceedance Days in Critical Year	Allowable Exceedance Load (Billion MPN/mth)	Total Allowable Load [=TMDL] (Billion MPN/mth)
San Joaquin Hills HSA (901.11)	Fecal Coliform	2,741	**200**	227				0	227
and Laguna Hills HSA (901.12)	Total Coliform	13,791	**1,000**	1,134	296	**0%**	0	0	1,134
- Pacific Ocean Shoreline	Enterococcus	2,321	**35**	40				0	40
Aliso HSA (901.13)	Fecal Coliform	5,470	**200**	242				0	242
- Pacific Ocean Shoreline - Aliso Creek	Total Coliform	26,639	**1,000**	1,208	296	**0%**	0	0	1,208
- Aliso Creek mouth	Enterococcus	4,614	**33***	40				0	40
Dana Point HSA (901.14)	Fecal Coliform	1,851	**200**	92				0	92
- Pacific Ocean Shoreline	Total Coliform	9,315	**1,000**	462	296	**0%**	0	0	462
	Enterococcus	1,567	**35**	16				0	16
Lower San Juan HSA (901.27)	Fecal Coliform	6,455	**200**	1,665				0	1,665
- Pacific Ocean Shoreline - San Juan Creek	Total Coliform	30,846	**1,000**	8,342	289	**0%**	0	0	8,342
- San Juan Creek mouth	Enterococcus	5,433	**33***	275				0	275
San Clemente HA (901.30)	Fecal Coliform	3,327	**200**	192				0	192
- Pacific Ocean Shoreline	Total Coliform	16,743	**1,000**	958	292	**0%**	0	0	958
	Enterococcus	2,817	**35**	33				0	33
San Luis Rey HU (903.00)	Fecal Coliform	1,737	**200**	1,058				0	1,058
- Pacific Ocean Shoreline	Total Coliform	8,549	**1,000**	5,289	275	**0%**	0	0	5,289
	Enterococcus	1,466	**35**	185				0	185
San Marcos HA (904.50)	Fecal Coliform	149	**200**	26				0	26
- Pacific Ocean Shoreline	Total Coliform	751	**1,000**	129	316	**0%**	0	0	129
	Enterococcus	126	**35**	5				0	5
San Dieguito HU (905.00)	Fecal Coliform	1,631	**200**	1,293				0	1,293
- Pacific Ocean Shoreline	Total Coliform	7,555	**1,000**	6,468	267	**0%**	0	0	6,468
	Enterococcus	1,368	**35**	226				0	226
Miramar Reservoir HA (906.10)	Fecal Coliform	205	**200**	7				0	7
- Pacific Ocean Shoreline	Total Coliform	1,030	**1,000**	36	271	**0%**	0	0	36
	Enterococcus	173	**35**	1				0	1

[Insert table number]. Summary of Dry Weather Existing and Allowable Indicator Bacteria Loads (Cont'd)

Watershed - Impaired Waterbody	Indicator Bacteria	Existing Bacteria Load (Billion MPN/mth)	30-Day Geometric Mean Objective (MPN/100mL)	Allowable Numeric Objective Load (Billion MPN/mth)	Total Dry Days in Critical Year	Allowable Exceedance Frequency	Allowable Dry Exceedance Days in Critical Year	Allowable Exceedance Load (Billion MPN/mth)	Total Allowable Load [=TMDL] (Billion MPN/mth)
Scripps HA (906.30)	Fecal Coliform	3,320	**200**	119				0	119
- Pacific Ocean Shoreline	Total Coliform	16,707	**1,000**	594	308	**0%**	0	0	594
	Enterococcus	2,811	**35**	21				0	21
Tecolote HA (906.50)	Fecal Coliform	4,329	**200**	234				0	234
- Tecolote Creek	Total Coliform	21,349	**1,000**	1,171	308	**0%**	0	0	1,171
	Enterococcus	3,657	**33***	39				0	39
Mission San Diego HSA (907.11)	Fecal Coliform	4,928	**200**	1,506				0	1,506
and Santee HSA (907.12)	Total Coliform	28,988	**1,000**	7,529	279	**0%**	0	0	7,529
- Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles) - Pacific Ocean Shoreline	Enterococcus	4,106	**33***	248				0	248
Chollas HSA (908.22)	Fecal Coliform	5,068	**200**	398				0	398
- Chollas Creek	Total Coliform	25,080	**1,000**	1,991	300	**0%**	0	0	1,991
	Enterococcus	4,283	**33***	66				0	66

* Total Allowable Load [=TMDL] calculated using a Enterococcus numeric target of 33 MPN/mL that is conservatively protective of the REC-1 "designated beach" usage frequency for watersheds with impaired freshwater creeks.

Existing Bacteria Load = Predicted existing bacteria load discharged from the watershed calculated by the plug-flow reactor model using estimated flows and bacteria densities for 30 dry days during the critical year 1993

30-Day Geometric Mean Objective = Target bacteria densities based on numeric 30-day geometric mean water quality objectives that are protective of REC-1 beneficial uses
Allowable Numeric Objective Load = Allowable load from the watershed calculated by the plug-flow reactor model using estimated flows and the numeric 30-day geometric mean water quality objective bacteria densities for 30 dry days during the critical year 1993

Total Dry Days in Critical Year = Number of dry days (i.e., day not including rainfall events of 0.2 inches or greater and the following 72 hours) in the critical year 1993 (i.e., wettest year between 1990 and 2002)
Allowable Exceedance Frequency = Assumed to be zero; data collected from reference systems generally do not show exceedances of REC-1 water quality objectives
Allowable Wet Exceedance Days = (Total Dry Days in Critical Year) X (Allowable Exceedance Frequency)
Allowable Exceedance Load = Sum of exceedance loads from the allowable exceedance days for all dry days during the critical year 1993

Total Allowable Load [i.e. TMDL] = (Allowable Numeric Objective Load) + (Allowable Exceedance Load) for a 30-day period

[Insert table number]. Wet Weather Fecal Coliform Bacteria Existing Loads, TMDLs, WLA, LAs Expressed as Annual Loads (Billion MPN/year)

Watershed	Total Watershed		Point Sources						Nonpoint Sources					
			Municipal MS4			Caltrans			Agriculture			Open		
	Existing Load	TMDL*	Existing Load	WLA*	Reduction Required	Existing Load	WLA*	Reduction Required	Existing Load	LA*	Reduction Required	Existing Load	LA*	Reduction Required
San Joaquin Hills/ Laguna Hills HSAs (901.11 and 901.12)	705,015	664,634	77,548	37,167	52.07%	179	179	0.00%	7,346	7,346	0.00%	619,942	619,942	0.00%
Aliso HSA (901.13)	1,752,096	1,579,073	650,092	477,069	26.62%	260	260	0.00%	26,508	26,508	0.00%	1,075,237	1,075,237	0.00%
Dana Point HSA (901.14)	403,911	377,313	179,043	152,446	14.86%	13	13	0.00%	0	0	0.00%	224,854	224,854	0.00%
Lower San Juan HSA (901.27)	15,304,790	14,714,833	1,326,469	1,156,419	12.82%	1,713	1,713	0.00%	3,275,477	2,855,570	12.82%	10,701,131	10,701,131	0.00%
San Clemente HA (901.30)	1,441,723	1,378,931	255,445	192,653	24.58%	335	335	0.00%	366	366	0.00%	1,185,577	1,185,577	0.00%
San Luis Rey HU (903.00)	33,120,012	32,444,242	943,501	914,026	3.12%	1,537	1,537	0.00%	20,687,954	20,041,659	3.12%	11,487,019	11,487,019	0.00%
San Marcos HA (904.50_	20,886	17,224	8,095	6,558	18.98%	8	8	0.00%	11,199	9,073	18.98%	1,585	1,585	0.00%
San Dieguito HU (905.00)	21,286,910	21,101,649	810,008	798,175	1.46%	1,310	1,310	0.00%	11,872,240	11,698,811	1.46%	8,603,352	8,603,352	0.00%
Miramar Reservoir HA (906.10)	10,392	10,256	6,839	6,703	1.99%	0	0	0.00%	0	0	0.00%	3,552	3,552	0.00%
Scripps HA (906.30)	204,057	176,907	128,403	101,253	21.14%	0	0	0.00%	0	0	0.00%	75,654	75,654	0.00%
Tecolote HA (906.5)	261,966	229,322	159,449	126,806	20.47%	553	553	0.00%	0	0	0.00%	101,963	101,963	0.00%
Mission San Diego/ Santee HSAs (907.11 and 907.12)	4,932,380 +1,302**	4,680,838 +1,302*	472,660	221,117	53.22%	1,009	1,009	0.00%	414,721	414,721	0.00%	4,043,991	4,043,991	0.00%
Chollas HSA (908.22)	603,863	520,440	335,901	252,479	24.84%	892	892	0.00%	0	0	0.00%	267,070	267,070	0.00%

* TMDLs, WLAs, and LAs calculated based on numeric targets consisting of the single sample maximum WQO for fecal coliform (400 MPN/100mL) and a 22 percent allowable exceedance frequency. Meeting the numeric targets in the discharge and/or receiving water indicate the TMDLs, WLAs, and/or LAs have been met.

** Permitted existing fecal coliform bacteria load from Padre Dam Municipal Water District Water Reclamation Plant (Padre Dam), assigned as a separate point source wasteload allocation for discharges from Padre Dam equal to the permitted existing load

Watershed Existing Load = Predicted existing fecal coliform bacteria loads discharged from all land use categories in the watershed calculated by the Loading Simulation Program in C++ (LSPC) model using modeled flows and bacteria densities for all wet days during the critical year 1993

Watershed TMDL = Total Maximum Daily Load (TMDL) or total allowable load (Allowable Numeric Objective Load + Allowable Exceedance Load) that can be discharged from all land uses in the watershed on an annual basis

MS4 Existing Load = Predicted exiting fecal coliform bacteria loads discharged from Municipal Separate Storm Sewer System (MS4) land use categories in the watershed (i.e., commercial/institutional, high density residential, low density residential, parks/recreation, military, transitional, and industrial/transportation, not including Caltrans transportation) calculated by the LSPC model

MS4 WLA = Point source wasteload allocation (WLA) for discharges from Municipal MS4 land uses

MS4 Reduction Required = Percent of the MS4 Existing Load that must be reduced to meet the MS4 WLA = (MS4 Existing Load – MS4 WLA)/(MS4 Existing Load)

Caltrans Existing Load = Predicted exiting fecal coliform bacteria loads discharged from Caltrans land use areas in the watershed calculated as a fraction of the discharge from industrial/transportation land use category area

Caltrans WLA = Point source wasteload allocation (WLA) for discharges from Caltrans land uses, assumed to be equal to Caltrans Existing Load

Caltrans Reduction Required = Percent of the Caltrans Existing Load that must be reduced to meet the Caltrans WLA = (Caltrans Existing Load – Caltrans WLA)/(Caltrans Existing Load)

Agriculture Existing Load = Predicted exiting fecal coliform bacteria loads discharged from Agriculture land use categories in the watershed (i.e., agriculture, dairy/livestock, horse ranch) calculated by the LSPC model

Agriculture LA = Non-point source load allocation (LA) for discharges from Agriculture land uses, assumed to be equal to Agriculture Existing Load in watersheds with existing bacteria load contributions for all three indicator bacteria of less than 5 percent; calculated as a relative load percent of the TMDL minus Caltrans WLA and Open Space LA, based on existing load contributions from MS4 and Agriculture land use categories in watersheds with existing bacteria load contributions for all three indicator bacteria of greater than 5 percent

Agriculture Reduction Required = Percent of the Agriculture Existing Load that must be reduced to meet the Agriculture LA = (Agriculture Existing Load – Agriculture LA)/(Agriculture Existing Load)

Open Existing Load = Predicted exiting fecal coliform bacteria loads discharged from Open Space land use categories in the watershed (i.e., open space, open recreation, water) calculated by the LSPC model

Open LA = Non-point source load allocation (LA) for discharges from Open Space land uses, assumed to be equal to the Open Space Existing Load

Open Reduction Required = Percent of the Open Space Existing Load that must be reduced to meet the Open Space LA = (Open Space Existing Load – Open Space LA)/(Open Space Existing Load)

[Insert table number]. Wet Weather Total Coliform Bacteria Existing Loads, TMDLs, WLA, LAs Expressed as Annual Loads (Billion MPN/year)

Watershed	Total Watershed		Point Sources						Nonpoint Sources					
			Municipal MS4			Caltrans			Agriculture			Open		
	Existing Load	TMDL*	Existing Load	WLA*	Reduction Required	Existing Load	WLA*	Reduction Required	Existing Load	LA*	Reduction Required	Existing Load	LA*	Reduction Required
San Joaquin Hills/ Laguna Hills HSAs (901.11 and 901.12)	8,221,901	7,445,649	1,656,904	880,652	46.85%	7,722	7,722	0.00%	50,774	50,774	0.00%	6,506,501	6,506,501	0.00%
Aliso HSA (901.13)	23,210,774	20,190,798	11,943,241	8,923,264	25.29%	11,003	11,003	0.00%	179,828	179,828	0.00%	11,076,702	11,076,702	0.00%
Dana Point HSA (901.14)	6,546,962	6,031,472	3,919,497	3,404,008	13.15%	634	634	0.00%	0	0	0.00%	2,626,830	2,626,830	0.00%
Lower San Juan HSA (901.27)	130,258,863	122,879,189	19,919,322	16,093,160	19.21%	60,480	60,480	0.00%	18,499,884	14,946,372	19.21%	91,779,178	91,779,178	0.00%
San Clemente HA (901.30)	16,236,606	15,147,603	4,566,742	3,477,739	23.85%	13,534	13,534	0.00%	2,370	2,370	0.00%	11,653,960	11,653,960	0.00%
San Luis Rey HU (903.00)	231,598,677	224,150,535	15,229,456	14,373,954	5.62%	54,508	54,508	0.00%	117,360,800	110,768,160	5.62%	98,953,913	98,953,913	0.00%
San Marcos HA (904.50_	515,278	425,083	366,021	298,430	18.47%	533	533	0.00%	122,414	99,809	18.47%	26,311	26,311	0.00%
San Dieguito HU (905.00)	163,541,133	159,814,184	17,406,569	16,660,538	4.29%	47,969	47,969	0.00%	69,551,416	66,570,499	4.29%	76,535,178	76,535,178	0.00%
Miramar Reservoir HA (906.10)	212,986	210,180	174,243	171,436	1.61%	9	9	0.00%	0	0	0.00%	38,734	38,734	0.00%
Scripps HA (906.30)	5,029,519	4,356,973	4,120,310	3,447,764	16.32%	0	0	0.00%	0	0	0.00%	909,209	909,209	0.00%
Tecolote HA (906.5)	7,395,789	6,379,770	6,152,484	5,136,598	16.51%	27,095	27,095	0.00%	0	0	0.00%	1,216,077	1,216,077	0.00%
Mission San Diego/ Santee HSAs (907.11 and 907.12)	72,757,569	66,105,222	17,442,867	10,790,520	38.14%	53,141	53,141	0.00%	3,495,960	3,495,960	0.00%	51,765,601	51,765,601	0.00%
Chollas HSA (908.22)	15,390,608	13,247,626	12,023,766	9,880,784	17.82%	45,652	45,652	0.00%	0	0	0.00%	3,321,191	3,321,191	0.00%

* TMDLs, WLAs, and LAs calculated based on numeric targets consisting of the single sample maximum WQO for total coliform (10,000 MPN/100mL) and a 22 percent allowable exceedance frequency. Meeting the numeric targets in the discharge and/or receiving water indicate the TMDLs, WLAs, and/or LAs have been met.

Watershed Existing Load = Predicted existing total coliform bacteria loads discharged from all land use categories in the watershed calculated by the Loading Simulation Program in C++ (LSPC) model using modeled flows and bacteria densities for all wet days during the critical year 1993
Watershed TMDL = Total Maximum Daily Load (TMDL) or total allowable load (Allowable Numeric Objective Load + Allowable Exceedance Load) that can be discharged from all land uses in the watershed on an annual basis

MS4 Existing Load = Predicted exiting total coliform bacteria loads discharged from Municipal Separate Storm Sewer System (MS4) land use categories in the watershed (i.e., commercial/institutional, high density residential, low density residential, parks/recreation, military, transitional, and industrial/transportation, not including Caltrans transportation) calculated by the LSPC model
MS4 WLA = Point source wasteload allocation (WLA) for discharges from Municipal MS4 land uses
MS4 Reduction Required = Percent of the MS4 Existing Load that must be reduced to meet the MS4 WLA = (MS4 Existing Load – MS4 WLA)/(MS4 Existing Load)

Caltrans Existing Load = Predicted exiting total coliform bacteria loads discharged from Caltrans land use areas in the watershed calculated as a fraction of the discharge from industrial/transportation land use category area
Caltrans WLA = Point source wasteload allocation (WLA) for discharges from Caltrans land uses, assumed to be equal to Caltrans Existing Load
Caltrans Reduction Required = Percent of the Caltrans Existing Load that must be reduced to meet the Caltrans WLA = (Caltrans Existing Load – Caltrans WLA)/(Caltrans Existing Load)

Agriculture Existing Load = Predicted exiting total coliform bacteria loads discharged from Agriculture land use categories in the watershed (i.e., agriculture, dairy/livestock, horse ranch) calculated by the LSPC model
Agriculture LA = Non-point source load allocation (LA) for discharges from Agriculture land uses, assumed to be equal to Agriculture Existing Load in watersheds with existing bacteria load contributions for all three indicator bacteria of less than 5 percent; calculated as a relative load percent of the TMDL minus Caltrans WLA and Open Space LA, based on existing load contributions from MS4 and Agriculture land use categories in watersheds with existing bacteria load contributions for all three indicator bacteria of greater than 5 percent
Agriculture Reduction Required = Percent of the Agriculture Existing Load that must be reduced to meet the Agriculture LA = (Agriculture Existing Load – Agriculture LA)/(Agriculture Existing Load)

Open Existing Load = Predicted exiting total coliform bacteria loads discharged from Open Space land use categories in the watershed (i.e., open space, open recreation, water) calculated by the LSPC model
Open LA = Non-point source load allocation (LA) for discharges from Open Space land uses, assumed to be equal to the Open Space Existing Load
Open Reduction Required = Percent of the Open Space Existing Load that must be reduced to meet the Open Space LA = (Open Space Existing Load – Open Space LA)/(Open Space Existing Load)

[Insert table number]. Wet Weather Enterococcus Bacteria Existing Loads, TMDLs, WLA, LAs Expressed as Annual Loads (Billion MPN/year)

Watershed	Total Watershed		Point Sources						Nonpoint Sources					
			Municipal MS4			Caltrans			Agriculture			Open		
	Existing Load	TMDL*	Existing Load	WLA*	Reduction Required	Existing Load	WLA*	Reduction Required	Existing Load	LA*	Reduction Required	Existing Load	LA*	Reduction Required
San Joaquin Hills/ Laguna Hills HSAs (901.11 and 901.12)	852,649	782,799	136,267	66,417	51.26%	365	365	0.00%	3,201	3,201	0.00%	712,816	712,816	0.00%
Aliso HSA (901.13)	2,230,206	1,950,964**	1,014,732	735,490	27.52%	516	516	0.00%	11,245	11,245	0.00%	1,203,713	1,203,713	0.00%
Dana Point HSA (901.14)	501,526	462,306	258,747	219,528	15.16%	25	25	0.00%	0	0	0.00%	242,753	242,753	0.00%
Lower San Juan HSA (901.27)	12,980,098	12,152,446**	1,900,520	1,385,094	27.12%	2,823	2,823	0.00%	1,151,266	839,040	27.12%	9,925,490	9,925,490	0.00%
San Clemente HA (901.30)	1,663,100	1,563,187	395,581	295,668	25.26%	635	635	0.00%	148	148	0.00%	1,266,736	1,266,736	0.00%
San Luis Rey HU (903.00)	18,439,920	17,463,618	1,472,296	1,300,235	11.69%	2,397	2,397	0.00%	6,881,755	6,077,514	11.69%	10,083,473	10,083,473	0.00%
San Marcos HA (904.50_	40,558	32,966	29,784	23,771	20.19%	26	26	0.00%	7,825	6,246	20.19%	2,923	2,923	0.00%
San Dieguito HU (905.00)	14,796,210	14,307,087	1,911,170	1,763,603	7.72%	2,288	2,288	0.00%	4,423,566	4,082,010	7.72%	8,459,187	8,459,187	0.00%
Miramar Reservoir HA (906.10)	11,564	11,405	8,269	8,109	1.93%	0	0	0.00%	0	0	0.00%	3,295	3,295	0.00%
Scripps HA (906.30)	377,839	324,032	285,842	232,035	18.82%	0	0	0.00%	0	0	0.00%	91,997	91,997	0.00%
Tecolote HA (906.5)	708,256	603,761**	575,708	471,211	18.15%	1,266	1,266	0.00%	0	0	0.00%	131,284	131,284	0.00%
Mission San Diego/ Santee HSAs (907.11 and 907.12)	7,255,759	6,590,966*	1,555,411	890,617	42.74%	2,430	2,430	0.00%	213,149	213,149	0.00%	5,484,770	5,484,770	0.00%
Chollas HSA (908.22)	1,371,972	1,152,645**	1,022,245	802,918	21.46%	2,062	2,062	0.00%	0	0	0.00%	347,665	347,665	0.00%

* TMDLs, WLAs, and LAs calculated based on numeric targets consisting of the single sample maximum WQO for enterococcus (104 MPN/100mL or 61 MPN/100mL) and a 22 percent allowable exceedance frequency. Meeting the numeric targets in the discharge and/or receiving water indicate the TMDLs, WLAs, and/or LAs have been met.

** Total Maximum Daily Load calculated using a Enterococcus numeric target of 61 MPN/mL that is conservatively protective of the REC-1 "designated beach" usage frequency for freshwater creeks and downstream beaches. If the usage frequency of the ffreshwater creeks can be established as "moderately to lightly used," alternative Total Maximum Daily Loads calculated using an Enterococcus numeric target of 104 MPN/ml presented in Table 9-5 may be used.

Watershed Existing Load = Predicted existing Enterococcus bacteria loads discharged from all land use categories in the watershed calculated by the Loading Simulation Program in C++ (LSPC) model using modeled flows and bacteria densities for all wet days during the critical year 1993

Watershed TMDL = Total Maximum Daily Load (TMDL) or total allowable load (Allowable Numeric Objective Load + Allowable Exceedance Load) that can be discharged from all lan uses in the watershed on an annual basis

MS4 Existing Load = Predicted exiting Enterococcus bacteria loads discharged from Municipal Separate Storm Sewer System (MS4) land use categories in the watershed (i.e., commercial/institutional, high density residential, low density residential, parks/recreation, military, transitional, and industrial/transportation, not including Caltrans transportation) calculated by the LSPC model

MS4 WLA = Point source wasteload allocation (WLA) for discharges from Municipal MS4 land uses

MS4 Reduction Required = Percent of the MS4 Existing Load that must be reduced to meet the MS4 WLA = (MS4 Existing Load – MS4 WLA)/(MS4 Existing Load)

Caltrans Existing Load = Predicted exiting Enterococcus bacteria loads discharged from Caltrans land use areas in the watershed calculated as a fraction of the discharge from industrial/transportation land use category area

Caltrans WLA = Point source wasteload allocation (WLA) for discharges from Caltrans land uses, assumed to be equal to Caltrans Existing Load

Caltrans Reduction Required = Percent of the Caltrans Existing Load that must be reduced to meet the Caltrans WLA = (Caltrans Existing Load – Caltrans WLA)/(Caltrans Existing Load)

Agriculture Existing Load = Predicted exiting Enterococcus bacteria loads discharged from Agriculture land use categories in the watershed (i.e., agriculture, dairy/livestock, horse ranch) calculated by the LSPC model

Agriculture LA = Non-point source load allocation (LA) for discharges from Agriculture land uses, assumed to be equal to Agriculture Existing Load in watersheds with existing bacteria load contributions for all three indicator bacteria of less than 5 percent; calculated as a relative load percent of the TMDL minus Caltrans WLA and Open Space LA, based on existing load contributions from MS4 and Agriculture land use categories in watersheds with existing bacteria load contributions for all three indicator bacteria of greater than 5 percent

Agriculture Reduction Required = Percent of the Agriculture Existing Load that must be reduced to meet the Agriculture LA = (Agriculture Existing Load – Agriculture LA)/(Agriculture Existing Load)

Open Existing Load = Predicted exiting Enterococcus bacteria loads discharged from Open Space land use categories in the watershed (i.e., open space, open recreation, water) calculated by the LSPC model

Open LA = Non-point source load allocation (LA) for discharges from Open Space land uses, assumed to be equal to the Open Space Existing Load

Open Reduction Required = Percent of the Open Space Existing Load that must be reduced to meet the Open Space LA = (Open Space Existing Load – Open Space LA)/(Open Space Existing Load))

[Insert table number]. Alternative Wet Weather Enterococcus Bacteria Existing Loads, TMDLs, WLA, LAs Expressed as Annual Loads (Billion MPN/year)

Watershed	Total Watershed		Point Sources						Nonpoint Sources					
			Municipal MS4			Caltrans			Agriculture			Open		
	Existing Load	TMDL*	Existing Load	WLA*	Reduction Required	Existing Load	WLA*	Reduction Required	Existing Load	LA*	Reduction Required	Existing Load	LA*	Reduction Required
Aliso HSA (901.13)	2,230,206	1,952,517**	1,014,732	737,042	27.37%	516	516	0.00%	11,245	11,245	0.00%	1,203,713	1,203,713	0.00%
Lower San Juan HSA (901.27)	12,980,098	12,159,138**	1,900,520	1,389,261	26.90%	2,823	2,823	0.00%	1,151,266	841,564	26.90%	9,925,490	9,925,490	0.00%
Tecolote HA (906.50)	708,256	604,180**	575,708	471,630	18.08%	1,266	1,266	0.00%	0	0	0.00%	131,284	131,284	0.00%
Mission San Diego/ Santee HSAs (907.11 and 907.12)	7,255,759	6,595,208**	1,555,411	894,859	42.47%	2,430	2,430	0.00%	213,149	213,149	0.00%	5,484,770	5,484,770	0.00%
Chollas HSA (908.22)	1,371,972	1,153,599**	1,022,245	803,871	21.36%	2,062	2,062	0.00%	0	0	0.00%	347,665	347,665	0.00%

* TMDLs, WLAs, and LAs calculated based on numeric targets consisting of the single sample maximum WQO for enterococcus (104 MPN/100mL) and a 22 percent allowable exceedance frequency. Meeting the numeric targets in the discharge and/or receiving water indicate the TMDLs, WLAs, and/or LAs have been met.

** Total Maximum Daily Load calculated using a Enterococcus numeric target of 104 MPN/ml protective of the REC-1 "moderately to lightly used area" usage frequency that is protective freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative wet weather TMDLs, WLAs, and LAs can be implemented in these watersheds.

Watershed Existing Load Predicted existing Enterococcus bacteria loads discharged from all land use categories in the watershed calculated by the Loading Simulation Program in C++ (LSPC) model using modeled flows and bacteria densities for all wet days during the critical year 1993
Watershed TMDL = Total Maximum Daily Load (TMDL) or total allowable load (Allowable Numeric Objective Load + Allowable Exceedance Load) that can be discharged from all land uses in the watershed on an annual basis

MS4 Existing Load = Predicted exiting Enterococcus bacteria loads discharged from Municipal Separate Storm Sewer System (MS4) land use categories in the watershed (i.e., commercial/institutional, high density residential, low density residential, parks/recreation, military, transitional, and industrial/transportation, not including Caltrans transportation) calculated by the LSPC model
MS4 WLA = Point source wasteload allocation (WLA) for discharges from Municipal MS4 land uses
MS4 Reduction Required = Percent of the MS4 Existing Load that must be reduced to meet the MS4 WLA = (MS4 Existing Load – MS4 WLA)/(MS4 Existing Load)

Caltrans Existing Load = = Predicted exiting Enterococcus bacteria loads discharged from Caltrans land use areas in the watershed calculated as a fraction of the discharge from industrial/transportation land use category area
Caltrans WLA = Point source wasteload allocation (WLA) for discharges from Caltrans land uses, assumed to be equal to Caltrans Existing Load
Caltrans Reduction Required = Percent of the Caltrans Existing Load that must be reduced to meet the Caltrans WLA = (Caltrans Existing Load – Caltrans WLA)/(Caltrans Existing Load)

Agriculture Existing Load = Predicted exiting Enterococcus bacteria loads discharged from Agriculture land use categories in the watershed (i.e., agriculture, dairy/livestock, horse ranch) calculated by the LSPC model
Agriculture LA = Non-point source load allocation (LA) for discharges from Agriculture land uses, assumed to be equal to Agriculture Existing Load in watersheds with existing bacteria load contributions for all three indicator bacteria of less than 5 percent; calculated as a relative load percent of the TMDL minus Caltrans WLA and Open Space LA, based on existing load contributions from MS4 and Agriculture land use categories in watersheds with existing bacteria load contributions for all three indicator bacteria of greater than 5 percent
Agriculture Reduction Required = Percent of the Agriculture Existing Load that must be reduced to meet the Agriculture LA = (Agriculture Existing Load – Agriculture LA)/(Agriculture Existing Load)

Open Existing Load = Predicted exiting Enterococcus bacteria loads discharged from Open Space land use categories in the watershed (i.e., open space, open recreation, water) calculated by the LSPC model
Open LA = Non-point source load allocation (LA) for discharges from Open Space land uses, assumed to be equal to the Open Space Existing Load
Open Reduction Required = Percent of the Open Space Existing Load that must be reduced to meet the Open Space LA = (Open Space Existing Load – Open Space LA)/(Open Space Existing Load)

[Insert table number]. Dry Weather Fecal Coliform Bacteria Existing Loads, TMDLs, WLA, LAs Expressed as Monthly Loads (Billion MPN/month)

Watershed	Total Watershed		Point Sources						Nonpoint Sources					
			Municipal MS4			Caltrans			Agriculture			Open		
	Existing Load	TMDL*	Existing Load	WLA*	Reduction Required	Existing Load	WLA*	Reduction Required	Existing Load	LA*	Reduction Required	Existing Load	LA*	Reduction Required
San Joaquin Hills/ Laguna Hills HSAs (901.11 and 901.12)	2,741	227	2,741	227	91.72%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Aliso HSA (901.13)	5,470	242	5,470	242	95.58%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Dana Point HSA (901.14)	1,851	92	1,851	92	95.03%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Lower San Juan HSA (901.27)	6,455	1,665	6,455	1,665	74.21%	0	0	0.00%	0	0	0.00%	0	0	0.00%
San Clemente HA (901.30)	3,327	192	3,327	192	94.23%	0	0	0.00%	0	0	0.00%	0	0	0.00%
San Luis Rey HU (903.00)	1,737	1,058	1,737	1,058	39.09%	0	0	0.00%	0	0	0.00%	0	0	0.00%
San Marcos HA (904.50_	149	26	149	26	82.55%	0	0	0.00%	0	0	0.00%	0	0	0.00%
San Dieguito HU (905.00)	1,631	1,293	1,631	1,293	20.72%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Miramar Reservoir HA (906.10)	205	7	205	7	96.59%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Scripps HA (906.30)	3,320	119	3,320	119	96.42%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Tecolote HA (906.5)	4,329	234	4,329	234	94.59%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Mission San Diego/ Santee HSAs (907.11 and 907.12)	4,928 +461**	1,506 +461*	4,928	1,506	69.44%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Chollas HSA (908.22)	5,068	398	5,068	398	92.15%	0	0	0.00%	0	0	0.00%	0	0	0.00%

* TMDLs, WLAs, and LAs calculated based on numeric targets consisting of the 30-day geometric mean WQO for fecal coliform (200 MPN/100mL) and a 0 percent allowable exceedance frequency. Meeting the numeric targets in the discharge and/or receiving water indicate the TMDLs, WLAs, and/or LAs have been met.

** Permitted existing fecal coliform bacteria load from Padre Dam Municipal Water District Water Reclamation Plant (Padre Dam), assigned as a separate point source wasteload allocation for discharges from Padre Dam equal to the permitted existing load

Watershed Existing Load = Predicted existing fecal coliform bacteria loads discharged from all land use categories in the watershed calculated by a plug-flow reactor model using estimated flows and bacteria densities for 30 dry days during the critical year 1993
Watershed TMDL = Total Maximum Daily Load (TMDL) or total allowable load (Allowable Numeric Objective Load + Allowable Exceedance Load) that can be discharged from all land uses in the watershed for a 30-day period

MS4 Existing Load = Predicted exiting fecal coliform bacteria loads discharged from Municipal Separate Storm Sewer System (MS4) land use categories in the watershed (i.e., commercial/institutional, high density residential, low density residential, parks/recreation, military, transitional, and industrial/transportation, not including Caltrans transportation) calculated by the plug-flow reactor model
MS4 WLA = Point source wasteload allocation (WLA) for discharges from Municipal MS4 land uses
MS4 Reduction Required = Percent of the MS4 Existing Load that must be reduced to meet the MS4 WLA = (MS4 Existing Load – MS4 WLA)/(MS4 Existing Load)

Caltrans Existing Load = Fecal coliform bacteria loads discharged from Caltrans land use areas in the watershed assumed to be unlikely during dry weather conditions, or zero bacteria load during dry weather
Caltrans WLA = Point source wasteload allocation (WLA) for discharges from Caltrans land uses, assumed to be equal to the Caltrans Existing Load
Caltrans Reduction Required = Percent of the Caltrans Existing Load that must be reduced to meet the Caltrans WLA = (Caltrans Existing Load – Caltrans WLA)/(Caltrans Existing Load)

Agriculture Existing Load = Fecal coliform bacteria loads discharged from Agriculture land use categories in the watershed (i.e., agriculture, dairy/livestock, horse ranch) assumed to be unlikely during dry weather conditions, or zero bacteria load during dry weather
Agriculture LA = Non-point source load allocation (LA) for discharges from Agriculture land uses, assumed to be equal to the Open Space Existing Load
Agriculture Reduction Required = Percent of the Agriculture Existing Load that must be reduced to meet the Agriculture LA = (Agriculture Existing Load – Agriculture LA)/(Agriculture Existing Load)

Open Existing Load = Fecal coliform bacteria loads discharged from Open Space land use categories in the watershed (i.e., open space, open recreation, water) assumed to be unlikely during dry weather conditions, or zero bacteria load during dry weather
Open LA = Non-point source load allocation (LA) for discharges from Open Space land uses, assumed to be equal to the Open Space Existing Load
Open Reduction Required = Percent of the Open Space Existing Load that must be reduced to meet the Open Space LA = (Open Space Existing Load – Open Space LA)/(Open Space Existing Load)

[Insert table number]. Dry Weather Total Coliform Bacteria Existing Loads, TMDLs, WLA, LAs Expressed as Monthly Loads (Billion MPN/month)

Watershed	Total Watershed		Point Sources						Nonpoint Sources					
			Municipal MS4			Caltrans			Agriculture			Open		
	Existing Load	TMDL*	Existing Load	WLA*	Reduction Required	Existing Load	WLA*	Reduction Required	Existing Load	LA*	Reduction Required	Existing Load	LA*	Reduction Required
San Joaquin Hills/ Laguna Hills HSAs (901.11 and 901.12)	13,791	1,134	13,791	1,134	91.78%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Aliso HSA (901.13)	26,639	1,208	26,639	1,208	95.47%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Dana Point HSA (901.14)	9,315	462	9,315	462	95.04%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Lower San Juan HSA (901.27)	30,846	8,342	30,846	8,342	72.96%	0	0	0.00%	0	0	0.00%	0	0	0.00%
San Clemente HA (901.30)	16,743	958	16,743	958	94.28%	0	0	0.00%	0	0	0.00%	0	0	0.00%
San Luis Rey HU (903.00)	8,549	5,289	8,549	5,289	38.13%	0	0	0.00%	0	0	0.00%	0	0	0.00%
San Marcos HA (904.50_	751	129	751	129	82.82%	0	0	0.00%	0	0	0.00%	0	0	0.00%
San Dieguito HU (905.00)	7,555	6,468	7,555	6,468	14.39%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Miramar Reservoir HA (906.10)	1,030	36	1,030	36	96.50%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Scripps HA (906.30)	16,707	594	16,707	594	96.44%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Tecolote HA (906.5)	21,349	1,171	21,349	1,171	94.51%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Mission San Diego/ Santee HSAs (907.11 and 907.12)	28,988	7,529	28,988	7,529	74.03%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Chollas HSA (908.22)	25,080	1,991	25,080	1,991	92.06%	0	0	0.00%	0	0	0.00%	0	0	0.00%

* TMDLs, WLAs, and LAs calculated based on numeric targets consisting of the 30-day geometric mean WQO for total coliform (1,000 MPN/100mL) and a 0 percent allowable exceedance frequency. Meeting the numeric targets in the discharge and/or receiving water indicate the TMDLs, WLAs, and/or LAs have been met.

Watershed Existing Load = Predicted existing total coliform bacteria loads discharged from all land use categories in the watershed calculated by a plug-flow reactor model using estimated flows and bacteria densities for 30 dry days during the critical year 1993
Watershed TMDL = Total Maximum Daily Load (TMDL) or total allowable load (Allowable Numeric Objective Load + Allowable Exceedance Load) that can be discharged from all land uses in the watershed for a 30-day period

MS4 Existing Load = Predicted exiting total coliform bacteria loads discharged from Municipal Separate Storm Sewer System (MS4) land use categories in the watershed (i.e., commercial/institutional, high density residential, low density residential, parks/recreation, military, transitional, and industrial/transportation, not including Caltrans transportation) calculated by the plug-flow reactor model
MS4 WLA = Point source wasteload allocation (WLA) for discharges from Municipal MS4 land uses
MS4 Reduction Required = Percent of the MS4 Existing Load that must be reduced to meet the MS4 WLA = (MS4 Existing Load – MS4 WLA)/(MS4 Existing Load)

Caltrans Existing Load = Total coliform bacteria loads discharged from Caltrans land use areas in the watershed assumed to be unlikely during dry weather conditions, or zero bacteria load during dry weather
Caltrans WLA = Point source wasteload allocation (WLA) for discharges from Caltrans land uses, assumed to be equal to the Caltrans Existing Load
Caltrans Reduction Required = Percent of the Caltrans Existing Load that must be reduced to meet the Caltrans WLA = (Caltrans Existing Load – Caltrans WLA)/(Caltrans Existing Load)

Agriculture Existing Load = Total coliform bacteria loads discharged from Agriculture land use categories in the watershed (i.e., agriculture, dairy/livestock, horse ranch) assumed to be unlikely during dry weather conditions, or zero bacteria load during dry weather
Agriculture LA = Non-point source load allocation (LA) for discharges from Agriculture land uses, assumed to be equal to the Open Space Existing Load
Agriculture Reduction Required = Percent of the Agriculture Existing Load that must be reduced to meet the Agriculture LA = (Agriculture Existing Load – Agriculture LA)/(Agriculture Existing Load)

Open Existing Load = Total coliform bacteria loads discharged from Open Space land use categories in the watershed (i.e., open space, open recreation, water) assumed to be unlikely during dry weather conditions, or zero bacteria load during dry weather
Open LA = Non-point source load allocation (LA) for discharges from Open Space land uses, assumed to be equal to the Open Space Existing Load
Open Reduction Required = Percent of the Open Space Existing Load that must be reduced to meet the Open Space LA = (Open Space Existing Load – Open Space LA)/(Open Space Existing Load)

[Insert table number]. Dry Weather Enterococcus Bacteria Existing Loads, TMDLs, WLA, LAs Expressed as Monthly Loads (Billion MPN/month)

Watershed	Total Watershed		Point Sources						Nonpoint Sources					
			Municipal MS4			Caltrans			Agriculture			Open		
	Existing Load	TMDL*	Existing Load	WLA*	Reduction Required	Existing Load	WLA*	Reduction Required	Existing Load	LA*	Reduction Required	Existing Load	LA*	Reduction Required
San Joaquin Hills/ Laguna Hills HSAs (901.11 and 901.12)	2,321	40	2,321	40	98.28%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Aliso HSA (901.13)	4,614	40**	4,614	40	99.13%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Dana Point HSA (901.14)	1,567	16	1,567	16	98.98%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Lower San Juan HSA (901.27)	5,433	275**	5,433	275	94.94%	0	0	0.00%	0	0	0.00%	0	0	0.00%
San Clemente HA (901.30)	2,817	33	2,817	33	98.83%	0	0	0.00%	0	0	0.00%	0	0	0.00%
San Luis Rey HU (903.00)	1,466	185	1,466	185	87.38%	0	0	0.00%	0	0	0.00%	0	0	0.00%
San Marcos HA (904.50_	126	5	126	5	96.03%	0	0	0.00%	0	0	0.00%	0	0	0.00%
San Dieguito HU (905.00)	1,368	226	1,368	226	83.48%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Miramar Reservoir HA (906.10)	173	1	173	1	99.42%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Scripps HA (906.30)	2,811	21	2,811	21	99.25%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Tecolote HA (906.5)	3,657	39**	3,657	39	98.94%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Mission San Diego/ Santee HSAs (907.11 and 907.12)	4,106	248**	4,106	248	93.96%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Chollas HSA (908.22)	4,283	66**	4,283	66	98.46%	0	0	0.00%	0	0	0.00%	0	0	0.00%

* TMDLs, WLAs, and LAs calculated based on numeric targets consisting of the 30-day geometric mean WQO for enterococcus (35 MPN/100mL or 33 MPN/100mL) and a 0 percent allowable exceedance frequency. Meeting the numeric targets in the discharge and/or receiving water indicate the TMDLs, WLAs, and/or LAs have been met.

** Total Maximum Daily Load calculated using a Enterococcus numeric target of 33 MPN/mL that is conservatively protective of the REC-1 "designated beach" usage frequency for freshwater creeks and downstream beaches.

Watershed Existing Load = Predicted existing Enterococcus bacteria loads discharged from all land use categories in the watershed calculated by a plug-flow reactor model using estimated flows and bacteria densities for 30 dry days during the critical year 1993
Watershed TMDL = Total Maximum Daily Load (TMDL) or total allowable load (Allowable Numeric Objective Load + Allowable Exceedance Load) that can be discharged from all land uses in the watershed for a 30-day period

MS4 Existing Load = Predicted exiting Enterococcus bacteria loads discharged from Municipal Separate Storm Sewer System (MS4) land use categories in the watershed (i.e., commercial/institutional, high density residential, low density residential, parks/recreation, military, transitional, and industrial/transportation, not including Caltrans transportation) calculated by the plug-flow reactor model
MS4 WLA = Point source wasteload allocation (WLA) for discharges from MS4 land uses
MS4 Reduction Required = Percent of the MS4 Existing Load that must be reduced to meet the MS4 WLA = (MS4 Existing Load – MS4 WLA)/(MS4 Existing Load)

Caltrans Existing Load = Enterococcus bacteria loads discharged from Caltrans land use areas in the watershed assumed to be unlikely during dry weather conditions, or zero bacteria load during dry weather
Caltrans WLA = Point source wasteload allocation (WLA) for discharges from Caltrans land uses, assumed to be equal to the Caltrans Existing Load
Caltrans Reduction Required = Percent of the Caltrans Existing Load that must be reduced to meet the Caltrans WLA = (Caltrans Existing Load – Caltrans WLA)/(Caltrans Existing Load)

Agriculture Existing Load = Enterococcus bacteria loads discharged from Agriculture land use categories in the watershed (i.e., agriculture, dairy/livestock, horse ranch) assumed to be unlikely during dry weather conditions, or zero bacteria load during dry weather
Agriculture LA = Non-point source load allocation (LA) for discharges from Agriculture land uses, assumed to be equal to the Open Space Existing Load
Agriculture Reduction Required = Percent of the Agriculture Existing Load that must be reduced to meet the Agriculture LA = (Agriculture Existing Load – Agriculture LA)/(Agriculture Existing Load)

Open Existing Load = Enterococcus bacteria loads discharged from Open Space land use categories in the watershed (i.e., open space, open recreation, water) assumed to be unlikely during dry weather conditions, or zero bacteria load during dry weather
Open LA = Non-point source load allocation (LA) for discharges from Open Space land uses, assumed to be equal to the Open Space Existing Load
Open Reduction Required = Percent of the Open Space Existing Load that must be reduced to meet the Open Space LA = (Open Space Existing Load – Open Space LA)/(Open Space Existing Load)

(h) TMDL Implementation Plan

The ultimate goal of the Implementation Plan is to restore the impaired beneficial uses of the waterbodies addressed by these TMDLs. Restoring the impaired beneficial uses will be accomplished by achieving the TMDLs in the receiving waters, and the wasteload allocations (WLAs) for point sources and load allocations (LAs) for nonpoint sources. The actions taken by the San Diego Water Board depends on the regulatory authority and the source. The regulatory authorities and actions that the San Diego Water Board will use to compel the controllable sources to implement these TMDLs are as follows.

(1) Basin Plan Waste Discharge Prohibitions

The San Diego Water Board may specify certain conditions or areas where the discharge of waste or certain types of waste is not permitted, known as "waste discharge prohibitions," in the Basin Plan.[48] Basin Plan waste discharge prohibitions that are applicable to the implementation of these TMDLs include the following:

- The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in Water Code section 13050, is prohibited.

- The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the Regional Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

- The dumping, deposition, or discharge of waste directly into waters of the state, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the Regional Board.

- Any discharge to a storm water conveyance system that is not composed entirely of "storm water" is prohibited unless authorized by the Regional Board. [The federal regulations, 40 CFR 122.26(b)(13), define storm water as storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from fire fighting activities.] [Section 122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

- The unauthorized discharge of treated or untreated sewage to waters of the state or to a storm water conveyance system is prohibited.

Existing discharges are violating one or more of these of these Basin Plan prohibitions. The existing Basin Plan prohibitions are consistent with the TMDLs, WLAs, and LAs. If

[48] Authorized pursuant to Water Code section 13243

necessary, the San Diego Water Board may amend the Basin Plan to revise current waste discharge prohibitions or include new waste discharge prohibitions. The controllable sources must comply with the Basin Plan waste discharge prohibitions.

(2) Waste Discharge Requirements

The primary regulatory authority used by the San Diego Water Board to protect water resources and water quality in the San Diego Region is the issuance of waste discharge requirements (WDRs).[49] The San Diego Water Board will issue, or revise and re-issue WDRs to point sources and/or nonpoint sources in the San Diego Region to be consistent with the TMDLs, WLAs, and LAs. The controllable sources regulated under WDRs must comply with the requirements to be consistent with the TMDLs, WLAs, and LAs. Specific San Diego Water Board actions with regard to WDRs for point sources and nonpoint sources are discussed in the following subsections.

(A) Point Sources

The San Diego Water Board regulates discharges from point sources to surface waters with WDRs that implement federal NPDES regulations (NPDES requirements). NPDES requirements must contain water quality-based effluent limitations (WQBELs) consistent with the assumptions and requirements of the WLAs of any applicable TMDL.[50]

When developing WQBELs to be incorporated in to NPDES requirements, the following summarizes the requirements and assumptions included in the calculation of the TMDLs, WLAs, and LAs that should be considered:

<u>Numeric Targets</u>

- The numeric targets consist of the numeric WQOs from the Basin Plan and/or Ocean Plan and an allowable exceedance frequency.
- The numeric targets for the wet weather TMDLs consist of the REC-1 single sample maximum WQOs and a 22 percent allowable exceedance frequency.
- The numeric targets for dry weather TMDLs consist of the REC-1 30-day geometric metric mean WQOs and a 0 percent allowable exceedance frequency.
- The TMDL calculations are based on either the single sample maximum WQO (for wet weather) or 30-day geometric mean WQOs (for dry weather), but both the single sample maximum and 30-day geometric mean numeric WQOs and allowable exceedance frequencies must be met in the receiving waters.
- The TMDLs, and in turn the WLAs for point sources and LAs for nonpoint sources, are assumed to be met when the numeric targets for all three indicator bacteria (fecal coliform, total coliform, and *Enterococcus*) are met in the receiving waters.

<u>Critical Conditions</u>

- The mass-load based TMDLs were calculated under critical conditions consisting of flows generated during a critical wet year and estimation of existing and allowable loads at a critical location.

[49] Authorized pursuant to Water Code sections 13263 and 13264
[50] Code of Federal Regulations Title 40 section 122.44(d)(1)(vii)(B)

- The flow from the critical wet year is a "worst case" annual wet weather flow and loading scenario. Actual annual wet weather flow and loading will vary from year to year.
- The mass-load based TMDLs calculated at the critical location are dependent on the flow, which can vary from year to year, but the numeric targets will not vary. When the numeric targets are met in the receiving water, the TMDLs are assumed to be met.
- The mass-load based TMDLs, WLAs, and LAs are calculated for the critical location, but the appropriate numeric targets (based on freshwater and/or saltwater REC-1 WQOs and allowable exceedance frequencies) must be met throughout the waterbodies addressed by these TMDLs.

Linkage Analysis

- The linkage analysis was performed by utilizing calibrated and validated models to predict flow from surface runoff and predict bacteria densities under the critical conditions (i.e., during the critical wet year at the critical location). Existing mass loads and allowable mass loads (i.e., TMDLs) were calculated for each watershed. The existing mass loads were calculated based on model-predicted flow and model-predicted bacteria densities. The allowable mass loads (i.e., TMDLs) were calculated based on model-predicted flow and the numeric targets (i.e., numeric WQOs and allowable exceedance frequencies).
- The wet weather existing mass loads and allowable mass loads (i.e., wet weather mass-load based TMDLs) are calculated assuming surface runoff is generated by rainfall from storm events and discharged from all land use categories to receiving waters.
- The dry weather existing mass loads and allowable mass loads (i.e., dry weather mass-load based TMDLs) are calculated assuming surface runoff is generated only by anthropogenic activities and discharged from specific land use categories to receiving waters. The possible contribution of subsurface or groundwater flows to bacteria loads in receiving waters during dry weather was not accounted for in any land use category.

Allocations

- Each mass-load based TMDL is allocated to known point sources and nonpoint sources. Wasteload allocations (WLAs) are assigned to point sources, and load allocations (LAs) are assigned to nonpoint sources. WLAs and LAs are the maximum load a source can discharge and still achieve the TMDL in the receiving water.
- The TMDLs, and in turn the WLAs for point sources and LAs for nonpoint sources, are assumed to be met when the numeric targets are met in the receiving waters.
- The sources were identified based on land use and grouped in to Municipal MS4, Caltrans MS4 (Caltrans), Agriculture, and Open Space categories. The Municipal MS4 and Caltrans land use categories are point sources, and the Agriculture and Open Space land use categories are nonpoint sources.
- Sources that are not identified are assumed to be assigned a zero allowable load as part of the mass-load based TMDL (i.e., WLA = 0 or LA = 0). In other words,

discharges of pollutant loads from these sources are not expected or allowed as part of the TMDLs.

- Sources that are assigned an allowable load equal to the existing mass load as part of the mass-load based TMDL (i.e., WLA or LA = existing mass load) are not expected or allowed to increase their mass load in the future. In other words, discharges of pollutant loads (i.e., flows and bacteria densities) from these sources are not allowed to increase.
- The allocation of the dry weather mass-load based TMDLs assumes that no surface runoff discharge to receiving waters occurs from Caltrans, Agriculture, or Open Space land use categories (i.e., $WLA_{Caltrans} = 0$, $LA_{Agriculture} = 0$, and $LA_{OpenSpace} = 0$), meaning the entire dry weather mass-load based TMDL (i.e., allowable mass load) is allocated to Municipal MS4 land use categories (i.e., WLA_{MS4} = TMDL) (see Tables [Insert seventh through ninth table numbers]).
- The allocation of the wet weather mass-load based TMDLs assumes surface runoff discharge occurs from all land use categories, and allocated according to the following steps (see Tables [Insert third through sixth table numbers]):
  1) Sources are separated in to controllable and uncontrollable sources. Discharges from Municipal MS4, Caltrans, and Agriculture land use categories are assumed to be controllable (i.e., subject to regulation), and discharges from Open Space land use categories are assumed to be uncontrollable (i.e., not subject to regulation).
  2) Because discharges from Open Space land use categories are uncontrollable (i.e., not subject to regulation), the LAs for Open Space land use categories are set equal to the existing mass loads calculated under the critical conditions.
  3) For discharges from controllable land use categories that do not contribute more than 5 percent of the total existing mass load for all three indicator bacteria, the WLA or LA is set equal to the existing mass loads from those land uses calculated under the critical conditions.
  4) After the WLAs and LAs are assigned based on steps 2 and 3, the remaining portion of the mass-load based TMDL is assigned to discharges from controllable land use categories that contribute more than 5 percent of the total existing mass load for all three indicator bacteria. The allowable mass load for each source (WLA or LA) is calculated based on the ratio of the existing mass loads from those sources relative to each other.

<u>Load Reductions</u>

- The load reductions required to meet the mass-load based TMDLs, WLAs, and LAs are based on reducing the loads compared to pollutant loads from 2001 to 2002.
- Load reductions for each source are calculated based on the difference between the existing mass load and the mass-load based WLA or LA for each source (see Tables [Insert third through ninth table numbers]).
- WLAs and LAs that are set equal to the existing mass loads do not require load reductions to be calculated, but this also means that existing mass loads from those sources cannot increase over time (i.e., pollutant loads should be less than or equal to pollutant loads relative to 2001 to 2002).

- The load reductions needed to meet the WLAs for point sources and LAs for nonpoint sources are assumed to be achieved when the numeric targets are met in the receiving waters.

The persons identified as responsible for point source discharges causing or contributing to bacteria impairments at the beaches and creeks addressed in these TMDLs include:

- Phase I MS4s,
- Phase II MS4s,
- Caltrans,
- POTWs and wastewater collection systems, and
- CAFOs.

According to Tables [Insert third through ninth table numbers], Municipal (Phase I and Phase II) MS4s and Caltrans are the only point sources that have been assigned WLAs. POTWs,[51] CAFOs, and any other unidentified point sources were not assigned WLAs, which is equivalent to being assigned a WLA of zero. All these identified point sources are subject to NPDES regulations.

In order for the WDRs, NPDES requirements, and discharges from these point sources to be consistent with the TMDLs and WLAs, the San Diego Water Board will issue or revise and re-issue the WDRs for these point sources as follows:

(i) Phase I MS4s
The TMDLs and Municipal MS4 WLAs, with respect to discharges from Phase I MS4s, will be implemented primarily by revising and re-issuing the existing NPDES requirements that have been issued for Phase I MS4 discharges.

The Phase I MS4s subject to these TMDLs are regulated under San Diego Water Board WDRs that implement NPDES requirements.[52] The NPDES requirements regulating the Phase I MS4s include discharge prohibitions and receiving water limitations that are applicable to the implementation of these TMDLs, as summarized below:

- Discharges from MS4s are subject to all Basin Plan prohibitions.

- Discharges from MS4s that cause or contribute to the violation of water quality standards (designated beneficial uses and water quality objectives developed to protect beneficial uses) are prohibited.

[51] Not including Padre Dam, which has been allocated a fecal coliform TMDL based on the effluent limitations in the WDRs for Padre Dam
[52] Phase I MS4s in Orange County are regulated under San Diego Water Board Order No. R9-2002-0001 or subsequent orders; Phase I MS4s in San Diego County are regulated under San Diego Water Board Order No. R9-2007-0001 or subsequent orders.

- Discharges into and from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance, in waters of the state are prohibited.

- Effectively prohibit all types of non-storm water discharges into the MS4 unless such discharges are either authorized by separate NPDES requirements, or not prohibited (i.e., exempted) by the NPDES requirements regulating the MS4. Exempted non-storm water discharges into the MS4 are not prohibited unless the discharge category is identified as a significant source of pollutants to waters of the United States.

The available data reported by the Phase I MS4s and the results of the technical TMDL analysis indicate that discharges into and from MS4s are in violation of the discharge prohibitions and receiving water limitations above. Enforcement of the current discharge prohibitions and receiving water limitations is an action that the San Diego Water Board can immediately implement to compel the MS4s to reduce discharge of bacteria to the receiving waters.

In addition to the discharge prohibitions and receiving water limitations, WQBELs consistent with the assumptions and requirements of the WLAs of any applicable TMDL must also be incorporated into the NPDES requirements. The San Diego Water Board will revise and re-issue the WDRs and NPDES requirements for Phase I MS4s to incorporate the following:

- WQBELs consistent with the requirements and assumptions of the Municipal MS4 WLAs. WQBELs may be expressed as numeric effluent limitations, when feasible, and/or as a BMP program of expanded or better-tailored BMPs.[53]

- If the WQBELs include a BMP program, periodic reporting requirements on BMP planning, implementation, and effectiveness in improving water quality at impaired beaches and creeks (i.e., progress reports). Progress reports will also be required to include water quality monitoring results. Progress reports will be required as long as necessary to ensure that the beneficial uses of the impaired waterbodies have been restored and maintained.

- Compliance schedule for Phase I MS4s to attain the MS4 WLAs and TMDLs in the receiving waters.

The WQBELs will likely consist of receiving water limitations (based on the numeric targets) and require the implementation of a BMP program to achieve the TMDLs in the receiving waters. The Phase I MS4s will be required to submit Bacteria Load Reduction Plans (BLRPs) or Comprehensive Load Reduction Plans (CLRPs) outlining a proposed BMP program that will be capable of achieving the necessary load reductions required to attain the TMDLs in the receiving waters, acceptable to the San

[53] Code of Federal Regulations Title 40 section 122.44(k)(2)&(3)

Diego Water Board, within 18 months after the effective date of these TMDLs.[54] The San Diego Water Board will require the BLRPs or CLRPs to be developed on a watershed or region wide scale. The BLRPs or CLRPs should be developed and incorporated as part of the Watershed Runoff Management Programs required under the Phase I MS4 NPDES requirements. Ideally, the Phase I MS4s and Caltrans will develop and coordinate the elements of their BLRPs or CLRPs together.

If the receiving water limitations (based on the numeric targets) are met in the receiving waters, the assumption will be that the MS4s have met their WLAs. If, however, the receiving water limitations are not being met in the receiving waters, the Phase I MS4s will be responsible for reducing their bacteria loads and/or demonstrating that controllable anthropogenic discharges from the Phase I MS4s are not causing the exceedances, as outlined below in the Monitoring for TMDL Compliance section below.

(ii) Phase II MS4s

The TMDLs and MS4 WLAs, with respect to discharges from Phase II MS4s, will be implemented primarily by requiring compliance with the existing general WDRs and NPDES requirements that have been issued for Phase II MS4 discharges. Phase II MS4s are subject to regulation under State Water Board general WDRs implementing NPDES requirements.[55]

Owners and operators of Phase II MS4s in the watersheds subject to these TMDLs, identified by the San Diego Water Board as significant sources of bacteria discharging to the receiving waters and/or Phase I MS4s, will be required to submit a Notice of Intent[56] to comply with the NPDES requirements in the State Water Board general WDRs as soon as possible after the effective date of these TMDLs.[57] Once enrolled under the general WDRs, Phase II MS4 owners and operators are required to comply with the provisions of the State Water Board general WDRs and NPDES requirements to reduce the discharge of bacteria as specified in their Stormwater Management Plans/Programs (SWMPs).

For any individual Phase II MS4s that are identified as a significant source of pollutants, the San Diego Water Board may also issue individual WDRs requiring the implementation of WQBELs that are consistent with the requirements and assumptions of the Municipal MS4 WLAs. Upon issuance of such individual WDRs by the San Diego Water Board, the State Water Board general WDRs for Phase II MS4s shall no longer regulate the affected individual Phase II MS4s.[58]

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[54] The effective date is the date the Office of Administrative Law approves this Basin Plan amendment.
[55] Phase II MS4s in the San Diego Region are subject to regulation under State Water Board Order No. 2003-0005-DWQ, or subsequent orders.
[56] The Notice of Intent, or NOI, is attachment 7 to Order No. 2003-0005-DWQ.
[57] The effective date is the date the Office of Administrative Law approves this Basin Plan amendment.
[58] As authorized under State Water Board Order No. 2003-0005-DWQ, section G.

Similarly, for any category of Phase II MS4s that are identified as a significant source of pollutants, the San Diego Water Board may issue general WDRs requiring the implementation of WQBELs that are consistent with the requirements and assumptions of the Municipal MS4 WLAs above. Upon issuance of such general WDRs by the San Diego Water Board, the State Water Board general WDRs for Phase II MS4s shall no longer regulate the affected category of Phase II MS4s.[59]

In the event that the San Diego Water Board issues individual or general WDRs for Phase II MS4s in the San Diego Region, the WQBELs will likely consist of receiving water limitations (based on the numeric targets) and require the implementation of a BMP program to achieve the TMDLs in the receiving waters. The Phase II MS4s will likely be required to submit Bacteria Load Reduction Plans (BLRPs) or Comprehensive Load Reduction Plans (CLRPs) outlining a proposed BMP program that will be capable of achieving the necessary load reductions required to attain the TMDLs in the receiving water, acceptable to the San Diego Water Board. When and where possible, the San Diego Water Board will require the BLRPs or CLRPs to be developed on a watershed or region wide scale and have the Phase II MS4 BMP programs coordinate with the BMPs programs for Phase I MS4s and Caltrans.

If the receiving water limitations (based on the numeric targets) are met in the receiving waters, the assumption will be that the Phase II MS4s have met their WLAs. If, however, the receiving water limitations are not being met in the receiving waters and one or more Phase II MS4 dischargers are identified as sources of bacteria causing exceedances, the specific Phase II MS4s will be responsible for reducing their bacteria loads and/or demonstrating that controllable anthropogenic discharges from those specific Phase II MS4s are not causing the exceedances, as outlined below in the Monitoring for TMDL Compliance section below.

(iii) Caltrans

The TMDLs and Caltrans WLAs will be implemented primarily by revising and re-issuing the existing NPDES requirements that have been issued for Caltrans discharges.

Caltrans is regulated under State Water Board general WDRs that implement NPDES requirements.[60] The San Diego Water Board will request the State Water Board to revise and re-issue the WDRs and NPDES requirements to incorporate the following for Caltrans discharges in the San Diego Region:

- WQBELs consistent with the requirements and assumptions of the Caltrans WLAs. WQBELs may be expressed as numeric effluent limitations, when feasible, and/or as a BMP program of expanded or better-tailored BMPs.[61]

- If the WQBELs include a BMP program, periodic reporting requirements on BMP planning, implementation, and effectiveness in improving water quality at

[59] Ibid.
[60] Caltrans is subject to regulation under State Water Board Order No. 99-06-DWQ, and subsequent orders.
[61] Code of Federal Regulations Title 40 section 122.44(k)(2)&(3)

impaired beaches and creeks (i.e., progress reports). Progress reports will also be required to include water quality monitoring results. Progress reports will be required as long as necessary to ensure that the beneficial uses of the impaired waterbodies have been restored and maintained.

- Compliance schedule for Caltrans to attain the Caltrans WLAs and TMDLs in the receiving waters.

The WQBELs will likely consist of receiving water limitations (based on the numeric targets) and require the implementation of a BMP program to achieve TMDLs in the receiving waters. Caltrans will be required to submit Bacteria Load Reduction Plans (BLRPs) or Comprehensive Load Reduction Plans (CLRPs) outlining a proposed BMP program that will be capable of attaining the TMDLs in the receiving waters, acceptable to the San Diego Water Board, within 18 months after the effective date of these TMDLs.[62] The San Diego Water Board will require the BLRPs or CLRPs to be developed on a watershed or region wide scale. Ideally, Caltrans and the Phase I MS4s will develop and coordinate the elements of their BLRPs or CLRPs together.

If the receiving water limitations (based on the numeric targets) are met in the receiving waters, the assumption will be that Caltrans has met its WLAs. If, however, the receiving water limitations are not being met in the receiving waters, and Caltrans MS4s are identified as a source of bacteria causing exceedances, Caltrans will be responsible for reducing its bacteria loads and/or demonstrating that controllable anthropogenic discharges from the Caltrans MS4s are not causing the exceedances, as outlined below in the Monitoring for TMDL Compliance section below.

(iv) Publicly Owned Treatment Works and Wastewater Collection Systems
The TMDLs, with respect to discharges from POTWs and wastewater collection systems, will be implemented primarily by requiring compliance with any existing individual and/or general WDRs and NPDES requirements that have been issued. POTWs are subject to regulation under individual WDRs that implement NPDES requirements. Wastewater collection systems are subject to regulation under general WDRs issued by the State Water Board and San Diego Water Board.[63]

Because POTWs and wastewater collection systems have been assigned WLAs of zero,[64] no discharges of bacteria are expected or allowed under the wet weather TMDLs or dry weather TMDLs. If discharges of bacteria from POTWs and/or wastewater collection systems do occur as a result of sanitary sewer overflows and result in WQO exceedances, these exceedances will not apply to the compliance status of other dischargers.

[62] The effective date is the date the Office of Administrative Law approves this Basin Plan amendment.
[63] State Water Board Order No. 2006-0003-DWQ and San Diego Water Board Order No. R9-2007-0005
[64] With the exception of Padre Dam, which has a fecal coliform mass-load based WLA that is calculated based on numeric effluent limitations derived from the REC-1 WQOs in the Basin Plan.

If necessary, individual WDRs for POTWs and/or the San Diego Water Board WDRs for wastewater collection systems can be revised to require more aggressive monitoring, maintenance, and repair schedules to ensure discharges of bacteria wasteloads to surface waters are eliminated.

(v) Concentrated Animal Feeding Operations
The TMDLs, with respect to discharges from CAFOs, will be implemented primarily by requiring compliance with any existing individual and/or general WDRs and NPDES requirements that have been issued. CAFOs that discharge to surface waters are subject to regulation under general WDRs that implement NPDES requirements.

Because CAFOs have been assigned WLAs of zero, no discharges of bacteria are expected or allowed under the wet weather TMDLs or dry weather TMDLs.

If necessary, the general WDRs and NPDES requirements for CAFOs can be revised to require more aggressive monitoring, maintenance, and repair schedules to ensure discharges of bacteria wasteloads to surface waters are minimized and/or eliminated.

(vi) Other Unidentified Point Sources
Unidentified point sources have not been assigned WLAs, which is equivalent to being assigned a WLA of zero. No discharges of bacteria are expected or allowed from unidentified point sources under the wet weather TMDLs or dry weather TMDLs.

Therefore, the TMDLs, with respect to discharges from unidentified point sources to surface waters, will be implemented primarily by issuing WDRs implementing NPDES requirements, or requiring the point sources to cease their discharges.

(B) Nonpoint Sources
The persons identified as responsible for controllable nonpoint source bacteria discharges causing or contributing to bacteria impairments at the beaches and creeks in these watersheds include the owners and operators of the following:

- agricultural facilities,
- nurseries,
- dairy/intensive livestock facilities,
- horse ranches,
- manure composting and soil amendment operations not regulated by NPDES requirements, and
- individual septic systems.

Agriculture (including nurseries), dairy/livestock, and horse ranch land uses (collectively called "agriculture" land uses) are controllable nonpoint sources that have been assigned LAs, as shown in Tables [Insert third through ninth table numbers]. Manure composting operations, soil amendment operations, and individual septic systems that are not part of agriculture land uses, and any other unidentified controllable nonpoint sources were not assigned LAs, which is equivalent to being

assigned a LA of zero. Any controllable nonpoint source that has not been assigned a LA or has a LA of zero is not expected or allowed to discharge a pollutant load as part of the TMDL.

Controllable nonpoint source discharges are present in most watersheds, however, in only four watersheds do these discharges require load reductions to meet the Agriculture LAs. These watersheds are the Lower San Juan HSA, San Luis Rey HU, San Marcos HA, and San Dieguito HU watersheds (see Tables [Insert table numbers]).

If individual or general WDRs are developed and issued to controllable nonpoint sources, the WDRs should incorporate one or more the following:

- Effluent limitations that are consistent with the requirements and assumptions of the nonpoint source LAs. Effluent limitations should be expressed as numeric effluent limitations, if feasible, and/or as a BMP program.

- Periodic reporting requirements on BMP planning, implementation, and effectiveness in improving the water quality of discharges from the nonpoint source (i.e., progress reports). Progress reports will also be required to include water quality monitoring results. Progress reports will be required as long as necessary to ensure that the beneficial uses of the impaired waterbodies have been restored and maintained.

- Compliance schedule and/or implementation milestones.

The San Diego Water Board will work with the nonpoint source dischargers and/or stakeholders when developing the WDRs. When and where possible, the San Diego Water Board will have the nonpoint source BMP programs coordinate with the BMPs programs for Phase I MS4s and Caltrans.

If the receiving water limitations (based on the numeric targets) are met in the receiving waters, the assumption will be that controllable nonpoint sources have met their LAs. If, however, the receiving water limitations are not being met in the receiving waters, and one or more controllable nonpoint source dischargers are identified as sources of bacteria causing exceedances, the San Diego Water Board may regulate those identified nonpoint sources, as needed, with WDRs or other enforcement actions, and those nonpoint sources will be responsible for reducing their bacteria loads and/or demonstrating that discharges from those nonpoint sources are not causing the exceedances, as outlined below in the Monitoring for TMDL Compliance section below.

(3) Conditional Waivers of Waste Discharge Requirements

There are several types of point source discharges to land, as well as nonpoint source discharges to land and surface waters that may not have an adverse affect on the quality of the waters of the state, and/or are not readily amenable to regulation under WDRs. For

these types of discharge, the San Diego Water Board has the authority to issue conditional waivers of WDRs.[65]

There are controllable nonpoint source land uses (agriculture, horse ranches, and dairies/intensive livestock) that were identified in 8 watersheds that are contributing to the bacteria impairments. Four of the 8 watersheds were identified as requiring load reductions (Lower San Juan HSA, San Luis Rey HU, San Marcos HA, and San Dieguito HU) to meet the assigned wet weather Agriculture LAs.

In general, the San Diego Water Board utilizes conditional waivers of WDRs to address the discharges from controllable nonpoint sources. Development and enforcement of waiver conditions that are protective of water quality will likely be sufficient to implement the Agriculture LAs. The controllable nonpoint sources eligible for conditional waivers must comply with the conditions of the waiver to be consistent with the TMDLs and Agriculture LAs. Controllable nonpoint sources that do not comply with the waiver conditions are no longer eligible for the waiver and must either come into compliance with the waiver conditions, become regulated under WDRs, or cease any discharge of wastes to waters of the state.

Currently, discharges from these controllable nonpoint sources may be eligible for one of the general conditional waivers of WDRs, which are currently provided in the Basin Plan.[66] Conditional waivers of WDRs may not exceed 5 years in duration, but may be revised and renewed, or may be terminated at any time.[67] The San Diego Water Board will implement the conditional waivers of WDRs applicable to the Agriculture land uses to be consistent with the TMDLs and Agriculture LAs.

Because the conditional waivers of WDRs that may be utilized to implement the Agriculture LAs are contained in the Basin Plan, any revision of the conditions will require a Basin Plan amendment. If needed, the San Diego Water Board may amend the Basin Plan to remove these conditional waivers of WDRs from the Basin Plan and re-issue the conditional waivers of WDRs as a general order to reduce the administrative requirements for revising waiver conditions.

As required, the effectiveness of the conditional waivers of WDRs must be evaluated at least once every 5 years. If the conditions in the waivers of WDRs are not sufficient to implement the TMDLs and Agriculture LAs, the San Diego Water Board will amend the waiver conditions to include more stringent conditions, including, but not limited to, additional BMP implementation, monitoring, and/or reporting.

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[65] Authorized pursuant to Water Code section 13269

[66] The current general conditional waivers in the Basin Plan were adopted under San Diego Water Board Resolution No. R9-2007-0104. These waivers will expire December 31, 2012. Conditional Waiver No. 3 (Animal Operations) and Conditional Waiver No. 4 (Agriculture and Nursery Operations) may be utilized to implement the Agriculture LAs. Future iterations of these conditional waivers may be issued in a separate implementing order and removed from the Basin Plan.

[67] Pursuant to Water Code section 13269(a)(2)

If a conditional waiver of WDRs no longer appears to be effective in protecting water quality from discharges from specific nonpoint source facilities or category of nonpoint source facilities, the waiver may be terminated. For nonpoint source facilities that are no longer eligible for a conditional waiver of WDRs, they will need to be regulated under WDRs, or cease any discharges of waste to waters of the state.

(4) Enforcement Actions

The San Diego Water Board shall consider enforcement actions, as necessary, for any discharger failing to comply with applicable waiver conditions, WDRs, or Basin Plan waste discharge prohibitions.[68] Enforcement actions can also be taken, as necessary, to control the discharge of bacteria to impaired beaches and creeks, to attain compliance with the assumptions and requirements of the TMDLs, WLAs, and LAs.

In order for implementation of the TMDLs to begin as soon as possible, the San Diego Water Board may issue enforcement actions, in lieu of or before revising and re-issuing general WDRs and NPDES requirements, for Phase I MS4s and Caltrans, directing them to begin implementing additional measures to restore compliance with the bacteria WQOs. Enforcement actions may also be issued to require the submission of Bacteria Load Reduction Plans (BLRPs) or Comprehensive Load Reduction Plans (CLRPs) to the San Diego Water Board within 18 months after the effective date of these TMDLs,[69] or sooner. The San Diego Water Board will require the BLRPs or CLRPs to be developed on a watershed or region wide scale.

The San Diego Water Board will also issue enforcement actions, as necessary, to any other discharger that is identified by the San Diego Water Board and/or other parties as a significant source causing or contributing to the bacteria impairments in the waterbodies addressed in these TMDLs.

(5) Investigative Orders

The San Diego Water Board has the authority to require any state or local agency to investigate and report on any technical factors involved in water quality control or to obtain and submit analyses of water.[70] The San Diego Water Board has the authority to require technical or monitoring program reports from persons who have discharged or are discharging waste that could affect the quality of the waters in the San Diego Region.[71] The San Diego Water Board also has the authority to establish monitoring and recordkeeping requirements for discharges regulated under NPDES requirements.[72]

Investigative orders may be issued requiring the submission of Bacteria Load Reduction Plans (BLRPs) or Comprehensive Load Reduction Plans (CLRPs), acceptable to the San Diego Water Board, within 18 months after the effective date of these TMDLs,[73] or sooner.

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[68] Authorized pursuant to Water Code sections 13300-13304, 13308, 13350, 13385, and/or 13399
[69] The effective date is the date the Office of Administrative Law approves this Basin Plan amendment.
[70] Authorized pursuant to Water Code section 13225
[71] Authorized pursuant to Water Code section 13267
[72] Authorized pursuant to Water Code section 13383
[73] The effective date is the date the Office of Administrative Law approves this Basin Plan amendment.

The San Diego Water Board will require the BLRPs or CLRPs to be developed on a watershed or region wide scale. The San Diego Water Board may require the Phase I MS4s and Caltrans to develop and coordinate the elements of their BLRPs or CLRPs together. The BLRPs or CLRPs will be incorporated into the WDRs and NPDES requirements.

The San Diego Water Board may issue subsequent investigative orders to confirm items in the BLRPs or CLRPs. The BLRPs or CLRPs must be capable of achieving the WLAs for the bacteria TMDLs. The CLRPs must also be capable of restoring the beneficial uses in receiving waters for other impairing pollutants in the watershed, and achieving the goals and objectives of any other water quality improvement projects included in the CLRPs within the time frame of the compliance schedule.

The San Diego Water Board will also issue investigative orders requiring BLRPs or CLRPs, or other technical or monitoring program reports, as necessary, to any other discharger that is identified by the San Diego Water Board or other parties as a significant source causing or contributing to the bacteria impairments in the waterbodies addressed in these TMDLs.

(6) Basin Plan Amendments

As the implementation of these TMDLs progress, the San Diego Water Board recognizes that revisions to the Basin Plan may be necessary in the future. The San Diego Water Board will initiate a Basin Plan amendment project to revise the requirements and/or provisions for implementing these TMDLs within 5 years from the effective date of this Basin Plan amendment or earlier if all the following conditions are met:

- Sufficient data are collected to provide the basis for the Basin Plan amendment.
- A report is submitted to the San Diego Water Board documenting the findings from the collected data.
- A request is submitted to the San Diego Water Board with specific revisions proposed to the Basin Plan, and the documentation supporting such revisions.

The San Diego Water Board will work with the project proponents to ensure that the data and documentation will be adequate for the initiation of the Basin Plan amendment. The San Diego Water Board staff will be responsible for taking the Basin Plan amendment project through the administrative and regulatory processes for adoption by the San Diego Water Board, and approval by the State Water Board, OAL, and USEPA.

If no Basin Plan amendment has been initiated within 5 years of the effective date of this TMDL Basin Plan amendment, and the Executive Officer determines, with Regional Board concurrence, that insufficient data exist to support the initiation of a Basin Plan amendment, a subsequent Basin Plan amendment to revise the requirements and/or provisions for the implementation of these TMDLs will not be initiated until the Executive Officer determines the conditions specified above are met.

(7) Other Actions

For these TMDLs, the San Diego Water Board shall recommend that the State Water Board assign a high priority to awarding grant funding[74] for projects to implement the bacteria TMDLs. Special emphasis will be given to projects that can achieve quantifiable bacteria load reductions consistent with the specific bacteria TMDLs, WLAs, and LAs.

Implementation of these TMDLs by the San Diego Water Board should not require any special studies to be conducted by the dischargers or other entities. The San Diego Water Board, however, will encourage and support any special studies proposed and undertaken by the dischargers or other entities that will provide information to refine and improve the implementation of these TMDLs. The San Diego Water Board may develop agreements (e.g., a Memorandum of Understanding) with one or more entities to support and use the findings from any special studies that may be conducted. Proposing a special study project and initiating an agreement with the San Diego Water Board to use the results of the study to modify this TMDL Implementation Plan is the responsibility of the project proponent(s).

(i) Monitoring for TMDL Compliance and Compliance Assessment

An essential component of implementation is water quality monitoring. Monitoring is needed to evaluate the progress toward attainment of the TMDLs and restoring the beneficial uses in the receiving waters. When all discharges from controllable sources meet their assigned WLAs and LAs, and the numeric targets (i.e., numeric WQOs and allowable exceedance frequencies) are also met in the receiving waters, , compliance with the TMDLs will be achieved. Additionally, sufficient water quality data are necessary to support the removal of a waterbody from the 303(d) List. Water quality data can also be used identify additional regulatory actions that may need to be implemented by the San Diego Water Board to restore and protect beneficial uses.

Monitoring for compliance will initially be conducted by the Phase I MS4s and Caltrans. The minimum components for any monitoring program that will be used to evaluate progress toward attainment of the TMDLs should include the following:

- For beaches addressed by these TMDLs, monitoring locations should consist of, at a minimum, the same locations used to collect data required under MS4 NPDES monitoring requirements and beach monitoring for Health and Safety Code section 115880.[75] If exceedances of the receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations and/or other source identification methods must also

[74] The State Water Board administers the awarding of grants funded from Proposition 13, Proposition 50, Clean Water Act section 319(h) and other federal appropriations to projects that can result in measurable improvements in water quality, watershed condition, and/or capacity for effective watershed management. Many of these grant fund programs have specific set-asides for expenditures in the areas of watershed management and TMDL project implementation for non-point source pollution.

[75] Commonly referred to as AB 411 monitoring

be used to demonstrate that the bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

- For creeks addressed by these TMDLs, monitoring locations should consist of, at a minimum, a location at or near the mouth of the creek (e.g., Mass Loading Station or Mass Emission Station) and one or more locations upstream of the mouth (e.g., Watershed Assessment Stations). If exceedances of the receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations and/or other source identification methods must also be used to demonstrate that the bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

- Because there are dry weather and wet weather TMDLs, monitoring under both conditions is needed. Wet weather[76] monitoring should occur at least once within 24 hours of the end of a storm event[77] that occurs during the rainy season (i.e., October 1 through April 30). Dry weather[78] monitoring should occur at least on a monthly basis, and may be required more often during the summer months (e.g., weekly) when the REC-1 and REC-2 beneficial uses occur most frequently in the creeks and at the beaches.

Compliance with the TMDLs, WLAs, and LAs will be assessed primarily by comparing receiving water indicator bacteria results from the monitoring locations outlined above with receiving water limitations expressed in terms of the appropriate numeric REC-1 WQOs and allowable exceedance frequencies of the appropriate numeric REC-1 WQOs. The appropriate numeric WQOs and allowable exceedance frequencies are dependent upon the type of receiving water (i.e., beach or creek) and weather conditions (i.e., dry weather or wet weather), as shown in Tables [Insert table numbers].

[76] Defined as days with a storm with at least 0.2 inches of rainfall and the 72 hour period after the storm event
[77] The end of a storm event is when there is no more precipitation
[78] Defined as days with less than 0.2 inches of rainfall on each of the previous three days

[Insert table number]. Receiving Water Limitations for Beaches

Indicator Bacteria	Wet Weather Days [a]		Dry Weather Days [b]	
	Wet Weather Numeric Objective [c] (MPN/100mL)	Wet Weather Allowable Exceedance [d] Frequency	Dry Weather Numeric Objective [e] (MPN/100mL)	Dry Weather Allowable Exceedance Frequency
Fecal Coliform	400	22%	200	0%
Total Coliform	10,000	22%	1,000	0%
Enterococcus	104	22%	35	0%

a. Wet weather days defined as days with rainfall events of 0.2 inches or greater and the following 72 hours.
b. Dry weather days defined as days with less than 0.2 inch of rainfall observed on each of the previous 3 days.
c. Wet weather numeric objectives based on the single sample maximum water quality objectives in the California Ocean Plan (2005). Compliance with the wet weather TMDLs in the receiving water is based on the frequency that the wet weather days in any given year exceed the wet weather numeric objective, but 30-day geometric mean must also be met.
d. The wet weather allowable exceedance frequency is set at 22%. In the calculation of the wet weather TMDLs, the San Diego Regional Board chose to apply the 22 percent allowable exceedance frequency as determined for Leo Carillo Beach in Los Angeles County. At the time the wet weather watershed model was developed, the 22 percent exceedance frequency from Los Angeles County was the only reference beach exceedance frequency available. The 22 percent allowable exceedance frequency used to calculate the wet weather TMDLs is justified because the San Diego Region watersheds' exceedance frequencies will likely be close to the value calculated for Leo Carillo Beach, and is consistent with the exceedance frequency that was applied by the Los Angeles Regional Board.
e Dry weather numeric objectives based on the 30-day geometric mean water quality objectives in the California Ocean Plan (2005). Compliance with the dry weather TMDLs in the receiving water is based on the frequency that the dry weather days in any given year exceed the dry weather numeric objective.

[Insert table number]. Receiving Water Limitations for Creeks

Indicator Bacteria	Wet Weather Days [a]		Dry Weather Days [b]	
	Wet Weather Numeric Objective [c] (MPN/100mL)	Wet Weather Allowable Exceedance [d] Frequency	Dry Weather Numeric Objective [e] (MPN/100mL)	Dry Weather Allowable Exceedance Frequency
Fecal Coliform	400	22%	200	0%
Enterococcus	61 (104) [f]	22%	33	0%

a. Wet weather days defined as days with rainfall events of 0.2 inches or greater and the following 72 hours.
b. Dry weather days defined as days with less than 0.2 inch of rainfall observed on each of the previous 3 days.
c. Wet weather numeric objectives based on the single sample maximum (or equivalent) water quality objectives in the Water Quality Control Plan for the San Diego Basin (1994). Compliance with the wet weather TMDLs in the receiving water is based on the frequency that the wet weather days in any given year exceed the wet weather numeric objective, but 30-day geometric mean must also be met.
d. The wet weather allowable exceedance frequency is set at 22%. In the calculation of the wet weather TMDLs, the San Diego Regional Board chose to apply the 22 percent allowable exceedance frequency as determined for Leo Carillo Beach in Los Angeles County. At the time the wet weather watershed model was developed, the 22 percent exceedance frequency from Los Angeles County was the only reference beach exceedance frequency available. The 22 percent allowable exceedance frequency used to calculate the wet weather TMDLs is justified because the San Diego Region watersheds' exceedance frequencies will likely be close to the value calculated for Leo Carillo Beach, and is consistent with the exceedance frequency that was applied by the Los Angeles Regional Board.
e. Dry weather numeric objectives based on the 30-day geometric mean (or equivalent) water quality objectives in Water Quality Control Plan for the San Diego Basin (1994). Compliance with the dry weather TMDLs in the receiving water is based on the frequency that the dry weather days in any given year exceed the dry weather numeric objective.
f. A wet weather numeric objective for *Enterococcus* of 104 MPN/100mL may be applied as a receiving water limitation for creeks, instead of 61 MPN/100mL, if one or more of the creeks addressed by these TMDLs (San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek, San Diego River, and/or Chollas Creek) is designated with a "moderately to lightly used area" or less frequent usage frequency in the Basin Plan. Otherwise, the wet weather numeric objective of 61 MPN/100mL for Enterococcus will be used to assess compliance with the wet weather allowable exceedance frequency.

At the end of the TMDL Compliance Schedules, which are given in the following section, the receiving waters must meet the receiving water limitations above to be considered in compliance with these TMDLs, WLAs, and LAs. Determination of compliance with the TMDLs will be assessed differently for dry weather and wet weather as follows:

1. *Compliance with Dry Weather TMDLs*: At the end of the dry weather TMDL compliance schedule, the bacteria densities in the receiving waters for all dry weather days[79] must be less than or equal to the 30-day geometric mean REC-1 WQOs 100 percent of the time (i.e., dry weather days in a 30-day period shall not exceed the 30-day geometric mean REC-1 WQOs more than 0 percent of the time). In addition, the bacteria densities must be consistent with the single sample maximum REC-1 WQOs in the Ocean Plan for beaches, and the Basin Plan for creeks.

   The method and number of samples needed for calculating the 30-day geometric mean should be consistent with the number of samples required by the Ocean Plan for beaches, and the Basin Plan for creeks. Analysis of the monitoring results should also be consistent with the methods given in the Water Quality Control Policy For Developing California's Clean Water Act Section 303(d) List.

   Because the dry weather TMDLs are assigned entirely to the Municipal MS4s as WLAs, the Municipal MS4s are assumed to be the only source of bacteria during dry weather (i.e., dry weather TMDL = MS4 WLA). Discharges from other controllable sources (i.e., Caltrans, Agriculture) during dry weather are not expected and/or not allowed (i.e., WLA = 0 or LA = 0). If at the end of the dry weather TMDL compliance schedule the receiving waters exceed the 30-day geometric mean REC-1 WQOs more than 0 percent of the time, the municipal Phase I MS4s are responsible for demonstrating their discharges into the receiving waters are not causing the exceedances, or they will be considered out of compliance. If controllable sources other than the Phase I MS4s are identified as causing the exceedances, and the Phase I MS4s have demonstrated they are not causing or contributing to the exceedances, the Phase I MS4s will not be considered out of compliance.

   The Phase I MS4s may demonstrate that their discharges are not causing the exceedances in the receiving waters by providing data from their discharge points to the receiving waters, by providing data collected at jurisdictional boundaries, and/or by using other methods accepted by the San Diego Water Board. Otherwise, at the end of the dry weather TMDL compliance schedule, the municipal Phase I MS4s will be held responsible and considered out of compliance unless other information or evidence indicates another controllable or uncontrollable source is responsible for the exceedances in the receiving waters. If controllable sources other than discharges from the municipal Phase I MS4s are identified before or after the end of the dry weather TMDL Compliance Schedule as causing the exceedances, those controllable sources will be responsible for reducing their bacteria loads and/or demonstrating that discharges from those sources are not causing the exceedances. The San Diego Water Board shall implement additional actions (e.g., issue enforcement actions, amend

[79] Defined as days with less than 0.2 inches of rainfall on each of the previous three days

existing NPDES requirements or conditional waivers), as needed, to bring all controllable sources into compliance with the dry weather TMDLs.

2. *Compliance with Wet Weather TMDLs*: At the end of the wet weather TMDL compliance schedule, the bacteria densities in the receiving waters for all wet weather days[80] cannot exceed the single sample maximum REC-1 WQOs more than the allowable exceedance frequency. In addition, the bacteria densities must be less than or equal to the 30-day geometric mean REC-1 WQOs 100 percent of the time (i.e., both dry and wet weather days in a 30-day period shall not exceed the 30-day geometric mean REC-1 WQOs more than 0 percent of the time).

   As described in the minimum monitoring components above, wet weather samples should be collected within 24 hours of the end of a storm event that occurs during the rainy season (i.e., October 1 through April 30). At least one wet weather sample per storm is expected to be collected for each waterbody in each watershed (i.e., Pacific Ocean shoreline, creek mouth, and/or creek). Because of the many issues related to collecting wet weather samples from multiple sites within a short time frame, dischargers are expected to develop a wet weather monitoring and sampling approach in their BLRPs or CLRPs. If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event shall be equal to the results from that one sample. If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all the wet weather days not sampled shall be equal to the highest bacteria density result reported from samples collected. The exceedance frequency shall be calculated by dividing the number of wet weather days that exceed the single sample maximum REC-1 WQOs by the total number of wet weather days during the rainy season. If at the end of the wet weather TMDL Compliance Schedule the receiving waters exceed the single sample maximum REC-1 WQOs more than the allowable exceedance frequency, all controllable sources are responsible for demonstrating their discharges into the receiving waters are not causing the exceedances, or they will be considered out of compliance.

   The data collected for compliance with the dry weather TMDLs, described above, shall be used in addition to the data collected for wet weather with the wet weather TMDLs to calculate the wet weather 30-day geometric mean. If at the end of the wet weather TMDL Compliance Schedule the receiving waters exceed the 30-day geometric mean REC-1 WQOs at any time, all controllable sources are responsible for demonstrating their discharges into the receiving waters are not causing the exceedances, or they will be considered out of compliance.

   Because the Phase I MS4s are located at the base of the watersheds and have been identified as the most significant controllable source of bacteria, the municipal Phase I MS4s will have the primary responsible for monitoring the receiving waters. Caltrans will also have monitoring responsibilities. Phase II MS4s, agricultural dischargers, and other sources that are identified as significant sources (i.e., causing

[80] Defined as days with a storm with at least 0.2 inches of rainfall and the 72 hour period after the storm event

or contributing to exceedances in the receiving waters) will also be responsible for monitoring the receiving waters. The municipal Phase I MS4s and other dischargers are responsible for reducing their bacteria loads and/or demonstrating their discharges into the receiving waters are not causing the exceedances.

The municipal MS4s may demonstrate that their discharges are not causing the exceedances in the receiving waters by providing data from their discharge points to the receiving waters, by providing data collected at jurisdictional boundaries, and/or by using other methods accepted by the San Diego Water Board. Otherwise, at the end of the wet weather TMDL compliance schedule, the municipal Phase I MS4s will be held responsible and considered out of compliance unless other information or evidence indicates another controllable or uncontrollable source is responsible for the exceedances in the receiving waters. If controllable sources other than discharges from the municipal Phase I MS4s are identified before or after the end of the wet weather TMDL Compliance Schedules as causing the exceedances, those controllable sources will be responsible for reducing their bacteria loads and/or demonstrating that discharges from those sources are not causing the exceedances. If controllable sources other than the Phase I MS4s are identified as causing the exceedances, and the Phase I MS4s have demonstrated they are not causing or contributing to the exceedances, the Phase I MS4s will not be considered out of compliance. The San Diego Water Board shall implement additional actions (e.g., issue enforcement actions, amend existing NPDES requirements or conditional waivers), as needed, to bring all those controllable sources into compliance with the wet weather TMDLs.

Between the effective date of these TMDLs and the end of the TMDL Compliance Schedules, monitoring is also required to demonstrate progress toward achieving and complying with the TMDLs, WLAs, and LAs. Progress can be demonstrated with reductions in exceedance frequencies in the receiving waters until the allowable exceedance frequencies ultimately are achieved at the end of the TMDL Compliance Schedules. Demonstrating progress toward attaining the TMDLs in the receiving waters will be assessed differently for dry weather and wet weather as follows:

1. *Measuring Progress Toward Attaining Dry Weather TMDLs*: For the dry weather TMDLs, available historical monitoring data from the years 1996-2002 should be used to calculate the "existing" dry weather exceedance frequency of the 30-day geometric mean REC-1 WQOs for each watershed. "Existing" dry weather exceedance frequencies may be calculated separately for each impaired waterbody listed, or an "existing" dry weather exceedance frequency may be calculated that is applicable to the entire watershed.

   The "existing" dry weather exceedance frequencies should be reduced until the final allowable dry weather exceedance frequency is achieved by the end of the dry weather TMDL Compliance Schedule. If the TMDL Compliance Schedules include interim milestones that must be achieved to demonstrate progress toward attaining the dry weather TMDLs, reductions in the exceedance frequencies in the receiving water may be used. For example, if the "existing" dry weather exceedance frequency is 60

percent, the final dry weather exceedance frequency is 0 percent, and an interim milestone requires a 50 percent reduction, the exceedance frequency in the receiving water should be 30 percent or less by the interim milestone date. By the end of the dry weather TMDL Compliance Schedule, the final allowable dry weather exceedance frequency of the 30-day geometric mean REC-1 WQOs is 0 percent in the receiving waters for both beaches and creeks.

2. *Measuring Progress Toward Attaining Wet Weather TMDLs*: For the wet weather TMDLs, the number of wet days and number of wet exceedance days during the critical wet year from the wet weather model were used to calculate the "existing" wet weather exceedance frequency that needs to be reduced to the allowable wet weather exceedance frequency. For example, if a watershed had 69 wet weather days during the critical wet year, and the wet weather model predicted that all the subwatersheds had an average of 41 wet weather exceedance days during the critical wet year, the "existing" wet weather exceedance frequency is 41/69=59%. For the watershed addressed by these TMDLs, the number of wet weather exceedance days for each indicator bacteria predicted by the wet weather model for the critical wet year are summarized below in Table [Insert Table Number]:

[Insert table number]. Modeled Estimate of Critical Year "Existing" Wet Weather Exceedance Frequencies by Watershed

Watershed	Number of Wet Days in Critical Wet Year	"Existing" Wet Weather Exceedance Frequency of Simgle Sample Maximum REC-1 WQO [a]		
		Fecal Coliform	Total Coliform	Enterococcus
San Joaquin Hills HSA/ Laguna Beach HSA	69	52%	54%	55%
Aliso HSA	69	59%	59%	62% (62%) [b]
Dana Point HSA	69	50%	50%	50%
Lower San Juan HSA	76	66%	66%	74% (72%) [b]
San Clemente HA	73	47%	47%	50%
San Luis Rey HU	90	68%	66%	76%
San Marcos HA	49	57%	57%	59%
San Dieguito HU	98	43%	44%	49%
Miramar Reservoir HA	94	30%	30%	30%
Scripps HA	57	52%	52%	52%
Tecolote HA	57	75%	75%	81% (79%) [b]
Mission San Diego HSA/ Santee HSA	86	70%	63%	79% (76%) [b]
Chollas HSA	65	60%	60%	63% (63%) [b]

a. Calculated by taking the average number of wet days that are predicted by the wet weather model to exceed the single sample maximum REC-1 water quality objective (400 MPN/100mL for fecal coliform, 10,000 MPN/100mL for total coliform, and 61 or 104 MPN/100mL) divided by the total number of wet days in the critical wet year (1993).

b. Allowable exceedance frequency calculated based on an *Enterococcus* single sample maximum REC-1 water quality objective of 61 MPN/100mL. Allowable exceedance frequency in parenthesis calculated based on an Enterococcus single sample maximum REC-1 water quality objective of 104 MPN/100mL, which may be applicable if the usage frequency of the creeks in these watersheds are designated as "moderately to lightly used area" or less frequent usage frequency in the Basin Plan.

> The "existing" wet weather exceedance frequencies should be reduced until the final allowable wet weather exceedance frequency is achieved by the end of the wet weather TMDL Compliance Schedule. If the TMDL Compliance Schedules include interim milestones that must be achieved to demonstrate progress toward attaining the wet weather TMDLs, reductions in the exceedance frequencies in the receiving water may be used. For example, if the "existing" wet weather exceedance frequency is 59 percent, the final wet weather exceedance frequency is 22 percent, and an interim milestone requires a 50 percent reduction, the exceedance frequency in the receiving water should be 41 percent or less by the interim milestone date. By the end of the wet weather TMDL Compliance Schedule, the allowable wet weather exceedance frequency is 22 percent in the receiving waters for both beaches and creeks.

The specific receiving waters (i.e., specific beaches and creek segments) identified on the 2002 303(d) List are shown in the TMDL Compliance Schedule in the following section. Because the REC-1 WQOs and allowable exceedance frequencies must be met throughout the 20 waterbodies addressed by these bacteria TMDLs, monitoring data from these locations and any other beach segments and/or creek monitoring points in the watersheds addressed by these TMDLs may be used to determine compliance.

Because the municipal MS4s are the most significant controllable sources of bacteria and the Phase I MS4s often discharge directly to the receiving waters addressed by these TMDLs, the municipal Phase I MS4s will be primarily responsible for conducting the monitoring. Caltrans will also have monitoring responsibilities. Phase II MS4s, agricultural dischargers, and other sources that are identified as significant sources (i.e., causing or contributing to exceedances in the receiving waters) will also be responsible for monitoring the receiving waters. Additional monitoring locations and frequency may be required to identify sources that need additional controls to reduce bacteria loads. While this TMDL Implementation Plan recommends monitoring at one or two locations for each waterbody, monitoring only one or two locations in the receiving waters may not provide the data to differentiate between and locate sources of bacteria in the watershed. Therefore, the municipal Phase I MS4s and other dischargers may wish to establish additional monitoring locations at key jurisdictional boundaries as part of their monitoring programs, especially in watersheds where Caltrans and Agriculture have been identified as sources contributing bacteria loads to the receiving waters.

Investigative orders, enforcement actions, WDRs, or conditional waiver of WDRs issued by the San Diego Water Board should require monitoring program plans that include, as applicable, the minimum monitoring locations and frequencies outlined above, but also provide the dischargers an opportunity to propose additional or alternative monitoring locations and frequency of monitoring events. The San Diego Water Board may also issue investigative orders, enforcement actions, WDRs, or conditional waiver of WDRs that specify additional or alternative monitoring, monitoring locations, and/or frequency of monitoring events.

The San Diego Water Board will coordinate, to the extent possible, the monitoring that is required by the dischargers, to minimize the monitoring resources required and maximize the temporal and spatial coverage of the data collection.

(j) TMDL Compliance Schedule

The purpose of these TMDLs is to restore the impaired beneficial uses of the waterbodies addressed through mandated reductions of bacteria from controllable point and nonpoint sources discharging to impaired waters. The requirements of these TMDLs mandate that the San Diego Water Board require dischargers improve water quality conditions in impaired waters by achieving the assigned WLAs and LAs. After the controllable sources achieve their assigned WLAs and LAs, the TMDLs in the receiving waters will be met and beneficial uses restored.

Until the dischargers achieve their assigned WLAs and LAs, the beneficial uses of the waterbodies addressed by this project will likely remain impaired, and the dischargers will continue violating one or more Basin Plan waste discharge prohibitions. The San Diego Water Board recognizes that restoring the beneficial uses of the waterbodies impaired by elevated bacteria levels will require time and multiple approaches to implement. Therefore, the bacteria TMDLs are expected to be implemented in a phased approach with a monitoring component to identify bacteria sources, determine the effectiveness of each phase, and guide the selection of BMPs, as outlined in the BMP programs proposed in the BLRPs or CLRPs that are accepted by the San Diego Water Board.

(1) Prioritization of Waterbodies

"Impaired" waters were prioritized based on several factors, because the waterbodies included in these TMDLs are numerous and diverse in terms of geographic location, swimmer accessibility and use, and degree of contamination.

Dischargers accountable for attaining load reductions in multiple watersheds may have difficulty providing the same level of effort simultaneously in all watersheds. In order to address these concerns a scheme for prioritizing implementation of bacteria reduction strategies in waterbodies within watersheds was developed. The prioritization scheme is largely based on the following criteria:

- Level of beach (marine or freshwater) swimmer usage;
- Frequency of exceedances of WQOs; and
- Existing programs designed to reduce bacteria loading to surface waters.

Dischargers were placed into one of three groups (North, Central, and South), based on geographic location. Group N consists of dischargers located in watersheds within Orange County, the northernmost region watersheds included in these TMDLs. Group C consists of dischargers located in watersheds in northern San Diego County, outside the City of San Diego limits, the central region watersheds included in these TMDLs. Group S consists of dischargers who are located in watersheds within and south of the City of San Diego limits, the southernmost region watersheds included in these TMDLs. Table [Insert table number] shows the dischargers in each of the three groups.

[Insert table number]. Responsible Municipalities and Lead Jurisdictions†

Watershed	Waterbody***	Segment or Area**	Responsible Municipalities	Group
San Joaquin Hills HSA (901.11) & Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Dr. - Riviera Way	City of Laguna Beach **County of Orange** Orange County Flood Control District Caltrans Owners/operators of small MS4s*	N
		at Heisler Park – North		
	Pacific Ocean Shoreline	at Main Laguna Beach	City of Aliso Viejo **County of Orange** City of Laguna Beach City of Laguna Woods Orange County Flood Control District Caltrans Owners/operators of small MS4s*	
		Laguna Beach at Ocean Avenue		
		Laguna Beach at Laguna Avenue		
		Laguna Beach at Cleo Street		
		Arch Cove at Bluebird Canyon Road		
		Laguna Beach at Dumond Drive		
Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place/Blue Lagoon Place at Aliso Beach	City of Aliso Viejo City of Laguna Beach City of Laguna Hills City of Laguna Niguel City of Laguna Woods City of Lake Forest City of Mission Viejo **County of Orange** Orange County Flood Control District Caltrans Owners/operators of small MS4s*	N
	Aliso Creek	The entire reach (7.2 miles) and associated tributaries Aliso Hills Channel, English Canyon Creek, Dairy Fork Creek, Sulphur Creek, and Wood Canyon Creek		
	Aliso Creek (mouth)	At creek mouth		
Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	City of Dana Point City of Laguna Beach City of Laguna Niguel **County of Orange** Orange County Flood Control District Caltrans Owners/operators of small MS4s*	N
		Aliso Beach at Table Rock Drive		
		1000 Steps Beach at Pacific Coast Hwy at Hospital (9th Ave)		
		at Salt Creek (large outlet)		
		Salt Creek Beach at Salt Creek service road		
		Salt Creek Beach at Dana Strand Road		

[Insert table number]. Responsible Municipalities and Lead Jurisdictions† (Cont'd)

Watershed	Waterbody***	Segment or Area**	Responsible Municipalities	Group
Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	At San Juan Creek	City of San Juan Capistrano City of Mission Viejo City of Laguna Hills City of Laguna Niguel City of Dana Point City of Rancho Santa Margarita **County of Orange** Orange County Flood Control District Caltrans Owners/operators of small MS4s*	N
	San Juan Creek	Lower 1 mile		
	San Juan Creek (mouth)	At creek mouth		
San Clemente HA (901.30)	Pacific Ocean Shoreline	Poche Beach	City of San Clemente **County of Orange** Orange County Flood Control District Dana Point Caltrans Owners/operators of small MS4s*	N
		Ole Hanson Beach Club Beach at Pico Drain		
		San Clemente City Beach at El Portal Street Stairs		
		San Clemente City Beach at Mariposa Street		
		San Clemente City Beach at Linda Lane		
		San Clemente City Beach at South Linda Lane		
		San Clemente City Beach at Lifeguard Headquarters		
		Under San Clemente Municipal Pier		
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)		
		San Clemente State Beach at Riviera Beach		
		San Clemente State Beach at Cypress Shores		
San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River Mouth	**City of Oceanside** City of Vista County of San Diego Caltrans Owners/operators of small MS4s* Controllable nonpoint sources	C

[Insert table number]. Responsible Municipalities and Lead Jurisdictions† (Cont'd)

Watershed	Waterbody***	Segment or Area**	Responsible Municipalities	Group
San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	City of Carlsbad **City of Encinitas** City of Escondido City of San Marcos County of San Diego Caltrans Owners/operators of small MS4s* Controllable nonpoint sources	C
San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon Mouth	City of Del Mar **City of Escondido** City of Poway City of San Diego City of Solana Beach County of San Diego Caltrans Owners/operators of small MS4s* Controllable nonpoint sources	C/S
Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	City of Del Mar **City of Poway** City of San Diego County of San Diego Caltrans Owners/operators of small MS4s*	S
Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	**City of San Diego** Owners/operators of small MS4s*	S
		La Jolla Shores Beach at Caminito Del Oro		
		La Jolla Shores Beach at Vallecitos		
		La Jolla Shores Beach at Ave de la Playa		
		at Casa Beach, Children's Pool		
		South Casa Beach at Coast Blvd.		
		Whispering Sands Beach at Ravina Street		
		Windansea Beach at Vista de la Playa		
		Windansea Beach at Bonair Street		
		Windansea Beach at Playa del Norte		
		Windansea Beach at Palomar Ave.		
		at Tourmaline Surf Park		
		Pacific Beach at Grand Ave.		

[Insert table number]. Responsible Municipalities and Lead Jurisdictions† (Cont'd)

Watershed	Waterbody***	Segment or Area**	Responsible Municipalities	Group
Tecolote HA (906.50)	Tecolote Creek	Tecolote Creek	**City of San Diego** Owners/operators of small MS4s*	S
Mission San Diego HSA (907.11) & Santee HSA (907.12)	Forrester Creek	Lower 1 mile	**City of El Cajon** City of Santee County of San Diego Caltrans Owners/operators of small MS4s*	S
	San Diego River, Lower	Lower 6 miles	**City of El Cajon** City of La Mesa City of San Diego City of Santee County of San Diego Caltrans Owners/operators of small MS4s* Padre Dam Water Treatment Facility	S
	Pacific Ocean Shoreline	At San Diego River Mouth at Dog Beach		
Chollas HSA (908.22)	Chollas Creek	Lower 1.2 miles	City of La Mesa City of Lemon Grove **City of San Diego** County of San Diego San Diego Unified Port District Caltrans Owners/operators of small MS4s*	S

† Developed based on the 2002 Clean Water Act Section 303(d) List
*Owners/operators of small MS4s are listed in Appendix Q.
** As listed on the 2002 Clean Water Act Section 303(d) List
*** Listings on the 2006 and 2008 303(d) List compared to listing shown above are provided in Appendix T to the Technical Report.

Impaired waters were given a priority number of 1, 2, or 3 with 1 being the highest priority. Priority 1 waters also included waterbodies likely to be removed from the Clean Water Act Section 303(d) List of Water Quality Limited Segments. Priority schemes are designated within watersheds. A prioritized list of impaired beaches and creeks included in this project is shown below in Table [Insert table number].

[Insert table number]. Prioritized List of Impaired Waters for TMDL Implementation

Watershed	Waterbody[b]	Segment or Area[a]	Priority
San Joaquin Hills HSA (901.11) & Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Dr. - Riviera Way	1
		at Heisler Park – North	1
	Pacific Ocean Shoreline	at Main Laguna Beach	1
		Laguna Beach at Ocean Avenue	1
		Laguna Beach at Laguna Avenue	1
		Laguna Beach at Cleo Street	1
		Arch Cove at Bluebird Canyon Road	1
		Laguna Beach at Dumond Drive	1
Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place/Blue Lagoon Place at Aliso Beach	1
	Aliso Creek	The entire reach (7.2 miles) and associated tributaries Aliso Hills Channel, English Canyon Creek, Dairy Fork Creek, Sulphur Creek, and Wood Canyon Creek	3
	Aliso Creek (mouth)	At creek mouth	3
Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	1
		Aliso Beach at Table Rock Drive	1
		1000 Steps Beach at Pacific Coast Hwy at Hospital (9th Ave)	1
		at Salt Creek (large outlet)	1
		Salt Creek Beach at Salt Creek service road	2
		Salt Creek Beach at Dana Strand Road	2
Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	At San Juan Creek	1
	San Juan Creek	Lower 1 mile	3
	San Juan Creek (mouth)	At creek mouth	1

[Insert table number]. Prioritized List of Impaired Waters for TMDL Implementation †
(Cont'd)

Watershed	Waterbody[b]	Segment or Area[a]	Priority
San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach (large outlet)	1
		Ole Hanson Beach Club Beach at Pico Drain	1
		San Clemente City Beach at Linda Lane	1
		San Clemente State Beach at Riviera Beach	1
		San Clemente City Beach at Mariposa Street	2
		San Clemente State Beach at Cypress Shores	2
		San Clemente City Beach at Lifeguard Headquarters	2
		Under San Clemente Municipal Pier	2
		San Clemente City Beach at El Portal Street Stairs	2
		San Clemente City Beach at South Linda Lane	3
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	3
San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River Mouth	2
San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	1
San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon Mouth	1
Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline[a]	Torrey Pines State Beach at Del Mar (Anderson Canyon)	1
Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	1
		La Jolla Shores Beach at Caminito Del Oro	1
		La Jolla Shores Beach at Vallecitos	1
		La Jolla Shores Beach at Ave de la Playa	1
		at Casa Beach, Children's Pool	1
		South Casa Beach at Coast Blvd.	1
		Whispering Sands Beach at Ravina Street	1
		Windansea Beach at Vista de la Playa	1
		Windansea Beach at Bonair Street	1
		Windansea Beach at Playa del Norte	1
		Windansea Beach at Palomar Ave.	1
		at Tourmaline Surf Park	1
		Pacific Beach at Grand Ave.	1
Tecolote HA (906.10)	Tecolote Creek	The entire reach and associated tributaries	1

[Insert table number]. Prioritized List of Impaired Waters for TMDL Implementation † (Cont'd)

Watershed	Waterbody[b]	Segment or Area[a]	Priority
Mission San Diego HSA (907.11) & Santee HSA (907.12)	San Diego River, Lower	Lower 6 miles	3
	Pacific Ocean Shoreline	At San Diego River Mouth at Dog Beach	3
	Forrester Creek	Lower 1 mile	3
Chollas HSA (908.22)	Chollas Creek	Bottom 1.2 miles	3

† Developed based on the 2002 Clean Water Act Section 303(d) List
a As listed on the 2002 Clean Water Act Section 303(d) List
b Listings on the 2006 and 2008 303(d) List compared to listing shown above are provided in Appendix T to the Technical Report.

Beginning with the 2008 303(d) List, specific beach segments of the Pacific Ocean shoreline are listed individually, and may not be identified in the same way as those segments listed in the table above. Several of the segments or areas in the list above have been delisted or redefined in the 2008 303(d) List. In addition, other segments or areas have been added to the Pacific Ocean shorelines listed above. The TMDLs that address the Pacific Ocean shorelines identified in the 2002 303(d) List are assumed to be applicable to all the beaches located on the shorelines of the hydrologic subareas (HSAs), hydrologic areas (HAs), and hydrologic units (HUs) listed above, or as listed individually in the 2008 and future 303(d) Lists.

The prioritized list above recognizes that there are segments or areas where bacterial water quality improvements are most likely to occur first (Priority 1), and segments or areas where bacterial water quality improvements are most likely to require more time to achieve (Priority 3). In some cases, receiving water limitations are already being met, resulting in the delisting of those segments or areas from the 2006 and/or 2008 303(d) Lists. The protection of the REC-1 beneficial use of those delisted segments or areas, however, must also be maintained, and those segments or areas must remain off future iterations of the 303(d) List.

The BLRPs or CLRPs that are developed are expected to focus on implementing BMP programs to reduce bacteria loads to those segments or areas where exceedances of the receiving water limitations continue to occur. The BMP programs that are included in the BLRPs or CLRPs should include short-term and long-term implementation strategies. The short-term strategies should be able to result in bacteria load reductions that can result in achieving the TMDLs for Priority 1 segments or areas. The long-term strategies should be able to result in bacteria load reductions that will result in achieving the TMDLs in all segments or areas by the end of the TMDL compliance schedules and maintain the protection of the REC-1 beneficial use after the end of the TMDL compliance schedules.

In the segments or areas where the receiving water limitations are being met, the BLRPs or CLRPs also need to include a monitoring component to ensure that protection of the REC-1 beneficial use is maintained. If receiving water limitations are exceeded in the future in

those locations, the BLRPs or CLRPs must include the implementation of a BMP program that will ensure that the TMDLs will be achieved by the end of the TMDL compliance schedules.

(2) Compliance Schedule

Full implementation of the TMDLs for indicator bacteria shall be completed as soon as possible, but no later than 10 years[81] from the effective date[82] for both the dry weather and wet weather TMDLs, unless an alternative compliance schedule is approved as part of a Comprehensive Load Reduction Plan, as described in the following section. The effective date of these TMDLs is [*insert date on which OAL approves this Basin Plan amendment]*.

The San Diego Water Board will require the Phase I MS4s to submit Bacteria Load Reduction Plan (BLRPs) outlining a proposed BMP program that will be capable of achieving the necessary load reductions required to attain the bacteria TMDLs in the receiving waters, acceptable to the Regional Board within 18 months after the effective date of these TMDLs. The Phase I MS4 BLRPs should be incorporated into their Watershed Runoff Management Programs. Caltrans will also be required to develop and submit BLRPs outlining a proposed BMP program that will be capable of achieving the necessary load reductions required to attain the TMDLs in the receiving waters, acceptable to the Regional Board, within 18 months after the effective date of these TMDLs. To the extent possible, the Phase I MS4s and Caltrans should develop and coordinate the elements of their BLRPs together. The BLRPs will allow the Phase I MS4s and Caltrans to propose a compliance schedule for WQBELs that implement the bacteria TMDLs. The compliance schedule for the Phase I MS4s and Caltrans to attain their respective WLAs and the TMDLs in the receiving waters will be based on the BMP program proposed in the BLRPs.

For watersheds in [Insert table number] where there are no longer any impairments listed on the 2008 303(d) List, the Phase I MS4s and Caltrans are not required to submit a BLRP or CLRP within 18 months of the effective date of these TMDLs. If, however, any segment of a waterbody for the watershed (Pacific Ocean shoreline, creek, or mouth as shown in Table 11-5) is re-listed on a future 303(d) List for any type of indicator bacteria, the Phase I MS4s and Caltrans will be required to submit a BLRP or CLRP within 6 months of the adoption of the 303(d) List by the San Diego Regional Board.

If the Phase I MS4s and Caltrans choose to submit BLRPs that address only bacteria, the proposed schedule for compliance with the wet weather and dry weather TMDLs cannot extend beyond 10 years from the effective date, and must include at least a milestone for achieving a 50 percent exceedance frequency reduction. Additional milestones for achieving exceedance frequency reductions (e.g., 25 and 75 percent) are encouraged, but may also be required by the Regional Board. If the BLRPs do not include a proposed compliance schedule that is acceptable to the Regional Board, the compliance schedule will be as follows.

[81] If a Comprehensive Load Reduction Plan (CLRP) is developed to address several pollutants, including bacteria, the implementation of the wet weather bacteria TMDLs shall be completed as soon as possible, but no later than 20 years from the effective date. See Alternative Compliance Schedules under section (j)(3).
[82] The effective date is the date the Office of Administrative Law approves this Basin Plan amendment.

The compliance schedule for achieving the dry weather and wet weather bacteria TMDLs (Tables [Insert table numbers], respectively) are structured in a phased manner, with 100 percent of dry weather exceedance frequency reductions, and 100 percent of wet weather exceedance frequency reductions within 10 years from the effective date. At the end of the dry weather TMDL compliance schedule, the receiving waters must not exceed the 30-day geometric mean REC-1 WQOs more than 0 percent of the time. At the end of the wet weather TMDL compliance schedule, the receiving waters must not exceed the single sample maximum REC-1 WQOs more than the wet weather allowable exceedance frequency. All of these reductions are aimed at restoring water quality to a level that supports REC-1 beneficial uses in the ocean shoreline and in impaired creeks. These reductions required by the compliance schedule vary on the timeline based on the priority scheme described in Table [Insert table number]. Intermediate milestone reductions in bacteria wasteloads are required sooner in the higher priority waters.

[Insert Table Number]. Dry Weather Compliance Schedule and Milestones for Achieving Exceedance Frequency Reductions

Compliance Year (year after OAL approval)	Required Exceedance Frequency Reduction		
	Priority 1	**Priority 2**	**Priority 3**
5	50% (All Dry Weather)		
6		50% (All Dry Weather)	
7			50% (All Dry Weather)
10+	100% (All Dry Weather)	100% (All Dry Weather)	100% (All Dry Weather)

[Insert Table Number]. Wet Weather Compliance Schedule and Milestones for Achieving Exceedance Frequency Reductions

Compliance Year (year after OAL approval)	Required Exceedance Frequency Reduction		
	Priority 1	**Priority 2**	**Priority 3**
5	50% (All Wet Weather)		
6		50% (All Wet Weather)	
7			50% (All Wet Weather)
10+	100% (All Wet Weather)	100% (All Wet Weather)	100% (All Wet Weather)

The first four years of the compliance schedules above do not require any exceedance frequency reductions from current conditions. These years will provide the dischargers time to identify sources, develop plans and implement enhanced and expanded BMPs capable of achieving the mandated decreases in exceedance frequencies of the REC-1 WQOs in the impaired beaches and creeks. The Regional Board may also include

additional milestones for achieving exceedance frequency reductions (e.g., 25 and 75 percent).

If appropriate and acceptable to the Regional Board, the proposed compliance schedules included in the BLRPs will be incorporated into the various TMDL implementing orders, such as the municipal Phase I MS4 stormwater WDRs and NPDES requirements. Otherwise, the compliance schedules given above will be implemented.

(3) Alternative Compliance Schedules

The dischargers to Chollas Creek in the Chollas HSA watershed will have to address reductions from multiple water quality improvement projects in addition to bacteria, namely TMDLs for copper, lead, zinc, and diazinon,[83] and a trash reduction program. Addressing multiple pollutants (in addition to bacteria) will require the development and submittal of a Comprehensive Load Reduction Plan (CLRP) by the Phase I MS4s and Caltrans. The CLRP will allow the Phase I MS4s and Caltrans to propose a compliance schedule to address impairments due to loads from multiple pollutants, including bacteria.

Full implementation of the TMDLs for indicator bacteria included under the CLRP for the Chollas HSA watershed shall be completed as soon as possible, but cannot extend beyond 10 years for the dry weather bacteria TMDLs and 20 years for the wet weather bacteria TMDLs. The proposed compliance schedules for the bacteria TMDLs included under the CLRP must include at least a milestone for achieving a 50 percent exceedance frequency reduction. Additional milestones for achieving exceedance frequency reductions (e.g., 25 and 75 percent) are encouraged. If the CLRP for the Chollas HSA watershed does not include a proposed compliance schedule, specifically for bacteria, the compliance schedule will be as given in Table [*Insert table number*].

[*Insert table number*]. *Alternative Compliance Schedule*
Chollas Creek

Compliance Year*	Exceedance Frequency Reduction Milestone**
7	50% for dry weather
10	100% for dry weather 50% for wet weather
20	100% for wet weather

* Year after effective date for the TMDL that initiated the development of the CLRP.
** The Regional Board may also include additional milestones for achieving exceedance frequency reductions (e.g., 25 and 75 percent).

Likewise, dischargers in other bacteria-impaired watersheds may also find that undertaking concurrent load reduction programs for other pollutant constituents (e.g. metals, pesticides, trash, nutrients, sediment, etc.) together with the bacteria load reduction requirements in these TMDLs, is more cost effective, and has fewer potential environmental impacts from structural BMP construction. In these cases, the dischargers may develop and submit a CLRP for all constituents of concern in lieu of the BLRP, and to

[83] As described in *Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek, Tributary to San Diego Bay*, adopted under Resolution No. R9-2007-0043, and *Total Maximum Daily Load for Diazinon in Chollas Creek Watershed, San Diego County*, adopted under Resolution No. R9-2002-0123.

propose an appropriately tailored alternative compliance schedule. Proposed alternative compliance schedules tailored under this provision may not extend beyond 10 years for the dry weather bacteria TMDLs and 20 years for the wet weather bacteria TMDLs from the effective date, and must include at least a milestone for achieving a 50 percent exceedance frequency reduction. Additional milestones for achieving exceedance frequency reductions (e.g., 25 and 75 percent) are encouraged, but may also be required by the Regional Board.

If appropriate and acceptable to the Regional Board, the proposed alternative compliance schedules included in the CLRPs will be incorporated into the various TMDL implementing orders. Otherwise, the alternative compliance schedule given above as an example for Chollas Creek will be implemented for a CLRP that is developed for any other watershed.

(k) TMDL Implementation Milestones

Accomplishing the goals of the implementation plan will be achieved by cooperative participation from all responsible parties, including the San Diego Water Board. Major milestones are described in Table [*Insert table number*].

[*Insert table number*]. *TMDL Implementation Milestones*

Item	Implementation Action	Responsible Parties	Date
1	Obtain approval of Beaches and Creeks Indicator Bacteria TMDLs from the State Water Board, OAL, and USEPA.	San Diego Water Board	Effective date[a] [Insert Date of OAL Approval]
2	Issue investigative orders to Phase I MS4s and Caltrans requiring the development and submittal of BLRPs or CLRPs acceptable to the Regional Board within 18 months of effective date	San Diego Water Board	As soon as possible (if necessary)
3	Issue, reissue, or revise general WDRs and NPDES requirements for the Phase I MS4s to incorporate the requirements for complying with the TMDLs and MS4 WLAs.	San Diego Water Board	Within 5 years of effective date[b]
4	Issue, reissue, or revise general WDRs and NPDES requirements for Caltrans to incorporate the requirements for complying with the TMDLs and Caltrans WLAs.	San Diego Water Board, State Water Board	Within 5 years of effective date[b]
5	Issue, reissue, or revise the WDRs and NPDES requirements for POTWs and wastewater collection systems to incorporate new requirements for sewer line surveillance and maintenance, consistent with the zero WLA.	San Diego Water Board	Within 5 years of effective date[b]
6	Meet 50% Dry Weather exceedance frequency reductions required to achieve TMDLs in receiving waters in Priority 1 watersheds.	Municipal Dischargers,[d] Caltrans, Agriculture/Livestock Dischargers	5 years after effective date[b]
7	Meet 50% Wet Weather exceedance frequency reductions required to achieve TMDLs in receiving waters in Priority 1 watersheds.	Municipal Dischargers,[d] Caltrans, Agriculture/Livestock Dischargers	5 years after effective date[b]
8	Meet 50% Dry Weather exceedance frequency reductions required to achieve TMDLs in receiving waters in Priority 2 watersheds.	Municipal Dischargers,[d] Caltrans, Agriculture/Livestock Dischargers	6 years after effective date[b]
9	Meet 50% Wet Weather exceedance frequency reductions required to achieve TMDLs in receiving waters in Priority 2 watersheds.	Municipal Dischargers,[d] Caltrans, Agriculture/Livestock Dischargers	6 years after effective date[b]
10	Meet 50% Dry Weather exceedance frequency reductions required to achieve TMDLs in receiving waters in Priority 3 watersheds.	Municipal Dischargers,[d] Caltrans, Agriculture/Livestock Dischargers	7 years after effective date[b]
11	Meet 50% Wet Weather exceedance frequency reductions required to achieve TMDLs in receiving waters in Priority 3 watersheds.	Municipal Dischargers,[d] Caltrans, Agriculture/Livestock Dischargers	7 years after effective date[b]
12	Meet 100% Dry Weather exceedance frequency reductions required to achieve TMDLs in receiving waters in all watersheds.	Municipal Dischargers,[d] Caltrans, Agriculture/Livestock Dischargers	10 years after effective date[b,c]

Item	Implementation Action	Responsible Parties	Date
13	Meet 100% Wet Weather exceedance frequency reductions required to achieve TMDLs in receiving waters in all watersheds.	Municipal Dischargers,[d] Caltrans, Agriculture/Livestock Dischargers	10 to 20 years after effective date[b,c]
14	Amend discharge conditions of appropriate waivers to be consistent with the requirements for complying with the TMDLs and Agriculture LAs.	San Diego Water Board	As needed after effective date
15	Issue individual or general WDRs or Basin Plan prohibitions consistent with the TMDLs and LAs for controllable nonpoint source discharges not eligible conditional waivers.	San Diego Water Board	As needed after effective date
16	Submit BLRP or CLRP Progress Reports to San Diego Water Board	Phase I MS4s, Phase II MS4s, Caltrans	In accordance with BLRPs or CLRPs accepted by the Regional Board
17	Enroll Phase II MS4s identified as significant sources of bacteria to receiving waters under State Water Board general WDRs and NPDES requirements.	San Diego Water Board	As needed after effective date
18	Issue individual or general WDRs and NPDES requirements consistent with the TMDLs and WLAs for specific Phase II MS4s or category of Phase II MS4s.	San Diego Water Board	As needed after effective date
19	Take enforcement actions against controllable point sources and nonpoint sources to attain compliance with the WLAs and LAs.	San Diego Water Board	As needed after effective date
20	Recommend TMDL-related projects as high priority for grant funds.	San Diego Water Board	As needed after effective date
21	Amend the Basin Plan and/or provisions of these TMDLs (e.g., usage frequency or creeks or watershed-specific allowable exceedance frequency) based on evidence provided by dischargers and/or other entities	San Diego Water Board, Municipal Dischargers,[d] Caltrans, Agriculture/Livestock Dischargers	Within 5 years after effective date [e]

[a] Effective date = date of approval by OAL

[b] May defer to alternative compliance schedule proposed in BLRPs or CLRPs that have been incorporated into implementing orders (e.g., WDRs, cleanup and abatement orders)

[c] Compliance schedules for dry weather and wet weather TMDLs proposed in BLRPs cannot extend beyond 10 years from the effective date. Compliance schedules proposed in CLRPs for dry weather TMDLs cannot extend beyond 10 years and for wet weather TMDLs cannot extend beyond 20 years from the effective date.

[d] Because there are no Phase II MS4s enrolled under the State General Permit for Small MS4s, discharges from Phase II MS4s are not permitted (i.e., WLA = 0) and Municipal Dischargers are only the Phase I MS4s in this Implementation Milestone item. When a Phase II MS4 is enrolled under the State General Permit for Small MS4s or issued an individual NPDES permit, the Municipal Dischargers will be both the Phase I MS4s and Phase II MS4s in this Implementation Milestone item.

[e] If no Basin Plan amendment has been initiated within 5 years of the effective date of this TMDL Basin Plan amendment, and the Executive Officer determines, with Regional Board concurrence, that insufficient data exist to support the initiation of a Basin Plan amendment, a subsequent Basin Plan amendment to revise the requirements and/or provisions for the implementation of these TMDLs will not be initiated until the Executive Officer determines the conditions to initiate a Basin Plan amendment are met.

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California Regional Water Quality Control Board
San Diego Region

Revised Total Maximum Daily Loads for Indicator Bacteria Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

FINAL
TECHNICAL REPORT
February 10, 2010

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Documents also are available at: http://www.waterboards.ca.gov/sandiego.

Revised Total Maximum Daily Loads For Indicator Bacteria Project I – Twenty Beaches and Creeks in The San Diego Region (Including Tecolote Creek)

Final
Technical Report

Adopted by the
California Regional Water Quality Control Board
San Diego Region
On February 10, 2010

Approved by the
State Water Resources Control Board
on _____, 201x
and the
Office of Administrative Law
on _____,201x
and the
United States Environmental Protection Agency
on _____. 201x

Cover Photograph: Aliso Beach, Orange County (2002) by Christina Arias

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List of Acronyms and Abbreviations

ac	Acre
AGR	Agricultural supply
ALERT	Automatic Local Evaluation in Real-Time
AQUA	Aquaculture
Basin Plan	Water Quality Control Plan for the San Diego Basin (9)
BASINS	Better Assessment Science Integrating Point and Nonpoint Sources
BIOL	Preservation of biological habitats of special significance
BLRP	Bacteria Load Reduction Plan
BMP(s)	Best Management Practice(s)
CAFOs	Concentrated animal feeding operations
Caltrans	California Department of Transportation
CAMMPR	California's Management Measures for Polluted Runoff
CASQA	California Stormwater Quality Association
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
cfs	Cubic feet per second
CIMIS	California Irrigation Management Information System
CLRP	Comprehensive Load Reduction Plan
COLD	Cold freshwater habitat
COMM	Commercial and sport fishing
CWA	Clean Water Act
DEH	San Diego County Department of Environmental Health
DHS	Department of Health Services
EST	Estuarine habitat
EQIP	Environmental Quality Incentives Program
FRSH	Freshwater replenishment
GWR	Ground water recharge
HA	Hydrologic Area
HSA	Hydrologic Sub Area
HSPF	Hydrological Simulation Program–FORTRAN
HU	Hydrologic Unit
IND	Industrial water supply
LA	Load allocations
LAX	Los Angeles Airport
Los Angeles Water Board	California Regional Water Quality Control Board, Los Angeles Region
LSPC	Loading Simulation Program in C++

MEP	Maximum extent practicable
MAR	Marine habitat
MIGR	Migration of aquatic organisms
mL	milliliter
MM	Management measure
MOS	Margin of safety
MP	Management practice
MPN	Most probable number of bacteria colonies
MRLC	Multi-Resolution Land Characteristic
MS4	Municipal separate storm sewer systems
MUN	Municipal and domestic supply
Municipal Dischargers	Persons owning and/or operating MS4s other than Caltrans
NAV	Navigation
NCDC	National Climatic Data Center
NHD	National Hydrography Dataset
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of intent
NPDES	National Pollutant Discharge Elimination System
NPS	Nonpoint source
NRCS	Natural Resources Conservation Service
OAL	Office of Administrative Law
Ocean Plan	Water Quality Control Plan for Ocean Waters of California
POTW(s)	Publicly owned treatment work(s)
POW	Hydropower generation
PROC	Industrial process supply
RARE	Rare and endangered species
REC-1	Water contact recreation
REC-2	Non-contact water recreation
RWD	Report of waste discharge
San Diego Water Board	California Regional Water Quality Control Board, San Diego Region
SAL	Inland saline water habitat
SAG	Stakeholder Advisory Group
SANDAG	San Diego Regional Planning Agency
SCAG	Southern California Association of Governments
SCCWRP	Southern California Coastal Water Research Project
SHELL	Shellfish harvesting
SPWN	Spawning, reproduction, and/or early development
State Water Board	State Water Resources Control Board
STATSGO	State soil geographic

TBEL(s)	Technology based effluent limitation(s)
TMDL(s)	Total maximum daily load(s)
U.S.	United States
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey
WARM	Warm freshwater habitat
WDR(s)	Waste discharge requirement(s)
WILD	Wildlife habitat
WLA(s)	Wasteload allocation(s)
WQBEL(s)	Water quality based effluent limitation(s)
WQO(s)	Water quality objective(s)
WQS	Water quality standards
yr	Year

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1 Executive Summary

The purpose of this technical report is to present the development of the Total Maximum Daily Loads (TMDLs) for 20 beaches and creeks impaired by indicator bacteria (fecal coliform, total coliform, and/or enterococcus) in the San Diego Region. A TMDL represents the maximum amount of the pollutant of concern that the waterbody can receive and still attain water quality standards. Once this maximum pollutant amount has been calculated, it is then divided up and allocated among all of the contributing sources in the watershed. For each of the 20 waterbodies addressed by this TMDL project, separate wet weather TMDLs and dry weather TMDLs were developed for each of the three indicator bacteria.

This technical report is a revised version of the technical report for the Total Maximum Daily Loads for Indicator Bacteria, Project I – Beaches and Creeks in the San Diego Region (or Bacteria TMDLs Project I) adopted by the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) on December 12, 2007. Bacteria TMDLs Project I addressed 19 beaches and creeks listed as impaired by indicator bacteria on the 2002 Clean Water Act Section 303(d) List of Water Quality Limited Segments (303(d) List). Because the State Water Board had not yet considered and approved Bacteria TMDLs Project I, and revisions to Bacteria TMDLs Project I would likely be required soon after its anticipated approval, the San Diego Water Board withdrew Bacteria TMDLs Project I from State Water Board consideration for approval on December 17, 2008.

Significant revisions have been made to the Bacteria Project I technical report, but the underlying technical approach and assumptions used for calculating the TMDLs have not been changed. The revisions are primarily associated with revisions that are required due to the adoption and approval of the Reference System and Antidegradation Approach/Natural Sources Exclusion Approach (RSAA/NSEA) Basin Plan amendment.[1] The "final" TMDLs have been removed and the "interim" TMDLs, which incorporate a reference system approach as discussed below, are the only TMDLs included in the project. Additionally, because the same modeling approaches can be used, and the resources available for the development of TMDLs have become more limited, the bacteria TMDL for Tecolote Creek that was being developed under a separate project has been incorporated in to these bacteria TMDLs for beaches and creeks in the San Diego Region. Finally, the TMDL Implementation Plan has been revised to provide additional guidance on potential actions that may be taken by the San Diego Water Board and/or other entities to implement the TMDLs, minimum monitoring that will be required to assess the implementation of the TMDLs, and the potential for alternative compliance schedules.

The 20 beaches and creeks addressed by this revised TMDL project (Table 1-1) are located within or hydraulically downstream of five watersheds in Orange County (with a small portion in Riverside County) and eight watersheds in San Diego County. Most of the waterways flow directly to the Pacific Ocean, except Tecolote Creek, which flows to Mission Bay, and Chollas Creek, which flows to San Diego Bay. The combined watersheds cover roughly 1,740 square miles (4,500 square kilometers).

[1] Resolution No. R9-2008-0028, *Implementation Provisions for Indicator Bacteria Water Quality Objectives to Account for Loading from Natural Uncontrollable Sources Within the Context of a TMDL,* adopted by the San Diego Water Board on May 14, 2008, approved by the State Water Board on March 17, 2009, approved by OAL on June 25, 2009, and approved by USEPA on September 16, 2009, 2009.

Table 1-1. Bacteria-Impaired Water Quality Limited Segments Addressed in This Analysis

Watershed	Type of Listing	Impaired Waterbody Name [a,c]	Drainage Area (mi^2)[b]	Number of Listings
San Joaquin HSA/ Laguna Beach HSA	Shoreline	Pacific Ocean Shoreline	13.94	2 [b]
Aliso HSA	Creek Estuary Shoreline	Aliso Creek Aliso Creek (mouth) Pacific Ocean Shoreline	35.74	3
Dana Point HSA	Shoreline	Pacific Ocean Shoreline	8.89	1
Lower San Juan HSA	Creek Estuary Shoreline	San Juan Creek San Juan Creek (mouth) Pacific Ocean Shoreline	177.18	3
San Clemente HA	Shoreline	Pacific Ocean Shoreline	18.78	1
San Luis Rey HU	Shoreline	Pacific Ocean Shoreline (at San Luis Rey River mouth)	560.42 (354.12)	1
San Marcos HA	Shoreline	Pacific Ocean Shoreline	1.43	1
San Dieguito HU	Shoreline	Pacific Ocean Shoreline (at San Dieguito Lagoon mouth)	346.22 (292.24)	1
Miramar Reservoir HA	Shoreline	Pacific Ocean Shoreline	93.73	1
Scripps HA	Shoreline	Pacific Ocean Shoreline	8.75	1
Tecolote HA	Creek	Tecolote Creek	10.00	1
Mission San Diego HSA/ Santee HSA	Creek Creek Shoreline	Forester Creek San Diego River (Lower) Pacific Ocean Shoreline	436.48 (173.95)	3
Chollas HSA	Creek	Chollas Creek	26.80	1
TOTAL NUMBER OF LISTINGS				**20**

Note: HSA = hydrologic subarea; HA = hydrologic area; HU = hydrologic unit

[a] Listed as impaired on the 2002 Clean Water Act Section 303(d) List of Water Quality Limited Segments due to exceedances of the water contact recreation (REC-1) water quality objectives (WQOs) for fecal coliform, and/or total coliform, and/or enterococci indicator bacteria.

[b] Two separate segments of the Pacific Ocean Shoreline are included in the listings for the San Juan Hills/Laguna Beach watershed.

[c] Listings on the 2006 and 2008 303(d) List compared to listing shown above are provided in Appendix T to the Technical Report.

Fecal bacteria originate from the intestinal biota of warm-blooded animals, and their presence in surface water is used as an indicator of human pathogens. Pathogens can cause illness in recreational water users. Bacteria have been historically used as indicators of human pathogens because bacteria are easier and less costly to measure than the pathogens themselves. As required by section 303(d) of the Clean Water Act, TMDLs for indicator bacteria were developed to address these 20 bacteria-impaired waterbodies in the San Diego Region.

Bacteria densities in these waterbodies have historically exceeded the numeric water quality objectives (WQOs) for total coliform (TC), fecal coliform (FC), and/or *Enterococcus* (ENT) indicator bacteria as defined in the San Diego Water Board's *Water Quality Control Plan for the San Diego Basin (9)* (Basin Plan) and/or State Water Board's *Water Quality Control Plan for*

Ocean Waters for California (Ocean Plan). These exceedances threaten or impair the recreational water contact (REC-1) and non-water contact (REC-2) beneficial uses of these waterbodies.

Because the climate in southern California has two distinct hydrological patterns, two modeling approaches were developed for estimating existing bacteria loads and allowable bacteria loads (i.e., TMDLs) to account for seasonal variations. One modeling approach specifically quantified loading during wet weather events (storms), which tend to be episodic and short in duration, and characterized by rapid wash-off and transport of very high bacteria loads from all land use types. The other modeling approach quantified bacteria loading during dry weather conditions, which tend to have flows and loads much smaller in magnitude than wet weather conditions, do not occur from all land use types, and are more uniform than stormflow.

Different numeric targets were selected for calculating the allowable bacteria loads (i.e., TMDLs) under wet weather and dry weather conditions. Single sample maximum WQOs were used as the basis of the wet weather numeric targets. Geometric mean WQOs were used as the basis of the dry weather numeric targets. Although the dry weather TMDLs were calculated based on the geometric mean WQOs, the single sample maximum WQOs must also be met pursuant to the Ocean Plan and Basin Plan. Likewise, even though the wet weather TMDLs were calculated based on the single sample maximum WQOs, the geometric mean WQOs must also be met.

Another difference between the wet weather and dry weather TMDL calculations, besides the use of single sample maximum WQOs versus geometric mean WQOs, is the frequencies that the WQOs are allowed to be exceeded. Allowable exceedance frequencies are based on a reference system approach.[2] The purpose of the reference system approach is to account for the natural, and largely uncontrollable sources of bacteria (e.g., bird and wildlife feces) in the loads generated in the watersheds and at the beaches that can, by themselves, cause exceedances of WQOs. The reference system approach is utilized in the calculation of the wet weather TMDLs by allowing a 22 percent exceedance frequency of the single sample maximum WQOs for REC-1. The dry weather TMDLs are calculated using a 0 percent allowable exceedance frequency.

Bacteria sources were quantified by land-use type since bacteria loading can be highly correlated with land-use practices. Bacteria loads attributable to point sources are primarily discharged from land uses associated with municipal separate storm sewer systems (MS4s). The principal MS4s contributing bacteria to receiving waters are owned or operated by either municipalities located throughout the watersheds or Caltrans. Additionally, there are wastewater treatment plants located in the watersheds addressed by these TMDLs. However, most of the effluent from these facilities is discharged to the Pacific Ocean through offshore ocean outfalls, and was therefore not included in the TMDL calculations. The only exception is Padre Dam, which discharges effluent to the San Diego River via a series of ponds that feed the Santee Lakes.

[2] Allowing exceedances of the bacteria water quality objectives is authorized within the context of a TMDL pursuant to Resolution No. R9-2008-0028, *Implementation Provisions for Indicator Bacteria Water Quality Objectives to Account for Loading from Natural Uncontrollable Sources Within the Context of a TMDL,* adopted by the San Diego Water Board on May 14, 2008, approved by the State Water Board on March 17, 2009, approved by OAL on June 25, 2009, and approved by USEPA on September 16, 2009.

Nonpoint sources were separated into controllable and uncontrollable categories. Controllable nonpoint sources are identified by land use types and coverages. Controllable nonpoint sources include land uses associated with agriculture, dairy/intensive livestock, and horse ranches (collectively referred to as agriculture land uses). These were considered controllable because the land uses are anthropogenic in nature, and load reductions can be reasonably expected with the implementation of suitable management measures. Uncontrollable nonpoint sources include loads from open recreation, open space, and water land uses (collectively referred to as open space land uses). Loads from these areas are considered uncontrollable because they come from mostly natural sources (e.g. bird and wildlife feces).

A TMDL is equal to the sum of the wasteload allocations (WLAs), load allocations (LAs), and a margin of safety (MOS). Because of the conservative assumptions that were included in the development of the TMDLs, there was no explicit margin of safety included. Instead, the TMDLs include an implicit margin of safety (i.e., MOS = 0) by including conservative assumptions throughout the TMDL analysis. The TMDL is divided up and assigned among the known point sources as wasteload allocations (WLAs) and nonpoint sources as load allocations (LAs). Portions of the TMDLs were assigned as WLAs to Municipal MS4s and Caltrans, and as LAs to Agriculture and Open Space land uses. Discharges from Municipal MS4s, Caltrans, and Agriculture land uses are considered controllable. Discharges from Open Space land uses are considered uncontrollable.

In general, controllable point and nonpoint sources generating less than 5 percent of the total loads (e.g., Caltrans and/or Agriculture) were assigned WLAs and LAs equal to their existing loads, resulting in no load reduction requirements. While they are not required to reduce their existing loads, this means, however, that these sources are not allowed to increase their loads over time, and cannot cause exceedances of the numeric WQOs in the receiving waters.

For the wet weather TMDLs, the Caltrans WLAs (which generates less than 5 percent of the total load in all watersheds) and Open Space LAs (which are uncontrollable) were set equal to the existing wet weather loads, thus load reductions are not required. The remaining portions of the TMDLs were assigned to Municipal MS4s WLAs and Agriculture LAs. In watersheds where the bacteria load from Agriculture land uses were less than 5 percent of the total existing wet weather load, the wet weather Agriculture LAs were set equal to the existing wet weather load, and no load reductions were required. Required load reductions were calculated for Municipal MS4s to achieve the wet weather MS4 WLAs, and for Agriculture land uses, in watersheds where the existing wet weather loads for all indicator bacteria were more than 5 percent of total existing wet weather load, to achieve the wet weather Agriculture LAs.

For the dry weather TMDLs, the discharges and bacteria loads from land uses associated with Caltrans, Agriculture, and Open Space land uses are expected to be zero. This is because there is no flow source that is expected during dry weather to wash bacteria off of these land uses. Thus the dry weather Caltrans WLAs, Agriculture LAs, and Open Space LAs were set equal to zero. The total dry weather TMDLs were assigned to the Municipal MS4s WLAs. Required load reductions were calculated for Municipal MS4s to achieve the dry weather MS4 WLAs.

For both wet weather and dry weather TMDLs, any controllable point source or nonpoint sources that has not been assigned a WLA or LAs, or has a WLA or LA of zero (i.e., WLA or LA = 0) is not expected or allowed to discharge a pollutant load as part of the TMDL. Sources that are assigned an allowable mass load equal to the existing mass load (i.e., WLA or LA = existing mass load) are not allowed to increase their pollutant loads over time.

In order to ensure that the TMDLs are achieved in the receiving waters, and as required under state law, an Implementation Plan was developed. The goal of the Implementation Plan is restore the impaired beneficial uses of the waterbodies addressed by these TMDLs. TMDLs are not self-implementing or directly enforceable against sources in the watershed. Instead, TMDLs must be implemented through the programs or authorities of the San Diego Water Board and/or other entities to compel dischargers responsible for controllable sources to achieve the pollutant load reductions identified by a TMDL analysis to restore and protect the designated beneficial uses of a waterbody.

The San Diego Water Board uses its authorities and programs to regulate discharges from the controllable sources in the Region. The controllable sources that are subject to regulation are, in turn, responsible for complying with the requirements issued the San Diego Water Board. Ultimately, the dischargers subject to regulation are responsible for reducing their pollutant loads in order for the TMDLs, WLAs, and LAs to be achieved. When all discharges from controllable sources meet their assigned WLAs and LAs, and the numeric targets (i.e., numeric WQOs and allowable exceedance frequencies) are also met in the receiving waters, compliance with the TMDLs will be achieved.

The authorities that are available to the San Diego Water Board to regulate dischargers are given under the Porter-Cologne Water Quality Control Act (Division 7 of the Water Code). The available regulatory authorities include incorporating discharge prohibitions in to the Basin Plan, issuing individual or general waste discharge requirements (WDRs), or issuing individual or general conditional waivers of WDRs. The San Diego Water Board has the authority to enforce Basin Plan prohibitions, WDRs, or conditional waivers of WDRs through the issuance of enforcements actions (e.g., time schedule orders, cleanup and abatement orders, cease and desist orders, administrative civil liabilities). The San Diego Water Board also has the authority to require monitoring and/or technical reports from dischargers, which may be used to support the development, refinement, and/or implementation of TMDLs, WLAs, and/or LAs.

The TMDLs will be implemented primarily by revising and re-issuing the existing WDRs and National Pollutant Discharge Elimination System (NPDES) requirements that have been issued for discharges from Phase I MS4s and Caltrans MS4s. Federal regulations require that NPDES requirements incorporate water quality based effluent limitations (WQBELs) that must be consistent with the requirements and assumptions of any available WLAs,[3] which may be expressed as numeric effluent limitations, when feasible, and/or as a best management practice (BMP) program of expanded or better-tailored BMPs.[4]

[3] Code of Federal Regulations Title 40 section 122.44(d)(1)(vii)(B)
[4] Code of Federal Regulations Title 40 section 122.44(k)(2)&(3)

When developing WQBELs to be incorporated in to NPDES requirements, the following summarizes the requirements and assumptions included in the calculation of the TMDLs, WLAs, and LAs that should be considered:

Numeric Targets

- The numeric targets consist of the numeric WQOs from the Basin Plan and/or Ocean Plan and an allowable exceedance frequency.
- The numeric targets for the wet weather TMDLs consist of the REC-1 single sample maximum WQOs and a 22 percent allowable exceedance frequency.
- The numeric targets for dry weather TMDLs consist of the REC-1 30-day geometric metric mean WQOs and a 0 percent allowable exceedance frequency.
- The TMDL calculations are based on either the single sample maximum WQO (for wet weather) or 30-day geometric mean WQOs (for dry weather), but both the single sample maximum and 30-day geometric mean numeric WQOs and allowable exceedance frequencies must be met in the receiving waters.
- The TMDLs, and in turn the WLAs for point sources and LAs for nonpoint sources, are assumed to be met when the numeric targets for all three indicator bacteria (fecal coliform, total coliform, and *Enterococcus*) are met in the receiving waters.

Critical Conditions

- The mass-load based TMDLs were calculated under critical conditions consisting of flows generated during a critical wet year and estimation of existing and allowable loads at a critical location.
- The flow from the critical wet year is a "worst case" annual wet weather flow and loading scenario. Actual annual wet weather flow and loading will vary from year to year.
- The mass-load based TMDLs calculated at the critical location are dependent on the flow, which can vary from year to year, but the numeric targets will not vary. When the numeric targets are met in the receiving water, the TMDLs are assumed to be met.
- The mass-load based TMDLs, WLAs, and LAs are calculated for the critical location, but the appropriate numeric targets (based on freshwater and/or saltwater REC-1 WQOs and allowable exceedance frequencies) must be met throughout the waterbodies addressed by these TMDLs.

Linkage Analysis

- The linkage analysis was performed by utilizing calibrated and validated models to predict flow from surface runoff and predict bacteria densities under the critical conditions (i.e., during the critical wet year at the critical location). Existing mass loads and allowable mass loads (i.e., TMDLs) were calculated for each watershed. The existing mass loads were calculated based on model-predicted flow and model-predicted bacteria densities. The allowable mass loads (i.e., TMDLs) were calculated based on model-predicted flow and the numeric targets (i.e., numeric WQOs and allowable exceedance frequencies).
- The wet weather existing mass loads and allowable mass loads (i.e., wet weather mass-load based TMDLs) are calculated assuming surface runoff is generated by rainfall from storm events and discharged from all land use categories to receiving waters.
- The dry weather existing mass loads and allowable mass loads (i.e., dry weather mass-load based TMDLs) are calculated assuming surface runoff is generated only by

anthropogenic activities and discharged from specific land use categories to receiving waters. The possible contribution of subsurface or groundwater flows to bacteria loads in receiving waters during dry weather was not accounted for in any land use category.

Allocations

- Each mass-load based TMDL is allocated to known point sources and nonpoint sources. Wasteload allocations (WLAs) are assigned to point sources, and load allocations (LAs) are assigned to nonpoint sources. WLAs and LAs are the maximum load a source can discharge and still achieve the TMDL in the receiving water.
- The TMDLs, and in turn the WLAs for point sources and LAs for nonpoint sources, are assumed to be met when the numeric targets are met in the receiving waters.
- The sources were identified based on land use and grouped in to Municipal MS4, Caltrans MS4 (Caltrans), Agriculture, and Open Space categories. The Municipal MS4 and Caltrans land use categories are point sources, and the Agriculture and Open Space land use categories are nonpoint sources.
- Sources that are not identified are assumed to be assigned a zero allowable load as part of the mass-load based TMDL (i.e., WLA = 0 or LA = 0). In other words, discharges of pollutant loads from these sources are not expected or allowed as part of the TMDLs.
- Sources that are assigned an allowable load equal to the existing mass load as part of the mass-load based TMDL (i.e., WLA or LA = existing mass load) are not expected or allowed to increase their mass load in the future. In other words, discharges of pollutant loads (i.e., flows and bacteria densities) from these sources are not allowed to increase.
- The allocation of the dry weather mass-load based TMDLs assumes that no surface runoff discharge to receiving waters occurs from Caltrans, Agriculture, or Open Space land use categories (i.e., $WLA_{Caltrans} = 0$, $LA_{Agriculture} = 0$, and $LA_{OpenSpace} = 0$), meaning the entire dry weather mass-load based TMDL (i.e., allowable mass load) is allocated to Municipal MS4 land use categories (i.e., WLA_{MS4} = TMDL).
- The allocation of the wet weather mass-load based TMDLs assumes surface runoff discharge occurs from all land use categories, and allocated according to the following steps:
  1) Sources are separated in to controllable and uncontrollable sources. Discharges from Municipal MS4, Caltrans, and Agriculture land use categories are assumed to be controllable (i.e., subject to regulation), and discharges from Open Space land use categories are assumed to be uncontrollable (i.e., not subject to regulation).
  2) Because discharges from Open Space land use categories are uncontrollable (i.e., not subject to regulation), the LAs for Open Space land use categories are set equal to the existing mass loads calculated under the critical conditions.
  3) For discharges from controllable land use categories that do not contribute more than 5 percent of the total existing mass load for all three indicator bacteria, the WLA or LA is set equal to the existing mass loads from those land uses calculated under the critical conditions.
  4) After the WLAs and LAs are assigned based on steps 2 and 3, the remaining portion of the mass-load based TMDL is assigned to discharges from controllable land use categories that contribute more than 5 percent of the total existing mass load for all three indicator bacteria. The allowable mass load for each source (WLA or LA) is

calculated based on the ratio of the existing mass loads from those sources relative to each other.

Load Reductions

- The load reductions required to meet the mass-load based TMDLs, WLAs, and LAs are based on reducing the loads compared to pollutant loads from 2001 to 2002.
- Load reductions for each source are calculated based on the difference between the existing mass load and the mass-load based WLA or LA for each source.
- WLAs and LAs that are set equal to the existing mass loads do not require load reductions to be calculated, but this also means that existing mass loads from those sources cannot increase over time (i.e., pollutant loads should be less than or equal to pollutant loads relative to 2001 to 2002).
- The load reductions needed to meet the WLAs for point sources and LAs for nonpoint sources are assumed to be achieved when the numeric targets are met in the receiving waters.

The WQBELs will likely consist of receiving water limitations (based on the numeric targets) and require the implementation of a BMP program to achieve the TMDLs in the receiving waters. The Phase I MS4s and Caltrans will be required to submit Bacteria Load Reduction Plans (BLRPs) or Comprehensive Load Reduction Plans (CLRPs) outlining a proposed BMP program that will be capable of achieving the necessary load reductions required to attain the TMDLs in the receiving waters, acceptable to the San Diego Water Board, within 18 months after the effective date of these TMDLs. The San Diego Water Board will require the BLRPs or CLRPs to be developed on a watershed or region wide scale. BLRPs will only address bacteria. CLRPs will address other pollutant constituents (e.g. metals, pesticides, trash, nutrients, sediment, etc.) together with the bacteria load reduction requirements in these TMDLs. Ideally, the Phase I MS4s and Caltrans will develop and submit their BLRPs or CLRPs together.

The TMDLs and LAs for controllable nonpoint sources will be implemented primarily by utilizing and enforcing conditional waivers of WDRs. Currently, discharges from the identified controllable nonpoint sources may be eligible for one of the general conditional waivers of WDRs, which are provided in the Basin Plan. Conditional waivers of WDRs may not exceed 5 years in duration, but may be revised and renewed, or may be terminated at any time. The San Diego Water Board will implement the conditional waivers of WDRs applicable to the Agriculture land uses to be consistent with the TMDLs and Agriculture LAs.

The San Diego Water Board shall consider enforcement actions, as necessary, for any discharger failing to comply with applicable waiver conditions, WDRs, or Basin Plan waste discharge prohibitions. Enforcement actions can also be taken, as necessary, to control the discharge of bacteria to impaired beaches and creeks, to attain compliance with the assumptions and requirements of the TMDLs, WLAs, and LAs.

The bacteria TMDLs are expected to be implemented in a phased approach with a monitoring component to determine the effectiveness of each phase and guide the selection of BMPs. The Implementation Plan includes a compliance schedule that may be used by the San Diego Water Board if the BLRPs or CLRPs do not include a proposed compliance schedule. The compliance

schedule for the Phase I MS4s and Caltrans to attain their respective WLAs will likely be based on the BMP program and compliance schedules proposed in the BLRPs or CLRPs. If the Phase I MS4s and Caltrans choose to submit BLRPs to address only bacteria, the schedule for compliance with the TMDLs cannot extend beyond 10 years. If the Phase I MS4s and Caltrans choose to submit CLRPs to address all constituents of concern in lieu of the BLRP, the schedule for compliance with the TMDLs cannot extend beyond 20 years. If appropriate, the proposed compliance schedules will be incorporated into the various TMDL implementing orders.

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2 Introduction

According to Clean Water Act section 303(d)(1)(A), "Each state shall identify those waters within its boundaries for which the effluent limitations…are not stringent enough to implement any water quality standard (WQS) applicable to such waters." The waters identified as not meeting water quality standards, or impaired waters, are placed on a list known as the Clean Water Act Section 303(d) List of Water Quality Limited Segments (a.k.a. the "303(d) List"). The Clean Water Act also requires states to establish a priority ranking of Water Quality Limited Segments and to establish Total Maximum Daily Loads (TMDLs) for such waters.

On the 2002 303(d) List, a significant number of waterbodies throughout the San Diego Region were identified and listed as impaired by bacteria. Elevated bacteria levels in the waters in the San Diego Region were resulting in frequent beach closures. At the time, identifying the sources and reducing the discharges of bacteria to the coastal shorelines was set as a very high priority for the Regional Water Quality Control Board, San Diego Region (San Diego Water Board). For this reason, and to maximize the efficiency in TMDL development to address bacteria in the San Diego Region, the San Diego Water Board initiated a TMDL project to address all the waterbodies listed as impaired by bacteria on the 2002 303(d) List. Due to different TMDL modeling approaches required for different types of waterbodies, the initial TMDL project had to be separated in to several smaller projects by waterbody type.

The first of the bacteria TMDL projects developed was known as "*Bacteria TMDLs Project I-Beaches and Creeks in the San Diego Region*" or "*Bacteria TMDLs Project I*." Bacteria TMDLs Project I included TMDLs that addressed 19 beaches and creeks in the San Diego Region, including 9 segments of Pacific Ocean shoreline, 5 creek/lagoon mouths, and 5 creeks. The TMDLs developed for these 19 beaches and creeks included "interim" and "final" wet weather TMDLs. "Interim" wet weather TMDLs included an allowance for exceedances of bacteria water quality objectives due to natural sources, whereas the "final" wet weather TMDLs did not. Bacteria TMDLs Project I was adopted by the San Diego Water Board on December 12, 2007.

The San Diego Water Board adopted Bacteria Project I contingent upon the adoption of a Reference System and Antidegradation Approach/Natural Sources Exclusion Approach (RSAA/NSEA) Basin Plan amendment that would allow for exceedances of bacteria water quality standards within the context of a TMDL. Adoption of the RSAA/NSEA Basin Plan amendment would require Bacteria TMDLs Project I to be revised to remove the "final" wet weather TMDLs.

The RSAA/NSEA Basin Plan amendment was adopted by the San Diego Water Board on May 14, 2008 and appeared likely to be approved by the State Water Board, OAL, and USEPA before or very soon after Bacteria TMDLs Project I. Because the State Water Board had not yet considered and approved Bacteria TMDLs Project I, and it appeared the RSAA/NSEA Basin Plan amendment would be approved and require the revision of Bacteria TMDLs Project I soon after its anticipated approval, the San Diego Water Board withdrew Bacteria TMDLs Project I from State Water Board consideration for approval on December 17, 2008.

This technical report is a revised version of the technical report for Bacteria TMDLs Project I. Significant revisions have been made to the Bacteria TMDLs Project I technical report, but the

underlying technical approach and assumptions used for calculating the TMDLs have not been changed. The revisions are primarily associated with revisions that are required due to the adoption and approval of the RSA/NSEA Basin Plan amendment.[5] The "final" TMDLs have been removed and the "interim" TMDLs, which incorporate a reference system approach as discussed below, are the only TMDLs included in the project. Additionally, because the same modeling approaches can be used, and the resources available for the development of TMDLs have become more limited, the bacteria TMDLs for Tecolote Creek that were being developed under a separate project have been incorporated in to these bacteria TMDLs for beaches and creeks in the San Diego Region. Finally, the TMDL Implementation Plan has been revised to provide additional guidance on potential actions that may be taken by the San Diego Water Board and/or other entities to implement the TMDLs, minimum monitoring that will be required to assess the implementation of and compliance with the TMDLs, and the potential for alternative compliance schedules. Hereafter this project will be referred to in this revised technical report as "*Revised Bacteria TMDLs Project I- Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)*" or "*Revised Bacteria TMDLs Project I*."

For Revised Bacteria TMDLs Project I, TMDLs were developed to address 20 waterbodies in the San Diego Region that have been listed as impaired by bacteria on the 2002 303(d) List, including 9 segments of Pacific Ocean shoreline, 5 creek/lagoon mouths, and 6 creeks. The presence of bacteria, especially fecal bacteria, in surface water is often used as an indicator for human pathogens. Pathogens can cause illness in recreational water users, but are usually difficult and/or very expensive to measure. Historically, fecal bacteria have been used as indicators of human pathogens because they are easier and less costly to measure than the pathogens themselves. This TMDL project has been developed to specifically address indicator bacteria as a pollutant causing impairment of the beneficial uses in 20 beaches and creeks in the San Diego Region.

This project involved developing TMDLs for beaches and creeks located in 13 watersheds in the San Diego Region. These watersheds drain to the Pacific Ocean (with the exception of Tecolote Creek, which flows to Mission Bay, and Chollas Creek, which flows to San Diego Bay) and include both urbanized and non-urbanized land areas. The waterbodies for which TMDLs were developed include 48 impaired beach segments (including creek/lagoon mouths and coastal shoreline segments) and 5 creeks in the San Diego Region. These locations compose 20 distinct locations identified on the 2002 303(d) List (multiple beach segments are included in each listing). This project is confined to creeks, coastal shorelines, and creeks discharging to shorelines. The waterbodies addressed in this project were added to the List of Water Quality Limited Segments on, or before, the 2002 listing cycle.

A TMDL is intended to fulfill two purposes: 1) calculation of the assimilative loading capacity for an impaired waterbody, and 2) development of a strategy to restore an impaired waterbody so the water quality can once again meet the water quality standards. Under federal regulations, a TMDL is defined as the "sum of the individual waste load allocations (WLAs) for point sources

[5] Resolution No. R9-2008-0028, *Implementation Provisions for Indicator Bacteria Water Quality Objectives to Account for Loading from Natural Uncontrollable Sources Within the Context of a TMDL,* adopted by the San Diego Water Board on May 14, 2008, approved by the State Water Board on March 17, 2009, approved by OAL on June 25, 2009, and approved by USEPA on September 16, 2009

and load allocations (LAs) for non-point sources and natural background"[6] such that the capacity of the waterbody to assimilate the loading of a specific pollutant (the loading capacity) is not exceeded. The WLA or LA is the maximum allowable amount of a specific pollutant can be discharged by a point or nonpoint source, respectively. When all the sources meet their respective WLAs or LAs, the water quality standards should be restored and attained.

The TMDL process begins with the development of a technical analysis which includes the following 7 components: (1) a **Problem Statement** describing which WQOs are not being attained and which beneficial uses are impaired; (2) identification of **Numeric Targets** which will result in attainment of the WQOs and protection of beneficial uses; (3) a **Source Analysis** to identify all of the point and nonpoint sources of the impairing pollutant in the watersheds and to estimate the current pollutant loading for each source; (4) a **Linkage Analysis** to calculate the **Loading Capacity** (or assimilative capacity) of the waterbodies for the pollutant; i.e., the maximum amount of the pollutant that may be discharged to the waterbodies without causing exceedances of WQOs and impairment of beneficial uses; (5) a **Margin of Safety** (MOS) to account for uncertainties in the analyses; (6) the division and **Allocation** of the TMDL among each of the contributing sources in the watersheds, wasteload allocations (WLAs) for point sources and load allocations (LAs) for nonpoint and background sources; and (7) a description of how **Seasonal Variation and Critical Conditions** are accounted for in the TMDL determination.

The write-up of the above components is generally referred to as the technical TMDL analysis. The scientific basis of this technical TMDL analysis has undergone external peer review pursuant to Health and Safety Code section 57-004 during the development of Bacteria TMDLs Project I. The scientific basis for this technical TMDL analysis has not been changed for Revised Bacteria TMDLs Project I, thus a second external peer review was not required. The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) has considered and responded to all comments submitted by the peer review panel. The peer reviewer's comments and the San Diego Water Board's responses to comments are contained in Appendix A.

The results of the technical TMDL analysis were used to develop an **Implementation Plan**. The Implementation Plan describes the actions that must be taken by the San Diego Water Board and/or other entities to further regulate various dischargers to meet the WLAs and LAs. The dischargers will be responsible for meeting their assigned WLAs or LAs and for monitoring to assess the effectiveness of the implementation measures at achieving the TMDLs in the receiving waters. A time schedule for meeting the WLAs and LAs is also included in the Implementation Plan.

Once established, the regulatory provisions of the TMDLs are incorporated into the *Water Quality Control Plan for the San Diego Basin (9)* or "Basin Plan" (San Diego Water Board, 1994).[7] Typically, the San Diego Water Board, following a public comment period and hearing process, adopts a resolution amending the Basin Plan to incorporate the TMDLs, allocations, reductions, and implementation plan with a compliance schedule and minimum monitoring

[6] Code of Federal Regulations Title 40 section 130.2(i)
[7] Pursuant to Code of Federal Regulations section 130.6(c)(1) and Water Code section 13242

requirements. Pursuant to the California Environmental Quality Act (CEQA), most Basin Plan amendments, including TMDL amendments, must also undergo an evaluation of the environmental impacts of complying with the amendment, and an evaluation of the costs of complying with the amendment.

As with any Basin Plan amendment involving surface waters, a TMDL amendment will not take effect until it has undergone subsequent agency approvals by the State Water Resources Control Board (State Water Board) and the Office of Administrative Law (OAL). The United States Environmental Protection Agency (USEPA) must also approve any amendment involving surface water. For purposes of state law, however, the effective date of the TMDL Basin Plan amendment will begin upon approval by OAL.

Following these approvals, the San Diego Water Board is required to incorporate the regulatory provisions of the TMDL into all applicable orders prescribing waste discharge requirements (WDRs), or other regulatory mechanisms. For point sources, the San Diego Water Board will issue, reissue amend, and/or enforce existing WDRs that implement National Pollutant Discharge Elimination System (NPDES) requirements and/or Basin Plan waste discharge prohibitions. For nonpoint sources, the San Diego Water Board will issue, reissue, amend, or enforce WDRs, waivers of WDRs, or Basin Plan waste discharge prohibitions. Water quality based effluent limitations (WQBELs) for the impairing pollutant in the subject watersheds are incorporated in the appropriate WDRs to implement and make the TMDLs enforceable. WQBELs may be expressed as numeric effluent limitations, when feasible, and/or as a best management (BMP) program of expanded or better-tailored BMPs.[8]

The final and most important step in the process is the implementation of the TMDLs by the dischargers. Per the governing implementing order (or other regulatory mechanism), each discharger must reduce its current loading of the pollutant to its assigned allocation in accordance with the time schedule specified in the Implementation Plan in this Technical Report and the Basin Plan amendment. When each discharger has achieved its required load reduction, the beneficial uses should be restored in the receiving waters.

Public participation has been a key element in the development of these TMDLs. The San Diego Water Board formed a Stakeholder Advisory Group (SAG), made up of key stakeholders to assist in the development of this Technical Report. The SAG was comprised of representatives from various disciplines and geographic locations. Participants that have been involved in the SAG included representatives for municipal separate storm sewer system (MS4) owners/operators from all coastal watersheds in the San Diego Region included in this project, publicly owned treatment works (POTWs), environmental groups, California Department of Transportation (Caltrans), research and academia, agricultural interests, and business and industry interests.

All public hearings and public meetings have been conducted as stipulated in the regulations [40 CFR 25.5 and 40 CFR 25.6, respectively], for all programs under the CWA. During the development of Bacteria TMDLs Project I, public participation was provided through two public workshops, numerous SAG meetings and communications. In addition, staff contact information

[8] Code of Federal Regulations Title 40 section 122.44(k)(2)&(3)

was provided on the San Diego Water Board's web site, along with periodically updated drafts of TMDL project documents throughout the development process. Public participation also took place through the San Diego Water Board's Basin Plan amendment process, which included an additional public workshop, two hearings, and three formal public comment periods.

For Revised Bacteria TMDLs Project I, additional meetings were held with the SAG to discuss the revisions made. Public participation also took place through the San Diego Water Board's Basin Plan amendment process, which included a formal public comment period and a public hearing.

2.1 Technical Approach

The San Diego Water Board and the USEPA coordinated a watershed assessment and modeling study to support the development of TMDLs. In order to assist the San Diego Water Board in the development of the technical analysis, the USEPA used Clean Water Act section 106 funds to contract the environmental consulting firm, Tetra Tech, Inc. Tetra Tech provided the San Diego Water Board with technical assistance in calculating the mass-load based TMDLs for the impaired waterbodies through the development of region-wide watershed models. Although beaches and creeks are separate systems with different WQOs, the technical approach for assessing both systems were identical.

Because the climate in southern California has two distinct hydrological patterns, two modeling approaches were developed for estimating bacteria loads. One modeling approach specifically quantified loading during wet weather events (storms), which tend to be episodic and short in duration, and characterized by rapid wash-off and transport of very high bacteria loads from all land use types. The wet weather approach is consistent with the methodologies used for bacteria TMDL development for impaired coastal areas of the Los Angeles Region, specifically Santa Monica Bay beaches (Los Angeles Water Board, 2002) and also Malibu Creek (Los Angeles Water Board, 2004). In contrast, the dry weather modeling approach quantified bacteria loading during dry weather conditions. Dry weather loading was much smaller in magnitude, did not occur from all land use types, and exhibited less variability over time. In addition to estimating current loading, both models were used to estimate TMDLs for the two climate conditions for each watershed.

A significant portion of bacteria loads can often be attributed to natural sources. Bacteria loads from these natural sources may cause exceedances of bacteria WQOs even if there are no anthropogenic sources. It is not the intent of these TMDLs to require treatment or diversion of natural waterbodies or to require treatment of natural sources of indicator bacteria. Therefore, the San Diego Water Board adopted an amendment to the Basin Plan to incorporate authorization to implement the indicator bacteria WQOs, within the context of a TMDL, using the "reference system approach."[9]

[9] A Basin Plan amendment to incorporate a reference system approach for implementation of the WQOs for bacteria (Resolution No. R9-2008-0028) was adopted by the San Diego Water Board on May 14, 2008, approved by the State Water Board on March 17, 2009, approved by OAL on June 25, 2009, and approved by USEPA on September 16, 2009.

The reference system approach, which is explained in more detail in section 4, allows exceedances of the numeric WQOs for water contact recreation (REC-1) beneficial uses, expressed as an allowable exceedance frequency. The purpose of the allowable exceedance frequency is to account for the natural, and largely uncontrollable sources of bacteria (e.g. bird and wildlife feces, and re-suspension or re-growth at the beach) in the bacteria loads generated in the watersheds which can, by themselves, cause exceedances of the numeric WQOs. An allowable exceedance frequency of the numeric WQOs was included in the development of the wet weather and dry weather TMDLs.

In these TMDLs, WLAs were calculated for point source discharges and LAs were calculated for nonpoint source discharges. For wet weather, two WLAs were calculated for each watershed; one for Caltrans, and one for municipal MS4 dischargers.[10] LAs for wet weather were calculated for controllable sources consisting of discharges from agricultural and livestock land uses, and uncontrollable sources from open recreation and open space land uses, and water.

[10] The dry and wet weather wasteload allocation for discharges from wastewater treatment facilities, also know as publicly owned treatment works (POTWs), is zero. This means that POTWs are not expected or allowed to discharge a bacteria load as part of these TMDLs. The only exception is Padre Dam whose discharge to the San Diego River is regulated by the San Diego Waterboard and must meet REC-1 permit requirements. Therefore Padre Dam received a separate TMDL wasteload allocation which is based on the effluent limitations of its WDRs, and is included in addition to these TMDLs which are based on surface runoff. Please see section 8.1.5 for further discussion.

3 Problem Statement

Bacteria densities in the waters of the beaches and creeks addressed in this project have exceeded the numeric WQOs for total, fecal, and/or enterococci bacteria. Exceedances of WQOs for indicator bacteria are shown in the monitoring data for beach segments where such data exist. Other beaches were consistently posted with health advisories and/or closed. These exceedances and postings threaten and impair the water contact (REC-1) and non-water contact (REC-2) beneficial uses. REC-1 includes uses of water for recreational activities involving body contact with water, where ingestion of water is reasonably possible, such as swimming or other water sports. REC-2 includes the uses of water for recreational activities involving proximity to water, but not normally involving body contact with water, where ingestion of water is reasonably possible. Examples include picnicking and sunbathing. All inland surface waters and coastal marine waters in the Region are designated with both REC-1 and REC-2 beneficial uses.

Although WQOs for REC-1 and REC-2 beneficial uses are written in terms of density of indicator bacteria colonies (most probable number of colonies per 100 milliliter of water), the actual risk to human health is caused by the presence of disease-causing pathogens. When the risk to human health from pathogens in the water is so great that beaches are posted with health advisories or closure signs, the quality and beneficial use of the water are impaired. At present, measuring pathogens directly is difficult and expensive, and for this reason high concentrations of bacteria, which originate from the intestinal biota of warm-blooded animals, are used to indicate the presence of pathogens. For a discussion of the use of indicator bacteria to measure water quality and the presence of pathogens, see Appendix C.

Sources of bacteria under all conditions vary widely and include natural sources such as feces from aquatic and terrestrial wildlife, and anthropogenic sources such as sewer line breaks, illegal sewage disposal from boats along the coastline, trash, and pet waste. Once in the environment, bacteria also re-grow and multiply. Bacteria sources and their transport mechanisms to receiving waters are discussed in section 6.

3.1 Project Area Description

The beaches and creeks addressed in this analysis are in southern California, primarily in southern Orange and San Diego Counties. The beaches and creeks are located within or hydraulically downstream of five watersheds in Orange County (with a small portion in Riverside County) (Figure 3-1) and eight watersheds in San Diego County (Figure 3-2). Table 3-1 lists the watersheds that affect the bacteria-impaired waterbodies in the Region. Most of the waterways flow directly to the Pacific Ocean, except Tecolotec Creek, which flows to Mission Bay, and Chollas Creek, which flows to San Diego Bay. The combined watersheds cover roughly 1,740 square miles (4,500 square kilometers).

The climate in the Region is generally mild with annual temperatures averaging around 65°F near the coastal areas. Average annual rainfall ranges from 9 to 11 inches along the coast to more than 30 inches in the eastern mountains. There are three distinct types of weather in the Region. Summer dry weather occurs from late April to mid-October. During this period almost no rain falls. The winter season (mid-October through early April) has two types of weather; 1) winter dry weather when rain has not fallen for the preceding 72 hours, and 2) wet weather

consisting of storms of 0.2 inches of rainfall and the 72 hour period after the storm. Eighty five to 90 percent of the annual rainfall occurs during the winter season (County of San Diego, 2000).

The land use of the Region is highly variable. The coastline areas are highly concentrated with urban and residential land uses, and the inland areas primarily consist of open space. Most of the area is open space or recreational land use (64.2 percent), followed by low-density residential (14.1 percent) and agriculture/livestock (12.4 percent) land uses. Other major land uses are commercial/institutional (3.0 percent), high-density residential (2.2 percent), industrial/transportation (1.6 percent), military (1.0 percent), transitional (0.8 percent), and water (0.7 percent).

3.2 Impairment Overview

The waterbodies included in this project have been documented to be impaired by the State Water Board's *2002 Clean Water Act Section 303(d) List of Water Quality Limited Segments Requiring TMDLs* (2002 303(d) List). The waterbodies included in this project were listed as impaired primarily because of non-attainment of the indicator bacteria WQOs associated with contact recreation. The beaches were listed as impaired based on monitoring data for total coliform, fecal coliform, and enterococci bacteria, or because the beaches were consistently posted with health advisories and/or closed.

For this study, a watershed-based approach was developed to calculate bacteria mass loadings for the impaired shoreline and creek segments. Table 3-1 lists the impaired waterbodies addressed in this study. The drainage areas of many of the watersheds that affect shoreline impairments are located above more than one impaired beach segment. Table 3-1 lists the watersheds (shown in Figures 3-1 and 3-2) that affect impaired waterbodies due to bacteria loadings. Appendix D provides a more detailed list of the 20 waterbodies from the 2002 303(d) List addressed by this TMDL project, including waterbody segment names and approximate length of impairment. Appendix E shows higher resolution maps of the impaired watersheds.

Table 3-1. Beach and Creeks Addressed in this TMDL Analysis

Watershed	Type of Listing	Impaired Waterbody Name [a,c]	Drainage Area (mi^2)[b]	Number of Listings
San Joaquin Hills HSA (901.11)/ Laguna Beach HSA (901.12)	Shoreline	Pacific Ocean Shoreline	13.94	2 [b]
Aliso HSA (901.13)	Creek Estuary Shoreline	Aliso Creek Aliso Creek (mouth) Pacific Ocean Shoreline	35.74	3
Dana Point HSA (901.14)	Shoreline	Pacific Ocean Shoreline	8.89	1
Lower San Juan HSA (901.27)	Creek Estuary Shoreline	San Juan Creek San Juan Creek (mouth) Pacific Ocean Shoreline	177.18	3
San Clemente HA (901.30)	Shoreline	Pacific Ocean Shoreline	18.78	1
San Luis Rey HU (903.00)	Shoreline	Pacific Ocean Shoreline (at San Luis Rey River mouth)	560.42 (354.12)	1
San Marcos HA (904.50)	Shoreline	Pacific Ocean Shoreline	1.43	1
San Dieguito HU (905.00)	Shoreline	Pacific Ocean Shoreline (at San Dieguito Lagoon mouth)	346.22 (292.24)	1
Miramar Reservoir HA (906.10)	Shoreline	Pacific Ocean Shoreline	93.73	1
Scripps HA (906.30)	Shoreline	Pacific Ocean Shoreline	8.75	1
Tecolote HA (906.50)	Creek	Tecolote Creek	10.00	1
Mission San Diego HSA (907.11)/ Santee HSA (907.12)	Creek Creek Shoreline	Forester Creek San Diego River (Lower) Pacific Ocean Shoreline	436.48 (173.95)	3
Chollas HSA (908.22)	Creek	Chollas Creek	26.80	1
TOTAL NUMBER OF LISTINGS				**20**

Note: HSA = hydrologic subarea; HA = hydrologic area; HU = hydrologic unit

[a] Listed as impaired on the 2002 Clean Water Act Section 303(d) List of Water Quality Limited Segments due to exceedances of the water contact recreation (REC-1) water quality objectives (WQOs) for fecal coliform, and/or total coliform, and/or enterococci indicator bacteria.

[b] Two separate segments of the Pacific Ocean Shoreline are included in the listings for the San Juan Hills/Laguna Beach watershed.

[c] Listings on the 2006 and 2008 303(d) List compared to listing shown above are provided in Appendix T to the Technical Report.

On the 2002 303(d) List, the Pacific Ocean shoreline is listed for several hydrologic subareas (HSAs), hydrologic areas (HAs), and hydrologic units (HUs). The listing of Pacific Ocean shorelines on the 2002 303(d) List are applicable to all the beaches located on the shorelines of the HSAs, HAs, and HUs listed above.

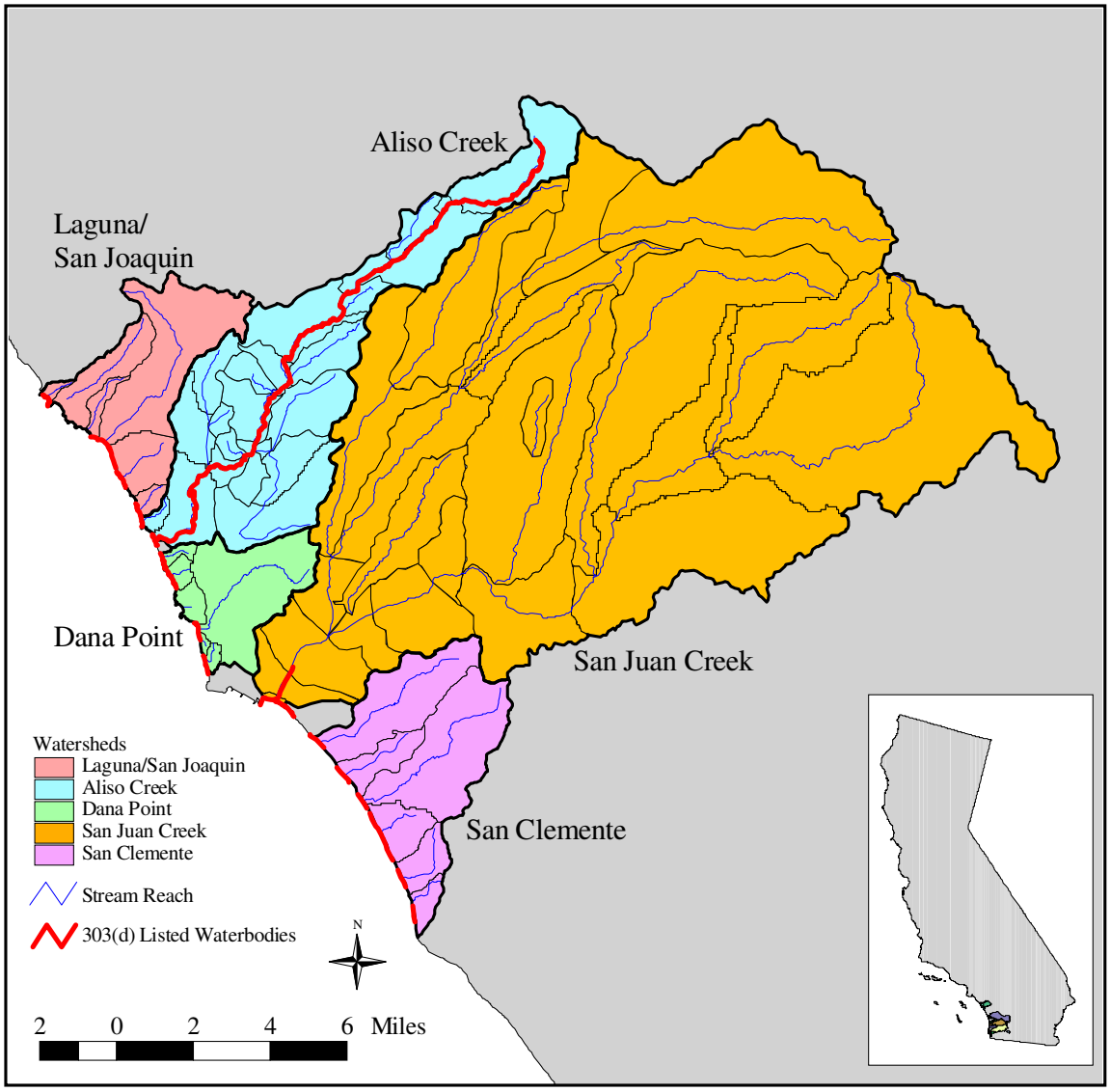

Figure 3-1. Watersheds of interest in Orange County.

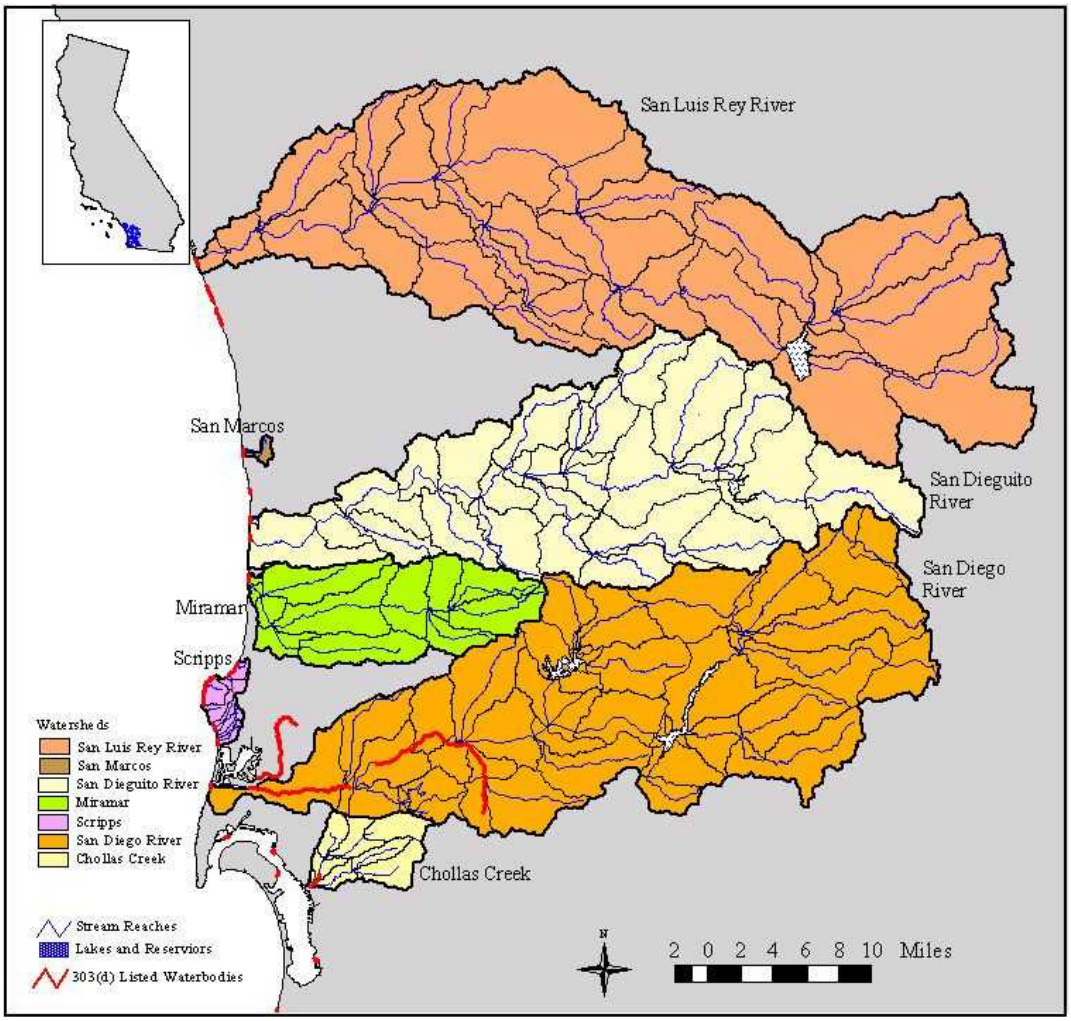

Figure 3-2. Watersheds of interest in San Diego County.

3.3 Applicable Water Quality Standards

Water quality standards consist of WQOs, beneficial uses, and the antidegradation policy. WQOs are defined under Water Code section 13050(h) as "limits or levels of water quality constituents or characteristics which are established for the reasonable protection of beneficial uses of water." Under section 304(a)(1) of the CWA, the USEPA is required to publish water quality criteria that incorporate ecological and human health assessments based on current scientific information. WQOs must be based on scientifically sound water quality criteria, and be at least as stringent as those criteria.

The Basin Plan and *Water Quality Control Plan for Ocean Waters of California* (Ocean Plan) identify beneficial uses and WQOs for the impaired waterbodies. The beneficial use designations are as follows:

- Municipal and domestic supply (MUN)
- Agricultural supply (AGR)
- Industrial process supply (PROC)
- Industrial water supply (IND)
- Ground water recharge (GWR)
- Freshwater replenishment (FRSH)
- Navigation (NAV)
- Hydropower generation (POW)
- Water contact recreation (REC-1)
- Non-contact recreation (REC-2)
- Commercial and sport fishing (COMM)
- Aquaculture (AQUA)
- Warm freshwater habitat (WARM)
- Cold freshwater habitat (COLD)
- Inland saline water habitat (SAL)
- Estuarine habitat (EST)
- Marine habitat (MAR)
- Wildlife habitat (WILD)
- Preservation and enhancement of "Areas of Special Biological Significance" (BIOL)
- Rare and endangered species (RARE)
- Migration of aquatic organisms (MIGR)
- Spawning, reproduction, and/or early development (SPWN)
- Shellfish harvesting (SHELL)

Table 3-2 lists the beneficial uses for each of the impaired inland segments and the Pacific Ocean shoreline.

Table 3-2. Beneficial Uses of the Impaired Waters

Waterbody Type	Waterbody	Designated Beneficial Uses
Creek	Aliso Creek	MUN,[a] AGR, REC-1,[b] REC-2, WARM, WILD
Creek	San Juan Creek	MUN,[a] AGR, IND, REC-1, REC-2, WARM, COLD, WILD
Creek	Forrester Creek	MUN,[b] IND, REC-1, REC-2, WARM, WILD
Creek	Tecolote Creek	REC-1,[b] REC-2, WARM, WILD
Creek	San Diego River, Lower	MUN,[a] AGR, IND, REC-1, REC-2, WARM, WILD, RARE
Creek	Chollas Creek	MUN,[a] REC-1,[b] REC-2, WARM, WILD
Coastal water	Pacific Ocean Shoreline	IND, NAV, REC-1, REC-2, COMM, BIOL, WILD, RARE, MAR, AQUA, MIGR, SPWN, SHELL

[a] The waterbody is exempted by the San Diego Water Board under terms and conditions of State Water Board Resolution No. 88-63, *Sources of Drinking Water Policy*.
[b] This use is listed as a potential beneficial use.
Source: San Diego Water Board, 1994.

The REC-1 WQOs for indicator bacteria that are applicable to the Pacific Ocean shoreline are contained in the Ocean Plan (State Water Board, 2005). Those applicable to inland surface waters are contained in the Basin Plan. The objectives contained in both Plans are derived from water quality criteria promulgated by the USEPA in 1976, 1986, and 2004. Both the Ocean Plan and Basin Plan contain REC-1 objectives for total coliform, fecal coliform, and enterococci.[11] In addition, the Basin Plan contains REC-1 objectives for *Escherichia coli* (*E. coli)* for inland surface waters.

[11] The Basin Plan and Ocean Plan also contain SHELL objectives for total coliform. SHELL TMDLs for total coliform are being developed in a separate TMDL or standards action.

For each type of bacteria, WQOs are expressed as the most probable number (MPN) of bacteria colonies per 100 mL of water sample. For a complete discussion of WQOs for each beneficial use and each type of waterbody, see Appendix F.

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4 Numeric Target Selection

When performing a technical TMDL analysis, one or more quantitative numeric targets are required to calculate a TMDL. Numeric targets are selected based on the water quality standards (i.e., beneficial uses and the water quality objectives) that are applicable to the waterbody. The selected numeric target(s) must be able to implement existing water quality standards. In other words, when the numeric targets are met, the water quality standards should be restored.

The beneficial uses of the beaches and creeks addressed by this technical TMDL analysis are set forth in the Basin Plan, and discussed and summarized in section 3.3 and Table 3-2. This TMDL analysis specifically addresses the water contact recreation (REC-1) and non-water contact recreation (REC-2) beneficial uses. The water quality objectives (WQOs) are set forth in the *Water Quality Control Plan for the San Diego Basin (9)* (Basin Plan) and in the *Water Quality Control Plan for Ocean Waters of California* (Ocean Plan). Because the REC-1 bacteria WQOs are more stringent than the REC-2 stringent WQOs, waters that can meet the REC-1 bacteria WQOs will also meet the REC-2 WQOs. The REC-1 bacteria WQOs are based on four bacterial indicators and include both geometric mean limits and single sample maximum limits. The Ocean Plan and Basin Plan's objectives for bacteria are as follows:

REC-1
Ocean Waters (from Ocean Plan[12])

30-day Geometic Mean – The following standards are based on the geometric mean of the five most recent samples from each site:

i. **Total coliform** density shall not exceed 1,000 MPN per 100 ml;
ii. **Fecal coliform** density shall not exceed 200 MPN per 100 ml; and
iii. **Enterococci** density shall not exceed 35 MPN per 100 ml.

Single Sample Maximum:

i. **Total coliform** density shall not exceed 10,000 MPN per 100 ml;
ii. **Fecal coliform** density shall not exceed 400 MPN per 100 ml;
iii. **Enterococci** density shall not exceed 104 MPN per 100 ml; and
iv. **Total coliform** density shall not exceed 1,000 MPN per 100 ml when the fecal coliform/total coliform ratio exceeds 0.1.

[12] As adopted by the State Water Board on January 20, 2005 and April 21, 2005, approved by OAL on October 12, 2005, and approved by USEPA on February 14, 2006

REC-1
Inland Surface Waters, Enclosed Bays and Estuaries and Coastal Lagoons (from Basin Plan[13])

Fecal Coliform Water Quality Objective for Contact Recreation:

The fecal coliform concentration, based on a minimum of not less than five samples for any 30-day period, shall not exceed a log mean of 200 organisms per 100 ml.

In addition, the fecal coliform concentration shall not exceed 400 organisms per 100 ml for more than 10 percent of the total samples during any 30-day period.

Enterococci and **E. Coli** Water Quality Objectives for Contact Recreation:

The USEPA published E. coli and enterococci bacteriological criteria applicable to waters designated for contact recreation (REC-1) in the Federal Register, Vol. 51, No. 45, Friday, March 7, 1986, 8012-8016.

USEPA BACTERIOLOGICAL CRITERIA FOR WATER CONTACT RECREATION
(in colonies per 100 ml)

	Freshwater		Saltwater
	Enterococci	E. coli	Enterococci
Steady State			
(all areas)	33	126	33
Maximum			
(designated beach)	61	235	61
(moderately or lightly used area)	108	406	108
(infrequently used area)	151	576	151

Total Coliform Water Quality Objective for Contact Recreation for Bays and Estuaries:

In bays and estuaries, the most probable number of total coliform organisms in the upper 60 feet of the water column shall be less than 1,000 organisms per 100 ml (10 organisms per ml); provided that not more than 20 percent of the samples at any sampling station, in any 30-day period, may exceed 1,000 organisms per 100 ml (10 per ml); and provided further that no single sample as described below is exceeded.

The most probable number of total coliform organisms in the upper 60 feet of the water column in no single sample when verified by a repeat sample taken within 48 hours shall exceed 10,000 organisms per 100 ml (100 organisms per ml).

[13] As amended in the Basin Plan as part of Resolution No. R9-2008-0028, *Implementation Provisions for Indicator Bacteria Water Quality Objectives to Account for Loading from Natural Uncontrollable Sources Within the Context of a TMDL,* adopted by the San Diego Water Board on May 14, 2008, approved by the State Water Board on March 17, 2009, approved by OAL on June 25, 2009, and approved by USEPA on September 16, 2009

These objectives are generally based on an acceptable health risk for recreational waters of 19 illnesses per 1,000 exposed individuals as set forth by the USEPA (US EPA, 1986). The bacteria WQOs apply throughout the year.

Because the bacteria WQOs are expressed in numeric terms, the numeric targets used in the technical TMDL analysis were based on the numeric WQOs for bacteria for the REC-1 beneficial use. Different dry weather and wet weather numeric targets were used for mass load calculations because the bacteria transport mechanisms to receiving waters are different under wet and dry weather conditions. Because wet weather conditions, or storm flow, are episodic and short in duration, and characterized by rapid wash-off and transport of high bacteria loads, with short residence times, from all land use types to receiving waters, the single sample maximum WQOs were appropriate for use as wet weather numeric targets. For dry weather conditions, because dry weather runoff is not generated from storm flows, is not uniformly linked to every land use, and is more uniform than stormflow, with lower flows, lower loads, and slower transport, making die-off and/or amplification processes more important, the geometric mean WQOs were appropriate for use as dry weather numeric targets.

For impaired beaches, the numeric targets for the calculations in the technical TMDL analysis are based on the total coliform, fecal coliform and enterococci WQOs for REC-1. Wet weather numeric targets are based on the single sample maximum REC-1 WQOs, while dry weather numeric targets are based on the geometric mean REC-1 WQOs.

The numeric targets used to calculate the mass-load based TMDLs for beaches were also used to calculate TMDLs for impaired creeks. Numeric targets for load calculations for beaches and creeks are summarized in sections 4.1 and 4.2.

Even though beaches and creeks are separate waterbodies with slightly different numeric WQOs, all creeks included in this project eventually discharge to beaches, and therefore WQOs applicable to beaches must be protected at creek mouths. In other words, although the total coliform objective is not an applicable WQO in freshwater creeks and rivers, the total coliform density in these waters where they discharge to the Pacific Ocean must meet the Ocean Plan total coliform WQO at the shorelines. Thus, the WQO for total coliform is the appropriate numeric target for the TMDLs for creeks and rivers even though they do not need to meet this objective. Although REC-1 WQOs for fecal coliform and enterococci apply throughout the watersheds, the total coliform TMDLs must be met only at the bottom of the watershed where creeks and rivers discharge to the Pacific Ocean. Numeric targets for load calculations for beaches and creeks are summarized in sections 4.1 and 4.2.

4.1 Wet Weather Numeric Targets

Another difference between the wet weather and dry weather mass-load based TMDL calculations, besides the use of single sample maximum WQOs versus geometric mean WQOs, is the allowable exceedance frequency that is applied. The wet weather numeric targets are implemented in the TMDL by allowing the single sample WQOs for REC-1 to be exceeded due to bacteria loads that are attributed to natural, uncontrollable sources of bacteria. The allowable exceedance of the single sample maximum bacteria WQOs is authorized by a Basin Plan amendment that was recently adopted by the San Diego Water Board.

4.1.1 Authorization to Allow Exceedances of Bacteria Water Quality Objectives

A Basin Plan amendment was recently adopted by the San Diego Water Board authorizing the development of indicator bacteria TMDLs that account for exceedances of bacteria WQOs due to bacteria loads from natural uncontrollable sources.[14] Allowing exceedances of bacteria WQOs may be incorporated into the bacteria TMDLs using a reference system approach or natural sources exclusion approach.

The reference system approach incorporates an allowable exceedance frequency into the calculation of the TMDLs. The purpose of the exceedance frequency is to account for the natural, and largely uncontrollable sources of bacteria (e.g., bird and wildlife feces) in the wet weather loads generated in the watersheds and at the beaches which can, by themselves, cause exceedances of WQOs.

The allowable exceedance frequency is determined by identifying an appropriate reference system. An appropriate reference system is a beach and upstream watershed that are minimally impacted by anthropogenic activities. The frequency of exceedances of the indicator bacteria single sample maximum WQOs at a reference system can be used to determine an allowable exceedance frequency for the target watershed. The reference system approach also incorporates antidegradation principles in that, if water quality in the target waterbody is better than that of the reference system in a particular location, no degradation of existing bacteriological water quality is permitted. The reference system approach was first developed by the California Regional Water Quality Control Board, Los Angeles Region (Los Angeles Water Board), and is included in its Basin Plan as an implementation policy for single sample bacteria WQOs in the context of a TMDL.[15]

The Basin Plan amendment also authorizes the implementation of indicator bacteria single sample maxmum WQOs (REC-1 & REC-2) using a natural sources exclusion approach in the context of a TMDL. This approach authorizes the development or re-calculation of a bacteria TMDL that allows exceedances of WQOs after all sources of indicator bacteria associated with human and domesticated animal wastes are controlled. Under the natural sources exclusion approach, after all such anthropogenic sources of indicator bacteria have been controlled, a certain frequency of exceedance of WQOs can be authorized for developing TMDLs based on the residual exceedance frequency of the WQO in the specific waterbody. The residual exceedance frequency can be used to calculate the allowable exceedance load due to natural sources.

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[14] Resolution No. R9-2008-0028, *Implementation Provisions for Indicator Bacteria Water Quality Objectives to Account for Loading from Natural Uncontrollable Sources Within the Context of a TMDL,* was adopted by the San Diego Water Board on May 14, 2008, approved by the State Water Board on March 17, 2009, approved by OAL on June 25, 2009, and approved by USEPA on September 16, 2009, 2009.

[15] The Los Angeles Water Board used the Arroyo Sequit Watershed as the reference system watershed for development of TMDLs for the Santa Monica Bay beaches and Malibu Creek (Los Angeles Water Board, 2002 and 2003). This watershed, consisting primarily of unimpacted land use (98 percent open space), discharges to Leo Carillo Beach, where 22 percent of wet weather fecal coliform data (10 out of 46 samples) were observed to exceed the WQOs).

The reference system approach may be used to account for exceedances of bacteria WQOs during the initial development and calculation of bacteria TMDLs. The natural sources exclusion approach can only be used to account for exceedances of bacteria WQOs after the responsible dischargers demonstrate they have implemented all appropriate BMPs to control all anthropogenic sources of indicator bacteria to the target water body such that they do not cause or contribute to exceedances of the indicator bacteria WQOs, typically after a bacteria TMDL has already been adopted and implemented.

Implementation of indicator bacteria WQOs using a reference system approach requires control of indicator bacteria from anthropogenic sources so that the bacteriological water quality that is achieved is consistent with that of a reference system. In contrast, implementation of indicator bacteria water quality objectives using the natural sources exclusion approach also requires control of indicator bacteria from anthropogenic sources, but rather than requiring achievement of reference system bacteria levels, it requires evidence that remaining indicator bacteria densities do not indicate a human health risk. For these TMDLs, the reference system approach appears to be an appropriate method for accounting for exceedances of bacteria WQOs in the calculation of the wet weather TMDLs, as discussed below.

4.1.2 Applicability of the Reference System Approach

Determining whether the use of the reference system approach in the calculation of wet weather indicator bacteria TMDLs in the San Diego Region is appropriate was evaluated by analyzing data collected from the mouth of San Mateo Creek and from San Onofre State Beach, both located in northern San Diego County (Figure 4-1). These data were only evaluated in this TMDL technical analysis to show that using the reference system approach is appropriate for these TMDLs. The data were not used to determine region specific or watershed specific exceedance frequencies for the watersheds addressed by these TMDLs.

Most of the San Mateo Creek watershed is open space (85 percent); minor areas are associated with agriculture (2 percent) and low-density residential (1 percent). The remaining land uses, which contribute less that two percent of the total area, include high-density residential, commercial/institutional, industrial/transportation, parks/recreation, open recreation, horse ranches, and transitional (construction activities). The watershed that drains to San Onofre State Beach is likewise mostly open space. Because of the high percentage of open space and land uses with low anthropogenic activities, the San Mateo Creek watershed appears to be a potential reference system in the San Diego Region. A recent study of potential reference systems in southern California conducted by the Southern California Coastal Water Research Project (SCCWRP) also included the San Mateo Creek watershed in the study (Schiff, et al., 2006).

The data evaluated in this TMDL technical analysis were collected by the San Diego County Department of Environmental Health (DEH) during routine monitoring as part of a wider beach-monitoring program. The DEH collected bacteria data at two stations located near the mouth of San Mateo Creek from 1999 through 2002 (Appendix G, No. 16).

The monitoring data were separated based on their association with wet or dry conditions to better understand bacteria concentration variability during wet weather runoff verses dry weather runoff. To separate the data into two distinct groups, the wet period was defined to be consistent

with the DEH's General Advisory to avoid contact with ocean and bay water within 300 feet on either side of any storm drain, river, or lagoon outlet. A wet period is specifically defined as periods of rainfall of 0.2 inch or more and the following 72 hours. For each monitoring station, sampling dates were compared to rainfall data collected at the closest rainfall gage (ALERT21) to determine whether bacteria samples had been collected during wet or dry periods (Appendix G, No. 23). Once the data for all stations were designated as wet or dry samples, the wet weather samples were compared to single sample maximum WQOs for fecal coliform, total coliform, and enterococci at each station (Tables 4-1).

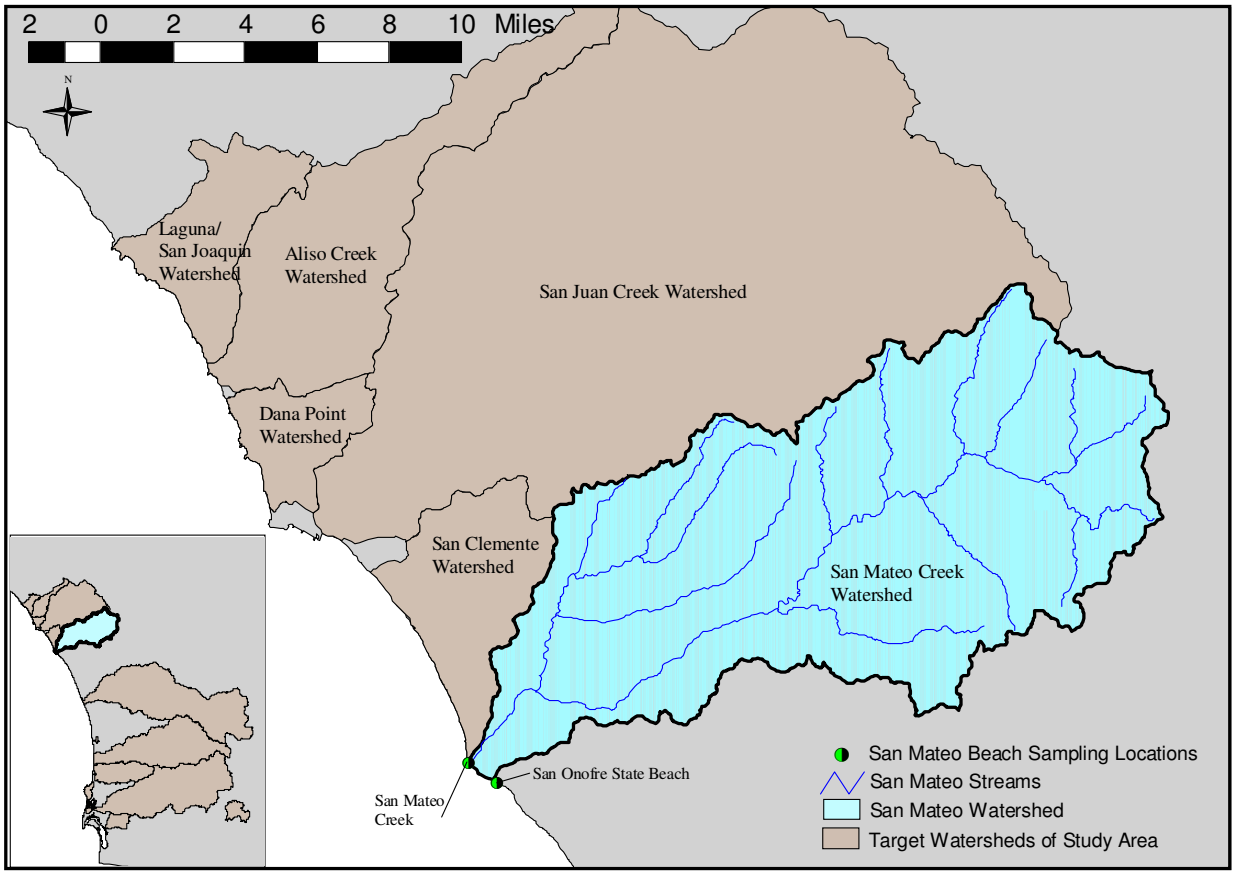

Figure 4-1. San Mateo watershed and San Onofre State Beach.

Table 4-1. Wet Weather Exceedances in Potential Reference Systems

Site ID	Location	Number of wet weather samples	Number of wet weather exceedances	Wet weather exceedance probability
Fecal Coliform				
EH-520	San Mateo Creek	6	2	33%
EH-510	San Onofre State Beach	5	2	40%
Total Coliform				
EH-520	San Mateo Creek	6	1	17%
EH-510	San Onofre State Beach	5	1	20%
Enterococci				
EH-520	San Mateo Creek	6	3	50%
EH-510	San Onofre State Beach	5	2	40%

An analysis of the wet weather water quality data provided by DEH (Table 4-1) from San Mateo Creek and San Onofre State Beach show that single sample maximum WQOs for fecal coliform, total coliform, or enterococci are exceeded in 17 to 50 percent of the wet weather samples depending on the indicator. Although this data set is limited in size, the high percentage of exceedances suggests that during wet weather events, a reference system approach is appropriate for use in calculating the wet weather indicator bacteria TMDLs for the San Diego Region.

4.1.3 Allowable Exceedance Frequency for the Reference System Approach

In the calculation of the wet weather mass-load based TMDLs, the San Diego Water Board chose to apply the 22 percent allowable exceedance frequency as determined for Leo Carillo Beach in Los Angeles County. At the time the wet weather watershed model was developed, the 22 percent exceedance frequency from Los Angeles County was the only reference beach exceedance frequency available. Since then, additional data were collected and analyzed for five other reference beaches by SCCWRP (Schiff, et al., 2006).

The study conducted by SCCWRP occurred over only two wet seasons (2004-2005 and 2005-2006). The data collected and analyzed by SCCWRP indicate that the flux of indicator bacteria from undeveloped watersheds and the resulting frequency of water quality threshold exceedences at reference beaches during wet weather can be correlated to watershed size, storm size, and early versus late season storms. Exceedance frequencies ranged from zero percent to 30 percent for an exceedance of any bacteria indicator.

Two of the reference beaches included in the study were from the San Diego Region (San Onofre State Beach at the mouth of San Onofre Creek and San Mateo State Beach at the mouth of San Mateo Creek). Both reference beaches had the highest exceedance frequencies during wet weather, but were also the largest watersheds in the study. The exceedance frequencies for these two San Diego Region watersheds may not be appropriate for every watershed addressed by these TMDLs. Additional data will be required to determine appropriate watershed specific exceedance frequencies for indicator bacteria TMDLs in the San Diego Region. If watershed specific exceedance frequencies are determined for any of the watersheds addressed in this TMDL, the wet weather TMDLs can be re-calculated based on these watershed specific exceedance frequencies.

At this time, however, the 22 percent exceedance frequency used to calculate the wet weather TMDLs is justified because the San Diego Region watersheds' exceedance frequencies will likely be close to the value calculated for Leo Carillo Beach, and is consistent with the exceedance frequency that was applied by the Los Angeles Water Board. If this exceedance frequency does indeed turn out to be appropriate for all the watersheds addressed in this TMDL, or if an appropriate exceedance frequency is determined to be greater for one or more watersheds, then the resulting wet weather TMDLs will be the same as, or less stringent than, the wet weather TMDLs that have been developed. If so, the wet weather TMDLs may be revised if requested. If, however, the appropriate exceedance frequency is determined to be lower for one or more watersheds, then the resulting wet weather TMDLs may be more stringent, and the San Diego Water Board may determine that the wet wet weather TMDLs need to be revised to restore and protect the beneficial uses of the waterbodies in these watersheds.

4.1.4 Summary of Wet Weather Numeric Targets for Mass-Load Based Calculations

The numeric targets used in the wet weather mass-load based TMDL calculations are based on the REC-1 single sample maximum WQOs. The numeric targets used in the calculations of the wet weather TMDLs include a 22 percent allowable exceedance frequency of the REC-1 single sample maximum WQOs. The allowable mass load (i.e., TMDL) that is calculated based on these numeric targets consists of the sum of two parts: 1) the bacteria load that is calculated with the REC-1 WQOs and, 2) the bacteria load that is associated with the allowable exceedance frequency.

For all beaches (except those that are downstream of San Juan Creek, Aliso Creek and the San Diego River), the wet weather numeric targets based on REC-1 WQOs are as follows: fecal coliform 400 most probable number of colonies (MPN)/100 milliliters (mL); total coliform 10,000 MPN/100 mL; and enterococci 104 MPN/100 mL. These single sample maximum values may be exceeded 22 percent of the time in the calculation of the wet weather mass-load based TMDLs.

For San Juan Creek and downstream beach, Aliso Creek and downstream beach, Tecolote Creek, Forrester Creek and the (lower) San Diego River and downstream beach, and Chollas Creek, the wet weather numeric targets are as follows: fecal coliform 400 MPN/100 mL; total coliform 10,000 MPN/100 mL; and enterococci 61 MPN/100 mL. These single sample maximum values may be exceeded 22 percent of the time in the calculation of the wet weather mass-load based TMDLs.

Different enterococci REC-1 WQOs were used to calculate TMDLs in watersheds modeled with the inland freshwater creeks (i.e., San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek, (lower) San Diego River, and Chollas Creek) and watersheds modeled only with coastal saltwater beaches. The WQOs applicable to ocean waters are provided in the Ocean Plan. The Ocean Plan is applicable only to ocean waters and does not apply to marine bays, estuaries and lagoons. The WQOs applicable to all other surface waters in the San Diego Region (e.g., marine bays, estuaries and lagoons, and freshwater inland surface waters) are contained in the Basin Plan.

There are different enterococci REC-1 WQOs in the Ocean Plan compared to the Basin Plan. Specifically, the Ocean Plan contains REC-1 single sample maximum and 30-day geometric mean WQOs for ocean waters that do not vary. In the Basin Plan, however, the REC-1 single sample maximum WQOs for enterococci are dependent upon the type (e.g., freshwater or saltwater) and usage frequency (e.g., designated beach, moderately or lightly used area, or infrequently used area) of the waterbody, and the REC-1 geometric mean WQOs are dependent of the type (e.g., freshwater or saltwater) of waterbody. The enterococci saltwater REC-1 WQOs in the Basin Plan, for waters designated with "designated beach" usage frequency, are the same as the enterococci REC-1 WQOs in the Ocean Plan.

For the application of the Basin Plan's enterococci REC-1 WQOs, unless otherwise specified in the Basin Plan, all waterbodies in the San Diego Region designated with REC-1 beneficial use are assumed to have a "designated beach" usage frequency. The "designated beach" usage frequency has the lowest and most stringent enterococci REC-1 WQOs in the Basin Plan. The enterococci REC-1 single sample maximum WQOs in the Basin Plan are more stringent for freshwater (61 MPN/100mL) than for saltwater (104 MPN/100mL) waterbodies. The enterococci REC-1 geometric mean WQOs in the Basin Plan are also more stringent for freshwater (33 MPN/100mL) than for saltwater (35 MPN/100mL) waterbodies. Since coastal saltwater beaches are downstream of inland freshwater creeks, TMDLs for coastal saltwater beaches are calculated using the more conservative enterococci REC-1 WQOs applicable to freshwater creeks (i.e., 61 MPN/100mL and 33 MPN/100mL). The numeric targets used in the calculation of the TMDLs for Tecolote Creek and Chollas Creek are also based on the enterococci REC-1 WQOs applicable to freshwater creeks.

However, the dischargers commented that the "designated beach" category may be over-protective of water quality because of the infrequent recreational use in the impaired creeks. The recreational usage frequency in these creeks may correspond to the "moderately to lightly used area" category in the Basin Plan, which has an enterococci WQO of 108 MPN/100mL. . In such cases, the "designated beach" enterococci saltwater REC-1 single sample maximum WQO (104 MPN/100mL) would also be protective of the "moderately to lightly used area" freshwater creek

Before the less stringent enterococci single sample maximum saltwater REC-1 WQO may be applied to a freshwater creek, the Basin Plan must be amended to designate a lower usage frequency (i.e., "moderately to lightly used area") for each freshwater creek. If information and evidence are provided to justify the "moderately to lightly used area" usage frequency for a freshwater creek, and the designated usage frequency of the freshwater creek is amended to "moderately to lightly used area" in the Basin Plan, the wet weather TMDLs that were calculated in a watershed that was modeled with a freshwater creek using the enterococci saltwater REC-1 WQOs can be implemented instead.

Table 4-2. Wet Weather Numeric Targets

Indicator Bacteria	Numeric Target (MPN/100mL)	Allowable Exceedance Frequency [a]
Fecal coliform	400 [b]	22%
Total coliform	10,000 [c]	22%
Enterococci	104[d] / 61[e]	22%

a. Percent of wet days (i.e., rainfall events of 0.2 inches or greater and the following 72 hours) allowed to exceed the wet weather numeric targets. Exceedance frequency based on reference system in the Los Angeles Region.
b. Fecal coliform single sample maximum WQO for REC-1 use in creeks and at beaches.
c. Total coliform single sample maximum WQO for REC-1 use at beaches and the point in creeks that discharges to beaches.
d. Enterococci single sample maximum WQO for REC-1 use in creeks established and designated as "moderately or lightly used" in the Basin Plan and at beaches downstream of those creeks, as well as all other beaches.
e. Enterococci single sample maximum WQO for REC-1 use in creeks not established and designated as "moderately or lightly used" in the Basin Plan and at beaches downstream of those creeks ("designated beach" frequency of use; applicable to San Juan Creek and downstream beach, Aliso Creek and downstream beach, Tecolote Creek, Forrester Creek, San Diego River and downstream beach, and Chollas Creek).

4.2 Dry Weather Numeric Targets

4.2.1 Allowable Exceedance Frequency for Dry Weather

Little data are available regarding exceedances of WQOs in a reference system (i.e., a beach and upstream watershed that are minimally impacted by anthropogenic activities) during dry weather. Water quality data from the mouth of San Mateo Creek and San Onofre State Beach (Table 4-3) indicate that exceedances of the single sample WQOs during dry weather conditions are uncommon in the relatively undeveloped San Mateo watershed. Furthermore, if the exceedance of the single sample maximum WQOs is unlikely, exceedances of the geometric mean are even more unlikely. However, if adequate data are collected to characterize dry weather flows and bacteria densities using a statistical approach, the reference system approach may be an option that would allow an exceedance frequency to be included with the dry weather numeric targets in the dry weather TMDLs.

The low percentage of exceedances of the single sample maximum WQOs during dry weather conditions could be caused by the existence of berms that prohibit creeks from flowing all the way to the ocean. When the berms are in place, there may be substantial levels of bacteria in the creeks. Data from the creeks are needed to verify this hypothesis. If berms were in place when the beach data were collected, the exceedances measured at the beaches were most likely caused by local sources on the beach that exist downstream of the mixing zone such as birds, marine mammals, resuspension from sediment, or re-growth in the wrack line.

The Southern Coastal California Water Research Project's (SCCWRP) Study published and titled, *Fecal Indicator Bacteria (FIB) levels during dry weather from southern California reference streams* (Tiefenthaler, et al., 2008) shows that exceedances of REC-1 WQOs in nautral streams typically occur at levels below State water quality standards during dry weather conditions. Results of the study also indicated that exceedances of the single sample maximum WQOs during dry weather conditions do occur. Additional studies may indicate that an allowable exceedance frequency for dry weather may be appropriate.

More data could be collected to better characterize a reference watershed during dry weather flows. Therefore, WQOs, without any allowable exceedances, are sufficient for use as dry weather TMDL targets. Although the dry weather allowable mass loads were calculated based on the geometric mean WQOs, the single sample maximum WQOs must also be met pursuant to the Ocean Plan and Basin Plan.

Table 4-3. Single Sample Maximum Dry Weather Exceedances in Potential Reference Systems

Site ID	Location	Number of dry weather samples	Number of dry weather exceedances	Dry weather exceedance probability
Fecal Coliform				
EH-520	San Mateo Creek	101	0	0%
EH-510	San Onofre State Beach	72	0	0%
Total Coliform				
EH-520	San Mateo Creek	100	0	0%
EH-510	San Onofre State Beach	72	0	0%
Enterococci				
EH-520	San Mateo Creek	101	3	3%
EH-510	San Onofre State Beach	72	1	1%

4.2.2 Summary of Dry Weather Targets for Load Calculations

The numeric targets used in the dry weather mass-load based TMDL calculations are based on the REC-1 geometric mean WQOs. The numeric targets used in the calculations of the dry weather TMDLs include a 0 percent allowable exceedance frequency of the REC-1 geometric mean WQOs.

For all beaches (except those that are downstream of San Juan Creek, Aliso Creek and the San Diego River), the dry weather numeric targets based on REC-1 WQOs are as follows: fecal coliform 200 MPN/100 mL; total coliform 1,000 MPN/100 mL; and enterococci 35 MPN/100 mL (30-day geometric mean in all instances). These geometric mean values may be exceeded 0 percent of the time in the calculation of the dry weather mass-load based TMDLs.

For San Juan Creek and downstream beach, Aliso Creek and downstream beach, Tecolote Creek, Forrester Creek and the (lower) San Diego River and downstream beach, and Chollas Creek, the numeric targets are as follows: fecal coliform 200 MPN/100 mL; total coliform 1,000 MPN/100 mL; and, enterococci 33 MPN/100 mL (30-day geometric mean in all instances). These geometric mean values may be exceeded 0 percent of the time in the calculation of the dry weather mass-load based TMDLs.

Table 4-4. Dry Weather Numeric Targets

Indicator Bacteria	Numeric Target (MPN/100mL)	Allowable Exceedance Frequency [a]
Fecal coliform	200 [b]	0%
Total coliform	1,000 [c]	0%
Enterococci	35 [d] / 33 [e]	0%

a. Percent of dry days (i.e., days with less than 0.2 inch of rainfall observed on each of the previous 3 days) allowed to exceed the dry weather numeric targets.
b. Fecal coliform 30-day geometric mean WQO for REC-1 use in creeks and at beaches.
c. Total coliform 30-day geometric mean WQO for REC-1 at beaches and the point in creeks that discharges to beaches.
d. Enterococci 30-day geometric mean WQO for REC-1 at beaches.
e. Enterococci 30-day geometric mean WQO for REC-1 use in impaired creeks and beaches downstream of those creeks (applicable to San Juan Creek and downstream beach, Aliso Creek and downstream beach, Tecolote Creek, Forrester Creek, San Diego River and downstream beach, and Chollas Creek).

5 Data Inventory and Analysis

Data from numerous sources were used to characterize the watersheds and water quality conditions, identify land uses associated with bacteria sources, and support the calculation of TMDLs for the watersheds. No new data were collected as part of this effort. The data analysis provided an understanding of the conditions that result in impairments.

5.1 Data Inventory

The categories of data used in developing these TMDLs include physiographic data that describe the physical conditions of the watershed and environmental monitoring data that identify past and current conditions and support the identification of potential pollutant sources. Table 5-1 presents the various data types and data sources used in the development of these TMDLs. The following sections describe the key data sets used for TMDL development.

5.1.1 Water Quality Data

Monitoring data for the impaired beaches were received from a number of agencies in San Diego and Orange Counties. Data were received for 52 locations monitored along impaired shorelines, in addition to 7 unimpaired shoreline locations (Figures 5-1 and 5-2; Appendix G, No. 15-20). Bacteria data (including fecal coliform, total coliform, and enterococci data) were collected at various times from 1999 through 2002, and the amount of data varied among monitored locations. Most locations had fecal coliform, total coliform, and enterococci data for assessment of existing conditions.

Special studies were conducted for Aliso Creek and San Juan Creek (San Diego Water Board, 2002b) by the Orange County Public Facilities and Resources Department and the Orange County Public Health Laboratory, respectively (Figure 5-3; Appendix G, No. 4 and 6). The City of San Diego conducted studies of Rose Creek and Tecolote Creek (data included in Figure 5-4 were collected in 2001 and 2002; Appendix G, No. 5). For each of the studies, multiple bacteria samples were collected throughout the year at stations throughout the watersheds and along several tributaries.

In addition, monitoring data were obtained for the following five rivers or creeks from various agencies in the Region: San Diego River (Padre Dam Municipal Water District), San Mateo Creek (Southwest Division Naval Facilities Engineering Command), Santa Margarita River (Southwest Division Naval Facilities Engineering Command), and San Luis Rey River (City of Oceanside). Data sources are described in Appendix G.

Water quality data from six major inland discharges—five at Camp Pendleton and one on Murrieta Creek (Santa Rosa Water Reclamation Facility)—were obtained. All these sources are in the Santa Margarita River watershed. Discharge data for inland outfalls to streams are limited to the period prior to 2002, after which these major inland discharges were either discontinued or diverted to ocean outfalls.

Table 5-1. Inventory of Data and Information Used for the Source Assessment of Bacteria

Data Set	Type of Information	Data Source(s)
Watershed physiographic data	Location of dams	USEPA BASINS
	Stream network	USEPA BASINS (Reach File, Versions 1 and 3); USGS National Hydrography Dataset (NHD) reach file; special studies of Aliso Creek, Tecolote Creek, and Rose Creek.
	Land use	USGS MRLC (1993); San Diego Regional Planning Agency – 2000 land use coverage for San Diego County (SANDAG); Southern California Association of Governments (SCAG) land use coverage of Orange and portions of Riverside Counties (1993)
	Counties	USEPA BASINS
	Cities/populated places	USEPA BASINS, U.S. Census Bureau's Tiger Data
	Soils	USEPA BASINS (USDA-NRCS STATSGO)
	Watershed boundaries	USEPA BASINS (8-digit hydrologic cataloging unit); CALWTR 2.2 (1995)
	Topographic and digital elevation models (DEMs)	USEPA BASINS; USGS
Environmental monitoring data	Water quality monitoring data	USEPA's STORET; California Department of Environmental Health; County of San Diego Department of Environmental Health; Orange County Pubic Facilities and Resources Department; City of San Diego; City of Oceanside; Orange County Public Health Laboratory, San Diego Water Board; Padre Dam Municipal Water District; Southwest Division Naval Facilities Engineering Command
	Streamflow data	USGS; Orange County Public Facilities and Resources Department; City of San Diego
	Meteorological station locations	BASINS; National Oceanic and Atmospheric Administration - National Climatic Data Center (NOAA-NCDC); California Irrigation Management Information System (CIMIS); California Department of Water Resources, Division of Flood Management; ALERT (Automatic Local Evaluation in Real-Time) Flood Warning System

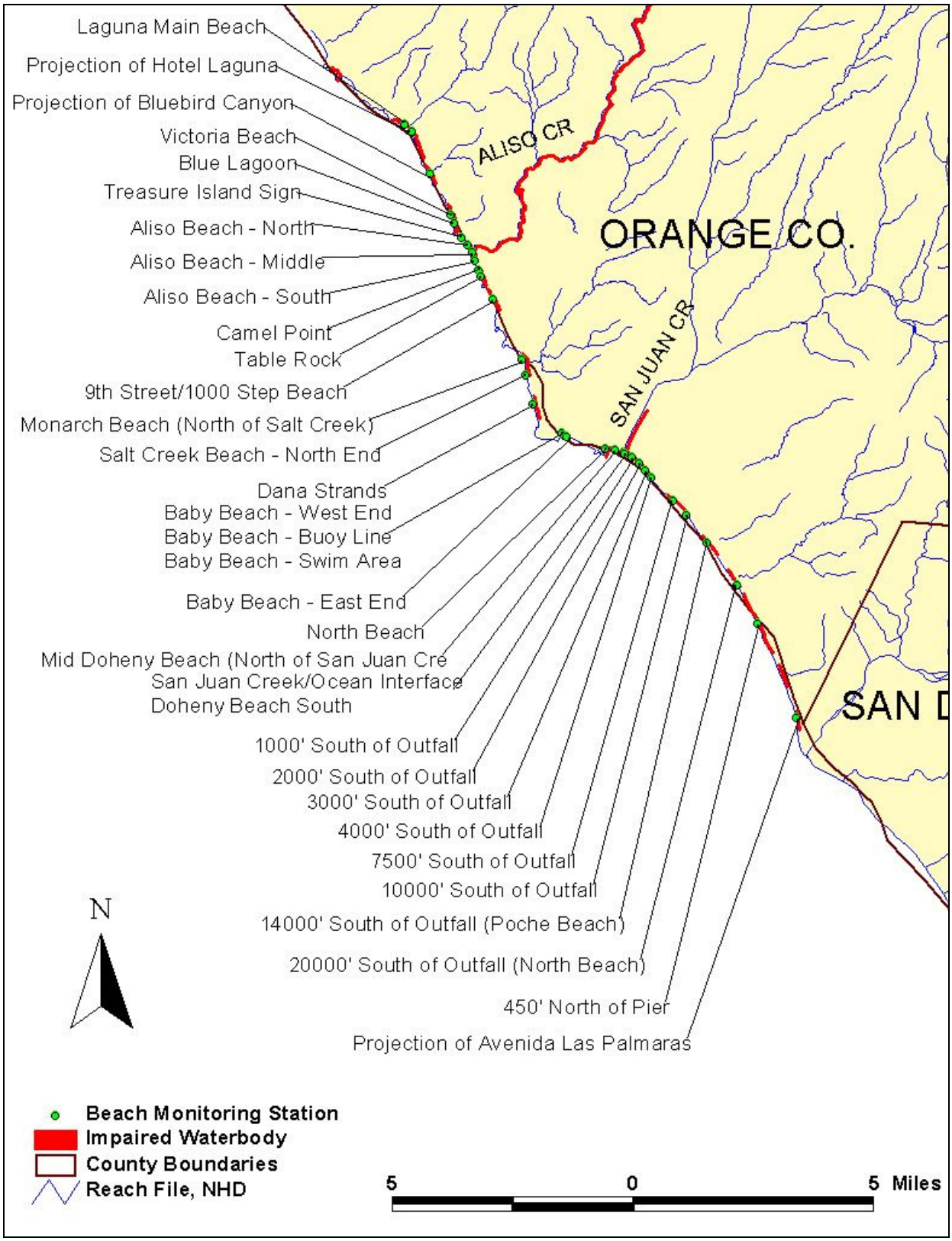

Figure 5-1. Beach monitoring station locations in Orange County.

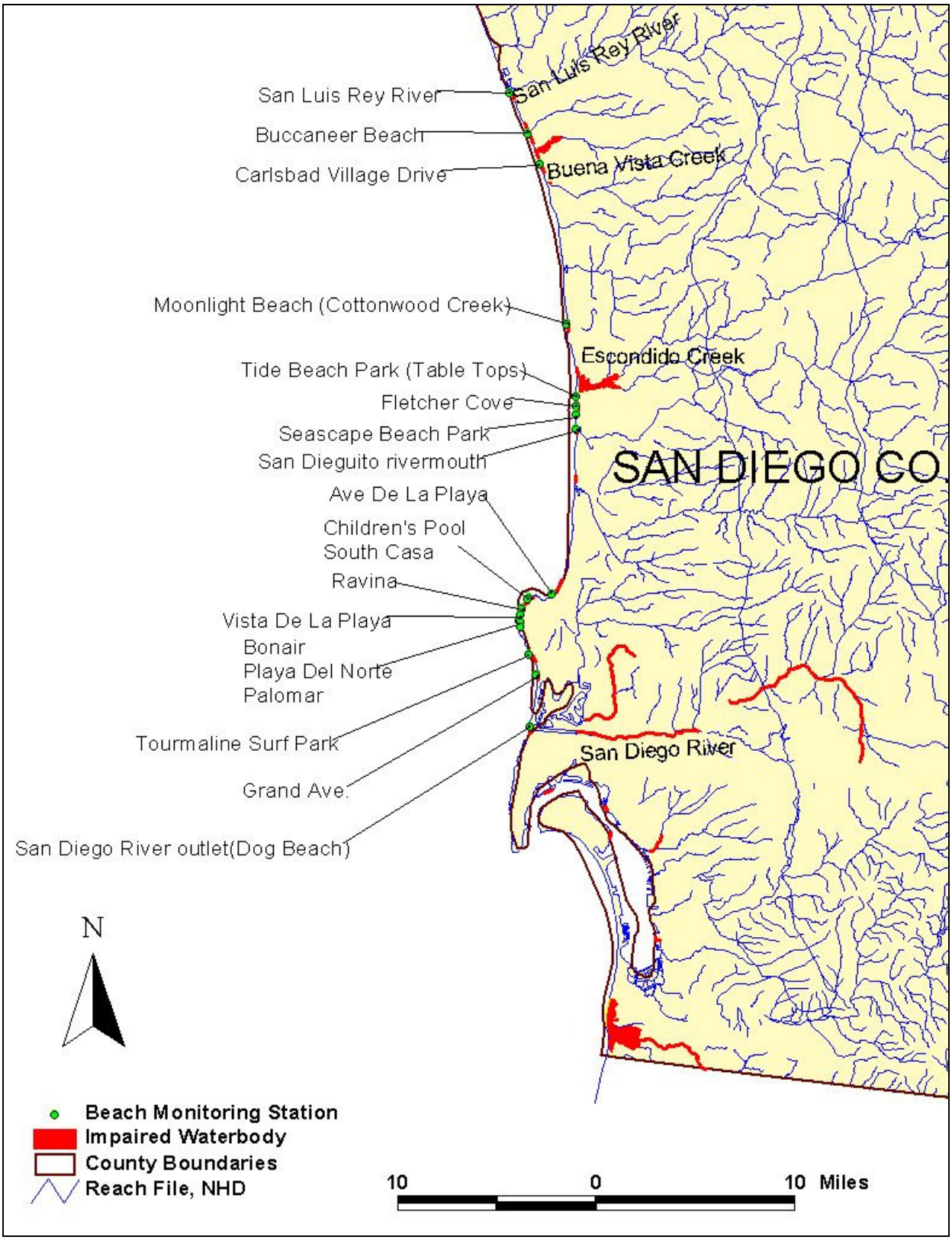

Figure 5-2. Beach monitoring station locations in San Diego County.

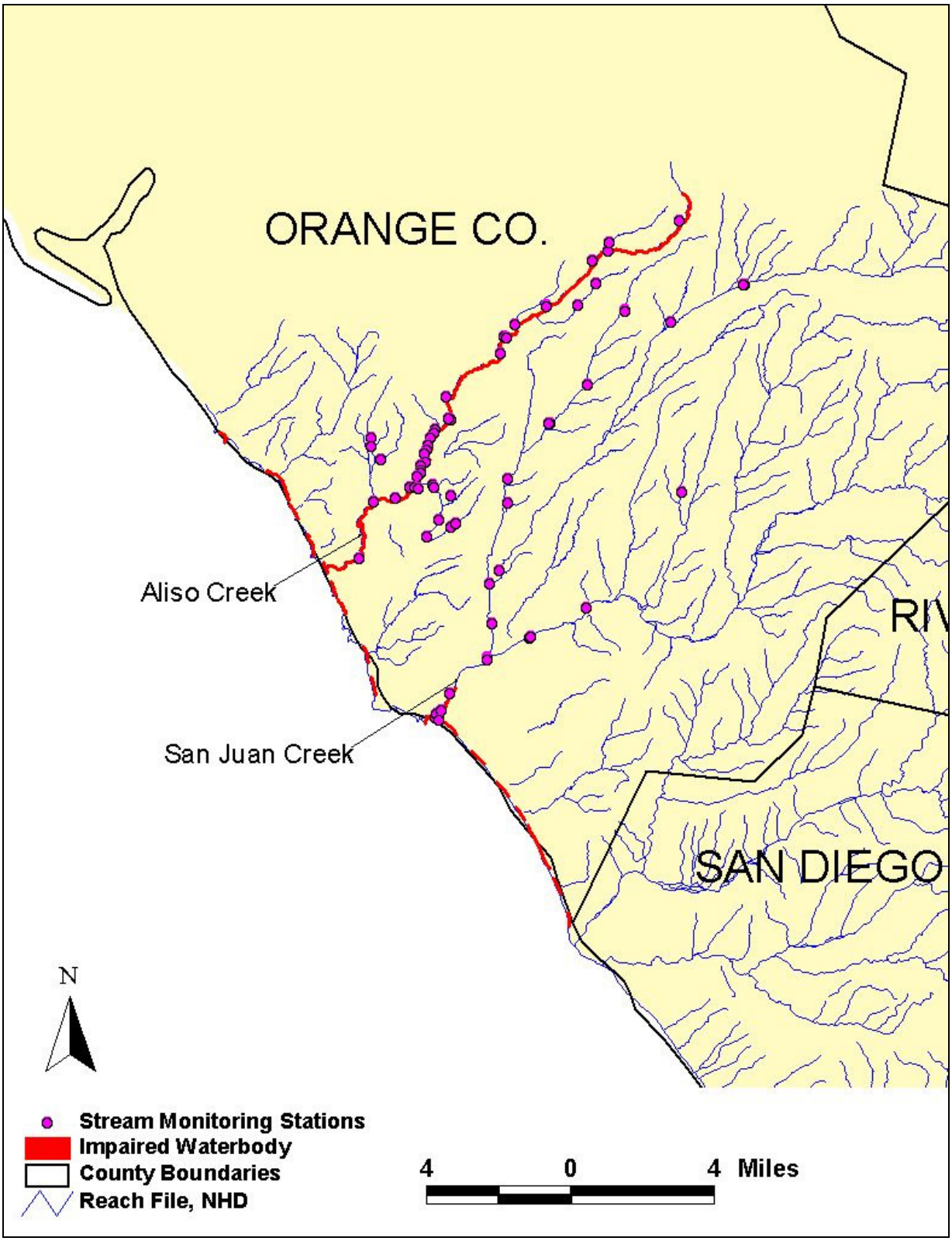

Figure 5-3. Bacteria monitoring stations on Aliso Creek and San Juan Creek.

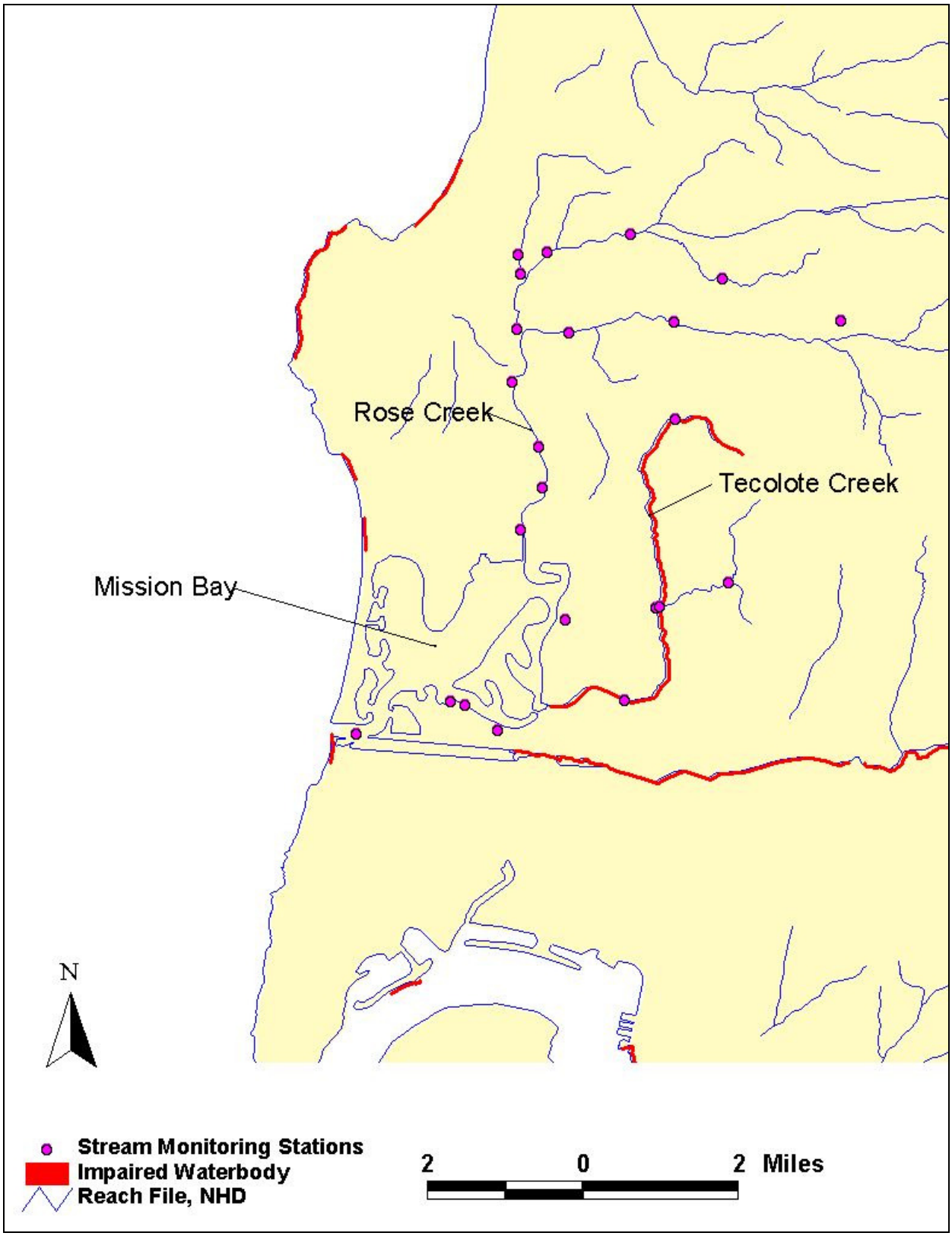

Figure 5-4. Bacteria monitoring stations on Rose Creek and Tecolote Creek.

5.1.2 Waterbody Characteristics

The assessment of waterbody characteristics involved analyzing streamflow data and assessing physical information. This information was used to determine the volume and hydraulic features of waterbodies for determining assimilative capacity and physical processes that affect bacteria transport for TMDL analysis.

A limited amount of streamflow data for the listed segments was available. The Aliso Creek, Rose Creek, and Tecolote Creek watersheds had streamflow information associated with special studies performed for the assessment of bacteria loading characteristics (see section 5.1.1). In addition, U.S. Geological Survey (USGS) gages with recent streamflow records were identified in the study area (Table 5-2). Historical streamflow data and data for stream channel geometry (width and depth) for these gages were obtained from USGS (Appendix G, No. 3).

Table 5-2. USGS Streamflow Gages in the San Diego Region with Recent Data

Station Number	Station Name	Historical Record
11022480	San Diego River at Mast Road near Santee, CA	5/1/1912–9/30/2002
11023000	San Diego River at Fashion Valley at San Diego, CA	1/18/1982–9/30/2002
11023340	Los Penasquitos Creek near Poway, CA	10/1/1964–9/30/2002
11025500	Santa Ysabel Creek near Ramona, CA	2/1/1912–9/30/2002
11028500	Santa Maria Creek near Ramona, CA	12/1/1912–9/30/2002
11042000	San Luis Rey River at Oceanside, CA	10/1/1912–11/10/1997; 4/29/1998–9/30/2002
11042400	Temecula Creek near Aguanga, CA	8/1/1957–9/30/2002
11044300	Santa Margarita River at FPUD Sump near Fallbrook, CA	10/1/1989–9/30/2002
11046000	Santa Margarita River at Ysidora, CA	3/1/1923–2/25/1999; 10/1/2001–9/30/2002
11046530	San Juan Creek at La Novia Street Bridge near San Juan Capistrano, CA	10/1/1985–9/30/2002
11047300	Arroyo Trabuco near San Juan Capistrano, CA	10/1/1970–9/30/1989; 10/1/1995–9/30/2002
11022350	Forrester Creek near El Cajon, CA	10/1/1993–9/30/2002
11039800	San Luis Rey River at Couser Canyon Bridge near Pala, CA	10/1/1986–1/4/1993

5.1.3 Meteorological Data

Hourly rainfall data were obtained from the National Climatic Data Center (NCDC) of the National Oceanic and Atmospheric Administration (NOAA). To augment the NCDC data, hourly rainfall data were also obtained from the California Irrigation Management Information System (CIMIS); California Department of Water Resources, Division of Flood Management;

and the Automatic Local Evaluation in Real-Time (ALERT) Flood Warning System. In addition, hourly evapotranspiration data were obtained from CIMIS (Appendix G, No. 21-23).

5.1.4 Land Characteristic Data

Available land use data to support this study included the 1993 USGS Multi-Resolution Land Characteristic (MRLC) data, which were available for the entire study area. The San Diego Regional Planning Agency (SANDAG) had a more detailed and recent 2000 land use data set that covers San Diego County. For Orange County and portions of Riverside County, land use data were obtained from the Southern California Association of Governments (SCAG). A combination of MRLC, SANDAG, and SCAG data was used to provide the most complete and up-to-date land use representation of the Region (Appendix G, No. 25).

In addition, soil data were obtained from the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) State Soil Geographic (STATSGO) database and topographic information was obtained from the USEPA's Better Assessment Science Integrating Point and Nonpoint Sources (BASINS) system (Appendix G, No. 26).

5.2 Review of Impaired Segments

Bacteria data collected from beach and creek segments were analyzed to provide guidance for the source assessment. Results of these analyses are reported in the following sections.

5.2.1 Beach Impairments

Bacteria monitoring data for beach stations (Appendix G, No. 15-20) were analyzed to provide insight into the spatial extent of impairment and the timing of any exceedances of WQOs. Results of this analysis were also used in the source assessment to identify the proximity of impaired coastal segments to tributaries, outfalls, and other potential sources (see Section 6). Monitoring data were reviewed based on their association with wet or dry conditions to better understand variability during periods when methods of transport differ (wet weather runoff versus dry weather runoff). The wet period was defined to be consistent with the DEH General Advisory to avoid contact with ocean and bay water within 300 feet on either side of any storm drain, river, or lagoon outlet for 72 hours after 0.2 inch or more of rain. For each monitoring station, sampling dates were compared to rainfall data collected at the closest rainfall gage to determine whether bacteria samples had been collected during wet or dry periods. Once the data for all stations were identified as wet or dry, the number of exceedances of single sample WQOs was quantified for fecal coliform, total coliform, and enterococci at each station. Wet weather data cannot be analyzed for exceedance of 30-day geometric mean WQOs because wet weather periods do not come close to approaching 30 days in length.

To assess the spatial variability of bacteria levels during both wet and dry conditions, the exceedance frequency of the REC-1 (fecal coliform, enterococci and total coliform) single sample WQOs for each station were plotted in Figures H-1 through H-6 of Appendix H. These plots show that at some locations, bacteria concentrations frequently exceed the WQOs for indicator bacteria. The frequency of exceedances varies for each indicator bacteria, location, and for wet or dry weather conditions. Also, higher exceedance frequencies are observed in the

vicinity of creeks or lagoons and major stormwater outfalls, especially at the mouths of those creeks and lagoons that are impaired due to high bacteria levels.

5.2.2 Creek Impairments

The analysis of beach monitoring data confirms that the highest number of exceedances of WQOs was in the vicinity of rivers, major stormwater outfalls, and known local sources (e.g., waterfowl at creek outlets; Appendix G, No. 15-20). This analysis is important in review of creek impairments because high numbers of exceedances were observed at the mouths of Aliso Creek, San Juan Creek, Tecolote Creek, and the San Diego River. Tables 5-3 through 5-5 list the number of monitoring stations and observed data, ranges of indicator bacteria levels observed, and exceedance frequencies of marine WQOs in the watershed of each impaired creek addressed in this TMDL where data were available (Appendix G, No. 4, 5, 6, 10, 11, 12, 13, and 14), and respective indicator bacteria were identified as the pollutant/stressor. For each impaired watershed, exceedances of marine WQOs were observed. Although the data are from inland surface waters (creeks), the marine WQOs were used to tally the number of exceedances likely to occur at a beach at the outlet of the watershed. This is because high bacteria counts in the watershed generally lead to high bacteria counts downstream, at the shoreline.

Table 5-3. Summary of Fecal Coliform Data for Impaired Creeks

Stream	Number of Monitoring Stations	Total Number of Samples	Fecal Coliform (MPN/100mL)			Frequency of Exceedance of WQOs for Marine Waters
			Minimum	Mean	Maximum	
Aliso Creek	108	8,816	2	10,739	684,600	77%
Tecolote Creek	5	208	5	16,429	1,732,870	40%
San Diego River	6	36	2	1,557	24,000	36%
San Juan Creek	31	357	10	5,680	350,000	58%

Table 5-4. Summary of Total Coliform Data for Impaired Creeks

Stream	Number of Monitoring Stations	Total Number of Samples	Total Coliform (MPN/100 mL)			Frequency of Exceedance of WQOs for Marine Waters
			Minimum	Mean	Maximum	
Aliso Creek	108	8,815	2	40,750	878,400	55%
Tecolote Creek	5	208	959	171,746	2,419,200	63%
San Diego River	6	34	300	14,885	300,000	15%
San Juan Creek	31	357	10	130,683	14,900,000	45%

Table 5-5. Summary of Enterococci Data for Impaired Creeks

Stream	Number of Monitoring Stations	Total Number of Samples	Enterococci (MPN/100 mL)			Frequency of Exceedance of WQOs for marine waters
			Minimum	Mean	Maximum	
Aliso Creek	108	8,817	1	6,018	492,800	98%
Tecolote Creek	5	208	5	15,099	2,419,200	95%
San Juan Creek	31	357	5	4,834	280,000	89%

5.3 Analyses of Beach Water Quality Versus Magnitude of Streamflow

A statistical comparison of flow versus bacteria density was also performed to evaluate historical effects of high- and low-flow conditions near the mouths of the creeks. Two USGS gage stations in close proximity to the monitoring locations had flow data for the same time period as the bacteria monitoring data: San Diego River–Dog Beach (USGS 11023000 and FM-010) and San Luis Rey River (USGS 11042000 and OC-100; Appendix G, No. 3, 18-19). Figures 5-5 and 5-6 show the flow versus fecal coliform density comparisons. In general, high fecal coliform levels were observed under a range of flow levels. For both locations, high fecal coliform densities were observed under low-flow and high-flow conditions. This indicates the need to assess bacteria sources separately during both wet weather events and dry weather conditions.

Location: Dog Beach
Pollutant: Fecal Coliform
Data from: 1/4/1999 to 9/27/2001 (316 Observations)

Flow Range	# Obs	Flow (cfs)			Concentration (#/100 mL)		
Percentile	*Count*	*Mean*	*Min*	*Max*	*Mean*	*Min*	*Max*
0-10	32	1.059	0.790	1.200	170.73	6.00	1400.00
10-20	32	1.422	1.200	1.700	552.58	2.00	16000.00
20-30	32	1.809	1.700	2.000	299.54	2.00	3200.00
30-40	31	2.529	2.100	3.200	552.92	2.00	6800.00
40-50	31	3.961	3.200	4.700	360.19	2.00	7600.00
50-60	32	5.934	4.800	6.700	494.83	2.00	3600.00
60-70	31	7.968	6.800	8.800	86.50	20.00	800.00
70-80	31	12.581	9.000	14.000	135.76	16.00	800.00
80-90	32	25.094	15.000	39.000	245.75	2.00	2300.00
90-100	32	114.094	42.000	347.000	1438.09	20.00	12000.00

Location: Dog Beach
Pollutant: Fecal Coliform
Data from: 1/4/1999 to 9/27/2001 (316 Observations)

Time Period	# Obs	Flow (cfs)			Concentration (#/100 mL)		
Month	*Count*	*Mean*	*Min*	*Max*	*Mean*	*Min*	*Max*
January	15	19.013	4.900	153.000	614.71	2.00	2400.00
February	38	54.066	5.500	347.000	2179.54	2.00	12000.00
March	25	56.960	11.000	182.000	199.64	2.00	2300.00
April	26	26.262	6.500	248.000	687.87	2.00	1800.00
May	42	7.421	3.600	11.000	282.45	2.00	3600.00
June	41	3.566	1.500	5.600	370.64	2.00	7600.00
July	52	1.830	0.980	2.600	680.52	2.00	16000.00
August	23	1.346	0.790	2.100	61.05	4.00	300.00
September	19	1.284	0.930	1.900	198.19	6.00	1600.00
October	13	34.908	1.000	146.000	260.46	2.00	1500.00
November	13	4.815	1.500	15.000	150.41	20.00	3200.00
December	9	5.344	2.400	14.000	72.16	2.00	500.00

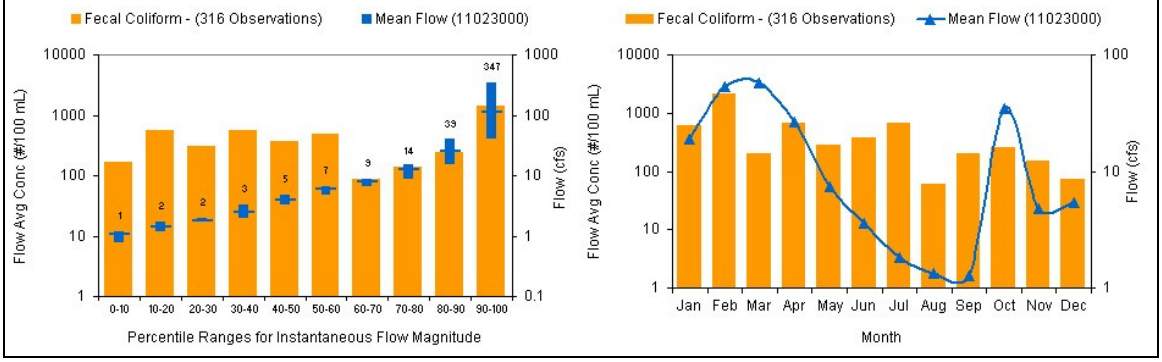

Figure 5-5. Flow versus fecal coliform concentration near San Diego River outlet (Dog Beach).

Location: San Luis Rey River
Pollutant: Fecal Coliform
Data from: 1/11/1999 to 9/25/2001 (144 Observations)

Flow Range	# Obs	Flow (cfs)			Concentration (#/100 mL)		
Percentile	*Count*	*Mean*	*Min*	*Max*	*Mean*	*Min*	*Max*
0-10	15	0.000	0.000	0.000	195.85	2.00	2400.00
10-20	14	0.000	0.000	0.000	285.52	2.00	1600.00
20-30	14	0.041	0.000	0.060	11.19	2.00	240.00
30-40	15	0.239	0.090	0.460	59.52	4.00	500.00
40-50	14	1.098	0.570	1.600	57.09	2.00	240.00
50-60	14	2.057	1.600	2.600	78.52	2.00	240.00
60-70	15	4.260	2.900	5.700	144.03	11.00	500.00
70-80	15	10.173	6.200	14.000	177.98	17.00	700.00
80-90	13	20.385	15.000	24.000	128.66	2.00	300.00
90-100	15	71.533	28.000	180.000	741.48	5.00	3000.00

Location: San Luis Rey River
Pollutant: Fecal Coliform
Data from: 1/11/1999 to 9/25/2001 (144 Observations)

Time Period	# Obs	Flow (cfs)			Concentration (#/100 mL)		
Month	*Count*	*Mean*	*Min*	*Max*	*Mean*	*Min*	*Max*
January	7	31.570	0.060	180.000	2449.41	2.00	3000.00
February	5	53.140	5.700	124.000	440.47	11.00	700.00
March	8	50.875	22.000	137.000	135.83	13.00	300.00
April	12	35.750	13.000	95.000	271.09	5.00	900.00
May	17	9.700	4.500	19.000	169.62	17.00	700.00
June	10	5.200	1.600	12.000	74.53	17.00	130.00
July	15	1.799	0.420	5.100	61.14	2.00	240.00
August	15	0.579	0.000	2.100	86.87	7.00	130.00
September	17	1.231	0.000	3.700	134.64	2.00	500.00
October	17	0.241	0.000	4.100	500.00	2.00	2400.00
November	13	0.178	0.000	0.990	168.30	2.00	500.00
December	8	0.029	0.000	0.060	15.39	2.00	240.00

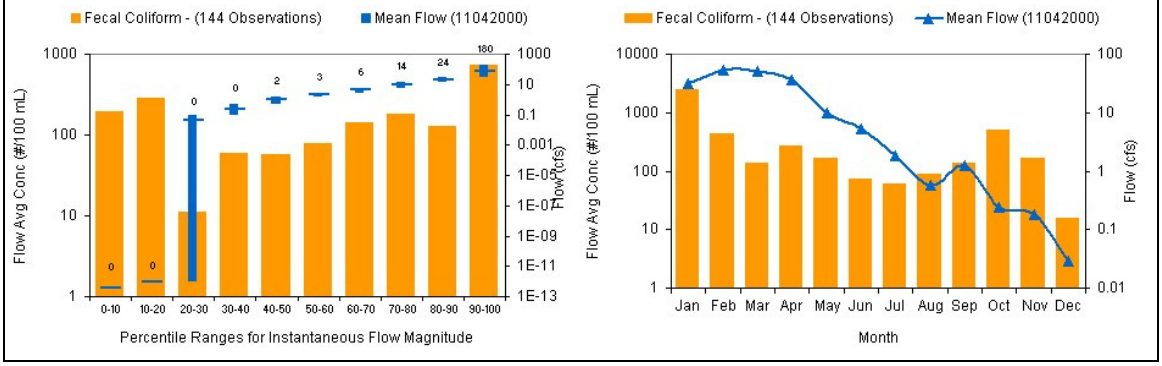

Figure 5-6. Flow versus fecal coliform concentration near San Luis Rey River

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6 Source Analysis

The purpose of the source analysis is to identify and quantify the sources of bacteria causing or contributing to the impairment of the beaches and creeks. Both in-stream and watershed data were used to identify potential sources and characterize the relationship between point and nonpoint source loadings and in-stream response, under both wet weather and dry weather conditions. Point sources typically discharge at a specific location from pipes, outfalls, and conveyance channels from, for example, municipal wastewater treatment plants or municipal separate storm sewer systems (MS4s). These discharges are regulated through waste discharge requirements (WDRs) that implement federal NPDES (National Pollutant Discharge Elimination System) requirements issued by the State Water Board or the San Diego Water Board through various orders.[16] Nonpoint sources are diffuse sources that have multiple routes of entry into surface waters. Some nonpoint sources, such as agriculture, livestock, and horse ranch facilities (hereafter referred to collectively as agriculture land uses) may be regulated through WDRs, or may be eligible for conditional waivers of WDRs.

During both wet weather and dry weather periods, multiple point and nonpoint sources of bacteria may contribute to overall loads to the impaired waterbodies. Bacteria are deposited both directly to the waterways and also onto land surfaces. Sources can include storm drain discharges, sewer line breaks, leaking septic systems, agricultural activities, deposit of waste from aquatic and terrestrial wildlife and pets, decaying matter, soil, and deposit of waste from encampments of homeless persons. Discharges directly to marine shorelines include illegal sewage disposal from boats along the coastline, direct input to waterbodies from waterfowl, bacteria re-growth in the wrack line, and even swimmers themselves.

Sources of bacteria are the same under both wet weather and dry weather conditions. However, the method of transport for the two conditions is very different. Wet weather loading is dominated by episodic storm flows that wash off bacteria that build up on the surface of all land use types in a watershed during dry periods. Dry weather loading is dominated by nuisance flows from urban land use activities such as car washing, sidewalk washing, and lawn over-irrigation, which pick up bacteria and deposit it into receiving waters. These types of nuisance flows are generally referred to as urban runoff. Because the relative loads from bacteria sources vary significantly between wet weather events and dry weather conditions, load assessment required separate wet and dry weather analyses. For this reason, two distinct modeling platforms were used to assess bacteria loading and TMDLs. These models are described in the Linkage Analysis in section 7.

6.1 Land Use / Bacteria Source Correlation

In this technical TMDL analysis, bacteria sources were quantified by land-use type since bacteria loading can be highly correlated with land-use practices. Some land use types, such as low and high density residential, produce high concentration of bacteria while other land use types such as military produce relatively smaller concentrations of bacteria.

[16] A discussion of the State Water Board and San Diego Water Board Orders regulating point source discharges of bacteria is presented in the Implementation Plan, section 11.

Since several land-use types share hydrologic or pollutant loading characteristics, many were grouped into similar classifications, resulting in a subset of 13 categories for modeling. Selection of these land-use categories was based on the availability of monitoring data and literature values that could be used to characterize individual land use contributions and critical bacteria-contributing practices associated with different land uses. For example, multiple urban categories were represented independently (e.g., high density residential, low density residential and commercial/institutional), whereas forest and other natural categories were grouped.

6.1.1 Wet Weather Transport

During wet weather events, wash-off of bacteria from various land uses is considered the primary mechanism for transport of bacteria. This is due to the relatively large bacteria levels observed at the mouths and/or within the watersheds of impaired creeks. After bacteria build up on the land surface as the result of various land sources and associated management practices (e.g., management of livestock in agricultural areas, pet waste in residential areas), many of the bacteria are washed off the surface during rainfall events. The amount of runoff and associated bacteria concentrations are therefore highly dependent on land use. This methodology of correlating land use to bacteria sources produced successful modeling results, despite the fact that some sources are distributed across several different land uses (i.e. wildlife inhabiting open space land use and also urbanized land uses such as high and low density residential).

Pie charts were developed that show relative bacteria loads by land use type for each watershed (Appendix I). Land use classifications were provided by SANDAG and SCAG and were grouped in some instances (Appendix J). Land uses were further classified into either point source dominated discharge or nonpoint source dominated discharge (Appendix I).

6.1.2 Dry Weather Transport

From analysis of spatial distributions of bacteria concentrations along the Pacific Ocean shoreline, high bacteria levels were observed at the mouths of major stormwater outfalls and creeks under dry conditions. This observance was validated through an analysis of streamflow versus bacteria concentration that indicated a significant dry weather bacteria source to streams. During dry conditions, most impaired streams exhibit a sustained baseflow even if no rainfall has occurred for a significant period to provide runoff. These flows result from various urban land use practices that generate urban runoff, which enters storm drains and creeks. As these flows travel across lawns and urban surfaces, bacteria are carried from these areas to receiving waters.

Analysis of flow and bacteria data from Aliso Creek, San Juan Creek, Tecolote Creek, and Rose Creek showed that dry weather urban runoff and associated bacteria levels could be estimated from land use information in a given watershed. This analysis is discussed in detail in Appendix K.

6.2 Point Sources

Bacteria loads attributable to point sources are discharged in urban runoff from the following land use types:

- Low Density Residential;

- High Density Residential;
- Commercial/Institutional;
- Industrial/Transportation (excluding areas owned by Caltrans)
- Caltrans;
- Military;
- Parks/Recreation; and
- Transitional (construction activities).

These land use types were classified as generating point source loads because, although the bacteria sources on these land use types may be diffuse in origin, the pollutant loading is transported and discharged to receiving waters through MS4s. The principal MS4s contributing bacteria to receiving waters are owned or operated by either municipalities located throughout the watersheds or Caltrans.[17]

6.3 Nonpoint Sources

Bacteria loads attributable to nonpoint sources are discharged in stormwater runoff from the following land use types:

- Agriculture;
- Dairy/Intensive Livestock;
- Horse Ranches;
- Open Recreation;
- Open Space;
- Water.

These land use types were classified as generating nonpoint source loads because the loads are discharged in overland stormwater runoff that is diffuse in origin, and are largely located in areas without constructed (man-made) MS4s or in areas upstream of MS4 networks. One exception is that several dairies in these watersheds are regulated as point source discharges pursuant to NPDES requirements.

6.4 Wastewater Treatment Facilities and Collection Systems

Wastewater treatment facilities and collection systems are located in the watersheds addressed by these TMDLs. However, most of the effluent from these facilities is discharged to the Pacific Ocean through offshore ocean outfalls. Therefore, these loads were not included in the TMDL calculations. The only exception is the Padre Dam Municipal Water District Water Reclamation Plant (Padre Dam), which discharges effluent to the San Diego River via a series of ponds that feed the Santee Lakes. However, Padre Dam's bacterial discharges do not contribute to the San Diego River's bacterial impairment because Padre Dam's effluent meets the REC-1 water quality standard.

[17] A complete discussion regarding the dischargers identified for meeting allocations is available in section 10, Legal Authority for TMDL Implementation Plan.

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7 Linkage Analysis

The technical TMDL analysis of pollutant loading from watersheds, and the waterbody response to this loading is referred to as the linkage analysis. The purpose of the linkage analysis is to quantify the "existing" bacteria loads that are currently generated by the pollutant sources in the watershed under critical conditions, and quantify the maximum allowable bacteria loading to each impaired waterbody that will result in in attainment of the numeric targets under the same critical conditions. This maximum allowable bacteria loading is, in other words, the TMDL. Existing loads and TMDLs were calculated for each watershed. The load reduction from the total existing load in a watershed needed in order to attain the TMDLs in the receiving waters was also calculated for each watershed.

For these TMDLs, a distinction is made between wet weather events and dry weather conditions because bacteria loads differ between the two scenarios and implementation measures will be specific to wet and dry conditions. The linkage analysis utilized two district modeling approaches for calculating bacteria loads. One modeling approach specifically quantified loading during wet weather events. The other modeling approach quantified loading during dry weather conditions. Both current loading and TMDLs were calculated for each watershed under both wet weather events and dry weather conditions. This information is available in Tables 9-1 through 9-4.

7.1 Consideration Factors for Model Selection

In selecting an appropriate linkage analysis modeling approach for TMDL calculation, technical and regulatory criteria were considered. Technical criteria include the physical system in question, including watershed or stream characteristics and processes, and the constituent of interest, in this case, bacteria. Regulatory criteria include water quality standards or procedural protocol. The following discussion details the considerations in each of these categories. Based on these considerations, appropriate models were chosen to simulate both wet weather events and dry weather conditions. The same technical approaches were used for both beaches and creeks.

7.1.1 Technical Criteria

Technical criteria are divided into four main topics. Consideration of each topic was critical in selecting the most appropriate modeling approach to address the types of sources and the numeric targets associated with the impaired waters.

7.1.1.a Physical Domain

Representation of the physical domain is perhaps the most important consideration in model selection. The physical domain is the focus of the modeling effort—typically described by either the receiving water itself or a combination of the contributing watershed and the receiving water. Selection of the appropriate modeling domain depends on the constituents and the conditions under which the stream exhibits impairment. For a stream dominated by point source inputs (e.g., wastewater treatment plant discharge; urban runoff discharged from stormwater outfalls) that exhibits impairments under only low-flow conditions, a steady-state approach is typically used. This type of modeling approach focuses on only in-stream (receiving water) processes during a user-specified condition. For streams affected additionally or solely by nonpoint

sources or primarily rainfall-driven flow and pollutant contributions during wet weather, a dynamic approach is recommended. Dynamic watershed models consider time-variable nonpoint source contributions from a watershed surface or subsurface. Some models consider monthly or seasonal variability, while others enable assessment of conditions immediately before, during, and after individual rainfall events. Dynamic models require a substantial amount of information regarding input parameters and data for calibration purposes.

For this project, two conditions were recognized that require specific model development to address key physical and environmental conditions. For wet weather, it was assumed that the San Diego Region is dominated by nonpoint sources that are generally constant on an hourly time step and deposit directly to drains. For dry weather, streams in the Region are characterized by much smaller flows than wet conditions, with flows less dynamic than wet periods and assumed steady-state for model development. Although during both conditions the sources are nonpoint in nature, their behavior in the streams is represented in the models more like that of a point source, since specific discharge points of watershed inflows are assumed.

7.1.1.b Source Contributions

Primary sources of pollution to a waterbody must be considered in the model selection process. Accurately representing contributions from nonpoint sources and regulated point sources is critical in properly representing the system and ultimately evaluating potential load reduction scenarios.

Water quality monitoring data were not sufficient to fully characterize all sources of bacteria in the watersheds draining to impaired waterbodies. However, analyses of the available data indicate that the main controllable sources are dry and wet weather urban runoff. Thus, models were selected to develop bacteria TMDLs for beaches and creeks to address the major source categories during wet weather events and dry weather conditions considered controllable for TMDL implementation purposes.

7.1.1.c Critical Conditions

The goal of a TMDL analysis is to determine the assimilative capacity of a waterbody and to identify potential allocation scenarios that will enable the waterbodies to achieve the numeric targets, and thus the TMDLs, in the receiving waters. The critical condition is the set of environmental conditions for which controls designed to protect water quality will ensure attainment of objectives for all other conditions. The critical conditions typically include the location and the period of time in which the waterbody exhibits the most vulnerability. Critical conditions are accounted for in this project by way of using separate modeling approaches for wet weather events and dry weather conditions. In addition, to ensure that numeric targets are met in impaired waterbodies, a critical period associated with extreme rainfall conditions was selected for watershed modeling analysis. The dry weather critical condition was based on predictions of flow from the steady-state model (described in Appendix K).

7.1.1.d Constituents

Another important consideration in model selection and application is the constituent(s) to be assessed. Choice of state variables is a critical part of model application. The more state variables included, the more difficult the model is to apply and calibrate. However, if key state

variables are omitted from the simulation, the model might not simulate all necessary aspects of the system and might produce unrealistic results. A delicate balance must be met between minimal constituent simulation and maximum applicability.

The focus of development of these TMDLs is on fecal coliform, total coliform, and enterococci bacteria. Factors affecting the survival of bacteria include soil moisture content, pH, solar radiation, and available nutrients. In-stream bacteria dynamics can be extremely complex, and accurate estimation of bacteria concentrations relies on a host of interrelated environmental factors. Bacteria concentrations in the water column are influenced by die-off, re-growth, partitioning of bacteria between water and sediment during transport, settling, and re-suspension of bottom materials. First-order die-off is likely the most important dynamic process to simulate in the San Diego Region, despite observations that bacteria re-grow in low flow conditions. The limited data available provide few insights into which of the other factors listed above might be most influential on bacterial behavior for the models. A description of assumptions regarding these factors is described in Appendix L.

7.1.2 Regulatory Criteria

A properly designed and applied model provides the source-response linkage component for each waterbody and enables accurate assessment of assimilative capacities. A stream's assimilative capacity is determined by assuming adherence to water quality standards (i.e., the beneficial uses and the WQOs that support those uses). The Basin Plan establishes, for all waters in the San Diego Region, the beneficial uses for each waterbody to be protected, the WQOs that support and protect those uses, and an implementation plan that accomplishes those objectives. The modeling platform must enable direct comparison of model results to in-stream concentrations and allow for the analysis of the duration of those concentrations. For the watershed loading analysis and implementation of measures to reduce sources, that the modeling platform enable examination of gross land use loading as well as in-stream concentration is also important.

7.2 Wet Weather Modeling Analysis

During wet weather events, sources of bacteria are associated with wash-off of bacteria accumulated, or built up, on the land surface. Bacteria are delivered to receiving waters through creeks and stormwater collection systems. In this analysis, bacteria sources were linked to specific land use types with higher relative bacteria accumulation rates because they are more likely to deliver bacteria to waterbodies through stormwater collection systems. To assess the link between sources of bacteria and the impaired waters, a modeling system that simulates the build-up and wash-off of bacteria and the hydrologic and hydraulic processes that affect delivery was used. The wet weather modeling approach assumes the following:

- All sources can be represented through build-up/wash-off of bacteria from specific land use types.
- The discharge of sewage is zero. Sewage spill information was reserved for use during the calibration process to account for observed spikes in bacteria indicators, as applicable; however, the calibration process did not necessitate removal of any wet

weather data considered to be affected by sewage spill information. In other words, data from wet weather events used for calibration were not indicative of sewage spills.

- For numeric target assessment, the critical points were assumed to be the point upstream of where the creek/watershed or storm drain initially mixes with ocean water at the surf zone.

The wet weather modeling approach chosen for use in this project is based on the application of the USEPA's Loading Simulation Program in C++ (LSPC) model to estimate bacteria loading from streams and assimilation within the waterbodies. LSPC is a recoded C++ version of the USEPA's Hydrological Simulation Program–FORTRAN (HSPF) that relies on fundamental (and USEPA-approved) algorithms. LSPC has been successfully applied and calibrated in the Los Angeles, San Gabriel, and San Jacinto Rivers in Southern California. A complete discussion of LSPC configuration, calibration, and application is provided in Appendix J. Additional assumptions for wet weather modeling can be found in Appendix L.

Although the name implies that a "daily load" is calculated, wet weather mass-load based TMDLs for each watershed are expressed as "annual loads" in terms of number of bacteria colonies per year (billion MPN/yr). Wet weather mass-load based TMDLs are expressed in terms of annual loads because wet weather events (i.e., storm events) do not occur on a regular basis in any given year, and expressing the TMDL on a daily basis would be extremely difficult.

7.3 Dry Weather Modeling Analysis

The density of bacteria in receiving water during dry weather is extremely variable in nature. This necessitated an approach that relied on detailed analysis of available data to better identify and characterize sources. Data collected from dry weather samples were used to develop empirical relationships that represent water quantity and water quality associated with dry weather runoff from various land uses. For each monitoring station, a watershed was delineated and the land use was related to flow and bacteria densities. A statistical relationship was established between streamflow, bacteria densities, and areas of each land use.

To represent the linkage between source contributions and in-stream response, a steady-state mass balance model was developed to simulate transport of bacteria in the impaired creeks and the creeks flowing to impaired shorelines. This predictive model represents the streams as a series of plug-flow reactors, with each reactor having a constant, steady-state flow and bacteria load. A complete discussion of the development of the empirical framework for estimating watershed loads, and a description of the configuration and calibration of the stream-modeling network is provided in Appendix K.

The model was created to estimate bacteria densities in the San Diego Region, to develop necessary load allocations for TMDL development, and to allow for incorporation of any new data. Bacteria densities in each segment were calculated using available water quality data, and assuming values for a first-order die-off rate, stream infiltration, basic channel geometry, and flow. Assumptions made for dry weather modeling can be found in Appendix L.

Dry weather mass-load based TMDLs for each watershed are expressed as "monthly loads" in terms of number of bacteria colonies per month (billion MPN/mo). Dry weather mass-load

based TMDLs are expressing in terms of monthly loads because the dry weather numeric targets are based on 30-day geometric means, and expressing the TMDL on a daily basis would not be strictly comparable to the numeric targets.

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8 Allocation and Reduction Calculations

The calibrated models were used to simulate flow and bacteria densities for use in estimating existing bacteria mass loads to the impaired waterbodies under the critical conditions. The simulated flow from the models and the numeric targets were used in estimating the allowable bacteria mass loads (i.e., mass-load based TMDLs) that could be assimilated by the impaired waterbodies. The estimated existing mass loads were compared to the calculated mass-load based TMDLs, and the difference between the two were quantified as the mass load reductions needed to meet the numeric targets in the receiving waters, which are based on the numeric indicator bacteria WQOs and allowable exceedance frequency.

Although allocations are distributed to the dischargers of bacteria identified in the technical TMDL analysis, this does not imply that other potential sources do not exist. Any potential sources in the watersheds not receiving an explicit allocation (i.e., WLA = 0 or LA = 0) described in the technical TMDL analysis is not expected or allowed to discharge bacteria to the impaired beaches and creeks.

This section describes briefly the methodology used to calculate and allocate the mass-load based TMDLs. An in-depth discussion of this topic is the subject of Appendix I.

8.1 Wet Weather Mass Loading Analysis

The LSPC model (see Appendix J) was used to estimate existing bacteria mass loads at critical conditions for comparison to allowable bacteria mass loads calculated based on the numeric targets, and determination of required reductions for each watershed. The hydrology calibration and validation results for the LSPC model are shown in Appendix M. A comparison of the modeling results to observed bacteria densities are shown in Appendix N.

8.1.1 Identification of the Critical Wet Weather Condition

To ensure that numeric targets are met in impaired waterbodies during wet weather events, a critical period associated with extreme wet conditions was selected for the wet weather mass-load based TMDL calculations. The year 1993 was selected as the critical wet period for assessment of extreme wet weather loading conditions because this year was the wettest year of the 12 years of record (1990 through 2002) evaluated in the TMDL analysis. This corresponds to the 92nd percentile of annual rainfalls for those 12 years measured at multiple rainfall gages in the San Diego Region (Appendix G, No.21-23). Selection of this year was consistent with studies performed by the Southern California Coastal Water Research Project (SCCWRP). An analysis of rainfall data for the Los Angeles Airport (LAX) from 1947 to 2000 shows that 1993 was the 90th percentile year, meaning 90 percent of the years between 1947 and 2000 had less annual rainfall than 1993 (Los Angeles Water Board, 2002).

8.1.2 Wet Weather Mass Load Estimation

Estimation of “existing” mass loading and “allowable” mass loading (i.e., mass-load based TMDL) to the impaired waterbodies required use of the model to predict flows and bacteria densities under critical conditions. The dynamic model-simulated watershed processes, based on observed rainfall data as model input, provided temporally variable load estimates for the critical period. These load estimates were simulated using calibrated, land use-specific processes

associated with hydrology and build-up and wash-off of bacteria from the land surface. Transport processes of bacteria loads from the source to the impaired waterbodies were also simulated in the model with a first-order loss rate based on literature values.

For estimation of bacteria loading during wet weather events, simulations were performed using local rainfall data. The total number of wet days for each watershed is listed in Table 8-1. For larger watersheds that extend into the mountains (e.g., San Luis Rey River, San Dieguito River, San Diego River), more rainfall was observed. Although the Miramar watershed is near the coast and does not extend into the mountains as do the larger watersheds, localized rainfall patterns for 1993 suggested that there were a large number of wet days relative to neighboring watersheds.

Table 8-1. Wet Days of the Critical Period (1993) Identified for Watersheds Affecting Impaired Waterbodies

Watershed	Number of Wet Days in 1993
San Joaquin Hills HSA/Laguna Beach HSA	69
Aliso HSA	69
Dana Point HSA	69
Lower San Juan HSA	76
San Clemente HA	73
San Luis Rey HU	90
San Marcos HA	49
San Dieguito HU	98
Miramar Reservoir HA	94
Scripps HA	57
Tecolote HA	57
Mission San Diego HSA/Santee HSA	86
Chollas HSA	65

Only the model-predicted flows and bacteria densities for wet days were considered in estimating existing mass loads and mass-load based TMDLs. A separate modeling approach was used for assessment of dry weather mass loads (see section 8.2).

8.1.3 Identification of Allowable Wet Weather Exceedance Days

The numeric targets used to calculate the wet weather mass-load based TMDLs is discussed in section 4.1.4. For the calculation of the wet weather mass-load based TMDLs, these numeric targets include a 22 percent allowable exceedance frequency. This exceedance frequency is used to identify the number of allowable exceedance days during the critical period. The allowable exceedance days, or the total number of days that numeric targets may be exceeded based on reference conditions, was calculated for each of the watersheds addressed by these TMDLs. Calculations of the allowable exceedance days for each watershed were performed by multiplying the allowable exceedance frequency (22 percent or 0.22) by the number of wet days for the critical period, as presented in Table 8-1. For example, the number of allowable exceedance days for the Aliso HSA watershed is 22 percent of 69 wet days during the critical period, which is equal to 15 allowable exceedance days during the critical period. The resulting number of allowable exceedance days for each watershed is listed in Table 8-2.

Table 8-2. Allowable Wet Weather Exceedance Days in the Critical Period (1993) for Watersheds Affecting Impaired Waterbodies

Watershed	Number of Allowable Wet Exceedance Days
San Joaquin Hills HSA/Laguna Beach HSA	15
Aliso HSA	15
Dana Point HSA	15
Lower San Juan HSA	17
San Clemente HA	16
San Luis Rey HU	20
San Marcos HA	11
San Dieguito HU	22
Miramar Reservoir HA	21
Scripps HA	13
Tecolote HA	13
Mission San Diego HSA/Santee HSA	19
Chollas HSA	14

8.1.4 Critical Points for Wet Weather Mass-Load Based TMDL Calculation

The existing mass loads and mass-load based TMDLs were calculated for each watershed at a node in the model representing the culmination point at the bottom of the watershed, before intertidal mixing and dilution takes place (or at the downstream end of the impaired creek segment, in the case of Forrester Creek). Since the approach for the wet weather mass load calculation was identical for both impaired beaches and impaired creeks, one critical point was identified for each watershed. The critical point in the wet weather model represents the lowest point in the watershed where creeks and storm drains discharge, and before mixing with the surf zone and dilution takes place. This critical point is considered to be a conservative location for assessment of water quality conditions, and is therefore selected based on high bacteria loads predicted at that location. Although this critical point for water quality assessment is utilized to calculate the bacteria mass loads discharged from the watersheds, compliance with TMDLs in the receiving waters must be assessed and maintained for all segments of a waterbody to ensure that impairments of beneficial uses do not occur. Beneficial uses apply throughout all segments of a waterbody.

8.1.5 Calculation of Wet Weather Mass-Load Based TMDLs

For each modeled subwatershed discharging to an impaired waterbody (subwatersheds and proximity to impaired waterbodies are shown in Appendix E), existing wet weather mass loads were compared to mass-load based TMDLs through the use of load-duration curves. Load-duration curves are bar graphs that rank the modeled flows into percentiles, or groups arranged in increasing orders of magnitude. This allows current estimated bacteria mass loads to be compared to the numeric targets. Load-duration curves for each modeled watershed are provided in Appendix O.

On each load-duration curve, much of the lower range of flow has no associated bacteria mass loads. This is due to model predicted flows or bacterial densities close to zero. Although days

were categorized as wet periods based on a criterion associated with rainfall (0.2 inches or more of rainfall and the following 72 hours), some of these days were actually dry in terms of streamflow (some streams may return to baseflow conditions within 72 hours following a rainfall event), leading to poor modeling results. For this reason, bacteria loading during dry weather (low flow) was analyzed with a separate computer model.

For each watershed, load-duration curves were produced for each indicator bacteria showing the daily loads ranked by the percentile of their associated flow magnitude. These plots formed the basis for the existing mass load and mass-load based TMDL calculations as described below.

1. Calculation of allowable mass-load based on REC-1 single sample maximum WQO – daily flows were multiplied by the representative REC-1 single sample maximum WQO to create a "numeric target line" across the load-duration curves;
2. Calculation of daily existing mass loads – daily existing loads (colored bars) for the wet weather days in the critical period (1993) were ranked based on their associated flow percentile; daily loads above the numeric target line are in exceedance of the REC-1 single sample maximum WQO, while loads below the numeric target line do not cause the REC-1 single sample maximum WQO to be exceeded;
3. Calculation of the allowable exceedance mass loads using reference system approach - sum of the highest daily exceedance loads (loads above the numeric target line) corresponding to the number of allowable exceedance days (shown as the blue bar segments above the numeric target line in the load-duration curves). The number of allowable exceedance days was equal to 22 percent of the wet days during the critical period of 1993 for each watershed (see Table 8-2);
4. Calculation of non-allowable exceedance mass loads - sum of the daily loads exceeding the numeric targets minus allowable exceedance loads from Step 3 (shown as the patterned bar segments above the numeric target line); and
5. Calculation of the required annual load reduction - total calculated existing mass load (sum of all the colored bar segments above and below the numeric target line) minus allowable mass loads (sum of bar segments below numeric target line and blue bar segments above numeric target line), equal to the non-allowable exceedance mass loads from Step 4.

The use of load-duration curves to calculate wet weather mass-load based TMDLs is further described in Appendix I.

For the San Diego River wet weather mass-load based TMDLs, the wasteload from the Padre Dam waste water discharge was added to the load calculated from the flow duration curves. The Padre Dam facility discharges effluent pursuant to San Diego Water Board Order No. R9-2003-0179, Waste Discharge Requirements for the discharge of effluent to the San Diego River. These requirements allow the Padre Dam facility to discharge 2.0 million gallons per day of tertiary treated municipal wastewater to the San Diego River. These discharges have bacteria MPN limits for fecal coliform.

According to Order No. R9-2003-0179, the "fecal coliform concentration based on a minimum of not less than five samples for any 30-day period, shall not exceed a log

mean of 200/100 ml, nor shall more than 10 percent of total samples during any 30-day period exceed 400/100 ml." This is consistent with the REC-1 water quality standard for fecal coliform in the Basin Plan.

At a rate of 2.0 million gallons per day, the associated average permitted yearly discharge of fecal coliform is 5,526 billion MPN per year. Accordingly, the waste load allocation for the Padre Dam facility is 5,526 billion MPN per year. Padre Dam's bacterial discharges do not contribute to the San Diego River bacterial impairment because Padre Dam's effluent is required to meet the REC-1 water quality standard.

In order to distribute this yearly wasteload into the appropriate wet and dry weather allocations, the wet and dry weather days for the 1993 critical period were utilized to apportion the load. In 1993, there were 86 wet days and 279 dry days in the San Diego River Watershed. Therefore, the wet weather WLA is (5,526 billion MPN per year) x (86/365) = 1,302 billion MPN per year. The dry weather WLA is (5,526 billion MPN per year) x (279/365) = 4,224 billion MPN per year, or 461 billion MPN per month.

8.1.6 Allocation of Wet Weather Bacteria Mass Loads to Point and Nonpoint Sources

The mass-load based TMDLs were allocated to point sources and nonpoint sources as follows. Loads generated by urban land uses were classified as point sources because of the likelihood that urban lands are drained by MS4s. Loads generated by rural land uses were classified as nonpoint sources based on the likelihood that MS4s are absent in these areas. Loads generated on undeveloped lands were classified as uncontrollable nonpoint sources based on the likelihood that loads from these lands are from natural and wildlife sources. For each watershed, wasteload allocations (WLAs) were developed for municipal discharges and Caltrans discharges from urban lands.[18] Load allocations (LAs) were developed for controllable nonpoint source discharges that include agricultural land uses (i.e., agriculture, horse ranches, dairies/intensive livestock). Finally, LAs were developed for uncontrollable nonpoint sources from undeveloped lands.

Municipalities and Caltrans own and/or operate the MS4s within the watersheds and are regulated under different NPDES requirements. Therefore, separate WLAs were developed for the municipalities and Caltrans for each watershed. The wet weather WLAs for Caltrans were set equal to existing loads, since discharges from Caltrans were found to account for less than 1 percent of the wet weather load. The rationale and methodology for distributing the WLAs are described in Appendix I.

Nonpoint sources were separated into controllable and uncontrollable categories. Controllable nonpoint sources were identified by land use types and coverages. Controllable sources include those found in the following land-use types: agriculture, dairy/intensive livestock, and horse ranches. These are considered controllable because the activities that generate bacteria pollutant

[18] The dry and wet weather wasteload allocation for discharges from wastewater treatment facilities, also know as publicly owned treatment works (POTWs), is zero. The only exception is Padre Dam whose discharge to the San Diego River is regulated by the San Diego Waterboard and must meet REC-1 permit requirements. Therefore Padre Dam received a wasteload allocation which is based on the effluent limitations of its WDRs, and is included in addition to these TMDLs which are based on urban runoff. Please see section 8.1.5 for further discussion.

loads on these land uses are anthropogenic in nature, and load reductions can be reasonably expected with the implementation of suitable management measures. For implementation purposes, controllable nonpoint source discharges were associated with loads from agriculture, livestock, and horse ranch facilities. Because these loads are controllable, these nonpoint source discharges were given LAs and in watersheds where these loads were greater than 5 percent of the total load, were required to reduce their bacteria loads (see section 10).

In the watersheds addressed by these TMDLs, there are four concentrated animal feeding operations (CAFOs) that are regulated as point source discharges under NPDES requirements.[19] Although technically point sources of bacteria, these facilities are included in the controllable nonpoint source load allocations because the precision of the modeling results, and loading parameters associated with the dairy/intensive livestock land use category is not sufficient to calculate individual WLAs for these facilities. The same is true for other agriculture, livestock, and horse ranch facilities in the watersheds regulated under non-NPDES waste discharge requirements.

Uncontrollable nonpoint sources include loads from open recreation, open space, and water land uses. Loads from these areas are considered uncontrollable because they come from mostly natural sources (e.g. bird and wildlife feces) and the areas are located in parts of the watershed not likely to be drained by MS4 systems. Loads from these sources were quantified and accounted for in the wet weather mass-load based TMDL calculations using the reference system approach. The methodology for calculating the WLAs assigned to point sources and LAs assigned to and nonpoint sources is presented in Appendix I.

8.1.7 Margin of Safety

TMDLs must include a margin of safety (MOS). There are two ways to incorporate the MOS: (1) implicitly incorporate the MOS using conservative model assumptions to develop TMDLs and (2) explicitly specify a portion of the total TMDL as the MOS and use the remainder for allocations (USEPA, 1991). For the wet weather TMDLs, some general assumptions were made regarding overall conditions facilitating bacteria subsistence and growth, and conditions affecting bacteria die-off. These assumptions are conservative in that they are expected to be protective of beneficial uses during extreme conditions. Because of the conservative assumptions that were included in the development of the TMDLs, there was no explicit margin of safety included. Instead, the TMDLs include an implicit margin of safety. The following examples describe the conservative assumptions that constitute the implicit MOS for the wet weather TMDLs.

- *Critical Point for Loading Assessments* - For existing mass load and mass-load based TMDL calculations, the water quality is assessed at a *critical point* or location in each impaired waterbody. For beaches, the critical points for evaluating numeric targets are at

[19] Order No. 2000-163 NPDES No. CA0109053 *Waste Discharge Requirements for Frank J. Konyn, Frank J. Konyn Dairy, San Diego County*, Order No. 2000-18 NPDES No. CA0109011 *Waste Discharge Requirements for Jack and Mark Stiefel Dairy, Riverside County*, Order No. 2000-0206, NPDES No. CA 0109321, *Waste Discharge Requirements for Diamond Valley Dairy, Riverside County*, Order No. 2002-0067 NPDES No.CA0109371 *Waste Discharge Requirements for S&S Farms, Swine Raising Facility, San Diego County*.

the mouths of the watersheds, upstream of any surf zone mixing and dilution. High bacteria loads are predicted at this area. This critical point is therefore a conservative location for assessment of water quality conditions. Because beneficial uses of the beach are to be maintained at all locations, including the discharge point of creeks, the conservative approach was to evaluate numeric targets at those discharge points where bacterial densities are assumed to be greatest. For development of TMDLs for impaired creeks, critical points were also selected at the mouths of the impaired creek segments. This approach provides an implicit margin of safety to ensure protection of the beneficial uses of the beaches and creeks under critical conditions.

- *Wet Weather TMDL Numeric Targets* –Because bacteria in wet weather runoff and streamflows have a quick travel time, and therefore, a short residence time in the waterbodies, the REC-1 single-sample maximum WQOs were determined to be most appropriate for the wet weather TMDLs. The numeric targets used for the wet weather mass-load based and concentration based TMDLs are assumed to be conservative by utilizing the most stringent REC-1 single sample maxmimum WQOs contained in the Ocean Plan and/or Basin Plan.
- *Wet Weather Critical Wet Weather Condition* – The critical wet weather condition was selected based on identification of the wettest year of the 12 years of record (1990 through 2002) included in this technical TMDL analysis. This corresponds to the 92nd percentile of annual rainfalls for those 12 years measured at multiple rainfall gages in the San Diego region. This resulted in selection of 1993 as the critical wet year for assessment of wet weather mass loading conditions. This condition was consistent with studies performed by Southern California Coastal Water Research Project (SCCWRP), where a 90th percentile year was selected based on rainfall data for LAX from 1947 to 2000, also resulting in selection of 1993 as the critical year (Los Angeles Water Board, 2002). Because of the large amount of rainfall, bacteria loads are assumed higher in 1993 than another year with less rainfall.

8.1.8 Seasonality

Through simulation of an entire critical wet year, daily existing wet weather mass loads were estimated for all seasons of that year and compared to mass-load based TMDLs to determine necessary load reductions. Model simulation of a full year accounted for seasonal variations in rainfall, evaporation, and associated impacts on runoff and transport of bacteria loads to receiving waters. Although large storms in the wet season of the critical wet year were associated with large volumes of runoff that transported large bacteria loads, smaller storms during the dry season (April-October) also provided large bacteria loads resulting from wash-off of bacteria that had accumulated on the surface during the preceding extended dry period. For estimating bacteria loads during dry weather conditions, a separate dry weather modeling approach was used.

8.2 Dry Weather Mass Loading Analysis

A low-flow, steady state modeling apporach was used to estimate bacteria mass loads during dry weather conditions. The steady-state aspect of the model resulted in estimation of a constant bacteria mass load from each watershed. This mass load is representative of the average flow and bacteria loading conditions resulting from various urban land use practices (e.g., runoff from

lawn irrigation or sidewalk washing). A complete discussion of the dry weather model development, calibration, and validation is provided in Appendix K.

Because dry weather loading was estimated as a function of steady-state flows derived from an analysis of average dry weather flows, there was no critical dry period identified. Dry weather days were selected based on the criterion that less than 0.2 inch of rainfall was observed on each of the previous 3 days. Based on analysis of dry weather flow, critical flows were predicted for each impaired watershed.

8.2.1 Dry Weather Mass Load Estimation

For each watershed, the dry weather model was used to estimate the flows and bacteria densities resulting from dry weather urban runoff. Estimation of source loadings was based on empirical relationships established between both flow and bacteria densities and land use distribution in the watershed. Transport of bacteria loads was simulated using standard plug-flow equations to describe steady-state losses resulting from first-order die-off and stream infiltration. Steady-state estimates of bacteria mass loads were assumed constant for all dry days.

For consistency with the wet weather modeling approach, dry days were assessed for the critical wet year, identified as 1993. The dry days in 1993 (365 days minus the wet days in Table 8-1) for each watershed are listed in Table 8-3.

Table 8-3. Dry Days of the Critical Period (1993) Identified for Watersheds Affecting Impaired Waterbodies

Watershed	Number of Dry Days in 1993
San Joaquin Hills HSA/Laguna Beach HSA	296
Aliso HSA	296
Dana Point HSA	296
LowerSan Juan HSA	289
San Clemente HA	292
San Luis Rey HU	275
San Marcos HA	316
San Dieguito HU	267
Miramar Reservoir HA	271
Scripps HA	308
Tecolote HA	308
Mission San Diego HSA/Santee HSA	279
Chollas HSA	300

8.2.2 Dry Weather Numeric Targets

Dry weather numeric targets consist of the REC-1 30-day geometric mean WQOs and a zero percent allowable exceedance frequency. Since the REC-1 30-day geometric mean WQO is an average bacteria density of 5 samples over 30 days, using the 30-day geometric mean in the numeric target is appropriate for the dry weather analysis because the dry weather model simulates average flows. The dry weather numeric targets are discussed further in section 4.2.

8.2.3 Critical Points for Dry Weather Mass-Load Based TMDL Calculation

Consistent with the approach used for wet weather analysis, the dry weather existing mass loads and mass-load based TMDLs were calculated based on modeled flow and bacteria density at a node in the model, called the *critical point*, which represents the watershed mouth. Since the approach for TMDL calculation was identical for both beaches and creeks, one critical point was identified for each watershed model draining to an impaired waterbody. The critical point in the model represents the lowest point in the watershed where creeks and storm drains discharge, and before mixing with the surf zone and dilution takes place. This critical point is considered to be a conservative location for assessment of water quality conditions, and is therefore selected based on high bacteria loads predicted at that location. Although this critical point for water quality assessment is utilized to calculate the bacteria mass loads discharged from the watersheds, compliance with the TMDLs in the receiving waters must be assessed and maintained for all segments of a waterbody to ensure that impairments of beneficial uses do not occur. Beneficial uses apply throughout all segments of a waterbody.

8.2.4 Calculation of Dry Weather Mass-Load Based TMDLs

For each modeled watershed discharging to an impaired waterbody (see Figures 3-1 and 3-2), calculation of allocations and required load reductions were performed using the following steps:

1. Calculation of the existing mass loads based on model-predicted flows multiplied by applicable model-predicted bacteria densities;
2. Calculation of the mass-load based TMDLs based on model-predicted flows multiplied by applicable numeric targets; and
3. Calculation of required load reductions based on the difference between existing bacteria mass loads from Step 1 and mass-load based TMDLs from Step 2.

For the San Diego River dry weather mass-load based TMDLs, the wasteload from the Padre Dam discharge was added to the model predicted load. The Padre Dam facility discharges effluent pursuant to San Diego Water Board Order No. R9-2003-179, Waste Discharge Requirements for the discharge of effluent to the San Diego River. These requirements allow the Padre Dam facility to discharge 2.0 million gallons per day of tertiary treated municipal wastewater to the San Diego River. These discharges have bacteria MPN limits for fecal coliform.

According to Order No. R9-2003-179, the "fecal coliform concentration based on a minimum of not less than five samples for any 30-day period, shall not exceed a log mean of 200/100 ml, nor shall more than 10 percent of total samples during any 30-day period exceed 400/100 ml." This is consistent with the REC-1 water quality standard for fecal coliform in the San Diego Basin Plan.

At a rate of 2.0 million gallons per day, the associated average permitted yearly discharge of fecal coliform is 5,526 Billion MPN per year. Accordingly, the waste load allocation for the Padre Dam facility is 5,526 Billion MPN per year. Padre Dam's bacterial discharges do not contribute to the San Diego River bacterial impairment because Padre Dam's effluent meets the REC-1 water quality standard.

In order to distribute this yearly load into the appropriate dry and wet weather allocations, the dry and wet weather days for the 1993 critical period were utilized in order to determine the ration. In 1993, there were 279 dry days and 86 wet days. Therefore, the dry weather WLA is (5,526 Billion MPN per year) x (279/365) = 4,224 Billion MPN per year. The wet weather WLA is (5,526 Billion MPN per year) x (86/365) = 1,302 Billion MPN per year.

8.2.5 Allocation of Wet Weather Bacteria Mass Loads to Point and Nonpoint Sources

Unlike the wet weather approach, for the dry weather approach, the allocation of the dry weather mass-load based TMDLs assumes that no surface runoff discharge to receiving waters occurs from Caltrans, agricultural, or undeveloped land use categories (i.e., $WLA_{Caltrans} = 0$, $LA_{Agriculture} = 0$, and $LA_{OpenSpace} = 0$), meaning the entire dry weather mass-load based TMDL (i.e., allowable mass load) is allocated to Municipal MS4 land use categories (i.e., WLA_{MS4} = TMDL). See Appendix I for methodology used for assigning dry weather WLAs.

8.2.6 Margin of Safety

As with the wet weather TMDLs, conservative assumptions were made during the development of the dry weather TMDLs. These assumptions are conservative in that they are expected to be protective of beneficial uses during extreme condition. Because of the conservative assumptions that were included in the development of the TMDLs, there was no explicit margin of safety included. Instead, the TMDLs include an implicit margin of safety. The following examples describe the conservative assumptions that constitute the implicit MOS for the dry weather TMDLs.

- *Critical Point for Loading Assessments* - For existing mass load and mass-load based TMDL calculations, the water quality is assessed at a *critical point* or location in each impaired waterbody. For beaches, the critical points for evaluating numeric targets are at the mouths of the watersheds, upstream of any surf zone mixing and dilution. High bacteria loads are predicted at this area. This critical point is therefore a conservative location for assessment of water quality conditions. Because beneficial uses of the beach are to be maintained at all locations, including the discharge point of creeks, the conservative approach was to evaluate numeric targets at those discharge points where bacterial densities are assumed to be greatest. For development of TMDLs for impaired creeks, critical points were also selected at the mouths of the impaired creek segments. This approach provides an implicit margin of safety to ensure protection of the beneficial uses of the beaches and creeks under critical conditions.
- *Dry Weather TMDL Numeric Targets* - Because dry weather conditions have flows and bacteria loads much smaller in magnitude than wet weather conditions, do not occur from all land use types, and are more uniform than stormflow, the REC-1 30-day geometric mean WQOs were determined to be most appropriate for the dry weather TMDLs. The numeric targets used for the dry weather mass-load based and concentration based TMDLs are assumed to be conservative by utilizing the most stringent REC-1 30-day geometric mean WQOs contained in the Ocean Plan and/or Basin Plan.

8.2.7 Seasonality

The dry weather approach uses a unique modeling system designed to assess average bacteria loading and TMDLs during dry weather conditions. This approach is distinct from the wet weather approach described in section 8.1.

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9 Total Maximum Daily Loads and Allocations

The TMDL (i.e., loading capacity or allowable load) for a specific pollutant and waterbody combination is the total amount of the pollutant of concern that can be assimilated by the receiving waterbody while still achieving water quality standards under all conditions. In California, water quality standards primarily consist of beneficial uses and the water quality objectives (WQOs) that support those uses.[20]

Quantitative numeric targets were selected for development of the TMDLs (see section 4). Numeric targets are selected to implement existing water quality standards. For these TMDLs, the numeric targets were set equal to the numeric WQOs that support the REC-1 and REC-2 beneficial uses with an allowable exceedance frequency. In other words, when the numeric targets are met, the REC-1 and REC-2 beneficial uses should be restored. Of particular note, however, is that while the TMDLs use numeric targets to interpret water quality standards, *TMDLs are not water quality standards*.

The TMDL is set equal to the sum of individual wasteload allocations (WLAs) for point sources, and load allocations (LAs) for both nonpoint sources and natural background levels. In addition, the TMDL must include a margin of safety (MOS), either implicitly or explicitly, to account for the uncertainty in the relationship between pollutant loads and the quality of the receiving waterbody. Conceptually, this definition is represented by the equation:

$$\text{TMDL} = \sum \text{WLAs} + \sum \text{LAs} + \text{MOS}$$

In TMDL development, allowable loadings from pollutant sources that cumulatively amount to no more than the TMDL must be established; this provides the basis to establish water quality-based controls. The San Diego Water Board is responsible for incorporating the WLAs and LAs into the enforceable regulatory mechanisms that are available to compel controllable sources to reduce their pollutant loads. Controllable sources are responsible for taking actions to reduce their pollutant loads to meet their assigned WLAs or LAs. When all the regulated controllable sources meet their assigned WLAs and LAs, and the numeric targets (i.e., numeric WQOs and allowable exceedance frequencies) are also met in the receiving waters, compliance with the TMDLs will be achieved.

TMDLs can be expressed as mass per time (i.e., mass-loading basis), or other appropriate measure (e.g., as a concentration).[21] For these TMDLs, the wet weather and dry weather TMDLs are expressed both in terms of concentration and on a mass loading basis. The concentration based TMDLs will be used to determine compliance with the TMDLs in the receiving waters. Mass-load based TMDLs were calculated for the impaired waterbodies in each watershed. The mass-load based TMDLs were allocated to the identified point and nonpoint sources and used to identify the controllable sources that need to reduce their bacteria loads in order for the concentration based TMDLs to be met in the receiving waters. The concentration based TMDLs, mass-load based TMDLs, and allocations are discussed below.

[20] Water quality standards in California also include an anti-degradation policy.
[21] Code of Federal Regulations Title 40 section 130.2(1) [40CFR130.2(1)]

9.1 Concentration Based TMDLs

The wet weather and dry weather concentration based TMDLs are based on meeting the numeric targets (i.e., numeric WQOs and allowable exceedance frequencies) in the receiving waters. The numeric WQOs for REC-1 beneficial uses are the basis of the numeric targets used to calculate the TMDLs, expressed as number of bacteria colonies per volume. An allowable exceedance frequency is included as part of the numeric target to allow for exceedances that may be caused by natural sources, based on a reference system. Tables 9-1 and 9-3 summarize the concentration based TMDLs, which are expressed as numeric objectives and allowable exceedance frequencies in the receiving waters for each watershed, for wet weather and dry weather, respectively. Meeting the concentration based TMDLs in the receiving waters will be used to determine compliance with the TMDLs.

9.2 Mass-Load Based TMDLs

The numeric targets were used to calculate the TMDLs on a mass loading basis under a set of critical conditions. The TMDLs that were calculated in terms of mass loading were used to identify the bacteria loads from controllable sources that need to be reduced in order for the numeric targets to be met in the receiving waters.

On a mass loading basis, TMDLs are defined as the maximum mass of a pollutant the waterbody can receive and still protect the designated beneficial uses. Separate mass-load based TMDLs were calculated for wet weather and dry weather conditions to account for seasonal variations, and because the transport mechanism, flow, and bacteria loads are different between dry and wet weather conditions.

On a mass-loading basis, the TMDLs are expressed as number of bacteria colonies per unit time. In order for bacteria loading to be calculated, both flow rates and bacteria densities must be measured at a point in time and location. When multiplied together, these two parameters result in bacteria mass loading, or the number of bacteria colonies measured per unit time.

$$Bacteria\ Loading = flow\ rate\,(volume / time) \times bacteria\ density(number\ of\ colonies / volume)$$

The wet weather mass-load based TMDLs are expressed as “annual loads” in terms of number of bacteria colonies per year (billion MPN/yr). The dry weather mass-load based TMDLs are expressed as “monthly loads” in terms of number of bacteria colonies per month (billion MPN/mth).

9.3 Summary of Technical Approach for Mass-Load Based TMDL Calculations

Calibrated models were used to simulate flow and bacteria densities. This information was used to calculate the “existing” bacteria mass loads to, and allowable mass loads (i.e., mass-load based TMDLs) for, each impaired segment. The existing mass loads that were calculated represent the worst case flows and bacteria densities that are expected from the watershed during the critical wet year. The mass-load based TMDLs were calculated based on the flows expected during the critical wet year and the numeric targets. Existing mass loads were compared to the mass-load

based TMDLs. The difference between the existing mass loads and the mass-load based TMDLs is the load reduction required to meet the numeric targets in the receiving waters.

For each watershed containing an impaired waterbody, existing mass loads and mass-load based TMDLs were calculated at a critical point for both wet weather events and dry weather conditions during a critical wet year. The calculations and technical approaches were different for the two conditions.

9.3.1 Summary of Wet Weather Mass-Load Based TMDL Calculations

For wet weather, TMDLs were calculated, and allocations were divided among point source dischargers and nonpoint source dischargers. The mass-load based TMDLs for wet weather were calculated by applying the reference system approach, which takes into consideration loading of bacteria from natural sources within the watersheds. The numeric targets used to calculate the wet weather mass-load based TMDLs utilized the single sample maximum component of the REC-1 WQOs and a 22 percent allowable exceedance frequency.

Federal regulations require TMDLs to include individual WLAs for each point source.[22] The only wet weather point sources identified to affect impaired waterbodies addressed in this study were MS4s (municipal and Caltrans), although other point sources of bacteria exist (such as concentrated animal feeding operations (CAFOs) or publicly owned treatment works (POTWs)). USEPA's permitting regulations require municipalities to obtain NPDES requirements for all stormwater discharges from MS4s. The existing mass loads estimated from the wet weather modeling approach were solely the result of watershed runoff, not other types of point sources. WLAs were assigned to municipalities and Caltrans. The exception to this is the San Diego River wet weather mass-load based TMDLs where a WLA was assigned to the Padre Dam facility as previously described.

TMDLs must also include LAs for each nonpoint source. LAs were divided into controllable and uncontrollable categories. Controllable sources include discharges from agriculture land uses and were quantified by the agriculture, dairy/intensive livestock, and horse ranches land use categories. Uncontrollable sources include loads from natural sources and, although LAs are presented, no reductions are required.

In general, controllable point and nonpoint sources generating less than 5 percent of the total loads (e.g., Caltrans and/or Agriculture) were assigned wet weather WLAs and LAs equal to their existing loads, resulting in no load reduction requirements. While they are not required to reduce their existing loads, this means, however, that these sources are not allowed to increase their loads over time, and cannot cause exceedances of the numeric WQOs in the receiving waters.

For the wet weather mass-load based TMDLs, the Caltrans WLAs (which generates less than 5 percent of the total load in all watersheds) and Open Space LAs (which are uncontrollable) were set equal to the existing wet weather mass loads, thus load reductions are not required. The

[22] Code of Federal Regulations Title 40 section 130.7 [40 CFR 130.7]

remaining portions of the wet weather mass-load based TMDLs were assigned to Municipal MS4 WLAs and Agriculture LAs. In watersheds where the bacteria load from Agriculture land uses were less than 5 percent of the total existing wet weather load, the wet weather Agriculture LAs were set equal to the existing wet weather load, and no load reductions were required. Required load reductions were calculated for Municipal MS4s to achieve the wet weather Municipal MS4 WLAs, and for Agriculture land uses, in watersheds where the existing wet weather loads for all indicator bacteria were more than 5 percent of total existing wet weather load, to achieve the wet weather Agriculture LAs.

Because the wet weather modeling approach used to calculate the mass-load based TMDLs, WLAs, LAs, and existing wasteloads and loads were based on critical conditions (i.e., worst case loading scenario), the mass loading numbers (i.e., existing mass loads, and mass-load based TMDLs, WLAs, and LAs expressed in terms of billion MPN/year) presented in Tables 9-1 and 9-2a through 9-2c represent conservative mass-load estimates expected to be protective of the beneficial uses under extreme conditions. The mass loading numbers also provide a tool for identifying bacteria sources that need to be controlled and existing bacteria loads that need to be reduced to meet the TMDLs in the receiving waters.

Ultimately, controllable point and nonpoint sources must reduce their anthropogenic loads so the wet weather concentration based TMDLs, which are based on the numeric REC-1 WQOs in the Basin Plan and allowable exceedance frequencies, can be met during wet weather conditions during each year. Meeting the wet weather numeric targets in the discharge and/or receiving water will indicate the wet weather TMDLs, WLAs, and/or LAs have been met.

9.3.2 Summary of Dry Weather Mass-Load Based TMDL Calculations

For dry weather, TMDLs were calculated, and allocations were assigned solely to point source dischargers. Available data show that exceedances of REC-1 WQOs in local reference systems during dry weather conditions are uncommon (see section 4.2). Further, reference systems do not generate significant dry weather bacteria loads because flows are minimal. During dry weather, flow, and hence bacteria loads, are generated by urban runoff, which is not a product of a reference system. The numeric targets used to calculate the dry weather TMDLs utilized the REC-1 geometric mean WQOs and a 0 percent allowable exceedance frequency.

The only dry weather point sources identified to affect impaired waterbodies addressed in this study were MS4s (municipal), although other point sources of bacteria exist (such as CAFOs or POTWs). In the San Diego River watershed, the Padre Dam facility, which has its own NPDES requirements, was also identified as a dry weather point source. USEPA's permitting regulations require municipalities to obtain NPDES requirements for all urban runoff discharges from MS4s. The existing mass loads estimated from the wet weather modeling approach were solely the result of watershed runoff, not other types of point sources. WLAs were assigned to municipalities located in the affected watersheds. Unlike the wet weather approach, dry weather WLAs were not assigned to Caltrans. This is because Caltrans-owned freeway surfaces are not likely to discharge bacteria to receiving waters during dry weather conditions.

Although TMDLs must also include LAs for each nonpoint source, LAs were not developed for controllable sources for dry weather conditions. This is because land uses associated with

nonpoint sources are not expected to discharge bacteria to receiving waters during dry weather conditions. Because Caltrans is not assigned a WLA and controllable nonpoint sources are not assigned LAs, discharge of pollutants is not expected, nor allowed, under the dry weather TMDLs.

Because the dry weather modeling approach used to calculate the mass-load based TMDLs, WLAs, LAs, and existing wasteloads and loads were based on critical conditions (i.e., worst case loading scenario), the mass loading numbers (i.e., existing loads, TMDLs, WLAs and LAs expressed in terms of billion MPN/month) presented in Tables 9-3 and 9-4a through 9- represent conservative mass-load estimates expected to be protective of the beneficial uses under extreme conditions. The mass loading numbers also provide a tool for identifying bacteria sources that need to be controlled and existing bacteria loads that need to be reduced to meet the TMDLs in the receiving waters.

Ultimately, controllable point and nonpoint sources must reduce their anthropogenic loads so the dry weather concentration based TMDLs, which are based on the numeric REC-1 WQOs in the Basin Plan and allowable exceedance frequencies, can be met during dry weather conditions during each year. Meeting the dry weather numeric targets in the discharge and/or receiving water will indicate the dry weather TMDLs, WLAs, and/or LAs have been met.

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Table 9-1. Summary of Wet Weather Numeric Targets and Existing and Allowable Indicator Bacteria Loads

Watershed - Impaired Waterbody	**Indicator Bacteria**	**Existing Bacteria Load (Billion MPN/year)**	**Single Sample Maximum Objective (MPN/100mL)**	**Allowable Numeric Objective Load (Billion MPN/year)**	**Total Wet Days in Critical Year**	**Allowable Exceedance Frequency**	**Allowable Wet Exceedance Days in Critical Year**	**Allowable Exceedance Load (Billion MPN/year)**	**Total Allowable Load [=TMDL] (Billion MPN/year)**
San Joaquin Hills HSA (901.11)	Fecal Coliform	705,015	**400**	16,043				648,591	664,634
and Laguna Hills HSA (901.12)	Total Coliform	8,221,901	**10,000**	401,049	69	**22%**	15	7,044,601	7,445,649
- Pacific Ocean Shoreline	Enterococcus	852,649	**104**	4,175				778,624	782,799
Aliso HSA (901.13)	Fecal Coliform	1,752,096	**400**	84,562				1,494,512	1,579,073
- Pacific Ocean Shoreline - Aliso Creek	Total Coliform	23,210,774	**10,000**	2,109,600	69	**22%**	15	18,081,198	20,190,798
- Aliso Creek mouth	Enterococcus	2,230,206	**104***	22,682				1,929,834	1,952,517
		2,230,206	**61**	13,644				1,937,321	1,950,964
Dana Point HSA (901.14)	Fecal Coliform	403,911	**400**	14,894				362,419	377,313
- Pacific Ocean Shoreline	Total Coliform	6,546,962	**10,000**	372,328	69	**22%**	15	5,659,144	6,031,472
	Enterococcus	501,526	**104**	3,875				458,431	462,306
Lower San Juan HSA (901.27)	Fecal Coliform	15,304,790	**400**	358,410				14,356,423	14,714,833
- Pacific Ocean Shoreline - San Juan Creek	Total Coliform	130,258,863	**10,000**	8,947,114	76	**22%**	17	113,932,076	122,879,189
- San Juan Creek mouth	Enterococcus	12,980,098	**104***	95,357				12,063,781	12,159,138
		12,980,098	**61**	56,119				12,096,327	12,152,446
San Clemente HA (901.30)	Fecal Coliform	1,441,723	**400**	36,481				1,342,450	1,378,931
- Pacific Ocean Shoreline	Total Coliform	16,236,606	**10,000**	911,994	73	**22%**	16	14,235,609	15,147,603
	Enterococcus	1,663,100	**104**	9,491				1,553,696	1,563,187
San Luis Rey HU (903.00)	Fecal Coliform	33,120,012	**400**	640,595				31,803,647	32,444,242
- Pacific Ocean Shoreline	Total Coliform	231,598,677	**10,000**	15,993,384	90	**22%**	20	208,157,151	224,150,535
	Enterococcus	18,439,920	**104**	167,152				17,296,466	17,463,618
San Marcos HA (904.50)	Fecal Coliform	20,886	**400**	1,559				15,665	17,224
- Pacific Ocean Shoreline	Total Coliform	515,278	**10,000**	38,984	49	**22%**	11	386,099	425,083
	Enterococcus	40,558	**104**	406				32,559	32,966
San Dieguito HU (905.00)	Fecal Coliform	21,286,910	**400**	425,968				20,675,680	21,101,649
- Pacific Ocean Shoreline	Total Coliform	163,541,133	**10,000**	10,637,225	98	**22%**	22	149,176,959	159,814,184
	Enterococcus	14,796,210	**104**	113,253				14,193,834	14,307,087
Miramar Reservoir HA (906.10)	Fecal Coliform	10,392	**400**	312				9,943	10,256
- Pacific Ocean Shoreline	Total Coliform	212,986	**10,000**	7,809	94	**22%**	21	202,371	210,180
	Enterococcus	11,564	**104**	81				11,323	11,405

Table 9-1. Summary of Wet Weather Numeric Targets and Existing and Allowable Indicator Bacteria Loads (Cont'd)

Watershed - Impaired Waterbody	**Indicator Bacteria**	**Existing Bacteria Load (Billion MPN/year)**	**Single Sample Maximum Objective (MPN/100mL)**	**Allowable Numeric Objective Load (Billion MPN/year)**	**Total Wet Days in Critical Year**	**Allowable Exceedance Frequency**	**Allowable Wet Exceedance Days in Critical Year**	**Allowable Exceedance Load (Billion MPN/year)**	**Total Allowable Load [=TMDL] (Billion MPN/year)**
Scripps HA (906.30)	Fecal Coliform	204,057	**400**	10,329				166,578	176,907
- Pacific Ocean Shoreline	Total Coliform	5,029,519	**10,000**	258,228	57	**22%**	13	4,098,745	4,356,973
	Enterococcus	377,839	**104**	2,686				321,347	324,032
Tecolote HA (906.50)	Fecal Coliform	261,966	**400**	25,080				204,241	229,322
- Tecolote Creek	Total Coliform	7,395,789	**10,000**	626,414	57	**22%**	13	5,753,355	6,379,770
	Enterococcus	708,256	**104***	6,522				597,659	604,180
		708,256	**61**	3,825				599,936	603,761
Mission San Diego HSA (907.11)	Fecal Coliform	4,932,380	**400**	310,820				4,370,018	4,680,838
and Santee HSA (907.12)	Total Coliform	72,757,569	**10,000**	7,752,284	86	**22%**	19	58,352,938	66,105,222
- Forrester Creek - San Diego River (lower) - Pacific Ocean Shoreline	Enterococcus	7,255,759	**104***	80,899				6,514,309	6,595,208
		7,255,759	**61**	47,479				6,543,487	6,590,966
Chollas HSA (908.22)	Fecal Coliform	603,863	**400**	55,516				464,924	520,440
- Chollas Creek	Total Coliform	15,390,608	**10,000**	1,386,037	65	**22%**	14	11,861,589	13,247,626
	Enterococcus	1,371,972	**104***	15,008				1,138,590	1,153,599
		1,371,972	**61**	9,073				1,143,572	1,152,645

* Total Maximum Daily Load calculated using a Enterococcus numeric target of 61 MPN/mL that is conservatively protective of the REC-1 "designated beach" usage frequency for freshwater creeks and downstream beaches. If the usage frequency of the freshwater creeks can be established as "moderately to lightly used" in the Basin Plan, alternative Total Maximum Daily Loads calculated using an Enterococcus numeric target of 104 MPN/ml may be used.

Existing Bacteria Load = Predicted existing bacteria load discharged from the watershed calculated by the Loading Simulation Program in C++ (LSPC) model using modeled flows and bacteria densities for all wet days during the critical year 1993

Single Sample Maximum Objective = Target bacteria densities based on numeric single sample maximum water quality objectives that are protective of REC-1 beneficial uses
Allowable Numeric Objective Load = Allowable load from the watershed calculated by the LSPC model using modeled flows and the numeric single sample maximum water quality objective bacteria densities for all wet days during the critical year 1993

Total Wet Days in Critical Year = Number of wet days (i.e., rainfall events of 0.2 inches or greater and the following 72 hours) in the critical year 1993 (i.e., wettest year between 1990 and 2002)
Allowable Exceedance Frequency = Assumed to be 22 percent exceedance frequency. In the calculation of the wet weather TMDLs, the San Diego Regional Board chose to apply the 22 percent allowable exceedance frequency as determined for Leo Carillo Beach in Los Angeles County. At the time the wet weather watershed model was developed, the 22 percent exceedance frequency from Los Angeles County was the only reference beach exceedance frequency available. The 22 percent allowable exceedance frequency used to calculate the wet weather TMDLs is justified because the San Diego Region watersheds' exceedance frequencies will likely be close to the value calculated for Leo Carillo Beach, and is consistent with the exceedance frequency that was applied by the Los Angeles Regional Board.
Allowable Wet Exceedance Days = (Total Wet days in Critical Year) X (Allowable Exceedance Frequency)
Allowable Exceedance Load = Sum of exceedance loads from the allowable exceedance days with the highest exceedance loads calculated by the LSPC model using modeled flows and bacteria densities for all wet days during the critical year 1993

Total Allowable Load [i.e. TMDL] = (Allowable Numeric Objective Load) + (Allowable Exceedance Load)

Table 9-2a. Wet Weather Fecal Coliform Bacteria Existing Loads, TMDLs, WLA, LAs Expressed as Annual Loads (Billion MPN/year)

	Total Watershed		Point Sources						Nonpoint Sources					
			Municipal MS4			Caltrans			Agriculture			Open		
Watershed	Existing Load	TMDL*	Existing Load	WLA*	Reduction Required	Existing Load	WLA*	Reduction Required	Existing Load	LA*	Reduction Required	Existing Load	LA*	Reduction Required
San Joaquin Hills/ Laguna Hills HSAs (901.11 and 901.12)	705,015	664,634	77,548	37,167	52.07%	179	179	0.00%	7,346	7,346	0.00%	619,942	619,942	0.00%
Aliso HSA (901.13)	1,752,096	1,579,073	650,092	477,069	26.62%	260	260	0.00%	26,508	26,508	0.00%	1,075,237	1,075,237	0.00%
Dana Point HSA (901.14)	403,911	377,313	179,043	152,446	14.86%	13	13	0.00%	0	0	0.00%	224,854	224,854	0.00%
Lower San Juan HSA (901.27)	15,304,790	14,714,833	1,326,469	1,156,419	12.82%	1,713	1,713	0.00%	3,275,477	2,855,570	12.82%	10,701,131	10,701,131	0.00%
San Clemente HA (901.30)	1,441,723	1,378,931	255,445	192,653	24.58%	335	335	0.00%	366	366	0.00%	1,185,577	1,185,577	0.00%
San Luis Rey HU (903.00)	33,120,012	32,444,242	943,501	914,026	3.12%	1,537	1,537	0.00%	20,687,954	20,041,659	3.12%	11,487,019	11,487,019	0.00%
San Marcos HA (904.50_	20,886	17,224	8,095	6,558	18.98%	8	8	0.00%	11,199	9,073	18.98%	1,585	1,585	0.00%
San Dieguito HU (905.00)	21,286,910	21,101,649	810,008	798,175	1.46%	1,310	1,310	0.00%	11,872,240	11,698,811	1.46%	8,603,352	8,603,352	0.00%
Miramar Reservoir HA (906.10)	10,392	10,256	6,839	6,703	1.99%	0	0	0.00%	0	0	0.00%	3,552	3,552	0.00%
Scripps HA (906.30)	204,057	176,907	128,403	101,253	21.14%	0	0	0.00%	0	0	0.00%	75,654	75,654	0.00%
Tecolote HA (906.5)	261,966	229,322	159,449	126,806	20.47%	553	553	0.00%	0	0	0.00%	101,963	101,963	0.00%
Mission San Diego/ Santee HSAs (907.11 and 907.12)	4,932,380 +1,302**	4,680,838 +1,302*	472,660	221,117	53.22%	1,009	1,009	0.00%	414,721	414,721	0.00%	4,043,991	4,043,991	0.00%
Chollas HSA (908.22)	603,863	520,440	335,901	252,479	24.84%	892	892	0.00%	0	0	0.00%	267,070	267,070	0.00%

* TMDLs, WLAs, and LAs calculated based on numeric targets consisting of the single sample maximum WQO for fecal coliform (400 MPN/100mL) and a 22 percent allowable exceedance frequency. Meeting the numeric targets in the discharge and/or receiving water indicate the TMDLs, WLAs, and/or LAs have been met.

** Permitted existing fecal coliform bacteria load from Padre Dam Municipal Water District Water Reclamation Plant (Padre Dam), assigned as a separate point source wasteload allocation for discharges from Padre Dam equal to the permitted existing load

Watershed Existing Load = Predicted existing fecal coliform bacteria loads discharged from all land use categories in the watershed calculated by the Loading Simulation Program in C++ (LSPC) model using modeled flows and bacteria densities for all wet days during the critical year 1993

Watershed TMDL = Total Maximum Daily Load (TMDL) or total allowable load (Allowable Numeric Objective Load + Allowable Exceedance Load) that can be discharged from all land uses in the watershed on an annual basis

MS4 Existing Load = Predicted exiting fecal coliform bacteria loads discharged from Municipal Separate Storm Sewer System (MS4) land use categories in the watershed (i.e., commercial/institutional, high density residential, low density residential, parks/recreation, military, transitional, and industrial/transportation, not including Caltrans transportation) calculated by the LSPC model

MS4 WLA = Point source wasteload allocation (WLA) for discharges from Municipal MS4 land uses

MS4 Reduction Required = Percent of the MS4 Existing Load that must be reduced to meet the MS4 WLA = (MS4 Existing Load – MS4 WLA)/(MS4 Existing Load)

Caltrans Existing Load = Predicted exiting fecal coliform bacteria loads discharged from Caltrans land use areas in the watershed calculated as a fraction of the discharge from industrial/transportation land use category area

Caltrans WLA = Point source wasteload allocation (WLA) for discharges from Caltrans land uses, assumed to be equal to Caltrans Existing Load

Caltrans Reduction Required = Percent of the Caltrans Existing Load that must be reduced to meet the Caltrans WLA = (Caltrans Existing Load – Caltrans WLA)/(Caltrans Existing Load)

Agriculture Existing Load = Predicted exiting fecal coliform bacteria loads discharged from Agriculture land use categories in the watershed (i.e., agriculture, dairy/livestock, horse ranch) calculated by the LSPC model

Agriculture LA = Non-point source load allocation (LA) for discharges from Agriculture land uses, assumed to be equal to Agriculture Existing Load in watersheds with existing bacteria load contributions for all three indicator bacteria of less than 5 percent; calculated as a relative load percent of the TMDL minus Caltrans WLA and Open Space LA, based on existing load contributions from MS4 and Agriculture land use categories in watersheds with existing bacteria load contributions for all three indicator bacteria of greater than 5 percent

Agriculture Reduction Required = Percent of the Agriculture Existing Load that must be reduced to meet the Agriculture LA = (Agriculture Existing Load – Agriculture LA)/(Agriculture Existing Load)

Open Existing Load = Predicted exiting fecal coliform bacteria loads discharged from Open Space land use categories in the watershed (i.e., open space, open recreation, water) calculated by the LSPC model

Open LA = Non-point source load allocation (LA) for discharges from Open Space land uses, assumed to be equal to the Open Space Existing Load

Open Reduction Required = Percent of the Open Space Existing Load that must be reduced to meet the Open Space LA = (Open Space Existing Load – Open Space LA)/(Open Space Existing Load)

Table 9-2b. Wet Weather Total Coliform Bacteria Existing Loads, TMDLs, WLA, LAs Expressed as Annual Loads (Billion MPN/year)

	Total Watershed		Point Sources						Nonpoint Sources					
			Municipal MS4			Caltrans			Agriculture			Open		
Watershed	Existing Load	TMDL*	Existing Load	WLA*	Reduction Required	Existing Load	WLA*	Reduction Required	Existing Load	LA*	Reduction Required	Existing Load	LA*	Reduction Required
San Joaquin Hills/ Laguna Hills HSAs (901.11 and 901.12)	8,221,901	7,445,649	1,656,904	880,652	46.85%	7,722	7,722	0.00%	50,774	50,774	0.00%	6,506,501	6,506,501	0.00%
Aliso HSA (901.13)	23,210,774	20,190,798	11,943,241	8,923,264	25.29%	11,003	11,003	0.00%	179,828	179,828	0.00%	11,076,702	11,076,702	0.00%
Dana Point HSA (901.14)	6,546,962	6,031,472	3,919,497	3,404,008	13.15%	634	634	0.00%	0	0	0.00%	2,626,830	2,626,830	0.00%
Lower San Juan HSA (901.27)	130,258,863	122,879,189	19,919,322	16,093,160	19.21%	60,480	60,480	0.00%	18,499,884	14,946,372	19.21%	91,779,178	91,779,178	0.00%
San Clemente HA (901.30)	16,236,606	15,147,603	4,566,742	3,477,739	23.85%	13,534	13,534	0.00%	2,370	2,370	0.00%	11,653,960	11,653,960	0.00%
San Luis Rey HU (903.00)	231,598,677	224,150,535	15,229,456	14,373,954	5.62%	54,508	54,508	0.00%	117,360,800	110,768,160	5.62%	98,953,913	98,953,913	0.00%
San Marcos HA (904.50_	515,278	425,083	366,021	298,430	18.47%	533	533	0.00%	122,414	99,809	18.47%	26,311	26,311	0.00%
San Dieguito HU (905.00)	163,541,133	159,814,184	17,406,569	16,660,538	4.29%	47,969	47,969	0.00%	69,551,416	66,570,499	4.29%	76,535,178	76,535,178	0.00%
Miramar Reservoir HA (906.10)	212,986	210,180	174,243	171,436	1.61%	9	9	0.00%	0	0	0.00%	38,734	38,734	0.00%
Scripps HA (906.30)	5,029,519	4,356,973	4,120,310	3,447,764	16.32%	0	0	0.00%	0	0	0.00%	909,209	909,209	0.00%
Tecolote HA (906.5)	7,395,789	6,379,770	6,152,484	5,136,598	16.51%	27,095	27,095	0.00%	0	0	0.00%	1,216,077	1,216,077	0.00%
Mission San Diego/ Santee HSAs (907.11 and 907.12)	72,757,569	66,105,222	17,442,867	10,790,520	38.14%	53,141	53,141	0.00%	3,495,960	3,495,960	0.00%	51,765,601	51,765,601	0.00%
Chollas HSA (908.22)	15,390,608	13,247,626	12,023,766	9,880,784	17.82%	45,652	45,652	0.00%	0	0	0.00%	3,321,191	3,321,191	0.00%

* TMDLs, WLAs, and LAs calculated based on numeric targets consisting of the single sample maximum WQO for total coliform (10,000 MPN/100mL) and a 22 percent allowable exceedance frequency. Meeting the numeric targets in the discharge and/or receiving water indicate the TMDLs, WLAs, and/or LAs have been met.

Watershed Existing Load = Predicted existing total coliform bacteria loads discharged from all land use categories in the watershed calculated by the Loading Simulation Program in C++ (LSPC) model using modeled flows and bacteria densities for all wet days during the critical year 1993
Watershed TMDL = Total Maximum Daily Load (TMDL) or total allowable load (Allowable Numeric Objective Load + Allowable Exceedance Load) that can be discharged from all land uses in the watershed on an annual basis

MS4 Existing Load = Predicted exiting total coliform bacteria loads discharged from Municipal Separate Storm Sewer System (MS4) land use categories in the watershed (i.e., commercial/institutional, high density residential, low density residential, parks/recreation, military, transitional, and industrial/transportation, not including Caltrans transportation) calculated by the LSPC model
MS4 WLA = Point source wasteload allocation (WLA) for discharges from Municipal MS4 land uses
MS4 Reduction Required = Percent of the MS4 Existing Load that must be reduced to meet the MS4 WLA = (MS4 Existing Load – MS4 WLA)/(MS4 Existing Load)

Caltrans Existing Load = Predicted exiting total coliform bacteria loads discharged from Caltrans land use areas in the watershed calculated as a fraction of the discharge from industrial/transportation land use category area
Caltrans WLA = Point source wasteload allocation (WLA) for discharges from Caltrans land uses, assumed to be equal to Caltrans Existing Load
Caltrans Reduction Required = Percent of the Caltrans Existing Load that must be reduced to meet the Caltrans WLA = (Caltrans Existing Load – Caltrans WLA)/(Caltrans Existing Load)

Agriculture Existing Load = Predicted exiting total coliform bacteria loads discharged from Agriculture land use categories in the watershed (i.e., agriculture, dairy/livestock, horse ranch) calculated by the LSPC model
Agriculture LA = Non-point source load allocation (LA) for discharges from Agriculture land uses, assumed to be equal to Agriculture Existing Load in watersheds with existing bacteria load contributions for all three indicator bacteria of less than 5 percent; calculated as a relative load percent of the TMDL minus Caltrans WLA and Open Space LA, based on existing load contributions from MS4 and Agriculture land use categories in watersheds with existing bacteria load contributions for all three indicator bacteria of greater than 5 percent
Agriculture Reduction Required = Percent of the Agriculture Existing Load that must be reduced to meet the Agriculture LA = (Agriculture Existing Load – Agriculture LA)/(Agriculture Existing Load)

Open Existing Load = Predicted exiting total coliform bacteria loads discharged from Open Space land use categories in the watershed (i.e., open space, open recreation, water) calculated by the LSPC model
Open LA = Non-point source load allocation (LA) for discharges from Open Space land uses, assumed to be equal to the Open Space Existing Load
Open Reduction Required = Percent of the Open Space Existing Load that must be reduced to meet the Open Space LA = (Open Space Existing Load – Open Space LA)/(Open Space Existing Load)

Table 9-2c. Wet Weather Enterococci Bacteria Existing Loads, TMDLs, WLA, LAs Expressed as Annual Loads (Billion MPN/year)

	Total Watershed		Point Sources						Nonpoint Sources					
			Municipal MS4			Caltrans			Agriculture			Open		
Watershed	Existing Load	TMDL*	Existing Load	WLA*	Reduction Required	Existing Load	WLA*	Reduction Required	Existing Load	LA*	Reduction Required	Existing Load	LA*	Reduction Required
San Joaquin Hills/ Laguna Hills HSAs (901.11 and 901.12)	852,649	782,799	136,267	66,417	51.26%	365	365	0.00%	3,201	3,201	0.00%	712,816	712,816	0.00%
Aliso HSA (901.13)	2,230,206	1,950,964**	1,014,732	735,490	27.52%	516	516	0.00%	11,245	11,245	0.00%	1,203,713	1,203,713	0.00%
Dana Point HSA (901.14)	501,526	462,306	258,747	219,528	15.16%	25	25	0.00%	0	0	0.00%	242,753	242,753	0.00%
Lower San Juan HSA (901.27)	12,980,098	12,152,446**	1,900,520	1,385,094	27.12%	2,823	2,823	0.00%	1,151,266	839,040	27.12%	9,925,490	9,925,490	0.00%
San Clemente HA (901.30)	1,663,100	1,563,187	395,581	295,668	25.26%	635	635	0.00%	148	148	0.00%	1,266,736	1,266,736	0.00%
San Luis Rey HU (903.00)	18,439,920	17,463,618	1,472,296	1,300,235	11.69%	2,397	2,397	0.00%	6,881,755	6,077,514	11.69%	10,083,473	10,083,473	0.00%
San Marcos HA (904.50_	40,558	32,966	29,784	23,771	20.19%	26	26	0.00%	7,825	6,246	20.19%	2,923	2,923	0.00%
San Dieguito HU (905.00)	14,796,210	14,307,087	1,911,170	1,763,603	7.72%	2,288	2,288	0.00%	4,423,566	4,082,010	7.72%	8,459,187	8,459,187	0.00%
Miramar Reservoir HA (906.10)	11,564	11,405	8,269	8,109	1.93%	0	0	0.00%	0	0	0.00%	3,295	3,295	0.00%
Scripps HA (906.30)	377,839	324,032	285,842	232,035	18.82%	0	0	0.00%	0	0	0.00%	91,997	91,997	0.00%
Tecolote HA (906.5)	708,256	603,761**	575,708	471,211	18.15%	1,266	1,266	0.00%	0	0	0.00%	131,284	131,284	0.00%
Mission San Diego/ Santee HSAs (907.11 and 907.12)	7,255,759	6,590,966*	1,555,411	890,617	42.74%	2,430	2,430	0.00%	213,149	213,149	0.00%	5,484,770	5,484,770	0.00%
Chollas HSA (908.22)	1,371,972	1,152,645**	1,022,245	802,918	21.46%	2,062	2,062	0.00%	0	0	0.00%	347,665	347,665	0.00%

* TMDLs, WLAs, and LAs calculated based on numeric targets consisting of the single sample maximum WQO for enterococcus (104 MPN/100mL or 61 MPN/100mL) and a 22 percent allowable exceedance frequency. Meeting the numeric targets in the discharge and/or receiving water indicate the TMDLs, WLAs, and/or LAs have been met.

** Total Maximum Daily Load calculated using a Enterococcus numeric target of 61 MPN/mL that is conservatively protective of the REC-1 "designated beach" usage frequency for freshwater creeks and downstream beaches. If the usage frequency of the ffreshwater creeks can be established as "moderately to lightly used," alternative Total Maximum Daily Loads calculated using an Enterococcus numeric target of 104 MPN/ml presented in Table 9-5 may be used.

Watershed Existing Load = Predicted existing Enterococcus bacteria loads discharged from all land use categories in the watershed calculated by the Loading Simulation Program in C++ (LSPC) model using modeled flows and bacteria densities for all wet days during the critical year 1993

Watershed TMDL = Total Maximum Daily Load (TMDL) or total allowable load (Allowable Numeric Objective Load + Allowable Exceedance Load) that can be discharged from all lan uses in the watershed on an annual basis

MS4 Existing Load = Predicted exiting Enterococcus bacteria loads discharged from Municipal Separate Storm Sewer System (MS4) land use categories in the watershed (i.e., commercial/institutional, high density residential, low density residential, parks/recreation, military, transitional, and industrial/transportation, not including Caltrans transportation) calculated by the LSPC model

MS4 WLA = Point source wasteload allocation (WLA) for discharges from Municipal MS4 land uses

MS4 Reduction Required = Percent of the MS4 Existing Load that must be reduced to meet the MS4 WLA = (MS4 Existing Load – MS4 WLA)/(MS4 Existing Load)

Caltrans Existing Load = Predicted exiting Enterococcus bacteria loads discharged from Caltrans land use areas in the watershed calculated as a fraction of the discharge from industrial/transportation land use category area

Caltrans WLA = Point source wasteload allocation (WLA) for discharges from Caltrans land uses, assumed to be equal to Caltrans Existing Load

Caltrans Reduction Required = Percent of the Caltrans Existing Load that must be reduced to meet the Caltrans WLA = (Caltrans Existing Load – Caltrans WLA)/(Caltrans Existing Load)

Agriculture Existing Load = Predicted exiting Enterococcus bacteria loads discharged from Agriculture land use categories in the watershed (i.e., agriculture, dairy/livestock, horse ranch) calculated by the LSPC model

Agriculture LA = Non-point source load allocation (LA) for discharges from Agriculture land uses, assumed to be equal to Agriculture Existing Load in watersheds with existing bacteria load contributions for all three indicator bacteria of less than 5 percent; calculated as a relative load percent of the TMDL minus Caltrans WLA and Open Space LA, based on existing load contributions from MS4 and Agriculture land use categories in watersheds with existing bacteria load contributions for all three indicator bacteria of greater than 5 percent

Agriculture Reduction Required = Percent of the Agriculture Existing Load that must be reduced to meet the Agriculture LA = (Agriculture Existing Load – Agriculture LA)/(Agriculture Existing Load)

Open Existing Load = Predicted exiting Enterococcus bacteria loads discharged from Open Space land use categories in the watershed (i.e., open space, open recreation, water) calculated by the LSPC model

Open LA = Non-point source load allocation (LA) for discharges from Open Space land uses, assumed to be equal to the Open Space Existing Load

Open Reduction Required = Percent of the Open Space Existing Load that must be reduced to meet the Open Space LA = (Open Space Existing Load – Open Space LA)/(Open Space Existing Load))

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Table 9-3. Summary of Dry Weather Numeric Targets and Existing and Allowable Indicator Bacteria Loads

Watershed - Impaired Waterbody	**Indicator Bacteria**	**Existing Bacteria Load (Billion MPN/mth)**	**30-Day Geometric Mean Objective (MPN/100mL)**	**Allowable Numeric Objective Load (Billion MPN/mth)**	**Total Dry Days in Critical Year**	**Allowable Exceedance Frequency**	**Allowable Dry Exceedance Days in Critical Year**	**Allowable Exceedance Load (Billion MPN/mth)**	**Total Allowable Load [=TMDL] (Billion MPN/mth)**
San Joaquin Hills HSA (901.11)	Fecal Coliform	2,741	**200**	227				0	227
and Laguna Hills HSA (901.12)	Total Coliform	13,791	**1,000**	1,134	296	**0%**	0	0	1,134
- Pacific Ocean Shoreline	Enterococcus	2,321	**35**	40				0	40
Aliso HSA (901.13)	Fecal Coliform	5,470	**200**	242				0	242
- Pacific Ocean Shoreline - Aliso Creek	Total Coliform	26,639	**1,000**	1,208	296	**0%**	0	0	1,208
- Aliso Creek mouth	Enterococcus	4,614	**33***	40				0	40
Dana Point HSA (901.14)	Fecal Coliform	1,851	**200**	92				0	92
- Pacific Ocean Shoreline	Total Coliform	9,315	**1,000**	462	296	**0%**	0	0	462
	Enterococcus	1,567	**35**	16				0	16
Lower San Juan HSA (901.27)	Fecal Coliform	6,455	**200**	1,665				0	1,665
- Pacific Ocean Shoreline - San Juan Creek	Total Coliform	30,846	**1,000**	8,342	289	**0%**	0	0	8,342
- San Juan Creek mouth	Enterococcus	5,433	**33***	275				0	275
San Clemente HA (901.30)	Fecal Coliform	3,327	**200**	192				0	192
- Pacific Ocean Shoreline	Total Coliform	16,743	**1,000**	958	292	**0%**	0	0	958
	Enterococcus	2,817	**35**	33				0	33
San Luis Rey HU (903.00)	Fecal Coliform	1,737	**200**	1,058				0	1,058
- Pacific Ocean Shoreline	Total Coliform	8,549	**1,000**	5,289	275	**0%**	0	0	5,289
	Enterococcus	1,466	**35**	185				0	185
San Marcos HA (904.50)	Fecal Coliform	149	**200**	26				0	26
- Pacific Ocean Shoreline	Total Coliform	751	**1,000**	129	316	**0%**	0	0	129
	Enterococcus	126	**35**	5				0	5
San Dieguito HU (905.00)	Fecal Coliform	1,631	**200**	1,293				0	1,293
- Pacific Ocean Shoreline	Total Coliform	7,555	**1,000**	6,468	267	**0%**	0	0	6,468
	Enterococcus	1,368	**35**	226				0	226
Miramar Reservoir HA (906.10)	Fecal Coliform	205	**200**	7				0	7
- Pacific Ocean Shoreline	Total Coliform	1,030	**1,000**	36	271	**0%**	0	0	36
	Enterococcus	173	**35**	1				0	1

Table 9-3. Summary of Dry Weather Numeric Targets and Existing and Allowable Indicator Bacteria Loads (Cont'd)

Watershed - Impaired Waterbody	**Indicator Bacteria**	**Existing Bacteria Load (Billion MPN/mth)**	**30-Day Geometric Mean Objective (MPN/100mL)**	**Allowable Numeric Objective Load (Billion MPN/mth)**	**Total Dry Days in Critical Year**	**Allowable Exceedance Frequency**	**Allowable Dry Exceedance Days in Critical Year**	**Allowable Exceedance Load (Billion MPN/mth)**	**Total Allowable Load [=TMDL] (Billion MPN/mth)**
Scripps HA (906.30)	Fecal Coliform	3,320	**200**	119				0	119
- Pacific Ocean Shoreline	Total Coliform	16,707	**1,000**	594	308	**0%**	0	0	594
	Enterococcus	2,811	**35**	21				0	21
Tecolote HA (906.50)	Fecal Coliform	4,329	**200**	234				0	234
- Tecolote Creek	Total Coliform	21,349	**1,000**	1,171	308	**0%**	0	0	1,171
	Enterococcus	3,657	**33***	39				0	39
Mission San Diego HSA (907.11)	Fecal Coliform	4,928	**200**	1,506				0	1,506
and Santee HSA (907.12)	Total Coliform	28,988	**1,000**	7,529	279	**0%**	0	0	7,529
- Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles) - Pacific Ocean Shoreline	Enterococcus	4,106	**33***	248				0	248
Chollas HSA (908.22)	Fecal Coliform	5,068	**200**	398				0	398
- Chollas Creek	Total Coliform	25,080	**1,000**	1,991	300	**0%**	0	0	1,991
	Enterococcus	4,283	**33***	66				0	66

* Total Allowable Load [=TMDL] calculated using a Enterococcus numeric target of 33 MPN/mL that is conservatively protective of the REC-1 "designated beach" usage frequency for watersheds with impaired freshwater creeks.

Existing Bacteria Load = Predicted existing bacteria load discharged from the watershed calculated by the plug-flow reactor model using estimated flows and bacteria densities for 30 dry days during the critical year 1993

30-Day Geometric Mean Objective = Target bacteria densities based on numeric 30-day geometric mean water quality objectives that are protective of REC-1 beneficial uses
Allowable Numeric Objective Load = Allowable load from the watershed calculated by the plug-flow reactor model using estimated flows and the numeric 30-day geometric mean water quality objective bacteria densities for 30 dry days during the critical year 1993

Total Dry Days in Critical Year = Number of dry days (i.e., day not including rainfall events of 0.2 inches or greater and the following 72 hours) in the critical year 1993 (i.e., wettest year between 1990 and 2002)
Allowable Exceedance Frequency = Assumed to be zero; data collected from reference systems generally do not show exceedances of REC-1 water quality objectives
Allowable Wet Exceedance Days = (Total Dry Days in Critical Year) X (Allowable Exceedance Frequency)
Allowable Exceedance Load = Sum of exceedance loads from the allowable exceedance days for all dry days during the critical year 1993

Total Allowable Load [i.e. TMDL] = (Allowable Numeric Objective Load) + (Allowable Exceedance Load) for a 30-day period

Table 9-4a. Dry Weather Fecal Coliform Bacteria Existing Loads, TMDLs, WLA, LAs Expressed as Monthly Loads (Billion MPN/month)

	Total Watershed		Point Sources						Nonpoint Sources					
			Municipal MS4			Caltrans			Agriculture			Open		
Watershed	Existing Load	TMDL*	Existing Load	WLA*	Reduction Required	Existing Load	WLA*	Reduction Required	Existing Load	LA*	Reduction Required	Existing Load	LA*	Reduction Required
San Joaquin Hills/ Laguna Hills HSAs (901.11 and 901.12)	2,741	227	2,741	227	91.72%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Aliso HSA (901.13)	5,470	242	5,470	242	95.58%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Dana Point HSA (901.14)	1,851	92	1,851	92	95.03%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Lower San Juan HSA (901.27)	6,455	1,665	6,455	1,665	74.21%	0	0	0.00%	0	0	0.00%	0	0	0.00%
San Clemente HA (901.30)	3,327	192	3,327	192	94.23%	0	0	0.00%	0	0	0.00%	0	0	0.00%
San Luis Rey HU (903.00)	1,737	1,058	1,737	1,058	39.09%	0	0	0.00%	0	0	0.00%	0	0	0.00%
San Marcos HA (904.50_	149	26	149	26	82.55%	0	0	0.00%	0	0	0.00%	0	0	0.00%
San Dieguito HU (905.00)	1,631	1,293	1,631	1,293	20.72%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Miramar Reservoir HA (906.10)	205	7	205	7	96.59%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Scripps HA (906.30)	3,320	119	3,320	119	96.42%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Tecolote HA (906.5)	4,329	234	4,329	234	94.59%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Mission San Diego/ Santee HSAs (907.11 and 907.12)	4,928 +461**	1,506 +461*	4,928	1,506	69.44%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Chollas HSA (908.22)	5,068	398	5,068	398	92.15%	0	0	0.00%	0	0	0.00%	0	0	0.00%

* TMDLs, WLAs, and LAs calculated based on numeric targets consisting of the 30-day geometric mean WQO for fecal coliform (200 MPN/100mL) and a 0 percent allowable exceedance frequency. Meeting the numeric targets in the discharge and/or receiving water indicate the TMDLs, WLAs, and/or LAs have been met.

** Permitted existing fecal coliform bacteria load from Padre Dam Municipal Water District Water Reclamation Plant (Padre Dam), assigned as a separate point source wasteload allocation for discharges from Padre Dam equal to the permitted existing load

Watershed Existing Load = Predicted existing fecal coliform bacteria loads discharged from all land use categories in the watershed calculated by a plug-flow reactor model using estimated flows and bacteria densities for 30 dry days during the critical year 1993
Watershed TMDL = Total Maximum Daily Load (TMDL) or total allowable load (Allowable Numeric Objective Load + Allowable Exceedance Load) that can be discharged from all land uses in the watershed for a 30-day period

MS4 Existing Load = Predicted exiting fecal coliform bacteria loads discharged from Municipal Separate Storm Sewer System (MS4) land use categories in the watershed (i.e., commercial/institutional, high density residential, low density residential, parks/recreation, military, transitional, and industrial/transportation, not including Caltrans transportation) calculated by the plug-flow reactor model
MS4 WLA = Point source wasteload allocation (WLA) for discharges from Municipal MS4 land uses
MS4 Reduction Required = Percent of the MS4 Existing Load that must be reduced to meet the MS4 WLA = (MS4 Existing Load – MS4 WLA)/(MS4 Existing Load)

Caltrans Existing Load = Fecal coliform bacteria loads discharged from Caltrans land use areas in the watershed assumed to be unlikely during dry weather conditions, or zero bacteria load during dry weather
Caltrans WLA = Point source wasteload allocation (WLA) for discharges from Caltrans land uses, assumed to be equal to the Caltrans Existing Load
Caltrans Reduction Required = Percent of the Caltrans Existing Load that must be reduced to meet the Caltrans WLA = (Caltrans Existing Load – Caltrans WLA)/(Caltrans Existing Load)

Agriculture Existing Load = Fecal coliform bacteria loads discharged from Agriculture land use categories in the watershed (i.e., agriculture, dairy/livestock, horse ranch) assumed to be unlikely during dry weather conditions, or zero bacteria load during dry weather
Agriculture LA = Non-point source load allocation (LA) for discharges from Agriculture land uses, assumed to be equal to the Open Space Existing Load
Agriculture Reduction Required = Percent of the Agriculture Existing Load that must be reduced to meet the Agriculture LA = (Agriculture Existing Load – Agriculture LA)/(Agriculture Existing Load)

Open Existing Load = Fecal coliform bacteria loads discharged from Open Space land use categories in the watershed (i.e., open space, open recreation, water) assumed to be unlikely during dry weather conditions, or zero bacteria load during dry weather
Open LA = Non-point source load allocation (LA) for discharges from Open Space land uses, assumed to be equal to the Open Space Existing Load
Open Reduction Required = Percent of the Open Space Existing Load that must be reduced to meet the Open Space LA = (Open Space Existing Load – Open Space LA)/(Open Space Existing Load)

Table 9-4b. Dry Weather Total Coliform Bacteria Existing Loads, TMDLs, WLA, LAs Expressed as Monthly Loads (Billion MPN/month)

	Total Watershed		Point Sources						Nonpoint Sources					
			Municipal MS4			Caltrans			Agriculture			Open		
Watershed	Existing Load	TMDL*	Existing Load	WLA*	Reduction Required	Existing Load	WLA*	Reduction Required	Existing Load	LA*	Reduction Required	Existing Load	LA*	Reduction Required
San Joaquin Hills/ Laguna Hills HSAs (901.11 and 901.12)	13,791	1,134	13,791	1,134	91.78%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Aliso HSA (901.13)	26,639	1,208	26,639	1,208	95.47%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Dana Point HSA (901.14)	9,315	462	9,315	462	95.04%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Lower San Juan HSA (901.27)	30,846	8,342	30,846	8,342	72.96%	0	0	0.00%	0	0	0.00%	0	0	0.00%
San Clemente HA (901.30)	16,743	958	16,743	958	94.28%	0	0	0.00%	0	0	0.00%	0	0	0.00%
San Luis Rey HU (903.00)	8,549	5,289	8,549	5,289	38.13%	0	0	0.00%	0	0	0.00%	0	0	0.00%
San Marcos HA (904.50_	751	129	751	129	82.82%	0	0	0.00%	0	0	0.00%	0	0	0.00%
San Dieguito HU (905.00)	7,555	6,468	7,555	6,468	14.39%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Miramar Reservoir HA (906.10)	1,030	36	1,030	36	96.50%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Scripps HA (906.30)	16,707	594	16,707	594	96.44%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Tecolote HA (906.5)	21,349	1,171	21,349	1,171	94.51%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Mission San Diego/ Santee HSAs (907.11 and 907.12)	28,988	7,529	28,988	7,529	74.03%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Chollas HSA (908.22)	25,080	1,991	25,080	1,991	92.06%	0	0	0.00%	0	0	0.00%	0	0	0.00%

* TMDLs, WLAs, and LAs calculated based on numeric targets consisting of the 30-day geometric mean WQO for total coliform (1,000 MPN/100mL) and a 0 percent allowable exceedance frequency. Meeting the numeric targets in the discharge and/or receiving water indicate the TMDLs, WLAs, and/or LAs have been met.

Watershed Existing Load = Predicted existing total coliform bacteria loads discharged from all land use categories in the watershed calculated by a plug-flow reactor model using estimated flows and bacteria densities for 30 dry days during the critical year 1993
Watershed TMDL = Total Maximum Daily Load (TMDL) or total allowable load (Allowable Numeric Objective Load + Allowable Exceedance Load) that can be discharged from all land uses in the watershed for a 30-day period

MS4 Existing Load = Predicted exiting total coliform bacteria loads discharged from Municipal Separate Storm Sewer System (MS4) land use categories in the watershed (i.e., commercial/institutional, high density residential, low density residential, parks/recreation, military, transitional, and industrial/transportation, not including Caltrans transportation) calculated by the plug-flow reactor model
MS4 WLA = Point source wasteload allocation (WLA) for discharges from Municipal MS4 land uses
MS4 Reduction Required = Percent of the MS4 Existing Load that must be reduced to meet the MS4 WLA = (MS4 Existing Load – MS4 WLA)/(MS4 Existing Load)

Caltrans Existing Load = Total coliform bacteria loads discharged from Caltrans land use areas in the watershed assumed to be unlikely during dry weather conditions, or zero bacteria load during dry weather
Caltrans WLA = Point source wasteload allocation (WLA) for discharges from Caltrans land uses, assumed to be equal to the Caltrans Existing Load
Caltrans Reduction Required = Percent of the Caltrans Existing Load that must be reduced to meet the Caltrans WLA = (Caltrans Existing Load – Caltrans WLA)/(Caltrans Existing Load)

Agriculture Existing Load = Total coliform bacteria loads discharged from Agriculture land use categories in the watershed (i.e., agriculture, dairy/livestock, horse ranch) assumed to be unlikely during dry weather conditions, or zero bacteria load during dry weather
Agriculture LA = Non-point source load allocation (LA) for discharges from Agriculture land uses, assumed to be equal to the Open Space Existing Load
Agriculture Reduction Required = Percent of the Agriculture Existing Load that must be reduced to meet the Agriculture LA = (Agriculture Existing Load – Agriculture LA)/(Agriculture Existing Load)

Open Existing Load = Total coliform bacteria loads discharged from Open Space land use categories in the watershed (i.e., open space, open recreation, water) assumed to be unlikely during dry weather conditions, or zero bacteria load during dry weather
Open LA = Non-point source load allocation (LA) for discharges from Open Space land uses, assumed to be equal to the Open Space Existing Load
Open Reduction Required = Percent of the Open Space Existing Load that must be reduced to meet the Open Space LA = (Open Space Existing Load – Open Space LA)/(Open Space Existing Load)

Table 9-4c. Dry Weather Enterococci Bacteria Existing Loads, TMDLs, WLA, LAs Expressed as Monthly Loads (Billion MPN/month)

	Total Watershed		Point Sources						Nonpoint Sources					
			Municipal MS4			Caltrans			Agriculture			Open		
Watershed	Existing Load	TMDL*	Existing Load	WLA*	Reduction Required	Existing Load	WLA*	Reduction Required	Existing Load	LA*	Reduction Required	Existing Load	LA*	Reduction Required
San Joaquin Hills/ Laguna Hills HSAs (901.11 and 901.12)	2,321	40	2,321	40	98.28%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Aliso HSA (901.13)	4,614	40**	4,614	40	99.13%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Dana Point HSA (901.14)	1,567	16	1,567	16	98.98%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Lower San Juan HSA (901.27)	5,433	275**	5,433	275	94.94%	0	0	0.00%	0	0	0.00%	0	0	0.00%
San Clemente HA (901.30)	2,817	33	2,817	33	98.83%	0	0	0.00%	0	0	0.00%	0	0	0.00%
San Luis Rey HU (903.00)	1,466	185	1,466	185	87.38%	0	0	0.00%	0	0	0.00%	0	0	0.00%
San Marcos HA (904.50_	126	5	126	5	96.03%	0	0	0.00%	0	0	0.00%	0	0	0.00%
San Dieguito HU (905.00)	1,368	226	1,368	226	83.48%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Miramar Reservoir HA (906.10)	173	1	173	1	99.42%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Scripps HA (906.30)	2,811	21	2,811	21	99.25%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Tecolote HA (906.5)	3,657	39**	3,657	39	98.94%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Mission San Diego/ Santee HSAs (907.11 and 907.12)	4,106	248**	4,106	248	93.96%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Chollas HSA (908.22)	4,283	66**	4,283	66	98.46%	0	0	0.00%	0	0	0.00%	0	0	0.00%

* TMDLs, WLAs, and LAs calculated based on numeric targets consisting of the 30-day geometric mean WQO for enterococcus (35 MPN/100mL or 33 MPN/100mL) and a 0 percent allowable exceedance frequency. Meeting the numeric targets in the discharge and/or receiving water indicate the TMDLs, WLAs, and/or LAs have been met.

** Total Maximum Daily Load calculated using a Enterococcus numeric target of 33 MPN/mL that is conservatively protective of the REC-1 "designated beach" usage frequency for freshwater creeks and downstream beaches.

Watershed Existing Load = Predicted existing Enterococcus bacteria loads discharged from all land use categories in the watershed calculated by a plug-flow reactor model using estimated flows and bacteria densities for 30 dry days during the critical year 1993
Watershed TMDL = Total Maximum Daily Load (TMDL) or total allowable load (Allowable Numeric Objective Load + Allowable Exceedance Load) that can be discharged from all land uses in the watershed for a 30-day period

MS4 Existing Load = Predicted exiting Enterococcus bacteria loads discharged from Municipal Separate Storm Sewer System (MS4) land use categories in the watershed (i.e., commercial/institutional, high density residential, low density residential, parks/recreation, military, transitional, and industrial/transportation, not including Caltrans transportation) calculated by the plug-flow reactor model
MS4 WLA = Point source wasteload allocation (WLA) for discharges from MS4 land uses
MS4 Reduction Required = Percent of the MS4 Existing Load that must be reduced to meet the MS4 WLA = (MS4 Existing Load – MS4 WLA)/(MS4 Existing Load)

Caltrans Existing Load = Enterococcus bacteria loads discharged from Caltrans land use areas in the watershed assumed to be unlikely during dry weather conditions, or zero bacteria load during dry weather
Caltrans WLA = Point source wasteload allocation (WLA) for discharges from Caltrans land uses, assumed to be equal to the Caltrans Existing Load
Caltrans Reduction Required = Percent of the Caltrans Existing Load that must be reduced to meet the Caltrans WLA = (Caltrans Existing Load – Caltrans WLA)/(Caltrans Existing Load)

Agriculture Existing Load = Enterococcus bacteria loads discharged from Agriculture land use categories in the watershed (i.e., agriculture, dairy/livestock, horse ranch) assumed to be unlikely during dry weather conditions, or zero bacteria load during dry weather
Agriculture LA = Non-point source load allocation (LA) for discharges from Agriculture land uses, assumed to be equal to the Open Space Existing Load
Agriculture Reduction Required = Percent of the Agriculture Existing Load that must be reduced to meet the Agriculture LA = (Agriculture Existing Load – Agriculture LA)/(Agriculture Existing Load)

Open Existing Load = Enterococcus bacteria loads discharged from Open Space land use categories in the watershed (i.e., open space, open recreation, water) assumed to be unlikely during dry weather conditions, or zero bacteria load during dry weather
Open LA = Non-point source load allocation (LA) for discharges from Open Space land uses, assumed to be equal to the Open Space Existing Load
Open Reduction Required = Percent of the Open Space Existing Load that must be reduced to meet the Open Space LA = (Open Space Existing Load – Open Space LA)/(Open Space Existing Load)

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9.3.3 Alternative Enterococci Wet Weather TMDLs for Impaired Creeks and Downstream Beaches

As mentioned in section 4, there are different enterococci REC-1 WQOs in the Ocean Plan compared to the Basin Plan. Specifically, the Ocean Plan contains REC-1 single sample maximum and 30-day geometric mean WQOs that apply only to ocean waters. In the Basin Plan, the REC-1 WQOs for enterococci are dependent upon the type (e.g., freshwater or saltwater) and usage frequency (e.g., designated beach, moderately or lightly used area, or infrequently used area) of the waterbody. The enterococci REC-1 WQOs in the Basin Plan only apply to inland surface waters, enclosed bays and estuaries, and coastal lagoons. The enterococci saltwater REC-1 WQOs in the Basin Plan, for waters designated with "designated beach" usage frequency, are the same as the enterococci REC-1 WQOs in the Ocean Plan.

Of the saltwater and various freshwater enterococci REC-1 WQOs in the Basin Plan, the most stringent is the freshwater REC-1 WQO for the "designated beach" frequency of use (61 MPN/100mL). Therefore, as a conservative approach, the freshwater designated beach REC-1 WQO was used as basis for the numeric targets for the enterococci wet weather TMDLs for six impaired creeks (San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek and the (lower) San Diego River, and Chollas Creek) and their associated downstream beaches (see Tables 4-2 and 4-3), as applicable.

In comments, the municipal dischargers pointed out that, for the impaired creeks, the "designated beach" usage frequency REC-1 WQO for enterococci may be over-protective of water quality because of the infrequent recreational use in the impaired creeks. They claim that the recreational usage frequency in these creeks more likely corresponds to the "moderately to lightly used area" category in the Basin Plan, which has an enterococci REC-1 WQO of 108 MPN/100mL. In these cases, using a less stringent numeric target, based on the saltwater enterococci REC-1 WQO of 104 MPN/100 mL ("designated beaches" usage frequency) would result in wet weather TMDLs protective of REC-1 uses in the inland freshwater creeks and at the downstream coastal saltwater beaches.[23] Therefore, if the "moderately to lightly used area" usage frequency is appropriate for the six impaired creeks, and the enterococci saltwater REC-1 single sample maximum WQO of 104 MPN/100 mL could be used as the basis of the numeric target for the enterococci wet weather TMDLs.

The six creeks included in these TMDLs, however, have not been designated in the Basin Plan as "moderately to lightly used area" waterbodies as of the adoption of these TMDLs. If the Basin Plan does not specify the usage frequency of a waterbody, the most stringent and conservative WQOs are appropriate and applicable. For enterococci, the most stringent and conservative WQOs for the freshwater creeks are associated with the "designated beach" usage frequency and freshwater waterbody type. Thus, the enterococci WQOs associated with the freshwater

[23] The enterococci WQOs in the Basin Plan are structured to reflect the frequency of recreational use. The enterococci freshwater WQO for a "designated beach" area is 61 MPN/100 mL. For a "moderately or lightly used area," the WQO is 108 MPN/100 mL. The saltwater WQO for "designated beach" area is 104 MPN/100 mL. Where the "moderately or lightly used area" designation is appropriate for creeks, the saltwater WQO of 104 MPN/100 mL could be used as the numeric target because it is also protective of both the freshwater creek and the downstream marine beach.

"designated beach" usage frequency are applicable until sufficient evidence is provided to warrant an amendment to the Basin Plan that designates a lower usage frequency to one or more of the six creeks addressed by these TMDLs (San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek, San Diego River, and Chollas Creek).

According to the federal regulations,[24] usage frequencies are defined as follows:

- Designated Beach Area: those recreation waters that, during the recreation season, are heavily used (based upon a comparison of use within the state) and may have a lifeguard, bathhouse facilities, or public parking for beach access. States may include any other waters in this category even if the waters do not meet these criteria.

- Moderate Full Body Contact Recreation: those recreation waters that are not designated bathing beach waters but typically, during the recreation season, are used by at least half of the number of people as at typical designated bathing beach waters within the state. States may also include light use or infrequent use coastal recreation waters in this category.

- Lightly Used Full Body Contact Recreation: those recreation waters that are not designated bathing beach waters but typically, during the recreation season, are used by less than half of the number of people as at typical designated bathing beach waters within the state, but are more than infrequently used. States may also include infrequent use coastal recreation waters in this category.

- Infrequently Used Full Body Contact: those recreation waters that are rarely or occasionally used.

If sufficient evidence can be provided to the San Diego Water Board that can demonstrate the usage frequency for one or more of the six impaired creeks falls under the "Lightly Used Full Body Contact Recreation" or "Infrequently Used Full Body Contact" usage frequency, the Basin Plan may be amended to designate one or more of the creeks with the "moderately to lightly used area" usage frequency.

If one or more of the six creeks (San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek, San Diego River, and/or Chollas Creek) are designated in the Basin Plan with the "moderately to lightly used area" usage frequency, the enterococci wet weather TMDLs, WLAs, and LAs based on the 104 MPN/100mL (see Table 9-1 and Table 9-5) will be implemented. Otherwise, the more stringent enterococci wet weather TMDLs, WLAs, and LAs based on the freshwater "designated beach" usage frequency WQO of 61 MPN/100mL (see Table 9-1 and Table 9-2c) will be implemented.

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[24] Code of Federal Regulations Title 40 section 131.41 [40CFR131.41]

Table 9-5. Alternative Wet Weather Enterococci Bacteria Existing Loads, TMDLs, WLA, LAs Expressed as Annual Loads (Billion MPN/year)

Watershed	Total Watershed		Point Sources						Nonpoint Sources					
			Municipal MS4			Caltrans			Agriculture			Open		
	Existing Load	TMDL*	Existing Load	WLA*	Reduction Required	Existing Load	WLA*	Reduction Required	Existing Load	LA*	Reduction Required	Existing Load	LA*	Reduction Required
Aliso HSA (901.13)	2,230,206	1,952,517**	1,014,732	737,042	27.37%	516	516	0.00%	11,245	11,245	0.00%	1,203,713	1,203,713	0.00%
Lower San Juan HSA (901.27)	12,980,098	12,159,138**	1,900,520	1,389,261	26.90%	2,823	2,823	0.00%	1,151,266	841,564	26.90%	9,925,490	9,925,490	0.00%
Tecolote HA (906.50)	708,256	604,180**	575,708	471,630	18.08%	1,266	1,266	0.00%	0	0	0.00%	131,284	131,284	0.00%
Mission San Diego/ Santee HSAs (907.11 and 907.12)	7,255,759	6,595,208**	1,555,411	894,859	42.47%	2,430	2,430	0.00%	213,149	213,149	0.00%	5,484,770	5,484,770	0.00%
Chollas HSA (908.22)	1,371,972	1,153,599**	1,022,245	803,871	21.36%	2,062	2,062	0.00%	0	0	0.00%	347,665	347,665	0.00%

* TMDLs, WLAs, and LAs calculated based on numeric targets consisting of the single sample maximum WQO for enterococcus (104 MPN/100mL) and a 22 percent allowable exceedance frequency. Meeting the numeric targets in the discharge and/or receiving water indicate the TMDLs, WLAs, and/or LAs have been met.

** Total Maximum Daily Load calculated using a Enterococcus numeric target of 104 MPN/ml protective of the REC-1 "moderately to lightly used area" usage frequency that is protective freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative wet weather TMDLs, WLAs, and LAs can be implemented in these watersheds.

Watershed Existing Load Predicted existing Enterococcus bacteria loads discharged from all land use categories in the watershed calculated by the Loading Simulation Program in C++ (LSPC) model using modeled flows and bacteria densities for all wet days during the critical year 1993
Watershed TMDL = Total Maximum Daily Load (TMDL) or total allowable load (Allowable Numeric Objective Load + Allowable Exceedance Load) that can be discharged from all land uses in the watershed on an annual basis

MS4 Existing Load = Predicted exiting Enterococcus bacteria loads discharged from Municipal Separate Storm Sewer System (MS4) land use categories in the watershed (i.e., commercial/institutional, high density residential, low density residential, parks/recreation, military, transitional, and industrial/transportation, not including Caltrans transportation) calculated by the LSPC model
MS4 WLA = Point source wasteload allocation (WLA) for discharges from Municipal MS4 land uses
MS4 Reduction Required = Percent of the MS4 Existing Load that must be reduced to meet the MS4 WLA = (MS4 Existing Load – MS4 WLA)/(MS4 Existing Load)

Caltrans Existing Load = = Predicted exiting Enterococcus bacteria loads discharged from Caltrans land use areas in the watershed calculated as a fraction of the discharge from industrial/transportation land use category area
Caltrans WLA = Point source wasteload allocation (WLA) for discharges from Caltrans land uses, assumed to be equal to Caltrans Existing Load
Caltrans Reduction Required = Percent of the Caltrans Existing Load that must be reduced to meet the Caltrans WLA = (Caltrans Existing Load – Caltrans WLA)/(Caltrans Existing Load)

Agriculture Existing Load = Predicted exiting Enterococcus bacteria loads discharged from Agriculture land use categories in the watershed (i.e., agriculture, dairy/livestock, horse ranch) calculated by the LSPC model
Agriculture LA = Non-point source load allocation (LA) for discharges from Agriculture land uses, assumed to be equal to Agriculture Existing Load in watersheds with existing bacteria load contributions for all three indicator bacteria of less than 5 percent; calculated as a relative load percent of the TMDL minus Caltrans WLA and Open Space LA, based on existing load contributions from MS4 and Agriculture land use categories in watersheds with existing bacteria load contributions for all three indicator bacteria of greater than 5 percent
Agriculture Reduction Required = Percent of the Agriculture Existing Load that must be reduced to meet the Agriculture LA = (Agriculture Existing Load – Agriculture LA)/(Agriculture Existing Load)

Open Existing Load = Predicted exiting Enterococcus bacteria loads discharged from Open Space land use categories in the watershed (i.e., open space, open recreation, water) calculated by the LSPC model
Open LA = Non-point source load allocation (LA) for discharges from Open Space land uses, assumed to be equal to the Open Space Existing Load
Open Reduction Required = Percent of the Open Space Existing Load that must be reduced to meet the Open Space LA = (Open Space Existing Load – Open Space LA)/(Open Space Existing Load)

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10 LEGAL AUTHORITY FOR TMDL IMPLEMENTATION PLAN

This section presents the legal authority and regulatory framework used as a basis for assigning responsibilities to dischargers to implement and monitor compliance with the requirements set forth in these TMDLs. The laws and policies governing point source[25] and nonpoint source discharges are described below. A large portion of the bacteria loads generated in the watersheds and discharged to beaches and creeks comes from natural, nonanthropogenic sources. These nonpoint sources are considered largely uncontrollable and therefore cannot be regulated.

Discharger accountability for attaining bacteria allocations is established in this section. The legal authority and regulatory framework is described in terms of the following:

- Controllable water quality factors;
- Regulatory framework;
- Persons accountable for point source discharges; and
- Persons accountable for controllable nonpoint source discharges.

10.1 Controllable Water Quality Factors

The source analysis (section 6) found that the vast majority of bacteria are transported to impaired beaches and creeks through wet and dry weather runoff generated from human habitation and land use practices. Much of these bacteria discharges result from controllable water quality factors which are defined as those actions, conditions, or circumstances resulting from man's activities that may influence the quality of the waters of the state and that may be reasonably controlled. These TMDLs establish wasteload allocations (WLAs) for point sources and load allocations (LAs) for nonpoint sources for these controllable discharges.

10.2 Regulatory Framework

The regulatory framework for point sources of pollution differs from the regulatory framework for nonpoint sources. The different regulatory frameworks are described in the subsections below.

10.2.1 Point Sources

Clean Water Act section 402 establishes the National Pollutant Discharge Elimination System (NPDES) program to regulate the ‘‘discharge of a pollutant,’’ other than dredged or fill materials, from a ‘‘point source’’ into ‘‘waters of the U.S.” Under section 402, discharges of pollutants to waters of the U.S. are authorized by obtaining and complying with NPDES permits.

In California, state Waste Discharge Requirements (WDRs) for discharges of pollutants from point sources to navigable waters of the United States that implement federal NPDES regulations and CWA requirements serve in lieu of federal NPDES permits. These are referred to as NPDES

[25] The term ‘‘point source’’ is defined in CWA section 502(6) to mean any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged. This term does not include agricultural storm water discharges and return flows from irrigated agriculture.

requirements. Such requirements are issued by the State pursuant to independent state authority described in California's Porter Cologne Water Quality Control Act[26] (not authority delegated by the USEPA or derived from the CWA).

Because point sources identified as discharing bacteria were largely determined to be from storm water and non-storm water runoff discharged from MS4s (Municipal and Caltrans), the primary mechanism for TMDL attainment will be regulation of these discharges with WDRs that implement NPDES requirements. Mechanisms to impose regulations on these discharges are discussed in the Implementation Plan, section 11.

10.2.2 Nonpoint Sources

While laws mandating control of point source discharges are contained in the federal CWA's NPDES regulations, direct control of nonpoint source pollution is left to state programs developed under state law. LAs for nonpoint sources sources are not directly enforceable under the Clean Water Act and are only enforceable to the extent they are made so by state laws and regulations. The Porter-Cologne Water Quality Control Act applies to both point and nonpoint sources of pollution and serves as the principle legal authority in California for the regulation of discharges from controllable nonpoint sources.

Although the majority of bacteria reductions in these TMDLs will take place by regulation of point source discharges, in some watersheds controllable wet weather nonpoint sources have been identified as potentially significant sources of bacteria. Controllable nonpoint sources that warrant regulation include, for example, runoff from agricultural facilities, nurseries, dairy/intensive livestock operations, horse ranches, and manure composting and soil amendment operations not regulated under NPDES requirements, and septic systems. Land uses associated with these practices comprise a significant area in the Lower San Juan HSA, San Luis Rey HU, San Marcos HA, and San Dieguito HA watersheds. Wet weather bacteria loads generated from these land uses in these watersheds comprise more than 5 percent of the total wet weather bacteria load. Nonpoint source discharges from natural sources (bacteria deposition from aquatic and terrestrial wildlife, and bacteria bound in soil, humic material, etc.) are considered largely uncontrollable, and therefore cannot be regulated. The State policy pertaining to regulation of nonpoint sources of pollution in California is provided in the *Plan for California's Nonpoint Source Pollution Control Plan* (NPS Program Plan; State Water Board, 2000) and the *Policy for the Implementation and Enforcement of the Nonpoint Source Pollution Control Program* (NPS Implementation and Enforcement Policy; State Water Board, 2004).

The primary objective of the NPS Program Plan is to reduce and prevent nonpoint source pollution so that the waters of California support a diversity of biological, educational, recreational, and other beneficial uses. Towards this end, the NPS Program Plan focuses on implementation of 61 management measures[27] (MMs) and related management practices[28] (MPs) in six land use categories by the year 2013.[29]

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[26] Division 7 of the Water Code, commencing with section 13000

[27] MMs serve as general goals for the control and prevention of nonpoint source polluted runoff.

[28] MPs are the implementation actions taken by nonpoint source dischargers to achieve the management measure goals. The USEPA and the SWRCB have dropped the word 'best' when describing the implementation actions taken by nonpoint source dischargers to control NPS pollution because "best" is considered too subjective. The

The success of the NPS Program Plan depends upon individual discharger implementation of MPs. Pollutants can be effectively reduced in nonpoint source discharges by the application of a combination of pollution prevention,[30] source control, and treatment control MPs. Source control MPs (both structural and non-structural) minimize the contact between pollutants and flows (e.g., rerouting run-off around pollutant sources or keeping pollutants on-site and out of receiving waters). Treatment control (or structural) MPs remove pollutants from NPS discharges. MPs can be applied before, during, and after pollution producing activities to reduce or eliminate the introduction of pollutants into receiving waters.

The NPS Implementation and Enforcement Policy provides guidance on the statutory and regulatory authorities of the State Water Board and the San Diego Water Board to prevent and control nonpoint source pollution.

10.3 Persons Responsible for Point Source Discharges

Persons identified as responsible for point source discharges of bacteria include the following:

- municipal Phase I urban runoff dischargers (Phase I MS4s),
- municipal Phase II urban runoff dischargers (Phase II MS4s),
- Caltrans,
- publicly owned treatment works (POTWs) and waste water collection systems, and
- concentrated animal feeding operations (CAFOs) of a certain size that subject them to regulation underNPDES requirements.

Caltrans and the Municipal MS4s have been assigned WLAs, as shown in Tables 9-2a through 9-2c and 9-4a through 9-4c. These point sources are regulated under WDRs that implement NPDES requirements. The Padre Dam POTW, which is regulated under WDRs that implement NPDES requirement, has been assigned a fecal coliform TMDL based on its NPDES requirements (see Tables 9-2a and 9-4a). CAFOs that are regulated under NPDES requirements have not been assigned a WLA. Any point source that has not been assigned a WLA or has a WLA of zero is not allowed to discharge a pollutant load as part of the TMDL.

10.4 Persons Responsible for Controllable Nonpoint Source Discharges

Controllable nonpoint source discharges are present in most watersheds, however, in only four watersheds do these dischargers account for more than 5 percent of the total wet weather load for

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"best" management practice in one area or situation might be entirely inappropriate in another area or situation. In this document the term "best management practices (BMPs)" is used exclusively in reference to schedules of activities, prohibitions of practices, maintenance procedures, and other management practices taken by NPDES dischargers.

[29] MMs are identified in Volume II of the *Plan for California's Nonpoint Source Pollution Control Program* (NPS Program Plan) 1999 Program Plan: *California's Management Measures for Polluted Runoff* (CAMMPR) (http://www.waterboards.ca.gov/nps/cammpr.html).

[30] Pollution prevention, the initial reduction/elimination of pollutant generation at its source should be used in conjunction with source control and treatment control MPs. Pollutants that are never generated do not have to be controlled or treated.

all three indicator bacteria. These watersheds are the Lower San Juan HSA, San Luis Rey HU, San Marcos HA, and San Dieguito HA watersheds.

The persons identified as responsible for controllable nonpoint source bacteria discharges in these watershed include the owners and operators of the following:

- agriculture facilities (including nurseries),
- dairy/intensive livestock facilities,
- horse ranches,
- manure composting and soil amendment operations not regulated by NPDES requirements, and
- individual septic systems.

Agriculture land uses (i.e., agriculture facilities, dairy/intensive livestock facilities, and horse ranches) are controllable nonpoint sources that have been assigned LAs, as shown in Tables 9-2a through 9-2c and 9-4a through 9-4c. Controllable nonpoint sources will be regulated via individual or general WDRs, conditional waivers of WDRs, or Basin Plan discharge prohibitions as mandated by California's NPS Implementation and Enforcement Policy. Any controllable nonpoint source that has not been assigned a LA or has a LA of zero is not allowed to discharge a pollutant load as part of the TMDL.

11 IMPLEMENTATION PLAN

The ultimate goal of the Implementation Plan is to restore the impaired beneficial uses of the waterbodies addressed by these TMDLs. Restoring the impaired beneficial uses will be accomplished by achieving the TMDLs in the receiving waters, and the wasteload allocations (WLAs) for point sources and load allocations (LAs) for nonpoint sources. This section describes the actions necessary to implement the TMDLs to restore the recreational beneficial uses in the bacteria impaired beaches and creeks.

TMDLs are not self-implementing or directly enforceable for sources in the watershed. Instead, TMDLs must be implemented through the programs or authorities of the San Diego Water Board and/or other entities to compel dischargers responsible for controllable sources to achieve the pollutant load reductions identified by a TMDL analysis to restore and protect the designated beneficial uses of a waterbody. Federal regulations require TMDLs to be incorporated into the Basin Plan.[31] Because TMDLs must be incorporated into the Basin Plan, and are developed to implement previously established water quality standards (i.e., beneficial uses and WQOs), state statute requires the Basin Plan amendment to include a program of implementation (or Implementation Plan) for achieving water quality objectives.[32]

11.1 Regulatory Authority for Implementation Plans

TMDL implementation plans are not currently required under federal law; however, federal policy is that TMDLs should include implementation plans. The USEPA is authorized to require implementation plans for TMDLs.[33] USEPA regulations implementing Clean Water Act section 303 do not currently require states to include implementation plans for TMDLs but are likely to be revised in the future. USEPA regulations require states to incorporate TMDLs in the State Water Quality Management Plans (Basin Plans) along with adequate implementation measures to implement all aspects of the plan.[34] USEPA policy is that states must include implementation plans as an element of TMDL Basin Plan amendments submitted to USEPA for approval.[35]

TMDL implementation plans are required under State law. Basin plans must have a program of implementation to achieve WQOs.[36] The implementation plan must include a description of actions that are necessary to achieve the objectives, a time schedule for these actions, and a description of surveillance to determine compliance with the WQOs.[37] State law requires that a TMDL include an implementation plan since a TMDL supplements, interprets, and/or refines existing water quality objectives. The TMDLs, LAs, and WLAs must be incorporated into the Basin Plan.[38]

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[31] Code of Federal Regulations Title 40 section 130.6(c)(1)
[32] Water Code section 13242
[33] Code of Federal Regulations Title 40 section 130 [40CFR130]
[34] Code of Federal Regulations Title 40 section 130.6 [40CFR130.6]
[35] See *Guidance for Developing TMDLs in California,* USEPA Region 9, (January 7, 2000).
[36] See Water Code section 13050(j). A "Water Quality Control Plan" or "Basin Plan" consists of a designation or establishment for the waters within a specified area of all of the following: (1) Beneficial uses to be protected, (2) Water quality objectives and (3) A program of implementation needed for achieving water quality objectives.
[37] See Water Code section 13242.
[38] See Clean Water Act section 303(e).

11.2 San Diego Water Board Actions

This section describes the actions that the San Diego Water Board will take to implement the TMDLs. The San Diego Water Board uses its authorities and programs to regulate discharges from the controllable sources in the Region. The controllable sources that are subject to regulation are, in turn, responsible for complying with the requirements issued by the San Diego Water Board. Ultimately, the dischargers subject to regulation are responsible for reducing their pollutant loads in order for the TMDLs, WLAs, and LAs to be achieved. When all discharges from controllable sources meet their assigned WLAs and LAs, and the numeric targets are met in the receiving waters, the beneficial uses should be restored and compliance with the TMDLs will be achieved.

The authorities that are available to the San Diego Water Board to regulate dischargers are given under the Porter-Cologne Water Quality Control Act (Division 7 of the Water Code). The available regulatory authorities include incorporating discharge prohibitions in to the Basin Plan,[39] issuing individual or general WDRs,[40] or issuing individual or general conditional waivers of WDRs.[41] The San Diego Water Board has the authority to enforce Basin Plan prohibitions, WDRs, or conditional waivers of WDRs through the issuance of enforcements actions (e.g., time schedule orders, cleanup and abatement orders, cease and desist orders, administrative civil liabilities).[42] The San Diego Water Board also has the authority to require monitoring and/or technical reports from dischargers,[43] which may be used to support the development, refinement, and/or implementation of TMDLs, WLAs, and/or LAs.

The actions taken by the San Diego Water Board depends on the regulatory authority and the source. The regulatory authorities and actions that the San Diego Water Board will use to implement these TMDLs are as follows.

11.2.1 Basin Plan Waste Discharge Prohibitions

The San Diego Water Board may specify certain conditions or areas where the discharge of waste, or certain types of waste is not permitted, known as "waste discharge prohibitions," in the Basin Plan.[44] Waste discharge prohibitions can apply to any controllable sources, including point sources and nonpoint sources discharged to ground or surface waters. The waste discharge prohibitions for the San Diego Region are listed in Chapter 4 (Implementation) of the Basin Plan, under the heading "Waste Discharge Prohibitions." Basin Plan waste discharge prohibitions that are applicable to the implementation of these TMDLs include the following:

- The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in Water Code section 13050, is prohibited.

[39] Pursuant to Water Code section 13243
[40] Pursuant to Water Code section 13263 and 13264
[41] Pursuant to Water Code section 13269
[42] Pursuant to Water Code sections 13301-13304, 13308, 13350, 13385 and/or 13399
[43] Pursuant to Water Code sections 13225, 13267, and/or 13383
[44] Authorized pursuant to Water Code section 13243

- The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the Regional Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

- The dumping, deposition, or discharge of waste directly into waters of the state, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the Regional Board.

- Any discharge to a storm water conveyance system that is not composed entirely of "storm water" is prohibited unless authorized by the Regional Board. [The federal regulations, 40 CFR 122.26(b)(13), define storm water as storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from fire fighting activities.] [Section 122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

- The unauthorized discharge of treated or untreated sewage to waters of the state or to a storm water conveyance system is prohibited.

Existing discharges are violating one or more of these of these Basin Plan prohibitions. The existing Basin Plan prohibitions are consistent with the TMDLs, WLAs, and LAs. If necessary, the San Diego Water Board may amend the Basin Plan to revise current waste discharge prohibitions or include new waste discharge prohibitions. The controllable sources must comply with the Basin Plan waste discharge prohibitions.

11.2.2 Waste Discharge Requirements

The primary regulatory authority used by the San Diego Water Board to protect water resources and water quality in the San Diego Region is the issuance of WDRs.[45] The San Diego Water Board can issue WDRs to any controllable point source or nonpoint source discharging waste to ground or surface waters of the state. The WDRs impose conditions which protect water quality, implement the provisions of the Basin Plan, and when the discharge is to waters of the United States, meet the requirements of the Clean Water Act.

The San Diego Water Board will issue, or revise and re-issue WDRs to point sources and/or nonpoint sources in the San Diego Region to be consistent with the TMDLs, WLAs, and LAs. Specific San Diego Water Board actions with regard to WDRs for point sources and nonpoint sources are discussed in the following subsections.

[45] Authorized pursuant to Water Code sections 13263 and 13264

11.2.2.1 Point Sources

The USEPA has delegated responsibility to the State and Regional Boards for implementation of the federal National Pollutant Discharge Elimination System (NPDES) program, which specifically regulates discharges of "pollutants" from point sources to "waters of the United States." The San Diego Water Board regulates discharges from point sources to surface waters with WDRs that implement federal NPDES regulations (NPDES requirements).

The NPDES requirements may include numerical effluent limitations, when feasible, on the amounts of specified pollutants that may be discharged and / or specified best management practices (BMPs) designed to minimize water quality impacts.[46] These numerical effluent limitations and BMPs or other non-numerical effluent limitations must implement both technology-based and water quality-based requirements of the Clean Water Act. Technology-based effluent limitations (TBELs) represent the degree of control that can be achieved by point sources using various levels of pollution control technology.

If necessary to achieve compliance with applicable water quality standards, NPDES requirements must contain water quality-based effluent limitations (WQBELs), derived from the applicable receiving water quality standards, more stringent than the applicable technology-based standards. In the context of a TMDL, the WQBELs must be consistent with the assumptions and requirements of the WLAs of any applicable TMDL.[47]

Although NPDES requirements must contain WQBELs that are consistent with the assumptions and requirements of the TMDL WLAs, the federal regulations do not specifically require the WQBELs to be identical to the WLAs. The regulations leave open the possibility that the San Diego Water Board could determine that fact-specific circumstances render something other than literal incorporation of the WLA to be consistent with the TMDL assumptions and requirements. For example, the WLAs in Tables 9-2a through 9-2c and 9-4a through 9-4c are expressed as billion MPN per year or per month; however, the WQBELs prescribed in response to the WLAs may or may not be written using the same metric. WQBELs may be expressed as numeric effluent limitations using a different metric and/or as BMP development, implementation, and revision requirements.

When developing WQBELs to be incorporated in to NPDES requirements, the following summarizes the requirements and assumptions included in the calculation of the TMDLs, WLAs, and LAs that should be considered:

<u>Numeric Targets</u>

- The numeric targets consist of the numeric WQOs from the Basin Plan and/or Ocean Plan and an allowable exceedance frequency.
- The numeric targets for the wet weather TMDLs consist of the REC-1 single sample maximum WQOs and a 22 percent allowable exceedance frequency.
- The numeric targets for dry weather TMDLs consist of the REC-1 30-day geometric metric mean WQOs and a 0 percent allowable exceedance frequency.

[46] Code of Federal Regulations Title 40 section 122.44(k)(2)&(3)
[47] Code of Federal Regulations Title 40 section 122.44(d)(1)(vii)(B)

- The TMDL calculations are based on either the single sample maximum WQO (for wet weather) or 30-day geometric mean WQOs (for dry weather), but both the single sample maximum and 30-day geometric mean numeric WQOs and allowable exceedance frequencies must be met in the receiving waters.
- The TMDLs, and in turn the WLAs for point sources and LAs for nonpoint sources, are assumed to be met when the numeric targets for all three indicator bacteria (fecal coliform, total coliform, and *Enterococcus*) are met in the receiving waters.

Critical Conditions

- The mass-load based TMDLs were calculated under critical conditions consisting of flows generated during a critical wet year and estimation of existing and allowable loads at a critical location.
- The flow from the critical wet year is a "worst case" annual wet weather flow and loading scenario. Actual annual wet weather flow and loading will vary from year to year.
- The mass-load based TMDLs calculated at the critical location are dependent on the flow, which can vary from year to year, but the numeric targets will not vary. When the numeric targets are met in the receiving water, the TMDLs are assumed to be met.
- The mass-load based TMDLs, WLAs, and LAs are calculated for the critical location, but the appropriate numeric targets (based on freshwater and/or saltwater REC-1 WQOs and allowable exceedance frequencies) must be met throughout the waterbodies addressed by these TMDLs.

Linkage Analysis

- The linkage analysis was performed by utilizing calibrated and validated models to predict flow from surface runoff and predict bacteria densities under the critical conditions (i.e., during the critical wet year at the critical location). Existing mass loads and allowable mass loads (i.e., TMDLs) were calculated for each watershed. The existing mass loads were calculated based on model-predicted flow and model-predicted bacteria densities. The allowable mass loads (i.e., TMDLs) were calculated based on model-predicted flow and the numeric targets (i.e., numeric WQOs and allowable exceedance frequencies).
- The wet weather existing mass loads and allowable mass loads (i.e., wet weather mass-load based TMDLs) are calculated assuming surface runoff is generated by rainfall from storm events and discharged from all land use categories to receiving waters.
- The dry weather existing mass loads and allowable mass loads (i.e., dry weather mass-load based TMDLs) are calculated assuming surface runoff is generated only by anthropogenic activities and discharged from specific land use categories to receiving waters. The possible contribution of subsurface or groundwater flows to bacteria loads in receiving waters during dry weather was not accounted for in any land use category.

Allocations

- Each mass-load based TMDL is allocated to known point sources and nonpoint sources. Wasteload allocations (WLAs) are assigned to point sources, and load allocations (LAs) are assigned to nonpoint sources. WLAs and LAs are the maximum load a source can discharge and still achieve the TMDL in the receiving water.
- The TMDLs, and in turn the WLAs for point sources and LAs for nonpoint sources, are assumed to be met when the numeric targets are met in the receiving waters.

- The sources were identified based on land use and grouped in to Municipal MS4, Caltrans MS4 (Caltrans), Agriculture, and Open Space categories. The Municipal MS4 and Caltrans land use categories are point sources, and the Agriculture and Open Space land use categories are nonpoint sources.
- Sources that are not identified are assumed to be assigned a zero allowable load as part of the mass-load based TMDL (i.e., WLA = 0 or LA = 0). In other words, discharges of pollutant loads from these sources are not expected or allowed as part of the TMDLs.
- Sources that are assigned an allowable load equal to the existing mass load as part of the mass-load based TMDL (i.e., WLA or LA = existing mass load) are not expected or allowed to increase their mass load in the future. In other words, discharges of pollutant loads (i.e., flows and bacteria densities) from these sources are not allowed to increase.
- The allocation of the dry weather mass-load based TMDLs assumes that no surface runoff discharge to receiving waters occurs from Caltrans, Agriculture, or Open Space land use categories (i.e., $WLA_{Caltrans} = 0$, $LA_{Agriculture} = 0$, and $LA_{OpenSpace} = 0$), meaning the entire dry weather mass-load based TMDL (i.e., allowable mass load) is allocated to Municipal MS4 land use categories (i.e., WLA_{MS4} = TMDL) (see Tables 9-4a through 9-4c).
- The allocation of the wet weather mass-load based TMDLs assumes surface runoff discharge occurs from all land use categories, and allocated according to the following steps (see Tables 9-2a through 9-2c):
  1) Sources are separated in to controllable and uncontrollable sources. Discharges from Municipal MS4, Caltrans, and Agriculture land use categories are assumed to be controllable (i.e., subject to regulation), and discharges from Open Space land use categories are assumed to be uncontrollable (i.e., not subject to regulation).
  2) Because discharges from Open Space land use categories are uncontrollable (i.e., not subject to regulation), the LAs for Open Space land use categories are set equal to the existing mass loads calculated under the critical conditions.
  3) For discharges from controllable land use categories that do not contribute more than 5 percent of the total existing mass load for all three indicator bacteria, the WLA or LA is set equal to the existing mass loads from those land uses calculated under the critical conditions.
  4) After the WLAs and LAs are assigned based on steps 2 and 3, the remaining portion of the mass-load based TMDL is assigned to discharges from controllable land use categories that contribute more than 5 percent of the total existing mass load for all three indicator bacteria. The allowable mass load for each source (WLA or LA) is calculated based on the ratio of the existing mass loads from those sources relative to each other.

<u>Load Reductions</u>

- The load reductions required to meet the mass-load based TMDLs, WLAs, and LAs are based on reducing the loads compared to pollutant loads from 2001 to 2002.
- Load reductions for each source are calculated based on the difference between the existing mass load and the mass-load based WLA or LA for each source (see Tables 9-2a through 9-2c and 9-4a through 9-4c).
- WLAs and LAs that are set equal to the existing mass loads do not require load reductions to be calculated, but this also means that existing mass loads from those sources cannot

increase over time (i.e., pollutant loads should be less than or equal to pollutant loads relative to 2001 to 2002).

- The load reductions needed to meet the WLAs for point sources and LAs for nonpoint sources are assumed to be achieved when the numeric targets are met in the receiving waters.

The persons identified as responsible for point source discharges causing or contributing to bacteria impairments at the beaches and creeks addressed in these TMDLs include:

- Phase I MS4s,
- Phase II MS4s,
- Caltrans,
- POTWs and wastewater collection systems, and
- CAFOs.

According to Tables 9-1 through 9-4, Municipal (Phase I and Phase II) MS4s and Caltrans are the only point sources that have been assigned WLAs. POTWs,[48] CAFOs, and any other unidentified point sources were not assigned WLAs, which is equivalent to being assigned a WLA of zero. All these identified point sources are subject to NPDES regulations.

In order for the WDRs, NPDES requirements, and discharges from these point sources to be consistent with the TMDLs and WLAs, the San Diego Water Board will issue or revise and re-issue the WDRs for these point sources as follows:

Phase I MS4s

According to Tables 9-1 through 9-4, Municipal MS4s were identified as requiring load reductions to achieve and meet its WLAs. The linkage analysis identified urban land uses, primarily associated with Phase I MS4s, as the most significant controllable point source causing or contributing to the bacteria impairments during wet and dry weather conditions in all the watersheds addressed in these TMDLs.

The TMDLs and Municipal MS4 WLAs, with respect to discharges from Phase I MS4s, will be implemented primarily by revising and re-issuing the existing NPDES requirements that have been issued for Phase I MS4 discharges.

The Phase I MS4s subject to these TMDLs are regulated under San Diego Water Board WDRs that implement NPDES requirements.49 The NPDES requirements regulating the Phase I MS4s include discharge prohibitions and receiving water limitations that are applicable to the implementation of these TMDLs, as summarized below:

- Discharges from MS4s are subject to all Basin Plan prohibitions.

[48] Not including Padre Dam, which has been allocated a fecal coliform TMDL based on the effluent limitations in the WDRs for Padre Dam

[49] Phase I MS4s in Orange County are regulated under San Diego Water Board Order No. R9-2002-0001 or subsequent orders; Phase I MS4s in San Diego County are regulated under San Diego Water Board Order No. R9-2007-0001 or subsequent orders.

- Discharges from MS4s that cause or contribute to the violation of water quality standards (designated beneficial uses and water quality objectives developed to protect beneficial uses) are prohibited.

- Discharges into and from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance, in waters of the state are prohibited.

- Effectively prohibit all types of non-storm water discharges into the MS4 unless such discharges are either authorized by separate NPDES requirements, or not prohibited (i.e., exempted) by the NPDES requirements regulating the MS4. Exempted non-storm water discharges into the MS4 are not prohibited unless the discharge category is identified as a significant source of pollutants to waters of the United States.

The available data reported by the Phase I MS4s and the results of the technical TMDL analysis indicate that discharges into and from MS4s are likely in violation of the discharge prohibitions and receiving water limitations above. Enforcement of the current discharge prohibitions and receiving water limitations is an action that the San Diego Water Board can immediately implement to compel the MS4s to reduce discharge of bacteria to the receiving waters.

In addition to the discharge prohibitions and receiving water limitations, WQBELs consistent with the assumptions and requirements of the WLAs of any applicable TMDL must also be incorporated into the NPDES requirements. The San Diego Water Board will revise and re-issue the WDRs and NPDES requirements for Phase I MS4s to incorporate the following:

- WQBELs consistent with the requirements and assumptions of the Municipal MS4 WLAs described in Tables 9-1 through 9-4. WQBELs may be expressed as numeric effluent limitations, when feasible, and/or as a BMP program of expanded or better-tailored BMPs.[50]

- If the WQBELs include a BMP program, periodic reporting requirements on BMP planning, implementation, and effectiveness in improving water quality at impaired beaches and creeks (i.e., progress reports). Progress reports will also be required to include water quality monitoring results. Progress reports will be required as long as necessary to ensure that the beneficial uses of the impaired waterbodies have been restored and maintained.

- Compliance schedule for Phase I MS4s to attain the Municipal MS4 WLAs and TMDLs in the receiving waters.

The WQBELs will likely consist of receiving water limitations (based on the numeric targets) and require the implementation of a BMP program to achieve the TMDLs in the receiving waters. The Phase I MS4s will be required to submit Bacteria Load Reduction Plans (BLRPs) or Comprehensive Load Reduction Plans (CLRPs) to the San Diego Water Board within 18 months

[50] Code of Federal Regulations Title 40 section 122.44(k)(2)&(3)

after the effective date of these TMDLs.[51] Ideally, the Phase I MS4s and Caltrans will develop and submit their BLRPs or CLRPs together. The San Diego Water Board will require the BLRPs or CLRPs to be developed on a watershed or region wide scale. The BLRPs or CLRPs should be developed and incorporated as part of the Watershed Runoff Management Programs required under the Phase I MS4 NPDES requirements. Ideally, the Phase I MS4s and Caltrans will develop and coordinate the elements of their BLRPs or CLRPs together.

If the receiving water limitations (based on the numeric targets) are met in the receiving waters, the assumption will be that the Phase I MS4s have met their WLAs. If, however, the receiving water limitations are not being met in the receiving waters, the Phase I MS4s will be responsible for reducing their bacteria loads and/or demonstrating that controllable anthropogenic discharges from the Phase I MS4s are not causing the exceedances.

Phase II MS4s

According to Tables 9-1 through 9-4, Municipal MS4s were identified as requiring load reductions to achieve and meet its WLAs. The linkage analysis identified urban land uses, primarily associated with Phase I MS4s, as the most significant controllable point source causing or contributing to the bacteria impairments during wet and dry weather conditions in all the watersheds addressed in these TMDLs. Some urban land uses are associated with non-traditional, small MS4s, which are governmental facilities such as military bases, public campuses, and prison and hospital complexes (hereafter refer to as Phase II MS4s).

The TMDLs and Municipal MS4 WLAs, with respect to discharges from Phase II MS4s, will be implemented primarily by requiring compliance with the existing general WDRs and NPDES requirements that have been issued for Phase II MS4 discharges. Phase II MS4s are subject to regulation under State Water Board general WDRs implementing NPDES requirements.[52]

Under these general WDRs and NPDES requirements, Phase II MS4s are required to develop and implement a Stormwater Management Plan/Program (SWMP). The SWMPs specify what BMPs will be used to address certain program areas. The program areas include public education and outreach; illicit discharge detection and elimination; construction and post-construction; and good housekeeping for municipal operations.

The State Water Board general WDRs for Phase II MS4s identifies the facilities in the San Diego Region subject to regulation under the NPDES requirements. Currently, none of these facilities are enrolled under the Phase II MS4 general WDRs. Appendix Q contains the current list of the Phase II MS4 facilities in the watersheds addressed by these TMDLs.

Owners and operators of Phase II MS4s in the watersheds subject to these TMDLs, identified by the San Diego Water Board as significant sources of bacteria discharging to the receiving waters and/or Phase I MS4s, will be required to submit a Notice of Intent[53] to comply with the NPDES requirements in the State Water Board general WDRs as soon as possible after the effective date

[51] The effective date is the date the Office of Administrative Law approves this Basin Plan amendment.
[52] Phase II MS4s in the San Diego Region are subject to regulation under State Water Board Order No. 2003-0005-DWQ, or subsequent orders.
[53] The Notice of Intent, or NOI, is attachment 7 to Order No. 2003-0005-DWQ.

of these TMDLs.[54] Once enrolled under the general WDRs, Phase II MS4 owners and operators are required to comply with the provisions of the State Water Board general WDRs and NPDES requirements to reduce the discharge of bacteria as specified in their SWMPs.

For any individual Phase II MS4s that are identified as a significant source of pollutants, the San Diego Water Board may also issue individual WDRs requiring the implementation of WQBELs that are consistent with the requirements and assumptions of the Municipal MS4 WLAs described in Tables 9-1 through 9-4. Upon issuance of such individual WDRs by the San Diego Water Board, the State Water Board general WDRs for Phase II MS4s shall no longer regulate the affected individual Phase II MS4s.[55]

Similarly, for any category of Phase II MS4s that are identified as a significant source of pollutants, the San Diego Water Board may issue general WDRs requiring the implementation of WQBELs that are consistent with the requirements and assumptions of the Municipal MS4 WLAs described in Tables 9-1 through 9-4. Upon issuance of such general WDRs by the San Diego Water Board, the State Water Board general WDRs for Phase II MS4s shall no longer regulate the affected category of Phase II MS4s.[56]

In the event that the San Diego Water Board issues individual or general WDRs for Phase II MS4s in the San Diego Region, the WQBELs will likely consist of receiving water limitations (based on the numeric targets) and require the implementation of a BMP program to achieve the TMDLs in the receiving waters. The Phase II MS4s will likely be required to submit Bacteria Load Reduction Plans (BLRPs) or Comprehensive Load Reduction Plans (CLRPs) outlining a proposed BMP program that will be capable of achieving the necessary load reductions required to attain the TMDLs in the receiving water, acceptable to the San Diego Water Board. When and where possible, the San Diego Water Board will require the BLRPs or CLRPs to be developed on a watershed or region wide scale and have the Phase II MS4 BMP programs coordinate with the BMPs programs for Phase I MS4s and Caltrans.

If the receiving water limitations (based on the numeric targets) are met in the receiving waters, the assumption will be that the Phase II MS4s have met their WLAs. If, however, the receiving water limitations are not being met in the receiving waters and one or more Phase II MS4 dischargers are identified as sources of bacteria causing exceedances, the specific Phase II MS4s will be responsible for reducing their bacteria loads and/or demonstrating that controllable anthropogenic discharges from those specific Phase II MS4s are not causing the exceedances.

Caltrans

According to Tables 9-1 through 9-4, the WLAs for Caltrans are equal to the existing load estimated from Caltrans discharges. Caltrans has been assigned an allowable load (i.e., WLA) during wet weather conditions, and no allowable load (i.e., WLA = 0) during dry weather conditions. Although Caltrans is not required to reduce discharges of bacteria from existing loading, WLAs are established so that Caltrans shall not increase its wet weather loads above

[54] The effective date is the date the Office of Administrative Law approves this Basin Plan amendment.
[55] As authorized under State Water Board Order No. 2003-0005-DWQ, section G.
[56] Ibid.

current levels. The TMDLs and Caltrans WLAs will be implemented primarily by revising and re-issuing the existing NPDES requirements that have been issued for Caltrans discharges.

Caltrans is regulated under State Water Board general WDRs that implement NPDES requirements.[57] The San Diego Water Board will request the State Water Board to revise and re-issue the WDRs and NPDES requirements to incorporate the following for Caltrans discharges in the San Diego Region:

- WQBELs consistent with the requirements and assumptions of the Caltrans WLAs described in Tables 9-1 through 9-4. WQBELs may be expressed as numeric effluent limitations, when feasible, and/or as a BMP program of expanded or better-tailored BMPs.[58]

- If the WQBELs include a BMP program, periodic reporting requirements on BMP planning, implementation, and effectiveness in improving water quality at impaired beaches and creeks (i.e., progress reports). Progress reports will also be required to include water quality monitoring results. Progress reports will be required as long as necessary to ensure that the beneficial uses of the impaired waterbodies have been restored and maintained.

- Compliance schedule for Caltrans to attain the Caltrans WLAs and TMDLs in the receiving waters.

The WQBELs will likely consist of receiving water limitations (based on the numeric targets) and require the implementation of a BMP program to achieve TMDLs in the receiving waters. Caltrans will be required to submit Bacteria Load Reduction Plans (BLRPs) or Comprehensive Load Reduction Plans (CLRPs) outlining a proposed BMP program that will be capable of attaining the TMDLs in the receiving waters, acceptable to the San Diego Water Board, within 18 months after the effective date of these TMDLs.[59] The San Diego Water Board will require the BLRPs or CLRPs to be developed on a watershed or region wide scale. Ideally, Caltrans and the Phase I MS4s will develop and coordinate the elements of their BLRPs or CLRPs together.

If the receiving water limitations (based on the numeric targets) are met in the receiving waters, the assumption will be that Caltrans has met its WLAs. If, however, the receiving water limitations are not being met in the receiving waters, and Caltrans MS4s are identified as a source of bacteria causing exceedances, Caltrans will be responsible for reducing its bacteria loads and/or demonstrating that controllable anthropogenic discharges from the Caltrans MS4s are not causing the exceedances.

[57] Caltrans is subject to regulation under State Water Board Order No. 99-06-DWQ, and subsequent orders.
[58] Code of Federal Regulations Title 40 section 122.44(k)(2)&(3)
[59] The effective date is the date the Office of Administrative Law approves this Basin Plan amendment.

Publicly Owned Treatment Works and Wastewater Collection Systems
Tables 9-1 through 9-4 do not include WLAs for POTWs and wastewater collection systems (i.e., WLA = 0).[60] In other words, discharges of bacteria from POTWs and wastewater collection systems to the impaired waters addressed by these TMDLs are not expected or allowed.

The TMDLs, with respect to discharges from POTWs and wastewater collection systems, will be implemented primarily by requiring compliance with any existing individual and/or general WDRs and NPDES requirements that have been issued. POTWs are subject to regulation under individual WDRs that implement NPDES requirements. Wastewater collection systems are subject to regulation under general WDRs issued by the State Water Board and San Diego Water Board.[61]

If necessary, individual WDRs for POTWs and/or the San Diego Water Board WDRs for wastewater collection systems can be revised to require more aggressive monitoring, maintenance, and repair schedules to ensure discharges of bacteria wasteloads to surface waters are minimized and/or eliminated.

Concentrated Animal Feeding Operations
Tables 9-1 through 9-4 do not include WLAs for CAFOs (i.e., WLA = 0). In other words, discharges of bacteria from CAFOs to the impaired waters addressed by these TMDLs are not expected or allowed.

The TMDLs, with respect to discharges from CAFOs, will be implemented primarily by requiring compliance with any existing individual and/or general WDRs and NPDES requirements that have been issued. CAFOs that discharge to surface waters are subject to regulation under general WDRs that implement NPDES requirements.

If necessary, the general WDRs and NPDES requirements for CAFOs can be revised to require more aggressive monitoring, maintenance, and repair schedules to ensure discharges of bacteria wasteloads to surface waters are minimized and/or eliminated.

Other Unidentified Point Sources
Tables 9-1 through 9-4 do not include WLAs for any other unidentified point sources (i.e., WLA = 0). In other words, discharges of bacteria from any other unidentified point sources to the impaired waters addressed by these TMDLs are not expected or allowed.

The TMDLs, with respect to discharges from unidentified point sources to surface waters, will be implemented primarily by issuing WDRs implementing NPDES requirements, or requiring the point sources to cease their discharges.

[60] Except for the permitted existing wet weather and dry weather fecal coliform bacteria loads from the Padre Dam Municipal Water District Water Reclamation Plant (Padre Dam), assigned as a separate point source wasteload allocation for discharges from Padre Dam that was set equal to the permitted existing load.
[61] State Water Board Order No. 2006-0003-DWQ and San Diego Water Board Order No. R9-2007-0005

11.2.2.2 Nonpoint Sources

Unlike discharges from point sources to surface waters, discharges from nonpoint sources to surface waters are not subject to regulation under the federal Clean Water Act. Discharges from nonpoint sources, however, are subject to regulation under the California state Porter-Cologne Water Quality Control Act. The San Diego Water Board can regulate discharges from controllable nonpoint sources to surface waters with individual or general WDRs.

The persons identified as responsible for controllable nonpoint source bacteria discharges causing or contributing to bacteria impairments at the beaches and creeks in these watersheds include the owners and operators of the following:

- agricultural facilities,
- nurseries,
- dairy/intensive livestock facilities,
- horse ranches,
- manure composting and soil amendment operations not regulated by NPDES requirements, and
- individual septic systems.

The California's Nonpoint Source Implementation and Enforcement Policy requires that controllable nonpoint sources be regulated via individual or general WDRs, conditional waivers of WDRs, or Basin Plan waste discharge prohibitions. Agriculture (including nurseries), dairy/livestock, and horse ranch land uses (collectively called "agriculture" land uses) are controllable nonpoint sources that have been assigned Agriculture LAs, as shown in Tables 9-1 through 9-4. Manure composting operations, soil amendment operations, and individual septic systems that are not part of agriculture land uses, and any other unidentified controllable nonpoint sources were not assigned LAs, which is equivalent to being assigned a LA of zero. Any controllable nonpoint source that has not been assigned a LA or has a LA of zero is not allowed to discharge a pollutant load as part of the TMDL.

Controllable nonpoint source discharges are present in most watersheds, however, in only four watersheds do these discharges require load reductions to meet the Agriculture LAs. These watersheds are the Lower San Juan HSA, San Luis Rey HU, San Marcos HA, and San Dieguito HU watersheds (see Tables 9-1 through 9-4).

In general, discharges from controllable nonpoint sources in the San Diego Region are not regulated under WDRs. The San Diego Water Board prefers to utilize conditional waivers of WDRs for discharges from controllable nonpoint sources. If necessary, however, the San Diego Water Board will issue individual WDRs to a specific nonpoint source operation that is identified as a significant source causing or contributing to an impairment in the waterbodies addressed in these TMDLs. Likewise, the San Diego Water Board may issue general WDRs for a type or category of controllable nonpoint source discharges that is identified as a significant source causing or contributing to an impairment in the watersheds and/or waterbodies addressed in these TMDLs.

If individual or general WDRs are developed and issued to controllable nonpoint sources, the WDRs should incorporate one or more the following:

- Effluent limitations that are consistent with the requirements and assumptions of the nonpoint source LAs described in Tables 9-1 through 9-4. Effluent limitations should be expressed as numeric effluent limitations, if feasible, and/or as a BMP program.

- Periodic reporting requirements on BMP planning, implementation, and effectiveness in improving the water quality of discharges from the nonpoint source (i.e., progress reports). Progress reports will also be required to include water quality monitoring results. Progress reports will be required as long as necessary to ensure that the beneficial uses of the impaired waterbodies have been restored and maintained.

- Compliance schedule and/or implementation milestones.

The San Diego Water Board will work with the nonpoint source dischargers and/or stakeholders when developing the WDRs. When and where possible, the San Diego Water Board will have the nonpoint source BMP programs coordinate with the BMPs programs for Phase I MS4s and Caltrans.

If the receiving water limitations (based on the numeric targets) are met in the receiving waters, the assumption will be that controllable nonpoint sources have met their LAs. If, however, the receiving water limitations are not being met in the receiving waters, and one or more controllable nonpoint source dischargers are identified as sources of bacteria causing exceedances, the San Diego Water Board may regulate those identified nonpoint sources, as needed, with WDRs or other enforcement actions, and those nonpoint sources will be responsible for reducing their bacteria loads and/or demonstrating that discharges from those nonpoint sources are not causing the exceedances.

11.2.3 Conditional Waivers of Waste Discharge Requirements

There are several types of point source, as well as nonpoint source discharges that may not have an adverse affect on the quality of the waters of the state, and/or are not readily amenable to regulation under WDRs. For these types of discharge, the San Diego Water Board has the authority to issue conditional waivers of WDRs.[62] The types of discharge which may be eligible for a waiver only include discharges to land and groundwater, and discharges to surface waters that are not otherwise subject to National Pollutant Discharge Elimination System (NPDES) regulations.[63] NPDES regulations are federal regulations. There are no federal or state regulations that allow NPDES regulations to be waived.

The point sources that were identified as causing or contributing to the bacteria impairments in the waterbodies addressed in these TMDLs are subject to regulation under WDRs that implement NPDES requirements. Thus, discharges from these point sources would not be eligible for conditional waivers of WDRs.

[62] Authorized pursuant to Water Code section 13269
[63] Defined in Code of Federal Regulations Title 40 section 122.3 [40 CFR 122.3]

There are, however, controllable nonpoint source land uses (agriculture, horse ranches, and dairies/intensive livestock) that were identified in 8 watersheds that are contributing to the bacteria impairments. Four of the 8 watersheds were identified as requiring load reductions (Lower San Juan HSA, San Luis Rey HU, San Marcos HA, and San Dieguito HU) to meet the assigned wet weather Agriculture LAs.

In general, the San Diego Water Board utilizes conditional waivers of WDRs to address the discharges from controllable nonpoint sources. Development and enforcement of waiver conditions that are protective of water quality will likely be sufficient to implement the Agriculture LAs. The controllable nonpoint sources eligible for conditional waivers must comply with the conditions of the waiver to be consistent with the TMDLs and Agriculture LAs. Controllable nonpoint sources that do not comply with the waiver conditions are no longer eligible for the waiver and must either come into compliance with the waiver conditions, become regulated under WDRs, or cease any discharge of wastes to waters of the state.

Currently, discharges from these controllable nonpoint sources may be eligible for one of the general conditional waivers of WDRs, which are provided in the Basin Plan.[64] Conditional waivers of WDRs may not exceed 5 years in duration, but may be revised and renewed, or may be terminated at any time.[65] The San Diego Water Board will implement the conditional waivers of WDRs applicable to the Agriculture land uses to be consistent with the TMDLs and Agriculture LAs.

Because the conditional waivers of WDRs that may be utilized to implement the Agriculture LAs are contained in the Basin Plan, any revision f the conditions will require a Basin Plan amendment. If needed, the San Diego Water Board may amend the Basin Plan to remove these conditional waivers of WDRs from the Basin Plan and re-issue the conditional waivers of WDRs as a general order to reduce the administrative requirements for revising waiver conditions.

As required, the effectiveness of the conditional waivers of WDRs must be evaluated at least once every 5 years. If the conditions in the waivers of WDRs are not sufficient to implement the TMDLs and Agriculture LAs, the San Diego Water Board will amend the waiver conditions to include more stringent conditions, including, but not limited to, additional BMP implementation, monitoring, and/or reporting.

If a conditional waiver of WDRs no longer appears to be effective in protecting water quality from discharges from specific nonpoint source facilities or category of nonpoint source facilities, the waiver may be terminated. For nonpoint source facilities that are no longer eligible for a conditional waiver of WDRs, they will need to be regulated under WDRs, or cease any discharges of waste to waters of the state.

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[64] The current general conditional waivers in the Basin Plan were adopted under San Diego Water Board Resolution No. R9-2007-0104. These waivers will expire December 31, 2012. Conditional Waiver No. 3 (Animal Operations) and Conditional Waiver No. 4 (Agriculture and Nursery Operations) may be utilized to implement the Agriculture LAs.

[65] Pursuant to Water Code section 13269(a)(2)

11.2.4 Enforcement Actions

The regulatory actions described above generally consist of requirements that a discharge from a controllable source must comply with in order for the discharge to legally occur. If a discharge does not comply with those requirements, a violation has occurred. Violations are subject to enforcement action by the San Diego Water Board.

An enforcement action is any formal or informal action taken to address an incidence of actual or threatened noncompliance with existing regulations or provisions designed to protect water quality. Potential enforcement actions including notices of violation (NOVs), notices to comply (NTCs), imposition of time schedule (TSO), issuance of cease and desist orders (CDOs) and cleanup and abatement orders (CAOs), administrative civil liability (ACL), and referral to the attorney general (AG) or district attorney (DA). The San Diego Water Board generally implements enforcement through an escalating series of actions to: (1) assist cooperative dischargers in achieving compliance; (2) compel compliance for repeat violations and recalcitrant violators; and (3) provide a disincentive for noncompliance.

For the controllable sources that have been identified (i.e., Municipal MS4s, Caltrans, and Agriculture land uses), the requirements in existing Basin Plan waste discharge prohibitions, WDRs and NPDES requirements, and conditional waivers of WDRs can be immediately enforced to compel dischargers to implement measures to improve water quality in the receiving waters.

For example, the general WDRs and NPDES requirements for Phase I MS4s and Caltrans require additional BMPs be implemented to reduce bacteria discharges in impaired watersheds to the maximum extent practicable and *to restore compliance with the bacteria WQOs*. This obligation is triggered when either the discharger or the State Water Board or San Diego Water Board determines that Phase I MS4 and Caltrans discharges are *causing or contributing to an exceedance* of an applicable water quality objective, in this case indicator bacteria REC-1 WQOs. Designation of beaches and/or creeks as water quality limited segments under 303(d) List provided sufficient evidence that that Phase I MS4 and Caltrans discharges are causing or contributing to the violation of water quality standards. Thus, Phase I MS4s and Caltrans should be implementing these provisions of the WDRs and NPDES requirements with respect to bacteria discharges into water quality limited segments. The San Diego Water Board could immediately issue enforcement actions to direct the Phase I MS4s and Caltrans to implement measures to restore compliance with the bacteria WQOs.

The San Diego Water Board shall consider enforcement actions, as necessary, against any discharger failing to comply with applicable waiver conditions, WDRs, and/or Basin Plan waste discharge prohibitions.[66] Enforcement actions can also be taken, as necessary, to control the discharge of bacteria to impaired beaches and creeks, to attain compliance with the assumptions and requirements of the TMDLs, WLAs, and LAs.

In order for implementation of the TMDLs to begin as soon as possible, the San Diego Water Board may issue enforcement actions, in lieu of or before revising and re-issuing general WDRs

[66] Authorized pursuant to Water Code sections 13300-13304, 13308, 13350, 13385, and/or 13399

and NPDES requirements, for Phase I MS4s and Caltrans, directing them to begin implementing additional measures to restore compliance with the bacteria WQOs. Enforcement actions may also be issued to require the submission of Bacteria Load Reduction Plans (BLRPs) or Comprehensive Load Reduction Plans (CLRPs) to the San Diego Water Board within 18 months after the effective date of these TMDLs,[67] or sooner. The San Diego Water Board will require the BLRPs or CLRPs to be developed on a watershed or region wide scale.

The San Diego Water Board will also issue enforcement actions, as necessary, to any other discharger that is identified by the San Diego Water Board or other parties as a significant source causing or contributing to the bacteria impairments in the water bodies addressed in these TMDLs.

11.2.5 Investigative Orders

The San Diego Water Board has the authority to require any state or local agency to investigate and report on any technical factors involved in water quality control or to obtain and submit analyses of water.[68] The San Diego Water Board has the authority to require technical or monitoring program reports from persons who have discharged or are discharging waste that could affect the quality of the waters in the San Diego Region.[69] The San Diego Water Board also has the authority to establish monitoring and recordkeeping requirements for discharges regulated under NPDES requirements.[70]

The San Diego Water Board may issue investigative orders requiring the submission of Bacteria Load Reduction Plans (BLRPs) or Comprehensive Load Reduction Plans (CLRPs) to the San Diego Water Board within 18 months after the effective date of these TMDLs.[71] The San Diego Water Board will require the BLRPs or CLRPs to be developed on a watershed or region wide scale. The San Diego Water Board may require the Phase I MS4s and Caltrans to develop and submit their BLRPs or CLRPs together.

The BLRPs or CLRPs will allow the Phase I MS4s and Caltrans to propose methods for assessing compliance and a compliance schedule for WQBELs that implement the TMDLs. The compliance schedule for the Phase I MS4s and Caltrans to attain the their respective WLAs will be based on the BMP program proposed in the BLRPs or CLRPs, as discussed in section 11.5. Components that are recommended for incorporation in the BLRPs or CLRPs are presented in Appendix P. The San Diego Water Board may issue subsequent investigative orders to confirm items in the BLRPs or CLRPs.

The San Diego Water Board will also issue investigative orders requiring BLRPs or CLRPs, or other technical or monitoring program reports, as necessary, to any other discharger that is identified by the San Diego Water Board or other parties as causing or contributing to the bacteria impairments in the waterbodies addressed in these TMDLs.

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[67] The effective date is the date the Office of Administrative Law approves this Basin Plan amendment.
[68] Authorized pursuant to Water Code section 13225
[69] Authorized pursuant to Water Code section 13267
[70] Authorized pursuant to Water Code section 13383
[71] The effective date is the date the Office of Administrative Law approves this Basin Plan amendment.

11.2.6 Basin Plan Amendments

As the implementation of these TMDLs progress, the San Diego Water Board recognizes that revisions to the TMDLs, WLAs, LAs, Implementation Plan, and potentially to beneficial uses and water quality objectives for specific waterbodies may be necessary in the future. Any future revisions to the Basin Plan necessary to implement these TMDLs will require a Basin Plan amendment.

Revisions to the Basin Plan typically require substantial evidence and supporting documentation to initiate the Basin Plan amendment process. Given the severely limited resources available to the San Diego Water Board for developing Basin Plan amendment projects, developing the evidence and documentation to initiate a Basin Plan amendment will be the responsibility of the dischargers and/or other parties interested in amending the requirements or provisions implementing these TMDLs.

The San Diego Water Board will initiate a Basin Plan amendment project to revise the requirements and/or provisions for implementing these TMDLs (including, but not limited to, the TMDLs, WLAs, LAs, Implementation Plan, numeric targets, watershed specific allowable exceedance frequencies, specific waterbody usage frequencies) within 5 years from the effective date of this Basin Plan amendment or earlier if all the following conditions are met:

- Sufficient data are collected to provide the basis for the Basin Plan amendment.
- A report is submitted to the San Diego Water Board documenting the findings from the collected data.
- A request is submitted to the San Diego Water Board with specific revisions proposed to the Basin Plan, and the documentation supporting such revisions.

The San Diego Water Board will work with the project proponents to ensure that the data and documentation will be adequate for the initiation of the Basin Plan amendment. The San Diego Water Board will be responsible for taking the Basin Plan amendment project through the administrative and regulatory processes for adoption by the San Diego Water Board, and approval by the State Water Board, OAL, and USEPA.

If no Basin Plan amendment has been initiated within 5 years of the effective date of this TMDL Basin Plan amendment, and the Executive Officer determines, with Regional Board concurrence, that insufficient data exist to support the initiation of a Basin Plan amendment, a subsequent Basin Plan amendment to revise the requirements and/or provisions for the implementation of these TMDLs will not be initiated until the Executive Officer determines the conditions specified above are met.

11.2.7 Other Actions

In addition to the regulatory authorities and actions that the San Diego Water Board can use to implement these TMDLs, the San Diego Water Board may take other actions to help the regulated community implement measures to comply with the regulatory actions above.

For these TMDLs, the San Diego Water Board shall recommend that the State Water Board assign a high priority to awarding grant funding[72] for projects to implement the bacteria TMDLs. Special emphasis will be given to projects that can achieve quantifiable bacteria load reductions consistent with the specific bacteria TMDLs, WLAs, and LAs.

Implementation of these TMDLs by the San Diego Water Board should not require any special studies to be conducted by the dischargers or other entities. The San Diego Water Board, however, will encourage and support any special studies proposed and undertaken by the dischargers or other entities that will provide information to refine and improve the implementation of these TMDLs. The San Diego Water Board may develop agreements (e.g., a Memorandum of Understanding) with one or more entities to support and use the findings from any special studies that may be conducted. Proposing a special study project and initiating an agreement with the San Diego Water Board to use the results of the study to modify this TMDL Implementation Plan is the responsibility of the project proponent(s). A few topics that may require additional investigation with a special study are discussed in section 11.4.

11.3 Monitoring for TMDL Compliance and Compliance Assessment

An essential component of implementation is water quality monitoring. Monitoring is needed to evaluate the progress toward attainment of the TMDLs and restoring the beneficial uses in the receiving waters. When all discharges from controllable sources meet their assigned WLAs and LAs, and the numeric targets (i.e., numeric WQOs and allowable exceedance frequencies) are also met in the receiving waters, compliance with the TMDLs will be achieved. Additionally, sufficient water quality data are necessary to support the removal of a waterbody from the 303(d) List. Water quality data can also be used identify additional regulatory actions that may need to be implemented by the San Diego Water Board to restore and protect beneficial uses.

Monitoring for compliance will initially be conducted by the Phase I MS4s and Caltrans. The minimum components for any monitoring program that will be used to evaluate progress toward attainment of the TMDLs should include the following:

- For beaches addressed by these TMDLs, monitoring locations should consist of, at a minimum, the same locations used to collect data required under MS4 NPDES monitoring requirements and beach monitoring for Health and Safety Code section 115880.[73] If exceedances of the receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations and/or other source identification methods must also be used to demonstrate that the bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

[72] The State Water Board administers the awarding of grants funded from Proposition 13, Proposition 50, Clean Water Act section 319(h) and other federal appropriations to projects that can result in measurable improvements in water quality, watershed condition, and/or capacity for effective watershed management. Many of these grant fund programs have specific set-asides for expenditures in the areas of watershed management and TMDL project implementation for non-point source pollution.
[73] Commonly referred to as AB 411 monitoring

- For creeks addressed by these TMDLs, monitoring locations should consist of, at a minimum, a location at or near the mouth of the creek (e.g., Mass Loading Station or Mass Emission Station) and one or more locations upstream of the mouth (e.g., Watershed Assessment Stations). If exceedances of the receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations and/or other source identification methods must also be used to demonstrate that the bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

- Because there are dry weather and wet weather TMDLs, monitoring under both conditions is needed. Wet weather[74] monitoring should occur at least once within 24 hours of the end of a storm event[75] that occurs during the rainy season (i.e., October 1 through April 30). Dry weather[76] monitoring should occur at least on a monthly basis, and may be required more often during the summer months (e.g., weekly) when the REC-1 and REC-2 beneficial uses occur most frequently in the creeks and at the beaches.

Compliance with the TMDLs, WLAs, and LAs will be assessed primarily by comparing receiving water indicator bacteria results from the monitoring locations outlined above with receiving water limitations expressed in terms of the appropriate numeric REC-1 WQOs and allowable exceedance frequencies of the appropriate numeric REC-1 WQOs. The appropriate numeric WQOs and allowable exceedance frequencies are dependent upon the type of receiving water (i.e., beach or creek) and weather conditions (i.e., dry weather or wet weather), as shown in Tables 11-1 and 11-2.

[74] Defined as days with a storm with at least 0.2 inches of rainfall and the 72 hour period after the storm event
[75] The end of a storm event is when there is no more precipitation
[76] Defined as days with less than 0.2 inches of rainfall on each of the previous three days

Table 11-1. Receiving Water Limitations for Beaches

Indicator Bacteria	Wet Weather Days [a]		Dry Weather Days [b]	
	Wet Weather Numeric Objective [c] (MPN/100mL)	Wet Weather Allowable Exceedance [d] Frequency	Dry Weather Numeric Objective [e] (MPN/100mL)	Dry Weather Allowable Exceedance Frequency
Fecal Coliform	400	22%	200	0%
Total Coliform	10,000	22%	1,000	0%
Enterococcus	104	22%	35	0%

a. Wet weather days defined as days with rainfall events of 0.2 inches or greater and the following 72 hours.
b. Dry weather days defined as days with less than 0.2 inch of rainfall observed on each of the previous 3 days.
c. Wet weather numeric objectives based on the single sample maximum water quality objectives in the California Ocean Plan (2005). Compliance with the wet weather TMDLs in the receiving water is based on the frequency that the wet weather days in any given year exceed the wet weather numeric objective, but 30-day geometric mean must also be met.
d. The wet weather allowable exceedance frequency is set at 22%. In the calculation of the wet weather TMDLs, the San Diego Regional Board chose to apply the 22 percent allowable exceedance frequency as determined for Leo Carillo Beach in Los Angeles County. At the time the wet weather watershed model was developed, the 22 percent exceedance frequency from Los Angeles County was the only reference beach exceedance frequency available. The 22 percent allowable exceedance frequency used to calculate the wet weather TMDLs is justified because the San Diego Region watersheds' exceedance frequencies will likely be close to the value calculated for Leo Carillo Beach, and is consistent with the exceedance frequency that was applied by the Los Angeles Regional Board.
e Dry weather numeric objectives based on the 30-day geometric mean water quality objectives in the California Ocean Plan (2005). Compliance with the dry weather TMDLs in the receiving water is based on the frequency that the dry weather days in any given year exceed the dry weather numeric objective.

Table 11-2. Receiving Water Limitations for Creeks

Indicator Bacteria	Wet Weather Days [a]		Dry Weather Days [b]	
	Wet Weather Numeric Objective [c] (MPN/100mL)	Wet Weather Allowable Exceedance [d] Frequency	Dry Weather Numeric Objective [e] (MPN/100mL)	Dry Weather Allowable Exceedance Frequency
Fecal Coliform	400	22%	200	0%
Enterococcus	61 (104) [f]	22%	33	0%

a. Wet weather days defined as days with rainfall events of 0.2 inches or greater and the following 72 hours.
b. Dry weather days defined as days with less than 0.2 inch of rainfall observed on each of the previous 3 days.
c. Wet weather numeric objectives based on the single sample maximum (or equivalent) water quality objectives in the Water Quality Control Plan for the San Diego Basin (1994). Compliance with the wet weather TMDLs in the receiving water is based on the frequency that the wet weather days in any given year exceed the wet weather numeric objective, but 30-day geometric mean must also be met.
d. The wet weather allowable exceedance frequency is set at 22%. In the calculation of the wet weather TMDLs, the San Diego Regional Board chose to apply the 22 percent allowable exceedance frequency as determined for Leo Carillo Beach in Los Angeles County. At the time the wet weather watershed model was developed, the 22 percent exceedance frequency from Los Angeles County was the only reference beach exceedance frequency available. The 22 percent allowable exceedance frequency used to calculate the wet weather TMDLs is justified because the San Diego Region watersheds' exceedance frequencies will likely be close to the value calculated for Leo Carillo Beach, and is consistent with the exceedance frequency that was applied by the Los Angeles Regional Board.
e. Dry weather numeric objectives based on the 30-day geometric mean (or equivalent) water quality objectives in Water Quality Control Plan for the San Diego Basin (1994). Compliance with the dry weather TMDLs in the receiving water is based on the frequency that the dry weather days in any given year exceed the dry weather numeric objective.
f. A wet weather numeric objective for Enterococcus of 104 MPN/100mL may be applied as a receiving water limitation for creeks, instead of 61 MPN/100mL, if one or more of the creeks addressed by these TMDLs (San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek, San Diego River, and/or Chollas Creek) is designated with a "moderately to lightly used area" or less frequent usage frequency in the Basin Plan. Otherwise, the wet weather numeric objective of 61 MPN/100mL for Enterococcus will be used to assess compliance with the wet weather allowable exceedance frequency.

At the end of the TMDL Compliance Schedules, which are discussed in section 11.5, the receiving waters must meet the receiving water limitations above to be considered in compliance with these TMDLs, WLAs, and LAs. Determination of compliance with the TMDLs will be assessed differently for dry weather and wet weather as follows:

1. *Compliance with Dry Weather TMDLs*: At the end of the dry weather TMDL compliance schedule, the bacteria densities in the receiving waters for all dry weather days[77] must be less than or equal to the 30-day geometric mean REC-1 WQOs 100 percent of the time (i.e., dry weather days in a 30-day period shall not exceed the 30-day geometric mean REC-1 WQOs more than 0 percent of the time). In addition, the bacteria densities must be consistent with the single sample maximum REC-1 WQOs in the Ocean Plan for beaches, and the Basin Plan for creeks.

   The method and number of samples needed for calculating the 30-day geometric mean should be consistent with the number of samples required by the Ocean Plan for beaches, and the Basin Plan for creeks. Analysis of the monitoring results should also be consistent with the methods given in the Water Quality Control Policy For Developing California's Clean Water Act Section 303(d) List.

   Because the dry weather TMDLs are assigned entirely to the Municipal MS4s as WLAs, the Municipal MS4s are assumed to be the only source of bacteria during dry weather (i.e., dry weather TMDL = MS4 WLA). Discharges from other controllable sources (i.e., Caltrans, Agriculture) during dry weather are not expected and/or not allowed (i.e., WLA = 0 or LA = 0). If at the end of the dry weather TMDL compliance schedule the receiving waters exceed the 30-day geometric mean REC-1 WQOs more than 0 percent of the time, the municipal Phase I MS4s are responsible for demonstrating their discharges into the receiving waters are not causing the exceedances, or they will be considered out of compliance. If controllable sources other than the Phase I MS4s are identified as causing the exceedances, and the Phase I MS4s have demonstrated they are not causing or contributing to the exceedances, the Phase I MS4s will not be considered out of compliance.

   The Phase I MS4s may demonstrate that their discharges are not causing the exceedances in the receiving waters by providing data from their discharge points to the receiving waters, by providing data collected at jurisdictional boundaries, and/or by using other methods accepted by the San Diego Water Board. Otherwise, at the end of the dry weather TMDL compliance schedule, the municipal Phase I MS4s will be held responsible and considered out of compliance unless other information or evidence indicates another controllable or uncontrollable source is responsible for the exceedances in the receiving waters. If controllable sources other than discharges from the municipal Phase I MS4s are identified before or after the end of the dry weather TMDL Compliance Schedule as causing the exceedances, those controllable sources will be responsible for reducing their bacteria loads and/or demonstrating that discharges from those sources are not causing the exceedances. The San Diego Water Board shall implement additional actions (e.g., issue

[77] Defined as days with less than 0.2 inches of rainfall on each of the previous three days

enforcement actions, amend existing NPDES requirements or conditional waivers), as needed, to bring all controllable sources into compliance with the dry weather TMDLs.

2. *Compliance with Wet Weather TMDLs*: At the end of the wet weather TMDL compliance schedule, the bacteria densities in the receiving waters for all wet weather days[78] cannot exceed the single sample maximum REC-1 WQOs more than the allowable exceedance frequency. In addition, the bacteria densities must be less than or equal to the 30-day geometric mean REC-1 WQOs 100 percent of the time (i.e., both dry and wet weather days in a 30-day period shall not exceed the 30-day geometric mean REC-1 WQOs more than 0 percent of the time).

   As described in the minimum monitoring components above, wet weather samples should be collected within 24 hours of the end of a storm event that occurs during the rainy season (i.e., October 1 through April 30). At least one wet weather sample per storm is expected to be collected for each waterbody in each watershed (i.e., Pacific Ocean shoreline, creek mouth, and/or creek). Because of the many issues related to collecting wet weather samples from multiple sites within a short time frame, dischargers are expected to develop a wet weather monitoring and sampling approach in their BLRPs or CLRPs. If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event shall be equal to the results from that one sample. If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all the wet weather days not sampled shall be equal to the highest bacteria density result reported from samples collected. The exceedance frequency shall be calculated by dividing the number of wet weather days that exceed the single sample maximum REC-1 WQOs by the total number of wet weather days during the rainy season. If at the end of the wet weather TMDL Compliance Schedule the receiving waters exceed the single sample maximum REC-1 WQOs more than the allowable exceedance frequency, all controllable sources are responsible for demonstrating their discharges into the receiving waters are not causing the exceedances, or they will be considered out of compliance.

   The data collected for compliance with the dry weather TMDLs, described above, shall be used in addition to the data collected for wet weather with the wet weather TMDLs to calculate the wet weather 30-day geometric mean. If at the end of the wet weather TMDL Compliance Schedule the receiving waters exceed the 30-day geometric mean REC-1 WQOs at any time, all controllable sources are responsible for demonstrating their discharges into the receiving waters are not causing the exceedances, or they will be considered out of compliance.

   Because the Phase I MS4s are located at the base of the watersheds and have been identified as the most significant controllable source of bacteria, the municipal Phase I MS4s will have the primary responsible for monitoring the receiving waters. Phase II MS4s, Caltrans and agricultural dischargers that are identified as significant sources causing or contributing to exceedances in the receiving waters will also be responsible for monitoring the receiving waters. The municipal Phase I MS4s and other dischargers are

[78] Defined as days with a storm with at least 0.2 inches of rainfall and the 72 hour period after the storm event

responsible for reducing their bacteria loads and/or demonstrating their discharges into the receiving waters are not causing the exceedances.

The municipal MS4s may demonstrate that their discharges are not causing the exceedances in the receiving waters by providing data from their discharge points to the receiving waters, by providing data collected at jurisdictional boundaries, and/or by using other methods accepted by the San Diego Water Board. Otherwise, at the end of the wet weather TMDL compliance schedule, the municipal Phase I MS4s will be held responsible and considered out of compliance unless other information or evidence indicates another controllable or uncontrollable source is responsible for the exceedances in the receiving waters. If controllable sources other than discharges from the municipal Phase I MS4s are identified before or after the end of the wet weather TMDL Compliance Schedules as causing the exceedances, those controllable sources will be responsible for reducing their bacteria loads and/or demonstrating that discharges from those sources are not causing the exceedances. If controllable sources other than the Phase I MS4s are identified as causing the exceedances, and the Phase I MS4s have demonstrated they are not causing or contributing to the exceedances, the Phase I MS4s will not be considered out of compliance. The San Diego Water Board shall implement additional actions (e.g., issue enforcement actions, amend existing NPDES requirements or conditional waivers), as needed, to bring all those controllable sources into compliance with the wet weather TMDLs.

Between the effective date of these TMDLs and the end of the TMDL Compliance Schedules, monitoring is also required to demonstrate progress toward achieving and complying with the TMDLs, WLAs, and LAs. Progress can be demonstrated with reductions in exceedance frequencies in the receiving waters until the allowable exceedance frequencies ultimately are achieved at the end of the TMDL Compliance Schedules. Demonstrating progress toward attaining the TMDLs in the receiving waters will be assessed differently for dry weather and wet weather as follows:

1. *Measuring Progress Toward Attaining Dry Weather TMDLs*: For the dry weather TMDLs, available historical monitoring data from the years 1996-2002 should be used to calculate the "existing" dry weather exceedance frequency of the 30-day geometric mean REC-1 WQOs for each watershed. "Existing" dry weather exceedance frequencies may be calculated separately for each impaired waterbody listed, or an "existing" dry weather exceedance frequency may be calculated that is applicable to the entire watershed.

   The "existing" dry weather exceedance frequencies should be reduced until the final allowable dry weather exceedance frequency is achieved by the end of the dry weather TMDL Compliance Schedule. If the TMDL Compliance Schedules include interim milestones that must be achieved to demonstrate progress toward attaining the dry weather TMDLs, reductions in the exceedance frequencies in the receiving water may be used. For example, if the "existing" dry weather exceedance frequency is 60 percent, the final dry weather exceedance frequency is 0 percent, and an interim milestone requires a 50 percent reduction, the exceedance frequency in the receiving water should be 30 percent or less by the interim milestone date. By the end of the dry weather TMDL Compliance Schedule,

the final allowable dry weather exceedance frequency of the 30-day geometric mean REC-1 WQOs is 0 percent in the receiving waters for both beaches and creeks.

2. *Measuring Progress Toward Attaining Wet Weather TMDLs*: For the wet weather TMDLs, the number of wet days and number of wet exceedance days during the critical wet year from the wet weather model were used to calculate the "existing" wet weather exceedance frequency that needs to be reduced to the allowable wet weather exceedance frequency. For example, if a watershed had 69 wet weather days during the critical wet year, and the wet weather model predicted that all the subwatersheds had an average of 41 wet weather exceedance days during the critical wet year, the "existing" wet weather exceedance frequency is 41/69=59%. For the watershed addressed by these TMDLs, the number of wet weather exceedance days for each indicator bacteria predicted by the wet weather model for the critical wet year are summarized below in Table11-3:

Table 11-3. Modeled Estimate of Critical Year "Existing" Wet Weather Exceedance Frequencies by Watershed

Watershed	Number of Wet Days in Critical Wet Year	"Existing" Wet Weather Exceedance Frequency of Simgle Sample Maximum REC-1 WQO [a]		
		Fecal Coliform	Total Coliform	Enterococcus
San Joaquin Hills HSA/ Laguna Beach HSA	69	52%	54%	55%
Aliso HSA	69	59%	59%	62% (62%) [b]
Dana Point HSA	69	50%	50%	50%
Lower San Juan HSA	76	66%	66%	74% (72%) [b]
San Clemente HA	73	47%	47%	50%
San Luis Rey HU	90	68%	66%	76%
San Marcos HA	49	57%	57%	59%
San Dieguito HU	98	43%	44%	49%
Miramar Reservoir HA	94	30%	30%	30%
Scripps HA	57	52%	52%	52%
Tecolote HA	57	75%	75%	81% (79%) [b]
Mission San Diego HSA/ Santee HSA	86	70%	63%	79% (76%) [b]
Chollas HSA	65	60%	60%	63% (63%) [b]

a. Calculated by taking the average number of wet days that are predicted by the wet weather model to exceed the single sample maximum REC-1 water quality objective (400 MPN/100mL for fecal coliform, 10,000 MPN/100mL for total coliform, and 61 or 104 MPN/100mL) divided by the total number of wet days in the critical wet year (1993).

b. Allowable exceedance frequency calculated based on an *Enterococcus* single sample maximum REC-1 water quality objective of 61 MPN/100mL. Allowable exceedance frequency in parenthesis calculated based on an Enterococcus single sample maximum REC-1 water quality objective of 104 MPN/100mL, which may be applicable if the usage frequency of the creeks in these watersheds are designated as "moderately to lightly used area" or less frequent usage frequency in the Basin Plan.

The "existing" wet weather exceedance frequencies should be reduced until the final allowable wet weather exceedance frequency is achieved by the end of the wet weather TMDL Compliance Schedule. If the TMDL Compliance Schedules include interim milestones that must be achieved to demonstrate progress toward attaining the wet weather TMDLs, reductions in the exceedance frequencies in the receiving water may be used. For example, if the "existing" wet weather exceedance frequency is 59 percent, the final wet

weather exceedance frequency is 22 percent, and an interim milestone requires a 50 percent reduction, the exceedance frequency in the receiving water should be 41 percent or less by the interim milestone date. By the end of the wet weather TMDL Compliance Schedule, the allowable wet weather exceedance frequency is 22 percent in the receiving waters for both beaches and creeks.

The specific receiving waters (i.e., specific beaches and creek segments) identified on the 2002 303(d) List are shown in section 11.5. Because the REC-1 WQOs and allowable exceedance frequencies must be met throughout the 20 waterbodies addressed by these bacteria TMDLs, monitoring data from these locations and any other beach segments and/or creek monitoring points in the watersheds addressed by these TMDLs may be used to determine compliance.

Because the municipal MS4s are the most significant controllable sources of bacteria and the Phase I MS4s often discharge directly to the receiving waters addressed by these TMDLs, the municipal Phase I MS4s will be primarily responsible for conducting the monitoring. Caltrans will also have monitoring responsibilities. Phase II MS4s, agricultural dischargers, and other sources that are identified as significant sources (i.e., causing or contributing to exceedances in the receiving waters) will also be responsible for monitoring the receiving waters. Additional monitoring locations and frequency may be required to identify sources that need additional controls to reduce bacteria loads. While this TMDL Implementation Plan recommends monitoring at one or two locations for each waterbody, monitoring only one or two locations in the receiving waters may not provide the data to differentiate between and locate sources of bacteria in the watershed. Therefore, the municipal Phase I MS4s and other dischargers may wish to establish additional monitoring locations at key jurisdictional boundaries as part of their monitoring programs, especially in watersheds where Caltrans and Agriculture have been identified as sources contributing bacteria loads to the receiving waters.

Investigative orders, enforcement actions, WDRs, or conditional waiver of WDRs issued by the San Diego Water Board should require monitoring program plans that include, as applicable, the minimum monitoring locations and frequencies outlined above, but also provide the dischargers an opportunity to propose additional or alternative monitoring locations and frequency of monitoring events. The San Diego Water Board may also issue investigative orders, enforcement actions, WDRs, or conditional waiver of WDRs that specify additional or alternative monitoring, monitoring locations, and/or frequency of monitoring events.

The San Diego Water Board will coordinate, to the extent possible, the monitoring that is required by the dischargers, to minimize the monitoring resources required and maximize the temporal and spatial coverage of the data collection.

11.4 Topics for Additional Investigation

The San Diego Water Board recognizes that there ares several topics or areas of study that may require additional investigation by the regulated community and/or other interested persons which could result in improved TMDL implementation, or modification of the requirements and/or provisions for implementing these TMDLs. The topics discussed in this section are not a comprehensive list, but data needs that have been identified by the San Diego Water Board and others that could be useful in the TMDL implementation.

11.4.1 Investigate Landfills as a Potential Bacteria Source

At this time, whether or not landfills are a significant source of bacteria to surface waters is not known. The San Diego Region has 47 regulated landfills (Class III and Class I) and approximately 80 unregulated land discharge sites (e.g., historical burn-ash, waste piles, and other past discharges of waste to land). All 7 of the active Class III (municipal solid waste or MSW) landfills include engineered liner systems with annual leachate monitoring, regular groundwater monitoring and stormwater monitoring under the statewide Industrial Stormwater WDRs (Order No. 97-03-DWQ). Under the applicable solid waste regulations (CCR Title 27 and CFR Title 40 Part 258), the existing monitoring systems do not include bacteria monitoring. The remaining regulated landfills perform groundwater monitoring and some form of stormwater monitoring but do not test for bacteria.

MSW landfills contain waste-metabolizing bacteria in their waste management units as evidenced by the continued off-gassing of methane in landfill gas, although the extent of underground migration of landfill gas (LFG) is generally limited to favorable bacteriological habitat and food source, and the effectiveness of LFG extraction systems.

Sewage wastes are categorically prohibited from being discharged into MSW landfills by the applicable regulations (cited above), however under certain specific conditions active MSW landfills can accept some types of treated sewage sludge for disposal, or use such materials as a component to an alternative daily cover (as allowed under CCR Title 27). Landfills may contain waste-metabolizing bacteria that are actively degrading wastes within the waste management unit.

Active landfills may contribute discharges of stormwater containing waste-metabolizing bacteria to the beaches and creeks because their waste management operations are not fully capped and therefore may result in stormwater discharges. Closed and inactive landfills (not closed under CCR Title 27 or CFR Title 40) in the San Diego Region are generally covered by an engineered soil cap. These caps vary in thickness from 2 feet to approximately 8 feet of earthen cover to protect against pollutant migration from the wastes buried in the waste management unit.

All 47 MSW landfills are regulated by WDRs (general or site specific) issued by the San Diego Water Board and via the statewide Industrial Stormwater NPDES requirements for landfills. Both are interrelated in that a change to the statewide WDRs are always reflected in the Regional WDRs, which are renewed in 5 or 10 year cycles depending on the perceived threat to water quality and complexity ranking of the facility (pursuant to CCR Title 23, section 2200).

From the information available to the San Diego Water Board, active MSW landfills could be a potential source for indicator bacteria discharges to surface waters. If studies provided to the San Diego Water Board indicate that discharges from MSW landfills are a significant source of bacteria, an investigative order (under authority of Water Code section 13267) can be issued to the owners and operators of all active MSW landfills to determine if the active MSW landfills are contributing bacteria via pathways that affect beaches and creeks.

11.4.2 Collect Data Useful for Model Improvement

As described in Appendices J and K, calibration and verification of the models used for TMDL analysis was based on limited data (water quality, flow) and assumed values for input parameters such as rates for bacteria die-off and re-growth. Studies designed to collect additional data that can be used for model improvement will result in more accurate TMDL results. Also, data from each watershed can be collected and used to calibrate and verify the models for that watershed instead of relying on the regional calibration used in this project. Models that are specifically developed for a watershed can help to target the areas or specific sources are that the most likely cause of impairments.

11.4.3 Improve Understanding Between Bacteria Levels and Health Effects

The San Diego Water Board recognizes that there are potential problems associated with using bacteriological WQOs to indicate the presence of human pathogens in receiving waters free of sewage discharges. The indicator bacteria WQOs were developed, in part, based on epidemiological studies in waters with sewage inputs. The risk of contracting a water-born illness from contact with urban runoff devoid of sewage, or human-source bacteria is not known. Some pathogens, such as *giardia* and *cryptosporidium* can be contracted from animal hosts. Likewise, domestic animals can pass on human pathogens through their feces. These and other uncertainties need to be addressed through special studies and, as a result, revisions to the TMDLs established in this project may be appropriate.

Indicator bacteria are used to measure the risk of swimmer illness because they have been shown to indicate the presence of human pathogens, such as viruses, when human bacteria sources are present. Bacterial indicators have been historically used because they are easier and less costly to measure than the pathogens themselves (see Appendix C). In recent years, however, questions have been raised regarding the validity of using indicator bacteria to ascertain risk to swimmers in recreational waters, since they appear to be less correlated to viruses when sources are from urban runoff (Jiang et al, 2001). In fact, most epidemiology studies conducted to measure the risk of swimmer illness in the presence of indicator bacteria have taken place in receiving waters containing known sewage impacts.

To date, only two epidemiology studies have been conducted where the bacteria source was primarily urban runoff.[79] The Santa Monica Bay epidemiology study (Haile et al, 1999) reported that there was a direct correlation between swimming related illnesses and densities of indicator bacteria. The sites included in this study were known to contain human sources of fecal contamination. Most recently, the Mission Bay epidemiological study (Colford et al, 2005) showed that there was no correlation between swimmer illness and concentrations of indicator bacteria. Unlike Santa Monica Bay, bacteria sources in Mission Bay were shown to be primarily of nonhuman origin (City of San Diego and MEC/Weston, 2004). The studies caution against extrapolating the results from the Mission Bay study to other locations, since there have been extensive cleanup activities on this waterbody and subsequently bacteria source analyses have shown that human fecal sources are only a minor contributor. The link between bacteria loads

[79] An epidemiology study looking at the health effects associated with urban runoff is scheduled for 2007 at Doheny Beach, located in the City of Dana Point.

from urban runoff containing mostly nonhuman sources, and risk of illness needs to be better understood.

Recent studies have also shown that bacteria regrowth is a significant phenomenon (City of San Diego and MEC/Weston, 2004; City of Laguna Niguel and Kennedy Jenks, 2003). Such regrowth can cause elevations in bacteria levels that do not correspond to an increase in human pathogens and risk of illness. For example, the Mission Bay Source Identification Study found that bacteria multiply in the wrack line on the beach (eel grass and other debris) during low tide, causing exceedances of the water quality objectives during high tide when the wrack is inundated. This same phenomenon likely occurs inside storm drains, where tidal cycles and freshwater input can cause bacteria to multiply. In both these cases, an increase in bacteria densities does not necessarily correlate to an increase in the presence of human pathogens. The regrowth phenomenon is problematic since dischargers must expend significant resources to reduce the current bacteria loads to receiving waters to meet the required waste load reductions.

As information is gathered, initiating special studies to understand the uncertainties between bacteria levels and bacteria sources within the watersheds may be useful. Specifically, continuing research may be helpful to answer the following questions:

- What is the risk of illness from swimming in water contaminated with urban/stormwater runoff devoid of sewage?
- Do exceedances of the bacteria water quality objectives from animal sources (wildlife and domestic) increase the risk of illness?
- Are there other, more appropriate surrogates for measuring the risk of illness than the indicator bacteria WQOs currently used?

Addressing these uncertainties can be useful in identifying and implementing strategies to reduce the risk of illness, which is currently measured by indicator bacteria densities.

11.4.4 Identification of Method for Direct Pathogen Measurement

Ultimately, the San Diego Water Board supports the idea of measuring pathogens (the agents causing impairment of beneficial uses) rather than indicator bacteria (surrogates for pathogens). However, as stated previously, indicator bacteria have been used to measure water quality historically because measurement of pathogens is both difficult and costly. The San Diego Water Board is supportive of any efforts by the scientific community to perform epidemiological studies and/or investigate the feasibility of measuring pathogens directly.

11.4.5 Identification of Region-wide or Watershed-Specific Allowable Exceedance Frequencies

The San Diego Water Board utilized the reference system approach in the calculation of the wet weather TMDLs to account for the natural, and largely uncontrollable sources of bacteria generated in the watersheds and at the beaches that can, by themselves, cause exceedances of WQOs. The reference system and anti-degradation approach (RSAA) is utilized in the TMDLs by allowing a 22 percent exceedance frequency of the REC-1 single sample maximum WQOs for wet weather, and a 0 percent allowable exceedance frequency of the REC-1 geometric mean WQOs for dry weather. The allowable exceedance frequencies were based on measurements from a reference system in Los Angeles County.

For the wet weather TMDLs, the San Diego Water Board chose to apply the 22 percent exceedance frequency determined for Leo Carillo Beach in Los Angeles County because, at the time of model development, the 22 percent exceedance frequency from Los Angeles County was the only reference beach exceedance frequency available. Since then, additional data were collected and analyzed for five other reference beaches by SCCWRP (Schiff, et al., 2006).

The study conducted by SCCWRP occurred over only two wet seasons (2004-2005 and 2005-2006). The data collected and analyzed by SCCWRP indicate that the flux of indicator bacteria from undeveloped watersheds and the resulting frequency of water quality threshold exceedences at reference beaches during wet weather can be correlated to watershed size, storm size, and early versus late season storms. Exceedance frequencies ranged from zero percent to 30 percent for an exceedance of any bacteria indicator.

Two of the reference beaches included in the study were from the San Diego Region (San Onofre State Beach at the mouth of San Onofre Creek and San Mateo State Beach at the mouth of San Mateo Creek). Both reference beaches had the highest exceedance frequencies during wet weather, but were also the largest watersheds in the study. The exceedance frequencies for these two San Diego Region watersheds may not be appropriate for every watershed addressed by these TMDLs. Additional data are required to determine appropriate watershed specific exceedance frequencies for indicator bacteria TMDLs in the San Diego Region.

11.4.6 Identification of Natural Versus Anthropogenic Sources of Bacteria

Recently, the San Diego Water Board adopted a Basin Plan amendment that authorizes the use of the Natural Sources Exclusion Approach (NSEA) to allow for exceedances of bacteria WQOs due solely to natural sources within the context of a TMDL. Under the NSEA, all anthropogenic sources of indicator bacteria to the waterbodies subject to an indicator bacteria TMDL must be controlled. Dischargers must also demonstrate that all anthropogenic sources of indicator bacteria to the target waterbody are controlled and that residual indicator bacteria densities do not indicate a health risk.

Once control of all anthropogenic sources and demonstration of appropriate health risk levels have been achieved, the residual indicator bacteria loads in the waterbodies attributable to uncontrollable sources can be identified and measured. Likewise, the frequency that uncontrollable sources cause exceedances of indicator bacteria water quality objectives in the waterbody can be identified. The information can be used to establish an allowable indicator bacteria WQO exceedance frequency in the impaired waterbody based upon the residual exceedance frequency observed. This information can then be used to recalculate the TMDLs, WLAs, and LAs.

The use of the NSEA is contingent upon demonstration of control of all anthropogenic sources of indicator bacteria to the waterbodies subject to an indicator bacteria TMDL. Since this task is likely to be formidable, use of the NSEA is not expected to occur immediately. Rather, the NSEA would be used to recalculate TMDLs at some point after their initial adoption, following demonstration of control of all anthropogenic sources.

11.5 TMDL Compliance Schedule and Implementation Milestones

The purpose of these TMDLs is to restore the impaired beneficial uses of the waterbodies addressed through mandated reductions of bacteria from controllable point and nonpoint sources discharging to impaired waters. The requirements of these TMDLs mandate that the San Diego Water Board require dischargers improve water quality conditions in impaired waters by achieving the assigned WLAs and LAs. After the controllable sources achieve their assigned WLAs and LAs, the TMDLs in the receiving waters will be met and beneficial uses restored.

Until the dischargers achieve their assigned WLAs and LAs, the beneficial uses of the waterbodies addressed by this project will likely remain impaired, and the dischargers will continue violating one or more Basin Plan waste discharge prohibitions. The San Diego Water Board recognizes that restoring the beneficial uses of the waterbodies impaired by elevated bacteria levels will require time and multiple approaches to implement. Therefore, the bacteria TMDLs are expected to be implemented in a phased approach with a monitoring component to identify bacteria sources, determine the effectiveness of each phase, and guide the selection of BMPs, as outlined in the BMP programs proposed in the BLRPs or CLRPs that are accepted by the San Diego Water Board.

11.5.1 Prioritization of Waterbodies

"Impaired" waters were prioritized based on several factors, because the waterbodies included in these TMDLs are numerous and diverse in terms of geographic location, swimmer accessibility and use, and degree of contamination.

Dischargers accountable for attaining load reductions in multiple watersheds may have difficulty providing the same level of effort simultaneously in all watersheds. In order to address these concerns a scheme for prioritizing implementation of bacteria reduction strategies in waterbodies within watersheds was developed. The prioritization scheme is largely based on the following criteria:

- Level of beach (marine or freshwater) swimmer usage;
- Frequency of exceedances of WQOs; and
- Existing programs designed to reduce bacteria loading to surface waters.

Dischargers were placed into one of three groups (North, Central, and South), based on geographic location. Group N consists of dischargers located in watersheds within Orange County, the northernmost region watersheds included in these TMDLs. Group C consists of dischargers located in watersheds in northern San Diego County, outside the City of San Diego limits, the central region watersheds included in these TMDLs. Group S consists of dischargers who are located in watersheds within and south of the City of San Diego limits, the southernmost region watersheds included in these TMDLs. Table 11-4 shows the dischargers in each of the three groups.

Table 11-4. Responsible Municipalities and Lead Jurisdictions†

Watershed	Waterbody***	Segment or Area**	Responsible Municipalities	Group
San Joaquin Hills HSA (901.11) & Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Dr. - Riviera Way	City of Laguna Beach **County of Orange** Orange County Flood Control District Caltrans Owners/operators of small MS4s*	N
		at Heisler Park – North		
	Pacific Ocean Shoreline	at Main Laguna Beach	City of Aliso Viejo **County of Orange** City of Laguna Beach City of Laguna Woods Orange County Flood Control District Caltrans Owners/operators of small MS4s*	
		Laguna Beach at Ocean Avenue		
		Laguna Beach at Laguna Avenue		
		Laguna Beach at Cleo Street		
		Arch Cove at Bluebird Canyon Road		
		Laguna Beach at Dumond Drive		
Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place/Blue Lagoon Place at Aliso Beach	City of Aliso Viejo City of Laguna Beach City of Laguna Hills City of Laguna Niguel City of Laguna Woods City of Lake Forest City of Mission Viejo **County of Orange** Orange County Flood Control District Caltrans Owners/operators of small MS4s*	N
	Aliso Creek	The entire reach (7.2 miles) and associated tributaries Aliso Hills Channel, English Canyon Creek, Dairy Fork Creek, Sulphur Creek, and Wood Canyon Creek		
	Aliso Creek (mouth)	At creek mouth		
Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	City of Dana Point City of Laguna Beach City of Laguna Niguel **County of Orange** Orange County Flood Control District Caltrans Owners/operators of small MS4s*	N
		Aliso Beach at Table Rock Drive		
		1000 Steps Beach at Pacific Coast Hwy at Hospital (9th Ave)		
		at Salt Creek (large outlet)		
		Salt Creek Beach at Salt Creek service road		
		Salt Creek Beach at Dana Strand Road		

Table 11-4. Responsible Municipalities and Lead Jurisdictions† (Cont'd)

Watershed	Waterbody***	Segment or Area**	Responsible Municipalities	Group
Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	At San Juan Creek	City of San Juan Capistrano City of Mission Viejo City of Laguna Hills City of Laguna Niguel City of Dana Point City of Rancho Santa Margarita **County of Orange** Orange County Flood Control District Caltrans Owners/operators of small MS4s*	N
	San Juan Creek	Lower 1 mile		
	San Juan Creek (mouth)	At creek mouth		
San Clemente HA (901.30)	Pacific Ocean Shoreline	Poche Beach	City of San Clemente **County of Orange** Orange County Flood Control District Dana Point Caltrans Owners/operators of small MS4s*	N
		Ole Hanson Beach Club Beach at Pico Drain		
		San Clemente City Beach at El Portal Street Stairs		
		San Clemente City Beach at Mariposa Street		
		San Clemente City Beach at Linda Lane		
		San Clemente City Beach at South Linda Lane		
		San Clemente City Beach at Lifeguard Headquarters		
		Under San Clemente Municipal Pier		
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)		
		San Clemente State Beach at Riviera Beach		
		San Clemente State Beach at Cypress Shores		
San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River Mouth	**City of Oceanside** City of Vista County of San Diego Caltrans Owners/operators of small MS4s* Controllable nonpoint sources	C

Table 11-4. Responsible Municipalities and Lead Jurisdictions† (Cont'd)

Watershed	Waterbody***	Segment or Area**	Responsible Municipalities	Group
San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	City of Carlsbad **City of Encinitas** City of Escondido City of San Marcos County of San Diego Caltrans Owners/operators of small MS4s* Controllable nonpoint sources	C
San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon Mouth	City of Del Mar **City of Escondido** City of Poway City of San Diego City of Solana Beach County of San Diego Caltrans Owners/operators of small MS4s* Controllable nonpoint sources	C/S
Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	City of Del Mar **City of Poway** City of San Diego County of San Diego Caltrans Owners/operators of small MS4s*	S
Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	**City of San Diego** Owners/operators of small MS4s*	S
		La Jolla Shores Beach at Caminito Del Oro		
		La Jolla Shores Beach at Vallecitos		
		La Jolla Shores Beach at Ave de la Playa		
		at Casa Beach, Children's Pool		
		South Casa Beach at Coast Blvd.		
		Whispering Sands Beach at Ravina Street		
		Windansea Beach at Vista de la Playa		
		Windansea Beach at Bonair Street		
		Windansea Beach at Playa del Norte		
		Windansea Beach at Palomar Ave.		
		at Tourmaline Surf Park		
		Pacific Beach at Grand Ave.		

Table 11-4. Responsible Municipalities and Lead Jurisdictions† (Cont'd)

Watershed	Waterbody***	Segment or Area**	Responsible Municipalities	Group
Tecolote HA (906.50)	Tecolote Creek	Tecolote Creek	**City of San Diego** Owners/operators of small MS4s*	S
Mission San Diego HSA (907.11) & Santee HSA (907.12)	Forrester Creek	Lower 1 mile	**City of El Cajon** City of Santee County of San Diego Caltrans Owners/operators of small MS4s*	S
	San Diego River, Lower	Lower 6 miles	**City of El Cajon** City of La Mesa City of San Diego City of Santee County of San Diego Caltrans Owners/operators of small MS4s* Padre Dam Water Treatment Facility	S
	Pacific Ocean Shoreline	At San Diego River Mouth at Dog Beach		
Chollas HSA (908.22)	Chollas Creek	Lower 1.2 miles	City of La Mesa City of Lemon Grove **City of San Diego** County of San Diego San Diego Unified Port District Caltrans Owners/operators of small MS4s*	S

† Developed based on the 2002 Clean Water Act Section 303(d) List
*Owners/operators of small MS4s are listed in Appendix Q.
** As listed on the 2002 Clean Water Act Section 303(d) List
*** Listings on the 2006 and 2008 303(d) List compared to listing shown above are provided in Appendix T to the Technical Report.

The SAG applied the above criteria and proposed a prioritization scheme for implementing bacteria reduction strategies in the impaired waters addressed in these TMDLs. Impaired waters were given a priority number of 1, 2, or 3 with 1 being the highest priority. Priority 1 waters also included waterbodies likely meeting WQOs and likely to be removed from the List of Water Quality Limited Segments. Priority schemes are designated within watersheds. A prioritized list of impaired beaches and creeks included in this project is shown in Table 11-5.

Table 11-5. Prioritized List of Impaired Waters for TMDL Implementation †

Watershed	Waterbody[b]	Segment or Area[a]	Priority
San Joaquin Hills HSA (901.11) & Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Dr. - Riviera Way	1
		at Heisler Park – North	1
	Pacific Ocean Shoreline	at Main Laguna Beach	1
		Laguna Beach at Ocean Avenue	1
		Laguna Beach at Laguna Avenue	1
		Laguna Beach at Cleo Street	1
		Arch Cove at Bluebird Canyon Road	1
		Laguna Beach at Dumond Drive	1
Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place/Blue Lagoon Place at Aliso Beach	1
	Aliso Creek	The entire reach (7.2 miles) and associated tributaries Aliso Hills Channel, English Canyon Creek, Dairy Fork Creek, Sulphur Creek, and Wood Canyon Creek	3
	Aliso Creek (mouth)	At creek mouth	3
Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	1
		Aliso Beach at Table Rock Drive	1
		1000 Steps Beach at Pacific Coast Hwy at Hospital (9th Ave)	1
		at Salt Creek (large outlet)	1
		Salt Creek Beach at Salt Creek service road	2
		Salt Creek Beach at Dana Strand Road	2
Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	At San Juan Creek	1
	San Juan Creek	Lower 1 mile	3
	San Juan Creek (mouth)	At creek mouth	1

Table 11-5. Prioritized List of Impaired Waters for TMDL Implementation † (Cont'd)

Watershed	Waterbody[b]	Segment or Area[a]	Priority
San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach (large outlet)	1
		Ole Hanson Beach Club Beach at Pico Drain	1
		San Clemente City Beach at Linda Lane	1
		San Clemente State Beach at Riviera Beach	1
		San Clemente City Beach at Mariposa Street	2
		San Clemente State Beach at Cypress Shores	2
		San Clemente City Beach at Lifeguard Headquarters	2
		Under San Clemente Municipal Pier	2
		San Clemente City Beach at El Portal Street Stairs	2
		San Clemente City Beach at South Linda Lane	3
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	3
San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River Mouth	2
San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	1
San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon Mouth	1
Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline[a]	Torrey Pines State Beach at Del Mar (Anderson Canyon)	1
Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	1
		La Jolla Shores Beach at Caminito Del Oro	1
		La Jolla Shores Beach at Vallecitos	1
		La Jolla Shores Beach at Ave de la Playa	1
		at Casa Beach, Children's Pool	1
		South Casa Beach at Coast Blvd.	1
		Whispering Sands Beach at Ravina Street	1
		Windansea Beach at Vista de la Playa	1
		Windansea Beach at Bonair Street	1
		Windansea Beach at Playa del Norte	1
		Windansea Beach at Palomar Ave.	1
		at Tourmaline Surf Park	1
		Pacific Beach at Grand Ave.	1
Tecolote HA (906.10)	Tecolote Creek	The entire reach and associated tributaries	1

Table 11-5. Prioritized List of Impaired Waters for TMDL Implementation † (Cont'd)

Watershed	Waterbody[b]	Segment or Area[a]	Priority
Mission San Diego HSA (907.11) & Santee HSA (907.12)	San Diego River, Lower	Lower 6 miles	3
	Pacific Ocean Shoreline	At San Diego River Mouth at Dog Beach	3
	Forrester Creek	Lower 1 mile	3
Chollas HSA (908.22)	Chollas Creek	Bottom 1.2 miles	3

† Developed based on the 2002 Clean Water Act Section 303(d) List
a As listed on the 2002 Clean Water Act Section 303(d) List
b. Listings on the 2006 and 2008 303(d) List compared to listing shown above are provided in Appendix T to the Technical Report.

Beginning with the 2008 303(d) List, specific beach segments of the Pacific Ocean shoreline are listed individually, and may not be identified in the same way as those segments listed in the table above. Several of the segments or areas in the list above have been delisted or redefined in the 2008 303(d) List. In addition, other segments or areas have been added to the Pacific Ocean shorelines listed above. The TMDLs that address the Pacific Ocean shorelines identified in the 2002 303(d) List are assumed to be applicable to all the beaches located on the shorelines of the hydrologic subareas (HSAs), hydrologic areas (HAs), and hydrologic units (HUs) listed above, or as listed individually in the 2008 and future 303(d) Lists.

The prioritized list above recognizes that there are segments or areas where bacterial water quality improvements are most likely to occur first (Priority 1), and segments or areas where bacterial water quality improvements are most likely to require more time to achieve (Priority 3). In some cases, receiving water limitations are already being met, resulting in the delisting of those segments or areas from the 2006 and/or 2008 303(d) Lists. The protection of the REC-1 beneficial use of those delisted segments or areas, however, must also be maintained, and those segments or areas must remain off future iterations of the 303(d) List.

The BLRPs or CLRPs that are developed are expected to focus on implementing BMP programs to reduce bacteria loads to those segments or areas where exceedances of the receiving water limitations continue to occur. The BMP programs that are included in the BLRPs or CLRPs should include short-term and long-term implementation strategies. The short-term strategies should be able to result in bacteria load reductions that can result in achieving the TMDLs in the receiving waters of Priority 1 segments or areas. The long-term strategies should be able to result in bacteria load reductions that will result in achieving the TMDLs in the receiving waters of all segments or areas by the end of the TMDL compliance schedules and maintain the protection of the REC-1 beneficial use after the end of the TMDL compliance schedules.

In the segments or areas where the receiving water limitations are being met, the BLRPs or CLRPs also need to include a monitoring component to ensure that protection of the REC-1 beneficial use is maintained. If receiving water limitations are exceeded in the future in those locations, the BLRPs or CLRPs must include the implementation of a BMP program that will ensure that the TMDLs will be achieved by the end of the TMDL compliance schedules.

11.5.2 Compliance Schedule

Full implementation of the TMDLs for indicator bacteria shall be completed as soon as possible, but no later than 10 years[80] from the effective date[81] for both the dry weather and wet weather TMDLs, unless an alternative compliance schedule is approved as part of a Comprehensive Load Reduction Plan (CLRP), as described in the following section.

The San Diego Water Board will require the Phase I MS4s to submit Bacteria Load Reduction Plan (BLRPs) outlining a proposed BMP program that will be capable of achieving the necessary load reductions required to attain the bacteria TMDLs in the receiving waters, acceptable to the Regional Board within 18 months after the effective date of these TMDLs. The Phase I MS4 BLRPs should be incorporated into their Watershed Runoff Management Programs. Caltrans will also be required to develop and submit BLRPs outlining a proposed BMP program that will be capable of achieving the necessary load reductions required to attain the TMDLs in the receiving waters, acceptable to the Regional Board, within 18 months after the effective date of these TMDLs. To the extent possible, the Phase I MS4s and Caltrans should develop and coordinate the elements of their BLRPs together. The BLRPs will allow the Phase I MS4s and Caltrans to propose a compliance schedule for WQBELs that implement the bacteria TMDLs. The compliance schedule for the Phase I MS4s and Caltrans to attain their respective WLAs and the TMDLs in the receiving waters will be based on the BMP program proposed in the BLRPs.

For watersheds in Table 11-5 where there are no longer any impairments listed on the 2008 303(d) List, the Phase I MS4s and Caltrans are not required to submit a BLRP or CLRP within 18 months of the effective date of these TMDLs. If, however, any segment of a waterbody for the watershed (Pacific Ocean shoreline, creek, or mouth as shown in Table 11-5) is re-listed on a future 303(d) List for any type of indicator bacteria, the Phase I MS4s and Caltrans will be required to submit a BLRP or CLRP within 6 months of the adoption of the 303(d) List by the San Diego Regional Board.

If the Phase I MS4s and Caltrans choose to submit BLRPs that address only bacteria, the proposed schedule for compliance with the wet weather and dry weather TMDLs cannot extend beyond 10 years from the effective date, and must include at least a milestone for achieving a 50 percent exceedance frequency reduction. Additional milestones for achieving exceedance frequency reductions (e.g., 25 and 75 percent) are encouraged, but may also be required by the Regional Board. If the BLRPs do not include a proposed compliance schedule that is acceptable to the Regional Board, the compliance schedule will be as follows.

The compliance schedule for achieving the dry weather and wet weather bacteria TMDLs (Tables 11-6 and 11-7, respectively) are structured in a phased manner, with 100 percent of dry weather exceedance frequency reductions, and 100 percent of wet weather exceedance frequency reductions within 10 years from the effective date. At the end of the dry weather TMDL compliance schedule, the receiving waters must not exceed the 30-day geometric mean REC-1 WQOs more than 0 percent of the time. At the end of the wet weather TMDL compliance

[80] If a Comprehensive Load Reduction Plan (CLRP) is developed to address several pollutants, including bacteria, the implementation of the wet weather bacteria TMDLs shall be completed as soon as possible, but no later than 20 years from the effective date. See Alternative Compliance Schedules under section (j)(3).
[81] The effective date is the date the Office of Administrative Law approves this Basin Plan amendment.

schedule, the receiving waters must not exceed the single sample maximum REC-1 WQOs more than the wet weather allowable exceedance frequency. All of these reductions are aimed at restoring water quality to a level that supports REC-1 beneficial uses in the ocean shoreline and in impaired creeks. These reductions required by the compliance schedule vary on the timeline based on the priority scheme described in Table 11-5. Intermediate milestone reductions in bacteria wasteloads are required sooner in the higher priority waters.

Table 11-6. Dry Weather Compliance Schedule and Milestones for Achieving Exceedance Frequency Reductions

Compliance Year (year after OAL approval)	Required Exceedance Frequency Reduction		
	Priority 1	**Priority 2**	**Priority 3**
5	50% (All Dry Weather)		
6		50% (All Dry Weather)	
7			50% (All Dry Weather)
10+	100% (All Dry Weather)	100% (All Dry Weather)	100% (All Dry Weather)

Table 11-7. Wet Weather Compliance Schedule and Milestones for Achieving Exceedance Frequency Reductions

Compliance Year (year after OAL approval)	Required Exceedance Frequency Reduction		
	Priority 1	**Priority 2**	**Priority 3**
5	50% (All Wet Weather)		
6		50% (All Wet Weather)	
7			50% (All Wet Weather)
10+	100% (All Wet Weather)	100% (All Wet Weather)	100% (All Wet Weather)

The first four years of the compliance schedules above do not require any exceedance frequency reductions from current conditions. These years will provide the dischargers time to identify sources, develop plans and implement enhanced and expanded BMPs capable of achieving the mandated decreases in exceedance frequencies of the REC-1 WQOs in the impaired beaches and creeks. The Regional Board may also include additional milestones for achieving exceedance frequency reductions (e.g., 25 and 75 percent).

If appropriate and acceptable to the San Diego Water Board, the proposed compliance schedules included in the BLRPs will be incorporated into the various TMDL implementing orders, such as the municipal Phase I MS4 stormwater WDRs and NPDES requirements. Otherwise, the compliance schedules given above will be implemented.

11.5.3 Alternative Compliance Schedules

The dischargers to Chollas Creek in the Chollas HSA watershed will have to address reductions from multiple water quality improvement projects in addition to bacteria, namely TMDLs for copper, lead, zinc, and diazinon,[82] and a trash reduction program. Addressing multiple pollutants (in addition to bacteria) will require the development and submittal of a Comprehensive Load Reduction Plan (CLRP) by the Phase I MS4s and Caltrans. The CLRP will allow the Phase I MS4s and Caltrans to propose a compliance schedule to address impairments due to loads from multiple pollutants, including bacteria.

Full implementation of the TMDLs for indicator bacteria included under the CLRP for the Chollas HSA watershed shall be completed as soon as possible, but cannot extend beyond 10 years for the dry weather bacteria TMDLs and 20 years for the wet weather bacteria TMDLs. The proposed compliance schedules for the bacteria TMDLs included under the CLRP must include at least a milestone for achieving a 50 percent exceedance frequency reduction. Additional milestones for achieving exceedance frequency reductions (e.g., 25 and 75 percent) are encouraged. If the CLRP for the Chollas HSA watershed does not include a proposed compliance schedule, specifically for bacteria, the compliance schedule will be as given in Table 11-8.

Table 11-8. *Alternative Compliance Schedule for Chollas Creek*

Compliance Year*	Exceedance Frequency Reduction Milestone**
7	50% for dry weather
10	100% for dry weather 50% for wet weather
20	100% for wet weather

* Year after effective date for the TMDL that initiated the development of the CLRP.
** The Regional Board may also include additional milestones for achieving exceedance frequency reductions (e.g., 25 and 75 percent).

Likewise, dischargers in other bacteria-impaired watersheds may also find that undertaking concurrent load reduction programs for other pollutant constituents (e.g. metals, pesticides, trash, nutrients, sediment, etc.) together with the bacteria load reduction requirements in these TMDLs, is more cost effective, and has fewer potential environmental impacts from structural BMP construction. In these cases, the dischargers may develop and submit a CLRP for all constituents of concern in lieu of the BLRP, and to propose an appropriately tailored alternative compliance schedule. Proposed alternative compliance schedules tailored under this provision may not extend beyond 10 years for the dry weather bacteria TMDLs and 20 years for the wet weather bacteria TMDLs from the effective date, and must include at least a milestone for achieving a 50 percent exceedance frequency reduction. Additional milestones for achieving exceedance frequency reductions (e.g., 25 and 75 percent) are encouraged, but may also be required by the Regional Board.

[82] As described in *Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek, Tributary to San Diego Bay*, adopted under Resolution No. R9-2007-0043, and *Total Maximum Daily Load for Diazinon in Chollas Creek Watershed, San Diego County*, adopted under Resolution No. R9-2002-0123.

If appropriate and acceptable to the Regional Board, the proposed alternative compliance schedules included in the CLRPs will be incorporated into the various TMDL implementing orders. Otherwise, the alternative compliance schedule given above as an example for Chollas Creek will be implemented for a CLRP that is developed for any other watershed.

11.5.4 Implementation Milestones

Accomplishing the goals of the implementation plan will be achieved by cooperative participation from all responsible parties, including the San Diego Water Board. Major milestones are described in Table 11-9.

Table 11-9. *TMDL Implementation Milestones*

Item	Implementation Action	Responsible Parties	Date
1	Obtain approval of Beaches and Creeks Indicator Bacteria TMDLs from the State Water Board, OAL, and USEPA.	San Diego Water Board	Effective date[a]
2	Issue investigative orders to Phase I MS4s and Caltrans requiring the development and submittal of BLRPs or CLRPs acceptable to the Regional Board within 18 months of effective date	San Diego Water Board	As soon as possible (if necessary)
3	Issue, reissue, or revise general WDRs and NPDES requirements for the Phase I MS4s to incorporate the requirements for complying with the TMDLs and MS4 WLAs.	San Diego Water Board	Within 5 years of effective date[b]
4	Issue, reissue, or revise general WDRs and NPDES requirements for Caltrans to incorporate the requirements for complying with the TMDLs and Caltrans WLAs.	San Diego Water Board, State Water Board	Within 5 years of effective date[b]
5	Issue, reissue, or revise the WDRs and NPDES requirements for POTWs and wastewater collection systems to incorporate new requirements for sewer line surveillance and maintenance, consistent with the zero WLA.	San Diego Water Board	Within 5 years of effective date[b]
6	Meet 50% Dry Weather exceedance frequency reductions required to achieve TMDLs in receiving waters in Priority 1 watersheds.	Municipal Dischargers,[d] Caltrans, Agriculture/Livestock Dischargers	5 years after effective date[b]
7	Meet 50% Wet Weather exceedance frequency reductions required to achieve TMDLs in receiving waters in Priority 1 watersheds.	Municipal Dischargers,[d] Caltrans, Agriculture/Livestock Dischargers	5 years after effective date[b]
8	Meet 50% Dry Weather exceedance frequency reductions required to achieve TMDLs in receiving waters in Priority 2 watersheds.	Municipal Dischargers,[d] Caltrans, Agriculture/Livestock Dischargers	6 years after effective date[b]
9	Meet 50% Wet Weather exceedance frequency reductions required to achieve TMDLs in receiving waters in Priority 2 watersheds.	Municipal Dischargers,[d] Caltrans, Agriculture/Livestock Dischargers	6 years after effective date[b]

Item	Implementation Action	Responsible Parties	Date
10	Meet 50% Dry Weather exceedance frequency reductions required to achieve TMDLs in receiving waters in Priority 3 watersheds.	Municipal Dischargers,[d] Caltrans, Agriculture/Livestock Dischargers	7 years after effective date[b]
11	Meet 50% Wet Weather exceedance frequency reductions required to achieve TMDLs in receiving waters in Priority 3 watersheds.	Municipal Dischargers,[d] Caltrans, Agriculture/Livestock Dischargers	7 years after effective date[b]
12	Meet 100% Dry Weather exceedance frequency reductions required to achieve TMDLs in receiving waters in all watersheds.	Municipal Dischargers,[d] Caltrans, Agriculture/Livestock Dischargers	10 years after effective date[b,c]
13	Meet 100% Wet Weather exceedance frequency reductions required to achieve TMDLs in receiving waters in all watersheds.	Municipal Dischargers,[d] Caltrans, Agriculture/Livestock Dischargers	10 to 20 years after effective date[b,c]
14	Amend discharge conditions of appropriate waivers to be consistent with the requirements for complying with the TMDLs and Agriculture LAs.	San Diego Water Board	As needed after effective date
15	Issue individual or general WDRs or Basin Plan prohibitions consistent with the TMDLs and LAs for controllable nonpoint source discharges not eligible conditional waivers.	San Diego Water Board	As needed after effective date
16	Submit BLRP or CLRP Progress Reports to San Diego Water Board	Phase I MS4s, Phase II MS4s Caltrans	In accordance with BLRPs or CLRPs accepted by the Regional Board
17	Enroll Phase II MS4s identified as significant sources of bacteria to receiving waters under State Water Board general WDRs and NPDES requirements.	San Diego Water Board	As needed after effective date
18	Issue individual or general WDRs and NPDES requirements consistent with the TMDLs and WLAs for specific Phase II MS4s or category of Phase II MS4s.	San Diego Water Board	As needed after effective date
19	Take enforcement actions against controllable point sources and nonpoint sources to attain compliance with the WLAs and LAs.	San Diego Water Board	As needed after effective date
20	Recommend TMDL-related projects as high priority for grant funds.	San Diego Water Board	As needed after effective date
21	Amend the Basin Plan and/or provisions of these TMDLs (e.g., usage frequency or creeks or watershed-specific allowable exceedance frequency) based on evidence provided by dischargers and/or other entities	San Diego Water Board, Municipal Dischargers,[d] Caltrans, Agriculture/Livestock Dischargers	Within 5 years after effective date[e]

[a] Effective date = date of approval by OAL

[b] May defer to alternative compliance schedule proposed in BLRPs or CLRPs that have been incorporated into implementing orders (e.g., WDRs, cleanup and abatement orders)

[c] Compliance schedules for dry weather and wet weather TMDLs proposed in BLRPs cannot extend beyond 10 years from the effective date. Compliance schedules proposed in CLRPs for dry weather TMDLs cannot extend beyond 10 years and for wet weather TMDLs cannot extend beyond 20 years from the effective date.

[d] Because there are no Phase II MS4s enrolled under the State General Permit for Small MS4s, discharges from Phase II MS4s are not permitted (i.e., WLA = 0) and Municipal Dischargers are only the Phase I MS4s in this Implementation Milestone item. When a Phase II MS4 is enrolled under the State General Permit for Small MS4s or issued an individual NPDES permit, the Municipal Dischargers will be both the Phase I MS4s and Phase II MS4s in this Implementation Milestone item.

[e] If no Basin Plan amendment has been initiated within 5 years of the effective date of this TMDL Basin Plan amendment, and the Executive Officer determines, with Regional Board concurrence, that insufficient data exist to support the initiation of a Basin Plan amendment, a subsequent Basin Plan amendment to revise the requirements and/or provisions for the implementation of these TMDLs will not be initiated until the Executive Officer determines the conditions to initiate a Basin Plan amendment are met.

12 Environmental Analysis, Environmental Checklist, and Economic Factors

The San Diego Water Board must comply with the California Environmental Quality Act (CEQA) when amending the Basin Plan as proposed in this project to adopt these TMDLs for bacteria in the San Diego Region. Under the CEQA, the San Diego Water Board is the Lead Agency for evaluating the environmental impacts of the reasonably foreseeable methods of compliance with the proposed TMDLs.

The environmental impacts of the reasonably foreseeable methods of compliance with the proposed TMDLs were evaluated as part of Bacteria TMDLs Project I, which was adopted by the San Diego Water Board on December 12, 2007. Because there have been no fundamental changes to the technical approach or reasonably foreseeable methods of compliance with the proposed TMDLs, the environmental analysis, environmental analysis, and economic factors from Bacteria TMDLs Project I also apply to Revised Bacteria TMDLs Project I..

The following section summarizes the environmental analysis conducted to fulfill the CEQA requirements. The complete environmental analysis, including the environmental checklist and discussion of economic factors, are discussed in detail in Appendix R.

12.1 California Environmental Quality Act Requirements

The CEQA authorizes the Secretary of the Resources Agency to certify state regulatory programs, designed to meet the goals of the CEQA, as exempt from its requirements to prepare an Environmental Impact Report (EIR), Negative Declaration, or Initial Study. The State Water Board's and San Diego Water Board's Basin Plan amendment process is a certified regulatory program and is therefore exempt from the CEQA's requirements to prepare such documents.

The State Water Board's CEQA implementation regulations describe the environmental documents required for Basin Plan amendment actions. These documents consist of a written report that includes a description of the proposed activity, alternatives to the proposed activity to lesson or eliminate potentially significant environmental impacts, and identification of mitigation measures to minimize any significant adverse impacts.

The CEQA and CEQA Guidelines limit the scope to an environmental analysis of the reasonably foreseeable methods of compliance with the WLAs and LAs. The State Water Board CEQA Implementation Regulations for Certified Regulatory Programs require the environmental analysis to include at least the following:

1. A brief description of the proposed activity. In this case, the proposed activity is the TMDL Basin Plan amendment.
2. Reasonable alternatives to the proposed activity.
3. Mitigation measures to minimize any significant adverse environmental impacts of the proposed activity.

Additionally, the CEQA and CEQA Guidelines require the following components, some of which are repetitive of the list above:

1. An analysis of the reasonably foreseeable environmental impacts of the methods of compliance.
2. An analysis of the reasonably foreseeable feasible mitigation measures relating to those impacts.
3. An analysis of reasonably foreseeable alternative means of compliance with the rule or regulation, which would avoid or eliminate the identified impacts.

Additionally, the CEQA Guidelines require the environmental analysis take into account a reasonable range of:

1. Environmental factors.
2. Economic factors.
3. Technical factors.
4. Population.
5. Geographic areas.
6. Specific sites.

12.2 Analysis of Reasonably Foreseeable Methods of Compliance

The analysis of potential environmental impacts is based on the numerous alternative means of compliance available for controlling bacteria loading to beaches and creeks in the San Diego Region. The majority of bacteria discharged into the 12 watersheds result from urban and stormwater runoff from a combination of point and nonpoint sources. Attainment of the WLAs will be achieved through discharger implementation of structural and non-structural Best Management Practices (BMPs) for point sources and management measures (MMs) for nonpoint sources. The BMP and MM control strategies should be designed to reduce bacteria loading in urban and stormwater runoff.

The controls evaluated in Appendix R include the following non-structural and structural BMPs and MMs:

- Education and outreach;
- Road and street maintenance;
- Storm drain system cleaning;
- BMP inspection and maintenance;
- Enforcement of local ordinances;
- Manure fertilizer management plan;
- Sizing and location of facilities;
- Buffer strips and vegetated swales;
- Bioretention;
- Infiltration trenches;
- Sand filters;
- Diversion systems;
- Animal exclusion; and
- Waste treatment lagoons.

Structural and non-structural control strategies can be based on specific land uses, sources, or periods of a storm event. In order to comply with these TMDLs, emphasis should be placed on BMPs and MMs that control the sources of pollutants and on the maintenance of BMPs and MMs that remove pollutants from runoff.

12.3 Possible Environmental Impacts

The CEQA and CEQA Guidelines require an analysis of the reasonably foreseeable environmental impacts of the methods of compliance with the TMDL Basin Plan amendment. The environmental checklist identifies the potential environmental impacts associated with these methods with respect to earth, air, water, plant life, animal life, noise, light, land use, natural resources, risk of upset, population, housing, transportation, public services, energy, utilities and services systems, human health, aesthetics, recreation, and archeological/historical concerns.

From the 61 reasonably foreseeable environmental impacts identified in the checklist, none were considered to be "Potentially Significant." Fifty-five were considered either "Less Than Significant with Mitigation" or "Less Than Significant." Ten were considered to have "No Impact" on the environment. See sections 4 and 5 in Appendix R for a complete discussion of the potential environmental impacts.

In addition to the potential impacts mentioned above, mandatory finding of significance regarding short-term, long-term, cumulative, and substantial impacts were evaluated. Based on this review, the San Diego Water Board concluded that the potentially significant cumulative impacts can be mitigated to less than significant levels as discussed in Appendix R.

12.4 Alternative Means of Compliance

The CEQA requires an analysis of reasonably foreseeable alternative means of compliance with the rule or regulation, which would avoid or eliminate the identified impacts. The dischargers can use the structural and non-structural BMPs and MMs described in Appendix R or other structural and non-structural BMPs and MMs, to control and prevent pollution, and meet the TMDLs' required load reductions. The alternative means of compliance with the TMDLs consist of the different combinations of structural and non-structural BMPs and MMs that the dischargers might use. Since most of the adverse environmental effects are associated with the construction and installation of large scale structural BMPs, to avoid or eliminate impacts, compliance alternatives should minimize structural BMPs, maximize non-structural BMPs, and site, size, and design structural BMPs in ways to minimize environmental effects.

12.5 Reasonably Foreseeable Methods of Compliance at Specific Sites

The San Diego Water Board analyzed various reasonably foreseeable methods of compliance at specific sites within the subject watersheds. Because this project is large in scope (encompassing 12 watersheds), the specific sites analysis was focused on reviewing potential compliance methods within various land uses. The land uses analyzed correspond to the land uses that were utilized for watershed model development (discussed section 7).

In the discussion of potential compliance methods in section 6 of Appendix R, the San Diego Water Board assumed that, generally speaking, the BMPs suitable for the control of bacteria generated from a specific land use within a given watershed are also suitable for the control of bacteria generated from the same land use category within a different watershed. For example, a BMP used to control the discharge of bacteria from a residential area in the San Diego River watershed is likely suitable to control the discharge of bacteria from a residential area in the Aliso Creek watershed. However, in addition to land use, BMP selection includes considering site-specific geographical factors such as average rainfall, soil type, and the amount of impervious surfaces, and non-geographical factors such as available funding. Such factors vary between watersheds. The most suitable BMP(s) for a particular site must be determined by the dischargers in a detailed, project-specific environmental analysis.

In order to meet TMDL requirements, dischargers will determine and implement the actual compliance method(s) after a thorough analysis of the specific sites suitable for BMP implementation within each watershed. In most cases, the San Diego Water Board anticipates a potential strategy to be the use of management measures, or other non-structural BMPs as a first step in controlling bacteria discharges, followed by structural BMP installation if necessary.

12.6 Economic Factors

The environmental analysis required by the CEQA must take into account a reasonable range of economic factors. This section contains estimates of the costs of implementing the reasonably foreseeable methods of compliance with the TMDL Basin Plan amendment. Specifically, this analysis estimates the costs of implementing the structural and non-structural BMPs which the dischargers could use to reduce bacteria loading.

As discussed in section 7 in Appendix R, the cost estimates for non-structural BMPs ranged from $0 to $211,000. The cost estimates for treating 10 percent of the watershed with structural BMPs ranged from $50,000 to $973 million, depending on BMP selection, with yearly maintenance costs estimated from $10,000 to $68 million. Implementation of these TMDLs will also entail water quality monitoring which has associated costs. Assuming that a two-person sampling team can collect samples at 5 sites per day, the total cost for one day of sampling would be $2,274.

The specific BMPs and MMs to be implemented will be chosen by the dischargers after adoption of these TMDLs. All costs are preliminary estimates since particular elements of a BMP and MM, such as type, size, and location, would need to be developed to provide a basis for more accurate cost estimations.

12.7 Reasonable Alternatives to the Proposed Activity

The environmental analysis must include an analysis of reasonable alternatives to the proposed activity. The proposed activity is a Basin Plan Amendment to incorporate bacteria TMDLs for the beaches and creeks in the San Diego Region. The purpose of this analysis is to determine if there is an alternative that would feasibly attain the basic objective of the rule or regulation (the proposed activity), but would lessen, avoid, or eliminate any identified impacts. The alternatives analyzed include taking no action and modifying water quality standards. These alternative actions are discussed in section 8 of Appendix R. Because these alternatives are not expected to

attain the basic objective of the proposed activity at this point in time, the preferred alternative is the proposed activity itself, which is the Basin Plan amendment incorporating the bacteria TMDLs.

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13 Necessity of Regulatory Provisions

The OAL is responsible for reviewing administrative regulations proposed by State agencies for compliance with standards set forth in California's Administrative Procedure Act, Government Code section 11340 *et seq*., for transmitting these regulations to the Secretary of State and for publishing regulations in the California Code of Regulations. Following State Water Board approval of this Basin Plan amendment establishing TMDLs, any regulatory portions of the amendment must be approved by the OAL per Government Code section 11352. The State Water Board must include in its submittal to the OAL a summary of the necessity[83] for the regulatory provision.

This Basin Plan amendment for Bacteria Impaired Waters meets the "necessity standard" of Government Code section 11353(b). Amendment of the Basin Plan to establish and implement bacteria TMDLs in affected watersheds in the San Diego Region is necessary because the existing water quality does not meet applicable numeric WQOs for indicator bacteria. Applicable state and federal laws require the adoption of this Basin Plan amendment and regulations as provided below.

The State Water Board and Regional Water Boards are delegated the responsibility for implementing California's Porter Cologne Water Quality Control Act and the federal CWA. Pursuant to relevant provisions of both of those acts the State Water Board and San Diego Water Boards establish water quality standards, including designated (beneficial) uses and criteria or objectives to protect those uses.

Section 303(d) of the CWA [33 USC section 1313(d)] requires the states to identify certain waters within their borders that are not attaining WQSs and to establish TMDLs for certain pollutants impairing those waters. USEPA regulations [40 CFR 130.2] provide that a TMDL is a numerical calculation of the amount of a pollutant that a water body can assimilate and still meet standards. A TMDL includes one or more numeric targets that represent attainment of the applicable standards, considering seasonal variations and a MOS, in addition to the allocation of the target or load among the various sources of the pollutant. These include WLAs for point sources, and LAs for nonpoint sources and natural background. TMDLs established for impaired waters must be submitted to the USEPA for approval.

CWA section 303(e) requires that TMDLs, upon USEPA approval, be incorporated into the state's Water Quality Management Plans, along with adequate measures to implement all aspects of the TMDL. In California, these are the basin plans for the nine regions. Water Code sections 13050(j) and 13242 require that basin plans have a program of implementation to achieve WQOs. The implementation program must include a description of actions that are necessary to achieve the objectives, a time schedule for these actions, and a description of surveillance to determine compliance with the objectives. State law requires that a TMDL project include an implementation plan because TMDLs normally are, in essence, interpretations or refinements of existing WQOs. The TMDLs have to be incorporated into the Basin Plan [CWA section 303(e)],

[83] "Necessity" means the record of the rulemaking proceeding demonstrates by substantial evidence the need for a regulation to effectuate the purpose of the statute, court decision, provision of law that the regulation implements, interprets, or makes, taking into account the totality of the record. For purposes of this standard, evidence includes, but is not limited to, facts, studies, and expert opinion. [Government Code section 11349(a)].

and, because the TMDLs supplement, interpret, or refine existing objectives, State law requires a program of implementation.

14 Public Participation

Public participation is an important component of TMDL development. The federal regulations [40 CFR 130.7] require that TMDL projects be subject to public review. All public hearings and public meetings have been conducted as stipulated in the regulations [40 CFR 25.5 and 25.6], for all programs under the CWA. Public participation was provided through two public workshops, and through the formation and participation of the Stakeholder Advisory Group. In addition, staff contact information was provided on the San Diego Water Board's website, along with periodically updated drafts of the TMDL project documents. Public participation also took place through the San Diego Water Board's Basin Plan amendment process, which included an additional public workshop, a hearing, and a formal public comment period. A chronology of public participation and major milestones is provided in Table 14-1.

Table 14-1. Public Participation Milestones

Date	Event
March 27, 2003	Public Workshop and CEQA Scoping Meeting
March 9, 2004	Public Workshop and SAG Meeting
March 26, 2004	SAG Meeting
June 15, 2004	SAG Meeting
August 2, 2004	SAG Meeting
September 20, 2004	SAG Meeting
December 14, 2004	SAG Meeting
January 11, 2005	SAG Meeting
February 16, 2005	SAG Meeting
May 10, 2005	SAG Meeting
May 31, 2005	SAG Meeting
December 9, 2005	Draft Documents released for first public review
January 11, 2006	Public Workshop
February 8, 2006	1st Public Hearing
August 4, 2006	Draft Documents released for second public review
September 12, 2006	SAG Meeting
March 9, 2007	Draft Documents released for third public review
April 25, 2007	2nd Public Hearing
June 25, 2007	Draft Documents released for fourth public review
December 12, 2007	3rd Public Hearing and Adoption.
June 3, 2009	SAG Meeting
November 25, 2009	Revised Draft Documents released for public review
December 16, 2009	SAG Meeting
January 7, 2010	SAG Meeting
February 10, 2010	Public Hearing and Adoption

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APPENDIX A

PEER REVIEW COMMENTS AND RESPONSES

The technical portions of the proposed Basin Plan amendment to incorporate TMDLs for indicator bacteria were peer reviewed by Professor Patricia Holden of the Donald Bren School of Environmental Science & Management, University of California, Santa Barbara, and by Professor Kara Nelson of the Department of Civil and Environmental Engineering, University of California, Berkeley. External scientific peer review of the technical portion of a proposed rule (in this case, the proposed Basin Plan amendment) is mandated by Health and Safety Code section 57004. This statute states that the reviewer's responsibility is to determine whether the scientific portion of the proposed rule is based upon sound scientific knowledge, methods, and practices. The San Diego Water Board provided the peer reviewers with the draft Technical Report, the draft Basin Plan amendment, and a list of key issues with discussion for the peer reviewers to address. The list of key issues with discussion provided to the peer reviewers is given below in the first section of this appendix. The peer reviewers' comments and the San Diego Water Board's responses follow in subsequent sections.

Issues for Peer Review

1. **Use of land use composition to quantify bacteria sources from all watersheds to affected beaches and creeks in the San Diego Region.**
   Bacteria are ubiquitous in the environment, as there are numerous sources including both controllable and non-controllable. Controllable sources include sewage related sources (spills, leaking sewer lines), trash, farm animal waste, and pet waste. Noncontrollable sources include aquatic and terrestrial wildlife, decaying matter, and soil. To manage this abundance of sources and quantify them in a useful way, land-use types were identified in the San Diego Region and quantified in terms of bacteria generation.

   Various bacteria sources are present across different land-use categories. For example, wildlife can be present in both urbanized and non-urbanized areas. Despite this source variability, loading can be highly correlated with land use practices. For this reason, it was decided to quantify the bacteria load coming from each land use type rather than quantify the sources directly. This approach was applied to both wet weather and dry weather conditions.

2. **Use of wet weather model to simulate fate and transport of bacteria, and to calculate TMDLs, to affected beaches and creeks.**
   A regional watershed-based approach (model study) was developed to simulate the build-up and wash-off of bacteria, and the hydrologic and hydraulic processes that affect delivery of bacteria to the impaired waters. In this approach, bacteria re-growth is assumed to be zero.

   This approach was based on the application of the U.S. Environmental Protection Agency's (USEPA) Loading Simulation Program in C++ (LSPC) to estimate bacteria loading from streams and assimilation within the waterbody to determine existing bacteria loads, as well as total maximum daily loads, to receiving waters. LSPC integrates a geographical information system (GIS), comprehensive data storage and management capabilities, a dynamic

watershed model (a re-coded version of EPA's Hydrological Simulation Program—FORTRAN [HSPF]), and a data analysis/post-processing system into a convenient PC-based windows interface that dictates no software requirements. Please comment on the use of this modeling system for the purpose of calculating TMDLs to impaired waters during wet weather.

3. **Selection of a Los Angeles watershed as a "reference" for background loading of bacteria in the San Diego Region during wet weather.**
The interim numeric target for the TMDL calculations is based on the use of a "reference watershed approach," a concept that was introduced by the Los Angeles Regional Water Quality Control Board in the Santa Monica Bay Beaches TMDL (Los Angeles Water Board, 2002). In this approach, a certain amount of exceedances of the single sample maximum water quality objectives are allowed, based on the frequency of exceedances expected in a relatively pristine, or "reference," watershed. Since there are natural sources of bacteria in a reference watershed, a certain amount of exceedances of the water quality objectives are expected. It is assumed that these exceedances are not from anthropogenic origin. This exceedance frequency is incorporated into the waste load allocations that were calculated for all urbanized watersheds. However, if water quality is better than that of the reference watershed in a particular location, no degradation of existing bacteriological water quality is permitted. This approach ensures no further bacteriological degradation of water quality where existing conditions are better than that of the reference watershed.

   In the San Diego Region, candidate watersheds for use as a "reference" for TMDL development have been identified. However, to date, these candidate watersheds do not have sufficient data needed for characterization. In lieu of suitable data originating from the San Diego Region, the exceedance frequency of the reference watershed used for TMDL development in Los Angeles, the Arroyo Sequit watershed, were used. Specifically, the allowance frequency of 22 percent was used in the calculation of the interim TMDLs. Final TMDLs for wet weather were calculated using the single sample maximum water quality objectives (no allowable frequency of exceedance).

4. **Use of single-sample maximum objectives for wet weather numeric targets.**
Bacteria water quality objectives have two temporal components: single sample maximum values and 30-day geometric mean values. As a conservative measure for wet weather analyses, the single sample maximum values were chosen as TMDL numeric targets.

   Wet weather events, and subsequent high bacterial counts, are sporadic and episodic. Wet weather runoff and flows contain elevated bacteria densities, but have a quick time of travel. Thus, bacteria densities remain elevated for relatively short time periods following storm flows. Storm events do not typically result in an exceedance of the 30-day geometric mean bacteria densities, even though single sample densities are very high. Therefore, the single sample maximum values were used as numeric targets for the wet weather simulations.

5. **Reasonableness of assumptions (described in Appendix L) for wet weather modeling.**
Several assumptions are relevant to the LSPC model developed to simulate the fate and transport of wet weather sources of bacteria in the Region. This model was used to estimate

both existing bacteria loads and total maximum daily loads. Please comment on the validity of these assumptions.

6. **Use of wet weather modeling parameters to simulate build-up/wash-off of bacteria from a similar study in Los Angeles (Los Angeles Water Board, 2002).**
As explained earlier, sources of bacteria are quantified by correlating land use types to bacteria loading.

   Land use data was classified into 13 distinct categories. Each category had a unique parameter describing the amount of bacteria loading directly to the *critical point* (defined as the culmination point at the bottom of each affected watershed). These unique parameters were obtained by using those that were previously defined in the TMDL for Santa Monica Bay (Los Angeles Water Board, 2002). This includes land-use-specific accumulation rates and build-up limits. Using these values assumes that land use characteristics for all categories in the San Diego Region are sufficiently similar to characteristics of all land use categories in the Los Angeles Region. This assumption was validated through evaluation of model results with local water quality data. Please comment on the application of modeling parameters derived in the Los Angeles Region to the San Diego Region.

7. **Use of dry weather model to simulate fate and transport of bacteria, and to calculate TMDLs, to affected beaches and creeks.**
During dry weather conditions, bacteria levels are highly variable and not predicted well using standard modeling techniques, such as the LSPC model developed for wet weather. To account for this variability, empirical equations were developed to represent water quantity and quality associated with dry weather runoff from various land uses. Concentrations of fecal coliform were developed using regression analysis as a function of total area and land use composition in each subwatershed. Concentrations of total coliform and enterococci were developed as functions of fecal coliform concentrations.

   The predictive model represents the streams as a series of plug-flow reactors, with each reactor having a constant source of flow and bacteria. Although it is understood that dry weather flows and bacteria densities vary over time for any given stream, for prediction of average conditions in the stream, flows and concentrations are assumed to be in steady state. Bacteria re-growth is assumed to be zero.

8. **Use of data from Aliso, San Juan, Rose, and Tecolote Creeks to characterize dry weather source loading in the entire San Diego Region.**
Data from Aliso Creek, San Juan Creek (Orange County), Rose Creek, and Tecolote Creek (San Diego County) were used for characterization of dry weather flows and water quality because the data sets associated with these creeks are assumed sufficient in size. Data from these four creeks were used to generate regression equations describing flow and water quality as functions of land use composition and watershed size. Conditions in these four creeks are assumed representative of conditions throughout the Region.

9. **Use of geometric mean objectives for dry weather numeric targets.**
Bacteria water quality objectives have two temporal components: single sample maximum

values and 30-day geometric mean values. For dry weather analyses, the geometric mean values were chosen as TMDL numeric targets. This is because the dry weather model simulates steady state flow for predictions of average conditions in the creeks. To compare the conditions of these average flows to water quality objectives, the geometric mean is more appropriate since this value likewise represents average conditions over 30 days.

10. **Reasonableness of assumptions (described in Appendix L) for dry weather modeling.**
Several assumptions are relevant to the empirical model developed to simulate the fate and transport of bacteria during dry weather in the Region. Please comment on the validity of these assumptions.

11. **Location of *critical points* for TMDL calculation.**
The *critical point* for loading assessment is defined as the culmination point at the bottom of the watershed, before inter-tidal mixing takes place. Both current loading and total maximum daily loading is calculated at the critical point for each watershed having an impaired waterbody. High bacteria loading is predicted at the critical point, and is therefore considered a conservative location for TMDL calculation. TMDL calculations were determined at the critical point in both wet and dry weather.

12. **Use of conservative assumptions to comprise an implicit Margin of Safety.**
Rather than incorporating an explicit margin of safety (MOS) to TMDL calculation, the conservative assumptions built into both the wet weather and dry weather models are considered sufficient to account for any uncertainties. The implicit MOS was thus generated by incorporating a series of conservative assumptions regarding current source loading of bacteria from the watersheds, as well as assumptions regarding the assimilation of bacteria into the waterbodies and surrounding environment.

Overarching Questions

Reviewers were not limited to addressing only the specific issues presented above, and were asked to contemplate the following "big picture" questions.

(a) In reading the Technical Report and proposed implementation language, are there any additional scientific issues that are part of the scientific basis of the proposed rule (the Basin Plan amendment) not described above? If so, please comment with respect to the statute language given above.

(b) Taken as a whole, is the scientific portion of the proposed rule based upon sound scientific knowledge, methods, and practices?

Reviewers were asked to note that some proposed actions may rely significantly on professional judgment where available scientific data are not as extensive as desired to support the statute requirement for absolute scientific rigor. In these situations, the proposed course of action is favored over no action.

Comments from Professor Holden

1. Use of land use composition to quantify bacteria sources from all watersheds to affected beaches and creeks in the San Diego region.

Comment: In concept, this seems fine. However, as per the regression model on page K-6, not all land uses correlated with indicator bacteria discharge during dry weather. There were 13 land use categories overall, and eight are listed on page K-6. Perhaps comments are being requested for only the wet weather calculations (this review point only).

As for the wet weather usage, how current are land use data from 2000 (page J-4)? Has development in the region been so rapid as to make these land use data obsolete in some areas?

Response: For the dry weather analyses, eight of thirteen land uses were determined to have statistical significance for prediction of fecal coliform concentrations. The remaining land uses do not have statistical significance for prediction of fecal coliform concentrations.

Development or changes in stormwater management resulting from land uses may have changed since 2000 when spatial coverages were compiled. However, these were the most recent datasets available at the time of TMDL development. Should these datasets be updated in the future that confirm significant changes in land use, the models can be updated and TMDLs can be revised.

2. Use of wet weather model to simulate fate and transport of bacteria, and to calculate TMDLs, to affected beaches and creeks.

Comment: Few details about the model are provided, but the methods appear to be well-referenced. The model simulations (e.g. Figure N-3) of concentration appear to fit the real data well (where there are data). However, for some of the figures (e.g. N-1, N-2) it is not possible to tell how well the simulations worked because of the density of the simulated data.

Response: To improve visualization of results, Figure N-1 was divided into 3 figures (Figures N-1-A, N-1-B, and N-1-C) representing different periods of record, and Figure N-2 was edited and confined to the period with the most observed data (1997-1999).

3. Selection of a Los Angeles watershed as a "reference" for background loading of bacteria in the San Diego Region during wet weather.

Comment: In the absence of a sufficiently characterized "reference" (i.e. relatively undeveloped) watershed in the San Diego region, designating a nearby, well-characterized, similarly undeveloped watershed in the Los Angeles region as a "reference" watershed seems fine. However, the use of the "reference" watershed as a concept or decision tool is not clear. The document refers to a 22 percent exceedance frequency in the Arroyo Sequit Watershed (in Los Angeles) and this compares similarly to two undeveloped watersheds in San Diego (Tables 4-1

and 4-5, San Mateo Creek and San Onofre State Beach). However, on page 15[1] (section 4.1) of the document it is stated there is no "reference watershed implementation policy" which seems to imply that the use of a "reference watershed" concept is not allowed. This is confusing and it is suggested that it be clarified by either moving this reference watershed discussion to a later point in the document (i.e. implementation) or more clearly stating how it is used at this point in the TMDL process**.**

The "reference" watershed concept inherently assumes that all indicator bacteria are created equal. That is, indicator organisms from an urbanized area are just as problematic as those from an undeveloped watershed. This may not be the case. If false positive results on indicator organism assays frequently occur at the outlets of undeveloped watersheds, this would imply that natural lands discharge bacteria but few pathogens. Transferring an allowable exceedance from an undeveloped watershed to a developed one may inadvertently "allow" the discharge of more pathogens from developed watersheds because it is more likely that microbes discharged from developed watersheds will include pathogens.

Response: The Technical Report has been updated to clarify how the allowable exceedance frequency was used to calculate interim TMDLs, and also why the allowable exceedance frequency was applied to interim, not final, TMDLs. Specifically, the allowable exceedance frequency of 22 percent was used to calculate "interim TMDLs" and accounts for bacteria loads from natural sources. The 22 percent exceedance frequency originates from studies in the Arroyo Sequit watershed in Los Angeles County. The Los Angeles Regional Water Quality Control Board (Los Angeles Water Board) adopted "reference watershed implementation provisions" to incorporate the allowable exceedance frequency as a formal Basin Plan amendment. The Los Angeles Water Board was then able to use the exceedance frequency to calculate TMDLs.

In contrast, the San Diego Water Board has not adopted a Basin Plan amendment to incorporate reference watershed implementation provisions to allow exceedances of the WQOs. Therefore, ultimately, TMDLs must be calculated using existing WQOs in the Basin Plan. As an interim goal, however, interim TMDLs were calculated based on the 22 percent allowable exceedance frequency, as established by the Los Angeles Water Board.

Since the TMDL Report was first made available to peer reviewers on February 7, 2005, a new study has been completed which characterizes a reference watershed in the San Diego Region. The study (Schiff et al., 2005) found that four reference watersheds in Southern California (Ventura, Orange, and San Diego counties) had an average exceedance frequency of 25 percent during wet weather. The San Diego Water Board is currently working on an amendment to the Basin Plan to incorporate reference watershed implementation provisions using this new information. When this occurs, the TMDLs developed in this project can be re-visited to reflect these provisions. Consequently, TMDLs will no longer be distinguished into "interim" and "final" TMDLs; only final TMDLs will be relevant, and will take into account loads due to natural sources.

[1] The reviewer is referring to page 15 of the draft Technical Report that she received. The "reference watershed implementation policy" is referred to as the "reference system approach" in the draft Technical Report dated December 9, 2005.

In calculating interim TMDLs, the San Diego Water Board did assume that indicator bacteria, whether from an undeveloped watershed or an urbanized watershed, behave similarly. In other words, an exceedance frequency developed in an undeveloped watershed is the same as the exceedance frequency in an urbanized watershed. The San Diego Water Board assumed that bacteria loading from natural sources is present in all watersheds, and that this loading occurs in identical quantities.

4. Use of single-sample maximum objectives for wet weather numeric targets.

Comment: The use of single sample maximum objectives for wet weather seems fine. However, given that rainfall events subject the watersheds to more variability in flow and load, the use of a geometric mean for wet weather seems more practical. This is discussed again for the dry weather assumptions.

Response: The analysis used in this Technical Report was divided into wet weather and dry weather approaches specifically to address the variability between the two scenarios. The dry weather model makes use of the geometric mean and assumes a steady state base flow. The wet weather model analyzes bacteria loads during conditions of high flows and loads, as the commenter suggests. The single sample maximum WQOs are designed to protect human health risk at short intervals, including peak loads. The geometric mean value does not evaluate peak loads at short intervals because values are calculated over several-week's time. Because the model used for wet weather analyzes high flow and loads, which are short-term events, the numeric target must likewise characterize risk from short-term events. Therefore the single sample maximum WQOs were used.

5. Reasonableness of assumptions (described in Appendix L) for wet weather modeling.

Comment: In Section 8.1.1, it is stated that the "92nd percentile" was used as the critical condition for wet weather years. Other than SCCWRP used a 90th percentile previously, what is the scientific justification for this? Was 1993 an El Nino year? Is there an accepted process, similar to flood frequency estimations used in treatment facility designs, for selecting a storm frequency for this process?

Response: Storm frequency analyses can be used for selection of critical wet periods for TMDL calculation. However, a critical wet 'year' was selected for TMDL calculation, which incorporates multiple storms that can occur during the period. Evaluation of a wet year is often reported as a frequency of occurrence (e.g., 1 in 10 years). Based on the data compiled for this study, the 92nd percentile (1 out of 12 years) was determined adequate for identification of the critical wet year. This year corresponded to 1993, which was also identified by SCCWRP as the critical wet year for indicator bacteria loading to Santa Monica Bay beaches. 1993 is considered an El Nino period.

6. Use of wet weather modeling parameters to simulate build-up/wash-off of bacteria from a similar study in Los Angeles (Los Angeles Water Board, 2002).

Comment: There is insufficient information in the report for this to be evaluated. The idea of simulating build up and wash off is logical and sound. But the modeling parameters are not detailed sufficiently for comment. The Santa Monica Bay TMDL used the same approach, but the report provided does not contain detailed information on the modeling.

Response: The modeling parameters referred to in this comment have been incorporated into Appendix J. The item was not meant to solicit opinion about the parameters themselves, but rather the idea of using values identical to parameters that describe the Los Angeles area.

7. Use of dry weather model to simulate fate and transport of bacteria, and to calculate TMDLs, to affected beaches and creeks.

Comment: The model on page K-3 is a simple first order decay model. The derivation of a correct and appropriate model based on mass balance principles, within the context of the assumption of a plug flow reactor, should be provided. Even if each reach is modeled as a complete mix reactor, the resultant equation will not be what is given on page K-3. It should also be stated that bacteria are assumed to be discrete particles that don't settle unless "die off" refers to the combined processes of settling of particle-associated bacteria and death.

The dry weather flow rate of 15 cubic feet per second (cfs) is stated as an assumption (page K-4) but the justification is not provided.

The significances (p values) for regressions (beginning on page K-4) are important. If they are greater than 0.05 (assuming 95 percent confidence intervals for these estimates) then the use of the correlations should be further justified.

Response: The plug flow equation can be derived from the following materials balance equation:

$$QC_{in} - QC_{out} + rV_R = V_R \frac{dC_{out}}{dt}$$

where, $Q = Q_t + Q_r$

V_R = reactor volume
r = rate of change in C
t = time

For simplicity, infiltration losses (I) were not considered. Assuming plug flow with $dC_{out}/dt = 0$ (steady-state), and dividing both sides by V_R,

$$-\frac{dC}{dt} + r = 0$$

With $r = -kC$ (first order loss), and $t = x/u$, the above equation can be determined.

The context of the 15 cfs dry weather flow criterion on page K-4 was specific to screening of regional flows for determination of physical stream dimensions for the model. All flow data for 53 USGS stations in the region were screened so that equations could be developed for prediction of stream cross-sectional area and width as a function of low flows. The purpose for limiting to 15 cfs was to ensure that coefficients of equations 4 and 5 (Appendix K), derived through regression analyses, were not controlled by high wet-weather flows when width verses flow relationships can vary. The 15 cfs assumption was not, of itself, used in development of equations, and therefore does not require justification.

For the multivariable regression analysis performed for dry-weather flows and fecal coliform concentrations (equations 6 and 7), p-values were evaluated for each variable to test statistical significance. Section K.4 was edited to present p-values of each variable. All p-values were below 0.05 cfs, with the exception of the equation 7 variable representing the percentage of subwatershed land use assigned to open recreation, which only slightly exceeded at 0.067.

8. Use of data from Aliso, San Juan, Rose, and Tecolote Creeks to characterize dry weather source loading in the entire San Diego Region.

Comment:Again (as above), the significance (p value) of the derived correlation should be provided. Otherwise, it is hard to know that the equation is valid for predictions (page K-6). It is interesting, and somewhat curious, that the correlation is to so many factors (land uses and watershed size). How this analysis was performed would be important to convey in the document.

If the p value is high for the equation on page K-6, this would suggest that monitoring of the other watersheds should occur. Even if the p value is high, however, the lack of data would suggest that little knowledge exists regarding the need for TMDL extrapolation to the other watersheds, and that data should be collected to refine the process.

Response: P-values and further explanation of the multivariable regression analyses procedure was added to the text.

The San Diego Water Board agrees that as additional data are collected in the region to further characterize dry-weather flows and indicator bacteria concentrations, methods for bacteria load estimation and calculation of TMDLs should be refined in the future.

9. Use of geometric mean objectives for dry weather numeric targets.

Comment: The use of a geometric mean for dry weather numeric targets should be discussed in light of monitoring activities at beaches and how convenient this will be for making posting and closure decisions. A single sample-basis target is potentially more useful (for decision making) regarding beach closures. Also, dry weather conditions are likely to be less variable as compared to wet weather conditions.

Response: The use of geometric means for numeric targets for TMDL calculations is distinct from making posting and closure decisions at public beaches. The decision to post or close a

beach is determined by single sample measurements of bacteria, and an immediate response is required if a measurement exceeds the bacteria WQOs for any of the three indicator bacteria for marine waters (total coliform, fecal coliform, or enterococci). This protocol is described and mandated by Health and Safety Code section 115880.

In contrast, TMDL projects are long-term strategies for achieving water quality. Numeric targets are used to calculate the assimilative capacity, and hence the TMDL, of a waterbody. Once the TMDL for a waterbody has been determined for a given pollutant, the required load and waste load reductions are calculated and the method(s) of enforcement determined. The use of a geometric mean for dry weather numeric targets is used for calculating TMDLs, and not proposed for making posting and closure decisions. The San Diego Water Board agrees that dry weather conditions are likely to be less variable than wet weather conditions. For this reason, the geometric mean was used as dry weather numeric targets, since this modeling platform assumes a steady state base flow.

10. Reasonableness of assumptions (described in Appendix L) for dry weather modeling.

Comment: The assumptions appear to be sound. As above, the plug flow modeling probably needs to be shown more completely and double-checked. The multivariate regression analyses should be double checked for significance (p values) and significances reported.

Response: Appendix K has been modified to provide further explanation of the multivariable regression analysis. P values have also been provided.

11. Location of critical points for TMDL calculation.

Comment: The locations of critical points (mouths and bottom of creeks and watersheds) are reasonable for protecting beach water quality. The impact of the watershed at this point is fully integrated from up to downstream. However, where small estuaries or lagoons separate the creek mouth from the coastal ocean, they should also be considered in this process. Lagoons and estuaries can accumulate and discharge fecal coliform-laden sediments during low and high flow conditions, respectively.

Response: The San Diego Water Board recognizes that small estuaries and lagoons provide habitat for wildlife, and therefore can be significant sources of bacteria. For this reason, systems with estuaries or lagoons were not analyzed in this project. Impaired waters having lagoon-like characteristics will be addressed in a subsequent TMDL project, *Bacteria-Impaired Waters TMDLs for Lagoons in the San Diego Region*. The models used in this project are suitable for simulating the unique dynamics of lagoon systems.

12. Use of conservative assumptions to comprise an implicit Margin of Safety.

Comment: In this reviewer's mind, a "margin of safety" is an explicit add-on to a limit. It is really difficult to tell what are the "conservative assumptions". For example, in wet weather modeling, it might not be conservative to make the creek mouth the critical point if there is a lagoon or estuary. On the other hand, most of these discharges do not have lagoons or estuaries

downstream of the creek mouth. In any event, the Assumptions in Appendix L don't explicitly describe the "implicit' conservative assumptions, and the only real text devoted to the margin of safety issue appears to be in Section 8.1.7 rather than in the modeling appendices (J and K). It would be worthwhile to add some text to the document that more explicitly outlines where the "implicit" margin of safety is built in to each model.

Response: The location of the critical point at the creek mouth as an assumption is conservative because all watersheds included in this analysis did not include an adjacent lagoon or estuary (see response to comment 11). The discussion regarding the implicit margin of safety and how it was utilized was expanded in section 8.1.7.

Overarching Questions:

(a) Are there any other issues with the scientific basis of the proposed rule?

Comment: The mixed use of REC-1 and SHELL criteria for water quality targets at the same location may introduce some difficulty to water quality managers. The SHELL criteria are more stringent, so the mixed use of these results in a total coliform criteria that is lower than fecal coliform. Practically, this is difficult to achieve since fecal coliform are, in concept and practically, a subset of total coliform. How will total coliform levels ever be lower than fecal coliform levels at the same location? See Table 4-2 for the summary. It appears that this is only a problem at beaches.

Section 10 on Implementation is nonexistent. The impression from the placeholder paragraph is that dischargers may amend the TMDLs and that the timescale for implementation is unknown. If more data are to be collected for more study of the watersheds, and the resulting impact is delayed or uncertain implementation, this would delay protection of the coastal water quality in the San Diego Region. Implementation measures are the translation of the science into effective water quality management. The degree to which the science can be implemented adds to its validity in the TMDL process. Therefore, an additional comment on this document is that the presentation of implementation strategies and monitoring plans should be part of the TMDL document. One aspect of implementation will be flow measurement. As stated in Appendix K, few flow measures are available, yet to comply with the TMDLs these will have to be made.

Response: Table 4-2 has been modified for clarity. The San Diego Water Board recognizes that in all instances, final numeric targets for fecal coliform are greater than the numeric targets for total coliform, even though total coliform includes fecal coliform. This is because the final targets are based on WQOs associated with SHELL, and SHELL only applies to total coliform. Final targets for fecal coliform are associated with REC-1.

Since the Technical Report was made available to the peer reviewers on February 7, 2005, the San Diego Water Board, in consultation with the Stakeholder Advisory Group, has developed an Implementation Plan that outlines the strategy for achieving compliance with WLAs developed in the technical analysis. The TMDLs will be implemented primarily by reissuing or revising the existing NPDES requirements for MS4 discharges to include WQBELs that are consistent with the assumptions and requirements of the bacteria WLAs for MS4 discharges. The process for

issuance of NPDES requirements is distinct from the TMDL process, and is described in section 11.5.1. WQBELs for municipal stormwater discharges can be either numeric or non-numeric. Non-numeric WQBELs typically are a program of expanded or better-tailored BMPs and submission of annual water quality monitoring reports. Reporting shall continue until the bacteria WQOs are attained and maintained in impaired beaches and creeks.

(b) Is the scientific portion of the proposed rule based upon sound scientific knowledge, methods and practice?

Comment: In Appendix C-1, a small editorial recommendation is to remove the word "species" from the first line of page C-1. This is because "total coliform" and "fecal coliform" are empirically-defined groups of bacteria and are not "species" per se. While many taxonomic groups make up the total and fecal coliform, these indicator organism classifications are not derived from any accepted taxonomy.

Overall, it is great to see the development of and use of simulation tools for modeling bacterial discharge under two seasonal regimes as the basis for TMDL development. However, as with all TMDLs, there is a need to demonstrate a relationship between indicator bacteria and threat to swimmers and fishers. Increasingly, DNA-based metrics of human-waste associated *Bacteriodes* or *Enterococcus* are used to make a more robust link between the presence of bacteria in coastal waters and the presence of human waste. Better yet, these methods are increasingly becoming quantitative with the availability of real-time or quantitative polymerase chain reaction (QPCR). At the time of this review, there is a reasonable amount of evidence in the peer-reviewed scientific literature that DNA-based markers of human waste can be used to more definitively understand the presence of human waste. At the very least, new TMDL programs, as part of the monitoring portion of implementation, should strive to gather a better understanding of the real presence of human waste using DNA-based evidence from sampling and analysis in conjunction of standard indicator organism assays.

Response: The word "species" has been removed from the first line of page C-1.

The San Diego Water Board agrees that there is a need to demonstrate a relationship between indicator bacteria and threat to swimmers and fishers, and that this is an area of uncertainty. Furthermore the San Diego Water Board recognizes that there is an increasing amount of research being done to establish this link using innovative methods.

The required monitoring portions described in the Implementation Plan consist of monitoring for indicator bacteria. As part of source identification, responsible persons can monitor for DNA markers, or use other innovative methods as appropriate.

Comments from Professor Nelson

Comment: My overall assessment is that the approach used to determine interim TMDLs is technically sound, with the exception of the concerns raised below regarding the dry-weather model. I believe that implementation of the Interim TMDLs will result in a significant improvement in water quality, and is far preferable to postponing action until remaining sources of uncertainty can be addressed. However, there is an opportunity to learn more about the fundamental processes that contribute fecal indicator bacteria to the surface waters in the San Diego region through the monitoring that will be required to document compliance with Interim (and Final) TMDLs. I strongly recommend that the San Diego Water Board, in preparing the Implementation Plan, ensure that the monitoring data are collected in a manner that maximizes the amount of information that can be learned, including gaining more insight into the fundamental source, fate, and transport processes.

Response: Comment noted. The San Diego Water Board agrees that insight into the sources, fate, and transport processes for bacteria is valuable for designing strategies for abatement. The Implementation Plan outlines monitoring efforts that will be required from responsible persons, including receiving water monitoring and identification of bacteria sources.

1. Use of land use composition to quantify bacteria sources from all watersheds to affected beaches and creeks in the San Diego Region.

Comment: This is a reasonable approach.

Response: Comment noted.

2. **Use of wet weather model to simulate fate and transport of bacteria, and to calculate TMDLs, to affected beaches and creeks**.

Comment: In general, the approach used for the wet weather model seems reasonable given the limited existing data. The method for calibrating and validating the model is presented well. Although the model results agreed fairly well with the observed concentration for the high flows (especially above 60 percent unit area flow, as reported in Appendix N Figures 12-25), at low flows the model often underestimated the concentrations. In the text on p. J-11 it is stated that these flows may be better modeled as dry flows. However, since the flow on these days was defined as a wet flow, it is not clear to me that these loadings are being appropriately incorporated into the TMDLs. It may be necessary to redefine the classification of wet flows. In addition, as the science describing the sources of fecal pollution and their transport mechanisms improves, the model will need to be improved and TMDLs reevaluated. For example, the resuspension and erosion of sediments in water channels during storm events may be an important source of indicator bacteria that is not accounted for in the current model.

Specific comments on Appendix J:

a. (p.J-4) Please provide a table of the percent (%) impervious for each land-use category.

b. (p.J-6) I don't believe atmospheric deposition of fecal indicator bacteria is a potential source, unless you mean deposition from birds.

c. (p.J-12) I would not characterize the model and observed data as "extremely" well. I would say "fairly" well.

Additional comments on Appendix M:

d. It is difficult to see the curves for the observed and modeled daily rainfall on the calibration and validation graphs because the peaks are so sharp and the lines so thin. Since this graph is the only one presented for the validation, I suggest changing it to monthly rainfall rather than daily rainfall (as was done for the calibration).

e. The legend for the validation curves is incorrect (states monthly instead of daily rainfall).

Response: Wet and dry periods were identical to San Diego County Department of Environmental Health's General Advisory to avoid contact with ocean and bay water within 300 feet on either side of any storm drain, river, or lagoon outlet, and the timeframes for these advisories are designated as 72 hours after 0.2 inch or more of rain. For each watershed, rainfall data from the nearest rain gage was analyzed for identification of wet and dry days based on these criteria. The general nature of this approach may have resulted in selection of wet days that are not representative of wet conditions. This was shown in calibration results that illustrated under-prediction of bacteria concentrations during lower flow ranges that were categorized, based on the methodology above, as wet conditions. However, the impact of this under-prediction is minimal on overall wet-weather TMDL calculations because the required load reductions were dominated by higher flow conditions (loadings during wet weather were multiple orders of magnitude above dry - see Appendices O and P). If better methods are determined for defining criteria for selection of wet and dry conditions impacting beaches and creeks, the TMDLs can be reevaluated in the future.

The San Diego Water Board agrees that an improved understanding of bacteria sources and transport from the watersheds may require future updates of the wet-weather model and reevaluation of TMDLs. The association of bacteria to sediments in the stream channels and processes of settling and resuspension are important considerations, and the LSPC model includes capabilities for simulation of these processes if data becomes available to define modeling assumptions or facilitate model calibration.

Specific comments addressed in Appendices J and M were as follows:

a. Table J-2 was added to Appendix J that lists percent imperviousness for each of the urban land uses, based on assumptions from the National Resources Conservation Service's (formerly known as the Soil Conservation Service) TR-55 manual.

b. The San Diego Water Board agrees that atmospheric deposition is not a potential source of bacteria. This discussion was removed from the text on page J-6 of Appendix J.

c. The text on page J-12 of Appendix J was changed to state that the model and observed data matched "fairly" instead of "extremely" well.

d & e. All daily hydrology calibration and validation results reported in Appendix M show daily rainfall, although the plots were mislabeled as "Avg Monthly Rainfall." The plots were edited to correctly label rainfall as "Daily Rainfall." Daily results are more appropriate for these plots so that impacts on daily flows can be observed. Monthly rainfall would not show this relationship with the same resolution as daily results.

3. Selection of a Los Angeles watershed as a "reference" for background loading of bacteria in the San Diego Region during wet weather.

Comment: Given that sufficient data do not exist for a reference watershed in the San Diego Region, it is reasonable to use a reference watershed in Los Angeles. However, the Implementation Plan should require that one or more appropriate reference watersheds are identified and characterized for the San Diego region, and that these data are used to determine the final TMDLs.

Response: The San Diego Water Board agrees that an appropriate reference watershed(s) should be identified and characterized in the San Diego Region. The San Diego Water Board is actively participating in a workgroup chaired by the Southern California Coastal Water Research Project (SCCWRP) that has completed a study to characterize reference systems for bacteria in southern California. A reference system was defined in the study as a beach and upstream watershed consisting of at least 95 percent undeveloped land. Because the reference systems consist almost entirely of undeveloped land, the bacteria washed down to the beach come from natural, nonanthropogenic sources. Measurements during the 2004-2005 winter season showed that in four reference systems (two in Los Angeles County, one in Orange County, and one in San Diego County), 27 percent of all samples collected within 24 hours of rainfall exceeded water quality thresholds for at least one indicator (i.e. a single sample WQO was exceeded 27 percent of the time due to nonanthropogenic sources within 24 hours of rainfall) (Schiff et al., 2005). This is higher than the 22 percent found at the Arroyo Sequit watershed in Los Angeles, which was used to calculate interim TMDLs discussed in section 4.1. The Arroyo Sequit watershed is one of the four reference watersheds included in this study.

The reference system approach is designed to account for bacteria loading from natural sources. This approach assumes that the natural processes that generate bacteria loads in a reference system, such as bacteria regrowth on beach wrack,[2] resuspension from disturbed sediment, and direct deposition of bird and mammal feces in water, also occurs in the urbanized watershed and downstream beach. The frequency of exceedance of single sample bacteria WQOs from natural

[2] Wrack consists of seaweed, eel grass, kelp, and other marine vegetation that washes up on shore and accumulates at the high tide line. The "wrack line" is essentially the high tide line.

sources can be measured in reference systems, and applied in urbanized watersheds. As discussed in section 4, dischargers are not required to reduce bacteria loads from these and other natural sources to achieve TMDLs.

As written, this TMDL project requires attainment of both interim TMDLs, which incorporate the reference system approach, and final TMDLs, which adhere to WQOs as currently written in the Basin Plan. A Basin Plan amendment to authorize the reference system approach for implementing single sample bacteria WQOs is required to avoid the need to attain the final TMDLs. The San Diego Water Board will investigate and process the proposed reference system Basin Plan amendment in accordance with local priorities and resources. After this Basin Plan amendment is adopted, TMDLs included in this project can be re-calculated to reflect an appropriate exceedance frequency.

4. Use of single-sample maximum objectives for wet weather numeric targets.
Comment: The use of single-sample maximums for the wet weather targets is a reasonable approach.

Response: Comment noted.

5. Reasonableness of assumptions (described in Appendix L) for wet weather modeling.
Comment: The assumptions are reasonable, except please clarify that the first-order die-off rate is an "apparent" rate, not an actual rate.

Response: The first order die-off assumed in the wet-weather model was an "apparent" rate assumed based on model sensitivity analyses performed in similar studies in Southern California.

6. Use of wet weather modeling parameters to simulate build-up/wash-off of bacteria from a similar study in Los Angeles (Los Angeles Water Board, 2002).
Comment: The use of data from L.A. is reasonable given that no local data exist. However, the starting values taken from the Los Angeles Water Board should be reported in Appendix J, or in a separate Appendix.

Response: Comment noted. The values for the modeling parameters have been incorporated into Appendix J.

7. Use of dry weather model to simulate fate and transport of bacteria, and to calculate TMDLs, to affected beaches and creeks.

Comment: The assumption of plug-flow hydraulics to describe the creek flows, and the empirical approach used to model the bacterial concentrations appears to be an acceptable approach given the limited data that are available. However, I have some significant concerns about how the empirical relationships were developed. Appendix K is poorly written, and it is possible that most of my concerns could be addressed if the methods were explained more clearly and in more detail.

Response: The comment regarding the clarity of Appendix K was noted. Appendix K was revised to more clearly explain the development of the dry weather model.

Comment continued: My specific concerns are the following (many of these items are interrelated):

a. Please number each of the equations.

Response: All equations were numbered.

b. Please explain how the functional form (linear, exponential, etc.) and best fit (quantitative or qualitative?) for each of the equations in Appendix K was determined. In particular, how were the multiplication factors (constants) determined in the equations on p. K-5 and K-6? In the equation on p. K-6, why isn't A (total watershed area) multiplied by the rest of the equation? It seems to me that the fecal coliform concentration should increase or decrease proportionally (although not necessarily linearly) with the watershed area.

Response: Additional explanation of the multivariable regression equations developed to estimate dry weather flows and fecal coliform concentration was provided in Section K.3 and K.4 of Appendix K. These discussions describe the method for regression analyses, the justification for structure of the equations, and tests performed for evaluation of statistical significance of variables.

c. How are infiltration and evaporation incorporated into the flow mass balance (equation at top of p. K-4)?

Response: Infiltration and evaporation are not included in the mass balance (equation 2) since this equation is specific to calculation of the bacterial concentration of the *inflow* to the reach (C_{in}) that includes local watershed drainage as well as upstream reach flows. The infiltration/evaporation assumptions only apply for calculation of the flow at the bottom of the reach (see added explanation in text). This flow at the bottom of the reach is then multiplied by the concentration determined by equation 1 for determination of the loading from the reach.

d. (p.K-3) My understanding is that in the model for bacterial loading, the loading for the drainage area for each segment is added at the bottom of that segment (which is the top of the next segment). If this is the case, it is a conservative approach, because the decay of any bacteria that actually enter the watershed upstream of that point is not considered. This assumption should be discussed, and its contribution to the "Margin of Safety" should also be stated.

Response: The commentor's definition of the watershed loading input to a stream reach is correct. Also correct is the comment that bacterial decay is not considered explicitly upstream of the point where a watershed is assumed to discharge to the reach. However, the "total area of watershed" variable in equation 7 is also implicitly representative of additional die-off that may occur in the watershed prior to discharge to the reach (see

added explanation in text). As a result, we consider the two bacterial die-off formulations to be acceptable and not overly conservative, and therefore not necessary to mention in the Margin of Safety.

e. I have some major concerns about how the empirical equations for the bacterial loadings and die-off rates were developed. It seems that first the Equation on p. K-6 was developed by regression analysis. Then, using the same data set, die-off rates were incorporated and their values adjusted until the "best fit" was achieved between the modeled and observed (geometric mean) values at each sampling station. Thus, the die-off rates are just accounting for the inability of the regression equation to describe the observed data. If this is the case, the die-off rates are just fitting parameters but there is no reason to believe that what is being modeled is actually die-off. Furthermore, I do not understand how the die-off rates for total coliform bacteria and enterococci were determined independently from the multiplication ratios (on p.K-7), nor how the regression equations were evaluated for best fit. For example, in Figure K-11 the results are presented for the calibrated enterococci model, but the observed concentrations are significantly lower than the modeled concentrations. Thus, it does not seem that the model was calibrated correctly. In addition, it is not clear to me what parameter would be adjusted to achieve a better fit – increase the die-off rate, or decrease the multiplication factor?

Response: Several stations used in development of the regression analysis for prediction of watershed of bacteria concentration (equation 7) and the calibration and validation of in-stream bacterial die-off were the same. As many stations as possible were used in the regression analysis due to a general lack of watershed data in the region and a need for a robust dataset to provide statistical significance. Effects of bacteria die-off that may be implicitly incorporated in the regression equations (e.g., negative correlation of bacteria concentration to watershed size suggests effects of bacteria die-off in equation 7) were not considered duplicated in the reach assumptions. Model configuration of multiple subwatersheds and reaches differed from single representative watersheds used in regression analyses, and required incorporation of assumptions for reach infiltration and bacterial die-off to account for losses occurring during transport. Each model subwatershed used the regression equations to estimate flow and bacterial concentration that were routed through a network of stream reaches that ultimately met locations corresponding to monitoring stations used for calibration. However, watersheds used for regression analyses represented a single watershed for the same area, with no stream routing. Hence, the die-off rates developed for the reaches were not consistent with errors associated with regression equations applied to the entire watershed without reach routing and losses considered. To further prove the independence of the calibration procedure from the regression analyses, data from five additional in-stream monitoring stations that were not used for regression analyses were also used for calibration. Bacterial die-off rates were also validated for fifteen stations on Tecolote Creek and San Juan Creek, of which eight of these stations were not used in development of the regression equation 7.

The process for calibration of die-off rates for total coliform and enterococci were

consistent with the procedure used for fecal coliform. The die-off rates were calibrated to minimize the difference between observed in-stream bacteria levels and model predictions. Upon review of Figure K.11 that showed calibration results for the enterococci die-off rate, an error in the plot was discovered that resulted in depiction of modeled concentrations that were higher than those actually modeled. (All other calibration and validation plots were correct). The plot was fixed and replaced in the text. The modeled enterococci concentrations were well within the ranges of observed concentrations.

f. Other limitations to the empirical approach are evidenced by the fact that equations relating total coliform bacteria and enterococcus concentrations to land use could not be developed. I expect that the use of multipliers to determine the concentrations of these indicators as a function of fecal coliform concentrations is a major source of error in the model, because different sources of fecal waste may have different ratios; furthermore, the rates of removal and inactivation in the environment may differ for the different bacteria. The variation in the fecal coliform: enterococci ratio is expected to be particularly large, since it is known to range from a ratio of less than one in human waste to greater than 40 in some animals wastes. Thus, although there was fairly good agreement for the creek segments used to validate the model, I expect these assumptions to introduce significant amount of error for other creek segments (those that were not used for model calibration.)

Response: The San Diego Water Board agrees that there are limitations to the empirical approach that are evidenced by the inability to derive equations for total coliform and enterococci as a function of land use. Furthermore, the method for prediction of total coliform and enterococci based on fecal coliform introduces additional potential error in the technical approach. However, the San Diego Water Board feels that given the limited data in the region to define dry weather loading, and the proven ability of the model to calibrate and validate fairly well to data in multiple watersheds representative of environments in the north and south of the region, the empirical methods are sufficient for calculation of TMDLs. However, as more data are collected in the watersheds in the region, the empirical methods can be refined, retested, or even substituted with more robust methods developed through further study.

g. Some of my concerns with the empirical approach used to develop the equation on p.K-6 may be addressed if the explanation was better. Section K.4 needs significant improvement:
   i. In addition to the number of sampling stations for each Creek, please also report the number of samples for each station.
   ii. Clearly large data sets are better than small data sets, but was the number of samples at each station taken into account for the regression analysis? Was the data from some stations not used?
   iii. How is it known that 40 data points is enough to adequately represent the range of conditions at one sampling station?
   iv. Please explain exactly how the regression analysis was performed. How did the regression analysis of the data at each station result in the final equation?

Response: Tables K-1 and K-2 were added to the text to list the monitoring stations and number of measurements available for calculation of the average flows and geometric mean of indicator bacteria concentrations used in development of the regression equations.

Large datasets were preferred in the analyses of indicator bacteria data, but were not "required" as the original text had mistakenly reported. Many of the stations in the Aliso Creek study had 40 measurements for analyses. The number of measurements at stations in the other creeks varied. No criteria were developed for selection of stations based on the number of samples for representative geometric mean calculations. Rather, station selection included qualitative evaluation for consideration in the analyses. Specific stations of Rose Creek, Tecolote Creek, and San Juan Creek were selected for analyses even though few samples were available at these locations for geometric mean calculations. These stations were selected for multiple reasons, including the relatively low indicator bacteria concentrations observed (see Figure K-4), strategic locations of watersheds to provide an expanded spatial coverage for analyses, size of the watershed, or representation of key land uses. Since some of these stations were representative of subwatershed runoff that is less urban than other locations in the Aliso Creek watershed, and geometric means of concentrations were less than those for more urban areas, their inclusion in the analyses was determined useful regardless of the smaller datasets. Use of these lower concentrations also expands the applicability of regression equations for prediction of concentrations that fall within the range of values used in their development.

The accuracy of the regression equation 7 appears to be impacted by the amount of data used in the geometric mean calculation. It is evident from results shown in Figure K-4 that the model performs better for those stations that had many data points for geometric mean calculation. Prediction of lower concentrations for San Juan Creek, Rose Creek, and Tecolote Creek were less accurate, although the equation successfully predicted concentrations lower than what was observed in Aliso Creek. So, the general trend was captured for lower concentration ranges (based on geometric means of smaller datasets), but the exactness of the equation could be improved or evaluated better if more data was available at these stations.

Some stations were not used in the analyses because there was no information regarding the subwatershed draining to the station location (particularly in Aliso Creek that had many small, urbanized subwatersheds). Other stations were within the creek mainstem and were reserved for calibration or validation of the model's reach formulations. Other stations had no data.

Section K.4 was expanded to improve explanation of the method for regression analyses and how the final variables and associated coefficients were developed for equation 7.

8. Use of data from Aliso, San Juan, Rose, and Tecolote Creeks to characterize dry weather source loading in the entire San Diego Region.

Comment:It is difficult to assess whether these three creeks are representative of the rest of the watersheds in terms of runoff and bacterial densities. I suggest including a paragraph with a short description of these three watersheds and a discussion of how they compare to others. In the Implementation Plan, a strategy should be outlined for incorporating data from additional watersheds into the development of final TMDLs.

Response: A short description of the watersheds and their relevant characteristics was added to section K.1.

In terms of implementation, see response to comment 3. The Regional Board anticipates development of final TMDLs that are based on exceedances frequencies calculated from additional reference watersheds.

9. Use of geometric mean objectives for dry weather numeric targets.

Comment: The use of the geometric mean seems to be an appropriate water quality objective if the assumption that dry weather concentrations are fairly constant is correct. However, if future monitoring efforts identify high episodic concentrations, this approach may need to be reevaluated because health impacts are likely to result from exposure to the high episodic concentrations, which may not be adequately represented (and therefore regulated) by geometric means.

Response: The San Diego Water Board recognizes that dry weather concentrations are not constant and are likely to vary significantly during a 30-day period. However, accounting for this variability in TMDL calculation has proven to be complex due to difficulty in predicting the variability for watersheds where data are limited. Therefore, the San Diego Water Board believes that the method used in this prediction of bacteria loads for this TMDL analysis is adequate. As more data are collected to provide further study and development of improved methods for estimation of bacteria loading, TMDL calculations can be revisited in the future.

10. Reasonableness of assumptions (described in Appendix L) for dry weather modeling.

Comment: Most of the assumptions are reasonable, except:

a. Please clarify that the first-order die-off rate is an “apparent” rate, not an actual rate. Also, I agree that given the lack of data on the occurrence of bacterial regrowth in the Southern California region, it is not possible include regrowth in the model for dry weather flows. However, regrowth has been demonstrated in tidally-influenced river sediments in Florida (e.g. Desmarais, T. R., Solo-Gabriele, H. M., and Palmer, C. J. 2002. "Influence of soil on fecal indicator organisms in a tidally influenced subtropical environment." Applied and Environmental Microbiology, 68(3), 1165-1172.) Thus, regrowth should be recognized as a potential source of error, and should regrowth be documented in the region in the future, it may need to be incorporated into the modeling framework.

b. There is a typographical error in the "regrowth" assumption – it says "wet" instead of "dry".

Response: The first order die-off assumed in the wet weather model was an "apparent" rate assumed based on model sensitivity analyses performed in similar studies in Southern California. The San Diego Water Board recognizes that other factors such as bacteria regrowth may play a role in impaired streams, but presently there are no data to verify or quantify these factors. Therefore, the apparent rate of bacteria die-off may be representative of multiple factors that ultimately result in a net loss in bacteria over time. Should regrowth be documented and quantified in the future, model assumptions for re-growth and die-off can be redefined and TMDLs can be revised.

The typographical error has been corrected.

11. Location of critical points for TMDL calculation.

Comment: The location of the critical points is appropriate.

Response: Comment noted.

12. Use of conservative assumptions to comprise an implicit Margin of Safety.

Comment: The use of conservative assumptions rather than an explicit Margin of Safety is appropriate. Also see comment 7d above.

Response: Comment noted.

***Editorial Comment*:** Several of the references to Appendices, Tables and Figures were incorrect, as documented below. (The entire document should be checked).

- (p.7) Reference to Appendix G is incorrect (should be Appendix H?)
- (p.K-2) Reference to Sections J.2.2. and J.2.3. incorrect?
- (p.K-13) Should be Figures K-13 through K-15 (not J)
- (p.J-10) Should be Tables J-3 through J-5 (not F-3 through F-5)
- (p.J-11) Should be Tables J-3 through J-5 (not F-3 through F-5)
- (p.L-1) Should be Appendices J, M and N (not J, O and P)

Response: Comment noted. The Technical Report has been modified to correct the text, as noted above, and the entire report checked for consistency.

Appendix B

Tentative Resolution
And Draft Basin Plan Amendment

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Please see

Tentative Resolution No. R9-2010-0001

and

Attachment A to Tentative Resolution No. R9-2010-0001

(dated November 25, 2009)

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APPENDIX C

WHAT ARE INDICATOR BACTERIA?

Indicator bacteria are surrogates used to measure the potential presence of fecal material and associated fecal pathogens. Indicator bacteria such as fecal coliform and enterococcus are part of the intestinal flora of warm-blooded animals.

Indicator organisms have been long used to protect bathers from illnesses that may be contracted from recreational activities in surface waters contaminated by fecal pollution. These organisms often do not cause illness directly, but have demonstrated characteristics that make them good indicators of harmful pathogens in waterbodies. A direct link has been established between human illness and recreating near the outfalls of urban storm drains (San Diego Water Board, 2001, and 2002a).

Microorganisms are ubiquitous in all terrestrial and aquatic ecosystems. Of the vast number of species, only a small subset are human pathogens, capable of causing varying degrees of illness in humans. The source of these harmful organisms is usually the feces or other wastes of humans and various warm-blooded animals. The pathogens most commonly identified and associated with waterborne diseases can be grouped into the three general categories: bacteria, viruses and protozoa.

The detection and enumeration of all pathogens of concern is impractical in most circumstances due to the potential for many different pathogens to reside in a single waterbody, lack of readily available and affordable methods of detection, and the variation in pathogen concentrations. The use of indicators provides a means to ascertain the likelihood that human pathogens may be present in recreational waters.

More information on indicator bacteria and USEPA guidance for implementation of water quality criteria can be found at:

http://www.epa.gov/waterscience/criteria/bacteria/

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Appendix D

Bacteria-Impaired Waterbodies Addressed in the TMDLs
(Based on the 2002 Clean Water Act Section 303(d) List)

Beach Shoreline Listings (North to South)						
	Hydrologic Descriptor	**Waterbody[c]**	**Segment or Area[c]**	**Pollutant or Stressor[c]**	**Extent of Impairment[c]**	**Year Listed**
1	San Joaquin Hills HSA (901.11) & Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Dr. - Riviera Way	Bacteria Indicators[b]	0.6 miles	1998
			at Heisler Park – North			
2	San Joaquin Hills HSA (901.11) & Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	at Main Laguna Beach	Bacteria Indicators[b]	1.8 miles	1998
			Laguna Beach at Ocean Avenue			
			Laguna Beach at Laguna Avenue			
			Laguna Beach at Cleo Street			
			Arch Cove at Bluebird Canyon Road			
			Laguna Beach at Dumond Drive			
3	Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place/Blue Lagoon Place	Bacteria Indicators[b]	0.7 miles	1998
			at Aliso Beach			
4	Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	Bacteria Indicators[b]	1.9 miles	1998
			Aliso Beach at Table Rock Drive			
			1000 Steps Beach at Pacific Coast Hwy at Hospital (9th Ave)			
			at Salt Creek (large outlet)			
			Salt Creek Beach at Salt Creek service road			
			Salt Creek Beach at Dana Strand Road			
5	Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	At San Juan Creek beach	Bacteria Indicators[b]	1.2 miles	1998

Beach Shoreline Listings (North to South) (Cont'd)						
	Hydrologic Descriptor	**Waterbody[c]**	**Segment or Area[c]**	**Pollutant or Stressor[c]**	**Extent of Impairment[c]**	**Year Listed**
6	San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach (large outlet)	Bacteria Indicators[b]	3.4 miles	1998
			Ole Hanson Beach Club Beach at Pico Drain			
			San Clemente City Beach at El Portal Street Stairs			
			San Clemente City Beach at Mariposa Street			
			San Clemente City Beach at Linda Lane			
			San Clemente City Beach at South Linda Lane			
			San Clemente City Beach at Lifeguard Headquarters			
			Under San Clemente Municipal Pier			
			San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)			
			San Clemente State Beach at Riviera Beach			
			San Clemente State Beach at Cypress Shores			
7	San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	Bacteria Indicators[b]	0.4 miles	1998
8	Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline[a]	Torrey Pines State Beach at Del Mar (Anderson Canyon)	Bacteria Indicators[b]	0.4 miles	2002

Beach Shoreline Listings (North to South) (Cont'd)						
	Hydrologic Descriptor	**Waterbody[c]**	**Segment or Area[c]**	**Pollutant or Stressor[c]**	**Extent of Impairment[c]**	**Year Listed**
9	Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	Bacteria Indicators[b]	3.9 miles	1998
			La Jolla Shores Beach at Caminito Del Oro			
			La Jolla Shores Beach at Vallecitos			
			La Jolla Shores Beach at Ave de la Playa			
			at Casa Beach, Children's Pool			
			South Casa Beach at Coast Blvd.			
			Whispering Sands Beach at Ravina Street			
			Windansea Beach at Vista de la Playa			
			Windansea Beach at Bonair Street			
			Windansea Beach at Playa del Norte			
			Windansea Beach at Palomar Ave.			
			at Tourmaline Surf Park			
			Pacific Beach at Grand Ave.			

Creek Listings						
	Hydrologic Descriptor	**Waterbody[c]**	**Segment or Area[c]**	**Pollutant or Stressor[c]**	**Extent of Impairment[c]**	**Year Listed**
1	Aliso HSA (901.13)	Aliso Creek	See Footnote b	Enterococci, *E. coli*, Fecal Coliform	See footnote c	1998
2	Lower San Juan HSA (901.27)	San Juan Creek		Bacteria Indicators[b]	1 mile	1998
3	Tecolote HA (906.50)	Tecolote Creek		Bacteria Indicators[b]	6.6 miles	1998
4	Santee HSA (907.12)	Forrester Creek		Fecal coliform	lower 1 mile	2002
5	Mission San Diego HSA (907.11) & Santee HSA (907.12)	San Diego River, Lower		Fecal coliform	lower 6 miles	2002
6	Chollas HSA (908.22)	Chollas Creek		Bacteria Indicators[b]	1.2 miles	1998

Creek/Lagoon Mouths Listings						
	Hydrologic Descriptor	**Waterbody[c]**	**Segment or Area[c]**	**Pollutant or Stressor[c]**	**Extent of Impairment[c]**	**Year Listed**
1	Aliso HSA (901.13)	Aliso Creek	at creek mouth	Bacteria Indicators[c]	0.29 acres	1996
2	Lower San Juan HSA (901.27)	San Juan Creek	at creek mouth	Bacteria Indicators[c]	6.3 acres	1998
3	San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River Mouth	Bacteria Indicators[b]	0.49 miles	1996
4	San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon Mouth	Bacteria Indicators[b]	0.86 miles	1996
5	Mission San Diego HSA (907.11)	Pacific Ocean Shoreline	at San Diego River Mouth (aka Dog Beach)	Bacteria Indicators[b]	0.37 miles	1996

[a]In 1998 and previously, bacteria indicators implies that impairment was due to total coliforms, fecal coliforms, or both. In 2002 impairment may have also been caused by enterococci.
[b]The entire reach (7.2 miles) is listed for enterococci, *E. coli* and fecal coliforms. In addition, Aliso Hills Channel, English Canyon Creek, Dairy Fork Creek, Sulphur Creek, and Wood Canyon Creek are listed for enterococci and *E. coli*.
[c]Based on the 2002 Clean Water Act Section 303(d) List. Beginning with the 2008 303(d) List, specific beach segments of the Pacific Ocean shoreline are listed individually, and may not be identified in the same way as those segments listed in the table above. Several of the segments or areas in the list above have been delisted or redefined in the 2008 303(d) List. In addition, other segments or areas have been added to the Pacific Ocean shorelines listed above. The TMDLs that address the Pacific Ocean shorelines identified in the 2002 303(d) List are assumed to be applicable to all the beaches located on the shorelines of the hydrologic subareas (HSAs), hydrologic areas (HAs), and hydrologic units (HUs) listed above.

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Appendix E

Maps of Impaired Watersheds

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Maps of Impaired Watersheds

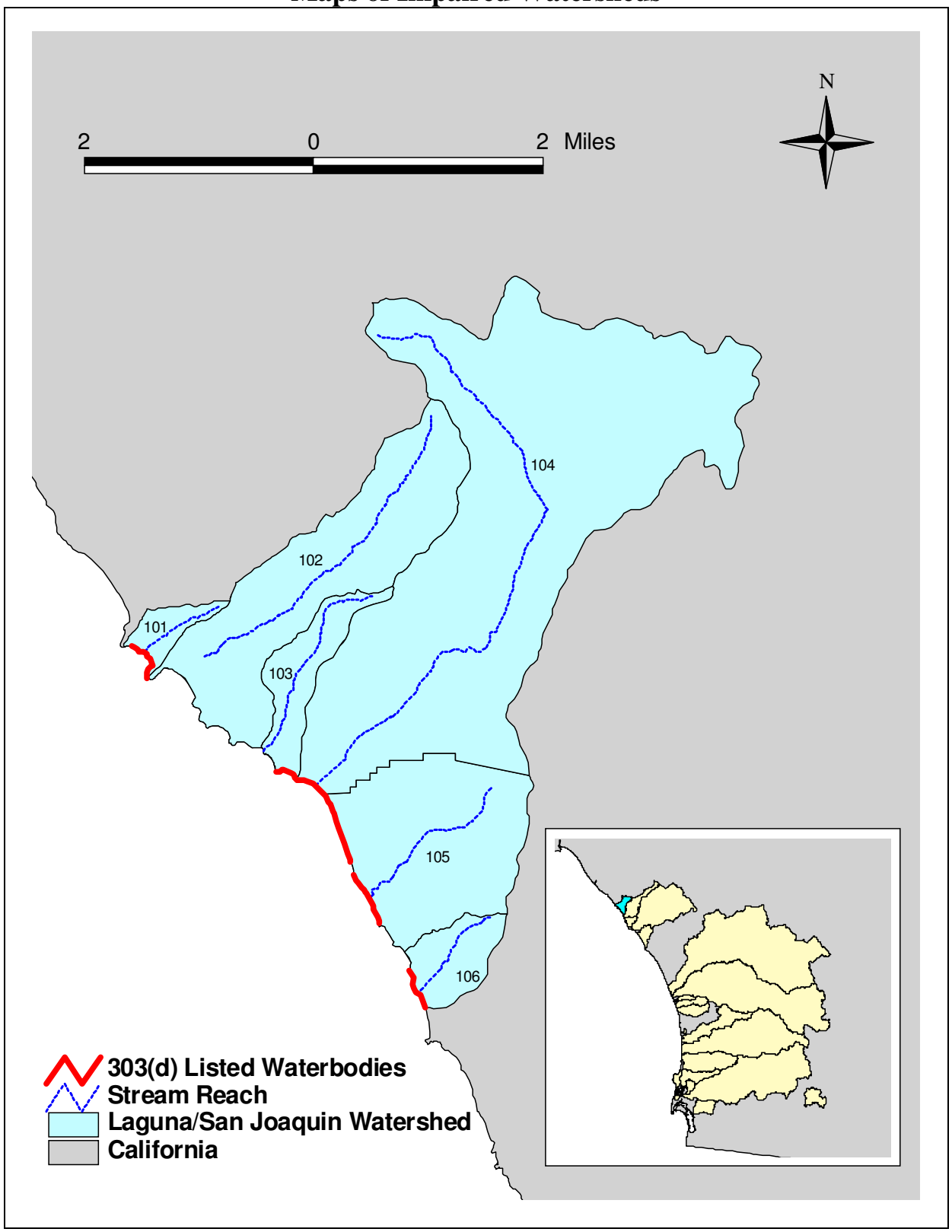

Figure E-1. San Joaquin HSA /Laguna Beach HSA Watershed

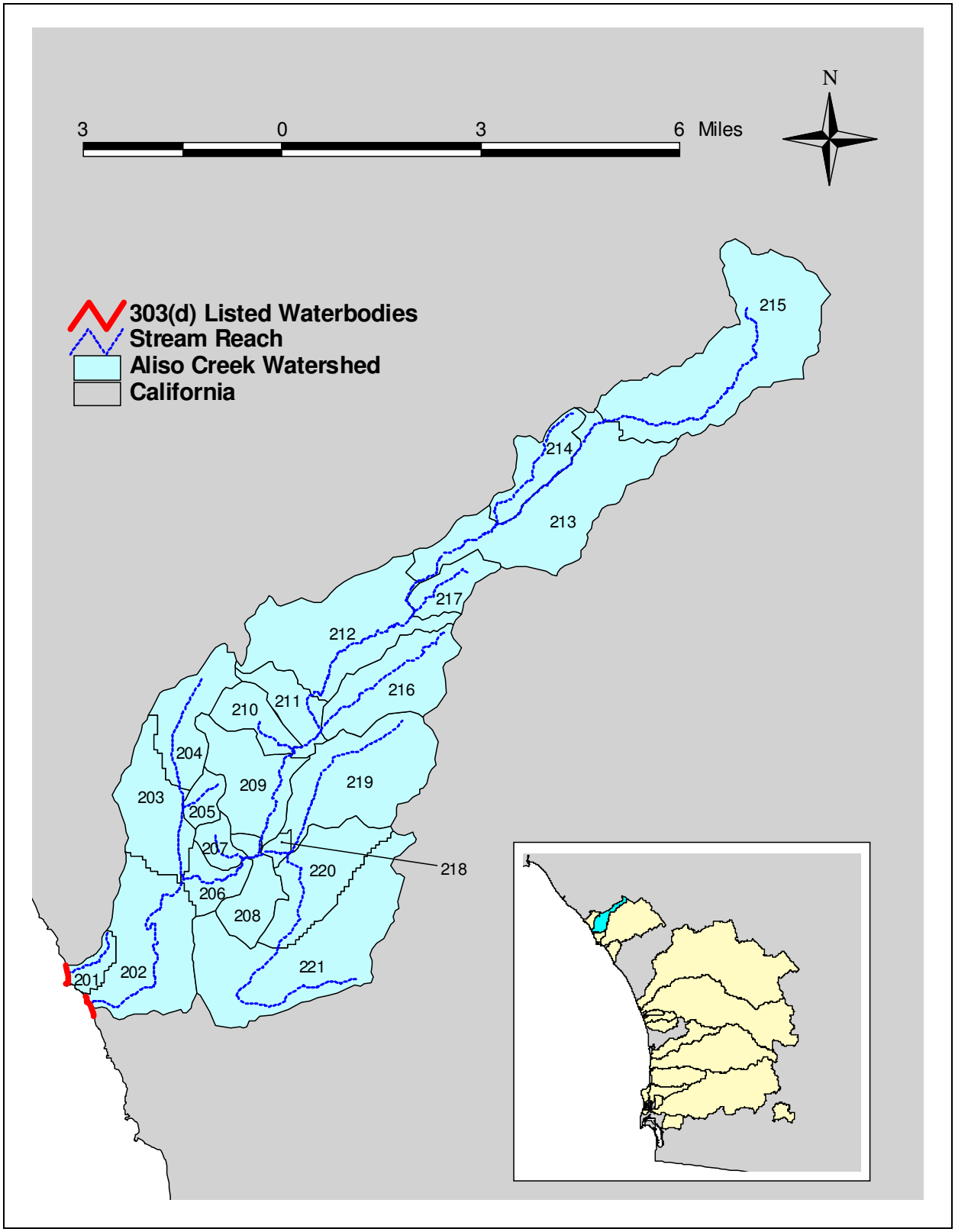

Figure E-2. Aliso HSA Watershed

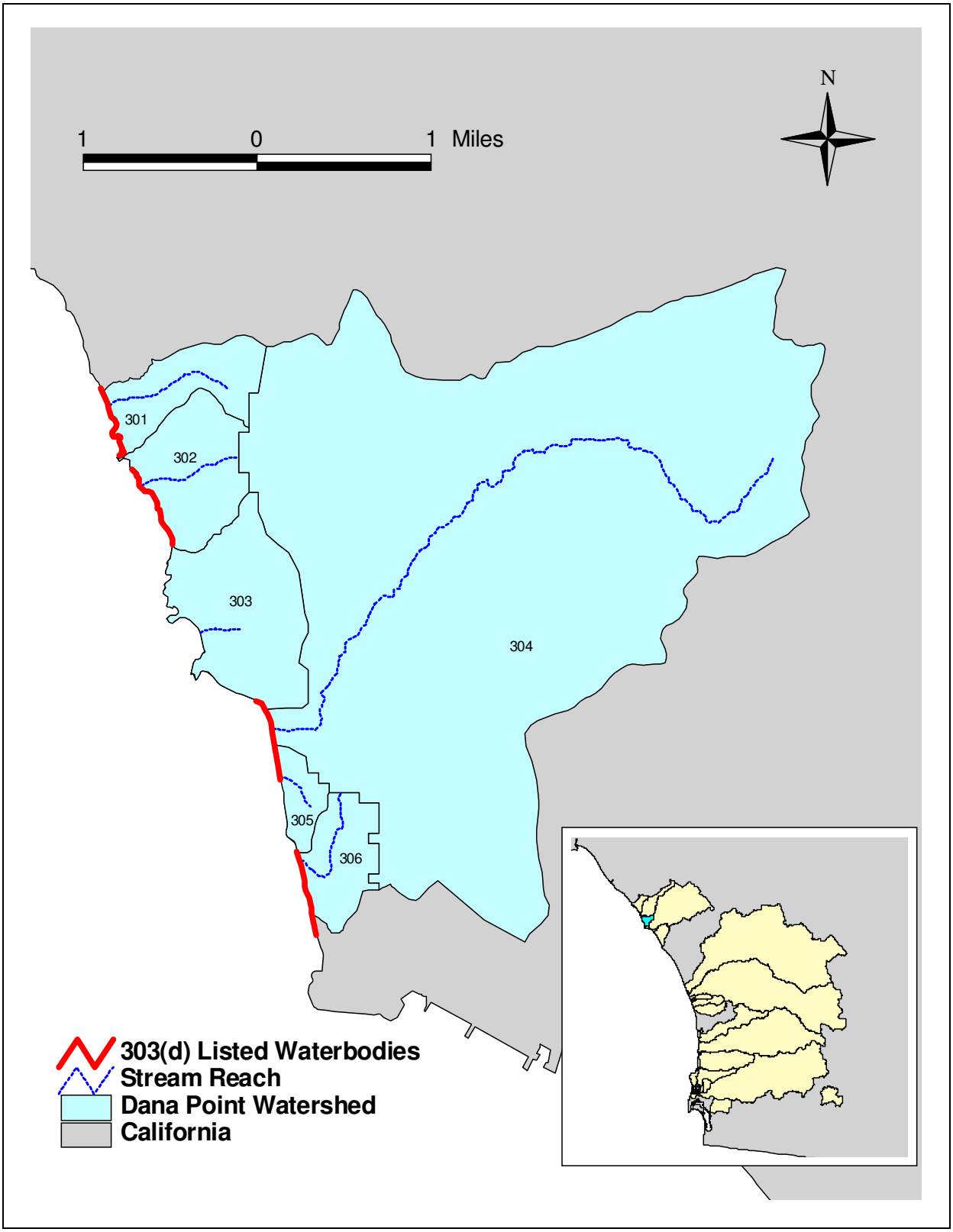

Figure E-3. Dana Point HSA Watershed

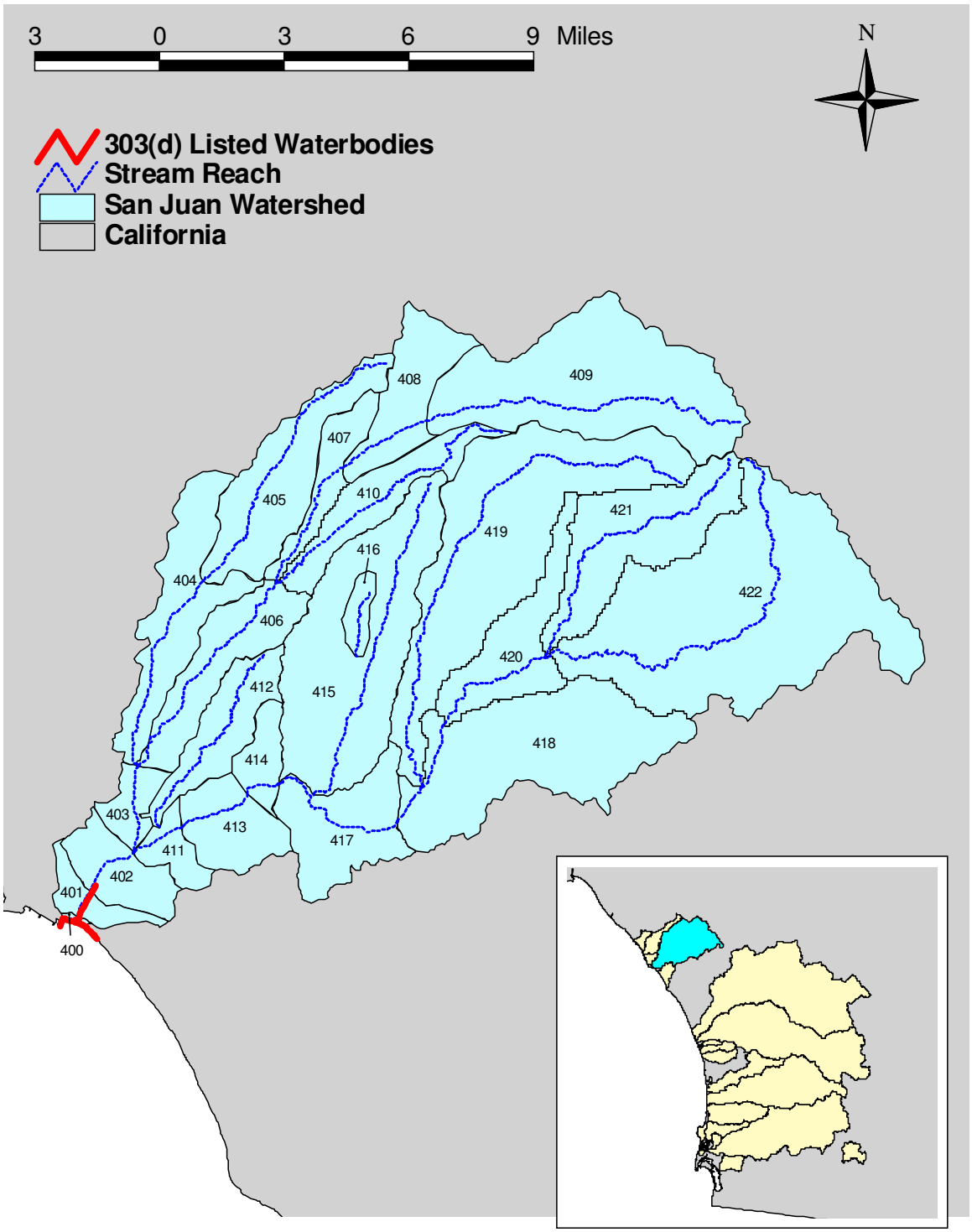

Figure E-4. Lower San Juan HSA Watershed

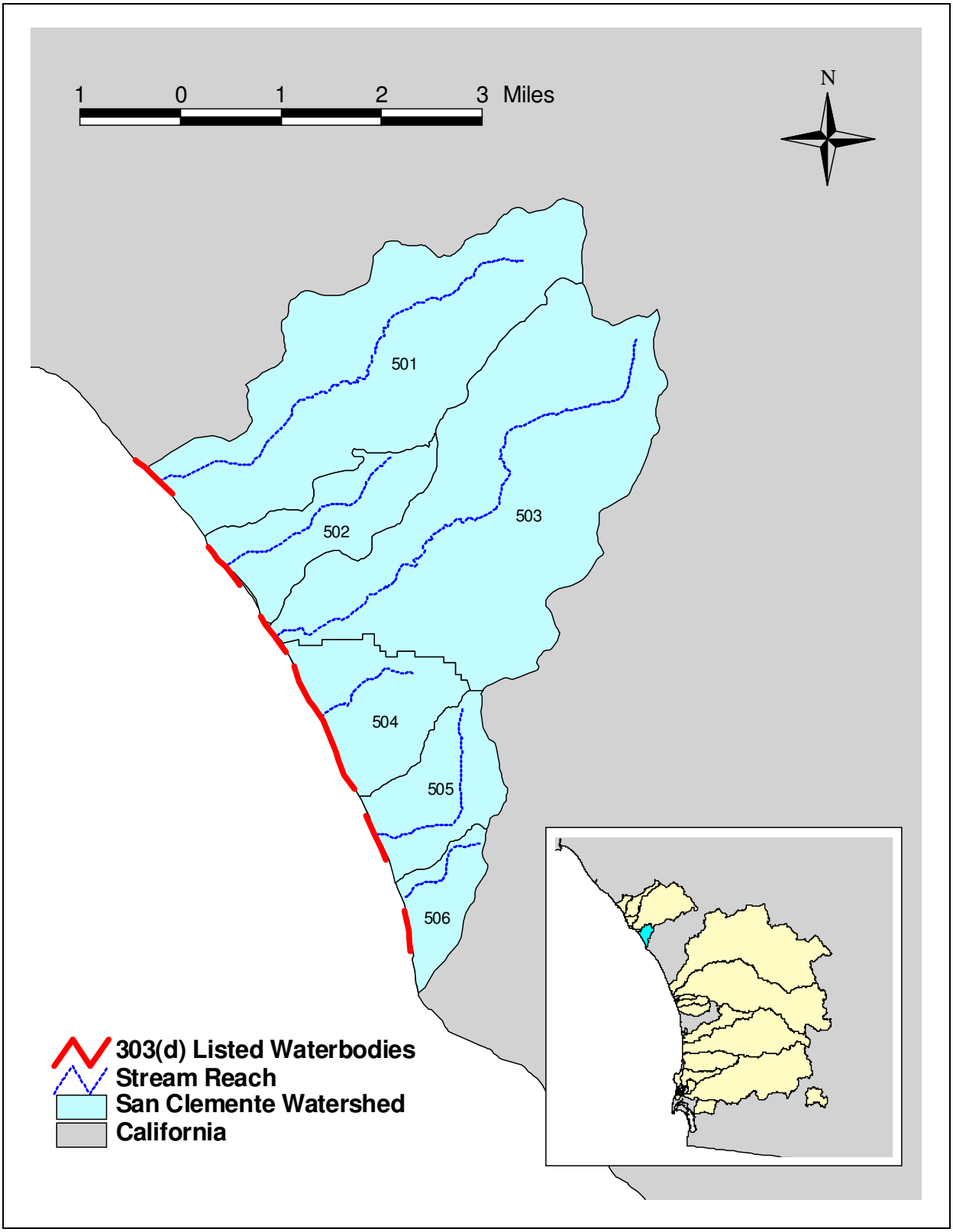

Figure E-5. San Clemente HA Watershed

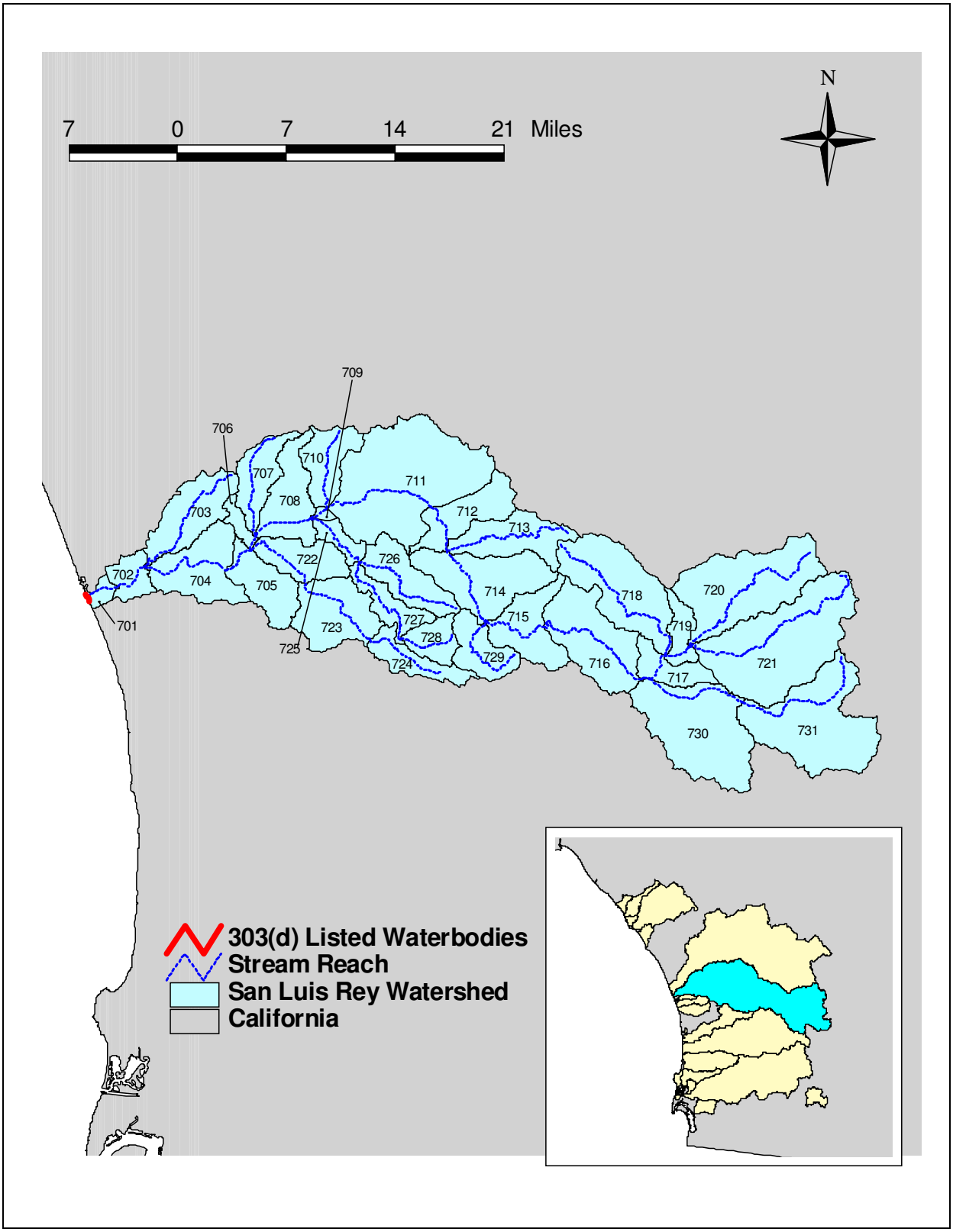

Figure E-6. San Luis Rey HU Watershed

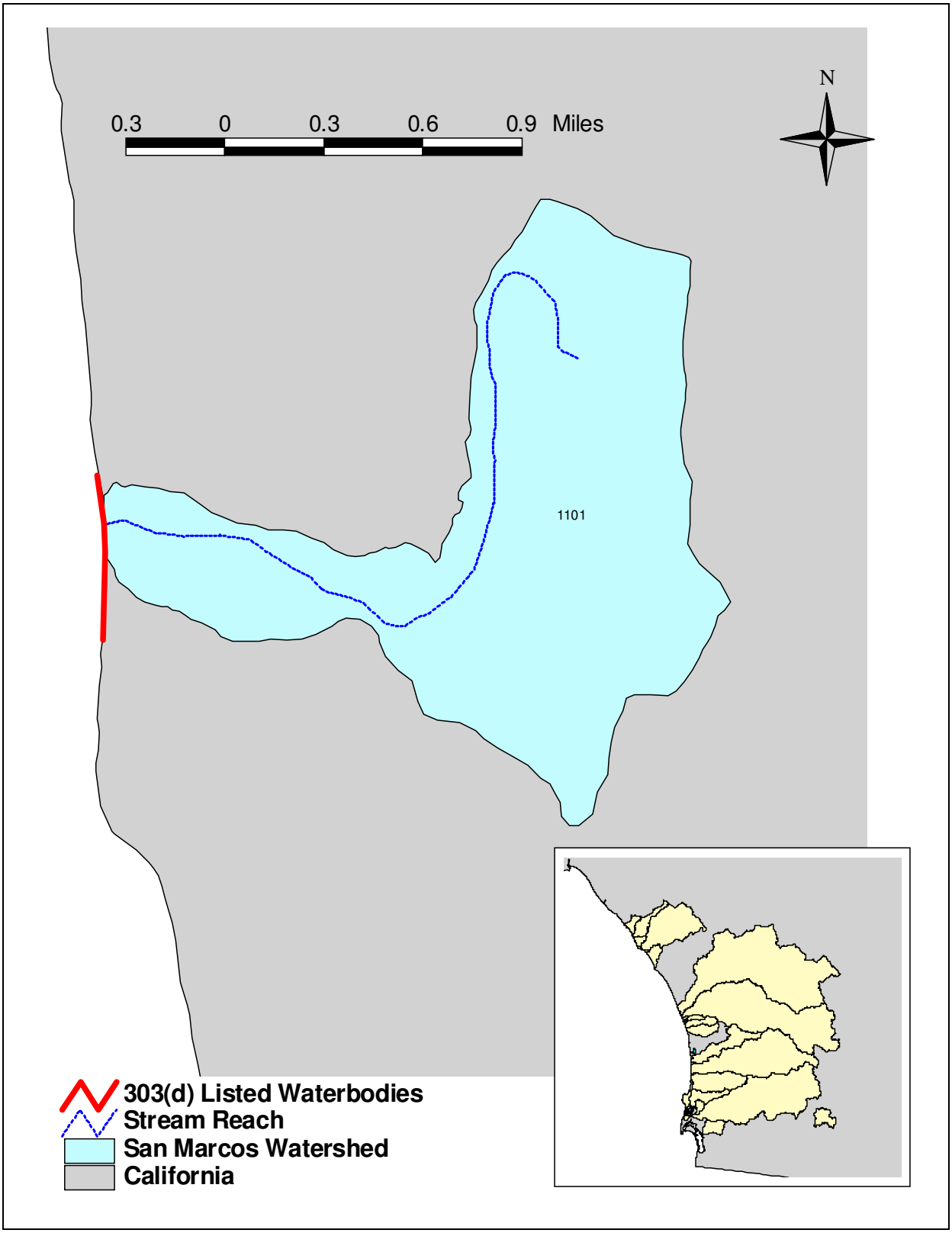

Figure E-7. San Marcos HA Watershed

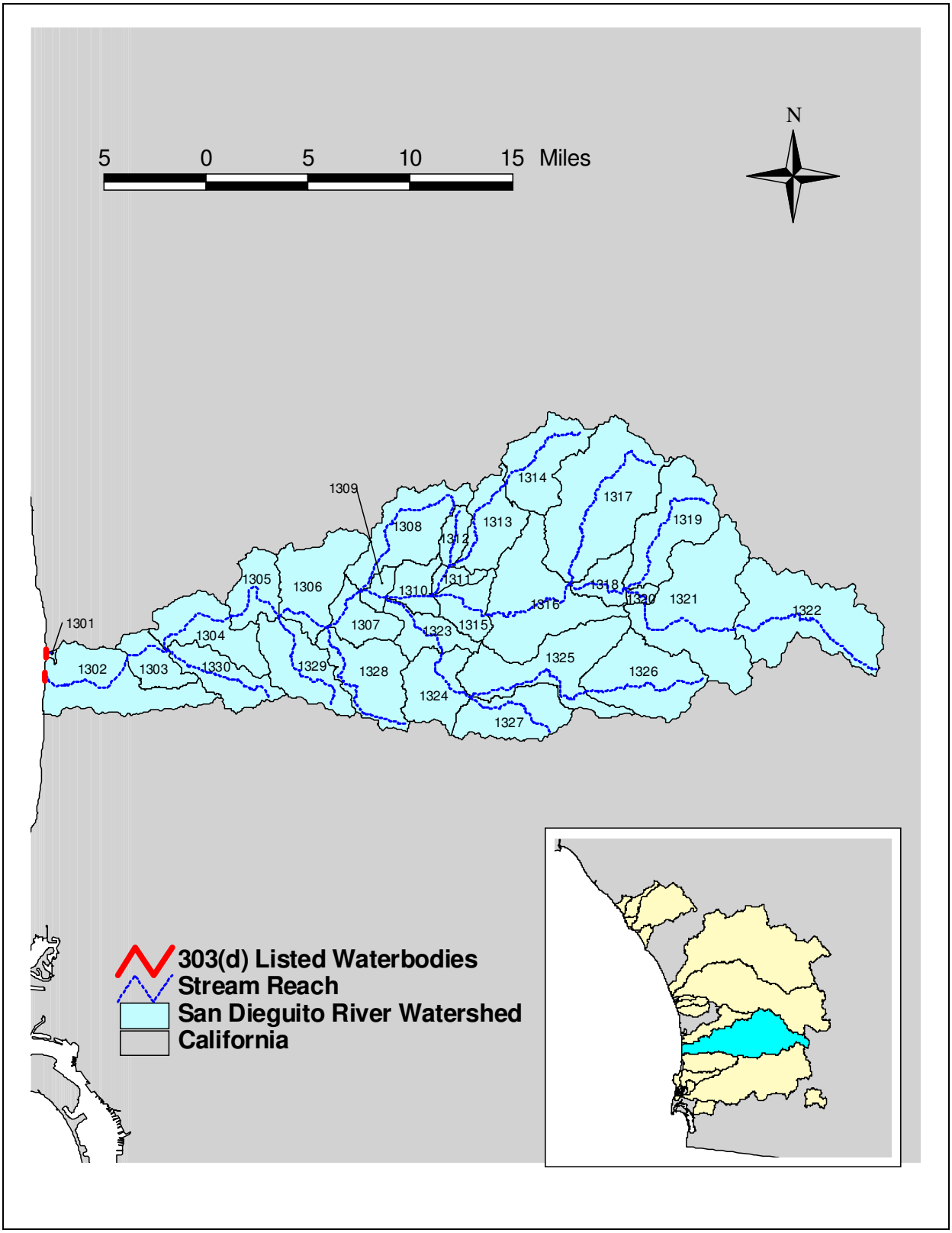

Figure E-8. San Dieguito HU Watershed

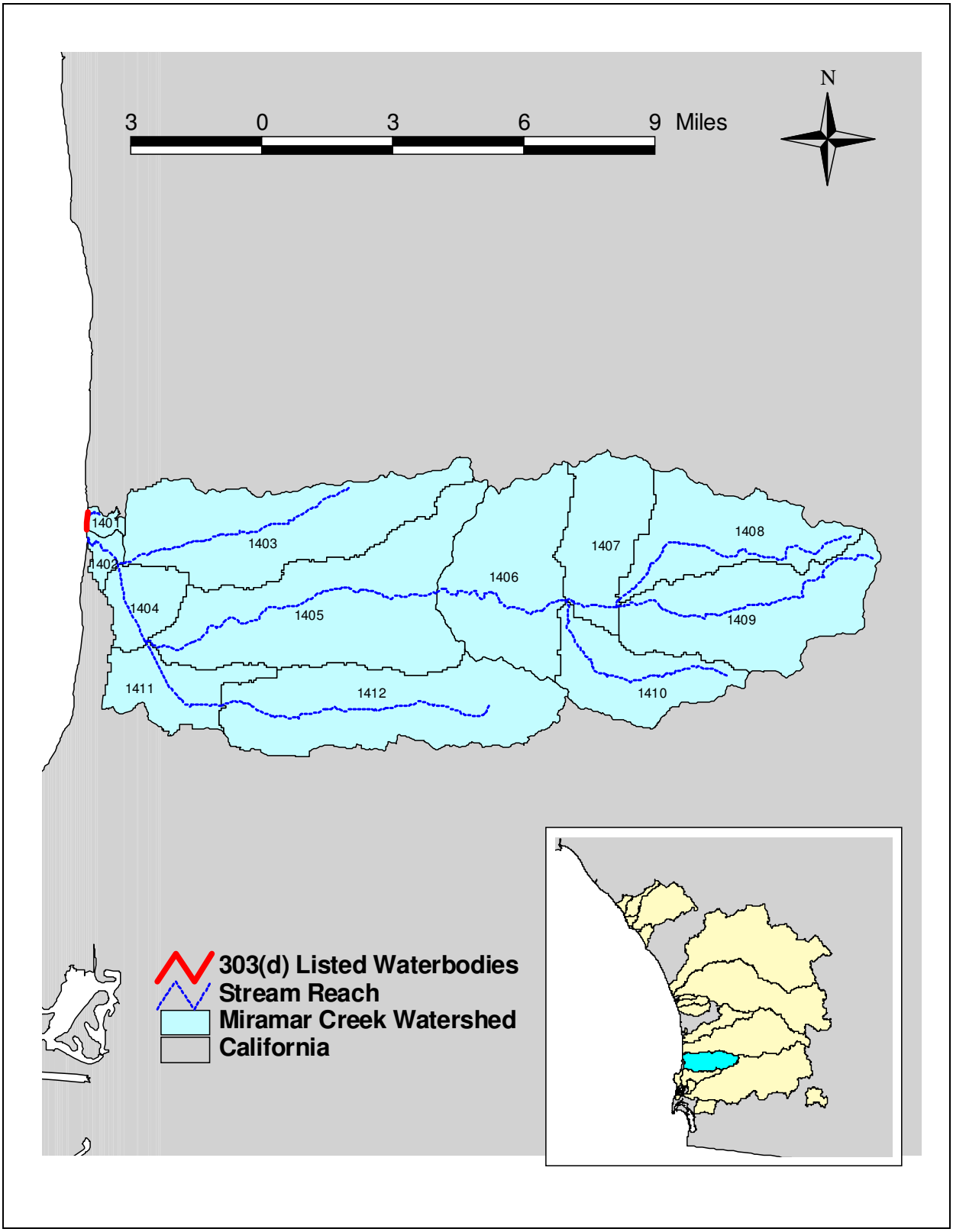

Figure E-9. Miramar Reservoir HA Watershed

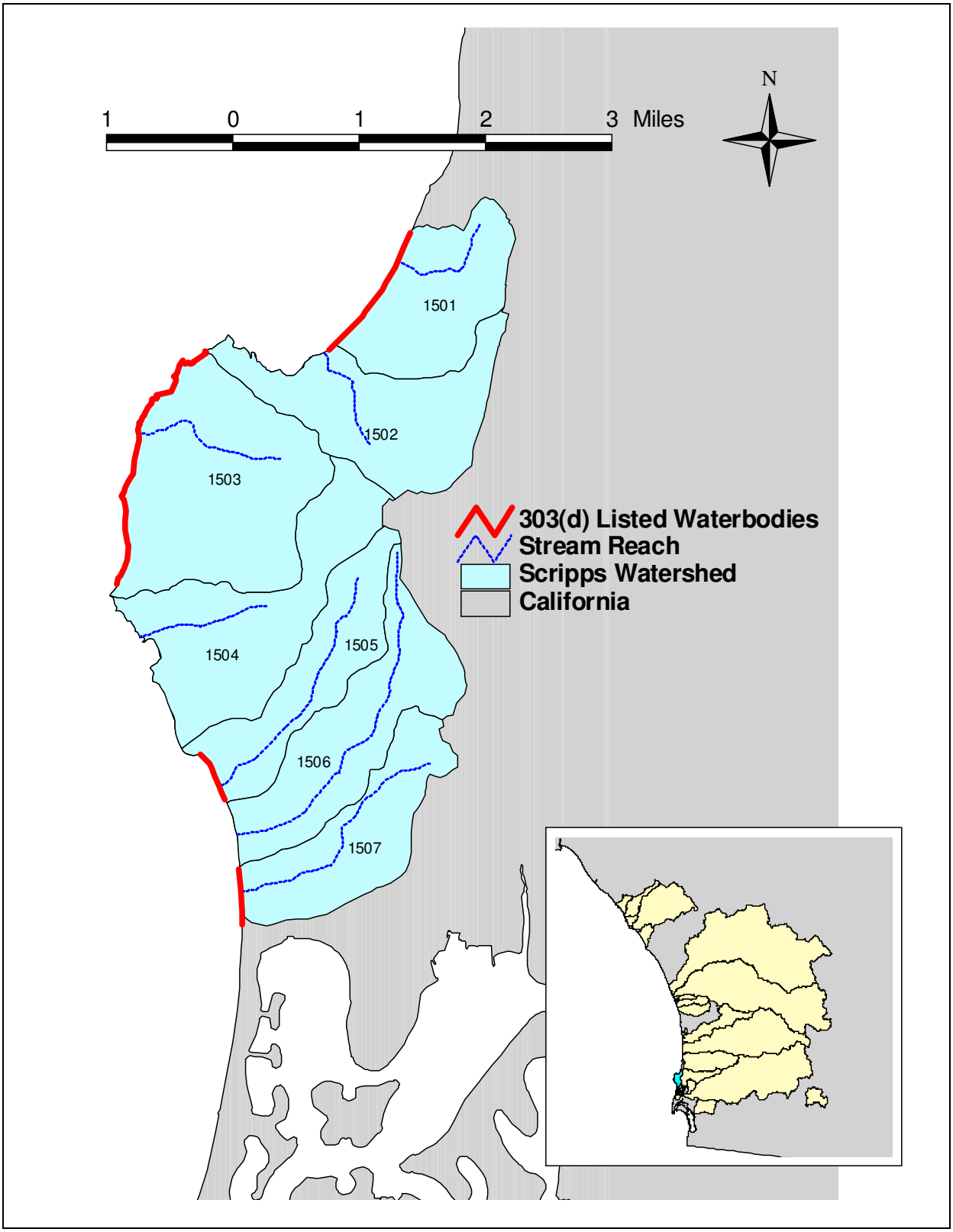

Figure E-10. Scripps HA Watershed

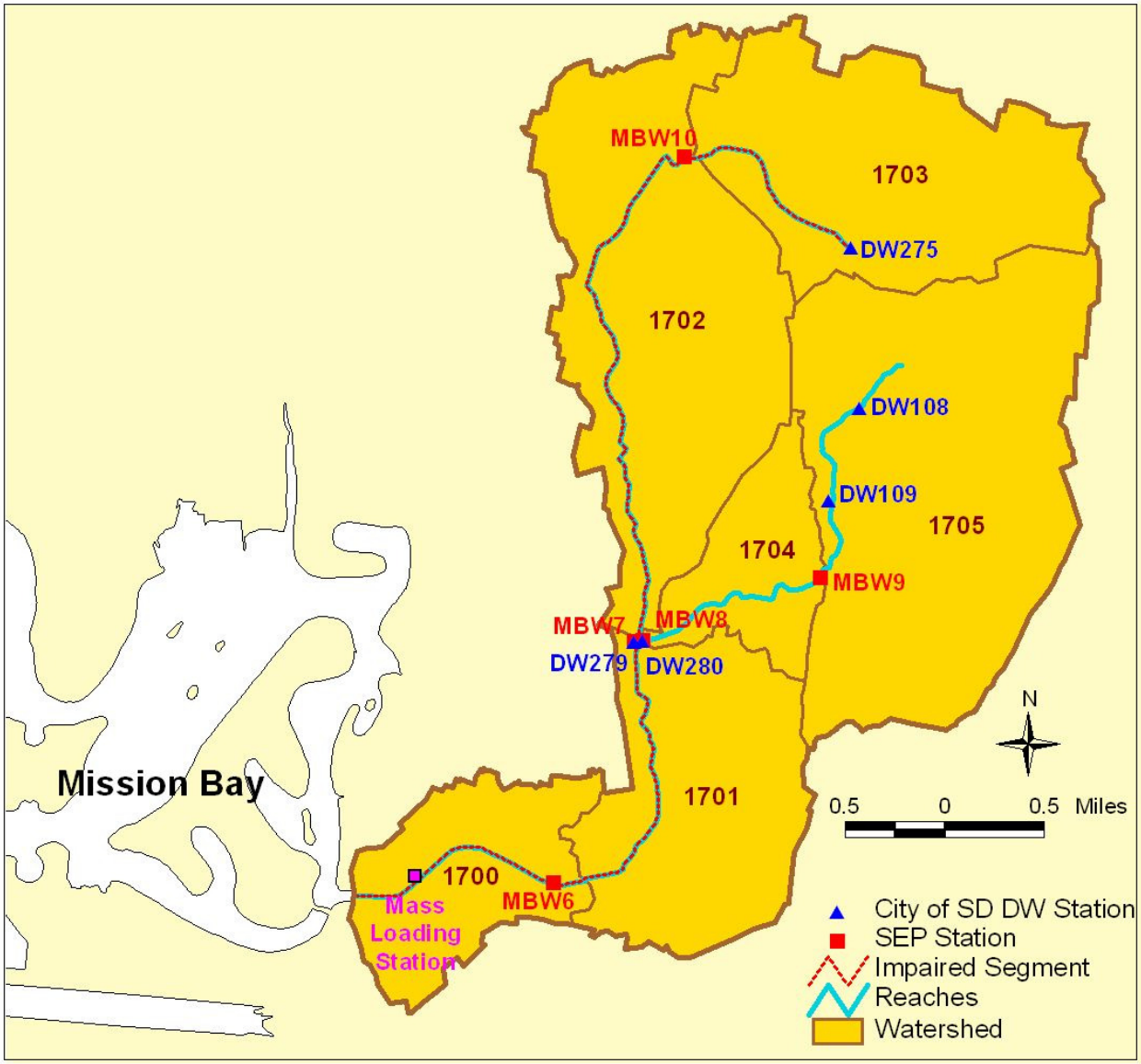

Figure E-11. Tecolote HA Watershed

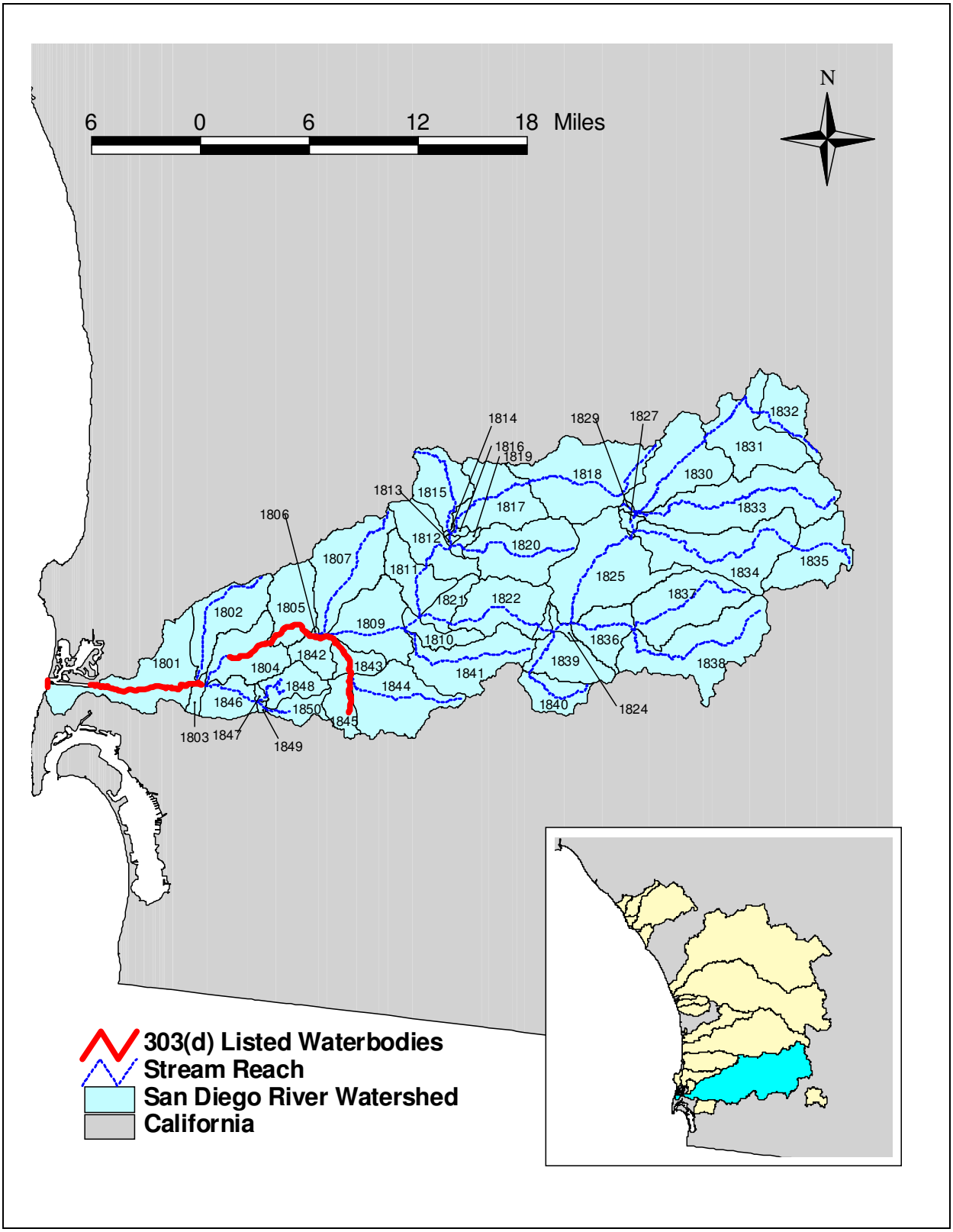

Figure E-12. Mission San Diego HSA / Santee HSA Watershed

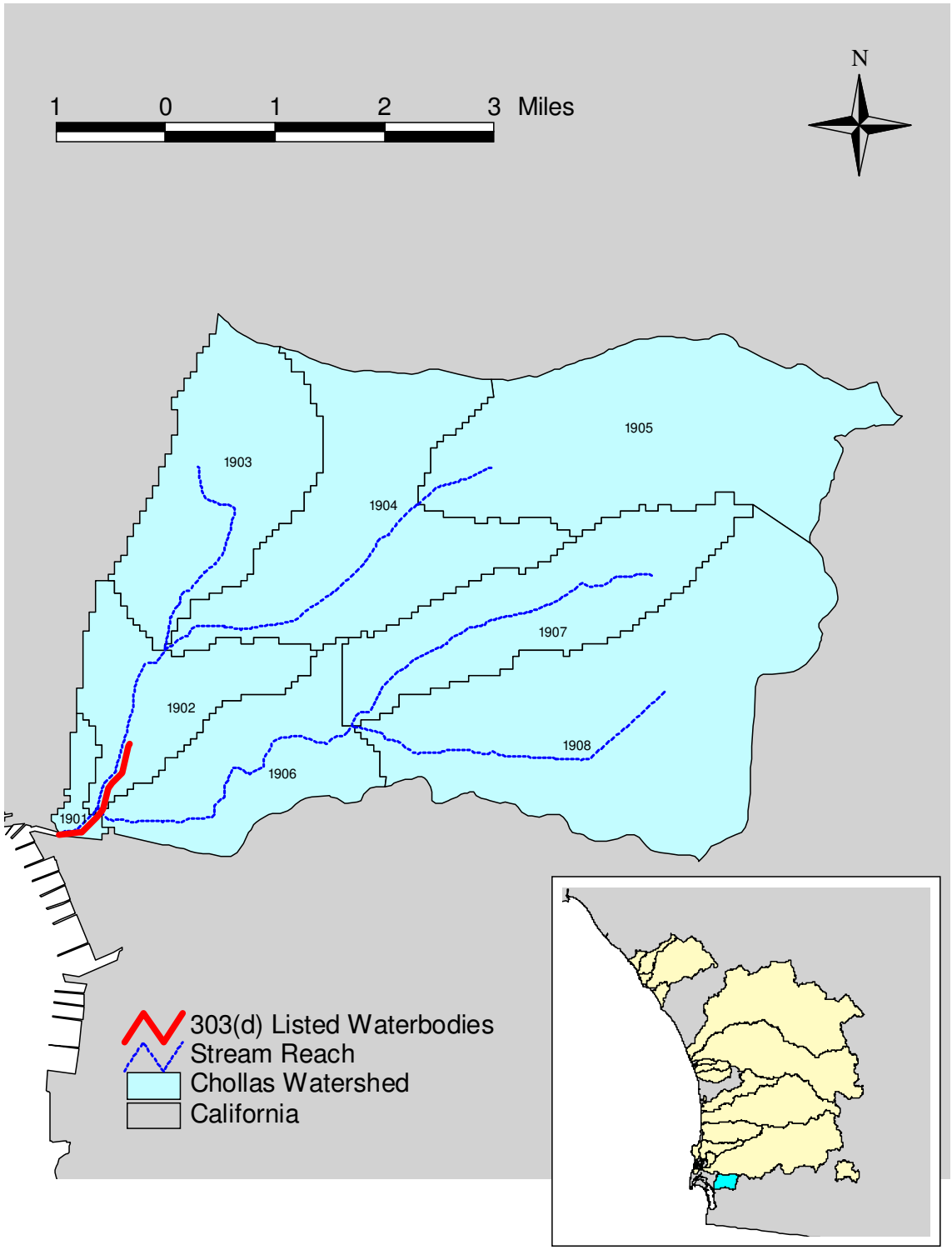

Figure E-13. Chollas HSA Watershed

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APPENDIX F

WATER QUALITY OBJECTIVES FOR INDICATOR BACTERIA

Under section 304(a) of the Clean Water Act, the USEPA is required to publish water quality criteria accurately reflecting the latest scientific knowledge for the protection of human health and aquatic life. Prior to 1986, the USEPA recommended bacteria criteria based on fecal coliforms to protect human health.[1] In 1986, the USEPA recommended the use of criteria based on *Escherichia coli* (*E. coli*) for fresh waters and enterococci for fresh and marine waters rather than the use of criteria based on fecal coliform.[2] The USEPA recommended this change in the use of bacteria indicator organisms because the USEPA studies demonstrated that *E. coli* and enteroccocci are better predictors of the presence of gastrointestinal illness-causing pathogens than fecal and total coliforms and hence provide a better means of protecting human health. Subsequent supporting research led the USEPA to reaffirm these findings in 2002.[3] The USEPA strongly recommends the replacement of water quality objectives based on fecal or total coliforms with objectives based on enterococci and *E. coli*.

In January 2005 the State Water Resources Control Board (SWRCB) adopted an amendment to the Water Quality Control Plan for Ocean Waters of California (Ocean Plan) that maintained the total and fecal coliform water quality objectives. Additionally, the SWRCB added provisions that required additional monitoring if the single sample maximum water quality objectives are exceeded. Water quality objectives for enterococci were also added to the Ocean Plan at this time.

As described below, the Basin Plan for the San Diego Region contains objectives based on fecal and total coliform as well as enterococci and *E. coli* for inland surface waters, enclosed bays and estuaries and coastal lagoons.

I. REC-1 Water Quality Objectives in the San Diego Region

The REC-1 water quality objectives for bacterial indicators applicable in the San Diego Region are contained in the Ocean Plan and in the San Diego Water Board's Basin Plan. The objectives contained in both are derived from water quality criteria promulgated by the USEPA in 1976 and 1986. The Ocean Plan currently contains REC-1 objectives for total and fecal coliforms and enterococci. The Basin Plan currently contains REC-1 objectives for total coliform, fecal coliform, enterococci and *E. coli* as shown below.

[1] Quality Criteria for Water. USEPA 1976
[2] Ambient Water Quality Criteria for Bacteria. USEPA 1986
[3] Implementation Guidance for Ambient Water Quality Criteria for Bacteria. May 2002 DRAFT.

REC-1
Ocean Waters (from Ocean Plan)

Within a zone bounded by the shoreline and a distance of 1,000 feet from the shoreline or the 30-foot depth contour, whichever is further from the shoreline, and in areas outside this zone used for water contact sports, as determined by the Regional Board (i.e., waters designated as REC-1), but including all kelp beds, the following bacterial objectives shall be maintained throughout the water column:

30-day Geometic Mean – The following standards are based on the geometric mean of the five most recent samples from each site:

i. **Total coliform** density shall not exceed **1,000** per 100 ml;
ii. **Fecal coliform** density shall not exceed **200** per 100 ml; and
iii. **Enterococci** density shall not exceed **35** per 100 ml.

Single Sample Maximum:

i. **Total coliform** density shall not exceed **10,000** per 100 ml;
ii. **Fecal coliform** density shall not exceed **400** per 100 ml;
iii. **Enterococci** density shall not exceed **104** per 100 ml; and
iv. **Total coliform** density shall not exceed **1,000** per 100 ml when the fecal coliform/total coliform ratio exceeds 0.1.

REC-1
Inland Surface Waters, Enclosed Bays and Estuaries and Coastal Lagoons (from Basin Plan)

Fecal Coliform Water Quality Objective for Contact Recreation:

The fecal coliform concentration, based on a minimum of not less than five samples for any 30-day period, shall not exceed a log mean of 200 organisms per 100 ml.

In addition, the fecal coliform concentration shall not exceed 400 organisms per 100 ml for more than 10 percent of the total samples during any 30-day period.

Enterococci and E. Coli Water Quality Objectives for Contact Recreation:

The USEPA published E. coli and enterococci bacteriological criteria applicable to waters designated for contact recreation (REC-1) in the Federal Register, Vol. 51, No. 45, Friday, March 7, 1986, 8012-8016.

USEPA BACTERIOLOGICAL CRITERIA FOR WATER CONTACT RECREATION
(in colonies per 100 ml)

	Freshwater		**Saltwater**
	Enterococci	**E. coli**	**Enterococci**
Steady State			
(all areas)	33	126	35
Maximum			
(designated beach)	61	235	104
(moderately or lightly used area)	108	406	276
(infrequently used area)	151	576	500

Total Coliform Water Quality Objective for Contact Recreation for Bays and Estuaries:

In bays and estuaries, the most probable number of total coliform organisms in the upper 60 feet of the water column shall be less than 1,000 organisms per 100 ml (10 organisms per ml); provided that not more than 20 percent of the samples at any sampling station, in any 30-day period, may exceed 1,000 organisms per 100 ml (10 per ml); and provided further that no single sample as described below is exceeded.

The most probable number of total coliform organisms in the upper 60 feet of the water column in no single sample when verified by a repeat sample taken within 48 hours shall exceed 10,000 organisms per 100 ml (100 organisms per ml).

II. REC- 2 Water Quality Objectives in the San Diego Region

The REC-2 water quality objectives for bacterial indicators applicable in the San Diego Region are contained in the Basin Plan and are derived from water quality criteria promulgated by the USEPA in 1976.

REC-2
Inland Surface Waters, Enclosed Bays and Estuaries and Coastal Lagoons (from Basin Plan)

Fecal Coliform Water Quality Objective for Non-contact Recreation:

In waters designated for non-contact recreation (REC-2) and not designed for contact recreation (REC-1), the average fecal coliform concentrations for any **30-day period**, shall not exceed **2,000** organisms per 100 ml, nor shall more than **10 percent** of total samples collected during any **30-day period** exceed **4,000** organisms per 100 ml.

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Appendix G

Data Sources

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Table G-1. Monitoring Data Sources

Index	Data Source	Location	Station ID	Years Compiled	Purpose
Stream Flow					
1	Orange County Pubic Facilities and Resources Department[1]	Aliso Creek	J01P08, J01P06, J07P02, J07P01, J01P0, J01P05, J01P03, J1P04, J06, J05, J01P30, J01P28, J01P27, J01P33, J01P25, J0126, J01P24, J01P23, J01P22, J03P02, J01P21, J02P05, J02P08, J03P13, J03P05, J03P01, J04	4/2001-12/2002	Instantaneous flow measurements used for development of multi-variable regression equations for prediction of dry-weather streamflows
			J01P22, J01P23, J01P27, J01P28, J06, J01P05, J01P01, J01BN8, J04, J03P13, J03P01	4/2001-12/2002	Instantaneous flow measurements used for calibration of dry-weather modeled streamflows
2	City of San Diego[1]	Rose Creek and Tecolote Creek (Mission Bay Drainage)	MBW07	11/2001-4/2003	Instantaneous flow measurements used for development of multi-variable regression equations for prediction of dry-weather streamflows
			MBW09, MBW13, MBW16	7/2001-4/2003	
			MBW11	12/2001-4/2003	
			MBW13, MBW15, MBW17	7/2001-4/2003	Instantaneous flow measurements used for calibration of dry-weather modeled streamflows
			MBW20	11/2001-4/2003	
			MBW11	12/2001-4/2003	
			MBW24	12/2001-3/2003	
			MBW06, MBW10, MBW09	7/2001-4/2003	Instantaneous flow measurements used for validation of dry-weather modeled streamflows
			MBW07, MBW08	11/2001-4/2003	
3	United States Geological Survey (USGS)[2]	San Juan Creek	11047300	10/1970-1/2002	Average daily flows on dry days used for calibration of dry-weather modeled streamflows
		San Diego River	11022480	1/1991-12/2001	Average daily flows on wet days used for calibration and validation of wet-weather modeled streamflows
		San Diego River	11023000	1/1991-12/2001	
		Miramar	11023340	1/1991-12/2001	
		San Dieguito	11025500	1/1991-12/2001	
		San Dieguito	11028500	1/1991-12/2001	
		San Luis Rev	11042000	9/1993-5/2002	
		Santa Margarita	11042400	1/1991-12/2001	
		Santa Margarita	11044300	1/1991-12/2001	
		Santa Margarita	11046000	1/1991-12/1998	
		San Juan Creek	11046530	1/1991-12/2001	
		San Juan Creek	11047300	10/1995-4/2002	

Index	Data Source	Location	Station ID	Years Compiled	Purpose
		San Diego River	11022350	1/1991-9/1993	
		San Luis Rey	11039800	1/1991-12/1992	
Water Quality					
4	Orange County Pubic Facilities and Resources Department[1]	Aliso Creek	J01P08, J01P06, J07P02, J07P01, J01P01, J01P05, J01P03, J1P04, J06, J05, J01P30, J01P28, J01P27, J01P33, J01P25, J0126, J01P24, J01P23, J01P22, J03P02, J01P21, J02P05, J02P08, J03P13, J03P05, J03P01, J04	4/2001-12/2002	Development of multi-variable regression equations for prediction of dry-weather bacteria levels
			J01P22, J01P23, J01P27, J01P28, J06, J01P05, J01P01, J01BN8, J04, J03P13, J03P01	4/2001-12/2002	Calibration of dry-weather model for bacteria levels
5	City of San Diego[1]	Rose Creek and Tecolote Creek (Mission Bay Drainage)	MBW07, MBW08	11/2001-4/2003	Development of multi-variable regression equations for prediction of dry-weather bacteria levels
			MBW06, MBW09, MBW10, MBW13, MBW15, MBW16	7/2001-4/2003	
			MBW24	12/2001-3/2003	
			MBW13, MBW15, MBW17	7/2001-4/2003	Calibration of dry-weather model for bacteria levels
			MBW20	11/2001-4/2003	
			MBW11	12/2001-4/2003	
			MBW24	12/2001-3/2003	
			MBW06, MBW10, MBW09	7/2001-4/2003	Validation of dry-weather model for bacteria levels
			MBW07, MBW08	11/2001-4/2003	
6	Orange County Public Health Laboratory (SDRWQCB, 2002)	San Juan Creek	SJ13	4/2001-7/2001	Development of multi-variable regression equations for prediction of dry-weather bacteria levels
			SJ14, SJ15, SJ16, SJ19, SJ20, SJ21, SJ29, SJ32	5/2001-7/2001	
			SJ01, SJ04, SJ05, SJ24	4/2001-7/2001	Validation of dry-weather model for bacteria levels
			SJ15, SJ17, SJ18, SJ29	5/2001-7/2001	
7	Southwest Division Naval Facilities Engineering Command	Santa Margarita	501, 504, 508, 502, 503, 505, 506, 507	12/1997-2/1999	Validation of wet weather water quality predictions

Index	Data Source	Location	Station ID	Years Compiled	Purpose
8	Rancho California Water District	Santa Margarita River	Station #1 (Upstream from Santa Rosa Plant), Station #2 (Willow Glen), Station #3 (Deluz Crossing), Station #4 (Estuary)	12/1997-2/2001	
9	Camp Pendleton	Santa Margarita River	Plant #3 Upstream; Plant #13 Upstream	1/1995-3/2002	
10	The Orange County Public Facilities and Resources Department (OCPFRD)	Aliso creek	D/S J01/J02, J01 @ TP, U/S J01/J02, J02TBN1, D/S J01P21, U/S J01P21, J01P22, D/S J01/J03, U/S J01/J03, D/S J01P23, D/S J01P24, D/S J01P25, D/S J01P26, D/S J01P27, D/S J01P33, D/S J01TBN4, J01P28, U/S J01P23, U/S J01P24, U/S J01P25, U/S J01P26, U/S J01P27, U/S J01P33, U/S J01TBN4, D/S J01P30, U/S J01P30, D/S J06, U/S J06, D/S J01P04, D/S J01P05, D/S J01P32, D/S J01TBN2, D/S J01TBN3, J01P01, J07P01J07P02, U/S J01P04, U/S J01P05, U/S J01P32, U/S J01TBN2, U/S J01TBN3, D/S J01P08, D/S J01TBN8, J01P06, J02P08, U/S J01P08, U/S J01TBN8, D/S J05, U/S J05, J01P03, J04, U/S J04, J02P05, J03P02, J03P05, J03P13, J03P01, J03TBN1, J03TBN2	4/2001-11/2003	
11	Orange County Public Health Laboratory (SDRWQCB, 2002)	San Juan Creek	SJ02, SJ09, SJ10, SJ12, SJ13, SJ25, SJ30	5/2001-12/2001	

Index	Data Source	Location	Station ID	Years Compiled	Purpose
12	City of San Diego (2000)	Rose Creek and Tecolote Creek (Mission Bay Drainage)	MBW06, MBW07, MBW08, MBW09, MBW10, MBW11, MBW12, MBW13, MBW14, MBW15, MBW16, MBW17, MBW18, MBW19, MBW20, MBW21, MBW23, MBW24	11/2001-2/2002	
13	Padre Dam Municipal Water District	San Diego River	1, 2, 3, 4, 5, 6	3/1998-4/2002	
14	City of San Diego-Water Department, Cleveland National Forest Descanso Ranger District	Pine Valley Creek	NPC3A, NPC3C, NPC3D, PVC1A	2/1998-4/1998	
15	Orange County Environmental Health	Mouth of San Juan Creek	ODB02, ODB05	6/1999-10/2002	Analyzed to confirm the water quality impairment at beaches, provide an insight regarding the spatial extent of impairments, and assess the relationship with wet and dry conditions
		Mouth of Aliso Creek	OLB00		
		Dana Point	OSL25, BDP12, BDP13, BDP14, BDP15		
16	County of San Diego, Department of Health (DEH)	Mouth of Agua Hedionda Lagoon	EH-460	5/1999-10/2001	
		Scripps	EH-260	4/1999-9/2000	
		Scripps	EH-290	4/1999-11/2000	
		Mouth of San Luis Rey River	EH-490	4/1999-10/2001	
		Mouth of Agua Hedionda Lagoon	EH-440	4/1999-10/2001	
		Mouth of Agua Hedionda Lagoon	EN-030	1/1999-11/2001	
		Scripps	EH-250, EH-280	4/1999-10/2002	
		Scripps	EH-300	1/1999-10/2002	
		Scripps	EH-310	4/1999-9/2002	
		Buena Vista	EH-475	10/1999-10/2002	
		San Marcos	EH-420	4/1999-10/2002	
		San Dieguito	EH-380, EH-390	4/1999-10/2002	
		San Clemente	EH-510	8/1999-10-2002	
		San Clemente	EH-520	6/1999-10/2002	
		Scripps	EH-305	2/2001-10/2002	
		Agua Hedionda	EH-455	1/2001-10/2001	

Index	Data Source	Location	Station ID	Years Compiled	Purpose
17	South Orange County Wastewater Authority (SOCWA)	San Clemente and mouth of San Juan Creek Lagoon	S-0, S-1, S-3, S-5, S-7, S-11, S-13, S-15, S-17, S-19, S-23	3/2000-10/2002	
		Mouth of San Juan Creek Lagoon	S-2	1/1999-10/2002	
		Dana Point and mouth Aliso Creek	S01, S02, S04, S06, S07, S08, S09, S10	1/1999-10/2002	
		Laguna/mouth of San Joaquin	S11, S13, S15, S14, S16	1/1999-10/2002	
18	City of San Diego[1]	Miramar, Scripps and mouth of San Diego River	FM-010, FM-030, FM-080	1/1999-10/2002	
			FM-050	1/1999-9/2002	
19	City of Oceanside	Mouth of San Luis Rey River	OC-100	1/1999-10/2002	
		Mouth of Loma Alta Slough	OC-022		
20	City of Escondido	Mouth of Escondido Creek and San Dieguito Creek	SE-020, SE-010	1/1999-10/2002	
Meteorological Data					
21	National Oceanographic and Atmospheric Administration-National Climatic Data Center (NOAA-NCDC)	San Diego	COOP ID #047740	1990-2002	Hourly rainfall data used for hydrologic and water quality modeling for wet-weather conditions
		Laguna/San Joaquin, Aliso, Dana Point, San Juan, San Clemente	CA4650		
		Aliso Creek, San Juan Creek	CA8992		
		San Juan Creek	CA7837		
		Santa Margarita River	CA8844		
		Santa Margarita, San Luis Rey	CA6319		
		Santa Margarita, San Luis Rey, San Luis Rey, Loma Alta, Buena Vista, Agua Hedionda, San Marcos	CA6379		
		Pine Valley Creek	CA2239		
		Miramar, Scripps, Rose Creek, Tecolate, San Diego River, Chollas	CA7740		
22	California Irrigation Management Information System (CIMIS)	Escondido Creek, San Dieguito Creek, Miramar	CIMIS74	1990-2002	Hourly rainfall, Evaporation data used for hydrologic and water quality modeling for wet-weather conditions

23	Automatic Local Evaluation in Real-Time (ALERT) Flood Warning System	San Clemente	21	1990-2002	Hourly rainfall data used for hydrologic and water quality modeling for wet-weather conditions
		San Marcos, Escondido Creek, San Deigouito Creek, Miramar	22		
		San Dieguito Creek, Miramar, Rose Creek, San Diego River	24		
		Chollas	31		
		Santa Margarita, San Luis Rey, San Dieguito	52		
		San Luis Rey, San Dieguito, Miramar, San Diego	53		

[1] Not complete at the time of TMDL report development, Final report not available for study
[2] www.usgs.gov

Table G-2. GIS Data Sources

Index	Data Type	Data Source	Years Compiled	Purpose
24	Stream network	USGS -National Hydrography Dataset (NHD)	-	Determination of representative modeled stream for each sub-watershed
25	Land Use	USGS - Multi-Resolution Land Characteristics (MRLC)	1993	Designation of Land uses in the region
		San Diego's Regional Planning Agency (SANDAG)	2001	
		Southern California Association of Governments (SCAG)	2000	
26	Soils	USDA-NRCS (STATSGO)	1994	STATSGO soil data used for modeling
27	Topographic and digital elevation models (DEMs)	USEPA BASINS, USGS[2]	-	To derive streams and watershed boundaries

[2] www.usgs.gov

Appendix H

Shoreline Bacteria Data Water Quality Objectives Exceedance Analysis

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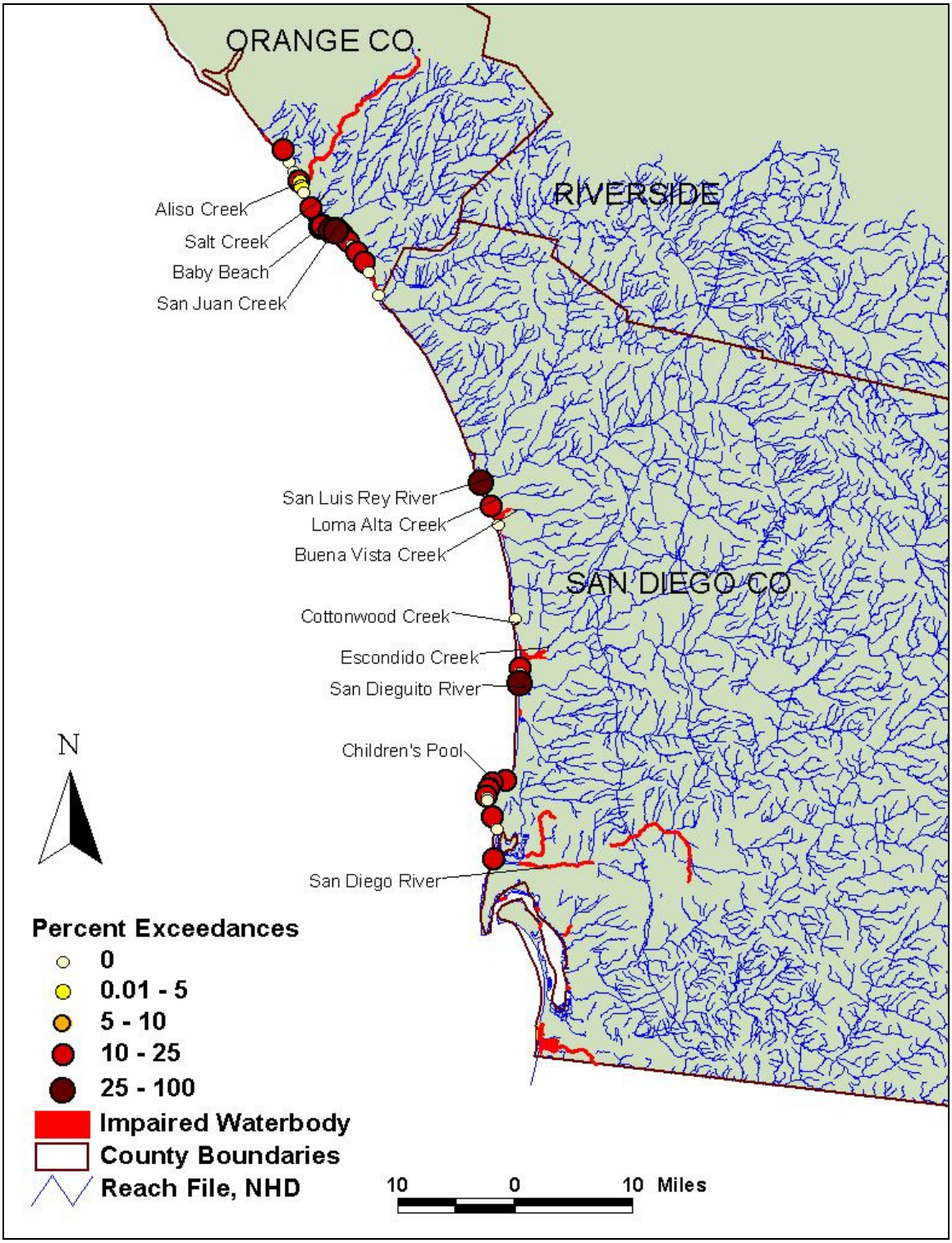

Figure H-1. Exceedances of Fecal Coliform Single Sample Objective (REC-1) During Wet Weather Conditions

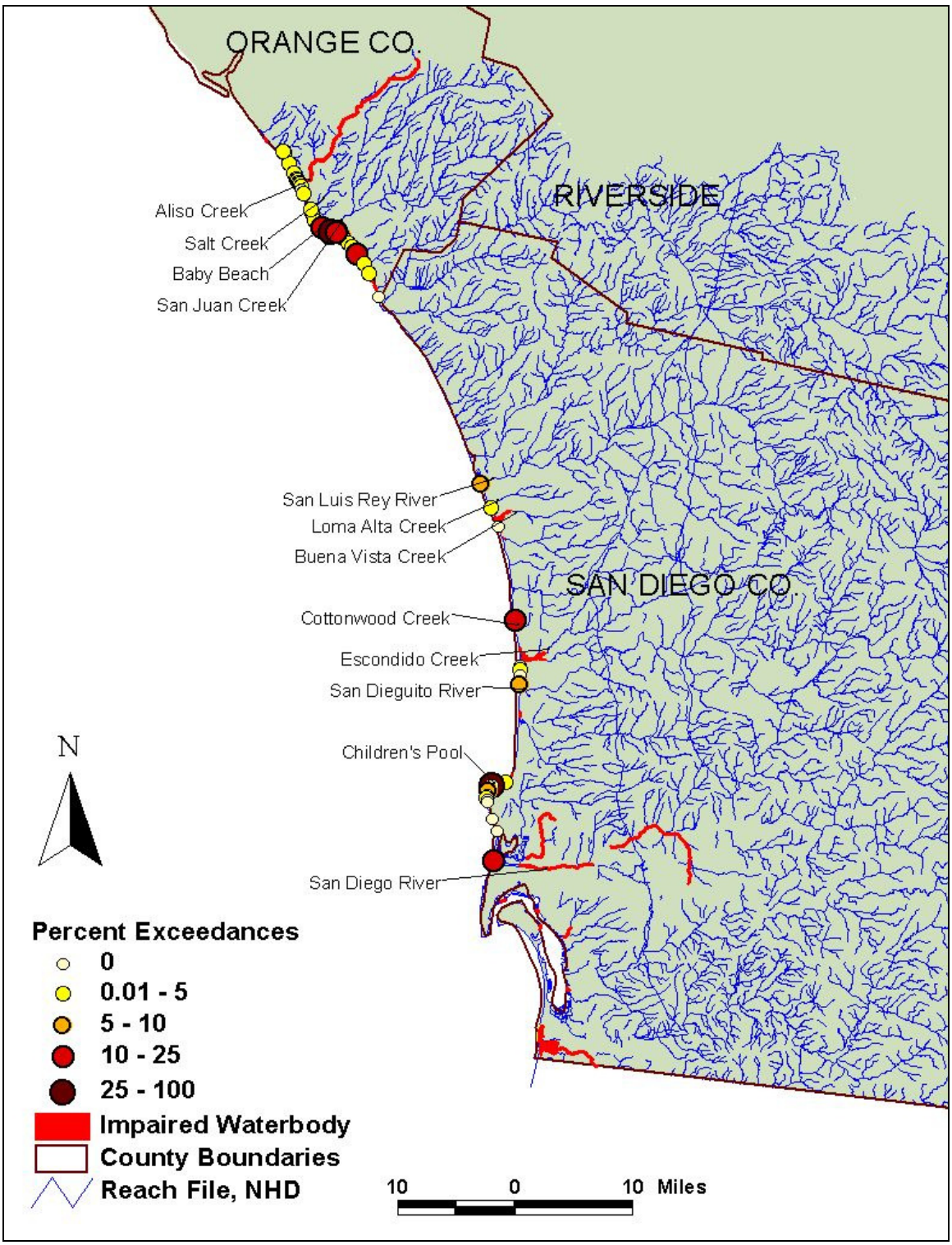

Figure H-2. Exceedances of Fecal Coliform Single Sample Objective (REC-1) During Dry Weather Conditions

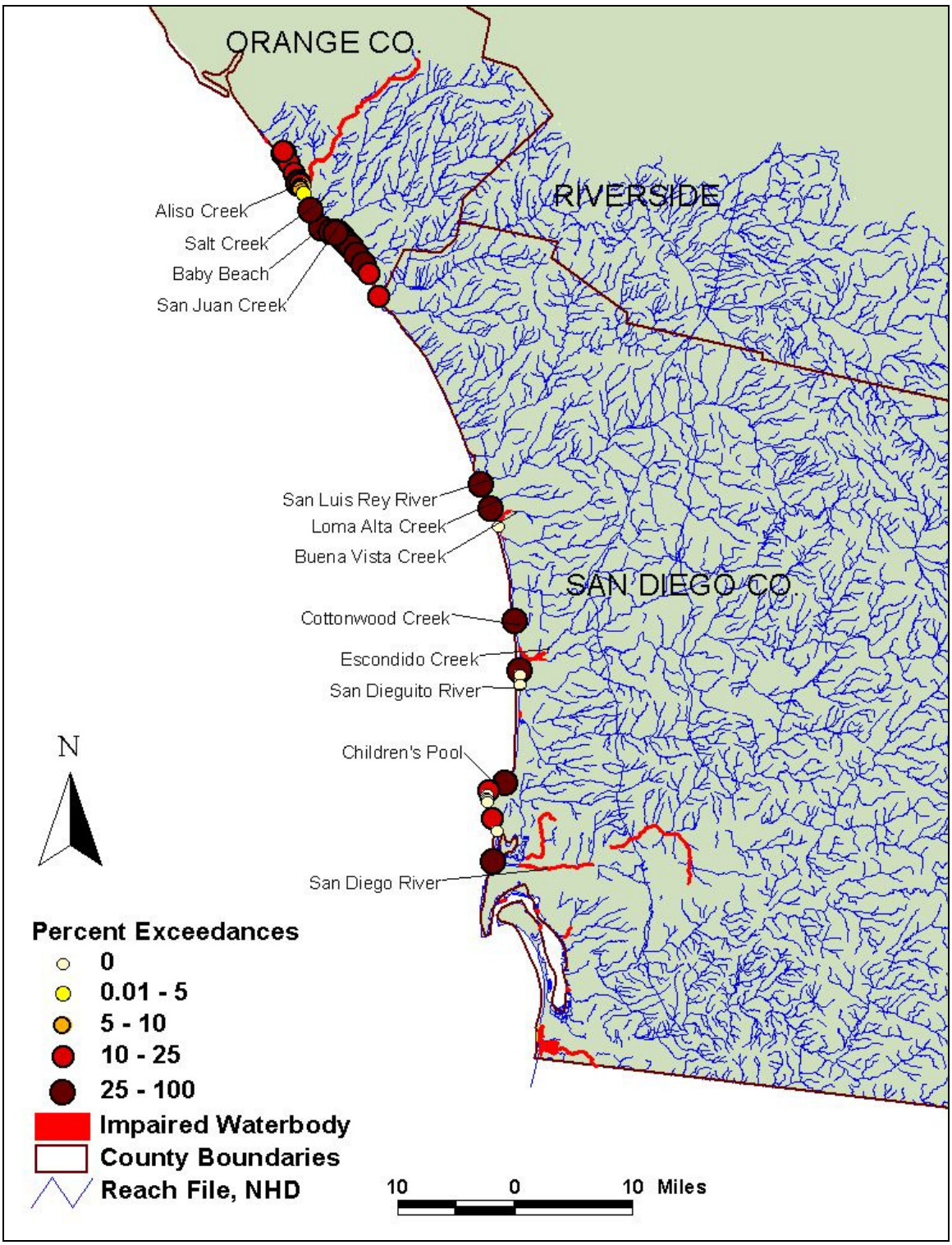

Figure H-3. Exceedances of Enterococcus Single Sample Objective (REC-1) During Wet Weather Conditions

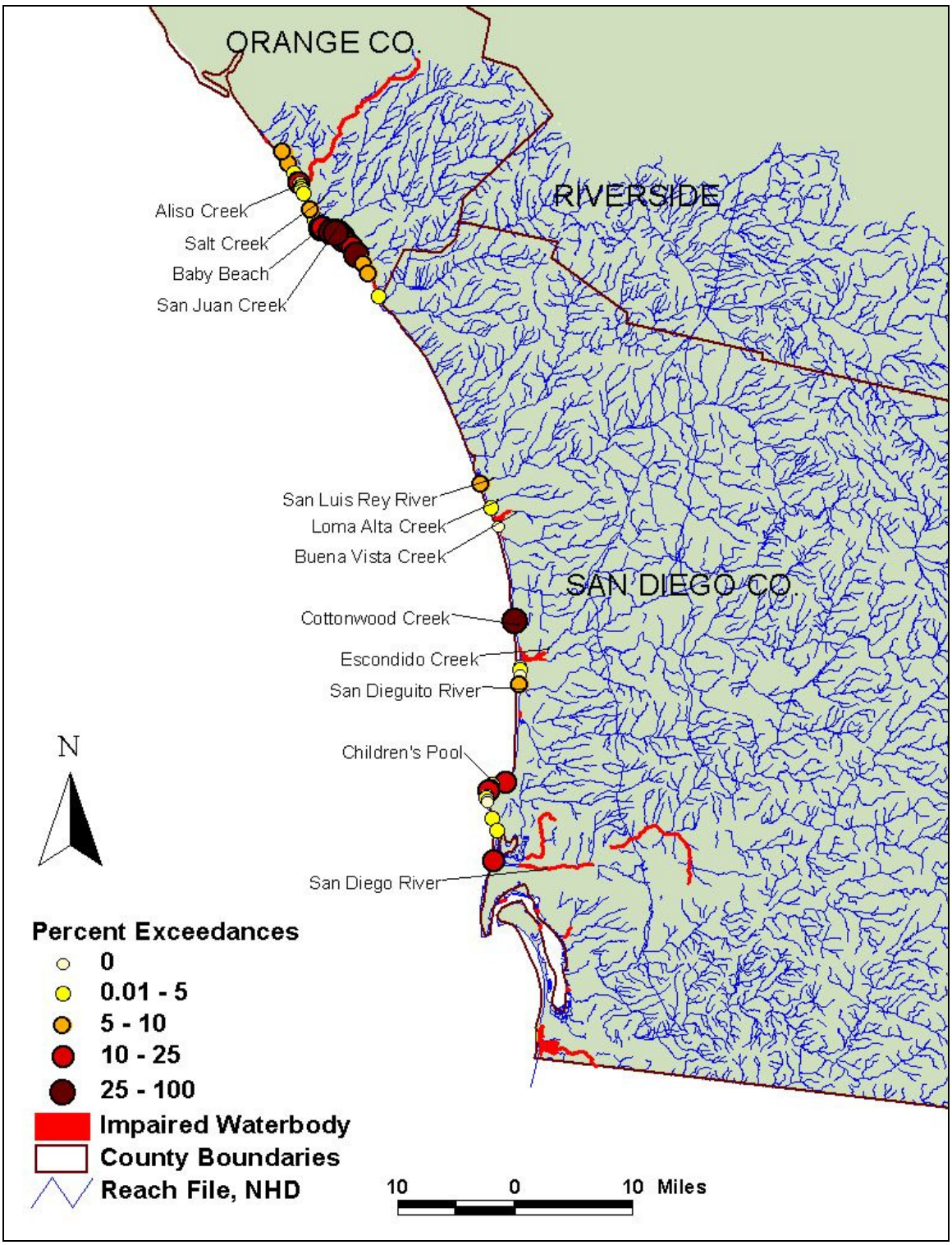

Figure H-4. Exceedances of Enterococcus Single Sample Objective (REC-1) During Dry Weather Conditions

APPENDIX I

METHODOLOGY FOR CALCULATING MASS-LOAD BASED TMDLs FOR IMPAIRED BEACHES AND CREEKS AND ALLOCATING TO SOURCES

I.1 Introduction

This appendix describes the methodology for calculating the mass-load based Total Maximum Daily Loads (TMDLs) for impaired beaches and creeks and allocating the allowable bacteria loads to sources in each watershed. Calibrated and validated models were used to calculate "existing" bacteria mass loads and "allowable" bacteria mass loads (i.e., TMDLs) in each watershed under a set of critical conditions. Because the climate in southern California has two distinct hydrological patterns (wet and dry), two modeling approaches were developed for estimating bacteria loads.

In the San Diego Region, storms tend to be episodic and short in duration, and characterized by rapid wash-off and transport of very high bacteria loads from all land use types. The wet weather modeling approach used for calculation of existing loads and TMDLs was USEPA's Loading Simulation Program in C++ (LSPC). LSPC was used to estimate bacteria loading from streams and assimilation within the waterbodies, and specifically quantified loading during wet weather events, defined as 0.2 inches of rain and the 72 hours that follow. LSPC is a recoded C++ version of the USEPA's Hydrological Simulation Program–FORTRAN (HSPF) that relies on fundamental (and USEPA-approved) algorithms. A complete discussion of LSPC configuration, calibration, and application is provided in Appendix J.

In contrast, bacteria loading under dry weather conditions was found to be much smaller in magnitude, did not occur from all land use types, and exhibited less variability over time. To represent the linkage between source contributions and in-stream response, a steady-state mass balance model was developed to simulate transport of bacteria in the impaired creeks and the creeks flowing to impaired shorelines. This predictive model represented the streams as a series of plug-flow reactors, with each reactor having a constant, steady-state flow and bacteria load. A complete discussion of the development of the empirical framework for estimating watershed loads, and a description of the configuration and calibration of the stream-modeling network is provided in Appendix K. In addition to estimating current loading, both models were used to estimate TMDLs for the two climate conditions for each watershed. Assumptions made for both wet weather and dry weather modeling can be found in Appendix L.

This appendix describes the methodology for calculating existing loads and TMDLs using the wet and dry weather modeling results. Section I.2 of this appendix describes the numeric targets that were used to calculate wet weather and dry weather TMDLs. Section I.3 discusses the use of load-duration curves, which were instrumental in calculating wet weather TMDLs from model output. Section I.4 discusses the derivation of wet weather TMDLs and allocations. Section I.5 discusses the derivation of dry weather TMDLs and allocations.

In all cases, bacteria sources were quantified by land-use type since bacteria loading can be highly correlated with land-use practices. For purposes of implementation, land use practices were grouped according to the most likely method of regulation by the San Diego Water Board of bacteria discharges from the land use type.

I.2 Numeric Target Selection for Wet Weather and Dry Weather TMDLs

When calculating TMDLs, numeric targets must be selected to be able to meet water quality standards (i.e., water quality objectives (WQOs) that ensure the protection of beneficial uses). The numeric targets selected for these TMDL calculations are based primarily on the numeric WQOs for bacteria for the water-contact recreation (REC-1) beneficial uses. Numeric targets applicable to beaches were also used for impaired creeks for the reasons discussed in section 4 of the Technical Report.

Different dry weather and wet weather numeric targets were used because the bacteria transport mechanisms to receiving waters are different under wet and dry weather conditions. Single sample maximum WQOs were included in the wet weather numeric targets because wet weather, or storm flow, is episodic and short in duration, and characterized by rapid wash-off and transport of high bacteria loads, with short residence times, from all land use types to receiving waters. Geometric mean WQOs were included in the numeric targets for dry weather periods because dry weather runoff is not generated from storm flows, is not uniformly linked to every land use, and is more uniform than stormflow, with lower flows, lower loads, and slower transport, making die-off and/or amplification processes more important.

Another difference between the wet weather and dry weather TMDL calculations, besides the use of single sample maximum WQOs versus geometric mean WQOs, is the allowable exceedance frequency of the WQO. The allowable exceedance frequency that is based on using a reference system approach. The purpose of the reference system approach is to account for the natural, and largely uncontrollable sources of bacteria (e.g., bird and wildlife feces) in the wet weather loads generated in the watersheds and at the beaches that can, by themselves, cause exceedances of WQOs.

The reference system approach is included in the numeric target for the wet weather TMDL calculations by allowing a 22 percent exceedance frequency of the single sample WQOs for REC-1. Twenty-two percent is the frequency of exceedance of the single sample maximum WQOs measured in a reference system in Los Angeles County.[1] A reference system is a beach and upstream watershed that are minimally impacted by anthropogenic activities. A reference system typically has at least 95 percent open space.

In contrast to wet weather, the dry weather numeric targets include an allowable exceedance frequency of zero percent. This is because available data show that exceedances of geometric

[1] In the calculation of the wet weather TMDLs, the San Diego Regional Board chose to apply the 22 percent allowable exceedance frequency as determined for Leo Carillo Beach in Los Angeles County. At the time the wet weather watershed model was developed, the 22 percent exceedance frequency from Los Angeles County was the only reference beach exceedance frequency available. The 22 percent allowable exceedance frequency used to calculate the wet weather TMDLs is justified because the San Diego Region watersheds' exceedance frequencies will likely be close to the value calculated for Leo Carillo Beach, and is consistent with the exceedance frequency that was applied by the Los Angeles Regional Board.

mean WQOs in local reference systems during dry weather conditions are uncommon (see Technical Report, section 4.2). Furthermore, reference systems do not generate significant dry weather bacteria loads because flows are minimal. During dry weather, flow, and hence bacteria loads, are largely generated by non-storm water runoff, which is not a product of a reference system. Therefore, a zero percent allowable exceedance frequency is included in the numeric targets for the dry weather TMDL calculations.

I.3 Using Load Duration Curves to Calculate Wet Weather Mass-Load Based TMDLs

For the wet weather analysis, "existing" loads and TMDLs were calculated using output from the LSPC watershed model. The existing loads calculated by the LSPC model are the bacteria loads that are expected to be discharged from the watershed under a set of critical conditions (i.e., worst case loading scenario). The TMDLs calculated by the LSPC model are the bacteria loads that can be discharged from the watershed and will not cause the numeric targets (numeric WQOs and allowable exceedance frequency) to be exceeded under the same set of critical conditions . The difference between the existing load and the TMDL is the bacteria load reduction that is required to restore the REC-1 beneficial use of an impaired waterbody and still account for natural, and largely uncontrollable sources of bacteria (e.g., bird and wildlife feces) in the wet weather loads.

To ensure that the numeric targets are met in impaired waterbodies during wet weather events, a critical period associated with extreme wet conditions was selected for TMDL calculations. Extreme wet conditions have the highest wet weather flows and bacteria loads. The year 1993 was selected as the critical wet period for assessment of extreme wet weather loading conditions because this year was the wettest year of the 12 years of record (1990 through 2002) evaluated in the TMDL analysis. This corresponds to the 92nd percentile of annual rainfalls for those 12 years measured at multiple rainfall gages in the San Diego Region.

Model output was used to produce load-duration curves, such as the one shown in Figure I-1. Load-duration curves are bar graphs that display information for a specific watershed mouth (watersheds were delineated into smaller subwatersheds for loading analysis). In other words, each subwatershed has a unique load-duration curve. The y-axis shows the bacteria load (billion most-probable-number per day, or billion MPN/day) associated with the flow for a given day. Each daily wet weather load is represented by a bar. The bars are ranked across the x-axis according to the magnitude of the associated daily flow from lowest to highest. Appendix O shows the load-duration curves for each modeled subwatershed, for each type of bacteria. Figure I-1 shows model-calculated fecal coliform loads for one of the subwatersheds (identified as subwatershed number 202) in the Aliso HSA watershed (which consists of subwatersheds 201 and 202).

The daily bacteria load (each blue bar) is equal to the modeled average daily flow for the wet day times the average daily bacteria density for that day. The height of the blue bars indicates the most probable number of fecal coliform colonies corresponding to the flow on a given day. The dark line running across the bar graph is referred to as the "load capacity curve" or "numeric target line."

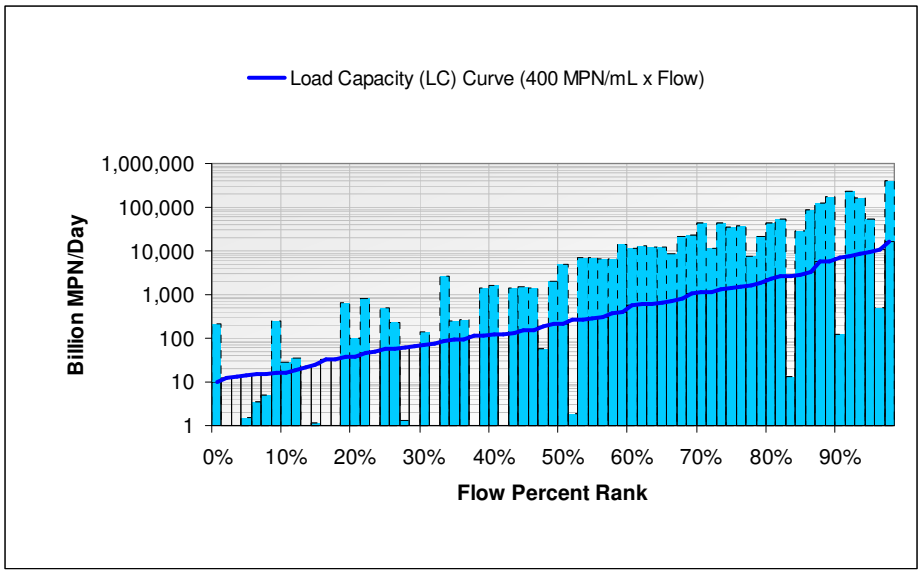

Figure I-1. Load Duration Curve for Aliso HSA Subwatershed # 202

The y-value of the numeric target line at any point on the graph represents the total maximum bacteria load that would not result in an exceedance of the WQO for the flow on that day. The summation of the loads represented by the solid-line outlined bar segments below the numeric target line represents the loading capacity of the waterbody on an annual basis that will not cause numeric WQO to be exceeded. The dashed-line outlined bar segments above the numeric target line represent the bacteria load that is exceeding the load capacity based on the WQO on each wet day. For some wet days, the existing bacteria load (blue bar) is below the numeric target line, indicating the load on that day would not cause an exceedance in the WQO.

Load-duration curves are useful for quantifying the total load for existing conditions (during the critical period), and the allowable loads (TMDLs) that must not be exceeded in order to attain WQOs and restore the REC-1 beneficial use of an impaired waterbody. Section I.4 shows how load-duration curves were used to calculate TMDLs using numeric targets (numeric WQOs and allowable exceedance frequencies). In the wet weather analyses, existing loads and TMDLs are expressed on a yearly basis (billion MPN/year) because of the extremely high daily variability in storm flow magnitude and loading in the watersheds addressed by these TMDLs. The variability in the modeled daily loads is evident in the load duration curves in Appendix O.

I.4 Calculation of Wet Weather Mass-Load Based TMDLs and Allocations

As mentioned previously, wet weather TMDLs for recreational uses incorporated the reference system approach. Since storm flow loading in reference watersheds causes exceedances of single sample maximum WQOs, TMDLs for urban watersheds should allow the single sample WQOs to be exceeded at the same frequency as in a similar reference system. Load duration curves were used to calculate allowable exceedance loads from allowable exceedance days for wet weather TMDLs. A load-duration curve showing the application of the reference system approach is shown in Figure I-2.

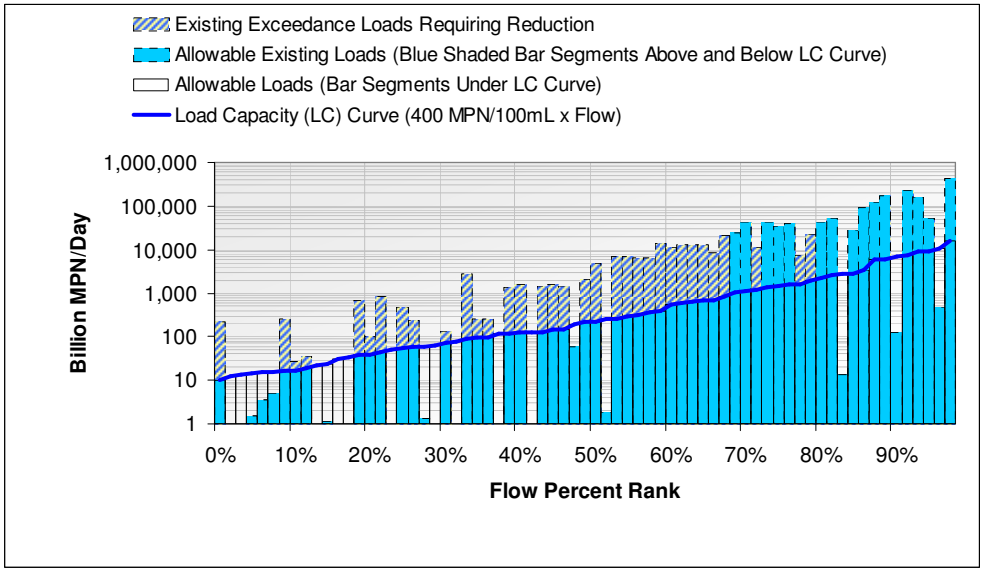

Subwatershed 202 Fecal Coliform Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	69	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	49	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	15	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	34	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**1,732,709**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	83,999	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	1,478,595	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Lo	**1,562,594**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Lo	**170,116**	**Billion MPN/Year**

Figure I-2. Load Duration Curve for Aliso HSA Subwatershed #202 Using Reference System Approach

The methodology for calculating and allocating the wet weather TMDLs for each watershed using the reference system approach is described in the following steps:

Step 1. Quantify Total Existing Wet Weather Loads;
Step 2. Quantify Allowable Loads;
Step 3. Quantify Allowable Exceedance Loads;
Step 4. Quantify Wet Weather TMDLs;
Step 5. Classify Land Use Types as Point and Nonpoint Sources, and Classify Nonpoint Sources as Controllable or Uncontrollable;
Step 6. Quantify Relative Contribution of Bacteria Loads From Each Land Use Type;
Step 7. Separate Caltrans Existing Loads from Loads Generated by Industrial/Transportation Land Use;
Step 8. Combine Land Use Types Based on Method of Regulation by the San Diego Water Board;
Step 9. Distribute TMDL Among Four Discharge/Land Use Categories.

Steps 1 through 4 use the information provided by load-duration curves. Steps 5 through 9 are determined based on land use data. Descriptions of each step are provide below. Sample calculations are provided showing all the steps involved.

1. Quantify Total Existing Wet Weather Loads

As discussed in section I.3, the output from the LSPC model was used to predict bacteria loading from each watershed for the critical wet period in 1993. Model-predicted loads were used to construct load-duration curves for each of the three indicator bacteria. Figure I-1, above, is a sample load-duration curve that shows model-calculated fecal coliform loads for subwatershed 202 in the Aliso HSA watershed.

The load-duration curves are bar graphs that rank the modeled flows into percentiles, or groups arranged in increasing orders of magnitude. The height of the blue bars indicates the number of bacteria colonies corresponding to the flow volume on a given day. The summation of all the blue bar segments represents the total existing annual bacteria load for wet weather in the critical wet period of 1993.

2. Quantify Allowable Loads

The dark line running across the bar graph (referred to as the "numeric target line" or "load capacity curve") in Figures I-1 and I-2 represents the total maximum bacteria load that would not result in an exceedance of the numeric WQO for the flow volume on that day. In the case for Figures I-1 and I-2, the wet weather numeric WQO is the single sample maximum REC-1 WQO for fecal coliform, which is 400 MPN/100mL (see section 4 of the Technical Report). The load capacity curve is calculated by multiplying the numeric WQO by the total flow volume for each day. So, if the daily flow volume increases, the target daily load will increase; but the numeric target stays constant.

The solid-line outlined bar segments below the numeric target line represent the loading capacity of the waterbody that will not cause the numeric WQO (i.e., REC-1 WQO) to be exceeded for each day. The summation of the solid-line outlined bar segments below the numeric target line is total allowable annual bacteria load for wet weather in the critical wet period of 1993, based only on the numeric WQOs.

3. Quantify Allowable Exceedance Loads

Because natural, and largely uncontrollable sources of bacteria (e.g., bird and wildlife feces) in the wet weather loads generated in the watersheds and at the beaches can, by themselves, cause exceedances of WQOs, allowable exceedance loads were calculated and incorporated into the wet weather TMDLs. A Basin Plan amendment (Resolution No. R9-2008-0028) was adopted by the San Diego Water Board authorizing the development of indicator bacteria TMDLs that account for exceedances of bacteria WQOs due to bacteria loads from natural uncontrollable sources.[2]

[2] Resolution No. R9-2008-0028, *Implementation Provisions for Indicator Bacteria Water Quality Objectives to Account for Loading from Natural Uncontrollable Sources Within the Context of a TMDL,* adopted by the San Diego Water Board on May 14, 2008, approved by the State Water Board on March 17, 2009, approved by OAL on June 25, 2009, and approved by USEPA on September 16, 2009.

The first step was to identify an appropriate allowable exceedance frequency. The allowable exceedance frequency is determined by identifying an appropriate reference system. A reference system is a beach and upstream watershed that are minimally impacted by anthropogenic activities, typically having at least 95 percent open space.. To be consistent with the Los Angeles Water Board, in the calculation of the wet weather TMDLs the San Diego Water Board chose to apply the 22 percent allowable exceedance frequency as determined for Leo Carillo Beach in Los Angeles County.[3]

The next step is to quantify the allowable exceedance load associated with a 22 percent exceedance frequency. The allowable exceedance frequency was converted into allowable exceedance days. The number of allowable exceedance days for each subwatershed was calculated as follows. For each watershed, the number of wet days in 1993 was documented. Wet days are defined as days with 0.2 inches or more of rainfall and the following 72 hours. For each watershed, the number of wet days in 1993 is presented Table I-1.

Table I-1. Wet Days of the Critical Period (1993) Identified for Watersheds Affecting Impaired Waterbodies

Watershed	Number of Wet Days in 1993
San Joaquin Hills HSA/Laguna Beach HSA	69
Aliso HSA	69
Dana Point HSA	69
Lower San Juan HSA	76
San Clemente HA	73
San Luis Rey HU	90
San Marcos HA	49
San Dieguito HU	98
Miramar Reservoir HA	94
Scripps HA	57
Tecolote HA	57
Mission San Diego HSA/Santee HSA	86
Chollas HSA	65

The number of days that exceedances of numeric targets are allowed for each particular watershed is obtained by multiplying the number of wet days by the exceedance frequency. For example, the Aliso HSA watershed had 69 wet days in 1993. The allowable exceedance frequency of the wet weather numeric targets under the reference system approach is 22 percent. Therefore, the number of allowable exceedance days for the Aliso HSA watershed is:

$$69 \text{ Wet Days} * 0.22 = 15 \text{ Allowable Exceedance Days}$$

The number of allow exceedance days for each watershed is presented Table I-2.

[3] The Los Angeles Water Board used the Arroyo Sequit Watershed as the reference system watershed for development of TMDLs for the Santa Monica Bay beaches and Malibu Creek (Los Angeles Water Board, 2002 and 2003). This watershed, consisting primarily of unimpacted land use (98 percent open space), discharges to Leo Carillo Beach, where 22 percent of wet weather fecal coliform data (10 out of 46 samples) were observed to exceed the WQOs).

Table I-2. Allowable Exceedance Days for Watersheds Affecting Impaired Waterbodies

Watershed	Number of Allowable Exceedance Days
San Joaquin Hills HSA/Laguna Beach HSA	15
Aliso HSA	15
Dana Point HSA	15
Lower San Juan HSA	17
San Clemente HA	16
San Luis Rey HU	20
San Marcos HA	11
San Dieguito HU	22
Miramar Reservoir HA	21
Scripps HA	13
Tecolote HA	13
Mission San Diego HSA/Santee HSA	19
Chollas HSA	14

The days with the highest loads were chosen as the allowable exceedance days because the highest loads in most of the watersheds correspond to open space land uses where bacteria loads are generated from natural sources. The solid blue bar segments above the numeric target line shown on the example load-duration curve in Figure I-2 correspond to the 22 percent exceedance frequency allowed for loading from uncontrollable sources. The number of solid blue bar segments above the numeric target line is equal to the allowable exceedance days shown in Table I-2. For the Aliso HSA watershed, there are 15 allowable exceedance days, which correspond to the 15 solid blue bar segments above the numeric target line shown in Figure I-2.

The solid blue bar segments above the numeric target line represent the reference system loading capacity of the waterbody that will not cause the numeric targets to be exceeded on more than 22 percent of the wet days. The summation of the solid blue bar segments above the numeric target line is the total allowable annual bacteria exceedance load for wet weather in the critical wet period of 1993.

4. Quantify Wet Weather TMDLs

The solid-line outlined bar segments below the numeric target line plus the solid blue bar segments above the numeric target line are equal to the total allowable bacteria loads, or total maximum annual wet weather bacteria loads, for the subwatershed. In other words, the sum of the allowable loads calculated under step 2 and the allowable exceedance loads calculated under step 3 is equal to the TMDL for the subwatershed.

The existing loads and TMDLs for each watershed are calculated by summing the existing loads and TMDLs of all the modeled subwatersheds in each watershed. For example, the total existing bacteria load from the Aliso HSA watershed is comprised of loads from subwatershed numbers 201 and 202 (these two subwatersheds are adjacent to the Pacific Ocean and are cumulative of the upstream watersheds). Numerical values were obtained from the charts associated with the load-duration curves for the Aliso HSA watershed, specifically Tables O-16 and O-19 (Appendix O) for this example. The “Total Existing Load For Existing Condition” (Existing Load) for the

Aliso HSA watershed is the sum of the "Total Existing Load for Existing Conditions" for subwatersheds 201 and 202 from Tables O-16 and O-19, respectively. The "TMDL" for the Aliso HSA watershed is the sum of the "Total Allowable Load [TMDL]" (Allowable Load) for subwatersheds 201 and 202 from Tables O-16 and O-19, respectively. The Total Load and the TMDL for the Aliso HSA watershed are calculated in the following equations.

$$\text{Existing Load} = (\text{Existing Load})_{\text{Subwatershed 201}} + (\text{Existing Load})_{\text{Subwatershed 202}}$$
$$= 19{,}386 \text{ billion MPN/mL} + 1{,}732{,}709 \text{ billion MPN/mL}$$
$$= 1{,}752{,}095 \text{ billion MPN/mL}$$

$$\text{TMDL} = (\text{Allowable Load})_{\text{Subwatershed 201}} + (\text{Allowable Load})_{\text{Subwatershed 202}}$$

$$= 16{,}480 \text{ billion MPN/mL} + 1{,}562{,}594 \text{ billion MPN/mL}$$
$$= 1{,}579{,}074 \text{ billion MPN/mL}$$

The same calculations were performed for each watershed by summing the "Total Existing Load for Existing Condition" and "Total Allowable Load [TMDL]," respectively, of all the modeled subwatersheds in each watershed. Table I-3 shows the wet weather existing loads and TMDLs on an annual basis for all major watersheds included in this project for fecal coliform, total coliform, and enterococci bacteria, which were derived from the load-duration curves in Appendix O.

Table I-3. Wet Weather Existing Loads and TMDLs (Billion MPN/Year)

Watershed	Fecal Coliform		Total Coliform		Enterococci	
	Existing	TMDL	Existing	TMDL	Existing	TMDL
San Joaquin Hills HSA/Laguna Beach HSA	705,015	664,634	8,221,901	7,445,649	852,649	782,799
Aliso HSA	1,752,095	1,579,073	23,210,774	20,190,798	2,230,206	1,950,964
Dana Point HSA	403,911	377,313	6,546,962	6,031,472	501,526	462,306
Lower San Juan HSA	15,304,790	14,714,833	130,258,863	122,879,189	12,980,098	12,152,446
San Clemente HA	1,441,723	1,378,931	16,236,606	15,147,603	1,663,100	1,563,187
San Luis Rey HU	33,120,012	32,444,242	231,598,677	224,150,535	18,439,920	17,463,618
San Marcos HA	20,886	17,224	515,278	425,083	40,558	32,966
San Dieguito HU	21,286,910	21,101,649	163,541,133	159,814,184	14,796,210	14,307,087
Miramar Reservoir HA	10,392	10,256	212,986	210,180	11,564	11,405
Scripps HA	204,057	176,907	5,029,519	4,356,973	377,839	324,032
Tecolote HA	261,966	229,322	7,395,789	6,379,770	708,256	603,761
Mission San Diego HSA/Santee HSA	4,932,380	4,680,838	72,757,569	66,105,222	7,255,759	6,590,966
Chollas HSA	603,863	520,440	15,390,608	13,247,626	1,371,972	1,152,645

The difference between the existing load and TMDL is represented by the sum of the patterned bar segments above the numeric target line. The patterned bar segments above the numeric target line represent the bacteria loads that are in exceedance of the numeric target (i.e., REC-1 WQOs and allowable exceedance frequency) that must be reduced to meet the TMDL.

5. Classify Land Use Types as Point or Nonpoint Sources, and Classify Nonpoint Sources as Controllable or Uncontrollable

For purposes of TMDL allocation to sources, all land use types were classified based on whether or not they generated mainly point or nonpoint sources of bacteria. Nonpoint source land use

categories were further divided into controllable or uncontrollable sources. The classification of a land use as generating either point or nonpoint sources was based on the likelihood that the land use was urban and would occur in an area drained by municipal separate storm sewer systems (MS4s), or was rural and outside of MS4 drained areas. The rationale for identifying specific responsible dischargers is discussed in the Technical Report, sections 10 and 11.

Point sources are defined as "any discernable, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged" [CWA section 502(6)].
Land use types considered urban and generating mostly point source loads from storm drain discharges were identified as:

- Low Density Residential;
- High Density Residential;
- Commercial/Institutional;
- Industrial/Transportation (excluding areas owned by Caltrans);
- Caltrans;
- Military;
- Parks/Recreation; and
- Transitional (construction activities).

Bacteria loads from these land use types were classified as point sources because, although they may be diffuse in origin, these land uses are typically found in urbanized areas, and the pollutant loading is transported and discharged to receiving waters through MS4s. MS4s are considered point sources because they discharge waste out of a discrete pipe. The principal MS4s contributing bacteria to receiving waters are owned or operated by either municipalities located throughout the watersheds or the California Department of Transportation (Caltrans). Municipal and Caltrans MS4 discharges are regulated separately under different NPDES requirements. For this reason, in each watershed, loads generated by Caltrans were separated from loads generated by Municipal MS4s.

Land use types considered rural and outside of areas drained by MS4s were identified as:

- Agriculture;
- Dairy/Intensive Livestock;
- Horse Ranches;
- Open Recreation;
- Open Space; and
- Water.

Bacteria loads from these land use types were classified as nonpoint sources because bacteria-laden discharges from these land uses are diffuse in origin, and originate in areas without constructed (man-made) MS4s. Nonpoint sources were separated into controllable and uncontrollable categories. Controllable sources included those found in the following land-use types: Agriculture, Dairy/Intensive Livestock, and Horse Ranches. These were considered

controllable because the land uses are anthropogenic in nature, and load reductions can be reasonably expected with the implementation of suitable management measures. For implementation purposes, controllable nonpoint source discharges are recognized as originating from activities related to agriculture, livestock, and horse ranch facilities. For this reason, these types of discharges were given load allocations (LAs) and were required to reduce their bacteria loads if they constitute more than 5 percent of the total TMDL (see step 7 for methodology for calculating LAs).

Uncontrollable nonpoint sources include loads from Open Recreation, Open Space, and Water land uses. Loads from these areas were considered uncontrollable because they come from natural sources (e.g. bird and wildlife feces) rather than anthropogenic sources. LAs from these sources were developed, but there were no accompanying load reductions expected since these sources are natural, largely uncontrollable, and regulation is not warranted.

6. Quantify Relative Contribution of Bacteria Loads From Each Land Use Type

The sum of all the shaded bars in the load-duration curves provides an estimate of the total load expected in each watershed during the critical condition (rainfall conditions documented in the critical period in 1993). The watershed model results were used to calculate the percent contribution from each of the 13 land use types to the total existing load (see Appendix J for discussion). Pie charts, like Figure I-3 below, shows these percentages for each watershed. Loads from each land use type were calculated by multiplying the existing load for the watershed by the percentages in the pie charts. Pie charts for each watershed are presented in Figures I-5 through I-40.

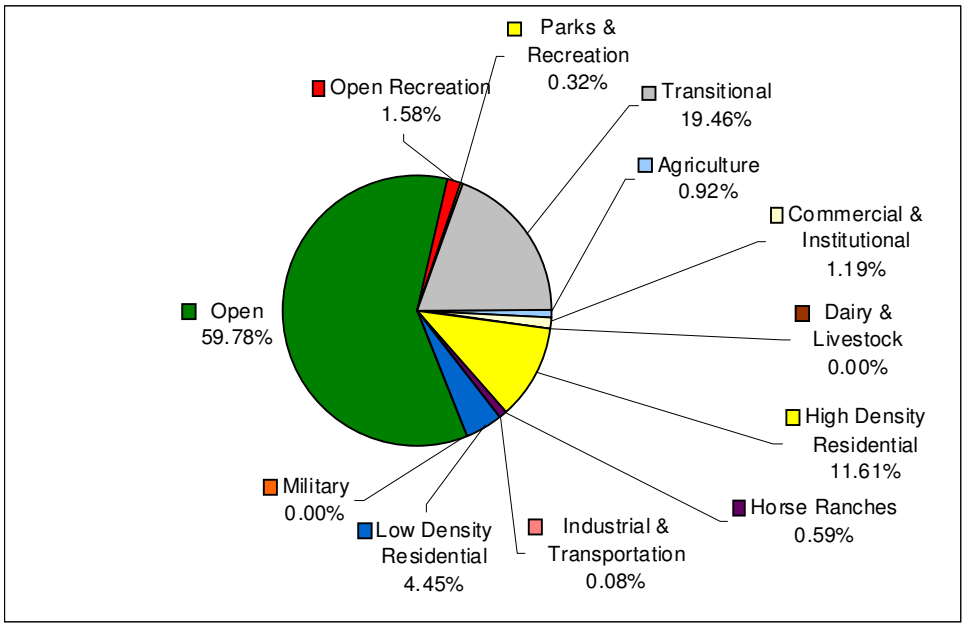

Figure I-3. Percent of Fecal Coliform Load Generated by Different Land Uses in the Aliso HSA Watershed

For example, the existing load from all sources to the Aliso HSA watershed is 1,752,095 billion MPN/year (Table O-16, O-19, Appendix O). The relative load from the High Density Residential land use can be calculated as follows:

Existing Load from High Density Residential = 1,752,095 billion MPN/year * 11.61%

= 203,418 billion MPN/year

Relative loads from all land use types, in all watersheds and each indicator bacteria are presented in Tables I-12 through I-14.

7. Separate Caltrans Existing Loads from Loads Generated by Industrial/Transportation Land Use

Highways owned by Caltrans are assumed to be part of the industrial and transportation land use category. Bacteria loads generated from Caltrans highways need to be quantified separately from the Industrial/Transportation land use, since ultimately discharges from Caltrans highways are regulated under their own set of waste discharge requirements (WDRs) implementing National Pollutant Discharge Elimination System (NPDES) regulations. Caltrans land use areas were not delineated in the geographic information system (GIS) data used in the wet weather modeling analysis. Thus, relative loads contributed by Caltrans could not be extracted directly from the watershed model results. To calculate an existing load from Caltrans, the area occupied by impermeable Caltrans owned highway surfaces was expressed as a percent of the total area occupied by the Industrial/Transportation land use, for each watershed. The area occupied by Caltrans in each of the impaired watersheds was provided by Caltrans (Richard Watson, Caltrans, personal communication, September 23, 2005) as shown in Table I-4.

Using this information, the existing loads associated with the Industrial/Transportation land use was divided into two sources; one generated by the Municipal MS4s and one generated by Caltrans based on the percent of the total Industrial/Transportation land use area occupied by impermeable Caltrans' highways.

Table I-4. Caltrans Occupied Areas in Each Watershed

Watershed	Caltrans Occupied Area (sq miles)
San Joaquin Hills HSA/Laguna Beach HSA	0.19
Aliso HSA	0.17
Dana Point HSA	0.06
Lower San Juan HSA	0.73
San Clemente HA	0.18
San Luis Rey HU	1.17
San Marcos HA	0.01
San Dieguito HU	0.78
Miramar Reservoir HA	0.74
Scripps HA	0.00
Tecolote HA	0.24
Mission San Diego HSA/Santee HSA	1.94
Chollas HSA	0.57

An example calculation for the Aliso HSA watershed is shown below.

Industrial/Transportation land use area = 0.89 sq miles (Table J-1 in Appendix J)

Caltrans occupied area = 0.17 sq miles (Table I-4)

The percent of the Industrial/Transportation land use area that is occupied by Caltrans is:

$$\frac{0.17\ sq\ miles}{0.89\ sq\ miles} = 0.191 = 19.1\%$$

The existing loads generated by Caltrans were obtained by multiplying the percent area occupied by Caltrans by the loads generated by the Industrial/Transportation land use (Table I-10):

Existing Fecal Coliform Load Generated by Caltrans	=	(Percent of land use occupied by Caltrans) * (Existing Fecal Coliform Load Generated by the Industrial/Transportation land use)
	=	0.191 * 1,402 billion MPN/year
	=	268 billion MPN/year

For two watersheds, San Joaquin Hills HSA/Laguna Beach HSA, and Dana Point HSA, the Caltrans occupied area was reported as being larger than the area reported for the Industrial/Transportation land use. The Caltrans data are more current (2005) than the GIS land use data (2000), thus, the discrepancy is most likely due to new highway construction since 2000 by Caltrans in these watersheds. In these cases, the loads generated by the Industrial/ Transportation land use were attributed solely by Caltrans.

The loads generated by Caltrans calculated from the above methodology in the remaining watersheds are shown in Tables I-15 through I-17.

8. <u>Combine Land Use Types Based on Method of Regulation by the San Diego Water Board</u>
After the existing loads were calculated from each land use type (sources) in steps 6 and 7, the land use types were then combined into one of four discharge/land use categories. These categories were based on the manner in which discharges associated with these land uses are regulated by the San Diego Water Board. The land uses were grouped into the following four discharge categories:

Municipal MS4s	=	Sum of existing loads generated from Low Density Residential, High Density Residential, Commercial/Institutional, Industrial/Transportation (excluding Caltrans), Military, Parks/Recreation, and Transitional land uses
Caltrans	=	Existing load calculated from step 7

Agriculture/Livestock Operations (Ag/Livestock)	=	Sum of existing loads from Agriculture, Dairy/Intensive Livestock, and Horse Ranches land uses
Undeveloped Land (Open Space)	=	Sum of existing loads from Open Recreation, Open Space, and Water land uses

Discharges from the various land use types were grouped into these four categories for implementation purposes. Section 11 of the Technical Report discusses implementation of the TMDLs.

9. Allocate TMDL to the Four Discharge/Land Use Categories

Once TMDLs were determined in step 4, they were allocated to the four discharge/land use categories described in step 8. Wasteload allocations (WLAs) were assigned to point source discharges and load allocations (LAs) were assigned to nonpoint source discharges. The wet weather TMDLs were distributed as follows:

$$TMDL = WLA(Municipal MS4s) + WLA(Caltrans) + LA(Ag / Livestock) + LA(Open\ Space)$$

where *TMDL* = Total Maximum Daily Load for entire watershed

WLA (Municipal MS4s)	=	Point source wasteload allocation for owners/operators of Municipal MS4s
WLA (Caltrans)	=	Point source wasteload allocation for Caltrans
LA (Ag/Livestock)	=	Nonpoint source load allocation for owners/operators of agriculture, livestock, and horse ranch facilities land uses
LA (Open Space)	=	Nonpoint source load allocation for uncontrollable sources of bacteria for open space, open recreation, and water land uses

Since loads from Open Space, Open Recreation, and Water land uses are uncontrollable, the LAs for this category cannot be lower than the existing loads. Therefore the LAs for this category are the same as the existing loads generated by uncontrollable sources, as calculated from step 6, and cannot be reduced (i.e., *Existing Load (Open Space) = LA (Open Space)*).

Similarly, for Caltrans, the WLAs are identical to the existing loads generated by Caltrans in each watershed. However, the reasoning for this determination is different than the reasoning described for loading from uncontrollable sources. Inspection of Figures I-5 through I-40 indicate that wet weather loading from the Industrial/Transportation land use is less than 1 percent of the total existing load in all watersheds. Furthermore, Caltrans occupies a portion of this land use (Tables I-15 through I-17). Since Caltrans is an insignificant bacteria source compared to other controllable sources, the San Diego Water Board shall not impose stricter regulation than what is already in place (see section 11 for a description of regulation of Caltrans with respect to these TMDLs). Therefore, no reductions are required for Caltrans . (i.e., *Existing Load (Caltrans) = WLA (Caltrans)*) The remaining portion of the TMDL is distributed between the Municipal MS4s and Ag/Livestock categories, as follows:

$$TMDL - WLA(Caltrans) - LA(Open\ Space) = WLA(Municipal MS4s) + LA(Ag / Livestock)$$

The methodology used for distributing the remaining portions of the TMDL between the Municipal MS4s and the Ag/Livestock categories depended on whether or not the relative bacteria loads contributed by agriculture, livestock, and horse ranch facilities (i.e., *Existing Load (Ag/Livestock)*) were significant compared to loads from urbanized areas. Although allocations are distributed to the identified dischargers of bacteria, this does not imply that other potential sources do not exist. Any potential sources in the watersheds, such as publicly owned treatment works, not receiving an explicit allocation as described above is allowed a zero discharge of bacteria to the impaired beaches and creeks.

a) Methodology When Ag/Livestock Sources are an Insignificant Portion of the Total Existing Load

Figures I-5 through I-40 demonstrate that in the San Joaquin Hills HSA/Laguna Beach HSA, Aliso HSA, Dana Point HSA, San Clemente HA, Miramar Reservoir HA, Scripps HA, Mission San Diego HSA/Santee HSA, and Chollas HSA watersheds, the proportion of the total existing load for all 3 indicator bacteria due to agriculture, livestock, and horse ranch facilities (loads associated with Agriculture, Dairy/Intensive Livestock, and Horse Ranches land uses) is less than 5 percent. For these watersheds, the LAs for agriculture, livestock, and horse ranch facilities are identical to existing loads calculated from these land uses. As with Caltrans and Open Space, LAs are given to agriculture, livestock, and horse ranch facilities; however no load reductions are required since these sources are insignificant compared to existing loads generated by urban sources in these watersheds (ie., *Existing Load (Ag/Livestock) = LA (Ag/Livestock)*). Therefore Municipal MS4s alone are required to reduce bacteria loads during wet weather events in these watersheds to meet the TMDLs.

WLAs for municipal MS4s are given by:

$$WLA(Municipal\ MS4s) = TMDL - WLA(Caltrans) - LA(Ag\ /\ Livestock) - LA(Open\ Space)$$

In the above equation, WLAs for Caltrans, LAs for agriculture, livestock, and horse ranch facilities, and LAs for uncontrollable sources are equal to existing loads from these sources as determined in steps 6 and 7. Using the Aliso HSA watershed as an example, the WLA for Municipal MS4s can be calculated using Table I-12. The WLA for fecal coliform for Municipal MS4s is

WLA (Municipal MS4s) = [1,579,073 – 260 – 26,508 – 1,075,237] billion MPN/year

= 477,069 billion MPN/year

The percent reduction required for fecal coliform for the Municipal MS4s in the Aliso HSA watershed is

$$Percent\ Reduction = \frac{(Existing\ Load\ From\ Municipal\ MS4s - WLA\ (Municipal\ MS4s))}{Existing\ Load\ From\ Municipal\ MS4s}$$

$$= \frac{(650{,}092\ billion\ MPN / year - 477{,}069\ billion\ MPN / year)}{650{,}092\ billion\ MPN / year}$$

$$= 0.2662$$

$$= 26.62\%$$

b) Methodology When Ag/Livestock Sources are a Significant Portion of the Total Existing Load

In the Lower San Juan HSA, San Luis Rey HU, San Marcos HA, and San Dieguito HU watersheds, the agriculture, livestock, and horse ranch facilities generate more than 5 percent of the total wet weather load for all three indicator bacteria. Table I-5 shows the percent contribution of bacteria from agriculture, livestock, and horse ranch facilities to the total existing load in each watershed. This information is derived from the pie charts (Figures I-5 through I-40).

Table I-5. Percent Contribution of Bacteria from Agriculture, Livestock, and Horse Ranch Facilities to the Total Existing Loads

Watershed	Percent of Existing Load		
	Fecal Coliform	Total Coliform	Enterococci
San Joaquin Hills HSA/Laguna Beach HSA	1.04%	0.62%	0.38%
Aliso HSA	1.51%	0.77%	0.50%
Dana Point HSA	0.00%	0.00%	0.00%
Lower San Juan HSA	**21.40%**	**14.20%**	**8.87%**
San Clemente HA	0.03%	0.01%	0.01%
San Luis Rey HU	**62.46%**	**50.67%**	**37.32%**
San Marcos HA	**53.62%**	**23.76%**	**19.29%**
San Dieguito HU	**55.77%**	**42.53%**	**29.90%**
Miramar Reservoir HA	0.00%	0.00%	0.00%
Scripps HA	0.00%	0.00%	0.00%
Tecolote HA	0.00%	0.00%	0.00%
Mission San Diego HSA/Santee HSA	8.41%	4.80%	2.94%
Chollas HSA	0.00%	0.00%	0.00%

Similarly, the percent contribution from urbanized (i.e., municipal MS4) sources for each watershed is shown in Table I-6.

Table I-6. Percent Contribution of Bacteria from Urbanized Municipal MS4 Sources to the Total Existing Loads

Watershed	Percent of Existing Load		
	Fecal Coliform	Total Coliform	Enterococci
San Joaquin Hills HSA/Laguna Beach HSA	11.00%	20.15%	15.98%
Aliso HSA	37.10%	51.46%	45.50%
Dana Point HSA	44.33%	59.87%	51.59%
Lower San Juan HSA	8.67%	15.29%	14.64%
San Clemente HA	17.72%	28.13%	23.79%
San Luis Rey HU	2.85%	6.58%	7.98%
San Marcos HA	38.76%	71.03%	73.44%
San Dieguito HU	3.81%	10.64%	12.92%
Miramar Reservoir HA	65.81%	81.81%	71.50%
Scripps HA	62.93%	81.92%	75.65%
Tecolote HA	60.87%	83.19%	81.29%
Mission San Diego HSA/Santee HSA	9.58%	23.97%	21.44%
Chollas HSA	55.63%	78.12%	74.51%

Owners and operators of agriculture, livestock, and horse ranch facilities in the Lower San Juan HSA, San Luis Rey HU, San Marcos HA, and San Dieguito HU watersheds are given required reductions that are proportional to the existing loads generated by these sources. The LAs for the Ag/Livestock category are calculated as follows:

$$LA(Ag\ /\ Livestock) = \left[TMDL - WLA(Caltrans) - LA(Open\ Space)\right] * \left[\frac{X}{Y}\right]$$

where X = % Total Existing Load from Agriculture/Livestock/Horse land uses (Table I-3),

and

Y = % Total Existing Load from Agriculture/Livestock/Horse land uses + % Total Existing Load from Urban land uses (summation of entries from Table I-5 and I-6)

In other words, the wasteload allocations for Caltrans and Open Space, which are equal to the existing loads for these categories and do not require reductions, are subtracted from the TMDL load. That difference ([*TMDL – WLA (Caltrans) – LA(Open Space*]) must be divided between the Ag/Livestock category and Municipal MS4 category. The ratio of the existing Ag/Livestock loading to the existing Municipal MS4 loading (the [X/Y] term in the equation) is the basis for splitting the difference between the two categories.

The variables X and Y are determined from Tables I-3 and I-4, which are in turn derived from the pie charts (Figures I-5 through I-40).

An example calculation for Lower San Juan HSA watershed is shown below. The value for the TMDL is found in Table I-3. The values for the WLA (Caltrans), LA (Open Space) are equal to existing loads and are found in Table I-12. All values are specific to the Lower San Juan HSA watershed.

$$LA\ (Ag/Livestock) = [14{,}714{,}833 - 1{,}713 - 10{,}701{,}131] * \left[\frac{21.4\%}{21.4\% + 8.67\%}\right]$$

$$= 2{,}855{,}570 \text{ billion MPN/year}$$

The percent reduction required for fecal coliform for agriculture, livestock, and horse ranch facilities is

$$Percent\ Reduction = \frac{(Existing\ Load\ From\ Ag/Livestock - LA\ (Ag/Livestock))}{Existing\ Load\ From\ Ag/Livestock}$$

$$= \frac{(3{,}275{,}477\ billion\ MPN/year - 2{,}855{,}570\ billion\ MPN/year)}{3{,}275{,}477\ billion\ MPN/year}$$

$$= 0.1282$$

$$= 12.82\%$$

Once WLAs for agriculture, livestock, and horse ranch facilities have been determined, the remaining portion of the TMDL is allocated to Municipal MS4s. The WLAs for Municipal MS4s are given by:

$$WLA(Municipal\ MS4s) = TMDL - WLA(Caltrans) - LA(Ag/Livestock) - LA(Open\ Space)$$

Using the value for *LA (Ag/Livestock)* calculated in the previous step, *WLA (Municipal MS4s)* can be determined for the Lower San Juan HSA watershed.

$$WLA\ (Municipal\ MS4s) = [14{,}714{,}833 - 1{,}713 - 10{,}701{,}131 - 2{,}855{,}477] \text{ billion MPN/year}$$

$$= 1{,}156{,}419 \text{ billion MPN/year}$$

Note that the formula for determining WLAs for Municipal MS4s is the same as the one described in methodology a). An important point is that the difference between the two methodologies is that in watersheds where loads from Ag/Livestock are insignificant, the LAs for this category are identical to existing loads. However, in watersheds where loads from Ag/Livestock are significant, the LAs for this category are lower than existing loads.

Table I-7 shows the WLAs, LAs, and percent reductions required for the Aliso HSA and Lower San Juan HSA watersheds using the methods outlined in this appendix. For the Lower San Juan HSA, San Luis Rey HU, San Marcos HA, and San Dieguito HU watershed, the Municipal MS4s and Ag/Livestock categories are required to reduce the bacteria loads in each watershed by the amount specified in Table I-18 through I-20.

Table I-7. WLAs and LAs (Billion MPN/Year) for Fecal Coliform in the Aliso Creek and San Juan Creek Watersheds

Watershed	TMDL	Point Sources				Nonpoint Sources				
		MS4		Caltrans*		Ag/Livestock			Open Space*	
		WLA	Reduction Required	WLA	Reduction Required	X Y**	LA	Reduction Required	LA	Reduction Required
Aliso HSA	1,579,073	477,069	26.62%	260	0.00%	0.04	26,508	0.00%	1,075,237	0.00%
Lower San Juan HSA	14,714,833	1,156,419	12.82%	1,713	0.00%	0.71	2,855,570	12.82%	10,701,131	0.00%

* No reductions are required for Caltrans or Open Space
** X = % Total Existing Load from Agriculture/Livestock/Horse land uses, and Y = % Total Existing Load from Agriculture/Livestock/Horse land uses + % Total Existing Load from Municipal MS4 land uses

The information in Table I-7 (except for the values for X and Y) is available for the remaining watersheds, and for total coliform and enterococci, and is reported in Tables I-18 through I-20, as well as Tables 9-2a, 9-2b, and 9-2c in section 9 of the Technical Report.

I.5 Calculation of Dry Weather TMDLs and Allocations

Because the density of bacteria in receiving waters during dry weather is extremely variable in nature, a separate approach from the wet weather LSPC model was needed. An approach was developed that relied on detailed analysis of available data to better identify and characterize sources.

To represent the linkage between source contributions and in-stream response, a steady-state mass balance model was developed to simulate transport of bacteria in the impaired creeks and the creeks flowing to impaired shorelines. This predictive model represents the streams as a series of plug-flow reactors, with each reactor having a constant, steady state flow and bacteria load. The development of the dry weather model is described in Appendix K.

The methodology for calculating and allocating the dry weather TMDLs for each watershed is described in the following steps:Step 1. Calculate Dry Weather Existing Loads and TMDLs;
Step 2. Distribute TMDL Among Four Discharge/Land Use Categories.

Descriptions of each step are provide below.

1. <u>Calculate Dry Weather Existing Loads and TMDLs</u>

Unlike the wet weather modeling approach, the numeric targets used in the dry weather modeling approach have a zero percent allowable exceedance frequency. This is because available data show that exceedances of WQOs in local reference systems during dry weather conditions are uncommon (see Technical Report, section 4.2). Furthermore, reference systems do not generate significant dry weather bacteria loads because flows are minimal. During dry weather, flow, and hence bacteria loads, are largely generated by urban runoff, which is not a product of a reference system. Thus, the dry weather TMDL calculations are based entirely on meeting the geometric mean REC-1 WQOs.

A steady-state plug-flow reactor model was used to calculate dry weather existing loads and allowable loads. Total existing bacteria loads were calculated using the plug-flow reactor model predicted flow multiplied by the land-use-specific bacteria densities derived from regression analyses of bacteria water quality data from several regional watersheds. Allowable dry weather bacteria loads, or TMDLs, were calculated using the dry weather plug-flow reactor model predicted flow multiplied by the applicable numeric target, which is the geometric mean REC-1 WQO (see section 4 of the Technical Report). Table I-10 shows the dry weather existing loads and TMDLs calculated for all watersheds.

Table I-10. Dry Weather TMDLs (Billion MPN/Month)

	Fecal Coliform		Total Coliform		Enterococci	
Watershed	**Existing**	**TMDL**	**Existing**	**TMDL**	**Existing**	**TMDL**
San Joaquin Hills HSA/Laguna Beach HSA	2,741	227	13,791	1,134	2,321	41
Aliso HSA	5,470	242	26,639	1,208	4,614	40
Dana Point HSA	1,851	92	9,315	462	1,567	16
Lower San Juan HSA	6,455	1,665	30,846	8,342	5,433	275
San Clemente HA	3,327	192	16,743	958	2,817	33
San Luis Rey HU	1,737	1,058	8,549	5,289	1,466	185
San Marcos HA	149	26	751	129	126	5
San Dieguito HU	1,631	1,293	7,555	6,468	1,368	226
Miramar Reservoir HA	205	7	1,030	36	173	1
Scripps HA	3,320	119	16,707	594	2,811	21
Tecolote HA	4,329	234	21,349	1,171	3,657	39
Mission San Diego HSA/Santee HSA	4,928	1,506	28,988	7,529	4,106	248
Chollas HSA	5,068	398	25,080	1,991	4,283	66

2.
Unlike wet weather loading, which is caused by rain events, dry weather analysis showed that dry weather loading is dominated by nuisance flows from urban land use activities such as car washing, sidewalk washing, and lawn over-irrigation, which pick up and transport bacteria the the municipal MS4s into receiving waters. These types of nuisance flows are referred to as urban runoff. Urban runoff is non-storm water runoff.

Because urban runoff is overwhelmingly the main source of bacteria loading during dry weather, the TMDLs were allocated solely to Municipal MS4s. Allocations for nonpoint sources were unnecessary since land uses associated with these sources generally do not generate runoff to receiving water during dry weather conditions. Additionally, dry weather loads from Caltrans highways were assumed to be insignificant because during dry periods there is no significant urban runoff from Caltrans owned roadway surfaces. Because nonpoint sources and Caltrans are not expected to generate runoff during dry weather conditions, the dry weather TMDLs were distributed as follows:

$$TMDL = WLA(Municipal MS4s) + WLA(Caltrans) + LA(Ag / Livestock) + LA(Open\ Space)$$

where *TMDL* = Total Maximum Daily Load for entire watershed

WLA (Municipal MS4s) = Point source wasteload allocation for owners/operators of Municipal MS4s

WLA (Caltrans) = 0 = No point source wasteload allocation for Caltrans because no runoff expected

LA (Ag/Livestock) = 0 = No nonpoint source load allocation for owners/operators of agriculture, livestock, and horse ranch facilities/land uses because no runoff expected

LA (Open Space) = 0 = No nonpoint source load allocation for uncontrollable sources of bacteria for open space, open recreation, and water land uses because no runoff expected

In other words, dry weather discharges from any sources other than Municipal MS4s is not expected or allowed. Therefore, the dry weather TMDL is as follows:

$$TMDL = WLA(Municipal MS4s)$$

Dry weather TMDLs are expressed on a monthly basis (MPN/month) because the numeric targets are equal to the 30-day geometric mean WQOs, and the dry weather model simulates average flows. An example showing the total coliform TMDL allocation is shown using the Aliso Creek watershed as an example. For the Aliso Creek watershed, the existing total coliform load estimated by the model was approximately 26,639 billion MPN/month. The percent reduction required and the allocations are shown in Tables I-11.

Table I-11. Dry Weather Final WLAs and LAs (Billion MPN/Month) for Total Coliform in the Aliso Creek Watershed

		Point Sources				Nonpoint Sources			
		MS4		Caltrans		Ag/Livestock		Open Space	
Watershed	TMDL	WLA	Reduction Required	WLA	Reduction Required	LA	Reduction Required	LA	Reduction Required
Aliso HSA	1,208	1,208	95.9%	0	0.00%	0	0.00%	0	0.00%

Similar information for the remaining watersheds is reported in Tables 9-4a, 9-4b and 9-4c in section 9 of the Technical Report.

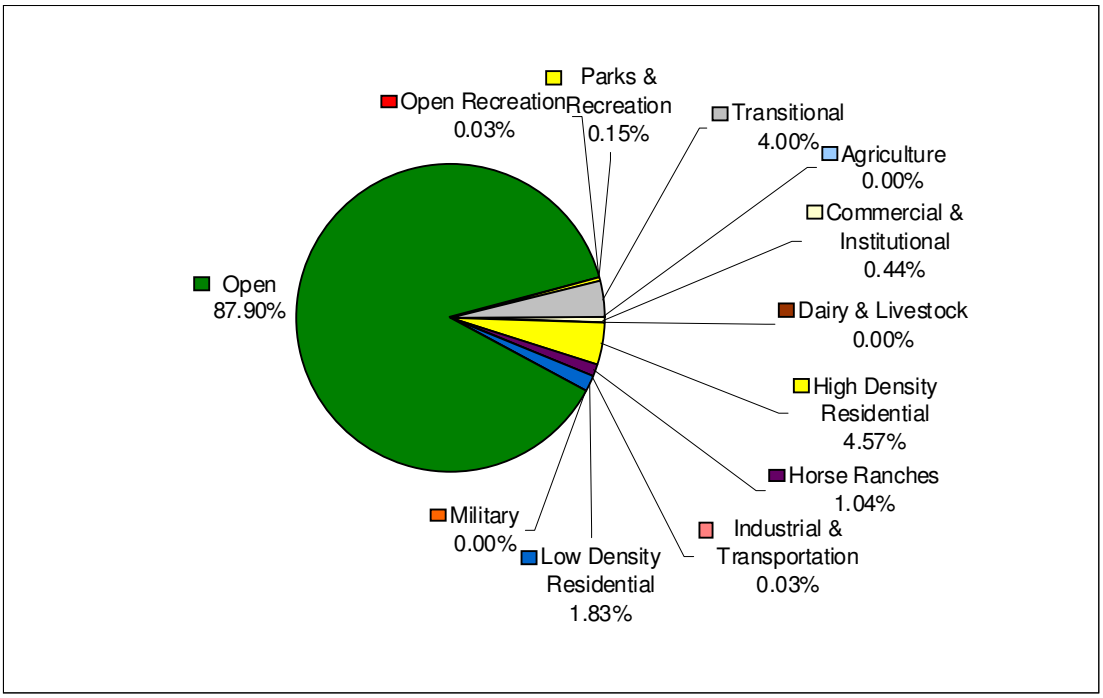

Figure I-5. Percent of Fecal Coliform Load Generated by Different Land Uses in the San Joaquin Hills HSA/Laguna Beach HSA Watershed

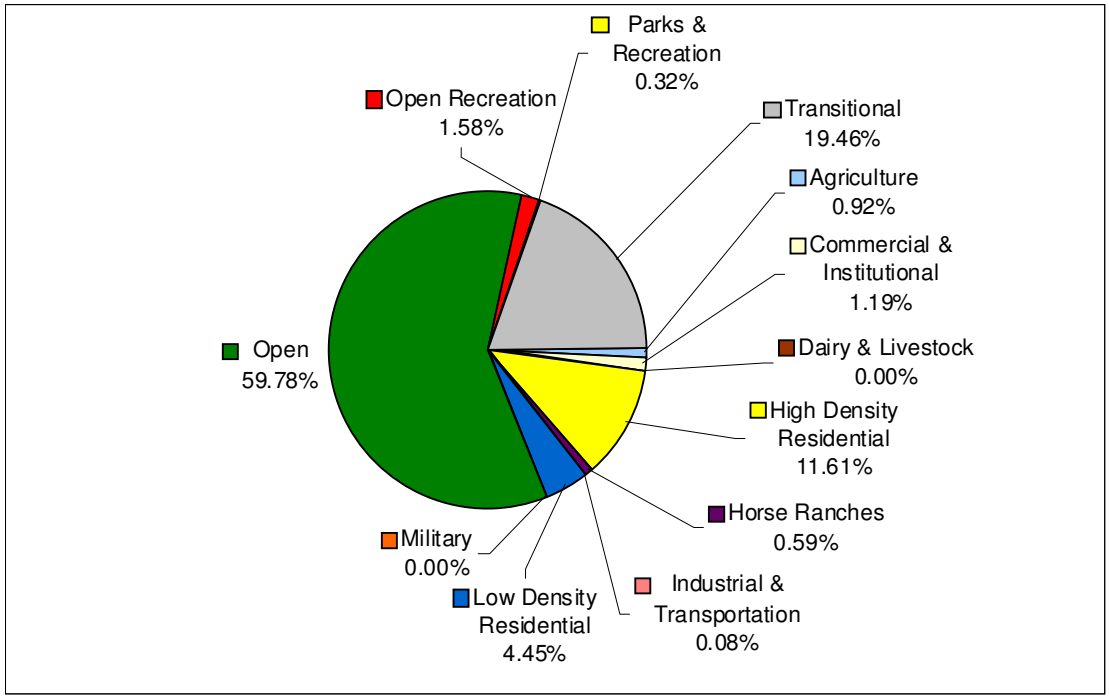

Figure I-6. Percent of Fecal Coliform Load Generated by Different Land Uses in the Aliso HSA Watershed

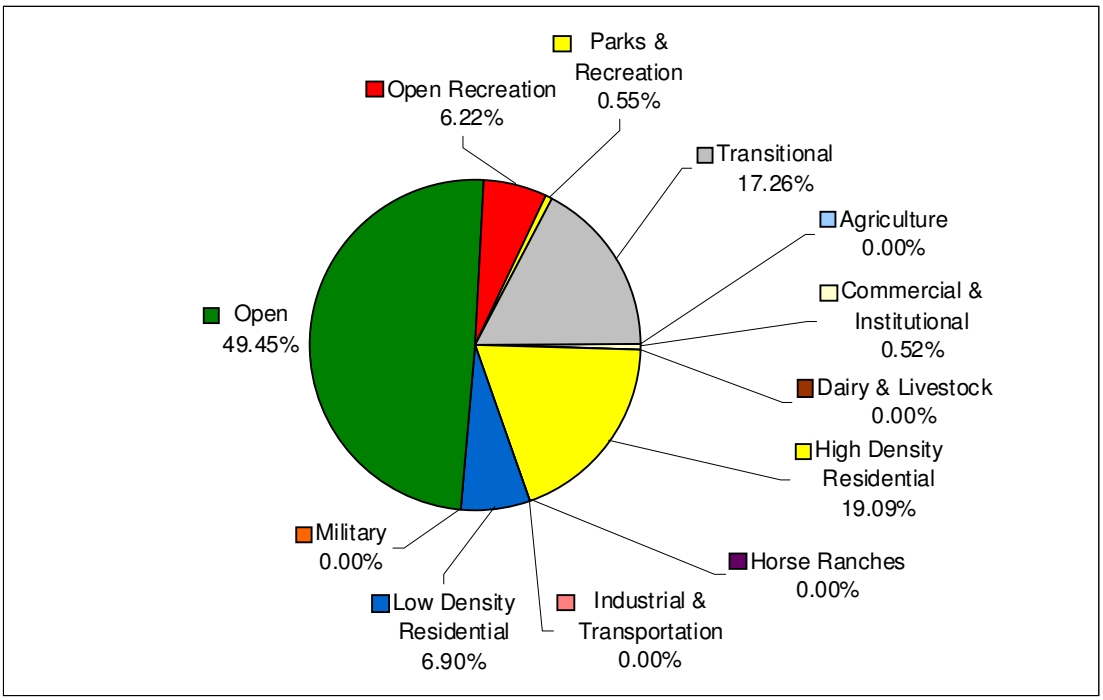

Figure I-7. Percent of Fecal Coliform Load Generated by Different Land Uses in the Dana Point HSA Watershed

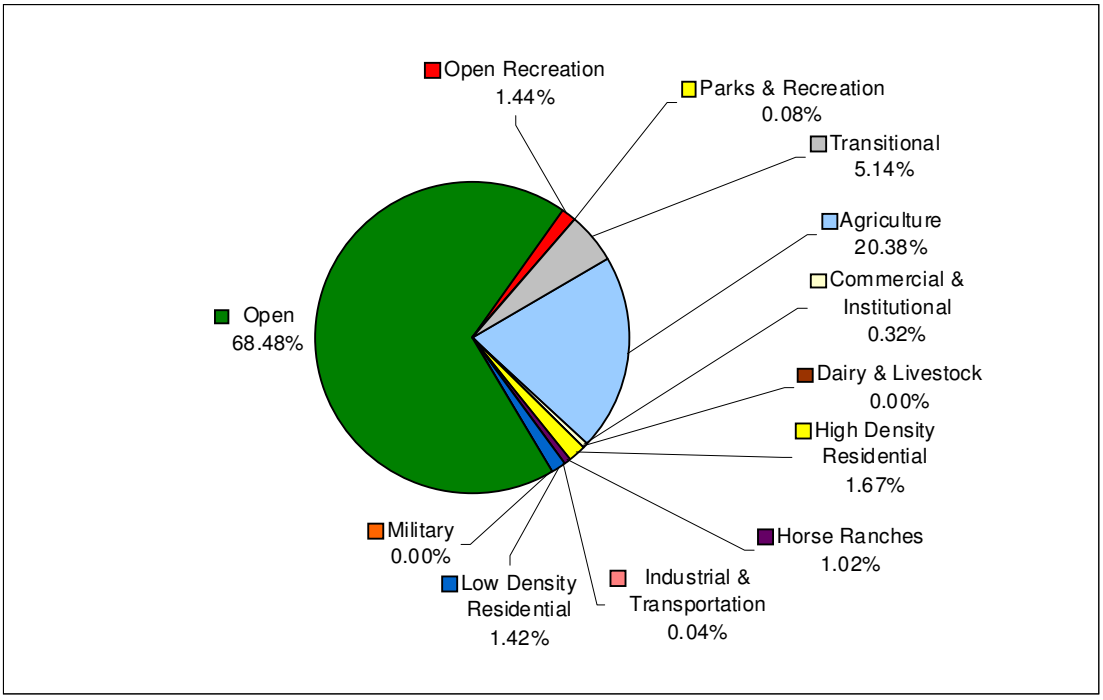

Figure I-8. Percent of Fecal Coliform Load Generated by Different Land Uses in the Lower San Juan HSA Watershed

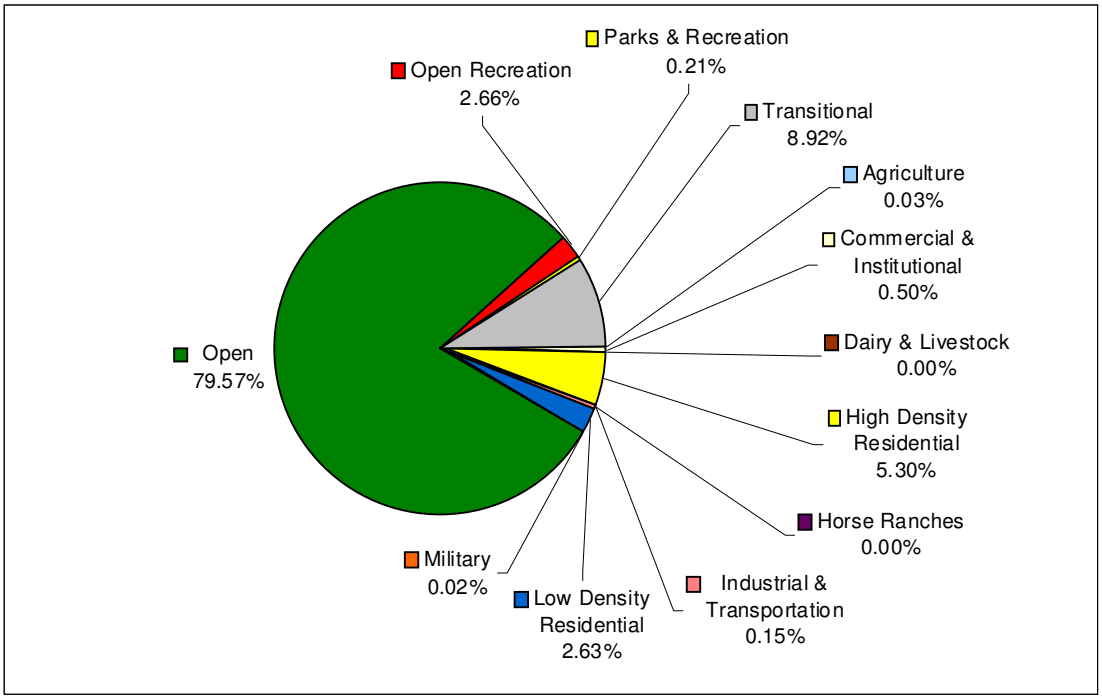

Figure I-9. Percent of Fecal Coliform Load Generated by Different Land Uses in the San Clemente HA Watershed

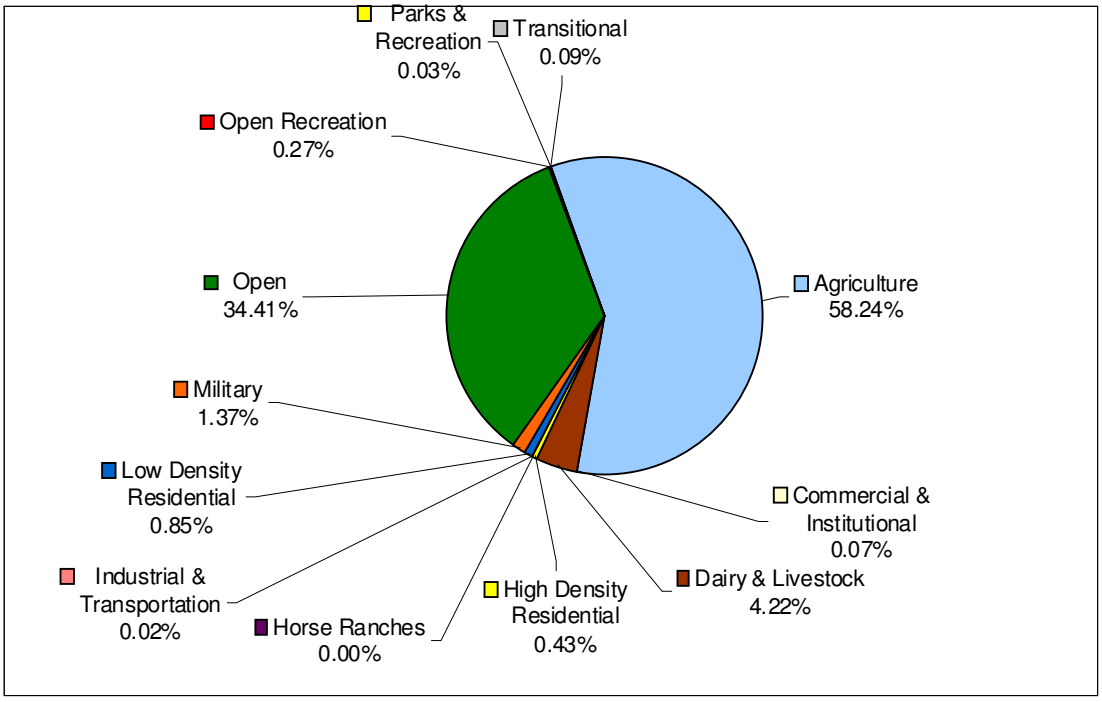

Figure I-10. Percent of Fecal Coliform Load Generated by Different Land Uses in the San Luis Rey HU Watershed

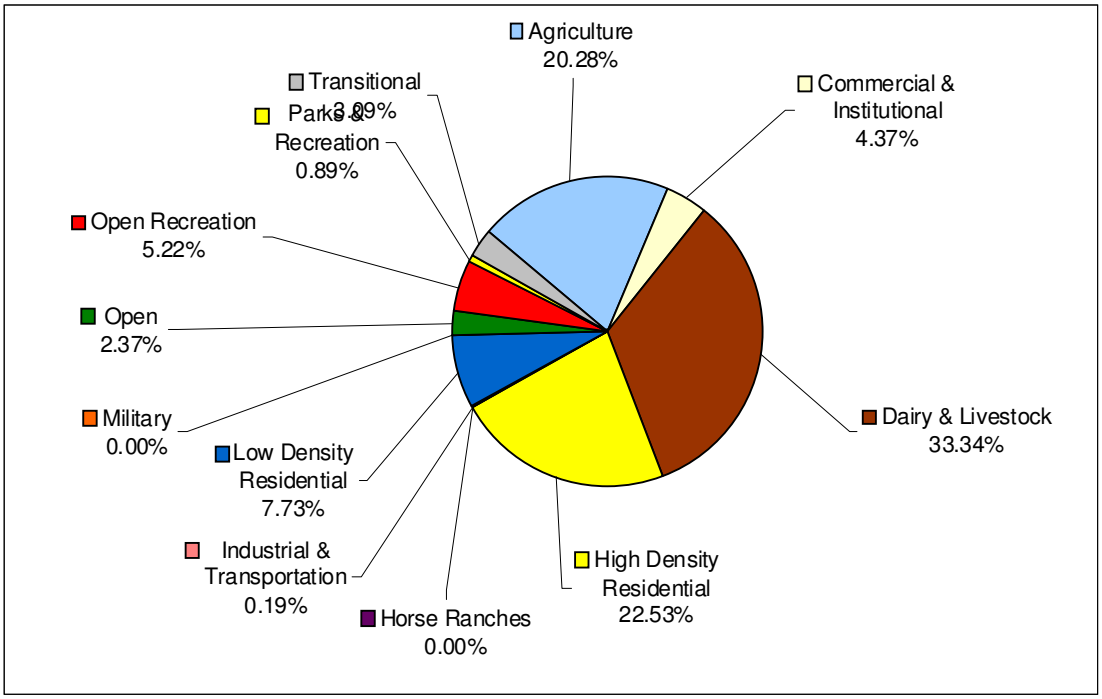

Figure I-11. Percent of Fecal Coliform Load Generated by Different Land Uses in the San Marcos HA Watershed

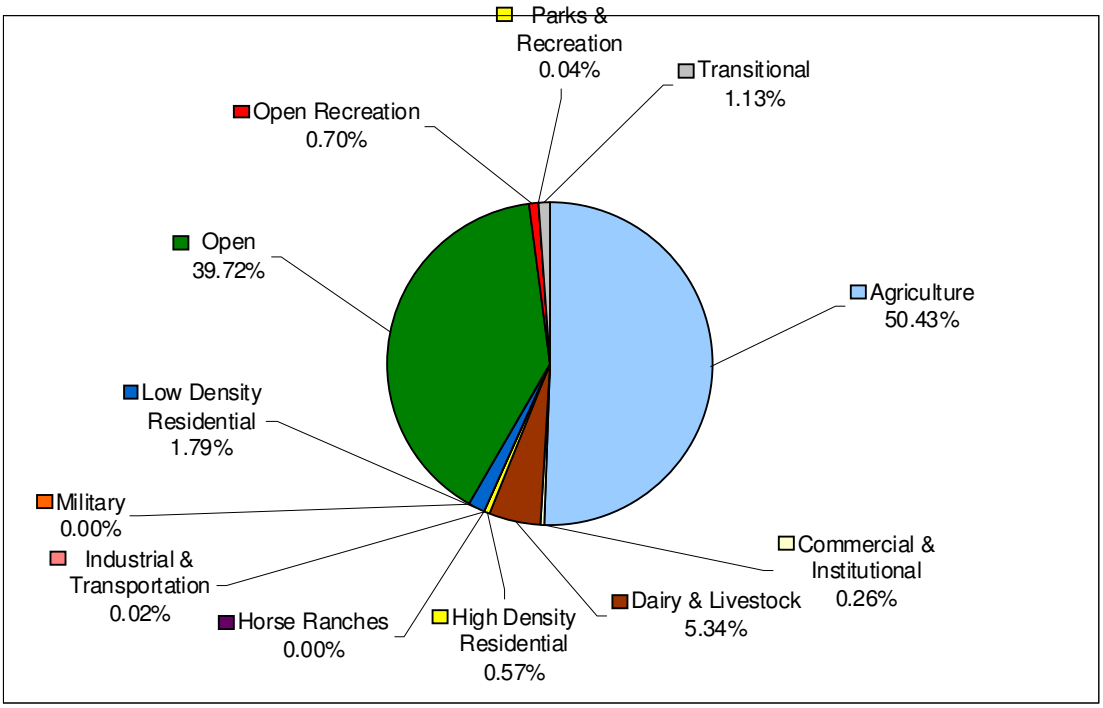

Figure I-12. Percent of Fecal Coliform Load Generated by Different Land Uses in the San Dieguito HU Watershed

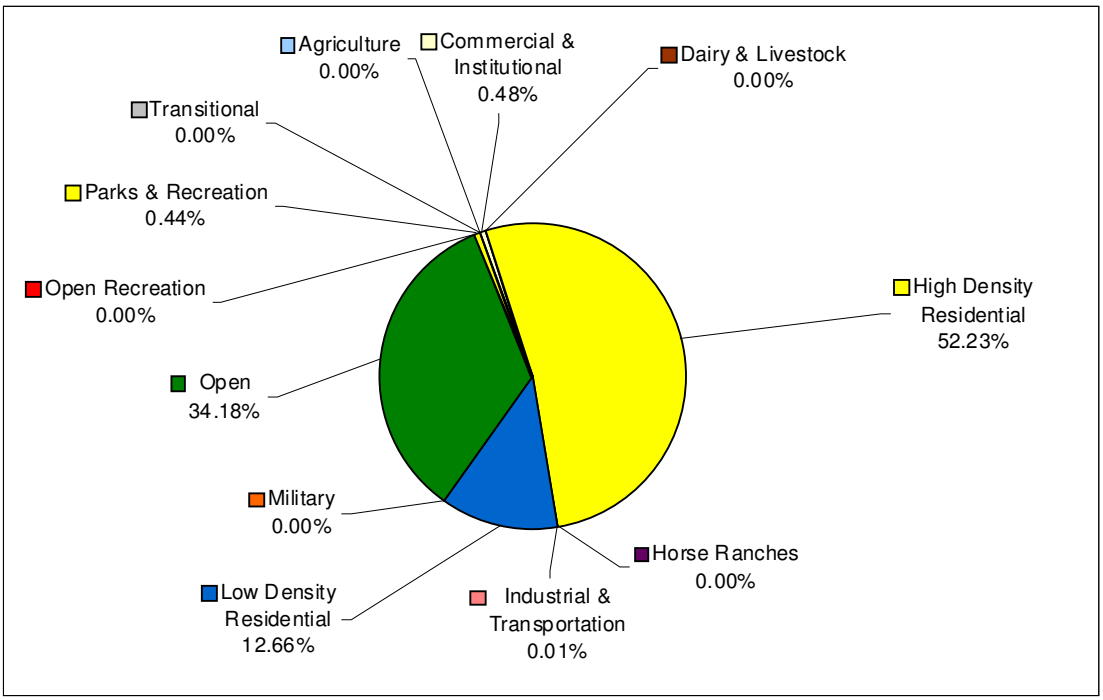

Figure I-13. Percent of Fecal Coliform Load Generated by Different Land Uses in the Miramar Reservoir HA Watershed

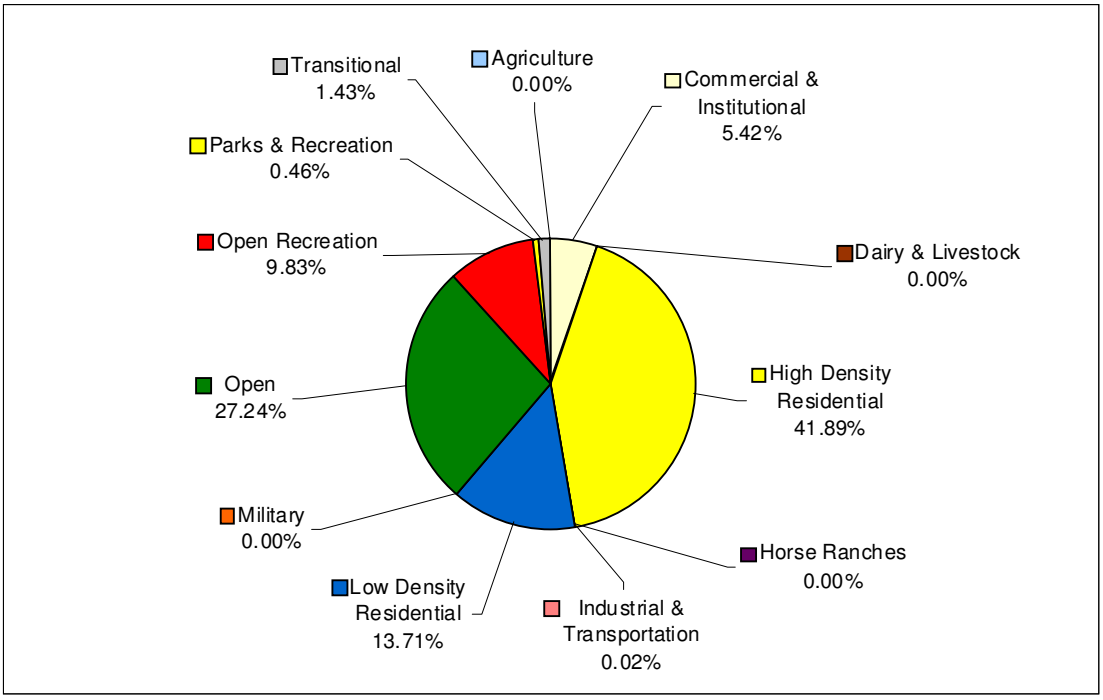

Figure I-14. Percent of Fecal Coliform Load Generated by Different Land Uses in the Scripps HA Watershed

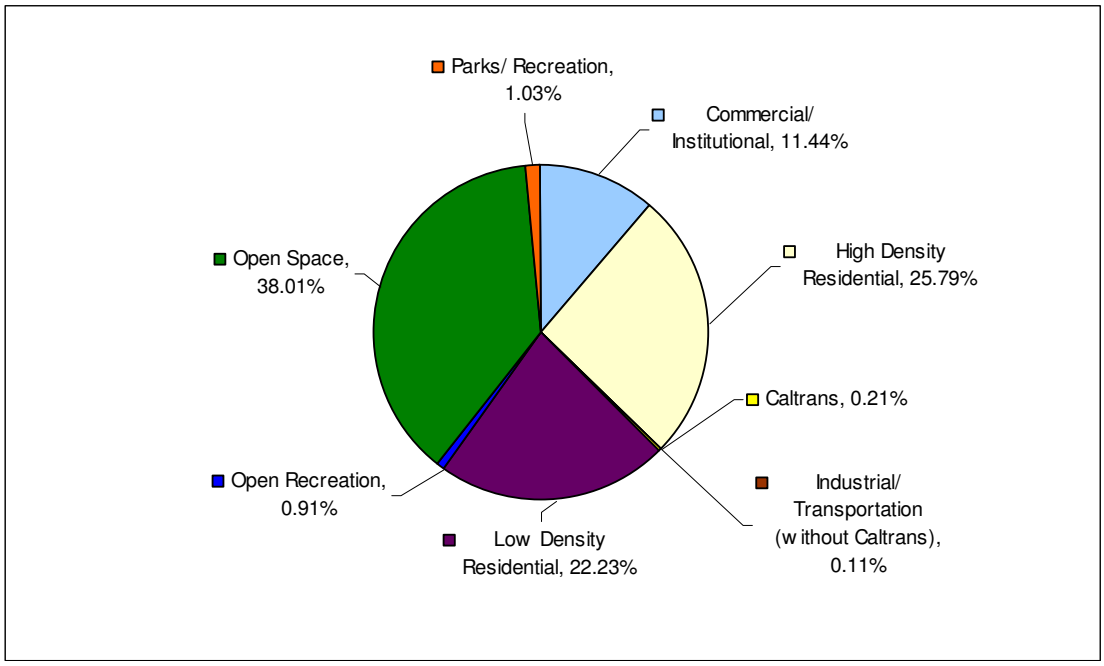

Figure I-15. Percent of Fecal Coliform Load Generated by Different Land Uses in the Tecolote HA Watershed

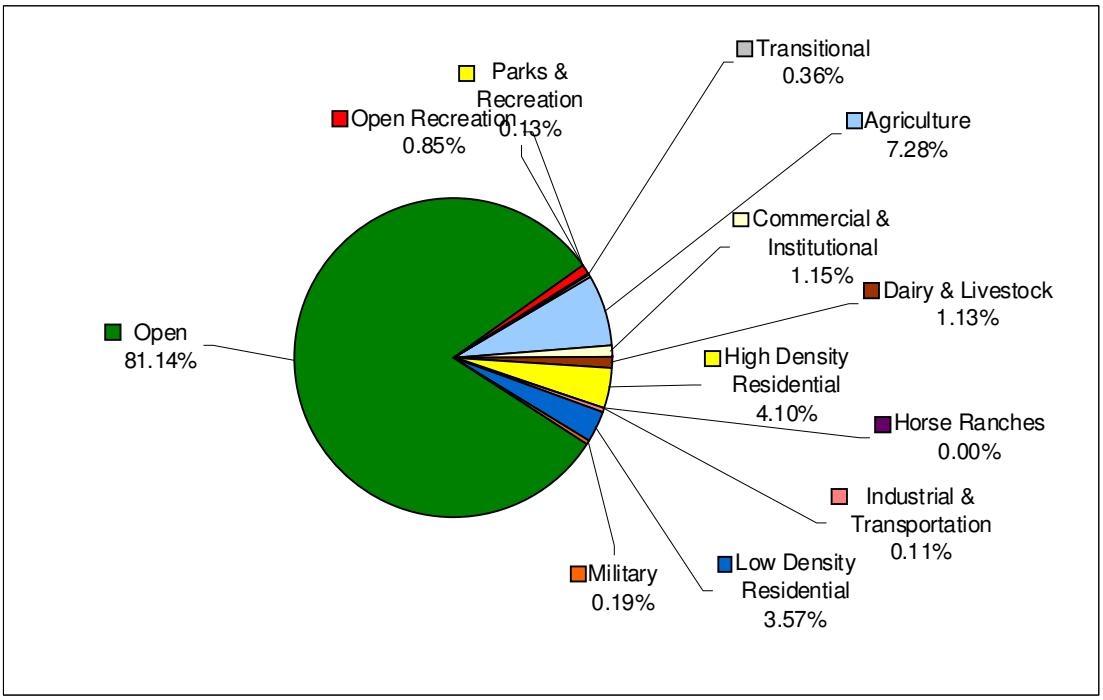

Figure I-16. Percent of Fecal Coliform Load Generated by Different Land Uses in the Mission San Diego HSA/Santee HSA Watershed

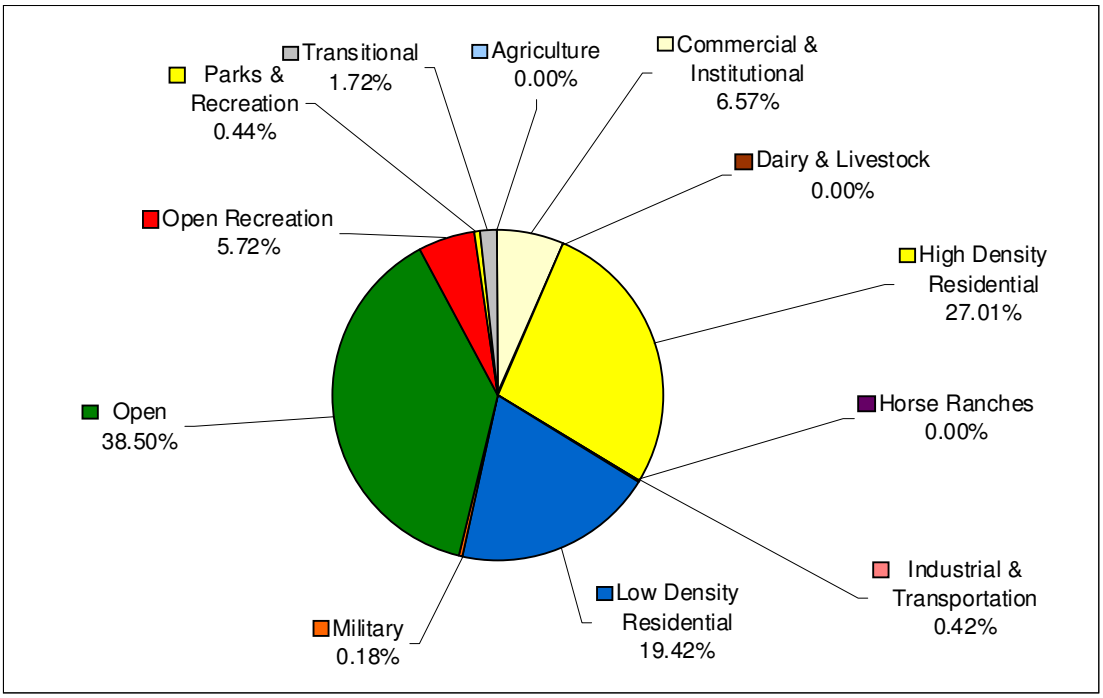

Figure I-17. Percent of Fecal Coliform Load Generated by Different Land Uses in the Chollas HSA Watershed

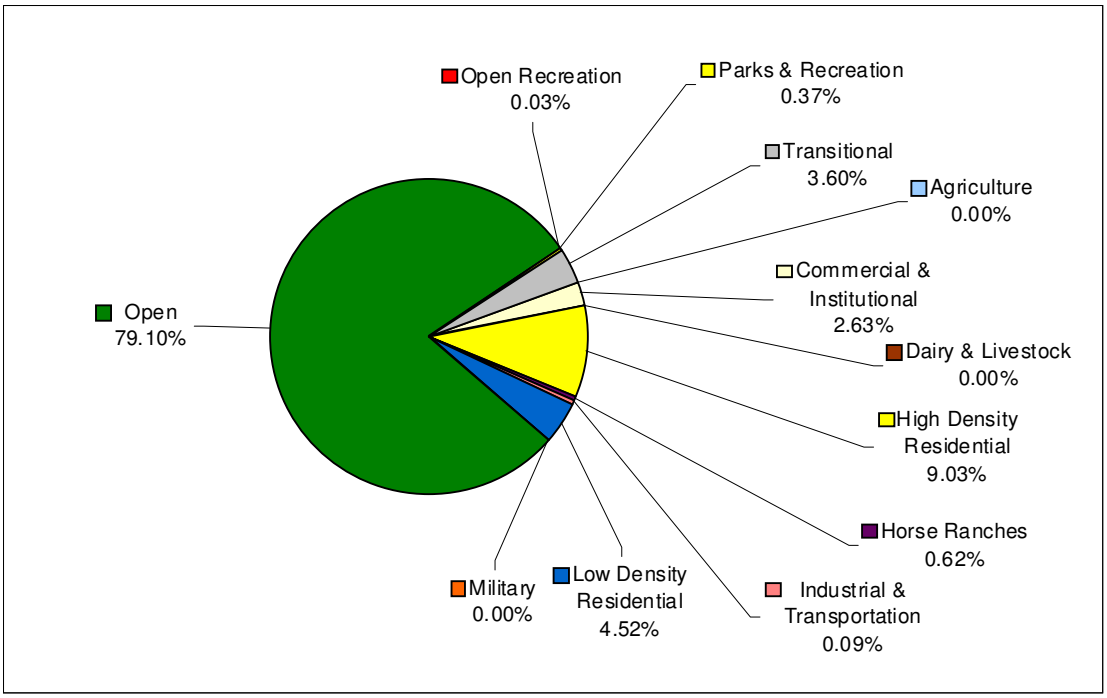

Figure I-18. Percent of Total Coliform Load Generated by Different Land Uses in the San Joaquin Hills HSA/Laguna Beach HSA Watershed

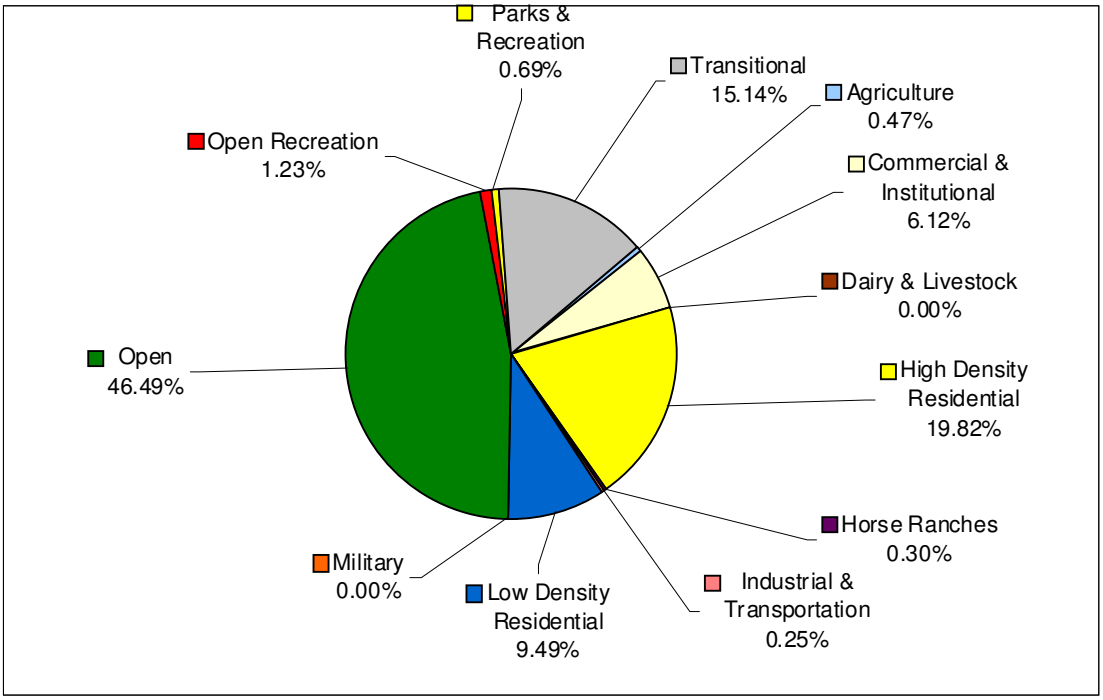

Figure I-19. Percent of Total Coliform Load Generated by Different Land Uses in the Aliso HSA Watershed

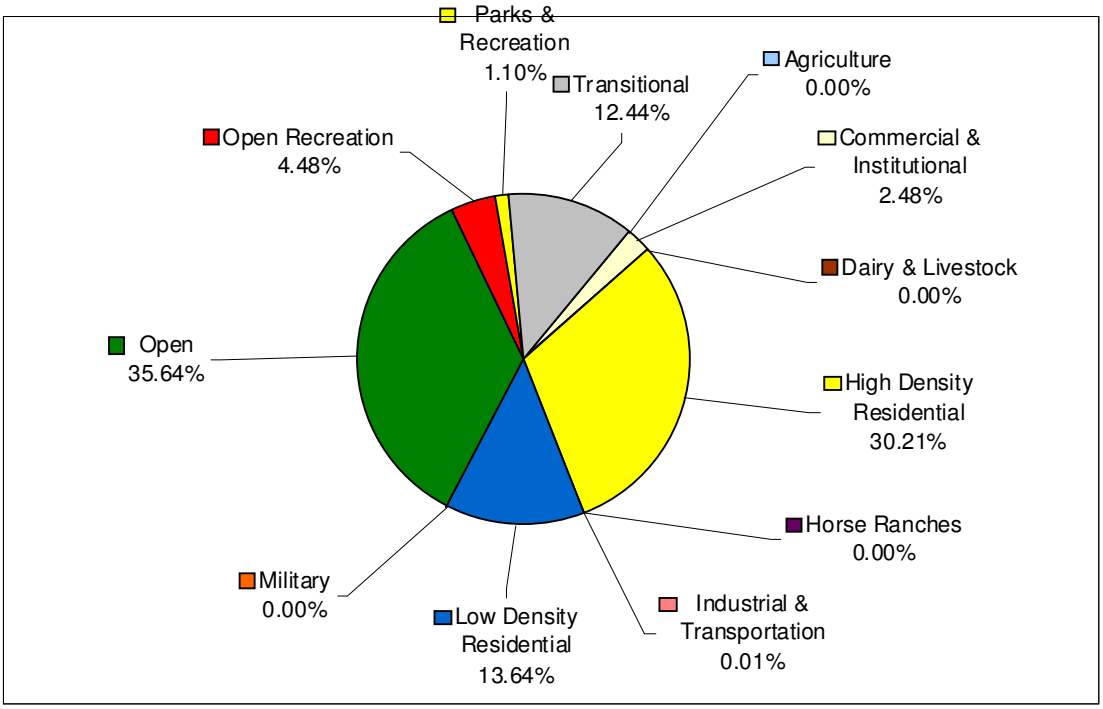

Figure I-20. Percent of Total Coliform Load Generated by Different Land Uses in the Dana Point HSA Watershed

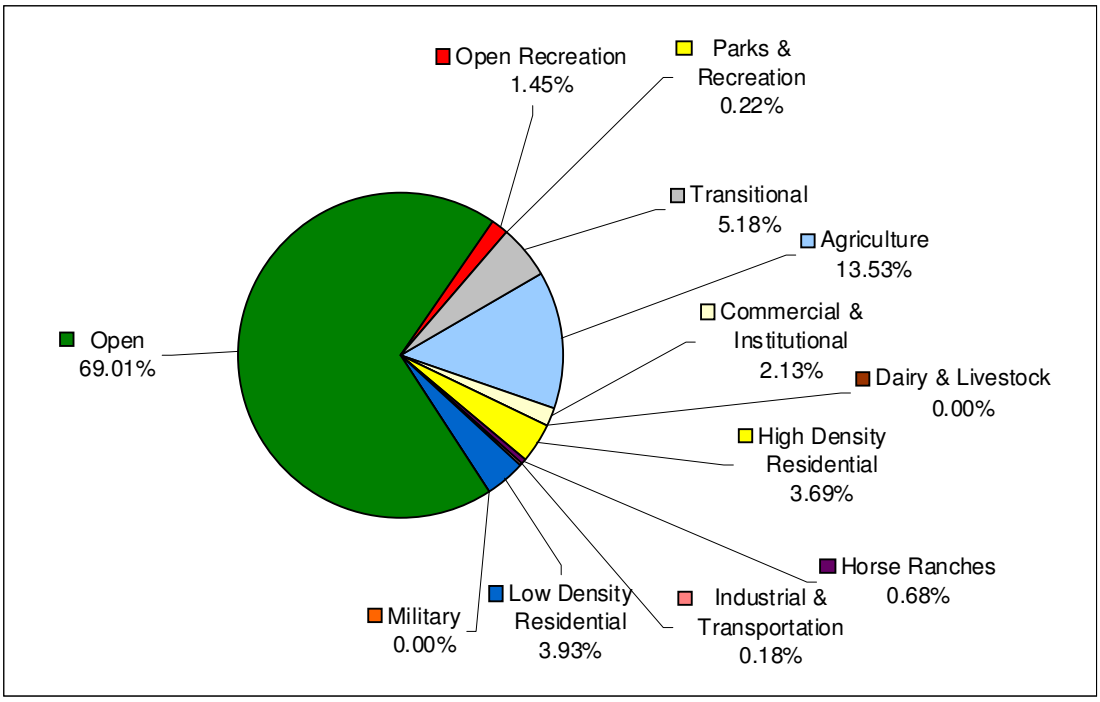

Figure I-21. Percent of Total Coliform Load Generated by Different Land Uses in the Lower San Juan HSA Watershed

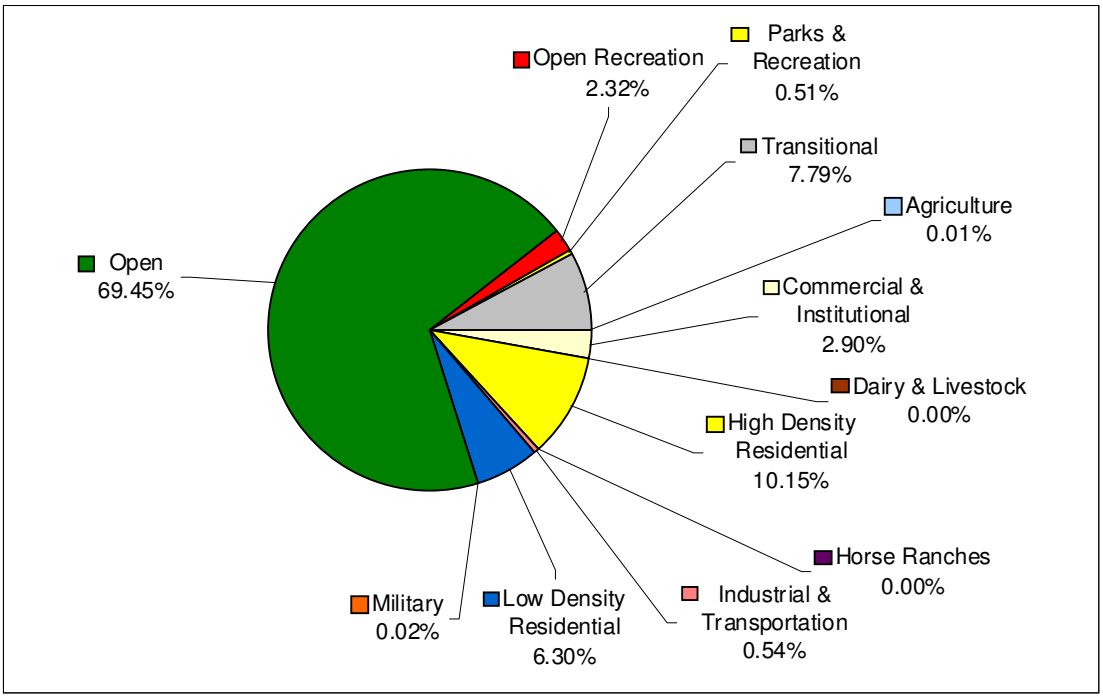

Figure I-22. Percent of Total Coliform Load Generated by Different Land Uses in the San Clemente HA Watershed

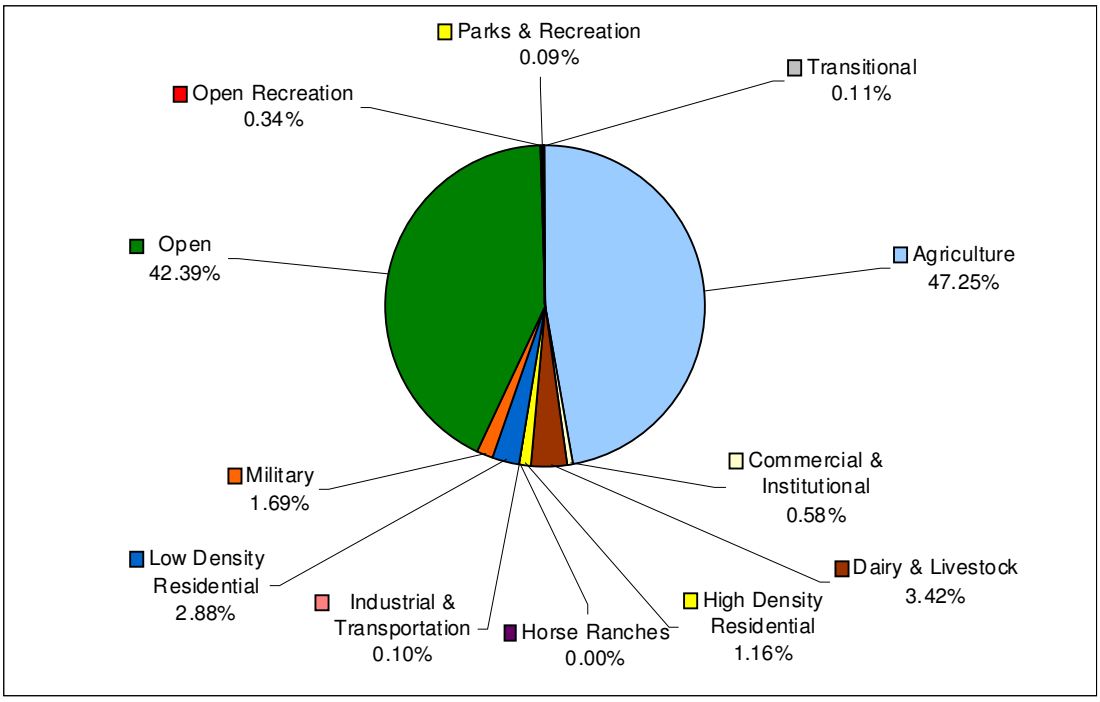

Figure I-23. Percent of Total Coliform Load Generated by Different Land Uses in the San Luis Rey HU Watershed

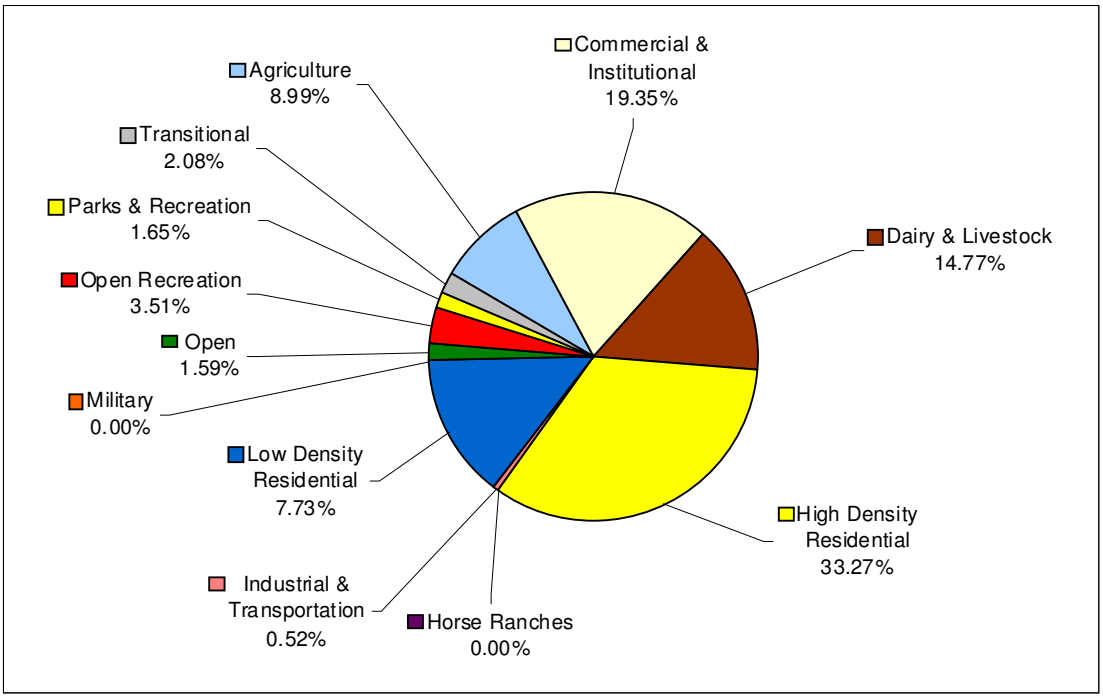

Figure I-24. Percent of Total Coliform Load Generated by Different Land Uses in the San Marcos HA Watershed

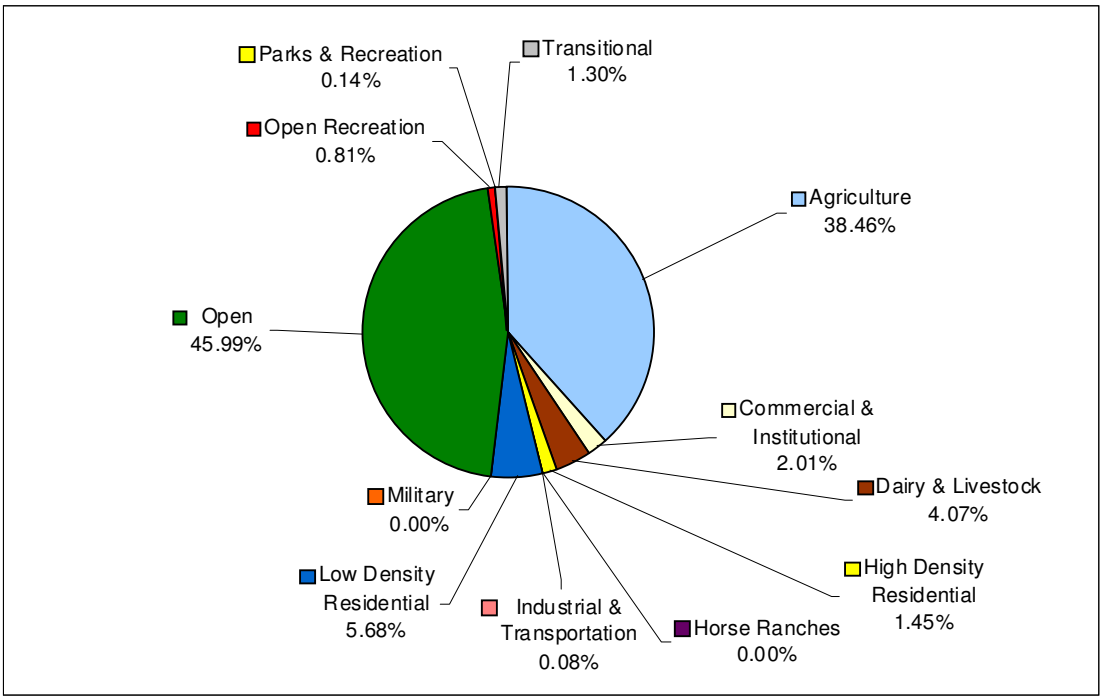

Figure I-25. Percent of Total Coliform Load Generated by Different Land Uses in the San Dieguito HU Watershed

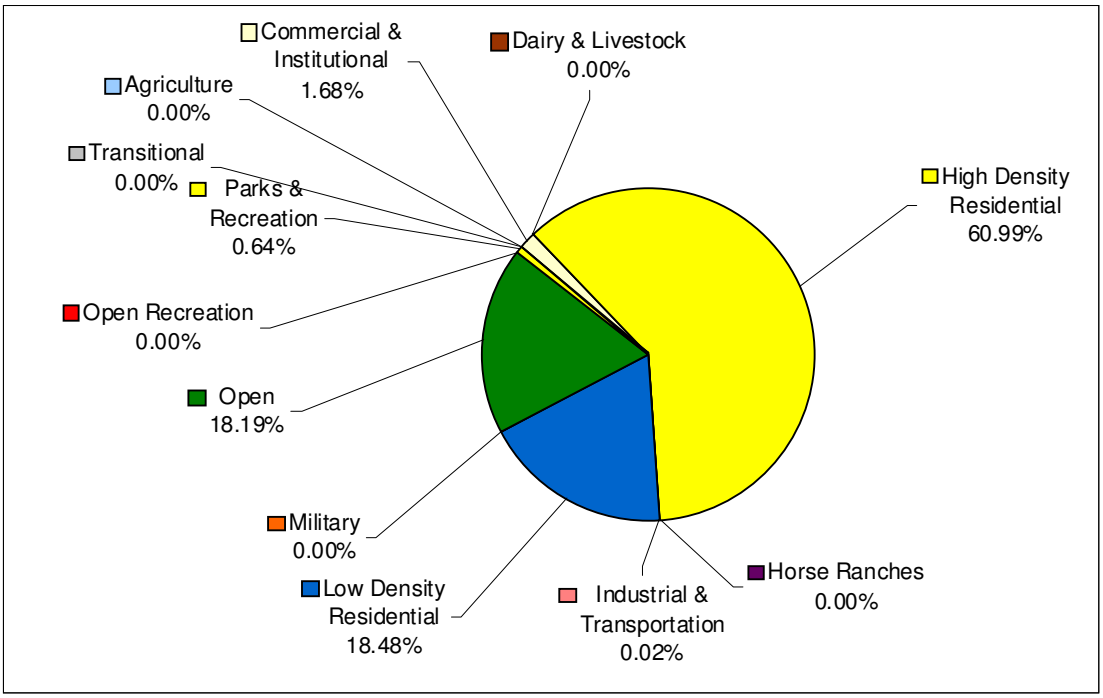

Figure I-26. Percent of Total Coliform Load Generated by Different Land Uses in the Miramar Reservoir HA Watershed

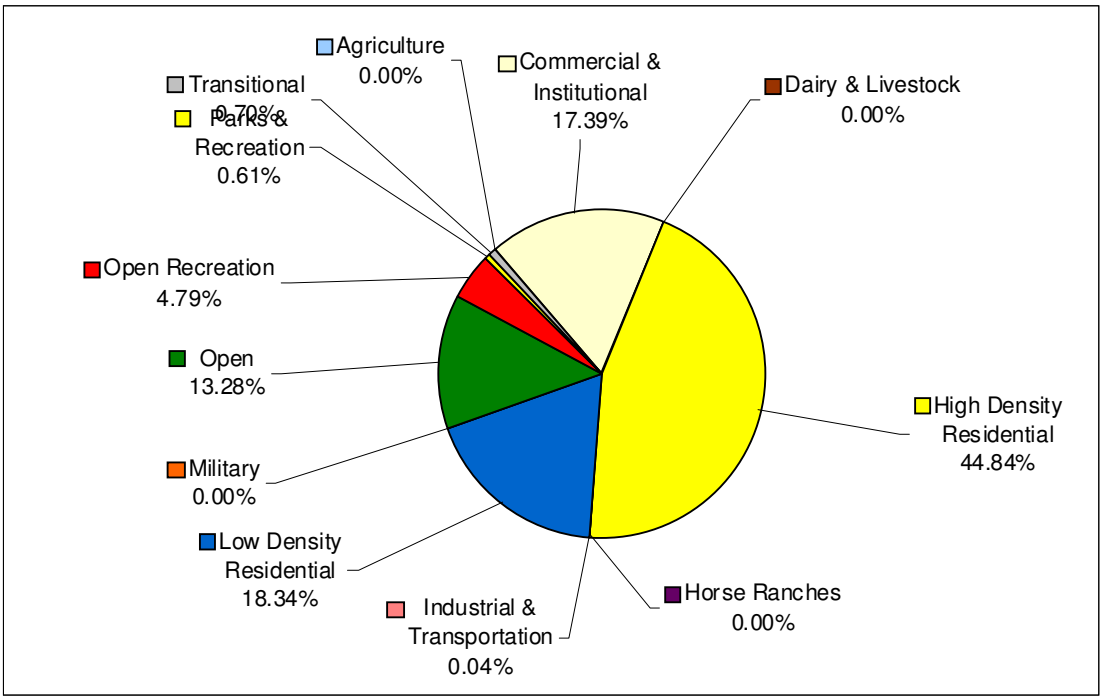

Figure I-27. Percent of Total Coliform Load Generated by Different Land Uses in the Scripps HA Watershed

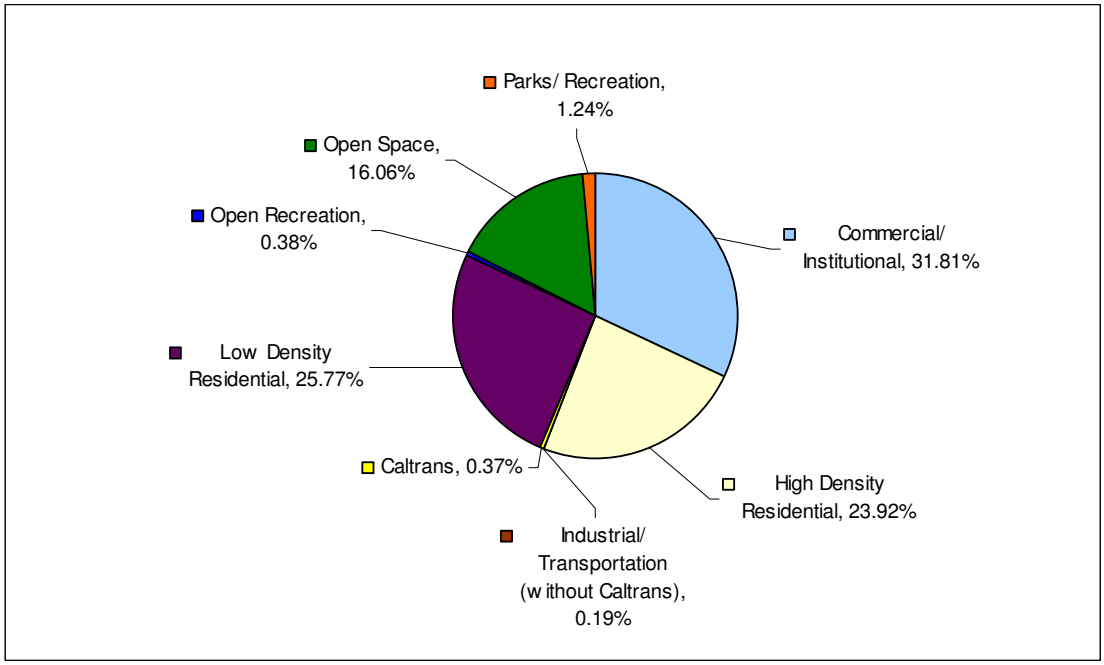

Figure I-28. Percent of Total Coliform Load Generated by Different Land Uses in the Tecolote HA Watershed

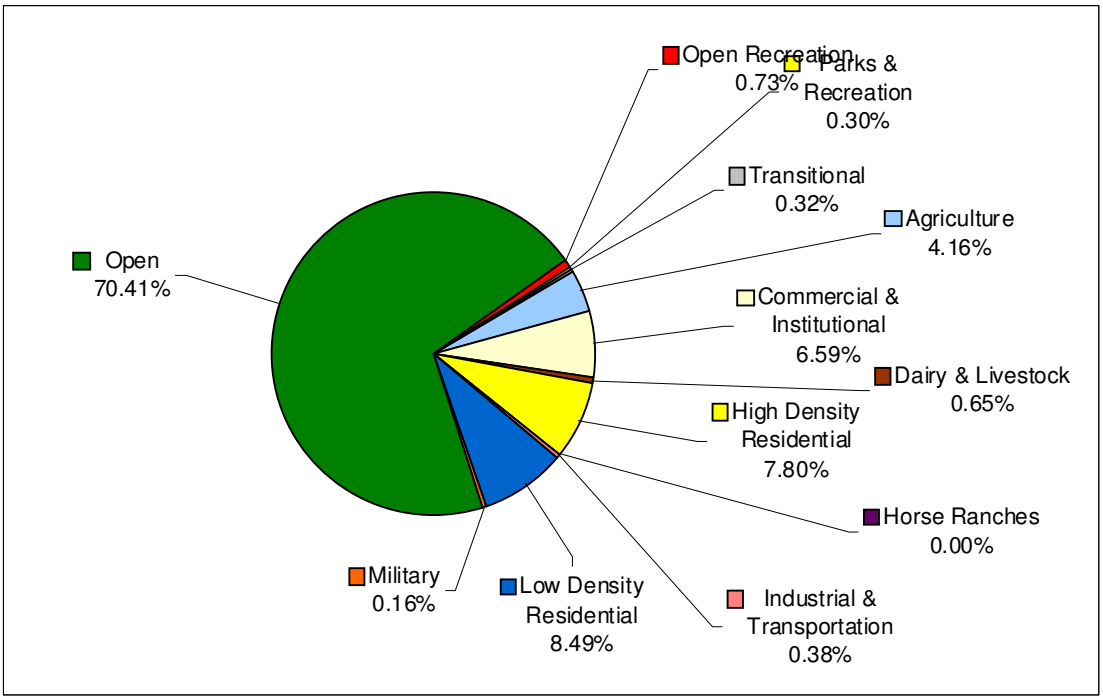

Figure I-29. Percent of Total Coliform Load Generated by Different Land Uses in the Mission San Diego HSA/ Santee HSA Watershed

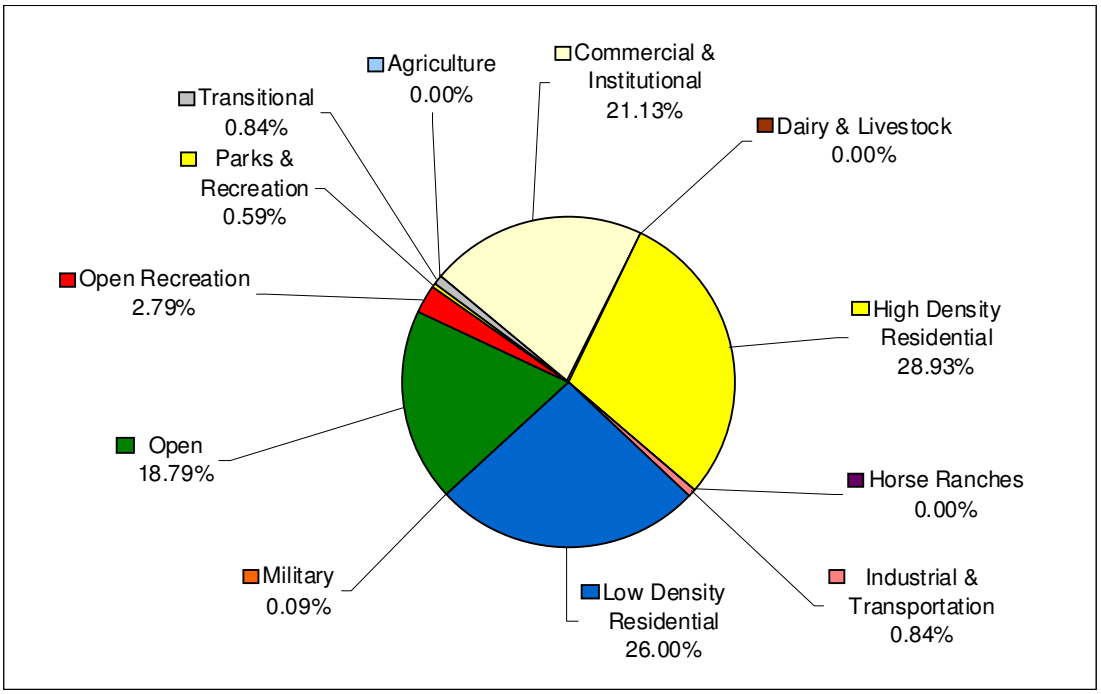

Figure I-30. Percent of Total Coliform Load Generated by Different Land Uses in the Chollas HSA Watershed

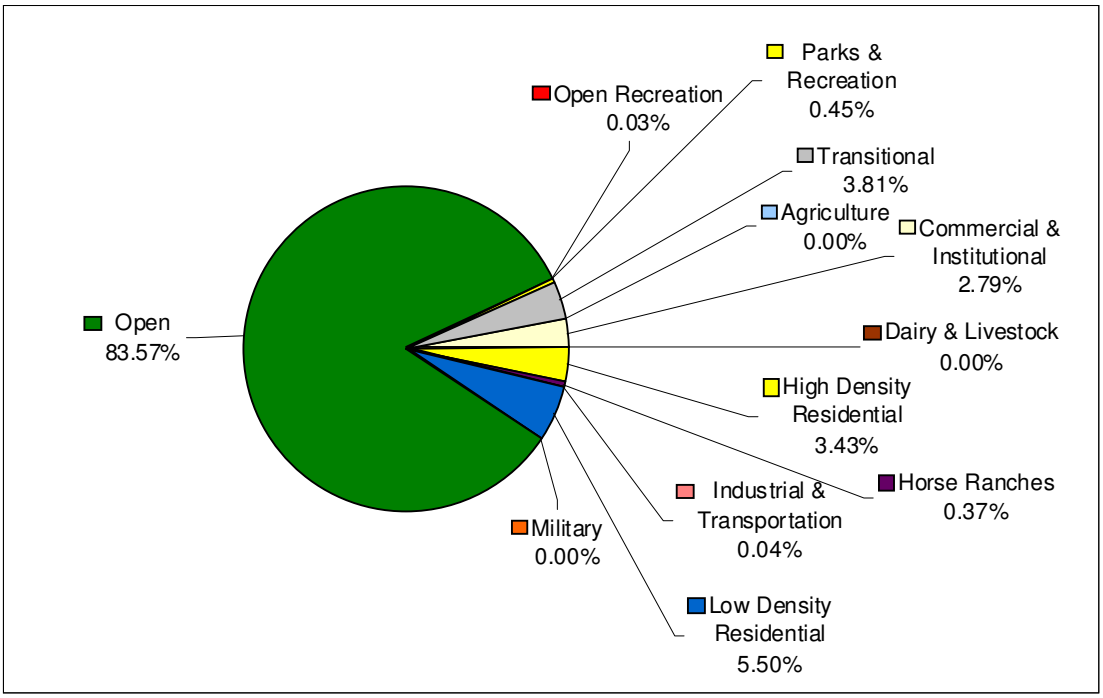

Figure I-31. Percent of Enterococci Load Generated by Different Land Uses in the San Joaquin Hills HSA/Laguna Beach HSA Watershed

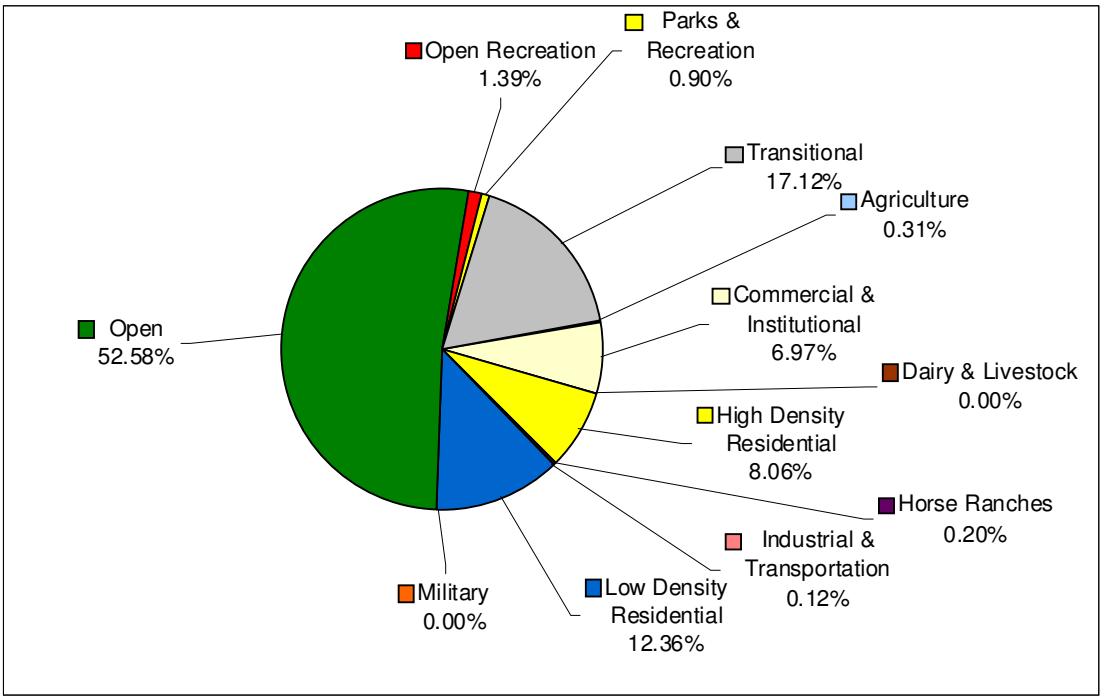

Figure I-32. Percent of Enterococci Load Generated by Different Land Uses in the Aliso HSA Watershed

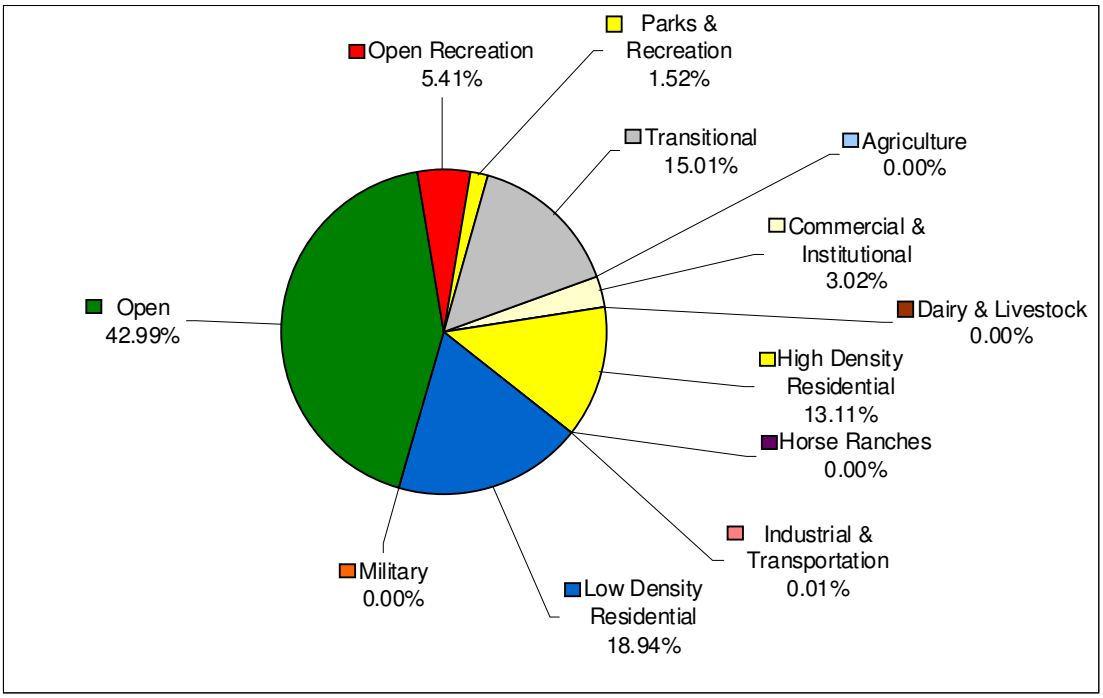

Figure I-33. Percent of Enterococci Load Generated by Different Land Uses in the Dana Point HSA Watershed

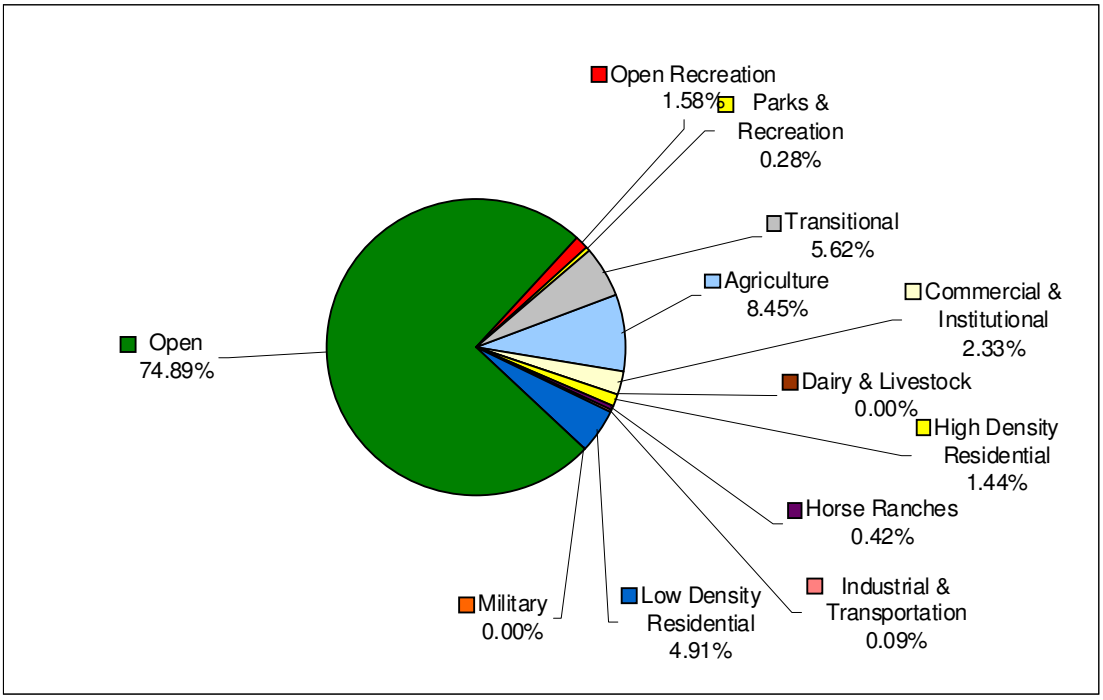

Figure I-34. Percent of Enterococci Load Generated by Different Land Uses in the Lower San Juan HSA Watershed

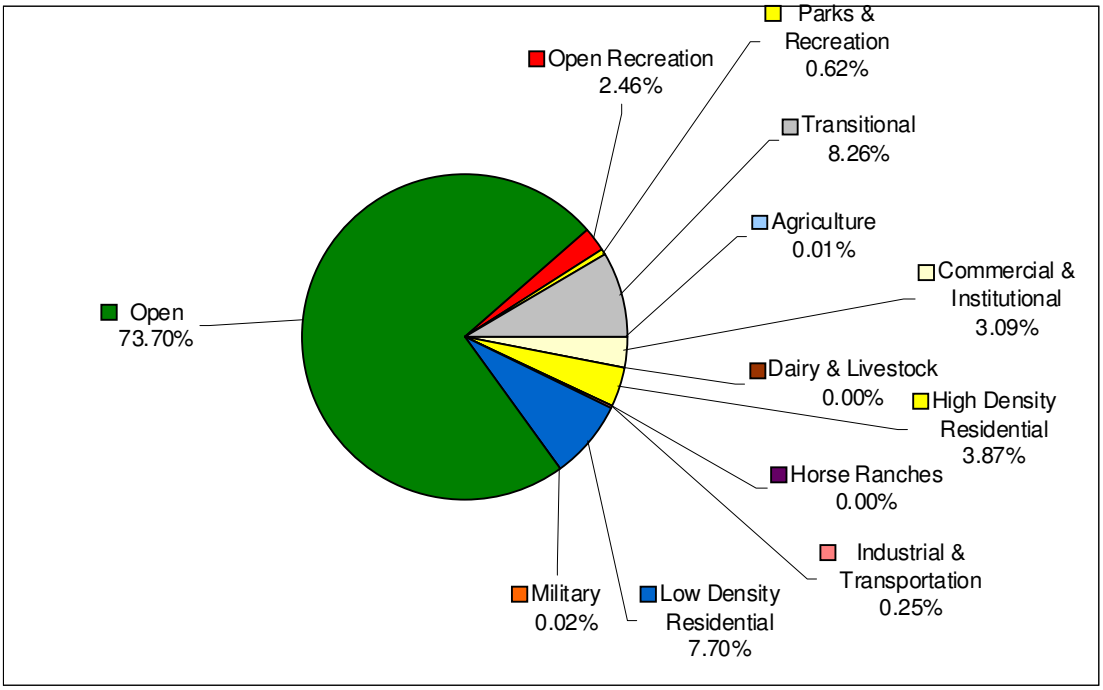

Figure I-35. Percent of Enterococci Load Generated by Different Land Uses in the San Clemente HA Watershed

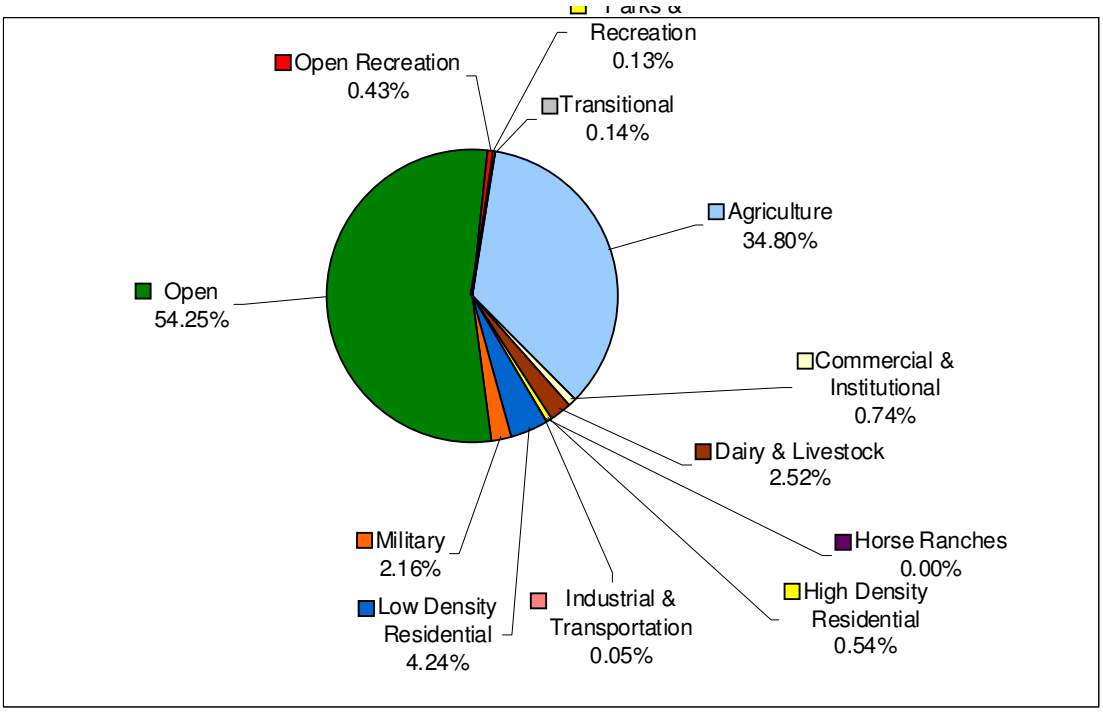

Figure I-36. Percent of Enterococci Load Generated by Different Land Uses in the San Luis Rey HU Watershed

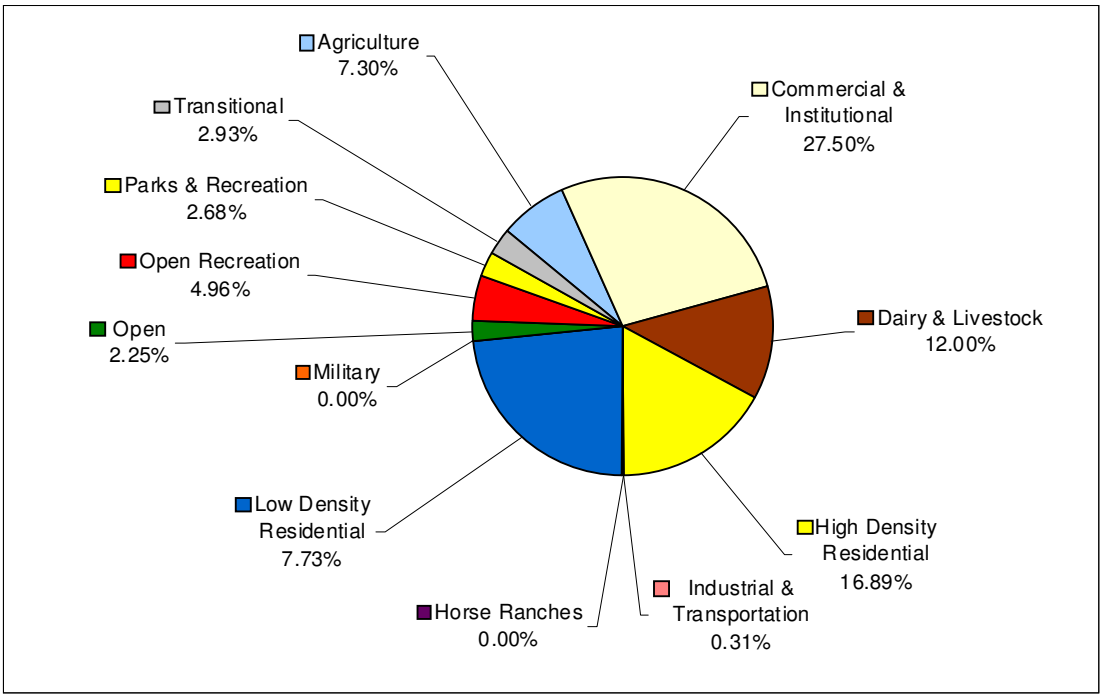

Figure I-37. Percent of Enterococci Load Generated by Different Land Uses in the San Marcos HA Watershed

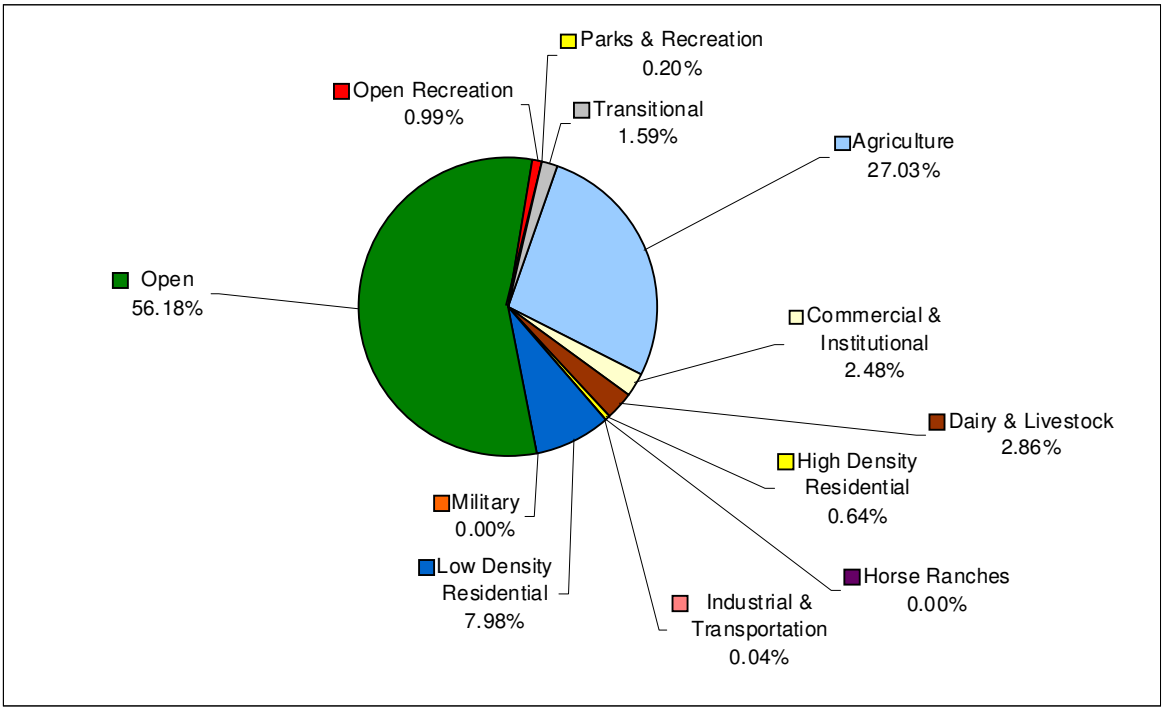

Figure I-38. Percent of Enterococci Load Generated by Different Land Uses in the San Dieguito HU Watershed

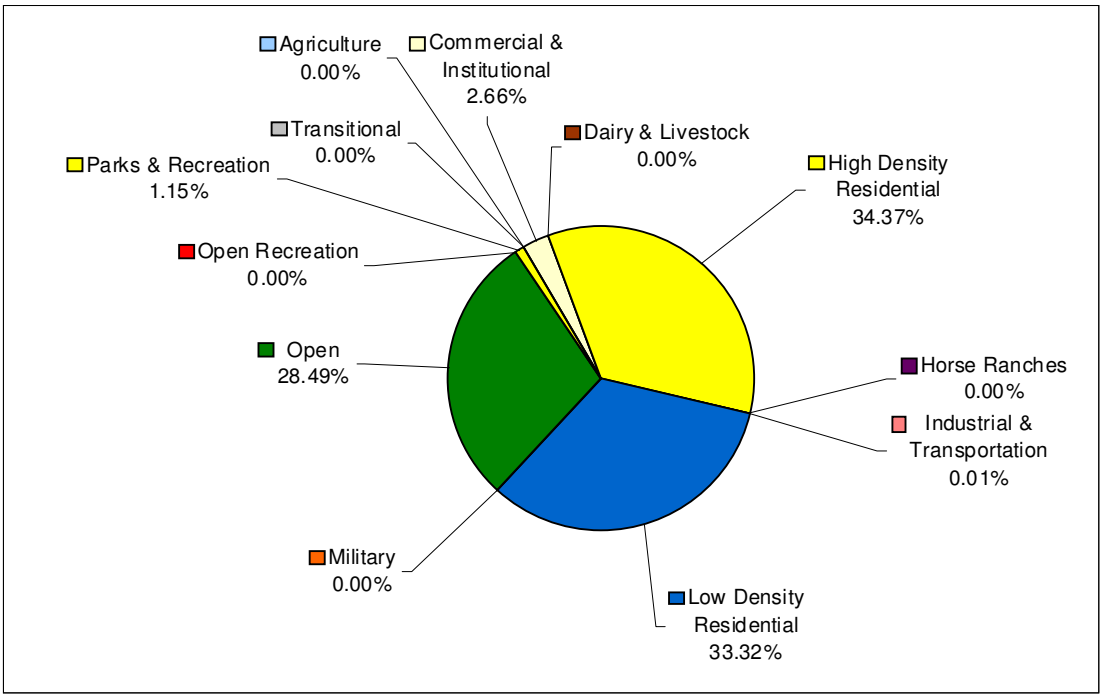

Figure I-39. Percent of Enterococci Load Generated by Different Land Uses in the Miramar Reservoir HA Watershed

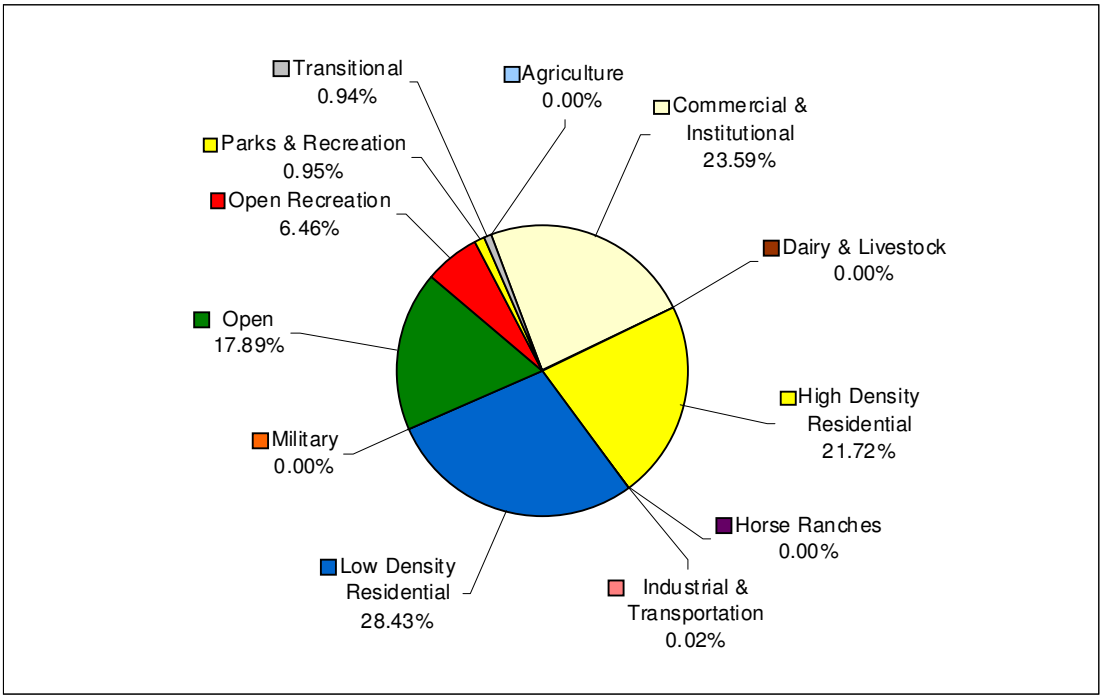

Figure I-40. Percent of Enterococci Load Generated by Different Land Uses in the Scripps HA Watershed

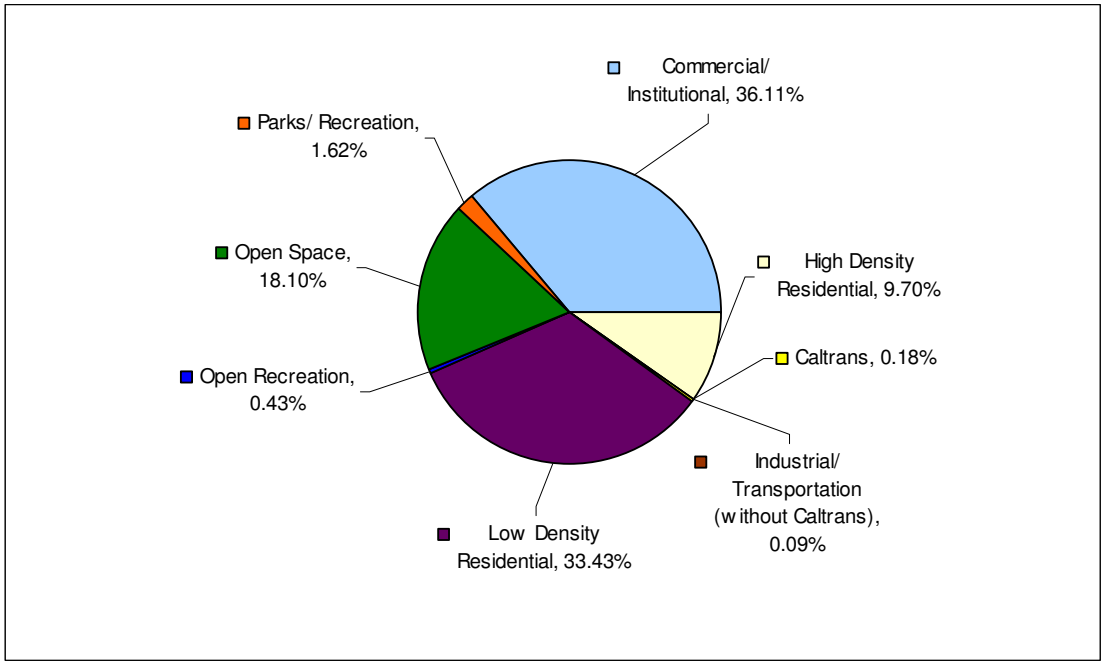

Figure I-41. Percent of Enterococci Load Generated by Different Land Uses in the Tecolote HA Watershed

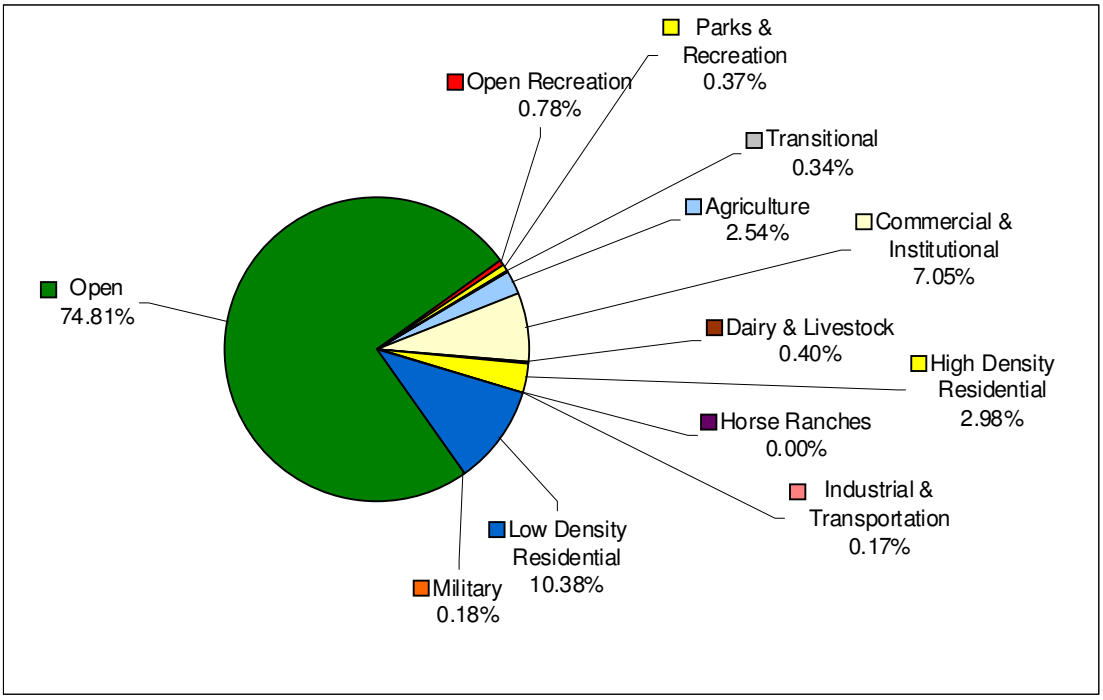

Figure I-42. Percent of Enterococci Load Generated by Different Land Uses in the Mission San Diego HSA/Santee HSA Watershed

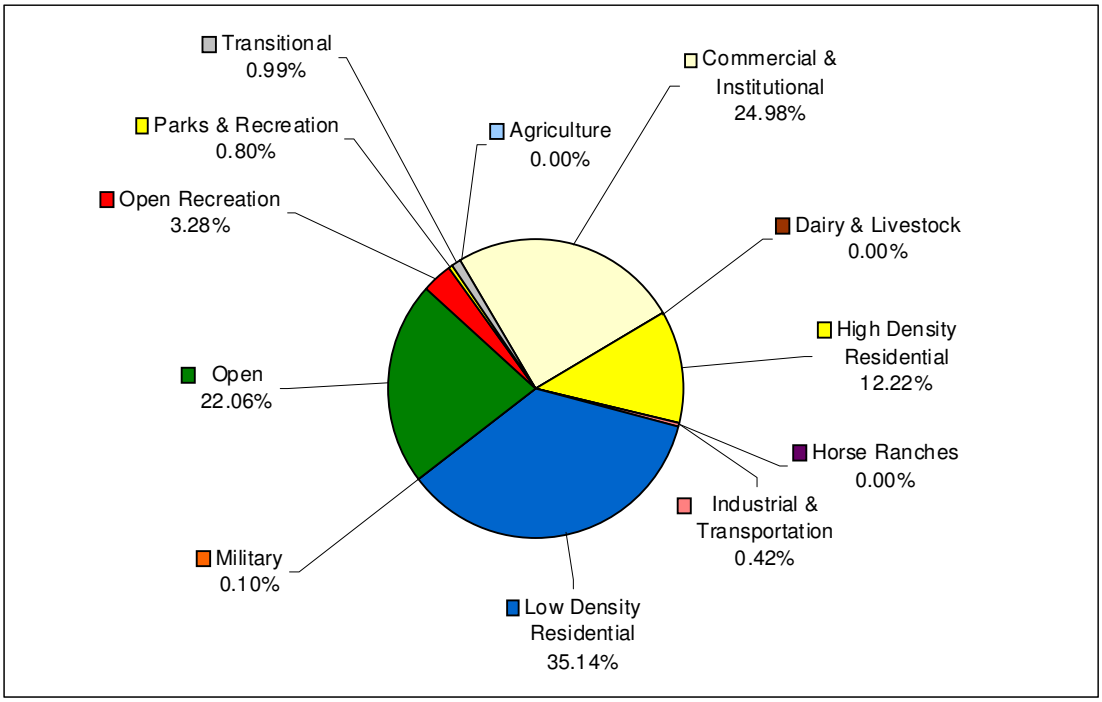

Figure I-43. Percent of Enterococci Load Generated by Different Land Uses in the Chollas HSA Watershed

Table I-12. Fecal Coliform Loads (Billion MPN/year) Generated by Different Land Uses

	Municipal MS4								Agriculture/Livestock			Open Space			
Watershed	**COMM/ INST**	**HIDEN RES**	**LODEN RES**	**PARK/ REC**	**MIL**	**TRANS**	**IND/ TRANS***	**CAL TRANS***	**AGRI**	**DAIRY/ LIVSTK**	**HORSE RANCH**	**OPEN SPACE**	**OPEN REC**	**WATER**	**TOTAL**
San Joaquin Hills HSA/ Laguna Beach HSA	3,123 0.44%	32,219 4.57%	12,911 1.83%	1,065 0.15%	0 0.00%	28,229 4.00%	0 0.00%	179 0.03%	12 0.00%	0 0.00%	7,334 1.04%	619,697 87.90%	245 0.03%	0 0.00%	705,015 100.00%
Aliso HSA	20,935 1.19%	203,419 11.61%	77,956 4.45%	5,649 0.32%	0 0.00%	341,034 19.46%	1,099 0.06%	260 0.01%	16,124 0.92%	0 0.00%	10,384 0.59%	1,047,472 59.78%	27,765 1.58%	0 0.00%	1,752,096 100.00%
Dana Point HSA	2,113 0.52%	77,115 19.09%	27,864 6.90%	2,239 0.55%	0 0.00%	69,712 17.26%	0 0.00%	13 0.00%	0 0.00%	0 0.00%	0 0.00%	199,729 49.45%	25,125 6.22%	0 0.00%	403,911 100.00%
Lower San Juan HSA	49,127 0.32%	255,357 1.67%	217,489 1.42%	12,231 0.08%	0 0.00%	787,171 5.14%	5,093 0.03%	1,713 0.01%	3,119,750 20.38%	0 0.00%	155,727 1.02%	10,480,603 68.48%	220,528 1.44%	0 0.00%	15,304,790 100.00%
San Clemente HA	7,263 0.50%	76,380 5.30%	37,951 2.63%	3,079 0.21%	310 0.02%	128,621 8.92%	1,840 0.13%	335 0.02%	366 0.03%	0 0.00%	0 0.00%	1,147,224 79.57%	38,354 2.66%	0 0.00%	1,441,723 100.00%
San Luis Rey HU	23,591 0.07%	142,670 0.43%	281,805 0.85%	8,795 0.03%	453,236 1.37%	28,477 0.09%	4,927 0.01%	1,537 0.00%	19,290,677 58.24%	1,397,277 4.22%	0 0.00%	11,396,020 34.41%	90,999 0.27%	0 0.00%	33,120,012 100.00%
San Marco HA	912 4.37%	4,705 22.53%	1,614 7.73%	187 0.89%	0 0.00%	645 3.09%	31 0.15%	8 0.04%	4,236 20.28%	6,963 33.34%	0 0.00%	495 2.37%	1,090 5.22%	0 0.00%	20,886 100.00%
San Dieguito HU	56,175 0.26%	121,831 0.57%	380,242 1.79%	9,559 0.04%	0 0.00%	239,782 1.13%	2,419 0.01%	1,310 0.01%	10,735,210 50.43%	1,137,030 5.34%	0 0.00%	8,454,478 39.72%	148,874 0.70%	0 0.00%	21,286,910 100.00%
Miramar Reservoir HA	50 0.48%	5,428 52.23%	1,315 12.66%	46 0.44%	0 0.00%	0 0.00%	1 0.01%	0 0.00%	0 0.00%	0 0.00%	0 0.00%	3,552 34.18%	0 0.00%	0 0.00%	10,392 100.00%
Scripps HA	11,051 5.42%	85,490 41.89%	27,976 13.71%	937 0.46%	0 0.00%	2,910 1.43%	40 0.02%	0 0.00%	0 0.00%	0 0.00%	0 0.00%	55,589 27.24%	20,065 9.83%	0 0.00%	204,057 100.00%
Tecolote HA	29,956 11.44%	67,571 25.79%	58,239 22.23%	3,388 1.29%	14 0.01%	0 0.00%	281 0.11%	553 0.21%	0 0.00%	0 0.00%	0 0.00%	99,585 38.01%	2,378 0.91%	0 0.00%	261,966 100.00%
Mission San Diego HSA/ Santee HSA	56,873 1.15%	202,038 4.10%	175,889 3.57%	6,294 0.13%	9,373 0.19%	17,966 0.36%	4,227 0.09%	1,009 0.02%	358,880 7.28%	55,841 1.13%	0 0.00%	4,002,217 81.14%	41,774 0.85%	0 0.00%	4,932,380 100.00%
Chollas HSA	39,703 6.57%	163,125 27.01%	117,275 19.42%	2,683 0.44%	1,084 0.18%	10,404 1.72%	1,627 0.27%	892 0.15%	0 0.00%	0 0.00%	0 0.00%	232,504 38.50%	34,566 5.72%	0 0.00%	603,863 100.00%

* See Table I-15 for how fecal coliform bacteria loads from Caltrans land use areas are separated from Industrial/Transportation land use areas

Table I-13. Total Coliform Loads (Billion MPN/year) Generated by Different Land Uses

	Municipal MS4								Agriculture/Livestock			Open Space			
Watershed	**COMM/ INST**	**HIDEN RES**	**LODEN RES**	**PARK/ REC**	**MIL**	**TRANS**	**IND/ TRANS***	**CAL TRANS***	**AGRI**	**DAIRY/ LIVSTK**	**HORSE RANCH**	**OPEN SPACE**	**OPEN REC**	**WATER**	**TOTAL**
San Joaquin Hills HSA/ Laguna Beach HSA	215,853 2.63%	742,277 9.03%	371,822 4.52%	30,674 0.37%	0 0.00%	296,278 3.60%	0 0.00%	7,722 0.09%	86 0.00%	0 0.00%	50,688 0.62%	6,503,925 79.10%	2,576 0.03%	0 0.00%	8,221,901 100.00%
Aliso HSA	1,420,213 6.12%	4,599,980 19.82%	2,203,565 9.49%	159,674 0.69%	0 0.00%	3,513,206 15.14%	46,603 0.20%	11,003 0.05%	109,385 0.47%	0 0.00%	70,443 0.30%	10,790,677 46.49%	286,025 1.23%	0 0.00%	23,210,774 100.00%
Dana Point HSA	162,592 2.48%	1,977,554 30.21%	893,185 13.64%	71,764 1.10%	0 0.00%	814,402 12.44%	0 0.00%	634 0.01%	0 0.00%	0 0.00%	0 0.00%	2,333,311 35.64%	293,519 4.48%	0 0.00%	6,546,962 100.00%
Lower San Juan HSA	2,774,700 2.13%	4,807,521 3.69%	5,118,237 3.93%	287,838 0.22%	0 0.00%	6,751,244 5.18%	179,782 0.14%	60,480 0.05%	17,620,337 13.53%	0 0.00%	879,547 0.68%	89,887,797 69.01%	1,891,381 1.45%	0 0.00%	130,258,863 100.00%
San Clemente HA	470,171 2.90%	1,648,096 10.15%	1,023,612 6.30%	83,059 0.51%	3,051 0.02%	1,264,318 7.79%	74,436 0.46%	13,534 0.08%	2,370 0.01%	0 0.00%	0 0.00%	11,276,953 69.45%	377,008 2.32%	0 0.00%	16,236,606 100.00%
San Luis Rey HU	1,338,298 0.58%	2,697,850 1.16%	6,661,047 2.88%	207,883 0.09%	3,904,364 1.69%	245,311 0.11%	174,704 0.08%	54,508 0.02%	109,434,181 47.25%	7,926,619 3.42%	0 0.00%	98,170,007 42.39%	783,906 0.34%	0 0.00%	231,598,677 100.00%
San Marco HA	99,702 19.35%	171,443 33.27%	73,530 14.27%	8,513 1.65%	0 0.00%	10,702 2.08%	2,131 0.41%	533 0.10%	46,303 8.99%	76,110 14.77%	0 0.00%	8,214 1.59%	18,097 3.51%	0 0.00%	515,278 100.00%
San Dieguito HU	3,290,924 2.01%	2,379,081 1.45%	9,281,579 5.68%	233,330 0.14%	0 0.00%	2,133,097 1.30%	88,558 0.05%	47,969 0.03%	62,890,325 38.46%	6,661,091 4.07%	0 0.00%	75,210,801 45.99%	1,324,377 0.81%	0 0.00%	163,541,133 100.00%
Miramar Reservoir HA	3,586 1.68%	129,908 60.99%	39,357 18.48%	1,362 0.64%	0 0.00%	0 0.00%	30 0.01%	9 0.00%	0 0.00%	0 0.00%	0 0.00%	38,734 18.19%	0 0.00%	0 0.00%	212,986 100.00%
Scripps HA	874,595 17.39%	2,255,304 44.84%	922,557 18.34%	30,893 0.61%	0 0.00%	34,969 0.70%	1,993 0.04%	0 0.00%	0 0.00%	0 0.00%	0 0.00%	668,068 13.28%	241,141 4.79%	0 0.00%	5,029,519 100.00%
Tecolote HA	2,352,810 31.81%	1,769,021 23.92%	1,905,887 25.77%	110,886 1.50%	93 0.00%	0 0.00%	13,788 0.19%	27,095 0.37%	0 0.00%	0 0.00%	0 0.00%	1,187,711 16.06%	28,366 0.38%	0 0.00%	7,395,789 100.00%
Mission San Diego HSA/ Santee HSA	4,794,240 6.59%	5,677,064 7.80%	6,177,862 8.49%	221,053 0.30%	119,975 0.16%	229,973 0.32%	222,699 0.31%	53,141 0.07%	3,025,241 4.16%	470,719 0.65%	0 0.00%	51,230,867 70.41%	534,734 0.73%	0 0.00%	72,757,569 100.00%
Chollas HSA	3,251,407 21.13%	4,452,966 28.93%	4,001,695 26.00%	91,547 0.59%	13,477 0.09%	129,379 0.84%	83,294 0.54%	45,652 0.30%	0 0.00%	0 0.00%	0 0.00%	2,891,344 18.79%	429,847 2.79%	0 0.00%	15,390,608 100.00%

* See Table I-16 for how total coliform bacteria loads from Caltrans land use areas are separated from Industrial/Transportation land use areas

Table I-14. Enterococci Loads (Billion MPN/year) Generated by Different Land Uses

	Municipal MS4								Agriculture/Livestock			Open Space			
Watershed	**COMM/ INST**	**HIDEN RES**	**LODEN RES**	**PARK/ REC**	**MIL**	**TRANS**	**IND/ TRANS***	**CAL TRANS***	**AGRI**	**DAIRY/ LIVSTK**	**HORSE RANCH**	**OPEN SPACE**	**OPEN REC**	**WATER**	**TOTAL**
San Joaquin Hills HSA/ Laguna Beach HSA	23,814 2.79%	29,247 3.43%	46,881 5.50%	3,867 0.45%	0 0.00%	32,458 3.81%	0 0.00%	365 0.04%	5 0.00%	0 0.00%	3,195 0.37%	712,533 83.57%	282 0.03%	0 0.00%	852,649 100.00%
Aliso HSA	155,419 6.97%	179,783 8.06%	275,593 12.36%	19,970 0.90%	0 0.00%	381,783 17.12%	2,186 0.10%	516 0.02%	6,840 0.31%	0 0.00%	4,405 0.20%	1,172,631 52.58%	31,083 1.39%	0 0.00%	2,230,206 100.00%
Dana Point HSA	15,131 3.02%	65,726 13.11%	94,996 18.94%	7,633 1.52%	0 0.00%	75,261 15.01%	0 0.00%	25 0.01%	0 0.00%	0 0.00%	0 0.00%	215,628 42.99%	27,125 5.41%	0 0.00%	501,526 100.00%
Lower San Juan HSA	302,177 2.33%	186,986 1.44%	637,026 4.91%	35,825 0.28%	0 0.00%	730,116 5.62%	8,391 0.06%	2,823 0.02%	1,096,531 8.45%	0 0.00%	54,735 0.42%	9,720,946 74.89%	204,544 1.58%	0 0.00%	12,980,098 100.00%
San Clemente HA	51,464 3.09%	64,428 3.87%	128,049 7.70%	10,390 0.62%	332 0.02%	137,426 8.26%	3,492 0.21%	635 0.04%	148 0.01%	0 0.00%	0 0.00%	1,225,757 73.70%	40,979 2.46%	0 0.00%	1,663,100 100.00%
San Luis Rey HU	137,330 0.74%	98,872 0.54%	781,175 4.24%	24,380 0.13%	397,857 2.16%	24,997 0.14%	7,683 0.04%	2,397 0.01%	6,416,957 34.80%	464,798 2.52%	0 0.00%	10,003,592 54.25%	79,881 0.43%	0 0.00%	18,439,920 100.00%
San Marco HA	11,154 27.50%	6,850 16.89%	9,401 23.18%	1,088 2.68%	0 0.00%	1,189 2.93%	102 0.25%	26 0.06%	2,960 7.30%	4,865 12.00%	0 0.00%	912 2.25%	2,010 4.96%	0 0.00%	40,558 100.00%
San Dieguito HU	366,288 2.48%	94,571 0.64%	1,180,642 7.98%	29,680 0.20%	0 0.00%	235,764 1.59%	4,224 0.03%	2,288 0.02%	3,999,911 27.03%	423,655 2.86%	0 0.00%	8,312,808 56.18%	146,379 0.99%	0 0.00%	14,796,210 100.00%
Miramar Reservoir HA	307 2.66%	3,974 34.37%	3,853 33.32%	133 1.15%	0 0.00%	0 0.00%	1 0.01%	0 0.00%	0 0.00%	0 0.00%	0 0.00%	3,295 28.49%	0 0.00%	0 0.00%	11,564 100.00%
Scripps HA	89,116 23.59%	82,072 21.72%	107,432 28.43%	3,597 0.95%	0 0.00%	3,538 0.94%	87 0.02%	0 0.00%	0 0.00%	0 0.00%	0 0.00%	67,598 17.89%	24,399 6.46%	0 0.00%	377,839 100.00%
Tecolote HA	255,786 36.11%	68,685 9.70%	236,798 33.43%	13,777 1.95%	18 0.00%	0 0.00%	644 0.09%	1,266 0.18%	0 0.00%	0 0.00%	0 0.00%	128,222 18.10%	3,062 0.43%	0 0.00%	708,256 100.00%
Mission San Diego HSA/ Santee HSA	511,533 7.05%	216,332 2.98%	753,328 10.38%	26,955 0.37%	12,712 0.18%	24,367 0.34%	10,183 0.14%	2,430 0.03%	184,449 2.54%	28,700 0.40%	0 0.00%	5,428,113 74.81%	56,657 0.78%	0 0.00%	7,255,759 100.00%
Chollas HSA	342,748 24.98%	167,647 12.22%	482,103 35.14%	11,029 0.80%	1,411 0.10%	13,544 0.99%	3,763 0.27%	2,062 0.15%	0 0.00%	0 0.00%	0 0.00%	302,668 22.06%	44,997 3.28%	0 0.00%	1,371,972 100.00%

* See Table I-17 for how *Entercocci* bacteria loads from Caltrans land use areas are separated from Industrial/Transportation land use areas

Table I-15. Loads Generated by Caltrans: Fecal Coliform

Watershed	IND/ TRANS Land Use Total Load [a] (Billion MPN/yr)	IND/TRANS GIS-Based Land Use Area [b] (sq mi)	CALTRANS Land Use Area [c] (sq mi)	IND/ TRANS Land Use w/o CALTRANS Land Use			IND/TRANS Land Use Occupied by CALTRANS Land Use		
				Land Use Area		Bacteria Load	Land Use Area		Bacteria Load
				(percent)	(sq mi)	(Billion MPN/yr)	(percent)	(sq mi)	(Billion MPN/yr)
San Joaquin Hills HSA/Laguna Beach HSA [d]	179	0.11	0.19	100.00%	0.11	179	0.00%	0	0
Aliso HSA	1,359	0.89	0.17	19.10%	0.17	260	80.90%	0.72	1,099
Dana Point HSA [ad]	13	0.01	0.06	100.00%	0.01	13	0.00%	0	0
Lower San Juan HSA	6,806	2.9	0.73	25.17%	0.73	1,713	74.83%	2.17	5,093
San Clemente HA	2,174	1.17	0.18	15.38%	0.18	335	84.62%	0.99	1,840
San Luis Rey HU	6,465	4.92	1.17	23.78%	1.17	1,537	76.22%	3.75	4,927
San Marcos HA	39	0.05	0.01	20.00%	0.01	8	80.00%	0.04	31
San Dieguito HU	3,729	2.22	0.78	35.14%	0.78	1,310	64.86%	1.44	2,419
Miramar Reservoir HA	1	3.28	0.74	22.56%	0.74	0	77.44%	2.54	1
Scripps HA	40	0.05	0	0.00%	0	0	100.00%	0.05	40
Tecolote HA	834	0.36	0.24	66.27%	0.24	553	33.73%	0.12	281
Mission San Diego HSA/Santee HSA	5,236	10.07	1.94	19.27%	1.94	1,009	80.73%	8.13	4,227
Chollas HSA	2,519	1.61	0.57	35.40%	0.57	892	64.60%	1.04	1,627

a. Total bacteria load generated by Industrial/Transportation land use area calculated by multiplying the total existing load (see Table I-3) by the percent load generated by Industrial & Transportation from Figures I-5 through I-40.
b. Total Industrial/Transportation land use area from GIS land use data (SANDAG 2000)
c. Total Caltrans land use area reported by Caltrans (Richard Watson, Caltrans, personal communication, September 23, 2005)
d. Caltrans reported area greater than GIS-based land use area in this watershed, therefore 100 percent of load was assumed to be generated by Caltrans land use area.

Table I-16. Loads Generated by Caltrans: Total Coliform

Watershed	IND/ TRANS Land Use Total Load [a] (Billion MPN/yr)	IND/TRANS GIS-Based Land Use Area [b] (sq mi)	CALTRANS Land Use Area [c] (sq mi)	IND/ TRANS Land Use w/o CALTRANS Land Use			IND/TRANS Land Use Occupied by CALTRANS Land Use		
				Land Use Area		Bacteria Load	Land Use Area		Bacteria Load
				(percent)	(sq mi)	(Billion MPN/yr)	(percent)	(sq mi)	(Billion MPN/yr)
San Joaquin Hills HSA/Laguna Beach HSA [d]	7,722	0.11	0.19	100.00%	0.11	7,722	0.00%	0	0
Aliso HSA	57,606	0.89	0.17	19.10%	0.17	11,003	80.90%	0.72	46,603
Dana Point HSA [d]	634	0.01	0.06	100.00%	0.01	634	0.00%	0	0
Lower San Juan HSA	240,261	2.9	0.73	25.17%	0.73	60,480	74.83%	2.17	179,782
San Clemente HA	87,970	1.17	0.18	15.38%	0.18	13,534	84.62%	0.99	74,436
San Luis Rey HU	229,211	4.92	1.17	23.78%	1.17	54,508	76.22%	3.75	174,704
San Marcos HA	2,664	0.05	0.01	20.00%	0.01	533	80.00%	0.04	2,131
San Dieguito HU	136,527	2.22	0.78	35.14%	0.78	47,969	64.86%	1.44	88,558
Miramar Reservoir HA	39	3.28	0.74	22.56%	0.74	9	77.44%	2.54	30
Scripps HA	1,993	0.05	0	0.00%	0	0	100.00%	0.05	1,993
Tecolote HA	40,883	0.36	0.24	66.27%	0.24	27,095	33.73%	0.12	13,788
Mission San Diego HSA/Santee HSA	275,840	10.07	1.94	19.27%	1.94	53,141	80.73%	8.13	222,699
Chollas HSA	128,945	1.61	0.57	35.40%	0.57	45,652	64.60%	1.04	83,294

a. Total bacteria load generated by Industrial/Transportation land use area calculated by multiplying the total existing load (see Table I-3) by the percent load generated by Industrial & Transportation from Figures I-5 through I-40.
b. Total Industrial/Transportation land use area from GIS land use data (SANDAG 2000)
c. Total Caltrans land use area reported by Caltrans (Richard Watson, Caltrans, personal communication, September 23, 2005)
d. Caltrans reported area greater than GIS-based land use area in this watershed, therefore 100 percent of load was assumed to be generated by Caltrans land use area.

Table I-17. Loads Generated by Caltrans: Enterococci

Watershed	IND/ TRANS Land Use Total Load [a] (Billion MPN/yr)	IND/TRANS GIS-Based Land Use Area [b] (sq mi)	CALTRANS Land Use Area [c] (sq mi)	IND/ TRANS Land Use w/o CALTRANS Land Use			IND/TRANS Land Use Occupied by CALTRANS Land Use		
				Land Use Area		Bacteria Load	Land Use Area		Bacteria Load
				(percent)	(sq mi)	(Billion MPN/yr)	(percent)	(sq mi)	(Billion MPN/yr)
San Joaquin Hills HSA/Laguna Beach HSA [d]	365	0.11	0.19	100.00%	0.11	365	0.00%	0	0
Aliso HSA	2,702	0.89	0.17	19.10%	0.17	516	80.90%	0.72	2,186
Dana Point HSA [d]	25	0.01	0.06	100.00%	0.01	25	0.00%	0	0
Lower San Juan HSA	11,214	2.9	0.73	25.17%	0.73	2,823	74.83%	2.17	8,391
San Clemente HA	4,127	1.17	0.18	15.38%	0.18	635	84.62%	0.99	3,492
San Luis Rey HU	10,080	4.92	1.17	23.78%	1.17	2,397	76.22%	3.75	7,683
San Marcos HA	128	0.05	0.01	20.00%	0.01	26	80.00%	0.04	102
San Dieguito HU	6,512	2.22	0.78	35.14%	0.78	2,288	64.86%	1.44	4,224
Miramar Reservoir HA	1	3.28	0.74	22.56%	0.74	0	77.44%	2.54	1
Scripps HA	87	0.05	0	0.00%	0	0	100.00%	0.05	87
Tecolote HA	1,910	0.36	0.24	66.27%	0.24	1,266	33.73%	0.12	644
Mission San Diego HSA/Santee HSA	12,613	10.07	1.94	19.27%	1.94	2,430	80.73%	8.13	10,183
Chollas HSA	5,826	1.61	0.57	35.40%	0.57	2,062	64.60%	1.04	3,763

a. Total bacteria load generated by Industrial/Transportation land use area calculated by multiplying the total existing load (see Table I-3) by the percent load generated by Industrial & Transportation from Figures I-5 through I-40.
b. Total Industrial/Transportation land use area from GIS land use data (SANDAG 2000)
c. Total Caltrans land use area reported by Caltrans (Richard Watson, Caltrans, personal communication, September 23, 2005)
d. Caltrans reported area greater than GIS-based land use area in this watershed, therefore 100 percent of load was assumed to be generated by Caltrans land use area.

Table I-18. Wet Weather Fecal Coliform Loads: Percent Reduction Required to Meet Wet Weather TMDLs

	Total			Point Sources				Nonpoint Sources			
				MS4		Caltrans		Ag/Livestock		Open Space	
Watershed	**Existing Load**	**TMDL**	**Reduction Required**	**WLA**	**Reduction Required**	**WLA**	**Reduction Required**	**LA**	**Reduction Required**	**LA**	**Reduction Required**
San Joaquin Hills HSA/ Laguna Beach HSA [d]	705,015	664,634	5.73%	37,167	52.07%	179	0.00%	7,346	0.00%	619,942	0.00%
Aliso HSA	1,752,096	1,579,073	9.88%	477,069	26.62%	260	0.00%	26,508	0.00%	1,075,237	0.00%
Dana Point HSA [d]	403,911	377,313	6.59%	152,446	14.86%	13	0.00%	0	0.00%	224,854	0.00%
Lower San Juan HSA	15,304,790	14,714,833	3.85%	1,156,419	12.82%	1,713	0.00%	2,855,570	12.82%	10,701,131	0.00%
San Clemente HA	1,441,723	1,378,931	4.36%	192,653	24.58%	335	0.00%	366	0.00%	1,185,577	0.00%
San Luis Rey HU	33,120,012	32,444,242	2.04%	914,026	3.12%	1,537	0.00%	20,041,659	3.12%	11,487,019	0.00%
San Marcos HA	20,886	17,224	17.53%	6,558	18.98%	8	0.00%	9,073	18.98%	1,585	0.00%
San Dieguito HU	21,286,910	21,101,649	0.87%	798,175	1.46%	1,310	0.00%	11,698,811	1.46%	8,603,352	0.00%
Miramar Reservoir HA	10,392	10,256	1.31%	6,703	1.99%	0	0.00%	0	0.00%	3,552	0.00%
Scripps HA	204,057	176,907	13.31%	101,253	21.14%	0	0.00%	0	0.00%	75,654	0.00%
Tecolote HA	261,966	229,322	12.46%	126,806	20.47%	553	0.00%	0	0.00%	101,963	0.00%
Mission San Diego HSA/ Santee HSA	4,932,380	4,680,838	5.10%	221,117	53.22%	1,009	0.00%	414,721	0.00%	4,043,991	0.00%
Chollas HSA	603,863	520,440	13.81%	252,479	24.84%	892	0.00%	0	0.00%	267,070	0.00%

Table I-19. Wet Weather Total Coliform Loads: Percent Reduction Required to Meet Wet Weather TMDLs

	Total			Point Sources				Nonpoint Sources			
				MS4		Caltrans		Ag/Livestock		Open Space	
Watershed	**Existing Load**	**TMDL**	**Reduction Required**	**WLA**	**Reduction Required**	**WLA**	**Reduction Required**	**LA**	**Reduction Required**	**LA**	**Reduction Required**
San Joaquin Hills HSA/ Laguna Beach HSA [d]	8,221,901	7,445,649	9.44%	880,652	46.85%	7,722	0.00%	50,774	0.00%	6,506,501	0.00%
Aliso HSA	23,210,774	20,190,798	13.01%	8,923,264	25.29%	11,003	0.00%	179,828	0.00%	11,076,702	0.00%
Dana Point HSA [d]	6,546,962	6,031,472	7.87%	3,404,008	13.15%	634	0.00%	0	0.00%	2,626,830	0.00%
Lower San Juan HSA	130,258,863	122,879,189	5.67%	16,093,160	19.21%	60,480	0.00%	14,946,372	19.21%	91,779,178	0.00%
San Clemente HA	16,236,606	15,147,603	6.71%	3,477,739	23.85%	13,534	0.00%	2,370	0.00%	11,653,960	0.00%
San Luis Rey HU	231,598,677	224,150,535	3.22%	14,373,954	5.62%	54,508	0.00%	110,768,160	5.62%	98,953,913	0.00%
San Marcos HA	515,278	425,083	17.50%	298,430	18.47%	533	0.00%	99,809	18.47%	26,311	0.00%
San Dieguito HU	163,541,133	159,814,184	2.28%	16,660,538	4.29%	47,969	0.00%	66,570,499	4.29%	76,535,178	0.00%
Miramar Reservoir HA	212,986	210,180	1.32%	171,436	1.61%	9	0.00%	0	0.00%	38,734	0.00%
Scripps HA	5,029,519	4,356,973	13.37%	3,447,764	16.32%	0	0.00%	0	0.00%	909,209	0.00%
Tecolote HA	7,395,789	6,379,770	13.74%	5,136,598	16.51%	27,095	0.00%	0	0.00%	1,216,077	0.00%
Mission San Diego HSA/ Santee HSA	72,757,569	66,105,222	9.14%	10,790,520	38.14%	53,141	0.00%	3,495,960	0.00%	51,765,601	0.00%
Chollas HSA	15,390,608	13,247,626	13.92%	9,880,784	17.82%	45,652	0.00%	0	0.00%	3,321,191	0.00%

Table I-20. Wet Weather Enterococci Loads: Percent Reduction Required to Meet Wet Weather TMDLs

	Total			Point Sources				Nonpoint Sources			
				MS4		Caltrans		Ag/Livestock		Open Space	
Watershed	**Existing Load**	**TMDL**	**Reduction Required**	**WLA**	**Reduction Required**	**WLA**	**Reduction Required**	**LA**	**Reduction Required**	**LA**	**Reduction Required**
San Joaquin Hills HSA/ Laguna Beach HSA [d]	852,649	782,799	8.19%	66,417	51.26%	365	0.00%	3,201	0.00%	712,816	0.00%
Aliso HSA	2,230,206	1,950,964	12.52%	735,490	27.52%	516	0.00%	11,245	0.00%	1,203,713	0.00%
Dana Point HSA [d]	501,526	462,306	7.82%	219,528	15.16%	25	0.00%	0	0.00%	242,753	0.00%
Lower San Juan HSA	12,980,098	12,152,446	6.38%	1,385,094	27.12%	2,823	0.00%	839,040	27.12%	9,925,490	0.00%
San Clemente HA	1,663,100	1,563,187	6.01%	295,668	25.26%	635	0.00%	148	0.00%	1,266,736	0.00%
San Luis Rey HU	18,439,920	17,463,618	5.29%	1,300,235	11.69%	2,397	0.00%	6,077,514	11.69%	10,083,473	0.00%
San Marcos HA	40,558	32,966	18.72%	23,771	20.19%	26	0.00%	6,246	20.19%	2,923	0.00%
San Dieguito HU	14,796,210	14,307,087	3.31%	1,763,603	7.72%	2,288	0.00%	4,082,010	7.72%	8,459,187	0.00%
Miramar Reservoir HA	11,564	11,405	1.38%	8,109	1.93%	0	0.00%	0	0.00%	3,295	0.00%
Scripps HA	377,839	324,032	14.24%	232,035	18.82%	0	0.00%	0	0.00%	91,997	0.00%
Tecolote HA	708,256	603,761	14.75%	471,211	18.15%	1,266	0.00%	0	0.00%	131,284	0.00%
Mission San Diego HSA/ Santee HSA	7,255,759	6,590,966	9.16%	890,617	42.74%	2,430	0.00%	213,149	0.00%	5,484,770	0.00%
Chollas HSA	1,371,972	1,152,645	15.99%	802,918	21.46%	2,062	0.00%	0	0.00%	347,665	0.00%

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APPENDIX J

WET WEATHER MODEL CONFIGURATION, CALIBRATION AND VALIDATION

Wet weather sources of bacteria are generally associated with wash-off of loads accumulated on the land surface. During rainy periods, these bacteria loads are delivered from the land surface to the waterbody via storm water runoff through creeks and stormwater collection systems. Often, bacteria sources can be linked to specific land use types that have higher relative accumulation rates of bacteria, or are more likely to deliver bacteria to waterbodies due to delivery through stormwater collection systems. To assess the link between sources of bacteria and the impaired waters, a modeling system may be utilized that simulates the build-up and wash-off of bacteria and the hydrologic and hydraulic processes that affect delivery. Understanding and modeling of these processes provides the necessary decision support for TMDL development and allocation of loads to sources.

The mass-load based wet weather TMDL calculation was based on a watershed model of the drainage area associated with each impaired waterbody. The USEPA's Loading Simulation Program in C++ (LSPC) was selected to simulate the hydrologic processes and bacteria loading to receiving waterbodies in the San Diego Region. LSPC is a component of the USEPA's TMDL Modeling Toolbox (Toolbox), which has been developed through a joint effort between the USEPA and Tetra Tech, Inc. It integrates a geographical information system (GIS), comprehensive data storage and management capabilities, a dynamic watershed model (a re-coded version of the USEPA's Hydrological Simulation Program – FORTRAN [HSPF]) and a data analysis/post-processing system into a convenient PC-based windows interface that dictates no software requirements.

An LSPC model was configured for many of the watersheds in the San Diego Region and was then used to simulate a series of hydraulically connected subwatersheds. Configuration of the model involved subdividing the watersheds within the San Diego Region into modeling units, followed by continuous simulation of flow and water quality for those units using meteorological, land use, soils, stream, point source and bacteria representation data. Development and application of the watershed model to address the project objectives involved a number of important steps:

1. Watershed Segmentation
2. Configuration of Key Model Components
3. Model Calibration and Validation

J.1 Watershed Segmentation

Watershed segmentation refers to the subdivision of all watersheds in the San Diego Region into smaller, discrete subwatersheds for modeling and analysis. This subdivision was primarily based on the stream networks and topographic variability and secondarily on the locations of flow and water quality monitoring stations, consistency of hydrologic factors, land use consistency and existing watershed boundaries (based on CALWTR 2.2 watershed boundaries). The San Diego

Region was divided into sixteen basins for model configuration and subwatershed delineation—thirteen basins were modeled for assessment of bacteria loads to impaired waterbodies; three additional watersheds (Santa Margarita River, Tecolote Creek and Rose Creek) were configured for region-wide calibration, since data in these watersheds were plentiful. Basins and respective subwatershed delineations are presented in Appendix E.

J.2 Configuration of Key Model Components

Configuration of the watershed model involved consideration of four major components: meteorological data, land use representation, hydrologic and pollutant representation and waterbody representation. These components provided the basis for the model's ability to estimate flow and pollutant loadings. Meteorological data essentially drive the watershed model. Rainfall and other parameters are key inputs to LSPC's hydrologic algorithms. The land use representation provides the basis for distributing soils and pollutant loading characteristics throughout the basin. Hydrologic and pollutant representation refers to the LSPC modules or algorithms used to simulate hydrologic processes (e.g., surface runoff, evapotranspiration and infiltration) and pollutant loading processes (primarily accumulation and washoff). Waterbody representation refers to LSPC modules or algorithms used to simulate flow and pollutant transport through streams and rivers.

J.2.1 Meteorology

Meteorological data are a critical component of the watershed model. LSPC requires appropriate representation of precipitation and potential evapotranspiration. In general, hourly precipitation (or finer resolution) data are recommended for nonpoint source modeling. Therefore, only weather stations with hourly-recorded data were considered in the precipitation data selection process. Rainfall-runoff processes for each subwatershed were driven by precipitation data from the most representative station. These data provide necessary input to LSPC algorithms for hydrologic and water quality representation.

Meteorological data have been accessed from a number of sources in an effort to develop the most representative dataset for the San Diego Region. Hourly rainfall data were obtained from the National Climatic Data Center (NCDC) of the National Oceanic and Atmospheric Administration (NOAA), the Automatic Local Evaluation in Real Time (ALERT) Flood Warning System managed by the County of San Diego and the California Irrigation Management Information System (CIMIS) (Appendix G, No. 21-23). The above data were reviewed based on geographic location, period of record and missing data to determine the most appropriate meteorological stations. Ultimately, meteorological data were utilized from 16 area weather stations for January 1990-September 2002 (Figure J-1).

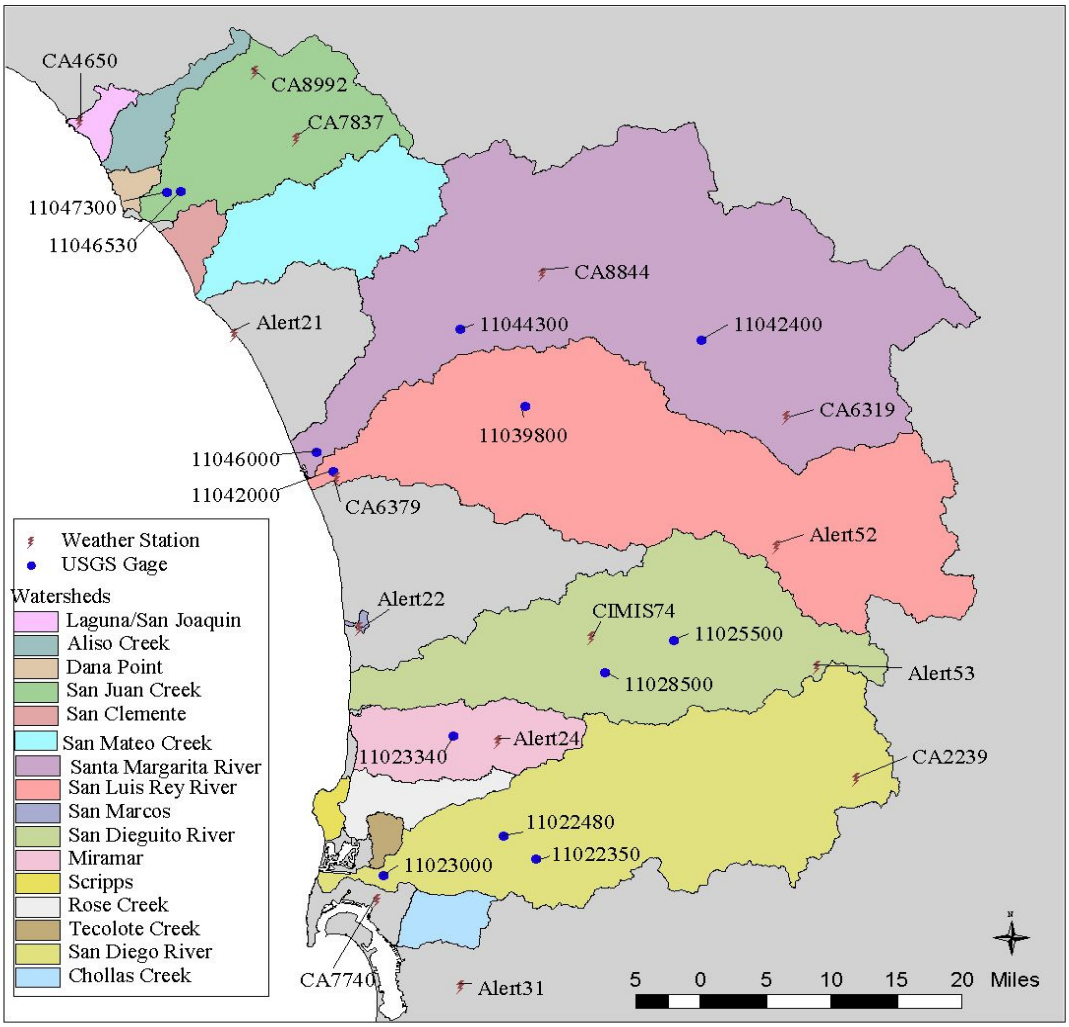

Figure J-1. Weather stations and flow gages utilized for wet weather modeling

Long-term hourly wind speed, cloud cover, temperature and dew point data are available for a number of weather stations in the San Diego Region. Data from Lindbergh Field, the San Diego Airport (COOP ID #047740), were obtained from NCDC for characterization of meteorology of the modeled watersheds (Appendix G, No. 21). Using this data, the METCMP utility, available from USGS, was used to calculate hourly potential evapotranspiration.

J.2.2 Land Use Representation

The watershed model requires a basis for distributing hydrologic and pollutant loading parameters. This is necessary to appropriately represent hydrologic variability throughout the basin, which is influenced by land surface and subsurface characteristics. It is also necessary to represent variability in pollutant loading, which is highly correlated to land practices. The basis for this distribution was provided by land use coverage of the entire watershed.

Three sources of land use data were used in this modeling effort. The primary source of data was the San Diego Association of Governments (SANDAG) 2000 land use dataset that covers San Diego County. This dataset was supplemented with land use data from the Southern California Association of Governments (SCAG) for Orange County and portions of Riverside County. A small area in Riverside County was not covered by either land use dataset. To obtain complete coverage, the 1993 USGS Multi-Resolution Land Characteristic data was used to fill this remaining data gap (Appendix G, No. 25).

Although the multiple categories in the land use coverage provide much detail regarding spatial representation of land practices in the watershed, such resolution is unnecessary for watershed modeling if many of the categories share hydrologic or pollutant loading characteristics. Therefore, many land use categories were grouped into similar classifications, resulting in a subset of 13 categories for modeling. Selection of these land use categories was based on the availability of monitoring data and literature values that could be used to characterize individual land use contributions and critical bacteria-contributing practices associated with different land uses. For example, multiple urban categories were represented independently (e.g., high density residential, low density residential and commercial/institutional), whereas forest and other natural categories were grouped. Table J-1 presents the land use distribution in each of the thirteen watersheds contributing to waterbody impairments. Land use categories are identified by land use codes, shown in parentheses.

LSPC algorithms require that land use categories be divided into separate pervious and impervious land units for modeling. This division was made for the appropriate land uses (primarily urban) to represent impervious and pervious areas separately. The division was based on typical impervious percentages associated with different land use types from the Soil Conservation Service's TR-55 Manual (Soil Conservation Service, 1986) (Table J-2).

Table J-1. Land use areas (square miles) of each modeled watershed

Watershed	LRD (1100)	HDR (1200)	COM/ INST (1400)	IND/ TRNS (1500)	MIL (1600)	PRK/ REC (1700)	TRAN (7000)	DRY/ LIV (2400)	AGR (2000)	HRS (2700)	OPRC (1800)	OPSP (4000)	WTR (5000)	TOTAL
San Joaquin Hills HSA/ Laguna Beach HSA	2.39	0.61	0.34	0.11	0	0.18	0.23	0	0	0.02	0.02	10.02	0	13.92
Aliso HSA	8.75	3.76	2.14	0.89	0	0.69	2.86	0	0.07	0.03	0.4	16.09	0.06	35.74
Dana Point HSA	3.51	1.3	0.25	0.01	0	0.28	0.53	0	0	0	0.32	2.7	0	8.9
Lower San Juan HSA	15.61	2.97	3.09	2.9	0	1.03	4.03	0	7.57	0.4	1.86	137.07	0.66	177.19
San Clemente HA	3.85	1.31	0.66	1.17	0.02	0.37	0.81	0	0	0	0.52	10.06	0	18.77
San Luis Rey HU	42.86	4.22	3.24	4.92	15.31	1.65	0.63	8.51	123.49	0	2.56	350.46	2.56	560.41
San Marcos HA	0.34	0.17	0.19	0.05	0	0.04	0.1	0.25	0.06	0	0.1	0.13	0.01	1.44
San Dieguito HU	43.58	2.26	5.33	2.22	0	1.19	2.34	5.71	61.72	0	3.19	215.96	2.72	346.22
Miramar Reservoir HA	22.42	3.86	11.41	3.28	0	1.7	1.96	0.93	2.29	0	1.14	44.47	0.26	93.72
Scripps HA	5.21	1.32	0.86	0.05	0	0.13	0.03	0	0	0	0.2	0.94	0.01	8.75
Teoclote HA	4.83	0.78	1.89	0.36	0.03	0.31	0	0	0	0	0.09	1.74	0	10.0
Mission San Diego HSA/ Santee HSA	65.65	10.61	16.36	10.07	3.07	2.73	0.5	0.87	9.46	0	2.06	308.67	6.44	436.49
Chollas HSA	14.75	2.87	3.79	1.61	0.02	0.38	0.09	0	0	0	0.52	2.73	0.03	26.79

Abbreviations:

LDR: Low density residential
HDR: High density residential
COM/INST: Commercial/Institutional
IND/TRNS: Industrial/Transportation
MIL: Military
PRK/REC: Parks/Recreation
TRAN: Transitional
DRY/LIV: Dairy/Intensive livestock
AGR: Agriculture
HRS: Horse ranch
OPRC: Open recreation
OPSP: Open space
WTR: Water

Table J-2. Percent impervious for urban land uses (based on TR-55)

Land Use	Impervious
Industrial/Transportation	72%
Low Density Residential	15%
High Density Residential	65%
Commercial/Institutional	85%
Parks/Recreation	12%

J.2.3 Hydrology Representation

The LSPC PWATER (water budget simulation for pervious land segments) and IWATER (water budget simulation for impervious land segments) modules, which are identical to those in HSPF, were used to represent hydrology for all pervious and impervious land units (Bicknell et al., 1996). Designation of key hydrologic parameters in the PWATER and IWATER modules of LSPC were required. These parameters are associated with infiltration, groundwater flow and overland flow. USDA's STATSGO Soils Database served as a starting point for designation of infiltration and groundwater flow parameters (Appendix G, No. 26). For parameter values not easily derived from these sources, documentation on past HSPF applications were accessed, particularly the recent modeling studies performed for the San Jacinto River Watershed (Tetra Tech, Inc., 2003) and Santa Monica Bay (Los Angeles Water Board, 2002). Starting values were refined through the hydrologic calibration process (described in the next section).

J.2.4 Hydrology Representation

The LSPC PWATER (water budget simulation for pervious land segments) and IWATER (water budget simulation for impervious land segments) modules, which are identical to those in HSPF, were used to represent hydrology for all pervious and impervious land units (Bicknell et al., 1996). Designation of key hydrologic parameters in the PWATER and IWATER modules of LSPC were required. These parameters are associated with infiltration, groundwater flow and overland flow. USDA's STATSGO Soils Database served as a starting point for designation of infiltration and groundwater flow parameters (Appendix G, No. 26). For parameter values not easily derived from these sources, documentation on past HSPF applications were accessed, particularly the recent modeling studies performed for the San Jacinto River Watershed (Tetra Tech, Inc, 2003) and Santa Monica Bay (Los Angeles Water Board, 2002). Starting values were refined through the hydrologic calibration process (described in the next section).

J.2.5 Pollutant Representation

Loading processes for FC, TC and ENT were represented for each land unit using the LSPC PQUAL (simulation of quality constituents for pervious land segments) and IQUAL (simulation of quality constituents for impervious land segments) modules, which are identical to those in HSPF. These modules simulate the accumulation of pollutants during dry periods and the washoff of pollutants during storm events. Starting values for parameters relating to land-use-specific accumulation rates and buildup limits, were obtained from a study performed by the Southern California Coastal Water Research Project (SCCWRP) to support bacteria TMDL development of Santa Monica Bay (Los Angeles Water Board, 2002 and Ackerman, 2006). These starting values (Table J-3) served as baseline conditions for water quality calibration; the

appropriateness of these values to the San Diego Region watershed was validated through comparison to local water quality data.

Table J-3. Model Build-up Rates for Fecal Indicator Bacteria Calibrated by Land Use in Santa Monica Bay

Land Use	Fecal Coliform (MPN/Ac*day)	Total Coliform (MPN/Ac*day)	Enterococci (MPN/Ac*day)
Agriculture	5×10^{10}	3×10^{11}	2×10^{10}
Commercial	5×10^{8}	3×10^{10}	3.5×10^{9}
High Density Residential	3×10^{9}	6×10^{10}	2.5×10^{9}
Industrial	8×10^{7}	3×10^{9}	1.5×10^{8}
Low Density Residential	6×10^{8}	1.5×10^{10}	2×10^{9}
Open	9×10^{9}	8.2×10^{10}	9.5×10^{9}
Transportation	1×10^{8}	3.5×10^{9}	3.5×10^{9}
Mixed Urban	6.6×10^{8}	1.2×10^{10}	2.1×10^{9}

There were six major inland dischargers during the simulation period and these were incorporated into the LSPC model as point sources of flow and bacteria. Each point source is located in the Santa Margarita River watershed – five at Camp Pendleton and one along Murrieta Creek (Santa Rosa Water Reclamation Facility). Although the Santa Margarita River watershed had no waterbodies impaired for bacteria, it was simulated in this wet weather modeling effort due to the availability of streamflow and bacteria monitoring data, which were used for hydrologic and water quality calibration and validation. It is important to note that all six major inland discharges were eliminated by 2002.

J.2.6 Waterbody Representation

Each delineated subwatershed was represented with a single stream assumed to be completely mixed, one-dimensional segments with a trapezoidal cross-section. The National Hydrography Dataset (NHD) stream reach network for USGS hydrologic units 18070301 through 18070305 were used to determine the representative stream reach for each subwatershed. Once the representative reach was identified, slopes were calculated based on DEM data and stream lengths measured from the original NHD stream coverage (Appendix G, No. 24 and 27). In addition to stream slope and length, mean depths and channel widths are required to route flow and pollutants through the hydrologically connected subwatersheds. Mean stream depth and channel width were estimated using regression curves that relate upstream drainage area to stream dimensions. An estimated Manning's roughness coefficient of 0.2 was also applied to each representative stream reach.

In addition to the streams which route flow and transport pollutants through the watersheds, there were several reservoirs within the region that were large enough to impound a significant portion of flow during wet periods. To represent these reservoirs in the watershed model, the length, width, maximum depth, infiltration rate and spillway height and width were obtained for each reservoir. The reservoirs impounded all upstream flow until the water depth exceeded the spillway height, causing overflow and thus contributing to downstream flow and bacteria loading.

J.3 Model Calibration and Validation

After the model was configured, model calibration and validation were performed. This is generally a two-phase process, with hydrology calibration and validation completed before repeating the process for water quality. Upon completion of the calibration and validation at selected locations, a calibrated dataset containing parameter values for each modeled land use and pollutant was developed.

Calibration refers to the adjustment or fine-tuning of modeling parameters to reproduce observations. The calibration was performed for different LSPC modules at multiple locations throughout the watershed. This approach ensured that heterogeneities were accurately represented. Subsequently, model validation was performed to test the calibrated parameters at different locations or for different time periods, without further adjustment. To ensure that the model results are as current as possible and to provide for a range of hydrologic conditions, January 1991 through September 2002 was selected as the time period for simulation.

J.3.1 Hydrology Calibration and Validation

Hydrology is the first model component calibrated because estimation of bacteria loading relies heavily on flow prediction. The hydrology calibration involves a comparison of model results to in-stream flow observations at selected locations. After comparing the results, key hydrologic parameters were adjusted and additional model simulations were performed. This iterative process was repeated until the simulated results closely represented the system and reproduced observed flow patterns and magnitudes.

Gaging stations representing diverse hydrologic regions of the San Diego Region were used for calibration, including eleven USGS streamflow gage stations (Table J-4 and Figure J-1) (Appendix G, No.3). These gaging stations were selected because they either had a robust historical record or they were in a strategic location (i.e. along a 303(d) listed waterbody, downstream of a reservoir, or along an otherwise unmonitored reach).
The calibration years were selected based on annual precipitation variability and the availability of observation data to represent a continuum of hydrologic conditions: low, mean and high flow. Calibration for these conditions was necessary to ensure that the model would accurately predict a range of conditions over a longer period of time.

Key considerations in the hydrology calibration included the overall water balance, the high-flow/low-flow distribution, storm flows and seasonal variation. At least two criteria for goodness of fit were used for calibration: graphical comparison and the relative error method. Graphical comparisons were extremely useful for judging the results of model calibration; time-variable plots of observed versus modeled flow provided insight into the model's representation of storm hydrographs, baseflow recession, time distributions and other pertinent factors often overlooked by statistical comparisons. The model's accuracy was primarily assessed through interpretation of the time-variable plots. The relative error method was used to support the goodness of fit evaluation through a quantitative comparison.

After calibrating hydrology at the eleven locations, a validation of these hydrologic parameters was made through a comparison of model output to different time periods at the same gages as well as two additional gages (Table J-4). The validation essentially confirmed the applicability

of the regional hydrologic parameters derived during the calibration process. Validation results were assessed in a similar manner to calibration: graphical comparison and the relative error method.

Hydrology calibration and validation results, including time series plots and relative error tables, are presented for each gage in Appendix M. The calibration results, which are presented first, include graphs to represent overall model fit, seasonal trends and two time series plots. These graphs are followed by a table that quantified the model results and observed gage data. This table also provides relative errors between the modeled and observed values in the storm volumes and highest flows. The presentation of model validation results follows the calibration tables and graphs for each gage. Two additional gages that had a limited historical record were used as additional validation. Validation was assessed through a time series plot and a relative error table identical to the calibration table.

Overall, during model calibration the model predicted storm volumes and storm peaks well. Since the runoff and resulting streamflow is highly dependent on rainfall, occasional storms were over-predicted or under-predicted depending on the spatial variability of the meteorologic and gage stations. The validation results also showed a good fit between modeled and observed values, thus confirming the applicability of the calibrated hydrologic parameters to the San Diego Region.

Table J-4. USGS stations used for hydrology calibration and validation

Station Number	Station Name	Historical Record	Selected Calibration Period	Selected Validation Period	Watershed and Model Subwatershed
11022480	San Diego River at Mast Road near Santee, CA	5/1/1912 - 9/30/2002	1/1/1991 - 12/31/1996	1/1/1997 - 12/31/2001	San Diego River (1805)
11023000	San Diego River at Fashion Valley at San Diego, CA	1/18/1982 - 9/30/2002	1/1/1991 - 12/31/1996	1/1/1997 - 12/31/2001	San Diego River (1801)
11023340	Los Penasquitos Creek near Poway, CA	10/1/1964 - 9/30/2002	1/1/1991 - 12/31/1996	1/1/1997 - 12/31/2001	Miramar (1406)
11025500	Santa Ysabel Creek near Ramona, CA	2/1/1912 - 9/30/2002	1/1/1991 - 12/31/1996	1/1/1997 - 12/31/2001	San Dieguito (1316)
11028500	Santa Maria Creek near Ramona, CA	12/1/1912 - 9/30/2002	1/1/1991 - 12/31/1996	1/1/1997 - 12/31/2001	San Dieguito (1324)
11042000	San Luis Rey River at Oceanside, CA	10/1/1912 - 11/10/1997; 4/29/1998 - 9/30/2002	9/1/1993 - 8/31/1997	5/1/1998 - 4/30/0202	San Luis Rey (702)
11042400	Temecula Creek near Aguanga, CA	8/1/1957 - 9/30/2002	1/1/1991 - 12/31/1996	1/1/1997 - 12/31/2001	Santa Margarita (658)
11044300	Santa Margarita River at FPUD Sump near Fallbrook, CA	10/1/1989 - 9/30/2002	1/1/1991 - 12/31/1996	1/1/1997 - 12/31/2001	Santa Margarita (615)
11046000	Santa Margarita River at Ysidora, CA	3/1/1923 - 2/25/1999; 10/1/2001 - 9/30/2002	1/1/1991 - 12/31/1995	1/1/1996 - 12/31/1998	Santa Margarita (602)
11046530	San Juan Creek at La Novia Street Bridge near San Juan Capistrano, CA	10/1/1985 - 9/30/2002	1/1/1991 - 12/31/1996	1/1/1997 - 12/31/2001	San Juan (411)
11047300	Arroyo Trabuco near San Juan Capistrano, CA	10/1/1970 - 9/30/1989; 10/1/1995 - 9/30/2002	10/1/1995 - 4/30/1999	5/1/1999 - 4/30/2002	San Juan (403)
11022350	Forester Creek near El Cajon, CA	10/1/1993 - 9/30/2002	none (insufficient period of record)	1/1/1991 - 9/30/1993	San Diego River (1843)
11039800	San Luis Rey River at Couser Canyon Bridge near Pala, CA	10/1/1986 - 1/4/1993	none (insufficient period of record)	1/1/1991 - 12/31/1992	San Luis Rey (711)

J.3.2 Water Quality

After the model was calibrated and validated for hydrology, water quality simulations were performed. As described above, previously calibrated, land use specific accumulation and maximum build up rates for fecal coliforms, total coliforms and enterococci (Los Angeles Water Board, 2002) were used for the water quality simulations. Since these values have been successfully applied to recent bacteria models, including TMDLs, in southern California, they

were considered to be sufficiently calibrated. Therefore, the water quality simulations were used to further validate these rates. The objective of the validation process was to best represent bacteria concentrations during storm events at monitoring stations throughout the region.

Only data from wet weather events (rainfall of 0.2 inches or greater and the following 72 hours) were used for comparison with model water quality output. This greatly reduced the availability of bacteria monitoring data for use in the validation process; however, it was important to differentiate between wet and dry periods due to the separate approaches utilized for this TMDL. There were 107 monitoring stations in the modeled subwatersheds with wet weather monitoring data that overlapped with the modeling period (Tables J-5 through J-7) (Appendix G, No. 7-14). The spatial variability of these locations was excellent (ranging from urban to open land uses); however, the temporal variability and total number of samples limited statistical analysis to basinwide summary statistics rather than comprehensive time series and relative error analyses at each monitoring location.

Table J-5. Basin-wide water quality data used for fecal coliform validation

Basin	Number of		Fecal Coliform (MPN/100mL)		
	Sites	Samples	Minimum	Mean	Maximum
Aliso Creek	59	217	2	11,142	160,000
San Juan Creek	7	9	200	4,222	26,000
Santa Margarita River	14	83	2	1,204	50,000
Rose Creek & Tecolote Creek	17	30	31	9,939	137,400
San Diego River	6	36	2	1,557	24,000

Table J-6. Basin-wide water quality data used for total coliform validation

Basin	Number of		Total Coliform (MPN/100mL)		
	Sites	Samples	Minimum	Mean	Maximum
Aliso Creek	56	206	2	32,246	160,000
San Juan Creek	7	9	680	16,356	70,000
Santa Margarita River	14	36	230	3,248	50,000
Rose Creek & Tecolote Creek	15	24	4,884	333,384	2,419,200
San Diego River	6	34	300	14,885	300,000

Table J-7. Basin-wide water quality data used for enterococcus validation

Basin	Number of		Enterococcus (MPN/100mL)		
	Sites	Samples	Minimum	Mean	Maximum
Aliso Creek	59	217	1	3,720	72,000
San Juan Creek	7	9	340	8,056	51,000
Rose Creek & Tecolote Creek	17	29	20	6,978	32,550

To assess model fit with available data, the time series model output was graphically compared to the observed data. Appendix N (Figures 1-11) presents time series graphs of modeled and observed data for downstream subwatersheds with a reasonable number of samples. Ensuring

that the storm events were represented within the range of the data over time is the most practical and meaningful means of assessing the quality of the model output. The time series plots indicate that the model predicts the fecal coliform, total coliform and enterococci concentrations within the range of observed data (ranges of observed data are presented in Tables J-3 through J-5) and at a similar frequency. This is especially evident in subwatersheds where there is a significant amount of data across a wide temporal range (see Appendix N, Figures N-1-A through N-1-C).

To provide a side-by-side comparison of the available wet weather monitoring data with model output for the same day, data were grouped by basin to increase sample size. Graphs of concentration by percentile of unit area flow (inches/acre-day) are presented in Appendix N (Figures 12-24) for each pollutant in the basins where data were available. Presenting the data as a function of flow facilitates analysis of the results which are pertinent to the wet weather model. Specifically, the higher flows (larger percentiles) are likely associated with the actual precipitation event, rather than the assumed wet period of 72 hours following the storm. For lower flows, observed data that met the wet weather criterion (0.2 inches of rainfall and following 72 hours) may not be representative of true wet conditions, which explains the deviance between model predictions and ranges of observed water quality. However, dry periods are addressed in a separate approach in this TMDL with better accuracy.

Figures 12 through 24 in Appendix N depict the average and range for observed and modeled fecal coliform, total coliform, and enterococci concentrations in the basins identified above. These graphs indicate that the model compared well to observed data, especially for basins with larger sample sizes and in the larger unit area flow percentiles. Discrepancies may be due to small sample sizes, the variability in bacteria monitoring and analysis, or the range of time defined as a wet period (72 hours after a 0.2 inch or greater storm).

Analysis of the time series graphs and the unit area flow summary plots indicate that the previously calibrated bacteria accumulation and maximum build-up rates (Los Angeles Water Board, 2002) are applicable and therefore validated, for the San Diego region. Additional bacteriological data collection is likely to further support these findings considering that the model matched observed data fairly well for all three pollutants when an abundance of observed wet weather data was available (see Appendix N, Figures 12-14).

J.4 Application of Wet Weather Model

After completing model calibration and validation for hydrology and water quality, the model was applied to obtain hourly output for the critical wet year period described in section 6.1.1 of the Technical Report. The maximum hourly fecal coliform, total coliform, and enterococci concentrations were obtained for each wet day in the critical wet year period (1993) for all subwatersheds associated with a 303(d) listed segment. These concentrations, along with their associated average daily flow, were used to generate TMDL load duration curves (Appendix O).

APPENDIX K

DRY WEATHER MODEL CONFIGURATION, CALIBRATION AND VALIDATION

The variable nature of bacteria sources during dry weather required an approach that relied on detailed analyses of flow and water quality monitoring data to identify and characterize sources. This TMDL used data collected from dry weather samples to develop empirical equations that represent water quantity and water quality associated with dry weather runoff from various land uses. For each monitoring station, a watershed was delineated and the land use was related to flow and bacteria concentrations. A statistical relationship was established between areas of each land use and flow and bacteria concentrations.

K.1 Background

Characterization of dry weather flow and indicator bacteria concentrations was based on analyses of data collected during studies of four watersheds in the San Diego Region. Two of these watersheds, Aliso Creek and San Juan Creek, are located in Orange County and are representative of conditions in the northern part of the Region (Figure 5-3). The remaining two watersheds, Rose Creek and Tecolote Creek, are located in San Diego County and discharge to Mission Bay (Figure 5-4). Three of these watersheds, Aliso Creek, San Juan Creek, and Tecolote Creek, are associated with water quality impairments due to bacteria and are therefore representative of conditions that may contribute to similar impairments in neighboring watersheds. Land uses for all four watersheds are consistent with other impaired watersheds in this study, with varying amounts of urban/residential land uses and open space in different subwatersheds.

To represent the linkage between source contributions and in-stream response, a mass balance spreadsheet model was developed to simulate source loadings and transport of bacteria in the impaired streams and streams flowing to impaired beaches. The model estimates bacterial concentrations to develop load allocations and to allow for future incorporation of new data. This predictive model represents the streams as a series of plug-flow reactors, with each reactor having a constant source of flow and bacteria. A plug-flow reactor can be thought of as an elongated rectangular basin with a constant level in which advection (unidirectional transport) dominates (Figure K-1).

The model segments are assumed to be well mixed laterally and vertically at a steady-state condition (constant flow and constant input). Variations in the longitudinal dimension are what determine any changes in parameters of concern. A “plug” of a conservative substance introduced at one end of the reactor will remain intact as it passes through the reactor. The initial concentration of bacteria can be entered for the injection point. At points farther downstream, the concentration can be estimated based on first- order die-off and mass balance.

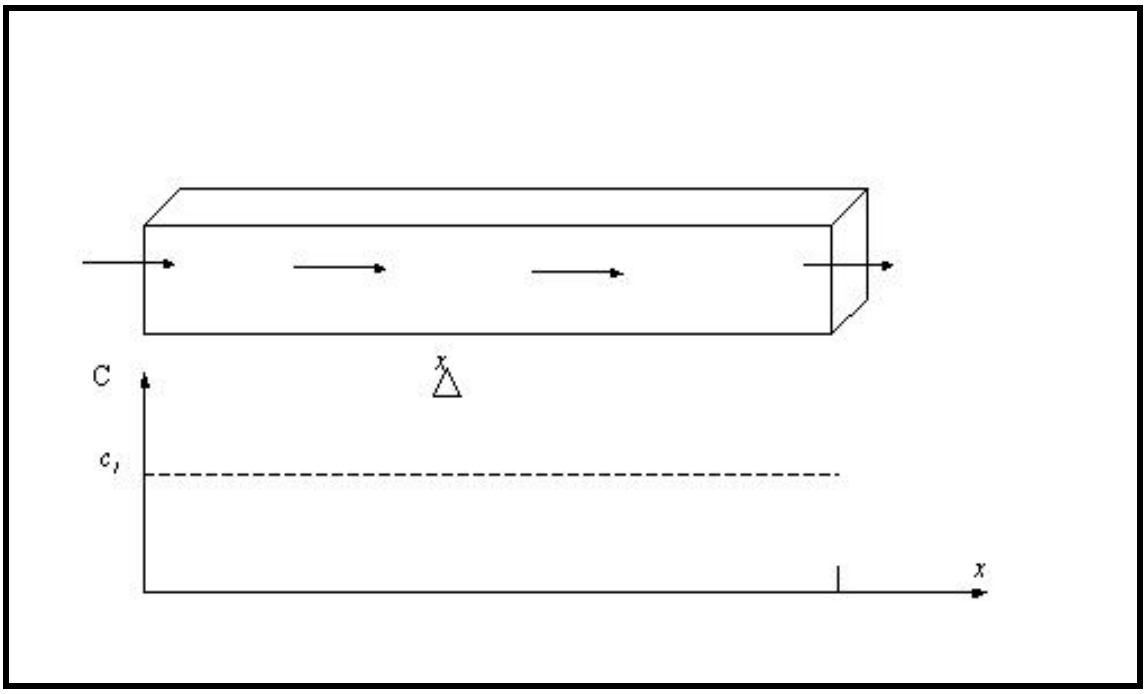

Figure K-1. Theoretical plug-flow reactor

This modeling approach relies on basic segment characteristics, which include flow, width and cross-sectional area. Model input for the flows and bacteria concentration of dry weather urban runoff was estimated using regression equations based on analyses of observed dry weather data. It is important to note that because each of these model parameters was estimated, the accuracy of the model is subject to the accuracy of the estimations. Bacteria concentrations in each reactor, or segment, are calculated using water quality data, a bacteria die-off rate, basic channel geometry and flow. Bacteria die-off rates, which can be attributed to solar radiation, temperature and other environmental conditions, were assumed first-order.

K.2 Model Configuration

Conceptually, the streams are segmented into a series of plug-flow reactors defined along the entire length of the stream to simulate the steady-state distribution of bacteria along its length. Multiple source contributions in a reactor are lumped and represented as a single input based on empirically derived inflows and bacteria concentrations. The model is one-dimensional (longitudinal) under a steady-state condition. Each reactor defines the mass balance for bacteria and water.

K.2.1 Physical Configuration

The first step in setting up and applying the model was the determination of an appropriate scale for analysis. Model subwatersheds were based on CALWTR 2.2 watersheds, stream networks, locations of flow and water quality monitoring stations, consistency of hydrologic factors and land use uniformity. The subwatersheds used in the dry weather model were the same as those used for the wet-weather model (see Appendix E for delineation of the subwatersheds).

Figure K-2 depicts an example of model connectivity of segments for the Chollas Creek watershed. Segments 1905, 1903, 1908 and 1907 are headwater segments. Segment 1902

begins where Segment 1903 and 1904 converge and so forth. For each model segment, mass balance is performed on all inflows from upstream segments, input from local watershed runoff, first-order bacteria die-off, stream infiltration and evaporation and outflow.

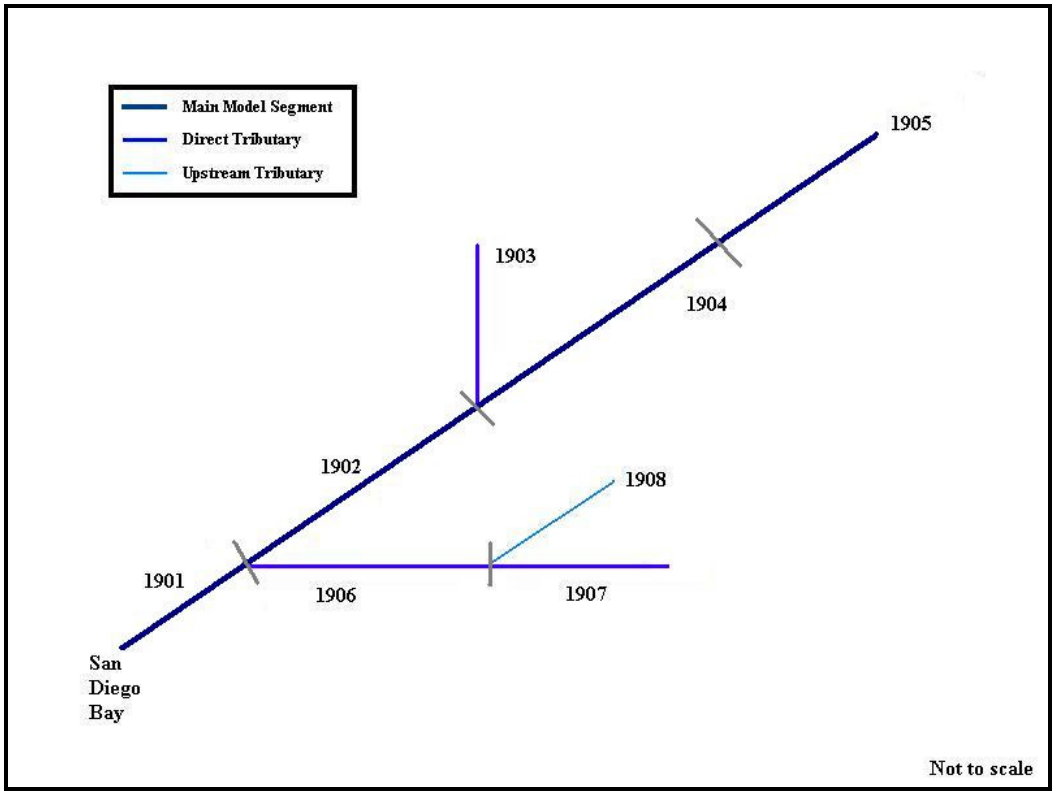

Figure K-2. Schematic of model segments for Chollas Creek and its tributaries

Using an upstream boundary condition of initial concentration (C_{in}) for inflow, the final water column concentration (C_{out}) in a segment can be calculated using the decay equation given below:

$$\frac{dc}{dt} = -kc \qquad \text{or} \qquad C_{out} = C_{in}e^{-kt} = C_{in}e^{-\left(k\frac{x}{u}\right)} \qquad (1)$$

where

C_{in} = initial concentration (#/100 mL)
C_{out} = final concentration (#/100 mL)
k = die-off rate (1/d)
χ = segment length (mi)
u = stream velocity (mi/d)

At each confluence, a mass balance of the watershed load and, if applicable, the load from the upstream tributary is performed to determine the initial concentration in the inflow to the reach. This is represented by the following equation:

$$C_{in} = \frac{Q_r C_r + Q_t C_t}{Q_r + Q_t} \qquad (2)$$

where

Q = flow (ft^3/s)
C = concentration (#/100 mL)

In the previous equation, Q_r and C_r refer to the flow and concentration from the receiving watershed and Q_t and C_t refer to the flow and concentration from the upstream tributary. The concentration calculated from this equation is then used as the initial concentration (C_{in}) in equation 1 for the receiving segment.

For calculation of outflows from the reach, the following equation is used. Infiltration rates for the model were determined through model calibration and comparison to literature ranges (see section K.5), and are dependent on stream length and width.

$$Q = Q_t + Q_r - I \qquad (3)$$

where

I = infiltration (ft^3/s)

Precise channel geometry data were not available for the modeled stream segments and therefore stream dimensions were estimated from analysis of observed data. Analysis was performed on streamflow data and associated stream dimension data from 53 USGS gages throughout Southern California. For this analysis, it was assumed that all streamflow at these gages less than 15 ft^3/s represented dry weather flow conditions. Using this dry weather data, the relationship between flow and cross-sectional area was estimated ($R^2 = 0.51$). The following is the resulting regression equation relating flow to cross-sectional area:

$$A = e^{0.2253 \times Q} \qquad (4)$$

where

A = cross-sectional area (ft^2)
Q = flow (ft^3/s)

In addition, data from the USGS gages were used to determine the width of each segment based on a regression between cross-sectional area and width. The best relationship ($R^2 = 0.75$) was based on the natural logarithms of each parameter. The following is the resulting regression equation from the analysis:

$$LN(W) = (0.6296 \times LN(A)) + 1.3003 \quad \text{or} \quad W = e^{((0.6296 \times LN(A)) + 1.3003)} \qquad (5)$$

where

W = width of model segment (ft)
A = cross-sectional area (ft^2)

K.3 Estimation of Dry weather Runoff

Flow data were not available for many of the subwatersheds. Estimates of inflows from the subwatersheds to the stream model were obtained through analysis of available data. Monitoring studies for which dry weather flow data were collected were available for Aliso Creek (performed by the Orange County Pubic Facilities and Resources Department and the Orange County Public Health Laboratory) and for Rose Creek and Tecolote Creek (performed by the City of San Diego) (Appendix G, No. 1 and 2). Information from these studies was assumed sufficient for use in characterizing dry weather flow conditions for the entire study area. For each study, flow data were collected throughout the year at stations throughout the watersheds. This information was used to understand the relationship between land use and stream flow.

An analysis was performed using dry weather data from the Aliso Creek (27 stations), Rose Creek (3 stations) and Tecolote Creek (2 stations) subwatersheds to determine whether there is a correlation between the respective land use types and the average of dry weather flow measurements collected at the mouth of each subwatershed. Table K-1 lists the stations and number of flow measurements used in this analysis. Selection of stations used in the analyses considered the number of flow measurements, the size of the watershed, as well as strategic locations of multiple watersheds representative of varied land uses. A linear relationship was established based on land use areas, with coefficients established through a *step-wise* multivariable regression analyses. For this regression, variables (land use areas) were added to the regression in a step-wise approach, and *p*-values were evaluated for each parameter. A *p*-value of less than 0.05 for each variable was used to determine their statistical significance. Some variables added at an early state of the regression analysis became statistically insignificant as additional variables were subsequently added to the model, which verified the necessity for a robust *step-wise* regression analyses over other more simplified methods. The resulting equation showed a good correlation between the flow and the commercial/institutional, open space and industrial/transportation land uses ($R^2 = 0.78$). The following is the resulting equation from the analysis (*p*-values for each variable are listed below):

$$Q = (A_{COM} \times 0.00168) + (A_{OPS} \times 0.000256) - (A_{IND} \times 0.00141) \qquad (6)$$

where

Q = flow (ft^3/s)
A_{COM} = area of commercial/institutional (acres) (*p*-value = 6E-13)
A_{OPS} = area of open space, including military operations (acres) (*p*-value = 0.029)
A_{IND} = area of industrial/transportation (acres) (*p*-value = 0.002)

Table K-1. Number of Flow Measurements at Each Station Used in Analyses

Watershed	Station	No. of Flow of Measurements
Aliso Creek	J01P08	35
	J01P06	21
	J07P02	40
	J07P01	38
	J01P01	40
	J01P05	39
	J01P03	40
	J01P04	40
	J06	15
	J05	39
	J01P30	39
	J01P28	39
	J01P27	40
	J01P33	40
	J01P25	40
	J01P26	40
	J01P24	35
	J01P23	40
	J01P22	39
	J03P02	39
	J01P21	32
	J02P05	39
	J02P08	40
	J03P13	38
	J03P05	40
	J03P01	39
	J04	6
Rose Creek	MBW11	7
	MBW13	80
	MBW16	76
Tecolote Creek	MBW7	23
	MBW9	77

Figure K-3 shows the predicted and observed flow data used in this regression.

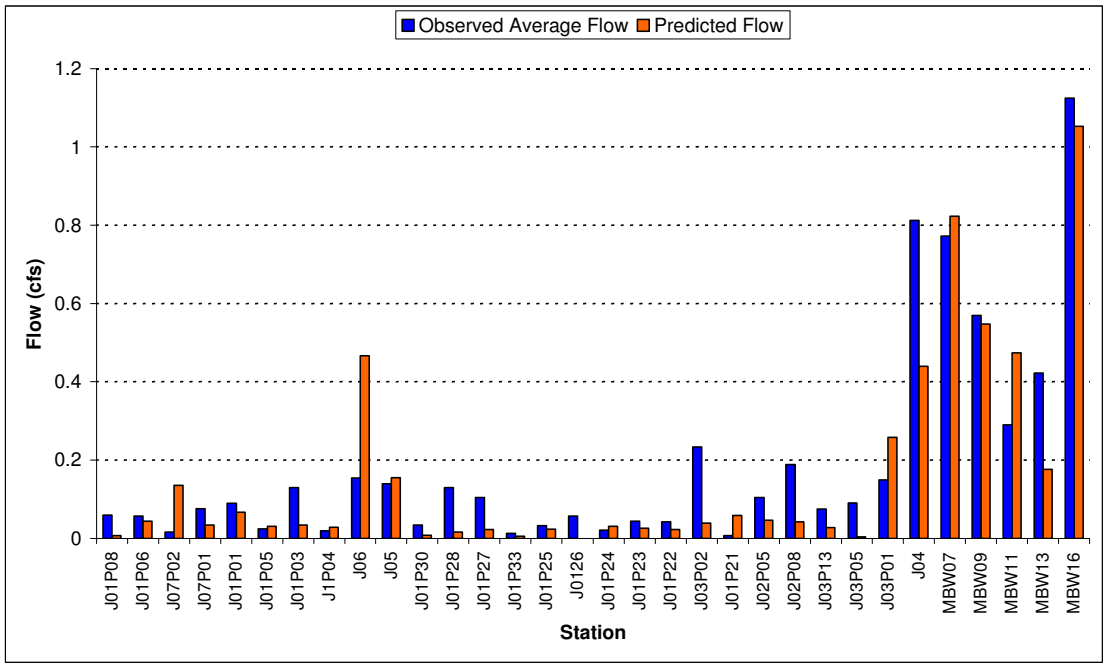

Figure K-3. Predicted and observed flows in Aliso Creek, Rose Creek and Tecolote Creek.

K.4 Estimation of Bacteria Densities

Like flow data, bacteria data were not available for many watersheds modeled. However, bacteria data had been collected for Aliso Creek (Orange County Pubic Facilities and Resources Department), San Juan Creek (Orange County Pubic Facilities and Resources Department) and Rose Creek and Tecolote Creek in the Mission Bay area (City of San Diego) (Appendix G, No. 4-6). For each study, multiple bacteria samples were collected throughout the year at stations throughout the watersheds. For this study, the information was used to understand the relationship between land use and water quality.

An analysis was performed using data from subwatersheds tributary to Aliso Creek (27 stations), Tecolote Creek (5 stations), Rose Creek (4 stations) and San Juan Creek (9 stations) to determine the correlation between dry weather fecal coliform concentrations, land use distribution and the overall size of the subwatersheds. For comparison, geometric means were calculated for each station using all dry weather data collected. Large data sets are preferred to reduce random error and normalize observations at each site. For example, if a station has 40 dry weather samples, the geometric mean of bacteria concentrations can be used for that station with confidence that they are representative of the range of conditions that normally occur. Likewise, if a station has only two samples, there is less confidence. It was critical that the data are normalized as well as possible before regression analysis so that variability does not propagate error. However, no criteria were developed for selection of stations based on the number of samples for representative geometric mean calculations. Rather, station selection included qualitative evaluation for consideration in the analyses. Specific stations of Rose Creek, Tecolote Creek, and San Juan Creek were selected for analyses even though few samples were available at these

locations for geometric mean calculations. These stations were selected based on multiple reasons, including the relatively low indicator bacteria concentrations observed (see Figure K-4), strategic locations of watersheds to provide an expanded spatial coverage for analyses, size of the watershed, or representation of key land uses.

Table K-2. Number of Water Quality Samples at Each Station Used in Analyses

Watershed	Station	Number of Samples		
		Fecal Coliform	Total Coliform	Enterococci
Aliso Creek	J01P08	40	40	40
	J01P06	39	39	39
	J07P02	40	40	40
	J07P01	40	40	40
	J01P01	40	40	40
	J01P05	40	40	40
	J01P03	40	40	40
	J01P04	40	40	40
	J06	40	40	40
	J05	40	40	40
	J01P30	40	40	40
	J01P28	40	40	40
	J01P27	40	40	40
	J01P33	40	40	40
	J01P25	40	40	40
	J01P26	40	40	40
	J01P24	40	40	40
	J01P23	40	40	40
	J01P22	40	40	40
	J03P02	40	40	40
	J01P21	33	33	33
	J02P05	40	40	40
	J02P08	40	40	40
	J03P13	40	40	40
	J03P05	40	40	40
	J03P01	40	40	40
	J04	40	40	40
Rose Creek	MBW13	55	80	60
	MBW15	22	78	26
	MBW16	18	76	21
	MBW24	3	7	3

Table K-2. Number of Water Quality Samples at Each Station Used in Analyses (Cont'd)

Watershed	Station	Number of Samples		
		Fecal Coliform	Total Coliform	Enterococci
Tecolote Creek	MBW6	5	70	8
	MBW7	6	23	11
	MBW8	5	27	15
	MBW9	20	77	25
	MBW10	40	88	54
San Juan Creek	SJ13	11	11	11
	SJ14	10	10	10
	SJ15	11	11	11
	SJ16	11	11	11
	SJ19	3	3	3
	SJ20	11	11	11
	SJ21	11	11	11
	SJ29	2	2	2
	SJ32	11	11	11

A regression analysis was then performed to determine whether there is a correlation between the representative geometric mean of fecal coliform data at each station, the percent of each land use category in the subwatershed and the total subwatershed area. Due to the variability of bacteria concentrations that often exceed multiple orders of magnitude, the analyses was based on the natural log of bacteria concentrations.

Coefficients in the equation were established through a *step-wise* multivariable regression analyses. For this regression, variables (percent of land uses) were added to the regression in a step-wise approach, and *p*-values were evaluated for each parameter. Percentages of land uses were used instead of land use areas since concentrations are not expected to increase with the size of the watershed, but rather due to the density of specific land uses. To include a function for reduction of bacteria concentration due to watershed size and increased potential for bacteria die-off (prior to entering the stream), an additional variable was added for watershed area. A *p*-value of less than 0.05 for each variable was used to determine their statistical significance (although this criterion was relaxed for open recreation which slightly exceeded at 0.067). As with the flow analysis, some variables added at an early state of the regression analysis became statistically insignificant as additional variables were subsequently added to the model, verifying the need for a robust *step-wise* regression analyses over other more simplified methods.

Results showed a good correlation between the natural log of fecal coliform concentrations and low-density residential, high-density residential, industrial/transportation, open space, transitional, commercial/institutional and recreation land uses, as well as subwatershed size (R^2=0.74). The following is the resulting regression equation from the analysis of fecal coliform concentrations (*p*-values for each variable are listed below). Figure K-4 shows observed geometric means and predicted concentrations to allow comparison.

$$LN(FC) = 8.48 \times (\%LU_{LDR}) + 9.81 \times (\%LU_{HDR}) + 8.30 \times (\%LU_{IND}) + 8.46 \times (\%LU_{OPS}) + 10.76 \times (\%LU_{TRN}) + 6.60 \times (\%LU_{COM}) + 17.92 \times (\%LU_{PRK}) + 12.85 \times (\%LU_{OPR}) - 0.000245 \times A \quad (7)$$

where: FC = fecal coliform concentration (#/100 mL)
$\%LU_{LDR}$ = percent of low density residential (p-value = 8E-16)
$\%LU_{HDR}$ = percent of high density residential (p-value = 7E-15)
$\%LU_{IND}$ = percent of industrial/transportation (p-value = 0.005)
$\%LU_{OPS}$ = percent of open space, including military operations (p-value = 7E-24)
$\%LU_{TRN}$ = percent of transitional space (p-value = 1E-19)
$\%LU_{COM}$ = percent of commercial/institutional (p-value = 4E-9)
$\%LU_{PRK}$ = percent of park/recreation (p-value = 0.009)
$\%LU_{OPR}$ = percent of open recreation (p-value = 0.067)
A = total area of watershed (acres) (p-value = 1E-7)

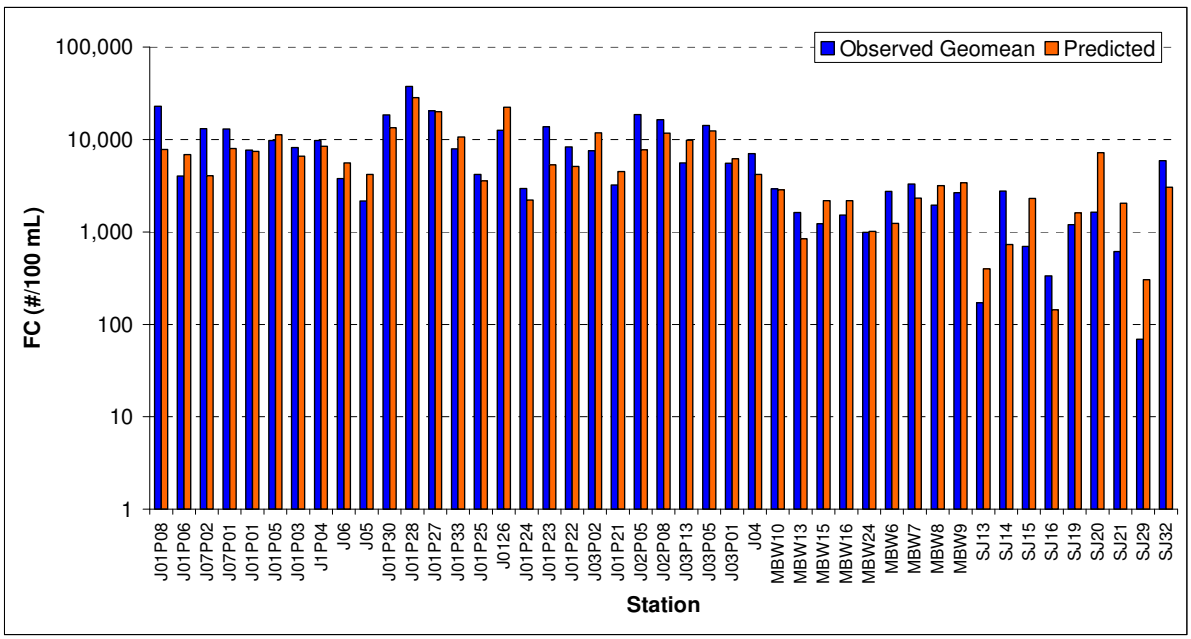

Figure K-4. Predicted versus observed fecal coliform concentrations.

The methodology for estimating fecal coliform concentrations was not as successful for prediction of total coliform and enterococci. Similar regression analyses were performed to determine whether there are relationships between total coliform and enterococci and land use and subwatershed size, but no acceptable correlations were found. As a result, a separate approach was used for estimating total coliform and enterococci concentrations in dry weather runoff for each subwatershed. For all stations in Aliso Creek, San Juan Creek, Rose Creek, and Tecolote Creek with five or more measurements of indicator bacteria concentrations (total of 170 stations), geometric means of fecal coliform, total coliform, and enterococci were calculated for each station and analyzed for trend analyses. This resulted in a single, normalized value of fecal coliform, total coliform, and enterococci at each station for comparison. Regression analyses were performed to determine whether there is a correlation between fecal coliform and levels of

enterococci and total coliform. Results showed a good correlation for prediction of total coliform and enterococci as a function of fecal coliform (R^2=0.67 and R^2=0.77, respectively). The following are the resulting equations obtained (units of fecal coliform and total coliform/enterococci are consistent):

$$\text{total coliform} = 5.0324 \times \text{fecal coliform and}$$
$$\text{enterococci} = 0.8466 \times \text{fecal coliform} \qquad (8)$$

Figures K-5 and K-6 show comparisons of predicted (based on fecal coliform) and geometric means of observed total coliform and enterococci concentrations at each station.

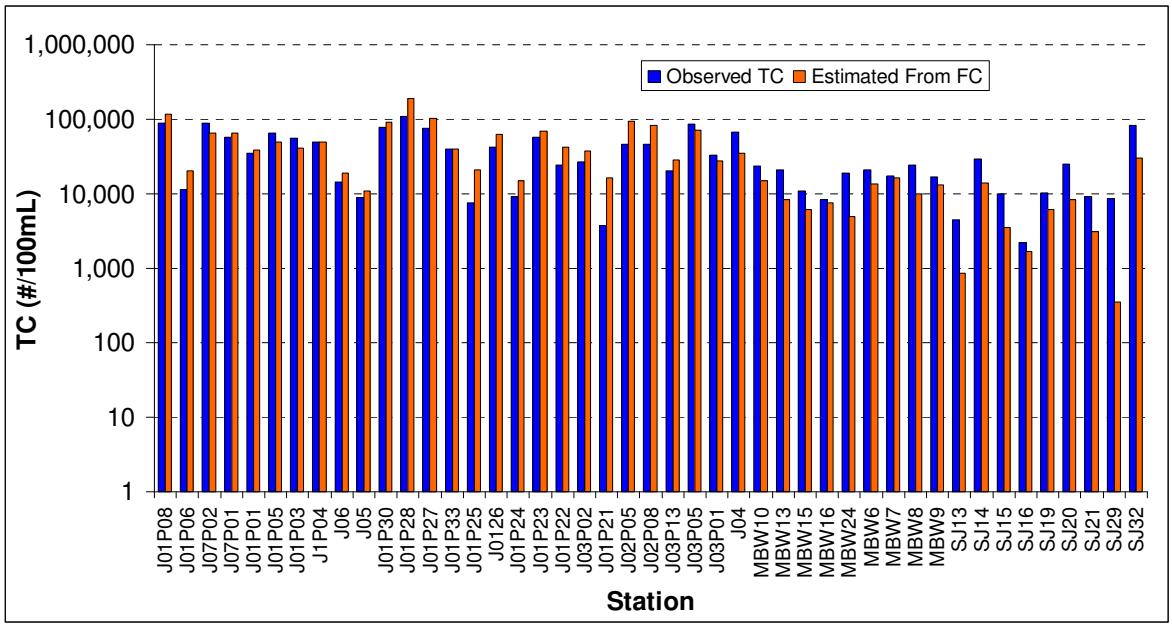

Figure K-5. Predicted versus observed total coliform densities

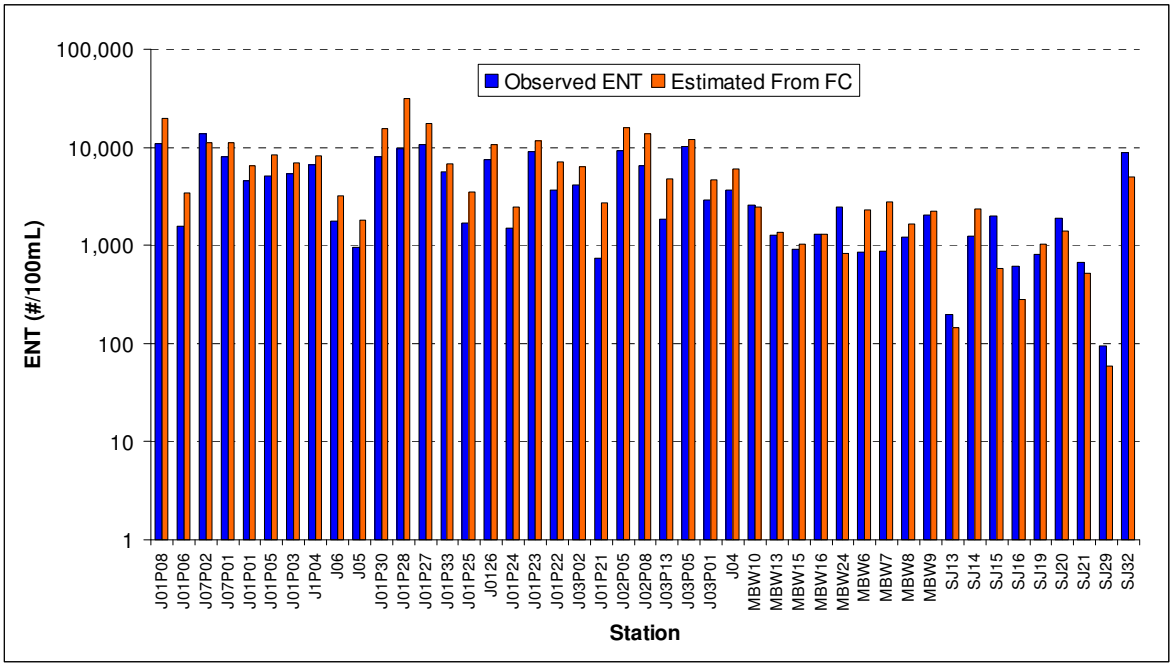

Figure K-6. Predicted versus observed enterococci densities

The above equations were used to estimate steady-state flows and indicator bacteria concentrations for each of the model subwatersheds. Several of the subwatersheds associated with monitoring stations used in the above analyses did not correspond to subwatersheds used in model development. For instance, stations on the Aliso Creek mainstem were used in regression analyses, and included the entire upstream watershed tributary to that location for characterization of land use and total area. However, model development of Aliso Creek included several smaller subwatersheds flowing into multiple segmented reaches that, although may result in a total watershed area consistent with the single watershed used in the regression analyses, differed in that stream infiltration and bacterial die-off rates in the multiple reaches must be defined. Therefore, model prediction of flows and bacterial concentration at locations on the Aliso Creek mainstem were based on upstream subwatershed loads predicted using the above equations, and routing through stream reaches that included assumptions for infiltration and bacterial die-off (based on model reach calibration and validation).

K.5 Model Calibration and Validation

Model assumptions for stream reach infiltration and bacterial die-off rates were derived through calibration based on data collected within reaches of Aliso Creek (11 stations) and Rose Creek (6 stations). Some of these stations were also used for development of regression equations for prediction of flow and fecal coliform concentrations from subwatersheds, however, effects of infiltration or bacteria die-off that may be implicitly incorporated in the regression equations (e.g., negative correlation of bacteria concentration to watershed size suggests effects of bacteria die-off in equation 7) were not considered duplicated in the reach assumptions. Model configuration of multiple subwatersheds and reaches differed from single representative watersheds used in regression analyses, and required incorporation of assumptions for reach infiltration and bacterial die-off to account for losses occurring during transport. Each model

subwatershed used the regression equations to estimate flow and bacterial concentration that were routed through a network of stream reaches that ultimately met locations corresponding to monitoring stations used for calibration. However, watersheds used for regression analyses represented a single watershed for the same area, with no stream routing. Hence, the infiltration and die-off rates developed for the reaches were not consistent with errors associated with regression equations applied to the entire watershed without reach routing and losses considered. To further prove the independence of the calibration procedure from the regression analyses, data from five additional instream monitoring stations that were not used for regression analyses were also used for calibration. Model validation included nine additional stations not included in the regression analyses.

The calibration was completed by adjusting infiltration rates to reflect observed in-stream flow conditions and adjusting bacteria die-off rates to reflect observed in-stream bacteria concentrations. Following model calibration to in-stream flow and bacteria concentrations, a separate validation process was undertaken to verify the predictive capability of the model in other watersheds. Table K-3 lists the sampling locations used in calibration and validation, along with their corresponding watersheds. Figure K-7 shows the sampling locations in relation to the watersheds modeled for TMDL development (Appendix G, No. 4-6).

Table K-3. Calibration and Validation Sampling Locations

Calibration – Flow and Bacteria		Validation – Flow		Validation – Bacteria	
Watershed	**Sampling Location**	**Watershed**	**Sampling Location**	**Watershed**	**Sampling Location**
208	J01P22	403	USGS11047300	402	SJ04
209	J01P23	1701	MBW06	403	SJ05
210	J01P28	1702	MBW07	405	SJ18
211	J01P27	1703	MBW10	406	SJ24
212	J06	1704	MBW08	408	SJ1
213	J01P05	1705	MBW09	409	SJ29 & SJ17
214	J01P01			411	SJ06
215	J01TBN8			413	SJ08 & SJ07
219	J04			414	SJ30 & SJ09
220	J03P13			416	SJ15
221	J03P01			1701	MBW06
1601	MBW20			1702	MBW07
1602	MBW17			1703	MBW10
1603	MBW15			1704	MBW08
1605	MBW11			1705	MBW09
1606	MBW13				
1607	MBW24				

In the model, infiltration rates vary by soil type. Stream infiltration was calibrated by adjusting a single infiltration value, which was varied for each soil type by factors established from literature ranges (USEPA, 2000) of infiltration rates specific to each soil type. The goal of calibration was to minimize the difference between averages of observed streamflows and modeled flow at each station location (Figure K-7). Nine stations were used in calibrating the infiltration rate. The

resulting infiltration rates were 1.368 in/hr (Soil Group A), 0.698 in/hr (Soil Group B), 0.209 in/hr (Soil Group C) and 0.084 in/hr (Soil Group D). The infiltration rates for Soil Groups B, C and D are within the infiltration range given in literature (Wanielisata et al., 1997). Soil Group A is below the range given in Wanielisata et al. (1997), however only one watershed in this TMDL is dominated by Soil Group A. Figure H-8 shows the results of the model calibration.

The modeled first-order die-off rate reflects the net effect on bacteria of various environmental conditions, such as solar radiation, temperature, dissolved oxygen, nutrients, regrowth, deposition, resuspension and toxins in the water. The die-off rates for fecal coliform, total coliform and enterococci were used as calibration parameters to minimize the difference between observed in-stream bacteria levels and model predictions. Calibration results for fecal coliform, total coliform and enterococci are presented in Figures K-9 through K-11. Die-off rates were determined for fecal coliform (0.137 1/d), total coliform (0.209 1/d) and enterococci (0.145 1/d). These values are within the range of die-off rates used in various modeling studies as reported by the USEPA (1985). Seventeen stations were used in calibrating die-off rates.

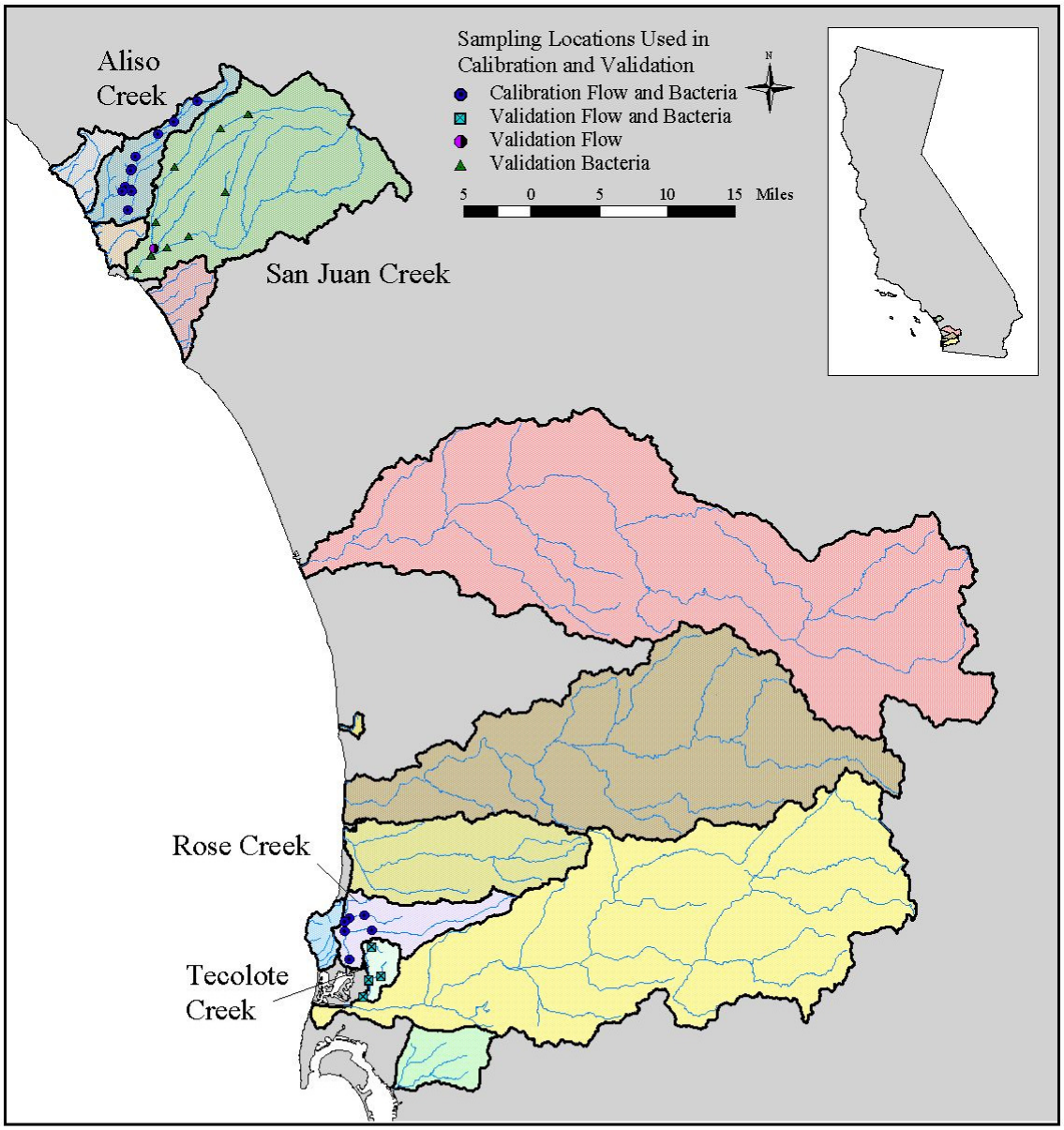

Figure K-7. Sampling locations used in model calibration and validation

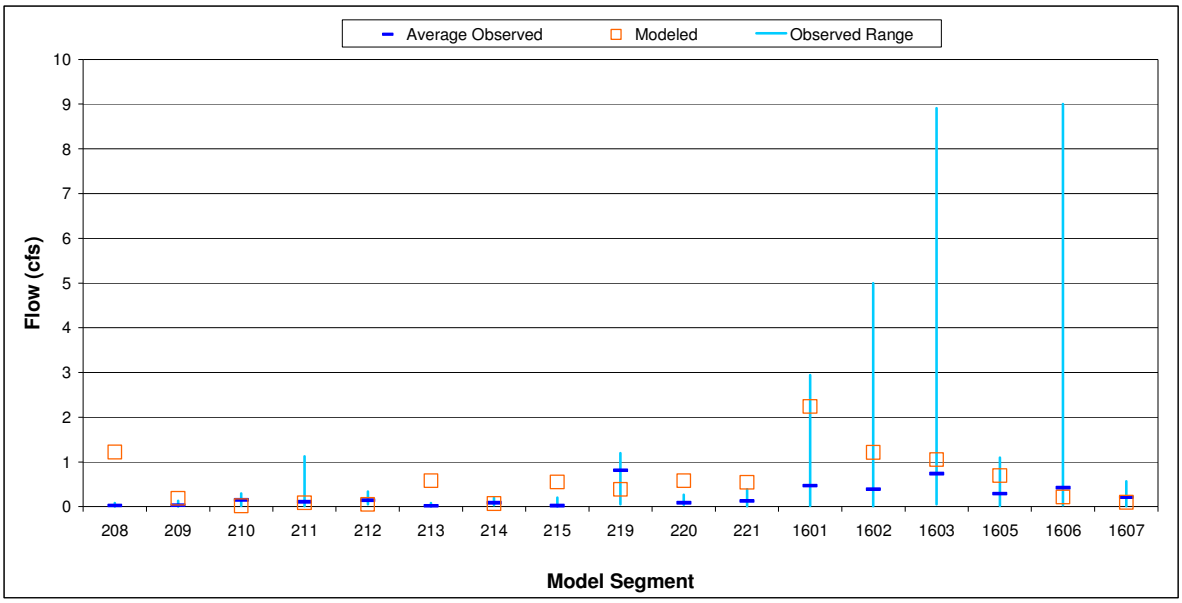

Figure K-8. Calibration modeled versus observed flows for Aliso Creek, Rose Creek and Tecolote Creek (Appendix B, No. 1 and 2)

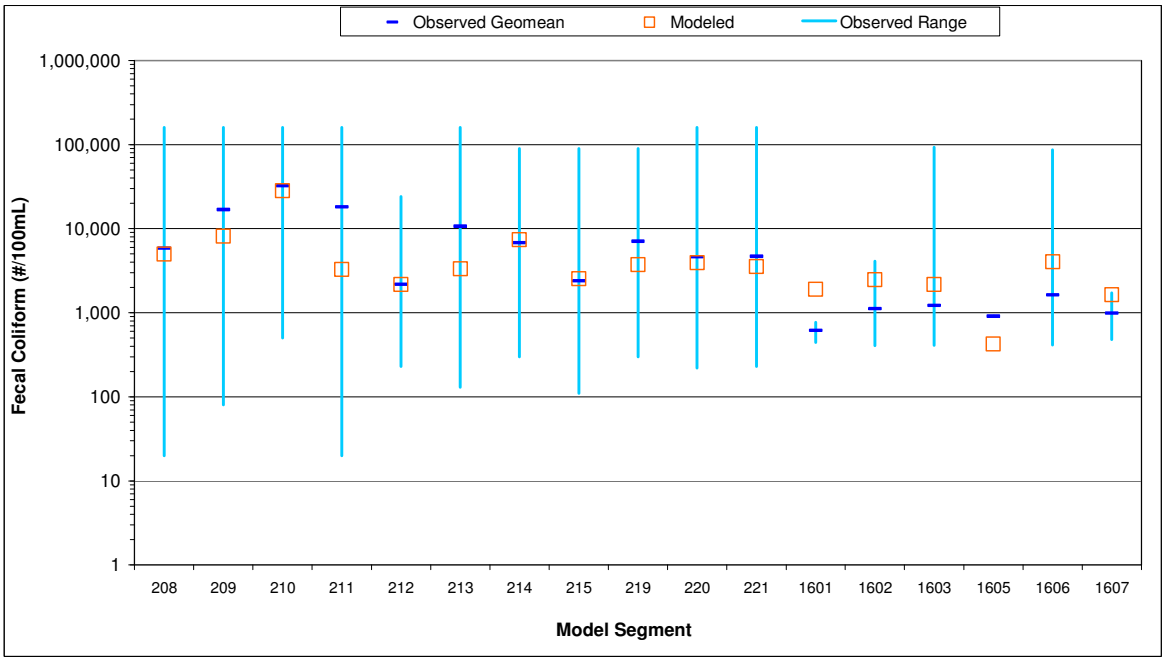

Figure K-9. Calibration modeled versus observed in-stream fecal coliform concentra-tions for Aliso Creek, Rose Creek and Tecolote Creek (Appendix B, No. 4 and 5)

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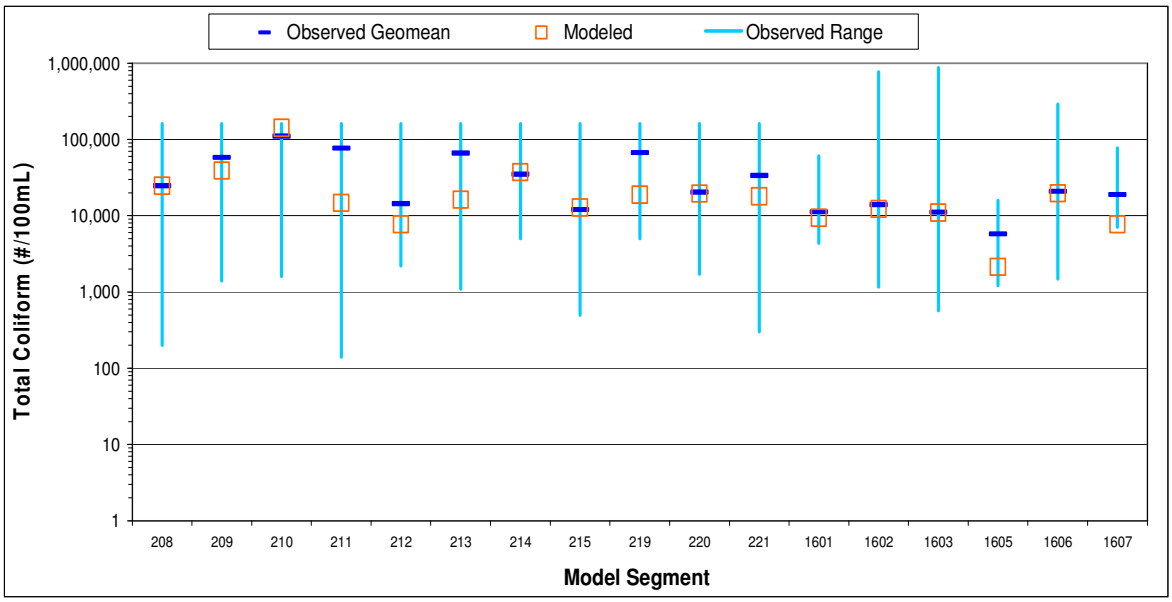

Figure K-10. Calibration modeled versus observed in-stream total coliform concentra-tions for Aliso Creek, Rose Creek and Tecolote Creek (Appendix B, No. 4 and 5)

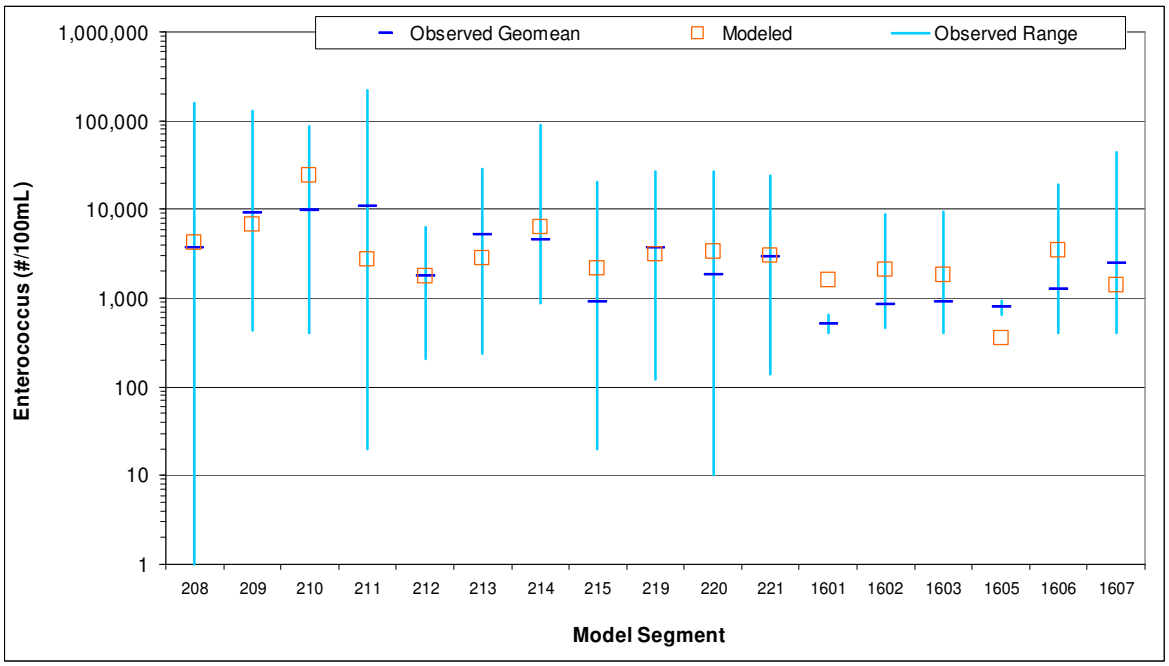

Figure K-11. Calibration modeled versus observed in-stream enterococci concentrations for Aliso Creek, Rose Creek and Tecolote Creek (Appendix B, No. 4 and 5)

The model was validated using six stations from San Juan Creek and Tecolote Creek (Appendix G, No. 2 and 3). One of these stations (USGS11047300) was not used in development of the regression equation 6. The model-predicted flows were within the observed ranges of dry weather flows (Figure K-12).

Model validation to in-stream water quality was provided using 15 stations on Tecolote Creek and San Juan Creek (Appendix G, No. 5 and 6). Eight of these stations were not used in development of the regression equation 7. The results of the water quality validation are presented in Figures K-13 through K-15.

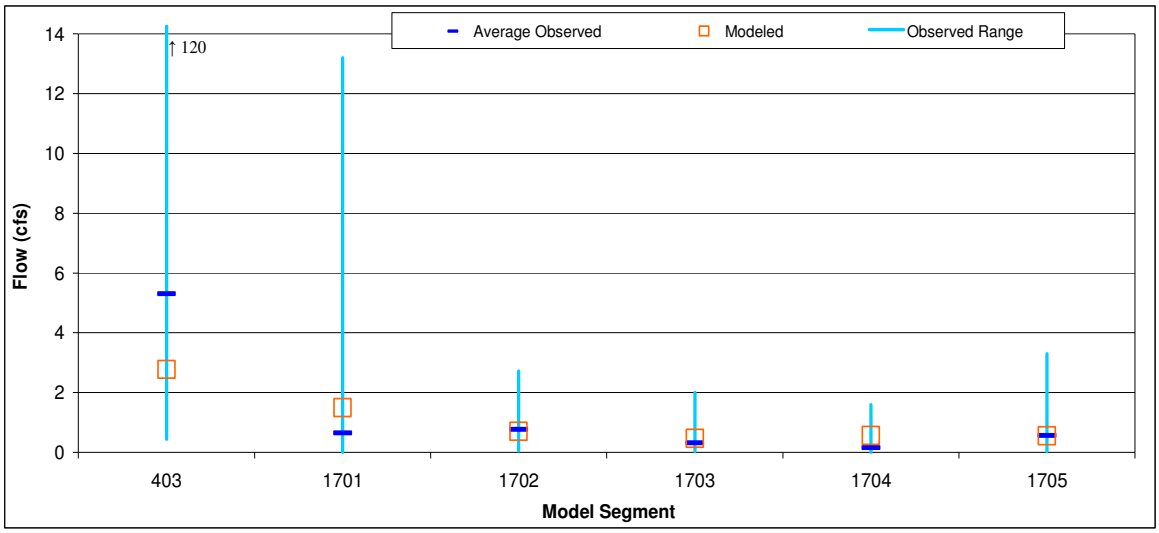

Figure K-12. Validation of modeled versus observed streamflow for San Juan Creek, Rose Creek and Tecolote Creek (Appendix B, No. 2 and 3)

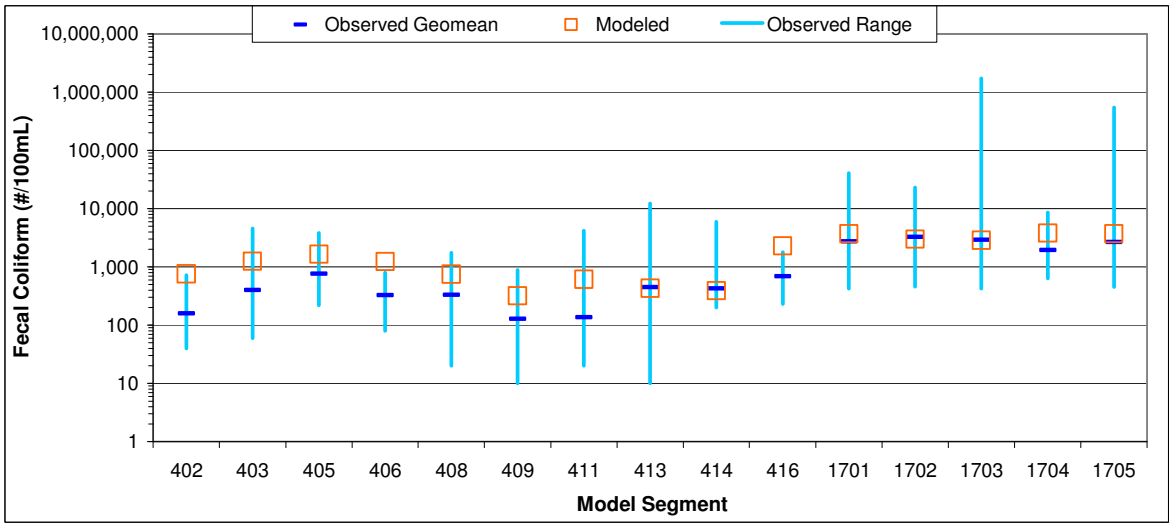

Figure K-13. Validation modeled versus observed fecal coliform concentration for San Juan Creek, Rose Creek and Tecolote Creek (Appendix B, No. 5 and 6)

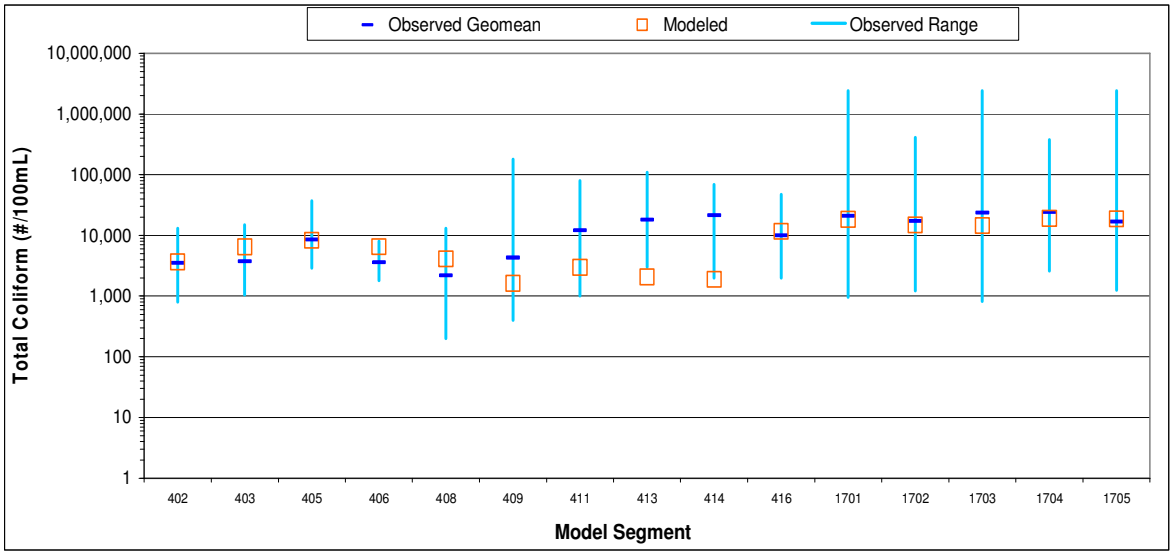

Figure K-14. Validation modeled versus observed total coliform concentration for San Juan Creek, Rose Creek and Tecolote Creek (Appendix B, No. 5 and 6)

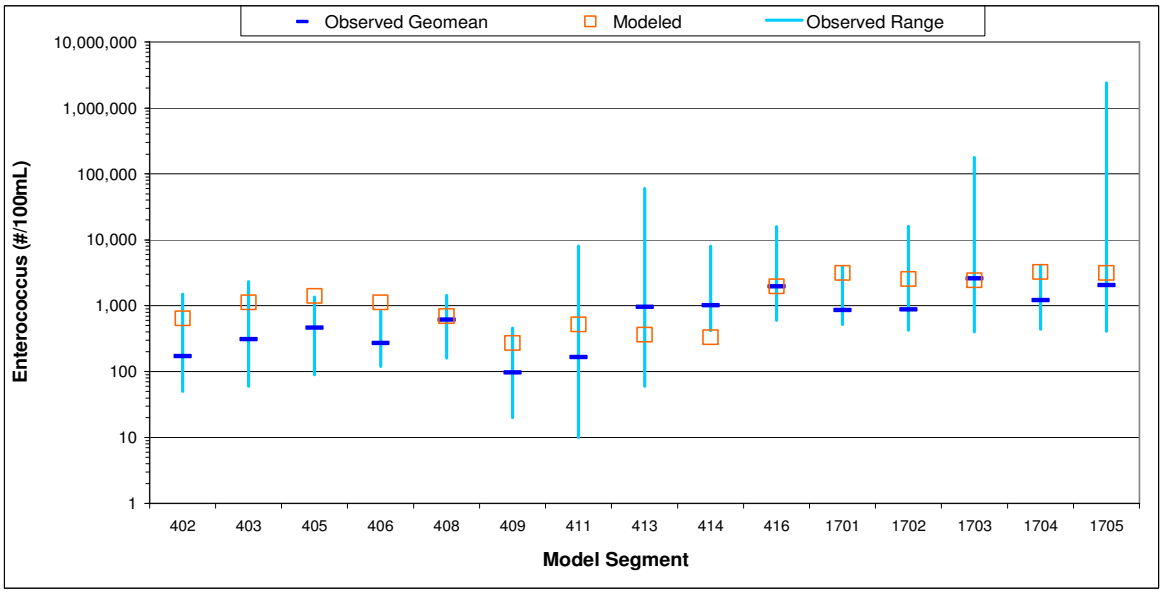

Figure K-15. Validation modeled versus observed enterococci concentration for San Juan Creek, Rose Creek and Tecolote Creek (Appendix B, No. 5 and 6)

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APPENDIX L

ASSUMPTIONS

This appendix describes assumptions that were made for the development of the wet weather and dry weather TMDLs. TMDLs were calculated for both wet and dry conditions; therefore the assumptions involved in both sets of calculations are described below. Additionally, some general assumptions were made regarding overall conditions in the environment affecting bacteria subsistence and growth. These assumptions were intended to be conservative in nature, therefore generating an implicit margin of safety for the TMDLs.

Wet Weather Modeling Assumptions

The watershed modeling system developed to represent wet weather conditions is described in Appendix J of the Technical Report. The following assumptions are relevant to the LSPC model developed to simulate wet weather sources of bacteria in the region.

- *General LSPC/HSPF Model Assumptions* - Many model assumptions are inherent in the algorithms used by the LSPC watershed model and are reported extensively in Bicknell et al. (1996).
- *Land Use* - A combination of SCAG, SANDAG and MRLC land use GIS datasets is assumed representative of the current land use areas. For areas where significant changes in land use have occurred since the creation of these datasets, model predictions may not be representative of observed conditions.
- *Stream Representation* - Each delineated subwatershed was represented with a single stream assumed to be a completely mixed, one-dimensional segment with a trapezoidal cross-section.
- *Hydrologic Modeling Parameters* - Hydrologic modeling parameters were developed during previous modeling studies in southern California (e.g., Los Angeles River, San Jacinto River) and refined through calibration to streamflow data collected in the San Diego Region. Through the calibration and validation process (summary statistics reported in Appendix M of the Technical Report), a set of modeling parameters were obtained specific to land use and hydrologic soil groups. These parameters are assumed to be representative of the hydrology of other watersheds in the San Diego Region that are presently ungaged and therefore unverified.
- *Water Quality Modeling Parameters* - Dynamic models require a substantial amount of information regarding input parameters and data for calibration purposes. All sources of indicator bacteria from watersheds are represented in the LSPC model as build-up/wash-off from specific land use categories. Limited data are currently available in the San Diego Region to allow development of unique modeling parameters for simulation of build-up/wash-off, so parameters were obtained from a similar study performed in the Los Angeles Region. These build-up/wash-off modeling parameters were originally developed by the Southern California Coastal Water Research Project (SCCWRP) for a watershed model of the Santa Monica Bay Beaches (Los Angeles Water Board, 2002) and are assumed representative of land use sources in the San Diego region. This

assumption was validated through evaluation of model results with local data. Summary statistics of model validation are reported in Appendix M of the Technical Report.

- *Lumped Parameter Model Characteristic* - LSPC is a lumped-parameter model and is assumed to be sufficient for modeling transport of flows and bacteria loads from watersheds in the region. For lumped parameter models, transport of flows and bacteria loads to the streams within a given model subwatershed cannot consider relative distances of land use activities and topography that may enhance or impede time of travel over the land surface. Although this limitation could result in mistiming of peak flows or under-prediction of bacteria die-off because overland losses are not simulated, impacts are assumed minimal.
- *Bacteria Loading Rates* – Bacteria loading rates associated with various land use categories are constant. Rates estimated for current loading are accurate for establishing total allowable loading for each land use category.
- *First-order Bacteria Die-off* - Each stream is modeled assuming an apparent first-order die-off of bacteria. Bacteria die-off rates for wet weather are assumed to be 0.8/day, based on sensitivity analyses performed by SCCWRP (Los Angeles Water Board, 2002).
- *In-stream Bacteria Re-growth* - The LSPC model assumes no in-stream regrowth of bacteria. No data or literature were located to provide indication that such sources are significant during wet weather or could be estimated for model input.

Dry Weather Modeling Assumptions

The watershed modeling system developed for simulation of steady-state dry weather flows and sources of bacteria is described in Appendix K of the Technical Report. The following assumptions are relevant to that discussion.

- *Channel Geometry* - Channel geometry during low-flow, dry weather conditions is assumed to be represented appropriately using equations derived from flows and physical data collected at 53 USGS stream gages in southern California.
- *Steady-state Model Configuration* - Although dry weather flows and bacteria densities vary over time for any given stream, for prediction of average conditions in the stream, flows and concentrations are assumed to be steady state.
- *Plug Flow Model Configuration* - Plug flow reaction kinetics are assumed sufficient in modeling dry weather, steady-state stream routing and bacteria die-off (with first-order die-off).
- *Sources for Characterization of Dry Weather Conditions* - Data used for characterization of dry weather flows and water quality are assumed representative of conditions throughout the region.
- *Methods for Characterization of Dry Weather Conditions* - The equations derived through multivariable regression analyses are assumed sufficient to represent the dry weather flows and water quality as functions of land use and watershed size. This assumption was verified through model calibration and validation (summary statistics reported in Appendix M of the Technical Report).
- *First-order Bacteria Die-off* - Each stream is modeled assuming an apparent first-order die-off of bacteria. First-order rates were obtained through model calibration and verified as consistent with ranges reported by the USEPA (1985). These values were determined

for fecal coliform, total coliform, and enterococci bacteria as 0.137/day, 0.209/day and 0.145/day, respectively. These die-off rates are assumed representative of all streams studied in the region.

- *Bacteria Re-growth* - The dry weather model assumed no in-stream sources or regrowth of bacteria. No data or literature were located to provide an indication that such sources are significant during dry weather or could be estimated for model input.
- *Stream Infiltration* - Losses of volume through stream infiltration were modeled assuming infiltration rates were constant for each of the four hydrologic soil groups (A, B, C and D). Infiltration rates were based on literature vales and refined through model calibration and validation (summary statistics reported in Appendix M of the Technical Report). The resulting infiltration rates were 1.368 in/hr (Soil Group A), 0.698 in/hr (Soil Group B), 0.209 in/hr (Soil Group C) and 0.084 in/hr (Soil Group D). These infiltration rates are within the range of values given in literature (Wanielisata et al., 1997). These infiltration rates are assumed representative for all streams studied in the region within each hydrologic soil group.
- *Dilution From Groundwater* – Dilution factors caused by groundwater base flows were not considered.

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Appendix M

Wet Weather Model
Hydrology Calibration and Validation
Summary Statistics

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Summary statistics of wet weather model hydrology calibration to USGS gage 11022480 (Appendix G, No. 3) (1 of 2).

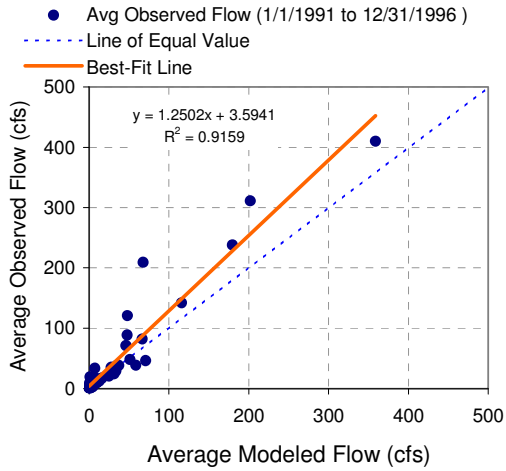

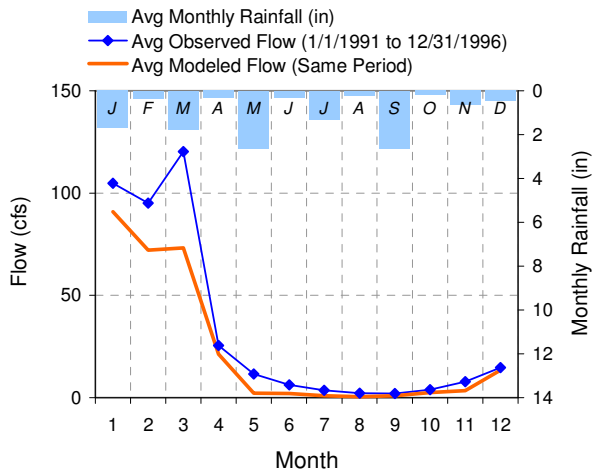

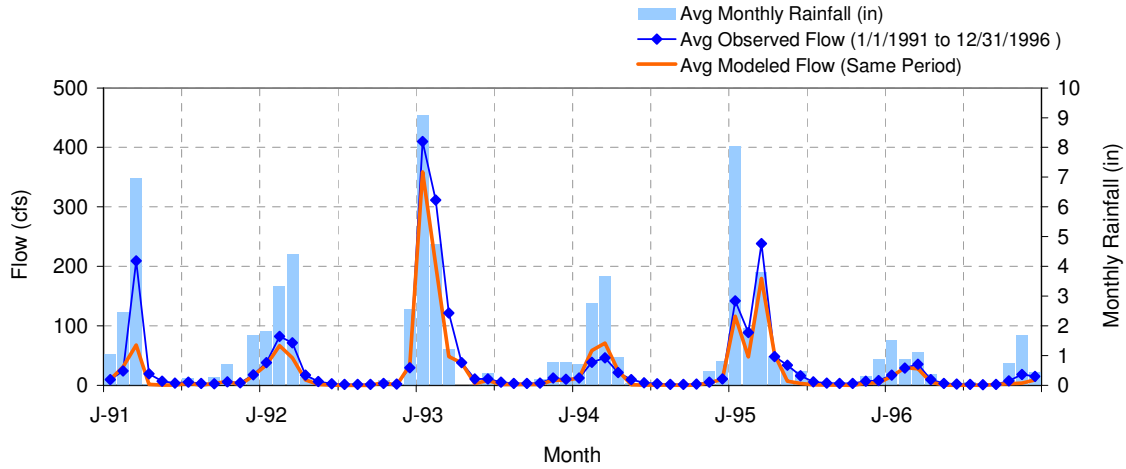

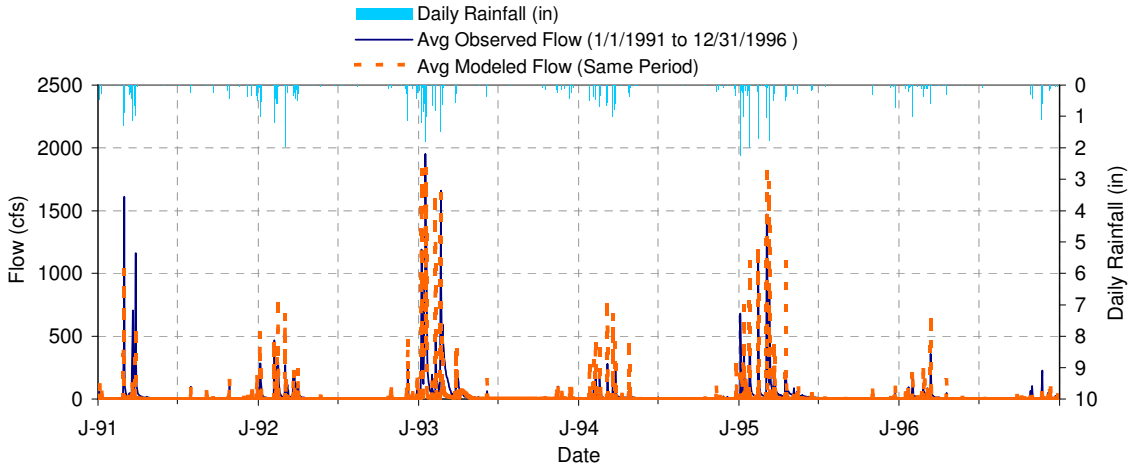

Summary statistics of wet weather model hydrology calibration to USGS gage 11022480 (Appendix G, No. 3) (2 of 2).

LSPC Simulated Flow		Observed Flow Gage		
REACH OUTFLOW FROM SUBBASIN 1805 6-Year Analysis Period: 1/1/1991 - 12/31/1996 Flow volumes are (inches/year) for upstream drainage area		**USGS 11022480 SAN DIEGO R A MAST RD NR SANTEE CA** San Diego County, California Hydrologic Unit Code 18070304 Latitude 32°50'25", Longitude 117°01'30" NAD27 Drainage area 368 square miles		
Total Simulated In-stream Flow:	**13.93**	Total Observed In-stream Flow:		**19.55**
Total of simulated highest 10% flows:	**13.16**	Total of Observed highest 10% flows:		**14.77**
Total of Simulated lowest 50% flows:	**0.04**	Total of Observed Lowest 50% flows:		**0.77**
Simulated Summer Flow Volume (months 7-9):	**0.12**	Observed Summer Flow Volume (7-9):		**0.39**
Simulated Fall Flow Volume (months 10-12):	**0.98**	Observed Fall Flow Volume (10-12):		**1.33**
Simulated Winter Flow Volume (months 1-3):	**11.59**	Observed Winter Flow Volume (1-3):		**15.69**
Simulated Spring Flow Volume (months 4-6):	**1.25**	Observed Spring Flow Volume (4-6):		**2.13**
Total Simulated Storm Volume:	**12.06**	Total Observed Storm Volume:		**10.08**
Simulated Summer Storm Volume (7-9):	**0.06**	Observed Summer Storm Volume (7-9):		**0.06**
Errors (Simulated-Observed)	*Current Run (n)*	*Recommended Criteria*	*Run (n-1)*	*Run (n-2)*
Error in 10% highest flows:	-12.20	15		
Error in storm volumes:	16.43	20		

Summary statistics of wet weather model hydrology validation to USGS gage 11022480 (Appendix G, No. 3).

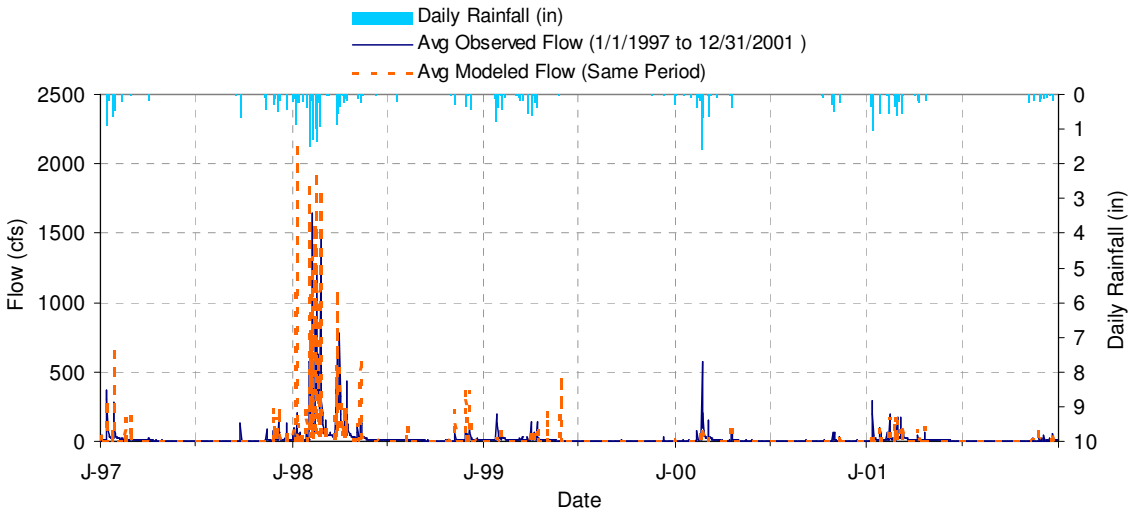

LSPC Simulated Flow		Observed Flow Gage	
REACH OUTFLOW FROM SUBBASIN 1805 5-Year Analysis Period: 1/1/1997 - 12/31/2001 Flow volumes are (inches/year) for upstream drainage area		**USGS 11022480 SAN DIEGO R A MAST RD NR SANTEE CA** San Diego County, California Hydrologic Unit Code 18070304 Latitude 32°50'25", Longitude 117°01'30" NAD27 Drainage area 368 square miles	
Total Simulated In-stream Flow:	**11.23**	Total Observed In-stream Flow:	**12.95**
Total of simulated highest 10% flows:	**10.66**	Total of Observed highest 10% flows:	**9.60**
Total of Simulated lowest 50% flows:	**0.01**	Total of Observed Lowest 50% flows:	**0.68**
Simulated Summer Flow Volume (months 7-9):	**0.15**	Observed Summer Flow Volume (7-9):	**0.42**
Simulated Fall Flow Volume (months 10-12):	**1.09**	Observed Fall Flow Volume (10-12):	**1.18**
Simulated Winter Flow Volume (months 1-3):	**8.19**	Observed Winter Flow Volume (1-3):	**8.87**
Simulated Spring Flow Volume (months 4-6):	**1.80**	Observed Spring Flow Volume (4-6):	**2.47**
Total Simulated Storm Volume:	**10.11**	Total Observed Storm Volume:	**6.69**
Simulated Summer Storm Volume (7-9):	**0.07**	Observed Summer Storm Volume (7-9):	**0.08**

Errors (Simulated-Observed)	*Current Run (n)*	*Recommended Criteria*	*Run (n-1)*	*Run (n-2)*
Error in 10% highest flows:	9.93	15		
Error in storm volumes:	33.83	20		

Summary statistics of wet weather model hydrology calibration to USGS gage 11023000 (Appendix G, No. 3) (1 of 2).

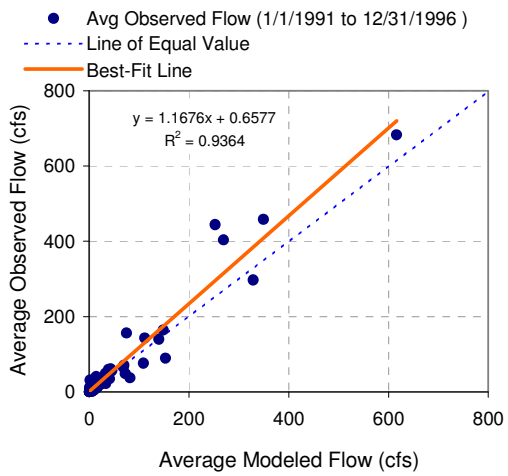

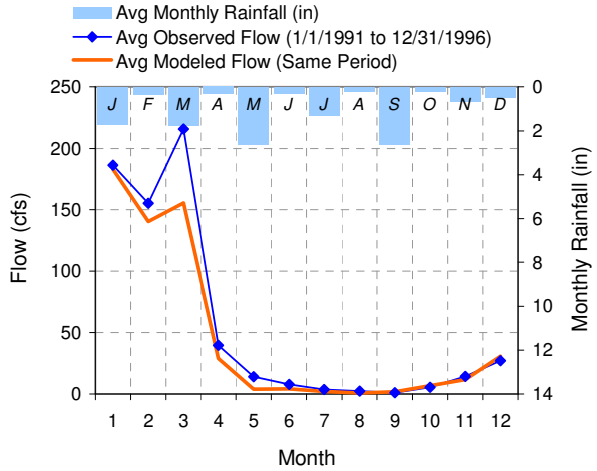

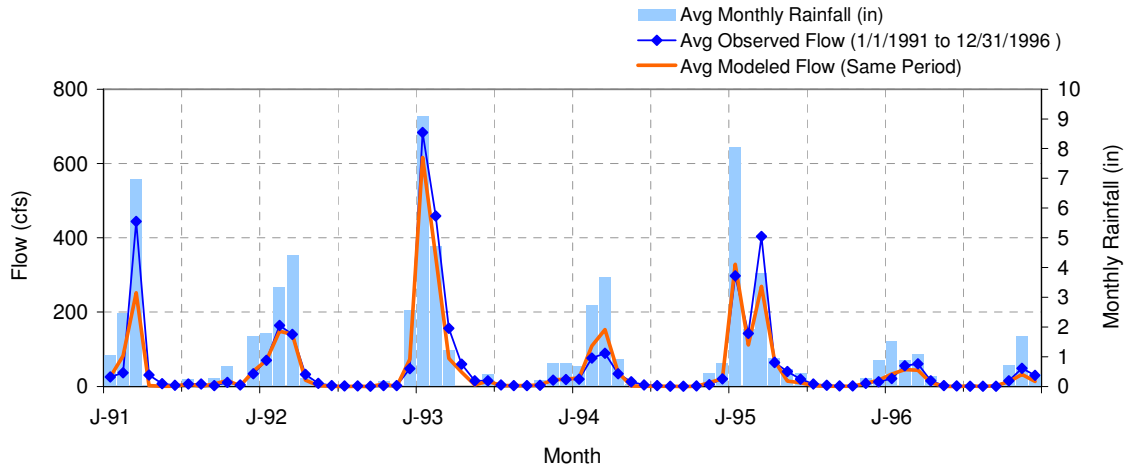

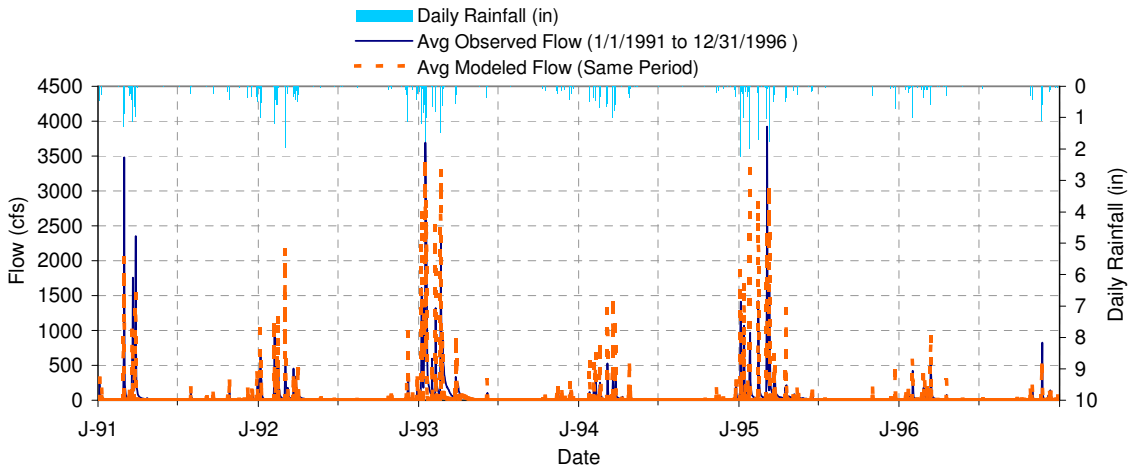

Summary statistics of wet weather model hydrology calibration to USGS gage 11023000 (Appendix G, No. 3) (2 of 2).

LSPC Simulated Flow		Observed Flow Gage		
REACH OUTFLOW FROM SUBBASIN 1801 6-Year Analysis Period: 1/1/1991 - 12/31/1996 Flow volumes are (inches/year) for upstream drainage area		**USGS 11023000 SAN DIEGO R A FASHION VALLEY AT SAN DIEGO CA** San Diego County, California Hydrologic Unit Code 18070304 Latitude 32°45'54", Longitude 117°10'04" NAD27 Drainage area 429 square miles		
Total Simulated In-stream Flow:	**1.49**	Total Observed In-stream Flow:		**1.77**
Total of simulated highest 10% flows:	**1.42**	Total of Observed highest 10% flows:		**1.38**
Total of Simulated lowest 50% flows:	**0.00**	Total of Observed Lowest 50% flows:		**0.04**
Simulated Summer Flow Volume (months 7-9):	**0.01**	Observed Summer Flow Volume (7-9):		**0.02**
Simulated Fall Flow Volume (months 10-12):	**0.13**	Observed Fall Flow Volume (10-12):		**0.12**
Simulated Winter Flow Volume (months 1-3):	**1.25**	Observed Winter Flow Volume (1-3):		**1.46**
Simulated Spring Flow Volume (months 4-6):	**0.10**	Observed Spring Flow Volume (4-6):		**0.16**
Total Simulated Storm Volume:	**1.43**	Total Observed Storm Volume:		**1.26**
Simulated Summer Storm Volume (7-9):	**0.01**	Observed Summer Storm Volume (7-9):		**0.01**
Errors (Simulated-Observed)	*Current Run (n)*	*Recommended Criteria*	*Run (n-1)*	*Run (n-2)*
Error in 10% highest flows:	2.65	15		
Error in storm volumes:	12.33	20		

Summary statistics of wet weather model hydrology validation to USGS gage 11023000 (Appendix G, No. 3).

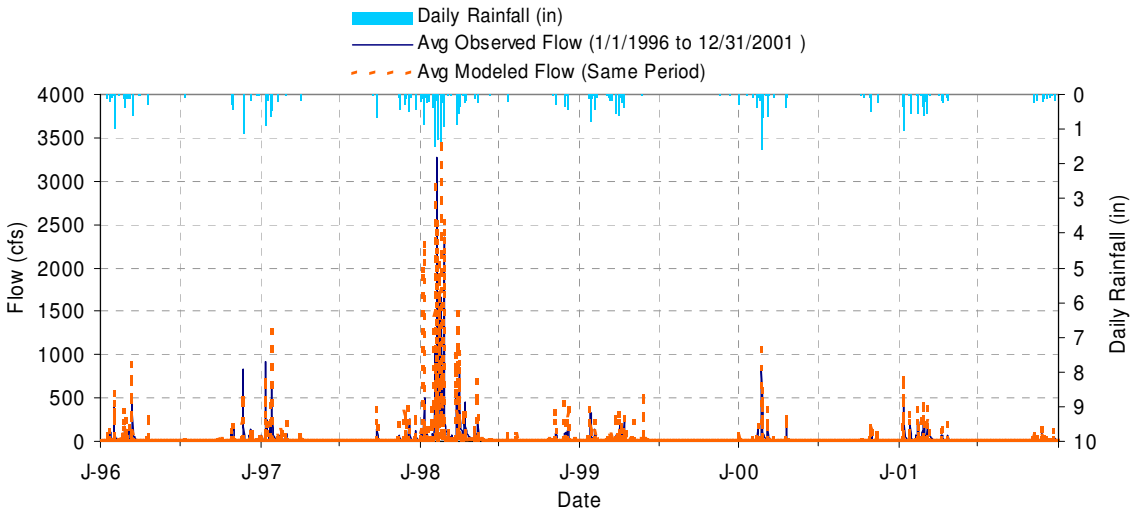

LSPC Simulated Flow		Observed Flow Gage		
REACH OUTFLOW FROM SUBBASIN 1801 6-Year Analysis Period: 1/1/1996 - 12/31/2001 Flow volumes are (inches/year) for upstream drainage area		**USGS 11023000 SAN DIEGO R A FASHION VALLEY AT SAN DIEGO CA** San Diego County, California Hydrologic Unit Code 18070304 Latitude 32°45'54", Longitude 117°10'04" NAD27 Drainage area 429 square miles		
Total Simulated In-stream Flow:	**0.93**	Total Observed In-stream Flow:		**0.97**
Total of simulated highest 10% flows:	**0.89**	Total of Observed highest 10% flows:		**0.71**
Total of Simulated lowest 50% flows:	**0.00**	Total of Observed Lowest 50% flows:		**0.04**
Simulated Summer Flow Volume (months 7-9):	**0.01**	Observed Summer Flow Volume (7-9):		**0.02**
Simulated Fall Flow Volume (months 10-12):	**0.11**	Observed Fall Flow Volume (10-12):		**0.12**
Simulated Winter Flow Volume (months 1-3):	**0.68**	Observed Winter Flow Volume (1-3):		**0.68**
Simulated Spring Flow Volume (months 4-6):	**0.12**	Observed Spring Flow Volume (4-6):		**0.15**
Total Simulated Storm Volume:	**0.89**	Total Observed Storm Volume:		**0.62**
Simulated Summer Storm Volume (7-9):	**0.01**	Observed Summer Storm Volume (7-9):		**0.01**
Errors (Simulated-Observed)	*Current Run (n)*	*Recommended Criteria*	*Run (n-1)*	*Run (n-2)*
Error in 10% highest flows:	20.16	15		
Error in storm volumes:	29.61	20		

Summary statistics of wet weather model hydrology calibration to USGS gage 11023340 (Appendix G, No. 3) (1 of 2).

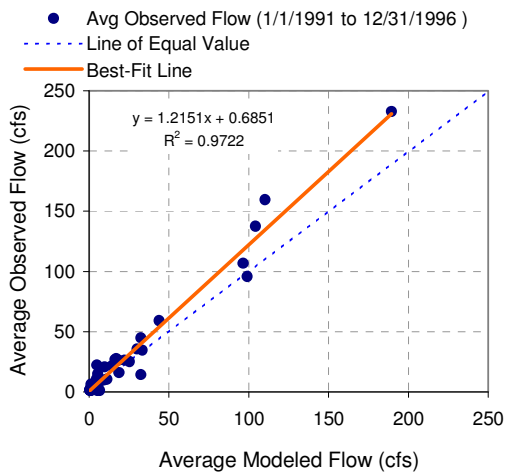

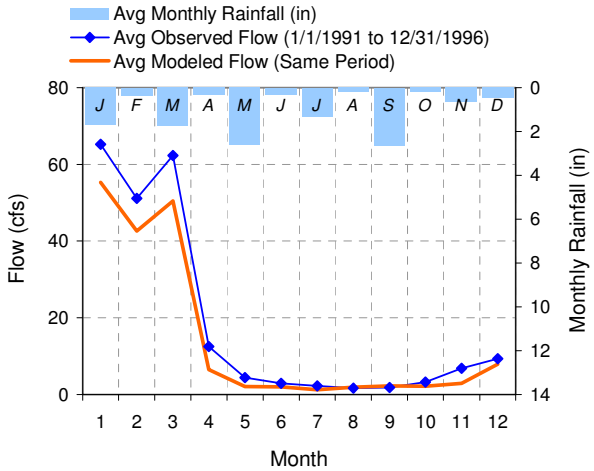

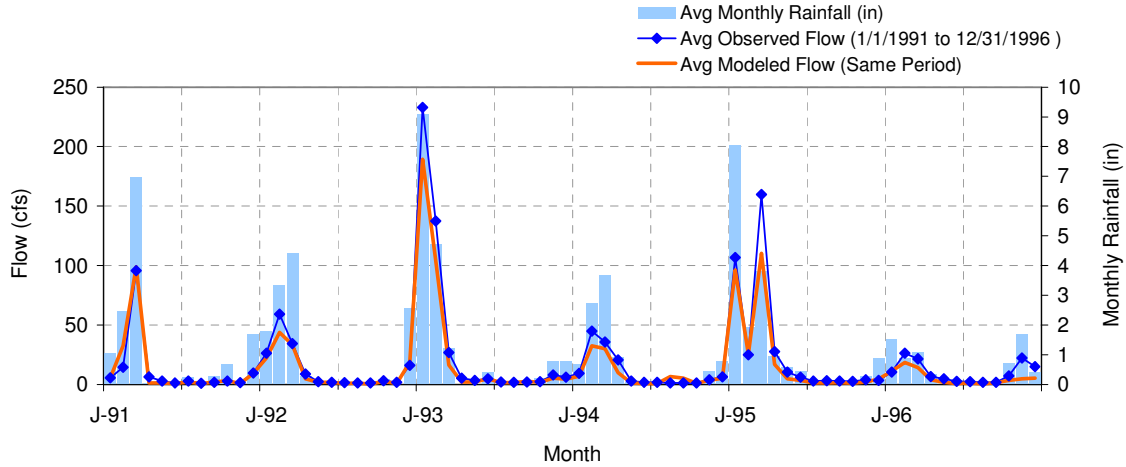

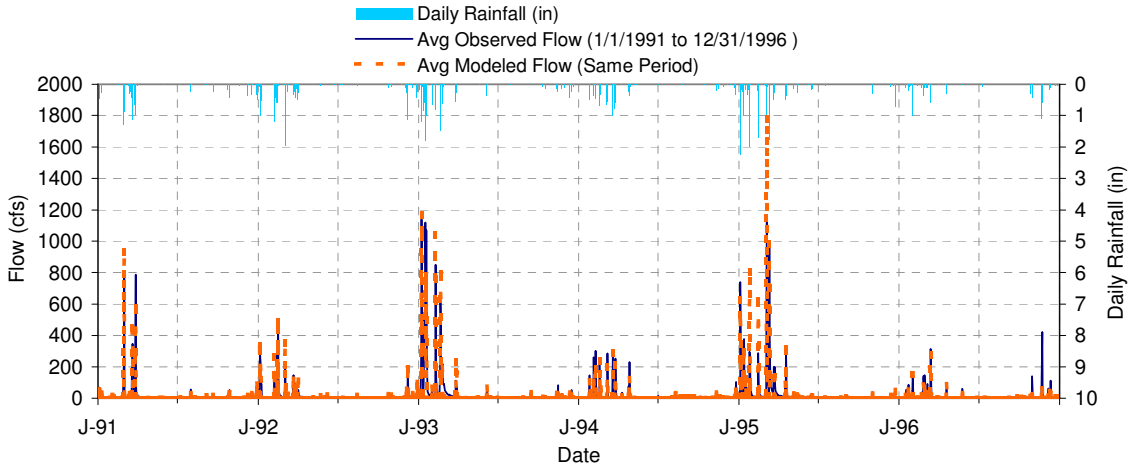

Summary statistics of wet weather model hydrology calibration to USGS gage 11023340 (Appendix G, No. 3) (2 of 2).

LSPC Simulated Flow		Observed Flow Gage		
REACH OUTFLOW FROM SUBBASIN 1406 6-Year Analysis Period: 1/1/1991 - 12/31/1996 Flow volumes are (inches/year) for upstream drainage area		**USGS 11023340 LOS PENASQUITOS C NR POWAY CA** San Diego County, California Hydrologic Unit Code 18070304 Latitude 32°56'35", Longitude 117°07'15" NAD27 Drainage area 42.1 square miles		
Total Simulated In-stream Flow:	**4.74**	Total Observed In-stream Flow:		**5.98**
Total of simulated highest 10% flows:	**4.38**	Total of Observed highest 10% flows:		**4.91**
Total of Simulated lowest 50% flows:	**0.09**	Total of Observed Lowest 50% flows:		**0.26**
Simulated Summer Flow Volume (months 7-9):	**0.14**	Observed Summer Flow Volume (7-9):		**0.15**
Simulated Fall Flow Volume (months 10-12):	**0.35**	Observed Fall Flow Volume (10-12):		**0.53**
Simulated Winter Flow Volume (months 1-3):	**3.96**	Observed Winter Flow Volume (1-3):		**4.77**
Simulated Spring Flow Volume (months 4-6):	**0.28**	Observed Spring Flow Volume (4-6):		**0.53**
Total Simulated Storm Volume:	**4.44**	Total Observed Storm Volume:		**4.49**
Simulated Summer Storm Volume (7-9):	**0.09**	Observed Summer Storm Volume (7-9):		**0.03**
Errors (Simulated-Observed)	*Current Run (n)*	*Recommended Criteria*	*Run (n-1)*	*Run (n-2)*
Error in 10% highest flows:	-12.11	15		
Error in storm volumes:	-1.31	20		

Summary statistics of wet weather model hydrology validation to USGS gage 11023340 (Appendix G, No. 3).

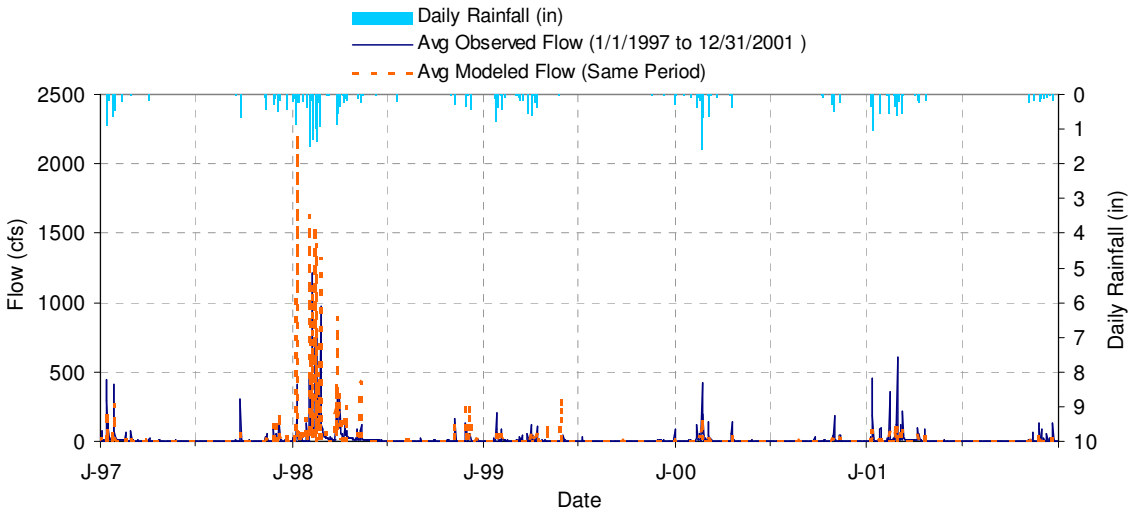

LSPC Simulated Flow		Observed Flow Gage		
REACH OUTFLOW FROM SUBBASIN 1406 5-Year Analysis Period: 1/1/1997 - 12/31/2001 Flow volumes are (inches/year) for upstream drainage area		**USGS 11023340 LOS PENASQUITOS C NR POWAY CA** San Diego County, California Hydrologic Unit Code 18070304 Latitude 32°56'35", Longitude 117°07'15" NAD27 Drainage area 42.1 square miles		
Total Simulated In-stream Flow:	**4.68**	Total Observed In-stream Flow:		**5.10**
Total of simulated highest 10% flows:	**4.38**	Total of Observed highest 10% flows:		**3.95**
Total of Simulated lowest 50% flows:	**0.04**	Total of Observed Lowest 50% flows:		**0.38**
Simulated Summer Flow Volume (months 7-9):	**0.09**	Observed Summer Flow Volume (7-9):		**0.28**
Simulated Fall Flow Volume (months 10-12):	**0.45**	Observed Fall Flow Volume (10-12):		**0.67**
Simulated Winter Flow Volume (months 1-3):	**3.47**	Observed Winter Flow Volume (1-3):		**3.37**
Simulated Spring Flow Volume (months 4-6):	**0.67**	Observed Spring Flow Volume (4-6):		**0.78**
Total Simulated Storm Volume:	**4.39**	Total Observed Storm Volume:		**3.59**
Simulated Summer Storm Volume (7-9):	**0.04**	Observed Summer Storm Volume (7-9):		**0.10**
Errors (Simulated-Observed)	*Current Run (n)*	*Recommended Criteria*	*Run (n-1)*	*Run (n-2)*
Error in 10% highest flows:	9.91	15		
Error in storm volumes:	18.20	20		

Summary statistics of wet weather model hydrology calibration to USGS gage 11025500 (Appendix G, No. 3) (1 of 2).

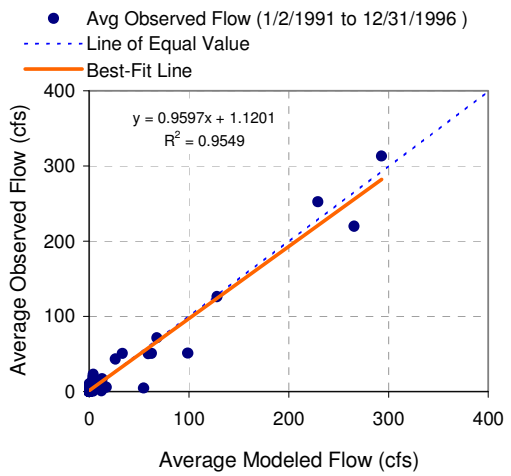

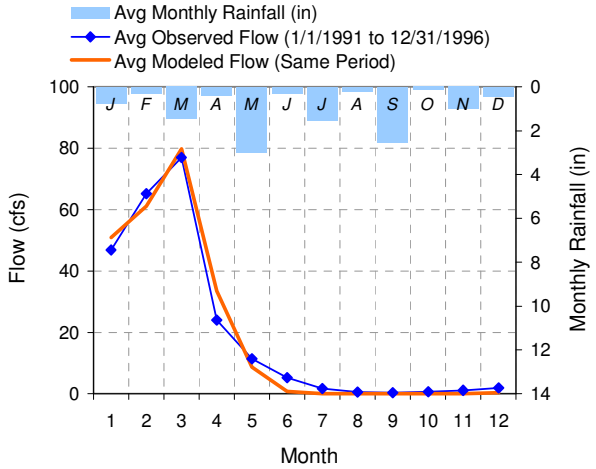

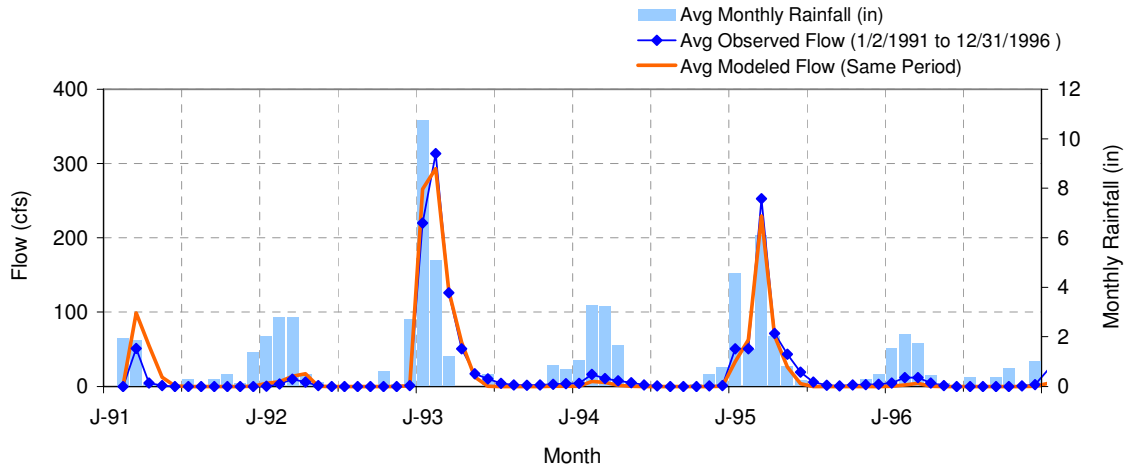

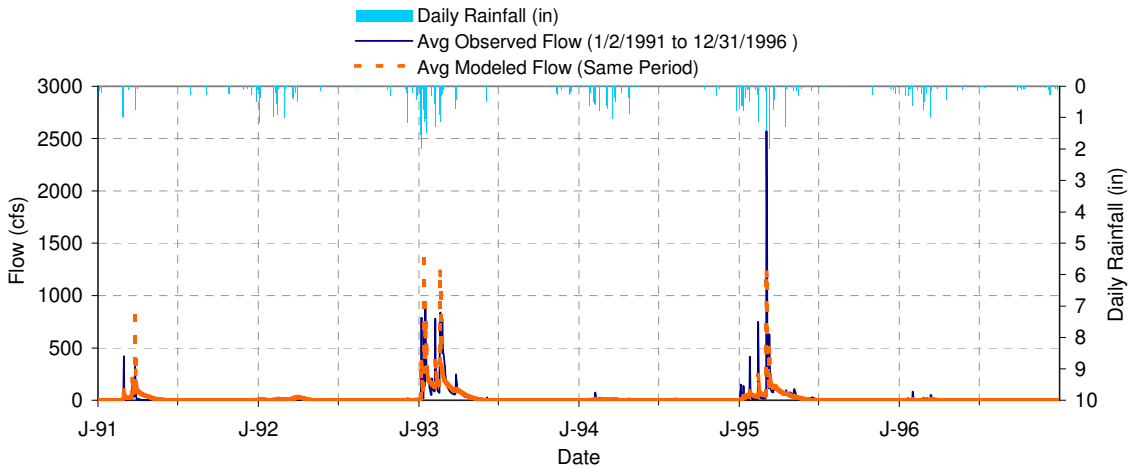

Summary statistics of wet weather model hydrology calibration to USGS gage 11025500 (Appendix G, No. 3) (2 of 2).

LSPC Simulated Flow		Observed Flow Gage		
REACH OUTFLOW FROM SUBBASIN 1316 6-Year Analysis Period: 1/1/1991 - 12/31/1996 Flow volumes are (inches/year) for upstream drainage area		**USGS 11025500 SANTA YSABEL C NR RAMONA CA** San Diego County, California Hydrologic Unit Code 18070304 Latitude 33°06'25", Longitude 116°51'55" NAD27 Drainage area 112 square miles		
Total Simulated In-stream Flow:	**11.52**	Total Observed In-stream Flow:		**11.54**
Total of simulated highest 10% flows:	**9.86**	Total of Observed highest 10% flows:		**9.74**
Total of Simulated lowest 50% flows:	**0.00**	Total of Observed Lowest 50% flows:		**0.09**
Simulated Summer Flow Volume (months 7-9):	**0.00**	Observed Summer Flow Volume (7-9):		**0.13**
Simulated Fall Flow Volume (months 10-12):	**0.02**	Observed Fall Flow Volume (10-12):		**0.19**
Simulated Winter Flow Volume (months 1-3):	**9.39**	Observed Winter Flow Volume (1-3):		**9.22**
Simulated Spring Flow Volume (months 4-6):	**2.10**	Observed Spring Flow Volume (4-6):		**2.00**
Total Simulated Storm Volume:	**3.52**	Total Observed Storm Volume:		**5.06**
Simulated Summer Storm Volume (7-9):	**0.00**	Observed Summer Storm Volume (7-9):		**0.02**
Errors (Simulated-Observed)	*Current Run (n)*	*Recommended Criteria*	*Run (n-1)*	*Run (n-2)*
Error in 10% highest flows:	1.20	15		
Error in storm volumes:	-43.75	20		

Summary statistics of wet weather model hydrology validation to USGS gage 11025500 (Appendix G, No. 3).

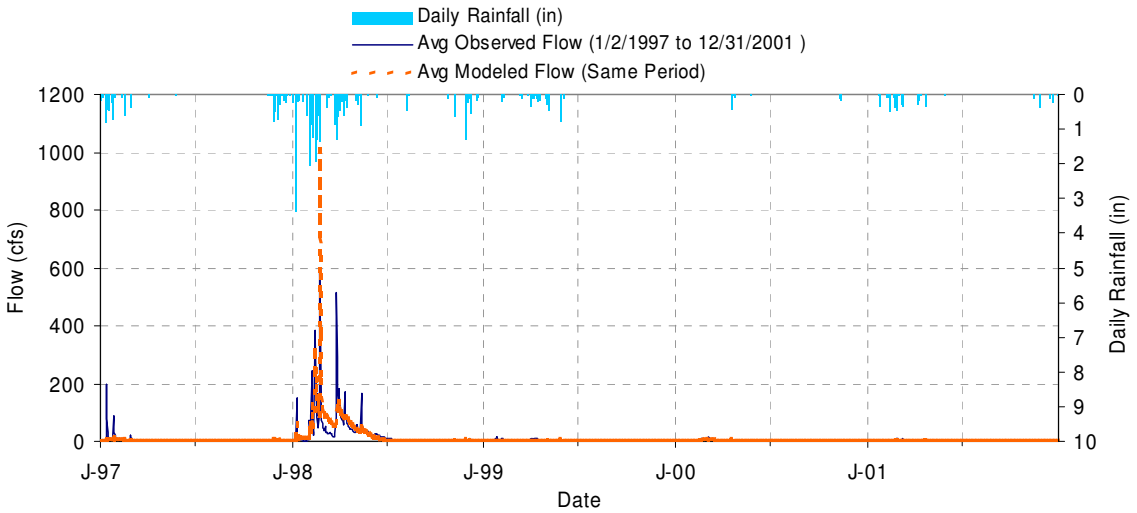

LSPC Simulated Flow		Observed Flow Gage	
REACH OUTFLOW FROM SUBBASIN 1316 5-Year Analysis Period: 1/1/1997 - 12/31/2001 Flow volumes are (inches/year) for upstream drainage area		**USGS 11025500 SANTA YSABEL C NR RAMONA CA** San Diego County, California Hydrologic Unit Code 18070304 Latitude 33°06'25", Longitude 116°51'55" NAD27 Drainage area 112 square miles	
Total Simulated In-stream Flow:	**3.58**	Total Observed In-stream Flow:	**4.08**
Total of simulated highest 10% flows:	**3.45**	Total of Observed highest 10% flows:	**3.38**
Total of Simulated lowest 50% flows:	**0.00**	Total of Observed Lowest 50% flows:	**0.01**
Simulated Summer Flow Volume (months 7-9):	**0.00**	Observed Summer Flow Volume (7-9):	**0.08**
Simulated Fall Flow Volume (months 10-12):	**0.03**	Observed Fall Flow Volume (10-12):	**0.10**
Simulated Winter Flow Volume (months 1-3):	**2.33**	Observed Winter Flow Volume (1-3):	**2.44**
Simulated Spring Flow Volume (months 4-6):	**1.22**	Observed Spring Flow Volume (4-6):	**1.46**
Total Simulated Storm Volume:	**0.92**	Total Observed Storm Volume:	**1.59**
Simulated Summer Storm Volume (7-9):	**0.00**	Observed Summer Storm Volume (7-9):	**0.01**

Errors (Simulated-Observed)	*Current Run (n)*	*Recommended Criteria*	*Run (n-1)*	*Run (n-2)*
Error in 10% highest flows:	2.02	15		
Error in storm volumes:	-73.39	20		

Summary statistics of wet weather model hydrology calibration to USGS gage 11028500 (Appendix G, No. 3) (1 of 2).

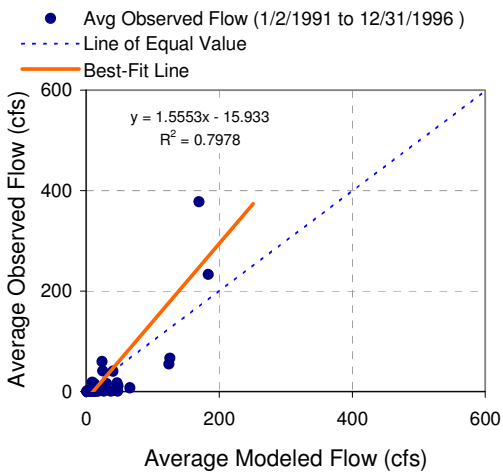

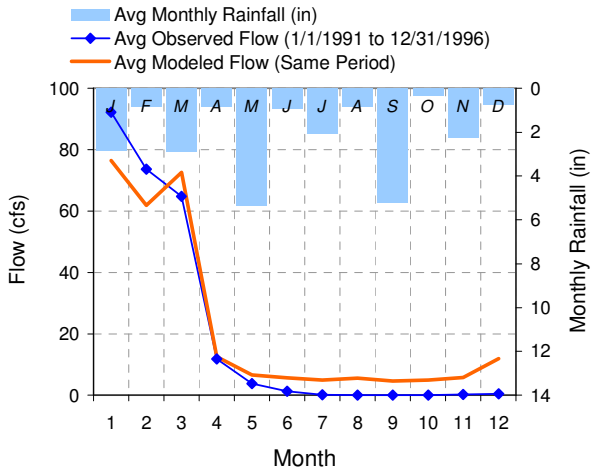

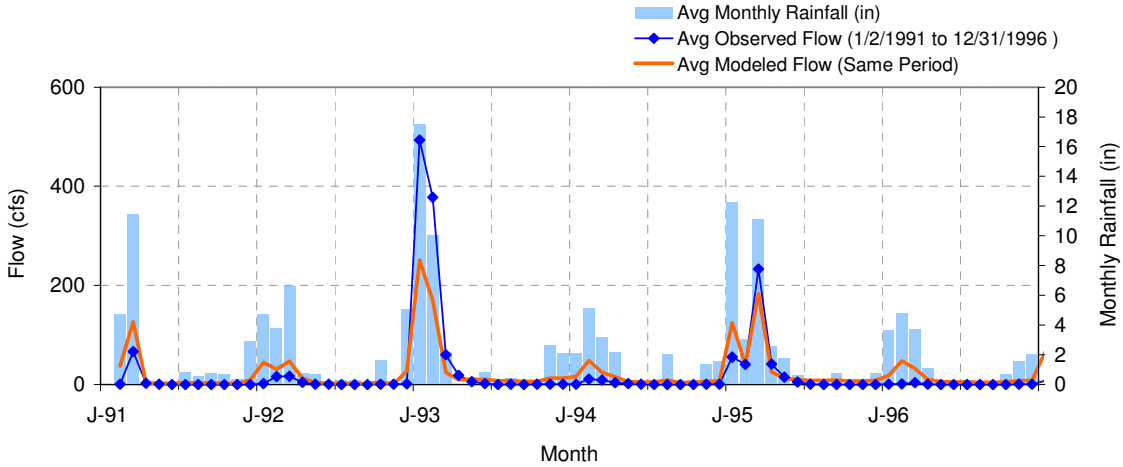

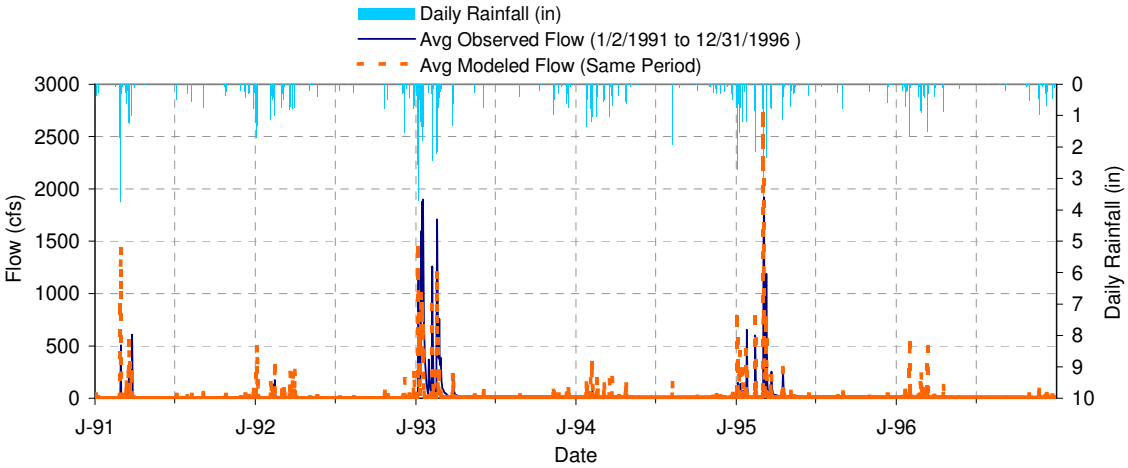

Summary statistics of wet weather model hydrology calibration to USGS gage 11028500 (Appendix G, No. 3) (2 of 2).

LSPC Simulated Flow		Observed Flow Gage		
REACH OUTFLOW FROM SUBBASIN 1324 6-Year Analysis Period: 1/1/1991 - 12/31/1996 Flow volumes are (inches/year) for upstream drainage area		**USGS 11028500 SANTA MARIA C NR RAMONA CA** San Diego County, California Hydrologic Unit Code 18070304 Latitude 33°03'08", Longitude 116°56'41" NAD27 Drainage area 57.6 square miles		
Total Simulated In-stream Flow:	**13.43**	Total Observed In-stream Flow:		**12.15**
Total of simulated highest 10% flows:	**10.76**	Total of Observed highest 10% flows:		**11.48**
Total of Simulated lowest 50% flows:	**0.81**	Total of Observed Lowest 50% flows:		**0.02**
Simulated Summer Flow Volume (months 7-9):	**0.75**	Observed Summer Flow Volume (7-9):		**0.01**
Simulated Fall Flow Volume (months 10-12):	**1.13**	Observed Fall Flow Volume (10-12):		**0.04**
Simulated Winter Flow Volume (months 1-3):	**10.33**	Observed Winter Flow Volume (1-3):		**11.27**
Simulated Spring Flow Volume (months 4-6):	**1.21**	Observed Spring Flow Volume (4-6):		**0.83**
Total Simulated Storm Volume:	**9.56**	Total Observed Storm Volume:		**7.40**
Simulated Summer Storm Volume (7-9):	**0.12**	Observed Summer Storm Volume (7-9):		**0.01**
Errors (Simulated-Observed)	*Current Run (n)*	*Recommended Criteria*	*Run (n-1)*	*Run (n-2)*
Error in 10% highest flows:	-6.62	15		
Error in storm volumes:	22.58	20		

Summary statistics of wet weather model hydrology validation to USGS gage 11028500 (Appendix G, No. 3).

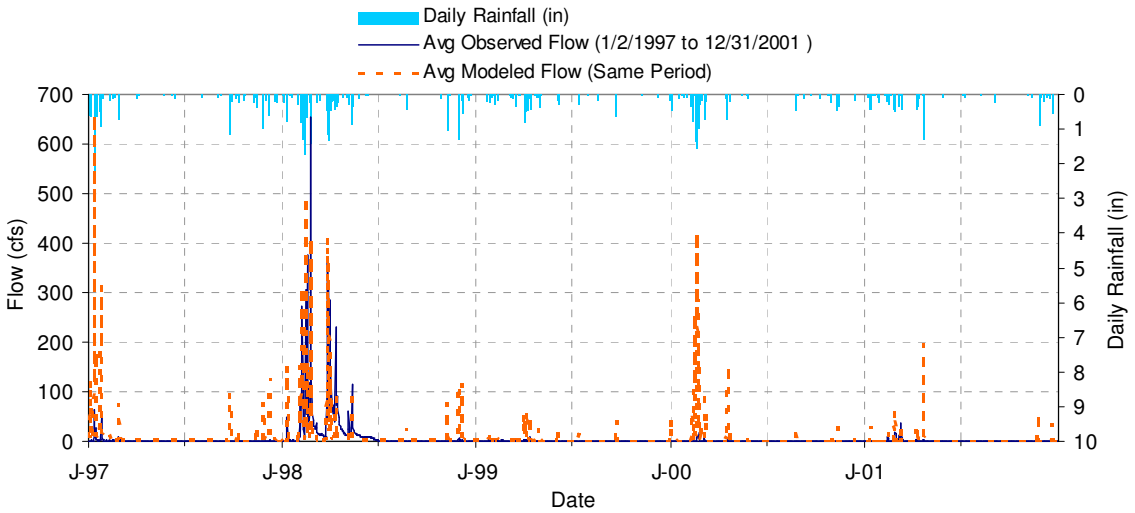

LSPC Simulated Flow		Observed Flow Gage		
REACH OUTFLOW FROM SUBBASIN 1324 5-Year Analysis Period: 1/1/1997 - 12/31/2001 Flow volumes are (inches/year) for upstream drainage area		**USGS 11028500 SANTA MARIA C NR RAMONA CA** San Diego County, California Hydrologic Unit Code 18070304 Latitude 33°03'08", Longitude 116°56'41" NAD27 Drainage area 57.6 square miles		
Total Simulated In-stream Flow:	**4.28**	Total Observed In-stream Flow:		**2.68**
Total of simulated highest 10% flows:	**3.50**	Total of Observed highest 10% flows:		**2.55**
Total of Simulated lowest 50% flows:	**0.13**	Total of Observed Lowest 50% flows:		**0.00**
Simulated Summer Flow Volume (months 7-9):	**0.26**	Observed Summer Flow Volume (7-9):		**0.01**
Simulated Fall Flow Volume (months 10-12):	**0.49**	Observed Fall Flow Volume (10-12):		**0.02**
Simulated Winter Flow Volume (months 1-3):	**2.81**	Observed Winter Flow Volume (1-3):		**1.72**
Simulated Spring Flow Volume (months 4-6):	**0.72**	Observed Spring Flow Volume (4-6):		**0.93**
Total Simulated Storm Volume:	**3.19**	Total Observed Storm Volume:		**1.52**
Simulated Summer Storm Volume (7-9):	**0.09**	Observed Summer Storm Volume (7-9):		**0.00**
Errors (Simulated-Observed)	*Current Run (n)*	*Recommended Criteria*	*Run (n-1)*	*Run (n-2)*
Error in 10% highest flows:	27.19	15		
Error in storm volumes:	52.24	20		

Summary statistics of wet weather model hydrology calibration to USGS gage 11042000 (Appendix G, No. 3) (1 of 2).

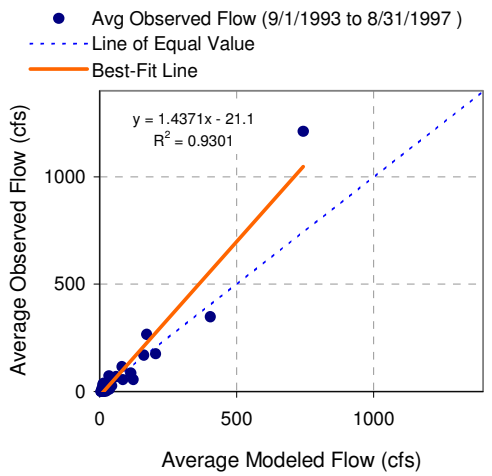

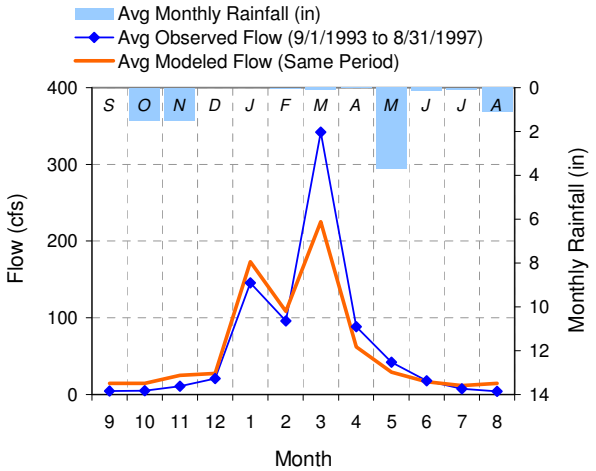

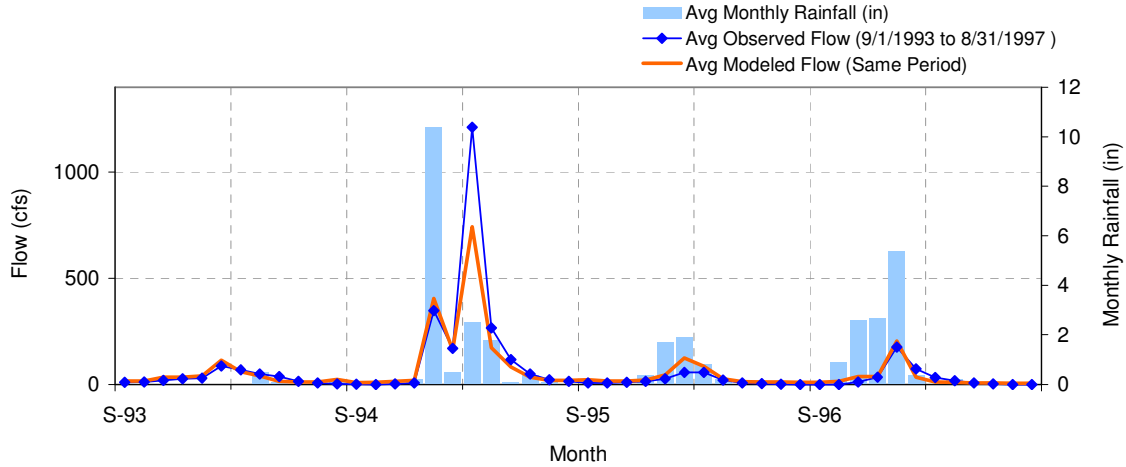

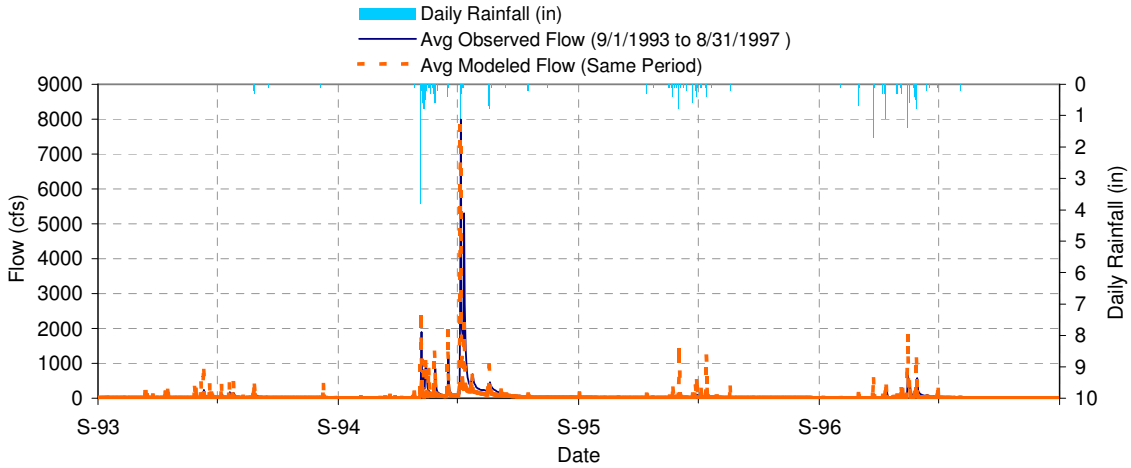

Summary statistics of wet weather model hydrology calibration to USGS gage 11042000 (Appendix G, No. 3) (2 of 2).

LSPC Simulated Flow		Observed Flow Gage		
REACH OUTFLOW FROM SUBBASIN 702 4-Year Analysis Period: 9/1/1993 - 8/31/1997 Flow volumes are (inches/year) for upstream drainage area		**USGS 11042000 SAN LUIS REY R A OCEANSIDE CA** San Diego County, California Hydrologic Unit Code 18070303 Latitude 33°13'05", Longitude 117°21'34" NAD27 Drainage area 557 square miles		
Total Simulated In-stream Flow:	**1.47**	Total Observed In-stream Flow:		**1.60**
Total of simulated highest 10% flows:	**1.07**	Total of Observed highest 10% flows:		**1.15**
Total of Simulated lowest 50% flows:	**0.12**	Total of Observed Lowest 50% flows:		**0.06**
Simulated Summer Flow Volume (months 7-9):	**0.08**	Observed Summer Flow Volume (7-9):		**0.03**
Simulated Fall Flow Volume (months 10-12):	**0.14**	Observed Fall Flow Volume (10-12):		**0.07**
Simulated Winter Flow Volume (months 1-3):	**1.03**	Observed Winter Flow Volume (1-3):		**1.19**
Simulated Spring Flow Volume (months 4-6):	**0.22**	Observed Spring Flow Volume (4-6):		**0.30**
Total Simulated Storm Volume:	**0.94**	Total Observed Storm Volume:		**0.77**
Simulated Summer Storm Volume (7-9):	**0.01**	Observed Summer Storm Volume (7-9):		**0.00**
Errors (Simulated-Observed)	*Current Run (n)*	*Recommended Criteria*	*Run (n-1)*	*Run (n-2)*
Error in 10% highest flows:	-7.69	15		
Error in storm volumes:	18.76	20		

Summary statistics of wet weather model hydrology validation to USGS gage 11042000 (Appendix G, No. 3).

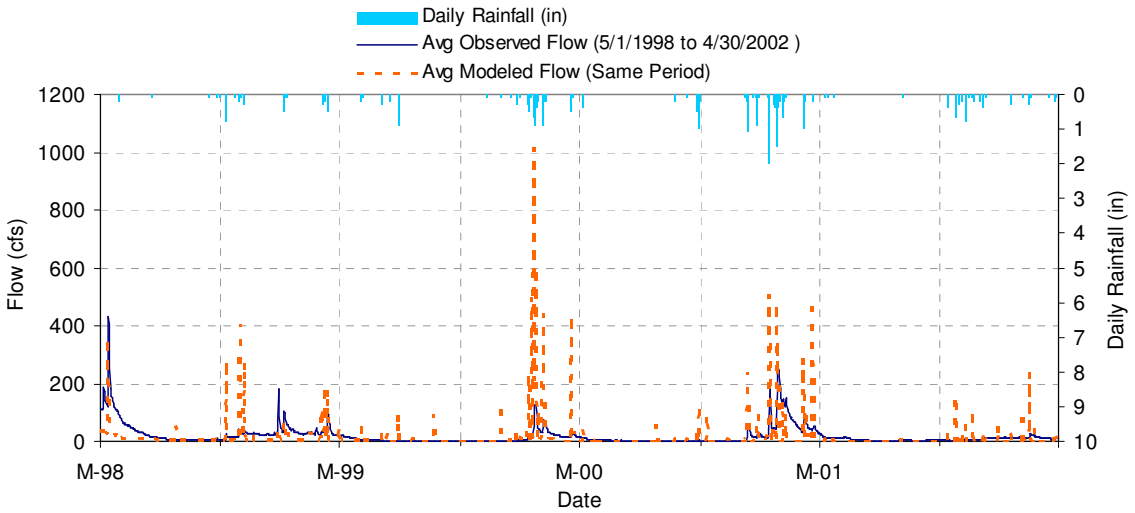

LSPC Simulated Flow		Observed Flow Gage	
REACH OUTFLOW FROM SUBBASIN 702 4-Year Analysis Period: 5/1/1998 - 4/30/2002 Flow volumes are (inches/year) for upstream drainage area		**USGS 11042000 SAN LUIS REY R A OCEANSIDE CA** San Diego County, California Hydrologic Unit Code 18070303 Latitude 33°13'05", Longitude 117°21'34" NAD27 Drainage area 557 square miles	
Total Simulated In-stream Flow:	**0.34**	Total Observed In-stream Flow:	**0.43**
Total of simulated highest 10% flows:	**0.27**	Total of Observed highest 10% flows:	**0.23**
Total of Simulated lowest 50% flows:	**0.01**	Total of Observed Lowest 50% flows:	**0.02**
Simulated Summer Flow Volume (months 7-9):	**0.03**	Observed Summer Flow Volume (7-9):	**0.02**
Simulated Fall Flow Volume (months 10-12):	**0.05**	Observed Fall Flow Volume (10-12):	**0.03**
Simulated Winter Flow Volume (months 1-3):	**0.17**	Observed Winter Flow Volume (1-3):	**0.20**
Simulated Spring Flow Volume (months 4-6):	**0.09**	Observed Spring Flow Volume (4-6):	**0.18**
Total Simulated Storm Volume:	**0.27**	Total Observed Storm Volume:	**0.11**
Simulated Summer Storm Volume (7-9):	**0.01**	Observed Summer Storm Volume (7-9):	**0.00**

Errors (Simulated-Observed)	*Current Run (n)*	*Recommended Criteria*	*Run (n-1)*	*Run (n-2)*
Error in 10% highest flows:	12.00	15		
Error in storm volumes:	57.19	20		

Summary statistics of wet weather model hydrology calibration to USGS gage 11042400 (Appendix G, No. 3) (1 of 2).

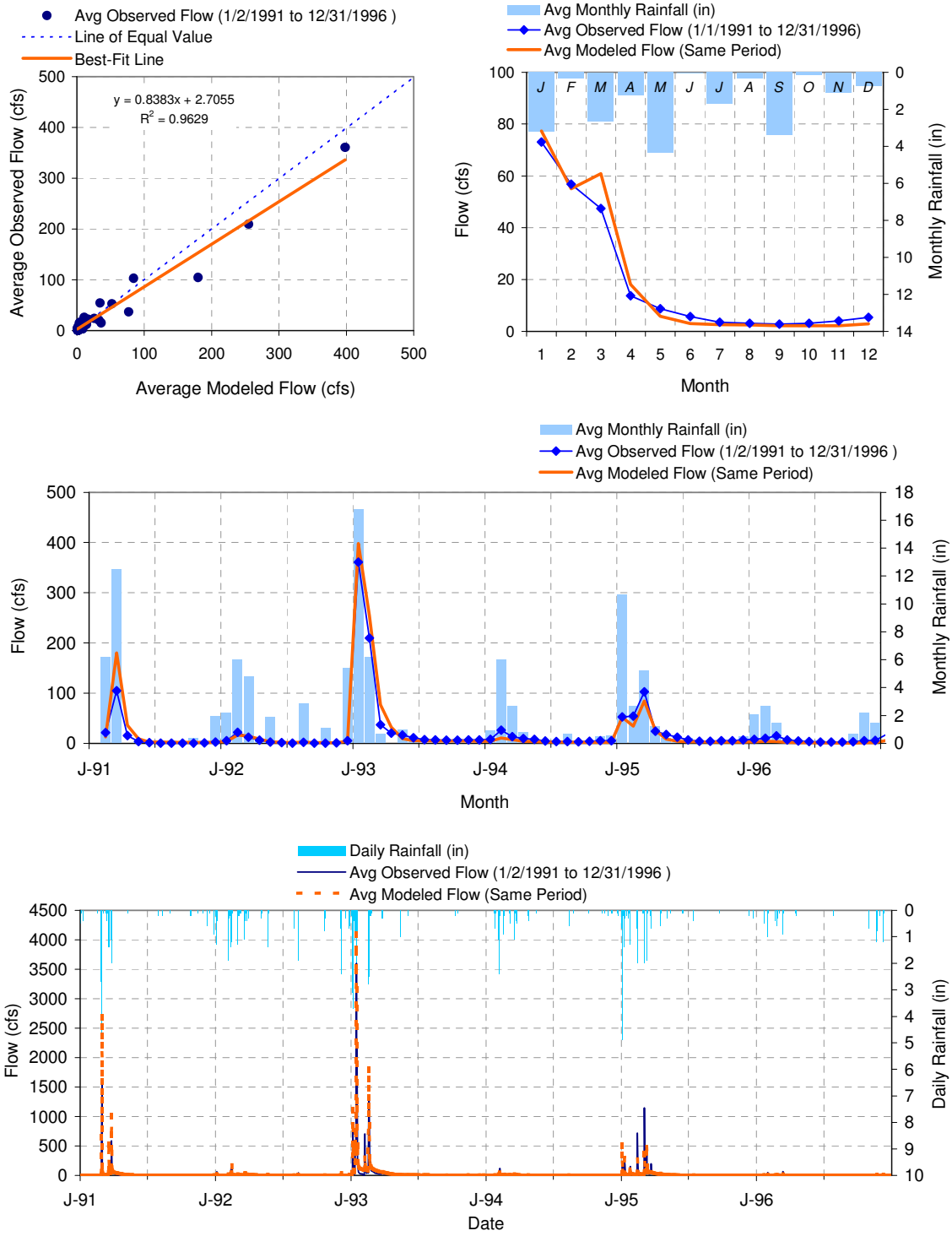

Summary statistics of wet weather model hydrology calibration to USGS gage 11042400 (Appendix G, No. 3) (2 of 2).

LSPC Simulated Flow		Observed Flow Gage		
REACH OUTFLOW FROM SUBBASIN 658 6-Year Analysis Period: 1/1/1991 - 12/31/1996 Flow volumes are (inches/year) for upstream drainage area		**USGS 11042400 TEMECULA C NR AGUANGA CA** Riverside County, California Hydrologic Unit Code 18070302 Latitude 33°27'33", Longitude 116°55'22" NAD27 Drainage area 131 square miles		
Total Simulated In-stream Flow:	**2.01**	Total Observed In-stream Flow:		**1.95**
Total of simulated highest 10% flows:	**1.64**	Total of Observed highest 10% flows:		**1.43**
Total of Simulated lowest 50% flows:	**0.08**	Total of Observed Lowest 50% flows:		**0.12**
Simulated Summer Flow Volume (months 7-9):	**0.06**	Observed Summer Flow Volume (7-9):		**0.08**
Simulated Fall Flow Volume (months 10-12):	**0.06**	Observed Fall Flow Volume (10-12):		**0.11**
Simulated Winter Flow Volume (months 1-3):	**1.66**	Observed Winter Flow Volume (1-3):		**1.51**
Simulated Spring Flow Volume (months 4-6):	**0.23**	Observed Spring Flow Volume (4-6):		**0.24**
Total Simulated Storm Volume:	**1.11**	Total Observed Storm Volume:		**1.19**
Simulated Summer Storm Volume (7-9):	**0.00**	Observed Summer Storm Volume (7-9):		**0.01**
Errors (Simulated-Observed)	*Current Run (n)*	*Recommended Criteria*	*Run (n-1)*	*Run (n-2)*
Error in 10% highest flows:	12.78	15		
Error in storm volumes:	-7.18	20		

Summary statistics of wet weather model hydrology validation to USGS gage 11042400 (Appendix G, No. 3).

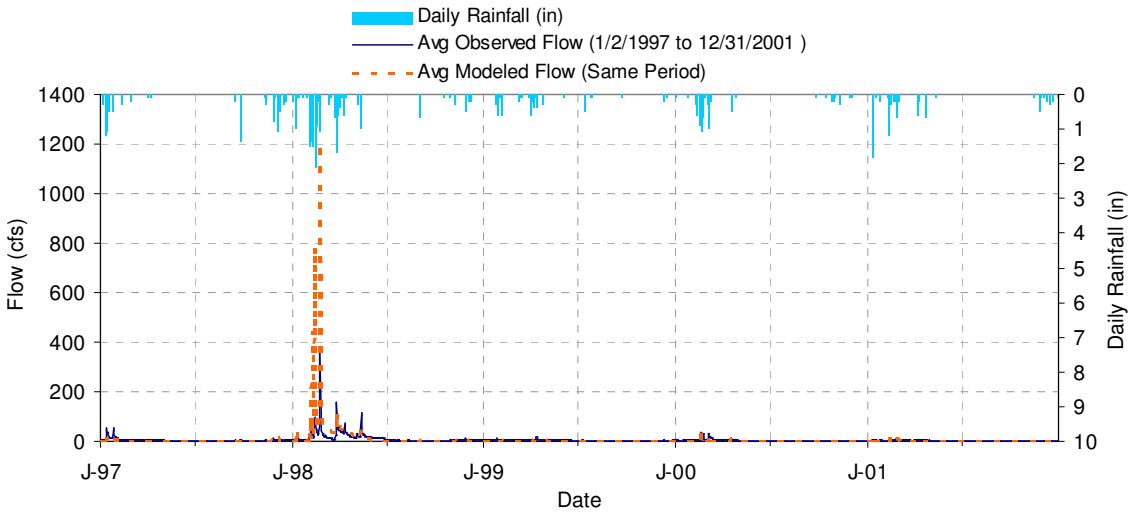

LSPC Simulated Flow		Observed Flow Gage		
REACH OUTFLOW FROM SUBBASIN 658 5-Year Analysis Period: 1/1/1997 - 12/31/2001 Flow volumes are (inches/year) for upstream drainage area		**USGS 11042400 TEMECULA C NR AGUANGA CA** Riverside County, California Hydrologic Unit Code 18070302 Latitude 33°27'33", Longitude 116°55'22" NAD27 Drainage area 131 square miles		
Total Simulated In-stream Flow:	**0.58**	Total Observed In-stream Flow:		**0.55**
Total of simulated highest 10% flows:	**0.52**	Total of Observed highest 10% flows:		**0.29**
Total of Simulated lowest 50% flows:	**0.00**	Total of Observed Lowest 50% flows:		**0.07**
Simulated Summer Flow Volume (months 7-9):	**0.01**	Observed Summer Flow Volume (7-9):		**0.04**
Simulated Fall Flow Volume (months 10-12):	**0.02**	Observed Fall Flow Volume (10-12):		**0.06**
Simulated Winter Flow Volume (months 1-3):	**0.43**	Observed Winter Flow Volume (1-3):		**0.27**
Simulated Spring Flow Volume (months 4-6):	**0.12**	Observed Spring Flow Volume (4-6):		**0.18**
Total Simulated Storm Volume:	**0.30**	Total Observed Storm Volume:		**0.16**
Simulated Summer Storm Volume (7-9):	**0.00**	Observed Summer Storm Volume (7-9):		**0.01**
Errors (Simulated-Observed)	*Current Run (n)*	*Recommended Criteria*	*Run (n-1)*	*Run (n-2)*
Error in 10% highest flows:	43.86	15		
Error in storm volumes:	47.39	20		

Summary statistics of wet weather model hydrology calibration to USGS gage 11044300 (Appendix G, No. 3) (1 of 2).

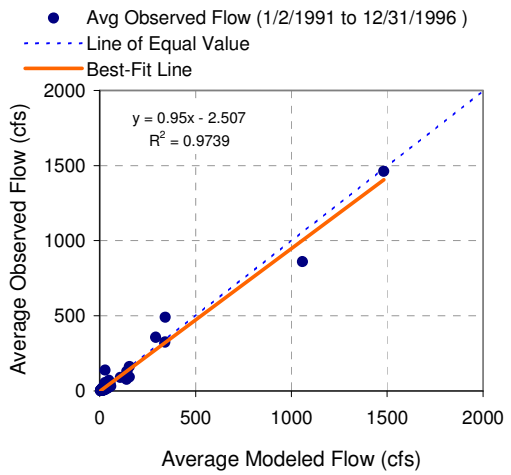

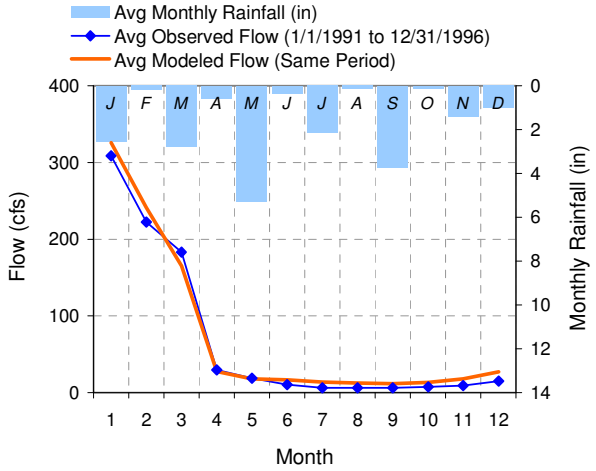

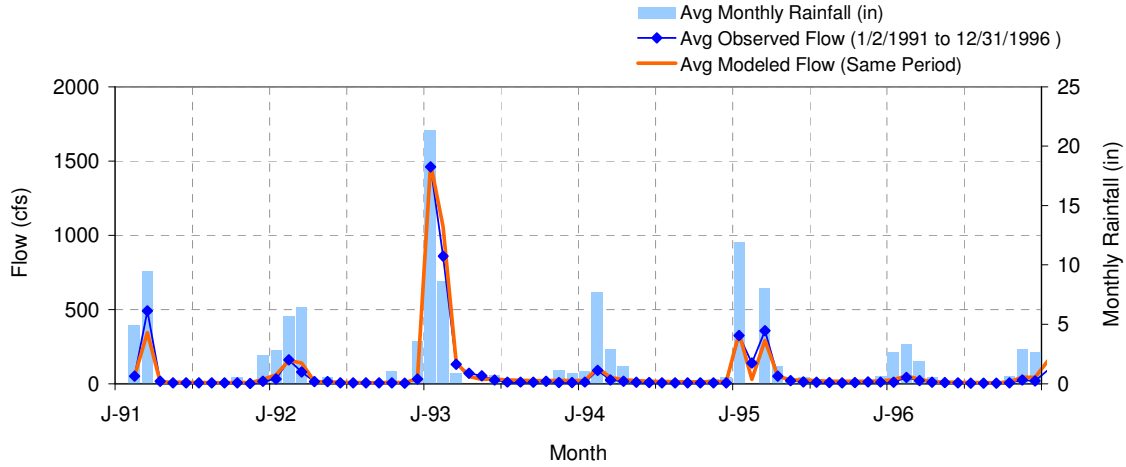

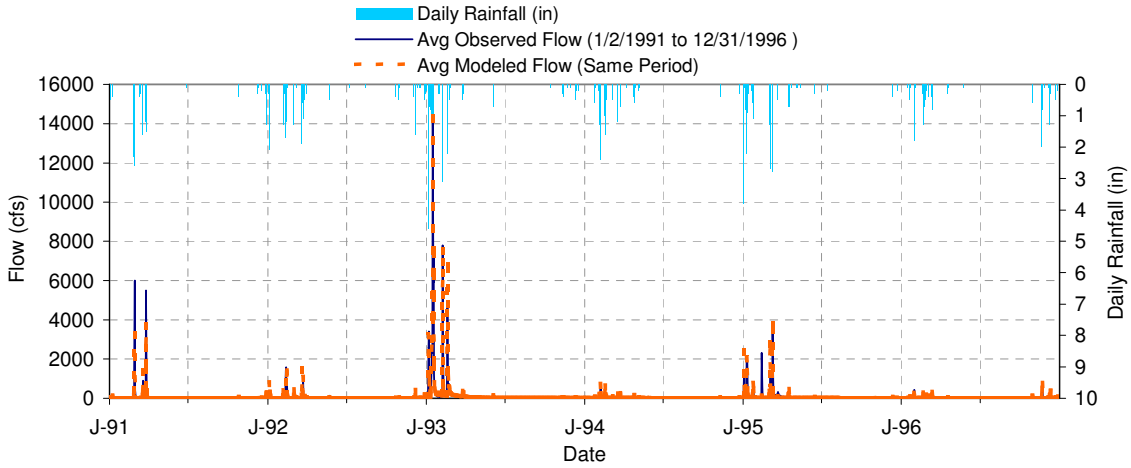

Summary statistics of wet weather model hydrology calibration to USGS gage 11044300 (Appendix G, No. 3) (2 of 2).

LSPC Simulated Flow		Observed Flow Gage		
REACH OUTFLOW FROM SUBBASIN 615 6-Year Analysis Period: 1/1/1991 - 12/31/1996 Flow volumes are (inches/year) for upstream drainage area		**USGS 11044300 SANTA MARGARITA R A FPUD SUMP NR FALLBROOK CA** San Diego County, California Hydrologic Unit Code 18070302 Latitude 33°24'49", Longitude 117°14'25" NAD27 Drainage area 620 square miles		
Total Simulated In-stream Flow:	**1.69**	Total Observed In-stream Flow:		**1.57**
Total of simulated highest 10% flows:	**1.40**	Total of Observed highest 10% flows:		**1.35**
Total of Simulated lowest 50% flows:	**0.10**	Total of Observed Lowest 50% flows:		**0.05**
Simulated Summer Flow Volume (months 7-9):	**0.07**	Observed Summer Flow Volume (7-9):		**0.03**
Simulated Fall Flow Volume (months 10-12):	**0.11**	Observed Fall Flow Volume (10-12):		**0.06**
Simulated Winter Flow Volume (months 1-3):	**1.39**	Observed Winter Flow Volume (1-3):		**1.36**
Simulated Spring Flow Volume (months 4-6):	**0.12**	Observed Spring Flow Volume (4-6):		**0.11**
Total Simulated Storm Volume:	**1.26**	Total Observed Storm Volume:		**1.22**
Simulated Summer Storm Volume (7-9):	**0.00**	Observed Summer Storm Volume (7-9):		**0.00**
Errors (Simulated-Observed)	*Current Run (n)*	*Recommended Criteria*	*Run (n-1)*	*Run (n-2)*
Error in 10% highest flows:	3.57	15		
Error in storm volumes:	3.40	20		

Summary statistics of wet weather model hydrology validation to USGS gage 11044300 (Appendix G, No. 3).

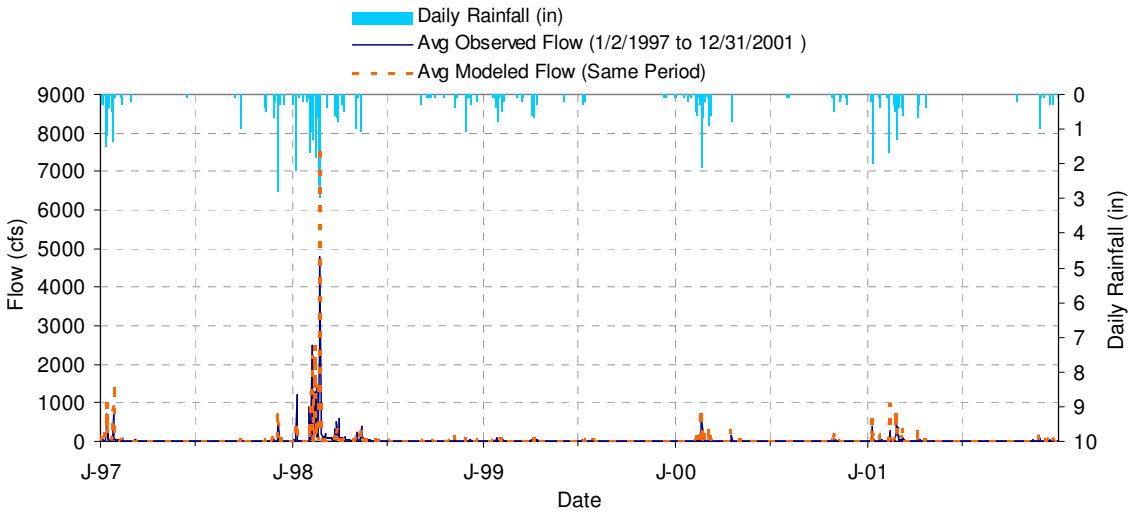

LSPC Simulated Flow		Observed Flow Gage		
REACH OUTFLOW FROM SUBBASIN 615 5-Year Analysis Period: 1/1/1997 - 12/31/2001 Flow volumes are (inches/year) for upstream drainage area		**USGS 11044300 SANTA MARGARITA R A FPUD SUMP NR FALLBROOK CA** San Diego County, California Hydrologic Unit Code 18070302 Latitude 33°24'49", Longitude 117°14'25" NAD27 Drainage area 620 square miles		
Total Simulated In-stream Flow:	**0.74**	Total Observed In-stream Flow:		**0.63**
Total of simulated highest 10% flows:	**0.55**	Total of Observed highest 10% flows:		**0.50**
Total of Simulated lowest 50% flows:	**0.07**	Total of Observed Lowest 50% flows:		**0.04**
Simulated Summer Flow Volume (months 7-9):	**0.06**	Observed Summer Flow Volume (7-9):		**0.03**
Simulated Fall Flow Volume (months 10-12):	**0.08**	Observed Fall Flow Volume (10-12):		**0.05**
Simulated Winter Flow Volume (months 1-3):	**0.51**	Observed Winter Flow Volume (1-3):		**0.47**
Simulated Spring Flow Volume (months 4-6):	**0.09**	Observed Spring Flow Volume (4-6):		**0.09**
Total Simulated Storm Volume:	**0.54**	Total Observed Storm Volume:		**0.47**
Simulated Summer Storm Volume (7-9):	**0.01**	Observed Summer Storm Volume (7-9):		**0.01**
Errors (Simulated-Observed)	*Current Run (n)*	*Recommended Criteria*	*Run (n-1)*	*Run (n-2)*
Error in 10% highest flows:	8.70	15		
Error in storm volumes:	12.74	20		

Summary statistics of wet weather model hydrology calibration to USGS gage 11046000 (Appendix G, No. 3) (1 of 2).

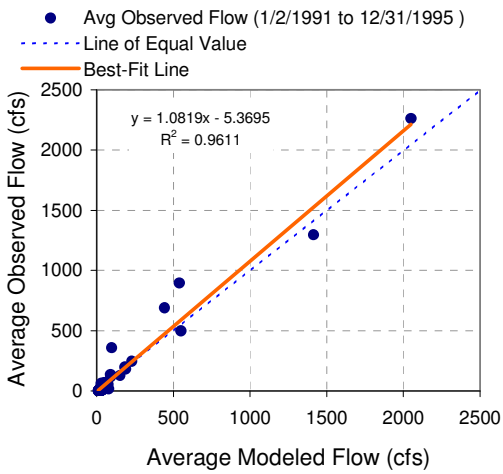

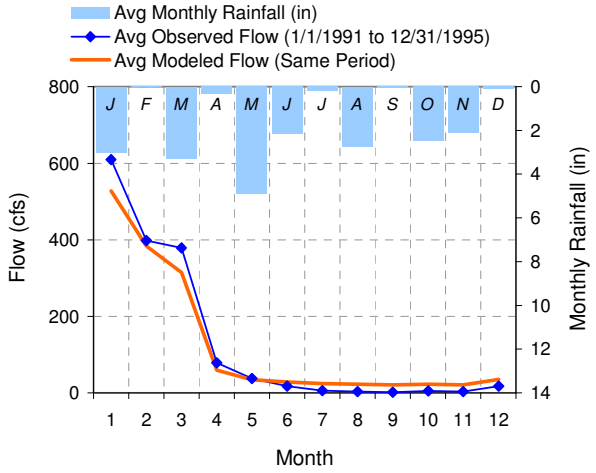

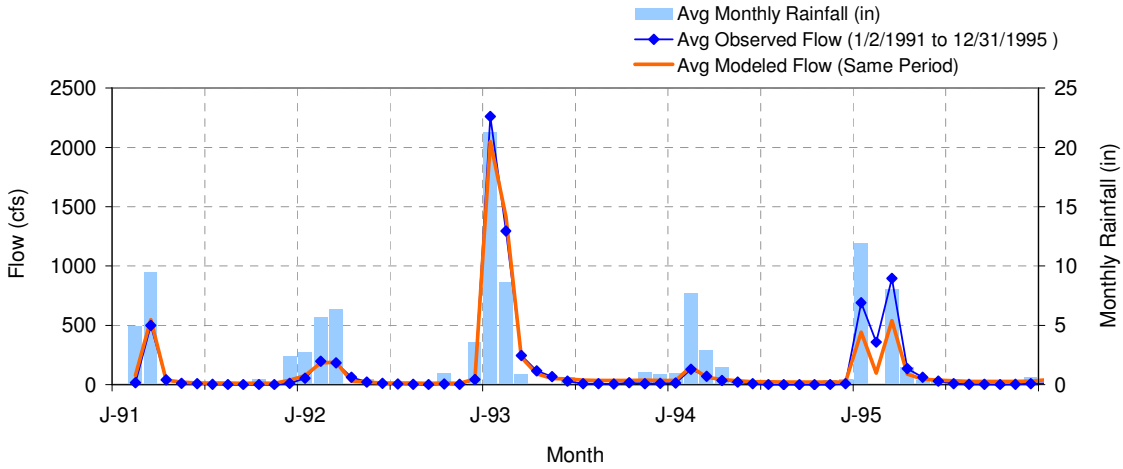

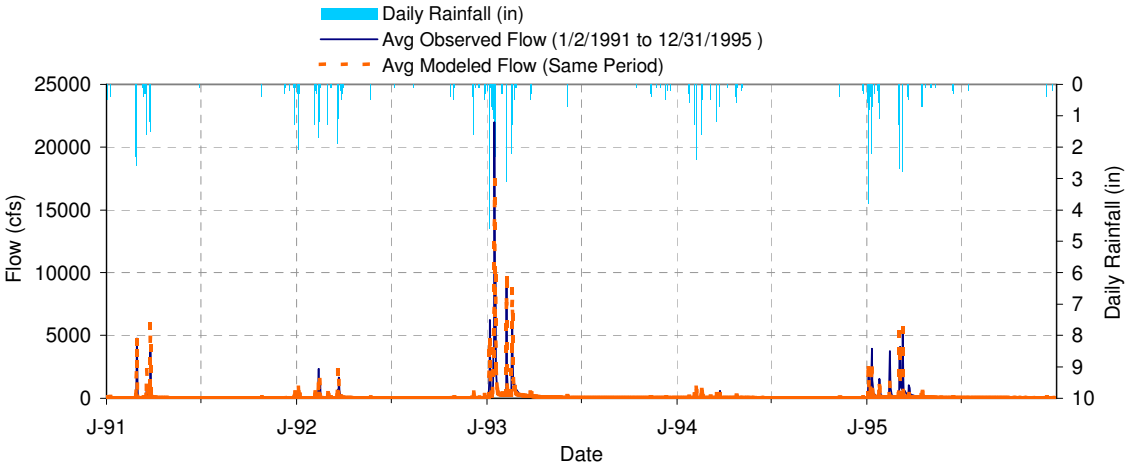

Summary statistics of wet weather model hydrology calibration to USGS gage 11046000 (Appendix G, No. 3) (2 of 2).

LSPC Simulated Flow		Observed Flow Gage		
REACH OUTFLOW FROM SUBBASIN 602 5-Year Analysis Period: 1/1/1991 - 12/31/1995 Flow volumes are (inches/year) for upstream drainage area		**USGS 11046000 SANTA MARGARITA R A YSIDORA CA** San Diego County, California Hydrologic Unit Code 18070302 Latitude 33°14'13", Longitude 117°23'14" NAD27 Drainage area 723 square miles		
Total Simulated In-stream Flow:	**2.32**	Total Observed In-stream Flow:		**2.42**
Total of simulated highest 10% flows:	**1.84**	Total of Observed highest 10% flows:		**2.05**
Total of Simulated lowest 50% flows:	**0.16**	Total of Observed Lowest 50% flows:		**0.04**
Simulated Summer Flow Volume (months 7-9):	**0.11**	Observed Summer Flow Volume (7-9):		**0.02**
Simulated Fall Flow Volume (months 10-12):	**0.13**	Observed Fall Flow Volume (10-12):		**0.04**
Simulated Winter Flow Volume (months 1-3):	**1.89**	Observed Winter Flow Volume (1-3):		**2.15**
Simulated Spring Flow Volume (months 4-6):	**0.19**	Observed Spring Flow Volume (4-6):		**0.21**
Total Simulated Storm Volume:	**1.63**	Total Observed Storm Volume:		**1.75**
Simulated Summer Storm Volume (7-9):	**0.00**	Observed Summer Storm Volume (7-9):		**0.00**
Errors (Simulated-Observed)	*Current Run (n)*	*Recommended Criteria*	*Run (n-1)*	*Run (n-2)*
Error in 10% highest flows:	-11.53	15		
Error in storm volumes:	-7.48	20		

Summary statistics of wet weather model hydrology validation to USGS gage 11046000 (Appendix G, No. 3).

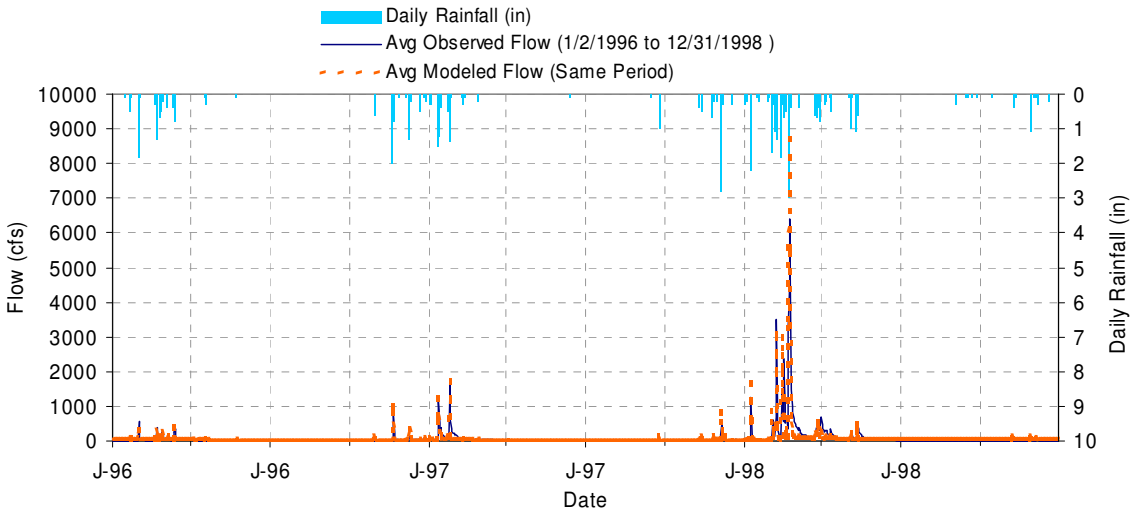

LSPC Simulated Flow		Observed Flow Gage		
REACH OUTFLOW FROM SUBBASIN 602 3-Year Analysis Period: 1/1/1996 - 12/31/1998 Flow volumes are (inches/year) for upstream drainage area		**USGS 11046000 SANTA MARGARITA R A YSIDORA CA** San Diego County, California Hydrologic Unit Code 18070302 Latitude 33°14'13", Longitude 117°23'14" NAD27 Drainage area 723 square miles		
Total Simulated In-stream Flow:	**1.28**	Total Observed In-stream Flow:		**1.29**
Total of simulated highest 10% flows:	**0.90**	Total of Observed highest 10% flows:		**1.03**
Total of Simulated lowest 50% flows:	**0.13**	Total of Observed Lowest 50% flows:		**0.02**
Simulated Summer Flow Volume (months 7-9):	**0.09**	Observed Summer Flow Volume (7-9):		**0.01**
Simulated Fall Flow Volume (months 10-12):	**0.17**	Observed Fall Flow Volume (10-12):		**0.09**
Simulated Winter Flow Volume (months 1-3):	**0.86**	Observed Winter Flow Volume (1-3):		**0.99**
Simulated Spring Flow Volume (months 4-6):	**0.16**	Observed Spring Flow Volume (4-6):		**0.20**
Total Simulated Storm Volume:	**0.85**	Total Observed Storm Volume:		**0.85**
Simulated Summer Storm Volume (7-9):	**0.01**	Observed Summer Storm Volume (7-9):		**0.00**
Errors (Simulated-Observed)	*Current Run (n)*	*Recommended Criteria*	*Run (n-1)*	*Run (n-2)*
Error in 10% highest flows:	-14.13	15		
Error in storm volumes:	0.84	20		

Summary statistics of wet weather model hydrology calibration to USGS gage 11046530 (Appendix G, No. 3) (1 of 2).

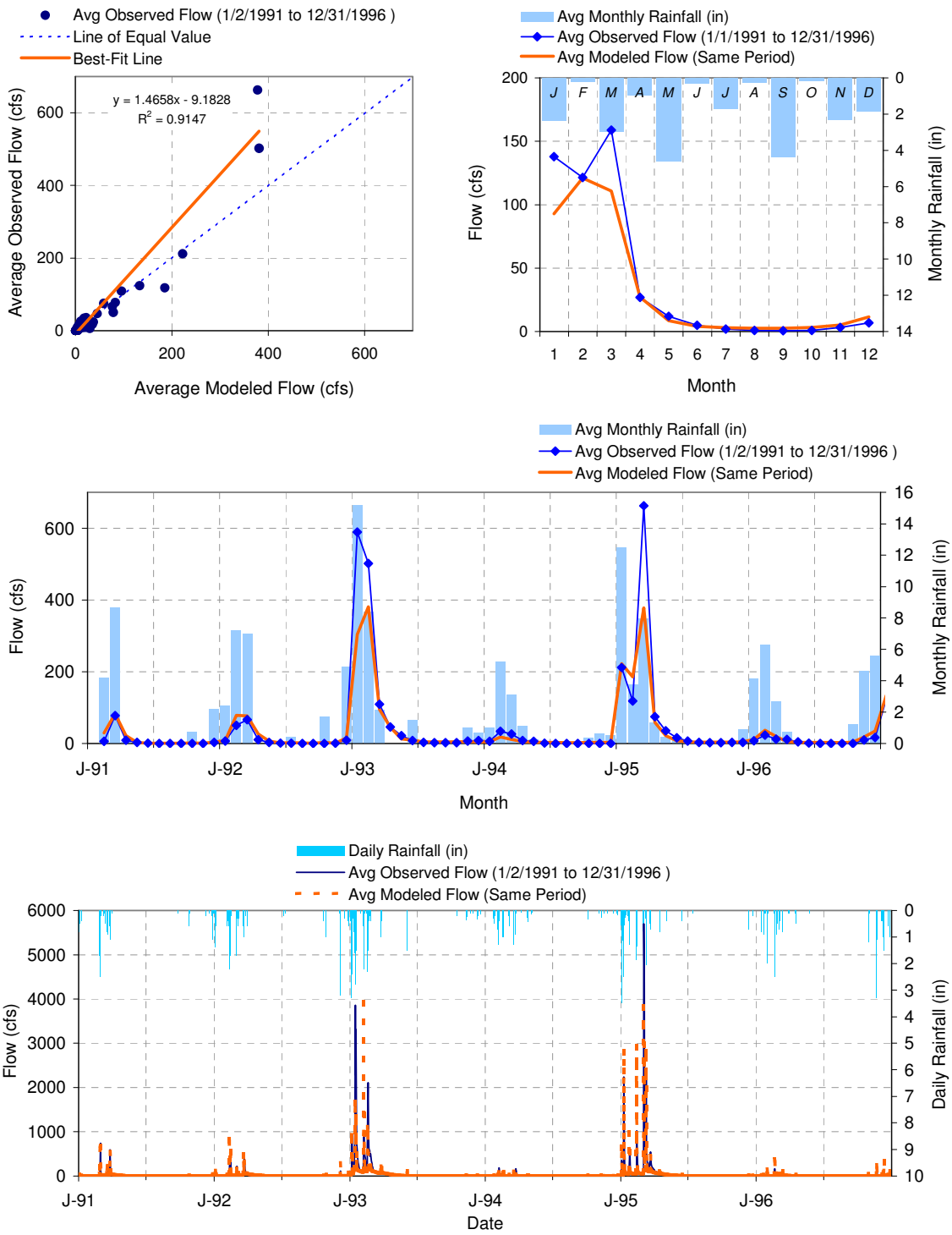

Summary statistics of wet weather model hydrology calibration to USGS gage 11046530 (Appendix G, No. 3) (2 of 2).

LSPC Simulated Flow		Observed Flow Gage		
REACH OUTFLOW FROM SUBBASIN 411 6-Year Analysis Period: 1/1/1991 - 12/31/1996 Flow volumes are (inches/year) for upstream drainage area		**USGS 11046530 SAN JUAN C AT LA NOVIA ST BR AT SAN JUAN CAPIS CA** Orange County, California Hydrologic Unit Code 18070301 Latitude 33°30'09", Longitude 117°38'50" NAD27 Drainage area 109 square miles		
Total Simulated In-stream Flow:	**4.02**	Total Observed In-stream Flow:		**4.90**
Total of simulated highest 10% flows:	**3.26**	Total of Observed highest 10% flows:		**4.22**
Total of Simulated lowest 50% flows:	**0.12**	Total of Observed Lowest 50% flows:		**0.05**
Simulated Summer Flow Volume (months 7-9):	**0.08**	Observed Summer Flow Volume (7-9):		**0.03**
Simulated Fall Flow Volume (months 10-12):	**0.21**	Observed Fall Flow Volume (10-12):		**0.11**
Simulated Winter Flow Volume (months 1-3):	**3.32**	Observed Winter Flow Volume (1-3):		**4.31**
Simulated Spring Flow Volume (months 4-6):	**0.41**	Observed Spring Flow Volume (4-6):		**0.45**
Total Simulated Storm Volume:	**2.59**	Total Observed Storm Volume:		**2.95**
Simulated Summer Storm Volume (7-9):	**0.00**	Observed Summer Storm Volume (7-9):		**0.01**
Errors (Simulated-Observed)	*Current Run (n)*	*Recommended Criteria*	*Run (n-1)*	*Run (n-2)*
Error in 10% highest flows:	-29.36	15		
Error in storm volumes:	-13.85	20		

Summary statistics of wet weather model hydrology validation to USGS gage 11046530 (Appendix G, No. 3).

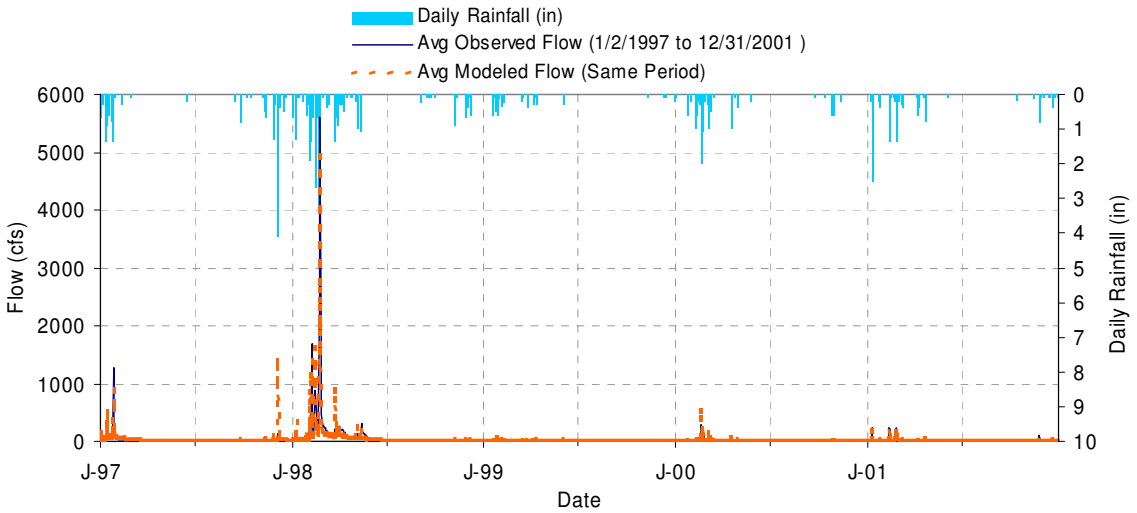

LSPC Simulated Flow		Observed Flow Gage		
REACH OUTFLOW FROM SUBBASIN 411 5-Year Analysis Period: 1/1/1997 - 12/31/2001 Flow volumes are (inches/year) for upstream drainage area		**USGS 11046530 SAN JUAN C AT LA NOVIA ST BR AT SAN JUAN CAPIS CA** Orange County, California Hydrologic Unit Code 18070301 Latitude 33°30'09", Longitude 117°38'50" NAD27 Drainage area 109 square miles		
Total Simulated In-stream Flow:	**3.14**	Total Observed In-stream Flow:		**3.21**
Total of simulated highest 10% flows:	**2.57**	Total of Observed highest 10% flows:		**2.82**
Total of Simulated lowest 50% flows:	**0.12**	Total of Observed Lowest 50% flows:		**0.02**
Simulated Summer Flow Volume (months 7-9):	**0.09**	Observed Summer Flow Volume (7-9):		**0.03**
Simulated Fall Flow Volume (months 10-12):	**0.24**	Observed Fall Flow Volume (10-12):		**0.10**
Simulated Winter Flow Volume (months 1-3):	**2.39**	Observed Winter Flow Volume (1-3):		**2.51**
Simulated Spring Flow Volume (months 4-6):	**0.42**	Observed Spring Flow Volume (4-6):		**0.57**
Total Simulated Storm Volume:	**1.92**	Total Observed Storm Volume:		**1.93**
Simulated Summer Storm Volume (7-9):	**0.01**	Observed Summer Storm Volume (7-9):		**0.01**
Errors (Simulated-Observed)	*Current Run (n)*	*Recommended Criteria*	*Run (n-1)*	*Run (n-2)*
Error in 10% highest flows:	-9.98	15		
Error in storm volumes:	-0.53	20		

Summary statistics of wet weather model hydrology calibration to USGS gage 11047300 (Appendix G, No. 3) (1 of 2).

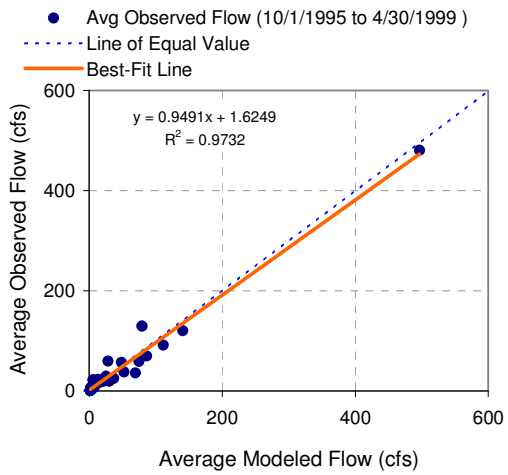

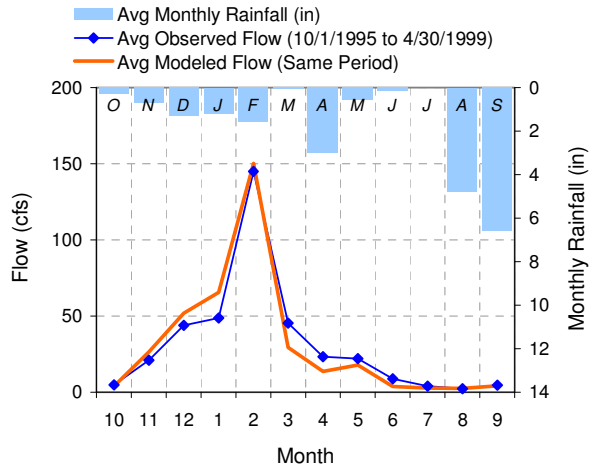

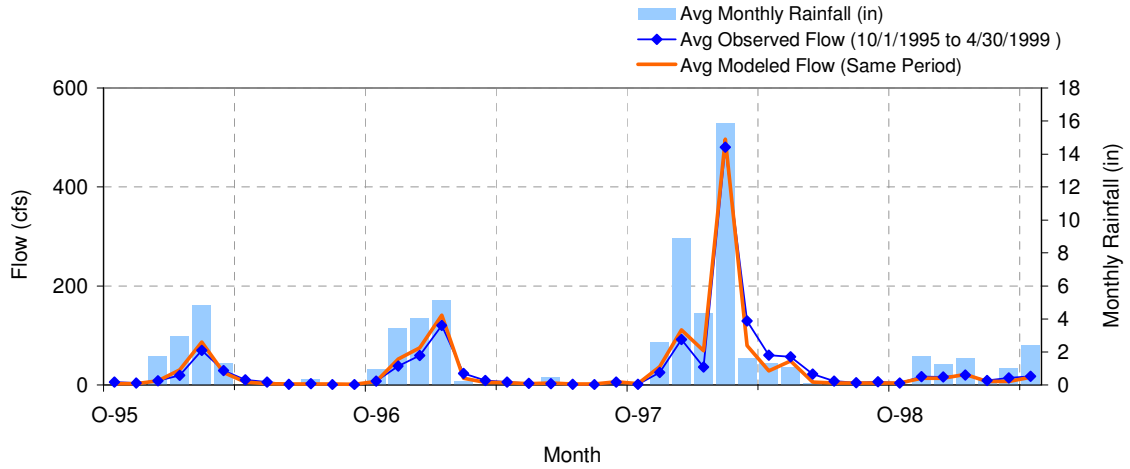

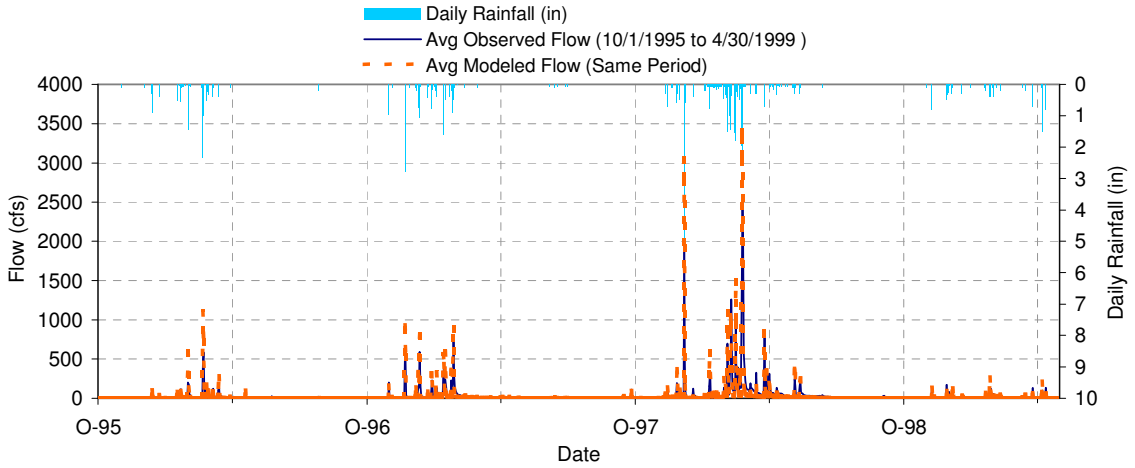

Summary statistics of wet weather model hydrology calibration to USGS gage 11047300 (Appendix G, No. 3) (2 of 2).

LSPC Simulated Flow		Observed Flow Gage		
REACH OUTFLOW FROM SUBBASIN 403 3.58-Year Analysis Period: 10/1/1995 - 4/30/1999 Flow volumes are (inches/year) for upstream drainage area		**USGS 11047300 ARROYO TRABUCO A SAN JUAN CAPISTRANO CA** Orange County, California Hydrologic Unit Code 18070301 Latitude 33°29'54", Longitude 117°39'54" NAD27 Drainage area 54.1 square miles		
Total Simulated In-stream Flow:	**8.31**	Total Observed In-stream Flow:		**8.28**
Total of simulated highest 10% flows:	**7.15**	Total of Observed highest 10% flows:		**6.32**
Total of Simulated lowest 50% flows:	**0.28**	Total of Observed Lowest 50% flows:		**0.36**
Simulated Summer Flow Volume (months 7-9):	**0.16**	Observed Summer Flow Volume (7-9):		**0.19**
Simulated Fall Flow Volume (months 10-12):	**1.94**	Observed Fall Flow Volume (10-12):		**1.63**
Simulated Winter Flow Volume (months 1-3):	**5.51**	Observed Winter Flow Volume (1-3):		**5.39**
Simulated Spring Flow Volume (months 4-6):	**0.70**	Observed Spring Flow Volume (4-6):		**1.08**
Total Simulated Storm Volume:	**7.07**	Total Observed Storm Volume:		**5.72**
Simulated Summer Storm Volume (7-9):	**0.03**	Observed Summer Storm Volume (7-9):		**0.06**
Errors (Simulated-Observed)	*Current Run (n)*	*Recommended Criteria*	*Run (n-1)*	*Run (n-2)*
Error in 10% highest flows:	11.71	15		
Error in storm volumes:	18.99	20		

Summary statistics of wet weather model hydrology validation to USGS gage 11047300 (Appendix G, No. 3).

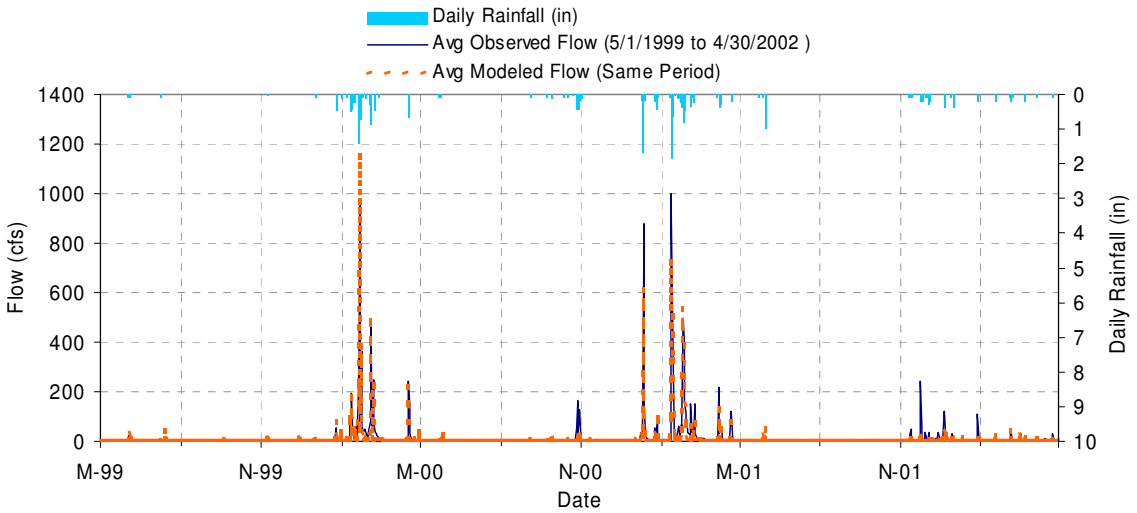

LSPC Simulated Flow		Observed Flow Gage		
REACH OUTFLOW FROM SUBBASIN 403 3-Year Analysis Period: 5/1/1999 - 4/30/2002 Flow volumes are (inches/year) for upstream drainage area		**USGS 11047300 ARROYO TRABUCO A SAN JUAN CAPISTRANO CA** Orange County, California Hydrologic Unit Code 18070301 Latitude 33°29'54", Longitude 117°39'54" NAD27 Drainage area 54.1 square miles		
Total Simulated In-stream Flow:	**2.28**	Total Observed In-stream Flow:		**3.35**
Total of simulated highest 10% flows:	**1.93**	Total of Observed highest 10% flows:		**2.57**
Total of Simulated lowest 50% flows:	**0.13**	Total of Observed Lowest 50% flows:		**0.23**
Simulated Summer Flow Volume (months 7-9):	**0.11**	Observed Summer Flow Volume (7-9):		**0.10**
Simulated Fall Flow Volume (months 10-12):	**0.15**	Observed Fall Flow Volume (10-12):		**0.45**
Simulated Winter Flow Volume (months 1-3):	**1.71**	Observed Winter Flow Volume (1-3):		**2.32**
Simulated Spring Flow Volume (months 4-6):	**0.30**	Observed Spring Flow Volume (4-6):		**0.47**
Total Simulated Storm Volume:	**1.91**	Total Observed Storm Volume:		**2.33**
Simulated Summer Storm Volume (7-9):	**0.02**	Observed Summer Storm Volume (7-9):		**0.01**
Errors (Simulated-Observed)	*Current Run (n)*	*Recommended Criteria*	*Run (n-1)*	*Run (n-2)*
Error in 10% highest flows:	-33.27	15		
Error in storm volumes:	-21.87	20		

Summary statistics of wet weather model hydrology validation to USGS gage 11022350 (Appendix G, No. 3).

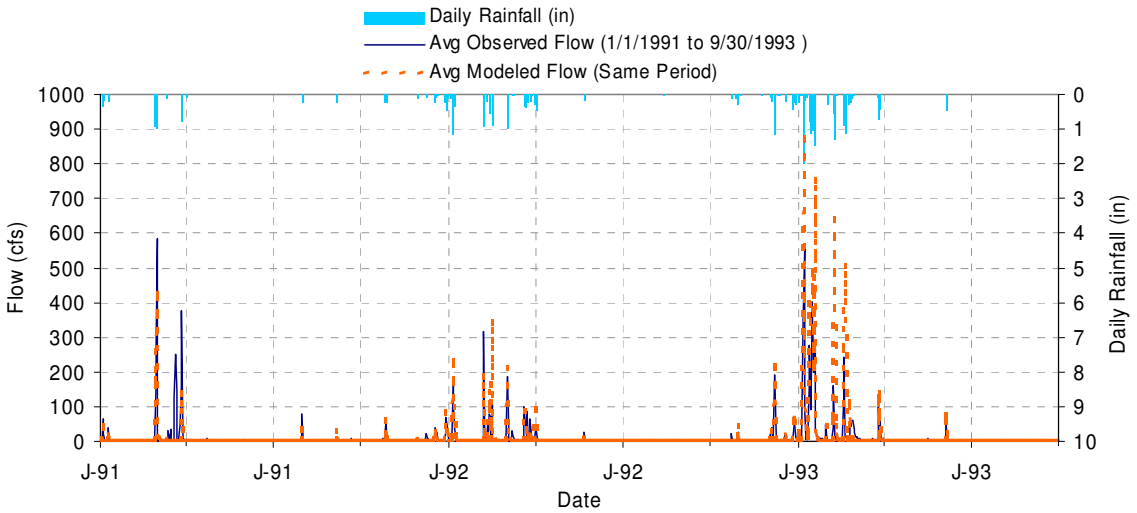

LSPC Simulated Flow		Observed Flow Gage		
REACH OUTFLOW FROM SUBBASIN 1843 2.75-Year Analysis Period: 1/1/1991 - 9/30/1993 Flow volumes are (inches/year) for upstream drainage area		**USGS 11022350 FORESTER C A EL CAJON CA** San Diego County, California Hydrologic Unit Code 18070304 Latitude 32°49'16", Longitude 116°58'32" NAD27 Drainage area 21.3 square miles		
Total Simulated In-stream Flow:	**6.50**	Total Observed In-stream Flow:		**5.96**
Total of simulated highest 10% flows:	**6.37**	Total of Observed highest 10% flows:		**5.32**
Total of Simulated lowest 50% flows:	**0.03**	Total of Observed Lowest 50% flows:		**0.13**
Simulated Summer Flow Volume (months 7-9):	**0.07**	Observed Summer Flow Volume (7-9):		**0.13**
Simulated Fall Flow Volume (months 10-12):	**0.50**	Observed Fall Flow Volume (10-12):		**0.55**
Simulated Winter Flow Volume (months 1-3):	**5.77**	Observed Winter Flow Volume (1-3):		**4.96**
Simulated Spring Flow Volume (months 4-6):	**0.16**	Observed Spring Flow Volume (4-6):		**0.32**
Total Simulated Storm Volume:	**5.58**	Total Observed Storm Volume:		**4.87**
Simulated Summer Storm Volume (7-9):	**0.05**	Observed Summer Storm Volume (7-9):		**0.07**
Errors (Simulated-Observed)	*Current Run (n)*	*Recommended Criteria*	*Run (n-1)*	*Run (n-2)*
Error in 10% highest flows:	16.45	15		
Error in storm volumes:	12.64	20		

Summary statistics of wet weather model hydrology validation to USGS gage 11039800 (Appendix G, No. 3).

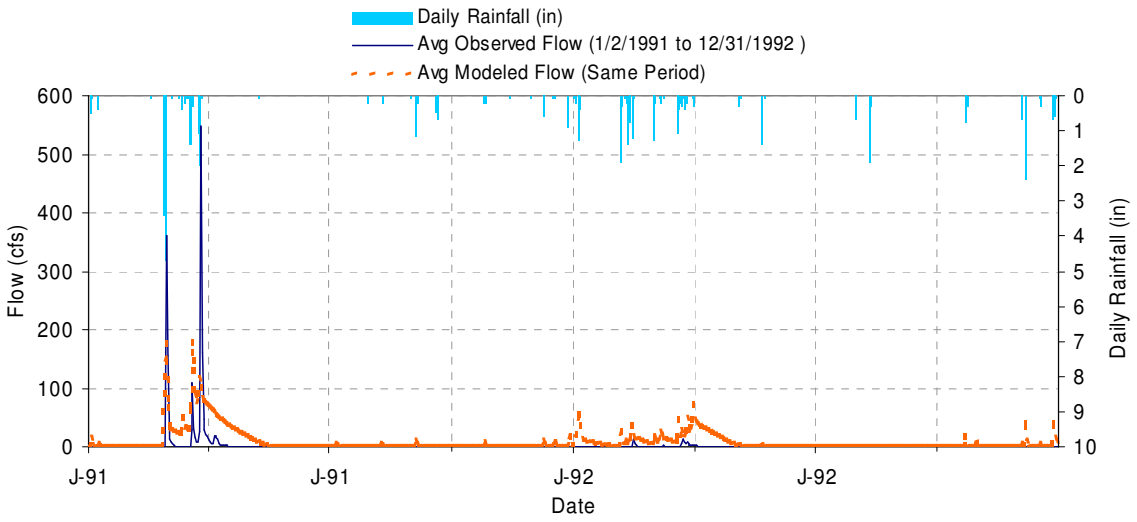

LSPC Simulated Flow		Observed Flow Gage		
REACH OUTFLOW FROM SUBBASIN 711 2-Year Analysis Period: 1/1/1991 - 12/31/1992 Flow volumes are (inches/year) for upstream drainage area		**USGS 11039800 SAN LUIS REY R A COUSER CYN BR NR PALA CA** San Diego County, California Hydrologic Unit Code 18070303 Latitude 33°20'26", Longitude 117°07'50" NAD27 Drainage area 364 square miles		
Total Simulated In-stream Flow:	**4.77**	Total Observed In-stream Flow:		**1.48**
Total of simulated highest 10% flows:	**3.30**	Total of Observed highest 10% flows:		**1.48**
Total of Simulated lowest 50% flows:	**0.00**	Total of Observed Lowest 50% flows:		**0.00**
Simulated Summer Flow Volume (months 7-9):	**0.03**	Observed Summer Flow Volume (7-9):		**0.00**
Simulated Fall Flow Volume (months 10-12):	**0.23**	Observed Fall Flow Volume (10-12):		**0.00**
Simulated Winter Flow Volume (months 1-3):	**2.75**	Observed Winter Flow Volume (1-3):		**1.36**
Simulated Spring Flow Volume (months 4-6):	**1.77**	Observed Spring Flow Volume (4-6):		**0.12**
Total Simulated Storm Volume:	**1.41**	Total Observed Storm Volume:		**1.24**
Simulated Summer Storm Volume (7-9):	**0.03**	Observed Summer Storm Volume (7-9):		**0.00**
Errors (Simulated-Observed)	*Current Run (n)*	*Recommended Criteria*	*Run (n-1)*	*Run (n-2)*
Error in 10% highest flows:	55.14	15		
Error in storm volumes:	11.54	20		

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Appendix N

Comparison of Wet Weather Modeling Results to Observed Densities

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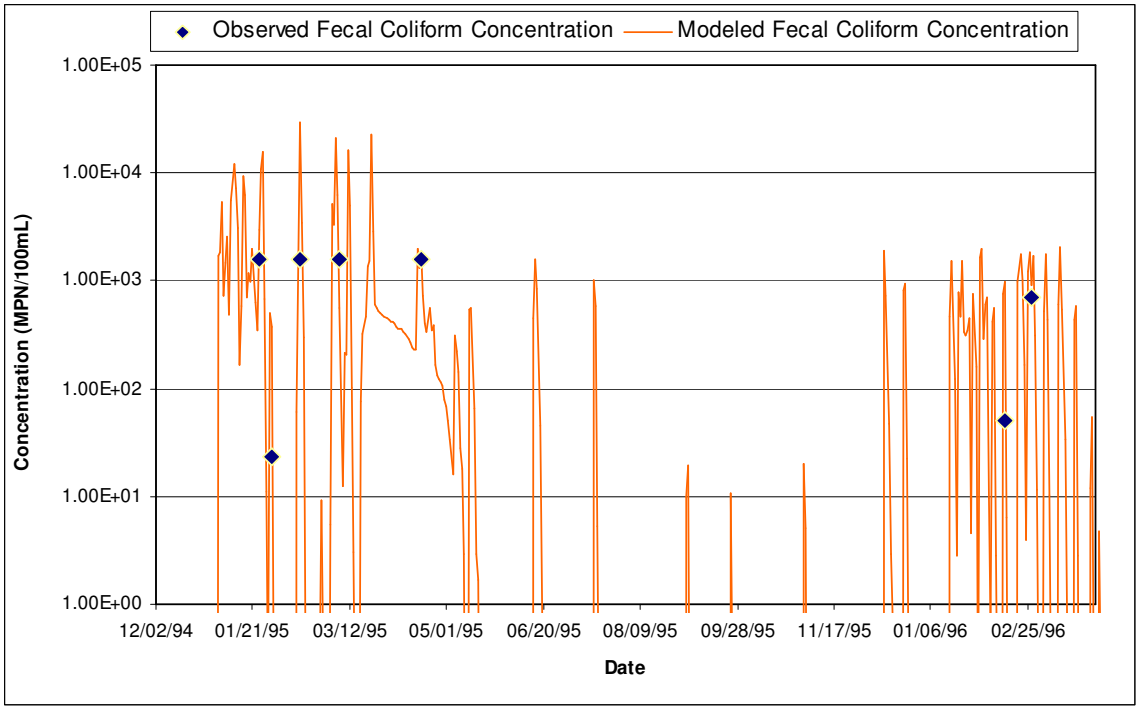

Figure N-1-A. Time-series comparison of modeled and observed wet weather fecal coliform densities in the Santa Margarita River watershed (Appendix G, No. 8 [station #4] and No. 9 [plant #13])

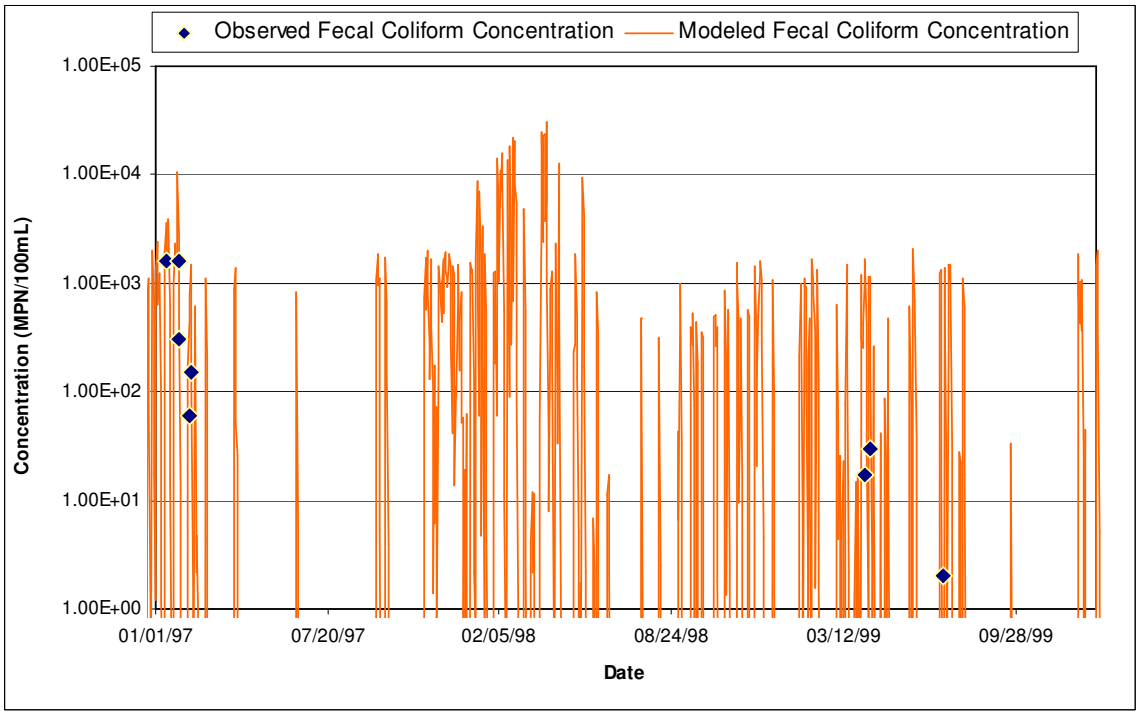

Figure N-1-B. Time-series comparison of modeled and observed wet weather fecal coliform densities in the Santa Margarita River watershed (Appendix G, No. 8 [station #4] and No. 9 [plant #13])

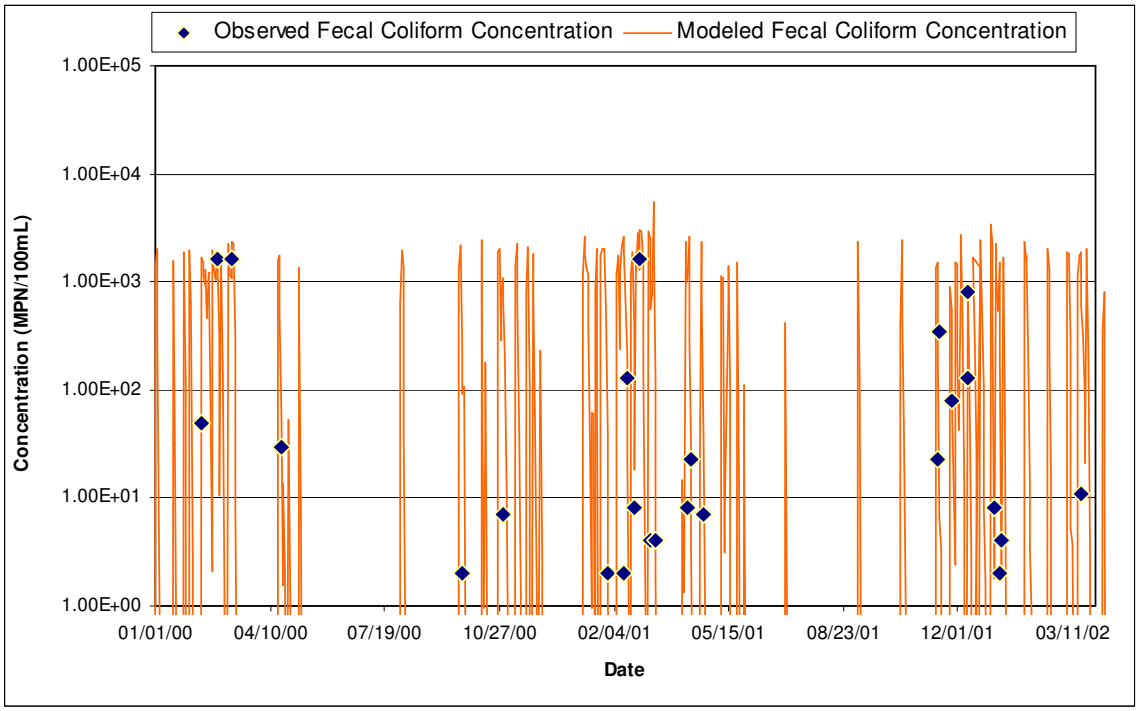

Figure N-1-C. Time-series comparison of modeled and observed wet weather fecal coliform densities in the Santa Margarita River watershed (Appendix G, No. 8 [station #4] and No. 9 [plant #13])

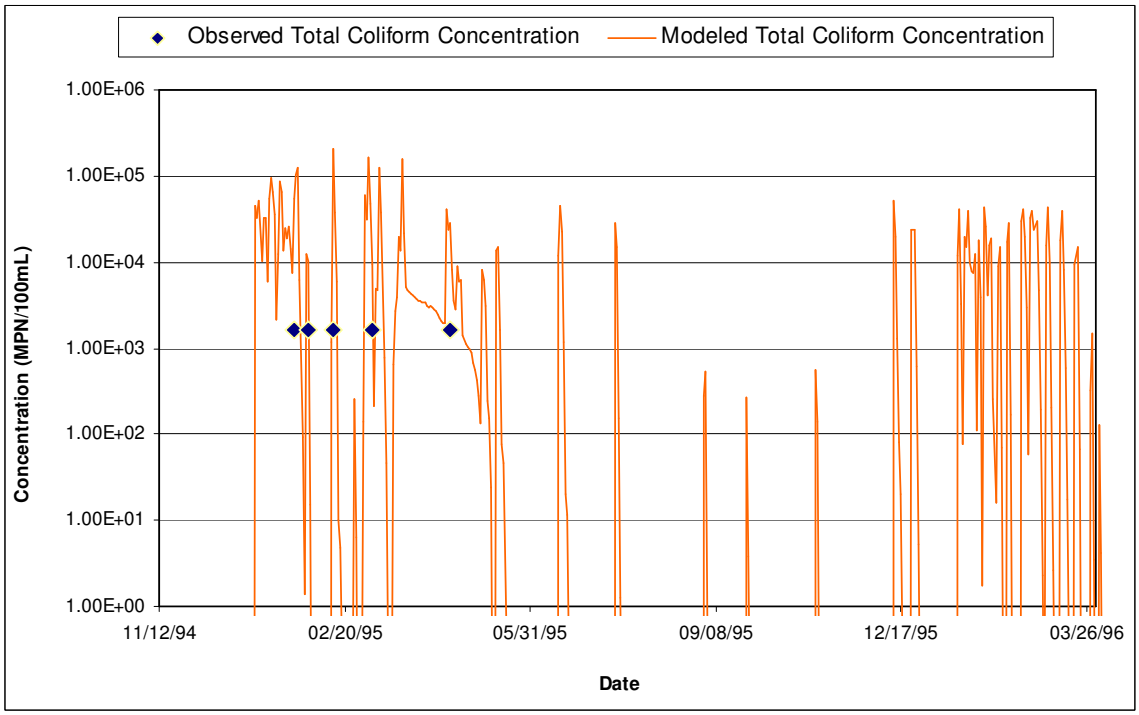

Figure N-2. Time-series comparison of modeled and observed wet weather total coliform densities in the Santa Margarita River watershed (Appendix G, No. 8 [station #4] and No. 9 [plant #13])

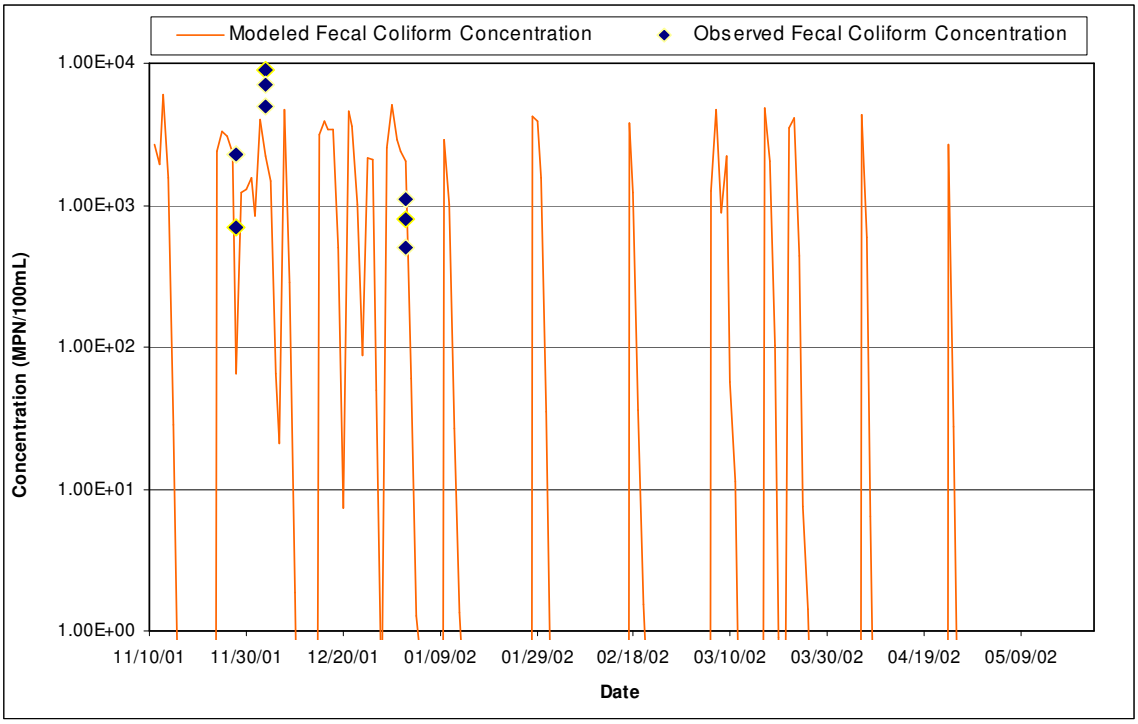

Figure N-3. Time-series comparison of modeled and observed wet weather fecal coliform densities in the Aliso Creek watershed (Appendix G, No. 10 [station J01 at TP and U/S J01/J02])

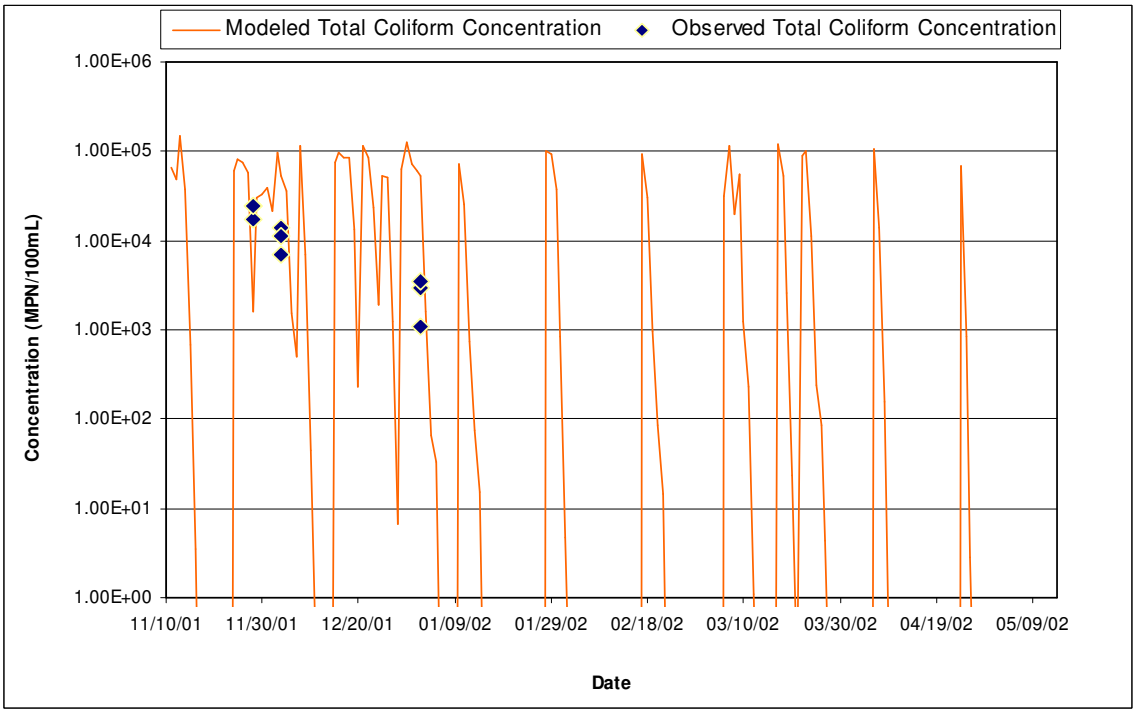

Figure N-4. Time-series comparison of modeled and observed wet weather total coliform densities in the Aliso Creek watershed for stations (Appendix G, No. 10 [station J01 at TP and U/S J01/J02])

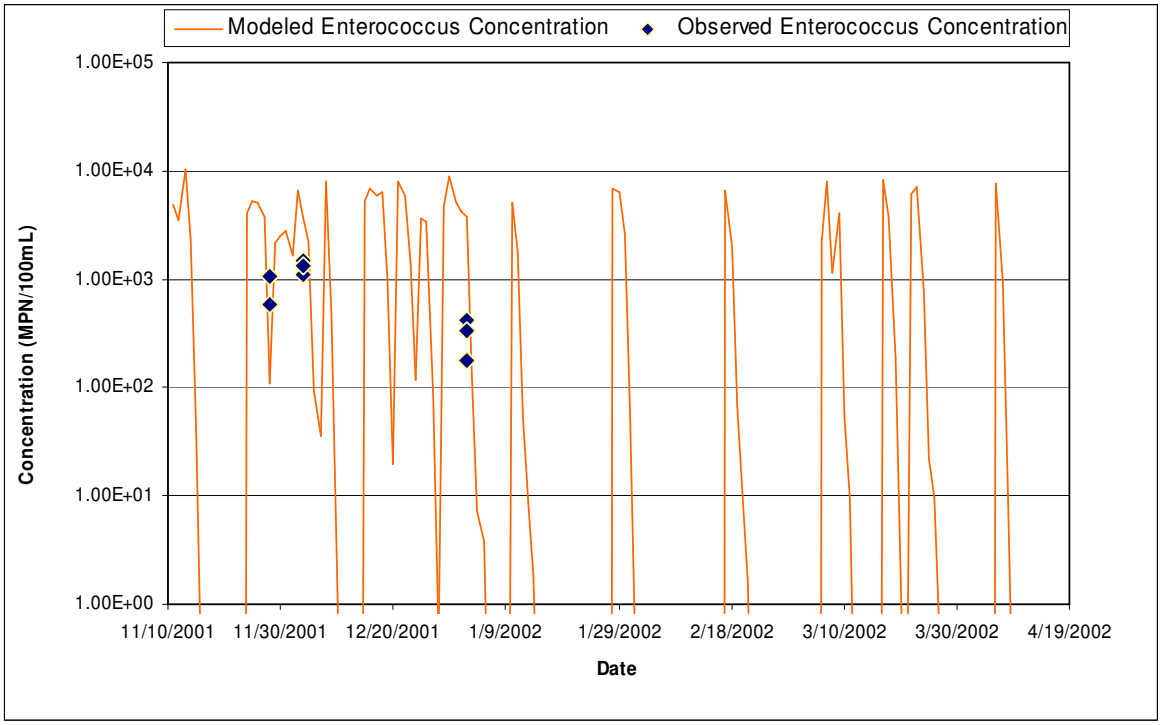

Figure N-5. Time-series comparison of modeled and observed wet weather enterococcus densities in the Aliso Creek watershed for stations (Appendix G, No. 10 [station J01 at TP and U/S J01/J02])

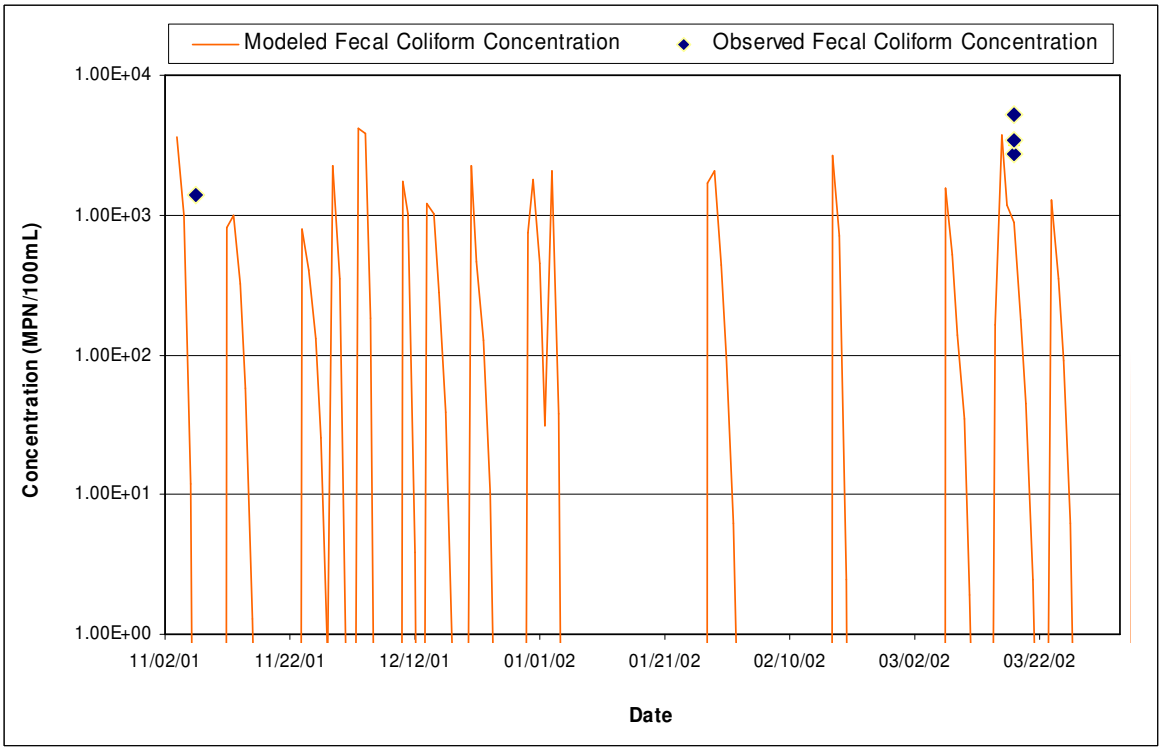

Figure N-6. Time-series comparison of modeled and observed wet weather fecal coliform densities in the Rose Creek watershed (Appendix G, No. 12 [stations MBW 20 and MBW 21])

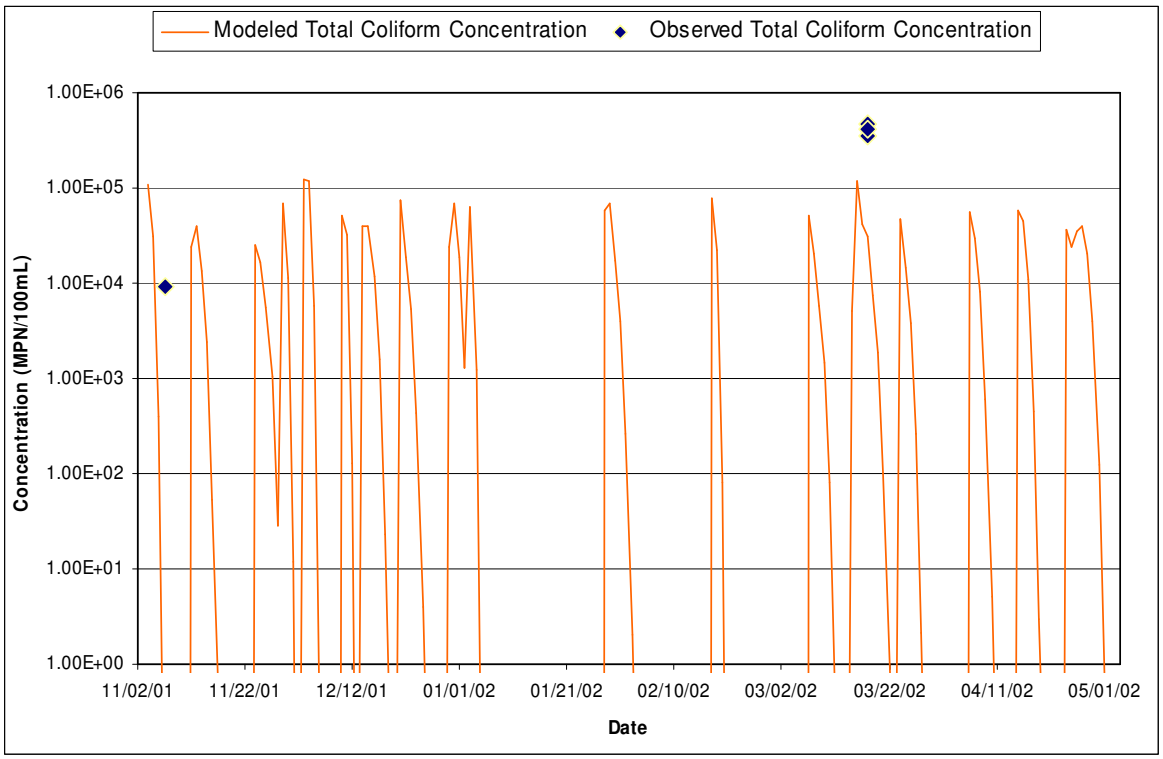

Figure N-7. Time-series comparison of modeled and observed wet weather total coliform densities in the Rose Creek watershed (Appendix G, No. 12 [stations MBW 19, MBW 20 and MBW 21]).

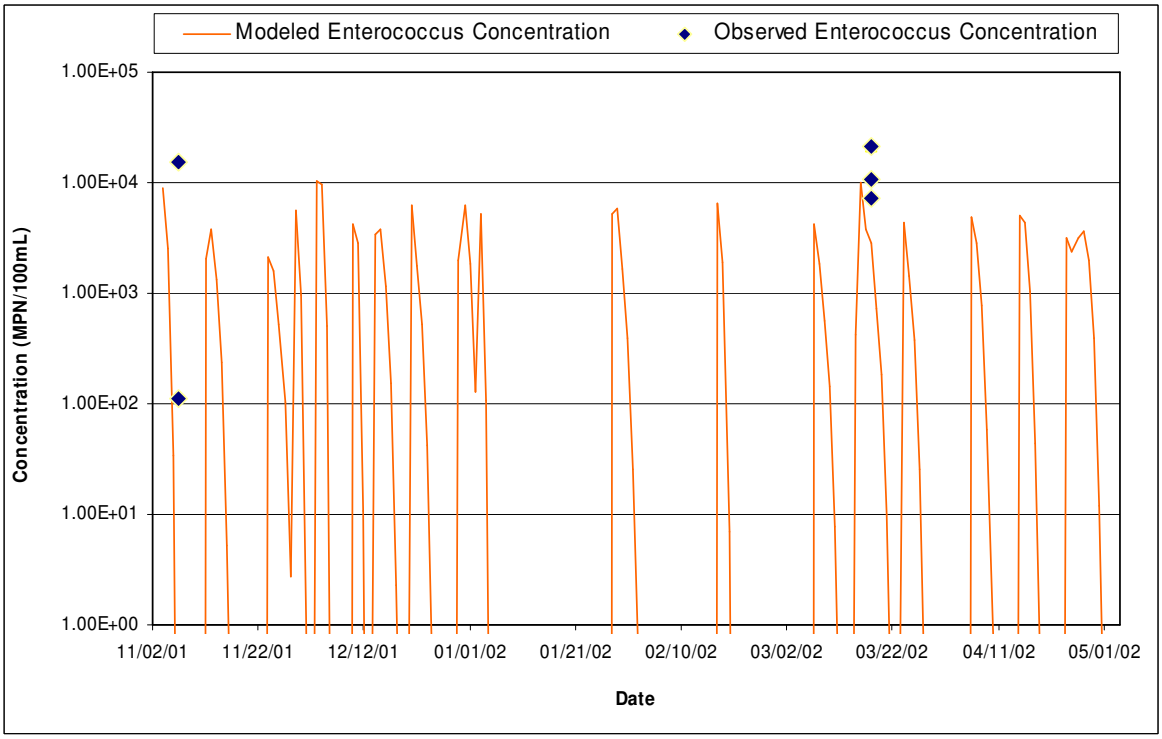

Figure N-8. Time-series comparison of modeled and observed wet weather enterococcus densities in the Rose Creek watershed (Appendix G, No. 12 [stations MBW 19, MBW 20 and MBW 21])

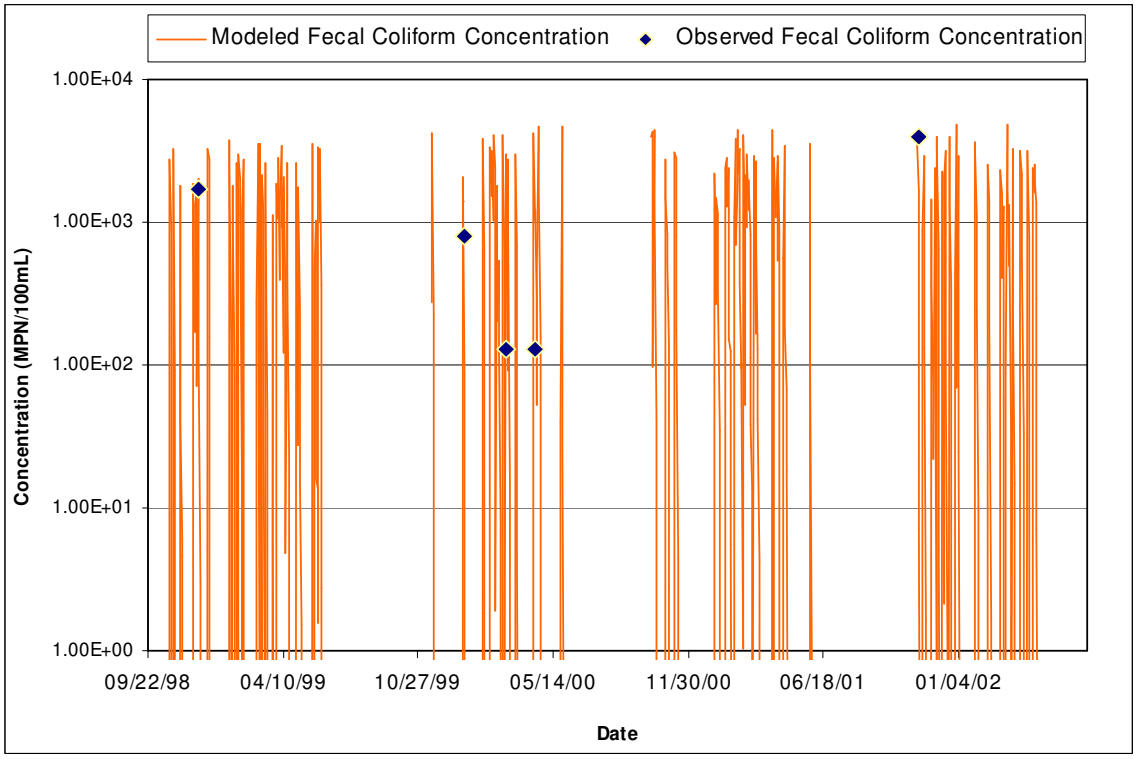

Figure N-9. Time-series comparison of modeled and observed wet weather fecal coliform densities in the San Diego River watershed (Appendix G, No. 13 [station 1])

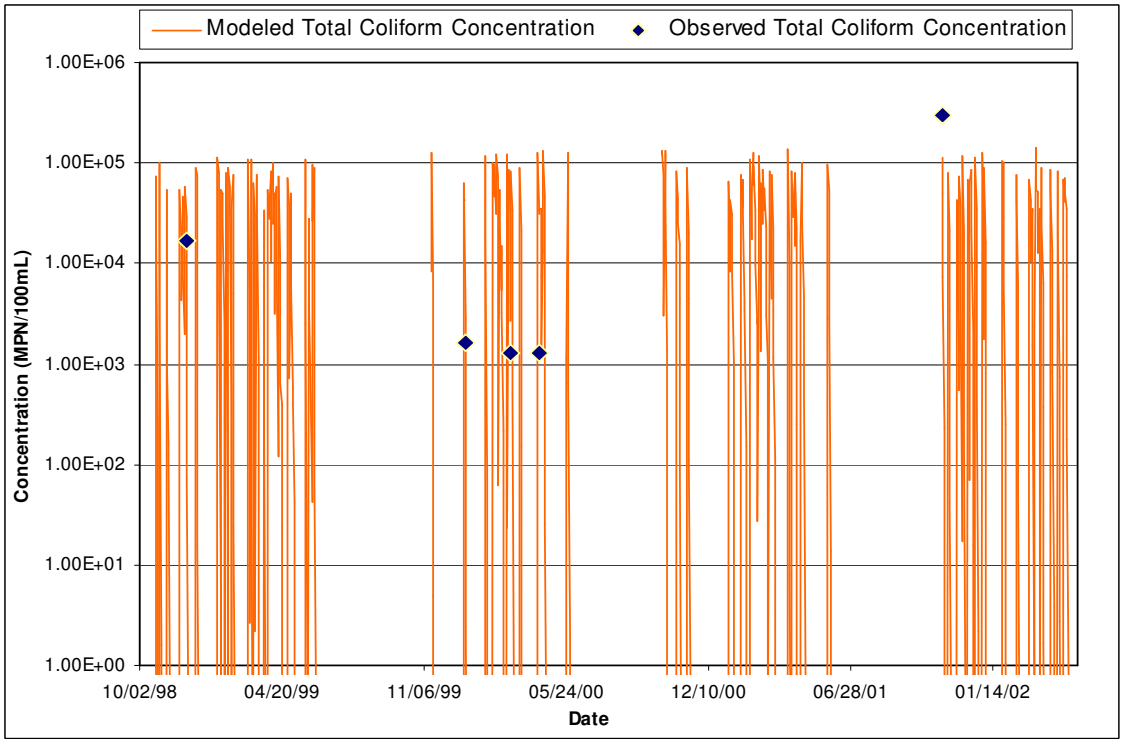

Figure N-10. Time-series comparison of modeled and observed wet weather total coliform densities in the San Diego River watershed (Appendix G, No. 13 [station 1])

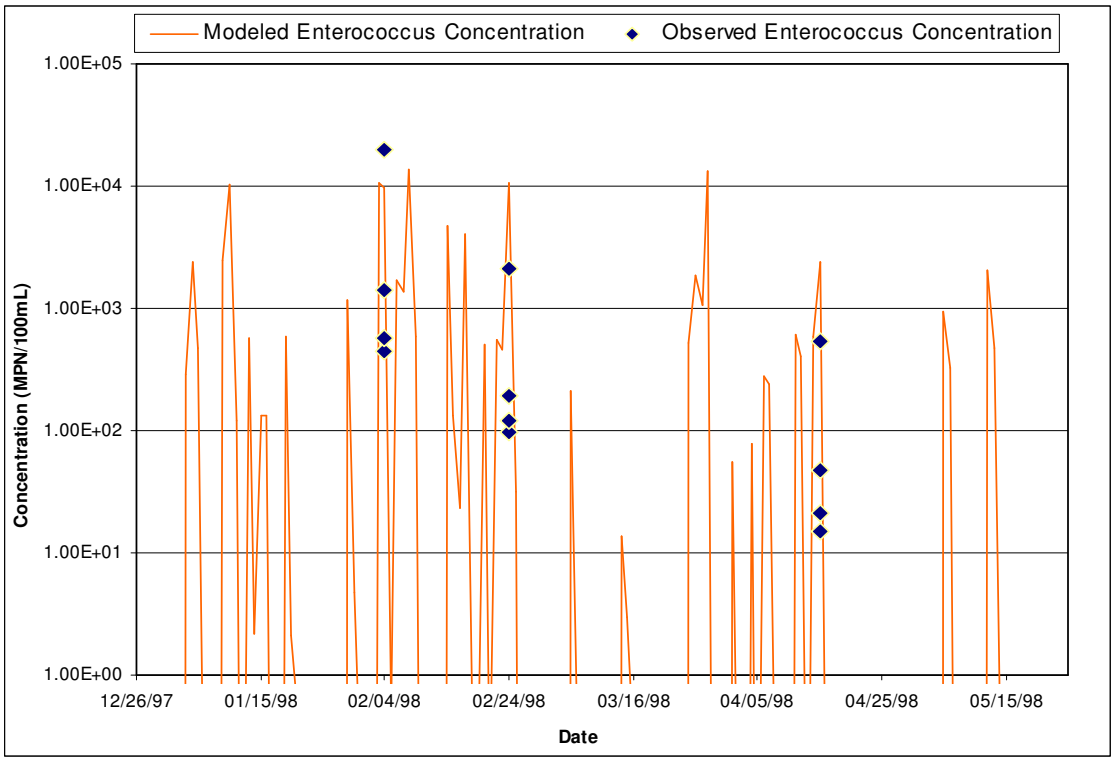

Figure N-11. Time-series comparison of modeled and observed wet weather enterococcus densities in the Pine Valley watershed (Appendix G, No.14 [stations NPC3C, NPC3D, and PVC1A])

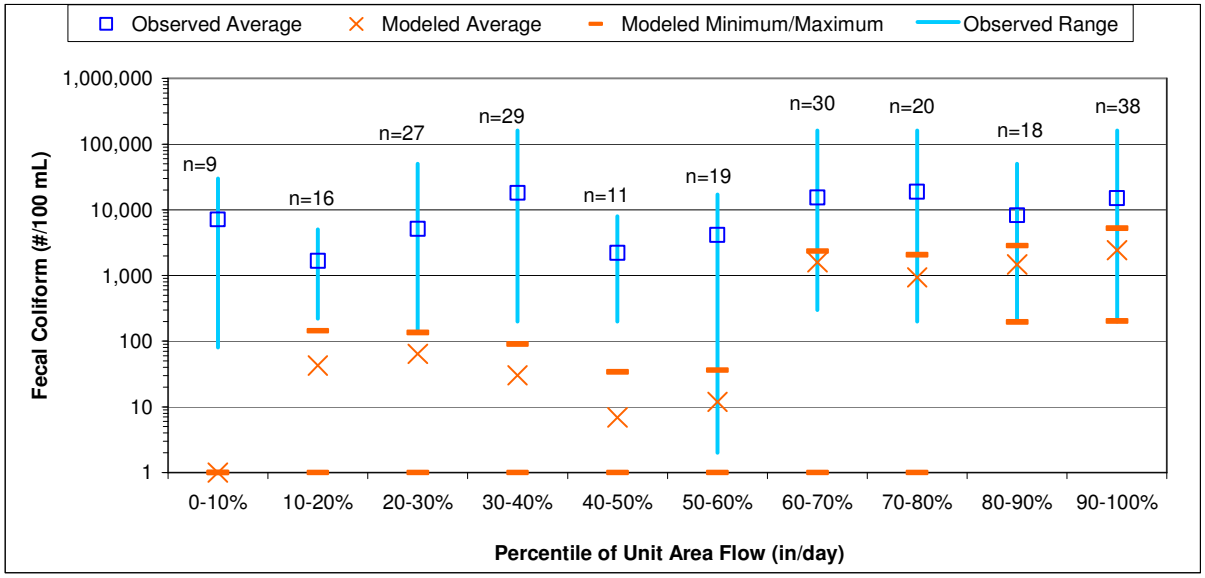

Figure N-12. Graphical comparison of LSPC model results and observed fecal coliform data in the Aliso Creek watershed (Appendix G, No.10)

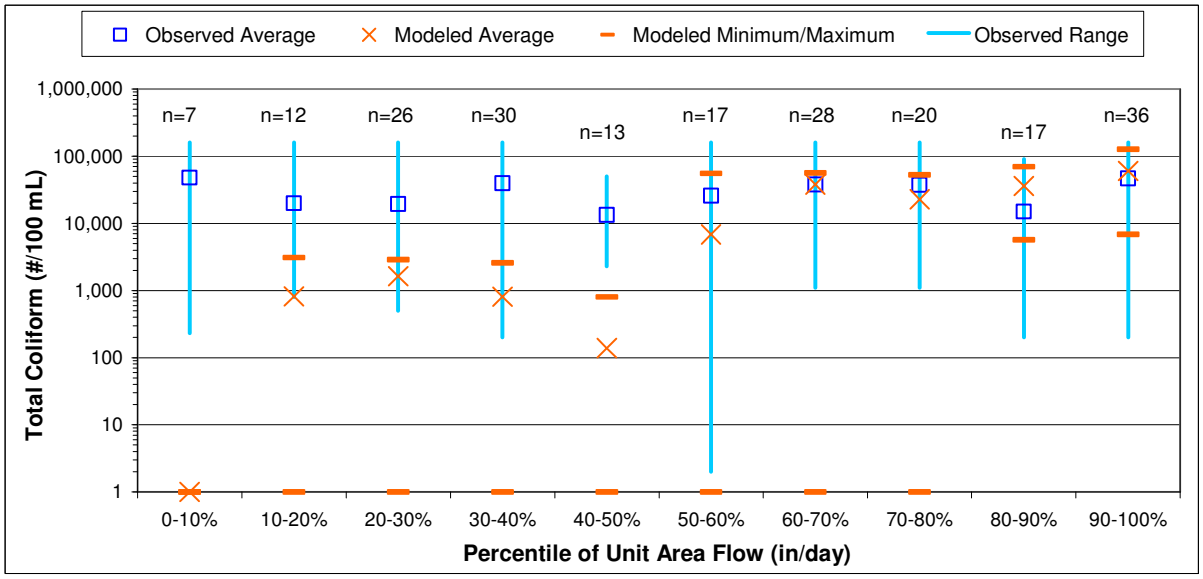

Figure N-13. Graphical comparison of LSPC model results and observed total coliform data in the Aliso Creek watershed (Appendix G, No.10)

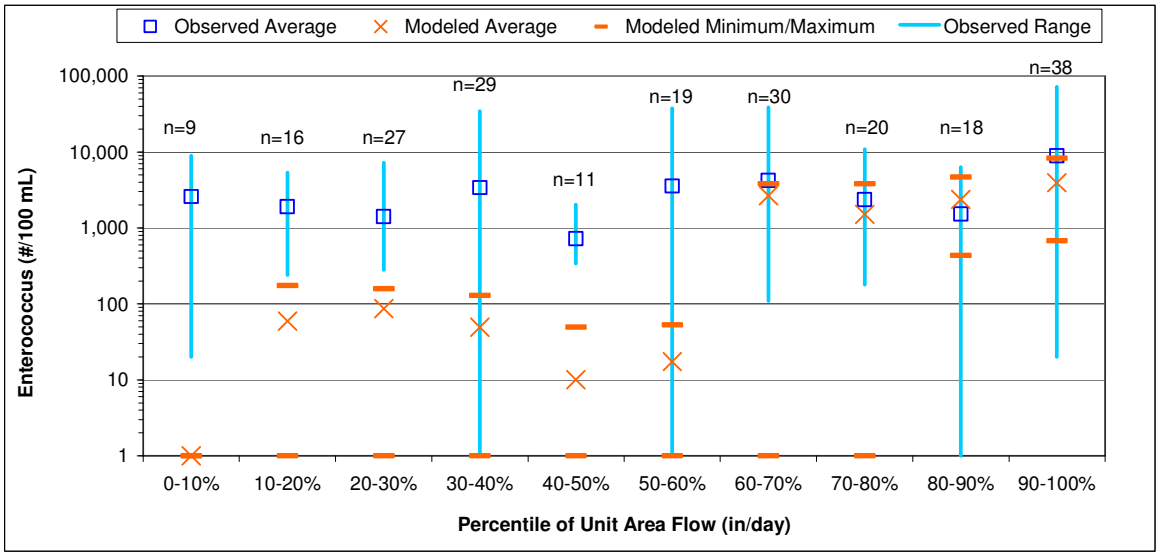

Figure N-14. Graphical comparison of LSPC model results and observed enterococcus data in the Aliso Creek watershed (Appendix G, No.10)

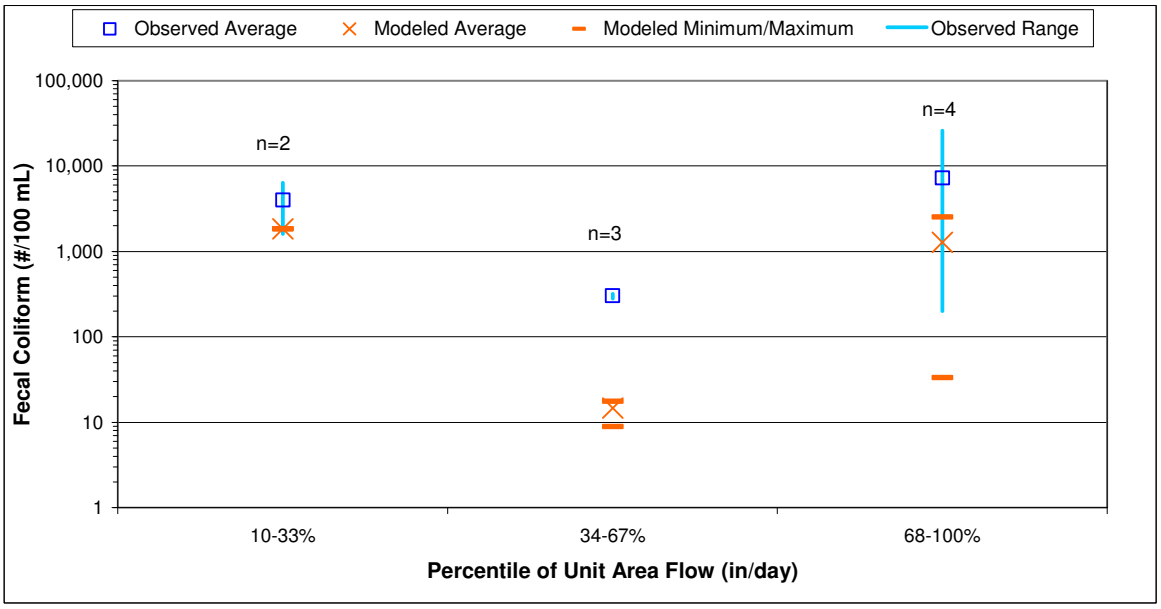

Figure N-15. Graphical comparison of LPSC model results and observed fecal coliform data in the San Juan Creek watershed (Appendix G, No 11)

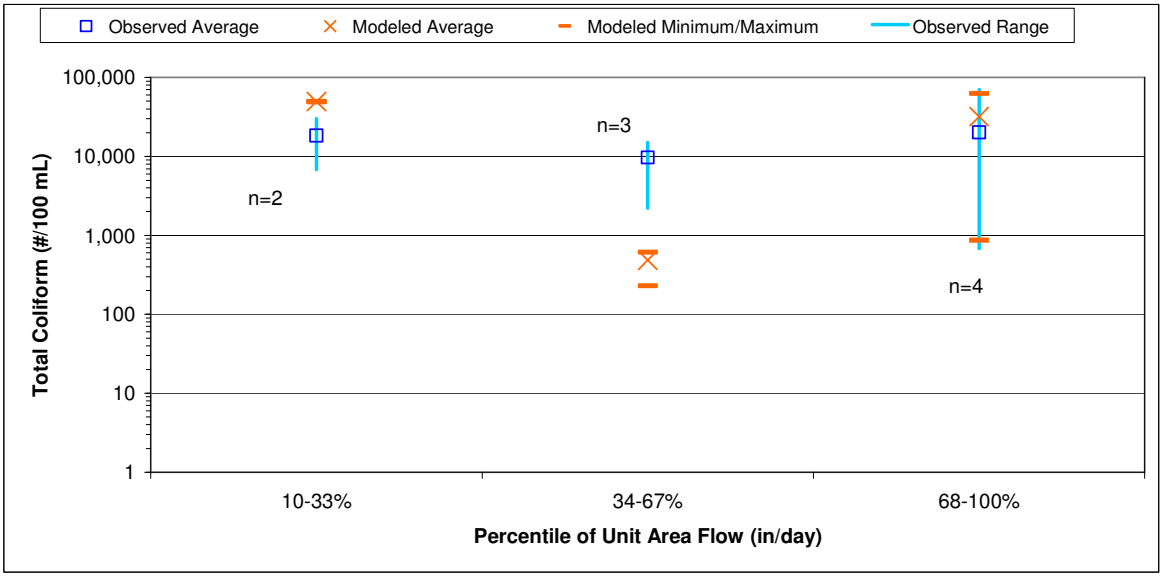

Figure N-16. Graphical comparison of LPSC model results and observed total coliform data in the San Juan Creek watershed (Appendix G, No 11)

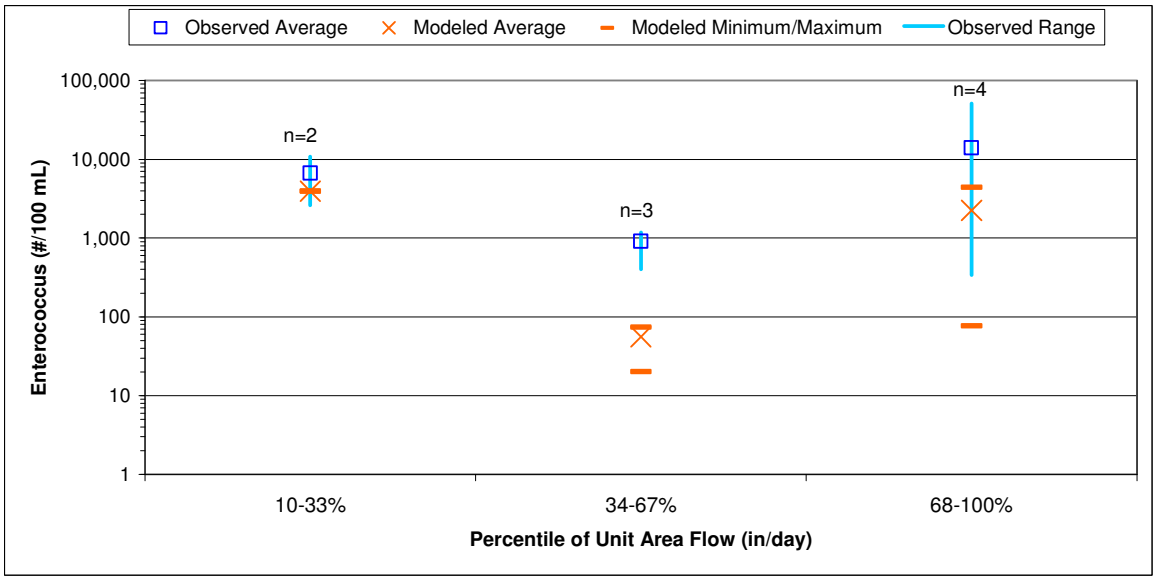

Figure N-17. Graphical comparison of LPSC model results and observed enterococcus data in the San Juan Creek watershed (Appendix G, No 11)

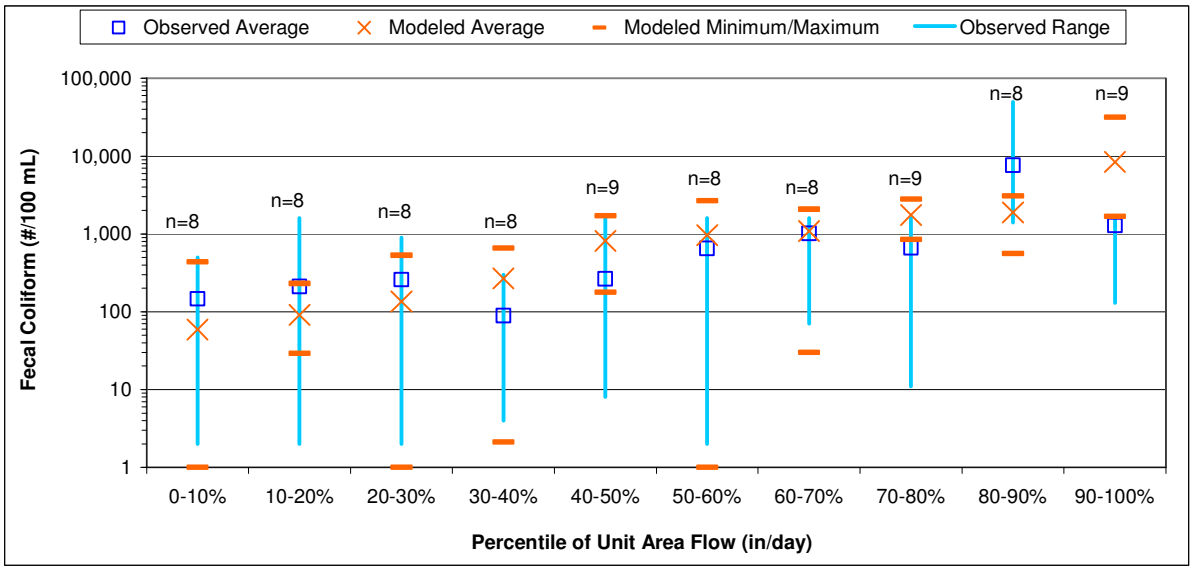

Figure N-18. Graphical comparison of LPSC model results and observed fecal coliform data in the Santa Margarita River watershed (Appendix G, No. 8 and 9)

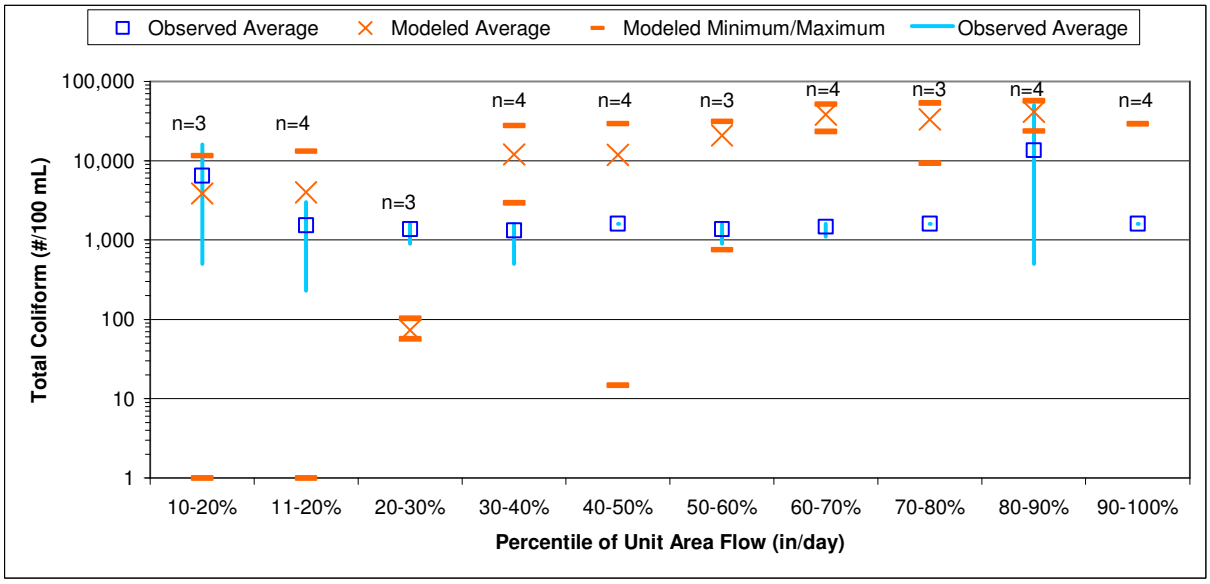

Figure N-19. Graphical comparison of LPSC model results and observed total coliform data in the Santa Margarita River watershed (Appendix G, No. 8 and 9)

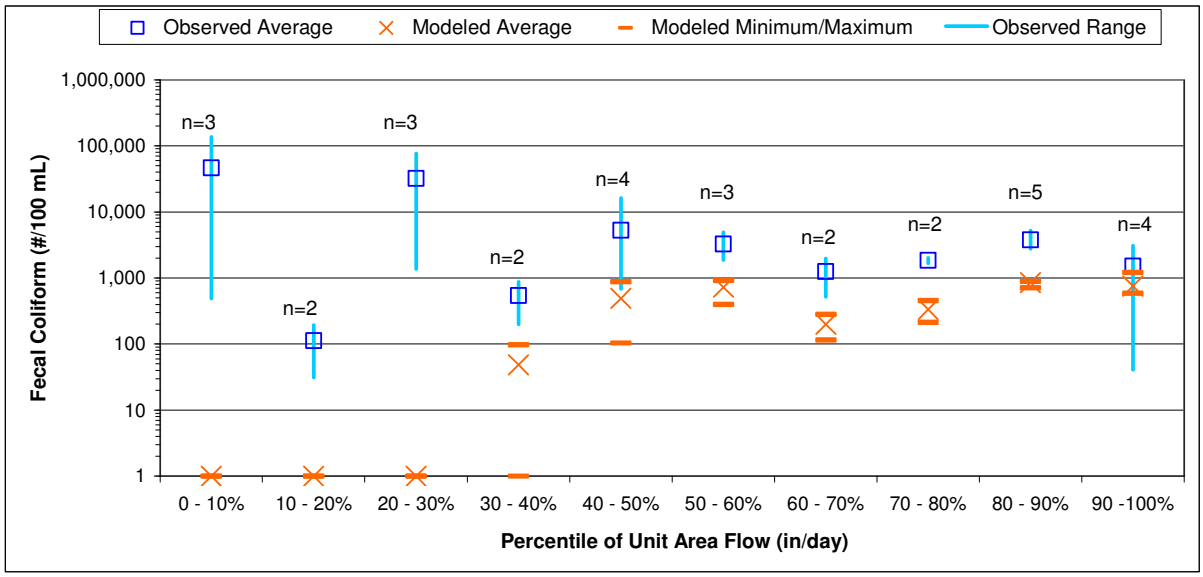

Figure N-20. Graphical comparison of LPSC model results and observed fecal coliform data in the Rose Creek and Tecolote Creek watersheds (Appendix G, No. 12)

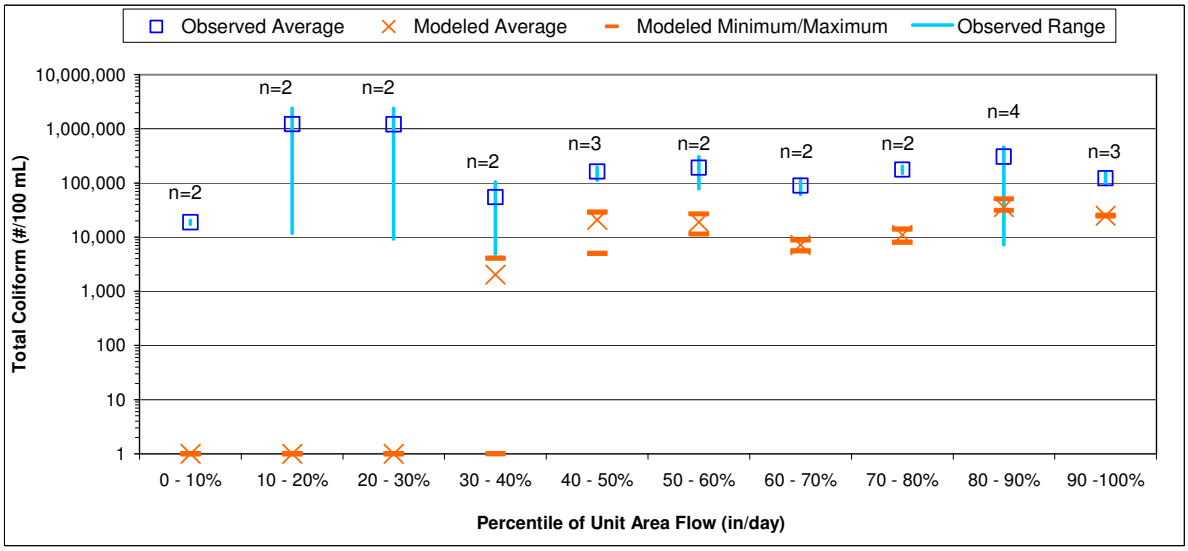

Figure 21. Graphical comparison of LPSC model results and observed total coliform data in the Rose Creek and Tecolote Creek watersheds (Appendix G, No. 12)

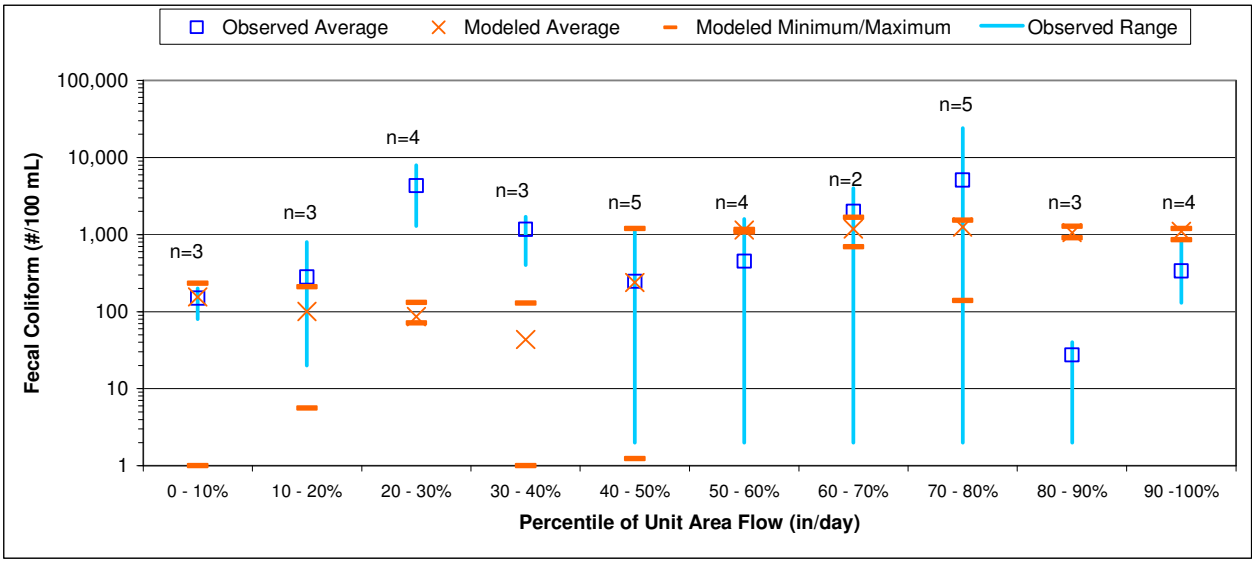

Figure N-22. Graphical comparison of LPSC model results and observed enterococcus data in the Rose Creek and Tecolote Creek watersheds (Appendix G, No. 12)

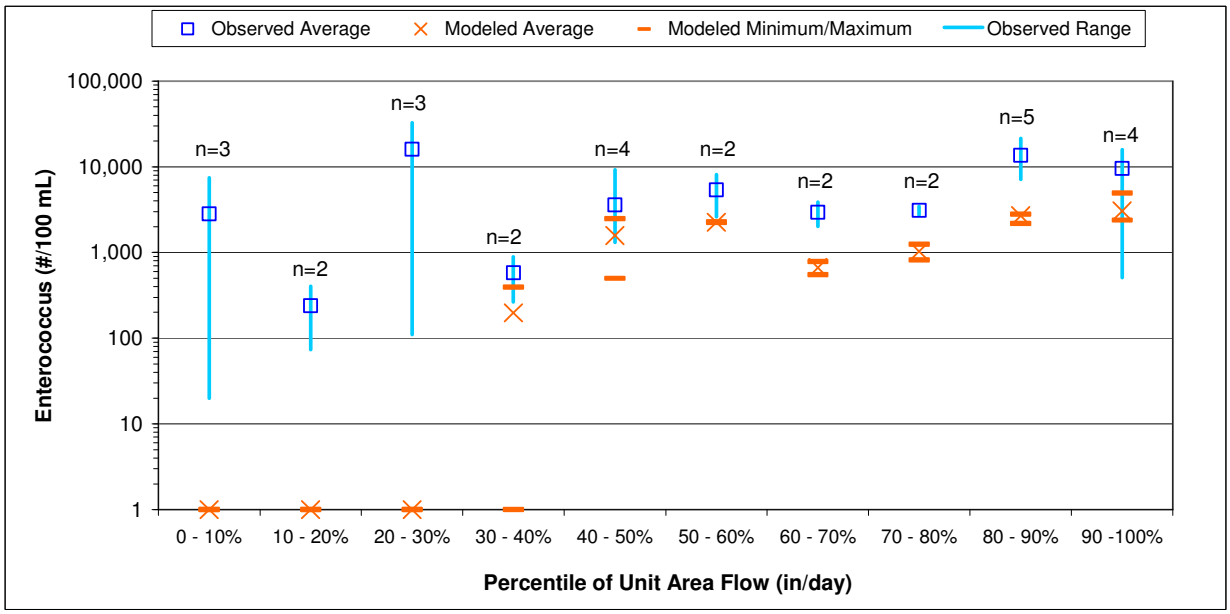

Figure N-23. Graphical comparison of LPSC model results and observed fecal coliform data in the San Diego River watershed (Appendix G, No. 13)

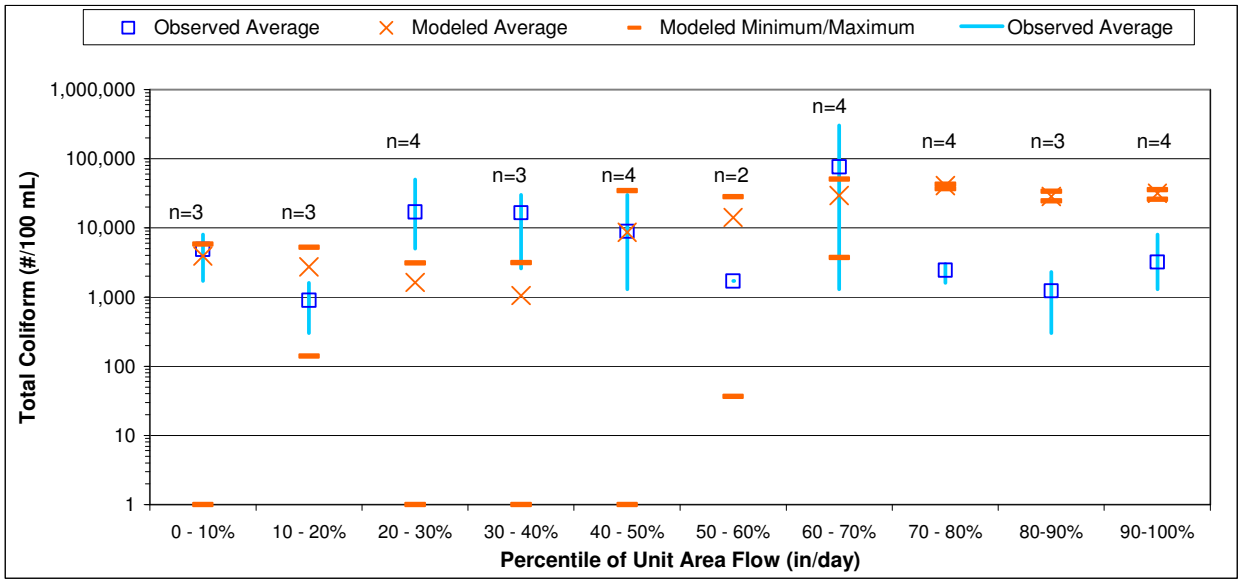

Figure N-24. Graphical comparison of LPSC model results and observed total coliform data in the San Diego River watershed (Appendix G, No. 13)

Appendix O

Wet Weather
Bacteria Load Duration Curves

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San Joaquin Hills HSA/Laguna Beach HSA

Load Duration Curves

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Table O-1. Subwatershed 101 Fecal Coliform Load Duration Curve

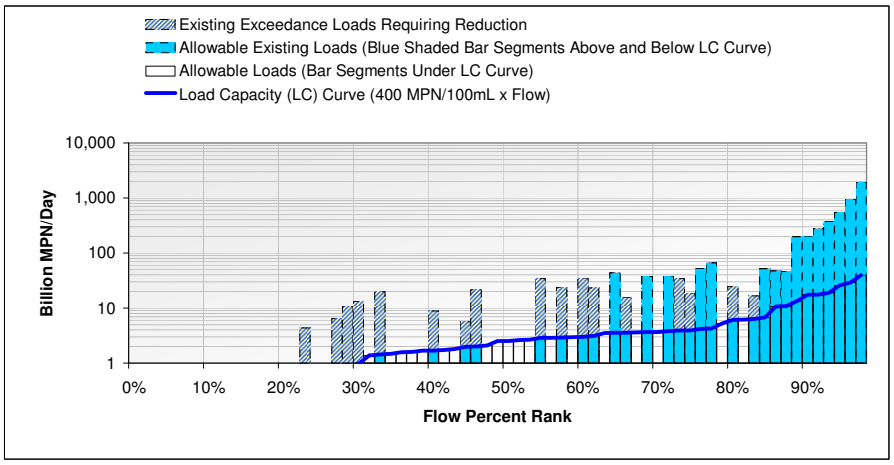

Subwatershed 101 Fecal Coliform Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	69	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	33	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	15	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	18	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**5,179**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	255	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	4,651	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**4,906**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**272**	**Billion MPN/Year**

Table O-2. Subwatershed 101 Total Coliform Load Duration Curve

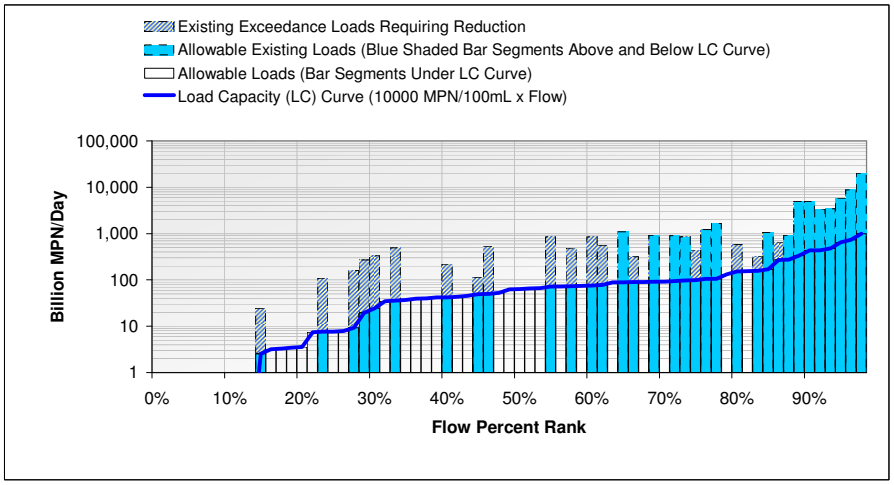

Subwatershed 101 Total Coliform Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	69	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	33	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	15	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	18	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**67,350**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	6,386	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	54,954	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**61,340**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**6,010**	**Billion MPN/Year**

Table O-3. Subwatershed 101 Enterococcus Load Duration Curve

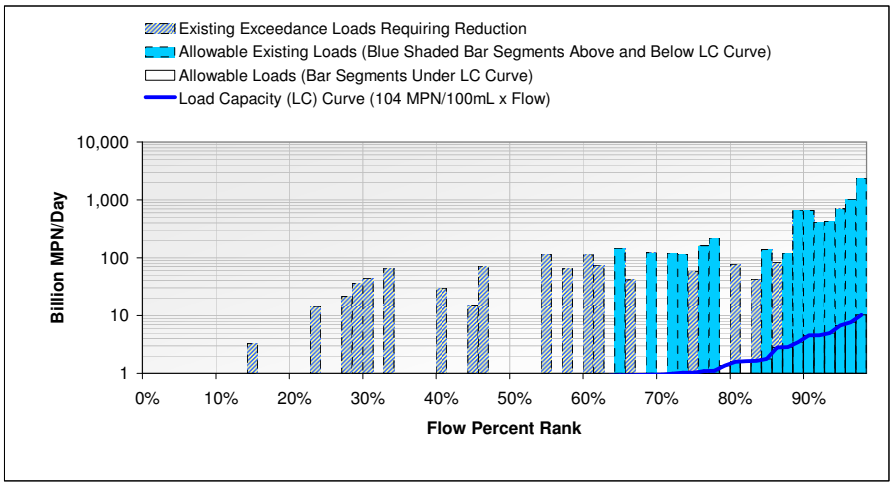

Subwatershed 101 Enterococcus Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	69	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	33	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	15	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	18	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**8,374**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	66	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	7,356	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**7,422**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**952**	**Billion MPN/Year**

Table O-4. Subwatershed 103 Fecal Coliform Load Duration Curve

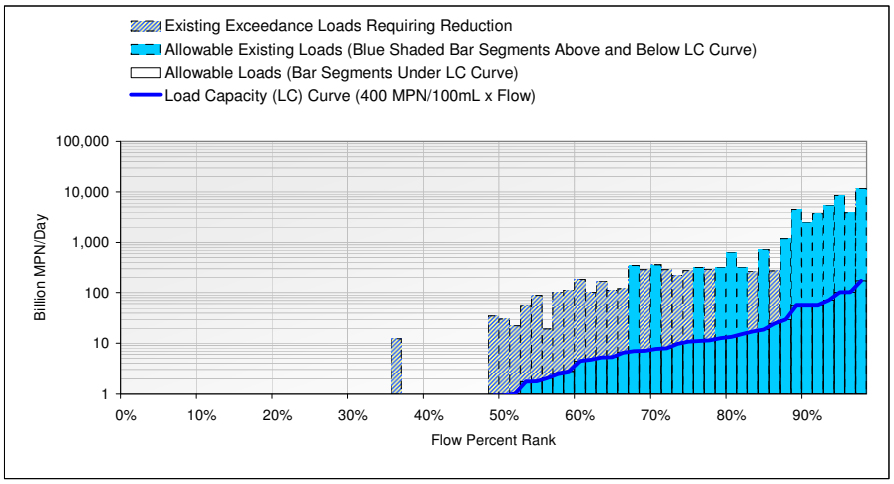

Subwatershed 103 Fecal Coliform Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	69	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	36	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	15	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	21	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**47,497**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	864	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	43,703	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**44,568**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**2,930**	**Billion MPN/Year**

Table O-5. Subwatershed 103 Total Coliform Load Duration Curve

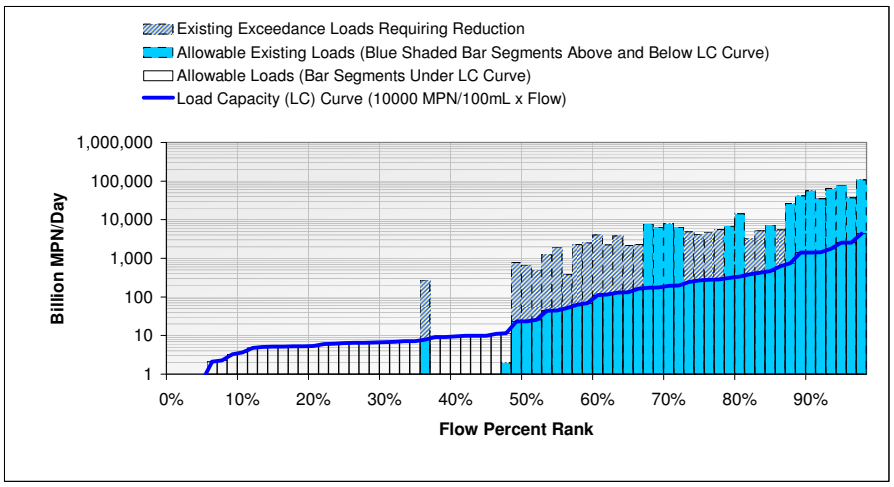

Subwatershed 103 Total Coliform Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	69	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	36	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	15	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	21	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**561,319**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	21,610	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	484,661	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**506,271**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**55,048**	**Billion MPN/Year**

Table O-6. Subwatershed 103 Enterococcus Load Duration Curve

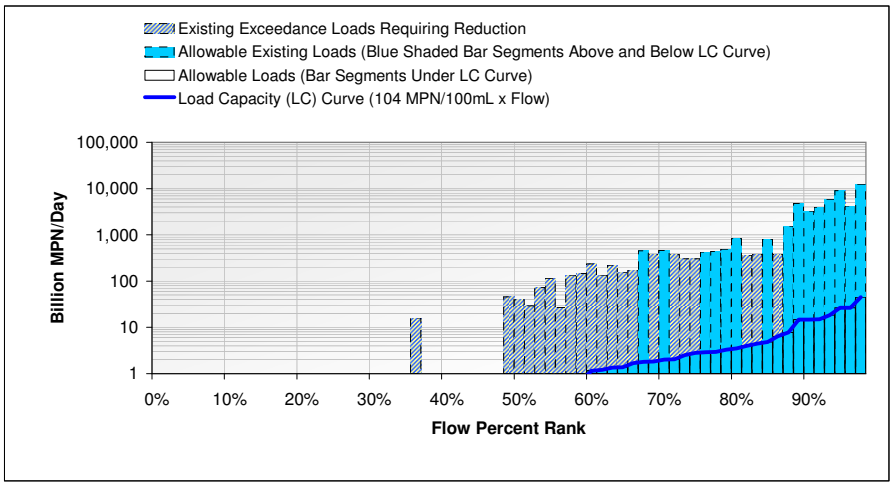

Subwatershed 103 Enterococcus Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	69	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	37	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	15	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	22	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**52,977**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	225	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	48,772	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**48,997**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**3,980**	**Billion MPN/Year**

Table O-7. Subwatershed 104 Fecal Coliform Load Duration Curve

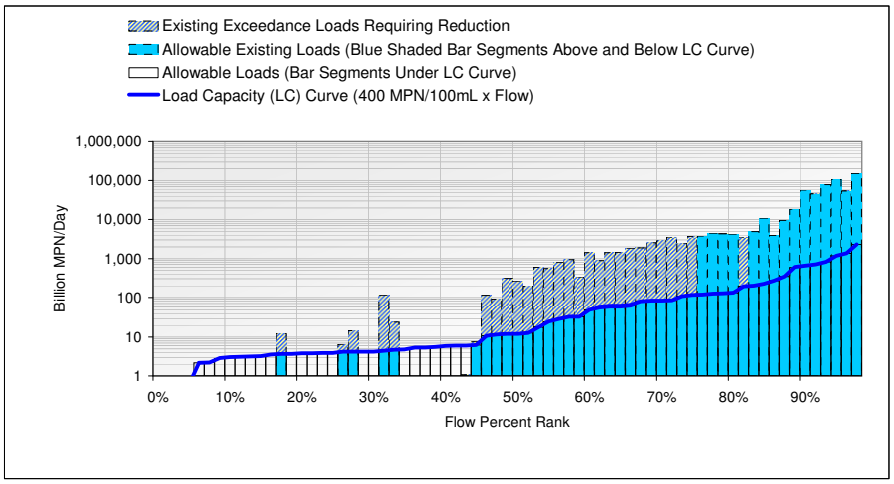

Subwatershed 104 Fecal Coliform Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	69	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	43	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	15	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	28	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**592,496**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	10,417	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	551,370	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**561,787**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**30,709**	**Billion MPN/Year**

Table O-8. Subwatershed 104 Total Coliform Load Duration Curve

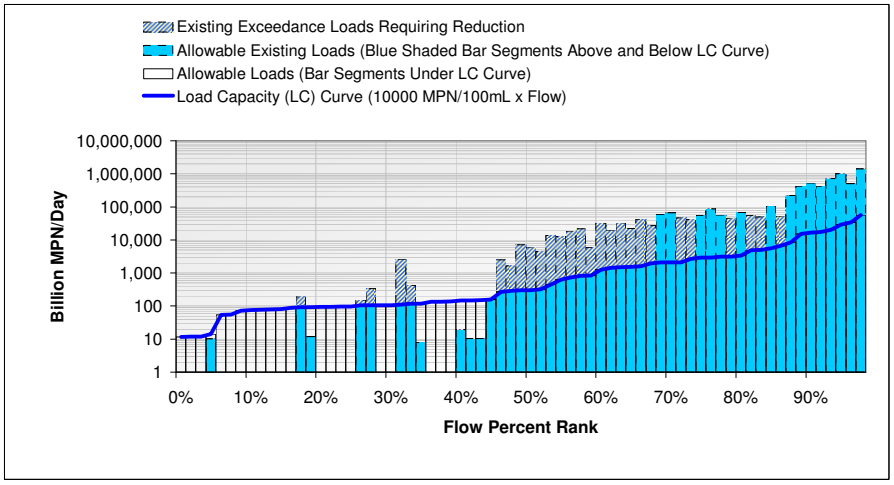

Subwatershed 104 Total Coliform Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	69	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	43	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	15	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	28	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**6,278,214**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	260,396	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	5,489,973	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**5,750,369**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**527,845**	**Billion MPN/Year**

Table O-9. Subwatershed 104 Enterococcus Load Duration Curve

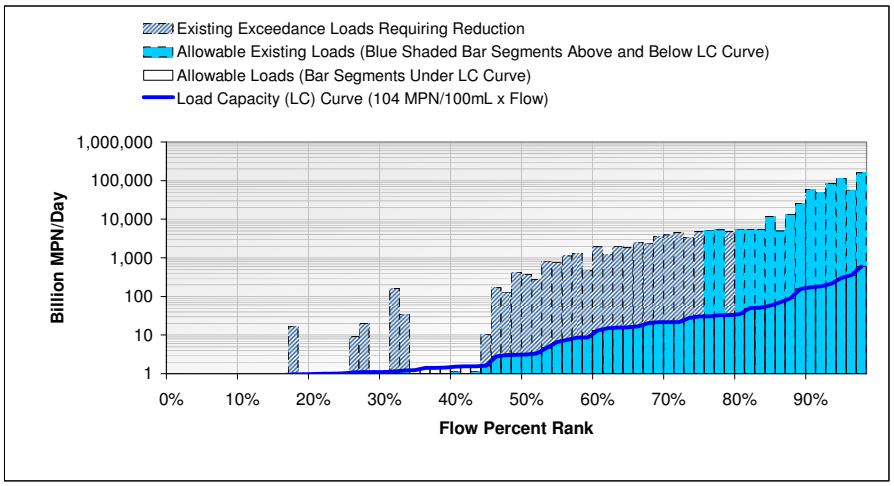

Subwatershed 104 Enterococcus Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	69	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	44	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	15	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	29	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**650,651**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	2,712	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	605,227	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**607,939**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**42,711**	**Billion MPN/Year**

Table O-10. Subwatershed 105 Fecal Coliform Load Duration Curve

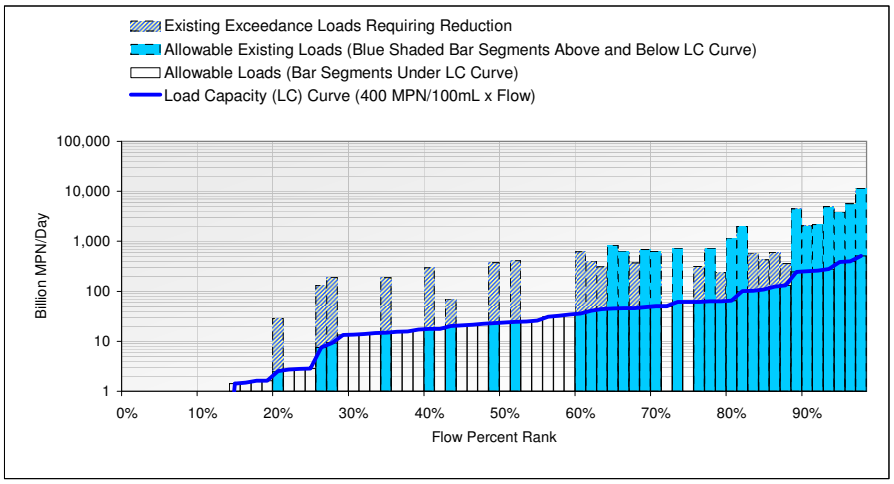

Subwatershed 105 Fecal Coliform Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	69	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	33	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	15	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	18	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**47,842**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	3,688	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	39,125	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**42,814**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**5,029**	**Billion MPN/Year**

Table O-11. Subwatershed 105 Total Coliform Load Duration Curve

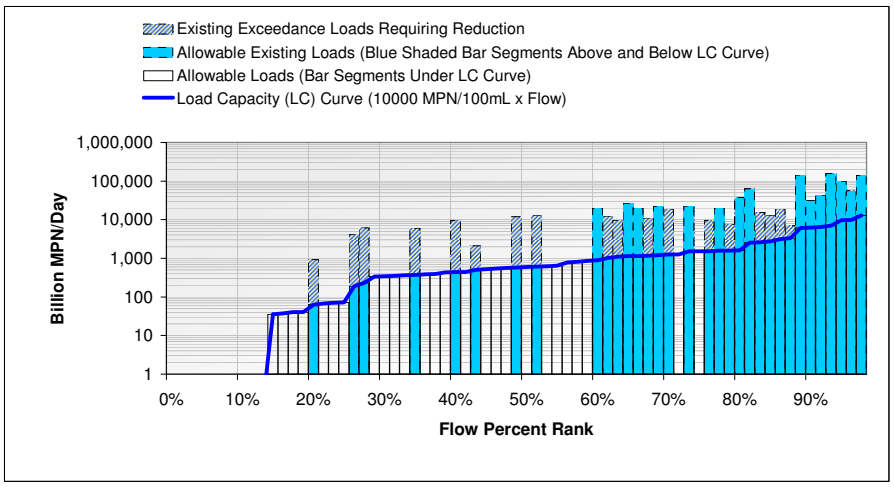

Subwatershed 105 Total Coliform Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	69	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	33	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	15	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	18	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**1,076,489**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	92,211	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	829,984	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**922,195**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**154,294**	**Billion MPN/Year**

Table O-12. Subwatershed 105 Enterococcus Load Duration Curve

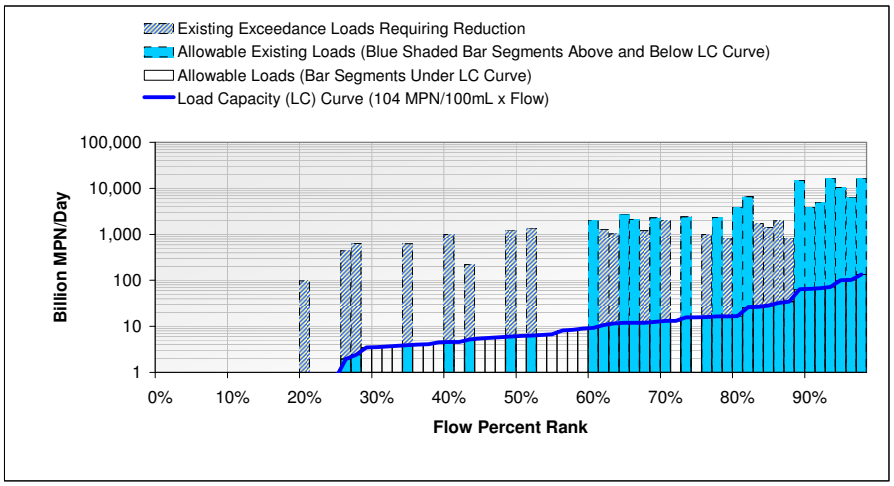

Subwatershed 105 Enterococcus Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	69	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	33	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	15	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	18	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**117,393**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	959	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	97,724	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**98,683**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**18,710**	**Billion MPN/Year**

Table O-13. Subwatershed 106 Fecal Coliform Load Duration Curve

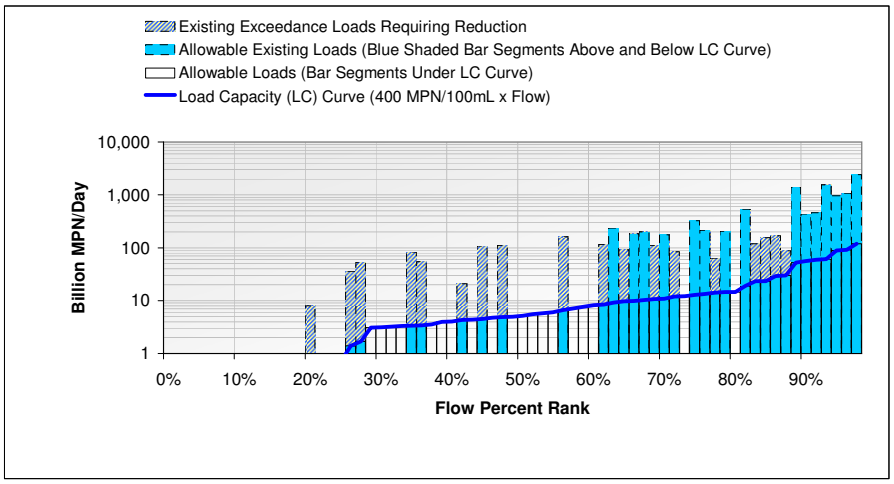

Subwatershed 106 Fecal Coliform Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	69	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	33	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	15	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	18	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**12,001**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	818	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	9,742	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**10,559**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**1,441**	**Billion MPN/Year**

Table O-14. Subwatershed 106 Total Coliform Load Duration Curve

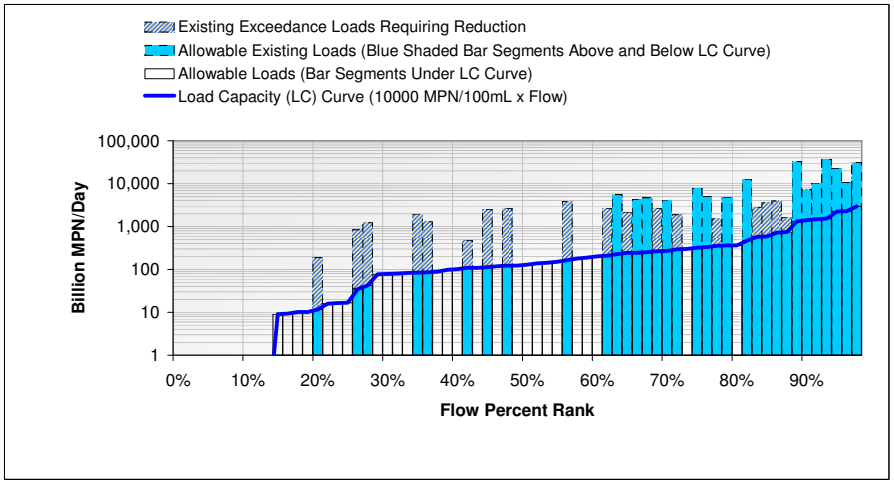

Subwatershed 106 Total Coliform Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	69	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	33	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	15	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	18	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**238,530**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	20,446	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	185,029	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**205,475**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**33,055**	**Billion MPN/Year**

Table O-15. Subwatershed 106 Enterococcus Load Duration Curve

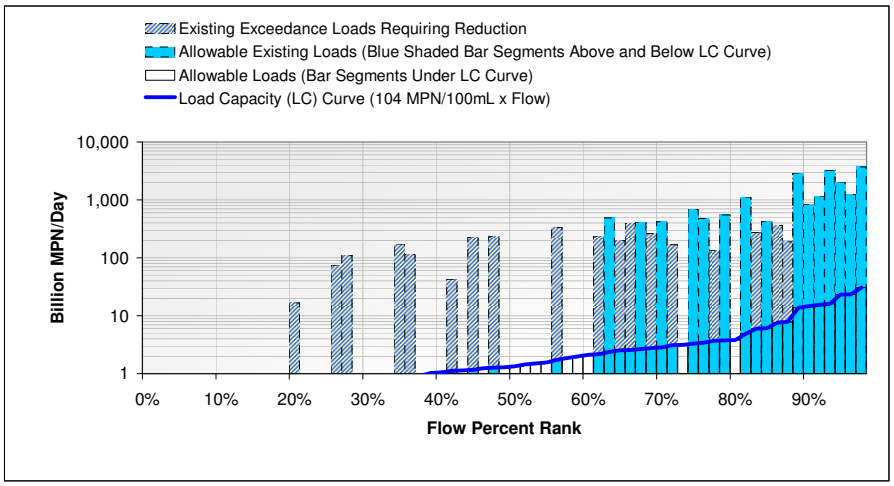

Subwatershed 106 Enterococcus Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	69	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	33	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	15	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	18	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**23,254**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	213	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	19,545	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**19,757**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**3,496**	**Billion MPN/Year**

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Load Duration Curves

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Table O-16. Subwatershed 201 Fecal Coliform Load Duration Curve

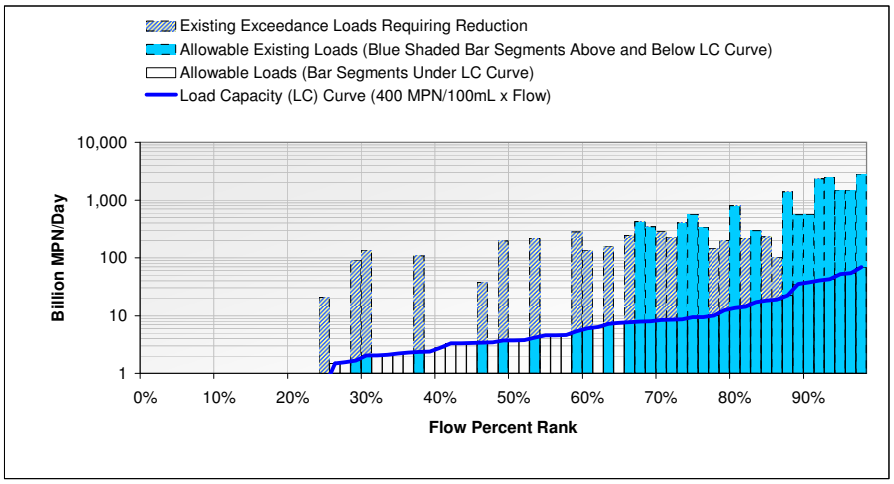

Subwatershed 201 Fecal Coliform Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	69	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	33	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	15	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	18	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**19,386**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	563	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	15,917	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**16,480**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**2,907**	**Billion MPN/Year**

Table O-17. Subwatershed 201 Total Coliform Load Duration Curve

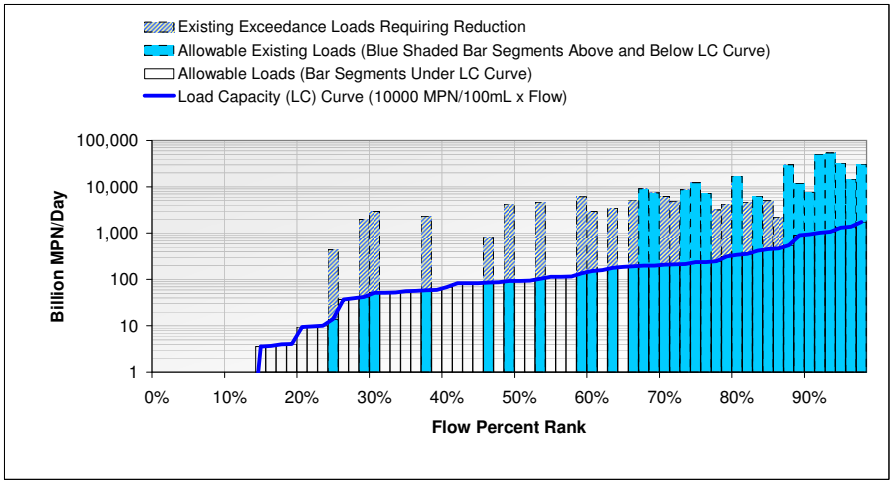

Subwatershed 201 Total Coliform Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	69	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	33	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	15	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	18	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**364,715**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	14,080	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	288,838	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**302,919**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**61,796**	**Billion MPN/Year**

Table O-18a. Subwatershed 201 Enterococcus (61) Load Duration Curve

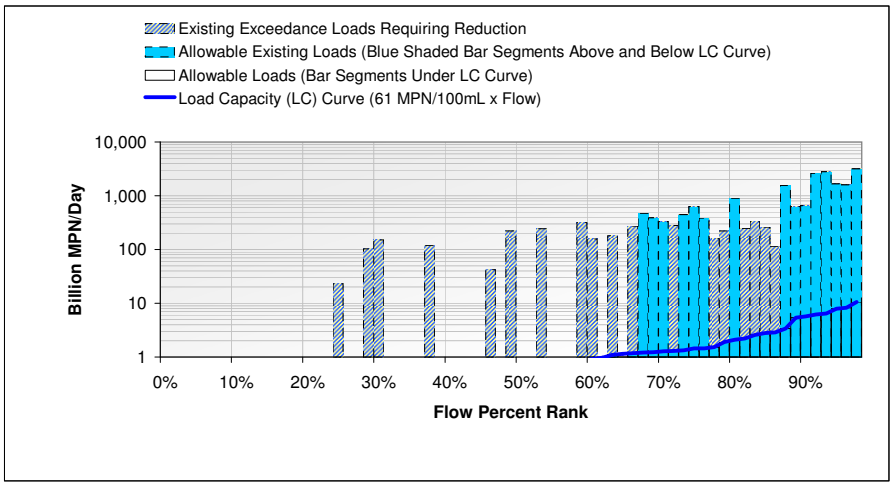

Subwatershed 201 Enterococcus (61) Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	69	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	33	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	15	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	18	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**21,646**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	86	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	18,138	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**18,224**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**3,422**	**Billion MPN/Year**

Table O-18b. Subwatershed 201 Enterococcus (104) Load Duration Curve

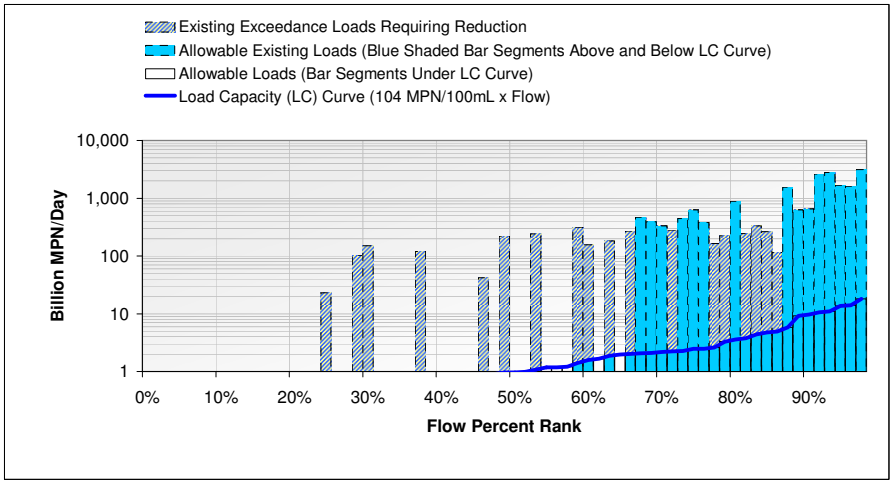

Subwatershed 201 Enterococcus (104) Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	69	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	33	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	15	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	18	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**21,646**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	146	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	18,093	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**18,239**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**3,407**	**Billion MPN/Year**

Table O-19. Subwatershed 202 Fecal Coliform Load Duration Curve

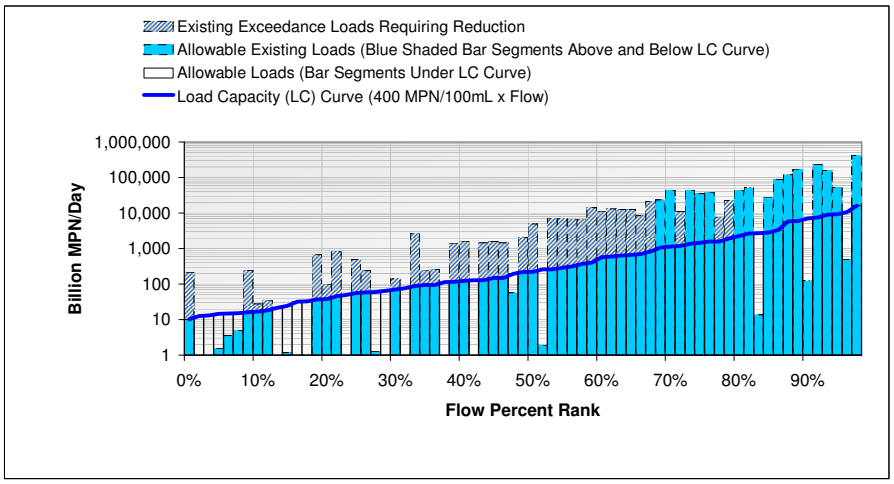

Subwatershed 202 Fecal Coliform Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	69	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	49	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	15	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	34	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**1,732,709**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	83,999	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	1,478,595	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**1,562,594**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**170,116**	**Billion MPN/Year**

Table O-20. Subwatershed 202 Total Coliform Load Duration Curve

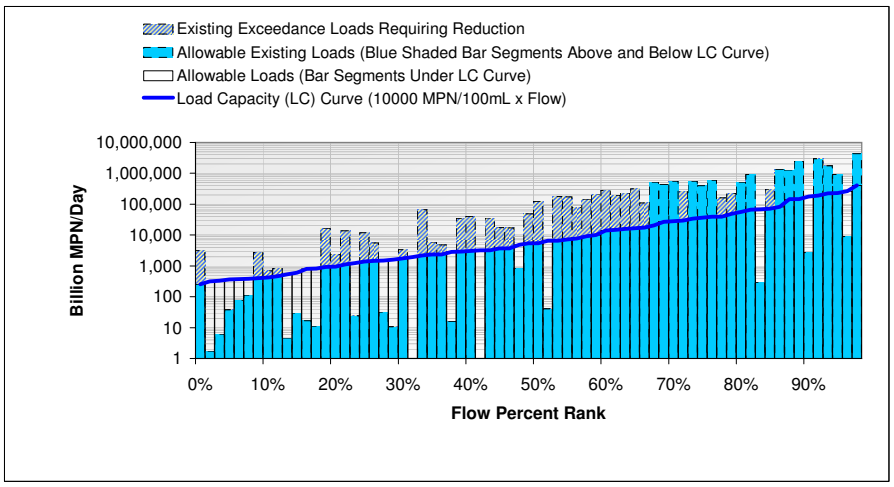

Subwatershed 202 Total Coliform Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	69	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	49	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	15	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	34	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**22,846,059**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	2,095,519	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	17,792,360	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**19,887,879**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**2,958,180**	**Billion MPN/Year**

Table O-21a. Subwatershed 202 Enterococcus (61) Load Duration Curve

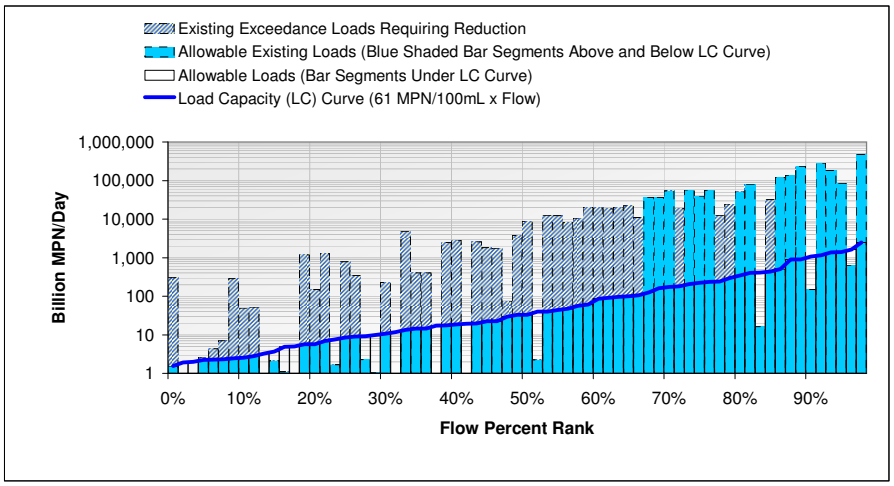

Subwatershed 202 Enterococcus (61) Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	69	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	53	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	15	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	38	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**2,208,560**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	13,558	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	1,919,183	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**1,932,741**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**275,820**	**Billion MPN/Year**

Table O-21b. Subwatershed 202 Enterococcus (104) Load Duration Curve

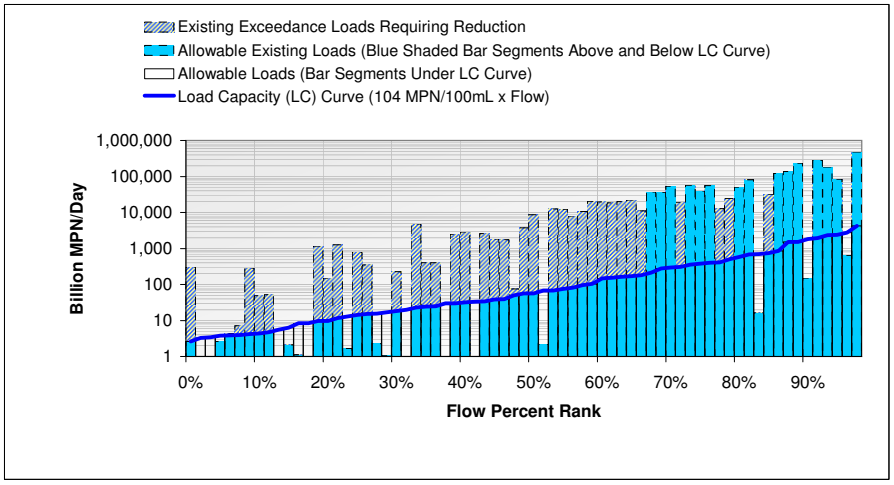

Subwatershed 202 Enterococcus (104) Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	69	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	52	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	15	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	37	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**2,208,560**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	22,536	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	1,911,741	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**1,934,277**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**274,283**	**Billion MPN/Year**

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Load Duration Curves

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Table O-22. Subwatershed 301 Fecal Coliform Load Duration Curve

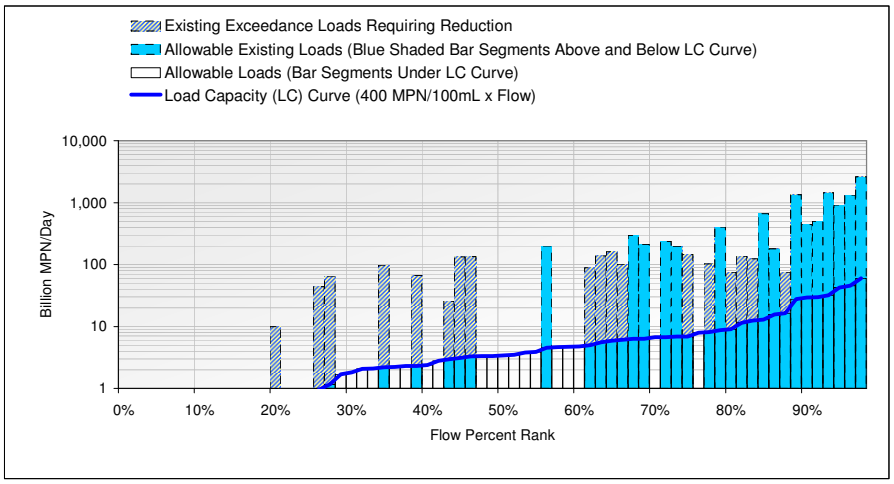

Subwatershed 301 Fecal Coliform Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	69	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	33	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	15	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	18	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**12,677**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	438	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	10,615	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**11,053**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**1,624**	**Billion MPN/Year**

Table O-23. Subwatershed 301 Total Coliform Load Duration Curve

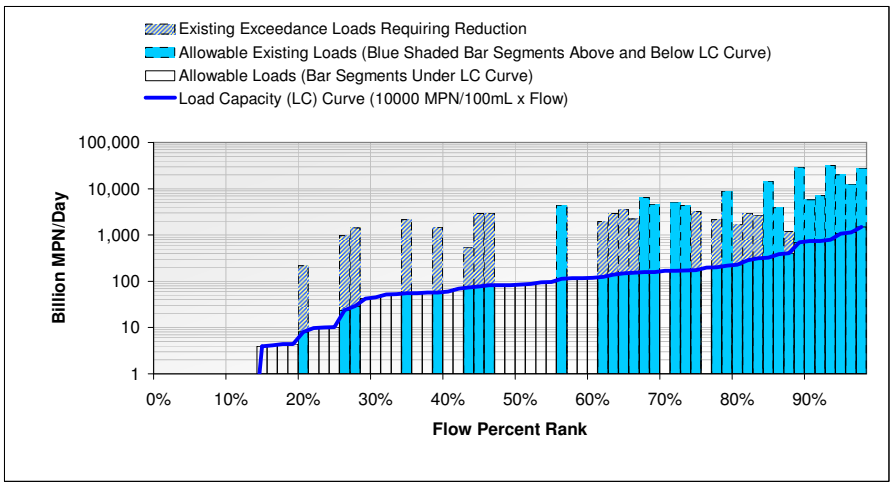

Subwatershed 301 Total Coliform Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	69	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	33	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	15	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	18	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**224,286**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	10,952	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	178,693	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**189,646**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**34,640**	**Billion MPN/Year**

Table O-24. Subwatershed 301 Enterococcus Load Duration Curve

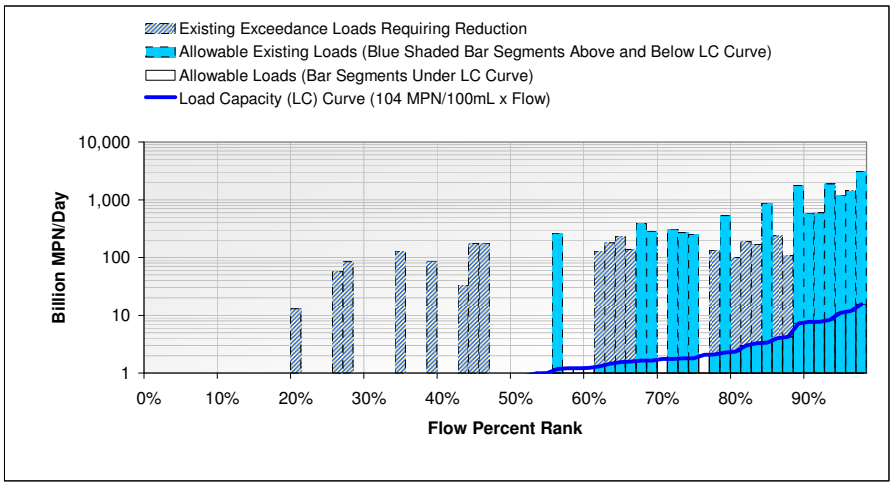

Subwatershed 301 Enterococcus Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	69	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	33	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	15	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	18	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**16,137**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	114	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	13,679	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**13,793**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**2,344**	**Billion MPN/Year**

Table O-25. Subwatershed 302 Fecal Coliform Load Duration Curve

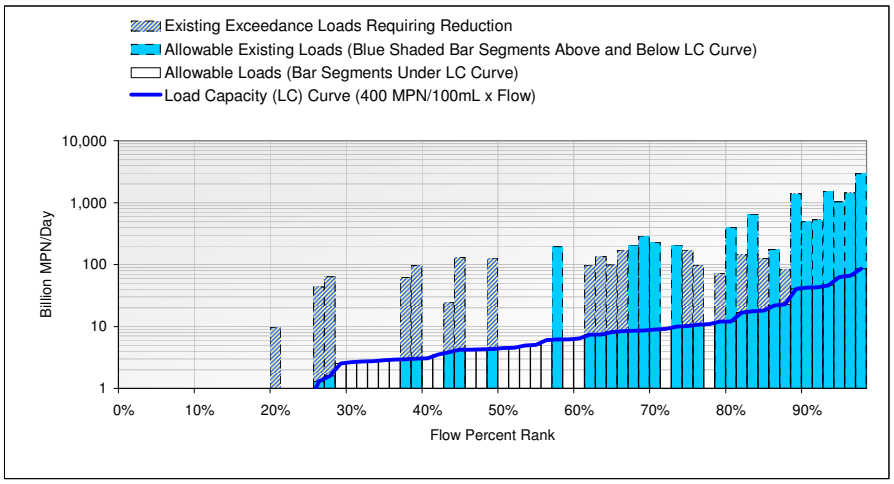

Subwatershed 302 Fecal Coliform Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	69	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	33	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	15	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	18	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**13,426**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	623	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	11,193	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**11,816**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**1,610**	**Billion MPN/Year**

Table O-26. Subwatershed 302 Total Coliform Load Duration Curve

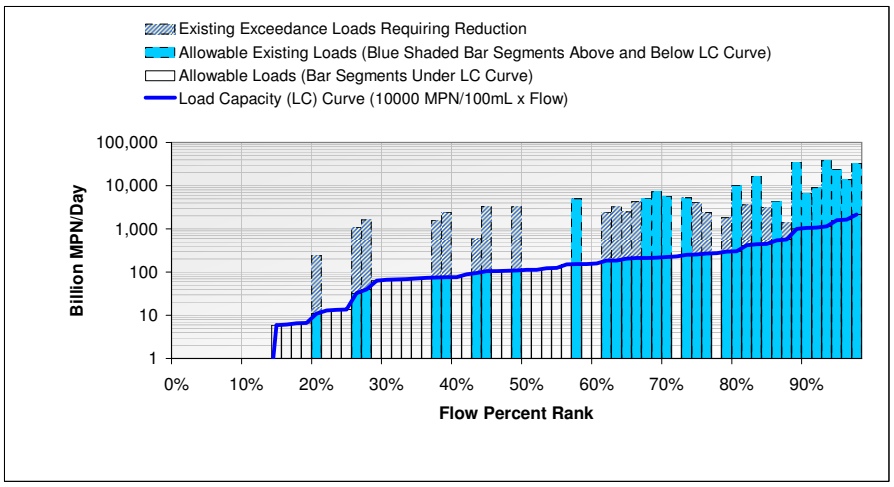

Subwatershed 302 Total Coliform Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	69	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	33	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	15	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	18	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**261,979**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	15,576	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	207,050	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**222,626**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**39,353**	**Billion MPN/Year**

Table O-27. Subwatershed 302 Enterococcus Load Duration Curve

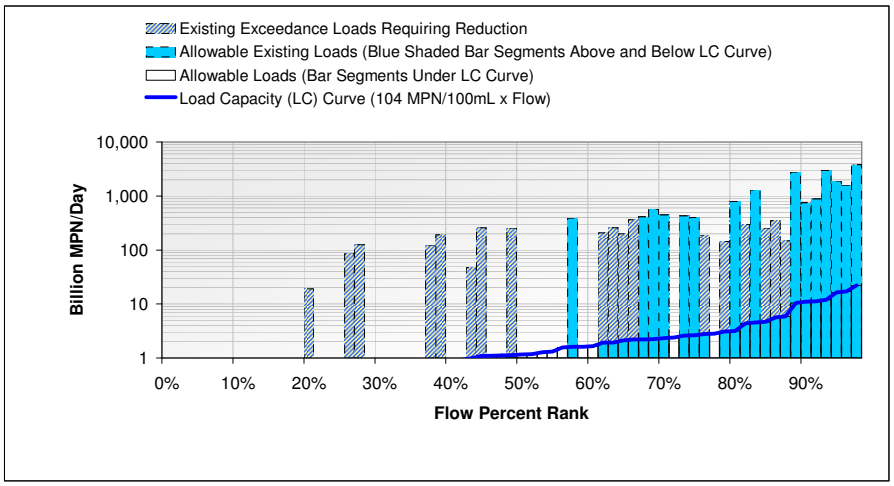

Subwatershed 302 Enterococcus Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	69	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	33	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	15	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	18	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**22,871**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	162	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	19,236	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**19,398**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**3,473**	**Billion MPN/Year**

Table O-28. Subwatershed 304 Fecal Coliform Load Duration Curve

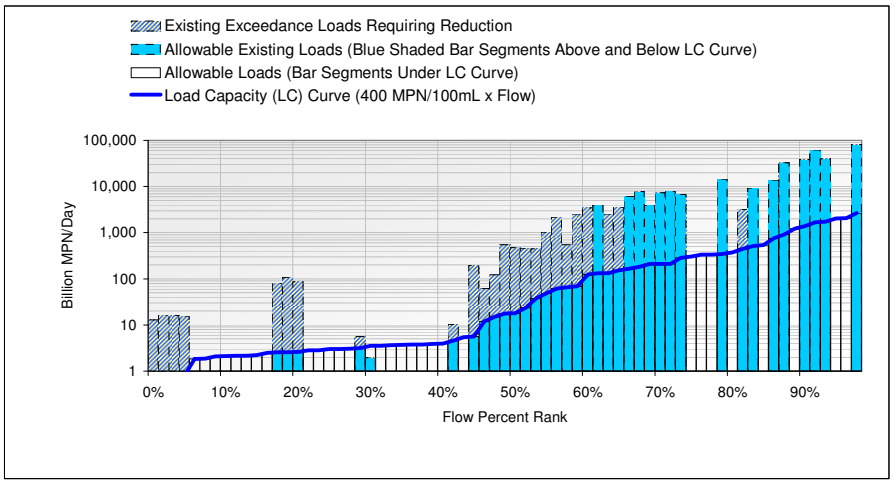

Subwatershed 304 Fecal Coliform Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	69	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	39	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	15	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	24	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**356,926**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	12,657	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	323,853	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**336,510**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**20,416**	**Billion MPN/Year**

Table O-29. Subwatershed 304 Total Coliform Load Duration Curve

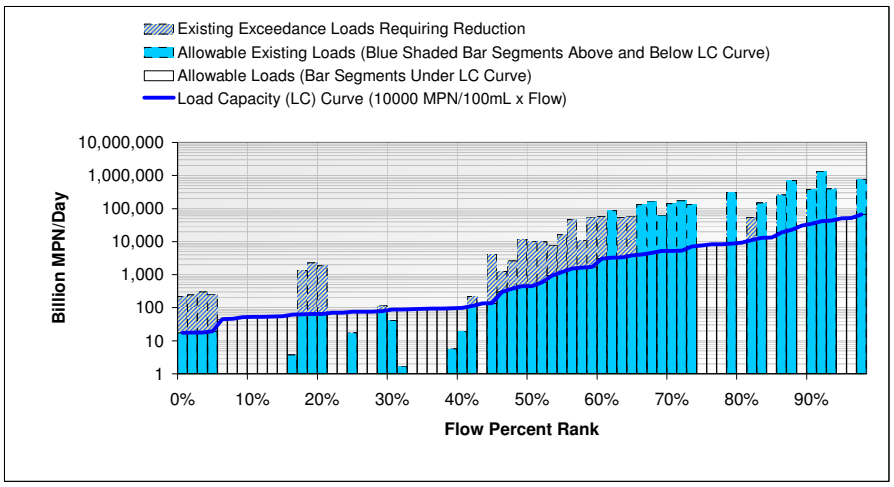

Subwatershed 304 Total Coliform Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	69	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	39	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	15	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	24	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**5,599,516**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	316,396	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	4,906,479	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**5,222,874**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**376,642**	**Billion MPN/Year**

Table O-30. Subwatershed 304 Enterococcus Load Duration Curve

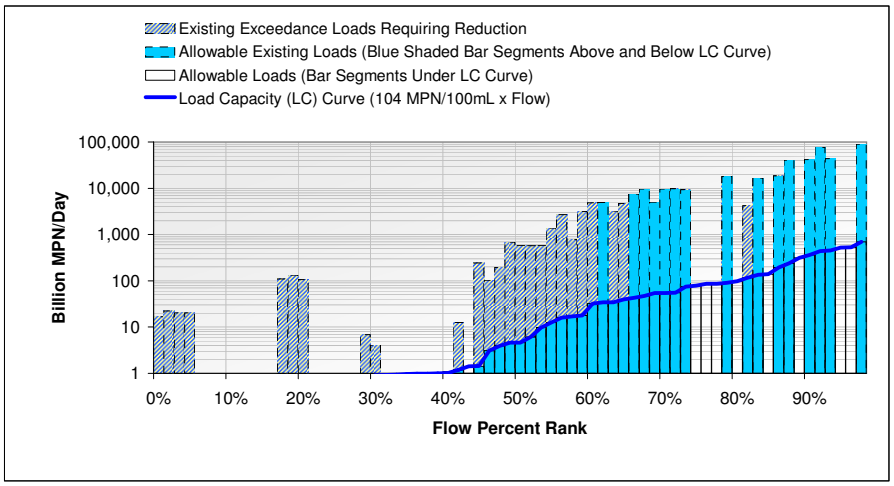

Subwatershed 304 Enterococcus Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	69	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	42	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	15	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	27	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**428,285**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	3,293	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	396,971	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**400,264**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**28,020**	**Billion MPN/Year**

Table O-31. Subwatershed 305 Fecal Coliform Load Duration Curve

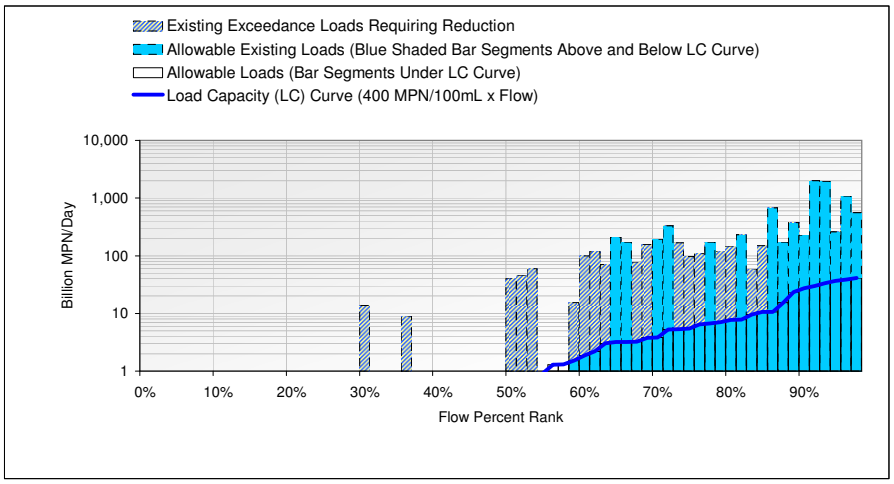

Subwatershed 305 Fecal Coliform Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	69	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	33	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	15	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	18	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**10,149**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	357	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	8,306	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**8,662**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**1,486**	**Billion MPN/Year**

Table O-32. Subwatershed 305 Total Coliform Load Duration Curve

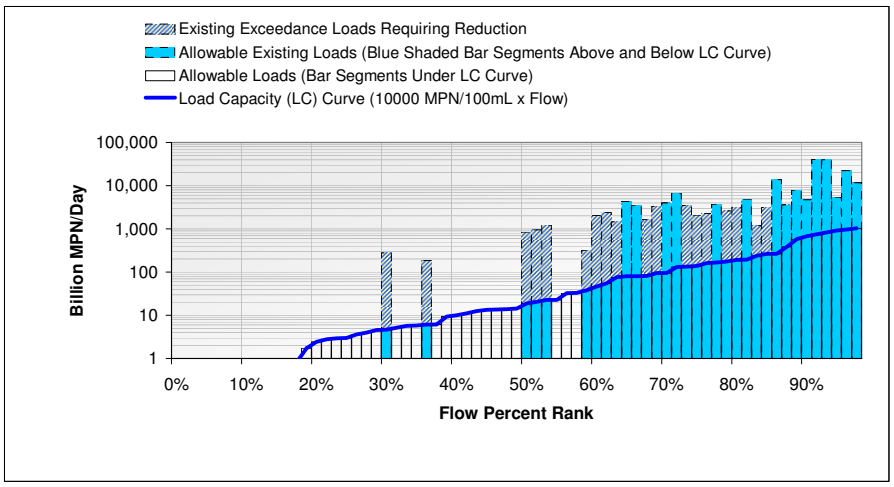

Subwatershed 305 Total Coliform Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	69	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	33	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	15	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	18	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**209,193**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	8,922	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	169,640	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**178,563**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**30,630**	**Billion MPN/Year**

Table O-33. Subwatershed 305 Enterococcus Load Duration Curve

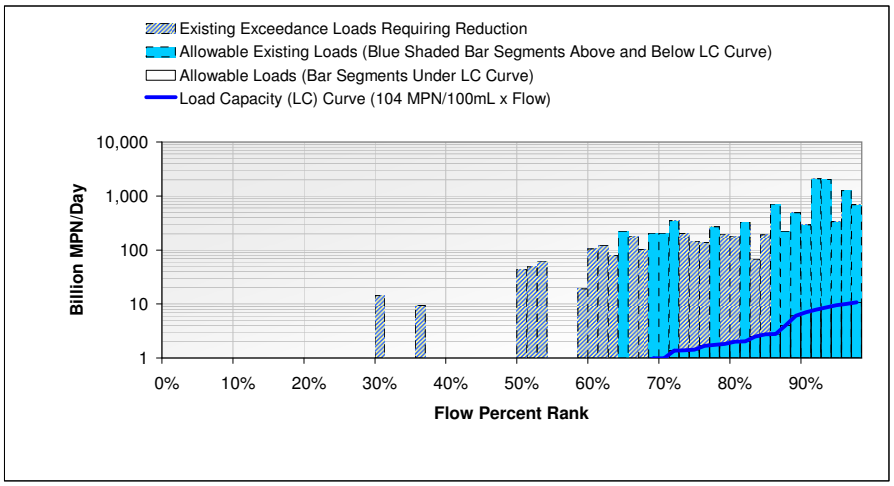

Subwatershed 305 Enterococcus Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	69	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	33	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	15	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	18	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**11,603**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	93	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	9,618	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**9,711**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**1,892**	**Billion MPN/Year**

Table O-34. Subwatershed 306 Fecal Coliform Load Duration Curve

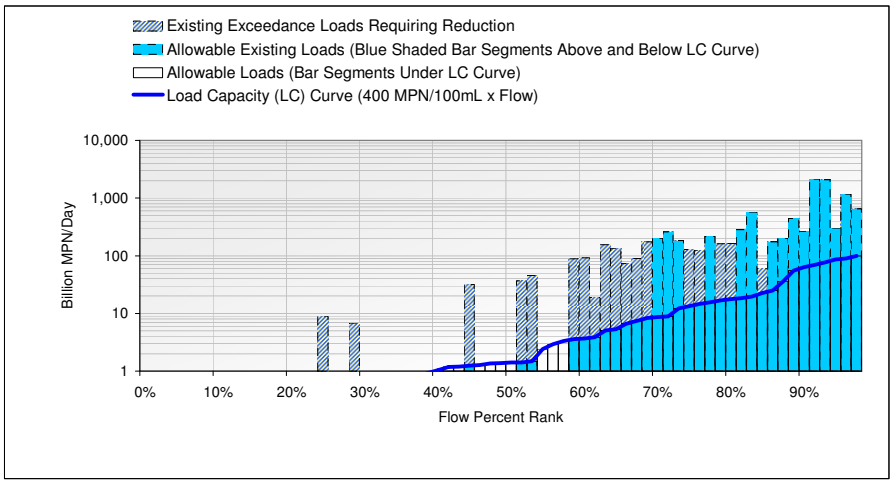

Subwatershed 306 Fecal Coliform Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	69	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	33	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	15	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	18	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**10,733**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	819	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	8,452	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**9,272**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**1,461**	**Billion MPN/Year**

Table O-35. Subwatershed 306 Total Coliform Load Duration Curve

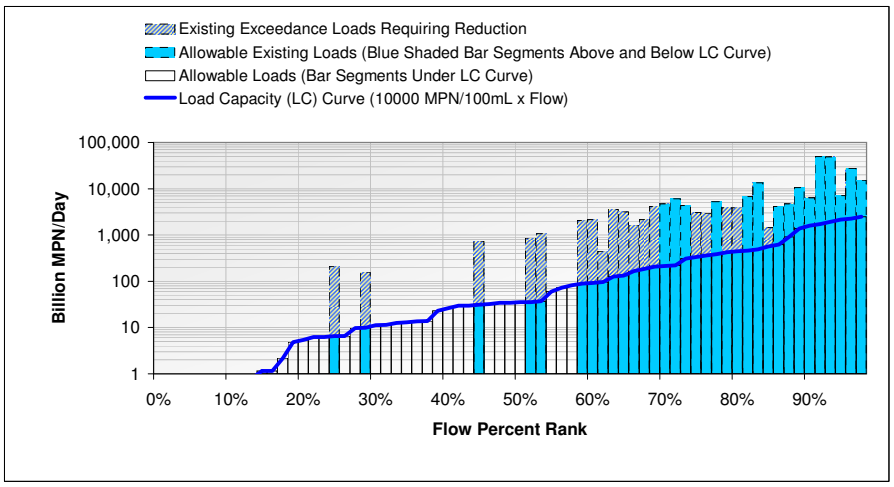

Subwatershed 306 Total Coliform Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	69	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	33	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	15	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	18	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**251,988**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	20,481	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	197,282	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**217,763**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**34,225**	**Billion MPN/Year**

Table O-36. Subwatershed 306 Enterococcus Load Duration Curve

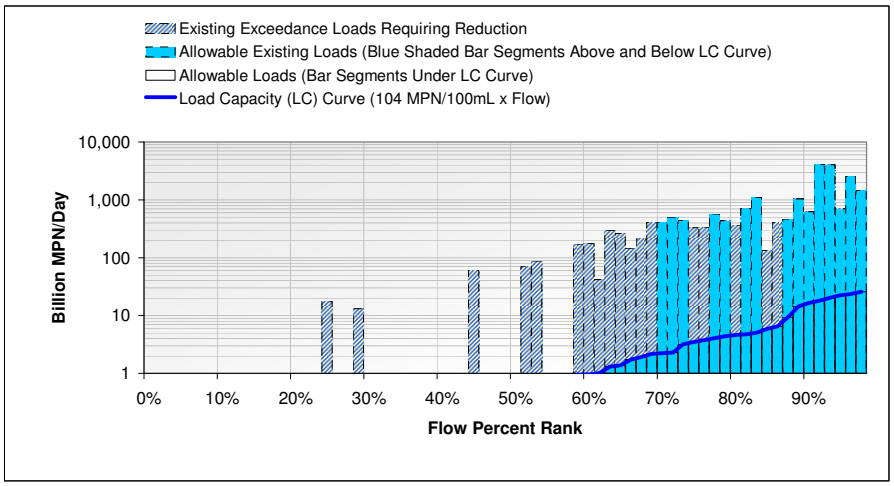

Subwatershed 306 Enterococcus Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	69	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	33	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	15	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	18	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**22,629**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	213	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	18,927	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**19,140**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**3,489**	**Billion MPN/Year**

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Load Duration Curves

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Table O-37. Subwatershed 401 Fecal Coliform Load Duration Curve

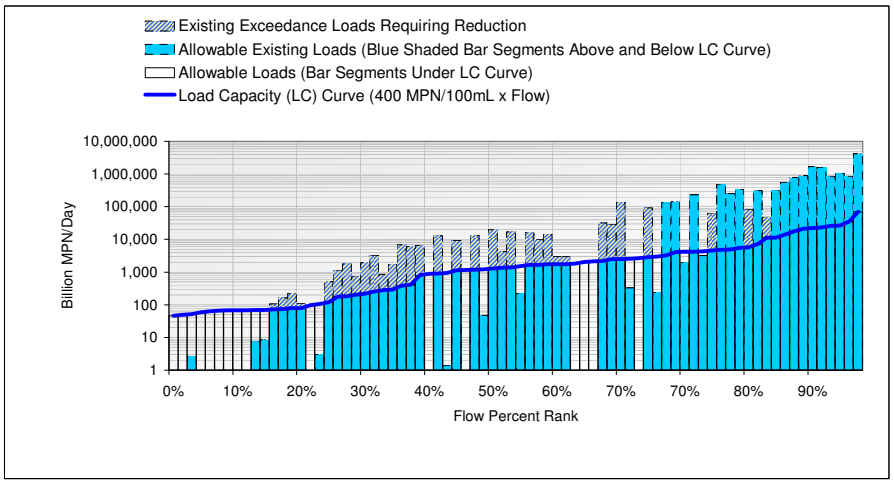

Subwatershed 401 Fecal Coliform Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	76	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	50	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	17	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	33	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**15,304,790**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	358,410	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	14,356,423	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**14,714,833**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**589,958**	**Billion MPN/Year**

Table O-38. Subwatershed 401 Total Coliform Load Duration Curve

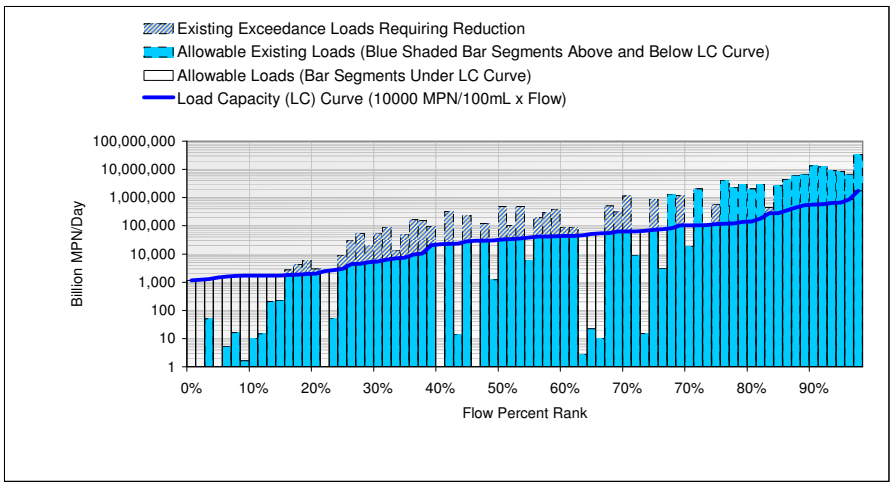

Subwatershed 401 Total Coliform Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	76	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	50	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	17	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	33	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**130,258,863**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	8,947,114	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	113,932,076	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**122,879,189**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**7,379,673**	**Billion MPN/Year**

Table O-39a. Subwatershed 401 Enterococcus (61) Load Duration Curve

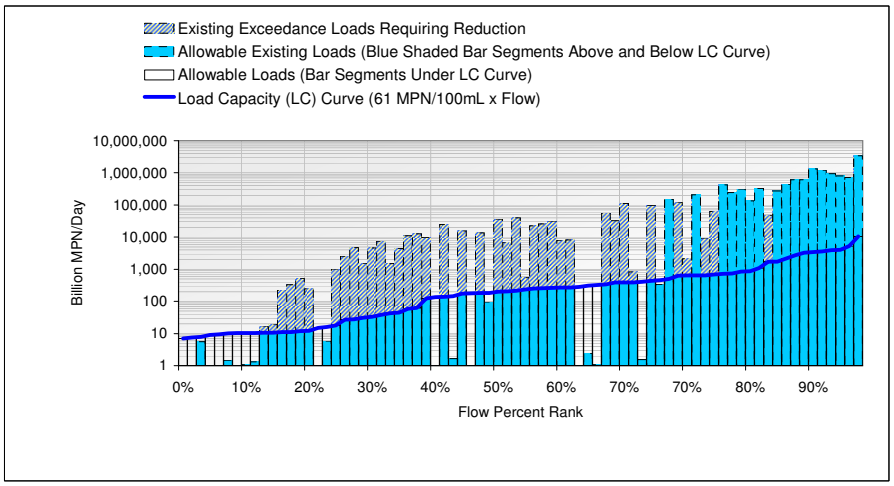

Subwatershed 401 Enterococcus (61) Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	76	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	56	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	17	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	39	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**12,980,098**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	56,119	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	12,096,327	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**12,152,446**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**827,652**	**Billion MPN/Year**

Table O-39b. Subwatershed 401 Enterococcus (104) Load Duration Curve

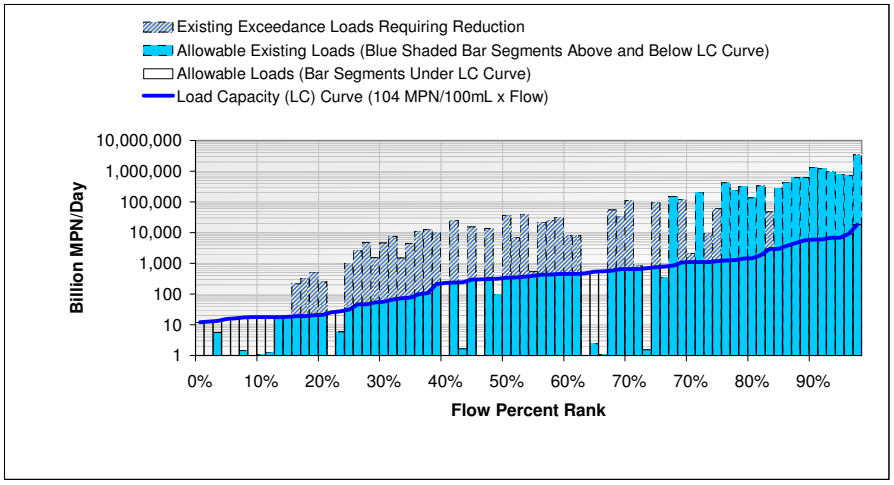

Subwatershed 401 Enterococcus (104) Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	76	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	55	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	17	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	38	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**12,980,098**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	95,357	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	12,063,781	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**12,159,138**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**820,960**	**Billion MPN/Year**

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Load Duration Curves

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Table O-40. Subwatershed 501 Fecal Coliform Load Duration Curve

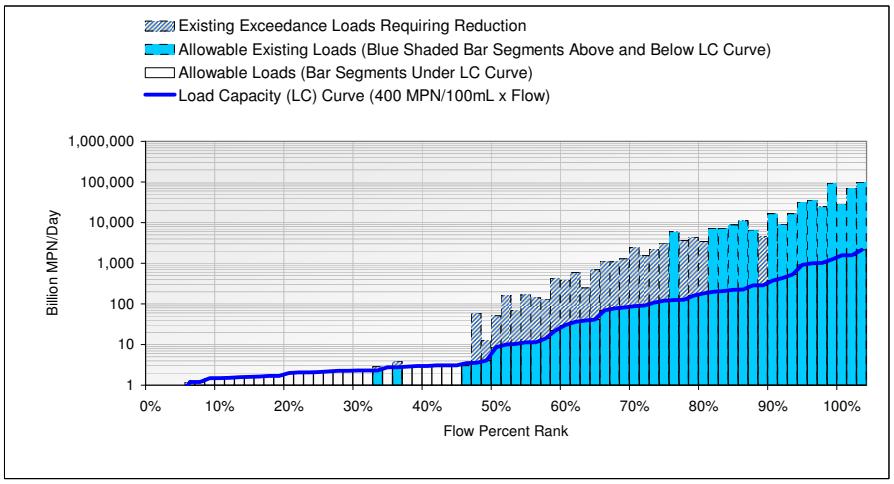

Subwatershed 501 Fecal Coliform Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	73	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	42	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	16	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	26	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**503,463**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	13,706	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	459,283	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**472,989**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**30,474**	**Billion MPN/Year**

Table O-41. Subwatershed 501 Total Coliform Load Duration Curve

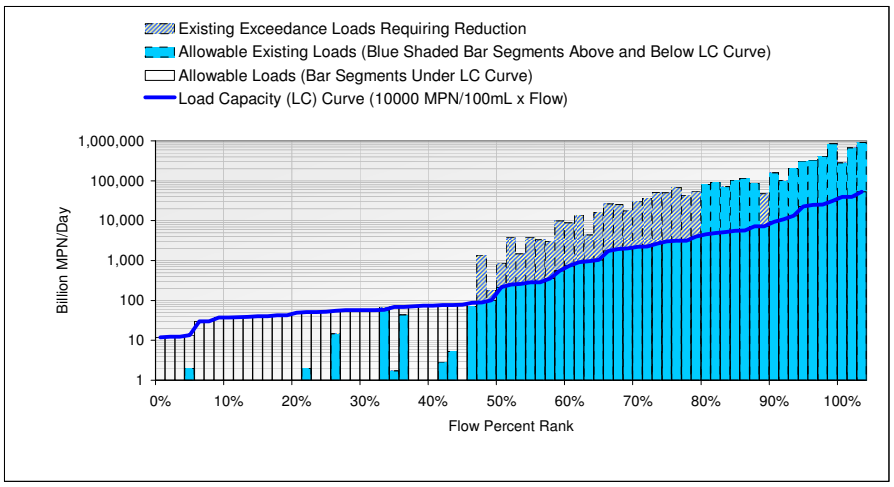

Subwatershed 501 Total Coliform Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	73	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	41	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	16	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	25	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**5,276,543**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	342,618	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	4,451,026	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**4,793,644**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**482,899**	**Billion MPN/Year**

Table O-42. Subwatershed 501 Enterococcus Load Duration Curve

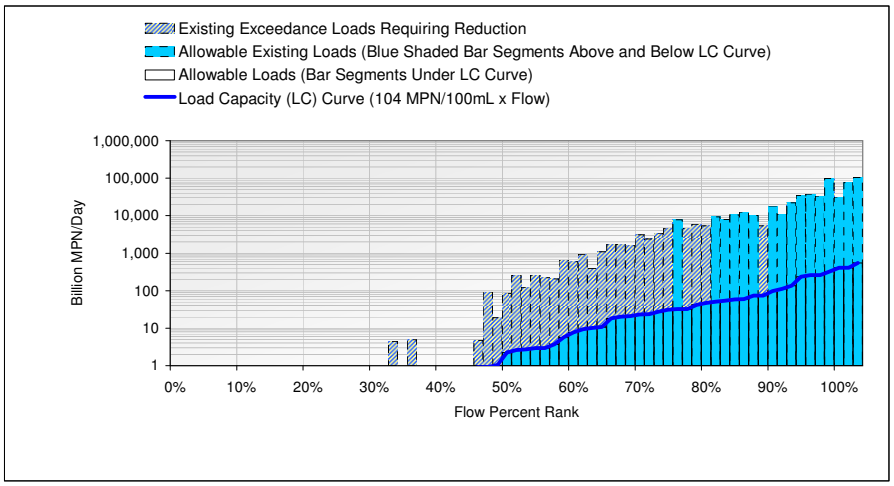

Subwatershed 501 Enterococcus Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	73	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	45	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	16	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	29	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**570,531**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	3,565	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	522,815	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**526,380**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**44,151**	**Billion MPN/Year**

Table O-43. Subwatershed 502 Fecal Coliform Load Duration Curve

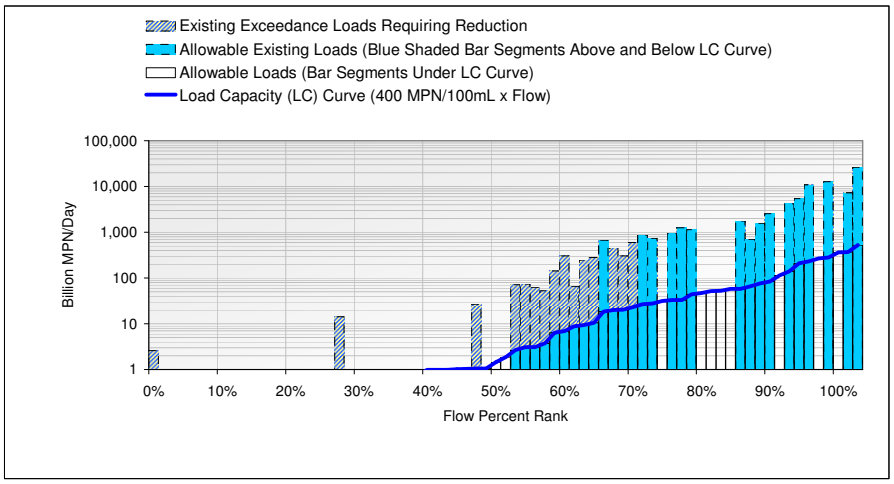

Subwatershed 502 Fecal Coliform Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	73	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	31	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	16	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	15	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**81,336**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	2,340	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	76,435	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**78,774**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**2,561**	**Billion MPN/Year**

Table O-44. Subwatershed 502 Total Coliform Load Duration Curve

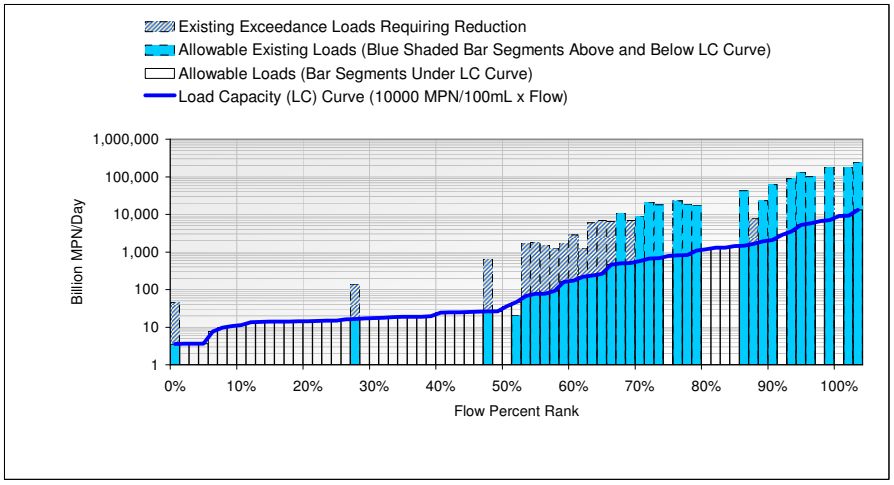

Subwatershed 502 Total Coliform Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	73	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	31	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	16	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	15	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**1,217,027**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	58,491	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	1,115,636	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**1,174,127**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**42,900**	**Billion MPN/Year**

Table O-45. Subwatershed 502 Enterococcus Load Duration Curve

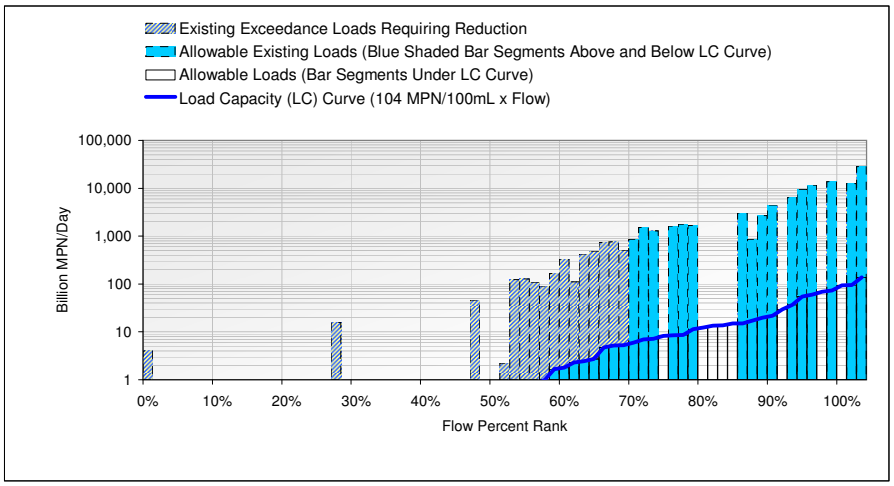

Subwatershed 502 Enterococcus Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	73	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	32	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	16	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	16	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**105,722**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	609	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	101,090	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**101,698**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**4,024**	**Billion MPN/Year**

Table O-46. Subwatershed 503 Fecal Coliform Load Duration Curve

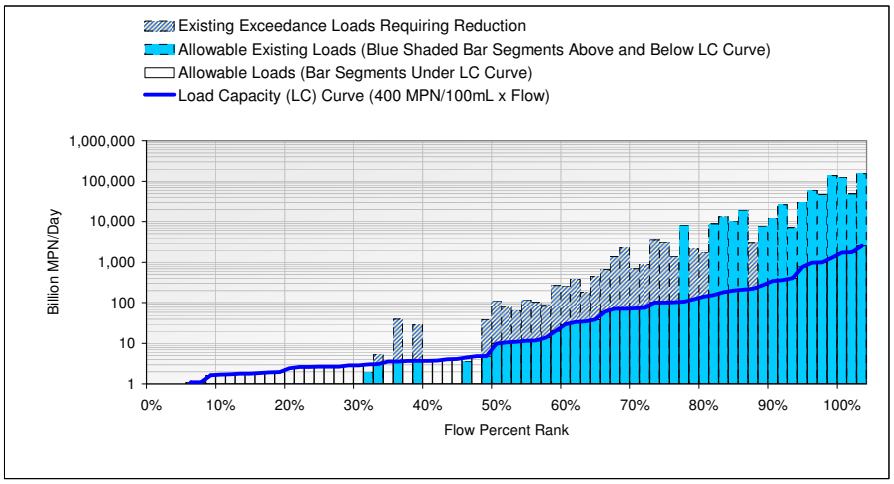

Subwatershed 503 Fecal Coliform Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	73	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	42	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	16	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	26	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**736,628**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	13,802	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	701,010	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**714,812**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**21,816**	**Billion MPN/Year**

Table O-47. Subwatershed 503 Total Coliform Load Duration Curve

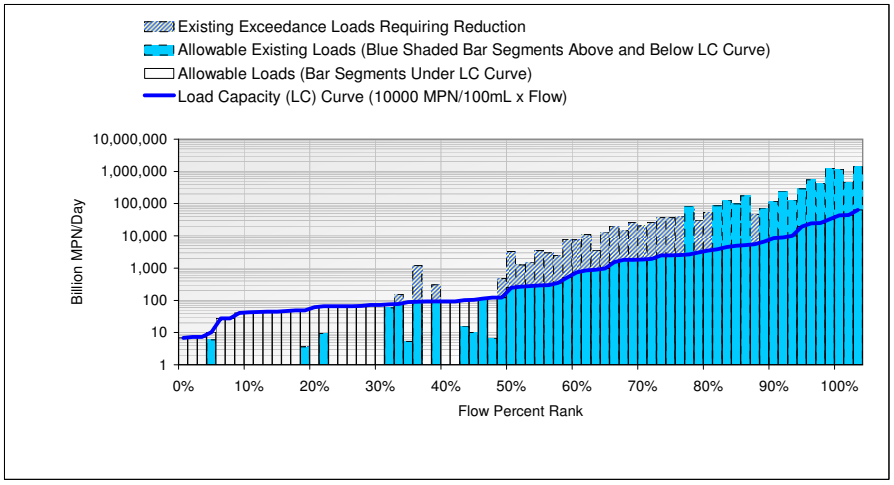

Subwatershed 503 Total Coliform Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	73	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	42	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	16	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	26	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**7,101,866**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	345,066	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	6,378,829	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**6,723,895**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**377,971**	**Billion MPN/Year**

Table O-48. Subwatershed 503 Enterococcus Load Duration Curve

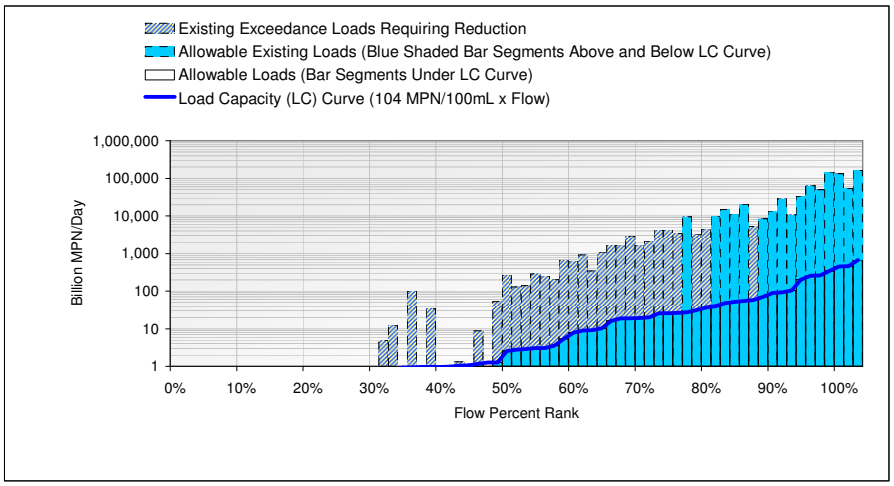

Subwatershed 503 Enterococcus Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	73	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	47	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	16	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	31	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**806,853**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	3,593	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	763,994	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**767,587**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**39,266**	**Billion MPN/Year**

Table O-49. Subwatershed 504 Fecal Coliform Load Duration Curve

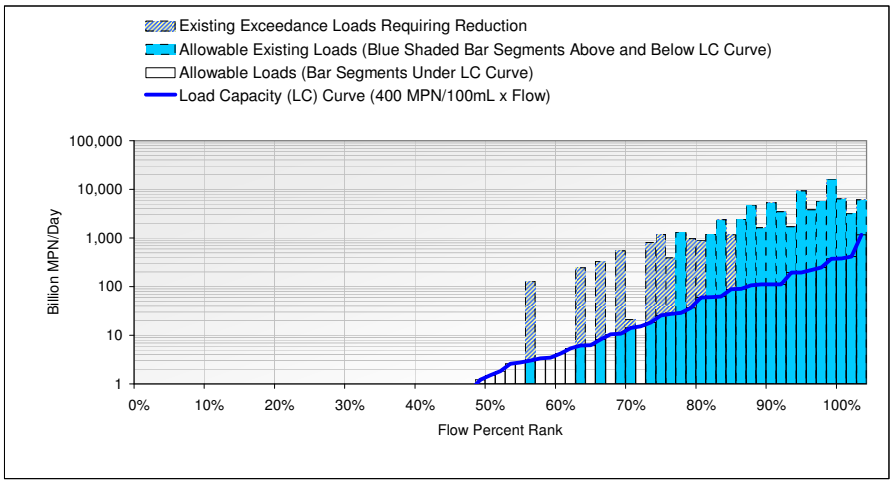

Subwatershed 504 Fecal Coliform Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	73	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	28	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	16	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	12	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**81,576**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	4,172	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	71,022	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**75,194**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**6,382**	**Billion MPN/Year**

Table O-50. Subwatershed 504 Total Coliform Load Duration Curve

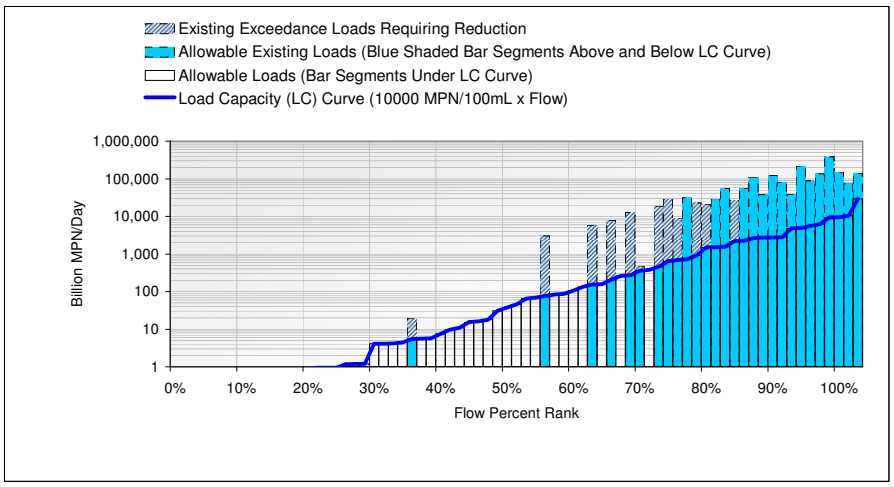

Subwatershed 504 Total Coliform Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	73	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	28	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	16	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	12	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**1,903,632**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	104,298	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	1,650,517	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**1,754,815**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**148,817**	**Billion MPN/Year**

Table O-51. Subwatershed 504 Enterococcus Load Duration Curve

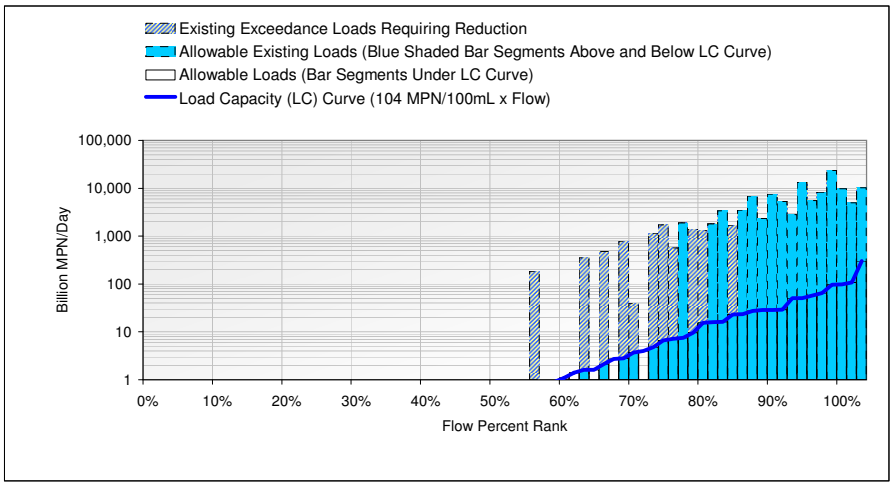

Subwatershed 504 Enterococcus Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	73	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	28	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	16	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	12	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**120,842**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	1,085	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	110,148	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**111,233**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**9,609**	**Billion MPN/Year**

Table O-52. Subwatershed 505 Fecal Coliform Load Duration Curve

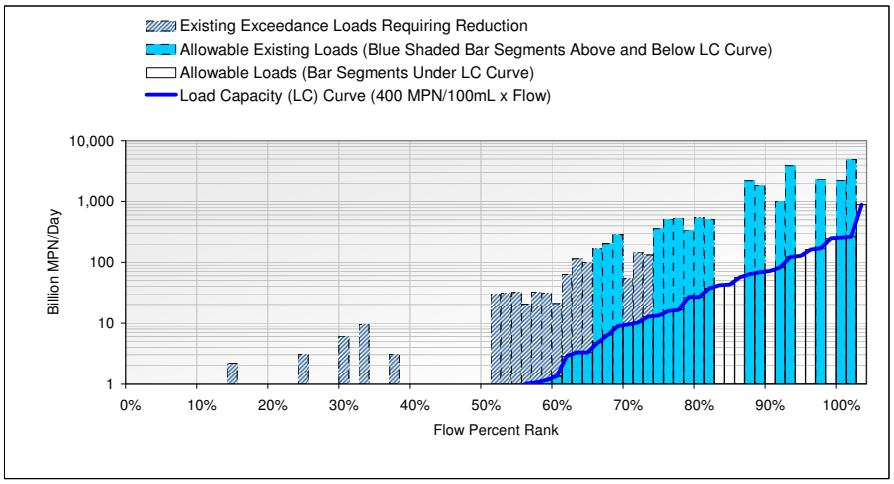

Subwatershed 505 Fecal Coliform Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	73	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	37	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	16	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	21	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**22,706**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	1,235	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	20,691	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**21,926**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**781**	**Billion MPN/Year**

Table O-53. Subwatershed 505 Total Coliform Load Duration Curve

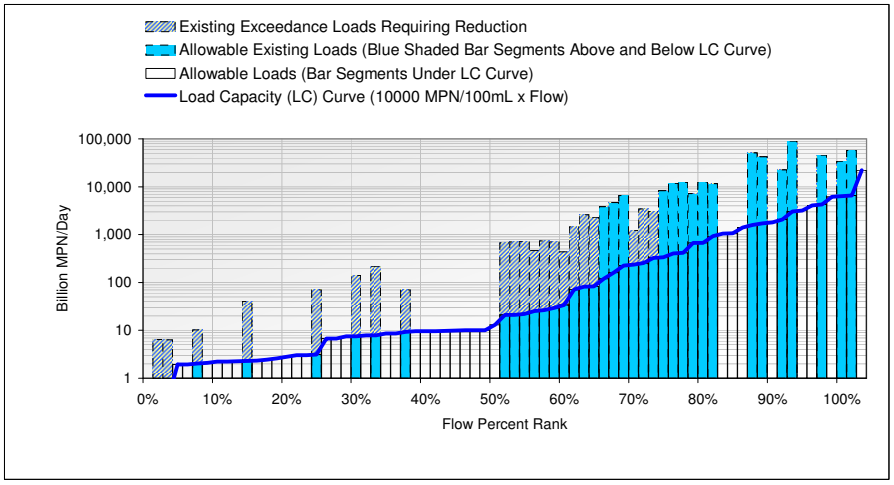

Subwatershed 505 Total Coliform Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	73	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	37	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	16	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	21	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**439,319**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	30,864	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	390,691	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**421,555**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**17,764**	**Billion MPN/Year**

Table O-54. Subwatershed 505 Enterococcus Load Duration Curve

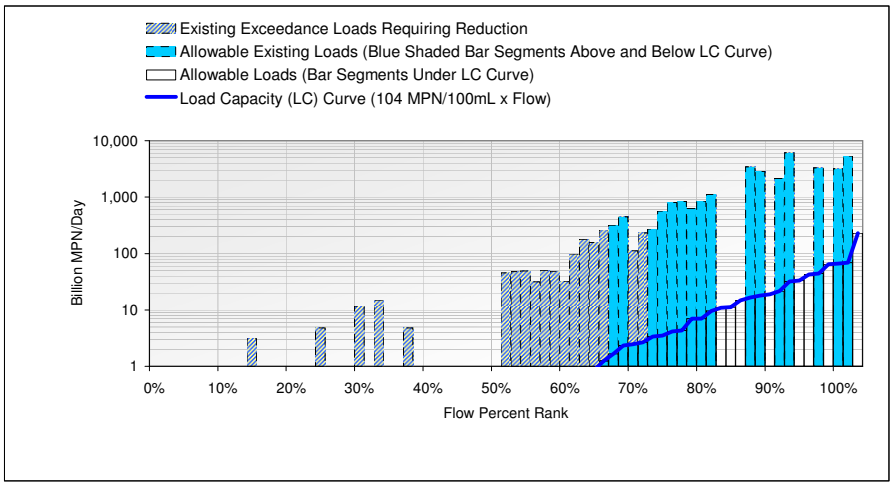

Subwatershed 505 Enterococcus Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	73	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	37	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	16	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	21	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**33,571**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	321	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	31,875	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**32,196**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**1,375**	**Billion MPN/Year**

Table O-55. Subwatershed 506 Fecal Coliform Load Duration Curve

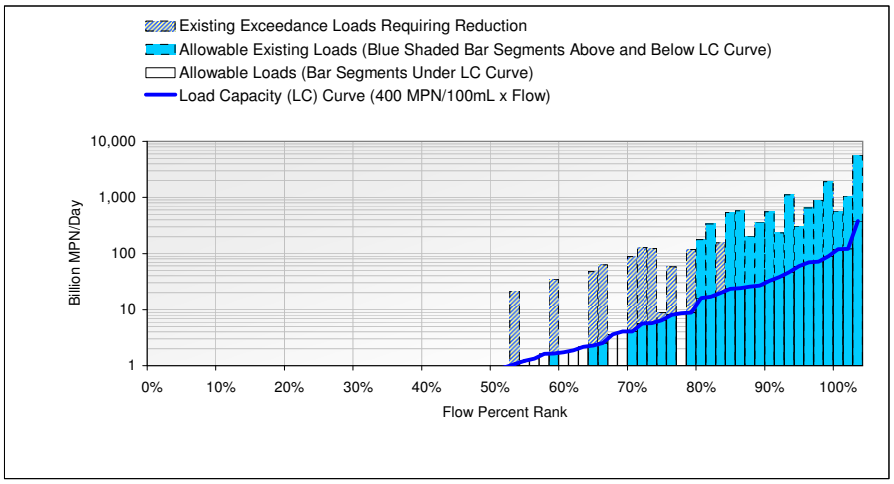

Subwatershed 506 Fecal Coliform Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	73	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	28	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	16	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	12	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**16,014**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	1,226	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	14,009	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**15,235**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**779**	**Billion MPN/Year**

Table O-56. Subwatershed 506 Total Coliform Load Duration Curve

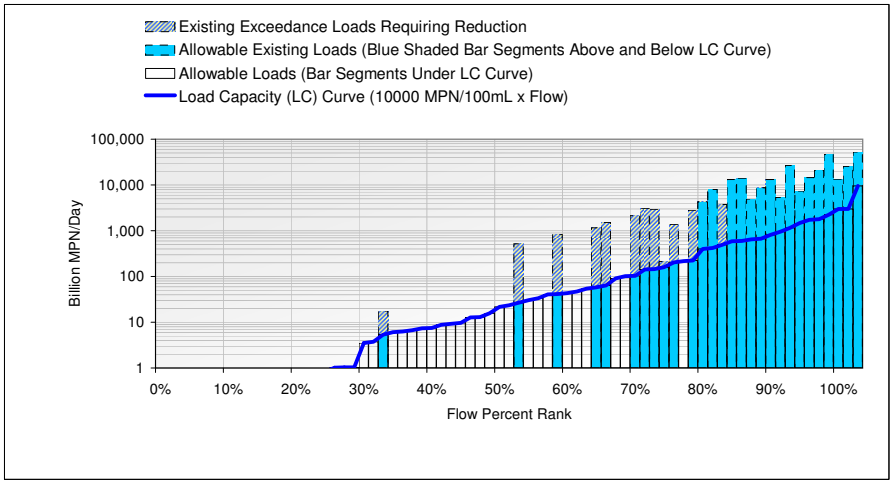

Subwatershed 506 Total Coliform Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	73	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	28	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	16	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	12	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**298,219**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	30,657	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	248,909	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**279,566**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**18,652**	**Billion MPN/Year**

Table O-57. Subwatershed 506 Enterococcus Load Duration Curve

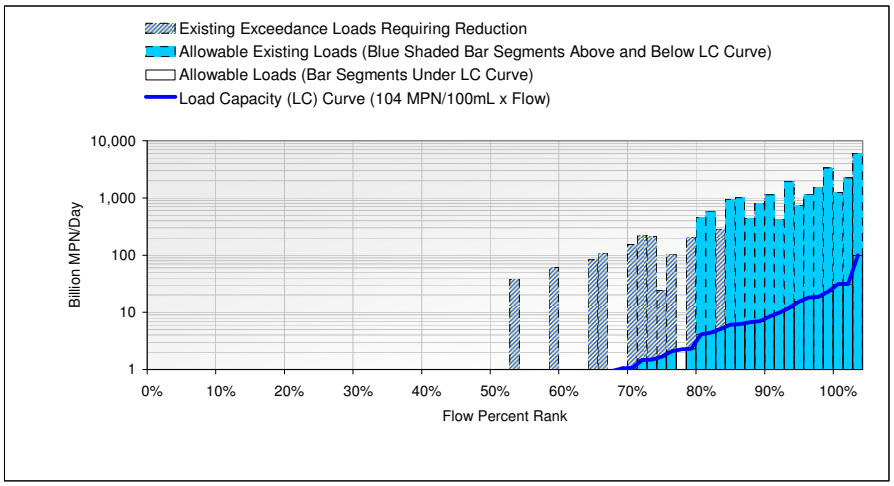

Subwatershed 506 Enterococcus Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	73	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	28	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	16	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	12	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**25,580**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	319	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	23,774	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**24,093**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**1,487**	**Billion MPN/Year**

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Load Duration Curves

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Table O-58. Subwatershed 701 Fecal Coliform Load Duration Curve

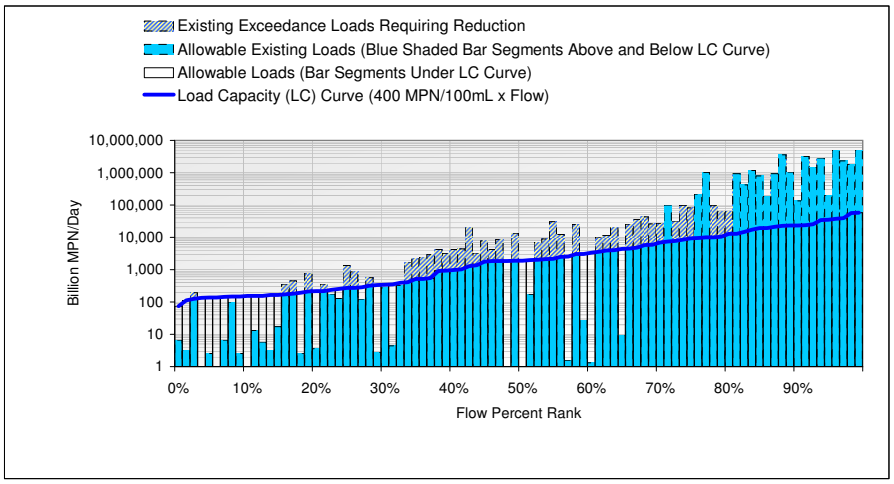

Subwatershed 701 Fecal Coliform Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	90	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	61	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	20	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	41	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**33,120,012**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	640,595	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	31,803,647	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**32,444,242**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**675,770**	**Billion MPN/Year**

Table O-59. Subwatershed 701 Total Coliform Load Duration Curve

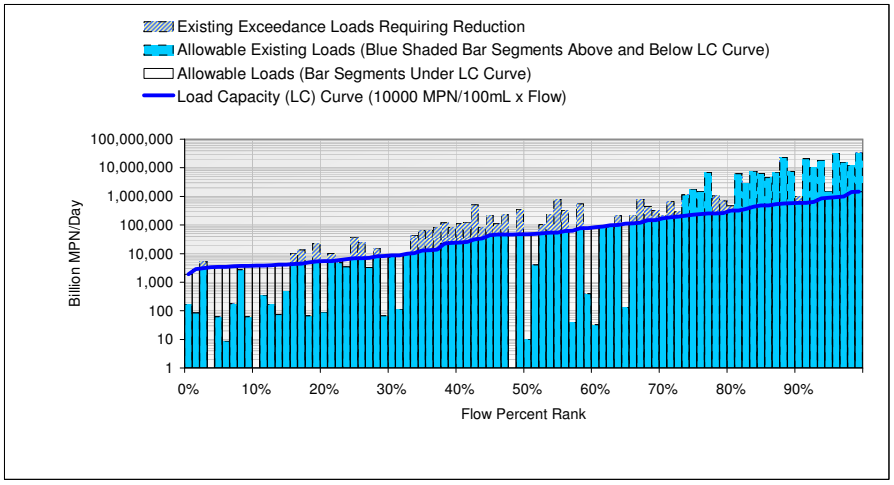

Subwatershed 701 Total Coliform Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	90	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	59	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	20	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	39	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**231,598,677**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	15,993,384	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	208,157,151	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**224,150,535**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**7,448,142**	**Billion MPN/Year**

Table O-60. Subwatershed 701 Enterococcus Load Duration Curve

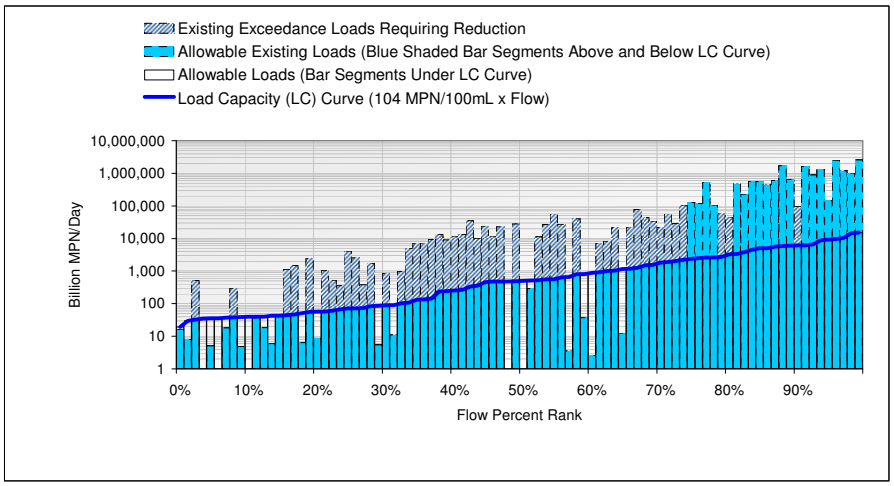

Subwatershed 701 Enterococcus Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	90	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	68	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	20	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	48	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**18,439,920**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	167,152	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	17,296,466	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**17,463,618**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**976,302**	**Billion MPN/Year**

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Load Duration Curves

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Table O-61. Subwatershed 1101 Fecal Coliform Load Duration Curve

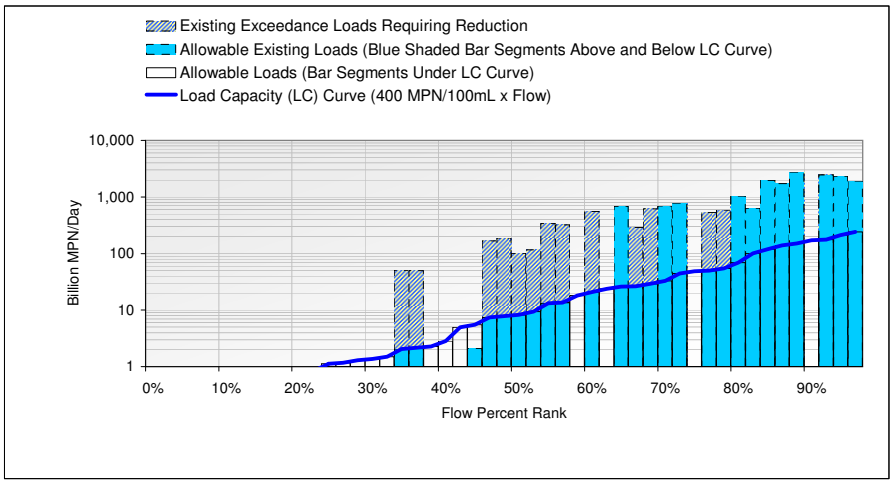

Subwatershed 1101 Fecal Coliform Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	49	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	28	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	11	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	17	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**20,886**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	1,559	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	15,665	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**17,224**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**3,662**	**Billion MPN/Year**

Table O-62. Subwatershed 1101 Total Coliform Load Duration Curve

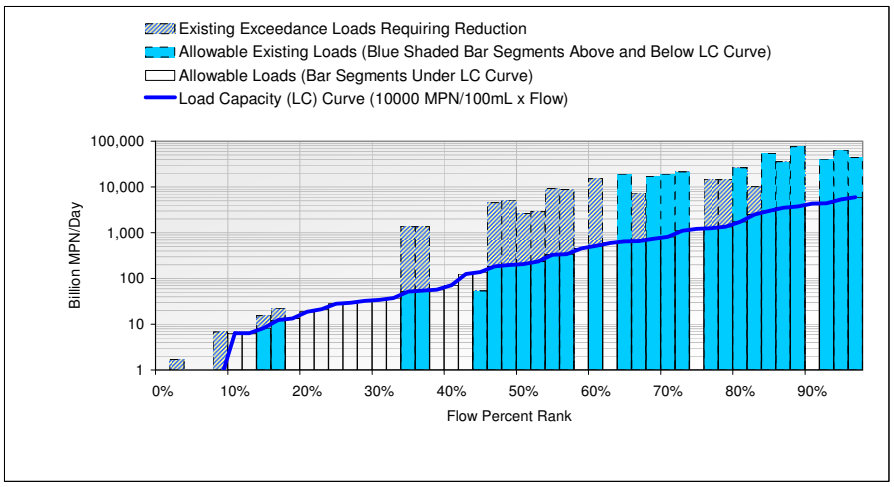

Subwatershed 1101 Total Coliform Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	49	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	28	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	11	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	17	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**515,278**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	38,984	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	386,099	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**425,083**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**90,196**	**Billion MPN/Year**

Table O-63. Subwatershed 1101 Enterococcus Load Duration Curve

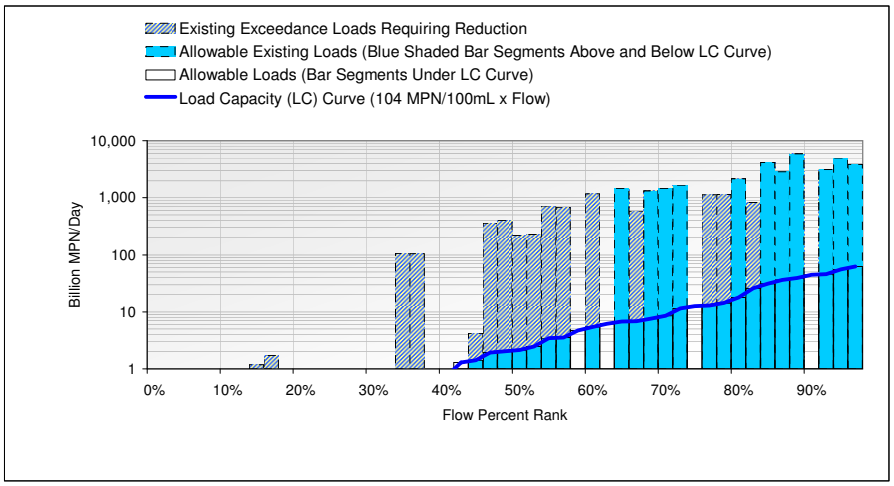

Subwatershed 1101 Enterococcus Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	49	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	29	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	11	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	18	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**40,558**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	406	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	32,559	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**32,966**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**7,592**	**Billion MPN/Year**

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Load Duration Curves

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Table O-64. Subwatershed 1301 Fecal Coliform Load Duration Curve

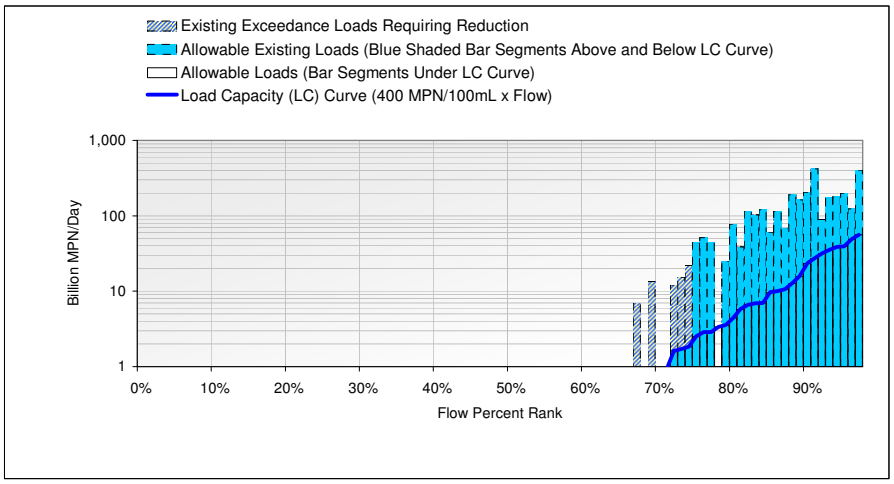

Subwatershed 1301 Fecal Coliform Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	98	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	27	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	22	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	5	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**3,081**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	410	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	2,609	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**3,018**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**63**	**Billion MPN/Year**

Table O-65. Subwatershed 1301 Total Coliform Load Duration Curve

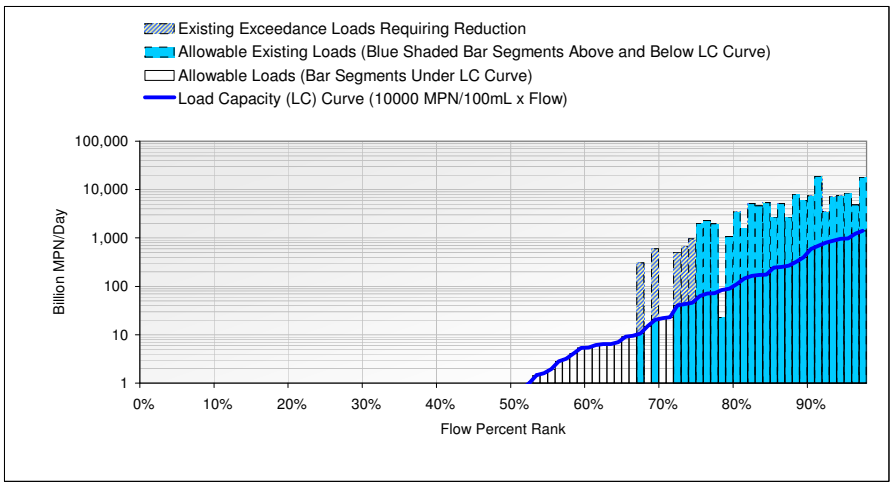

Subwatershed 1301 Total Coliform Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	98	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	27	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	22	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	5	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**130,532**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	10,246	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	117,387	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**127,632**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**2,900**	**Billion MPN/Year**

Table O-66. Subwatershed 1301 Enterococcus Load Duration Curve

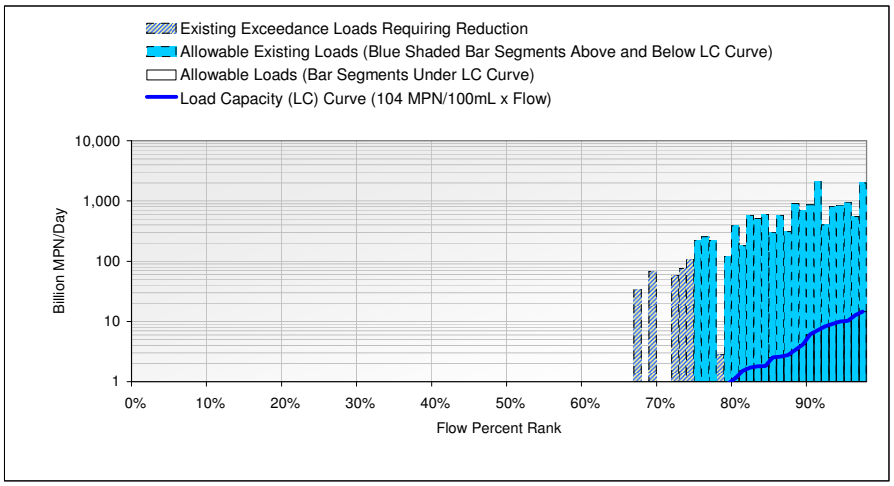

Subwatershed 1301 Enterococcus Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	98	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	28	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	22	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	6	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**14,763**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	107	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	14,312	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**14,419**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**344**	**Billion MPN/Year**

Table O-67. Subwatershed 1302 Fecal Coliform Load Duration Curve

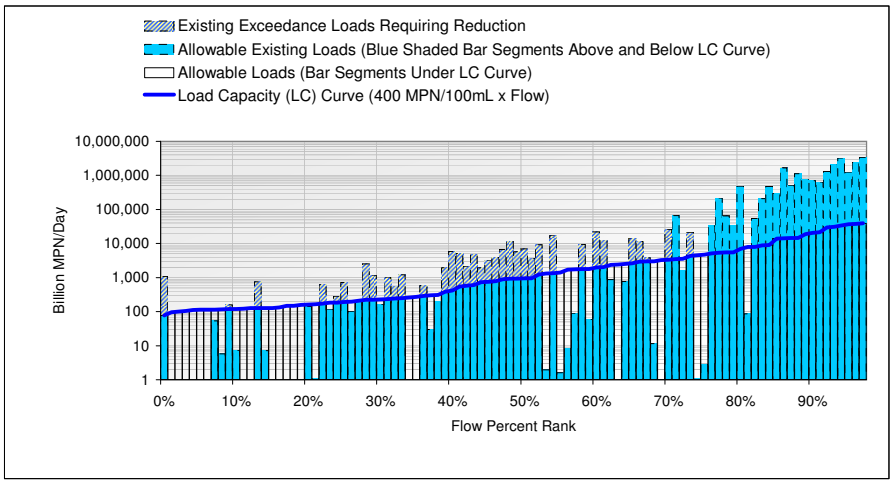

Subwatershed 1302 Fecal Coliform Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	98	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	58	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	22	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	36	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**21,283,828**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	425,559	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	20,673,072	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**21,098,630**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**185,198**	**Billion MPN/Year**

Table O-68. Subwatershed 1302 Total Coliform Load Duration Curve

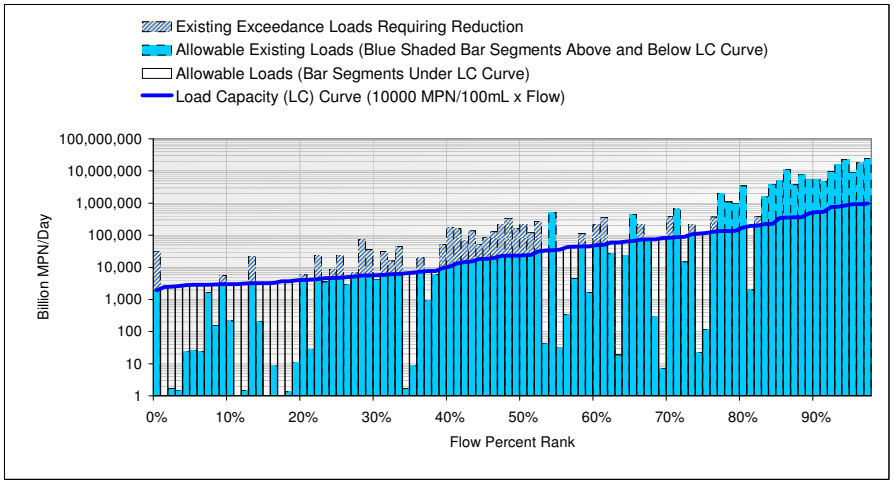

Subwatershed 1302 Total Coliform Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	98	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	59	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	22	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	37	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**163,410,600**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	10,626,979	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	149,059,572	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**159,686,552**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**3,724,049**	**Billion MPN/Year**

Table O-69. Subwatershed 1302 Enterococcus Load Duration Curve

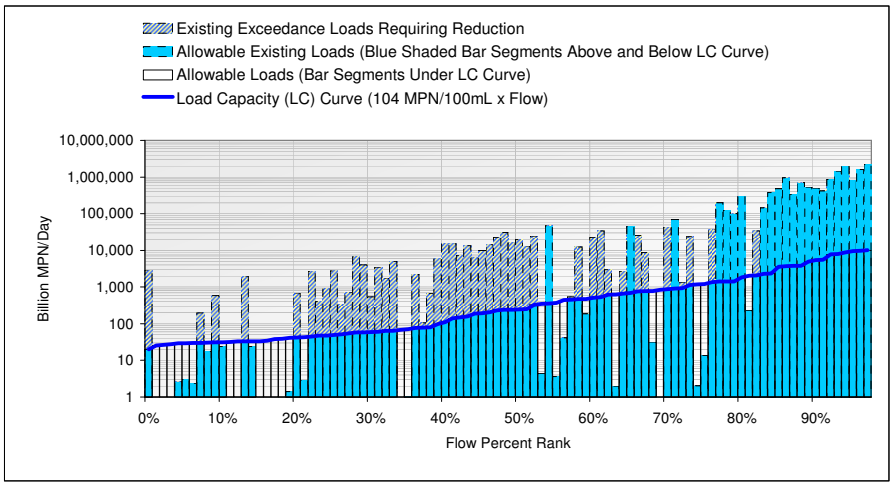

Subwatershed 1302 Enterococcus Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	98	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	69	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	22	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	47	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**14,781,447**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	113,146	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	14,179,522	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**14,292,668**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**488,779**	**Billion MPN/Year**

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Load Duration Curves

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Table O-70. Subwatershed 1401 Fecal Coliform Load Duration Curve

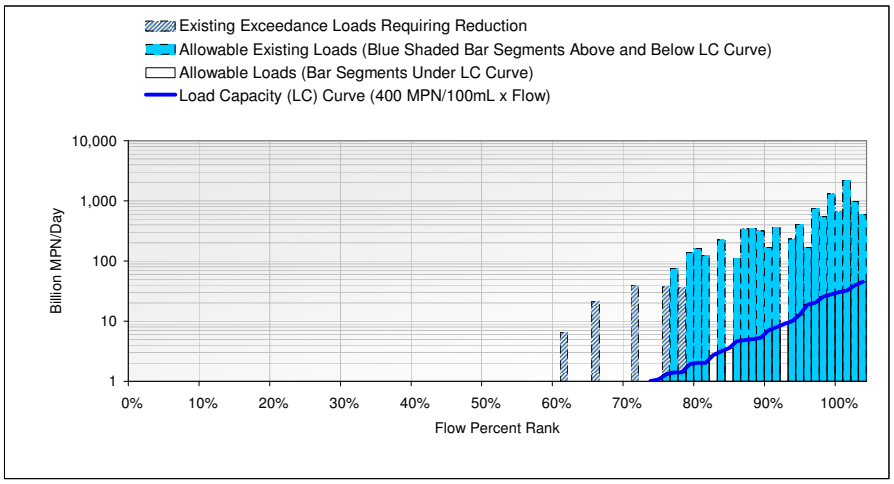

Subwatershed 1401 Fecal Coliform Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	94	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	28	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	21	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	7	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**10,392**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	312	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	9,943	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**10,256**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**136**	**Billion MPN/Year**

Table O-71. Subwatershed 1401 Total Coliform Load Duration Curve

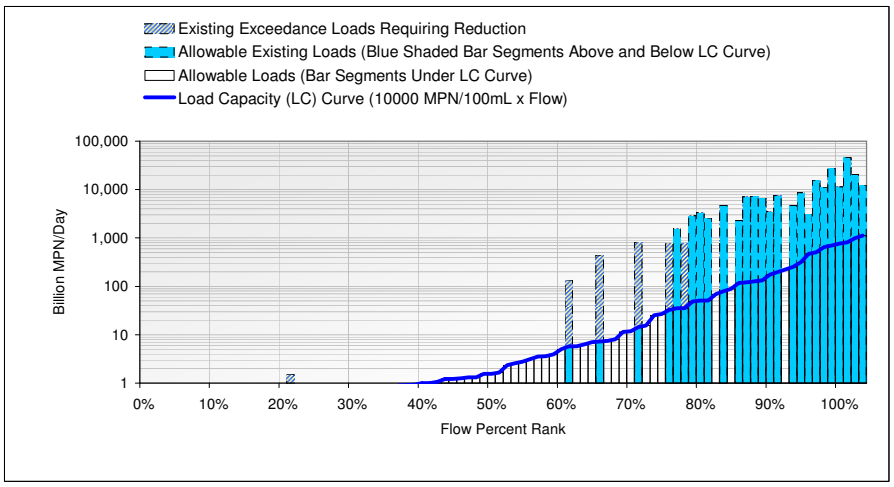

Subwatershed 1401 Total Coliform Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	94	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	28	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	21	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	7	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**212,986**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	7,809	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	202,371	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**210,180**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**2,807**	**Billion MPN/Year**

Table O-72. Subwatershed 1401 Enterococcus Load Duration Curve

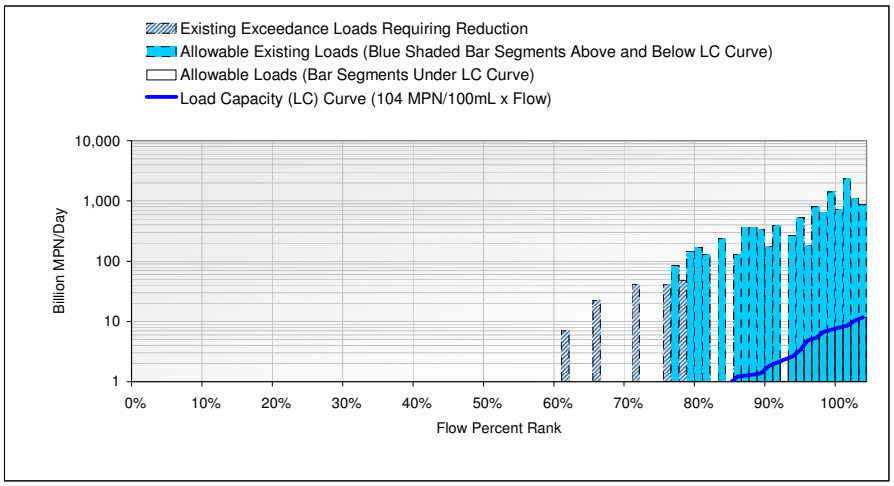

Subwatershed 1401 Enterococcus Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	94	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	28	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	21	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	7	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**11,564**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	81	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	11,323	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**11,405**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**160**	**Billion MPN/Year**

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Load Duration Curves

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Table O-73. Subwatershed 1501 Fecal Coliform Load Duration Curve

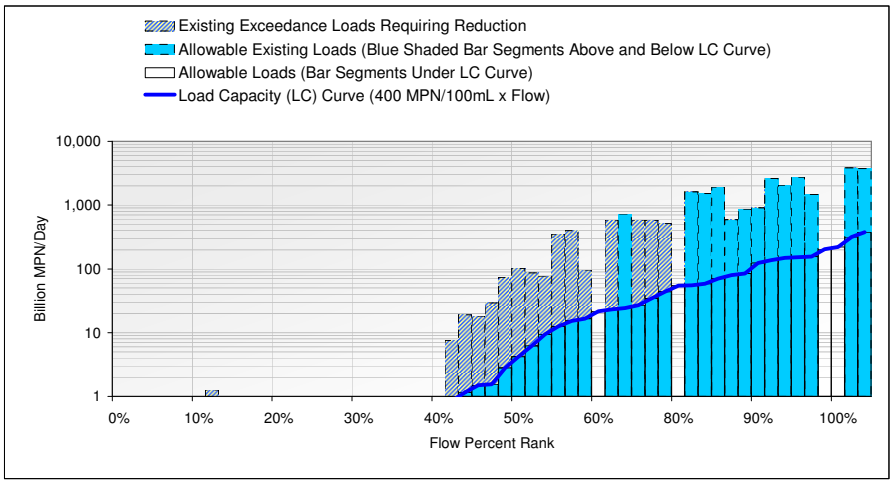

Subwatershed 1501 Fecal Coliform Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	57	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	29	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	13	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	16	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**28,044**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	1,983	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	22,749	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**24,731**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**3,312**	**Billion MPN/Year**

Table O-74. Subwatershed 1501 Total Coliform Load Duration Curve

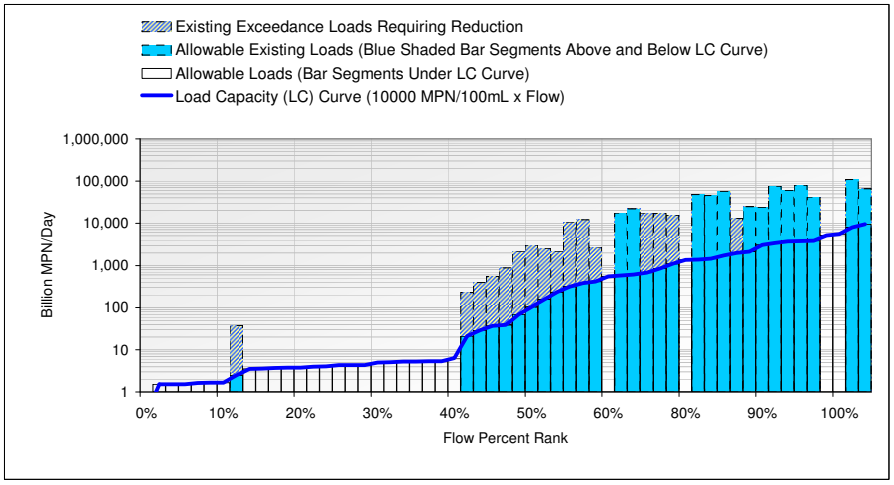

Subwatershed 1501 Total Coliform Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	57	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	29	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	13	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	16	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**768,912**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	49,567	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	625,589	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**675,156**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**93,756**	**Billion MPN/Year**

Table O-75. Subwatershed 1501 Enterococcus Load Duration Curve

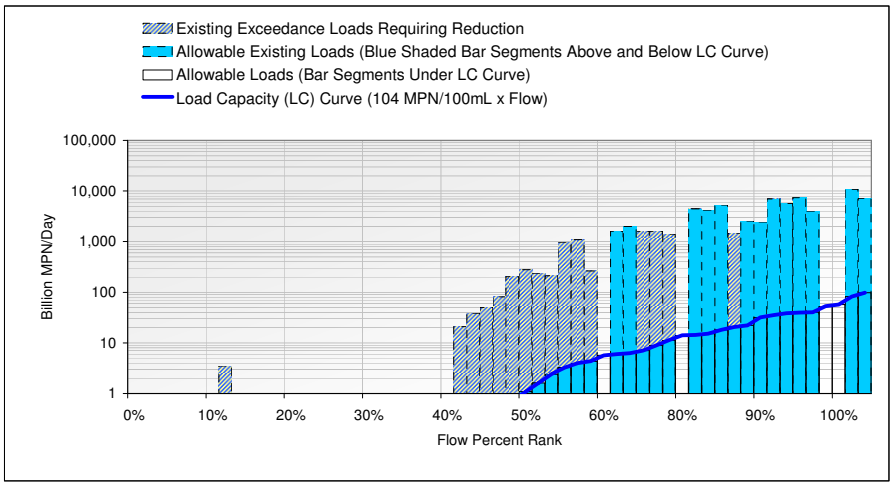

Subwatershed 1501 Enterococcus Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	57	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	29	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	13	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	16	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**74,057**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	515	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	64,059	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**64,574**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**9,483**	**Billion MPN/Year**

Table O-76. Subwatershed 1503 Fecal Coliform Load Duration Curve

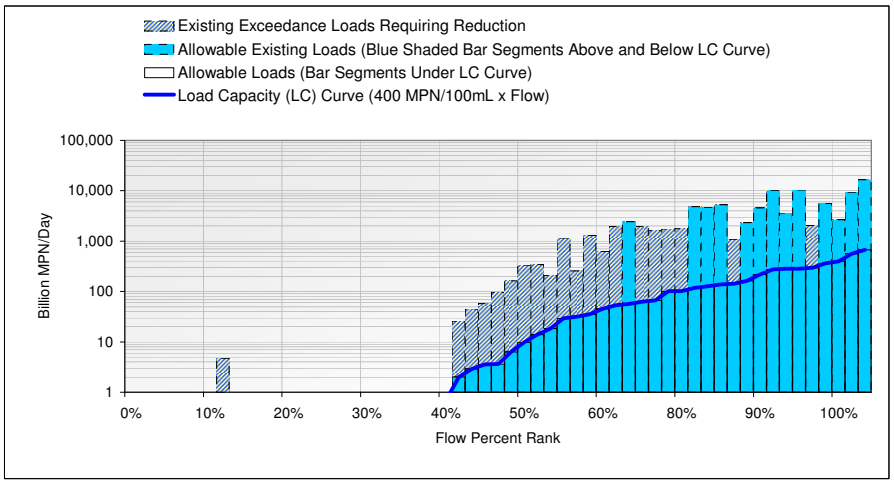

Subwatershed 1503 Fecal Coliform Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	57	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	33	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	13	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	20	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**98,955**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	4,683	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	78,531	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**83,214**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**15,740**	**Billion MPN/Year**

Table O-77. Subwatershed 1503 Total Coliform Load Duration Curve

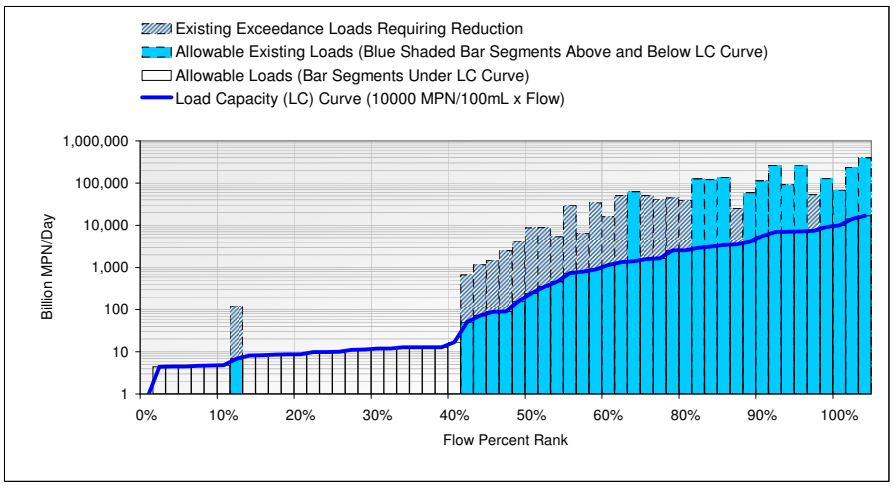

Subwatershed 1503 Total Coliform Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	57	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	33	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	13	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	20	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**2,485,458**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	117,080	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	1,971,219	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**2,088,298**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**397,159**	**Billion MPN/Year**

Table O-78. Subwatershed 1503 Enterococcus Load Duration Curve

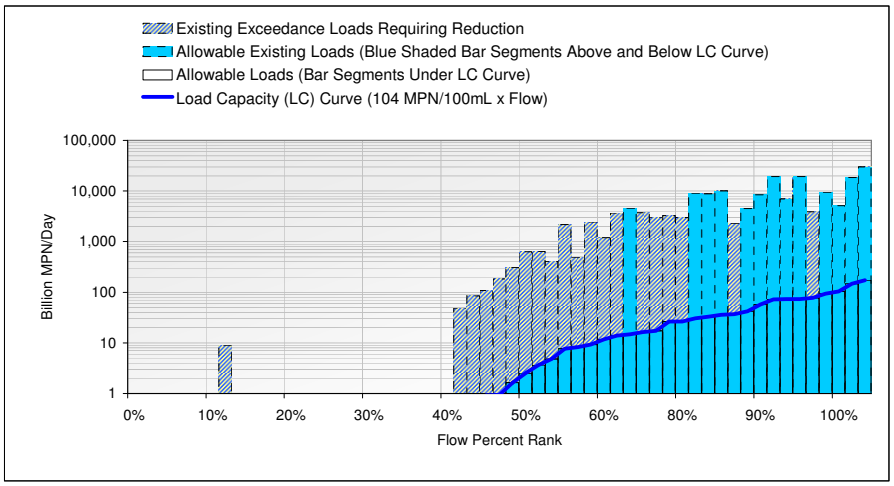

Subwatershed 1503 Enterococcus Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	57	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	33	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	13	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	20	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**185,674**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	1,218	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	153,059	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**154,277**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**31,398**	**Billion MPN/Year**

Table O-79. Subwatershed 1505 Fecal Coliform Load Duration Curve

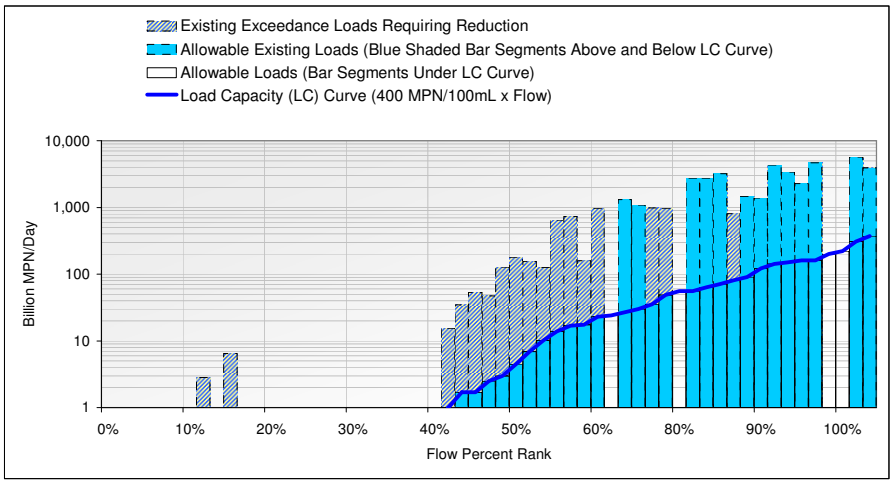

Subwatershed 1505 Fecal Coliform Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	57	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	30	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	13	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	17	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**44,212**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	2,023	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	36,432	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**38,455**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**5,757**	**Billion MPN/Year**

Table O-80. Subwatershed 1505 Total Coliform Load Duration Curve

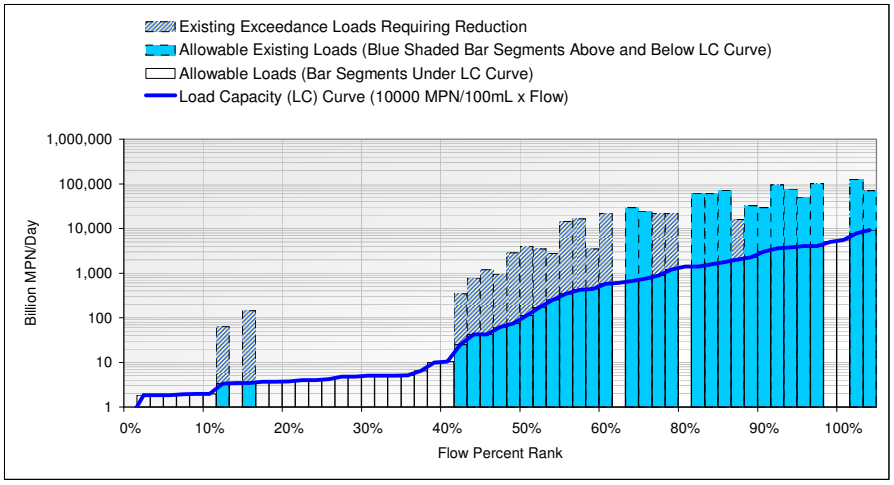

Subwatershed 1505 Total Coliform Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	57	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	30	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	13	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	17	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**958,988**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	50,571	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	783,138	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**833,709**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**125,279**	**Billion MPN/Year**

Table O-81. Subwatershed 1505 Enterococcus Load Duration Curve

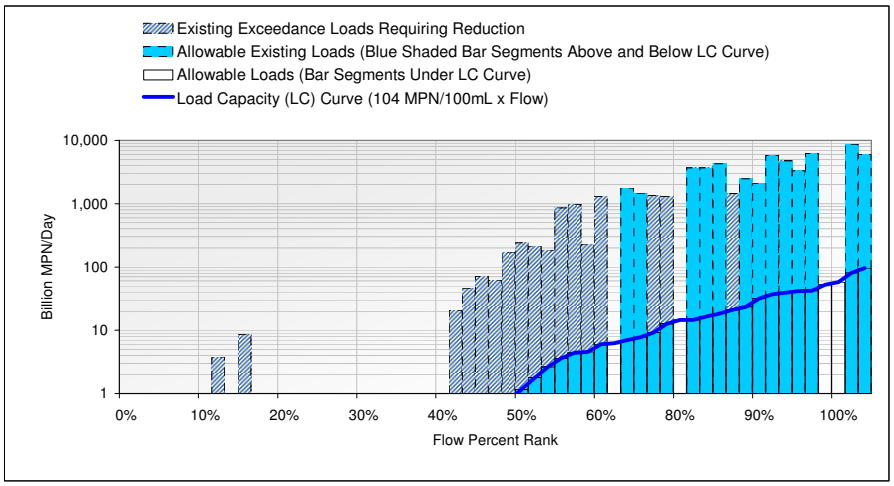

Subwatershed 1505 Enterococcus Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	57	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	30	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	13	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	17	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**62,646**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	526	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	53,700	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**54,226**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**8,420**	**Billion MPN/Year**

Table O-82. Subwatershed 1507 Fecal Coliform Load Duration Curve

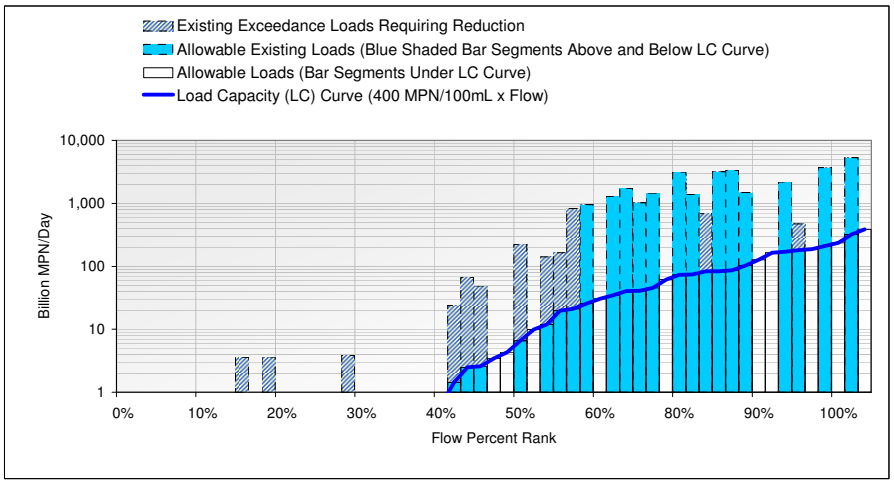

Subwatershed 1507 Fecal Coliform Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	57	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	26	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	13	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	13	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**32,846**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	1,640	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	28,866	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**30,506**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**2,340**	**Billion MPN/Year**

Table O-83. Subwatershed 1507 Total Coliform Load Duration Curve

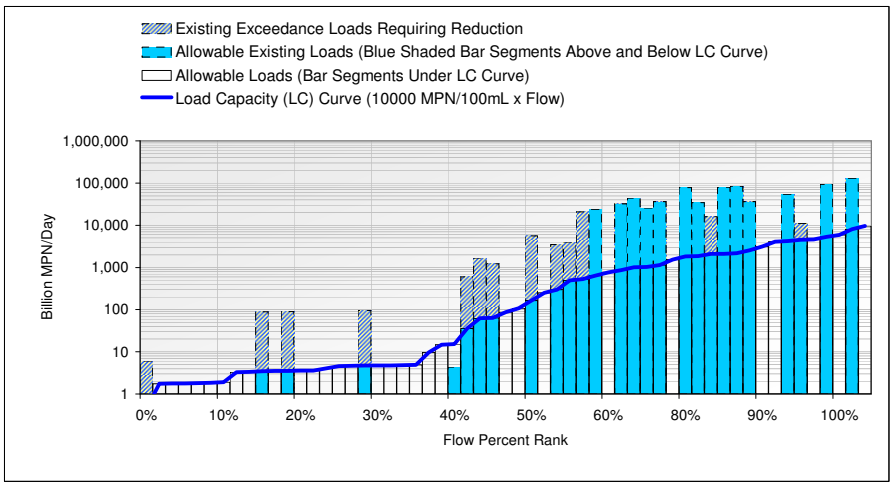

Subwatershed 1507 Total Coliform Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	57	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	26	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	13	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	13	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**816,160**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	41,010	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	718,799	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**759,809**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**56,351**	**Billion MPN/Year**

Table O-84. Subwatershed 1507 Enterococcus Load Duration Curve

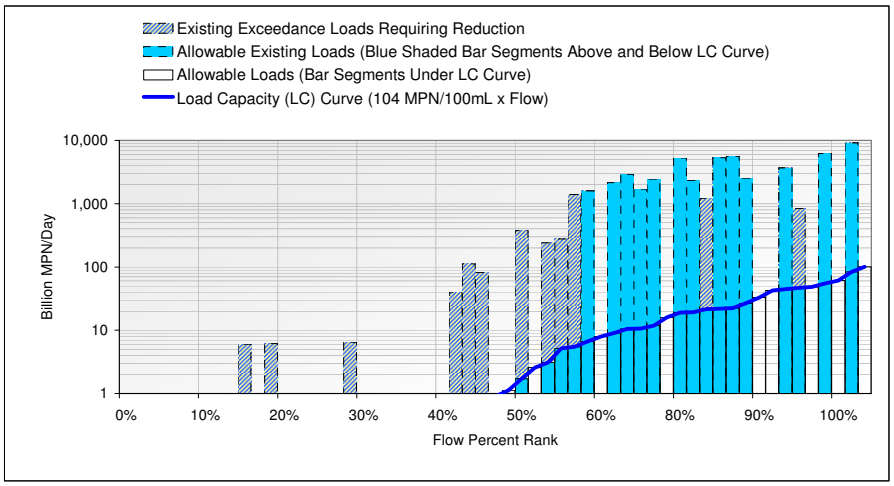

Subwatershed 1507 Enterococcus Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	57	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	27	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	13	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	14	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**55,462**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	427	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	50,529	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**50,956**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**4,506**	**Billion MPN/Year**

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Load Duration Curves

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Table O-85. Subwatershed 1700 Fecal Coliform Load Duration Curve

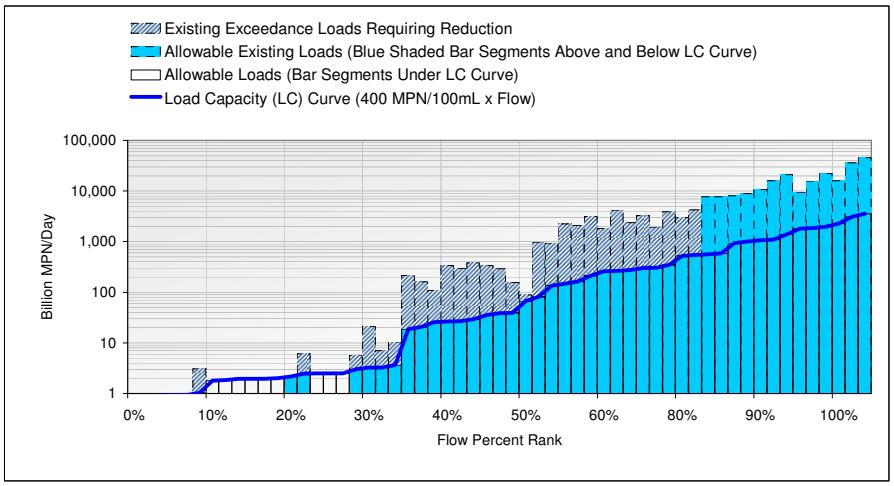

Subwatershed 1700 Fecal Coliform Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	57	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	43	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	13	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	30	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**261,966**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	25,080	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	204,241	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**229,322**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**32,644**	**Billion MPN/Year**

Table O-86. Subwatershed 1700 Total Coliform Load Duration Curve

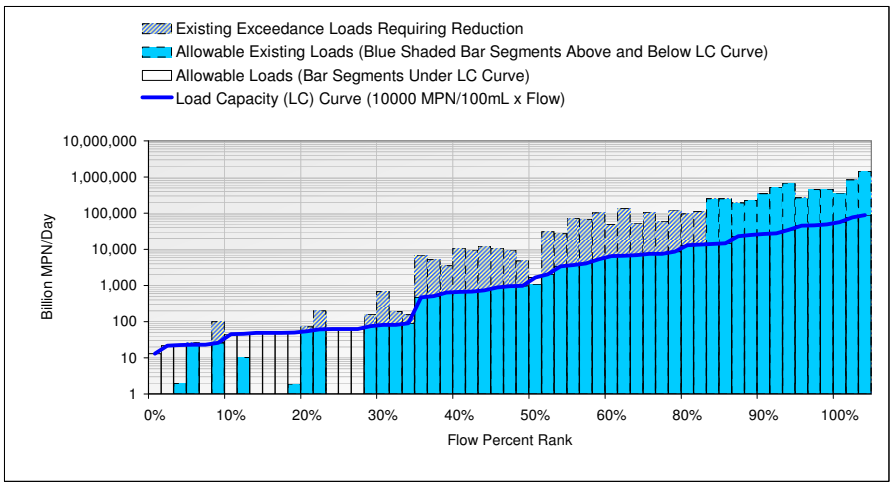

Subwatershed 1700 Total Coliform Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	57	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	43	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	13	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	30	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**7,395,789**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	626,414	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	5,753,355	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**6,379,770**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**1,016,019**	**Billion MPN/Year**

Table O-87a. Subwatershed 1700 Enterococcus (61) Load Duration Curve

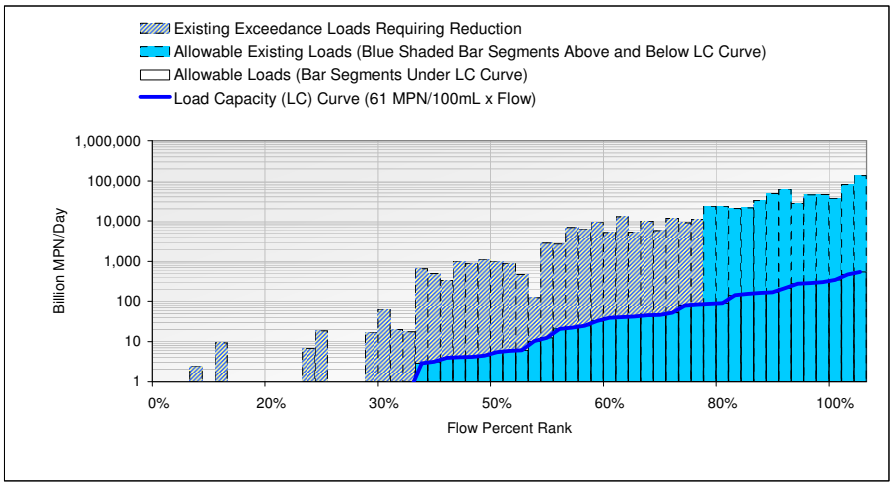

Subwatershed 1700 Enterococcus (61) Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	57	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	46	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	13	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	33	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**708,256**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	3,825	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	599,936	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**603,761**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**104,495**	**Billion MPN/Year**

Table O-87b. Subwatershed 1700 Enterococcus (104) Load Duration Curve

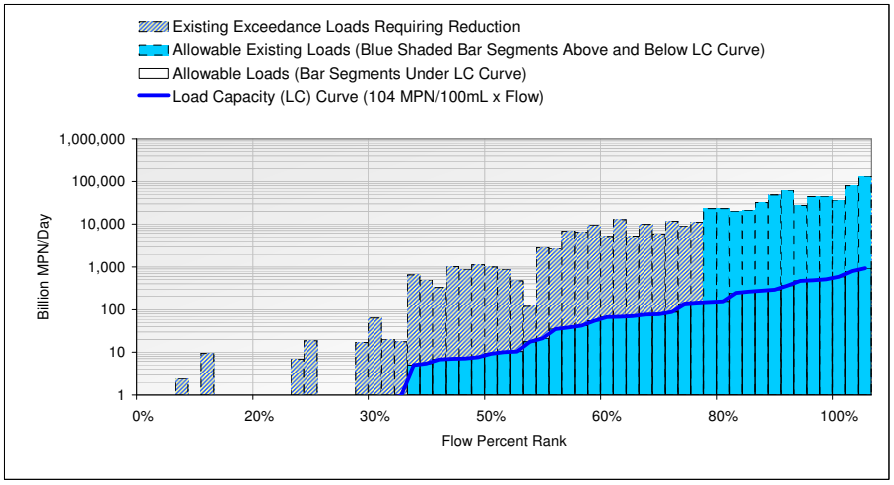

Subwatershed 1700 Enterococcus (104) Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	57	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	45	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	13	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	32	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**708,256**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	6,522	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	597,659	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**604,180**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**104,076**	**Billion MPN/Year**

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Load Duration Curves

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Table O-88. Subwatershed 1801 Fecal Coliform Load Duration Curve

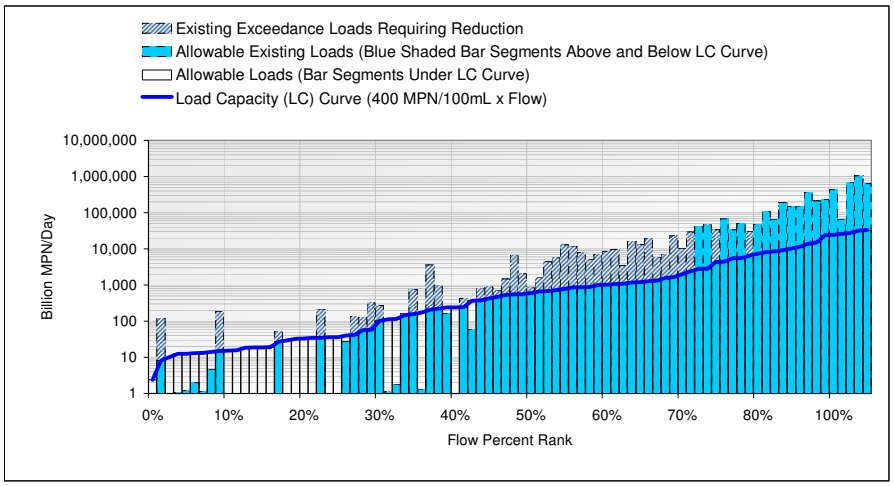

Subwatershed 1801 Fecal Coliform Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	86	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	60	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	19	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	41	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**4,932,380**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	310,820	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	4,370,018	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**4,680,838**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**251,543**	**Billion MPN/Year**

Table O-89. Subwatershed 1801 Total Coliform Load Duration Curve

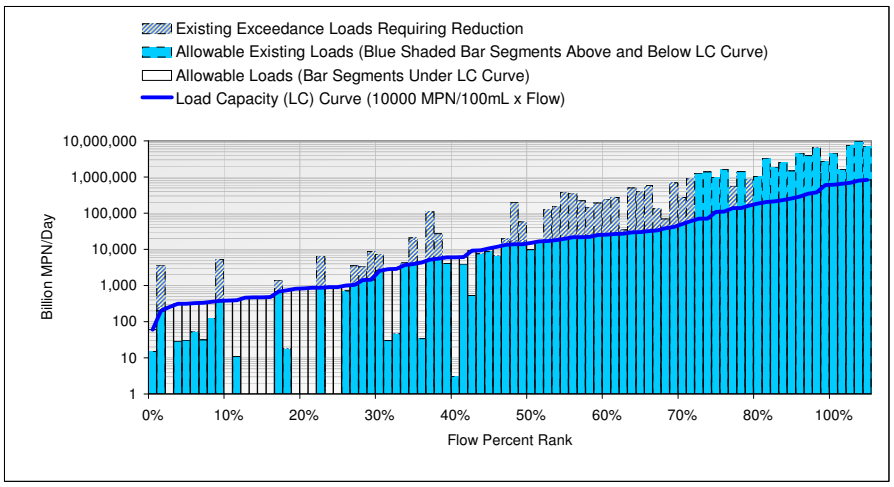

Subwatershed 1801 Total Coliform Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	86	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	54	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	19	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	35	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**72,757,569**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	7,752,284	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	58,352,938	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**66,105,222**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**6,652,347**	**Billion MPN/Year**

Table O-90a. Subwatershed 1801 Enterococcus (61) Load Duration Curve

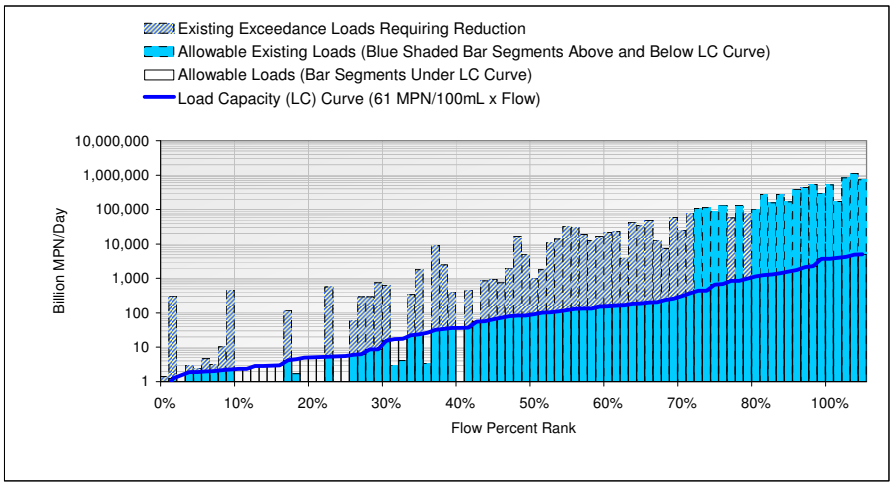

Subwatershed 1801 Enterococcus (61) Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	86	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	68	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	19	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	49	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**7,255,759**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	47,479	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	6,543,487	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**6,590,966**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**664,794**	**Billion MPN/Year**

Table O-90b. Subwatershed 1801 Enterococcus (104) Load Duration Curve

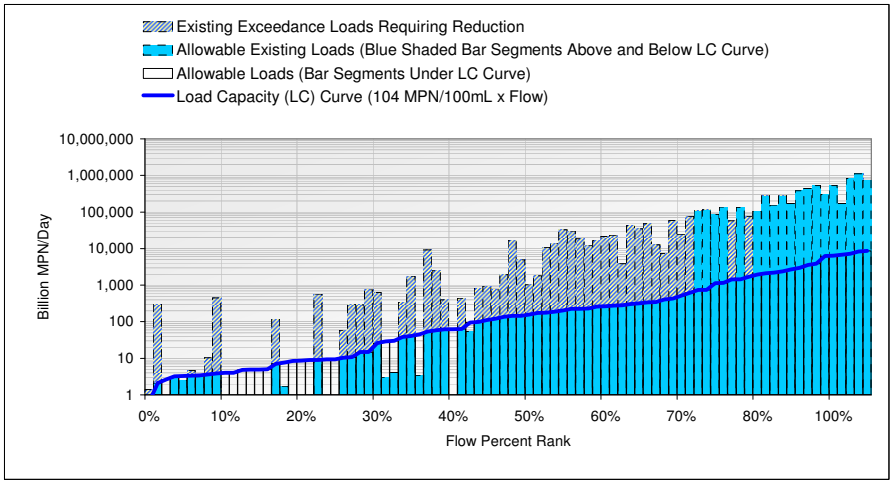

Subwatershed 1801 Enterococcus (104) Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	86	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	65	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	19	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	46	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**7,255,759**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	80,899	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	6,514,309	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**6,595,208**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**660,551**	**Billion MPN/Year**

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Load Duration Curves

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Table O-91. Subwatershed 1901 Fecal Coliform Load Duration Curve

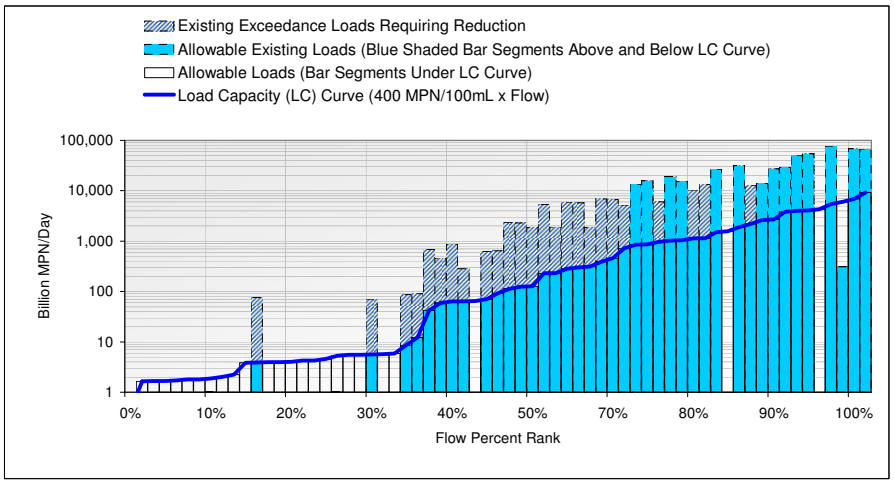

Subwatershed 1901 Fecal Coliform Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	65	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	39	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	14	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	25	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**603,863**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	55,516	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	464,924	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**520,440**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**83,423**	**Billion MPN/Year**

Table O-92. Subwatershed 1901 Total Coliform Load Duration Curve

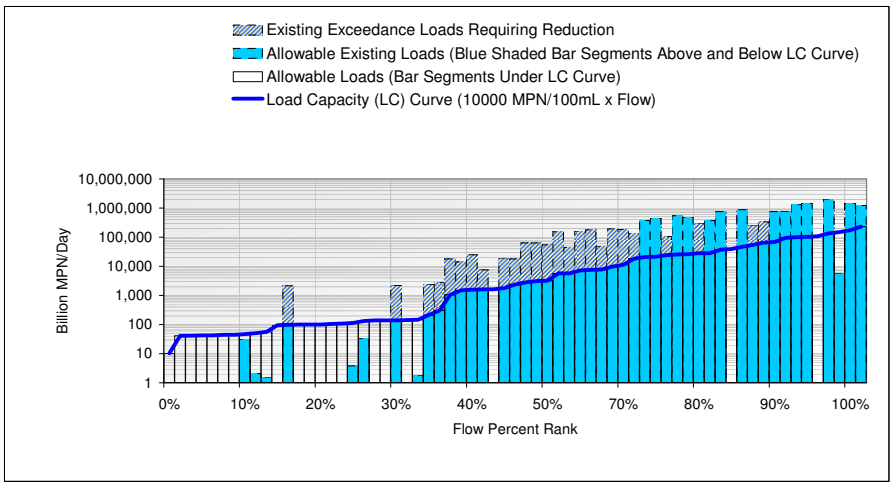

Subwatershed 1901 Total Coliform Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	65	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	39	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	14	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	25	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**15,390,608**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	1,386,037	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	11,861,589	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**13,247,626**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**2,142,982**	**Billion MPN/Year**

Table O-93a. Subwatershed 1901 Enterococcus (61) Load Duration Curve

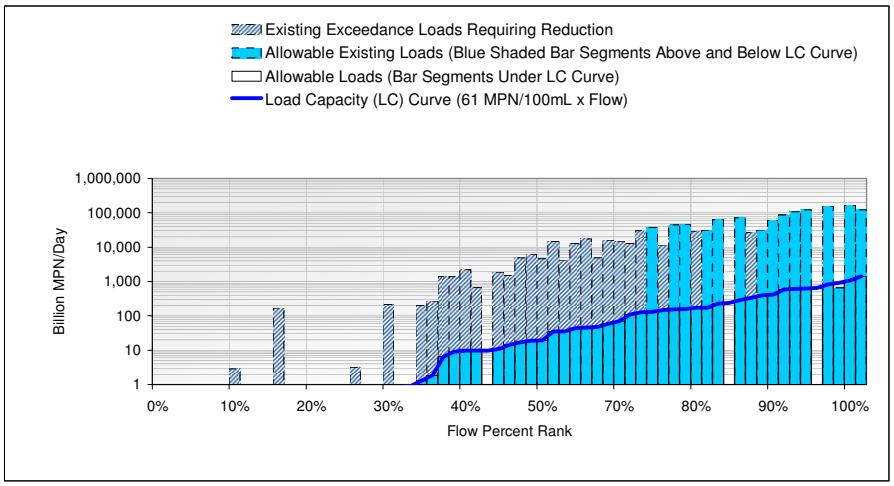

Subwatershed 1901 Enterococcus (61) Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	65	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	41	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	14	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	27	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**1,371,972**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	9,073	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	1,143,572	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**1,152,645**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**219,327**	**Billion MPN/Year**

Table O-93b. Subwatershed 1901 Enterococcus (104) Load Duration Curve

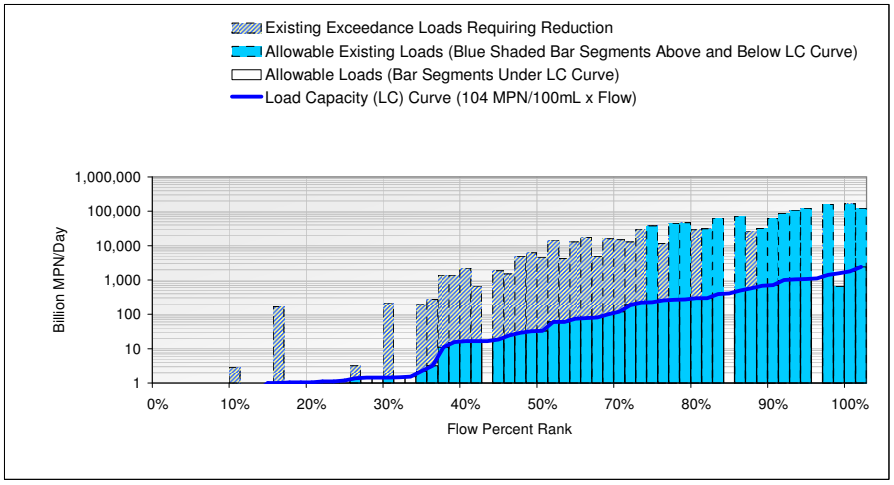

Subwatershed 1901 Enterococcus (104) Loading Summary	Value	Units
Total Wet Days During Critical Wet Year	65	Days
Total Wet Exceedence Days (Number of Bars with Segment Above LC Curve)	41	Days
Allowable Wet Weather Exceedance Frequency	22	Percentage
Allowable Wet Exceedance Days (Total Wet Days x Exceedance Frequency)	14	Days
Non-Allowable Wet Exceedance Days Requiring Load Reduction	27	Days
Total Existing Load for Existing Condition (Sum of All Shaded Bar Segments)	**1,371,972**	**Billion MPN/Year**
Allowable Load (Sum of Solid Outline Bar Segments Under LC Curve)	15,008	Billion MPN/Year
Allowable Exceedance Load (Sum of Blue Shaded Bar Segments Above LC Curve)	1,138,590	Billion MPN/Year
Total Allowable Load [TMDL] (Sum of Allowable Load and Allowable Exceedance Load)	**1,153,599**	**Billion MPN/Year**
Exceedance Load Requiring Reduction (Total Existing Load - Total Allowable Load)	**218,374**	**Billion MPN/Year**

Appendix P

Recommended Components for Bacteria and Comprehensive Load Reduction Plans

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Introduction

Dischargers will be required to submit Bacteria Load Reduction Plans (BLRPs) or Comprehensive Load Reduction Plans (CLRPs) outlining a proposed BMP program that will be capable of achieving the necessary load reductions required to attain the TMDLs in the receiving waters, acceptable to the San Diego Water Board, within 18 months after the effective date of these TMDLs.[1]

The Bacteria Load Reduction Plans or Comprehensive Load Reduction Plans are the dischargers' opportunity to propose methods for assessing compliance with the water quality based effluent limitations (WQBELs) that implement the TMDLs. The monitoring components included in the BLRPs or CLRPs should be formulated according to particular compliance assessment strategies. The monitoring components are expected to be consistent with, and support whichever compliance assessment methods are proposed. The San Diego Water Board will coordinate with the dischargers during the development of their proposed monitoring components and associated compliance assessment methods to ensure that the BLRPs or CLRPs will implement actions that can achieve the assigned wasteload allocations (WLAs) or load allocations (LAs), and meet the TMDLs in the receiving waters.

The BLRPs or CLRPs should be periodically re-evaluated and revised as additional data and information are collected. The BLRPs and CLRPs should be iterative and adaptive according to assessments and any special studies.

To provide guidance to the dischargers and San Diego Water Board in preparing BLRPs and CLRPs, components that should be considered for incorporation in the BLRPs and CLRPs are given in the following BLRP and CLRP outlines. The following outlines are components that are recommended at this time, but may be augmented or modified, as needed, to ensure that the dischargers can demonstrate that the actions implemented under the BLRPs or CLRPs will achieve the WLAs, LAs, and TMDLs.

[1] The effective date is the date the Office of Administrative Law approves this Basin Plan amendment.

Bacteria Load Reduction Plan Outline

Bacteria Load Reduction Plans (BLRPs) should include the following components:

I. Comprehensive Watershed Approach

A. Identify the Lead Watershed Contact for their BLRPs. The Lead Watershed Contact should serve as liaison between all other common watershed dischargers and the San Diego Water Board, where appropriate.

B. Describe a program for encouraging collaborative, watershed-based, land-use planning in their jurisdictional planning departments.

C. Develop and periodically update a map of the BLRP watershed, to facilitate planning, assessment, and collaborative decision-making. As appropriate, the map should include features such as receiving waters (including the Pacific Ocean); Clean Water Act section 303(d) impaired receiving waters; water quality projects; land uses; MS4s; major highways; jurisdictional boundaries; and inventoried commercial, industrial, and municipal sites.

D. Periodically assess the water quality of impaired water body in their BLRPs in order to identify all water quality problems within the impaired water body. This assessment should use applicable water quality data, reports, and analysis generated in accordance with the requirements of the applicable monitoring and reporting programs, as well as applicable information available from other public and private organizations.

E. Develop and implement a collective watershed BLRP strategy to meet the bacteria TMDL. The strategy should guide dischargers in developing a Bacteria Compliance Schedule (BCS) which includes BMP planning and scheduling as outlined below.

F. Collaborate to develop and implement the BLRPs. The BLRP should include a proposal for frequent regularly scheduled meetings among the dischargers in the impaired watershed.

G. Each BLRP and BCS should be reviewed periodically to identify needed modifications and improvements. The dischargers should develop and implement a plan and schedule, included in the BCS, to address the identified modifications and improvements. All updates to the BLRP should be documented in the BLRP, and submitted to the San Diego Water Board. Individual dischargers should also review and modify their jurisdictional ordinances and activities as necessary so that they are consistent with the requirements of the BLRP.

II. Bacteria Compliance Schedule - BMP Planning and Scheduling

The BCS should identify the BMPs/water quality projects that are planned for implementation and provide an implementation schedule for each BMP/water quality project.

The BCS should demonstrate how the BMPs/water quality projects will address all the bacteria TMDLs. The BCS, at a minimum, should include scheduling for the following:

A. Non-structural BMP phasing:

1. Initial Non-Structural BMP Analysis - Watershed data should be analyzed to identify effective non-structural BMPs for implementation. This should be completed and included in the BCS.

2. Scheduled Non-structural BMP Implementation - The above analysis should be used to identify BMPs that will be implemented and to develop an aggressive non-structural BMP implementation schedule. The BCS should include a schedule of the current BMP staffing for each impaired area, and provide a discussion on adjustments to staff scheduling to meet new non-structural BMP demands. Schedules should be realistic and justifiable.

3. Scheduled Periodic BMP Assessment and Optimizing Adjustments - As the nonstructural BMPs are being implemented, a scheduled in-depth assessment of the nonstructural BMPs' performance should follow. Non-structural BMPs that are found to be ineffective should be modified to incorporate optimizing adjustments to improve performance or be replaced by other effective non-structural BMPs. The results from this assessment should also be used to determine structural BMP selection and the schedule for structural BMP implementation. The BCS should include periodic schedule for in-depth non-structural BMP assessment and optimizing adjustments.

4. Scheduled Continuous Budget and Funding Efforts- Securing budget and funding for non-structural BMP staffing and equipment should be scheduled early and continue until the bacteria TMDLs are met. The BCS should include a schedule for staff time, including position and job description, authorized for securing budget and funding for non-structural BMP implementation.

B. Structural BMP phasing:

1. Scheduled Initial Structural BMP Analysis– Structural BMP analysis should utilize all available information, including the non-structural BMP assessment, to identify, locate, design and build structural BMPs, or a train of BMPs, to meet the these Bacteria TMDLs. The BCS should include a schedule for structural BMP analysis.

2. Scheduled BMP Construction - The BCS should include a projected general construction schedule with a realistic and justifiable timeline for BMP construction.

3. Scheduled Periodic BMP Assessment, Optimization Adjustments, and Maintenance - Assessment for structural BMPs should begin immediately upon initial BMP completion, followed by continuously scheduled BMP assessment, optimization adjustments, and maintenance, to both the individual structural BMPs and the

structural BMP program as a whole. The BCS should include a periodic schedule for in-depth structural BMP assessment.

4. Scheduled Continuous Budget and Funding Effort - Securing budget and funding for structural BMPs and additional maintenance staff should be scheduled early and continue until the bacteria TMDLs are met. The BCS should include a schedule for staff time, including position and job description, authorized for securing budget and funding for structural BMP implementation.

III. Reporting

Reports should be submitted periodically. Reports should assess and describe the effectiveness of implementing the Bacteria Load Reduction Plan. Effectiveness assessments should be based on a program effectiveness assessment framework, such as the one developed by the California Stormwater Quality Association (CASQA, no date). Using the CASQA framework as an example, the assessments should address the framework's outcome levels 1-5 on an annual basis, and outcome level 6 once every five years.[2] Methods used for assessing effectiveness should include the following or their equivalent: surveys, pollutant loading estimations, and receiving water quality monitoring. The long-term strategy should also discuss the role of monitoring data in substantiating or refining the assessment. Once WQOs have been attained, a reduced level of monitoring may be appropriate.

[2] Outcome level 1 assesses compliance with activity-based permit requirements. Outcome level 2 assesses changes in attitudes, knowledge, and awareness. Outcome level 3 assesses behavioral change and BMP implementation. Outcome level 4 assesses pollutant load reductions. Outcome level 5 assesses changes in urban runoff and discharge water quality. Outcome level 6 assesses changes in receiving water quality. See CASQA "An Introduction to Stormwater Program Effectiveness Assessment."

Comprehensive Load Reduction Plan Outline

Comprehensive Load Reduction Plans (CLRPs) should include the following components:

I. Comprehensive Watershed and Pollutant Approach

A. Identify the Lead Watershed Contact for their CLRPs. The Lead Watershed Contact should serve as liaison between all other common watershed dischargers and the San Diego Water Board, where appropriate.

B. Describe a program for encouraging collaborative, watershed-based, land-use planning in their jurisdictional planning departments.

C. Develop and periodically update a map of the CLRP watershed, to facilitate planning, assessment, and collaborative decision-making. As appropriate, the map should include features such as receiving waters (including the Pacific Ocean); Clean Water Act section 303(d) impaired receiving waters; water quality projects; land uses; MS4s; major highways; jurisdictional boundaries; and inventoried commercial, industrial, and municipal sites.

D. Periodically assess the water quality of impaired water body in their CLRPs in order to identify all water quality problems within the impaired water body. This assessment should use applicable water quality data, reports, and analysis generated in accordance with the requirements of the applicable NPDES MS4 monitoring and reporting programs, as well as applicable information available from other public and private organizations.

E. Identified water quality problems in the impaired water body to be addressed by the CLRP should include, in addition to bacteria, all CWA section 303(d) listings, persistent violations of water quality standards, toxicity, impacts to beneficial uses, water quality conditions for which water quality improvement projects are currently being implemented, and any other pertinent conditions. All impaired waters should be included. Impaired water bodies where bacteria is the only impairing pollutant are not eligible to submit a CLRP.

F. Develop and implement a collective watershed CLRP strategy to meet the bacteria TMDL and all other receiving water quality standards for all other pollutants being addressed in the CLRPs. The strategy should guide dischargers in developing a Comprehensive Compliance Schedule (CCS) which includes BMP planning and scheduling as outlined below.

G. Collaborate to develop and implement the CLRPs. The CLRP should include a proposal for frequent regularly scheduled meetings among the dischargers in the impaired watershed.

H. Each CLRP and CCS should be reviewed periodically to identify needed modifications and improvements. The dischargers should develop and implement a plan and schedule,

included in the CCS, to address the identified modifications and improvements. All updates to the CLRP should be documented in the CLRP, and submitted to the San Diego Water Board. Individual dischargers should also review and modify their jurisdictional ordinances and activities as necessary so that they are consistent with the requirements of the CLRP.

II. Comprehensive Compliance Schedule - BMP Planning and Scheduling

The CCS should identify the BMPs/water quality projects that are planned for implementation and provide an implementation schedule for each BMP/water quality project. The CCS should demonstrate how the BMPs/water quality projects will address all water quality problems in the impaired water body and result in achievement of water quality standards. It should also demonstrate how comprehensive treatment of all the pollutants together justifies a longer compliance schedule for the bacteria TMDLs. The CCS, at a minimum, should include scheduling for the following:

A. Non-structural BMP phasing:

1. Initial Non-Structural BMP Analysis - After identifying and listing all the 303(d) listed impairing pollutants and other water quality problems in an impaired water body, the water body and data should be analyzed to identify effective non-structural BMPs for implementation. This should be completed and included in the CCS.

2. Scheduled Non-structural BMP Implementation - The above analysis should be used to identify BMPs that will be implemented and to develop an aggressive non-structural BMP implementation schedule. The CCS should include a schedule of the current BMP staffing for each impaired area, and provide a discussion on adjustments to staff scheduling to meet new non-structural BMP demands. Schedules should be realistic and justifiable.

3. Scheduled Periodic BMP Assessment and Optimizing Adjustments - As the nonstructural BMPs are being implemented, a scheduled in-depth assessment of the nonstructural BMPs' performance should follow. Non-structural BMPs that are found to be ineffective should be modified to incorporate optimizing adjustments to improve performance or be replaced by other effective non-structural BMPs. The results from this assessment should also be used to determine structural BMP selection and the schedule for structural BMP implementation. The CCS should include an annual schedule for in-depth non-structural BMP assessment and optimizing adjustments.

4. Scheduled Continuous Budget and Funding Efforts- Securing budget and funding for non-structural BMP staffing and equipment should be scheduled early and continue until the bacteria TMDLs are met, water quality objectives for other impairing pollutants are achieved, and the goals and objectives of other water quality

improvement projects are met.[3] The CCS should include a schedule for staff time, including position and job description, authorized for securing budget and funding for non-structural BMP implementation.

B. Structural BMP phasing:

1. Scheduled Initial Structural BMP Analysis– Structural BMP analysis should utilize all available information, including the non-structural BMP assessment, to identify, locate, design and build structural BMPs, or a train of BMPs, that restore water quality for all the 303(d) listed impairing pollutants and other water quality problems in an impaired water body. The CCS should include a schedule for structural BMP analysis.

2. Scheduled BMP Construction - The CCS should include a projected general construction schedule with a realistic and justifiable timeline for BMP construction.

3. Scheduled Periodic BMP Assessment, Optimization Adjustments, and Maintenance - Assessment for structural BMPs should begin immediately upon initial BMP completion, followed by continuously scheduled BMP assessment, optimization adjustments, and maintenance, to both the individual structural BMPs and the structural BMP program as a whole. The CCS should include periodic schedule for in-depth structural BMP assessment.

4. Scheduled Continuous Budget and Funding Effort - Securing budget and funding for structural BMPs and additional maintenance staff should be scheduled early and continue until the bacteria TMDLs are met, water quality objectives for other impairing pollutants are achieved, and the goals and objectives of other water quality improvement projects are met.[4] The CCS should include a schedule for staff time, including position and job description, authorized for securing budget and funding for structural BMP implementation.

III. Economic Justifications

The dischargers should show how the estimated cost of the structural BMPs, and the opportunity to tailor BMP implementation to include all the 303(d) listed impaired water bodies, and/or other water quality improvement projects in an affected area, will require more time to fund and schedule. Cost estimates for the construction of potential structural BMPs, while general at this stage in planning, should be realistic and justifiable.

[3] In this case, achieving the "water quality objectives for other impairing pollutants" means that Caltrans must meet the Receiving Water Limitations requirements of their NPDES Stormwater WDRs. These Receiving Water Limitations include an iterative process requiring implementation of increasingly stringent BMPs that will result in achievement of water quality objectives. Caltrans NPDES Stormwater WDRs also contain monitoring requirements, which can be adapted to monitor, document, and assess BMP implementation. All proposals for CLRPs must include achievement of water quality objectives in receiving waters for all impairing pollutants, by meeting NPDES Receiving Water Limitations as verified through NPDES monitoring requirements, within the CCS timeframe.
[4] Please see footnote immediately above.

IV. Reporting

Reports should be submitted periodically. Reports should assess and describe the effectiveness of implementing the Comprehensive Load Reduction Plan. Effectiveness assessments should be based on a program effectiveness assessment framework, such as the one developed by the California Stormwater Quality Association (CASQA, no date). Using the CASQA framework as an example, the assessments should address the framework's outcome levels 1-5 on an annual basis, and outcome level 6 once every five years.[5] Methods used for assessing effectiveness should include the following or their equivalent: surveys, pollutant loading estimations, and receiving water quality monitoring. The long-term strategy should also discuss the role of monitoring data in substantiating or refining the assessment. Once WQOs have been attained, a reduced level of monitoring may be appropriate.

[5] Outcome level 1 assesses compliance with activity-based permit requirements. Outcome level 2 assesses changes in attitudes, knowledge, and awareness. Outcome level 3 assesses behavioral change and BMP implementation. Outcome level 4 assesses pollutant load reductions. Outcome level 5 assesses changes in urban runoff and discharge water quality. Outcome level 6 assesses changes in receiving water quality. See CASQA "An Introduction to Stormwater Program Effectiveness Assessment."

Appendix Q

Small Municipal Separate Storm Sewer Systems in the Revised Bacteria TMDLs Project I Watersheds

Agency	Facility	Address	City, State, Zip
California Community Colleges	Cuyamaca College	900 Rancho San Diego Parkway	El Cajon, CA 92019-4304
California Community Colleges	Grossmont College	8800 Grossmont College Drive	El Cajon, CA 92020-1799
California Community Colleges	MiraCosta College	1 Barnard Drive	Oceanside, CA 92056-3899
California Community Colleges	Palomar College	1140 West Mission Road	San Marcos, CA 92069-1487
California Community Colleges	Saddleback College	28000 Marguerite Parkway	Mission Viejo, CA 92692-3699
California State University	California State University San Marcos	333 S. Twin Oaks Valley Rd.	San Marcos, CA 92096
California State University	San Diego State University	5500 Campanile Drive	San Diego, CA 92182
Defense, Department of	Miramar Marine Corps Air Station	PO Box 452013	San Diego, CA 92145
Defense, Department of	Mission Gorge Recreational Facility	33000 Nixie Way Bldg 50, Suite 326	San Diego, CA 92147-5110
Defense, Department of	Navy Public Works Center, Taylor Street Facility	33000 Nixie Way Bldg 50, Suite 326	San Diego, CA 92147-5110
District Agricultural Association	San Diego County Fairgrounds	2260 Jimmy Durante Blvd	Del Mar, CA
San Diego Community Colleges	Mesa College	7250 Mesa College Drive Room J108	San Diego, CA 92111
School District, Alpine Union Elementary		1323 Administration Way	Alpine, CA 91901-2104
School District, Bonsall Union Elementary		31505 Old River Road	Bonsall, CA 92003-5112
School District, Cajon Valley Union Elementary		189 Roanoke Road	El Cajon, CA 92022-1007
School District, Capistrano Unified		32972 Calle Perfecto	San Juan Capistrano, CA 92675-4706
School District, Dehesa Elementary		4612 Dehesa Road	El Cajon, CA 92019-2922
School District, Del Mar Union Elementary		225 Ninth St.	Del Mar, CA 92014-2716
School District, Escondido Union Elementary		1330 E. Grand Ave.	Escondido, CA 92027-3099
School District, Escondido Union High		302 N. Midway Dr.	Escondido, CA 92027-2741
School District, Grossmont Union High		1100 Murray Dr.	La Mesa, CA 91944-1043
School District, Julian Union Elementary		1704 Hwy. 78	Julian, CA 92036-0337
School District, Julian Union High		1656 Hwy. 78	Julian, CA 92036-0417
School District, La Mesa-Spring Valley		4750 Date Ave.	La Mesa, CA 91941-5214
School District, Laguna Beach Unified		550 Blumont St.	Laguna Beach, CA 92651-2356
School District, Lakeside		12335 Woodside Ave.	Lakeside, CA 92040-

Agency	Facility	Address	City, State, Zip
Union Elementary			0578
School District, Lemon Grove Elementary		8025 Lincoln St.	Lemon Grove, CA 91945-2515
School District, Oceanside Unified		2111 Mission Ave.	Oceanside, CA 92054-2326
School District, Poway Unified		13626 Twin Peaks Road	Poway, CA 92064-3034
School District, Ramona City Unified		720 Ninth St.	Ramona, CA 92065-2348
School District, Saddleback Valley Unified		25631 Peter A Hartman Way	Mission Viejo, CA 92691-
School District, San Diego City Unified		4100 Normal St.	San Diego, CA 92103-2653
School District, San Marcos Unified		1 Civic Center Dr., Suite 300	San Marcos, CA 92069-
School District, San Pasqual Union Elementary		16666 San Pasqual Valley Road	Escondido, CA 92027-7001
School District, Santee Elementary		9625 Cuyamaca St.	Santee, CA 92071-2674
School District, Spencer Valley Elementary		4414 Hwys. 78 and 79	Santa Ysabel, CA 92070-0159
School District, Warner Unified		30951 Hwy. 79	Warner Springs, CA 92086-0008
University of California	University of California, San Diego	9500 Gilman Dr.	La Jolla, CA 92093
Veteran Affairs	VA San Diego Healthcare System	3350 La Jolla Village Drive	San Diego, CA 92161

Appendix R

Environmental Analysis and Checklist

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APPENDIX R: ENVIRONMENTAL ANALYSIS AND CHECKLIST

R.1 California Environmental Quality Act Requirements

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) must comply with the California Environmental Quality Act (CEQA) when amending the Water Quality Control Plan for the San Diego Basin (Basin Plan) as proposed in this project to adopt total maximum daily loads (TMDLs) for indicator bacteria in beaches and creeks in the San Diego Region. Under the CEQA, the San Diego Water Board is the Lead Agency for evaluating the environmental impacts of the reasonably foreseeable methods of compliance with the proposed TMDLs.

The adoption of a Basin Plan amendment is an activity subject to CEQA requirements because Basin Plan amendments constitute rules or regulations requiring the installation of pollution control equipment, establishing a performance standard, or establishing a treatment requirement.[1] TMDL Basin Plan amendments normally contain a quantifiable numeric target that interprets the applicable water quality objective. TMDLs also include wasteload allocations (WLAs) for point sources and load allocations (LAs) for nonpoint sources and natural background. The quantifiable target together with the allocations may be considered a performance standard.[2] Sections 1.1 and 1.2 below describe in detail the statutory requirements and scope of this environmental analysis required by the CEQA for Basin Plan amendments.

R.1.1 Exemption from Requirement to Prepare Standard CEQA Documents

The CEQA authorizes the Secretary of the Resources Agency to certify state regulatory programs, designed to meet the goals of the CEQA, as exempt from its requirements to prepare an Environmental Impact Report (EIR), Negative Declaration, or Initial Study. The State Water Resources Control Board's (SWRCB) and the Regional Water Quality Control Board's Basin Plan amendment process is a certified regulatory program and is therefore exempt from the CEQA's requirements to prepare such documents. [3]

The SWRCB's CEQA implementation regulations[4] describe the environmental documents required for Basin Plan amendment actions. These documents consist of a written report that includes a description of the proposed activity, alternatives to the proposed activity to lesson or eliminate potentially significant environmental impacts, and identification of mitigation measures to minimize any significant adverse impacts. For this project, these documents are the Technical Report entitled *Total Maximum Daily Loads for Indicator Bacteria Project I – Beaches and Creeks in the San Diego Region* (Technical Report), an initial draft of the Basin

[1] 14 CCR section 15187 (a).
[2] The term "performance standard" is defined in the rulemaking provisions of the Administrative Procedure Act [Government Code sections 11340-l 1359]. A "performance standard" is a regulation that describes an objective with the criteria stated for achieving the objective [Government Code section 11342(d)].
[3] 14 CCR section 15251(g) and Public Resources Code section 21080.5.
[4] 23 CCR section 3720 et seq. "Implementation of the Environmental Quality Act of 1970."

Plan amendment (Appendix B) and an environmental checklist (section 4 below). These components fulfill the requirements of the CEQA for preparation of environmental documents for this Basin Plan amendment.[5]

R.1.2 Scope of Environmental Analysis

The CEQA has specific provisions that establish the scope of the environmental analysis required for the adoption of this TMDL Basin Plan amendment. The CEQA limits the scope to an environmental analysis of the reasonably foreseeable methods of compliance with the WLAs and LAs. The SWRCB CEQA Implementation Regulations for Certified Regulatory Programs[6] require the environmental analysis to include at least the following:

1. A brief description of the proposed activity. In this case, the proposed activity is the TMDL Basin Plan amendment. This amendment is described in section 2 of this appendix.

2. Reasonable alternatives to the proposed activity (discussed in section 8).

3. Mitigation measures to minimize any significant adverse environmental impacts of the proposed activity (discussed in section 5).

Additionally, the CEQA[7] and CEQA Guidelines[8] require the following components, some of which are repetitive from the list above:

1. An analysis of the reasonably foreseeable environmental impacts of the methods of compliance. These methods may be employed to comply with the TMDL Basin Plan amendment. Reasonably foreseeable methods of compliance are described in section 3. Sections 4 and 5 identify the environmental impacts associated with the methods of compliance.

2. An analysis of the reasonably foreseeable feasible mitigation measures relating to those impacts. This discussion is also in section 5.

3. An analysis of reasonably foreseeable alternative means of compliance with the rule or regulation, which would avoid or eliminate the identified impacts. This discussion is in section 5.1.

Additionally, the CEQA Guidelines require the environmental analysis take into account a reasonable range of:[9]

1. Environmental factors (section 5).

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[5] 23 CCR section 3777
[6] Ibid.
[7] Public Resources Code section 21159 (a)
[8] 14 CCR section 15187(c)
[9] 14 CCR section 15187(d),Public Resources Code section 21159 (c)

2. Economic factors (section 7).
3. Technical factors (section 6).
4. Population (section 6).
5. Geographic areas (section 6).
6. Specific sites. (section 6)

A "reasonable range" does not require an examination of every site, but a reasonably representative sample of them. The statute specifically states that the agency shall not conduct a "project level analysis."[10] Rather, a project level analysis must be performed by the dischargers that are required to implement the TMDLs.[11] Notably, the San Diego Water Board is prohibited from specifying the manner of compliance with its regulations,[12] and accordingly, the actual environmental impacts will necessarily depend upon the compliance strategy selected by the dischargers. In preparing this environmental analysis, the San Diego Water Board has considered the pertinent requirements of state law,[13] and intends this analysis to serve as a tier 1 environmental review.

Any potential environmental impacts associated with the TMDL depend upon the specific compliance projects selected by the dischargers, most of whom are public agencies subject to their own CEQA obligations. If not properly implemented or mitigated at the project level, there could be adverse environmental impacts from implementing these TMDLs. The substitute CEQA documents identify broad mitigation approaches that could be considered at the project level. Consistent with the CEQA, the substitute documents do not engage in speculation or conjecture, but rather consider the reasonably foreseeable environmental impacts of the reasonably foreseeable methods of compliance, the reasonably foreseeable mitigation measures, and the reasonably foreseeable alternative means of compliance, which would avoid, eliminate, or reduce the identified impacts.

[10] Public Resources Code section 21159(d)
[11] Public Resources Code section 21159.2
[12] Water Code section 13360
[13] Public Resources Code section 21159 and 14 CCR section 15187

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R.2 Description of the Proposed Activity

The Basin Plan designates beneficial uses of waterbodies, establishes water quality objectives for the protection of these beneficial uses, and outlines a plan of implementation for maintaining and enhancing water quality. The proposed amendment would incorporate into the Basin Plan TMDLs for indicator bacteria in the San Diego Region.

Three beneficial uses exist in San Diego Region that are sensitive to, and subject to impairment by elevated concentrations of bacteria in the water column. Water contact (REC-1) and shellfish harvesting (SHELL) require water quality suitable for the protection of recreational uses in or near water and aquatic habitat suitable for shellfish harvesting. The water quality in the beaches and creeks of the San Diego Region have exceeded the numeric water quality objectives (WQOs) for total, fecal, and/or enterococci bacteria. Other beaches were consistently posted with health advisories and/or closed to the public. These exceedances and postings threaten and impair water contact (REC-1) and shellfish harvesting (SHELL) beneficial uses.

The San Diego Water Board's goal in adopting the TMDL is to eliminate the water quality problems caused by bacteria in its beaches and creek. Although WQOs for REC-1, and SHELL beneficial uses are written in terms of density of indicator bacteria colonies (most probable number of colonies per milliliter of water), the actual risk to human health is caused by the presence of disease-causing pathogens. When the risk to human health from pathogens in the water is so great that beaches are posted with health advisories or closure signs, or shellfish are unsafe to consume, the quality and beneficial use of the water are impaired. The adoption of a TMDL is not discretionary; rather, it is compelled by section 303(d) of the federal Clean Water Act.

The TMDLs for indicator bacteria, and their derivation are discussed in the Technical Report, section 9. For point sources, the TMDLs will be implemented primarily through waste discharge requirements (WDRs) for urban runoff that implement federal National Pollutant Discharge Elimination System (NPDES) regulations. The primary dischargers are municipalities located in the watersheds, small municipal storm separate sewer systems (MS4s), and the California Department of Transportation (Caltrans). Dischargers will receive wasteload allocations that can be met over a phased compliance schedule that should result in attainment of water quality standards.

In the San Juan Creek, San Luis Rey River, San Marcos Creek, and San Dieguito River watersheds, significant bacteria loads come from nonpoint sources in addition to wasteloads discharged from MS4s. In these watersheds, load reductions from agriculture, livestock, and horse ranch facilities will be needed to meet bacteria WQOs. The San Diego Water Board will implement the load reductions in these watersheds by enforcing facility specific WDRs and the Waiver Policy with respect to waivers for discharges of waste from agricultural, nursery, and orchard irrigation return flow, animal feeding operations, manure composting and soil amendment operations, and septic systems. The Implementation Plan and compliance schedule are discussed in the Technical Report, section 11.

R.2.1 Surrounding Land Uses and Setting

The beaches and creeks addressed in this analysis are in southern California, primarily in southern Orange and San Diego Counties. The beaches and creeks are located within or hydraulically downstream of five watersheds in Orange County (with a small portion in Riverside County) and eight watersheds in San Diego County. Most of the waterways flow directly to the Pacific Ocean, except Chollas and Tecelote Creeks, which flow to San Diego Bay and Mission Bay respectively. The combined watersheds cover roughly 1,730 square miles (4,480 square kilometers).

The climate in the Region is generally mild with annual temperatures averaging around 65°F near the coastal areas. Average annual rainfall ranges from 9 to 11 inches along the coast to more than 30 inches in the eastern mountains. There are three distinct types of weather in the Region. Summer dry weather occurs from late April to mid-October. During this period almost no rain falls. The winter season (mid-October through early April) has two types of weather; 1) winter dry weather when rain has not fallen for the preceding 72 hours, and 2) wet weather consisting of storms of 0.2 inches of rainfall and the 72 hour period after the storm. Eighty five to 90 percent of the annual rainfall occurs during the winter season (County of San Diego, 2000).

The land use of the Region is highly variable. The coastline areas are highly concentrated with urban and residential land uses, and the inland areas primarily consist of open space. Most of the area is occupied by open space or recreational land use, followed by low-density residential and agriculture/livestock land uses. Other major land uses are commercial/institutional, high-density residential, industrial/transportation, military, transitional, and water. More information is provided in section 3 of the Technical Report.

R.3 Analysis of Reasonably Foreseeable Methods of Compliance

This section identifies a range of reasonably foreseeable method(s) of compliance with the Basin Plan amendment. Bacteria generation is linked to different types of land uses, and bacteria are transported to receiving waters via urban runoff, runoff from lands used for agriculture, livestock, and horse ranch operations, natural background, and sewage spills from wastewater treatment plants. The most significant controllable source of bacteria to receiving waters is urban runoff discharges from MS4s during wet and dry weather. In wet weather, the amount of runoff and associated bacteria densities are highly dependent on land use and associated management practices (e.g., management of livestock in agricultural areas, pet waste in residential areas). In dry weather, the amount of runoff and associated bacteria densities result from various land use practices that cause water to enter storm drains and creeks, such as lawn irrigation runoff and car washing. In the final wet weather TMDLs, background sources were not added to the TMDLs and thus, take up the entire loading capacity of the creeks resulting in load and wasteload allocations of zero.

The most reasonably foreseeable methods of compliance with the wasteload and load reductions of these TMDLs are for dischargers to implement structural and non-structural best management practices (BMPs) for point source discharges, and management measures (MMs) for nonpoint sources. Typical BMPs/MMs that may be chosen by dischargers to comply with the load and wasteload reductions are divided into non-structural and structural controls, and are described below.

Non-structural Controls

Non-structural controls typically are aimed at controlling sources of a pollutant and generally do not involve new construction. No potentially significant impacts on the environment were identified for these controls.

Education and Outreach: Conduct education and outreach to residents to minimize the potential for contamination of stormwater runoff by cleaning up after their pets, picking up litter, minimizing runoff from agriculture, livestock, and horse ranch facilities, and controlling excessive irrigation. Bacterial source-tracking studies in a watershed in the Seattle, Washington area found that nearly 20 percent of the bacteria isolates that could be matched with host animals were matched with dogs.[14]

Road and Street Maintenance: Increase frequency of street sweeping to maintain clean sidewalks, streets, and gutters. Street sweeping can reduce non-point source pollution by 5 to 30 percent when a conventional mechanical broom and vacuum-assisted wet sweeper is used.[15] The U.S. Environmental Protection Agency (USEPA) reports that the new vacuum assisted dry sweepers can achieve 50 to 88 percent overall reductions in the annual sediment loading for a residential street, depending on sweeping frequency. A reduction in sediment load may lead to a reduction in bacteria being carried to the MS4, and ultimately to beaches and creeks.

[14] USEPA, 1999, National Menu of Best Management Practices for Stormwater-Phase II, *http://cfpub.epa.gov/npdes/stormwater/menuofbmps*
[15] ibid

Storm Drain System Cleaning: Storm drain systems should be cleaned regularly since flows in the drains are rarely high enough to flush the drains. Cleaning of the storm drain systems will reduce the levels of bacteria as well as reduction of other pollutants, trash, and debris both in the storm drain system and in receiving waters.

BMP Inspection and Maintenance: Conduct regular inspections of treatment control BMPs to ensure their adequacy of design and proper function. Routine inspection and maintenance is an efficient way to prevent potential nuisance situations, such as odors, mosquitoes, weeds, etc., and can reduce the need for repair maintenance and the chance of polluting storm water runoff by finding and correcting problems before the next rain.[16]

Enforcement of Local Ordinances: Develop and/or enforce municipal ordinances prohibiting the discard of litter, pet cleanup negligence, or lawn over-watering. Enforcement of such ordinances will decrease the likelihood of bacteria from controllable sources reaching storm drains.

Manure Fertilizer Management Plan: Farms and livestock operations that use manure as a soil amendment, or dispose of manure on site can adopt a manure fertilizer management plan to ensure that manure fertilizers or wastes are stored, used, and disposed of in ways that minimize exposure of manure to stormwater.

Sizing and Location of Facilities: Manure composting and storage facilities, and livestock holding pens, paddocks, and corrals should be properly sized, and sited in areas that do not drain to surface streams.

Structural Controls

Structural controls divert, store, and treat stormwater, or infiltrate stormwater into the ground. Structural controls can involve construction and operation activities that create potentially significant environmental impacts.

Buffer Strips and Vegetated Swales: Construct and maintain vegetative buffer strips along roadsides and in medians to slow runoff velocity and increase stormwater infiltration. Replace curbs with vegetated swales to allow highway and road runoff to percolate into the ground. Buffer strips can also be used to keep stormwater out of livestock holding pens, corrals, and paddocks.

Bioretention: Construct and maintain bioretention BMPs to provide on-site removal of pollutants from stormwater runoff through landscaping features.

Infiltration Trenches: Construct and maintain infiltration trenches designed to capture and naturally filter stormwater runoff.

[16] ibid

Sand Filters: Install and maintain sand filters, which are effective for pollutant removal from stormwater. Sand filters may be a good option in densely developed urban areas with little pervious surface since the filters occupy minimal space.

Diversion /Treatment Systems: Install diversion systems to capture non-stormwater runoff. During low flow conditions, runoff may be diverted to an on-site treatment system and released back to the MS4/receiving water, or it may be diverted to wastewater collection plants for treatment. Diversion systems consist of berms, roofs, or enclosures that can be used at farms and livestock facilities to drain storm water away from holding pens, paddocks, corrals, and manure composting areas.

Animal Exclusion: Construct fencing, hedgerows, and livestock trails and walkways to exclude animals from streams and riparian areas to prevent direct deposition of feces into surface waters. Alternative water supplies, shade, and forage may need to be provided if animals are excluded from streams and riparian areas.

Waste Treatment Lagoon: Construct liquid manure storage and treatment structures to store and treat facility wastewater and the contaminated runoff from livestock facilities at all times, up to and including storms exceeding a 25-year, 24-hour frequency event.

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R.4 Environmental Checklist

	ENVIRONMENTAL CHECKLIST	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant	No Impact
1.	**Earth. Will the proposal result in:**				
	a. Unstable earth conditions or in changes in geologic substructures?		X		
	b. Disruptions, displacements, compaction or overcoming of the soil?			X	
	c. Change in topography or ground surface relief features?		X		
	d. The destruction, covering or modification of any unique geologic or physical features?		X		
	e. Any increase in wind or water erosion of soils, either on or off the site?			X	
	f. Changes in deposition or erosion of beach sands, or changes in siltation, deposition or erosion which may modify the channel of a river or stream or the bed of the ocean or any bay, inlet or lake?			X	
	g. Exposure of people or property to geologic hazards, such as earthquakes, landslides, mudslides, ground failure, or similar hazards?		X		
2.	**Air. Will the proposal result in:**				
	a. Substantial air emissions or deterioration of ambient air quality?		X		
	b. The creation of objectionable odors?		X		
	c. Alteration of air movement, moisture or temperature, or any change in climate, either locally or regionally?				X

	ENVIRONMENTAL CHECKLIST	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant	No Impact
3.	**Water. Will the proposal result in:**				
	a. Changes in currents, or the course of direction or water movements, in either marine or fresh waters?			X	
	b. Changes in absorption rates, drainage patterns, or the rate and amount of surface water runoff?			X	
	c. Alterations to the course of flow of flood waters?		X		
	d. Change in the amount of surface water in any water body?		X		
	e. Discharge into surface waters, or in any alteration of surface water quality, including but not limited to temperature, dissolved oxygen, or turbidity?		X		
	f. Alteration of the direction or rate of flow of ground waters?		X		
	g. Change in the quantity or quality of ground waters, either through direct additions or withdrawals, or through interception of an aquifer by cuts or excavations?		X		
	h. Substantial reduction in the amount of water otherwise available for public water supplies?		X		
	i. Exposure of people or property to water related hazards such as flooding or tidal waves?		X		
4.	**Plant Life. Will the proposal result in:**				
	a. Change in the diversity of species, or number of any species of plants (including trees, shrubs, grass, crops, microflora and aquatic plants)?		X		
	b. Reduction of the numbers of any unique, rare or endangered species of plants?		X		

	ENVIRONMENTAL CHECKLIST	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant	No Impact
	c. Introduction of new species of plants into an area, or in a barrier to the normal replenishment of existing species?		X		
	d. Reduction in acreage of any agricultural crop?		X		
5.	**Animal Life. Will the proposal result in:**				
	a. Change in the diversity of species, or numbers of any species of animals (birds, land animals including reptiles, fish and shellfish, benthic organisms, insects or microfauna)?		X		
	b. Reduction of the numbers of any unique, rare or endangered species of animals?		X		
	c. Introduction of new species of animals into an area, or result in a barrier to the migration or movement of animals?		X		
	d. Deterioration to existing fish or wildlife habitat?		X		
6.	**Noise. Will the proposal result in:**				
	a. Increases in existing noise levels?		X		
	b. Exposure of people to severe noise levels?			X	
7.	**Light and Glare. Will the proposal:**				
	a. Produce new light or glare?		X		
8.	**Land Use. Will the proposal result in:**				
	a. Substantial alteration of the present or planned land use of an area?			X	
9.	**Natural Resources. Will the proposal result in:**				
	a. Increase in the rate of use of any natural resources?				X
	b. Substantial depletion of any nonrenewable natural resource?				X

	ENVIRONMENTAL CHECKLIST	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant	No Impact
10.	**Risk of Upset. Will the proposal involve:**				
	a. A risk of an explosion or the release of hazardous substances (including, but not limited to: oil, pesticides, chemicals or radiation) in the event of an accident or upset conditions?			X	
11.	**Population. Will the proposal:**				
	a. Alter the location, distribution, density, or growth rate of the human population of an area?			X	
12.	**Housing. Will the proposal:**				
	a. Affect existing housing, or create a demand for additional housing?			X	
13.	**Transportation/Circulation. Will the proposal result in:**				
	a. Generation of substantial additional vehicular movement?			X	
	b. Effects on existing parking facilities, or demand for new parking?		X		
	c. Substantial impact upon existing transportation systems?			X	
	d. Alterations to present patterns of circulation or movement of people and/or goods?			X	
	e. Alterations to waterborne, rail or air traffic?			X	
	f. Increase in traffic hazards to motor vehicles, bicyclists or pedestrians?			X	
14.	**Public Service. Will the proposal have an effect upon, or result in a need for new or altered governmental services in any of the following areas:**				
	a. Fire protection?			X	
	b. Police protection?			X	

	ENVIRONMENTAL CHECKLIST	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant	No Impact
	c. Schools?				X
	d. Parks or other recreational facilities?			X	
	e. Maintenance of public facilities, including roads?		X		
	f. Other governmental services?		X		
15.	**Energy. Will the proposal result in:**				
	a. Use of substantial amounts of fuel or energy?				X
	b. Substantial increase in demand upon existing sources of energy, or require the development of new sources of energy?				X
16.	**Utilities and Service Systems. Will the proposal result in a need for new systems, or substantial alterations to the following utilities:**				
	a. Power or natural gas?			X	
	b. Communications systems?				X
	c. Water?				X
	d. Sewer or septic tanks?			X	
	e. Storm water drainage?			X	
	f. Solid waste and disposal?		X		
17.	**Human Health. Will the proposal result in:**				
	a. Creation of, and exposure of people to, any health hazard or potential health hazard (excluding mental health)?		X		
18.	**Aesthetics. Will the proposal result in:**				
	a. The obstruction of any scenic vista or view open to the public?		X		

	ENVIRONMENTAL CHECKLIST	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant	No Impact
	b. The creation of an aesthetically offensive site open to public view?		X		
19.	**Recreation. Will the proposal result in:**				
	a. Impact upon the quality or quantity of existing recreational opportunities?		X		
20.	**Archeological/Historical. Will the proposal:**				
	a. Result in the alteration of a significant archeological or historical site, structure, object or building?		X		
21.	**Mandatory Findings of Significance**				
	Potential to degrade: Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?		X		
	Short-term: Does the project have the potential to achieve short-term, to the disadvantage of long-term, environmental goals? (A short-term impact on the environment is one which occurs in a relatively brief, definitive period of time, while long-term impacts will endure well into the future.)				X
	Cumulative: Does the project have impacts which are individually limited, but cumulatively considerable? (A project may impact on two or more separate resources where the impact on each resource is relatively small, but where the effect of the total of those impacts on the environment is significant.)		X		
	Substantial adverse: Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?		X		

R.5 Discussion of Possible Environmental Impacts of Reasonably Foreseeable Compliance Methods and Mitigation Measures

As stated previously, the environmental analysis must include an analysis of the reasonably foreseeable environmental impacts of the methods of compliance and the reasonably foreseeable feasible mitigation measures relating to those impacts. This section, consisting of answers to the questions in the checklist, discusses compliance methods and mitigation measures as they pertain to the checklist.

In formulating these answers, the impacts of implementing the non-structural and structural BMPs/MMs listed in section 3 in the various watersheds were evaluated. At this time, the exact type, size, and location of BMPs that might be implemented to comply with the TMDLs is unknown. This analysis considers a range of non-structural and structural BMPs that might be used, but is by no means an exhaustive list of available BMPs. When BMPs are selected for implementation, a project-level and site-specific CEQA analysis must be performed by the responsible agency.

Potential reasonably foreseeable impacts were evaluated with respect to earth, air, water, plant life, animal life, noise, light, land use, natural resources, risk of upset, population, housing, transportation, public services, energy, utilities and services systems, human health, aesthetics, recreation, and archeological/historical concerns. Additionally, mandatory findings of significance regarding short-term, long-term, cumulative and substantial impacts were evaluated. Based on this review, we concluded that the potentially significant impacts can be mitigated to less than significant levels. The evaluation considered whether the construction or implementation of the BMPs would cause a substantial, adverse change in any of the physical conditions within the area affected by the BMP. In addition, the evaluation considered environmental effects in proportion to their severity and probability of occurrence.

A significant effect on the environment is defined in regulation as "*a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project, including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance. A social or economic change by itself shall not be considered a significant effect on the environment. A social or economic change related to a physical change may be considered in determining whether the physical change is significant*."[17]

A significant effect on the environment is defined in statute as "*a substantial, or potentially substantial, adverse change in the environment*"[18] where "*Environment*" is defined as "*the physical conditions which exist within the area which will be affected by a proposed project, including air, water, minerals, flora, fauna, noise, objects of historic or aesthetic significance*."[19]

In this analysis, the level of significance was based on baseline conditions (i.e., current conditions). Short-term impacts associated with the construction of structural BMPs were considered less than significant because the impacts due to construction activities are temporary

[17] 14 CCR section 15382
[18] Public Resources Code section 21068
[19] Public Resources Code section 21060.5

and similar to typical capital improvement projects and maintenance activities currently performed by municipalities. The long-term impacts associated with structural BMPs were considered potentially significant, but only if they could have an adverse, or potentially adverse, impact on the environment.

Social or economic changes related to a physical change of the environment were also considered in determining whether there would be a significant effect on the environment. However, adverse social and economic impacts alone are not significant effects on the environment.

1. Earth. a. **Will the proposal result in unstable earth conditions or in changes in geologic substructure?**

Answer**: Less than significant with mitigation**

Discussion: Non-structural BMPs would not create unstable earth conditions or changes in geologic substructure because none of these BMPs or MMs include earth moving activities.

For structural BMPs, infiltration of collected stormwater could potentially result in unstable earth conditions if loose or compressible soils are present, or if such BMPs were to be located where infiltrated stormwater flowing as groundwater could destabilize existing slopes. These impacts can be avoided by siting infiltration type BMPs away from areas with loose or compressible soils, and away from slopes that could become destabilized by an increase in groundwater flow. Infiltration type BMPs can also be built on a small enough scale to avoid these types of impacts.

If dischargers install facilities such as detention basins or waste treatment lagoons on a scale that could result in unstable earth conditions or in changes in geologic substructures, potential impacts could be avoided through proper geotechnical investigations, siting, design, and ground and groundwater level monitoring to ensure that structural BMPs are not employed in areas subject to unstable soil conditions.

1. Earth. b. **Will the proposal result in disruptions, displacements, compaction or overcoming of the soil?**

Answer**: Less than significant**

Discussion: Non-structural BMPs would not result in disruptions, displacements, compaction or overcoming of the soil because none of these BMPs include earth moving activities.

Depending on the structural BMPs selected in urbanized areas, the proposal may result in minor surface soil excavation or grading during construction of structural BMPs resulting in increased

disturbance of the soil. However, much of the urbanized areas have already undergone soil compaction and hardscaping. Standard construction techniques, including but not limited to, shoring, piling and soil stabilization can mitigate any potential short-term impacts. In addition, structural BMPs can be designed and sited in areas where the risk of new soil disruption is minimal. Soil disruptions, displacements, compaction, or overcoming during construction activities would be similar to typical temporary capital improvement construction and maintenance activities currently performed by municipalities, and no long-term impacts to the soil are expected.

In non-urbanized areas, structural BMPs like fences or waste treatment lagoons have the potential to disturb soil during construction. However, the use of standard construction techniques discussed above, along with proper siting, will eliminate any erosion potential at the site.

1. Earth. c. **Will the proposal result in change in topography or ground surface relief features?**

   Answer**: Less than significant with mitigation**

Discussion: Non-structural BMPs would not affect topography or ground relief features because none of the non-structural BMPs would result in earth moving activities.

Implementation of structural BMPs could result in some change in topography or ground surface relief features; however, most of the potential BMPs are so small that changes to topography will not be noticeable. If the dischargers implement BMPs on a scale large enough to change topography or ground relief features, then potential adverse impacts could be avoided or mitigated through siting such topographic alterations in geologically stable areas, or by installing or designing structural BMPs with the least amount of impact to the topography.

1. Earth d. **Will the proposal result in the destruction, covering or modification of any unique geologic or physical features?**

   Answer**: Less than significant with mitigation**

Discussion: Non-structural BMPs would not cause the destruction, covering or modification of any unique geologic or physical features because none of these BMPs would result in earth moving activities.

Constructing structural BMPs in areas where doing so would result in the destruction, covering or modification of a unique geologic or physical features is not a reasonably foreseeable alternative that dischargers would choose. Furthermore, no impact is expected because foreseeable methods of compliance, including implementation of structural BMPs to

control bacteria, would not be of the size or scale to result in the destruction, covering or modification of any unique geologic or physical features. In the unlikely event that dischargers might install facilities on a scale that could result in the destruction, covering or modification of any unique geologic or physical features, potential impacts could be mitigated by mapping these features to avoid siting facilities in these areas.

1. Earth. e. **Will the proposal result in any increase in wind or water erosion of soils, either on or off the site?**

   Answer**: Less than significant**

Discussion: Non-structural BMPs would not result in increase in wind or water erosion of soils, either on or off site because none of the non-structural BMPs would result in increased stormwater discharge, or in exposing soils to erosion by wind and water.

Depending on the structural BMPs selected, the proposal may result in minor soil excavation during construction of structural BMPs. However, construction related erosion impacts will cease with the cessation of construction. Wind or water erosion of soils may occur as a potential short-term impact. In urbanized areas, on-site soil erosion during construction activities will be similar to typical temporary capital improvement projects and maintenance activities currently performed by the municipalities. Typical established BMPs should be used during implementation to minimize offsite sediment runoff or deposition. Construction sites are required to retain sediment on site, both under general construction stormwater WDRs and through the construction program of the applicable MS4 WDRs; both of which are already designed to minimize or eliminate erosion impacts on receiving water. Over the long term, off-site erosion of canyons and natural channels could potentially be reduced if the structural BMPs divert stormwater from entering the canyons and channels, or reduce the runoff flow velocity, which may be considered a beneficial impact.

1. Earth. f. **Will the proposal result in changes in deposition or erosion of beach sands, or changes in siltation, deposition or erosion which may modify the channel of a river or stream or the bed of the ocean or any bay, inlet or lake?**

   Answer**: Less than significant**

Discussion: Non-structural BMPs would not result in erosion of beach sands, or increases in siltation, deposition or erosion which may modify the channel of a river or stream or the bed of the ocean or any bay, inlet or lake; however, non-structural BMPs, such as increased street sweeping, may reduce siltation and sediment deposition in canyons and natural channels. Reduction in siltation and sediment deposition in the creeks is beneficial as bacteria and pathogens may adsorb to fine sediments.

Deposition of significant volumes of sediment to beaches occurs mostly during wet weather flows. Therefore, wet weather diversion and treatment BMPs that remove the stream's sediment load could impact deposition of sand on beaches. End of stream detention basins that capture sediment, resulting in possible changes in deposition or erosion, can be mitigated through sand replacement and importation.

1. Earth. g. **Will the proposal result in exposure of people or property to geologic hazards, such as earthquakes, landslides, mudslides, ground failure, or similar hazards?**

   Answer**: Less than significant with mitigation**

Discussion: Non-structural BMPs would not result in exposure of people or property to geologic hazards because none of these BMPs would result in earth moving activities.

For structural BMPs, infiltration of collected stormwater could possibly result in ground failure if loose or compressible soils are present, or if such BMPs were to be located where introduced groundwater movements could destabilize existing slopes. This may result in landslides, mudslides, ground failure, or similar hazards. However, complying with these TMDLs using structural BMPs in areas where doing so, or of a size or scale that would result in exposure of people or property to such geologic hazards is unlikely when other alternatives exist. In the unlikely event that dischargers might install facilities on a scale that could result in exposure of people or property to geologic hazards, a geotechnical investigation should be prepared at the project level to ensure that structural BMPs are not employed in areas subject to potential geologic hazards.

2. Air. a. **Will the proposal result in substantial air emissions or deterioration of ambient air quality?**

   Answer**: Less than significant with mitigation**

Discussion: Short term increases in traffic during the construction and installation of structural BMPs and long-term increases in traffic caused by non-structural BMPs and maintenance of structural BMPs are potential sources of air emissions that may adversely affect ambient air quality. Several mitigation measures are available to reduce potential impacts to ambient air quality due to increased traffic during short-term construction and long-term maintenance activities. Mitigation measures could include, but are not limited to, the following: 1) use of construction, maintenance, and street sweeper vehicles with lower-emission engines, 2) use of soot reduction traps or diesel particulate filters, 3) use of emulsified diesel fuel, 4) use of vacuum-assisted street sweepers to eliminate potential re-suspension of sediments during sweeping activity, 5) the design of structural devices to minimize the frequency of maintenance trips, and/or 6) proper maintanance of vehicles so they operate cleanly and efficiently.

The generation of fugitive dust and particulate matter during construction or maintenance activities could also impact ambient air quality. An operations plan for the specific construction and/or maintenance activities could be completed to address the variety of available measures to limit the ambient air quality impacts. These could include vapor barriers and moisture control to reduce transfer of particulates and dust to air.

The emission of air pollutants during short-term construction activities associated with reasonably foreseeable methods of compliance would not likely change ambient air conditions, because long-term ambient air quality would not change after short-term construction activities are completed.

Ambient air quality may change as a result of increased traffic due to an increase in street sweeping and/or structural BMP maintenance activities. However, the impact to ambient air quality can be reduced by using the mitigation measures described above for street sweepers and maintenance vehicles. The potential impact to ambient air quality can be further reduced if street sweeping and/or maintenance activities are scheduled to be performed at the same time as other maintenance activities performed by the municipalities, or at times when these activities have lower impact, such as periods of low traffic activity. In any case, the number of additional vehicles expected in the watersheds due to non-structural and structural BMPs is not expected to increase the level of pollutants in the air compared to current conditions, because various common managerial practices are available to mitigate the adverse effects. In fact, additional street sweeping could potentially reduce the amount of dust and particulates that may be available on the streets.

2. Air. b. **Will the proposal result in creation of objectionable odors?**

Answer**: Less than significant with mitigation**

Discussion: Non-structural BMPs could result in the creation of objectionable odors in urbanized areas caused by exhaust from street sweepers or maintenance vehicles. Objectionable odors due to engine exhaust would be temporary and dissipate once the vehicle has passed through the area. Objectionable odors from exhaust could be reduced if gasoline or propane engines were used instead of diesel engines. Additionally, street sweepers and maintenance vehicles could be scheduled to be performed at the same time as other maintenance activities performed by the municipalities, or at times when these activities have lower impact, such as periods when there are fewer people in the area.

Construction and installation of structural BMPs may result in objectionable odors in the short-term due to exhaust from construction equipment and vehicles, but no more so than during typical infrastructure construction and maintenance activities currently performed by the municipalities. However, structural BMPs may be a source of objectionable odors if BMP designs allow for water stagnation or collection of water with sulfur-containing compounds. Stormwater runoff is not likely to contain sulfur-containing compounds, but stagnant water could create objectionable odors.

Mitigation measures to eliminate odors caused by stagnation could include proper BMP design to eliminate standing water, covers, aeration, filters, barriers, and/or odor suppressing chemical additives. Structural BMPs should be inspected regularly to ensure that treatment devices are not clogged, pooling water, or odorous. During maintenance, odorous sources should be uncovered for as short of a time period as possible. Structural BMPs should be designed to minimize stagnation of water and installed in such a way so as to increase the distance to sensitive receptors in the event of any stagnation.

2. Air. c. **Will the proposal result in alteration of air movement, moisture or temperature, or any change in climate, either locally or regionally?**

   Answer**: No impact**

Discussion: Non-structural and/or structural BMPs would not be of the size or scale to result in alteration of air movement, moisture or temperature, or any change in climate, either locally or regionally.

3. Water. a. **Will the proposal result in changes in currents, or the course of direction or water movements, in either marine or fresh waters?**

   Answer**: Less than significant**

Discussion: Most non-structural BMPs will not cause changes in currents, or the course of direction or water movements, in either marine or fresh waters because most of these BMPs would not introduce any physical effects that could impact these characteristics. Elimination of dry weather flows is the only foreseeable non-structural BMP that could have a physical impact in the watersheds due to a reduction in sediment and refuse discharge. However, any reduction of dry weather nuisance flows would bring the creeks to a more natural, pre-development condition with respect to currents, which is beneficial to the environment as discussed in the answer to question 4a.

Structural BMPs may change the currents in the watersheds by diverting flow away from the channels. However, streamflow in the urbanized lower watersheds are highly channelized, therefore none of the reasonably foreseeable structural BMPs would alter the direction or slope of the stream channels in the lower watersheds. The roughness coefficient may be reduced as sediment is kept out of the channels, which could increase the flow rate in the channels but would not change the direction of flow. The increase in flow rate in the channels could be offset by the reduction of peak flow, as a result of the installation of structural BMPs such as detention basins, sand filters or infiltration basins. Overland flow in the urbanized portion of the watershed is directed primarily to storm drains. This overland flow may change depending on the structural BMPs installed such as infiltration basins. If stormwater runoff flow is reduced, or is diverted to detention basins and not returned to the

creeks, these changes would reduce the potential for erosion, which is beneficial to the environment.

In agricultural areas where creeks flow in more natural conditions, BMPs such as detention basins and waste treatment lagoons could change the currents in the watersheds by storing water that would otherwise reach creeks and/or conveyance systems; however, this could be mitigated through proper siting and planning, including the use of hydrologic models to ensure that sufficient flow is maintained in or returned to watersheds to avoid adverse impacts to currents.

3. Water. b. **Will the proposal result in changes in absorption rates, drainage patterns, or the rate and amount of surface water runoff?**

Answer**: Less than significant**

Discussion: Non-structural BMPs would not result in changes in absorption rates, drainage patterns, or the rate and amount of surface water runoff because none of these BMPs would introduce any physical effects that could impact these characteristics.

Depending on the structural BMPs selected, absorption rates, drainage patterns, and surface water runoff may change. Grading and excavation during construction and installation of structural BMPs could result in alterations in absorption rates, drainage patterns, and surface water runoff. Several types of structural BMPs for both urban and agricultural areas collect and/or inhibit stormwater flow, which would likely alter drainage patterns, and also decrease the rate and amount of surface water runoff. For example, structural BMPs such as buffer strips would change drainage patterns by increasing absorption rates, which would reduce the amount of surface runoff to creeks. If stormwater runoff is diverted to wastewater treatment facilities, drainage patterns would be altered and surface runoff to the creeks could be reduced. If stormwater is diverted to wastewater treatment facilities, thereby reducing the overall flow, the erosion and scour that would normally be caused in the streams by stormwater runoff would be reduced. The amount of flow within the stream channel may change; however, the channelized drainage pattern would remain essentially unchanged.

In general, reducing stormwater runoff due to non-structural and structural BMPs would be beneficial to the environment because peak flows would be attenuated, reducing erosion and channel scour. Reduction in the amount of water in the stream channel may affect the ecology of the stream; however, all of these affects can be mitigated to less than significant levels as discussed below in the answers to questions 4 and 5 on Plant Life and Animal Life.

3. Water. c. **Will the proposal result in alterations to the course of flow of flood waters?**

Answer**: Less than significant with mitigation**

Discussion: Non-structural BMPs are unlikely to alter the course of flow of flood waters because none of the BMPs would introduce any physical effects that could impact these characteristics.

The course of flow of flood waters may change depending on the structural BMPs selected. Structural BMPs, such as sand filters, could reduce a storm drain's ability to convey flood waters. This can be mitigated through proper design (including flood water bypass systems), sizing, and maintenance of these types of structural BMPs. Other structural BMPs, such as waste treatment lagoons, sewer diversions, detention basins or infiltration basins, could alter the volume of flood waters by diverting a portion of the flood waters, but these BMPs are unlikely to alter the course of flood waters.

3. Water. d. **Will the proposal result in change in the amount of surface water in any water body?**

Answer**: Less than significant with mitigation**

Discussion: Non-structural BMPs such as ordinances that prohibit nuisance flows would result in a reduction in the amount of dry weather surface water in the watersheds. Because the reduction of nuisance flows would return the watersheds to a more natural, predevelopment condition, this impact is not significant. Waterbodies that are naturally occurring during dry weather are most likely groundwater fed and will not be impacted by nonstructural BMPs.

Depending on the structural BMPs selected, stormwater runoff may be retained and/or diverted for groundwater infiltration and/or to detention basins. Water that is retained or diverted would not flow into the canyons and stream channels. Because the surface water runoff to the creeks would be reduced, the adverse effects of channel scour and erosion of the creeks would also be reduced.

Reduction in the amount of water in the stream channels may affect the ecology of the streams; however, all of these affects can be mitigated to less than significant levels as discussed below in the answers to questions 4 and 5 on Plant Life and Animal Life.

3. Water. e. **Will the proposal result in discharge to surface waters, or in any alteration of surface water quality, including but not limited to temperature, dissolved oxygen, or turbidity?**

   Answer**: Less than significant with mitigation**

Discussion: Non-structural and/or structural BMPs would not result in any additional discharge to surface waters. Depending on the structural BMPs selected, the current amount of runoff discharged to surface waters may actually be reduced if diverted for groundwater infiltration or to wastewater treatment facilities.

If non-structural and/or structural BMPs are implemented, the level of pollutants discharged to the watersheds would be reduced. Therefore, implementation of these TMDLs will improve the surface water quality.

During wet weather discharges, certain structural BMPs (including waste treatment lagoons, detention basins, infiltration basins, and sand filters) would reduce turbidity and increase dissolved oxygen, because these BMPs would remove sediment and bioavailable oxygen demanding substances from the surface water. Reduced turbidity, and increased dissolved oxygen is beneficial to the environment.

Onsite facilities may be employed for treatment of dry weather or storm flows that use oxidizing agents such as ozone for disinfection, which can result in decreased bacteria loads. If not used properly, use of these technologies can result in adverse alteration of surface water quality because of the production of disinfection by-products. For example, if a surface water has significant concentrations of bromide, reaction with ozone can cause the formation of brominated by-products that can cause both immediate and delayed toxicity to marine organisms even after relatively short periods of ozonation.[20] Mitigation measures could include removal of bromide before contact with ozone occurs, or not using this treatment method where high concentrations of bromide are present.

A reduction of dry weather discharges (i.e., a cessation or reduction in nuisance flows) would result in a reduction of overall water in the watersheds during the dry season. This would result in a water temperature increase, and a decrease of dissolved oxygen in dry weather pools in the watersheds. Reduction in the amount of water in the stream channels may affect the ecology of the streams; however, all of these affects can be mitigated to less than significant levels as discussed below in the answers to questions 4 and 5 on Plant Life and Animal Life.

[20] William Cooper et al. 2002. Final Report. *Ozone, seawater, and aquatic nonindigenous species: Testing a full-scale ozone ballast water treatment system on an American oil tanker.*

3. Water. f. **Will the proposal result in alteration of the direction or rate of flow of groundwaters?**

   Answer**: Less than significant with mitigation**

Discussion: Non-structural BMPs would not result in alteration of the direction or rate of flow of groundwaters because none of the BMPs would introduce any physical effects that could impact these characteristics.

Over the long term, infiltration of stormwater runoff via infiltration type BMPs such as vegetative strips could significantly alter the direction or rate of flow of groundwater. This could result in unstable earth conditions if such BMPs were to be located where infiltrated stormwater flowing as groundwater could destabilize existing slopes. As discussed in the answer to question 1.a, these impacts can be avoided by siting infiltration type BMPs away from areas with loose or compressible soils, and away from slopes that could become destabilized by an increase in groundwater flow. Infiltration type BMPs can also be built on a small enough scale to avoid these types of impacts. In the unlikely event that dischargers might install facilities on a scale that could result in unstable earth conditions, potential impacts could be avoided through proper groundwater investigations, siting, design, and groundwater level monitoring to ensure that structural BMPs are not employed in areas where slopes could become destabilized.

3. Water. g. **Change in the quantity or quality of groundwaters, either through direct additions or withdrawals, or through interception of an aquifer by cuts or excavations?**

   Answer**: Less than significant with mitigation**

Discussion: Non-structural BMPs will not change the quantity or quality of groundwaters because none of these BMPs would introduce any physical effects that could impact these characteristics.

Infiltration type BMPs such as infiltration trenches may increase the quantity and degrade the quality of groundwaters. The increase in quantity is unlikely to have any adverse effects since, under pre-development conditions, infiltration rates of stormwater runoff to groundwater were most likely much higher than they are today due to the absence of hardscapes. However, as discussed in question 3.f above, increased infiltration of stormwater near steep slopes, such as canyon walls, could potentially destabilize these slopes by saturating the soils, making them more prone to sliding. Mitigation could include not siting large infiltration BMPs near canyon walls or other steep slopes.

In addition to bacteria, stormwater also contains dissolved pollutants such as nutrients, metals, pesticides, hydrocarbons, oil and grease. However, infiltration BMPs are not expected to degrade groundwater with respect to these pollutants for the following reasons.

Ambient nitrogen and phosphorus concentrations in groundwater are likely higher than nutrient concentrations in stormwater due to decades of over application of fertilizers on domestic and commercial landscapes, and agricultural areas, and deep percolation of applied irrigation water. Nonetheless, if stormwater nutrient concentrations are higher than ambient concentrations in the groundwater, mitigation could include education and outreach to homes and business to better manage fertilizer use. Fertilizer management plans could be required at commercial nurseries and agricultural operations. Phytoremediation can also be used to remove nutrients from stormwater runoff.

Bacteria and metals in stormwater runoff are not expected to degrade groundwater quality since they tend to adsorb to clay and organic particles in the soil. Likewise, oil and grease would become bound up in the soil and remain nearer to the surface due to lower densities. Pesticides and hydrocarbons are not expected to degrade groundwater quality because natural bacteria in the soil and groundwater tend to break down pesticides.

3. Water. h. **Will the proposal result in substantial reduction in the amount of water otherwise available for public water supplies?**

Answer**: Less than significant with mitigation**

Discussion: For the most part, the structural and non-structural BMPs will not reduce public water supplies because most of the public water supplies for the watersheds included in these TMDLs are imported from outside the region. Exceptions are discussed below.

San Juan Creek Watershed: Elimination of dry weather nuisance flows could eliminate a source of recharge to the groundwater basin which is an important public water supply. However, if the elimination of nuisance flows is achieved through a decrease in water use, such as prohibiting runoff from landscaped areas, the reduction in demand should offset the decrease in supply. Stormwater infiltration basins could also increase recharge to the basin, thereby increasing the public water supply and offsetting any loss of supply due to elimination of dry weather nuisance flows.

San Luis Rey River Watershed: Lake Henshaw on the San Luis Rey River is an important water supply reservoir. This reservoir is located above urban areas, thus, urban BMPs will not affect the water supply in this reservoir. The reservoir is surrounded predominantly by grazing lands. Animal exclusion, the principal MM for grazing lands, will not reduce runoff into the reservoir. Therefore, the public water supply from this reservoir will not be reduced due to implementation of MMs. The City of Oceanside utilizes groundwater wells in the Mission Basin of the watershed for public water supply. The discussion above on the San Juan Creek Watershed groundwater basin applies here also.

San Dieguito River Watershed: Lake Hodges in the San Dieguito watershed is an important water supply reservoir. This reservoir is located above urban areas, thus, urban BMPs will not affect the water supply in this reservoir. The reservoir is surrounded predominantly by

open space and grazing lands. Animal exclusion, the principal MM for grazing lands, will not reduce runoff into the reservoir. Therefore, the public water supply from this reservoir will not be reduced due to implementation of MMs.

San Diego River Watershed: San Vicente and El Capitan reservoirs are important water supply reservoirs. These reservoirs are located above urban areas, thus, urban BMPs will not affect the water supplies in this reservoir. These reservoirs are surrounded predominantly by open space and grazing lands. Animal exclusion, the principal MM for grazing lands, will not reduce runoff into the reservoir. Therefore, the public water supply from this reservoir will not be reduced due to implementation of MMs. The City of San Diego is planning to utilize groundwater wells in the Mission Valley Basin of the watershed for public water supply. The discussion above on the San Juan Creek Watershed groundwater basin applies here also.

3. Water. i. **Will the proposal result in exposure of people or property to water related hazards such as flooding or tidal waves?**

   Answer**: Less than significant with mitigation**

Discussion: Non-structural BMPs will not result in exposure of people or property to water related hazards such as flooding or tidal waves because none of these BMPs would introduce any physical effects that could impact these characteristics.

Installation of structural BMPs that are not properly designed and constructed to allow for bypass of stormwater during storms that exceed design capacity can cause flooding. However, this potential impact can be mitigated through proper design and maintenance of structural BMPs. Any modifications to the watershed hydrology should be modeled and accounted for in the design of BMPs.

4. Plant Life. a. **Will the proposal result in change in the diversity of species, or number of any species of plants (including trees, shrubs, grass, crops, microflora and aquatic plants)?**

   Answer**: Less than significant with mitigation**

Discussion: Most non-structural BMPs will not result in change in the diversity of species, or number of any species of plants (including trees, shrubs, grass, crops, microflora and aquatic plants) because most of these BMPs would not introduce any physical effects that could impact these characteristics. However, the creation and enforcement of ordinances to eliminate nuisance flows could result in a change in the diversity of species, or number of any species of plants (including trees, shrubs, grass, crops, microflora and aquatic plants), especially in the dry weather season. No adverse impacts are expected because the elimination of nuisance flows would return the creek's dry weather flows to a more natural,

pre-development condition. This in turn would facilitate the return of the stream's plant community to a more natural, pre-development condition and could impede the propagation of water-loving non-native and invasive plant species. Impeding the propagation of invasive species is not a negative impact.

These flow reductions could lead to a reduction in total plant biomass along the creek's corridors. The reduced plant biomass could very well represent a significant decrease in the area of invasive and non-native plant species (such as *Arundo donax*) within the watersheds. A reduction in invasive species is necessary before the native plant populations could be restored to pre-development conditions.

The decrease in flow may result in an increase in native plant species. Native plant species that previously thrived in the watersheds may naturally repopulate the areas that are currently occupied by invasive species. Increased diversity or area of native plant cover also could be accomplished through restoration/mitigation projects within the watersheds. Regardless of the method, the opportunity for restoration/enhancement of the stream corridors to pre-development conditions is realistic.

Conversely, a decrease in flow may decrease plant diversity by reducing the number of species that require a more constant water supply. However, these plant species are likely non-natives to Southern California and would not be present in the watersheds absent the nuisance dry weather flows.

During the wet weather season, the installation of structural BMPs such as vegetated swales, buffer strips, engineered (bioretention) wetlands, or retention ponds could increase the diversity or number of plant species, which is beneficial to the environment by increasing available habitat. However, during storm events, structural BMPs could also divert, reduce, and/or eliminate surface water runoff discharge, which may reduce the number and/or diversity of plant species within the streams, by modifying the hydrology of the creeks, which could be adverse. This can be mitigated through proper project modeling, siting, and design so that the resulting creek hydrology mimics natural conditions.

Onsite facilities may be employed for treatment of dry weather or storm flows that use oxidizing agents such as ultraviolet radiation (UV) or ozone for disinfection, which can result in decreased bacteria loads. If not used properly, use of these technologies can be harmful to a number of plant and animal species. For example, disinfecting agents can be toxic to non-target marine and freshwater organisms, including phytoplankton and zooplankton. Mitigation should include avoiding these technologies in areas where these organisms propagate.

Use of oxidizing agents can also result in the production of harmful disinfection by-products. For example, if surface water has significant concentrations of bromide, reaction with ozone can cause the formation of brominated by-products that can cause both immediate and delayed toxicity to marine organisms even after relatively short periods of ozonation. [21]

[21] William Cooper et al. 2002. Final Report. *Ozone, seawater, and aquatic nonindigenous species: Testing a full-scale ozone ballast water treatment system on an American oil tanker.*

Mitigation measures could include removal of bromide before contact with ozone occurs, or not using this treatment method where high concentrations of bromide are present.

Construction activities could result in the elimination of plant cover in the construction zone. The number or diversity of plant species could be maintained by preserving them prior, during, and after the construction of structural BMPs, or by re-establishing and maintaining the plant communities post construction. Or, municipalities may choose to implement non-structural BMPs and/or structural BMPs that do not reduce the surface water runoff that would be discharged to the canyons and stream channels.

Should large impermeable detention basin be required, they could be constructed underground so as not to impact the diversity of species, or number of any species of plants (including trees, shrubs, grass, crops, microflora and aquatic plants).

4. Plant life. b. **Will the proposal result in reduction of the numbers of any unique, rare or endangered species of plants?**

   Answer**: Less than significant with mitigation**

Discussion: Non-structural BMPs will not result in a reduction of the numbers of any unique, rare, or endangered species of plants because these BMPs will not affect the habitat of any unique, rare, or endangered species of plants.

Depending on the structural BMPs selected, direct or indirect impacts to special-status plant species may occur during and after construction. Mitigation measures could be implemented to ensure that potential impacts to unique, rare or endangered plant species are eliminated. When the specific projects are developed and sites identified, a focused protocol plant survey and/or a search of the California Natural Diversity Database should be performed to confirm that any potentially sensitive or special status plant species in the site area are properly identified and protected as necessary. If sensitive plant species occur on the project site, mitigation is required in accordance with the Endangered Species Act. Mitigation measures should be developed in consultation with the California Department of Fish and Game (CDFG) and the United States Fish and Wildlife Service (USFWS). Additionally, according to the Basin Plan, the San Luis Rey River, San Dieguito, and San Diego watersheds support the RARE beneficial use. Specifically, these areas provide riparian habitat for the willowy monardella. Therefore compliance methods involving structural BMPs should avoid affecting habitat that is vital for the survival of this plant species.

Responsible agencies should avoid installing structural BMPs that could result in reduction of the numbers of unique, rare or endangered species of plants, and instead opt for non-structural BMPs and/or identify and install structural BMPs in areas that will not reduce the numbers of such plants.

4. Plant life. c. **Will the proposal result in introduction of new species of plants into an area, or in a barrier to the normal replenishment of existing species?**

Answer**: Less than significant with mitigation**

Discussion: Most non-structural BMPs will not result in introduction of new species of plants into an area, or in a barrier to the normal replenishment of existing species because most of the BMPs would not introduce any physical effects that could impact these characteristics. However, the creation and enforcement of ordinances to eliminate nuisance flows could result in the introduction of new species of plants into an area, or in a barrier to the normal replenishment of existing species especially in the dry weather season. However, no adverse impacts are expected as discussed in the answer to question 4.a.

For structural BMPs that may include the use of plants, such as vegetated swales or engineered (bioretention) wetlands, new species of plants may possibly be introduced into the area. However, in cases where plants or landscaping is incorporated into the specific project design, the possibility of disruption of resident native species could be avoided or minimized by using only plants native to the area. The use of exotic invasive species or other plants listed in the Exotic Pest Plant of Greatest Ecological Concern in California (1999, California Invasive Plant Council, as amended) should be prohibited.

4. Plant life. d. **Will the proposal result in reduction in acreage of any agricultural crop?**

Answer**: Less than significant with mitigation**

Discussion: Non-structural BMPs such as irrigation management plans will not result in a reduction in acreage of agricultural crops because establishing such BMPs does not necessitate area acquisition.

Structural BMPs could result in a reduction in acreage of agricultural crops. Dischargers should check the California Department of Conservation, Division of Land Resources Protection, Farmland Mapping and Monitoring Program, to see if there is Prime Farmland, Farmland of Statewide Importance, Unique Farmland or Farmland of Local Importance in the proposed project areas. Dischargers should avoid placing structural BMPs in areas that could affect the integrity of special status areas, and instead place them in areas that will have a minimal effect on crop production. If structural BMPs are installed, mitigation could include proper siting, design, or placement underground.

5. Animal Life. a. **Will the proposal result in change in the diversity of species, or numbers of any species of animals (birds, land animals including reptiles, fish and shellfish, benthic organisms, insects or microfauna)?**

   Answer**: Less than significant with mitigation**

Discussion: Non-structural BMPs, such as the creation and enforcement of ordinances to eliminate nuisance flows, could result in change in the diversity of species, or numbers of any species of animals (birds, land animals including reptiles, fish and shellfish, benthic organisms, insects or microfauna) due to a reduction of dry weather flows that could eliminate instream habitats dependant on those flows. However, this would return dry weather flows in the watersheds to a more natural, pre-development condition as discussed in the answer to question 4.a. Animal species that thrived in the creeks in the absence of nuisance flows should not be adversely impacted by habitat changes if the flows are eliminated. Impeding the propagation of invasive species is not a negative impact.

Nuisance flow supported stream riffle and run habitat would decrease in duration during dry weather conditions, thereby limiting aquatic-dependent species to pools during that time period. While migration of aquatic species would be limited during dry weather, migration would be possible during wet weather flows. However, this impact is probably not significant because migration could only occur during wet weather conditions before the existence of dry weather nuisance flows. Additionally, only San Juan Creek, the San Luis Rey River, the San Dieguito River, and San Diego River watersheds have aquatic species with life cycles that would be dependent upon riffle and run habitat.

The installation of structural BMPs such as vegetated swales, buffer strips, engineered (bioretention) wetlands, or retention ponds could increase the diversity or number of animal species, which is beneficial by creating habitat for those species. However, these types of structural BMPs could also increase the likelihood of vectors and pests. For example, constructed basins and vegetated swales may develop locations of pooled standing water that would increase the likelihood of mosquito breeding. Mitigation includes the prevention of standing water through the construction and maintenance of appropriate drainage slopes and through the use of aeration pumps.[22] Mitigation for vectors and pests should involve the use of appropriate vector and pest control strategies, maintenance, and frequent inspections.

Installation of non-vector producing structural BMPs can help mitigate vector production from standing water. Netting can be installed over structural BMPs to further mitigate vector production. Structural BMPs can be designed and sites can be properly protected to prevent accidental vector production. Vector control agencies may also be employed as another source of mitigation. Structural BMPs prone to standing water can be selectively installed away from high-density areas and away from residential housing and/or by requiring oversight and treatment of those systems by vector control agencies.

[22] http://www.cabmphandbooks.com/Muncipal.asp

Structural BMPs could also divert, or reduce stormwater runoff discharge, which could decrease the number and/or diversity of animal species within the stream channels by eliminating habitat dependant on those flows. Because the downstream portions of several watersheds are heavily developed with significant areas of impermeable surfaces, stormflow generated streamflow is very likely higher today than under pre-development conditions. Therefore, native communities of animals and the habitats they depend upon likely can thrive under lower streamflow conditions than what currently exist in the watersheds. Hydrologic modeling could be used to estimate the rate and volume of pre-development stormwater runoff to, and flow in, the watersheds. Using this information, BMPs could be selected and sized to not reduce streamflows in the watersheds below pre-development levels. BMPs that completely eliminate stormwater runoff are not reasonably foreseeable because of their cost and the availability of other feasible and less costly alternatives.

The current number or diversity of animal species could be maintained by minimizing the size of structural BMPs and limiting the encroachment and/or removal of animal habitat. Additionally, dischargers may choose to implement non-structural BMPs and/or structural BMPs that do not divert or reduce the stormwater runoff that would be discharged to the canyons and stream channels. Should an impermeable detention basin be required, it could be constructed underground so as to preserve habitat leading to a change in the diversity of species, or numbers of any species of animals (birds, land animals including reptiles, fish and shellfish, benthic organisms, insects or microfauna).

For a discussion of the adverse impacts caused by disinfection technologies such as ultraviolet light or ozone, please see the discussion under Question 4a).

5. Animal Life. b. **Will the proposal result in reduction of the numbers of any unique, rare or endangered species of animals?**

Answer**: Less than significant with mitigation**

Discussion: Non-structural BMPs will not result in a reduction of the numbers of unique, rare or endangered species of animals because these BMPs will not cause a reduction in habitat for unique, rare, or endangered animals. However, the creation and enforcement of ordinances to eliminate nuisance flows could eliminate riparian habitat dependant on those flows. Some of the watersheds, such as the San Luis Rey River, are home to special status species dependant on riparian habitat, such as the least bell's vireo. If the elimination of dry weather nuisance flows threatens to eliminate the riparian habitat of a special status species, this can be mitigated by treating the water and returning it to the stream to ensure the stream hydrology remains intact. Alternatively, mitigation banking could be used to create new habitat or improve existing habitat in the watershed.

Depending on the structural BMPs selected, direct or indirect impacts to special-status animal species may possibly occur during and after construction. Special-status species are present in many of the watersheds. If special status species are present during activities such as ground disturbance, construction, operation and maintenance activities associated with the

potential projects, direct impacts to special status species could result including the following:

- Direct loss of a special status species
- Increased human disturbance in previously undisturbed habitats
- Mortality by construction or other human-related activity
- Impairing essential behavioral activities, such as breeding, feeding or shelter/refuge
- Destruction or abandonment of active nest(s)/den sites
- Direct loss of occupied habitat

In addition, potential indirect impacts may include but are not limited to, the following:

- Displacement of wildlife by construction activities
- Disturbance in essential behavioral activities due to an increase in ambient noise levels and/or artificial light from outdoor lighting around facilities

Mitigation measures, however, could be implemented to ensure that special status animals are not negatively impacted, nor their habitats diminished. For example, when the specific projects are developed and sites identified, a focus protocol animal survey and/or a search of the California Natural Diversity Database should be performed to confirm that any potentially special-status animal species in the site area are properly identified and protected as necessary.

If special-status animal species are potentially near the project site area, as required by the Endangered Species Act (ESA), two weeks prior to grading or the construction of facilities and per applicable USFWS and/or CDFG protocols, pre-construction surveys to determine the presence or absence of special-status species should be conducted. The surveys should extend an appropriate distance (buffer area) off site in accordance with USFWS and/or CDFG protocols to determine the presence or absence of any special-status species adjacent to the project site. If special-status species are present on the project site or within the buffer area, mitigation would be required under the ESA. To this extent, mitigation measures shall be developed with the USFWS and CDFG to reduce potential impacts.

Additionally, habitat occupied by special status species could be negatively impacted if animal exclusion measures are placed in areas where cattle graze near streambeds.[23] Cattle grazing may help rather than hurt special status species by maintaining the suitability of vernal pool hydrological conditions.[24] Mitigation measures in areas where fencing is used to exclude cattle from the creeks include allowing cattle to graze along creek beds at set time intervals. Land owners could also provide water troughs near creeks to encourage cattle to drink from alternative sources, thereby minimizing the chances of cattle defecating directly into the creeks.

[23] Cori Calvert, USDA NRCS, personal communication, March 6, 2007.
[24] Pyke, Christopher R. and Jaymee Marty, 2005. Cattle Grazing Mediates Climate Change Impacts on Ephemeral Wetlands. *Conservation Biology* (October 2005)19:5:1619-1625.

Finally, according to the Basin Plan, the San Luis Rey River, San Dieguito, and San Diego watersheds support the RARE beneficial use. Specifically, these areas provide riparian habitat to the southwestern willow flycatcher, and the least bell's vireo. Therefore compliance methods involving structural BMPs should avoid affecting habitat that is vital for the survival of these bird species.

5. Animal Life. c. **Will the proposal result in introduction of new species of animals into an area, or in a barrier to the migration or movement of animals?**

Answer**: Less than significant with mitigation**

Discussion: Most non-structural BMPs will not result in introduction of new species of animals into an area, or in a barrier to the migration or movement of animals because most of the BMPs would not introduce any physical effects that could impact these characteristics. However, the creation and enforcement of ordinances to eliminate nuisance flows could result in a barrier to the migration or movement of animals especially in the dry weather season by eliminating habitat dependant on those flows. However, this would cause dry weather flows in the watersheds to return to a more natural, pre-development condition, as discussed in the answer to question 4a. Animal species that thrived in the creeks in the absence of nuisance flows should not be adversely impacted by habitat changes if the flows are eliminated. Impeding the propagation of invasive species is not a negative impact.

Structural BMPs would not foreseeably introduce new species. In urbanized areas, the potential installation sites would not act as a travel route or regional wildlife corridor. However, BMPs could potentially be constructed in agricultural areas or open space where travel routes or regional wildlife corridors exist. A travel route is generally described as a landscape feature (such as a ridgeline, canyon, or riparian strip) within a larger natural habitat area that is used frequently by animals to facilitate movement and provide access to necessary resources such as water, food, or den sites). Wildlife corridors are generally an area of habitat, usually linear in nature, which connect two or more habitat patches that would otherwise be fragmented or isolated from one another. Construction of reasonably foreseeable structural BMPs likely would not restrict wildlife movement because the sizes of BMPs are generally too small to obstruct a corridor. For terrestrial animals, corridors would be maintained regardless of stream flow since reduced flows would not provide physical barriers for these animals. In the event that any structural BMPs built would hinder animals from moving throughout the stream corridor, a pathway around the BMPs could be constructed. Additionally, some wildlife migration may be impeded by the use of fencing to coral livestock. Mitigation for this BMP includes using fence gaps large enough to allow migrating wildlife to pass through.

A net loss of native animal species habitat in the stream corridor due to BMP installation should be mitigated. Initially, avoidance and minimization of habitat loss should be considered. In some cases, BMPs may actually provide important habitat for animals in the stream corridor. Examples of such BMPs include detention/ retention ponds, vegetated swales, and buffer strips.

Dischargers should avoid compliance measures that could result in significant barriers to the migration or movement of animals, and instead opt for non-structural BMPs and/or structural BMPs other than fences that would not change the migration or movement of animals. Potential project sites in open space areas that might be used to install structural BMPs should be evaluated in consultation with CDFG to identify potential wildlife travel routes. If a wildlife travel route is identified that could be impacted by the installation of structural BMPs, then the project should be designed to include a new wildlife travel route in the same general location.

Some migratory avian species may use portions of potential project sites, including ornamental vegetation, during breeding season and may be protected under the Migratory Bird Treaty Act (MBTA) while nesting. The MBTA includes provisions for protection of migratory birds under the authority of the USFWS and CDFG. The MBTA protects over 800 species including, geese, ducks, shorebirds, raptors, songbirds, and many other relatively common species. If construction occurs during the avian breeding season for special status species and/or MBTA-covered species, generally February through August, then prior (within 2 weeks) to the onset of construction activities, surveys for nesting migratory avian species should be conducted on the project site following USFWS and/or CDFG guidelines. If no active avian nests are identified on or within the appropriate distance of construction areas, further mitigation may not be necessary.

Alternatively, to avoid impacts, the agencies implementing the TMDL may begin construction after the previous breeding season for covered avian species and before the next breeding season begins. If a protected avian species was to establish an active nest after construction was initiated and outside of the typical breeding season (February – August), the project sponsor, would be required to establish a buffer as required by USFWS between the construction activities and the nest site.

If active nest for protected avian species are found within the construction footprint or within the proscribed buffer zone, construction would be required to be delayed within the construction footprint and buffer zone until the young have fledged or appropriate mitigation measures responding to the specific situation are developed in consultation with USFWS or CDFG. These impacts are highly site specific, and assuming they are foreseeable, they would require a project-level analysis and mitigation plan.

Finally, steelhead trout, a special status species, rely on riffle and run habitat, and annual breaching of creek mouth sand bars to migrate up freshwater creeks from marine waters in order to spawn. Additionally, young steelhead reared in freshwater creeks need riffle and run habitat, and breaching of sandbars to migrate to the ocean. Adequate storm flows in the creeks are needed to create good quality migration habitat, and to breach sand bars. Creek flow volumes and rates could be insufficient to create and maintain migration habitat and breach sand bars if storm flows are entirely diverted to wastewater treatment facilities or detention basins. Mitigation measures include allowing a sufficient amount of water to remain in the creeks during storm flows to maintain habitat for steelhead migration and sand bar breaching. Alternatively, diverted and treated water could be returned to the creeks at a

flow rate and volume sufficient to maintain habitat and breach sand bars. Sand bars also can be artificially breached.

5. Animal Life. d. **Will the proposal result in deterioration to existing fish or wildlife habitat?**

Answer**: Less than significant with mitigation**

Discussion: Non-structural BMPs will not result in deterioration to existing fish or wildlife habitat as discussed in the answers to questions 4 and 5.
Depending on the structural BMPs selected, direct or indirect impacts to existing fish or wildlife habitat may occur. In urbanized areas, the installation of structural BMPs would not likely result in the deterioration of existing fish and or wildlife habitat in the immediate area of a project. Nonetheless, potential effects on fish or wildlife habitat can be reduced by minimizing the size of structural BMPs and limiting the encroachment and/or removal of animal habitat.

Structural BMPs could also divert, reduce, and/or eliminate stormwater runoff discharge, which could potentially change the fish and wildlife habitat within the stream channels by changing the flow regime of the creeks. In urbanized creeks with significant areas of impermeable surfaces, stormflow generated streamflow is very likely higher today than under pre-development conditions. Therefore, native communities of animals and the habitats they depend on likely can thrive under lower stormflow generated streamflow conditions than what currently exists. Hydrologic modeling could be used to estimate the rate and volume of pre-development stormwater runoff to, and flow in, the watersheds. Using this information, BMPs could be selected and sized to avoid reducing streamflows in the watersheds below pre-development levels. BMPs that completely eliminate stormwater runoff are not reasonably foreseeable because of their cost and the availability of other feasible and less costly alternatives. The return to more natural, pre-development flow regimes in the watersheds could be beneficial to restoring native habitats in the creeks.

In agricultural areas, dischargers may choose to implement non-structural BMPs and/or structural BMPs that do not divert or reduce the surface water runoff that would be discharged to the creeks, and instead rely on source control. Options for source control include managing irrigation and fertilizer to ensure no excess water or pollutants leave the property site, or utilizing livestock fencing to ensure livestock do not approach riparian habitat.

Should an impermeable detention basin be required, this could be constructed underground so as not to result in deterioration to existing fish or wildlife habitat at the project site.

6. Noise. a. **Will the proposal result in increases in existing noise levels?**

Answer**: Less than significant with mitigation**

Discussion: Non-structural BMPs could result in increases in existing noise levels due to increased traffic from street sweepers and/or maintenance vehicles which may increase the noise level temporarily as the vehicles pass through an area. However, the increase in noise levels would be no greater than typical infrastructure maintenance activities currently performed by municipalities and is therefore, less than significant.

The construction and installation of structural BMPs would result in temporary increases in existing noise levels, but this would be short term and only exist until construction is completed. Therefore, this noise impact is less than significant for humans. For some special status wildlife species, however, even temporary increases in noise levels could result in significant impacts. For example, special status birds might abandon nesting sites in response to the stress of noise impacts. Mitigation measures for increased noise levels that adversely affect rare and endangered species are discussed under question 5 b.

The noise associated with the construction and installation of structural BMPs would be the same as typical construction activities in urbanized areas, such as ordinary road and infrastructure maintenance and building activities. Contractors and equipment manufacturers have been addressing noise problems for many years and through design improvements, technological advances, and a better understanding of how to minimize exposures to noise, noise effects can be minimized. An operations plan for the specific construction and/or maintenance activities could be prepared to identify the variety of available measures to limit the impacts from noise to adjacent homes and businesses.

Severe noise levels could be mitigated by implementing commonly-used noise abatement procedures, such as sound barriers, mufflers, and limiting construction and maintenance activities to times when these activities have lower impact, such as periods when there are fewer people near the construction area. Applicable and appropriate mitigation measures could be evaluated when specific projects are determined, depending upon proximity of construction activities to receptors.

6. Noise. b. **Will the proposal result in exposure of people to severe noise levels?**

Answer**: Less than significant**

Discussion: Non-structural BMPs would not result in increases in exposure of people to severe noise levels because none of these BMPs would introduce any physical effects that could impact this characteristic. Increased traffic from street sweepers and/or maintenance vehicles may increase the noise level temporarily as the vehicles pass through an area, but these levels will not be severe.

There is the possibility that severe noise levels could be emitted during construction activities. The increase in noise levels could be mitigated by implementing commonly-used noise abatement procedures, such as sound barriers, mufflers, and limiting construction and maintenance activities to times when these activities have lower impact, such as periods when there are fewer people in the area. Applicable and appropriate mitigation measures should be evaluated when specific projects are determined, depending upon proximity of construction activities to receptors.

7. Light and Glare. **Will the proposal produce new light or glare?**

Answer**: Less than significant with mitigation**

Discussion: Non-structural BMPs will not produce new light or glare because none of the BMPs would introduce any physical effects that could impact light and glare.

The construction and installation of structural BMPs could potentially be performed during evening or night time hours. If this scenario were to occur, night time lighting would be required to perform the work. Also, lighting could possibly be used to increase safety around structural BMPs. If temporary artificial lighting is required for construction purposes, this could be stressful for some rare and endangered species. For example, special status birds might abandon nesting sites in response to the stress of light and glare impacts. Mitigation measures for artificial light or glare that adversely affect rare and endangered species are discussed under question 5 b.

In the unlikely event that construction is performed during night time hours, a lighting plan should be prepared to include mitigation measures. Mitigation measures can include shielding on all light fixtures, and limiting light trespass and glare through the use of directional lighting methods. Other potential mitigation measures may include using screening and low-impact lighting, performing construction during daylight hours, or designing security measures for installed structural BMPs that do not require night lighting.

8. Land Use. **Will the proposal result in substantial alteration of the present or planned land use of an area?**

Answer**: Less than significant**

Discussion: Non-structural BMPs will not result in alteration of the present or planned land use of an area because none of the BMPs would introduce any physical effects that could impact land uses.

Implementation of structural BMPs may potentially cause minor alterations in present or planned land use of an area. However, municipalities are not required or expected to change

present or planned land uses to comply with the TMDLs, and are encouraged to seek alternatives that would have the lowest impact on the land use and the environment. Potential conflicts between complying with the TMDLs and other land uses can be resolved by standard planning efforts under which specific projects are reviewed by local planning agencies. Applicable and appropriate mitigation measures could be evaluated when specific projects are determined, and a cost-benefit analysis of proposed compliance alternatives should be performed.

More reasonable alternatives should be evaluated and implemented, such as non-structural BMPs and low impact and/or small scale structural BMPs, before considering an alternative that would create considerable hardship for the community in the area.

9. Natural Resources. a. **Will the proposal result in increase in the rate of use of any natural resources?**

Answer**: No impact**

Discussion: Non-structural and/or structural BMPs will not increase the rate of use of any natural resources. Implementation of non-structural and/or structural BMPs should not require quarrying, mining, dredging, or extraction of locally important mineral resources. Operation of street sweepers, construction, and maintenance vehicles could increase the use of fossil fuels, and some types of equipment used in structural BMPs may consume electricity to operate pumps, etc. However, the relative amounts of additional fossil fuel and electricity that might be used would fall well within the capacity and expectations of the region's normal rate of use of natural resources. The additional use of fossil fuels and electricity could be mitigated and reduced if dischargers used alternative fuels and/or renewable energies to power their vehicles and equipment.

9. Natural Resources. b. **Will the proposal result in substantial depletion of any non-renewable natural resource?**

Answer**: No impact**

Discussion: Non-structural and/or structural BMPs will not substantially deplete any non-renewable natural resource. Operation of street sweepers, construction, and maintenance vehicles could increase the use of fossil fuels, and some types equipment used in structural BMPs may consume electricity to operate pumps, etc. However, the relative amounts of additional fossil fuel and electricity that might be used would fall well within the capacity and expectations of the region's energy supply and natural resources. The additional use of fossil fuels and electricity could be mitigated and reduced if dischargers used alternative fuels and/or renewable energies to power their vehicles and equipment.

10. Risk of Upset. **Will the proposal involve a risk of an explosion or the release of hazardous substances (including, but not limited to: oil, pesticides, chemicals or radiation) in the event of an accident or upset conditions?**

Answer**: Less than significant**

Discussion: Non-structural and structural BMPs will not involve a risk of an explosion or the release of hazardous substances (including, but not limited to: oil, pesticides, chemicals or radiation) in the event of an accident or upset conditions. The reasonably foreseeable non-structural and structural BMPs included in this evaluation would not be subject to explosion or the release of hazardous substances in the event of an accident because these types of substances would not be present. There is the possibility that hazardous materials (e.g., paint, oil, gasoline) may be present during construction and installation activities, but potential risks of exposure can be mitigated with proper handling and storage procedures. All risks of exposure would be short term and would be eliminated with the completion of construction and installation activities.

11. Population. **Will the proposal alter the location, distribution, density, or growth rate of the human population of an area?**

Answer**: Less than significant**

Discussion: Non-structural BMPs will not alter the location, distribution, density, or growth rate of the human population of an area because none of the BMPs would introduce any physical effects that could impact these characteristics.

Implementation of structural BMPs may potentially alter the location, distribution, density, or growth rate of the human population of an area. However, dischargers are not required or expected to change present or planned land uses to comply with the TMDLs, and dischargers are encouraged to seek alternatives that would have the lowest impact on the existing and planned population of an area. Potential conflicts between complying with the TMDLs and planned growth can be resolved by standard planning efforts under which specific projects are reviewed by local planning agencies. Applicable and appropriate mitigation measures could be evaluated when specific projects are determined.

More reasonable alternatives should be evaluated and implemented, such as non-structural BMPs and low impact and/or small scale structural BMPs, before considering an alternative that would create the need to relocate the population of parts of the watersheds.

12. Housing. **Will the proposal affect existing housing, or create a demand for additional housing?**

Answer**: Less than significant**

Discussion: Non-structural BMPs will not affect existing housing, or create a demand for additional housing because none of these BMPs would introduce any physical effects that could impact housing.

Implementation of structural BMPs may potentially affect existing housing. However, dischargers are not required or expected to change present or planned land uses to comply with the TMDLs, and dischargers are encouraged to seek alternatives that would have the lowest impact on land use and the environment. Potential conflicts between complying with the TMDLs and other land uses can be resolved by standard planning efforts under which specific projects are reviewed by local planning agencies. Applicable and appropriate mitigation measures could be evaluated when specific projects are determined.

More reasonable alternatives should be evaluated and implemented, such as non-structural BMPs and low impact and/or small scale structural BMPs, before considering an alternative that would create considerable hardship for the community in the area.

13. Transportation/Circulation. a. **Will the proposal result in generation of substantial additional vehicular movement?**

Answer**: Less than significant**

Discussion: Non-structural and/or structural BMPs will not result in generation of substantial additional long-term vehicular movement. There may be additional vehicular movement during construction of structural BMPs and during street sweeping and/or maintenance activities. However, vehicular movement during construction would be temporary, and vehicular movement during street sweeping and/or maintenance activities would be periodic and only as the vehicle passes through the area. This may generate minor additional vehicular movement.

In order to reduce the impact of construction traffic, a construction traffic management plan could be prepared for traffic control during any street closure, detour, or other disruption to traffic circulation. The plan could identify the routes that construction vehicles would use to access the site, hours of construction traffic, and traffic controls and detours. The plan could also include plans for temporary traffic control, temporary signage and stripping, location points for ingress and egress of construction vehicles, staging areas, and timing of construction activity which appropriately limits hours during which large construction equipment may be brought on or off site.

The potential impact to vehicular movement can be reduced if street sweeping and/or maintenance activities are scheduled to be performed at the same time as other maintenance activities performed by municipalities, or at times when these activities have lower impact, such as periods of low traffic activity.

13. Transportation/Circulation. b. **Effects on existing parking facilities, or demand for new parking?**

Answer**: Less than significant with mitigation.**

Discussion: Non-structural BMPs may affect existing parking facilities, or create demand for new parking structures, if increased street sweeping and/or maintenance is implemented in areas with parking along roadsides. Available parking in an area could be reduced during certain times of the day, week, and/or month, depending on frequency of street sweeping and/or maintenance events. Street sweeping and maintenance events should be scheduled to be performed at the same time as other maintenance activities performed by the municipalities, and/or at times when these activities have lower impact, such as periods of low traffic activity and parking demand.

Depending on the structural BMPs selected, alterations to existing parking facilities may occur to incorporate structural BMPs. This could reduce available parking in an area. However, structural BMPs can be designed to accommodate space constraints or be placed under parking spaces and do not have to occupy space in existing parking facilities. Available parking spaces can be reconfigured to provide equivalent number of spaces or provide functionally similar parcels for use as offsite parking to reduce potential impacts.

13. Transportation/Circulation. c. **Will the proposal result in substantial impacts upon existing transportation systems?**

Answer**: Less than significant**

Discussion: Non-structural BMPs will not result in significant impacts upon existing transportation systems. The only foreseeable impact would come from increased street sweeping, however long-term impacts are unlikely because any increase in maintenance vehicular activities would fall well within the present day activities in any municipality, and would therefore not qualify as substantial.

Depending on the structural BMPs selected, temporary alterations to existing transportation systems may be required during construction and installation activities. The potential impacts would be limited and short-term. Potential impacts could be reduced by limiting or restricting hours of construction so as to avoid peak traffic times and by providing temporary traffic signals and flagging to facilitate traffic movement.

13. Transportation/Circulation. d. **Will the proposal result in alterations to present patterns of circulation or movement of people and/or goods?**

Answer**: Less than significant**

Discussion: Non-structural BMPs will not result in alterations to present patterns of circulation or movement of people and/or goods, because none of the BMPs, including increased street sweeping, would introduce any physical effects that could impact these characteristics. No long-term impacts are expected because any increase in maintenance vehicular activities would fall well within the present day activities in any municipality.

Depending on the structural BMPs selected, temporary alterations to present patterns of circulation or movement of people and/or goods may be required during construction and installation activities. The potential impacts would be limited and short-term. Potential impacts could be reduced by limiting or restricting hours of construction so as to avoid peak traffic times and by providing temporary traffic signals and flagging to facilitate traffic movement.

13. Transportation/Circulation. e. **Will the proposal result in alterations to waterborne, rail or air traffic?**

Answer**: Less than significant**

Discussion: Non-structural and/or structural BMPs are not expected to result in alterations to waterborne, rail or air traffic because none of the BMPs would introduce any physical effects that could impact these characteristics.

Depending on the structural BMPs selected, temporary alterations to rail transportation could potentially occur during construction and installation activities. However, those potential impacts would limited and short-term and could be avoided through proper siting and design, and scheduling of construction activities.

13. Transportation/Circulation. f**. Will the proposal result in increase in traffic hazards to motor vehicles, bicyclists or pedestrians?**

Answer**: Less than significant**

Discussion: Non-structural BMPs could result in an increase in traffic hazards to motor vehicles, bicyclists or pedestrians due, for example, to increased street sweeping. However, any foreseeable impact from increased street sweeping would fall well within the present day conditions in any municipality, and would therefore not present new safety concerns.

Depending on the structural BMPs selected, a temporary increase in traffic hazards may occur during construction and installation activities. The specific project impacts can be reduced and mitigated by marking, barricading, and controlling traffic flow with signals or traffic control personnel in compliance with authorized local police or California Highway Patrol requirements. These methods would be selected and implemented by responsible local agencies considering project level concerns. Standard safety measures should be employed including fencing, other physical safety structures, signage, and other physical impediments designed to promote safety and minimize pedestrian/bicyclists accidents.

14. Public Service. a. **Will the proposal have an effect upon, or result in a need for new or altered governmental services in any of the following areas: Fire protection?**

Answer**: Less than significant**

Discussion: Non-structural BMPs will not have an effect upon, or result in a need for new or altered fire protection services because none of the BMPs would introduce any physical effects that could impact this characteristic.

During construction and installation of structural BMPs, temporary delays in response time of fire vehicles due to road closure/traffic congestion during construction activities may occur. However, any construction activities would be subject to applicable building and safety and fire prevention regulations and codes. The responsible agencies could notify local emergency service providers of construction activities and road closures and could coordinate with local providers to establish alternative routes and appropriate signage. In addition, an Emergency Preparedness Plan could be developed for the construction of proposed new facilities in consultation with local emergency providers to ensure that the proposed project's contribution to cumulative demand on emergency response services would not result in a need for new or altered fire protection services. Most jurisdictions have in place established procedures to ensure safe passage of emergency vehicles during periods of road maintenance, construction, or other attention to physical infrastructure. In any case, the installation of structural devices would not create any more significant impediments than such other ordinary activities.

14. Public Service. b. **Will the proposal have an effect upon, or result in a need for new or altered governmental services in any of the following areas: Police protection?**

Answer**: Less than significant**

Discussion: Non-structural BMPs will not have an effect upon, or result in a need for new or altered fire protection services because none of the BMPs would introduce any physical effects that could impact this characteristic.

During construction and installation of structural BMPs, temporary delays in response time of police vehicles due to road closure/traffic congestion during construction activities may occur. The responsible agencies could notify local police service providers of construction activities and road closures and could coordinate with local police to establish alternative routes and traffic control during construction projects. In addition, an Emergency Preparedness Plan could be developed for the proposed new facilities in consultation with local emergency providers to ensure that the proposed project's contribution to cumulative demand on emergency response services would not result in a need for new or altered police protection services. Most jurisdictions have in place established procedures to ensure safe passage of emergency vehicles during periods of road maintenance, construction, or other attention to physical infrastructure. In any case, the installation of structural devices would not create any more significant impediments than such other ordinary activities.

14. Public Service. c. **Will the proposal have an effect upon, or result in a need for new or altered governmental services in any of the following areas: Schools?**

Answer**: No impact.**

Discussion: Non-structural and structural BMPs will not have an effect upon, or result in a need for new or altered schools or school services because none of the BMPs would introduce any physical effects that could impact this characteristic.

14. Public Service. d. **Will the proposal have an effect upon, or result in a need for new or altered governmental services in any of the following areas: Parks or other recreational facilities?**

Answer**: Less than significant.**

Discussion: Non-structural BMPs will not have an effect upon, or result in a need for new or altered parks or other recreational facilities because none of the BMPs would introduce any physical effects that could impact parks or recreational facilities.

During construction and installation of structural BMPs, parks or other recreational facilities could be temporarily affected. Construction activities could potentially be performed near or within a park or recreational facilities. Potential impacts would be limited and short-term and could be avoided through siting, designing, and scheduling of construction activities.

In the unlikely event that the municipalities might install facilities on a scale that could alter a park or recreational facility, the structural BMPs could be designed in such a way as to be incorporated into the park or recreational facility. Additionally, should an impermeable detention basin be required, this could be constructed underground to avoid the need for new or altered parks or other recreational facilities.

14. Public Service. e. **Will the proposal have an effect upon, or result in a need for new or altered governmental services in any of the following areas: maintenance of public facilities, including roads?**

Answer**: Less than significant with mitigation**

Discussion: Non-structural BMPs may include additional road maintenance such as additional and/or increased street sweeping. Structural BMPs may require additional maintenance by dischargers to ensure proper operation. As discussed above for Questions 2, 6, and 13, additional or increased street sweeping and maintenance activities could affect air, noise, and transportation/circulation. The increase in air pollutants and noise levels would be no greater than typical street sweeping and maintenance activities currently performed by the municipalities. Street sweeping and maintenance events could be scheduled to be performed at the same time as other maintenance activities performed by the municipalities, or at times when these activities have lower impact, such as periods of low traffic activity and parking demand.

14. Public Service. f. **Will the proposal have an effect upon, or result in a need for new or altered governmental services in any of the following areas: other government services?**

Answer**: Less than significant with mitigation**

Discussion: As discussed above, non-structural and/or structural BMPs may include increased street sweeping and/or additional maintenance by dischargers to ensure proper operation of newly installed structural BMPs. However, the potential impacts to air, noise, and transportation/circulation would be no greater than typical street sweeping and maintenance activities currently performed by municipalities. Street sweeping and maintenance events could be scheduled to be performed at the same time as other maintenance activities performed by the municipalities, or at times when these activities have lower impact, such as periods of low traffic activity and parking demand.

Implementation of the TMDLs will result in the need for increased monitoring in the watersheds and to track compliance with the TMDLs. However, no effects to the environment would be expected from these monitoring activities.

15. Energy. a. **Will the proposal result in use of substantial amounts of fuel or energy?**

Answer**: No impact**

Discussion: Non-structural and/or structural BMPs will not use substantial amounts of fuel or energy. As discussed above for Question 9, operation of street sweepers, construction, and maintenance vehicles could increase the use of fossil fuels, and some types equipment used in structural BMPs may consume electricity to operate pumps, etc. The additional use of fossil fuels and electricity could be reduced if the dischargers used alternative fuels and/or renewable energies to power their vehicles and equipment.

15. Energy. b. W**ill the proposal result in a substantial increase in demand upon existing sources of energy, or require the development of new sources of energy?**

Answer**: No impact**

Discussion: Non-structural and/or structural BMPs will not result in a substantial increase in demand upon existing sources of energy, or require the development of new sources of energy. As discussed for Questions 9 and 15a above, operation of street sweepers, construction, and maintenance vehicles could increase the use of fossil fuels, and some types of equipment used in structural BMPs may consume electricity to operate pumps, etc. The additional use of fossil fuels and electricity could be reduced if the dischargers used alternative fuels and/or renewable energies to power their vehicles and equipment.

If alternative sources of energy are used, sources of alternative energy and fuel may be needed. Equipment and components for renewable sources of energy such as solar or wind are readily available. Alternative fuels such as ethanol or biodiesel are commercially available and can be used. Sources of new energy are not required to be developed.

16. Utilities and Service Systems. a. **Will the proposal result in a need for new systems, or substantial alterations to the following utilities: power or natural gas?**

Answer**: Less than significant**

Discussion: Non-structural BMPs will not result in a need for new systems or alterations to power or natural gas utilities because none of the BMPs would introduce any physical effects that could impact this characteristic.

Installation of structural BMPs may require alterations or installation of new power or natural gas lines. Power and natural gas lines might need to be rerouted to accommodate the addition of structural BMPs. The degree of alteration depends upon local system layouts which careful placement and design can minimize. However, that the installation of structural BMPs will result in a substantial increased need for new systems, or substantial alterations to power or natural gas utilities, is not reasonably foreseeable, because none of these BMPs are large enough to substantially tax current power or natural gas sources. No

long term effects on the environment are expected if alterations to power or natural gas utilities are required.

16. Utilities and Service Systems. b. **Will the proposal result in a need for new systems, or substantial alterations to the following utilities: communications systems?**

Answer**: No impact**

Discussion: Non-structural BMPs will not result in a need for new systems or alterations to communications systems because none of the BMPs would introduce any physical effects that could impact this characteristic. Current forms of communications used in street sweeping and maintenance vehicles could still be used.

New systems or alterations to communications systems are not necessarily required for structural BMPs. Structural BMPs can be manually inspected and maintained without any communications system required. However, that municipalities could install a remote monitoring system, which could include a new communications system, is possible. A telephone line or wireless communications system could be installed, which would not be a substantial alteration.

16. Utilities and Service Systems. c. **Will the proposal result in a need for new systems, or substantial alterations to the following utilities: water?**

Answer**: No impact**

Discussion: Non-structural and/or structural BMPs will not result in a need for new systems or alterations to water lines. The need for new municipal or recycled water to implement these TMDLs is not foreseeable.

16. Utilities and Service Systems. d. **Will the proposal result in a need for new systems, or substantial alterations to the following utilities: Sewer or septic tanks?**

Answer**: Less than significant**

Discussion: Non-structural and/or structural BMPs will not result in a need for new systems or alterations to sewer or septic tanks because none of the BMPs would introduce any physical effects that could impact this characteristic.

Depending on the structural BMPs selected, a portion or all of the surface water runoff may be diverted to wastewater treatment facilities. If stormwater is diverted for treatment at a wastewater treatment facility, new connections to existing sanitary sewer lines may be required, but no new major sewer trunks or substantial alterations to sewer system would be expected because BMPs utilizing the sewer would likely contribute small amounts of first flush storm water. Any environmental affects from associated construction activities would be small scale and short-term and similar to typical municipal capital improvement projects.

16. Utilities and Service Systems. e. **Will the proposal result in a need for new systems, or substantial alterations to the following utilities: stormwater drainage?**

Answer**: Less than significant**

Discussion: Non-structural BMPs will not result in a need for new systems, or substantial alterations to stormwater drainage systems because none of the BMPs would introduce any physical effects that could impact this characteristic.

In order to achieve compliance with the TMDLs, the stormwater drainage systems may need to be reconfigured and/or retrofitted with structural BMPs to capture and/or treat a portion or all of the stormwater runoff. The alterations and/or additions to stormwater drainage systems will depend on the compliance strategy selected by each discharger at each location where structural BMPs might be installed. Impacts from construction activities to retrofit or reconfigure the storm drain system as part of BMP installation, and mitigation measures have been considered and discussed in the previous responses to the questions.

16. Utilities and Service Systems. f. **Will the proposal result in a need for new systems, or substantial alterations to the following utilities: solid waste and disposal?**

Answer**: Less than significant with mitigation**

Discussion: Most non-structural BMPs will not result in a need for new systems, or substantial alterations to the solid waste and disposal systems because none of the BMPs would introduce any physical effects that could impact this characteristic. In urbanized areas, increased street sweeping would generate additional solid waste, but this additional waste is not expected to exceed the maintenance capacity of normal city operations. No new solid waste or disposal systems would be expected.

The installation of structural BMPs may generate construction debris. Additionally, installed structural BMPs may collect sediment and solid wastes that will require disposal. However, no new solid waste or disposal systems would be needed to handle the relatively small volume generated by these projects. Construction debris may be recycled at aggregate

recycling centers or disposed of at landfills. Sediment and solid wastes that may be collected can be disposed of at appropriate landfill and/or disposal facilities. In the event that structural BMPs are placed in areas of intensive livestock, resulting in the collection of animal waste, mitigation includes composting and/or manure production to reduce the volume of solid waste going to landfills.

17. Human Health. a. **Will the proposal result in creation of, and exposure of people to, any health hazard or potential health hazard (excluding mental health)?**

Answer**: Less than significant with mitigation**

Discussion: As discussed above for Questions 2 and 13, non-structural BMPs such as street sweeping and maintenance vehicles could have an effect on air and transportation/circulation. Non-structural BMPs could increase the amount of pollutants emitted into the atmosphere above ambient conditions. Non-structural BMPs could also increase traffic, which could potentially decrease the safety of pedestrians. In both cases, potential impacts can be reduced or eliminated if street sweeping and/or maintenance activities are scheduled to be performed at the same time as other maintenance activities performed by the dischargers, or at times when these activities have lower impact, such as periods of low traffic activity.

As discussed above for questions 1, 2, 3, 5, and 13, the installation of structural BMPs could have an effect on earth, air, water, animal life, and transportation/circulation. Structural BMPs could increase the risk of unstable earth conditions, which could pose a physical risk to persons in the area should a slope fail. Construction, installation, and maintenance of structural BMPs could increase the amount of pollutants the air, which could have an effect on health. Structural BMPs could potentially result in additional habitat and/or standing water which can attract pests, such as flies, mosquitoes and/or rodents, which can be carriers of disease. Maintenance of structural BMPs could also increase traffic, which could potentially decrease the safety of pedestrians. Additionally, heavy machinery and materials that may be used during construction and installation of structural BMPs could pose physical and/or chemical risks to human health.

Potential impacts to earth could be avoided or mitigated through proper geotechnical investigations, siting, design, and ground and groundwater level monitoring to ensure that structural BMPs are not employed in areas subject to unstable soil conditions. Potential health hazards attributed to installation and maintenance of structural BMPs can be mitigated by use of OSHA construction and maintenance health and safety guidelines. Potential health hazards attributed to BMP maintenance can be mitigated through OSHA industrial hygiene guidelines. Installation of non-vector producing structural BMPs can help mitigate vector production from standing water. Netting can be installed over structural BMPs to further mitigate vector production. Structural BMPs can be designed and sites can be properly protected to prevent accidental health hazards as well as prevent vector production. Vector control agencies may also be employed as another source of mitigation. Structural BMPs prone to standing water can be selectively installed away from high-density areas and away from residential housing and/or by requiring oversight and treatment of those systems by vector control agencies. Potential impacts to transportation/circulation can be reduced or

eliminated if maintenance activities are scheduled to be performed at the same time as other maintenance activities performed by the municipalities, or at times when these activities have lower impact, such as periods of low traffic activity. Appropriate planning, design, siting, and implementation can reduce or eliminate potential health hazards due to the installation of structural BMPs.

18. Aesthetics. a. **Will the proposal result in the obstruction of any scenic vista or view open to the public?**

Answer**: Less than significant with mitigation**

Discussion: Non-structural BMPs will not result in the obstruction of any scenic vista or view open to the public because none of the BMPs would introduce any physical effects that could impact this characteristic.

That dischargers would comply with this TMDL by installing structural BMPs that would adversely affect a scenic vista or view open to the public is not reasonably foreseeable. Most structural BMPs that will likely be used can be constructed as subsurface devices, such as sand filters. Once completed, structural BMPs would not foreseeably obstruct scenic vistas or open views to the public. In the unlikely event that the dischargers might install facilities on a scale that could obstruct scenic views, such impacts could be reduced or eliminated with appropriate planning, design, and siting of the structural BMPs. Additionally, many structural BMPs can, if necessary, be constructed underground to eliminate aesthetic issues.

18. Aesthetics. b. **Will the proposal result in the creation of an aesthetically offensive site open to public view?**

Answer**: Less than significant with mitigation**

Discussion: Non-structural BMPs will not result in the creation of an aesthetically offensive site open to public view because none of the BMPs would introduce any physical effects that could impact this characteristic.

The installation of structural BMPs could potentially create an aesthetically offensive site open to public view. Structural BMPs may create an aesthetically offensive site to the public during construction and installation, but this would be temporary until construction is completed. Once installation of the structural BMPs is complete, the site may continue to be aesthetically offensive to the public. However, many structural BMPs can be designed to provide wildlife habitat, recreational areas, and green spaces in addition to improving stormwater quality. Appropriate architectural and landscape design practices can be implemented to reduce adverse aesthetic effects. Screening and landscaping may also be used to mitigate adverse aesthetic effects. The adverse aesthetic effects could be reduced or eliminated and possibly improved with appropriate planning and design of the structural

BMPs. Additionally, many structural BMPs can, if necessary, be constructed underground to eliminate aesthetic issues.

19. Recreation a. **Will the proposal result in impact on the quality or quantity of existing recreational opportunities?**

Answer**: Less than significant with mitigation**

Discussion: Non-structural BMPs will not result in impact on the quality or quantity of existing recreational opportunities because none of the BMPs would introduce any physical effects that could impact these characteristics.

During construction and installation of structural BMPs, parks or other recreational areas could be temporarily affected. Construction activities could potentially be performed near or within a park or recreational area. Potential impacts would be limited and short-term, and could be avoided through proper siting, design, and scheduling of construction activities.

In the event that the municipalities might install facilities on a scale that could alter a park or recreational area, the structural BMPs could be designed in such a way as to be incorporated into the park or recreational area. Additionally, any structural BMPs can, if necessary, be constructed underground to minimize impacts on the quality or quantity of existing recreational opportunities. Mitigation to replace lost areas may include the creation of new open space recreation areas and/or improved access to existing open space recreation areas.

Additionally, improvement of water quality could create new recreation opportunities in urbanized areas of the watersheds by providing the opportunity to recreate in and near a clean water body with a robust and diverse population of plants and animals.

20. Archeological/Historical a. **Will the proposal result in the alteration of a significant archeological or historical site, structure, object or building?**

Answer**: Less than significant with mitigation**

Discussion: Non-structural BMPs will not result in the alteration of a significant archeological or historical site, structure, object or building because none of the BMPs would introduce any physical effects that could impact these characteristics.

In the unlikely event that dischargers might install facilities on a scale that could result in significant adverse effects on a significant archeological or historical site, structure, object or building, a project level, site-specific environmental assessment should be performed to identify the mitigation measures that could be employed to minimize the potential effects on archeological or historical sites and identify alternatives that could potentially be used that would have less impact. The agencies responsible for implementing this TMDL could consult

the relevant local archeological or historical commissions or authorities to identify these types of sites and determine ways to avoid significant adverse impacts. The potentially adverse effects on archeological or historical sites that might be present could be reduced or eliminated with appropriate planning, design, and siting of the structural BMPs.

21. Mandatory Findings of Significance - Potential to degrade: **Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?**

Answer**: Less than significant with mitigation**

Discussion: Non-structural BMPs will not result in the substantial degradation of the environment for plant and animal species because none of the BMPs would introduce any physical effects that could impact these characteristics.

As discussed above in Questions 4 and 5, plant and animal species could potentially be adversely affected by the installation and operation of structural BMPs. Mitigation measures could be implemented to ensure that unique, rare or endangered plant and/or animal species and their habitats are not taken or destroyed. When specific projects are developed and sites identified, a focused protocol plant and/or animal survey and/or a search of the California Natural Diversity Database should be performed to confirm that any potentially sensitive or special status plant and/or animal species in the site area are properly identified and protected as necessary. If sensitive plant and/or animal species occur on the project site, mitigation is required in accordance with the Endangered Species Act. Mitigation measures should be developed in consultation with the CDFG and the USFWS. Dischargers should avoid installing structural BMPs that could adversely affect any unique, rare or endangered species of plants and/or animals, and instead opt for non-structural BMPs and/or identify and install structural BMPs that will have little or no impact such as underground BMPs.

Taken all together, the potential impacts of the project will not cause a significant cumulative impact in the environment. In any case, the implementation of this TMDL will result in improved water quality in the waters of the Region and will have significant beneficial impacts to the environment over the long term.

21. Mandatory Findings of Significance - Short-term: **Does the project have the potential to achieve short-term, to the disadvantage of long-term, environmental goals? (A short-term impact on the environment is one which occurs in a relatively brief, definitive period of time, while long-term impacts will endure well into the future.)**

Answer**: No impact**

Discussion: There are no short-term beneficial effects on the environment from the implementation of non-structural and/or structural BMPs that would be at the expense of long-term beneficial effects on the environment. The implementation and compliance with this TMDL will result in improved water quality in the waters of the Region and will have significant beneficial impacts to the environment over the long term.

21. Mandatory Findings of Significance - Cumulative: **Does the project have impacts which are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)**

Answer**: Less than significant with mitigation**

Discussion: Cumulative impacts, defined in section 15355 of the CEQA Guidelines, refer to two or more individual effects, that when considered together, are considerable or that increase other environmental impacts. Cumulative impact assessment must consider not only the impacts of the proposed bacteria TMDLs, but also the impacts from other TMDL, municipal, and private projects, which have occurred in the past, are presently occurring, and may occur in the future, in the watershed during the period of implementation.

Past and present projects may be regarded as the general construction (development and maintenance) which has brought several regional creeks from a natural, pristine condition, to the urban, developed setting which is present today. This provides a baseline level of construction with which to compare all water quality project requirements. The past and present baseline of construction in the urbanized watersheds will probably remain constant in the future. The increment of increase proposed by the cumulative requirements of all water quality requirements can be mitigated through scheduling, and is insignificant compared to the past and on-going baseline of typical municipal construction.

Present and future impacts will come from all of the water quality control programs and pollutant load reduction projects being implemented in the watershed or planned for the near future. This includes waterbodies for which other TMDLs are to be developed, and projects to comply with the WDRs in Order Nos. R9-2007-0001 and R9-2002-0001 (the San Diego County and Orange County municipal stormwater requirements).

Cumulative impacts of these bacteria TMDLs and other water quality control programs are not expected to be significant because effective non-structural BMPs, that have no adverse impacts, will most likely be an initial strategy for implementation of the bacteria TMDLs. For example, the bacteria TMDLs can be implemented through education and outreach, and enforcement of ordinances requiring pet owners to properly dispose of pet waste, ordinances prohibiting disposal of grease, food products, and other bacteria-laden waste products into the storm drain, and ordinances curbing nuisance flows into the stormdrain system. Another important bacteria load reduction program is to find and fix illegal cross-connections between the sanitary sewer system and the stormdrain system. Fixing cross connections between the stormdrain and sanitary sewer systems may increase the overall number of construction projects needed in the watershed to implement TMDLs. However, estimating the number of cross connections that might exist is purely speculative. Further, these types of construction projects are on a small scale and fall well within typical municipal capital improvement and maintenance activities. Additionally, some of these practices, such as curbing nuisance flows, will be effective at addressing other pollutants in addition to bacteria. Therefore the cumulative effects will not be considerable, and can be mitigated, if necessary, through scheduling.

The dischargers may opt to use structural BMPs to reduce bacteria and other pollutants to the watersheds, which would increase the likelihood of environmental effects that are cumulatively considerable. The City of San Diego funded an assessment of BMP strategies that would lessen the anticipated impacts and allow an integrated TMDL strategy that address both current and anticipated TMDLs in Chollas Creek. In this study,[25] the authors recommended a strategy that used a tiered approach that reduces the impact to the environment, and allows for more cost effective implementation of lower-impact BMPs. The tiered approach consists of three major components:

- Tier 1 – Control of Pollutants at the Source and Prevent Pollutants from Entering Runoff
- Tier 2 – Conduct Design Studies and Implement Aggressive Street Sweeping and Runoff and Treatment Volume Reduction BMPs
- Tier 3 – Infrastructure Intensive Treatment BMPs

Implementation of this BMP strategy, because it emphasizes BMPs with the least adverse impacts to the environment, should reduce cumulative impacts to less than significant levels. Although this study was specific to Chollas Creek, the recommended strategy is applicable to reducing pollutants in all watersheds.

Present and future specific TMDL projects may include structural BMP construction which must be environmentally evaluated for potential cumulative impacts by the implementing municipality. Present and future specific TMDL projects and other construction activities may result in short-term cumulative impacts as described below. However, appropriate and available mitigation measures, including scheduling, are available to reduce adverse

[25] Weston Solutions, 2006. *Chollas Creek TMDL Source Loading, Best Management Practices, and Monitoring Strategy Assessment,* September, 2006.

environmental impacts associated with construction to less than significant levels.

Noise and Vibration - Local residents in the near vicinity of installation and maintenance activities may be exposed to noise and possible vibration. The cumulative effects, both in terms of added noise and vibration at multiple bacteria BMP installation sites, and in the context of other related projects, are not likely to be cumulatively considerable due to the temporary nature of noise increases and the small scale of the projects. Noise mitigation methods including scheduling of construction are discussed above, and should be used to keep cumulative noise and vibration affects to acceptable levels.

Air Quality - Implementation of the bacteria TMDL program may cause additional emissions of air pollutants and slightly elevated levels of carbon monoxide during construction activities. Emission of air pollutants resulting from installation of TMDL compliance devices may exceed certain regulatory thresholds, and therefore the TMDL, in conjunction with all other construction activity, may contribute to the region's overall exceedance of certain regulatory thresholds during the installation period. However, because these installation-related emissions are temporary, compliance with the TMDL would not result in long-term cumulatively considerable air quality impacts. Short-term impacts can be avoided through scheduling.

Transportation and Circulation - Compliance with the bacteria TMDLs could involve installation activities occurring simultaneously at a number of sites along the creek included in this project. Installation of bacteria reduction BMPs may occur in the same general time and space as other related or unrelated projects. In these instances, construction activities from all projects could produce cumulative traffic effects depending upon a range of factors including the specific location involved and the precise nature of the conditions created by the numerous construction activities. Special coordination efforts may be necessary to reduce the combined effects to an acceptable level. Overall, cumulatively considerable impacts are not anticipated because coordination can occur and because transportation mitigation methods are available.

Public Services - The cumulative effects on public services due to the bacteria TMDLs would be limited to traffic inconveniences. These effects are not likely to be cumulatively considerable as long as alternative traffic route are available around construction sites.

Aesthetics - Construction activities associated with other related projects may be ongoing in the vicinity of one or more bacteria TMDL construction sites. To the extent that combined construction activities do occur, there would be temporary elevated adverse visual effects. However, these effects are not cumulatively considerable in the long-term because the effects will cease with the completion of construction. Short-term impacts can be avoided through scheduling.

As analyzed above, the construction of structural BMPs, along with other construction and maintenance projects, could have short-term cumulative effects; however, these effects can be mitigated through proper construction scheduling. In addition, these effects are not cumulatively considerable in the long-term because the effects will cease with the completion of construction. In summary, appropriate and available mitigation measures, including scheduling, are available to reduce adverse environmental impacts associated with

construction to less than significant levels.

21. Mandatory Findings of Significance - Substantial adverse: **Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?**

    Answer**: Less than significant with mitigation**

Discussion: All of the potentially significant impacts to human beings, such as air quality, noise, aesthetics, alterations to utilities, fire protection, police protections etc., are either short-term in nature, or can be mitigated to acceptable levels as previously discussed.

R.5.1 Alternative Means of Compliance

The CEQA requires an analysis of reasonably foreseeable alternative means of compliance with the rule or regulation, which would avoid or eliminate the identified impacts.[26] The dischargers can use the structural and non-structural BMPs described in section 3, or other structural and non-structural BMPs, to control and prevent pollution, and meet the TMDLs' required load reductions. The alternative means of compliance with the TMDLs consist of the different combinations of structural and non-structural BMPs that the dischargers might use. Because there are innumerable ways to combine BMPs, all of the possible alternative means of compliance cannot be discussed here. However, because most of the adverse environmental effects are associated with the construction and installation of structural BMPs, to avoid or eliminate impacts, compliance alternatives should minimize structural BMPs, maximize non-structural BMPs, and site, size, and design structural BMPs in ways to minimize environmental effects.

[26] 14 CCR section 15187 (c) (3)

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R.6 Reasonably Foreseeable Methods of Compliance at Specific Sites

The San Diego Water Board analyzed various reasonably foreseeable methods of compliance at specific sites within the subject watersheds. Because this project is large in scope (encompassing 12 watersheds), the specific sites analysis was focused on reviewing potential compliance methods within various land uses. The land uses cited below correspond to the land uses that were utilized for watershed model development (the watershed models are discussed extensively in section 7 of the Technical Report and Appendices J and K). Land uses in this analysis include: dairies/intensive livestock/horse ranches, transitional (construction areas), agriculture, residential, parks/recreation, commercial/institutional, industrial/transportation, and military. These land uses represent a range of population densities and geographical settings found in the San Diego Region. Although all of these land uses generate bacteria, the ones that have the highest human and/or animal population densities are the most likely to produce human pathogens that can pollute surface waters and impair beneficial uses.

In this discussion of potential compliance methods, the San Diego Water Board assumed that, generally speaking, the BMPs suitable for the control of bacteria generated from a specific land use within a given watershed are also suitable for the control of bacteria generated from the same land use category within a different watershed. For example, a BMP used to control the discharge of bacteria from a residential area in the San Diego River watershed is likely suitable to control the discharge of bacteria from a residential area in the Aliso Creek watershed. However, in addition to land use, BMP selection includes considering site-specific geographical factors such as average rainfall, soil type, and the amount of impervious surfaces, and non-geographical factors such as available funding. Such factors vary between watersheds. The most suitable BMP(s) for a particular site must be determined by the dischargers in a detailed, project-specific environmental analysis.

The following discussion involves a programmatic level review of specific site compliance methods, or combination of compliance methods that have been implemented in the subject watersheds, as well as other BMP examples that could potentially be implemented at additional sites. The dischargers are in no way limited to using the BMPs included here to achieve TMDL compliance, and may choose not to implement these particular BMPs.

In order to meet TMDL requirements, dischargers will determine and implement the actual compliance method(s) after a thorough analysis of the specific sites suitable for BMP implementation within each watershed. In most cases, the San Diego Water Board anticipates a potential strategy to be the use of management measures, or other non-structural BMPs as a first step in controlling bacteria discharges, followed by structural BMP installation if necessary.

R.6.1 Potential BMPs for Dairy/ Intensive Livestock Areas and Horse Ranches

Livestock and horse ranch areas in the San Diego Region are usually found in rural areas with lower population densities than the urbanized areas. However, small horse ranches and individual horse corrals are sometimes found within urbanized areas with higher population densities.[27]

[27] The US Census Bureau's 2000 data reported the City of San Diego to have a population density of 3,771 people per square mile.

Examples of management measures to achieve TMDL compliance include ensuring that livestock and horse holding pens, paddocks, and corrals are properly sized and sited in areas that do not drain to surface streams. Additionally, animal waste should be properly managed (i.e., stored in a manner that prevents leaching pollutants into runoff and prevents runoff from reaching waterways during a rain event.

Examples of structural BMPs include the installation of roof gutters to prevent rain water from mixing with manure and causing erosion, or diversion structures, such as vegetative strips, that absorb runoff and prevent it from reaching waterways. Another example includes the construction of animal exclusion devices, such as fences or other physical barriers, to keep animals out of the creeks, as shown in Figures 1 and 2. Figure 1 depicts a galvanized fence that is useful for keeping dairy cows from the Konyn Dairy in Escondido, California, (background) out of the creek bed (foreground). However, this control would be more effective if set back farther from the creek bank and with a vegetative strip between the fence and the creek bank. Figure 2 shows a similar fencing device that is useful for keeping horses confined and away from surface waters. No adverse environmental effects are expected as a result of implementing these types of BMPs.

Figure R-1. Animal Exclusion Device at Konyn Dairy, Valley Center Road, San Dieguito Watershed.

Figure R-2. Animal Exclusion Device at Happy Trails Horse Ranch, Black Mountain Road, Penasquitos Watershed.

R.6.2 Potential BMPs for Construction Sites

Construction activities typically take place in various settings and existing land uses. In San Diego County, construction activities result in new residential units both in urban and suburban environments, as well as industrial and commercial sites, such as business parks and shopping malls. Population densities in the areas of construction vary greatly with the specific projects.

A potential strategy to achieve TMDL compliance includes the use of structural BMPs, such as fiber rolls as shown in Figure 3. Other examples include compost blankets, netting, silt fences, or filter berms. Such devices prevent pollutants such as bacteria and sediment from reaching stormwater and stormwater drainage pathways by allowing the water and contaminants to infiltrate into the surrounding soil. Still other BMPs that are appropriate to use at construction sites include the use of sandbags, such as the ones shown in Figure 4. Sandbags also prevent runoff containing pollutants from reaching stormwater drainage pathways.

Possible adverse environmental effects include the reduction or elimination of storm flows from the use of structural barriers that prevent flow from reaching creek beds. Although such devices prevent pollutants from reaching receiving waters, so do they prevent water from reaching areas that might depend on it to provide habitat. Additionally, infiltration devices could alter the flow rate of groundwater. For a complete discussion of possible adverse effects of these BMPs, see section 5.

Figure R-3. Use of Netting and Fiber Rolls at San Elijo Hills Construction Site, Northstar Way, Carlsbad Watershed.

Figure R- 4. Use of Sandbags upstream of Moonlight State Beach, Encinitas Blvd., Carlsbad Watershed.

R.6.3 Potential BMPs for Agricultural Areas

In the San Diego Region, there are few agricultural areas compared to other regions in the state, such as the Central Valley. Agricultural areas account for about 12 percent of the land in the region (see Table J-1 in Appendix J) and have lower population densities than urbanized areas.

Examples of reasonably foreseeable management measures to achieve TMDL compliance include irrigation practices that control the volume and flow rate of runoff water, thereby keeping the soil in place, and reducing soil transport (bacteria and pathogens can adsorb to sediment particles). This is especially important where manure fertilizers are applied to agricultural fields. Examples of structural BMPs include the use of sandbags (see Figure 5) to

prevent runoff containing pollutants from agricultural fields, such as the strawberry fields located in Carlsbad, California, (background) from reaching the storm drains that protect flooding of the adjacent roadways (foreground). Possible adverse environmental effects include the reduction or elimination of storm flows from the use of structural barriers (sandbags) that prevent flow from reaching creek beds. Although such devices prevent pollutants from reaching receiving waters, so do they prevent water from reaching areas that might depend on it to provide habitat. For a complete discussion of possible adverse effects of these BMPs, see section 5.

Figure R-5. Use of Sandbags near Strawberry Fields, Cannon Rd. near Interstate 5, Carlsbad Watershed.

R.6.4 Potential BMPs for Residential Areas

Residential areas comprise about 15 percent of the land use in the San Diego Region. Population densities tend to be highest in the residential areas as compared to other land use categories. Thus, residential areas have the highest potential for producing human pathogens that can contaminate surface waters.

In order to achieve TMDL compliance, residential land use areas, like the area shown in Figure 6, may only require non-structural BMPs; however, structural BMPs could be retrofitted, if appropriate. Potential non-structural BMPs at this specific site include increased street sweeping, and development and enforcement of municipal ordinances prohibiting the discharge of bacteria and nuisance flows to stormwater and stormwater drainage pathways. Other potential BMPs include adoption and enforcement of ordinances to pick up pet waste, and regular inspections of storm drains for cross connections with the sanitary sewers.

Potential structural BMPs include the installation of storm drain filter sacks, which require routine maintenance. Newer residential areas, including the one shown in Figure 7, could be designed with vegetative strips to control the velocity of runoff, increase infiltration, and prevent pollutants from entering stormwater drainage pathways.

Possible adverse environmental effects include the reduction or elimination of storm flows by the use of structural barriers that prevent flow from reaching creek beds. Although such mechanisms prevent pollutants from reaching receiving waters, so do they prevent water from reaching areas that might depend on it to provide habitat. Additionally, infiltration devices could alter the flow rate and/or quality of groundwater. For a complete discussion of possible adverse effects of these BMPs, see section 5.

Figure R-6. Clean Storm Drain in Residential Area, D Street, Carlsbad Watershed

Figure R-7. Vegetative Strip in Residential Area, San Elijo Hills, Carlsbad Watershed

R.6.5 Potential BMPs for Park and Recreational Areas

Park and recreational areas make up less than 1 percent of the total land area in the San Diego Region. Because these areas do not have housing or industrial units, population densities in these areas are low. However, parks and recreational areas may have significant use as dog walking areas, and be at risk for accumulating pet wastes.

In order to achieve TMDL compliance, park and recreational areas, like the dog park shown in Figure 8, may only require non-structural controls to encourage responsible actions by pet owners, and efficient irrigation practices that do not result in runoff leaving the site. Potential non-structural controls at this specific site include the availability of pet waste plastic bags and garbage cans. Other non-structural BMPs include the enforcement of pet waste ordinances (see Figure 9). No adverse environmental effects are expected from such measures.

Figure R-8. Plastic Bag Dispenser at Mayflower Dog Park, Valley Center Road, San Dieguito Watershed.

Figure R-9. Municipal Code Signage at Mayflower Dog Park, Valley Center Road, San Dieguito Watershed.

Some park and recreation areas provide land that can be used to treat pollutants originating from the upstream watershed. For example, structural BMPs, such as the constructed wetlands shown in Figure 10, can be incorporated into a park setting. Such devices provide wildlife habitat, are visually pleasing, and are successful at reducing or removing a number of pollutants from the creeks. Figure 11 shows Cottonwood Creek Park in Encinitas, California, in the foreground, and the constructed wetlands in the background. Bioassessments performed in this manufactured wetlands before and after construction demonstrated that this project did not result in any adverse environmental effects.[28]

Figure R-10. Manufactured Wetlands at Cottonwood Creek Park, Encinitas Blvd., Carlsbad Watershed.

[28] Kathy Weldon, City of Encinitas, personal communication, February 6, 2007.

Figure R-11. Cottonwood Creek Park, Encinitas Blvd., Carlsbad Watershed.

R.6.6 Potential BMPs for Commercial/Institutional Areas

Commercial and institutional areas account for approximately 2.75 percent of the land use in the San Diego Region (commercial and institutional areas were analyzed as one land use in the watershed models). Population densities vary on an hourly basis but are relatively high in these areas, compared to other land uses.

A potential strategy to achieve TMDL compliance includes non-structural controls, which may be sufficient to limit bacteria discharges. Commercial businesses and keepers of school grounds should use cleaning practices that contain pollutants instead of allowing them to enter conveyance systems. For example, debris and other waste should be swept up and disposed of properly, and trash receptacles should be available and properly maintained. Potential structural BMPs include the installation of vegetative strips and grassy areas as part of landscaping to control the velocity of runoff, increase infiltration, and prevent pollutants from entering stormwater drainage pathways. Possible adverse environmental effects include alteration of the flow rate and/or quality of groundwater from the use of infiltration devices. For a complete discussion of possible adverse effects of these BMPs, see section 5.

Another potential structural BMP that could be utilized in areas where storm drains discharge directly into receiving waters with high recreational use is a dry weather diversion, which are widely used near popular swimming beaches. Dry weather diversions are effective at reducing or removing urban runoff, or nuisance flows, from reaching receiving waters by directing them into sewer systems. These BMPs are suitable in land use categories where the specific site has similar hydrologic settings (dry weather nuisance flows discharging directly into receiving waters).

R.6.7 Potential BMPs for Industrial and Transportation Areas

Industrial and transportation areas account for about 1.6 percent of the total land area in the San Diego Region. As with the previous discussion, population densities are variable, depending on time of day and also day of week.

Several industrial parks and roadways have adjacent landscaped areas where both management areas and structural BMPs could be designed to help reduce bacteria discharges to surface waters. Management measures include using manure fertilizers sparingly, and efficient irrigation practices that minimize the amount of runoff leaving the site. Landscaping can be designed to capture and control the velocity of runoff, increase infiltration, and prevent pollutants from entering stormwater drainage pathways. Additionally, pervious surfaces near transportation areas often have steep slopes. To prevent erosion and the transport of sediment and bacteria to stormwater drainage pathways, various structural BMPs can be used. Some examples are fiber rolls, netting, and compost blankets.

Possible adverse environmental effects include the reduction or elimination of nuisance dry weather flows from the use of structural barriers that prevent flow from reaching creek beds. Although such devices prevent pollutants from reaching receiving waters, so do they prevent water from reaching areas that might depend on it to provide habitat. Additionally, infiltration devices could alter the flow rate and/or quality of groundwater. For a complete discussion of possible adverse effects of these BMPs, see section 5.

R.6.8 Potential BMPs for Military Areas

Military areas account for about 1 percent of the land area in the San Diego Region and have relatively high population densities, as compared to most land uses. Although military areas are treated as an independent land use for TMDL analysis, military areas are actually comprised of the various aforementioned land uses. Military areas have residential, commercial, and transportation areas, for example. Therefore the applicable structural and non-structural BMPs mentioned for possible use in these land uses would also be suitable in military areas.

R.7 Economic Factors

This section presents the San Diego Water Board's economic analysis of the most reasonably foreseeable methods of compliance with the Basin Plan amendment to incorporate TMDLs for bacteria indicators at beaches and creeks in the San Diego region.

R.7.1 Legal Requirement for Economic Analysis

The San Diego Water Board must comply with CEQA when amending the Basin Plan.[29] The CEQA process requires the San Diego Water Board to analyze and disclose the potential adverse environmental impacts of a Basin Plan amendment that is being considered for approval. TMDL Basin Plan amendments typically include "performance standards."[30] TMDLs normally contain a quantifiable numeric target that interprets the applicable WQO. TMDLs also include WLAs for point sources and LAs for both nonpoint sources and natural background. The quantifiable target together with the allocations may be considered a performance standard.

CEQA has specific provisions governing the San Diego Water Board's adoption of regulations such as the regulatory provisions of Basin Plans that establish "performance standards" or treatment requirements.[31] These provisions require that the San Diego Water Board perform an environmental analysis of the reasonably foreseeable methods of compliance with the WLAs and LAs prior to the adoption of the TMDL Basin Plan amendment. The San Diego Water Board must consider the economic costs of the methods of compliance in this analysis.[32] The proposed Basin Plan amendment does not include new WQOs but implements existing objectives to protect beneficial uses. The San Diego Water Board is therefore not required to consider the factors in Water Code section 13241 (a) through (f).

The most reasonably foreseeable methods of compliance with this Basin Plan amendment is for dischargers to implement structural and non-structural controls to reduce bacteria loads in their discharges to surface waters. Additionally, dischargers will need to conduct surface water monitoring to evaluate the effectiveness of the controls they implement.

Porter Cologne Water Quality Control Act, Article 3, section 13141, California Water Plan, states that "prior to implementation of any agricultural water quality control program, an estimate of the total cost of such a program, together with an identification of potential sources of financing, shall be indicated in any regional water quality control plan." Section 5.2.3 in this document addresses this requirement.

R.7.2 TMDL Project Implementation Costs

The specific controls to be implemented for bacteria reduction will be chosen by the dischargers after adoption of this TMDL Basin Plan amendment. All costs are preliminary estimates only

[29] Public Resources Code section 21080
[30] The term "performance standard" is defined in the rulemaking provisions of the Administrative Procedure Act (Government Code sections 11340-l 1359). A "performance standard" is a regulation that describes an objective with the criteria stated for achieving the objective. [Government Code section11342(d)].
[31] Public Resources Code sections 21159 and 21159.4
[32] See Public Resources Code section 21159(c)

since particular elements of a control, such as type, size, and location, would need to be developed to provide a basis for more accurate cost estimations. Identifying the specific controls that dischargers will choose to implement is speculative at this time and the controls presented in this section serve only to demonstrate potential costs. Therefore, this section discloses typical costs of conventional controls for urban runoff, as well as monitoring program costs. The Implementation Plan for these TMDLs does not require additional controls for stormwater runoff from agriculture, livestock, and horse ranch facilities other than what is already required in existing WDRs for these facilities, and in the Basin Plan WDR Waiver Policy. Therefore, there will be no additional costs to agricultural and livestock facility owners and operators to comply with these TMDLs.

R.7.3 Cost Estimates of Typical Controls for Urban Runoff Discharges

Approximate costs associated with typical non-structural and structural BMPs that might be implemented in order to comply with the requirements of this TMDL project are provided below. The BMPs are divided into non-structural and structural classes. Cost estimates for structural BMPs cited from "*Stormwater Best Management Practice Handbook – New Development and Redevelopment. January 2003*" are for new construction costs only (CASQA, 2003). These estimates generally do not take into account retrofit of existing structures or the potential purchase on land needed for the BMP. Cost estimates provided by Caltran's *BMP Pilot Retrofit Pilot Program* were from BMPs retrofitted on existing State owned land (Caltrans, 2004). Annual maintenance costs estimates are based on a percentage of the construction cost estimate (USEPA, 1999).

Non-Structural Controls

Education and Outreach: Education and outreach to residents, businesses and industries can be a very effective tool. These efforts can include methods to reduce sources of pathogens like pet waste in residential areas and livestock in agricultural areas and methods aimed at reducing excessive irrigation that will flow into the storm drain system. The cost of educational programs will vary with the scope of efforts and are estimated range up to $210,900. Educations materials can cost from 10¢ per flyer to $1,750 for household surveys (USEPA, 1999). Because education and outreach efforts are typically a component of water quality programs, the cost to develop educational programs and materials to comply with the TMDL project requirements are expected to be less than estimated because the programs and materials addressing storm water and urban runoff related issues may already exist.

Road and Street Maintenance: Another effective BMP to prevent pollutants, trash, and organic material from entering the storm drain is proper maintenance and cleaning of the sidewalks, streets, and gutters. The largest expenditures for street sweeping programs are in staffing and equipment. The capital cost for a street sweeper is between $60,000 and $180,000 and the average useful life of a sweeper is about four to eight years (USEPA, 1999). Operation and maintenance costs are estimated to range from $15 to $30 per curb mile. This particular BMP may prove to be more cost-effective than certain structural controls, especially in more urbanized areas with greater areas of pavement.

Illicit Connection Identification: Illicit connections of sanitary sewer line and infiltration from leaking sewer lines to the storm water drain system can be a source of pathogens in urban runoff.

Identification of illegal connections can be done through visual inspection or through the use of dye and smoke tests. Visual inspection of the storm drain system can cost from $1,250 to $1,750 per square mile (USEPA, 1999).

Land Use Modifications: Land Use Modifications can be used to minimize the degradation of water resources caused by storm water run-off by directing urban growth and development away from environmentally sensitive areas and waterways. Sensitive areas can be protected through open space preservation and rezoning of development rights. Costs for new development will be lower if the site is adjacent to existing urban areas because the infrastructure and public services should already exist. Savings can also be realized if the development site is modified to reduce the impacts from urban run-off caused by impervious surfaces by reducing street widths, clustering housing developments, smaller parking lots, and incorporating vegetative BMPs into the site design. Savings come through the reduction of costs associated with clearing and grading, road paving, and storm water drainage systems. See Table R-1 for an example of capital cost savings (CASQA, 2003).

Table R-1. Summary of Potential Savings by Land Use Modifications

Development Pattern	Capital Costs (2005 Dollars)[4]
Compact Growth[1]	$31,000
Low-Density Growth (3 units/acre)[2]	$60,100
Low-Density Growth, 10 miles from Existing Development[3]	$82,500

[1]Costs include streets (full curb and gutter), central sewage and water supply, storm drainage and school construction.
[2]Assumes housing mix of 30 percent single-family units and townhouses; 70 percent apartments.
[3]Assumes housing is located 10 miles from major concentration of employment, drinking water plant and sewage treatment plant.
[4] Adjusted for inflation from 1987 dollars (Sahr, 2006).

Structural Controls

Vegetated Buffer or Filter Strips: Vegetated buffer strips are vegetated surfaces that are designed to treat sheet flow from adjacent surfaces, such as parking lots, highways, and rooftops (CASQA, 2003). The costs associated with vegetated buffer strips vary and are dependent of the costs associated with establishing the vegetation. Cost estimates range from $13,000 to $30,000 per acre. Additional costs could include the purchase of land for the buffer strip (CASQA, 2003). Maintenance of the buffer strip consists mainly of irrigation, mowing, weeding, and litter removal. Costs are estimated to be $350/acre/year (CASQA, 2003). Caltrans reported actual construction costs of a buffer strip for Carlsbad Maintenance Station to be $81,000 with average annual maintenance cost of $1,900 (Caltrans, 2004).

Bioretention: Bioretention systems are designed to mimic the functions of a natural ecosystem for treating storm water runoff (USEPA, 1999). Pollutants are removed by a number of processes including adsorption, filtration, volatilization, ion exchange, and decomposition (USEPA, 1999). Bioretention construction costs in residential areas are estimated to be $3 to $4 per square foot depending on the soil conditions and plant selection. Commercial and industrial costs range from $10 to $40 per square foot depending on the design and need for storm drains

(CASQA, 2003). Maintenance activities conducted on bioretention facilities were not found to be very different from maintenance of a landscaped area (CASQA, 2003).

Sand Filters: Media filters are commonly used to treat runoff from small sites such as parking lots and small developments, in areas with high pollution potential such as industrial areas, or in highly urbanized areas where land availability or costs preclude the use of other BMP types (USEPA, 1999). An Austin Sedimentation-Filtration System (a type of surface sand filter) is estimated to cost $18,500 (CASQA, 2003). A sand filter constructed at the La Costa Park and Ride for a 2.7-acre watershed area cost $226,000 with an average annual maintenance cost of $870 (Caltrans, 2004).

Infiltration Trench: Infiltration systems are designed to capture a volume of storm water runoff, retain it, and infiltrate that volume into the ground (USEPA, 1999). Infiltration trench is estimated to cost $45,000 for a 5-acre commercial site (USEPA. 1999). An infiltration trench constructed at the Carlsbad Maintenance Station for a 0.7-hectare watershed area cost $180,000 with an average annual maintenance cost of $723 (Caltrans, 2004).

Diversion/Treatment Systems: If no other on-site treatment options are available, diverting the polluted runoff to the sanitary sewer system or other treatment plant may be considered. An individual diversion structure is likely to cost over one million dollars, which does not include maintenance costs.

For example, the City of Dana Point recently put into operation a diversion and ozone treatment system targeting Salt Creek and Monarch Beach. The system has a capacity of 1,000 gallons per minute. According to the Orange County Register (October 18, 2005), the system cost $6.7 million. These costs include $1 million in architectural features, and $1 million for design and administration of the project. Operation and maintenance is contracted out at a cost of $90,000 per year. In another example, the City of Encinitas has constructed a diversion and ultraviolet radiation treatment system to kill bacteria in runoff to Moonlight Beach. The system has a capacity of 150 gallons per minute, and cost $1 million for testing, design and construction. Operation and maintenance costs are $10,000 per year (Jeremy J. Clemmons, PBS&J, personal communication, October 26, 2005).

R.7.4 Cost Estimate Summary for Urban Runoff Controls

Table R-2 summarizes the estimated costs of non-structural urban runoff controls. Tables R-3 summarizes for each watershed the estimated costs of the specific structural urban runoff BMPs that were evaluated for each watershed. The cost estimates for the structural controls are based on sizing the control to treat 10 percent of the urbanized area of each watershed. For example, using the 10 percent cost estimates provided in Table R-3, a cost estimate for 100 percent land treatment could easily be calculated by multiplying the 10 percent cost estimate by 10, or by 5 for 50 percent, or 8 for 80 percent, etc. Additionally, the estimated cost of one diversion structure is provided and can be scaled upward depending on the individual needs in any given watershed.

Table R-2. Summary of Cost Estimates for Non-Structural Controls

BMP	Estimated Cost[1]
Education and Outreach	$0 to $210,900 per program
Road and Street Maintenance	$60,000 to $180,000
Illicit Connection Identification	$1,250 to $1,750 per square mile
Land Use Modifications	Potential cost reduction to developers and local government

[1] USEPA, 1999.

Table R-3. Cost Estimates for Structural Controls for 10 Percent of Urbanized Areas

Laguna/San Joaquin Watershed

BMP	Estimated Total Cost to Treat 10 % of an Urbanized Area (in acres) [1, 2, 3]	Estimated Yearly Maintenance Cost[2]
Vegetated Buffer Strip	$1,605,752 - $3,705,583	$39,526
Bioretention	$3,866,672 - $51,555,919	$270,667 - $3,608,914
Sand Filters	$5,434,855 - $21,492,379	$706,531 - $2,794,009
Infiltration Trench	$217,394 - $513,841	$43,479 - $102,768
Diversion	> $1 million per diversion structure	> $10,000 per structure

Aliso Creek Watershed

BMP	Estimated Total Cost to Treat 10 % of an Urbanized Area (in acres) [1, 2, 3]	Estimated Yearly Maintenance Cost[2]
Vegetated Buffer Strip	$7,941,403 - $18,326,314	$195,481
Bioretention	$19,122,996 - $254,974,741	$1,338,610 - $17,848,232
Sand Filters	$26,878,594 - $106,292,622	$3,494,217 - $13,818,041
Infiltration Trench	$1,075,144 - $2,541,249	$215,029 - $508,250
Diversion	> $1 million per diversion structure	> $10,000 per structure

[1] CASQA, 2003.
[2] USEPA, 1999.
[3] Urbanized Area includes the following Land Uses: Residential (low and high), Commercial, Industrial, Military, Parks/Recreation, and Transitional.

Table R-3. Cost Estimates for Structural Controls for 10 Percent of Urbanized Areas, Continued

Dana Point (Salt Creek Watershed)

BMP	Estimated Total Cost to Treat 10 % of an Urbanized Area (in acres) [1, 2, 3]	Estimated Yearly Maintenance Cost[2]
Vegetated Buffer Strip	$2,446,069 - $5,644,774	$60,211
Bioretention	$5,890,163 - $78,535,960	$412,311 - $5,497,517
Sand Filters	$8,279,001 - $32,739,687	$1,076,270 - $4,256,159
Infiltration Trench	$331,160 - $782,742	$66,232 - $156,548
Diversion	> $1 million per diversion structure	> $10,000 per structure

San Juan Creek Watershed

BMP	Estimated Total Cost to Treat 10 % of an Urbanized Area (in acres) [1, 2, 3]	Estimated Yearly Maintenance Cost[2]
Vegetated Buffer Strip	$12,326,022 - $28,444,667	$303,410
Bioretention	$29,681,213 - $395,751,785	$2,077,685 - $27,702,625
Sand Filters	$41,718,844 - $164,979,067	$5,423,450 - $21,447,279
Infiltration Trench	$1,668,754 - $3,944,327	$333,751 - $788,865
Diversion	> $1 million per diversion structure	> $10,000 per structure

San Clemente Hydrologic Area

BMP	Estimated Total Cost to Treat 10 % of an Urbanized Area (in acres) [1, 2, 3]	Estimated Yearly Maintenance Cost[2]
Vegetated Buffer Strip	$3,407,024 - $7,862,363	$83,865
Bioretention	$8,204,156 - $109,389,373	$574,291 - $7,657,256
Sand Filters	$11,531,466 - $45,601,091	$1,499,091 - $5,928,222
Infiltration Trench	$461,259 - $1,090,248	$92,252 - $218,050
Diversion	> $1 million per diversion structure	> $10,000 per structure

San Luis Rey River Watershed

BMP	Estimated Total Cost to Treat 10 % of an Urbanized Area (in acres) [1, 2, 3]	Estimated Yearly Maintenance Cost[2]
Vegetated Buffer Strip	$30,297,138 - $69,916,472	$745,776
Bioretention	$72,955,881 - $972,750,675	$5,106,912 - $68,092,547
Sand Filters	$102,544,159 - $405,515,539	$13,330,741 - $52,717,020
Infiltration Trench	$4,101,766 - $9,695,084	$820,353 - $1,939,017
Diversion	> $1 million per diversion structure	> $10,000 per structure

[1] CASQA, 2003.
[2] USEPA, 1999.
[3] Urbanized Area includes the following Land Uses: Residential (low and high), Commercial, Industrial, Military, Parks/Recreation, and Transitional.

Table R-3. Cost Estimates for Structural Controls for 10 Percent of Urbanized Areas, Continued

San Marcos Hydrologic Area

BMP	Estimated Total Cost to Treat 10 % of an Urbanized Area (in acres) [1, 2, 3]	Estimated Yearly Maintenance Cost[2]
Vegetated Buffer Strip	$370,238 - $854,396	$9,114
Bioretention	$891,538 - $11,887,246	$62,408 - $832,107
Sand Filters	$1,253,114 - $4,955,497	$162,905 - $644,215
Infiltration Trench	$50,125 - $118,476	$10,025 - $23,695
Diversion	> $1 million per diversion structure	> $10,000 per structure

San Dieguito River Watershed

BMP	Estimated Total Cost to Treat 10 % of an Urbanized Area (in acres) [1, 2, 3]	Estimated Yearly Maintenance Cost[2]
Vegetated Buffer Strip	$23,678,609 - $54,642,944	$582,858
Bioretention	$57,018,382 - $760,249,464	$3,991,287 - $53,217,462
Sand Filters	$80,142,984 - $316,929,074	$10,418,588 - $41,200,780
Infiltration Trench	$3,205,719 - $7,577,155	$641,144 - $1,515,431
Diversion	> $1 million per diversion structure	> $10,000 per structure

Miramar (Miramar Reservoir Hydrologic Area)

BMP	Estimated Total Cost to Treat 10 % of an Urbanized Area (in acres) [1, 2, 3]	Estimated Yearly Maintenance Cost[2]
Vegetated Buffer Strip	$18,565,993 - $42,844,599	$457,009
Bioretention	$44,707,140 - $596,098,622	$3,129,500 - $41,726,904
Sand Filters	$62,838,745 - $248,498,675	$8,169,037 - $32,304,828
Infiltration Trench	$2,513,550 - $5,941,118	$502,710 - $1,188,224
Diversion	> $1 million per diversion structure	> $10,000 per structure

Scripps Hydrologic Area

BMP	Estimated Total Cost to Treat 10 % of an Urbanized Area (in acres) [1, 2, 3]	Estimated Yearly Maintenance Cost[2]
Vegetated Buffer Strip	$3,161,585 - $7,295,966	$77,824
Bioretention	$7,613,136 - $101,509,064	$532,920 - $7,105,634
Sand Filters	$10,700,750 - $42,316,602	$1,391,097 - $5,501,158
Infiltration Trench	$428,030 - $1,011,707	$85,606 - $202,341
Diversion	> $1 million per diversion structure	> $10,000 per structure

[1] CASQA, 2003.
[2] USEPA, 1999.
[3] Urbanized Area includes the following Land Uses: Residential (low and high), Commercial, Industrial, Military, Parks/Recreation, and Transitional.

Table R-3. Cost Estimates for Structural Controls for 10 Percent of Urbanized Areas, Continued

San Diego River Watershed

BMP	Estimated Total Cost to Treat 10 % of an Urbanized Area (in acres) [1, 2, 3]	Estimated Yearly Maintenance Cost[2]
Vegetated Buffer Strip	$45,339,627 - $104,629,910	$1,116,052
Bioretention	$109,178,381 - $1,455,720,117	$7,642,487 - $101,900,408
Sand Filters	$153,457,201 - $606,853,475	$19,949,436 - $78,890,952
Infiltration Trench	$6,138,288 - $14,508,681	$1,227,658 - $2,901,736
Diversion	> $1 million per diversion structure	> $10,000 per structure

Tecolote Creek Watershed

BMP	Estimated Total Cost to Treat 10 % of an Urbanized Area (in acres) [1, 2, 3,4]	Estimated Yearly Maintenance Cost[2,4]
Vegetated Buffer Strip	$3.810,684 - $8,684,633	$83,763 - $83,763
Bioretention	$9,603,201 - $128,043,490	$628,247 - $8,376,677
Sand Filters	$14,254,587 - $56,371,165	$1,639,908 - $6,485,178
Infiltration Trench	$605,479 - $1,431,213	$100,913 - $238,536
Diversion	> $1 million per diversion structure	> $10,000 per structure

Chollas Creek Watershed

BMP	Estimated Total Cost to Treat 10 % of an Urbanized Area (in acres) [1, 2, 3]	Estimated Yearly Maintenance Cost[2]
Vegetated Buffer Strip	$9,780,114 - $22,569,494	$240,741
Bioretention	$23,550,635 - $314,010,276	$1,648,544 - $21,980,719
Sand Filters	$33,101,925 - $130,903,066	$4,303,250 - $17,017,399
Infiltration Trench	$1,324,077 - $3,129,637	$264,815 - $625,927
Diversion	> $1 million per diversion structure	> $10,000 per structure

[1] CASQA, 2003.
[2] USEPA, 1999.
[3] Urbanized Area includes the following Land Uses: Residential (low and high), Commercial, Industrial, Military, Parks/Recreation, and Transitional.
[4] Numbers adjusted to 2006 prices to account for inflation using, Sahr, R.C. 2006. Consumer Price Index Conversion Factors 1800 to Estimated 2016 to Convert to Dollars of 2005.

R.7.5 Costs for Agricultural Sources of Nonpoint Pollution

The most reasonably foreseeable method of compliance with this Basin Plan amendment establishing TMDL projects for agricultural areas and livestock facilities involves reducing bacteria loading to surface waters by implementing MMs (management measures) and MPs (management practices). Current WDRs for agricultural facilities already require the design and implementation of systems that collect solids, reduce contaminant concentrations, and reduce runoff to minimize the discharge of contaminants in both facility wastewater and in runoff that is caused by storms up to and including a 25-year, 24-hour frequency storm. Additionally, the

Waiver Policy[33] may conditionally waive the issuance of WDRs for specific types of discharges if the terms of the waiver conditions are met. Conditional waivers may apply to animal feeding operations, plant crop residues, agricultural and nursery irrigation return water, manure composting and soil amendment operations, and storm water runoff where not regulated by NPDES requirements. Therefore, compliance with this TMDL project will not result in additional costs beyond what is already required by enforcement of WDRs and waivers.

Animal waste can be managed in several different ways including: prevention of livestock entering a waterway (fencing and water troughs), re-routing runoff water away from areas with animal waste (dike, diversion, roof runoff structure), removing waste (waste storage facility, manure transfer), or treating waste (waste treatment pond, composting facility, anaerobic digester).

Costs for purchase and maintenance of MPs varies not only by the type of MP needed, but also for the cost of a specific MP depending upon the type and number of livestock, the number of acres for runoff to filter, and the physiography of the acreage. The costs reported in Table R-4 are based on actual MPs that have been funded through the Farm Bill Environmental Quality Incentives Program (EQIP) in San Diego County from 2004 to 2006.

Considering that WDRs and the Waiver Policy already require animal feeding operations to conform with regulations that prevent pollutants from being discharged to waters of the U.S., additional costs to install MPs should not be needed for existing facilities, and therefore are estimated to be $0. However, new facilities, or facilities out of compliance, will be required to install the appropriate MPs to meet the conditions in the WDRs and Waiver Policy, and will have a start up cost ranging from $40,000 to $100,000 for poultry, and $3,000 to $50,000 for equestrian facilities (which generally have many fewer animals than poultry farms and dairies in the San Diego Region). Average start up costs for dairy MPs can range from $50,000 to $200,000, depending upon the number of cows. The sheer volume of manure generated at the larger dairy operations requires more ambitious and effective MPs ranging in cost from $100,000 to $500,000. These MPs include composting, solid/liquid waste separation facilities, or anaerobic digestion. To reduce individual operator expenses, these more expensive MP facilities can be shared among dairy operators.

[33] California Regional Water Quality Control Board, San Diego Region, Waiver of Waste Discharge Requirements (Waiver Policy), November 1, 2002. Resolution No. R09-2002-0186.

Table R-4. Environmental Quality Incentives Program - San Diego MP Cost List with Designation of Appropriate Use for Poultry, Dairy, and Horses

Management Practice	Unit	Avg. Cost	Poultry	Dairy	Horse
Anaerobic Digester	EA	$500,000		X	
Animal Mortality Facility		NA	X		
Composting Facility	EA	$100,000	X	X	X
Dike	FT	$10	X		X
Diversion	FT	$20	X	X	X
Fence	FT	$4		X	X
Grassed Waterway	AC	$500	X	X	X
Lined Waterway or Outlet	FT	$100	X	X	X
Manure Transfer*	EA	$30,000		X	
Nutrient Management	AC	$32	X	X	X
Open Channel*	FT	$10	X	X	X
Pipeline	FT	$10	X	X	
Pond Sealing or Lining	EA	$10,000	X	X	
Roof Runoff Structure	EA	$10,000	X	X	X
Solid / Liquid Waste Separation Facility		NA		X	
Underground Outlet	FT	$20	X	X	X
Waste Facility Cover		NA	X	X	
Waste Storage Facility	EA	$100,000	X	X	X
Waste Treatment Strip*	AC	$400	X	X	X
Waste Treatment Pond*	EA	$50,000	X	X	X
Waste Utilization*	AC	$100	X	X	X
Watering Facility	EA	$10,000		X	X

EA = Each; FT = Lineal Feet; AC = Acre, NA = Costs Not Available, X = Appropriate Use
Values are taken from the NRCS EQIP San Diego Cost Share List for 2006, unless the BMP name has an * after it, then values are taken from the 2004-2005 State Approved Cost Share List or the 2004-2005 San Diego Cost Share List.

When manure is transferred from an animal feeding operation to be used as fertilizer for crops, then runoff from these fields that contribute to bacterial loading must be considered for MPs. MPs for fields with manure application may include upgrades or installation of new irrigation equipment, and filter or buffer strips. Prices listed in Table R-5 for irrigation systems are for a complete system, and will be less for upgrading a system already in place. Costs for MPs per site range from $5,000 to $50,000, assuming an irrigation system will not need to be completely replaced.

Table R-5. Environmental Quality Incentives Program, San Diego MP Cost List for Addressing Runoff from Fields with Manure Application.

Management Practice	Unit	Avg. Cost
Irrigation System, Micro-irrigation	AC	$6,000
Irrigation Sprinkler System	AC	$4,500
Irrigation Water Management	AC	$50
Irrigation Tailwater Management	EA	$25,000
Filter Strip	AC	$400
Buffer Strip	AC	$800

R.7.6 Potential Sources of Funding

The most prevalent source of funding for agricultural MPs is the funding associated with the Farm Bill EQIP. These funds can be obtained through the USDA Natural Resources Conservation Service (NRCS) Office. For the San Diego Region, the local NRCS Field Office is located at 332 S. Juniper St., Suite 110, Escondido, CA 92025. Upon review and approval of a project, the NRCS will authorize payment for up to 50 percent of the estimated costs for purchasing and installing agricultural MPs.

Other sources of funding are administered by the SWRCB, which receives funding, through the USEPA, for Federal CWA section 319(h) and section 205(j) programs, and from the State of California Proposition 13 program.

R.7.7 Cost Estimates for Surface Water Monitoring

The Health and Safety Code already requires a monitoring and reporting program for indicator bacteria at ocean beaches throughout California during dry weather.[34] Thus, the dischargers will incur no additional costs for monitoring water quality at beaches from April 1 through October 31 (the required monitoring period). Water quality and flow monitoring for inland surface water and storm drains will be required to measure the effectiveness of controls implemented by the dischargers to reduce bacteria loads. This additional monitoring will add to the costs of implementing these TMDLs.

The TMDLs do not specify the locations and frequencies of sampling of inland surface waters, storm drains, and beaches outside the Health and Safety Code requirements, to measure the effectiveness of bacteria load reduction controls. Each watershed is different in terms of size, flow, land uses, existing bacteria load, and reductions needed. Thus, a different monitoring plan individually tailored for each watershed must be formulated and implemented by the dischargers.

This analysis discloses the costs of collecting, transporting, and analyzing a water sample for the four indicator bacteria for which there are inland surface water WQOs. The costs disclosed are that of a two-person team, day-long sampling effort. The laboratory analytical costs were taken

[34] Health and Safety Code section 15880 (Assembly Bill 411, Statutes of 1997, Chapter 765).

from the San Diego Water Board's Laboratory Services Contract cost tables. Where different analytical methods were available, the more expensive method was used in the estimate. Staff costs were estimated based on a two person sampling team in the field for an 8-hour day. The staff costs were estimated based on a billing rate of $90 per hour, the rate used for billing San Diego Water Board staff costs in the Cost Recovery Programs. This rate includes overhead costs. The vehicle costs were estimated assuming a distance traveled of 100 miles per day, and a vehicle cost of $0.34 per mile, the per diem reimbursement rate for San Diego Water Board staff when they use their own cars for State business. This analysis assumes that the dischargers possess basic field monitoring equipment, including meters to measure temperature, conductivity, and pH, and equipment to measure flow in the field. No additional costs were computed for these items. Surface water monitoring costs are summarized in the Table R-6 below. Assuming that a two-person sampling team can collect samples at 5 sites per day, the total cost for one day of sampling would be $2274.

Table R-6. Cost Estimates for Surface Water Monitoring

Expenditure	Cost per Unit
Laboratory Analyses	
Total Coliform	$40 per sample
Fecal Coliform	$40 per sample
Enterococci	$40 per sample
E. Coli	$40 per sample
Staff Costs	$180 per hr
Vehicle Costs	$34 per 100 mi

R.8 Reasonable Alternatives to the Proposed Activity

The environmental analysis must include an analysis of reasonable alternatives to the proposed activity.[35] The proposed activity is a Basin Plan Amendment to incorporate bacteria TMDLs for the beaches and creeks in the San Diego Region. The purpose of this analysis is to determine if there is an alternative that would feasibly attain the basic objective of the rule or regulation (the proposed activity), but would lessen, avoid, or eliminate any identified impacts. The alternatives analyzed include taking no action and modifying water quality standards. The alternatives are discussed in the subsections below.

R.8.1 No Action Alternative

Under the "no action" alternative, the San Diego Water Board would not adopt the proposed TMDL Basin Plan amendment, and bacteria loading would likely continue at current levels. The "no action" alternative 1) does not comply with the CWA; 2) is inconsistent with the mission of the San Diego Water Board; and 3) does not meet the purpose of the proposed TMDL Basin Plan Amendment. Under CWA section 303(d), the San Diego Water Board is obligated to adopt a TMDL project for waters that do not meet water quality standards.[36] Therefore the "no action" alternative is not viable and cannot be considered an acceptable alternative.

R.8.2 Water Quality Standards Action

Another alternative to adopting the TMDL Basin Plan amendment is the modification of water quality standards. If the applicable standards are not appropriate, a plausible regulatory response may be to correct the standards through mechanisms such as a use attainability analysis (UAA) or a site-specific objective (SSO). If the REC-1 and SHELL beneficial uses are improperly designated for any of the beaches and creeks included in this project, or if SSOs for total coliform, fecal coliform, and enterococci would be less stringent than what is reported in the Ocean Plans and Basin Plan, the TMDLs might not be necessary, or the required pollutant load reductions might be lower. This alternative might lessen or eliminate the adverse impacts associated with constructing structural BMPs by eliminating the need for structural BMPs or reducing the number of structural BMPs necessary. This alternative should not be construed as implying that standards may be changed as a convenient means of "restoring" waterbodies. To the contrary, federal and state law contain numerous detailed requirements that in many cases would prevent modifications of the standards, especially if modifications would result in less stringent waste discharge requirements. However, modification of standards may be appropriate to make uses more specific, to manage conflicting uses, to address site-specific conditions, and for other such reasons.[37]

As a first step in developing TMDLs, the San Diego Water Board confirmed the impairment status of the beaches and creeks and determined, from the available evidence, that bacteria densities exceeded water quality objectives that support REC-1 and SHELL beneficial uses. At

[35] 23 CCR section 3777
[36] Water quality standards are comprised of designated beneficial uses, the applicable numeric and/or narrative WQOs to protect those uses, and the SWRCB's anti-degradation policy provisions (Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality of Waters in California*).
[37] SWRCB. 2005. *A Process for Addressing Impaired Waters in California*, June 2005

this time, the San Diego Water Board has no evidence that REC-1 and SHELL beneficial uses were inappropriately designated for the beaches and creeks. Therefore based on the available information, an action to de-designate these beneficial uses may be harmful to the environment, and this option is not preferred.

Developing SSOs for total coliform, fecal coliform, and enterococci may be appropriate at specific sites if epidemiology or other scientific studies demonstrate that less stringent water quality objectives would still be protective of human health, or if better indicator(s) are identified. SSOs should be (1) based on sound scientific rationale; (2) protective of the designated beneficial uses of the beaches and creeks; and (3) adopted by the San Diego Water Board in a Basin Plan amendment.

There are no efforts currently underway or planned by interested persons to fund the scientific studies needed to develop SSOs for bacteria in the beaches and creeks. Furthermore, the development of SSOs for bacteria in the beaches and creeks, including the scientific and epidemiological studies necessary to support them, would be costly, time consuming, and resource intensive.

Even in the event that scientific studies were initiated and SSOs developed and adopted, the need for a TMDL likely would not be eliminated. If SSOs for bacteria were developed in the future and adopted, this TMDL Basin Plan Amendment would be modified accordingly. If interested parties were willing to fund and oversee development of scientific studies to investigate SSOs, the most effective and expeditious means to improve water quality would be to conduct these studies concurrent with actions necessary to achieve compliance with the current TMDL.

R.8.3 Preferred Alternative

Because the previous three alternatives discussed are not expected to attain the basic objective of the proposed activity at this point in time, the preferred alternative is the proposed activity itself, which is the Basin Plan amendment incorporating the bacteria TMDLs.

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R.9 CEQA Determination

The implementation of these TMDLs will result in improved water quality in the San Diego region, but it may result in temporary or permanent localized significant adverse impacts to the environment. Specific projects employed to implement the TMDLs may have significant impacts, but these impacts are expected to be limited, short-term, or may be mitigated through careful design and scheduling. The Technical Report, the draft Basin Plan amendment, and the Environmental Checklist and associated analysis provide the necessary information pursuant to state law[38] to conclude that properly designed and implemented structural or non-structural methods of compliance will not have a significant adverse effect on the environment, and all agencies responsible for implementing the TMDLs should ensure that their projects are properly designed and implemented. Any of the potential impacts need to be mitigated at a subsequent project level because they involve specific sites and designs not specified or specifically required by the Basin Plan amendment to implement the TMDLs. At this stage, any more particularized conclusions would be speculative.

Specific projects that may have a significant impact would be subject to a separate environmental review. The lead agency for subsequent projects would be obligated to mitigate any impacts they identify, for example, by mitigating potential flooding impacts by designing the BMPs with adequate margins of safety.

Furthermore, implementation of the TMDLs is both necessary and beneficial. If at some time, it is determined that the alternatives, mitigation measures, or both, are not deemed feasible by those local agencies, the necessity of implementing the federally required TMDLs and removing the indicator impairment from the San Diego Region (an action required to achieve the express, national policy of the Clean Water Act) remains.

The benefits of meeting water quality standards to achieve the expressed, national policy of the Clean Water Act far outweigh the potential adverse environmental impacts that may be associated with the projects undertaken by persons responsible for reducing discharges of bacteria to beaches and creeks of the San Diego Region. Meeting water quality standards and the national policy of the Clean Water Act is a benefit to the people of the state because of their paramount interest in the conservation, control, and utilization of the water resources of the state for beneficial use and enjoyment (Water Code section 13000). Furthermore, the health, safety and welfare of the people of the state requires that the state be prepared to exercise its full power and jurisdiction to protect the quality of waters in the state from degradation, particularly including degradation that unreasonably impairs the water quality necessary for beneficial uses.

Water quality that supports the beneficial uses of water are necessary for the survival and well being of people, plants, and animals. Water contact (REC-1),and shellfish harvesting (SHELL) are beneficial uses of water that serve to promote the social and environmental goals of the people of the San Diego Region and require water quality suitable for the protection of human health, aquatic life and aquatic dependent wildlife.

[38] Public Resources Code, section 21159

In addition, implementation of the TMDLs will have substantial benefits to water quality and will enhance beneficial uses. Enhancement of the REC-1 and SHELL beneficial uses will have positive, indirect social and economic effects by increasing the natural habitat and aesthetic value of the 12 watersheds. These substantial benefits outweigh any unavoidable temporary adverse environmental effects.

In accordance with state law,[39] the San Diego Water Board finds that, although the proposed project could have significant effect on the environment, revisions in the project to avoid or substantially lessen the impacts, can and should be made or agreed to by the project proponents. This finding is supported by the evidence provided in the impact evaluation section of this document, which indicates that all foreseeable impacts are either short-term or can be readily mitigated.

On the basis of the initial environmental review checklist and analysis, and Technical Report for these TMDLs, which collectively provide the required information;

☐ I find the proposed Basin Plan amendment could not have a significant effect on the environment.

☒ I find that the proposed Basin Plan amendment could have a significant adverse effect on the environment, but that those impacts should be mitigated. This substitute environmental documentation constitutes a program-level analysis. The Water Boards cannot specify manner of compliance. Any impacts that might occur as a result of specific implementation projects can and should be mitigated by the entity carrying out or permitting that project. However, there are feasible mitigation measures that would substantially lessen any significant adverse impacts. These mitigation measures are discussed above and in the Technical Report for the TMDLs.

☐ I find the proposed Basin Plan amendment may have a significant effect on the environment. There are no feasible alternatives and/or feasible mitigation measures available which would substantially lessen any significant adverse impacts. See the attached written report for a discussion of this determination.

David W. Gibson
Executive Officer

2-22-2010
Date

[39] Public Resources Code, section 15091

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Appendix S

Responses to Comments

For Bacteria TMDLs Project I
Adopted by the San Diego Water Board on
December 12, 2007

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1 List of Persons Submitting Comments

The following persons submitted comments on one or more of the versions of the Total Maximum Daily Loads (TMDLs) for Indicator Bacteria Project I—Beaches and Creeks in the San Diego Region. The table in section 2, below, links the commenter with the comment number, and version of the TMDL documents on which the comment was made.

- California Department of Transportation
- City of Dana Point
- City of Encinitas
- City of Laguna Beach
- City of Laguna Niguel
- City of Oceanside
- City of Poway
- City of San Diego
- County of Orange
- County of San Diego
- Department of the Navy
- San Diego Coastkeeper
- San Diego Farm Bureau
- Sierra Club
- U.S. Environmental Protection Agency
- Heal The Bay

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3 Introduction

This report provides responses to public comments received on the Total Maximum Daily Loads (TMDLs) for Indicator Bacteria Project I—Beaches and Creeks in the San Diego Region. Draft TMDL documents distributed for public review and comment included the Technical Report, Resolution No. R9-2007-0044, and the Basin Plan amendment. The draft documents were made available to the public for formal review and comment for three comment periods, through the website of the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) and at the San Diego Water Board office. The first public comment period opened December 9, 2005, and continued for 62 days. The second comment period opened August 4, 2006, and continued for 45 days. The third comment period opened March 9, 2007, and continued for 47 days.

The San Diego Water Board received many comments in testimony, letters, and emails from interested persons on the draft TMDL documents. The letters were not reproduced in this document. Individual comments were excerpted from the letters and testimony, and organized by subject. The comments are numbered sequentially in this report. Individual commenters are identified in the "List of Persons Submitting Comments" on page S-4 of this appendix.

Additional information requested by members of the San Diego Water Board is described in section 4 below. Individual comments and responses are discussed in section 5.

4 Additional Information Requested by the San Diego Water Board

4.1 Load Reductions Required for Discharger Categories and Recalculation of Allocations

Comment: At the December 14, 2005 meeting, Board Member Johnson commented that the percent reductions for wet weather discharges reported in the draft Technical Report were for all dischargers collectively in each watershed, thereby making it difficult to ascertain the percent reductions required from each discharger category (municipal MS4s, Caltrans, controllable nonpoint sources such as agriculture and animal facilities, and uncontrollable sources). He also noted that the watershed-wide load reduction percentages were misleading because they were smaller than the load reduction percentages for the individual discharger categories.

Response: We revised the tables in section 9 of the draft Technical Report to show the percent load reductions required for each of the discharger categories, instead of showing the percent reduction needed on a watershed-wide basis, as was reported previously.

4.2 Cost Estimates for Virus Surface Water Monitoring

Comment: At the February 8, 2006 meeting, Board Member Anderson requested information regarding cost estimates for monitoring pathogens.

Response: Pathogens are defined as agents that cause disease, and include microorganisms like bacteria, viruses, or fungi. In response to this comment, we

analyzed the costs associated with monitoring viruses, since this analysis has been done (although not widely used), and information is readily available.

Industry standards for virus detection are not available, and methods that have been used to date are expensive. However, expenses are expected to decrease significantly within the next few years due to new techniques that are being developed. Two types of viruses should be considered for water quality monitoring: the coliphages and human adenoviruses. Adenoviruses can cause large-scale epidemics of respiratory illness, however, they also are the second leading cause of gastroenteritis in children. Adenoviruses are consistently found in raw sewage throughout the world and are considered hardy, with a 2-log increase in population size in 99 days.[1]

Although adenoviruses were detected in the majority of samples collected from urban waterways and polluted coastal areas, one researcher reported that hepatitis A and enteroviruses were found in water samples where adenoviruses were absent. Therefore, the author concluded that adenoviruses alone cannot serve as an index for human viral contamination in Southern California.[2] Hence, two measurements of viral populations/ communities are provided in the present report. A quantitative test using polymerase chain reaction (PCR) techniques for one species of human adenovirus costs approximately $2,000/sample.[3]

Coliphages are viruses that infect Esherichia coli (E. coli) bacteria. Coliphages are found in high concentrations in sewage, with concentrations typically ranging from 100 to 10,000 infectious units per milliliter.[4]

A quantification technique for coliphages, applying traditional microbiological techniques, involves growing coliphages using E. coli concentrated on an agar medium. The water sample, which possibly contains coliphages, is then incubated in the agar plate.[5] The 28-day assay test is very expensive, approximately $1,500/sample. Conversely, a simple presence/absence test for coliphage costs between $50 to $100/sample, but provides limited information.[6]

Despite the possible high concentrations, viruses can be very difficult to isolate and usually require sampling large volumes of water (20 to 40 liters) quoted prices include concentration of viruses from the water samples, which can be time-intensive. Assuming that a two-person sampling team can collect samples at 5 sites per day, at 100 miles

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[1] Jiang, S., R. Noble and W. Chu. 2001.Human Adenoviruses and Coliphages in Urban Runoff-Impacted Coastal Waters of Southern California. *Applied and Environmental Microbiology* 67:1:179-184.

[2] Jiang, S. 2002. Adenovirus as an Index of Human Viral Contamination. Microbiological Source Tracking Workshop, February 5, 2002, Irvine, CA. National Water Research Institute, Fountain Valley, CA.

[3] Ken Schiff, SCCWRP, personal communication, March 15, 2006

[4] Sobsey, M. 2002. Coliphage Tracking to Identify Sources of Fecal Contamination. Microbiological Source Tracking Workshop, February 5, 2002, Irvine, CA. National Water Research Institute, Fountain Valley, CA.

[5] Ibid.

[6] Ken Schiff, SCCWRP, personal communication, March 15, 2006.

round trip, using the PCR technique for adenovirus and the 28-day standard methods test for coliphage, the total cost for one day of sampling would be $18,974.

Table 1. Cost Estimates for Surface Water Monitoring for Viruses

Expenditure	Cost per Unit
Laboratory Analyses	
Adenovirus, one species, PCR	$2,000/sample
Coliphage, 28-day test	$1,500/sample
Coliphage, presence/absence test	$50 - 100/sample
Field Sampling Costs – two people	$1,440 per day
Vehicle Costs	$34 per 100 mi

4.3 Adaptability of TMDLs and Compliance Schedules Based on New Data or Information

Comment: At the February 8, 2006 meeting, several Board Members requested clarification regarding the adaptability of TMDLs and associated compliance schedules if new data or information becomes available.

Response: As with all TMDLs, the development of the bacteria TMDLs was characterized by data gaps and uncertainties. Scientific uncertainty is a reality within all water quality programs, including the TMDL program, and this uncertainty cannot be entirely eliminated. The TMDL program must move forward in the face of these uncertainties if progress in attaining water quality objectives (WQOs) in impaired waters is to be made.

The National Research Council addressed this issue in their report for the U.S. Congress entitled Assessing the TMDL Approach to Water Quality Management (2000) and concluded that

> "… the ultimate way to improve the scientific foundation of TMDLs is to incorporate the scientific method, and not simply the results from analysis of particular data sets or models, into TMDL planning. The scientific method starts with limited data and information from which a tentatively held hypothesis about cause and effect is formed. The hypothesis is tested, and new understanding and new hypotheses can be stated and tested. By definition, science is this process of continuing inquiry. Thus, calls to make policy decisions based on the "the science," or calls to wait until "the science is complete," reflect a misunderstanding of science. Decisions to pursue some actions must be made, based on a preponderance of evidence, but there may be a need to continue to apply science as a process (data collection and tools of analysis) in order to minimize the likelihood of future errors."

We have structured an adaptive implementation plan in the draft Technical Report that simultaneously makes progress toward achieving bacteria WQOs while relying on monitoring data to reduce uncertainty and fill data gaps as time progresses. This monitoring data can be used to revise and improve the initial TMDL forecast over time. This type of approach will help ensure that implementation of TMDLs is not halted because of a lack of data and information, but rather progresses while better data are collected to verify or refine assumptions, resolve uncertainties, and improve the scientific foundation of the TMDLs.

Once adopted, modifications to TMDLs can be incorporated with a subsequent Basin Plan amendment, if appropriate. The request to initiate the amendment process may be voiced by interested persons to the San Diego Water Board at any time.

One option for revising these TMDLs, once adopted into the Basin Plan, is the Triennial Review process. During the Triennial Review, the public may recommend issues that the San Diego Water Board should address in the near future that will result in Basin Plan amendments. The San Diego Water Board develops and adopts a prioritized list of Basin Plan issues that may be investigated over a span of three years. These issues include interpretation of WQOs and incorporation of implementation plans. Initiation of the Basin Plan amendment process can take place during the Triennial Review or upon the San Diego Water Board's direction to staff at any time.

4.4 Addressing Beaches and Creeks Simultaneously

Comment: At the February 8, 2006 meeting, former Board Member Kraus requested that clarification be provided concerning the need to address both beaches and creeks simultaneously, rather than in separate analyses.

Response: One TMDL for each indicator bacteria was calculated for each of the five freshwater creeks (Aliso Creek, San Juan Creek, the San Diego River, Forrester Creek, and Chollas Creek) and their downstream ocean beaches because the beaches and creeks are connected hydrologically, and sources of bacteria to both beaches and creeks are the same; namely urban and stormwater runoff. Thus reducing bacteria loading from urban and stormwater runoff should restore water quality both in the creeks and at the beaches.

The watershed models predicted the accumulation of bacteria on the watershed surfaces and the loading at the critical points, which are model nodes representing the bottom-most point in each watershed before the creeks discharge to the beaches, and before intertidal mixing takes place. The critical point is a modeling tool that theoretically represents the exact point where the freshwater creek ends and the marine water beach environment begins. Because each watershed is unique in terms of hydrological conditions, the point where the freshwater creek system ends, and the marine system begins does not exist in the same location in each watershed. Although useful for calculating bacteria loads and TMDLs, the critical point in the watershed models does not necessarily represent a point in the watershed where TMDL compliance will be measured.

In terms of calculating TMDLs, we chose the more stringent of the marine or freshwater WQO for each indicator bacteria as the numeric target for the five beach/creek

watersheds. For total coliform, the more stringent WQO is associated with the SHELL beneficial use for marine beaches. For fecal coliform, the more stringent WQO is associated with the REC-1 beneficial use for marine beaches. For enterococci, the more stringent WQO is associated with the REC-1 beneficial use for freshwater creeks.

Several dischargers expressed concern that calculating one TMDL per indicator bacteria per watershed erroneously imposes creek WQOs onto beaches, and beach WQOs onto creeks. However, this is not the case. The TMDLs do not require that saltwater SHELL total coliform, nor saltwater REC-1 fecal coliform objectives, be met throughout the creek, or that freshwater enterococci WQOs be met at the beach. We revised the text in the draft Technical Report to make this clear.

In terms of protecting creek water quality, we chose the more stringent enterococci WQO for creeks because the creek is the upstream receiving water. Even though the marine beaches have less stringent enterococci WQOs associated with them, dischargers have no more of a burden to meet this standard at the beach, since the more stringent WQO already has been met upstream.

In terms of protecting beach water quality, we used the more stringent total and fecal coliform targets (these WQOs are more stringent than the WQOs associated with creeks). In taking this approach, we assumed that attainment of the WQOs at the point where the creeks discharge to the beaches will result in attainment of the WQOs at the downstream beach. If WQOs are met at the mouth of the watershed, then WQOs likely also are met at the beach because dilution with the wavewash has taken place. This approach is justified because (1) the beach ocean shorelines are the ultimate receiving waterbodies. All creeks included in this project discharge to the ocean or San Diego Bay which are designated with REC-1 and SHELL uses, (2) the beaches have more recreational users than creeks, and (3) the beaches are designated with the most sensitive beneficial use, shellfish harvesting, whereas creeks are not.

In terms of measuring compliance with TMDLs, the mouths of the watersheds, represented in the models by the critical point, are not necessarily the location where compliance will be measured. The compliance monitoring points for freshwater and marine water TMDLs have not been determined at this time. Appropriate compliance points will be determined on a watershed-by-watershed basis with input from the stakeholders, when the implementing orders for these TMDLs are developed. Compliance will likely be assessed in three categories; 1) load reductions, 2) changes in urban runoff and discharge quality, and 3) changes in receiving water quality. These categories correspond to Levels 4, 5, and 6 in the California Stormwater Quality Association's paper "An Introduction to Stormwater Program Effectiveness Assessment." Dischargers will not be held accountable for achieving SHELL WQOs in the freshwater creeks. The dischargers will be held accountable for reducing total coliform loads at the mouths of the creeks to levels that do not cause the SHELL total coliform WQO to be exceeded at the beaches.

4.5 Nurseries as a Potential Bacteria Source

Comment: At the April 25, 2007 meeting, Board Member Anderson requested that clarification be provided concerning the identification of nurseries as a possible source of bacteria to surface waters.

Response: The Technical Report seeks to describe all controllable nonpoint sources that have the potential to be significant sources of bacteria. Due to their fertilizer storage and usage, nurseries have the potential to discharge bacteria in storm water runoff.[7] As such, the inclusion of nurseries in the Technical Report as a potential significant nonpoint source of bacteria is appropriate. This is consistent with how the TMDL addresses all other controllable nonpoint sources, such as agriculture, dairy/livestock, and horse ranch facilities. However, the inclusion of nurseries in the TMDL as a potential source of bacteria does not mean that nurseries are in fact a significant source. Rather, the Technical Report only requires that to the extent that nurseries are a source of bacteria, that those sources of bacteria be controlled, even though, properly composted manure fertilizers should be devoid of human and animal pathogens.

Regardless of whether or not nurseries are a significant source of bacteria, the TMDLs do not result in a change in how discharges from nurseries are managed or regulated. Waste discharge requirements (WDRs), the WDR Waiver Policy, and the NPS Implementation and Enforcement Policy will continue to apply to nurseries where appropriate. The TMDLs require that nurseries continue to comply with these regulations and requirements. Therefore, if nurseries are currently in compliance with these regulations and rules, the TMDLs will not result in a change in nursery operations. This is especially true if nurseries are determined to not be a source of bacteria. In such a case, the nurseries will have no problem meeting the load allocations prescribed in the Technical Report.

[7] San Diego Stormwater Copermittees, 2005. Baseline Long-Term Effectiveness Assessment. P. C-69.

5 Comments and Responses

5.1 Reference System Approach Basin Plan Amendment

Comment 1

Compliance with contact recreation standards. In all but one watershed, the load allocations for the background/non-controllable sources exceed the TMDL for the watersheds; therefore, the watershed will never attain the water quality standards. The Department strongly supports the Regional Board's adoption of a basin plan amendment to allow implementation provisions for a reference system approach as used to develop the interim limits within the TMDL. We encourage the Regional Board to obtain sufficient data needed for proper characterization of a reference watershed within the San Diego Region. The TMDL provides for 22% of samples during wet weather to exceed standards based on the reference watershed in the Los Angeles Region; however, reference watersheds indicate natural exceedances up to 50% of the time (Table 4-1).

Response: One important difference between the data sets mentioned by Caltrans is that the purpose for acquiring the data was different. In the case of the data from the Arroyo Sequit watershed in Los Angeles, the data were gathered to characterize and quantify a suitable reference system. In contrast, the data from San Onofre Creek and San Mateo Creek watersheds (Table 4-1) were collected by the San Diego County Department of Environmental Health (DEH) during routine monitoring as part of a wider beach monitoring program. These data were not collected for the purposes of characterizing a reference watershed. Additionally, San Mateo Creek beach was rejected as a reference beach for study by the Southern California Coastal Water Research Project (SCCWRP) because of too much development in the watershed. The Technical Report has been modified to discuss this important distinction.

Comment 2

Uncontrollable Sources of Natural Background Bacteria: There are now several studies supporting the fact that year-round natural bacteria sources and re-growth contribute to high bacteria levels and exceedances of water quality standards. The TMDL document states this fact. We recommend the TMDL document include a reasonable allowance for uncontrollable sources of bacteria and re-growth, based on the best available information, in the wet and dry season and for the final TMDLs. This allowance may be adjusted to actual watershed specific conditions over time as special study and monitoring data become available.

We suspect that by not including a reasonable allowance for natural sources, this may cause the negative impact of requiring agencies to spend significant public funds to install systems to treat uncontrollable natural sources of bacteria that have not been proven to impair beneficial uses or be a public health risk.

Response: The interim wet weather TMDLs include a reasonable allowance for uncontrollable sources of bacteria and re-growth based on the reference system approach. A Basin Plan amendment has been initiated to authorize the use of a reference

system/natural sources exclusion approach for the purpose of calculating final TMDLs. Since re-growth on wrack lines and other natural and uncontrollable sources are accounted for in the reference system approach, final wet weather TMDLs will be recalculated using this approach following adoption and subsequent approvals of the reference system approach Basin Plan amendment. The allocations and percent reductions calculated using the reference system approach are expected to be similar to interim wet weather TMDLs. Dischargers will be required to reduce current loading by approximately 22 percent in all watersheds, with the biggest reduction of 53 percent required in the San Diego River watershed. Upon adoption of this Basin Plan amendment, we will recalculate the bacteria TMDLs using the appropriate exceedance frequency.

As opposed to the wet weather approach for calculating TMDLs, a reference system approach will not be utilized for dry weather applications. A reference system approach is not applicable to these dry weather TMDL calculations because numeric targets are based on the geometric mean WQOs. A reference system approach uses an allowable exceedance frequency—meaning the number of times the ***single sample maximum*** WQOs are exceeded in a reference system—to calculate TMDLs. An allowable exceedance frequency does not apply to a geometric mean because the geometric mean is an average value over the course of 30 days. Further, evidence from reference systems show that during dry weather, single sample maximum WQOs are rarely exceeded. However, if significant relevant data become available from reference watershed studies to justify modification of dry-weather TMDLs with a reference system approach, we will consider re-evaluation of the TMDLs. The current dry-weather TMDLs are based on the 30-day geometric mean WQOs, which should be included when considering relevancy of reference conditions. For wet weather, reference conditions were incorporated into the TMDL based on allowable daily exceedances of the single sample maximum WQO. Similar assumptions are not directly transferable to the dry-weather approach, so new approaches for consideration of reference conditions will be required for dry weather.

As stated above, the Basin Plan amendment will incorporate a natural sources exclusion approach for implementing the REC-1 and SHELL WQOs. The natural sources exclusion approach will essentially authorize exceedances of WQOs as long as all anthropogenic sources of indicator bacteria are controlled. Under the natural sources exclusion approach, after all anthropogenic sources of indicator bacteria have been controlled, a certain frequency of exceedance of the WQOs can be authorized based on the residual exceedance frequency in the specific water body. The residual exceedance frequency can be used to calculate an allowable exceedance load for TMDL calculation. Therefore, to the extent that natural background conditions are causing exceedances of WQOs, the dischargers will not be held responsible for those exceedances. Alternatively, a TMDL could also be calculated without an exceedance frequency based simply on the existing bacteria loading after anthropogenic sources have been adequately controlled.

To take advantage of the natural sources exclusion approach, dischargers must control all anthropogenic sources of indicator bacteria. Examples of measures that can be taken by dischargers to control anthropogenic sources of indicator bacteria include enforcement of ordinances requiring pet owners to properly dispose of pet waste, enforcement of

ordinances prohibiting disposal of grease, food products, and other bacteria-laden waste products into the municipal separate storm sewer system (MS4), prevention of nuisance flows from entering the MS4, correction of sanitary sewer/MS4 cross-connections, prevention of infiltration from the sanitary sewer into the MS4, control of or sanitation for homeless encampments in and near water bodies, control of sanitary sewer overflows, etc.

The dischargers expressed a legitimate concern regarding planning and implementing costly controls for the final wet weather TMDLs, and final dry weather total coliform TMDLs as the San Diego Water Board has every intention of revising them. Thus, the dischargers will not be required to submit Bacteria Load Reduction Plans (discussed in sections 11.5.2 and 11.5.3 of the Technical Report) for the final wet weather TMDLs and final dry weather total coliform TMDLs until after we have considered the reference system/natural sources exclusion approach Basin Plan amendment, and considered revisions to those TMDLs. We have committed to considering the Basin Plan amendment and revisions to the TMDLs within one year of the effective date of this TMDL Basin Plan amendment. When we revise the TMDLs, we will also revise the compliance schedule for meeting final wet weather TMDLs, and the final dry weather total coliform TMDL. The revised final wet weather enterococci and fecal coliform TMDLs will likely be similar to the interim TMDLs. Thus, the revised final compliance schedule for these TMDLs likely will not be longer than 10 years. Similarly, we intend to revise the final wet and dry weather total coliform TMDLs for SHELL using the natural sources exclusion approach, and will revise the compliance schedule accordingly based on the estimated time needed to control sources of bacteria associated with human and domesticated animal wastes.

We recognize the concern that dischargers must spend significant resources to reduce bacteria discharges, when pathogens such as viruses are recognized as the causative agent. For this reason, the discussion of special studies described in section 11.6 has been modified to include the need to search for an appropriate and affordable pathogenic indicator of water quality. However, we must emphasize that whether or not natural sources pose a public health risk in and of themselves is not well known. Pathogens from wildlife hosts such as *giardia* have been found in areas where there is little anthropogenic impact.

Comment 3

The text needs to include a reasonable allowance for uncontrollable sources of bacteria and re-growth, based on best available information for wet and dry seasons and for the final TMDLs. As stated in the text, natural bacterial sources and re-growth contribute to high bacteria levels. This allowance may be adjusted to watershed specific conditions, based on special studies and monitoring data as it accumulates over time.

The City's concern is that if reasonable allowances are not made for natural sources of bacteria, cities may be required to spend significant public funds to install systems to treat uncontrollable natural sources of bacteria that have not been proven to impair beneficial uses or be a public health risk.

Response: Please see the response to Comment 2 in regards to the commenter's claim that uncontrollable sources will need to be treated. In terms of public health risk, an important consideration is that illness rates associated with enterococci densities can be costly to beachgoers. In a recent study,[8] scientists investigated the economic impacts associated with contracting gastrointestinal illness from swimming at contaminated coastal waters at beaches in southern California. Authors used water quality data (specifically enterococci) from the year 2000, along with beach attendant data from 28 beaches, spanning 160 km of coastline in Los Angeles and Orange Counties, as input into two epidemiological dose-response models. The authors estimate that approximately 1 million excess gastrointestinal illnesses occur at beaches in Los Angeles and Orange Counties each year due to coastal contamination. Considering loss of time at work, doctor visits, and medicine for each occurrence, this equates to expenditures of about $36 million annually. This number is conservative because it does not include expenses associated with contracting other types of waterborne illnesses, nor does it account for lost recreational value, a swimmer's willingness to pay to avoid getting sick, or loss to coastal market economies that depend on contribution from beachgoers. Although this study focused specifically on beaches in Los Angeles and Orange Counties, we believe the results are applicable to the San Diego Region. Therefore, although we recognize the significant expenses associated with implementing BMPs, we also assert that efforts to abate bacteria contamination are necessary to avoid the likewise significant expenses associated with recreating in contaminated waters.

Comment 4

Section 9.1.2, Tables 9-1 through 9-6, should include Dry Weather wasteload allocations for Caltrans, as well as Dry Weather Controllable Load Allocations for agricultural uses and Dry Weather Non-Controllable Load Allocations for open space/natural background, in parallel to the Wet Weather TMDLs. An identifiable percentage of Caltrans' property features large landscape irrigation systems with potential to discharge runoff during dry weather, and agricultural land is also widely irrigated. Since the model's total annual load is theoretically based on a "critical wet year", it is particularly unreasonable to assume that natural streams in undeveloped watersheds would not be flowing or producing non-controllable background loads except on rainy days. A study in the Aliso watershed suggested that the anthropogenic component of dry weather baseline flow may be in the range of 46 to 87%. The Report text should include a commitment to incorporating flow and bacteria data from SCCWRP's ongoing Natural Loadings project, when these analyses become available, to update the Non-controllable Load Allocation.

Response: Calculation of flows/loads for the critical wet period is a separate issue than for dry periods. The critical period applied to wet weather TMDLs only and consisted of the wet weather days of and hydrology modeled from 1993 rainfall, an extremely wet year. For consistency sake, 1993 rainfall was used to select dry weather days for dry weather TMDL development; however, dry weather loading was estimated as a function

[8] Given, Suzan, Linwood H. Pendleton, and Alexandria B. Boehm. 2006. Regional Public Health Cost Estimates of Contaminated Coastal Waters: A Case Study of Gastroenteritis at Southern California Beaches. *Environmental Science and Technology* (July 2006) 40 (16), 4851 -4858.

of steady-state flows derived from an analysis of average dry weather flows. There is no critical dry period identified. Although the wet days identified in the TMDL were based on those occurring during the critical year 1993, dry days were assumed to occur during low-flow periods when baseflow resulting from preceding wet events are limited and the resulting assimilative capacity of the streams is reduced. Therefore, estimation of dry-weather loads is independent of antecedent periods and the potential presence of residual baseflows from previous rainfall events. Although the occurrence of such dry flows absent of groundwater baseflows is questionable during a wet year such as 1993, the dry day is defined independent of the seasonal or annual conditions, and is specifically defined to protect beneficial uses of receiving waters during periods when the assimilative capacity of the waters is limited due to reduced dilution from non-urban flows.

We did not develop dry weather allocations for Caltrans, agricultural areas, and open space areas for the reasons discussed in the response to Comment 23.

Comment 5

Section 9.1.2, Summary of Dry Weather TMDLs- Dry weather flow included a contribution of groundwater seepage into the stream bed. This baseflow may be affected by bacteria from natural sources such as bird and other wildlife feces. If the upcoming reference creek watershed study will consider these sources, the City of San Diego requests that the reference creek watershed approach be used to modify the bacteria dry weather loads in this TMDL.

Response: Please see the response to Comment 2.

Comment 6

Section 9.1.2 – Summary of Dry Weather TMDLs- Dry weather flow includes a contribution of groundwater seepage into the stream bed. This baseflow may be affected by bacteria from natural sources such as bird and other wildlife feces. If the upcoming reference watershed study demonstrates this, the County of San Diego requests that the reference watershed approach be used to modify the bacteria dry weather loads in this TMDL.

Response: Please see the response to Comment 2.

Comment 7

Section 11.5.7 – This section states that *" Measurements during the 2004-2005 winter season showed that in four reference systems (two in Los Angeles County, one in Orange County and one in San Diego County), 27 percent of all samples collected within 24 hours of rainfall exceeded water quality thresholds for at least one indicator. This is higher that the 22 percent found at Arroyo Sequit watershed in Los Angeles, which was used to calculate interim TMDLs discussed in section 4.1. The Arroyo Sequit watershed is one of the four reference watersheds included in this study."* The City of San Diego

and other dischargers participated in the reference beach study. The 27% exceedance rate should be used in the calculation for interim allowable exceedance rate.

Response: We plan to permanently implement an allowable exceedance frequency for wet weather TMDL calculations, but only after a Basin Plan amendment to incorporate the reference system approach has been adopted and approved. The 27 percent exceedance frequency cited in the SCCWRP report may not be appropriate for the wet weather TMDLs because it applies to the 24 hours after cessation of rainfall. However, wet weather in the TMDLs is defined as up to 72 hours after a rainfall event. Samples collected at the 72-hour mark probably exceed the WQOs at a much lower frequency than 27 percent.

Comment 8

The way certain dry weather data have been used to set targets is not logical. In some instances, shoreline data have been used to support the assumption that there is no loading of indicator bacteria from watersheds during dry weather, despite the fact that creek mouths were sealed by sand berms. Because the berms blocked creek flow, it is not possible to use shoreline data to say anything about bacteria levels on the inland, or creek, side of the berms. They are two physically separate systems. There may or may not have been substantial levels of indicator bacteria in the creeks but it is impossible to determine this. The response that this represents a "margin of safety" is flawed in two respects. First, it is a dangerous precedent to base a margin of safety on an obviously faulty interpretation of system behavior. Second, margins of safety are usually set by applying a multiple of some measured or estimated risk or design parameter. Simply applying an irrelevant measurement and setting a parameter at zero is not an appropriate approach for establishing a margin of safety. While the staff contends that treating this issue differently would not change the overall TMDL targets, the use of an obviously false premise does not inspire confidence that the TMDL is using a systematic and logical approach to dealing with key issues and uncertainties.

Response: The commenter's assertion that dry weather data have been used to set targets is incorrect. For all three indicator bacteria, dry weather numeric targets were based on the geometric mean WQOs described in the Ocean Plan and Basin Plan. The geometric mean was used because dry weather flow is more steady-state in nature than wet weather flows, and a geometric mean represents an average over 30 days. Dry weather beach data from near the outlets of San Mateo and San Onofre Creeks (relatively undeveloped watersheds) were used in this project to show that single sample maximum WQOs are rarely exceeded during dry flow conditions. In contrast, SCCWRP showed that single sample maximum WQOs are frequently exceeded at beaches near the outlets of undeveloped (reference) watersheds during wet weather, or storm flow conditions. Thus, a TMDL that allows some exceedance of single sample WQOs is appropriate for storm flow conditions, but not for dry flow conditions.

In addition, a reference system approach is not applicable to dry weather TMDL calculations because numeric targets are based on the geometric mean WQOs. A reference system approach uses an allowable exceedance frequency—meaning the

number of times the ***single sample maximum*** WQOs are exceeded in a reference system—to calculate TMDLs. An allowable exceedance frequency is not relevant to a geometric mean because the geometric mean is an average value over the course of 30 days.

The low percentage of exceedances of the single sample WQOs could be due to the existence of berms that prohibit creeks from flowing all the way to the ocean. Because the berms are in place, we recognize that there may be substantial levels of indicator bacteria in the creeks, and that the absence of data in the creeks represents an unknown. When berms are in place, exceedances measured in the downstream beaches are likely caused by local sources on the beach that exist downstream of the mixing zone such as birds, marine mammals, or re-growth in the wrack line.

More data should be collected to better characterize a reference watershed during dry weather flows. However, this information would probably not be used to establish implementation provisions for TMDL calculation for dry weather flow, since the geometric mean component of the WQOs are used as the numeric targets. Therefore WQOs, without any allowable exceedances, are sufficient for use as dry weather TMDL targets. The discussion in section 4.2 of the Technical Report has been clarified to this effect.

Setting the numeric targets equal to WQOs, with no application of a reference system is not a margin of safety. The decision not to apply a reference system approach to dry weather was based on the method of TMDL calculation, namely the use of the geometric mean as the numeric target, and the inappropriateness of an exceedance frequency to be applied to the geometric mean. However, the natural sources exclusion approach could be used for achieving dry weather TMDLs.

Comment 9

P. 37, Section 4.2 Dry Weather Targets

a) The document states that "…exceedances of WQOs during dry weather conditions are uncommon in these relatively undeveloped watersheds." The bacteria data utilized were collected either at the mouth of San Mateo Creek or at San Onofre State Beach and shows that there were no dry weather exceedances (Table 4-5). This finding is used to support the decision to make no allowance for reference bacterial loads during dry weather. However, this conclusion is flawed in two ways. First, the Creek apparently does not flow to the beach during the vast majority of the dry weather period. Thus, establishing targets for creeks using samples taken from locations with no physical connection to a creek is not appropriate. Second, assuming the Creek does flow to the beach during dry weather, using samples from the mixing zone at the mouth of the Creek or from a nearby beach to establish targets for a creek itself does not allow for potential dilution due to mixing of the creek water with the ocean. Dry-weather targets for creeks should be established with data from a creek itself, not from the ocean.

b) There is no discussion of whether the data from the Santa Monica reference watershed discharging to Leo Carillo Beach had any dry-weather exceedances. It would be useful to compare dry-weather conditions at the San Mateo and Leo Carillo watersheds, both at the mouth of each and inland.

Response (a): As stated in the response to Comment 2, the data collected at the shoreline of San Onofre and San Mateo Creeks was not used to establish an acceptable exceedance frequency for dry weather. The data was used merely to demonstrate that local beach sources, such as birds, marine mammals, and re-growth in the wrack line, are not sufficient to cause exceedances of single sample maximum WQOs during dry weather conditions.

We recognize that there is essentially no data at this point to quantify bacteria loading from a reference watershed during dry weather. However, a reference system approach will not be used to calculate dry weather TMDLs for the reasons described in the response to Comment 8.

TMDLs were calculated at the critical point in the models for both beaches and creeks. The critical point is a node in the model that represents the bottom of the watershed, before any inter-tidal mixing (dilution) takes place. The critical point was chosen as a conservative measure to protect the downstream beach, where the majority of REC-1 use occurs. If WQOs are met at the bottom of the watershed, then they are most likely met at the beach, after dilution occurs. Dischargers should not rely on dilution to achieve REC-1 WQOs, since beneficial uses apply throughout all segments of a waterbody including creek mouths.

Response (b): Dry weather samples from Leo Carillo beach taken during the winter season showed a 3 percent exceedance frequency. Comparing Leo Carillo beach to San Mateo is improper because the watershed draining to Leo Carillo beach is around 95 percent undeveloped, whereas the watershed draining to San Mateo beach is around 85 percent undeveloped. Because of this, SCCWRP rejected the San Mateo watershed and beach as a reference system for its studies.

Comment 10

P. 69, Section 9.1.2: As stated in Comment 2, the data collected in the local reference system does not adequately represent the level of naturally occurring bacteria in creeks and therefore should not be used to evaluate the rate of exceedances in local reference systems during the dry season. San Mateo Creek apparently does not flow to the beach during the vast majority of the dry weather period. Thus, establishing targets for creeks using samples taken from locations with no physical connection to a creek is not appropriate. Second, assuming the Creek does flow to the beach during dry weather, using samples from the mixing zone at the mouth of the Creek or from a nearby beach to establish targets for a creek itself does not allow for potential dilution due to mixing of the creek water with the ocean. Dry-weather targets for creeks should be established with data from a creek itself, not from the ocean.

Response: Please see the response to Comment 8.

Comment 11

The City is concerned that these TMDLs are moving through the adoption process without sufficient consideration given to whether the proposed WLAs are necessary to protect appropriate beneficial uses. The City suggests that these issues should be resolved prior to adoption of the TMDLs. For example, Regional Board staff is in the process of conducting a reference study which is expected to show that the current proposal to allow zero anthropogenic bacteria in urban runoff is more stringent than necessary to protect Basin Plan-adopted beneficial uses (the State Department of Health standard for drinking water is higher than the final WLAs proposed in the Bacti-1 TMDL). This approach is similar to the "reference system approach" alternative described in the Bacti-1 environmental analysis. This alternative would result in less significant impacts and should therefore be selected for approval.

Similarly, the City has previously presented evidence which suggests that the beneficial uses SHELL and REC-1 have been improperly ascribed to Chollas Creek, resulting in proposed WLAs for metals that are orders of magnitude lower than those permitted at the Point Loma Wastewater Treatment Plant outfall. This approach is similar to the "Water Quality Standards Action" alternative described in the Chollas Dissolved Metals environmental analysis. This alternative would result in less significant impacts and should therefore be selected for approval.

Response: We appreciate the City's concern. However, the approach that we have taken is the most conservative approach that will be protective of the beneficial uses for each water body in the Basin Plan. The beneficial uses and WQOs are established in the Basin Plan, and the bacteria TMDLs were calculated based on these established water quality standards. There may be evidence to suggest that beneficial uses have been improperly ascribed, but the Basin Plan would have to be amended to remove or alter those beneficial uses, which is a process that is separate from a TMDL Basin Plan amendment.

The final wet weather TMDLs and WLAs that were calculated are the most protective of beneficial uses without regard to uncontrollable (natural or background) sources. In contrast, the interim wet weather TMDLs and WLAs were calculated using a reference system approach which allows a 22 percent exceedance frequency of the single sample maximum WQOs for REC-1. The purpose of the exceedance frequency is to account for the natural, and largely uncontrollable sources of bacteria in the wet weather loads generated in the watersheds and at the beaches which can, by themselves, cause exceedances of WQOs.

The dischargers have been provided 10 years to meet the interim TMDLs and final dry weather fecal coliform and enterococci TMDLs. An additional 10 years have been provided in the compliance schedule to meet the final wet weather and total coliform TMDLs. We are currently in the process of developing a Basin Plan amendment to permanently allow the use of the reference system approach in calculating TMDLs and WLAs. The reference system approach Basin Plan amendment is a high priority for us.

We fully expect to adopt the reference system approach Basin Plan amendment before the dischargers must comply with the final TMDLs.

Once the reference system approach Basin Plan amendment is adopted, region-wide, bacteria-specific, and/or watershed-specific allowable exceedance frequencies may be developed, and the TMDLs and WLAs will be revised accordingly. The region-wide, bacteria-specific, and/or watershed-specific allowable exceedance frequencies that are developed are expected to be close to the 22 percent exceedance frequency that was used in the interim wet weather TMDL calculations. Therefore, after the reference system approach Basin Plan amendment is adopted, the final wet weather TMDLs will likely become similar to the interim wet weather TMDLs that were calculated. In the Implementation Plan, the San Diego Water Board has committed to considering the reference system/natural sources exclusion approach Basin Plan amendment, and revised final wet weather and dry weather total coliform TMDLs within one year of the effective date of the amendment for this TMDL project.

The reasonable alternatives to the TMDL Basin Plan amendment are discussed in section R.8 of Appendix R. One alternative is to correct the water quality standards ascribed to the beaches and creeks through a use attainability analysis. However, the appendix states that the San Diego Water Board has no evidence that REC-1 and SHELL beneficial uses were inappropriately designated for the beaches and creeks.

The City of San Diego did provide the San Diego Water Board with information showing that parts of Chollas Creek and the San Diego Bay shoreline at the mouth of Chollas Creek were substantially modified from their natural conditions prior to November 28, 1975. This date is significant because according to the Clean Water Act, beneficial uses that existed in waterbodies on or after this date must be designated for the waterbody in the Basin Plan. Much of Chollas Creek was hydromodified into concrete channels while the natural San Diego Bay shoreline was industrialized with rip rap and vertical concrete seawalls. The City of San Diego suggested that, because of the modifications to the channel and shoreline, the beneficial uses ascribed to Chollas Creek and the SHELL use ascribed to San Diego Bay at the mouth of Chollas Creek might not have existed on or after November 28, 1975.

The fact that the hydromodification took place before November 28, 1975 alone is not enough evidence to rebut the presumption that one or more of the beneficial use designations was improper. More definitive information is needed on whether or not the pre-1975 hydromodifications precluded the WARM, WILD, potential REC-1, and REC-2 beneficial uses of Chollas Creek, and the REC-1 and SHELL beneficial uses of San Diego Bay at the mouth of Chollas Creek, and whether or not water quality in Chollas Creek and San Diego Bay at the mouth of Chollas Creek has ever been at a level to support these uses since November 28, 1975. We suggest that the City of San Diego continue to investigate this issue and provide us with more complete information. This issue can also be submitted for consideration during the next Triennial Review of the Basin Plan.

Comment 12

Why doesn't Regional Board staff complete the bacteria reference study before recommending adoption of the Bacti-1 TMDL?

Response: Adoption of these bacteria TMDLs do not rely upon the reference system approach Basin Plan amendment. These TMDLs already include a reference system approach in its calculation of an interim wet weather TMDLs. The reference system/natural sources exclusion approach Basin Plan amendment will only change the final wet weather TMDLs.

Delaying adoption of the TMDLs until adoption of the reference system/natural sources exclusion approach Basin Plan amendment will result in added and unnecessary delays in implementing the interim wet weather TMDLs and the final dry weather fecal coliform and enterococci TMDLs. The revised final wet weather TMDLs (per the reference system/natural sources exclusion amendment) are likely to be very similar to the interim wet weather TMDLs, and the dry weather fecal coliform and enterococci TMDLs will not be affected by the reference system/natural sources exclusion approach Basin Plan amendment. Therefore, the dischargers should be compelled to take actions to meet the interim wet weather TMDLs, and dry weather fecal coliform and enterococci TMDLs without further delay.

The final wet and dry weather SHELL TMDLs will be revised pursuant to the natural sources exclusion approach Basin Plan amendment, however, this revision of the TMDLs will occur after bacteria load reduction BMPs have successfully controlled anthropogenic sources of bacteria associated with human and domestic animal wastes. At that time, the TMDLs can be recalculated based on the actual bacteria loading to the watershed, or on the actual WQO exceedance frequency at the beach with the bacteria reduction BMPs in place and functioning.

The dischargers have a legitimate concern regarding planning and implementing costly controls for the final wet weather TMDLs since the San Diego Water Board has every intention of revising them. Thus, providing additional time in the compliance schedule to meet the final wet weather TMDLs is reasonable so that the dischargers will not have to engage in implementation planning for TMDLs that will be revised. Extending the compliance schedule for the final wet weather and final dry weather total coliform TMDLs to 20 years and not requiring the dischargers to submit pollution control reduction plans for these TMDLs until after the San Diego Water Board has considered the reference system/natural sources exclusion approach Basin Plan amendment, and considered revisions to these TMDLs should provide sufficient time and flexibility for achieving the final TMDL requirements.

Comment 13

The acceptability of the Draft TMDL is predicated on the prior or concurrent approval of a companion Basin Plan Amendment (BPA) allowing the use of the "reference system approach" to natural source exclusions for wet and dry weather, which would allow the "interim" targets in the Draft TMDL to become "final" targets. Although the 'reference system' BPA was given priority for funding in the last Triennial Review cycle and the

amendment process was actually initiated, it has been brought to the SAG's attention that RWQCB staff have subsequently been diverted and the BPA process has been effectively put on hold. The TMDL is not acceptable or implementable without the BPA. Approval of the TMDL accompanied by delays in the BPA approval could force the Permittees to prepare Bacteria Load Reduction Plans based on the Final targets instead of the Interim ones. More ominously, if EPA ultimately upheld the TMDL but not the BPA, every MS4 and Agricultural land use will be required to implement 100% reduction of all wet-weather bacteria loads within 10 years – a feat that is technically and economically infeasible and counter to the expressed intent of the TMDL (see Section 11.5.7: "A Basin Plan Amendment to authorize the reference system approach… is required to avoid the need to attain the final TMDLs." It is critical that the 'reference system' BPA be put back on the front burner so it can move through the required Regional, State and Federal EPA approvals prior to, or at least concurrently with, the TMDL. This may mean that the TMDL approval should be deferred while the BPA catches up; or that the TMDL approval should be explicitly contingent on BPA approval and that the TMDL's forwarding for SWRCB and EPA approval should be delayed accordingly.

Response: The San Diego Water Board is actively working on the reference system approach Basin Plan amendment at this time. However, as previously stated, adoption of these bacteria TMDLs do not rely upon the reference system approach Basin Plan amendment. These TMDLs already include a reference system approach in its calculation of interim wet weather TMDLs. The reference system approach Basin Plan amendment will only change the final wet weather TMDLs. Please see the responses to Comments 2 and 12 for additional explanation.

Comment 14

Section 11.5.7 discusses the Reference Watershed Basin Plan Amendment and indicates that the RWQCB will "investigate and process the proposed reference system Basin Plan amendment in accordance with local priorities and resources." The Basin Plan amendment process, although given priority for funding in the current Triennial Review, is already substantially behind schedule. This wording leaves open the possibility of substantial and indefinite delays in processing the reference system amendment and completely ignores the potential impact of any such delay on the dischargers, who would be compelled in the meantime to prepare and begin implementing Bacteria Load Reduction Plans based on Final targets currently shown as up to 100% reductions. This is not an appropriate use of resources. There may be several alternatives to resolve this problem, including: 1) the approval of this TMDL could be delayed until the Basin Plan amendment catches up to it in the approval process; 2) approval and implementation of the TMDL could be made contingent on the approval of the Basin Plan amendment; or 3) a final sentence could be added to this section specifying:

> *In the interim, Bacteria Load Reduction Plans will be allowed to provide for phased Plan development; dischargers will not to be required to include provisions for attaining the Final targets until after the Basin Plan amendment is approved and the re-calculations are incorporated into the TMDL.*

In any case, prudence would dictate that the Reference System Basin Plan amendment needs to be completed as soon as possible. The RWQCB should make a specific timing commitment in this regard.

Response: Please see the responses to Comments 2 and 12.

Comment 15

Section 11.5.7 makes reference to SCCWRP's Natural Loading Studies and describes natural exceedances of Total Coliform, but neglects to mention that these data also identified significant natural exceedances of Enterococci and E. coli (a subset of Fecal Coliform) under both wet and dry conditions. SCCWRP's "reference" bacteria studies for both wet and dry weather are ongoing and substantially more local exceedance-rate data will be available by Summer 2007. The EPA representative (in preliminary meetings with RWQCB staff and the SAG relating to the Reference System Basin Plan amendment) has already preliminarily concurred that naturally-occurring dry-weather bacteria need not be controlled and that the Basin Plan amendment could reflect this policy. Section 11.5.7 indicates that "After this [Reference System] Basin Plan amendment is adopted, TMDLs included in this project can be re-calculated to reflect an appropriate exceedance frequency." Given the SCCWRP findings and the EPA concurrence, this sentence should be revised to read, " …TMDLs included in this project will be re-calculated to reflect appropriate wet- and/or dry-weather exceedance frequencies"; or other wording to acknowledging dry-weather natural bacteria occurrence. The text should also identify who will be doing this re-calculation and what procedural requirements there will be to incorporate the new findings as the new Final targets. The text should also indicate that exceedance rates used for the re-calculations may vary among the different waterbodies if local reference data provide sufficient justification.

Response: At this time, the reference system approach will only be applied to the wet weather TMDLs. However, the natural sources exclusion approach could be used for attainment of dry weather TMDLs. The natural sources exclusion approach will allow the San Diego Water Board to develop TMDLs that result in exceedances of WQOs for both REC-1, REC-2, and SHELL uses, as long as all bacteria sources associated with human and domesticated animal wastes are controlled. Under the natural sources exclusion approach, after all such sources of bacteria are controlled, a certain frequency of exceedance of the WQOs can be authorized based on the residual exceedance frequency in the specific water body. The residual exceedance frequency can be used to calculate an allowable exceedance load for the purpose of a TMDL. Alternatively, a TMDL could also be calculated without an exceedance frequency based simply on the existing bacteria loading after anthropogenic sources have been adequately controlled.

Comment 16

Section 11.5.7 discusses the Reference Watershed Basin Plan Amendment and indicates that the RWQCB will "investigate and process the proposed reference system Basin Plan amendment in accordance with local priorities and resources. After this Basin Plan

amendment is adopted, TMDLs included in this project can be re-calculated to reflect an appropriate exceedance frequency."

The acceptability of the Draft TMDL is predicated on the prior or concurrent approval of a companion Basin Plan Amendment (BPA) allowing the use of the "reference system approach" to natural source exclusions for wet and dry weather, which would allow the "interim" targets in the Draft TMDL to become "final" targets. Although the 'reference system' BPA was given priority for funding in the last Triennial Review cycle and the amendment process was actually initiated, it has been brought to the SAG's attention that RWQCB staff have subsequently been diverted and the BPA process has been effectively put on hold. The TMDL is not acceptable or implementable without the BPA. Approval of the TMDL accompanied by delays in the BPA approval could force the Permittees to prepare Bacteria Load Reduction Plans based on the Final targets instead of the Interim ones. More ominously, if EPA ultimately upheld the TMDL but not the BPA, every MS4 and Agricultural land use will be required to implement 100% reduction of all wet-weather bacteria loads within 10 years – a feat that is technically and economically infeasible and counter to the expressed intent of the TMDL (see Section 11.5.7: "A Basin Plan Amendment to authorize the reference system approach… is required to avoid the need to attain the final TMDLs." It is critical that the 'reference system' BPA be placed as a high priority for RWQCB so it can move through the required Regional, State and Federal EPA approvals prior to, or at least concurrently with, the TMDL. This may mean that the TMDL approval should be deferred while the BPA catches up; or that the TMDL approval should be explicitly contingent on BPA approval and that the TMDL's forwarding for SWRCB and EPA approval should be delayed accordingly.

Response: Please see the responses to Comments 2 and 12.

Comment 17

Conceptually, the use of the reference system approach for wet weather is appropriate and your Board should consider adopting a Basin Plan Amendment allowing the use of the reference system approach in bacteria TMDLs. However, the methodology of combining the reference system approach developed by the Los Angeles Regional Board to allow a specific exceedance frequency with the wet weather loading approach above to estimate required load reductions during wet weather, is without technical basis. Further, we are very concerned with the lack of sensitivity analysis associated with the current reference system approach. Local reference stations, based on limited data show exceedances of up to 50%, yet the allowable frequencies specified in the TMDL, based on data from the Los Angeles Regional Board, are 22%. We believe that the potential impacts associated with characterizing the sensitivity of reference watersheds to variability justify rigorous and prioritized investigation. Finally, the reference system approach should also be applied to winter dry weather as is the case in TMDLs conducted by the Los Angeles Regional Board.

Response: In developing the reference system approach, there will be variation in exceedance frequencies from reference watershed to reference watershed. There will also

be variation in exceedance frequencies based on the method used to determine an acceptable exceedance frequency (e.g., minimum, mean, maximum).

The commenter notes that local reference stations show exceedances of up to 50 percent. However, the commenter fails to note that there are data from reference watersheds that have exceedances as low as 0 percent.

We used a conservative approach when developing the TMDLs. Until evidence is provided that demonstrates a less conservative approach is warranted, the TMDLs that are developed must be protective of the beneficial uses of the receiving waters. At this time, we determined that an allowable exceedance frequency of 22 percent, based on data from the Los Angeles Water Board to be acceptable by the San Diego Water Board for purposes of developing interim TMDLs. When the reference system/natural sources exclusion approach Basin Plan amendment is adopted, region-wide, bacteria-specific, and/or watershed-specific allowable exceedance frequencies will be developed. In regards to applying the reference system approach to winter dry weather, please see the response to Comment 8.

Comment 18

At various points in the document, there is discussion about the use of reference systems. In general, the technical authors appear to justify the use of reference conditions for comparisons of the wet weather data. There is considerable precedence for this technical approach. Although the authors present data using the reference system approach, they explain that the Basin Plan does not yet permit such an approach (i.e., that the TMDL program would need to wait for a potential lengthy public review process of the Basin Plan to consider it). Considering that the TMDL program was established to provide comprehensive protection and regulation of watershed and waterbody aquatic ecosystems, it is unfortunate that it can be undermined by the failure to integrate it with the legacy regulatory programs. This should be a simple fix during the next Basin Plan update.

Response: The reference system approach Basin Plan amendment is a high priority for the San Diego Water Board and is currently being developed. TMDLs will be recalculated and the compliance schedule adjusted once the Basin Plan amendment has been adopted. We have committed to considering the Basin Plan amendment and revisions to the TMDLs within one year of the effective date of this TMDL Basin Plan amendment.

Comment 19

Considering reference system comparisons in the document, there should be more justification provided for the use of the Los Angeles region, which provides the 22% exceedance value. For the limited data set established regionally, the values are considerably higher. It seems that the Board would want to find reference conditions close to the sites of concern rather than further away.

Response: Since the interim TMDLs were developed, the SCCWRP has characterized three additional reference beaches, and is in the process of characterizing reference subwatersheds. We intend to consider all the available reference system data when we recalculate the final wet weather TMDLs.

Comment 20

We are also concerned about the fact that the wet weather allowable load for controllable nonpoint sources is zero. This puts farmers in the untenable position of controlling one-hundred percent of indicator bacteria when, as mentioned above, there is a lack of evidence for the need for control. It is critically important that this TMDL return to the reference stream approach as used in the interim TMDL. At a minimum, farmers should be granted the load that is given to like acreages of uncontrollable nonpoint sources. This is given the fact that if the farm didn't exist and the land was in its natural state an allocation would be granted.

Response: We do not agree that farmers should be granted a load that is given to similar acreages of uncontrollable nonpoint sources. Bacteria loads from uncontrollable nonpoint sources (i.e., open spaces) are different than from farmers (i.e., agriculture/livestock). For open spaces, the assumption is that there are no human activities, and the bacteria loads originate from the wildlife fauna.

However, farmers and their activities (e.g., livestock maintenance and manure management, application of amendments and/or mulches to soil) have an anthropogenic influence on the land, which can have a significant impact on the potential bacteria loads that can be transported in storm water runoff. If farmers implement proper management measures and practices, bacteria loads can be eliminated from storm water that runs off from agricultural lands to receiving waters. Another important point is that farmers are not required to take additional pollutant load reduction actions beyond what is required in WDRs and waivers.

As discussed above, the reference system approach Basin Plan amendment is a high priority for us and is currently being developed. The dischargers have been provided 10 years to meet the interim TMDLs. An additional 10 years have been provided in the compliance schedule to meet the final TMDLs. Upon adoption of the reference system Basin Plan amendment, we will recalculate TMDLs and adjust the compliance schedule appropriately.

Comment 21

Reference System Basin Plan Amendment Appropriately Follows TMDL Adoption.

We support the use of a reference system approach, as is envisioned in the TMDL through the interim targets. We understand that staff is now working on a Basin Plan Amendment (BPA) to allow those interim targets to replace the final targets. The reference system approach is the most appropriate way to develop a TMDL that will ensure beneficial uses are attained without requiring control of natural sources.

We are well aware of the stated concerns of some municipalities that the BPA and Bacteria TMDL are not coming forward at the same time. Both Regional Board staff and SAG members understand that our mutual goal is to adopt the interim targets as final once the BPA has been prepared. However, we must begin the TMDL process. There is no sense in delaying the TMDL in order to bring it to you concurrently with the BPA. Rather, the TMDL should move forward, followed closely by the BPA. Municipality concerns that the BPA process will never move forward to approval are unfounded, as that very act is the stated goal in the TMDL. Conversely, there are very real concerns that should the TMDL not be adopted now, it and the BPA may be severely delayed. Without the pressure of an approved TMDL, municipalities will not have incentive to begin this cleanup and reduction process. The affected waters have been on the 303(d) list of impaired waterbodies for years. We cannot afford to wait while public health and safety continue to be at risk.

Response: We agree that dischargers should not delay implementing bacteria load reduction BMPs. Adoption of these bacteria TMDLs do not rely upon the reference system approach Basin Plan amendment. Once these TMDLs are adopted, dischargers must begin or continue to meet load allocations and wasteload allocations in accordance with the compliance schedule for the reasons discussed in the response to Comment 12. However, once the reference system Basin Plan amendment is adopted, we will recalculate some of the TMDLs and adjust the compliance schedule appropriately.

Comment 22

An appropriate reference site should be selected in the San Diego Region.

An important modification that needs to occur in the SD beaches and streams TMDL is the usage of the 22% allowable exceedances as a target. The 22% allowable exceedance value was not determined as acceptable by Region 4, but the approach based on the number of exceedances at a reference beach during the 90th percentile storm year was approved. We strongly urge the SD Board to modify their approach and determine allowable exceedances based on the number of exceedances at a reference beach during the 90th% storm year. This is an easy analysis with the extensive monitoring data base that exists in the SD region.

There has been a great deal of concern expressed about how an exceedance based approach is not consistent with the current SD Region Basin Plan. The Los Angeles Region routinely modifies the Basin Plan with Basin Plan amendments concurrently with approval of their TMDLs. We strongly encourage the San Diego region to move forward with a Basin Plan amendment concurrently with TMDL approval to ensure that public health protection and Rec-1 waters beneficial use attainment occur as soon as feasible.

The Santa Monica Bay fecal bacteria approach was utilized in San Pedro Bay, Marina Del Rey and Malibu Creek as well.

Response: The commenter incorrectly states that these TMDLs are not consistent with an exceedance frequency based approach. Interim TMDLs were calculated using exactly this approach (see Technical Report, section 8). Assuming the commenter is referring to how TMDL compliance will be assessed, this statement is also incorrect for the reasons

stated in the response to Comment 147. The TMDL process will not be put on hold while we develop the reference system approach Basin Plan amendment because it is imperative that dischargers begin load reductions immediately.

5.2 Technical Analysis

Comment 23

The TMDL needs to develop load and waste load allocations for all identified sources of bacteria for both dry and wet weather. Only wet weather loadings have been developed for Caltrans and non-point sources from open recreation, open space and confined animal feeding operations based on the assumption that loading will only occur during rain events and that rain water is the only source of water for creeks. This assumption erroneously ignores irrigation practices by Caltrans and on open space and agricultural areas during dry weather and documented base flow in perennial creeks in the watersheds. Since irrigation is seen as the cause of the majority of loading from urban areas, this reasoning should be applied equally to Caltrans, managed open space and agricultural/animal feeding operation lands where irrigation also occurs. Additionally, a load allocation should be developed to reflect the natural level of bacteria in creek base flows during dry weather.

Response: The lack of a WLA for Caltrans and LAs for agricultural dischargers for dry weather is premised on the assumption that these sources are unlikely to discharge significant bacteria loads during dry weather. Irrigation runoff from these sources was assumed to be minimal compared to irrigation practices within urbanized watersheds that drain to MS4s owned and operated by municipalities.

Transportation land use areas used in the model only include hardscape areas. Although Caltrans-owned right of ways encompass landscaped areas, these areas were included with other land use types and attributed to the Municipal dischargers. The total irrigated right-of-way area is small compared to the other urban land use areas that produce nuisance flows into the MS4s. Table I-2 shows that the Caltrans occupied areas in the 12 watersheds of this TMDL project range in size from 0.00 square miles to 1.94 square miles. Assuming that the irrigated right-of-ways are twice the area of the impermeable highway areas, the largest irrigated area would be just less than 4 square miles. This value is for the San Diego River watershed. These areas are so small relative to the rest of the urban areas that a dry weather wasteload allocation is not justified. Although no load reductions are required from Caltrans, bacteria discharges should not increase above current loading. For this reason, the Technical Report was modified to state that we will recommend that the State Board develop WQBELs to establish an upper limit on bacteria loading equal to the current loading. Load reductions are not required; conversely, no increases in loading are allowed.

Under the Waiver Policy, discharges from controllable nonpoint sources such as discharges from animal feeding operations and agricultural and nursery irrigation return water are not allowed to cause nuisance conditions to receiving waters or violations of applicable WQOs. Thus, if dischargers are abiding by the conditions stated in their WDRs and waivers, then no exceedances of WQOs are occurring, and the initial assumption that dry weather loading is insignificant is correct. The Implementation Plan states that the San Diego Water Board will enforce facility specific WDRs and waivers with respect to discharges from animal feeding operations, manure composting and soil amendment operations, and agricultural and nursery irrigation return flow in the

watersheds with significant agricultural sources of bacteria (the San Juan Creek, San Luis Rey River, San Marcos Creek, and San Dieguito River watersheds). If, upon enforcement of the waivers, nuisance conditions or exceedances of WQOs still occur from agricultural bacteria sources then WDRs can be issued to violators.

We did not consider loading from creek base flows in TMDL calculations. Base flows from groundwater can be associated with residual flows from wet weather events. Since dry weather modeling is distinct from wet weather modeling, we did not include contribution from base flows. A conservative approach for assessing dry weather loads is to exclude dilution factors such as base flows. Appendix L has been modified to include a discussion of this conservative assumption.

Comment 24

Section 9.1.2, Tables 9-1 through 9-5 - Overspray from the irrigation of roadside landscapes contributes to dry weather flows. Caltrans should be allocated a dry weather flow load to reflect this contribution.

Response: Please see the response to Comment 23.

Comment 25

P. 9, Section 1.4; para. 5: The statement "…Caltrans-owned areas (freeway surfaces) are unlikely to discharge bacteria to receiving waters during dry weather conditions because there is no flow source to wash off of Caltrans highways during dry weather." ignores the irrigation practices which are cited as the prime source of urban runoff attributed to the MS4 system. Irrigation of landscaped areas in Caltrans right-of-ways provides a flow source for the wash off of bacteria during dry weather and should be included in the dry weather waste load allocation.

Response: Please see the response to Comment 23.

Comment 26

Page 4, last paragraph describes the wasteload allocations for Caltrans using the impermeable surfaces of the Caltrans owned highways. During dry weather the report states that there is no significant urban runoff from the highways. Accordingly on page 69, dry weather WLA's were not distributed to Caltrans. There is a potential bacterial runoff from the irrigated landscape areas immediately adjacent to the highways and maintained by Caltrans during wet and dry weather. It is known that Caltrans uses where it is available, reclaimed water for irrigation. Even though the reclaimed water is disinfected address the potential for re-growth of bacteria. Also address the fertilizers applied to the landscape as a source of bacteria. The total bacterial runoff from impermeable highway surfaces and irrigated landscapes should be evaluated and WLAs assigned as required.

Response: Please see the response to Comment 23.

Comment 27

The TMDL should distribute load and waste load allocations to all identified sources of bacteria for both dry and wet weather. To date, only wet weather loadings have been developed for Caltrans and non-point sources from open recreation, open space and confined animal feeding operations based on the assumption that loading will only occur during rain events and that rain water is the only source of water for creeks. This assumption erroneously ignores irrigation practices by Caltrans and on open space and agricultural areas during dry weather and documented base flow in perennial creeks in the watersheds. Since irrigation is seen as the cause of the majority of loading from urban areas, this reasoning should be applied equally to Caltrans, managed open space and agricultural/animal feeding operation lands where irrigation also occurs.

Response: Please see the response to Comment 23.

Comment 28

Wet weather modeling. The technical report's definition of wet weather conditions is not appropriate for many types of storms. In relatively undeveloped watersheds, 0.2 inches of rain will produce little or no direct runoff, and any impact on water quality is unlikely to persist for 72 hours. Consequently, many of the observed values at monitoring sites throughout the watershed may not be representative of true wet weather conditions.

The use of basin-wide summary statistics for model calibration and verification is not appropriate. For instance, water quality measurements from 59 sites in the Aliso Creek watershed are averaged together for comparison with predicted data. Model results should be compared only to single sites that correspond to the locations of the predicted values.

To assess model fit with available data, the time series model output was graphically compared to the observed data. This is not an appropriate test for model calibration and verification. A quantitative test using root mean square error or other comparable methodology would be preferred. The horizontal and vertical scales of the figures presented in Appendix N preclude any meaningful visual assessment of the match between observed and predicted values.

Figures 12 through 25 in Appendix N depict the average and range for observed and modeled fecal coliform, total coliform, and enterococcus concentrations in the basins. In contrast to the conclusion of the report, these graphs indicate that the model does a poor job in many of the watersheds of predicting bacteria concentrations. Even where observed and predicted values appear to be relatively close together because of the logarithmic scale, the observed and predicted values often differ by a factor of 5 to 10 or more.

Response: We recognize the discrepancy between the assumption for defining a wet-weather event and the occurrence of actual wet flows. Wet days, identified based on the defined storm (0.2 inches of rainfall and the following 72 hours) may not be entirely accurate for identifying wet-weather monitoring data. Regardless, observed data were used only for model validation, and comparison did not result in modification of bacteria

modeling parameters. Recall that the bacteria build-up/wash-off modeling parameters were assumed "previously calibrated" based on robust analysis at land-use-specific sites in the Los Angeles Region. Similar detailed land use runoff data were not available in the San Diego Region. Therefore, for this study the bacteria modeling parameters were "validated" through comparison with local data, but not enough data were considered available in the San Diego Region to justify adjustment of modeling parameters through additional calibration. As a result, selection of wet-weather data in the region for comparison to model-predicted bacteria densities may have impacted analysis, but did not result in adjustment of modeling parameters potentially caused by unrepresentative wet-weather data.

Where data were not collected at consistent locations of model subwatershed outlets, data collected throughout the subwatersheds were pooled and relative ranges of observed bacteria densities were compared with ranges predicted by the models at the subwatershed outlet. The results shown in Figures N-12 through N-24 provide an analysis of the general trends, but were not used to support or justify calibration of modeling parameters. Regardless, comparisons in Figures N-12 through N-24 were provided in an attempt to utilize all data collected in the region, although these datasets may not be suitable for robust model calibration, nor was the purpose for their collection associated with watershed model development. However, results of these comparisons show the dependence of both model results and observed data on flow magnitudes, which were normalized in these figures based on watershed area. Except for lower flow ranges, the general trend of model results and observed data appear to be consistent relative to the flow ranges shown. To address low-flow periods that were not predicted with accuracy based on LSPC, a separate modeling approach was developed.

Model calibration and validation can be performed using both quantitative and qualitative techniques. Qualitative calibration and validation are often performed using graphical analysis, as was reported for both hydrology and water quality for the dry- and wet-weather models of the report. Quantitative evaluation of model uncertainty of bacteria predictions based on the recommended methods requires a robust set of observed data to provide meaningful comparison to model predictions and result in statistical significance. Such large datasets were not available for most watersheds used for model validation in this study. In addition, the extreme variability of bacteria densities (often exceeding orders of magnitude) further impacts statistical calculations.

To present the graphical comparison of model results with observed data, logarithmic scales were used on the y axis for bacteria densities. Given the logarithmic variability of bacteria levels, accuracy of a model within an order of magnitude is generally considered successful. In addition, logarithmic comparisons of bacteria concentrations are typical. It should be noted that if bacteria levels were reported on a normal scale, visual inspection of model results and observed data would be even more difficult, as much of the smaller concentrations would be practically impossible to read and evaluate due to the extreme vertical range.

Comment 29

Table 1-2 indicates that beaches and creeks included in this TMDL project are to meet more rigorous requirements than beaches that are not listed as impaired. Beaches must exceed standards more than 4% of the time to be listed as impaired; whereas, listed beaches will be allowed "no" exceedances**.** What is the rationale for this difference?

Response: We assume that this comment refers to the 4 percent allowable exceedance percentage allowed for beach monitoring data on page 5 of the *Water Quality Control Policy for Developing California's Clean Water Act 303(d) List* (Listing Policy). Comparing the allowed exceedance percentage in the binomial test in the Listing Policy to the exceedance frequencies allowed in the TMDL calculations is off base. The TMDL is a plan for attaining bacteria WQOs and restoring beneficial uses in receiving water. Conservative assumptions and margins of safety are utilized in the TMDL to ensure that water quality supports beneficial uses in the receiving water at all times. The binomial test is applied to a monitoring data set for a water body to determine whether or not the waterbody is impaired and a TMDL should be calculated for the waterbody. Exceedances in the binomial test are allowed to account for potential transient effects, errors, bias, and outliers in the data.

Comment 30

Page 33 of the draft Technical Report explains how staff determined the TMDL for beaches and creeks. Total coliform was used for numeric targets in the TMDLs to determine the required load reductions needed to ensure that the REC-1 and SHELL beneficial uses will be protected. Some stakeholders have expressed a concern that the selection of the same numeric targets for beach and creeks would enforce salt water total coliform limits in the creeks. Coastkeeper does not believe that this concern is valid. It is possible, however, that in order to meet the SHELL standard in the saltwater, a more stringent creek WQO may be required. We suggest that the draft Technical Report be revised to state that the intent is not to impose the salt water coliform limits on creeks. Rather, the modeling used to determine the TMDLs includes an implicit margin of safety. As staff responded in peer review, the location of the critical point and the use of total coliform provide, at least in part, the margin of safety.

Response: The Technical Report was clarified in the March 9, 2007 version regarding the use of the total coliform WQOs as numeric targets for TMDLs applied at the mouths of the creeks. As the commenter suggests, our intent is not to impose total coliform WQOs for SHELL uses throughout the creeks, but to ensure that water quality in the creeks where they discharge to coastal waters is protective of SHELL beneficial uses at the beaches and in San Diego Bay. For further discussion regarding the simultaneous technical analysis of beaches and creeks, please see section 4.4.

Comment 31

The technical analysis is based on the assumption that all bacteria loading from sewage spills will be reduced to zero and thus this source of bacteria receives a 100% reduction in the TMDL. This assumption is not realistically achievable.

Response: Whether or not publicly owned treatment works (POTWs) can reduce sewage spills to zero, such spills are prohibited in their waste discharge requirements and prohibited by the Basin Plan. Therefore, sewage spills were not included in the source analysis, and therefore were not assigned a WLA. However, as the comment notes, WLAs for POTWs are essentially zero. Water quality data used for model calibration and validation were cross-referenced with sewage spill information. Any exceedances in bacteria WQOs associated with sewage spills were removed from the data set, ensuring that model calibration, validation, and output consisted of loading from urban runoff from the watersheds.

POTWs, and other potential dischargers not mentioned in section 10 of the Technical Report, are allowed zero discharge. Should a sewage spill occur, loads associated with the discharge would not be counted against the LAs and WLAs assigned to dischargers. Loads associated with sewage spills are regulated under San Diego Water Board Order No. R9-2007-0005.

Comment 32

The technical analysis is based on the assumption that all bacteria loading from encampments of homeless individuals will be reduced to zero and thus this source of bacteria receives a 100% reduction in the TMDL. This assumption is probably not achievable and addresses a wide-reaching societal issue that is germane to the [Water Code section] 13241 requirement that affordable housing is considered.

Response: Bacteria discharges from direct deposition of human feces into and near receiving waters did not receive an allocation in these TMDLs. Unlike urban runoff, bacteria loading from human feces is completely from human sources and carries a higher risk of association with human pathogens. Like pet waste, deposition of human feces where it can be transported to storm drains or receiving water should be highly discouraged in the municipal dischargers' storm water programs. Attainment of WQOs and the requirements of this project will take place in part through enforcement activities by municipalities to discourage a range of discharges or illegal activities, including direct deposition of human feces where it can be transported to storm drains or receiving waters.

Water Code section 13241 is not applicable to this TMDL project since section 13241 only applies when new WQOs are established. The bacteria TMDLs interpret existing WQOs as stated in the Basin Plan, but do not promulgate new objectives.

Comment 33

The document does not appear to have been developed in accordance with the Revised Draft Water Quality Control Policy for Addressing Impaired Waters: Regulatory Structure & Options (June 2005) or the Draft State of California S.B. 469 TMDL Guidance (March 2005). Attachment A: Impaired Waters Regulatory Decision Tree of the Regulatory Structure and Options guidance outlines the regulatory options available to address impaired waters, many of which have not been evaluated for the bacteria-

impaired water bodies covered by the Technical Draft. Prior to developing a TMDL, the following steps should be taken:

a) The original listing of the water body should be re-evaluated based on current, existing data. According to Regulatory Structure and Options policy, "If the water body is neither impaired nor threatened, the appropriate regulatory response is to delist the water body." Several Laguna Beach area beaches are currently included in the TMDL despite the fact that they have been meeting water quality standards since 1999. Data and statistical evaluations to support the delisting has been provided to Regional Board staff. Based on the 303(d) List De-listing criteria, the following sites should be de-listed and removed from the TMDL: Cameo Cove at Irvine Cove/Riviera Way; Heisler Park North; Main Laguna Beach; Laguna Beach at Ocean Avenue; Laguna Beach at Laguna Avenue; Laguna Beach at Cleo Street; Arch Cove at Bluebird Canyon Road; Laguna Beach at Dumond Drive; Laguna Beach at Lagunita Place/Blue Lagoon Place; Aliso Beach at West Street; Aliso Beach at Table Rock Drive; 1000 Steps Beach at PCH/Hospital/9th.

b) The appropriateness of the Water Quality Standards should be investigated, including whether a Use Attainability Analysis, Site-Specific Objective, or finding of Anti-degradation would be more appropriate. In particular, we are concerned about the appropriateness of the Shellfish beneficial use which is applied to all ocean waters irrespective of whether the area could support, is supporting or has ever supported shellfish populations. We would also request review of the REC-1 designation of all areas of the affected creeks, particularly with respect to the use definition which includes the statement "where ingestion of water is reasonably possible". There are many areas of the listed creeks which do not support, and have not supported this level of recreation; and

c) Alternative Regulatory Action consideration: The Regulatory Structure and Options policy states, "If a solution to an impairment is being implemented by a regulatory action of another state, regional, local or federal agency, and the Regional Board finds that the solution will actually correct the impairment, the Regional Board may certify that the regulatory action will correct the impairment and if applicable, implement the assumptions of the TMDL, in lieu of adopting a redundant program." The Aliso Creek watershed is currently under a 13225 Directive for bacterial indicators. The document does not address or recognize the redundancy of the TMDL and the requirements of the directive. Since there is an alternative enforceable program in place for this watershed, consideration should be given to removal of Aliso Creek from the TMDL process.

Response (a): Orange County, along with other municipal dischargers are commended for their success in restoring water quality at the beach segments listed in item a) above. Whether or not these beach segments meet WQOs during storm events is unclear, since the data submitted by the City of Laguna Beach consisted strictly of dry weather samples.

In a letter to the SWRCB dated January 31, 2006, the San Diego Water Board recommended that all waterbodies, regardless of quality during dry weather, remain listed if no wet weather data is available to demonstrate support of beneficial uses.

Even if the waterbodies in question are de-listed in the 2008 list evaluation, they will be included in this TMDL project. Please see the response to Comment 190 for further discussion.

Response (b): The Ocean Plan bacteria WQOs were revised in January 2005 by the SWRCB following a public review process. The San Diego Water Board has no basis to reject the Ocean Plan WQOs and use different ones. The State and Regional Water Boards are in the process of developing statewide bacteria WQOs for freshwater. The CEQA Scoping meeting and first public workshop for these statewide WQOs should be scheduled for the fall of 2007. Once adopted by the SWRCB, the San Diego Water Board will amend its Basin Plan to incorporate the statewide bacteria WQOs. If needed, the bacteria TMDLs will be revised to reflect any changes to the Basin Plan bacteria WQOs resulting from this statewide effort. We highly recommend that Orange County and all affected dischargers participate in the public review process on this action.

A Use Attainability Analysis (UAA) is not appropriately addressed in the TMDL process. States may remove a designated use, which is not an existing use, or establish sub-categories of a use if the State can demonstrate that attaining the designated use is not feasible. To change existing Beneficial Uses there is a need to rebut the presumption that the use existed on or after November 28, 1975. The bacteria indicator WQOs are the benchmarks that will be used unless scientific studies show that alternative site-specific water quality objectives (SSO) are appropriate for the waterbodies involved in this TMDL project. At this time, we have no plans to change the beneficial uses of the creeks involved in this TMDL.

For the San Diego Water Board to consider SSOs, the SSOs would need to (1) be based on sound scientific rationale; (2) protect the designated beneficial uses of the waterbodies; and (3) be adopted by the San Diego Water Board in a Basin Plan amendment. Dischargers or other interested parties would need to fund and initiate the scientific studies to develop the SSO. As stated in the previous comment, progress on these TMDLs would not stop for the development and adoption of SSOs. The bacteria TMDL would proceed as outlined in the Implementation Plan and SSOs could be incorporated into the TMDL when they are adopted by the San Diego Water Board.

We disagree with the concern of the appropriateness of the SHELL beneficial use. As stated in section 3 of the Technical Report, SHELL includes uses of water that support habitats suitable for the collection of filter-feeding shellfish for human consumption, commercial, and sport purposes. Collection of shellfish for consumption along California's coasts and bays is well documented for both commercial and sport purposes. Pismo (*Tivela stultorum*) and 7 species of Littleneck clams (*Chione californiensis, Chione fluctifraga, Chione undatella, Protothaca laciniata, Protothaca staminea, Protothaca tenerrima,* and *Tapes philippinarum*) are commonly collected by sport fishers

and regulated by the Department of Fish and Game.[9] The Pismo clam's historic range is from Half Moon Bay, CA to Socorro Island, Mexico and five of the seven mentioned species of Littleneck clams are found in Southern California (DFG, 2001). Department of Fish and Game biologists concur with the SHELL use designation for the entire Pacific Ocean coastline in the San Diego Region.[10]

Response (c): We can only take the action suggested in this comment if the regulatory action is being implemented by another State, federal, regional, or local agency, not the San Diego Water Board. Since the efforts in the watershed have not been successful in attaining and maintaining WQOs, or evidence submitted that *anthropogenic* bacteria sources have been abated, we are not compelled to remove the watershed from the TMDL process.

Comment 34

The modeling of the TMDL does not appear to have followed the guidance prepared by USEPA's Council for Regulatory Environmental Modeling. This guidance describes best modeling practices needed to determine when a model can be appropriately used to inform a decision (USEPA, 2003). Using best modeling practices allows decision makers be more informed about the confidence that can be placed in model results. A model's quality to support a decision becomes known when specific information is available to assess these factors. The guidance specifies that model developers: 1) subject their model to credible, objective peer review; 2) assess the quality of the data they use; 3) corroborate their model by evaluating the degree to which it corresponds to the system being modeled; and 4) perform sensitivity and uncertainty analyses. The model used in this TMDL did not conform to the guidance in the following ways:

a) Data Quality Objectives for the modeling were not set. There was no discussion on how good the model needed to perform to inform the decision. There are "recommended criteria" for modeled hydrology shown in a table without a corresponding discussion on how these DQOs were set. In addition, model predictions were still used even when these "recommended" criteria were exceeded.

b) Model performance was not quantified. Calibration and validation of model performance are presented only as figures for a visual inspection. Some error analysis was conducted for the wet-weather hydrology, but not discussed. There are several statistical tests that could be used to describe model performance. Bias can be described with the median scaled residual. Precision can be described with root mean square error, median absolute deviation, scaled residuals, or relative error.

Response: Data Quality Objectives, as defined by the USEPA guidance document, refer to the quality and quantity of data used to develop and corroborate models.

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[9] Department of Fish and Game. 2001. California's Living Marine Resources: A Status Report. December, 2001.

[10] Robin Lewis and Bill Paznokas, Department of Fish and Game, personal communication, November 3, 2006.

Section 3.1.3.1 of this report states, "this guidance uses the term data uncertainty to refer to the uncertainty that is caused by measurement errors, analytical imprecision and limited sample sizes during the collection and treatment of data." Data Quality Objectives do not refer to pre-determined margins of error that the models must meet to be sufficient for regulatory decision-making.

The "recommended criteria" for quantification of model error in predicting hydrology were obtained from a U.S. Geological Survey report.[11] These were reported to provide a reference for evaluation of model error and were used as a guide for model calibration. However, these criteria were not used for determining whether model output was acceptable for prediction of historic flows and watershed loadings.

Model calibration and validation can be performed using both quantitative and qualitative techniques. Qualitative calibration and validation are often performed using graphical analysis, as was reported for both hydrology and water quality for the dry- and wet-weather models of the report. For hydrology, several analyses were reported (35 pages of results) for multiple watersheds that included graphical and tabular comparison of measured and observed flows and volumes. Additional statistical quantitative analysis can be performed for hydrologic results, but such an analysis would provide no indication of the conditions (e.g., high flows or baseflows) or time periods (e.g., seasonal storms) that impact model results, and include specific modeling parameters for characterization. The analysis of hydrologic model error based on volumetric comparisons provided sufficient evaluation of model error for purposes of this study.

Comment 35

Sensitivity and uncertainty analysis was not conducted. Sensitivity analysis evaluates the effect of changes in input values or assumptions on a model's results. The report does a good job of identifying all the modeling assumptions (Appendix L), but does not provide any information on the significance of these assumptions to the model results. Uncertainty analysis investigates the effects of lack of knowledge and other potential sources of error in the model. In this case, uncertainty analysis could be conducted on the empirical relationships used to estimate flows and bacteria concentrations. Due to the high variability, the model should be run using input values representing high and low confidence interval values. This approach would give a range of predicted values and could be used to explicitly define the margin of safety (MOS). Similarly, the simple empirical relationship used between fecal coliform with enterococci and total coliform should also undergo uncertainty analysis. Additional examples of areas where an analysis of variability and uncertainty should be presented include:

a) How sensitive are the results to the critical wet year assumption?

b) How sensitive are the results to the model's estimates of wet season bacterial loadings?

[11] Lumb, A.M., McCammon, R.B., and Kittle, J.L., Jr. 1994. Users Manual for an Expert System (HSPEXP) for Calibration of the Hydrologic Simulation Program--Fortran: U.S. Geological Survey Water-Resources Investigations Report 94-4168.

c) How sensitive are the results to seasonal changes and other site-specific conditions (such as temperature, UV light intensity, salinity, etc.) relative to the first order die-off coefficient for the bacterial indicators?

d) How is the variability and uncertainty of the MPN unit of measure accounted for?

Response: In the guidance document prepared by USEPA's Council for Regulatory Environmental Modeling, Section 3.1.3.3 states the following:

> "Uncertainty analysis investigates the lack of knowledge about a certain population or the real value of model parameters. Uncertainty is sometimes reducible through further study and with the collection of additional data. Existing Agency guidance distinguishes uncertainty analysis from methods that are used to account for variability in input data and model parameters. Variability in model parameters and input data can be better characterized through further study but is usually not reducible."

Evaluation of the sensitivity of modeling parameters was a key consideration during the model calibration process to provide modelers insight regarding parameters requiring adjustment. The LSPC model used for estimation of wet-weather flows and bacteria loads includes several parameters based on typical vales reported in literature and similar modeling studies in Southern California, as well as calibration to local datasets. To provide information recommended by the commenter on model uncertainty based on sensitivity analysis, many model input parameters would require adjustment based on high and low confidence interval values. However, such confidence intervals are not available for each parameter, which would result in an arbitrary selection of a confidence range (e.g., +/- 50% of the parameter value). As a result, sensitivity analyses would be informative regarding sensitivity of each input parameter, but ranges of predictive values are not directly transferable for determination of model uncertainty and a numeric MOS with confidence. Moreover, additional non-modeling assumptions were considered in the implicit MOS of the TMDL, and quantitative measures of each of these assumptions relative to modeling assumptions will also require further study.

The uncertainty in the modeling is acceptable for the regulatory decisions required in this TMDL which is based on the best available data and method of analysis. We acknowledge that the development of the bacteria TMDLs is characterized by data gaps and uncertainties. Scientific uncertainty is a reality within all water quality programs, including the TMDL program, and it cannot be entirely eliminated. The TMDL program must move forward in the face of these uncertainties if progress in establishing TMDLs and attaining WQOs in impaired waters is to be made.

However, we recognize that the additional sensitivity analyses, as recommended by the commenter, would provide additional information regarding variability and potential error in key model assumptions. To effectively measure these uncertainties, additional data collection and further study will be required. This is a typical procedure for model development and continued refinements to better quantify model uncertainty and focus future study on addressing key data gaps and information required for model refinement.

Most previous monitoring studies in the region were not focused on providing data for model development. Although sufficient for development of the models for the purpose of this TMDL, future refinements in monitoring efforts can focus on collection of datasets specific to addressing uncertainty analyses and quantification of a numeric MOS. If additional datasets become available, evaluation of model uncertainty can be considered in future study and may result in re-evaluation of the TMDL and the MOS.

Comment 36

The conservative modeling assumptions used for an implicit MOS should be quantified. The assumption of not applying mixing zone in the surf zone is significant to the allocations. This approach applies the marine SHELL standard to the mouths of the freshwater streams. The report should explicitly list each of the conservative assumptions used to form the MOS and (at least) discuss the relative magnitude of the assumption on the estimated loading capacity.

Response: The implicit MOS of this TMDL included both modeling and non-modeling assumptions outlined in Appendix L and section 8.1.7. For example, the assumption mentioned by the commentator regarding the lack of mixing zone in the surf zone was not a modeling assumption and is therefore not quantifiable using either the wet- or dry-weather model. All conservative assumptions used for the MOS are listed in Appendix L and section 8.1.7. To explicitly list relative magnitudes of each assumption on the estimated loading capacity would require an explicit, quantifiable MOS. An explicit MOS is not required for calculation of TMDLs.

Comment 37

Dry weather loading was estimated based on 'average' dry weather flows. Flow distributions are almost always log-normal with a left skew. Average (or mean) values do not represent the central tendency of the distribution. Median flow values should be used since mean flow values will greatly increase the loading due to higher assumed flow.

Response: The average flows calculated for the dry-weather model were based on dry-weather monitoring data collected from Aliso Creek, Rose Creek, and Tecolote Creek. These average flows were relatively small, ranging from 0.007 to 0.23 cfs. The differences between calculated median and average (mean) flows are less than 0.05 cfs, which are negligible. Moreover, the monitoring data are unlikely to be accurate within this range. Thus, average flows are acceptable for estimation of dry-weather flows in this study.

Comment 38

P. 5, Section 1.2, para. 3: the identification of MS4s as the primary source of bacteria does not acknowledge the fact that MS4s often act as conduits for background sources of coliforms such as wildlife and soils. The presence of bacteria in an MS4 does not automatically mean that all such bacteria derive from urban sources.

Response: We recognize that MS4s act as conduits for background sources of bacteria. Although MS4s are identified as the primary transport mechanism of bacteria discharges, we did not assume that all bacteria are derived from urban sources. The reference system approach, which will be incorporated into the Basin Plan permanently, accounts for discharges of bacteria from background sources. Loads that are generated by background sources were quantified for each watershed. These loads are assumed to be generated by the open space, open recreation, and water land uses. Loading from background sources was found to vary by watershed. For example, background sources account for about 60 percent of the fecal coliform loading to the Aliso Creek watershed, while only about 8 percent in the San Marcos watershed (Figures I-5 and I-10, Appendix I).

Dischargers are not required to reduce loads caused by background sources, even though these loads are eventually transmitted to receiving waters via MS4s. For each watershed, a total existing load was calculated that included loading from background sources. Dischargers are not required to reduce loads identified as originating from background sources (the highest loads demonstrated in the load duration curves in Appendix O). Dischargers are required to reduce the loads from urban sources (the remaining loads in the load duration curves that exceed the numeric target line and therefore exceed the assimilative capacity of the waterbody.) In this approach, the San Diego Water Board assumed that the highest loads generated in each watershed during a wet weather event are caused by natural sources, and therefore are not the responsibility of the dischargers.

Comment 39

The document apparently misses an opportunity to improve understanding of the reference watershed approach by comparing data from the San Mateo Creek and Arroyo Sequit watersheds. Such a comparison could have shown whether patterns of dry- and wet-weather exceedances differed. Conversely, if the data were not comparable (e.g., because sampling locations were fundamentally different), then this could provide guidance for the design of additional reference watershed sampling.

Response: The discussion regarding the San Mateo and San Onofre Creek watersheds suggested that these watersheds could be explored for the purpose of establishing a reference system applicable to the San Diego Region. Once a reference system is properly characterized and exceedance frequencies are quantified for wet weather flows, then a Basin Plan amendment will be adopted to establish implementation provisions for the purpose of calculating final TMDLs.

The data provided in Tables 4-1 and 4-5 were collected by the San Diego County DEH during routine monitoring as part of a wider beach monitoring program. These data were not collected for the purposes of characterizing a reference watershed during stormflow conditions and were for the most part collected during dry weather. In contrast, the data collected at Leo Carillo Beach at the mouth of the Arroyo Sequit watershed was collected primarily for the purpose of quantifying exceedance frequencies for this relatively undeveloped watershed during storm flow conditions.

Since the first draft of the Technical Report was available for peer review in February 2004, SCCWRP has completed one study looking at potential reference watersheds in

southern California.[12] San Mateo Creek watershed did not meet the criteria for a reference watershed because it does not have less than 95 percent undeveloped open space (more than 5 percent of the watershed has been urbanized).

In light of this newer information, comparing the data from the Leo Carillo Beach to the DEH data from beaches at the mouths of the San Mateo and San Onofre Creeks is not appropriate.

Comment 40

P.50, Section 5.3: The "statistical comparison of flow versus bacterial density" referred to here is exceptionally weak, with conclusions based on simple visual inspection rather than statistical analysis. In particular, Figures 5-5 and 5-6 are interpreted to mean that bacteria sources must be assessed during both wet and dry weather periods. However, other more important implications of the data are not addressed. For example, the right-hand portion of both figures shows little if any relationship between seasonal changes in river flow and bacteria levels at nearby beaches. In fact, for the riverine flow to consistently be the major source of the observed bacteria levels would almost require an inverse relationship between flow and loads. Because of the implications of the assumptions regarding flow versus bacterial density underlying this TMDL, such relationships should be investigated with formal statistical analysis.

Response: We agree that Figures 5-5 and 5-6 suggest that little if any relationship exists between seasonal changes in river flow and bacteria levels at nearby beaches. In fact, the purpose of including these figures was to demonstrate this variability. Because such variability exists between flow conditions and bacteria loading, evaluating this relationship using two distinct modeling platforms were necessary. By doing so, better modeling results were attained for dry weather flows.

The modeling analysis does not assume that there is a consistent relationship between flow and bacteria loads. Bacteria loads are assumed to be a function of land use types comprising each watershed, as discussed in the source analysis.

Comment 41

P. 51 Section 6.1 para. 4: The statement about the dependence of bacteria concentrations on land use is essentially lacking in content, and therefore not useful in evaluating the modeling approach and results. The description of the watershed model in the Appendix refers to a SCCWRP study and a Regional Board publication, but presents no actual data on bacteria loads from different land uses. Because these data are so key to the model results, this paragraph, or the Appendix, should present the estimates of loads from specific land uses and discuss their implications. For example, there should be a logical relationship between the relative magnitude of loads from urbanized and open space land

[12] Schiff, K., J. Griffith, and G. Lyon. 2005. Microbial Water Quality at Reference Beaches in Southern California During Wet Weather. Southern California Coastal Water Research Project Technical Report # 448. Southern California Coastal Water Research Project, Westminster, CA.

uses, the proportion of each watershed in open space, and the size of the background allowance for each watershed. In general, there is a lack of such internal consistency checks in the validation of the modeling assumptions.

Response: The SCCWRP modeling study referenced in the text provides documentation of the differences in monitoring data and resulting development of land-use-specific modeling parameters. The pie charts referenced in section 6.1.1 and provided in Appendix I provide much information regarding the relative magnitude of loads from land uses. These load estimates are based on model estimates that are impacted by land-use-specific modeling parameters, spatial distribution of rainfall and sources, and land use area in each watershed. Although allocation of loads to background allowances is relevant to the Source Analysis, quantification of these loads and discussion of identification of allowances are discussed fully in section 8 (Allocation and Reduction Calculations).

Validation of modeling assumptions specific to land uses was limited by the lack of land-use-specific water quality data collected in the San Diego Region. For this reason, modeling parameters were obtained from monitoring and modeling studies performed in the Los Angeles Region, and validated at a watershed scale for the present study. If sufficient land-use-specific monitoring data are collected in the San Diego Region to provide acceptable validation of modeling assumptions for each land use, the model can be validated further in the future.

Comment 42

P. 54, Section 7: This section, which describes the rationale for choosing between the steady-state and dynamic modeling approaches, is internally inconsistent. Steady-state models are described as best suited to streams dominated by point source inputs with impairment only under low-flow conditions. Dynamic models, in contrast, are more suited to streams affected by nonpoint sources or rainfall-driven flow and pollutant contributions. Preceding sections make it clear that the bacteria problem in watersheds in the San Diego Region occurs in both dry and wet weather and the document argues that bacteria loading is driven by the rainfall-mediated washoff of bacteria accumulated on land surfaces, a notably variable process. This would suggest that a steady-state model is not appropriate. However, on the basis of an unsupported assumption that the Region is "dominated by nonpoint sources that are generally constant on an hourly time step and deposit directly to drains," a steady-state modeling approach is chosen. There is no documentation given for this assumption about the behavior of nonpoint sources, nor is there any reference to more detail in an Appendix. In fact, available data show strong variability in flow and bacteria levels over the course of a day. The conclusion that the nonpoint sources can be treated as point sources is thus simply an assertion, and it seems that this decision may have been motivated instead by the availability of data. Given the rather significant management implications of the TMDL targets, which are based on modeling results, this level of justification for a major technical decision is inadequate. The evidence for the "generally constant" behavior of nonpoint sources should be presented and the sensitivity of the modeling results to different technical approaches should be investigated.

Response: The statement that the "document argues that bacteria loading is driven by the rainfall-mediated washoff of bacteria accumulated on land surfaces, a notable variable process" refers to wet weather conditions when rainfall occurs. The steady-state model is used to represent streams during periods of no rainfall when flows are less variable. We have acknowledged that under dry conditions, dry-weather flows also exhibit variability that is not simulated by a steady-state model. Regardless, the steady-state model provides simulation of average conditions that are comparable to the dry-weather numeric target based on the 30-day geometric mean WQOs. If variable minimum and maximum daily dry-weather flows and bacteria concentrations were predicted, this would also require comparison to numeric targets based on single sample maximums. Such variability is expected to be watershed-specific, and therefore should be based on data collected in each watershed for accurate estimation of ranges. If additional data are collected through further study to provide prediction of daily ranges of bacteria loads for each watershed, we will consider re-evaluation of the TMDL.

The assumption in the comment that the Region is "dominated by nonpoint sources that are generally constant on an hourly time step and deposit directly to drains" refers to wet weather, for which a LSPC model was developed that provides hourly predictions of flow and bacteria concentrations assumed constant during each hourly time step. This does not refer to an assumption used in selecting a dry-weather modeling approach, as stated by the comment. The text has been clarified to this effect.

For all models, simulation of receiving waters such as rivers requires assumptions for specific locations for inflows and associated bacteria loading from watershed runoff. In the current study, model development for wet and dry periods required estimation of sources from runoff that were simulated as discharges to the receiving waters (rivers) at specific locations. In this way, nonpoint sources are treated like point sources within the modeling domain. This is a basic assumption for model development and is not based on data availability, nor does such a basis need to be established since this is a basic concept for model development.

The steady-state approach for defining dry-weather flows and bacteria loads is acceptable and adequate for loading assessment and TMDL calculation. A steady-state approach for prediction of dry-weather flows is typical for source assessments used in TMDLs. Similar modeling approaches have been used for calculation of TMDLs in the Los Angeles Region where dry-weather runoff is also common, including TMDLs for Ballona Creek and Los Angles River, and models currently under development by USEPA for estimation of dry-weather loads to San Gabriel River and Los Angeles and Long Beach Harbors.

Comment 43

P. 58 Section 8.1.1, para. 3: The selection of the baseline year for modeling wet year loads is critical. It would be useful to see model runs that show the sensitivity of the TMDL targets to different rainfall years. As it stands, the choice of this particular year seems arbitrary.

Response: The critical wet year was the wettest year of the model simulation period based on rainfall data used to develop the wet-weather model. The model simulation period was from 1990 through 2002. Year 1993 was characterized with the most rainfall, and produced more flows and resulting loading of bacteria to receiving waters than any other year during the simulation period. Since the TMDL must provide protection of receiving waters during all periods when the designated use is applicable, including periods most impacted by watershed flows, the wettest year was used as the critical period for TMDL calculation. Reduction in bacteria loads calculated based on the critical wet year provides assurance that load reductions will be sufficient during all periods. The same critical wet year was used in calculation of TMDLs for Santa Monica Bay Beaches in the Los Angeles Region. Therefore, selection of this critical period was not arbitrary.

Comment 44

This section reflects an incompletely developed conceptual model of background or natural sources of bacteria. The conceptual model implicit here and in other places in the document is that bacteria from natural sources enter receiving waters either directly (e.g., waterfowl) or as the result of runoff directly into receiving waters from open space. The possibility that bacteria from natural sources could enter MS4s is apparently not considered and/or accounted for. The only way the statements in the document can be understood to be logically consistent is as follows:

- Natural sources are uncontrollable.
- Sources from urban runoff associated with MS4s are controllable. Therefore, natural sources do not contribute to urban runoff in MS4s.

However, this does not account for observations that:

- Wildlife (e.g., rabbits, skunks, coyotes, birds) frequent developed areas and bacteria from their droppings enters the MS4 via runoff after rain
- MS4s in many locations drain combinations of urbanized and open space, for example, where development abuts open space and runoff from the open space flows onto streets and then into the MS4
- Portions of the MS4 (e.g., stormdrains and channels) are used as habitat by some species of wildlife.

Assuming that these sources are controllable simply because they end up in the MS4 is simplistic and is unrealistic.

Response: This comment incorrectly states that the possibility that bacteria from natural sources could enter MS4s is not considered or accounted for. Bacteria loading was modeled as a function of land use, and all land uses have both natural sources (wildlife) and anthropogenic sources of bacteria. Once pollutants are washed into an MS4, municipalities are responsible for these pollutants in the waste stream discharged from the MS4s. The commenter misunderstands the application of the reference system approach. See the response to Comment 38.

We recognize that MS4s act as conduits for background sources of bacteria. Although MS4s are identified as the primary source of point source discharges, that all bacteria are derived from urban sources is not assumed. The reference system approach allows the San Diego Water Board to adopt a TMDL that allows a certain exceedance of WQOs attributed to natural sources. The TMDLs also allocate loads to uncontrollable non-point sources assumed to be generated mostly on open space land. If a significant portion of the loads generated on open space are transmitted to receiving waters via MS4s, then that portion of the load allocated to uncontrollable non-point sources could be reallocated to the municipal dischargers. Information is needed to quantify such a reallocation.

Comment 45

P. 58, Section 8.1.1: The justification for the selection of the critical wet-weather condition is not logical. Flows in creeks and rivers in southern California during "extreme wet conditions" are high and rapid, the ocean environment off creek and river mouths is turbulent and dangerous, and REC1 use at these places and times is highly unlikely. In fact, anyone engaging in body contact recreation under these conditions might well run a much higher risk of drowning than of illness from exposure to contaminated water. Standard risk management approaches typically focus on circumstances in which risk is highest, generally assessed as a combined function of the level of hazard and the number of people exposed. While the level of the hazard in the wet-weather critical period is high, the number of people exposed is most probably extremely limited. Therefore, the justification for using this period to set the TMDL targets, with their attendant consequences for management policies and implementation costs, is weak.

Response: We disagree that the selection of the critical wet-weather condition is not logical. The bacteria TMDLs must ensure that WQOs are met in all conditions and at all times. The critical wet-weather condition was selected because this period would produce the highest possible load from the watershed. Furthermore, the scientific peer review panel did not have any issues with the use of critical wet weather conditions. Both reviewers commented that the use of a single-sample maximum for the wet weather targets is a reasonable approach. See Appendix A, responses to Item 4.

The REC-1 beneficial use is a component of a water quality standard and is not intended to be used as a risk management index that calculates a level of risk. The bacteria TMDLs will not address issues dealing with the appropriateness of existing REC-1 beneficial uses or the bacteria water quality standards in the Ocean Plan. These types of issues are more appropriately addressed by amending the WQOs in the Ocean Plan through the formal amendment process.

The commenter should also keep in mind that the wet weather TMDLs address not just the period of the storm, but the 72 hours after cessation of rainfall when bacteria levels remain high at beaches. Weather can improve significantly within 1 to 3 days of a storm, so the assumption that inclement weather keeps swimmers out of the water during storm flow conditions is not entirely correct.

Comment 46

P. 59, Section 8.1.4: The fundamental assumption underlying the location of the critical point, i.e., that "bacterial densities are assumed to be greatest" at the "mouths of the watersheds" is not supported by reference to any data presentation or process model. If this is a prediction of the modeling, it should be so referenced. However, this is not consistent with available monitoring data. For dry weather, the extensive Aliso Creek monitoring data showed that densities were consistently higher in the upper reaches of the watershed, where the ratio of discharge input to ambient flow is highest and where die-off has not yet had much opportunity to affect bacteria populations. Given the Aliso Creek data, it is not logical to assume that compliance with WQOs must be "maintained for all segments of a waterbody to ensure that impairments of beneficial uses are not observed." There are many plausible scenarios in which a combination of spatially heterogeneous bacteria input combined with progressive die-off might lead to meeting WQOs at the mouth of the watershed.

Response: The assumption for the critical point was not a modeling assumption, but rather a conservative assumption specific to TMDL calculation. The higher bacteria concentrations referred to at the mouths of watersheds refer to data collected at beaches and creeks. A robust analysis of these data is discussed in section 5.2, with maps presented in Appendix H showing spatial variation in observed ranges of indicator bacteria. These results showed that higher bacteria densities are common in the vicinity of the mouths of creeks and major stormwater outfalls.

We agree that concentrations within streams throughout a watershed are not likely consistent with concentrations at the mouths of watersheds at the critical point used for TMDL calculation. The longitudinal variation of bacteria densities within streams resulting from various sources and instream die-off was considered in development of models for dry and wet weather. Regardless, a single point for TMDL calculation was determined for each watershed, thus resulting in a "watershed approach" for calculation of the TMDL, wasteload allocations, and necessary load reductions. Otherwise, separate TMDLs would require calculation for each subwatershed throughout the region shown in Appendix E, which would create unnecessary detail and confusion since this includes over a hundred subwatersheds.

Comment 47

P. 68, Section 9.1.1: The text states "Comparing the final wet weather allowable loads to the loads allocated to uncontrollable sources shows that, in every watershed, the uncontrollable nonpoint source allocation is greater than the TMDL. This indicates that the natural bacteria sources in the watersheds consume and exceed the assimilative capacity of the creeks, resulting in allocations of zero loads to all remaining sources, namely controllable point and nonpoint sources." This being the case, water quality objectives will not be met during wet weather regardless of control efforts taken by dischargers to control urban discharges. This calls into question the need for designating wet weather reductions and the benefit to be gained from the expense incurred through BMP installation and maintenance.

Response: Bacteria loading from urban creeks should be reduced even though open space loading exceeds the capacity of the creeks and beaches because pet waste and human sewage are more likely to occur in urban runoff. We recognize that it will be difficult for dischargers to meet final allocations and WQOs during wet weather. Therefore, we are developing a Basin Plan amendment to permanently incorporate a reference system/natural sources exclusion approach for implementing bacteria WQOs, as described in the response to Comment 2.

Comment 48

P. 94, Section 10.2.3: The text states, "Excess fertilizers and **irrigation runoff** (emphasis added), as well as rainfall runoff, can wash bacteria and sediments off properties into nearby waterways." This contradicts previous statements that dry weather allocations for sources other than MS4s were not necessary due to the lack of flow to transport bacteria to waterways. Dry weather allocations should be developed for identified nonpoint source dischargers. This comment applies to Agricultural fields, orchards, and dairy/intensive livestock and horse ranch facilities.

Response: The statement that irrigation runoff can wash bacteria into nearby waterways is meant to identify a potential, not actual, bacteria source and/or transport mechanism. Whether or not bacteria loads are definitively generated by irrigation runoff is unknown.

Dry weather allocations may be developed for nonpoint source dischargers if it is found that irrigation runoff volume is comparable to urban runoff volume. Such a determination will be made only after steps are taken to enforce applicable WDRs and waivers. Please see the response to Comment 23.

Comment 49

Table 5-5 – Summary of Enterococci Data for Impaired Creeks – The County of San Diego requests the removal of Pine Valley Creek as it is not part of this TMDL.

Response: Table 5-5 has been modified as requested.

Comment 50

Executive Summary. Numeric Target Selection. We recommend that this section be revised for clarity. The use of the Interim TMDL is introduced in the second sentence and should be explicitly defined here; that it allows for the natural, largely uncontrollable sources of bacteria. A measurement of a reference watershed, one that is minimally impacted by human activities, serves to determine the natural sources of bacteria. The details of the interim TMDL then can be explained in the third paragraph by first stating that it is based on the reference system in Los Angeles County and then citing the 22% exceedance frequency of occurrence for the WQOs. The report should indicate whether the Los Angeles County reference system will be used or whether a San Diego based reference system will be developed and used instead. We question the use of the Los Angeles County reference system without adequate validation for this region. The Board has announced that a CEQA scoping meeting is scheduled in March of this year for an

amendment to the Basin Plan to incorporate the reference system. The selection of a validated, specific reference system would have to be in the amendment.

Response: The Executive Summary has been modified for clarity. In particular, the text has been modified to state that, if the proposed Basin Plan amendment authorizing the use of a reference system approach is adopted and approved, final TMDLs will be recalculated that will allow WQOs to be exceeded based on the frequency of exceedance of WQOs in a reference system. The Basin Plan amendment will not specify which reference watershed(s) or exceedance frequencies are appropriate for wet weather TMDL calculations. Designation of an appropriate reference watershed, for purposes of calculating TMDLs, will take place in a case-by-case basis. As more reference systems are studied and characterized, the San Diego Water Board will be better able to match an urbanized watershed with an appropriate reference system.

Comment 51

The report should address the bacteria loads from onsite wastewater treatment systems (e.g., septic systems). The State Water Resources Control Board has recently conducted hearings on the provisions of AB 885 and has prepared several reports. One that is of interest is the "Onsite Wastewater Treatment System Repair of Failure/Malfunction Survey, January 2003". The survey reports that 500 systems in San Diego County required repairs. We can expect an increase in housing along with the number septic systems in the rural areas of the County. Consequently, the implementation plan should have measures to minimize septic system failures to assure conformance with the load allocations. This is a different situation from POTWs as there is no formal, regular monitoring of these septic systems.

Response: The Technical Report was revised in the March 9, 2007 version to address septic systems. Section 10.2.3 now includes a discussion of septic systems as a potential nonpoint source of bacteria, and owners of individual septic systems are identified as persons responsible for controllable nonpoint source discharges in section 10.4. Additionally, section 11.5.5 has been modified to state that the San Diego Water Board will implement load reductions from nonpoint sources by enforcing waivers with respect to conventional septic systems, subsurface disposal systems for residential units, commercial/industrial establishments, and campgrounds, and waivers for alternative individual sewerage systems.

Comment 52

Section 8.1 Wet Weather Loading Analysis refers the reader to Appendix N for a comparison of the modeling results to observed bacteria densities. Figures N-1 to N-11 compare the time series of observed and modeled data. These results do not reveal very good model fidelity. Figures N-12 to N-24 chart the percentile unit area flow per day for the observed with the modeled data for fecal coliform, total coliform and enterococcus. Here the fidelity of the model varies from poor to good. The text should provide the reader with a candid evaluation of the modeling results. What are the expected errors? Does the margin of safety assigned in the TMDL account for the model errors?

Response: The comparisons of model results to observed bacteria densities shown in Figures N-1 through N-11 of Appendix N show acceptable model fidelity for this study. Recall that bacteria modeling parameters were obtained from a robust calibration process performed by SCCWRP based on detailed storm-specific water quality data collected from homogeneous land use sites in Los Angeles. Similar detailed datasets are currently not available in the San Diego Region to provide consistent evaluation of model simulation of land use sources. Therefore, the present study relied on the previously calibrated values, which were validated based on instream data shown in Appendix N. All bacteria data collected in modeled watersheds were utilized for this validation process, although datasets consisted of grab samples or storm composite samples at locations and frequencies that were not sufficient for detailed comparison with model output. In addition, data collected at specific locations, often at the bottom of a watershed below a large area with multiple land uses, did not include significant datasets to justify refinement of land-use-specific modeling parameters.

Where data were not collected at consistent locations of model subwatershed outlets, data collected throughout the subwatersheds were pooled and relative ranges of observed bacteria densities were compared with ranges predicted by the models at the subwatershed outlet. The results shown in Figures N-12 through N-24 provide an analysis of the general trends, but were not used to support or justify calibration of modeling parameters. Regardless, comparisons in Figures N-12 through N-24 were provided in an attempt to utilize all data collected in the region, although these datasets may not be suitable for robust model calibration, nor was the purpose for their collection associated with watershed model development. However, results of these comparisons show the dependence of both model results and observed data on flow magnitudes, which were normalized in these figures based on watershed area. Except for lower flow ranges, the general trend of model results and observed data appear to be consistent relative to the flow. To address low-flow periods that were not predicted with accuracy based on LSPC, a separate modeling approach was developed.

Previous monitoring plans were not focused on collection of data required for calibration or validation of watershed models. Regardless, results of the model validation for water quality were reported in Appendix N to provide indication of the accuracy of the model. Not enough water quality data were available in each watershed to provide meaningful evaluation and quantification of model error based on statistical calculation. Evaluation of model error is also confounded by the highly variable bacterial concentrations (levels often vary by multiple orders of magnitude), which impact statistical calculations. Hydrologic model uncertainty also impacts model error in load prediction, which were evaluated separately in Appendix M. Due to the complexity in evaluating model error for each watershed, model error is not included explicitly in the TMDL margin of safety. Rather, an implicit margin of safety was assumed resulting from multiple conservative assumptions listed in Appendix L and section 8.2.5.

Comment 53

Section 6.2, 6.3, Point/non-point sources. Landfills, active and post closure, are not listed. Solid wastes contain animal wastes, pathogens, and may contain sewage sludge.

A review of the monitoring and reporting requirements of several landfills in this region do not contain bacterial monitoring of surface runoff. Explain why landfills should not be listed as a source.

Response: We concur that landfills are a potential bacteria source, therefore, the Technical Report was revised in the March 9, 2007 version to include a discussion pertaining to the possibility of landfills as a bacteria source.

Comment 54

Source analysis and bacteria re-growth issue. During the SAG meetings, bacteria re-growth in wrack lines, storm drains, culverts, and streams was discussed. The report, section 7.1.1.d, Constituents, states that bacteria concentrations are influenced by several factors including re-growth. However, Appendix L Assumptions states that the wet and dry weather models assume zero re-growth based on lack of data or literature. Were computer studies conducted to evaluate the influence of re-growth on the results? Were sensitivity studies conducted with bacteria die-off rate set to zero? A study conducted at the University of Alabama at Birmingham on the survivability of pathogens indicates that computer models using first order die-off rate of indicator bacteria may be an oversimplification. A report by the Regional Cooperation for Water Quality Improvement in Southwestern Pennsylvania in Southwestern Pennsylvania indicates that re-growth of bacteria adsorbed in sediments occurs and indicator bacteria concentrations can rise sharply with resuspension of sediment in streams in warm climes.

Response: Bacteria re-growth is a complex process that must consider site-specific features of a watershed for estimation (e.g., temperature, organic material). Information for quantification of re-growth is not available for all watersheds in the region modeled in this study. As a result, assumptions were required to provide consideration of potential re-growth in the models.

We assumed bacteria re-growth occurs predominately during dry periods when stream velocities are low and travel times are longer, providing sufficient opportunity for re-growth to occur before discharge to coastal waters. Therefore, wet-weather models did not include re-growth, but rather assumed a first-order die-off rate based on literature values. For dry weather, the steady-state models were calibrated to determine a "net" die-off rate to assume for all streams (Appendix K). This calibration process was based on changes of observed bacteria levels occurring longitudinally in streams (where/when bacteria data were available), which are subject to many complicating factors that can enhance or impede die-off rates, or even be offset by potential re-growth. Regardless of these complicating factors, a net reduction rate of bacteria was calibrated. Although these net rates are assumed to result primarily from die-off, additional factors such as re-growth are also assumed to be incorporated implicitly within these values. As a result, if re-growth is present within those streams used for calibration of net die-off rates in the dry-weather model, this will essentially result in net die-off rates that include both die-off and re-growth in their value.

As additional data are collected through further study to determine site-specific bacteria die-off and re-growth rates for each stream modeled in the region, the dry-weather model

can be updated. Until such data is available, we believe that the present assumptions for bacteria die-off and re-growth are sufficient for both wet and dry conditions.

Comment 55

Section 10.3, 10.4. Landfill operators, both active and post closure, should be listed as dischargers.

Response: Section 10 of the Technical Report describes the legal authority for the implementation plan, including identification of dischargers. This section has been revised in the March 9, 2007 version of the Technical Report to identify landfill operations as potential (not known) bacteria sources. Because landfills are potential bacteria sources, landfills are discussed in section 11 under "Additional Actions" by the San Diego Water Board. This section describes actions we will take to determine whether or not landfills contribute significant bacteria loads to impaired waters.

Comment 56

Page 101, Section 11.3.3 states that only one WLA is assigned to the municipal dischargers in each watershed. This requires the municipal dischargers to be collectively responsible for meeting the WLA. Because computer modeling was used in developing the WLAs, will these municipal dischargers have access to and assistance in using the computer models as a tool to evaluate their management strategies and BMPs?

Response: The municipal dischargers, and other interested persons, will have access to the computer models as a tool to evaluate their management strategies and BMPs.

Comment 57

The USEPA is concerned that the units for the TMDL and allocations are expressed as number of bacteria colonies "per year" rather than "per month" or "per day."

Response: Wet weather TMDLs are best expressed as an annual load because of the extremely high daily variability in storm flow magnitude and loading in the watersheds addressed by these TMDLs. The variability in the modeled daily loads is evident in the load duration curves in Appendices O and P.

We agree that the dry weather TMDLs are better expressed as monthly loads rather than annual loads. This approach makes sense because the numeric targets are equal to the 30-day geometric mean WQOs, and the dry weather model simulates average flows. Tables 9-3, 9-6, 9-7, and 9-10 were updated or created in the August 4, 2006 version of the Technical Report to express the dry weather TMDLs as monthly loads.

Comment 58

The TMDL needs to develop load and waste load allocations for all identified sources of bacteria for both dry and wet weather. Only wet weather loadings have been developed for controllable and uncontrollable non-point sources. This erroneously ignores irrigation practices on agricultural areas during dry weather and documented

natural dry-weather base flow and bacteria in perennial creeks in the watersheds. Despite this consensus, no change was made for dry-weather conditions in the Revised Draft, presumably due to perceived data gaps. Substantial research efforts on natural uncontrollable wet- and dry-weather loads are currently being conducted by the Southern California Coastal Water Research Project, and full findings will be available within another two to three years. For example, the SCCWRP work will help address the need for determining a natural exceedance-day percentage for *creeks* under wet-weather conditions (the exceedance-days allowance currently incorporated is based only on *beach* data). Based on the Final TMDL modeled calculations of uncontrollable natural loads, the natural *creek* wet-weather exceedance rate could be expected to be closer to 100% than to 22%. It is critical that this and many other data gaps and scientific findings, such as land use changes since 2000 and improvements in tracking actual pathogens, be acknowledged. As concurred by the entire SAG, ***the Implementation Plan should include a time period to collect the data necessary to enable the model to simulate a more accurate representation of each watershed. Once the additional data have been collected, the plan should commit to a recalibration of the model and a re-evaluation of the TMDL targets, load and waste load allocations. The Report should clearly establish a commitment to re-evaluate and re-calculate the TMDLs on a five-year schedule.*** Establishing a pre-set re-evaluation commitment would avoid the probability of individual watershed stakeholders requesting piecemeal reviews and straining the time and resources of both the RWQCB and the public. Without a specific commitment in the Report to re-calculating the TMDLs, permittees cannot be assured that RWQCB resources will be committed to this effort. This issue is critical enough that we anticipate that the MS4 permittees would be more than willing to commit their own resources to the re-evaluation efforts.

Response: We developed LAs and WLAs only for the significant sources of bacteria (allocations were not developed for insignificant sources of bacteria for dry weather TMDLs). The rationale for doing so is explained in the response to Comment 23. Nonetheless, the Implementation Plan requires that agricultural operations comply with WDRs or the waivers of WDRs for irrigated agriculture. Enforcement of WDRs and waivers should ensure that loading from this source is minimized.

We recognize that the models used for TMDL analysis could be improved with additional data, and that the models produce the most accurate results when the latest and best information, such as the results of SCCWRP's reference watershed study, is utilized. However, attempts to restore water quality and meeting the TMDLs as calculated must not be delayed for acquisition of new information. Even as new information is being sought, attempts to decrease existing bacteria levels must take place, since bacteria contamination is indicative of a public health risk. Available information indicates that high bacteria densities have persisted in the beaches and creeks included in this project. Even if new data and information is obtained that result in more accurate model and TMDL results, chances are that significant load reductions would still have to take place. As the waterbodies included in this project have been on the List of Water Quality Limited Segments for years, there is no reason why dischargers cannot begin or continue with attaining load reductions immediately.

We will recalculate TMDLs after the reference system approach/natural sources exclusion Basin Plan has been adopted. However, we cannot commit to reevaluating the watershed models. TMDL recalculation based on new models will occur when data exist to fill gaps and in accordance with San Diego Water Board resources and priorities. However, interested persons can request the San Diego Water Board to initiate the Basin Plan amendment process to incorporate new information at any time, as described in section 2.3 of this appendix.

Alternatively, dischargers are encouraged to formulate a workplan for model refinement. The purpose of this workplan would be to identify and generate information that could be used to refine the models used to calculate TMDLs. This information could consist of, for example, water quality data, flow data, and land use data. This workplan would be written and executed by dischargers, with oversight participation by the San Diego Water Board. Additionally, if San Diego Water Board resources are not available to prepare a TMDL Basin Plan amendment, workplan participants could lead a third-party TMDL effort. For example, the SAG could draft the TMDL documents, leaving staff the job of taking the TMDLs through the Basin Planning process.

Information obtained in a Model Refinement Workplan may or may not overlap with information obtained as required by the Bacteria Load Reduction Plans discussed in section 11.5 of the Technical Report. A suggested series of steps involved with a Model Refinement Workplan is discussed below.

1. **Development of Workplan and Identification of Participants**. Dischargers in watersheds subject to this TMDL who are interested in model refinement would submit a Model Refinement Workplan that describes what information is to be gathered, who is participating in the effort, and how this information is to be utilized for model refinement and TMDL recalculation.
2. **Identify Funding Sources**. Participants in the Model Refinement Workplan would identify funding sources for the needed work, including grant opportunities from the State Water Resources Control Board or the USEPA.
3. **Data Collection**. Participants in the Model Refinement Workplan would collect data to fill identified data gaps in the TMDL models. This could consist of, for example, flow data, water quality data, and land use data.
4. **Model Execution**. Once a sufficient amount of data has been collected, workplan participants could reconfigure and/or re-run the computer models, or hire a contractor to perform this task.
5. **Lead a third-party TMDL effort**. If staff resources from the San Diego Water Board are not available to prepare a Basin Plan amendment to incorporate modified TMDLs, then the workplan participants could coordinate this effort via a third-party agreement with the San Diego Water Board.

Refinements to the computer models as a result of such efforts would not necessarily be limited to recalculation of bacteria TMDLs. The computer models used for development of the bacteria TMDLs could also be used to calculate TMDLs for other pollutants. For this reason, we encourage the collection of data for other impairing pollutants in addition to bacteria.

Comment 59

Page 33, the document indicates that WQOs are expressed as the most probable number (MPN) of bacteria, many of the existing monitoring programs which are referenced in the document express indicator bacteria in CFUs. In terms of evaluating compliance, we consider these equivalent, unless otherwise advised.

Response: We agree with the comment and therefore consider the alternate metric for measuring bacteria, "colony forming units" (CFU), equivalent to "most probable number" (MPN).

Comment 60

It is unclear how the Total Maximum Daily Loads correspond to each of the Model Subwatersheds and Hydrologic Descriptors identified in Tables in Section 9.

Response: The TMDLs do not correspond directly to each model subwatersheds, but rather are the sums of the allowable loads for each of the model subwatersheds. An "allowable loading" was calculated for each of the subwatersheds (the delineations of the subwatersheds are shown in Appendix E). The subwatershed identification number originates from the numbering system used in model development for tracking the routing of flows and bacteria loads through the watersheds. For example, the San Clemente hydrologic area is composed of subwatershed numbers 501-506. The allowable bacteria loading calculated for each subwatershed was then summed to produce a TMDL for the entire watershed, which are reported in Tables 9-1 through 9-12.

Comment 61

The maps provided in Appendix E should include more information, such as jurisdictional boundaries, major roadways for reference, waterbody names for reference, etc. The County may be able to provide this information.

Response: The subwatersheds were modeled to calculate allowable bacteria loading for each watershed as a whole. The maps in Appendix E show the subwatershed boundaries only. Although additional information on the maps may be desirable, the maps are adequate for their purpose. Considering the time constraint, we will not update these figures.

Comment 62

The Report should reflect all current work/studies as of date of writing, for example, the reference beach study for the San Diego Region should be included in this TMDL document at this time.

Response: The reference beach study to which the commenter refers has been cited in the Technical Report. All relevant work to date that has a direct impact on these TMDLs has been cited.

Comment 63

Wet Weather Model Selection. The EPA supported LSPC watershed runoff model, based on the Hydrologic Simulation Program Fortran (HSPF) (Bicknell et al., 1997; 2001), was used to simulate a continuous multi-year time series of streamflow, land use dependent bacterial loading and bacterial transport and fate in the streams of the San Diego Region watersheds of the study. The watershed model framework of LSPC, and its predecessor model (HSPF), is well known and has been subject to several peer reviews to ascertain the technical credibility of the mechanistic and empirical approaches adopted in the model.

The selection of *LSPC as the wet weather model for bacterial loading, transport and fate is appropriate for the data sets available, the determination of TMDLs and the load allocation objectives of the analysis.*

Response: Comment noted.

Comment 64

Regional Land Use Data. Watersheds of the San Diego Region were delineated as 16 sub-watersheds with 13 of the watersheds containing impaired reaches. Three watersheds were included because of an abundance of bacterial data that could be used to support calibration of the model. Land use was represented using data obtained from 3 different data sources. San Diego County (SANDAG) land use was the primary source with land uses as of 2000. The San Diego database was supplemented with data obtained from the Southern California Association of Governments (SCAG) for Orange County and portions of Riverside County. The effective year identified for this land use data source is not given in Appendix J. Minor data gaps in land use coverage were assigned using a 1993 USGS Multi-Resolution Land Characteristics database.

Of the numerous land use categories reported in the databases, detailed land uses with similar characteristics were combined for a total of 13 land use categories defined for the San Diego Region model. The 13 land uses represented in the study consisted of the following non-urban categories: agriculture, livestock, horse ranches, open space and surface water. Urban categories included low-density residential, high- density residential, commercial/industrial, industrial/transportation, Caltrans (roads), military facilities, parks and recreation, and construction sites (transitional).

The temporal resolution of the land use data sources (i.e., ca. 2000) is typical of many watershed modeling studies and appears appropriate for development of a regional scale watershed model. As more recent land use data becomes available, the land use distributions used in the model framework can be adjusted, if needed, to revisit the TMDL calculations in the future. For the regional scale model, t*he level of detail of the various land uses appears adequate to represent watershed runoff and bacterial loading in this region. More importantly, the level of detail of the land use categories appears adequate to provide the information needed to municipal officials and other land owners to design and implement BMPs to achieve the waste load allocations and load allocations determined from the TMDL modeling study.*

Response: Comment noted.

Comment 65

Local Scale Land Use Data for San Marcos Basin (1101). *For Cottonwood Creek in Encinitas, included in the San Marcos Watershed (1101), the land use characterization of agricultural uses (0.06 square miles; 4.2 %) and livestock/dairy operations (0.25 square miles; 17.5%) extracted from the land use data sources may not accurately reflect contemporary land use conditions in this small sub-watershed (1.43 square miles). Land use in this watershed is dominated by urban uses with the heavily used I-5 corridor running north-south in the central portion of the sub-watershed. Although agricultural land uses were historically important in this area, there has been pronounced transformation of once agricultural lands to urbanized uses over the past several years. The assignment of the correct drainage areas for agricultural and livestock dairy operation land uses in this small watershed is a critical issue to resolve since the 53% proportion of fecal coliform bacterial loading estimated for these non-urban land uses is quite high (see Table I-12) and affects the calculation of load reductions for this watershed. It is recommended that more recent land use data be collected and compiled to match the 13 land use categories adopted for the San Diego Region watershed model.*

Response: The model results for the San Marcos watershed can be revised with updated land use information in a future refinement of the TMDLs. Time and resources do not permit us to remodel the San Marcos watershed at this point.

Comment 66

Hydrologic Calibration of Watershed Model. The hydrologic model is calibrated to flow data collected from 1991-1996. The model is then validated to data collected from 1997-2001. Model performance targets are also given in Appendix M as relative error statistics for the 10% highest flows (15%) and the total storm volume (20%) to document the ability of the hydrologic model to represent high flow/wet weather conditions.

As shown in time series plots of model results (Appendix M), the hydrologic model appears to be well calibrated to simulate daily and monthly high flows, the winter-summer pattern of high and low flows, and the seasonal variation of monthly streamflow for many of the watersheds of the study. For most of the watersheds, the performance targets are achieved for both the calibration and validation periods. The ready availability of hydrologic parameters values calibrated for other Southern California watershed models of the San Jacinto River and Santa Monica Bay undoubtedly were of great assistance to the model developers in calibrating parameter values for the hydrologic model of the San Diego Region watersheds.

In addition to the time series plots of the model-data comparisons for the different watersheds, flow duration curves for model results should be shown to allow for comparison to the observed flow data. This information would help to determine if low flow characteristics, such as baseflow, of the watersheds were adequately represented by the calibration parameters of the hydrologic model. A detailed analysis of urban runoff in Cottonwood Creek (City of Encinitas, 2002), for example, concluded that a

considerable component of dry weather flow in the lower reaches of Cottonwood Creek was groundwater derived (i.e., baseflow). A hydrologic model that is run continuously for multiple year time scales, as was the San Diego Regional model, should be capable of adequately reproducing seasonal cycles of wet and dry periods to represent the complete range of flows from low to high flows. A simple visual comparison of the time series model-data plots suggests that the hydrologic model does, in fact, represent the lower flows fairly well. Presentation of the relative error statistics to show the model performance at all flow ranges, including mid and low flows, would be desirable. The presentation of model-data flow duration curves then serves to visually support the model performance statistics over the entire flow range for a watershed.

Response: Flow duration curves were developed for calibration and validation and were used internally for verification of necessary model refinements, but were not included in the report in an effort to reduce unnecessary volume of appendices, and ease the review process. Regardless, these flow duration curves are only relevant for assessment of wet flows, as dry flows associated with urban runoff were not simulated by the model for the TMDL. Instead, a separate model was developed to account for dry conditions, which was discussed in the report. To provide representation and review of LSPC model performance across multiple flow magnitudes, we considered time series plots to be sufficient.

Comment 67

Hydraulic Reach Model. Each of the 16 delineated sub-watersheds was represented by a single, completely mixed one-dimensional computational segment. A representative stream reach was selected from the NHD database streams shown for each sub-watershed. Stream length and channel slope were computed from NHD and DEM data. Stream width and depth for each representative channel of a sub-watershed were estimated using regression curves relating upstream drainage area and stream geometry.

Information given in Appendix J (Section J.2.6) does not document the mathematics of the regression relationships used for the computation of drainage area dependent depth and width of a stream channel. Appendix J also does not document the citation or published source of the regression relationships or technical study. Since a trapezoidal cross-section is used to represent the stream channels, the side slopes of the bankfull channel and the floodplain must be assigned as model input. What are the numerical values and what is the basis of the assumptions used to assign side slopes for the waterbody representations? The City of Encinitas would specifically like to see the mathematical relationship used and the numerical estimates of stream width and depth used to represent the hydraulic properties of Cottonwood Creek in the San Marcos Basin (1101).

Response: Estimation of bankfull widths and depths were based on regional curves reported in *Applied Stream Morphology*[13], with coefficients developed specifically for southern California based on regression analyses of depth and width data collected from

[13] Rosgen, D. 1996. *Applied River Morphology*. Wildlife Hydrology, Pagosa Springs, CO.

53 USGS streamflow stations in the region. Results of this analysis were not included in the report due to the insignificance of assumptions on overall model simulations, and the unnecessary attention that would result in peer review of modeling assumptions. Channel dimensions do not impact flow or water quality computations, other than insignificant impacts on stream velocity that would only influence time of travel calculations within the stream in terms of minutes. At the daily time step used for hydrology calibration/validation, the minor impacts on timing of storm peaks were not noticeable. Furthermore, since model results used for TMDL analysis were based on daily loads, the effects of timing resulting from stream geometry assumptions were not considered critical.

Comment 68

Channel Geometry Data Sources. FEMA Flood Insurance Studies (FIS) have been performed for many urban areas of the nation over the past two decades. As a component of a FEMA study, hydraulic models, such as HEC-2 and HEC-RAS, are often constructed to delineate flood boundaries. Stream channel cross-section data that was used for input to the hydraulic models is often available from FEMA archives.

Was FEMA contacted as a potential source of stream geometry data for development of the watershed model to identify if such data would be available for the San Diego Region to supplement stream geometry estimates determined from the drainage area regression?

Response: FEMA Flood Insurance Studies are focused on flood events and therefore cross-sections used for model development are specific to the flood plain. However, these cross-sections often do not provide sufficient information at the much smaller scale required for assessment of typical flow conditions confined to the bankfull width and depth of the channel. Regardless, for reasons consistent with the response to Comment 69, investigation of methods for estimating stream geometry was focused on techniques for establishing regional assumptions due to the number of stream segments modeled**.**

Comment 69

Bacteria Loading Rates**.** Section J.2.5 and Table J-3 documents the Santa Monica Bay watershed model land use dependent bacteria accumulation rates used for determining bacteria loads from each watershed for the San Diego Regional model. The availability of such a data set is a valuable source of information for development of the San Diego Regional model. Table J-3 presents loading rates for 8 land uses. The San Diego Regional model accounts for 13 land uses.

Table J-3 should show the loading rates assigned to each of the 13 land uses defined for the San Diego Regional model. Table J-3, for example, defines a loading rate for 'agriculture' as the largest—by two orders of magnitude-- area based component of bacteria loading. In the San Diego Regional model, as shown in Table J-1, additional agricultural land uses are defined explicitly for 'dairy/intensive livestock' and 'horse ranches'. It is not likely that the bacteria loading rate from an agricultural field of crops, nursery operations or citrus tree groves, is the same as the bacteria loading rate from

'livestock' land uses. 'Agriculture' and 'Livestock' land uses of 0.06 (4.2%) and 0.25 (17.5%) square miles of the San Marcos (Cottonwood Creek) Basin, for example, are admittedly small, but not insignificant components of the total drainage area of the San Marcos Basin (1.43 square miles) sub-watershed (data from Table J-1).

Agricultural land uses in the San Marcos Basin in Encinitas have been transformed into urbanized land uses in the past several years. Since the loading rate for 'Agriculture' land uses is the highest of all the urban and non-urban land uses listed in Table J-1, it is critical that the assumptions used to characterize the bacterial loading rates for the actual 'Agricultural' and 'Livestock' land uses of the San Marcos basin accurately differentiate agricultural uses such as nursery operations from other agricultural related land uses. It is understood that loading rates for some of the land uses might be similar. Justification is needed, however, to support the assumption of similar loading characteristics for 5 of the land uses that are obviously lumped somehow into the 8 land uses shown in Table J-3.

Response: Specific modeling parameters associated with 'dairy/intensive livestock' and 'horse ranches' have not been developed for southern California due to lack of land-use-specific monitoring data to provide calibration. Therefore, their modeling parameters were based on 'agriculture' parameters listed in Table J-3. However, we recognize that these land uses likely represent different loading conditions, so they were included independently in the model although consistent with 'agriculture' modeling assumptions. As new data are collected that justify calibration of specific modeling parameters for these land uses, the model can be easily updated. We encourage all stakeholders to collect necessary monitoring data to improve assumptions for 'dairy/intensive livestock' and 'horse ranches' represented in the model.

Comment 70

Bacteria Loading Parameters. Table J-3 documents the land use dependent accumulation loading rates of bacteria. The watershed model also requires the specification of washoff rates and maximum accumulation rates.

The calibrated values assigned for each of these two additional parameters need to be documented for each of the 13 land uses assigned for the San Diego Regional watershed model. These three parameters, in particular, would be adjusted in the watershed model to simulate the effectiveness of BMP alternatives such as street sweeping.

Response: The maximum accumulation rate (SQOLIM) and the washoff rate (WSQOP) in the model were not adjusted for calibration purposes, but were instead held constant using consistent assumptions used by SCCWRP in their original calibration for Santa Monica Bay drainage areas, as reported in Appendix J. The maximum accumulation rates for each land use and indicator bacteria were assumed a concentration 1.8 times their respective build-up rates reported in Table J-3. The washoff rate, or the rate of surface runoff that removes 90% of the pollutant stored on the surface, was assumed 0.5 inches for all land uses and indicator bacteria. These assumptions, including sensitivity analysis, were reported fully in the Santa Monica Bay modeling reported referenced in Appendix J. We encourage a complete review of this preliminary work that formed the

basis of the modeling assumptions for this TMDL. Because these assumptions are consistent for each land use and indicator bacteria, they are not considered critical to Table J-3.

Comment 71

Bacterial Die-Off Kinetics. In addition to the land use dependent bacteria loading rates, an effective die-off rate of 0.8 per day was assigned to represent bacterial mortality, net settling and other losses in the wet weather model. Bacterial mortality is strongly dependent on water temperature.

It is not indicated in the report, or the technical appendices, if water temperature dependence of bacterial mortality is represented in the water quality model. A water temperature dependent bacteria die-off rate should be employed in the model framework for technical credibility. The die-off rate should be defined at a reference temperature of 20 C and a temperature coefficient value of 1.08 should be defined for bacterial die-off.

Response: Water temperature was not modeled in LSPC, so a temperature dependent assumption for bacteria die-off could not be simulated. Regardless, due to the velocity and overwhelming flows during wet weather and the dependence of die-off kinetics on time of travel (or time provide for die-off to occur), the impact of temperature dependent die-off rates are considered extremely small for wet weather flows.

Comment 72

Regional Scale Model-Data Comparison for Bacteria. The water quality model for bacteria was calibrated to data collected during 1991-1996 and validated to data collected during 1997-2001. A mix of dry, normal and wet flow conditions characterized the years used for calibration and validation. The definition of 'wet weather conditions' was used to split out wet weather data from the observed data sets and the model results for the critical year results generated for 1993. Figures N-1 through N-11 of Appendix N show the time series results for bacterial densities for the watersheds with observed data records.

The definition of wet conditions appears reasonable; it is a simple matter to adjust the definition to revise the TMDL calculations if a better definition is proposed and accepted.

The model-data comparisons for bacteria appear to be good although the log scale, which has to be used to show the bacterial density data, can be visually misleading. It would be beneficial to the readers to present regression plots of log scale modeled vs. log scale observed bacteria to show performance of the model where data is available for comparison. The availability of bacterial data is obviously limited but appears to be adequate to support model calibration for some watersheds. It would be helpful to clarify the availability of bacterial data for calibration and validation by presenting a table listing each sub-watershed to document the presence/absence of data from 1991-2001 for the calibration and validation years. Separate tables should be presented for Fecal Coliforms, Total Coliforms and Enterococcus. Inventory tables should also be compiled to document the availability of data for wet weather conditions and dry weather

conditions. It is noted that bacteria data does not seem to be available for model calibration for 1993. This was the year that was selected as the critical year for wet weather conditions computation of the existing loads and maximum allowable loads.

Response: Presentation of comparisons of model results with observed data presently includes 24 figures (15 pages) representing different locations and time periods. These results were specifically designed to provide the reviewer a detailed view of varying locations and timing. Sufficient opportunity was provided to the Stakeholder Advisory Group (SAG) and public to offer suggestions for presentation of model comparisons, but this comment was not received until well after model development and documentation was complete. We had already addressed comments by the SAG to provide further documentation addressing how monitoring data were used in model development, which are reflected in previous changes to the draft TMDL and modeling report.

It is important to note that no calibration was performed for bacteria modeling parameters. The present study provided validation of modeling parameters previously calibrated for the Los Angeles Region. Insufficient data were determined available to provide meaningful calibration of land use parameters for the San Diego Region. For this reason, a detailed presentation of model comparisons with observed data was determined unnecessary. Once sufficient land use monitoring data is collected in the San Diego Region, detailed results of model calibration and validation can be performed and more-detailed assessment of model accuracy can be provided, including additional presentation of comparisons of model results and observed data using a number of graphical and statistical techniques.

It is not necessary to show validation of the model for all years simulated, including the critical year used for TMDL calculation. Model calibration and validation is a separate process specific to the period data is available. Once validated, the model can be used to simulate all other years for which data is not available. This is one of the primary purposes for a model – to develop the model based on periods that data is available and subsequently use the model to predict conditions where/when data is unavailable.

Comment 73

Regional Scale Bacteria Model-Data Results in Appendix N. Figures N-12 through N-24 of Appendix N show the model-data results grouped by watershed basins and sorted by flow ranges.

The text in Appendix J on page J-12 states that the unit area flow is inches/acre. The plots shown in Appendix N, however, show the units as in/day. The units, whatever they are, need to be correct, and in agreement, in both appendices. The legend in these figures indicates observed average and modeled average of the bacteria data. The documents do not indicate if the average values are based on arithmetic or geometric calculations. Averages of bacteria data, since both the observations and model results span several orders of magnitude, should be based on geometric averages rather than arithmetic averages. \

Response: The rate (1/day) was not indicated on page J-12. The unit area flow was changed to inches/acre-day on page J-12. All averages reported in Figures N-12 through N-24 were calculated as geometric means.

Comment 74

Model Performance Statistics for Bacteria Results. Model performance statistics as relative errors are presented in Appendix M for the hydrologic model calibration and validation results for streamflow.

Comparable model performance statistics are not presented for the bacteria model results since the limited data sets that were available did not warrant the calculation of relative errors as is typically done for other watershed modeling studies.

It is unfortunate that sufficient bacteria data records are not available to allow the calculation of model performance statistics for the bacteria model. In the absence of an observed data base that can be used to evaluate statistics of the performance of the model, calibration and validation of the bacteria model, instead, relies solely on a visual comparison of the time series plots of model vs. data for the sub-watershed that have water quality monitoring data. Since there is no presentation of an uncertainty analysis of the watershed model results to indicate how the results might change with different sets of input parameters, it is difficult to infer the credibility of the watershed model framework as a tool for wet weather TMDL determinations.

Response: It is important to note that no calibration was performed for bacteria modeling parameters. The present study provided validation of modeling parameters previously calibrated for the Los Angeles Region. The reviewer should review additional model calibration results reported by SCCWRP for Santa Monica Bay drainage areas, included as an appendix to the bacteria TMDL for Santa Monica Bay beaches.

If sufficient data were available for calibration of bacteria modeling parameters, it is important to note that presentation of statistical evaluation of mode uncertainty is not a requirement to justify the model's use for TMDL calculations.

Comment 75

San Marcos Basin Local Scale Model-Data Comparison for Bacteria. *For the City of Encinitas, it is a concern that wet weather bacterial data was not available in Cottonwood Creek to provide convincing evidence that the bacteria loading rate assumptions taken from Table J-3, particularly the 53% of the total estimated load contributed by 'Agriculture' and 'Livestock', would in fact, result in good agreement to actual in-stream bacterial counts. If the assumptions regarding the land use dependent loads for the San Marcos Basin are inappropriate, then the model results would not provide good agreement to observed bacterial counts in Cottonwood Creek at the confluence with the Pacific Ocean at Moonlight State Beach. In the absence of bacterial data collected in the lower reaches of Cottonwood Creek that can be compared to watershed model results, the City of Encinitas does not have any convincing model-data results that can be used to support the investment that will be needed for implementation*

of the final TMDL determinations (i.e. 92-99% removal documented in Appendix P) and the construction of BMPs designed to reduce bacterial loading in our small watershed. It is recommended that wet weather and dry weather bacteria data be collected in conjunction with stream flow measurements in Cottonwood Creek near the confluence with the Pacific Ocean. This new data can be used for future watershed model-data comparisons for the San Marcos basin (1101).

Response: It is not necessary to calibrate the model in all watersheds to prove that modeling parameters are valid regionally or for each land use. We agree that additional bacteria data should be collected in all watersheds addressed by this TMDL to verify model performance. We encourage the City to collect bacteria data from various land uses to provide update of modeling parameters and possible refinement of the TMDL. We also encourage the City to collect data from Cottonwood Creek to provide comparison to model predictions, and provide assurance of model performance to justify implementation of BMPs.

Comment 76

Selection of 1993 as Critical Wet Year and Calculation of Existing and Allowable Maximum Loads. *While the methodology is appropriate for calculating existing and estimated maximum allowable loads, the limited amount of bacterial data prevents robust model calibration/validation. This raises questions regarding the validity of the loading estimates simulated for the critical year of 1993.*

Response: Please see the response to Comment 74.

Comment 77

Selection of Downstream Confluence with Pacific Ocean as Critical Location for Determination of TMDL. *The use of the most downstream location in each sub-watershed as the critical location for extraction of model results to compute existing and allowable bacteria loads is appropriate for the analysis to provide protection to the nearshore ocean beach sites.*

Response: Comment noted.

Comment 78

Dry Weather Model Approach and Source Term Methodology. Appendix K provides the rationale for development of a separate steady state model framework for determination of a dry weather TMDL for bacteria loading. The report states that: "The variable nature of bacteria sources during dry weather required an approach that relied on detailed analyses of flow and water quality monitoring data to identify and characterize sources. This TMDL used data collected from dry weather samples to develop empirical equations that represent water quantity and water quality associated with dry weather runoff from various land uses. For each monitoring station, a watershed was delineated and the land use was related to flow and bacteria concentrations. A statistical relationship was established between areas of land use and flow and bacteria concentrations".

Streamflow data, not available for many sub-watersheds, was estimated using a step-wise regression technique to empirically assign stream flow as a function of the land uses contributing to flow measurements recorded at streamflow gages in the study area. In-stream bacteria data sets available from water quality monitoring stations was used to infer a relationship between land uses contributing dry weather loading to a stream and the geometric mean of observed *in situ* bacteria counts. Multiple step-wise regression techniques were used to define Fecal Coliform Bacteria concentrations as an empirical function of contributing land uses. Total Coliforms and Enterococcus densities were estimated as a function of Fecal Coliform Bacteria estimates.

It is not clearly stated in the documentation of the methodology in Appendix K how the empirically derived bacteria concentration estimates were then used as input to the steady state model. Presumably, land use dependent flow estimates were multiplied by land use dependent bacteria concentrations to derive land use dependent loading rates. The loading rates were then assigned as either (a) upstream boundary condition for headwater stream reaches or (b) lateral tributary inflows for stream reaches downstream of headwater reaches. Mass balance calculations were then performed at the upstream end of a reach to compute the initial concentration at the upstream end of the reach. The concentration at the downstream end of the reach was then calculated as a function of the calibrated die-off coefficient and travel time within the reach. The model was calibrated by adjusting the in-stream die-off rate to match observed bacteria data and adjusting infiltration rates to improve the match to observed flow data. The model was then validated using data sets extracted from watersheds that were not used to determine the empirically defined regression relationships.

As shown in the figures presented in Appendix K, the spatial distribution of observed flow and bacteria counts are reproduced fairly well in the sub-watershed reach segments. It is not particularly noteworthy, however, that the dry weather model results provide a good match to the observed dry weather flow and bacteria data. This is to be expected since the observed flow and bacteria data was used to derive the land use dependent source loading terms assigned as input to the model.

Although we agree that the use of a steady-state model is appropriate for an analysis of dry weather flow and bacteria distributions to determine the dry weather assimilative capacity of the streams for bacteria, the dry weather source term methodology developed for the San Diego Region TMDL study has some flaws. Consequently, the approach and the results are lacking. The methodology, as documented in Appendix K, essentially seems to include what might be considered circular reasoning to compute the in-stream bacteria concentrations. In-stream flows and bacteria measurements are averaged, compiled for several sub-watersheds and empirically related with a multiple regression technique to contributing land uses and watershed area. Upstream boundary conditions for headwaters and tributary inflows are then computed from the composite empirical relationships for flow and bacteria and assigned as flow and bacteria source loading terms for each reach based on land uses and catchment areas contributing to a reach.

Response: The reviewer summarized the linkages and configuration of the dry-weather mode accurately, indicating that the documentation was sufficient for explaining the methodology. However, the reviewer is incorrect in stating that data used for regression

analysis and development of loading estimates were also used for model calibration. Data used for regression analysis and development of equations to predict watershed runoff flows and water quality were independent of datasets used to calibrate instream infiltration and bacteria die-off.

It is true that some data from monitoring stations used in the regression equations were also used in calibration of instream infiltration and bacteria die-off. However, a detailed discussion is provided on page K-12 that addresses this issue and explains how circular reasoning is not considered an issue.

Comment 79

Equations used for Dry Weather Model. Appendix K presents the analytical solution that was coded as the steady state, one-dimensional stream model as a series of plug flow reactors. Each stream reach segment (reactor) is assigned a constant source of flow and bacteria at the upstream end of the computational segment. Flow and bacteria concentrations assigned as model input data were empirically estimated from the regression relationships discussed in Comment 78.

In addition to the questionable methodology used to derive the source loading terms for the dry weather model, we do not believe that the analytical model itself correctly represents the water quality response within a reach to a uniformly distributed nonpoint source input of flow and bacteria. The analytical model, as presented in Appendix K, is appropriate for the representation of a point source discharge at the upstream end of a reach and the subsequent exponential decay (die-off) based on travel time along the length of the reach. The model, as structured, assigns the distributed flow and bacteria load that accumulates over the length of a reach as a "point source" discharge at the upstream end of the reach.

Thomann and Mueller (1987) (page 61-69) present the analytical solution for a steady state stream model that includes the water quality response to point source discharges at the upstream boundary end of a reach and distributed nonpoint source inputs contributed along the entire length of a reach. The differential equation for a mass balance at steady state with constant flow (Q) in a reach is given as:

$$U\frac{dS}{dx} + K.S = \frac{w}{A}$$

where: w is the uniformly distributed source with units of mass/length-time and A is the cross-sectional area of the reach. The solution of the model is given as:

$$S(x) = S_o \exp(-K\frac{x}{u}) + (\frac{w}{A.K})[1 - \exp(-K\frac{x}{u})]$$

where: S_o is the completely mixed concentration determined from the mass balance computation based on of the upstream boundary and the lateral inflow at the upstream end of a reach; K is the die-off rate (day^{-1}); x is distance along the length of the reach where x = 0 is the upstream end of the reach and x=L at the downstream end of a reach of length L; u is the velocity in the reach $u = \frac{Q}{A}$ *; and S(x) is the concentration as a function of distance, x, along the reach.*

The approach used in the dry weather model defined in Appendix K essentially incorporates all the bacteria load into the S_o term of the solution as a point source at the upstream end of a reach rather than assigning a bacteria load that is parameterized as a line source. It appears that calculations have not been performed for this review to determine how much of a numerical difference would result from the use of the correct analytical model to represent nonpoint source loading of bacteria. Regardless of the numerical differences between the approach adopted for the dry weather model described in Appendix K and what we believe to be the more appropriate approach identified above, the technical credibility of the dry weather model is lacking without the use of the distributed nonpoint source term in the model framework.

Response: The commenter is correct that the distributed loading equation is likely more representative of actual conditions than the point source version used. However, it is important to note that the distributed loading equation, as defined by the commenter, does not incorporate the increased complexity due to decreasing flows resulting from infiltration and the resulting reduced assimilative capacity of loads along the stream length. Also, urban runoff loads are unlikely to be evenly distributed along a stream length, and as with wet flows, are likely to increase in magnitude as the watershed size and tributaries increase downstream. Moreover, as flows increase, so does the stream's cross-sectional area, wetted perimeter, and resulting ability of flows to infiltrate via a wider stream bottom. In most "gaining" streams, or streams that are supplied water by groundwater baseflow, the general distributed loading equation is most useful and can be based directly on the formulation outlined by the reviewer. However, in urban streams of arid environments such as southern California, where the majority of flow is provided by urban runoff and the streams are generally "losing" water due to infiltration, the true formulation of the distributed loading equation is much more detailed than the version outlined by the reviewer. Even more important, the distributed loading equation would require additional assumptions for distributing the load and losses through infiltration, without additional information to justify or define these assumptions. Therefore, the best equation was determined to be the simplest approach that provides representation of the most processes considered critical to TMDL calculation, with sufficient data to base assumptions. For this reason, the point source form of the equation was considered the most technically credible given the amount of data available to base assumptions and provide calibration/validation of key parameters.

Comment 80

Selection of Dry Weather Model Approach for TMDL Determination.

Over and above the questionable representation of the water quality response of nonpoint sources in the dry weather steady state model, the larger issue, however, is that it is not at all clear why a separate steady state modeling approach was even adopted for the dry weather TMDL evaluation. Appendix K notes that the large spatial variability of dry weather bacteria data necessitated the use of a "different approach" to define more detailed source functions. Based on the hydrologic model results given in Appendix M, the watershed runoff model seems to do a reasonable job of representing low flow conditions during the April-May through October months. The wet weather model-data results given in Appendix M clearly show a seasonal cycle of high and low flow conditions with low flow conditions occurring during April/May through October/November. Although model performance statistics are not presented, the hydrologic model appears to adequately represent streamflow during the seasonal low flow conditions. Although land use dependent bacteria loading rates (Table J-3) were calibrated for the wet weather TMDL analysis, the time variable results of the watershed runoff model were apparently not extracted either for generation of load duration curves or statistical analyses of the model vs. data response for days defined by dry weather conditions. The watershed runoff model presumably could have been used for the dry weather TMDL evaluation if a slightly different conceptual model was adopted to account for chronic, dry weather constant loading of bacteria in addition to the wet weather storm event driven loading of bacteria where both dry and wet weather loads are dependent on land uses.

Using a modified conceptual model, calibration of the bacteria model would have first focused on dry weather measurements of flow and in-stream bacteria to calibrate a set of land use dependent "export coefficients" to represent constant bacteria loading from the sub-watersheds. Export coefficients would be adjusted for the different land uses until the weighted mix of loading rates resulted in a good match to observed dry weather bacteria data. The calibrated dry weather model results would then be used to derive load duration curves for each sub-watershed using the identical approach adopted for the wet weather analysis. Existing dry weather load duration curves would be compared to maximum allowable load duration plots based on dry weather numeric target criteria for bacteria and model flow data. The total load reductions for dry weather conditions would then be computed as the difference between the existing dry weather load and the maximum allowable TMDL.

Following calibration of the bacteria model to dry weather conditions, the model would be calibrated to wet weather conditions. The dry weather export coefficients used to define chronic constant loading would be imposed as a component of the wet weather evaluation since by definition, dry weather loading is essentially constant over time. Presumably, wet weather in-stream bacteria measurements reflect both the dominant

storm-driven loading as well as the chronic constant loading that is present during dry weather conditions.

The technical credibility of the dry weather TMDL evaluation would be greatly enhanced if the LSPC watershed runoff model was applied within an internally consistent model framework for both dry weather and wet weather conditions.

Response: LSPC is insufficient for modeling dry-weather flows and bacteria loads for a number of reasons. Although LSPC calibration results show a good comparison to dry seasonal volumes, it is important to note that "seasonal" includes any rainfall event that occurred during this period. As a result, these seasonal volumes are not confined to dry-weather flows. It is important to note that flows simulated by LSPC are only produced by rainfall-runoff processes. The model does not include capability for estimation of dry urban runoff resulting from anthropogenic sources unrelated to natural hydrology (e.g., car washing, lawn irrigation runoff). Since the model does not include runoff volume from dry urban runoff, it is impossible to assign an associated load of bacteria. LSPC also does not provide sufficient resolution for simulation of instream infiltration that is a major factor for dry flows.

The approach recommended by the reviewer for estimation of dry flows and instream bacteria loads using "export coefficients" is flawed due to the inability of LSPC to predict dry urban runoff. Essentially, there is no flow predicted by LSPC to calibrate to dry weather measurements. It is unclear how the reviewer would intend to use "export coefficients" to represent constant bacteria loading from the subwatersheds. Such 'constant' loads are steady-state and do not provide variability of loading estimates during dry weather. If the dry loads do not vary, then it is impossible to produce dry weather load duration curves (dependent on a range of small to large flows) recommended by the reviewer. If the dry flows and loads are constant and steady-state, then it is unclear how this approach provides any advantage over the approach used in the TMDL.

Comment 81

The proposed TMDL affects approximately 356,733 acres of land within the City of San Diego, runoff from which enters receiving waters via approximately 4,660 storm drain outfalls. The proposed TMDL allows for zero discharge of human-generated indicator bacteria from these outfalls (i.e., before the storm water reaches receiving waters) regardless of weather conditions.

Response: Final wet weather allocations for controllable sources are zero. We are aware that identifying specific sources of bacteria, and differentiating between human generated and non-human generated, is difficult and costly. The TMDL relies on WQOs for indicator bacteria, meaning that receiving waters should not have bacteria densities in excess of WQOs. As long as WQOs are met, the source of the bacteria is not necessarily a determining factor for TMDL compliance.

The purpose of established WQOs is to ensure conditions that are safe for recreational swimming and shellfish harvesting. We recognize that there may be shortcomings with using indicator bacteria to measure water quality instead of pathogens directly. For

example, if bacteria re-grow in the environment, this does not necessarily correlate to an increase in public health risk. For that reason, we encourage the elimination of human-generated sources of bacteria, and the verification of these accomplishments wherever possible. Please see the response to Comment 2.

Comment 82

Significant concerns with the project are as follows:

- Recent data provided to the Regional Board at its February, 2006 workshop on this project suggest that indicator bacteria are not indicative of public health threats at southern California beaches. Indicator bacteria standards in the Basin Plan were established in the 1970s based on older and inapplicable epidemiological studies.
- Recent studies conducted by the City of San Diego have concluded that bacterial contamination at beaches is largely due to kelp, birds, and flies on beaches.
- The Basin Plan standard for bacteria in relation the beneficial use "SHELL" was established in the 1970s to protect human health from consumption of shellfish. However, the State Department of Health Services, which actually has regulatory control over bacteria levels in commercial shellfish, uses a less conservative standard than that in the proposed TMDL.
- The Basin Plan erroneously applied SHELL to the mouth of Chollas Creek since the mouth of Chollas Creek has been dredged and surrounded by commercial uses since the 1920s.
- The Basin Plan erroneously applied REC-1 as a potential beneficial use throughout the Chollas Creek watershed since significant portions of the creek were channelized for flood control purposes prior to adoption of the Basin Plan.
- The only known technologies that will eliminate bacteria in storm water are diversion (to eliminate the storm water via, for example, infiltration) and treatment with chemicals (such as chlorine and ozone) or ultraviolet light. The TMDL requires maintenance of existing hydrology in receiving waters; therefore, treatment of at least dry weather flows is required.
- Diversion and treatment will both result in the removal of sediment from storm water discharges. The impact of sediment removal on creeks and beaches should have been documented during TMDL development.
- Allowing zero bacteria in storm water discharges, coupled with bacterial re-growth in storm drains, means that diversions and treatment facilities must be located in areas as close as possible to storm drain outfalls. Most of these areas are privately owned and developed.
- The potential for widespread use of infiltration, which is based on soil types in the watersheds, is unknown but should have been documented during TMDL development.
- The environmental impacts associated with the massive public works that must be undertaken for compliance are not disclosed in the Regional Board's CEQA analysis.

- The financial impacts associated with the massive public works that must be undertaken for compliance are not disclosed in the Regional Board's technical report.
- Many water bodies affected by this TMDL are currently listed as impaired. The City must address all pending TMDLs when it complies with this TMDL; therefore, the City recommends that this TMDL be integrated with other TMDLs on a watershed by watershed basis.
- The 10-year implementation schedule sets up the City of San Diego for non-compliance, the financial penalties associated therewith, and lawsuits from other stakeholders.

Response: The numerous comments above are addressed separately below.

Indicator bacteria. As previously stated, we recognize that there may be shortcomings with using indicator bacteria to measure water quality instead of pathogens directly, and that the accuracy of the correlation of bacteria densities to health risks is the subject of recent discussions. For this reason, several studies have been completed or initiated to examine the health risks associated with indicator bacteria, as well as potentially new indicators of health risks.

We are obligated to proceed with utilizing WQOs consisting of total coliform, fecal coliform, and enterococci bacteria to calculate TMDLs because they are the established indicators of risk to public health. Under Clean Water Act (CWA) section 303(d), the San Diego Water Board is obligated to develop TMDLs for waters not meeting WQSs (WQOs and the beneficial uses they are designated to protect). TMDL calculations must be based on existing WQOs.

The administrative proceedings at the San Diego Water Board level are not the appropriate forum for investigating the validity of the bacteria WQOs. Reevaluation of water quality criteria that are the basis for WQOs cited in the Basin Plan takes place at the USEPA level. Should USEPA promulgate new water criteria, then the WQOs in the Basin Plan will be updated accordingly and TMDLs recalculated.

Kelp as source. We are aware that much of the bacterial contamination at beaches is largely due to kelp, birds, and flies on the beach. For that reason, interim wet weather TMDLs were calculated using the "reference system approach," which takes into account bacteria densities caused by such sources. The reference system approach allows a 22 percent exceedance frequency of the single sample WQOs for REC-1. TMDLs were calculated taking this exceedance frequency into account. Although the reference system approach only applies to interim TMDLs, a Basin Plan amendment has been initiated to permanently incorporate a reference system approach for the purpose of calculating TMDLs. After this takes place, final wet weather TMDLs will be recalculated to allow exceedances of single sample WQOs during wet weather due to natural background loads including bacteria from kelp, birds, and flies. The reference system approach was not used for dry weather for the reasons outlined in response to Comment 2.

Shellfish and REC-1 designations and WQOs. According to section 303(d) of the Clean Water Act, we are obligated to calculate TMDLs for all impaired waterbodies using the existing applicable WQOs. We realize that not all stakeholders agree that TMDLs should

be based on WQOs designed to be protective of shellfish harvesting, nor do all stakeholders think the beneficial use should be designated across all ocean waters of the Region. However, just as we are obligated to calculate TMDLs using indicator bacteria for REC-1 use, so are we obligated to calculate TMDLs for the SHELL beneficial use. Whether or not the use is appropriate at the mouth of Chollas Creek, or anywhere else, is a discussion that can only take place when evidence is produced demonstrating that the SHELL use was not occurring on or after November 28, 1975, and that water quality necessary to support SHELL use has not been attained in the water body since November 28, 1975. Although the City of San Diego has produced some evidence to support its contention, more definitive evidence is needed before the San Diego Water Board can change the SHELL use from "existing" to "potential" and conduct a use attainability analysis. To de-designate channelized portions of Chollas Creek for REC-1, the San Diego Water Board needs evidence that a use attainability analysis is appropriate.

Maintenance of existing hydrology. The commenter incorrectly states that the TMDLs require maintenance of existing hydrology in receiving waters. We agree that treatment of dry weather flows may be a suitable option for reducing bacteria. The environmental analysis (Appendix R) has been revised to clarify this issue.

Sediment removal on creeks and beaches. Appendix R has been revised to address this comment.

Location of treatment facilities. Although a concern, the siting of structural BMPs, whether in private or public land, is a project level issue the dischargers will have to address.

Widespread use of infiltration. Whether or not the use of infiltration is feasible in terms of complying with TMDL requirements is the responsibility of the dischargers to investigate. We cannot speculate on the manner of compliance with the TMDLs.

Environmental impacts of massive public works. Appendix R has been revised to include a more extensive discussion of the adverse environmental impacts and financial impacts associated with the reasonably foreseeable methods of compliance.

Integrated TMDLs. The City of San Diego put forth a specific 20 year compliance schedule for metals and bacteria TMDLs in Chollas Creek. We have incorporated a modified version of that schedule in these TMDLs, and added an option for extending the compliance schedule if dischargers propose addressing all water quality problems in a watershed in their pollutant load reduction plans. These revisions can be found in section 11.4.2 of the Technical Report.

Comment 83

The City of San Diego questions the rationale for not providing Caltrans, General Industrial Permittees, other Phase II Municipal Storm Water Permittees (MS4s) and non-point sources with a waste load allocation (WLA). It may appear that their contribution is minimal; however, with 100% reductions required, all sources need to reduce their loading. This concept is particularity important with those entities that hold an existing NPDES permits and/or Waste Discharge Requirements (WDRs). It is improper that the

Regional Board place the responsibility and liability to comply with this TMDL Phase I MS4s.

The City of San Diego again requests a time line regarding when the Regional Board will contact the Phase II MS4 permittees for inclusion into this TMDL Program. Currently, University of California, San Diego, San Diego State University, University of San Diego, the Community College District's facilities and the San Diego Unified School District's facilities have not been included in this process. These Phase II MS4s and others are contribute loading to the listed impaired waterbodies and should be notified of their requirement to participate by the Regional Board. The City believes that, since bacteria reproduce in storm drains, all storm drains, including Caltrans', have a substantial potential for introducing bacteria into receiving waters. In addition, the City has documented issues with the discharge of food waste from outdoor eating areas at schools. These discharges also constitute potentially substantial contributions of bacteria that should be considered in the TMDL.

Response: As indicated in the final wet weather TMDL tables in section 9 of the Technical Report, Caltrans, municipal dischargers, and controllable nonpoint source dischargers all receive a WLA or LA of zero, or 100 percent reduction. Table 11-2 describes the responsible municipalities in each jurisdiction, which includes small MS4s in each watershed. We recognize that it will be difficult for dischargers to meet final allocations and WQOs during wet weather. Therefore, we are developing a Basin Plan amendment to permanently incorporate a reference system/natural sources exclusion approach for implementing bacteria WQOs as described in the response to Comment 2.

We have contacted by phone the small MS4s listed in Appendix Q to make them aware of these TMDLs. Steps to regulate small MS4s will begin after we have initiated steps to regulate Phase I municipal dischargers in accordance with the discussion in section 11.5.3 of the Technical Report.

Comment 84

In good faith members of the Stakeholders Advisory Group participated in the Reference Beach Bacteria Study at San Mateo and San Onofre Creeks. The purpose of the study was to help Southern California Coastal Waters Research Project (SCCWRP) gather data from beaches that have minimal human development. This data was to be used to develop a baseline for natural bacteria background concentrations. Many SAG members volunteered staff time and resources. The City of San Diego volunteered many man hours to collect some samples and processed all the samples. How was this data used in the development of the TMDL?

Response: The effort to which the commenter refers is being used to develop the reference system approach/natural sources exclusion Basin Plan amendment. The data retrieved in this effort is not being used for development of the current TMDLs. However, these TMDLs will be recalculated once the Basin Plan amendment authorizing the reference system/natural sources exclusion approach has been adopted.

Comment 85

The City of San Diego understands that Margin of Safety (MOS) is a required component for the development of TMDLs. This TMDL uses an implicit MOS that applies conservative assumptions throughout the development of the TMDL. However, the application of this conservative MOS is on top of the MOS the US Environmental Protection Agency (EPA) applied when they developed the REC1 standards. The City of San Diego questions the application of the implicit MOS with its conservation assumptions when another MOS Watershed already has been applied to this TMDL indirectly. The City of San Diego believes the use of an explicit MOS is more appropriate for this TMDL.

Response: Please see the response to Comment 36.

Comment 86

The label on "Table 9-3: Interim/Final Dry Weather TMDLs for Fecal Coliform as a Monthly Load" shows that both the interim and final loads are the same; therefore, a decision needs to be made as to whether this monthly load requirement is for interim or final compliance.

Response: Final TMDLs are based on WQOs for SHELL, and therefore are only meaningful for total coliform. Therefore for fecal coliform and enterococci, final TMDLs are the same as interim TMDLs. We deleted the term "interim" from the title.

Comment 87

Table 9-5 Interim Wet Weather TMDLs for Total Coliform Expressed as an Annual Load's percentage of reduction appears to be in conflict with Table 11-4: Compliance Schedule and Interim Goals for Achieving waste load reductions.

Response: The comment is unclear as to how the information in Table 9-5 is in conflict with Table 11-4. We assume the conflict involves the zero WLA for controllable sources. Please see the response to Comment 2.

Comment 88

Table 9-8: Interim Wet Weather TMDLs for Enterococcus Expressed as an Annual Load's percentage of reduction appears to be in conflict with Table 11-4: Compliance Schedule and Interim Goals for Achieving Waste Load Reductions.

Response: The comment is unclear as to how the information in Table 9-8 is in conflict with Table 11-4. We assume the conflict involves the zero WLA for controllable sources. Please see the response to Comment 2.

Comment 89

The label on Table 9-10: Interim/Final Dry Weather TMDLs for Enterococcus as a Monthly Load shows that both the interim and final loads are the same; therefore, a

decision needs to be made as to whether this monthly load requirement is for interim or final compliance

Response: Please see the response to Comment 86.

Comment 90

Section 9 Total Maximum Daily Loads and Allocations: Greater wet weather loading reductions for all indicators should be required from identified agriculture/livestock dischargers due to the fact that these relatively small facilities lend themselves to the opportunity for water quality control. As calculated in Table 9-1, the load allocation assigned to agriculture/livestock in the San Juan Creek watershed is 2,856,458 billion MPN/year. This is more than twice the 1,155,725 billion MPN/year waste load allocation assigned to the MS4 dischargers. Yet both allocations are assigned the same percent reduction. The loadings from the agricultural areas come from a small defined land area and most likely, easily identifiable sources (manure stockpiles, fertilizers, etc.). In contrast, the loading from the MS4 system comes from diffuse and unknown sources spread over the entire watershed area. Greater loading reductions should be more easily achievable from the agricultural/livestock land areas.

Response: The commenter is correct in saying that the percent reduction for the agriculture/livestock dischargers is the same as the percent reduction required for MS4 dischargers. The methodology used to develop allocations in the San Juan Creek, San Luis Rey River, San Marcos Creek, and San Dieguito River watersheds was designed to produce proportional load reductions among the two main discharger categories. In formulating this methodology, we attempted to use a fair approach to developing load allocations and reductions. Setting allocations *proportional* to existing loading was the way we chose to accomplish this.

We agree that agricultural and livestock practices lend themselves to the opportunity for water quality control. Agricultural and livestock dischargers may be able to meet their allocations easier or faster than MS4 dischargers, or achieve that load reductions in excess of 13 percent. This could create an opportunity for trading pollution credit. Municipal dischargers could meet their reductions by paying for BMPs to achieve higher load reductions from agricultural and livestock facilities.

Comment 91

The interim wet weather numeric target for the indicator bacteria incorporates the reference beach concept to allow for natural sources of the indicator bacteria. While we do endorse this method there may be potential public perception issues that could arise when a wet weather monitoring report for a given beach indicates that the samples exceed the numeric targets but are below the 22% exceedence frequency limit. A beach warning would be posted. The first issue would require public outreach to explain the intent of the 22% exceedence frequency allowance should this matter arise. The exceedence should in no way detract from the required beach warning and closure per AB 411. The second issue follows and this deals with the health risk associated with the natural sources of the fecal indicator bacteria. Section 11.6.2 discusses this matter and we

strongly support that studies should be conducted to determine the health risks to humans from the potential pathogens from animal sources. We also support research to provide rapid response indicators of pathogens as in Section 11.6.3.

Response: The allowable exceedance frequency to account for natural sources of bacteria will not affect the beach warnings and closure protocol described in this comment. The protocol is outlined in Health and Safety Code 15880 (commonly referred to as "AB 411") and is independent of these TMDLs.

Comment 92

The term "bacteria" is generally used in the report to mean indicator bacteria. However, we recommend revisions to Investigate Landfills as a Potential Bacteria Source on page 134, section 11.5.6 Additional Actions, in order to clarify the distinction between the potential pathogens in the landfills, indicator bacteria, and the bacteria that are associated with the generation of methane during the decomposition of organic matter. We recommend that in the topic heading and the first sentence replace "Bacteria" with "Pathogens". The second paragraph incorrectly infers the presence of indicator bacteria because evidence of methane gas. Different types of bacteria are involved methane gas formation. See for example, the cited references on methane gas formation. Therefore, we recommend that this paragraph be deleted because generation of methane gas is not germane to investigating the presence of indicator bacteria and pathogens in the landfills.

We disagree with the third sentence in the third paragraph that states that landfills are an "unlikely source of bacteria with respect to these TMDLs". Presumably, these are the fecal indicator bacteria. If this is correct, then does this mean that the sewage sludge that are allowed in landfills do not contain fecal bacteria? Furthermore, opportunistic mammals visit landfills and it is reasonable to assume that they deposit feces. Other sources include discarded residential pet wastes and soiled diapers. The last sentence of this paragraph should be deleted for clarity as these are the methane forming bacteria explained above.

In the fourth paragraph we recommend that "bacteria" in the first sentence be replaced by "indicator bacteria".

Other pathogens not related to indicator bacteria could potentially be in solid wastes that are discarded in the landfills and enter into the waters of the state. We concur with the recommended investigations to determine if landfills are a potential source of indicator bacteria discharges into surface waters on page 135. We further would recommend that these investigations include pathogens not related to the indicator bacteria.

Response: We have modified the Technical Report for clarity in response to this comment. Please see section 11.

Comment 93

Table 11-3, the Prioritized list of Impaired Waters for TML Implementation, was developed by the SAG in consultation with RWQCB staff, and has appeared in prior versions of the Draft Technical report. However, in the current draft the RWQCB staff

unilaterally changed the Priority designation of San Juan Creek from 3 to 1, and added San Juan Creek mouth as a Priority 1 location, contrary to the input from the SAG. The Priority designation of San Juan Creek and the beach at its mouth should be returned to the previously concurred Priority 1. These waterbodies should be the same priority as they will have to be managed together. As we learn more about the dynamics and interrelationship of the creek mouth and beach water quality, it would be futile to treat them independently.

Response: Previously, the San Juan creek mouth was not included in this project because it was to be included in the TMDLs for bays and lagoons, a separate effort from the beaches and creeks TMDLs. The creek mouth was later included in the beaches and creeks TMDLs because the characteristics of the mouth were better suited for the beaches and creeks TMDLs than it was for the lagoons TMDLs (the computer modeling in both TMDL projects were different). Because the mouth of the creek discharges to a heavily populated beach, we gave the creek mouth a 1 priority. Since, achieving WQOs at the mouth/beach is dependent on the water quality of the creek; we changed the priority for the creek from 3 to 1. This decision was made in consultation with SAG member Amanda Carr from the County of Orange.

Comment 94

Section 11.6.1 indicates that "data from each watershed can be collected and used to calibrate and verify the models for that watershed instead of relying on the regional calibration used in this project." It seems likely that the refined modeling could result in different estimates of Existing Load than currently shown in the Tables in Section 9; and that the Wasteload Allocations and Percent Reductions would therefore also be different. The text should identify who will be doing this model refining work and what procedural requirements there will be to incorporate the findings of the refined models as updated TMDL targets and updated Bacteria Load Reduction Plans.

Response: The Technical Report has been updated to clarify that either the San Diego Water Board or a stakeholder, through a Memorandum of Understanding, could update the watershed models used for TMDL development. TMDLs would need to be updated through the Basin Planning process. We recommend stakeholders review USEPA's guidance for third-party led TMDLs for procedural requirements.

Comment 95

On page B-7, Allocations and Reductions: "……..Although considered a controllable source, load reductions from the California Department of Transportation (Caltrans) are not necessary because in all watersheds, loads from Caltrans are a minor contributor to the total existing loads." The City requests documentation to support this statement, please. The City did not see any Caltrans data sources in Appendix G that may help support this statement.

Response: The methodology for allocating TMDLs amongst dischargers is described in Appendix I. The assertion that Caltrans is a minor contributor of bacteria is supported by the relatively low bacteria loads originating from the industrial/transportation land use

(see Tables I-12 through I-14). Furthermore, Caltrans occupies only a fraction of the industrial/transportation land use area (see Table I-2).

Comment 96

During dry weather, application of the loading-based approach effectively puts in place water quality standards that are more stringent than those in the Basin Plan. (The loading based approach requires the arithmetic average concentration to be equal to the geometric mean value specified in the Basin Plan. Because fecal indicator data are known to be lognormally distributed, the average is always greater than the geometric mean, thus this approach puts in place more stringent requirements).

Response: Dry-weather loads were not predicted based on the arithmetic average bacteria densities, but were based on the regression analyses of the geometric mean of bacteria densities observed in multiple streams throughout the San Diego Region, as discussed on page K-7 of Appendix K.

Comment 97

We urge the Board to thoroughly review the comments summarized above and consider revising the TMDL to address our comments. In this regard, an appropriate starting point would include a thorough evaluation of the appropriateness of the TMDL's loading-based approach, a reconsideration and thorough explanation for the use of SHELL WQOs for total coliform as the appropriate numeric target for creeks and rivers even though they do not support the SHELL use, and much more thorough evaluation of the potential public health and environmental benefits and likely costs associated with implementation of the TMDL.

Response: We have thoroughly reviewed all comments received and made modifications to the Technical Report as appropriate. We have discussed these issues at length with the Stakeholder Advisory Group (SAG) since its inception in 2003. Some changes to the Technical Report have been made as a result of suggestions from the SAG, and some suggestions resulted in no changes because they were in conflict with the underlying goal of these TMDLs.

The rationale behind the loading based approach is described in the response to Comment 147. The explanation of the SHELL WQOs as the numeric target for total coliform TMDLs can be found in section 4.3 of this appendix. A discussion of the potential health and environmental benefits that are compromised because of poor water quality is described in the response to Comment 3. Likely costs associated with structural and nonstructural BMPs to achieve bacteria load reductions are discussed in Appendix R.

Comment 98

Inconsistency between Department WLAs and current Department loads – We appreciate that the Regional Board acknowledges that Department's discharges constitute a small fraction of the total bacteria indicator load for this TMDL. We understand that it is the

Regional Board's intent to maintain the Department's current pathogen indicator load as the Department's final waste load allocation (WLA). However, we are concerned that, as presented, the WLAs might be open to interpretation. The Department would like to be assured that the WLAs accurately reflect the Department's load. If subsequent bacteria issues arise within these subject watersheds, such as uncharacteristically high levels of bacteria from Department facilities, the Department will address them on a case-by-case basis.

The inconsistency between the loads calculated for the different watersheds covered by the TMDL is one reason for our concern. For example, the WLA assigned to the Department at the Miramar watershed is very small compared to other similar sized watersheds throughout the TMDL (please refer to Table I-15), as illustrated by the following cases:

- The WLA assigned to Industrial/Transport runoff (including the Department) in the San Dieguito River watershed is 4.2 trillion MPN/year, whereas that assigned to Miramar is 1 billion MPN/year. The area used for Industrial/Transport in Miramar is about 50% larger than that within the San Dieguito watershed. The staff report should explain this inconsistency or the WLAs should be adjusted.
- The WLA assigned to the Department in the Dana Point watershed is 0 MPN per year. The Department has a drainage area less than 40 acres in this watershed and, as a result, a pathogen indicator load will most likely be discharged from the Department roadways. Even though the load is expected to be relatively small, it should be accounted for in the staff report.

Response: The discrepancy between the two WLAs in this example is due to the difference in size, and bacteria loads, washing off of the two watersheds. The San Dieguito River watershed is roughly 346 square miles, and the Miramar watershed is roughly 93 square miles (Table J-1). This translates into a sizeable difference between the bacteria loads washing off the watersheds. The total existing fecal coliform load washing off the San Dieguito River watershed is 21,286,909 billion MPN/year, and the total existing fecal coliform load washing off the Miramar watershed is 10,392 billion MPN/year (Table I-12). Therefore, because these two watersheds vary greatly with size and bacteria generation, the estimated loads generated by the industrial/transportation land uses likewise varies.

The industrial/transportation land use is responsible for about .02 percent of the total existing load in the San Dieguito watershed, or about 4,257 billion MPN/year. The industrial/transportation land use is responsible for about .01 percent of the total existing load in the Miramar watershed, or about 1 billion MPN/year (Table I-12).

Once the loads generated by the industrial/transportation land use are quantified, then a portion of that total load was attributed to Caltrans, and the rest was attributed to municipal dischargers. For example, in San Dieguito, 35 percent of the industrial/land use area is attributed to Caltrans, therefore Caltrans generates about 1,496 billion MPN/year (Table I-15). The WLA for Caltrans is the same as the total existing load generated by Caltrans, so the WLA for Caltrans in this watershed in 1,496 billion MPN/year. In the Miramar watershed, the full allocation is given to municipal

dischargers. This is because the total existing fecal coliform load, 1 billion MPN/year, is small compared to loads in the remaining watersheds. We did not divide the WLA smaller than 1 billion MPN/year.

Table I-15 describes the existing fecal coliform loads generated by the industrial/transportation land use and Caltrans. To the order of magnitude used in our analysis, 1 billion MPN/year, we found that there is no significant discharge of fecal coliform originating from these sources relative to other land uses in the Dana Point watershed. Therefore Caltrans is allotted a zero WLA of fecal coliform, the same as their existing load.

Comment 99

Final and interim WLAs – We are concerned with data presented in Tables 9-2, 9-5, and 9-9. The tables list the Department's final wet weather WLAs for fecal coliform, total coliform, and enterococci as 0 MPN per year. The wet weather WLAs for the Department are identified to be set equal to existing loads "since discharges from Caltrans were found to account for less than 1 percent of the total wet weather load in all watersheds". In contrast, Tables 9-1, 9-4, and 9-8 contain the interim WLAs for the Department that have been set to existing WLAs. Since the Department will be responsible for maintaining existing loads, the final loads should be the same as the interim loads.

Response: As indicated in the final wet weather TMDL tables in section 9 of the Technical Report, Caltrans, municipal dischargers, and controllable nonpoint source dischargers all receive a WLA or LA of zero, or 100 percent reduction. We recognize that it will be difficult for dischargers to meet final allocations and WQOs during wet weather. Therefore, we are developing a Basin Plan amendment to permanently incorporate a reference system/natural sources exclusion approach for implementing bacteria WQOs as described in the response to Comment 2.

Comment 100

Simple loading of bacteria, whether by monitoring data or modeling simulations, does not completely address whether "downstream" shellfish beds in nearby embayments (e.g., San Diego Bay) or the coastal shorelines of the Pacific Ocean may be impacted. It would be more complete and realistic to combine the loading scenario with a waterbody dispersion (hydrodynamic) model or in-situ monitoring – to determine whether the bacterial populations remain viable and harmful after mixing in the receiving system.

Response: At the time of TMDL development, we explored the use of such dispersion models but found that estimating external loading from shoreline processes was difficult due to limited data. We chose a watershed based approach because this provided effective information regarding bacteria loading into receiving waters from both controllable and uncontrollable sources in the watersheds. We can consider using dispersion models in future TMDL refinement if more data is collected regarding shoreline sources such as marine mammals, birds, and sediment resuspension.

Comment 101

Page 3, Section 1.1, Why was a reference system from Los Angeles County used vice a reference system from the San Diego watershed? What are the details of the LA county reference system (beach and upstream watershed) that matched the San Diego watershed?

Response: The Arroyo Sequit watershed in Los Angeles County was used for TMDL development in the San Diego Region because, at the time that this project began, this was the only suitable reference watershed in southern California for which data were available. The criteria for a watershed to be considered for use as a "reference" watershed, for both the Los Angeles and San Diego regions, are that the watersheds consist of primarily open space (> 95 percent).

SCCWRP has characterized three other reference beaches, and is characterizing several reference watersheds. Upon adoption of the reference system approach Basin Plan amendment, we will recalculate TMDLs considering all available reference system data.

Comment 102

In sum as written, the San Diego Creek and Beach Bacteria TMDL will not lead to water quality standards attainment. Instead, the San Diego Regional Board should follow an approach similar to the Los Angeles Region approach in the Santa Bay Beaches Bacteria TMDLs and the Malibu Creek Bacteria TMDL. The approach taken in the development of these TMDLs has been accepted by the State Water Resources Control Board and the US Environmental Protection Agency.

Response: We disagree that the proposed TMDLs will not lead to water quality standards attainment, in part because the technical approach for wet weather was essentially identical to the approach used in developing the TMDLs in Santa Monica Bay. We assume the commenter is referring to the use of loads, instead of exceedance days, for expressing TMDLs as the main difference between the two projects. The "load" metric will not necessarily be used as the metric for determining TMDL compliance. We discussed this issue at length with our Stakeholder Advisory Group, which led us to add clarification in various places in the Technical Report (see section 11.5.1, for instance). We believe expressing TMDLs and WLAs as "loads" is appropriate for the reasons outlined in the response to Comment 147.

5.3 Water Quality Objectives/Indicator Bacteria

Comment 103

Section 3.2 of the Report states, "the waterbodies included in this project were listed as impaired primarily because of non-attainment of the indicator bacteria WQOs associated with contact recreation [REC-1]." Why, then, are Total Coliform objectives associated exclusively with SHELL use in marine waters added into this TMDL; and in fact applied at a critical point in freshwater upstream of any saltwater influence? Current science, EPA guidelines and local REC-1 objectives fully acknowledge that there is ***no*** epidemiological correlation between Total Coliform and public health risk for contact recreation. Furthermore, inclusion of the SHELL Total Coliform objectives has led to a flagrant logical absurdity in the final numeric targets (Tables 4-2, 4-3, and 4-6): Fecal Coliform is a *subset* of Total Coliform, but the final targets for Fecal Coliform are listed as *higher* than for Total Coliform.

Response: Water quality objectives for total coliform were used to calculate TMDLs because, although some waterbodies were specifically listed for impairment of the REC-1 beneficial use, all marine waters (shoreline and some estuarine) have the SHELL beneficial use designation. Since all inland surface waters eventually drain to these marine waters, bacteria densities of inland surface waters must be protective of the downstream SHELL beneficial use. Calculating TMDLs for total coliform in freshwater creeks and rivers using the SHELL WQO as a numeric target ensures that the SHELL beneficial use is protected at the shoreline. Prior to the point of discharge to the Pacific Ocean, the creeks and rivers are only required to meet the REC-1 WQOs.

We disagree that local REC-1 objectives acknowledge that there is no epidemiological correlation between total coliform and public health risk for contact recreation. Effective February 14, 2006, the SWRCB updated the Ocean Plan to maintain WQOs for total and fecal coliform. (Although the USEPA recommends using enterococci and *E. coli* as WQOs, states have the ability to use more stringent criteria.) The Ocean Plan contains the WQOs that are relevant to these TMDLs.

We are aware that fecal coliform is a subset of total coliform. Since total coliform are driven by the more stringent SHELL WQOs, the result is that total coliform numeric targets are lower than fecal coliform numeric targets. The apparent discrepancy between total coliform and fecal coliform TMDLs disappears when beneficial uses are taken into account.

Comment 104

P. 36, Section 4.1.2: For both the interim and final wet weather numeric targets the total coliform values are less than the fecal coliform values. This illogical discrepancy (total coliform values should be inevitably be greater than fecal coliform values since by definition total coliforms are the sum of fecal plus all other coliforms) will by default create a stricter bacteria standard that will be impossible to meet.

Response: Please see the response to Comment 103.

Comment 105

P. 38, Section 4.2.1: For both the interim and final dry weather numeric targets the total coliform values are less than the fecal coliform values. This illogical discrepancy (total coliform values should be inevitably be greater than fecal coliform values since by definition total coliforms are the sum of fecal plus all other coliforms) will by default create a stricter bacteria standard that will be impossible to meet.

Response: Please see the response to Comment 103.

Comment 106

The technical analysis is based on a policy decision made by the staff that 303(d) listings must be determined from an exceedance of any of three bacterial indicator organisms. The best available science clearly indicates that 2 of the 3 indicator organisms employed by staff (total and fecal coliform) are uncorrelated with risk to human health and thus, to the protection of the beneficial use. We believe that the Regional Board should consider the policy implications of this assumption relative to current and future listings, as well as the implications of this assumption as it constrains the ability of the staff to evaluate impairment based on the best available scientific information. Staff efforts should be focused on the indicators that have the strongest link to public health issues and that will result in true protection of beneficial uses. Limited staff and resources should not be wasted on researching and controlling indicators that will not result in a measurable improvement of protecting public health.

Response: That a listing decision is determined by exceedance of any of the three bacteria indicator organisms is not a policy decision made by staff; listing decisions are based on the procedures in the Listing Policy. Since the Basin Plan and Ocean Plan include WQOs for total and fecal coliform, we are required to develop TMDLs for waterbodies not meeting these WQOs. This TMDL process is not the forum for revising objectives. We agree that efforts by all parties should be focused on the indicators that have the strongest link to public health issues and will result in true protection of beneficial uses; therefore we encourage dischargers to focus their efforts on abating anthropogenic sources of bacteria. The discharges may choose to conduct special studies to identify controllable anthropogenic bacteria sources to help focus their load reduction efforts. We believe that focusing on controllable sources may prove effective at protecting beneficial uses, as was the case with Mission Bay. In this waterbody, diversion of urban runoff and other management measures essentially eliminated significant threats to human health during dry weather conditions.

Comment 107

It is becoming more and more widely acknowledged that the traditional indicator bacteria can provide unreliable estimates of potential public health impacts. EPA is developing improved indicators and others are developing new methods that identify specific contamination sources and/or pathogens. Thus, the TMDL targets are based on measurements that we cannot confidently link to the desired policy outcome (i.e., lowering public health risk). Admittedly, the Regional Board

is operating under certain constraints in terms of the TMDL schedule and is not able to delay implementation until these improved indicators and methods are available. However, simply stating that the TMDL targets may be reviewed and revised as better information becomes available is an inadequate policy response. Municipalities and other entities must soon start to make costly, irreversible, and long-term decisions about how to meet the TMDL targets. There is a large amount of uncertainty about whether and to what extent these decisions will actually reduce health risks.

Response: We disagree that traditional indicator bacteria provide "unreliable" estimates of potential public health impacts; however, we recognize that the accuracy of the correlation of bacteria densities to health risks is the subject of recent discussions. For this reason, several studies have been completed or initiated to examine the health risks associated with indicator bacteria, as well as potentially new indicators of health risks.

We are obligated to proceed with utilizing WQOs consisting of total coliform, fecal coliform, and enterococci bacteria to calculate TMDLs because they are the established indicators of risk to public health. Under Clean Water Act (CWA) section 303(d), the San Diego Water Board is obligated to develop TMDLs for waters not meeting water quality standards (WQOs and the beneficial uses they are designated to protect). TMDL calculations must be based on existing WQOs.

The administrative proceedings at the San Diego Water Board level are not the appropriate forum for investigating the validity of the bacteria WQOs. Reevaluation of water quality criteria that are the basis for WQOs cited in the Basin Plan takes place at the USEPA level. Should USEPA promulgate new water criteria, then the WQOs in the Basin Plan will be updated accordingly and TMDLs recalculated.

The SWRCB is considering the adoption of statewide bacteria criteria for inland surface waters. Although the bacteria indicator WQOs will be under review by the SWRCB, adoption and implementation of these TMDLs should move forward. Mechanisms exist to modify the bacteria TMDLs if and when the regulatory framework changes.

We further disagree with the commenter that achieving the TMDL targets might not result in the desired outcome, i.e. lowering public health risk. If the numeric targets are overly conservative in terms of lowering risk to public health, then the desired policy outcome (sufficiently high receiving water quality) has been achieved if WQOs have been attained. At the same time, we recognize that reducing bacteria loads is costly. Therefore, we will continue to work with our stakeholders to refine the TMDLs to ensure that public health is protected and that public money is prudently spent.

Comment 108

The City is pleased to see that the Report had been revised to acknowledge the potential value of future efforts, such as the recently funded epidemiology and microbial source tracking study at Doheny State Beach and potential role that the study results may have on recalculating WQOs, if necessary.

Response: The commenter refers to section 11.6 of the Technical Report, which describes how future studies can be used to fill in data gaps related to TMDL analysis. TMDLs can be recalculated for a number of reasons, including the availability of new data for model calibration and validation, or the establishment of new WQOs, on which TMDLs are based. WQOs are not recalculated by the San Diego Water Board. WQOs are based on water quality criteria developed by USEPA, which are in turn based on epidemiology studies.

Comment 109

The City of San Diego coordinated with Weston Solutions regarding the Bacterial Monitoring and Source Tracking for Pacific Beach Point (CD attached). The study objective was to design and implement a bacterial investigation that would identify sources of bacterial contamination impacting the receiving waters at PB Point and subsequently recommend management actions to reduce or eliminate those sources. The study found that the bacterial sources from the wrackline, birds and flies, not sewage or urban runoff. This study points to the need for addition research to determine the human health risk for REC1 use when there is no human sewage and urban runoff sources. This information can also be used to help develop a natural sources exclusion approach to be included in the Basin Plan.

Response: Comment noted. This type of information could be used to recalculate TMDLs based on the natural sources exclusion approach. We strongly encourage additional research and special studies that can be used to improve the TMDLs.

Comment 110

Since EPA's Fecal Coliform and Enterococcus WQOs represent statistically equivalent health risks for contact recreation, the TMDL should allowance for compliance to be determined with either the FC or the ENT targets, not necessarily both of them.

Response: The commenter points out that the EPA's fecal coliform and enterococcus WQOs represent statistically equivalent health risks for contact recreation. This means that exceeding the fecal coliform **or** entrococcus WQOs would present an increased health risk for water contact recreation. In other words, if the entrococcus target is exceeded, but the fecal coliform target is not exceeded, or vice versa, there is an increased risk to human health. Therefore, allowing compliance with either fecal coliform or enterococcus would not be protective of the REC-1 beneficial use if one bacteria indicator is exceeded, and the other is not. Compliance with the WQOs for all indicator bacteria is required to be protective of health risks for REC-1 beneficial uses.

Comment 111

The TMDLs should be based on the California Department of Health Services beach bathing water standards.

The Santa Monica Bay Beach Bacteria TMDLs were developed over a three year period with extensive scientific analysis of monitoring databases and epidemiology studies. The

TMDL has been in place for nearly four years and has already resulted in dramatic improvement in beach water quality during the AB 411 months between April and October. The Santa Monica Bay approach is as follows:

- TMDL targets are based on allowable exceedances of all seven of the state's beach water quality standards in the California Ocean Plan:
- Single sample
    - Total coliform 10,000 MPN
    - Fecal coliform 400 MPN
    - Enterococcus 104 MPN
    - Total/fecal ratio <= 10
- Geometric mean
    - Total coliform 1,000 MPN
    - Fecal coliform 200 MPN
    - Enterococcus 35 MPN

Response: The bacteria TMDLs are calculated using the same numeric targets as the WQOs described in this comment. The WQOs described in this comment are applicable to beaches, therefore where WQOs for freshwater are more stringent, these are used instead. Single sample maximum values are used for wet weather TMDL calculation, and geometric mean WQOs are used for dry weather TMDL calculation. The total/fecal ratio was not used because TMDLs are expressed on a loading basis as described in the response to Comment 147.

Different dry weather and wet weather numeric targets were used because the bacteria transport mechanisms to receiving waters are different under wet and dry weather conditions. Single sample maximum WQOs were used as wet weather numeric targets because wet weather, or storm flow, is episodic and short in duration, and characterized by rapid wash-off and transport of high bacteria loads, with short residence times, from all land use types to receiving waters. Geometric mean WQOs were used as numeric targets for dry weather periods because dry weather runoff is not generated from storm flows, is not uniformly linked to every land use, and is more uniform than stormflow, with lower flows, lower loads, and slower transport, making die-off and/or amplification processes more important. Please see sections 4.1.2 and 4.2.1 of the Technical Report for a summary of the numeric targets.

Comment 112

The TMDL requires bacterial reductions in the watershed based on occurrence of three bacterial indicators during both wet and dry seasons. Scientific evidence available since 1986[14,15,16] clearly indicates that there is no scientifically valid relation between the

[14] U.S. EPA Ambient water quality criteria for bacteria; EPA440/5-84-002; 1986;
[15] Pruss, A., Review of Epidemiological Studies on Health Effects from Exposure to Recreational Water. Int J Epidemiol. 1998, 27, (1),1-9.
[16] Wade, T.J., Pai, N., Eisenberg, J. & Colford, J.M., Do US EPA water quality guidelines for recreational waters prevent gastrointestinal illness? A systematic review and meta-analysis. Environ. Heal. Perspec. 2003, 111, (8), 1102-09.

occurrence of two (total coliform and fecal coliform) of the three indicators employed and adverse human health effects, and thus protection of the REC-1 beneficial use.

Response: Please see the response to Comment 107.

Comment 113

The single sample maximum value water quality objective is used as the basis for the wet weather TMDL analyses. However, careful review of the original documentation that explains the derivation of the single sample maximum[17] clearly indicates that this value was not intended to apply during wet weather events in general, and particularly not in the case of stormwater dominated waterbodies.

Response: We are familiar with the documentation that the commenter refers to, but we do not agree that it indicates that the single sample maximum was not intended to apply during wet weather events in general. The original documentation states that "To set the single sample maximum, it is necessary to specify the desired chance that the beach will be left open when the protection is adequate."

In southern California and the San Diego Region, the beaches are open year-round, even during wet weather conditions. There are many members of the public that may recreate in the water during wet weather (e.g., surfers). Therefore, protection must be adequate year-round and during wet weather conditions.

Many of the creeks in the Region only flow during stormflow conditions. However, the levels of bacteria that are transported in storm flow by the creeks are often elevated. Because the creeks in the Region ultimately flow out to ocean during wet weather conditions, the bacteria levels in the creeks, and ultimately the ocean must meet either the geometric mean or the single sample WQOs to be protective of recreational swimmers.

A geometric mean objective cannot be used for wet weather because a storm even doesn't last for 30 days. A geometric mean must be calculated with several data points, ideally equally spaced over 30 days. Storm events in southern California are typically short term and episodic, and collecting enough samples to calculate a geometric mean would be difficult and costly, nor would it make sense to do so because of the short duration. The sampling results would likely result in exceedances of the geometric mean more frequently than exceedances of the single sample maximum WQOs. Because wet weather, or storm flow, is episodic and short in duration, and characterized by rapid wash-off and transport of high bacteria loads, with short residence times, the single sample maximum is the most appropriate WQO for the wet weather TMDL analysis.

Comment 114

California's overall technical approach for addressing bacterial issues appears to be outdated and not in line with the latest EPA guidance. EPA has moved away from the use of Total Coliforms, and towards Enterococci for effects to bathers and swimmers (REC-

[17] U.S. EPA Ambient water quality criteria for bacteria; EPA440/5-84-002; 1986.

1) in marine waters [note E-Coli for same in freshwater]. For SHELL, they recommend fecal coliform. Consideration should be given for using these as the indicator parameters.

Response: The commenter correctly states that USEPA recommends using only enterococci and *E. coli* to evaluate potential health risks for water contact recreation uses. However, states have option of adopting more stringent criteria. The existing Basin Plan and the Ocean Plan both have WQOs for total coliform, fecal coliform, and enterococci for REC-1, and total coliform for SHELL.

We are obligated to proceed with utilizing WQOs consisting of total coliform, fecal coliform, and enterococci bacteria to calculate TMDLs because they are the established indicators of risk to public health. Under Clean Water Act (CWA) section 303(d), the San Diego Water Board is obligated to develop TMDLs for waters not meeting the existing water quality standards in the Basin Plan and/or Ocean Plan (WQOs and the beneficial uses they are designated to protect). TMDL calculations must be based on existing WQOs.

Comment 115

The technical basis/rationale should be provided for the bacterial standards used, particularly in relation to the interim and final numbers (review of the Executive Summary and the document through Section 8 [p.72] did not uncover this). Review of the Basin Plan also failed to uncover the basis for these values.

Response: The technical basis/rationale for the bacterial standards used is not required to develop the TMDLs. However, the rationale for the use of the WQOs for TMDL development is discussed in the response to Comment 107.

Comment 116

As mentioned in our letter of September 6, 2005, we remain concerned about building a TMDL while an acknowledged gap exists in the link between indicator bacteria and human pathogens. The lack of epidemiological studies that might establish a link, or lack thereof, between nonhuman sources of bacteria and the risk of illness must be resolved. The Revised Technical Report states, "The San Diego Water Board recognizes that there are potential problems associated with using bacteriological WQOs to indicate the presence of human pathogens in receiving waters free of sewage discharges." The failure to establish this critical link will lead to expensive and costly testing, structural investments, and changes to accepted cultural practices by farmers that might not be needed. While the authority to establish the TMDL is clear, there is a responsibility to the public not to do it in a manner that is arbitrary and capricious.

Response: As discussed in the response to Comment 107, we are obligated to proceed with utilizing WQOs consisting of total coliform, fecal coliform, and enterococci bacteria to calculate TMDLs. Under Clean Water Act (CWA) section 303(d), the San Diego Water Board is obligated to develop TMDLs for waters not meeting the existing water quality standards in the Basin Plan and/or Ocean Plan (WQOs and the beneficial uses they are designated to protect).

While the risk of contracting a water-born illness from contact with runoff free of sewage discharges is not known, there are some pathogens (e.g., *giardia* and *cryptosporidium*) that originate from animal hosts, such as domesticated animals (e.g., cows, sheep, horses, etc.), which are known to cause human illness. Until epidemiological studies establish that there is no link between nonhuman sources of bacteria and the risk of human illness, the WQOs in the Basin Plan and/or Ocean Plan and the conservative nature of the TMDL calculations are appropriate.

5.4 Beneficial Uses

Comment 117

SHELL Beneficial Use and Water Quality Objectives (WQO): We are concerned that the SHELL total coliform WQO has been inappropriately applied in the final TMDLs. The TMDL document states that "final dry weather total coliform TMDLs utilize the SHELL WQO as a numeric target because this WQO is more stringent than the REC-1 WQO for total coliform". There is no basis provided in the document that justifies using the more stringent SHELL WQO in place of the REC-1 WQO.

It is our understanding that the San Diego Region waters are 303(d) listed as impaired for REC-1 beneficial uses, not SHELL. In this case, we believe the REC-1 WQO should be utilized in the final TMDLs for waters that are 303(d) listed as impaired for REC-1 beneficial uses.

Response: The bacteria TMDLs were calculated from modeled flow at the bottom of the watershed at critical points. These critical points are nodes in the model representing locations just before inter-tidal mixing occurs in the surf zone. The basis for using the SHELL water quality objective as the numeric target for total coliform TMDLs, is justified because the flow from the watershed will end up discharging to the Pacific Ocean shoreline or San Diego Bay. All beneficial uses of a waterbody must be protected and for the Pacific Ocean and San Diego Bay, this includes SHELL which also is the most sensitive water quality objective for total coliform bacteria.

In the 2006 update of the List of Water Quality Limited Segments, the State Board did not evaluate data with respect to the SHELL water quality objective for bacteria. Thus, the 2006 list is likely not accurate with regard to water quality supporting the SHELL use at Pacific Ocean shorelines. The information presented in the Technical Report show a significant number of exceedances of the SHELL water quality objective. See Appendix H, Figures H-3 and H-4.

Comment 118

TMDLs for impaired saltwater beaches should be expressed separately from TMDLs for impaired Freshwater creeks for both wet and dry weather. Specifically, Interim Beach TMDLs should be defined in terms of allowable exceedance days along the beaches, which have already been calculated for wet weather (Table 8-2), so little additional effort is needed to make this change in the text, and which offer a useful, easily-understandable metric. Separation of saltwater and freshwater TMDLs is supported by the lack of established linkage between creek loads and beach exceedances. The wet-exceedance allowances in the TMDL Report were based on studies only at reference pristine saltwater beaches – with *no* data available within the creeks discharging to those beaches. In some cases, sand berms had formed naturally at the creek mouth, so that beach exceedances sometimes occurred despite *no creek discharge at all*. For both wet and dry weather, the "critical point" of the model is located in freshwater upstream of many factors (salt vs. fresh; dilution/assimilation; beach bacteria sources such as sea birds and wrack line; single-sample vs. geomean criteria; natural exceedance allowance, etc.) that

confound the creek/beach relationship. This has all contributed to ***model results that defy common sense: at Aliso, for example, the daily maximum load of fecal coliform bacteria on one of the 15 allowable wet-weather exceedance days is 8,000 times higher than the daily allowable load of bacteria on any one of the 296 dry-weather days***.* Separation of the beach and creek TMDLs would be a simple and practical way to rectify these modeling discrepancies *now* without requiring significant supplemental staff time. Better research data from ongoing reference-beach and creek-natural-loading studies will soon be available to better inform our understanding of actual beach/creek bacteria-load relationships. The report already makes provision for future updating and correcting of the TMDLs as these findings are developed.

*Calculated as 968,920 billion/15 days divided by 2,383 billion/296. If we attempt to guesstimate the more obvious correction factors (x2 for numeric target of 400 vs. 200; x9 for 90% natural bacteria not accounted under dry weather, and x3 for 2/3 of dry weather flows being anthropogenic), that would still be a predicted wet:dry load relationship of only x54, not x8,000.

Response: The rationale for calculating one TMDL for each indicator bacteria for a creek and its downstream beach is discussed in section 4.4 of this Appendix. Additionally, the WLAs are expressed as loads (billion MPN/year) as opposed to exceedance days for the reasons outlined in the response to Comment 147.

As stated in the comment, the exceedance frequency during wet weather described in the Technical Report were based on studies only at a reference saltwater beach, with no data available within the creek discharging to the beach. The 22 percent allowable exceedance frequency for wet weather was based on measurements in the wavewash at Leo Carillo beach (downstream of the Arroyo Sequit watershed) in Los Angeles County. In this situation, creeks were not obstructed from flowing to the beach; therefore bacteria loading was presumed to originate mostly from the watershed. However, other local beach sources downstream of the mixing zone such as birds, marine mammals, and bacteria re-growth on the wrack line, likely contributed to exceedances of the WQOs.

There is little data at this point regarding exceedances of the single sample maximum WQOs in a reference system during dry weather. Some exceedances have been observed at San Onofre beach in San Diego County, even though berms separating the creeks from the beaches are in place most of the time. However, these exceedances are very few (exceedances for enterococci are 1 percent, zero for total and fecal coliform). Monitoring results from weekly beach sampling are presented in Table 4-4. Because the berms are in place, exceedances are most likely caused by local sources on the beach, downstream of the mixing zone. More recently, weekly data from the winter-dry beach and creek monitoring conducted by the SAG at San Onofre and San Mateo beaches from November 2004 through March 2005 showed that the bacteria densities at the creek sampling locations were typically higher or similar to bacteria densities at the ocean sampling locations. Although this data set is limited, it does support the dischargers claim that natural sources in the watershed may be causing exceedances, which may not be detected with beach sampling.

SCCWRP has initiated a study to quantify background loading from a reference watershed(s) during both wet and dry weather (Eric Stein, SCCWRP, personal communication, April 3, 2006). The goal of the study will be to characterize the background loading of bacteria from a number of reference watersheds under various hydrological conditions. The watersheds vary by size, location, and other parameters. Despite the quantification of loading during dry weather conditions, a reference watershed approach will not be used to calculate dry weather TMDLs. While most studies quantify the frequency of exceedances of the single sample maximum WQOs, TMDL calculation during dry weather makes use of the geometric mean WQOs. An allowable exceedance frequency does not apply to a geometric mean because the geometric mean is an average value over the course of 30 days.

We disagree that model results defy common sense. The reason for the sizeable difference between the TMDLs for wet and dry weather is due to the difference in magnitude between these two types of flows. Wet weather flows are typically orders of magnitude higher than dry weather flows, thus the wet weather bacteria loads are orders of magnitude higher. For example, in Aliso Creek, wet weather flows were predicted to be about 1,650 cubic feet per second (cfs) in the critical wet year, while dry weather flows were estimated at 1.6 cfs. Since the flow rate increases by 3 orders of magnitude during wet flows, so does the assimilative capacity of the waterbody. The waterbody can receive significantly higher loads during wet weather events because the additional volume provides dilution and the ability to assimilate the pollutant.

Comment 119

TMDLs for impaired saltwater beaches should be expressed separately from TMDLs for impaired Freshwater creeks for both wet and dry weather. Specifically, Interim Beach TMDLs should be defined in terms of allowable exceedance days along the beaches, which have already been calculated for wet weather (Table 8-2), so little additional effort is needed to make this change in the text. Separation of saltwater and freshwater TMDLs is supported by the lack of established linkage between creek loads and beach exceedances in the reference data. The wet-exceedance allowances in the TMDL Report were based on studies only at reference pristine saltwater beaches – with *no* data available within the creeks discharging to those beaches. In some cases, sand berms had formed naturally at the creek mouth, so that beach exceedances sometimes occurred despite *no creek discharge at all*. For both wet and dry weather, the "critical point" of the model is located in freshwater upstream of many factors (salt vs. fresh; dilution/assimilation; beach bacteria sources such as sea birds and wrack line; single-sample vs. geomean criteria; natural exceedance allowance, etc.) that confound the creek/beach relationship. This has contributed to questionable model results: at Aliso, for example, the daily maximum load of fecal coliform bacteria on one of the 15 allowable wet-weather exceedance days is 56 times higher than the daily allowable load of bacteria on any of the 296 dry-weather days**.** Separation of the beach and creek TMDLs would be a simple and practical way to rectify these modeling discrepancies *now* without requiring significant supplemental staff time. Better research data from ongoing reference-beach and creek-natural-loading studies will soon be available to better inform

our understanding of actual beach/creek bacteria-load relationships, but the report already makes provision for future updating and correcting of the TMDLs as these findings are developed.

Response: Please see the response to Comment 118.

Comment 120

TMDLs for impaired saltwater beaches should be expressed separately from TMDLs for impaired freshwater creeks for both wet and dry weather. Interim Beach TMDLs should be defined in terms of allowable exceedance days along the beaches, which have already been calculated for wet weather (Table 8-2) and which would be consistent with locally-established precedent in RWQCB Region 4. In keeping with the saltwater/freshwater separation, SHELL Total Coliform WQOs should not be applied to freshwater creeks. Separation of saltwater and freshwater TMDLs is supported by:

- Lack of established linkage between creek loads and beach exceedances in the reference data. The wet-exceedance allowances in the TMDL Report were based on studies only at reference pristine saltwater beaches – with no data available within the creeks discharging to those beaches. In some instances, sand berms had formed naturally at the creek mouth, so that beach exceedances sometimes occurred despite no creek discharge at all. Years of data at Aliso Creek and Beach indicate that more typically (especially in dry weather) freshwater creek exceedances far outnumber saltwater beach exceedance days, and the magnitude of creek exceedances is also much higher.
- The TMDL Report's stacking-up of reference beach exceedance days, freshwater bacteria load calculations, and multiple unquantified margin-of-safety assumptions has produced model results so skewed as to be profoundly implausible. The Total Maximum Daily Load is supposed to represent the amount of a pollutant that a water body can assimilate without exceeding water quality objectives. Why would a beach's maximum daily load vary by 4 orders of magnitude (10,000 times) between wet and dry weather? Consider the one example of Aliso Creek: The TMDL Report (Table 9.1) says, in effect, that 968,920 billion fecal coliform bacteria (the 90.1% of creek total wet-weather bacteria load defined as non-controllable non-point "natural background") are needed to cause 15 days (per Table 8.2) of allowable "natural background" fecal coliform exceedance at the beach annually. On average, that's a load of at least 64,595 billion bacteria to produce one exceedance day at the beach. How can it be plausible that the daily TMDL load for dry weather (8 billion bacteria for each of the 296 dry days per year per Table 8-3) would be only 0.012% (8/64,595th) of the daily TMDL load needed to produce one beach exceedance day in wet weather? Or that the dry weather load for the entire 296-day dry season would be only 3.7% (2,383/64,595) of the allowable load for one wet-weather day?
- Separation of the beach and creek TMDLs would be a simple and effective way to rectify these discrepancies now without requiring significant supplemental staff time. The report already makes provision for future updating and correcting of

the TMDLs and Basin Plan as better research data from current reference-beach and creek-natural-loading studies lead to better understanding of actual beach/creek bacteria-load relationships.

Response: Please see response to Comment 118.

Comment 121

SHELL Total Coliform numeric targets should not be selectively forced onto the impaired freshwater creeks. SHELL Total Coliform Water Quality Objectives apply to marine salt waters, not to inland surface freshwaters. Tables 4-3 and 4-6 explicitly and wrongly place Total Coliform numeric targets on Aliso Creek and the San Diego River. The excuse is given that this is necessary for officially-impaired creeks in order to protect the impaired downstream beach. But Total Coliform TMDLs (Tables 9-3 and 9-4) are calculated for every creek mouth and storm drain outfall to all the impaired beaches, regardless of whether the creeks or storm drains are specifically 303(d) listed as impaired. The implicit effect of singling out Aliso Creek and the San Diego River in Tables 4-3 and 4-6 is to force Total Coliform WQOs onto the two freshwater creeks' entire waterbodies, not just the mouths. This is inappropriate and improper.

Response: The comment that we are singling out Aliso Creek and the San Diego River as being the only fresh waterbodies with a need to protect a downstream SHELL beneficial use is incorrect. For this reason, the discussion of numeric targets pertaining to these waters was modified in sections 4.1 and 4.2 to avoid the misunderstanding that they are being singled out.

Although SHELL is not a designated use in freshwater creeks and rivers, the total coliform density in these waters where they discharge to the Pacific Ocean must be at a level that support SHELL use at the approximate point where the creeks and rivers discharge at the shorelines. Thus, the SHELL WQO for total coliform is the appropriate numeric target for the TMDLs for impaired creeks and rivers even though they do not support SHELL use. Although REC-1 WQOs for fecal coliform and enterococci apply throughout the watersheds, the total coliform TMDLs for SHELL must be met only at the bottom of the watershed in the marine waters where creeks and rivers discharge to the Pacific Ocean.

Please see section 4.4 of this appendix for a discussion about the difference between the critical points used to model TMDLs and potential points that may be selected for compliance with the TMDLs.

Comment 122

SHELL Total Coliform numeric targets should not be selectively applied to the impaired freshwater creeks. SHELL Total Coliform Water Quality Objectives apply to marine salt waters, not to inland surface freshwaters. Tables 4-3 and 4-6 explicitly and wrongly place Total Coliform numeric targets on Aliso Creek and the San Diego River. The reason given is that this is necessary for officially-impaired creeks in order to protect the impaired downstream beach. But Total Coliform TMDLs (Tables 9-3 and 9-4) are

calculated for every creek mouth and storm drain outfall to all the impaired beaches, regardless of whether the creeks or storm drains are specifically 303(d) listed as impaired. The implicit effect of singling out Aliso Creek and the San Diego River in Tables 4-3 and 4-6 is to force Total Coliform WQOs onto the two freshwater creeks' entire waterbodies, not just the mouths. This is inappropriate and imposes stricter water quality standards than those identified in the Basin Plan.

Response: Please see the response to Comment 121.

Comment 123

The technical analysis is based on the assumption that REC-1 is appropriate in all segments of all waterbodies at all times of the year. Due to the variable nature of bacterial contamination, seasonal and frequency of use/potential exposure based considerations should be addressed. This is especially evident at Aliso and Chollas Creeks, where the beneficial use for the creek is designated not as REC-1, but as REC-2 (potential REC-1) in the Basin Plan. The "potential" designation indicates that (although there may be plans, possibilities or desires for REC-1 use), actual existing or pre-existing REC-1 use has not been established. Compared to popular public ocean beaches where heavy dry-weather use justifies using the "designated beach" water quality objectives, compliance within Aliso and Chollas Creeks should be judged by the REC-2 objectives; and the REC-1 creeks or creek segments should be selectively subject to "moderate full contact recreation", "lightly used full body contact recreation", or "infrequently used full body contact recreation" designations and objectives depending on site-specific usage conditions, as recommended by US EPA and referenced in the Basin Plan. Similarly, wet-weather targets for ocean beaches should utilize the "lightly used" or "infrequent use" objectives (depending on location) to reflect much lower usage rates during rain.

Response: The TMDLs make no assumption about the water quality standards. The standards are established in the Basin Plan and Ocean Plan. The Clean Water Act (CWA) requires that the TMDLs ensure that water quality supports existing and potential uses. Use of the "designated beach" water quality objective as a TMDL numeric target is reasonable due to the high-density population along the Southern California coast and the general appeal of the ocean and beaches for contact and non-contact recreation.

The dischargers must provide evidence to justify classifying an ocean beach as a "moderately or lightly used area." If compelling evidence is provided, the "moderately or lightly used area" enterococci WQOs could be used as the wet weather numeric target to revise the TMDLs.

Comment 124

The technical analysis is based on the assumption that the Regional Board's policy is that REC-1 is appropriate in all segments of all streams in all watersheds at all times of the year. Due to the variable nature of bacterial contamination, seasonal and frequency of use/potential exposure based considerations should be addressed.

The technical analysis is based on the assumption that it is the Board's policy throughout the entire Region that all segments of all waterbodies in all watersheds are subject to "designated beach" water quality objectives rather than applying "moderate full contact recreation", "lightly used full body contact recreation", or "infrequently used full body contact recreation" designations, as recommended by US EPA and referenced in the Basin Plan.

Response: Please see the response to Comment 123.

Comment 125

Table 9-4 - Final TMDLs for Total Coliform – The total coliform load assigned to Chollas Creek appears to reflect the SHELL fecal coliform water quality objective standard instead of the REC 1 water quality objective. This is inconsistent with the statement in Section 4.2.1 that SHELL beneficial use would not be assigned to Chollas Creek and other creeks. Please modify Table 9-4.

Response: The commenter correctly states that there is an inconsistency with the text of section 4.1.2 and Table 9-4. Although the text omits the application of SHELL numeric targets to Chollas Creek TMDLs for total coliform, Table 9-4 contains total coliform TMDLs for Chollas Creek (total coliform WQOs only pertain to SHELL beneficial use). As opposed to modifying Table 9-4, the text in section 4.2.1 has been modified so that the total coliform WQOs associated with the SHELL beneficial use are the indicated numeric targets for TMDLs for the impaired creeks, including Chollas Creek (the Technical Report previously applied the SHELL WQOs only to Aliso Creek and the San Diego River).

Although SHELL is not a designated use in freshwater creeks and rivers, the total coliform density in these waters where they discharge to the coastal waters must support the SHELL use at the approximate point where the creeks and rivers discharge at the shorelines. Thus, the SHELL WQO for total coliform is the appropriate numeric target for the creeks and rivers even though they do not support SHELL use. Although REC-1 WQOs for fecal coliform and enterococci must be met throughout the watersheds, the total coliform TMDLs for SHELL use must be met only at the bottom of the watershed in the marine waters where creeks and rivers discharge to coastal waters. See section 4.4 of this appendix.

Comment 126

The technical approach assumes that there is a direct relationship between the control of bacteria loading during rainfall events and the protection of recreational uses. The technical approach estimates the total bacterial loading to watersheds, and computes a required bacterial reduction from those loading values. The vast majority of the bacterial loadings occur during rainfall events. Presumably, these rainfall events correspond to times of the year when the actual beneficial use is at its minimum (the number of recreators is least during rainfall events). The technical approach assumes in effect that to protect the use, bacterial loadings must be reduced during these storm events. A much more practical approach, and one consistent with Porter-Cologne would be to prioritize

the reduction of bacterial concentrations during the times when the beneficial use is at its maximum.

Response: We agree that rainfall events correspond to times of the year when the REC-1 beneficial use is at its minimum. However, beneficial uses apply at all times, and therefore must be protected at all times, regardless of season or hydrological conditions. Despite poor water quality, or even dangerous oceanographic conditions, REC-1 use is still occurring during wet weather events and the following 72 hours. The technical approach does assume that to protect the use, bacterial loading must be reduced during these storm events.

We agree that reduction strategies should be prioritized according to when the use is highest, namely the summer dry season. However, this does not obviate the need to eventually address wet weather loads. The compliance schedule does not preclude dischargers from addressing dry weather loads before addressing wet weather loads.

Comment 127

Table 9-4 – Final TMDLs for Total Coliform – The total coliform load assigned to Forrester Creek appears to reflect the SHELL fecal coliform water quality objective standard instead of the REC 1 water quality objective. This is inconsistent with the statement in Section 4.2.1 that SHELL beneficial use would not be assigned to Forrester Creek. Please modify Table 9-4.

Response: The error in Table 9-4 has been corrected as a result of this comment. Only 1 TMDL for each indicator was calculated at the critical point for the San Diego River watershed. Separate TMDLs for the lower San Diego River and Forrester Creek were not calculated. In addition, the text in section 4.1 and 4.2 was modified to show that the SHELL total coliform WQOs was used as a numeric target for TMDLs for bacteria loading from all inland surface waters, including the San Diego River which includes Forrester Creek.

Although SHELL is not a designated use in freshwater creeks and rivers, the total coliform density in these waters where they discharge to the Pacific Ocean must be protective of the SHELL use at the approximate point where the creeks and rivers discharge at the shorelines. Thus, the SHELL WQO for total coliform is the appropriate numeric target for the TMDLs for beaches even though the creeks that discharge to the beaches do not support SHELL use. Although REC-1 WQOs for fecal coliform and enterococci apply throughout the watersheds, the total coliform TMDLs must be met only at the bottom of the watershed in the marine waters where creeks and rivers discharge to the Pacific Ocean. See section 4.4 for further discussion.

Comment 128

In response to previous critiques regarding the inappropriate application of SHELL saltwater Total Coliform water quality objectives (WQOs) discriminately onto inland freshwater Aliso Creek and the San Diego River, the Revised Draft Report exacerbates its problems by lumping *all* the freshwater creeks *and* their downstream saltwater beaches

into Table 4-3. This change results in A) forcing the more-stringent freshwater Enterococci WQOs to be applied inappropriately to saltwater sites, in addition to B) inappropriately forcing the SHELL Total Coliform WQO onto creeks, for wet weather conditions. The Revised Draft Report also *expands* its inappropriate application of SHELL Total coliform WQO to apply to *all* creeks (not just Aliso and San Diego) for the Dry Weather targets (Table 4-5). The Revised Draft Report attempts to justify these moves by citing the need to control discharge of creeks to protect the beaches, but this argument works in diametrically conflicting directions relative to Total Coliform WQOs (which are more stringent at saltwater) and Enterococci WQOs (which are more stringent at freshwater). The Revised Draft Report also still retains the logical absurdity of the final dry-weather Total Coliform targets being less than the Fecal Coliform targets (despite Fecal Coliform being a subset of Total Coliform biologically).

Response: Please see section 4.4 of this appendix, which explains why one TMDL for each indicator bacteria was calculated for each impaired creek and its downstream beach and where WQOs are applicable. In response to the total coliform/fecal coliform discrepancy, the reason for this discrepancy is that final numeric targets for total coliform are based on the SHELL beneficial use, which is more stringent than WQOs for REC-1. There are no WQOs for fecal coliform for SHELL. Because the WQOs associated with SHELL are more stringent than the WQOs for REC-1, then this results in final numeric targets showing a discrepancy between values for total coliform and fecal coliform.

The result of this discrepancy is that, although the numeric target of 400 MPN/mL is reported for fecal coliform, in practice a lower fecal coliform density will have to be met in order to meet the total coliform target of 230 MPN/mL. This apparent lack of logic disappears when beneficial uses are taken into account.

Comment 129

<u>The Enterococci conundrum could be readily solved</u> by correcting the single-sample wet-weather numeric Enterococci target for creeks to reflect the most appropriate criterion in the Basin Plan. The Basin Plan divides the single-sample Enterococci objectives, used in the TMDL for wet weather, based on ”designated beaches”, “moderately or lightly used areas”, or “infrequently used areas”. The appropriate (in fact, generous) description of actual REC-1 use of creeks under wet weather conditions should be “moderately or lightly used” with a single-sample freshwater Enterococci target at 108 CFU/100 ml; or (more realistically) “infrequently used” with a freshwater Enterococci target at 151 CFU/100 ml. But the Draft Report currently uses the “designated beach” freshwater criterion, which does not realistically describe actual use under wet weather conditions along any of the creeks, many of which are actually designated (even under dry-weather conditions) as REC-2 (with only *potential* for REC-1). The freshwater “designated beach” single-sample WQO is 61 CFU/100 ml, which is unnecessarily *over-protective* relative to the “designated beach” single-sample saltwater criterion, which is 104 CFU/100 ml. Correcting the creek freshwater wet-weather Enterococci criterion to 108 CFU/100 ml would be adequately protective of recreation use at downstream saltwater beaches, given the assimilative capacity and reference-beach allowable exceedances

discussed under Comment #1 above. Making this correction could require the separation calculation of creek and beach TMDLs (for example, separating the "Aliso Creek" TMDLs from the "Aliso Beach" TMDLs), as previously discussed under Comment #2 above. Or more simply and since the difference is slight, **the single-sample 104 CFU saltwater criterion should be applied to both beaches *and* creeks for wet weather.**

Response: The Basin Plan does include saltwater and fresh water enterococci single sample objectives for "designated beaches," "moderately or lightly used area," and "infrequently used area." The Basin Plan does not provide criteria for assigning these categories to beaches. We must use the most conservative WQOs to protect REC-1 users.

To use the saltwater designated beach WQO of 104 MPN/100mL, and assume it supports the REC-1 use in Aliso Creek, we need substantial evidence supporting a conclusion that REC-1 uses of Aliso Creek are moderate to light. However, in response to this comment, the wet weather TMDLs for enterococci were calculated using both 61 MPN/100mL and 104 MPN/mL as the numeric target. The more stringent TMDL applies, unless dischargers provide the San Diego Water Board with substantial evidence that REC-1 use in Aliso Creek, San Juan Creek, Forrester Creek, the San Diego River, and Chollas Creek are at the "moderately or lightly used area" level. See revisions to section 9 of the Technical Report.

Comment 130

The "problem" of Total Coliform targets exceeding Fecal Coliform targets could be solved by recognizing that <u>the broad application of the SHELL Total Coliform numeric targets as currently shown in this Draft Report is unlikely to pass muster as legally supportable:</u>

a. Most of the 303(d) listings to coastal waters were for impairments to REC-1 beneficial use, not SHELL beneficial use. It is improper to require TMDLs for beneficial use impairments that have not been 303(d) listed.
b. Even where the 303(d) beach listings were for SHELL, there is no SHELL beneficial use designation in the Basin Plan for any inland surface water, so SHELL Total Coliform objectives could not properly be applied directly to their tributary freshwater creeks. **Separate calculation and labeling of creek vs. beach-discharge TMDLs for wet and dry weather would enable this Total Coliform issue to be corrected.**
c. Although SHELL is designated for coastal waters at the "Pacific Ocean", it is specifically *not* designated for coastal lagoons at San Dieguito, the mouth of the San Luis Rey River, and the mouth of Aliso Creek (Basin Plan Table 2-3), so these sites could not even be 303(d) listed for SHELL. Total coliform SHELL objectives therefore would not be applicable at these coastal locations.
d. The SHELL Total Coliform WQO of 70 MPN/100 ml in the Basin Plan (compared to 1,000 MPN/100 ml for REC-1 in the Ocean Plan) was originally "borrowed" as a single parameter cherry-picked from a longer list of parameters

in the State's Shellfish Sanitation standards as they are applied to "Approved" commercial shellfish growing grounds. An "Approved Area" means the site is free enough from sewage impacts to mass-propagate shellfish suitable for direct human consumption without cooking or other processing. The only State-authorized commercial shellfishing site in Region 9 is in Agua Hedionda Lagoon, but even this authorization is on a "Restricted" basis (meaning harvested shellfish must be processed or cooked before marketing). The applicable Total Coliform Shellfish Sanitation standard for a "Restricted Area" is 700 MPN/100 ml. Commercial shellfish propagation at any site in Region 9 other than Agua Hedionda is actually prohibited by the State. Furthermore, due to the possibility of biotoxins completely unrelated to Total Coliform, *any* harvesting in Region 9 (by anyone) for raw consumption is prohibited by the State from at least May to October annually (comprising the bulk of the "Dry Weather" period). The Shellfish Sanitation standards also allow for "Conditional" harvesting restrictions based on predictable bacteria-generating events, such as stormwater flows. In the recently-approved Bacteria TMDL for Tomales Bay (an "Approved Area" actively commercially harvested), the TMDL provided for an annual bacteria natural-exceedance allowance for stormflows; and devised a model-calculated Total Coliform standard (95 MPN/100 ml) for dry-weather tributary discharges to account for assimilative processes within the Bay. Within Tomales Bay, the Shellfish Sanitation standard for Fecal Coliform (14 MPN/100 ml geomean) was also applied as necessary to protect the use. The San Diego Region Basin Plan makes no acknowledgement of the Shellfish Sanitation Fecal Coliform standard, which is better correlated to actual fecal contamination and is dramatically more restrictive than the REC-1 standard. Due apparently to the reaction to the Tomales Bay TMDL and the contradictions between Regions with regard to the SHELL WQOs, RWQCB staff have advised the SAG that the State has put a moratorium on adding any new SHELL impairments to the 303(d) list.

Given this context, **a moratorium on enforcing Final Total Coliform TMDLs for SHELL should be explicitly stated in the Report, and considerations for enforcement should be deferred until the related beneficial use questions and appropriate WQOs are better resolved State-wide. For the interim, the Total Coliform target for beaches should be set at the REC-1 Ocean Plan standard for beaches, and Total Coliform should be deleted from the impaired-creek targets. The beach-discharge TMDLs for Total Coliform should be calculated/labeled separately from creeks. No Total Coliform targets or TMDLs should be specified for impaired creeks.**

Response: The development of TMDLs is not strictly limited to the water bodies on the List of Water Quality Limited Segments. The water bodies on the List of Water Quality Limited Segments have been given the highest priority for development of TMDLs. However, at some point in the future, TMDLs will be developed for all water bodies in the San Diego Region based on the beneficial uses and WQOs in the Basin Plan and/or Ocean Plan.

Whether or not shellfish harvesting is taking place for commercial or non-commercial purposes, the fact remains that the entire Pacific Ocean shoreline in the San Diego Region is designated for the SHELL beneficial use. The WQOs are established in the Basin Plan and Ocean Plan and must be used in the development of the TMDL. However, the commenter is correct that the SHELL WQOs only apply where the SHELL beneficial use has been designated in the Ocean Plan, which is in the marine waters of the Pacific Ocean shoreline and San Diego Bay. Thus, the SHELL WQOs are not required to be met in inland freshwater segments. Please see section 4.4 of this appendix for additional explanation about where WQOs are applicable.

The SWRCB chose not to evaluate bacteria data with regard to SHELL WQOs in the update of the 2006 List. However, this does not mean that water quality supports the SHELL use in our region. Whether or not a beach segment is specifically listed for SHELL impairment, SHELL is the most sensitive beneficial use in the watersheds of these TMDLs, and TMDLs were appropriately calculated for total coliform to protect the use.

According to the California Department of Fish and Game, native shellfish populations exist and harvesting is occurring in some coastal areas within the San Diego region,[18] therefore the argument that this use is not valid is unsubstantiated. However, the appropriateness of any standard or WQO must be addressed as a Basin Planning issue, not a TMDL issue. The Triennial Review process is the most appropriate forum for questioning the appropriateness of a beneficial use and/or a WQO.

Comment 131

SHELL Total Coliform numeric targets should not be applied to freshwater creeks. SHELL Total Coliform Water Quality Objectives apply to marine salt waters, not to inland surface waters. This approach wrongly places SHELL Total Coliform numeric targets on fresh waters in the region. This change results in requiring more stringent Total coliform requirements on the creeks. The justification for this approach is to protect the SHELL beneficial use at the downstream beaches. The effect of this is to force the extremely low SHELL Total Coliform WQOs onto entire watersheds, not just the mouths. This is inappropriate, improper, and not fully accounted for in the CEQA analysis.

Based upon evaluation of the data from studies conducted by the City of San Diego, we question the appropriateness of applying REC1 and SHELL beneficial use Water Quality Objectives (WQO) to entire watersheds. The Mission Bay Source Identification Study, funded by the State Water Resources Control Board Proposition 13 funding, found that the majority of the problems at the beaches were from the wrackline and birds. The City conducted the Bacterial Monitoring and Source Tracking for Pacific Beach Point, which built upon the Mission Bay study. This study was a source identification study and concluded that the problems at this beach were attributed to the wrackline, birds, and flies, not sewage or urban runoff.

[18] Robin Lewis and Bill Paznokas, personal communication, November 3, 2006.

The Basin Plan SHELL designation is for the protection of human health from the consumption of shellfish. However, the California Department of Health Services is the state's designated authority regarding the regulation the harvesting and sale of shellfish for human consumption. Their regulations have higher levels of allowed bacteria than the Basin Plan and this TMDL. Therefore, the experts in this field need to be included in the design of the SHELL component of the TMDL to ensure that the numeric limit is appropriate and not overly-conservative. For example, the Tomales Bay TMDL requirements are not as strict as this TMDL and shellfish are commercially harvested in that bay. If the San Diego Regional Board will not unilaterally support an appropriate standard, the City of San Diego recommends that this issue be addressed on a statewide basis.

Because the Regional Board is not funded to do so, the City of San Diego intends to pursue Basin Plan amendments to eliminate SHELL as a beneficial use at the mouth of Chollas Creek and REC-1 as a potential beneficial use throughout the watershed. Review of historical documents indicates that the harvesting of shellfish for human consumption was not occurring at the mouth of Chollas Creek on or after November 28, 1975. The mouth of Chollas Creek has been dredged and surrounded by commercial sites since the 1920's. Additionally, the City of San Diego has provided the Regional Board with documentation that large areas of the creek were channelized prior to the November 1975 Basin Plan adoption date. This documentation will be incorporated into a submittal to the Regional Board requesting the removal of the potential REC1 beneficial use of Chollas Creek.

Response: The commenter incorrectly states that the effect of the TMDL is to force the extremely low SHELL total coliform WQOs onto entire watersheds, not just the mouths. Please see section 4.4 of this appendix, which explains why one TMDL for each bacteria indicator was calculated for each impaired creek and its downstream beach and where WQOs are applicable.

The comment overstates the findings of the Mission Bay Source Identification Study. Keep in mind that this study was conducted during dry weather conditions, not storm flow conditions. Further, since dry weather urban runoff from the surrounding neighborhoods is diverted before reaching Mission Bay, that the predominate bacteria source was birds is not surprising. We would not expect the same finding at a coastal area with no dry weather diversion BMPs. We will work closely with the City of San Diego as it develops information for a Basin Plan amendment regarding REC-1 and SHELL use in Chollas Creek/mouth of Chollas Creek. Please also see the response to Comment 130.

Comment 132

Section 4 Numeric Target Selection: Assigning the marine water quality objectives for shellfishing to fresh water creeks sets overly strict and inappropriate standards for both fecal and total coliform for freshwater systems. The assumptions leading to this assignment are flawed from both a policy and scientific perspective:

a) The Shellfishing beneficial use (SHELL) only applies to coastal marine waters. Freshwater creeks do not support shellfishing habitat or species and are not assigned the SHELL beneficial use nor water quality objectives to support shellfishing activities;

b) Water quality objectives for freshwater were developed with a margin of safety to protect downstream uses. Therefore, the protection of downstream marine habitat has already been considered and accounted for in the development of freshwater bacteria standards. If it was necessary for freshwater discharges to meet shellfish water quality objectives, such objectives would have been applied by the SWRCB to all creeks discharging to the Pacific Ocean through the Ocean Plan;

c) In applying the shellfish water quality objective to freshwater, the resulting total coliform levels are set below fecal coliform levels, which is scientifically impossible, since fecal coliform is a sub-set of the total coliform group.

On a related issue, Board Member Kraus requested staff to, "…provide more clarification with regard to the linkage between creek loads and beach exceedences to help justify why we are addressing beach and creek --- combining beach and creek TMDLs." (February 8, 2006 Regional Board Meeting Transcript, p. 154). This information is necessary to address the shellfish water quality objective issue and has not been provided

Response (a): Please see section 4.4 of this appendix.

Response (b): Downstream beneficial uses are not considered in the establishment of a WQO or its margin of safety; the margin of safety accounts for scientific uncertainty in the WQO in the immediate waterbody to which it is applied. Therefore, WQOs established for freshwaters are designed to protect the beneficial uses of freshwaters, and do not consider downstream marine beneficial uses.

In calculating TMDLs, we are not imposing marine beneficial uses onto freshwaters. Rather, we are protecting both types of waterbodies and associated beneficial uses by regulating discharges so that both freshwater and downstream marine WQOs are considered and maintained.

Response (c): Please see the response to Comment 103.

Comment 133

Table 4-2- This table applies a reverse tributary rule that does not exist in the Basin Plan. The text on page 38 indicates "Specifically, the water quality objectives for Enterococci are more stringent for creeks than beaches. Since beaches are downstream of creeks, and numeric targets are equal to WQOs (water quality objectives), TMDLs for beaches are calculated using the more stringent Enterococci standard on the downstream beaches will result in waste load allocations that are overly conservative. Please revise the table appropriately.

Response: Please see section 4.4 of this appendix, which explains why the creek enterococci WQO was used as the numeric target for TMDLs for San Juan Creek, Aliso

Creek, the San Diego River, and Chollas Creek, instead of the less stringent ocean enterococci WQO.

Comment 134

Tables 4-2, 4-3, 4-4, and 4-5, SHELL Total Coliform numeric targets should not be used for the mouth of San Luis Rey River, the coastal lagoon of San Dieguito, and the mouth of Aliso Creek, which do not have a SHELL designation in Table 2-3 (pages 2-47, 2-48) of the Water Quality Control Plan for the San Diego Basin (9), September 8, 1994. Although SHELL is designated for coastal water of the Pacific Ocean, the tributary rule does not apply to the ocean, which is covered by the Ocean Plan, not the inland Basin Plan. These changes will also require changes to the waste load allocations in Appendix B.

Response: The commenter is correct in saying that the waterbodies mentioned do not have a SHELL designation in the Basin Plan, and that the tributary rule does not apply to the ocean. However, all of the waterbodies included in this project eventually discharge to a beach, and all beaches have a SHELL designation. TMDLs are based on numeric targets that protect the most sensitive downstream beneficial use. In order to accomplish this, numeric targets based on WQOs for SHELL must be used. Dischargers will not be held accountable for meeting SHELL WQOs in freshwater creeks.

Comment 135

Section 11.4.1 of the Bacti-1 TMDL incorrectly identifies the "priority" of some creeks. The Bacti-1 applies the water quality standards throughout the watershed. On page 41 the enterococcus standard is listed as 61 most probable number (MPN)/100 milliliters (ml). This standard was taken from the Basin Plan, page 3-6 for a freshwater designed beach. We question the application of freshwater "beach" standards to the rivers and creeks in this TMDL. In the Basin Plan there are also designations for moderately or lightly used areas at 108 MPN/ml or infrequently used areas at 151 MPN/ml. We request the Regional Board revisit the designation of freshwater water quality standards and concern the application of moderately or lightly used areas that is similar to the saltwater standards.

Response: The TMDLs were calculated using numeric targets that were selected from the most conservative WQOs in the Basin Plan and/or Ocean Plan. The Basin Plan does include saltwater and freshwater enterococci single sample maximum objectives for "designated beaches," "moderately or lightly used area," and "infrequently used area." However, the Basin Plan does not provide criteria for assigning these categories to beaches. We must use the most conservative WQOs to protect REC-1 users. Thus, we selected the "designated beaches" WQOs for enterococci. For enterococci, 61 MPN/100 mL is the most conservative water quality objective for freshwater or saltwater. This water quality objective is protective of both freshwater and marine water REC-1 beneficial uses.

The dischargers must provide evidence to justify classifying a beach as a "moderately or lightly used area." If compelling evidence is provided, the "moderately or lightly used

area" enterococci water quality objective could be used as the wet weather numeric target to revise the TMDLs. We calculated enterococci TMDLs using the less stringent numeric target in addition to the stringent numeric targets as described in the response to Comment 129. Therefore, if dischargers provide compelling evidence that the creek usage frequency is at the level of a "moderately to lightly used area," the less stringent enterococci TMDLs can be implemented. This information must be received by the San Diego Water Board prior to the adoption of implementing orders.

Comment 136

The comments and recommendation previously expressed remains unanswered and valid: The single-sample 104 CFU saltwater criterion for Enterococcus should be applied to both beaches and creeks for wet weather. The comments and recommendations under Comment 126 were partially answered with the new Draft's clarification that "total coliform TMDLs must be met only at the bottom of the watershed where creeks and rivers discharge to the Pacific Ocean", and the new provisions for time extensions contingent on shellfishing surveys. One of the 4B recommendations still stands: A moratorium on enforcing Final Total Coliform TMDLs for SHELL should be explicitly stated in the Report, and considerations for enforcement should be deferred until the related beneficial use questions and appropriate WQOs are better resolved State-wide.

Response: Please see the responses to Comments 129 and 130.

Comment 137

On Page B-8 Compliance Schedule: "Full implementation of the TMDLs for indicator bacteria shall be completed within 12 years from the effective date of the Basin Plan amendment in areas where shellfish is known or suspected of occurring, and 17 years in areas where shellfishing is known not to occur……." The City has a concern of implementing a costly compliance program where a particular Beneficial Use is "suspected" of occurring, when this term is so ill-defined. Per a memo to Julie Chan from Christina Arias, subject: Meeting with Department of Fish & Game, dated November 3, 2006 (attached), it appears the although there is documentation of shellfish harvesting in specific areas of San Diego County, there are no observations nor definitive documentation of shellfish harvesting in southern Orange County, within the SDRWQCB region. The City requests that the RWQCB define, clarify and provide documentation of where the shellfish harvesting areas are known or "suspected" so we know the extent of our compliance requirements.

Page 8 of the Technical Report states, "Shellfishing determinations must be made by execution of special studies or surveys." A study of this nature was conducted in Orange County and was extremely costly. The economic analysis does not account for these studies, but it needs to. This report does not identify who is responsible for conducting these studies. Please clarify.

Response: Regardless of whether or not shellfish harvesting is taking place, the fact remains that the entire Pacific Ocean shoreline in the San Diego Region is designated for

the SHELL beneficial use. The WQOs are established in the Basin Plan and Ocean Plan. Please see the response to Comment 130.

Comment 138

With respect to the technical underpinning that has been used for the development of the Project I Bacteria TMDL, our concern is that the selected technical approach for the TMDL could require substantial bacteria loading reduction in the watersheds of interest and expenditure of significant public funds, without commensurate enhancement in beneficial use protection. These concerns apply to both wet and dry seasons.

Response: Beneficial uses are supported when the WQOs are met for those beneficial uses. Any reduction in bacteria loads will improve water quality and restore and/or support beneficial uses.

Under Clean Water Act (CWA) section 303(d), the San Diego Water Board is obligated to develop TMDLs for waters not meeting water quality standards (water quality objectives and the beneficial uses they are designated to protect). TMDL calculations must be based on existing WQOs, and the dischargers must comply with the TMDLs.

The compliance schedule provides the dischargers 10 years to comply with the interim TMDLs, and 20 years to comply with the final TMDLs. Within that time period, the dischargers can implement measures in a phased approach, beginning with the least expensive measures, such as source control. If water quality does not sufficiently improve, additional measures must be implemented until compliance with the TMDLs is achieved. Even if WQOs are relaxed and the necessary load reductions are subsequently reduced, reductions will likely still be required. Given that these waters have been listed for years, strategies to reduce bacteria should begin immediately.

Comment 139

During wet weather, the TMDL is based on estimated bacteria loadings which are proportional to the flow (and thus amount of rainfall). Therefore, those days with the highest flows are disproportionately weighted in the TMDL calculations compared to days with lower flows. These days are also the ones in which the likely level of recreational use is the lowest. In terms of actual use protection, this approach appears to be fundamentally flawed (that is, why do the days in which recreation is least likely count the most, and, is there any science or policy basis for weighting any particular day more than another?).

Response: There is no disproportionate weighting in the TMDL calculations. The numeric targets are fixed. The calculations are proportional to the flow. The more flow there is, the more assimilative capacity is available, thus the more load is allowed in the discharge.

We agree that rainfall events correspond to times of the year when the REC-1 beneficial use is at its minimum. However, beneficial uses apply at all times, and therefore must be protected at all times, regardless of season or hydrological conditions. Despite poor

water quality, or even dangerous oceanographic conditions, REC-1 use is still occurring during wet weather events and the following 72 hours.

Comment 140

The dry weather total coliform numeric targets for beaches are based on the unjustified assertion that the SHELL WQO for total coliform is appropriate for creeks and rivers even though they do not support the SHELL use. The draft report indicates that the SHELL WQOs must be met at the bottom of the watershed where creeks and rivers discharge to the Pacific Ocean (which does have a SHELL designated use). This assumption is faulty, given that the SHELL use is designated for the Shoreline, not the point at which creeks and rivers discharge to the Ocean. Given the low dry weather volume of water discharging from the creeks and rivers (relative to the Pacific Ocean), a prioritized investigation is needed to determine the relative impact of the creeks on the SHELL use on the Shoreline (i.e. if dilution of greater than ~15:1 occurs, the effective WQOs in creeks for the REC-1 use and on the shoreline for the SHELL use would be similar for total coliform).

Response: The commenter is correct that the SHELL beneficial use is designated for the shoreline, not the creeks and rivers. However, there is a location on the shoreline where the creek or river eventually discharges to the ocean. In the watershed models, this is called the critical point. The critical point is a node in the watershed model, and does not necessarily reflect an actual location in the watershed.

The dry weather watershed model assumes an average flow and load for dry weather days, and calculates a TMDL in terms of a monthly load. However, there may not be dry weather discharge to the shoreline every day in a given month. If there is no discharge on a given day, the bacteria loads from the creek or river to the shoreline and ocean would be zero on that day. On dry weather days when the creek or river does discharge to the ocean, there is a bacteria load that is discharged to the shoreline. Conceptually, the sum of the bacteria loads from the creek or river at the shoreline from every day in a given month must be less than or equal to the dry weather TMDL.

The dry weather watershed models included several conservative assumptions to ensure that the beneficial uses of the creeks and beaches are supported. However, if there is a concern that the TMDL is too conservative, the discharger may choose to perform an investigation or special study to determine the relative impact of the creeks on the SHELL beneficial use at the shoreline. If the discharger can provide compelling evidence that the TMDL should include a dilution factor, the TMDLs can be revised to do so. However, until that evidence is provided, the assumptions that are included in the TMDL calculations will result in water quality that supports all beneficial uses designated for the creeks and beaches.

Comment 141

The Water Board may wish to consider revisiting the Beneficial Uses of certain water bodies. Regulations permit the following actions after Uses have been established:

(1) Change the Use (40 CFR 131.10(e)),
(2) Remove the Use (131.10(g)),
(3) Revise the Use (131.10(i)), or
(4) perform a Use Attainability Analysis (UAA, 131.10(j)/(k))

Response: A water quality standards action was evaluated in the environmental analysis (Appendix R, section R.8 Reasonable Alternatives to the Proposed Activity). The San Diego Water Board does not have sufficient evidence that REC-1 and SHELL beneficial uses were inappropriately designated for the beaches, creeks, and San Diego Bay. The appropriateness of any water quality standard (including beneficial uses or water quality objectives) must be addressed as a Basin Planning issue at this time. The Triennial Review process is the most appropriate forum for raising this Basin Planning issue if the dischargers have sufficient evidence that a use was improperly designated.

Comment 142

Section 1.1, Pages 2 & 3, first paragraph; This section of the draft bacteria TMDL states, "*Numeric targets for the TMDL calculations were equal to the WQO's for bacteria for either REC-1 or SHELL beneficial uses. Numeric targets used for beaches were also used for impaired creeks. Although SHELL is not a designated use in freshwater creeks and rivers, the total coliform density in these waters where they discharge to the Pacific Ocean must be protective of the SHELL use at the shorelines."*

Not all creeks within this Region, Chollas Creek as an example, discharge directly to the Pacific Ocean. Given the above quoted basis for requiring SHELL bacteria limits, creeks and rivers that do not discharge to the Pacific Ocean should not have SHELL (Shellfish harvesting) bacteria limits applied to them. Additionally, some of the creeks and rivers listed in the draft bacterial TMDL do not hold a REC-1 designation use nor are they accessible to the public, i.e. they are restricted waters. Chollas Creek and 7th Street Channel are examples of such creeks.

Using a blanket assumption of REC-1 or SHELL WQOs for the TMDL numeric target is in appropriate. Targets should be developed for the WQOs that the creeks or the nearby receiving waters support.

Response: The commenter is correct that Chollas Creek does not discharge directly into the Pacific Ocean. However, Chollas Creek does discharge into San Diego Bay, which also has been designated with the SHELL beneficial use.

According to the Basin Plan, Chollas Creek is designated as having a REC-1 potential beneficial use. The Clean Water Act (CWA) requires that the TMDLs ensure that water quality supports existing **and** potential uses. The appropriateness of any water quality standard (including beneficial uses and water quality objectives) must be addressed as a Basin Planning issue, not a TMDL issue. The Triennial Review process is the most appropriate forum for raising this Basin Planning issue.

Please see section 4.4 of this appendix, which explains why beaches and creeks were evaluated simultaneously and where WQOs are applicable.

Comment 143

Page 14, last paragraph, Why are SHELL WQOs being applied to areas that are not designated as such in the San Diego Basin plan? Page 15, Table 1-2, Using SHELL bacteria limits for watersheds that do not have shellfish harvesting listed for them in the San Diego Basin Plan is an incorrect use of the designation.

Page 37, Section 4, 4th paragraph, The draft bacteria TMDL states, "In other words, although SHELL is not a designated use in freshwater creeks and rivers, the total coliform density in these water where they discharge to the Pacific Ocean must be protective of the SHELL use at the shorelines."

Response: Please see section 4.4 of this appendix for additional explanation about where WQOs are applicable.

Comment 144

Page 37, Section 4, 4th paragraph. Chollas Creek is designated a REC-2 beneficial use not a REC-1 and the bacteria TMDL should be set accordingly. Page 44, Table 4-5, "Interim and Final Numeric Dry Weather Targets for Beaches and Creeks"; In the San Diego Basin Plan, Table 2-2 titled "Beneficial Uses of Inland Surface Waters", lists Chollas Creek as a REC-2 (Non-Contact) beneficial use and a potential REC-1 use. However, REC-1 limitations are being applied to the in the draft bacteria TMDL Technical Report. Bacteria TMDL targets should match San Diego Basin Plan beneficial uses. REC-2 bacteria limitations should be applied to Chollas Creek. If in the future the Basin Plan beneficial use for Chollas is changed to REC-1, then those bacteria limitations should be applied.

Response: The Clean Water Act (CWA) requires that the TMDLs ensure that water quality supports existing **and** potential uses, not just existing uses. Thus, using WQOs for REC-1 uses as numeric targets for Chollas Creek TMDLs are appropriate.

Comment 145

Section 4.0 of the Draft TMDL, in establishing numeric bacteria targets, states that: "Although SHELL is not a designated use in freshwater creeks and rivers, the total coliform density in these waters where they discharge to the Pacific Ocean must be protective of the SHELL use at the shorelines. Thus, the SHELL WQO for total coliform is the appropriate numerical target for the TMDLs for creeks and rivers even though they do not support SHELL use." The City of Laguna Beach does not agree with the establishment of SHELL water quality standards in waters where SHELL is not a beneficial use. The final TMDL should establish bacteria standards in the regulated water bodies based on the beneficial uses designated for those water bodies.

Response: Please see section 4.4 of this appendix for additional explanation about where WQOs are applicable.

Comment 146

Use Attainability Language Is Inappropriate And Should Be Removed From The TMDL

Page 14 of the Draft Technical Report March 9, 2007 seems to contemplate a Use Attainability Analysis for the SHELL standard. This discussion has no place in the TMDL. If staff is proposing that the SHELL designation, or current shellfish harvesting should be a criterion for determining priority waterbodies, this should be more clearly explained. We agree with staff's determination (Draft Technical Report March 9, 2007, page 2) that the total coliform density in beach and creek waterbodies where they discharge to the Pacific Ocean must be protective of the SHELL use at the shorelines. Nothing in the compliance schedule should impact that designation or change the requirements of the UAA should a municipality choose to implement one.

Response: We assume that this comment, which refers to the March 9, 2007 version of the Technical Report, equates the requirement to document the non-existence of shellfish harvesting with the need for a UAA. We are not suggesting that the use be removed; however if shellfish is not occurring, there should be no increased risk to public health by giving dischargers additional time to meet the TMDLs for SHELL uses.

This comment is moot, however, since the referenced language was deleted in the June 22, 2007 version of the report. We expanded the compliance schedule to 20 years for meeting final wet and dry total coliform TMDLs for SHELL because of how stringent these TMDLs are. We intend to revise these TMDLs, and the 20-year compliance schedule after adoption of the reference system/natural sources exclusion approach Basin Plan amendment. This process is described in the response to Comment 2.

5.5 Implementation Plan/Compliance Assessment

Comment 147

Expressing the waste load allocations as number of bacteria of colonies per year (billion MPN/yr) is not a useful metric to measure for compliance with the TMDL. We understand the need to define a load allocation in a concentration per time unit; however, the current allocations set a target that we will never be certain we are meeting. Additionally, deferring the determination of the measurement metric until the revision of the NPDES permits is inappropriate and leaves much uncertainty for the regulated entities. The waste load allocations in the TMDL should be expressed in a metric that is clearly measurable and reportable.

Response: We are not proposing that bacteria loads be used for measuring compliance. However, this metric is usable for expressing WLAs because quantification of loads allows urban runoff program managers to know the magnitude by which WQOs are exceeded. Strategies for reducing bacteria loads will be dependent upon the magnitude of the bacteria loads. For example, a watershed having very frequent exceedances consisting of lower magnitude loads will require different BMPs from watersheds having infrequent exceedances consisting of higher magnitude loads. A metric expressed in a term different from a load, such as exceedance days, does not allow program managers to decipher a percentage by which loads must be reduced, nor help with selection of BMPs. Expressing WLAs as a load per time is consistent with the intent of the TMDL program.

The TMDLs for beaches and creeks are not the first TMDLs where the allocations are expressed as loads. The *Nooksack River Watershed Bacteria TMDL*, developed by the Washington Department of Ecology in 2001, and the *Lynnhaven Bay TMDL Report for Shellfish Areas Listed Due to Bacteria Contamination,* developed by the Virginia Department of Environmental Quality in 2004, both use loads as the method of expressing the allocations. Additionally, the bacteria TMDL for Canyon Lake (San Jacinto watershed), which is under development by the Santa Ana Water Board, also expresses the allocations in terms of loads.

We further disagree that number of bacteria colonies per year is not measurable or reportable. Loads can be calculated by multiplying measured flows (volume/time) by measured bacteria densities (number of bacteria/sample volume). Flow and density measurements can be made at selected monitoring locations at a set frequency, which would be used to estimate an annual average flow and density from which an average annual load estimation could be calculated.

TMDL compliance will not necessarily be measured against the metric used to express WLAs. As described in section 10.2 of the Technical Report, WLAs are the maximum amounts of pollutant that can be contributed to a waterbody by point source discharges of the pollutant in order to attain WQOs. NPDES requirements must include conditions (WQBELs) that are consistent with the assumptions and requirements of the WLAs. *WQBELs may be expressed as numeric effluent limitations or as BMP development, implementation, and revision requirements*. Numeric effluent limitations require monitoring to assess load reductions while non-numeric provisions, such as BMP

programs, require progress reports on BMP implementation and efficacy, and could also require monitoring of the waste stream for conformance with a numeric WLA requiring a mass load reduction. The metric for which WQBELs will be expressed and included in NPDES requirements for urban runoff, (also known as municipal "permits") for the purpose of implementing WLAs, has not been determined at this time. Examples for suitable metrics could include measurements of bacteria loads, bacteria densities, the number of days that WQOs are exceeded, or evidence of an iterative BMP program.

WQBELs will be incorporated into NPDES requirements for urban runoff upon re-issuance or revision of these requirements. WQBELs and other requirements implementing the TMDLs could be incorporated into these NPDES requirements upon the normal renewal cycle or sooner, if appropriate. Reissuence of NPDES requirements is a public process, and the public will have ample opportunity to propose a metric or comment on the proposed metric to be used to measure compliance and details concerning monitoring and reporting requirements.

We agree that, at this time, there is uncertainty for the regulated entities regarding which metric will be used to express WQBELs and measure compliance. However, the public process associated with reissuence of NPDES requirements is the proper forum for establishing this metric.

Comment 148

The text needs to define what will constitute "maintaining" Water Quality Objectives (WQOs). For how long will WQOs need to be met before the water body is considered "maintaining" the objective? Additionally, the text should state that the monitoring plans will likely need to be revised once WQOs are attained. Verification of WQO compliance will most likely be accomplished through a reduced level of monitoring than that necessary to monitor the gradual attainment of WQOs through the implementation of BMPs.

Response: We have modified the text in the Technical Report to clarify the term "maintaining WQOs." WQOs are considered "attained" when the waterbody under consideration can be removed from the List of Water Quality Limited Segments. WQOs are considered "maintained" when, upon subsequent listing cycles, the waterbody has not returned to an impaired condition necessitating re-listing on the List of Water Quality Limited Segments. Attaining and maintaining WQOs will be accomplished by achieving wasteload allocations (WLAs) for point sources and load allocations (LAs) for nonpoint sources.

We agree that the monitoring plans can likely be revised once WQOs are attained, and that verification of WQO compliance can most likely be accomplished through a reduced level of monitoring. We modified the text of the Technical Report to reflect these changes.

Comment 149

The text needs to clarify the entities which will provide the monitoring results to be used to identify if small MS4s and discharges from nonpoint sources (owners or operators of agriculture, nursery or animal feeding operations) that may contribute to the impairments at the beaches and creeks. The text should include a commitment from the Regional Board to either conduct or require monitoring by third parties to assess the quality discharges from these entities in the vicinity of the impaired waterbodies to identify potential sources of bacteria. Data that confirms bacterial water quality impairments should be used to enroll other participants in the TMDL.

Response: At this point, we are not requiring monitoring results to identify if discharges from small MS4s and controllable nonpoint sources are contributing to impairments at the beaches and creeks. Instead, we are relying first on regulation to eliminate any threats to water quality. Owners and operators of small MS4s in the watersheds subject to this TMDL shall be required to submit Notices of Intent to comply with the requirements of Order No. 2003-0005-DWQ. Order No. 2003-0005-DWQ was issued by the SWRCB and describes General NPDES requirements for the discharge of stormwater from small MS4s. This Order requires the Phase II small MS4 dischargers to develop and implement a Stormwater Management Plan/Program with the goal of reducing the discharge of pollutants to the MEP.

For controllable nonpoint source discharges, we will enforce existing WDRs and enforce the waivers. Specifically, we will enforce facility specific WDRs and waivers with respect to discharges from animal feeding operations, manure composting and soil amendment operations, and agricultural and nursery irrigation return flow in the San Juan, San Luis Rey, San Marcos Creek, and San Dieguito watersheds where loading from these sources is significant. If, upon enforcement of the waivers, nuisance conditions or exceedances of WQOs occur despite the stated conditions, then WDRs will be issued for these discharges.

As a result of these steps, monitoring by third parties to identify potential sources of bacteria may not be necessary. These steps provide a means of curtailing discharges of bacteria, either by implementing stormwater programs or enforcing existing regulatory programs. However, if, after the measures described above are implemented, and sources are still unknown, then we can require monitoring from suspected dischargers in the vicinity of an impaired waterbody. Since it is unknown whether or not such monitoring is necessary, this amount of detail in the Technical Report is not appropriate.

Comment 150

The discussion of special studies needs to address the weaknesses in the model used to develop the TMDL (lack of water quality data, lack of representation of actual bacteria life-cycle processes (die-off, regrowth), lack of flow data, etc.) and outline a series of studies to collect the necessary data to strengthen and verify the model. The Implementation Plan should include a re-evaluation of the TMDL in conjunction with the NDPES permit renewal. The plan should commit to a recalibration and validation of the model using new data collected during program monitoring and special studies and any

new information regarding bacteria fate and transport, indicator/pathogen correlations and epidemiological studies. The re-evaluation should include the TMDL targets, load and wasteload allocations. Achieving the WQOs for bacteria will be an expensive and long-term project for the named dischargers. Accurate targets based on specific data from each watershed are essential for the achievement of the TMDL in a timely and cost-effective manner.

Response: We agree that adding language in the discussion of special studies to address the weaknesses in the model used to develop the TMDL is appropriate and that more data in these areas will result in better computer modeling results. The text of the Technical Report has been modified to reflect these additions.

The models and all associated data used for TMDL development are available for public use. Dischargers are free to utilize the models to determine what kinds of special studies are needed to improve model performance, recognizing that each watershed could be unique in terms of special studies required for model improvement. Dischargers should outline a series of studies for this purpose. One appropriate place to document this information is the Bacteria Load Reduction Plans submitted by Lead Jurisdictions. We will partner with dischargers in this effort to the extent that resources are available.

In terms of reevaluating TMDLs, please see the response to Comment 58.

Comment 151

Determining Compliance with Waste Load Allocations (WLA): As suggested by the SAG, it is not clear how compliance with the WLA will be tracked and measured. The method being proposed is not practical or easily understood. It appears a complicated and costly computer generated modeling and statistical analysis may be needed on a routine basis. We recommend the WLA be simplified and expressed as "allowable exceedance days" that will achieve the required water quality objectives and waste load reductions. This approach was used in both the Malibu Creek and Santa Monica Bay Beaches TMDL Basin Plan amendments.

Response: Costly computer generated modeling and statistical analysis likely won't be needed on a routine basis (to track and measure compliance with the WLAs). We have not proposed a method for determining compliance with TMDLs. Please see the response to Comment 147.

Comment 152

Responsible Jurisdictions: As indicated by SAG, the TMDL document should be reviewed and modified as needed to ensure that dischargers under the Project I TMDL are not responsible for other dischargers water quality violations that lead to exceedances of WQO or WLAs in cases where dischargers are either; 1) under a separate NPDES permit, or 2) outside the dischargers jurisdiction.

Response: The WLAs for municipal dischargers specifically were not subdivided among jurisdictions in order to allow the dischargers some flexibility on how the bacterial loads will be reduced and to allow pollutant load trading between dischargers. We have not

modified the Technical Report in response to this comment because it addresses an enforcement issue that is appropriately addressed if or when there is a violation of an implementing order.

During implementation of the TMDLs, we will review the Bacteria Load Reduction Plans and the results generated in subsequent reports prepared by the dischargers. Subsequent reports should indicate if one municipal discharger in a watershed is not implementing BMPs to address the bacteria problem. For the discharger(s) not contributing appropriately to bacteria load reductions, we can take enforcement actions to bring them into compliance with their requirements.

Comment 153

The Executive Summary discussed "third party agreements" where the Regional Board could conditionally waive regulation of bacteria sources based on the existence of an adequate pollution control program that adequately addresses the sources. The Technical Report does not provide the criteria to be used to determine when such waivers are appropriate. When municipalities are being asked to achieve 100% compliance, and other sources have the ability to opt out of the program, this process should be outlined for all stakeholders to review. We recommend that these sources be required to perform both dry and wet weather monitoring and meet the same Ocean Plan or Basin Plan bacteria standards as the municipalities.

Response: The commenter incorrectly states that nonpoint source dischargers of bacteria can "opt out" of meeting required reductions and instead pursue third party agreements with the San Diego Water Board. Nonpoint source dischargers cannot "opt out" of meeting LAs and required load reductions. For nonpoint sources, regulation will take place primarily by enforcing facility specific WDRs and the Waivers with respect to waivers for dischargers of waste from agricultural and orchard irrigation return flow, animal feeding operations, and manure composting and soil amendment operations in the San Juan Creek, San Luis Rey River, San Marcos Creek, and San Dieguito River watersheds, where controllable nonpoint sources contribute more than 5 percent of the total wet weather bacteria load. Under the Waivers, discharges from controllable nonpoint sources are not allowed to cause nuisance conditions to receiving waters or violations of applicable WQOs. If, upon enforcement of the Waivers, nuisance conditions or exceedances of WQOs occur despite the stated conditions, then facility specific or general WDRs or waivers can be issued to violators.

We will pursue a Third-Party regulatory-based approach only for discharges not otherwise regulated by WDRs or waivers, or where issuing facility specific or general WDRs or waivers are appropriate. Upon enforcement of WDRs, waivers, or third party agreements, we may require dischargers to conduct water quality monitoring.

Comment 154

Table 11-2 - Responsible Municipalities and Lead Jurisdictions –As stated in our June 20, 2006 letter, we suggest that Table 11-2 lead agencies be organized the same as the current MS4 NPDES permits watershed lead agencies. This will be beneficial since watershed

plans needed for MS4 NPDES compliance have already been developed and stakeholder group established.

Response: We agree that Lead Jurisdictions identified in the Technical Report should be consistent with Lead Agencies identified in MS4 requirements. Table 11-2 has been modified accordingly. The text of section 11.3.3 has been modified to allow municipal dischargers to elect a Lead Jurisdiction different from the ones indicated in Table 11-2. Lead Jurisdictions identified in Table 11-2 are default designations in the event that dischargers do not elect one.

Comment 155

Section 11.5 discussed Water Quality Based Effluent Limitations (WQBELs). The first paragraph of this section states *"WQBELs for municipal storm water discharges can be either numeric or non-numeric. Non-numeric WQBELs typically are a program of expanded or better tailored BMPs. The USEPA expects that most WQBELs for NPDES-regulated municipal discharges will be in the form of BMPs, and that numeric limitations will be only used in rare instances. WQBELs can be incorporated into NPDES requirements for MS4 dischargers by reissuing or revising these requirements."* The Technical Report does not explain why the Bacteria 1 TMDL needs to be the exception, i.e,. a numeric limit. This appears to be more stringent than the MEP requirement of the federal Clean Water Act.

Response: Whether or not the WLAs are expressed in NPDES requirements as numeric limitations, or a program of BMPs, will be decided when the NPDES requirements are revised. Considering the variability inherent in bacteria sampling results, expressing the WLAs as a program of BMPs seems prudent. The NPDES requirements require that standards be met in receiving waters. The TMDLs provide a time schedule for achieving that result.

Comment 156

Section 11.5.4 – The City of San Diego is requesting a time line regarding when the Regional Board will contact the Phase II MS4 permittees for inclusion into this TMDL Program. Currently, University of California, San Diego has not been included in this progress. UCSD is located adjacent to the Scripps Areas of Special Biological Significance and should be notified of their requirement to participate, along with other Phase II MS4s that contribute bacteria into these impaired waterbody segments.

Response: We have contacted by phone the small MS4s listed in Appendix Q to make them aware of these TMDLs. Steps to regulate small MS4s will begin after we have initiated steps to regulate Phase I municipal dischargers in accordance with the discussion in section 11.5.3 of the Technical Report.

Comment 157

P. 96, Section 10.3.2: The Regional Board should commit to requiring small MS4 facilities located in impaired watersheds to enroll in the Municipal Phase II MS4 Statewide Order.

Response: We have committed to this action. Section 11.5.4 of the Technical Report states that the San Diego Water Board shall require owners and operators of small MS4s in the watersheds subject to this TMDL to submit Notices of Intent to comply with the requirements of Order No. 2003-0005-DWQ, the General NPDES requirements for the discharge of stormwater from small MS4s.

Comment 158

P. 98, Section 10.4: The Regional Board should commit to verifying through discharge sampling that conditional waivers for runoff from agricultural facilities, orchards, animal feeding operations and soil amendment and composting facilities are not violating waiver conditions.

Response: We have committed to enforcing waiver conditions as a result of these TMDLs, in the San Juan Creek, San Luis Rey, San Marcos Creek, and San Dieguito River watersheds where agricultural and livestock sources are significant. In these watersheds, bacteria loading from controllable nonpoint sources accounts for more than 5 percent of the total wet weather load. Upon enforcement of waivers, we may require nonpoint source dischargers to perform water quality monitoring to verify whether or not waiver conditions are being met. Whether or not such actions will be necessary is not known at this time. Additionally, we are in the process of revising the waivers for agricultural and animal facility operations to make identification of these facilities easier for the San Diego Water Board. Identification of facilities is the first step in enforcing the waivers.

Should water quality data be needed to identify a suspected discharger, we have discretion at any point in time to request this information pursuant to Water Code section 13267.

Comment 159

Table 11-2- Responsible Municipalities and Lead Jurisdictions – The County of San Diego does not have land use jurisdiction in the lower 1 mile of Forrester Creek that is impaired. The County requests that the lead jurisdiction is assigned to a jurisdiction with land use authority in the impaired segment. The County of San Diego is committed to do its fair share in improving the water quality in Forrester Creek and will work cooperatively with the other stakeholders.

Response: Table 11-2 has been modified to identify the City of El Cajon as the lead jurisdiction for the San Diego River hydrologic unit (907.00). This change was made for consistency with the San Diego Water Board Order No. R9-2007-0001, *Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s), Draining the Watersheds of the County of San Diego, the Incorporated*

Cities of San Diego County, the San Diego Unified Port District, and the San Diego County Regional Airport Authority.

Comment 160

Section 11.5.1, Process and Schedule for issuing NPDES Requirements. This section should more fully describe this process for several reasons:

- The compliance schedule to achieve the final wasteload reductions is 12 years but NPDES permits are renewed every five years. How will the NPDES permits be managed during this transition period?
- There are differences between the interim and final wet weather WLAs. Will the Board issue interim NPDES permits?
- The municipal discharges in each watershed collectively are required to determine how to divide the allocations of the one WLA for the watershed but that the Board issues the NPDES permits for each point source discharger within the each watershed. This raises a potential conflict issue between the allocations made by the discharges and the WQBELs in each NPDES permit.
- Requirements for new point sources and reallocations of WLAs and WQBELs for existing NPDES permits

Response: The new NPDES requirements for San Diego County and the draft requirements for Orange County municipal dischargers do not include interim WQBELs to implement the bacteria TMDLs. Whether interim and final WQBELs will be added to the requirements mid-cycle, or added during the next renewal, is unknown at this time. Please see the revisions to section 11.5.1 for further clarification.

Comment 161

Expressing the waste load allocations as billions MPN/year is not a useful metric to measure for compliance with the TMDL. The waste load allocations in the TMDL should be expressed in a metric that is clearly measurable and reportable. Despite the SAG consensus, no fundamental change to the wasteload allocation metric was made in the Revised Draft. A change was made to the dry-weather loads to present them monthly rather than annually. Some tinkering with the presentation of wet-weather load reduction percentages occurred, but no basic change of metric approach was incorporated. We fully acknowledge that the wet-weather TMDL calculations represent an impressively complex achievement on the part of your technical consultants as a snapshot of how far we need to go and could be a tool in BMP implementation planning. But from a practical standpoint of measuring progress in the receiving waters, it should be recognized that it is virtually impossible to collect the data needed to track progress in this way. The physical dangers of collecting samples under storm conditions are prohibitive. Given the inherent variability of bacteria measurements (commonly 6 or 7 orders of magnitude) and the huge variation in wet-weather storm flow rates, attempting to extrapolate single-sample daily wet-weather concentration measurements into billions of annual MPN would be

sheer mathematical guesswork and would not serve anyone's interest (with the possible exception of consulting statisticians).

We recognize that the RWQCB is obligated to make TMDL calculations and that considering changes to the fundamental approach at this point in the process would be unacceptably time-consuming. We recommend that **language should be added to the Technical Report clarifying that alternative metrics to determine compliance with the TMDLs may be developed in conjunction with the Compliance Monitoring Plan,** which will be carried out in cooperation with the RWQCB's NPDES permit staff after the TMDL is formally approved.

Response: The Technical Report has been modified to explain that metrics other than "loads" to determine compliance with the TMDLs may be developed in conjunction with the monitoring plan for these TMDLs. Please see the response to Comment 147.

Comment 162

Some acknowledgement should be made in the report regarding just how costly, challenging (and probably infeasible) it will be to achieve actual target or TMDL compliance in some situations. An illustrative case: among the many bacteria-reduction efforts already implemented in the San Juan Hydrologic Unit are three constructed-treatment wetlands built in Laguna Niguel in 2001-2003 in the Aliso Creek watershed to treat dry weather flows from a 0.9-square-mile existing residential subdrainage area. One of the three wetlands (the "West Wetland") was engineered/optimized in acreage size for fecal coliform removal and functioned under a 3-day hydraulic residence time (HRT). The "East Wetland" was oversized relative to the optimum and functioned with a 17-day HRT; while the "North Wetland" was "supersized" with a functioning HRT of about 36 days. All three wetlands actually achieved 95%+ removal of Fecal Coliform, which was sufficient to produce water cleaner than the REC-1 fecal coliform objectives. However, the size-optimized West Wetland was only able to achieve an 80% reduction of Enterococcus, reducing to a geomean concentration of 635 Ent/100 ml; the oversized East Wetland achieved 98% reduction to a geomean of 82 Ent/100 ml; and the "supersized" North Wetland achieved 99.6% reduction to a geomean of 68 Ent/100 ml. But the freshwater geomean WQO for Enterococcus is 33 Ent/100 ml. So despite using up to <u>twelve times as much land</u> as needed to effectively remove fecal coliform and even though (at the "supersized" level) achieving the 99.1% reduction required by the dry-weather TMDL, the wetlands' discharge still doesn't meet the freshwater Ent WQO in dry weather. <u>Why, since EPA's Fecal Coliform and Enterococcus WQOs theoretically represent "equivalent" health risks, is it considered necessary to meet both the FC *and* Ent targets and not just one or the other of them?</u>

Probably the only way to reliably comply with *all* the bacteria WQOs in this drainage is through full technological treatment, such as is occurring at the Salt Creek Ozone Plant. The Salt Creek facility cost $6.7 million to build and runs an annual O&M cost of $230,000 (including $7,300 *per month* just for electricity) - and it only treats dry-weather flows. It is mind-boggling even to contemplate how much land it would take to treat *wet*

weather flows through a treatment wetland, or how huge and expensive a technological-treatment plant would have to be in this already-fully-developed drainage where storm flows can run 10,000 times higher than dry-weather flow rates. Even adjusted to "only" the 27.6% Enterococcus MS4 load reduction required for Aliso Creek in wet weather, what, realistically, would constitute a "feasible means of compliance" to treat a 2,760-fold higher flow rate?

Response: We recognize that dischargers will have a difficult time achieving bacteria WQOs because of the sizeable load reductions needed to do so. For this reason, the compliance schedule is relatively long (20 years, as opposed to most TMDLs which are 10 years) to allow dischargers time to develop effective strategies for reducing anthropogenically-derived bacteria. We realize that natural sources of bacteria can pose an especially difficult challenge, and for this reason, we are developing a reference system approach Basin Plan amendment, as described in the response to Comment 2.

In terms of the fecal coliform/*E. Coli* issue, we are required to develop TMDLs for both because both are indicated in the Basin Plan (we did not develop TMDLs for *E. Coli* due to lack of data). The SWRCB is reviewing WQOs for bacteria for freshwater, which, if different from the current objectives, would replace the objectives in the Basin Plan. The public is encouraged to comment on WQOs development. The CEQA scoping meeting is scheduled for fall, 2007.

Comment 163

Table 11-2. Responsible Municipalities and Lead Jurisdictions; the City of El Cajon does not have land use jurisdiction in the lower 6 miles of San Diego River Lower and at the San Diego River Mouth (a.k.a. Dog Beach) that is impaired. The City requests that the lead jurisdiction be assigned to a jurisdiction with land use authority in the impaired segment. The City of El Cajon is committed to do its fair share in improving the water quality in the San Diego River and will work cooperatively with the other stakeholders.

Response: Although the City of El Cajon does not have land use jurisdiction in either the lower reaches of the San Diego River or Forrester Creek, the City of El Cajon is responsible for reducing bacteria loads to both waterbodies. We are leaving the City of El Cajon as the Lead Jurisdiction for the San Diego Hydrologic Unit (containing both the San Diego River and Forrester Creek) to be consistent with San Diego Water Board Order Number 2007-0001.

The Technical Report clearly states that the role of Lead Jurisdiction is negotiable and that dischargers within the watersheds are free to elect a more suitable Lead without the oversight of the San Diego Water Board. The City of El Cajon should consult with the other municipal dischargers in the watershed to see if a different municipality would be willing to assume the Lead Jurisdiction role.

Comment 164

Table 11-2. Responsible Municipalities and Lead Jurisdictions; the City of El Cajon does not have land use jurisdiction in the lower 1 mile of Forrester Creek that is impaired. The

City requests that the lead jurisdiction be assigned to a jurisdiction with land use authority in the impaired segment. The City of El Cajon is committed to do its fair share in improving the water quality in Forrester Creek within its jurisdiction and will work cooperatively with the other stakeholders.

Response: Please see the response to Comment 163.

Comment 165

The Owner/operators of small MS4s listed in Appendix Q should be named individually in Table 11.2.

Response: To list the numerous owners and operators in Table 11.2 is not necessary, as they are clearly described in Appendix Q. The entities noted in Appendix Q may or may not be exhaustive of all the owners and operators of small MS4s in the San Diego Region. As we become aware of more owners and operators of small MS4s in the Region, they can be added to Appendix Q appropriately.

Comment 166

The City of San Diego is concerned about language in the TMDL which addresses "attaining" and "maintaining" 303(d) list status. Section 1.6 clearly defines what attainment is; however, it states that "WQOs are considered "maintained" when, upon subsequent listing cycles, the waterbody is not returned to an impaired condition via re-listing on the 303(d) list. This requirement does not clearly state the number of 3-year listing cycles it takes to meet the monitoring requirements of the subsequent listing cycles. This ruling is arbitrary and needs to be clearly defined. Additionally, this section uses 40 CFR Section 131.38 as justification for this requirement. This section is titled "Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California" and is for "*toxic*" pollutants. The three indicator bacteria are not included in any of the tables or lists in Section 131.38. In fact, this new requirement also appears to be in conflict with the State Water Resources Control Board (State Board) Resolution 2005-0050, Water Quality Control Policy for Addressing Impaired Waters: Regulatory Structure and Options. This State Board policy indicates that when listed waters which attain standards are to be delisted. There are no additional actions required. The City of San Diego is requesting the removal of the first paragraph in Section 1.6 based upon the review of both the cited 40 CFR section and the State Board policy. The Regional Board should prepare a new, separate TMDL if a water body is de-listed and then subsequently returned to impaired status.

Response: The language to which the commenter refers is not a requirement or ruling. The Technical Report clearly states that attaining and maintaining WQOs are *goals* of the Implementation Plan. We did not cite the CFR because we did not consult the CFR when writing this language. As attaining WQOs are fundamental goals of the TMDLs and Implementation Plan, this language does not trump the State Board's policy indicating when waterbodies have reached appropriate status for removal from the List of Water Quality Limited Segments.

Comment 167

Section 11.5.6 requires the named entities to investigate landfills as potential bacteria sources. The section states that 47of these landfills are currently regulated by the Regional Board by WDRs or by the General Industrial Storm Water Permit. This requirement is duplicative and is not required by the Clean Water Act or the MS4 permit requirements. The City of San Diego strongly recommends that this section require Regional Board oversight of landfills.

Response: Municipalities are responsible for runoff and associated bacteria discharged from landfills on multiple levels. As the owners and/or operators of landfills, they are responsible for their landfill discharges. Landfills also discharge to the municipalities' municipal separate storm sewer systems (MS4s), at which point the municipalities accept responsibility for the landfill discharges. In addition, Order No. 2007-0001 and Tentative Order 2007-0002 require that source identification, best management practice (BMP) designation and implementation, and inspections be applied to municipal and private landfills. Moreover, landfills are subject to municipalities' local ordinances.

The fact that landfills are regulated by the San Diego Water Board does not negate municipalities' responsibility for runoff from landfills. Responsibility for discharges remains with the discharger, whether the discharger is a landfill owner or an MS4 owner receiving and discharging landfill runoff. Since municipalities are responsible for runoff discharges from landfills, it is appropriate that they be aware of whether or not each landfill is a source of bacteria. As such, municipalities must investigate landfills as potential bacteria sources. However, it is worth noting that municipalities have discretion regarding the scope of investigations to be conducted.

Comment 168

The City of San Diego requests the inclusion of a Re-Evaluation clause with dates. This will provide an opportunity to analyze new land use data, new monitoring data and new scientific technologies under development by EPA and SCCWRP. The inclusion of dates will provide named entities motivation to participate in special studies so they can be included in the re-evaluation process.

Response: Please see the response to Comment 58.

Comment 169

The City of San Diego requests that the Regional Board assess compliance with their existing agricultural waivers and take actions as required. This action requires the review and evaluation of existing data submitted to the Regional Board, assessing the data, finding data gaps, inspect facilities as necessary, and initiate enforcement actions when required.

Response: The San Diego Water Board is in the process of revising the Agricultural/ Nursery/Animal Facility waivers to make it easier to identify these dischargers, and assess and enforce compliance with these waivers. Mo Lahsaiezadeh of the SAG is on

the Advisory Committee for these waivers representing municipal dischargers. Draft waivers will be available for review in July, 2007.

Comment 170

The TMDL should be drafted as a Phased TMDL with a set date for re-evaluation of the numeric model utilizing additional data collected since 2002, further developments in the understanding of bacteria fate and transport and the human health risks from non-human sewage contaminated urban runoff. The reasons for this are as follows:

a) The August 2, 2006 EPA Memorandum regarding "Clarification Regarding "Phased" Total Maximum Daily Loads" states, "the (TMDL) Guidance recommends the phased approach for situations where available data only allow for "estimates" of necessary load reductions for "non-traditional problems" where predictive tools may not be adequate to characterize the problem with a sufficient level of certainty.[19]" This approach clearly applies to this TMDL for the following reasons:

   i) The TMDL is based on limited data. An examination of Appendix G Data Sources illustrates the limited data sets used in the modeling. In many watersheds only a few data points were used and no actual measured flow data was incorporated. Flow data, a key component in the calculation of bacteria loading, is limited at all sites and model-generated values need to be verified with actual field measurements. The modeling for Aliso Creek utilized the largest data set, yet was based on less than 2 years of bacteria concentration data, while at the time of the original modeling analysis, approximately 4 years of data had been reported to the Regional Board under the Aliso Creek CWC §13225 Directive. Data collection in many watersheds has continued through the development of the TMDL document and has not been incorporated into the modeling analysis.

   ii) Bacteria are a non-conservative pollutant with natural sources which are currently indistinguishable from human sources. Additionally, bacteria can reproduce in the environment, while the pathogens that bacteria serve as the indicator for cannot reproduce outside of a host. This leads to a situation where bacteria measurements, in areas not impacted by human sources of bacteria and pathogens, will not truly reflect the health risk from human pathogens. This situation is not currently reflected in the TMDL.

   iii) Recent studies indicate that the major assumption underlying the model used to develop the TMDL (i.e. the assumption that loadings of bacteria from specific land uses are predictive) is flawed. Researchers from University of California at Irvine have found "…distributed

[19] USEPA, 1991. Guidance for Water Quality-based Decisions: The TMDL Process, EPA440-4-91-001 http://www.epa.gov/OWOW/tmdl/decisions/ (page 22)

watershed models of pollutant transport in surface water can be used to define relationships between land use, water quality and stormwater runoff. However, application of distributed models to fecal indicator bacteria and fecal indicator viruses is complicated by the fact that once microbial indicators enter the environment, their fate and transport are likely to be affected by poorly characterized ecological processes, such as the proliferation of environmentally adapted strains of fecal indicator bacteria. Consequently, fecal indicator bacteria and viruses are unlikely to accumulate and wash off in at reproducible and land-use specific rates - an assumption inherent in most distributed watershed models.[20]" Additionally, most assumptions utilized in the model have not been verified nor analyzed for sensitivity to data changes (see Technical Issues comment #1, February 2, 2006 Letter).

Similarly, during the February, 2006 Board Meeting, Regional Board Member Johnson directed staff to address the comments submitted by the Sierra Club and County of Orange regarding modeling and modeling assumptions. (February 8, 2006 Regional Board Meeting Transcript, 154)

iv) The relationship between bacteria levels in waters not impacted by human sewage inputs and human health risk is currently unknown. Recent studies in Mission Bay indicated no link between the illnesses and bacteria levels. A similar study will begin this summer at Doheny Beach in Dana Point. The combined results of both of these studies should be evaluated and incorporated into the TMDL.

b) A re-evaluation of the model is necessary for accurate and verifiable TMDL targets, which are essential to ensuring the most timely and cost-effective implementation of Best Management Practices (BMPs) to address bacteria loads. As illustrated by Section 13 of the TMDL, bacteria control BMPs are extremely expensive to construct and maintain. Additionally, for many of the suggested structural controls (vegetated buffer strips, bioretention, sand filters and infiltration trenches), opportunities for implementation are limited due to the amount of current development in the impacted watersheds and the limited land area for retrofit projects. As such, of the recommended options, diversion and treatment of Municipal Separate Storm Sewer System (MS4) is the most applicable to the affected areas. However, this treatment option is limited not only by the high cost of diversion structure construction, but by limited treatment capacity of area wastewater treatment facilities and by restrictions on salt levels with respect to reclaimed water production. In order to utilize this treatment option, separate or additional treatment plant processes may have to be constructed, the cost of which has not been

[20] Surbeck et al, "Flow Fingerprinting Fecal Pollution and Suspended Solids in Stormwater Runoff from an Urban Coastal Watershed". Environ. Sci. and Technol. **2006** *40* 4435-4441

included in the Economic Analysis in Section 13. TMDL targets should be re-evaluated after the collection of necessary baseline data and epidemiological studies to ensure that appropriate and cost-effective BMP measures are employed.

c) A set date for TMDL re-evaluation is necessary to ensure it occurs and will also serve to coordinate research activities among all watersheds. Setting a re-evaluation date will provide the necessary schedule coordination for activities conducted within each watershed, allowing for the entire TMDL to be re-evaluated at one time. Without a set date, requests for re-evaluation of new data and information will come forward on a watershed-by-watershed basis requiring more Regional Board staff time and effort. Additionally, the re-evaluation date could be set to coincide with the re-calculation of exceedence frequencies and load allocations for San Diego Region reference systems already proposed by Regional Board staff in relation to the proposed Reference Watershed Approach for Implementing Bacteria Water Quality Objectives Basin Plan amendment.

d) The commitment by the Regional Board to a timely re-evaluation of the TMDL will provide assurances to the regulated community of the Regional Board's dedication to accurate and up-to-date regulatory requirements. Just as the named discharges are being asked to budget staff time and resources to address this issue in a timely and structured manner, we are asking the Regional Board to do the same in committing to a re-evaluation schedule.

   Regional Board Member Wright expressed support at the February 8, 2006 Board Meeting for a set re-evaluation timeline for the TMDL model. He stated, "…I'd feel a lot more comfortable if we had built into this whole process some kind of steps along the way where we would review the models. Models have a way of just becoming accepted and becoming engrained in the way we operate." (February 8, 2006 Regional Board Meeting Transcript, 138-139)

Response: Several stakeholders have expressed opinion that there is a need to reevaluate TMDLs at a set date in the future to ensure that the most up-to-date, accurate information is used for model output, and ultimately, TMDL calculation. The commenter cites numerous arguments in support of this position, such as the fact that the model is based on little data; bacteria are a non-conservative pollutant and are often naturally-occurring; bacteria loading cannot always be correlated to land uses with good results; and the relationship between bacteria levels and the human health risk is less understood in waters where no sewage contamination is present. The commenter also states that re-evaluation of the models used for TMDL calculation is necessary for accurate analysis and that a set date for TMDL re-evaluation is necessary to ensure it will occur, and that in doing so, dischargers can coordinate research activities needed for model enhancement.

We agree that the models produce the most accurate results when the latest and best information is utilized, that the commenter raises valid points concerning shortcomings of the models and in the TMDL process. However, attempts to restore water quality and meeting the TMDLs as calculated must not be delayed for acquisition of new information. Even as new information is being sought, attempts to decrease existing bacteria levels must take place, since bacteria contamination is indicative of a public health risk. Available information indicates that high bacteria densities have persisted in the beaches and creeks included in this project, further, we have no information showing that sewage, human wastes, and domesticated animal wastes have been removed from nuisance flows and storm water runoff in any of the watersheds. Even if new data and information are obtained that result in more accurate model and TMDL results, chances are that significant load reductions would still have to take place. As the waterbodies included in this project have been on the List of Water Quality Limited Segments for years, there is no reason why dischargers cannot begin or continue with attaining load reductions immediately.

Please see the response to Comment 58 for further discussion of this issue.

Comment 171

Section 11 Implementation Plan: It should be clarified in the TMDL that the compliance schedule applies to Phase II MS4 dischargers and persons responsible for controllable non-point source (NPS) discharges. As such, the Regional Board should commit to a time schedule for pursuing regulatory controls for all sources of bacteria identified in the TMDL: Phase II MS4 systems, individual landowners with controllable NPS discharges such as nurseries, dairies, horse ranches, septic systems and manure composting operations.

Response: The Technical Report clearly states in Table 11-2 that owners and operators of small MS4s (Phase II) are considered responsible municipalities. Section 11.2, Implementation Plan Objectives, outlines specific actions we will pursue in executing these TMDLs. We will reissue or revise the various existing statewide and regional NPDES requirements that regulate urban runoff and other point source discharges to beaches and creeks addressed in this project, including small MS4s. We will also enforce the Waiver Policy, which will address nonpoint, but controllable sources. We have not committed to a specific timeframe to accomplish these tasks as they must be prioritized with other Board projects.

Comment 172

Section 11 Implementation Plan: Clarification of the requirements of the monitoring in Bacteria Load Reduction Plans is necessary for the following items:

a) Provide information showing whether or not wasteload reductions are being met. As previously discussed (see SAG consensus point #1) the mechanism for computing compliance with wasteload reductions expressed as million billion MPN/year is unknown. As shown by Graph 1, bacteria water quality data is extremely variable. For example, two samples taken side-by-side at the same

time can result in widely varying results. Similarly, flow rates within many urban creeks vary significantly on an hourly and sub-hourly basis. Accurately computing the bacteria load and any wasteload reduction is much more complicated than simply multiplying a single concentration value by an instantaneous flow rate. Further, utilizing the TMDL model for such characterization would be beyond the capabilities of most municipal dischargers, requiring expert support from consultants knowledgeable in model configuration and with the computer capabilities to manage the process.

Chairman Minan requested staff provide "…the support for why that approach (expressing wasteload reductions as million billion MPN/year) is better than the approach taken with respect to Santa Monica Bay. And this is a point that the SAG group raised. So I think you are going to need to do some additional work in that area." (February 8, 2006 Regional Board Meeting Transcript, 52)

b) Locate anthropogenic hot spots and identify and characterize anthropogenic bacteria sources. Reliable scientific methods for differentiating between human and non-human sources of bacteria do not currently exist. It is unclear how dischargers will be able to determine whether bacteria originate from anthropogenic or natural sources.

Response (a): We do not agree that the specificity discussed in this comment is necessary to incorporate into the Technical Report. First, although TMDLs are expressed as "loads" in Tables 9-1 through 9-12, this does not imply that compliance will necessarily be measured in this metric. Second, the manner in which WQBELs are expressed (which must be consistent with WLAs), will be determined upon revision or reissuance of the NPDES requirements for urban runoff. The public process associated with reissuance of the NPDES requirements is the proper place to propose alternative metrics to measure compliance. Please see the response to Comment 147 for further discussion.

Response (b): In order to comply with the stated condition, dischargers do not necessarily have to differentiate between human and non-human sources of bacteria (we assume that the comment implies the use of DNA or other molecular-based approach). More appropriately, dischargers should differentiate between anthropogenic and non-anthropogenic sources of bacteria. For example, dischargers can check suspect bacteria hotspots for upstream cross-connections between sewer and storm drain lines. Additionally, evidence of pet waste, lawn over-fertilization, or trash, are sources of bacteria that we consider anthropogenically-derived, and therefore controllable.

We cannot clarify how compliance will take into account natural sources of pollutants, because these details are not necessary at this stage, and are more appropriately discussed upon re-issuance of NPDES requirements. Dischargers should propose both compliance methods and assessment locations in their Bacteria Load Reduction Plans, which will be unique to each watershed.

Comment 173

In our previous comment letters we have expressed concerns about 1) the technical underpinning that has been used for the development of the Project I Bacteria TMDL, and 2) various policy-level implications associated with the TMDL as proposed. Former Board Chairman Minan clearly appreciated these concerns, as he requested staff to provide "the support for why that approach (expressing wasteload reductions as million MPN/year) is better than the approach taken with respect to Santa Monica Bay" (February 8, 2006 Regional Board meeting).

Response: Please see the response to Comment 147.

Comment 174

The City of Del Mar should not be listed as a responsible municipality in Table 11-2 Responsible Municipalities and Lead Jurisdictions

<u>Miramar Reservoir</u>

The City of Del Mar has drainage from only 150 acres or four tenths of one percent of the Miramar Reservoir Hydrologic SubArea as shown in Figure 1 (Attachment A). The Draft Technical Report names the bacteria-impaired water quality limited segments (Table 3-1) in this watershed as the Pacific Ocean Shoreline for the Miramar Reservoir HA (part of Los Peñasquitos).

Del Mar acknowledges it will have a role in the continued monitoring and assessment of the Anderson Canyon storm drain outfall and will collaborate with watershed dischargers, including the North County Transit District, as part of the bacteria TMDL process. Del Mar anticipates a level of effort comparable to the limited geographical contribution to the watershed and does not believe it is appropriate to be named as the "responsible municipality" in charge of reporting and submittals on behalf of the Miramar Reservoir HA dischargers which includes much larger jurisdictions with more at stake in the program. Del Mar requests that an alternative "default" Responsible Municipality be named in the Draft Technical Report in Table 11-2 – Responsible Municipalities and Lead Jurisdictions; either Poway or the City of San Diego would be equally appropriate.

A similar request has been granted on comparable grounds in the past and Del Mar is no longer listed as the Lead Copermittee for the Los Peñasquitos Watershed in the Municipal Separate Storm Sewer System NPDES Permit or Tentative Order No. R9-2006-0011 (see Table 4 in the order).

Response: We agree that the default Lead Jurisdictions described in Table 11-2 should be consistent with the Lead Copermittees described in Order No. 2007-0001, *Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego County, and the San Diego Unified Port District, and the San Diego County Regional Airport Authority.*. Therefore the Lead Copermittee for the Miramar Reservoir hydrologic area will be changed to the City of Poway in the Technical Report.

Comment 175

Del Mar requests that Torrey Pines State Beach at Del Mar (Anderson Canyon) be removed from the Bacteria TMDL Project I

The water quality impaired or 303(d) listing from 1998 is the basis for the beach segments included in this Bacterial TMDL. The listing was last approved by EPA in July 2003 but was not updated to reflect new data and information. The most recent coastal water quality data collected by Del Mar and other stormwater program copermittees to comply with the Coastal Outfall Monitoring Program in Order No. 2001-01 has not been taken into account. The data has been reported annually as part of the reporting and monitoring program requirements, most recently in the *San Diego County Municipal Copermittees 2004-05 Urban Runoff Monitoring Final Report (December 2005).* The coastal outfall monitoring program includes hundreds of samples of the receiving water tested for total coliform, fecal coliform and enterococci **that clearly demonstrate that water quality for various segments of the Pacific Ocean shoreline are not bacteria-impaired**. It is Del Mar's opinion that the listings in San Diego County, including the Torrey Pines State Beach at Del Mar (Anderson Canyon), should be reassessed using data collected and reported from April 1, 2003 through August 15, 2006. The data includes 165 samples tested for all three bacterial indicators and shows attainment of water quality during this time period (see Attachment B). We request that the Regional Board initiate delisting of Anderson Canyon by applying the guidance in State Water Resources Control Board Resolution No. 2005-0050 as described in Section I.A:

> **"If the water body is neither impaired nor threatened, the appropriate regulatory response is to delist the water body.**
>
> The first step in addressing a listing is to identify the scope of the problem. In some cases, this analysis will lead to a conclusion that standards are in fact being attained and the water is not threatened, either because the assumptions underlying the listing were incorrect, or because the impairment has been corrected. In such circumstances, it is appropriate to delist the water body in accordance with the "Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List."

If the implementation of the Bacteria TMDL Project I continues as described in the Draft Technical Report and the existing data is not fully considered, valuable municipal and state resources will be spent on a project that will not provide a benefit to water quality comparable to the expenditures.

Response: Even though recent measurements show that the Del Mar beach at Anderson Canyon meets WQOs (at least during dry weather), this and other improved sites will remain included in this project. Whether or not these beach segments meet WQOs during storm events is unclear, since the data submitted for de-listing purposes consisted strictly of dry weather samples. In a letter to the SWRCB dated January 31, 2006, the San Diego Water Board recommended that all waterbodies, regardless of quality during dry weather, remain listed if no wet weather data is available to demonstrate support of beneficial uses. Furthermore, whether or not the SHELL use is supported is also unclear, since the data used for de-listing was not evaluated using the total coliform SHELL WQO.

Although dry weather bacteria load reduction plans would not be required for the watersheds draining to these beaches and any beaches meeting WQOs, BMPs implemented in these watersheds to reduce bacteria loading should be maintained, and monitoring, even if on an infrequent basis to assess the effectiveness of the BMPs, should continue. Wet weather bacteria load reduction plans are still needed, unless dischargers can demonstrate attainment of uses in wet weather. Dischargers can discuss the possibility of a reduced level of monitoring and reporting at sites such as Anderson Canyon with San Diego Water Board staff who oversee the TMDL implementation. TMDL implementation will take place primarily by incorporation of WQBELs into WDRs for urban runoff (such as Order No. 2007-0001). The process is described in section 11.5.3 in the Technical Report.

Comment 176

The Report should clearly establish a commitment to re-evaluate and recalculate the TMDLs on a five-year schedule. This is supported by the following:

i. Limited data from 2002 were used to calibrate the model and substantially more data will be available

ii. Land use data from 2000 was used to calibrate the model and needs to be updated to fairly develop the wet weather allocations to dischargers

iii. Southern California Coastal Water Research project and others are conducting research studies that will further our understanding of background loads and the linkage between indicator bacteria and human pathogens. The results of these studies expected in two to three years should be used to further improve the TMDL analysis.

iv. Based on the results of the year five re-evaluation, the mandatory compliance benchmarks contained in Table 1-2 also will need to modified accordingly.

Response: Please see response to Comment 58.

Comment 177

One reason why it is important to consider more appropriate pollutant loads at this point in time is that anti-backsliding provisions in the Clean Water Act will not allow the Regional Board to increase the Waste Load Allocations (WLAs) associated with these TMDLs once the TMDLs are incorporated into the San Diego Municipal Storm Water permit. Even if the standards can be relaxed after they are incorporated into the Storm Water permit, the City will have already taken expensive activities to comply with the TMDLs as proposed prior to relaxation of the standards.

Response: The San Diego Water Board can increase the WLA after the TMDLs are incorporated into the San Diego Municipal stormwater requirements as a result of new site specific objectives, a change to beneficial uses, or a refinement of the TMDLs based on new data. NPDES regulations [40 CFR section 122.44(l)(1)] prevent backsliding unless the circumstance upon which the previous permit was based have materially and

substantially changed since the time the permit was issued. New site specific objectives, a change to beneficial uses, or a refinement of the TMDL based on new information would qualify as a material and substantial change of circumstance.

Comment 178

The San Diego Municipal Storm Water permit prohibits using Waters of the State to convey or treat storm water. The Bacti-1 TMDL indicates that WLAs must be met prior to discharge of storm water into receiving waters. Given San Diego's topography and existing storm water conveyance system design, Waters of the State/receiving waters generally occur immediately below (downstream of) storm drain outfalls. Therefore, treatment facilities must be located above (upstream of) storm drain outfalls. Moreover, given the propensity for bacteria to breed in the storm drain conveyance system, treatment facilities must be located as close to storm drain outfalls as possible, as the bacteria that regrows in storm drains is considered to be anthropogenic and subject to the zero WLA. Most land above storm drain outfalls is developed with private land uses and these land uses would be displaced by the construction of treatment facilities.

The environmental analysis for both TMDLs states that the construction of treatment BMPs has the potential to displace crops, native biota, and existing land uses but suggests that these impacts can be avoided or minimized by locating treatment BMPs where these things are not present. However, all evidence presented dictates that compliance via treatment requires treatment facilities to be located close to and upstream of storm drain outfalls. Even if treatment facilities are built underground, structures cannot be re-built on top of them. Instead of indicating where treatment BMPs should not be located, the City suggests that the environmental analyses focus on where treatment BMPs may reasonably be located and evaluate the impacts of building treatment BMPs at those locations.

Response: The CEQA requires the San Diego Water Board to consider a reasonable range of specific sites in its analysis, but does not require us to speculate on the specific locations where the dischargers may or may not choose to build BMPs. However, in evaluating potential impacts of BMPs, we considered what those impacts might be in all land use types present in the watershed. We disagree that structures cannot be built on top of underground detention basins. Please see the response to Comment 233.

Comment 179

Please clarify where compliance would be measured for both TMDLs. How would an evaluation of compliance take into account pollutants such as feral animal excrement and aerially-deposited metals that are allowed into receiving waters downstream of storm drain outlets?

Response: We cannot clarify where TMDL compliance will be measured, or how compliance will take into account natural sources of pollutants, because these details are not necessary at this stage, and are more appropriately discussed upon re-issuance of NPDES requirements. Dischargers should propose both compliance methods and

assessment locations in their Bacteria Load Reduction Plans, which will be unique to each watershed.

Comment 180

Is it possible to increase the WLAs for either TMDL (i.e., as a result of new Site Specific Objectives, change to beneficial uses, results of implementing a tiered approach, completion of the bacteria reference study) after the TMDL is incorporated into the San Diego Municipal permit?

Response: Yes it is possible to increase WLAs after the WQBELs have been incorporated into the NPDES requirements.

Comment 181

When is it anticipated that the TMDLs will be incorporated into the San Diego Municipal permit?

Response: The TMDLs must undergo a series of approvals before they can be incorporated into Order No. R9-2007-0001. The TMDLs must be adopted by the San Diego Water Board, followed by the State Water Resources Control Board, Office of Administrative Law, and USEPA. The approvals following the adoption by the San Diego Water Board typically take 6 to 12 months. Incorporation of TMDLs into the NPDES requirements will take place upon the normal 5-year renewal cycle, or sooner, if appropriate.

Comment 182

The City requests that both TMDLs include a re-evaluation provision so that the need for the final WLAs can be formally re-evaluated after non-structural and less-intensive BMPs are evaluated for their maximum effectiveness.

Response: Please see the response to Comment 58.

Comment 183

The City is requesting that San Diego State University and any other universities and colleges be notified to participate in these TMDLs and the Phase II Municipal Storm Water Permit program.

Response: Please see the response to Comments 156 and 157.

Comment 184

For the bacterial TMDL, please clarify whether the final Waste Load Allocation for all anthropogenic indicator bacteria is zero.

Response: Yes, the final wet weather WLAs for anthropogenic sources of bacteria are zero. The WLAs will be revised when the final TMDLs are revised pursuant to either the reference system or natural sources exclusion approach.

Comment 185

For the bacterial TMDL, please clarify whether bacteria from feral dogs and cats, potable water (up to 2 MPN/100 ml) that could be used to maintain wetland vegetation after diverting dry weather flows, and re-growth in storm drains would be considered anthropogenic sources.

Response: Feral dogs and cats could be considered anthropogenic sources. Because domestic or feral animals are, or can be in contact with humans, they are capable of spreading pathogens to humans, and feral dog and cat populations can be controlled. Therefore loads from these sources should be reduced. Potable water used to maintain wetlands is not considered a source of bacteria. If human pathogens do not regrow in storm drains, then this regrowth could be considered non-anthropogenic. Information on whether or not human pathogens regrow in storm drains is not conclusive.

Comment 186

If future monitoring were to find that that bacteria concentrations are in excess of the TMDL limits, please clarify how it would be determined whether the exceedence is or is not due to anthropogenic bacteria. Would the City be required to conduct DNA testing to prove that anthropogenic bacteria are not the cause of the exceedence? We are not aware of many laboratory facilities that can conduct this type of testing.

Response: Please see the response to Comment 172 b).

Comment 187

On page 10, the Bacteria TMDL lists the municipalities and Caltrans that are in the Chollas Creek Watershed. The City requests that the US Navy be included in this TMDL.

Response: The US Navy is a small MS4, therefore they are responsible for meeting TMDL requirements where its facilities are located in impaired watersheds.

Comment 188

The City is concerned why we have to investigate bacteria loads from Regional Board regulated landfills when these facilities already have WDRs. The City is requesting that draft report removed those landfills with existing WDRs from this TMDL because those facilities are regulated directly by the Regional Board.

Response: Please see the response to Comment 167.

Comment 189

The SAG consensus points in Prior Comments both remain unanswered and valid, as does the recommendation: The Technical Report should clearly establish a commitment to re-evaluate and re-calculate the TMDLs on a five-year schedule.

Response: Please see the response to Comment 58.

Comment 190

The last paragraph of Section 11.5.3 indicates that dischargers to certain beach segments that were being de-listed in 2006 would not be required to prepare Bacteria Load Reduction Plans. There are a significant number of other beaches that were proposed for de-listing in 2006 but were not considered for it due to technicalities not related to actual water quality; these beaches (and perhaps some additional ones) are expected to be re-nominated and successfully de-listed in 2008. The Bacteria Load Reduction Plans are not scheduled to be completed until 2009. The second sentence in this paragraph should be modified as follows:

> *For those beach segments de-listed in 2006, or other beach or creek segments removed from the 303(d) list prior to the scheduled completion date for its respective Bacteria Load Reduction Plan, municipal dischargers and Caltrans need not prepare Bacteria Load Reduction Plans for their discharges in these watersheds.*

Response: We have revised the indicated language in the Technical Report, but we did not use the suggested language in this comment. Because the beaches that were de-listed in 2006 were not evaluated against the SHELL total coliform WQO, whether or not the SHELL beneficial use is supported is unknown. Furthermore, the data used for de-listing purposes was confined to dry weather conditions. This indicates that several municipalities have been effective at implementing dry weather BMPs. Therefore, Bacteria Load Reduction Plans are still needed in all watersheds for wet weather, unless dischargers demonstrate that uses are attained in wet weather.

Comment 191

Section 11.5.6 indicates that active Municipal Solid Waste Landfills should be investigated to determine if they are potential sources of bacteria, but the Section does not explain who is supposed to be performing these investigations. Since these facilities are separately permitted, this would seem to be an appropriate task for the RWQCB.

Response: Please see the response to Comment 167.

Comment 192

Del Mar requests that Torrey Pines State Beach at Del Mar (Anderson Canyon) be removed from the Bacteria TMDL Project I

The most recent water quality impaired list or 303(d) listing, dated October 25, 2006, should be the basis for including the beach segments in this Bacterial TMDL project. The listing was last approved by the State Water Resources Control Board to reflect new data and information in accordance with the Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List (Listing Policy). The fact sheet for the Pacific Ocean Shoreline at Miramar Reservoir HA (Attachment A) recommended the delisting of the segment using the weight of evidence and in compliance with the Listing Policy. Del Mar asserts that the Bacteria TMDL Project I Draft Technical Report must be amended to show this segment has been removed and no longer requires a TMDL. This

action is necessary in order to provide consistency and clear priorities, for both the RWQCB and dischargers, in the development and implementation of TMDLs.

Response: Please see the response to Comment 175.

Comment 193

Del Mar requests that Table 1-1. Bacteria-Impaired Water Quality Limited Segments Addressed in this Analysis be modified.

Table 1-1 Bacteria-Impaired Water Quality Limited Segments Addressed in this Analysis should be modified and the segment for Miramar Reservoir HA removed to reflect the delisting of this area as of October 25, 2006 and to make it consistent with the Listing Policy.

Response: Please see the response to Comment 175.

Comment 194

Del Mar requests removal from the obligation to prepare a Bacteria Load Reduction Plan and comply with reporting requirements.

Removing the Miramar Reservoir at Anderson Canyon segment from the Bacteria TMDL Project I effectively eliminates the requirement to develop and implement the Bacteria Load Reduction Plan required per Section 1.6 of the Technical Report. Del Mar believes that the language in Section 1.6 is too vague and may require unnecessary plans and reports for a water segment that has been delisted by the SWRCB and approved by EPA. Removing the segment from the TMDL project effectively eliminates the City's (and other parties) obligation to comply with these requirements. Limiting this project to the 303(d) listings complies with the State's policies and allows the City to focus resources on high priority water impairments and future TMDLs, rather than on a segment that has effectively shown attainment with water quality objectives.

Response: TMDLs for beaches that have been de-listed in the section 303(d) process ensures that dischargers continue to implement BMPs to meet WQOs. We agree that dischargers should focus their resources on problematic areas, therefore areas meeting WQOs can be considered low priority and a reduced level of monitoring can suffice. Bacteria Load Reduction Plans for wet weather are still needed as described in the response to Comment 175.

Comment 195

Del Mar requests changes to Table 11-2 Responsible Municipalities and Lead Jurisdictions.

Del Mar urges that the Miramar Reservoir HA (906.10) Torrey Pines State Beach at Del Mar (Anderson Canyon) segment be removed from Table 11-2 for the same reasons noted previously.

Responses: Please see the response to Comment 175.

Comment 196

Del Mar requests changes to Table 11-3 Prioritized List of Impaired Waters for TMDL Implementation.

Del Mar urges that Miramar Reservoir HA (906.10) watershed be removed from Table 11-3 for the same reasons noted previously.

If the revisions requested by Del Mar are not incorporated, the end result for this and future TMDLs will be unpredictable and unjustifiable expenditures of limited resources. Del Mar seeks consistency throughout the region and the State so that an "even playing field" is set as originally intended by the SWRCB and the Delisting Policy. If the implementation of the Bacteria TMDL Project I continues as described in the Draft Technical Report, the Regional Board will be deviating from the SWRCB Listing Policy and defying its purpose. Del Mar believes the revisions to the delisting shown in the 303(d) List for 2006 should occur prior to approval of the Bacterial TMDL Project I.

We believe that our position is consistent with what we have heard you say on numerous occasions…..that agencies need to be strategic in what they attempt to do in order to leverage limited resources in the most cost-effective ways.

Response: We disagree that this and future TMDLs will cause unpredictable and unjustifiable expenditures of limited resources. The goal of the implementation plan is to attain and maintain WQOs throughout all seasons and hydrologic conditions. If dischargers have met this burden, then their only expenditures would be to report that WQOs are attained, and reporting would occur at an appropriate frequency as specified in the discharger's monitoring and reporting programs.

Comment 197

The last paragraph of Section 11.5.3 indicates that dischargers to certain beach segments that were being de-listed in 2006 would not be required to prepare Bacteria Load Reduction Plans. There are a significant number of other beaches that were proposed for de-listing in 2006 but were not delisted; these beaches are expected to be resubmitted and successfully de-listed in 2008. In addition, other beaches have since been evaluated and have met delisting criteria (all the water segments in Dana Point HSA 901.14, for example), and are anticipated to be delisted from the 2008 303(d) List. The Bacteria Load Reduction Plans are not scheduled to be completed until 2009. The second sentence in this paragraph should be modified as follows:

> *For those beach segments de-listed in 2006 or 2008, or other beach or creek segments removed from the 303(d) list prior to the scheduled completion date for its respective Bacteria Load Reduction Plan, municipal dischargers and Caltrans need not prepare Bacteria Load Reduction Plans for their discharges in these watersheds.*

Response: Please see the response to Comment 190.

Comment 198

Page 7, Section 1.4 This section discusses modeling used to estimate existing bacteria loads and discusses using estimates for model flow and bacteria loading. Later on page 160 the report discusses collection of useful data for model improvement. There should be some language added that gives flexibility written in to the implementation plan for the new data and results.

Response: Please see the response to Comment 58.

Comment 199

Page 60, Section 7.1.1.d explains the complexity inherent in bacterial modeling. Any kind of watershed loading or waterbody dispersion model must be developed, calibrated and validated with rigorous data sets. The report indicates this did not occur with Chollas Creek. Therefore, it is recommended that a monitoring program be established to gather the data necessary to tailor the model for this watershed.

Response: Dischargers are free to propose the execution of special studies for the purpose of gathering data for model improvement as part of their Bacteria Load Reduction Plans.

Comment 200

The City of Poway is requesting to be removed from its responsibility for the listed areas of the San Diego River Watershed: Mission San Diego, HSA (907.11) and Santee HSA (907.12). The justification for this request is that in California Regional Water Quality Control Board, San Diego Region, Order No. R9-2007-0001, the City of Poway has been removed from responsibility for the entire San Diego River Watershed.

As you know, the City only occupies 120 acres of this watershed, all of which is protected habitat. This area is located on top of Iron Mountain, as shown on the enclosed map. Because this land is zoned as Open Space—Resource Management, it can never be developed. This small area will remain in a natural state and does not have the potential to discharge pollutants to the watershed.

Response: We agree with this comment. The City of Poway has been removed from the list of responsible municipalities in hydrologic sub-areas 907.11 and 907.12.

Comment 201

Section 11.5.3 specifies that dischargers to certain beach segments that were being removed from the 303(d) list in 2006 would not be required to prepare Bacteria Load Reduction Plans. This section makes no reference to segments eligible for removal from the 2008 list. While the suitable segments in Laguna Beach were eligible for removal in 2006, they must now wait for the 2008 cycle for final delisting. The final TMDL should have provisions for exemption from the requirements of creating a Bacteria Load Reduction Plan for segments delisted in the 2008 cycle.

Response: Please see the response to Comment 190.

Comment 202

The City of Laguna Beach is also concerned with the seemingly "open ended" commitment implied by the draft TMDL. The final TMDL should provide provisions for dischargers who meet the goals of the program to be exempted from the requirements of the program.

Response: The provisions for dischargers who have implemented bacteria load reduction strategies, which have resulted in subsequent de-listings, are described in the response to Comment 175.

Comment 203

The City of Laguna Beach has invested a great deal of effort and funding into bacteria reduction and the protection of beneficial uses along our shoreline. The results of these efforts are clear- the Pacific Ocean shoreline along much of the Laguna Beach coastline meets the bacteria standards established in the 303(d) delisting guidelines. The City feels that future efforts and funding commitment should be made in areas where bacteria is a significant problem rather than areas where goals have been met.

Response: We agree with this comment and therefore the language in the Technical Report acknowledges the reduced level of effort needed from dischargers in areas meeting de-listing guidelines. Please see the response to Comment 175.

Comment 204

Lastly, the City continues to support the Aliso Creek SUPER project to meet the TMDL standards in the Aliso Hydrologic Sub-Area. The City urges the Regional Bard to adopt a balanced approach to achieving water quality objectives which includes source control, public outreach and Best Management Practices as proposed by the SUPER project; bio-filtration, erosion prevention, structural diversions and in-stream treatment.

Response: We agree that a balanced approach to achieving WQOs should include source control, public outreach, and the various BMPs suggested in this comment. Dischargers should include such measures in their Bacteria Load Reduction Plans. Also, dischargers should not wait for TMDL adoption and approval to begin reducing loads from other pollutants.

Comment 205

The issue of uncertainty about the linkage between indicator bacteria and human pathogens is worsened by the fact that farmers may choose to use composted manures and greenwaste mulches to reduce the use of manufactured nutrients and control runoff. Studies have shown substantial increases in the presence of indicator bacteria, but no human pathogens, when composted manures and greenwaste are used. If farmers administer those practices in an effort to come into compliance with stormwater regulations they may find they are running afoul of the TMDL because of the production of indicator bacteria.

Response: We agree that properly composted manure should not contain pathogens, and therefore bacteria from farming sites using properly composted manure do not pose a public health threat. Composted manures and greenwaste mulches can be effective at minimizing runoff; therefore, we anticipate its use will help, and not worsen, bacteria loads leaving sites.

Comment 206

Should this TMDL move forward as written it is our suggestion that farm sites identified as sources of indicator bacteria be further tested by the Regional Board to make the positive identification that human pathogens are present. While we have no reason to question that farm sites could be sources of indicator bacteria, it is imperative that positive linkages be established to avoid punitive measures that will do nothing to improve water quality on our beaches and in our creeks.

Response: We agree that testing for human pathogens may be a definitive way to rule out farm sites as sources of pathogens. However, this is not needed as a first step in ensuring that discharges from farms contain pathogens (or even bacteria). We are assuming that farms are not discharging bacteria and pathogens because they are prohibited from doing so under waivers of WDRs. We may have to enforce the waivers in order to confirm this assumption. If, when doing so, we find that farmers are abiding by the conditions set forth in their waivers, yet there are still bacteria loads coming from agricultural land use areas, we could require the owners and operators of the agricultural to perform testing for pathogens.

Comment 207

Concerns About Waste Load Allocation (WLA) Metrics Should be Addressed Through WQBELS

One of our earliest consensus points with all members of the SAG was that expressing the waste load allocations as number of bacteria colonies per year (billion MPN/yr) was not a useful metric for measuring compliance with the TMDL. Many of the concerns over the last four years of public participation and at the April 25th public hearing centered on this measurement of TMDL compliance.

An often-voiced complaint is that using an annual load metric in the TMDL will make it impossible to assure compliance in the beaches and creeks. We certainly agree that importing the WLAs wholesale into permits would be confusing and detrimental to achieving cost-effective reductions. However, such metrics can and should be changed when the water quality based effluent limits (WQBELs) are developed in response to the WLAs. Indeed, the draft Technical Report specifically allows for this possibility. "WQBELs may be expressed as numeric effluent limitations using a different metric, or, more likely, as BMP development, implementation, and revision requirements." Draft Technical Report at 150.

As staff explained at the April 25th hearing, such matters are appropriately resolved after the adoption of the TMDL. Indeed, a WQBEL is based on the WLAs in the adopted

TMDL. We agree that the number of days that exceed beach water quality standards may be a more easily implementable metric than total number of bacteria in the water for implementation of the TMDL. However, we cannot agree that using the annual or monthly load metric in the TMDL itself is incorrect. WQBELs need only be consistent with the requirements of the WLAs in a TMDL, the two need not be identical. As staff has explained, the stakeholder group will be engaged by staff to choose a useful and appropriate metric for implementation.

Response: We agree with this comment. An appropriate metric for measuring compliance with TMDLs will be selected with public input upon re-issuance of the pertinent NPDES requirements.

Comment 208

A Reference-Based approach is appropriate for setting waste load allocations and load allocations.

Heal the Bay strongly favors the Los Angeles Water Quality Control Board's approach in setting the TMDL targets for the Santa Monica Bay Beaches Bacteria TMDLs. This approach is based on exceedances of fecal indicator bacteria standards for both interim and final TMDL targets. The most important beneficial use that is impaired by high fecal indicator bacteria densities is recreational water contact. A TMDL based on the total number of fecal bacteria in the water, rather than the numbers of days that exceed beach water quality standards, will not lead to beneficial use attainment and is an insurmountable compliance assurance problem. How will anyone be able to determine compliance with a monthly waste load allocation in terms of billion MPN/month? Further, how will this approach verify that the receiving waterbody is no longer impaired?

Every time a beach water quality standard is exceeded, a beach gets closed or warning signs are posted, and this is an impaired beneficial use. An exceedance based approach is more consistent with current risk management procedures, AB 411 requirements, and public health protection.

Response: We agree that measuring TMDL compliance with exceedance days may be a suitable metric for beaches. Therefore, we encourage the commenter to stay involved with the public process associated with the re-issuance of the municipal NPDES requirements, which is the appropriate forum for determining the compliance metric(s) for these TMDLs. Please see the response to Comment 147 for further discussion. Unlike the Santa Monica Bay TMDLs, this project is inclusive of inland creeks, and therefore compliance methods must be suitable for determining attainment of standards in creeks in addition to beaches.

We further agree that a compliance metric based on exceedance days is consistent with current risk management procedures. However, in terms of formulating strategies for BMP implementation, the exceedance days approach does nothing to help dischargers quantify the magnitude of existing loads. A loading approach provides the ability to calculate percent reductions needed in each unique watershed. For example, in the San Luis Rey watershed, a 3 percent reduction is needed in fecal coliform loading, compared

to a 53 percent reduction needed in the San Diego watershed. Further, the load contributions by land use are discussed in Appendix I. This information is useful in determining which watersheds require the most effort, and what types of BMPs may be effective, and where they might be placed. An exceedance day-based analysis does not provide such useful information.

5.6 Compliance Schedule

Comment 209

Compliance Schedule and Proposed Reductions: We are concerned that the time schedules and percent reductions proposed are too aggressive and do not fully recognize; 1) the bacteria source identification technical advances and special studies (natural loading etc.) that are necessary to achieve the bacteria reduction levels, and 2) the time necessary for public agencies to execute the watershed agency agreements, work contracts and budget the necessary funds to execute the implementation plan. We recommend the time schedule be reevaluated to allow adequate time to address the necessary steps for successful compliance.

Response: We disagree that the proposed compliance schedule is too aggressive and does not recognize the need for special studies or the time needed for dischargers to execute the implementation plan. The bacteria TMDLs can be recalculated if justified by technical advances or the results of special studies. However, these advances or studies are unlikely to justify no bacteria load reductions, thus moving forward with implementation of the TMDLs is justified. In establishing the compliance schedule for achieving the TMDLs, we must balance the need of the dischargers for a reasonable amount of time to implement an effective BMP program against the broad-based public interest in having water quality standards attained in beaches and creeks as soon as practicable. The public interest is best served when dischargers take all reasonable and immediately feasible actions to reduce pollutant discharges to impaired waters in the shortest possible time. In light of these considerations, the San Diego Water Board believes the compliance schedule in the Technical Report is reasonable.

Some of the beaches and creeks included in the Technical Report were placed on the List of Water Quality Limited Segments in 1996. Others were placed on the List in 1998 or 2002. If the dischargers were not aware of the List of Water Quality Limited Segments during any of these listing cycles, the problem was brought to their attention in March 2003 when the San Diego Water Board held its first public workshop and CEQA scoping meeting regarding these TMDLs.

In 1999, WDRs for Caltrans' MS4 discharges were issued by the SWRCB. Receiving Water Limitation No. C-1-3.a of these WDRs (SWRCB Order No. 99-06-DWQ) prohibits the discharge of stormwater from a facility or activity that causes or contributes to the violation of WQSs or WQOs. Similarly, dischargers regulated under San Diego Water Board Order Nos. 2007-0001 and Tentative Order 2007-0002 (San Diego County and Orange County MS4 NPDES requirements for discharges of urban runoff) are subject to a similar prohibition (Receiving Water Limitation No. A.3.a.1).

The Caltrans, San Diego County, and Orange County MS4 NPDES requirements place an additional obligation on the dischargers to submit a report to the San Diego Water Board that describes BMPs that are currently being implemented and additional BMPs that will be implemented to prevent or reduce any pollutants that are causing or contributing to the exceedance of WQSs (Receiving Water Limitations No. A.3.a.1 respectively). The WDRs require implementation of the BMPs described in the report. This obligation is

triggered when either ***the dischargers*** or the San Diego Water Board determine that MS4 discharges are causing or contributing to an exceedance of an applicable standard, in this case, indicator bacteria and their associated beneficial uses. To date, neither Caltrans nor the municipal dischargers have formally made this determination or notified the San Diego Water Board as required by conditions of their WDRs.

Considering that initiation of the TMDLs took place upon the first public workshop in 2003, and the existing obligation under the Receiving Water Limitations, the compliance schedule has not been modified. Dischargers should not be rewarded for their lack of action to restore WQOs in beaches and creeks during wet weather flows. Dischargers should have initiated BMP planning and monitoring to address the impairments following adoption of WDRs in 1999 (Caltrans), 2001 (San Diego County MS4s), and 2002 (Orange County MS4s), respectively. We recognize that dischargers will face difficulty reaching final TMDLs, therefore we are developing a reference system/natural sources exclusion Basin Plan amendment, as discussed in the response to Comment 2. We will recalculate final wet weather TMDLs and modify the compliance schedule upon adoption of this Basin Plan amendment.

Comment 210

Table 1-2- Compliance Schedule – The timeframe of 5 to 7 years for a 50% waste load reduction is not realistic. The control of wet weather flows is a substantial undertaking. This allows inadequate time to fine-tune the modeling and use the results to cite the location of BMPs, identify sources, develop plans, develop memorandum of understanding with stakeholders, secure funding, acquire land, conduct permitting, bid out contracts and install BMPs.

Response: Please see the response to Comment 209.

Comment 211

The compliance schedule should separate the timeframes for dry weather versus wet weather compliance. The timeframe of 5 to 7 years for a 50% wasteload reduction, or of 10 years to 100% compliance, may be feasible for dry weather due to relatively small water volumes; and suitable because that's when most REC-1 use occurs. It is not realistic for storm flows, which account for around 98% of the annual load, because of the time required to fine-tune the modeling, locate large-volume BMPs, identify sources, develop plans, develop memoranda of understanding with stakeholders, secure funding, acquire land, conduct permitting, bid out contracts, and complete the installations. Since wet weather flows affect only a tiny percentage of REC-1 users, the separation of dry and wet weather schedules would also clarify that first priority should be given to dry weather programs, which would be most cost-effective. Furthermore, certain waterbodies were originally only 303(d) listed as impaired for wet-weather exceedances, so applying dry-weather TMDLs and schedules to them is inappropriate. We recommend that a wet-weather compliance schedule for Priority 1 sites should be 10 years for 50%, 15 years for 75% and 20 years for 100%.

Response: We have changed the compliance schedule (Table 11-4) to differentiate between dry weather and wet weather wasteload reductions. Attainment of dry weather TMDLs for REC-1 (enterococcus and fecal coliform) are required soonest. More time is allotted for attainment of wet weather and total coliform SHELL TMDLs.

Comment 212

The compliance schedule in Table 1-2 appears to combine both wet and dry weather TMDLs. In the City of San Diego approximately 296 days of the year are dry weather days, and most recreational activities occur in dry weather. It will be counterproductive to combine the relatively small, but important, dry weather loads with the large, but infrequently occurring and difficult to control, wet weather loads. Other regions (e.g., Santa Monica) have separate bacteria TMDLs for dry and a wet weather, and have applied different compliance schedules, as the control of wet weather loads is a considerable technical challenge that will take additional time and resources to achieve. As stated in our June 20, 2006 letter, we recommend a phasing of the wet- weather compliance schedule such that for Priority 1 locations the reduction target is 25% in year 5, 50% in year 10, and 75% in year 15 and 100% final TMDL compliance in year 20. The Priority 2 and 3 schedules should be adjusted accordingly.

Response: Please see the response to Comment 211.

Comment 213

TMDL implementation is recognized as likely to be very costly. We anticipate that the Bacteria Load Reduction Plans for each impaired water body will consequently be encouraged to give priority to conditions where real potential risks for public health are highest, especially during the interim prior to the 5-year re-evaluation date. In recognition of the costs and substantive technical issues, permittees should not, however, be forced to prematurely chase moving targets. **The overall Compliance Schedule should not set a 50% compliance date sooner than the recommended 5-year re-evaluation provision** so that TMDLs can be re-calculated, where appropriate, adequately in advance of mandatory compliance progress benchmarks. The overall Compliance Schedule should also reflect the daunting realities of procedural, fiscal, and inter-party coordination and staffing required to plan, design, fund, acquire land and construct multiple structural BMP projects to treat wet-weather flows over large percentages of the watersheds' urban drainage areas – very likely concurrently with implementing TMDLs for other constituents.

Please be assured that MS4 permittees have not deferred serious compliance efforts pending approval of the TMDL document or its associated schedule. It should be noted that <u>as a result of permittees' efforts to date, the vast majority of the Orange County beach segments addressed in the Draft Report already meet de-listing criteria and are expected to be de-listed within the current 303(d) listing cycle.</u> Despite permittee requests, RWQCB staff declined to delete these de-listable segments from the TMDL Report, helping perpetuate the (erroneous) perception that MS4 permittees haven't been taking any corrective action. Consequently, the perception also persists that setting an

overall Compliance Schedule adequate for permittees to address the more difficult conditions would allow them too much leeway to delay taking action in the short term. To address these concern, **the Load Reduction Plan to be prepared for each impaired waterbody in Year 1 should be required to include a Site-Specific Compliance Schedule with expedited timeframes wherever more rapid compliance is feasible.** These site-specific schedules, which would be expected in some cases to achieve compliance prior to the 5-year re-evaluation, should be incorporated into the NPDES permits along with any revised targets or allocations at the time of the 5-year TMDL re-evaluations.

The compliance schedule in the TMDL Report should reflect not only the priority that should be given to ocean beaches due to their high dry-weather REC-1 usage rates, but the practical reality that achieving compliance is going to be substantially more difficult and costly during wet weather in all already-developed watersheds. **As an outside maximum, we recommend the following overall deadlines for compliance:**

Year after OAL approval	
Year 1	**TMDL formally approved; Bacteria Load Reduction Planning and Data Gap Infill studies proceed**
Year 5	**5-year re-evaluation and re-calculation of models, targets and allocations based on new information**
Year 7	**50% compliance for Dry Weather at Beaches**
Year 12	**100% compliance for Dry Weather at Beaches; 50% compliance for Dry Weather at Creeks**
Year 17	**100% compliance for Dry Weather at Creeks; 50% compliance for Wet Weather at Beaches**
Year 22	**100% compliance for Wet Weather at Creeks and Beaches**

Response: The compliance schedule is not too aggressive for the reasons outlined in the response to Comment 209.

In terms of the waterbodies that have recently been delisted, please see the response to Comment 190.

Comment 214

Table 9-5: Final Wet Weather TMDLs for Total Coliform Expressed as an Annual Load's percentage of reduction does not allow for any bacteria in all storm events. It is unrealistic to expect that the City can achieve this goal in 10 years. Table 9-9: Final Wet Weather TMDLs for Enterococcus Expressed as an Annual Load's percentage of reduction does not allow for any bacteria in storm events. It is unrealistic to expect that the City can achieve this goal in 10 years.

Response: We realize achieving the necessary load reductions will be challenging. Therefore we have initiated a reference system approach Basin Plan amendment to account for natural sources of bacteria. Please see the response to Comment 2.

Comment 215

The TMDL states that the interim reductions must be required 10 years after OAL approval. It is the City of San Diego understands that TMDLs become officially once the EPA approval is given. We recommend that this statement be modified to reflect the complete process required by 40 CFR.

Response: Once OAL approves a rule or regulation, it goes into effect as state law and is therefore implementable. The rule or regulation remains in effect until modified. If, in its review process, USEPA requires changes to be made to the TMDLs, we would modify them appropriately.

Comment 216

Section 9 Total Maximum Daily Loads and Allocations and Section 11 Implementation Plan: The current load reduction targets and compliance timeframes for MS4 discharges are unrealistic and unachievable and should be modified for the following reasons:

a) The load reductions and timeframes do not consider the lessons learned from the 5 year implementation of the Aliso Creek CWC §13225 Directive for bacterial impairment. To illustrate the challenges of addressing bacterial contamination the following two graphs have been developed. The first graph below shows all dry-weather fecal coliform concentrations (mpn/100 ml) at the mouth of Aliso Creek from 1999-2005. In the second graph, this data has been transformed to a quarterly geo-mean value in an effort to show trends in the data. The red vertical line indicates when the 13225 Directive was issued and intensive monitoring and BMP implementation began in the watershed. The two blue vertical lines indicate when major treatment BMPs were activated.

Graph 1

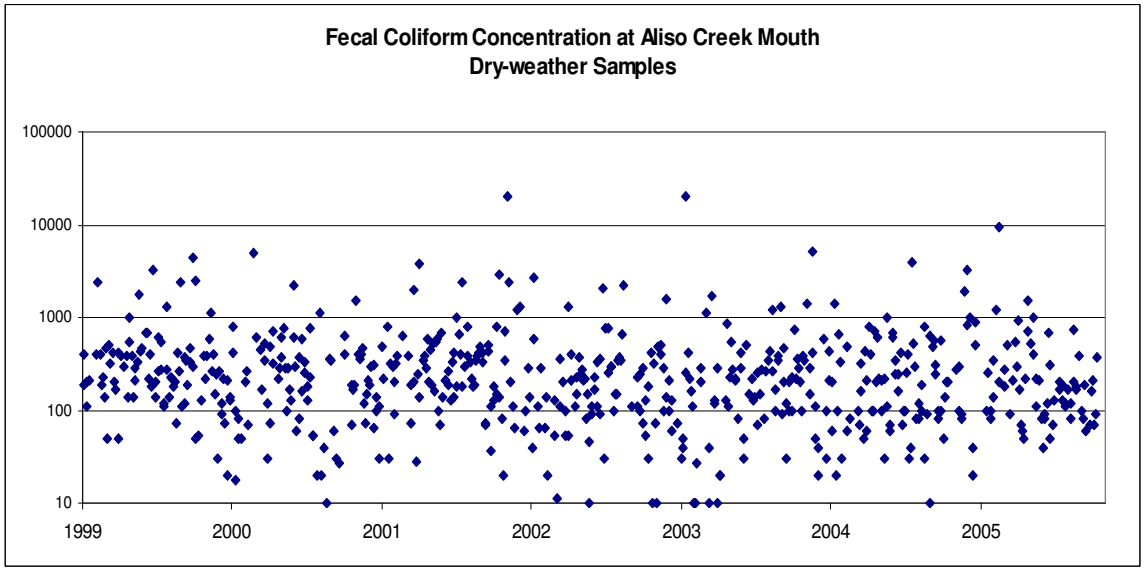

Graph 2

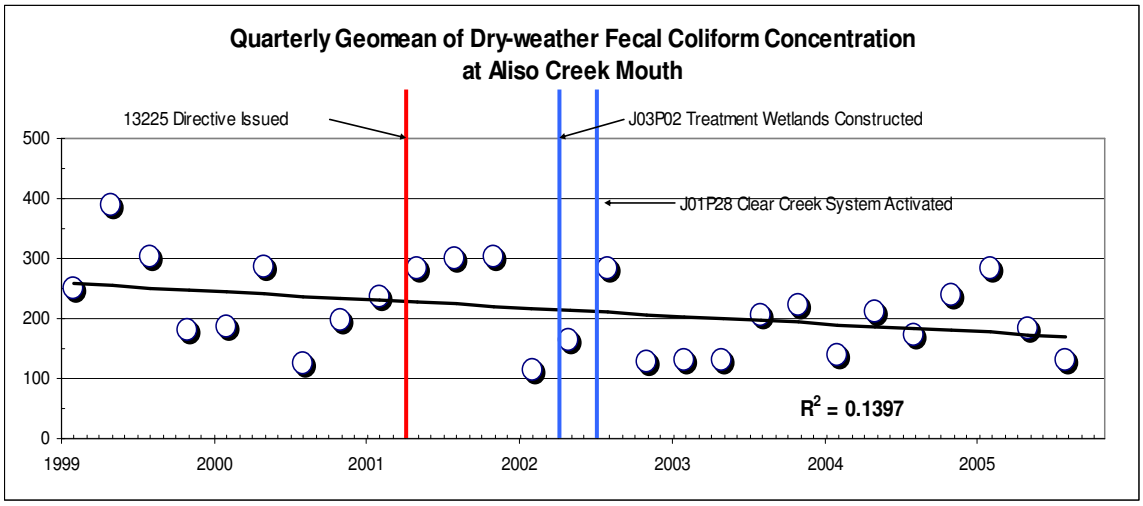

b) Over the past 7 years, the municipalities in the watershed have invested an estimated $10,075,400 in bacteria control BMPs, including $2,500,000 in coastal area diversions. Additionally, from April 2001 through October 2005, $2,858,251 has been spent on monitoring and data analysis. Despite these intensive BMPs efforts, a simple regression analysis of the data seems to indicate only a very weak downward in the data. The current TMDL implementation schedule requires a 50% reduction in bacteria

loads in 5 to 7 years depending on watershed priority. Based on our experience in Aliso Creek, this timeframe is far too short to achieve such reductions even with intensive BMP implementation.

c) In Section 1.5 Legal Authority for TMDL Implementation Plan, the following statement is made: "Much of these bacteria discharges result from controllable water quality factors which are defined as those actions, conditions or circumstances resulting from man's activities that may influence the quality of waters of the State and that may be reasonably controlled." (emphasis added) This assumption erroneously implies that all sources of bacteria discharged via the MS4 system are controllable and has lead to the supposition that 100% reduction of dry weather bacteria loading is possible. As discussed previously, the sources of bacteria are myriad and complex. Regrowth of bacteria within the MS4 system, wildlife inputs from birds, bats and mammals living within the storm drains, and bacteria from organic matter such as leaves, soil and grass clippings are just a few common sources of fecal indicator bacteria in the MS4 system which do not contribute human pathogens, and are not controllable. Additionally, experience in the Aliso Creek watershed has shown that natural sources of bacteria can eliminate the reductions achieved through BMPs. At the J01P28 Clear Creek System, clean, treated water is discharged from an ultra-violet light disinfection system into an earthen channel with no additional inputs. After traveling 30 feet in an earthen channel before discharge into the creek, bacteria levels in the treated discharge can rebound to above water quality standards.

d) Meeting the shellfish water quality objectives should not be addressed until shellfish populations in the affected areas are documented to be sufficient for recreational harvesting. Regional Board staff has stated in meetings with the SAG that the Department of Fish and Game indicate that shellfish resources in the San Diego Region have been overfished and are not currently present at harvestable levels, if at all. As such, bacterial water quality is not the limiting factor for this issue and improvement in bacteria water quality will not result in increases in shellfish populations. Compliance efforts and timeframes should be focused on meeting REC-1 standards in a realistic manner.

e) The implementation plan should be revised to focus efforts on the reduction of sources of human pathogens rather than bacteria in the following manner:

   i) Municipalities will confirm and clearly document that there are no sources of human sewage (and therefore human pathogens) discharging into the MS4 system;

   ii) Targeted monitoring programs will be developed to identify "hot spot" storm drain discharges that are having a negative impact on bacteria levels in the receiving water, and source tracking efforts will be

employed to determine whether the source is able to be identified as anthropogenic;

iii) BMPs will focus on urban-runoff reduction and public education regarding human-controlled sources of bacteria, such as pet waste and other activities.

f) Chairman Minan expressed support for an adaptive and flexible TMDL during the February 8, 2006 Board meeting:

i) Chairman Minan stated,"…I understand you are saying that it's adaptive, but when you look at the reality of the situation, I'm concerned that it may not be as adaptive as you are representing. I would be interested in your analysis." (February 8, 2006 Regional Board Meeting Transcript, 117)

ii) Chairman Minan reiterated this concern later in the hearing, "…I'm going to be very interested when the staff come back to tell us exactly how adaptive and flexible this proposal is, because I'm not convinced at the current time that it is very adaptive and flexible….I need to see the evidence to support the position with the staff on that." (February 8, 2006 Regional Board Meeting Transcript, 143)

Response (a): We disagree that load reductions and timeframes do not consider lessons learned. The compliance schedule is greater than 10 years—which is exceptionally long for TMDLs. Dischargers should focus their efforts on controllable sources of bacteria that may be associated with pathogens, as suggested in your comment e). Please see the response to comment e) below.

Response (b): We are aware of the regrowth phenomenon in conveyance pipes and hydromodified channels. This information supports the need for the natural sources exclusion approach described in the response to Comment 2, and to return hydromodified channels to more naturally functioning channels.

Response (c): Please see the response to comment e) below.

Response (d): We agree that requirements to meet the SHELL WQOs should be extended, since shellfishing is not known to occur in all areas of the region. Although it is true that shellfish populations are small in some areas, we are unsure if this is because of overfishing, poor environmental conditions, or both.

Response (e): The implementation plan will not be revised to specify that efforts to reduce bacteria should be accomplished in a certain manner, since we cannot dictate a means or methods of compliance with meeting TMDLs. The level of detail specified by the commenter is more appropriately placed in the Bacteria Load Reduction Plans, submitted by the dischargers, rather than the TMDL Implementation Plan. The implementation plan, by design, leaves dischargers with the flexibility to achieve bacteria reductions in a manner that is preferable to the discharger.

Although we cannot include the suggested language in the Technical Report, we believe the ideas specified in this comment represent a reasonable approach for achieving the

load reductions. Since bacteria from natural sources may or may not contain harmful pathogens, we believe it is reasonable to prioritize efforts first on curbing anthropogenic sources of bacteria, as the commenter suggests. This approach could also build a body of data and information with which to apply the natural sources exclusion approach to a refinement of the TMDLs. See the response to Comment 2 for a discussion of the natural sources exclusion approach.

Response (f): Please see section 4.3 of this appendix for the response to this comment.

Comment 217

The City of San Diego would like to take this opportunity to express our appreciation to the Regional Board for reviewing our compliance schedule concerns and modifying the compliance schedule. On page 72, the modified compliance schedule is for all pollutants listed in the watershed. The City of San Diego is concerned that new pollutants listed in at the end of the proposed compliance schedule will be required to achieve compliance is a condensed time schedule.

Response: We suggest the City of San Diego address all known problematic pollutants in their Pollutant Load Reduction Plans in order to avoid having to achieve compliance in a condensed time schedule. Dischargers should not wait for TMDL initiation to begin strategies for reducing pollutants.

Comment 218

Table 11-5 of the Draft Technical Report presents a 'tailored' Compliance Schedule unique to Chollas Creek that extends for 20 years, with the justification that Chollas Creek dischargers will be comprehensively addressing BMP planning and load reductions for copper, lead, zinc, diazinon and trash in addition to bacteria. Considering the many acknowledged uncertainties surrounding the correlation of bacteria and actual human health risk, and the potentially enormous cost of pursuing bacteria control programs that may ultimately be recognized as not entirely justified, comprehensive multi-parameter planning and tailored compliance schedules should be actively encouraged in the TMDL for any waterbody listed as impaired or otherwise impacted by more than one constituent of concern. We suggest that the text following Table 11-5 be amended to add the following:

> *Dischargers in other bacteria-impaired watersheds will also be addressing impairments and/or load reduction programs for other pollutant constituents (i.e. metals, pesticides, trash, nutrients, sediment etc.) concurrently with the bacteria load reduction requirements in this TMDL. In these cases, the dischargers will have the option to submit a Comprehensive Load Reduction Plan for all constituents of concern in lieu of the Bacteria Load Reduction Plan for the impaired waterbody, and to propose an appropriately tailored comprehensive compliance schedule. Comprehensive compliance schedules tailored under this provision may not extend bacteria compliance milestones beyond the interim milestones set forth in Table 11-5.*

Response: We have revised the language following Table 11-5 to incorporate the concepts discussed in this comment (some revisions were made to the suggested wording; please see Technical Report for new text). One important advantage of addressing multiple pollutants concurrently, instead of consecutively, is that fewer structural BMPs will be needed. This is considered environmentally superior because we anticipate that possible adverse environmental impacts would most likely be associated with the construction and installation of structural BMPs.

Extension of the compliance schedule described in Table 11-4 is not automatic upon completion of a Comprehensive Pollutant Load Reduction Plan. Consideration for schedule extensions will take place on a case-by-case basis.

Comment 219

The overall Compliance Schedule [Table 11-4 in the current draft] should not set a 50% compliance date sooner than the recommended 5-year re-evaluation provision. *The second and third recommendation, regarding Site-Specific Compliance schedules, was addressed in my April 12, 2007 letter urging that tailored Comprehensive Load Reduction Plans and Comprehensive Compliance Schedules be available as an option for other watersheds instead of just for Chollas Creek.*

Response: Please see the responses to Comments 23 and 218.

Comment 220

In addition, several dischargers in bacteria-impaired watersheds will also be addressing impairments and/or load reduction programs for other pollutant constituents (i.e. metals, pesticides, trash, nutrients, sediment etc.) concurrently with the bacteria load reduction requirements in the bacteria TMDL. In these cases, the dischargers should have the option to submit a Comprehensive Load Reduction Plan for all constituents of concern in lieu of the Bacteria Load Reduction Plan for the impaired waterbody, and to propose an appropriately tailored comprehensive compliance schedule similar to that provided for Chollas Creek in the current version of the Project I Bacteria TMDL.

Response: Please see the response to Comment 218.

Comment 221

Compliance Schedule Is More Than Adequate To Address Bacteria Reductions

Coastkeeper supports the five to seven year schedule to meet 50% of interim reductions and the 10 year compliance schedule to meet 100% of interim targets. While we would like to see more immediate reductions, we appreciate the priority criteria outlined in the TMDL. We will work with the municipalities and EPA representatives to ensure that adequate progress is made to reach the TMDL milestones.

We do note that the Santa Monica Bay TMDL for fecal bacteria included a three year compliance schedule. That more aggressive timeline applied only to dry weather flows,

and has proved very effective in reducing beach closures related to bacteria exceedances. The San Diego approach does not separate out dry and wet weather compliance schedules. However, the San Diego schedule has 50% reductions in the first 5-7 years depending on waterbody priority. As dry weather exceedances are less difficult to address than wet weather, we anticipate that municipalities will attempt to address these first. Given the success of the Santa Monica TMDL in an even shorter initial timeframe, we feel the five year milestone and ten year 100% interim reductions are certainly reasonable.

We understand the distinction made for Chollas Creek, which will be operating under a TMDL for dissolved metals as well as for bacteria. If the need for additional time is demonstrable in this instance, where best management practices will address multiple pollutants, staff should include such demonstrations in their findings. The Regional Board should not assume that waterbodies impaired by more than one pollutant will require additional time.

We cannot support the approach suggested by Laguna Niguel, that dischargers propose a compliance schedule specific to their waters after the adoption of the TMDL. This approach would undermine the certainty and transparency of the public TMDL process. Discharger plans would not be publicly noticed, and changes could be accepted by staff without the knowledge of the Board. We also note that the author's suggested language limits proposed schedules to the interim milestones (100% of reductions within 10 years). While we appreciate that compliance schedules would not be extended, as a practical matter, this would only give dischargers less time to clean up waterbodies impaired by multiple pollutants.

Response: Although we think it is preferable to address multiple pollutants, extension of the compliance schedule is not automatic. Extension of the compliance schedule will take place on a case-by-case basis. Stakeholders will have opportunity to review and comment on proposed changes to compliance schedules upon reissuance of the NPDES requirements that will be used to implement the TMDLs.

Comment 222

Compliance schedules should be separated based on the time of year (wet-weather vs. dry-weather) and type of receiving water (freshwater, saltwater, and estuarine).
In the Santa Monica Bay Beaches Bacteria TMDLs, compliance schedules vary based on the time of year. For instance:

- Targets were set for the AB 411 time period (3 years to comply), winter dry weather (November through March)(six years to comply), and wet weather (defined as a 0.1 inch storm plus 72 hours after the storm)(10 years to comply).
- The AB 411 targets was zero exceedance days, the winter dry weather target was 3 days, and the wet weather target was based on the 90th percentile storm year at a beach at the terminus of a reference watershed (approximately 22% exceedances which equals 17 days).

The system is appropriate for the San Diego Draft TMDL as well because dry-weather compliance should take less time, and this timeframe poses the greatest risk to human health.

Response: We agree that compliance with dry weather TMDLs will take less time and that this timeframe poses the greatest risk to public health. The compliance schedule does not preclude dischargers from taking this approach. In many cases, dischargers named in this project have succeeded in attaining dry weather TMDLs, as several beach locations have been de-listed since this project began.

5.7 Environmental Analysis

Comment 223

It is not at all clear that "reasonably foreseeable methods of compliance" exist for the capture and treatment of all storm flows on existing developments, that are not cost-prohibitive, may be ineffective in terms of remedying actual risk to public health, and/or are not contradictory to other environmental policy goals, such as conserving energy or avoiding wide-spread eminent domain actions to secure land for the treatment. As such, a design storm criterion should be designated to limit the maximum potential flow- or volume-based treatment obligation of permittees. This limit should be clearly identified as a ceiling rather than a floor, to allow permittees flexibility in pursuing preventative rather than treatment-based solutions.

Response: Designating design storm criteria is consistent with technology based effluent limitations in NPDES requirements. For example, NPDES requirements for concentrated animal feeding operations (CAFOs) designate that waste lagoons capture a 25-year, 24-hour storm. The industrial and municipal discharger NPDES requirements also contain "design storm" criteria. Designating design storm criteria for structural BMPs in the NPDES requirements to implement these TMDLs is reasonable. However, a design storm need not be designated as part of our environmental review of reasonably foreseeable method of compliance and economic considerations. The design storm for BMP sizing should be proposed by the dischargers based on site specific hydrology, water quality, and other characteristics that affect BMP construction at the project level phase of TMDL implementation. Section 12.4 of the Technical Report describes reasonably foreseeable methods of compliance for wet and dry weather loads, and these methods are divided into non-structural controls and structural controls. The examples described in this chapter are meant to be illustrative, not prescriptive.

Comment 224

The text should indicate the design storm size criteria for wet weather BMP development. It will be physically impossible to design and implement a BMP to capture and treat all storm flows. As such a design storm criterion, such as the 85th percentile storm for example, should be designated.

Response: Although a design storm is important for sizing structural BMPs, this level of detail is beyond the scope of the requirements that we must meet in order to comply with CEQA. Under CEQA, we must identify potential impacts from reasonably foreseeable methods of compliance—such as the implementation of BMPs. Calculating design storm size criteria is a site-specific consideration, and is more appropriately addressed by the project level CEQA analysis, not the planning level CEQA analysis (the Technical Report).

Comment 225

The Regional Board should notify all potential dischargers if the "Tributary Rule" is going to be applied to the installation of structural BMPs because additional land acquisition costs will need to be included in the economic analysis.

Response: The City of San Diego concluded that the construction of extensive detention and diversion/infiltration facilities, requiring the acquisition and demolition of hundreds of acres of developed land uses, would be an inevitable consequence of the TMDLs based in part on a belief that we would strictly interpret and apply the "tributary rule"[21] to prohibit the construction of BMPs within urban creeks. While all waters tributary to urban creeks should be of a quality consistent with the attainment in the creeks of the WQOs necessary to support the beneficial uses designated for the creeks, this policy does not, necessarily, preclude the installation of pollutant reduction BMPs in urban creeks or their tributaries. Source control is the preferred means of compliance with the TMDLS. However, in-stream structural BMPs may be reasonable, depending on the location and type of BMP, provided that they are consistent with the beneficial uses of the creek, and the natural aquatic ecosystem characteristics of the creek. This level of detail should be evaluated by municipal dischargers in coordination with the San Diego Water Board when the dischargers propose specific projects for structural BMPs to achieve the load reductions allocated to them for the implementation of the TMDLs. Please also see the response to Comment 233.

Comment 226

The City notes that the relationship between the State Board and the Regional Board with respect to the finality of environmental determinations is not well-defined. Water Code section 13245 states that Basin Plan amendments (such as TMDLs) do not have the force and effect of law until the State Board approves the amendment. Under CEQA and the State Board/Regional Board's CEQA regulations, a notice of decision regarding the environmental determination is to be filed with the Secretary of Resources. CEQA Guidelines § 15252(b); 23 CCR § 3720. At what point is such a document to be filed with the Secretary of Resources regarding the Bacteria TMDL?

Response: We will file the Notice of Decision within 30 days of USEPA approval of the Basin Plan amendment.

Comment 227

An Inadequate Project Description and Examination of Compliance Alternatives Set the Stage For Failure.

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[21] The "tributary rule" reflects early interpretations of the scope and extent of "navigable water" subject to federal jurisdiction under the Clean Water Act. [*United States v. Ashland Oil and Transp. Co.,* 504 F.2d 1317, 1329 (6th Cir.1974); *Headwaters, Inc. v. Talent Irrigation Dist.,* 243 F.3d 526, 533-34, (9th Cir.2001),] Accordingly, water quality in tributaries must be consistent with the water quality objectives needed to support designated beneficial uses in downstream navigable waters. However, the City interprets the "tributary rule" to require strict attainment of the most stringent downstream water quality objectives throughout Chollas Creek and its tributaries.

A critical component of an EIR is the environmental setting. In San Diego County watersheds, many of the tributaries: (1) are surrounded by developed areas within which storm water is conveyed by storm drains to outfalls at canyon rims; (2) lie within canyons and contain "waters" which originate at the end of the storm drains; and (3) are ephemeral and dominated by urban runoff during all but infrequent precipitation. However, the Initial Study (page R-1 of the draft Technical Report) describes the environmental setting of much of the affected areas in one paragraph and is incorrect by characterizing the Miramar, Scripps, and Chollas Creek watersheds as having "inland areas [that] primarily consist of open space with some agricultural/livestock uses".

Response: Regarding the comment on land uses within the Miramar, Scripps, and Chollas Creek watersheds, Appendix R was revised to remove the reference to agricultural/livestock uses.

Comment 228

"CEQA Alternatives": Given that the above-noted significant effects appear to be unmitigable, CEQA requires the evaluation of alternatives that would lessen the impacts. One such alternative should be provided to set the TMDL to a higher level. Such an alternative may still result in Basin Plan compliance; however, the reduced need for BMP acreage would preserve more existing land uses, effectively mitigating (partially) the significant impacts to existing land uses. Alternatively, the environmental analysis should describe why such an alternative will not achieve the basic purposes of the project.

Response: We disagree that the potentially significant impacts of the reasonably foreseeable methods of compliance appear to be unmitigable. Nonetheless, an alternative that sets the TMDLs to a higher level may fail to meet applicable WQOs that support beneficial uses. Such an alternative could not be considered because it would not attain the basic objective of the proposed activity (the TMDLs).

Comment 229

The determination that works are prohibited in "receiving waters" may also have one other consequence. Representatives of the environmental community in San Diego are concerned that the outfalls of existing storm drains at the top of canyon walls has led to erosion on canyon walls and at the base of the canyon walls. To address these concerns, in some situations the City may wish, in conjunction with constructing storm drain improvements including detention basins, to extend the storm drains to the canyon floors in order to minimize this erosion. While it could be expected that, in general, erosion on these canyon walls would decrease because of to-be-constructed upstream detention works, a prohibition on works in waters of the US/State would preclude the City from addressing this community concern.

Response: The San Diego County stormwater NPDES requirements do not preclude dischargers from moving outfalls in Chollas Creek to address erosion problems.

Comment 230

Given the fact that this TMDL requires 100% compliance in all wet weather flows, we do not believe that this analysis evaluated all reasonably foreseeable methods. To achieve 100% compliance in wet weather flows, wet weather diversion or advanced treatment methods, beyond that of the Point Loma POTW, will be necessary to achieve storm flows that have NO bacteria. Treatment will be required to maintain existing creek hydrology at approximately 2/3 of the existing storm drain outfalls which currently flow in dry weather. Because of the Regional Board's interpretation of the tributary rule (page 13 of the Technical Report), and because bacteria are known to grow in storm drains, the Regional Board must consider the impacts of building advanced treatment works immediately upstream of the approximately 3,100 of the 4,660 outfalls which currently contribute to creek hydrology.

Response: We anticipate revised TMDLs to go into effect well before the final WLAs need to be met. In fact, we will recalculate TMDLs immediately after adoption of the reference system approach/natural sources exclusion Basin Plan amendment, as discussed in the response to Comment 2.

Comment 231

CEQA Compliance - The Analysis Impermissibly Applies Inconsistent Standards

The environmental analysis begins with a discussion of the standards that apply to the Basin Plan amendment. The document states that the Regional Board has specific obligations under the Public Resources Code because the TMDL establishes performance standards or treatment requirements, and sets out an abbreviated list of those specific requirements. *See* Basin Plan Amendment at 158 – 159. The document goes on, however, to state that the Regional Board "method of analysis" is similar to "tiering" and "limited its analysis in this document to the broad environmental issues at the Basin Plan amendment "performance standard" adoption stage." The documents then goes on to opine that "the Regional Board is not required, at the Basin Plan amendment adoption stage, to evaluate environmental issues associated with specific projects to be undertaken later to comply with the performance standards." *Id*. at 159. The document contains no citation to legal authority for these propositions. This is because these contentions are incorrect statements of the law.

Response: Appendix R, as revised in the March 9, 2007 version, does not equate the substitute environmental documents with a Tier I EIR. The appendix states that the San Diego Water Board has considered the pertinent requirements of state law,[22] and intends the analysis to serve as a tier 1 environmental review. The substitute environmental documents are not intended for others to tier off of, however, municipal entities can utilize all information included in the substitute environmental document when developing their own environmental documents.

[22] Public Resources Code section 21159 and 14 CCR section 15187

Comment 232

a. The Regional Board Does Not Fully Comply With Public Resources Code Section 21159

Here, the Regional Board concedes that the provisions of Public Resources Code section 21159 apply. Having made that concession, the Regional Board does not have the option to ignore the other specific requirements of that section. Nevertheless, the Basin Plan Amendment, completely ignores the requirements of subdivision (c) of section 21159, which states:

> The environmental analysis ***shall*** take into account a reasonable range of environmental, economic, and technical factors, population and geographic areas, and ***specific sites***.

PUBLIC RESOURCES CODE § 21159(c)(emphasis added)

Looking at each category of analysis specified in Public Resources Code section 21159, subdivision (c), the Regional Board's analysis is deficient because the TMDL applies to various watersheds, including the Scripps, Chollas Creek, San Dieguito and San Diego River watersheds. Both the entirety of the Scripps and Chollas Creek watersheds are heavily urbanized, while the upper portions of the San Dieguito and San Diego watersheds are substantially open space. Thus:

- There will be distinctly different technical challenges to implementing even the most basic structural controls in Scripps and Chollas Creek watersheds compared to the upper portions of the San Diego River and San Dieguito River watersheds because most infrastructure installed in Scripps and Chollas will disturb existing structures, while there is open space available in the upper San Diego River and San Dieguito River watersheds;
- There will be distinctly different environmental challenges for these same reasons; particularly the potential for infrastructure within the upper watersheds to disturb sensitive habitat.
- If it is necessary for the City to acquire land to implement any structural controls, the economics of implementing these measures will be different in developed watersheds when compared to undeveloped watersheds because of the relative land values;
- Not one specific site is examined despite the unambiguous statutory requirement to do so.

Thus, the record clearly reflects that the analysis does not satisfy all of the statutory requirements of an environmental analysis under Public Resources Code section 21159.

Response: We expanded our discussion of specific sites in the March 9, 2007 revisions to Appendix R. This discussion looks at existing structural and nonstructural BMPs in all major land use categories in the watersheds of this TMDL project.

Comment 233

The Regional Board has made two different contentions regarding the adequacy of the environmental analysis: (1) that treatment controls are not a reasonably foreseeable method of compliance; and (2) that the Regional Board is not required to do a site specific analysis. The first contention is not factually supported; the second is legally incorrect.

As respects treatment controls, the Regional Board ignores three critical facts in that regard:

- There is no evidence that compliance in all watersheds can be achieved in practice during both wet weather and dry weather conditions by using only non-structural controls.
- Public entities subject to this TMDL have already deployed treatment systems to combat this problem;
- At least one lead agency – the City of San Diego – has stated that it intends to implement treatment controls because it perceives treatment controls as the only means of attaining the treatment standard.

Thus, the only facts that are available undercuts the Regional Board's contention that treatment controls are a reasonably foreseeable method of compliance, which under Public Resources Code section 21159(a), must have its impacts analyzed.

As respects site specific analyses, Public Resources Code section 21159(c) unambiguously states that an analysis shall take into account a reasonable range of specific sites. A contention to the contrary is simply an incorrect statement of the law.

Even if the Regional Board does not believe that it has the responsibility to implement PRC Section 21159(c) as interpreted above, the City believes that the Regional Board has defined the TMDL with enough specificity, particularly with respect to required load reductions (which dictate the types of BMPs required), the tributary rule, and prohibitions on in-stream diversions (which dictate the possible locations of the BMPs), and failure to develop a design storm (which leaves open the acreage requirements of the BMPs), to conduct a "programmatic" level of analysis of the reasonably foreseeable means of compliance. In accordance with Section 15187of the State CEQA Guidelines this analysis could utilize numeric ranges and averages when specific data is not available. Section 15146 of the CEQ Guidelines addresses the level of specificity that is required for projects such as the TMDL. For CEQA purposes, adoption of the TMDLs by the Regional Board is comparable to adoption of a General Plan or Community Plan by a jurisdiction's legislative body with land use powers. What is required is the production of information sufficient to understand the environmental impacts of the proposed project. The current analysis does not fulfill this requirement.

Response: We disagree that the level of specificity in the substitute environmental documents is not adequate. Appendix R contains adequate information and analysis for the public to understand the potential adverse environmental impacts of the project. In response to repeated comments pertaining to inclusion of discussions of treatment

systems and specific sites, we have modified Appendix R appropriately. Please see responses below for discussions pertaining to the tributary rule and where the BMPs can be located, and the design storm issue.

Design Storm - The CEQA provisions allow the San Diego Water Board to limit analysis in these substitute environmental documents to broad environmental issues which are ripe for decision at the TMDL adoption stage. At this stage, the San Diego Water Board is not required to evaluate environmental issues associated with specific projects undertaken to comply with the TMDLs. CEQA provisions allow for project level environmental considerations to be deferred so that more detailed examination of the effects of these projects in subsequent CEQA environmental documents can be made by the appropriate lead agency.

The San Diego Water Board does not need to designate the storm size for the design and construction of the BMPs to meet CEQA requirements for the TMDLs. The CEQA requires that the San Diego Water Board provide substitute environmental documents that contain sufficient information and analysis for the public to understand the potential adverse environmental impacts of the project, and to provide the San Diego Water Board with meaningful discussion and comment on these impacts. Our substitute environmental documents do that by describing a range of potential structural and non-structural controls the dischargers could construct or implement to meet the wasteload allocations (WLAs). The documents also discuss the potential adverse environmental impacts associated with those controls. Because the CEQA does not require the San Diego Water Board to speculate on the location or size of specific structural controls that the dischargers might choose to implement, we did not specify any sizing criteria such as a design storm.

The San Diego Water Board appreciates the City's efforts in moving forward with BMP planning, and is willing to discuss potential BMP siting and design issues, and different compliance monitoring approaches that could be used. However, we do not have the authority to delegate which methods or BMPs must be used to comply with the bacteria TMDLs. Additionally, it is not the purpose of the TMDLs to provide complete guidance for compliance. The San Diego Water Board has flexibility in making waste discharge requirements consistent with WLAs and establishing monitoring programs to gage compliance.

Tributary Rule - TMDLs allocate wasteloads to MS4 discharges, as opposed to receiving waters. For this reason, discharges from MS4s are required to meet WLAs. The WLAs are designed to restore water quality in receiving waters as defined by applicable WQOs. Since the San Diego County and Orange County municipal storm water requirements (Order No. R9-2007-0001 and Tentative Order No. R9-2007-0002, or their successors) will be used to implement the TMDLs at issue, the term "receiving waters" in this case refers to waters of the United States.

The conditions under which MS4s discharge to receiving waters are exceptionally diverse. This makes it difficult to define a precise "bright line" of demarcation for determining when MS4s end and receiving waters begin that will be applicable in every case. In fact, such determinations are often made on a case-by-case basis (such as with

the 401 Water Quality Certification Program). While case-by-case determinations will continue to be necessary in many instances, generally speaking, where an outfall exists, receiving waters extend upstream to the outfall location.

The issues of where WLAs must be met and where receiving waters begin are important for determining where to locate BMPs. The San Diego Water Board's typical practice has been to discourage implementation of BMPs in receiving waters. For example, Order No. R9-2007-0001 states that "urban runoff treatment and/or mitigation must occur prior to the discharge of urban runoff into a receiving water" (Finding D.10). However, the issue of BMP location ultimately depends upon site specific circumstances and how compliance with WLAs is to be assessed.

There are many different monitoring approaches that the San Diego Water Board can use to determine compliance with WLAs. For example, the Chollas Creek diazinon TMDL, Order No. R9-2004-0227 requires monitoring two stations in Chollas Creek for compliance with the diazinon WLA. This relatively simple compliance monitoring was justified because the principal control, namely banning the pesticide, had been accomplished, and water quality in Chollas Creek was meeting the interim TMDL milestone at the time the new MS4 requirements were adopted. In the extreme, the San Diego Water Board could require monitoring at every storm drain outfall, and at numerous locations in Chollas Creek and its tributaries. The compliance monitoring the San Diego Water Board likely will require will be something between these two approaches, and may depend on the level of dischargers' efforts to reduce pollutant sources and loading before the San Diego Water Board issues implementing orders.

Another compliance assessment issue to be considered is how monitoring data are analyzed. Again, a wide range of approaches are available to the San Diego Water Board to determine compliance. For example, a regression approach to analysis of monitoring data can be used, where the monitoring data must exhibit a certain regression slope over time to show compliance with WLA. Other approaches, such as averaging of data, can also be used if appropriate. For example, in making water quality assessments for listing and delisting purposes, the *Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List* states that "samples collected within 200 meters of each other should be considered samples from the same location."

These different monitoring and compliance assessment methods may provide MS4 dischargers with the opportunity to implement a wide range of strategies for complying with TMDL requirements, including strategies that rely on restoration of receiving waters. The methods to be used to determine compliance will be developed following adoption of TMDLs, as municipalities develop urban runoff management plans that will implement MS4 requirements and TMDLs.

Finally, we assumed that structural BMPs could be built anywhere in the watershed, and did not exclude any land type from our analysis of potential impacts.

Comment 234

The TMDL and Environmental Analysis Do Not Satisfy the Criteria For Tiering

When applying statutes, specific statutes control over general. *See Cavalier Acres, Inc. v. San Simeon Acres Community Services District*, 151 Cal. App. 3d 798 (1984) (Where there is a specific provision requiring community services district to increase rates via ordinance, that specific statute controls over general provision allowing public entities to increase rates via resolution).

Here, the general provisions relate to tiered CEQA documents. *See* PUBLIC RESOURCES CODE § 21093 and 21094. The environmental analysis attempts to justify giving short-shrift to the topics required by Public Resources Code section 21159(c) under the guise of tiering; this violates the rule that specific provisions control over the general. Moreover, there are other problems with the Regional Board's reliance on the tiering provisions.

First, both Public Resources Code section 21093 and 21094 refer to the preparation of an environmental impact report as the first tier document. As the Regional Board readily notes, the environmental analysis for the basin plan amendment is **not** an EIR. *See* Remy, et al, *Guide to the California Environmental Quality Act*, 10th ed., at 495 (The definition of tiering "suggests that tiering must commence with the preparation of an EIR.") Thus, there is no authority for the proposition that the Regional Board may use a substitute document as a first tier CEQA document.

Further complicating this aspect of the Regional Board's environmental analysis are the specific provisions of CEQA Guidelines section 15253, which governs the use of an EIR substitute by a responsible agency. Specifically, subdivision (a) states a substitute document shall be used by another agency "granting an approval ***for the same project*** where the conditions in subdivision (b) have been met." Subdivision (c) of that same Guidelines section amplifies this limitation, stating:

> Where a certified agency does not meet the criteria in subdivision (b), any other agencies granting approvals for the project shall comply with CEQA in the normal manner.

Hence, the CEQA Guidelines make clear that the only permissible uses of a substitute document are with respect to that project, and not with subsequent related projects. Accordingly, it is inappropriate to treat the Basin Plan Amendment environmental analysis as a "first tier" document because no second tier document can legally flow from a "first tier substitute document."

It is also important to note that under CEQA Guidelines section 15253 subdivision (b), it is a responsible agency that may use the substitute document for subsequent approval of the project. Responsible agencies are "public agencies other than the lead agency which have discretionary approval power over the project." CEQA Guidelines section 15381. The only other California agency that has discretionary approval power over the Basin Plan amendment is the State Water Resources Control Board. Neither the Regional Board nor the State Board will issue subsequent approvals related to this project that will require CEQA compliance. Hence, the authorization in CEQA Guidelines section15253 does not apply to any subsequent activity that will involve site-specific impacts or any of the other analyses the Regional Board contends may be deferred until the second tier projects are implemented. Accordingly, the notion that the TMDL environmental analysis will serve as a first-tier analysis is inappropriate.

Second, Public Resources Code § 21093 states that the purpose of tiering is to expedite the construction of housing and other development projects by eliminating repetitive environmental review. Here, the project is not a development project; it is the imposition of performance or treatment standards. Thus, this activity does not fall within the type of projects the Legislature sought to expedite through tiering, and accordingly, there is no legal basis for the Regional Board to rely upon these principles in analyzing the impacts of the TMDL.

Response: Please see the response to Comment 231.

Comment 235

The project description is also a critical component of an adequate environmental document. *See Santiago County Water District v. County of Orange*, 118 Cal.App.3d 818 (1981) (EIR inadequate because of failure to discuss construction of water delivery facilities in project description). The project description in this case is influenced by Public Resources Code section 21159, which provides the ***minimum*** requirements for an environmental analysis of a rule or regulation that requires the installation of pollution controls.[23] That statute requires certain state agencies to analyze the following:

> (1) An analysis of the reasonably foreseeable environmental impacts of the methods of compliance.
>
> (2) An analysis of reasonably foreseeable feasible mitigation measures.
>
> (3) An analysis of reasonably foreseeable alternative means of compliance with the rule or regulation.

PUBLIC RESOURCES CODE § 21159(a)

Response: Appendix R was reorganized to make clear where the items mentioned in this comment are located.

Comment 236

Thus, the methods of compliance are part of the project description because the impacts, mitigation measures, and alternatives to the methods of compliance must be analyzed.

With that in mind, it is easy to see that the project description in this case contained only a cursory discussion of the methods of compliance. The Technical Report for the TMDL states that the required reduction in pollutants may be achieved by education, street sweeping, storm drain cleaning, BMP inspection and maintenance, manure fertilizer management plans, buffer strips and vegetated swales, bioretention, infiltration trenches, sand filters, diversion systems, animal exclusion, and waste treatment lagoons (for manure storage). The TMDL document is devoid of evidence that suggests that the pollutant reductions required to achieve full compliance with the TMDL can be achieved

[23] The statute clearly states that these topics are the minimum requirements for an adequate environmental analysis; other impacts must be identified if the impacts are a direct result or a reasonably foreseeable indirect result of the project.

by anything other than: (1) diversion or (2) treatment. Treatment is required in hundreds of locations to maintain dry flows in order to maintain creek hydrology. Again, MS4 operators the City of Laguna Niguel and Orange County installed a treatment system in Aliso Creek that reduced bacteria levels by 99%. The Caltrans Retrofit Pilot Study (2004) found removal efficiencies of no greater than 79% when the influent contained moderate levels of fecal coliform (Attachment 3) Thus, it is reasonably foreseeable that operators will install treatment controls (UV, chlorine/dechlorination or ozone), necessitating an analysis of the environmental impacts. In accordance with the Regional Board's interpretation of the tributary rule, these treatment controls would need to be installed upstream of the storm drain outfalls. Because bacteria re-grows in storm drains, the controls would need to be located as close to the outfall as possible.

Response: We revised Appendix R to include analysis of environmental impacts from UV and ozone technologies. We did not discuss chlorination/de-chlorination because this process is primarily used for drinking water treatment. We do not think that this process would be used to treat urban and stormwater runoff because of difficulties associated with chlorine transport, storage, and corrosiveness.

The CEQA does not require the level of detail requested in the comment for a planning level analysis. The dischargers are responsible for determining the specific BMPs that will be implemented at specific locations, and for evaluating the potential site specific environmental impacts of those BMPs. Dischargers should consult available literature for determining BMP efficiencies.

Comment 237

Having identified the types of facilities that could be constructed to achieve compliance (diversion and detention/infiltration), Public Resources Code section 21159, subdivision (c) kicks in to specify the details of the analysis that is required in terms of environmental, technical, and specific sites. Thus, issues that must be included to properly address these considerations in the scope of this TMDL include:

a. The "tributary rule," which subjects all receiving waters within the affected watersheds to the TMDL. The application of this rule in complying with this TMDL creates an interesting overlay in that the TMDL does not define "receiving waters, yet the San Diego County Municipal Storm Water NPDES permit states that in some instances receiving waters and the MS4 are the same;

b. Topography, which prevents BMP works from being built on canyon walls below storm drain outfalls but above receiving waters that are subject to the WQO in the TMDL;

c. The structural BMPs need to capture and treat a very high percentage of storm water due to the large level of loading reduction required by the TMDL; i.e., it is not reasonable to expect that works located far from the storm drain outfalls would, by themselves, meet the TMDL because significant amounts of storm water run into the conveyance system immediately above the outfalls.

d. Locating works some distance from the receiving waters would be infeasible because it would be necessary to construct a new, separate conveyance system to prevent the treated water from mixing with untreated water.

e. The number of control devices that may be required to achieve compliance is a technical consideration in complying with the TMDL. Because the TMDL defines the maximum loads of bacteria that may flow into receiving waters without regard to the size of a rain event, loading must be controlled in all storm events. Accordingly, certain assumptions must be made with respect to the size of the storm in order to design structural BMPs that will provide adequate contaminant reduction. Lacking a "design storm," or information on soil infiltration rates, the Regional Board's CEQA analysis must include assumptions regarding a design storm size and the acreage of detention/infiltration facilities that would be needed (including any manufactured slopes). Information is available from the City of San Diego, the California Department of Conservation, and the United States Soil Conservation Service on soil infiltration rates that would be necessary in this analysis. For purposes of revising the CEQA analysis, the Regional Board could use the following estimates of the number of storm drain outfalls within the areas affected by the TMDL:

- the Chollas Creek watershed has approximately 816 storm drain outfalls within the City of San Diego,
- there are approximately 1,315 outfalls within the City of San Diego within the San Diego River watershed, and
- there are approximately 61 outfalls within 300 feet of the beaches identified in the TMDL.

The project description in the CEQA analysis is devoid of any discussion or analysis of these issues, and thus is inadequate because the failure to include this information prevented a meaningful analysis of the impacts of compliance.

As indicated in our letter on the Chollas Creek Metals TMDL, it is reasonably foreseeable that the TMDL implementation could require the City to build a large number of relatively smaller sized works in areas immediately behind a geologically-safe setback above all existing storm drain outfalls which have receiving waters immediately below them. In the Chollas Creek watershed, these works could occupy 1,387 acres – almost 10 percent of the 16,273 total acres in the watershed.

Response: The CEQA does not require the San Diego Water Board to designate a design storm or speculate on the number of control devices that the dischargers might construct. The CEQA does not require the San Diego Water Board to speculate on the specific locations where the dischargers might construct BMPs. Where BMPs can be constructed with regard to receiving waters, and the design storm issue, is discussed in the response to Comment 233.

Comment 238

CEQA Compliance – The Environmental Analysis Does Not Analyze the All Impacts Associated With Construction of Structural BMPs

Only when a meaningful discussion of the environmental setting is set forth and a thorough project description has been prepared can an adequate analysis of impacts and mitigation measures be prepared. *County of Inyo v. City of Los Angeles*, 71 Cal.App.3d 185 (1977). Here, the Regional Board has put itself in an "Catch-22." While the Regional Board contends that it is not reasonably foreseeable that treatment controls will be used as a compliance method, it nevertheless analyzed the impacts – albeit poorly – of diversion structures. Having analyzed some of the impacts to diversion structures, the Regional Board must ensure that the analysis is complete, and supported by substantial evidence. CEQA determinations related to quasi-legislative decisions must be supported by substantial evidence. *See* PUBLIC RESOURCES CODE § 21167.5; *Western States Petroleum Association v. Air Resources Board*, 9 Cal.4th 559 (1995).

Substantial evidence is defined in CEQA as:

> For the purposes of this section and this division, substantial evidence includes fact, a reasonable assumption predicated upon fact, or expert opinion supported by fact.
>
> Substantial evidence is not argument, speculation, unsubstantiated opinion or narrative, evidence that is clearly inaccurate or erroneous, or evidence of social or economic impacts that do not contribute to, or are not caused by, physical impacts on the environment.

PUBLIC RESOURCES CODE § 21080(e)

Response: New analysis, including mitigation of the construction of treatment controls, was added to the March 9, 2007 version of Appendix R. The expanded analysis addressed the concerns raised in the comment.

Comment 239

The following analyses in Chapter 12 and Appendix R are deficient because the conclusions are not supported by substantial evidence:

a. Aesthetics –

Appendix R states that the creation of structural BMPs can create adverse aesthetic impacts. The Regional Board's analysis of this impact states:

> Depending on the controls chosen, the project may result in the installation of urban runoff storage, diversion, or treatment facilities and other structural controls that could be aesthetically offensive if not properly designed, sited, and maintained. Many structural controls can be designed to provide habitat, recreational areas, and green spaces in addition to improving urban runoff water quality. In-creek diversions should not be used as controls, therefore, there should be no adverse impacts on aesthetics resulting from construction of concrete-lined basins or treatment facilities within creeks.

This analysis is legally inadequate because it does not state what constitutes a significant aesthetic impact and how designing the treatment works to serve as habitat, recreational

areas, or green spaces mitigates any adverse aesthetic impact, much less mitigating any significant, adverse impact below the level of significance. It addition, the analysis ignores the reasonably foreseeable size and location of the BMPs described above, the works would be too small and subject to too many edge effects to create sustainable habitat. Moreover, regular maintenance would require periodic removal of plant growth and sediments. Topographically, it is reasonable to assume that basins associated with the works will need to be excavated and that significant portions of the basins would consist of manufactured slopes, limiting recreational opportunities. Deeper infiltration basins could be built to reduce acreage requirements; however, maintenance needs would preclude the construction or re-construction above these vaults and pumps would be needed in areas of impermeable soil to convey overflows to treatment controls. Moreover, deeper equalization basins would not be able to take advantage of evaporation or evapotranspiration. Thus, the "analysis" is merely "speculation, unsubstantiated opinion or narrative" that does not support the conclusion that the listed impact will be reduced below the level of significance, and is not, therefore, supported by substantial evidence, as required by law.

Response: The levels of significance for aesthetic impacts were set at no long term impacts including among other considerations, no long term obstruction of any scenic vistas. New analysis of aesthetics was added to the March 9, 2007 version of Appendix R that expanded the previous discussion and addressed the City of San Diego's concern.

Comment 240

b. Air Quality –

Appendix R makes the following statement regarding Air Quality:

> The construction of structural controls might adversely affect air quality because construction might require the use of diesel fuel engines to operate equipment. Potential impacts are likely to be limited and mostly short-term in nature. Impacts may be mitigated through measures such as limiting hours and amount of construction, eliminating excessive idling when vehicles are not in use, limiting construction during periods of poor air quality, and/or using alternative fuel vehicles rather than diesel fuel vehicles. Any impacts to air quality, both short-term and long-term, would be subject regulation by the appropriate air pollution control agencies under a separate process.

This analysis is deficient because the analysis does not state what the threshold of significance for impacts to air quality from toxic air pollutants, nor does it have any basis for concluding that the programs implemented by air pollution control agencies will, in fact, reduce any impacts below the unstated threshold of significance. Thus, the "analysis" is merely "speculation, unsubstantiated opinion or narrative" that does not support the conclusion that the listed impact will be reduced below the level of significance, and is not, therefore, supported by substantial evidence, as required by law.

Response: The levels of significance for air quality impacts were set at no long term impacts including, among other considerations, no long term degradation of ambient air

quality or long term ongoing problems with odor which can not be remedied. New analysis was added to the March 9, 2007 version of Appendix R that expanded the previous discussion and addressed the City of San Diego's concern. Additionally, an analysis which includes the air quality impacts of street sweepers was added to the Checklist where the impact was determined to be less than significant with mitigation.

Comment 241

c. Biological Resources –

Appendix R states that there are potential impacts to riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or US Fish and Wildlife Service, but that those impacts would be reduced below the level of significance through mitigation.

The analysis does not state what sensitive species are located within the project area. It does not mention the San Diego County Multiple Species Conservation Plan – a regional plan that addresses impacts to sensitive species. The analysis that is done seems to assume that the only manner in which habitat or species can be impacted is through urban runoff flow diversion; even though the construction of treatment works could displace non-riparian species. Given the experience in Aliso Creek noted above, it is reasonable to assume that upland impacts may occur as a result of the need to intercept sheet flow runoff from canyon walls (immediately below developed areas) for treatment before these flows enter receiving waters. These interceptors would logically be located near and above the receiving waters - in areas where many canyons support native, upland vegetation and sensitive species. Impacts would result not only from construction of the diversions, but also from construction of treatment works and the associated pumps that would be necessary to put the treated water back into the receiving waters at a location near its diversion point.

Once again, the analysis does not contain facts, reasonable assumptions predicated on facts, or expert opinion based on facts; it is merely "speculation, unsubstantiated opinion or narrative" that does not rise to the level of substantial evidence.

Response: Although the analysis does not list the sensitive species in the watershed, this information can be obtained from a search of the California Natural Diversity database or through surveys of the specific location chosen for BMP construction. Thank you for bringing the San Diego County Multiple Species Conservation Plan to our attention. Dischargers should consult this plan if sensitive species are present at BMP construction sites.

That sheet flow from the urban areas flowing over canyon walls will need to be treated is not reasonably foreseeable. The volume of this flow will be small compared to flow from storm drain outfalls.

Comment 242

d. Cultural Resources –

Appendix R completely fails to address potential impacts to cultural resources. There is ample evidence available from local land use agencies about the location of cultural resources in San Diego County.

The affected watersheds are located in parts of San Diego that are designated as "Urbanized" or "Urbanizing" by the City's Progress Guide and General Plan because they are fully developed or in the process of being developed. Many structures within the watersheds were built prior to 1960, making them at least 45 years old and thus potentially significant historic resources under the criteria in 14 C.C.R. section 15064.5(a)(3)(C). Thus, with regard to checklist item V(a), the loss of an undetermined number of significant historic structures (located above storm drain outfalls/tributaries) should be considered a potentially significant effect.

With regard to checklist item V(b), it is generally accepted by land use agencies that because many older structures were built prior to or without the benefit of heavy earth-moving equipment, the soils underneath older structures have the potential to contain potentially significant archaeological resources. Therefore, the excavation of soils under potentially significant historic resources should be considered to have a potentially significant effect on archaeological resources.

Response: New analysis on potential impacts to cultural resources was added to the March 9, 2007 version of Appendix R to address the concerns in the comment.

Comment 243

e. Hydrology and Water Quality

Appendix R states that the diversion of storm flows and dry weather urban runoff would cause impacts to existing drainage patterns, but concludes that any such impact would be less than significant because "diversion of the entire stormflow of a creek is not required to meet wasteload allocations."

This statement is not supported by facts, reasonable assumptions predicated on facts, or expert opinion based on facts. There is no technical way for an MS4 operator to ascertain what percentage of a storm flow must be diverted for a particular storm to ensure that the pollutant loads do not exceed the wasteload allocations. If treatment is necessary, all storm flow must be detained and treated to ensure that the standards are met. Thus, the conclusion that this impact will be less than significant is ; "speculation, or unsubstantiated opinion" that does not rise to the level of substantial evidence.

Response: New analyses on potential impacts to hydrology and water quality were added to the March 9, 2007 version of Appendix R, which addresses the concerns in the comment.

Comment 244

f. Geology and Soils –

Appendix R concludes that there will be no impacts to Geology and Soils. This conclusion is no supported by substantial evidence.

Excavating infiltration works in the vicinity of canyon rims has the potential to make canyon walls unstable (only basins serving an equalization purpose could be lined). Increasing infiltration increases instability even if the slope in question is already engineered. For slopes that aren't engineered (and this is the case in older neighborhoods – see above), this instability can lead to failure. Increasing the integrity of slopes downhill of detention works could also result in increased impacts to biological resources or, if retaining walls are used, aesthetic impacts. Therefore, as a result of the project change, checklist item V(c) should indicate that the geology impact from the project is potentially significant.

For purposes of revising the CEQA analysis, we suggest that the Board consider that works which involve any level of infiltration be setback from a canyon rim such that a 45 degree line drawn from the bottom of the basin nearest the canyon rim does not intersect the canyon wall.

Infiltration or treatment of runoff will remove all sediment loading from the creeks. What is the impact of this on the creeks and downstream beaches?

In accordance with Section 15126.2, the Regional Board must consider the impacts of the environment on a project as well as the impacts of a project on the environment. Therefore, in concluding that infiltration can play a major role in implementing the TMDL, the Regional Board should, programmatically and on a site-specific basis, evaluate the permeability of soils within the areas affected by the TMDL.

Similarly, many formational materials within the watersheds are fossiliferous (Kennedy, 1977). Therefore, given that excavation of detention works could penetrate through surficial soils and into ungraded formational materials, the response to checklist item V(c) should indicate that this impact is potentially significant.[24] Because the environmental analysis does not discuss impacts to these resources or propose mitigation measures, the environmental analysis is inadequate.

Response: New analyses on potential impacts to geology and soils were added to the March 9, 2007 version of Appendix R, which addresses the concerns in the comment.

Thank you for the comment concerning potential fossil finds. Additional discussion on impacts and mitigation has been added to explanation of the answer to question 20 (Archeological/Historical).

Comment 245

g. Land Use and Planning –

[24] The "Kennedy Maps" are maps of geologic formations that may contain specific paleontological resources, and are specifically used by planning and land use agencies to identify the potential for significant paleontolgical resources. Such resources occur within the City of San Diego, and therefore could occur within the Chollas Creek watershed. *See* Geology of the La Jolla, Del Mar, La Mesa, Poway, Point Loma, and Southwest Quarter of the Escondido Quadrangles, San Diego County, California, by Michael P. Kennedy, 1975; and Geology of National City, Imperial Beach, and Otay Mesa Quadrangles, Southern San Diego Metropolitan Area, California, by Michael P. Kennedy and Siang S. Tan, 1977.

Checklist Item IX(b) indicates that the project would not conflict with any applicable land use plan, policy or regulation of an agency with jurisdiction over the project adopted for purposes of avoiding or mitigating and environmental effect." This conclusion is not supported by substantial evidence; substantial evidence supports the opposite conclusion. The following examples are taken from the Chollas Creek watershed; a similar analysis should be made of all watersheds.

First, while the Regional Board's environmental analysis foresees the need to construct works, because no analysis was done on the required number or location of treatment works, the analysis does not discuss the need for the City to acquire and demolish hundreds of acres of developed land uses in order to construct the works. This is inconsistent with the only listed impact in the draft environmental analysis, where Regional Board staff discusses the impacts from operating a works that detains water – the works has to be constructed before it can be operated. Because the Regional Board did not properly analyze this impact, the Regional Board's analysis incorrectly concludes that the impacts will be less than significant or that they can be mitigated to below the level of significance. This conclusion is incorrect because it does not consider the following:

Housing

The Housing Element of the City's adopted General Plan and the position taken by the City Council when declaring a "Housing State of Emergency" both have as a basic objective an increase in the housing supply. According to Appendix E of the Technical Report, low and high density residential uses account for almost 64% of the land uses within the Chollas Creek Watershed. On average, this means that 64% of the 480-1400 acres if land that would be occupied by treatment works (307 to 896 acres) is currently developed with homes. Assuming an average of 10 dwelling units per acre (4,000 square foot lots are common in the watershed), this equates to the loss of 3,070 to 8,960 units. Removal of this number existing dwelling units would decrease the housing supply and is thus in conflict with adopted City policy.

Industrial Land

The Industrial Element of the City's adopted General Plan states that there is a serious shortage of large parcels suitable for industrial development exists in the City. Related goals and recommendations include:

"Insure that industrial land needs as required for a balanced economy and balanced land use are met consistent with environmental considerations" (p.286)

""Protect a reserve of manufacturing lands from encroachment by non-manufacturing uses." (p. 286)

"As mentioned earlier, in allocating additional land for industrial use it is imperative that sufficient acreage be designated to meet projected needs so that the existing market can operate effectively." (p.287)

The general theme of the existing Industrial element is precisely this shortage of industrial land, high industrial and prices, etc. and how the economy is negatively

affected by the non-industrial use of industrial land. The supply increased only slightly since 1979 and has not increased since. In fact it is now at crisis level proportions.

According to Appendix E of Region 9's Technical Report, low and high density residential uses account for 3.12% of the land uses within the Chollas Creek Watershed. On average, this means that 3.12% of the 480-1400 acres of land that would be occupied by treatment works (15 to 43.7 acres) is currently developed with industrial uses.

The removal of housing and industrial acreage from the City's stock in order to build storm water treatment works required to comply with the TMDL would conflict with the City's General Plan and its declared Housing State of Emergency. Therefore, as a result of the project change, checklist item IX(b) should indicate that the Land Use and Planning impact from the project is potentially significant with respect to the loss of residential and industrial lands. The environmental analysis in inadequate because it failed to analyze this impact.

Given that none of the City's land use plans identify storm water treatment works and the nature of detention/infiltration works, the City believes that land use impacts would be significant and suggests that the Regional Board evaluate the City's plans to determine where and the extent to which inconsistencies would result.

h. Population and Housing –

Checklist item XII(c) indicates that there would be no displacement of substantial numbers of people, necessitating the construction of replacement housing elsewhere. Within the Chollas Creek watershed alone, the number of dwellings that would be lost as a result of the project change (3,070 to 8,960) should be considered substantial. According to U.S. Census Data, the average dwelling unit in San Diego houses 2.6 people. The loss of 3,070 to 8,960 dwelling units would therefore result in the displacement of 7,982 to 23,296 people. This number of dwellings that would be lost as a result of the project change should be considered substantial. Therefore, as a result of the project change, checklist items XII (b) and XII (c) should indicate that the Population and Housing impact from the project is potentially significant.

The City believes that this is in and of itself a significant impact and suggests that the Regional Board conduct a similar impact evaluation in all of the watersheds that would be subject to the TMDL.

Response: The City based the sizing of the BMP equalization basins on a 3 foot depth, neglecting to analyze deeper equalization basins in order to avoid securing a dam permit (Weston, 2006).[25] Based on the decision not to secure dam permits, the City then concluded that private property must be condemned and demolished to make room for the large, shallow equalization basins. If equalization basin are required, the City could secure dam permits and design the basins deep enough to avoid condemnation and demolition of private property.

[25] Weston Solutions, Inc. Chollas Creek TMDL Source Loading, Best Management Practices, And Monitoring Strategy Assessment, Final Report, September 2006.

Comment 246

i. Utilities and Service Systems –

Checklist item XVI (c) indicates that the project will not require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects. This is directly contradicted by the Technical Report, and given that the project change causes the additional significant impacts cited above, there is even more reason why this item should indicate that the Utilities and Service Systems impact from the project is potentially significant.

Response: New analysis on potential impacts to utilities and service systems was added to the March 9, 2007 version of Appendix R in response to this comment.

Comment 247

Given that the project change will result in previously undisclosed significant effects, CEQA compliance to date has deprived interested parties the opportunity to provide meaningful comment. In particular, we suggest that opportunity to comment be provided to historic preservationists, housing advocates, industrial developers, and those interested in public policy as it pertains to preservation of San Diego's shrinking supply of industrial lands.

Response: Although we disagree that TMDL implementation will result in significant environmental impacts from the loss of housing, industrial lands, or cultural resources, two additional comment periods were provided since the City offered the above comment. All interested persons have had ample time to respond to the changes and new analysis in the Technical Report and supporting documents.

Comment 248

Regional Board staff has, in the past, stated that it need not conduct a detailed analysis because it contends that the TMDL environmental analysis functions as a "first tier document," or would be speculative These statements are inaccurate because:

- Tiering does not excuse the lead agency from adequately analyzing the reasonably foreseeable significant environmental effects of the project and does not justify deferring such analysis to a later tier EIR or negative declaration." 14 C.C.R. Section 15152(b).
- Lead agencies cannot hide behind an inadequate analysis and leave it to the public to produce the necessary substantial evidence regarding adverse impacts. *Gentry v. City of Murietta*, 36 Cal.App.4th 1359, 1379 (1995). While foreseeing the unforeeable is not possible, the agency must find out and disclose all that it reasonably can. 14 C.C.R. § 15144.
- To claim that an impact is speculative and terminate a discussion requires analysis – it does not excuse a failure to investigate and analyze. *See Marin Municipal Water District v. KG Land California Corporation*, 235 Cal.App.3d 1652 (1991)

and 14 C.C.R. Section 15145. The record does not support a finding that the Regional Board has conducted this investigation

Response: Please see the response to Comment 231.

Comment 249

CEQA Compliance – The Regional Board Has Not Analyzed the Cumulative Impacts of All Proposed TMDLs.

CEQA requires that cumulative impacts be assessed as part of determining whether a project may have a significant effect on the environment (CEQA Guidelines Section 15064(h)(1). A Lead Agency may determine that a project's incremental contribution to a cumulative effect is not cumulatively considerable if the project will comply with the requirements in a previously approved plan (CEQA Guidelines Section 15064(h)(3). However, Section 15064(h)(3) also requires preparation of an EIR (meaning a finding that the cumulative impact is significant) if there is substantial evidence that the possible effects of a particular project are still cumulatively considerable, notwithstanding that he project complies with the specified plan. Cumulatively considerable means that the incremental effects of a project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects."

The initial study checklist indicates that cumulative impacts from the project will not occur, but no rationale is provided for that conclusion. CEQA Guidelines Section 15130(b) describes alternative lists of projects and projections that an agency is required to consider when evaluating significant impacts. Given that the Regional Board has a mandate to adopt TMDLs for receiving waters on the 303(d) list, the checklist should, at a minimum, consider the impacts of this project in the context of impacts that would result from reasonably foreseeable means of compliance with other TMDLs, such as the recently adopted TMDL for metals in Chollas Creek (see the attached letter from Deputy City Attorney Tim Miller to the State Water Resources Control Board regarding the Chollas Creek Metals TMDL for the impacts expected to occur from that project). Moreover, the analysis should include the impacts from TMDLs that are in various stages of consideration, adoption, or implementation throughout all the affected watersheds, including the Chollas Creek Dissolved metals TMDL, and – to the extent this TMDL affects the Scripps watershed – State Board activities related to discharges into Areas of Special Biological Significance.

Response: The discussion of cumulative impacts was revised in the March 9, 2007 version of Appendix R.

Comment 250

CEQA Compliance – Chapter 12 and Appendix R Are Inconsistent:

Appendix R concludes that all listed impacts are either insignificant, or can be mitigated below the level of significance. Nevertheless, Chapter 12 contains a statement that some impacts may not be mitigated below the level of significance, but that the goals of the

Clean Water Act override these impacts. As noted previously, all findings must be supported by substantial evidence. To the extent that Appendix R and Chapter 12 conflict, one of the two conclusions is not supported by substantial evidence.

Unless mitigation to reduce potentially significant impacts to a level below significance is "guaranteed", the analysis must conclude that the impacts are significant (CEQA Guidelines, Section 15152(f)(3). In that case, "Findings" and a "Statement of Overriding Considerations" must be adopted.

Response: Although the San Diego Water Board found that all potentially significant impacts could be reduced to less than significant with mitigation, we nonetheless incorporated a finding and statement of overriding consideration in the Technical Report and Resolution. It was incorporated because the San Diego Water Board may not have approval authority over specific implementation projects and therefore, cannot ensure that mitigation will be incorporated when the projects are built.

Comment 251

Here the only alternatives analyzed are the "no action" alternative, and the "reference system approach." This is an inadequate range of alternatives. *See Citizens of Goleta Valley v. Board of Supervisors*, 52 Cal.3d 553 (1990)[Requiring a reasonable range of feasible alternatives.

Here, the Regional Board has failed to explain why setting the TMDL to a higher level is not a feasible alternative. Such an alternative may still result in Basin Plan compliance; however, the reduced need for BMP acreage would preserve more existing land uses, effectively mitigating (partially) the significant impacts to existing land uses. Alternatively, the environmental analysis should describe why such an alternative will not achieve the basic purposes of the project.

Another alternative that has not been addressed is, to the extent that the implementation plan is part of the project, whether a longer compliance schedule will result in pilot project technology becoming mainstream technology that can be deployed and reduce certain impacts.

Response: As stated in several places in the Technical Report, TMDLs must be based on WQOs established in the Basin Plan and Ocean Plan. Therefore the TMDLs cannot be arbitrarily raised to a higher level. However, we anticipate adoption of the reference system/natural sources exclusion approach Basin Plan amendment well before dischargers must meet final TMDLs. This Basin Plan amendment will result in higher TMDLs. The water quality standards alternative was added to the March 9, 2007 version of Appendix R. Whether or not pilot technology will become mainstream within a longer compliance schedule is too speculative to be a plausible alternative.

Comment 252

Appendix R, Environmental Checklist page R-14. Item 10 Risk Upset. We recommend that structural controls such as bioretention BMPs or waste treatment lagoons could have the potential for major failures that result in release of wastes into surface waters. These

should be listed as less than significant with mitigation or significant impact depending on the volume of the wastes that are released during the upset. Upsets could be caused by unusually high rainfall causing a breach of the containment structure or poor design and/or construction.

Response: Item 10-Risk Upset in the checklist specifically refers to hazardous wastes, which does not include wastes from treatment lagoons. In regards to impacts from upsets due to episodic rainfall events, we considered them to be less than significant because overflow would not occur in a properly designed pond unless the rain event exceeded the 25-year, 24-hour storm. Since a storm exceeding this size is extremely rare, we considered this impact to be less than significant.

Comment 253

The Regional Board is required to prepare environmental analyses for the TMDLs to assess the impacts of implementing a reasonable range of alternative means of compliance. By understating magnitude of structural treatment facilities needed to comply with the TMDLs, the City believes that the existing environmental analysis does not fulfill the Regional Board's obligation under CEQA.

Response: Please see the response to Comment 238.

Comment 254

In summary, construction of hundreds of acres of structural treatment facilities, in conjunction with maximizing infiltration opportunities, will be necessary to comply with the required bacteria and metals load reductions. No evidence has been presented by anyone to suggest that solutions other than infiltration/diversion or treatment of entire rain events can result in compliance. The TMDLs allow no exceedences of load reductions regardless of storm size or duration; therefore, regardless of the treatment mechanism selected (grass swales, retention, biofiltration, sand filters, etc.), treatment facilities will need to incorporate acreage-intensive detention/equalization facilities because storm water cannot be treated as fast as rain falls from the sky – certain contact times are required. The significant impacts to existing development from construction of these treatment and equalization facilities has been previously documented and was calculated based allowing one exceedence every three years. The City suggests that the TMDLs include an exceedence frequency and that the Regional Board's environmental analysis include an analysis of the acreage required for treatment based on the exceedence standard. What storm size or exceedence frequency was used by Regional Board staff to calculate the costs of implementing the TMDLs?

Response: The evidence, in the form of the Weston report, submitted by the City outlines some of the challenges which will be faced in complying with the metals TMDLs in Chollas Creek. However, the Weston report presented very few options as solutions to the challenges. Securing dam permits (to increase basin depth and decrease basin size) may be more reasonable than private property demolition to make room for large equalization basins.

No storm size or exceedance frequency was used to estimate the cost of implementing the TMDLs. Estimates in the substitute environmental documents were generated utilizing observed annual stormwater volumes in the watersheds. Base on the average volume, a cost to treat the entire annual volume was determined. This annual cost was divided by ten as a broad and convenient tool to aid dischargers in estimating the total required cost based on the 10th portion of the urbanized watershed needing treatment. For example, if the discharger determines that 36 percent of the urbanized watershed will require treatment, then the cost based on the 10th portion can be multiplied by 3.6 to obtain as reasonable cost estimate. Please see section 7 (Economic Factors) of Appendix R, of the Technical Report, for additional details.

Comment 255

The environmental analyses for both TMDLs identifies as a reasonably foreseeable means of compliance the diversion of dry weather flows to infiltration or sanitary sewer facilities. The current environmental analyses analyze the effects of this compliance mechanism on native, downstream wetland vegetation which is dependent upon these flows; however, the conclusion regarding the significance of this impact is not clear. Overall, the conclusion seems to be that the loss of wetland vegetation which would occur after dry weather flows are diverted is less than significant because remaining and replacement vegetation would be more similar to that which persisted prior to development (i.e., native, upland vegetation). This conclusion that the loss of wetland vegetation is not significant is inconsistent with State policy and the Regional Board's own 401 certification requirements. Have trustee agencies such as the California Department of Fish and Game were consulted on this conclusion? The City suggests that this issue be clarified in revised environmental analyses.

Response: Wetland vegetation dependant on nuisance flows in the watersheds is likely not "native." The San Diego Water Board 401 requirements derive from the Army Corp of Engineer's 404 certification requirements. The San Diego Water Board, as a certifying agency for the 404 program, has broad leeway in certification and mitigation requirements. Ensuring nuisance flow dependant non-native pest species plant propagation is not consistent with the San Diego Water Board 401 requirements.

The decrease in stream flow may result in a change in the plant communities found in and near each stream. A decrease in plant diversity or abundance may occur by reducing the number of species that require a more constant water supply. However, many of these plant species may be non-natives to Southern California, and most likely would not provide habitat or a food source for native wildlife. Native plant species that previously thrived in the stream corridor may naturally repopulate the areas that are currently occupied by invasive species. Increased diversity or area of native plant cover also could be accomplished through restoration/ mitigation projects within the stream corridor. Regardless of the method, the opportunity for restoration/ enhancement of the stream corridor to pre-development conditions is realistic.

Scientists from the U.S. Fish and Wildlife Service (USFWS)[26], and the California Department of Fish and Game (DFG)[27] were contacted regarding this subject. The DFG stated that the action could be a possible concern to the DFG, depending upon each case. They would become involved in the process in cases where a streambed alteration agreement was needed or during the comment period for CEQA. The USFWS stated that reduction of contaminant loading to the streams would be beneficial; however, reduced stream flow could result in the loss of aquatic and riparian habitat (depending upon the amount of flow reduced). They would consider project impacts on a case by case basis.

Comment 256

Page R-5/page 4 of the environmental analysis for the Bacti-1 TMDL/Chollas Dissolved Metals TMDL indicate that the environmental analyses do not require an examination of every site but a reasonably representative sample of them. Please describe the sample set of sites that were examined in the analyses.

Response: The substitute environmental documents evaluated specific sites where BMPs could be located, in each of the major land use types in the watersheds, including residential, industrial, commercial, roadways and open space land uses. Please see section 6 (Reasonably Foreseeable Methods of Compliance at Specific Sites) of Appendix R.

Comment 257

While both environmental analyses note where treatment BMPs should not be built (on Prime Farmland, in special status species habitat, in areas developed with privately-owned land uses), neither analyses identifies where treatment BMPs could reasonably be built. This listing of suitable locations is critical to a determination of whether construction of treatment facilities would result in significant impacts.

Response: Avoidance is a standard mitigation measure, thus the analysis discusses where treatment BMPs should not be built. The San Diego Water Board is not required to speculate on where the discharger may or may not choose to construct BMPs. However, in discussing potential impacts, we considered constructing BMPs in all land use types.

Comment 258

Page R-19/page 15 of the environmental analyses for the Bacti-1/Chollas Dissolved Metals TMDLs indicate that short term construction impacts are not considered to be potentially significant. Why are these impacts considered less than significant on these pages and answered "less than significant" in the discussion section when mitigation measures, in the form of mufflers and lighting plans are recommended?

Response: Thank you for the comment. The designation "less than significant" has been changed to "less than significant with mitigation" in Appendix R.

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[26] Katie Zeeman, USFWS, personal communication, March 8, 2007.
[27] Kelly Fisher, DFG, personal communication, March 7, 2007.

Comment 259

Please clarify the significance determination for changes in native flora and fauna that would result from diverting dry weather flows from storm drain outfalls where the flora and fauna are dependent upon dry weather flows.

a. How would the loss of dry weather flows and the concurrent loss of wetland vegetation affect the habitat-related beneficial uses in the receiving waters?

b. How would the loss of native and vegetation due to diversion of dry weather flows affect temperature in the receiving water?

Response: The significance thresholds used to assess potential impacts to plants and animals are as follows: 1) No net reduction in native or beneficial (high value) plant species. 2) No net loss of number of plant species or area of natural pre-development habitat. 3) No barriers to native or high value plant communities and no introduction of non native species. 4) No net loss of native or beneficial animal species. 5) No deterioration of high value beneficial animal habitat compared to current conditions.

A reduction or loss of dry weather flows may affect the present habitats found in the watersheds. Wildlife use of the creeks as a drinking water source may be impacted with flow reduction; however, improvements in the water quality of the remaining water in the streams should be beneficial to wildlife.

A decrease in the flow volume and flow duration during dry weather conditions most likely would return the stream ecosystem to a more natural, pre-development condition, which may include a reduction in total plant biomass, a change in the plant diversity (increase or decrease), or a decrease in certain non-native or invasive plant species.

The changes in plant species could positively or negatively impact wildlife. Loss of invasive or non-native plant species will allow space for native plant species to grow. The native wildlife species are adapted to the native plant communities which comprise wildlife habitat. They use the plant community for food and shelter for themselves and indirectly as food and shelter for their prey. In addition, the opportunity for restoration/enhancement of native plant species could be developed to benefit wildlife. If native plant communities naturally do not overtake the areas where biomass was lost, then restoration efforts should be considered.

A detailed explanation of how plant and animal species may respond to changes in stream flow during dry weather can be found in Appendix R, in the explanations to questions 4a and 4d.

Summertime dry weather flow in the watersheds that existed before extensive urban development in the watershed likely was supported by groundwater seepage into the channel. Since there is no groundwater development in the watersheds to lower the water table, dry weather base flow from groundwater seepage is likely to be at or higher than under pre-development conditions, due to a rise in the groundwater table from irrigation water recharge. Eliminating nuisance flows should not alter the dry weather flow in the watersheds due to groundwater seepage. Thus, stream reaches with perennial stream flow and riparian or wetland habitats should not diminish below pre-development levels.

Assuming that some flow remains in the streams, loss of vegetation may affect the stream temperature in two ways: by reducing canopy cover (if the vegetation lost is tall enough to shade the stream), or by reduction in flow from evapotranspiration. Vegetation that provides canopy cover will shade the water thereby preventing an increase in water temperature due to direct sunlight. Similarly, the shading will reduce the amount of evaporation in the stream, thereby maintaining a lower water temperature. Conversely, vegetation in and near a stream will absorb water from the stream or water table, which would then reduce the amount of water in a stream and increase water temperatures.

These temperature effects from reduced flows will be less than significant for the creeks because pre-development conditions would not provide aquatic habitat during the dry season, and therefore, instream habitat would naturally be minimal or nonexistent during the dry season. Presently, species native to San Diego and Orange County may occur in the creeks, but would not occur without anthropogenic sources. Net loss of native habitats or loss of species diversity will not be tolerated, as defined by the significance thresholds in the first paragraph of this response. Mitigation is expected for any losses that may occur due to this project.

Comment 260

Mitigation measures in the environmental analyses for both TMDLs specify maintaining dry weather flows for purposes of maintaining certain animal populations. What is the reasonably foreseeable means for maintaining these flows given that the flows must also comply with the WLAs?

Response: In the March 9, 2007 version of Appendix R, we did not identify maintaining dry weather flows as a mitigation measure. We did not find impacts associated with elimination of dry weather flows.

Comment 261

Both TMDLs provide cost estimates for compliance using a variety of structural and non-structural BMPs based on data from EPA and CASQA. What is the design storm or exceedence frequency assumed in the cost estimates listed? In one example, page 70 of the environmental analysis for the Chollas Creek Dissolved Metals TMDL refers to treating 29,072,731 cubic feet of storm water, referring to this quantity as an annual "average". However, the TMDLs do not limit compliance to an average year. How does the lack of a design storm/allowable exceedence frequency affect the cost calculation?

a. Both environmental analyses reference the costs and effectiveness of Caltrans' BMPs. What was the storm size that the Caltrans BMPs were designed to and are they effective in wet weather. If they are effective in wet weather, please extrapolate the acreage required for the BMP and its equalization facilities to give a fair representation of the acreage required in the watersheds affected by the TMDL.

Response: The cost estimates were based on average annual measured flow volumes for the watersheds. Until a design storm is selected, the average and design storm cannot be compared.

The Caltrans BMPs referred to above were not extrapolated into BMP acreage requirement because of the potential variability in BMP design. However, all construction related adverse environmental impacts and mitigation has been provided. Please also see the response to Comment 254.

Comment 262

Given known data regarding water quality in the affected watersheds, what approximately is the percentage of a typical storm event that would need to be treated in order to comply with the TMDL? In other words, would "first-flush" treatment likely achieve loading requirements throughout a typical storm?

Response: CEQA does not require this level of detail. For a discussion on design storm please see the response to Comment 233.

Comment 263

In discussing impacts to population and housing, the environmental analyses for both TMDLs recommends evaluating and implementing more reasonable alternatives such as nonstructural BMPs and low impact and/or small scale structural BMPs before considering an alternative that would create considerable hardship for the community in the area. This is what the City proposed in its September, 2006 correspondence; however, the City concluded that such efforts would most likely not result in compliance. Please expand on how the Regional Board envisions that this means of compliance would roll out given the interim compliance goals.

Response: If the dischargers choose this BMP approach, how it would roll out depends on how quickly the dischargers conduct feasibility studies, select sites for implementation, and secure financing for construction. If this approach does not result in compliance, the City of San Diego would have to combine this approach with other BMP alternatives.

Comment 264

Page R-61/page 57 of environmental analyses for the Bacti-1/Chollas Dissolved Metals TMDLs indicates that the analyses do not analyze all possible means of compliance because alternative means of compliance consist of the different combinations of BMPs that dischargers might use and there are innumerable ways to combine BMPs. The preceding is correct in that the analyses not include combinations of BMPs that are not expected to result in compliance with the WLAs in the TMDLs. However, the analyses unfortunately do not list any single BMP or combinations of BMPs that 1) are documented to result in the required load reductions and 2) will not have significant impacts by displacing existing development. Please list a single combination of non-

structural and less-intensive BMPs that will result in compliance with the Bacti-1 TMDL and, for the Chollas Creek watershed, both TMDLs.

Response: The substitute environmental documents contain sufficient information and analysis for the public to understand the potential adverse environmental impacts of the project, including the impacts from any possible combination of BMPs, and to provide the San Diego Water Board with meaningful discussion and comment on these impacts. The CEQA does not require the level of detail requested in the comment for a planning level analysis. The dischargers are responsible for determining the specific BMPs that will be implemented at specific locations, and for evaluating the potential site specific environmental impacts of those BMPs.

Comment 265

Why is there such a large discrepancy between the cost estimates in the Chollas Creek watershed to comply with the two TMDLs (Tables R-3 and I.2)? As suggested previously, the environmental analyses for the TMDLs should address the cumulative effects of both TMDLs (in terms of cost insofar as such an analysis is required, but certainly in terms of environmental impacts).

Response: Cost discrepancy between Tables R-3 and I.2 come from utilizing different sources for cost reference. Cost estimates can differ significantly. For example, a sand filter built by Caltrans is much more robust in design and construction (therefore more costly), compared to a small sand filter retrofit for a city street. Where the same sources were utilized in the two tables (i.e., diversion structures), the cost indicated for Chollas watershed are identical.

Comment 266

Page R-6 of the environmental analysis for the Bacti-1 TMDL states that the adoption of a TMDL is not discretionary; rather, it is compelled by section 303(d) of the federal Clean Water Act.

a. If adoption of the TMDL is not discretionary, why is the Regional Board preparing CEQA documentation for the action? CEQA compliance is only required if an agency proposes a discretionary action.

b. Why is the Bacti-1 TMDL being proposed for beaches that are not currently on the 303(d) list? On March 13, 2007, the US Environmental Protection Agency (EPA) partially approved the 2004-2006 303(d) List of Impaired Waterbody Segments. This list included the removal of 12 Scripps HA (906.30) ocean beaches. These beaches have not been removed from the TMDL for Indictor Bacteria Project 1. The City is requesting that these beaches be removed from this TMDL. The Clean Water Act, 40 CFR Section 131.38 has provisions for toxic pollutants to remain on the list for subsequent listing cycles; however, bacteria is not a toxic pollutant and has not met this criterion.

Response (a): The CEQA requires an environmental analysis of reasonably foreseeable environmental impacts of the methods of compliance with the proposed activity, which is

the Basin Plan amendment. Since the TMDLs are adopted as part of a Basin Plan amendment, a CEQA analysis is required.

Response (b): Please see the response to Comment 190. Additionally, the CFR was not referenced in this project.

Comment 267

Why does the Bacti-1 environmental analysis not recognize that storm water treatment via ozonation, ultraviolet radiation, reverse osmosis, or chlorination/de-chlorination are reasonably foreseeable means of compliance? The City is aware of no evidence to suggest that compliance with the zero WLA for bacteria can be achieved by any other treatment method.

a. Please provide references for any BMP that indicates that any BMP will achieve compliance with the TMDL – that they are 100% effective under all storm conditions or the prescribe storm conditions.

b. Please provide references for the BMPs that are listed in the environmental analysis that would indicate that these BMPs would result in compliance with the final WLAs.

Response: We revised Appendix R to include analysis of environmental impacts from UV and ozone technologies. We did not discuss chlorination/de-chlorination because this process is primarily used for drinking water treatment. We do not think it is reasonably foreseeable that this process would be used to treat urban and stormwater runoff because of difficulties associated with chlorine transport, storage, and corrosiveness. We did not include an analysis of reverse osmosis because this technology is not effective for removing bacteria. Please see the response to Comment 236 for the discussion of the requested references.

Comment 268

Please identify the Lead and, if they exist, the Responsible and Trustee Agencies (all as defined by the California Environmental Quality Act) associated with this project.

Response: The San Diego Water Board is the Lead Agency. There are no Responsible Agencies. The Trustee Agencies are:

(a) The Department of Fish and Game with regard to the fish and wildlife of the state;

(b) The State Lands Commission with regard to state owned "sovereign" lands such as the beds of navigable waters and state school lands;

(c) The State Department of Parks and Recreation with regard to units of the State Park System; and

(d) The University of California with regard to sites within the Natural Land and Water Reserves System.

Comment 269

The City continues to request that the Regional Board explicitly recognize in its CEQA documentation that treatment and/or diversion (e.g., via infiltration) of storm water will be required to comply with the proposed load reductions given the ubiquitous, legal, and uncontrollable sources of the pollutants. While Board staff has taken a step closer to doing this by listing these strategies as reasonably foreseeable, the impact analysis of this construction is inadequate.

Response: Our level of analysis, in the substitute environmental documents, is sufficient to disclose the level of impacts of the project and provide a forum for meaningful public discussion and comment on those impacts, including the impacts from any possible combination of BMPs. CEQA does not require the level of detail requested in the comment for a planning level analysis. The dischargers are responsible for determining the specific BMPs that will be implemented at specific locations, and for evaluating the potential site specific environmental impacts of those BMPs.

Comment 270

The City continues to request that the Regional Board provide specificity on how compliance will be evaluated in terms of the number of Notices of Violation and/or fines that dischargers would be subject to if compliance is not obtained (e.g., one fine per outfall per day, one fine per tributary, one fine per gallon). I am pleased that the compliance issue with regard to where compliance would be measured (e.g., at storm water outfalls and/or locations downstream) as described in number 5 below.

Response: The specificity requested in this comment is not necessary for adoption of TMDLs, and is better addressed upon re-issuance of the implementing order, as described in the response to Comment 147.

Comment 271

The City continues to request that the Regional Board dictate a design storm or allowable number of exceedences in the Bacteria-1 TMDL. Such an allowance is now recognized as at least a planning goal in the Chollas Creek Dissolved Metals TMDL as one exceedence every three years since this frequency is allowed by the California Toxics Rule; however, the Bacteria-1 TMDL provides no such guidance from the state or federal government. Without this direction, the City is unable to design with certainty towards compliance its treatment and infiltration facilities and the Regional Board is unable to evaluate the environmental impacts of building the facilities. Moreover, since the Technical Report for the Chollas Creek Dissolved Metals TMDL indicates that 99.7% of the metals loading occurs during wet weather (page 35) and since the bacteria TMDL allows for zero anthropogenic-related bacteria, it is clear that treatment and/or infiltration of wet weather flows will be essential to compliance.

Response: Please see response to Comment 233.

Comment 272

The City has prepared a reasonable 'Tiered" approach to implement the TMDLs. The approach entails implementing, as experiments, various combinations of non-structural BMPs, and structural BMPs on public property and voluntary incentive programs for private property owners. The goal of this part of the approach is to 1) determine whether, contrary to existing data, widespread treatment and/or infiltration of storm water is not required to comply with the TMDLs and 2) determine the maximum effectiveness of these Tier I and II in order to minimize the impacts of constructing Tier III (infiltration and treatment) BMPs on developed and privately owned land. The City requests that the Regional Board commit to a formal re-evaluation provision in the TMDL to that final load reductions and compliance strategies can be re-assessed after collecting data from Tier I and Tier II efforts.

Response: The San Diego Water Board cannot commit to a formal re-evaluation of the TMDLs for the reasons discussed in the response to Comment 58. However, bacteria TMDLs will be recalculated immediately after the adoption of the reference system/natural sources exclusion approach Basin Plan amendment. The implementation plan and compliance schedule were revised to commit the San Diego Water Board to considering the reference system/natural sources exclusion approach within 1 year of the effective date of the TMDL Basin Plan amendment.

Comment 273

Regional Board staff has made a number of statements (referenced in previous comments) which provide a de facto prohibition on building treatment or infiltration works below storm drain outfalls for purposes of complying with the TMDLs. The City asks that the Regional Board formally state its position on where BMPs can be located to comply with these TMDLs.

Response: Please see the responses to Comment 233.

Comment 274

"Potential structural BMPs include the installation of storm drain filter sacks, which require routine maintenance". Please clarify what a "storm drain filter sack" is and provide documentation of its effectiveness in treating bacteria. The City is intrigued by this product, as we have been aggressive pursuing effective methods of reducing bacteria in the creeks and beaches within our City and have found that effective solutions to treat bacteria are difficult to find, difficult to demonstrate effectiveness, and costly to implement. To date, the City has only been able to show bacteria reduction success (in field) with nuisance water diversion and ozone treatment technology.

Response: The San Diego Water Board appreciates the earnest efforts undertaken by the City in its BMP researches. All the BMPs listed in the Technical Report should be considered, among others, as potential BMPs either used separately or as part of a treatment train of BMPs. Filter sacks are effective in removing large debris (diapers,

etc…) from storm water and may provide some benefit in bacteria reduction. However, the actual BMPs to be implemented will be determined by the discharger.

5.8 Economics

Comment 275

Economics: The TMDL document as written provides available best management practice cost considerations, but falls short in providing estimated costs for overall compliance programs based on the tasks necessary to carry out the TMDL implementation plan (A Process for Addressing Impaired Waters in California, Section 7.5, draft SWRCB document March 2005). This information is essential for developing the public policy and funding mechanisms necessary to prepare and comply with the requirements.

Response: We are required to consider the costs of reasonably foreseeable methods of compliance with the proposed TMDL. Because the Implementation Plan includes an agricultural water quality control program, an estimate of the total cost of that program must be disclosed and potential sources of funding identified as required by Water Code section 13141. The Technical Report has been revised to include this information on the agricultural component. We have considered this information in implementation planning – specifically in determining the length of the compliance period. The dischargers may need to expand on this analysis to develop policy and funding mechanisms for site specific projects.

Comment 276

The presentation of the "Total Cost Estimates for Structural Controls for Urbanized Areas" in Table 13-3 is inadequate and misleading. Despite the title of the table, the treatment cost range presented is for only 10% of an urbanized area, not 100%; and in the case of "diversion", the cost for a single diversion is listed without estimating the number/total cost of diversions that might be called for over the urbanized acreage. There is also no mention in the text that various BMPs have different bacteria-removal effectiveness rates not necessarily capable of achieving the necessary reduction targets; that some BMPs are suitable for dry weather flows but not wet weather; or that no real analysis has been done to indicate whether spending all this money (even on the high end) would achieve compliance. It should also be noted that achieving compliance with bacteria indicators may not achieve the over-arching goal of reducing risks to public health, since the bacteria are only indicators, and not the actual pathogens of concern.

Response: Cost estimates are provided in increments of 10 percent to allow for upward scaling of costs since the amount of treatment and methods needed to achieve compliance with the proposed TMDLs may vary within a watershed and from watershed to watershed. For example, using the 10 percent cost estimates provided in Table 13-3, a cost estimate for 100 percent land treatment could easily be calculated by multiplying the 10 percent cost estimate by 10, or by 5 for 50 percent, or 8 for 80 percent, etc. Likewise, the estimated cost of one diversion structure is provided and can be scaled upward depending on the scenario of what might be needed in any given watershed. To improve clarity, the title of Table 13-3 has been renamed and additional language has been added

to section 13.2.2 to clarify the use of cost estimates based on 10 percent of urbanized area.

The commenter requests information on BMP effectiveness rates and suitability for dry weather flows versus wet weather flows, and an analysis about whether spending money on TMDL implementation would achieve compliance. Watershed and site-specific studies will be needed to plan and determine the effectiveness and feasibility of BMPs to ensure that targets are met. However, providing this information is beyond the scope of this discussion. We are required to consider the costs of reasonably foreseeable methods of compliance with the proposed TMDL. The purpose of this analysis is to provide cost information useful for implementation planning; most significantly, the length of the compliance schedule.

We disagree with the statement that "achieving compliance with bacteria indicators may not achieve the over-arching goal of reducing risks to public health, since the bacteria are only indicators, and not the actual pathogens of concern." In fact, the Mission Bay source identification study[28] and epidemiological study[29] show that there is a vastly reduced public health risk to swimmers in a water body where BMPs have virtually eliminated urban runoff to the receiving water. Therefore, in contrast to focusing on the relationship between bacteria and pathogens, we recommend that dischargers focus on abating anthropogenic sources that are the cause of illness, which are largely associated with urban runoff.

Comment 277

The economic analysis for TMDL project implementation costs is inadequate. The analysis does not take into account the urbanized nature of the majority of watersheds in the TMDL and the need to purchase land for BMP installation. Project implementation costs need to include land acquisition costs. Additionally, the analysis should include the bacteria-reduction effectiveness of the proposed BMPs. Without this information it is impossible to judge the potential effect on water quality the BMP will have for the cost listed.

Response: We disagree that the economic analysis is inadequate. We are required to consider the costs of reasonably foreseeable methods of compliance with the proposed TMDL, such as implementation of reasonably foreseeable types of BMPs for the purpose of bacteria reduction. This economic analysis includes a presentation of a variety of BMP types that includes a range of costs and potential effectiveness rates. We consider this information for implementation planning purposes – specifically in setting the length of the compliance period. Providing a cost benefit analysis based on BMP effectiveness rates is beyond the scope of this requirement. We are not required to speculate about

[28] City of San Diego and MEC/Weston. 2004. Mission Bay Clean Beaches Initiative Bacterial Source Identification Study. City of San Diego and MEC Analytical Systems-Weston Solutions, Inc., San Diego California. Prepared for the State Water Resources Control Board, Sacramento, CA.
[29] Colford, M.J., T.J. Wade, K.C. Schiff, C.C. Wright, J.F. Griffith, S.K. Sandhu, S.B. Weisberg. 2005. Recreational water contact and illness in Mission Bay, CA. Southern California Coastal Water Research Project Technical Report No. 449. Southern California Coastal Water Research Project, Westminster, CA.

site-specific projects that persons or entities identified as dischargers might implement or which BMP will be the most appropriate based on cost and effectiveness. We disagree that the need to purchase land for BMP installation is reasonably foreseeable. In fact, due to the expense of land acquisition, dischargers are most likely to select BMPs that do not require land acquisition. Additionally, because the size of BMPs can be minimized through the types of BMPs selected, and engineering solutions exist to minimize the footprint of structural BMPs, displacement of existing development is not likely to be on a scale that will cause significant economic hardship.

Comment 278

The Executive Summary, Section 1.8 last paragraph states that there would be no additional beach water quality monitoring costs incurred by the discharges because it is required by the California Health & Safety Code. This is an incorrect statement. The County of San Diego Department of Environmental Health performs monitoring of beach water quality and is reimbursed by the State Board for those sites that meet AB411 criteria. The coastal San Diego MS4 copermittees perform monitoring at some of those beaches biweekly April through October and monthly the remaining time of the year. The proposed monitoring for the TMDL is a minimum of three times greater than the current monitoring costs.

Response: Sections 1.8 and 13.2.4 discuss cost estimates for surface water monitoring as a result of implementing these TMDLs. The statement that "the dischargers will incur no additional costs for monitoring water quality at beaches" has been deleted. The monitoring and reporting as required by Health and Safety Code section 15880 spans the summer months, only. Therefore, should monitoring for TMDL compliance take place in the winter months, dischargers will incur additional costs over those associated with the requirements of the Health and Safety Code.

The Technical Report does not specify locations or a monitoring frequency for determining compliance with the TMDLs. How the costs associated with monitoring as a result of these TMDLs will compare to existing monitoring costs is not known because specific TMDL monitoring plans have not been prepared. Therefore, the costs reported in the Technical Report are those associated with a two-person sampling team on a one-day effort. Once appropriate sampling locations and frequencies are identified in the Bacteria Load Reduction Plans, total costs associated with compliance with these TMDLs can be estimated.

Comment 279

Section 13 – The Economic Analysis for TMDL project implementation costs is inadequate. Table 13-1 uses capital costs in uninflated dollars. The analysis does not take into account the urbanized nature of the majority of watersheds in the TMDL and the need to purchase land for BMP installation. Project implementation costs need to include land acquisition costs. Table 13-3 is misleading by only calculating the potential costs for 10% of the watershed. If 100% compliance is required, 100% of the costs should be shown. Additionally, the analysis should include the bacteria-reduction effectiveness of

the proposed BMPs. Without this information it is impossible to judge the potential effect on water quality the BMP will have for the cost listed. Please identify the source used for these estimates and correct, if appropriate, noted in the attached letter regarding the Chollas Creek Metals TMDL.

The diversion BMP noted in the Regional Board's economic impact vastly underestimates the cost of this BMP by estimating only a $1 million cost associated with building a diversion structure. Other costs that would be required to implement this BMP would be upsizing of sewer pipe capacity between the diversion and the Point Loma Wastewater Treatment Plant because existing pipes are not large enough to convey storm water flows (and the TMDL for San Diego specifically addresses storm water flows). Given that sewers are generally not over-sized so that they can be "self-cleaning", a parallel conveyance system would be required. At the end of this conveyance, the Point Loma plant itself would need to be expanded to handle storm water flows. Region 9's CEQA analysis includes as mitigation a requirement to reintroduce water to drainages to avoid "drying out existing wetlands. A reintroduction of treated water to the headwaters of Waters of the US/state would also require construction of a new reclaimed or potable water distribution system. If reclaimed, rather than potable water were to be used, t is unknown whether Total Dissolved Solids levels in reclaimed water would adversely affect the beneficial uses in the receiving waters.

Response: We disagree that the economic analysis is inadequate. However, as recommended in the commenter, the capital cost amounts in Table 13-1 have been adjusted for inflation to provide clarity. The sources used for these estimates are noted in the footnote to Table 13-3. The full references can be found in section 16.

As part of CEQA, we are required to consider the costs of reasonably foreseeable methods of compliance with the proposed TMDL, such as implementation of reasonably foreseeable types of BMPs for the purpose of bacteria reduction. This economic analysis includes a presentation of a variety of BMP types that includes a range of costs and potential effectiveness rates. We have considered this information for implementation planning purposes – specifically in setting the length of the compliance period. Providing a cost benefit analysis based on BMP effectiveness rates is beyond the scope of this requirement. Furthermore, we are not required to speculate about site-specific projects that persons or entities identified as sources might implement or which BMP will be the most appropriate based on cost and effectiveness. See the response to Comment 277 for a discussion of land acquisition.

While 100 percent compliance is ultimately required by the proposed TMDL, treatment of 100 percent of the land may not be required to achieve compliance. In the analysis, we do not assume that every watershed will require 100 percent of the land to be treated with all of the potential BMP options; therefore, cost estimates are provided in increments of 10 percent to allow for upward scaling of costs, since the amount of treatment and methods needed to achieve compliance with the proposed TMDL may vary from watershed to watershed. For example, using the 10 percent cost estimates provided in Table 13-3, a cost estimate for 100 percent land treatment could easily be calculated by multiplying the 10% cost estimate by 10, or by 5 for 50 percent, or 8 for 80 percent, etc. To clarify, the title of Table 13-3 has been renamed and additional language has been

added to section 13.2.2 to clarify the use of cost estimates based on 10 percent of urbanized area.

We disagree that the estimate for a diversion BMP is underestimated. As noted in Table 13-3, the cost estimate for a diversion BMP is "greater than" $1 million, not $1 million as stated in the comment. Additionally, two examples are sited regarding diversion systems in section 13.2.1 and include a diversion and ultraviolet radiation treatment system that cost $1 million and a diversion and ozone treatment system that cost $6.7 million. Considerations, such as the "other costs" associated with building a diversion structure described by the comment, as well as the comments on potential mitigation discussed in the CEQA analysis, are project level, site-specific factors that we are not required to provide in this planning level discussion.

We removed the reference to the reintroduction of water to avoid "drying out of existing wetlands." Costs associated with land acquisition are addressed in the response to Comment 277.

Comment 280

P. 128 TMDL Project Implementation Costs: The economic analysis for TMDL project implementation costs is inadequate. The analysis does not take into account the urbanized nature of the majority of watersheds in the TMDL and the need to purchase land for BMP installation. Project implementation costs need to include land acquisition costs. Additionally, the analysis should include the bacteria-reduction effectiveness of the proposed BMPs. Without this information it is impossible to judge the potential effect on water quality the BMP will have for the cost listed. None of the proposed BMPs result in 100% reduction of bacteria, except for diversions during dry weather flow conditions.

Response: Please see the response to Comment 279.

Comment 281

It is clear, both from cost estimates in the document and from discussion during the Board workshop on January 11, that the total cost of BMPs needed to meet the TMDL targets is very large. This raises two issues. The first is whether the cost to prevent an illness is within the range established by other public health policies. This analysis could be conducted with information readily available from the health policy literature. If the cost per illness prevented, especially when weighted for relative severity, is near the top end of this range, it is likely that the TMDL program will generate public resistance, especially if the program "crowds out" other municipal investments in public health. The second cost-related issue stems from the fact that this TMDL program will not be implemented in isolation. Other TMDL programs are being developed and implemented and each will have its own implementation requirements. The Regional Board should conduct a costing exercise to estimate what the aggregate TMDL-related investment could be, whether this is even economically feasible, and whether there are possible cost-saving approaches. For example, is it possible to design and/or site the bacteria BMPs in a way that will help meet targets for other TMDLs? The permittees do not all have the

technical expertise to conduct such analyses. The current approach, in which TMDL implementation will apparently be addressed in a linear manner, will require separate BMP design and implementation cycles for each TMDL, an approach not designed for maximum efficiency.

Response: We recognize that implementing BMPs to comply with the TMDL requirements will likely be a substantial and costly undertaking by the dischargers; however, so are the costs associated with not adequately abating bacteria contamination.

In a recent study,[30] scientists investigated the economic impacts associated with contracting gastrointestinal illness from swimming at contaminated coastal waters at beaches in southern California. Authors used water quality data (specifically enterococci) from the year 2000, along with beach attendant data from 28 beaches, spanning 160 km of coastline in Los Angeles and Orange Counties, as input into two epidemiological dose-response models. The authors estimate that approximately 1 million excess gastrointestinal illnesses occur at beaches in Los Angeles and Orange Counties each year due to coastal contamination. Considering loss of time at work, doctor visits, and medicine for each occurrence, this equates to expenditures of about $36 million annually. This number is conservative because it does not include expenses associated with contracting other types of waterborne illnesses, nor does it account for lost recreational value, a swimmer's willingness to pay to avoid getting sick, or loss to coastal market economies that depend on contribution from beachgoers. Although this study focused specifically on beaches in Los Angeles and Orange Counties, we believe the results are applicable to the San Diego Region. Therefore, although we recognize the significant expenses associated with implementing BMPs, we also assert that efforts to abate bacteria contamination are necessary to avoid the likewise significant expenses associated with recreating in contaminated waters.

Recognizing the dischargers' need to develop comprehensive BMP programs, we are attempting to develop new TMDL projects that address all the impaired waterbodies in a watershed. We are cognizant of the fact that TMDLs can be substantial projects and multiple impairments in a single waterbody may complicate future TMDLs. Due to the complexity, development time, and the long implementation schedules, it would be impossible for us to predict the costs or impacts of current TMDLs on future TMDLs. Since the control measures will be selected by the dischargers when they develop their Bacteria Load Reduction Plans, whether or not the selected BMPs and MPs address solely bacteria reduction or a combination of bacteria and other pollutants of concern is at their discretion. Dischargers and stakeholders are not required to wait until a TMDL is initiated before they begin addressing water quality issues in their watersheds. However, to encourage dischargers to integrate BMP planning for all water quality problems in their watersheds, we have included a compliance schedule option to allow more time to meet the bacteria TMDLs, if integrated BMP planning and implementation is undertaken. Please see the revisions to section 11.4.2.

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[30] Given, Suzan, Linwood H. Pendleton, and Alexandria B. Boehm. 2006. Regional Public Health Cost Estimates of Contaminated Coastal Waters: A Case Study of Gastroenteritis at Southern California Beaches. *Environmental Science and Technology* (July 2006) 40 (16), 4851 -4858.

Comment 282

The Economic Analysis which begins on page B-11 is not sufficient as presented as the costs are based on data from 1999 and 2003. An economic analysis based on current and projected cost throughout the TMDL compliance schedule (i.e. account for inflation) should be provided, as well as the other items discussed in this letter, please.

Response: Providing the projected costs throughout the TMDL compliance schedule is beyond the scope of our requirements. Dischargers should run such analyses as part of their BMP planning effort.

Comment 283

On page R-66, "In order to achieve TMDL compliance, residential land use areas, like the area shown in Figure 6, may only require non-structural BMPs; however, structural BMPs could be retrofitted, if appropriate. Potential non-structural BMPs at this specific site include increased street sweeping, and development and enforcement of municipal ordinances prohibiting the discharge of bacteria and nuisance flows to stormwater and Stormwater drainage pathways. Other potential BMPs include adoption and enforcement of ordinances to pick up pet waste, and regular inspections of storm drains for cross connections with the sanitary sewers.

It should be noted that many of the underlined "potential" non-structural BMPs underlined above are already being implemented in most watersheds, if not all of them. So while the report states that "…residential land use areas,…may only require non-structural BMPs…." may not be appropriate and the costs for some structural BMPs should be accounted for in the economic analysis. Please also define "retrofit".

Response: We are unsure of whether or not structural BMPs will be necessary, therefore our language was appropriately not definitive. In some cases, structural BMPs may not be necessary to achieve the desired goal of reduced bacteria levels. In other cases, structural BMPs will be necessary. By retrofitting BMPs, we mean to install, fit, or adapt a structural BMP (such as a storm drain filter sack) into existing stormwater drainage pathways.

Appendix T

Comparison of 2002, 2006, and 2008 303(d) Listings Included in Revised Bacteria TMDLs Project I

Watershed	2002		2006		2008	
San Joaquin Hills HSA (901.11)/ Laguna Beach HSA (901.12)	Pacific Ocean Shoreline, San Joaquin Hills HSA *-Impairment located at Cameo Cove at Irvine Cove Dr./Riviera Way, Heisler Park-North*	Bacteria Indicators	Pacific Ocean Shoreline, San Joaquin Hills HSA *-Impairment located at Cameo Cove at Irvine Cove Dr./Riviera Way, Heisler Park-North*	Indicator Bacteria	NO LISTINGS	
	Pacific Ocean Shoreline, Laguna Beach HSA *-Impairment located at Main Laguna Beach, Laguna Beach at Ocean Avenue, Laguna Beach at Laguna Avenue, Laguna Beach at Cleo Street, Arch Cove at Bluebird Canyon Road, Laguna Beach at Dumond Drive.*	Bacteria Indicators	Pacific Ocean Shoreline, Laguna Beach HSA *-Impairment located at Main Laguna Beach, Laguna Beach at Ocean Avenue, Laguna Beach at Laguna Avenue, Laguna Beach at Cleo Street, Arch Cove at Bluebird Canyon Road, Laguna Beach at Dumond Drive.*	Indicator Bacteria	Pacific Ocean Shoreline, Laguna Beach HSA	
					at Laguna Beach at Cleo Street	Indicator Bacteria
Aliso HSA (901.13)	Aliso Creek	Bacteria Indicators	Aliso Creek *-This listing for indicator bacteria applies to the Aliso Creek mainstem and all the major tributaries of Aliso Creek which are Sulphur Creek, Wood Canyon, Aliso Hills Canyon, Dairy Fork, and English Canyon.*	Indicator Bacteria	Aliso Creek	Indicator Bacteria
	Aliso Creek (mouth)	Bacteria Indicators	Aliso Creek (mouth)	Indicator Bacteria	Aliso Creek (mouth)	Indicator Bacteria
	Pacific Ocean Shoreline, Aliso HSA *-Impairment located at Laguna Beach at Lagunita Place / Blue Lagoon Place, Aliso Beach.*	Bacteria Indicators	Pacific Ocean Shoreline, Aliso HSA *-Impairment located at Laguna Beach at Lagunita Place / Blue Lagoon Place, Aliso Beach.*	Indicator Bacteria	Pacific Ocean Shoreline, Aliso HSA	
					at Aliso Beach - middle	Total Coliform
					at Aliso Creek mouth	Enterococcus
						Fecal Coliform
						Total Coliform
Dana Point HSA (901.14)	Pacific Ocean Shoreline, Dana Point HSA *-Impairment located at Aliso Beach at West Street, Aliso Beach at Table Rock Drive, 1000 Steps Beach at Pacific Coast Hwy (Hospital, 9th Ave), Salt Creek (large outlet), Salt Creek Beach at Salt Creek service road, Salt Creek Beach Dana Strand Road.*	Bacteria Indicators	Pacific Ocean Shoreline, Dana Point HSA *-Impairment located at Aliso Beach at West Street, Aliso Beach at Table Rock Drive, 1000 Steps Beach at Pacific Coast Hwy (Hospital, 9th Ave), Salt Creek (large outlet), Salt Creek Beach at Salt Creek service road, Salt Creek Beach Dana Strand Road.*	Indicator Bacteria	Pacific Ocean Shoreline, Dana Point HSA	
					at Aliso Beach at West Street	Indicator Bacteria
					at Salt Creek outlet at Monarch Beach	Total Coliform
Lower San Juan HSA (901.27)	San Juan Creek	Bacteria Indicators	San Juan Creek	Indicator Bacteria	San Juan Creek	Indicator Bacteria
	San Juan Creek (mouth)	Bacteria Indicators	San Juan Creek (mouth)	Indicator Bacteria	San Juan Creek (mouth)	Indicator Bacteria
	Pacific Ocean Shoreline, Lower San Juan HSA *-Impairment located at North Beach Creek, San Juan Creek (large outlet), Capistrano Beach, South Capistrano Beach at Beach Road.*	Bacteria Indicators	Pacific Ocean Shoreline, Lower San Juan HSA *-Impairment located at North Beach Creek, San Juan Creek (large outlet), Capistrano Beach, South Capistrano Beach at Beach Road.*	Indicator Bacteria	Pacific Ocean Shoreline, Lower San Juan HSA	
					at North Beach Creek	Enterococcus
						Total Coliform
					at North Doheny State Park Campground	Fecal Coliform
						Enterococcus
						Total Coliform
					at San Juan Creek	Enterococcus
						Fecal Coliform
						Total Coliform
					at South Doheny State Park Campground	Enterococcus
San Clemente HA (901.30)	Pacific Ocean Shoreline, San Clemente HA *-Impairment located at Poche Beach (large outlet), Ole Hanson Beach Club Beach at Pico Drain, San Clemente City Beach at El Portal St. Stairs, San Clemente City Beach at Mariposa St., San Clemente City Beach at Linda Lane, San Clemente City Beach at South Linda Lane, San Clemente City Beach at South Linda Lane, San Clemente City Beach at Lifeguard Headquarters, Under San Clemente Municipal Pier, San Clemente City Beach at Trafalgar Canyon (Trafalgar Ln.), San Clemente State Beach at Riviera Beach, San Clemente State Beach at Cypress Shores.*	Bacteria Indicators	Pacific Ocean Shoreline, San Clemente HA *-Impairment located at Poche Beach (large outlet), Ole Hanson Beach Club Beach at Pico Drain, San Clemente City Beach at El Portal St. Stairs, San Clemente City Beach at Mariposa St., San Clemente City Beach at Linda Lane, San Clemente City Beach at South Linda Lane, San Clemente City Beach at South Linda Lane, San Clemente City Beach at Lifeguard Headquarters, Under San Clemente Municipal Pier, San Clemente City Beach at Trafalgar Canyon (Trafalgar Ln.), San Clemente State Beach at Riviera Beach, San Clemente State Beach at Cypress Shores.*	Indicator Bacteria	Pacific Ocean Shoreline, San Clemente HA	
					at Poche Beach	Enterococcus
						Fecal Coliform
						Total Coliform
					at San Clemente City Beach at Pier	Enterococcus
					at San Clemente City Beach, North Beach	Total Coliform
					at South Capistrano Beach at Beach Road	Enterococcus
					at South Capistrano County Beach	Enterococcus
						Total Coliform

Appendix T

Comparison of 2002, 2006, and 2008 303(d) Listings Included in Revised Bacteria TMDLs Project I

Watershed	2002		2006		2008	
San Luis Rey HU (903.00)	Pacific Ocean Shoreline, San Luis Rey HU *-Impairment located at San Luis Rey River Mouth.*	Bacteria Indicators	Pacific Ocean Shoreline, San Luis Rey HU *-Impairment located at San Luis Rey River Mouth.*	Indicator Bacteria	Pacific Ocean Shoreline, San Luis Rey HU	
					at San Luis Rey River mouth	Enterococcus
						Total Coliform
San Marcos HA (904.50)	Pacific Ocean Shoreline, San Marcos HA *-Impairment located at Moonlight State Beach.*	Bacteria Indicators	Pacific Ocean Shoreline, San Marcos HA *-Impairment located at Moonlight State Beach.*	Indicator Bacteria	Pacific Ocean Shoreline, Batiquitos HSA	
					at Moonlight State Beach (Cottonwood Creek outlet)	Total Coliform
San Dieguito HU (905.00)	Pacific Ocean Shoreline, San Diequito HU *-Impairment located at San Dieguito Lagoon Mouth, Solana Beach*	Bacteria Indicators	Pacific Ocean Shoreline, San Diequito HU *-Impairment located at San Dieguito Lagoon Mouth, Solana Beach*	Indicator Bacteria	Pacific Ocean Shoreline, San Dieguito HU	
					at San Dieguito Lagoon Mouth at San Dieguito River Beach	Total Coliform
Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline, Miramar Reservoir HA *-Impairment located at Torrey Pines State Beach at Del Mar (Anderson Canyon)*	Bacteria Indicators	NO LISTINGS		Pacific Ocean Shoreline, Miramar Reservoir HA	
					at Los Penasquitos River mouth	Total Coliform
Scripps HA (906.30)	Pacific Ocean Shoreline, Scripps HA *-Impairment located at La Jolla Shores Beach at El Paseo Grande, La Jolla Shores Beach at Caminito Del Oro, La Jolla Shores Beach at Vallecitos, La Jolla Shores Beach at Ave de la Playa, Casa Beach (Childrens Pool), South Casa Beach at Coast Blvd., Whispering Sands Beach at Ravina St., Windansea Beach at Vista de la Playa, Windansea Beach at Bonair St., Windansea Beach at Playa del Norte, Windansea Beach at Palomar Ave., Tourmaline Surf Park, Pacific Beach at Grand Ave.*	Bacteria Indicators	Pacific Ocean Shoreline, Scripps HA *-This listing for indicator bacteria onliy applies to the Childrens Pool Beach area of this ocean shoreline segment.*	Indicator Bacteria	Pacific Ocean Shoreline, Scripps HA	
					at Avenida de la Playa at La Jolla Shores Beach	Total Coliform
					at Childrens Pool	Enterococcus
						Fecal Coliform
						Total Coliform
						Indicator Bacteria
					at La Jolla Cove	Total Coliform
					at Pacific Beach Point , Pacific Beach	Enterococcus
						Fecal Coliform
						Total Coliform
					at Ravina	Total Coliform
					at Vallecitos Court at La Jolla Shores Beach	Total Coliform
Tecolote HA (906.50)	Tecolote Creek	Bacteria Indicators	Tecolote Creek	Indicator Bacteria	Tecolote Creek	Indicator Bacteria
Mission San Diego HSA (907.11)/ Santee HSA (907.12)	Forester Creek	Fecal Coliform	Forester Creek	Fecal Coliform	Forester Creek	Fecal Coliform
	San Diego River (Lower)	Fecal Coliform	San Diego River (Lower)	Fecal Coliform	San Diego River (Lower)	Fecal Coliform
						Enterococcus
	Pacific Ocean Shoreline, San Diego HU *-Impairment located at San Diego River Mouth (aka Dog Beach).*	Bacteria Indicators	Pacific Ocean Shoreline, San Diego HU *-Impairment located at San Diego River Mouth (aka Dog Beach).*	Indicator Bacteria	Pacific Ocean Shoreline, San Diego HU	
					at the San Diego River outlet, at Dog Beach	Total Coliform
Chollas HSA (908.22)	Chollas Creek	Bacteria Indicators	Chollas Creek	Indicator Bacteria	Chollas Creek	Indicator Bacteria

	2002	2006	2008
Number of Creeks	6	6	6
Number of Creek Mouths	2	2	2
Number of Pacific Ocean Shorelines	12	11	11
Number of Listed Pollutant-Waterbody Combinations Addressed by TMDLs	20	19	50

Appendix U

Responses to Comments Part II

For Bacteria TMDLs Project I
Adopted by the San Diego Water Board on
December 12, 2007

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1 List of Persons Submitting Comments

The following persons submitted comments on the June 25, 2007 version of the Technical Report for the Total Maximum Daily Loads (TMDLs) for Indicator Bacteria Project I—Beaches and Creeks in the San Diego Region. The table in section 2, below, links the commenter with the comment number, and version of the TMDL documents on which the comment was made.

- City of Dana Point
- City of Del Mar
- City of Laguna Beach
- City of Laguna Niguel
- City of Poway
- City of San Diego
- City of San Juan Capistrano
- County of Orange
- County of San Diego
- Heal The Bay
- San Diego Coastkeeper
- Sierra Club
- U.S. Environmental Protection Agency

2 Comment Numbers and Categories

Section	Comment Number	Commenter	Version of Technical Report	Page Number
4.1 Reference System Approach Basin Plan Amendment				
4.1	284	Sierra Club	June 25. 2007	6
4.1	285	City of Dana Point	June 25. 2007	6
4.1	286	City of Dana Point	June 25. 2007	6
4.1	287	City of Dana Point	June 25. 2007	7
4.1	288	County of Orange	June 25. 2007	8
4.1	289	County of Orange	June 25. 2007	9
4.1	290	County of Orange	June 25. 2007	9
4.2 Technical Analysis				
4.2	291	City of Dana Point	June 25. 2007	12
4.2	292	City of Dana Point	June 25. 2007	13
4.2	293	City of Dana Point	June 25. 2007	13
4.2	294	City of Dana Point	June 25. 2007	14
4.2	295	City of Dana Point	June 25. 2007	14
4.2	296	County of Orange	June 25. 2007	15
4.2	297	County of Orange	June 25. 2007	16
4.2	298	County of Orange	June 25. 2007	19
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4.2	300	County of Orange	June 25. 2007	20
4.2	301	County of Orange	June 25. 2007	21
4.2	302	County of Orange	June 25. 2007	22
4.2	303	County of Orange	June 25. 2007	23
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4.2	305	County of Orange	June 25. 2007	23
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4.2	307	County of Orange	June 25. 2007	24
4.2	308	County of Orange	June 25. 2007	25
4.2	309	County of Orange	June 25. 2007	26
4.2	310	County of Orange	June 25. 2007	26
4.2	311	County of Orange	June 25. 2007	27
4.2	312	County of Orange	June 25. 2007	27
4.2	313	County of Orange	June 25. 2007	28
4.2	314	City of San Diego	June 25. 2007	29
4.2	315	City of San Diego	June 25. 2007	29
4.2	316	City of San Diego	June 25. 2007	29

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4.3 Water Quality Objectives / Indicator Bacteria				
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4.3	318	County of Orange	June 25. 2007	32
4.3	319	County of Orange	June 25. 2007	33
4.3	320	County of Orange	June 25. 2007	33
4.3	321	City of San Diego	June 25. 2007	34
4.3	322	U.S. Environmental Protection Agency	June 25. 2007	35
4.4 Beneficial Uses				
4.4	323	City of Dana Point	June 25. 2007	36
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4.4	325	County of Orange	June 25. 2007	37
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4.4	327	County of Orange	June 25. 2007	38
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4.4	329	City of San Diego	June 25. 2007	39
4.5 Implementation Plan / Compliance Assessment				
4.5	330	City of Dana Point	June 25. 2007	40
4.5	331	City of Dana Point	June 25. 2007	40
4.5	332	City of Dana Point	June 25. 2007	41
4.5	333	City of Del Mar	June 25. 2007	41
4.5	334	City of Del Mar	June 25. 2007	44
4.5	335	City of Del Mar	June 25. 2007	44
4.5	336	City of Del Mar	June 25. 2007	45
4.5	337	City of Del Mar	June 25. 2007	45
4.5	338	City of Del Mar	June 25. 2007	46
4.5	339	City of Del Mar	June 25. 2007	47
4.5	340	City of Del Mar	June 25. 2007	47
4.5	341	City of Del Mar	June 25. 2007	48
4.5	342	County of Orange	June 25. 2007	48
4.5	343	County of Orange	June 25. 2007	49
4.5	344	City of San Diego	June 25. 2007	50
4.5	345	City of San Diego	June 25. 2007	50
4.5	346	City of San Diego	June 25. 2007	51
4.6 Compliance Schedule				
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4.6	349	County of Orange	June 25. 2007	53
4.6	350	City of San Diego	June 25. 2007	53
4.6	351	Heal the Bay	June 25. 2007	54
4.6	352	Heal the Bay	June 25. 2007	54

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4.7 Environmental Analysis				
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4.8	358	City of San Diego	June 25. 2007	59
4.9 Comprehensive Load Reduction Plans				
4.9	359	City of Laguna Niguel	June 25. 2007	61
4.9	360	City of Dana Point	June 25. 2007	62
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4.9	362	San Diego Coastkeeper	June 25. 2007	63
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4.10 Independent Advisory Panel				
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4.11 Miscellaneous				
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4.11	370	City of Dana Point	June 25. 2007	70
4.11	371	City of San Diego	June 25. 2007	71
4.11	372	City of San Diego	June 25. 2007	72
4.11	373	City of San Diego	June 25. 2007	72
4.11	374	City of San Diego	June 25. 2007	73
4.11	375	Heal the Bay	June 25. 2007	73
4.11	376	Heal the Bay	June 25. 2007	74
4.11	377	City of Laguna Niguel	June 25. 2007	75
4.11	378	City of Laguna Niguel	June 25. 2007	75
4.11	379	City of Poway	June 25. 2007	75

3 Introduction

This report provides responses to public comments received on the June 25, 2007 version of the Technical Report for the Total Maximum Daily Loads for Indicator Bacteria Project I - Beaches and Creeks in the San Diego Region. The TMDL documents were made available to the public for formal review and comment beginning June 25, 2007.

The San Diego Water Board received comments in letters and emails from interested persons on the June 25, 2007 version of the TMDL documents. The letters were not reproduced in this document. Individual comments were excerpted from the letters and email, and organized by subject. The comments were numbered sequentially in this report and the comment numbers were continued from Appendix S, *Response to Comments,* dated June 25, 2007. Individual commenters are identified in the "List of Persons Submitting Comments" on page U-1 of this appendix.

4 Comments and Responses

Comments and responses are grouped according to subject matter in the following subsections.

4.1 Reference System Approach Basin Plan Amendment

Comment 284

We support the interim TMDLs which account for natural sources of indicator bacteria during wet weather. We recommend that steps be taken to amend the Basin Plan to incorporate the reference system approach. There is a sense of urgency to move forward with this amendment as the final TMDLs are significantly higher and therefore, more costly to attain absent the allowance for natural bacteria sources.

Response: The San Diego Water Board is currently working on an amendment to the Basin Plan authorizing the use of a reference system and antidegradation approach or natural sources exclusion approach during implementation of indictor bacteria water quality objectives within the context of a TMDL. Drafts of the technical report and amendment language have been reviewed by the Reference System Stakeholder Advisory Group. The drafts are currently undergoing external scientific peer review. Once the peer review process is completed, the drafts will be released for public review. Release of the drafts for public review is expected to occur in the winter of 2007-2008.

Comment 285

The City is pleased to see that both the State Water Resources Control Board (SWRCB) and the San Diego Regional Water Quality Control Board (RWQCB) have acknowledged the need to address natural sources of pollutants. RWQCB staff has included language that is more definitive in regards to developing a reference system/natural sources exclusion approach Basin Plan amendment under a separate effort from this TMDL project, with a deadline of one-year after the effective date of the TMDL. RWQCB staff had indicated that the project is currently in process, and a Stakeholder Advisory Group (SAG) has been established to participate in this process.

The State Water Resources Control Board is proposing to amend the Ocean Plan to acknowledge non-human sources of bacteria. As we slowly, but diligently, learn more, it appears that addressing non-human sources of bacteria will be a significant piece of the puzzle in terms of planning and implementation. The City has commented appropriately on the Ocean Plan Scoping Document. The City encourages the RWQCB staff to ensure that the TMDL development coincides with the State's proposed efforts.

Response: The San Diego Water Board is an active participant in the State Water Board's public process to amend the Ocean Plan and intends to implement the TMDL consistently with the State Water Board's Ocean Plan efforts.

Comment 286

Page S-21 states that in order to use the natural sources exclusion approach, dischargers must control all anthropogenic sources of indicator bacteria, including the prevention or

infiltration from the sanitary sewer and control of sanitary sewer over flows, etc. It should be noted that the sanitary sewer is owned and operated by an independent water/sewer district in Dana Point, as well as in other cities in south Orange County, over which we have no control. We ask that this fact be acknowledged in the TMDL document.

Response: In order to address this situation, the TMDL has been modified to include as responsible dischargers wastewater agencies that control the sanitary sewer systems. As such, the wastewater agencies will be primarily responsible for sewer leaks or overflows that may enter MS4s and be discharged into receiving waters. This action does not increase the responsibilities of the wastewater agencies as they are already required to prevent discharges from the sanitary sewer to the storm sewers pursuant to their waste discharge requirements prescribed in State Water Board Order No. 2006-0003-DWQ. However, municipalities will also continue to remain secondarily responsible for sewage that is collected, transported, and discharged by their MS4s. This is consistent with the requirements of the Clean Water Act, which requires that municipalities effectively prohibit non-storm water discharges, such as sewage, into their MS4s.[1]

Comment 287

Page S-20 states that the natural sources exclusion approach will essentially recognize natural exceedances of WQOs as long as all anthropogenic sources of indicator bacteria arc controlled. Under the natural sources exclusion approach, after all anthropogenic sources of indicator bacteria have been controlled, a certain frequency of exceedance of the WQOs can be authorized based on applying a natural exceedance frequency to the specific water body.

The City is concerned that this document and process has not considered the detailed method of compliance. For example, the document has made reference of "anthropogenic" sources of indicator bacteria as human and domestic animal waste.

In the following hypothetical scenario, from the eyes of a regulator, do the actions below "demonstrate" that all anthropogenic bacteria are controlled?

- Sewer agency implements its Sanitary Sewer Overflow Prevention Program
- Areas of repeated homeless activity arc regular inspected and homeless are forced to move per current protocol.
- Pet owner ordinance requiring pet owners to pick up pet waste.
- City provides poop pick up bags and trash receptacle in hot spot areas.
- Ongoing education regarding impacts of pet waste to water quality is conducted.

The City feels it is crucial to think about how this TMDL document is going to be implemented in the real world as we are still in the planning/development stage. We understand that details will come later; however we ask that, at the very minimum, please conceptualize how the connection between regulatory requirements and implementation and compliance assessment will work or acknowledge that what was provided above would meet current expectations.

[1] Clean Water Act section 402(p)(B)(3)(ii).

Response: Under the natural sources exclusion approach, control of anthropogenic sources is expected to be demonstrated by using the weight of evidence gathered from several different efforts. The general framework for such an approach would include: (1) demonstration of compliance with all permit BMP requirements related to indicator bacteria sources; (2) implementation of BMPs to control indicator bacteria discharges, such as those BMPs mentioned in the comment, as well as others; (3) performance of a sanitary survey that identifies no ongoing anthropogenic sources; (4) monitoring of indicator bacteria in the target water body to show indicator bacteria levels consistent with natural sources; (5) performance of an epidemiological study demonstrating that swimmers are not subject to elevated health risks; and (6) microbial source tracking indicating that controllable anthropogenic sources are not contributing indicator bacteria to the target water body.

Comment 288

Comment 8. The response in Appendix S indicates that *"Dry weather beach data from near the outlets of San Mateo and San Onofre Creeks (relatively undeveloped watersheds) were used in this project to show that single sample maximum WQOs are rarely exceeded during dry flow conditions. In contrast, SCCWRP showed that single sample maximum WQOs are frequently exceeded at beaches near the outlets of undeveloped (reference) watersheds during wet weather, or storm flow conditions. Thus, a TMDL that allows some exceedance of single sample WQOs is appropriate for storm flow conditions, but not for dry flow conditions. In addition, a reference system approach is not applicable to dry weather TMDL calculations because numeric targets are based on the geometric mean WQOs."*

During dry flow conditions, San Mateo and San Onofre Creeks do not discharge to the ocean. The mouths of the creeks are closed by sand berms during much of the dry season, therefore it is questionable whether this data set is appropriate for determining whether creek inputs can cause single sample maximum WQO exceedances at the beach. This response also appears in conflict with the response to Comment 9 which states *"We recognize that there is essentially no data at this point to quantify bacteria loading from a reference watershed during dry weather."* Additionally, inspection of the dry weather monitoring during 2004-2005 (not evaluated by the Regional Board in the TMDL) within the undeveloped San Onofre Creek watershed also exhibits frequent exceedances of single sample maximum water quality objectives for indicator bacteria. Inspection of data available to the Regional Board clearly indicates that frequent exceedances were observed upstream in San Onofre Creek and the San Onofre lagoon for E. coli and enterococcus, while frequent exceedances at the beach were observed for total coliform. Given the undeveloped nature of this watershed, reexamination and careful consideration of the reference system approach for dry weather seems appropriate.

Response: The San Diego Water Board is currently working on an amendment to the Basin Plan that will authorize the use of a reference system and antidegradation approach or natural source exclusion approach during implementation of indictor bacteria water quality objectives within the context of TMDLs. The amendment is anticipated to authorize use of a reference system and antidegradation approach for dry weather

TMDLs. As such, there will be an opportunity to recalculate the dry weather TMDLs for inland streams using a reference system and antidegradation approach in the future once data are sufficient to use a statistical approach rather than a modeling approach for dry weather TMDL calculations.

Comment 289

Comment 9. *"the data collected at the shoreline of San Onofre and San Mateo Creeks was not used to establish an acceptable exceedance frequency for dry weather. The data was used merely to demonstrate that local beach sources, such as birds, marine mammals, and re-growth in the wrack line, are not sufficient to cause exceedances of single sample maximum WQOs during dry weather conditions. We recognize that there is essentially no data at this point to quantify bacteria loading from a reference watershed during dry weather. However, a reference system approach will not be used to calculate dry weather TMDLs for the reasons described in the response to Comment 8."*

The data from 2004-2005 indicate very different results than those described in the response above. Given that there are exceedances of WQO in undeveloped watersheds during the dry season, the reexamination and careful consideration of the reference system approach for dry weather seems appropriate (as recommended above in #8).

The critical point was chosen as a conservative measure to protect the downstream beach, where the majority of REC-1 use occurs.

It is noted that the perspective of focusing on areas where the majority of the use occurs is one that we condone and encourage the Board to emphasize. In fact, not only are the locations where the majority of the use occurs important, so are the times of the year when the majority of the use occurs.

Response: The 2004-2005 dry weather data from San Onofre Beach support the San Diego Water Board's previous response. Of twelve samples collected and tested for total coliform, E. coli, and enterococci during dry weather at San Onofre Beach, only one sample exceeded water quality objectives, and only for one parameter (enterococci). However, water quality objectives were more frequently exceeded at inland locations on San Onofre Creek during dry weather. These data indicate that a reference system and antidegradation approach may be useful for dry weather TMDLs for creeks. As such, the San Diego Water Board is developing a Basin Plan amendment that will authorize the use of a reference system and antidegradation approach during implementation of indictor bacteria water quality objectives within the context of dry weather TMDLs. Please see the response to Comment 284 above for further discussion of this amendment.

Regarding the comment of focusing where and when the majority of the use occurs, the San Diego Water Board will do so when such an approach conservatively protects beneficial uses.

Comment 290

Comment 17. *In developing the reference system approach, there will be variation in exceedance frequencies from reference watershed to reference watershed. There will*

also be variation in exceedance frequencies based on the method used to determine an acceptable exceedance frequency (e.g., minimum, mean, maximum).

The commenter notes that local reference stations show exceedances of up to 50 percent. However, the commenter fails to note that there are data from reference watersheds that have exceedances as low as 0 percent.

We used a conservative approach when developing the TMDLs. Until evidence is provided that demonstrates a less conservative approach is warranted, the TMDLs that are developed must be protective of the beneficial uses of the receiving waters. At this time, we determined that an allowable exceedance frequency of 22 percent, based on data from the Los Angeles Water Board to be acceptable by the San Diego Water Board for purposes of developing interim TMDLs. When the reference system/natural sources exclusion approach Basin Plan amendment is adopted, region-wide, bacteria-specific, and/or watershed-specific allowable exceedance frequencies will be developed.

The response does not address the comment that was made. The salient points, which remain unanswered are: 1) the methodology of combining the reference system approach developed by the Los Angeles Regional Board to allow a specific exceedance frequency with the wet weather loading approach to estimate required load reductions during wet weather, is without precedent or technical basis, 2) we are very concerned with the lack of sensitivity analysis associated with the current reference system approach. Local reference stations, based on limited data show exceedances of <u>up to</u> 50%, yet the allowable frequencies specified in the TMDL, based on data from the Los Angeles Regional Board, are 22%, 3) We believe that the potential impacts associated with characterizing the sensitivity of reference watersheds to variability justify rigorous and prioritized investigation, and 4) the reference system approach should also be applied to winter dry weather as is the case in TMDLs conducted by the Los Angeles Regional Board (and may be supported by the data discussed in #8 above)

Response: Our response is organized according to the numbered issues found in the comment:

(1) The methodology of using the reference system and antidegradation approach to calculate an allowable exceedance load using exceedance days is technically sound. The methodology has undergone external scientific peer review and has been thoroughly described in the technical report (see Appendix I).

(2 & 3) The allowable exceedance frequency of 22 percent is used for interim TMDLs. As described in our previous response, the 22 percent frequency was chosen as a conservative measure using the best available data (data from more local reference systems was not sufficient for TMDL calculation). However, as new data from better matched reference systems becomes available, the final wet weather TMDLs will be recalculated. Likewise, continuing to characterize and understand variability among different reference systems is important. New information from these efforts can also be used to better quantify exceedance frequencies and recalculate the final TMDLs. The San Diego Water Board will continue to support the ongoing research being conducted on this issue by SCCWRP.

(4) The San Diego Water Board is currently working on an amendment to the Basin Plan that will authorize the use of a reference system and antidegradation approach during implementation of indictor bacteria water quality objectives within the context of TMDLs. The amendment is anticipated to authorize use of a reference system and antidegradation approach for dry weather TMDLs.

4.2 Technical Analysis

Comment 291

We must take exception to the Existing Beneficial Uses statement on page S-44, last paragraph regarding SHELL beneficial use. "Collection of shellfish for consumption along California's coasts and bays is well documented for both commercial and sport purposes," The "well documented" appears unsubstantiated, specifically for the south Orange County area in the northern portion of the San Diego RWQCB region. The City requests a copy of any documentation substantiating this statement for the coast in southern Orange County. RWQCB staff has provided, to date, only an internal memo (attached), dated November 3, 2006 from Christina Arias to Julie Chan regarding a meeting with Department of Fish & Game (DFG) which indicates that DFG wardens have observed shellfishing and/or habitat in San Diego County, and Huntington Beach. From the information provided in the memo, it appears that there are data gaps in south Orange County (areas north of Oceanside in the San Diego Region). Absent any additional "well documented" evidence of shellfishing and/or habitat along the south Orange County coastline, acknowledgement that no documentation exists for south Orange County is requested, please.

Further, the blanket approval for all beaches to meet a higher standard than for human recreation is simply unattainable within the TMDL time frame required and it is also potentially financially infeasible. We would submit that sections of beaches adjacent to major creeks and outfalls from an urban environment, with large bird populations, will seldom meet bacteria total coliform numbers of 70/ l00ml and should be excluded from shellfish harvesting. Let's be smart about this! Since there appears to be no evidence or proof of collection and consumption of shellfish along south Orange County beaches, let's carefully choose certain sections of beaches where shellfishing can be reinstated and have a reasonable chance of regularly meeting this difficult to obtain standard. The RWQCB has repeatedly indicated that this TMDL is not the appropriate venue to address the beneficial uses, as identified in the Basin/Ocean Plan; however wouldn't it make sense to revisit this issue as part of the TMDL implementation plan before dischargers are forced to spend millions and potentially billions of dollars trying to restore a beneficial use that may not be appropriate for all beaches?

Response: All the coastal waters in the San Diego Region are designated as having existing SHELL beneficial use. If a water body is designated with a beneficial use in the Basin Plan, this means that the beneficial use must be supported and the mission of the San Diego Water Board is to ensure that the water quality supports the beneficial use to be in compliance with the Basin Plan. The TMDL is developed to restore and protect water quality to support the beneficial uses in the Basin Plan. The TMDL may identify beneficial uses that are difficult to support, but a TMDL does not determine whether a beneficial use is appropriate or not.

We consulted the DFG to evaluate the possibility that the SHELL beneficial use does not exist anywhere along the coastal waters of the San Diego Region. However, after consulting with the DFG, we concluded that the habitat along the coast, especially the

beaches in this TMDL, is suitable for several harvestable types of shellfish. If the City believes that the SHELL beneficial use does not exist along any coastal segments in Orange County, sufficient evidence must be provided to support the removal of the beneficial use from the Basin Plan. Until then, the all coastal waters will remain designated with the SHELL beneficial use.

The natural sources exclusion approach presented a method for calculating SHELL TMDLs that would not result in meeting WQOs at all times. However, consultation with the USEPA led us to discover that the National Shellfish Sanitation Program Model Ordinance, on which our WQOs for SHELL are based, does not allow consideration of non-anthropogenic sources in its implementation. Because the data from reference beaches show that non-anthropogenic bacteria sources frequently cause exceedances of SHELL WQOs, we decided to remove the SHELL TMDLs from this project.

SHELL will be addressed in a separate SHELL TMDL and/or standards action pending the outcome of the work of the statewide task force involving the Ocean Planning Unit of the State Water Board, the California Department of Public Health, the USEPA, and the coastal Regional Water Boards.

Comment 292

The response to Comment 38 indicates numerous times that "Dischargers are not required to reduce loads caused by background sources, even though these loads are eventually transmitted to receiving waters via MS4s". The City has concern as to how this is going to be quantified and implemented. It also does not account for regrowth/proliferation of background bacteria. For example, even if we could quantify an amount of background bacteria that enters an MS4, that "background" bacteria could multiply in the MS4 and the amount of background bacteria exiting the MS4 could be more that what entered. These issues will need to be taken into account when determining how the natural background exclusion, implementation and assessment methods are developed. Please discuss.

Response: For a TMDL developed using the reference system approach, the load from background sources for an urban watershed is estimated based on the loading in a reference watershed. The “allowable exceedance load” is ascribed to the natural sources and the dischargers do not need to quantify natural loads in the urban watershed. For a TMDL developed using the natural sources exclusion approach, a suggested methodology for estimating non-anthropogenic loads is outlined in the response to Comment 287. How to account for bacteria re-growth in storm drains is an issue that needs further study. Although pathogenic viruses cannot reproduce outside of a host, pathogenic bacteria might be capable of reproducing in the biofilms that line storm drains. The risk posed to human health by “re-growth” bacteria is not well understood at this time.

Comment 293

The response to Comment 41 acknowledges that the there was "limited" validation of the modeling assumptions specific to land use, which is the basis for the entire TMDL. We have any concerns about pursuing an intense regulatory document that will require

extremely large amounts of public funds to implement on a program based on a model that may not be appropriately or carefully validated. The stated lack of time and resources of the RWQCB would seem to be the same difficulty with which dischargers are struggling with.

Response: As stated in the response to Comment 41, validation of modeling assumptions specific to land uses was limited by the lack of land-use-specific water quality data collected in the San Diego Region. Land-use-specific water quality data collected by SCCWRP in the Los Angeles Region were used to determine ranges of bacteria build up rates on specific land uses.

We used bacteria build up rates on different land uses based on the water quality data collected in the Los Angeles Region because there are no land-use-specific water quality data for the San Diego Region. During the calibration of the LSPC model the bacteria build up rates were selected from the bacteria build up rate ranges determined by SCCWRP for the Los Angeles Region. The bacteria build up rates that were selected were then validated to San Diego Region water quality data. Please see Appendix J, section J.2.5 for a more detailed discussion.

The commenter may be concerned that the build up rates selected are not based on San Diego Region water quality data. However, the alternative is to make assumptions that are not based on any water quality data, but based on literature or other sources that would likewise not be based on data specific to the San Diego Region. We believe that the bacteria build up rates selected are appropriate based on the results of the model validation using the model calibrated with the bacteria build up rates selected.

However, a special study could be performed as part of the TMDL implementation to obtain bacteria build up rates for different land uses specific to the San Diego Region. The model can be re-calibrated and re-validated with the new bacteria build up rates based on the San Diego Region land-use-specific water quality data.

Comment 294

Per Comment 59, the City requests that the concurrence that MPN is an equivalent metric to CFU be written into the TMDL document.

Response: We concur that MPN is an equivalent metric to CFU. However, we have not revised the TMDL documents. The units that will be used to measure bacteria densities in the water samples collected should be discussed during the stakeholder process prior to submission of the Pollutant Load Reduction Plans.

Comment 295

The response to Comment 82, "Whether or nor the use of infiltration is feasible in terms of complying with TMDL requirements is the responsibility of the dischargers to investigate. We cannot speculate on the manner of compliance with the TMDLs."

One has to question how realistic the financial analysis is, in terms of Implementation, as well as assessment of compliance, with the RWQCB response noted above. Suffice to say that we believe the financial analysis provided to date is vastly underestimated.

Response: We have provided an economic analysis that is based on the reasonably foreseeable means of compliance. We have provided a range of potential costs for several types of BMPs for 10 percent of urbanized areas. The costs may be scaled up or down depending on the planned percentage of urbanized areas where structural controls will be implemented. The methods to comply with the TMDLs will be selected by the dischargers. What methods are selected will determine the cost of implementation. The estimated cost ranges are based on the sources cited in the economic analysis, which are accepted industry costs. We do not believe the economic analysis is underestimated.

Comment 296

Based on our detailed review of this most recent version of the TMDL document including Appendix S, it is clear that 1) other interested organizations and agencies shared many of the same concerns we expressed, 2) many of our comments were not addressed in a substantive manner, and 3) on many of the issues that we perceive to be most critical, we have reached a scientific and/or technical impasse with Board staff.

For example, we have been and continue to be particularly concerned that the selected technical approach for the TMDL may not lead to enhancements in beneficial use protection that are commensurate with the expenditure of potentially significant public funds that will be required to achieve the required bacteria loading reduction in the various watersheds. Heal the Bay expressed a similar concern in their comments (P. S-89) indicating that the TMDL would not lead to attainment of the water quality standards. Board staff continue to support the position that this approach is the most suitable for the impaired waters addressed in this TMDL, although the approach employed for this TMDL appears not to have been used previously (the TMDL document indicates that two previous TMDLs have used a similar method of expressing the allocations, however the technical approach used for TMDL LA and WLA development employed in this TMDL is substantially different than those cited), and is apparently intentionally ambiguous in terms of measuring compliance. During the February 2006 Regional Board meeting, former Board Chairman Minan requested staff to provide "the support for why that approach (expressing wasteload reductions as million MPN/year) is better than the approach taken with respect to Santa Monica Bay". In our opinion, the explanation provided by Board staff (p. S-119)[2] is inaccurate and not sufficient to overcome the serious shortcomings noted above.

Response: The WLAs and LAs and existing loads calculated in the watershed models provide a basic understanding of where bacteria loads may be reduced to meet the TMDLs. While expressing the TMDLs in terms of "exceedance days" may give the dischargers the impression that it will be allowable for WLAs to be exceeded, it is not a metric that can be used by watershed managers to identify where bacteria loads can be reduced. The primary goal of the TMDLs is to restore the water quality of the impaired water bodies to support the designated beneficial uses.

2 . "A metric expressed in a term different from a load, such as exceedance days (as has been approved by the LA RWQCB and SWRCB) does not allow program managers to decipher a percentage by which loads must be reduced, nor help with selection of BMPs

Million MPN/year may or may not be used as a metric for compliance, but is used in this TMDL as a metric for identifying controllable bacteria sources that require load reductions. The TMDLs are calculated using numeric targets based on water quality objectives in the Ocean Plan and Basin Plan for indicator bacteria. If the water quality objectives are met, the water quality supports the designated beneficial uses. This essentially means that compliance with the water quality objectives in the Ocean Plan and/or Basin Plan will restore the water quality that will support the designated beneficial uses and, thus, will result in compliance with the TMDLs.

Reducing the bacteria loads in the receiving waters will likely require a reduction of bacteria sources as well as end of pipe treatment. The costs associated with end of pipe treatment can be prohibitively expensive if the bacteria sources are not adequately controlled. If the dischargers believe end of pipe treatment methods are the only means that may be implemented to comply with the TMDLs, then we can understand a statement such as "*the TMDL may not lead to enhancements in beneficial use protection that are commensurate with the expenditure of potentially significant public funds that will be required to achieve the required bacteria loading reduction in the various watersheds*" can be made. However, source control methods (i.e., public education, and developing and enforcing ordinances) can significantly reduce pollutant loads with comparatively low expenses. We encourage the dischargers to explore the effectiveness of source control before concluding that bacteria pollutant loads cannot be reduced to meet the TMDLs.

Comment 297

The draft report indicates the wet weather numeric targets were set equal to the <u>single sample maximum WQS</u> (p.35), where the basis for the WQS are as follows:

"The REC-1 WQOs for indicator bacteria that are applicable to the Pacific Ocean shoreline are contained in the Ocean Plan (SWRCB, 2005). Those applicable to inland surface waters are contained in the Basin Plan. The objectives contained in both Plans are derived from water quality criteria promulgated by the USEPA in 1976, 1986, and 2004. Both the Ocean Plan and Basin Plan contain REC-1 objectives for total coliform, fecal coliform, and enterococci, and SHELL objectives for total coliform. In addition, the Basin Plan contains REC-1 objectives for Escherichia coli (E. coli) for inland surface waters." (P. 34).

This comment applies specifically to the single sample maximum values for the total coliform objective for the SHELL use and the fecal coliform objective for the REC-1 use for inland surface waters (that is, creek and steams). Based on the information presented in Appendix F, the relevant WQS are as follows:

<u>Fecal coliform WQS for REC-1 for inland waters</u>: Based on a minimum of not less than five samples for any 30-day period, shall not exceed a log mean of 200 per 100 ml, nor shall more than 10 percent of total samples during any 30-day period exceed 400 per 100 ml.

<u>Total coliform WQS for SHELL</u>: At all areas where shellfish may be harvested for human consumption, as determined by the Regional Board, the following bacteria objectives

shall be maintained throughout the water column: The median total coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml.

Table 4-2 indicates that the interim and final wet weather target for fecal coliform is 400MPN/100mL and the final wet weather target for total coliform is 230MPN/100mL (p.40). Further, the allowable loads were computed as the daily flows multiplied by the representative numeric targets to create a numeric target line across the load duration curve (pp64-65).

Based on this information, it appears that the allowable loads neglect the fact that in both cases the WQS are 90th percentile values, not values which are never to be exceeded. The potential implications in terms of allowable loads is significant, as illustrated below. Assuming that the distribution of bacterial indicators is lognormal with a 50th percentile (median) of 70MPN/100mL total coliform and 90th percentile of 230 MPN/100ml (as would be the case for the SHELL WQS), the expected distribution of TC for a waterbody meeting the WQS is as follows (obtained via simulation of 25,000 iterations, exact solution would vary slightly):

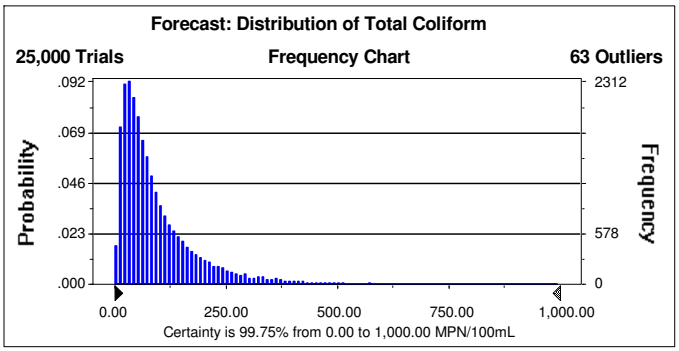

Summary statistics for this distribution are as follows:

%ile of Distribution	MPN/100 mL
0%	3
10%	21
20%	31
30%	42
40%	54
50%	68
60%	88
70%	112
80%	152
90%	229
91%	240
92%	252
93%	270
94%	288
95%	317
96%	348
97%	390
98%	460
99%	580
99.5%	730
99.7%	895
99.9%	1495

Inspection of these data clearly indicates that a 90th percentile drastically underestimates the maximum coliform densities that could be expected when a waterbody is in compliance with the WQS. For example, the data shown indicate that 1% of the time, total coliform densities above 580 MPN/100mL should be expected in a waterbody just meeting the applicable WQS, and 0.5% of the time total coliform densities above 730 MPN/100mL should be expected. When this information is considered in the context of the loading based approach employed for TMDL allocations, the potential impacts on the TMDL are substantial. For example, the bacterial loadings that would be associated with an observed total coliform concentration of 580 MPN/100mL (which would be expected 1% of the time in a waterbody meeting the WQS) could be up to 150% higher than the allowed load based on the methodology described in the Draft TMDL document.

A similar analysis can be developed of the fecal coliform WQS that apply to the REC-1 wet weather TMDLs for inland waters. Such an analysis (not shown) indicates that 1% of the time, fecal coliform densities above 690 MPN/100mL should be expected in a waterbody just meeting the applicable WQS, and 0.5% of the time fecal coliform densities above 800 MPN/100mL should be expected in such a waterbody. For comparative purposes, the allowable loads in the draft TMDL document are based on a maximum concentration of 200 MPN/100ml.

Thus, the allowed loads, as computed in the TMDL may substantially underestimate the loads that should be allowed under the methodology described in the draft document, based on the stringency of the WQS in the Basin Plan. Further, the differences noted above could be substantially greater than the usual 10% that is included as an explicit margin of safety.

If it was the intention of the Regional Board to set the stringency of the TMDL equal to that of the applicable WQS (with a reasonable and appropriate margin of safety), it

appears that the loading (and all subsequent) calculations corresponding to the single sample maximum values for the total coliform objective for the SHELL use and the fecal coliform objective for the REC-1 use for inland surface waters may need revision.

Response: While the commenter's statistical analysis is technically correct, there are several points that should be acknowledged.

First, there may be water samples collected with bacteria densities that exceed the single sample maximum numeric targets selected for the TMDLs that could still statistically be in compliance with the water quality objectives found in the Basin Plan. However, in our experience, seldom do the dischargers collect enough samples in a month to statistically demonstrate that a high bacteria density result is either an anomaly or within a statistically acceptable range. Additionally, if we were to take the statistical example provided by the commenter to the extreme, technically the "maximum" result could be infinity, given the asymptotic result of the simulation, which is obviously not acceptable under any circumstances.

Second, the water quality objectives of the Ocean Plan, included in the discussion of applicable water quality objectives in Appendix F of the Technical Report, are also a factor in selecting the numeric target. The Ocean Plan states that the single sample maximum fecal coliform density shall not exceed 400 MPN/100 ml. Because all the water bodies in this TMDL are within the ocean, or ultimately discharge into the ocean, the water quality must be consistent with the water quality objectives in the Ocean Plan.

The numeric targets for the TMDLs were selected to be protective of water quality under "critical" conditions and protective of beneficial uses designated in the Basin Plan and Ocean Plan. The commenter has not provided any evidence to show that the numeric targets could be increased and still be protective of beneficial uses under "critical" conditions.

Comment 298

Comment 33a. *In a letter to the SWRCB dated January 31, 2006, the San Diego Water Board recommended that all waterbodies, regardless of quality during dry weather, remain listed if no wet weather data is available to demonstrate support of beneficial uses. Even if the waterbodies in question are de-listed in the 2008 list evaluation, they will be included in this TMDL project. Please see the response to Comment 190 for further discussion.*

The response does not address the comment. The comment was that draft SWRCB policy and guidance for the development of TMDLs has not been followed. According to the SWRCB policy, the original listing of the water body should be re-evaluated based on current existing data. According to the State Regulatory Structure and Options Policy, "If the water body is neither impaired nor threatened, the appropriate regulatory response is to delist the water body." The SDRWQCB recommendation regarding listing waterbodies does not conform with the SWRCB Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List.

Response: The existing data were evaluated in the early stages of TMDL development, and during the 2006 303(d) process. Although beaches in the Scripps and Miramar

Reservoir Hydrologic Subareas were delisted by the State Water Board in 2006, the Technical Report has been revised to provide an explanation for why we are proposing TMDLs for these beaches. Please see Appendix T.

Comment 299

Comment 33b. *The San Diego Water Board has no basis to reject the Ocean Plan WQOs and use different ones.*

The response does not address the comment. It is not suggested that the WQOs be rejected. Rather our comment was to indicate that the appropriateness of the uses be evaluated for some of the listed sites. In fact, changes have been made to this version of the TMDL document that are consistent with this comment. For example, refer to page 39 and Table 4-2. Our original concerns remain, and we believe that the Regional Board has much more leeway and authority in interpreting the Basin Plan than has been exercised to date.

Response: The beneficial uses are designated in the Basin Plan and Ocean Plan. Any de-designation of a beneficial use for a water body could only occur after a Use Attainability Analysis and Basin Plan amendment, which would require significant evidence as well as public input. This type of analysis is beyond the scope of these TMDLs. Further, the dischargers have not yet provided convincing evidence that the San Diego Water Board should pursue a standards action rather than a TMDL to address the bacteria listings. If this information is developed, it can be brought to the San Diego Water Board for consideration at any time.

Comment 300

Comment 34. *The analysis of hydrologic model error based on volumetric comparisons provided sufficient evaluation of model error for purposes of this study.*

As one example illustrating our concerns with the TMDL modeling and performance, please consider the following text from Appendix K. *"The methodology for estimating fecal coliform concentrations was not as successful for prediction of total coliform and enterococci. Similar regression analyses were performed to determine whether there are relationships between total coliform and enterococci and land use and subwatershed size, but no acceptable correlations were found. As a result, a separate approach was used for estimating total coliform and enterococci concentrations in dry weather runoff for each subwatershed….. The following are the resulting equations obtained (units of fecal coliform and total coliform/enterococci are consistent): total coliform = 5.0324 × fecal coliform and enterococci = 0.8466 ×fecal coliform."*

Given the available scientific information regarding the ubiquitous and substantial variability of indicator data in ambient waters, we question the robustness of the stated relationships with respect to temporal and spatial variability. Further, without any sensitivity analysis it is impossible to know how these point estimates for characterizing indicator densities impact the resultant TMDL loadings. Thus, it is difficult to understand what the basis was for accepting that the potential model error is sufficient for the purposes of this study.

Response: There were two models and approaches calibrated separately for TMDL development: a dynamic model for wet periods and a steady-state model for dry periods. The referenced text, *the analysis of hydrologic model error based on volumetric comparisons provided sufficient evaluation of model error for purposes of this study,* from the response to Comment 34 was used to describe the hydrologic calibration which the original comment stated *Calibration and validation of model performance are presented only as figures for a visual inspection. Some error analysis was conducted for the wet-weather hydrology, but not discussed*. The reference text was meant to address this comment. However, the response above refers to the dry weather model, and references discussions that are not relevant to the wet-weather hydrologic calibration discussion. Furthermore, the response uses as examples text from Appendix K that describes assumptions developed for the dry modeling approach, not calibration results or results meant to illustrate model accuracy. Separate calibration results were presented for illustration of the sufficiency of these assumptions to represent typical dry-weather bacterial densities.

Comment 301

Comment 35. *Evaluation of the sensitivity of modeling parameters was a key consideration during the model calibration process to provide modelers insight regarding parameters requiring adjustment…. To provide information recommended by the commenter on model uncertainty based on sensitivity analysis, many model input parameters would require adjustment based on high and low confidence interval values. However, such confidence intervals are not available for each parameter, which would result in an arbitrary selection of a confidence range (e.g., +/- 50% of the parameter value). As a result, sensitivity analyses would be informative regarding sensitivity of each input parameter, but ranges of predictive values are not directly transferable for determination of model uncertainty and a numeric MOS with confidence. Moreover, additional non-modeling assumptions were considered in the implicit MOS of the TMDL, and quantitative measures of each of these assumptions relative to modeling assumptions will also require further study.*

The uncertainty in the modeling is acceptable for the regulatory decisions required in this TMDL which is based on the best available data and method of analysis. We acknowledge that the development of the bacteria TMDLs is characterized by data gaps and uncertainties. Scientific uncertainty is a reality within all water quality programs, including the TMDL program, and it cannot be entirely eliminated. The TMDL program must move forward in the face of these uncertainties if progress in establishing TMDLs and attaining WQOs in impaired waters is to be made.

Based on the responses in the first paragraph above, it appears that the Board staff appreciate the technical importance of this comment. However, science policy decisions, as described in the subsequent paragraph are flawed. For example, no information is presented to suggest that the uncertainty is acceptable. While we agree that improvements to water quality are necessary, the appropriate balancing of resources with benefits is conditional on the best possible inferences from the available science which therefore requires a high level of transparency and rigor, to the degree feasible. Thus, as suggested in the original comment, sensitivity and

uncertainty analyses should be conducted and used to evaluate and/or verify the potential impacts on the loading required by the TMDL.

Response: As stated in the original response to this comment, *To provide information recommended by the commenter on model uncertainty based on sensitivity analysis, many model input parameters would require adjustment based on high and low confidence interval values. However, such confidence intervals are not available for each parameter, which would result in an arbitrary selection of a confidence range (e.g., plus or minus 50 percent of the parameter value). As a result, sensitivity analyses would be informative regarding sensitivity of each input parameter, but ranges of predictive values are not directly transferable for determination of model uncertainty and a numeric MOS with confidence.* The commenter should be aware that each parameter can have different impacts on results, and arbitrary selection of a range for that parameter, such as the parameter values plus and minus 20 percent or 50 percent, does not have meaningful translation when evaluating impacts of model results on TMDL load estimates.

The model calibration results were sufficient to use the models for science policy decisions such as this TMDL. These results represent the present state of the science in modeling indicator bacteria loads in the region for both wet and dry conditions. Further technical peer review verified this opinion as the reviewers were specifically asked whether modeling assumptions or results were sufficient. None of these independent, unbiased, peer reviewers suggested that these models or their applications were insufficient for the TMDL.

As more water quality and flow data are collected in the waterbodies addressed in this TMDL, the models can be further tested and additional uncertainty analyses can be performed in the future. We encourage stakeholders to collect such data and further test model uncertainty under an expanded range of hydrologic and pollutant loading conditions. These results will prove useful in working with the San Diego Water Board to evaluate the implementation of the TMDL and ensure that future resources and benefits are balanced with the latest and most up-to-date state of the science.

Comment 302

Comment 36. *An explicit MOS is not required for calculation of TMDLs.*

Our comment was that the report should explicitly list each of the conservative assumptions used to form the MOS and (at least) discuss the potential relative magnitude of the assumption's importance on the estimated loading capacity. The response does not address the comment.

Response: The report explicitly *lists* the modeling and non-modeling assumptions in Appendix L and section 8.1.7. Quantitatively describing the impact of each individual assumption is equal to describing an explicit assumption, which was the basis of the original response to the comment. Implicit conservative assumptions are acceptable for TMDL development, and do not require quantification or translation into explicit assumptions with defined quantitative impacts on TMDL results.

Comment 303

Comment 37. *The average flows calculated for the dry-weather model were based on dry weather monitoring data collected from Aliso Creek, Rose Creek, and Tecolote Creek. These average flows were relatively small, ranging from 0.007 to 0.23 cfs. The differences between calculated median and average (mean) flows are less than 0.05 cfs, which are negligible. Moreover, the monitoring data are unlikely to be accurate within this range. Thus, average flows are acceptable for estimation of dry-weather flows in this study.*

Our comment was that median flow values should be used (to compute loadings) since mean flow values will greatly increase the loading due to higher assumed flow. Based on the response it appears that monitoring data may not be sufficiently accurate to compute loadings, which brings into question the reductions required by the TMDL. While we understand that modeling is necessary in cases where sufficient data do not exist to make decisions, it is important that technical underpinnings are as correct as possible. The response above does not help to understand if/how the reductions required by the TMDL are accurate.

Response: As stated in the original response, *The differences between calculated median and average (mean) flows are less than 0.05 cubic feet per second (cfs), which are negligible. Moreover, the monitoring data are unlikely to be accurate within this range*. The difference of 0.05 cfs does not *greatly increase* the loading as stated in the response above. Also, the accuracy mentioned in the original response describes the ability to measure a difference of 0.05 cfs in the field, and in no way illustrates that *data may not be sufficiently accurate to compute loadings, which brings into question the reductions required by the TMDL*, as stated in the response above.

Comment 304

Comment 38. *The reference system approach, which will be incorporated into the Basin Plan permanently, accounts for discharges of bacteria from background sources.*

We encourage the Regional Board to adopt the TMDL and the Basin Plan amendment simultaneously so that there is no ambiguity on this point.

Dischargers are not required to reduce loads caused by background sources, even though these loads are eventually transmitted to receiving waters via MS4s.

Please clarify whether this statement is true throughout the year including the winter dry weather season.

Response: The statement is taken out of context with regard to the complete response to Comment 38, in which we discussed how the reference system approach accounts for background loads. Please see the response to Comment 292 where we clarify the statement about loads from background sources.

Comment 305

Comment 40. *The modeling analysis does not assume that there is a consistent relationship between flow and bacteria loads. Bacteria loads are assumed to be a*

function of land use types comprising each watershed, as discussed in the source analysis.

The response does not help to clarify the issue addressed in the comment. Section 5.3 of the TMDL indicates that fecal coliform levels varied throughout the year and were not related to flow. The text then indicates that "This indicates the need to assess bacteria separately during both wet weather events and dry weather conditions." We do not understand the logic used to arrive at such a conclusion based on the observation presented. Please clarify this point.

Response: In Section 5.3, high bacteria densities were shown to occur during both dry and wet conditions. The statement, *this indicates the need to assess bacteria separately during both wet weather events and dry weather conditions*, simply means that since both conditions result in high bacteria densities, both conditions should be addressed in modeling analyses.

Comment 306

Comment 41. *Validation of modeling assumptions specific to land uses was limited by the lack of land use-specific water quality data collected in the San Diego Region.*

Thank you for the clarification. Our point was that "these data are so key to the model results" that the implications of the uncertainties need to be discussed.

Response: Lack of land-use-specific water quality data collected in the San Diego Region can lead to model uncertainty. However, this uncertainty cannot be evaluated or quantified until land-use-specific monitoring data are collected and available in the San Diego Region for comparison with model predictions.

Comment 307

Comment 42. *The steady-state approach for defining dry-weather flows and bacteria loads is acceptable and adequate for loading assessment and TMDL calculation. A steady-state approach for prediction of dry-weather flows is typical for source assessments used in TMDLs. Similar modeling approaches have been used for calculation of TMDLs in the Los Angeles Region where dry-weather runoff is also common, including TMDLs for Ballona Creek and Los Angles River, and models currently under development by USEPA for estimation of dry-weather loads to San Gabriel River and Los Angeles and Long Beach Harbors.*

We indicated that the fundamental decision about which type of modeling to employ was based on the assumption that the Region is "*dominated by nonpoint sources that are generally constant on an hourly time step and deposit directly to drains*". We further noted that there is no documentation given for the basis of this assumption about the behavior of nonpoint sources, nor is there any reference to more detail in an Appendix. The response to our comment does not substantively explain the technical decision that was made.

Response: As stated in the original response to this comment, *the assumption in the comment that the Region is "dominated by nonpoint sources that are generally constant*

on an hourly time step and deposit directly to drains" refers to wet weather, for which a LSPC model was developed that provides hourly predictions of flow and bacteria concentrations assumed constant during each hourly time step. This does not refer to an assumption used in selecting a dry-weather modeling approach, as stated by the comment. The text has been clarified to this effect. In other words, the stated assumption regarding the *dominated by nonpoint sources that are generally constant on an hourly time step and deposit directly to drains* is meant to refer to wet weather. This refers to the adequacy of the wet-weather model to simulate flows and bacteria densities at an hourly time-step. It is unclear given the statement quoted above from the response to the comment, in addition to the new response provided above, what the new response is referring to regarding the technical decision made. We are confident that an hourly timestep is sufficient to model and characterize wet-weather flows and bacteria densities, and does not require more-detailed discussion, justification, or documentation in the report. Since the rainfall data is typically provided at an hourly time-step, and the models are based on rainfall for model input, the model cannot be expected to provide simulation at a time-step less than an hour.

Comment 308

Comment 43. *The TMDL must provide protection of receiving waters during all periods when the designated use is applicable, including periods most impacted by watershed flows, the wettest year was used as the critical period for TMDL calculation. Reduction in bacteria loads calculated based on the critical wet year provides assurance that load reductions will be sufficient during all periods.*

We indicted that it would be useful to see model runs that show the sensitivity of the TMDL targets to different rainfall years, and that the choice of this particular year seems arbitrary. We continue to believe that without some sensitivity analysis, the implications of the selected year are unknown.

Response: As stated in the original response, *The critical wet year was the wettest year of the model simulation period based on rainfall data used to develop the wet-weather model. The model simulation period was from 1990 through 2002. Year 1993 was characterized with the most rainfall, and produced more flows and resulting loading of bacteria to receiving waters than any other year during the simulation period. Since the TMDL must provide protection of receiving waters during all periods when the designated use is applicable, including periods most impacted by watershed flows, the wettest year was used as the critical period for TMDL calculation. Reduction in bacteria loads calculated based on the critical wet year provides assurance that load reductions will be sufficient during all periods. The same critical wet year was used in calculation of TMDLs for Santa Monica Bay Beaches in the Los Angeles Region. Therefore, selection of this critical period was not arbitrary.* Sensitivity analysis is irrelevant when considering that the criterion for selection of the critical period was the wettest from 1990 through 2002 modeled (and is also the wettest through 2006). Any sensitivity analysis will still show that 1993 was the wettest year for this period.

Comment 309

Comment 44. *Bacteria loading was modeled as a function of land use, and all land uses have both natural sources (wildlife) and anthropogenic sources of bacteria. Once pollutants are washed into an MS4, municipalities are responsible for these pollutants in the waste stream discharged from the MS4s.*

This comment seems to be in conflict with the response to comment #38, which indicates: "*Dischargers are not required to reduce loads caused by background sources, even though these loads are eventually transmitted to receiving waters via MS4s.*" Please clarify.

Response: The dischargers are responsible for any bacteria loads that are discharged from the MS4s. However, if the dischargers can demonstrate that the bacteria loads from the MS4s are not from anthropogenic sources, then those loads may be considered background or natural loads for the purpose of calculating a TMDL under the natural sources exclusion approach. With the reference system approach, an allowable exceedance load is calculated based on the exceedance frequency in a reference system. The allowable exceedance load represents the non-anthropogenic loading in the urban watershed that causes allowable exceedance of WQOs.

Comment 310

Comment 45. *The bacteria TMDLs must ensure that WQOs are met in all conditions and at all times. The REC-1 beneficial use is a component of a water quality standard and is not intended to be used as a risk management index that calculates a level of risk. The bacteria TMDLs will not address issues dealing with the appropriateness of existing REC-1 beneficial uses or the bacteria water quality standards in the Ocean Plan. These types of issues are more appropriately addressed by amending the WQOs in the Ocean Plan through the formal amendment process.*

This response did not address the comment. The important issue is whether or not REC-1 is appropriately designated for <u>creeks and streams</u> during storm events. While it is agreed that this TMDL may not be the appropriate venue for resolving the question, the question is germane in that the TMDL requires municipal agencies to reduce bacterial loadings during storm events based on the assumption that the designations are appropriate during storm events. The Santa Ana RWQCB has recognized this as an important issue also and is considering how to rectify the issue in their jurisdiction. The SD RWQCB should consider this issue in the near future and the TMDL should be subsequently amended.

The commenter should also keep in mind that the wet weather TMDLs address not just the period of the storm, but the 72 hours after cessation of rainfall when bacteria levels remain high at beaches. Weather can improve significantly within 1 to 3 days of a storm, so the assumption that inclement weather keeps swimmers out of the water during storm flow conditions is not entirely correct.

Please clarify whether the loading (flow times concentration) that occurs during the 72 hours following a storm is considered to be part of the wet or dry weather TMDL allocation.

Response: For the response to the first part of this comment, please see the response to Comment 299.

The peak of the flow from a watershed after a storm may not occur until after the storm ends. The loading that occurs during the storm flow is considered to be part of the wet weather TMDL allocation. For TMDL calculations, we included the 3 days (72 hours) after a storm in the wet weather load calculations.

Comment 311

Comment 47. *Bacteria loading from urban creeks should be reduced even though open space loading exceeds the capacity of the creeks and beaches because pet waste and human sewage are more likely to occur in urban runoff. We recognize that it will be difficult for dischargers to meet final allocations and WQOs during wet weather. Therefore, we are developing a Basin Plan amendment to permanently incorporate a reference system/natural sources exclusion approach for implementing bacteria WQOs.*

This response highlights the importance of adopting the Basin Plan Amendment at the same time as the TMDL to ensure that the TMDL is implementable.

Response: The Basin Plan amendment is a high priority for the San Diego Water Board. In the Implementation Plan, the San Diego Water Board has committed to consider the Basin Plan amendment and revise the wet weather TMDLs within one year of OAL approval of these TMDLs. Further, the dischargers will not be required to submit Bacteria Load Reduction Plans for the final wet weather TMDLs until after the San Diego Water Board takes that action.

Comment 312

Comment 90. *The methodology used to develop allocations … was designed to produce proportional load reductions among the two main discharger categories. In formulating this methodology, we attempted to use a fair approach to developing load allocations and reductions. Setting allocations proportional to existing loading was the way we chose to accomplish this. We agree that agricultural and livestock practices lend themselves to the opportunity for water quality control. Agricultural and livestock dischargers may be able to meet their allocations easier or faster than MS4 dischargers, or achieve that load reductions in excess of 13 percent. This could create an opportunity for trading pollution credit. Municipal dischargers could meet their reductions by paying for BMPs to achieve higher load reductions from agricultural and livestock facilities.*

While this comment provides insight towards understanding how the decision was made, it seems inequitable, unreasonable, and arbitrary. We encourage the Board to reconsider this policy decision and formulate a policy that emphasizes reductions of loadings based on ease (and cost) of implementation in conjunction with the likely benefits associated with such reductions (i.e. those that are easy and inexpensive should be required first).

Response: The decision was made based on the model results showing that the MS4s are the largest controllable sources of bacteria. Reduction of bacteria loads from the largest controllable sources of bacteria should be the first focus of the efforts to meet the TMDLs. Load reductions from the largest controllable sources of bacteria will further

highlight and help identify the sources of loading that is occurring from smaller controllable sources of bacteria.

Methods of implementation are more appropriately discussed in a stakeholder process prior to submission of the Pollutant Load Reduction Plans. The MS4 dischargers should propose both compliance methods and assessment locations in their Pollutant Load Reduction Plans, which will be unique to each watershed. The compliance methods and assessment locations will help the dischargers determine where and what types of BMPs should be implemented. The dischargers must decide which methods, in terms of ease and expense, will be implemented first.

Comment 313

Comment 96. *Dry-weather loads were not predicted based on the arithmetic average bacteria densities, but were based on the regression analyses of the geometric mean of bacteria densities observed in multiple streams throughout the San Diego Region, as discussed on page K-7 of Appendix K.*

The response does not address the comment. The point of the comment is that the loading based approach using the geometric mean WQO times the average flow as the basis for the allowable loading, unintentionally imposes WQS more stringent than those in the basin plan. For example, assume for the sake of simplicity that the flow in a hypothetical stream covered by the TMDL is constant for a whole month and that daily (30) fecal coliform observations are available for the stream. The allowable loading based on the stated approach (p.68) would be the geometric WQO (200 MPN/100mL) times a constant times 30 days. The actual loading (based on observed data) would be the sum of each of the observations times the same constant. Thus to meet the allowable load, the sum of the 30 observations would need to be less than the geometric mean standard times 30 (or equivalently the arithmetic average of the observed data must be no greater than the geometric mean WQO). The response to comment 140 confirms this: *Conceptually, the sum of the bacteria loads from the creek or river at the shoreline from every day in a given month must be less than or equal to the dry weather TMDL.* The point is that this method inadvertently requires the average value (sum/#observations) to equal the geometric mean standard. Because bacterial indicator data are typically lognormally distributed (right skewed), this effectively puts in place a standard that is more stringent than in the Basin Plan.

Response: The method for implementing, monitoring, and reporting compliance with the dry weather wasteload allocation has not been specified in this TMDL, and will not be determined until wasteload allocations are ultimately incorporated into the revised MS4 permits. As an example of an alternative to the approach mentioned by the commenter, the 30-day geometric mean of observed daily (or weekly, which has also yet to be determined for specification in the revised MS4 permit) bacteria densities can first be calculated, and this value can then be multiplied by the sum of the daily flows. This will not result in comparison of an arithmetic average verses a geometric mean. There are other options for implementing the TMDL, which will be fully described in the revised MS4 permit.

Comment 314

I'm curious please explain what is a "waste metabolozing bacteria" is. The reference to this is found on page 144 in the landfills section.

Response: "Waste metabolizing bacteria" breakdown volatile organic compounds (VOCs) in a landfill (e.g. petroleum hydrocarbons, chlorinated solvents). The bacteria are naturally occurring, but can be increased in the landfill by adding food sources, or additional cultures to speed up the breakdown of VOCs if necessary. Naturally occurring bacteria break down almost anything organic in the landfill.

Comment 315

With regard to achieving the zero Wasteload Allocation in any size storm, is there data to suggest that the facilities shown in R-67 or R-70 would lead to compliance with this TMDL?

Response: The facilities shown are examples of BMPs that may be implemented by the dischargers. At this time we have not determined how compliance with the TMDLs will be measured because these details are not necessary at this stage. Methods for determining compliance are more appropriately discussed in a stakeholder process prior to submission of the Pollutant Load Reduction Plans. The dischargers should propose compliance methods, assessment locations, and compliance metrics in their Pollutant Load Reduction Plans, which may be unique to each watershed.

Comment 316

Please describe how a bacteria loading at the “critical point” (modeled as being above the tidal prism, approximately one mile from the nearest beach in the San Diego River) is related to achieving receiving water standards at the beaches at the base of the river. This assumption is the foundation of the TMDL, the proposed Waste Load Allocations, and BMP requirements.

Response: The critical point is a node in the model representing the culmination point at the bottom of the watershed, before intertidal mixing and dilution takes place. Conceptually, this critical point is the place where freshwater and saltwater meet. The actual location in the watershed where freshwater and saltwater meet will depend on the time of day and year, but may be well inland during extreme high tides, and at the beaches of the coast during extreme low tides. During extreme low tides, when the freshwater conceptually may be discharging directly to the beach, the water quality objectives of the freshwater must comply with the water quality objectives of the beach waters. Thus, the critical point must meet the water quality objectives of both inland surface waters and surface waters at the beaches. Also, by calculating the TMDLs at the “critical point,” we incorporated an implicit margin of safety into the TMDLs by not considering any dilution of creek water in the wave wash of the beach.

4.3 Water Quality Objectives/Indicator Bacteria

Comment 317

Comment 106. Our comment was: The best available science clearly indicates that 2 of the 3 indicator organisms employed in the TMDL (total and fecal coliform) are uncorrelated with risk to human health and thus, to the protection of the beneficial use. We believe that the Regional Board should consider the policy implications of this assumption relative to current and future listings, as well as the implications of this assumption as it constrains the ability of the staff to evaluate impairment based on the best available scientific information. Staff efforts should be focused on the indicator(s) that has (have) the strongest link to public health protection (enterococci) and that will result in true protection of beneficial uses. Limited resources should not be spent on controlling indicators that do not correlate with protecting public health.

The response was: *Since the Basin Plan and Ocean Plan include WQOs for total and fecal coliform, we are required to develop TMDLs for waterbodies not meeting these WQOs. We agree that efforts by all parties should be focused on the indicators that have the strongest link to public health issues and will result in true protection of beneficial uses; therefore we encourage dischargers to focus their efforts on abating anthropogenic sources of bacteria.*

We believe that the Regional Board has more authority than alluded to in this comment. There is not credible epidemiological evidence linking either total coliform or fecal coliform with health effects in humans via recreational activities. The large base of scientific information strongly indicates that the indicators recommended by USEPA, at the current time are the best available (*E. coli* and/or enterococci). Our comment was not to revise the objectives, but rather to "consider the policy implications of this assumption relative to current and future listings, as well as the implications of this assumption as it constrains the ability of the staff to evaluate impairment based on the best available scientific information". Further, we feel very strongly that efforts and resources should be focused on the indicators that have the strongest link to public health protection (*E. coli* and enterococcus). Such an effort would be most likely to result in true protection of beneficial uses.

Response: We do not have the authority to develop TMDLs for some bacteria WQOs and not others. We are required to adopt TMDLs for all bacteria WQOs in the Ocean Plan and Basin Plan for the affected waterbodies, or else undertake a standards action to either de-designate the beneficial use or revise the WQO. The bacteria objectives in the Ocean Plan were revised by the State Water Board in 2005 to include a WQO for enterococci. However, the State Water Board retained WQOs for total and fecal coliform in the Ocean Plan at that time. Thus, we are required to develop and adopt TMDLs for those WQOs.

Further, we disagree that total coliform and fecal coliform levels are not positively correlated to adverse health outcomes, and that the TMDLs should focus on the enterococci WQO. An independent technical group, the Microbiological Advisory

Committee (MAC) was formed in 1992 to advise the State Water Board on the indicator organism issue. As a starting point, the MAC recommended a statistical analysis of two data sets which included concurrent measurement of all three indicators. A contract was initiated with the University of California, Berkeley (UC Berkeley) in 1993, stipulating the following:

a. at each monitoring station, for each month and for each individual indicator organism, the number of times the measured level exceeded the allowable value contained in the California Ocean Plan was determined; and,

b. for each monitoring station, the density of indicator organisms were compared against each other and to physical parameters measured at the same time (water temperature, salinity, dissolved oxygen, etc.).

The contract also required that recent epidemiological studies be reviewed, summarized, and related (if possible) to the discharger data analyses. Based on review of both discharger monitoring data and results of recent epidemiological studies, UC Berkeley was to make recommendations for possible revision of the California Ocean Plan water-contact bacterial standards.

Because there was interest in the environmental fate of indicator organisms based on monitoring data taken over a time course of several years and under diverse environmental conditions, data from the City of San Diego and the City and County of San Francisco were analyzed. The study[3] concluded that:

- when fecal contamination is present, all three indicators respond similarly;
- during less polluted periods, this relationship breaks down and the three indicator organisms vary independently;
- from a risk management perspective, the measurement of enterococci levels seems to add little to the information provided by total and fecal coliform data;
- where there is increased likelihood of fecal contamination, enterococci levels are well predicted by the fecal coliform measurement; and
- based on these findings, the California Ocean Plan could revert to the pre-1990 bacterial monitoring requirements calling for total and fecal coliform only.

As part of the UC Berkeley contract, five epidemiological studies were reviewed.[4] In general, these five studies consistently show that bathing at beaches where the water is contaminated by urban runoff, domestic wastewater discharges, or other swimmers can lead to an increased risk of gastrointestinal and respiratory disorders, as well as ear, eye, and skin infections in some circumstances. However, there is no consistent relationship between any one indicator and health endpoints. In a 1996 report, Fleisher, *et al*. concluded that even within a single study, different indicators predict different health endpoints and that "these findings argue against the use of a single illness or indicator organism in the establishment of marine standards for recreational water quality." A complete explanation for retaining the total coliform and fecal coliform WQOs in the Ocean Plan is discussed in the State Water Board document titled "Final Functional

[3] Spear et al, 1998.
[4] Cheung et al, 1990; Fleisher et al, 1993; Corbett et al, 1993; Kay et al, 1994; and Haile et al, 1996.

Equivalent Document, Amendment to the Water Quality Control Plan for Ocean Waters of California" dated December 2004 which can be accessed at http://www.waterboards.ca.gov/plnspols/docs/oplans/bactffed.pdf.

Comment 318

Comment 107. *We disagree that traditional indicator bacteria provide "unreliable" estimates of potential public health impacts; however, we recognize that the accuracy of the correlation of bacteria densities to health risks is the subject of recent discussions.* Please refer to the citations below. In particular, see page 6 and Table 2 in the 1986 US EPA document which indicates: "The freshwater studies confirmed the findings of the marine studies with respect to enterococci and fecal coliforms in that the densities of the former in bathing water showed strong correlation with swimming associated gastroenteritis rates and densities of the latter showed no correlation at all."

Pruss A. 1998. Review of Epidemiological Studies on Health Effects from Exposure to Recreational Water. Int. J. Epidemiol. 27: 1-9.

Wade TJ, Pai N, Eisenberg J, Colford JM. 2003. Do US EPA water quality guidelines for recreational waters prevent gastrointestinal illness? A systematic review and meta-analysis. Environ. Heal. Perspec. 111: 1102-1109.

U.S. EPA. 1986, Ambient water quality criteria for bacteria, Office of Water, EPA440/5-84-002,Washington, DC,

TMDL calculations must be based on existing WQOs. Reevaluation of water quality criteria that are the basis for WQOs cited in the Basin Plan takes place at the USEPA level. Should USEPA promulgate new water criteria, then the WQOs in the Basin Plan will be updated accordingly and TMDLs recalculated.

Please refer to comment #106. We find the second portion of the comment hard to understand, as we are encouraging the Regional Board to focus on the information that has been available from and recommended by EPA since 1986.

We further disagree with the commenter that achieving the TMDL targets might not result in the desired outcome, i.e. lowering public health risk. If the numeric targets are overly conservative in terms of lowering risk to public health, then the desired policy outcome (sufficiently high receiving water quality) has been achieved if WQOs have been attained.

If there is no scientifically defensible relation between the indicators in question (total coliform and fecal coliform) and health risk (EPA, 1986), then reductions of those indicators would not correlate with a reduced risk to human health.

Response: Please see the response to Comment 317 which summarizes the scientific basis for retaining the total coliform and fecal coliform WQOs in the Ocean Plan. Based on the information considered by the State Water Board in its 2005 amendments to the Ocean Plan, we disagree that there is no scientifically defensible relation between total coliform and fecal coliform, and health risk.

Comment 319

Comment 112. *We are obligated to proceed with utilizing WQOs consisting of total coliform, fecal coliform, and enterococci bacteria to calculate TMDLs because they are the established indicators of risk to public health. Under Clean Water Act (CWA) section 303(d), the San Diego Water Board is obligated to develop TMDLs for waters not meeting water quality standards (WQOs and the beneficial uses they are designated to protect). TMDL calculations must be based on existing WQOs.*

It is agreed that the TMDL must include all of these indicators. The Regional Board does have the authority to focus the TMDL on the indicators that have the strongest link to human health risk. It seems hard to believe that EPA would not approve a TMDL that employed as its basis the indicators that are recommended in their 1986 ambient water quality criteria document.

Response: Please see the response to Comment 317 which summarizes the scientific basis for retaining the total coliform and fecal coliform WQOs in the Ocean Plan. Based on the information considered by the State Water Board in its 2005 amendments to the Ocean Plan, we cannot recommend focusing the bacteria TMDLs on the enterococci WQO.

Comment 320

Comment 113. *…we do not agree that it (the 1986 EPA ambient water quality criteria document) indicates that the single sample maximum was not intended to apply during wet weather events in general.*

In southern California and the San Diego Region, the beaches are open year-round, even during wet weather conditions. There are many members of the public that may recreate in the water during wet weather (e.g., surfers). Therefore, protection must be adequate year-round and during wet weather conditions.

The 1986 US EPA document is not explicit on this topic. It states the following: "In general, samples should be collected during dry weather periods to establish so-called "steady state" conditions. Special studies may be necessary to evaluate the effects of wet weather conditions on waters of interest especially if sanitary surveys indicate the area may be subject to storm water effects." We discussed this point in detail with individuals who were involved in the development of the document in question at US EPA. Those conversations confirmed that in fact there is little to no reason to believe that the relationships are valid under stormwater dominated conditions. Further evidence on this point may be found in a newly released research report from the Water Environment Research Foundation (WERF Report 03-SW-2, 2007).

We agree that the REC-1 use occurs and is appropriate at beaches during wet weather. It is questioned however, whether or not the REC-1 use is appropriate for creeks and streams during wet weather (greater than some specified flow), and how the assumption that it is appropriate impacts the magnitude of the bacterial reductions that are required and the subsequent societal and economic impacts under this TMDL.

Response: We fully vetted these TMDLs via our USEPA liaison, and the TMDLs were peer reviewed. Thus, we maintain that the single sample maximum is appropriate to use as a numeric target for wet weather TMDL calculations. Whether REC-1 use exists during wet weather is a Basin Planning issue which can be evaluated if information is forthcoming and if the action is warranted.

Comment 321

Please describe the empirical basis for the statement on page R-67 of the Environmental Analysis which describes how structural controls may not be required for residential areas (i.e., is there an example of how a discharger has achieved a zero Wasteload Allocation for indicator bacteria in dry and wet weather with non-structural controls?)

How would the Regional Board staff expect dischargers to show compliance with zero Wasteload Allocation given that the detection limit of standard laboratory analytical procedures are greater than zero?

Response: Dry weather wasteload allocations can be met by completely eliminating dry weather nuisance flows via city ordinances and enforcement. Empirically, where there are zero flows, the WLA is automatically met.

For the interim wet weather TMDLs, the question is moot because zero WLA are not required. However, in order for municipal dischargers to meet the current interim wet weather targets (which are near or at what the final TMDLs will be after the reference watershed approach has been incorporated), they must reduce their current bacteria contribution by certain percentages for all three indicators (e.g. fecal coliform, enterococci, and total coliform), depending on the watershed. For all the watersheds, these percent reductions fall within the following ranges:

Fecal Coliform - 1.6 to 53.3 percent
Enterococci - 1.9 to 51.4 percent
Total Coliform - 1.6 to 47.0 percent

The amount of required reduction depends on the watershed, with some watersheds requiring less than 2 percent reduction, thereby allowing more than 98 percent of the current municipal load to continue. On the other hand the largest required reduction will be less than 54 percent, thereby allowing more than 46 percent of the current municipal load to continue. The San Diego Water Board believes that the municipalities are capable of achieving 2 to 54 percent reductions via a combination of aggressive non-structural and structural BMPs.

Concerning laboratory detection limits, the San Diego Water Board would consider a laboratory result showing bacteria below the detection limit as meeting the WLA, assuming one-half the detection limit is less than the bacteria WQO. This is consistent with the typical methods used in handling non-detect results in human health and ecological risk assessments.

Comment 322

EPA supports the Regional Board's use of the natural sources exclusion approach (NSEA) to develop numeric targets and allocations to protect recreational uses in waters of San Diego. EPA has approved such use in other bacteria TMDLs (e.g., Santa Monica Bay Bacteria TMDL, Los Angeles River Bacteria TMDLs). We support Regional Board's use of the NSEA approach to address recreational beneficial uses in the identified beaches and creeks of San Diego.

In addition, we have been in discussion with you to determine if sufficient data exists to support development of a TMDL and whether the NSEA approach can appropriately address the need to protect the shellfish harvesting use. At this point, we support deferring the establishment of TMDLs to address the shellfish harvesting use; this deferral would allow more time for monitoring, impairment assessment, and numeric targets development that are appropriate to address the impaired shellfish harvesting use. Although NSEA provides a mechanism to address non-human sources of bacteria, it was originally intended to address recreational uses in coastal waters (see 2004 final rule for *Water Quality Standards for Coastal and Great Lakes Recreation Waters*).

The existing standards for shellfish designated areas, currently incorporated in the Basin Plan, originated from the National Shellfish Sanitation Program (NSSP). These standards are used by the California Department of Health Services (DHS) to approve shellfish beds for commercial use. More extensive monitoring, sanitary surveys and an epidemiological study would assist in the establishment of TMDLs to protect the shellfish harvesting use. We hope to see some of this work included in the implementation plan for the bacteria TMDL to address recreational uses in San Diego beaches and creeks; this will assist with the development of a TMDL to address the shellfish harvesting beneficial use.

Response: Thank you for the comment. The SHELL TMDLs have been removed from these bacteria TMDLs, and the SHELL impairments are being addressed in separate TMDLs and/or standards action. At this time we have not required work related to the SHELL standard in the Implementation Plan. However, the San Diego Water Board will use its investigative authority, if needed, to require dischargers to submit technical reports with the information we need to refine the SHELL TMDLs and/or develop a SHELL standards action to address the SHELL listings.

4.4 Beneficial Uses

Comment 323

Page S - 126 stales "We agree that, at this time, there is uncertainty for the regulated entities regarding which metric will be used to express WQBELs and measure compliance. However, the public process associated with reissuance of NPDES requirements is the proper forum for establishing this metric."

The NPDES reissuance public process for south Orange County is occurring now and TMDL compliance has yet to be addressed. The RWQCB has indicated that this could occur at the scheduled Permit issuance date or before, if appropriate. When does the RWQCB foresee the TMDL being incorporated into the NDPES Permit, specifically for south Orange County?

Response: If warranted, the San Diego Water Board may choose to incorporate the TMDL requirements into NPDES Stormwater WDRs at any time. All persons are allowed to petition the San Diego Water Board to open and amend existing NPDES WDRs, if a strong case can be made. However, the most likely time for inclusion of these TMDL requirements is during the five year NPDES WDR reissuance cycle. Actual inclusion into the Orange County NPDES permit will depend on when these TMDLs are adopted in relation to the Orange County 5-year NPDES WDR reissuance cycle.

Comment 324

Comment 126. *We agree that rainfall events correspond to times of the year when the REC-1 beneficial use is at its minimum. However, beneficial uses apply at all times, and therefore must be protected at all times, regardless of season or hydrological conditions. Despite poor water quality, or even dangerous oceanographic conditions, REC-1 use is still occurring during wet weather events and the following 72 hours. The technical approach does assume that to protect the use, bacterial loading must be reduced during these storm events.*

We agree that reduction strategies should be prioritized according to when the use is highest, namely the summer dry season. However, this does not obviate the need to eventually address wet weather loads. The compliance schedule does not preclude dischargers from addressing dry weather loads before addressing wet weather loads.

Several important issues are raised in the above response. First, as indicated above (comment 113), it is disputed that the REC-1 use is appropriate or that *REC-1 use is still occurring* in creeks and streams under storm event conditions. Second, the use of the loading based approach in the TMDL necessarily focuses bacterial reductions on these storm events even though these *events correspond to times of the year when the REC-1 beneficial use is at its minimum*. This is true because the loadings that are associated with storm events are so much greater than dry weather (when higher levels of REC-1 use occurs), that the implementation strategies will be forced to focus on these events if there is hope of meeting the TMDL requirements.

Response: The San Diego Water Board maintains that reduction strategies should be prioritized according to when the use is highest, namely the summer dry season. However, this does not obviate the need to eventually address wet weather loads. The compliance schedule does not preclude dischargers from addressing dry weather loads before addressing wet weather loads.

A high-flow REC-1 use suspension Basin Plan amendment could be developed if warranted. However, REC-1 use at beaches likely occurs even during storm events and certainly in the 72-hours after storms.

Comment 325

Comment 132. The comment was that the Shellfishing beneficial use (SHELL) only applies to coastal marine waters. Freshwater creeks do not support shellfishing habitat or species and are not assigned the SHELL beneficial use nor water quality objectives to support shellfishing activities.

In response it was indicated in section 4.4 of Appendix S that *If WQOs are met at the mouth of the watershed, then WQOs likely also are met at the beach because dilution with the wavewash has taken place. This approach is justified because (1) the beach ocean shorelines are the ultimate receiving waterbodies. All creeks included in this project discharge to the ocean or San Diego Bay which are designated with REC-1 and SHELL uses, (2) the beaches have more recreational users than creeks, and (3) the beaches are designated with the most sensitive beneficial use, shellfish harvesting, whereas creeks are not.*

Dischargers will not be held accountable for achieving SHELL WQOs in the freshwater creeks. The dischargers will be held accountable for reducing total coliform loads at the mouths of the creeks to levels that do not cause the SHELL total coliform WQO to be exceeded at the beaches.

It is agreed that the point articulated above in the second paragraph is appropriate. However, it is not clear that this perspective is accounted for in calculating loadings in the TMDL document. Clarification on this point is requested. In addition, it is further requested that the perspectives discussed in Comment 140 be considered in the response here.

Response: The SHELL TMDLs were removed from these Bacteria TMDLs, therefore, at this time, the comment is moot. We will consider the SHELL TMDL comments at the time when we revise the draft SHELL TMDLs.

Comment 326

Comment 140. *The commenter is correct that the SHELL beneficial use is designated for the shoreline, not the creeks and rivers.*

If the discharger can provide compelling evidence that the TMDL should include a dilution factor, the TMDLs can be revised to do so. However, until that evidence is provided, the assumptions that are included in the TMDL calculations will result in water quality that supports all beneficial uses designated for the creeks and beaches.

This information seems to be in conflict with the response to Board member Kraus, as identified above under comment 132 (from section 4.4 of Appendix S). The comment was that given the low dry weather volume of water discharging from the creeks and rivers (relative to the Pacific Ocean), a prioritized investigation is needed to determine the relative impact of the creeks on the SHELL use on the Shoreline (i.e. if dilution of greater than ~15:1 occurs, the effective WQOs in creeks for the REC-1 use and on the shoreline for the SHELL use would be similar for total coliform). Based on the data that were used to develop the TMDL, it seems likely that a simple paper exercise would indicate whether or not, on average a 15:1 dilution is likely to occur at areas that feasibly could support the SHELL use (i.e. not the mouths of the creeks as the creeks do not support the SHELL use, but at a point on the shoreline that could support the use). If so, the REC-1 standard at the mouth of the creeks and streams would be protective of the SHELL use at the point at which it occurs.

Response: The SHELL TMDLs were removed from these Bacteria TMDLs, therefore, at this time, the comment is moot. We will consider the SHELL TMDL comments at the time when we revise the draft SHELL TMDLs.

Comment 327

Comment 170. *Several stakeholders have expressed opinion that there is a need to reevaluate TMDLs at a set date in the future to ensure that the most up-to-date, accurate information is used for model output, and ultimately, TMDL calculation. The commenter cites numerous arguments in support of this position… However, attempts to restore water quality and meeting the TMDLs as calculated must not be delayed for acquisition of new information.*

As indicated in the main body of our letter, we agree that actions to institute water quality improvements should begin as soon as possible. However, development of the TMDL began in 2004, but only data collected through 2002 was utilized in the modeling. Throughout the development of the TMDL SAG members have been requesting that all available information, particularly data submitted to the Regional Board through other programs, be included in the modeling process. SAG members and others have continued to collect new data during the development and multiple revisions of this TMDL. Some of those data could be used to fill data gaps and otherwise inform the TMDL. However, the Regional Board has not taken full advantage of these data to date. The comment was not proposing that the process be stopped to collect more data, rather that currently available data be fully utilized in the TMDL calculations.

Response: Incorporating updated land use data and new flow and water quality data into the watershed models and recalculating the TMDLs is an expensive and time consuming process and one we will not undertake at this time. Since the final TMDLs will be revised in the near future, an opportunity exists to explore the benefits and cost of updating the models. San Diego Water Board staff and stakeholders should investigate the possibilities.

Comment 328

Comment 172. *Although TMDLs are expressed as "loads" in Tables 9-1 through 9-12, this does not imply that compliance will necessarily be measured in this metric. Second, the manner in which WQBELs are expressed (which must be consistent with WLAs), will be determined upon revision or reissuance of the NPDES requirements for urban runoff.*

The issue of compliance is of great concern in this TMDL. The Board's justification for selecting the loading based approach over other methods that have been used successfully in bacterial TMDLs was that "A metric expressed in a term different from a load, such as exceedance days (as has been approved by the LA RWQCB and SWRCB) does not allow program managers to decipher a percentage by which loads must be reduced, nor help with selection of BMPs" (from response to comment 147). Given all of the uncertainties and technical difficulties discussed herein, we believe that this justification is not sufficient to overcome the serious shortcomings of the technical method employed.

Response: The technical basis of these TMDLs is sound, and has been peer reviewed. Whether or not to express WLAs as exceedance days or loads in the implementing orders will be decided when the orders are written.

Comment 329

The draft technical report states that the Enterococcus for the creeks is designed to protect the downstream beach. This scenario is commendable; however, it does not address the fact that Chollas Creek has no downstream beach. Usage at the mouth of Chollas Creek is restricted by the Department of Defense and entry into the area is not allowed due to national security reasons. Therefore, the City recommends that the Regional Board establish a different goal/requirement for the Chollas Creek watershed.

Response: Although not a "beach," San Diego Bay at the mouth of Chollas Creek is designated with REC-1 beneficial uses. Before we could consider revising the beneficial use designation as an alternative to the TMDL, an investigation of the issue must first be conducted. Then if warranted, a Basin Plan amendment revising the REC-1 use and the Bacteria TMDL could be developed. Until the issue is better investigated, revising the enterococci TMDL is premature.

4.5 Implementation Plan/Compliance Assessment

Comment 330

Can you explain how the waiver system will be implemented in regards to municipal discharger compliance assessment, BMP sizing, etc.? We are particularly concerned about how the impacts of bacteria loads from waivers are going to be addressed at the bottom of the watersheds (i.e. beaches). Schools, sewer agencies and waiver recipients must be held to the same standards as the dischargers identified in the TMDL or an allowance make in the authorized exceedence levels, similar to backgrounds sources for authorized waivers. It appears that waivers would allow a zero bacteria discharge, but how can we be sure of this?

Response: The San Diego Water Board will enforce waiver conditions to ensure that waiver discharges meet wasteload allocations. The San Diego Water Board has recently adopted new waiver conditions that better enable direct regulation of waiver dischargers by requiring enrollment and monitoring. Waiver compliance is expected to be assessed by more localized and upper watershed monitoring, rather than at the bottom of the watersheds. This monitoring may be a combination of monitoring conducted under the waiver program and municipal storm water programs.

Comment 331

In regards to the response to Comment 149. First, we are happy to see a commitment to enforce the Phase II requirements. However, as the City looks forward in an attempt to try and conceptualize how this program is going to be implemented, we have concerns. The response indicates. "If, upon enforcement of the waivers, nuisance conditions or exceedences of WQOs occur despite the stated conditions, then WDRs will be issued for these discharges." The City's concern is how the enforcing agency is going to 1) know if exceedences of WQOs occur and, 2) if an exceedence does occur, how will you know who the responsible party is – especially when you indicate that you arc not requiring monitoring from Phase II communities? Obviously the dischargers are concerned over being held responsible should Phase II communities not succeed in compliance.

Response: Exceedances of water quality objectives by Phase II municipalities and non-point sources will be determined by typical compliance assessment measures such as inspections, surveillance, complaint response, reporting, and monitoring. These measures are also expected to be sufficient to identify responsible dischargers if exceedances are noted. While the TMDLs do not expressly require monitoring by these dischargers, Phase II municipalities are required to conduct monitoring under Order No. 2003-0005-DWQ. Likewise, agricultural dischargers will be required to conduct monitoring under waiver conditions. These monitoring efforts are expected to provide useful information in determining whether or not water quality objectives are met. Moreover, any discharger can be required to conduct monitoring if there is a suspected water quality problem, under the San Diego Water Board's investigation authority (Water Code section 13267).

Comment 332

Your response to Comment 170 indicates that "we have no information showing that sewage, human wastes, and domesticated animal wastes have been removed from nuisance flows and Stormwater runoff in any of the watersheds." The City disagrees with this statement. For one, bacteria reductions have been documented at a number of beaches where data has indicated that the beach water quality meets de-listing criteria. Each year the City submits an annual report, including a San Juan Creek Watershed Action Plan (WAP), which highlights all the watershed-wide actions that have been implemented to address bacteria. In addition, the City has provided reports directly to TMDL staff outlining the actions we have taken to reduce human sources of bacteria in San Juan Creek in the Dana Point jurisdiction. And, the South Coast Water District also submits regular reports to the RWQCB indicating their aggressive sewer spill prevention plan, including their operations and maintenance, videoing and grease control ordinance via their regular reporting requirements. Considering this, it is requested that this comment be revised accordingly.

Response: Your comment clarifies the record concerning information on bacteria load reductions in the watersheds of concern to you. While many measures have been implemented that have achieved indicator bacteria reductions, much more needs to be done. Indicator bacteria levels in receiving waters frequently exceed standards, especially during wet weather. For example, 195 of 217 (90 percent) wet weather samples collected from Agua Hedionda Creek, Escondido Creek, Los Penasquitos Creek, San Diego River, San Dieguito River, San Luis Rey River, Santa Margarita River, and Sweetwater River in San Diego County from 1998-2006 exceeded indicator bacteria water quality objectives.[5] Although various entities have undertaken efforts to control sources of indicator bacteria especially during dry weather, the continuing high levels of indicator bacteria warrant further action especially during wet weather.

Comment 333

This comment letter is organized showing our original and remaining requests for changes in the Draft Technical Report (Items 1 through 4) followed by the Regional Board's comments in *italics* as provided in Appendix S of the Draft Technical Report, and lastly the City's additional supporting arguments for each of the four issues.

Del Mar requests that Torrey Pines State Beach at Del Mar (Anderson Canyon) be removed from the Bacteria TMDL Project I

The most recently adopted water quality impaired list or 303(d) listing, dated October 25, 2006, should be the basis for the beach segments included in this Bacterial TMDL. The listing was last approved by the State Water Resources Control Board to reflect new data and information in accordance with the Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List (Listing Policy). The fact sheet for the Pacific Ocean Shoreline at Miramar Reservoir HA recommended the delisting of the segment using the weight of evidence and in compliance with the Listing Policy. It is Del

[5] San Diego County Municipal Copermittees, 2007. 2005-2006 Urban Runoff Monitoring. Volume 1 – Final Report.

Mar's request that the Bacteria TMDL Project I Draft Technical Report be amended to show this segment has been removed and no longer requires a TMDL. This action is necessary in order to provide consistency and clear priorities, for both the RWQCB and dischargers, in the development and implementation of TMDLs.

Regional Board Response (No. 192 and 175 Draft Technical Report Appendix S).

The Regional Board Response to this comment states: "Even though recent measurements show that the Del Mar beach at Anderson Canyon meets WQOs (at least during dry weather), this and other improved sites will remain included in this project. Whether or not these beach segments meet WQOs during storm events is unclear, since the data submitted for de-listing purposes consisted strictly of dry weather samples. In a letter to the SWRCB dated January 31, 2006, the San Diego Water Board recommended that all waterbodies, regardless of quality during dry weather, remain listed if no wet weather data is available to demonstrate support of beneficial uses. Furthermore, whether or not the SHELL use is supported is also unclear, since the data used for de-listing was not evaluated using the total coliform SHELL WQO. Although dry weather bacteria load reduction plans would not be required for the watersheds draining to these beaches and any beaches meeting WQOs, BMPs implemented in these watersheds to reduce bacteria loading should be maintained, and monitoring, even if on an infrequent basis to assess the effectiveness of the BMPs, should continue. Wet weather bacteria load reduction plans are still needed, unless dischargers can demonstrate attainment of uses in wet weather. Dischargers can discuss the possibility of a reduced level of monitoring and reporting at sites such as Anderson Canyon with San Diego Water Board staff who oversee the TMDL implementation. TMDL implementation will take place primarily by incorporation of WQBELs into WDRs for urban runoff (such as Order No. 2007-0001). The process is described in section 11.5.3 in the Technical Report."

Del Mar's Response Comment No.1: Regional Board Does Not Present Any Basis for TMDL for Waterbody in Attainment of Water Quality Objectives.

In this above response the Regional Board, without giving a citation to policy or regulation, has expanded its authority to include as part of the Bacteria 1 TMDL a waterbody that has attained water quality as defined in the Listing Policy. Del Mar does not find the Regional Board's explanation is supported by the Listing Policy, Clean Water Act or California Water Code. We base our position on the following statements found in the Listing Policy:

"The Water Quality Control Policy for Developing California's CWA Section 303(d) List" (Policy) is intended to provide SWRCB and RWQCB staff with recommended procedures for evaluating information solicited in support of listing or delisting candidate water bodies for the section 303(d) list. The Policy does not develop new or revise existing water quality standards (i.e., beneficial uses, water quality objectives, or the State's Non-degradation Policy). The Policy does address scheduling of listed water bodies for eventual development and implementation of TMDLs.

Section 13191.3(a) of the California Water Code (CWC) requires the State Water Resources Control Board (SWRCB), on or before July 1, 2003, to prepare guidelines to be used by the SWRCB and the RWQCBs (Regional Water Quality Control Boards) in

listing, delisting, developing, and implementing TMDLs pursuant to section 303(d) of the federal CWA (33 United States Code [USC] section 1313(d)). In addition, the 2001 Budget Act Supplemental Report required the use of a "weight of evidence" approach in developing the Policy for listing and delisting waters and to include criteria that ensure the data and information used are accurate and verifiable."

Del Mar believes that the State has clearly outlined the priorities for the TMDL program and that they should apply only to impaired water segments as defined in the 303(d) List which has used a weight of evidence approach to provide statewide consistency in its application.

Del Mar respectfully requests that the Regional Board provide references to its authority to impose more stringent TMDL requirements on dischargers than outlined in the State's Listing Policy.

Response: Section 303(d)(3) of the Clean Water Act supports the San Diego Water Board's inclusion of the Miramar Reservoir Hydrologic Area (HA) in the TMDL. This section requires that "each State shall identify all waters within its boundaries which it has not identified under paragraph (I)(A) and (I)(B) of this subsection and estimate for such waters the total maximum daily load […]" As such, the Clean Water Act directs the San Diego Water Board to develop TMDLs for all water bodies, not just those water bodies found on the 303(d) list. This requirement is recognized in *Pronsolino v. Nastri,* (9th Cir. 2002) 291 F.3d 1123, 1128. Moreover, the San Diego Water Board's proceeding with a TMDL for the Miramar Reservoir HA does not contravene the State Water Board's *Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List* (Listing Policy). While the Listing Policy requires that impaired water bodies be prioritized, it contains no language stating that a Regional Water Board must follow the designated prioritization when developing TMDLs. Likewise, the Clean Water Act, section 303(d), does not require that the Regional Water Board follow a designated prioritization for TMDL development. The San Diego Water Board generally follows the priorities found in the 303(d) list when developing TMDLs, but also exercises its discretion when it is prudent to do so. The Clean Water Act, section 303(d), does not prohibit state action as long as the state is not attempting to adopt more lenient pollution control standards already in place under the Clean Water Act. See *City of Arcadia v. State Water Resources Control Board* (135 Cal.App.4th 1392, 1419) (citing *City of Arcadia v. EPA* (9th Cir. 2005) 411 F.3d 1103, 1107.)

The Miramar Reservoir HA is a location where the San Diego Water Board finds that it is appropriate to develop a TMDL for a water body that is not on the 303(d) list. The Miramar Reservoir HA was previously on the 303(d) list for indicator bacteria impairment, but was removed in 2006 based on dry weather data only. The lack of wet weather data used in the analysis makes the determination that the HA is not impaired by indicator bacteria inconclusive. For example, the County of San Diego Department of Environmental Health issues a general advisory during wet weather, advising people to avoid contact with ocean water for 72 hours following a storm event. This advisory applies to the Miramar Reservoir HA shoreline. In addition, TMDL modeling results indicate that beaches addressed by the TMDL are impaired by indicator bacteria during wet weather, including the beaches in the Miramar Reservoir HA. Moreover, data from

the Miramar Reservoir HA were only assessed for one location in the HA (the beach at Anderson Canyon) in 2006. Data collected from another location within the HA (the beach at the mouth of Los Penasquitos Lagoon) demonstrates that the HA is impaired by indicator bacteria. This information, combined with modeling results and the lack of wet weather indicator bacteria data at the beach at Anderson Canyon, demonstrates that it is appropriate for the Miramar Reservoir HA to be addressed by the TMDL.

The Technical Report has been revised at Appendix T to exhibit that the Miramar Reservoir HA is impaired by indicator bacteria.

Comment 334

Del Mar's Response Comment No. 2: Regional Board's Argument to Use SHELL WQO Unfounded

The Regional Board is arguing that the SHELL Beneficial Use should be protected in this segment that has not been listed to be impaired in the most recent 303(d) listing dated October 25, 2006. As mentioned above, Del Mar does not believe the Regional Board has supported, in policy or regulation, requiring a TMDL for a waterbody that has attained water quality.

Del Mar respectfully requests that the Regional Board provide references to its authority to impose more stringent TMDL requirements on dischargers than outlined in the State's Listing Policy.

Response: As previously discussed, Clean Water Act Section 303(d)(3) requires the San Diego Water Board to develop TMDLs for all water bodies. The San Diego Water Board has evaluated indicator bacteria data from the Miramar Reservoir HA and found that the Miramar Reservoir HA does not meet indicator bacteria water quality objectives. This finding applies to water quality objectives that support the SHELL beneficial use. Please see our response to Comment 333 for further discussion.

Comment 335

Del Mar's Response Comment No. 3: Regional Board Requires Bacterial Load Reduction Plans for De-Listed Waterbodies

The Regional Board plans to require Bacterial Load Reduction Plans for wet weather discharges for a de-listed waterbody and has not provided the basis to impose this requirement for a waterbody segment that has attained water quality objectives.

Del Mar respectfully requests that the Regional Board provide references to its authority to require a Load Reduction Plan or Implementation Plan for a segment that has attained water quality objectives based on the State's Listing Policy.

Response: As previously discussed, Clean Water Act Section 303(d)(3) requires the San Diego Water Board to develop TMDLs for all water bodies. The San Diego Water Board has evaluated indicator bacteria data from the Miramar Reservoir HA and found that the Miramar Reservoir HA does not meet indicator bacteria water quality objectives. As such, it is appropriate for the Miramar Reservoir HA to be subject to the TMDL and its

Bacteria Load Reduction Plan requirements. Please see our response to Comment 333 for further discussion.

Comment 336

Del Mar's Response Comment No. 4: Regional Board Requires Assessment of BMP Effectiveness and Monitoring Already in Place as part of the MS4 Permit.

The BMP assessment and other requirements that include "reduced level of monitoring" are not justified and should not extend beyond the existing programs currently in place to comply with the MS4 Permit (Order No. 2001-01 and 2007-0001) which is the basis for the programs being implemented by Del Mar. Attainment of water quality in this waterbody segment was accomplished by demonstrating that it was erroneously listed in 1998 using very limited water quality data and delisted only after the data collected by Del Mar from 2002-2006 was considered by the SWRCB in compliance with the Listing Policy of 2004.

Response: As previously discussed, Clean Water Act Section 303(d)(3) requires the San Diego Water Board to develop TMDLs for all water bodies. The San Diego Water Board has evaluated indicator bacteria data from the Miramar Reservoir HA and found that the Miramar Reservoir HA does not meet indicator bacteria water quality objectives. As such, it is appropriate for the Miramar Reservoir HA to be subject to the TMDL and its BMP effectiveness assessment and monitoring requirements. Please see our response to Comment 333 for further discussion.

Comment 337

Del Mar requests that Table 1-1. *Bacteria-Impaired Water Quality Limited Segments Addressed in this Analysis* be modified

Table 1-1 *Bacteria-Impaired Water Quality Limited Segments Addressed in this Analysis* should be modified and the segment for Miramar Reservoir HA removed to reflect the delisting of this area as of October 25, 2006 and to make it consistent with the Listing Policy.

Regional Board Response No. 193 and 175 (Draft Technical Report Appendix S) is the Same as Above.

Del Mar's Response Comments No. 1 through No. 4 to the Regional Board's Responses are shown above.

Response: As previously discussed, Clean Water Act Section 303(d)(3) requires the San Diego Water Board to develop TMDLs for all water bodies. The San Diego Water Board has evaluated indicator bacteria data from the Miramar Reservoir HA and found that the Miramar Reservoir HA does not meet indicator bacteria water quality objectives. As such, it will not be removed from Table 1-1 as a bacteria-impaired water quality limited segment. Please see our response to Comment 333 for further discussion.

Comment 338

Del Mar requests removal from the obligation to prepare a Bacteria Load Reduction Plan and comply with reporting requirements.

Removing the Miramar Reservoir at Anderson Canyon segment from the Bacteria TMDL Project I effectively eliminates the requirement to develop and implement the Bacteria Load Reduction Plan required per Section 1.6 of the Technical Report. Del Mar believes that the language in Section 1.6 is too vague and may require unnecessary plans and reports for a water segment that has been effectively delisted by the SWRCB and approved by EPA. Removing the segment from the TMDL effectively eliminates the City's (and other parties) obligation to comply with these requirements. The end result for this small City is to allow us to focus limited resources on high priority water impairments and future TMDLs and not on a segment that has effectively shown attainment with water quality objectives.

Regional Board Response No. 194 (Draft Technical Report Appendix S): *TMDLs for beaches that have been de-listed in the section 303(d) process ensures that dischargers continue to implement BMPs to meet WQOs. We agree that dischargers should focus their resources on problematic areas, therefore areas meeting WQOs can be considered low priority and a reduced level of monitoring can suffice. Bacteria Load Reduction Plans for wet weather are still needed as described in the response to Comment 175.*

Furthermore, the Regional Board added text to Section 1.6 in the revised Draft Technical Report in response to the City's previous comments regarding the Load Reduction Plan requirements (page 19, 4th paragraph):

"In some cases, waterbodies included in this project are no longer on the List of Water Quality Limited Segments (footnote: Beaches in the Miramar Reservoir and Scripps hydrologic area were removed from the List of Water Quality Limited Segments in 2006 based on assessment of dry weather data). For these areas, municipal dischargers and Caltrans need not prepare bacteria load reduction plans for their discharges in these watersheds if attainment of WQOs is demonstrated in both wet and dry weather. However, any BMPs implemented in these watersheds to reduce bacteria loading should be continued and maintained. Likewise, monitoring to assess the effectiveness of these BMPs should continue. For areas that have been de-listed strictly based on dry weather samples, wet weather bacteria load reduction plans are needed."

<u>Del Mar's Response Comment No. 5: Regional Board Requires Bacterial Load Reduction Plans for De-Listed Waterbodies</u>

The Regional Board plans to require Bacterial Load Reduction Plans for wet weather discharges for a de-listed waterbody and has not provided the basis to impose this requirement for a waterbody segment that has attained water quality objectives. The Regional Board has not provided the basis, in policy or regulation, for this requirement. Del Mar requests that the Regional Board cite its authority to expand the requirements beyond those waterbodies on the 303(d) List and subject to a TMDL prior to adoption of the Bacteria 1 TMDL.

Response: As previously discussed, Clean Water Act Section 303(d)(3) requires the San Diego Water Board to develop TMDLs for all water bodies. The San Diego Water Board has evaluated indicator bacteria data from the Miramar Reservoir HA and found that the Miramar Reservoir HA does not meet indicator bacteria water quality objectives. As such, it is appropriate for the Miramar Reservoir HA to be subject to the TMDL and its Bacteria Load Reduction Plan requirements. Please see our response to Comment 333 for further discussion.

Comment 339

Del Mar's Response Comment No. 6: Regional Board Requires Assessment of BMP Effectiveness and Monitoring Already in Place as part of the MS4 Permit.

The BMP assessment and other requirements that include "monitoring" are not justified and should not extend beyond the existing programs in place as part of compliance with the MS4 Permit (Order No. 2001-01 and 2007-0001) which is the basis for the current programs being implemented by Del Mar. Attainment of water quality in this watershed was accomplished by demonstrating that it was erroneously listed in 1998 with very limited water quality data only after the data collected by Del Mar from 2002-2006 was considered by the SWRCB in compliance with the Listing Policy of 2004. Del Mar should only be required to continue to implement its Jurisdictional Urban Runoff Management Plan (JURMP) in compliance with NPDES Order No. 2007-0001 to demonstrate sustainable water quality for this segment. The Regional Board should provide in its response to this comment letter the basis in policy or regulation to require additional monitoring or assessment of BMPs for a waterbody that has attained water quality in accordance with the Listing Policy.

Response: As previously discussed, Clean Water Act Section 303(d)(3) requires the San Diego Water Board to develop TMDLs for all water bodies. The San Diego Water Board has evaluated indicator bacteria data from the Miramar Reservoir HA and found that the Miramar Reservoir HA does not meet indicator bacteria water quality objectives. As such, it is appropriate for the Miramar Reservoir HA to be subject to the TMDL and its BMP effectiveness assessment and monitoring requirements. Please see our response to Comment 333 for further discussion.

Comment 340

Del Mar requests changes to Table 11-3 *Prioritized List of Impaired Waters for TMDL Implementation*

Del Mar requests Miramar Reservoir HA (906.10) watershed be removed from Table 11-3 for the same reasons noted previously.

If the revisions requested by Del Mar are not incorporated, the end result for this and future TMDLs will be unpredictability and unjustifiable expenditure of resources. Del Mar seeks consistency throughout the region and the State so that an "even playing field" is set as originally intended by the SWRCB and the Delisting Policy. If the implementation of the Bacteria TMDL Project I continues as described in the Draft Technical Report, the Regional Board will be deviating from the SWRCB Listing Policy

and defying its purpose. Del Mar believes the revisions to the delisting shown in the 303(d) List for 2006 should be taken into consideration prior to approval of the Bacterial TMDL Project I adoption.

Regional Board Response No. 196: *We disagree that this and future TMDLs will cause unpredictable and unjustifiable expenditures of limited resources. The goal of the implementation plan is to attain and maintain WQOs throughout all seasons and hydrologic conditions. If dischargers have met this burden, then their only expenditures would be to report that WQOs are attained, and reporting would occur at an appropriate frequency as specified in the discharger's monitoring and reporting programs.*

See Del Mar's Comments to Response No. 6 above.

Response: As previously discussed, Clean Water Act Section 303(d)(3) requires the San Diego Water Board to develop TMDLs for all water bodies. The San Diego Water Board has evaluated indicator bacteria data from the Miramar Reservoir HA and found that the Miramar Reservoir HA does not meet indicator bacteria water quality objectives. For this reason, it will not be removed from Table 11-3. Please see our response to Comment 333 for further discussion.

Comment 341

The Regional Board has provided responses in Appendix S of the Draft Technical Report to our previous comments submitted on April 17, 2007 and September 15, 2006, but **has not addressed what Del Mar believes is the most significant issue and comment to date**. We provide below additional arguments supporting our position that a waterbody that is no longer on the State's 303(d) list of Water Quality Impaired Water Bodies should not be subjected to a Total Maximum Daily Load (TMDL) program because it as "attained" status with respect to water quality objectives.

The reason this is important to Del Mar is that we believe the requirements are unfounded and unreasonable when they go beyond the State's current Listing Policy and create an economic disadvantage and burden to the community for **no perceived environmental benefit**. The Regional Board has not provided the City with the basis of its authority to require TMDL implementation for a waterbody in attainment status.

Response: As previously discussed, Clean Water Act Section 303(d)(3) requires the San Diego Water Board to develop TMDLs for all water bodies. The San Diego Water Board has evaluated indicator bacteria data from the Miramar Reservoir HA and found that the Miramar Reservoir HA does not meet indicator bacteria water quality objectives. As such, it is appropriate to develop an indicator bacteria TMDL for the Miramar Reservoir HA. Please see our response to Comment 333 for further discussion.

Comment 342

Comment 173. *The TMDLs for beaches and creeks are not the first TMDLs where the allocations are expressed as loads. The Nooksack River Watershed Bacteria TMDL, developed by the Washington Department of Ecology in 2001, and the Lynnhaven Bay TMDL Report for Shellfish Areas Listed Due to Bacteria Contamination, developed by*

the Virginia Department of Environmental Quality in 2004, both use loads as the method of expressing the allocations.

The response does not adequately address the comment. Our comment was regarding the technical basis of this TMDL. Careful review of the TMDLs cited above clearly indicates that the methodology used to derive allocations in this TMDL is substantially different than those in the TMDLs referred to in the response. While, it is true that the referred to TMDLs employed loading based approaches, the technical basis for this TMDL is without precedent. We have conducted a detailed review of available information and have not found other TMDLs that have derived allocations in the same manner as has been done in this TMDL. This lack of precedent reinforces our concerns regarding the technical underpinning of the TMDL methodology. In further support of this point of view, a newly released EPA document highlighting 17 TMDLs with stormwater sources (EPA 841-R-07-002, 2007) indicates that there are innovative methods that have been used successfully to address bacteria in stormwater impacted areas, however the method employed in this TMDL is not mentioned.

TMDL compliance will not necessarily be measured against the metric used to express WLAs. …NPDES requirements must include conditions (WQBELs) that are consistent with the assumptions and requirements of the WLAs. WQBELs may be expressed as numeric effluent limitations or as BMP development, implementation, and revision requirements. Numeric effluent limitations require monitoring to assess load reductions while non-numeric provisions, such as BMP programs, require progress reports on BMP implementation and efficacy, and could also require monitoring of the waste stream for conformance with a numeric WLA requiring a mass load reduction. <u>The metric for which WQBELs will be expressed and included in NPDES requirements for urban runoff, (also known as municipal "permits") for the purpose of implementing WLAs, has not been determined at this time</u>.

As noted above in comment 172, this issue is of great concern and should be resolved prior to adoption of the TMDL.

Response: The commenter provides no support for the position that the approach used to calculate the TMDLs' wasteload allocations is technically inadequate. While other TMDLs may not use the same approach, that does not mean that the approach is invalid.

Although TMDLs are expressed as "loads," this does not imply that compliance will necessarily be measured in this metric. The manner in which WQBELs are expressed (which must be consistent with WLAs), will be determined upon revision or reissuance of the NPDES requirements for urban runoff. The public process associated with reissuance of the NPDES requirements is the proper place to propose alternative metrics to measure compliance.

Comment 343

Comment 208. We are in agreement with the Heal the Bay comments that indicated the following : "The most important beneficial use that is impaired by high fecal indicator bacteria densities is recreational water contact. A TMDL based on the total number of fecal bacteria in the water, rather than the numbers of days that exceed beach water

quality standards, will not lead to beneficial use attainment and is an insurmountable compliance assurance problem."

Response: We agree that measuring TMDL compliance with exceedance days may be a suitable metric for beaches. Therefore, we encourage the commenter to stay involved with the public process associated with the re-issuance of the municipal NPDES requirements, which is the appropriate forum for determining the compliance metric(s) for these TMDLs. However, unlike the Santa Monica Bay TMDLs, this project is inclusive of inland creeks, and therefore compliance methods must be suitable for determining attainment of standards in creeks in addition to beaches. Moreover, in terms of formulating strategies for BMP implementation, the exceedance days approach does nothing to help dischargers quantify the magnitude of existing loads or link those loads to their sources. A loading approach provides the ability to calculate percent reductions needed in each unique watershed. For example, in the San Luis Rey watershed, a 3 percent reduction is needed in fecal coliform loading, compared to a 53 percent reduction needed in the San Diego watershed. Further, the load contributions by land use are discussed in Appendix I of the technical report. This information is useful in determining which watersheds require the most effort, and what types of BMPs may be effective, and where they might be placed. An exceedance day-based analysis does not provide such useful information.

Comment 344

The approved 2006 303(d) list removed beaches from the Miramar Reservoir and Scripps Hydrologic Areas for bacteria, with the exception of the Children's Pool; however, they are still included in this TMDL. The Water Quality Control Plan for the San Diego Region 9 does not provide the ability to list pollutants by seasonal variations. The City of San Diego requests that these beaches be removed from this TMDL and be compliant with the State Water Board's Water Quality Control Policy for Addressing Impaired Waters, or provide an interpretation of State Water Board Resolution 2005-0050 which authorizes the above referenced policy.

Response: As discussed in our response to Comment 333, the Clean Water Act supports the San Diego Water Board inclusion in these TMDLs of beaches in the Miramar Reservoir and Scripps HAs. Please refer to the response to that comment for a complete discussion of this issue.

Comment 345

Enforcement - <u>The City continues to request that the Regional Board provide specificity on how compliance will be evaluated</u> in terms of the number of Notices of Violation and/or fines that dischargers would be subject to if compliance is not obtained (e.g., one fine per outfall per day, one fine per tributary, a certain dollar amount per gallon). Given the difficulty that dischargers will encounter in trying to comply with the TMDL, it is only fair to offer dischargers a basis for considering cost/benefit consequences during their implementation planning.

Response: The San Diego Water Board determines appropriateness of different enforcement measures at the time of non-compliance. Numerous factors are considered,

such as magnitude of impact to beneficial uses, duration of impact to beneficial uses, previous compliance record of the discharger, etc. Since this information is not currently known, the expected number of enforcement actions or their severity cannot be established at this time. Moreover, the San Diego Water Board expects dischargers to be in compliance with the waste discharge requirements that implement the TMDLs. As such, it does not accommodate planned non-compliance in the manner suggested in the comment. In addition, please note that any potential economic benefit derived from non-compliance is taken into account when administrative civil liability penalties are calculated.

Comment 346

With regard to the discussion of where Wasteload Allocations need to be met (i.e., above or below outfalls, and the discussion of using receiving waters to convey or assimilate waste,) please clarify the graphics on page R-67 and R-70 of the Environmental Analyses. These graphics show, respectively, sandbags and treatment wetlands in what appear to be Waters of the State.

Response: The graphics on pages R-67 and R-70 of the Environmental Analysis and Checklist are provided only as examples of BMP implementation. The graphics are not meant to dictate where in relation to Waters of the State BMPs can or cannot be implemented. While the images do not provide adequate information to determine if the BMPs are located in Waters of the State or not, both of the BMPs presented (sand bags and constructed wetlands) can certainly be implemented outside of Waters of the State.

4.6 Compliance Schedule

Comment 347

Coastkeeper supports adoption of this TMDL, followed by the Basin Plan Amendment (BPA) that will incorporate the reference approach for final wet weather. We recognize the compromise staff has made to balance stakeholder concerns, including extending the final compliance schedule for this TMDL to 20 years. Coastkeeper supports this TMDL only with the understanding that the Reference Approach BPA will provide for a more appropriate compliance schedule for final limits. That is, that the schedule for the revised limits should be consistent with the interim compliance schedule of this TMDL.

The Technical Report seems to recognize this concern, stating that the revised final limits of the TMDL, once the reference approach is applied, will be "similar" to the interim limits of this TMDL (see page 14). However, the report does not indicate how far the similarity will extend. Without limits clearly spelled out in the TMDL or Technical Report, we are concerned that hard-fought negotiations on the compliance schedule will be lost once the Reference Approach BPA is adopted. Coastkeeper supports limiting the new reference schedule to the interim schedule of this TMDL.

Response: In determining appropriate interim wet weather TMDLs, the San Diego Water Board chose to apply the 22 percent exceedance frequency determined for Leo Carillo Beach in Los Angeles County. At the time, the 22 percent exceedance frequency from Los Angeles County was the only reference beach exceedance frequency available. Since then, four other reference beaches have been characterized by SCCWRP. Based on all the available reference beach data, all watersheds in this TMDL will receive a watershed specific exceedance frequency once the reference system basin plan amendment has been adopted. The 22 percent exceedance frequency was justified for the current interim targets because the exceedance frequencies of our Region's urban watersheds will likely be close to the value as the one calculated for Leo Carillo Beach. If this does indeed turn out to be the case, or if the exceedance frequency is greater than 22 percent, then the resulting final wet weather TMDLs will be the same as, or less stringent than, the interim TMDL. In this case, a 10-year compliance period would be appropriate for the revised final TMDLs.

Comment 348

Although the County supports the timely adoption of the TMDL, it should be noted that the timeframe of 5-7 years for a 50% waste load reduction as presented in Table 11-4 of the TMDL technical Report is not realistic. The control of wet weather flows is a substantial undertaking. This schedule does not allow adequate time to fine-tune the modeling and use the results to site the location of BMPs, identify sources, develop plans, develop formal agreements with stakeholders, secure funding, acquire land, conduct permitting, bid out contracts, and install BMPs. As we have previously commented, we recommend a timeframe of 7-10 years for reaching the 50% waste load reduction requirement.

Response: The San Diego Water Board believes that 5-7 years to meet the 50 percent wasteload reductions of the interim wet weather targets is reasonable for the following reasons.

In order for municipal dischargers to meet the current interim wet weather targets, they must reduce their current bacteria contribution by certain percentages for all three indicators (e.g. fecal coliform, enterococci, and total coliform), depending on the watershed. For all the watersheds, these percent reductions fall within the following ranges:

Fecal Coliform - 1.6 to 53.3 percent
Enterococci - 1.9 to 51.4 percent
Total Coliform - 1.6 to 47.0 percent

In order for municipal dischargers to meet the required 50 percent wasteload reduction of the current interim wet weather targets, they must reduce their current bacteria contributions by a percentage, depending on the watershed, within the following ranges:

Fecal Coliform - 0.8 to 26.3 percent
Enterococci - 1.0 to 25.7 percent
Total Coliform - 0.8 to 23.5 percent

The amount of required reduction depends on the watershed, with some watersheds requiring less than 1 percent reduction, thereby allowing more than 99 percent of the current municipal load to continue. On the other hand the largest required reduction will be less than 27 percent, thereby allowing more than 73 percent of the current municipal load to continue.

The San Diego Water Board believes that the municipalities are capable of achieving 1 to 27 percent reductions within 5 to 7 years via a combination of aggressive non-structural BMPs, and targeted structural BMPs in known bacterial hot spots.

Comment 349

Comment 216. Numerous specific responses were provided in the comments, nevertheless, our concern remains that the current load reduction targets and compliance timeframes for MS4 discharges are unrealistic and unachievable. The load reduction targets are impacted by many of the comments described in this attachment, and our concern regarding timing is inextricably linked to those targets.

Response: Please see response to Comment 348.

Comment 350

Compliance Schedule – The June 25, 2007 draft technical report modified the Final Dry Fecal Coliform and Enterococcus compliance schedule. This change is inconsistent with the previous Regional Board staff position which was based on an acknowledgement that, while it is feasible for dischargers to comply with final Wasteload Allocations within 17 years, it is infeasible for the dischargers to comply with these final Wasteload Allocations within 10 years. Please describe the rationale for the change, anticipated impacts to dischargers, and feasibility of compliance.

Response: The San Diego Water Board believes that 10 years is the maximum required timeline to achieve dry weather TMDLs. In fact, many beaches included in this TMDL are meeting WQOs during summer dry weather as shown by monitoring data. This is due to low flow diversion structures and other BMPs implemented by coastal municipal dischargers since 2002. We also believe that a 10-year compliance schedule for dry weather TMDLs is feasible because non-structural, less expensive source reduction BMPs are available to the dischargers.

Comment 351

The compliance schedule and interim goals/milestones should be clarified.
The Draft TMDL's compliance schedule requires 50% of "all interim and final dry ENT and FC" to be met several years before 100% interim reductions are required. The Regional Board should clarify what is meant by "50%". Is this 50% of the billion MPN/year existing load or is it a 50% reduction in exceedance days? Also does "all interim" refer to both dry and wet weather interim requirements? This is extremely confusing. For comparison, the Santa Monica Bay Beaches Bacteria TMDL sets interim compliance targets as maximum allowable exceedance days. The Regional Board should clarify this language.

Response: Thank you for the comment. The required reductions have been clarified by separating the wet and dry weather requirements into two tables. The required 50 percent reduction is a wasteload reduction.

Comment 352

The compliance point for final dry weather targets should be moved forward.
The Draft TMDL requires final dry and wet weather targets to be met 20 years after TMDL approval. The timeframe appears excessive for meeting final dry weather targets. As you know dry weather targets are much easier to meet than wet weather targets, and the dry weather period is the most critical period from a public health perspective. The Santa Monica Bay, Marina del Rey and San Pedro Bay Beaches Bacteria TMDLs require final dry weather targets to be met three years after adoption for the AB411 time period and 6 years for winter dry weather. Since this deadline has past, we have seen great improvements in beach water quality in Santa Monica Bay. Many municipalities in Los Angeles County have implemented best management practices such as dry weather diversions and treatment facilities to improve beach water quality. San Diego Regional Board staff should separate the final compliance dates for dry and wet weather, so that the dry weather targets are met within at most five years. This is necessary to protect public health as soon as feasible during the high-use beach period.

Response: To clarify, the compliance period for the dry weather TMDLs is 10 years. The San Diego Water Board developed the compliance schedule through several years of collaborative efforts with our stakeholders. Even though the TMDLs were not yet adopted, our municipal dischargers showed their commitment to meeting water quality objectives during dry weather by implementing BMPs like those mentioned in the comment. Monitoring data show that many San Diego Region beaches included in this TMDL are meeting REC-1 standards during summer dry weather. The compliance

schedule, with its 10 year period to meet interim wet and final dry TMDLs, was developed to allow dischargers as much flexibility as possible to meet TMDLs. For these reasons, we are not proposing to shorten the dry weather compliance period it at this time.

4.7 Environmental Analysis

Comment 353

With regard to the impacts of diverting dry weather flows on existing wetland vegetation, please provide the basis for the statements on pages R-32 and S-185 that impacted plants would likely be non-natives.

Response: Under natural conditions, most southern California inland wetlands would generally be dry during the summer and only appear wet after storm events, after the soil becomes saturated and enough storm water runoff is available to remain on the surface. Therefore, under natural conditions, inland wetlands in southern California would only appear to be wet on the surface for short periods of time primarily during the wet season.

Species of plants native to southern California inland wetlands are adapted to long periods where the wetland surface is dry. On the other hand, inland wetlands that exist due to urban runoff would have much shorter dry periods, or no dry periods at all. This type of regime encourages the growth of plant species with higher water requirements. Non-native species of plants that require significantly more water than native species, such as *Arundo donax*, crowd out the native species as long as there is an artificial source of water sustaining their growth and reproduction.

If urban runoff, which is the primary source of dry weather flows, is significantly reduced or ceases completely, the dry periods for inland wetlands are expected to become longer and more conducive to the re-emergence of native inland wetland plant species.

Comment 354

With regard to the contention on page S-185 that the elimination of dry weather flows and enhance future restoration opportunities, it is true that the removal of non-natives can facilitate enhanced growth of natives. However, if the diversion of water results in the elimination of hydrophytic non-natives, wouldn't the same diversion also reduce the area in which the hydrophytic natives could thrive?

Response: Many of the hydrophytic non-native plant species thrive when the water table is close to the surface. Additionally, many non-native species, especially *Arundo donax*, reproduce more quickly and consume significantly more water resources than native species. Therefore, the reduction or elimination of dry weather flows would remove the source of water that sustains many of the hydrophytic non-native plant species. Removal of the non-native species would also decrease the competition for and increase the availability of water for native plant species.

With a reduction in urban runoff, the area in which hydrophytic native plant species could thrive may be reduced. However, the reduction in area would likely reflect a more natural condition.

Comment 355

The City believes that achieving zero indicator bacteria at its beaches involves much more than eliminating indicator bacteria from its storm water discharges because of regrowth in receiving water and because bacteria which is generated at the beaches by birds and "dog beaches". Please address the reasonable foreseeability that dischargers will need to eliminate the wracklines upon which birds feed and excrete waste (along with the potential impacts to sensitive bird species and grunion) as well as the potential need for dischargers to prohibit dogs on beaches (along with the potential recreation impacts).

Response: The TMDL does not require a zero load of indicator bacteria at beaches. There is an allowable load for both wet and dry weather conditions. Bacteria generated by birds on wracklines are considered natural sources that are not included in the WLA for the MS4 dischargers. If the bacteria loads from natural sources exceed the TMDL, then the WLA for the MS4 dischargers may be zero. MS4 dischargers are not responsible for reducing the bacteria load from natural sources. Eliminating the wracklines is not a requirement for the municipalities to meet their WLAs, thus this is not a reasonably foreseeable alternative that will be implemented by the municipalities.

As for bacteria in dog feces, there is no need to prohibit dogs on beaches as long as the municipalities enforce their ordinances requiring dog owners to pick up after their dogs. Municipalities can also encourage dog owners to pick up after their dogs by providing plastic bags and trash receptacles at the beaches. Enforcement of a municipality's ordinances and providing plastic bags and trash receptacles are reasonably foreseeable alternatives that will not have an adverse impact on recreation, and will likely increase recreational use of beaches.

4.8 Economics

Comment 356

In the responses to comments there are numerous references to conducting more studies, gathering more data and model refinement (since the RWQCB indicated they cannot commit to re-evaluating the watershed models used, even though numerous flaws have been acknowledged); however the costs of these studies, data collection and model refinement did not appear in the economic analysis. Studies can be extremely costly (for example, the SCCWRP Epidemiology study is $2M-$3M plus) and resource intensive and they need to be considered in the economic analysis.

Response: The economic analysis considers the costs of reasonably foreseeable methods of compliance with the proposed TMDL. Methods of compliance include the implementation of non-structural and structural controls to reduce pollutant loads to meet the TMDL and collection of data to determine compliance with the proposed TMDL. However, collection of data and conducting studies for model refinement or TMDL refinement are not part of the reasonably foreseeable methods of compliance with these TMDLs. Therefore, the economic analysis is not required to consider data collection, studies, and model refinement for this purpose.

Comment 357

Comment 281. The response to comment 281 does not address either of the salient issues in the comment. Those issues are as follows: 1) whether the cost to prevent an illness is within the range established by other public health policies, and 2) this TMDL program will not be implemented in isolation. Other TMDL programs are being developed and implemented and each will have its own implementation requirements. It was recommended that the Regional Board conduct a costing exercise to estimate what the aggregate TMDL-related investment could be, whether this is even economically feasible, and whether there are possible cost saving approaches.

It is difficult to understand how the cited study (Given et al 2006) applies to the current TMDL. A more relevant analysis would estimate the cost of an illness avoided by implementation of BMPs to achieve water quality standards. The cited study presents costs of all illnesses in the specific area of Southern California due to recreational activities based on the EPA (1986) and Kay et al. (2004) relations between enterococci densities and health risk. It is important to keep in mind that EPA has set an acceptable level of risk at ~1 illness per 100 recreation events. So even if all waters investigated in that study were to be in compliance with the EPA standards, there would be substantial costs associated with GI illness in Southern California, given the large number of recreation events that occur annually. It should also be noted that there is substantial and unresolved scientific controversy regarding the use of the Kay et al relation as employed by Given et al (2006) (See commentary by Wymer et al. in Water Research 2006).

Response: The commenter's recommendation that the San Diego Water Board conduct a costing exercise to estimate what the aggregate TMDL-related investment could be,

whether this a economically feasible, and whether there are cost saving approaches is beyond the scope of the economic factors the San Diego Water Board must consider in its environmental analysis. The study cited (Given et al 2006) in the response to Comment 281 was simply an example that shows there are economic benefits for the dischargers to comply with the TMDL. The economic impact due to illnesses contracted from swimming at contaminated coastal waters can offset the costs of complying with the TMDL. However, compliance with the TMDL is a requirement, and while public health is a consideration, it is not an overriding factor that allows the dischargers to discharge in exceedance of the wasteload allocations. A TMDL is not a public health policy, it is for the restoration and/or protection of water quality.

We do recognize that this TMDL program will not be implemented in isolation. We have revised the implementation plan to allow the dischargers to submit a Comprehensive Load Reduction Plan (CLRP) for all constituents of concern in lieu of the Bacteria Load Reduction Plan. The CLRP may provide a basis for an appropriately tailored comprehensive compliance schedule (CCS), which may not extend beyond 20 years. The CCS will allow the dischargers to budget implementation of measures to comply with the TMDLs for all constituents of concern over a longer period of time, thereby reducing the annual costs required. In the CLRP and CCS, the dischargers will be able to identify the most cost effective approach and cost saving opportunities to implement their programs to comply with the TMDLs.

Comment 358

Reasonably Foreseeable Means of Compliance <u>The City continues to request that the Regional Board explicitly acknowledge that treatment and/or diversion (e.g., infiltration) of storm water will be required</u> in order to produce storm water discharges with zero indicator bacteria as required by the final Wasteload Allocations. Unlike Chollas Creek Dissolved Metals TMDL which acknowledged this reasonably foreseeable means of compliance, the staff response for this TMDL (page S-2001) states that in some cases structural BMPs may not be necessary. Does this response apply only to discharges which have no anthropogenic-related bacteria sources in the drainage area? Analysis of water quality samples collected in the city reveal that 79% of the samples contain detectable levels of indicator bacteria (DNA analysis is required to determine whether the source of this bacteria is anthropogenic). Detection limits vary, but it is reasonable to assume that some of the remaining 21% of samples contain indicator bacteria in excess of the zero Wasteload Allocation.

Response: The response referred to by the comment was in reference to the discussion about potential non-structural or structural controls that may be implemented in residential areas. We do not know which non-structural and/or structural controls will be implemented by the dischargers in residential areas to comply with the TMDLs. In some cases, non-structural controls (e.g., enforcement of ordinances, education) may be all that is required to meet load and wasteload allocations. In other cases, structural controls may also be required. The dischargers will have to determine what non-structural and/or structural controls will need to be implemented on a cases-by-case basis, appropriate to the environmental setting and potential sources of bacteria. Treatment and/or diversion

of storm water will be necessary to meet a zero wasteload allocation for wet weather. Because we intend to revise the final wet weather TMDLs to incorporate a reference system approach, the Implementation Plan does not require the dischargers to conduct wet weather planning, or reduce wet weather loads until after the San Diego Water Board has considered adopting the revised TMDLs.

4.9 Comprehensive Load Reduction Plans

Comment 359

We appreciate the inclusion in the June 2007 Draft TMDL Report of provisions allowing watershed co-permittees to propose Comprehensive Load Reduction Plans with tailored compliance timeframes so that other interrelated watershed concerns such as hydromodification and nutrients can be addressed cost-effectively in lieu of just bacteria load reduction. While it seems likely that all impaired waters could benefit from a comprehensive approach, the South Orange County Co-Permittees consider the two impaired creeks (Aliso and San Juan) as best justified and the highest priority to be addressed in the comprehensive manner, due to multiple impairments and the existence of already-substantial bodies of watershed data, planning and BMP efforts. The County of Orange, with the full support of the Co-Permittees including the City of Laguna Niguel, has taken the lead since the release of the June 2007 Draft TMDL to develop a framework document, based on the Chollas Creek framework document previously developed by the City of San Diego, to support a comprehensive load reduction program for Aliso and San Juan Creeks. This document, called the *TMDL Strategic Assessment and Watershed Implementation Framework* (a.k.a. ASJIF, for *Aliso/San Juan Implementation Framework)* will be submitted to the RWQCB by the County of Orange by August 1, 2007. The ASJIF will establish the foundation for the development of Comprehensive Load Reduction Plans with 20-year tailored compliance schedules for Aliso and San Juan Creeks, in lieu of the respective Bacteria Load Reduction Plans. ***The Co-Permittees request that these two creeks be specifically authorized for comprehensive planning and 20-year compliance schedules, along with Chollas Creek, explicitly in the Bacteria TMDL Report prior to the scheduled RWQCB action in September 2007.*** Please note that this limited request is driven primarily by time constraints and is not intended to imply that future similar requests will not be made for the other impaired waterbodies in South Orange County, as provided for in the Revised Draft TMDL.

Response: The San Diego Water Board appreciates the timely efforts put forth in the *TMDL Strategic Assessment and Watershed Implementation Framework: Aliso Creek and San Juan Creek Watersheds*, (Orange County ASJIF) which was submitted to our office on August 2, 2007.

In response to a comment from Coastkeeper, the San Diego Water Board developed conceptual performance standards for CLRPs, and these are included in the revised Technical Report. Among the performance standards is a requirement that municipalities achieve water quality objectives in receiving waters for other impairing pollutants that are to be included along with bacteria in the CLRPs, within the proposed timeframe for the CLRPs, not to exceed 20 years. That CLRPs be designed to meet water quality objectives in receiving waters was always our intent. However, this was not explicitly made clear in the draft Technical Report. In this context, “achieving the water quality objectives in receiving waters for other impairing pollutants” means that the municipal dischargers and Caltrans meet the Receiving Water Limitations requirements of their respective NPDES

Storm Water WDRs. These Receiving Water Limitations include an iterative process of increasingly stringent BMPs that will result in achieving water quality objectives. The respective NPDES Storm Water WDRs also contain monitoring requirements which can be adapted to monitor, document, and assess BMP implementation. All CLRPs must be designed to achieve water quality objectives in receiving waters for other impairing pollutants, by meeting NPDES Receiving Water Limitations as verified through NPDES monitoring requirements, within the CLRP timeframe.

While the Orange County ASJIF contains many of the conceptual performance standards discussed in the Technical Report, and deserves to be commended, it falls short of committing to achieving water quality objectives in receiving waters for other impairing pollutants within the proposed timeframe of 20 years. Rather, it states that the ASJIF "will move the improvement schedule for the parameters dramatically forward." Because of this shortcoming, the San Diego Water Board cannot authorize a 20 year compliance schedule for the San Juan Creek and Aliso Creek Watersheds.

Comment 360

The City is pleased to see that the compliance schedule has been revised with a phased-approach. In addition, the option of a comprehensive load reduction plan framework makes a lot of sense. South Orange County Cities have worked expediently and cooperatively together to prepare a comprehensive watershed specific load reduction framework, "TMDL Strategic Assessment & Watershed Implementation Framework for the San Juan Creek and Aliso Creek Watersheds," which has been/will be submitted to the RWQCB by the County of Orange on behalf of the municipalities. The City of Dana Point has been an active participant in the development of this framework and fully supports this more comprehensive effort. The City highly encourages RWQCB staff to consider including details (revised compliance schedule, etc.) of this element in the TMDL prior to adoption (similar to Chollas Creek).

Response: Please see response to Comment 359.

Comment 361

The Cities of Laguna Beach, Laguna Woods, Mission Viejo, and San Juan Capistrano support the development and implementation of the *TMDL Strategic Assessment and Watershed Implementation Framework* for the Aliso Creek and San Juan Creek watersheds, prepared and submitted by the County of Orange. This document establishes the foundation for the development of a Comprehensive Load Reduction Plan, which will be prepared upon adoption of the Indicator Bacteria TMDL for the Project I Beaches and Creeks in the San Diego Region.

The proposed approach will address all of the 303(d) listed pollutants in the Aliso Creek and San Juan Creek watersheds as well as other local watershed concerns such as hydromodification and flooding. A 20-year implementation period is proposed to allow for a comprehensive and adaptive plan. A comprehensive watershed approach rather than a bacteria-focused approach will provide many benefits, including:

- Best use of resources through multi-objective BMPs. Comprehensive planning will necessitate that BMPs be selected that can address a range of impairments. This will result in cost savings to the public by limiting the number of BMPs that will be required.
- Best use of resources through adaptive management. The phased implementation of BMPs will allows for adaptive management through the implementation period. This will result in cost savings to the public as the plan is continually refined to incorporate data from earlier phases.
- Accelerated attention to additional 303(d) listed impairments. While the bacteria TMDL will likely be approved in 2008, additional 303(d) impairments are not scheduled for TMDL completion until 2019. Pursuing a comprehensive plan at this time will result in improving water quality related to those impairments earlier.
- Development of critical monitoring data. In order to address impairments outside of bacteria, the Permittees are committed to a robust data acquisition strategy that will develop monitoring data related to a wide range of impairments. This data will be available to the Permittees as well as the Regional Board.

Response: Please see response to Comment 359.

Comment 362

One revision in latest version of the Technical Report gives dischargers addressing other pollutant constituents concurrently with the bacteria load reduction the option to submit a Comprehensive Load Reduction Plan in lieu of the Bacteria Load Reduction Plan (see page 16). In the CLRP, a discharger may propose a comprehensive compliance schedule, different from the milestones and compliance points set forth in the TMDL.

Coastkeeper agrees with the rationale of encouraging cities to proactively address pollutants, especially in waters currently listed as impaired, but not yet covered by a TMDL restoration plan. However, without mandatory Board approval and adequate public participation, there is insufficient oversight of discharger accountability in the CLRP process. Adequate public participation includes notifying stakeholder groups of the CLRP submission, an opportunity for public comment, public hearing (and notice of the hearing), and requisite review by the Regional Board.

Without input from interested stakeholders, compliance schedules and pollution reduction practices could potentially be implemented without a uniform standard, permitting some dischargers to implement their CLRPs with less stringent requirements and compliance schedules than other dischargers. This concern may be clarified with more information about the performance standards to be used.

a. Conceptual Performance Standards Must be Developed and Clarified
At the July 9th SAG meeting, staff alluded to 'performance standards' that would be used to determine whether the actions and compliance schedules proposed by dischargers are adequate for the Comprehensive Load Reduction Plans. After talking with staff, it seems these standards have not been developed and are still under staff consideration. No performance standard or template has been shared with the SAG or posted on the website. The format of the standards will be critical to developing a transparent,

objective, and consistent system. We are particularly interested in ensuring that the CLRPs do not result in inconsistent compliance schedules.

The concept of addressing multiple pollutants was raised in the Chollas Creek Metals TMDL (Technical Report, May 30, 2007, Appendix I, Section 8.4). However, in that case, a significant study (Weston Solutions, 2006. Chollas Creek TMDL Source Loading, Best Management Practices, and Monitoring Strategy Assessment, September, 2006) was the basis for a tiered system. Specifically, the tiering was outlined in several public meetings, and stakeholders were able to comment on the length of the compliance schedule, and the particular tiered objectives. Any performance standard allowed for the Bacteria 1 TMDL should use defined targets that ensure compliance standards and schedules are respected.

Response: Conceptual performance standards for Bacteria Load Reduction Plans (BLRPs) and CLRPs were developed and are included in the draft technical report in section 11. These performance standards should result in consistent CLRPs and consistent information upon which to base tailored compliance schedules. When compliance schedules are incorporated into stormwater WDRs, the public will have ample opportunity to review and comment on the compliance schedules.

Comment 363

b. Review by Regional Board Review Must be Mandatory
The technical report states CLRPs are "subject" to review by the San Diego Water Board, but does not appear to make this review mandatory (see page 16). Without moving the CLRPs through the Board process, stakeholders will have no opportunity to comment on specific CLRPs, nor will dischargers or other interested parties have access to notice and feedback when the CLRPs are submitted.

If, as we suspect, Board approval is not mandatory, we find this to be an inappropriate delegation of authority by the Board to its executive officer. Section 13223(a) of the California Water Code provides that a regional board may delegate substantial powers to its executive officer, except for "the issuance, modification, or revocation of any water quality control plan, …" (Cal. Water Code § 13223(a) (2007)). The TMDL amends the Basin Plan, the San Diego water quality control plan. A water quality control plan must contain "a program of implementation needed for achieving water quality objectives." (Cal. Water Code §13050(j) (2007)).

Generally, load reduction plans submitted during the implementation phase of other TMDLs focus on how compliance with the TMDL will be attained. However, here the CLRP could potentially modify this TMDL by changing its substantive provisions, namely the compliance schedule and quantity of other pollutants addressed. Thus, the CLRP is a component of the water quality control plan, rather than simply the implementation method, and so requires a public hearing to be consistent with §13244 of the California Water Code.

Response: CLRPs will be submitted in compliance with an implementing order of the San Diego Water Board, and will not be added to the Basin Plan. As such, section 13244 of the Water Code does not apply, because the Basin Plan is not being amended.

Furthermore, CLRPs cannot change the bacteria TMDLs or load and wasteload allocations. Since the Implementation Plan allows tailored compliance schedules when justified in a CLRP, the compliance schedule provisions of the TMDL are not substantively changed when a longer compliance schedule is authorized pursuant to a CLRP.

A public review and comment process will occur when CLRPs are incorporated into NPDES stormwater WDRs during renewal. Any TMDL implementation provisions and any compliance schedule proposed in a CLRP, and proposed by the San Diego Water Board for incorporation into NPDES stormwater WDRs, will be subject to the public review process for renewing WDRs.

Comment 364

The Technical Report purports to limit compliance schedules in a CLRP in that they may not extend bacteria compliance milestones beyond the interim milestones set forth for Chollas Creek (See page 16). The term 'interim milestones' could refer to the 10 year, 80% reductions or the 20 year, 100% reductions in the Chollas Creek Technical Report (Table 11.2) and should be clarified. In either case, subsequent to Board action on the TMDL, the compliance schedule for bacteria could change, potentially tripling the compliance schedule approved by the Board based on the CLRPs.

Response: Thank you for the comment. The technical report has been clarified. The previous draft incorrectly referred to 'interim milestones' and was actually intended to establish the same 20-year maximum compliance schedule for CLRPs as per the Chollas Creek Metals TMDL.

4.10 Independent Advisory Panel

Comment 365

With respect to this TMDL, RDMD's goal is active and responsible stewardship of the waters within our jurisdiction. Within this context we have interest in ensuring, to the extent feasible that public resources allocated towards water quality improvements will enhance protection of the beneficial uses (that is, actual reduction of risk to levels that are acceptable), and thus, public health protection. At the same time, we understand that the Regional Board would like to move the TMDL forward and begin to see implementation of water quality improvements in the most expeditious manner possible. To resolve these potentially competing goals, we offer the suggestion of convening an Independent Advisory Panel (IAP) comprised of nationally recognized experts to assist the Regional Board in resolving the technical issues that have led to the impasse described above. We suggest this approach because the existing peer review process has not adequately addressed these issues. We envision contracting an independent third party agency to assemble the panel, manage the review process, and provide documentation of the panel's proceedings, findings, and recommendations. RDMD would be willing to participate in setting up and supporting the IAP process. Further, we would expect Regional Board staff to actively participate in this IAP process by submitting suggestions for charge questions and attending IAP meetings. Upon completion, the proceedings from the IAP would be provided to the Regional Board. It is our hope that the findings and recommendations from the IAP would be key to informing the next steps and shaping the direction of the final TMDL. We anticipate the findings from the panel could be available in a time period of 3-4 months from the point of initiation.

Logistically, the adoption of the TMDL could be delayed until the IAP process is concluded, or a specific clause for a re-opener could be included in the TMDL to address the findings of the IAP. Given that development of the TMDL has taken several years to date, and that results from the IAP could be available in a relatively short time period, it would be preferable to commence the IAP process as quickly as possible and postpone adoption of the TMDL until the process concludes. This approach has the additional appeal of allowing sufficient time so that the Basin Plan amendment addressing the reference system approach and natural sources could be adopted at the same time as the TMDL, thus resulting in a comprehensive and implementable TMDL process, as many stakeholders have recommended and requested. If the Regional Board is willing to adopt this approach, RDMD will work with Orange County stakeholders to begin to move forward with TMDL implementation in a prioritized manner in parallel to the IAP process. The initial focus would be on elements that address dry weather exceedances of bacterial water quality standards at beaches, as the highest priority, as these exceedances are of the greatest public health concern.

Response: Periodic reviews of TMDLs and consideration of new information are key to making the TMDL process adaptive. As part of the Implementation of these TMDLs, and the development of the revised final wet weather TMDLs, the stakeholders are encouraged to form an expert panel to provide input and information on refining and

improving the TMDLs to the San Diego Water Board. TMDL program staff will interact with the panel to the extent that is feasible and practical. We have not included a "fixed" TMDL review schedule in the Implementation Plan because we cannot predict when information justifying TMDL revisions will be collected and available. However, when data and information are collected and available, and they indicate the TMDLs are either too conservative or too liberal, we will make revising the TMDLs a program priority.

Comment 366

Additionally, because numerous important issues (methods for calculating loadings, using the 90th percentile standards as not-to-exceed values, feasibility of load reduction targets, potential implementation costs, etc.) have yet to be resolved, and will likely not be resolved prior to initial TMDL adoption and implementation, we believe that ongoing discussion and review by an independent expert panel should be part of the TMDL implementation process. The County of San Diego supports the concurrent implementation of the TMDL and the convening of an expert panel on bacteria to aid in the refinement of the TMDL technical criteria, improvements to data evaluation and modeling, and the development of feasible and appropriate Bacteria Load Reduction Plans.

We request that the Regional Board commit, as part of the ongoing TMDL implementation process, to periodic reviews and discussion of input received through the independent expert panel or other sources, and that needed modifications be made to the TMDL as identified through that process. While we understand that your Board has the discretion to consider modifications to the TMDL in response to staff recommendations at any time, we feel it is crucial that a fixed review schedule be incorporated as part of the implementation process. As the science of bacteria evolves and additional monitoring data are collected, continued open communication and improved refinement of the modeling will further ensure that the public funds for structural or other improvements to reduce bacteria in streams and beaches are necessary and appropriate.

Response: Please see response to Comment 365.

Comment 367

The City of Laguna Niguel endorses the comment letter submitted on July 25, 2007 by the County of Orange regarding its ongoing concerns with the Total Maximum Daily Loads for Indicator Bacteria Project I – Beaches and Creeks in the San Diego Region Draft Technical Report dated June 25, 2007. While we appreciate the RWQCB staff's efforts in this latest Draft to incorporate adaptability into the process, we share the County's concerns that the TMDL's load reduction emphasis on wet-weather days when recreational use is minimal is not cost-beneficial with respect to public health risk; that WQOs and load reductions are inappropriately applied statistically and geographically; and that the issue of a useful compliance metric – brought up by the SAG on numerous occasions – has once again been pushed to a later date, leaving the municipalities, the public, and the RWQCB's NPDES permit-implementation staff all dangling without assurance of what's going to be required. In its current letter, the County proposes that an Independent Advisory Panel be convened to address these issues, preferably in

advance of adoption of the TMDL by the RWQCB, so that the IAP's findings would be timely to be reflected also in the text of the proposed Reference System/Natural Sources Exclusion Basin Plan Amendment. We support this approach.

Response: Neither the federal Clean Water Act nor the state Porter-Cologne Water Quality Control Act allow us to take into account cost-benefit considerations when we implement water quality standards. Although fewer people recreate in the ocean and inland waters during winter-time storm events compared to summer months, we must ensure that water quality supports REC-1 uses year round. We disagree that the load reductions are inappropriately applied geographically and statistically and have addressed comments on this topic in our two Response to Comments Appendices. By not requiring a particular metric for compliance, we have allowed time for dialogue among the stakeholders and San Diego Water Board staff to develop a workable compliance approach to incorporate into the TMDL implementing orders. We believe this approach allows us to move forward now to adopt the TMDLs while still providing time to develop an appropriate compliance metric, even though it leaves unanswered questions at this time.

4.11 Miscellaneous

Comment 368

The apparent aggressive pursuit, with pressures from EPA and State, of finalizing the TMDL with acknowledgement of the lack of data, data that will be available in the near future and refusal to revise the model based on best available data, continues to cause tremendous concern. Repeated written responses and comments from the RWQCB staff that the TMDL cannot be delayed any longer because dischargers need to start doing something to address bacteria are not justified, particularly in South Orange County, in our opinion.

It should be noted that South Orange County dischargers have been aggressively focusing their efforts under the current Stormwater permit and their watershed actions plans for at least the past five years. The fact that beaches in every south Orange County coastal City (San Clemente. Dana Point and Laguna Beach) meet criteria for de-listing demonstrate significant achievement from the efforts that the Cities' have made to address indicator bacteria issues. Dischargers are doing plenty! The City of Dana Point aggressively pursued funding and committed $500,000 itself to initiated the Epidemiology and Microbial Source Tracking Study at Doheny State Beach, currently being conducted by the Southern California Coastal Water Research Project (SCCWRP) and University of California Berkeley - knowing that this effort is greatly needed to help effectively address this TMDL effort and beyond.

Response: We appreciate the proactive and effective actions of the South Orange County dischargers to reduce dry weather loading. However, we are not aware of any actions taken to address wet weather loads. The adoption and implementation of the TMDLs should not wait until the studies being performed on behalf of the dischargers are completed. When the studies are completed, the results of the studies and the data that are collected by the dischargers may help the dischargers identify anthropogenic sources that can be further reduced to meet the wasteload allocations, as well as provide a basis for modifying the parameters in the models used to calculate the TMDLs.

Comment 369

Although, the City has continued concerns regarding the method of implementation and method of compliance evaluation of the TMDL program, we have been told by staff that the details will he developed in the load reduction plans. We feel strongly that the natural background exclusion Basin Plan Amendment and the Epidemiology study should provide valuable information that will help develop these plans. However, the RWQCB, along with the SAG, have only briefly mentioned a few options of compliance assessment that may be considered (verbally indicating that effluent limits are not necessarily required) which has only provided a modicum of comfort. As an agency who serves the public, we must ensure that programs are developed in our constituents' best interest in a financially responsible way. We hope to continue a cooperative relationship with the RWQCB so that these items are developed and the final outcome will he reasonable, flexible and effective: however we need to note that we remain concerned

that because these items are not being addressed at this time, with the potential change of staff, etc., the intent could be lost, whereby subjecting dischargers to undue methods of implementation and compliance assessment.

Response: Upon adoption of this TMDL, a Transfer Plan will be developed to lay out the expected actions that will be taken by the San Diego Water Board to implement the TMDLs. The load reduction plans and methods of compliance assessment will require a cooperative effort between the dischargers and the San Diego Water Board.

The dischargers have the primary responsibility of developing the load reduction plans. Therefore, the dischargers are given an opportunity to propose a monitoring strategy that will provide the flexibility they are looking for as long as they provide the data and information to determine compliance with the TMDL.

Comment 370

Another great concern that has just been brought to the table in the NPDES reissuance process, is the newly defined Facility that Extracts, Treats and Discharges (FETD) waters of the US or State. This language and the proposed monitoring requirements, as well as long-term intention of requiring these facilities to obtain individual NPDES discharge permits (meeting all applicable water quality standards), was recently included in the revised draft tentative order for the south Orange County MS4 Permit. It is an entirely new addition, as it was not included in the first iteration of the draft Permit. This proposed requirement is quite alarming, as it requires addition monitoring, which may or may not be based on the treatments purpose. At this time it appears that in order to meet the goals of the TMDL, treatment facilities will be necessary. This extra layer of regulatory requirements will put an extra burden on dischargers trying to do the right thing and may exclude potential solutions to the problems at hand.

The City sincerely understands the need to ensure that a treatment facility will not create additional concerns (such as toxic byproducts), and we also understand that it is prudent to address more than one concern at a time when it makes sense (hence our support and development of a comprehensive load reduction plant); however the language included requires monitoring that may not be applicable to the pollutants of concern and does not address the concern of toxic products of treatment.

Why does the RWQCB feel the necessity to pursue individual NPDES permits for FETDs? It appears that that this will block any "end of pipe" solutions that address current 303(d) list bacteria reduction efforts, when it is these ends of pipe solutions that may be the only way to get us to our goal. It seems logical to require monitoring for potential toxic byproducts for a specific time to see if they are in fact a concern, but the reasons for requiring monitoring for other parameters is not understood. It seems logical to look at specific projects on a case by case basis, under the existing NPDES Permit and TMDL Bacteria Load Reduction Plans to determine what monitoring makes sense for that particular project. Please address.

Response: As stated in revised Tentative Order No. R9-2007-0002, facilities that extract, treat, and discharge (FETDs) to waters of the U.S. may discharge effluent that does not support all designated beneficial uses without proper treatment processes. The use of the

MS4 NPDES requirements to regulate discharges from FETDs is an interim approach until individual or general NPDES requirements are developed. Until then, discharges from FETDs are expected to meet all applicable water quality standards (i.e., antidegredation policy, water quality objectives, and beneficial uses) to comply with the NPDES requirements for Southern Orange County. This does not differ from what is generally required of any discharge to a surface water body from a point source. If FETDs can meet all water quality standards, there may be no need to issue individual NPDES permits.

However, development of individual NPDES requirements for an individual FETD, or general NPDES requirements for region wide FETDs would allow for a more focused monitoring and reporting program than what is required to comply with the Southern Orange County NPDES requirements. In any case, the discharges from FETDs are considered point source discharges to surface water bodies and must comply with the water quality standards in the Basin Plan.

Comment 371

Design Storm – The City continues to request the Regional Board provide a design storm or an allowable exceedance frequency. Regional Board staff has declined to do so, indicating that providing such a number is not required by CEQA. This response misses the mark in that the issue here is not necessarily the CEQA compliance but needed guidance on how large to build treatment and diversion facilities. For example, on page R-76 of the Environmental Analysis, treatment systems in Dana Point and Encinitas are described, including their costs. Based on the capacities noted (1,000 gallons per minute and 150 gallons per minute) these facilities (assuming they operate correctly) would themselves result in compliance with the TMDL in terms of size and effectiveness on the downstream beach. If they wouldn't, please describe a facility of a size and capacity comparable to that which would be needed to comply with the proposed TMDL. Without guidance on this issue, it is impossible for dischargers to know with certainty how to comply with the TMDL. It is not reasonable to expect dischargers to be able to design or build treatment or infiltration facilities with enough capacity to comply with a final zero Wasteload Allocation during a storm of infinite size.

Page S-162 of the Regional Board's responses to comments states that "[d]esignating a design storm criteria for structural BMPs in the NPDES requirements to implement these TMDLs is reasonable". Page S-120 indicates that the storm water permit may not be amended to incorporate the TMDL until it is renewed. The last storm water permit, Order 2001-01, was effective for almost 6 years before it was renewed. Guidance on this issue is needed much sooner in order to comply with the 10-year interim milestones in the TMDL.

Response: We understand that a design storm criterion is important for sizing and designing structural BMPs. However, specifying a design storm is not within the scope of this TMDL or environmental analysis. If the dischargers and/or San Diego Water Board develop an appropriate design storm, the NPDES storm water requirements can be amended to include it. Amending the NPDES storm water requirements is a different process and not within the scope of this project.

Comment 372

Best Management Practices (BMPs) Locations - The City continues to request that the Regional Board acknowledge its own requirement that Wasteload Allocations must be achieved prior to discharge of runoff from storm drain outfalls. The issued here is not whether the Regional Board's 401 certification program can permit BMPs in receiving water but whether BMPs built in receiving waters can result in compliance with the TMDL. Regional Board staff deleted the term "prior to discharge[d]" from pages 13 and 122 of the Technical Report (note the comparable language was not deleted from page S-168 under the "Tributary Rule" discussion0; however, this change does not appear to be of any effect given the July 23, 2007 correspondence from John Robertus to Chris Zirkle which reiterates the prohibition on using the loading capacity of receiving waters to convey or assimilate waste. Coupled with Regional Board staff's admission that, "generally speaking, where an outfall exists, receiving water extend upstream to the outfall location" (page S-169), it is apparent that the treatment and infiltration facilities need to be built above storm drain outfalls. Given the propensity for indicator bacteria to re-grow even in treated storm water effluent, storm water will either have to be infiltrated (in locations where slope stability is not an issue) or treated immediately above outfalls on land that is privately owned or currently developed.

Response: At this time we have not determined where TMDL compliance will be measured because these details are not necessary at this stage, and are more appropriately discussed in a stakeholder process prior to submission of the Pollutant Load Reduction Plans. The City of San Diego should propose both compliance methods and assessment locations in their Pollutant Load Reduction Plans, which will be unique to each watershed. The compliance methods and assessment locations will help the dischargers determine where and what types of BMPs should be implemented. We encourage the City to continue its discussion with the San Diego Water Board Storm Water Program staff on site-specific BMP proposals for compliance with TMDLs.

Comment 373

Pages S-180 and S-184 of the Regional Board's Responses to Comments critique the City's 2006 "Weston Report" by estimating the acreage required for treatment facilities based on the assumption that three-foot deep detention basins would be required upstream of the treatment works. The Weston Report uses as the basis for this three-foot depth the admittedly arbitrary criteria based on the need to obtain a dam permit to build deeper detention basins which would reduce the acreage required. However, it is the Regional Board's obligation under CEQA to disclose the reasonably foreseeable alternative means of compliance and the environmental impacts thereof, not the City's.

Response: We have provided a range of reasonably foreseeable methods of compliance in our analysis. The range of compliance methods is not a complete list of possible methods by any means, but is a range of methods that is reasonable and foreseeable. Our analysis includes the reasonably foreseeable environmental impacts, and identifies the potential mitigation measures that may be implemented. Our environmental analysis fulfills our obligations under CEQA.

Comment 374

If the Regional Board finds the Weston Report to accurately represent a reasonably foreseeable means of compliance but for the three-foot detention basin depth (or with regard to the location/sizing of treatment facilities), the Regional Board should discuss an amended scenario and the environmental impacts thereof.

Response: We agree with the Weston Report's tiered and iterative implementation strategy to comply with the TMDL, but we do not endorse any specific methods or scenarios. In our analysis, we have provided a range of reasonably foreseeable methods of compliance. Our analysis includes the reasonably foreseeable environmental impacts, and identifies the potential mitigation measures that may be implemented. However, the strategy for implementation and the selection of compliance methods will be the responsibility of the dischargers, not the San Diego Water Board.

Comment 375

Dry weather targets and waste load allocations should be clarified.
The Draft TMDL provides interim and final dry weather targets based on 30-day geometric mean water quality objectives. However, there are **seven** Ocean Plan water quality standards for indicator bacteria. Specifically, there are rolling 30-day geometric mean limits for total coliform, fecal coliform and enterococcus and single sample limits for total coliform, fecal coliform, enterococcus and a fecal-to-total coliform ratio. Thus, the final dry weather targets in the Draft TMDL should include all seven bacteria indicators. Also AB411 requires immediate public notification if a single sample standard is exceeded, so the current geometric mean-based targets conflict with this requirement. Clearly, a beach has impaired waters when public health warnings are issued and signs are posted.

In addition, the Draft TMDL does not clearly state that zero exceedances of the numeric targets are allowed in the AB411 time period at the final compliance milestone. In order to meet water quality standards and fully protect public health, no exceedances should occur at any shoreline monitoring location during summer dry weather (April 1 to October 31) unless there is a rain event. A final waste load allocation of zero exceedances is further supported by the fact that the California Department of Health Services has established minimum protective bacteriological standards – the same as the Ocean Plan standards – which, when exceeded during the period April 1 to October 31, result in posting a beach with a health hazard warning (California Code of Regulations, title 17, section 7958). After partaking in conversations with your staff, a zero exceedance waste load allocation appears to be the intention for dry weather. However, this should be clearly stated in both the Basin Plan Amendment and the accompanying Technical Document.

Response: The Technical Report has been revised to clarify that all of the Ocean Plan water quality objectives for REC-1 are TMDL numeric targets. The dry weather TMDLs are calculated based on the 30-day geometric mean, but the single sample maximums and the total-to-fecal coliform ratio are still applicable. The dry weather TMDLs represent an average maximum load that a water body can assimilate without exceeding the water

quality objectives over a period of time rather than at an instantaneous moment in time. There is the possibility that a single sample may exceed the single sample maximum water quality objective and still be able to meet the 30-day geometric mean water quality objective. However, any exceedance of the single sample maximums at beaches monitored pursuant to the Health and Safety Code (AB411) during dry weather would still be required to post signs to notify the public. Therefore, there is no conflict between the dry weather TMDLs and the Health and Safety Code.

Each discharger is assigned a wasteload allocation to comply with the TMDL. The compliance schedule provides the wasteload reduction required to meet the wasteload allocation. By the end of the compliance schedule, a 100 percent wasteload reduction is required to meet the wasteload allocation. If the dischargers do not reduce their wasteloads and exceed their assigned wasteload allocations after the end of the TMDL compliance schedule, they are not complying with the TMDL. Therefore, the TMDLs and compliance schedule implicitly state that there are zero allowable exceedances of wasteload allocations by the end of the TMDL compliance implementation period.

Comment 376

The numeric limits should not be based on the frequency of use.
The Draft TMDL appears to account for beach usage in determining the appropriate numeric targets. As stated in the Draft TMDL, "…the "designated beach" category may be over-protective of water quality because of the infrequent recreational use in the impaired creeks. The recreational usage frequency in these creeks may correspond to the "moderately to lightly used areas" category. If information is obtained to justify the "moderately to lightly used area" usage frequency, TMDLs using the corresponding to this numeric target will be used instead." This approach is inappropriate. This policy approach is in essence saying that it is okay if a few beach-goers get sick after recreating in polluted water. The Draft TMDL should not differentiate the numeric limits in this manner. If the Board believes that receiving waters are not used for recreational purposes, then the Regional Board should complete a Use Attainability Analysis to determine if the use is truly absent.

Response: The Basin Plan for the San Diego Region has different enterococci water quality objectives for different usages or use frequencies for both freshwater and saltwater, whereas the Ocean Plan only has enterococci water quality objectives for saltwater without differentiating usages or use frequencies. At the impaired segments located along the Pacific Ocean shoreline, the Ocean Plan enterococci water quality objectives are applicable. However, for inland freshwater creeks, the Basin Plan water quality objectives are applicable.

The Technical Report acknowledges that the four impaired creeks (San Juan Creek, Aliso Creek, San Diego River, and Chollas Creek) included in the TMDL project, which are freshwater water bodies, may not be necessarily used at "designated beach" level, but may potentially be classified as "moderately or lightly uses areas" for recreational purposes. However, the dischargers must provide evidence justifying the "moderately to lightly used area" usage frequency for the four impaired creeks before the San Diego

Water Board issues orders to implement the TMDLs. Otherwise, we will implement the more stringent enterococci TMDLs based on the "designated beach" usage frequency.

This approach is appropriate and is consistent with the Basin Plan and Ocean Plan.

Comment 377

Table 4-4 (Final Dry Weather Targets) implies that the final Total Coliform target for creeks is 70 MPN, which contradicts the associated text which describes it as 1,000 MPN. The table also does not reflect all the other differences described in the text between beaches and creeks with respect to interim targets. Also, the text in Section 4 should at least paraphrase the discussion included in Section 1.1, acknowledging that SHELL is not a designated use in freshwater creeks and rivers and that total coliform wet/dry and interim/final TMDLs are only applicable at the ocean shoreline, not upstream in the creeks.

Response: Thank you for noting the error. The error has been corrected and, in addition, the SHELL TMDLs were removed from this project and will be addressed in a separate SHELL TMDL and/or standards action. As a result, there are now only final dry weather targets, and no interim dry weather targets.

Comment 378

The descriptions in Tables 11-4 and 11-5 (the compliance schedules) have been generalized to the extent that what is meant by "All Interim" and "All Wet" is unclear and can be read as contradictory to the associated text. The most straightforward way to avoid misinterpretations would be more explicitness in the descriptions and inclusion of the Section 9 Table Numbers in each relevant line, for example for Years 5 through 7 in Table 11-4: "50% Interim Wet FC, TC, & Ent (Tables 9-1, 9-4, and 9-8); 50% Interim Dry TC (Table 9-6); and 50% Final Dry FC & Ent (Tables 9-3 and 9-10)", etc..

Response: Thank you for noting where the tables were unclear. Table 11-4 has been split into two distinct tables to more clearly distinguish between wet and dry weather milestones. In addition, the SHELL TMDLs were removed from this project and will be addressed in a separate SHELL TMDL and/or standards action. As a result, there are now only final dry weather targets, and no interim dry weather targets.

Comment 379

In reviewing the Technical Report released on June 25th, I noticed what must be an administrative oversight, that the City of Poway is still listed as responsibly municipality for the Mission San Diego and Santee HSA on page 137.

Response: Thank you for noting the oversight. The City of Poway has been removed from the list of responsible municipalities in the Mission San Diego and Santee HSA.

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Appendix V

Responses to Comments
Part III

Responses to written comments received on or before January 25, 2010 for Revised Total Maximum Daily Load for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek), dated November 25, 2009.

Responses to comments (Parts I and II) received on Total Maximum Daily Loads for Indicator Bacteria, Project I – Beaches and Creeks in the San Diego Region, adopted December 17, 2007, are available in Appendices S and U to the draft Technical Report.

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1 Introduction

The documents for the *Revised Total Maximum Daily Loads (TMDLs) for Indicator Bacteria Project I—Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)* (hereinafter *Revised Bacteria TMDLs Project I*) were made available to the public for formal review and comment beginning November 25, 2009. This document provides written responses to written comments received on or before January 25, 2010.

The comments letters received were not reproduced in this document. Individual comments were excerpted from the letters. The comments are numbered sequentially in this report. Comments are separated in this document by section. Each section is for each individual commenter. Individual commenters are identified in the "List of Persons Submitting Comments" below.

2 Key Issues

Based upon a review of the written comments submitted on or before January 25, 2010, several key issues raised by the commenters were identified. The key issues and general responses are provided below.

2.1 Removal of Delisted Beaches from TMDLs

Several commenters are opposed to including certain beaches in these TMDLs that were recently delisted from the 2008 303(d) List.

Response: Several beaches listed on the 2002 Clean Water Act Section 303(d) List of Water Quality Limited Segments (303(d) List) have been delisted on the 2008 303(d) List. Removal of a beach segment from the 303(d) List, however, does not ensure that it will not be placed on the list again in the future. All the specific beaches addressed by these TMDLs were listed at one time on the 2002 303(d) List, or earlier, indicating impairment by bacteria has occurred in the past, and the threat still remains in the present and future.

While some specific beach segments have been delisted from the 2008 303(d) List, the majority of the beach segments along the Pacific Ocean shorelines listed on the 2002 303(d) List and addressed by these TMDLs remain listed on the 2008 303(d) List. Because these indicator bacteria TMDLs are applicable to the entire Pacific Ocean shoreline of a watershed, all the beaches that fall within the Pacific Ocean shoreline are included in the TMDLs. Therefore, if a delisted beach is listed again in the future, there will be applicable TMDLs already in place to address the impairment. Likewise, if a beach along one of those Pacific Ocean shorelines that was not listed in the past is listed in a future iteration of the 303(d) List, there will be applicable TMDLs already in place to address the impairments. This is significant since the development of TMDLs is very resource and time intensive and TMDLs already in place can be implemented immediately.

Furthermore, the San Diego Water Board has expended a significant amount of resources to develop these indicator bacteria TMDLs. Removing specific beach segments from these TMDLs at this time would not be a good use of those spent resources, especially if those beaches were to be re-listed in the future. By having these TMDLs in place, the San Diego Water Board is maximizing its limited resources and ensuring that current and future potential bacteria impairments will be addressed.

Finally, Clean Water Act Section 303(d)(1) requires each state to identify waters within its boundaries not able to meet water quality standards and establish a priority ranking for such waters. In addition, section 303(d)(1) requires the establishment of TMDLs for those waters. For waters not identified and prioritized as required by section 303(d)(1), section 303(d)(3) requires the estimation of TMDLs as well. Thus, section 303(d) requires the establishment of TMDLs with seasonal variations and margin of safety for all waterbodies, regardless of whether or not they are on the Clean Water Act Section 303(d) List of Water Quality Limited Segments (303(d) List). The 303(d) List is just a list of the waterbodies with the highest priority for the development of TMDLs and TMDL implementation plans.

The adoption of bacteria TMDLs for all 20 waterbodies will ensure that the San Diego Water Board has a plan in place to address the existing and the future potential bacteria impairments, as well as fulfill the requirements of Clean Water Act section 303(d)(1) and (3).

2.2 Definition of Wet Days

Several commenters asserted that the allowable exceedance frequency for the wet weather TMDLs should be based on wet weather days defined as days with 0.1-inches of rainfall and the following 72 hours, instead of 0.2-inches and the following 72 hours, as defined in these TMDLs.

Response: A wet weather day was defined as days with 0.2 inches of rainfall and the following 72 hours in the original Bacteria TMDLs Project I Basin Plan amendment adopted on December 12, 2007 and has not been changed. There were no comments submitted at the time that opposed this definition of a wet weather day, thus no change in the definition was made.

This comment was raised during the January 7, 2010 SAG meeting that the exceedance frequencies at Leo Carrillo Beach were calculated based on wet weather days defined as rainfall events of at least "0.1 inch and the following 72 hours." The Leo Carillo Beach reference study identified a reference system that was used to define an allowable exceedance frequency specific to the Los Angeles Region. For these bacteria TMDLs, the San Diego Water Board decided to use the 22 percent wet weather exceednace frequency as an *initial* allowable exceedance frequency, with the expectation that a region specific or multiple watershed specific allowable exceedance frequencies would be developed as additional data were collected in reference systems identified for the San Diego Region. There were several comments submitted for *Bacteria TMDLs Project I* that supported developing a region specific allowable exceedance frequency.

Presumably, because these TMDLs define a wet weather day based on 0.2 inches rather than 0.1 inches of rainfall, there would be fewer wet weather days and potentially a higher exceedance frequency. Another option would be to set the wet weather allowable exceedance frequency at 0 percent until a region specific allowable exceedance frequency is developed. This, however, was the initial (and current) reason that the Reference System Approach Basin Plan amendment was needed and developed.

Because of the uncertainty associated with using a reference system that is not specific to the San Diego Region, using a somewhat conservative wet weather allowable exceedance frequency (i.e., 22 percent) is warranted until a region specific wet weather allowable exceedance frequency is developed. The San Diego Water Board supports developing and establishing a region specific allowable exceedance frequency during wet weather conditions based on data collected from reference systems in the San Diego Region.

Until a region specific wet weather exceedance frequency is developed, the 22 percent wet weather exceedance frequency is an appropriate *initial* allowable exceedance frequency for these TMDLs.

2.3 Dry Weather Allowable Exceedance Frequency

Several commenters asserted that the dry weather TMDLs should include an allowable exceedance frequency greater than 0 percent.

Response: This comment was raised during the January 7, 2010 SAG meeting about the application of the Leo Carillo Beach reference study used by the Los Angeles Water Board. The Leo Carillo Beach reference study identified a reference system that was used to define an allowable exceedance frequency specifically for the Los Angeles Region. In the Los Angeles Region, there is an allowable exceedance frequency of the single sample maximum for wet weather (22 percent), winter dry weather (3 percent), and summer dry weather (0 percent).

For these bacteria TMDLs, the San Diego Water Board decided to use the 0 percent dry weather exceedance frequency as an *initial* allowable exceedance frequency for the dry weather TMDLs, applicable for the entire year. The 0 percent dry weather allowable exceedance frequency applies to all dry weather days for both the single sample maximum and 30-day geometric mean WQOs. Because of the uncertainty associated with using a reference system that is not specific to the San Diego Region, using the most conservative dry weather allowable exceedance frequency (i.e., 0 percent) is warranted until a region specific dry weather allowable exceedance frequency is developed.

The San Diego Water Board supports developing and establishing an allowable exceedance frequency during dry weather conditions based on data collected from reference systems in the San Diego Region. The dry weather allowable frequency that is developed may include a seasonal component (e.g., summer vs. winter dry weather conditions) if the data support it.

Until a region specific dry allowable exceedance frequency is developed, a 0% allowable exceedance frequency for dry weather conditions is appropriate for the dry weather TMDLs.

2.4 Dry Weather Surface Runoff Assumption

Several commenters disagreed with the assumption that surface runoff during dry weather conditions is generated only by anthropogenic activities.

Response: The assumption is that *surface runoff* during dry weather is generated only by anthropogenic activities and discharged from specific land use categories to receiving waters. Several of the comments reference studies by the Southern California Coastal Water Research Project (SCCWRP) which indicate that there are reference systems that have natural flow during dry weather. Comments also assert groundwater inputs and natural springs can cause dry weather flows.

The dry weather TMDL calculations and allocations assume that all the surface runoff is associated with land uses associated with the Municipal MS4s. Land uses associated with Caltrans, Agriculture, and Open Space are assumed to have no flow, thus the entire TMDL is allocated to the Municipal MS4s as a WLA, and the other sources are not allocated any portion of the TMDL (i.e., WLA = 0 or LA = 0). If there is a load that is generated by a source that results in a WLA or LA of greater than 0, then the Municipal MS4 WLA will have to have to be reduced by the same amount. At this time there are insufficient data available that support

assigning a WLA or LA greater than 0 to the Caltrans, Agriculture, or Open Space land use categories.

Groundwater inputs and natural springs are not surface runoff and may not originate from anthropogenic land uses. At this time, there is insufficient data about bacteria loads associated with natural sources such as groundwater inputs and natural springs and their contribution to dry weather flows in stream systems. Historically, stream systems in the Region were ephemeral or intermittent. With increased development, flows in some streams have become less ephemeral or intermittent and more perennial, which is likely due to the anthropogenic influences on the landscape of most watersheds in the San Diego Region, including increased groundwater levels.

Additional studies may be performed to characterize the loads associated with other land use categories or natural sources that contribute to dry weather flows in the stream systems in the region which may affect the allocation of the dry weather TMDLs. Additional studies may also be performed to identify an allowable exceedance frequency for the dry weather TMDLs which may be applied with the reference system approach or natural sources exclusion approach.

In any case, until more data regarding other land use categories and natural sources that contribute to dry weather flows are collected, the assumption that all dry weather *surface runoff* flows originate from the land uses associated with Municipal MS4s is appropriate.

2.5 Water Code Section 13241

Several commenters assert that this TMDL Basin Plan amendment should be subject to the requirements of Water Code section 13241, especially the economic considerations.

Response: A similar concern was raised during the public comment period of Bacteria TMDLs Project I before it was adopted in December 2007 (see comment 33 in Appendix S to the draft Technical Report). Water Code section 13241 only applies when new WQOs are established. TMDLs interpret *existing* WQOs that are already in the Basin Plan. The TMDLs do not establish new WQOs. For this reason, the requirement to consider the Water Code section 13241 factors when establishing TMDLs (these and any others) does not apply.

2.6 TMDL Re-opener

Several commenters assert that there should be a commitment and a specific timeline for re-opening the TMDLs for revisions.

Response: A similar concern was raised during the public comment period of the original Bacteria TMDLs Project I before it was adopted in December 2007 (see comment 213 in Appendix S to the draft Technical Report). The Basin Plan amendment, in fact, already commits to future revisions of the TMDL, as necessary. See page A49 of the draft Basin Plan amendment (and page 114 of the draft Technical Report). This section outlines the elements necessary for the San Diego Water Board to amend the Basin Plan.

In addition, the last item in the TMDL Implementation Milestones is for amendments to "the Basin Plan and/or provision of the TMDL based on evidence provided by the dischargers and/or other entities" on an as needed basis after the effective date of these TMDLs. Please see item 21

in the TMDL Implementation Milestones table on page A70 of the draft Basin Plan amendment (and Table 11-9 on page 139 of the draft Technical Report).

Revisions to the provisions of these TMDLs may take place anytime after the effective date. If there are compelling data and evidence that warrant a revision to the provisions of these TMDLs, the San Diego Water Board will make every effort to amend the TMDLs in the Basin Plan accordingly. Therefore, a specific timeline is not necessary.

2.7 Other Key Issues

In addition to the key issues that were identified and addressed above, there were a few additional common themes found throughout the comments that are addressed below.

2.7.1 Assessment of Compliance

Several commenters were opposed to including the 30-day geometric mean REC-1 WQOs as part of the compliance assessment for the wet weather TMDLs, and questioned whether it was appropriate to include it as part of the compliance assessment.

Response: The goal of any TMDL is to restore the beneficial uses of an impaired waterbody. This means that the water quality objectives that support those beneficial uses must be met in the receiving waters. If the water quality objectives are not being met in the receiving waters, the impairment has not been corrected.

The water quality objectives in the Ocean Plan and Basin Plan include a single sample maximum and a geometric mean and do not differentiate between dry and wet weather. Both objectives are applicable to these TMDLs throughout the entire year.

At this time for these TMDLs, the San Diego Water Board has chosen to use a 22 percent allowable exceedances frequency of the single sample maximum water quality objectives specific to wet weather. This is the only allowable exceedance frequency greater than 0 percent authorized under these TMDLs. We have not chosen an allowable exceedance frequency of the geometric mean that is greater than 0 percent for wet weather or dry weather TMDLs. We have also not provided an allowable exceedance frequency of the single sample maximum WQOs for dry weather TMDLs greater than 0 percent.

The Phase I MS4s dischargers must meet each of the four bacteria receiving water limits shown below in order to be considered "in compliance" with the TMDL. If controllable sources other than the Phase I MS4s are identified as causing the exceedances, and the Phase I MS4s have demonstrated they are not causing or contributing to the exceedances, the Phase I MS4s will not be considered out of compliance. The receiving water limits are comprised of (1) the two bacteria water quality objectives (from Ocean Plan and Basin Plan) that are applicable, namely, the single sample maximum and 30-day geometric mean; and, (2) the allowable exceedance frequencies. These receiving water limits as the apply during wet weather and dry weather are summarized below

Compliance with Wet Weather TMDLs in Receiving Waters

a. Single Sample Maximum REC-1 WQOs and a 22% allowable exceedance frequency applicable to all wet weather days between October 1 and April 30.
b. 30-day Geometric Mean REC-1 WQOs and a 0% allowable exceedance frequency applicable to wet and dry weather days between October 1 and April 30.

Compliance with Dry Weather TMDLs in Receiving Waters

a. Single Sample Maximum REC-1 WQOs and a 0% allowable exceedance frequency applicable to all dry weather days during the year.
b. 30-day Geometric Mean REC-1 WQOs and a 0% allowable exceedance frequency applicable to all dry weather days during the year.

At this time, compliance will be measured in the receiving waters (rather than in the effluent) and will be assessed on a watershed basis. Compliance with the receiving water limits is required no later than 10 years from effective date of these TMDLs if the Phase I MS4s and Caltrans develop and implement Bacteria Load Reduction Plans (BLRPs). The wet weather TMDLs may be extended to no later than 20 years if the Phase I MS4s and Caltrans develop and implement CLRPs.

In addition, the San Diego Water Board supports developing and establishing region specific or watershed specific allowable exceedance frequencies of the single sample maximum or geometric mean based on data collected from reference systems in the San Diego Region. The allowable exceedance frequencies developed may include a seasonal component (e.g., winter vs. summer seasons) if support by the data.

2.7.2 Responsibilities of Phase I MS4s and Other Dischargers

There were several comments that were related to defining the responsibilities of the Phase I MS4s compared to other dischargers.

Response: The following table summarizes the responsibilities of the San Diego Water Board, Phase I MS4s, and other dischargers.

TMDL Implementation Plan Summary

Discharger	Wet Weather WLA/LA	Wet Weather Load Reduction Requirement?	Dry Weather WLA/LA	Dry Weather Load Reduction Requirement?	BLRP/CLRP Requirement?	Monitoring Required?	San Diego Water Board Actions
Point							
Phase I MS4s	WLA Assigned	YES	WLA Assigned	YES	YES	YES (as specified in NPDES req's)	• Revise and re-issue NPDES permit • Issue investigative orders for BLRPs as needed • Issue enforcement orders as needed
Caltrans	WLA Assigned	NO (Cannot exceed existing load)	WLA = 0	NO (Discharge Prohibited)	YES	YES (as specified in NPDES req's)	• Request State Water Board to revise and re-issue NPDES permit • Issue investigative orders for BLRPs as needed • Issue enforcement orders as needed
Phase II MS4s	WLA = 0[1]	NO (Discharge Prohibited)	WLA = 0[1]	NO (Discharge Prohibited)	NO[2]	NO[2]	• If identified as a significant source, enroll under State General Permit or issue individual NPDES Permit • Issue investigative orders for BLRPs as needed • Issue enforcement orders as needed
POTWs	WLA = 0	NO (Discharge Prohibited)	WLA = 0	NO (Discharge Prohibited)	NO	NO	• If identified as significant source, issue enforcement orders as needed to cease discharge
CAFOs	WLA = 0	NO (Discharge Prohibited)	WLA = 0	NO (Discharge Prohibited)	NO	NO	• If identified as significant source, issue enforcement orders as needed to cease discharge
Other Point Sources	WLA = 0	NO (Discharge Prohibited)	WLA = 0	NO (Discharge Prohibited)	NO	NO	• If identified as significant source, issue enforcement orders as needed to cease discharge
Nonpoint							
Agriculture	LA Assigned[3,4]	YES[3] and NO[4]	WLA = 0	NO (Discharge Prohibited)	NO[2]	YES[3,4]	• If identified as significant source, revise conditional waivers, or issue WDRs and/or enforcement orders as needed
Other Nonpoint Sources	LA = 0	NO (Discharge Prohibited)	WLA = 0	NO (Discharge Prohibited)	NO[2]	NO[2]	• If identified as significant source, revise conditional waivers, or issue WDRs and/or enforcement orders as needed to cease discharge

1. Because there are no Phase II MS4s enrolled under the State General Permit, discharges from Phase II MS4s are not permitted (i.e., WLA = 0). When a Phase II MS4 is enrolled under the State General Permit or issued an individual NPDES permit, the discharge will be considered part of the Municipal MS4 WLA.
2. If the discharger is identified as a significant source, the San Diego Water Board may require the discharger to prepare and submit a BLRP, which will also have a required monitoring component.
3. Discharges from agriculture land uses in 4 watersheds were identified as significant sources of bacteria and assigned LAs and load reduction requirements for wet weather. Irrigated agriculture is regulated with conditional waivers. The conditional waiver for irrigated agriculture has a monitoring requirement.
4. Discharges from agriculture land uses in 8 watersheds were assigned LAs equal to the modeled existing loads for wet weather. There is no load reduction requirement, but they cannot increase their existing loads. Irrigated agriculture is regulated with conditional waivers. The conditional waiver for irrigated agriculture has a monitoring requirement.

3 List of Persons Submitting Comments

The following persons submitted written comments on the Revised Draft Final Technical Report for the Revised Total Maximum Daily Loads (TMDLs) for Indicator Bacteria, Project I—Twenty Beaches and Creeks (including Tecolote Creek) in the San Diego Region, dated November 25, 2009.

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4 Comments and Responses

Comments and responses are grouped according to individual commenters in the following subsections.

4.1 California Department of Transportation

Comment 1

Caltrans would like to request that the Regional Water Quality Control Board remove the requirement to submit a BLRP or CLRP since Caltrans is not a considerable source of indicator bacteria to the listed water bodies. We will continue our efforts to eliminate indicator bacteria sources discharging to the listed receiving water bodies and report these activities with other actions and planned activities to comply with the TMDL in the Stormwater Management Program Annual Report, as done for other TMDLs throughout the state.

Response: The BLRP or CLRP requirement for Caltrans was also included in Bacteria TMDLs Project I adopted in December 2007. Please see pages 185-192 in the underline/strikeout version of the draft Technical Report. The BLRP or CLRP requirement for Caltrans is consistent with the Basin Plan amendment adopted on December 12, 2007, and will remain in the revised Basin Plan amendment.

4.2 City of Carlsbad

No comments requiring response.

4.3 City of Dana Point

Comment 2

Page 81 of the Technical Report states, "Available data show that exceedances of REC-1 WQOs in local reference systems during dry weather conditions are uncommon (see section 4.2)."

This statement is not accurate. San Diego Board staff members are aware of the study conducted by the independent Southern Coastal California Water Research Project (SCCWRP) published and titled, Fecal Indicator Bacteria (FIB) levels during dry weather from southern California reference streams. 2008, LL Tiefenthaler, ED Stein, GS Lyon. Technical Report 542., which states, "A total of 18.2% of the indicator bacteria samples (for all three indicators) from the natural sites exceeded daily (single sample) water quality standards. Approximately 1.5%, 14%, and 3% of E. coli, enterococci, and total coliforms, respectively, exceeded single sample water quality criteria."

Taking this information into account, the statement that WQO exceedences during dry weather are "uncommon" is thus incorrect and a reference system approach is thus necessary for the dry weather TMDLs in issue.

A calculated exceedance frequency for dry weather TMDLs based on the reference watershed data should thus be incorporated into the TMDL at this time, prior to adoption of the proposed TMDL. We are aware of the San Diego Board's and EPA's desire to keep this TMDL moving forward, with no substantive changes thereto, but do not believe that this significant data can be ignored for the sake of expediency. As such, at a minimum, we propose that the following or similar language be added to the TMDL, and that other appropriate changes be made to the TMDL consistent with the objective of the suggested language below:

> "More recently published data, Southern Coastal California Water Research Project's (SCCWRP) Study published and titled, Fecal Indicator Bacteria (FIB) levels during dry weather from southern California reference streams. 2008. LL Tiefenthaler, ED Stein, GS Lyon, shows that exceedances of REC-1 WQOs in local reference systems during dry weather conditions is not uncommon. A reference system approach for dry weather TMDLs, as in the wet weather TMDLs, resulting in an allowable exceedance frequency, is thus warranted and will be developed by San Diego Board staff prior to final adoption of this TMDL, and once developed will be utilized as the basis for the waste load allocation for dry weather runoff."

Response: We are aware of the study that the commenter referenced. The study is specific to streams during dry weather and would not be applicable to beaches. The study was limited to one year of monitoring. In addition to the statement cited by the commenter, the study also stated that "*Annual mean concentrations (both single sample and 30-day geometric mean) were below established water quality criteria for all three indicators*." This statement appears to support that the statement made in the draft Technical Report.

The San Diego Water Board supports developing and establishing an allowable exceedance frequency during dry weather conditions based on data collected from reference systems in the San Diego Region. The study conducted by SCCWRP that is referenced by the commenter is a

good beginning toward establishing an allowable exceedance frequency for dry weather conditions, but the results are far from conclusive. Further studies and data collection are required before an allowable exceedance frequency for dry weather can be established for the San Diego Region.

Until then, a 0% allowable exceedance frequency for dry weather conditions is appropriate for the dry weather TMDLs.

We do, however, acknowledge that the study referenced by the commenter should be included in the discussion of the Technical Report. The following paragraph will be added after the second paragraph of Section 4.2.1 in the Technical Report (page 34) and the report added to the references:

> The Southern Coastal California Water Research Project's (SCCWRP) Study published and titled, *Fecal Indicator Bacteria (FIB) levels during dry weather from southern California reference streams* (Tiefenthaler, et al., 2008) shows that exceedances of REC-1 WQOs in nautral streams typically occur at levels below State water quality standards during dry weather conditions. Results of the study also indicated that exceedances of the single sample maximum WQOs during dry weather conditions do occur. Additional studies may indicate that an allowable exceedance frequency for dry weather may be appropriate.

Comment 3

The underlying assumption that surface runoff is only generated by anthropogenic activities is also inaccurate. There are creeks that flow during dry weather. Natural springs and groundwater inputs into creeks and MS4 systems also contribute to non anthropogenic dry weather flows. The factual data must be acknowledged in the TMDL, and an appropriate load assigned to this nonpoint source, with the MS4 Permittees not being held responsible for these loads.

Response: The assumption is that *surface runoff* during dry weather is generated only by anthropogenic activities. Groundwater inputs and natural springs are not surface runoff. At this time, there is insufficient data about bacteria loads associated with groundwater inputs and natural springs that results in flow in stream systems. Historically, stream systems in the region were ephemeral or intermittent. With the increased development, flows in some streams have become less ephemeral or intermittent and more perennial, which is likely due to the anthropogenic influences on the landscape of most watersheds in the San Diego Region, including increased groundwater levels.

Additional studies may be performed to characterize the loads associated with groundwater inputs and natural springs that occurs in the stream systems in the region which may affect the allocation of the dry weather TMDLs. Additional studies may also be performed to identify an allowable exceedance frequency for the dry weather TMDLs which may be applied with the reference system approach or natural sources exclusion approach.

In any case, until more data regarding groundwater inputs and natural springs are collected, the assumption that all dry weather *surface runoff* flows originate from the land uses associated with Municipal MS4s is appropriate.

Comment 4

Caltrans and other land use dischargers have been allocated a WLA/LAs of zero during dry weather based on the invalid assumption that there is no surface runoff discharge to receiving waters from these facilities during dry weather and thus that they are "not likely to discharge bacteria" (Page 82 of Technical Report).These are false assumptions. Because Caltrans and agricultural uses, for example, irrigate during dry weather, some amount of runoff occurs and this runoff likely conveys bacteria through the MS4 to the receiving water. These discharges are either non-point sources of bacteria, or are non municipal point discharges and as such, again the MS4 Permittees cannot lawfully be required to monitor and otherwise be responsible for these discharges. The TMDL must therefore be revised so that proper loads and waste loads are assigned, and the City and other MS4 Permittees are not forced to address loads they are not responsible for.

Response: If a source is assigned a WLA or LA of zero, bacteria loads from that source is not expected or allowed under the TMDL. If there are discharges from other sources (e.g., Caltrans or agriculture) during dry weather conditions to the Phase I MS4s, those discharges become the responsibility of the Phase I MS4s under their NPDES requirements. That responsibility primarily involves investigating, confirming, and informing the San Diego Water Board of their findings. If investigations indicate that discharges from other sources are significant (i.e., causing discharges from the Phase I MS4s to cause or contribute to exceedances of the water quality standards in the receiving waters), the Phase I MS4s have the responsibility under their NPDES requirements to notify the San Diego Water Board so that it may impose further regulation, if appropriate. Further regulation will most likely take the form of.new or revised waste discharge requirements, NPDES requirements, or conditional waiver requirements. Please also see the response in Section 2.7.2.

Comment 5

Page 13 states, "A TMDL is intended to fulfill two purposes: 1) calculation of the assimilative loading capacity for an impaired waterbody, and 2) development of a strategy to restore an impaired waterbody so the water quality can once again meet the water quality standards."

Since the 2008 303(d) List has been approved by the RWQCB with several delistings of waterbodies impacted by the TMDL, it begs the question as to why the delisted waterbodies remain in this TMDL, as the purpose of the TMDL has already been accomplished. If the water quality standards are being met, based on the 2008 303(d) list, the TMDL serves no purpose for these waterbodies, at this point. As such, it is arbitrary and capricious to adopt a TMDL and accompanying load allocations and waste load allocations for water bodies for pollutants that are no longer considered to be impairing the designated uses.

Response: Please see the response in Section 2.1.

Comment 6

Although, we feel that de-listed waterbodies should be removed from this TMDL (see comment #2 above), in absence of San Diego Board's agreement to remove delisted waterbodies, at a minimum, the following text or similar language should be added on page A1 of the BPA:

> "Some of the waterbodies listed in the above table have been delisted from the 2008 303(d) list that was approved by the San Diego Board on December 16, 2009. Waterbodies that have been delisted have demonstrated that they meet water quality standards and therefore are not subject to any further action as long as monitoring data continues to support compliance with water quality standards."

Response: Please see the response in Section 2.1.

In addition, we recognize that there have been several beach segments that have been removed from the 2008 303(d) List. The last paragraph on page A1 of the draft Basin Plan amendment and appropriate text in the draft Technical Report will be revised as follows:

> ~~Beginning with the 2008 303(d) List, specific beach segments of the Pacific Ocean shoreline are listed individually.~~ The TMDLs that have been developed for the Pacific Ocean shorelines are ~~assumed to be~~ applicable to all the beaches located on the shorelines of the hydrologic subareas (HSAs), hydrologic areas (HAs), and hydrologic units (HUs) listed above. Beginning with the 2008 303(d) List, specific beach segments of the Pacific Ocean shoreline are listed individually. Specific beach segments from some of the Pacific Ocean shorelines listed in the above table have been delisted from the 2008 303(d) list that was approved by the San Diego Board on December 16, 2009.

Comment 7

The table in Appendix Q, Small Municipal Separate Storm Sewer Systems in the Revised Bacteria TMDLs Project I Watersheds, must be revised to identify the appropriate waterbody which the facility is impacting.

Response: The list provided in Appendix Q lists the small MS4s (or Phase II MS4s) that may contribute to the bacteria loads in the watersheds included in these TMDLs. If any of them are identified a significant sources of bacteria, those Phase II MS4s may require additional regulation by the San Diego Water Board.

Comment 8

Page 40 of the Technical Report states, "However, if adequate data are collected to characterize dry weather flows and bacteria densities using a statistical approach, the reference system approach may be an option that would allow an exceedance frequency to be included with the dry weather numeric targets in the dry weather TMDLs to revise the final dry weather targets in this TMDL project." Unfortunately, however this language does not appear in the Basin Plan Amendment as it should. Please include this language in the BPA. We suggest, at a minimum, the following changes on page 12, #28 of the BPA:

> "At the end of the dry weather TMDL compliance schedule, the 30- day geometric mean REC-1 WQOs for dry weather days must be met 100 percent of the time, or must be consistent with the allowable exceedance frequency established for the receiving water."

Response: The current dry weather allowable exceedance frequency of the 30-day geometric mean REC-1 WQOs is 0 percent for all waterbodies included in these TMDLs. If an allowable exceedance frequency greater than 0 percent for dry weather can be established, a future Basin Plan amendment can include this proposed revision in the appropriate places of the provisions

for these TMDLs. Until then, a 0% allowable exceedance frequency for dry weather conditions is appropriate for the dry weather TMDLs. Also, please see the response to Comment 2.

Comment 9

"*The concentration based TMDLs will be used to determine compliance with the TMDLs in the receiving waters*."

This statement is in conflict with the introduction to Appendix P of the Technical Report (Recommended Components for Bacteria Load Reduction Plans and Comprehensive Load Reduction Plans) which states that the BLRP or CLRP is 'the dischargers' opportunity to propose methods for assessing compliance with the WQBELS." The BLRP/CLRP language is consistent with what was envisioned for compliance during the SAG development process. Changing to concentration-based waste load allocations is thus in direct conflict with the stakeholder process and the language provided in Appendix P.

Moreover, it is clear that the federal Clean Water Act does not require that MS4 Permittees strictly comply with any waste load allocations in a TMDL, i.e., either concentration-based or otherwise. In a November 22, 2002 U.S. EPA Guidance Memorandum (Exhibit "1" hereto) entitled, "Establishing Total Maximum Daily Loads (TMDL) Waste Load Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs," EPA established federal policy to be utilized in developing TMDLs when addressing storm water discharges. Such policy makes clear that because of the problems in frequency and variability with storm water, that MS4 Permit limits to comply with a TMDL typically should be expressed as Best Management Practices (BMPs), that numeric limits in such permits will only be used in rare instances, and, importantly, that the TMDLs should themselves "reflect" this BMP approach. According to this EPA TMDL Guidance Memorandum:

> EPA expects that most WQBELs [water quality based effluent limits] for NPDES regulated municipal and small construction storm water discharges will be in theform of BMPs, and that **numeric limits will be used only in rare instances**.
>
> When a non-numeric water quality based effluent limit is imposed, the permit's administrative record, including the fact sheet when one is required, needs to support that the BMPs are expected to be sufficient to implement the WLA in the TMDL. (Id. at p. 2; emphasis added.)
>
> EPA's policy recognizes that because storm water discharges are due to storm events that are highly variable in frequency and duration and are not easily characterized, **only in rare cases will it be feasible or appropriate to establish numeric limits for municipal and small construction storm water discharges**. (Id. at p. 4.)
>
> Under certain circumstances, BMPs are an appropriate form of effluent limits to control pollutants in storm water. See 40 C.F.R. § 122.44(k)(2) & (3). If it is determined that a BMP approach (including an iterative BMP approach) is appropriate to meet the storm water component of the TMDL, EPA recommends that the TMDL reflect this. (Id. at p. 5.)

In conjunction with the above, we are concerned about the agreed upon approach discussed during the stakeholder process getting lost at such time as the TMDL is to be incorporated into the NPDES Permits, just as the new MS4 Permit approved in December 2009 for South Orange

County itself includes, concentration-based numeric targets for the Baby Beach TMDL (which also went against the intent of BMP-based compliance approach that was developed and agreed upon during the TMDL stakeholder meetings). We commented on this issue for the MS4 Permit, but these comments were not addressed, and yet we continue to be assured that "TMDL staff will coordinate with NPDES Permit staff"; however our recent experience proves differently. As such, as the EPA TMDL Guidance Memorandum recommends that the TMDL itself reflect that it will be implemented through a BMP approach, the proposed TMDL must be revised at this time to "reflect" this approach.

Response: There is no conflict with the statement in Appendix P. The key is that compliance with the TMDLs will be assessed *in the receiving waters*, rather than in the effluent from the MS4s. If the REC-1 WQOs and allowable exceedance frequencies are met *in the receiving waters*, the assumption is that the effluent discharged by the MS4s, Caltrans, and Agriculture are meeting their WLAs and LAs.

The BLRPs or CLRPs will be the framework of monitoring, BMP implementation, and other studies and actions that the dischargers will implement over the course of the TMDL compliance schedule to achieve the TMDLs and restore the water quality standards in the receiving waters. Source identification will be an important element of the monitoring so BMP implementation can be properly focused. Other studies may also be performed to identify and establish region or watershed specific wet weather and/or dry weather allowable exceedance frequencies. Studies could also collect data to support the application of a natural sources exclusion approach if natural sources are truly the cause of continued exceedances even after anthropogenic sources are controlled.

Also, please see the response in Section 2.7.1.

Comment 10

Page 15, #35. Economic analysis is inadequate. We continue to dispute that an adequate economic analysis was conducted (the economic factor discussion is on Page 230 of the Technical Report). The vague statement indicating that the San Diego Regional Board has considered the costs of the reasonable foreseeable methods of compliance is not adequate, nor correct. The rudimentary calculations and astronomically large range of cost provided is not adequate and there appears to be no consideration of the actual likely costs of compliance, nor any consideration of whether or not these TMDLs are "reasonably achievable." (See California Water Code sections 13241 and 13000.) What is the rationale supporting the assumption that only 10% of the watershed will need to be treated to achieve the TMDL goals? Due to proliferation and regrowth, the evidence shows that treating 10% of the watershed will not result in compliance and therefore the low-ended and very wide ranging estimates of $50,000 to $973,000,000 for treating only 10% of the watershed only reinforce the fact that the TMDL has not been developed in accordance with the analysis required under CWC sections 13241/13000. We anticipate that we will need to treat much more than 10% of the watershed to meet wet and dry weather TMDLs, and the costs in reality will escalate accordingly. The conclusion that only 10% of the watershed will require treatment is not supported by the evidence, and the adoption of the TMDL based on this incorrect assumption would be arbitrary and capricious.

The requirement for the Board to consider "economics" as well as whether the TMDLs "could reasonably be achieved," along with other factors as set forth in CWC sections 13000 and 13241 must be met as a part of the TMDL development process. CWC section 13000 requires a consideration by the Board of "all demands being made and to be made" on the subject waters bodies, including the "total values involved, beneficial and detrimental, economic and social, tangible and intangible." (CWC § 13000.) CWC section 13241 specifically then requires the Boards, when developing water quality objectives, to consider a series of factors including but not limited the "environmental characteristics of the hydrographic unit under consideration," as well as whether the water quality conditions "could reasonably be achieved through the coordinated control of all factors which affect water quality in the area," and "economic considerations." (CWC § 13241(b), (c) & (d).)

The proposed TMDL has not been developed in accordance with CWC sections 13000 and 13241. For example, the recent data not considered by Board Staff on the number of exceedances in dry weather runoff shows that there are natural dry weather loads of bacteria that have not been accounted for in the TMDL. Thus, without allowing for a certain number of exceedances to accommodate these natural loads, the TMDL as written is not "reasonably achievable." Similarly, the TMDL does not include any analysis of the type, level and extent of structural best management practices ("BMPs") that will be needed to meet the requirements of the TMDL, and the assumption that only 10% of the watershed will require treatment, as discussed above, is not supported by the evidence. There is no discussion of how effective the non-structural BMPs are expected to be towards meeting the waste load allocations, and it appears clear that a number of structural BMPs will likely be necessary in order to meet the proposed concentration-based waste load allocations. Yet there is no discussion as to the amount of land and the practicability of installing structural based BMPs throughout a good portion of the various jurisdictions to meet the bacterial limits in question, and nor is there any good faith analysis of the true potential economic impacts from installing the necessary structural TMDLs to strictly comply with the numeric waste load allocations. Instead, the TMDL includes a completely arbitrary and meaningless range of costs to comply with the TMDL, i.e., a range of $50,000 to $973,000,000 to comply. In short there is no analysis as required under CWC sections 13241/13000, of the true potential economic impacts and costs to comply with this TMDL, and the proposed TMDL is therefore defective and cannot lawfully be adopted at this time.

In EPA's "Guidance for Developing TMDLs in California," dated January 7, 2000 ("EPA California TMDL Guidance"), (Exhibit "2" hereto), EPA recognized that although its regulations do not require "any particular form of economic analysis," it also recognized that "the Office of Chief Counsel, State Water Resources Control Board, issued the following memorandum addressing economic analysis requirements under state law." The Office of Chief Counsel Memorandum referenced by EPA was a Memorandum dated October 27, 1999 from Sheila Vassey, Office of Chief Counsel for the State Board, and was entitled "Economic Considerations in TMDL Development and Basin Planning" (hereafter "Vassey Memo," a copy of which is marked hereto and attached as Exhibit "3"). In the Vassey Memo (cited in EPA's California TMDL Guidance), the Chief Counsel's Office concluded as follows:

> **Porter-Cologne requires that the Regional Water Boards take "economic considerations," among other factors, into account when they establish water quality objectives**. . . .

> **Attached to this memorandum is a 1994 memorandum containing guidance on the consideration of economics in the adoption of water quality objectives. The key points of this guidance are:**
>
> **• The Boards have an affirmative duty to consider economics when adopting water quality objectives**.
>
> **• At a minimum, the Boards must analyze: (1) whether a proposed objective is currently being attained; (2) if not, what methods are available to achieve compliance with the objective; and (3) the cost of those methods.**
>
> **• If the economic consequences of adoption of a proposed objective are potentially significant, the Board must state on the record why adoption of the objective is necessary to ensure the reasonable protection of beneficial uses or the prevention of nuisance**. (Exhibit "3," Vassey Memo, pp. 3-4.)

The State Board's Chief Counsel Memo further provides that the regional boards must comply with CEQA when they amend their basin plans (*id*. at 4), and that CEQA requires the Water Boards to conduct an environmental analysis of the reasonably foreseeable methods of compliance with performance standards or treatment requirements. In doing so, "**[t]hey must consider economic factors in this analysis**." (See Exhibit "3," Vassey Memo, p. 4; and Public Resources Code ["PRC"] § 21159.)1

The Chief Counsel concluded as follows:

> **Thus, the Regional Water Board must identify the reasonably foreseeable methods of compliance with the wasteload and load allocations and consider economic factors for those methods. This economic analysis is similar to the analysis for water quality objectives discussed above.** (*Id*. at p. 6, emphasis added.)

Accordingly, pursuant to CWC sections 13241 and 13000, and PRC section 21159, as underscored by the administrative interpretation provided in the Chief Counsel's Memo, the Board is required to consider "economics" before adopting the TMDL.

In this case, there has been no real consideration of whether the TMDL in question, particularly if it is intended to be applied as a concentration-based effluent limit in the Municipal NPDES Permits, "could reasonably be achieved," and nor has there been any true consideration, of the "economic" impacts from such a TMDL, or any of the other factors and consideration under CWC sections 13000 and 13241. The proposed TMDL should therefore not be adopted until the requirements of these sections have been met.

Response: Please see the response in Section 2.5

In addition, although a full economic analysis is not required pursuant to Water Code section 13241, we disagree that the economic analysis is inadequate. An economic analysis is included as part of the Environmental Analysis in Appendix R to the draft Technical Report. As part of CEQA, we are required to consider the costs of reasonably foreseeable methods of compliance with the proposed TMDL, such as implementation of reasonably foreseeable types of BMPs for the purpose of bacteria reduction. This economic analysis presents of a variety of BMP types and includes the range of costs and rates of potential effectiveness for each type. We have considered this information for implementation planning purposes – specifically in setting the

length of the compliance period. Providing a cost benefit analysis based on BMP effectiveness rates is beyond the scope of the CEQA requirements. Furthermore, we are not required to speculate about site-specific projects that persons or entities identified as sources might implement or which BMP will be the most appropriate based on cost and effectiveness.

While 100 percent compliance is ultimately required by the proposed TMDL, treatment of 100 percent of the land may not be required to achieve compliance. In the analysis, we do not assume that every watershed will require 100 percent of the land to be treated with all of the potential BMP options; therefore, cost estimates are provided in increments of 10 percent to allow for upward scaling of costs, since the amount of treatment and methods needed to achieve compliance with the proposed TMDL may vary from watershed to watershed. For example, using the 10 percent cost estimates provided in Table 13-3, a cost estimate for 100 percent land treatment could easily be calculated by multiplying the 10% cost estimate by 10, or by 5 for 50 percent, or 8 for 80 percent, etc.

The substitute environmental documents contain sufficient information and analysis for the public to understand the potential adverse environmental impacts of the project, including the impacts from any possible combination of BMPs and associate potential costs, and to provide the San Diego Water Board with meaningful discussion and comment on these impacts. The CEQA does not require the level of detail requested in the comment for a planning level analysis. The dischargers are responsible, as governing entities with land use authority, for determining the specific BMPs, cost, and cost benefit analysis for project implementation at specific locations, and for evaluating the potential site specific environmental impacts of those BMPs.

Comment 11

Page A12 & A65 of the BPA, we disagree that the beach segments began to be listed separately with the 2008 303(d) List; the 2006 303(d) lists specific beach segments where the impairment is located. Therefore, the identified beach segments should be included in the Tables on pages A12 & A25-A35. We have provided an example with information taken directly from the 2006 303(d) List. See suggested changes in red text below.

Watershed	Type of Listing	Waterbody Name [a]	Number of Listings	Impairment located at
Aliso HSA (901.13)	Creek	Aliso Creek	3	
	Estuary	Aliso Creek (mouth)		
	Shoreline	Pacific Ocean Shoreline, Aliso HSA		*North Beach Creek, San Juan Creek (large outlet), Capistrano Beach, South Capistrano Beach at Beach Road.*

Response: The listings given in the table on page A12 are accurate. Also, please see response in Section 2.1.

Comment 12

Page A14 of the BPA, footnote 5 is inaccurate. As we discussed with your staff and EPA staff at the stakeholder meeting held on January 7, 2010, we suggest the following language changes or similar language:

5 Available water quality data from San Diego Region reference systems during time of development indicated that exceedances of the single sample WQOs during dry weather conditions are uncommon. However, recently published data by Southern Coastal California Water Research Project (SCCWRP) Study titled, *Fecal Indicator Bacteria (FIB) levels during dry weather from southern California reference streams***.** 2008. LL Tiefenthaler, ED Stein, GS Lyon. Technical Report 542, indicated to the contrary and that**,** *"A total of 18.2% of the indicator bacteria samples (for all three indicators) from the natural sites exceeded daily (single sample) water quality standards. Approximately 1.5%, 14%, and 3% of E. coli, enterococci, and total coliforms, respectively, exceeded single sample water quality criteria."* and the applicability of an allowable exceedance frequency for dry weather TMDLS will be evaluated further. ~~Furthermore, if the exceedance of the single sample WQOs during dry weather is unlikely, exceedances of the geometric mean are even more unlikely.~~

In addition, the following changes should be made:

The allowable load (i.e., TMDL) that is calculated based on these numeric targets consists of the sum of two parts: 1) the bacteria load that is calculated with the REC-1 WQOs and, 2) the bacteria load that is associated with the allowable exceedance frequency, calculated using the existing load in exceedance of the REC-1 WQOs on the allowable exceedance days. For wet weather, the allowable exceedance days are calculated based on the allowable exceedance frequency and total number of wet days in a year. For dry weather TMDLs using a reference system approach, the allowable exceedance days are calculated based on the allowable exceedance frequency and the total number of dry days in a year.

In addition, please add the following underlined sentence to the end of footnote 4:

4 In the calculation of the wet weather TMDLs, the San Diego Regional Board chose to apply the 22 percent allowable exceedance frequency as determined for Leo Carrillo Beach in Los Angeles County. At the time the wet weather watershed model was developed, the 22 percent exceedance frequency from Los Angeles County was the only reference beach exceedance frequency available. The 22 percent allowable exceedance frequency used to calculate the wet weather TMDLs is justified because the San Diego Region watersheds' exceedance frequencies will likely be close to the value calculated for Leo Carrillo Beach, and is consistent with the exceedance frequency that was applied by the Los Angeles Regional Board. Ongoing studies by SCCWRP and the dischargers indicate there are more local reference beaches that are appropriate for these TMDLs. The information and evidence justify revising the TMDL to account for these additional references.

Response: The suggested revisions are appreciated, but current text is accurate. When sufficient evidence is provided, a future Basin Plan amendment can include the suggested revisions in the appropriate places of the provisions for these TMDLs. Also, please see the response to Comment 2.

Comment 13

On page A16 of the BPA, the following underlined text should be added to the footnote a. under both tables and in the Table on A25-A35, as appropriate:

a. Percent of wet days (i.e., rainfall events of 0.2 inches or greater and the following 72 hours) allowed to exceed the wet weather numeric targets. Exceedance frequency based on reference system in the Los Angeles Region. The information and evidence justify using a different exceedance frequency for wet weather TMDLS, and as such the reference frequency is to be recalculated/revised.

a. Percent of dry days (i.e., days with less than 0.2 inch of rainfall observed on each of the previous 3 days) allowed to exceed the dry weather numeric targets. The information and

evidence justify using a reference system for the dry weather TMDLs, and as such the allowable exceedance frequency for dry weather TMDLS is to be recalculated/revised.

Response: The suggested revisions are appreciated, but current text is accurate. When sufficient evidence is provided, a future Basin Plan amendment can include the suggested revisions in the appropriate places of the provisions for these TMDLs. Also, please see the response to Comment 2.

Comment 14

On page A20 of the BPA, please add the following underlined text to foot note 7 and correspondingly in the footnotes to the Tables on A26:

> In the calculation of the wet weather TMDLs, the San Diego Regional Board chose to apply the 22 percent allowable exceedance frequency as determined for Leo Carrillo Beach in Los Angeles County. At the time the wet weather watershed model was developed, the 22 percent exceedance frequency from Los Angeles County was the only reference beach exceedance frequency available. The 22 percent allowable exceedance frequency used to calculate the wet weather TMDLs is justified because the San Diego Region watersheds' exceedance frequencies will likely be close to the value calculated for Leo Carrillo Beach, and is consistent with the exceedance frequency that was applied by the Los Angeles Regional Board. New information is available showing that more applicable reference system data is available. The information and evidence justify revising the TMDL for dry and wet weather to account for this information and the TMDLs will be recalculated/revised accordingly.

Response: The suggested revisions are appreciated, but current text is accurate. When sufficient evidence is provided, a future Basin Plan amendment can include the suggested revisions in the appropriate places of the provisions for these TMDLs. Also, please see the responses to Comment 2 and in Section 2.3.

Comment 15

On page A42 of the BPA:

a. How is the San Diego Board going to identify Phase II MS4s as "significant sources of bacteria discharging to the receiving waters and/or Phase I MS4s?

b. It appears that Phase I and Phase II MS4s are being held to different standards – the implementation plan indicates that Phase II MS4s are required to implement a SWMP with the goal of reducing the discharge of pollutants to the maximum extent practicable (page 154), while the Phase I MS4s are facing compliance with numerical effluent limitations on the amounts of specified pollutants that may be discharged and/or specified best management practices (BMPs) designed to minimize water quality impacts. These numerical effluent limitations and BMPs or other non-numerical effluent limitations must implement both technology based and water quality-based requirements of the Clean Water Act. Technology-based effluent limitations (TBELs) represent the degree of control that can be achieved by point sources using various levels of pollution control technology. (Page 148). The standard for both Phase I and Phase II MS4 Permittees should be the same, *i.e.,* the MEP standard, and the use of a different standard for Phase II versus Phase I MS4 Permittees is arbitrary and capricious.

Response: Several municipalities have noted in the past that Phase II MS4s are discharging into their MS4 systems and/or the receiving waters. The municipalities, however, have not provided any evidence to show that discharges from those facilities are significant sources of bacteria. When the San Diego Water Board is provided the evidence, as a first step the Phase II MS4s will be regulated under the General NPDES Requirements for Small MS4s. If, however, a Phase II MS4 remains a significant source, the San Diego Water Board will issue individual NPDES requirements with the same requirements of the Phase I MS4s. Please see the description of how Phase II MS4 will be addressed on pages 105-106 of the draft Technical Report and pages A42-A43 of the draft Basin Plan amendment. Also, please see the response in Section 2.7.2.

Comment 16

On page A45 of the BPA, has an evaluation of the WDRs and NPDES requirements for Concentrated Animal Feeding Operations (CAFOs) been conducted, and if so, are there any recommendations for a more aggressive program? If an evaluation has not occurred, it should occur, and the results of that evaluation should be included in this BPA. It is arbitrary and capricious to do otherwise.

Response: Because CAFOs have not been assigned a WLA, by default they are assigned a WLA of zero. A zero WLA means that any discharge of waste from a CAFO to surface waters is not allowed and would be considered out of compliance with the requirements of the TMDL. In general, NPDES requirements for CAFO do not allow for the direct discharge of surface runoff to receiving waters. This is consistent with a WLA equal to zero.

Comment 17

Page 165 of Technical Report, there is no standard for Total Coliform in the Basin Plan and therefore Total Coliform should be removed from Table 11-2. Superscript f should be deleted as well.

Response: The commenter is correct that the total coliform water quality objectives do not apply to the creeks. The tables with the Receiving Water Limitations for Creeks (see page A52 of the draft Basin Plan amendment and Table 11-2 on page 117 will be revised as follows:

Table 11-2. Receiving Water Limitations for Creeks

Indicator Bacteria	Wet Weather Days [a]		Dry Weather Days [b]	
	Wet Weather Numeric Objective [c] (MPN/100mL)	Wet Weather Allowable Exceedance [d] Frequency	Dry Weather Numeric Objective [e] (MPN/100mL)	Dry Weather Allowable Exceedance Frequency
Fecal Coliform	400	22%	200	0%
~~Total Coliform [f]~~	~~10,000~~	~~22%~~	~~1,000~~	~~0%~~
Enterococcus	61 (104) [g]	22%	33	0%

a. Wet weather days defined as days with rainfall events of 0.2 inches or greater and the following 72 hours.
b. Dry weather days defined as days with less than 0.2 inch of rainfall observed on each of the previous 3 days.
c. Wet weather numeric objectives based on the single sample maximum (or equivalent) water quality objectives in the Water Quality Control Plan for the San Diego Basin (1994). Compliance with the wet weather TMDLs in the receiving water is based on the frequency that the wet weather days in any given year exceed the wet weather numeric objective, but 30-day geometric mean must also be met.
d. The wet weather allowable exceedance frequency is set at 22%. In the calculation of the wet weather TMDLs, the San Diego Regional Board chose to apply the 22 percent allowable exceedance frequency as determined for Leo Carillo Beach in Los Angeles County. At the time the wet weather watershed model was developed, the 22 percent exceedance frequency from Los Angeles County was the only reference beach exceedance frequency available. The 22 percent allowable exceedance frequency used to calculate the wet weather TMDLs is justified because the San Diego Region watersheds' exceedance frequencies will likely be close to the value calculated for Leo Carillo Beach, and is consistent with the exceedance frequency that was applied by the Los Angeles Regional Board.
e. Dry weather numeric objectives based on the 30-day geometric mean (or equivalent) water quality objectives in Water Quality Control Plan for the San Diego Basin (1994). Compliance with the dry weather TMDLs in the receiving water is based on the frequency that the dry weather days in any given year exceed the dry weather numeric objective.
~~f. Wet and dry weather numeric objectives for total coliform apply at the point in a creek that discharges to a beach, bay, or estuary.~~
f.~~g.~~ A wet weather numeric objective for Enterococcus of 104 MPN/100mL may be applied as a receiving water limitation for creeks, instead of 61 MPN/100mL, if one or more of the creeks addressed by these TMDLs (San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek, San Diego River, and/or Chollas Creek) is designated with a "moderately to lightly used area" or less frequent usage frequency in the Basin Plan. Otherwise, the wet weather numeric objective of 61 MPN/100mL for Enterococcus will be used to assess compliance with the wet weather allowable exceedance frequency.

Comment 18

When was the last time that the conditional waivers for agriculture were evaluated? It appears that the general conditional waivers will expire December 31, 2012. When will San Diego Board begin to evaluate these to decide whether or not they are sufficient to implement the agriculture load allocations? How will the San Diego Water Board ensure that such owners and operators of are not discharging in excess of their loads?

Response: The current conditions of the waiver require enrollment, implementation of BMPs, development of a monitoring program, and a year of monitoring by the owners and operators of irrigated agriculture operations. The results of the monitoring will provide much needed data to identify whether agriculture is a source of several pollutants in several watersheds in the San Diego Region. The Phase I MS4s are also encouraged to monitor at the boundaries between their jurisdictions and agricultural operations (and other dischargers). The conditions of the waiver will likely be modified during the next waiver renewal. The requirements of these TMDLs will likely be a significant factor in the development of any new conditions for the waiver.

The conditional waivers for agriculture were last adopted by the San Diego Water Board in October 2007. As required under Water Code section 13267, the conditional waiver will have to be re-evaluted and renewed or terminated after December 31, 2012. Re-evalution and renewal will likely begin sometime in 2011.

Comment 19

Page A49. The City disagrees with the statement "Implementation of these TMDLs by the San Diego Water Board should not require any special studies to be conducted by the dischargers or other entities." During discussions at the January 7 stakeholder meeting, it was acknowledged that this TMDL is based on old data or a lack of data and that special studies will most likely be part of the dischargers Load Reduction Plan. It is thus not clear why this statement was made, and discussions regarding old data and lack of data illustrate the fact that the Board does not have sufficient data at this time to adopt the proposed TMDL.

Response: We agree that the dischargers will likely *want* to conduct special studies; however, implementation of the TMDLs by the San Diego Water Board does not *require* the dischargers conduct special studies. If the dischargers would like to modify elements of the TMDLs (e.g., allowable exceedance frequencies), the San Diego Water Board will support those efforts, but they are not a requirement.

Comment 20

The Environmental Review prepared by Board Staff in an effort to comply with the California Environmental Quality Act ("CEQA") is deficient and does not comport with CEQA. There is a wholly inadequate analysis of the "reasonably foreseeable" BMPs that will need to be utilized in type, size, number and location, and as such, the CEQA Environmental Review prepared by Board Staff to access the environmental impacts from the installation of the "reasonably foreseeable" BMPs, is entirely lacking in substance.

For example, the analysis under the section entitled "The Utilities and Service Systems. a" on page R-51 of the Environmental Analysis and Checklist ("EAC"), provides that the "Installation of structural BMPs may require alterations or installation of new power or natural gas lines" but, "that the installation of structural BMPs will result in a substantial increased need for new systems, or substantial alterations to power or natural gas utilities, is not reasonably foreseeable, because none of these BMPs are large enough to substantially tax current power or natural gas sources." Yet, there is no analysis in the EAC describing the number and size of treatment facility BMPs, such as the number and necessary expansions to existing sanitary sewer facilities, to support this statement. In fact, the EAC makes no attempt to describe how large of a BMP is too large "to substantially tax current power or natural gas sources," and in general wholly fails to describe the "reasonably foreseeable" approximate number, type, size and location of the various types of structural BMPs that will be needed to meet the TMDL's waste load allocations, or even the extent of the non-structural BMPs that will be needed (e.g., the extent street sweeping will need to be increased, in what areas, the extent of the increase, etc).

Complying with CEQA necessarily involves some degree of forecasting. "While forecasting the unforeseeable is not possible, an agency must use its best efforts to find out and disclose all that it reasonably can." (CEQA Guidelines, 14 CCR § 15144.) Here, the Board has ignored this mandate.

The discussion contained throughout the EAC simply deems impacts to be insignificant under the presumption that the BMPs and mitigation measures ultimately selected to implement the TMDLs will be properly designed and sited by local agencies. The Board makes no effort to

analyze "reasonably foreseeable" physical changes to the environment necessitated by the TMDL.

As one example, the Board's discussion relating to whether the proposal will result in any "change in climate" consists entirely of the following conclusory statement: "Non-structural and/or structural BMPs would not be of the size or scale to result in alterations of air, movement, moisture, or temperature, or any change in climate, either locally or regionally." (EAC, p. R-25.) This analysis completely fails to adequately evaluate the project's impacts on the climate.

With the adoption of SB 97 in 2007, the California legislature directed that greenhouse gas ("GHG") emissions and the effects of climate change be included in future analyses under CEQA. More specifically, SB 97 directs the State Office of Planning and Research ("OPR") to develop draft CEQA Guidelines "for the mitigation of GHG emissions or the effects of GHG emissions" by July 1, 2009 and directs the Natural Resources Agency to certify and adopt revised CEQA Guidelines by January 1, 2010.

Proposed CEQA Guidelines, received by the Natural Resources Agency on April 13th, 2009, outline in 14 CCR section 15064.4 the following responsibilities for Lead Agencies in determining the significance of GHG emissions:

> *a) The determination of the significance of greenhouse gas emissions calls for a careful judgment by the lead agency consistent with the provisions in section 15064. A lead agency should make a good-faith effort, based on available information, to describe, calculate or estimate the amount of greenhouse gas emissions resulting from a project. A lead agency shall have discretion to determine, in the context of a particular project, whether to:*
>
> *(1) Use a model or methodology to quantify greenhouse gas emissions resulting from a project, and which model or methodology to use. The lead agency has discretion to select the model it considers most appropriate provided it supports its decision with substantial evidence. The lead agency should explain the limitations of the particular model or methodology selected for use; or*
>
> *(2) Rely on a qualitative analysis or performance based standards.*
>
> *b) A lead agency may consider the following when assessing the significance of impacts from greenhouse gas emissions on the environment:*
>
> *(1) The extent to which the project may increase or reduce greenhouse gas emissions as compared to the existing environmental setting;*
>
> *(2) Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project.*
>
> *(3) The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of greenhouse gas emissions. Such regulations or requirements must be adopted by the relevant public agency through a public review process and must include specific requirements that reduce or mitigate the project's incremental contribution of greenhouse gas emissions. If there is substantial evidence that the possible effects of a particular project are still cumulatively considerable notwithstanding compliance with the adopted regulations or requirements, an EIR must be prepared for the project.*

Proposed subsection (c) to 14 CCR section 15126.4 provides additional guidelines on how to minimize and mitigate a project's GHG emissions. While the Board, for example, recognizes potential impacts of air quality due to increased traffic, it makes no attempt to quantify foreseeable increases in vehicular emissions. Moreover, the analysis similarly fails to estimate GHG emissions as a result of (1) increased energy usage, (2) increased emissions from organic sources, or (3) increased solid waste generation.

In short, the Board makes no effort to describe, calculate or estimate the type and number of BMPs that will generate GHG emissions, nor the *amount* of GHG emissions that will result from the construction, installation, operation, and maintenance of these BMPs. Nor does the Board's Environmental Review make any attempt to otherwise determine the reasonably foreseeable BMPs needed to meet the TMDL in general, and thus generally fails to analyze the reasonably foreseeable impacts to the environment from the implementation of these expected BMPs.

Response: The level of specificity in the substitute environmental documents is adequate for the purposes of this Basin Plan amendment. Appendix R to the Technical Report (Environmental Analysis and Checklist) contains adequate information and analysis for the public to understand the potential adverse environmental impacts of the project.

The CEQA provisions allow the San Diego Water Board to limit analysis in these substitute environmental documents to broad environmental issues which are ripe for decision at the TMDL adoption stage. At this stage, the San Diego Water Board is not required to evaluate environmental issues associated with specific projects undertaken to comply with the TMDLs. CEQA provisions allow for project level environmental considerations to be deferred so that more detailed examination of the effects of these projects in subsequent CEQA environmental documents can be made by the appropriate lead agency.

The CEQA requires that the San Diego Water Board provide substitute environmental documents that contain sufficient information and analysis for the public to understand the potential adverse environmental impacts of the project, and to provide the San Diego Water Board with meaningful discussion and comment on these impacts. Our substitute environmental documents do that by describing a range of potential structural and non-structural controls the dischargers could construct or implement to meet the wasteload allocations (WLAs) and load allocations (LAs) required to achieve these TMDLs. The documents also discuss the potential adverse environmental impacts associated with those controls. The CEQA does not require the San Diego Water Board to speculate on the location or size of specific structural controls that the dischargers might choose to implement.

The San Diego Water Board appreciates the City's efforts in moving forward with BMP planning, and is willing to discuss potential BMP siting and design issues, and different compliance monitoring approaches that could be used. However, we do not have the authority to delegate which methods or BMPs must be used to comply with the bacteria TMDLs. Additionally, it is not the purpose of the TMDLs to provide complete guidance for compliance. The San Diego Water Board has flexibility in making waste discharge requirements consistent with the requirements and assumptions of any WLAs and LAs required by the applicable TMDLs and in establishing monitoring programs to gage compliance.

The CEQA does not require the level of detail requested in the comment for a planning level analysis. The dischargers are solely responsible for determining the specific BMPs that will be

implemented at specific locations, and for evaluating the potential site specific environmental impacts of those BMPs. Ultimately, the dischargers are solely responsible for complying with all specific CEQA requirements.

As alluded to by the commenter, the environmental analysis includes analyses of several other potential impacts that may result in increases in emissions, such as air, transportation, energy, and utilities and service systems, but did not specifically discuss greenhouse gas emissions. However, non-structural and/or structural BMPs should not substantially increase greenhouse gas emissions. Operation of street sweepers, construction, and maintenance vehicles could increase the use of fossil fuels, and some types equipment used in structural BMPs may consume electricity to operate pumps, etc., which could increase greenhouse gas emissions These greenhouse gas emissions should fall within the current emissions expectations for the region. The additional greenhouse gas emissions could be mitigated and reduced if non-CO2 generating alternative fuels and/or renewable energies are used to power vehicles and equipment, or the use of vehicles is minimized by reducing of trips needed to perform multiple tasks. Additionally, some BMPs may include the use of vegetation which can also reduce emissions. These BMPs may generate additional solid waste and decaying organic matter, which can also result in increased greenhouse gas emissions. If the waste and organic matter is taken to a landfill, the methane that is generated can be harvested and used as an energy source at the site, which can offset emissions that would be generated from offsite energy sources. The potential impact to climate change is likely to be less than significant, especially if mitigation measures are implemented.

As noted in the comment, at this time the CEQA Guidelines for determining significance of greenhouse gas emissions are *proposed*. They have not yet been approved by the Office of Administrative Law (OAL) and promulgated. Therefore, the current environmental analysis is adequate for the purposes of this TMDL Basin Plan amendment.

4.4 City of Del Mar

Comment 21

The Pacific Ocean Shoreline, Miramar Reservoir was delisted for bacteria in the most recently adopted water quality impaired list or 303(d) listing, dated October 25, 2006. The listing was last approved by the State Water Resources Control Board to reflect new data and information in accordance with the Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List (Listing Policy). The fact sheet for the Pacific Ocean Shoreline at Miramar Reservoir HA recommended the delisting of the segment using the weight of evidence and in compliance with the Listing Policy. The City recognizes that Section 303(d)(3) of the Clean Water Act states that,

> *"for the specific purpose of developing information, each State shall identify all waters within its boundaries which it has not identified under paragraph (I)(A) and (I)(B) of this subsection and estimate for such water the total maximum daily load […]."*

However, the City firmly believes that the inclusion of this previously delisted water body will result in valuable municipal and state resources being spent on a project that will not provide any benefit to water quality comparable to the anticipated expenditures. Limiting the Indicator Bacteria Project I TMDL to 303(d) listings allows the City to focus its resources on high priority water impairments, and future TMDLs, rather than on a segment that has effectively shown attainment of water quality objectives.

Response: In developing the BLRPs or CLRPs, we expect that the load reduction implementation actions will focus on those locations and areas where exceedances of the indicator bacteria water quality objectives continue to indicate that the impairment exists and warrant the listing on the 303(d) List.

For locations or areas that have been removed from the 303(d) List, continuing the monitoring that is already required will be the only implementation action required to achieve the TMDLs. Monitoring is already required under several other programs and regulatory requirements, thus this is not expected to increase the need for additional resources.

If, however, future monitoring data indicate that the bacteria impairment returns, the BLRPs or CLRPs need to provide a framework of the actions that will be taken to restore the impaired recreational beneficial uses. In most cases, the action will likely include investigating and locating the sources of bacteria causing the impairment, and implementing BMPs to reduce the bacteria from the controllable sources. These actions are also already requirements under the Phase I MS4 NPDES requirements.

Comment 22

If the delisted Pacific Ocean Shoreline, Miramar Reservoir segment remains a part of this proposed TMDL, the City respectfully requests that the Load Reduction Plan requirements be revised. Specifically, the City requests that the following language be added to the second paragraph on Page A65:

"For areas that are no longer on the List of Water Quality Limited Segments (303(d) List), Phase I and II MS4 dischargers and Caltrans need not prepare Bacteria Load Reduction Plans for their discharges in these watersheds, providing that attainment of WQOs continues to be demonstrated."

Response: The Pacific Ocean Shoreline, Miramar Reservoir segment will remain as part of these TMDLs. The following language will be added after the second paragraph of section 11.5.2 of the draft Technical Report and on page A66 of the Basin Plan amendment:

For watersheds in Table 11-5 where there are no longer any impairments listed on the 2008 303(d) List, the Phase I MS4s and Caltrans are not required to submit a BLRP or CLRP within 18 months of the effective date of these TMDLs. If, however, any segment of a waterbody for the watershed (Pacific Ocean shoreline, creek, or mouth as shown in Table 11-5) is re-listed on a future 303(d) List for any type of indicator bacteria, the Phase I MS4s and Caltrans will be required to submit a BLRP or CLRP within 6 months of the adoption of the 303(d) List by the San Diego Regional Board.

Comment 23

Page A40 states that, "Municipal (Phase I and Phase II) MS4s and Caltrans are the only point sources that have been assigned WLAs". However, the table on page A59 also lists the owners/operators of small MS4s as responsible Municipalities in all of the watersheds included in this Resolution. It is unclear in many instances throughout the Resolution as to whether Phase II MS4s (non□Municipal) are subject to certain requirements because they are not specifically listed. Therefore, the City respectfully requests that Regional Board staff review the Resolution to ensure that all Phase II MS4 (municipal and non□municipal) dischargers are included in the requirements applicable to Phase I MS4 dischargers and Caltrans. For example, Phase II MS4 discharges should be added to the Compliance Schedule on page A66 and be required to develop and submit Bacteria Load Reduction Plans (BLRPs). This language change will ensure that smaller MS4s with a high potential for discharge of bacteria loads are also included in this TMDL.

Response: Please see the responses to Comment 15 and in Section 2.7.2.

Comment 24

The City also requests that owners/operators of small MS4s be added to the Table on pages A69 and A70 as a responsible party for Items 6□13, 16, and 21.

Response: Please see the response in Section 2.7.2. "Municipal Dischargers" includes Phase I and Phase II MS4s. In order to clarify the role of the Phase I MS4s and Phase II MS4s, the following revisions will be made to the TMDL Implementation Milestones table: 1) a footnote will be added to the "Municipal Dischargers" in Items 6-13 and 21 that states, "Because there are no Phase II MS4s enrolled under the State General Permit for Small MS4s, discharges from Phase II MS4s are not permitted (i.e., WLA = 0) and Municipal Dischargers are only the Phase I MS4s in this Implementation Milestone item. When a Phase II MS4 is enrolled under the State General Permit for Small MS4s or issued an individual NPDES permit, the Municipal Dischargers will be both the Phase I MS4s and Phase II MS4s in this Implementation Milestone item"; and 2) Phase II MS4s will be added as to the Responsible Parties for Item 16.

4.5 City of Encinitas

Comment 25

Comprehensive Load Reduction Plans: The Revised TMDL for Indicator Bacteria allows the Phase 1 MS4s to submit Comprehensive Load Reduction Plans (CLRPs) outlining a Best Management Practice (BMP) Program that will be capable of achieving the necessary load required to attain the TMDLs in the receiving water within 18 months after the effective date of these TMDLs.

If the Phase 1 MS4s choose to submit CLRPs, the compliance targets for any additional constituents of concern have not been defined. Therefore, if BMPs are designed to support water quality objectives for Bacteria, the Phase 1 MS4s will not know what the allowable loads are for any of the additional constituents of concern that may be included in their CLRPs.

Response: Water quality standards (i.e., beneficial uses and water quality objectives) are used as the basis for developing TMDLs. For many pollutants of concern (e.g., metals, pesticides) there are numeric water quality objectives that are available, which are ultimately what is expected to be met in the receiving waters. Therefore, the water quality objectives in the Basin Plan can be used to identify target pollutant concentrations in any discharges and/or receiving waters to ensure that the effluent will not cause or contribute to the exceedance of water quality objectives in the receiving water.

Comment 26

Wet Weather Exceedance Frequencies: The Revised TMDL for Indicator Bacteria identifies exceedance frequencies for wet weather expressed as percentages. Wet weather exceedance frequencies are calculated by dividing the number of wet weather days that exceed the single sample maximum REC-1 WQOs by the total number of wet weather days during the rainy season.

This formula makes it difficult for the responsible parties to assess compliance with theTMDL until the end of the wet season and thereby does not provide the responsible parties with an opportunity to take appropriate actions or make timely changes to their programs.

Response: For TMDL compliance purposes, the wet weather exceedances will likely be assessed by the Regional Board after the end of a wet season. Determining compliance with the allowable exceedance frequency, however, does not have to be assessed at the end of the wet season (October 1 to April 30). The wet weather exceedance frequency may be calculated for each wet weather event (i.e., each storm with 0.2 inches of rainfall and the following 72 hours). With each additional wet weather event, the exceedance frequency may be recalculated until the end of the wet season. Each wet weather event can provide additional data to identify actions that can be taken to reduce exceedances in subsequent wet weather events during a wet season and subsequent wet seasons.

4.6 City of La Mesa

Comment 27

On Page A62 of Attachment A of the Tentative Resolution R9-2010-0001 and on Page 131 of the Draft Technical Report, the City of La Mesa is listed as a responsible municipality for Forrester Creek, within the Mission San Diego and Santee HAS watershed heading. No portion of the City of La Mesa is tributary to Forrester Creek. Please remove the City of La Mesa from the Responsible Municipalities grouping for this listing.

Response: We reviewed of the municipalities located within the Mission San Diego/Santee HSAs that are within the drainage area of Forrester Creek. The City of La Mesa will be removed from the list of Responsible Municipalities on pages A61 of the draft Basin Plan amendment, and page 130 of the draft Technical Report.

4.7 City of Laguna Niguel

Comment 28

A. Resolution paragraph 10, page 4: "……At the time Resolution No. R9-2007-0044 was adopted, allowing exceedances of the REC-1 WQOs during either wet or dry weather was not authorized by the Basin Plan. The San Diego Water Board, however, recognized that exceedances of the REC-1 WQOs during both wet and dry weather was likely, and may be partially due to bacteria loads contributed from natural sources. Therefore, the San Diego Water Board agreed to develop a Reference System Anti-Degradation Approach/Natural Source Exclusion Basin Plan Amendment, which would authorize an allowance for wet or dry weather exceedances of the REC-1 WQOs based on the ~~wet weather~~ natural exceedance frequencies observed in a comparable reference system; and/or based on the effective control of all anthropogenic sources of indicator bacteria, coupled with a demonstration that residual indicator bacteria densities are not indicative of an elevated human health risk. For this reason, adoption of the Bacteria TMDLs Project I Basin Plan amendment was made contingent upon the future consideration of a separate Reference System Antidegradation Approach/Natural Source Exclusion (RSAA/NSE) Basin Plan amendment by the San Diego Water Board. It was assumed that upon the subsequent adoption of the RSAA/NSE Basin Plan Amendment, Bacteria TMDLs Project I would be appropriately revised and brought back to the San Diego Water Board for re-adoption. The key revision would include incorporation of the reference system approach into the final wet weather TMDLs….."

Response: Adoption of Resolution No. R9-2007-0044 was contingent upon adopting a subsequent Reference System Approach Basin Plan amendment for the specific purpose of applying of the reference system approach only to the wet weather TMDLs. We do recognize that the Reference System Approach Basin Plan amendment can be applied for both wet and dry weather. Finding 10 in Tentative Resolution No. R9-2010-0001 will be revised as follows:

10. **Adoption of Bacteria TMDLs Project I Basin Plan Amendment Contingent Upon Adoption of Reference System Approach Basin Plan Amendment:** The bacteria TMDLs adopted under Resolution No. R9-2007-0044 included "interim" and "final" wet weather TMDLs. The "interim" wet weather TMDLs were calculated to include an allowance for exceedances of REC-1 WQOs due to bacteria loads from natural sources based on the exceedances in a reference system.[1] The "final" wet weather TMDLs that were calculated did not allow for exceedances of REC-1 WQOs due to bacteria loads from natural sources. At the time Resolution No. R9-2007-0044 was adopted, allowing exceedances of the REC-1 WQOs during either wet or dry weather was not authorized by the Basin Plan. The San Diego Water Board, however, recognized that exceedances of the REC-1 WQOs during wet weather was likely, and may be partially due to bacteria loads contributed from natural sources. Therefore, the San Diego Water Board agreed to develop a Reference System Approach Basin Plan Amendment, which would authorize an allowance for ~~wet weather~~ exceedances of the REC-1 WQOs based on the ~~wet weather~~ exceedance frequencies observed in a reference system.

[1] A reference system is a watershed and the beach to which the watershed discharges that is minimally impacted by anthropogenic activities that can affect bacterial densities in the waterbody.

For this reason, adoption of the Bacteria TMDLs Project I Basin Plan amendment was made contingent upon the future consideration of a separate Reference System Approach Basin Plan amendment by the San Diego Water Board. It was assumed that upon the subsequent adoption of the Reference System Approach Basin Plan amendment, Bacteria TMDLs Project I would be appropriately revised and brought back to the San Diego Water Board for re-adoption. The key revision would include incorporation of the reference system approach into the final wet weather TMDLs. Specifically, the previously established "interim" wet weather TMDLs, which were calculated based on the reference system approach, would become the only wet weather TMDLs. The previously established "final" TMDLs, which did not use the reference system approach, would be removed.

Comment 29

B. Resolution paragraph 11, page 4: "….Specifically, it authorizes the San Diego Water Board to develop bacteria TMDLs that allow exceedances of the ~~single sample maximum bacteria~~ WQOs ~~during wet weather~~ for the purpose of accounting for natural, uncontrollable sources of bacteria (e.g., birds, wildlife, soil, etc.). Such sources, by themselves and in the absence of human activities, have been found to cause exceedances of the ~~single sample maximum~~ WQOs ~~during wet weather~~…."

Response: Finding 11 in Tentative Resolution No. R9-2010-0001 will be revised as suggested by the commenter.

Comment 30

C. Resolution paragraph 12, page 5: "….Additionally, the San Diego Water Board needed to make the revisions that had been committed to upon adoption of the RSAA/NSE Basin Plan amendment, as described in finding 10."

Response: The suggested revision is appreciated, but current text is accurate.

Comment 31

D. Resolution paragraph 14, page 5: "….Revisions to the original Bacteria TMDLs Project I Basin Plan amendment include: 1) finalizing the TMDLs to include allowable wet-weather exceedances of the REC-1 WQOs using the reference system approach authorized by the RSAA/NSE Basin Plan amendment adopted under Resolution No. R9-2008-0028 (see finding 11)…."

Response: The suggested revisions are appreciated, but current text is accurate.

Comment 32

E. Resolution paragraph 17, page 8: "….Exceedances of bacteria REC-1 WQOs may be allowed within the context of bacteria TMDLs using a reference system approach or natural sources exclusion approach. Re-calculation of the controllable WLAs or LAs and/or re-setting of the exceedance frequency numeric targets is allowable contingent upon the demonstration of

more accurate reference system or natural residual exceedance frequencies for specific target water bodies, conditions or seasons, subject to the approval of the San Diego Water Board."

Response: The suggested revision is appreciated, but current text is accurate.

Comment 33

F. Resolution paragraph 18, page 8: "….The numeric targets selected for these bacteria TMDLs are based primarily on the REC-1 WQOs for indicator bacteria contained in the Ocean Plan and/or Basin Plan (finding 16), and allowable wet-weather exceedance frequencies using a reference system approach (findings 11 and 17). Different numeric targets (i.e. numeric WQOs and allowable exceedance frequencies) were used to calculate dry weather TMDLs and wet weather TMDLs, respectively. The numeric targets were selected based on the applicability of the Ocean Plan and/or Basin Plan REC-1 WQOs (i.e., Pacific Ocean shoreline or inland surface water) and the allowable exceedance frequencies of the REC-1 WQOs in ~~available~~ reference systems for the different weather conditions (i.e. wet weather or dry weather), based on data available at the time the TMDL process was initiated.

Response: The suggested revisions are appreciated, but current text is accurate.

Comment 34

G. Resolution paragraph 22, page 10: "….For developing the dry weather TMDLs, a major underlying assumption ~~is~~ was that there is no discharge of surface runoff, thus no discharge of bacteria, expected from land uses associated with the Caltrans, Agriculture and Open Space land use categories during dry weather. Because no discharge of surface runoff ~~is~~ was expected from these land use categories during summer or winter dry weather, they were assigned dry weather WLAs and LAs of zero. The dry weather TMDLs were assigned entirely to the Municipal MS4s land use category as dry weather WLAs, meaning only discharges of bacteria loads from the Municipal MS4s land use category to the receiving waters are expected or allowed ~~from the Municipal MS4s land use category~~ during dry weather. In calculating the WLAs and LAs, the possible contribution of subsurface or groundwater flows to bacteria loads in receiving waters during winter or summer dry weather was not accounted for in any land use category. However, an allowable exceedance frequency of 3% was established specifically for winter dry weather in recognition of conditions at the reference beach, where exceedances were observed during winter dry weather due to creek flows and bacteria loads swollen by antecedent rainfall."

Response: The suggested revisions are appreciated, but current text is accurate. Also, please see the response in Sections 2.3 and 2.7.1.

Comment 35

H. Resolution paragraph 26, page 11: "…WQBELs may be expressed as numeric effluent limitations, when feasible; other quantifiable metrics, such as as exceedance days in receiving waters; and/or as a best management practice (BMP) program of expanded or better-tailored BMPs. The WQBELs will likely need to include a BMP program to achieve the load reductions required to attain the TMDLs in the receiving waters. Prior to incorporation into the NPDES requirements, the Municipal MS4s and Caltrans will be required to submit Bacteria or Comprehensive Load Reduction Plans outlining a proposed BMP program that will be capable of

achieving the necessary controllable load reductions required to attain the TMDLs in the receiving water. The Municipal MS4s and Caltrans will be responsible for reducing their controllable bacteria loads and/or demonstrating that their discharges are not causing exceedances of the numeric WQOs ~~and~~ beyond the allowable exceedance frequencies in the receiving waters, and/or are not causing elevated risks to human health."

Response: Please see the response in Section 2.7.2.

In addition, Finding 26 in Tentative Resolution No. R9-2010-0001 will be revised as follows:

26. Implementation of TMDLs: Because the ~~Municipal~~ Phase I MS4s are located at the base of the watersheds and have been identified as ~~a~~ the most significant controllable source of bacteria discharging to the receiving waters, these TMDLs will be implemented primarily through the revision of the National Pollutant Discharge Elimination System (NPDES) discharge requirements regulating discharges from the ~~Municipal~~ Phase I MS4s ~~and Caltrans~~. The Caltrans NPDES requirements will also be revised. Federal regulations require that NPDES requirements incorporate water quality based effluent limitations (WQBELs) that must be consistent with the requirements and assumptions of any available WLAs. WQBELs may be expressed as numeric effluent limitations, when feasible, and/or as a best management practice (BMP) program of expanded or better-tailored BMPs. The WQBELs will likely need to include a BMP program to achieve the load reductions required to attain the TMDLs in the receiving waters. The ~~Municipal~~ Phase I MS4s and Caltrans will be required to submit Bacteria or Comprehensive Load Reduction Plans outlining a proposed BMP program that will be capable of achieving the necessary load reductions required to attain the TMDLs in the receiving water. The ~~Municipal~~ Phase I MS4s and Caltrans will be responsible for reducing their bacteria loads and/or demonstrating that their discharges are not causing exceedances of the numeric WQOs and allowable exceedance frequencies in the receiving waters. Other dischargers identified as significant sources of bacteria will also be responsible for reducing their bacteria loads and/or demonstrating that their discharges are not causing exceedances of the numeric WQOs and allowable exceedance frequencies in the receiving waters.

Comment 36

I. Resolution paragraph 28, page 12: "…At the end of the dry weather TMDL compliance schedule, the 30-day geometric mean REC-1 WQOs for summer dry weather days must be met 100 percent of the time in the receiving waters; and during winter dry weather days must not be exceeded in the receiving waters more frequently than the allowable exceedance frequencies. At the end of the wet weather TMDL compliance schedule, the single sample maximum ~~and 30-day geometric mean~~ REC-1 WQOs must not be exceeded in the receiving waters more frequently than the allowable exceedance frequencies."

Response: The suggested revisions are appreciated, but current text is accurate. Also, please see the responses to Comment 8 and in Sections 2.3 and 2.7.1.

Comment 37

J. Attachment A, paragraph 3, page A6: "…WQBELs may be expressed as numeric effluent limitations, when feasible; other quantifiable metrics such as exceedance days in receiving

waters; and/or as a best management practice (BMP) program of expanded or better-tailored BMPs."

Response: The suggested revision is appreciated, but current text is accurate.

Comment 38

K. Attachment A, page A11: - Item #4 is missing something at the end of the sentence, probably the location of the TMDL: "4. Total Maximum Daily Loads (TMDLs) for Total Nitrogen and Total Phosphorus in the..>>>?????"

Response: The text will be corrected as follows:

4. Total Maximum Daily Loads (TMDLs) for Total Nitrogen and Total Phosphorus in the Rainbow Creek Watershed

Comment 39

L. Attachment A, page A13, Footnote 2: "Wet weather days defined as days with rainfall events of 0.1" ~~0.2"~~ or greater and the following 72 hours."

Response: Please see the response in Section 2.2.

Comment 40

M. Attachment A, page A13, Footnote 3: "Dry weather days defined as days with less than 0.1 ~~0.2~~ inches of rainfall observed on each of the previous 3 days. Winter dry weather days defined as dry weather days between October 1 and April 30. Summer dry weather days defined as dry weather days between May 1 and September 30."

Response: Please see the responses in Sections 2.2 and 2.3.

Comment 41

N. Attachment A, page A14, paragraph 2: "…The numeric targets used to calculate summer dry weather TMDLs include a zero percent allowable exceedance frequency of the REC-1 geometric mean WQOs. The numeric targets to calculate winter dry weather TMDLs include a 3 percent allowable excedance frequency of the REC-1 geometric mean WQOs."

Response: Please see the response in Section 2.3.

Comment 42

O. Attachment A, page A14, paragraph 3: "…Allowable exceedance days are calculated based on the allowable exceedance frequencies and the total number of wet days or winter dry days in a year."

Response: Please see the response in Section 2.3.

Comment 43

P. Footnote 4, page A14: "In the calculation of the wet weather TMDLs, the San Diego Regional Board chose to apply the 22 percent allowable exceedance frequency as determined for Leo Carillo Beach in Los Angeles County. At the time the wet weather watershed model was

developed, the 22 percent exceedance frequency from Los Angeles County was the only reference beach exceedance frequency available. No exceedance frequency data were available at reference creeks in wet weather, but the model suggests that creek wet-weather exceedances may be substantially higher than at beaches. The 22 percent allowable exceedance frequency used to calculate the wet weather TMDLs is justified because the San Diego Region ~~watersheds'~~ beaches' exceedance frequencies will likely be close to the value calculated for Leo Carillo Beach, and is consistent with the exceedance frequency that was applied to beaches by the Los Angeles Regional Board."

Response: Please see the responses to Comment 2 and in Section 2.2.

Comment 44

Q. Footnote 5, page 14: "Limited water quality data available from San Diego Region reference ~~systems~~ beaches when the TMDL project was initiated, indicated that exceedances of the single sample WQOs during dry weather conditions are uncommon at reference beaches. ~~Furthermore, if the exceedance of the single sample WQOs during dry weather is unlikely, are even more unlikely.~~ More recent data developed by SCCWRP in Orange and San Diego Counties indicate that dry-weather exceedances may seasonally be much more common in reference creeks. Depending on the magnitude and consistency of the single-sample exceedances, exceedances of the geometric mean may be more or less common than single-sample exceedances."

Response: Please see the responses to Comment 2 and in Section 2.3.

Comment 45

Q. Footnote 5, page 14: "Limited water quality data available from San Diego Region reference ~~systems~~ beaches when the TMDL project was initiated, indicated that exceedances of the single sample WQOs during dry weather conditions are uncommon at reference beaches. ~~Furthermore, if the exceedance of the single sample WQOs during dry weather is unlikely, are even more unlikely.~~ More recent data developed by SCCWRP in Orange and San Diego Counties indicate that dry-weather exceedances may seasonally be much more common in reference creeks. Depending on the magnitude and consistency of the single-sample exceedances, exceedances of the geometric mean may be more or less common than single-sample exceedances."

Response: Please see the response to Comment 2.

Comment 46

R. Attachment A, Page A18, paragraph 3: "… The concentration based TMDLs and allowable exceedance frequencies will be used to determine compliance with the TMDLs in the receiving waters…."

Response: The suggested revision is appreciated, but current text is accurate. The concentration based TMDLs consist of the numeric REC-1 WQOs and the allowable exceedance frequencies.

Comment 47

S. Attachment A, Page 16, footnote (a) to Wet Weather Numeric Targets Table: "(a) Percent of wet days (i.e. rainfall events of 0.1 ~~0.2~~ inches or greater and the following 72 hours)…."

Response: Please see the response in Section 2.2.

Comment 48

T. Attachment A, page A16, Dry Weather Numeric Targets Table:

Dry Weather Numeric Targets

Indicator Bacteria	Numeric Target (MPN/100 mL)	Summer Allowable Exceedance Frequency	Winter Allowable Exceedance Frequency
Fecal coliform	200	0%	3%
Total coliform	1,000	0%	3%
Enterococci	35/33	0%	3%

(a). Percent of dry days (i.e., days with less than 0.1 ~~0.2~~ inch of rainfall observed on each of the previous 3 days) allowed to exceed the dry weather numeric targets. Summer is defined as May 1 through September 30 and winter is defined as October 1 through April 30."

Response: Please see the response in Section 2.3.

Comment 49

U. Attachment A, page A18, paragraph 2: "…the dry weather steady-state model-predicted flows at the critical location during the dry days of the critical wet year in combination with the dry weather numeric targets were used to calculated the mass-based monthly allowable dry weather bacteria loads, or mass-based dry weather TMDLs, for summer dry weather. For the 7 months (October-April) of winter dry weather, the 3% allowable exceedance-day frequency was used to pro-rate the existing excess monthly bacteria load, and added to the summer monthly load based on the numeric targets."

Response: Please see the response in Section 2.3.

Comment 50

V. Attachment A, page A20, paragraph 2: "…All of the summer dry weather mass-load based TMDLs were calculated using a 0 percent exceedance frequency. All of the winter dry weather mass-load based TMDLs were calculated using a 3 percent exceedance frequency. These allowable exceedance frequencies were used to calculate the numer of wet and dry weather allowable exceedance days during the critical wet year."

Response: Please see the response in Section 2.3.

Comment 51

W. Attachment A, page A23, paragraph 3: "The summer dry weather mass-load based TMDLs were assigned entirely to discharges from MS4 land uses because the runoff that transports bacteria loads to surface waters during dry weather are expected to occur only in urban

areas. The mass load associated with the allowable exceedance frequency of 3% established for winter dry weather is assignable to open space because it represents natural loading from undeveloped reference systems…."

Response: Please see the response in Section 2.3.

Comment 52

X. Page A24, add to end of paragraph 1 (or add new separate paragraphs): "Ultimately, controllable point and nonpoint sources must reduce their anthropogenic loads so the concentration based wet weather and dry weather TMDLs, which are based on the numeric REC-1 WQOs I the Basin Plan and allowable reference exceedance frequencies, can be met during wet weather and dry weather conditions during each year. Meeting the wet weather and dry weather numeric targets in the ~~discharge and/or~~ receiving water will indicate the TMDLs, WLAs, and/or LAs have been met.

After all anthropogenic sources of indicator bacteria have been controlled such that anthropogenic sources do not cause exceedances of the indicator bacteria water quality objectives, exceedances of the indicator bacteria water quality objectives may alternatively be allowed based on the residual exceedances in the target water body. The residual exceedances in the target water body define the background level of exceedance due to natural sources, under the Natural Sources Exclusion approach allowable under the RSAA/NSE Basin Plan amendment adopted under Resolution No. R9-2008-0028. This approach further requires that natural sources be identified and quantified, and dischargers demonstrate that residual indicator bacteria densities are not indicative of elevated human health risk.

The San Diego Water Board will evaluate the appropriateness of the specific approaches and exceedances or exceedance frequencies to be allowed under any proposed recalculation of WLAs or LAs or revisions of numeric targets using either an alternative reference system model or a natural source exclusion model."

Response: The suggested revisions are appreciated, but current text is accurate.

Comment 53

Y. Attachment A, page A27, revisions to selected columns in Table, Summary of Dry Weather Existing and Allowable Indicator Bacteria Loads: *Note, the correction in the first column heading shown below is typographical. The calculated inputs in the other columns are an example based on the first waterbody in the table (San Joaquin Hills HSA and Laguna Hills HSA); these calculations should be conducted for all waterbodies in the table.*

Allowable Numeric Objective Load (Billion MPN/~~year~~**month**	Total Dry Days in Critical Year	Allowable Exceedance Frequency (Winter 7 months Only)	Allowable Dry Exceedance Days in Critical Year (Winter 7 months Only)*	Allowable Exceedance Load (billion MPN/Month, Winter 7 months only)**	Total allowable load = TMDL (billion MPN/month) (Winter/Summer)
227	296	3%	4.38	52.4	279/227
1,134	296	3%	4.38	264	1,398/1,134
40	296	3%	4.38	47.6	87.6/40

* Calculated as 3% x (total dry days in year – 150 summer days).
** Calculated as (existing load – allowable numeric objective load)/30 days x (allowable winter exceedance days/7 months)

Response: Please see the response in Section 2.3. The units in the column with the heading "Allowable Numeric Objective Load" will be corrected to "Billion MPN/mth" on the Table on pages A27-A28 of the draft Basin Plan amendment, and Table 9-3 on pages 83-84 of the draft Technical Report.

Comment 54

Z. Attachment A, page A33, revisions to selected columns in Nonpoint Source/Open Space section of the Table, Dry Weather Fecal Coliform Bacteria Existing Loads, TMDLs, WLA, Las Expressed as Monthly Loads (Billion MPN/month *The calculated inputs are an example based on the first waterbody in the table (San Joaquin Hills HAS and Laguna Hills HSA); these calculations should be conducted for all waterbodies in the table. The data comes from the calculations done above (see comment Y).*

Existing load (Winter/summer)	Load Allocation (winter/summer)	Reduction Required
52.4/0	52.4/0	0%
264/0	264/0	0%
47.6/0	47.6/0	0%

Response: Please see the response in Section 2.3.

Comment 55

AA. Page A36, bulletpoint #4: "…any discharge to a stormwater conveyance system that is not composed entirely of "storm water", or exempt categories of non-stormwater, is prohibited unless authorized by the Regional Board…."

Response: The suggested revision is appreciated, but current text is accurate. This bulletpoint is a direct citation from the Basin Plan. See Chapter 4, page 4-20, Waste Discharge Prohibition number (8).

Comment 56

BB. Page A37, bulletpoint #3,: **"**The numeric targets for dry weather TMDLs consist of the REC-1 30-day geometric mean WQOs, with ~~and~~ a 0 percent allowable exceedance frequency for summer dry weather and a 3% allowable exceedance frequency for winter dry weather."

Response: Please see the response in Section 2.3.

Comment 57

CC. Page A37, **bulletpoint #4:** "The TMDL calculations are based on either the single sample maximum WQO (for wet weather) or 30-day geometric mean WQOs (for dry weather), but both the single sample maximum and the 30-day geometric mean numeric WQOs must be met in the receiving waters during dry weather."

Response: This text will be revised in the draft Basin Plan amendment and draft Technical Report as follows:

> The TMDL calculations are based on either the single sample maximum WQO (for wet weather) or 30-day geometric mean WQOs (for dry weather), but both the single sample maximum and the 30-day geometric mean numeric WQOs and allowable exceedance frequencies must be met in the receiving waters.

Comment 58

DD. Page A37, add additional bulletpoint under Numeric Targets: "Re-calculation of the TMDLs, WLAs or LAs and/or re-setting of the exceedance frequency numeric targets is allowable contingent upon the demonstration of more accurate reference system or natural residual exceedance frequencies for specific target water bodies, conditions or seasons, subject to the approval of the San Diego Water Board."

Response: The suggested revision is appreciated, but this is not a requirement or assumption that was used in the calculation of the TMDLs, WLAs, and LAs.

Comment 59

EE. Page A38, Add to the third bulletpoin under Linkage Analysis: "The dry weather existing mass loads and allowable mass loads (i.e.e, dry weather mass-load based TMDLs) are calculated assuming surface runoff is generated only by anthropogenic activities and discharged from specific land use categories to receiving waters. The possible contribution of subsurface or groundwater flows to bacteria loads in receiving waters during dry weather was not accounted for in any land use category."

Response: The revision will be made as suggested by the commenter.

Comment 60

FF. Page A41, **paragraph3, bulletpoint 1**: "….WQBELs may be expressed as numeric effluent limitations, when feasible; other quantifiable metrics such as exceedance days in receiving waters; and/or as a BMP program of expanded or better-tailored BMPs."

Response: The suggested revision is appreciated, but current text is accurate.

Comment 61

GG.Page A42, paragraph 2: "…If, however, the receiving water limitations are not being met in the receiving waters, the Phase I MS4s will be responsible for reducing their bacteria loads and/or demonstrating that controllable anthropogenic discharges from the Phase I MS4s are not causing the exceedances, as outlined below in the monitoring for TMDL Compliance section below."

Response: The revision will be made as suggested by the commenter.

Comment 62

HH. PageA51, and page A52, Tables, Dry Weather Days section of Receiving Water Limitations for Beaches; and page A52, Tables, Dry Weather Days section of Receiving Water Limitations for Beaches: *Change and add selected columns and footnotes:*

Summer Dry Weather Allowable Exceedance Frequency	Winter Dry Weather Allowable Exceedance Frequency
0%	3%
0%	3%
0%	3%

a. Wet weather days defined as days with rainfall events of ~~0.2~~ 0.1 inches or greater and the following 72 hours.
b. Dry weather days defined as days with less than ~~0.2~~ 0.1 inches of rainfall observed on each of the previous 3 days.

Response: Please see the response in Section 2.3.

Comment 63

II. Page A52, paragraph 2: "….(i.e., the running geomean on dry weather days in a 30-day period shall not exceed the 30-day geometric mean REC-1 WQOs more than 0 percent of the time in summer dry weather, or 3 percent of the time in winter dry weather."

Response: Please see the response in Section 2.3.

Comment 64

JJ. Page A53, paragraph 1: "…If at the end of the dry weather TMDL compliance schedule the receiving waters exceed the 30-day geometric mean REC-1 WQOs more than 0 percent of the time in summer or 3% of the time in winter, the municipal MS4s are responsible for…."

Response: Please see the response in Section 2.3.

Comment 65

KK. Page A53, paragraph 3, compliance with Wet Weather TMDLs: "At the end of the wet weather TMDL compliance schedule, the bacteria densities in the receiving waters for all wet weather days cannot exceed the single sample maximum REC-1 WQOs more than the allowable exceedance frequency. ~~In addition, the bacteria densities must be less than or equal to the 30-day geometric mean REC-1 WQOs 100 percent of the time (i.e, both dry and wet weather days in a~~

~~30-day period shall not exceed the 30-day geometric mean REC-1 WQOs more than 0 percent of the time."~~

Response: Please see the response in Section 2.7.

Comment 66

LL. Page A53, paragraph 4: "As described in the minimum monitoring components above, at least one sample should be collected within 24 hours of the end of a storm event that occurs during the rainy season (i.e., October 1 through April 30). Dischargers are expected to propose a wet weather compliance sampling and interpretation protocol in their Bacteria Load Reduction Plans, for approval by the San Diego Water Board. If an alternative protocol is not submitted or approved, the following shall govern: If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event shall be equal to the results from that one sample. If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all the wet weather days not sampled shall be equal to the highest bacteria density result reported from samples collected…."

Response: The paragraph referenced by the commenter describes the minimum monitoring requirements that should be included in any monitoring plan that is developed. The paragraph will be revised in the draft Basin Plan amendment and draft Technical Report as follows:

> As described in the minimum monitoring components above, ~~at least one sample~~ wet weather samples should be collected within 24 hours of the end of a storm event that occurs during the rainy season (i.e., October 1 through April 30). At least one wet weather sample per storm is expected to be collected for each waterbody in each watershed (i.e., Pacific Ocean shoreline, creek mouth, and/or creek). Because of the many issues related to collecting wet weather samples from multiple sites within a short time frame, dischargers are expected to develop a wet weather monitoring and sampling approach in their BLRPs or CLRPs. If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event shall be equal to the results from that one sample. If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all the wet weather days not sampled shall be equal to the highest bacteria density result reported from samples collected. The exceedance frequency shall be calculated by dividing the number of wet weather days that exceed the single sample maximum REC-1 WQOs by the total number of wet weather days during the rainy season. If at the end of the wet weather TMDL Compliance Schedule the receiving waters exceed the single sample maximum REC-1 WQOs more than the allowable exceedance frequency, all controllable sources are responsible for demonstrating their discharges into the receiving waters are not causing the exceedances, or they will be considered out of compliance.

Comment 67

MM. Page A53, Footnote: "Defined as days with a storm with at least ~~0.2~~ 0.1 inches of rainfall and the 72 hour period after the storm event."

Response: Please see the response in Section 2.2.

Comment 68

NN. Page A54, paragraph 2: ~~"The data collected for compliance with the dry weather TMDLs, described above, shall be used in addition to the data collected for wet weather with the wet weather TMDLs to calculate the wet weather 30-day geometric mean. If at the end of the wet weather TMDL Compliance Schedule the receiving waters exceed the 30-day geometric mean REC-1 WQOs at any time, all controllable sources are responsible for demonstrating their discharges into the receiving waters are not causing the exceedances, or they will be considered out of compliance."~~

Response: Please see the response in Section 2.7.1.

Comment 69

OO. Page A55, next to last paragraph: "Between the effective date of these TMDLs and the end of the TMDL Compliance Schedules, monitoring is also required to demonstrate progress toward achieving and complying with the TMDLs, WLAs, and LAs. Progress can be demonstrated by timely implementation of BMPs identified in the Bacteria Load Reduction Plans, and/or with reductions in exceedance frequencies in the receiving waters until the allowable exceedance frequencies ultimately are achieved at the end of the TMDL Compliance Schedules. Demonstrating progress toward attaining the TMDLs in the receiving waters will be assessed differently for dry weather and wet weather, as proposed and approved in the Bacteria Load Reduction and Monitoring Plans, or as follows if an alternative proposal is not approved:…"

Response: The suggested revisions are appreciated, but current text is accurate. Just implementing of BMPs will no longer be sufficient to demonstrate compliance. It must be demonstrated that the BMPs that are implemented are, in fact, effective at restoring water quality in the receiving waters. For this reason, progress toward compliance with the TMDLs will be demonstrated by measureable reductions in exceedance frequencies in the receiving waters.

Comment 70

PP. Page A56, Table: Insert into Title of Table: "Modeled Estimate of Critical Year Existing Wet Weather Exceedance Frequencies by Watershed."

Response: The revisions will be made as suggested by the commenter.

Comment 71

QQ. Page A56, last paragraph: "….Because the REC-1 WQOS must be met (subject to allowable exceedance frequencies) throughout the 20 waterbodies addressed by these bacteria TMDLs, monitoring data from these locations and any other beach segments and/or creek monitoring points in the watersheds addressed by these TMDLs may be used to determine compliance."

Response: The sentence will be revised as follows:

> Because the REC-1 WQOs and allowable exceedance frequencies must be met throughout the 20 waterbodies addressed by these bacteria TMDLs, monitoring data from these locations

and any other beach segments and/or creek monitoring points in the watersheds addressed by these TMDLs may be used to determine compliance.

Comment 72

RR. Page A66, second paragraph: "Full implementation of the TMDLs for indicator bacteria shall be completed as soon as possible, but no later than 10 years from the effective date for both the dry weather and wet weather TMDLs, unless an alternative compliance schedule is approved in conjunction with a Comprehensive Load Reduction Plan, as described below…."

Response: The sentence will be revised as follows:

Full implementation of the TMDLs for indicator bacteria shall be completed as soon as possible, but no later than 10 years from the effective date for both the dry weather and wet weather TMDLs, unless an alternative compliance schedule as part of a Comprehensive Load Reduction Plan (CLRP) is approved, as described in the following section.

4.8 City of Oceanside

Comment 73

Definition of a rain event: Data from a study at Leo Carrillo Beach (a largely undeveloped "reference" watershed in Los Angeles County) are used to establish a frequency at which beaches and creeks covered by this TMDL are allowed to exceed bacteria water quality objectives during wet weather *(220/0).* Allowable exceedance frequencies are appropriate in TMDLs because numerous studies have found that even reference watersheds that are not impacted by anthropogenic activities sometimes exceed water quality objectives. Exceedance frequencies at Leo Carrillo Beach were calculated based on wet weather days defined as rainfall events of at least "0.1 inch and the following 72 hours" (Resolution No. 2002002). This TMDL defines wet weather days as "rainfall events of 0.2 inches or greater and the following 72 hours." It is scientifically invalid to apply the wet weather exceedance frequency observed at Leo Carrillo Beach to a TMDL that uses a different definition of wet weather days. The exceedance frequency for rainfall events greater than 0.2 inches is very likely to be different than 22%. Wet weather days in this TMDL should be defined as "any rain event 0.1 inch or greater and the fo llowing 72 hours". This will ensure consistency with the Leo Carrillo Beach reference study.

Response: Please see the response in Section 2.2.

Comment 74

Application of Total Coliform Water Quality Objectives to Creeks: Footnote C to the tables on Page A16 and footnote F to the table on Page A52 of the proposed Basin Plan Amendment (strikeout/underline version) state that wet and dry weather numeric objectives for total coliform apply at the point in a creek that discharges to a beach, bay, or estuary. The Basin Plan does not contain total coliform water quality objectives applicable to inland surface waters. Language throughout the Resolution, Basin Plan amendment, and Technical Report should be reviewed and changed to correctly state that total coliform water quality objectives are not applicable in inland surface waters, only at the point in creeks where continual mixing with salt water occurs.

Response: Please see the response to Comment 17.

Comment 75

Applicability of TMDL requirements to non-impaired waters and the extension of responsibility to discharges not located within an impaired hydrologic area: Page Al of the proposed Basin Plan amendment states: "The TMDLs that have been developed for the Pacific Ocean shorelines are assumed to be applicable to all the beaches located on the shorelines of the hydrologic subareas (HSAs), hydrologic areas (HAs), and hydrologic units (HUs) listed [in a table] above." This statement implies, for example, that all dischargers located anywhere in the San Marcos HA (904.5) will be required to comply with the Revised Bacteria TMDL. In fact, Moonlight Beach is the only segment within the San Marcos HA that is identified as impaired on the 303(d) list. Moonlight Beach, although technically within the boundaries of the San Marcos HA, is hydrologically disconnected from the rest of the HA. The draft Technical Report recognizes this fact in Table 3-1 where Moonlight Beach is shown to have a total drainage area of only 1.43 square miles. The table on Page A61 goes one step further by listing all eight Phase

I MS4s in the Carlsbad HU, including the City of Oceanside, as "responsible municipalities" required to comply with TMDL requirements in the San Marcos HA, although the City of Oceanside has no discharges to, nor jurisdiction in, the San Marcos HA. The table implies that any Phase I MS4 located anywhere in the Carlsbad HU will be required to comply with TMDL requirements to address impairments at Moonlight Beach. In fact, only the City of Encinitas discharges to the Moonlight Beach Watershed. When asked at the January 7, 2010, SAG meeting, Regional Board staff indicated that the footnote was worded as intended and that the inclusion 0 f all eight Phase I MS4s within the Carlsbad HU was intentional. The implications 0 f this decision are far reaching. In the San Marcos HA example, seven municipalities would be required to monitor for compliance, and develop and implement load reduction plans, to address bacteria impairments at beaches that are not currently identified as impaired on the 303(d) list. This would constitute a gross misuse of resources when there are so many other impairments requiring attention in the region. To correct this problem in the San Marcos HA example, only the City of Encinitas should be assigned a WLA in the TMDL and only Encinitas should be assigned responsibility for the load reductions required in the TMDL, unless an impairment is determined for the remaining water bodies that can be linked to discharges from other municipalities.

Response: The TMDLs developed for the San Marcos HA will be applicable to any beach located within the Pacific Ocean shoreline of that that particular HA watershed. In the future, if there are additional beach segments that are added to the 303(d) List, the provisions of these TMDLs would be applicable. As such, all the municipalities located within the San Marcos HA will be responsible to reduce their loads that they contribute that are causing the impairment. If there are municipalities that are not contributing loads that are causing the impairment, the BLRPs or CLRPs should identify those specific municipalities that are responsible and the actions that will be taken by those specific municipalities.

We did, however, reviewed of the municipalities located within the San Marcos HA. The City of Oceanside, the City of Solana Beach, and the City of Vista will be removed from the list of Responsible Municipalities on pages A61 of the draft Basin Plan amendment, and page 130 of the draft Technical Report (clean version), as they are not located within the San Marcos HA. Also, please see the response in Section 2.1.

Comment 76

Combining dry and wet data to calculate a wet weather geometric mean: The proposed Basin Plan amendment (Page A54 of the strikeout/underline version) states that wet weather and dry weather samples will be used together to calculate the wet weather 30-day geometric mean and that no exceedances of the wet weather 30-day geometric mean are allowed. This methodology is not scientifically defensible. The 30-day geometric mean should not be applied to wet weather samples but only to the dry weather condition. Moreover, wet weather and dry weather samples should not be combined to calculate the 30-day geometric mean.

Response: Please see the response in Section 2.7.

Comment 77

No allowable exceedance frequency during dry weather: This TMDL allows no exceedances of bacteria water quality objectives during dry weather days (defined as "days with less than 0.2

inch of rainfall observed on each of the previous 3 days"). However, in other TMDLs where Leo Carrillo Beach is used as a reference system (i.e., Santa Monica Bay Beaches Bacteria TMDL), the dry weather TMDL is split into two seasons: summer dry (0% allowable exceedance frequency) and winter dry (3% allowable exceedance frequency). This is an important distinction because during the winter months, the Leo Carrillo Beach reference system exhibited some exceedances during dry weather days. This TMDL should allow a 3% exceedance frequency during dry weather until a more appropriate frequency can be established based on data collected from a reference system in the San Diego region.

Response: Please see the responses to Comment 2 and in Section 2.3.

Comment 78

Basin Plan amendments: Chapter 7 Section (f)(6) of the proposed Basin Plan amendment (page A49 of the strikeout/underline version) recognizes that revisions to the Basin Plan may be necessary in the future. It also specifies conditions that must be met before the Regional Board will initiate a Basin Plan amendment project. Because this TMDL is founded on several critical assumptions and uncertainties, and because several studies with bearing on these assumptions are either planned, ongoing, or completed, stronger language should be included in the Basin Plan amendment that includes a more specific commitment to and timeline for revising the TMDL.

A paragraph should be added at the end of Chapter 7 Section (f)(7) of the proposed Basin Plan amendment (page A50 of the strikeout/underline version) that states: "Any study conducted following the procedures outlined in this paragraph will be considered by the San Diego Regional Water Quality Control Board during the time period specified in Table (Insert Table Number) TMDL Implementation Milestones". Also, on page A69 in the strikeout/underline version, a row should be added to the TMDL Implementation Milestones Table as follows:

Item	Implementation Action	Responsible Parties	Date
6	San Diego Water Board will reconsider the TMDL to include results of any optional special stud ies and water quality monitoring data completed by the responsible entities and revise numeric targets. WLAs. LAs and the implementation schedule as needed.	San Diego Water Board	The later of: (1) within 5 years of effective date or (2) within 1 year of receipt of final study results

Response: Please see the response in Section 2.6.

Comment 79

Monitoring for TMDL Compliance and Compliance Assessment: Pages A50 and A51 of the Basin Plan Amendment (strikeout/underline version) describe monitoring requirements, including minimum number of stations and minimum sampling frequencies during wet and dry weather. Page A50 also states: "If exceedances of the receiving water limitations are observed in the monitoring data, additional monitoring locations must be added to identify the sources causing the exceedances. . .. " Page A54 states: "Because the Phase I MS4s are located at the base of the watersheds and have been identified as the most significant controllable source of

bacteria., the municipal Phase I MS4s will have the primary [responsibility] for monitoring the receiving waters .... The municipal MS4s may demonstrate that their discharges are not causing the exceedances in the receiving waters by providing data from their discharge points to the receiving waters, by providing data collected at jurisdictional boundaries, and/or by using other methods accepted by the San Diego Water Board. Otherwise, at the end of the wet weather TMDL compliance schedule, the municipal Phase I MS4s will be held responsible and considered out of compliance unless other information or evidence indicates another controllable or uncontrollable source is responsible for the exceedances in the receiving waters." The entire monitoring burden under this draft TMDL has been placed on Phase I MS4 dischargers, including monitoring to identify non-Phase I MS4 point and non-point dischargers that have been assigned wasteload allocations (WLAs) and load allocations (LAs) under this TMDL. At a minimum, all dischargers assigned WLAs and LAs under this TMDL should be required to participate in the source identification monitoring if exceedances of receiving water limitations are observed.

Response: Please see the response in Section 2.7.1.

The Phase I MS4 dischargers are the primary and largest controllable source of bacteria in the watersheds included in these TMDLs. They are also located at the base of the watersheds. Monitoring that is already required under the Phase I MS4 NPDES requirements and for AB411 beach water quality monitoring is expected to be the primary and most significant sources of data to determine whether water quality objectives and allowable exceedance frequencies are being met in the receiving waters. We do, however, recognize that there are other controllable sources that are upstream that should monitor. The paragraph referenced by the commenter will be as follows:

> Because the Phase I MS4s are located at the base of the watersheds and have been identified as the most significant controllable source of bacteria, the municipal Phase I MS4s will have the primary responsible for monitoring the receiving waters. Caltrans will also have monitoring responsibilities. Phase II MS4s, agricultural dischargers, and other sources that are identified as significant sources (i.e., causing or contributing to exceedances in the receiving waters) will also be responsible for monitoring the receiving waters. The municipal Phase I MS4s and other dischargers are responsible for reducing their bacteria loads and/or demonstrating their discharges into the receiving waters are not causing the exceedances.

Comment 80

TMDL Compliance Timelines: When the Regional Board originally adopted this TMDL in December 2007, the compliance timeline for achieving wet weather TMDLs was 20 years. In the currently proposed revised TMDL, the compliance timeline has been cut in half to 10 years for all water bodies except Chollas Creek. The TMDL and Tentative Resolution state that if dischargers submit a Comprehensive Load Reduction Plan (CLRP) addressing multiple constituents in addition to bacteria, the compliance timeline may be extended to 20 years for achievement of wet weather TMDLs only. There is no allowance for a timeline longer than 10 years for achieving the dry weather TMDLs. It is unclear why the compliance timeline for wet weather has been shortened to 10 years for most water bodies. Given the scale, complexity, and cost of the structural and nonstructural solutions that will be needed to reduce bacteria loads to

the required levels, 20 years is an aggressive timeline to expect compliance with either wet or dry weather TMDLs. The TMDL should be revised to allow for a 20-year compliance timeline for achievement ofboth wet and dry weather TMDLs.

Response: The timelines for the compliance schedules are the same as those in the original Basin Plan amendment adopted in December 2007. Please see the tables on pages 181-182 of the underline/strikeout version of the draft Technical Report. These tables have the same compliance schedules and interim milestones that are in the current draft Basin Plan amendment. No change in the compliance schedules has been made.

Comment 81

Assumption that all dry weather flows are anthropogenic. The assumption that all dry weather flows are due to anthropogenic influence is invalid. Those stream systems influenced by natural groundwater seepage are more likely to flow regardless of anthropogenic influence. Studies by the Southern California Coastal Water Research Project (SCCWRP) have shown that reference systems, including San Mateo Creek in San Diego County, contain natural flows during the dry season (Tiefenthaler, L., E. Stein and G. Lyon. 2008. Fecal indicator bacteria levels during dry weather from Southern California reference streams. SCCWRP Annual Report, Costa Mesa, CA). Technical Report Sections 6, 8,9, and 11 should provide updated text regarding this assumption.

Response: Please see the response in Section 2.4.

4.9 City of San Diego

Comment 82

Inclusion of Draft 2008 Regional Board §303(d) De-Listed Waterbodies in TMDL

The Bacteria Project I TMDL Revised Technical Report includes waterbody/pollutant combinations recommended for de-listing on the draft 2008 Regional Board§303(d) list. In accordance with the Clean Water Act (CWA), the State Board §303(d) listing process is used to prioritize waterbodies not currently subject to efluent limitations and is to be based on scientific data that indicate impairment. This prioritization process allows for focused use of limited resources to address impainnents through TMDL implementation by the municipalities, and other agencies, including the City.

The inclusion of de-listed indicator bacteria and waterbodies in the TMDL is counter to this prioritization process and cost-effective use of our City's resources. It is understood that the timing of the draft Bacteria Technical Report did not coincide with the approval of the most recent draft 2008 Regional Board§303(d) listings. To be consistent with the prioritization process, it is recommended the proposed de-listed indicator bacteria waterbodies he removed from this TMDL.

Response: Please see the response in Section 2.1.

Comment 83

Inconsistent Use of Reference Condition

Wet Weather Basis: The TMDL states that the reference condition from the Leo Carrillo Beach Reference Study (Leo Carrillo) is applied to estimate the allowable exceedance frequency at beaches and creeks in the TMDL. However, the exceedance frequency at Leo Carrillo is based on a rain event of 0.l inches and the following 72 hours," as stated in Resolution No. 2002-002. This TMDL is using the Leo Carrillo reference study results while redefining wet days as "0.2 inch of rain and the following 72 hours." It is scientifically invalid to use a reference condition for a different storm size, because the exceedance frequency for storm events of 0.2 inch or greater and 72 hours later is not known. To be consistent with the reference system study, it is recommended that a storm event or wet day be defined as any instance of a rain event 0.1 inch or greater and the following 72 hours.

Dry Weather Basis: The Leo Carrillo reference study was also used to establish the dry weather exceedance frequency limits in the Los Angeles area bacteria TMDLs, as stated in Resolution No. 2002-004. However, the draft technical report Section 4.2.1 states that "little data are available regarding exceedances of Water Quality Objectives (WQOs) in a reference system .... the reference system approach may be an option that would allow an exceedance frequency to be included with the dry weather numeric targets in the dry weather TMDLs." It is unclear why a reference system approach is appropriate for wet weather, but not for dry weather. It is recommended that the reference condition for dry weather at Leo Carrillo beach be used in this TMDL. Additionally, a TMDL reopener needs to be included that allows for the incorporation of any future data. It is essential that this process be documented in the TMDL.

In the TMDL, the dry weather exceedance frequency limits are set at zero. However, in the Los Angeles area, TMDLs where the Leo Carrillo system was used as a dry weather reference, the dry weather TMDL is split into summer dry and winter dry seasons. This is an important distinction because during the winter months, the reference system exhibited exceedance days. It is recommended that the TMDL separate dry period into summer and winter seasons instead of setting the dry weather exceedance frequency limit to zero during all dry periods. This is necessary because rains cause the ground water to increase the water table and infiltrate to the streams. The allowable exceedance frequency at Leo Carrillo is 3% during winter dry weather, and that standard should also apply in San Diego County. The summer dry weather exceedance frequency limit would remain zero using the Leo Carrillo reference study.

In addition, this TMDL defines the exceedance frequency for the wet weather condition, but not the number of allowable exceedance days based on the critical year. Instead, an allowable exceedance frequency is set. The use of the 1993, 90th percentile critical storm year to set the exceedance frequency incorporates critical conditions, but does not define the waste load allocations based on those critical conditions. It is recommended that the Regional Board use the reference condition exceedance frequency and the number of wet days in the critical year at each location within the TMDL to define a set allowance of exceedance days for each year.

Response: Please see the responses in Sections 2.2, 2.3 and 2.6 for responses to the first three paragraphs of this comment. The statements in the final paragraph are inaccurate. The 90th percentile storm year was not used to set the *allowable* exceedance frequency, but was used to set the model estimated "*existing*" exceedance frequency. The "*existing*" exceedance frequency is the "worst case" exceedance frequency and needs to be reduced to match the *allowable* exceedance frequency.

The San Diego Water Board has decided to use an allowable exceedance *frequency* rather than allowable exceedances *days*. The allowable exceedance days approach sets a fixed number of days for each year, regardless of the amount of rainfall each year. If we were to set the allowable exceedance days based on the critical wet year, it is quite possible that during very dry years, every wet day (i.e., 100%) could be in exceedance of the REC-1 WQOs and still be less than or equal to the number of allowable exceedance days. Likewise, if there is an extremely wet year that has significantly more wet days than the critical wet year, meeting the number of allowable exceedance days may be impossible to achieve.

The allowable exceedance frequency approach is adaptable for very dry to very wet years. Each year will have a different number of wet days, but the allowable exceedance frequency will not change. Therefore, each year will have a different number of wet weather allowable exceedance days. Also, please see the response to Comment 26.

Comment 84

TMDL Reopener Process Clarification

The TMDL, Section 4.1.3, states "watershed specific exceedance frequencies are determined for any of the watersheds addressed in the TMDL, the wet weather TMDLs can be recalculated based on these watershed specific exceedance frequencies." The specific process for amending the TMDL, as well as TMDL reopener schedule, should be incorporated into the TMDL. The

City recommends that the following language used in the Santa Monica Bay Beaches TMDL, Resolution 2002-022 be included in this Tentative Resolution:

- Four years after the effective date of the TMDL, the Regional Board shall reconsider the TMDL.
- The four areas of consideration when reconsidering the TMDL shall include:
  - o Refine allowable wet weather exceedance days based on additional data on bacterial indicator densities in the wave wash and an evaluation of site-specific variability in exceedance levels)
  - o Re-evaluate the reference system selected to set allowable exceedance levels, including a reconsideration of whether the allowable number of exceedance days should be adjusted annually dependent on the rainfall conditions and an evaluation of natural variability in exceedance levels in the reference system(s),
  - o Re-evaluate the reference year used in the calculation of allowable exceedance days, and
  - o Re-evaluate whether there is a need for further clarification or revision of the geometric mean implementation provision.

Response: Please see the response in Section 2.6.

Comment 85

Compliance Points and Monitoring Program/or Wet Weather

Match Compliance to Risk and Safety: To meet the beneficial use goals and use the City's resources cost-effectively, compliance to the TMDL needs to focus on river areas where the recreational benefit is consistent with the actual and potential use. The City is committed to this goal and through its ongoing bacteria reduction and public outreach efforts has been able to reduce beach postings by 76% since 2001. However, certain concrete-lined flood channel sections of creeks and streams are not subject to recreational use particularly during wet weather; yet they are still designated as REC-l waterbodies. These sections should not be part of the wet weather compliance monitoring program as public safety prohibits access during storm events.

Response: Similar concerns were raised during the adoption of Bacteria TMDLs Project I before it was adopted in December 2007 (see comments 11, 123, 131, and 144 in Appendix S to the draft Technical Report). The REC-1 designation applies to the entire waterbody in the Basin Plan unless otherwise noted. If there is evidence to de-designate the beneficial use, a separate Basin Plan amendment will be required.

If it becomes a priority and the resources become available, the San Diego Water Board may consider creating subcategories of beneficial uses in order to refine their applicability. Dischargers can propose such beneficial use refinements for consideration by the Board. Regarding safety considerations during monitoring, the City will need to assess it on a case-by-case basis.

Comment 86

Compliance Monitoring Directed at Human Sources: To use the City's funds cost-effectively, compliance monitoring during wet weather events should focus on follow-up source tracking of human sources.

Response: The BLRPs or CLRPs that are developed should provide a framework of the actions that will be taken to reduce bacteria loads. Monitoring and source identification are essential elements that need to be included in the BLRPs or CLRPs. While sources that can be traced specifically to humans may be helpful, other anthropogenic sources may not be human in origin (e.g., domestic pets). Furthermore, the health risk associated with bacteria from non-human sources is not well understood at this time. Special studies and monitoring that is above and beyond the minimum monitoring requirements can certainly be included in the BLRPs or CLRPs, and would be supported by the San Diego Water Board.

Comment 87

Compliance Based on Sound Science: Preliminary data presented in the Tecolote Creek Microbial Source Tracking Study suggested that storm water is characterized by higher concentrations of fecal indicator bacteria during the first flush. There is an increasing predominance of enterococcus bacteria associated with plant matter and re-growth later in the storm, which are not known to cause human illness. Compliance measures must be focused on sound science so that Best Management Practices (BMPs) are designed in a cost-effective manner.

Response: The studies undertaken by the City of San Diego are the kinds of studies that the San Diego Water Board encourages and would like to see continued. Data from these types of studies may be used to develop region or watershed specific allowable exceedance frequencies, or a waterbody specific natural sources exclusion. Identifying natural uncontrollable sources may be just as important as identifying anthropogenic and controllable sources so BMP implementation can be properly focused.

Comment 88

Human versus Anthropogenic: Compliance should be measured by addressing human sources of bacteria detected above water quality objectives in wet weather flows at appropriate compliance points. If the purpose of the TMDL is to restore the REC-l beneficial use so the public can swim, use of the United States Environmental Protection Agency (EPA) bathing standards have been and continue to be followed. This is because the REC-l bathing standards are based on epidemiologic studies to protect human health from risk of illness from human sewage sources. Monitoring should focus on human sources rather than a broad category of anthropogenic sources, which may not be associated with an unacceptable human health risk. Without focusing monitoring efforts on human sources, extensive public resources would be used to track sources of little or no risk to the public. It is recommended that a tracking program using Quantitative Polymerase Chain Reaction (QPCR) techniques be implemented.

Response: Please see the responses to Comments 85, 86, and 87.

Comment 89

The assumption in the TMDL that all dry weather exceedances may be attributed to the municipal separate storm sewer system (MS4) is invalid. This assumption was demonstrated as incorrect in the Mission Bay (2004) and San Diego River (2006) Bacteria Source Identification Studies, which were conducted for the State Board Proposition 13 Clean Beaches Initiative grants, and the Pacific Beach Point Bacteria Source Identification Study (2006) in coordination

with San Diego Coastkeeper. The results of these studies showed that birds and other wildlife are the source of indicator bacteria exceedances during dry weather at beaches. Holding the City and other MS4 dischargers accountable for indicator bacteria exceedances caused by natural sources that were demonstrated in the middle of this TMDL process is inappropriate.

All dry weather flows are not due to anthropogenic influences. Many of the streams in Southern California flow naturally during the dry season. Southern California Coastal Water Research Project (SCCWRP) studies have shown that reference systems have natural flows during the dry season, including San Mateo Creek in San Diego County. Additionally, during winter dry conditions, nearly all streams in San Diego County exhibit flow due to storm events that raise the groundwater table causing infiltration into the creek beds.

Response: Please see the responses to Comments 2 and 59, and in Section 2.4. We acknowledge that birds and other wildlife may cause dry weather exceedances, but in many situations there is a strong anthropogenic component associated with these sources. For example, birds (squirrels, etc) congregate where humans feed them or have left food. In many locations, the presence of humans and their food attract birds and wildlife in large numbers. Furthermore, the health risk associated with bacteria from non-human sources is not well understood at this time.

Comment 90

Stated Use ofthe Dry Weather Geometric Mean is Scientifically Invalid: Attachment A of the Tentative Resolution (page *AS4)* states that the wet weather and dry weather samples will be used together to calculate the wet weather 30-day geometric mean and that no exceedances of the wet weather, 30-day geometric mean are allowed. The allowable exceedance of single sample criteria is zero during dry weather periods, but there is a frequency allowance for wet weather samples. Using the two sets of samples together will most likely result in an exceedance of the 30-day geometric mean, and no exceedances of the geometric mean are allowed. This methodology of contributing the two data sets is not scientifically defensible. It is recommended that the 30-day geometric mean only be applied to dry weather samples.

The use of the 30-day wet weather geometric mean is not clear. Page A66 of the Tentative Resolution Compliance Schedule states that, "at the end of the wet weather TMDL compliance schedule, the receiving waters must not exceed the single sample maximum REC-l WQOs more than the wet weather allowable exceedance frequency." However, the Tentative Resolution page 12, item 28, states, "at the end of the wet weather TMDL compliance schedule, the single sample maximum and 30-day geometric mean REC-l WQOs must not be exceeded in the receiving water more frequently than the allowable exceedance frequencies." Because there is an allowable exceedance frequency for wet weather single sample compliance, but none for the 3D-day geometric mean, it is not clear how the 3D-day geometric mean will be used to assess compliance. Any allowable wet weather exceedance day concentration would be included in the 3D-day geometric mean, likely resulting in an exceedance of the 3D-day geometric mean. Please clarify the use of the wet weather 30-day geometric mean, its definition, purpose, whether or not it will be used as a measure of compliance, and if so, how will it be used.

Response: Please see the response in Section 2.7.

Comment 91

Compliance Points and Monitoring Program/or Dry Weather

Compliance Monitoring Needs to Account for Diversions: The City has invested in a dry weather diversion at the base of the Tecolote Watershed to protect the recreational use of Mission Bay. With no dry weather flows entering Mission Bay from Tecolote Creek, compliance to protect the beneficial use of the waterbody should be directed at monitoring the effectiveness of the diversions rather than any periodic flows in the flood control channel.

Response: Please see the responses to Comments 85 and 86. While the diversion may protect the waters of Mission Bay from the discharge of Tecolote Creek, the water quality standards must also be met in Tecolote Creek. The TMDLs were developed specifically for Tecolote Creek, not Mission Bay.

Comment 92

Concentration-Based TMDL -Load Reductions should he allowed to Show Progress toward TMDL Compliance

Best Management Practices and Reducing Dry Weather Concentration: The TMDL applies a concentration-based compliance goal, however many BMPs, including low impact development (LID) and irrigation controls, can effectively reduce loads but not concentration (City of Laguna). The compliance goals of the TMDL state that progress toward TMDL implementation will be based on exceedance frequency reduction. While important, it is also important to include mechanisms to show progress toward TMDL compliance using load reductions.

BMPs and Reducing Wet Weather Concentrations: LID BMPs may be used to reduce runoff volume during storm events, but this will not likely result in decreased concentrations of bacteria. LID can be part of an integrated suite of BMPs to reduce the volume of runoff and pollutant loading including bacteria, but if compliance is focused on concentration, this may discourage the innovative use of these and other more sustainable approaches. If the TMDL allows load reduction goals to show progress toward TMDL compliance, then these approaches would be more widely implemented to address bacteria and the variety of BMPs that may be used.

Response: The goal of any TMDL is to restore the beneficial uses of an impaired waterbody. This means that the water quality objectives that support those beneficial uses must be met in the receiving waters. If the water quality objectives are not being met in the receiving waters, the impairment has not been corrected.

The mass-load based WLAs and LAs were used primarily to identify the controllable sources with bacteria loads that required reductions. If the receiving water limitations (i.e., water quality objectives measured in concentration and allowable exceedance frequencies) are met in the receiving waters, the assumption is that the WLAs and LAs for controllable sources are being met. If, however, the receiving water limitations are not being met, the known controllable sources must demonstrate that they are not causing or contributing to the exceedances. If the controllable sources demonstrate they are not causing or contributing to the exceedances, then they have met their WLA or LA.

The most straightforward way a controllable discharge can demonstrate they are not causing or contributing to the exceedances is if there is no discharge, or if the bacteria density (or concentration) if their discharge is at or below the receiving water limitations (i.e., water quality objectives and allowable exceedance frequency). Monitoring at key jurisdictional boundaries may also provide evidence that upstream sources are the cause of the exceedances. If all controllable sources can demonstrate they are not causing or contributing to the exceedances of the receiving water limitations, then the application of the natural sources exclusion approach and revision of the TMDLs may be warranted.

Also, please see the response to Comment 9.

Comment 93

Compliance Timeline (Integrated Approach): The compliance schedule was 20 years in the previous version of the TMDL, and has now been reduced to ten years for all waterbodies, excepting Chollas Creek. It is stated in the TMDL and Tentative Resolution that if dischargers submit a Comprehensive Load Reduction Plan (CLRP), they may set the compliance schedule greater than ten years for wet weather but must meet dry weather compliance goals within ten years. It is recommended that the compliance schedule be returned to 20 years for both wet and dry compliance, since bacteria is one of the most complicated pollutants to regulate.

Response: Please see the response to Comment 80.

Comment 94

Inclusion of Teeolote Watershed in TMDL –Request for Inclusion o fData/or Sound Science Basis

Initially the Regional Board did not include Tecolote Creek in this TMDL. Therefore, the City initiated the Tecolote Creek Bacteria Characterization and Source Identification Project in order to assist the Regional Board with the development of a creek specific TMDL. Currently, the City is performing Phase III to assess bacteria storm drain system regrowth and bacterial speciation. The City has insisted on providing project updates to the Regional Board staff. Unfortunately this independent TMDL project was incorporated into this TMDL, effectively nullifying the good faith efforts we have put forth. We are requesting that Tecolote Creek be removed from this TMDL. It is recommended that a TMDL re-opener process for inclusion of new data be defined and a schedule be set to allow for future updates to the TMDL.

The application of outdated land use data has been identified as a potential issue during the review of previous TMDL versions. It is apparent that the land use data was not updated and as new information becomes available, it should be incorporated into the TMDL. Setting a firm reopener schedule would allow dischargers to update information and improve the TMDLs.

Response: The San Diego Water Board appreciates the studies undertaken by the City of San Diego. The studies undertaken by the City of San Diego are the kinds of studies that the San Diego Water Board encourages and would like to see continued. Data from these types of studies may be used to develop region or watershed specific allowable exceedance frequencies, or a waterbody specific natural sources exclusion. Identifying natural uncontrollable sources may be just as important as identifying anthropogenic and controllable sources so BMP implementation can be properly focused.

The resources available to the San Diego Water Board for the development of TMDLs have been greatly reduced. Additionally, the same modeling approaches can be applied used in Bacteria TMDLs Project I can be applied to the bacteria TMDLs for Tecolote Creek. Given this information, including Tecolote Creek as a waterbody addressed by these TMDL is the best and most effective use of the limited available resourses.

In addition, due to the diversion of resources to this project, and the expectation to complete at least two TMDLs (i.e., one TMDL is considered one pollutant and one waterbody combination), it was necessary to include the bacteria TMDLs for Tecolote Creek into this project.

Even though Tecolote Creek has been included into these TMDLs, that does not invalidate or nullify any of the studies and work performed by the City. In fact, the studies and the work done by the City are steps that will be necessary in the implementation of the TMDLs by the City Hopefully the City of San Diego will continue the excellent work that they have undertaken and include their plans for future studies in the BLRPs or CLRPs that will be developed. Also, please see the response in Section 2.1.

Comment 95

Porter-Cologne Water Quality Control Act

Section 13241 of the act requires the Regional Board to complete a series of steps before adoption ofa Basin Plan Amendment. Each Basin Plan Amendment is supposed to incorporate economic considerations. Review of this Tentative Resolution has concluded that this analysis is insufficient. The City of San Diego recommends compliance with all Porter-Cologne requirements.

Response: Please see the responses to Comment 10 and in Section 2.5.

Comment 96

Technical Report Section: Tentative Resolution Finding 35
Page: 15
Section Title/ Topic: Economic Analysis
Reason for Proposed Changes/Comments: "The San Diego Water Board has considered the costs..."
Comments/Proposed Changes: It is recommended that the Regional Board comply with the Porter-Cologne requirements and incorporate economic considerations. Please perform the economic analysis and provide the details in the Tentative Resolution.

Response: Please see the responses to Comment 10 and in Section 2.5.

Comment 97

Technical Report Section: 1
Page: 2
Section Title/ Topic: Table 1-1. Bacteria Impaired Water Quality Limited Segments
Reason for Proposed Changes/Comments: Several waterbodies have been proposed for delisting from the 2008 303(d) List. including San Dieguito Fecal Coliform and Enterococcus.

Miramar Reservoir HA Fecal Coliform and Enterococcus. several beaches in the Scripps HA, and Fecal Coliform and Enterococcus at Dog Beach.
Comments/Proposed Changes: It is recommended that the waterbodies already meeting bacteria standards be removed from the TMDL

Response: Please see the response in Section 2.1.

Comment 98

Technical Report Section: 1
Page: 4
Section Title/ Topic: Paragraph 3, first sentence
Reason for Proposed Changes/Comments: "In general, controllable point and nonpoint sources generating less than 5 percent of the total loads (e.g., Caltrans and/or Agriculture) were assigned WLAs and LAs equal to their existing loads, resulting in no load reduction requirements."
Comments/Proposed Changes: Please cite a reference or explain the rationale for assigning WLAs and LAs equal to existing loads based on a 5% rule.

Response: When examining the wet weather loads from different land uses modeled in each watershed, there were no loads from Caltrans predicted to be greater than 0.88 percent of the total load for any type of indicator bacteria. For agriculture, bacteria loads were predicted in 8 of the 13 modeled watershed. Of those 8 watersheds, there were 4 watersheds where the bacteria loads generated by agriculture land uses are clearly significant, predicted to contribute 10 percent (up to 60 percent) of the total load for all three indicator bacteria. The bacteria loads from agriculture land uses in the remaining 4 watersheds had bacteria loads that were typically well less than 5 percent of the total load and appeared to be insignificant compared to the loads generated by the Municipal MS4 land uses. Therefore, when developing the mass-load based WLAs and LAs, we used 5 percent in the method to identify sources than would not be required to reduce their modeled existing mass loads. This is discussed in Appendix I to the draft Technical Report. Also, please see the response in Section 2.7.2.

Comment 99

Technical Report Section: 1
Page: NA
Section Title/ Topic: Margin of Safety
Reason for Proposed Changes/Comments: The executive summary outlines most requirements of the TMDL, but does not include the Margin of Safety (MOS) or public participation.
Comments/Proposed Changes: Please incorporate information regarding the MOS (explicit, implicit, and why). as well as information on public participation.

Response: The second paragraph on page 4 of the draft Technical Report will be revised as follows:

> A TMDL is equal to the sum of the wasteload allocations (WLAs), load allocations (LAs), and a margin of safety (MOS). Because of the conservative assumptions that were included in the development of the TMDLs, there was no explicit margin of safety included. Instead, the TMDLs include an implicit margin of safety (i.e., MOS = 0) by including conservative

assumptions throughout the TMDL analysis. The TMDL is divided up and assigned among the known point sources as wasteload allocations (WLAs) and nonpoint sources as load allocations (LAs). Portions of the TMDLs were assigned as WLAs to Municipal MS4s and Caltrans, and as LAs to Agriculture and Open Space land uses. Discharges from Municipal MS4s, Caltrans, and Agriculture land uses are considered controllable. Discharges from Open Space land uses are considered uncontrollable.

Comment 100

Technical Report Section: 1
Page: NA
Section Title/ Topic: Reference System Approach
Reason for Proposed Changes/Comments: The City of San Diego supports the reference system approach
Comments/Proposed Changes: The City of San Diego supports the use of a reference system approach for the development of the Bacteria Project I TMDL.

Response: This support for including the reference system approach in the TMDLs is appreciated.

Comment 101

Technical Report Section: 2
Page: NA
Section Title/ Topic: Reference System Approach
Reason for Proposed Changes/Comments: The City of San Diego supports the reference system approach
Comments/Proposed Changes: The City of San Diego supports the use of are reference system approach for the development of the Bacteria Project I TMDL.

Response: This support for including the reference system approach in the TMDLs is appreciated.

Comment 102

Technical Report Section: 3.2
Page: 19
Section Title/ Topic: Table 3-1. Beach and Creeks Addressed in this TMDL
Reason for Proposed Changes/Comments: The TMDL includes water bodies that are recommended for delisting from the 2008 303(d) list.
Comments/Proposed Changes: Developing and implementing TMDLs for waterbodies that are meeting water quality standards is prohibitive with the additional effort and costs required for TMDL compliance monitoring and reporting. The Clean Water Act 303(d}(1)(C) requires establishing TMDLs for waterbodies on the 303(d} List in accordance with the priority ranking. CWA 303(d){1) (3) requires estimating TMDLs for all waterbodies for the purposes of developing information only. It is recommended that water bodies delisted from the 303{d) list be removed from the TMDL.

Response: Please see the response in Section 2.1.

Comment 103

Technical Report Section: 3.3
Page: 22
Section Title/ Topic: Table 3-2. Beneficial Uses of the Impaired Waters
Reason for Proposed Changes/Comments: Tecolote and Chollas Creeks are both designated as REC-2 beneficial use and a potential REC-1 beneficial use.
Comments/Proposed Changes:
Please clarify the application of REC-1 standards to waterbodies designated as only having a potential REC-1 beneficial use.

Response: A similar concern was raised during the public comment period of Bacteria TMDLs Project I before it was adopted in December 2007 (see comment 144 in Appendix S to the draft Technical Report).

Comment 104

Technical Report Section: 4.1.3
Page: 32
Section Title/ Topic: Allowable Exceedance Frequency for the Reference System Approach Paragraph 1
Reason for Proposed Changes/Comments: The 22% exceedance frequency used to calculate the wet weather TMDLs is based on a rain event of 0.1 inch, and the definition of a wet event is 0.2 inch in this TMDL.
Comments/Proposed Changes: Please revise the wet weather day definition to 0.1 inch.

Response: Please see the response in Section 2.2.

Comment 105

Technical Report Section: 4.1.3
Page: 32
Section Title/ Topic: Paragraph 1
Reason for Proposed Changes/Comments: The TMDL states that if the reference condition for wet weather is found to be different for watersheds in this TMDL compared to the Los Angeles TMDLs, then a request to amend the TMDL may be made.
Comments/Proposed Changes:

- Please define the methodology for amending the TMDL, and include a schedule for a TMDL re-opener. The following items should be considered when reopening the TMDL as found in the Santa Monica Bay Beaches TMDl, Resolution No. 2002-022:
- Refine allowable wet weather exceedance days based on additional data on bacterial indicator densities in the wave wash and an evaluation of site-specific variability in exceedance levels,
- Re-evaluate the reference system selected to set allowable exceedance levels, including an evaluation of natural variability in exceedance levels in the reference system(s),
- Re-evaluate the reference year used in the calculation of allowable exceedance days, and
- Re-evaluate whether there is a need for further clarification or revision of the geometric mean implementation provision.

Response: Please see the response in Section 2.6.

Comment 106

Technical Report Section: 4.1.4
Page: 33
Section Title/ Topic:
Summary of Wet Weather Numeric Targets for Mass-Load Based Calculations Paragraphs 2 and 4
Reason for Proposed Changes/Comments: Note: •All waterbodies in the San Diego Region designated with REC-1 beneficial use are assumed to have a-designated beach" usage frequency* (Enterococcus= 61 MPN/100 mL, Enterococcus geometric mean=33 MPN/100mL). Tecolote and Chollas Creeks are designated "potential REC-1" beneficial use, with a Basin Plan category of -designated beach: Dischargers must show that the usages are less frequent to apply the higher (less stringent) standard of 104 MPN/100mL for single sample WQO.
Comments/Proposed Changes: Please define the process for changing the usage frequency of a creek in the Basin Plan including the amount and type of data necessary to generate a Basin Plan Amendment.

Response: The federal regulations define the different usage frequencies in the Code of Federal Regulations Title 40 section 131.41, and the definitions are provided in the Basin Plan amendment. The process for changing the frequency has not been defined in this Basin Plan amendment, but like any other proposed changes to these TMDLs, changing the use frequency of a beneficial use will require a separate subsequent subsequent Basin Plan amendment.

The dischargers are free to propose the amount and type of data that will be collected. The dischargers are, however, encouraged to work with the San Diego Water Board before collecting and analyzing data. The Basin Planning staff of the San Diego Water Board will work with the project proponents to make sure the data collected will be suitable for the development of a Basin Plan amendment before it is collected.

Comment 107

Technical Report Section: 4.2.1
Page: 34
Section Title/ Topic: Allow Exceedance Frequency for Dry Weather Paragraph 1
Reason for Proposed Changes/Comments: Note: ".. .if adequate data are collected to characterize dry weather flows and bacteria densities using a statistical approach, the reference system approach may be an option that would allow an exceedance frequency to be included with the dry weather numeric targets in the dry weather TMDLs."
Comments/Proposed Changes: The Leo Canillo Beach reference study is currently used in Los Angeles for both the wet weather and dry weather TMDLs. It is recommended that a dry weather reference approach using Leo Carrillo data also be incorporated into this dry weather TMDL.

Response: Please see the response in Section 2.3.

Comment 108

Technical Report Section: 4.2.1
Page: 34
Section Title/ Topic: Table 4-2. Wet Weather Numeric Targets
Reason for Proposed Changes/Comments: The table lists the allowable wet weather exceedance frequency as 22% of the wet days.
Comments/Proposed Changes: An exceedance day approach allows for a direct relationship to waste load allocations, versus a variable number of exceedance days based on an allowable exceedance frequency. A set number of exceedance days also relates directly to the critical year, when the greatest threat to water quality is likely to occur. Using an exceedance frequency approach is unnecessarily conservative. It is recommended that an exceedance day approach be adopted, with a set number of allowable exceedance days based on the critical year.

Response: Please see the response to Comment 83.

Comment 109

Technical Report Section: 5.1.1
Page: 37
Section Title/ Topic: Water Quality Data Paragraph 1
Reason for Proposed Changes/Comments: The bacteria data used were collected from 1999 through 2002.
Comments/Proposed Changes: It is recommended that the most recent bacteria data be included in the TMDL assessment.

Response: The data inventory is specifically a list of the data that were used to develop the models. Data collected after the models were developed were not included and will not be included at this time. The models may be modified with additional data in the future if the City would like to do so.

Comment 110

Technical Report Section: 5.1.1
Page: 38
Section Title/ Topic: Table 5-1. Inventory of data and Information Used for the source of Assessment of Bacteria
Reason for Proposed Changes/Comments: The land use data used in the TMDL development is from SANDAG 2000 which is outdated.
Comments/Proposed Changes: A comparison of the land use proportions for each watershed area was made between the 2000 and 2009 SANDAG data. An increase in low-density residential and decrease In open space was observed in San Dieguito Miramar. Scripps, and lower San Diego River. It is recommended that the most recent land use data be applied when estimating load contributions from land uses.

Response: Please see the response to Comment 109.

Comment 111

Technical Report Section: 5.3
Page: 46
Section Title/ Topic: Analyses of Beach Water Quality Versus Magnitude of Streamflow
Reason for Proposed Changes/Comments: The text states that a ·statistical companson" of flow versus bactena density was completed to evaluated historical effects of high-and low·f1ow conditions. It is not clear from the text what statistics were used.
Comments/Proposed Changes: Please clarify what the statistical comparison was and what the results mean. There appears to be no correlation between high or low flows and bacteria concentrations. as stated in the text.

Response: Please refer to the figures that follow the text. There are mean, minimum, and maximum statistics for flow and concentration for each month. High fecal coliform densities were observed under low-flow and high-flow conditions. This indicates that the sources of the bacteria cannot be determine simply with this information alone given the different sources under wet weather and dry weather conditions. This indicates the need to assess bacteria sources separately during both wet weather events and dry weather conditions, as stated in the text.

Comment 112

Page: 50
Section Title/ Topic: Wet Weather Transport
Reason for Proposed Changes/Comments: It appears, from Appendix J. that build-up and wash-off rates were utilized from a SCCWRP study in Santa Monica Bay. The wash-off information was specific to 8 land use types. However, the allocation of total loads back to specific land uses was based solely on apportioning the load back to the percentage of each land use within a watershed area.
Comments/Proposed Changes: Bacteria contributions during wet weather are different for different land use types, with some contributing greater concentrations than others. Taking the total load and apportioning the land use contribution back to the proportion of land use in a watershed does not account for the differences in loading from each land use type. Although land use specific build-up and wash-off values were used to estimate the total load, how were the land use specific load estimates validated? Please clarify the methodology for apportioning loads back to land uses.

Response: The methodology is explained in Appendix J to the Technical Report.

Comment 113

Technical Report Section: 7.1.1.d
Page: 55
Section Title/ Topic: Constituents Paragraph 2
Reason for Proposed Changes/Comments: "First-order die-off is likely the most important dynamic process to simulate in the San Diego Region, despite observations that bacteria re-grow in low flow conditions."

Comments/Proposed Changes: There are studies currently underway to estimate the amount of re-growth of bacteria occurring in the MS4. It is recommended that data from these studies be incorporated into the TMDL when it is re-opened in the future.

Response: Please see the responses to Comments 86 and 87, and in Section 2.6.

Comment 114

Technical Report Section: 7.2
Page: 55
Section Title/ Topic: Wet Weather Modeling Analysis
Reason for Proposed Changes/Comments: Although the build-up and wash-off of bacteria for specific land uses was used in the model, land use-specific wet weather data are available to estimate load contributions during wet weather events.
Comments/Proposed Changes: Data exist that estimate observed bacteria load contributions per acre for land uses and may be used in conjunction with build-up/wash-off estimates to ensure that estimated load contributions from specific land uses are as accurate as possible. It is recommended that more precise land use-based load estimates be incorporated into the TMDL when it is re-opened at a future date.

Response: Please see the responses to Comments 86, 87, and 109, and in Section 2.6.

Comment 115

Technical Report Section: 7.3
Page: 56
Section Title/ Topic: Dry Weather Modeling Analysis Paragraph 1
Reason for Proposed Changes/Comments: "A statistical relationship was established between stream flow bacteria densities, and areas of each land use."
Comments/Proposed Changes: Please identify which statistics were used and how they represent the linkage between source contributions and in stream response. Please clarify the use of statistics to link stream flow bacteria densities and land use.

Response: Please see Appendix K to the draft Technical Report.

Comment 116

Technical Report Section: 8.1.3
Page: 61
Section Title/ Topic: Table 8-2. Allowable Wet Weather Exceedance Days in the Critical Period (1993) for Watersheds Affecting Impaired Waterbodies
Reason for Proposed Changes/Comments: The statement allowable wet weather exceedance days in the critical period (1993)" is repeated throughout the section. However, it is not explicitly stated that this is the number of allowable exceedance days for any calendar year moving forward with the TMDL.
Comments/Proposed Changes: It is recommended that the TMDL be modified to include an allowable number of exceedance days for compliance with the TMDL based on the critical condition.

Response: Please see the response to Comment 83.

Comment 117

Technical Report Section: 8.1.6
Page: 64
Section Title/ Topic: Allocation of Wet Weather Bacteria mass loads to Point and Nonpoint sources Paragraph 2
Reason for Proposed Changes/Comments: If concentrated animal feeding operations (CAFOs) are regulated as point source discharges, why are there no monitoring data associated with the facilities? They are included in the TMDL as controllable non-point sources due to no data available to estimate their bacteria load.
Comments/Proposed Changes: It is recommended that an effort should be made to quantify the bacteria load from the CAFOs.

Response: Please see the response to Comment 16.

Comment 118

Technical Report Section: 9.3.3
Page: 89
Section Title/ Topic: Alternative Entrococcus wet weather TMDLs
Reason for Proposed Changes/Comments: "moderately to light used area" compared to "frequently"
Comments/Proposed Changes: Please define process and data requirements for implementing the beach usage frequency change

Response: Please see the response to Comment 106.

Comment 119

Technical Report Section: 11.2.2.1
Page: 100
Section Title/ Topic: Point Sources
Reason for Proposed Changes/Comments: Numeric Targets: wet weather consists of REC-1 single sample maximum WOOs and 22% allowable exceedance frequency. Dry weather consist of REC-1 30-day geometric mean WQOs and 0% exceedance frequency.
Comments/Proposed Changes: It is recommended that the allowable number of exceedance days be set based on the critical year as shown in Tables 9-1 through 9-4c.

Response: Please see the response to Comment 83.

Comment 120

Technical Report Section: 11.2.2.1
Page: 102
Section Title/ Topic: 4th Bullett
Reason for Proposed Changes/Comments:
No surface runoff is assumed during dry weather and therefore the entire dry weather bacteria load is allocated to the MS4
Comments/Proposed Changes:

This assumption is invalid and several studies have shown that dry weather bacterial exceedances are also caused by sources other than the MS4, such as birds

Response: Please see the responses to Comments 2 and 89, and in Section 2.4.

Comment 121

Technical Report Section: 11.2.2.1
Page: 102
Section Title/ Topic: Load Reductions
Reason for Proposed Changes/Comments: "The load reductions required to meet the mass-load based TMDLs, WLAs and LAs are based on reducing the loads compared to pollutant loads from 2001 to 2002**:**
Comments/Proposed Changes: Please clarify this statement because the fourth bullet under this heading explicitly states that "The load reductions needed to meet the WLAs for point sources and the LAs for nonpoint sources are assumed to be achieved when the numeric targets are met in the receiving waters."

Response: These are two of the assumptions and requirements included in the calculation of the TMDLs, WLAs, and LAs that should be considered when developing WQBELs to be incorporated in to NPDES requirements and for assessing compliance.

Comment 122

Technical Report Section: 11.2.1
Page: 103
Section Title/ Topic: Load Reductions
Reason for Proposed Changes/Comments: "..CAFOs, and any other unidentified point sources were not assigned WLAs. which is equivalent to being assigned a WLA of zero."
Comments/Proposed Changes: Please clarify how these load allocations will be implemented and verified.

Response: Please see the responses to Comment 16 and in Sections 2.7.1 and 2.7.2. If a CAFO is identified as a significant sources that is discharging to a receiving water, the San Diego Water Board will need to take enforcement action so the CAFO ceases its discharge to be consistent with a WLA = 0.

Comment 123

Technical Report Section: 11.2.6
Page: 114
Section Title/ Topic: Basin Plan Amendments Paragraph 2
Reason for Proposed Changes/Comments: Revisions to the Basin Plan typically require substantial evidence and supporting documentation to inmate the Basin Plan Amendment process. Given the severely limited resources available to the San Diego Water Board for developing Basin Plan
amendment projects, developing the evidence and documentation to initiate a Basin Plan amendment will be the responsibility of the dischargers and for other parties interested in amending the requirements or provisions implementing these TMDLs"

Comments/Proposed Changes: Please clarify the process for amending the Basin Plan, including the amount of data necessary and the process to petition the Regional Board. It would be beneficial to schedule a TMDL re-opener to address proposed changes.

Response: Please see the responses to Comments 106 and in Section 2.6.

Comment 124

Technical Report Section: 11.3
Page: 116
Section Title/ Topic: Monitoring for TMDL Compliance and Compliance Assessment
Reason for Proposed Changes/Comments: Monitoring: wet weather monitoring at least once within 24 hours of the end of a storm event that occurs between October 1st and April 30th.
Comments/Proposed Changes: Sampling each wet weather event may be cost prohibitive, and a subset of wet weather events each year should be prescribed or allowed if dischargers wish to incorporate a prescribed monitoring program in their CLRP or BLRP. It is recommended that the number of wet weather monitoring events be set by the dischargers.

Response: Please see the response to Comment 66. The dischargers will be given an opportunity to propose a wet weather monitoring program, but we have also specific the minimum monitoring that will be required.

Comment 125

Technical Report Section: 11.3
Page: 116
Section Title/ Topic: first complete bullet
Reason for Proposed Changes/Comments: "Dry weather monitoring should occur at least on a monthly basis, and may be required weekly."
Comments/Proposed Changes: At a minimum, to calculate a geometric mean, 5 samples per 30 days must be collected. Please define the process for using a single monthly sample to assess TMDL compliance.

Response: This section discusses the minimum monitoring components required in any monitoring program. More specific information is provided in the following sections. For dry weather TMDL compliance monitoring, “the method and number of samples needed for calculating the 30-day geometric mean should be consistent with the number of samples required by the Ocean Plan for beaches, and the Basin Plan for creeks,” which is stated on page 118 of the draft Technical Report.

Comment 126

Technical Report Section: 11.3
Page: 119
Section Title/ Topic: Paragraph 2
Reason for Proposed Changes/Comments: Exceedance frequency calculation
Comments/Proposed Changes: It is recommended that the TMDL should set the number of allowable exceedance days at a site instead of an exceedance frequency calculated every year.

Response: Please see the response to Comment 83.

Comment 127

Technical Report Section: 11.3
Page: 119
Section Title/ Topic: Paragraph 3
Reason for Proposed Changes/Comments: 30-day wet weather geometric mean
Comments/Proposed Changes: It is recommended that the calculation of the 30-day geometric mean for compliance with the wet weather TMDL not include dry weather days. If separate dry day wet season exceedance criteria are set as recommended then the 30-day geometric mean should not be calculated.

Response: Please see the response in Section 2.7.

Comment 128

Technical Report Section: 11.4.6
Page: 126
Section Title/ Topic: Identification of Natural Versus Anthropogenic Sources of Bacteria
Reason for Proposed Changes/Comments: Section 11.4.3 states: Indicator bacteria are used to measure the risk of swimmer illness because they have been shown to indicate the presence of human pathogens, such as viruses, when human bacteria sources are present." And: “The risk of contracting a water-borne illness from contact with urban runoff devoid of sewage, or human-source bacteria is not known."
Comments/Proposed Changes: It is recommended to use the identification of human versus non-human sources of bacteria since non-human bacteria sources have not been demonstrated to affect human health and the analysis is less costly.

Response: Please see the response to Comment 86.

Comment 129

Technical Report Section: 11.5.2
Page: 135
Section Title/ Topic: Paragraph 2
Reason for Proposed Changes/Comments: BLRPs or CLRPs are due to the Regional Board within 18 months
Comments/Proposed Changes: The City of San Diego supports submission of the BLRPs and/or CLRPs 18 months after the TMDL effective date.

Response: This support for submission of the BLRPs and/or CLRPs 18 months after the TMDL effective date is appreciated.

Comment 130

Technical Report Section: 11.5.2
Page: 136
Section Title/ Topic: Tables 11-6 and 11-7 Compliance Schedules
Reason for Proposed Changes/Comments: TMDL compliance must be achieved for both wet and dry weather 10 years after TMDL effective date
Comments/Proposed Changes: Please provide the rationale for changing the TMDL compliance schedule from 20 years to 10 years.

Response: Please see the response to Comment 80.

Comment 131

Technical Report Section: 14
Page: NA
Section Title/ Topic: Tecolte Creek
Reason for Proposed Changes/Comments:
The City of San Diego initiated contact with the Regional Board staff beginning in during the first quarter of 2008. The following meetings/projects occurred:

- City begins talking with Regional Board about Tecolote Phase I study 1st Quarter 2008
- City requests data used in TMDL development for I comparison to Phase I study results -June 2008
- Final Tecolote Creek Phase I report produced –August 2008
- City begins collaboration with SCCWRP (review of work plan) -September 2008
- City presents results of Phase I study and presents outline for Phase II study and asks for Regional Board input -October 9, 2008
- City presents preliminary results of Phase II study to Regional Board input – April 17, 2009
- Final Tecolte phase II report produced – June 2009

Comments/Proposed Changes: It is recommended that the data collected in support of the Tecolote TMDL be incorporated into the final TMDL prior to final adoption of the TMDL.

Response: Please see the responses to Comments 87 and 94.

Comment 132

Technical Report Section: J
Page: NA
Section Title/ Topic: Tecolote Creek
Reason for Proposed Changes/Comments: The USGS stations used for hydrology calibration and validation are not representative of the Tecolote watershed. The selected stations are for very large watersheds, located far up the watershed, or located in Riverside or Orange County. None of these stations adequately represent the features associated with Tecolote, such as size. topography. soil classification, and land use combination.
Comments/Proposed Changes: It is recommended that the model used to estimate the existing exceeding frequency for wet weather be calibrated on Tecolte or similar type watershed

Response: The regional wet weather watershed models were calibrated based, in part, on data from the Tecolote Creek watershed. The model estimated "existing" exceedance frequency for Tecolote Creek is appropriate. If the City of San Diego would like to expend the resources to develop a watershed specific model to estimate an "existing" exceedance frequency for the Tecolote Creek watershed, the San Diego Water Board would support such efforts.

Comment 133

Technical Report Section: M
Page: NA
Section Title/ Topic: Calibration Statistics
Reason for Proposed Changes/Comments: The "error in 10% highest flows" and "error in storm volumes" does not meet the "recommended criteria" (stated as 15% and 20%, respectively) for the majority of the sites used for comparison during either the calibration period, validation period. or both periods. In some cases, the errors are two to three times greater than the recommended criteria.
Comments/Proposed Changes: It is recommended that the model be better calibrated in order to more accurately represent the hydrology of San Diego

Response: The model was adequately calibrated for the purposes of developing these TMDLs. If the City of San Diego would like to expend the resources to refine the calibration of the wet weather watershed models, the San Diego Water Board would support such efforts.

Comment 134

Technical Report Section: N
Page: NA
Section Title/ Topic: Tables N-8 through N-14
Reason for Proposed Changes/Comments: The LSPC model results do not accurately correlate to the observed data (see tables on N-8 through N-14). Many of the model values are several magnitudes different from the observed data. The model does not appear to be validated. Errors in the pollutant model maybe related to the significant errors in the hydrology model (see comments relating to Appendix M).
Comments/Proposed Changes: It is recommended that criteria be stated for the accuracy of the model, and the model be calibrated so that, in general, the modeled values meet the criteria.

Response: The model was adequately calibrated for the purposed of developing these TMDLs. If the City of San Diego would like to expend the resources to refine the wet weather watershed models, the San Diego Water Board would support such efforts.

Comment 135

Technical Report Section: Appendix U
Page: U-24
Section Title/ Topic: Comment 306
Reason for Proposed Changes/Comments: A comment was made regarding the use of land use specific water quality data and the implications to the TMDL WLAs.
Comments/Proposed Changes: It is recommended that the land-use-specific water quality data that have been collected within the Tecolote Watershed be used for comparisons against model predictions.

Response: If the City of San Diego would like to expend the resources to refine the wet weather watershed models with land-use specific water quality data collected from Tecolote Creek, the San Diego Water Board would support such efforts.

Comment 136

Technical Report Section: Appendix U
Page: U-38
Section Title/ Topic: Comment 327
Reason for Proposed Changes/Comments: The comment was made that up to date land use data should be used. The response was that San Diego Water Board Staff and stakeholder; should investigate the possibility when the final TMDL was being revised.
Comments/Proposed Changes: Please include the most current land use data in the TMDL provide rationale for why newer data were not used

Response: Given the reduced resources available, the models were not updated. If the City of San Diego would like to expend the resources to refine the wet weather watershed models, the San Diego Water Board would support such efforts. The TMDLs could be modified after these TMDLs have been adopted and the implementation has begun.

Comment 137

Technical Report Section: Appendix U
Page: U-1
Section Title/ Topic: List of Persons Submitting Comments
Reason for Proposed Changes/Comments: The City of San Diego is not listed as having provided comments. Section 2-Comment Number and Categories lists the City of San Diego as providing comment.
Comments/Proposed Changes: Please add the City of San Diego to the list of contributors.

Response: The revision will be made as suggested by the commenter.

Comment 138

Technical Report Section: Appendix U
Page: U-8
Section Title/ Topic: Comment 287
Reason for Proposed Changes/Comments: In a response to a query regarding the practicalities of a natural source exclusion approach, six categories are provided as a general framework.
Comments/Proposed Changes: The inclusion of source identification studies, together with epidemiological studies would be impossible to attain both practically and financially.

Response: The key words in the response to that comment were "weight of evidence." The six elements in the framework are all sources of evidence that may be used in making a decision.

Comment 139

Technical Report Section: Appendix U
Page: U-26
Section Title/ Topic: Comment 309
Reason for Proposed Changes/Comments: Comment was made regarding the impact of non-anthropogenic bacteria sources on MS4 discharges.
Comments/Proposed Changes: Recent investigations in Tecolote Creek watershed indicate that bio film growth within the MS4 can comprise communities of fecal indicator bacteria, but that these populations are rarely of fecal origin. Please provide methodology or process for how will these data be used under a natural source exclusion approach.

Response: The process has not been defined in the Basin Plan amendment, but will require a subsequent Basin Plan amendment. The dischargers are free to propose the methodology. The dischargers are, however, encouraged to work with the San Diego Water Board before collecting and analyzing data. The TMDL and Basin Planning staff of the San Diego Water Board will work with the project proponents to make sure the data collected will be suitable for the development of a Basin Plan amendment to incorporate a natural sources exclusion. The general process for using the natural sources exclusion approach is described in the Basin Plan amendment and technical report adopted under Resolution No. R9-2008-0028.

Comment 140

Technical Report Section: Appendix U
Page: U-26
Section Title/ Topic: Comment 310
Reason for Proposed Changes/Comments: Comment was made regarding the use of REC-1 designation during storm events
Comments/Proposed Changes: The RWQCB response did not fully address the association between public health risk, designation and TMDLs. Please clarify the REC-1 designation during storm events

Response: The Basin Plan does not provide any exceptions to the REC-1 beneficial use during storm events. Thus, the REC-1 beneficial use designation applied during storm events as well. However potential refinements or subcategorization of beneficial uses could be proposed and may be considered in the future. Please see the response to Comment 85.

4.10 City of Santee

Comment 141

Compliance should be measured on a load reduction basis to allow cities to implement and receive credit for effective BMPs that benefit the watershed

The TMDL will require the City to establish a baseline bacteria level from data gathered between 2001 and 2002. This is appropriate as it allows the cities to receive credit for any reductions achieved since that time. However, page A 54 of the TMDL states:

> For the dry weather TMDLs, availab1e historical monitoring data from the year 2002 to the effective date of these TMDLs should be used to calculate the "existing'~ dry weather exceedance frequency of the 30day geometric mean REC-I WQOs for each watershed.

This language cont1icts with the 2001 to 2002 baseline established elsewhere in the TMDL. More importantly however, it would effectively punish the City for bacteria reductions it has made in the watershed since 2005. As the Regional Board is aware, the City has invested several million dollars restoring Forester Creek. The improvements in Forester Creek have resulted in reduced bacteria levels downstream of the restoration project. The City should not be punished for n1aking improvements in the watershed by being forced to comply with what wou1d amount to an artificially low discharge standard. The above quoted language should therefore be revised to set the baseline data used to calculate the ··existing" dry weather exceedance frequency at levels from 2001 to 2002. This will prevent the City from being punished for its efforts to improve regional water quality.

***Suggested Revision*:** Revise the TMDL to set the baseline for dry weather flows and exceedances at 2001 to 2002 levels. Revise the TMDL to allow ultimate compliance to be measured on a load reduction basis.

Response: The paragraph referenced by the commenter will be revised as follows:

> For the dry weather TMDLs, available historical monitoring data from the years 1996-2002 ~~to the effective date of these TMDLs~~ should be used to calculate the "existing" dry weather exceedance frequency of the 30-day geometric mean REC-I WQOs for each watershed.

Comment 142

The City is also concerned with how credit is allocated for restoration projects and other bacteria reducing best management practices ("BMPs"). The decision to change the TMDL's compliance measure from a load based measure to a concentration based measure cou1d preclude the use of future BMPs to reduce bacteria loads. In some cases the only effective BMPs to control bacteria require removal and treatment, or diversion and treatment of water. Such BMPs reduce overall loads, but could increase concentrations in a given water body. This is especially true for inland creeks and streams that do not get the benefit of dilution from the ocean. Overall, the City and other potential dischargers need the flexibility to implement BMPs that will improve water quality throughout the region. To allow this, the TMDL should be revised to allow ultimate compliance with the TMDL to be measured on a load reduction basis.(1)

[1] Federal Regulations allow a TMDL to "be expressed in terms of either mass per time, toxicity, or other appropriate measure." (40 C.F.R. § 130.2(i).) It is the City's position that this does not expressly authorize the Regional Board to issue a concentration based TMDL, and that by measuring ultimate compliance with the TMDL by bacteria concentration in the receiving waters, the Regional Board may be violating the Clean Water Act.

Response: Please see the response to Comment 92.

Comment 143

A heightened REC-l Standard is being imposed on non-Rec-l water bodies

The TMDL is imposing a REC-l Designated Beach Area standard for a number of inland creeks and water bodies that do not warrant this designation. As a result, the TMDL will impose a heightened standard on these water bodies that is not necessary to protect the beneficial uses of these water bodies, or the environment in general. The TMDL recognizes that it is over-inclusive:

In some cases, the "'designated beach" category may be overprotective of water quality because of the infrequent recreational use in the impaired freshwater creeks. The recreational usage frequency in these freshwater creeks may correspond to the "'moderately to lightly used areas~' category, which has an enterococci freshwater REC-I single sample maximum WQO of 108 MPN/100mL.

> Before the less stringent enterococci single sample n1aximum saltwater REC-I WQO may be applied to a freshwater creek, the Basin Plan must be amended to designate a lower usage frequency (“moderately to lightly used area”) for each freshwater creek. If information and evidence are provided to justify the "moderately to lightly used area" usage frequency for a freshwater creek, and the designated usage frequency the freshwater creek is amended to '\moderately to lightly used area" in the Basin Plan, the wet weather TMDLs that were calculated in a watershed that was modeled with a freshwater creek using the enterococci saltwater REC-1 WQOs can be implemented instead. (TMDL, AlS.)

This places an unnecessary burden on the Cities. The inland water bodies deemed likely to be designated as being lightly used should be treated as such anyway. Water bodies, including Forester Creek, for wh1ch there is no body contact, the shallow depth or lack of water prevents such contact, should be appropriately designated at REC-2. A high standard has been set to get these changes made in future. This would be an excessive diversion of resources froll1 ill1proving the water bodies that are going to be used by the public, to creeks that do not require the same level of attention, simply to get the requirements at these unused creeks reduced. Not only is this a waste of resources, imposing this higher standard on inland surface bodies without evidence that it is necessary to achieve the water quality objectives is an abuse of discretion.

Lastly, the TMDL dismisses the over-inclusive nature of the designation of as high use areas on the grounds that a Basin Plan amendment would be required to allow the Regional Board to treat these water bodies in any other way. (TMDL A22.) The fact that the proposed TMDL is itself a Basin Plan Amendment appears to be lost in the minute.. Sufficient evidence of the average daily and seasonal use of these water bodies could easily be provided by the regulated parties. The proposed TMDL therefore could, and should incorporate a new designation for all such water bodies, with new LAs and WLAs based on inland surface water data. These revisions should

start with Forester Creek, which the TMDL now treats as a heavily used beach, but which in reality receives no body contact use.

***Suggested Revision*:** Designate Forester Creek as a REC-2 water body, and revise the WLAs assigned to it based on this designation. Designate other inland surface waters including the San Diego River as "Infrequently Used Full Body Contact" water bodies, and revise the WLAs assigned for those bodies based on the this designation.

Response: Unfortunately, amending the Basin Plan to re-designate a usage frequency or a beneficial use for a waterbody is not as simple as the commenter suggests. Sufficient evidence is required before a Basin Plan amendment such as re-designating a usage frequency or removing a beneficial use can be developed. If there are sufficient data and evidence warrant, a Basin Plan amendment will be developed as soon as practicable. The Basin Plan amendment may require scientific peer review and will definitively require a public process before it can be adopted. This process ensures that the public has a chance to weigh in on any decision to lower the frequency of use before the decision is made. This public process is required by law and is a protected public right.

The draft Basin Plan amendment includes a section on page A49 that outlines the elements necessary to do a Basin Plan amendment that would have an effect on the implementation of these TMDLs. Since the adoption of the original Bacteria TMDLs Project I in December 2007, no municipality or other entity has come forward with any data to support re-designating the usage frequency of any of the beaches or creeks included in this project.

One other type of Basin Plan amendment that could be considered is one that proposes to refine or subcategorize beneficial uses to allow them to be applied with greater flexibility. As a relevant example, a concrete channel during an intense storm may not be accessible to the public for recreation. In this situation, a more restricted refinement of the REC-1 beneficial use could be proposed and considered. In any case, a separate subsequent Basin Plan amendment is required.

Until the Basin Plan is amended to modify the usage frequency or beneficial uses, the TMDLs will be implemented as the usage frequencies and beneficial uses are currently designated in the Basin Plan.

Comment 144

There is no meaningful Natural Source Exclusion

The TMDL does not include a meaningful natural source exclusion for discharges that cause exceedances of the TMDL limits. When a water body subject to the TMD L is not meeting the TMDL requirements, the City will be required to reduce its bacteria discharges, or prove that its discharges are not causing the exceedances. (TMDL A42, A53.) If neither condition is met, the City will be considered out of compliance with the TMDL. This is an unmanageable standard.

Numerous uncontrollable sources of bacteria have been deemed "'controllable sources" in the TMDL. These sources include bacteria loads discharged from Low Density Residential, High Density Residential, Commercial/Institutional, Industrial/Transportation, Military, Parks/Recreation, and Transitional land use types that are included in the Municipal MS4s category. (TMDL A17.) They also include bacteria loads discharged from Agriculture,

Dairy/Intensive Livestock, and Horse Ranch land use types are included in the Agriculture category. (Id.) In many cases, the discharges from these sources will not come from end of pipe discharges from the City's MS4. The City will nevertheless be charged with controlling and/or demonstrating that these difficult to pinpoint sources are causing the exceedances.

The City lacks the authority to regulate 1uany of the above listed sources. The natural sources, including some not listed above, are diffuse and may lie beyond the City's jurisdiction. Some of the other listed sources are state or local agencies. California law clearly limits a city's ability to regulate state agencies within its jurisdiction. (See CaL Gov. Code § 53091; see also Hall v. Taft (1956) 47 Cal.2d 177 [holding that when the State engages in sovereign activities it is not subject to local regulations unless the California Constitution says it is, or the legislature has consented to it].)

Pursuant to the Clean Water Act, background pollutant loads such as those listed above are to be included in a TMDL's load allocation and not attributed to point source dischargers. (See 40 C.F.R. § 130.2(g).) Moreover, the history of the Clean Water Act demonstrates that Congress and the EPA intended cities and other MS4 dischargers to regulate urban runoff rather than agricultural sources and other diffuse and non-point source discharges. Indeed, when issuing the MS4 Permit regulations in 1990, EPA stated, "'it is the intent of EPA that [stormwater] management plans and other components of the programs focus on the urbanized and developing areas of the county." (55 Fed. Reg. 47989, 48041 (Nov. 16, 1990).) The urban discharge focus is reflected in the San Diego Region Basin Plan which discusses the problem of stormwater runoff in terms of urbanization and cites to EPA Guidance limiting regulation of stormwater to urban sources. *(See* San Diego Basin Plan, pp. 4-78, 4-79.) Consequently, under both the Clean Water Act, and state law, the Regional Board lacks the authority require City to regulate discharges that are beyond its authority to control.

As a practical matter, this standard is too high. It is not clear what proof of responsibility will be acceptable to the Regional Board to demonstrate that all controllable sources have been removed. A 1110re efficient approach would be to classify all natura1 sources (including groundwater seepage) as natural sources) and if the bacteria limits are not being met at the end of the TMDL implementation period, verify the loads frOll1 natural sources as part of an overall source investigation that includes all potentially responsible dischargers. The presumption that City is responsible for all bacteria levels in a watershed 111USt be removed. Not only is such a presumption impractical, but it holds the City responsible for natural conditions discharges from other entities in a manner that would appear to violate state and federal law.

***Suggested Revision*:** Revise the TMDL to clarify that the MS4 dischargers, including the City, will not be presumed responsible for all discharges to a water body if that water body is not meeting the TMDL's limits. Instead, the relevant sections of the TMDL on pages A 52 through A 57 should be revised to state: If at the end of the TMDL compliance schedule the receiving waters exceed the 30-day geometric mean REC-l WQOs, the Regional Board will issue investigative orders, enforcement actions, WDRs, or conditional waivers of WDRs as necessary to determine the source of the exceedances. In addition include "groundwater seepage in the list of natural sources in the paragraph on A 16 labeled (c) Source Analysis.

Response: Please see the responses to Comments 35 and 79, and in Sections 2.7.1 and 2.7.2.

Comment 145

Maximum loads and exceedance percentages for inland waterbodies should have been developed with data from inland water bodies, and need to be revised.

The model upon which the TMDL is based relies on a limited data set focuses on exceedances at beaches and river mouths. This data was extrapolated to develop bacteria levels for inland locations without taking into account the different conditions at inland water bodies, including reduced flow a lack of tidal influence. It is necessary to use data from inland creeks to assess the baseline percentage of exceedances for these locations, as it is likely these will be vastly different from those observed on the coast. In addition, data used from inland sources should be used in calculating the numeric targets, as the use of concentrations (particularly those collected at beaches and river mouths) skew the targets to be attainable on the coast, but not inland, even if the loads inland are the same or less.

***Suggested Revision*:** Revise the maximum loads and exceedance percentages for inland water bodies so that they are based on data from an inland reference system, and so that they reflect their frequency of use.

Response: The numeric targets that were used to calculate the mass-load based TMDLs are the same as the concentration based TMDLs, all of which originate from the REC-1 WQOs in the Basin Plan. There were no calculations necessary for developing the numeric targets because the REC-1 WQOs are numeric, and the exceedances frequencies that were chosen to be similar to those used in the Los Angeles Region.

The goal of any TMDL is to restore the beneficial uses of an impaired waterbody. This means that the water quality objectives that support those beneficial uses must be met in the receiving waters. The REC-1 WQOs are not expected to be significantly altered in the near future.

At this time for these TMDLs, the San Diego Water Board has chosen to use a 22 percent allowable exceedances frequency of the single sample maximum water quality objectives specific to wet weather. We have not chosen an allowable exceedance frequency of the geometric mean that is greater than 0 percent for wet weather or dry weather TMDLs. Also, please see the response in Section 2.7.1.

The San Diego Water Board supports developing and establishing an allowable exceedance frequency of the single sample maximum and/or geometric mean based on data collected from reference systems in the San Diego Region. Until then, the allowable exceedance frequencies that have been initially selected for implementation are appropriate and applicable for both the wet weather TMDLs and dry weather TMDLs.

Comment 146

The definition of "Wet Weather" needs to be revised to match relevant modeling data.

Much of the TMDL's technical analysis is based on data from a study of conditions at Leo Carrillo State Beach. The Regional Board used this date to establish a frequency at which beaches and creeks covered by this TMDL are allowed to exceed bacteria water quality objectives during wet weather. Excecdance frequencies in the Leo Carrillo watershed were calcu1ated based on wet weather days defined as rainfall events of at least "0.1 inch and the following 72 hours" (Resolution No. 2002-002).

In contrast, the TMDL defined wet weather days as “rainfall events of 0.2 inches or greater and the following 72 hours." It is sc1entifically invalid to apply the wet weather exceedance frequency observed at Leo Carrillo Beach to a TMDL that uses a different definition of wet weather days. The exceedance frequency for rainfall events greater than 0.2 inches is very like1y to be different than 22%. Wet weather days in this TMDL should be defined as "any rain event 0:1 inch or greater and the following 72 hours."

***Suggested Revision*:** Revise the TMDL so that a wet weather day is defined as any rain event 0.1 inch or greater and the following 72 hours.

Response: Please see the response in Section 2.2.

Comment 147

A zero exceedance WLA is not reasonably achieved

The TMDL will impose a zero exceedance discharge requirement on the City during periods of dry weather. The zero exceedance discharge requirement is problematic because the dry weather discharge limitations are so low that they are not reasonably achievable. This would be the case even if the City could control 100% of its dry weather discharges because other entities, including agricultural operations, natural groundwater seeps, and other state agencies contribute dry weather flows to the region's watersheds.

One of the major underlying assumptions of the TMDL is that these entities and land uses will not have dry weather flows. (TMDL, Finding 22.) This assumption fails to account for background discharges during dry weather that are uncontrollable by the Cities. Moreover, studies by the Southern California Coastal Water Research Project (SCCWRP) have shown that reference systems, including San Mateo Creek in San Diego County, contain natural flows during the dry season. (Ticfenthaler, L., E. Stein and G. Lyon. 2008. Fecal indicator bacteria levels during dry weather from Southe111 California reference streams. SCCWRP Annual Report, Costa Mesa, CA). In order to avoid the negative ramifications of this assumption, the TMDL needs to be revised to either: 1) raise the overall dry weather standard so that exceedances will not occur, or 2) allow a number of exceedance days, in an approach similar to the wet weather portions of the TMDL.

There have been numerous comments submitted on this issue throughout the TMDL development process. However it is worth reiterating that the basis for imposing this zero discharge requirement in the TMDL is legally and factually deficient, particularly when applied to inland surface water bodies. As stated above, studies by the Southen California Coastal Water Research Project (SCCWRP) have shown that reference systems, including San Mateo Creek in San Diego County, contain natural flows during the dry season. There is simply no basis for assuming that natural conditions do not result in dry weather flows. Moreover, by assuming that all dry weather flows are caused by municipal discharges, the TMDL will hold the City responsible for controlling non-point sources of pollution, discharges that are beyond its responsibility under the Clean Water Act.

The TMDL's attempt to hold the City responsible for such discharges is especially frustrating given that many of the entities implicated by this requirement are required to obtain their own NPDES permits, and thus should be regulated directly by the Regional Board. The Regional Board's failure to regulate discharges from these entities should not be imputed to the City. The

Regional Board's attempt to impose responsibility for these discharges on the City is arbitrary, capricious, and without justification. A quick solution to this issue could include allowing a 3% exceedance frequency during dry weather, based on data from the Leo Carrillo Beach reference system, until a more appropriate frequency can be established based on data collected from a reference system in the San Diego region.

***Suggested Revision*:** Revise the TMDL to allow a 3% exceedance frequency during dry weather until a more appropriate frequency can be established based on data collected from a reference system in the San Diego region.

Response: Please see responses in Sections 2.3, 2.4, and 2.7.1.

Comment 148

The TMDL implies that BLRPs will require Cities to develop plans that cover more than Bacteria.

At the botton1 of page A48, the TMDL states that BLRPs or CLRPS "must be capable of achieving the WLAs for the bacteria TMDLS, restoring the beneficial uses in receiving waters for other impairing pollutants in the watershed, and achieving the goals and objectives of any other water quality improvement projects included in the BLRPs or CLRPs within the time frame of the compliance schedule."

According to other passages in the TMDL, BLRPs are intended to address only bacteria loads, and would not include the other items in the paragraph quoted above. This appears to be a typographical error. Please revise this portion of the TMDL to clarify that the more comprehensive requirements apply to CLRPs only.

***Suggested Revision*:** Revise the last paragraph on page A 48 of the TMDL to state: The San Diego Water Board may issue subsequent investigative orders to confirm items in the BLRPs or CLRPs. The BLRPs or CLRPs must be capable of achieving the WLAs for the bacteria TMDLs. The CLRPs may also include requirements designed to restore the beneficial uses in receiving waters for other impairing pollutants in the watershed, and achieving the goals and objectives of any other water quality improvement projects included in the CLRPs within the time frame of the compliance schedule.

Response: The paragraph referenced by the commenter will be revised as follows:

> The San Diego Water Board may issue subsequent investigative orders to confirm items in the BLRPs or CLRPs. The BLRPs or CLRPs must be capable of achieving the WLAs for the bacteria TMDLs~~,~~. The CLRPs must also be capable of restoring the beneficial uses in receiving waters for other impairing pollutants in the watershed, and achieving the goals and objectives of any other water quality improvement projects included in the ~~BLRPs or~~ CLRPs within the time frame of the compliance schedule.

Comment 149

The process for developing the geometric mean is flawed and should be revised.

The TMDL states that wet weather and dry weather sa1nples will be used together to calculate the wet weather the 30-day geometric mean and that no exceedances of the wet weather 30-day

geometric mean are allowed. This methodology is flawed, 30-day geometric ll1ean should not be applied to wet weather samples but only to the dry weather condition. Moreover, wet weather and dry weather samples should not be combined to calculate the 30-day geometric mean. The City therefore requests that the TMDL be revised to remove the 3D-day geometric mean requirement.

***Suggested Revision*:** Revise the method by which the City will be required to calculate the 30-day geometric mean so that the calculation method does not mix wet weather and dry weather data.

Response: Please see response in Section 2.7.1.

Comment 150

The TMDL compliance timelines need to be revised.

When the Regional Board originally adopted this TMDL in December 2007, the compliance timeline for achieving wet weather TMDLs was 20 years. In the currently proposed revised TMDL, the compliance timeline has been cut in half to 10 years for all water bodies except Chollas Creek. The TMDL and Tentative Resolution state That if dischargers submit a Comprehensive Load Reduction Plan (CLRP) addressing multiple constituents in addition to bacteria, the compliance timeline may be extended to 20 years for achievement of wet weather TMDLs only_ There is no allowance for a timeline longer than 10 years for achieving the dry weather TMDLs. It is unclear why the compliance tin1eline for wet weather has been shortened to 10 years for most water bodies. Given the scale, complexity, and cost of the structurall and non-structural solutions that will be needed to reduce bacteria loads to the required levels, 20 years is an aggressive timeline to expect compliance with either wet or dry weather TMDLs. The TMDL should be revised to allow for a 20~year compliance tin1cline for achievement of both wet and dry weather TMDLs.

***Suggested Revision*:** Revise the TMDL to allow for a 20-year compliance timeline for the achievement of both wet and dry weather TMDL's.

Response: Please see response to Comment 80.

Comment 151

Delisted water bodies, and delisting candidate water bodies should be removed from the TMDL

If adopted, the TMDL will apply to a number of water bodies that are either not on the current Clean Water Act 303(d) list, or are candidates for delisting. Including these water bodies in the TMDL will require resources to be allocated to plan implementation, plan development, and bacteria monitoring. It is the Cities belief that resources used for TMDLs should be directed to where waters are in1paired. Moreover, including delisted water bodies in the TMDL would appear to violate the Clean Water Act.

Section 303(d) of the Clean Water Act requires the State to develop a list of those water bodies for which the effluent limitations required by the CWA are not stringent enough to implement the applicable water quality objective. (33 USC § 1313(d)(l)(A).) Section 303(d) further requires the State to establish a priority ranking for these water bodies, taking into account the severity of

the pollution and the uses to be made of such waters. (Id.) Lastly, Section 303(d) requires the State to establish, and in accordance with their respective priority rankings, the total maximum daily load "for the waters identified in" the 303(d) list. The Clean Water Act does not allow for the development of TMDLs that are not 011 a 303(d) list.

Practically speaking any water bodies that are not on the 303(d) list, or are candidates for deli sting from the 303(d) list should be removed from the TMDL. There is no reason to impose monitoring and other progran1 related costs on dischargers for water bodies that arc not impacted for bacteria. Including these water bodies in the TMDL would represent an abuse of discretion all the part of Regional Board. To avoid this outcome the City requests that the Regional Board remove from the TMDL, specifical1y the table on page A12, those water bodies that are not listed on the current 303(d) list for the San Diego Region, or are candidates to be removed from the list.

***Suggested Revision*:** Remove all water bodies that are not listed on the current 303(d) list for the San Diego Region, or are candidates to be removed from that list from the TMDL.

Response: Please see response in Section 2.1.

Comment 152

Water Code Section 13241 factors were not adequately considered.

The Regional Board has not considered the factors required by California Water Code sections 13000, 13241, and 13262. Any time the Regional Board amends its Basin Plan, it must consider the following factors:

(a) Past, present, and probable future beneficial uses of water.

(b) Environmental characteristics of the hydrographic unit under consideration, including the quality of water available thereto.

(c) Water quality conditions that could reasonably be achieved through the coordinated control of all factors which affect water quality in the area.

(d) Economic considerations.

(e) The need for developing housing in the region.

(f) The need to develop and use recycled water.

(Cal. Water Code § 13241.)

To date, the Regional Board has failed to conduct an adequate analysis of the factors listed in Water Code section 13241, including the economic impacts to the City. As a result, the Regional Board has failed to fully consider the economic costs associated with the TMDL. The TMDL's only findings on economic impacts are as follows:

35. **Economic Analysis**: The San Diego Water Board has considered the costs of the reasonably foreseeable methods of compliance with the load and wasteload allocations specified in these TMDLs. These compliance methods involve implementation of structural and non-structural controls. Surface water monitoring to evaluate the effectiveness of these controls will also be necessary.

Additional analysis in the TMDL Technical Report and other Appendices are minimal and do not explicitly recognize that some form of diversion and treatment will be required to meet the zero discharge limitations for dry weather flows. Region- wide, costs associated with compliance with the new TMDL are likely to run into the hundreds of millions of donors. Before the Regional Board imposes this obligation on the public, it needs to openly consider direct economic costs placed on discharger, including the City.

The purpose of Water Code section 13241 is to ensure that the public has an opportunity to have an honest, open discussion about the ramifications, costs, and benefits of a Regional Board's decision to modify Basin Plan requirements. The far reaching nature of the TMDL is just one example of why such factors need to be considered and discussed openly. Sidestepping these considerations not only violates Section 13241 but more importantly denies the public opportunity to determine what ramifications the TMDL could have for the region. The TMDL should therefore include a more in-depth analysis the economic costs the TMDL will impose on the dischargers, including the cost of designing, implementing and maintain permanent BMPs that extract and treat surface water for The TMDL should also give greater consideration to the present, and probable future beneficial uses of water bodies subject to the TMDL. As stated above, many inland surface water bodies are to the same bacteria standards as heavily used public beaches, despite the fact that they are not currently, and are unlikely to ever be used in manner.

***Suggested Revision*:** Revise the TMDL and its associated technical report to include a more in-depth analysis of the economic costs the TMDL will impose on the dischargers, including the cost of designing, implementing, and maintaining permanent BMPs that extract and treat surface water for bacteria, and to give greater consideration to the present, and probable future beneficial uses of water bodies subject to the TMDL.

Response: Please see responses to Comment 10 and in Section 2.5.

4.11 City of Vista

Comment 153

In the San Marcos HA, the City of Vista, as well as several other Copermittees, is listed as Responsible Parties. In this HA, the impairment is entirely within one jurisdiction and the responsibility for compliance and development of implementation plans should rest with that jurisdiction. As drafted, this table includes many jurisdictions that do not contribute drainage to the impaired water body. The table referenced is on page A59-62 of the draft resolution. The City respectfully requests that the Responsible Parties listed in the table be verified for accuracy prior to adoption.

Response: We reviewed of the municipalities located within the San Marcos HA. The City of Oceanside, the City of Solana Beach, and the City of Vista will be removed from the list of Responsible Municipalities on pages A61 of the draft Basin Plan amendment, and page 130 of the draft Technical Report.

4.12 County of Orange

Comment 154

Tentative Resolution No. R9-2010-001, page 3, section 7. Relationship Between Bacteria and Pathogens, second sentence should be revised as follows: "Humans may be exposed to these waterborne pathogens through recreational water use or by harvesting and consuming filter-feeding shellfish in waters impacted by human sewage. Bacteria have been historically used as indicators of human sewage and associated pathogens because 1) the presence of pathogens and the probability of disease are directly correlated with the density of indicator bacteria in waters used for recreation or shellfish harvesting in waters known to be impacted by human sewage…"

Response: The suggested revisions are appreciated, but current text is accurate.

Comment 155

Tentative Resolution No. R9-2010-001, page 6, section 15. Bacteria Impaired Waters Included in Revised Bacteria TMDLs Project I Table and Attachment A, page A1 table: The table should be revised to include the specific areas of impairment designated in the original 2002 Clean Water Act §303(d) list as shown below:

Watershed	Type of Listing	Waterbody Name [a]	Number of Listings	Impairment located at
Lower San Juan HSA (901.27)	Creek	Aliso Creek	3	
	Estuary	Aliso Creek (mouth)		
	Shoreline	Pacific Ocean Shoreline, Aliso HSA		*North Beach Creek, San Juan Creek (large outlet), Capistrano Beach, South Capistrano Beach at Beach Road.*

Response: Please see the response to Comment 11.

Comment 156

Tentative Resolution No. R9-2010-001, page 6, section 15. Bacteria Impaired Waters Included in Revised Bacteria TMDLs Project I; and Attachment A, page A1, second paragraph should be revised as follows: "…The TMDLs that have been developed for the Pacific Ocean shorelines are ~~assumed to be~~ applicable to all the beaches located on the shorelines of areas which were designated as and remain impaired in the hydrologic subareas (HSAs), hydrologic areas (HAs), and hydrologic units (HUs) listed above. It is recognized that several shoreline areas have been recommended for de-listing in the 2008 Clean Water Act Sections 305(b) and 303(d) Integrated Report for the San Diego Region approved by the San Diego Water Board on December 16, 2009. As long as water quality objectives are met at shoreline locations, these TMDL requirements will not apply and compliance and monitoring will be maintained through NPDES Permits and Waste Discharge Requirements.

Response: Please see the response to Comment 6.

Comment 157

Tentative Resolution No. R9-2010-001, page 9, section 19. Sources of Bacteria, second paragraph, 4th sentence should be revised as follows: "…Some ~~D~~discharges of bacteria from the Municipal MS4s, Caltrans, and Agriculture land use categories are assumed to be anthropogenic in origin and considered controllable. Some discharges from the Municipal MS4s may result from natural sources and transported through pipes and conveyance channels via infiltrating groundwater and are not considered controllable."

Response: The suggested revisions are appreciated, but current text is accurate.

Comment 158

Tentative Resolution No. R9-2010-001, page 10, section 22. Allocation of TMDLs to Point Sources and Nonpoint Sources, second paragraph should be revised as follows: "~~For~~ When the dry weather TMDLs were originally calculated, a major underlying assumption is was that there is no discharge of surface runoff, thus no discharge of bacteria, expected from land uses associated with the Caltrans, Agriculture, and Open Space land use categories during dry weather. Because no discharge of surface runoff ~~is~~ was expected from these land use categories during dry weather, they were assigned dry weather WLAs and LAs of zero. The dry weather TMDLs were assigned entirely to the Municipal MS4s land use category as dry weather WLAs, meaning only discharges of bacteria loads to the receiving waters are expected or allowed from the Municipal MS4s land use category during dry weather."

Response: The suggested revisions are appreciated, but current text is accurate.

Comment 159

Tentative Resolution No. R9-2010-001, page 13, section 29 should be revised as follows: "Compliance with WLAs and LAs: Ultimately, the TMDLs in the receiving waters will be met when the dischargers responsible for controllable sources meet their assigned WLAs and LAs and natural sources of bacteria and resulting exceedences are accounted for. When all discharges from controllable sources meet their assigned WLAs and LAs, the beneficial uses in the receiving waters should be restored and compliance with the TMDLs should be achieved. The TMDLs are calculated based on numeric targets consisting of the numeric bacteria REC-1 WQOs and allowable exceedance frequencies. Discharges from controllable sources that can meet the numeric bacteria REC-1 WQOs and allowable exceedance frequencies in their effluent are not expected to cause exceedances of the numeric targets in the receiving waters. However, exceedences may occur from natural sources in wet and dry weather. The Southern California Coastal Water Research Project (SCCWRP) has produced technical reports examining dry weather fecal indicator bacteria levels in natural reference creeks throughout Southern California from May 2006 – May 2007. Findings include a total of 18.2% of the fecal indicator bacteria samples from the sites exceeded daily (single sample) water quality standards and a total of 39% of enterococcus samples exceeded the 30-day geomean objectives. If the TMDLs are attained in the receiving waters, the assumption will be that the controllable sources are in compliance with their assigned WLAs and LAs. Otherwise, the dischargers responsible for controllable sources of bacteria must provide evidence and demonstrate to the San Diego Water Board that their discharges are not causing exceedances of the numeric WQOs and allowable exceedance frequencies in the receiving waters."

Response: The suggested revisions are appreciated, but current text is accurate. Please see the response to Comment 2.

Comment 160

Tentative Resolution No. R9-2010-001, page 15, section 35. Economic Analysis: The section should indicate whether the San Diego Water Board considers the estimated $50,000 - $973,000,000 to treat 10% of a watershed reasonable and acceptable. Even the cursory economic analysis that was conducted for this TMDL predicts astronomical costs of compliance given the modeled reductions needed for dry and wet weather.

Response: The suggested revision is appreciated, but current text is accurate.

Comment 161

Attachment A, page A14, footnote 5 should be revised as follows: "Available water quality data from the San Diego Reference Systems when the TMDL modeling was conducted indicated that exceedences of the single sample WQO during dry weather conditions were uncommon. Furthermore, it was assumed if the exceedence of the single sample WQOs during dry weather ~~is~~ was unlikely, exceedences of the geometic mean ~~are~~ were even more unlikely. Subsequently the Southern California Coastal Water Research Project (SCCWRP) has produced technical reports examining dry weather fecal indicator bacteria levels in natural reference creeks throughout Southern California from May 2006 – May 2007. Findings include a total of 18.2% of the fecal indicator bacteria samples from the sites exceeded daily (single sample) water quality standards and a total of 39% of enterococcus samples exceeded the 30-day geomean objectives. Data from the two studies clearly show that a 0 percent allowable exceedance frequency for either the single sample or geomean WQO is not supported by current scientific data."

Response: The suggested revisions are appreciated, but current text is accurate. Also, please see the response to Comments 2 and 12.

Comment 162

Attachment A, page A15, first paragraph should be revised as follows: "…The "designated beach" usage frequency has the ~~most conservative and protective~~ lowest enterococci REC-1 WQOs in the Basin Plan." This change is appropriate since the same level of risk protection is provided by each of the enterococcus REC-1 WQOs based on the usage frequency of the location. The standards provide swimmers at low use beaches have the same level of protection as those at high use beaches.

Response: The sentence will be revised in the draft Basin Plan amendment and draft Technical Report as follows:

> The "designated beach" usage frequency has the ~~most conservative and protective~~ lowest and most stringent enterococci REC-1 WQOs in the Basin Plan.

Comment 163

Attachment A, page A16; second table, footnote c should be revised as follows: "Total Coliform 30-day geometric mean WQO for REC-1 at beaches ~~and the point in creeks that discharge to~~

~~beaches~~." This change is appropriate because the Basin Plan does not contain Total Coliform standards for freshwater creeks.

Response: Please see the response to Comment 17.

Comment 164

Attachment A, page A16, (c) Source Analysis should be revised as follows: "In rural and undeveloped areas, bacteria are assumed to be washed off the land surface primarily by wet weather flows directly to surface waters. However, SCCWRP Technical Report 542 examined dry weather fecal indicator bacteria levels in natural reference creeks throughout Southern California from May 2006 - May2007 and documented exceedences of both single sample and geometic mean REC-1 WQOs when surface flows from precipitation did not occur. Discharges from…"

Response: The suggested revisions are appreciated, but current text is accurate. Also, please see the response to Comment 2.

Comment 165

Attachment A, page A19, (1) Concentration Based TMDLs should be revised as follows: "An allowable exceedence frequency is included as part of the wet weather numeric target…"

Response: The suggested revision is appreciated, but current text is accurate. Also, please see the response in Section 2.7.1.

Comment 166

Attachment A, page A37, (A) Point Sources, Numeric Targets, third bullet should be revised as follows: "The numeric targets for dry weather TMDLs consist of the REC-1 30-day geometric mean WQOs and a 0 percent allowable exceedence frequency. In 2007 SCCWRP produced technical reports examining dry weather fecal indicator bacteria levels in natural reference creeks throughout Southern California from May 2006 – May 2007. Findings include a total of 18.2% of the fecal indicator bacteria samples from the sites exceeded daily (single sample) water quality standards and a total of 39% of enterococcus samples exceeded the 30-day geomean objectives. Data from the two studies clearly show that a 0 percent allowable exceedance frequency for either the single sample or geomean WQO is not supported by current scientific data and an allowable exceedence frequency for dry weather WQOs should be considered."

Response: The suggested revision is appreciated, but current text is accurate. Also, please see the responses to Comments 2 and 58, and in Section 2.3.

Comment 167

Attachment A, page A41, first paragraph should be revised as follows: "The available data reported by the Phase I MS4s and the results of the technical TMDL analysis indicate that discharges into and from MS4s ~~are~~ may be in violation of the discharge prohibitions and receiving waters limitations above if said discharges come from controllable anthropogenic sources. It has yet to be determined what portion of discharges into and from MS4s originate from natural, uncontrollable sources and processes."

Response: The suggested revisions are appreciated, but current text is accurate.

Comment 168

Attachment A, page A41, last bullet should be revised as follows: "Compliance schedule for Phase I MS4s to attain, to the maximum extent practicable (MEP), the MS4 WLA and TMDLs in the receiving waters."

Response: The suggested revision is appreciated, but current text is accurate.

Comment 169

Attachment A, page A41, last paragraph should be revised as follows: "The Phase I MS4s will be required to submit Bacteria Load Reduction Plans (BLRPs) or Comprehensive Load Reduction Plans (CLRPs) outlining a proposed BMP program that will, to the MEP, be capable of achieving the necessary load reductions required to attain the TMDLs in the receiving waters…"

Response: The suggested revision is appreciated, but current text is accurate.

Comment 170

Attachment A, page A42, first paragraph should be revised as follows: "Ideally, the Phase I MS4s and Caltrans will develop and coordinate the elements of their BLRPs and CLRPs together in watersheds where both entities contribute to the water quality problem."

Response: The suggested revision is appreciated, but current text is accurate.

Comment 171

Attachment A, page A44, 4th paragraph should be revised as follows: "Because POTWs and wastewater collection systems have been assigned WLAs of zero, no discharges of bacteria are expected or allowed under the wet weather TMDLs or dry weather TMDLs. If discharges of bacteria from POTWs and/or wastewater collection systems do occur as a result of sanitary sewer overflows and result in WQO exceedences, these exceedences will not apply to other dischargers compliance status." This change is appropriate because it is reasonably foreseeable that accidental discharges from POTWs and/or wastewater collection systems may occur and the resulting WQO exceedences should not contribute to findings of non-compliance of dischargers unrelated to the POTW or wastewater collection system.

Response: The revisions will be made as suggested by the commenter.

Comment 172

Attachment A, page A50, (i) Monitoring for TMDL Compliance and Compliance Assessment, second sentence should be revised as follows: "When all discharges from controllable sources meet their assigned WLAs and LAs, natural sources of bacteria are accounted for, and the numeric targets…"

Response: The suggested revision is appreciated, but current text is accurate.

Comment 173

Attachment A, page A50, (i) Monitoring for TMDL Compliance and Compliance Assessment, first bullet should be revised as follows: "If exceedences of the receiving water limitations are observed in the monitoring data, additional monitoring locations, or other source identification tools ~~must~~ may be added to identify the sources causing the exceedences, if the cause is unknown. ~~An adequate number of additional monitoring locations and frequency of monitoring must be added to identify the sources causing the exceedences in the receiving water.~~ The additional monitoring locations or other source identification tools ~~must~~ may also be used to demonstrate that the bacteria loads from the sources identified have been addressed and are no longer causing exceedences in the receiving waters.

Response: The text referenced by the commenter will be revised in the draft Basin Plan amendment and draft Technical Report as follows:

> If exceedances of the receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be ~~added~~ implemented to identify the sources causing the exceedances. ~~An adequate number of additional monitoring locations and frequency of monitoring must be added to identify the sources causing the exceedances in the receiving waters.~~ The additional monitoring locations and/or other source identification methods must also be used to demonstrate that the bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

Comment 174

Attachment A, page A50, (i) Monitoring for TMDL Compliance and Compliance Assessment, second bullet should be revised as follows: "If exceedences of the receiving water limitations are observed in the monitoring data, additional monitoring locations, or other source identification tools ~~must~~ may be added to identify the sources causing the exceedences, if the cause is unknown. ~~An adequate number of additional monitoring locations and frequency of monitoring must be added to identify the sources causing the exceedences in the receiving water.~~ The additional monitoring locations or other source identification tools ~~must~~ may also be used to demonstrate that the bacteria loads from the sources identified have been addressed and are no longer causing exceedences in the receiving waters.

Response: Please see the response to Comment 173.

Comment 175

Attachment A, page A50, (i) Monitoring for TMDL Compliance and Compliance Assessment, third bullet: "Wet weather monitoring following two storms per rainy season (i.e., October 1 through April 30) should occur at least once within 24 hours of the end of ~~a~~the storm event ~~that occurs during the rainy season (i.e., October 1 through April 30)~~.

Response: Please see the response to Comment 66.

Comment 176

Attachment A, page A53, first paragraph should be revised as follows: "Discharges from other sources (i.e., Caltrans, Agriculture, POTWs, Wastewater Collection Systems, and Open Spaces) during dry weather are not expected and/or not allowed (i.e., WLA = 0 or LA = 0). If discharges of bacteria from these sources do occur and result in WQO exceedences, these exceedences will not apply to other dischargers (i.e., MS4s) compliance status."

Response: The paragraph referenced by the commenter will be revised in the draft Basin Plan amendment and draft Technical Report as follows:

> Because the dry weather TMDLs are assigned entirely to the Municipal MS4s as WLAs, the Municipal MS4s are assumed to be the only source of bacteria during dry weather (i.e., dry weather TMDL = MS4 WLA). Discharges from other controllable sources (~~i.e.~~e.g., Caltrans, Agriculture~~, and Open Spaces~~) during dry weather are not expected and/or not allowed (i.e., WLA = 0 or LA = 0). If at the end of the dry weather TMDL compliance schedule the receiving waters exceed the 30-day geometric mean REC-1 WQOs more than 0 percent of the time, the municipal Phase I MS4s are responsible for demonstrating their discharges into the receiving waters are not causing the exceedances, or they will be considered out of compliance. If controllable sources other than the Phase I MS4s are identified as causing the exceedances, the Phase I MS4s will not be considered out of compliance.

Comment 177

Attachment A, page A53, 2. Compliance with Wet Weather TMDLs, first paragraph should be revised as follows: "At the end of the wet weather TMDL compliance schedule, the bacteria densities in the receiving waters for all wet weather days cannot exceed the single sample maximum REC-1 WQOs more than the allowable exceedence frequency. ~~In addition, the bacteria densities must be less than or equal to the 30-day geometric mean REC-1 WQOs 100 percent of the time (i.e., both dry and wet weather days in a 30-day period shall not exceed the 30-day geometric mean REC-1 more than 0 percent of the time).~~ " This change is appropriate because wet weather TMDL compliance is based upon an allowable 22% single sample exceed frequency not the 30 day geometric mean with no exceedance frequency.

Response: Please see the response in Section 2.7.1.

Comment 178

Attachment A, page A54, third paragraph should be revised as follows: "If controllable sources other than discharges from the municipal Phase I MS4s are identified before or after the end of the wet weather TMDL Compliance Schedules as causing the exceedences, the identified exceedences will not apply to the MS4s compliance status, and those controllable sources will be responsible for reducing their bacteria loads and/or demonstrating that discharges from those sources are not no longer causing the exceedences."

Response: The suggested revision is appreciated, but current text is accurate. Also, please see the response to Comment 176.

Comment 179

Attachment A, page A54, fourth paragraph should be revised as follows: "…Progress can be demonstrated with reductions in exceedence frequencies in the receiving water, reductions in flows to the receiving water, iterative implementation of BMPs or other metrics, until the allowable exceedence frequencies ultimately are achieved at the end of the TMDL Compliance Schedules."

Response: The suggested revision is appreciated, but current text is accurate. Also, please see the response to Comment 69.

Comment 180

Attachment A, page A54, 1. Measuring Progress Toward Attaining Dry Weather TMDLs: "For the dry weather TMDLs, available historical monitoring data from the year 2002 ~~to the effective date of these TMDLs~~ should be used to calculate the "existing" dry weather exceedence frequency of the 30-day geometric mean REC-1 WQOs for each watershed." Calculating the "existing" dry weather exceedence frequency with data beyond 2002 will wipe out any recognition of the progress and iterative BMPs achieved under MS4 programs and other watershed initiatives from 2003 to the present. The County and cities have been working diligently on reducing bacteria loads from the initial 303(d) listings and deserve the compliance credit and recognition of these efforts and the related significant financial investment.

Response: Please see the response to Comment 141.

Comment 181

Attachment A, page A57, (j) TMDL Compliance Schedule, first paragraph, last sentence should be revised as follows: "After the controllable sources achieve their assigned WLAs and LAs and natural sources of bacteria are accounted for, the TMDLs in the receiving waters will be met and beneficial uses restored.

Response: The suggested revision is appreciated, but current text is accurate.

Comment 182

Attachment A, page A57, (j) TMDL Compliance Schedule, second paragraph, first sentence should be revised as follows: "Until the dischargers achieve their assigned WLAs and LAs and natural sources of bacteria are accounted for, the beneficial uses of the waterbodies addressed by this project will likely remain impaired~~, and the dischargers will continue violating one or more Basin Plan waste discharge prohibitions~~.

Response: The suggested revisions are appreciated, but current text is accurate.

Comment 183

Attachment A, page A65, first paragraph, second sentence should be revised as follows: "~~Several of the segments or areas in the list above~~The following segments or areas have been proposed for ~~delisted~~ delisting for one or more indicator bacteria species ~~or redefined~~ in the 2008 303(d) List by the San Diego Water Board:
Pacific Ocean Shoreline, San Joaquin Hills HSA, at Crescent Bay Beach

Pacific Ocean Shoreline, Laguna Beach HSA, at Bluebird Canyon
Pacific Ocean Shoreline, Laguna Beach HSA, at Dumond Drive at Victoria Beach
Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Beach at Cleo Street
Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Beach at Laguna Hotel
Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Beach at Main Beach
Pacific Ocean Shoreline, Aliso HSA, at Aliso Beach –middle
Pacific Ocean Shoreline, Aliso HSA, at Aliso Beach –north
Pacific Ocean Shoreline, Aliso HSA, at Blue Lagoon
Pacific Ocean Shoreline, Dan Point HSA, at Aliso Beach at West Street
Pacific Ocean Shoreline, Dan Point HSA, at Dana Strands Surfzone at Dana Strands Rd
Pacific Ocean Shoreline, Dan Point HSA, at Salt Creek outlet at Monarch Beach
Pacific Ocean Shoreline, Dan Point HSA, at South of Salt Creek outlet at Salt Creek Service Road
Pacific Ocean Shoreline, Dan Point HSA, at Table Rock
Pacific Ocean Shoreline, Dan Point HSA, at Thousand Steps Beach
Pacific Ocean Shoreline, Lower San Juan HSA, at North Beach Creek
Pacific Ocean Shoreline, San Clemente HA, at Capistrano Shores at North Ole Hanson Beach
Pacific Ocean Shoreline, San Clemente HA, at Riviera Beach
Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Linda Lane
Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Mariposa Lane
Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Pier
Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at South Trafalgar St Beach
Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at South Trafalgar Canyon outlet
Pacific Ocean Shoreline, San Clemente HA, at South Capistrano Beach at Beach Road
Pacific Ocean Shoreline, San Clemente HA, at South Capistrano County Beach
"…also include delist segments in San Diego County.

Response: Please see the response in Section 2.1. The paragraph referenced by the commenter will be revised in the draft Basin Plan amendment and draft Technical Report as follows:

> ~~Beginning with the 2008 303(d) List, specific beach segments of the Pacific Ocean shoreline are listed individually, and may not be identified in the same way as those segments listed in the table above. Several of the segments or areas in the list above have been delisted or redefined in the 2008 303(d) List. In addition, other segments or areas have been added to the Pacific Ocean shorelines listed above.~~ The TMDLs that address the Pacific Ocean shorelines identified in the 2002 303(d) List are ~~assumed to be~~ applicable to all the beaches located on the shorelines of the hydrologic subareas (HSAs), hydrologic areas (HAs), and hydrologic units (HUs) listed above, or as listed individually in the 2008 and future 303(d) Lists. Beginning with the 2008 303(d) List, specific beach segments of the Pacific Ocean shoreline are listed individually. Specific beach segments from some of the Pacific Ocean shorelines listed in the above table have been redefined or delisted from the 2008 303(d) list that was approved by the San Diego Board on December 16, 2009.

Comment 184

Attachment A, page A65, first paragraph, last sentence should be revised as follows: "The TMDLs that address the creeks and Pacific Ocean shorelines identified in the 2002 303(d) List are assumed to be applicable to all the beaches ~~located on the shorelines of the hydrologic subareas (HSAs), hydrologic areas (HUs), and hydrologic units (HUs) listed above, or~~ as listed individually in the 2008 and future 303(d) Lists.

Response: Please see the response to Comment 183.

Comment 185

Attachment A, page A70, (k) TMDL Implementation Milestones table: revise the date ~~As needed after effective date~~ to "5 years after effective date" for the following Implementation Actions:

14. Amend discharge conditions of appropriate waivers to be consistent with the requirements for complying with the TMDLs and Agriculture LAs;
15. Issue individual or general WDRs or Basin Plan prohibitions consistent with the TMDLs and LAs for controllable nonpoint sources discharges not eligible for conditional waivers;
17. Enroll Phase II MS4s identified as significant sources of bacteria to receiving waters under State Water Board general WDRs and NPDES requirements;
18. Issue individual or general WDRs and NPDES requirements consistent with the TMDLs and WLAs for specific Phase II MS4s or category of Phase II MS4s;
19. Take enforcement actions against controllable point sources and nonpoint sources to attain compliance with the WLAs and LAs.

These changes are appropriate since the assumption that the MS4s are the largest discharger of bacteria has been made based on the MS4s being the only dischargers currently required to submit monitoring data for their dischargers. A timely commitment to investigate and address discharges from known entities, such as Phase II MS4s and Agriculture is needed to ensure that TMDL reductions and timelines are met.

Response: The suggested revisions are appreciated, but current text is appropriate. Also, please see the response in Section 2.6.

Comment 186

Draft Technical Staff Report (TSR), Section 1 Executive Summary, page 4, 5th paragraph, 1st line states: "For the dry weather TMDLs, the discharges and bacteria loads from land uses associated with CalTrans, Agriculture and Open Space land uses are expected to be zero. This is because there is no flow source that is expected during dry weather to wash off of these land uses." And Draft TSR, Section 1 Executive Summary, page 6, Numeric Targets 3rd bullet: "The numeric targets for dry weather TMDLs consist of the REC-1 30-day geometric mean WQOs and a 0 percent allowable exceedence frequency." These statements are not supported by current scientific studies completed by SCCWRP. See comments 6, 8, 11, and 13 above. All references to a 0 percent allowable exceedence frequency in dry weather should be removed.

Response: Please see the responses to Comments 2 and in Sections 2.3 and 2.7.1.

Comment 187

Draft TSR, Section 1 Executive Summary, page 7, Allocations 6th bullet: The assumption that there is no runoff from agricultural land is unsupported and highly suspect give practical experience.

Response: Please see the responses to Comment 4 and in Section 2.4.

Comment 188

Draft TSR, Section 1 Executive Summary, page 7, Allocations 7th bullet #1: Just because a source is subject to regulation does not mean that it is controllable.

Response: If a source is subject to regulation, it implies a source is anthropogenic. Sources of bacteria that are anthropogenic are due to some human activity that can be controlled. If those anthropogenic sources are currently uncontrolled, that does not mean they cannot be controlled.

Comment 189

Draft TSR, Section 1 Executive Summary, page 8, Load Reductions, 1st paragraph states: "The WQBELs will likely consist of receiving water limitations (based on the numeric targets) and require the implementation of a BMP program to achieve the TMDLs in the receiving waters….Ideally, the Phase I MS4s and CalTrans will develop and submit their BLRPs or CLRPs together." This is a significant revision from the previous version of the TMDL and from the assurances given to members of the Stakeholder Advisory Group that the WQBELs would consist of an iterative BMP program.

Response: Please see the responses to Comment 69 and in Section 2.7.1.

Comment 190

Draft TSR, Section 2 Introduction, page 16, 3rd paragraph – The text should include a discussion of the Natural Sources Exclusion.

Response: The suggested revision is appreciated, but current text is accurate.

Comment 191

Draft TSR, Section 3, Problem Statement, pg 21 – "The listing of Pacific Ocean shorelines on the 2002 303(d) List are assumed to be applicable to all beaches located on the shorelines of the HSAs and HAs listed above". This assumption is baseless. The 2002 list specifically indicated the beaches that are impaired. This assumption is also inconsistent with the Stormwater Monitoring Coalition recommendations for the limited coastal area representative of coastal monitoring locations.

Response: Please see the responses to Comment 6 and in Section 2.1.

Comment 192

Draft TSR, Section 4 Numeric Target Selection, pg 32 states: "The natural sources exclusion approach can only be used to account for exceedences of bacteria WQOs after the responsible dischargers demonstrate that all anthropogenic sources have been *eliminated*…" In next

paragraph the text states "…the natural sources exclusion approach also requires *control* of indicator bacteria from anthropogenic sources…" (emphasis added). It is our understanding from discussions with Deborah Jayne your staff that the Natural Sources Exclusion Approach requires control, not elimination of anthropogenic sources. The text should be revised accordingly.

Response: The sentence referenced by the commenter will be revised as follows:

> The natural sources exclusion approach can only be used to account for exceedances of bacteria WQOs after the responsible dischargers demonstrate they have implemented all appropriate BMPs to control all anthropogenic sources of indicator bacteria to the target water body such that they do not cause or contribute to exceedances of the indicator bacteria WQOs ~~that all controllable anthropogenic sources have been eliminated~~, typically after a bacteria TMDL has already been adopted and implemented.

Comment 193

Draft TSR, Section 11 Implementation Plan, page 147, bottom paragraph should be revised as follows: "Existing dischargers ~~are~~ may be violating one or more of these Basin Plan prohibitions.

Response: The suggested revision is appreciated, but current text is accurate.

4.13 County of San Diego

Comment 194

A stronger commitment to and timeline for future TMDL revisions are necessary.

The TMDL recognizes that revisions to the Basin Plan may be necessary in the future (page A49). However, because this TMDL is founded on several critical assumptions, and because studies with bearing on these assumptions are either planned, ongoing, or already complete, stronger language should be included in the Basin Plan amendment to require a more specific commitment to and timeline for revising the TMDL to ensure that it is consistent with the most current science and available data from the San Diego region.

***Proposed Changes*:** A paragraph should be added at the end of Chapter 7 Section (f)(7) of the proposed Basin Plan amendment (page 450) stating: "Any study conducted following the procedures outlined in this paragraph will be considered by the San Diego Water Board during the time period specified in Table (Insert Table Number) TMDL Implementation Milestones".

A row should be added to the TMDL Implementation Milestones Table (page 469) to state:

- Implementation Action: San Diego Water Board will reconsider the TMDL to include results of any optional special studies and water quality monitoring data completed by the responsible entities and revise numeric targets, WLAs, Las and the implementation schedule as needed.
- Responsible Parties: San Diego Water Board
- Date: Within five years of the effective date of the TMDL or within one year of receipt of final study results, whichever is later

Response: Please see the response in Section 2.6.

Comment 195

Compliance monitoring under the TMDL should not be the sole responsibility of Phase I MS4s.

The entire compliance monitoring burden under the TMDL has been placed on Phase I MS4 dischargers, including monitoring necessary to identify the contributions of non-Phase I MS4 dischargers, some of which are even assigned wasteload allocations (WLAs) or load allocations (LAs) under this TMDL (i.e., Caltrans and agriculture). (see pages A50-454).

***Proposed Changes*:** At a minimum, the paragraph beginning "Because the Phase I MS4s are located at the base of the watersheds ..." should be written to specify that all dischargers assigned WLAs and LAs under this TMDL are required to participate in compliance monitoring.

Response: Please see the responses to Comment 79 and in Section 2.7.2.

Comment 196

The definition of a rain event should be changed from 0.2 inch to 0.1 inch.

Data from a study at Leo Carrillo Beach (a reference watershed in Los Angeles County) are used to establish a frequency at which beaches and creeks covered by this TMDL can exceed bacteria water quality objectives during wet weather (22%). Allowable exceedance frequencies are appropriate in this TMDL because numerous studies have found that even reference watersheds unimpacted by anthropogenic activities sometimes exceed bacteria water quality objectives. Exceedance frequencies at Leo Carillo Beach were calculated based on wet weather days defined as rainfall events of at least 0.1 inch and the following 72 hours. This TMDL defines wet weather days as rainfall events of 0.2 inches or greater and the following 72 hours. It is scientifically invalid to apply the wet weather exceedance frequency observed at Leo Carrillo Beach to this TMDL, which uses a different definition of wet weather. The exceedance frequency for rainfall events greater than 0.2 inches is unknown, but likely to be different than 22%.

***Proposed Changes*:** Wet weather days in this TMDL should be defined as any rain event 0.1 inch or greater and the following 72 hours. This will ensure consistency with the Leo Carrillo Beach reference study.

Response: Please see the response in Section 2.2.

Comment 197

The TMDL should not require compliance with total coliform water quality objectives in creeks or inland waterways.

The TMDL states that wet and dry weather numeric objectives for total coliform apply at the point in a creek that discharges to a beach, bay, or estuary. The San Diego Basin Plan does not contain total coliform water quality objectives applicable to inland surface waters, only to marine waters.

***Proposed Changes*:** Language throughout the Resolution, Basin Plan Amendment, and Technical Report should be reviewed and changed to correctly state that total coliform water quality objectives are not applicable in inland surface waters, only at the point in creeks where continual mixing with salt water occurs.

Response: Please see the response to Comment 17.

Comment 198

The TMDL should include allowable exceedance frequencies for dry weather similar to those established for wet weather.

This TMDL allows no exceedances of bacteria water quality objectives during dry weather days (defined as days with less than 0.2 inch of rainfall observed on each ofthe previous 3 days). In other TMDLs where Leo Carrillo Beach is used as a reference system (i.e., Santa Monica Bay Beaches Bacteria TMDL), the dry weather TMDL is split into two seasons: summer dry (0% allowable exceedance frequency) and winter dry (3% allowable exceedance frequency). This is a scientifically sound approach because studies have found that reference beaches and creeks do

sometimes exceed water quality objectives during dry weather. A recent study published by SCCWRP (Tiefenthalet,L, E. Stein and G. Lyon. 2008. Fecal indicator bacteria levels during dry weather from Southern California reference streams. SCCWRP Annual Report, Costa Mesa, CA) confirms that exceedances of bacteria water quality objectives do occur during dry weather conditions in Southern California reference streams, including San Mateo Creek in San Diego County.

Proposed Changes: The TMDL should allow a 3% exceedance frequency during dry weather conditions until a more appropriate frequency can be established based on data collected from a reference system in the San Diego region.

Response: Please see the response in Section 2.3.

Comment 199

The TMDL compliance timelines should be extended.

When the Regional Board originally adopted this TMDL in December 2007, the compliance timeline for achieving wet weather TMDLs was 20 years. In the revised TMDL, the compliance timeline has been cut in half to 10 years for all water bodies except Chollas Creek. It is unclear why this was necessary. The TMDL and Tentative Resolution state that if dischargers submit a Comprehensive Load Reduction Plan (CLRP) that addresses multiple constituents in addition to bacteria, the compliance timeline may be extended to 20 years for achievement of wet weather TMDLs only. However, CLRPs are not defined well enough for dischargers to understand how compliance would be determined if they decide to develop CLRPs. There is no allowance for a timeline longer than 10 years for achieving the dry weather TMDLs.

According to Table 3-l in the Technical Report, this TMDL is applicable to 1,738 square miles of Orange and San Diego Counties. Since the TMDL has been revised to require compliance with concentration-based water quality objectives, compliance is now potentially enforceable throughout the entire extent of these 1,738 square miles. Given the scale, scope, complexit¡ and cost of the structural and non-structural solutions likely to be needed to reduce bacteria loads to required levels, 20 years is an extremely aggressive compliance timeline and should not be reduced any further. A longer compliance timeline is appropriate in that 20 water bodies are covered under this TMDL. Most TMDLs cover only one water body. The County of San Diego, for example, will be required to reduce bacteria loads simultaneously in six watersheds.

***Proposed Changes*:** The TMDL should be revised to allow for a 20-year compliance timeline for achievement of both wet and dry weather TMDLs. (see pages 466-469).

Response: Please see the response to Comment 80.

Comment 200

The TMDL should not require bacteria load reductions or additional monitoring in unimpaired watersheds.

Page Al of the proposed Basin Plan amendment states: "The TMDLs that have been developed for the Pacific Ocean shorelines are assumed to be applicable to all the beaches located on the shorelines of the hydrologic subareas (HSAs), hydrologic areas (HAs), and hydrologic units (HUs) listed fin a table] above." This statement impliesthat all dischargers located anywhere in the San Marcos HA (904.5) will be required to comply with the requirements of the TMDL. In fact, Moonlight Beach is the only segment within the San Marcos HA that is identified as impaired on the 303(d) list.

Moonlight Beach is hydrologically disconnected from the rest of the San Marcos HA. The draft Technical Report recognizes this fact in Table 3-1 where Moonlight Beach is shown to have a total drainage area of only 1.43 square miles. The table on Page 461 goes one step further by listing eight Phase I MS4s as "responsible municipalities" that will be required to comply with TMDL requirements in the San Marcos HA. These eight municipalities represent all of the Phase I MS4s within the Carlsbad HU. The table implies that any Phase I MS4located anywhere in the Carlsbad HU will be required to comply with the requirements of this TMDL. In fact, the City of Encinitas is the only Phase I MS4 discharger to Moonlight Beach.

***Proposed Changes*:** The City of Encinitas is the only Phase I MS4 that should be assigned responsibility for load reductions and compliance monitoring in the San Marcos HA.

The text and table on page A1 should be revised to state that the TMDL in the San Marcos HA only applies to the 1.43 square mile Moonlight Beach drainage area. All other Phase I MS4s should be removed from the table on Page A61. Regional Board staff should review the other HSA, HA, and HU designations to ensure that monitoring and load reduction activities are not being required for entities discharging to non-impaired water bodies.

Response: Please see the response to Comment 75.

Comment 201

Further clarification is needed regarding how TMDL compliance will be determined.

The TMDL has been revised so that compliance will be determined based on achievement of concentration-based water quality objectives rather than waste load allocations and load allocations. If WLAs and LAs will not be used to determine compliance, why are they included in the TMDL? Also, it is unclear how non-compliance with water quality objectives at a beach will impact upstream dischargers. Currently, it appears that upstream dischargers would be determined to be out of compliance even if they could demonstrate that they are meeting their assigned WLAs or LAs.

***Proposed Changes*:** The 1st paragraph on page A5l should be revised to allow for a determination of compliance if dischargers can demonstrate that they are complying with assigned WLAs and LAs, even if receiving waters are exceeding the applicable water quality objectives.

Response: Please see the response in Section 2.7.1.

Comment 202

Geometric means should not be used to assess TMDL compliance during wet weather.

Item 28 of the Tentative Resolution states: "at the end of the wet weather TMDL compliance schedule, the single sample maximum and 30-day geometric mean REC-I = WQOs must not be exceeded in the receiving water more frequently than the allowable exceedance frequencies." The proposed Basin Plan amendment (Page A54) states that wet weather and dry weather samples will be used together to calculate the wet weather 30-day geometric mean and that no exceedances of the wet weather 30-day geometric mean are allowed. This methodology is not scientifically defensible. The 30-day geometric mean should not be applied to wet weather samples but only to the dry weather condition. Moreover, wet weather and dry weather samples should not be combined to calculate the 30- day geometric mean.

***Proposed Changes*:** Wet weather compliance should not be assessed using a geometric mean. It is more appropriate to use the single sample maximum since rain events are episodic in nature.

All references to the use of a geometric mean for calculating wet weather compliance should be removed.

Response: Please see the response in Section 2.7.1.

4.14 Heal the Bay

Comment 203

Reference-Based approach (percentage-based) for setting waste load allocations.

Heal the Bay supports using the reference beach approach for determining a 22% allowable exceedance frequency during wet weather and 0% exceedance frequency during dry weather in the Draft TMDL. As noted, this reference system approach was taken in the Santa Monica Bay Beaches Dry and Wet Weather Bacteria TMDLs adopted by the Los Angeles Regional Water Quality Control Board and ensures that bacteriological water quality is at least as good as that of a reference system. However, we do not understand the logic in basing wet weather "exceedances" on REC-1 *single sample* maximums and dry weather exceedances on the REC-1 *geometric mean*. Instead, we urge the Regional Board to use the single sample maximum standards to identify both wet and dry weather allowable exceedances, as is the case with the Santa Monica Bacteria TMDL. So please add the single sample maximum for dry weather as well.

Response: Meeting the single sample maximum will also be a requirement to comply with the dry weather TMDLs. Please see the last sentence of the first paragraph for bullet number 1 on page 118 of the draft Technical Report (and number 1 on page A52 of the draft Basin Plan amendment). Also, please see the response in Section 2.7.1.

Comment 204

Also does the Regional Board plan to develop a reference location within the Region, rather than using Leo Carillo Beach in Los Angeles County? Although the Regions may have some similarities, it would be prudent to develop a site within the Region to account for any differences.

Response: The San Diego Water Board would prefer to have region specific reference locations and allowable exceedance frequencies. Because of the limited resources available to the San Diego Water Board, developing the data required for region specific reference systems will be the responsibility of other entities.

Comment 205

Of note, the implementation strategy based on reducing mass-load is confusing and not protective of human health. It is unclear how monthly (billion MPN/month) and annual (billion MPN/year) loads calculations will help to implement bacteria TMDL compliance. Typically, a few samples a month are collected for beaches and there is rarely flow monitoring of storm drains and creeks. A few grab samples without accurate flow measures are not conducive to determining accurate loading estimates. The approach should be discussed in more detail.

Response: The mass-load based TMDLs were used primarily to identify controllable sources of bacteria that need to reduce their loads to be able to meet the numeric targets (i.e., water quality objectives and allowable exceedance frequencies) in the receiving waters. Because the numeric targets are essentially based on bacteria densities (or concentration) in the receiving waters, attaining the numeric targets in the receiving water should mean compliance with the TMDLs

has been achieved. The assumption is that if the water quality objectives and allowable exceedance frequencies are met in the receiving water, then the controllable sources are meeting their WLAs.

Comment 206

Numeric target objectives should be expanded to include all Ocean Plan Standards.

The Draft TMDL provides only a rolling 30-day geometric mean numeric target for dry weather. However, the Ocean Plan includes a total of seven water quality standards for indicator bacteria. These standards specifically include a rolling 30-day geometric mean for total coliform, fecal coliform, and enterococcus as well as a single sample limit for total coliform, fecal coliform, and enterococcus, in addition to a fecal-to-total coliform ratio. In several instances the Draft TMDL discusses additional bacteria standards ("Compliance with the wet weather TMDLs in the receiving water is based on the frequency that the wet weather days in any given year exceed the wet weather numeric objective, but 30-day geometric mean must also be met." Draft TDML at A51) but this is not reflected in the numeric targets. When any standard is exceeded, the REC-1 beneficial use is impaired. It is imperative numeric targets include all seven Ocean Plan bacteria standards, for greatest public health protection.

Response: The numeric targets that were selected were primarily used in the modeling and calculation of the mass-load based TMDLs. Compliance with the TMDLs is also based on the numeric targets, but also requires that the other water quality objectives are met. Please see the first paragraphs of numbers 1 and 2 on pages 118 and 119 of the draft Technical Report and bullet numbers 1 and 2 on pages A52 and A53 of the draft Basin Plan amendment.

In terms of measuring compliance with the TMDLs in the receiving waters, concentrations in the receiving waters will be based on the single sample maximum and 30-day geometric mean WQOs an allowable exceedance frequencies. The fecal-to-total coliform ration applies specifically to ocean waters, not creek. All the WQOs in the Ocean Plan must be met in the receiving waters. The total-to-fecal ratio can be included in the implementing orders as part of the receiving water limitations, but it is not specifically discussed in these TMDLs. Also, please see the response in Section 2.7.1.

Comment 207

Numeric limits should not be based on frequency of use.

Frequency of use should not be considered in determining numeric targets. The Draft TMDL states that dischargers' commented that for impaired creeks the "designated beach" approach may be over protective of water quality, due to infrequent use. Further, the Draft TMDL states, "If sufficient evidence can be provided to the San Diego Water Board that can demonstrate the usage frequency for one or more of the six impaired creeks falls under the "Lightly Used Full Body Contact Recreation" or "Infrequently Used Full Body Contact" usage frequency, the Basin Plan may be amended to designate one or more of the creeks with the "moderately to lightly used area" usage frequency." Heal the Bay opposes this approach and believes impaired creeks should have the same protection standards, regardless of recreation frequency. This approach does not favor maintaining appropriate water quality standards, and is unacceptable for infrequent bathers

to be subject to deficient public health protection. If the REC-1 use does not exist for particular receiving waters, then a UAA may be performed to change the REC-1 use.

Response: The Basin Plan for the San Diego Region includes multiple numeric water quality objectives for Enterococcus bacteria applicable to creeks, depending on the frequency of use. The different numeric water quality objectives are given for different levels of usage frequency, because the health risk is reduced as the population is reduced. In other words, the health risk remains the same with a higher water quality objective if the frequency of use is reduced. If the frequency of use of a creek can be established as less than the usage frequency for a "designated beach", then designating the creek as a "moderately to lightly used area" may be appropriate. Before this can happen, a separate Basin Plan amendment with its own public process would be required.

Comment 208

Compliance schedules should be moved forward for final dry and wet weather targets.

The Draft TMDL proposes a final dry and wet weather compliance target date of 10 years, with the option to move the wet weather compliance date to 20 years if a multiple TMDL implementation approach is pursued. The timeframe appears excessive, especially for meeting final dry weather targets. The dry weather period is the most critical period from a public health perspective. The Santa Monica Bay, Marina del Rey and San Pedro Bay Beaches Bacteria TMDLs require final dry weather targets to be met three years after adoption for the AB411 time period and 6 years for winter dry weather. Since this deadline has past, we have seen great improvements in beach water quality in Santa Monica Bay. Many municipalities in Los Angeles County have implemented best management practices such as dry weather diversions and treatment facilities to improve beach water quality. Thus we urge the Regional Board to split the dry weather into two distinct periods (AB411 dry and winter dry) and move the compliance date forward. In addition 20 years is excessive for complying with wet weather WLAs. Heal the Bay would like to see compliance date moved to 18 years which is consistent with the Santa Monica Bay Bacteria TMDL.

Response: The proposed maximum compliance schedules for the final dry and wet weather TMDLs are appropriate for the beaches and creeks that are in the San Diego Region. Also, please see the response to Comment 80.

Comment 209

Enforcement of compliance milestones should be clarified.

Specific milestones for achieving bacteria TMDL compliance should be implemented and enforced by the Regional Board. Multiple milestones, with set compliance dates, should be *required* by the Regional Board for all responsible dischargers. The language in the Draft TMDL waivers on its intent. For instance, the Draft TMDL states both "*if* the TMDL Compliance Schedules include interim milestones" (page A55) and then later provides interim milestones in the tables on page A67. Please provide clarification that milestones are required and identify them specifically in the compliance schedule.

Response: Interim milestones are required in the compliance schedules. The discharges are required to include at least one interim milestone in the compliance schedules proposed in their BLRPs or CLRPs. If the BLRPs or CLRPs do not include proposed compliance schedules, then the compliance schedules and interim milestones that are given in the draft Basin Plan amendment will become the default compliance schedules. Please see the compliance schedule and alternative compliance schedule requirements discussed on pages A66-A68 of the draft Basin Plan amendment.

Comment 210

Monitoring for TMDL compliance.

The TMDL describes compliance monitoring. We urge the Regional Board to include a statement to require point zero monitoring locations. The definition used by Los Angeles County of 'point zero' monitoring states, "The term *wave wash* is defined as the point at which the storm drain or creek empties and the effluent from the storm drain initially mixes with the receiving ocean water, this term is also referred to as *point zero."* Point zero monitoring ensures that the highest levels of indicator bacteria area captured in the sample which is critical for public health protection. People definitely swim and surf directly in front of flowing storm drains and creeks. Additionally, we urge the Regional Board to require that water monitoring during summer months (AB411 period) be conducted at least weekly, for the necessary evaluation of compliance progress.

Response: The draft Basin Plan amendment provides a framework of the minimum monitoring that is expected for determining compliance with the TMDLs. Please see the minimum monitoring requirements discussed on page A50 of the draft Basin Plan amendment. The minimum monitoring locations include locations required under the Phase I MS4 NPDES monitoring requirements and AB411 monitoring locations. These are located within the "point zero" location described by the commenter.

The final monitoring requirements will be determined when the implementing orders (i.e., MS4 NPDES requirements, WDRs, enforcement actions, or investigative orders) are developed. During that time, the public may be given an opportunity to provide additional input on the final monitoring requirements that should be included in the order.

4.15 San Diego Coastkeeper

Comment 211

Incorporation of stakeholder input in developing a local reference system dataset.

In response to comments made by Coastkeeper on May 13, 2008, Regional Board staff indicated that stakeholders would be involved in the determination of which reference systems to use for the final TMDL. Specifically, Board staff indicated that "we will once again engage the stakeholders before final decisions about which reference system to use and throughout the process of calculating the revised TMDL". We are disappointed the reference system was chosen without SAG input, simply incorporating the Los Angeles Region reference system. However, we are confident adequate data will be collected in the near future, and look forward to working with staff to incorporate it.

Response: Please see the responses to Comment 143, and in Sections 2.2, 2.3, and 2.6.

Comment 212

Direct measurements of human indicators must be incorporated into the process.

Although a watershed may be 95 percent undisturbed, this fact alone does not mean all exceedances of water quality objectives are due to natural sources. In SCCWRPs 2006 study, *Microbiological water quality at non-human impacted reference beaches in southern California during wet weather*, indicators of human sources were found in three instances. The indicator chosen for this study was one that directly measured the presence of human viruses, but would not detect when other human pathogens like bacteria were present. It is likely that if additional direct measures were chosen, more indications of human sources would have been detected. For example, recent research into the human genetic markers of Bacteroides, a gastrointestinal bacterium, has already proven useful in tracing human sources of bacteria in coastal and freshwater systems. The Bacteroides indicator has been used to detect the presence of human sources in SCCWRPs 2008 study on fecal indicator bacteria levels during dry weather. Thus, we feel it would be an important additional component of any reference watershed analysis. As the process moves forward, staff must normalize the natural exceedance frequency to the underlying human loading in reference systems. This must also entail a source identification analysis to ensure the exceedance frequency is indeed a natural occurrence and not partially related to anthropogenic impacts.

Response: We agree that differentiating between human and non-human sources of bacteria in a reference system would be an important component of a reference watershed analysis. Hopefully, Coastkeeper will be involved in the development of any plan that is developed to identify and monitor a region specific reference system. Also, please see the responses in Section 2.2 and 2.3.

Comment 213

Reference system approach must incorporate key biophysical factors into exceedance frequency

In SCCRWPs 2006 study, certain biophysical factors were found to correlate to the exceedance frequency. For example, the study found the exceedance frequency in reference watersheds was correlated to watershed size. Moving forward, the Regional Board staff must identify a way to incorporate important environmental factors like watershed size into the natural exceedance frequency. Given the variability in the size and variable flow rates of the watersheds in the applicable area, it is critical to evaluate such variables in choosing a reference system. Other basic factors that need to be considered include a full land use analysis, temporal variability and seasonal variability.

Response: We agree that factors discussed in the comment are important for any reference watershed analysis. Hopefully, Coastkeeper will be involved in the development of any plan that is developed to identify and monitor a region specific reference system. Also, please see the responses in Section 2.2 and 2.3.

Comment 214

Staff needs to clarify definition of wet weather.

The Leo Carillo study based a natural exceedance rate on a storm event definition of one inch of rain. In contrast, this TMDL uses a wet weather definition of two inches, yet does not modify the 22% natural exceedance frequency from the Leo Carillo study. Staff needs to articulate how this discrepancy will impact the calculation of exceedance frequencies in the implementation phase of this TMDL. A calculation of natural exceedance based on a one-inch definition of rain will increase the number of wet days because more days will meet the criteria. Thus, if more wet days occur, any exceedances that would have been attributable to dry weather are actually considered wet weather in the reference system. This results in more allowable exceedance days.

Though the co-permittees may feel it is inequitable to apply the two-inch rain standard for delineating wet weather, it may have resulted in a higher exceedance frequency calculation. Nonetheless, if co-permittees are concerned wet-weather days are defined by one inch of rainfall for calculation but not implementation, the one inch standard must be applied across the board to all instances in which wet weather is defined. Thus, copermittees would be required to prepare for wet-weather events of one inch of rainfall.

Moreover, if the co-permittees are concerned about lack of consistent application of a reference system and exceedance frequency calculated using different standards, the application of a completely removed and foreign reference system should also invalidate the application of the LARWQCB-derived frequency.

Response: Please see the responses in Sections 2.2, 2.3, and 2.7.1.

Comment 215

Incorporation of natural exceedance frequency into wet weather TMDL is not properly justified

Over the course of this process, Coastkeeper has provided detailed comments on our concerns regarding how the allowable exceedance loads were quantified using the natural exceedance frequency. These concerns have gone largely unaddressed and thus we incorporate by reference our previous comments. Some of our concerns include:

i. The determination of numbers of wet days is too broad

In Appendix I, Staff defines 'wet days' as days with 0.2 in of rain plus the following 72 hours, regardless of whether those days actually receive any precipitation. This overly broad definition of wet days inappropriately inflates the potential number of allowable exceedance days.

ii. *The calculation of the allowable exceedance load into the wet weather TMDL is not justified*

The approach used to calculate the allowable exceedance load from the allowable exceedance days is arbitrary and not fully justified. Appendix I states that "the days with the highest loads were chosen as the allowable exceedance days because the highest loads in most of the watersheds correspond to open space land uses where bacteria loads are generated from natural sources". No data are provided to support this assertion that open space areas have the largest loads and that the sources are necessarily natural. Open space areas do have anthropogenic impacts even if the land has not been highly modified (e.g. uncollected pet waste).

By including an overly broad definition of wet days and a calculation of allowable loads that is biased towards removing the highest loads from WLAs, staff has created a TMDL that errs on the side of giving co-permittees too much leeway and does not go far enough to protect water quality.

While we have reservations regarding the incorporation of the 22% allowable exceedance frequency developed for the Arroyo Sequit watershed into this TMDL, at this time we do not believe that there is sufficient data to support any other number for natural exceedance frequency. Sampling has been conducted at too few sites in the San Diego/Orange County region over too short a time period. The most conservative approach would therefore be to provide no allowable exceedance frequency until adequate data for an appropriate reference watershed is available and vetted through the SAG.

For a reference dataset to be complete it must, at a minimum, have sufficient sampling sites and frequencies to be a statistically robust. Of the two studies conducted by SCCWRP on this issue, one was focused on wet weather patterns for only two sampling years for a total of five sampling events at each site. The other was focused on dry weather for one sampling year. Also, the reference dataset must encompass sufficient inter-annual sampling in the same locations to account for differences in water years. As it stands now, we have a relatively sparse dataset for four sites in the San Diego/Orange County region. The currently available research conducted by SCCWRP, while a good foundation, is still too limited in its scope to provide the information necessary to determine a realistic and defendable natural exceedance frequency for the San

Diego region. The studies raise more questions than they answer and we cannot wait any longer to take action to restore the beneficial uses of our beaches and shorelines.

Response: The use of the wet weather allowable exceedance frequency in the wet weather TMDLs is the same as the "interim" wet weather TMDLs in the Basin Plan amendment adopted on December 12, 2007 and has not been changed. Also, please see the responses to Comments 212 and 213, and in Sections 2.2 and 2.3.

Comment 216

Compliance schedules and timelines

According to the Technical Report and BPA, permittees will be given eighteen months for the preparation of their load reduction plans ('BLRPs' or 'CLRPs'). This extended timeframe for the development of a plan to initiate action seems unjustified, particularly in light of the delay in the approval of this TMDL. Permittees have known since 2007 that load reduction plans would be a cornerstone of implementing this TMDL. The delay caused by procedural issues relating to natural exceedance frequencies should not affect the development of plans to implement BMPs to control loading.

Additionally, we are disappointed with the lengthy 10+ year timeframe for the compliance schedule. Waiting a decade for final compliance is too long – these are ten years during which local residents and tourists' health will continue to be at risk. At a minimum, the compliance schedule should require interim reductions sooner than four years. The only required interim milestone is the 50 percent in five years. We believe that the 25 percent reduction milestone should not be optional ("The Regional Board may also include additional milestones for achieving exceedance frequency reductions (e.g., 25 and 75 percent"12). It should be a requirement. There is no justification for further delaying those reductions.

Response: The suggested revisions are appreciated, but current requirements are appropriate. Also, please see the response to Comment 80.

Comment 217

Inappropriate distinction between Anthropogenic Sources and Controllable Sources

Coastkeeper's February 5th 2008 comment letter outlined our concerns with the Technical Report and the Basin Plan Amendment's inappropriate conflation of the terms anthropogenic and uncontrollable. The revised version of the Technical Report continues to conflate these terms. We therefore, reiterate our concern made during the SAG process as well as our letter from February 5th, 2008. As we have already pointed out, whether a bacteria source is controllable is unrelated to its source. The purpose of RSAA and NSEA is to "address circumstances where natural uncontrollable sources of indicator bacteria are the cause of exceedances of indicator bacteria water quality objectives." Thus, the BPA and Technical Report exempt "uncontrollable" anthropogenic sources from regulation. This language confusion continues with the Technical Reports interchangeable use of 'natural' and 'uncontrollable'.

Therefore, we recommend that Staff correctly and consistently use these terms throughout the Technical Report, BPA, and supporting Appendices.

Response: The suggested revisions are appreciated, but current text is accurate. The topic is also addressed in the RSAA/NSEA Basin Plan amendment and technical report adopted under Resolution No. R9-2008-0028.

4.16 San Diego Chapter of the Sierra Club

Comment 218

Our review of the Draft Technical Report has found the acronym for "most probable number" MPN misspelled as "MNP" on page 63 and 68 for a total of 13 times.

Response: The recommended corrections will be made in the draft Technical Report.

4.17 U.S. Environmental Protection Agency

Comment 219

Exceedence Frequency. Like other bacterial indicator TMDLs (i.e., Santa Monica Bay, Los Angeles Harbor, Malibu Creek, etc.), these TMDLs uses the reference system approach and exceedence days as a way to account for the "natural, and largely uncontrollable sources of bacteria (e.g., bird and wildlife feces) in the loads generated in the watersheds and at the beaches that can, by themselves, cause exceedences of WQOs". However, whereas other bacteria TMDLs establish a fixed number of allowable exceedence days per year for each waterbody, the San Diego Bacteria TMDLs set an exceedence frequency. Specifically, the reference system approach is used to calculate the wet weather TMDLs by allowing a 22 percent exceedance frequency of the single sample maximum WQOs for REC-1, and the dry weather TMDLs are calculated using a zero percent allowable exceedance frequency. Although the concept is exactly the same and the TMDLs describe the calculation of exceedence days clearly (i.e., multiplying the exceedence frequency by the number of wet days for the critical period), the TMDLs lack an explanation of how compliance is determined (BPA, Pg. 53-56 and Technical TMDL Report, Section 11.3). Since each waterbody will have a variable number of exceedence days each year, when and how will compliance be assessed. Each permittee would not be able to evaluate their compliance until after the wet weather or dry weather period ends. Would regional board evaluate compliance at the end of each year or a determined wet and dry weather period? We strongly urge the regional board to provide a more detailed description of compliance determination to increase the success of dischargers' efforts towards attaining the water quality targets.

Response: Please see the responses to Comment 26 and in Section 2.7.1.

Comment 220

Compliance Determination and TMDLs Goals (BPA and Technical TMDL Report). These TMDLs establishes two primary goals: meeting the (1) exeedence frequency based on the numeric targets and (2) total maximum mass loads (MPN/year). Although a detailed explanation of exceedence frequency and required follow-up compliance monitoring is provided, the TMDLs are deficient in describing how and when mass loads need to be achieved. For instance, is compliance evaluation determined by meeting both the number of allowable exceedence days for a described period and the mass-based Total Allowable Load requirements (BPA, Tables on Pg A25-28)? We strongly recommend further explanation of how both goals will be evaluated for compliance determination during the TMDL Compliance Period.

Response: Please see the responses to Comments 9 and 92, and in Section 2.7.1.

Comment 221

Finding 3: Definition of Total Maximum Daily Load (BPA, Pg. 2 and A5, paragraph 5). We suggest inclusion of additional language in the last sentence to read, "For the purpose of developing information for all waters not identified on the 303(d) List, states are also required to estimate the total maximum daily load with seasonal variations and margin of safety." The current use of the single word, "TMDL", implies the development of a complete TMDL

Technical Report including an implementation plan; Section 303(d)(3) only defined the requirement to develop and estimate three elements of the TMDL, as described above.

Response: The revision will be made as suggested by the commenter.

Comment 222

Finding 4: Water Quality Standards Interpreted in TMDLs with Numeric Targets (BPA, Pg. 2 and A5, paragraph 6). We recommend in addition to clarifying that "numeric targets and TMDLs interpret water quality standards", but are not themselves water quality standards, we suggest that this section be expanded. The additional description should describe that numeric targets and TMDLs become enforceable requirements when included in WDR regulatory mechanisms (e.g., NPDES permits, Municipal stormwater MS4 permits, etc.).

Response: The following sentence will be added to the end of the paragraph:

> The water quality standards, TMDLs, WLAs, LAs, receiving water limits, numeric targets, and/or WQBELs developed in this project become enforceable requirements after they have been incorporated into the regulatory orders issued by the San Diego Water Board and/or State Water Board (e.g., waste discharge requirements, conditional waivers, etc.).

Comment 223

Finding 7: Relationship Between Bacteria and Pathogens (BPA, Pg. 3). In support of your conclusion on identifying a correlation between pathogens and the probability of disease, we suggest adding the following citations:

a) 2004 EPA Beach Act Rule;
b) USEPA. 1984. Health effects criteria for fresh recreational waters. EPA-600/1 84-004.

Response: The citations listed above will be added as footnotes for Finding 7.

Comment 224

Numeric Targets Section (BPA Pg A15). Please provide more specific details on the type of information and evidence needed to justify the "moderately to lightly used area" usage frequency for a freshwater creek, as required by dischargers.

Response: Please see the responses to Comment 106 and in Section 2.6.

Comment 225

Numeric Targets Section (BPA Pg A15-16). The rationale on setting the Single Sample Maximum bacterial indicator concentrations as the wet weather targets, and geometric means as the dry weather targets should be included in the basin plan amendment; this rationale is currently provided in the Technical TMDL Report on Pg 29-30.

Response: The second paragraph of Chapter 7 section (b) will be revised as follows:

> Different REC-1 WQOs were used as the basis for wet weather and dry weather allowable load (i.e., TMDL) calculations because the bacteria transport mechanisms to receiving waters are different under wet and dry weather conditions. Because wet weather conditions, or storm flow, are episodic and short in duration, and characterized by rapid wash-off and

transport of high bacteria loads, with short residence times, from all land use types to receiving waters, the single sample maximum WQOs were appropriate for use as wet weather numeric targets. For dry weather conditions, because dry weather runoff is not generated from storm flows, is not uniformly linked to every land use, and is more uniform than stormflow, with lower flows, lower loads, and slower transport, making die-off and/or amplification processes more important, the geometric mean WQOs were appropriate for use as dry weather numeric targets. Wet weather TMDL calculations were based on the REC-1 single sample maximum WQOs while dry weather TMDL calculations were based on REC-1 geometric mean WQOs.

Comment 226

Source Analysis Section (BPA Pg. A17). We recommend including a description on controllable and uncontrollable sources of bacteria, as described on Pg 4 of the Technical TMDL Report, to be added in the Basin Plan Amendment. We recommend the following specific language be added to the BPA as follows:

"Nonpoint sources were separated into controllable and uncontrollable categories. Controllable nonpoint sources are identified by land use types and coverages. Controllable nonpoint sources include land uses associated with agriculture, dairy/intensive livestock, and horse ranches (collectively referred to as agriculture land uses). These were considered controllable because the land uses are anthropogenic in nature, and load reductions can be reasonably expected with the implementation of suitable management measures. Uncontrollable nonpoint sources include loads from open recreation, open space, and water land uses (collectively referred to as open space land uses). Loads from these areas are considered uncontrollable because they come from mostly natural sources (e.g. bird and wildlife feces)."

Response: The paragraph above will be added after the first paragraph of Chapter 7 section (c) in the proposed Basin Plan amendment.

Comment 227

Wet Weather TMDL Allocations (BPA, Pg. A21 and Technical TMDL Report): Discharges from controllable land use categories that do not contribute more than five percent of the total existing mass load for all three indicator bacteria, the WLA or LA is set equal to the existing mass loads. Please provide a rationale for the use of five percent as the dividing line to set acceptable existing mass loads and critical contribution of mass loads from controllable sources.

Response: Please see the response to Comment 98.

Comment 228

Margin of Safety (BPA Pg. A24). The discussion on Margin of Safety considerations for developing wet weather and dry weather targets are extremely helpful to further explain how the selected targets are conservative and should protect water quality. We suggest the following two paragraphs be included in the Margin of Safety Section in the BPA:

"Because bacteria in wet weather runoff and streamflows have a quick travel time, and therefore, a short residence time in the waterbodies, the REC-1 single-sample maximum

WQOs were determined to be most appropriate for calculating the wet weather TMDLs. The numeric targets used for the wet weather mass-load based and concentration based TMDLs are assumed to be conservative by utilizing the most stringent REC-1 single sample maxmimum WQOs contained in the Ocean Plan and/or Basin Plan. (Technical TMDL Report, Pg. 72)"

"Because dry weather conditions have flows and bacteria loads much smaller in magnitude than wet weather conditions, do not occur from all land use types, and are more uniform than stormflow, the REC-1 30-day geometric mean WQOs were determined to be most appropriate for the dry weather TMDLs. The numeric targets used for the dry weather mass-load based and concentration based TMDLs are assumed to be conservative by utilizing the most stringent REC-1 30 day geometric mean WQOs contained in the Ocean Plan and/or Basin Plan. (Technical TMDL Report, Pg. 76)."

Response: The revision will be made as suggested by the commenter.

Comment 229

Alternative TMDL Compliance Schedules (BPA, Pg. A68 and Technical TMDL Report). This Implementation Plan provides an alternative extended compliance period of up to 20 years for wet weather bacteria TMDLs for those dischargers who undertake load reduction programs for multiple pollutant constituents. This discussion does not clarify if this extended compliance period will require subsequent regional board or EO approval. We recommend further clarification of the process for which such an extended time period is allowed.

Response: As discussed in the section referenced by the commenter, the proposed alternative compliance schedules, if appropriate, will be incorporated into the various TMDL implementing orders. Depending on the type implementing order, approval may only be required by the Executive Officer (e.g., cleanup and abatement orders, investigative orders), or more likely may require approval by the San Diego Water Board (e.g., waste discharge requirements, NPDES requirements, cease and desist orders).

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CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD SAN DIEGO REGION

RESOLUTION NO. R9-2012-0033

A RESOLUTION AMENDING *THE WATER QUALITY CONTROL PLAN FOR THE SAN DIEGO BASIN (9)* TO INCORPORATE THE TOTAL MAXIMUM DAILY LOAD FOR SEDIMENTATION IN LOS PEÑASQUITOS LAGOON

WHEREAS, The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), finds that:

1. **Water Quality Control Plan:** The federal Clean Water Act[1] (CWA) and state Porter-Cologne Water Quality Control Act[2] require the San Diego Water Board to establish water quality standards for each waterbody within its region. The water quality standards for coastal waters in the San Diego Region are established in the *Water Quality Control Plan for the San Diego Basin (9)* (Basin Plan) and in the *Water Quality Control Plan for Ocean Waters of California* (Ocean Plan). Water quality standards include beneficial uses, water quality objectives (WQOs), and the antidegradation policy. The Basin Plan contains programs of implementation to achieve water quality standards.[3] Waterbodies that do not meet water quality standards are considered impaired.

2. **Clean Water Act Section 303(d) List of Water Quality Limited Segments:** Pursuant to section 303(d) of the Clean Water Act, each state is required to identify impaired waters and establish a total maximum daily load (TMDL) at a level necessary to implement the applicable water quality standards.[4] Each state is required to develop a list that identifies and establishes a priority ranking for those waters requiring TMDLs.[5] The list is known as the CWA section 303(d) List of Water Quality Limited Segments or more commonly, the 303(d) List. For the specific purpose of developing information, states are also required to estimate TMDLs for all other waters that are not identified on the 303(d) List.[6]

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[1] Clean Water Act section 303; U.S. Code section 1313
[2] California Water Code section 13240
[3] See Water Code section 13050(j). A "Water Quality Control Plan" or "Basin Plan" consists of a designation or establishment for the waters within a specified area of all of the following: (1) Beneficial uses to be protected, (2) Water quality objectives and (3) A program of implementation needed for achieving water quality objectives.
[4] Clean Water Act section 303(d)(1)(C); U.S. Code section 1313(d)(1)(C)
[5] Code of Federal Regulations Title 40 section 130.7(b)(1)
[6] Clean Water Act section 303(d)(3) states that "For the specific purpose of developing information, each State shall identify all waters within its boundaries, which it has not identified under paragraph (1)(A) and (1)(B) of this subsection and estimate for such waters the total maximum daily load with seasonal variations and margin of safety..."

3. **Purpose and Definition of Total Maximum Daily Load (TMDL):** The purpose of a TMDL is to restore an impaired waterbody to water quality conditions under which applicable water quality standards can once again be attained. This is done by establishing and implementing a TMDL for the impairing pollutant. Generally, when the TMDL, numeric targets and associated pollutant allocations are attained, water quality standards in the waterbody should be restored. A TMDL is both (1) a calculation of the maximum loading capacity of the impaired waterbody for each impairing pollutant; and (2) an implementation plan to guide actions necessary to cleanup the waterbody and restore water quality standards.

4. **TMDL Basin Plan Amendment:** Upon establishment and approval of TMDLs, the state is required to incorporate TMDLs into the state water quality management plan.[7] Along with various applicable statewide water quality control plans, the Basin Plan for the San Diego Region serves as the water quality management plan for the watersheds under the jurisdiction of the San Diego Water Board. Incorporating TMDLs into the Basin Plan requires an amendment to the Basin Plan and the development of an Implementation Plan. The Implementation Plan must include a description of the actions necessary to achieve the applicable water quality objectives, a time schedule for the actions to be taken, and a description of the monitoring to be undertaken to determine compliance with the objectives.[8]

5. **Water Quality Impairment of Los Peñasquitos Lagoon:** As required by CWA section 303(d), the Los Peñasquitos Lagoon (Lagoon) was placed on the 1996 List of Water Quality Limited Segments due to sedimentation and siltation loads that exceeded water quality objectives. The beneficial uses that are most sensitive to increased sedimentation are estuarine habitat and preservation of biological habitats of special significance. Deposition of watershed sediment contributes to elevation increases within the Lagoon, which is a critical variable that determines the productivity and stability of these uses. Legacy sediments from construction activities within the lagoon (e.g., construction of the railway berms and construction and operation of access roads) also play a role in the Lagoon's sedimentation impairment.

   Other beneficial uses listed in the Basin Plan for the Lagoon include contact water recreation, non-contact water recreation, wildlife habitat, rare, threatened or endangered species, marine habitat, migration of aquatic organisms, spawning, reproduction and/or early development, and shellfish harvesting.

   Other impacts associated with increased and rapid sedimentation include: reduced tidal mixing within Lagoon channels, increased vulnerability to flooding for surrounding urban and industrial developments, increased turbidity associated with siltation in Lagoon channels, and constricted wildlife corridors.

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[7] Code of Federal Regulations Title 40 section 130.6(c)(1)

[8] Pursuant to the requirements of Article 3, commencing with section 13240, of Chapter 4 of the Porter-Cologne Water Quality Control Act, as amended, codified in Division 7, commencing with section 13000, of the Water Code

6. **Water Quality Objective:** The water quality objective for sediment is contained in the Basin Plan. The Basin Plan states, *"The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses."*

7. **Numeric Targets:** One or more quantitative numeric targets must be selected to calculate a TMDL for an impaired waterbody. Numeric targets are derived from and must be able to interpret and implement water quality standards (beneficial uses, water quality objectives, and the antidegradation policy). This means that attainment of the selected numeric targets in the impaired waterbody represents attainment of applicable water quality standards in the waterbody; i.e., when the numeric targets are met, the TMDL should be met, WQOs should be met and the beneficial uses should be restored. While numeric targets and TMDLs are derived from, represent, interpret, and implement water quality standards, they are not water quality standards.

   The narrative sediment water quality objective requires numeric targets to evaluate attainment of the objective. Consideration of various lines of evidence indicates that the Lagoon was likely achieving the water quality standard for sediment in the mid-1970s. Using land-use coverage and Lagoon mapping, a "reference condition" was developed to establish watershed and Lagoon conditions present during the mid-1970s.

   The historic land use distribution was used to calculate the watershed numeric target, which is expressed as 12,360 tons of sediment per wet period (211 days) or 58.6 tons per day. Lagoon mapping was used to establish the Lagoon numeric target, which is expressed as an increasing trend in the total area of tidal saltmarsh and non-tidal saltmarsh toward 346 acres. This target acreage represents 80 percent of the total acreage of tidal and non-tidal saltmarsh present in 1973. As of the year 2010, 262 acres of tidal saltmarsh and non-tidal saltmarsh are present in the Lagoon. The calculation and interpretation of the numeric target as an increasing trend in acreage takes into account other factors impacting the salt marsh habitat in the lagoon, as well as the length of time necessary to successfully restore the biological, physical, chemical, and hydrological structural characteristics of salt marsh habitat. The final lagoon numeric target requires the successful restoration of tidal and non-tidal salt marsh to achieve a lagoon total of 346 acres. This can either mean:
   1. Successful restoration of 80 percent of the 1973 acreage of lagoon salt marsh habitat (346 acres); or
   2. Demonstrate that implementation actions are active on and/or affecting 346 acres with continued monitoring to ensure 80 percent target achievement.

8. **Sources of Sediment:** Sources of sediment to the Lagoon include erosion of canyon banks, bluffs, scouring stream banks, and tidal influx. Some of these processes are exacerbated by anthropogenic disturbances, such as land

development within the watershed. Land development transforms the natural landscape by exposing sediment and converting pervious surfaces to impervious surfaces, which increases the volume and velocity of runoff resulting in scouring of sediment, primarily below storm water outfalls that discharge into canyon areas. Sediment loads are transported downstream to the Lagoon during storm events causing deposits on the salt flats and in Lagoon channels. These sediment deposits have gradually built-up over the years due to increased sediment loading and inadequate flushing, which directly and indirectly affects Lagoon functions and salt marsh characteristics.

9. **Watershed Point and Non-point Sediment Sources:** There are two broad categories of sediment sources to the Lagoon: 1) watershed sources, and 2) the Pacific Ocean. The watershed sources consist of all point and non-point sources of sediment in the watershed area draining to Los Peñasquitos Lagoon. The total sediment contribution from all watershed sources is presented as the total wasteload allocation (WLA). The sediment contributions from the Pacific Ocean are considered a background source and are presented as the Load Allocation (LA). Hence, the responsible parties are assigned the total WLA and are jointly responsible for meeting the wasteload reductions required in this TMDL project.

10. **Responsible Parties Identification:** Responsible parties include the following: Phase I Municipal Separate Storm Sewer Systems (MS4s) copermittees (the County of San Diego, City of San Diego, City of Del Mar, and City of Poway), Phase II MS4 permittees, Caltrans, general construction storm water National Permit Discharge Elimination System (NPDES) permittees, and general industrial storm water NPDES permittees.

11. **Linkage Analysis:** Reducing watershed sediment loads from the year 2000 levels to historic levels is a necessary component for restoring and providing long-term protection of the Lagoon's beneficial uses. Deposition of watershed sediment contributes to elevation increases within the Lagoon, leading to an increase in height relative to mean sea level. Elevation is a critical variable that determines the productivity and stability of saltmarshes. The long-term existence of the saltmarsh depends on the success of the dominant plants, such as *Sarcoconia pacifica* (also referred to as *Salicornia virginica*) and *Frankenia salina*, and their close relationship to sediment supply, sea level change, and tidal range.

    Reduced sediment loading consistent with the watershed numeric target will encourage the establishment of native vegetation in degraded areas. To represent the linkage between source contributions and receiving water response, models were developed to simulate source loadings and transport of sediment into the Lagoon. The models provide an important tool to evaluate year 2000 conditions, to evaluate historic conditions, and to calculate TMDL load reductions.

    The Lagoon was capable of assimilating these historic sediment loads under historic Lagoon conditions. Because the Lagoon has evolved through time and accumulated

over 40 years of watershed sediment loads, it cannot be assumed that the Lagoon, in the year 2010 conditions, can assimilate the same historic sediment loads. Evaluation of the extent of vegetation types in the Lagoon provides the necessary tool to assess how the Lagoon responds to watershed sediment load reductions and to establish a target Lagoon condition under which the Lagoon can again assimilate the historic sediment loads.

12. TMDL Allocations and Reductions:

Wasteload Allocations to Watershed = 2,580 tons/year

As the primary point source to the Lagoon, a wasteload allocation (WLA) of 2,580 tons/year was assigned to the responsible parties. A 67 percent sediment load reduction from the Year 2000 load to the historical (mid-1970s) load is required of the responsible parties.

Load Allocations to Ocean = 9,780 tons/year

The ocean is a nonpoint source of sediment to the Lagoon and was assigned a load allocation (LA) of 9,780 tons/year. Because the ocean is a natural background source, load reductions are not required of the ocean.

Margin of Safety = Implicit

Conservative assumptions were used in selecting the TMDL numeric targets to provide an implicit margin of safety,

13. TMDL Implementation, Monitoring, and Compliance: The Responsible Parties must develop a Load Reduction Plan that will establish a watershed-wide, programmatic, adaptive management approach for implementation. The plan will include a detailed description of implementation actions, as identified and planned by the responsible parties, to meet the requirements of this TMDL. All responsible parties are responsible for reducing their sediment loads to the receiving waterbody or demonstrating that their discharges are not causing exceedances of the wasteload allocation.

Monitoring is required to assess progress towards achieving the wasteload and load allocations and numeric targets. Furthermore, the monitoring program must be capable of monitoring the effectiveness of implementation actions to improve water quality and saltmarsh habitat and remediation actions to remove sediment from the Lagoon.

Full implementation of the TMDL for sediment must be completed within 20 years from the effective date of the Basin Plan amendment. This timeline takes into consideration the planning needs of the responsible parties and other stakeholders to establish a Load Reduction Plan, time needed to address multiple impairments, and provides adequate time to measure temporal disparities between reductions in upland loading and the corresponding Lagoon water quality response.

14. **Scientific Peer Review:** The scientific basis for this TMDL has undergone external peer review pursuant to Health and Safety Code section 57004. The San Diego Water Board has considered and responded to all comments submitted by the peer review panel and has enhanced the Staff Report appropriately. As a result of the peer review process, changes were made to the TMDL including inclusion of the Lagoon numeric target and revision of the adaptive management approach.

15. **California Environmental Quality Act Requirements:** Pursuant to Public Resources Code section 21080.5, the Resources Agency has approved the San Diego Water Board's basin planning process as a "certified regulatory program" that adequately satisfies the California Environmental Quality Act (CEQA) (Public Resources Code, section 21000 et seq.) requirements for preparing environmental documents [14 CCR 15251(g); 23 CCR 3782]. As such, the "substitute environmental documents" that support the San Diego Water Board's proposed basin planning action contain the required environmental documentation under CEQA [23 CCR 3777]. The substitute environmental documents include the environmental checklist, the detailed Staff Report, peer review and public comments and responses to comments, this resolution, and the Basin Plan Amendment. For CEQA purposes, the "project" is the adoption of a Basin Plan amendment establishing a TMDL for sediment in the Lagoon. The CEQA checklist and other portions of the substitute environmental documents contain significant analysis and numerous findings related to impacts.

16. **Program and Project-Level CEQA Analysis:** In preparing the substitute environmental documents, the San Diego Water Board has considered the requirements of Public Resources Code section 21159 and California Code of Regulations, Title 14, section 15187, and intends those documents to serve as a tier 1 environmental review. This analysis is not intended to be an exhaustive analysis of every conceivable impact, but an analysis of the reasonably foreseeable consequences of the adoption of this regulation, from a programmatic perspective. The "Lead" agencies for tier 2 projects will assure compliance with project-level CEQA analysis of this programmatic project. Project level impacts will need to be considered in any subsequent environmental analysis performed by other public agencies, pursuant to Public Resources Code section 21159.2.

17. **CEQA Findings:** The proposed Basin Plan amendment could have a potentially significant adverse effect on historical, archaeological, and paleontological resources. There are feasible mitigation measures that if employed, would substantially lessen the potentially-significant adverse impacts identified in the substitute environmental documents; however such mitigation measures are within the responsibility and jurisdiction of other public agencies, not the San Diego Water Board. When the parties responsible for implementing this TMDL determine how they will proceed, the parties responsible for those parts of the project can and should incorporate such mitigation into any subsequent projects or project approvals as part of the environmental review process. These mitigation measures are described in more detail in the substitute environmental documents included as

Attachment 3 of the Staff Report and incorporated herein to this Resolution (14 CCR 15091(a)(2)). Where any subsequent project requires approval by the San Diego Water Board, the San Diego Water Board will include sufficient mitigation measures to substantially lessen the potentially significant adverse impacts.

18. **Statement of Overriding Consideration:** To the extent significant adverse environmental effects could occur, the San Diego Water Board has balanced the economic, legal, social, technological, and other benefits of the TMDL against the unavoidable environmental risks and finds that specific economic, legal, social, technological, and other benefits of the TMDL outweigh the unavoidable adverse environmental effects, such that those effects are considered acceptable. The basis for this finding is more fully set forth in the substitute environmental documents, included as Attachment 3 of the Staff Report and incorporated herein to this Resolution (14 CCR section 15093).

19. **Economic Analysis:** The San Diego Water Board has considered the costs of the reasonably foreseeable methods of compliance with the load and wasteload allocations specified in this TMDL. The most reasonably foreseeable methods of compliance involve implementation of structural and non-structural controls. Surface water monitoring will be necessary to evaluate the effectiveness of these controls.

20. **Necessity Standard [Government Code section 11353(b)]:** Amendment of the Basin Plan to establish and implement the sediment TMDL for the Lagoon is necessary because the existing water quality in the Lagoon does not meet applicable water quality objectives for sediment. Clean Water Act section 303(d) requires the establishment and implementation of a TMDL under the water quality conditions that exist at the Lagoon. The TMDL for sedimentation is necessary to promote attainment of applicable water quality objectives and restoration of water quality needed to support the beneficial uses designated for the Lagoon.

21. **Stakeholder & Public Participation:** Interested persons and the public have had reasonable opportunity to participate in review of the proposed TMDL. Efforts to solicit public review and comment included a public workshop and CEQA scoping meeting on February 15, 2011, multiple meetings with the Stakeholder Advisory Group, a public review and comment period consisting of 46 days, and a public hearing on June 13, 2012. Notices for all meetings were sent to interested parties including cities and counties with jurisdiction in the Los Peñasquitos watershed. All of the written comments submitted to the San Diego Water Board during the review and comment periods have been considered.

22. **Public Notice:** The San Diego Water Board has notified all known interested parties and the public of its intent to consider adoption of this Basin Plan amendment in accordance with Water Code section 13244.

NOW, THEREFORE, BE IT RESOLVED THAT

1. **Environmental Documents Certification:** The substitute environmental documents prepared pursuant to Public Resources Code section 21080.5 are hereby certified, and the Executive Officer is directed to file a Notice of Decision with the Resources Agency after State Water Resources Control Board (State Water Board), and Office of Administrative Law (OAL) approval of the Basin Plan amendment, in accordance with section 21080.5(d)(2)(E) of the Public Resources Code and the California Code of Regulations, Title 23, section 3781.

2. **Amendment Adoption:** The San Diego Water Board hereby adopts the attached Basin Plan amendment as set forth in Attachment A hereto to establish a sediment TMDL for the Lagoon.

3. **Agency Approvals:** The Executive Officer is directed to submit this Basin Plan amendment to the State Water Board in accordance with Water Code section 13245.

4. **Non-Substantive Corrections:** If, during the approval process for this amendment, the San Diego Water Board, the State Water Board, or the OAL determines that minor, non-substantive corrections to the language of the amendment are needed for clarity or consistency, the Executive Officer may make such changes, and shall inform the San Diego Water Board of any such changes.

I, David W. Gibson, Executive Officer, do hereby certify the foregoing is a full, true and correct copy of a Resolution adopted by the California Regional Water Quality Control Board, San Diego Region, on June 13, 2012.

David W. Gibson
Executive Officer

ATTACHMENT A
TO RESOLUTION NO. R9-2012-0033

AMENDMENT TO THE *WATER QUALITY CONTROL PLAN FOR THE SAN DIEGO BASIN (9)* TO INCORPORATE THE SEDIMENT TOTAL MAXIMUM DAILY LOAD (TMDL) FOR LOS PEÑASQUITOS LAGOON

This Basin Plan amendment establishes a sediment Total Maximum Daily Load (TMDL) and associated load and wasteload allocations for Los Peñasqutios Lagoon (Lagoon). This amendment includes a program to implement the TMDL and monitor its effectiveness. Chapters 2, 3, and 7 of the Basin Plan are amended as follows:

Chapter 2, *Beneficial Uses*

Table 2-3. *Beneficial Uses of Coastal Waters*
Consecutively number and add the following footnote to Los Peñasqutios Lagoon in Table 2-3:

> Los Peñasquitos Lagoon is designated as a water quality limited segment for sediment pursuant to Clean Water Act section 303(d). A Total Maximum Daily Load has been adopted to address this impairment. See Chapter 3, *Water Quality Objectives*, section entitled "Water Quality Objectives for Sediment." See also Chapter 7, *Total Maximum Daily Loads, section entitled "*Sediment Total Maximum Daily Load for Los Peñasqutios Lagoon."

Renumber any footnotes in Table 2-3 displaced by this new footnote.

Chapter 3, Water Quality Objectives

Water Quality Objectives for Sediment:
Add a second paragraph as follows:

> Los Peñasquitos Lagoon is designated as an impaired water body for sediment pursuant to Clean Water Act section 303(d). A Total Maximum Daily Load has been adopted to address this impairment. See Chapter 2, Beneficial Uses Table 2-3. Beneficial Uses of Coastal Waters, Los Peñasqutios Lagoon, Hydrologic Unit Basin Number 6.10. See also Chapter 7, *Total Maximum Daily Loads, section entitled "Sediment Total Maximum Daily Load for Los Peñasqutios Lagoon."*

Chapter 7, *Total Maximum Daily Loads*

On June 13, 2012, the San Diego Water Board adopted ***Resolution No. R9-2012-0033, A Resolution Amending the Water Quality Control Plan For The San Diego Basin (9) to Incorporate the Sediment Total Maximum Daily Load for Los Peñasquitos Lagoon.*** The TMDL Basin Plan Amendment was subsequently approved by the State Water Resources Control Board (State Board) on [Insert date], the Office of Administrative Law (OAL) on [Insert date], and the USEPA on [Insert date]. For purposes of state law, Resolution No. R9-2012-0033 became effective following OAL approval on [Insert date],

Technical TMDL Analysis

Component	Key Findings and Regulatory Provisions
Problem Statement	Under section 303(d) of the Clean Water Act (CWA), states are required to identify waters whose beneficial uses have been impaired due to specific constituents. Los Peñasquitos Lagoon was placed on the Section 303(d) list of Water Quality Limited Segments in 1996 for sedimentation and siltation with an estimated 469 acres affected. The Lagoon is subject to the development of a total maximum daily load (TMDL) (US EPA, 2009). The Lagoon is an estuarine system that is part of the Torrey Pines State Natural Reserve. In addition to its marine influence, the Lagoon receives freshwater inputs from an approximately 60,000-acre watershed comprised of three major canyons (Carroll Canyon, Los Peñasquitos Canyon, and Carmel Canyon). Given the status of "Natural Preserve" by the California State Parks, the Lagoon is one of the few remaining native saltmarsh lagoons in southern California, providing a home to several endangered species (California State Parks, 2009). The Lagoon is ecologically diverse, supporting a variety of plant species, and provides nursery grounds and habitat for numerous bird, fish, and small mammal populations. The Lagoon also serves as a stopover for the Pacific Flyway, offering migratory birds a safe place to rest and feed, as well as providing refuge for coastal marine species that use the Lagoon to feed and hide from predators. The San Diego Basin Plan states, "The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses." Beneficial uses listed in the Basin Plan for the Lagoon include contact water recreation; non-contact water recreation (although access is not permitted in

Component	Key Findings and Regulatory Provisions
	some areas per California State Parks); preservation of biological habitats of special significance; estuarine habitat; wildlife habitat; rare, threatened or endangered species; marine habitat; migration of aquatic organisms; spawning, reproduction and/or early development; and shellfish harvesting. The beneficial uses that are most sensitive to increased sedimentation are estuarine habitat (EST) and preservation of biological habitats of special significance (BIOL). Estuarine uses may include preservation or enhancement of estuarine habitats, vegetation, fish, shellfish, or wildlife (such as marine mammals or shorebirds). Impacts associated with increased and rapid sedimentation include: reduced tidal mixing within Lagoon channels, degraded and (in some cases) net loss of saltmarsh vegetation, increased vulnerability to flooding for surrounding urban and industrial developments, increased turbidity associated with siltation in Lagoon channels, and constricted wildlife corridors. The Los Peñasquitos Lagoon Enhancement Plan and Program (1985), San Diego Basin Plan, and Clean Water Act section 303(d) highlight sedimentation as a significant impact associated with urban development and a leading cause in the rapid loss of saltmarsh habitat in the Lagoon. Sediment reduction is a management priority. The Lagoon's 565 acres include 262 acres of tidal saltmarsh (including salt panne, tidal channels, and mudflats) and non-tidal saltmarsh and 132 acres of freshwater marsh, herbaceous wetland, and woody riparian (for example southern willow scrub and mulefat scrub) habitats. The remaining 171 acres of saltmarsh and brackish marsh vegetation are impaired by excessive sedimentation, which converted the coastal saltmarsh to *Lolium perenne* infested non-tidal saltmarsh, freshwater marsh, and woody riparian habitats. (California State Parks, 2011) The environmental processes that support wetland habitats in the Lagoon have been altered by urban development in three ways: 1) Increase in the volume and frequency of freshwater input, 2) Increase in sediment deposition, and 3) Decrease in the tidal prism. These factors have led to decreases in tidal and non-tidal saltmarsh habitats and increases in freshwater habitats and the abundance of non-native species.

Component	Key Findings and Regulatory Provisions
Numeric Target	**<u>Numeric Target</u>** The sediment water quality standard applies to sediment loading to the Lagoon and the accumulation of sediment in the Lagoon. The minimum protective target would be to reduce watershed sediment loads to non-anthropogenic levels and return the Lagoon to non-anthropogenic conditions with consideration given to background loading and other factors that also lend to impairment of beneficial uses. The numeric targets are calculated upon the historic condition (mid-1970s) when the sediment water quality standard was once met. A historic coverage for the Los Peñasquitos watershed was developed for this period using US Geological Survey topographic maps from the 1970s. This land-use distribution was used to calculate the watershed numeric target using the LSPC watershed model. This historic (mid-1970s) sediment load of 12,360 tons per critical wet period (211 days), or 58.6 tons per day, represents the sediment TMDL watershed numeric target. An analysis of the vegetation types present in the Lagoon was developed for the mid-1970s using historic aerial photographs from which the Lagoon numeric target was calculated. The Lagoon numeric target is expressed as an increasing trend in the total area of tidal and non-tidal saltmarsh toward 346 acres. This target acreage represents 80 percent of the total acreage of tidal and non-tidal saltmarsh present in 1973.
Sources and Responsible Parties	**<u>Watershed Point and Non-point Sediment Sources</u>** Sources of sediment include erosion of canyon banks, exposed soils, bluffs, scouring stream banks, and tidal influx. Some of these processes are exacerbated by anthropogenic disturbances, such as land development within the watershed. Land development transforms the natural landscape by exposing sediment and converting pervious surfaces to impervious surfaces, which increases the volume and velocity of runoff resulting in scouring of sediment, primarily below storm water outfalls that discharge into canyon areas. Sediment loads are transported downstream to the Lagoon during storm events causing deposits on the salt flats and in Lagoon channels. These sediment deposits have gradually built-up over time due to increased sediment loading and inadequate flushing, which directly and indirectly affects Lagoon functions and salt marsh characteristics.

Component	Key Findings and Regulatory Provisions
	There are two broad categories of sediment sources to the Lagoon: 1) watershed sources, and 2) the Pacific Ocean. The watershed sources consist of all of point and non-point sources of sediment in the watershed area draining to Los Peñasquitos Lagoon. The total sediment contribution from all watershed sources, currently, is presented as the total wasteload allocation (WLA). The watershed sources of sediment due to past historical activities that have resulted in accumulated sediment in the Lagoon over time are presented as the Watershed Load Allocation (LA). This source also includes, but is not limited to, in-Lagoon erosion and scouring. Since this loading could not be estimated given the limited data, the Lagoon numeric target is set as the compliance point for meeting this Watershed Load Allocation. The sediment contributions from the Pacific Ocean are considered a background source and are presented as the Load Allocation from the Ocean (LA). Hence, the responsible parties were assigned the total WLA and are jointly responsible for meeting the wasteload reductions required in this TMDL project. **<u>Responsible Parties</u>** Responsible parties include the following: Phase I Municipal Separate Storm Sewer Systems (MS4s) copermittees (the County of San Diego, City of San Diego, City of Del Mar, and City of Poway), Phase II MS4 permittees, Caltrans, general construction storm water NPDES permittees, and general industrial storm water NPDES permittees.
Linkage Analysis	**<u>Linkage Analysis</u>** Reducing watershed sediment loads from the year 2000 levels to historic levels is a necessary component for restoring and providing long-term protection of the Lagoon's beneficial uses. Deposition of watershed sediment contributes to elevation increases within the Lagoon, leading to an increase in height relative to mean sea level. Elevation is a critical variable that determines the productivity, diversity, and stability of saltmarshes. The long-term existence of the saltmarsh depends on the success of the dominant plants, such as *Sarcoconia pacifica* (also referred to as *Salicornia virginica*) and *Frankenia salina*, and their close relationship to sediment supply, soil salinity, sea level change, and tidal range. Reduced sediment loading consistent with the watershed numeric target will encourage the establishment of native vegetation in degraded areas. To represent the linkage between source

Component	Key Findings and Regulatory Provisions
	contributions and receiving water response, models were developed to simulate source loadings and transport of sediment into the Lagoon. The models provide an important tool to evaluate year 2000 conditions, to evaluate historic conditions, and to calculate TMDL load reductions. The Lagoon was capable of assimilating these historic sediment loads under historic Lagoon conditions. Because the Lagoon has evolved through time and accumulated over 40 years of watershed sediment loads, it cannot be assumed that the Lagoon, in the year 2010 conditions, can assimilate the same historic sediment loads. Evaluation of the extent of vegetation types in the Lagoon provides the necessary tool to assess how the Lagoon responds to watershed sediment load reductions and to establish a target Lagoon condition under which the Lagoon can again assimilate the historic sediment loads.
TMDL, Allocations, and Load Reductions	**TMDL = 12,360 tons of sediment per year** The maximum load of sediment that Los Peñasquitos Lagoon can receive from all sources and still meet the sediment water quality objective is 12,360 tons per year. **Wasteload Allocations to Watershed = 2,580 tons/year** As the primary point source to the Lagoon, a wasteload allocation (WLA) of 2,580 tons/year was assigned to the responsible parties. A 67 percent sediment load reduction from the Year 2000 load to the historical (mid-1970s) load is required of the responsible parties. **Load Allocations to Ocean = 9,780 tons/year** The ocean is a nonpoint source of sediment to the Lagoon and was assigned a load allocation (LA) of 9,780 tons/year. Because the ocean is a natural background source, load reductions are not required of the ocean. **Watershed Load Allocations to Lagoon** Past historical watershed loading has led to accumulated sediment, erosion, and scouring in the Lagoon causing impairment to the Lagoon habitats. The Lagoon numeric target is set as the compliance for this LA: maintain at least 346 acres of tidal and non-tidal saltmarsh, represents 80 percent of the total acreage of tidal and non-tidal saltmarsh present in 1973.

Component	Key Findings and Regulatory Provisions
	Margin of Safety = Implicit Conservative assumptions were used in selecting the TMDL numeric targets to provide an implicit margin of safety.
Critical Conditions	**Critical Location** Due to the variability and dynamic nature of conditions within the Lagoon (e.g., mouth closures, tidal fluctuations, sediment fate and transport, etc.), the entire modeled Lagoon area was assessed as the critical location. Load reductions for sediment were based on achieving the numeric TMDL target across the Lagoon. **Critical Condition** The wet season that includes the 1993 El Nino storm events (October 1, 1992-April 10, 1993) was selected as the critical condition time period for TMDL development. This is one of the wettest periods on record over the past several decades. Because of the large amount of rainfall, sediment loads were significantly higher during this period than in other years with less rainfall.
Seasonal Considerations	**Seasonal Considerations** Sources of sediment are similar for both dry and wet weather seasons (the two general seasons in the San Diego region). Despite the similarity of wet/dry sources, transport mechanisms can vary between the two seasons. Throughout the TMDL monitoring period, the greatest transport of sediment occurred during rainfall events. It is recognized that dry weather will contribute a de minimis discharge of sediment; however, model calibration and TMDL development focused on wet weather conditions as sediment transport is dramatically higher during wet weather.
Margin of Safety	**Margin of Safety (MOS)** An implicit MOS was incorporated through application of conservative assumptions.

Implementation Plan

Component	Key Findings and Regulatory Provisions
Implementation Actions	**Actions San Diego Water Board May Take** The San Diego Water Board may exercise any of its authorities under the Water Code to compel responsible parties to comply with this TMDL.

Component	Key Findings and Regulatory Provisions
	Responsible Parties Identification Under this TMDL, the responsible parties are collectively assigned a single WLA, which they are responsible for meeting. An aggregate WLA allows for flexibility in achieving the load reduction required to meet the TMDL and improve Lagoon conditions. Responsible parties include: Phase I MS4 copermittees (the County of San Diego, City of San Diego, City of Del Mar, and the City of Poway), Phase II MS4 permittees, Caltrans, and the General Construction and General Industrial Storm Water NPDES permittees. The San Diego Water Board encourages cooperation among all the responsible parties. All the responsible parties in the Los Peñasquitos watershed must reduce their collective sediment load. Responsible parties include, but are not limited to, specific identification of General construction and industrial stormwater permittees, such as sand and gravel operation facilities in the watershed *that have capacity for long-term potential loadings into the watershed*. The San Diego Water Board recommends all parties enter into a Memorandum of Understanding (MOU), or a similar formal joint effort, to collaboratively and more successfully implement the adaptive management framework. All responsible entities identified must submit a Comprehensive Load Reduction Plan (CLRP) or SWPPP as appropriate and are strongly encouraged to jointly submit a CLRP to the San Diego Water Board within 18 months of the effective date of the TMDL. The San Diego Water Board expects responsible parties to cooperate in TMDL implementation (e.g., load reduction, lagoon monitoring, lagoon restoration) as necessary to achieve compliance with this TMDL. Responsible Parties that have or are likely to cause or contribute to the CWA Section 303(d) listed impairment for sediment, and are not participating in TMDL implementation, shall be compelled to meet their compliance obligations through other regulatory authorities of the San Diego Water Board. Any Responsible Party identified is required to develop pollutant reduction plan that includes description and schedule for implementing BMPs to reduce sediments from being discharged from their facility, property, etc. The plan must describe how the

Component	Key Findings and Regulatory Provisions
	facility plans to meet the water quality objectives and pollutant reductions set forth in the TMDL. Any Responsible Party as identified for this TMDL shall contribute information regarding the amount of sediments/sedimentation from their facility/entity. This may be produced from existing monitoring plans or by developing a monitoring plan for those entities that currently do not have any discharge monitoring on site. The TMDL has identified a "collective" wasteload allocation that includes several sources of sediments into the watershed. By developing individual site/permitee monitoring plans for flow and TSS discharges, it will be feasible to estimate individual site contributions in the future. Monitoring should address, at minimum, representative values of flow rates and TSS concentrations from the individual permittee's site(s) whenever long-term discharges occur. Individual industrial facilities and construction sites are subject to regulation on two levels: (1) The San Diego Water Board is responsible for ensuring MS4 copermittees comply with the MS4 requirements in the MS4 storm water permit; and (2) each local municipality is responsible, under the MS4 storm water permit, for enforcing its own ordinances and permits (for violations of its ordinances/permits by an individual industrial facility or construction site within its jurisdiction). The San Diego Water Board is also responsible for enforcing the statewide General Industrial and Construction Storm Water NPDES Permits within its jurisdiction. The San Diego Water Board relies upon the municipality to enforce its ordinances/permits and then work with the municipality to coordinate information and actions to compel compliance. **Phased Implementation via the Adaptive Management Approach** A common problem in natural resource management involves a temporal sequence of decisions (or implementation actions), in which the best action at each decision point depends on the state of the managed system. Adaptive management is a structured iterative implementation process that offers flexibility for responsible parties to monitor implementation actions, determine the success of such actions and ultimately, base future management decisions upon the measured results of completed implementation actions and the current state of the system. This process enhances the understanding and estimation of predicted

Component	Key Findings and Regulatory Provisions
	outcomes and ensures refinement of necessary activities to better guarantee desirable results. In this way, understanding of the resource can be enhanced over time, and management can be improved. Adaptive management entails applying the scientific method to the TMDL. A National Research Council review of US EPA's TMDL program strongly suggests that the key to improving the application of science in the TMDL program is to apply the scientific method to TMDL implementation (NRC 2001). For a TMDL, applying the scientific method involves 1) taking immediate actions commensurate with available information, 2) defining and implementing a program for refining the information on which the immediate actions are based, and 3) modifying actions as necessary based on new information. This approach allows the Lagoon to make progress toward attaining water quality standards while regulators and stakeholders improve the understanding of the system through research and observation of how it responds to the immediate actions. Implementation actions to achieve the required WLA and improve the specified numeric targets will be implemented via an iterative process, whereby the information collected at each step will be used to inform the implementation of the next phase. The project will be adjusted, as necessary, based on the latest information collected to optimize the efficiency of implementation efforts. Ultimately, the path moving forward is to create the physical conditions related to remediating sediment impacts associated with this TMDL. The implementation effort can be divided into three primary phases for this TMDL, as described below: • Phase I Implementation includes elements to reduce the amount of sediment that is transported from the watershed to the Lagoon. An important component of Phase I will be to secure the relationships and agreements between cooperating parties and to develop a detailed scope of work with priorities. Phase I includes the following elements: o Incorporate interim limits into WDRs and NPDES permits; o Implement structural and nonstructural BMPs throughout the watershed; and o Develop and initiate a comprehensive monitoring program, which includes compliance monitoring and targeted special studies.

Component	Key Findings and Regulatory Provisions
	If appropriate, the TMDL will be reconsidered by the San Diego Water Board at the end of Phase I to consider completed special studies or policy. • Phase II includes the implementation of additional watershed actions that are targeted to reducing sediment loads from high priority areas, as well as lagoon-specific actions that may be needed to facilitate recovery of beneficial uses that have been affected by various complex processes, including sedimentation, nuisance flows, reduced tidal circulation, and other factors. These actions may include Lagoon sediment remediation efforts, re-connecting the Lagoon's historic tidal channels, and maintenance of the Lagoon inlet in collaboration with State Parks, the San Diego Water Board, the Los Angeles-San Diego-San Luis Obispo (LOSSAN) Rail Corridor Agency, US EPA, and the watershed responsible parties. Phase II may also include additional upstream protections and BMP implementation to further reduce watershed sediment contributions. Responsible parties will develop, prioritize, and implement Phase II elements based on data from compliance monitoring and special studies. • Phase III includes implementation of secondary and additional remediation actions, as necessary, to be in compliance with the required WLA allocation by the end of the compliance schedule. **Develop and Submit a Load Reduction Plan** Responsible parties are required to prepare and submit for San Diego Water Board review, comment, and revision, a Load Reduction Plan that demonstrates how they will comply with this TMDL. The San Diego Water Board expects that Load Reduction Plans will be developed collaboratively by the responsible parties within the watershed. The Load Reduction Plan shall be submitted to the San Diego Water Board within 18 months of the TMDL effective date, and reviewed by the San Diego Water Board Executive Officer within six months of submittal (this period will likely include a round of revisions by the responsible parties based on San Diego Water Board staff comments). The Load Reduction Plan shall establish a watershed-wide, programmatic, adaptive management approach for implementation and include a detailed description of

Component	Key Findings and Regulatory Provisions
	implementation actions, identified and planned by the responsible parties, to meet the requirements of this TMDL. Implementation actions identified by the Load Reduction Plan may include source control techniques, structural and/or non-structural storm water BMPs, and/or special studies that refine the understanding of sediment and pollutant sources within the watershed. The Load Reduction Plan shall include a description and objective of each implementation action, potential BMP locations, a timeline for project or BMP completion, and a monitoring plan to measure the effectiveness of implementation actions. Storm Water Pollution Prevention Plans (SWPPPs) prepared by Phase II MS4s, Industrial Permittees, and Construction Permittees pursuant to their respective statewide general NPDES permits fulfill these entities responsibility to prepare a Load Reduction Plan. Permittees within the Los Peñasquitos watershed shall update their SWPPPs within 12 months of the TMDL effective date with any additional BMPs, monitoring, etc. to account for their site's potential to impact the receiving waterbody with respect to sediment. Sites identified through monitoring data or site inspections as posing an increased risk to the receiving water body may be directed to perform additional monitoring by the San Diego Water Board Executive Officer to quantify sediment load contributions to the receiving waterbody. **Comprehensive Approach** The comprehensive approach to the Load Reduction Plan requires that implementation efforts address all current TMDLs, current 303(d) listed waterbody/pollutant combinations, and other targeted impairments within the Los Peñasquitos watershed. A comprehensive approach to the Load Reduction Plan is consistent with implementation planning currently underway to address all of the impaired segments that were included in the approved bacteria TMDLs for San Diego Region Beaches and Creeks (San Diego Water Board, 2010). The comprehensive approach to the Load Reduction Plan allows the responsible parties to proactively address other listed impairments within the watershed, which requires special studies to investigate sources and the water quality improvements needed to address these pollutants. Such special studies may significantly alter current understanding and refine the TMDL loading and/or allocations. This can impact the selection of subsequent implementation actions and how they are prioritized

Component	Key Findings and Regulatory Provisions
	by responsible parties. A comprehensive approach to development of the Load Reduction Plan will provide a more cost effective and efficient approach for TMDL implementation and will have fewer potential environmental impacts associated with construction of structural BMPs (San Diego Water Board, 2010). **Load Reduction Plan Framework** With increased land development and inadequate management of runoff from impervious areas, increasing amounts of sediment are deposited into the Lagoon annually. To minimize the effects of runoff, proper sediment control can be achieved through the execution of implementation actions such as BMPs. Sediment implementation actions can be grouped into the four categories as summarized below. 1) *Preservation and Restoration:* Significant areas of land have been set aside for open space. Such land acquisition and preservation prevents natural areas from being developed and disturbed. Additionally, the restoration of riparian buffers and wetlands can include the stabilization of steep slopes with native riparian vegetation. This not only helps restore the habitat but also the natural function of the stream. 2) *Education & Outreach:* As a source control technique, education and outreach can function as pollution prevention to reduce or eliminate the amount of sediment generated at its source. Education and outreach can be targeted at specific land user groups and/or staff involved with site maintenance. As an example, implementation actions such as municipal incentives can be used to encourage proper irrigation and landscaping and can significantly reduce volumes of runoff. 3) *Retrofitting, New Development, & Site Management:* Land development (MS4 contribution) is the primary source of anthropogenic sediment contribution above historical conditions. Development can expose sediment and contribute excessive amounts of sediment to the Lagoon. Additionally, increased imperviousness associated with development can lead to increased storm water runoff and soil erosion or gullying within the MS4 and receiving waters. Appropriate site management can partially or fully mitigate the effects of development. The Load Reduction Plan must identify and prioritize BMPs based on an analysis of opportunities and cost/benefit considerations. Furthermore, the Load Reduction Plan must detail BMP

Component	Key Findings and Regulatory Provisions
	projects and locations. Storm water BMPs can be implemented to reduce the effects of pollutant loading and increased storm water flows from development. Structural BMPs include incorporation of low impact development (LID) and storm flow hydrograph matching into new projects. The same structural BMPs can be utilized to retrofit existing sites or be applied as regional MS4 BMPs to treat pollutants and/or flows prior to discharge into receiving waters. 4) *Monitoring:* A coordinated monitoring plan is needed to establish existing watershed conditions (baseline conditions) from which future changes and anticipated improvement in water quality can be measured. Additional monitoring could focus on sensitive species, areas of saltmarsh coverage, extent of invasive plant species, BMP effectiveness, and/or reduction in impervious coverage. Additionally, monitoring is crucial in the assessment of implementation actions to gain an understanding of performance for future adaptive management actions. **<u>Load Reduction Plan Implementation</u>** The Load Reduction Plan must be implemented within 90 days upon receipt of San Diego Water Board comments and recommendation, but in any event, no later than 6 months after submittal. **<u>Monitoring</u>** Monitoring is required to measure the progress of pollutant load reductions and improvements in water and saltmarsh habitat acreage. The information presented below is intended to be a brief overview of the goals of the monitoring. Special studies may be planned to improve understanding of key aspects related to achievement of WLAs and LAs, restore the beneficial uses, and to assist in the modification of structural and non-structural BMPs if necessary. The goals of monitoring include: 1) To determine compliance with the assigned wasteload and load allocations. 2) To monitor the effect of implementation actions proposed by responsible parties to improve water and saltmarsh habitat quality including proposed structural and non-structural BMPs to reduce storm water run-off and sediment loading, and remediation actions to remove sediment from the Lagoon.

Component	Key Findings and Regulatory Provisions
	3) To monitor the extent of vegetation habitat acreages in the Lagoon and determine if additional implementation action should be required. 4) To implement the monitoring in a manner consistent with other TMDL implementation plans and regulatory actions within the Los Peñasquitos watershed. The proposed monitoring program shall be included in the Load Reduction Plan submitted to the San Diego Water Board Executive Officer for review. *Watershed Monitoring* Responsible parties must conduct suspended sediment, bedload, and flow monitoring to calculate total sediment loading to the Lagoon for each wet period (October 1 thru April 30) throughout the 20-year compliance period. The responsible parties must monitor enough storm events throughout to quantify sediment loading over each wet period. The compliance point for the WLA shall be the Lagoon as measured through the cumulative sediment loading from Los Peñasquitos, Carroll Canyon, and Carmel Creeks prior to entering the Lagoon. The responsible parties must monitor as many stations as necessary to quantify sediment loading to the Lagoon. Because of the natural variability in sediment delivery rates, sediment loading shall be evaluated using a 3-year, weighted rolling average. The first average must be calculated following the third critical wet period after the TMDL effective date. Responsible parties are encouraged to collaborate or coordinate their efforts with other regional and local monitoring programs to avoid duplication and reduce associated costs. *Lagoon Monitoring* The responsible parties shall monitor the Lagoon annually in the Fall for changes in extent of the vegetation types. Aerial photos of the Lagoon must be acquired, digitized onscreen (at an approximate 1:2,500 scale), interpreted, and mapped into generalized classifications. Vegetation types must be classified as saltmarsh, non-tidal saltmarsh, freshwater marsh, non-tidal saltmarsh – *Lolium perrene* infested, freshwater marsh, southern willow scrub/mulefat scrub, herbaceous wetland, or upland land cover (urban, beach, dune, upland vegetation, etc.). Vegetation

Component	Key Findings and Regulatory Provisions
	type classifications are described in the *Sediment TMDL for Los Peñasquitos Lagoon Staff Report*. Ground truthing may be performed after aerial photo interpretation to distinguish between vegetation types. **Compliance Schedule** The implementation schedule for this TMDL follows the form of an adaptive management strategy, tracks implementation progress with established milestones or interim goals, and sets forth a final compliance date. It is impractical for land managers to actually measure sediment loading on a daily basis; thus, compliance with the TMDL is most appropriately expressed as an average annual load and should be evaluated as a long-term running average to account for natural fluctuations and inaccuracies in estimating sediment loads. Pursuant to State Board Resolution No. 2000-015 and 2000-030 a TMDL compliance schedule must be as short as practicable, but in no case shall it exceed 20 years from the effective date of the Basin Plan amendment. This timeline in Table {Insert Table number} takes into consideration the planning needs of the responsible parties and other stakeholders to establish a Load Reduction Plan, time needed to address multiple impairments, and provides adequate time to measure temporal disparities between reductions in upland loading and the corresponding Lagoon water quality response. Current studies and other implementation actions or projects are underway to reduce sediment loading to the Lagoon and to gain a better understanding of source contributions. A variety of such projects will continue throughout the development of the Load Reduction Plan, ensuring there are no gaps in implementation efforts throughout the process. At the end of the TMDL compliance schedule, as outlined in Table {insert table number}, waters must meet the Lagoon's sediment water quality standard and therefore, the Lagoon numeric target. The final lagoon numeric target requires the successful restoration of tidal and non-tidal salt marsh to achieve a lagoon total of 346 acres. This can either mean: 1. Successful restoration of 80 percent of the 1973 acreage of lagoon salt marsh habitat (346 acres); or 2. Demonstrate that implementation actions are active on and/or affecting 346 acres with continued monitoring to ensure 80 percent target achievement.

Component	Key Findings and Regulatory Provisions
	If at any point during the implementation plan, monitoring data or special studies indicate that WLAs or LAs will be attained but the Lagoon numeric target may not be achieved, the San Diego Water Board shall reconsider the TMDL to modify WLAs and LAs to ensure that the Lagoon numeric target is attained.

Table {Insert table number}. Los Peñasquitos Lagoon Sediment TMDL Implementation Compliance Schedule

Item	Implementation Action	Responsible Party	Date
1	Obtain approval by OAL of Los Peñasquitos Lagoon Sediment TMDL = Establishes effective date of TMDL	San Diego Water Board, San Diego County, City of San Diego, City of Poway, City of Del Mar, Caltrans, General Storm Industrial and Construction permittees	Estimated June 2013
2a	Issue, reissue, or revise general WDRs and NPDES requirements for Phase I MS4s, including Caltrans, to incorporate requirements for complying with TMDL and WLAs	San Diego Water Board and State Water Board	Completed during permit renewal - within 5 years of applicable permit date, and every 5 years thereafter.
2b	Issue, reissue, or revise general WDRs and NPDES requirements for Construction and Industrial NPDES to incorporate requirements for complying with TMDL and WLAs	San Diego Water Board and State Water Board	Completed during permit renewal - within 5 years of applicable permit date, and every 5 years thereafter.
2c	Issue, reissue, or revise general WDRs and NPDES requirements for Phase II NPDES permittees to incorporate requirements for complying with TMDL and WLAs	San Diego Water Board and State Water Board	Completed during permit renewal - within 5 years of applicable permit date, and every 5 years thereafter.
3a	Completion of Load Reduction Plans	Phase 1 MS4s and Caltrans	Within 18 months of OAL effective date

Component	Key Findings and Regulatory Provisions			
				for sediment TMDL
	3b	Approval of Load Reduction Plan	San Diego Water Board Executive Officer	Within 6 months of submittal
	3c	Phased, adaptive implementation of Load Reduction Plan	Phase 1 MS4s and Caltrans	In accordance with Load Reduction Strategy – ongoing throughout the implementation
	3d	Revision of SWPPPs	Construction, industrial, and Phase II Permittees	Within 12 months of OAL effective date for sediment TMDL
	4a	Submit annual Progress Report to the San Diego Water Board due January 31 each year	Phase 1 MS4s	Annually after reissuance of NPDES WDR
	4b	Submit annual Progress Report to the San Diego Water Board due April 1 each year	Caltrans	Annually after reissuance of NPDES WDR
	5	Enforcement Actions	San Diego Water Board	As needed
	6	Refine Load Reduction Plan	Phase 1 MS4s and Caltrans	As warranted by completion of special studies, additional monitoring and data compilation.
	7	Reopen and reconsider TMDL	San Diego Water Board	As defensible through the collection of additional data and significant findings by the watershed stakeholders.
	8	Meet Interim Milestone #1: Attain 20 percent required reduction in sediment loading (equivalent to 6691 tons of sediment per year) and/or show progress in improving Lagoon	MS4s and NPDES permittees	Within 5 years of approved TMDL

Component	Key Findings and Regulatory Provisions			
		conditions consistent with the specified targets		
	9	Meet Interim Milestone #2: Attain 40 percent required reduction in sediment loading (equivalent to 5663 tons of sediment per year) and/or show progress in improving Lagoon conditions consistent with the specified targets	MS4s and NPDES permittees	Within 9 years of approved TMDL
	10	Meet Interim Milestone #3: Attain 60 percent required reduction in sediment loading (equivalent to 4636 tons of sediment per year) and/or show progress in improving Lagoon conditions consistent with the specified targets	MS4s and NPDES permittees	Within 13 years of approved TMDL
	11	Meet Interim Milestone #4: Attain 80 percent required reduction in sediment loading (equivalent to 3608 tons of sediment per year) and/or show progress in improving Lagoon conditions consistent with the specified targets	MS4s and NPDES permittees	Within 15 years of approved TMDL
	12	Meet Final Milestone: Achieve Lagoon numeric target: the successful restoration of tidal and non-tidal salt marsh to achieve a lagoon total of 346 acres.[1]	All Phase I, Phase II MS4s, Caltrans, and general construction and industrial NPDES enrollees, and other WDR and NPDES	Within 20 years of approved TMDL

[1] This can either mean:
1. Successful restoration of 80 percent of the 1973 acreage of lagoon salt marsh habitat (346 acres); or
2. Demonstrate that implementation actions are active on and/or affecting 346 acres with continued monitoring to ensure 80 percent target achievement.

Component	Key Findings and Regulatory Provisions
			permittees in the watershed[2]	
	Note: TMDL implementation schedule may be altered due to TMDL reconsideration; additionally, enforcement actions by the San Diego Water Board will be taken as necessary.

[2] For general construction and industrial permittees and other NPDES/WDR permittees, this applies to those facilities that have potential for long-term loadings into the watershed.

California Regional Water Quality Control Board
San Diego Region

Sediment TMDL for
Los Peñasquitos Lagoon

STAFF REPORT
June 13, 2012

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To request copies of the Basin Plan Amendment and Staff Report for the Sediment Total Maximum Daily Load for Los Peñasquitos Lagoon, please contact the San Diego Water Board at (858) 467-2952.

Documents also are available at: http://www.waterboards.ca.gov/sandiego.

Sediment TMDL
Los Peñasquitos Lagoon

Staff Report

Adopted by the
California Regional Water Quality Control Board
San Diego Region
on June 13, 2012

Approved by the
State Water Resources Control Board
on _____, 201x
and the
Office of Administrative Law
on _____, 201x
and the
United States Environmental Protection Agency
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Cover Photograph by Cathryn Henning

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Abbreviations:

BAT:	Best Available Technology
BMP:	Best Management Practice
CWA:	Clean Water Act
CFR:	Code of Federal Regulations
EFDC:	Environmental Fluids Dynamic Code
EMC:	Event Mean Concentration
LA:	Load Allocation
LSPC:	Loading Simulation Program in C++
MLS:	Mass Loading Station
MOS:	Margin of Safety
MS4:	Municipal Separate Storm Sewer System
NPS:	Non-point Source Pollution
NPDES:	National Pollutant Discharge Elimination System
SANDAG:	San Diego Association of Governments
TBELs:	Technology Based Effluent Limitations
TMDL:	Total Maximum Daily Load
TSS:	Total Suspended Solids
TWAS:	Temporary Watershed Assessment Stations
US EPA:	United States Environmental Protection Agency
USGS:	Unites States Geological Survey
WQOs:	Water Quality Objectives
WLA:	Wasteload Allocation
WDRs:	Waste Discharge Requirements
WQBELs:	Water Quality Based Effluent Limitations (WQBELs)

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Members of the Stakeholder Advisory Group during a field visit to Los Peñasquitos Lagoon. (Pictured from left: Jay Shrake, Roshan Sirimanne, Clint Boschen, Kelly Barker, Charles Cheng, Ken Johansson, Ruth Kolb, Cheryln Cac, Edith Guttierrez, Cathryn Henning, Malik Tamimi, Mike Hastings.)

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Executive Summary

This staff report supports tentative Resolution No. R9-2012-0033, which will amend the *Water Quality Control Plan for the San Diego Basin (9)* (Basin Plan) to incorporate the sediment Total Maximum Daily Load (TMDL) for Los Peñasquitos Lagoon (Lagoon). The Basin Plan amendment will incorporate the TMDL, associated wasteload allocations, and required load reductions into the Basin Plan. This TMDL addresses the Clean Water Act section 303(d) sediment impairment for the Lagoon.

Water Quality Impairment of Los Peñasquitos Lagoon

Los Peñasquitos Lagoon is one of the few remaining and irreplaceable coastal lagoons in southern California providing valuable estuarine habitat as well as numerous other important beneficial uses. Over the course of the 20th century, the Lagoon has incurred a number of anthropogenic disturbances which, cumulatively have resulted in excessive sedimentation and the gradual degradation and loss of the estuarine habitat.

As required by section 303(d) of the Clean Water Act, the Lagoon was placed on the 1996 List of Water Quality Limited Segments due to sedimentation and siltation loads that exceeded water quality objectives. The beneficial uses that are most sensitive to increased sedimentation are estuarine habitat (EST) and preservation of biological habitats of special significance (BIOL). Estuarine uses of the Lagoon may include preservation or enhancement of estuarine habitats, vegetation, fish, shellfish, or wildlife (such as marine mammals or shorebirds). Other beneficial uses listed in the Basin Plan for the Lagoon include contact water recreation, non-contact water recreation, wildlife habitat, rare, threatened or endangered species, marine habitat, migration of aquatic organisms, spawning, reproduction and/or early development, and shellfish harvesting.

Impacts associated with increased and rapid sedimentation include: reduced tidal mixing within Lagoon channels, degraded and (in some areas) net loss of saltmarsh vegetation, increased vulnerability to flooding for surrounding urban and industrial developments, increased turbidity associated with siltation in Lagoon channels, and constricted wildlife corridors.

The water quality objective for sediment is contained in the Basin Plan. The Basin Plan states, “The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.”

Numeric Target

The sediment water quality standard applies to sediment loading to the Lagoon and the accumulation of sediment in the Lagoon. The minimum protective target would be to reduce watershed sediment loads to non-anthropogenic levels and return the Lagoon to non-anthropogenic conditions with consideration given to background loading and other factors that also lend to impairment of beneficial uses. The numeric targets are calculated upon the historic condition (mid-1970s) when the sediment water quality standard was once met.

A historic coverage for the Los Peñasquitos watershed was developed for this period using US Geological Survey topographic maps from the 1970s. This land-use distribution was used to calculate the watershed numeric target using the LSPC watershed model. This historic (mid-1970s) sediment load of 12,360 tons per critical wet period (211 days), or 58.6 tons per day, represents the sediment TMDL watershed numeric target.

An analysis of the vegetation types present in the Lagoon was developed for the mid-1970s using historic aerial photographs from which the Lagoon numeric target was calculated (see Linkage Analysis, Section 7). The Lagoon numeric target is expressed as an increasing trend in the total area of tidal saltmarsh and non-tidal saltmarsh toward 346 acres. This target acreage represents 80 percent of the total acreage of tidal and non-tidal saltmarsh present in 1973.

Sources and Responsible Parties

Sources of sediment include erosion of canyon banks, exposed soils, bluffs, scouring stream banks, and tidal influx. Some of these processes are exacerbated by anthropogenic disturbances, such as land development within the watershed. Land development transforms the natural landscape by exposing sediment and converting pervious surfaces to impervious surfaces, which increases the volume and velocity of runoff resulting in scouring of sediment, primarily below storm water outfalls that discharge into canyon areas. Sediment loads are transported downstream to the Lagoon during storm events causing deposits on the salt flats and in Lagoon channels. These sediment deposits have gradually built-up over the years due to increased sediment loading and inadequate flushing, which directly and indirectly affects Lagoon functions and salt marsh characteristics.

There are two broad categories of sediment sources to the Lagoon: 1) watershed sources, and 2) the Pacific Ocean. The watershed sources consist of all point and non-point sources of sediment in the watershed area draining to Los Peñasquitos Lagoon. The total sediment contribution from all watershed sources is presented as the total wasteload allocation (WLA). The sediment contributions from the Pacific Ocean are considered a background source and are presented as the Load Allocation (LA). Hence, the responsible parties were assigned the total WLA and are jointly responsible for meeting the wasteload reductions required in this TMDL project. Responsible parties include the following: Phase I Municipal Separate Storm Sewer Systems (MS4s) copermittees (the County of San Diego, City of San Diego, City of Del Mar, and City of Poway), Phase II MS4s permittees, Caltrans, general construction storm water NPDES permittees, and general industrial storm water NPDES permittees.

Linkage Analysis

Reducing watershed sediment loads from the year 2000 levels to historic levels is a necessary component for restoring and providing long-term protection of the Lagoon's beneficial uses. Deposition of watershed sediment contributes to elevation increases within the Lagoon, leading to an increase in height relative to mean sea level. Elevation is a critical variable that determines the productivity, diversity, and stability of saltmarshes. The long-term existence of the saltmarsh depends on the success of the dominant plants, such as *Sarcoconia pacifica* (also referred to as *Salicornia virginica*) and *Frankenia salina*, and their close relationship to sediment supply, sea level change, and tidal range.

Reduced sediment loading consistent with the watershed numeric target will encourage the establishment of native vegetation in degraded areas. To represent the linkage between source contributions and receiving water response, models were developed to simulate source loadings and transport of sediment into the Lagoon. The models provide an important tool to evaluate year 2000 conditions, to evaluate historic conditions, and to calculate TMDL load reductions.

The Lagoon was capable of assimilating these historic sediment loads under historic Lagoon conditions. Because the Lagoon has evolved through time and accumulated over 40 years of watershed sediment loads, it cannot be assumed that the Lagoon, in the year 2010 conditions, can assimilate the same historic sediment loads. Evaluation of the extent of vegetation types in the Lagoon provides the necessary tool to assess how the Lagoon responds to watershed sediment load reductions and to establish a target Lagoon condition under which the Lagoon can again assimilate the historic sediment loads.

TMDL, Allocations and Reductions

TMDL = 12,360 tons per year

The maximum load of sediment that Los Peñasquitos Lagoon can receive from all sources and still meet the sediment water quality objective is 12,360 tons per year.

Wasteload Allocations to Watershed = 2,580 tons/year

A wasteload allocation (WLA) of 2,580 tons/year was assigned to the responsible parties. Collective wasteload reductions are required of the responsible parties.

Load Allocations to Ocean = 9,780 tons/year

The ocean was assigned a load allocation (LA) of 9,780 tons/year. Because the ocean is a natural background source, load reductions are not required of the ocean.

Margin of Safety = Implicit

Conservative assumptions were used in selecting the TMDL numeric targets and implementation activities to provide an implicit margin of safety.

The TMDL results are summarized in Tables ES-1 and ES-2.

Table ES-1. TMDL summary

Source	Critical Wet Period Load (tons)	Daily Load (tons)
Watershed contribution (WLA)	2,580	12.2
Ocean boundary (LA)	9,780	46.4
Margin of Safety (MOS)	implicit	implicit
TMDL	12,360	58.6

Table ES-2. Year 2000 vs. historical loads and percent reduction

Source	Year 2000 Load (tons)	Historical (mid-1970s) Load (tons)	Load Reduction (tons)	Percent Reduction Required
Watershed contribution (WLA)	7,719	2,580	5,139	67%
Ocean boundary (LA)	5,944	9,780	+3,836 (increase)	+39% (increase)
Total	13,663	12,360	1,303	10%

Implementation of TMDL

The responsible parties must develop a Load Reduction Plan that will establish a watershed-wide, programmatic, adaptive management approach for implementation. The plan will include a detailed description of implementation actions, as identified and planned by the responsible parties, to meet the requirements of this TMDL. All responsible parties are responsible for reducing their sediment loads to the receiving waterbody or demonstrating that their discharges are not causing exceedances of the wasteload allocation.

Monitoring Program

Monitoring is required to assess progress towards achieving the wasteload and load allocations and numeric targets. Furthermore, the monitoring program must be capable of monitoring the effectiveness of implementation actions to improve water quality and saltmarsh habitat and remediation actions to remove sediment from the Lagoon.

Compliance Schedule

Full implementation of the TMDL for sediment must be completed within 20 years from the effective date of the Basin Plan amendment. This timeline takes into consideration the planning needs of the responsible parties to establish a Load Reduction Plan, time needed to address multiple impairments, and provides adequate time to measure temporal disparities between reductions in upland loading and the corresponding Lagoon water quality response.

1 Introduction

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) is the California state agency responsible for water quality protection in the southwest portion of the state of California. It is one of nine Regional Water Boards in California, each generally separated by hydrological boundaries. Each Regional Water Board consists of nine governor-appointed members who serve four-year terms. The San Diego Water Board, under its federally designated authority, administers the Clean Water Act (CWA) within the San Diego Region. In accordance with the CWA, the San Diego Water Board has adopted the *Water Quality Control Plan for the San Diego Region (9)* (Basin Plan) that specifies water quality standards for waters in the San Diego Region and implementation measures to enforce those standards.

Section 305(b) of the CWA mandates biennial assessment of the nation's water resources to identify and list waters not meeting their water quality standards. These waters are listed in accordance with CWA section 303(d); and the list is commonly referred to as the 303(d) list. The CWA requires states to establish a priority ranking for impaired waters and to develop and implement Total Maximum Daily Loads (TMDLs) or alternatives to address the impairments. A TMDL is a written, quantitative assessment of water quality problems and contributing pollutant sources. It identifies one or more numeric targets for restoring beneficial uses based on applicable water quality standards, specifies the maximum pollutant load that can be discharged and still meet water quality standards, allocates pollutant loads among sources in the watershed, and provides a basis for taking actions needed to meet the numeric target(s) and water quality standards.

The Los Peñasquitos Lagoon (Lagoon) is currently listed on the 303(d) list for sedimentation/siltation because the narrative sediment water quality objective is not being met. Sedimentation within the Lagoon impacts numerous beneficial uses, primarily those associated with protection of native habitats that depend on tidal inundation and/or salinity levels in non-tidal soils. Sedimentation increases elevations within the Lagoon, which leads to an increase in height relative to mean sea level. Elevation is a critical variable that determines the productivity, diversity, and stability of saltmarshes. The long-term existence of the saltmarsh depends on the success of the dominant plants, such as *Sarcoconia pacifica* and *Frankenia salina*, and their close relationship to sediment supply, sea level change, soil salinity, and tidal range (US EPA, 2005).

The San Diego Water Board proposes to amend its Basin Plan to incorporate a TMDL and implementation plan to address sedimentation problems adversely affecting water quality in the Lagoon. This TMDL Staff Report describes the scientific and technical basis for confirming sediment impacts, developing numeric targets, determining sediment sources, and establishing wasteload and load allocations. Compliance with the TMDL will be assessed by monitoring the Lagoon and contributing watershed.

For the technical portion of this TMDL, the San Diego Water Board relied on the report prepared by Tetra Tech entitled, *Los Peñasquitos Lagoon Sediment/Siltation TMDL* (Technical Support Document, Attachment 1).

2 Problem Statement

Under section 303(d) of the Clean Water Act (CWA), states are required to identify waters whose beneficial uses have been impaired due to specific constituents. Los Peñasquitos Lagoon was placed on the Section 303(d) list of Water Quality Limited Segments in 1996 for sedimentation and siltation with an estimated 469 acres affected. The Lagoon is subject to the development of a total maximum daily load (TMDL) (US EPA, 2009).

The Lagoon is an estuarine system that is part of the Torrey Pines State Natural Reserve. In addition to its marine influence, the Lagoon receives freshwater inputs from an approximately 60,000-acre watershed comprised of three major canyons (Carroll Canyon, Los Peñasquitos Canyon, and Carmel Canyon). Given the status of "Natural Preserve" by the California State Parks, the Lagoon is one of the few remaining native saltmarsh lagoons in southern California, providing a home to several endangered species (California State Parks, 2009). The Lagoon is ecologically diverse, supporting a variety of plant species, and provides nursery grounds and habitat for numerous bird, fish, and small mammal populations. The Lagoon also serves as a stopover for the Pacific Flyway, offering migratory birds a safe place to rest and feed, as well as providing refuge for coastal marine species that use the Lagoon to feed and hide from predators.

The San Diego Basin Plan states, "The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses." Beneficial uses listed in the Basin Plan for the Lagoon include contact water recreation; non-contact water recreation (although access is not permitted in most areas per California State Parks); preservation of biological habitats of special significance; estuarine habitat; wildlife habitat; rare, threatened or endangered species; marine habitat; migration of aquatic organisms; spawning, reproduction and/or early development; and shellfish harvesting. The beneficial uses that are most sensitive to increased sedimentation are estuarine habitat and preservation of biological habitats of special significance. Estuarine uses may include preservation or enhancement of estuarine habitats, vegetation, fish, shellfish, or wildlife (such as marine mammals or shorebirds).

Impacts associated with increased and rapid sedimentation include: reduced tidal mixing within Lagoon channels, degraded and (in some cases) net loss of saltmarsh vegetation, increased vulnerability to flooding for surrounding urban and industrial developments, increased turbidity associated with siltation in Lagoon channels, and constricted wildlife corridors.

The Los Peñasquitos Lagoon Enhancement Plan and Program (1985), San Diego Basin Plan (1994), and Clean Water Act section 303(d) highlight sedimentation as a significant impact associated with urban development and a leading cause in the rapid loss of saltmarsh habitat in the Lagoon. Sediment reduction is a management priority.

The Lagoon's 565 acres include 262 acres of tidal saltmarsh (including salt panne, tidal channels, and mudflats) and non-tidal saltmarsh and 132 acres of freshwater marsh, herbaceous wetland, and woody riparian (for example southern willow scrub and mulefat scrub) habitats. The remaining 171 acres of saltmarsh and brackish marsh vegetation are impaired by excessive sedimentation, which converted the coastal saltmarsh to *Lolium* perenne infested non-tidal saltmarsh, freshwater marsh, and woody riparian habitats (California State Parks, 2011). The environmental processes that support wetland habitats in the Lagoon have been altered by urban development in three ways:

1) Increase in the volume and frequency of freshwater input,
2) Increase in sediment deposition, and
3) Decrease in the tidal prism.

These factors have led to decreases in tidal and non-tidal saltmarsh habitats and increases in freshwater habitats and the abundance of non-native species.

3 Background Information

This section describes the Los Peñasquitos watershed and Lagoon and provides background information on the impairment.

3.1 Los Peñasquitos Watershed Description

The Los Peñasquitos watershed is located in central San Diego County (Figure 1). Both the watershed and Lagoon are included in the Peñasquitos Hydrologic Unit (HU 906). In addition to the Los Peñasquitos watershed, the Peñasquitos HU includes Mission Bay and other coastal tributaries. The Los Peñasquitos watershed is 93 square miles (approximately 60,000 acres) and includes portions of the City of San Diego, City of Poway, City of Del Mar, and San Diego County (Figure 2). There are also several major road corridors and a railway within the watershed.

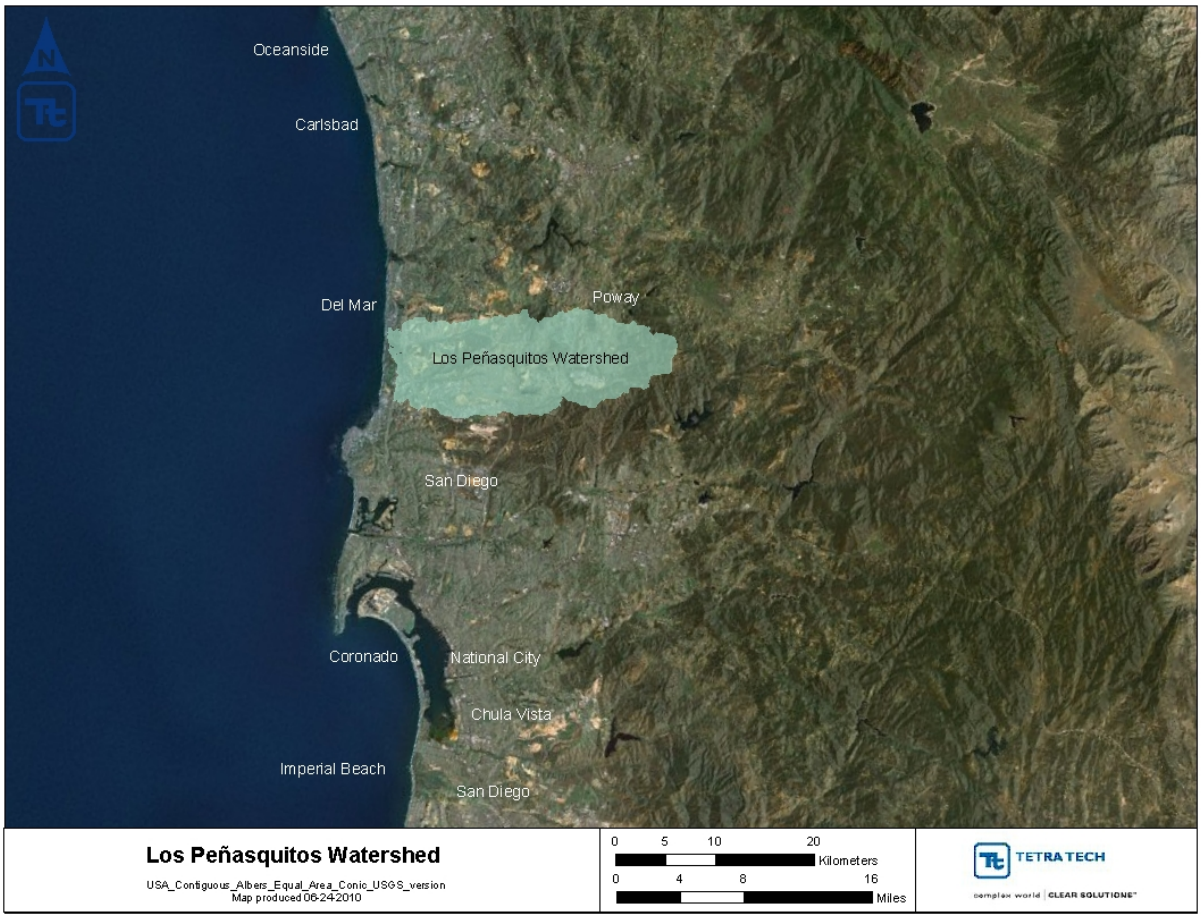

Figure 1. Location of the Los Peñasquitos watershed.

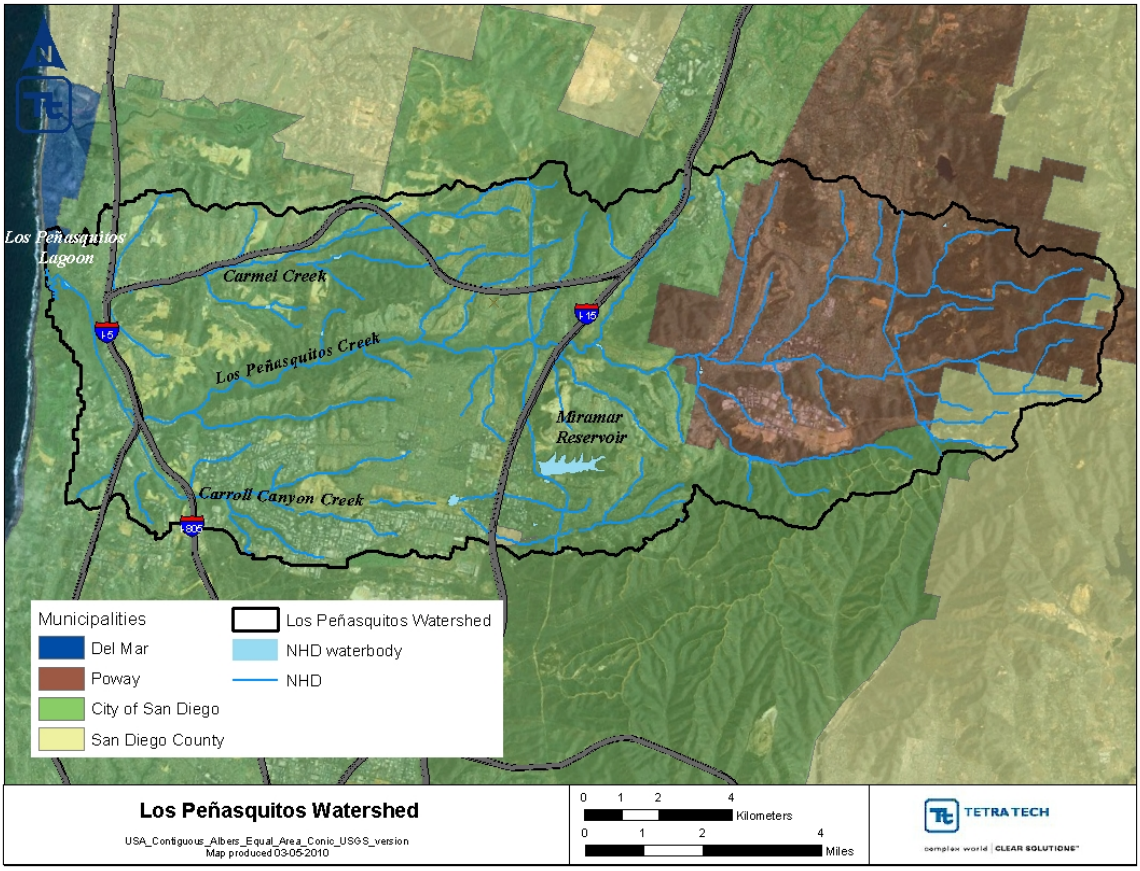

Figure 2. Municipalities and major roads within the Los Peñasquitos watershed.

The climate in the Los Peñasquitos watershed is like that of the entire San Diego Region, which is generally mild with annual temperatures averaging around 65°F near the coastal areas. Average annual rainfall ranges from nine to eleven inches along the coast. There are three distinct seasons in the San Diego Region. The summer dry season occurs from late April to mid-October. The winter season occurs from mid-October through early April and has two types of weather: 1) winter dry weather, and 2) wet weather. The winter wet weather season accounts for 85 to 90 percent of the annual rainfall.

Three major streams drain the watershed and flow into the Lagoon (Figure 2). Los Peñasquitos Creek is the largest catchment draining 59 square miles (approximately 37,760 acres) in the central portion of the watershed. Carroll Canyon Creek is the second largest catchment draining 18 square miles (approximately 11,520 acres) in the southern portion of the watershed. Carmel Creek is the smallest of the three catchments draining the remaining 16 square miles (approximately 10,240 acres) in the northern, coastal area. Los Peñasquitos Creek and Carroll Canyon Creek converge prior to entering the Lagoon. Miramar Reservoir drains 1 square mile (approximately 640 acres) of the Carroll Canyon Creek watershed. Miramar Reservoir retains imported drinking water and does not discharge downstream. Watershed elevation rises from sea level to 2,600 feet in the headwaters.

3.2 Los Peñasquitos Land Use and Population

Development within the Lagoon during the late 1800s and early 1900s altered Lagoon hydrology and set the stage for the Lagoon's vulnerability to impacts associated with intense development of the watershed that began in the mid-1970s. In 1888 a railway was constructed across the Lagoon on an elevated earthen berm just west of the current alignment of Sorrento Valley Road. This railway alignment was later abandoned and replaced in 1924. The new alignment of the railway line was placed on an elevated earthen berm that bisects the Lagoon, effectively cutting off several of the Lagoon's historic tidal channels. Both railway berms obstructed storm water flows from the watershed and facilitated sediment deposition in the southeastern portion of the Lagoon. Realignment of historic Highway 101 in the 1930s also modified the Lagoon's hydrology by realigning and fixing the ocean inlet under the southern bridge resulting in more frequent inlet closures.

In 1966 the upper Los Peñasquitos subwatershed was 9 percent urbanized (White and Greer, 2002); however, by 1975, the watershed experienced significant urbanization with agricultural areas being converted to urban uses, specifically in the Poway and Mira Mesa areas (City of San Diego, 2005). From 1966 to 1999, the acreage of urbanized land within the upper Los Peñasquitos Creek watershed increased by 290 percent (White and Greer, 2002), and by 2000, 54 percent of the Los Peñasquitos watershed was developed. Additional highway infrastructure was built in and around the Los Peñasquitos watershed to accommodate the increasing population growth. Realignment of Sorrento Valley Road (ca. 1966), Carmel Valley Road (1983), segments of the I-5 freeway (1994), and the State Route 56 overpass (1995) impacted the surrounding watershed.

To decrease impacts from road infrastructure, Sorrento Valley Road was converted to a bike path in 2003 and a new U.S. Highway 101 bridge was constructed over the Lagoon mouth in August 2005. To mitigate for impacts from State Route 56 and several other projects for the City of San Diego, the 27-acre El Cuervo Norte wetlands restoration project was created in the Peñasquitos Canyon Preserve. The El Cuervo Norte wetlands were designed to provide over 24 acres of southern willow scrub, oak-sycamore woodland and freshwater marsh habitat. The project consisted of approximately 9 acres of wetland creation, 14.3 acres of wetlands enhancement, 2 acres of upland native buffer, and 1.3 acres of park access road and a San Diego Gas & Electric power pole maintenance area (Dudek, 2010).

Land use associated with the mid-1970s time period is illustrated in Figure 3. Land-use/land cover data for the Los Peñasquitos watershed were not available for this period, therefore, a historical coverage was developed based on the location and type of structures that are shown in USGS topographic maps from the 1970s (primarily the La Jolla quadrangle – dated 1975).

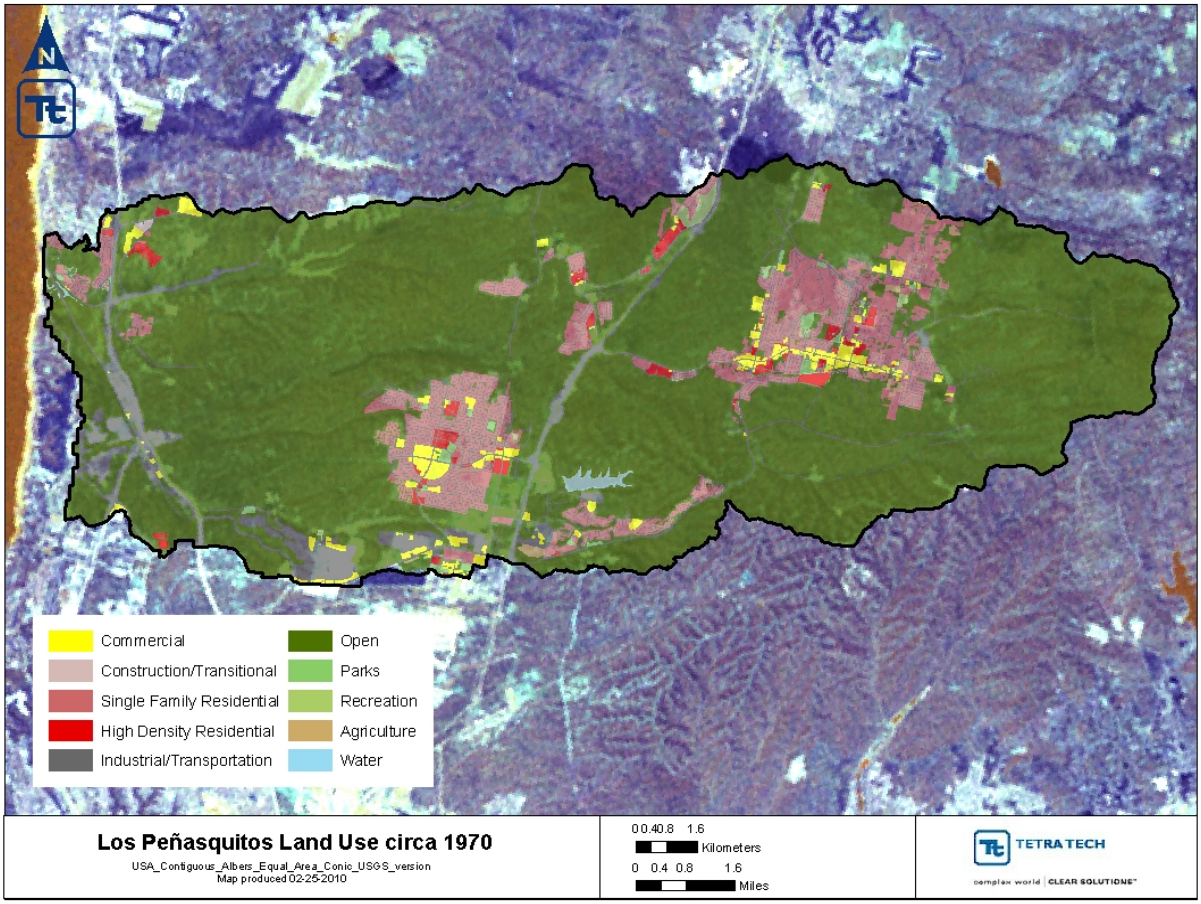

Figure 3. Historic land use in the Los Peñasquitos watershed (1970s).

Data detailing land use in the Los Peñasquitos watershed is available through the San Diego Association of Governments 2000 land-use coverage and is presented in Figure 4. Approximately 54 percent of the watershed has been developed, with 46 percent of that area classified as impervious. The largest single land-use type in the Los Peñasquitos watershed is open space (approximately 25,500 acres), followed by low density residential development (approximately 14,250 acres) and industrial/transportation (approximately 11,660 acres). Land use differences between the year 2000 and the historical time period are shown in Table 1.

To further characterize the land use changes, population trends are illustrated in Figure 5. Figure 5 depicts the expansive population growth from 1970 to 2010 in the San Diego region facilitated by intense development throughout the region.

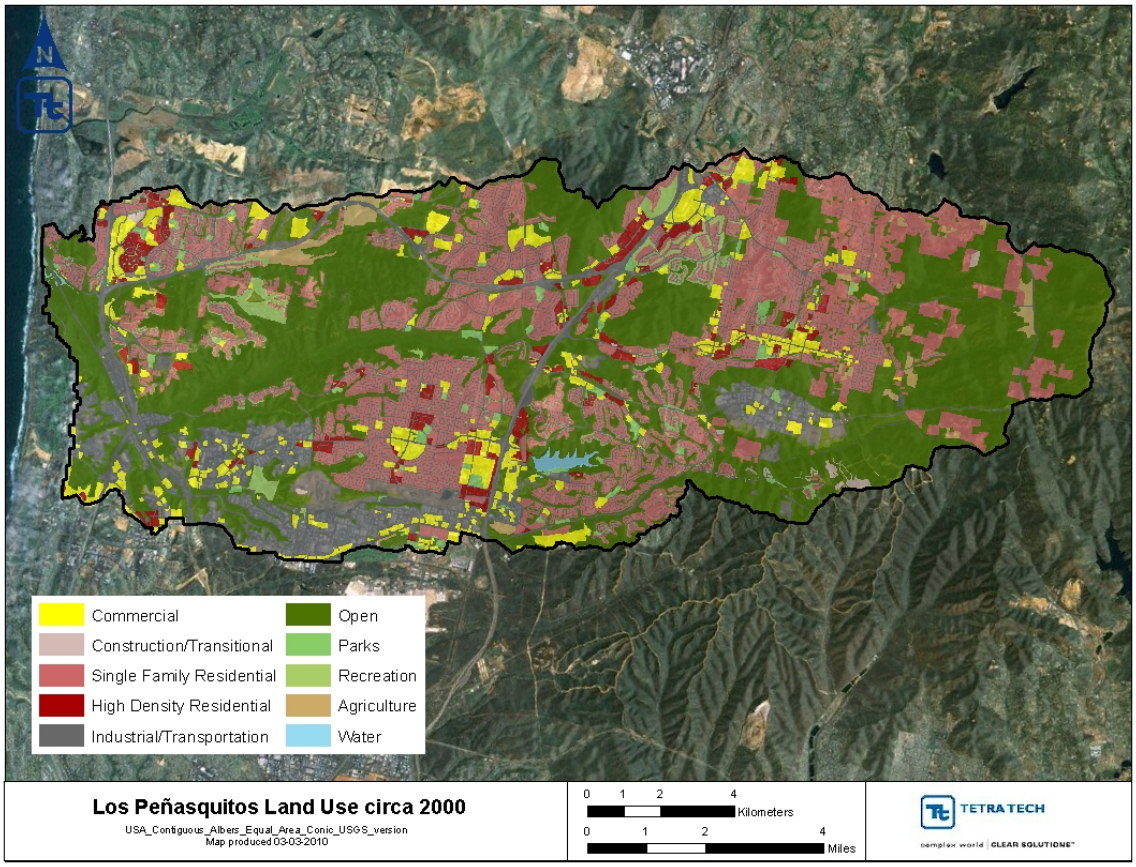

Figure 4. Year 2000 land uses in the Los Peñasquitos watershed.

Table 1. Year 2000 (SANDAG 2000) vs. historical land use comparison

Land Use	Year 2000 area (ac)	Year 2000 percent of total area	Historic, mid-1970s area (ac)	Historic, mid-1970s percent of total area	Percent change of total watershed area
Agriculture	741	1.24%	100	0.17%	1.07 %
Commercial	3,591	6.00%	1,088	1.82%	4.18%
Construction/ Transitional	169	0.28%	23	0.04%	0.24%
High Density Residential	1,840	3.07%	648	1.08%	1.99%
Industrial/ Transportation	11,654	19.46%	4,830	8.07%	11.40%
Open	25,463	42.52%	47,445	79.23%	-36.71%
Parks	1,326	2.22%	2,884	0.48%	1.73%
Recreation	670	1.12%	139	0.23%	0.89%
Single Family Residential	14,258	23.81%	5,155	8.61%	15.20%
Water	161	0.27%	160	0.27%	0.00%
Total	59,879	100.00%	59,879	100.00%	

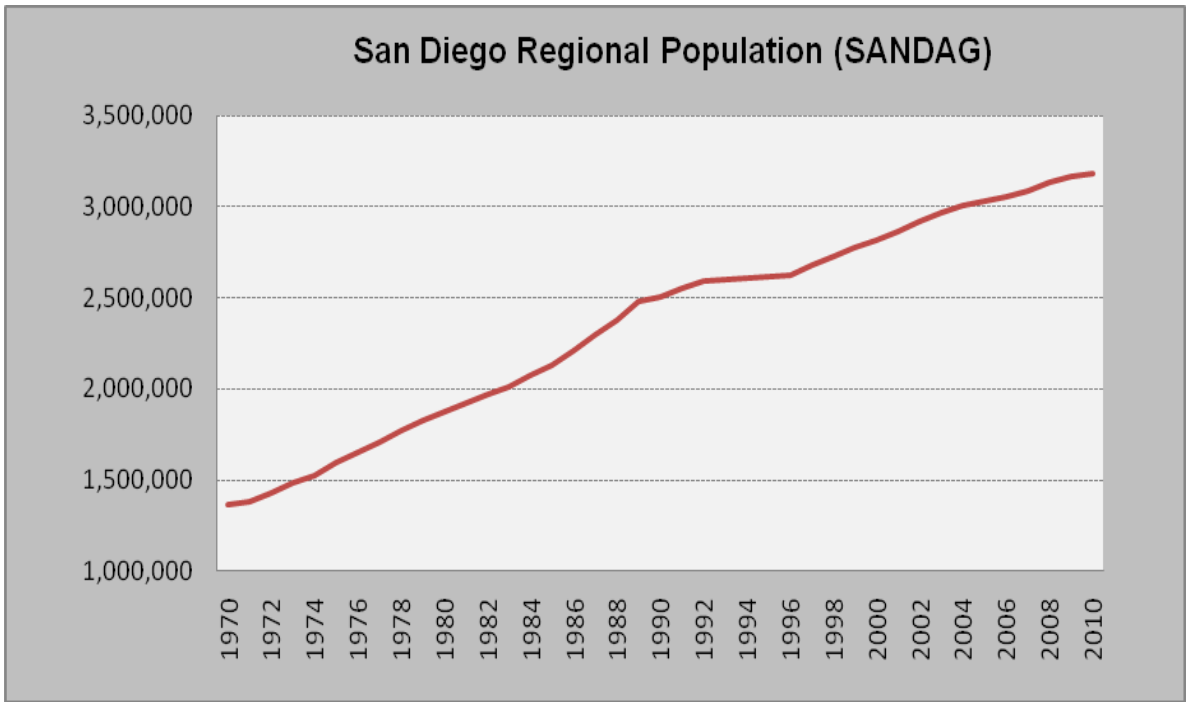

Figure 5. San Diego regional population trends (SANDAG, 2010).

3.3 Los Peñasquitos Lagoon Description

The Lagoon was formed many thousands of years ago when rising sea levels flooded the Peñasquitos Valley to form a deep marine embayment. Over the years, inflowing creeks deposited alluvial sediment, which gradually filled the embayment to form the small estuarine system seen today (Mudie et al. 1974). The Lagoon is in a dynamic state with continual influences from the tide and upstream runoff (Greer and Stowe, 2003). The Lagoon resides in Torrey Pines State Natural Reserve and is one of the few remaining native saltmarsh lagoons in southern California, thereby given the status of “Natural Preserve” by the California State Parks (Figure 6).

Figure 6. Photograph of Los Peñasquitos Lagoon. Tidal flows enter the Lagoon via a channel beneath the U.S. Highway 101 bridge and then bifurcate into the eastern and western branches.

The Lagoon is ecologically diverse, supporting a variety of plant species and providing habitat for numerous bird, fish, and small mammal populations. The saltmarsh daisy, San Diego sagewort, and coast wallflower reside in the Lagoon (LPL Foundation, 2011). The Lagoon also serves as a stopover for migratory birds and provides habitat for coastal marine and saltmarsh species. Listed bird species endemic to the Lagoon include the light-footed clapper rail (federally-listed, endangered), Belding's savannah sparrow (state-listed, endangered), California brown pelican (federally-delisted on November 17, 2009), western snowy plover (federally-listed, threatened) and California gnatcatcher (federally-listed, threatened) (Mudie et al. 1974). The Lagoon has also provided habitat for the federally-listed, endangered California least tern, although this species has not been observed in the Lagoon since 1980 (Cooper, 1984).

Maintaining a tidal prism and proper exchange between the ocean and the Lagoon are critical for maintaining adequate saltmarsh salinity levels. Tidal flow mainly keeps the mouth open; however, storm water flows play a role in re-establishing the thalweg in tidal channels and forcing sediment out of the inlet and back into the ocean. The role of storm water flows in performing these actions is diminished by the railway berm and by

thick stands of riparian and brackish marsh habitat at the base of the Lagoon's tributaries, which impede and detain runoff flows before they can scour the inlet area.

Deposition of sediment within the Lagoon inlet is caused primarily by tides, wave run up and storm surge that push sand and cobbles from nearby beaches and offshore sources into the inlet area (LPL Foundation and State Coastal Conservancy, 1985). Grain size analysis conducted at the Lagoon inlet indicate that sediment loading from the watershed may increase the build-up rate of sand bar formation, but the primary source of sedimentation in the Lagoon's inlet area is the ocean (Elwany, 2008).

During periods when the Lagoon mouth is open, tidal flows from the Pacific Ocean enter the Los Peñasquitos Lagoon via a channel beneath the southern bridge at Torrey Pines Road, formerly referred to as Highway 101. Historical records indicate that the Lagoon was continuously connected to the ocean at least until 1888 (Mudie et al. 1974). Under present conditions, a permanent mouth opening to the ocean cannot be naturally maintained, except during exceptionally wet winters. This is primarily due to the loss of the inlet's ability to meander along the beach and to the reductions in velocities of storm driven outflows. The Lagoon's inlet is often mechanically dredged to alleviate the danger of flooding and to improve the health of the Lagoon.

Approximately 150 yards from the Lagoon mouth, the main Lagoon channel bifurcates (Figure 6). The eastern branch runs inland under the railroad trestle, then trends southeastward terminating in a series of small creeks that drain the few remaining salt flats and non-tidal marsh on the southeastern side of the Lagoon. The eastern branch receives flow from Carmel Creek (Figure 7). The western branch of the main channel system is generally narrower and shallower than the eastern branch. It runs in a southerly direction and terminates in a dendritic pattern of creeks that drain the marsh on the southwestern side of the Lagoon. Two of these poorly defined creeks connect with the combined Los Peñasquitos and Carroll Canyon Creeks, which flow into the Lagoon through a narrow (approximately 10 feet wide) channel on the west side of the railroad berm (Figure 8).

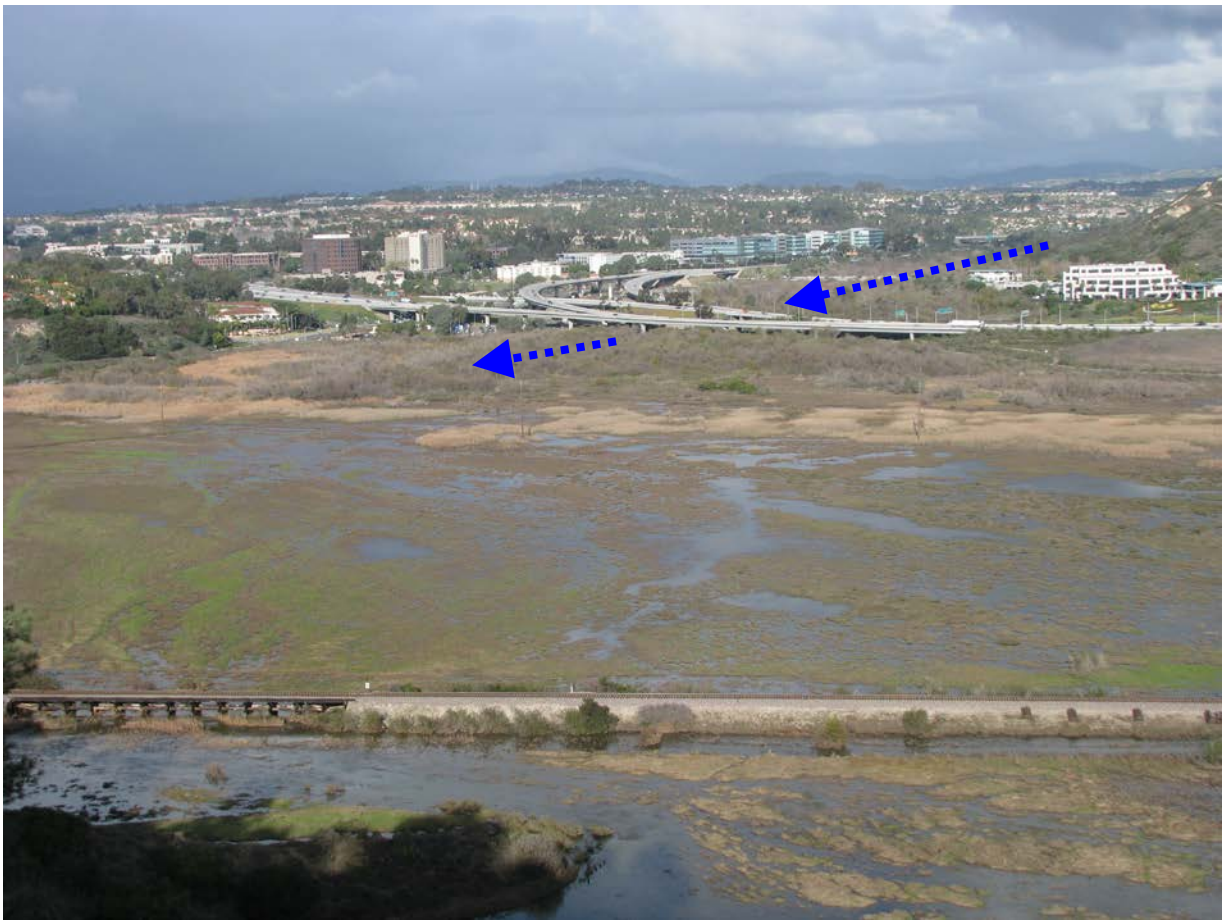

Figure 7. Photograph of Carmel Creek entering Los Peñasquitos Lagoon on January 3, 2011, shortly after a rain event. The creek flows along the dashed arrow, along SR 56 and beneath the I-5 freeway.

Figure 8. Photograph of the combined Los Peñasquitos and Carroll Canyon Creeks entering Los Peñasquitos Lagoon shortly after a rain event on January 3, 2011. The combined creeks flow along the dashed arrow, along the western side of the railroad berm.

3.4 Impairment Description

The Lagoon is listed as impaired on the 303(d) list for sedimentation/siltation. The 303(d) listing indicated that the entire Lagoon was not supporting beneficial uses and was impaired by sediment. Impacts due to sedimentation are not clearly differentiated from the impacts associated other stressors on the Lagoon such as freshwater inputs and physical barriers within the Lagoon.

3.4.1 Urbanization Impacts

Urbanization of the watershed has directly affected the natural drainage, pollutant loads, and hydrologic characteristics of the watershed (City of San Diego, 2005). The volume, velocity, duration, and timing of runoff events changes as the landscape changes from pervious to impervious. Recent research has shown that impervious surface is a useful metric to represent the imprint of land development on the landscape because it is directly related to runoff (Burton and Pitt, 2002; Scheuler, 1994). Land development

typically results in increased runoff and erosion rates; accounting for up to 50 percent of sediment loads in urban areas (Burton and Pitt, 2002).

Impervious cover has been identified as the ‘unifying theme’ in stream degradation (US EPA, 1999); with stream degradation occurring with as little as ten percent imperviousness of the watershed (Scheuler, 1994). The effects of impervious surfaces on sedimentation rates in the watershed is exacerbated by the location of MS4 outfalls along or just below mesa tops that release concentrated storm flows into steep drainages with moderately to highly erosive soils (Weston 2009).

Continued sedimentation and freshwater inputs, both resulting from urbanization, have resulted in significant alterations to habitat (White and Greer, 2002; Greer and Stowe, 2003; CE, 2003; Mudie et al. 1974; LPL Foundation and State Coastal Conservancy, 1985). The encroachment of freshwater wetlands and reduction of saltwater marsh is evident in the National Wetland Inventory (NWI) maps from 1985 and 2009 (Figures 9 and 10). The location of different wetland types is also shown in maps that were included in the Los Peñasquitos Lagoon Enhancement Plan (1985) and in the Mudie et al. 1974 report (Figures 11 and 12). Although there are differences in the depiction of wetland areas from each study and time period, these maps show an encroachment of riparian, freshwater, and upland vegetation types in the eastern portion of the Lagoon that is likely related to sediment accumulation, year-round freshwater flows, and physical impediments to tidal flow.

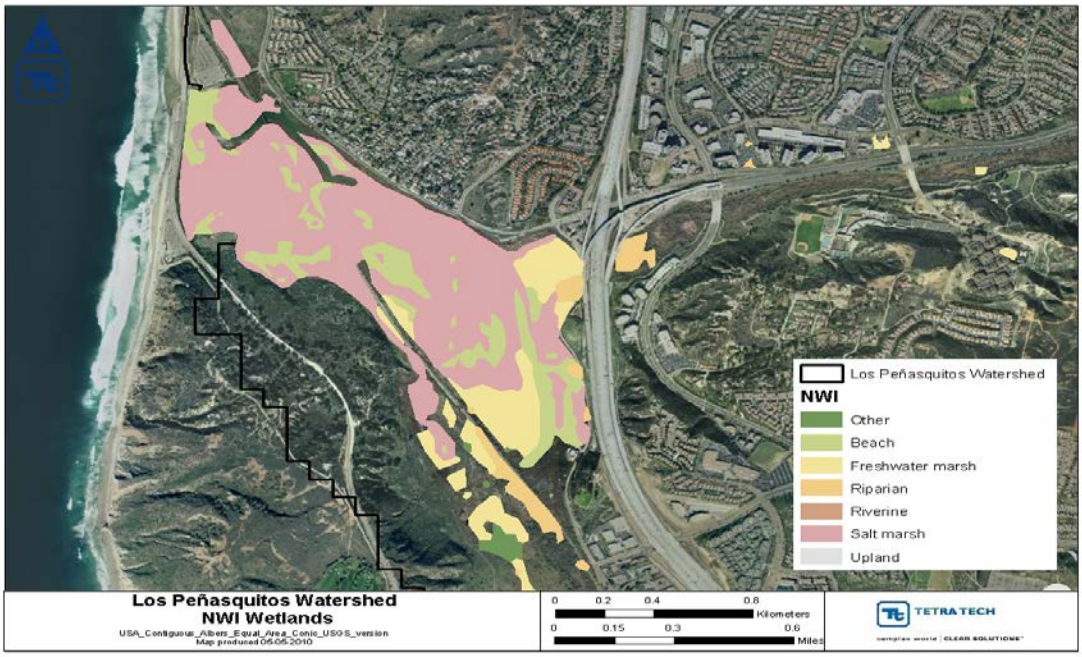

Figure 9. National Wetland Inventory (NWI) – 1985.

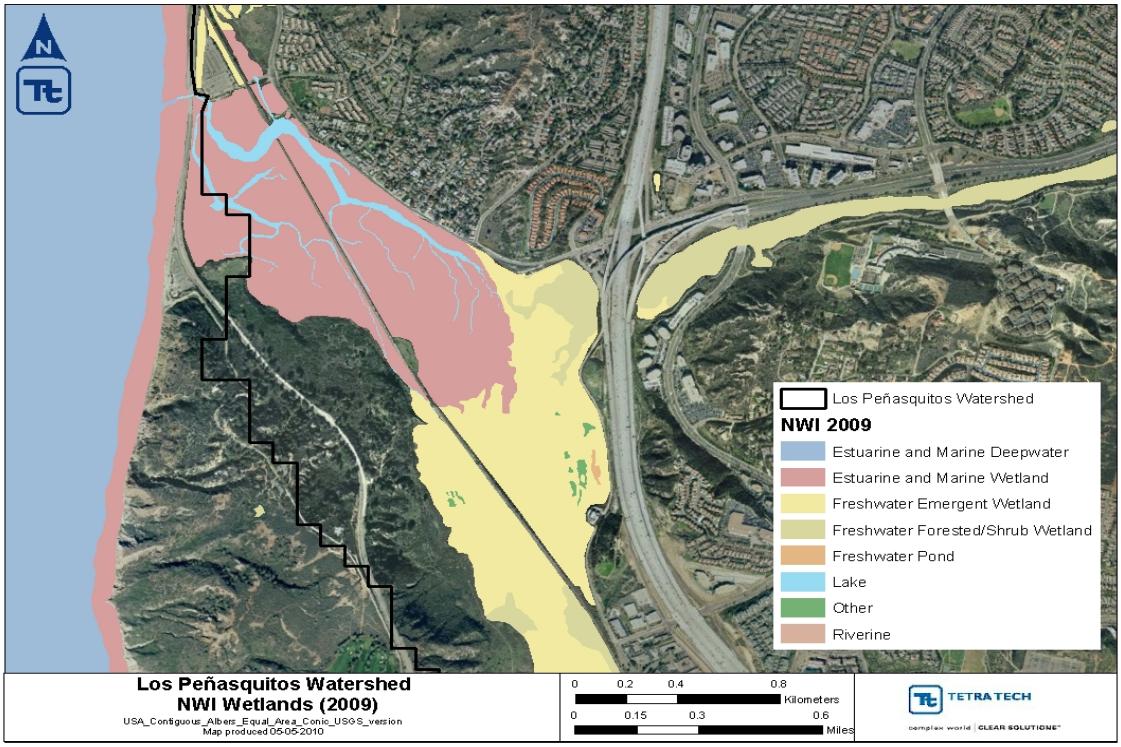

Figure 10. National Wetland Inventory (NWI) – 2009.

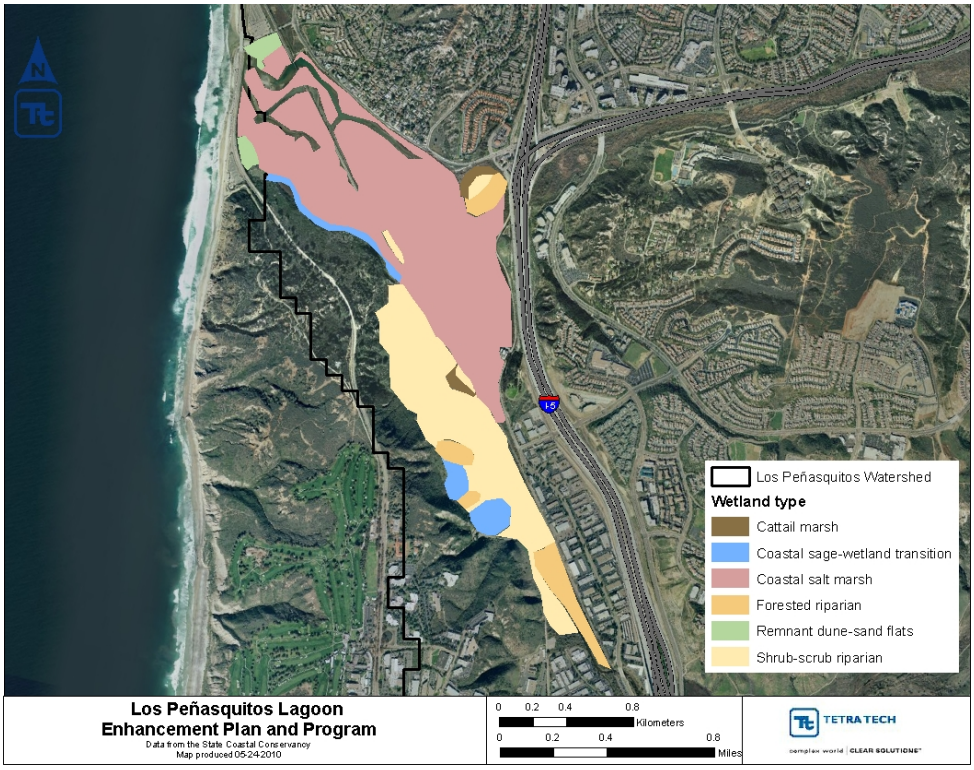

Figure 11. LPL Enhancement Plan – 1985 wetland types.

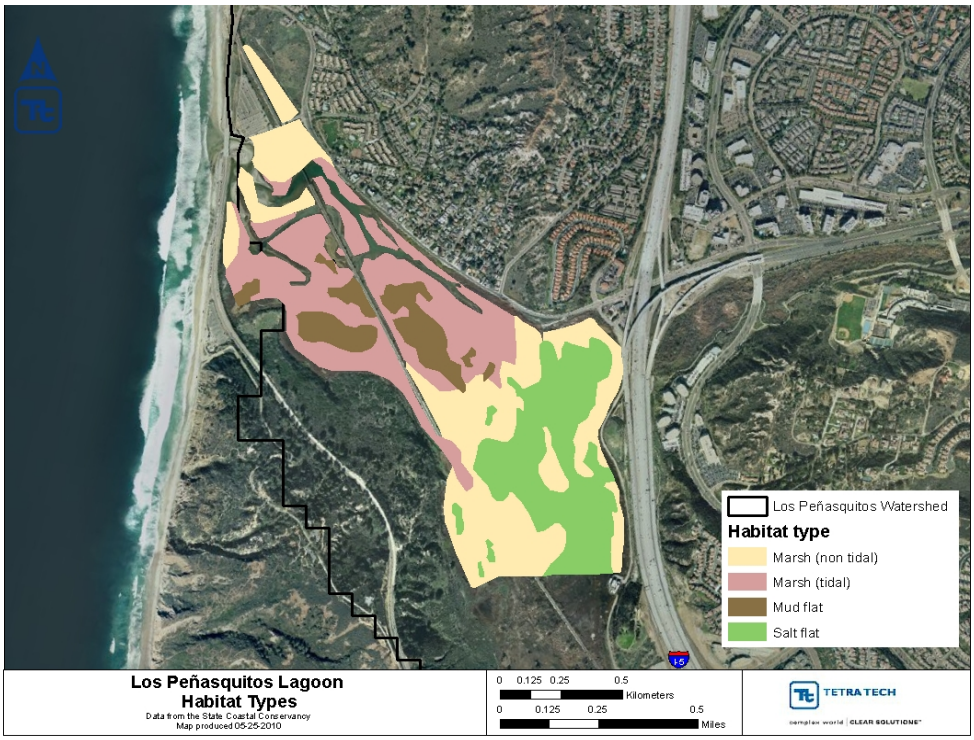

Figure 12. Historical lagoon wetland types (Mudie et al. 1974).

3.4.2 Sedimentation Impacts

Increased and rapid sedimentation results in reduced tidal mixing within Lagoon channels, degraded and net loss of saltmarsh vegetation, increased vulnerability to flooding for surrounding urban and industrial developments, increased turbidity associated with siltation in Lagoon channels, and constricted wildlife corridors. Specifically, deposition of watershed sediment contributes to elevation increases within the Lagoon, leading to an increase in height relative to mean sea level. Elevation is a critical variable that determines the productivity, diversity, and stability of saltmarshes. The long-term existence of the saltmarsh depends on the success of the dominant plants, such as *Sarcoconia pacifica* and *Frankenia salina*, and their close relationship to sediment supply, sea level change, soil salinity, and tidal range (US EPA, 2005). While these species can tolerate low salinity levels, year round inundation of freshwater and/or decreases in soil salinity prevent the ability of saltmarsh plants from outcompeting transitional or brackish marsh plant species.

Several studies have documented the influx of sediment originating in the watershed to the Lagoon. In 1985, the Los Peñasquitos Lagoon Enhancement Plan estimated that sedimentation had removed 25 acres from the coastal saltmarsh inventory. Mudie and Byrne (1980) estimate that sedimentation rates have increased to 50 cm/century since European settlement of the area. This increase in sedimentation was supported by an article published in 2000 by Cole and Wahl that examined a 3,600-year sediment core

take from the Lagoon (Cole, 2000). In 1978 a coastal commission report concluded that unmitigated urbanization could double the annual sediment load within 30 years (Prestegaard, 1978). The main depositional areas in the Lagoon are just downstream of the I-5 Carmel Creek culverts and at the southern end of the Lagoon near Sorrento Valley. Gradual sediment accumulation in the Lagoon results in areas of higher elevation, which tidal water no longer reaches. Between 1968 and 1985, sediment from Carmel Valley had raised the elevation of the northeast corner of the Lagoon by 6.1 feet, which has resulted in the conversion of saltmarsh vegetation into riparian and cattail marsh (LPL Foundation and State Coastal Conservancy, 1985). The formation of cattail marsh promotes sediment retention, further exacerbating sedimentation impacts.

There are many potential sources that have influenced the accumulation of sediment within the Lagoon. Sources include erosion of canyon banks and bluffs, scouring stream banks, exposed soils, and tidal influx. Some of these processes are exacerbated by anthropogenic disturbances, such as land development within the watershed. Land development transforms the natural landscape and results in increased runoff resulting in scouring of sediment, primarily in open space areas located below storm water outfalls that discharge into steep canyons just below the mesa top.

Sediment loads are transported downstream to the Lagoon during storm events causing deposits on the salt flats and in Lagoon channels. These sediment deposits have gradually built-up over time due to increased sediment loading and inadequate flushing, which directly and indirectly affects lagoon functions and saltmarsh characteristics.

Legacy sediments from construction activities within the Lagoon (e.g. construction of the railway berms, construction and operation of the sewage treatment plant, and construction and operation of access roads) also play a role in the Lagoon's sedimentation impairment.

3.4.3 Freshwater Impacts

Freshwater runoff from adjacent and upstream urban development reduces soil salinity, allowing brackish and freshwater plant species to encroach into the saltmarsh habitat (CE, 2003). White and Greer (2002) hypothesize that hydrology and soil salinity are significant drivers to maintain the distribution and abundance of Lagoon's native saltmarsh vegetation types and, ultimately, the associated biological communities.

Most of the freshwater input into the Lagoon flows through Los Peñasquitos Canyon. Carroll Canyon Creek to the south and Carmel Creek to the north also contribute freshwater to the Lagoon. Historically, Los Peñasquitos Creek was the only tributary that flowed year-round, but only during years of above average precipitation. Carroll

Canyon and Carmel Creeks only flowed during significant rainfall events and then reverted back to dry washes or creekbeds. Beginning in the 1990s, Carroll Canyon and Carmel Creeks began flowing year-round due to increased urban development within the watershed. Year-round freshwater flows attribute to habitat conversion, which results in sediment related impacts as newly established riparian and brackish marsh plant species serve as sediment traps during low to medium storm flows.

A 1974 report by the California Department of Fish and Game expressed concerns associated with a significant increase in the flow of urban runoff draining into the Lagoon's eastern channel. This report concluded that increased runoff was the result of intensive residential development of the mesas northeast of the Lagoon. During the fall of 1973, this runoff volume amounted to approximately 1,500 gallons per day (Mudie et al.,1974).

Previous studies that focused on the Lagoon and the surrounding watershed provide additional information on historical conditions and hydrologic changes associated with urbanization. For example, White and Greer (2002) classified three distinct periods of urbanization within the upper Los Peñasquitos Creek watershed: 1965-1973 was classified as low urbanization (<15 percent), 1973-1987 as moderate urbanization (15-25 percent), and 1988-2000 as high urbanization (>25 percent). Across the entire time period, the 1-2 year flood interval increased from 229 cubic feet per second (cfs) to 745 cfs to 1,272 cfs in each respective period. Flow duration curves indicate increased baseflow, such as discharges above 1.7 cfs occurred more often during the period between 1973 to 1987 than the earlier period (White and Greer, 2002). This study also estimated a four percent increase in runoff since 1972, with an increase in minimum flows throughout the study equivalent to 17 percent per year. These findings are supported by a recent review of flow data in Los Peñasquitos Creek (Figure 13), which demonstrates a steady increase in monthly mean flows since the 1970s.

The above analyses illustrate the general urbanization trends throughout the watershed that impact the Lagoon. The analyses also assist with identifying a period in time when increased sediment delivery from development was not the primary concern for the Lagoon's ecological functions.

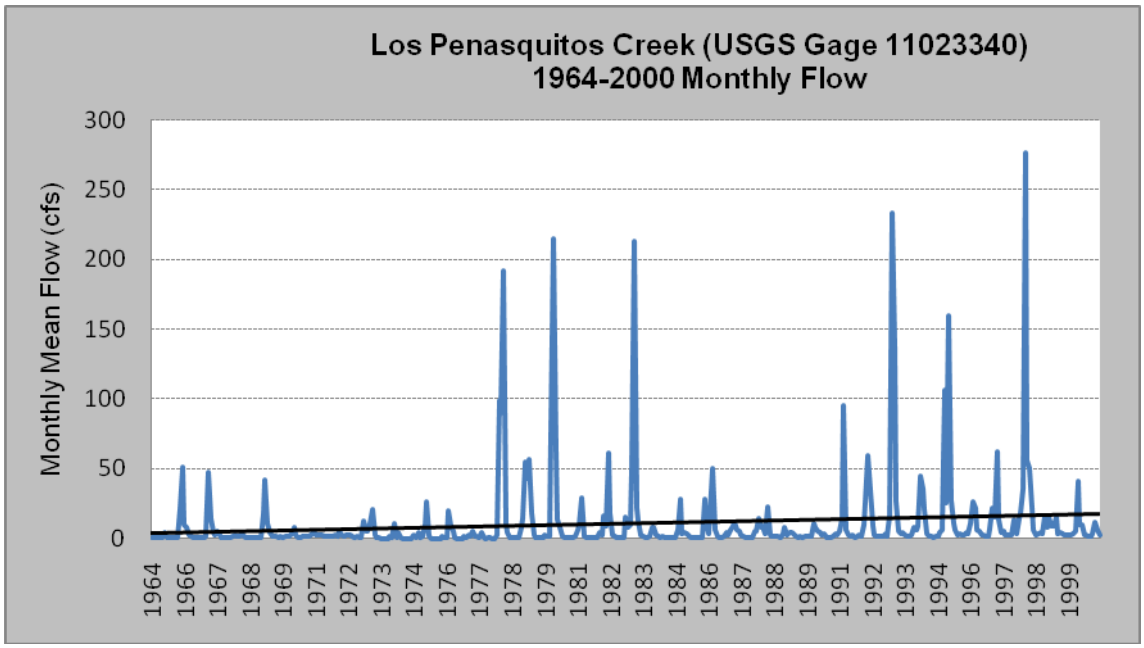

Figure 13. Hydrograph for Los Peñasquitos Creek.

3.4.4 Physical Impacts

As the region began to develop, urban infrastructure, including construction of the railroad (1880s-1925), altered the natural drainage and restricted tidal flows within the Lagoon. The original railroad was built along the eastern edge of the Lagoon (present Carmel Valley Road) and southwards across the salt flats. Construction of the Santa Fe Railroad (presently Burlington Northern Santa Fe Railroad) in 1925 moved the railway to the center of the Lagoon and cutoff several of its natural tidal channels by creating a barrier between the eastern and western portions of the Lagoon. Three railroad trestles provide the only connection between the eastern and western portions of the Lagoon. Later, the construction of Highway 101 (now referred to as Torrey Pines Road) in 1932 relocated the Lagoon's historic ocean inlet and confined the inlet to a single, narrow location under the lower bridge, which resulted in reduction of the Lagoon's tidal prism and exchange between the ocean and Lagoon (Mudie et al. 1974).

The North Beach Parking Lot was constructed in 1968 by State Parks in historically tidal areas that further influenced hydrologic exchanges (LPL Foundation and the State Coastal Conservancy, 1985).

3.4.5 Wastewater Treatment Plant Impacts

In response to increasing urban development within the watershed, two wastewater treatment plants operated from 1962-1972 and discharged effluent to the Lagoon and tributaries that ultimately reach the Lagoon. Although these facilities elevated minimum and median annual discharge values and assisted with maintaining the tidal prism, the

effluent caused insect and odor problems (Mudie et. al. 1974), elevated nutrients (Bradshaw and Mudie, 1972), and depressed salinity concentrations (Torrey Pines State Natural Reserve, 2009). These problems continued until 1972 when surrounding areas were all connected to the San Diego Metropolitan sewer system. However, pump station failures have resulted in numerous sewage spills into the Lagoon. The most recent spill from Pump Station 64 occurred on September 9, 2011, during which over 1.9 million gallons of untreated sewage was discharged just upstream of the Lagoon. Impacts to water quality and aquatic species were recorded upstream and within the Lagoon's channels, as well as along local beaches outside of the lagoon inlet.

4 Numeric Targets

When calculating TMDLs, numeric targets are selected to result in attainment of the water quality standard. The numeric target is a measurable value for the pollutant of concern that, if achieved, will meet the water quality objectives (WQOs) for a waterbody and subsequently ensure the restoration and/or protection of beneficial uses. Achievement of the water quality standard for sediment in the Lagoon was interpreted using multiple lines of evidence to determine the numeric target for this TMDL.

4.1 Applicable Water Quality Standards

The narrative sediment WQO, as set forth in the Basin Plan states, “The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses” (San Diego Water Board, 1994).

The Basin Plan identifies the beneficial uses that are designated for Los Peñasquitos Lagoon (Table 2) (San Diego Water Board, 1994). Compliance with WQOs must be assessed and maintained throughout the waterbody to protect all beneficial uses. While the estuarine (EST) and preservation of biological habitats of special significance (BIOL) beneficial uses are the most sensitive to increased sedimentation, the narrative sediment WQO is applied to all beneficial uses.

Table 2. Beneficial uses designated for Los Peñasquitos Lagoon

Beneficial Use	Beneficial Use Description
REC 1	Includes uses of water for recreation activities involving body contact with water, where ingestion of water is reasonable possible. These uses include, but are not limited to, swimming, wadding, water skiing, skin and SCUBA diving, surfing, white water activities, fishing, or use of natural hot springs.[1]
REC 2	Includes the use of water for recreational activities involving proximity to water, but not normally involving body contact with water, where ingestion of water is reasonable possible. These uses include, but are not limited to, picnicking, sunbathing, hiking, beach combing, camping, boating, tide pool and marine life study, hunting, sightseeing, or aesthetic enjoyment in conjunction with the above activities.[1]
BIOL	Includes uses of water that support designated area or habitats, such as established refuges, parks, sanctuaries, ecological reserves, or Areas of Special Biological Significance (ASBS), where the preservation or enhancement of natural resources requires special protection.

Beneficial Use	Beneficial Use Description
EST	Includes uses of water that support estuarine ecosystems including, but not limited to, preservation or enhancement of estuarine habitats, vegetation, fish, shellfish, or wildlife (e.g., estuarine mammals, waterfowl, shorebirds).
WILD	Includes uses of water that support terrestrial ecosystems including, but not limited to, preservation and enhancement of terrestrial habitats, vegetation, wildlife (e.g., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources.
RARE	Includes uses of water that support habitats necessary, at least in part, for the survival and successful maintenance of plant or animal species established under State or federal law as rare, threatened or endangered.
MAR	Includes uses of water that support marine ecosystems including, but not limited to, preservation and enhancement of terrestrial habitats, vegetation, wildlife (e.g., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources.
MIGR	Includes uses of water that support habitats necessary for migration, acclimatization between fresh and salt water, or other temporary activities by aquatic organisms, such as anadromous fish.
SPWN	Includes uses of water that support high quality aquatic habitats suitable for reproduction and early development of fish. This use is applicable only for the protection of anadromous fish.
SHELL	Includes uses of water that support habitats suitable for the collection of filter-feeding shellfish (e.g., clams, oysters and mussels) for human consumption, commercial, or sport purposes.

1. Access to some areas is not permitted per California State Parks.

4.2 Determining the Reference Condition

The narrative sediment WQO applies to sediment loading to the Lagoon and the accumulation of sediment in the Lagoon. One protective target would be to reduce watershed sediment loads to non-anthropogenic levels to help return and maintain the Lagoon to non-anthropogenic conditions with consideration given to background loading and other factors that also lend to impairment of beneficial uses. The numeric targets are calculated upon the historic condition when water quality standards were once met.

Available literature and past accounts of sedimentation impacts within the Lagoon were reviewed in the Technical Support Document (Attachment 1). This information provides the understanding of how watershed sedimentation results in impacts to the Lagoon's beneficial uses. Furthermore, this information was used in a weight of evidence approach to select the historic period that represents a time when water quality standards were being obtained.

The timeline of significant events and literature references (Figure 14 and Figure 15) summarizes the important changes in the Lagoon over time in relation to changes in land use (urbanization in particular) and other impacts discussed in Section 3 of this TMDL.

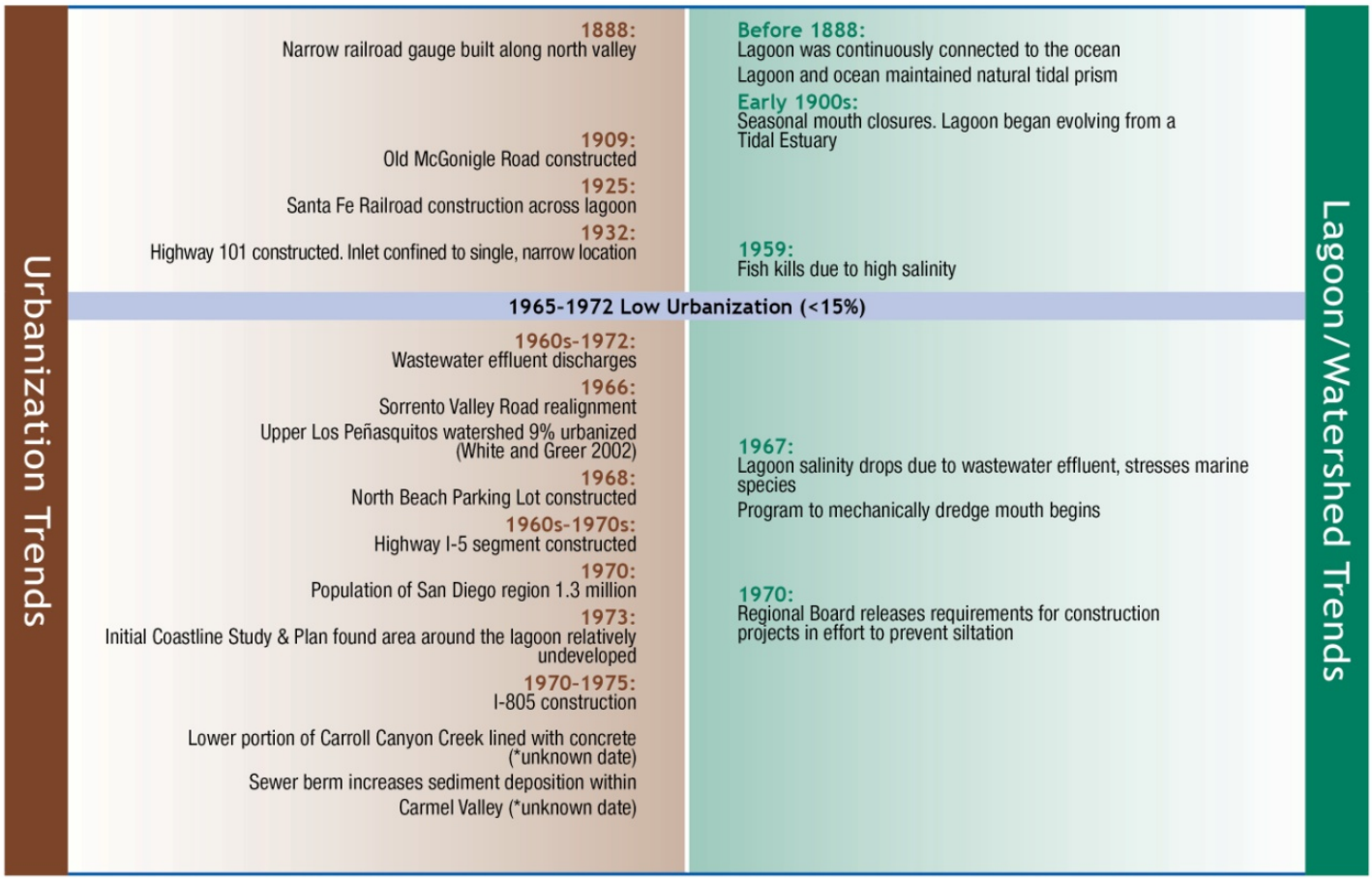

Figure 14. Timeline of urbanization and lagoon trends (1800s through early 1970s).

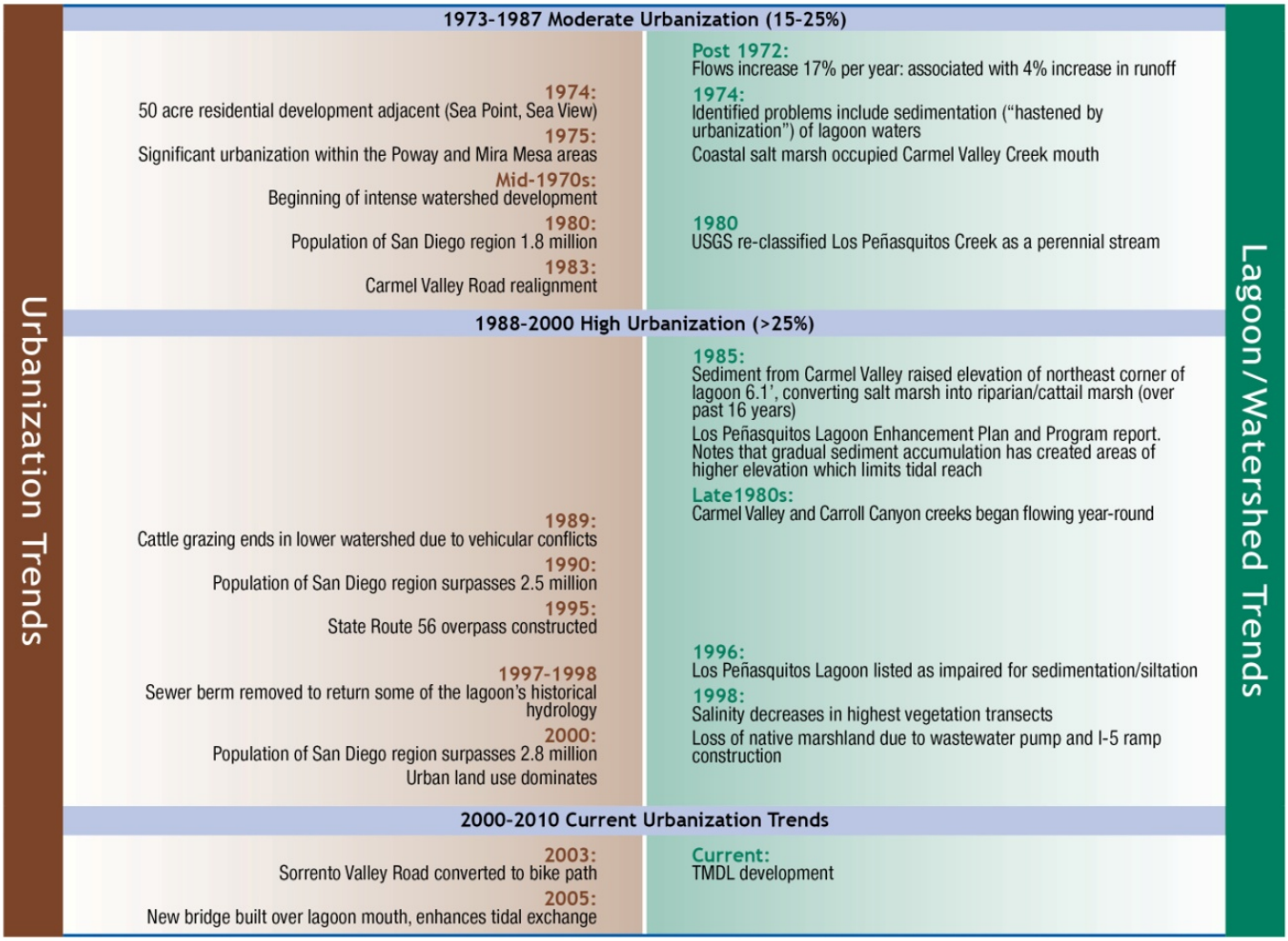

Figure 15. Timeline of urbanization and lagoon trends (mid-1970s through 2010).

Several lines of evidence were considered to determine the time period during which land-use distribution and Lagoon conditions supported water quality standards. This time period defines the reference condition upon which the numeric targets were calculated. The identified time period provides the link to the narrative sediment WQO and defines the conditions that will result in the protection of Lagoon beneficial uses from sedimentation. The lines of evidence considered include:

- **Urbanization trends**: A review of historical literature indicated that intensive development in the Los Peñasquitos watershed began in the mid-1970s. Land-use data shows a nearly 37 percent decrease in open space in the watershed beginning in the mid-1970s.
- **Population data**: Trend analysis of population data indicates that the population of the San Diego region has been steadily increasing since 1970.

- **Flow data**: Review of historical streamflow data from the US Geological Survey gage on Los Peñasquitos Creek and the conclusions drawn by White and Greer (2002) indicate that flow has increased substantially since the 1970s. White and Greer (2002) associated these flow increases with urbanization trends in the watershed.
- **Evaluation of Lagoon conditions:** As described in Section 3, Lagoon conditions have been influenced by several factors, which can be separated into watershed impacts and problems associated with the Lagoon mouth. Watershed impacts to the Lagoon include sediment delivery associated with land development, which increased substantially in the mid-1970s. The wastewater treatment plants impacted water quality in the Lagoon until 1972 when the area was connected to the city sewer system, making it difficult to differentiate between the wastewater impacts and development-associated impacts during this time period (pre-1972). Available literature indicates that sediment deposition from the watershed is not adequately flushed out of the system due to problems at the Lagoon mouth caused by the railroad berm (and other physical alterations) and sediment build-up at the ocean inlet. Note that the Highway 101 bridge abutments were recently replaced and have resulted in improved tidal exchange through the area. As discussed above, reductions in the tidal prism have resulted in increased sediment build-up at the ocean inlet. Sediment deposition at the ocean inlet are primarily a function of littoral forces (Elwany, 2008) and other factors that are largely separate from the sedimentation problems that originate from the watershed. These factors are important to understand in order to effectively manage and improve conditions within the Lagoon, but they are outside the scope of the sediment TMDL analysis.

Consideration of these various lines of evidence indicates that the Lagoon was likely achieving the water quality standard for sediment before the mid-1970s.

4.3 Watershed Numeric Target

A historic coverage for the Peñasquitos watershed was developed for the mid-1970s using US Geological Survey topographic maps (primarily the La Jolla quadrangle-dated 1975). This land-use distribution was used to calculate the watershed numeric target using the LSPC watershed model (see Linkage Analysis, Section 7). This historic (mid-1970s) sediment load of 12,360 tons per critical wet period (211 days), or 58.6 tons per day, represents the sediment TMDL watershed numeric target.

4.4 Lagoon Numeric Target

An analysis of the vegetation types and acreages present in the Lagoon was developed for the mid-1970s using historic aerial photographs (see Linkage Analysis, Section 7). This analysis determined a historic condition of 420 acres of salt marsh present during the time period. The Lagoon numeric target is expressed as an increasing trend in the total area of tidal saltmarsh and non-tidal saltmarsh toward 346 acres. This target acreage represents 80 percent of the total acreage of tidal and non-tidal saltmarsh present in 1973 (see Section 7.5).

5 Source Assessment

The purpose of the source assessment is to identify and quantify the sources of sediment to the Los Peñasquitos Lagoon. Sediment can enter surface waters from both point and non-point sources. Point sources typically discharge at a specific location from pipes, outfalls, and conveyance channels from, for example, municipal wastewater treatment plants or municipal separate storm sewer systems (MS4s). These discharges are regulated through waste discharge requirements (WDRs) that implement federal NPDES regulations issued by the State Water Board or the San Diego Water Board through various orders. Non-point sources are diffuse sources that have multiple routes of entry into surface waters. Some non-point sources, such as agricultural and livestock operations, are regulated under waivers of waste discharge requirements. The source assessment quantification is measured as an annual or daily load, which is then used to separate the load allocations or wasteload allocations for the TMDL. The following sections discuss the sediment sources that contribute to Los Peñasquitos Lagoon.

5.1 Sediment Processes within the Watershed

Wet weather events can cause significant erosion and transport of sediment downstream (especially from canyon areas below storm water outfalls). Dry weather loading attributes minimal sediment loading via nuisance flows from urban land-use activities such as car washing, sidewalk washing, and lawn over-irrigation, which pick up and transport the sediment into receiving waters. Due to the higher runoff potential associated with wet weather conditions, emphasis was placed on characterizing wet weather watershed loading.

Wet weather loading is dominated by episodic storm flows that wash off built up sediment on land surfaces, erode canyon areas below storm water outfalls, and scour stream banks. Erosion and scouring are exacerbated by anthropogenic disturbances, such as land development within the watershed. Development can expose sediment and increase the amount of impervious surfaces on formerly undeveloped landscapes. This reduces the capacity of the remaining pervious surfaces to capture and filter rainfall. As a result, a larger percentage of rainfall becomes runoff during any given storm. Subsequently, runoff reaches stream channels much more quickly, and peak discharge rates and total runoff volume are higher than before development for the same size rainfall event (SCCWRP, 2011). This process is termed hydromodification.

In the Los Peñasquitos Watershed, the results of hydromodification are most pronounced below storm water outfalls in open space areas that discharge into steep drainages, where canyon walls are eroding into creeks. This effect is illustrated in Figure 16. Sediment is transported downstream to the Lagoon during storm events and deposited on the salt flats and in the Lagoon channels.

Figure 16. Erosion of canyon walls below storm drain outfall in the Los Peñasquitos Creek watershed (Garrity and Collison, 2011).

In 2010, a geomorphic assessment of the Peñasquitos watershed was conducted. The goals of the assessment were to identify locations within the watershed that are the main sources of sediment to the Lagoon, identify processes (natural and anthropogenic) that contribute sediment, and identify and prioritize actions to reduce and manage sediment. This study identified multiple segments of Carroll Canyon Creek that highly contribute to sediment production and have increased sediment delivery potentials due primarily to hydromodification effects on open space areas and a channelized segment of Carroll Creek (City of San Diego, 2011).

5.2 Sediment Processes within the Lagoon

Sediment from the watershed is discharged to the Lagoon and then redistributed to other areas of the Lagoon by both anthropogenic and natural processes. Distribution of sediment within the Lagoon is affected by physical impediments within the Lagoon including the constricted Lagoon mouth, the buildup of the floodplain adjacent to the confluence of Los Peñasquitos and Carroll Canyon Creeks, and the railroad berm. These physical impediments do not directly contribute a sediment load to the Lagoon; therefore a daily sediment load for these structures cannot be calculated.

More information on the structure of the Lagoon can be found in Background Section 3.3.

5.3 Sediment Sources

There are two broad categories of sediment sources to the Lagoon: 1) watershed sources, and 2) the Pacific Ocean. The watershed sources consist of all point and non-point sources of sediment in the watershed area draining to Los Peñasquitos Lagoon. The total sediment contribution from all watershed sources is presented as the total wasteload allocation (WLA). Sediment contributions from the Pacific Ocean are considered background sources and are presented as the Load Allocation (LA).

5.3.1 Watershed Point Sources

Direct discharges from the watershed to the Lagoon include discharges from: 1) Carmel, Peñasquitos, and Carroll Canyon Creeks; and 2) gullies adjacent to the Lagoon. These are considered point sources. This is the case because virtually the entire Los Peñasquitos watershed is drained through the Phase I MS4 collection systems. The MS4 collection system is defined as a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains) (San Diego Water Board, 2007). In addition, and as stated in the San Diego County MS4 permit, historic and current development makes use of natural drainage patterns and features as conveyances for urban runoff. Urban streams used in this manner are part of the municipalities MS4 regardless of whether they are natural, man-made, or partially

modified features. In these cases, the urban stream is both an MS4 and a receiving water (Finding d.3.c, San Diego Water Board 2007). For this reason the Phase I MS4s can be thought of as the primary and ultimate point sources of sediment to the Lagoon.

Storm water runoff is regulated through the following NPDES permits: the San Diego County Phase I municipal separate storm sewer system (MS4) permit, the Phase II MS4 permit for small municipal dischargers, and the statewide storm water permits issued to Caltrans, construction sites, and industrial sites. The permitting process defines these discharges as point sources because storm water is discharged from the end of a storm water conveyance system.

Phase I Municipal Separate Storm Sewer System (MS4)
As discussed above, the Phase I MS4s can be thought of as the primary and ultimate point sources of sediment to the Lagoon. The principal MS4s contributing sediment to the Lagoon are owned or operated by the municipalities located throughout the Peñasquitos watersheds including the City of San Diego, City of Poway, City of Del Mar, and County of San Diego. Note that Caltrans, Phase II MS4s, and several construction and industrial sites discharge into the Phase 1 MS4s.

Phase I MS4s contribute sediment during both dry and wet weather events; however, it is during wet weather events when runoff from storm drain outfalls causes significant erosion along canyon walls below the outfalls and along creek channels that receive these flows. In addition, sediment build-up on land surfaces from various sources is washed into the storm drain outfalls during rainfall events. The increased volume, velocity, frequency and discharge duration of storm water runoff from developed areas has the potential to greatly accelerate downstream erosion, impair stream habitat in natural drainages, and negatively impact beneficial uses. Development and urbanization increase pollutant loads in storm water runoff and the volume of storm water runoff. Impervious surfaces can neither absorb water nor remove pollutants and thus lose the purification and infiltration provided by natural vegetated soil.

The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, interflow and groundwater flow) caused by urbanization or other land use changes is called “hydromodification”, and results in increased stream flows and sediment transport. In addition, alteration of stream and river channels, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

Phase II Municipal Separate Storm Sewer System (MS4)
Phase II MS4s are storm water systems that serve public campuses, military bases, and prison and hospital complexes within or adjacent to other regulated MS4s, or which pose significant water quality threats. They are responsible for addressing water quality

concerns from their small MS4s. Table 3 identifies the traditional and non-traditional small MS4s within the Los Peñasquitos watershed. Non-traditional small MS4s are federal and State operated facilities that can include universities, prisons, hospitals, military bases.

Table 3. List of traditional and non-traditional small MS4s

Agency	Facility	Address
California Community Colleges	San Diego Miramar College	10440 Black Mountain Road San Diego, CA 92126-2999
University of California	University of California, San Diego	9500 Gilman Drive La Jolla, 92093
State Park	Torrey Pines State Beach	N Torrey Pines Road San Diego, CA 92037

Storm water discharges from Phase II MS4s typically discharge into Phase I storm drain systems. As with Phase I MS4s, pollutants that build up on land surfaces within the small MS4s are washed off during rainfall events. In addition, urbanized areas within the Phase II MS4s also generate flows that exacerbate the natural erosion and scouring processes of the creek.

Caltrans MS4s

The storm water discharges from most of the Caltrans properties and facilities within the Peñasquitos watershed discharge into a Phase I MS4 system. As with Phase I MS4s, pollutants build up on land surfaces owned by Caltrans and are washed off during rainfall events. In addition, runoff from these surfaces result in hydromodification flows that exacerbate the natural erosion and scouring processes of the receiving creek.

Groundwater Extraction Discharges

Discharges from ground water extraction activities to surface waters are not a contributor of sediment to the Lagoon. These discharges are regulated under waste discharge requirements, which specify that suspended sediment concentrations in the effluent be no more than 50 milligrams per liter and that discharges shall not cause the rate of deposition of solids and characteristics of inert solids in the sediment to be changed such that benthic communities are degraded.

Discharges of Hydrostatic Test Water and Potable Water

Discharges of Hydrostatic Test Water and Potable Water are those discharges resulting from testing of pipelines, tanks and vessels that are dedicated to drinking water purveyance and storage. These discharges are regulated under waste discharge requirements which require the implementation of Best Management Practices (BMPs) for flow and pollutants prior to entering receiving waters and/or the MS4 system.

Discharges from Utility Vault and Underground Structures
Discharges from Utility Vault and Underground Structures are not a contributor of sediment to the Lagoon. These intermittent discharges range from a few gallons to a few thousand gallons and are routed to the Lagoon directly or indirectly via the Phase I MS4 system.

Construction and Industrial Sites
During wet weather, runoff from industrial and construction sites has the potential to contribute sediment loading to the Lagoon. During dry weather, the potential contribution of pollutant loadings from industrial and construction storm water is low because non-storm water discharges are prohibited or authorized by permit only under the following circumstances: when they do not contain significant quantities of pollutants, where BMPs are in place to minimize contact with significant materials and reduce flow, and when they are in compliance with San Diego Water Board and local agency requirements.

As of March 2012, there were 81 industrial facilities enrolled under the general industrial storm water permit in in the Los Peñasquitos watershed. Table 4 identifies the industrial facilities within the Peñasquitos watershed. These facilities include mining facilities, manufacturing facilities, transportation facilities, etc. Potential pollutants from an industrial site will depend on the type of facility and operations that take place at that facility. Facilities that discharge sediment have a potential to adversely impact the impaired Lagoon. For example, the two sand mining operations in Carroll Canyon have the potential to discharge sediment from their operation. Facilities with impervious surfaces or that alter the natural drainage of a watercourse also have the potential to adversely impact the impaired Lagoon.

Table 4. List of industrial facilities

Operator	Facility	Address
US Marine Corps Commanding Gen	US Marine Corp Air Station Mir	45249 Miramar Way, San Diego, CA 92145
Sycamore Landfill Inc	Sycamore Landfill	14494 Mast Blvd, San Diego, CA 92145
Hanson Aggregates Pacific Southwest	Hanson Aggregates	9229 Harris Plant Rd, San Diego, CA 92145
New Leaf Biofuel	New Leaf Biofuel	2285 Newton Ave, San Diego, CA 92124
Fyfe Co LLC	Fyfe Co LLC	8380 Miralani Dr, San Diego, CA 92126
Vulcan Material dba Cal Mat Co	Carroll Canyon Aggregates	10051 Black Mountain Rd, San Diego, CA 92126

Operator	Facility	Address
Hydranautics	Hydranautics	8270 Miralani Dr, San Diego, CA 92126
YRC Inc	YRC Inc	9525 Padgett St, San Diego, CA 92126
Ontrac	Ontrac	7077 Consolidated Way, San Diego, CA 92121
Penick II LLC	Olson dr	9747 Olson Dr, San Diego, CA 92121
Miramar Truck Center	Miramar Truck Center	6066 Miramar Road, San Diego, CA 92121
Penske Logistics LLC	Penske Logistics LLC	7170 Miramar Rd Ste 800 to 900, San Diego, CA 92121
Bimbo Bakeries USA	Bimbo Bakeries USA	5662 Eastgate Dr, San Diego, CA 92121
Illumina Inc	Research Place	5200 Research Pl, San Diego, CA 92121
California Precision Products Inc	California Precision Products Inc	6790 Flanders Dr, San Diego, CA 92121
Tayman Industries Inc	Tayman Industries Inc	5692 Eastgate Dr, San Diego, CA 92121
Illumina Inc	Carroll Park Dr Facility	9440 Carroll Park Dr, San Diego, CA 92121
California Commercial Asphalt	Carroll Canyon	9234 Camino Santa Fe, San Diego, CA 92121
Ametek Programmable Power	Ametek Programmable Power	9250 Brown Deer Rd, San Diego, CA 92121
Leed Recycling	Leed Recycling	8725 Miramar Pl, San Diego, CA 92121
Westside Building San Diego LLC	Westside Building San Diego LLC	7465 Carroll Rd, San Diego, CA 92121
West Tech Contracting Inc	West Tech Contracting	7625 Carroll Rd, San Diego, CA 92121
Integrated Microwave Corp	Integrated Microwave Corp	11353 Sorrento Valley Rd, San Diego, CA 92121
Angel P Hayes	Aquarius Marine	9384 Frost Mar Pl, San Diego, CA 92121
Stone Yard Inc	Stone Yard Inc	8980 Crestmar Point, San Diego, CA 92121
Old Dominion Freight	Old Dominion Freight Lines	9850 Olson Dr,

Operator	Facility	Address
Lines		San Diego, CA 92121
Josh Degano	PCF Group	8585 Miramar Pl, San Diego, CA 92121
Expo Industries INC	Expo Industries INC	7455 Carrol Rd, San Diego, CA 92121
Deere & Company	T Systems International	7545 Carroll Rd, San Diego, CA 92121
Dale L Watkins	Shefield Platers Inc	9850 Waples St, San Diego, CA 92121
RR Donnelley	RR Donnelley	7590 Carroll Rd, San Diego, CA 92121
Pacira Pharmaceuticals, Inc.	Pacira Pharmaceuticals	10450 Science Center Dr, San Diego, CA 92121
USF Reddaway Inc Yrc Worldwide Enterprise Services Inc	USF Reddaway Inc 398 SDO	7075 B Carroll Rd, San Diego, CA 92121
Robertsons Ready Mix	Robertsons Miramar Plant	5692 Eastgate Dr, Miramar (2), CA 92121
United Parcel Service Freight	UPS Ground Freight Inc	7075 A Carroll Rd, San Diego, CA 92121
MZ3D Inc	MZ3D Inc	10739 Roselle St, San Diego, CA 92121
FedEx HD Pomona Industry	FedEx Ground Home Delivery	8515 Miramar Place, San Diego, CA 92121
ATK Space Systems	ATK Space Systems	9617 Distribution Ave, San Diego, CA 92121
Rhino Linings Inc	Rhino Linings Inc	9151 Rehco Rd, San Diego, CA 92121
San Diego City	Pump Station 64	10745 Roselle St, San Diego, CA 92121
San Diego City	Pump Station 65	12112 Sorrento Valley Rd, San Diego, CA 92121
Illumina Inc	Illumina Inc	9885 Towne Centre Dr, San Diego, CA 92121
Quikrete	Quikrete	9265 Camino Santa Fe, San Diego, CA 92121
Allan Co	Allan Co	6733 Consolidated, San Diego, CA 92121
MJB Freight Systems	Mjb Freight Systems	6225 Marindustry Dr,

Operator	Facility	Address
		San Diego, CA 92121
FedEx Freight Whittier	Fed Ex Freight West	5550 Eastgate Mall, San Diego, CA 92121
Dixieline Lumber Co	Dixieline Lumber Ne Miramar	7292 Miramar Rd, San Diego, CA 92121
Calbiochem Nova Biochem	EMD Biosciences Inc	10394 Pacific Center Ct, San Diego, CA 92121
Hanson Aggregates Pacific Southwest	Hanson Aggregates	9255 Camino Santa Fe, San Diego, CA 92121
San Diego City	San Diego City N City Water Re	4949 Eastgate Mall, San Diego, CA 92121
Pall Filtration & Separations	Pall Filtration & Separations	4116 Sorrento Valley Blvd, San Diego, CA 92121
Fed Ex	Fed Ex	10585 Heater Ct, San Diego, CA 92121
Fed Ex Ground Packaging System	Fed Ex Ground	9999 Olson Dr, San Diego, CA 92121
Presidio Components Inc	Presidio Components Inc	7169 Construction Ct, San Diego, CA 92121
Qualcomm Inc	Qualcomm Inc	5525 Morehouse Dr, San Diego, CA 92121
Escondido Ready Mix	San Diego Ready Mix	9245 Camino Santa Fe, San Diego, CA 92121
Overnite Transportation	UPS Freight	7191 Carroll Rd, San Diego, CA 92121
RE Hazard Contracting Co	Re Hazard Contracting Co	6465 Marindustry Dr # 6485, San Diego, CA 92121
Titan Linkabit	Titan	3033 Science Park Rd, San Diego, CA 92121
Frazee Paint	Frazee Paint	6625 Miramar Rd, San Diego, CA 92121
Van Can Co	Van Can Co	9045 Carroll Way, San Diego, CA 92121
IMS Electronics Recycling Inc	IMS Electronics Recycling Inc	12455 Kerran St 300, Poway, CA 92064
Mobile Mini Inc	Mobile Mini Inc	12345 Crosthwaite Cir, Poway, CA 92064
General Atomics	General Atomics	14107 Stowe Dr,

Operator	Facility	Address
Aeronautical Sys Inc Bldgs 14 & 15	Aeronautical Sys Inc Bldgs 14 & 15	Poway, CA 92064
Toray Membrane USA Inc	Toray Membrance USA Inc	13435 Danielson St, Poway, CA 92064
Joe Peterson	San Diego Crating and Packing	12678 Brookpriuter Pl, Poway, CA 92064
Sysco Food Services of San Diego	Sysco Food Services of San Diego	12180 Kirkham Rd, Poway, CA 92064
San Diego Granite Inc	San Diego Granite Inc	13026 Stowe Dr, Poway, CA 92064
FedEx Freight Inc	FedEx Freight Inc ESD	12055 Tech Center Dr, Poway, CA 92064
Atlas Transfer & Storage	Atlas Transfer & Storage	13026 Stowe Dr, Poway, CA 92064
All State Van & Storage Inc	All State Van & Storage Inc	12356 Mc Ivers Cct, Poway, CA 92064
Uke, Alan	Underwater Kinetics	13400 Danielson St, Poway, CA 92064
Poway City	Poway City Material Landing Fa	12325 Crosthwaite Cir, Poway, CA 92064
Valley Metals	Valley Metals	13125 Gregg St, Poway, CA 92064
Halllmark Circuits Inc	Hallmark Circuits Inc	13500 Danielson St, Poway, CA 92064
Vulcan Material dba Cal Mat Co	Poway	10975 Beeler Canyon Rd, Poway, CA 92064
County of San Diego	Poway Landfill	14600 Poway Rd, San Diego, CA 92064
POWAY UNIFIED SCHOOL DISTRICT	Poway USD Transportation	13626 Twin Peaks Rd, Poway, CA 92064
Cor O Van Co	Cor O Van Co	12375 Kerran St, Poway, CA 92064
Designer Molecules Inc	Designer Molecules Inc	10080 Willow Creek Rd, San Diego, CA 92131

As of June 2010, there were 23 construction sites covering 442 acres enrolled under the general construction storm water permit in the watersheds draining to the Lagoon (Figure 17). While construction projects are intermittent and occur over relatively short durations, sediment loads from these projects can be significant.

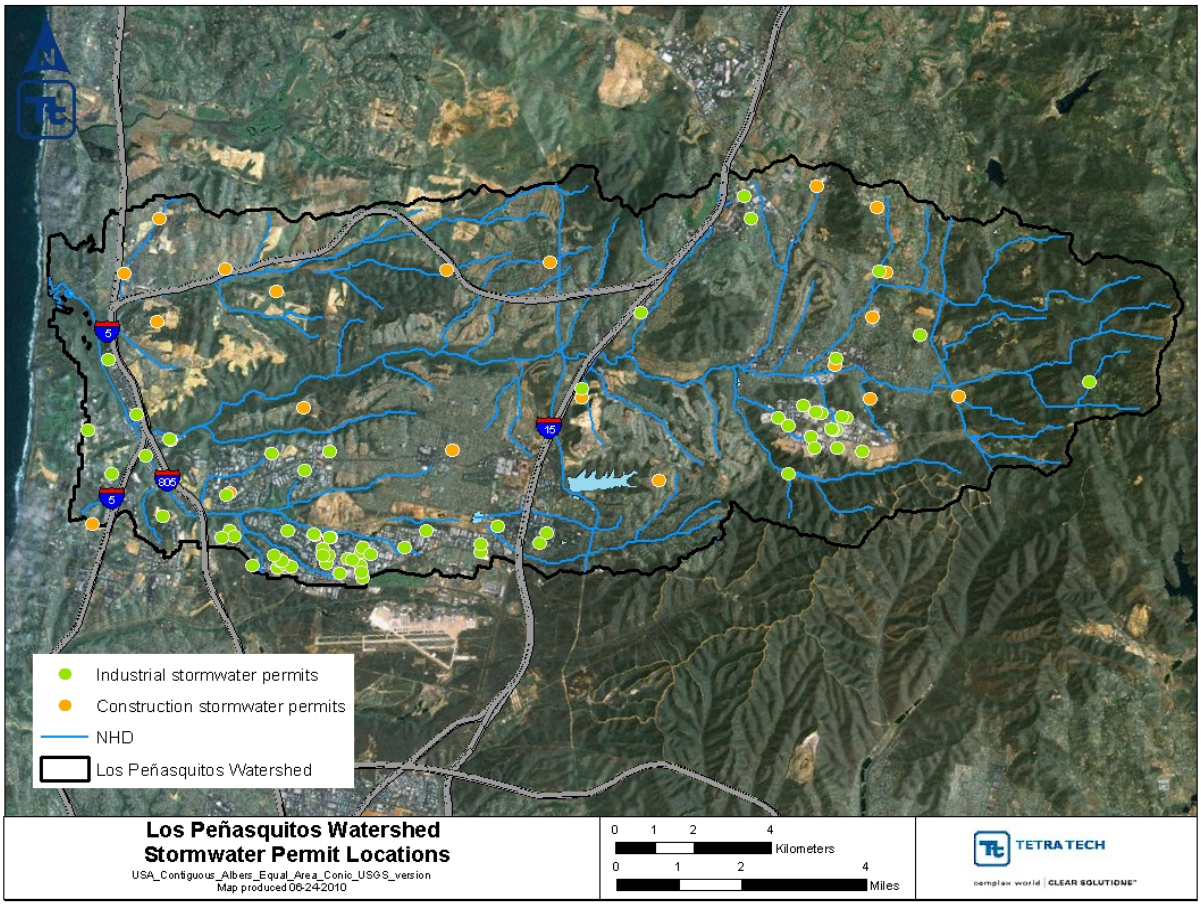

Figure 17. NPDES construction and industrial storm water permits as of June 2010.

5.3.2 Watershed Non-Point Sources

In this TMDL, the watershed sources also include all the *non-point sources located in the watershed* such as agriculture (1 percent of year 2000 land-use area) and open space (43 percent of year 2000 land-use area). This is the case because virtually the entire Los Peñasquitos watershed is drained through the Phase I MS4 collection systems. The total sediment contribution from all watershed sources is presented as the WLA.

5.3.3 Ocean Sediment Sources

Ocean sediment contributions are considered a background source and accordingly an LA is assigned to ocean sediment contributions from storm surges and wave action along the ocean boundary (see Identification of Load Allocations and Reductions Section 8.8). Sediment loads from the ocean are primarily a function of littoral forces

and other factors that are largely separate from the sedimentation problem originating from the watershed.

There is a natural tendency for wave-deposited sand to accumulate at the mouth of Los Peñasquitos Lagoon. This leads to the gradual formation of a broad sand bar in the vicinity of the junction of the two main branches of the lagoon drainage system. However, ocean sediments are dredged routinely from the Lagoon mouth to alleviate the danger of flooding and to improve the health of the Lagoon. The dredging of ocean sediments prevents the migration of sediment upstream into the lagoon system and maintains tidal exchange with the lagoon, both of which serve to maintain the tidal prism and lagoon soil salinities.

5.4 Quantification of Watershed Sediment Sources

Sediment sources were quantified by land-use group because sediment loading is highly correlated with land-use practices. Since several land-use types share hydrologic or pollutant loading characteristics, many were grouped into similar classifications, resulting in a subset of nine categories for modeling. Selection of these land-use categories was based on the availability of monitoring data and literature values that could be used to characterize individual land-use contributions and critical sediment-contributing practices associated with different land uses. For example, multiple urban categories were represented independently (e.g., high density residential, low density residential, and commercial/institutional), whereas other natural categories were grouped. The three major land-use sources in the watershed are open space, low density residential, and industrial/transportation. All land uses were classified as generating point source loads because, although the sediment sources within the watershed may be diffuse in origin, the pollutant loading is transported and discharged to the Lagoon waters through the storm water conveyance system.

The sediment load contributed by each land-use type was calculated using the LSPC model (note that unpermitted direct discharges of sediment to receiving waters were not explicitly quantified in the modeling analysis). Modeling parameters were varied by land use to provide the correlation between sediment loading and land-use type. More information on land uses is contained in Background Section 3.2 and the Modeling Report (Attachment 2).

6 Data Analysis and Inventory

Multiple data sources were used to characterize the watershed and Lagoon, including stream flow and water quality conditions. Much of this information was recently collected by watershed stakeholders to assist with TMDL model development. Data describing the watershed's topography, land use, soil characteristics, meteorological data, and irrigation needs along with available bathymetric survey information and data sondes analyzing pressure and salinity were used to calibrate the watershed and Lagoon models. The Technical Support Document (Attachment 1) summarizes stream flow and total suspended sediment data used for calculation of the watershed numeric target.

7 Linkage Analysis

The technical analysis of the relationship between pollutant loading from identified sources and the response of the waterbody to this loading is referred to as the linkage analysis. The purpose of the linkage analysis is to quantify the maximum pollutant loading that can be received by an impaired waterbody and still attain the WQOs of the applicable beneficial uses. This numeric value is represented by the TMDL.

The linkage analysis for this TMDL is based on biological index linkages and computer models that were developed to represent the physical processes within the impaired receiving waterbody and associated watershed. The models provided estimation of sediment loadings from the watershed based on rainfall events, land use, and simulation of the response of the receiving water to these loadings. The following sections provide more detailed discussion regarding model selection and linkage analysis.

7.1 Linkage of Targets and Sources to Beneficial Uses

As discussed in the Numeric Targets section 4, this TMDL finds that the water quality objective for sediment in the Lagoon was being attained and beneficial uses were being supported under historic conditions (mid-1970s). It follows that the Lagoon was capable of assimilating historic sediment loads under historic Lagoon conditions. The historic Lagoon condition has evolved through time with continual natural and anthropogenic sediment deposition and alterations to the Lagoon's natural systems, including: constriction of the Lagoon's floodplain by development, relocation of the Lagoon's natural ocean inlet, year round fresh water input, elevated peak discharges and volumes of storm runoff from impervious surfaces, and construction of two railway berms across the Lagoon.

Development within the Lagoon and increased sediment discharge to the Lagoon over time has contributed to sediment buildup and higher elevations that limit tidal flow and the extent of saltmarsh vegetation. This trend has resulted in adverse impacts to beneficial uses, in particular, the estuarine (EST) and preservation of biological habitats of special significance (BIOL) beneficial uses. Deposition of watershed sediment contributes to elevation increases within the Lagoon, leading to an increase in height relative to mean sea level. Elevation is a critical variable that determines the productivity, diversity, and stability of saltmarshes (e.g. see Pennings and Callaway 1992, Zedler and Callaway 2000). The long-term existence of the saltmarsh depends on the success of the dominant plants, such as *Sarcoconia pacifica* (*Salicornia virginica*) and *Frankenia salina*, and their close relationship to sediment supply, sea level change, soil salinity, and tidal range (US EPA, 2005). This subset of estuarine habitat is of

particular biological significance as it is estimated that only 10 percent of the original coastal marshland in San Diego County remains in existence (Mudie et al. 1974).

Watershed and Lagoon numeric targets were identified to calculate the watershed sediment load reduction required based on historical analysis, account for impairment of saltmarsh due to historic sediment loads, and to track implementation success.

It is expected that reduced sediment loading from storm water discharges consistent with the watershed sediment reduction target will encourage the establishment of native vegetation in degraded areas through various mechanisms. Implementation actions designed to reduce sedimentation will also likely reduce nuisance freshwater flows into the Lagoon that have contributed to observed habitat and beneficial use impacts. An adaptive management approach will be used to determine the most effective course of action to achieve the numeric targets and improve beneficial uses in the Lagoon (see Implementation Plan Section 9.3). Ultimately, sediment removal in some areas may be needed to remove the excess anthropogenic sediment that has been deposited since the mid-1970s to meet the requirements of this TMDL and to re-establish elevations conducive to saltmarsh habitats progression and diversity of species, as well as improved connectivity between the watershed, Lagoon, and tidal flow.

Reducing watershed sediment loads from the year 2000 levels to historic levels (mid 1970's) is a necessary component for restoring and providing long-term protection of the Lagoon's beneficial uses. To represent the linkage between source contributions and receiving water response, a dynamic water quality model was developed to simulate source loadings and transport of sediment into the Lagoon. The models provide an important tool to evaluate year 2000 conditions, to evaluate historic conditions, and to calculate TMDL load reductions.

As mentioned before, sedimentation within coastal estuaries and lagoons is a natural process, recently augmented by human activities in the watershed over the last 200 years with the majority of sedimentation impacts occurring over the past 40 years (see Figures 14 and 15). It is believed that the Lagoon was capable of assimilating these historic sediment loads under the historic Lagoon condition. Because the Lagoon has been impacted by sediment accumulation, as demonstrated by the type changes in salt marsh habitat over the last 40 years from watershed sediment loads and hydrologic inputs, it cannot be assumed that the Lagoon, in the year 2010 condition, can assimilate the same elevated sediment loads. The historic condition represents a time period prior to major land development in the watershed, but occurs at a period following major physical modifications to the lagoon (e.g. see Figure 14). Thus, the evaluation of the extent of vegetation types in the Lagoon provides the necessary tool to assess how the

Lagoon responds to watershed sediment load reductions and to establish a target Lagoon condition under which the Lagoon can again assimilate the historic mid-1970's sediment loads.

7.2 Model Selection and Overview

In selecting an appropriate approach for TMDL calculation, technical and regulatory criteria were considered. Technical criteria include the source contributions, critical conditions, constituents to be addressed, and the physical domain, which is one of the most important considerations in model selection and accounts for both watershed and receiving water characteristics and processes. Regulatory criteria include water quality objectives and procedural protocol such as US EPA's *Protocol for Developing Sediment TMDLs*. In selecting a modeling framework, the models' ability to enable direct comparison of model results to the selected numeric target must be considered. For the watershed loading analysis and implementation of required reductions, it is also important that the modeling framework allow for the examination of gross land-use loading.

The selected modeling system was divided into two components representative of the processes essential for accurately modeling hydrology, hydrodynamics, and water quality. The first component of the modeling system, the Loading Simulation Program in C++ (LSPC) model, is a watershed model that predicts runoff and external pollutant loading as a result of rainfall events. The second component, the Environmental Fluids Dynamic Code (EFDC) model, is a hydrodynamic and water quality model that simulates the complex water circulation and pollutant transport patterns in the Lagoon. LSPC was specifically used to simulate watershed hydrology and transport of sediments in the streams and storm drains flowing to the impaired Lagoon. The LSPC model was linked to the EFDC model to provide all freshwater flows and loadings as the EFDC model input.

The LSPC and EFDC models were used to calculate both historic and year 2000 conditions to establish the watershed numeric target and required load reductions from year 2000 conditions.

A complete discussion, including model configuration, hydrologic and hydrodynamic calibration and validation, and water quality calibration and validation of the LSPC and EFDC models is provided in the Modeling Report (Attachment 2). In summary, these models rely on several assumptions that attempting to predict natural processes in a highly complex system. However, models can still provide a useful tool for management decisions and their accuracy can be improved with the type and amount of data used to calibrate them.

The TMDL is not limited by the models or their implementation; however, the nature of the variability of precipitation in Southern California, which leads to an extremely difficult sampling problem, coupled with the lack of bank erosion and bed load transport data creates a degree of uncertainty in the TMDL. In light of this uncertainty, this TMDL establishes a Margin of Safety (MOS; see Section 8.11) and establishes an adaptive management approach, in which an effective monitoring system is put in place to obtain detailed sediment loading data while monitoring the response of the Lagoon.

7.3 Model Application

The models were initially calibrated to hydrologic and water quality data (see Section 6) to characterize year 2000 conditions in the watershed and Lagoon. Land-use conditions present during the mid-1970s were associated with loads that met the sediment WQO to characterize historic (mid-1970s) conditions. The 1993 El Niño time period (the critical wet period, October 1, 1992-April 30, 1993) was used to calculate sediment loads under historical and year 2000 conditions. Model simulations were performed using the same meteorological data to accurately compare the watershed and Lagoon response to the same weather conditions.

The resulting historical net annual sediment load was identified as the watershed numeric target, which represents the loading (assimilative) capacity for the Lagoon (i.e. the TMDL). Historic loads define the allowable load; therefore, required load reductions represent the difference between year 2000 sediment loads and historic (allowable) loads.

7.4 Mapping Vegetation Types in the Lagoon

Through the aerial photo interpretation effort, vegetation types of the Los Peñasquitos Lagoon were estimated for the year 1973 (historical conditions) and year 2010. Aerial photography has long been used to map and assess changes to wetlands (White and Greer, 2002).

Aerial photos were acquired from the County of San Diego to characterize historical vegetation types within the Lagoon. The vegetation types were interpreted from 1:12,000 scale, 1,200 dots per square inch scans of photos by staff at California State Parks. The photography was captured on November 25, 1973 with the exception of the southernmost photo, which was captured on June 17, 1974.

Aerial photos were acquired from USA Prime Imagery map service to characterize the year 2010 vegetation types within the Lagoon. The vegetation types were interpreted from the high resolution photos by staff at California State Parks. The photography was acquired for the fall of 2010 aerial from USA Prime Imagery's

I3_Imagery_Prime_World_2D map. This map presents satellite imagery for the world and high-resolution aerial imagery for the United States.

The photos representing historical vegetation types were geo-referenced to a minimum four locations within the marsh or low lying uplands to existing digital imagery. The fit appeared reasonable as transitions from one aerial to the next were not obviously misaligned and delineations fit well to modern high resolution aerial images. Individual pairs of points with high root mean square errors (RMSE) were discarded and replaced until an acceptable overall RMSE was achieved. The RMSE quantifies the distortion between a scanned aerial image and a rectified, geo-referenced base map. The average RMSE for the overall study was 7.65 pixels or 9.10 meters.

Vegetation types for historic and year 2010 conditions were heads-up digitized onscreen (at an approximate 1:2,500 scale), interpreted, and mapped into generalized classifications that could be reliably interpreted without field verification. Neither field verifications nor accuracy assessments were conducted. However, supplemental data was used to determine coarse elevations and vegetation types, including from SanGIS 2-foot topography and Google maps oblique aerials.

Vegetation types were classified as saltmarsh, non-tidal saltmarsh, non-tidal saltmarsh–*Lolium perrene* infested, freshwater marsh, southern willow scrub/mulefat scrub, herbaceous wetland, or upland land cover (urban, beach, dune, upland vegetation, etc.). Vegetation types are described below. Vegetation type extents under historic (mid-1970s) and year 2010 conditions are illustrated in Figures 18 and 19.

<u>Saltmarsh</u>

Description:	Exists below 6 feet (mean sea level) in elevation with an obvious tidal connection and no obvious presence of annual grasses or freshwater marsh vegetation. Also includes salt panne, mudflat, and tidal channels.
Indicators:	Deep brown and red-orange, smooth textured vegetation.
Common Species:	*Sarcoconia pacifica* (*Salicornia virginica*)*, Frankenia grandiflora, Juamea carnosa*.
Confidence:	Moderate-High. High confidence that vegetation is saltmarsh. Moderate confidence that this vegetation is tidal.

<u>Non-tidal Saltmarsh</u>

Description:	Exists above 4 feet (mean sea level) in elevation with no obvious tidal connection, but presence of annual grasses or freshwater marsh vegetation.

Indicators: Deep brown and red-orange, smooth textured vegetation, but lighter in color than tidal saltmarsh due to less moisture. Includes salt panne with no obvious tidal connection.

Common species: *Sarcoconia pacifica* (*Salicornia virginica*), *Frankenia grandiflora*. Vegetation distant from tidal connection has higher cover of *Frankenia salina* (orange color in aerials) and includes more brackish species (such as *Scirpus maritimus* and *Iva hayesiana*). This vegetation could be considered cismontane alkali marsh.

Confidence: Moderate-High. High confidence that vegetation is saltmarsh. Moderate confidence that this vegetation is non-tidal.

Non-tidal Salt Marsh – *Lolium perrene* infested

Description: Exists above 4 feet (mean sea level) in elevation with no obvious tidal connection. Dominated by annual grasses with presence of saltmarsh vegetation.

Indicators: Straw color of senescent annual grasses.

Common species: *Sarcoconia pacifica* (*Salicornia virginica*), *Frankenia grandiflora, Lolium perenne*. Could also contain *Bromus diandrus* or other non-native grass.

Confidence: Moderate.

Freshwater Marsh

Description: Freshwater marsh vegetation.

Indicators: Taller statured, more round-patterned, and pillowy-textured than saltmarsh and non-tidal saltmarsh vegetation. Lighter color than saltmarsh and non-tidal saltmarsh. Smooth texture and light color compared to Southern Willow Scrub/Mulefat Scrub.

Common species: *Typha* spp., *Scirpus californica, Scirpus americanus*

Confidence: High.

Southern Willow Scrub/Mulefat Scrub

Description: Tall-statured woody vegetation.

Indicators: Lumpy textured, bright green color. Presence of shadows.

Common species: *Salix lasiolepis, Baccharis sarothroides*.

Confidence: High.

Herbaceous Wetland (Unknown or Transitional Vegetation)

Description: A variety of vegetation types and textures mixed at close scales.

Indicators: Areas difficult to differentiate between vegetation types.

Common species: non-native grasses, freshwater marsh species, saltmarsh species, *Leymus tritichoides, Scirpus maritimus*, and others
Confidence: High.

Upland Land Cover (Urban, Beach, Dune, Upland Vegetation, etc.)
Description: Non-wetlands.
Indicators: Areas with urban infrastructure or non-wetland vegetation.
Common species: n/a
Confidence: High.

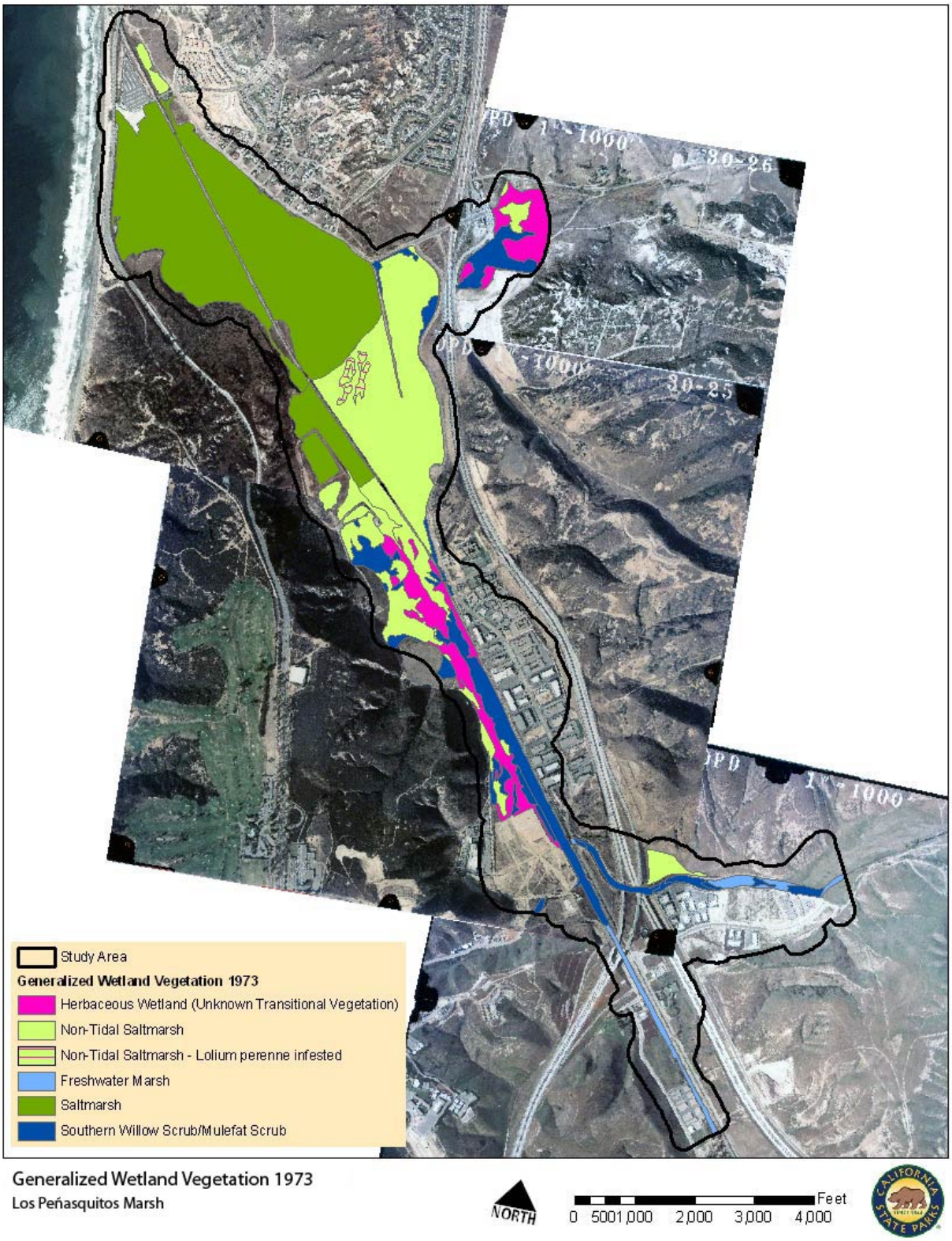

Figure 18. Historic wetland habitats within Los Peñasquitos Lagoon (California State Parks, 2011).

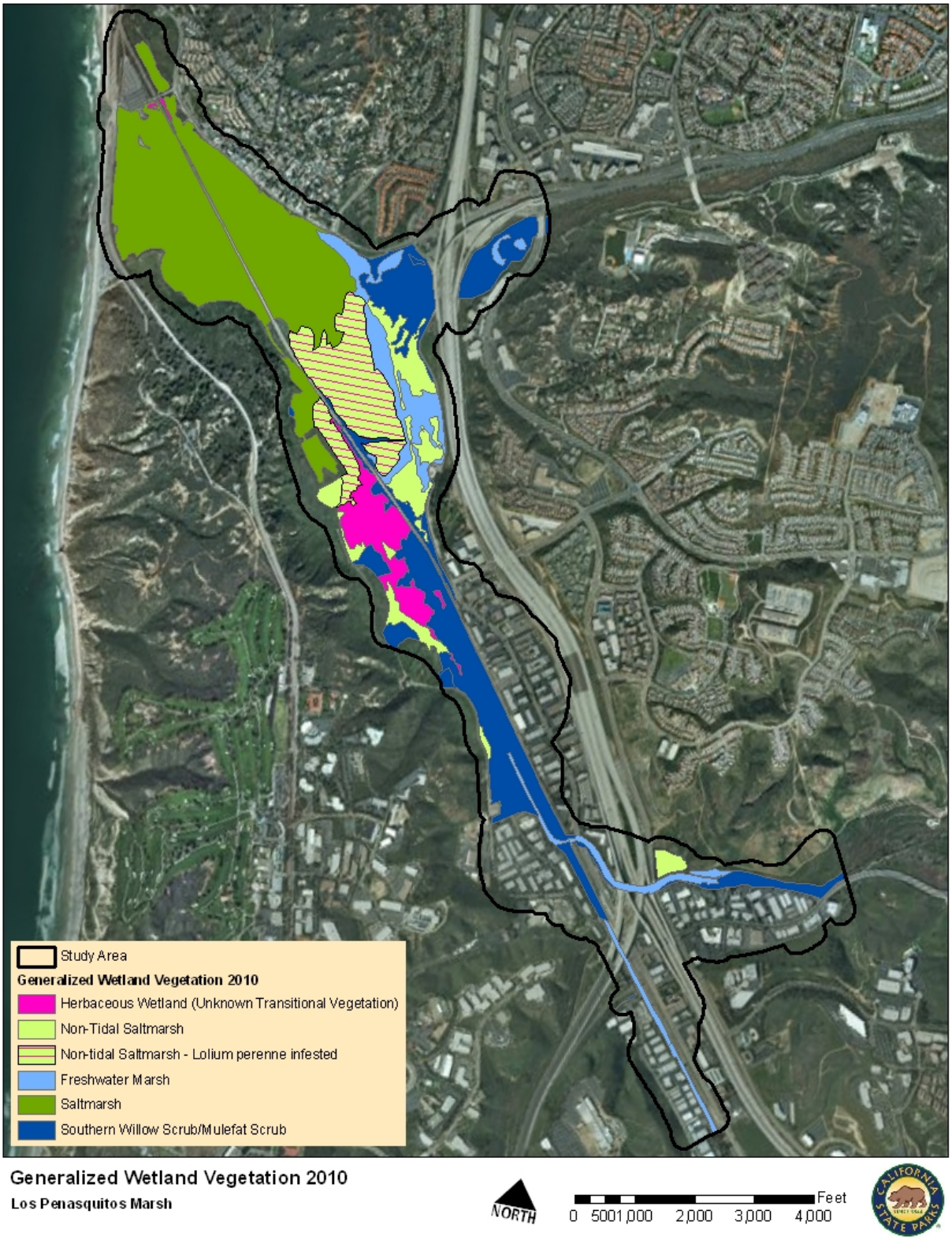

Figure 19. Year 2010 wetland habitats within Los Peñasquitos Lagoon (California State Parks, 2011).

7.5 Lagoon Mapping Application

Conditions present during the mid-1970s were associated with loads that met WQOs and did not adversely impact the Lagoon. To characterize this historical period, historic extent of vegetation types for the Lagoon were developed based on best available aerial photographs. Changes in vegetation types from 1973 to 2010 are summarized in Table 5.

Table 5. Summary of historical and year 2010 Lagoon vegetation types

Vegetation Types	1973 acreage (ac)	2010 acreage (ac)	Change in acreage (ac)
Saline Vegetation			
Tidal Saltmarsh	255	217	-38
Non-Tidal Saltmarsh	175	45	-130
Subtotal Saline	430	262	-168
Other Vegetation			
Non-tidal Saltmarsh - *Lolium perenne* (Perrenial Rye Grass) Infested, Non-native	4	67	63
Southern Willow Scrub/Mulefat Scrub	71	147	76
Freshwater Marsh	12	55	43
Herbaceous Wetland (Unknown or Transitional Vegetation)	49	34	-15
Subtotal Saline and Other Wetlands	566	565	-1
Upland Land Cover (Urban, Beach, Dune, Upland Vegetation, etc.)	639	640	1
Total Study Area	1205	1205	

The proposed numeric target highlights the importance of maintaining the critical saltmarsh and non-tidal saltmarsh habitats for protection of beneficial uses. Because the total study area of the Lagoon is constant, any increase in saltmarsh and non-tidal saltmarsh areas must be realized by reducing other areas. Of greatest priority and preference is the increase in areas of high biological importance (tidal saltmarsh and non-tidal saltmarsh) and reduction of areas with less biological importance, most notably the area identified as non-tidal saltmarsh-*Lolium perenne* infested. The Lagoon's 565 acres of non-upland land cover include 262 acres of tidal saltmarsh (including salt panne, tidal channels, and mudflats) and non-tidal saltmarsh and 132 acres of freshwater marsh, herbaceous wetland, and woody riparian (for example southern willow scrub and mulefat scrub) habitats. The remaining 171 acres of

vegetation (not considering upland) is impaired and converted from coastal saltmarsh to *Lolium perenne* infested non-tidal saltmarsh, freshwater marsh, and woody riparian habitats (California State Parks, 2011).

The Lagoon numeric target is expressed as an increasing trend in the total area of tidal saltmarsh and non-tidal saltmarsh toward 346 acres. This target acreage represents 80 percent of the total acreage of tidal and non-tidal saltmarsh present in 1973.

Historic saltmarsh and non-tidal saltmarsh acreage is equivalent to 430 acres with 168 acres lost due to sedimentation, freshwater, and other physical factors discussed in the Background section of this Staff Report. Without available studies to determine what proportion of this loss is due to sedimentation over other factors, best professional judgment is used to determine the amount of habitat loss due to historic sediment discharges.

The target tidal and non-tidal saltmarsh acreage was calculated based upon the total acreage of tidal and non-tidal saltmarsh lost multiplied by a factor of 0.5. A factor of 0.5 indicates that half the acreage of tidal and non-tidal saltmarsh lost is due to sedimentation or 84 acres. Subtracting this lost acreage due to sedimentation from the historic extent of tidal and non-tidal saltmarsh results in the target acreage of 346 acres of tidal and non-tidal saltmarsh. This target acreage represents 80 percent of the total acreage of tidal and non-tidal saltmarsh present in 1973 and provides a reasonable consideration of factors beyond sedimentation that have led to the loss of saltmarsh and non-tidal saltmarsh.

If insufficient acreage is available for remediation based on the results of future monitoring efforts and field investigations, the Lagoon numeric target may be adjusted according to the amount of areas that are present and feasible for restoration. Any revision to the Lagoon numeric target will require a Basin Plan amendment (see Reconsiderations section 9.7).

8 Identification of Load Allocations and Reductions

The calibrated models and Lagoon mapping were used to simulate historical and year 2000 sediment loads to the Los Peñasquitos Lagoon from which numeric targets and load reductions were established. This section discusses the methodology used for TMDL development and the resulting loading capacities and required load reductions for Los Peñasquitos Lagoon. Other TMDL components are also discussed including the margin of safety (MOS), seasonality and critical conditions, and a daily load expression.

8.1 Loading Analysis

Year 2000 sediment loads to the Lagoon were estimated using the calibrated LSPC model, and receiving water conditions were simulated using the EFDC model (see Linkage Analysis, Section 7). Using the EFDC model, the assimilative capacity of the Lagoon was assessed and compared to the historical numeric target for evaluation of sediment loading.

8.2 Application of Numeric Targets

As discussed in Section 4, the narrative WQO for sediment was interpreted using a weight of evidence approach to determine a reference condition to define the TMDL numeric target (i.e., a historical period when the Lagoon was not impaired for sedimentation). Several lines of evidence were used to establish the mid-1970s as the historic time period including urbanization trends, population data, flow data, and evaluation of Lagoon conditions over time. The watershed and Lagoon numeric targets were determined using modeling and Lagoon mapping under historical (mid-1970s) conditions.

8.3 Load Estimation

Estimation of year 2000 watershed loading to the impaired Lagoon required use of the LSPC model to predict flows and sediment loads. The dynamic model-simulated watershed processes, based on observed rainfall data as model input, provided temporally variable load estimates for the critical period. These load estimates were simulated using calibrated and validated land-use specific processes associated with hydrology and sediment transport (see Attachment 2).

8.4 Identification of Critical Conditions

Due to the higher transport potential of sediment during wet weather, the 1993 El Niño time period was selected as the critical period for assessment. The 1993 El Niño time period (October 1, 1992-April 10, 1993) is one of the wettest periods on record over the past several decades. Statistically,

1993 corresponds with the 93rd percentile of annual rainfall for the past 15 years measured at the San Diego Airport (Lindbergh Field). Selection of this year was also consistent with studies performed by the Southern California Coastal Water Research Project (SCCWRP). An analysis of rainfall data for the Los Angeles Airport from 1947 to 2000 shows that 1993 was the 90th percentile year; meaning 90 percent of the years between 1947 and 2000 had less annual rainfall than 1993 (Los Angeles Water Board, 2002).

The watershed numeric target and load reductions were calculated based on modeling of historical (mid-1970s) land-use conditions and the same meteorological data in order to accurately compare the watershed and Lagoon response to the same weather conditions

8.5 Critical Locations for TMDL Calculation

Due to the variability and dynamic nature of conditions within the Lagoon (e.g., mouth closures, tidal fluctuations, sediment fate and transport, etc.), the entire modeled Lagoon area was assessed as the critical location. Load reductions for sediment were based on achieving the numeric TMDL target across the Lagoon.

8.6 Calculation of TMDL and Allocation of Loads

Conceptually, a TMDL is represented by the equation:

$$TMDL = \sum WLAs + \sum LAs + MOS$$

The wasteload allocation (WLA) portion of this equation is the total loading assigned to point sources. The load allocation (LA) portion is the loading assigned to non-point sources. The margin of safety (MOS) is the portion of loading reserved to account for any uncertainty in the data and computational methodology. An implicit MOS was incorporated for this TMDL.

Load calculations for sediment were developed based on watershed modeling results and meteorological conditions.

8.7 Wasteload Allocations

The point sources identified in the Los Peñasquitos watershed are Phase I MS4 co-permittees (San Diego County and the cities of San Diego, Poway, and Del Mar), Phase II MS4s, Caltrans, and construction and industrial storm water permit holders. The year 2000 estimated loads were solely the result of watershed runoff (land-use based) and streambank erosion and not other types of point sources. The total sediment contribution from all responsible parties in the watershed is presented as the WLA.

8.8 Load Allocations

According to federal regulations (40 CFR 130.2(g)), load allocations (LA) are best estimates of the non-point source or background loading. For the Los Peñasquitos watershed, non-point source contributions to MS4 systems are included in the WLAs described above, including contributions due to hydromodification and accelerated erosion. An LA was assigned to sediment contributions from storm surges and wave action along the ocean boundary (ocean sediment contributions). The ocean is a background source of sediment to the Lagoon. The LA calculated using the models represents the amount of ocean sediments coming from the ocean and depositing at the Lagoon mouth.

8.9 Summary of TMDL Results

The overall TMDL and its component loads are presented in Table 6. Daily loads are established by dividing the modeled loads by the number of days (211 days) within the critical wet period (October 1, 1992–April 30, 1993). Year 2000 loads, historical loads, and required reductions are presented in Table 7. Year 2000 loads were estimated based on modeling of year 2000 land-use conditions (from the SANDAG 2000 land-use coverage) and meteorological conditions from the critical wet period (October 1, 1992–April 30, 1993). As described in Section 4, the numeric targets were calculated based on modeling of historical (mid-1970s) land-use conditions and the same critical wet period meteorological data in order to accurately compare the watershed and Lagoon response to the same weather conditions. Historic loads define the allowable load; therefore, required load reductions represent the difference between year 2000 sediment loads and historic (allowable) loads.

Sediment dynamics within the Lagoon are dependent on a number of factors, including runoff volumes and the amount of sediment that is transported to the Lagoon from the watershed. These factors are important components in determining the timing and magnitude of erosion and depositional processes within the Lagoon. Modeling Lagoon sediment dynamics shows that reducing watershed sediment loads increases the amount of ocean sediments that deposit throughout the Lagoon. Therefore, the TMDL results show reduced sediment deposition from tidal/oceanic input during the critical wet period under historical conditions because of complex lagoon deposition/erosion dynamics. This is likely explained by the hydrodynamic conditions within the watershed and Lagoon. The higher storm water flows (due to hydromodification) from the watershed under current conditions flushes ocean sediments from the mouth, whereas the lower storm water flows under historic conditions allows more ocean sediments to accumulate in the mouth.

To meet the TMDL, the total load reduction required from the watershed is approximately 67 percent. Tidal input from the ocean boundary represents natural background loads; therefore, no reduction is required for this source category.

Table 6. TMDL summary

Source	Critical Wet Period Load (tons)	Daily Load (tons)
Watershed contribution (WLA)	2,580	12.2
Ocean boundary (LA)	9,780	46.4
Margin of Safety (MOS)	implicit	implicit
TMDL	12,360	58.6

Table 7. Year 2000 vs. historical loads and percent reduction

Source	Year 2000 Load (tons)	Historical (mid-1970s) Load (tons)	Load Reduction (tons)	Percent Reduction Required
Watershed contribution (WLA)	7,719	2,580	5,139	67%
Ocean boundary (LA)	5,944	9,780	+3,836 (increase)	+39% (increase)
Total	13,663	12,360	1,303	10%

8.10 Daily Load Expression

Load allocations are expressed in terms of net sediment load for the critical period (tons) because sediment delivery to streams is highly variable on a daily and annual basis. Loads were also divided by the number of days in the critical period (211 days) to derive daily loading rates (tons/mi^2/day). Because of the natural variability in sediment delivery rates, compliance with load allocations must be evaluated using a long-term, weighted rolling average.

8.11 Margin of Safety

A margin of safety (MOS) is incorporated into a TMDL to account for uncertainty in developing the relationship between pollutant discharges and water quality impacts. For this TMDL, an implicit MOS was included through application of conservative assumptions during selection of numeric targets and development of the implementation plan.

Conservative assumptions were applied when selecting the watershed numeric target. The following list describes several key assumptions that were used.

- **Critical condition** - The wet season that includes the 1993 El Nino storm events (10/1/92 – 4/30/93) was selected as the critical condition time period for TMDL development. This is one of the wettest periods on record over the past several decades. Because of the large amount of rainfall, sediment loads were significantly higher during this period than in other years with less rainfall.

- **Soil composition** - Soils that are more easily transported typically have higher proportions of smaller particles sizes (silt and clay fractions), as compared to local parent soils, because of differences in settling rates and other sediment transport characteristics. To account for these differences in the model, soils transported by surface runoff were assumed to be composed of 5 percent sand, twice as much clay as the percentage of clay within each hydrologic soil group, and the remainder assigned to the silt fraction.

- **Numeric target** - The historical analysis involved an extensive literature search and technical analysis in order to identify an appropriate time period for development of the numeric sediment target. This comprehensive 'weight of evidence' analysis considered all available information regarding urbanization and lagoon impacts over time in order to identify a conservative reference condition.

Conservative assumptions were applied when selecting the Lagoon numeric target. By selecting a Lagoon numeric target in addition to the watershed numeric target, assurance is provided that sediment discharged between the mid-1970s and the year 2000 will be accounted for. Furthermore, the Lagoon numeric target provides a direct assessment of Lagoon conditions relative to beneficial uses relative to the watershed loading target.

Lastly, conservative assumptions were employed in the implementation plan through outlining the adaptive management approach to be used in determine the acceptable balance of sediment loading relative to progress in achieving and maintaining beneficial uses in the Lagoon and other factors.

8.12 Seasonality

The federal regulations at 40 CFR 130.7 require that TMDLs include seasonal variations. Sources of sediment are similar for both dry and wet weather seasons (the two general seasons in the San Diego region). Despite the similarity of wet/dry sources, transport mechanisms can vary between the two seasons. Throughout the TMDL monitoring period, the greatest transport of sediment occurred during rainfall events. Dry weather will contribute a deminimus discharge of sediment; however, model calibration and TMDL development focused on wet weather conditions because sediment transport is dramatically higher during wet weather. Model simulation was

completed for the October 1, 1992–April 30, 1993 wet period to account for the much greater sediment loading and associated impacts to the Lagoon during this time period.

9 Implementation Plan

Los Peñasquitos Lagoon (Lagoon) is impaired for sedimentation/siltation, requiring the development of a TMDL and an implementation plan. The goal of the implementation plan is to ensure water quality objectives (WQOs) for sediment are met in the Lagoon. Consistent with California Water Code section 13242, this implementation plan describes the required actions by responsible parties, establishes a timeline, identifies interim milestones, and outlines monitoring objectives that will be used to assess the success of TMDL implementation.

As discussed in the source assessment and allocation sections of this TMDL, increased sediment discharge to the lagoon over time has contributed to sediment buildup and higher elevations that limit tidal flow and the extent of saltmarsh vegetation. This trend has resulted in impacts to beneficial uses, in particular, the estuarine and preservation of biological habitats of special significance beneficial uses. Watershed and lagoon numeric targets were identified to calculate the watershed sediment load reduction required based on historical analysis and to track implementation success. Reduced loading from storm water discharges and sediment removal in some areas may be needed to meet the requirements of this TMDL and to re-establish a more natural connection between the watershed, lagoon, and tidal flow.

Compliance with this sediment TMDL shall be based on achieving the Lagoon numeric target within the compliance timeframe. The responsible parties can implement a variety of implementation strategies, including preservation and restoration; education and outreach; retrofitting, new development, and site management; storm water BMP project construction and maintenance; and monitoring. Responsible parties are encouraged to work collaboratively to achieve the numeric targets and allocations specified in this TMDL.

This implementation section includes discussion of implementation actions needed to address this TMDL and describes an adaptive management framework that accounts for environmental and political complexities, as well as the time and financial resources needed to restore a coastal lagoon. This framework includes the following implementation processes:

1) Implement and evaluate the effectiveness of BMPs and source control strategies in conjunction with remediation actions to remove sediment as necessary;

2) Evaluate the effectiveness of controlling sediment loading from Carroll Canyon, Los Peñasquitos, and Carmel Creeks.

3) Conduct monitoring to inform decision making and to evaluate compliance during and after implementation actions are completed.

4) Re-evaluate the WLAs and LAs, if necessary.

5) Evaluate compliance with interim and final milestones.

9.1 Regulation by the San Diego Water Board

The Porter-Cologne Water Quality Control Act provides that "All discharges of waste into the waters of the State are privileges, not rights." Furthermore, all discharges are subject to regulation under the Porter-Cologne Act including both point and nonpoint source discharges.[1] In obligating the State Water Board and Regional Water Boards to address all discharges of waste that can affect water quality, the legislature provides the State Water Board and Regional Water Boards with authority in the form of administrative tools (waste discharge requirements [WDRs], waivers of WDRs, and Basin Plan waste discharge prohibitions) to address ongoing and proposed waste discharges. Hence, all current and proposed discharges must be regulated under WDRs, waivers of WDRs, a prohibition, or some combination of these or other administrative tools (e.g. Statewide Policy for Implementation and Enforcement of the Nonpoint Source Pollution Control Program). Since the US EPA delegated responsibility to the State for implementation of the National Pollutant Discharge Elimination System (NPDES) program, WDRs for discharges to surface waters also serve as NPDES permits.

The regulatory mechanisms to implement the TMDL include, but are not limited to, general NPDES permits, individual NPDES permits, MS4 permits covering jurisdictions

[1] See Water Code sections 13260 and 13376.

and flood control districts within these waters, the Statewide Industrial Storm Water General Permit, the Statewide Construction Activity Storm Water General Permit, the Statewide Storm water Permit for Caltrans Activities, and the authority contained in Sections 13263, 13267 and 13383 of the Water Code. For each discharger assigned a WLA, the appropriate Order shall be reopened or amended when the order is reissued, in accordance with applicable laws, to incorporate the applicable WLA(s) as a permit requirement consistent with federal regulation and related guidance.[2]

9.2 Responsible Party Identification

Under this TMDL, the responsible parties are collectively assigned a single WLA, which they are responsible for meeting. An aggregate WLA allows for flexibility in achieving the load reduction required to meet the TMDL and improve Lagoon conditions. Responsible parties include: Phase I MS4 copermittees (the County of San Diego, City of San Diego, City of Del Mar, and the City of Poway), Phase II MS4 permittees, Caltrans, and the General Construction and General Industrial Storm Water NPDES permittees.

The San Diego Water Board encourages cooperation among all the responsible parties. While all the responsible parties in the Los Peñasquitos watershed must reduce their collective sediment load, the Phase I MS4 systems collect and drain virtually the entire watershed. As such, the Phase I MS4 copermittees represent the ultimate point source conveyor of sediment to the Lagoon. Therefore, it is the responsibility of the Phase I MS4 copermittees to assume the lead role in coordinating and carrying out the necessary actions, compliance monitoring requirements, and successful implementation of the adaptive management framework required as part of this TMDL.

Individual industrial facilities and construction sites are subject to regulation on two levels: (1) The San Diego Water Board is responsible for enforcing the statewide general industrial and construction storm water NPDES permits for sites within its jurisdiction.; and (2) each local municipality is responsible, under the MS4 storm water permit, for enforcing its own ordinances and permits (for violations of its ordinances/permits by an individual industrial facility or construction site within its jurisdiction). The San Diego Water Board is responsible for ensuring that the MS4 copermittees comply with specific MS4 permit requirements regarding the MS4 copermittees implementation of BMPs, such as inspections and ordinance enforcement, for construction and industrial sites within their jurisdiction.

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[2] 40 CFR 144.22(d)(1)(vii)(B); US EPA Memorandum “Revisions to the November 22, 2002 Memorandum ‘Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs’” (November 12, 2010).

The San Diego Water Board relies upon the municipality to enforce its ordinances/permits and then works with the municipality to coordinate information and actions to compel compliance at the local and state level.

9.3 Phased Implementation via the Adaptive Management Approach

A common problem in natural resource management involves a temporal sequence of decisions (or implementation actions), in which the best action at each decision point depends on the state of the managed system. Adaptive management is a structured iterative implementation process that offers flexibility for responsible parties to monitor implementation actions, determine the success of such actions and ultimately, base future management decisions upon the measured results of completed implementation actions and the current state of the system. This process enhances the understanding and estimation of predicted outcomes and ensures refinement of necessary activities to better guarantee desirable results. In this way, understanding of the resource can be enhanced over time, and management can be improved.

Adaptive management entails applying the scientific method to the TMDL. A National Research Council review of US EPA's TMDL program strongly suggests that the key to improving the application of science in the TMDL program is to apply the scientific method to TMDL implementation (NRC 2001). For a TMDL, applying the scientific method involves 1) taking immediate actions commensurate with available information, 2) defining and implementing a program for refining the information on which the immediate actions are based, and 3) modifying actions as necessary based on new information. This approach allows the Lagoon to make progress toward attaining water quality standards while regulators and stakeholders improve the understanding of the system through research and observation of how it responds to the immediate actions.

Implementation actions to achieve the numeric targets will be implemented via an iterative process, whereby the information collected at each step will be used to inform the implementation of the next phase. The project will be adjusted, as necessary, based on the latest information collected to optimize the efficiency of implementation efforts. Ultimately, the path moving forward is to create the physical conditions related to remediating sediment impacts associated with this TMDL.

The implementation effort can be divided into three primary phases for this TMDL, as described below:

- Phase I Implementation includes elements to reduce the amount of sediment that is transported from the watershed to the Lagoon. An important component of Phase I will be to secure the relationships and agreements between cooperating parties and to develop a detailed scope of work with priorities.

Phase I includes the following elements:

- Incorporate interim limits into WDRs and NPDES permits;
- Implement structural and nonstructural BMPs throughout the watershed; and
- Develop and initiate a comprehensive monitoring program, which includes compliance monitoring and targeted special studies.

If appropriate, the TMDL will be reconsidered by the San Diego Water Board at the end of Phase I to consider completed special studies or policy changes (see section 9.7).

- Phase II includes the implementation of additional watershed actions that are targeted to reduce sediment loads from high priority areas, as well as lagoon-specific actions that may be needed to facilitate recovery of beneficial uses that have been affected by various complex processes, including sedimentation, nuisance flows, reduced tidal circulation, and other factors. These actions may include Lagoon sediment remediation efforts, re-connecting the Lagoon's historic tidal channels, and maintenance of the Lagoon inlet in collaboration with State Parks, the San Diego Water Board, the Los Angeles-San Diego-San Luis Obispo (LOSSAN) Rail Corridor Agency, US EPA, and the watershed responsible parties. Phase II may also include additional upstream protections and BMP implementation to further reduce watershed sediment contributions. Responsible parties will develop, prioritize, and implement Phase II elements based on data from compliance monitoring and special studies.

- Phase III includes implementation of secondary and additional remediation actions, as necessary, to be in compliance with this TMDL.

9.4 Develop and Submit a Load Reduction Plan

Responsible parties are required to prepare and submit for San Diego Water Board review, comment, and revision, a Load Reduction Plan that demonstrates how they will comply with this TMDL. The San Diego Water Board expects that Load Reduction Plans will be developed collaboratively by the responsible parties within the watershed. The Load Reduction Plan shall be submitted to the San Diego Water Board within 18 months of the TMDL effective date, and reviewed by the San Diego Water Board Executive Officer within six months of submittal (this period will likely include a round of revisions by the responsible parties based on San Diego Water Board staff comments).

The Load Reduction Plan shall establish a watershed-wide, programmatic, adaptive management approach for implementation and include a detailed description of

implementation actions, identified and planned by the responsible parties, to meet the requirements of this TMDL. Implementation actions identified by the Load Reduction Plan may include source control techniques, structural and/or non-structural storm water BMPs, and/or special studies that refine the understanding of sediment and pollutant sources within the watershed. The Load Reduction Plan shall include a description and objective of each implementation action, potential BMP locations, a timeline for project or BMP completion, and a monitoring plan to measure the effectiveness of implementation actions.

Storm Water Pollution Prevention Plans (SWPPPs) prepared by Phase II MS4s, Industrial Permittees, and Construction Permittees pursuant to their respective statewide general NPDES permits fulfill these entities responsibility to prepare a Load Reduction Plan. Permittees within the Los Peñasquitos watershed shall update their SWPPPs within 12 months of the TMDL effective date with any additional BMPs, monitoring, etc. to account for their site's potential to impact the receiving waterbody with respect to sediment. Sites identified through monitoring data or site inspections as posing an increased risk to the receiving water body may be directed to perform additional monitoring by the San Diego Water Board Executive Officer to quantify sediment load contributions to the receiving waterbody.

9.4.1 Comprehensive Approach

The comprehensive approach to the Load Reduction Plan requires that implementation efforts address all current TMDLs, current 303(d) listed waterbody/pollutant combinations, and other targeted impairments within the Los Peñasquitos watershed. A comprehensive approach to the Load Reduction Plan is consistent with implementation planning currently underway to address all of the impaired segments that were included in the approved bacteria TMDLs for San Diego Region Beaches and Creeks (San Diego Water Board, 2010).

The comprehensive approach to the Load Reduction Plan allows the responsible parties to proactively address other listed impairments within the watershed, which requires special studies to investigate sources and the water quality improvements needed to address these pollutants. Such special studies (discussed in more detail below) may significantly alter current understanding and refine the TMDL loading and/or allocations. This can impact the selection of subsequent implementation actions and how they are prioritized by responsible parties. A comprehensive approach to development of the Load Reduction Plan will provide a more cost effective and efficient approach for TMDL implementation and will have fewer potential environmental impacts associated with construction of structural BMPs (San Diego Water Board, 2010).

9.4.2 Load Reduction Plan Framework

With increased land development and inadequate management of runoff from impervious areas, increasing amounts of sediment are deposited into the Lagoon annually. To minimize the effects of runoff, proper sediment control can be achieved through the execution of implementation actions such as BMPs. Sediment implementation actions can be grouped into four categories: preservation and restoration, education and outreach, retrofitting, new development, and site management, and monitoring. Proposed activities presented in the Load Reduction Plan may be grouped into these categories, each is summarized below.

1) **Preservation and Restoration:** Significant areas of land have been set aside for open space. Such land acquisition and preservation prevents natural areas from being developed and disturbed. Additionally, the restoration of riparian buffers and wetlands can include the stabilization of steep slopes with native riparian vegetation. This not only helps restore the habitat but also the natural function of the stream.

2) **Education & Outreach:** As a source control technique, education and outreach can function as pollution prevention to reduce or eliminate the amount of sediment generated at its source. Education and outreach can be targeted at specific land user groups and/or staff involved with site maintenance. As an example, implementation actions such as municipal incentives can be used to encourage proper irrigation and landscaping and can significantly reduce volumes of runoff.

3) **Retrofitting, New Development, & Site Management:** Land development (MS4 contribution) is the primary source of anthropogenic sediment contribution above historical conditions. Development can expose sediment and contribute excessive amounts of sediment to the Lagoon. Additionally, increased imperviousness associated with development can lead to increased storm water runoff and soil erosion or gullying within the MS4 and receiving waters. Appropriate site management can partially or fully mitigate the effects of development. The Load Reduction Plan must identify and prioritize BMPs based on an analysis of opportunities and cost/benefit considerations. Furthermore, the Load Reduction Plan must detail BMP projects and locations. Storm water BMPs can be implemented to reduce the effects of pollutant loading and increased storm water flows from development. Structural BMPs include incorporation of low impact development (LID) and storm flow hydrograph matching into new projects. The same structural BMPs can be utilized to retrofit existing sites or be applied as regional MS4 BMPs to treat pollutants and/or flows prior to discharge

into receiving waters.

4) **Monitoring:** A coordinated monitoring plan is needed to establish existing watershed conditions (baseline conditions) from which future changes and anticipated improvement in water quality can be measured. Additional monitoring could focus on sensitive species, areas of saltmarsh coverage, extent of invasive plant species, BMP effectiveness, in-stream hydromodification, and/or reduction in impervious coverage. Additionally, monitoring is crucial in the assessment of implementation actions to gain an understanding of performance for future adaptive management actions.

9.5 Load Reduction Plan Implementation

The Load Reduction Plan must be implemented within 90 days upon receipt of San Diego Water Board comments and recommendation, but in any event, no later than 6 months after submittal.

9.6 Monitoring

Monitoring is required to measure the progress of pollutant load reductions and improvements in water and saltmarsh habitat acreage. The information presented in this section is intended to be a brief overview of the goals of the monitoring. Special studies may be planned to improve understanding of key aspects related to achievement of WLAs, LAs, and numeric targets, restore the beneficial uses, and to assist in the modification of structural and non-structural BMPs if necessary.

The goals of monitoring include:

1) To determine compliance with the assigned wasteload and load allocations.

2) To monitor the effect of implementation actions proposed by responsible parties to improve water and saltmarsh habitat quality including proposed structural and non-structural BMPs to reduce storm water run-off and sediment loading, and remediation actions to remove sediment from the Lagoon.

3) To monitor the extent of vegetation habitat acreages in the Lagoon and determine if additional implementation action should be required.

4) To implement the monitoring in a manner consistent with other TMDL implementation plans and regulatory actions within the Los Peñasquitos watershed.

The proposed monitoring program shall be included in the Load Reduction Plan submitted to the San Diego Water Board Executive Officer for review.

Monitoring shall be conducted under technically appropriate Monitoring and Reporting Plans (MRPs) and Quality Assurance Project Plans (QAPPs). The MRPs shall include a requirement that the responsible parties report compliance and non-compliance with interim milestones as part of annual reports submitted to the San Diego Water Board. The QAPPs shall include protocols for sample collection, standard analytical procedures, and laboratory certification. All samples shall be collected in accordance with SWAMP protocols. The monitoring program must establish the following elements:

1) Specification of the constituents, sample locations and frequency of monitoring.
2) The types of monitoring techniques to be used.
3) The standard operating procedures and appropriate quality assurance protocols.
4) Analytical techniques and objectives for the interpretation and analysis of information gathered.
5) A process for refining and modifying the monitoring design in response to changing objectives and improved information.
6) A designated laboratory with sufficient capacity and appropriate levels of certification.

The San Diego Water Board Executive Officer may reduce, increase, or modify monitoring and reporting requirements, as necessary, based on the results of the TMDL monitoring program.

9.6.1 Watershed Monitoring

Responsible parties must conduct suspended sediment, bedload, and flow monitoring to calculate total sediment loading to the Lagoon for each wet period (October 1 thru April 30) throughout the 20-year compliance period. The responsible parties must monitor enough storm events throughout to quantify total annual sediment loading over each wet period. The compliance point for the WLA shall be the Lagoon as measured through the cumulative sediment loading from Los Peñasquitos, Carroll Canyon, and Carmel Creeks prior to entering the Lagoon. The responsible parties must monitor as many stations as necessary to quantify sediment loading to the Lagoon. Because of the natural variability in sediment delivery rates, sediment loading shall be evaluated using a 3-year, weighted rolling average. The first average must be calculated following the third critical wet period after the TMDL effective date.

Responsible parties are encouraged to collaborate or coordinate their efforts with other regional and local monitoring programs to avoid duplication and reduce associated costs.

In addition to the TMDL constituents identified above, the responsible parties should consider conducting general water chemistry (temperature, dissolved oxygen, pH, and electrical conductivity) at each sampling event. General chemistry measurements may be taken in the laboratory immediately following sample collection if auto samplers are used for sample collection or if weather conditions are unsuitable for field measurements.

9.6.2 Lagoon Monitoring

The responsible parties shall monitor the Lagoon annually in the fall for changes in extent of the vegetation types via aerial photography and/or land-based survey methods. Aerial photography must be conducted in accordance with compliance dates in Table 8 (below), specifically Items 1,8,9,10,11 and 12. Lagoon monitoring shall be consistent with the methodology used to calculate the numeric target described in Section 7.4. Aerial photos of the Lagoon must be acquired, digitized onscreen (at an approximate 1:2,500 scale), interpreted, and mapped into generalized classifications. Vegetation types must be classified as saltmarsh, non-tidal saltmarsh, freshwater marsh, non-tidal saltmarsh – *Lolium perrene* infested, freshwater marsh, southern willow scrub/mulefat scrub, herbaceous wetland, or upland land cover (urban, beach, dune, upland vegetation, etc.). Vegetation type classifications are described in Section 7.4. Ground truthing may be performed after aerial photo interpretation to distinguish between vegetation types.

9.7 Reconsiderations

Special studies may be used to refine source assessments, assign appropriate allocation based on updated information from the results of implementation actions and the monitoring program, and help focus implementation efforts. San Diego Water Board staff also recognize that the TMDL targets, allocations, and proposed implementation actions to reach those targets and allocations may change. The results of special studies submitted to the San Diego Water Board's Executive Officer will be considered during subsequent TMDL reopeners. In addition, it may be necessary to make adjustments to the TMDL to be responsive to new State policies and other regulations.

If appropriate, the TMDL will be reconsidered by the San Diego Water Board at the end of Phase I to consider completed special studies or policy changes.

The responsible parties always have the option to propose new numeric targets or a revised compliance schedule, with adequate support, to reopen the TMDL.

As the implementation of this TMDL progresses, the San Diego Water Board recognizes that revisions to the TMDL, WLA, LA, numeric targets, implementation plan, and potentially to beneficial uses and water quality objectives may be necessary in the future. Any future revisions to the Basin Plan necessary to implement this TMDL will require a Basin Plan amendment.

Revisions to the Basin Plan typically require substantial evidence and supporting documentation to initiate the Basin Plan amendment process. Given the severely limited resources available to the San Diego Water Board for developing Basin Plan amendment projects, developing the evidence and documentation to initiate a Basin Plan amendment will be the responsibility of the dischargers and/or other parties interested in amending the requirements or provisions implementing this TMDL.

The San Diego Water Board will initiate a Basin Plan amendment project to revise the requirements and/or provisions for implementing this TMDL (including, but not limited to, the TMDL, WLA, LA, numeric targets, implementation plan) if all the following conditions are met:

- Sufficient data are collected to provide the basis for the Basin Plan amendment.
- A report is submitted to the San Diego Water Board documenting the findings from the collected data.
- A request is submitted to the San Diego Water Board with specific revisions proposed to the Basin Plan, and the documentation supporting such revisions.
- TMDL revision is consistent with Basin Plan review priorities.

The San Diego Water Board will work with the project proponents to ensure that the data and documentation will be adequate for the initiation of the Basin Plan amendment. The San Diego Water Board will be responsible for taking the Basin Plan amendment project through the administrative and regulatory processes for adoption by the San Diego Water Board, and approval by the State Water Board, Office of Administrative Law, and US EPA.

9.8 Compliance Schedule and Determination

9.8.1 Compliance Schedule

As discussed above, the implementation schedule for this TMDL follows the form of an adaptive management strategy, tracks implementation progress with established milestones or interim goals, and sets forth a final compliance date. It is impractical for

land managers to actually measure sediment loading on a daily basis; thus, compliance with the TMDL is most appropriately expressed as an average annual load and should be evaluated as a long-term running average to account for natural fluctuations and inaccuracies in estimating sediment loads.

The expected timeframe to achieve the required reduction in sediment loading is 20 years following TMDL approval. This timeline takes into consideration the planning needs of the responsible parties and other stakeholders to establish a Load Reduction Plan, time needed to address multiple impairments, and provides adequate time to measure temporal disparities between reductions in upland loading and the corresponding Lagoon water quality response.

Current studies and other implementation actions or projects are already underway to reduce sediment loading to the Lagoon and to gain a better understanding of source contributions. A variety of such projects will continue throughout the development of the Load Reduction Plan, ensuring there are no gaps in implementation efforts throughout the process.

At the end of the TMDL compliance schedule, as outlined in Table 8, waters must meet the Lagoon's sediment water quality standard and therefore, the Lagoon numeric target. If at any point during the implementation plan, monitoring data or special studies indicate that WLA will be attained but the Lagoon numeric target may not be achieved, the San Diego Water Board shall reconsider the TMDL to modify WLA to ensure that the Lagoon numeric target is attained.

Table 8. Implementation compliance schedule.

Item	Implementation Action	Responsible Party	Date
1	Obtain approval by OAL of Los Peñasquitos Lagoon Sediment TMDL = Establishes effective date of TMDL	San Diego Water Board, San Diego County, City of San Diego, City of Poway, City of Del Mar, Caltrans, General Storm Industrial and Construction permittees	Estimated June 2013
2a	Issue, reissue, or revise general WDRs and NPDES requirements for Phase I MS4s, including Caltrans, to	San Diego Water Board and State Water Board	Completed during permit renewal - within 5 years of applicable permit date, and every

Item	Implementation Action	Responsible Party	Date
	incorporate requirements for complying with TMDL and WLAs		5 years thereafter.
2b	Issue, reissue, or revise general WDRs and NPDES requirements for Construction and Industrial NPDES to incorporate requirements for complying with TMDL and WLAs	San Diego Water Board and State Water Board	Completed during permit renewal - within 5 years of applicable permit date, and every 5 years thereafter.
2c	Issue, reissue, or revise general WDRs and NPDES requirements for Phase II NPDES permittees to incorporate requirements for complying with TMDL and WLAs	San Diego Water Board and State Water Board	Completed during permit renewal - within 5 years of applicable permit date, and every 5 years thereafter.
3a	Completion of Load Reduction Plans	Phase 1 MS4s and Caltrans	Within 18 months of OAL effective date for sediment TMDL
3b	Approval of Load Reduction Plan	San Diego Water Board Executive Officer	Within 6 months of submittal
3c	Phased, adaptive implementation of Load Reduction Plan	Phase 1 MS4s and Caltrans	In accordance with Load Reduction Strategy – ongoing throughout the implementation
3d	Revision of SWPPPs	Construction, Industrial, and Phase II Permittees	Within 12 months of OAL effective date for sediment TMDL
4a	Submit annual Progress Report to the San Diego Water Board due January 31 each year	Phase 1 MS4s	Annually after reissuance of NPDES WDR
4b	Submit annual Progress Report to the San Diego Water	Caltrans	Annually after reissuance of NPDES

Item	Implementation Action	Responsible Party	Date
	Board due April 1 each year		WDR
5	Enforcement Actions	San Diego Water Board	As needed
6	Refine Load Reduction Plan	Phase 1 MS4s and Caltrans	As warranted by completion of special studies, additional monitoring and data compilation.
7	Reopen and reconsider TMDL	San Diego Water Board	As defensible through the collection of additional data and significant findings by the watershed stakeholders.
8	Meet Interim Milestone #1: Attain 20 percent required reduction in sediment loading (equivalent to 6691 tons of sediment per year) and/or show progress in improving Lagoon conditions consistent with the specified targets	MS4s and NPDES permittees	Within 5 years of approved TMDL
9	Meet Interim Milestone #2: Attain 40 percent required reduction in sediment loading (equivalent to 5663 tons of sediment per year) and/or show progress in improving Lagoon conditions consistent with the specified targets	MS4s and NPDES permittees	Within 9 years of approved TMDL
10	Meet Interim Milestone #3: Attain 60 percent required reduction in sediment loading (equivalent to 4636 tons of sediment per year) and/or show progress in improving	MS4s and NPDES permittees	Within 13 years of approved TMDL

Item	Implementation Action	Responsible Party	Date
	Lagoon conditions consistent with the specified targets		
11	Meet Interim Milestone #4: Attain 80 percent required reduction in sediment loading (equivalent to 3608 tons of sediment per year) and/or show progress in improving Lagoon conditions consistent with the specified targets	MS4s and NPDES permittees	Within 15 years of approved TMDL
12	Meet Final Milestone: Achieve Lagoon numeric target: the successful restoration of tidal and non-tidal salt marsh to achieve a lgoon total of 346 acres.[3]	MS4s and NPDES permittees	Within 20 years of approved TMDL

**Note: TMDL implementation schedule may be altered due to TMDL reconsideration; additionally, enforcement actions by the San Diego Water Board will be taken as necessary.*

9.8.2 Compliance for Phase I MS4s and Caltrans

The TMDL is achieved and thus the sediment water quality standard is attained when the Lagoon numeric target is met. If the Lagoon numeric target is not met, the responsible parties must demonstrate they have 1) complied with the WLA and 2) addressed historical sediment discharged to the Lagoon since the 1970s that the responsible parties caused or contributed to. Responsible parties can address the discharges of historical sediment in numerous ways including, but not limited to, Lagoon restoration activities and monitored natural reduction of sediment in the Lagoon. Monitored natural reduction of sediment refers to the reliance on natural processes to achieve site-specific restoration objectives within a time frame that is reasonable compared to that offered by other more active methods. Compliance is assessed through special studies and monitoring of the Lagoon and its contributing watershed.

[3] This can either mean:
1. Successful restoration of 80 percent of the 1973 acreage of lagoon salt marsh habitat (346 acres); or
2. Demonstrate, with reasonable assurance for success, the implementation of activities that will lead to sustainable restoration of 80 percent of the 1973 acreage of lagoon salt marsh habitat (346 acres).

If the later, then continued monitoring will be required to demonstrate successful achievement of the 80 percent target, and a funding source must be identified for necessary remedial measures.

Compliance with interim milestones shall be assessed based on each party's ability to demonstrate that it has complied with the interim milestones. Since sediment transport can vary immensely between wet and dry years, compliance with interim targets shall be achieved if the responsible parties can demonstrate that they have 1) shown progress in improving Lagoon conditions consistent with the Lagoon numeric target and/or 2) achieved the sediment load reductions outlined in Table 8. Progress can be demonstrated through monitoring and reporting on implementation actions achieved as outlined in the Load Reduction Plan, implementation action successes, and/or improvements in saltmarsh and non-tidal saltmarsh habitat. For other measures to be considered, they must be described in the Load Reduction Plan and be accompanied by a monitoring plan to measure progress.

9.8.3 Compliance for Phase II MS4s, Construction Permittees, and Industrial Permittees

Phase II MS4s, Construction, and Industrial NPDES Permittees are assumed to be in compliance with the TMDL and their contribution to the total WLA if they are enrolled and in compliance with their respective general statewide permit, and are found to not contribute to the sediment impairment in the Lagoon through monitoring data and/or inspections. The San Diego Water Board may direct individual Permittees under the Phase II MS4, Construction, and Industrial general storm water NPDES permits to obtain an Individual NPDES permit for their storm water discharges. Direction by the San Diego Water Board to obtain an individual NPDES permit may occur based upon program audits, state or local compliance inspections, and/or Permittee monitoring.

As discussed in Section 9.2 above, it is the responsibility of the Phase I MS4 copermittees to assume the lead role in coordinating and carrying out the necessary actions, monitoring requirements, and successful implementation of the adaptive management framework required as part of this TMDL. The San Diego Water Board relies upon the Phase I MS4s to enforce its ordinances/permits and then work with the San Diego Water Board to coordinate information and actions to compel compliance. The San Diego Water Board shall consider enforcement actions, as necessary, to control the discharge of sediment to any receiving waterbody that ultimately impairs the Lagoon to attain compliance with the sediment WLA specified in this TMDL.

10 Necessity of Regulatory Provisions

The Office of Administrative Law (OAL) is responsible for reviewing administrative regulations proposed by State agencies for compliance with standards set forth in California's Administrative Procedure Act, Government Code section 11340 *et seq*., for transmitting these regulations to the Secretary of State and for publishing regulations in the California Code of Regulations. Following State Water Board approval of this Basin Plan amendment establishing a TMDL, any regulatory portions of the amendment must be approved by the OAL per Government Code section 11352. The State Water Board must include in its submittal to the OAL a summary of the necessity for the regulatory provision. "Necessity" means the record of the rulemaking proceeding demonstrates by substantial evidence the need for a regulation to effectuate the purpose of the statute, court decision, provision of law that the regulation implements, interprets, or makes, taking into account the totality of the record. For purposes of this standard, evidence includes, but is not limited to, facts, studies, and expert opinion [Government Code section 11349(a)].

This Basin Plan amendment for sediment impairment of the Los Peñasquitos Lagoon meets the “necessity standard” of Government Code section 11353(b). Amendment of the Basin Plan to establish and implement the sediment TMDL for the Los Peñasquitos Lagoon is necessary because the existing water quality does not meet the applicable narrative sediment WQOs. Applicable State and federal laws require the adoption of this Basin Plan amendment and regulations as provided below.

The State Water Board and Regional Water Boards are delegated the responsibility for implementing the California Water Code and the federal CWA. Pursuant to relevant provisions of both, the State Water Board and Regional Water Boards establish water quality standards, including designated (beneficial) uses and criteria or objectives to protect those uses.

Section 303(d) of the CWA [33 USC section 1313(d)] requires the states to identify certain waters within its borders that are not attaining water quality standards and to establish TMDLs for the pollutants impairing those waters. US EPA regulations [40 CFR 130.2] provide that a TMDL is a numerical calculation of the amount of a pollutant that a water body can assimilate and still meet standards. A TMDL includes one or more numeric targets that represent attainment of the applicable standard, considering seasonal variations, a margin of safety, and load allocations. TMDLs established for impaired waters must be submitted to the US EPA for approval.

CWA section 303(e) requires that TMDLs, upon US EPA approval, be incorporated into the state's Water Quality Management Plans, along with adequate measures to implement all aspects of the TMDL. In California, these are the basin plans for the nine regions. Water Code sections 13050(j) and 13242 require that basin plans have a program of implementation to achieve WQOs. The implementation program must include a description of actions that are necessary to achieve the objectives, a time schedule for these actions, and a description of surveillance to determine compliance with the objectives. California law requires that a TMDL project include an implementation plan because TMDLs normally are, in essence, interpretations or refinements of existing WQOs. The TMDL has to be incorporated into the region's basin plan [CWA section 303(e)] because the TMDL supplements, interprets, or refines an existing objective.

11 Public Participation

Public participation is an important component of TMDL development. Federal regulations [40 CFR 130.7] require that TMDL projects be subject to public review. All public hearings and public meetings have been conducted as stipulated in the regulations [40 CFR 25.5 and 25.6] for all programs under the CWA. Public participation was provided through one public workshop and through the formation and participation of the third party stakeholder group, which met at least monthly between April 2009 and June 2011, and additionally thereafter as needed to discuss technical issues and review draft documents. In addition, staff contact information was provided on the San Diego Water Board's website, along with periodically updated drafts of the TMDL project documents. Public participation also took place through the San Diego Water Board's Basin Plan amendment process, which included a hearing and two formal public comment periods. Public comments from the first formal public comment period are available in Attachment 5. A chronology of public participation and major milestones is provided in Table 9.

Table 9. Public participation milestones

Date	Event
February 15, 2011	Public Workshop and CEQA Scoping Meeting
April 22, 2011	Draft Documents released for public review
February 15, 2012	Revised Draft Documents released for public review
June 13, 2012	Public Hearing and Adoption

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Los Peñasquitos Lagoon Sediment/Siltation TMDL

Prepared for:

City of San Diego, Storm Water Department

and

U.S. Environmental Protection Agency Region IX

Prepared by:

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Final - October 20, 2010

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Abbreviations:

BAT:	Best Available Technology
BMP:	Best Management Practice
CWA:	Clean Water Act
CFR:	Code of Federal Regulations
EFDC:	Environmental Fluids Dynamic Code
EMC:	Event Mean Concentration
USEPA:	United States Environmental Protection Agency
LA:	Load Allocation
LSPC:	Loading Simulation Program in C++
MLS:	Mass Loading Station
MOS:	Margin of Safety
MS4:	Municipal Separate Storm Sewer System
NPS:	Nonpoint Source Pollution
NPDES:	National Pollutant Discharge Elimination System
SANDAG:	San Diego Association of Governments
TBELs:	Technology Based Effluent Limitations
TMDL:	Total Maximum Daily Load
TSS:	Total Suspended Solids
TWAS:	Temporary Watershed Assessment Stations
USGS:	Unites States Geological Survey
WQOs:	Water Quality Objectives
WLA:	Wasteload Allocation
WDRs:	Waste Discharge Requirements
WQBELs:	Water Quality Based Effluent Limitations (WQBELs)

Executive Summary

The purpose of this technical report is to present the development of a Total Maximum Daily Load (TMDL) for sedimentation/siltation in Los Peñasquitos Lagoon (Lagoon). Sedimentation within the Lagoon has restricted the tidal prism, or exchange between the ocean and the Lagoon, and degraded salt marsh habitats through various processes. As required by Section 303(d) of the Clean Water Act (CWA), a TMDL was developed to address sedimentation within the Lagoon, which was originally identified as impaired for sediment on the 1996 CWA Section 303(d) List of Water Quality Limited Segments.

The purpose of a TMDL is to attain water quality objectives (WQOs) that support beneficial uses in the waterbody. A TMDL is defined as the sum of the waste load allocations (WLAs) for point sources and load allocations (LAs) for nonpoint sources and natural background [40 CFR 130.2] such that the capacity of the waterbody to assimilate pollutant loading (i.e., the loading capacity) is not exceeded. Therefore, a TMDL represents the maximum amount of the pollutant of concern that the waterbody can receive and still attain water quality standards. Additionally, a TMDL represents a strategy for meeting WQOs by allocating quantitative limits for point and nonpoint pollution sources. Once this maximum pollutant amount has been calculated, it is then divided up and allocated among all of the contributing sources in the watershed.

Based on historical and current accounts of sediment-associated impacts to the Lagoon, the San Diego Regional Water Quality Control Board (Regional Board) placed the Lagoon on the CWA Section 303(d) List of Water Quality Limited Segments as being impaired (i.e., does not meet applicable water quality standards). Sediment water quality standards are narrative in nature and ensure that sediment accumulation or alteration does not cause a nuisance or adversely affect beneficial uses. Excessive sedimentation within the Lagoon threatens critical habitat areas and beneficial uses such as, Estuarine (EST), Marine Life Habitat (MAR), and Preservation of Biological Habitats of Special Significance (BIOL). Additional information on beneficial uses impacted by the impairment is discussed in Section 3.3.

In order to calculate a TMDL for sediment, a numeric target must be identified. A numeric target was selected based on historical conditions that met WQOs and supported the designated beneficial uses of the Lagoon. A historical analysis of available literature that describes the pattern of urbanization within the watershed and impacts to the Lagoon over time was used to identify the time period when the Lagoon met WQOs. Existing and historical land use conditions were then modeled to determine the acceptable net annual sediment load that the Lagoon could assimilate and still meet WQOs.

Available data were used to configure, calibrate, and validate a customized modeling framework developed to support sediment TMDL development. The modeling framework consists of a watershed model (based on the Loading Simulation Program in C++, LSPC) and a receiving water model (based on the Environmental Fluids Dynamic Code, EFDC). The watershed model was used to calculate existing and historical sediment loading to the Lagoon from the Los Peñasquitos watershed, while the Lagoon receiving water model was used to simulate hydrodynamics and sediment transport characteristics for this tidally-influenced waterbody.

A source analysis was performed to identify and quantify the sources of sediment to the Lagoon. The most significant source identified was urban development and urban runoff delivered by the storm drain system to the Lagoon from the surrounding watershed. In particular, from open space areas located below storm water outfalls and from stream bank erosion/bed scouring. Additional sources include wave action, tidal exchange, and loads contributed by transportation infrastructure.

The TMDL also includes a margin of safety (MOS) to account for the uncertainty in the relationship between pollutant loads and predicted water quality of the receiving water. An implicit MOS was included through the application of a number of conservative assumptions, including establishing the TMDL based on the 1993 critical wet period, and consideration of the overall predictive capability of the modeling framework that was developed for this study.

The TMDL is divided among the waste load allocation (WLA) for point sources, load allocation (LA) for nonpoint sources, and the MOS. Load reduction requirements are assigned to point sources and nonpoint sources. Identified point sources include the municipalities that are included in the San Diego County Phase I municipal separate storm sewer system (MS4s) permit, MS4 Phase II permittees, and the California Department of Transportation (Caltrans) storm water permit. Sediment loading to the Lagoon was estimated based on modeling of watershed runoff, streambank erosion, and sediment transport. A total WLA was assigned to the respective municipalities regulated under the Phase I MS4 permit (San Diego County, the City of San Diego, the City of Del Mar and the City of Poway), Phase II MS4 permittees, and Caltrans.

There is legal authority and a regulatory framework that empowers the Regional Board to require dischargers to implement and monitor compliance with the requirements set forth in this TMDL. As previously noted, sediment is transported to the impaired Lagoon through runoff generated from urbanization, scouring of canyons below storm outfalls, stream bank erosion/bed scouring, land use practices, and other processes. A

significant amount of the sediment load results from controllable water quality factors which are defined as those actions, conditions, or circumstances resulting from anthropogenic activities that may influence the quality of the waters of the State and that may be reasonably controlled. This TMDL establishes a WLA for point sources and a LA for nonpoint sources of sediment to the Lagoon.

The regulatory framework for point sources differs from the regulatory framework for nonpoint sources. CWA section 402 establishes the National Pollutant Discharge Elimination System (NPDES) program to regulate the ‘‘discharge of a pollutant,’’ other than dredged or fill materials, from a ‘‘point source’’ into ‘‘waters of the U.S.” Under section 402, discharges of pollutants to waters of the U.S. are authorized by obtaining and complying with NPDES permits. These permits commonly contain effluent limitations consisting of either Technology Based Effluent Limitations (TBELs) or Water Quality Based Effluent Limitations (WQBELs).

In California, State Waste Discharge Requirements (WDRs) for discharges of pollutants from point sources to navigable waters of the United States that implement federal NPDES requirements and CWA requirements (NPDES requirements) serve in lieu of federal NPDES permits. These are referred to as NPDES requirements. Such requirements are issued by the State pursuant to the authority that is described in California’s Porter Cologne Water Quality Control Act. Point source discharges of sediment to the Lagoon include municipal MS4 Phase I and II dischargers, Caltrans, and NPDES construction and industrial permits within the watershed.

For each TMDL where nonpoint sources are determined to be significant, a LA is calculated, which is the maximum amount of a pollutant that may be contributed to a waterbody by “nonpoint source” discharges in order to attain WQOs. The Porter-Cologne Water Quality Control Act applies to both point and nonpoint sources of pollution and serves as the principle legal authority in California for the application and enforcement of TMDL LAs for nonpoint sources. The State plan and policy for control and regulation of nonpoint source pollution is contained in the Plan for California’s Nonpoint Source Pollution Control Program (NPS Program Plan) and the Policy for the Implementation and Enforcement of the Nonpoint Source Pollution Control Program (NPS Implementation and Enforcement Policy). Nonpoint sources that warrant regulation include, for example, runoff from farms and urban development. This policy applies to discharges from agricultural irrigation return flow, nursery irrigation return flow, orchard irrigation return flow, animal feeding operations, manure composting, soil amendment operations, and septic systems. Individual landowners and other persons engaged in these land use activities can be held accountable for attaining sediment load

reductions in affected watersheds through enforcement of WDRs and the Waiver Policy.

Nonpoint source discharges from natural sources are considered largely uncontrollable, and therefore should not be regulated. Sediment discharged via tidal exchange is an example of an uncontrollable nonpoint sediment source that is not governed by a MS4 permit. Hydromodification and accelerated erosion via storm water runoff are controllable sources of sedimentation.

In order to meet the TMDL, a Sediment Load Reduction Plan (SLRP) will be developed that will describe the regulatory and/or enforcement actions that the Regional Board and dischargers may take to reduce pollutant loading and monitor effluent and/or receiving waters. The SLRP will describe the pollutant reduction actions that are recommended by the various dischargers to meet the allocation. The SLRP will include provisions to perform studies by the dischargers to fill data gaps, refine the TMDL and required load reductions, and/or modify compliance requirements. The dischargers will conduct monitoring to assess the effectiveness of the implementation measures at meeting the wasteload reduction.

The TMDL results are summarized in the tables below. The overall WLA is represented by the watershed contribution in Tables ES-1 and ES-2. The ocean boundary (LA) includes sediment loads from storm surge, wave action, and tidal exchange. The historical load represents the estimated load contribution from the mid-1970s time period (reference condition).

Table ES-1. TMDL summary

Source	Critical Wet Period Load (tons)	Daily Load (tons)
TMDL	12,360	59
Watershed contribution (WLA)	2,580	12
Ocean boundary (LA)	9,780	46
MOS	Implicit	Implicit

Table ES-2. Current vs. historical loads and percent reduction

Source	Current Load (tons)	Historical Load (tons)	Load Reduction (tons)	Percent Reduction Required
TMDL	13,663	12,360	1,303	10%
Watershed contribution (WLA)	7,719	2,580	5,139	**67%**
Ocean boundary (LA)	5,944	9,780	+3,836 (increase)	+39% (increase)

1 Introduction

The purpose of this technical report is to present the Total Maximum Daily Load (TMDL) that was developed for sediment/siltation for Los Peñasquitos Lagoon (Lagoon). The Lagoon is listed as impaired for sediment/siltation on the Clean Water Act (CWA) Section 303(d) List of Water Quality Limited Segments. Sedimentation within the Lagoon restricts the tidal prism, or exchange between the ocean and the Lagoon, and degrades critical salt marsh habitats through various processes. A TMDL is needed to help restore the beneficial uses of the Lagoon and achieve water quality standards.

Section 303(d) of the CWA requires that each state identify waterbodies within its boundaries for which the effluent limitations are not stringent enough to meet applicable water quality standards, which consist of beneficial uses, water quality objectives (WQOs), and an antidegradation policy. The CWA also requires states to establish a priority ranking for these impaired waters, known as the CWA Section 303(d) List of Water Quality Limited Segments, and to establish TMDLs for the identified waterbodies.

The purpose of a TMDL is to attain WQOs that support beneficial uses in the waterbody. A TMDL is defined as the sum of the individual wasteload allocations (WLAs) for point sources, and load allocations (LAs) for nonpoint sources and natural background, such that the capacity of the waterbody to assimilate pollutant loading (i.e., the loading capacity) is not exceeded[1]. A TMDL, therefore, represents the maximum amount of the pollutant of concern that the waterbody can receive and still attain water quality standards. Additionally, a TMDL represents a strategy for meeting WQOs by allocating quantitative limits for point and nonpoint pollution sources. Once the total maximum pollutant load has been calculated, it is divided up and allocated among all of the contributing sources in the watershed.

The TMDL process begins with the development of a technical analysis which includes the following seven components:

1) **Problem Statement** – generally describes impairment (Section 2)
2) **Numeric Targets** – identifies the historic numeric target which will result in attainment of the WQOs and protection of beneficial uses (Section 4)
3) **Source Assessment** – identifies all of the known point sources and nonpoint sources of the impairing pollutant in the watershed (Section 6)
4) **Linkage Analysis** – establishes the relationship between pollutant sources and receiving water conditions and calculates the Loading Capacity of the waterbody,

[1] 40 CFR 130.2

which is the maximum load of the pollutant that may be discharged to the waterbody without causing exceedances of WQOs and impairment of beneficial uses (Section 7)

5) **Margin of Safety (MOS)** – accounts for uncertainties in the analysis (Section 8)
6) **Seasonal Variation and Critical Conditions** – describes how these factors are accounted for in the TMDL determination (Section 8)
7) **Allocation of the TMDL** – division of the TMDL among each of the contributing sources in the watershed; wasteload allocations (WLAs) for point sources and load allocations (LAs) for nonpoint and background sources (Section 9)

The write-up for the above components is generally referred to as the technical TMDL analysis. This technical report also includes background information on the Lagoon, including a description of the Lagoon and its watershed, discussion of the applicable WQOs and beneficial uses (Section 3), and a discussion summary of the data that were used to characterize the impairment and associated pollution sources (Section 5). The TMDL Implementation Section will be included later, as this information is currently being developed. This section focuses on the Regional Board's regulatory authority. This information will be updated in the future through development of a detailed Sediment Load Reduction Plan (SLRP) that will be submitted for approval after adoption of the TMDL.

This TMDL was developed through close collaboration between the municipalities within the Los Peñasquitos watershed (City of San Diego, San Diego County, City of Del Mar, and City of Poway), the California Department of Transportation (Caltrans), San Diego Coastkeeper, California State Parks, the Los Peñasquitos Lagoon Foundation, and representatives from the Regional Board. This third party TMDL effort was led by the City of San Diego and included detailed modeling of the Lagoon and its contributing watershed.

2 Problem Statement

Under Section 303(d) of the Clean Water Act (CWA), states are required to identify waters whose beneficial uses have been impaired due to specific constituents. Los Peñasquitos Lagoon was placed on Section 303 (d) list of Water Quality Limited Segments in 1996 for sedimentation and siltation with an estimated area affected of 469 acres. The Lagoon is subject to the development of a total maximum daily load (TMDL) (USEPA, 2009).

The Lagoon is an estuarine system that is part of the Torrey Pines State Natural Reserve. In addition to its marine influence, the Lagoon receives freshwater inputs from an approximately 60,000-acre watershed comprised of three major canyons (Carroll Canyon, Los Peñasquitos Canyon, and Carmel Canyon). Given the status of “Natural Preserve” by the California State Parks, the Lagoon is one of the few remaining native salt marsh lagoons in southern California, providing a home to several endangered species (California State Parks, 2009). The Lagoon is ecologically diverse, supporting a variety of plant species, and providing habitat for numerous bird, fish, and small mammal populations. The Lagoon also serves as a stopover for the Pacific Flyway, offering migratory birds a safe place to rest and feed, as well as providing refuge for coastal marine species that use the Lagoon to feed and hide from predators.

The San Diego Basin Plan states, “The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses”. Beneficial uses listed in the basin plan for the lagoon include contact water recreation, non-contact water recreation (although access is not permitted in some areas per California State Parks), preservation of biological habitats of special significance, estuarine habitat, wildlife habitat, rare, threatened or endangered species, marine habitat, migration of aquatic organisms, and spawning, reproduction and/or early development. The beneficial use that is most sensitive to increased sedimentation is estuarine habitat. Estuarine uses may include preservation or enhancement of estuarine habitats, vegetation, fish, shellfish, or wildlife (such as marine mammals or shorebirds).

Impacts associated with increased and rapid sedimentation include: reduced tidal mixing within Lagoon channels, degradation and (in some cases) net loss of riparian and salt marsh vegetation, increased vulnerability to flooding for surrounding urban and industrial developments, turbidity associated with siltation in Lagoon channels, and constriction of a main wildlife corridor. The Los Peñasquitos Lagoon Enhancement Plan and Program (1985), San Diego Basin Plan (1994), and Clean Water Act Section 303(d) highlight sedimentation as a significant impact associated with urban development and

a leading cause in the rapid loss of salt marsh habitt in the Lagoon, making sediment reduction a management priority.

According to California State Parks, the Lagoon consists of approximately 510 acres of wetland habitats including coastal salt marsh (this includes salt panne, tidal channels, and mudflats), brackish marsh, riparian woodland and scrub, and freshwater marsh. The Lagoon's 510 acres includes approximately 210 acres of tidal salt marsh and 120 acres of freshwater wetlands are considered unimpaired (data from California State Parks 2010; see Figure 7). The remaining 180 acres of salt marsh and brackish marsh vegetation has been impaired by sedimentation, converting coastal salt marsh to freshwater or upland habitats. The environmental processes that support wetland habitats in the Lagoon have been altered by urban development in three ways:

1) Increase in the volume and frequency of freshwater input
2) Increase in sediment deposition
3) Decrease in the tidal prism

These factors have led to decreases in saltwater and brackish marsh habitats and increases in freshwater habitats as well as increases in the abundance of non-native species.

Developing a sediment TMDL for the Lagoon is necessary for the restoration of the beneficial uses of the Lagoon, including the estuarine beneficial use most impacted by sediment accumulation.

3 Background Information

This section describes the Los Peñasquitos watershed and Lagoon, applicable water quality standards (including beneficial uses and WQOs), and provides background information on the impairment.

3.1 Los Peñasquitos Watershed Description

The Los Peñasquitos watershed is located in central San Diego County (Figure 1). Both the watershed and Lagoon are included in the Los Peñasquitos Hydrologic Unit (906), which also includes Mission Bay and several coastal tributaries. This 93 mi^2 (approximately 60,000 acres) coastal watershed includes portions of the cities of San Diego, Poway, and Del Mar (Figure 2). In addition, a small portion of San Diego County is located in the eastern headwaters area. There are also several major road corridors that are maintained by Caltrans within the watershed.

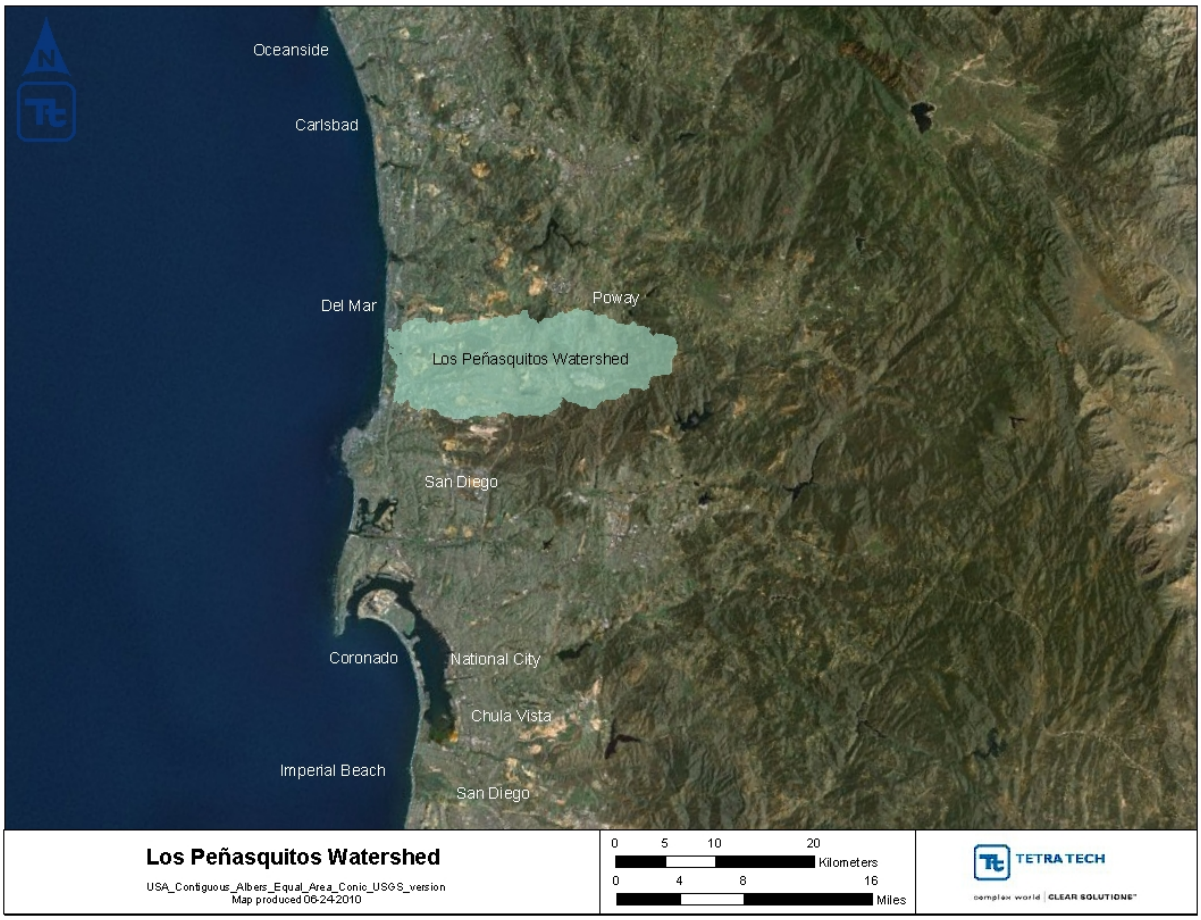

Figure 1. Location of the Los Peñasquitos watershed

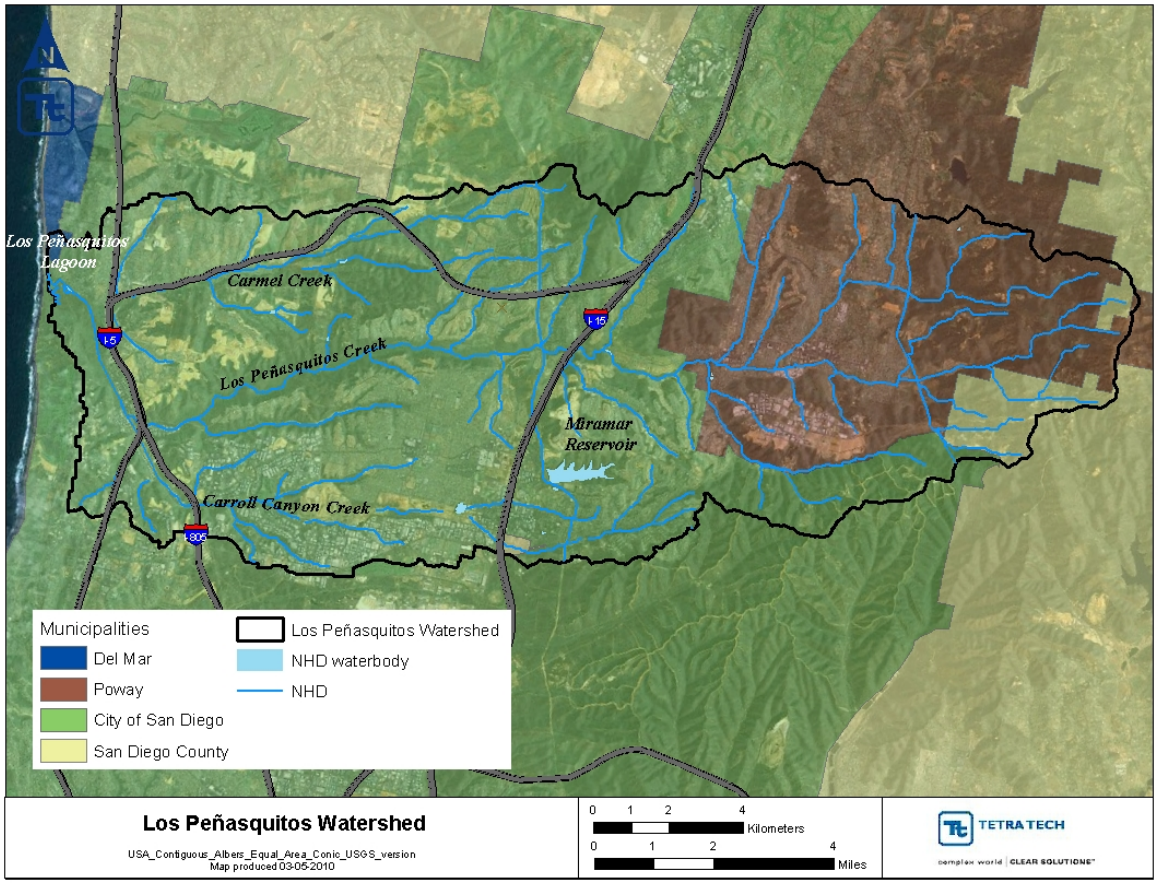

Figure 2. Municipalities within the Los Peñasquitos watershed

The climate in the Region is generally mild with annual temperatures averaging around 65°F near the coastal areas. Average annual rainfall ranges from nine to 11 inches along the coast. There are three distinct types of weather in the Region. The summer dry weather occurs from May 1 to September 30. The winter season occurs from October 1 to April 30 and has two types of weather; 1) winter dry weather when rain has not fallen for the preceding 72 hours, and 2) wet weather consisting of storms of 0.1 inches of rainfall (or greater) and the 72 hour period after the storm. 85 to 90 percent of the annual rainfall occurs during the winter season.

Three major streams drain the watershed and flow into the tidal Lagoon (Figure 2). Los Peñasquitos Creek is the largest catchment in the watershed draining 59 mi^2 (approximately 37,760 acres) through its central portion. Carroll Canyon Creek is the second largest catchment (approximately 18 mi^2 or 11,520 acres) and drains the southern portion of the watershed. Carmel Creek is located along the northern, coastal area and drains the remaining 16 mi^2 (approximately 10,240 acres). Los Peñasquitos Creek and Carroll Canyon Creek confluence together prior to entering the Lagoon.

There is one major dam in the Carroll Canyon Creek watershed, which drains approximately 1 mi^2 (approximately 640 acres) and forms Miramar Reservoir (retains imported drinking water; does not discharge downstream). Watershed elevation rises from sea level to 2,600 ft in the headwaters (Figure 3).

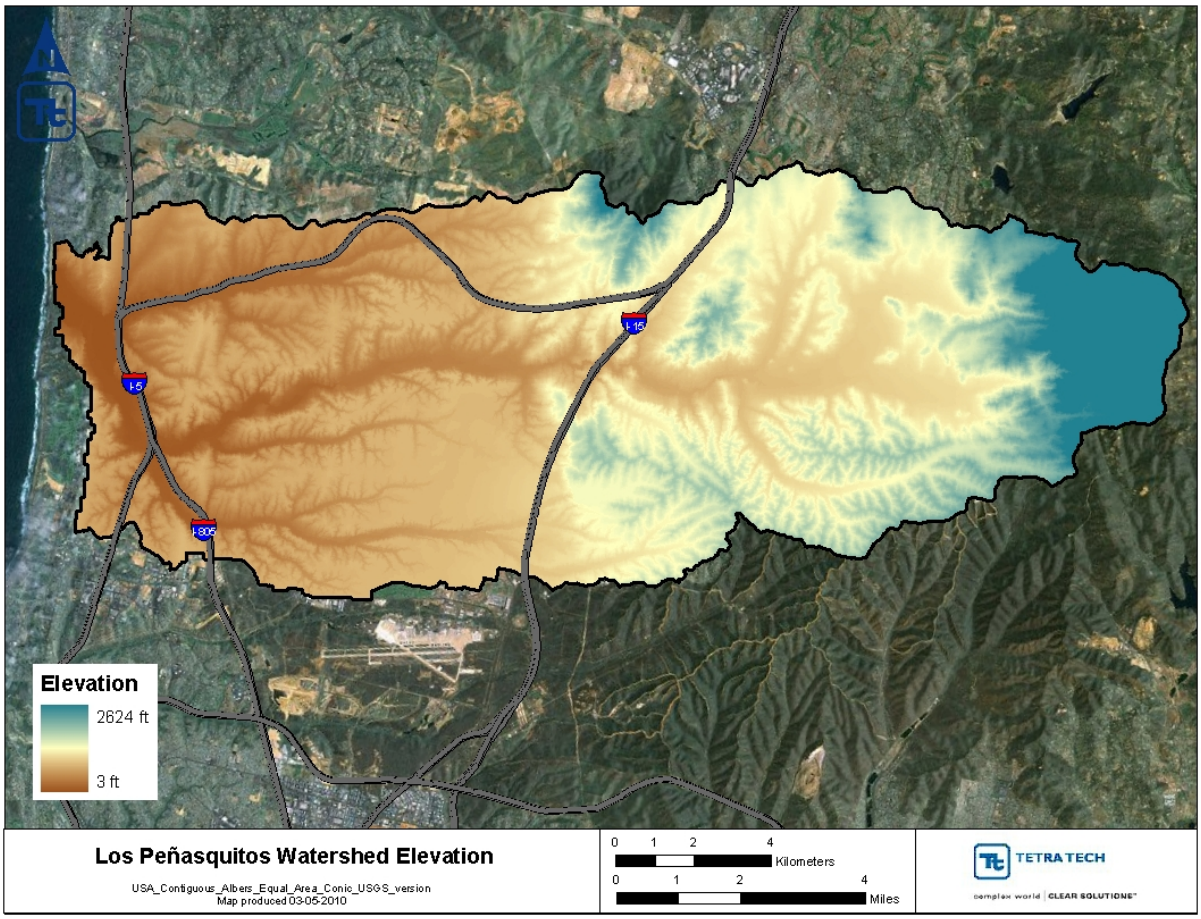

Figure 3. Los Peñasquitos watershed elevation

Data detailing land use in the Los Peñasquitos watershed is available through the San Diego Association of Governments 2000 land use coverage[2] and presented in (Figure 4). Approximately 54 percent of the watershed has been developed, with 46 percent of that area classified as impervious. The largest single land use type in the Los Peñasquitos watershed is open space (approximately 25,500 acres), followed by low density residential development (approximately 14,250 acres), and industrial/transportation (approximately 11,660 acres). The percent distribution of all land uses in the watershed is presented in Figure 5. Additional key watershed characteristics that are important for model configuration are described in later sections and within the modeling report (Appendix A).

[2] http://www.sandag.org/resources/maps_and_gis/gis_downloads/downloads/zip/Land/CurrentLand/lu.zip

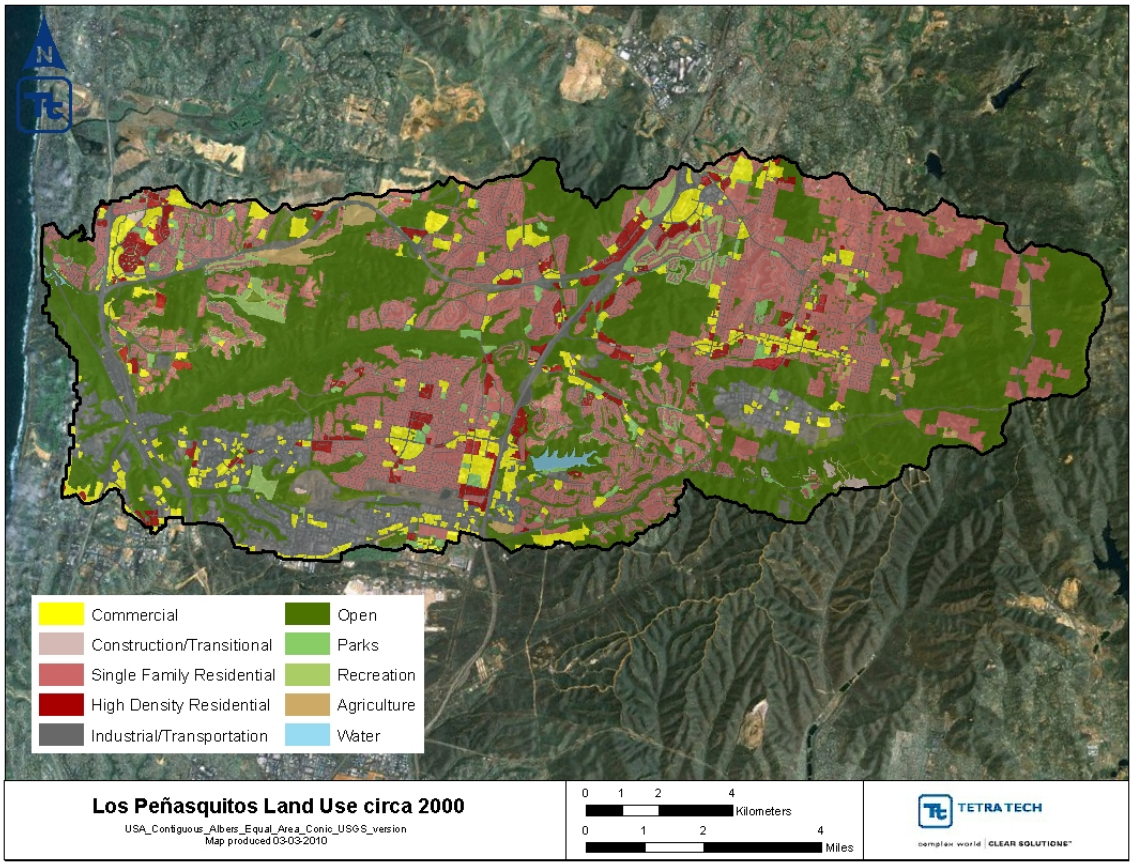

Figure 4. Land uses in the Los Peñasquitos watershed

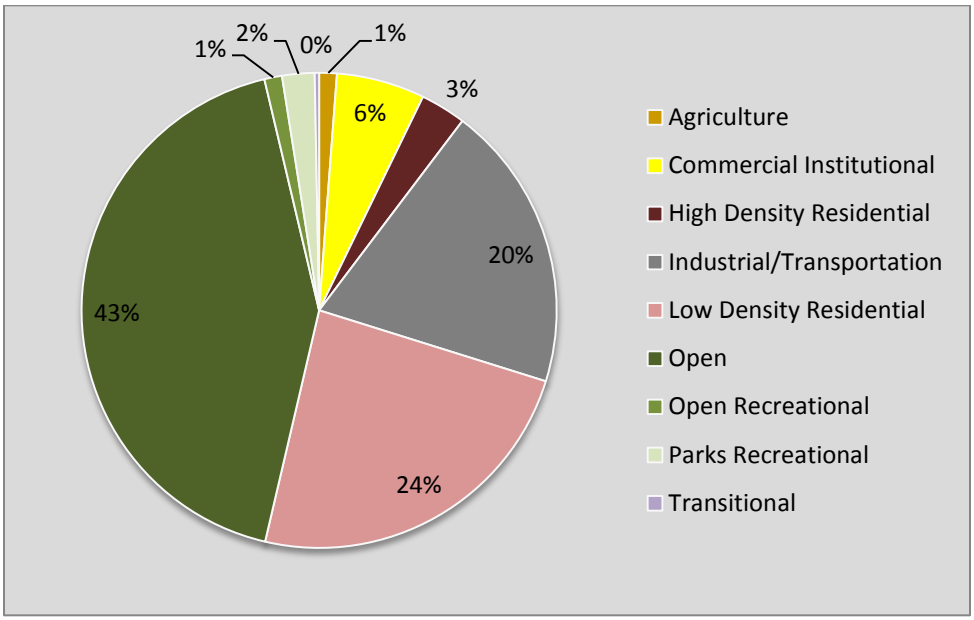

Figure 5. Land use distribution in the Los Peñasquitos watershed

3.2 Los Peñasquitos Lagoon Description

The Los Peñasquitos Lagoon is a relatively small estuarine system (approximately 0.6 mi^2 or 384 acres) that is part of the Torrey Pines State Natural Reserve (Figure 6). Given the status of "Natural Preserve" by the California State Parks, the Lagoon is one of the few remaining native salt marsh lagoons in southern California. The Lagoon is ecologically diverse, supporting a variety of plant species, and providing habitat for numerous bird, fish, and small mammal populations. The Lagoon also serves as a stopover for migratory birds and provides habitat for coastal marine and salt marsh species.

Figure 6. Photograph of Los Peñasquitos Lagoon

Tidal flows enter the Lagoon during periods when the Lagoon mouth is open to the ocean. Currently, the Lagoon mouth is open throughout most of the year. Mouth closures are typically caused by coastal processes (deposition of sand and cobble storms surges and wave action) and structures, such as the U.S. Highway 101 abutments. Mechanical dredging is used when needed to eliminate blockages and allow for tidal flow into the Lagoon in order to improve water quality conditions and support salt marsh species.

Most of the freshwater input flows through Los Peñasquitos Canyon into the Lagoon. Carroll Canyon Creek to the south and Carmel Creek to the north also contribute freshwater to the Lagoon. Historically, Los Peñasquitos Creek was the only tributary that flowed year-round, while Carroll Canyon and Carmel Creeks only flowed during significant rainfall events. Beginning in the 1990s, these drainages also began flowing year-round due to increasing urban development within the watershed. Carroll Canyon Creek confluences with Los Peñasquitos Creek upstream and the combined stream channel extends into the Lagoon along the western side of the railroad track berm. This berm acts as a barrier between the eastern and western portions of the Lagoon for much of its length. The railroad trestle along the northern side provides the main connection between eastern and western portions of the lagoon. The Lagoon channel that receives flow from Carmel Creek crosses through this area. In addition, there are two smaller bridges located in the southern portion of the Lagoon which allow flow from Carroll Canyon Creek to pass through to the eastern side of the Lagoon during high flow events.

3.3 Applicable Water Quality Standards

Water quality standards consist of WQOs, beneficial uses, and an anti-degradation policy. WQOs are defined under Water Code section 13050(h) as “limits or levels of water quality constituents or characteristics which are established for the reasonable protection of beneficial uses of water.” Under section 304(a)(1) of the CWA, the USEPA is required to publish water quality criteria that incorporate ecological and human health assessments based on current scientific information. WQOs must be based on scientifically sound water quality criteria, and be at least as stringent as those criteria.

The sediment WQO, as set forth in the Water Quality Control Plan for the San Diego Basin (Basin Plan), is narrative in nature and states “*The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses”* (Regional Board, 1994). To interpret the narrative nature of the sediment WQO, a numeric target was developed to establish the allowable sediment loading to the Lagoon. Section 4 presents the detailed information that was used to develop a numeric target for sediment.

The Basin Plan identifies the beneficial uses that are designated for Los Peñasquitos Lagoon (Regional Board, 1994) (Table 1). The narrative standard for sediment is applied to all beneficial uses. Compliance with WQOs must be assessed and maintained throughout the waterbody to protect all beneficial uses.

Table 1. Beneficial uses designated for Los Peñasquitos Lagoon

Beneficial Use	Beneficial Use Description
REC 1	Includes uses of water for recreation activities involving body contact with water, where ingestion of water is reasonable possible. These uses include, but are not limited to, swimming, wadding, water skiing, ski and SCUBA diving, surfing, white water activities, fishing, or use of natural hot springs. *Note that access to some areas is not permitted per California State Parks
REC 2	Includes the use of water for recreational activities involving proximity to water, but not normally involving body contact with water, where ingestion of water is reasonable possible. These uses include, but are not limited to, picnicking, sunbathing, hiking, beach combing, camping, boating, tide pool and marine life study, hunting, sightseeing, or aesthetic enjoyment in conjunction with the above activities. *Note that access to some areas is not permitted per California State Parks
BIOL	Includes uses of water that support designated area or habitats, such as established refuges, parks, sanctuaries, ecological reserves, or Areas of Special Biological Significance (ASBS), where the preservation or enhancement of natural resources requires special protection.
EST	Includes uses of water that support estuarine ecosystems including, but not limited to, preservation or enhancement of estuarine habitats, vegetation, fish, shellfish, or wildlife (e.g., estuarine mammals, waterfowl, shorebirds)
WILD	Includes uses of water that support terrestrial ecosystems including, but not limited to, preservation and enhancement of terrestrial habitats, vegetation, wildlife (e.g., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources.
RARE	Includes uses of water that support habitats necessary, at least in part, for the survival and successful maintenance of plant or animal species established under state or federal law as rare, threatened or endangered.
MAR	Includes uses of water that support marine ecosystems including, but not limited to, preservation and enhancement of terrestrial habitats, vegetation, wildlife (e.g., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources.
MIGR	Includes uses of water that support habitats necessary for migration, acclimatization, between fresh and salt water, or other temporary activities by aquatic organisms, such as anadromous fish.
SPWN	Includes uses of water that support high quality aquatic habitats suitable for reproduction and early development of fish. This use is applicable only for the protection of anadromous fish.
SHELL	Includes uses of water that support habitats suitable for the collection of filter-feeding shellfish (e.g., clams, oysters and mussels) for human consumption, commercial, or sport purposes.

3.4 Impairment Description

The Lagoon is listed as impaired on the CWA Section 303(d) list due to sediment/siltation impacts that originate from watershed sediment contributions. This impairment impacts several beneficial uses; however, the estuarine habitat use is the most sensitive to increased sedimentation. The Lagoon's wetland habitats consist of estuarine and riparian habitats, including coastal salt marsh habitat and wetland/upland buffer areas. The 303(d) listing indicates that an estimated area of 469 acres is impaired. Recent surveys by California State Parks indicate that greater than 180 acres of the 510 acres of coastal salt marsh has been impaired by sedimentation, converting coastal salt marsh to riparian habitat (California State Parks, 2009; California State Parks, 2010). .

As discussed in the problem statement, impacts associated with sedimentation include: reduced tidal mixing within Lagoon channels, degradation and (in some cases) net loss

of wetland vegetation, conversion from saline to freshwater habitats, and turbidity associated with siltation in Lagoon channels. There are many potential sources that have influenced the accumulation of sediment within the Lagoon. Sources include erosion of canyon banks, bluffs, scouring stream banks, and tidal influx. Some of these processes are exacerbated by anthropogenic disturbances, such as urban development within the watershed. Urban development transforms the natural landscape and results in increased runoff due to hydromodifcation resulting in scouring of sediment, primarily below storm water outfalls that discharge into canyon areas. Sediment loads are transported downstream to the Lagoon during storm events causing deposits on the salt flats, and in Lagoon channels. These sediment deposits have gradually built-up over the years due to increased sediment loading and inadequate flushing, which directly and indirectly affects lagoon functions and salt marsh characteristics.

To address the impairment, and interpret the narrative WQOs, a historical watershed-based approach was used to calculate the acceptable sediment load to the Lagoon. The historical analysis focused on identifying an earlier time period that corresponds with natural sediment loading from the watershed which did not exceed the Lagoon's assimilative capacity, as described in the following section (Section 4).

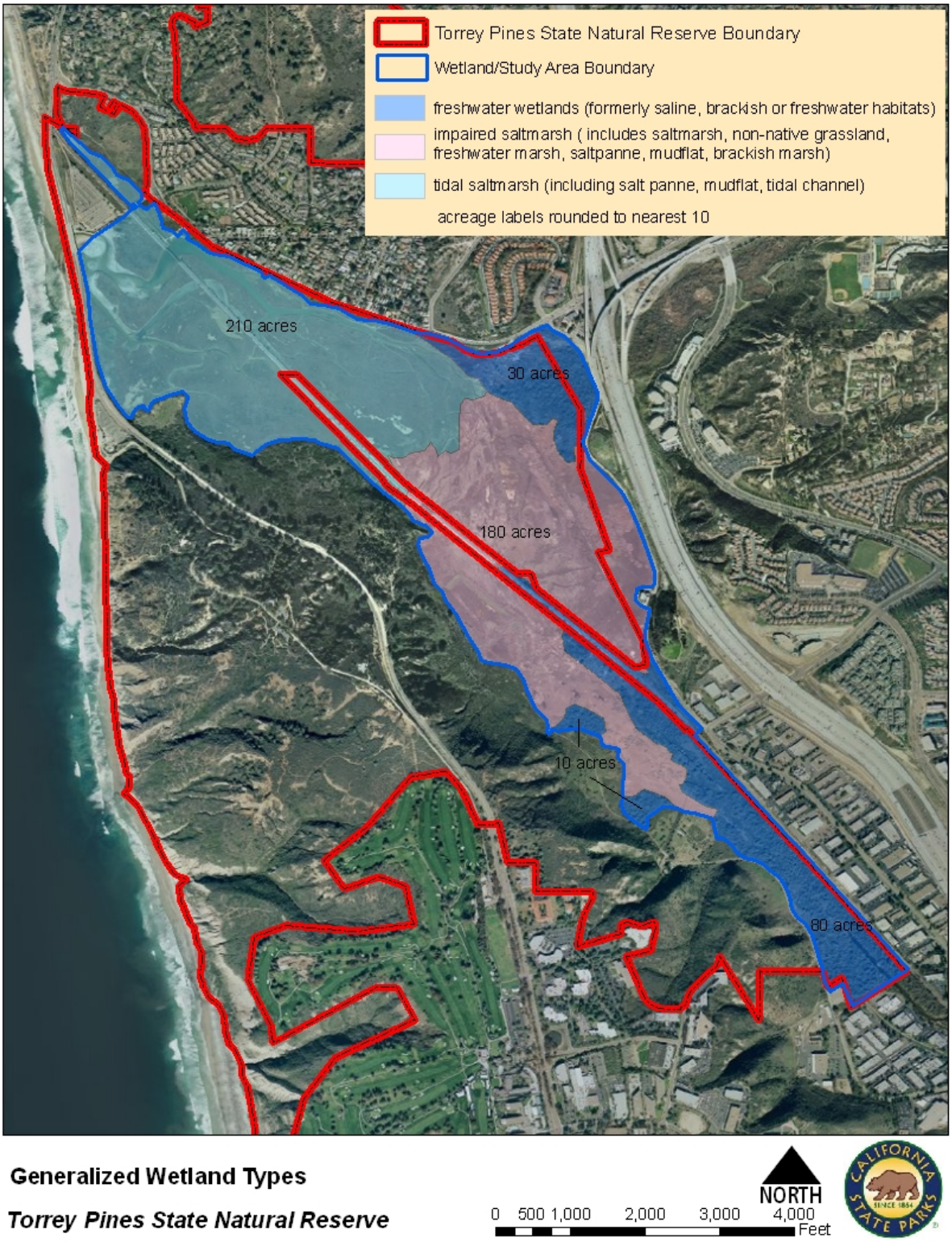

Figure 7. Wetland habitats within Los Peñasquitos Lagoon (California State Parks, 2010)

4 Numeric Targets

When calculating TMDLs, numeric targets are selected to meet the WQOs for a waterbody and subsequently establish measureable targets for the restoration and/or protection of beneficial uses. The sediment WQO, as set forth in the Basin Plan, is narrative and states:

The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses (Regional Board, 1994).

Due to the narrative nature of the sediment/siltation WQO, this WQO must be interpreted through the development of a numeric target for TMDL and implementation planning purposes. A numeric target is needed to define the conditions that will result in the attainment of water quality conditions. For the sediment/siltation impairment of the Lagoon, a numeric target was derived using a 'reference watershed approach'. The 'reference watershed approach' typically refers to the process of comparing the impaired waterbody to a similar-unimpaired waterbody to establish an acceptable loading capacity which would result in the attainment of water quality standards. Due to the unique characteristics of the Lagoon, it was determined that a historical analysis of the Lagoon and its watershed would provide the best information available for determining the conditions that support water quality standards. Available literature and past accounts of sedimentation impacts within the Lagoon were reviewed to understand the relationship between urbanization in the watershed and associated changes in Lagoon water quality conditions. A timeline of significant events and literature references was developed to document important changes in lagoon condition over time in relation to changes in land use (urbanization in particular) and other impacts (Figures 8 and 9). The linkage between these factors was evaluated using a weight of evidence approach (Sections 4.1 through 4.3) in order to identify an appropriate reference time period that could be used calculate the numeric target for sediment TMDL development (Section 4.4). Note that much of the background information presented below is also referenced in the historical timeline.

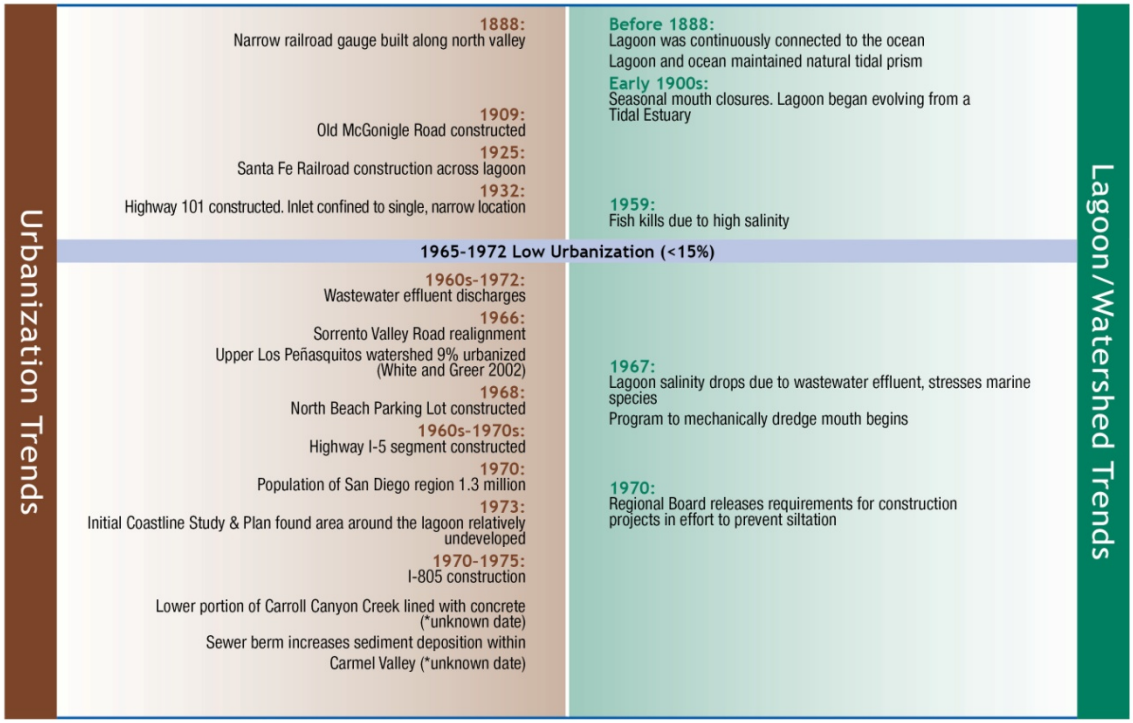

Figure 8. Timeline of urbanization and lagoon trends (1800s through early 1970s)

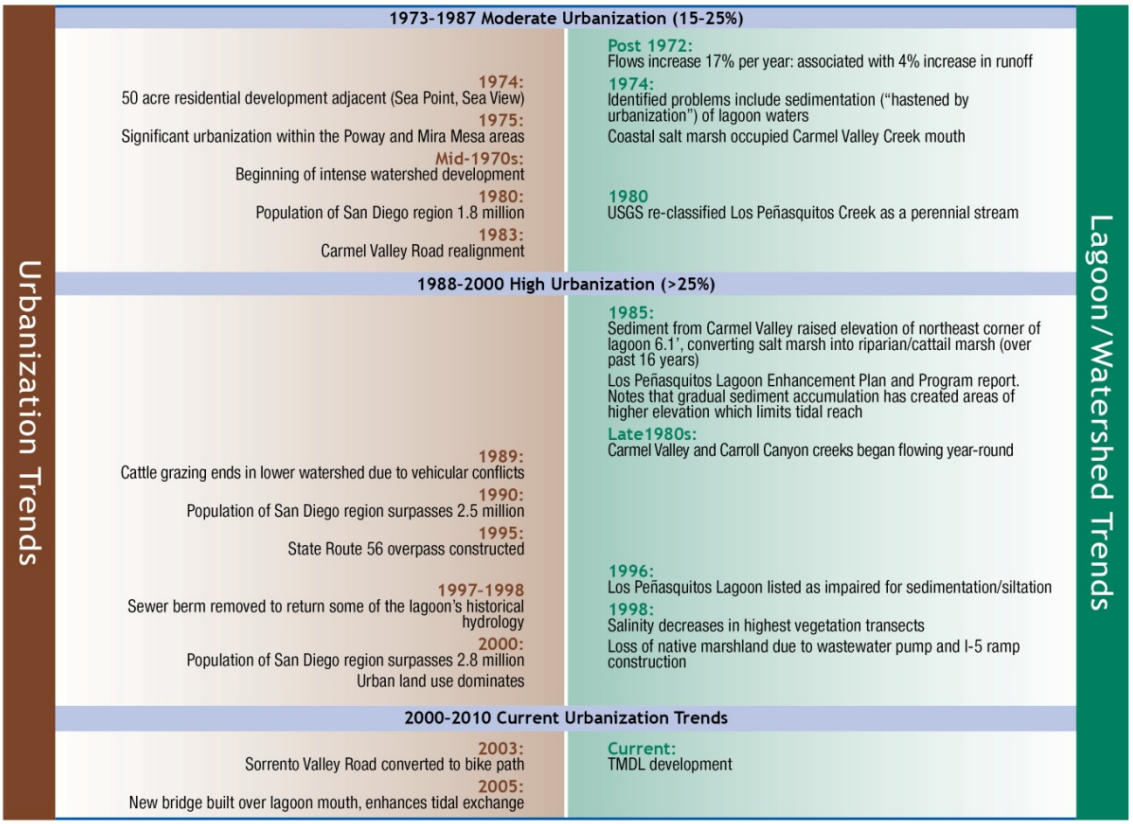

Figure 9. Timeline of urbanization and lagoon trends (mid 1970s through current)

4.1 Land Use Changes in the Los Peñasquitos Watershed

As the first Mexican land grant in California, land in the Los Peñasquitos watershed was historically maintained as a family homestead and livestock ranch throughout the 1800s and early 1900s. By the early 1900s, the City of San Diego and San Diego County began acquiring parcels of land surrounding the Lagoon. As the region began to develop, urban infrastructure, including construction of the railroad (1880s-1925), altered the natural drainage and restricted the mouth of the Lagoon. Later, the construction of U.S. Highway 101 in 1932 permanently confined the inlet to a single, narrow location and restricted the tidal prism and exchange between the ocean and Lagoon (Mudie et al., 1974). The North Beach Parking Lot was constructed in 1968 by California State Parks in historically tidal areas which further influenced hydrologic exchanges (LPL Foundation and the State Coastal Conservancy, 1985). Although there were significant alterations to the Lagoon's hydrology, the Initial Coastline Study and Plan released in 1973 found that the area surrounding the Lagoon remained relatively undeveloped (Duncan and Jones, 1973), but was at the threshold of rapid growth (Jet Propulsion, 1971).

In 1966 the Upper Los Peñasquitos subwatershed was 9% urbanized (White and Greer, 2002); however, by 1975, the watershed experienced significant urbanization with agricultural areas being converted to urban uses, specifically in the Poway and Mira Mesa areas (City of San Diego, 2005). In 1974, a California Fish and Game report expressed concerns associated with the anticipated completion of a 50 acre development along the shores of the Lagoon. The report also stated that within the following five years (1974 to 1979), the population surrounding the immediate lagoon environs was expected to increase by a factor of four to six over the 1972 level of approximately 1,000 people (Mudie et al., 1974). Urban runoff associated with the increased development had already been identified as the primary threat to water quality in the Lagoon (Jet Propulsion Lab, 1971); however, other factors existed including agriculture and grazing. In 1989, cattle grazing in the Los Peñasquitos Creek watershed ceased (White and Greer, 2002) primarily due to vehicular conflicts.

While development occurred sporadically before the 1970s, the mid-1970s appears to be the beginning of intense watershed development. Land use associated with this time period is illustrated in Figure 10. Land use/land cover data for the Los Peñasquitos watershed were not available for this period, therefore, a historical coverage was developed based on the location and type of structures that are shown in USGS topographic maps from the 1970s (primarily the La Jolla quadrangle – dated 1975). The most recent land use coverage (from SANDAG 2000 – refer to Section 3.1) was modified based on this information in order to create a uniform historical land use map

for the watershed for comparison. Land use differences between the current and historical time periods are shown in Table 2.

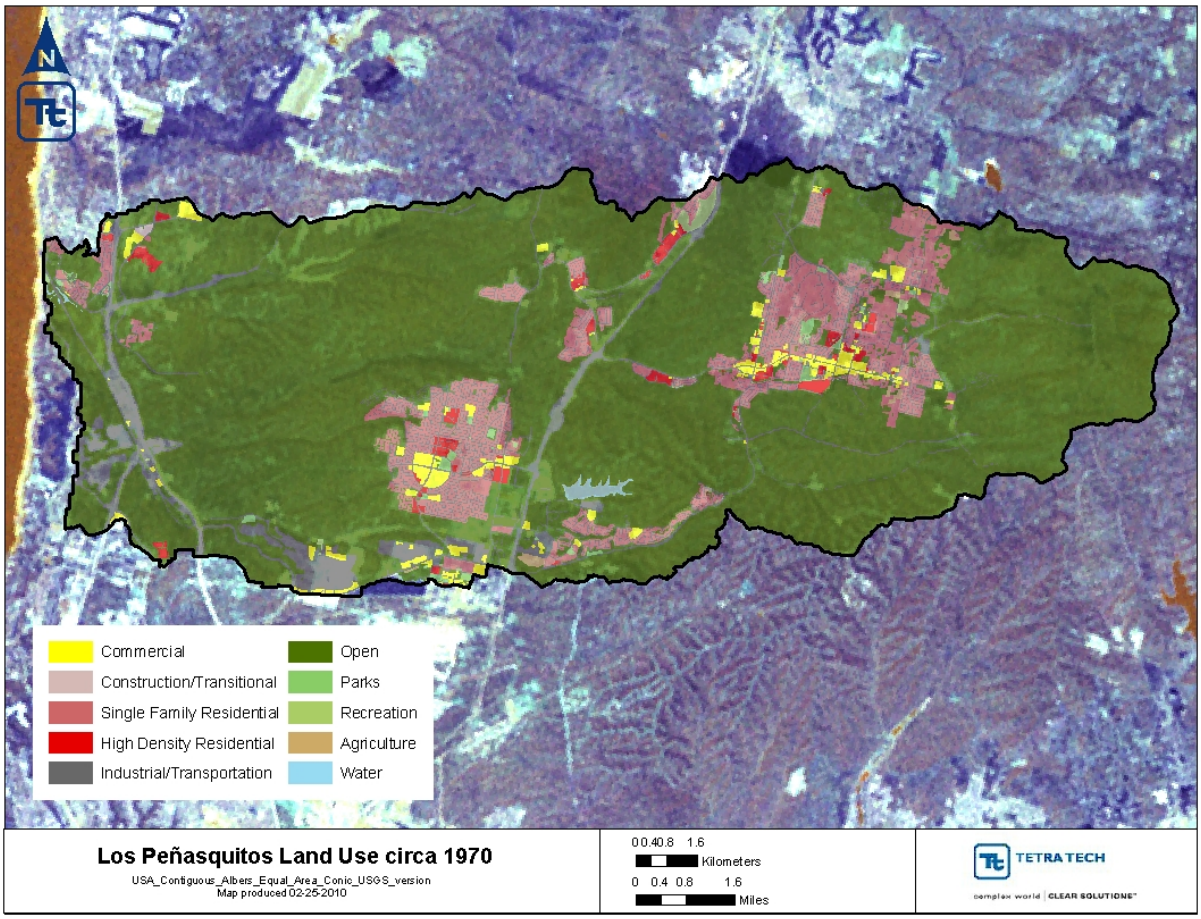

Figure 10. Historic land use in the Los Peñasquitos watershed (1970's)

Table 2. Current (SANDAG 2000) vs. historical land use comparison

Land Use	Current area (ac)	Current area (%)	Historic area (ac)	Historic area (%)	Relative Change (%)
Agriculture	741	1.24%	100	0.17%	1.07%
Commercial	3,591	6.00%	1,088	1.82%	4.18%
Construction/Transitional	169	0.28%	23	0.04%	0.24%
High Density Residential	1,840	3.07%	648	1.08%	1.99%
Industrial/Transportation	11,654	19.46%	4,830	8.07%	11.40%
Open	25,463	42.52%	47,445	79.23%	-36.71%
Parks	1,326	2.22%	2,884	0.48%	1.73%
Recreation	670	1.12%	139	0.23%	0.89%
Single Family Residential	14,258	23.81%	5,155	8.61%	15.20%
Water	161	0.27%	160	0.27%	0.00%
Total	59,879	100.00%	59,879	100.00%	

From 1966 to 1999, the acreage of urbanized land within the upper Los Peñasquitos Creek watershed increased by 290 percent (White and Greer, 2002) and by 2000, the Los Peñasquitos watershed was dominated by urban uses (City of San Diego, 2005). Additional highway infrastructure was built in and around the Los Peñasquitos watershed to accommodate increasing population growth. Realignment of Sorrento Valley Road (~1966) and Carmel Valley Road (1983) both impacted the surrounding watershed (Greer and Stow, 2003) as well as segments of the I-5 freeway (1994) and the State Route 56 overpass (1995). To decrease impacts from road infrastructure, Sorrento Valley Road was converted to a bike path in 2003 and a new U.S. Highway 101 bridge was constructed over the Lagoon mouth in August 2005, enhancing tidal exchange. Figure 11 shows the major roads within the watershed. Runoff from surrounding roads and highways ultimately reaches the Lagoon.

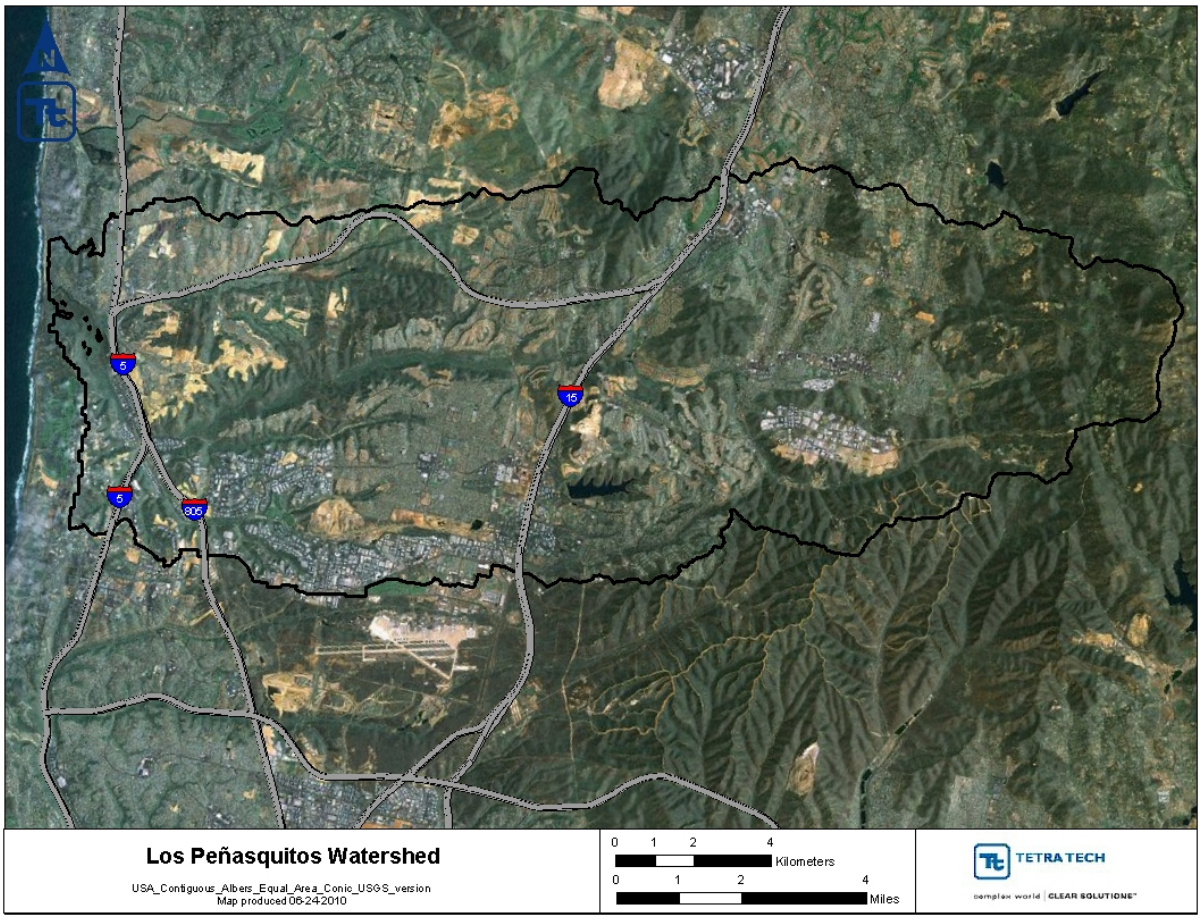

Figure 11. Major roads within the Los Peñasquitos watershed

To further characterize the land use changes, population trends in the San Diego region were evaluated. Population steadily increased from 1970 to 2010 in the San Diego region[3] as shown in Figure 12. This regional population analysis was used to evaluate general trends and includes surrounding areas. General trends show expansive population growth, resulting in intense development throughout the region.

[3] www.sandag.org

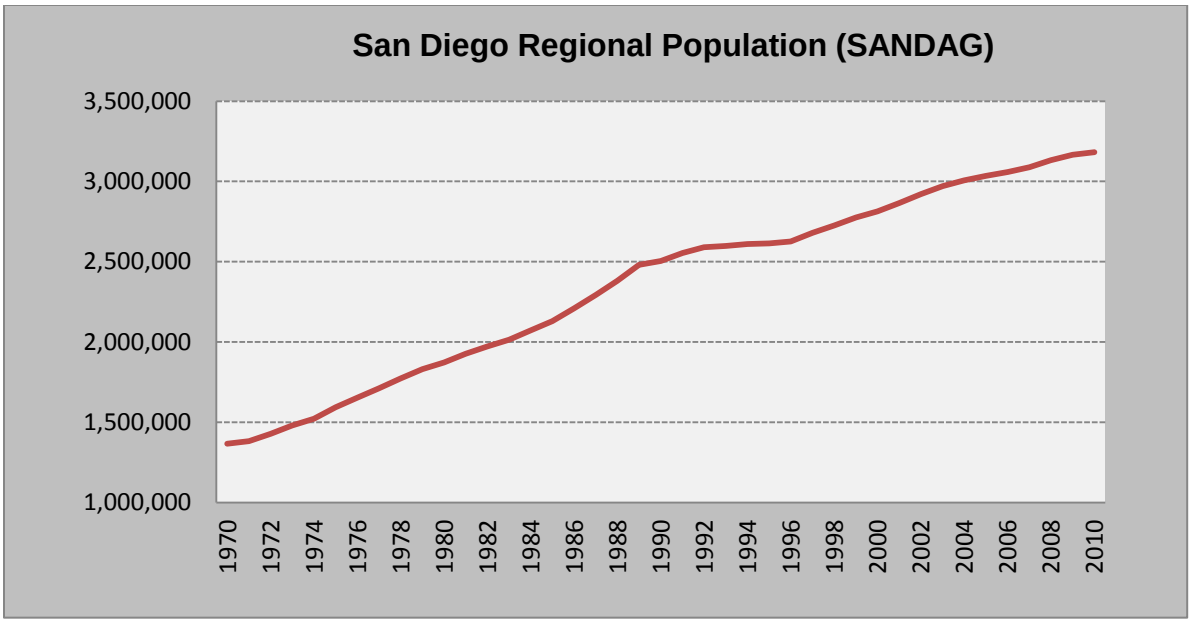

Figure 12. San Diego regional population trends (SANDAG, 2010)

4.1.1 Los Peñasquitos Lagoon Historical Water Quality Conditions

In the past 60 years, the Lagoon has evolved from a tidal estuary with an active connection to the ocean, to one that is closed to tidal action for long periods of time and requires mechanical excavation to reopen. The major factors that were responsible for degradation of the lagoon before the 1990s are: (1) the railroad embankment that cuts off lagoon channels; (2) construction of North Torrey Pines Road (part of U.S. Highway 101) along the barrier beach that restricted the location of the lagoon mouth; (3) construction of the North Beach Parking Lot in historic tidal areas; (4) increased sediment from changing land uses upstream; and, (5) decreased water quality from urban runoff and sewage effluent (LPL Foundation and State Coastal Conservancy, 1985). Hydromodification linked to urban development within the watershed and lagoon in the 1980s and 1990s played (and still plays) a major role in the degradation of the Lagoon. Water quality impacts to the Lagoon are primarily associated with a restricted tidal prism, historical discharge of wastewater effluent from 1962-1972; and more recently, hydromodification that has resulted in increased sedimentation and year-round freshwater inputs. Information that relates to each of these impacts is discussed below.

4.1.2 Tidal Prism Restriction

Maintaining a tidal prism, and proper exchange between the ocean and the Lagoon, is critical for maintaining adequate salt marsh salinity levels, and other water quality parameters. The Los Peñasquitos Enhancement Plan identifies mouth closures as one of the most important problems occurring in the Lagoon (Elwany, 2008). Tidal inflows and outflows of impounded water from large storm events help to keep the mouth open, whereas, wave-induced currents are responsible for the depositional processes which

tend to close the lagoon entrance (LPL Foundation and State Coastal Conservancy, 1985). Sedimentation of lagoon environments is a natural process; research of the Lagoon determined that the volume of sand trapped in the inlet is a function of wave and flooding dynamics (Elwany, 2008). Although increased sediment loading from the watershed may increase the build-up rate of sand bar formation, this study also determined that the grain size distribution of accumulated sand at the inlet was comparable to the distribution of grain size on the beach, thus identifying significant marine sources (Elwany, 2008) rather than watershed sources affecting the western portion of the Lagoon.

Despite the natural process, historical evidence indicates that the lagoon was continuously connected to the ocean until at least 1888 and after this time period, the natural process within the Los Peñasquitos watershed was accelerated by disturbances (Mudie et al., 1974). For example, construction of the railroad and U.S. Highway 101 across the lagoon reduced the volume of water flowing in and out of the lagoon; this allows sand to build up at the entrance and can prevent tidal flow altogether (Duncan and Jones, 1973). In 1966, a program was initiated to restore the tidal prism by mechanically dredging and removing the accumulated sediment at the mouth of the Lagoon (LPL Foundation and State Coastal Conservancy, 1985). This effort was later refined in the mid 1980s and early 1990s to improve tidal mixing and reduce the frequency of mouth closures. Because of continued, sporadic mouth closures, a dredging program continues to date (Elwany, 2008). The program seeks to enhance tidal flushing, water quality, and marine habitats.

4.1.3 Wastewater Effluent Discharge

To accommodate increasing urban development within the watershed, two wastewater treatment plants operated from 1962-1972 and discharged effluent to the Lagoon or tributaries that ultimately reach the Lagoon. Although these facilities elevated minimum and median annual discharge values and assisted with maintaining the tidal prism, the effluent caused insect and odor problems (Mudie et. al., 1974), as well as elevated nutrients (Bradshaw and Mudie, 1972), and depressed salinity[4] concentrations. These problems continued until 1972 when surrounding areas were all connected to the San Diego Metropolitan sewer system.

4.1.4 Watershed Sedimentation

Several studies have documented the influx of sediment originating in the watershed to the Lagoon. Mudie and Byrne (1980) estimate that sedimentation rates have increased to 50 cm/100 years since European settlement of the area. Between 1968 and 1985,

[4] (http://www.torreypine.org/parks/Peñasquitos-lagoon.html).

sediment from Carmel Valley has raised the elevation of the northeast corner of the lagoon by 6.1 feet, converting salt marsh vegetation into riparian and cattail marsh which helps retain sediment (LPL Foundation and State Coastal Conservancy, 1985). The main depositional areas in the lagoon are just downstream of the I-5 Carmel Valley Creek culverts and at the southern end of the Lagoon near Sorrento Valley. Deposition at the I-5 culvert, which is the outlet of Carmel Valley, was caused by a sewer berm located about 1000' west of I-5 (removed in the late 1980s). Storm flows from Carmel Valley pond behind the berm and allow coarse sediment to be deposited (LPL Foundation and State Coastal Conservancy, 1985). Gradual sediment accumulation in the lagoon has created areas of higher elevation which tidal water no longer reaches. The mouth of Carmel Valley Creek is the primary example of this process. In 1974, coastal salt marsh occupied the Carmel Valley Creek mouth; however, the ground elevation at the lower end of the Carmel Valley culverts rose 6.1 feet in the past 16 years, due to sedimentation from upstream (LPL Foundation and State Coastal Conservancy, 1985).

In an attempt to control the increasing sedimentation rate from development in the watershed, the Regional Board first approved a resolution (70-R26). This resolution established requirements for control of siltation from construction projects in areas that drain to the Lagoon in 1970 (Mudie et al., 1974). Despite these actions, a 1974 report by the California Department of Fish and Game expressed concerns associated with a significant increase in flow of urban runoff draining into the eastern channel. It was determined that the runoff was the result of intensive residential development of the mesas northeast of the lagoon. During the fall of 1973, this runoff volume amounted to approximately 1,500 gal/day (Mudie et al.,1974). Prestegaard (1978) concluded that unmitigated urbanization could double the annual sediment load within 30 years. More recently, the City of San Diego identified increasing urban development, resulting in alterations in hydrology and modified geomorphic conditions within the three main tributaries of the Lagoon's watershed, as a source of sedimentation (City of San Diego, 2005).

The regional climate is characterized by higher precipitation during winter months and lower precipitation, and corresponding high lagoon salinity, during the dry summer months (Williams, 1997). Storm events transport sediment into the lagoon which deposits on the salt flats and within lagoon channels. These sediment deposits have gradually built-up over the years due to increased sediment loading and inadequate flushing, which directly and indirectly affects lagoon functions and salt marsh characteristics.

4.1.5 Habitat alterations

Continued sedimentation and freshwater inputs, both resulting from urbanization, have resulted in significant alterations to habitat (White and Greer, 2002; Greer and Stowe, 2003; CE, 2003; Mudie et al, 1974; LPL Foundation and State Coastal Conservancy, 1985). In 1985, the Los Peñasquitos Lagoon Enhancement Plan estimated that sedimentation had removed 25 acres from the coastal salt marsh inventory. The encroachment of freshwater wetlands and reduction of saltwater marsh is evident in the National Wetland Inventory (NWI) maps from 1985 and 2009 (Figures 13 and 14). The location of different wetland types is also shown in maps that were included in the Los Peñasquitos Lagoon Enhancement Plan (1985) and in the Mudie et al. 1974 report (Figures 15 and 16). Although there are differences in the depiction of wetland areas from each study and time period, these maps show an encroachment of riparian, freshwater, and upland vegetation types in the eastern portion of the lagoon that is likely related to sediment accumulation and impediments to tidal flow. As discussed in Section 3.4, California State Parks estimated that 180 acres of the 390 to 570 acres of coastal salt marsh has been impaired by sedimentation, converting coastal salt marsh to more riparian habitat.

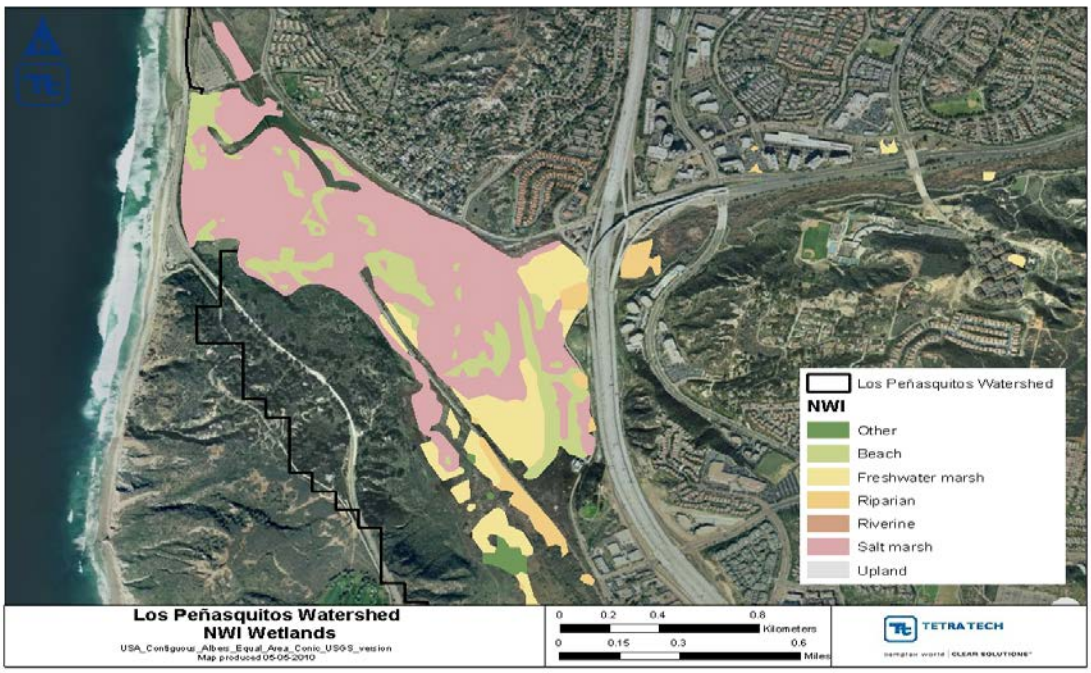

Figure 13. National Wetland Inventory (NWI) - 1985

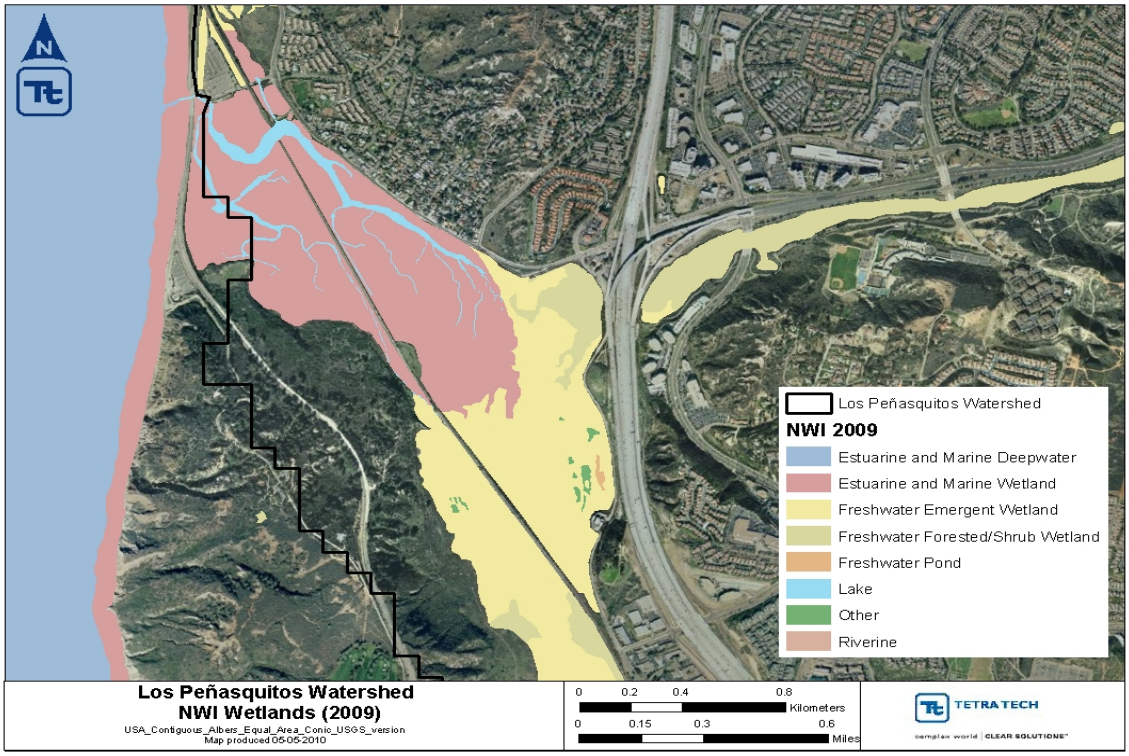

Figure 14. National Wetland Inventory (NWI) - 2009

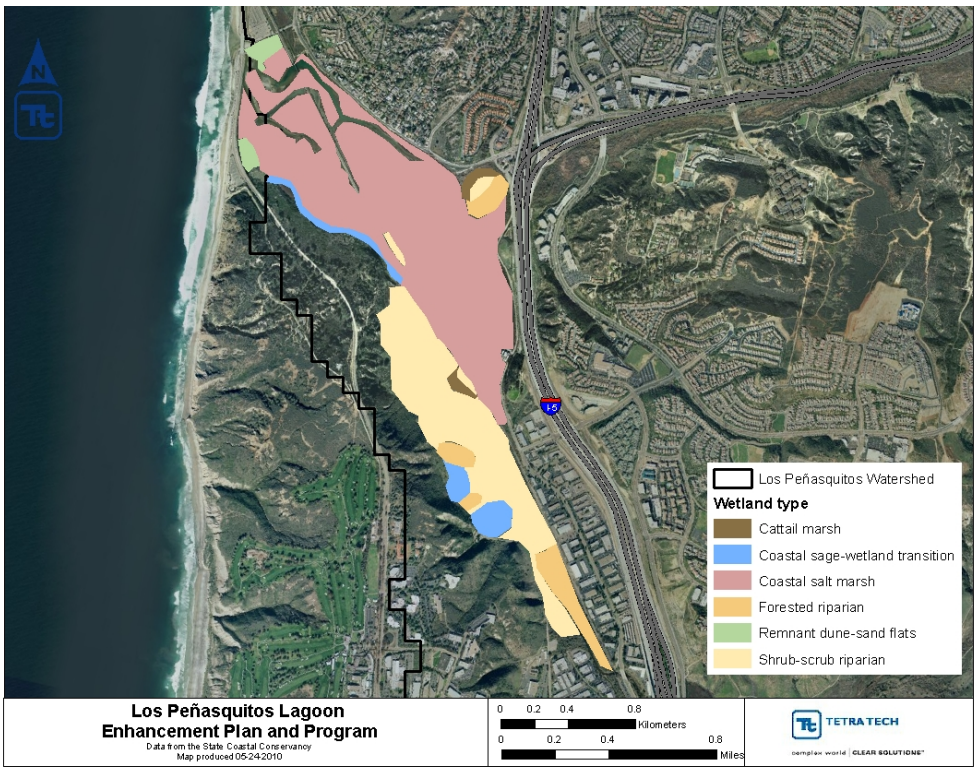

Figure 15. LPL Enhancement Plan – 1985 wetland types

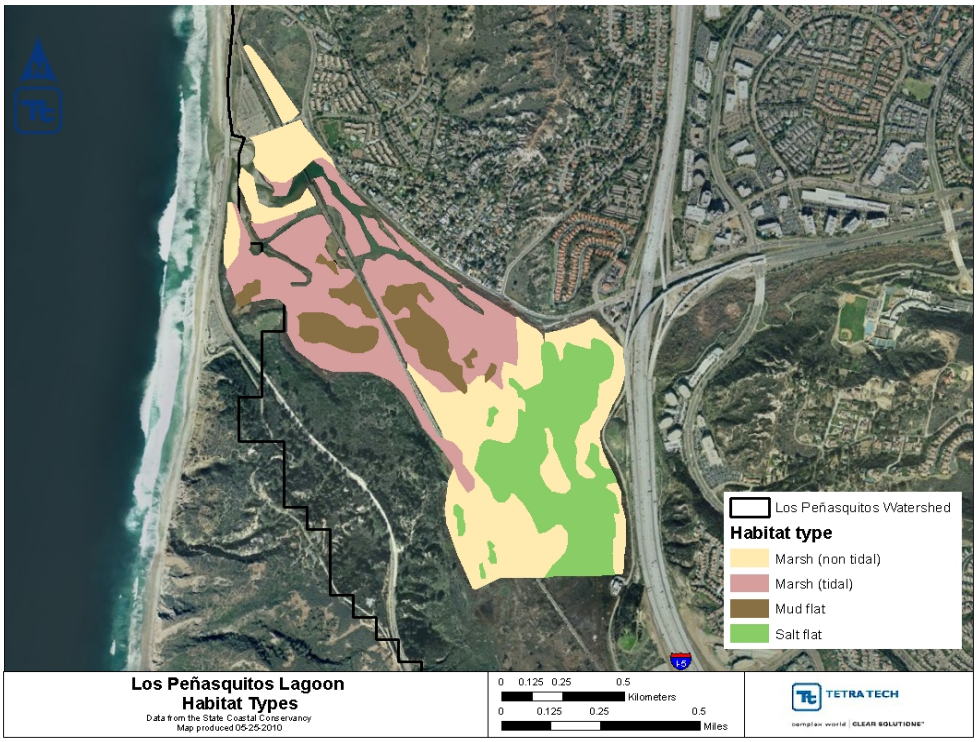

Figure 16. Historical lagoon wetland types (Mudie et al. 1974)

4.2 Impacts of Urbanization on Water Quality

Rapid urbanization of the watershed directly affects the natural drainage, pollutant loads and hydrologic characteristics such as peak flow rates, flow volumes, flow durations, and flow velocities (City of San Diego, 2005). Increased development has resulted in year-round flow in the main tributaries to the Lagoon (White and Greer, 2002; Greer and Stow, 2003). In addition to pollutant loading associated with specific land use practices, urbanization changes the landscape from pervious to impervious. Recent research has shown that impervious surfaces represent the imprint of land development on the landscape and is directly related to runoff (Burton and Pitt, 2002; Scheuler, 1994). Furthermore, impervious cover has been identified as the 'unifying theme' in stream degradation (USEPA, 1999); with stream degradation occurring with as little as ten percent imperviousness of the watershed (Scheuler, 1994).

The concerns associated with urban development are multifaceted. Land development typically results in increased erosion and runoff rates; accounting for up to 50 percent of sediment loads in urban areas (Burton and Pitt, 2002). In addition, urbanization increases imperviousness, resulting in alteration of the volume, velocity, duration, and timing of runoff events. Lowered infiltration rates speed surface runoff which leads to increased surface erosion and gullying. Ultimately, increased erosion destabilizes streambanks and washes sediment into surface waters. Freshwater runoff from

adjacent and upstream urban development also reduces salinity, and brackish and freshwater plant species have encroached upon the area, reducing the salt marsh acreage (CE, 2003).

Previous studies which focused on the Lagoon and the surrounding watershed provide additional information on historical conditions and hydrologic changes associated with urbanization. For example, White and Greer (2002) classified three distinct periods of urbanization within the upper Los Peñasquitos Creek watershed: 1965-1973 was classified as low urbanization (<15 percent), 1973-1987 as moderate urbanization (15-25 percent), and 1988-2000 as high urbanization (>25%). Across the entire time period, the 1-2 year flood interval increased from 229 cubic feet per second (cfs), to 745 cfs, to 1,272 cubic feet per second in each respective period. Flow duration curves indicate increased baseflow, such that discharges above 1.7 cfs occurred more often during the period between 1973 to1987 than the earlier period (White and Greer, 2002). This study also estimated a four percent increase in runoff since 1972, with an increase in minimum flows throughout the study equivalent to 17 percent per year (2002). These findings are supported by a recent review of flow data in Los Peñasquitos Creek (Figure 17), which demonstrates a steady increase in monthly mean flows since the 1970s. These analyses illustrate the general urbanization trends throughout the watershed that impact the Lagoon and assist with identifying a period in time when development, and increased sediment delivery from the watershed, was not the primary concern.

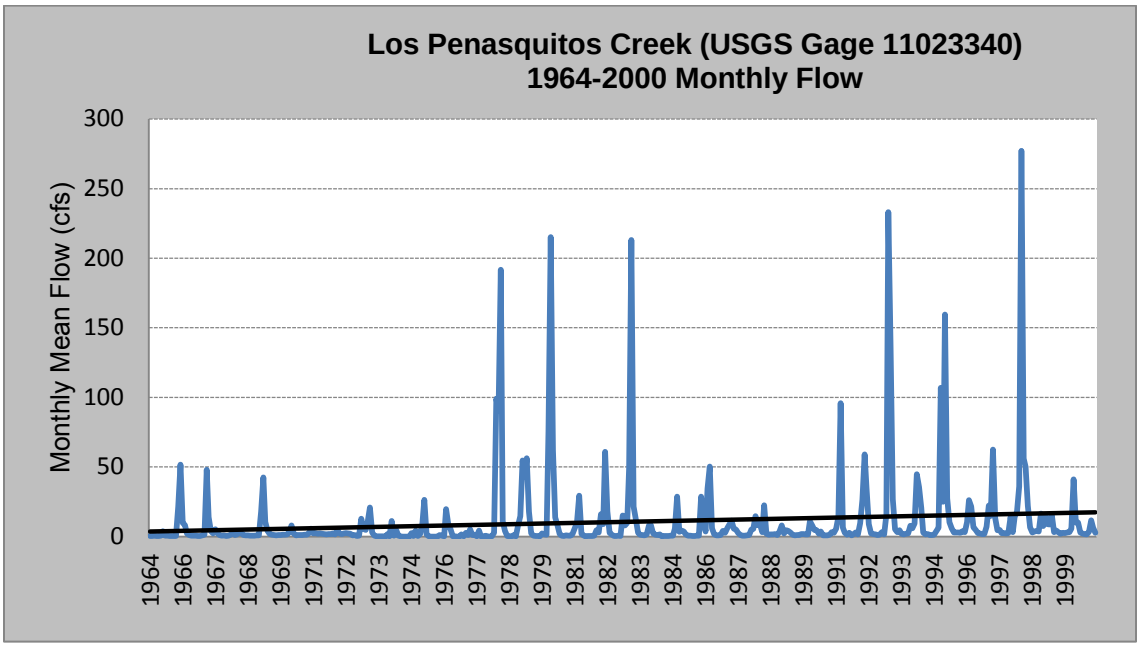

Figure 17. Hydrograph for Los Peñasquitos Creek

4.3 Selection of TMDL Numeric Target

A numeric sediment TMDL target was established through the historical analysis of land use and lagoon conditions using a 'weight of evidence' approach. The numeric target provides the link to the narrative WQO for sediment and defines the conditions that will result in the attainment of WQS for the Lagoon. Available data and literature studies of the Lagoon and watershed were evaluated to help identify the general time period when sedimentation impacts were likely minimal. This time period defines the reference condition upon which the numeric sediment target load was calculated. This approach was needed because numeric criteria are not specified in California's water quality standards and available data for the Lagoon does not specifically define a sediment loading rate or other measure of natural background sediment loading that can be used for TMDL development.

Several lines of evidence were considered when evaluating the watershed and Lagoon conditions in order to determine an appropriate reference time period for TMDL development. These lines of evidence include:

- **Urbanization trends**: A review of historical literature that describes urbanization in the watershed (Section 4.1) indicates that intensive development began in the in the mid-1970s. Land use data shows a nearly 37% decrease in open space in the watershed beginning in the mid 1970s.
- **Population data**: Trend analysis of population data (Section 4.1) indicates that the population of the San Diego region has been steadily increasing since 1970.
- **Flow data**: Review of historical streamflow data from the USGS gage on Los Peñasquitos Creek and the conclusions drawn by White and Greer (2002) indicate that flow has increased substantially since the 1970s. White and Greer (2002) associated these flow increases with urbanization trends in the watershed.
- **Evaluation of Lagoon conditions** (Section 4.1.1). As described above, Lagoon conditions have been influenced by several factors, which can be separated into watershed impacts and problems associated with the lagoon mouth. Salt marsh habitat loss is primarily associated with long-term sedimentation impacts, reduced tidal flushing, and year-round freshwater input. Watershed impacts to the Lagoon include sediment delivery associated with urban development, which increased substantially in the mid-1970s. The wastewater treatment plants impacted water quality in the Lagoon until 1972 when the area was connected to the city sewer system, making it difficult to differentiate between the wastewater impacts and development-associated impacts during this time period (pre-1972). Available literature indicates that sediment deposition from the watershed is not adequately flushed out of the system due to problems at the lagoon mouth caused by the railroad berm (and other physical alterations) and sediment build-

up at the ocean inlet. Note that the Highway 101 bridge abutments were recently replaced and have resulted in improved tidal exchange through the area. As discussed above, reductions in the tidal prism have resulted in increased sediment build-up at the ocean inlet. Sediment impacts at the ocean inlet are primarily a function of littoral forces (Elwany, 2008) and other factors that are largely separate from the sedimentation problems that originate from the watershed. These factors are important to understand in order to effectively manage and improve conditions within the Lagoon, but are outside the scope of the sediment TMDL analysis.

Consideration of these various lines of evidence indicates that the Lagoon was likely achieving WQS for sediment before the mid-1970s; therefore the numeric target was calculated based on the historic mid-1970s land use distribution for the watershed (Figure 10). Existing and historic land use areas and the calculated percent change by land use category are shown in Table 2. This table indicates that open space decreased by nearly 37% between the mid-1970s and existing conditions (based on SANDAG 2000 land use data). The percent impervious associated with the historic land use cover was also determined. Overall, in the mid-1970s the Los Peñasquitos Lagoon watershed was approximately 9.4% percent impervious, which is just below the threshold of stream degradation that occurs at 10 to 15 percent of watershed imperviousness (Scheuler, 1994), thereby further justifying use of this historic time period.

The historic land use coverage was used to calculate the sediment load to the Lagoon using the LSPC watershed model (see Appendix A). This historic sediment load represents the sediment TMDL numeric target.

5 Data Inventory and Analysis

Multiple data sources were used to characterize the watershed and Lagoon, in particular stream flow and water quality conditions. Much of this information was recently collected by watershed stakeholders to assist with TMDL model development. Data describing the watershed's topography, land use, soil characteristics, meteorological data, and irrigation needs along with available bathymetric survey information and data sondes analyzing pressure and salinity were used to calibrate the watershed and Lagoon models. This section summarizes stream flow and total suspended sediment data; refer to the Modeling Report (Appendix A) for additional details.

5.1 Streamflow Data Summary

Available streamflow data collected within the watershed were compiled for model calibration and validation. The United States Geological Survey (USGS) maintains a long term flow gage (11023340) in the upper Los Peñasquitos watershed (Figure 18). Daily data from 1990 through 2008 were downloaded for calibration of model hydrologic parameters. Total suspended solids (TSS) data were also collected at this location and a downstream USGS sediment monitoring station (325423117124501) (see Section 5.2). Additional streamflow data were collected at the base of Los Peñasquitos, Carroll Canyon, and Carmel Creeks as part of the Los Peñasquitos TMDL monitoring study (City of San Diego, 2009) as described in the Modeling Report (Appendix A) (Figure 18).

Los Peñasquitos Creek drains the largest area within the watershed and, accordingly, recorded the highest measured flows and runoff volume (Figure 19). Review of recent data (2007-2008) shows that median flows in Los Peñasquitos Creek were roughly twice those in Carmel Creek and two orders of magnitude greater than in Carroll Canyon Creek. A continual increase in cumulative volume for Los Peñasquitos Creek and Carmel Creek indicated consistent baseflows. By contrast, streamflow data collected on Carroll Canyon Creek included periods with little change in cumulative volume, flashy response time, and low baseflow. Low flows at this station were within the tenth percentile. Additional stream flow data, including a discussion of data from the mass loading station (MLS) and location-specific challenges to flow monitoring are presented in Appendix A.

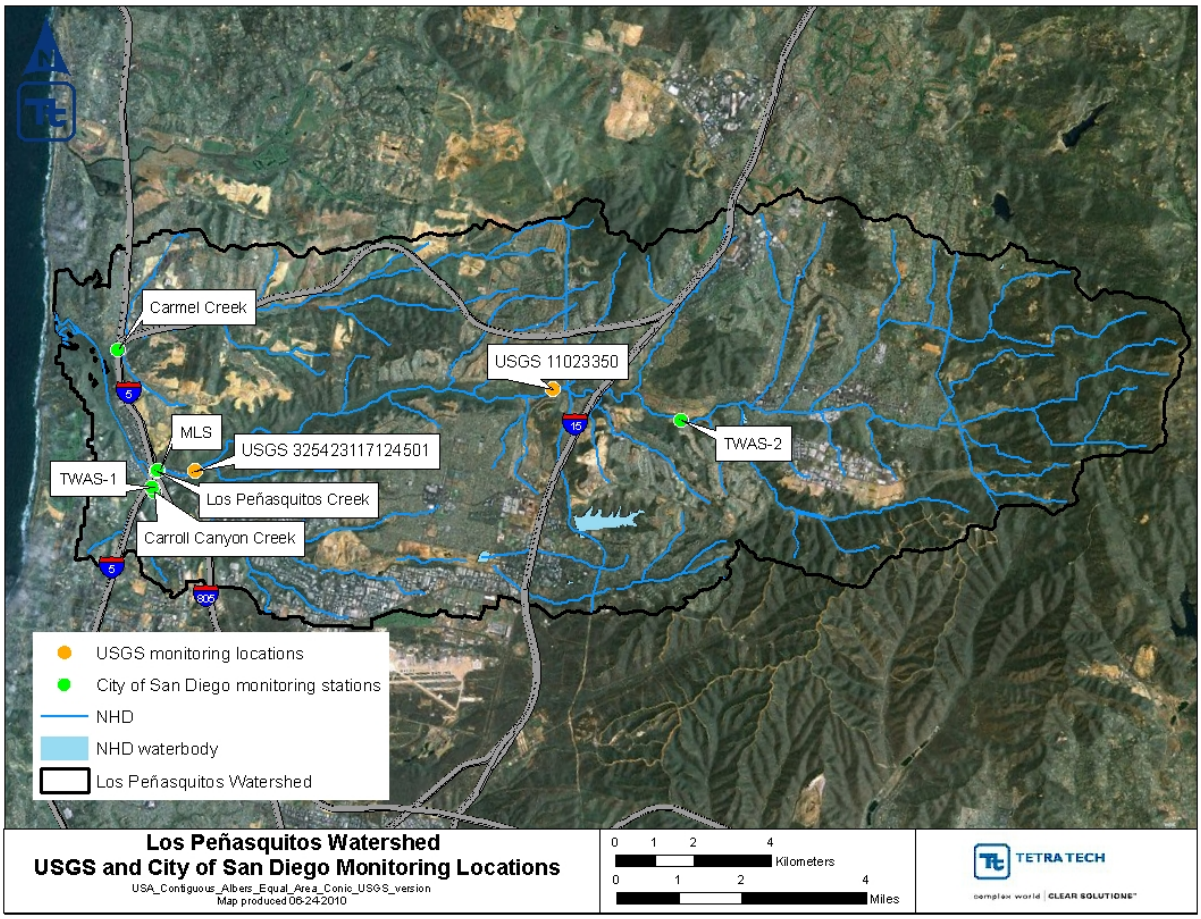

Figure 18. Monitoring locations in the Los Peñasquitos watershed

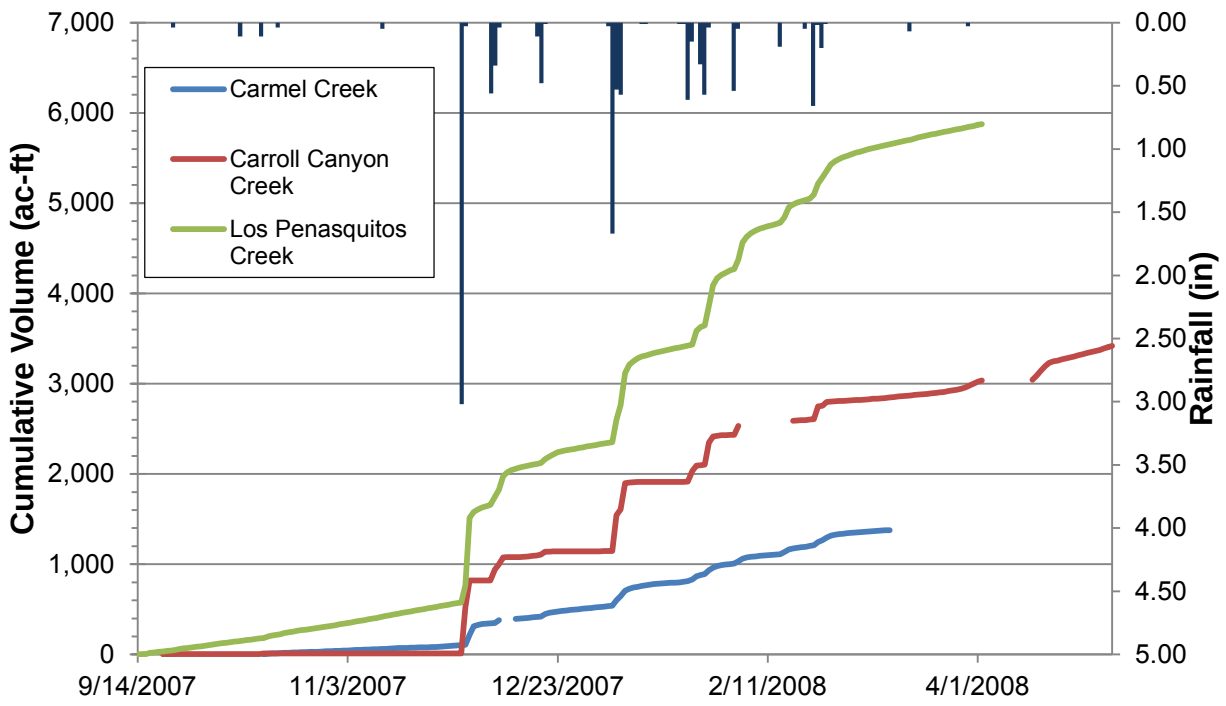

Figure 19. Cumulative flow volumes at TMDL monitoring locations

5.2 Suspended Sediment Data Summary

Total suspended solids and particle size data were collected by the City of San Diego (in accordance with Regional Board requirements) at several locations within the Los Peñasquitos watershed and used to develop and calibrate the watershed model (Figure 18). The USGS collected samples at gage 11023340 as well as at gage 325423117124501 (USGS, 2009). Event mean concentrations (EMCs) from storm water and dry weather runoff were collected at the MLS on Los Peñasquitos Creek near the confluence with Carroll Canyon Creek . Storm water and dry weather runoff events were also monitored at this station since 2001, in accordance with NPDES permit requirements. In addition, two Temporary Watershed Assessment Stations (TWAS) are located within the watershed on Los Peñasquitos Creek upstream (TWAS-2) and on Carroll Canyon Creek (TWAS-1). Collectively, these data were used to better understand the relationship between flow and sediment loading for model development purposes.

Pollutograph samples characterizing suspended sediment concentration changes throughout a storm were collected during three storms in the 2007-2008 storm season as part of the TMDL monitoring study. Samples were collected from the three major streams flowing into the lagoon: Los Peñasquitos, Carroll Canyon, and Carmel Creeks.

Longer-term datasets were also available for comparison (MLS and USGS stations). TSS concentrations recorded at the MLS on Los Peñasquitos Creek since 2001 were more than five times lower than the data collected by the USGS at both stations, possibly due to the presence of cattails upstream of the Los Peñasquitos MLS and the presence of the El Cuervo Norte wetland diverting flows from Los Peñasquitos Creek (Figure 20). When comparing just the pollutographs for the three major streams, TSS EMCs at Carroll Canyon Creek were consistently higher than those at Los Peñasquitos and Carmel Creeks (Figure 20). Additional details on sediment data, including particle size distribution, further comparison of the pollutographs and EMCs, and correlations with rainfall are presented in Appendix A.

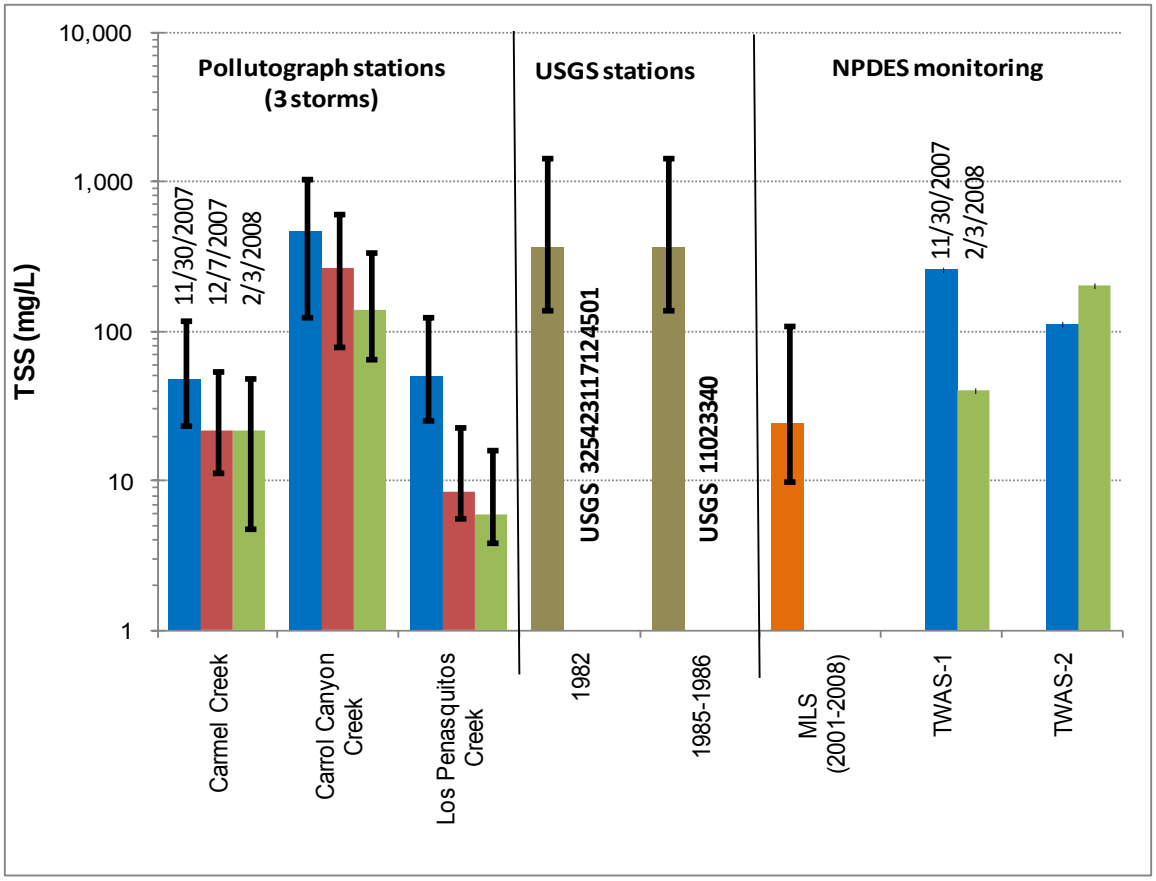

Figure 20. EMC/Median TSS and 95th percentile confidence intervals for all sampling events

6 Source Assessment

The purpose of the source assessment is to identify and quantify the sources of sediment to the Los Peñasquitos Lagoon. Sediment can enter surface waters from both point and nonpoint sources. Point sources typically discharge at a specific location from pipes, outfalls, and conveyance channels from, for example, municipal wastewater treatment plants or municipal separate storm sewer systems (MS4s). These discharges are regulated through waste discharge requirements (WDRs) that implement federal NPDES regulations issued by the State Water Board or the Regional Board through various orders. Nonpoint sources are diffuse sources that have multiple routes of entry into surface waters. Some nonpoint sources, such as agricultural and livestock operations are regulated under the Basin Plan's waste discharge requirement waiver policy (Waiver Policy). The source assessment quantification is measured as an annual or daily load, which is then used to separate the load allocations or wasteload allocations for the TMDL. The following sections discuss the sediment sources that contribute to Los Peñasquitos Lagoon.

6.1 Land Use / Sediment Source Correlation

Sources of sediment are generally the same under both wet weather and dry weather conditions; however, storm events can cause significant erosion and transport of sediment downstream (especially from canyon areas below storm water outfalls). Dry weather loading is dominated by nuisance flows from urban land use activities such as car washing, sidewalk washing, and lawn over-irrigation, which pick up and transport sediment into receiving waters. Wet weather loading is dominated by episodic storm flows that wash off sediment that has built up on land surfaces during dry periods and from canyon areas below storm water outfalls. Due to the higher runoff potential associated with wet weather conditions, emphasis was placed on characterizing wet weather watershed loading.

Sediment sources were quantified by land use group since sediment loading can be highly correlated with land use practices. For example, land disturbance may occur from construction or agricultural practices, disturbing native vegetative cover and leaving the soil susceptible to erosion. With the native cover disturbed, a rainfall event can cause soil detachment and further erosion of the land due to overland flow. For impervious areas, a different process occurs where sediment builds up over time to a maximum amount for each impervious land use type. For both pervious and impervious land uses, the amount of sediment that can be transported is a function of runoff. Scouring of stream banks can also occur in un-protected areas.

Since several land use types share hydrologic or pollutant loading characteristics, many were grouped into similar classifications, resulting in a subset of nine categories for modeling. Selection of these land use categories was based on the availability of monitoring data and literature values that could be used to characterize individual land use contributions and critical sediment-contributing practices associated with different land uses. For example, multiple urban categories were represented independently (e.g., high density residential, low density residential, and commercial/institutional), whereas other natural categories were grouped. The three major land use sources in the watershed are open space, low density residential, and industrial/transportation.

The sediment load contributed by each land use type was calculated using the LSPC model. Modeling parameters varied by land use to provide the correlation between sediment loading and land use type. The amount of runoff and associated sediment concentrations are highly dependent on land use.

6.2 Point Sources

Storm water runoff is regulated through the following NPDES permits: the San Diego County Phase I municipal separate storm sewer system (MS4) permit, the Phase II MS4 permit for small municipal dischargers, and the statewide storm water permit issued to Caltrans. The permitting process defines these discharges as point sources because storm water is discharged from the end of a storm water conveyance system, as described below. NPDES permits are also issued for construction and industrial sites that are enrolled in the statewide General Storm Water permit program. These sites are located within areas controlled by the San Diego County Phase I MS4 permit and are, therefore, not specifically included in the TMDL analysis.

6.2.1 Phase I Municipal Separate Storm Sewer System (MS4)

In 1990, the USEPA developed rules establishing Phase I of the NPDES storm water program, designed to prevent harmful pollutants from being washed by urban runoff into MS4s or from being discharged directly into MS4s, and then local receiving waters. Phase I of the program required operators of medium and large MS4s (those generally serving populations of 100,000 or more) to implement an urban runoff management program as a means to control polluted discharges from MS4s.

Approved urban runoff management programs for medium and large MS4s are required to address a variety of water quality-related issues, including roadway runoff management, municipally owned operations and hazardous waste treatment. More specifically, large and medium operators are required to develop and implement Urban Runoff Management Plans that address, at a minimum, the following elements:

- Structural control maintenance;
- Areas of significant development or redevelopment;
- Roadway runoff management;
- Flood control related to water quality issues;
- Municipally owned operations such as landfills, wastewater treatment plants, etc.;
- Hazardous waste treatment, storage, or disposal sites, etc.;
- Application of pesticides, herbicides and fertilizers;
- Illicit discharge detection and elimination;
- Regulation of sites classified as associated with industrial activity;
- Construction site and post-construction site runoff control; and
- Public education and outreach.

Twenty one entities are identified in Regional Board Order R9-2007-0001 (NPDES No. CAS0108758) and are responsible for addressing water quality concerns for the MS4 (Regional Board, 2007). Responsible Municipal Dischargers within the Los Peñasquitos watershed are San Diego County, the City of San Diego, the City of Del Mar, and the City of Poway.

During wet weather events, significant erosion can occur along canyon walls below storm water outfalls. Sediment also builds up on the land surface from various sources and associated management practices and is then washed off the surface during rainfall events. The amount of runoff and associated concentrations are, therefore, highly dependent on the nearby land management practices. Note that the redistribution of sediment to other areas of the Lagoon can be caused by both anthropogenic and natural processes; however, most of the sediment is contributed by point sources in the watershed so this resuspension is associated with and quantified in the MS4 load calculations.

All land uses were classified as generating point source loads because, although the sediment sources on these land use types may be diffuse in origin, the pollutant loading is transported and discharged to receiving waters through the MS4. Sediment loads that are attributed to point sources are discharged via the MS4 from all land uses. Note that several construction and industrial sites regulated under the General Statewide Storm Water Permit program are located within the Phase 1 MS4 permitted area. Additional information would be needed to estimate the sediment load contribution from these sites.

6.2.2 Phase II Municipal Separate Storm Sewer System (MS4)

In 1999, the USEPA developed rules establishing Phase II of the NPDES storm water program, extending the regulations to storm water discharges from small MS4s located in “urbanized areas” and construction activities that disturb 1 to 5 acres of land. Small MS4 systems are not permitted under the municipal Phase I regulations, and are owned or operated by the United States, a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity.

The General Permit for the Discharge of Storm Water from Small MS4s, Water Quality Order No. 2003-0005-DWQ (Small MS4 General Permit) regulates discharges of storm water from “regulated Small MS4s.” A “regulated Small MS4” is defined as a Small MS4 that discharges to a water of the United States or to another MS4 regulated by an NPDES permit. The General Permit requires that Small MS4 Dischargers develop and implement a Storm Water Management Program (SWMP) that reduces the discharge of pollutants through their MS4s to the Maximum Extent Practicable (MEP). The SWMP must describe the best management practices (BMPs), measurable goals, include time schedules of implementation, and assign responsibility of each task.

Non-traditional Small MS4s may also require coverage by the permit. The non-traditional Small MS4s include those located within or discharge to a permitted MS4, and that pose significant water quality threats. In general, these are storm water systems serving public campuses (including universities, community colleges, primary schools, and other publicly owned learning institutions with campuses), military bases, and prison and hospital complexes within or adjacent to other regulated MS4s, or which pose significant water quality threats. The State Water Board considered designating non-traditional small MS4s when adopting this General Permit.

Entities that enroll in Order No. 2003-0005-DWQ are responsible for addressing water quality concerns from their small MS4s. In the San Diego Region, the non-traditional small MS4s that are subject to the Order include the San Diego Unified School District (SDUSD) and others, as applicable, in the watershed.

As with Phase I MS4s, pollutants build up on land surfaces and then are washed off during rainfall events. The amount of runoff and associated concentrations are highly dependent on the nearby land uses and management practices.

6.2.3 Caltrans MS4s

Caltrans is regulated by a statewide storm water discharge permit that covers all municipal storm water activities and construction activities (State Board Order No. 99-06-DWQ; CAS000003). The Caltrans storm water permit authorizes storm water discharges from Caltrans properties such as the state highway system, park and ride facilities, and maintenance yards. The storm water discharges from most of these Caltrans properties and facilities eventually ends up in either a city or county storm drain system.

6.3 Nonpoint Sources

A nonpoint source is a source that discharges via sheet flow or natural discharges. Additionally, storm surges and ocean tides can be a source of sediment to the mouth of the Lagoon; however, a recent study found that accumulated sediment at the Lagoon's ocean inlet was similar to beach sediment and tidal sources (Elwany, 2008). For this reason, watershed loading was assumed to have a less significant contribution to sediment build-up at the inlet. Beach erosion processes cannot be modeled with the existing model configuration which lacks wave, wave-breaking, and wave-current interaction components; therefore, sediment modeling used a reduced grid which sets the open ocean boundary immediately outside of the ocean inlet (see Appendix A for a more detailed discussion).

7 Linkage Analysis

The technical analysis of the relationship between pollutant loading from identified sources and the response of the waterbody to this loading is referred to as the linkage analysis. The purpose of the linkage analysis is to quantify the maximum allowable sediment loading that can be received by an impaired waterbody and still attain the WQOs of the applicable beneficial uses. This numeric value is represented by the TMDL.

The linkage analysis for this TMDL is based on computer models that were developed to represent the physical processes within the impaired receiving waterbody and the associated watershed. The models provide estimation of sediment loadings from the watersheds based on rainfall events, and simulation of the response of the receiving water to these loadings. The following sections provide more detailed discussion regarding model selection and linkage analyses.

7.1 Model Selection Criteria

In selecting an appropriate approach for TMDL calculation, technical and regulatory criteria were considered. Technical criteria include the physical system, including watershed or receiving water characteristics and processes and the constituents of interest. Regulatory criteria include water quality objectives or procedural protocol. The following discussion details the considerations in each of these categories. Based on these considerations, appropriate models were chosen to simulate watershed and receiving water conditions.

7.2 Technical Criteria

Technical criteria were divided into four main topics. Consideration of each topic was critical in selecting the most appropriate modeling system to address the types of sources and the numeric target associated with the impaired waterbody.

Physical Domain

Representation of the physical domain is perhaps the most important consideration in model selection. The physical domain is the focus of the modeling effort—typically, either the receiving water itself or a combination of the contributing watershed and the receiving water. Selection of the appropriate modeling domain depends on the constituents and the conditions under which the waterbody exhibits impairment. For a waterbody dominated by point source inputs that exhibits impairments under only low-flow conditions, a steady-state approach is typically used. If the system includes tidal influences, quasi-steady-state simulation is typically performed that assumes steady-state inputs, but includes diurnal variability in hydrodynamics associated with tidal

effects. The steady-state and quasi-steady-state modeling approaches primarily focus on receiving water processes during a user-specified condition.

For waterbodies affected additionally or solely by nonpoint sources or primarily rainfall-driven flow and pollutant contributions, a dynamic approach is recommended. Dynamic models consider time-variable nonpoint source contributions from a watershed surface or subsurface, as well as a hydrodynamic response of the receiving water. Some models consider monthly or seasonal variability, while others enable assessment of conditions immediately before, during, and after individual rainfall events. Dynamic models require a substantial amount of information regarding input parameters and data for calibration purposes.

Source Contributions

Primary pollutant sources must be considered in the model selection process. Accurately representing contributions from nonpoint sources and point sources is critical in properly representing the system and ultimately evaluating potential load reduction scenarios.

Water quality monitoring data were not sufficient to fully characterize all sources of sediment to the Lagoon, however, available data indicate that the main controllable sources are watershed runoff and streambank erosion. As a result, the models selected to develop a sediment TMDL for the Los Peñasquitos Lagoon need to address the major source categories during conditions considered controllable for TMDL implementation purposes.

Critical Conditions

The goal of the TMDL analysis is to determine the assimilative capacity of the waterbody and to identify potential allocation scenarios that will enable that waterbody to achieve WQOs. The critical condition is the set of environmental conditions for which controls designed to protect water quality will ensure attainment of objectives for all other conditions. This is typically the period of time in which the waterbody exhibits the most vulnerability. For the Lagoon and its watershed there is a high degree of variability in when sediments are deposited at the mouths of each creek. This variability is due to the nature of wet weather events that represent the critical condition for sediment deposition.

Constituents

Another important consideration in model selection and application is the constituent(s) to be assessed. Choice of state variables is a critical part of model implementation. The more state variables included, the more difficult the model will be to apply and calibrate.

However, if key state variables are omitted from the simulation, the model might not simulate all necessary aspects of the system and might produce unrealistic results. A delicate balance must be met between minimal constituent simulation and maximum applicability.

7.3 Regulatory Criteria

A properly designed and applied model provides the source-response linkage component of the TMDL and enables accurate assessment of assimilative capacity and allocation distribution. The receiving water's assimilative capacity is determined by assuming adherence to WQOs. For all waters in the San Diego Region, the Basin Plan establishes the beneficial uses for each waterbody to be protected and the WQOs that protect those uses. In the case of narrative objectives, interpretation is required to develop a numeric target for TMDL development (refer to Section 4). The modeling framework must enable direct comparison of model results to the selected numeric target and allow for the analysis of the duration of those conditions. For the watershed loading analysis and implementation of required reductions, it is also important that the modeling framework allow for the examination of gross land use loading.

7.4 Model Selection and Overview

Establishing the relationship between the receiving water quality target and source loading is a critical component of TMDL development. This allows for the evaluation of management options that will help achieve the desired source load reductions. This can be established through a number of techniques, ranging from qualitative assumptions based on sound scientific principles to sophisticated modeling techniques. Ideally, the linkage will be supported by monitoring data that allow the TMDL developer to associate certain waterbody responses to flow and loading conditions. The objective of this section is to present the approach taken to develop the linkage between sources and receiving water responses for TMDL development in the Lagoon.

In addition, to assist in TMDL development and to provide decision support for watershed management, the models can be used to simulate various scenarios and may require future modifications to address specific management and environmental factors. Such scenarios may result from the augmentation of input data to be collected in ensuing monitoring efforts, future implementation of various management strategies or best management practices (BMPs), or adaptation and linkage to additional models developed in subsequent projects. Therefore, model flexibility is a key attribute for model selection.

The modeling system was divided into two components representative of the processes essential for accurately modeling hydrology, hydrodynamics, and water quality. The first component of the modeling system is a watershed model that predicts runoff and

external pollutant loading as a result of rainfall events. The second component is a hydrodynamic and water quality model that simulates the complex water circulation and pollutant transport patterns in the Lagoon.

The models selected for the Lagoon sediment TMDL are components of USEPA's TMDL Modeling Toolbox (Toolbox), which was developed through a joint effort between USEPA and Tetra Tech, Inc. (USEPA, 2003). The Toolbox is a collection of models, modeling tools, and databases that have been utilized over the past decade to assist with TMDL development and other environmental studies. The Loading Simulation Program in C++ (LSPC) is the primary watershed hydrology and pollutant loading model and the Environmental Fluids Dynamic Code (EFDC) is the receiving water hydrodynamic and water quality model in the Toolbox modeling package. Both the LSPC and EFDC models are summarized below and described in detail in the Modeling Report (Appendix A).

7.4.1 Watershed Model: Loading Simulation Program in C++ (LSPC)

LSPC was selected for simulation of land-use based sources of sediment and the hydrologic and hydraulic processes that affect delivery (Shen et al., 2004; Tetra Tech and USEPA, 2002; USEPA, 2003). LSPC was specifically used to simulate watershed hydrology and transport of sediments in the streams and storm drains flowing to the impaired Lagoon. LSPC is a watershed modeling system that includes streamlined Hydrologic Simulation Program Fortran (HSPF) (Bicknell et al., 1997) algorithms for simulating hydrology, sediment, and general water quality on land, as well as a simplified stream fate and transport model. Since its original public release, the LSPC model has been expanded to include additional GQUAL components for sorption/desorption of selected water quality constituents with sediment, enhanced temperature simulation, and the HSPF RQUAL module for simulating dissolved oxygen, nutrients, and algae.

The hydrologic (water budget) process is complex and interconnected within LSPC. Rain falls and lands on various constructed landscapes, vegetation, and bare soil areas within a watershed. Varying soil types allow the water to infiltrate at different rates while evaporation and plant matter exert a demand on this rainfall. Water flows overland and through the soil matrix. There may also be point source discharge and water withdrawals/intakes. The land representation in the LSPC model environment considers three flowpaths; surface, interflow, and groundwater outflow. The sediment routine in LSPC represents the general detachment of sediment due to rainfall, overland and instream transport, attachment when there is no rainfall, and scour.

The model can simulate sediment loadings from specific source areas (i.e., subwatershed or land use areas). This is important in terms of TMDL development and

allocation analysis. For this TMDL, the LSPC model was used to calculate both historic and existing conditions within the watershed to establish the TMDL numeric target and required load reductions from existing conditions. The LSPC model output was incorporated as an input to the receiving water model for the Lagoon, as described below.

7.4.2 Lagoon Model: Environmental Fluid Dynamics Code (EFDC)

The Los Peñasquitos Lagoon was simulated using the EFDC model. The LSPC watershed model was linked to EFDC and provided all freshwater flows and loadings as model input. EFDC is a public domain, general purpose modeling package for simulating one-dimensional (1-D), two-dimensional (2-D), and three-dimensional (3-D) flow, sediment transport, and biogeochemical processes in surface water systems including rivers, lakes, estuaries, reservoirs, wetlands, and coastal regions. The EFDC model was originally developed at the Virginia Institute of Marine Science for estuarine and coastal applications (Hamrick, 1992). This model is now being supported by the USEPA and has been used extensively to support TMDL development throughout the country. In addition to hydrodynamic, salinity, and temperature transport simulation capabilities, EFDC is capable of simulating cohesive and noncohesive sediment transport, near-field and far-field discharge dilution from multiple sources, eutrophication processes, the transport and fate of toxic contaminants in the water and sediment phases, and the transport and fate of various life stages of finfish and shellfish. The EFDC model has been extensively tested, documented, and applied to environmental studies worldwide by universities, governmental agencies, and other entities.

The EFDC model includes four primary modules: (1) a hydrodynamic model, (2) a water quality model, (3) a sediment transport model, and (4) a toxics model. The hydrodynamic model predicts water depth, velocities, and water temperature. The water quality portion of the model uses the results from the hydrodynamic model to compute the transport of the water quality variables. The water quality model then computes the fate of up to 22 water quality parameters including dissolved oxygen, phytoplankton (three groups), benthic algae, various components of carbon, nitrogen, phosphorus and silica cycles, and fecal coliform bacteria (Cerco and Cole 1994). The sediment transport and toxics modules use the hydrodynamic model results to calculate the settling of suspended sediment and toxics, resuspension of bottom sediments and toxics, and bed load movement of noncohesive sediments and associated toxics. For this project, the hydrodynamics and sediment transport models were used. The hydrodynamics model simulated the circulation, water temperature, and salinity in the lagoon driven by ocean tides and watershed inflows. The sediment transport model simulated the transport of sand, silt as non-cohesive sediments, and clay as cohesive sediment. Details of the EFDC model's hydrodynamic and eutrophication components are provided in Hamrick (1992) and Tetra Tech (2002, 2006a, 2006b, 2006c, 2006d).

The EFDC model was configured to simulate hydrodynamics and sediment transport in the Los Peñasquitos Lagoon for both existing and historic conditions. Specifically, water temperature and salinity were both modeled for hydrodynamics. Sediment fractions considered in the model include sand, silt, and clay. Sand and silt were modeled using the non-cohesive sediment module and clay was modeled using the cohesive sediment module in EFDC.

7.5 Model Application

A complete discussion, including model configuration, hydrologic and hydrodynamic calibration and validation, and water quality calibration and validation, of the LSPC and EFDC models is provided in the Modeling Report (Appendix A). These models provide the technical analysis framework that will be used to make regulatory and management decisions for the Lagoon and its watershed.

The models were initially calibrated to observed hydrologic and water quality data to characterize existing conditions in the watershed and Lagoon (required load reductions are based on these existing loads). In addition, the models were used to establish a TMDL numeric target for sediment. As described in Section 4, a historical review of available literature regarding urbanization trends and Lagoon impacts was used to identify an appropriate time period (mid 1970s) for calculating the numeric target that represents the sediment WQO. Conditions present at this time were associated with loads that met WQOs and did not adversely impact the Lagoon. To characterize this historical period, a historic land use coverage for the watershed was developed and model simulations were performed. The resulting historical net annual sediment load was identified as the TMDL numeric target and represents the loading (assimilative) capacity for the lagoon (i.e. the TMDL). Percent reductions were calculated based on the difference between the TMDL load and the sediment load that corresponds with existing conditions.

8 Identification of Load Allocations and Reductions

The calibrated models were used to simulate historical and existing sediment loads to the Los Peñasquitos Lagoon from which numeric targets and load reductions were established. Point sources were then assigned a wasteload allocation (WLA) while nonpoint sources were assigned a load allocation (LA). This section discusses the methodology used for TMDL development and the results in terms of loading capacities and required load reductions for the Los Peñasquitos Lagoon. Other TMDL components are also discussed including the margin of safety (MOS), seasonality and critical conditions, and a daily load expression.

8.1 Loading Analysis

The calibrated LSPC model was used to estimate existing sediment loads to the Lagoon, with the receiving water simulated based on the EFDC model (see Appendix A). Using the EFDC model, the assimilative capacity of the Lagoon was assessed and compared to the historical numeric target for evaluation of sediment quality.

8.2 Application of Numeric Targets

As discussed in Section 4, the narrative WQO for sediment was interpreted using a weight of evidence approach to determine a reference condition to define the TMDL numeric target (i.e., a historical period when the Lagoon was not impaired for sedimentation). Several lines of evidence used to establish a numeric sediment target include: urbanization trends, population data, flow data, and evaluation of Lagoon conditions over time.

8.3 Load Estimation

Estimation of current watershed loading to the impaired Lagoon required use of the LSPC model to predict flows and pollutant concentrations. The dynamic model-simulated watershed processes, based on observed rainfall data as model input, provided temporally variable load estimates for the critical period. These load estimates were simulated using calibrated, land use-specific processes associated with hydrology and sediment transport (see Appendix A).

8.4 Identification of Critical Conditions

Due to the higher transport potential of sediment during wet weather, the 1993 El Nino time period was selected as the critical period for assessment. The wet season that includes the 1993 El Nino storm events (10/1/92 – 4/30/93) is one of the wettest periods on record over the past several decades. Statistically, 1993 corresponds with the 93rd

percentile of annual rainfall for the past 15 years measured at the San Diego Airport (Lindbergh Field). Selection of this year was also consistent with studies performed by the Southern California Coastal Water Research Project (SCCWRP). An analysis of rainfall data for the Los Angeles Airport from 1947 to 2000 shows that 1993 was the 90th percentile year; meaning 90 percent of the years between 1947 and 2000 had less annual rainfall than 1993 (Los Angeles Water Board, 2002).

8.5 Critical Locations for TMDL Calculation

For TMDL calculation, a critical location within the impaired waterbody is selected for comparison to the numeric target in order to determine the required pollutant load reductions needed to meet the WQOs. The selection of a critical location (or locations) represents a conservative assessment of water quality conditions, as these areas typically display the worst water quality conditions and are the most vulnerable to pollution impacts. Although, a critical location is used for water quality assessment in the TMDL analysis, compliance with WQOs must be assessed and maintained throughout a waterbody in order to protect beneficial uses.

Due to the variability and dynamic nature of conditions within the Lagoon (e.g., mouth closures, tidal fluctuations, sediment fate and transport, etc.), the entire modeled Lagoon area was assessed as the critical location. Load reductions for sediment were based on achieving the numeric TMDL target across the Lagoon.

8.6 Calculation of TMDLs and Allocation of Loads

Load calculations for sediment were developed using land use-based generation rates and meteorological conditions from the critical wet period (10/1/92 – 4/30/93). The TMDL was divided among point sources as a WLA and nonpoint sources as a LA. The point sources identified in the Los Peñasquitos watershed are Phase I MS4 co-permittees (San Diego County and the cities of San Diego, Poway, and Del Mar), Phase II MS4s, and Caltrans. The USEPA's permitting regulations require municipalities to obtain NPDES requirements for all storm water discharges from MS4s. The existing loads estimated were solely the result of watershed runoff (land-use based) and streambank erosion and not other types of point sources.

8.7 Margin of Safety

A margin of safety (MOS) is incorporated into a TMDL to account for uncertainty in developing the relationship between pollutant discharges and water quality impacts (USEPA, 1991). The MOS can be incorporated in the TMDL either explicitly or implicitly. Reserving a portion of the loading capacity provides an explicit MOS, whereas, the use of conservative assumptions in the modeling and TMDL analysis provides an implicit

MOS. In either case, the purpose of the MOS is to ensure that the beneficial uses that are currently impaired will be restored, given the uncertainties in the TMDL analysis.

For this TMDL, an implicit MOS was included through the application of conservative assumptions throughout TMDL development. The following list describes several key assumptions that were used.

- **Critical condition** - The wet season that includes the 1993 El Nino storm events (10/1/92 – 4/30/93) was selected as the critical condition time period for TMDL development. This is one of the wettest periods on record over the past several decades. Because of the large amount of rainfall, sediment loads were significant higher during this period than in other years with less rainfall.

- **Soil composition** - Soils that are more easily transported typically have higher proportions of smaller particles sizes (silt and clay fractions), as compared to local parent soils, because of differences in settling rates and other sediment transport characteristics. To account for these differences in the model, soils transported by surface runoff were assumed to be composed of 5 percent sand, twice as much clay as the percentage of clay within each hydrologic soil group, and the remainder assigned to the silt fraction.

- **Numeric target** - The historical analysis involved an extensive literature search and technical analysis in order to identify an appropriate time period for development of the numeric sediment target. This comprehensive 'weight of evidence' analysis considered all available information regarding urbanization and lagoon impacts over time in order to identify a conservative reference condition.

- **Critical location** - TMDL load reductions are based on meeting the numeric target across the entire Lagoon (lagoon channels and marsh areas). This approach ensures protection of beneficial uses throughout the lagoon. .

It was determined that an explicit MOS was not needed because of use of conservative assumptions and the overall predictive capability of the modeling framework that was developed for this study.

8.8 Seasonality

The federal regulations at 40 CFR 130.7 require that TMDLs include seasonal variations. Sources of sediment are similar for both dry and wet weather seasons (the two general seasons in the San Diego region). Despite the similarity of wet/dry sources, transport mechanisms can vary between the two seasons. Throughout the TMDL monitoring period, the greatest transport of sediment occurred during rainfall events. It is recognized that dry weather will contribute a deminimus discharge of sediment;

however, model calibration and TMDL development focused on wet weather conditions as sediment transport is dramatically higher during wet weather. Model simulation was completed for the 10/1/92 – 4/30/93 wet period to account for the much greater sediment loading and associated impacts to the Lagoon during this time period.

8.9 Daily Load Expression

The load allocations for the Lagoon are presented in Section 9. Load allocations are expressed in terms of net sediment load for the critical period (tons) because sediment delivery to streams is highly variable on a daily and annual basis. Loads were also divided by the number of days in the critical period (211) to derive daily loading rates (tons/mi^2/day). EPA expects the load allocations to be evaluated using a long-term rolling average period (e.g. 15-year), because of the natural variability in sediment delivery rates. In addition, EPA does not expect each square mile within a particular source category throughout the watershed to necessarily meet the load allocation; rather, EPA expects the watershed average for the entire source category to meet the load allocation for that category.

9 Total Maximum Daily Loads and Allocations

The TMDL is the total amount of pollutant that can be assimilated by the receiving waterbody while still achieving the numeric target. Allowable loadings from pollutant sources that cumulatively amount to no more than the TMDL must be established; this provides the basis to establish water quality-based controls. TMDLs can be expressed on a mass loading basis (e.g., net sediment amount per year) or as a concentration in accordance with 40 CFR 130.2(I).

A TMDL for a given pollutant and waterbody is comprised of the WLA for point sources and LA for both nonpoint sources and natural background levels. In addition, the TMDL must include a margin of safety (MOS), either implicitly or explicitly, to account for the uncertainty in the relationship between pollutant loads and water quality in the receiving waterbody. Conceptually, this definition is represented by the equation:

$$TMDL = \sum WLAs + \sum LAs + MOS$$

A TMDL was established for the Lagoon using the methodology described above (Section 6). The WLA portion of this equation is the total loading assigned to point sources. The LA portion is the loading assigned to nonpoint sources. The MOS is the portion of loading reserved to account for any uncertainty in the data and computational methodology, as described in Section 8. An implicit MOS was incorporated for this TMDL.

9.1 Wasteload Allocations

Federal regulations (40 CFR 130.7) require TMDLs to include a WLA for point source discharges regulated under a discharge permit. The Los Peñasquitos watershed includes several MS4 municipalities and other permitted dischargers. The total sediment contribution from all dischargers in the watershed is presented as the WLA.

Twenty entities are identified in Regional Board Order R9-2007-0001 (NPDES No. CAS0108758) and are responsible for addressing water quality concerns for the MS4 (Regional Board, 2007). The Phase I MS4 municipal dischargers within the Los Peñasquitos watershed are the County of San Diego, the City of San Diego, the City of Del Mar, and the City of Poway. Sediment loads generated from land use activities within MS4 boundaries were included in the WLA. The total WLA includes the contribution from Phase II MS4 facilities within the watershed and highway areas regulated under the Caltrans MS4 permit. Permittees enrolled under the General

Statewide Construction and Industrial Storm Water Permit program are located within the permitted area of the Phase 1 MS4 municipalities and are, therefore, included in the total WLA. Additional information may be needed in the future to help determine the contribution from construction areas and industrial facilities in the watershed to assist with implementation planning. No other individual NPDES permits for point sources are located in the watershed.

9.2 Load Allocations

According to federal regulations (40 CFR 130.2(g)), load allocations are best estimates of the nonpoint source or background loading. For the Los Peñasquitos watershed, land use contributions to MS4 systems are included in the WLAs described above. A LA was assigned to sediment contributions from storm surges and wave action along the ocean boundary (ocean sediment contributions).

9.3 Summary of TMDL Results

The overall TMDL and its component loads are presented in Table 3. Daily loads are established by dividing the modeled loads by the number of days within the critical wet period (211 days). Current loads, historical loads, and required reductions are presented in Table 4. Existing loads were estimated based on modeling of current land use conditions (from the SANDAG 2000 land use coverage) and meteorological conditions from the critical wet period (10/1/92 – 4/30/93). As described in Section 4, the numeric target was calculated based on modeling of historical (mid-1970s) land use conditions and the same meteorological data in order to accurately compare the watershed and Lagoon response to the same weather conditions. Historic loads define the allowable load; therefore, required load reductions represent the difference between current sediment loads and historic (allowable) loads. Note that sediment dynamics within the Lagoon are dependent on a number of factors, including runoff volumes and the amount of sediment that is transported to the lagoon from the watershed. These factors are important components in determining the timing and magnitude of erosion and depositional processes within the Lagoon. The Lagoon model shows that a reduction in watershed sediment loading affects the amount of sediment that can deposit throughout the lagoon from oceanic inputs (considering a constant input of sediment from the ocean boundary under current and historical conditions). The model analysis for historical conditions indicates that a greater proportion of sediment that deposits in the Lagoon originates from tidal inputs during lower watershed loading periods, therefore, the TMDL results show that a net increase in oceanic loads occurs during the critical wet period under historical landuse conditions. To meet the TMDL, the total load reduction required from the watershed is approximately 67%. Tidal input from the ocean boundary represents natural background loads, therefore, no reduction is required for this source category.

Table 3. TMDL summary

Source	Critical Wet Period Load (tons)	Daily Load (tons)
TMDL	12,360	59
Watershed contribution (WLA)	2,580	12
Ocean boundary (LA)	9,780	46
MOS	Implicit	Implicit

Table 4. Current vs. historical loads and percent reduction

Source	Current Load (tons)	Historical Load (tons)	Load Reduction (tons)	Percent Reduction Required
TMDL	13,663	12,360	1,303	10%
Watershed contribution (WLA)	7,719	2,580	5,139	**67%**
Ocean boundary (LA)	5,944	9,780	+3,836 (increase)	+39% (increase)

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Los Peñasquitos Lagoon Sediment TMDL Modeling - Final

Referenced as Attachment 2 to the Staff Report for the Los Peñasquitos Lagoon Sediment/Siltation TMDL.

Also referenced as Appendix A to the Technical Support Document for the Los Peñasquitos Lagoon Sediment/Siltation TMDL.

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Introduction

The Los Peñasquitos watershed and lagoon are located in central San Diego County (Figure 1). Both the watershed and lagoon are included in the Los Peñasquitos Hydrologic Unit (906), which also includes Mission Bay and several coastal tributaries [1]. The lagoon was included in the Clean Water Act's (CWA) Section 303(d) list for sediment/siltation and is the primary focus of this study. Increasing urban development has altered hydrology within the watershed and modified the geomorphic conditions of the three main tributaries that feed into the lagoon. These conditions have resulted in sedimentation in the lagoon-watershed interface and within lagoon channels (City of San Diego, 2009).

Tetra Tech (Tt) is supporting the City of San Diego and stakeholders by developing and calibrating models to support ongoing sediment TMDL development efforts for Los Peñasquitos Lagoon. Water quality simulation models are needed to link potential sources of sediment loading to lagoon impacts for TMDL development and analysis of management scenarios. The linked watershed and lagoon models were developed based on models that were previously configured for the U.S. Environmental Protection Agency (EPA) and the Regional Water Quality Control Board. These models were refined with additional calibration and validation based on monitoring data that were recently collected by the watershed stakeholders.

This report describes the approach that was used to develop and refine the Los Peñasquitos watershed and lagoon models. Model calibration/validation results are also presented and discussed. The watershed model used information on watershed soils, land use, topography, and stream networks to simulate the hydrology and sediment input to the lagoon. The lagoon model incorporates watershed inputs and oceanic forcings (tidal flooding) to mimic the circulation and sediment transport within the lagoon. This modeling framework will eventually be used to simulate existing (baseline) conditions within the watershed and lagoon, calculate the numeric TMDL target, identify required sediment load reductions, and evaluate possible management actions.

[1] http://www.projectcleanwater.org/html/ws_penasquitos.html

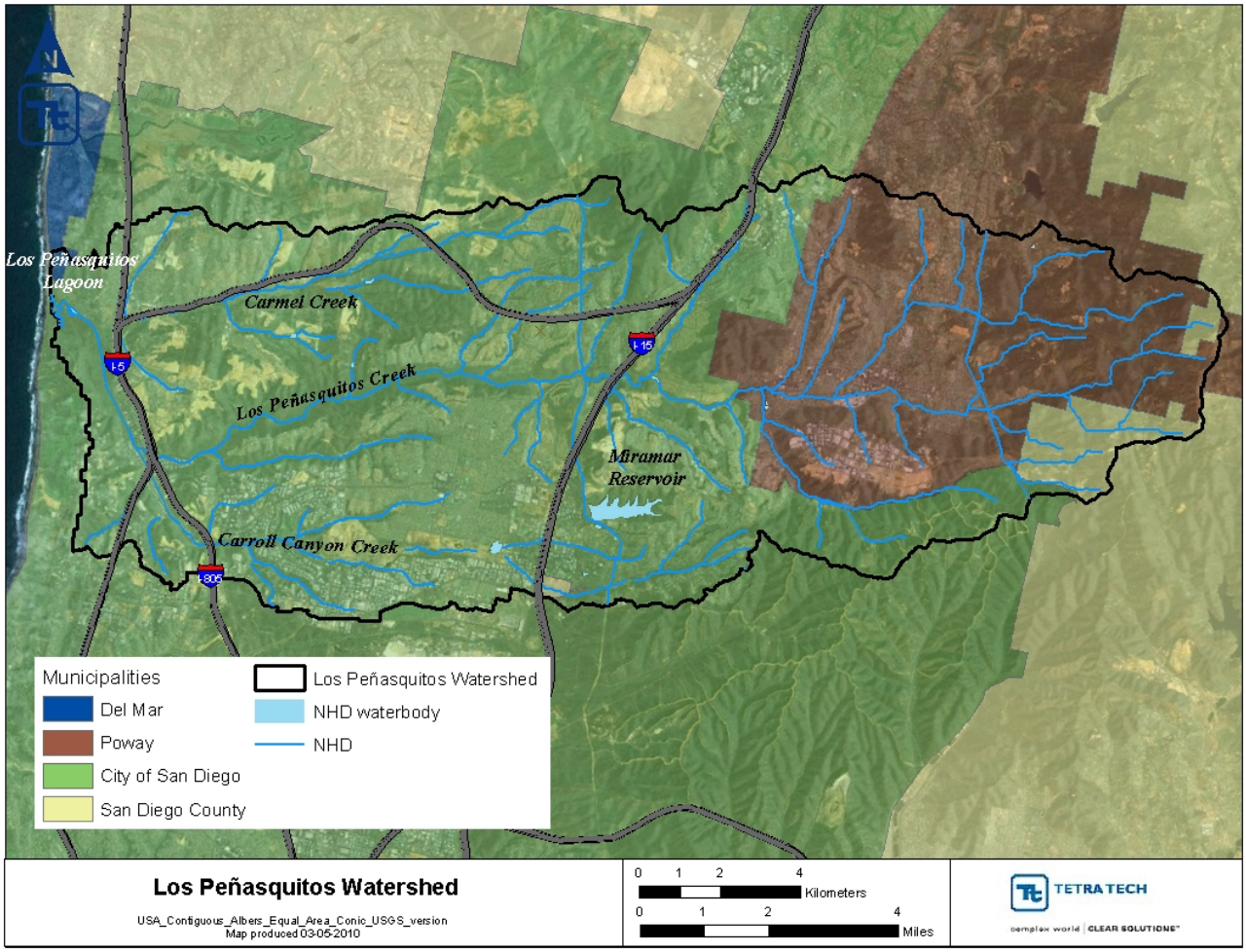

Figure 1. Location of the Los Peñasquitos watershed and lagoon

Watershed Description

The Los Peñasquitos Lagoon watershed is a 93 mi^2 coastal watershed located in central San Diego County. The watershed includes portions of the cities of San Diego, Poway, and Del Mar. In addition, a small portion of San Diego County is located in the eastern headwaters area. Three major streams drain the watershed and flow into the tidal lagoon. Los Peñasquitos Creek is the largest catchment in the watershed draining 59 mi^2 through its central portion. Carroll Canyon Creek is the second largest catchment (18 mi^2) and drains the southern portion of the watershed. Carmel Creek is located along the northern, coastal area and drains the remaining 16 mi^2. Los Peñasquitos Creek and Carroll Canyon Creek confluence together prior to entering the lagoon. There is one major dam in the Carroll Canyon Creek watershed, which drains approximately 1 mi^2 and forms Miramar Reservoir. Key watershed characteristics, including land use, soils, and other features that are important for model representation are described in later sections.

Lagoon Description

The Los Peñasquitos Lagoon is a relatively small salt marsh lagoon (0.6 mi^2) that is part of the Torrey Pines State Reserve. Given the status of "Natural Preserve" by the California State Parks, the lagoon is one of the few remaining native salt marsh lagoons in California and provides a home to several endangered species. The lagoon is ecologically diverse, supporting a variety of plant species, and providing habitat for numerous bird, fish, and small mammal populations. The lagoon also serves as a stopover for migratory birds and provides habitat for coastal marine and salt marsh species.

The lagoon is listed as impaired on the CWA's Section 303(d) list due to sediment/siltation impacts that originate from watershed sediment contributions. Tidal flows enter the lagoon during periods when the lagoon mouth is open to the ocean. Currently, the lagoon mouth is open throughout most of the year. Mouth closures are typically caused by coastal processes (deposition of sand and cobble from nearshore sources) and structures, such as the Highway 101 abutments. Mechanical dredging is used when needed to eliminate blockages and allow for tidal flow into the lagoon in order to improve water quality conditions and support salt marsh species. Most of the freshwater input flows through Los Peñasquitos Canyon into the lagoon. Carroll Canyon Creek to the south and Carmel Creek to the north also contribute freshwater to the lagoon. Historically, Los Peñasquitos Creek was the only tributary that flowed year-round, while Carroll Canyon and Carmel Creeks only flowed during significant rainfall events. Beginning in the 1980's, these drainages also began flowing year-round due to increasing urban development within the watershed. Carroll Canyon Creek confluences with Los Peñasquitos Creek upstream and the combined stream channel extends into the lagoon along the western side of the railroad track berm. This berm acts as a barrier between the eastern and western portions of the lagoon for much of its length. The railroad trestle along the northern side provides the only connection between eastern and western portions of the lagoon. The lagoon channel that receives flow from Carmel Creek crosses through this area.

The regional climate is characterized by higher precipitation during winter months and lower precipitation (and corresponding high lagoon salinity) during the dry summer months (Williams, 1997). Storm events transport sediment into the lagoon which deposits on the salt flats and within lagoon channels. These sediment deposits have gradually built-up over the years due to increased sediment loading and inadequate flushing, which directly and indirectly affects lagoon functions and salt marsh characteristics.

Data Inventory and Analysis

Multiple data sources were used to characterize the watershed and lagoon, in particular flow and water quality conditions. Much of this information was recently collected by the watershed stakeholders to assist with model development. Data describing the watershed's topography, land use, and soil characteristics were compiled and used to develop the watershed model. Stream flows and total suspended sediment concentrations were used to calibrate both the lagoon and watershed model components. The lagoon was also characterized using available bathymetric survey information, data sondes analyzing pressure and salinity, and sediment grab samples.

Land Use

Land use information was used in the model to characterize watershed imperviousness and the amount of sediment that washes off land surfaces, depending on land use type. Data detailing land use in the Los Peñasquitos watershed was based on the San Diego Association of Governments 2000 land use coverage[2] (Figure 2). The largest single land use type in the Los Peñasquitos watershed is open space. Approximately 54 percent of

[2] http://www.sandag.org/resources/maps_and_gis/gis_downloads/downloads/zip/Land/CurrentLand/lu.zip

the watershed has been developed, with 46 percent of that area classified as impervious. The area and percent distribution of land uses within the watershed is presented in Table 1.

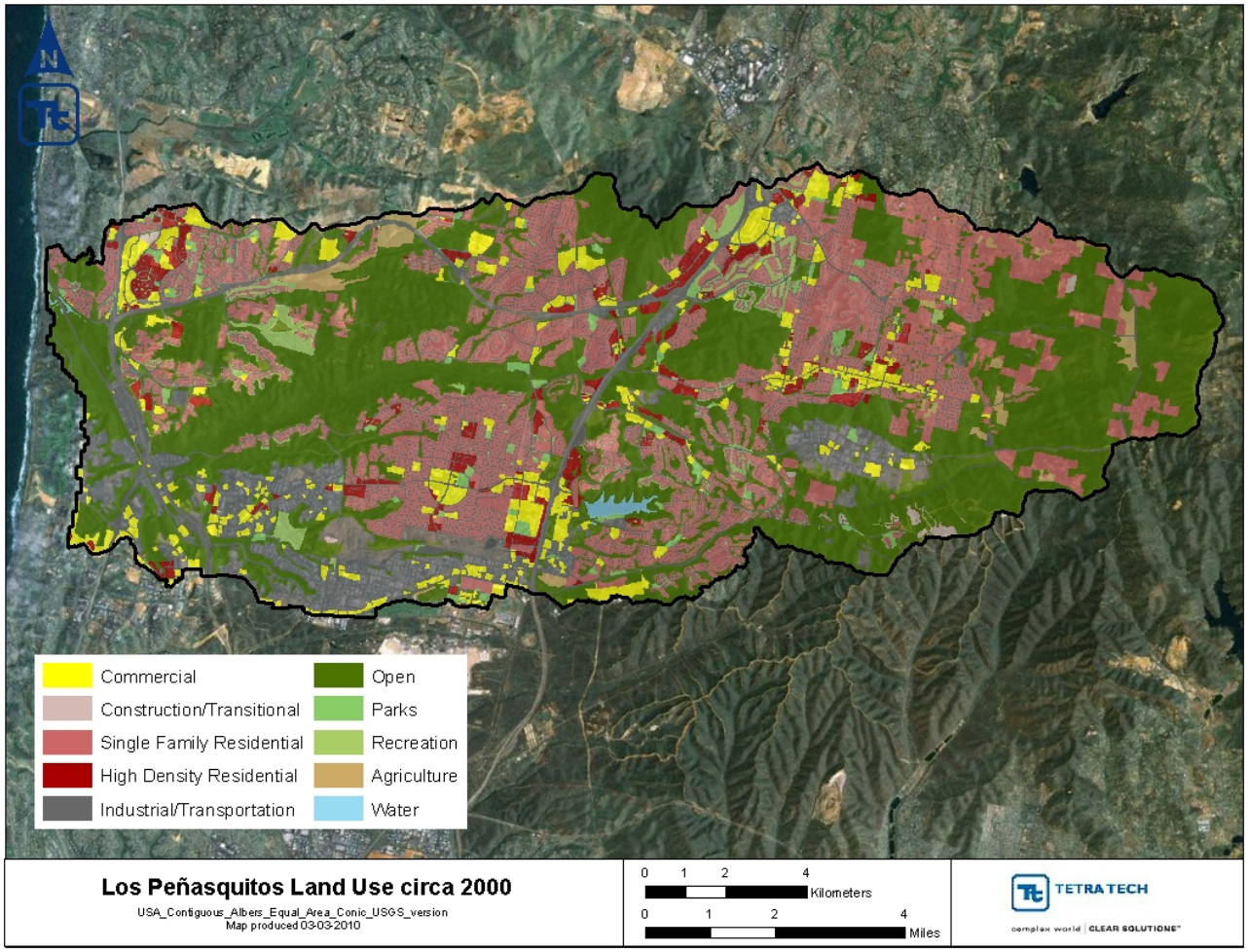

Figure 2. Land use distribution in the Los Peñasquitos watershed

Table 1. Area and percent land use distribution

Land Use Group	Land Use area (acres)	Percent Total
Agriculture	741	1.2%
Commercial Institutional	3,596	6.0%
High Density Residential	1,855	3.1%
Industrial/Transportation	11,658	19.5%
Low Density Residential	14,254	23.8%
Open	25,497	42.6%
Open Recreational	713	1.2%
Parks Recreational	1,335	2.2%
Transitional	171	0.3%

Topography

Topographical information was primarily used to describe the slope of the main tributaries within the watershed. Ten meter elevation data were obtained from the San Diego Association of Governments[3]. Elevation within the watershed rises from sea level to 2,600 ft in the headwaters (Figure 3).

[3] http://www.sandag.org/resources/maps_and_gis/gis_downloads/downloads/zip/elev10grd.zip

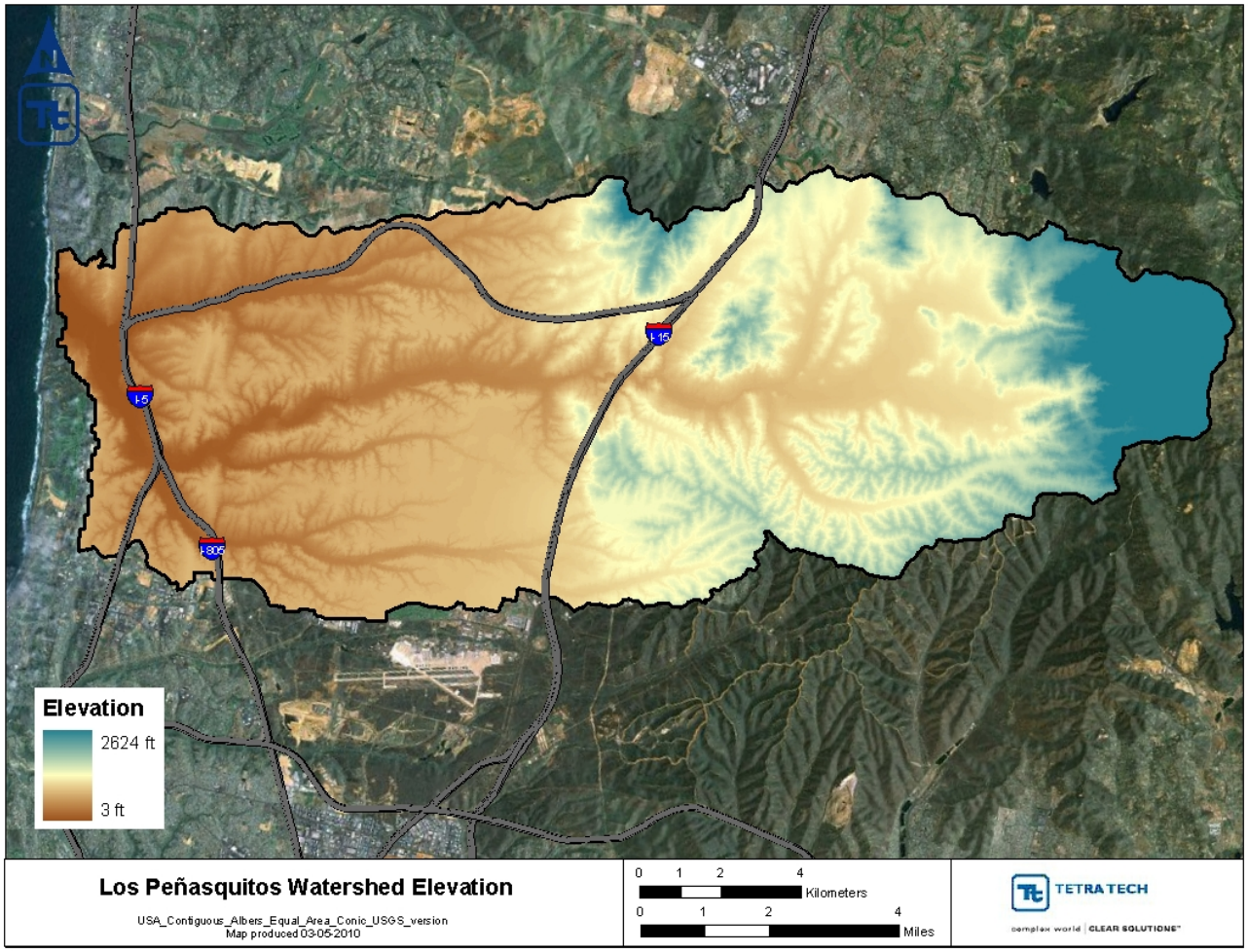

Figure 3. Topography in the Los Peñasquitos watershed

Soil Characteristics

Soils data for the Los Peñasquitos watershed were used to group watershed catchments based on differing infiltration rates. The Soil Survey Geographic (SSURGO) Database[4] was used to characterize the soils. The majority of the watershed is located within hydrologic soil group D, which is indicative of a low infiltration rate and a high potential for surface runoff (Figure 4). As a result, Group D soils are more susceptible to erosion and can contribute significant sediment loads.

Soil erodibility values (K factor) were obtained from the SSURGO database and used in conjunction with slope information to calculate the coefficient in the soil detachment equation (KRER) for each land use/hydrologic soil group combination. The proportion of sand, silt and clay within each hydrologic soil group (particle size distribution) was also extracted from the SSURGO database. Soils that are more easily transported typically have higher proportions of smaller particles sizes (silt and clay fractions), as compared to local parent soils, because of differences in settling rates and other sediment transport characteristics. To account for these differences, soils

[4]http://soils.usda.gov/survey/geography/ssurgo/. National Resources Conservation Service. Accessed September 2008

transported by surface runoff were assumed to be composed of 5 percent sand, twice as much clay as the percentage of clay within each hydrologic soil group, and the remainder assigned to the silt fraction (Table 2).

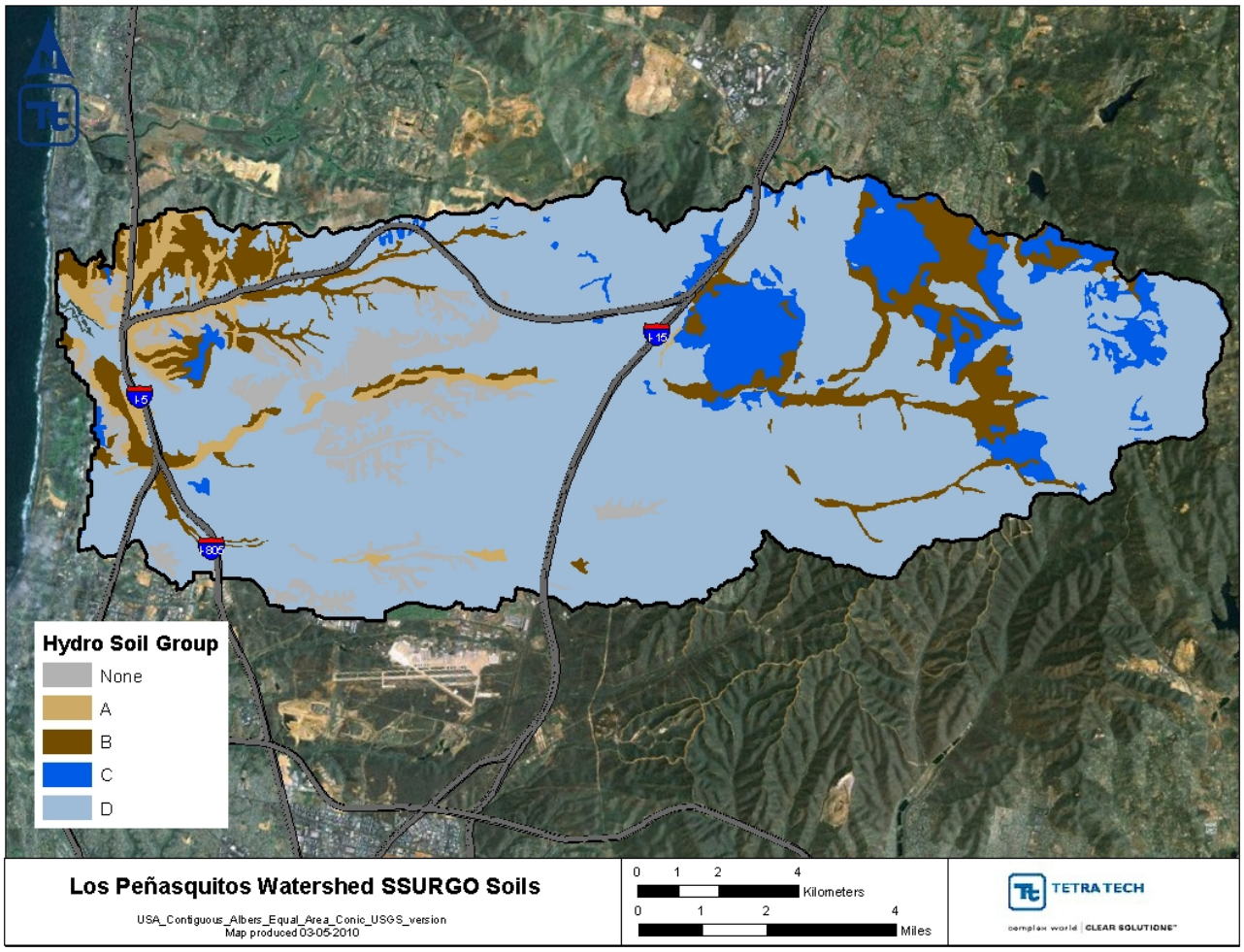

Figure 4. Hydrologic soil groups in the Los Peñasquitos watershed

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Table 2. Sand, silt, and clay distribution by hydrologic soil group

	Hydrologic Soils Group		
	B	C	D
SSURGO Soil Fractionation			
SAND	60 %	26 %	14 %
SILT	67 %	19 %	14 %
CLAY	47 %	32 %	21 %
Surface Soil Runoff Fractionation			
SAND	5 %	5 %	5 %
SILT	67 %	67 %	54 %
CLAY	28 %	28 %	41 %

Meteorological Data

Surface runoff and associated pollutant transport is dependent on the water balance, including precipitation inputs and evapotranspiration outputs. Meteorological data describing rainfall and potential evapotranspiration (PET) were compiled to describe the hydrologic cycle of the watershed. Precipitation data were obtained from two local Alert weather stations: 24 and 22 (available from the San Diego County Flood Control District) (Figure 5). Rainfall from Alert station 24 was used to represent the upper portion of the watershed and Alert station 22 the lower portion. Data collected at these stations were available from 1/1/1990 through 6/30/2008 (Table 3). Additional rainfall data were collected by the City of San Diego (2009) at three flow monitoring stations between 9/13/2007 and 6/16/2008.

The PET time series was developed from nearby California Irrigation Management Information System (CIMIS) stations[5] (Figure 5). CIMIS station 74 was primarily used to assign hourly PET values to each weather station. For days when the station did not record PET, a secondary station (CIMIS 62) was used to patch the missing dates (Table 4). CIMIS station 62 is located 30 miles to the northwest of the watershed in Temecula. A ratio of the average annual PET over the simulation period was used to scale the secondary PET values, as needed.

[5] http://wwwcimis.water.ca.gov/cimis/welcome.jsp

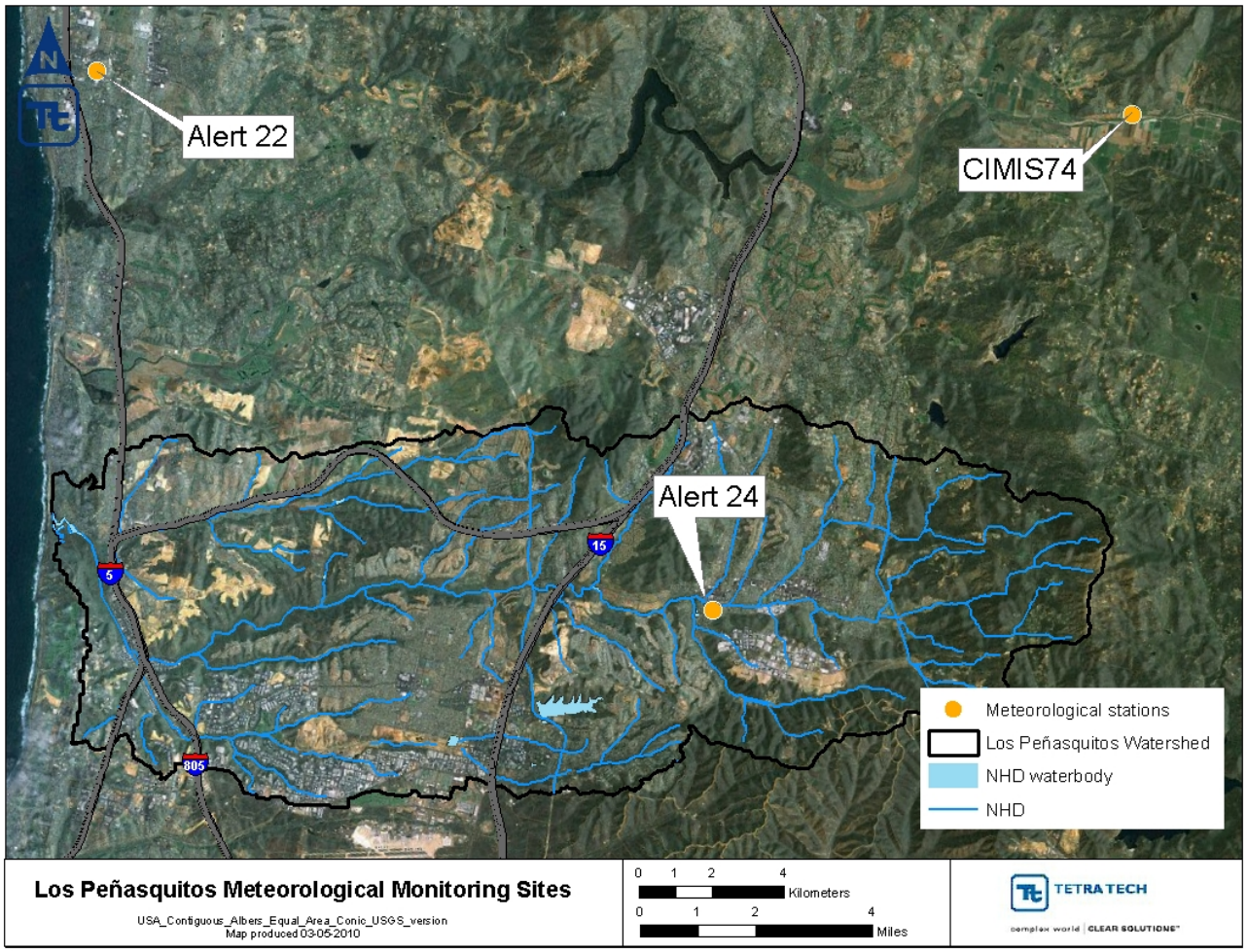

Figure 5. Meteorological stations within and near the Los Peñasquitos watershed

Table 3. Hourly rainfall gages

Station Name	Elevation (ft)	Data Collection Period		Precipitation (in/yr)
		Start	End	
Alert 24	446	1/1/1990	6/30/2008	8.14
Alert 22	250	1/1/1990	6/30/2008	6.96

Table 4. Potential evapotranspiration (PET) stations

Station Name	Elevation (ft)	Data Collection Period		Percent Missing
		Start	End	
CIMIS 74	450	1/1/1990	12/20/1998	48%
CIMIS 62	1420	1/1/1990	6/30/2008	3%

Streamflow Data

Available streamflow data collected within the watershed were compiled for model calibration and validation. The United States Geological Survey (USGS) maintains a long term flow gage (11023340) in the upper Los Peñasquitos watershed (Figure 6). Daily data from 1990 through 2008 were downloaded for calibration of model hydrologic parameters[6]. Total suspended solids (TSS) data were also collected at this location and a downstream USGS sediment monitoring station (325423117124501). Sediment monitoring data are described in the following section.

[6] http://waterdata.usgs.gov/nwis/dv/?site_no=11023340&referred_module=sw

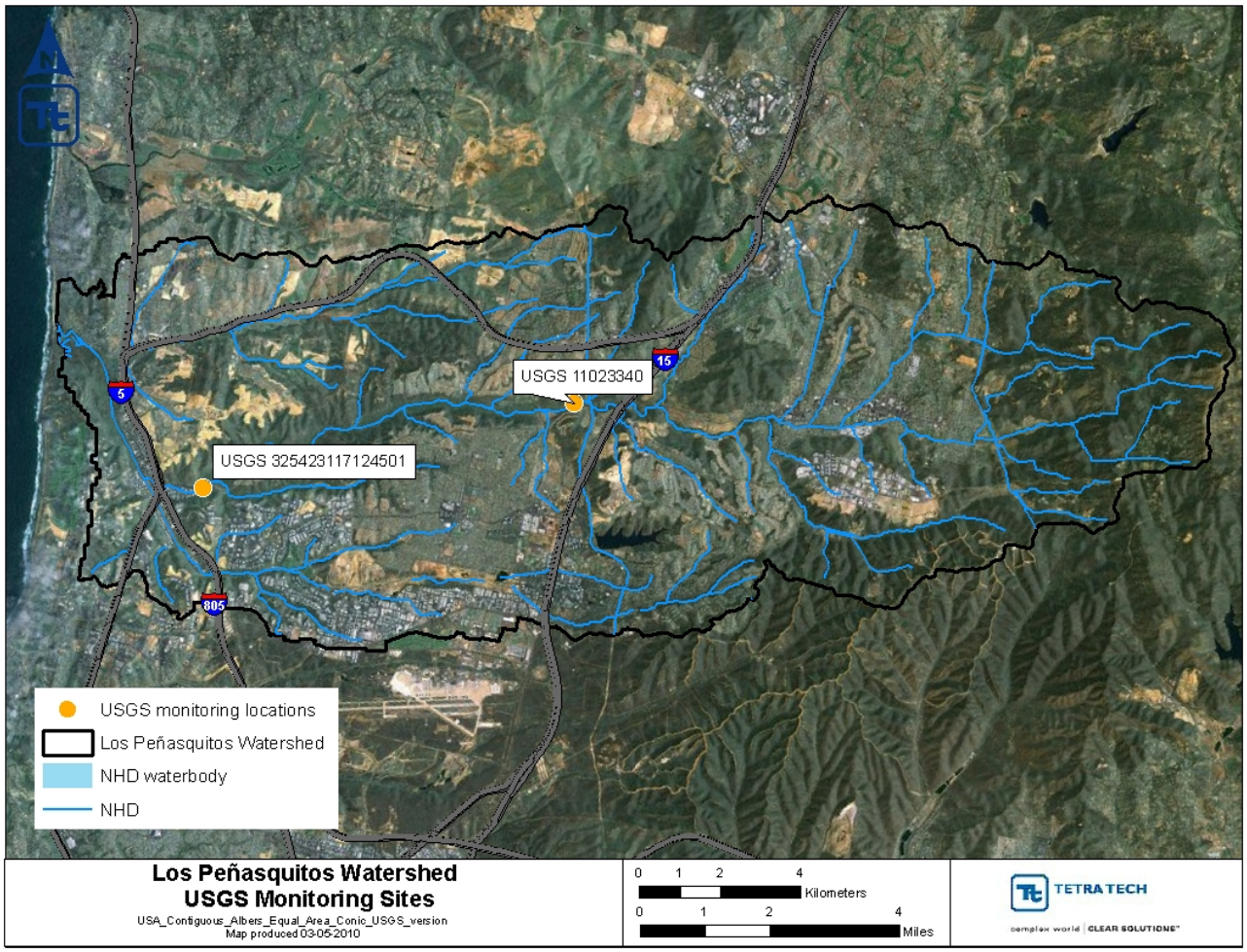

Figure 6. USGS monitoring locations in the Los Peñasquitos watershed

Additional streamflow data were collected at the base of Los Peñasquitos, Carroll Canyon, and Carmel Creeks as part of the Los Peñasquitos TMDL monitoring study (City of San Diego, 2009) (Figure 7). The Los Peñasquitos TMDL monitoring station was co-located with the long term Los Peñasquitos Creek Mass Loading Station (MLS) that undergoes routine water quality monitoring. Note that two additional monitoring stations within the watershed (LPC-TWAS-1 and LPC-TWAS-2) are shown in Figure 7 and are described in the following section. Flows were determined by applying the Manning's Equation to data collected with Sigma 950 or 920 flow meters with area velocity meters and pressure transducers. Sampling frequency ranged from 5 to 15 minute intervals. Instruments were deployed on 9/13/2007 and retrieved on 6/16/2008.

Los Peñasquitos Creek drains the largest area within the watershed and, accordingly, recorded the highest measured flows and runoff volume (Figure 8). Median flows in Los Peñasquitos Creek were roughly twice those in Carmel Creek and two orders of magnitude greater than in Carroll Canyon Creek. A continual increase in cumulative volume for Los Peñasquitos Creek and Carmel Creek indicated consistent baseflows. By contrast, streamflow data collected on Carroll Canyon Creek included periods with little change in cumulative volume, which indicates low baseflow. Low flows at this station were within the tenth percentile (Figure 8).

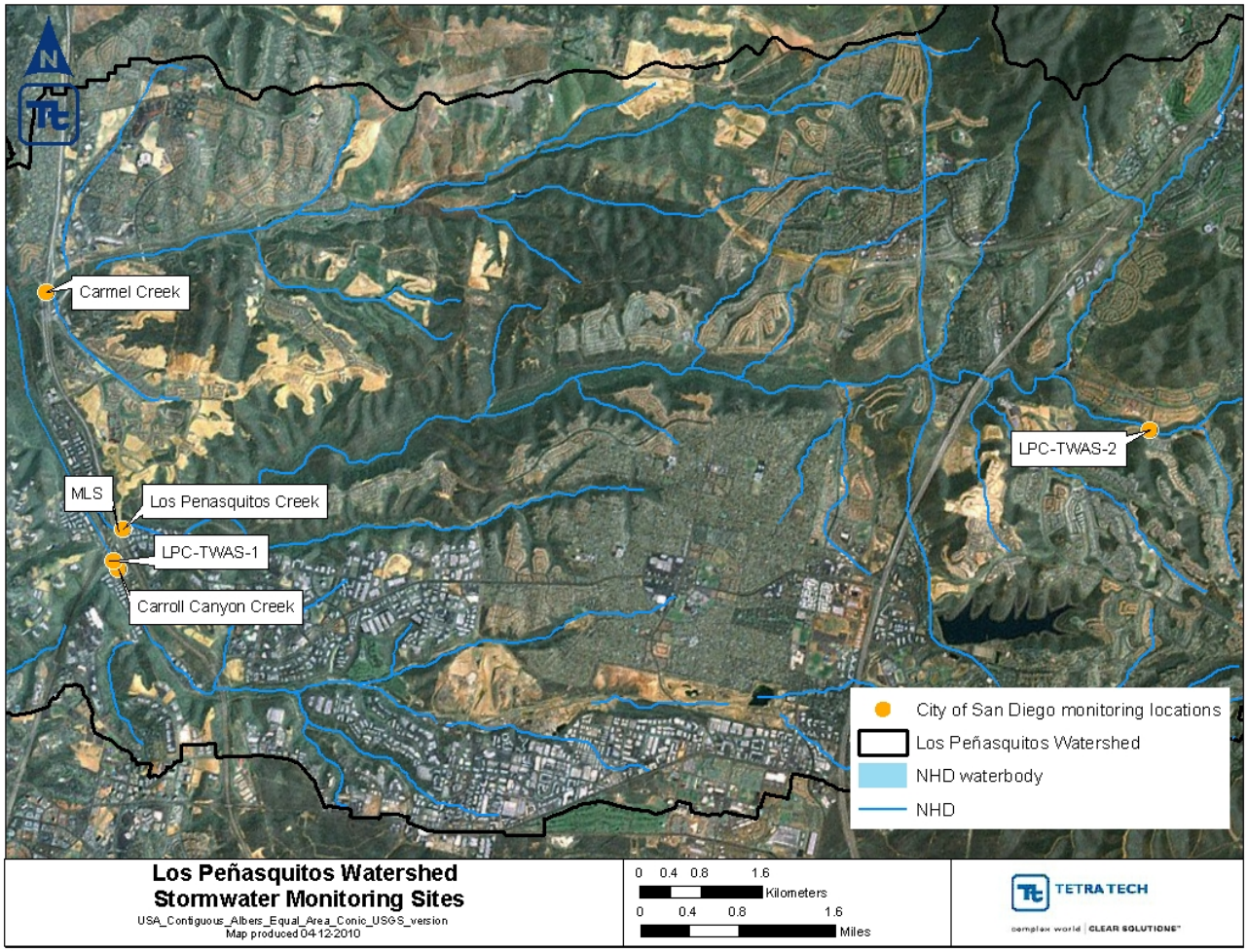

Figure 7. Stormwater monitoring locations in the Los Peñasquitos watershed

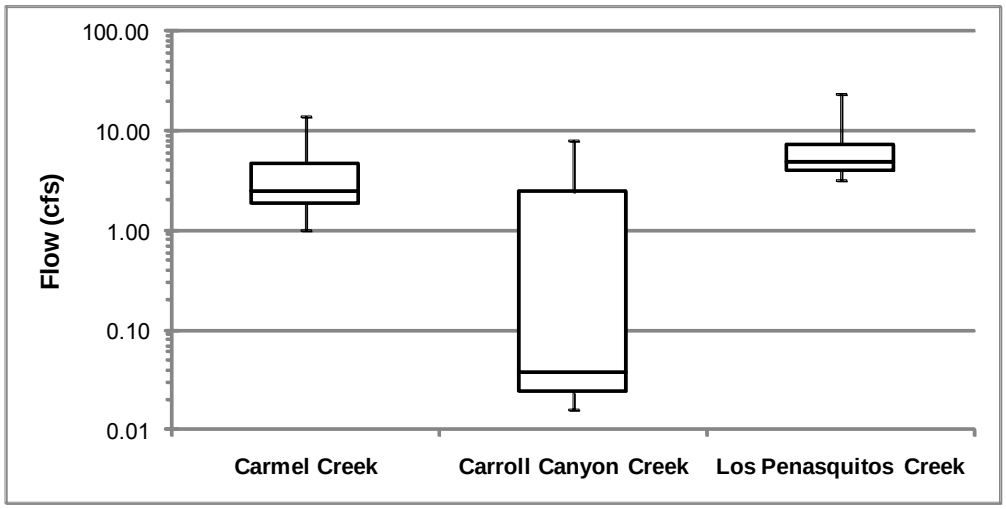

Figure 8. Measured flows at TMDL monitoring locations

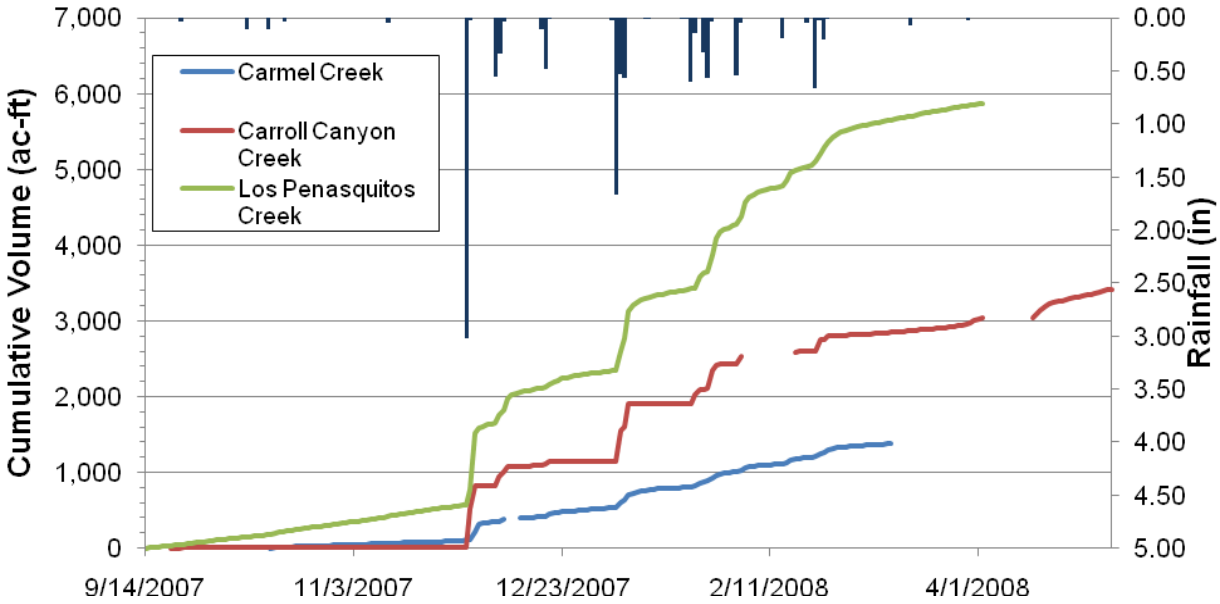

Figure 9. Cumulative volumes at TMDL monitoring locations

Measuring streamflow in the Los Peñasquitos watershed presents difficulties that are common to urban, arid watersheds. The Los Peñasquitos and Carmel Creek monitoring locations were both natural channels with heavy vegetation. During monitoring, cross section measurements were taken at each station at regular intervals with flows estimated using Manning's equation. The Carmel Creek location had ponded conditions due to a flow control structure located downstream of the box culvert. The Carroll Canyon Creek monitoring location is a concrete lined trapezoidal channel. Median depths in Los Peñasquitos, Carmel, and Carroll Canyon Creeks were 7.0, 4.8, and 0.95 inches, respectively. Because of shallow water depths, variability in natural channel cross sections, and water not distributed uniformly across the concrete channel in Carroll Canyon Creek, flows are difficult to accurately monitor over a long period (Figures 10 and 11). Also, small differences in depths or depth homogeneity across the channel can result in large differences in flows at the lower end of the station rating tables.

Figure 10. Photos near the Carroll Canyon Creek monitoring station

Figure 11. Photo at the Los Peñasquitos Creek monitoring station

Comparison of the flow record at the Los Peñasquitos Creek MLS and the USGS gaging station upstream (11023340) shows a distinct difference in recorded flows. There was small difference in average daily flow throughout the common period of record (9/13/2007 – 3/31/2008) (Figure 12). However, when cumulative volumes are compared (Figure 13), the total volume measured at the USGS station (8,000 ac-ft) is greater than the volume measured downstream at the MLS (5,870 ac-ft). An estimate of the water volume that would need to be infiltrated by the creek over the 200 days of record, assuming an average creek width of 8 ft, results in an infiltration rate of 0.6 in/hr. This estimated infiltration rate is higher than expected and may indicate an error in the rating table at the MLS station, especially at higher flows. It is difficult to develop a rating table at the MLS, or any of the monitoring locations, during storm flows because of the high velocities in the creek and safety concerns for monitoring staff. Possible data limitations were considered during model development and calibration.

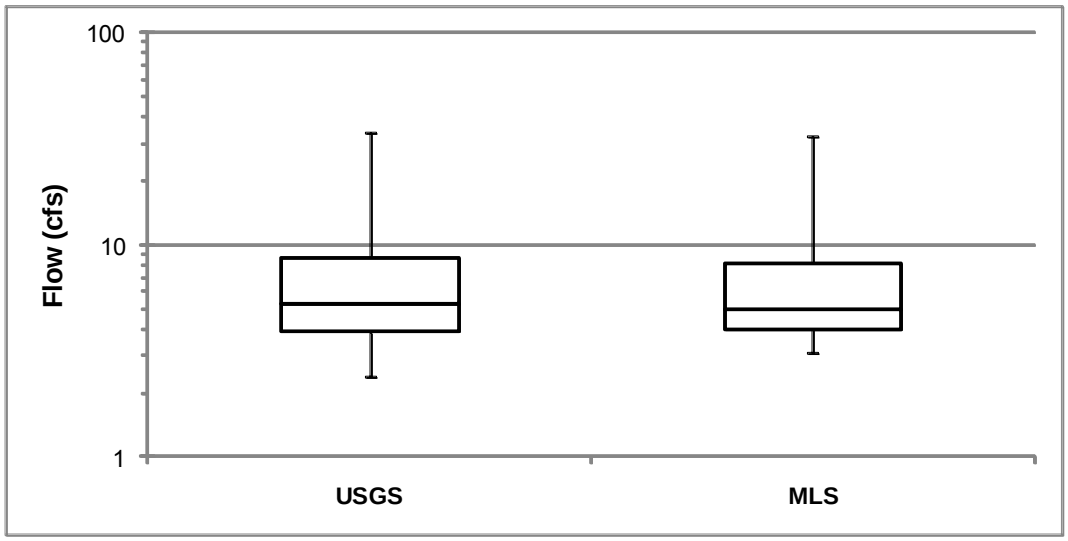

Figure 12. Comparison of flows at the MLS and USGS gaging station (11023340)

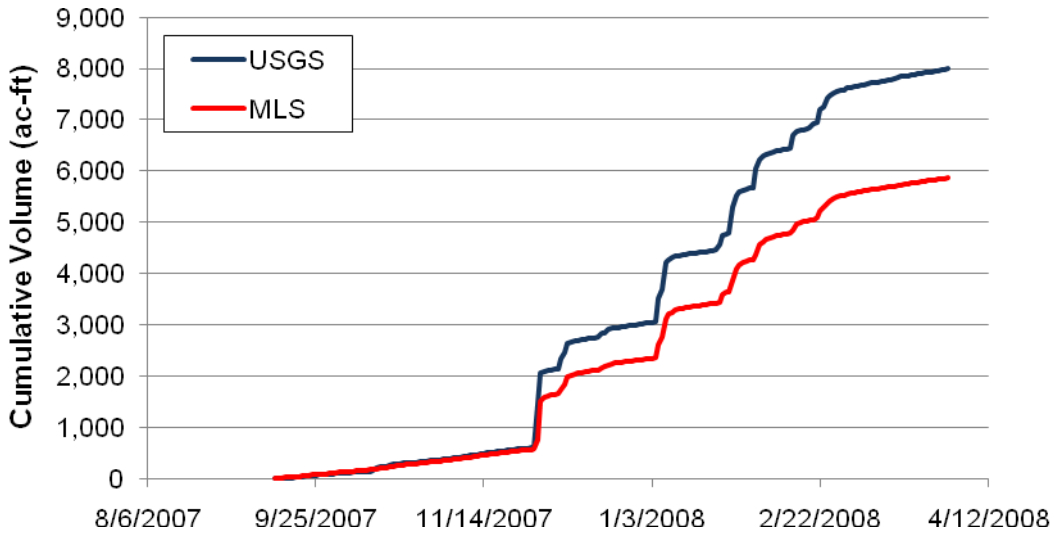

Figure 13. Comparison of cumulative volumes at the MLS and USGS gaging stations

Suspended Sediment Data

Suspended sediment and particle size data were collected at several locations within the Los Peñasquitos watershed and used to develop and calibrate the watershed model. Total suspended sediment (TSS) data were collected in the watershed by three different agencies. The USGS collected 19 samples at gage 11023340 between 11/12/1985 and 10/25/1986 and five samples at gage 325423117124501 from 1/20/1982 to 3/18/1982 (USGS, 2009) (Table 5). Event mean concentrations (EMCs) from stormwater and dry weather runoff were collected at the MLS on Los Peñasquitos Creek near the confluence with Carroll Canyon Creek. Stormwater and dry weather runoff events were also monitored at this station since 2001, in accordance with NPDES permit requirements. In addition, two Temporary Watershed Assessment Stations (TWAS) are located within the watershed on Los Peñasquitos Creek upstream (TWAS-2) and on Carroll Canyon Creek (TWAS-1). These stations were monitored on 11/30/2007 and 2/3/2008 (Figure 7 above; Table 6). The relationship between rainfall and flow at the MLS is shown in Figure 14. Collectively, these data were used to better understand the relationship between flow and sediment loading for model development purposes.

Table 5. TSS measurements at USGS stations on Los Peñasquitos Creek

USGS 11023340			USGS 325423117124501		
Date Time	Flow (cfs)	TSS Concentration (mg/L)	Date Time	Flow (cfs)	TSS Concentration (mg/L)
11/12/1985 10:00	70	362	1/20/1982 15:15	4.87	222
11/12/1985 10:30	70	365	1/21/1982 10:20	7.9	1060
11/12/1985 15:15	93	321	3/15/1982 8:40	4.33	1070
11/12/1985 16:00	100	321	3/17/1982 11:05	6.71	366
11/25/1985 13:00	460	1640	3/18/1982 16:50	10.9	245
11/25/1985 13:45	432	1400			
11/26/1985 13:00	32	252			
11/30/1985 10:30	162	605			
12/3/1985 12:30	180	570			
1/30/1986 14:40	39	120			
2/8/1986 10:15	136	436			
2/8/1986 14:00	209	334			
2/15/1986 14:30	639	1390			
2/16/1986 9:15	146	201			
3/10/1986 12:15	130	437			
3/10/1986 13:15	93	432			
3/16/1986 8:15	375	800			
9/25/1986 12:45	75	172			
10/25/1986 12:45	75	172			

Table 6. Rainfall and TSS measurements at the MLS and TWAS stations on Los Peñasquitos Creek

Date	Station	Rain (in)	TSS (mg/L)
11/29/01	MLS	0.10	<20
2/17/02	MLS	0.14	<20
3/17/02	MLS	0.35	<20
11/8/02	MLS	0.11	35
12/16/02	MLS	0.33	58
2/11/03	MLS	0.43	38
11/12/03	MLS	0.28	27
2/3/04	MLS	0.20	<20
2/18/04	MLS	0.12	<20
10/17/04	MLS	0.16	<20
2/11/05	MLS	0.52	<20
2/18/05	MLS	0.28	108
10/17/05	MLS	0.16	20
2/20/06	MLS	0.16	30
2/28/06	MLS	0.28	182
12/10/06	MLS	0.08	22
1/30/07	MLS	0.20	<20
2/19/07	MLS	1.10	81
11/30/07	MLS	3.03	130
11/30/07	TWAS-1	3.03	260
11/30/07	TWAS-2	3.03	113
2/3/08	MLS	0.59	26
2/3/08	TWAS-1	0.59	40
2/3/08	TWAS-2	0.59	200

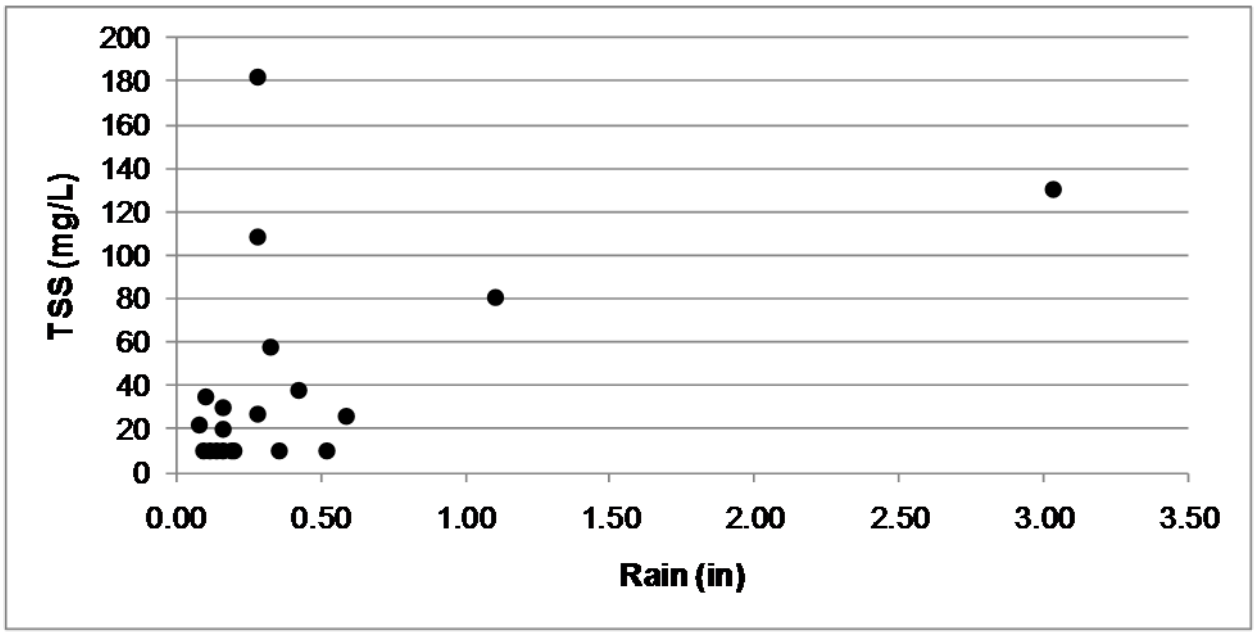

Figure 14. Relationship between rainfall and TSS measured at the MLS

Pollutograph samples characterizing suspended sediment concentration changes throughout a storm were collected during three storms in the 2007-2008 storm season as part of the TMDL monitoring study. Samples were collected from the three major streams flowing into the lagoon: Los Peñasquitos, Carroll Canyon, and Carmel Creeks (see Figure 7). The Los Peñasquitos Creek location was co-located with the MLS, which had EMC monitoring data. Pollutograph samples consist of multiple individual samples collected throughout a storm which are individually analyzed. Typically, EMCs are calculated for each monitored storm using the following equation:

$$EMC = \frac{\sum V_i * C_i}{\sum V}$$

where V is volume and C is concentration. Pollutograph samples are superior to volume- or time-weighted sampling because multiple samples provide insight into how concentrations change throughout a monitored event. The 95th percent confidence interval (1.96 * standard error of the mean) was calculated for each pollutograph sampling event and was used to compare to the median concentrations of the other sampling efforts.

$$CI = 1.96\sqrt{\frac{\sum\left[\left(c_i - \bar{c}\right)v_i\right]^2}{\left(\sum v_i\right)^2}}$$

Pollutograph TSS concentrations recorded during each storm event at the Los Peñasquitos, Carroll Canyon, and Carmel Creek TMDL stations are shown in Table 7 through 9.

Table 7. Pollutograph measurements of TSS (mg/L) at Carmel Creek

11/30/07 Storm		12/7/07 Storm		2/3/08 Storm	
Date Time	TSS	Date Time	TSS	Date Time	TSS
11/30/07 9:40	91	12/7/07 4:40	34	2/3/08 7:01	123.9
11/30/07 10:40	180	12/7/07 5:40	11	2/3/08 7:48	0.7*
11/30/07 11:40	56	12/7/07 6:40	8.5	2/3/08 8:18	4.3*
11/30/07 11:40	56	12/7/07 8:06	15.5	2/3/08 8:48	16
11/30/07 14:40	83	12/7/07 8:36	15.5	2/3/08 9:18	30
11/30/07 15:40	38	12/7/07 9:06	12	2/3/08 10:01	44
11/30/07 20:40	15	12/7/07 9:06	11.1	2/3/08 10:18	9.5
11/30/07 23:40	32	12/7/07 10:06	11	2/3/08 11:48	7.3
12/1/07 1:40	19.5	12/7/07 10:06	12.3	2/3/08 12:01	33.3
12/1/07 3:20	14	12/7/07 11:06	12.3	2/3/08 12:40	8.7
12/1/07 4:40	16	12/7/07 11:36	16	2/3/08 12:40	10
		12/7/07 13:06	14	2/3/08 13:01	32
		12/7/07 15:40	13	2/3/08 13:01	30.7
		12/7/07 21:02	38.3	2/3/08 13:40	10.7
				2/3/08 15:01	31.3
				2/3/08 15:10	14
				2/3/08 16:40	7
				2/3/08 17:01	62
				2/3/08 18:40	3.7*
				2/3/08 18:40	3.7*
				2/3/08 19:01	28.7
				2/3/08 20:10	4.7*
				2/3/08 21:15	15.3
				2/4/08 1:15	40
				2/4/08 1:15	2.7*
				2/4/08 5:15	21.3
				2/4/08 11:15	32
				2/4/08 15:15	24.7

* Less than reporting limit (RL)

Table 8. Pollutograph measurements of TSS (mg/L) at Carroll Canyon Creek

11/30/07 Storm		12/7/07 Storm		2/3/08 Storm	
Date Time	TSS	DateTime	TSS	DateTime	TSS
11/30/07 12:35	488	12/7/07 5:30	222	2/3/08 7:10	ND
11/30/07 13:36	340	12/7/07 7:10	130	2/3/08 7:10	1*
11/30/07 14:35	716	12/7/07 8:10	237	2/3/08 8:35	30.3
11/30/07 14:35	716	12/7/07 8:40	558	2/3/08 9:05	7.7
11/30/07 15:35	596	12/7/07 9:10	476	2/3/08 10:14	30
11/30/07 16:44	396	12/7/07 9:40	404	2/3/08 11:21	148
11/30/07 17:40	144	12/7/07 10:10	380	2/3/08 12:13	221
11/30/07 18:35	116	12/7/07 10:40	312	2/3/08 13:07	241
11/30/07 20:30	60	12/7/07 11:10	206	2/3/08 14:07	178
11/30/07 21:30	568	12/7/07 11:40	224	2/3/08 15:07	117.5
11/30/07 22:40	760	12/7/07 12:40	66	2/3/08 16:07	100
		12/7/07 15:31	29	2/3/08 17:07	106
				2/3/08 17:07	96
				2/3/08 21:37	31

* Less than reporting limit (RL)

Table 9. Pollutograph measurements of TSS (mg/L) at Los Peñasquitos Creek

11/30/07 Storm		12/7/07 Storm		2/3/08 Storm	
Date Time	TSS	Date Time	TSS	Date Time	TSS
11/30/07 11:14	53	12/7/07 7:52	3.7*	2/3/08 8:13	2*
11/30/07 14:14	35	12/7/07 11:52	5.3	2/3/08 8:13	3.3*
11/30/07 18:14	140	12/7/07 13:22	13.7	2/3/08 10:13	1.5*
11/30/07 18:14	134	12/7/07 15:01	22.3	2/3/08 12:13	ND
11/30/07 19:14	170	12/7/07 16:01	26.3	2/3/08 14:13	1*
11/30/07 21:14	68	12/7/07 17:01	23.3	2/3/08 16:13	6.7
11/30/07 22:14	60	12/7/07 18:01	17	2/3/08 17:13	12.7
12/1/07 1:14	40	12/7/07 19:01	15.7	2/3/08 19:13	17.3
12/1/07 4:14	23.3	12/7/07 22:01	5.7	2/3/08 21:13	12.7
12/1/07 6:14	78	12/8/07 1:01	4.3*	2/3/08 22:27	12.65
12/1/07 10:14	30	12/8/07 3:01	3.7*	2/4/08 0:27	7.3
		12/8/07 8:01	2.7*	2/4/08 6:27	3*
				2/4/08 6:27	1*
				2/4/08 12:16	4*

* Less than reporting limit (RL)

TSS data collected through all sampling efforts within the Los Peñasquitos watershed were compared (Figure 15). TSS concentrations recorded at the MLS on Los Peñasquitos Creek since 2001 were more than five times lower than the data collected by the USGS at both stations. There were no significant difference in TSS between the two USGS stations/sampling periods. A small difference in the TSS EMC was observed between TWAS-2 and the MLS during the first sampled storm (11/30/2007), which was a storm of 3.03 in. The second monitored storm was only 0.59 in, where TWAS-2 recorded TSS concentrations nearly an order of magnitude higher than the MLS.

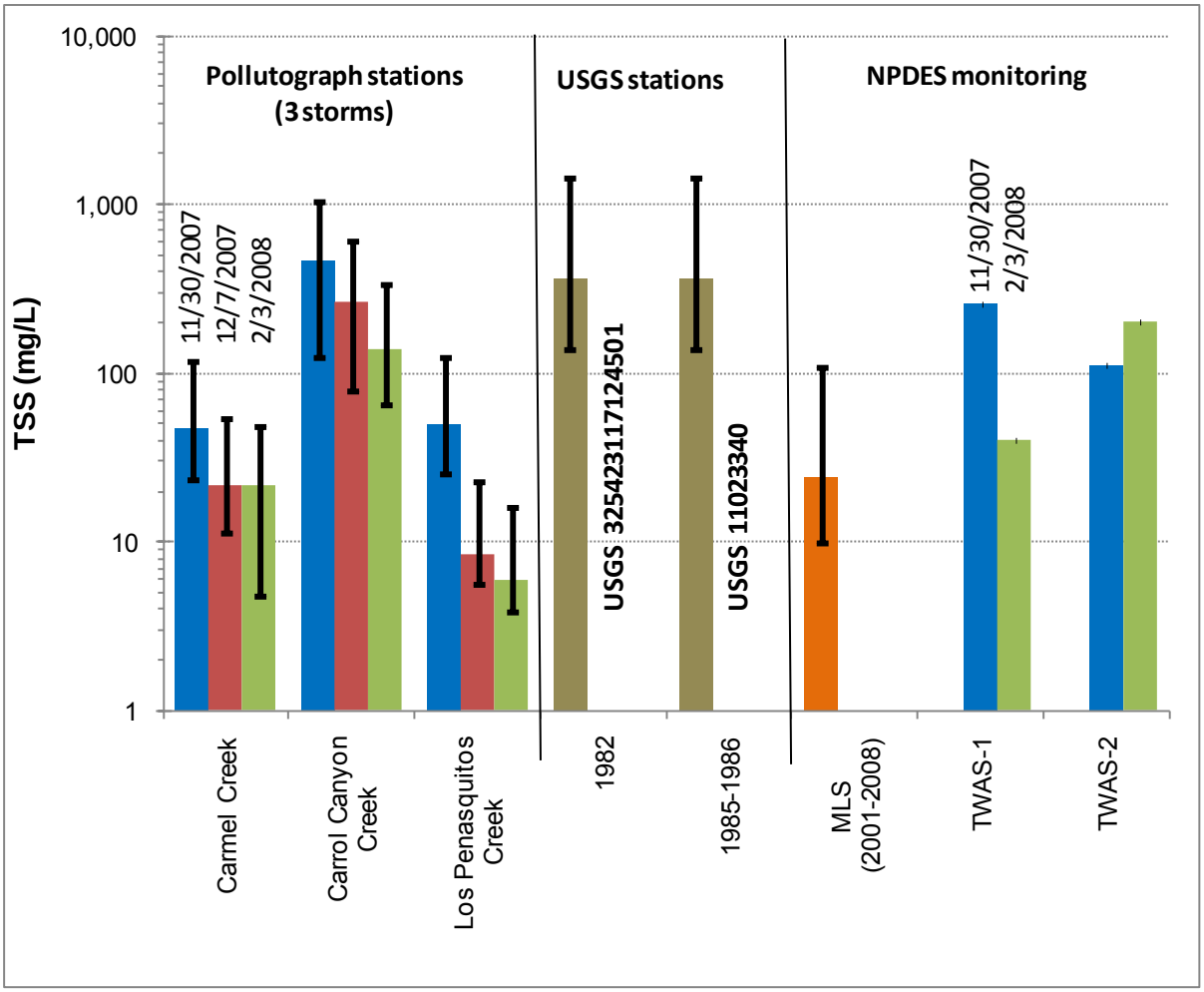

Figure 15. EMC/Median TSS and 95th percentile confidence intervals for all sampling events

Los Peñasquitos Creek was sampled using flow weighting and pollutograph sampling methods for two storms. These data showed considerable variability between the two sampling methods (Table 10). TSS EMCs were two to four times greater using the flow weighted sampling, as compared to the pollutograph sampling. The two stations were co-located and samples were collected using the same methods. Figure 11 shows this monitoring location had considerable vegetation within the creek, which may have caused significant differences in suspended particles considering depth and distance.

Table 10. TSS (mg/L) EMCs for the pollutograph and MLS stations on Los Peñasquitos Creek

	12/7/2007 Storm	2/3/2008 Storm
MLS	130	26
Pollutograph station	49.65	6.04

TSS particle size distribution was measured at the three pollutograph monitoring sites for two storms. A single composite sample was used to characterize the particle size distribution for each event. Samples were packed on ice, sent to the sample processing laboratory and analyzed with a Coulter Counter LS200. Samples from the first storm (11/30/2007) were shipped to the laboratory on 12/5/2007 and samples from the second storm (12/7/2007) were shipped on 12/11/2007. Particle size distributions for the pollutograph monitoring locations are shown in

Figure 16 and 17. Note that the particle size distributions likely do not characterize the finer particles well because they likely flocculated in the days between sampling and analysis. Li et al (2005) have shown that particles tend to flocculate together within six hours, which can affect the particle size distribution.

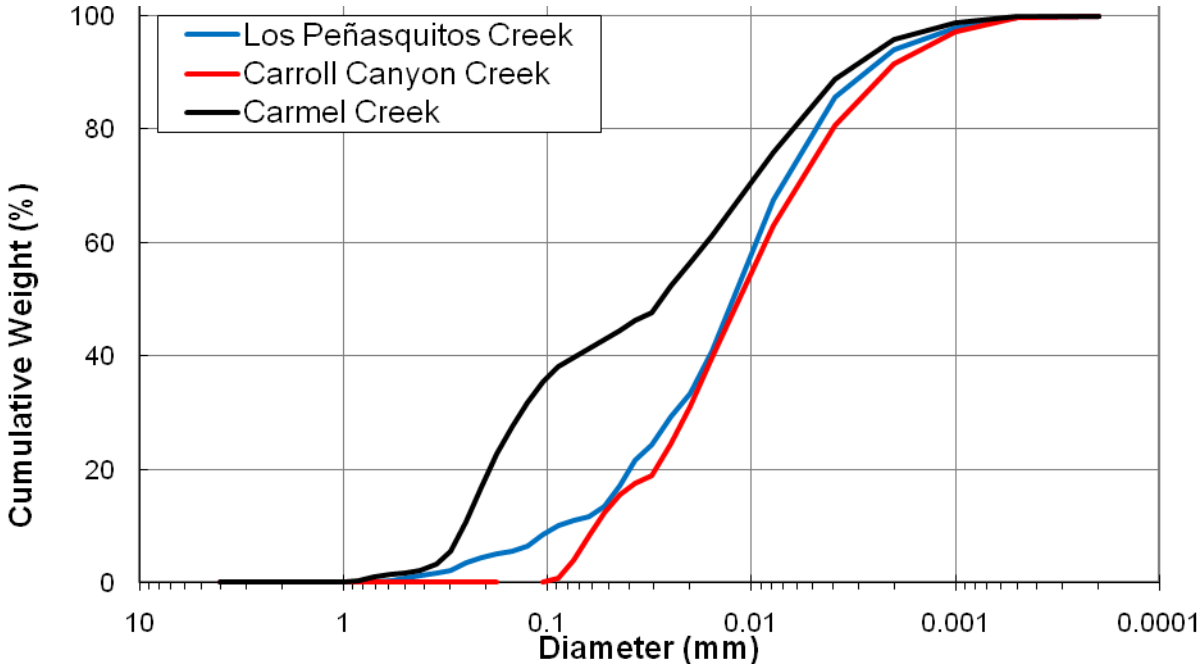

Figure 16. Particle size distribution for the 11/30/2007 storm event

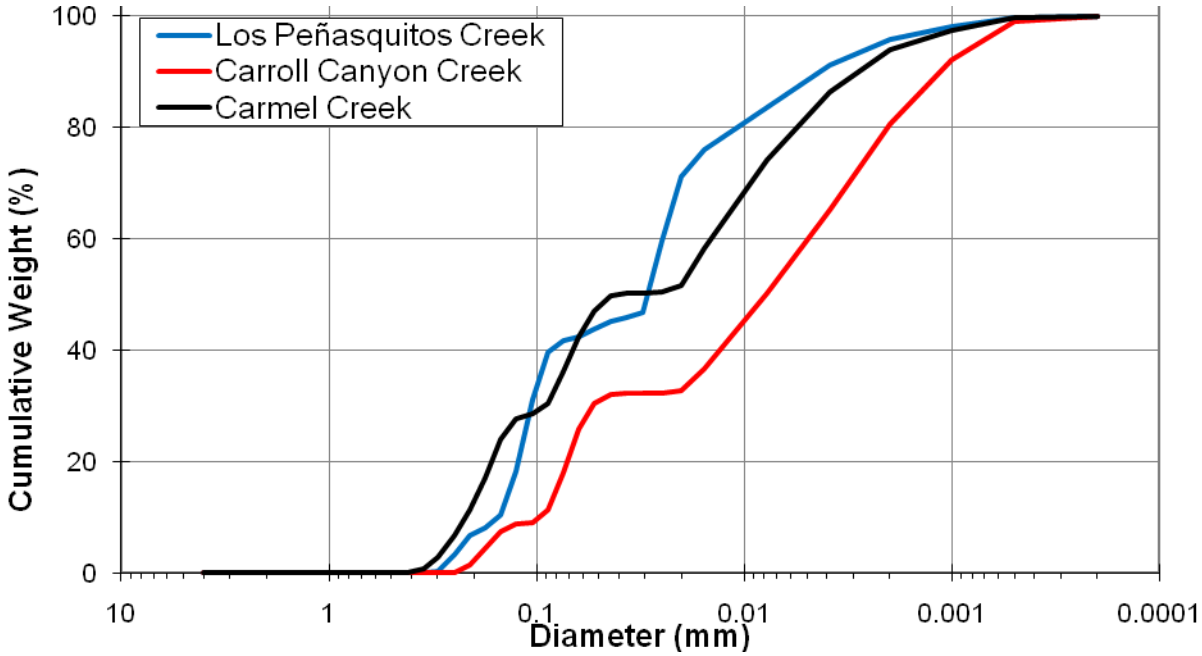

Figure 17. Particle size distribution for the 12/7/2007 storm event

Overview of Modeling Approach

The Los Peñasquitos watershed was modeled using the Loading Simulation Program in C++ (LSPC) model. The watershed model primarily uses information that details soil characteristics, land use distribution, topography, weather data, and the stream network to simulate hydrology and sediment contributions to the lagoon. Key data sources were compiled to support development of the watershed model (as described in previous sections). The Los Peñasquitos lagoon was modeled using the Environmental Fluid Dynamics Code (EFDC) model. The EFDC model incorporates meteorological data, watershed inputs, and oceanic forcings (tidal flooding). The watershed model is linked to the lagoon model through input of the LSPC results directly into the EFDC model for simulation of hydrodynamic and water quality conditions within the lagoon. Watershed model output was used to define the terrestrial inputs to the lagoon (flow and pollutant loads). Hourly watershed model flow and TSS concentrations (fractionated as sand, silt, and clay) were output for catchments 1401-1404 and 1411 and included as inputs to the EFDC lagoon model.

Watershed Model Description

LSPC (Shen et al., 2004; Tetra Tech and USEPA, 2002; USEPA, 2003) is a watershed modeling system that includes streamlined Hydrologic Simulation Program Fortran (HSPF) (Bicknell et al., 1997) algorithms for simulating hydrology, sediment, and general water quality on land, as well as a simplified stream fate and transport model. Since its original public release, the LSPC model has been expanded to include additional GQUAL components for sorption/desorption of selected water quality constituents with sediment, enhanced temperature simulation, and the HSPF RQUAL module for simulating dissolved oxygen, nutrients, and algae. LSPC has also been customized to address simulation of other pollutants such as nutrients and fecal coliform bacteria.

The hydrologic (water budget) process is complex and interconnected within LSPC (Figure 18). Rain falls and lands on various constructed landscapes, vegetation, and bare soil areas within a watershed. Varying soil types allow the water to infiltrate at different rates while evaporation and plant matter exert a demand on this rainfall. Water flows overland and through the soil matrix. There may also be point source discharge and water withdrawals/intakes. The land representation in the LSPC model environment considers three flowpaths; surface, interflow, and groundwater outflow.

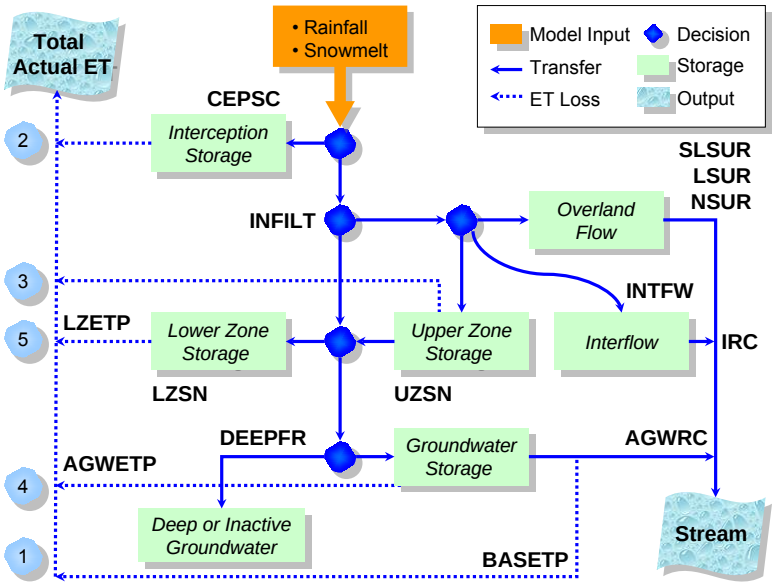

Figure 18. Schematic of LSPC Hydrology Components

The sediment routine in LSPC represents the general detachment of sediment due to rainfall, overland and instream transport, attachment when there is no rainfall, and scour. Land disturbance may occur from construction or agricultural practices, disturbing native vegetative cover and leaving the soil susceptible to erosion. With the native cover disturbed, a rainfall event may not only cause detachment, but can also provide sufficient rainfall in combination with the lack of vegetative cover to cause scour and further erosion as the overland flow proceeds to a defined channel. From impervious areas, a different process occurs where sediment builds up over time to a maximum value for each impervious land use type. For both pervious and impervious land uses, the amount of sediment that can be transported is a function of runoff. Sediment carried by runoff is fractionated into sand, silt, and clay portions depending on the underlying soil types. Once the sediment is in the stream channel, it is transported downstream where it can flow through the reach or settle out. If the stream velocity is sufficient, additional sediment can be mobilized via high shear stresses.

Watershed Model Setup

The Los Peñasquitos watershed model was developed to provide continuous sediment input to the EFDC lagoon model. Many data sources were used to develop the LSPC model of the Los Peñasquitos watershed. Smaller catchments within the watershed were delineated using available elevation data. Information about the soils and land use within each of those catchments was used to develop model parameters describing flow and sediment transport characteristics within the watershed.

Catchment Delineation

The Los Peñasquitos watershed was divided into smaller catchments for modeling efficiency based on 10 meter resolution digital elevation model (DEM) and hydrography. Catchment sizes ranged from 0.43 to 16.56 mi^2 with a median size of 7.19 mi^2 (Figure 19). The size of the catchments was determined to be adequate based on the accuracy needed for model predictions and linkage to the lagoon model. Delineation was based on several factors including, land use and soil information, stream channel characteristics, and the location of monitoring stations throughout the watershed for calibration purposes. Catchment 1404 receives flow from both Los Peñasquitos and Carroll Canyon Creeks. The lagoon is represented by Catchment 1402 and receives flow from Catchments 1401 (small direct drainage to the north), 1403 (Carmel Creek), and 1404 (Los Peñasquitos and Carroll Canyon Creeks).

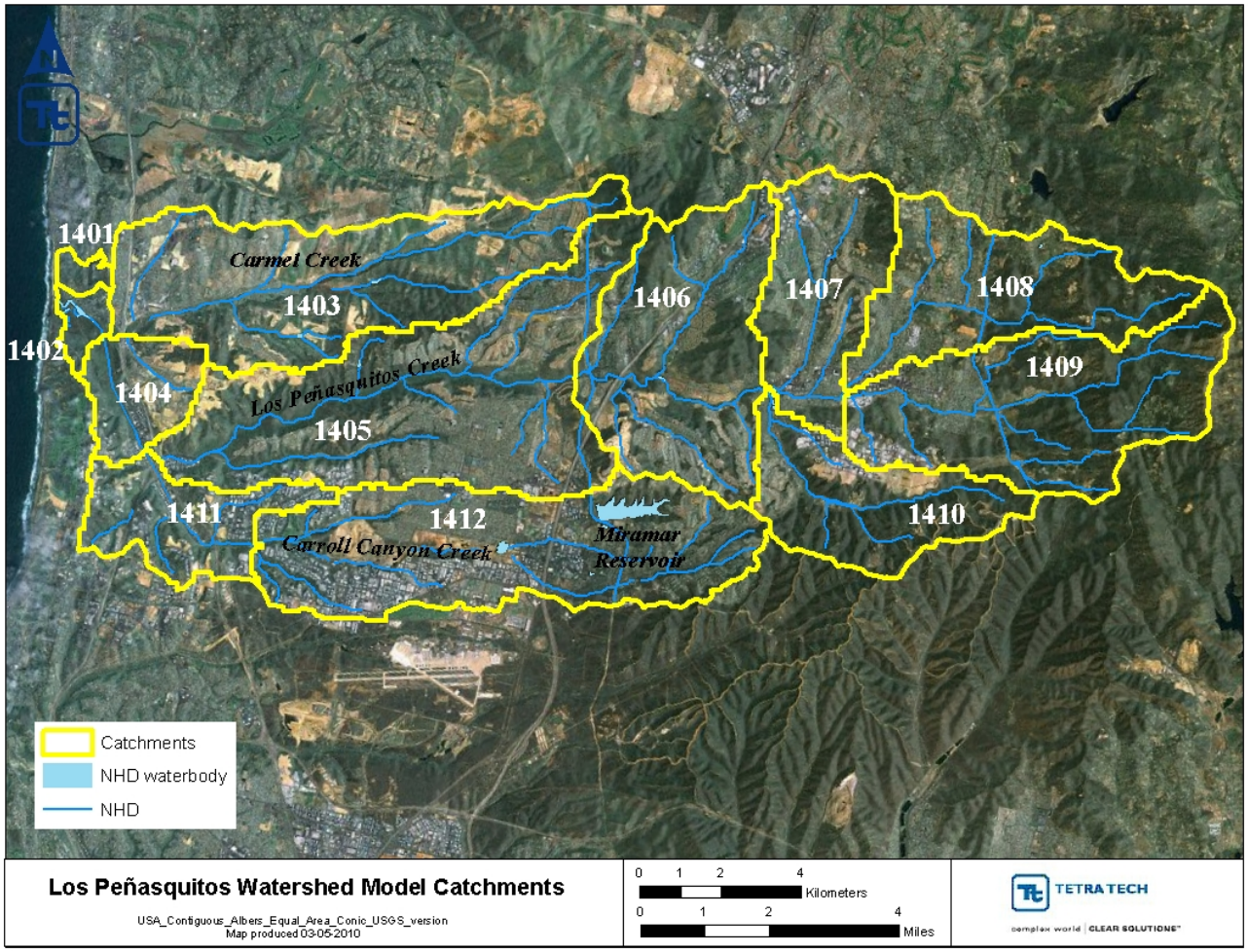

Figure 19. Catchment delineation in the Los Peñasquitos watershed

Streams

Each delineated catchment is represented with a single stream segment, as depicted in the National Hydrography Dataset (NHD), and assumed to be a completely mixed, one-dimensional segment with a trapezoidal cross-section. Once the representative reaches were identified, slopes were calculated based on elevation data (10 m DEM) and stream lengths measured from the original NHD stream coverage. In addition to stream slope and length, mean depths and channel widths are required to route flow and pollutants. Detailed cross section information did not exist for the watershed, therefore, mean stream depth and channel width were estimated using regression curves that relate upstream drainage area to stream dimensions available in the LSPC model setup spreadsheet that is described in the LSPC manual (Tetra Tech and USEPA, 2002). Manning's n values ranging from 0.03 to 0.2 reflected very different stream types, including streams with concrete channels to heavily vegetated channels.

Land Use

LSPC algorithms require land use in each catchment to be divided into pervious and impervious categories. The overall watershed land use distribution is shown above in Table 1. The estimated impervious fraction for each land use type was calculated by multiplying the total area by an impervious factor (Table 11).

Table 11. Impervious fraction by land use type

Land Use	Percent Impervious
Agriculture	0 %
Commercial Institutional	85 %
High Density Residential	65 %
Industrial/Transportation	72 %
Low Density Residential	15 %
Open	0 %
Open Recreational	0 %
Parks Recreational	12 %
Transitional	0 %

Soils

Soil characteristics within each catchment were calculated using SSURGO data, as described previously. The average soils class within each catchment was calculated. The majority of the catchments were within hydrologic soil group D areas, which typically have high surface runoff rates and low infiltration.

Irrigation

Irrigation is an important component of the water balance in Southern California. Through changes in soil moisture storages, irrigation can affect storm runoff, as well as baseflow conditions.

The irrigation demand for the Los Peñasquitos watershed model was calculated based on information presented in "A Guide to Estimating Irrigation Water Needs of Landscape Plantings in California" (University of California Cooperative Extension, 2000). This guide recommends comparing daily precipitation to water demand to determine the amount of irrigation water.

The estimated hourly PET was based on data collected at the nearby California irrigation measurement station, CIMIS 74 (Figure 5). Hourly values were summed over each day to determine the daily PET depth in inches. To convert PET depth to the water demand for a specific crop or vegetation type, a crop-specific coefficient is multiplied by the PET. The University of California Cooperative Extension (2000) suggests a crop coefficient of 0.6 for lawns planted with warm season grasses and 0.65 for agricultural citrus production. For the purposes of this analysis, a crop coefficient of 0.8 was used to estimate the daily water demand for residential and commercial lawns and 0.85 for agricultural areas.

The difference between daily water demand and daily precipitation was calculated for each day. If precipitation exceeded water demand, then the irrigation demand was set to zero. Precipitation was used to offset water demand from the following days until all of the precipitation was lost from the system. To estimate the amount of irrigation water applied, the University of California Cooperative Extension (2000) suggests dividing the irrigation demand by the efficiency of the irrigation system. An efficiency factor of 80 percent was used for both

the lawn and agricultural irrigation systems in order to estimate the depth of irrigation water applied. Finally, the irrigation water applied was added to the water balance in the LSPC simulation. The daily amount applied was assumed distributed evenly over time. The LSPC model also uses demand-based irrigation values based on the PET time series.

Sediment Fractionation

SSURGO data were used to estimate the fraction of total sediment contributed from the land within each particle size class and hydrologic soil group (Table 12). Adjustments were made to account for deposition during runoff periods based on the assumption that 50 percent of the sand fraction and 30 percent of silt is deposited using watershed delivery ratios presented in Vanoni, 1975. The resulting particle size fractions used for modeling are shown in Table 13

Table 12. Sediment fractions by hydrologic soil group

Hydrologic Soils Group	Sand	Silt	Clay
B	65 %	23 %	12 %
C	68 %	19 %	14 %
D	54 %	21 %	24 %

Table 13. Sediment fractions adjusted for watershed delivery

Hydrologic Soils Group	Sand	Silt	Clay
B	33 %	16 %	51 %
C	34 %	13 %	53 %
D	27 %	15 %	58 %

Configuration of Key Model Components

The initial basis for model parameterization was derived from “Hydrology: San Diego Region TMDL Model” (CARWQCB and USEPA, 2005). Final model hydrologic parameters are provided in Appendix A. Model calibration and validation focused on accurate characterization of precipitation in the watershed. Precipitation data from Alert gages 22 and 24 provided long term rainfall records for the lower watershed. Two catchments in the upper watershed (1408 and 1409) had increased rainfall due to higher elevation which was greater than observed at the Alert gage. Proportionally scaling the rainfall data using median rainfall from the CIMIS 74 gage and Alert 24 provided a better representation of rainfall in those catchments. Little adjustment of model parameters from the regional calibration was required once good rainfall records were established.

Sediment calibration focused on maintaining sediment balance in the streams. Sediment land use model parameters were developed following BASINS Technical Note 8 (USEPA, 2006) and Ackerman and Weisberg (2006). Sediment shear stress thresholds for deposition and scour were adjusted independently for each reach to maintain a dynamic steady state bed for silt and clay during a decadal simulation. Sand in the reaches was simulated using the average velocity power function in the reach, again, maintaining a dynamic balance throughout the decadal simulation. Several parameters were adjusted during calibration to achieve reasonable

loading rates by land use type and to improve model fit to observed data collected in the Los Peñasquitos watershed.

Lagoon Model Description

The Los Peñasquitos Lagoon was simulated using the EFDC model. EFDC is a public domain, general purpose modeling package for simulating one-dimensional (1-D), two-dimensional (2-D), and three-dimensional (3-D) flow, sediment transport, and biogeochemical processes in surface water systems including rivers, lakes, estuaries, reservoirs, wetlands, and coastal regions. The EFDC model was originally developed at the Virginia Institute of Marine Science for estuarine and coastal applications. This model is now being supported by the USEPA and has been used extensively to support TMDL development throughout the United States. In addition to hydrodynamic, salinity, and temperature transport simulation capabilities, EFDC is capable of simulating cohesive and noncohesive sediment transport, near-field and far-field discharge dilution from multiple sources, eutrophication processes, the transport and fate of toxic contaminants in the water and sediment phases, and the transport and fate of various life stages of finfish and shellfish. The EFDC model has been extensively tested, documented, and applied to environmental studies worldwide by universities, governmental agencies, and other entities.

The EFDC model includes four primary modules: (1) a hydrodynamic model, (2) a water quality model, (3) a sediment transport model, and (4) a toxics model. The hydrodynamic model predicts water depth, velocities, and water temperature. The water quality portion of the model uses the results from the hydrodynamic model to compute the transport of the water quality variables. The water quality model then computes the fate of up to 22 water quality parameters including dissolved oxygen, phytoplankton (three groups), benthic algae, various components of carbon, nitrogen, phosphorus and silica cycles, and fecal coliform bacteria (Cerco and Cole 1994). The sediment transport and toxics modules use the hydrodynamic model results to calculate the settling of suspended sediment and toxics, resuspension of bottom sediments and toxics, and bed load movement of noncohesive sediments and associated toxics. For this project, the hydrodynamics and sediment transport models were used. The hydrodynamics model simulated the circulation, water temperature, and salinity in the lagoon driven by ocean tides and watershed inflows. The sediment transport model simulated the transport of sand, silt as non-cohesive sediments, and clay as cohesive sediment. Details of the EFDC model's hydrodynamic and eutrophication components are provided in Hamrick (1992) and Tetra Tech (2002, 2006a, 2006b, 2006c, 2006d).

The EFDC model was configured to simulate hydrodynamics and sediment transport in the Los Peñasquitos Lagoon. Specifically, water temperature and salinity were both modeled for hydrodynamics. Sediment fractions considered in the model include sand, silt, and clay. Sand and silt were modeled using the non-cohesive sediment module and clay was modeled using the cohesive sediment module in EFDC.

Lagoon Model Setup

Various data sources were used to develop the EFDC model for the Los Peñasquitos Lagoon. Model development requires defining the computation domain and boundary conditions. The general steps to set up the EFDC model for the Los Peñasquitos Lagoon included generating the modeling grid, defining metrological conditions, estimating oceanic inputs, and linking the watershed (LSPC) model to EFDC. Key data sources were compiled to support development of the lagoon model. Model development steps and data used to identify initial conditions, boundary assignments, and calibration of key model parameters are further discussed below.

Grid Generation

The Los Peñasquitos Lagoon is composed of both deep and shallow channels and salt marsh areas. The lagoon connects with the ocean through a narrow inlet. Grid generation was primarily based on available bathymetry data, shoreline data, DEM data, and satellite imagery. The EFDC grid for the lagoon includes two portions—the lagoon itself and the ocean. During model development, hydrodynamic calibration was conducted first to ensure accurate exchange of salt and freshwater in the lagoon. A model grid was developed to include the ocean shoreline for hydrodynamic calibration. The grid including the ocean shoreline allowed for the use of tide elevation data for hydrodynamic calibration.

After the hydrodynamic calibration, a reduced grid was used to simulate sediment transport. The reduced grid set the ocean inlet, which is the location where the lagoon connects with the ocean, as the open boundary and does not include the ocean cells that were incorporated for hydrodynamic calibration. This was done because sediment, especially sand in the water column, are at relatively low levels in the ocean and sediment entering the lagoon are mainly due to beach erosion caused by various processes such as wave-breaking. Beach erosion processes cannot be modeled with the existing configuration which lacks wave, wave-breaking, and wave-current interaction components; therefore, sediment modeling used a reduced grid which sets the open ocean boundary immediately outside of the ocean inlet. The ocean part of the grid was not used for the sediment modeling. Note that for sediment modeling, the predicted tide elevations, water temperature, and salinity from the hydrodynamic calibration were assigned. In addition, bank erosion within lagoon channels was not simulated; therefore sediment erosion and resuspension are assumed to occur only with respect to the bottom sediment.

There are 374 computation cells in the full model grid, which includes the ocean cells, and 259 cells in the reduced grid that was used for modeling sediment transport. Lagoon channels near the ocean inlet are wider than upstream channels and have a finer resolution. Because of the complicated channel and salt marsh shapes, several grids were generated for each of the individual sections. The individual grids were then combined together to form one composite model grid for running EFDC. The full grid is shown in Figure 20. The grid includes the salt marsh area and two major channels. Two vertical layers were also included within the grid to better represent differences between upper and lower sections.

The channel that receives the flow and sediment loadings from Carmel Creek is called the Carmel Branch in this report. The channel that receives the flow and sediment from the merged Los Peñasquitos Creek and Carroll Canyon Creek is called the Los Peñasquitos Branch in this report. The small channels are coarsely represented together with the salt marsh area. In addition, the railroad track that bisects the lagoon was represented as a continuous berm that blocks flow and separates eastern and western portions of the lagoon, except for the railroad trestle (bridge) that crosses Carmel Branch. The model grid includes an opening at this location and allows flow through.

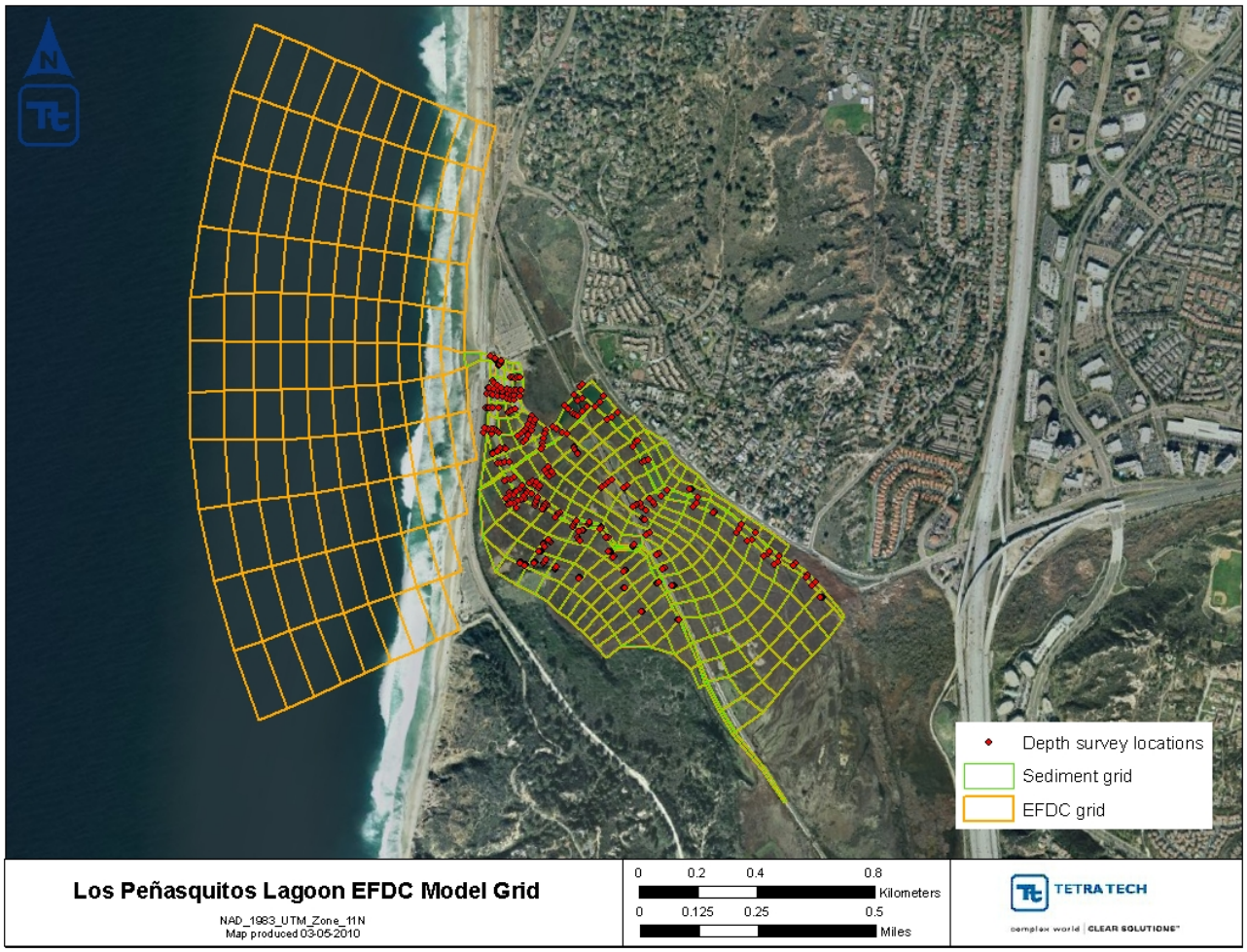

Figure 20. EFDC grid and bathymetry data for Los Peñasquitos Lagoon

As stated above, grid generation was based on available bathymetry data. A bathymetric survey of the Los Peñasquitos Lagoon was performed in March 2008 as part of the TMDL monitoring study (City of San Diego, 2009). The bathymetry for the two major channels were based on these data. These data include bottom elevations that were measured at several locations throughout the lagoon. Bottom elevation data were used to determine average grid bottom elevations. In addition, four lagoon mouth surveys were completed between October 2007 and April 2008 and were used to refine the ocean inlet. EFDC represents rectangular cross-sections; therefore, determination of grid bottom elevations cannot be assumed using average or lowest bottom elevations. Initial bottom elevations were estimated by reviewing these data and assigning the near deepest elevation values to each grid cell, where data are available. For grid cells where bottom elevations were not measured, initial bottom elevations were obtained through interpolation. Bottom elevations were refined during calibration for better hydrodynamic simulation.

For the salt marsh area, the more detailed USGS 1/9 arc second DEM data were downloaded. Average elevation within each EFDC cell was calculated using the DEM data. In addition to the DEM data, the 2006 Los Peñasquitos Lagoon Foundation monitoring report includes monitored elevation profiles in the lagoon (Hany et al, 2007). The elevations from the DEM were compared to the elevations in the report, and were adjusted slightly.

Boundary Conditions

As an open water system, conditions within the Los Peñasquitos Lagoon are continuously changing due to external forces. For example, flood tides allow for ocean water to flow into the lagoon, which increases salinity. Air temperature and solar radiation also have a strong influence on lagoon water temperature. These external forces are represented in the model using boundary conditions. In order to simulate water circulation and sediment transport using the EFDC model, boundary conditions must be specified. Boundary conditions include watershed freshwater inflows and associated sediment loading rates, the exchange of salt water and freshwater in the lagoon, and sediment carried by flood tide.

Watershed Inflow

Watershed inflows determine the amount of freshwater that is contributed to the lagoon and associated sediment loading rates. The lagoon primarily receives water from three main tributaries: Los Peñasquitos Creek, Carroll Canyon Creek, and Carmel Creek. Watershed hydrology and sediment loading were modeled using the LSPC model, as described earlier. Flow rates and sediment concentrations from catchments 1401, 1403, and 1404 were assigned as boundary conditions from the watershed to the EFDC model (Figure 21).

Modeled watershed flows were converted to EFDC format and assigned to the corresponding EFDC grid cells. Catchment 1401 is a small direct drainage to the lagoon and is input to grid cell (28,14). The reach in catchment 1403 is Carmel Creek and feeds into grid cell (26, 5), Los Peñasquitos Creek and Carroll Canyon Creek merge in catchment 1404 and feeds into grid cell (19, 3), and a small direct drainage area was specified at grid cell (19, 3). Water temperature for the watershed inflows were obtained from continuous temperature data provided by the City of San Diego (2009) and converted to EFDC format. Salinity from the direct drainage area was set to zero, and salinities from the three creeks were specified based on monitored salinity data. The LSPC model simulated three sediment particle sizes: sand, silt, and clay. LSPC modeled sand, silt, and clay concentrations were converted to EFDC format.

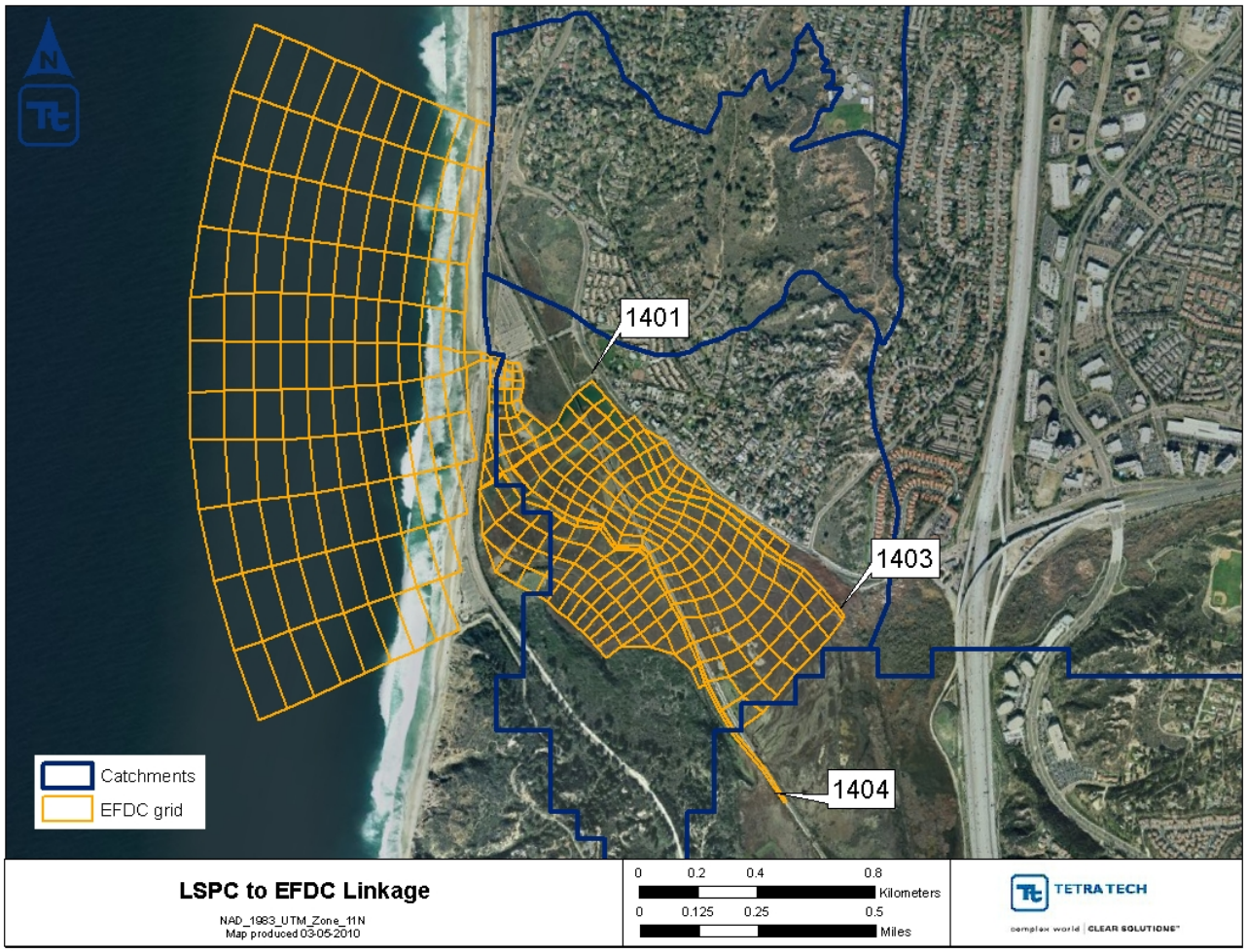

Figure 21. Assignment of watershed inputs to the EFDC grid

Representation of Ocean Boundary

In addition to the watershed, the ocean has both hydrodynamic and water quality influences on the lagoon. A narrow channel exists between the lagoon and the open ocean. The ocean is one of the major driving forces that influences lagoon circulation. Ocean water enters the lagoon during flood tides and leaves the lagoon during ebb tides. Changes in ocean water surface elevation determine the direction of flow and the transport of water quality constituents. Ocean water also increases or decreases the pollutant concentrations in the lagoon depending on water quality conditions along the ocean boundary. Required data for the ocean boundary include tidal elevation in the ocean, water temperature and salinity in the ocean water, and suspended sediment concentrations.

There are no monitoring stations located along the ocean boundary outside the lagoon mouth. Ocean inlet monitoring was conducted, however, this station is located at the lagoon/ocean interface. Conditions at this location are impacted by both the ocean and lagoon; therefore, data collected at the ocean inlet are not representative of ocean conditions. Tide data collected at the closest NOAA station in La Jolla were used to determine the open ocean water surface elevation boundaries for the lagoon model. The La Jolla station is located approximately 5 miles south of the Los Peñasquitos Lagoon. Tide data from La Jolla were used because it is similar to other available tide data in the vicinity and provides a more complete dataset in terms of the time period available. Mean sea level elevation data were downloaded from the NOAA site and were converted to EFDC

format (Figure 22). Water temperature data were also obtained from the La Jolla NOAA station, although salinity data were not available at this station. The salinity boundary condition was set to 35 psu at the ocean open boundary location.

For sediment simulations, the modeled water surface elevation, salinity, and water temperature immediately outside the lagoon (predicted from the full grid simulation) were specified as boundary conditions. Ocean sediment concentration data were not available. It is assumed that sediment entering the lagoon during flood tides primarily originates from beach erosion. The concentrations of sand, silt, and clay fractions were set to constant values initially and then adjusted during calibration.

Meteorological Data

Meteorological data are an important component of the EFDC model. Surface boundary conditions are determined by the meteorological conditions. Data required for model setup include atmospheric pressure, air temperature, relative humidity, precipitation, cloud cover, solar radiation, wind speed, and wind direction.

Meteorological data from station KCASAND153 located east of Interstate 5 in Torrey Woods Estates/Carmel Valley was downloaded from the website: www.weatherunderground.com. This website allows download of daily (5-minuted resolution) rainfall, wind speed and direction, air temperature, and percent humidity measurements (Figure 22). Solar radiation was estimated based on the latitude of the station and then adjusted based on the sky cover condition for each time-step. Sky condition data (i.e. cloud cover data) were not available and the estimated clear sky solar radiation data were adjusted/interpreted based on when precipitation occurred. Solar radiation data were further refined during calibration. Data for each day were provided by the City of San Diego (2009) from October 2007 through April 2008. These data were converted to the appropriate units and formatted for input into the EFDC model.

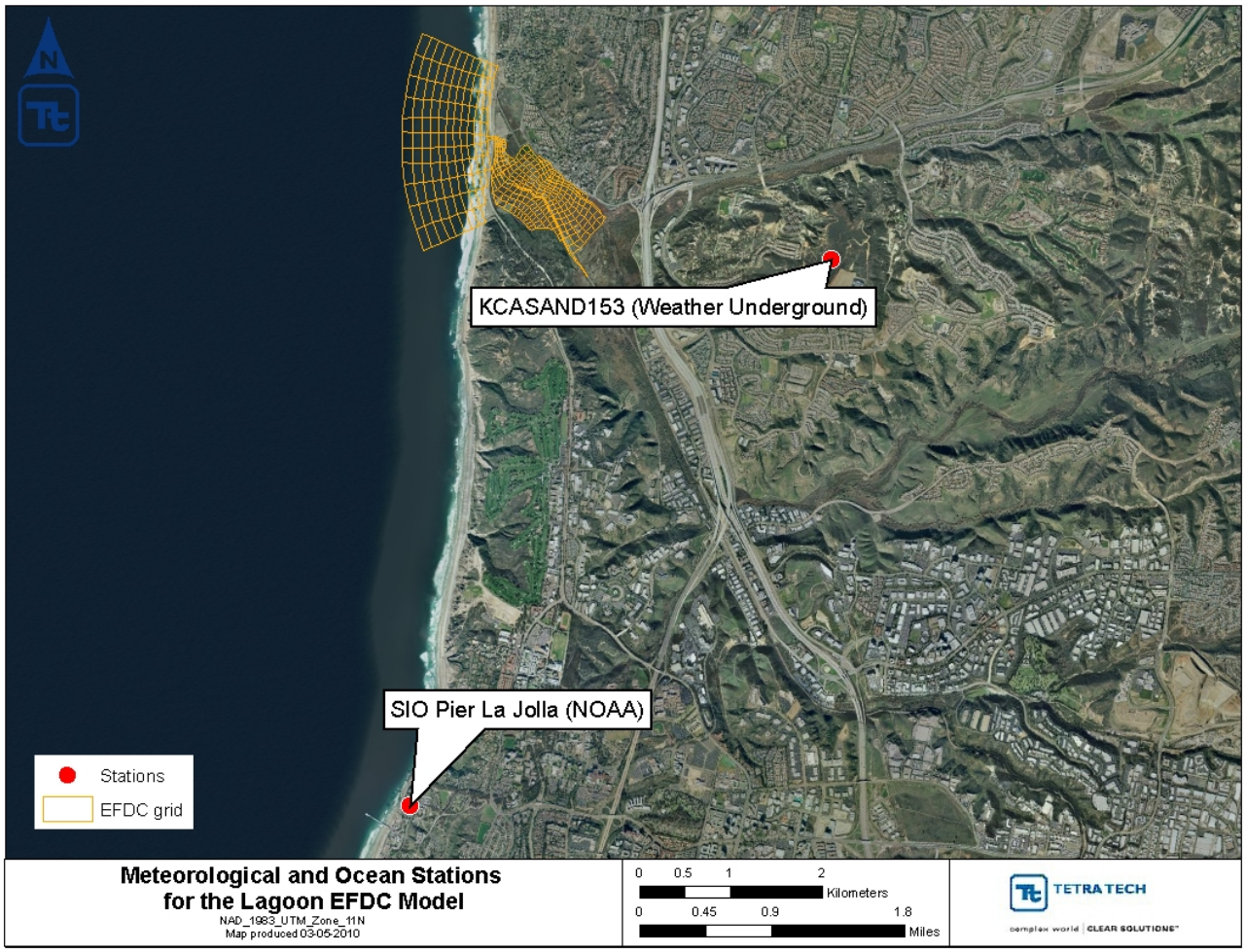

Figure 22. Meteorological and Ocean Boundary stations

Initial Conditions

For a dynamic model such as EFDC, initial conditions of water surface elevation, water temperature, salinity, water column sediments, and bottom sediments must be specified. Because the lagoon is an open system that is flushed by ocean water and watershed inflows frequently, the initial conditions of water surface elevation, water temperature, salinity, and water column sediments can be quickly replaced by boundary conditions. Model initial conditions were found to not be very sensitive to the model predictions. Initially assigned water surface elevation, water temperature, salinity, and water column sediment concentrations changed quickly as the model responds more readily to the driving boundary conditions from the ocean and watershed. Initial conditions were set to reasonable values based on modeling judgment. Water surface elevations were set to 0.92 meters above mean sea level (MSL) to ensure that all the grid cells were wet during the start of the simulation. Initial water temperatures were set to 10 degrees Celsius; salinities were set to 10 psu, and sand, silt, and clay fractions in the water column were set to 10 mg/L.

Sediment bottom conditions in the lagoon are the result of the long-term balance between deposition and erosion. Initial lagoon sediment depth at the beginning of the model simulation period determines the amount of sediment that can be eroded. Bottom sediment conditions were measured at the beginning of the modeling period on 10/1/2007. The only available data were collected (post storm) during 2/11/2008 and 2/15/2008 at 26 locations in

the lagoon for sediment size distributions as part of the TMDL monitoring study. Sand, silt, and clay percentages from the sediment size distributions were set as the initial mass fractions for the sediment bed in the lagoon with the assumption that the sediment components have reached an equilibrium status and did not change dramatically from the beginning of the modeling period to the survey dates. In addition to mass fractions, other sediment properties including porosity and density must be specified in the model. These data were not collected; therefore default values for porosity (0.4) and density (1.99 gm/cm3) were used (Tetra Tech, 2007).

Model Calibration and Validation

Modeling parameters for the watershed and lagoon models were adjusted based on available monitoring data, as detailed below. For both models, it was essential that the physics of the system (hydrology and hydrodynamics) be accurately characterized in order to provide a sound foundation for simulating water quality conditions within the lagoon. Simulations of sediment fate and transport processes are dependent on an accurate representation of runoff, water movement and circulation, and other dynamic components. The time-step for the LSPC model is hourly and the time-step for the EFDC model is 0.5 seconds.

Watershed Model Calibration and Validation

Long term hydrology (1993-2008) was calibrated and validated using streamflow data from USGS gage 11023340 at the bottom of catchment 1406 (Figure 6). The period of record was divided into separate calibration and validation periods. Additional flow data were collected during TMDL monitoring by the City of San Diego (2009) at the bottom of catchments 1403 (Carmel Creek), 1405 (Los Peñasquitos Creek), and 1411 (Carroll Canyon Creek) were used for validation of the model hydrology (see Figure 19).

Hydrology

Measured and modeled average daily flows compared well throughout the model calibration and validation periods. Overall summary statistics comparing observed and simulated hydrology were within the recommended criteria based on HSPEXP (Lumb et al., 1994) for all metrics except summer volume error. Summer volume was primarily a function of the irrigation factor which was developed to balance observed summer low flows throughout the entirety of the simulation period.

Figure 23 through 30 compare modeled and measured flows during the calibration (1993-2000) and validation (2000-2008) periods. Table 4 presents the statistical comparison of modeled and measured flows at the USGS gage on Los Peñasquitos Creek (11023340).

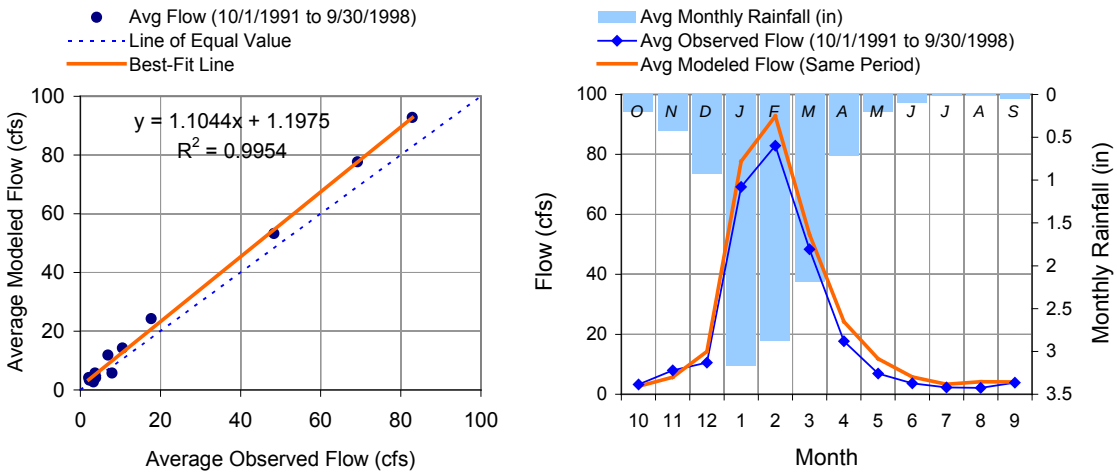

Figure 23. Mean monthly flow for calibration period (USGS 11023340)

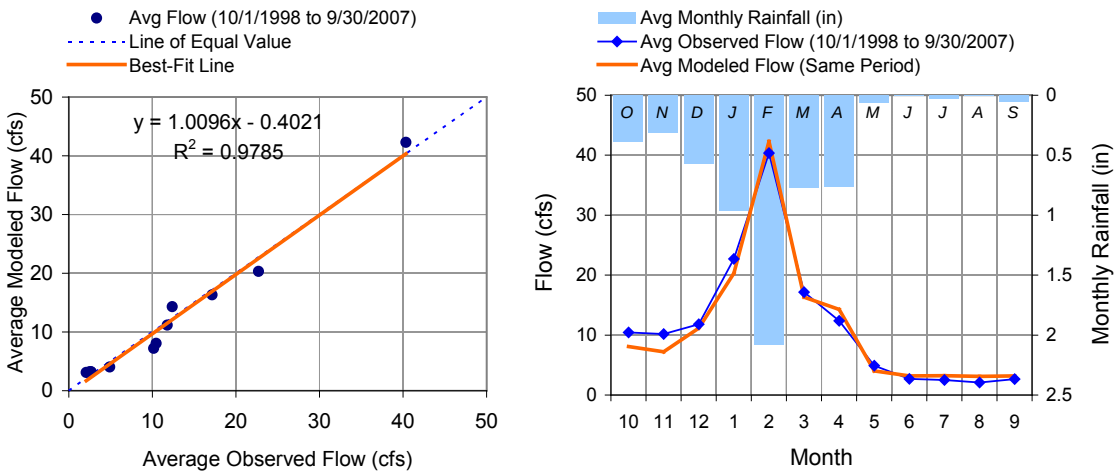

Figure 24. Mean monthly flow for validation period (USGS 11023340)

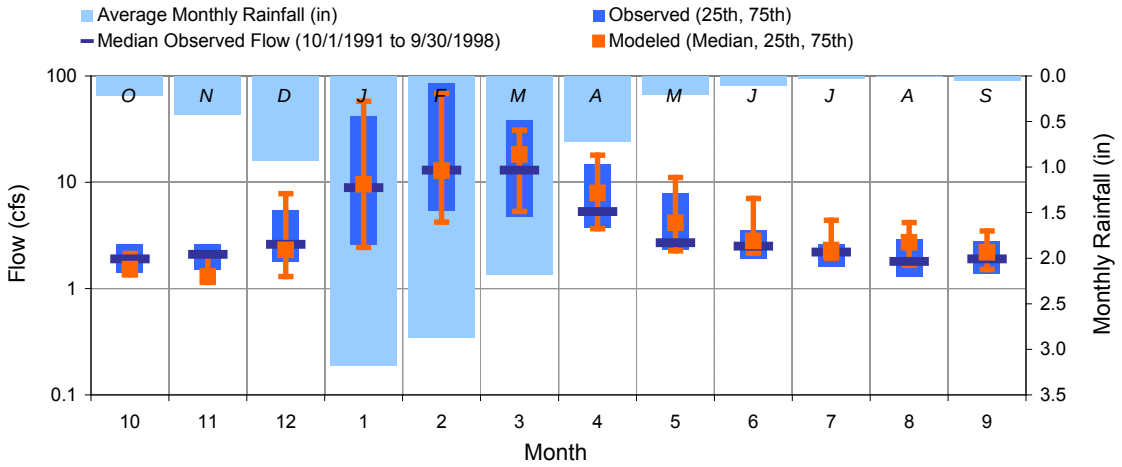

Figure 25. Monthly median and percentile flow comparison – calibration period

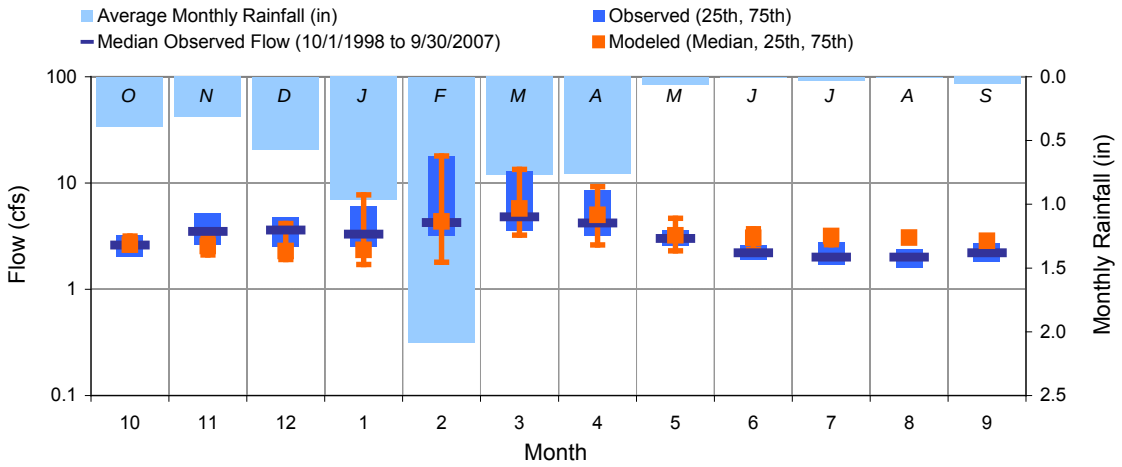

Figure 26. Monthly median and percentile flow comparison – validation period

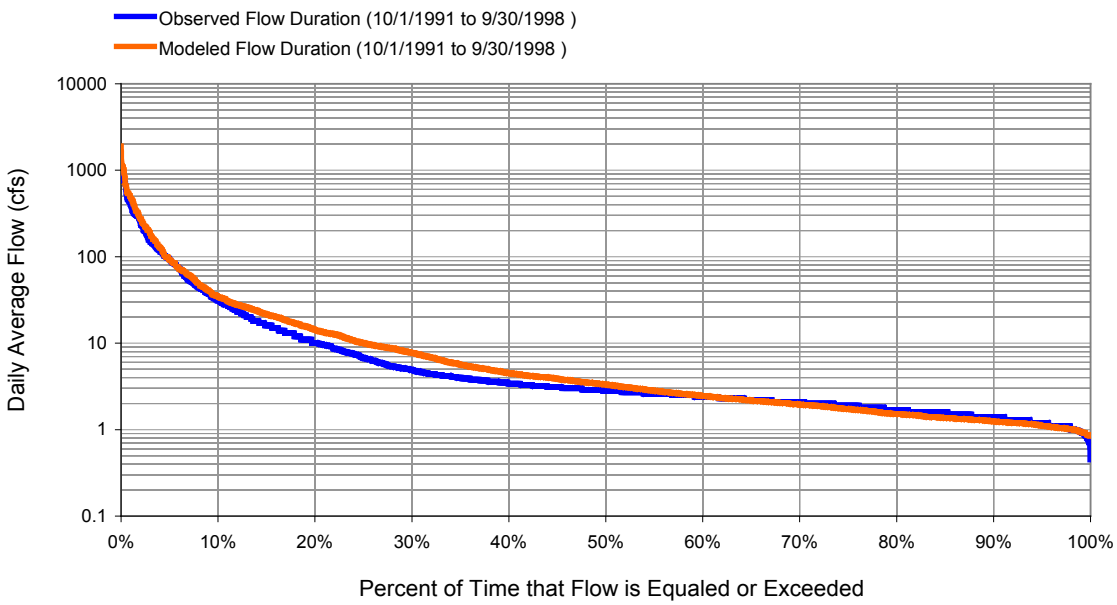

Figure 27. Flow exceedence output comparison – calibration period

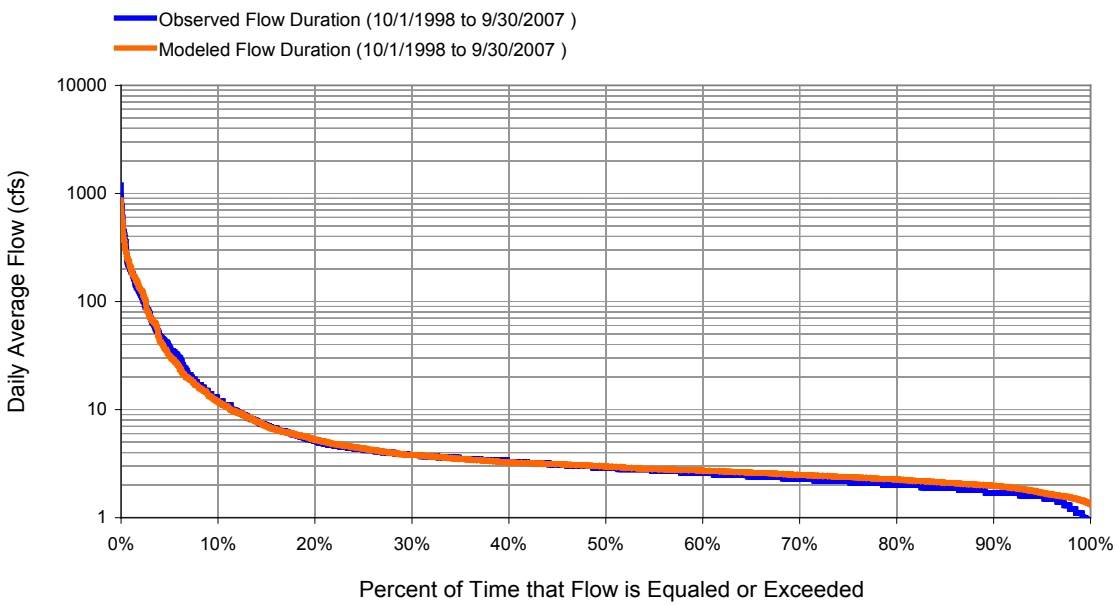

Figure 28. Flow exceedence output comparison – validation period

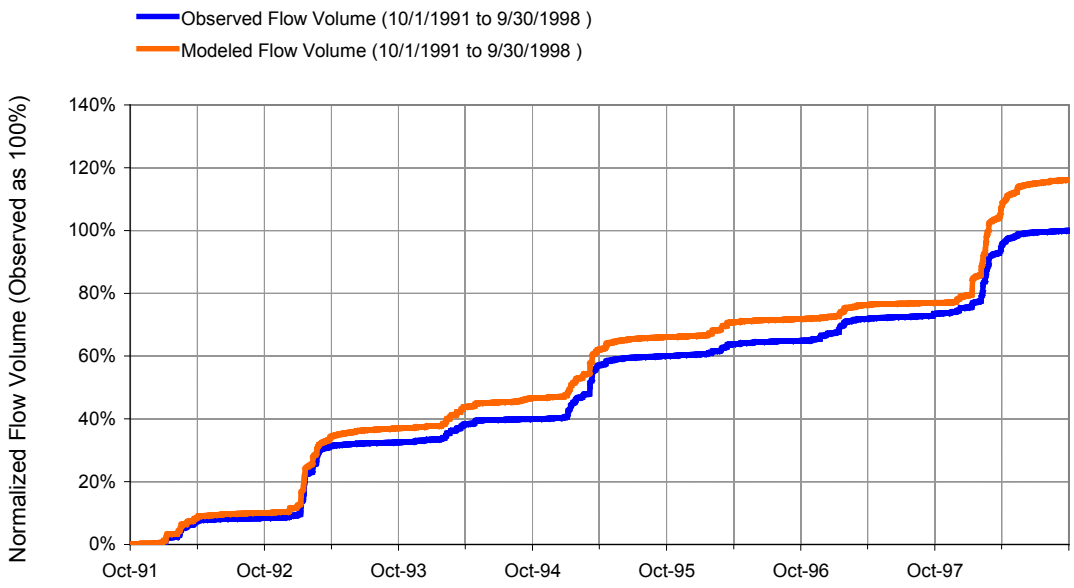

Figure 29. Cumulative volume comparison – calibration period

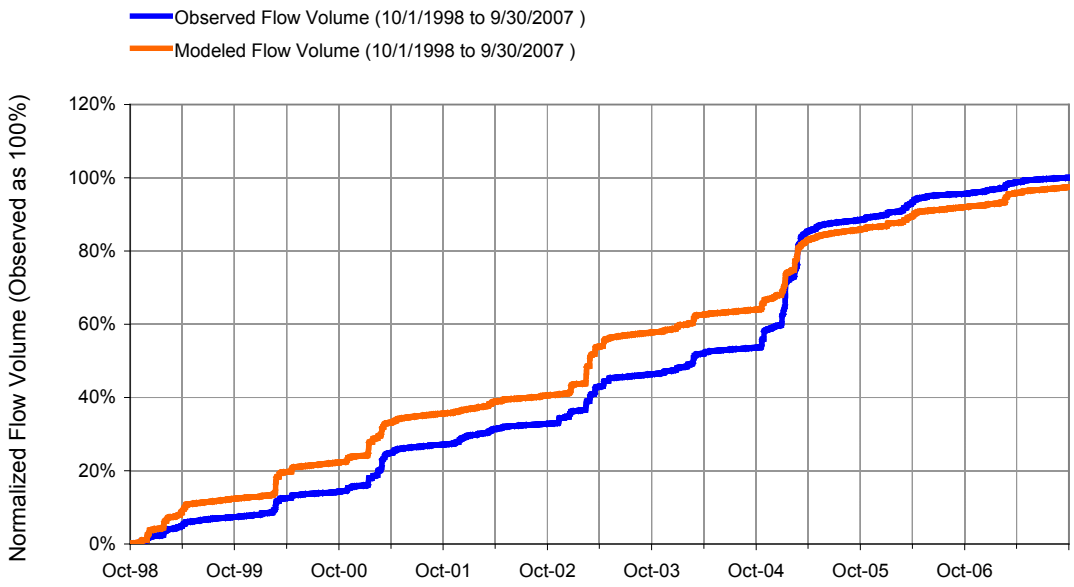

Figure 30. Cumulative volume comparison – validation period

Table 14. LSPC hydrologic model performance - entire simulation period

LSPC Simulated Flow		Observed Flow Gage		
OUTFLOW FROM CATCHMENT 1406 15.16-Year Analysis Period: 1/1/1993 - 2/29/2008 Flow volumes are normalized, with total observed as 100		USGS 11023340 USGS Home		
Total Simulated In-stream Flow:	116.10	Total Observed In-stream Flow:		
Total of simulated highest 10% flows:	91.68	Total of Observed highest 10% flows:		
Total of Simulated lowest 50% flows:	4.36	Total of Observed Lowest 50% flows:		
Simulated Summer Flow Volume (months 7-9):	4.60	Observed Summer Flow Volume (7-9):		
Simulated Fall Flow Volume (months 10-12):	9.01	Observed Fall Flow Volume (10-12):		
Simulated Winter Flow Volume (months 1-3):	86.17	Observed Winter Flow Volume (1-3):		
Simulated Spring Flow Volume (months 4-6):	16.33	Observed Spring Flow Volume (4-6):		
Total Simulated Storm Volume:	54.53	Total Observed Storm Volume:		
Simulated Summer Storm Volume (7-9):	0.85	Observed Summer Storm Volume (7-9):		
Errors (Simulated-Observed)	Error Statistics	Recommended Criteria	1995-1999	2000-2004
Error in total volume:	16.10	10	-1.43	7.35
Error in 50% lowest flows:	-2.00	10	-1.60	-3.91
Error in 10% highest flows:	13.77	15	2.26	1.75
Seasonal volume error - Summer:	42.46	30	13.27	-2.52
Seasonal volume error - Fall:	5.02	30	4.49	12.42
Seasonal volume error - Winter:	11.62	30	-18.21	13.31
Seasonal volume error - Spring:	48.44	30	1.90	6.11
Error in storm volumes:	21.88	20	1.13	12.07
Error in summer storm volumes:	11.76	50	3.16	15.42
Nash-Sutcliffe Coefficient of Efficiency, E:	0.675	Model accuracy increases as E or E' approaches 1.0	0.688	0.814
Baseline adjusted coefficient (Garrick), E':	0.683		0.517	0.549

Additional validation flow data from the City of San Diego (2009) were available for comparison to model output. Los Peñasquitos Creek flows were monitored by the USGS (15 minute data at gage 11023340) and the City of San Diego (5 minute data at MLS) which represent drainages of 42 and 59 mi^2, respectively. Flows at the two monitoring stations reflected the amount of rainfall that was received within each drainage area. Peak stormflow (Figure 31) and storm volume (Figure 32) were greater at the upstream USGS gage (11023340) than measured at the MLS near the bottom of the watershed. Baseflow volume, defined as daily flows with more than 50% of flow from surface runoff using hydrograph separation techniques, was 9% greater at the downstream gage. For each of the three sampling events that were monitored, model output compared well to streamflow measurements at the USGS gaging station as opposed to the MLS (Figure 33 through 35). Timing differences may be due to several factors including possible data limitations, as described below.

Flows typically increase further downstream barring withdrawals and/or infiltration; however, storm volumes during the monitoring period at the downstream station were significantly lower than reported at the upstream USGS gaging station. This may indicate that the flow rating table for the downstream station may not characterize higher flows well, especially since the model calibrated well to the upstream USGS gaging station. As a result, significant adjustments were not made to the model in order to match the measured flows at the MLS.

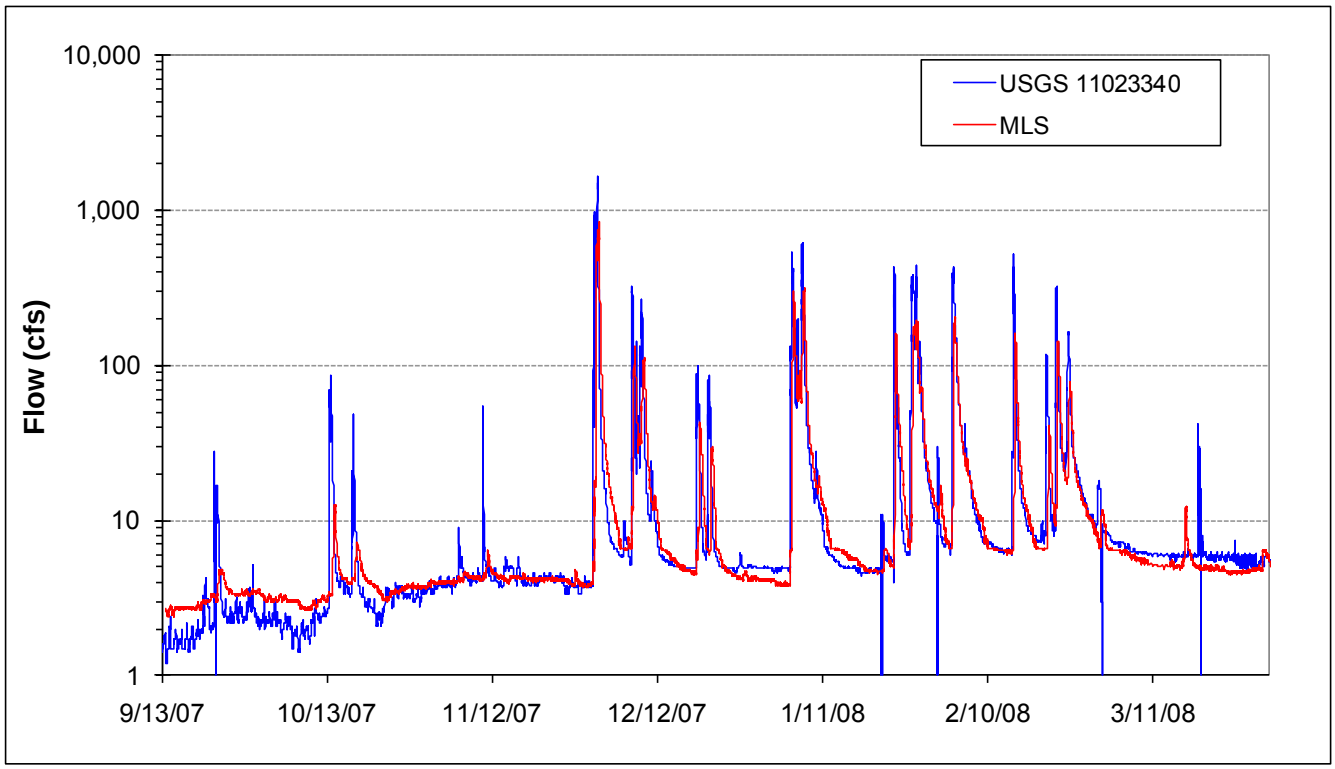

Figure 31. Time-series streamflow measured on Los Peñasquitos Creek

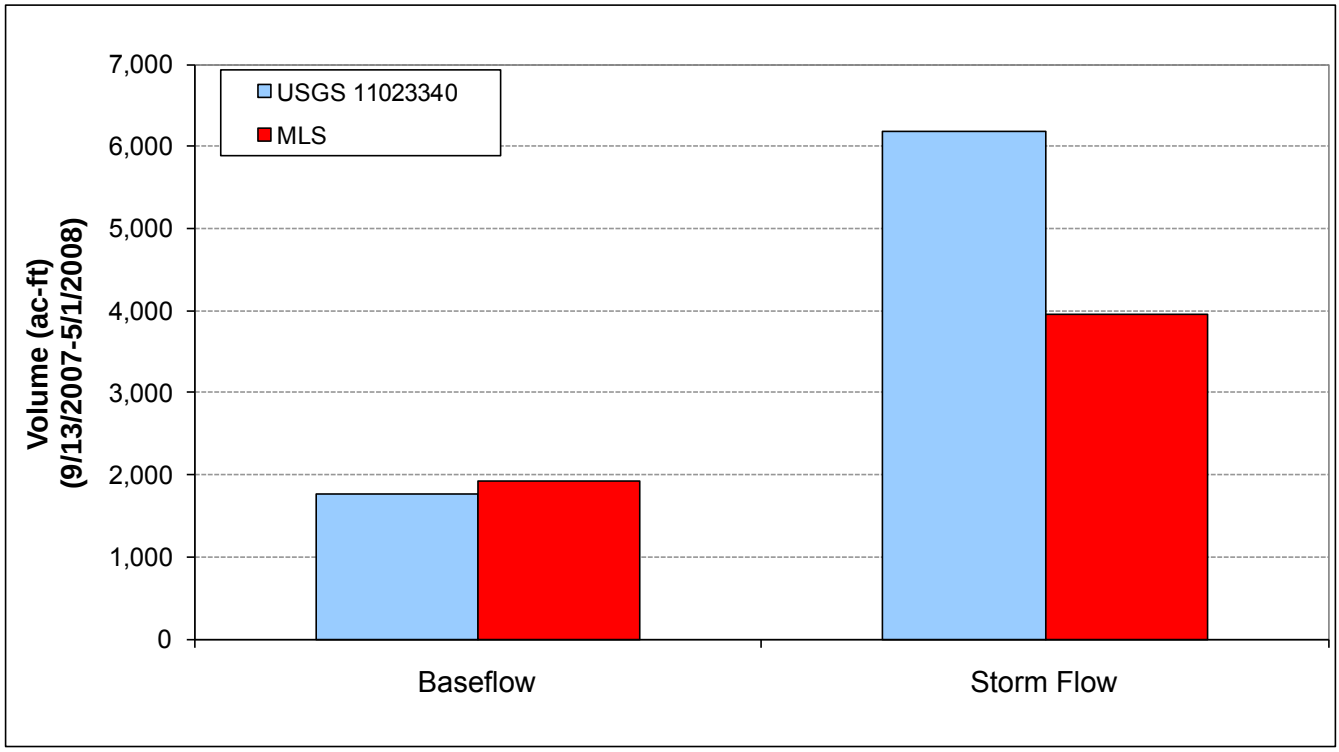

Figure 32. Baseflow and storm volumes measured on Los Peñasquitos Creek

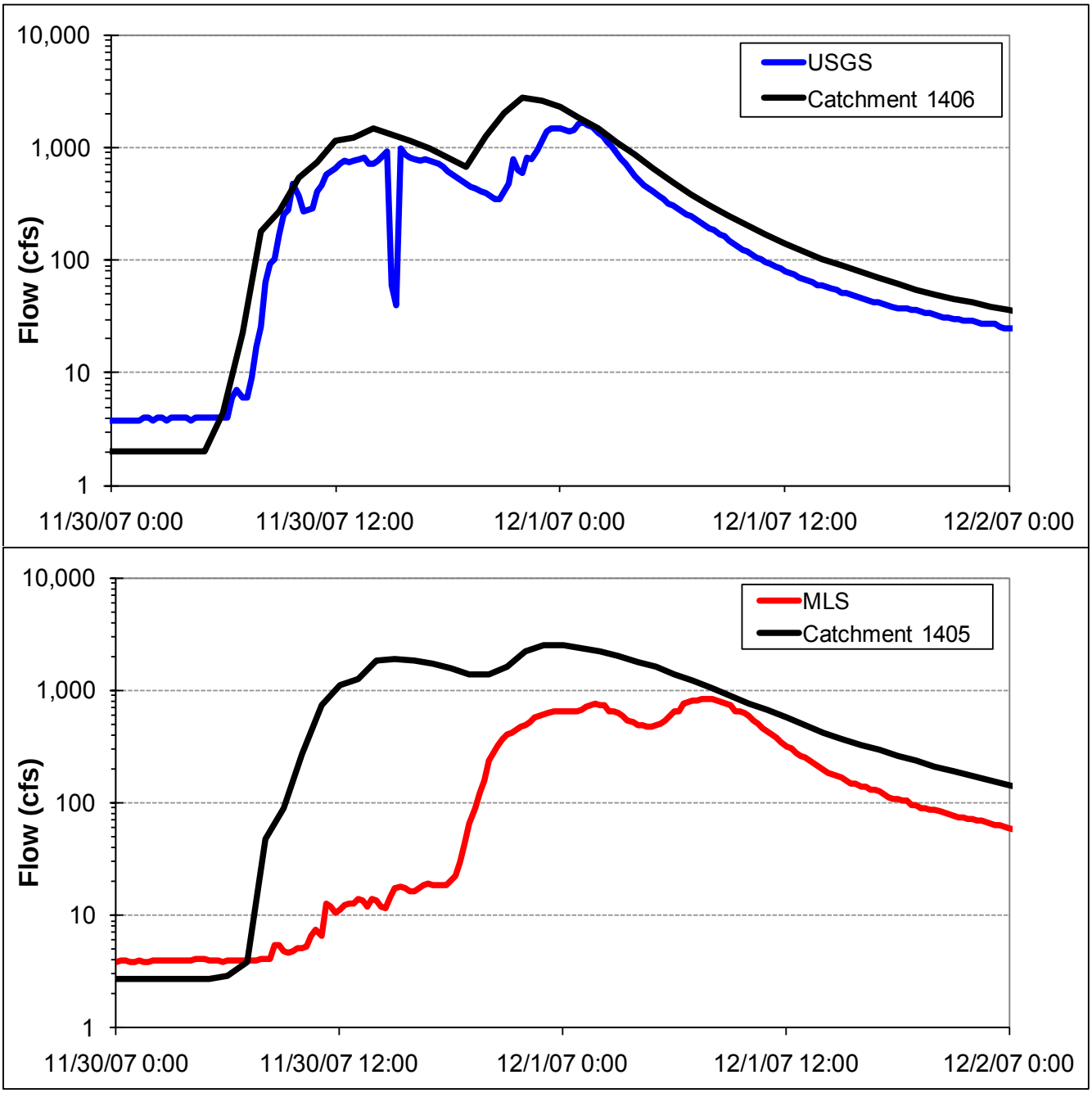

Figure 33. Comparison of modeled and observed flows at the USGS and MLS stations – 11/30/2007 storm

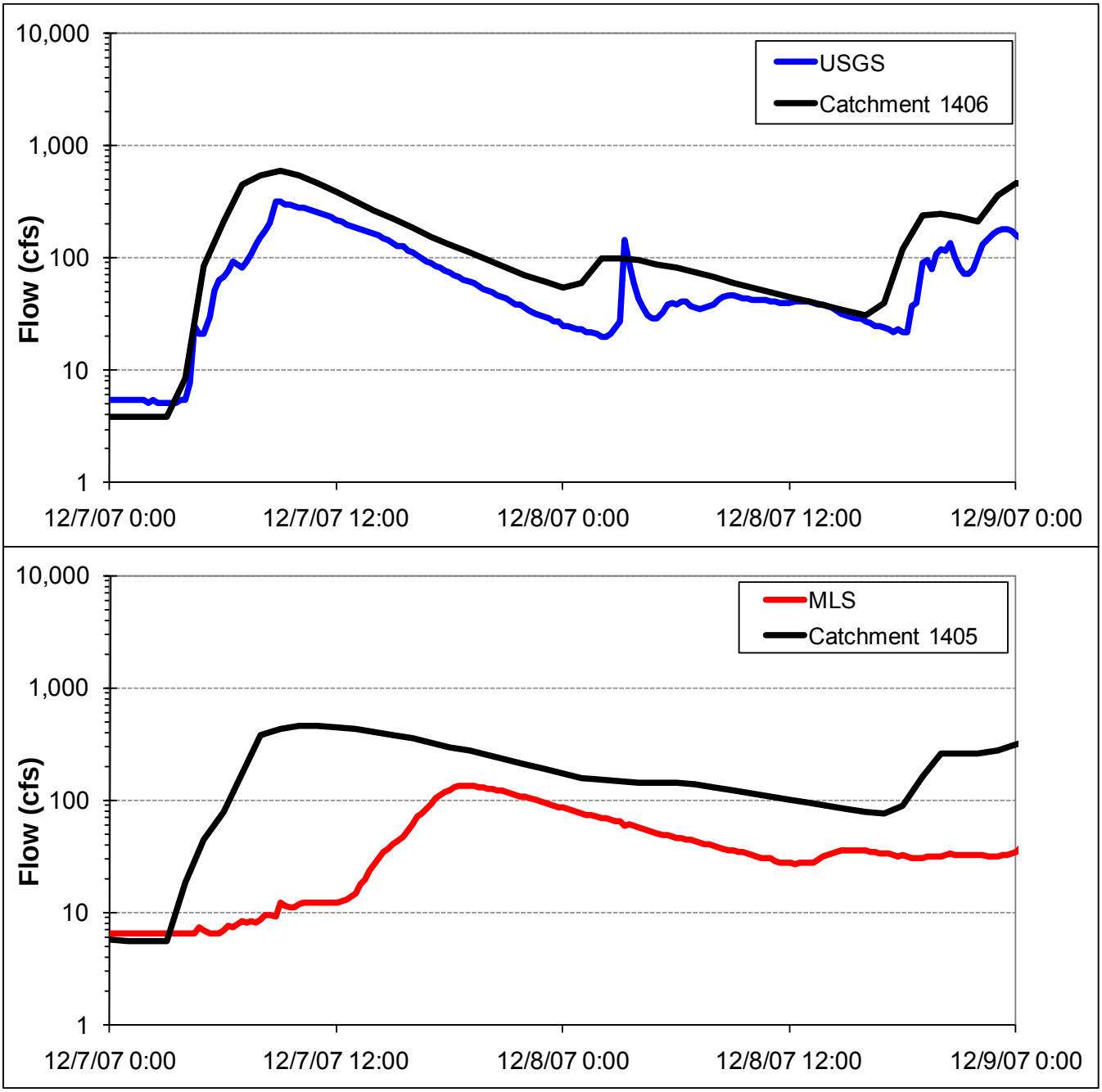

Figure 34. Comparison of modeled and observed flows at the USGS and MLS stations – 12/7/2007 storm

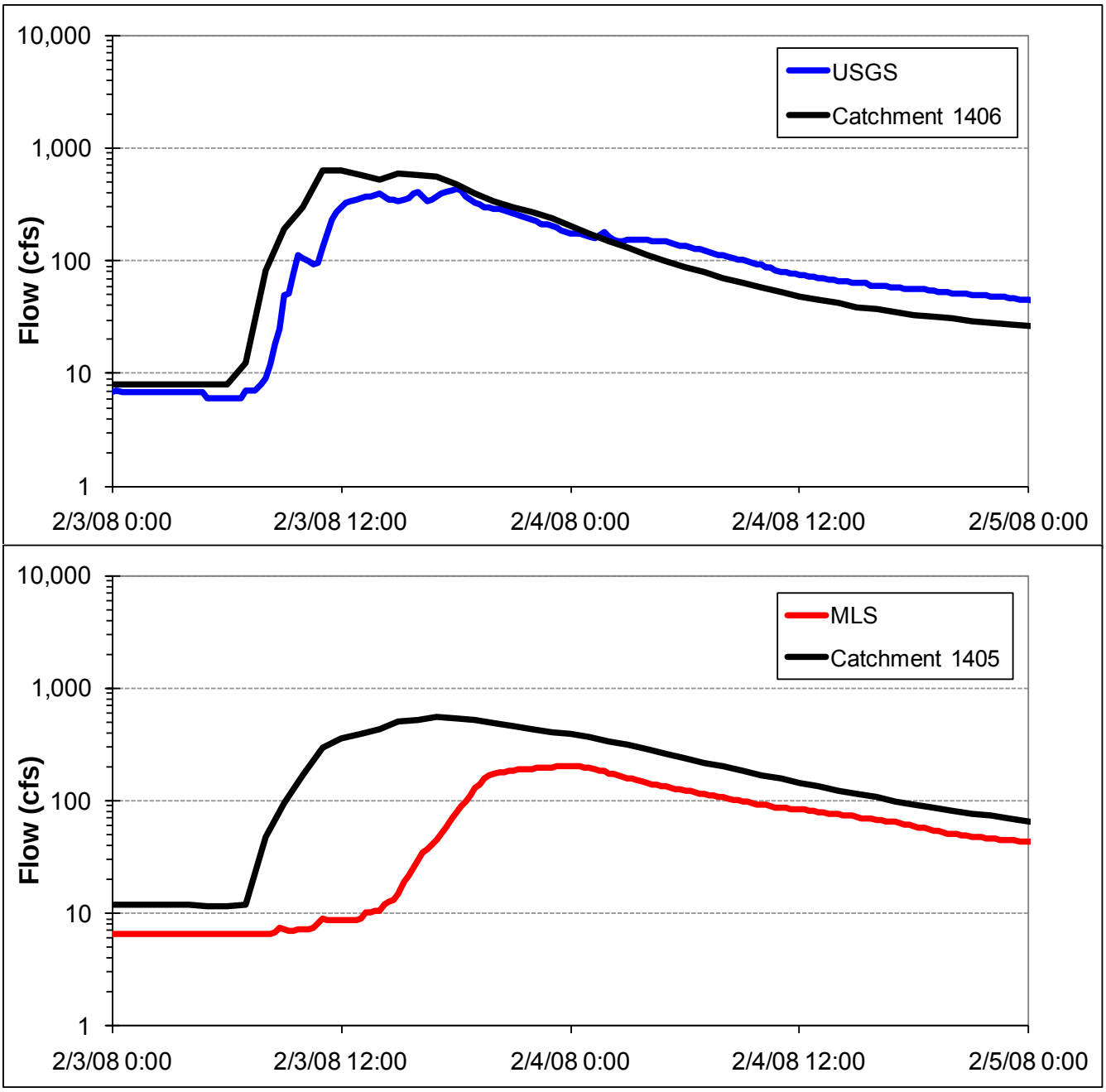

Figure 35. Comparison of modeled and observed flows at the USGS and MLS stations – 2/3/2008 storm

Suspended Sediment

Sediment deposition and scour can add or remove sediment from the modeled catchment reaches. Sand carrying capacity was assumed to be represented by a power function of velocity. The coefficient and exponent of the equation were modified to achieve a dynamic steady state where the sand in the bed remained relatively constant throughout a 16 year simulation period. The reach-specific shear stress required for deposition and resuspension of silt and clay were determined following the same methodology that was employed to define the sand dynamics.

At two of the monitoring locations, land use inputs were insufficient to replicate the observed suspended sediment concentrations. Both Carroll Canyon Creek and Carmel Creek required additional sediment inputs from the

streambanks. The streambank erosion module in LSPC was used to account for the additional sediment load to the system (see Appendix B for those coefficients). The incorporation of streambank erosion provided a much improved calibration of the model at those two sites; however, care must be used in interpreting those results. The stream cross sections in the model were based on an algorithm relating stream cross section to upstream drainage basin. Sensitivity analyses were performed on the bank erosion processes where the linear term of the bank erosion equation was modified by ±25 percent. Carmel Canyon Creek was relatively insensitive to the stream bank coefficients with a ±7 percent change in total sediment load from the catchment. Carroll Canyon Creek was more sensitive with load changes of ±21 percent when the stream bank coefficient was changed. To more accurately model the system, and the contribution from streambank erosion, accurate measurement of stream cross sections throughout the watershed would be required.

The primary dataset used in the calibration was pollutograph data for three storms that were sampled between November 2007 and February 2008 by the City of San Diego (2009) as part of the TMDL monitoring study. Both pollutograph samples and storm EMCs from the three events were used for comparison at the three monitoring sites (Figures 36 through 39). Note that flow calibration discrepancies shown in Figures 37 through 39 are likely due to possible problems with the flow rating tables and resulting streamflow estimates for these stations, as discussed in the previous section.

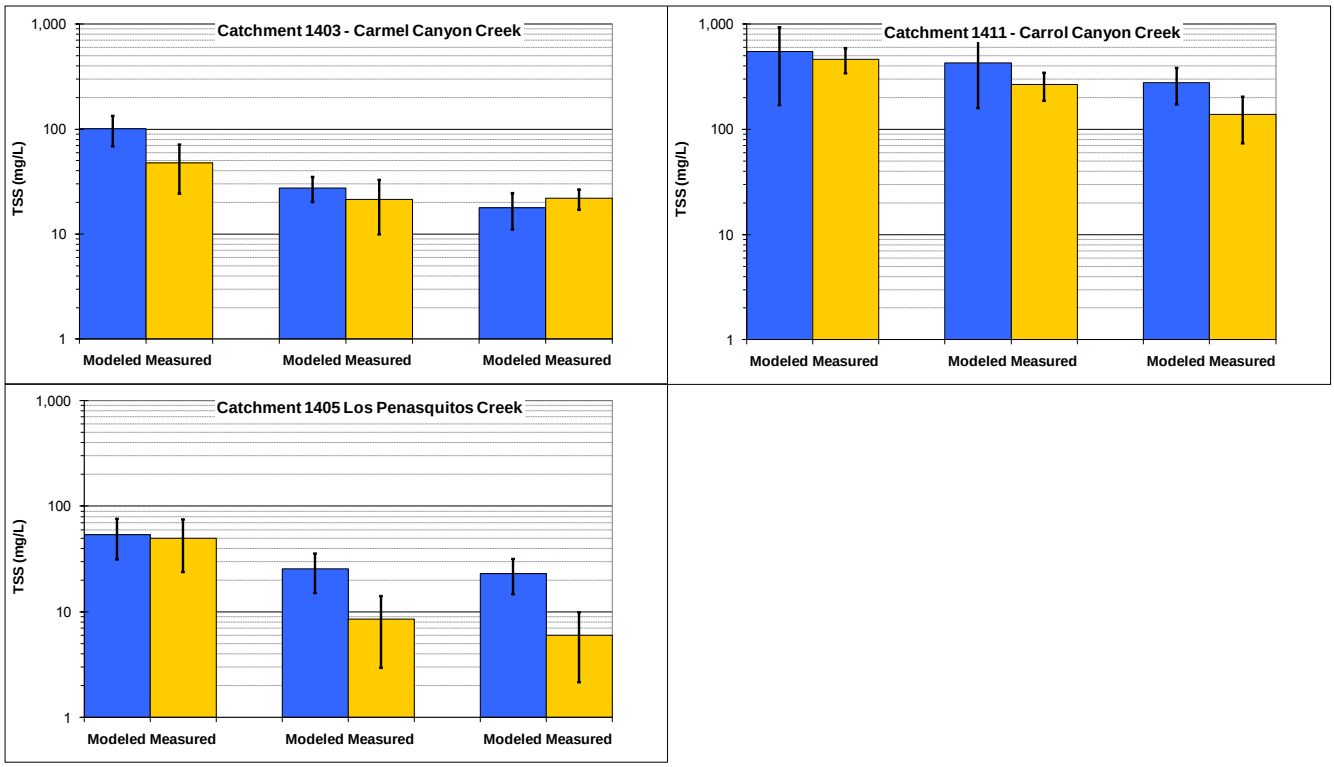

Figure 36. Comparison of EMC and 95th Percentile TSS data collected during each storm event

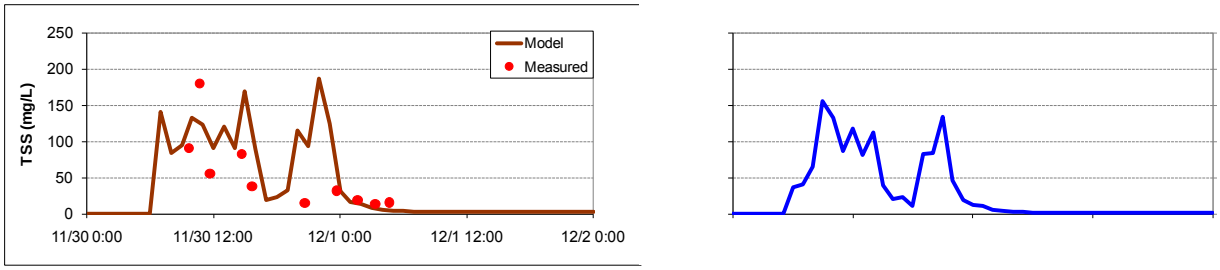

Figure 37. Pollutograph TSS calibration at Carmel Creek

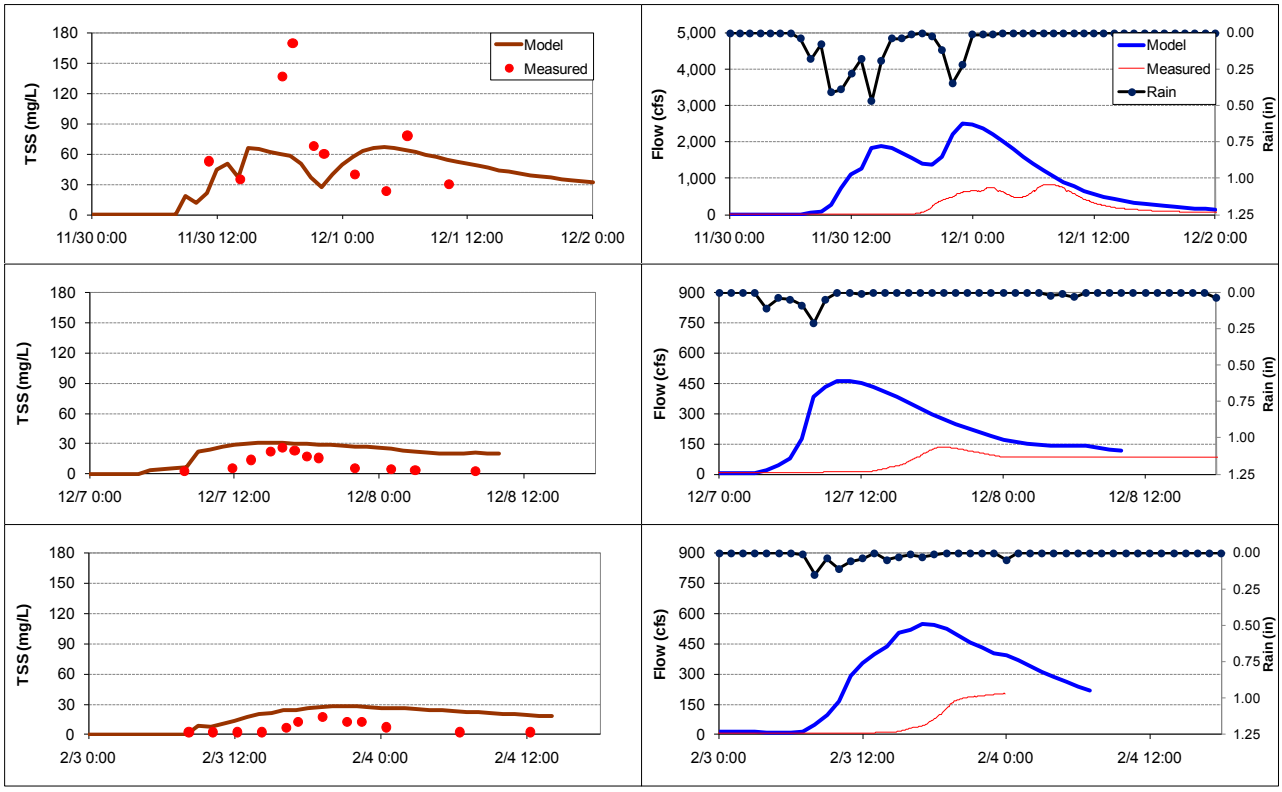

Figure 38. Pollutograph TSS calibration at Los Peñasquitos Creek

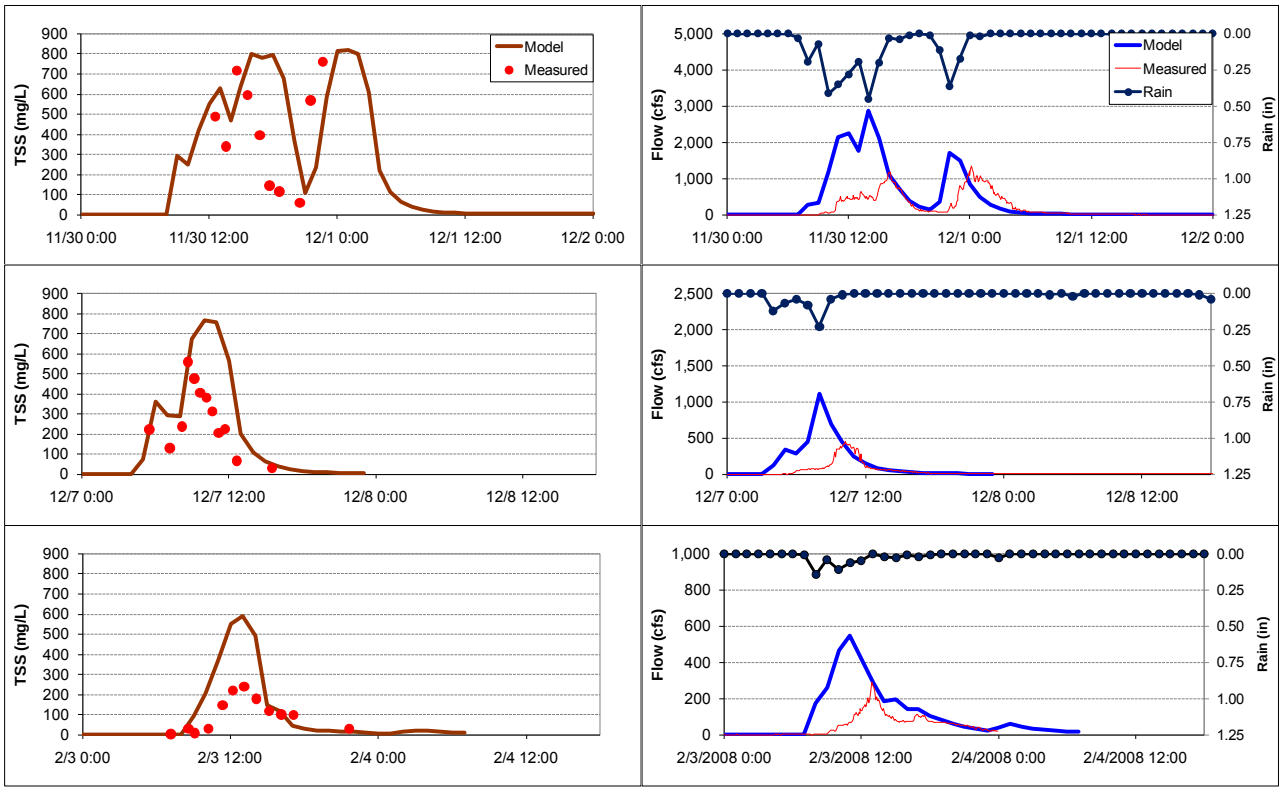

Figure 39. Pollutograph TSS calibration at Carroll Canyon Creek

Modeled particle size distributions were compared to the measured data presented in Figure 16 and 17. The measured particle size distributions were aggregated into sand (62.5-4000 µm), silt (3.1 – 53 µm) and clay (0.2 – 2 µm) fractions. Model output indicates a reasonable representation of the sand, silt and clay distributions observed in the 11/30/2007 and 12/7/2007 storms (Table 15).

Table 15. Comparison of modeled and measured sediment fractions for each storm event

	Sand		Silt		Clay	
11/30/2007	**Measured**	**Modeled**	**Measured**	**Modeled**	**Measured**	**Modeled**
Carmel Creek	41 %	32 %	48 %	36 %	11 %	32 %
Los Peñasquitos Creek	12 %	21 %	74 %	44 %	14 %	35 %
Carroll Canyon Creek	8 %	33 %	72 %	34 %	19 %	33 %
12/07/2007						
Carmel Creek	42 %	41 %	44 %	30 %	14 %	29 %
Los Peñasquitos Creek	42 %	28 %	49 %	38 %	9 %	34 %
Carroll Canyon Creek	26 %	32 %	40 %	34 %	34 %	34 %
02/03/2008						
Carmel Creek	n/a	36 %	n/a	32 %	n/a	32 %
Los Peñasquitos Creek	n/a	29 %	n/a	38 %	n/a	33 %
Carroll Canyon Creek	n/a	32 %	n/a	34 %	n/a	34 %

The model performed reasonably well with respect to the observed concentrations at the three monitoring locations. The average difference between modeled and measured EMCs for Carmel Creek, Los Peñasquitos Creek, and Carroll Canyon Creek was 83%, 51%, and 65%, respectively. However these predictions are highly influenced by mis-timing or simply a poor comparison of measured and modeled hydrographs. The difficulties of establishing a good relationship between flow and depth is discussed in the previous section. While the measured and modeled EMCs were dissimilar, the predicted concentrations agreed well with observed data (see Figure through 39).

Additional sampling efforts within the Los Peñasquitos watershed included stormwater TSS measurements. The USGS had two separate sampling efforts in the watershed in the 1980's (Table 5). NPDES monitoring on Los Peñasquitos Creek began in 2001 and is currently an ongoing effort. Two pollutograph sampling events (11/30/2007 and 12/7/2007) were also sampled during NPDES monitoring, providing both pollutograph and EMC data.

Output from a long term simulation (1/1/1998 – 2/28/2008) was used to validate the model. Storm TSS EMCs from the model output (Model) were compared against the USGS sampling results (USGS), NPDES monitoring (MLS), and paired NPDES (MLS-1 and -3)/pollutograph monitoring (Storms 1 and 3) (Figure 40). Model results were an order of magnitude lower than the USGS grab samples but were not significantly different at the 95th percentile level. Median model output was comparable to the long term NPDES EMC sampling. It is interesting to note that the EMCs from the two common storms for the pollutograph and NPDES sampling differed by more than double.

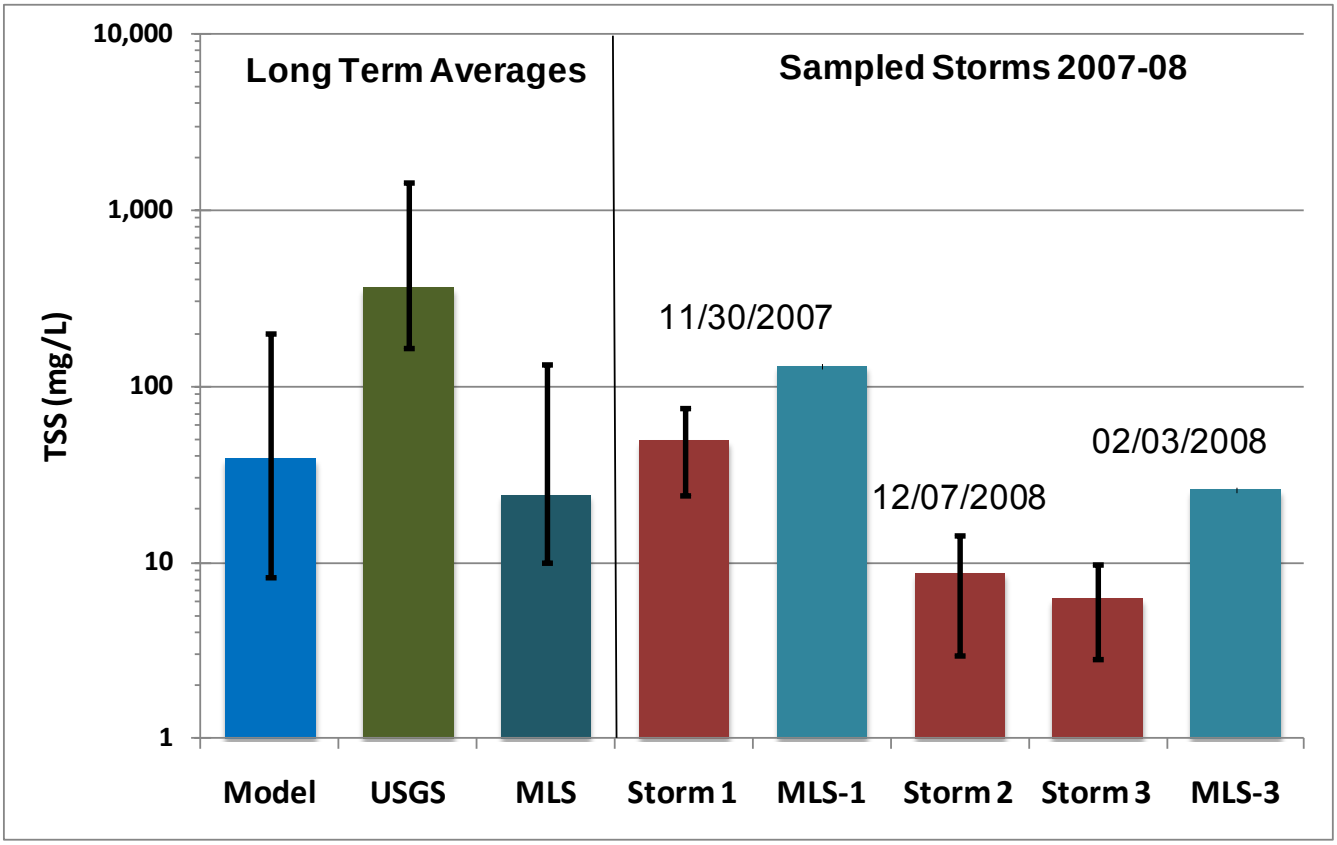

Figure 40. Comparison of modeled and measured TSS with 95th percentile confidence intervals

In 2005, the El Cuervo Norte wetlands were built upstream of the long-term MLS monitoring station. Flows from Los Peñasquitos Creek are diverted into the wetlands, creating the potential for solids to settle out and thus reduce the TSS measured at the MLS. Historic stormwater EMC monitoring data from the City of San Diego has not shown a significant reduction in TSS concentrations at the 95th percent confidence level (Figure 41).

Suspended sediment simulations reasonably predicted the observed stormwater TSS concentrations in the Los Peñasquitos watershed. Sediment transported via diffusive bed load processes also has the potential to be a significant source of sediment loadings; however, this source was neither characterized in the LSPC modeling or would be with traditional TSS sampling. Perennial flows into the lagoon were modeled with little to no sediment inputs throughout the majority of the simulation period. Because of the length of those periods without TSS at low levels, bed flow has the potential to be the dominate sediment transport pathway and could add significant sediment to the lagoon.

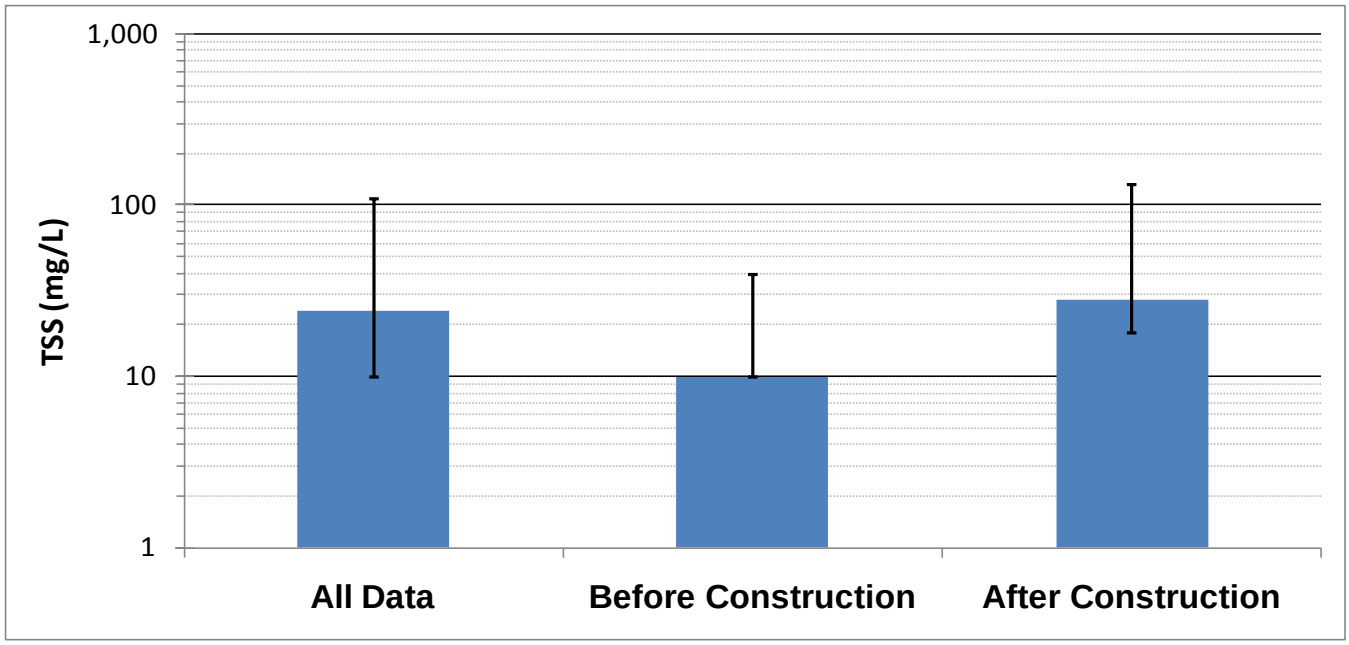

Figure 41. Measured TSS before/after construction of the El Cuervo Norte wetlands

Lagoon Model Calibration

Based on the TMDL monitoring study conducted by the City of San Diego (2009), two lagoon stations were available for model calibration. One station is located near the ocean inlet and one is located on the Carmel Branch lagoon segment. Figure 42 shows the locations where grab samples and continuous data were collected at these two locations within the lagoon. An inventory of all available monitoring data that were used during model calibration is provided in Table 16.

Table 16. Lagoon calibration data summary

Dates	Media	Sample type	Parameters	Location
11/30-12/1/07 12/07-12/8/07 2/02-2/04/08	Water	Pollutograph	TSS and Conductivity	Lagoon and ocean Inlet
11/30-12/1/07	Water	Storm composite	Percent composition of gravel, sand, silt, and clay	Lagoon segment and ocean inlet
10/07-4/08	Water	Continuous	Temperature, Conductivity, and Water Level (15 min data)	Lagoon segment and ocean inlet

In addition to these monitoring stations, the Los Peñasquitos Lagoon Foundation also routinely monitors salinity at station W2 (railroad trestle) (Figure 42). The EFDC model was calibrated based on monitoring data that were collected at these three locations. Note that monitoring data were not collected along the Los Peñasquitos/Canyon Creek lagoon segment (Los Peñasquitos Branch); therefore, comparisons could not be made to determine if the lagoon model results accurately predict conditions in this portion of the lagoon.

Model calibration involved adjusting parameters to achieve agreement between model results and observed data. The Los Peñasquitos lagoon model was calibrated in two steps. First, hydrodynamic parameters were calibrated, including examining the modeled water surface elevation, water temperature, and salinity at the two TMDL monitoring locations with the full grid. After hydrodynamics were calibrated, sediment processes were checked to ensure reasonable model representation of the lagoon using the reduced grid. The model was run from 10/1/2007 through 3/1/2008 in order to include the TMDL sampling events conducted by City of San Diego (2009).

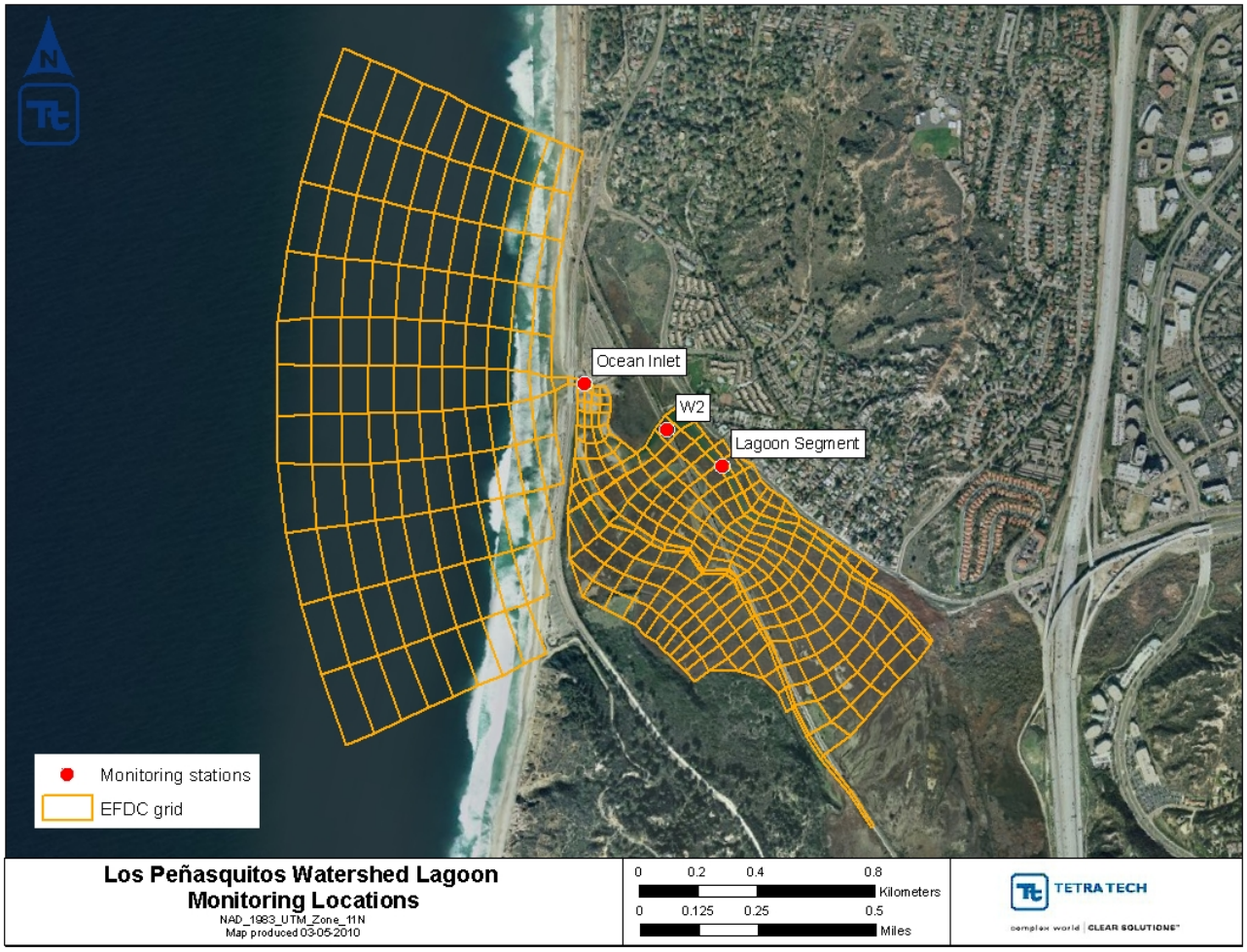

Figure 42. Calibration stations within Los Peñasquitos Lagoon

Hydrodynamics Calibration

During hydrodynamic calibration, roughness height and lagoon bottom elevations for the model grid cells were adjusted slightly. The cross-section of EFDC cells is rectangular; therefore, measured cross-section data cannot be used directly. Original bottom elevations were estimated using the relatively deep measurements across the cross-section data. Final bottom elevations were determined during calibration.

Modeled water surface elevations, water temperature, and salinities were compared against observed data. Available observed data do not include water surface elevations and salinity measurements. Instead, TMDL monitoring data collected by City of San Diego (2009) included depth and specific conductance. Because model results are average depths and observed depths were determined at the sampling points, they cannot be compared

directly. As a result, observed depths were converted to water surface elevations. The datum used for depth measurements was not recorded; therefore, conversion from depths to water surface elevations were estimated by assuming that average depths were near 0.5 meters above MSL.

Specific conductance data were measured continuously at the two sampling locations. EFDC can directly simulate the specific conductance as tracer. However, the impact of specific conductance on density cannot be considered as a tracer, therefore, salinity was modeled for the lagoon. Salinities were converted from specific conductance using the UNESCO algorithm (UNESCO, 1983). An Excel VBA function was developed to convert the specific conductance to salinity using the UNESCO algorithm.

Model calibration results for water surface elevation are shown in Figure 43. In general, modeled water surface elevations agree well with the elevations converted from observed depths at both of the locations. The model was able to capture the magnitude and timing of the fluctuations of water surface elevations driven by the tide and watershed inflows. The modeled elevations show some spikes with much higher elevations. These spikes are caused by modeled peak flows from the watershed, which can be different from the actual flows due to the uncertainties caused by rainfall and other parameters. In addition to uncertainty associated with the watershed inflows, the ocean inlet can change due to the sediment deposition and erosion by strong wave and/or flood tides during the simulation period. Changes in ocean inlet bathymetry can also affect the exchange of ocean water and the resulting water surface elevation. Note that for the entire calibration period (10/1/2007 – 2/28/2008), the ocean inlet was open with closures starting to occur sometime in March of 2008 as indicated in the Los Peñasquitos Lagoon TMDL monitoring report (City of San Diego, 2009)

Lagoon water temperature is mainly governed by the temperature associated with watershed inflows, ocean water temperature, and meteorological conditions. Modeled water temperature agrees well with observed water temperature at both of the monitoring locations. The model slightly over-predicted water temperature in the beginning of the simulation. This was mainly due to the open boundary water temperature data used in the model. Water temperature data were from the La Jolla station, which is approximately 5 miles south of the lagoon.
4 shows the temperature calibration at the two locations.

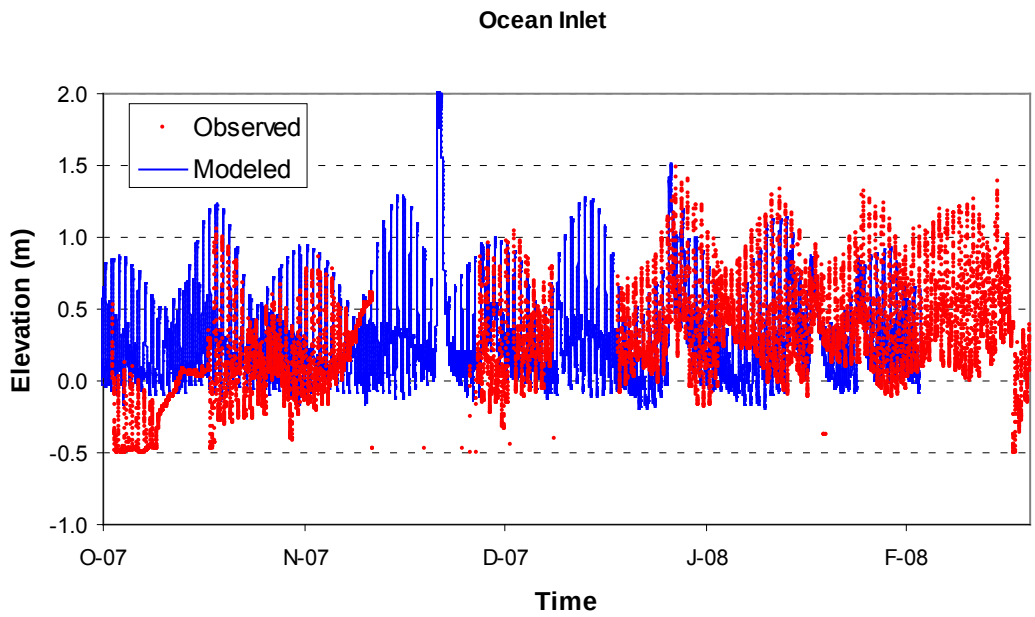

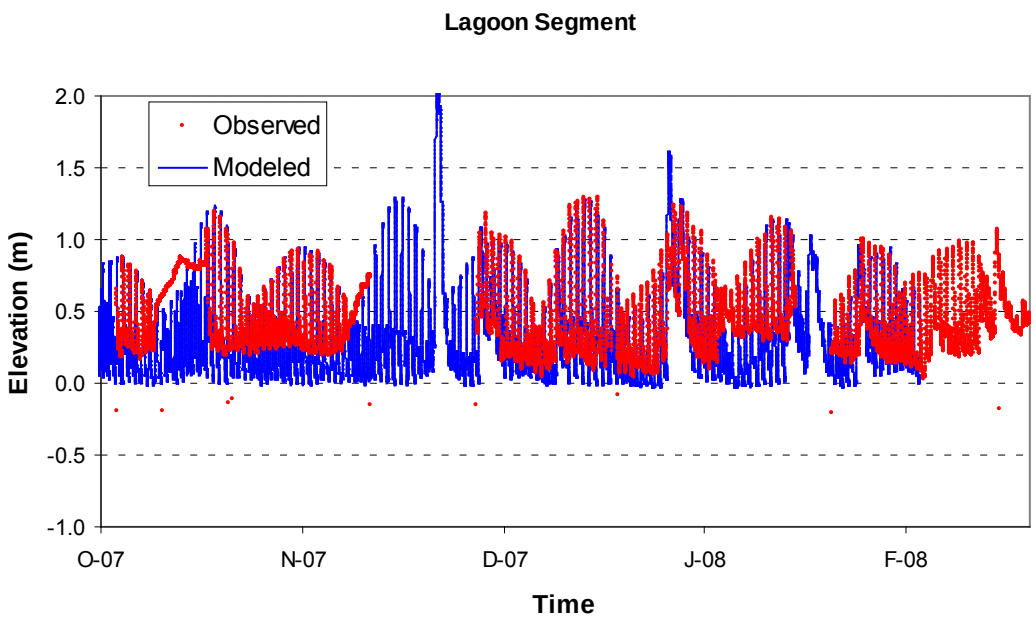

Figure 43. Water surface elevation calibration results

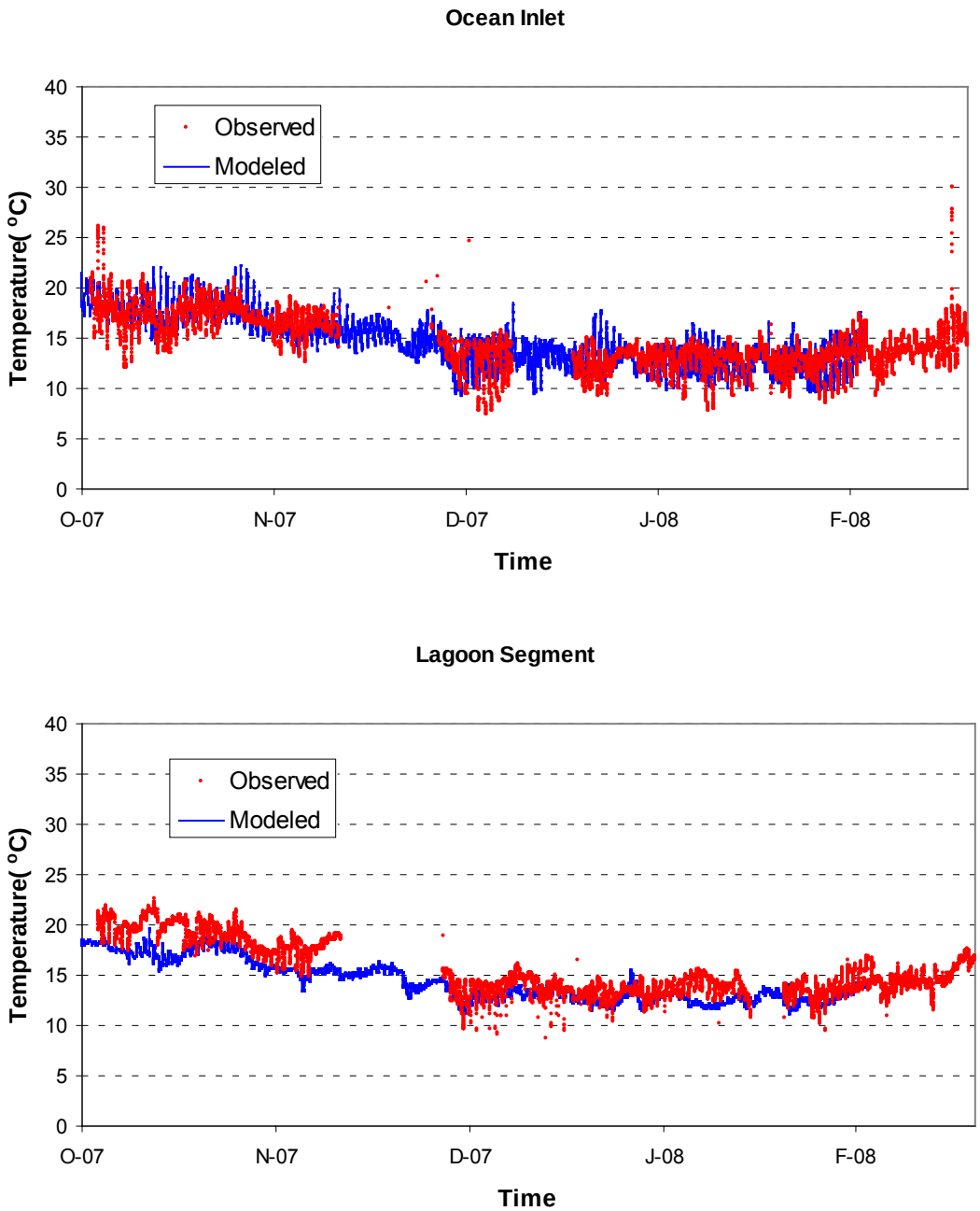

Figure 44. Temperature calibration results

Figure 45 presents the modeled and measured salinity results at the three lagoon monitoring stations. Overall, the model captured the fluctuation of salinity caused by the exchange of the ocean water and freshwater from watershed. Whenever there are storm events, the lagoon salinity decreases significantly. Salinity also changes along with the flood and ebb tides. Modeled salinity at the Ocean Inlet location agrees well with salinity data which were converted from specific conductance in terms of magnitude and fluctuation. The model under-predicted the fluctuation frequency of salinity at the Lagoon Segment location. Because the lagoon is very small compared to the watershed area, freshwater inflow has significant impact on salinity in the lagoon. The uncertainties associated with the estimation of the watershed inflows can be transported to the lagoon. In addition,

the lagoon mouth is constantly changing, but the model can only represent a fixed configuration. This approximation also brings in uncertainties in the model to calculate the salt water entering the lagoon. There are also questions related to the accuracy of the monitoring data. For example, salinity levels at the Lagoon Segment location are frequently higher than salinity levels at the Ocean Inlet location. Salinity levels at the Lagoon Segment and Ocean Inlet show a strong fluctuation in a relatively short time period, while salinities observed by the Los Peñasquitos Lagoon Foundation at station W2 show consistent high salinity during dry weather conditions. Therefore, these data can only serve for qualitative evaluation of the model performance.

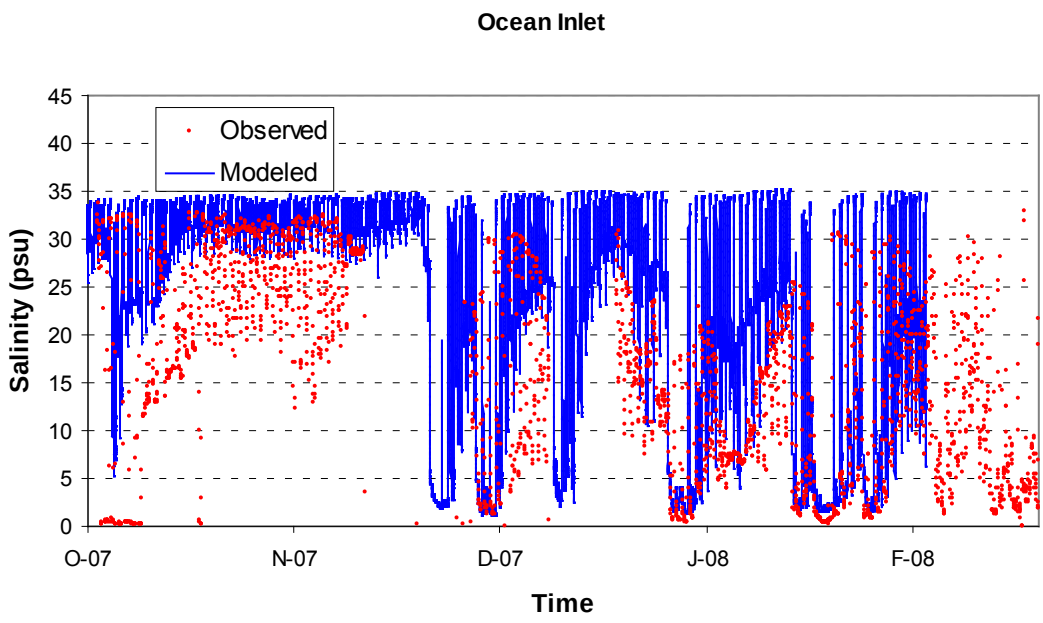

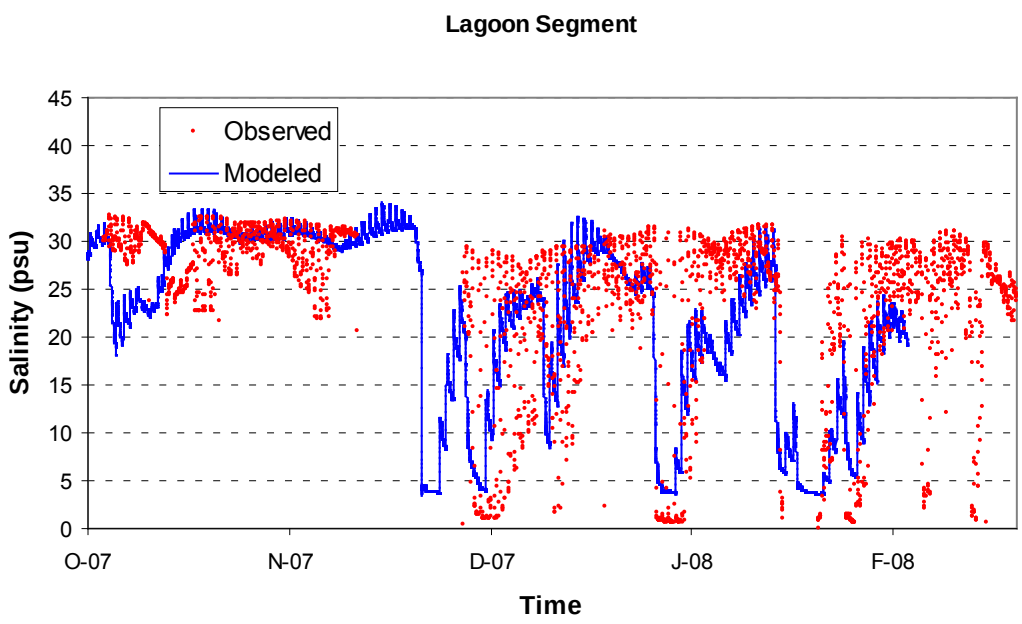

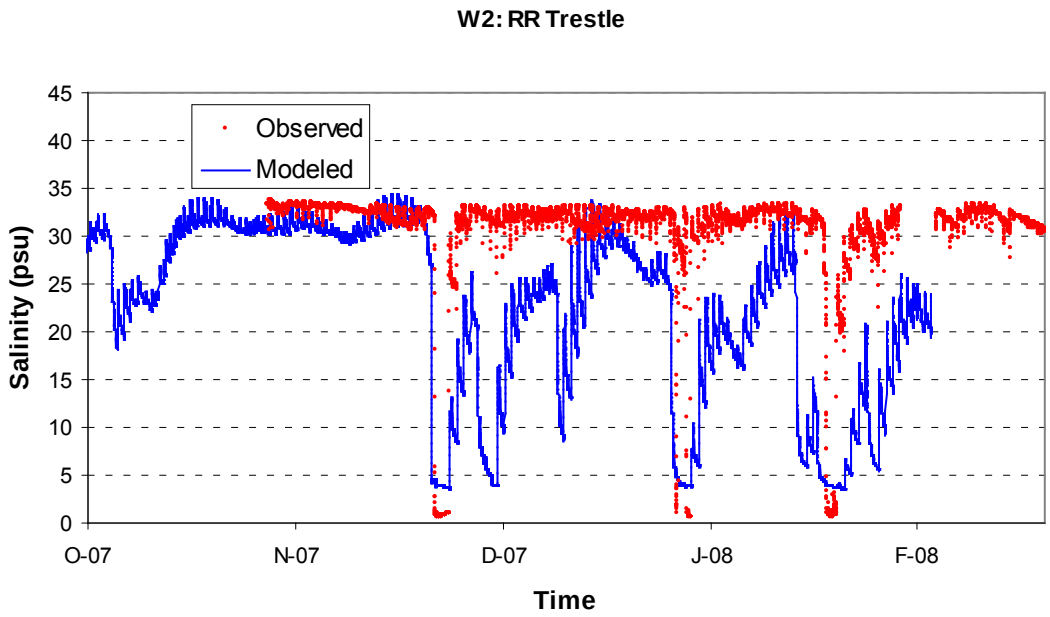

Figure 45. Salinity Calibration results for all stations (including Station W2)

Sediment Calibration

Sediment modeling in the lagoon mainly focused on the deposition and re-suspension of sand, slit, and clay fractions. The bed load transport of sand and silt was not modeled due to the lack of data needed for model representation. Sediment calibration mainly included adjustment of settling velocities for sediment deposition and critical shear stresses for sediment re-suspension. In addition, sand carried into the lagoon from the beach by flood tide represents a major source of sand based on the sediment bottom monitoring results. Monitoring was not conducted to measure the sand carried by the flood tide entering the lagoon; therefore, the concentrations of sediment at the open ocean boundary of the reduced grid were estimated during calibration. Modeled sediment components were compared against observed data during calibration.

TSS calibration plots for the Ocean Inlet and Lagoon Segment monitoring locations are shown in Figures 46 through 71. The entire calibration period is shown (Figures 46 and 59), as well as individual plots for each of the three storm events that occurred during the calibration period (Figures 47 through 49; Figures 60 through 62). In general, the model is able to capture the main pattern of sediment transport in the lagoon, which is related to storm events. The lagoon sediment in the water column increases during storm events due to the high watershed loading of sediment associated with storm events. Because the lagoon is sensitive to the watershed loadings, uncertainties associated with watershed modeling are transported to the lagoon modeling. The timing of modeled peak flow can be shifted several hours (earlier or later) and the peak concentrations of sediment may be different as compared to the observed data. For example, there appears to be a time lag in the TSS calibration results at the Lagoon Segment station (refer to Figure 60). Flow data collected at the MLS station on Los Peñasquitos Creek also indicate possible timing differences with the watershed model results, however, other information including the flow calibration results at the USGS gage upstream, TSS calibration results at each pollutograph station, and TSS calibration results at the Ocean Inlet station all indicate a good correlation with respect to time. Note that TSS grab samples were not collected at the Lagoon Segment station on 11/30/07 due to sampling problems; therefore, TSS samples were first collected on 12/1/07. Other data limitations are discussed below.

The calibration results for the Lagoon Segment station for the two later storm events (12/7/2007 and 2/3/2008) do not match because watershed flow into the lagoon during these storm events is relatively low in comparison to the first storm event (11/30/2007) (refer to Figures 59 through 62). Watershed contributions have a much greater influence on water quality conditions at this station, versus the Ocean Inlet station which showed better agreement in the calibration results. TSS calibration results for the watershed model showed good agreement for Carmel Creek; therefore, it is expected that TSS contributions from the watershed were correct. The lagoon model response for TSS was proportionate to the flow and sediment contributions from the watershed for all three storm events. It is also interesting to note that the TSS measurements from the Lagoon Segment station were similar in magnitude between the first and third storms, although watershed flows into the lagoon were much higher during the first storm. There may also be significant localized processes that affected TSS concentrations. For example, localized scour of bed or bank sediment may occur during storm events with high water velocity. The model represents the averaged condition of the channel and uses average width and depth for each grid cell. The modeled velocity for each grid cell represents average velocity and is, therefore, lower than the actual maximum velocity that can occur. Higher velocities can cause scouring and increase the sediment concentration locally, while the model will not mimic such local phenomenon. Other factors may also cause a discrepancy in the calibration results, including possible data quality issues, sample collection methods, and spatial differences in TSS concentration within lagoon channels (depth, distance from bank, etc.).

A detailed comparison of the three sediment size classes for both stations is also shown (Figures 50 through 58; Figures 63 through 71). Observed sand, silt, and clay fractions were estimated based on the TSS measurements and particle size distribution data that were derived from water column samples collected during the 11/30/07 monitoring event at these two locations. Among the three sediment classes modeled, sand is under-predicted. Sand from the ocean and watershed can settle out quickly due to its high settling velocity. Sand also moves throughout the lagoon primarily through bed load transport processes; therefore, sand concentrations near the bottom can be much higher than concentrations near the water surface. Modeled silt and clay fractions show better agreement with observed data at both stations. Note that the watershed model was calibrated using TSS rather than the individual sediment fractions. Also, particle size distributions for the observed data were based on sample results from one monitored storm event (11/30/2007). TSS data for all three storm events were separated into the three sediment classes based on the results from this single event. In addition, the particle size distribution for suspended sediment is highly time variable because of the different settling velocities for sand, silt, and clay fractions; therefore the size distribution from one storm sample cannot fully represent the size distribution of sediment throughout each storm event. Given the uncertainty of the sediment particle size distributions, model calibration focused on TSS and individual sediment class data only serve as supplemental evaluation of model performance.

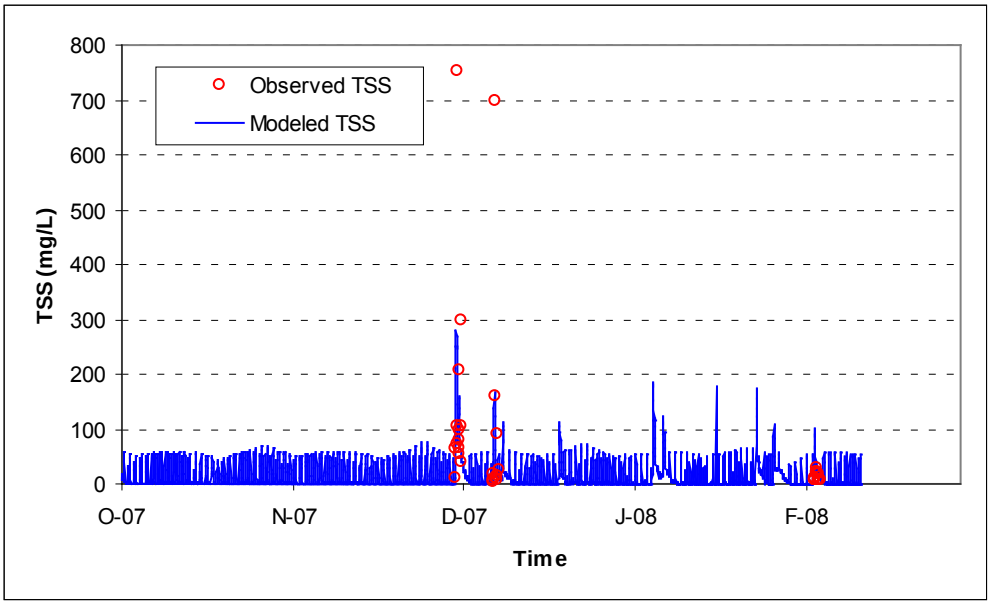

Figure 46. TSS calibration at Ocean Inlet – entire calibration period

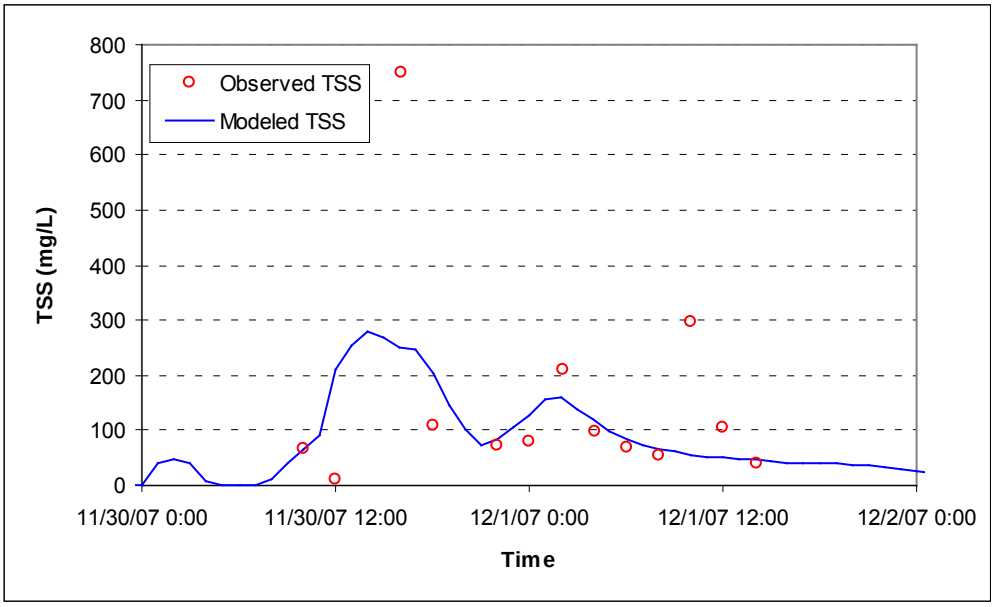

Figure 47. TSS calibration at Ocean Inlet – 11/30/2007 storm

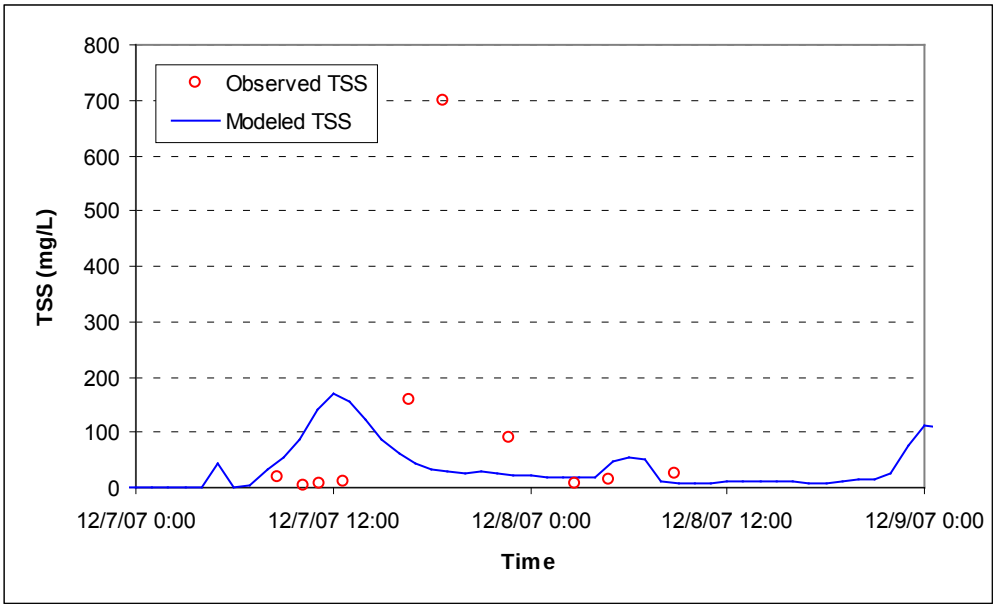

Figure 48. TSS calibration at Ocean Inlet – 12/7/2007 storm

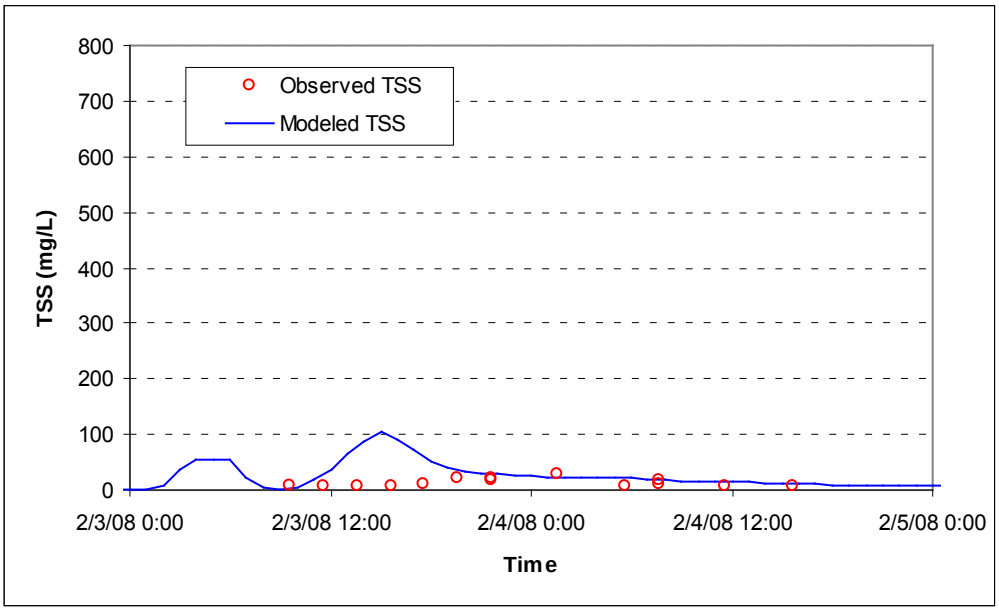

Figure 49. TSS calibration at Ocean Inlet – 2/3/2008 storm

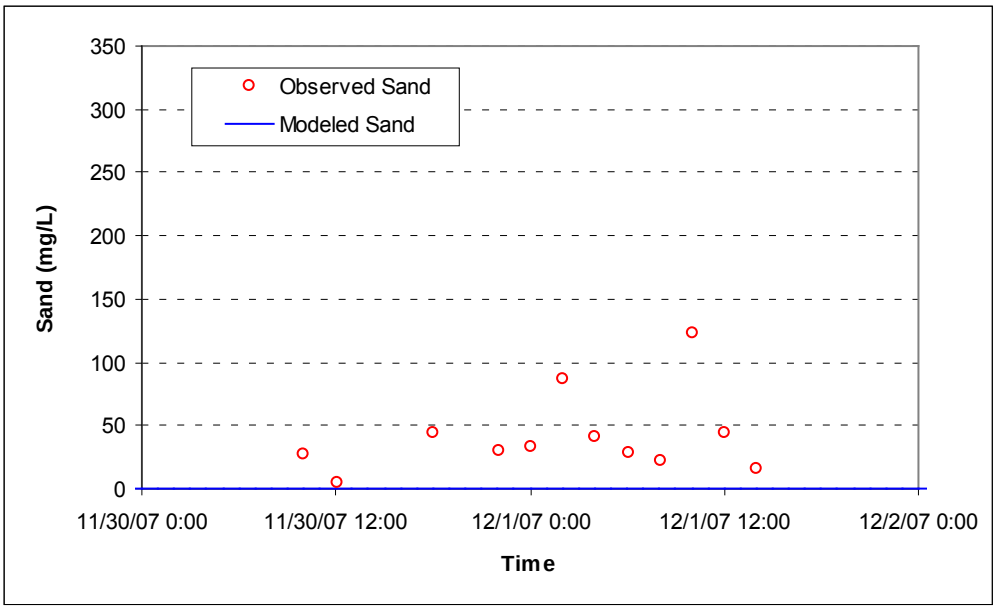

Figure 50. Modeled vs. observed sand fraction at Ocean Inlet – 11/30/2007 storm

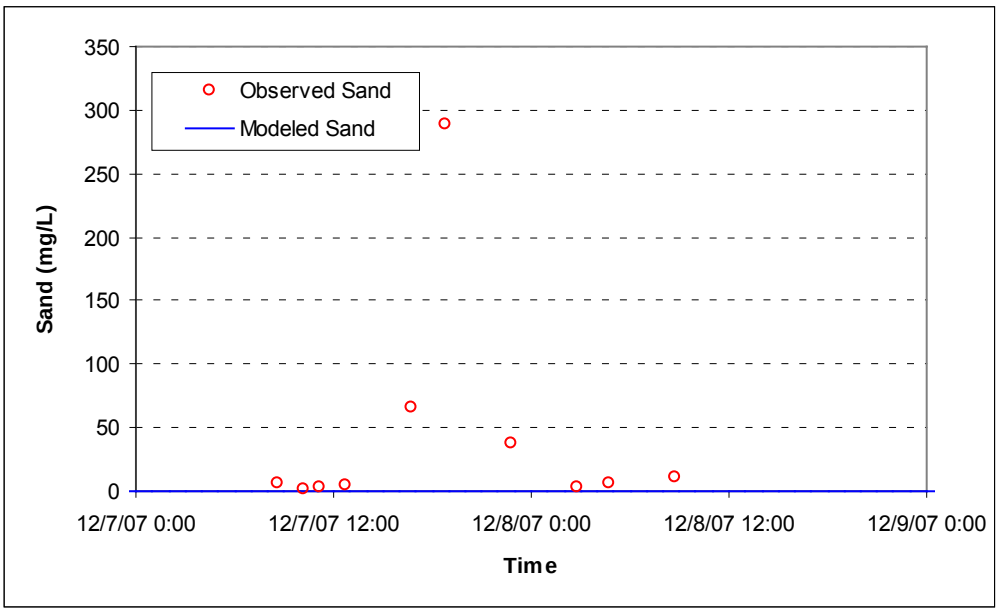

Figure 51. Modeled vs. observed sand fraction at Ocean Inlet – 12/7/2007 storm

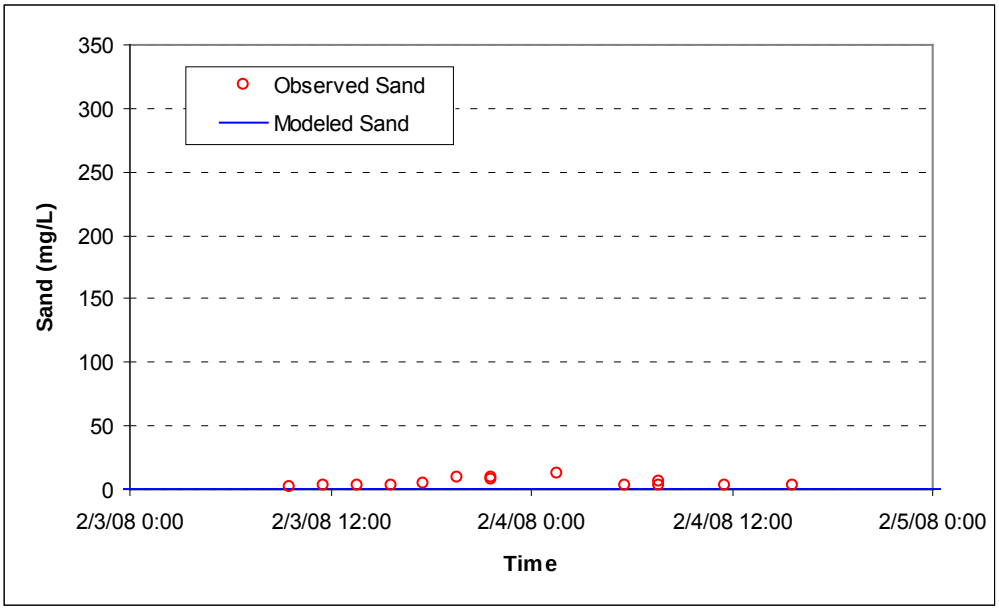

Figure 52. Modeled vs. observed sand fraction at Ocean Inlet – 2/3/2008 storm

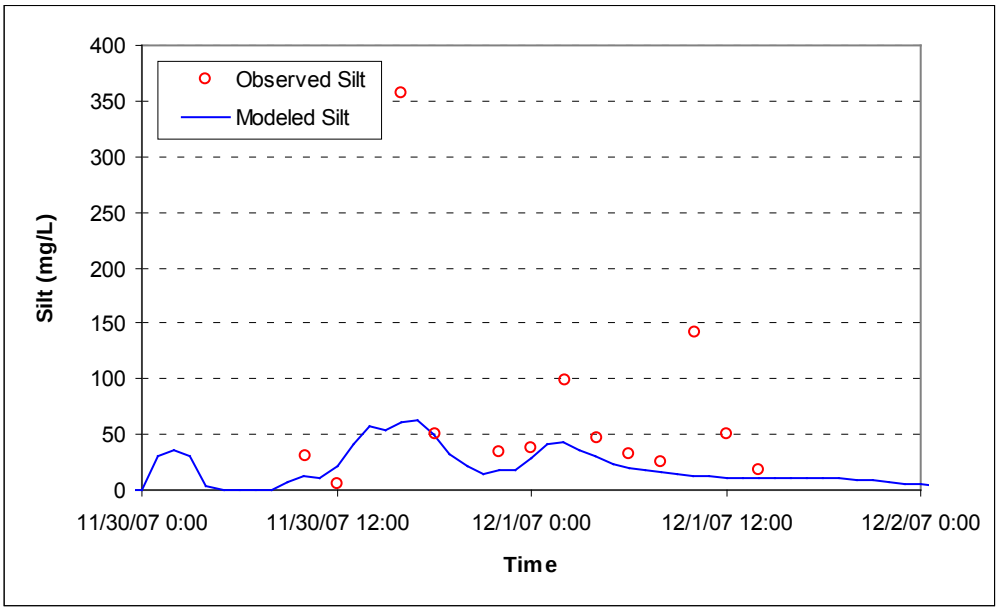

Figure 53. Modeled vs. observed silt fraction at Ocean Inlet – 11/30/2007 storm

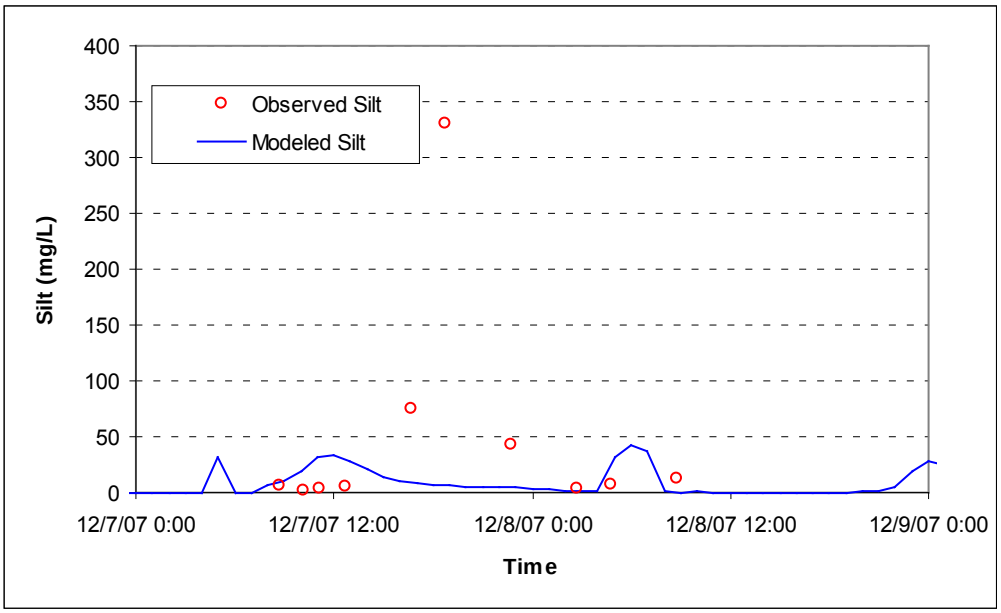

Figure 54. Modeled vs. observed silt fraction at Ocean Inlet – 12/7/2007 storm

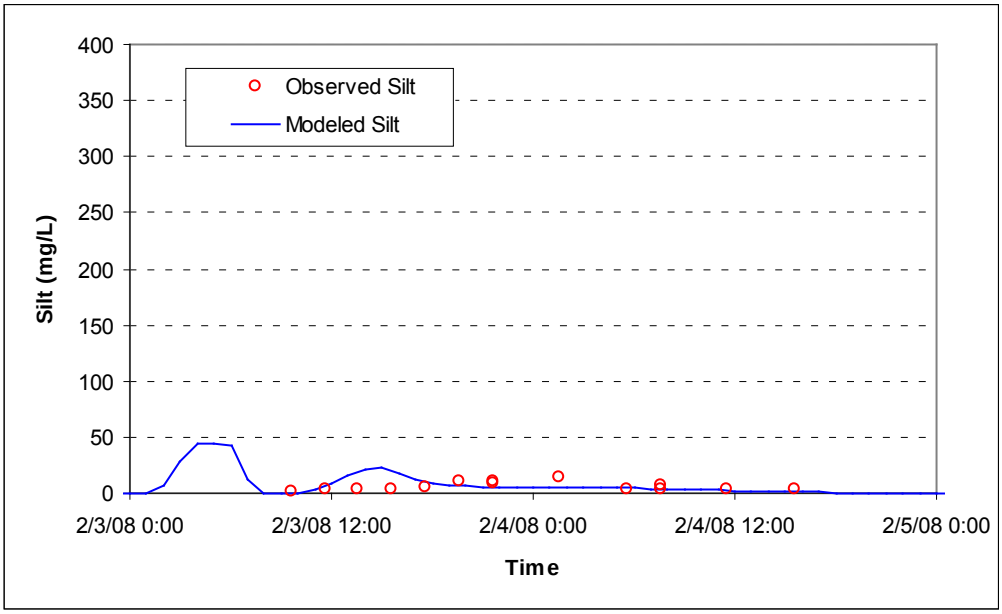

Figure 55. Modeled vs. observed silt fraction at Ocean Inlet – 2/3/2008 storm

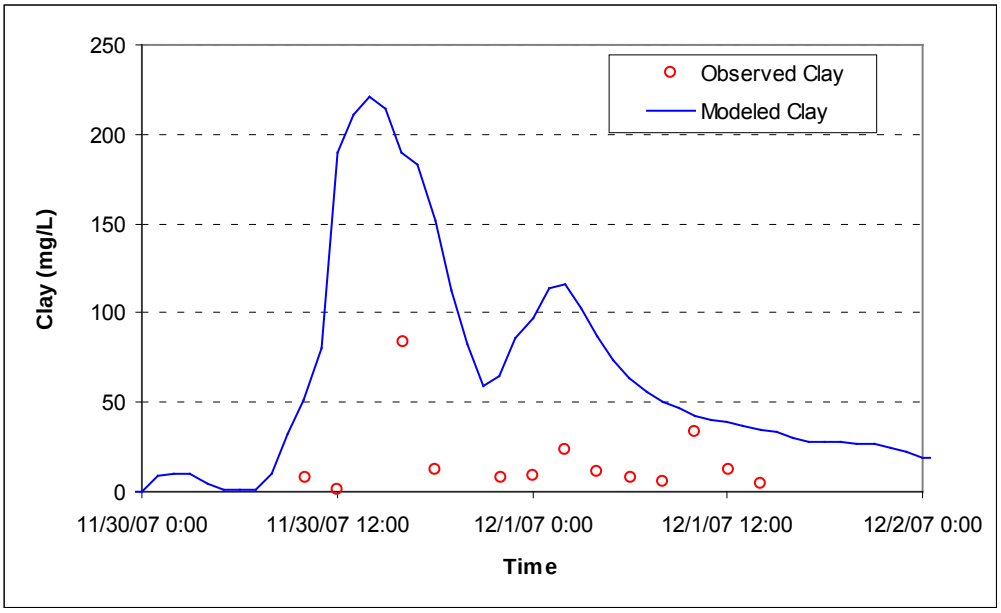

Figure 56. Modeled vs. observed clay fraction at Ocean Inlet – 11/30/2007 storm

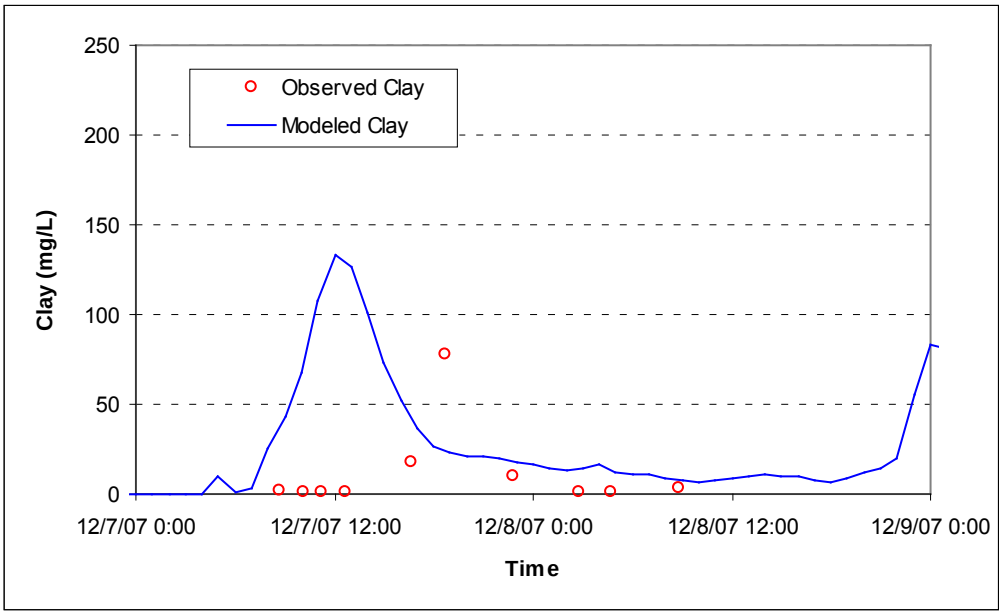

Figure 57. Modeled vs. observed clay fraction at Ocean Inlet – 12/7/2007 storm

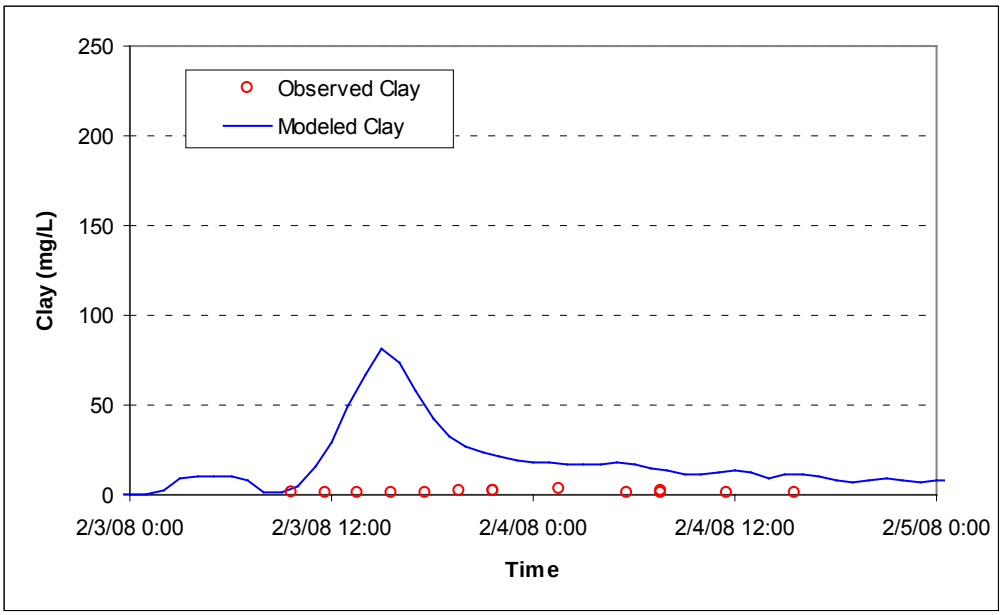

Figure 58. Modeled vs. observed clay fraction at Ocean Inlet – 2/3/2008 storm

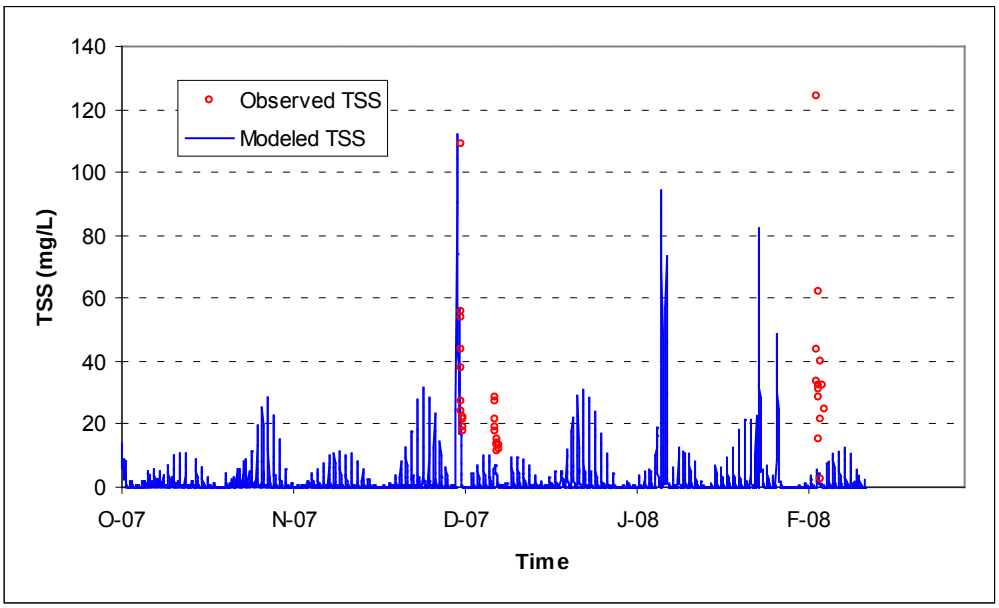

Figure 59. TSS calibration at Lagoon Segment – entire calibration period

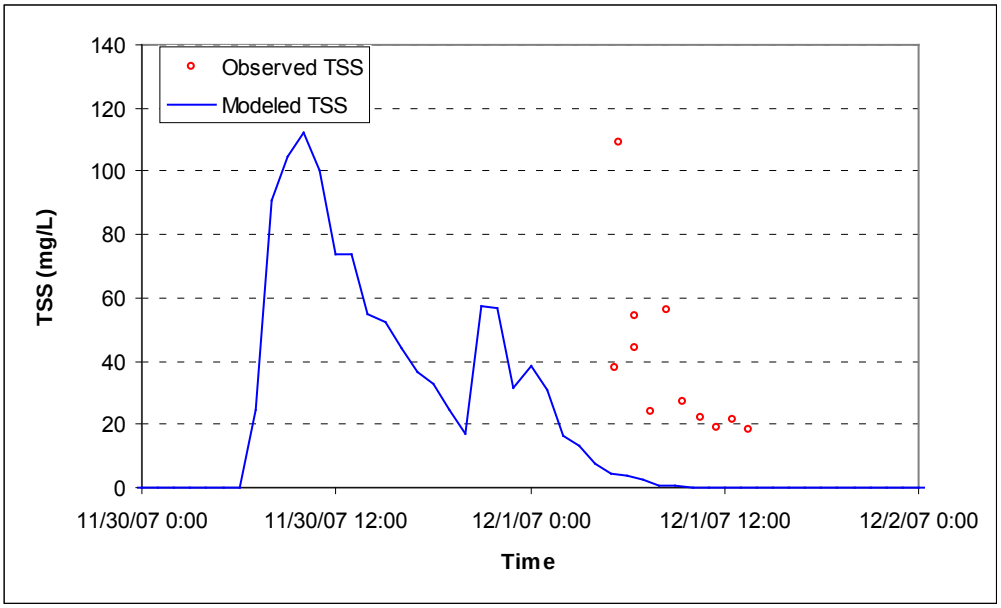

Figure 60. TSS calibration at Lagoon Segment – 11/30/2007 storm

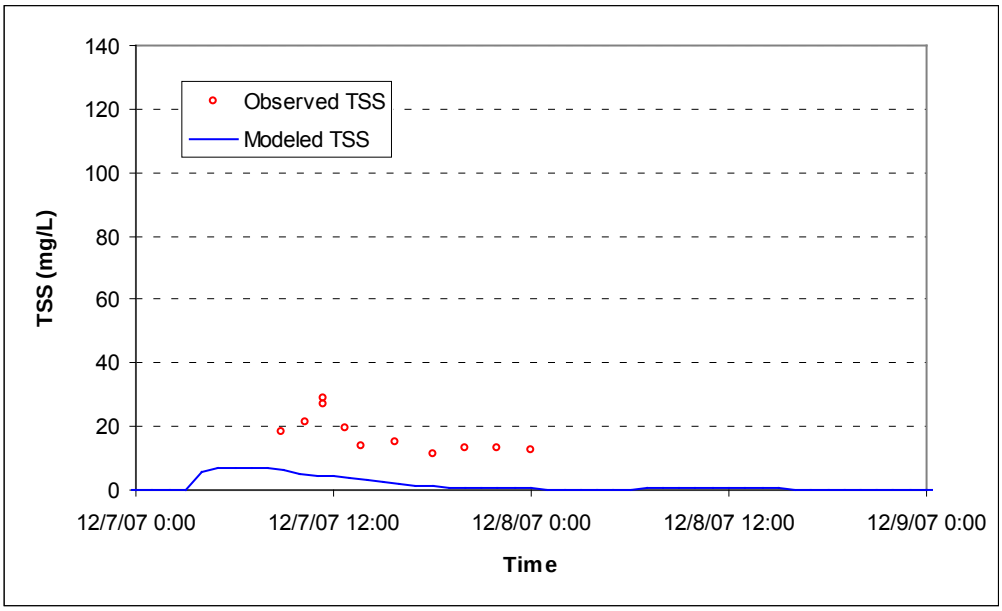

Figure 61. TSS calibration at Lagoon Segment – 12/7/2007 storm

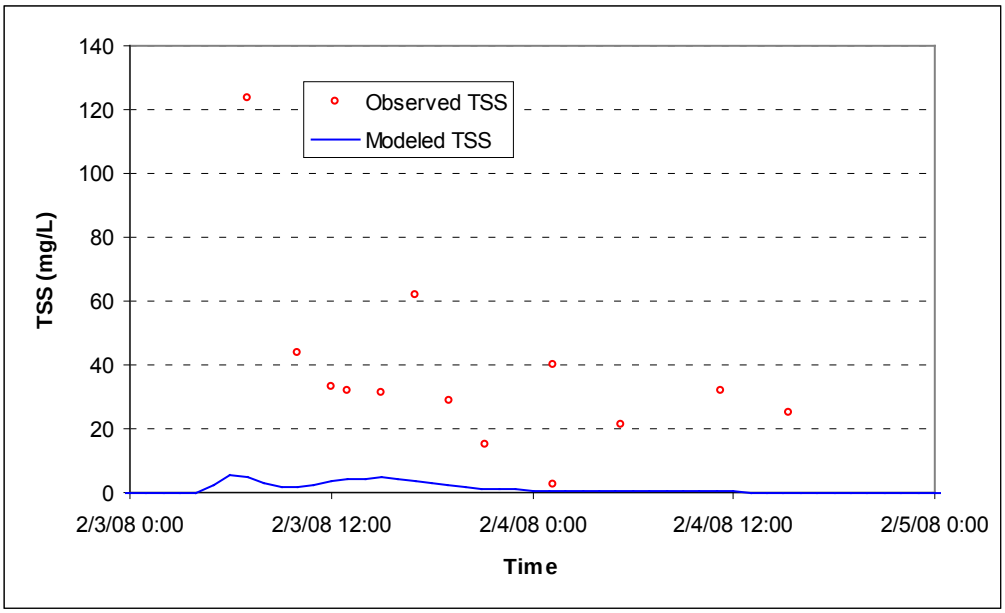

Figure 62. TSS calibration at Lagoon Segment – 2/3/2008 storm

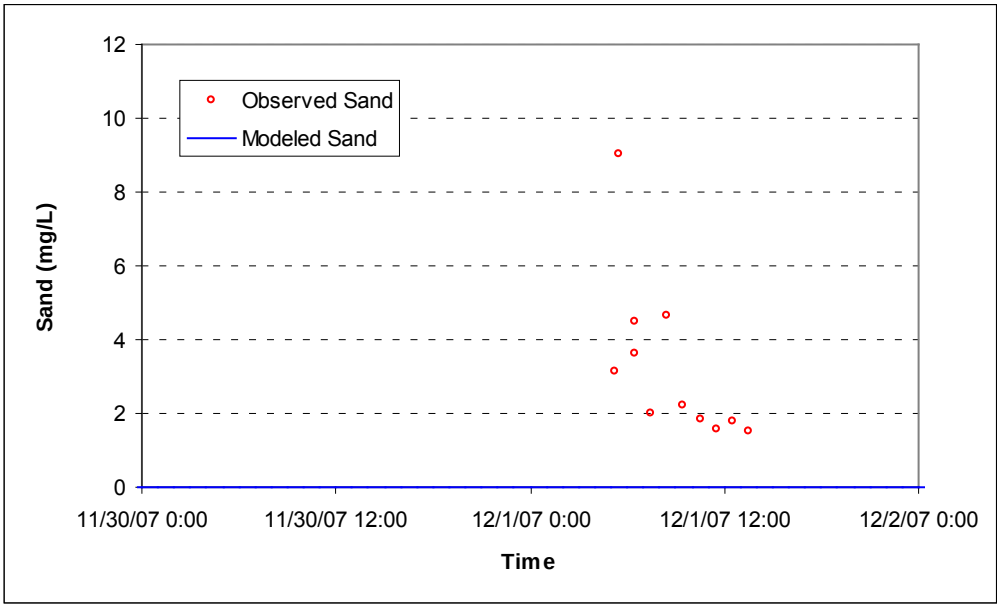

Figure 63. Modeled vs. observed sand fraction at Lagoon Segment – 11/30/2007 storm

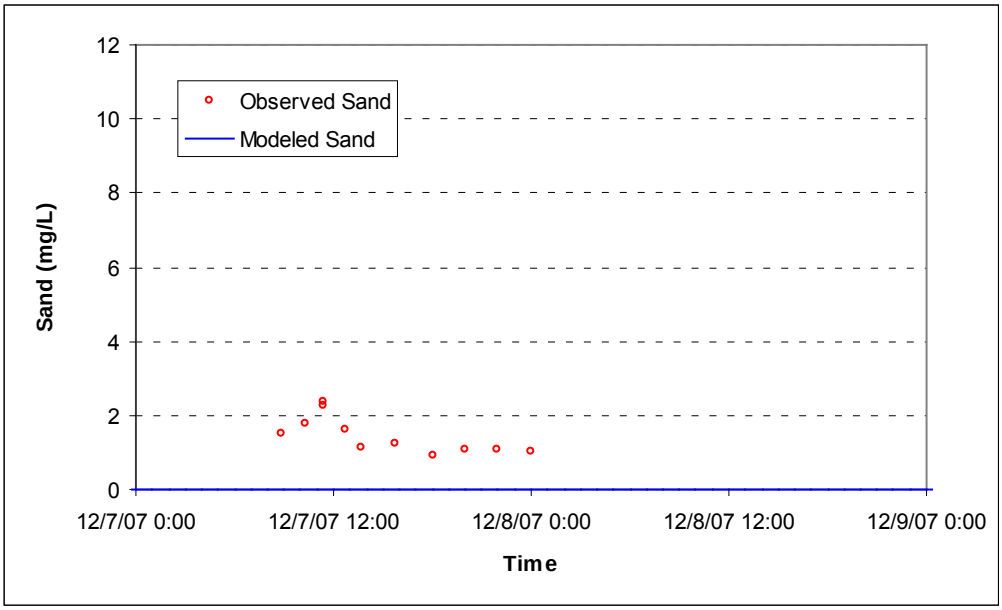

Figure 64. Modeled vs. observed sand fraction at Lagoon Segment – 12/7/2007 storm

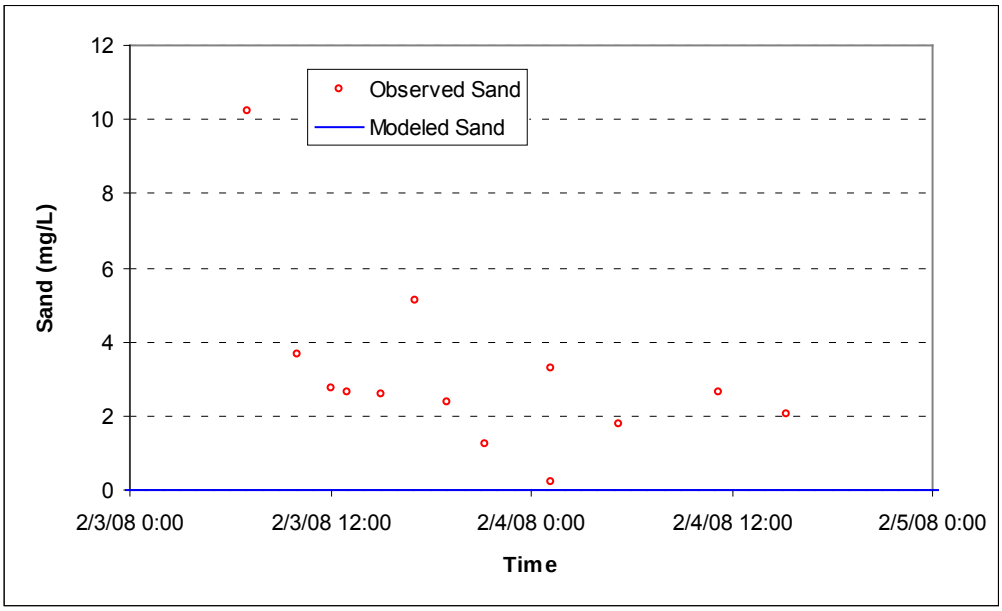

Figure 65. Modeled vs. observed sand fraction at Lagoon Segment – 2/3/2008 storm

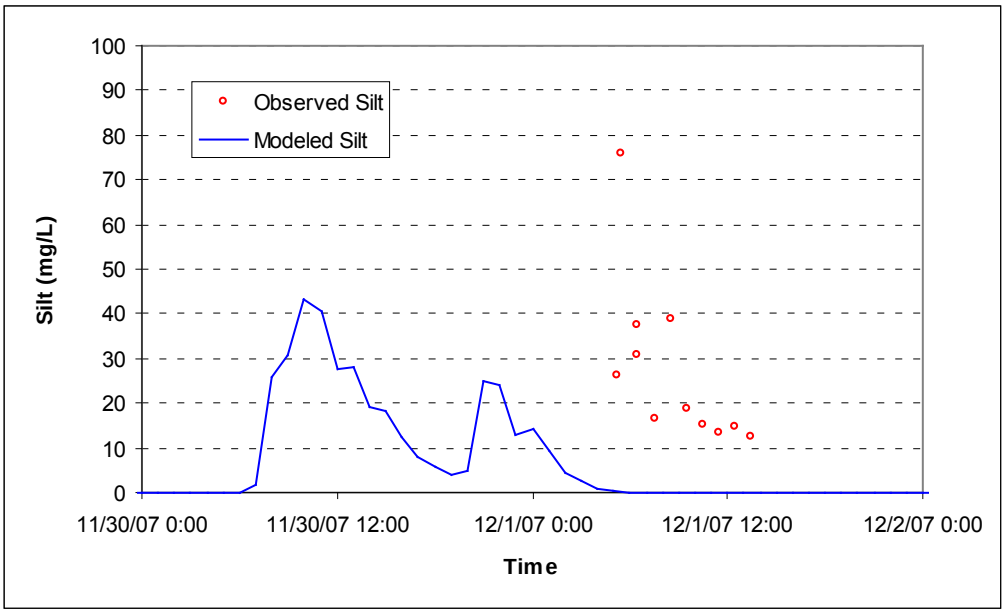

Figure 66. Modeled vs. observed silt fraction at Lagoon Segment – 11/30/2007 storm

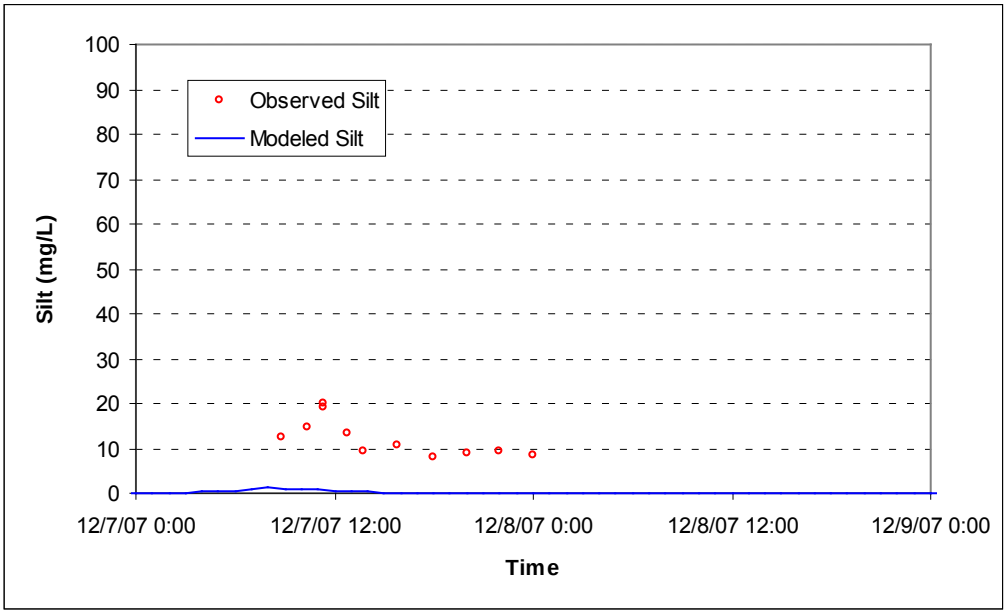

Figure 67. Modeled vs. observed silt fraction at Lagoon Segment – 12/7/2007 storm

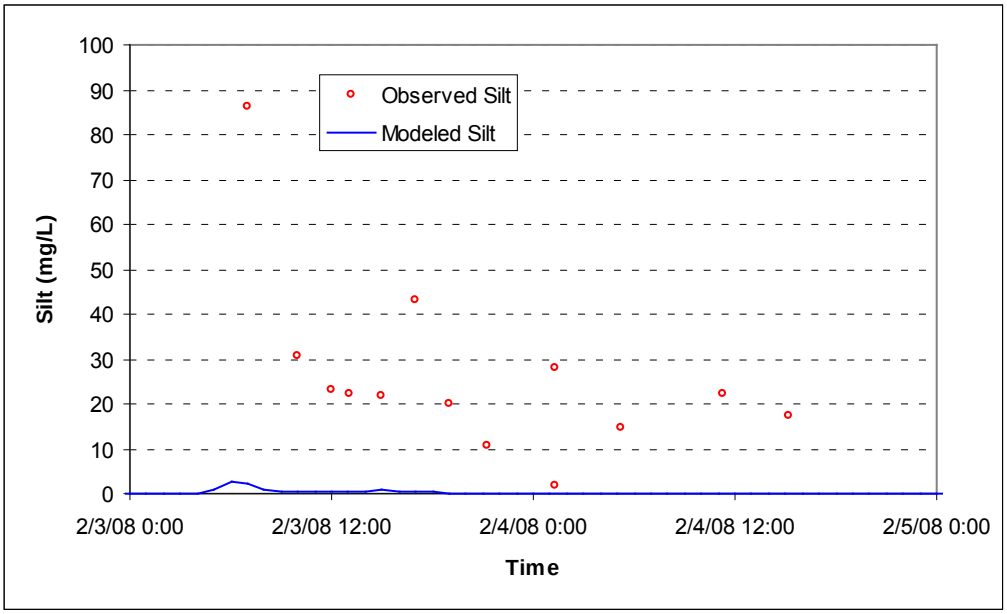

Figure 68. Modeled vs. observed silt fraction at Lagoon Segment – 2/3/2008 storm

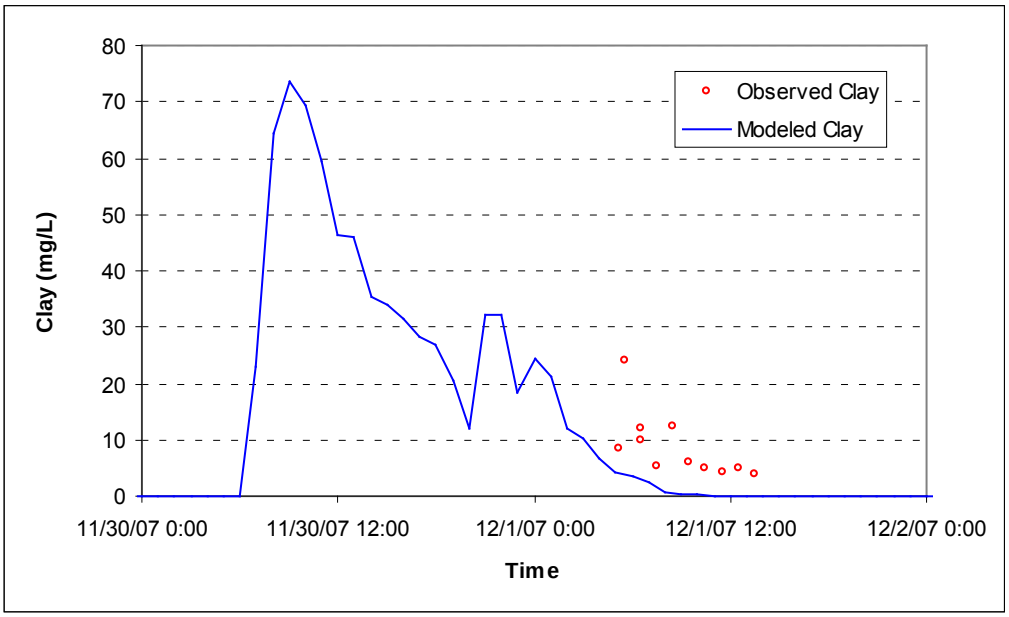

Figure 69. Modeled vs. observed clay fraction at Lagoon Segment – 11/30/2007 storm

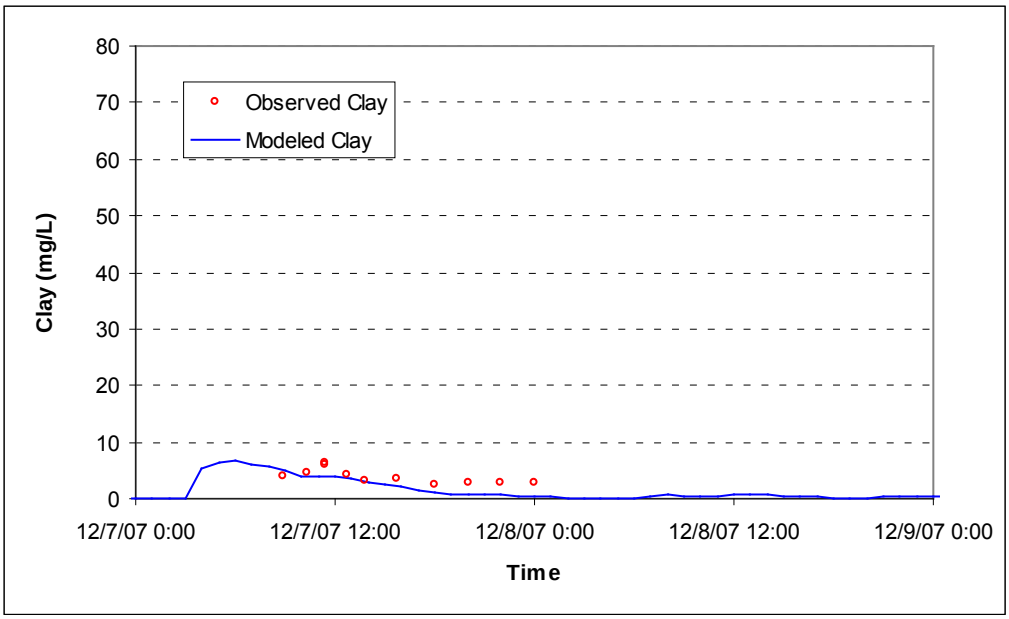

Figure 70. Modeled vs. observed clay fraction at Lagoon Segment – 12/7/2007 storm

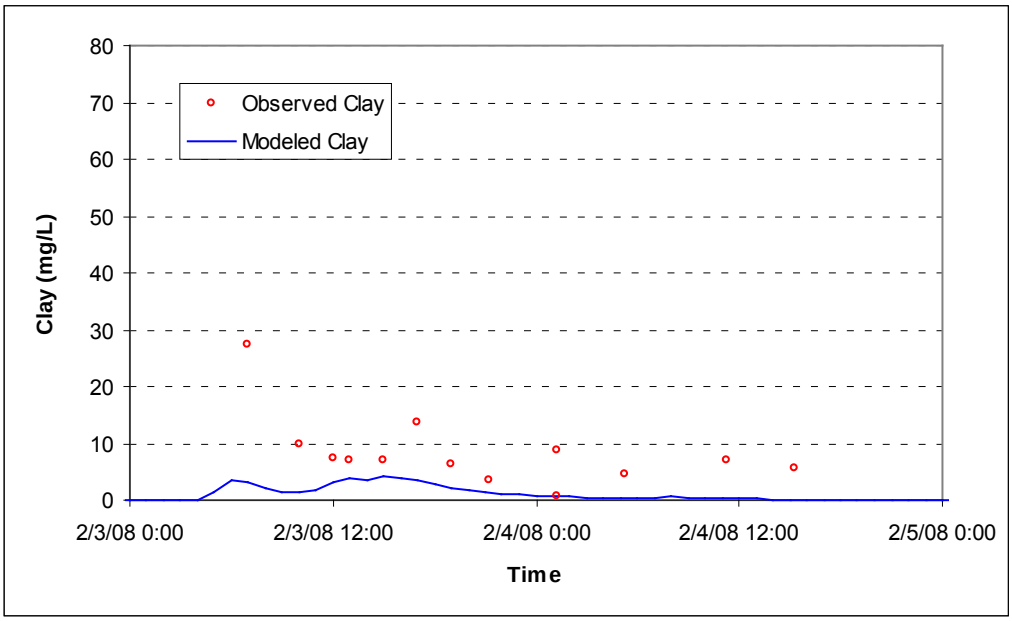

Figure 71. Modeled vs. observed clay fraction at Lagoon Segment – 2/3/2008 storm

Summary and Conclusions

A dynamic model was developed for the Los Peñasquitos Lagoon for simulating the transport of sediment through the lagoon using the EFDC framework. The model considered the ocean and watershed contributions of sediment. Model development involved two steps. In the first step, the model grid was extended into the ocean to use the tide elevation, salinity, and water temperature in the open ocean to drive the simulation of hydrodynamic conditions. After hydrodynamic calibration, the model was run using a reduced grid that incorporated the modeled water surface elevation, salinity, and water temperature at the immediate outside of the ocean inlet as the driving boundary conditions because the open ocean sediment conditions are significantly different from those at the ocean inlet. The sediment model was then calibrated using the reduced grid.

The Los Peñasquitos modeling framework can be used to simulate various management scenarios and for TMDL development purposes. In order to examine management scenarios related to controlling ocean and/or watershed inputs of sediment, model boundary conditions, the watershed model configuration, and the lagoon model grid can all be modified accordingly. For example, if the ocean inlet is widened, the model grid size can be increased at the ocean inlet. The application of BMPs within the watershed to control sediment input to the lagoon can also be examined through modifications to the sediment time series from the watershed, based on estimated BMP efficiencies, which can then be used to examine future changes in lagoon conditions. For management scenarios that involve dredging and other lagoon modifications, initial sediment bed conditions, such as the particle size distributions, can be updated accordingly.

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Appendix A: Model Hydrology Parameters

Table A-1. 110 pwat-parm2

defid	deluid	lzsn	infilt	kvary	agwrc
2	1	3.4	0.01	0.2	0.99
2	2	3.4	0.01	0.2	0.99
2	3	3.4	0.01	0.2	0.99
2	4	3.4	0.01	0.2	0.99
2	5	8	0.33	0.2	0.99
2	6	4	0.01	0.2	0.99
2	7	4.5	0.3	0.2	0.99
2	8	6.2	0.35	0.2	0.99
2	9	6.2	0.35	0.2	0.99
2	10	6.2	0.35	0.2	0.99
2	11	6.3	0.4	0.2	0.99
2	13	4.5	0.4	0.2	0.99
2	14	4	0.01	0.2	0.99
2	15	4	0.01	0.2	0.99
2	16	4	0.01	0.2	0.99
2	17	4	0.01	0.2	0.99
2	18	4	0.01	0.2	0.99
2	19	4	0.01	0.2	0.99
2	1	3.5	0.01	0.2	0.99
2	2	3.5	0.01	0.2	0.99
2	3	3.5	0.01	0.2	0.99
2	4	3.5	0.01	0.2	0.99
2	5	6.4	0.31	0.2	0.99
2	6	5	0.01	0.2	0.99
2	7	5.3	0.25	0.2	0.99
2	8	6.4	0.3	0.2	0.99
2	9	6.4	0.3	0.2	0.99
2	10	6.4	0.3	0.2	0.99
2	11	5	0.2	0.2	0.99
2	13	4.7	0.05	0.2	0.99
2	14	3.7	0.01	0.2	0.99
2	15	3.7	0.01	0.2	0.99
2	16	3.7	0.01	0.2	0.99
2	17	3.7	0.01	0.2	0.99
2	18	3.7	0.01	0.2	0.99
2	19	3.7	0.01	0.2	0.99
2	1	3.6	0.01	0.2	0.99
2	2	3.6	0.01	0.2	0.99
2	3	3.6	0.01	0.2	0.99
2	4	3.6	0.01	0.2	0.99
2	5	8	0.3	0.2	0.99
2	6	5.3	0.01	0.2	0.99
2	7	5.5	0.23	0.2	0.99
2	8	6.5	0.23	0.2	0.99
2	9	6.5	0.23	0.2	0.99
2	10	6.5	0.23	0.2	0.99
2	11	5	0.1	0.2	0.99
2	13	4.7	0.05	0.2	0.99
2	14	3.8	0.01	0.2	0.99
2	15	3.8	0.01	0.2	0.99
2	16	3.8	0.01	0.2	0.99
2	17	3.8	0.01	0.2	0.99
2	18	3.8	0.01	0.2	0.99
2	19	3.8	0.01	0.2	0.99
2	1	3.4	0.01	0.2	0.99
2	2	3.4	0.01	0.2	0.99
2	3	3.4	0.01	0.2	0.99
2	4	3.4	0.01	0.2	0.99
2	5	8	0.33	0.2	0.99
2	6	4	0.01	0.2	0.99
2	7	4.5	0.3	0.2	0.99
2	8	6.2	0.35	0.2	0.99
2	9	6.2	0.35	0.2	0.99
2	10	6.2	0.35	0.2	0.99
2	11	6.3	0.4	0.2	0.99
2	13	4.5	0.4	0.2	0.99
2	14	4	0.01	0.2	0.99
2	15	4	0.01	0.2	0.99
2	16	4	0.01	0.2	0.99
2	17	4	0.01	0.2	0.99
2	18	4	0.01	0.2	0.99
2	19	4	0.01	0.2	0.99

defid parameter group id
deluid land use id
lzsn lower zone nominal soil moisture storage (inches)
infilt index to the infiltration capacity of the soil (in/hr)
kvary variable groundwater recession (1/inches)
agwrc base groundwater recession (none)

Table A-2. 120 pwat-parm3

defid	deluid	petmax	petmin	infexp	infild	deepfr	basetp	agwetp
2	1	40	35	2	2	0.1	0	0.01
2	2	40	35	2	2	0.1	0	0.01
2	3	40	35	2	2	0.1	0	0.01
2	4	40	35	2	2	0.1	0	0.01
2	5	40	35	2	2	0.1	0.03	0.05
2	6	40	35	2	2	0.1	0	0.01
2	7	40	35	2	2	0.1	0	0.01
2	8	40	35	2	2	0.1	0	0.01
2	9	40	35	2	2	0.1	0	0.05
2	10	40	35	2	2	0.1	0	0.05
2	11	40	35	2	2	0.1	0.03	0.03
2	13	40	35	2	2	0.1	0	0.03
2	14	40	35	2	2	0.1	0	0
2	15	40	35	2	2	0.1	0	0
2	16	40	35	2	2	0.1	0	0
2	17	40	35	2	2	0.1	0	0
2	18	40	35	2	2	0.1	0	0
2	19	40	35	2	2	0.1	0	0
3	1	40	35	2	2	0.1	0	0.01
3	2	40	35	2	2	0.1	0	0.01
3	3	35	30	2	2	0.1	0	0.01
3	4	35	30	2	2	0.1	0	0.01
3	5	40	35	2	2	0.1	0.03	0.05
3	6	40	35	2	2	0.1	0	0.01
3	7	40	35	2	2	0.1	0	0.01
3	8	40	35	2	2	0.1	0	0.01
3	9	40	35	2	2	0.1	0	0.05
3	10	40	35	2	2	0.1	0	0.05
3	11	40	35	2	2	0.1	0.02	0.03
3	13	40	35	2	2	0.1	0	0.03
3	14	35	30	2	2	0.1	0	0
3	15	40	35	2	2	0.1	0	0
3	16	40	35	2	2	0.1	0	0
3	17	35	30	2	2	0.1	0	0
3	18	40	35	2	2	0.1	0	0
3	19	40	35	2	2	0.1	0	0
4	1	40	35	2	2	0.1	0	0.01
4	2	40	35	2	2	0.1	0	0.01
4	3	40	35	2	2	0.1	0	0.01
4	4	40	35	2	2	0.1	0	0.01
4	5	40	35	2	2	0.1	0.03	0.05
4	6	40	35	2	2	0.1	0	0.01
4	7	40	35	2	2	0.1	0	0.01
4	8	40	35	2	2	0.1	0	0.01
4	9	40	35	2	2	0.1	0	0.05

defid	deluid	petmax	petmin	infexp	infild	deepfr	basetp	agwetp
4	10	40	35	2	2	0.1	0	0.05
4	11	40	35	2	2	0.1	0.02	0.03
4	13	40	35	2	2	0.1	0	0.03
4	14	40	35	2	2	0.1	0	0
4	15	40	35	2	2	0.1	0	0
4	16	40	35	2	2	0.1	0	0
4	17	40	35	2	2	0.1	0	0
4	18	40	35	2	2	0.1	0	0
4	19	40	35	2	2	0.1	0	0

defid parameter group id

deluid land use id

petmax air temperature below which e-t will is reduced (deg F)

petmin air temperature below which e-t is set to zero (deg F)

infexp exponent in the infiltration equation (none)

infild ratio between the maximum and mean infiltration capacities over the PLS (none)

deepfr fraction of groundwater inflow that will enter deep groundwater (none)

basetp fraction of remaining potential e-t that can be satisfied from baseflow (none)

agwetp fraction of remaining potential e-t that can be satisfied from active groundwater (none)

Table A-3. 130 pwat-parm4

defid	deluid	cepsc	uzsn	nsur	intfw	irc	lzetp
2	1	0.08	0.204	0.2	1	0.5	0.3
2	2	0.08	0.204	0.2	1	0.5	0.3
2	3	0.08	0.204	0.2	1	0.5	0.3
2	4	0.08	0.204	0.2	1	0.5	0.2
2	5	0.27	0.48	0.3	1	0.5	0.5
2	6	0.15	0.24	0.2	1	0.5	0.3
2	7	0.15	0.27	0.3	1	0.5	0.4
2	8	0.15	0.372	0.3	1	0.5	0.7
2	9	0.3	0.372	0.3	1	0.5	0.6
2	10	0.3	0.372	0.3	1	0.5	0.6
2	11	0.15	0.378	0.3	1	0.5	0.55
2	13	0.15	0.27	0.3	1	0.5	0.4
2	14	0.05	0.24	0.08	1	0.5	0.3
2	15	0.05	0.24	0.08	1	0.5	0.3
2	16	0.05	0.24	0.08	1	0.5	0.3
2	17	0.05	0.24	0.08	1	0.5	0.3
2	18	0.05	0.24	0.08	1	0.5	0.3
2	19	0.1	0.24	0.08	1	0.5	0.3
3	1	0.08	0.21	0.2	1	0.5	0.2
3	2	0.08	0.21	0.2	1	0.5	0.15
3	3	0.08	0.21	0.2	1	0.5	0.15
3	4	0.08	0.21	0.2	1	0.5	0.15
3	5	0.27	0.384	0.3	1	0.5	0.5
3	6	0.15	0.3	0.2	1	0.5	0.3
3	7	0.15	0.318	0.3	1	0.5	0.4
3	8	0.15	0.384	0.3	1	0.5	0.7
3	9	0.3	0.384	0.3	1	0.5	0.6
3	10	0.3	0.384	0.3	1	0.5	0.6
3	11	0.15	0.3	0.3	1	0.5	0.5
3	13	0.15	0.282	0.1	1	0.5	0.2
3	14	0.05	0.222	0.08	1	0.5	0.3
3	15	0.05	0.222	0.08	1	0.5	0.3
3	16	0.05	0.222	0.08	1	0.5	0.2
3	17	0.05	0.222	0.08	1	0.5	0.2
3	18	0.05	0.222	0.08	1	0.5	0.3
3	19	0.1	0.222	0.08	1	0.5	0.3
4	1	0.08	0.216	0.2	1	0.5	0.2
4	2	0.08	0.216	0.2	1	0.5	0.15
4	3	0.08	0.216	0.2	1	0.5	0.15
4	4	0.08	0.216	0.2	1	0.5	0.15
4	5	0.27	0.48	0.3	1	0.5	0.65
4	6	0.15	0.318	0.2	1	0.5	0.3
4	7	0.15	0.33	0.3	1	0.5	0.4
4	8	0.15	0.39	0.3	1	0.5	0.7
4	9	0.3	0.39	0.3	1	0.5	0.6

defid	deluid	cepsc	uzsn	nsur	intfw	irc	lzetp
4	10	0.3	0.39	0.3	1	0.5	0.6
4	11	0.15	0.3	0.3	1	0.5	0.5
4	13	0.15	0.282	0.1	1	0.5	0.2
4	14	0.05	0.228	0.08	1	0.5	0.3
4	15	0.05	0.228	0.08	1	0.5	0.3
4	16	0.05	0.228	0.08	1	0.5	0.2
4	17	0.05	0.228	0.08	1	0.5	0.2
4	18	0.05	0.228	0.08	1	0.5	0.3
4	19	0.1	0.228	0.08	1	0.5	0.3

defid parameter group id
deluid land use id
cepsc interception storage capacity (inches)
uzsn upper zone nominal storage (inches)
nsur Manning's n for the assumed overland flow plane (none)
intfw interflow inflow parameter (none)
irc interflow recession parameter (none)
lzetp lower zone evapotranspiration parameter (none)

Appendix B: Model Sediment Parameters

Based on the SCWRRP regional sediment approach, the following parameters for the sediment module were used as initial values. Some adjustment was necessary based on local conditions and observed data.

Pervious Lands (PERLNDs)

SMPF 1.0

KRER The presented model varies this parameter by soil group and land use (area-weighted average) as follows:

SSUGRO soil data for San Diego County was utilized to calculate weighted KRER values for each land use and soil hydrologic group (HSG) within the Los Peñasquitos watershed. A weighted average of soil slope (*S*) and soil erodibility factors (*K*) were calculated for each soil map unit in ArcGIS using Soil Data Viewer. The land use classification layer (which contained HSG values for each parcel) was subsequently intersected with both the aggregated slope and K factor layers. In a spreadsheet program, slope and K factor values were subtotaled and area weighted for each land use classification and soil hydrologic group across the watershed. In order to calculate *KRER* values, length-slope (*LS*) factors were first calculated according to the Wischmeier and Smith (1978) equation:

$$LS = (0.045\ L)^b \cdot (65.41\ \sin^2 \theta_k + 4.56 \sin \theta_k + 0.065)$$

where $\theta_k = \tan^{-1}(S/100)$, S in the slope in percent, L is the slope length, and b equals the following values: 0.5 for $S \geq 5$, 0.4 for $3.5 \leq S \leq 5$, 0.3 for $1 \leq S \leq 3$, and 0.2 for $S < 1$. An L value of 15 meters was used for all LS calculations, and LS values were not allowed to exceed 5. Finally, KRER values were calculated using the following equations:

$$KRER = G \cdot K \cdot LS$$

where G accounts for unit conversion and was assigned a value of 4.102.

JRER Set all to 1.81 (SCWRRP used 2.0)

AFFIX All set at 0.005

COVER All set at 0.10 by SCWRRP

NVSI Set to 0

KSER Set to 1.8

JSER Set to 2.0

KGER Set to 0

JGER Set to 2.0 (inactive)

DETS 0.5 tons/ac

Impervious Lands (IMPLNDs)

KEIM and JEIM varies by land use. The following values for impervious surfaces for general land use categories were used.

Table B-1. Impervious surface coefficients (KEIM and JEIM) by landuse

	Industrial	LDR	HDR	Commercial	Open/Park
KEIM	soils B = 0.10 soils C/D = 0.07	0.03	0.015	0.10	0.20
JEIM	2.5	2.5	2.5	2.5	2.5

ACCSDP 0.1 tons/ac/d
REMDSP Set at 0.20

Upland Sediment Fractions

SSURGO data was used to set the fraction of total sediment from land that is sediment class (Table). Adjustments to account for deposition en route were made based on the assumption that 50 percent of the sand and 30 percent of silt is deposited using watershed delivery ratios in Vanoni, 1975. Table provides the resulting land fractions for the model.

Table B-2. Sediment fractions by hydrologic soil group

HSG	Sand	Silt	Clay
B	65	23	12
C	68	19	14
D	54	21	24

Table B-3. Sediment fractions adjusted for watershed delivery

HSG	Sand	Silt	Clay
B	33	16	51
C	34	13	53
D	27	15	58

Reaches (RCHRES)

The primary calibration parameters for maintaining dynamic steady state in each reach was defining the stresses for deposition and scour. The stream cross sections were defined by internal LSPC algorithms based on upstream watershed area. Properties for fall velocity in still water (w) and density (Rho) were set uniformly for all reaches (Table).

Table B-4. Model reach parameters

	Sand	Silt	Clay
Fall velocity (in/s)	1.0	0.05	0.0002
Rho (g/cm^3)	2.5	2.2	2.0

Sand transport in the reaches was simulated using the power function of velocity subroutine. The KSAND parameter was set to 1.0 and EXPSND to 2.0 within each reach. Critical shear stress deposition and scour stress and erodibility coefficient were unique by reach and calibrated to maintain a dynamic steady state during the long term calibration simulations.

Table B-5. Model reach sand and silt stress and erodibility coefficients

Reach	Sediment Class	Critical shear stress		Erodibility coefficient (m) ($lb/ft^2 \cdot d$)
		Deposition (lb/ft^2)	Scour (lb/ft^2)	
1	Silt	0.7	1.3	0.001
1	Clay	0.6	1.1	0.001
2	Silt	0.4	0.9	0.001
2	Clay	0.35	0.7	0.001
3	Silt	0.08	0.8	0.001
3	Clay	0.07	0.7	0.001
4	Silt	0.35	1	0.001
4	Clay	0.3	0.95	0.001
5	Silt	0.35	0.75	0.001
5	Clay	0.3	0.6	0.001
6	Silt	0.35	0.8	0.001
6	Clay	0.3	0.6	0.001
7	Silt	0.5	1	0.001
7	Clay	0.4	0.9	0.001
8	Silt	1.5	2.2	0.001
8	Clay	1.2	1.8	0.001
9	Silt	1.2	2	0.001
9	Clay	1	1.5	0.001
10	Silt	0.48	1.2	0.001
10	Clay	0.4	1	0.001
11	Silt	0.35	0.75	0.001

Reach	Sediment Class	Critical shear stress		Erodibility coefficient (m) ($lb/ft^2 \cdot d$)
11	Clay	0.3	0.6	0.001
12	Silt	0.6	1.2	0.001
12	Clay	0.5	1	0.001

kber coefficient for scour of the bank matrix soil (calibration)

jber exponent for scour of the bank matrix soil (calibration)

qber bank erosion flow threshold causing channel bank soil erosion (cfs)

RCHID	KBER	JBER	QBER	Sand	Silt	Clay
1	0	0.001	8.972199	0.34	0.33	0.33
2	0	0.001	94.98709	0.34	0.33	0.33
3	1.0	0.001	238.4284	0.34	0.33	0.33
4	0	0.001	92.76765	0.34	0.33	0.33
5	0	0.001	81.77471	0.34	0.33	0.33
6	0	0.001	68.26335	0.34	0.33	0.33
7	0	0.001	62.12131	0.34	0.33	0.33
8	0	0.001	78.1442	0.34	0.33	0.33
9	0	0.001	101.9106	0.34	0.33	0.33
10	0	0.001	43.68436	0.34	0.33	0.33
11	0.5	0.1	154.2955	0.34	0.33	0.33
12	0.5	0.1	223.6453	0.34	0.33	0.33

Attachment 3

Environmental Analysis and Checklist

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ATTACHMENT 3: ENVIRONMENTAL ANALYSIS AND CHECKLIST

Contents of this Attachment

California Environmental Quality Act Requirements
Project Description
- Environmental Setting
- Existing Local, Specific, and Regional Plans and Habitat Conservation Plans
- Statement of Project Objectives

Regulatory Authorities
- Implementing Agencies
- Regulating Agencies

Public Participation and Consultation
- Consultation with other Agencies
- Public Participation
- Scientific Peer Review

Implementation Plan
Environmental Checklist and Explanations
Cumulative Analysis
Alternatives Analysis and Selection of Preferred Alternative
Economic Analysis

3.1 Purpose and Objectives of the Basin Plan Amendment Project

Los Peñasquitos Lagoon (Lagoon) is designated by US Environmental Protection Agency (US EPA), under Section 303(d) of the federal Clean Water Act, as impaired by sediment. Sediment in the lagoon compromises designated beneficial uses, including contact water recreation; non-contact water recreation; biological habitats of special significance; estuarine habitat; wildlife habitat; rare, threatened or endangered species; marine habitat; migration of aquatic organisms; fish spawning, reproduction and/or early development; and shellfish harvesting.

The Project under consideration is the adoption of an amendment to the *Water Quality Control Plan for the San Diego Basin* (Basin Plan) incorporating a total maximum daily load (TMDL) for sediment in Lagoon.

The purpose of the Basin Plan amendment project is to attain the water quality standard for sediment that will protect all uses. This will require dischargers of sediment to meet numeric sediment reduction targets, as stated in the Sediment TMDL for Los Peñasquitos Lagoon Draft Staff Report (Draft Staff Report).

3.2 California Environmental Quality Act Requirements

The basic purposes of the California Environmental Quality Act (CEQA) are to: 1) inform decision makers and the public about potential significant environmental effects of a proposed project and give them opportunities to comment to the lead agency, 2) identify ways that environmental damage may be mitigated, 3) prevent significant,

avoidable damage to the environment by requiring changes in projects, through the use of implementation alternatives or mitigation measures when feasible, and 4) disclose to the public why an agency approved a project if significant effects may occur.[1]

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) must comply with the CEQA when amending the Basin Plan as proposed in this project. Under CEQA, the San Diego Water Board is the Lead Agency for evaluating potential environmental impacts of the proposed project.

Adoption of a Basin Plan amendment is an activity subject to CEQA requirements because Basin Plan amendments constitute rules or regulations requiring the installation of pollution control equipment, establishing a performance standard, or establishing a treatment requirement.[2] Sections 3.2.1 and 3.2.2 below describe in detail the statutory requirements and scope of this environmental analysis required by CEQA for adoption of Basin Plan amendments and water quality standards.

This TMDL Basin Plan amendment (TMDL) contains numeric targets designed to meet the narrative water quality objective for sediment and restore the beneficial uses in the Lagoon. The TMDL also includes wasteload allocations for point sources and load allocations for nonpoint sources and natural background. The numeric targets, together with the allocations, may be considered a new performance standard.[3] Because development of a performance standard does not constitute development of a new water quality objective, but rather implements existing objectives to protect beneficial uses, the San Diego Water Board is not required to consider the factors in Water Code section 13241 (a) through (f).

3.2.1 Exemption from Requirement to Prepare Standard CEQA Documents

CEQA authorizes the Secretary for Natural Resources to certify State regulatory programs designed to meet the goals of CEQA as exempt from requirements to prepare an Environmental Impact Report (EIR), Negative Declaration, or Initial Study. The Water Boards' Basin Plan amendment process is a certified regulatory program and is therefore exempt from CEQA's requirements to prepare such documents.[4] As such, the "substitute environmental documents" that support the San Diego Water Board's proposed basin planning action contain the required environmental documentation under CEQA.[5] The substitute environmental documents (SED) include the environmental checklist, the detailed Staff Report, peer review and public comments and responses to comments, this resolution, and the Basin Plan Amendment.

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[1] 14 CCR section 15002(a)
[2] 14 CCR section 15187 (a) and Public Resources Code sections 21159-21159.4.
[3] The term "performance standard" is defined in the rulemaking provisions of the Administrative Procedure Act [Government Code sections 11340-l 1359]. A "performance standard" is a regulation that describes an objective with the criteria stated for achieving the objective [Government Code section 11342(d)].
[4] 14 CCR section 15251(g) and Public Resources Code section 21080.5.
[5] 23 CCR section 3777

3.2.2 Scope of Environmental Analysis

The State Water Board's CEQA implementation regulations[6] describe the substitute environmental documents (SED) required for Basin Plan amendment actions. For this project, those documents include the Draft Staff Report, the draft Basin Plan amendment, and the environmental analyses contained in this Appendix. Specifically, these analyses include:[7]

1. A brief description of the proposed project, including a description of the environmental setting. In this case, the proposed project is the Basin Plan amendment adopting the Sediment TMDL for Los Peñasquitos Lagoon. This amendment is described in Section 3.3 of this attachment.

2. Identification of reasonably foreseeable environmental impacts of the proposed project (Section 3.7).

3. Reasonable alternatives to the proposed project and mitigation measures to avoid or reduce any significant or potentially significant adverse environmental impacts (discussed in Section 3.7 and 3.9).

4. An analysis of reasonably foreseeable methods of compliance. The analysis includes:

    a. Identification of reasonably foreseeable methods of compliance with the project (Section 3.6);
    b. A completed Environmental Checklist, with analysis of reasonably foreseeable significant adverse environmental impacts associated with those methods of compliance (Section 3.7);
    c. An analysis of reasonably foreseeable alternative means of compliance, which would have less significant adverse environmental impacts (Section 3.9); and
    d. An analysis of reasonably foreseeable mitigation measures that would minimize any unavoidable environmental impacts of the reasonably foreseeable methods of compliance (Section 3.7).

[6] 23 CCR section 3720 et seq. "Regulations for Implementation of the Environmental Quality Act of 1970."
[7] 23 CCR section 3777

Additionally, the environmental analysis takes into account a reasonable range of:[8]

- Environmental factors
- Economic factors
- Technical factors
- Population
- Geographic areas
- Specific sites

A "reasonable range" does not require an examination of every site, but a reasonably representative sample of the sites. The CEQA statute specifically states that the agency shall not conduct a "project level analysis."[9] Rather, a project level analysis must be performed by the responsible parties that are required to implement the TMDLs.[10] Actual environmental impacts will necessarily depend upon the compliance strategy selected by the responsible parties identified in the Staff Report. If not properly implemented or mitigated at the project level, there could be adverse environmental impacts from implementing this TMDL.

The SED identifies broad mitigation approaches that could be considered at the project level. Consistent with CEQA, the analysis in the SED does not engage in speculation or conjecture, but rather considers reasonably foreseeable environmental impacts of reasonably foreseeable methods of compliance, reasonably foreseeable mitigation measures, and reasonably foreseeable alternative means of compliance that would avoid, eliminate, or reduce the identified impacts. In preparing this environmental analysis, the San Diego Water Board has considered the pertinent requirements of state law,[11] and intends this analysis to serve as a program level environmental review.[12]

3.3 Project Description

As stated in Section 3.1 above, the project is adoption of an amendment to the San Diego Water Board's Basin Plan, incorporating a sediment TMDL for the Lagoon and an implementation plan to achieve the TMDL. As the San Diego Water Board's master planning document for water quality enhancement, restoration, and protection, the Basin Plan establishes the regulatory framework requiring actions that will reduce sediment inputs to the Lagoon to levels that will support the Lagoon's beneficial uses.

3.3.1 Environmental Setting

The Los Peñasquitos watershed is located in central San Diego County. Along with the Lagoon, the entire watershed is included in the Peñasquitos Hydrologic Unit (906), which also includes Mission Bay and several coastal tributaries. The Peñasquitos watershed includes portions of the following jurisdictions: City of San Diego, the City of

[8] 23 CCR section 3777(c); 14 CCR section 15187(d)
[9] Public Resources Code section 21159(d)
[10] Public Resources Code section 21159.2
[11] Public Resources Code section 21159 and 14 CCR section 15187
[12] 14 CCR section 15152; 14 CCR section 15168

Poway, the City of Del Mar, and San Diego County. Approximately 54 percent of the Peñasquitos watershed has been developed (e.g., low density residential, industrial/transportation, and commercial institutional land uses), with 46 percent of that area classified as impervious according to San Diego Association of Governments 2000 land use coverage. The largest single land use type in the Peñasquitos watershed is open space. A map of the watershed can be found in Section 3 of the Staff Report.

The watershed extends approximately 19 miles east, rising to an elevation of 2,600 feet above sea level. Los Peñasquitos, Carroll Canyon, and Carmel Creeks constitute the three sub-watersheds.

Freshwater drains from the 93 square mile Los Peñasquitos watershed into the Lagoon. The Lagoon is a 0.6 square mile coastal salt marsh lagoon located in Torrey Pines State Park. The Lagoon is designated as a "State Preserve," a label reserved for the rarest and most fragile state-owned lands. The Lagoon was formed when sea levels rose and flooded the young Los Peñasquitos River to form a deep embayment, which has filled with sediment over the millennia. Under present conditions, a permanent mouth opening to the ocean cannot be naturally maintained, except during exceptionally wet winters; therefore, the channel is often mechanically dredged to alleviate the danger of flooding and to improve the health of the Lagoon. Mouth closures are typically caused by coastal processes (deposition of sand and cobbles due to storms surges and wave action) and structures, such as the US Highway 101 abutments and railroad trestles.

The Lagoon is listed on the 2010 Clean Water Act section 303(d) list as impaired for sedimentation/siltation.[13] Los Peñasquitos Creek, a Lagoon tributary, is listed as impaired by enterococcus, fecal coliform, selenium, total dissolved solids, total nitrogen as N, and toxicity.

The Lagoon and its contributing watershed support a variety of sensitive species (state or federal endangered, threatened, candidate, or species of special concern). Important resources in this area include saltmarsh, coastal sage scrub and southern maritime chaparral. Furthermore, the San Diego Multiple Species Conservation Program identifies multiple covered species within the Peñasquitos watershed including San Diego thorn-mint, Shaw's agave, Del Mar manzanita, Encinitas baccharis, Orcutt's brodiaea, wart-stemmed ceanothus, short-leaved dudleya, variegated dudleya, San Diego button-celery, San Diego barrel cactus, willowy monardella, San Diego goldenstar, Torrey pine, San Diego mesa mint, Riverside fairy shrimp, southwestern pond turtle, San Diego horned lizard, orange-throated whiptail, California brown pelican, white-faced ibis, Canada goose, northern harrier, Cooper's hawk, golden eagle, western snowy plover, California least tern, burrowing owl, coastal cactus wren, California gnatcatcher, California rufous-crowned sparrow, Belding's savannah sparrow, grasshopper sparrow, mountain lion and mule deer. (City of San Diego, 1997)

[13] 2010 Integrated Report – Clean Water Act Section 303(d) List and 305(b) Report. Available at: http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml

The climate in coastal San Diego County is generally mild. Annual temperatures average 65°F near the ocean. Average annual rainfall ranges from nine to eleven inches along the coast. There are three distinct seasons in the region: summer dry, winter dry, and winter wet weather. The winter wet weather season accounts for 85 to 90 percent of the annual rainfall.

3.3.2 Existing Local, Specific, and Regional Plans and Habitat Conservation Plans

Multiple Species Conservation Program

The entire Peñasquitos watershed lies within the San Diego Multiple Species Conservation Program (MSCP) Plan. The City of San Diego, City of Del Mar, City of Poway, and County of San Diego implement their respective portions of the MSCP Plan through subarea plans, which describe specific implementing mechanisms for the MSCP. The majority of the Peñasquitos watershed lies within the City of San Diego MSCP Subarea Plan.

The MSCP is a comprehensive, long-term habitat conservation plan that addresses the needs of multiple covered species and the preservation of natural vegetation communities in San Diego County. The MSCP addresses the potential impacts of urban growth, natural habitat loss, and species endangerment; and includes a plan to mitigate for the potential loss of the multiple covered species and their habitat due to the direct impacts of future development of both public and private lands within the MSCP area (City of San Diego, 1997).

Los Peñasquitos Lagoon Enhancement Plan and Program

The Los Peñasquitos Lagoon Foundation is dedicated to the restoration of the Lagoon, its associated uplands and the preservation of land for scenic, historic, educational, recreational, agricultural, scenic and open space opportunities. The Foundation regularly updates its Los Peñasquitos Lagoon Enhancement Plan and Program to reflect current Lagoon conditions and management needs and priorities. Current efforts the Foundation is undertaking include monitoring of the Lagoon and operation of a restoration basin.

Physical, Chemical, and Biological Monitoring

The Pacific Estuarine Research Laboratory (PERL), based at San Diego State University, was contracted by the Foundation to monitor lagoon resources and use the data in its studies of regional wetland ecosystems. PERL monitored the physical and chemical characteristics of Lagoon channel water from 1987-2007 and sampled benthic invertebrates, fish, and saltmarsh vegetation from 1988-2004. These studies have led to the timely opening of the mouth and an increase in knowledge of the biology of southern California's estuaries. In July 2004, Lagoon monitoring was transferred to the Southwest Wetlands Interpretive Association and the Tijuana River National Estuarine Research Reserve.

Los Peñasquitos Creek Restoration Basin
Located in the western reach of the Los Peñasquitos Canyon Preserve, the 2.8-acre restoration basin is designed to intercept sediment (4,400 cubic yard capacity) during moderate to large storm events, thereby helping protect the Lagoon from the impacts associated with sediment and siltation. In addition, the basin constructed by the Los Peñasquitos Lagoon Foundation was designed to minimize impacts to nearby sensitive habitats and the creek, view corridors for the public, and flooding risks to a nearby industrial park. All disturbed areas have been revegetated with native species of vegetation, replacing an area that was previously dominated by invasive plant species.

Los Peñasquitos Canyon Preserve Natural Resource Management Plan
The *Los Peñasquitos Canyon Preserve Natural Resource Management Plan (1998)* was developed to provide guidance for the present and future development and maintenance of the Los Peñasquitos Canyon Preserve. The City of San Diego Development Services and Park and Recreation Departments are responsible for the administration of this plan. The County Planning Department is responsible for the administration of land use permits for County-owned land in the Los Peñasquitos Canyon Preserve and review of all public and County development proposals to determine conformity with County policies, Natural Resource Management Plan, and CEQA. Funding for enhancement, management, and maintenance for the Los Peñasquitos Canyon Preserve can come from a variety of sources. Some of the objectives of this plan include:

- To establish management practices and means for implementation that will foster cooperative County-City management strategies to preserve and protect cultural and biological resources while providing for future recreational use, maintenance, and land use in the Los Peñasquitos Canyon Preserve
- To enhance and restore native habitats in the Los Peñasquitos Canyon Preserve
- To manage native wildlife species for their survival
- To identify and maintain important wildlife corridors
- To control erosion along trails and streambeds throughout the Los Peñasquitos Canyon Preserve and further protect the watersheds
- To facilitate public use which is compatible with the protection and preservation of the natural and historical resources, such as picnicking, hiking, and other low-intensity recreational activities
- To ensure individual projects within the Los Peñasquitos Canyon Preserve meet federal, state, and local environmental standards and requirements
- To conduct education, outreach, and research programs which increase public awareness of the unique natural and cultural resources within the Preserve
- The Los Peñasquitos Canyon Preserve will eventually house two interpretative facilities, one run by the County focusing on cultural and historical resources and second run by the City focusing on natural history and biological resources with a

proposed location somewhere in the eastern portion of the Los Peñasquitos Canyon Preserve. (CVCC, 2006)

Peñasquitos Watershed Urban Runoff Management Plan

The Peñasquitos Watershed Urban Runoff Management Plan 2008 (WURMP) was prepared by the City of Poway, as lead agency, in collaboration with the cities of San Diego, Del Mar, and the County of San Diego – all local agencies that have jurisdiction over the Peñasquitos Watershed. The WURMP meets the requirements of the National Pollutant Discharge Elimination System (NPDES) Municipal Storm Water Permit for San Diego Copermittees (San Diego Water Board Order No. 2007-01; "Order"). The Order requires development and implementation of WURMPs for each of nine watershed management areas within San Diego County, including the Peñasquitos watershed.

The primary goal of the Order is to positively affect the water resources of the Peñasquitos Watershed while balancing economic, social, and environmental constraints. The Order identifies four primary objectives to strive towards this goal: (1) develop and expand methods to assess and improve water quality within the watershed; (2) integrate watershed principles into land use planning; (3) enhance public understanding of sources of water pollution; and (4) encourage the development of stakeholder participation.

To help reach these goals and objectives, the WURMP identifies and prioritizes water quality related issues within the watershed that can be potentially attributed (wholly or partially) to discharges from the municipal storm drain systems and may be addressed through a cross-jurisdictional approach. Additionally, activities to abate sources of pollution and restore and protect beneficial uses are also identified.

The WURMP was designed as an iterative process of watershed assessment, priority setting, monitoring, and implementation. At the conclusion of each yearly cycle, the process begins anew, allowing participants to respond to changing conditions or adjust strategies that have not performed as anticipated. This framework establishes mechanisms for the participants to evaluate priorities, improve coordination, assess program goals, and allocate finite resources in a cost-effective manner.

Local General Plans and Municipal Codes

The County of San Diego and Cities of Del Mar, Poway, and San Diego each have their own General Plans and Municipal Codes that establish policies of acceptable land uses and practices in their jurisdictions. General Plans and Municipal Codes form the framework for the growth and land development for each community.

3.4 Regulatory Authorities

The following agencies have approval authority over the Basin Plan amendment, oversight on related regulatory and/or environmental matters, or responsibility for implementation of reasonably foreseeable means of compliance.

3.4.1 Federal Regulatory Agencies

U. S. Environmental Protection Agency

The US Environmental Protection Agency (US EPA) is responsible for implementing the Clean Water Act. Section 305(b) of the Clean Water Act mandates biennial assessments of the nation's water resources. These water quality assessments are used, with any other available data and information solicited from the public, to identify and prioritize waters not attaining water quality standards. The resulting amalgamation of waters is referred to as the "303(d) List" or the "Impaired Waters List." Clean Water Act section 303(d)(1)(C) and (d)(1)(D) require that the state establish TMDLs for each listed water. Those TMDLs, and the 303(d) List itself, must be submitted to USEPA every two years for approval under section 303(d)(2).

The Clean Water Act mandates TMDLs or other actions to resolve listings for all pollutant-water body pairs on the 303(d) List. In California, US EPA delegates responsibility for developing TMDLs to the Water Boards.

National Oceanic Atmospheric Administration/National Marine Fisheries Service (NOAA/NMFS)

With the US Fish and Wildlife Service, NOAA/NMFS conducts Endangered Species Act Section 7 consultation for effects to migratory and endangered fish species; NOAA/NMFS also enforces the Magnuson-Stevens Fishery Conservation and Management Act, under which it regulates projects that may have a significant effect on such species within the Los Peñasquitos watershed.

US Fish and Wildlife Service

The US Fish and Wildlife Service enforces the Endangered Species Act, the Migratory Bird Treaty Act, and the Bald and Golden Eagle Protection Act. With NOAA/NMFS, the agency conducts Endangered Species Act Section 7 consultation for possible effects to listed species with federal status.

US Army Corps of Engineers

The US Army Corps of Engineers issues Clean Water Act section 404 permits for discharges to waters of the United States and dredging and fill projects in navigable waters.

3.4.2 California State Regulatory Agencies

State Water Resources Control Board and the San Diego Regional Water Quality Control Board (Water Boards)

The primary responsibility for water quality protection in California rests with the State Water Resources Control Board (State Water Board) and the nine Regional Water Quality Control Boards (Regional Water Boards). The State Water Board and Regional Water Boards share responsibility for regulating storm water discharges. The State Water Board issues statewide NPDES permits for the California Department of Transportation (Caltrans); for construction that disturbs more than one acre (Construction General Permit Order 2009-0009-DWQ; and for small municipal separate storm sewer systems (MS4s) under a General Permit for the Discharge of Storm Water from Small MS4s (WQ Order No. 2003-0005-DWQ).

The Porter-Cologne Water Quality Protection Act of 1972 requires that water quality control plans in California, including basin plans and basin plan amendments, incorporate a plan of implementation.

The Water Quality Control Plan for the San Diego Basin, in which the TMDL for sediment in the Lagoon will be incorporated, is the master planning document for water quality in San Diego. Basin Plan provisions, including TMDL implementation plans, are carried out and enforced by the San Diego Water Board through its various permitting authorities, orders, and prohibitions.

The San Diego Water Board regulates storm water discharges from the NPDES Phase I MS4s that discharge to the Peñasquitos watershed. These permits require the municipalities to develop and implement comprehensive Storm Water Management Plans, which provide the framework for local government storm water programs.

NPDES municipal storm water permits generally have five-year update cycles. Following adoption of the TMDL, the San Diego Water Board will incorporate the TMDL's waste load allocations and associated milestone requirements into the permits, and require the co-permittees to amend their Storm Water Management Plans accordingly. While the California Department of Transportation is a Responsible Party to this TMDL and required to comply with the Water Quality Plan for the San Diego Basin when this TMDL is incorporated, the statewide NPDES permit regulating discharges from Caltrans will also be amended to include similar planning and waste load allocation requirements.

The San Diego Water Board regulates other storm water discharges in the watershed, including surface discharges from agricultural and grazing activities, through waste discharge requirements and waivers of waste discharge requirements for individual dischargers. Waste discharge requirements issued to a number of large commercial property owners require implementation of best management practices to address storm water discharges.

In addition, Army Corps of Engineers cannot issue its Clean Water Act Section 404 permits until the San Diego Water Board has certified those projects under Section 401.

California Department of Fish and Game
The California Department of Fish and Game issues permits for incidental takes of state listed species under sections 2081(b) and (c) of the California Endangered Species Act and provides section 2081 consultation for effects to listed species.

If the Department determines that an activity may substantially adversely affect fish and wildlife resources, the applicant must prepare a Stream Alteration Agreement that includes reasonable conditions necessary to protect those resources. Compliance with CEQA is also required.

California Coastal Commission
The Coastal Commission, in partnership with coastal cities and counties, plans and regulates the use of land and water in the coastal zone. Development activities, which are broadly defined by the California Coastal Act to include (among others) construction of buildings, divisions of land, and activities that change the intensity of use of land or public access to coastal waters, generally require a coastal development permit from either the Coastal Commission or the local government.

California State Lands Commission
The California State Lands Commission (CSLC) manages nearly 4 million acres of "sovereign lands," which includes the beds of (1) more than 120 rivers, streams, and sloughs; (2) nearly 40 non-tidal navigable lakes; (3) tidal navigable bays and lagoons; and (4) tidal and submerged lands adjacent to the entire coast and offshore islands of California from the mean high tide line to 3 nautical miles offshore. The CSLC manages this watery domain. The sovereign lands can only be used for public purposes consistent with provisions of the Public Trust such as fishing, water-dependent commerce and navigation, ecological preservation, and scientific study (CSLC, 2010).

3.4.3 Local Regulatory Agencies

The County of San Diego, City of San Diego, City of Del Mar, and City of Poway have plans, policies, and ordinances that may be used to require mitigation of impacts caused by the kinds of controls proposed in Basin Plan amendment. The municipalities' ordinances cover construction, grading, and development plans for land use regulations, community plans, and environmental statutes.

City of San Diego
The City of San Diego's General Plan establishes the citywide policies for growth and development. The City of San Diego's Community Plans provide refinement of the General Plan's citywide policies, designates land uses, and offers additional location-based recommendations. The Los Peñasquitos Watershed contains portions of the following communities within the City of San Diego: Torrey Pines, Torrey Hills, Carmel

Valley, Los Peñasquitos Canyon Preserve, Mira Mesa, Del Mar Mesa, Pacific Highlands Ranch, Torrey Highlands, Rancho Peñasquitos, Carmel Mountain Ranch, Sabre Springs, Miramar Ranch North, Scripps Miramar Ranch, and Rancho Encantada.

The City of San Diego implements and enforces the Elements of the General Plan (Land Use and Community Planning; Mobility; Economic Prosperity; Public Facilities, Services and Safety; Urban Design; Recreation; Historic Preservation; Conservation; Noise; and Housing) and Community Plans through its various departments including, but not limited to: Development Services, Environmental Services, Public Utilities, Park & Recreation, Public Works, and Transportation & Storm Water.

City of Poway

The City of Poway Public Works Department is responsible for the maintenance of public infrastructure and environmental programs including storm water and flood control. The City of Poway Department of Development Services administers and implements the City's planning, land use, building, and engineering functions. Other activities include providing customer service for all permit activities, developing land use ordinances and various specific plans, and reviewing development plans. These departments enforce the City of Poway's Municipal Code, which includes such ordinances as Stormwater Management and Discharge Control, Wildland-Urban Interface Code, Building Code, Excavating and Grading, Drainage and Watercourse, Floodplain Management, Standard Urban Stormwater Mitigation Plan, and Zoning.

City of Del Mar

The City of Del Mar Planning and Community Development Department is responsible for a variety of services ranging from updating the City's General Plan and Zoning standards, managing key programs and projects such as the Clean Water Program, to preparation of new standards. This department oversees building services, code enforcement, and new development and construction for compliance. The City of Del Mar enforces local ordinances including, but not limited to: Noise Regulations, Fire Code, Stormwater Management and Discharge Control, Building and Construction, and Zoning Ordinances through issuance of permits. Permits include, but are not limited to land conservation, excavation, and grading permits.

County of San Diego

Within the County of San Diego, the Land Use and Environmental Group coordinates the County's efforts in land use, environmental protection and preservation, recreation, and infrastructure development and maintenance. The Land Use and Environmental Group consists of seven departments: Air Pollution Control District; Agriculture, Weights and Measures; Environmental Health; Farm and Home Advisor; Parks and Recreation; Planning and Land Use; and Public Works. These departments issue a variety of permits to enforce County Ordinances including, but not limited to: Biological Mitigation; Resource Protection; Zoning; Watershed Protection, Stormwater Management, and Discharge Control; Noise; Flood Damage Protection; Habitat Loss Permit; Grading, Clearing, and Watercourses Ordinances.

Air Pollution Control District
The County of San Diego Air Pollution Control District evaluates and issues construction and operating permits to ensure proposed new or modified commercial and industrial equipment and operations comply with air pollution control laws.

Planning and Land Use
The County of San Diego Department of Planning and Land Use (DPLU) issues various permits including building and discretionary permits. The DPLU is home to the Green Building Program and Multiple Species Conservation Program. In general, DPLU helps create and maintain the general plan; maintain and improve the zoning ordinance; and advise the Board of Supervisors and San Diego County Planning Commission on land use projects.

Public Works
The County of San Diego Public Works Department issues a variety of permits including: construction, drainage easement encroachment, encroachment, excavation, grading, moving, planting, and traffic control permits. The Public Works Department is responsible for: County-maintained roads; traffic engineering; land development civil engineering review; design engineering and construction management; land surveying and map processing; cartographic services; watershed quality and flood protection; County Airports; solid waste planning and diversion; inactive landfills; wastewater systems management; and special districts, such as the Flood Control District.

3.5 Public Participation and Consultation

3.5.1 Consultation with other agencies

The Notice of Filing noticing the availability of the substitute environmental documents for this project was posted on the San Diego Water Board website and in the San Diego Union Tribune on February 15, 2012. The Notice of Filing indicated that the formal public comment period began on Wednesday, February 15, 2012 and ended on Monday, April 2, 2012, for a total of 47 days. The February 15, 2012, Notice of Filing indicated the public hearing date of May 9, 2012. Following the cancelation of the May 9, 2012, public hearing, a notice of the cancelation and rescheduling of the public hearing was posted on the San Diego Water Board website and e-mailed to interested parties. The Notice of Filing serves as the notification to Responsible Agencies requesting consultation on the project and Trustee Agencies. As Trustee Agencies with resources affected by the project, the California Coastal Commission, California State Lands Commission, California Department of Fish and Game, US Fish and Wildlife Service, Office of Historic Preservation, and California Natural Resources Agency were provided the Notice of Filing by mail on Wednesday, February 15, 2012.

3.5.2 Public participation

CEQA's requirement for "Early Public Consultation" was met by holding a CEQA Scoping Meeting.[14] Notice of the CEQA Scoping Meeting for this project was issued on January 6, 2011 for the February 15, 2011 CEQA Scoping Meeting. The notice was posted on the San Diego Water Board website on January 6, 2011, published in the North County Times on January 14, 2011, and published in the Union Tribune on January 13, 2011. The CEQA scoping meeting was held at the office of the San Diego Water Board on February 15, 2011 and was attended by city, county, and industry representatives. Comments received during the meeting have been incorporated into the substitute environmental documents.

A stakeholder advisory group (SAG) was formed at the onset of this project. Participants included representatives of the Cities of Del Mar, Poway, and San Diego, County of San Diego, Caltrans, US EPA, California State Parks, Los Peñasquitos Lagoon Foundation, Coast Law Group, Tetra Tech, and AMEC. During 2008-2011, the SAG met frequently to discuss project development. The SAG provided insightful technical comments on early drafts of reports, suggested issues for technical peer review, raised important policy issues, and assisted with drafting the Implementation Plan.

3.6 Implementation Plan: Reasonably Foreseeable Methods of Compliance with the Basin Plan amendment

The Basin Plan amendment implementation plan would require actions to achieve the TMDL targets and allocations for sediment, and other actions to enhance sediment-related habitat attributes essential to water quality in the Lagoon. The proposed Basin Plan amendment would affect all segments of the Lagoon and its tributaries.

The proposed Basin Plan amendment contains sediment allocations for dischargers. The amendment does not prescribe specific projects through which dischargers and discharge categories are to meet the sediment allocations.

The San Diego Water Board would not directly undertake any actions that could physically change the environment. Adoption of the proposed Basin Plan amendment, however, would result in future actions by landowners, municipalities and other agencies to comply with the requirements of the Basin Plan amendment and these actions could result in physical changes to the environment. The environmental impacts of such physical changes are evaluated below to the extent that they are reasonably foreseeable. Additionally, the Basin Plan amendment may result in future actions by municipalities to revise or adopt local permits, enforce local ordinances and permits, or educate watershed residents and businesses. In accordance with CEQA, changes that are speculative in nature do not require environmental review.

Until the parties that must comply with a permit or other requirements derived from the Basin Plan amendment propose specific projects, many physical changes cannot be anticipated. That said, it is reasonably foreseeable that the following environmental changes may result from reasonably foreseeable methods of compliance: (1) minor

[14] 14 CCR section 15083

construction, (2) earthmoving, (3) vegetation enhancement, and (4) decrease storm flows in channels. Although these activities are reasonably foreseeable methods of compliance, the implementation plan does not specify the nature of these actions. Therefore, this analysis considers these actions in general programmatic terms. To illustrate the possible nature of these activities, some examples are described following the table.

Table 3-1. Reasonable Foreseeable Compliance Projects

Possible Actions	Environmental Change Subject to Review
Install treatment facilities, for example, retention/infiltration basins, vegetated/bio-swales, buffer zones, and/or constructed wetlands)	Earthmoving, minor construction, and/or decrease storm flows in channels
Use of surface erosion source control BMPs (e.g., straw/fiber rolls, silt fencing, geotextile covers/mats, hydroseeding, and/or storm drain inlet protection)	Earthmoving, minor construction, and/or enhanced vegetation cover
Stabilize slopes (e.g., terracing, geotextile covers/mats, and/or hydroseeding)	Earthmoving, minor construction, and/or enhanced vegetation cover
Install bypass channels and/or dissipaters to slow storm water discharge velocity to canyons	Earthmoving and/or minor construction
Perform stream or Lagoon habitat restoration actions	Earthmoving, minor construction, and/or enhanced vegetation cover
Decrease storm water runoff from impervious surfaces through Low Impact Development	Earthmoving, minor construction, enhanced vegetation cover, and/or decrease storm flows in channels

- **Minor construction**. Basin Plan amendment-related construction projects would generally be small. Examples may include: a) construction of retention or infiltration basins to capture sediment and/or reduce surface runoff during storms; b) construction of vegetated swale/bioswales to deposit sediment entrained in surface runoff; c) retrofitting or replacement of road crossings over stream channels to increase capacity to convey peak runoff; d) construction of bypass channels and/or energy dissipaters immediately downstream of stormdrain outfalls to control or prevent channel erosion.
- **Earthmoving operations**. Adoption of the Basin Plan amendment would likely result in earthmoving to reduce sediment supply to the Lagoon and its tributaries. For example, earthmoving may involve constructing and maintaining retention/infiltration basins or terracing steep slopes and banks to reduce erosion rates. As a consequence of rapid channel incision, some channel reaches have become disconnected from the floodplain due to the narrow channels and high, steep, erosive stream banks. Earthmoving would occur to re-establish stable channel geometry in these channel reaches. Also, some actions can be undertaken to stabilize gullies or steep slopes, maintain BMPs, and/or to enhance stream channel habitat may involve earthmoving. Earthmoving may also be employed to re-contour portions of the Lagoon to support habitat diversity.

- **Decrease Flows in Channels.** Adoption of the Basin Plan amendment would foreseeably result in a decrease of wet weather flows in channels due to a reduction in peak discharge and a decrease in runoff volume from impermeable areas. A decrease in wet weather flows reduces erosion and the transport of sediment and pollutants. In addition, as the volume of dry weather flows decrease, nuisance flows are prevented from entering channels, resulting in a reduction of the channel's base flow. Resultant potential decreases in flow may contribute to a decrease in the amount of riparian vegetation on gravel bars, flood plains, and lower channel banks in some stream reaches as well as in the amount of riparian vegetation in the Lagoon.

These examples are not intended to be exhaustive or exclusive. Other conceivable actions that could be taken as a result of the Basin Plan amendment require speculation, and therefore, cannot be evaluated. For example, although the implementation plan recognizes coordinated planning efforts among local, state, and federal government agencies to enhance water quality within the Peñasquitos watershed, actual outcomes and specific actions resulting from the proposed partnership are too speculative to determine at this time. Also, as discussed above, even in cases where some physical changes are foreseeable, the exact nature of these changes is speculative pending specific project proposals that will be ultimately put forth by those subject to requirements derived from the Basin Plan amendment. Under CEQA, the permitting agencies will be the Lead Agencies for such future projects.

3.7 Environmental Checklist

This section contains the Lead Agency's analysis of reasonably foreseeable environmental effects of the proposed Basin Plan amendment in each category in the environmental checklist.[15] The proposed amendment does not define the specific actions that responsible parties would take to achieve water quality objectives. The San Diego Water Board has chosen not to specify methods of compliance with its regulations,[16] and accordingly, actual environmental impacts will necessarily depend upon compliance strategies selected by the responsible parties.

This analysis considers a reasonable range of compliance measures, as described in Section 3.6, above, and takes into account environmental and technical factors, population and geographic areas, and specific sites.

[15] Appendix A to 23CCR sections 3720-3781
[16] Water Code section 13360

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
I. AESTHETICS: Would the project:				
a) Have a substantial adverse effect on a scenic vista	☐	☐	☒	☐
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway	☐	☐	☐	☒
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☒	☐
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☐	☒

Discussion:

a) Potential implementation projects resulting from this Basin Plan amendment that include minor construction for sediment reduction installations and habitat restoration activities would not substantially affect the scenic resource or vista, nor the existing visual character or quality of any scenic site and its surroundings. Any physical changes to the aesthetic environment as a result of the Basin Plan amendment would be small in scale and short-term in nature until vegetation re-establishes in any disturbed areas.

In addition, any potential implementation project will be required to comply with local ordinances, such as the County's Scenic Area Regulations[17] that regulate development in areas of high scenic value. Projects must also be consistent with general land use plans that exclude incompatible uses and structures to preserve and enhance the scenic resources in adjacent areas.[18]

Furthermore, one of the goals/objectives for urban habitat lands in the City of San Diego MSCP Subarea Plan is to afford visual enjoyment and psychological relief from urbanization, while supporting habitat for the maintenance of both common and rare species. Therefore, specific City of San Diego regulations that afford protection to MSCP areas also afford the protection of aesthetic and visual value. These regulations include the Resource Protection Ordinance; the Sensitive Coastal Resource Overlay Zone; the Environmentally Sensitive Lands Ordinance; and the Steep Hillside Guidelines.

For these reasons, the Water Board finds that implementation of the TMDL will cause a less than significant impact, if any, on any scenic vistas in the area.

[17] San Diego County Zoning Ordinance, Part 5 Special Area Regulations, section 5200
[18] San Diego County General Plan, Chapter 5 Conservation and Open Space Element, Visual Resources

b) Potential implementation projects would not result in adverse aesthetic impacts to state scenic highways because there are no officially designated State or County scenic highways within the Los Peñasquitos watershed (Caltrans, 2011).

c) Construction and installation of structural BMPs may create an aesthetically offensive view during construction and installation, but this would be temporary until construction is completed and re-vegetated areas become established. Potential implementation projects will be subject to permit review and compliance with local ordinances, such as the County's Scenic Area Regulations[19] that regulate development in areas of high scenic value and general land use plans that exclude incompatible uses and structures to preserve and enhance the scenic resources in adjacent. Structural BMPs can and should be designed to provide aesthetically pleasing wildlife habitat, recreational areas, and green spaces in addition to improving storm water quality. Appropriate architectural and landscape design practices, including screening, should be implemented to mitigate any adverse aesthetic effects or be constructed underground.

Furthermore, one of the goals/objectives for urban habitat lands in the City of San Diego MSCP Subarea Plan is to afford visual enjoyment and psychological relief from urbanization, while supporting habitat for the maintenance of both common and rare species. Therefore, City of San Diego regulations, which afford protection to MSCP areas, also afford protection of aesthetic and visual value in that area. These regulations include the Resource Protection Ordinance; the Sensitive Coastal Resource Overlay Zone; the Environmentally Sensitive Lands Ordinance; and the Steep Hillside Guidelines.

For these reasons, the Water Board finds that implementation of the TMDL will cause a less than significant impact on the existing visual character or quality of the site and its surroundings.

d) Actions and projects that implement the Basin Plan amendment would not foreseeably include new lighting or installation of large structures that could generate reflected sunlight or glare. Adoption of the Basin Plan amendment would not result in adverse light and glare impacts.

[19] Ibid.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
II. AGRICULTURE AND FOREST RESOURCES: In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment Project; and the forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☒	☐
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☒
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☒	☐

Discussion:

a) According to the California Department of Conservation's (DOC) Farmland Mapping and Monitoring Program, the Los Peñasquitos watershed has a small amount of unique farmland acreage in the Cities of San Diego and Poway and the County of San Diego (DOC, 2010). DOC (2010) indicates that there is no prime farmland or farmland of statewide importance in the watershed. Potential BMP installations to reduce sediment discharge or storm flow and potential stream channel restoration activities will not cause a change in unique farmland land use. Therefore, adoption of the Basin Plan amendment will not result in conversion of prime farmland, unique farmland, or farmland of statewide importance to non-agricultural use and will not cause an impact.

b) According to the DOC's San Diego County Williamson Act Lands 2008 Map, there are no Williamson Act lands designated in the Los Peñasquitos watershed (DOC, 2009). Neither the City of San Diego nor the County has any exclusively zoned

agricultural zoning in the Los Peñasquitos watershed.[20] The City of Poway also does not have specific zoning for agriculture; however, agricultural lands are included in the Open Space-Resource Management zones.[21] BMP installations to reduce sediment discharges to protect downstream resources would not displace agricultural operations themselves. Additionally, potential implementation projects that include sediment reduction installations and habitat restoration activities would be relatively small in scale, be located in existing developed areas or on public lands along water courses, and would not conflict with existing agricultural zoning. Impacts on existing agricultural zones would be less than significant.

c) Potential implementation projects resulting from this Basin Plan amendment will not conflict with existing zoning for, or cause rezoning of, forest land, timberland, or timberland zoned Timberland Production because forest land or timberland do not exist in the Los Peñasquitos watershed (Shih, 2002).[22] Therefore, no impacts will occur.

d) Potential implementation projects will not result in the loss of forest land or conversion of forest land to non-forest use because forest land does not exist in the Los Peñasquitos watershed.[23] Therefore, no impacts will occur.

e) Adoption of the Basin Plan amendment could increase the level of landowner participation in cooperative efforts to minimize soil disturbance in sensitive areas (on steep slopes and adjacent to stream channels), which could result in localized, minor reductions in the amount of land cultivated, particularly adjacent to stream channels. However, because less than 1 percent of the Los Peñasquitos watershed is used for unique farmland (DOC, 2010), any buffer or setback areas, which would be fallow, would comprise a small amount of land area. Therefore, less than significant impacts would result.

[20] City of San Diego General Plan, Land Use and Community Planning Element, Figure LU-2; County of San Diego County General Plan Land Use Map.
[21] Poway General Plan, Community Development Element.
[22] City of San Diego General Plan, Land Use and Community Planning Element, Figure LU-2; Poway General Plan, Community Development Element; and County of San Diego County General Plan, Chapter 3 Land Use Element, Figure LU-1.
[23] City of San Diego General Plan, Land Use and Community Planning Element, Figure LU-2; County of San Diego County General Plan Land Use Map.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
III. AIR QUALITY: Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	☒
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	☒	☐
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non- attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	☐	☐	☒	☐
d) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☐	☒

Discussion:

a) The California Air Resources Board (ARB) and local air districts are responsible for developing clean air plans to demonstrate how and when California will attain air quality standards established under both federal and California Clean Air Acts. The 1976 Lewis Air Quality Management Act established the San Diego Air Pollution Control District (APCD) and other air districts throughout the State. In San Diego, the US EPA has designated the San Diego Association of Governments (SANDAG) as the Metropolitan Planning Organization responsible for ensuring compliance with the requirements of the Clean Air Act for the San Diego Air Basin.

The San Diego Regional Air Quality Strategy (RAQS) outlines APCD's plans and control measures designed to bring the area into compliance with the requirements of federal and State air quality standards. The RAQS uses the assumptions and projections of local planning agencies to determine control strategies for regional compliance status (LSA Associates Inc., 2011). Since the RAQS is based on local General Plans, projects that are deemed consistent with the General Plan are found to be consistent with the air quality plan. Reasonably foreseeable methods of compliance would be assessed for consistency with local General Plans on a project specific basis. The proposed project in its entirety will not result in any population growth and thus lead to long-term regional air quality impacts.

Considering the above information, the project will not conflict with the RAQS, and no impact will result with respect to implementation of the air quality plan.

b) Both the state of California and the federal government have established health-based ambient air quality standards for seven air pollutants. These pollutants include ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), coarse particulate matter with a diameter of 10 microns or less (PM_{10}), fine particulate matter less than 2.5 microns in diameter ($PM_{2.5}$), and lead. In addition, the State has set standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles. These standards are designed to protect the health and welfare of the populace with a reasonable margin of safety.

Ambient air quality is in nonattainment with the federal 8-hour ozone standard, the state's 8-hour and 1-hour ozone standards, and the state's coarse and fine particulate matter standards (PM_{10} and $PM_{2.5}$, respectively; San Diego APCD, 2009).

In general, reasonably foreseeable air quality impacts from implementation of the Basin Plan amendment would be the result of construction activities and operation and maintenance.

Construction impacts predominantly result from two sources: fugitive dust from surface disturbance activities; and exhaust emissions resulting from the use of construction equipment (including, but not-limited to: graders, dozers, back hoes, haul trucks, stationary electricity generators, and construction worker vehicles). One of the pollutants of concern during construction is particulate matter, since PM_{10} is emitted as windblown (fugitive) dust during surface disturbance and as exhaust of diesel-fired construction equipment (particularly as $PM_{2.5}$). The potential for an incremental cancer risk resulting from diesel-fired construction equipment exists. Other emissions of concern include architectural coating products off-gassing (VOCs) and other sources of mobile source (on-road and off-road) combustion (NOx, SOx, CO, PM_{10}, $PM_{2.5}$, and VOCs) associated with the project (County of San Diego, 2007b).

Operational and maintenance emissions are those that would occur after project construction activities have been completed and the project becomes operational. These emissions are a result of increased average daily vehicle trips as well as any proposed stationary sources associated with the reasonably foreseeable method of compliance. Depending on the characteristics of the individual project, operational activities have the potential to generate emissions of criteria pollutants. Operational impacts are predominantly the result of vehicular traffic associated with projects. Combustion emissions (NOx, SOx, CO, PM_{10}, $PM_{2.5}$, and VOCs) associated with mobile sources are generally the primary concern. This includes diesel particulate emissions from that portion of the mobile fleet that runs on diesel fuel (County of San Diego, 2007b).

In September 2000, the ARB adopted the Diesel Risk Reduction Plan (Diesel RRP), which recommends many control measures to reduce the risks associated with DPM and to achieve goals of 75 percent diesel particulate matter reduction by 2010 and 85 percent by 2020. The Diesel RRP presents the ARB's proposal for a comprehensive plan to significantly reduce diesel PM emissions by requiring all new diesel-fueled vehicles and engines to use state-of-the-art catalyzed diesel particulate filters and very

low-sulfur diesel fuel. In addition, all existing vehicles and engines should be evaluated, and wherever technically feasible and cost-effective, retrofitted with diesel particulate filters (ARB, 2000).

Considering the above information, violation of any air quality standard or contribution to an existing or projected air quality violation will be less than significant.

c) See discussion to section (b), above.

Ambient air quality is in non-attainment with the federal 8-hour ozone standard, the state's 8-hour and 1-hour ozone standards, and the State's coarse and fine particulate matter standards (PM_{10} and $PM_{2.5}$, respectively) (San Diego APCD, 2009).

The project will result in a less than significant net increase of any criteria pollutant for which the San Diego Air Basin is non-attainment under an applicable federal or state ambient air quality standard.

d) Sensitive receptors may exist in areas where construction and operational emissions will occur and subject sensitive receptors to diesel-fired particulates and carbon monoxide. In San Diego County, APCD Rule 1210 implements the public notification and risk reduction requirements of state law, which requires facilities with high potential health risk levels to reduce health risks below significant risk levels. In addition, APCD Rule 1200 establishes acceptable risk levels and emission control requirements for new and modified facilities that may emit additional toxic air contaminants (TACs). Under Rule 1200, permits to operate may not be issued when emissions of TACs result in an incremental cancer risk greater than 1 in 1 million without application of Toxics-Best Available Control Technology (T-BACT), an incremental cancer risk greater than 10 in 1 million with application of T-BACT, or a health hazard index (chronic and acute) greater than one. The human health risk analysis is based on the time, duration, and exposures expected (County of San Diego, 2007b). Emissions from the potential implementation projects resulting from this Basin Plan amendment would be short in duration, infrequent, and occur on a small scale, and therefore would not have a high health risk potential.

Considering the above information, impacts to sensitive receptors will be less than significant.

e) The Basin Plan amendment would not involve the construction of any permanent sources of odor and therefore would not create objectionable odors affecting a substantial number of people. No odor impacts would result from the project.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
IV. BIOLOGICAL RESOURCES: Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or US Fish and Wildlife Service?	☐	☒	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?	☐	☒	☐	☐
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☒	☐	☐
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☐	☒
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☒
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

Discussion:

a) The MSCP Plan is a comprehensive, long-term habitat conservation plan that addresses the needs of multiple covered species and the preservation of natural vegetation communities in San Diego County. The MSCP addresses the potential impacts of urban growth, natural habitat loss, and species endangerment; and includes a plan to mitigate for the potential loss of the multiple covered species and their habitat due to the direct impacts of future development of both public and private lands within the MSCP area. The MSCP identifies special status species; see the Environmental Setting section of this analysis (City of San Diego, 1997).

The Basin Plan amendment was developed specifically to benefit, enhance, restore and protect biological resources, including fish, wildlife, rare and endangered species, and habitat. Nonetheless specific projects involving construction and earthmoving activities could potentially affect candidate, sensitive or special status species (collectively, special status species), either directly or through habitat modifications. Although minor construction and earthmoving operations would likely occur in already disturbed areas and might involve reconstruction, recontouring, or replacement of existing roads and structures, it is possible that these and other activities to reduce erosion and restore

stream or Lagoon habitat could occur in and impact areas where there are special status species and habitats.

Some proposed projects that could affect sensitive species would be subject to review and approval by the San Diego Water Board. The San Diego Water Board, in the course of carrying out its statutory duties to protect water quality and beneficial uses (including preservation of rare and endangered species and wildlife habitat as set forth in the Basin Plan), will either not approve compliance projects with significant adverse impacts on special status species and habitats or require avoidance or mitigation measures to reduce impacts to less than significant levels. It is not reasonably foreseeable that the San Diego Water Board would approve earthmoving work that would disrupt or destroy habitat of a known special status species (since protection of rare and endangered species is one of the beneficial uses we are protecting in the Lagoon). Furthermore, it is the San Diego Water Board's standard practice to work with the proponents of compliance projects to come up with actions that not only meet and further the proposed Basin Plan amendment's requirements and goals, but also all other components of the Basin Plan, such as protection of rare and endangered species and habitat. For example, where avoidance of impacts is not possible, the San Diego Water Board requires mitigation measures for work it approves that may impact special status species, riparian habitats, or other sensitive natural communities. These include but are not limited to requiring pre-construction surveys; construction buffers and setbacks; restrictions on construction during sensitive periods of time; employment of on-site biologists to oversee work; and avoidance of construction in known sensitive habitat areas or relocation and restoration of sensitive habitats.

In sum, through the course of the San Diego Water Board discharging its mandate to protect beneficial uses including rare and endangered species and wildlife habitat, impacts to special species and their habitats would be avoided or mitigated to less than significant levels.

If, however, impacts to the special status species and their habitats occur outside the San Diego Water Board's jurisdiction (e.g., in areas with no proximity or relation to waters of the state), then impacts must be addressed through other local, state, and federal regulatory programs. For example for projects that fill Clean Water Act Section 404 wetlands, the Army Corps of Engineers explicitly conditions its permits to require that impacts to federally listed species be less than significant. State and federal laws prohibit the take of special status species and their habitats except where incidental take permits have been issued. When issuing incidental take permits, state and federal agencies must ensure that the impacts of the take are minimized and mitigated to the maximum extent possible and ensure that the take will not appreciably reduce the likelihood of the survival and recovery of the species.

Proposed projects would be subject to the County of San Diego's Biological Mitigation Ordinance (BMO).[24] The BMO is the implementing ordinance for the Multiple Species Conservation Program County Subarea Plan. Compliance with this ordinance allows

[24] San Diego County Code, Title 8, Division 6, Chapter 5 Biological Mitigation Ordinance

the County to issue Incidental Take Permits for projects that impact sensitive habitats. The BMO establishes the criteria for avoiding impacts to Biological Resource Core Areas, to plant and animal populations within those areas, and the mitigation requirements for all projects requiring a discretionary permit. The BMO explains how mitigation for impacts is determined and establishes specific mitigation requirements for impacts to certain species. In addition, proposed projects would be subject to the County of San Diego's Resource Protection Ordinance (RPO).[25] The RPO requires that a Resource Protection Study must be completed prior to approval of any of the discretionary applications listed in section 86.603(a) of the San Diego County Code. If the Resource Protection Study identifies the presence of environmentally sensitive lands, one or more of the following actions may be required as a condition of approval for the discretionary permit: 1) Apply open space easements to portions of the project site that contain sensitive lands; 2) Rezone the entire project site through the application of a special area designator for sensitive lands; or 3) Other actions as determined by the decision-making body.[26]

Considering the above information, impacts, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or US Fish and Wildlife Service will be less than significant with mitigation.

b) As indicated in section a) above, the Basin Plan amendment is designed to benefit biological resources, particularly riparian habitat and other sensitive natural communities. Nonetheless activities to improve riparian conditions, such as channel restoration and Lagoon restoration, could result in minor and short term disruption to riparian habitat.

Projects proposed to comply with the Basin Plan amendment implementation plan involving grading or construction in the riparian corridor, are subject to review and approval by the San Diego Water Board. As described in section a) above, the San Diego Water Board, in the course of discharging its statutory duties to protect water quality and their beneficial uses will either not approve compliance projects with significant adverse impacts on riparian habitats and sensitive natural communities, or would require mitigation measures to reduce impacts to less than significant levels. Furthermore, it is the San Diego Water Board's standard practice to work with California Department of Fish and Game, US Fish and Wildlife Service, and proponents of compliance projects to come up with actions that not only meet and further the project objective, but also have minimal impacts. Mitigation measures routinely required by the San Diego Water Board include (but are not limited to) requiring pre-construction surveys; construction buffers and setbacks; restrictions on construction during sensitive periods of time; employment of on-site biologists to oversee work; and avoidance of construction in known sensitive habitat areas or relocation and restoration of sensitive habitats, but only if avoidance is impossible.

[25] San Diego County Code, Title 8, Division 6, Chapter 6 Resource Protection Ordinance
[26] San Diego County Code, Title 8, Division 6, Chapter 6, Section 86.603(c)

However, if impacts to sensitive natural communities occur outside the San Diego Water Board's jurisdiction, such as in upland communities, then impacts must be addressed through other local, state, and federal regulatory programs (as described in section a), above).

Considering the above information, impacts to any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Game or US Fish and Wildlife Service would be less than significant with mitigation.

c) Basin Plan amendment-related implementation actions may contribute to an increase in the acreage of land where habitat enhancement and/or erosion control projects are undertaken, a fraction of which could be within wetlands. The adverse impacts on wetlands would not be substantial. Under the Nationwide or Individual Permit programs administered by the US Army Corps of Engineers (per Section 404 of the Clean Water Act) there are general conditions that require that, for projects that may adversely affect wetlands, responsible parties must demonstrate that avoidance, minimization, and mitigation has occurred to the maximum extent practicable to ensure that adverse impacts to the aquatic environment are minimal. In addition, before the Army Corps can issue section a 404 permit, San Diego Water Board staff must certify the project (Section 401 certification) as compliant with state water quality standards, such as the Porter Cologne Water Quality Control Act, the California Wetland Conservation Policy, and the Basin Plan.

If a water or wetland, although delineated under the 404(b)(1) guidelines is not considered a Water of the United States (and therefore subject to Section 404 permitting by the Army Corps), as a water of California it is still protected by state laws. Proposed discharges to non-federal waters of the state are subject to Waste Discharge Requirements pursuant to Water Code section 13260.

This gives assurance that any potential impacts will be mitigated to a less than significant level.

d) The Basin Plan amendment would not substantially interfere with the movement of any native resident or migratory fish or wildlife species, with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites. The main goal of the Basin Plan amendment is to improve and enhance the saltmarsh habitat in the Lagoon. Thus, compliance projects would entail improving habitat as wildlife corridors, not adversely affecting them. Therefore, no impacts will occur to the movement of any native resident or migratory fish or wildlife species, with established native resident or migratory wildlife corridors, or impacts to use of native wildlife nursery sites.

e) The Basin Plan amendment itself does not conflict with any local policies or ordinances protecting biological resources. Therefore, no impacts will occur.

f) The Basin Plan amendment itself does not conflict with any adopted Habitat Conservation Plan, Natural Community Plan, or other approved local, regional or state habitat conservation plan, including the Los Peñasquitos Lagoon Enhancement Plan and Los Peñasquitos Canyon Preserve Natural Resource Management Plan. Therefore, no impacts will occur.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
V. CULTURAL RESOURCES: Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	☒	☐	☐	☐
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☒	☐	☐	☐
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☒	☐	☐	☐
d) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☐	☒	☐

Discussion:

a) In 1824, Los Peñasquitos canyon became a Mexican land grant named *Rancho Santa Maria de los Peñasquitos. Rancho Peñasquitos* was continuously managed as a ranch under several owners until the entire Rancho was bought in 1962 for a proposed residential development. San Diego County's second oldest standing residence, Rancho de Los Peñasquitos, is a historic landmark.

Projects involving earthmoving or minor construction to comply with requirements of the proposed Basin Plan amendment are reasonably foreseeable. The activities could occur in areas of California State Park lands and in Los Peñasquitos Creek where historic artifacts are present. Development in the Los Peñasquitos watershed is subject to the San Diego County's Resource Protection Ordinance (RPO).[27] This ordinance requires that resources be evaluated with a Resource Protection Study and a finding that the use or development permitted by the application is consistent with the provisions of the RPO prior to approval of any of the following types of discretionary applications, which are not limited to: tentative maps, revised tentative maps, rezones, major use permit modifications, certificates of compliance, site plans, administrative permits, vacations of open space easements. The RPO prohibits development, trenching, grading, clearing, and grubbing, or any other activity or use that may result in damage to significant prehistoric or historic site lands, except for scientific investigations with an approved research design prepared by an archaeologist certified by the Society of Professional Archaeologists.[28]

[27] San Diego County Code, Title 8, Division 6, Chapter 6 Resource Protection Ordinance
[28] San Diego County Code, Resource Protection Ordinance, sections 86.601-86.608

Projects occurring within the City of San Diego are subject to the City of San Diego's Historical Resources Regulations,[29] which are intended to assure that development occurs in a manner that protects the overall quality of historical resources. It is further the intent of these regulations to protect the educational, cultural, economic, and general welfare of the public, while employing regulations that are consistent with sound historical preservation principles and the rights of private property owners.[30]

Furthermore, city and county General Plans contain policies that protect historic resources including the Conservation Element of the San Diego County General Plan, the Historical Preservation Element of the City of San Diego's General Plan, the Historical Structures Chapter of the City of Poway's Municipal Code, and the Historic Preservation Overlay Zone of the City of Del Mar's Municipal Code. In addition, California Public Resources Code section 5024.5 requires that all state agencies consult with the Office of Historic Preservation when any proposed project may adversely affect any historical resources on state-owned property (including state parks), and section 5024 requires that all state agencies inventory, register, preserve, and maintain all historical resources within their jurisdiction.

Considering the above information, the proposed projects that would occur as a result of the Basin Plan amendment would have a potentially significant impact on historical resources, but mitigation measures are available to reduce impacts to less than significant levels. However, implementation of these mitigation measures is within the jurisdiction of the local regulatory agencies listed in this document (Section 3.4.3). These agencies have the ability to implement these mitigation measures, can and should implement these mitigation measures, and are required under CEQA to implement mitigation measures unless mitigation measures are deemed infeasible through specific considerations.[31]

b) The Los Peñasquitos watershed is known to contain archeological sites, with artifacts found showing indigenous people living there for over 6,000 years. In addition, considerable archeological interest has been centered on the Lagoon because of the proximity of many Indian middens and campsites. Because these sites were occupied by La Jolla Indians between four and five thousand years ago, they usually contain many shells of both lagoon and ocean mollusks, some animal bones, and primitive stone implements (Mudie et al., 1974).

Projects involving earthmoving or construction to comply with requirements of the proposed Basin Plan amendment are reasonably foreseeable. Construction would generally be small in scale, and earthmoving would likely occur in areas already disturbed by recent human activity (i.e., existing roads, and housing and industrial developments)—not at or in areas containing archaeological resources as defined by section 15064.5 of the CEQA Guidelines. In the event that unique archaeological resources are found, the project would be subject to California Public Resources Code section 21083.2, which requires that if a project will cause damage to a unique

[29] City of San Diego Municipal Code, Chapter 14, Article 3, Division 2 Historical Resources Regulations
[30] City of San Diego General Plan, Historic Preservation Element
[31] 14 CCR section 15091(a)(3)

archaeological resource, the lead agency for the project level environmental review may require reasonable efforts to be made to permit any or all of these resources to be preserved in place or left in an undisturbed state. Examples of that treatment, in no order of preference, may include, but are not limited to, any of the following: 1) planning construction to avoid archaeological sites, 2) deeding archaeological sites into permanent conservation easements, 3) capping or covering archaeological sites with a layer of soil before building on the sites, and/or 4) planning parks, greenspace, or other open space to incorporate archaeological sites.

Furthermore, city and county General Plans contain policies that protect archaeological resources including the Conservation Element of the San Diego County General Plan, the Historical Preservation Element of the City of San Diego's General Plan, the Historical Structures Chapter of the City of Poway's Municipal Code, and the Historic Preservation Overlay Zone of the City of Del Mar's Municipal Code.

Considering the above information, the proposed projects that would occur as a result of the Basin Plan amendment would have a potentially significant impact on archaeological resources, but mitigation measures are available to reduce impacts to less than significant levels. However, implementation of these mitigation measures is within the jurisdiction of the local regulatory agencies listed in this document (Section 3.4.3). These agencies have the ability to implement these mitigation measures, can and should implement these mitigation measures, and are required under CEQA to implement mitigation measures unless mitigation measures are deemed infeasible through specific considerations.[32]

c) Potential projects will involve earthmoving or construction to comply with requirements of the proposed Basin Plan amendment. These projects will occur near sea cliffs, on valley slopes, within the Lagoon, and/or in floodplains. Paleontological resources are typically found in the geologic deposits of sedimentary rock (e.g. sandstone, siltstone, mudstone, claystone, or shale) under surficial soil deposits within these types of areas. The Torrey Sandstone, Santiago Peak Volcanics Metasedimentary, and Lusardi Formation geologic units occur within the Peñasquitos watershed. The Torrey Sandstone and Lusardi Formation units have high resource sensitivities whereas the Santiago Peak Volcanics Metasedimentary unit has moderate resource sensitivity (City of San Diego, 2007). In general, formations with high resource potential are considered to have the highest potential to produce unique invertebrate fossil assemblages or unique vertebrate fossil remains and are, therefore, highly sensitive.

However, any project that is implemented will have to comply with local regulations and standards including the County of San Diego Grading Ordinance and the Conservation Element of the San Diego County General Plan. Section 87.430 of the Grading Ordinance provides for the requirement of a paleontological monitor at the discretion of the County. In addition, the suspension of grading operation is required upon the discovery of fossils greater than twelve inches in any dimension. The ordinance also

[32] 14 CCR section 15091(a)(3)

requires notification of the County Official (e.g. Permit Compliance Coordinator). The ordinance gives the County Official the authority to determine the appropriate resource recovery operations, which the permittee shall carry out prior to the County Official's authorization to resume normal grading operations. For projects occurring within the City of San Diego, resources are identified and protected through the environmental review process for discretionary projects. Through the City of San Diego's environmental process and prior to issuance of a Notice to Proceed (NTP) for any construction permits, including but not limited to, the first Grading Permit, Demolition Plans/Permits and Building Plans/Permits, the environmental review manager environmental designee shall verify that the requirements for Paleontological Monitoring have been noted on the appropriate construction documents.

Considering the above information, the proposed projects that would occur as a result of the Basin Plan amendment would have a potentially significant impact on paleontological resources, but mitigation measures are available to reduce impacts to less than significant levels. However, implementation of these mitigation measures is within the jurisdiction of the local regulatory agencies listed in this document (Section 3.4.3). These agencies have the ability to implement these mitigation measures, can and should implement these mitigation measures, and are required under CEQA to implement mitigation measures unless mitigation measures are deemed infeasible through specific considerations.[33]

d) Projects involving earthmoving or construction to comply with requirements of the proposed Basin Plan amendment are reasonably foreseeable. Construction would generally be small in scale, and earthmoving would likely occur in areas already disturbed by recent human activity (i.e., existing roads, and housing and industrial developments)—not at or in areas human remains, such as the El Camino Memorial Park located in Sorrento Valley.

In the event that human remains are discovered during a project level activity, the project proponent would be subject to Health and Safety Code section 7050.5, which requires that there shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlay adjacent remains until the County Coroner has examined the remains. If the Coroner determines the remains to be those of an American Indian, or has reason to believe that they are those of an American Indian, the Coroner contacts, by telephone within 24 hours, the Native American Heritage Commission.

Considering the above information, the proposed projects that would occur as a result of the Basin Plan amendment would not adversely affect human remains, and impacts would be less than significant.

[33] 14 CCR section 15091(a)(3)

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
VI. GEOLOGY AND SOILS: Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:	☐	☐	☐	☒
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42?	☐	☐	☐	☒
ii) Strong seismic ground shaking?	☐	☐	☐	☒
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☐	☒
iv) Landslides?	☐	☐	☐	☒
b) Result in substantial soil erosion or the loss of topsoil?	☐	☒	☐	☐
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☒	☐
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	☐	☒
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☒

Discussion:

a) The project area is not located near Alquist-Priolo fault zone (Holocene faults) or a County Special Study fault zone (Late-Quaternary faults) (County of San Diego, 2007e, Figure 1 and 2); the Near-Source Zones for ground-shaking (County of San Diego, 2007e, Figure 3); or the Potential Liquefaction Areas (County of San Diego, 2010b, Figure 4.3.6). The project area does include landslide prone formations near the canyon and along the coast where steep slope and bluff exist (County of San Diego, 2010b, Figure 4.3.5). However, the Basin Plan amendment would not involve the construction of habitable structures; therefore, it would not result in any human safety risks of loss, injury, or death related to fault rupture, seismic ground-shaking, ground failure including liquefaction, or landslides. Therefore, no impacts will occur.

b) Specific projects involving earthmoving or construction activities to comply with requirements of the Basin Plan amendment are reasonably foreseeable. Such activities in general would not result in substantial soil erosion or the loss of topsoil since implementation of the Basin Plan amendment should reduce erosion rather than increase it. Temporary earthmoving operations could result in short-term, limited

erosion. Construction projects affecting an area of one acre or more would require a general construction National Pollutant Discharge Elimination System (NPDES) permit from the State Water Board, and implementation of a storm water pollution prevention plan to control sediment erosion and runoff. These projects will be subject to the review and inspection by the San Diego Water Board, and will require implementation of routine and standard erosion control best management practices and proper construction site management. Other grading projects would be subject to non-discretionary requirements of local ordinance and code to reduce potential soil erosion from grading. Therefore, the Basin Plan amendment would not result in substantial soil erosion, and any impacts would be less than significant with mitigation.

c) Even though the project area includes landslide prone formations near the canyon and along the coast where steep slope and bluff exist (County of San Diego, 2010b), implementation of the Basin Plan amendment will not cause or result in further instability of these areas. On the contrary, implementation of the Basin Plan amendment will require actions to reduce sediment sources that may include landslide areas, eroding gullies, river banks and roads. Potential implementation projects would be designed to increase the stabilities of these unstable areas, both onsite and off-site, including minimization of any potential for landslides. Therefore, the Basin Plan amendment would not involve activities that would create or trigger landslide, lateral spreading, subsidence, liquefaction or collapse, and its impacts would be less than significant.

d) The Basin Plan amendment would not involve construction of buildings (as defined in the Uniform Building Code) or any habitable structures. Minor grading and construction could occur in areas with expansive soils but this activity would not create a substantial risk to life or property. Therefore, the Basin Plan amendment would not result in impacts related to expansive soils.

e) The Basin Plan amendment would not require wastewater disposal systems; therefore, affected soils need not be capable of supporting the use of septic tanks or alternative wastewater disposal systems. No impacts would result from the project with respect to septic tanks or alternative wastewater disposal systems.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
VII. GREENHOUSE GAS EMISSIONS: Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☐	☒
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☐	☒

Discussion:

a) Several reasonably foreseeable methods of compliance are likely to require additional motor vehicle trips and increased traffic during construction and maintenance of structural BMPs, which would increase greenhouse gas emissions from mobile sources. Considering the likely small contributions of the reasonably foreseeable methods of compliance relative to major facilities (i.e. cement plants, oil refineries, fossil-fueled electric-generating facilities/providers, cogeneration facilities, hydrogen plants, and other stationary combustion sources), the contribution from this implementation program is small in scale and the same as typical construction and maintenance activities in urbanized areas, such as road and infrastructure maintenance and building activities, and would not result in a significant impact on the environment.

b) In 2006, California passed AB 32, the Global Warming Solutions Act of 2006, which set the 2020 greenhouse gas emissions reduction goal into law. In December 2007, the California Air Resources Board (ARB) approved the 2020 emission limit of 427 million metric tons of CO_2 equivalents (CO_2e) of greenhouse gases. The 2020 target of 427 million metric tons of CO_2e requires the reduction of 169 million metric tons of CO_2e, or approximately 30 percent, from the state's projected 2020 emissions of 596 million metric tons of CO_2e (ARB, 2008).

AB 32 requires ARB to adopt mandatory reporting for the largest industrial sources to report and verify their greenhouse gas emissions. In 2007, ARB adopted the Regulation for the Mandatory Reporting of Greenhouse Gas Emissions. Currently, the regulation is being revised. A final rulemaking package was filed by ARB with the Office of Administrative Law on October 28, 2011. The regulation language applies to facilities on Table A-3 of 40 CFR Part 98, including cement plants, oil refineries, fossil-fueled electric-generating facilities/providers, cogeneration facilities, hydrogen plants, and other stationary combustion sources, regardless of emissions level. The regulation language also applies to facilities on Table A-4 of 40 CFR Part 98, including electronics manufacturing, fluorinated gas production, and glass production, that generate more than 10,000 metric tons/year CO_2e.[34] By requiring these largest facilities to report their emissions, approximately 94 percent of greenhouse gas emissions from industrial and commercial stationary sources in California will be accounted (ARB, 2007).

[34] 17 CCR sections 95100 – 95133 http://www.arb.ca.gov/regact/2010/ghg2010/mrrfro.pdf

On December 11, 2008, ARB adopted its Climate Change Scoping Plan with re-approval occurring on August, 24, 2011. The Scoping Plan proposes a comprehensive set of actions designed to reduce overall carbon emissions in California. Key elements of California's recommendations for reducing its greenhouse gas emissions to 1990 levels by 2020 include:

- Expanding and strengthening existing energy efficiency programs as well as building and appliance standards;
- Achieving a statewide renewables energy mix of 33 percent;
- Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system;
- Establishing targets for transportation-related greenhouse gas emissions for regions throughout California, and pursuing policies and incentives to achieve those targets;
- Adopting and implementing measures pursuant to existing state laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard; and
- Creating targeted fees, including a public goods charge on water use, fees on high global warming potential gases, and a fee to fund the administrative costs of the state's long term commitment to AB 32 implementation. (ARB, 2008)

Implementation of this TMDL will not conflict with implementation of the Climate Change Scoping Plan and no impact will occur.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
VIII. HAZARDS AND HAZARDOUS MATERIALS: Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☐	☒
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☐	☒
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☒	☐
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☒	☐

Discussion:

a) Compliance with the Basin Plan amendment implementation plan does not involve the routine transport, use, or disposal of hazardous materials. Therefore, no impacts from the use, transport or disposal of hazardous materials would result.

b) The Basin Plan amendment does not include actions that are likely to result in upset or accident conditions involving the release of hazardous materials. Potential implementation projects that include sediment reduction installations and habitat restoration activities would be relatively small in scale, be located in existing developed areas or on public lands along water courses, and would not contain, handle, or store any potential sources of chemicals or compounds that would present a significant risk of accidental explosion or release of hazardous substances. Therefore, no impacts will occur.

c) Basin Plan amendment actions such as minor construction to reduce erosion and habitat restoration projects would be located along the storm water conveyance system right of way and stream channels in areas used as open space, which are not likely to contain schools. In any case, the Basin Plan amendment and TMDL implementation actions would not emit hazardous materials, substances, or waste. Therefore, no impact from hazardous materials would occur within one-quarter mile of an existing or proposed school.

d) It is unlikely that Basin Plan amendment actions would occur on sites that are included on lists of hazardous material sites compiled pursuant to Government Code Section 65962.5, such as leaky underground storage tank sites or sites where hazardous materials violations have occurred. The possibility that hazardous materials or substances will be encountered during project activities on or near these sites is speculative and need not be considered in this analysis. Therefore, there would be no impacts from hazardous materials sites.

e) The Basin Plan amendment does not include actions that would result in a safety hazard to people residing or working in any potential project areas from a public airport. The Los Peñasquitos watershed is not within an airport land use plan, or within two miles of a public airport or public use airport; therefore, the Basin Plan amendment would not result in an air safety hazard for people residing or working in the project area.

f) A large portion of the watershed lies within the overflight influence of the Marine Corps Air Station Miramar (MCAS Miramar), which is located in the Rose Canyon Creek watershed immediately to the south of Los Peñasquitos watershed (ALUC, 2010). MCAS Miramar Airport Land Use Compatibility Plan (MCAS Miramar ALUCP) indicates that a portion of the Lagoon and the lower part of Carroll Canyon are in Accident Potential Zone II (APZII) bordered by a narrow Transition Zone (TZ) around the perimeter (ALUC 2010). APZII and TZ are the third and final tiers of the safety-related zones identified by the US Marine Corps and have the lowest potential for occurrence of aircraft accidents of the safety zones, which is based on distance from the ends of the runways. MCAS Miramar ALUCP necessitates restrictions on land uses in these safety zones for infill development (construction of residential and nonresidential buildings where people will inhabit or congregate). Potential implementation projects that include minor construction for sediment reduction installations and habitat restoration activities are not identified as the type of development requiring restriction. However, the construction and maintenance activities associated with these types of projects would be expected to meet or be below the APZII Maximum Intensity Limit of 50 people per acre, as set by the MCAS Miramar ALUCP for the “Water, Rivers, Creeks, Canals, Wetlands, Bays, Lakes, and Reservoirs” land use. These types of implementation projects in these two safety zones have a low potential for ground hazard from flight-related accidents during the construction phase and periodic maintenance work and represent a less than significant impact.

There are several private heliports in the vicinity of the Lagoon and preserve and Carroll Canyon Creek: San Diego Heliport, Qualcomm Building T Heliport, Henley Heliport, the

Plaza La Jolla Village Heliport, and Scripps Memorial Hospital La Jolla Heliport. The Federal Aviation Administration published an Advisory Circular for Heliport Design (AC) that provides guidance with respect to the design of the touchdown and liftoff pad for helicopters and requirements for obstruction-free approach/departure paths (FAA, 2004). The AC recommends helipad protection zones for public use facilities. These zones, equivalent to runway protection zones at airports, extend 280 feet from the edge of the Final Approach and Takeoff Area (FATO). A FATO is generally larger than the physical pad itself and its size usually depends on the size of the helicopters that will utilize the helipad. Potential implementation projects that include minor construction for sediment reduction installations and habitat restoration activities are not likely to be within the protection zone of any of the local helipads. There would be no impact from the presence of these local helipads.

Considering the above information as a whole, potential implementation projects result in a less than significant impact to the safety for people residing or working in the project area.

g) The following applicable emergency response plans or emergency evacuation plans are evaluated for potential project consistency.

Unified San Diego County Emergency Services Organization Operational Area Emergency Plan

The Operational Area Emergency Plan is a comprehensive emergency plan that defines responsibilities, establishes an emergency organization, defines lines of communications, and is designed to be part of the Emergency Plan (County of San Diego, 2010d). It provides guidance for emergency planning and requires subsequent plans to be established by each jurisdiction that has responsibilities in a disaster situation. Potential implementation projects resulting from this Basin Plan amendment will not interfere with this plan because it will not prohibit subsequent plans from being established or prevent the goals and objectives of existing plans from being carried out.

Dam Evacuation Plans

Built in 1960, Lake Miramar Dam is made of earth and has a high relative hazard rating (County of San Diego, 2010b, Figure 4.3.2). The dam inundation area impacts the length of Carroll Canyon and the Lagoon. Potential implementation projects that include minor construction for sediment reduction installations and habitat restoration activities may be located in the dam inundation area, but will not interfere with the Dam Evacuation Plan because the project will not involve building of structures that would contain large concentrations of people or special needs individuals that would limit the ability of the County Office of Emergency Services to implement a dam evacuation plan.

Emergency Air Support

Emergency and fire air support services tend to fly lower to the ground than passenger airplanes for law enforcement activities, to carry out search and rescue missions, to collect water for firefighting, and to evacuate victims from remote areas (County of San Diego, 2007d). Emergency response aircraft require sufficient ground clearance to safely and efficiently function during an emergency response. Potential implementation

projects resulting from this Basin Plan amendment would not involve building structures that would create an obstruction that could compromise the safety of emergency response aircraft and their ability to effectively respond in an emergency could result in physical interference in the implementation of an emergency response.

In general, potential implementation projects that include minor construction for sediment reduction installations and habitat restoration activities resulting from the Basin Plan amendment would not interfere with any emergency response plans or emergency evacuation plans. Therefore, no impact would occur.

h) Potential implementation projects resulting from this Basin Plan amendment that include minor construction for sediment reduction installations and habitat restoration activities may be adjacent to wildlands that have the potential to support wildland fires. The natural areas within the Lagoon and the canyons that drain to the lagoon have wildfire hazard risk level designations of moderate, high, and very high (County of San Diego, 2010b, Figure 4.3.7). However, these potential projects will be required by the local permitting agencies to comply with regulations relating to emergency access, water supply, and defensible space specified in the 2010 California Fire Code (ICC 2010; as adopted, amended, or modified by the Cities of San Diego[35], Poway[36], and Del Mar[37]) and the 2011 Consolidated Fire Code for the County and 16 unincorporated Fire Protection Districts in San Diego County, as adopted and amended by the local fire protection district (County of San Diego, 2011b). Project proponents will have to prepare fire protection plans that describe the level of fire hazard and the methods proposed to minimize the hazard, as required by the applicable jurisdiction's regulations. Therefore, it is not likely that a potential project related to this Basin Plan amendment would increase fire hazards, nor would a potential project expose people or structures to a significant risk of loss, injury or death involving wildland fires. The impact would be less than significant.

[35] City of San Diego, San Diego Municipal Code, Chapter 5, Article 5: Fire Protection and Prevention. Adoption of portions of the California Fire Code (2007 Edition), except as otherwise provided in this article.
[36] City of Poway, Poway Municipal Code, Chapter 15.24, Fire Code. Adoption of 2010 California Fire Code including Appendix Chapters 1 and 4 and Appendices B and F, as published by the International Code Council, except those portions that are deleted, modified, or amended by this chapter.
[37] City of Del Mar, Del Mar Municipal Code, Chapter 10.04, Fire Code. Adoption of 2010 California Fire Code, including Appendix Chapters; Appendix Chapter 4, Appendix B and H, as published by the International Code Council.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
IX. HYDROLOGY AND WATER QUALITY: Would the project:				
a) Violate any water quality standards or waste discharge requirements?	☐	☐	☐	☒
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☐	☒
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	☐	☒	☐	☐
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	☐	☐	☐	☒
e) Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff?	☐	☒	☐	☐
f) Otherwise substantially degrade water quality?	☐	☐	☐	☒
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☒
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☐	☐	☒	☐
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☒	☐
j) Inundation by seiche, tsunami, or mudflow	☐	☐	☐	☒

Discussion:

a) The Basin Plan amendment articulates applicable water quality standards; therefore, once compliance with the WLAs and numeric targets are met in the watershed, there would be no violation of water quality standards or waste discharge requirements, and no adverse impacts to water quality would result.

b) This Basin Plan amendment may result in implementation projects that involve construction of facilities, such as retention basins, infiltration basins, or vegetated swales, which may increase storm water infiltration and subsequently return groundwater recharge rates to pre-development rates. Potential implementation

projects will not necessitate use of groundwater for any purpose, including irrigation, domestic or commercial demands. Potential implementation projects will not result in a decrease in groundwater supplies. No adverse impacts to groundwater recharge would result.

c) Potential implementation projects resulting from this Basin Plan amendment may involve earthmoving or minor construction activities during the installation of BMPs. These BMPS would reduce or eliminate soil erosion and sediment runoff and reduce wet-weather flows. The purpose of these types of projects would be to reduce overall soil erosion. Such projects would affect existing drainage patterns, but result in more stable hydrology. For example, installation of facilities such as retention/infiltration basins or bioswales would modify the drainage; however, the facility would ultimately reduce peak wet-weather flows to a lower-flow condition that would be less erosive than existing conditions. Installation of implementation projects would not result in substantial erosion or siltation on- or off-site and would be less than significant.

Potential habitat restoration projects in any of the creek channels or the Lagoon, including projects designed to improve tidal flushing, improve salt marsh habitat, and ultimately restore beneficial uses in the lagoon, could include activities such as removing accumulated sediments, stabilizing banks, restoring natural channels, and revegetating affected land areas. Such projects could also affect existing drainage patterns and result in substantial short-term impacts from erosion on- and off-site, until system stabilization occurred.

Restoration projects such as these, which involve fill or dredging in wetlands or riparian areas, require federal and state review pursuant to the Federal Clean Water Act (CWA), California Water Code, and California State Policies. The San Diego Water Board will require that project proponents implement standard erosion control best management practices and utilize proper construction site management through its CWA section 401 Water Quality Certification Program. In addition, construction projects greater than one acre in size would require a general construction NPDES permit and implementation of a storm water pollution prevention plan. Therefore, any identified substantial impacts from these potential implementation projects would be mitigated by Water Board-issued permit requirements and be less than significant with mitigation incorporated.

d) Potential implementation projects resulting from this Basin Plan amendment could involve earthmoving operations that could substantially affect existing drainage patterns. Some projects may be performed to terrace steep slopes to reduce erosion rates and landslide potential or to re-establish stable channel geometry in some channel reaches for the purpose of reconnecting stream channels with the floodplain. The purpose of these projects is to reduce sedimentation in streams, which has the effect of reducing flooding and is environmentally beneficial. The numeric target in this TMDL will encourage responsible parties to implement erosion control measures for compliance purposes.

Potential implementation projects will not substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site of project areas; therefore, there will be no adverse impact.

e) Activities related to potential implementation projects resulting from this Basin Plan amendment are, by design, intended to decrease peak runoff rates from upland land uses to reduce sediment input to the Lagoon. These potential implementation projects will likely result in a decrease of wet weather flows and associated pollutant loads to channels. Therefore, potential implementation projects resulting from this Basin Plan amendment would not result in creating or contributing additional runoff water that would exceed the capacity of the existing storm water drainage system.

Potential implementation projects that involve minor construction activities and earthmoving operations could result in additional sources of polluted runoff due to accidental release of sediment into the waterway and pollutants such as petroleum products from construction equipment during the construction-phase. Construction projects affecting an area of one acre or more would require a general construction National Pollutant Discharge Elimination System (NPDES) permit from the State Water Board and implementation of a storm water pollution prevention plan to control sediment erosion and runoff. The San Diego Water Board will require proper construction site management and implementation of standard best management practices to control erosion and prevent spills. Additionally, implementation projects will receive local planning and environmental review through mandatory permitting processes that evaluate projects, minimize environmental impacts, and assure project consistency with plans, policies, and ordinances, such as local grading ordinances.

The impact of potential implementation projects creating or contributing substantial additional sources of polluted runoff will be less than significant with mitigation.

f) Activities related to potential implementation projects resulting from this Basin Plan amendment are intended to reduce erosion and sediment inputs to the Lagoon. The purpose of the Basin Plan amendment is to correct the water quality impairment and restore beneficial uses. Therefore, the Basin Plan amendment would not substantially degrade water quality and no long-term adverse water quality impacts would occur as a result of potential implementation projects.

g) The Basin Plan amendment will not result in construction of housing. Therefore, no housing would be placed within the 100-year flood hazard zone as a result of the proposed action. No flood hazard impacts would occur.

h) The 100-year floodplain is located along the stream drainages in the canyons of the TMDL area (County of San Diego, 2010b, Figure 4.3.4). Potential implementation projects may be performed to terrace steep slopes to reduce erosion rates and landslide potential or to re-establish stable channel geometry in some channel reaches for the purpose of reconnecting stream channels with the floodplain. While these types of activities would be near or in the floodplain, it is not likely that it would interfere with the floodplain. Other projects are likely to involve habitat restoration activities that would

increase salt marsh habitat, improve tidal flushing, and improve the water body's capacity to absorb flood water.

The purpose of these projects is to reduce sedimentation in streams, which has the effect of reducing flooding and is environmentally beneficial. The Basin Plan amendment will therefore result in less than significant impacts to the impediment or redirection of flood flows within a 100-year flood hazard zone.

i) Built in 1960, Lake Miramar Dam is made of earth and has a high relative hazard rating (County of San Diego, 2010b, Figure 4.3.2). The dam inundation area impacts the length of Carroll Canyon and the Lagoon. Potential implementation projects that include minor construction for sediment reduction installations and habitat restoration activities may be located in the dam inundation area of the Lake Miramar Dam. People working on these projects could be exposed to significant risk of loss, injury or death involving flooding as a result of dam failure; but this risk is speculative as failure is unlikely to be caused by the small projects resulting from the Basin Plan amendment. Any such risk would be very small because of the short-term nature of the construction-phase of such projects. Furthermore, the Basin Plan amendment does not include construction of buildings or housing in the inundation area and will not expose people or structures to a significant risk from flooding. The project's impact would be less than significant.

j) Potential implementation projects resulting from this Basin Plan amendment are likely to be located in upland, in canyons, or within lagoon areas. None of these locations would be impacted by seiche inundation or tsunami. County of San Diego (2010b) has produced maps illustrating the hazards for coastal storms/erosion/tsunami and rain-induced landslide based on historic disaster information. The projected hazard of the maximum tsunami projected run-up affects 0.5 to 0.75 miles inland from the coastline at the estuary mouth (County of San Diego, 2010b, Figure 4.3.1). High risk hazard from coastal storm surge is not indicated for the coastline of the Lagoon mouth. The cliffs lining the canyon areas along Carmel, Los Peñasquitos, and lower Carroll Canyon Creeks are indicated as most susceptible for landslide (County of San Diego, 2010b, Figure 4.3.5); however, BMP construction or lagoon restoration activities would be unlikely to occur during wet weather. Potential implementation projects would not expose people or property of inundation due to seiche, tsunami, or mudflow and would create no impact.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
X. LAND USE AND PLANNING: Would the project:				
a) Physically divide an established community?	☐	☐	☐	☒
b)Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☒

Discussion:

a) Potential implementation projects resulting from this Basin Plan amendment that include earthmoving and minor construction for sediment reduction installations and would not be of any size or configuration likely to physically divide an established community. Habitat restoration activities would likely occur within stream channels or the lagoon itself and would not introduce a new physical divide. Therefore, no adverse impact would occur.

b) Potential implementation projects that include earthmoving and minor construction for sediment reduction installations and habitat restoration activities would not conflict with any land use plan, policy, or regulation.

Installation of treatment control BMPs, such as infiltration/retention basins, buffer zones, or vegetated swales, would potentially reduce sediment; improve water quality, reduce peak storm water flows, increase infiltration of surface water, and/or decrease dry-weather flows. These types of BMPs are also used in Low Impact Development (LID) for the purpose of decreasing storm water runoff from impervious surfaces and reducing erosion hazards. LID is already required for land development and capital improvement projects within the cities and county jurisdictions (City of San Diego, 2011; City of Del Mar, 2011; County of San Diego, 2011a; Brown and Caldwell, 2011).[38]

Other potential BMPs that may be used are vegetation stabilization to prevent the occurrence of erosion, installation of energy dissipaters at the outlets of storm drains, culverts, conduits, or channels to slow storm water velocity in the canyons to prevent channel incision, and stabilization of steep or eroded slopes to reduce or eliminate erosion and landslide hazards. Stream channel restoration activities may be used to re-establish stable channel geometry to protect wetland function and minimize erosion. Additionally, the Basin Plan Amendment may require some restoration of lagoon habitat

[38] City of San Diego Municipal Code, Chapter 4, Article 3, Division 3, section 43.0307; Poway Municipal Code, Title 16, Division VI, Chapter 16.100; City of Del Mar Municipal Code, Title 11, Chapter 11.30; and County of San Diego Watershed Protection Ordinance, section 67.806.

to restore and enhance the biological value and hydrologic function of the coastal wetland.

These types of BMPs and activities may be used by the jurisdictions to maintain and improve infrastructure, conveyance system, and wetland resources and are consistent with the cities' and county general plan elements and ordinances.[39] Projects proposed to comply with Basin Plan amendment requirements would be subject to the review of these local agencies, assuring consistency with local land use plans or policies. For all of these reasons, no conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project is anticipated. Therefore, no impact would occur.

c) The Basin Plan amendment would not conflict with any habitat conservation plan or natural community conservation plan. Projects proposed to comply with Basin Plan amendment requirements would be subject to local agency review and would be conducted in accordance with the Multiple Species Conservation Plan (MSCP), the Los Peñasquitos Lagoon Enhancement Plan, and Los Peñasquitos Canyon Preserve Natural Resource Management Plan. The purposes of these plans are as follows:

- The MSCP addresses the potential impacts of urban growth, natural habitat loss, and species endangerment; and includes a plan to mitigate for the potential loss of the multiple covered species and their habitat due to the direct impacts of future development of both public and private lands within the MSCP area (City of San Diego, 1997).
- The Los Peñasquitos Lagoon Enhancement Plan and Program maintains an open lagoon mouth to support salt marsh habitat, maintains a native plant re-vegetation program to replace invasive species, and maintains a restoration basin to intercept sediment during moderate to large storm events.
- The City of San Diego Development Services and Park and Recreation Departments are responsible for the administration of the Los Peñasquitos Canyon Preserve Natural Resource Management Plan. Relevant objectives of this plan are to control erosion along trails and streambeds throughout the Los Peñasquitos Canyon Preserve, further protect the watersheds, and ensure individual projects within the Los Peñasquitos Canyon Preserve meet federal, state, and local environmental standards and requirements.

Potential projects resulting from this Basin Plan amendment will be consistent with existing habitat conservation plans, and no impact will occur.

[39] City of San Diego General Plan, Conservation and Public Facilities Elements; City of San Diego Municipal Code, Chapter 14, Article 2, Division 2, section 142.0220; City of San Diego Municipal Code, Chapter 14, Article 3, Division 1; City of Poway General Plan, Natural Resources Element; City of Del Mar Community Plan, Local Coastal Program Land Use Plan and Implementing Ordinances (Chapter 30.52); County of San Diego General Plan, Conservation and Open Space Element and Safety Element; and County of San Diego Grading Ordinance, Watershed Protection Ordinance, and Resource Protection Ordinance.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
XI. MINERAL RESOURCES: Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒

Discussion:

a) The watershed has large areas classified by the California Department of Conservation – Division of Mines and Geology as areas underlain by mineral deposits (MRZ-2) and areas of undetermined mineral resources (MRZ-3) (County of San Diego, 2008). There are two active aggregate facilities (i.e., sand, gravel, and crushed rock) located in Carroll Canyon, operated by Vulcan Materials Company and Hanson Aggregates, and an inactive rock quarry in Beeler Canyon located in Poway, currently operated as a concrete ready mix production facility by Vulcan Materials Company.

These facilities will be directly affected by the TMDL in that they may be subject to more stringent regulation to control the discharge of sediment by the San Diego Water Board through the Industrial Storm Water Permit or some other permitting or enforcement action. However, BMP installations to reduce sediment discharge or storm flow and stream/lagoon restoration activities will not prevent existing or future facilities from operating nor directly result in the loss of availability of known mineral resources of value to the region. Additionally, potential implementation projects that include sediment reduction installations and habitat restoration activities would be relatively small in scale, be located in existing developed areas or on public lands, and would not involve the construction of new buildings that would encroach upon existing or potential future mining sites.

Considering this information, the project will not impact the availability of mineral resources.

b) The City of San Diego's Conservation Element of the General Plan identifies a large area that includes Carroll Canyon, Mira Mesa, Scripps Ranch, and part of Rancho Peñasquitos as high quality mineral resource areas that are classified as MRZ-2. Many of these areas are already developed, and existing mining operations are in conflict with the MSCP. New facilities could be permitted provided the operation could be demonstrated to be compatible with the MSCP preserve goals for covered species and their habitats by protecting adjacent preserved areas and covered species, mitigating biological impacts, and restoring mined areas.

BMP installations would be used by facilities such as these to control and reduce sediment discharge from industrial operation areas to protect downstream resources

and would not displace or prevent the operations themselves. Additionally, potential implementation projects that include sediment reduction installations and habitat restoration activities would be relatively small in scale, be located in existing developed areas or on public lands along water courses, and would not involve the construction of new buildings that would encroach upon existing or potential future mining sites. Potentially significant loss of availability of a known mineral resource or locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan will not occur as a result of this project.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
XII. NOISE: Would the project result in:				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☒	☐
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☐	☒
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☐	☒
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☒	☐

Discussion:

a) Potential implementation projects resulting from this Basin Plan amendment that include earthmoving and construction could temporarily generate noise during the construction phase of those projects. In general, potential sediment reduction installations and habitat restoration activities would occur in discrete, localized areas throughout the watershed and would be located in outdoor and open space areas. Construction noise levels would be temporary in nature and similar to typical construction site projects. Potential projects will not generate construction noise that exceeds local noise ordinances for discretionary projects.[40] For this reason, a less than significant impact would occur.

[40] City of San Diego Municipal Code, Chapter 5, Article 9.5; Poway Municipal Code Chapter 8.08; City of Del Mar Municipal Code, Title 9, Chapter 9.20; County of San Diego Noise Ordinance, Title 3, Division 6, Chapter 4, sections 36.404 and 36.409.

b) To comply with requirements derived from the Basin Plan amendment, potential implementation projects involving earthmoving or minor construction could occur near noise sensitive land uses, such as a hospital, school, hotel, or library. These projects would be in discrete, localized areas throughout the watershed and would be located in outdoor and open space areas. Construction noise levels would be temporary in nature and similar to typical construction site projects. The possibility that potential projects would include blasting or boring activity is speculative and need not be considered in this analysis. Therefore, there would be no impacts from groundborne vibration and noise.

c) The Basin Plan amendment would not cause any permanent increase in ambient noise levels.

d) To comply with requirements derived from the Basin Plan amendment, potential implementation projects involving earthmoving or construction could result in a temporary increase in ambient noise levels. In general, potential sediment reduction installations and habitat restoration activities would be located in outdoor and open space areas, would not be a facility that contains noise-generating equipment, and would have construction noise levels similar to typical construction site projects. Potential projects will not generate construction noise levels that exceed local noise ordinances for discretionary projects.[41] Therefore, impacts from temporary increases in ambient noise would be less than significant.

e) The Los Peñasquitos watershed is not within an airport land use plan, or within two miles of a public airport or public use airport; therefore, the Basin Plan amendment would not result in exposure of people residing or working in any potential project areas to excessive noise levels.

f) The Los Peñasquitos watershed does not contain any private airstrips. However, a large portion of the watershed lies within the overflight influence of the MCAS Miramar. MCAS Miramar ALUCP indicates that Carroll Canyon, Sorrento Valley, parts of Mira Mesa, and a portion of the Los Peñasquitos Reserve are within the noise exposure contours for 60 – 65 dB CNEL[42] future average exposure and 65 – 70 dB CNEL annual day exposure (ALUC, 2010, Map MIR-1: Noise Compatibility Policy Map). Additionally, there are several private heliports in the vicinity of the Lagoon and preserve, and Carroll Canyon Creek: San Diego Heliport, Qualcomm Building T Heliport, Henley Heliport, the Plaza La Jolla Village Heliport, and Scripps Memorial Hospital La Jolla Heliport.

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[41] City of San Diego Municipal Code, Chapter 5, Article 9.5; Poway Municipal Code Chapter 8.08; City of Del Mar Municipal Code, Title 9, Chapter 9.20; County of San Diego Noise Ordinance, Title 3, Division 6, Chapter 4, sections 36.404 and 36.409.

[42] Community Noise Equivalent Level (CNEL) is the noise metric adopted by the State of California for land use planning purposes, including describing airport noise impacts. This noise metric compensates for the increase in people's sensitivity to noise during nighttime hours. The noise impacts typically are depicted by a set of contours, each of which represents points having the same CNEL value (ALUC, 2010).

Potential implementation projects in these areas resulting from this Basin Plan amendment would not cause any permanent exposure of residents to additional sources of noise above airport or heliport noise. Any persons constructing or maintaining BMPs within this area would be exposed to short-term noise levels from air traffic. Therefore, the impacts from private airstrip-generated noise to people working in potential project areas would be less than significant.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
XIII. POPULATION AND HOUSING: Would the project:				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☒
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

Discussion:

a) The Basin Plan amendment would not induce substantial population growth in the Los Peñasquitos watershed. Potential implementation projects resulting from this Basin Plan amendment will not propose a physical or regulatory change that would construct new public facilities that foster population or economic growth, construct new housing or businesses, or extend roads or infrastructure. Therefore, no impacts would occur.

b) Potential implementation projects resulting from the Basin Plan amendment would be contained within the storm water conveyance system right of way. Therefore, such projects would not be located to displace existing housing or any people that would need replacement housing. Therefore, no impact would occur.

c) The Basin Plan amendment would not displace substantial numbers of people or create a need for the construction of replacement housing (see discussion to section (b), above), and no impacts would occur.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
XIV. PUBLIC SERVICES:				
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:	☐	☐	☐	☒
Fire protection?	☐	☐	☐	☒
Police protection?	☐	☐	☐	☒
Schools?	☐	☐	☐	☒
Parks?	☐	☐	☐	☒
Other public facilities?	☐	☐	☐	☒

Discussion:

a) Compliance with the Basin Plan amendment would not involve provision or alteration of government facilities. Therefore the Basin Plan amendment would not affect service ratios, response times, or other performance objectives for fire protection, schools, or other public facilities and no impact would occur.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
XV. RECREATION:				
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	☒

Discussion:

a) Potential implementation projects resulting from this Basin Plan amendment that occur within the Los Peñasquitos Canyon Preserve could affect public access of trails during construction activities. However, projects would be small in scale, short in duration, and would not substantially affect park usage. In any case, such short-term shifts in use patterns would not result in substantial physical deterioration of park or recreation facilities and no impact would occur.

b) Although the Basin Plan amendment could result in some changes in road and trail configurations or permitted uses that could alter recreational use patterns, these changes would not result in the need for construction of or expansion of recreational facilities that could have an adverse effect on the environment. No impact is anticipated.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
XVI. TRANSPORTATION/TRAFFIC: Would the project:				
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	☐	☐	☐	☒
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	☐	☐	☐	☒
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☐	☒
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☒
e) Result in inadequate emergency access?	☐	☐	☐	☒
f) Conflict with adopted policies, plans or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	☐	☐	☒	☐

Discussion:

a) Adoption of the Basin Plan amendment will not interfere with public transit routes or pedestrian/bicycle trails and paths. Potential implementation projects would not create substantial traffic in relation to the existing load and capacity of existing street systems, and therefore, will not be in conflict with local general plans, the Regional Transportation Plan and Congestion Management Program,[43] the County Transportation Impact Fee Ordinance,[44] the Pedestrian Master Plan (City of San Diego, 2006), and other policies.

b) Potential implementation projects resulting from this Basin Plan amendment would require mobilization of construction vehicles to perform minor construction and habitat restoration activities. Any increase in traffic would be temporary and would be limited to local areas in the vicinity of individual construction or restoration projects. It is anticipated that individual projects would mobilize equipment at the beginning and end of the work and not generate a significant increase in traffic congestion. Additionally, potential implementation projects would not increase population or provide employment;

[43] SANDAG 2050 Regional Transportation Plan, Appendices, and Technical Appendices: http://www.sandag.org/index.asp?projectid=349&fuseaction=projects.detail (SANDAG, 2011)
[44] San Diego County, Ordinance to Amend the San Diego County Code Related to The Transportation Impact Fee. Effective April 27, 2008.

therefore, they would not generate any permanent increase in traffic congestion and would not affect level of service standards established by the SANDAG Congestion Management Program,[45] Poway Comprehensive Master Plan (Transportation Element),[46] or County Public Road Standards.[47] Therefore, the Basin Plan amendment would not result in permanent, substantial increases in traffic above existing conditions and not be in conflict with applicable congestion management programs and road standards. No impacts would occur.

c) Potential implementation projects would not result in a change in air traffic patterns or air traffic levels. The Basin Plan amendment would not affect air traffic that would result in substantial safety risks. No impacts would occur.

d) This Basin Plan amendment does not include provisions to construct new roads or modify existing roads to add sharp curves or dangerous intersections. No new hazards due to the design or engineering of the road network in the Los Peñasquitos watershed will occur and no incompatible uses will be introduced; therefore, there will be no impact from this project.

e) Potential implementation projects resulting from this Basin Plan amendment may be located in canyon and natural areas that may have limited access points. These areas are public lands that are managed by local municipalities, including the local fire and emergency response services agency. For this reason, it is not expected that emergency access would be an issue. Adoption of the Basin Plan amendment would not result in inadequate emergency access. No impacts would occur.

f) To the extent that potential implementation projects that include minor construction for sediment reduction installations and habitat restoration activities are conducted in locations near pedestrian or bike paths in the canyon and lagoon areas, there exists the potential to temporarily hinder access points or affect trails depending on the proximity to construction equipment. However, projects are not expected to permanently affect or reduce existing or future pedestrian, bicycle, or equestrian facilities. If pedestrian, bicycle, or equestrian safety issues are present, then conditions are placed on the project prior to approval to address those concerns. Also, potential implementation projects will not generate additional, ongoing motor vehicle trips that would increase traffic or congestion nor create design features on road segments/intersections that would create a hazard to pedestrians, bicyclists, or mass transit. In general, adoption of this Basin Plan amendment will not conflict with local plans and policies, including the City of San Diego's Mobility and Recreation Elements (General Plan) and the Pedestrian Master Plan (City of San Diego, 2006) supporting alternative transportation. Any impacts would be less than significant.

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[45] SANDAG, Final 2008 Congestion Management Program Update.
[46] Poway Comprehensive Plan: General Plan, Transportation Element.
[47] San Diego County Ordinance No. 10040 (N.S.), An Ordinance Amending Section 81.102 (bb) of the San Diego County Code to Provide a Reference to Amended Public Road Standards, February 24, 2010. http://www.sdcounty.ca.gov/dpw/docs/pbrdstds.pdf

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
XVII. UTILITIES AND SERVICE SYSTEMS: Would the project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☒
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☒	☐	☐
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☐	☒
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☒	☐
g) Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☐	☒

Discussion:

a) Potential implementation projects resulting from this Basin Plan amendment will not involve any uses that discharge any wastewater to sanitary sewer or on-site wastewater treatment systems. Therefore, there will not be any exceedance of any wastewater treatment requirements and no impacts will occur.

b) The Basin Plan amendment does not require, nor will potential implementation projects resulting from this Basin Plan amendment involve, the construction or expansion of water or wastewater treatment facilities. No impacts would be caused by this project.

c) Basin Plan amendment-related projects will likely include construction of new or expanded storm water drainage facilities that will treat accelerated storm water flows by slowing them and reducing both sediment and associated pollutants in storm water runoff and dry weather flows. Construction of these facilities affecting an area of one acre or more would require a general construction NPDES permit from the State Water Board, and implementation of a storm water pollution prevention plan to control sediment erosion and runoff. These projects will be subject to the review and inspection by the San Diego Water Board, and will require implementation of routine and standard erosion control best management practices and proper construction site management. Overall, any new facilities will improve water quality, reduce erosion, improve hydrology,

and/or restore wetland function. The environmental impact from the construction of implementation projects such as these would be less than significant with mitigation incorporated.

d) The Basin Plan amendment does not require, nor will potential implementation projects resulting from this Basin Plan amendment involve, water supply or services from a water district. Construction and maintenance of structural and non-structural BMPs would not rely on water service. Therefore, no impacts would occur.

e) The Basin Plan amendment and any potential implementation projects resulting from the amendment would not increase population or provide employment, and therefore, would not require an ongoing water supply or additional wastewater treatment services. No impacts would occur from this project.

f) Basin Plan amendment implementation may affect municipal solid waste generation or landfill capacities related to ongoing maintenance of BMPs. Such maintenance is likely to result in removal of debris and sediments from culverts, sedimentation basins, etc. The net volume of waste will be relatively small and infrequent; therefore, impacts will be less than significant.

g) The waste generated from BMP maintenance will be subject to federal, state, and local statutes and regulations related to solid waste. Such waste would not be expected to contain pollutants or materials that would violate statutes and regulations related to solid waste. Thus, no impacts would occur.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
XVIII. MANDATORY FINDINGS OF SIGNIFICANCE				
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☒	☐	☐	☐
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☐	☐	☒	☐
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☐	☒

Discussion:

a) As discussed in the checklist, reasonably foreseeable methods of compliance would not substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels. The proposed Basin Plan amendment is intended to increase the extent of areas with high biological importance. It is expected that reduced sediment loading from stormwater discharges consistent with the watershed sediment reduction target will encourage the establishment of native vegetation in degraded areas through various mechanisms. BMP implementation actions designed to reduce sedimentation will also likely reduce nuisance freshwater flows into the Lagoon that have historically contributed to observed habitat and beneficial use impacts. Reasonably foreseeable methods of compliance will facilitate recovery of beneficial uses that have been affected by various complex processes, including sedimentation, nuisance flows, reduced tidal circulation, and other factors. An adaptive management approach will be used to determine the most effective course of action to achieve the numeric targets and improve beneficial uses in the Lagoon with the least environmental impact. The reasonably foreseeable methods of compliance may cause some impacts to historical resources, but the impact by individual projects cannot be determined at the program level; a project level CEQA analysis will be performed by a local lead agency. However, regardless of the level of CEQA analysis, it is unlikely that the reasonable foreseeable methods of compliance are unavoidable as to cause elimination of important examples of the major periods of California history or prehistory. First of all, according to CEQA section 15064.5, a historical resource must be eligible as determined by the State Historical Resources Commission, and must be listed in the California Register of Historical Resources. Secondly, should a specific project identify significant impacts to historical resources, according to CEQA section 15091, no public agency shall approve

or carry out the project unless changes or alterations are made to avoid or alleviate the significant effects. The changes or alterations include those that are within the responsibility and jurisdiction of other public agency and not the agency making the finding; that have been adopted by such other agency or can and should be adopted by such other agency. In fact, the following regulations have been adopted by other agencies: the Conservation Element of the San Diego County General Plan, the Historical Preservation Element of the City of San Diego's General Plan, the Historical Structures Chapter of the City of Poway's Municipal Code, and the Historic Preservation Overlay Zone of the City of Del Mar's Municipal Code. The project not only will be reviewed and cleared before being approved by appropriate public agencies, but also will be closely monitored during the whole process, and will require mitigation measures to avoid and reduce such impact. However, despite the above information, as specific mitigation measures cannot be identified as specific projects are not identified, the impacts remain potentially significant.

Therefore, considering the above information, potentially significant impacts may no impacts will occur.

b) This SED concludes that reasonably foreseeable methods of compliance may result in potentially significant impacts to historical, archaeological, and paleontological resources (see explanation above for Cultural Resources). In examining the potential for cumulatively considerable effects, impacts to these historical, archaeological, and paleontological resources together with the effects of other known projects in or near the Los Peñasquitos watershed were considered that also involve minor construction and earthmoving. The contribution of the proposed Basin Plan amendment could be relatively major due to the wide-distribution of reasonably foreseeable methods of compliance throughout the watershed. However, as discussed in the checklist, these impacts could be fully offset if adequately mitigated on the project level by the lead agency. Therefore, the proposed Basin Plan amendment will have a less than significant cumulative effect on historical, archaeological, and paleontological resources. No other resources have the potential to be directly or indirectly impacted by the project.

c) The Basin Plan amendment would not cause any substantial adverse effects to human beings, either directly or indirectly. The Basin Plan amendment is intended to benefit human beings through implementation of actions to improve water quality and enhance habitat in the Lagoon. No impacts would occur.

3.8 Economic Factors

This section presents the San Diego Water Board's economic analysis of the most reasonably foreseeable methods of compliance with the Basin Plan amendment to incorporate the sediment TMDL for the Lagoon.

3.8.1 Legal Requirement for Economic Analysis

Porter-Cologne Section 13241(d) requires staff to consider costs associated with the establishment of water quality objectives. This TMDL does not establish water quality

objectives. It is merely a plan for achieving existing water quality objectives. Therefore, cost considerations required in Section 13241 are not required for this TMDL.

The purposes of this cost analysis are to provide the San Diego Water Board with information concerning the potential cost of implementing this TMDL and to address concerns about costs that may be raised by responsible parties. Potential costs are analyzed for the most reasonably foreseeable methods of compliance with this Basin Plan amendment, as discussed in Section 3.6.

Furthermore, the San Diego Water Board must comply with CEQA when amending the Basin Plan.[48] The CEQA process requires the San Diego Water Board to analyze and disclose the potential adverse environmental impacts of a Basin Plan amendment that is being considered for approval. The San Diego Water Board must consider the economic costs of the methods of compliance in this analysis.[49]

3.8.2 TMDL Project Implementation Costs

The cost of implementing this TMDL will range widely, depending on methods that the responsible parties select to meet the Waste Load and Load Allocations. The specific controls to be implemented for sediment reduction will be chosen by the responsible parties after adoption of this Basin Plan amendment. All costs are preliminary estimates only since particular elements of a control, such as type, size, and location, would need to be developed to provide a basis for more accurate cost estimations. Identifying the specific controls that responsible parties will choose to implement is speculative at this time, and the controls presented in this section serve only to demonstrate potential costs. Additional controls for storm water runoff from agriculture, livestock, and horse ranch facilities other than what is already required in existing WDRs for these facilities and in the Basin Plan WDR Waiver Policy is not reasonably foreseeable. Therefore, there will be no additional costs to agricultural and livestock facility owners and operators to comply with these TMDLs.

3.8.3 Cost Estimates of Typical Controls for Urban Runoff Discharges

Approximate costs associated with typical structural BMPs that might be implemented as reasonably foreseeable methods of compliance are provided below. Cost estimates for structural BMPs cited from "*Stormwater Best Management Practice Handbook – New Development and Redevelopment. 2003*" are for new construction costs only (CASQA, 2003). These estimates generally do not take into account retrofit of existing structures or the potential purchase on land needed for the BMP. Cost estimates provided by Caltrans' *BMP Pilot Retrofit Pilot Program* were from BMPs retrofitted on existing state owned land (Caltrans, 2004).

<u>Treatment Facilities</u>

Vegetated Swales:

[48] Public Resources Code section 21080

[49] See Public Resources Code section 21159(c)

Vegetated swales are constructed along drainage ways where storm water runoff is conveyed. Vegetation in swales and strips allows for the filtering of pollutants and infiltration of runoff into groundwater. Densely vegetated swales can be designed to add visual interest to a site or to screen unsightly views. They reduce runoff velocities, which allows sediment and other pollutants to settle out.

The effectiveness of vegetated swales depends on slopes of swales, soil permeability, grass cover density, contact time of storm water runoff and intensity of storm events. Vegetated swales, based on case studies, are capable of managing runoff from small drainage areas with approximate sizes of 10 acres.

Construction of swales begins with site clearing, grubbing, excavation, leveling and tilling, thereafter followed with seeding and vegetation planting. The cost of developing a swale unit is estimated in the range of $7,300 to $20,800 (CASQA, 2003). Routine maintenance activities include keeping up the hydraulic and removal efficiency of the channel, periodic mowing, weed control, watering, reseeding and clearing of debris and blockages for a dense, healthy grass cover.

Little data is available to estimate the difference in cost between various swale designs; however, with considerations of inflation rate to bring the monetary value to current and the vast areas, the unit price of constructing a vegetated swale is assumed to be $8,800 dollars each. Acreage of the Los Peñasquitos watershed requires approximately 2,738 units of vegetated swales to treat the 42.78 square miles of impervious surfaces in the watershed, which results in the overall cost of $24.1 million. Amortized with interest rate of 6 percent annually and into 20 years based on the implementation schedule, and with the average annual maintenance rate of 5 percent, the total annual cost is $2.17 million.

Maintenance costs derive primarily from mowing because all operation and maintenance is related to vegetation management requiring no special training. In addition, it is important to note that the special attention to the presence of gophers is a factor that can make operations and maintenance cumbersome.

Table 3-2. Summary of estimated cost for vegetative swales

Items	**Unit Cost**	**Total Cost**
Construction	$8,800 per unit swale for each 10-acre drainage area	$24.1 million $2.07 million annually if amortized with an interest rate of 6% for 20 years.
Maintenance	5 percent of construction cost annually	$104,000 annually
Total Cost		$2.17 million annually

Extended Detention Basins

Extended detention basins are basins whose outlets have been designed to detain the storm water runoff to allow particles to settle. These facilities differ from wet ponds in

the sense that they do not offer a large permanent pool. Extended detention basins also provide flood control due to additional flood detention storage.

The construction costs associated with extended detention basins vary considerably. Using the equation $C=12.4V^{0.760}$, where C is the cost and V is the volume, adjusted to 2011 dollars, a one acre-foot pond costs $50,855, and a 100 acre-foot pond costs $1,687,000 (CASQA, 2003). Designing for the 85th percentile storm (ranges from 0.55 to 0.85 inches; average 0.7 inches; County of San Diego, 2011a), the Los Peñasquitos watershed requires approximately 1,598 one acre-foot ponds or 16 100 acre-foot ponds to treat the 42.78 square miles of impervious surfaces in the watershed, which results in overall cost ranges from $27 million to $81.3 million. The total annual cost ranges from $2.55 million to $7.69 million, amortized with interest rate of 6 percent annually for 20 years (based on the implementation schedule) and using a maximum maintenance rate of 10 percent.

Maintenance costs are between 3 and 10 percent, not including any cost to dispose of the accumulated sediment (CASQA, 2003). Necessary operation and maintenance activities include, but are not limited to, mowing side slopes, managing pesticides and nutrients, mosquito control, repairing undercut or eroded areas, as well as removing litter and debris on an as needed basis. Larger maintenance projects include the removal of accumulated sediment and regrading roughly about every 10-25 years or when sediment volume exceeds 10-20 percent of the basins volume or accumulates to 6 inches. The removal of sediment from the forebay every 3-5 years can slow the overall accumulation of sediments within the basin.

Table 3-3. Summary of estimated cost for extended detention basins

Items	**1 Acre-Foot Basin Cost**	**100 Acre-Foot Basin Cost**
Construction	$50,855 per basin treating for 1 acre-foot of stormwater	$1,687,000 per basin treating for 100 acre-foot of stormwater
Construction Cost	$81.3 million for 1,598 basins $6.99 million if amortized with an interest rate of 6% for 20 years.	$27.0 million for 16 basins $2.32 million annually if amortized with an interest rate of 6% for 20 years.
Maintenance	10 percent of construction cost annually	10 percent of construction cost annually
Maintenance Cost	$699,000 annually	$232,000 annually
Total Cost	$7.69 million annually	$2.55 million annually

<u>Surface Erosion Controls</u>

Straw Fiber Rolls

Straw fiber rolls are tube shaped erosion control devices that are most effective in low shear stress areas. Straw fiber rolls are especially useful in preventing surface erosion as they complement best management practices aimed at source control and vegetation.

Material costs for fiber rolls range from $20 to $30 per 25-foot roll (CASQA, 2003). Labor costs vary, however they should be factored in for the installation, maintenance, and short-term maintenance. The maintenance requirements of fiber rolls are minimal,

but short-term inspection is recommended to ensure that the rolls remain firmly anchored in place and are not crushed or damaged by equipment traffic. There is no labor cost associated with removing these devices as they are biodegradable.

Slope Stabilization

Terracing

Terracing is a technique using earthen embankments and/or ridge and channel systems that reduce erosion by slowing, collecting, and redistributing surface runoff to stable outlets. This technique is especially applicable to the San Diego region because terracing is most effective in arid climates with expected water erosion problems.

Costs associated with terrace construction ranges between $1 and $6 per linear foot in addition to varying costs related to the construction of waterways and underground outlets (Natural Resources Conservation Service). Operations and maintenance cost derive from labor costs associated with sediment removal and periodic terrace repair.

Geotextile Covers/Mats

Geotextiles are porous fabrics that protect ground surfaces susceptible to storm water and wind erosion. These devices also increase stability by allowing for more vegetation growth as they hold in place fertilizers, seeds, and top soil. The effectiveness of geotextile covers is dependent upon their material.

The costs of using is geotextiles range between $1 and $17 per square yard, depending on the type used (State Water Board, 1991). Operations and maintenance cost derive from labor associated with regular inspection to determine the existence of cracks, tears, or breaches in the fabric.

Bypass Channels and/or Dissipaters

Storm Drain Repair and Replacement

Repairing and replacing existing storm drain systems will allow the existing controls to properly function, thus minimizing and/or eliminating erosion below storm drain outfalls. Such projects may include replacement of existing pipes and work on existing drainage easements. Repair and replacement projects can be done gradually at a minimal impact to residents in the area. The 7017 Keighley Court Storm Drain Repair Project in the City of San Diego is estimated to cost $277,714 (City of San Diego, 2012a). Similarly the Wenrich Drive Storm Drain Repair Project costs roughly $213,150 (City of San Diego, 2012b).

Stream or Lagoon Habitat Restoration Actions

Lagoon Restoration

Throughout the southern California region rapid development has yielded unprecedented levels of sedimentation compromising the overall health of surrounding streams and lagoons. The restoration of lagoons is important in the San Diego region for protection of the few remaining coastal wetlands to benefit fish, birds, and various wildlife species. In addition to the scenic beauty lagoons provide, continued maintenance protects public health from stagnant water and the accumulation of mosquitos and dead fish.

The overall cost of enhancing the larger, neighboring Batiquitos Lagoon was approximately $57.3 million in 1996 dollars, which adjusted for inflation would cost $82.1 million. This cost included planning, permitting, design, and management/administrative costs, as well as funding of the long-term maintenance program. The major project components included: construction of two low-profile rock jetties at the ocean entrance of the lagoon to maintain a permanent non-navigable tidal opening to the ocean without cutting off the southerly littoral drift, physical reconfiguration of the lagoon through dredging and contouring to create shallow subtidal and intertidal habitats, nourishment of adjacent ocean beaches with clean sands mined from the lagoon as part of the overall dredging and disposal plan, construction of approximately 32 acres of least tern nesting sites, and pilot planting of vegetation that requires tidal flushing and that did not occur in the lagoon including cordgrass (*Spartina foliosa*) and eelgrass (*Zoastera marina*) (Appy, 2012).

The San Dieguito Lagoon restoration project was completed in 2011 at a cost of $90 million (SDRVC, 2012). The project was proposed by Southern California Edison to fulfill permit conditions for the creation or substantial restoration of at least 150 acres of Southern California coastal wetlands as compensatory mitigation for fish losses caused by the San Onofre Nuclear Generating Station. Project elements included: cut and fill, water control structures, stormwater control measures, buffers and transition areas, removal of exotic species, and protection of existing salt marsh plants. The project provided the following habitat benefits: increased acreage of tidal habitats with beneficial impacts on associated species; improved functions and values of existing tidal habitats with beneficial impacts on associated species; enhanced functions and values of seasonal wetlands with beneficial impacts on associated species; restoration of native upland habitats with beneficial impacts on associated species; and creation of nesting sites benefiting California least tern, Western snowy plover, and other waterbirds contributing to the restoration of ecosystem functions and values (Southern California Edison, 2005).

While restoration activities in the Lagoon are not expected to occur at the scale experienced in the neighboring Batiquitos and San Dieguito Lagoons, these case studies provide a reasonable estimation of the maximum cost associated with lagoon restoration. Lagoon restoration in the Lagoon is estimated to cost $90 million. Amortized with interest rate of 6 percent annually and into 20 years based on the implementation schedule, the total annual cost is $7.74 million.

<u>Low Impact Development</u>

Low Impact Development (LID)

LID emphasizes conservation and use of on-site natural features to protect water quality. LID can significantly increase the protection of water quality through the implementation of engineered small-scale hydrologic controls that replicate the pre-development hydrologic regime of watersheds through infiltrating, filtering, storing, evaporating, and detaining runoff close to its source. Hazards associated with storm water runoff, such as increased sedimentation and the pollution of water bodies can greatly be decreased through the implementation of LID techniques in both new and

redesigned developments. Provided below are a number of various methods to aid in the reduction of hazardous storm water runoff into San Diego's regional water bodies.

Cisterns and rain barrels are LID techniques used to harvest, store, and release rain water from a roof downspout into the soil. This technique is useful in areas covered primarily with impervious surfaces. Rain barrels are used for smaller residential environments and cisterns for large scale commercial and industrial developments. The cost of a rain barrel is approximately $216 for a single residential lot. The cost of a cistern can range from $160 for a 165 gallon polyethylene tank to $10,000 for a 5,000 gallon fiberglass/steel composite tank (LIDC, 2007).

Vegetated roofs are an effective LID technique that provides storm water runoff control, air quality improvement, increased energy efficiency, urban heat island reduction, and improved aesthetics. A vegetated roof system uses foliage and a light weight soil mixture to absorb, filter, and detain rainfall. Installation of a vegetated roof cost between $10-16 per square foot (US EPA, 2000).

Permeable pavement design consists of a porous surface with an underlying stone reservoir to temporarily hold surface water runoff before it enters the subsoil. This increases groundwater infiltration and decreases storm water runoff into surrounding waterbodies. The strength of this LID techniques lies within its ability to balance both increased runoff infiltration and uses such as walking and/or driving. Porous concrete can range from $2 to $6 per square foot and various pavers can range from $1 to $10 per square foot, with grass and gravel pavers making up the lower range and concrete and stone pavers making up the higher range (PATH, 2008). Because of differences in surface texture and the importance for flow path through the surface, maintenance of permeable pavements is critical to their effectiveness. Cleaning by vacuum sweeping and pressure washing is generally recommended several times a year, depending on usage and traffic. With more traffic, the maintenance must increase (PATH, 2008).

Cost Comparison

Table 3-4 summarizes the estimated total costs as results of implementing this TMDL. The overall project costs arising from lagoon restoration activities and pollutant loading reduction in storm water could be in a range of $116.2 million to $185.2 million. With consideration of the maintenance cost to structural BMPs such as vegetated swales and extended detention basins, this overall cost may amortized, at an interest rate of 6 percent, to become as low as $9.91 million per year during implementation of this TMDL.

Table 3-4. Cost Summary for storm water treatment implementation alternatives

Implementation Alternatives	**Lagoon restoration and vegetative swales**	**Lagoon restoration and 1 acre-foot basins**	**Lagoon restoration and 100 acre-foot basins**
Total Project Cost	$116.2 million	$185.2 million	$121.6 million
Amortized Annual Cost	$9.91 million	$15.43 million	$10.29 million

3.9 Reasonable Alternatives to the Proposed Activity

The environmental analysis must include an analysis of reasonable alternatives to the proposed activity.[50] The proposed activity is a Basin Plan amendment to incorporate a sediment TMDL for Los Peñasquitos Lagoon. The purpose of this analysis is to determine if there is an alternative that would feasibly attain the basic objective of the rule or regulation (the proposed activity), but would lessen, avoid, or eliminate any identified impacts. The alternatives are discussed in the subsections below.

3.9.1 Alternative 1 – San Diego Water Board TMDL

This program alternative is based on the TMDL that is presently proposed for San Diego Water Board consideration. The proposed TMDL focuses on the reduction of sediment loads to the natural background loading rate in the Los Peñasquitos Watershed. The WLAs and LAs, as well as compliance schedules, are established through the Basin Plan amendment. The WLAs and the implementation schedule, once incorporated into the Basin Plan, will be considered by NPDES permit writers when developing permit limits that are adopted in separate actions by the San Diego and State Water Boards.

Foreseeable environmental impacts from methods of compliance, as discussed in Section 3.6, are well known and explored throughout the contents of this document. Potential adverse impacts to the environment stem principally from the installation, operation, and maintenance of structural BMPs. This document analyzes these impacts and concludes that installation of implementation projects are relatively short duration and small scale construction and maintenance activities that will result in less than significant environmental impacts. It also concludes that the benefits of the program outweigh any potentially significant adverse environmental effects.

3.9.2 Alternative 2 – US EPA TMDL

This program alternative is based on a TMDL that would be established by the US Environmental Protection Agency (US EPA) if the San Diego Water Board fails to adopt a sediment TMDL for the Lagoon, pursuant to the Clean Water Act section 303(d). Because the technical analysis by US EPA will be very similar to the San Diego Water Board analysis, and because the same laws and regulations would apply, it is assumed that the technical portions, WLAs, and LAs of this TMDL program alternative will be essentially the same as program Alternative 1. However, such a TMDL is not implemented through a Basin Plan amendment. Therefore, the WLAs will be implemented through NPDES permit limits without consideration of a compliance schedule. Because NPDES permits are renewed every five years, all responsible parties would be required to be in full compliance immediately following the TMDL adoption by US EPA, or within five years.

Absent US EPA completion of an alternative TMDL, it would be speculative to evaluate whether or not reasonable foreseeable actions needed to achieve the alternative TMDL would reduce or increase environmental impacts (as compared to Alternative 1).

[50] 23 CCR section 3777

Nevertheless, it is anticipated that this alternative would achieve compliance through the same foreseeable compliance projects listed in Table 3-1 analyzed for Alternative 1.

3.9.1 No Action Alternative

This program alternative assumes that neither the US EPA nor the San Diego Water Board implements a sediment TMDL for the Lagoon. While responsible parties could implement BMPs on a discretionary basis, this CEQA analysis is based on the assumption that no additional sediment reduction BMPs would be implemented in addition to those that are presently in place. However, Alternative 3 is contrary to federal and state law. While impacts to the environment from construction or maintenance of structural BMPs would be avoided in this alternative, failure to implement a TMDL would not restore beneficial uses in the Lagoon due to sediment impairment. In comparison, either Alternative 1 or 2 will restore beneficial uses and attain water quality standards by reducing sediment loads, thus representing a benefit to the environment, while Alternative 3 will result in a continued sediment impairment of the Lagoon.

3.9.2 Preferred Alternative

This environmental analysis finds that Alternative 1 is the most environmentally advantageous alternative.

Alternative 3 is not feasible because there is a legal requirement under the Clean Water Act to address the section 303(d) impairment listing. This alternative is not assumed to implement BMP projects to reduce sediment loads and restore beneficial uses in the Lagoon in a timely fashion, if at all. While Alternative 3 will avoid potential impacts due to discrete installation project, the waterbody impairment will continue.

Both Program Alternatives 1 and 2 will comply with the law and reduce sediment loads and restore beneficial uses in the Lagoon at a comparatively small environmental cost through completion of the foreseeable compliance projects listed in Table 3-1 of section 3.6. The key difference between these two program alternatives is the establishment of an implementation schedule. While the same LAs and WLAs will need to be met and the same technological choices will be available by both alternatives, Alternative 1 will allow a measured implementation plan, resulting in full compliance in 20 years. Alternative 2, in contrast, will require compliance at the time of TMDL adoption or permit renewal, which in all NPDES permit cases, is at most 5 years. The environmental impacts due to Alternative 2 may be of greater severity as the intensity of implementation actions will be greater to comply with the shorter time frame. The longer schedule of Alternative 1 allows for prioritization and planning, more thoroughly mitigated impacts, more appropriately designed, sited and sized structural devices and, therefore, less environmental impact in general. In addition, prioritization and planning will likely result in more efficient use of funds and lower overall costs.

3.10 Other Environmental Considerations

This section evaluates several other environmental considerations of reasonably foreseeable methods of complying with the Sediment TMDL, specifically:

3.10.1 Cumulative Impacts of the Program Alternatives (as required by CEQA Guidelines section 15130);

3.10.2 Potential Growth-Inducing Effects of the Program Alternatives (as required by CEQA Guidelines section 15126); and

3.10.3 Unavoidable Significant Impacts (as required by CEQA Guidelines section 15126.2).

3.10.1 Cumulative Impacts

Cumulative impacts, defined in Section 15355 of the CEQA Guidelines, refer to two or more individual effects, that when considered together, are considerable or that increase other environmental impacts. Cumulative impact assessment must consider not only the impacts of the proposed TMDL, but also the impacts from other municipal and private past, present, and future projects, which would occur in the watershed.

As discussed in the checklist, this SED concludes that reasonably foreseeable methods of compliance may result in potentially significant impacts to historical, archaeological, and paleontological resources (see explanation above for Cultural Resources). In examining the potential for cumulatively considerable effects, impacts to these historical, archaeological, and paleontological resources together with the effects of other known projects in or near the Los Peñasquitos watershed were considered that also involve minor construction and earthmoving. The following past, present, and future projects were considered:

- I-805 HOV Extension/Carroll Canyon Road Extension
- Carmel Valley Neighborhood 10
- Peñasquitos Glens Unit Number 4 of the Almazon Residences Project
- Los Peñasquitos Lagoon Basin
- Sorrento-Miramar Curve Realignment and Second Main Track Project
- Sorrento Pointe Development
- Sprint Nextel Black Mountain Middle School
- Bridge Replacement Project

None of the above listed projects identified significant impacts on historical, archaeological, or paleontological resources; however, several projects mitigated impacts to less than significant levels. The contribution of the proposed Basin Plan amendment could be relatively major due to the wide-distribution of reasonably

foreseeable methods of compliance throughout the watershed. However, as discussed in the checklist, these impacts could be fully offset if adequately mitigated on the project level by the lead agency.

3.10.2 Growth-Inducing Impacts

This section presents the following:

1) An overview of the CEQA Guidelines relevant to evaluating growth inducement,

2) A discussion of the types of growth that can occur in the Los Peñasquitos watershed,

3) A discussion of obstacles to growth in the watershed, and

4) An evaluation of the potential for the TMDL Program Alternatives to induce growth.

CEQA Growth-Inducing Guidelines

Growth-inducing impacts are defined by the State CEQA Guidelines as (CEQA Guidelines, Section 15126.2(d)):

> The ways in which a proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are impacts which would remove obstacles to population growth. Increases in the population may tax existing community service facilities, requiring construction of new facilities that could cause significant environmental effects... [In addition,] the characteristics of some projects… may encourage and facilitate other activities that could significantly affect the environment, either individually or cumulatively. It is not assumed that growth in any area is necessarily beneficial, detrimental, or of little significance to the environment.

Growth inducement indirectly could result in adverse environmental effects if the induced growth is not consistent with or accommodated by the land use plans and growth management plans and policies. Local land use plans provide for land use development patterns and growth policies that encourage orderly urban development supported by adequate public services, such as water supply, roadway infrastructure, sewer services, and solid waste disposal services.

Public works projects that are developed to address future unplanned needs (i.e., that would not accommodate planned growth) could result in removing obstacles to population growth. Direct growth inducement would result if, for example, a project involved the construction of new wastewater treatment facilities to accommodate populations in excess of those projected by local or regional planning agencies. Indirect growth inducement would result if a project accommodated unplanned growth and

indirectly established substantial new permanent employment opportunities (for example, new commercial, industrial, or governmental enterprises) or if a project involved a construction effort with substantial short-term employment opportunities that indirectly would stimulate the need for additional housing and services. Growth inducement also could occur if the project would affect the timing or location of either population or land use growth, or create a surplus in infrastructure capacity.

Types of Growth

The primary types of growth that occur within the Sediment TMDL area are:

1) Development of land, and

2) Population growth (Economic growth, such as the creation of additional job opportunities, also could occur; however, such growth generally would lead to population growth and, therefore, is included indirectly in population growth.)

Growth in Land Development
Growth in land development is the physical development of residential, commercial, and industrial structures in the Sediment TMDL area. Land use growth is subject to general plans, community plans, parcel zoning, and applicable entitlements and is dependent on adequate infrastructure to support development.

Population Growth
Population growth is growth in the number of persons that live and work in the Sediment TMDL area and other jurisdictions within the boundaries of the area. Population growth occurs from natural causes (births minus deaths) and net emigration to or immigration from other geographical areas. Emigration or immigration can occur in response to economic opportunities, life style choices, or for personal reasons.

Although land use growth and population growth are interrelated, land use and population growth could occur independently from each other. This has occurred in the past where the housing growth is minimal, but population within the area continues to increase. Such a situation results in increasing population densities with a corresponding demand for services, despite minimal land use growth.

Overall development in the County of San Diego and Cities of San Diego, Del Mar, and Poway is governed by their General Plans, which are intended to direct land use development in an orderly manner. The General Plan is the framework under which development occurs, and, within this framework, other land use entitlements (such as variances and conditional use permits) can be obtained. Because the General Plan guides land use development and allows for entitlements, it does not represent an obstacle to land use growth. The cities within the Sediment TMDL area also have plans which direct land use development.

Existing Obstacles to Growth

Obstacles to growth could include such things as inadequate infrastructure, such as an inadequate water supply that results in rationing, or inadequate wastewater treatment capacity that results in restrictions in land use development. Policies that discourage either natural population growth or immigration also are considered to be obstacles to growth.

Potential for Compliance with the Proposed TMDL to Induce Growth

Direct Growth Inducement
Because the reasonably foreseeable methods of compliance with the proposed Sediment TMDL focus on structural BMPs, non-structural BMPs and improvements to the storm drain system which are located throughout the urbanized portion of this TMDL area, this TMDL would not result in the construction of new housing and, therefore, would not directly induce growth.

Indirect Growth Inducement
Two areas of potential indirect growth inducement are relevant to a discussion of the proposed TMDL: (1) the potential for compliance with the TMDL to generate economic opportunities that could lead to additional immigration, and (2) the potential for the proposed TMDL to remove an obstacle to land use or population growth.

Installation and/or construction of structural BMPs to comply with the proposed TMDL would occur over a 20-year time period. Installation and maintenance spending for compliance would generate jobs throughout the region and elsewhere where goods and services are purchased or used to install structural BMPs. Based on the above annual construction cost estimates, the alternatives would result in direct jobs and indirect jobs. The creation of jobs in the region is considered a benefit.

Although the construction activities associated with the Sediment TMDL would increase the economic opportunities in the area and region, this construction is not expected to result in or induce substantial or significant population or land use development growth because the majority of the new jobs that would be created by this construction are expected to be filled the existing surplus of unemployed persons in the area and region.

The second area of potential indirect growth inducement is through the removal of obstacles to growth. As discussed above, no obstacles exist to land use or to population growth in the watershed.

3.10.3 Unavoidable Significant Adverse Impacts

Section 15126.2(a)(b) of the CEQA Guidelines requires a discussion of the significant environmental effects and the significant environmental effects which cannot be avoided if the proposed project is implemented. Reasonable foreseeable methods of compliance with the Basin Plan Amendment may have adverse significant impacts to historical, archaeological, and paleontological resources. Proposed projects that would

occur as a result of the Basin Plan amendment that would have potentially significant impacts on historical, archaeological, and paleontological resources would be untaken at the discretion of lead agencies under their respective local and state regulatory framework. Project specific impacts and mitigation measures will be evaluated in environmental reviews specific to those projects. While potential significant impacts to historical, archaeological, and paleontological resources may be mitigated through this discretionary environmental review, specific mitigation measures for said projects is not available at the programmatic level, since specific projects are unknown at this time. Therefore, although likely avoidable and mitigate able, potential impacts to historical, archaeological, and paleontological resources are significant and unavoidable.

Section 15126.2(c) of the CEQA Guidelines requires a discussion of potential significant, irreversible environmental changes that could result from a proposed project. Examples of such changes include commitment of future generations to similar uses, irreversible damage that may result from accidents associated with a project, or irretrievable commitments of resources. Resources (materials, labor, and energy) to implement TMDL-related projects do not represent a substantial irreversible commitment.

Furthermore, implementation of the Sediment TMDL is both necessary and beneficial. To the extent that the alternatives, mitigation measures, or both, that are examined in this SED are not deemed feasible by the municipalities and agencies complying with the TMDL, the necessity of implementing the federally required TMDL and removing the significant environmental effects from sediment impairment in the Lagoon (an action required to achieve the express, national policy of the Clean Water Act) remains. In addition, implementation of the TMDL will have substantial benefits to water quality and will enhance beneficial uses. Enhancement of the recreational, estuarine, and areas of biological significance beneficial uses will have positive social and economic effects by improving saltmarsh and non-tidal saltmarsh habitat for both aesthetic enjoyment and biological utility.

3.11 Statement of Overriding Considerations and Findings

The proposed Basin Plan amendment would result in potentially significant impacts to historical, archaeological, and paleontological resources through reasonably anticipated methods of compliance. Although it is likely that potential impacts will be avoided and/or mitigated, specific mitigation measures cannot be identified as specific projects are not identified. Therefore the potentially significant impacts may occur and must be considered, for this programmatic evaluation, significant and unavoidable.

The San Diego Water Board staff has balanced the economic, legal, social, technological, and other benefits of this proposed Sediment TMDL against the unavoidable environmental risks in determining whether to recommend that the San Diego Water Board approves this project. Upon review of the environmental information generated for this project and in view of the entire record supporting the TMDL, staff has determined that the specific economic, legal, social, technological, and other benefits of this proposed Sediment TMDL outweigh the unavoidable adverse environmental

effects, and that such adverse environmental effects are acceptable under the circumstances.

The implementation of this Basin Plan amendment will result in improved water quality in the waters of the region and will have significant positive impacts to the environment (including restoration and enhancement of beneficial uses) and the economy over the long term. The implementation of the Basin Plan amendment will restore and protect the Lagoon for use and enjoyment by the people of the state. Enhancement of the recreational, estuarine, and areas of biological significance beneficial uses will have positive social and economic effects by improving saltmarsh and non-tidal saltmarsh habitat for both aesthetic enjoyment and biological utility.

This TMDL is required by law under section 303(d) of the federal Clean Water Act (CWA), and if this San Diego Water Board does not establish this TMDL, the US EPA will be required to develop a TMDL. The CWA requires states to establish a priority ranking for waters on the 303(d) list of impaired waters and to develop and implement TMDLs for these waters.[51] The impacts associated with US EPA's establishment of the TMDL would be significantly more severe, as discussed herein, because US EPA will not provide a compliance schedule and the final waste load allocations, pursuant to federal regulations, would need to be complied with upon incorporation into the relevant stormwater permits.[52] Since compliance would not be authorized over a period of years, all of the impacts associated with complying would be truncated into a short time frame, thus exacerbating the magnitude of the cumulative effect of performing all projects relatively simultaneously throughout the region.

Reasonable foreseeable methods of compliance may have adverse significant impacts to historical, archaeological, and paleontological resources. However, mitigation measures are available for each resource to reduce environmental impacts to less than significant levels. Reasonable foreseeable methods of compliance will be implemented by responsible jurisdictions and would therefore be subject to a separate, project-level environmental review. The lead agencies for the reasonable foreseeable methods of compliance projects have the ability to mitigate project impacts, can and should mitigate project impacts, and are required under CEQA to mitigate any environmental impacts they identify, unless they have reason not to do so. Notably, in almost all circumstances, where unavoidable or immitigable impacts would present unacceptable hardship upon nearby receptors or venues, the local agencies have a variety of alternative implementation measures available instead.

Implementation of the TMDL is both necessary and beneficial. To the extent that the mitigation measures that are examined in this analysis are not deemed feasible by responsible agencies, the necessity of implementing the federally required TMDL and removing the sediment impairment from the Lagoon (an action required to achieve the express, national policy of the Clean Water Act) remains.

[51] 40 CFR 130.7
[52] 40 CFR 122.44(d)(1)(vii)(B).)

To the extent that future projects do not avoid or fully mitigate potential impacts, and the implemental of the Basin Plan amendment and this decision does not fully mitigate the adverse effects of those reasonably foreseeable projects, as discussed in greater detail above, the San Diego Water Board finds that overriding considerations of the greater public interest requires this action. Implementation of the Basin Plan amendment is in the greater public interest. The environmental, economic, and social benefits of implementing the Basin Plan amendment outweigh the potential adverse environmental effects that are not avoided or fully mitigated.

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Attachment 4
Response to Peer Review Comments

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Response to Dr. Rockwell Geyer Comments on
Review of Los Peñasquitos Lagoon Sedimentation/Siltation TMDL

Reviewer information:
Dr. Rockwell Geyer
Woods Hole Oceanographic Institute

Comment submittal date:
April 7, 2011

Comment ID	Comment	Water Board Response
1	This report provides a detailed analysis of the factors contributing to the impairment of Los Peñasquitos Lagoon and a quantitative analysis of the appropriate rate of sediment input that would support a "healthy" ecosystem. The report provides results of field studies as well as two coupled modeling studies, one of the watershed and one of the surface water flow within the Lagoon. The report is well written, and it appears that the underlying modeling and field conform to acceptable professional standards. I do not have any major objections with the methods of the details of the model implementation.	Comment noted.
2	My main objection to the report is that there is very little description (actually none that I could find) about the actual model runs the produced the numbers for the TMDL-i.e. the numbers in Tables ES-1 and ES-2. (Note that these are different runs than the model calibration runs, for which there was adequate detail).	Restoration of the Lagoon is a high priority for the San Diego Water Board. Acknowledging the environmental and political complexities, the uncertainties in sediment sampling, sediment load modeling, and quantification, as well as the time and the financial resources needed to restore a coastal lagoon, and recognizing the urgency to proceed with regulatory actions, the Board will implement a strategy of phased approaches to immediately address sediment impairment in Los Peñasquitos Lagoon and restore its designated beneficial uses. Unfortunately, these data could not be compiled from the model results and provided due to funding limitations. Also see responses to comments 3 and 4, below.

Comment ID	Comment	Water Board Response
3	A detailed description of the input variables and results for the "Current Load" condition and the "Historic Load" condition. This would include tabular and/or graphical summaries for each case of: • Precipitation, • Maximum and "wet season" integrated river discharges (of each subwatershed), • Mean and maximum sediment concentrations for each subwatershed, • Sediment loadings from each subwatershed and the ocean boundary for each of the runs, • Patterns and amounts of sediment deposition in the lagoon following wet weather events for the two cases. …I expect this information has been generated by the modelers. It should be included in the report. In fact, it really represents the essence of the modeling effort. It is hard to make an informed judgment about the appropriateness of the TMDLs without the information [above].	Subwatershed estimates were not provided because a policy decision was made to use the total load transported to the lagoon from the watershed to calculated allocations. Regarding the 5th bullet, time-series TSS calibration results for the lagoon are provided in the Lagoon Model Calibration section of the Modeling Report. These data show the lagoon responses during wet and dry weather periods. Sediment load results are typically not provided, except as needed for the TMDL calculations. Unfortunately, these data could not be compiled from the model results and provided due to funding limitations.

Comment ID	Comment	Water Board Response
4	Sensitivity studies for the TMDLs so as to arrive at error estimates. These should mainly involve varying the estimated sediment loading relationship for each subwatershed, as this is where most of the error comes from. The biggest source of uncertainty in the TMDL calculation is the estimation of an appropriate sediment loading curve for the Los Peñasquitos Creek, because of the vast discrepancy between the USGS data and the more recent data. Because this is the dominant contributor (from a water volume standpoint) to the receiving waters, the order-of-magnitude uncertainty in this loading translates into an order-of-magnitude uncertainty in the TMDL. There may be other parameters of model quantities that the modelers believe should be varied as well, for example the geometry of the inlet as influenced by the 101 bridge, in order to determine the sensitivity of the results to these uncertainties. …[T]his approach is more appropriate for the "margin of error" requirement than the more informal approach that was described in the report. I believe that the modelers should have reasonable information about the sensitivity of their results to the uncertainties of the inputs. Thus it should not be difficult to produce meaningful ranges of uncertainty of the worst-case and historical cases.	The Margin of Safety accounts for any lack of knowledge concerning the relationship between effluent limitations and water quality (CWA § 303(d)(1)(C), 40 CFR 130.7(c)(1)). EPA guidance explains that the MOS may be implicit, i.e., incorporated into the TMDL through conservative assumptions in the analysis, or explicit, i.e., expressed in the TMDL as loadings set aside for the MOS. The MOS for this TMDL was changed from implicit to explicit as a result of peer review and US EPA comments. The explicit MOS of 5 percent was applied to account for the difficulty in collecting water samples that accurately compute sediment transport and the lack of available bank erosion and bedload transport data. Key model parameters include the geometry of the ocean inlet (held static for the model runs) and other factors to calibrate the models based on available data. There were some discrepancies and uncertainties in the observed data, as described in the reports. Various sensitivity analyses were run to determine the final model configuration and to calibrate the models. Some of this information is included. For example, streambank erosion sensitivity analyses are discussed on page 46 of the Technical Support Document. Additional information on model sensitivity can be provided at a later date, due to time constraints.

Comment ID	Comment	Water Board Response
5	In the report, they say that considerable historical analyses were performed to determine that the 1970's represent the appropriate level of loading for the TMDL. I think it would be appropriate to include more of the historical analysis in the report. For example, what evidence is there for the quality of the wetlands in the 1970's or before? The reason I bring this up is to raise the possibility that factors other than land use-for example changes in the geometry of the flow within the lagoon due to the railroad and the 101 may have contributed to siltation even before there was major development of the watershed.	The Technical Support Document, Section 3, discusses in great detail historical information. Any information not found here is located in the references. The Background section of the Staff Report was modified to include more of the historical information, including figures that illustrate wetland extent. The comment has a valid point that factors other than land use may have contributed to siltation even before there was major development in the watershed. These other factors, mainly physical factors in the lagoon, do indeed affect water circulation and sedimentation processes, as described in the revised TMDL report. However, this TMDL focuses only on reduction of past, present, and future sediment sources from the watershed. The TMDL has been strengthened to include an adaptive management approach, which will allow responsible parties to address these, and other, factors that contribute to loss of salt marsh in the Lagoon in a holistic manner. The model can be further refined in the future to further examine changes in sediment loading and transport during implementation planning. Also see response to comment 2.

Comment ID	Comment	Water Board Response
6	Another issue that I expected to see addressed in the report is a discussion of the implications of reducing the loading to the TMDL that is established. What do the models say the sediment accumulation would be under those circumstances? What implications might there be to for remediation of the wetland?	A discussion of foreseeable methods to comply with the TMDL is discussed thoroughly in the California Environmental Quality Act (CEQA) Analysis, which was not available to the reviewers for peer review. The TMDL is written such that attainment of the numeric target will result in attainment of the sediment water quality standard for the Lagoon. Regardless of whether sediment load reductions will result in an increasing trend in saltmarsh habitat, the responsible parties have the burden to either rectify historic sediment discharges or demonstrate that they did not cause or contribute to the loss of saltmarsh. The modeled historical condition (which established the TMDL target) estimates the sediment contribution to the lagoon from the watershed and ocean inlet for the critical period. Sediment deposition and erosion events are dynamic, resulting in changing accumulation patterns. These questions can be studied further in the implementation stage of the TMDL using the models and additional field data collection. Also see response to comment 2.

Comment ID	Comment	Water Board Response
7	My overall reaction to this report is that the estimation of the TMDL is not limited by the models or their implementation but rather by inadequate data. The nature of the variability of precipitation in Southern California leads to an extremely difficult sampling problem with respect to watershed processes. Significant sediment transport only occurs during El Niño years, so it takes decades to obtain statistically significant data. Yet land uses and watershed management practices change on timescales comparable to the return interval of the major wet-weather periods, making it even more difficult to develop robust statistics about the sediment transport rates in the system. The vast differences between the USGS data and the subsequent estimates of sediment concentrations are probably not methodological-the indicate the system is highly non-stationary. I have two suggestions in the face of the uncertainty associated with the limited data base.	Comment noted.

Comment ID	Comment	Water Board Response
8	One is to use information about other watersheds in the southern California area that may have more extensive data sets to inform the determination of an appropriate TMDL. For instance, what are typical wet-weather suspended sediment concentrations in other similar watersheds with varying amounts of developed land? Obviously the lithology, soil types, relief and land use all factor in, watershed models can help normalize for these factors influencing sediment yield. My point is that more data are needed, and data from other watersheds are likely to help guide the determination of appropriate TMDLs.	Page 23 of the TMDL report states "Due to the unique characteristics of the Lagoon, it was determined that a historical analysis of the Lagoon and its watershed would provide the best information available for determining the conditions that support water quality standards". An effort was made to locate an appropriate reference lagoon, including discussions with local experts and the academic community. Lagoon environments throughout southern California (and throughout the state) have experienced significant degradation overtime, therefore, it was determined that modeling of the historical condition would provide the best measure of the sediment load reduction that would be needed for the TMDL. Also see response to comment id number 9, below.
9	My second suggestion in light of the uncertainty of the present sediment loading regime is to pursue an adaptive management approach, in which an effective monitoring system is put in place to obtain detailed sediment loading data while monitoring the response of the receiving waters. The TMDL that comes out of this study should be viewed as provisional, and it should be revised as the data allows a more accurate assessment of the actual loading rate and its impact on the receiving waters. Such a strategy does not preclude the pursuit of remediation efforts within the watershed and the receiving waters, but such efforts should be pursued with deliberation and cognizance of the uncertainty of the estimates of loading and it impact on the impairment of the receiving waters.	Changes have been made to the Staff Report and Basin Plan Amendment to further clarify the adaptive management approach that will be taken for this TMDL. The Implementation Plan section of the Staff Report will further elaborate on this approach. Also see response to comment 2.

Response to Dr. Kirk Barrett's Comments on
Review of Los Peñasquitos Lagoon Sedimentation/Siltation TMDL

Reviewer information:
Dr. Kirk R. Barrett, PE, PWS
Director, Passaic River Institute
Montclair State University

Comment submittal date:
April 5, 2011

Comments to address Identified Scientific Issues

Comment ID	Comment	Water Board Response
Sediment Loading Calculation		
1.	The LSPC model is a scientifically tenable model for modeling watershed hydrology and sediment transport, although it might be computational overkill and excessive parameterization (ie, a simpler model might give results that are just as useful).	Comment noted.
2.	LSPC does not include specific provisions for modeling construction sites. Construction sites are known to have the potential to generate intense loadings of sediment – although these loadings are controlled (to varying degrees) by BMPs. Given the rapid development in this watershed, construction sites may be a large source of sediment, whose load would be underestimated by this modeling approach. This issue should be investigated.	The models were calibrated based on observed data; therefore, all sources are implicitly represented in the simulated results. Furthermore, the model can be updated in the future, as needed, to explicitly represent particular sources depending on available data. Based on the San Diego Association of Governments 2000 land use coverage, approximately 171 acres, or 0.3 percent, of the total land use area is identified as construction/transitional. While construction only accounts for a small percentage of land use in the watershed, it is correct that construction sites are known to generate large sediment loads. Construction sites are dual regulated under both local ordinances and statewide general permits, which requires these sites to develop and implement storm water pollution prevention plans.
3.	The mid-70s load is calculated using extremely wet (1993) conditions, but this seems inappropriate since the mid-1970s load did not occur under such	The purpose of the reference period (mid-1970s) is to estimate the loading for the critical period based on landuse conditions in the watershed that preceded recent development and other activities that have led to increased

Comment ID	Comment	Water Board Response
	extremely wet conditions (based on the flow rates presented in Att. 1 Figure 17). Using an extremely wet year to model 1970s load may well greatly overestimate the actual 1970 loads.	sedimentation in the lagoon. For TMDL development, the same weather conditions (the critical wet period in this case) were modeled to determine the relative difference in sediment loading between the current and historical condition. The difference in sediment load represents the % reduction required to achieve the TMDL target (historical condition). This is the usual approach for reference condition based TMDLs. Over estimation of loads is weighted when determining compliance with the TMDL.
4.	It seems inappropriate to use a very wet year as the basis to compute loads because sedimentation is a cumulative phenomenon that occurs over several to many years – which will not be represented by an extremely wet year. I believe it would be better to model using a range of rainfall amounts, then weight the results based on the frequency of occurrence of those amounts	TMDLs are calculated under critical conditions. The critical condition can be thought of as the "worst case" scenario of environmental conditions in the waterbody in which the loading expressed in the TMDL for the pollutant of concern will continue to meet water quality standards. Critical conditions are the combination of environmental factors (e.g., flow, temperature, etc.) that results in attaining and maintaining the water quality criterion and has an acceptably low frequency of occurrence. Sediment is primarily contributed during storm events, which is why the 1993 El Nino water year was selected as the critical time period for TMDL development. The goal of the TMDL is to reduce the majority of the sediment loading to the Lagoon which occurs during storm periods. It wouldn't be reasonable to require sediment loading from storm periods to be equal or less than the total sediment load that's contributed during dry periods. The assumption is that if the watershed loading to the Lagoon under critical conditions is reduced to be equal to the historical condition then WQOs for sediment should be achieved. Because sediment loading is greatest during large storm events, loads are calculated under the wettest conditions, appropriately identified as the critical period (1993 conditions).
5.	Document says "Existing loads were estimated based on modeling of current land use conditions (from the SANDAG 2000 land use	The SANDAG 2000 land use coverage was the most recent landuse dataset that covers the entire watershed and is consistent with other TMDLs in the region. The model can be

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	coverage)", so the "current" land use is actually from 2000, now more than 10 years past. Figure 12 in Att. 1 (p 29) indicates a ~20% growth in population from 2000 to 2010. It seems inappropriate to use 10 year-old land use to calculate current loading.	updated in the future if needed to more accurately simulate current sediment loading.
6.	It is quite difficult to collect water samples to accurately compute sediment transport. A typical method of collecting a single grab sample is likely to be insufficient to characterize lateral and vertical variability in suspended solids concentrations. Details are needed regarding sample collection procedures and analysis and any QA/QC procedures to verify that representative samples were collected.	This comment has valid point, and we recognize the uncertainties and limitations in sampling suspended sediment concentrations. Sample collection procedures are detailed in Los Peñasquitos TMDL monitoring study (City of San Diego, 2009).
7.	The report indicates that streambank erosion is significant in Carroll Canyon Creek (CCC) and Carmel Creek (CC), but not in Los Peñasquitos Creek (LPC). This doesn't seem tenable since I expect that the geomorphic conditions are similar in each canyon. What physical explanation supports the differences in streambank erosion?	Carroll Canyon Creek is primarily responsible for the amount of sediment loading into the Lagoon due to various factors such as land cover/land use, slopes, development intrusion into riparian areas, hydrology, etc. This is supported by long-term observations of sediment loading by California State Parks, the Los Peñasquitos Lagoon Foundation, City of San Diego stormwater personnel, and other accounts. In addition, it should be noted that LPC runs through the Los Peñasquitos Canyon Preserve whereas urbanization occurs directly on the banks of CCC and CC. .
8.	Model parameters for streambank deposition and scour critical shear stresses varied by reach, as indicated in Appendix B. This doesn't seem tenable since I doubt the geologic material change significantly. What is the physical explanation that supports varying these parameters?	There are various differences in stream and watershed characteristics among different areas. Differences can be found in land cover/land use, slopes, development intrusion into riparian areas, hydrology, etc. Streambank erosion rates were based on available monitoring data and differences in modeled land loads. Additional monitoring data are currently being collected by the City of San Diego to further quantify streambank erosion characteristics in different areas for further calibration of the model.
9.	Figure 38 and 39 show poor	These discrepancies are addressed in the

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	agreement between measured and modeled flow rates for all 3 storms at all 3 sites, with the model greatly exceeding (often >50%) measured in all cases. Especially for the Carroll Canyon Creek and Carmel Creek subbasins, I can find little basis for trusting the model results are acceptably accurate.	Modeling Report (Attachment 2). The following statement is included on Page 46 of Attachment 2: *Note that flow calibration discrepancies shown in Figures 37 through 39 are likely due to possible problems with the flow rating tables and resulting streamflow estimates for these stations, as discussed in the previous section.* The previous section referenced above can be found on and Page 41 of Attachment 2: *Flows typically increase further downstream barring withdrawals and/or infiltration; however, storm volumes during the monitoring period at the downstream station were significantly lower than reported at the upstream USGS gaging station. This may indicate that the flow rating table for the downstream station may not characterize higher flows well, especially since the model calibrated well to the upstream USGS gaging station. As a result, significant adjustments were not made to the model in order to match the measured flows at the MLS.* Best available data were used, and the model was calibrated considering the limitations in the observed data.
10.	The text states "The average difference between modeled and measured EMCs for CC, LPC, and CCC was 83%, 51%, and 65%, respectively." These differences seem significantly large when compared with the percent reduction in sediment load required by the TMDL (67%).	Table 15 is comparing the fractionation of the sediment into sand/silt/clay between observed and modeled values. The 83%, 51%, and 65% refers to the EMC which is a comparison of the flow weighted average concentrations. <u>Generally applicable response</u> This comment has a valid point, and we recognize the uncertainties and limitations in developing the sediment TMDL. We will take into account this and other applicable comments in future improvement of the TMDL, consistent with the following overall strategy: Restoration of the Lagoon is a high priority for the San Diego Water Board. Acknowledging the environmental and political complexities, the uncertainties in sediment sampling, sediment load modeling, and quantification, as well as the time and the financial resources needed to restore a coastal lagoon, and recognizing the

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		urgency to proceed with regulatory actions, the Board will implement a strategy of phased approaches to immediately address sediment impairment in Los Peñasquitos Lagoon and restore its designated beneficial uses. The Implementation Section of the report has been revised, a Lagoon numeric target has been incorporated, and an explicit margin of safety has been calculated to provide additional assurances of water quality standard attainment.
11.	Note that goal of the simulation is not simulate only TSS concentrations but also TSS loads, which is the product of flow and concentration. Modeled and measured loads should be compared.	The models were used to estimate total sediment loading to the lagoon and the complex/varying nature of sediment processes within the lagoon. Available TSS data were used to help calibrate the LSPC model, but the total sediment load output was used for TMDL development. Bedload movement is generally not captured in the TSS results, therefore, differences between observed and modeled data are expected. Sediment loads were not measured in the field; therefore, the model results can only be compared to observed concentration data. This information can be obtained in the future and would help with implementation efforts. The models and TMDL were developed based on best available information.
12.	The document says "Sediment transported via diffusive bed load processes also has the potential to be a significant source of sediment loadings; however, this source was neither characterized in the LSPC modeling or would be with traditional TSS sampling" and "bed flow has the potential to be the dominate sediment transport pathway and could add significant sediment to the lagoon." It seems, therefore, unlikely that the TMDL can be accurately calculated without accounting for bed load.	The Technical Support Document (Attachment 1) includes a description of the LSPC modeling framework and cites references for additional information (Pages 24 & 25). This section states that scouring of the stream bottom and transport processes are included in the model algorithms. This captures the movement of bed material that is deposited and available for scouring and transport downstream, depending on stream velocities and other processes. Bed load contributions were considered in the LSPC watershed model. The model can be updated in the future to include sediment transport data collected as part of TMDL compliance monitoring.
13.	Regarding simulation of oceanic	The San Diego Water Board agrees with this

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	loading to the lagoon, the fact that the model cannot simulate the changing cross section at mouth of the lagoon seems like a serious limitation. The widening and narrowing of the mouth has major affect on tidal flushing and sediment dynamics in the lagoon.	comment that the lagoon mouth cross-section is constantly changing, but the ERDC model only represents a fixed rectangular cross-section configuration. Furthermore, the ERDC model cannot model beach erosion processes with the existing model configuration which lacks wave, wave-breaking, and wave-current interaction components. While the mouth's impact on Lagoon processes is important, the focus of this TMDL is to reduce discharges of sediment from the watershed to Lagoon. Also see response to comment 10 on San Diego Water Board's overall strategy.
14.	The omission of bed load modeling in the lagoon also seems like a serious limitation; bed load is likely a significant component of sediment transport.	See response to comment 12.
15.	Figures 46-71 show large disagreement between modeled and observed TSS concentrations and those of specific size-classes at the mouth and, even more so, at the lagoon segment. It appears to me that the lagoon modeling results are not really tenable for use in computing the required sediment reduction.	See responses to comments 10, 11, and 13.
16.	I would like to see an explicit explanation of how and why the modeled net sediment loading from the ocean showed a 39% decrease from the historical/target condition (9,780 tons) in the 1970s to 5,944 tons currently. How is this explained?	This explanation is contained in section 9.3 of the Technical Support Document (Attachment 1), which states: *The Lagoon model shows that a reduction in watershed sediment loading affects the amount of sediment that can deposit throughout the lagoon from oceanic inputs (considering a constant input of sediment from the ocean boundary under current and historical conditions). The model analysis for historical conditions indicates that a greater proportion of sediment that deposits in the Lagoon originates from tidal inputs during lower watershed loading periods, therefore, the TMDL results show that a net [de]crease (original typo) in oceanic loads occurs during the critical wet period under*

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		historical landuse conditions…Tidal input from the ocean boundary represents natural background loads, therefore, no reduction is required for this source category.
17.	In any case, it is not clear to me how the oceanic input is incorporated into the TMDL. I assume that calculation of the historical/target and current oceanic input had no effect on calculation of the historical/target and current watershed loadings or the resulting required reduction. In that case, I'm not sure why lagoon modeling was necessary or even useful. It seems to me that one only need compute the sediment load off the watershed to determine the TMDL. Is this correct?	It is correct that the oceanic load will not be considered for reduction, because it is a nonpoint background source, and the San Diego Water Board's authority lies in regulating point sources only. However, TMDL development requires the analysis of all potential sources (point and nonpoint), including the oceanic inputs. A Lagoon modeling was therefore necessary to develop a load allocation for the oceanic inputs.
18.	The approach of setting the target condition as a historical loading that produced no impairment in the lagoon seems tenable. Besides, the alternative approach of determining an allowable sedimentation rate in the lagoon and back-calculating the sediment load apparently isn't feasible (based on the large disagreements between measured and modeled results found in this study) given the serious modeling challenges.	Comment noted.
19.	Regarding irrigation, I don't think it matters much whether it is modeled accurately because the "critical period" which was modeled was based on climatic conditions from 10/1/92 – 4/30/93, which was 1) in the fall and winter when irrigation needs are small and 2) a very wet period which further reduces irrigation.	Comment noted.
20.	Regarding soil characteristics, using the Soil Survey Geographic Database seems a tenable choice. I don't understand the decision to modify the particle size distribution, but I don't think it has much of an	Comment noted.

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	effect on the TMDL since it was done for both the current and historical/target runs.	
21.	I have commented on bank erosion and bed load in #1 above.	See response to comment ids 7, 8, and 12.
22.	I don't think some of the assumptions are really conservative since they were applied to both the current and target conditions -- the "conservativeness" cancels out.	The San Diego Water Board agrees. The implicit margin of safety was replaced with an explicit margin of safety.
23.	As mentioned under #1, the choice of a very wet year is not conservative regarding historical conditions.	See responses to comments 3 and 4.
24.	I think the main problem with the implicit MOS is that I don't know how you can assess the magnitude of the MOS. That is a policy issue, though, not a scientific issue.	It is true that one cannot easily assess the magnitude of implicit Margin of Safety (MOS). The statute and regulations require that a TMDL include a margin of safety to account for any lack of knowledge concerning the relationship between effluent limitations and water quality (CWA § 303(d)(1)(C), 40 CFR 130.7(c)(1)). EPA guidance explains that the MOS may be implicit through conservative assumptions in the analysis that must be described.
25.	No comments	Comment noted.
26.	The scientists and engineers that worked on this project did about as good as they could within the constraints they were working. Nonetheless, in my opinion, there are aspects of the study whose scientific soundness is not adequately defended, particularly regarding bank erosion and bed load transport. This opinion, coupled with the significant disagreement between modeled and measured values that reveals uncertainty on a scale similar to the required reduction in sediment load, leads me to the opinion that I believe it is not scientifically sound to confidently conclude that the required reduction is either necessary or sufficient to correct the impairments in the Lagoon.	Please see response to comment 10. This adaptive management approach will allow the pursuit of remediation efforts within the watershed and the receiving waters to proceed with an understanding of the uncertainty of the loading estimates and Lagoon impacts.

Additional Detailed Comments

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Draft Staff Report			
27.	6	Problem statement is needs more support-it does not contain any real data about the cumulative amount or rates of sedimentation across the marsh, nor about the effects of sedimentation. Perhaps this data is contained in the referenced documents by California State Parks. If so, it should be at least summarized here. I expected to see actual data on sediment accumulation in the marsh via LIDAR, ground survey data, surface elevation tables, horizon markers and/or sediment traps. The modeling report references a 2008 bathymetric survey -- is that really all there is? The modeling report also references "the 2006 Los Peñasquitos Lagoon Foundation monitoring report" which "includes monitored elevation profiles in the lagoon" (Hany et al, 2007). Why are the results not presented here? Are there more of these reports? I also expected to see maps of the hydroperiod of the marsh (eg, average hours of flooding per day) and how it has changed over the years due to sedimention. Is it not possible to construct such maps? Moreover, there should be some real data about the effects of the vegetation, eg. ground-level surveys showing change from wetland vegetation to upland vegetation.	Lines of evidence of sediment impairment for Los Peñasquitos Lagoon are contained in the California's 303(d) Listing (the 303(d)/305(b) Integrated Report). The purpose of this study is to identify the overall sediment load reduction that is needed to help meet the lagoon's beneficial uses. The problem statement serves to further define the Lagoon impairment Lagoon, while the TMDL Staff Report is reserved to present the requested information. Please also see response to comment 10. Due to funding constraints, maps of the hydroperiod of the marsh were not incorporated into the reports.
28.	10	This section needs a close-up figure of the hydrography of the lagoon (include berms, culverts and trestles). I can't tell from the existing figures where/how water enters and	Comment noted. Additional photos and descriptions were added to the Staff Report.

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		moves through the marsh.	
29.	23	Document says "Note that the Highway 101 bridge abutments were recently replaced and have resulted in improved tidal exchange through the area." Increasing tidal flow could induce profound positive changes on the lagoon. Changes, if any, which have been observed in sedimentation rates and/or vegetation since the Highway 101 bridge was replaced in 2005 should be discussed. This could have large implications regarding the amount of reduction in sediment load that is required.	Modeling of current and historic conditions utilized the existing mouth (ocean inlet) geometry. Cross-section data were collected after replacement of the Highway 101 abutments, therefore, the model represents current conditions with respect to the bridge abutments. Examination of the effects of the previous abutments (as affects the ocean inlet geometry) was not required for TMDL development.
30.	23	Document says "This historic land use distribution (Figure 3) was used to calculate the numeric target …" but Figure 3 is actually the 2000 land use, not the 1970s land use (although the 1970s land use is depicted in a figure in Attachment 1).	The reference has been corrected.
31.	23	A USGS quad map is not a very good tool for determining land use, particularly in distinguishing agriculture from "open" land. How was this distinguished? Particularly, was ranching an important land use in the 1970s? Ranching could have an elevated sediment load relative to open land.	An extensive effort was made to locate the best available data to develop a spatial landuse coverage for the historical condition in the watershed. USGS topomaps provided the best information available. The SANDAG 2000 landuse coverage does not break out lands used for ranching versus traditional open space lands, assuming these areas were grouped under that category. Future updates to the model can include a more detailed landuse representation to estimate the loads from these areas.
32.	33	The mid-70s load is calculated using extremely wet (1993) conditions, but this seems inappropriate since the mid-1970s load did not occur under such extremely wet conditions (based on the flow rates presented in Att. 1 Figure 17). Using an extremely wet year to model 1970s	See response to comment 3.

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		load may well greatly overestimate the actual 1970 loads.	
33.	33	It seems in appropriate to use a very wet year as the basis to compute loads because sedimentation is a cumulative phenomenon that occurs over several to many years – which will not be represented by an extremely wet year. I believe it would be better to model using a range of rainfall amounts, then weight the results based on the frequency of occurrence of those amounts	See response to comment 4.
34.	35	Document says "Existing loads were estimated based on modeling of current land use conditions (from the SANDAG 2000 land use coverage)", so the "current" land use is actually from 2000, now more than 10 years past. Figure 12 in Att. 1 (p 29) indicates a ~20% growth in population from 2000 to 2010. Justify why it is appropriate to use 10 year-old land use to calculate current loading.	See response to comment 5.
35.	1	This needs to be labeled as "Attachment 1: Technical Support Document"	Reference corrected.
36.	32-33	Figures 13 and 14 indicate an *expansion* of wetlands in the lagoon from 2000 to 2009, including near the outlets of Carmel Creek (CC) and LPC – the very place sedimentation should be more severe. Perhaps this is an artifact of the mapping/classification techniques; if so, this should be explained. If it is not such an artifact, it calls in to question the presumption that the sedimentation is impairing wetlands in the lagoon. This issue should be discussed. (The figures do show a change from salt marsh to fresh marsh, but it should be explained why this	The wetland surveys depicted in these maps show a coarse representation of wetland areas and types in the lagoon. Also, the report mentions that different survey techniques were used in different years and studies. The purpose of the maps is to show the expansion of freshwater and riparian wetlands in recent years. Sections 4.1.5 and 3.4 state that California State Parks has indicated the sediment is a cause of the impairment and habitat conversion.

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		change can be attributed to sedimentation.)	
37.	35	The document states a "four percent increase in runoff since 1972"; I think that is a mistake – the increase should be much greater than 4%.	The reference has been corrected to state a “four percent increase in runoff per year since 1972.”
38.	40	Document says "Event mean concentrations (EMCs) from storm water and dry weather runoff were collected at the MLS on Los Peñasquitos Creek (LPC) ***near*** the confluence with Carroll Canyon Creek (CCC)." Use of "near" is confusing – is it upstream or downstream of the confluence? It makes a big difference.	The statement has been corrected to clarify that the MLS is located “immediately upstream of the confluence with Carroll Canyon Creek.”
39.	41	Document says "… presence of the El Cuervo Norte wetland diverting flows from Los Peñasquitos Creek". This is the first time this diversion has been mentioned. It needs more explanation.	A description of the El Cuervo Norte wetland has been included in section 3, Los Peñasquitos Watershed Description, as follows: *The 27-acre El Cuervo Norte wetlands restoration project is located in the Peñasquitos Canyon Preserve and will provide over 24 acres of southern willow scrub, oak-sycamore woodland and freshwater marsh habitat. The project consists of approximately 9 acres of wetland creation, 14.3 acres of wetlands enhancement, 2 acres of upland native buffer, and 1.3 acres of park access road and a San Diego Gas & Electric power pole maintenance area.*
40.	41	I think Sec 5 Data Inventory and Analysis, even as a summary, needs to be expanded to include more details on how much data was collected and when**. It should also address data collected at the ocean inlet and in the lagoon itself.**	Comment noted. This information can be located in the modeling report and references provided.
41.	8	I don't understand how the Surface Soil Runoff Fractionation was calculated. Please explain more clearly.	The calculation of these values is explained on Pages 6&7: “To account for these differences, soils transported by surface runoff were assumed to be composed of 5 percent sand, twice as

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			much clay as the percentage of clay within each hydrologic soil group, and the remainder assigned to the silt fraction (Table 2)”
42.	11	If you were using area-velocity meters, I don't understand why you have to use Manning's equation to calculate flow rate. The area-velocity meter measures average velocity over the entire water column, so it need only be multiplied by cross sectional area (derived from water depth and the stage-area relationship) to compute flow rate.	The Technical Support Document (Attachment 1) includes a description of the LSPC modeling framework and cites references for additional information (Pages 24 & 25). Model development requires Manning’s equation inputs.
43.	15	It is quite difficult to collect water samples to accurately compute sediment transport. (see "Improved protocol for Classification and analysis of Stormwater-borne solids" By Larry A. Roesner et al, Colorado State University, 2007). A typical method of collecting a single grab sample is likely to be insufficient to characterize lateral and vertical variability in suspended solids concentrations. Details are needed regarding sample collection procedures and analysis and any QA/QC procedures to verify that representative samples were collected.	See response to comment 6.
44.	15	CC is missing from the list of stations monitored. 12/7/07 is missing from the list of storms monitored.	Stations TWAS-1 and TWAS-2 were only monitored on 11/30/07 and 2/3/08. This is correct in the text and Table 6.
45.	15 and 16	The text on page 15 says Figure 14 presents the "relationship between rainfall and flow", but Figure 14 is labeled with TSS -- not flow. Which is correct? I don't believe a TSS vs. rain plot is meaningful. A plot of TSS vs. flow would be more useful.	Text will be corrected to state: rainfall and TSS.
46.	15-21	In Tables 5-9, include MLS or TWAS- in the station identifier for clarification.	The stations are identified correctly in the text.
47.	17	Flow rate should be added to Table	Comment noted; however, due to

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		6. Rain column should indicate rain over what period relative to when the TSS measurement was made, and should specify the location of the rainfall measurement.	funding constraints, no changes were made at this time.
48.	19-21	Show TSS pollutographs in graphical form, with the flow hydrograph superimposed on the same graph (ie, one axis for flow, another axis for TSS). This will aid in understanding the relationship between flow and TSS.	Comment noted; however, due to funding constraints, no changes were made at this time.
49.	21 and 22	The USGS often collects "suspended sediment concentration" data rather than "total suspended solids" data. Although identical in concept, they are analyzed differently. The USGS has reported that the two results are often not identical nor comparable ("Collection and Use of Total Suspended Solids Data" by John R. Gray and G. Doug Glysson). Please verify that the USGS data is really TSS and, if it is instead SSC, discuss if it is acceptable to compare with TSS data.	The USGS data are suspended sediment concentrations (SSC). It is not readily known if the pollutograph samples collected were TSS or SSC. Updates to the text will be made based on available information, but may require further investigation in the future to verify the reported parameter.
50.	21	The fact that " TSS concentrations recorded at the MLS on LPC since 2001 were more than five times lower than the data collected by the USGS at both stations" in 1982 to 1986 (including the station that is very near the MLS) seems to contradict the assertion that sediment loadings have increased over time. What explains this contradiction?	Several factors may be attributing to this observation including differing station locations and/or sampling time relative to storms. Due to the difficulties in quantifying sediment loads based off TSS data, these data should not be used solely to compare sediment loadings over time.
51.	22	I don't understand why TWAS-1 and TWAS-2 are included on this graph since I thought they were synonymous with MLS/LPC and CCC respectively.	TWAS-1 and TWAS-2 are different than the MLS and pollutograph stations. Refer to Figures 6 & 7.
52.	22	The EMCs measured by the different methods differ significantly. Which value one uses has large implications on calculation of sediment transport. Is one method	Different methods may have been used in different time periods and at different stations. Best available data from different stations and time periods were used to help develop

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		considered more reliable than the other and why?	and calibrate the LSPC model. It is not readily known if one method is considered more reliable than another.
53.	23	Present the data in Figures 16 and 17 in a table listing percent (by mass) clay, sand and silt	Comment noted; however, due to funding constraints, no changes were made at this time.
54.	26	Text says "Detailed cross section information did not exist for the watershed, therefore, mean stream depth and channel width were estimated using regression curves that relate upstream drainage area to stream dimensions available in the LSPC model setup spreadsheet …"." Drainage area-to-stream dimensions relationships can vary significant from one region to another. Are these relationships specific to this region? If not, how do you know they are applicable to this region?	The LSPC model was developed based on available data to represent the stream channel cross-sections. These data are not specific to southern California. The LSPC model has been successfully applied in multiple watersheds throughout southern California using these assumptions.
55.	26	Text says "Manning's n values ranging from 0.03 to 0.2 reflected very different stream types, including streams with concrete channels to heavily vegetated channels." How was the amount of vegetation in the channels determined?	Amounts of vegetation within channels were determined through visual observations and discussions with monitoring staff.
56.	27	Regarding irrigation, I don't understand how this procedure is appropriate to estimate the amount of irrigation water actually applied. It computes the irrigation demand, but where is the evidence that the amount of irrigation water applied is closely correlated with demand? If these areas are on public water supplies, it may be more accurate to compute irrigation from water use records. With that being said, I expect that very little irrigation takes place in the winter months (when the flows and sediment transport are high) and so it probably doesn't matter. Moreover, the "critical	Representation of the entire hydrologic cycle and water balance components was important for model development, even though the critical period was used to define the TMDL. Water use correlates with irrigation demand. Assumptions used are described on Page 27. Irrigation was assumed to occur year-round.

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		period" which was modeled to compute current and target loads ran from 10/1/92 – 4/30/93, which was 1) in the fall and winter when irrigation needs are minimal and 2) a very wet period which further reduces irrigation. So, please discuss irrigation rates in winter.	
57.	28	I am unsure about the applicability of watershed delivery ratios present in a 1975 textbook on sedimentation engineering (Vannoni, 1975). What other estimates of delivery ratios are there? Why have you chosen to used those published by Vannoni? How do you know they are valid in this watershed and climate?	These literature values were used to set the initial parameter values in the model. However, model calibration was used to make necessary adjustments to initial values.
58.	28	How do you know that "Two catchments in the upper watershed (1408 and 1409) had increased rainfall due to higher elevation which was greater than observed at the Alert gage"? I thought there was no gage in those watersheds.	Available rainfall data was scaled based on elevation to account for the difference in the upper watershed. These regional differences were recognized to increase modeling accuracy. Scaling is discussed on Page 28.
59.	34	Regarding oceanic input of sediment, the report says "The concentrations of sand, silt, and clay fractions were set to constant values initially and then adjusted during calibration." When I read this, I took it to mean that there was no independent estimate of oceanic concentrations. But later I saw that Figures 46-58 present observed TSS values at the ocean inlet (although the "Data inventory" section of the report has no discussion about how these data were collected). Why weren't these values used as boundary conditions? Without such a boundary condition, model calibration becomes an exercise of adjusting the input concentrations to match the model results -- without regard to whether the input concentrations match reality.	No data were available on the particle size distribution of oceanic sand input. These initial values were adjusted during calibration based on TSS data collected at the ocean inlet. The TSS data presented in Figures 46-58 were collected at the ocean inlet (lagoon mouth), which is governed by ocean input, watershed input, and local sediment deposition and resuspension. This is different than the oceanic input, which is represented as the ocean open boundary (open ocean far away from the beach). Data were not available to characterize this input.

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60.	40	Why are there missing numbers in the "observed flow" column? Why were the time periods 1995-1999 and 2000-2004 for selected for comparison? (I expected the calibration and validation periods to be compared.)	The report was updated with the missing numbers. Regarding the calibration and validation time periods, the modeling period was divided into two timeframes for calibration/validation. Modeled and observed values are compared within each time period.
61.	39 - 40	Figures 29 and 30 are a good way to compare observed and model results and model results look good, tracking observed cumulative volume. The results in Table 14 look good where it counts – ie, in the 10% highest flows and in the winter flow.	Comment noted.
62.	42-44	I don't understand Figs 33-35. I see only one line on each graph, which I assume corresponding to the same colored line in the legend. There is also black line in each legend, but there are no black lines on the graphs. I'm guessing you plotted observed flow, but omitted modeled flow. Add the modeled flow and include a table of summary statistics (eg, total and peak flow from each event and percent difference).	The Modeling Report has been updated with the correct figures.
63.	44	The report indicates that streambank erosion is significant in CCC and CC, but not in LPC. This doesn’t seem tenable since I expect that the geomorphic conditions are similar in each canyon. What would explain the differences in streambank erosion?	See response to comment 3.
64.	44	Model parameters for streambank deposition and scour critical shear stresses varied by reach, as indicated in Appendix B. This doesn't seem tenable since I doubt the geologic material change significantly. What is the physical explanation that supports varying these parameters?	See response to comment 8.
65.	45	The log scale in Fig. 36 confounds comparison of measured vs.	Comment noted. No change needed.

Comment ID	Page	Comment	Water Board Response
		modeled. In addition to the Fig, present these results in a table and compute percent error. I expect that several of them will exceed 50%.	
66.	46-47	Figure 38 and 39 show poor agreement between measured and modeled flow rates for all 3 storms at all 3 sites, with the model greatly (often >50%) exceeding measured in all cases. (The timing is off too, with the model peaking earlier than measured hydrographs – but errors in timing are not critical for computing sediment loading). The text attributes this disagreement to problems with the rating curves at the sites. This explanation has some credibility in the LPC subbasin because the model-measured flow agreement was good at the USGS station on LPC (over the whole period of record anyway – measured vs. modeled results for these 3 storms at the USGS gage are not presented). For the CCC and CC subbasins, I can find little basis for believing the model results are acceptably accurate.	See response to comment 9. Best available data were used, and the model was calibrated considering the limitations in the observed data. The model can be updated in the future to refine sediment loading numbers with new data such as bedload, flow, grain size, and suspended sediment data.
67.	46-47	Figures 38-39 also show significant disagreement between modeled and measured TSS concentrations. However, interpretation of this disagreement in confounded by 1) the disagreement in the timing of the model hydrograph with the measured hydrograph, coupled with 2) the likely (I have asked to see the plot) relationship between TSS and flow. Therefore, I don't think these plots are very useful for assessing the accuracy of TSS predictions. I suggest rescaling the time axis to a non-dimensional "fraction of time to peak flow". I also suggest constructing cumulative TSS mass graphs showing measured and modeled calculations. Given the above mentioned disagreement in	Overall, there is a good agreement between modeled and observed TSS concentrations, as shown in these figures. Measured TSS concentrations are highly variable; therefore perfect agreement is not expected. These results are consistent with the performance of similar modeling studies. See response to comment 9 for modeled hydrograph.

Comment ID	Page	Comment	Water Board Response
		flow, I expect there to be large disagreements in these cumulative mass plots.	
68.	48	The text states "The average difference between modeled and measured EMCs for CC, LPC, and CCC was 83%, 51%, and 65%, respectively." These differences seem significantly large; note that these percent differences (which one could interpret as an indicator of uncertainty in the results) are similar to the percent reduction in sediment load required by the TMDL (67%).	See response to comment 10.
69.	49	The report says "suspended sediment simulations reasonably predicted the observed stormwater TSS concentrations in the Los Peñasquitos watershed." The term "reasonably" is ambiguous and subjective and therefore not very useful in judging the appropriateness of the results. Moreover, the goal of the simulation is not only simulate TSS concentrations but to simulate TSS loads. As mentioned above, modeled and measured loads should be compared.	Comment noted. See response to comment 11.
70.	49	The document says " Sediment transported via diffusive bed load processes also has the potential to be a significant source of sediment loadings; however, this source was neither characterized in the LSPC modeling or would be with traditional TSS sampling" and "Because of the length of those periods without TSS at low levels, bed flow has the potential to be the dominate sediment transport pathway and could add significant sediment to the lagoon." It seems, therefore, unlikely that the TMDL can be accurately calculated without accounting for bed load.	See response to comment id number 12.
71.	52-56	The data is too densely compressed	Comment noted; however, due to

Comment ID	Page	Comment	Water Board Response
		on Figures 43-45 to allow interpretation regarding the agreement of modeled and measured values. This data needs to be presented in an additional or alternative way, for example, as a table with error statistics or scattered plots of modeled vs. measured data.	funding constraints, no changes were made at this time.
72.	54	The fact that the model cannot simulate the changing cross section at mouth of the lagoon seems like a serious limitation. The widening and narrowing of the mouth has major affect on tidal flushing and sediment dynamics in the lagoon.	See response to comment 13.
73.	56	The omission of bed load modeling in the lagoon also seems like a serious limitation; bed load is likely a significant component of sediment transport.	See responses to comments 12 and 14.
74.	58-64	Figures 46-58 present observed TSS values at the ocean inlet, but the "Data inventory" section of the report has no discussion about how these data were collected.	Monitoring is described in the report and references.
75.	58-71	Figures 46-71 show large disagreement between modeled and observed TSS concentrations and those of specific size-classes at the mouth and, even more so, at the lagoon segment. It is not possible, based on these figures alone, to quantify the size of this disagreement nor its implication on the uncertainty of predicted effects of sediment load reductions. Suffice it to say that it appears to me that the lagoon modeling results are not really tenable for use in computing the required sediment reduction.	Sediment modeling is highly complex and a significant amount of information is provided to compare the modeled vs. observed results. Detailed discussion of the sediment modeling results is provided in the Sediment Calibration section that begins on page 57 of the Technical Support Document (Attachment 1). The TMDL accounts for uncertainty through inclusion of an explicit margin of safety. Please also see response to comment id 10.
76.	71	I would like to see an explicit explanation of how and why the modeled net sediment loading from the ocean showed a 39% decrease	See response to comment 16.

Comment ID	Page	Comment	Water Board Response
		from the historical/target condition (9,780 tons) in the 1970s to 5,944 tons currently. How is this tenable?	
77.	71	Given that the choice of the target condition was a historical watershed sediment loading, I'm not sure why lagoon modeling is even necessary. It seems to me that one only need compute the sediment load off the watershed. (However, if other ways of reducing sedimentation in the lagoon will be considered such as more railroad trestles, digging more creeks or dredging the mouth more often, then the model could be useful.)	See response to comment 17.
78.	71	I expected the lagoon model results to include sedimentation rates within the lagoon. Ideally, there should be measured sedimentation rates with which to compare the modeled rates. This would be the real "acid test" of the modeling system – can it reproduce sediment accumulation rates in the lagoon?	Observed measurements of sediment loading in the lagoon are not available. This comparison can be made in the future, depending on the availability of information.
79.	71	This report needs an additional section discussing the application of the model to the critical period, under historical/target and current conditions.	Application of the model to the critical period under each condition is discussed in Sections 8 .6 and 9.3 of the Technical Support Document.

Attachment 5

Public Comments on April 22, 2011 Draft

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Attachment 5: Public Comments on April 22, 2011 Draft

On April 22, 2011, the San Diego Water Board provided tentative Resolution No. R9-2011-0021 and supporting documents for public comment. This document contains the public comments received from interested parties in response to tentative Resolution No. R9-2011-0021. The comment period ranged from April 22, 2010 to June 8, 2011. In response to public comments, the tentative Resolution and supporting documents were revised and then made available as tentative Resolution No. R9-2012-0033.

List of Commenters

Commenter ID Number	Company/Agency	Representative
1	City of San Diego	Kris McFadden
2	Hanson Aggregates	Steve Zacks
3	U.S. Environmental Protection Agency	Cindy Lin
4	County of San Diego	Cid Tesoro
5	Caltrans	Scott McGowen
6	California State Parks	Darren Scott Smith
7	City of Del Mar	Mikhail Ogawa
8	City of Poway	Malik Tamimi
9	Los Peñasquitos Lagoon Foundation	Mike Hastings
10	Cal CIMA	Adam Harper
11	Industrial Environmental Association	Patti Krebs

May 20, 2011

Electronic Delivery to: chenning@waterboards.ca.gov

Cathryn Henning, Water Resource Control Engineer
California Regional Water Quality Control Board
San Diego Region
9174 Sky Park Court, Suite 100
San Diego, California 92123

Subject: Comments on Tentative Resolution No. R9-2011-0021, to Amend the Water Quality Control Plan for the San Diego Basin (9) to Incorporate the Total Maximum Daily Load for Sedimentation in Los Peñasquitos Lagoon

Dear Ms. Henning:

The City of San Diego (City) Transportation and Storm Water Department is pleased to provide the San Diego Regional Water Quality Control Board (Regional Board) with comments regarding Tentative Resolution No. R9-2011-0021 (Resolution) to amend the San Diego Basin Plan to incorporate the Total Maximum Daily Load (TMDL) for Sedimentation in Los Peñasquitos Lagoon (Lagoon).

At the request of the Regional Board, the City led the third party development of the TMDL. The reason for this collaborative effort was to allow the dischargers to help develop the TMDL, and stay on schedule. It has been a two-year collaborative effort funded by the City of San Diego, with input from the other Responsible Parties, and guidance from the Regional Board, US Environmental Protection Agency, and other stakeholders. We facilitated monthly coordination stakeholder meetings, used consultant services to perform modeling and reporting, and assigned tasks to ensure the project stayed on schedule. The City has been integral in the development of the TMDL; consequently, we have a more thorough knowledge of the required process procedures.

The City believes that this Resolution goes beyond the scope of the sedimentation TMDL. A TMDL is a calculation of the maximum loading capacity of the impaired waterbody for each impairing pollutant, which is sediment in this case. On February 3, 2010, the Responsible Parties were directed by the Regional Board to focus on sediment only, and not surrogate measures in the lagoon.

Our general comments are presented below, as well as specific comments included in the attached table.

- The goal of the TMDL is to address sediment and not all of the potential pollutants of the lagoon. Step 2 Long-term Goal and Step 3 Final Goal of the Three-Step Waterbody Goal, in the Resolution attachment, is beyond the scope of this sedimentation TMDL.
- Load Reduction Plan requirements call for scheduled Best Management Plan (BMP) implementation with a construction schedule, adjustments to staff scheduling and resources. As a governmental agency, our resources and staffing are based upon city council approval. It is difficult to schedule in advance when and if BMPs will be constructed, and when staff and resources will be secured. Information regarding a construction schedule, staff time, positions, and job descriptions should not be required in the TMDL Load Reduction Plan.
- The City does not believe that the Required Special Study on Lagoon Stressors should be included as a requirement in the Resolution, because this TMDL addresses sedimentation impairments. Specials studies can be addressed by the Responsible Parties in the Load Reduction Plan.
- The Adaptive Management Schedule has management decisions being made as a result of the Special Studies on Lagoon Stressors within a 6 year timeframe. If the TMDL has a Comprehensive Load Reduction Plan, we are required to be at 20% reduction at 5 years. It is unknown how long it will take before we see improvement in the lagoon but since we are only required to be at 20% reduction in 5 years, it is not clear as to whether the Regional Board will move to Steps 2 and 3 based on the Special Study results in the 6 year timeframe.
- The environmental analysis and checklist addresses bacteria issues and not entirely on sediment.
- The SED should provide the level a detail as required in an EIR.
- Cumulative impacts are not addressed in the environmental analysis.
- The project has an inadequate impact analysis because there are less than significant impacts with mitigations not properly addressed and analyzed, such as cultural resources and land use.
- Provide findings as described in State CEQA Guidelines section 15091 for significant environmental effects identified in an environmental impact report, and if the project as adopted will result in the occurrence of significant effects that are not avoided or substantially lessened, provide the specific reasons to support its action based on the final EIR and/or other information in the record described in State CEQA Guidelines section 15093 for similar significant effects identified in an environmental impact report.
- The Statement of Overriding Considerations does not explain how the project benefits outweigh the environmental effects.

- The above mentioned following require significant changes and recirculation of the Substitute Environmental Documentation.
- We are requesting that facilities that qualify as Phase II MS4 permittees, be included in this TMDL. Additionally, Industrial General Permit facilities and Construction General Permit sites are point sources of sediment to the lagoon and should be identified in the TMDL as contributors. In this watershed, there gravel mines that discharge directly into the receiving waters and the jurisdictions have no authority to regulate them.

The City appreciates the opportunity to lead the TMDL development effort. We feel that we have a better understanding of the TMDL development process. We request that the TMDL be confined to the 303(d) listed pollutant.

If you have any questions, please contact Ruth Kolb at (858) 541-4328.

Sincerely,

Kris McFadden
Deputy Director

KM/rk

Attachment: City of San Diego Comments Table on the Los Peñasquitos Sediment TMDL

cc: Almis Udrys, Office of the Mayor
Garth K. Sturdevan, Director
Ruth Kolb, Program Manager
File

#	Document	Page(s)	Excerpt/Topic	Comments/Proposed Changes
1	Staff Report	6	Compliance Schedule Full implementation of the TMDL for sediment shall be completed within 10 years from the effective date of the Basin Plan amendment. As an incentive to take a more comprehensive pollution reduction approach, an alternative 20-year schedule is provided which requires responsible parties to plan for, and demonstrate required load reductions of bacteria and other pollutants, in addition to the sediment load reductions required by this project	Development of a comprehensive approach will include an analysis of additional pollutants that can be addressed in the load reduction strategy, depending on feasibility. Recommended edit: "… demonstrate required load reductions of bacteria and other pollutants (as feasible), in addition to the sediment load reductions required by this project"
2	Staff Report	10	The Sediment TMDL for Los Peñasquitos Lagoon should (1) result in reduction in the current watershed sediment loading rate to the early-1970s watershed sediment loading rate, and (2) initiate long-term Lagoon monitoring to assess Lagoon's response to decreasing sediment loads and overall health	(2) focuses on lagoon monitoring. The TMDL addresses watershed reductions that are needed to reduce sediment loads long-term. Compliance monitoring requirements for sediment will be specified in the upcoming CLRP. Special studies that address the overall health of the lagoon are needed but are outside the scope of this sediment TMDL. The CLRP can include recommendations for special studies of the lagoon, with the understanding that required compliance monitoring will focus on assessing sediment load reductions from the watershed.
3	Staff Report	31	General Statewide Storm Water Permits	We agree that it is important to include reference to the General Storm Water Permits in the TMDL. Data were not available during TMDL development to explicitly estimate the sediment load contribution from these facilities. Additional effort is needed in the future to quantify the loads and impacts from these facilities.

#	Document	Page(s)	Excerpt/Topic	Comments/Proposed Changes
4	Staff Report	42	Critical location (included in TMDL Technical Report)	This implicit margin of safety assumption should be included in the staff report
5	Staff Report	44	Section 8 - Implementation Plan 3-Step Waterbody Goal	We support the ultimate goal of restoring the lagoon and an adaptive management approach. As noted in Section 2 – Problem Statement, the lagoon was placed on the 303(d) list for sediment/siltation (also noted in the heading for Step 1). The TMDL only addresses sediment reductions based on this listing and discussion with the San Diego Regional Board during TMDL development. As a result, achieving the required sediment reduction is the focus of the TMDL. Steps 2 and 3 may be needed in the future if it's determined that additional actions are needed to restore the lagoon. These actions and related lagoon monitoring studies are, however, outside the scope of this TMDL. Lagoon monitoring should be referenced as follow-up special studies that may be needed to better understand existing conditions in the lagoon and to determine if additional actions are needed in the future. The 3-Step Goal statement is appropriate, however, the above clarification is needed.

#	Document	Page(s)	Excerpt/Topic	Comments/Proposed Changes
6	Staff Report	45	Section 8.1.2 – Responsible Party Identification	The 3rd paragraph under this section notes that the Phase 1 MS4 copermittees are the ultimate point source of sediment to the lagoon. It should be noted there are several General Storm Water Permit facilities (e.g. mining operations) that discharge directly to surface waters in the watershed and not to storm water conveyances maintained by the Phase 1 MS4 copermittees. The San Diego Water Board is responsible for enforcing these permits, as noted in the 4th paragraph. The TMDL notes that the sediment contribution from these facilities is likely significant and will need to be quantified to determine the impacts from these facilities.
7	Staff Report	46	SLRP/CLRP submittal	Approval of the SLRP or CLRP by the San Diego Water Board will be required in order to commit the necessary resources needed to implement the recommended actions. A timeline for the approval process should be specified
8	Staff Report	47	SLRP/CLRP requirements – 1)D	Staffing and other resource needs will be determined during development of the SLRP or CLRP. A general requirement that adequate staffing and oversight of implementation efforts is acceptable. Specific language requiring a schedule for staff time, etc. should be deleted.

#	Document	Page(s)	Excerpt/Topic	Comments/Proposed Changes
9	Staff Report	47	SLRP Requirements – 2) and 3)	Refer to Comment #5. Lagoon monitoring references should be edited as appropriate based on the recommended changes to Section 8.5.1. Lagoon monitoring should not be required as this TMDL addresses the sediment/siltation impairment of the lagoon.
10	Staff Report	47	SLRP Requirements – 4)	Clarify that the comparison to historic conditions (early 1970s) will focus on achieving the sediment load reduction required specified in the TMDL. Several of the lines of evidence specified in Section 8.3.1 do not provide a direct measure of sediment loading. This section should be edited to focus on monitoring efforts that provide direct feedback on sediment/siltation improvements that may result from reductions in watershed loading
11	Staff Report	48	CLRP Requirements – 2)D	Recommended edit: "Periodically assess the water quality of all water body/pollutant combinations within the Penasquitos watershed ***that are included*** in the CLRP to identify all water quality problems."
12	Staff Report	49	Section 8.1.4	Refer to Comment #7
13	Staff Report	50	Section 8.2	Refer to Comment #7

#	Document	Page(s)	Excerpt/Topic	Comments/Proposed Changes
14	Staff Report	51	Section 8.3.1 – Weight of Evidence Approach	The Lagoon Condition lines of evidence do not provide a direct measure of sediment load reduction which is the focus of this TMDL. Several Creek Condition lines of evidence also may not have a direct linkage with sediment improvements. As noted in previous comments and elsewhere in Section 8, this TMDL specifically addresses the sediment/siltation impairment of the lagoon. Special studies would need to be developed to assess lagoon and creek conditions that may be affected by other pollutants and physical disturbances
15	Staff Report	53	Section 8.5.1	Refer to Comments #2, #5, and #9. Lagoon monitoring should not be required as this TMDL addresses the sediment/siltation impairment of the lagoon. Lagoon monitoring should be referenced as follow-up special studies that may be needed to better understand existing conditions in the lagoon and to determine if additional actions are needed in the future. Specific requirements for conducting lagoon monitoring and special studies should be deleted.

#	Document	Page(s)	Excerpt/Topic	Comments/Proposed Changes
16	Staff Report	53 & 54	Section 8.5.1	Regarding the possible need to move to Steps 2&3 of the waterbody goals – improvements in lagoon condition in response to sediment reductions will be a slow, incremental process. Adequate time will be needed to demonstrate improvements in the lagoon resulting from BMP implementation. In addition, a well-designed compliance monitoring strategy must be developed and included in the SLRP or CLRP to document these improvements and link them back to reductions in sediment loading. Special studies of the lagoon must take into account the time that will be required to measure changes in lagoon condition over time. The need for additional regulatory or restorative actions (and resources) will be dependent on an accurate measure of the lagoon's response to BMP implementation.
17	Staff Report	54	Section 8.5.2	The Regional Board listed sediment/siltation as the 303(d) impairment cause for the lagoon. A comprehensive study of lagoon stressors, if needed, should be led and funded by the Regional Board, as this TMDL was developed to specifically address sedimentation impacts from the watershed. The SLRP or CLRP, therefore, will focus on identifying the BMP actions that are needed to reduce sediment loading to the lagoon and a compliance monitoring program to assess these changes over time.

#	Document	Page(s)	Excerpt/Topic	Comments/Proposed Changes
18	Staff Report	55	Section 8.5.3	Refer to Comment #16. The Adaptive Management Schedule does not allow sufficient time to show marked changes in lagoon condition from future BMP implementation activities. According to this schedule, special studies will be completed within 4 years of OAL approval. The Alternative Compliance Schedule (page 52) requires a 20% reduction in sediment loading within this time frame. Cost-effective management decisions cannot be made unless adequate time is allowed to measure and demonstrate changes in lagoon condition as a result of BMP implementation. A longer schedule is needed to be consistent with the Alternative Compliance Schedule and the time that will be needed for the lagoon to begin to show improvements. Refer to Comment #18 regarding the need for special studies of the lagoon and the responsible entity
19	Resolution No. R9-2011-0021	5	15. TMDL Implementation, Monitoring, and Compliance	Include the following: … implement a Sediment Load Reduction Plan (SLRP) <u>or Comprehensive Load Reduction Plan (CLRP)</u>. Include the following: … Final compliance with this TMDL must be achieved, as soon as possible, but no later than ten years <u>for the SLRP or no later than twenty years for the CLRP</u> from the effective date of the Basin Plan Amendment.

#	Document	Page(s)	Excerpt/Topic	Comments/Proposed Changes
20	Resolution No. R9-2011-0021	5	16. TMDL Project Objective and Waterbody Goal	The Resolution is for Sedimentation/Siltation TMDL. Delete the following: TMDL Project Objective ~~and Waterbody Goal~~: The objective of this TMDL project to attain the sediment water quality objective in the Los Penasquitos Lagoon. ~~This is considered an essential first step towards achievement of the ultimate waterbody goal. The final goal for the Los Penasquitos Lagoon is full attainment of all water quality objectives, protection of all beneficial uses, and restoration to a functional healthy estuarine ecosystem.~~
21	Resolution No. R9-2011-0021	6	18. California Environmental Quality Act Requirements:	Delete the following: For CEQA purposes, the "project" is both the adoption of a Basin Plan amendment establishing a TMDL for sediment in the Lagoon ~~and all of the implementation activities undertaken by the responsible parties to comply with the TMDL.~~

#	Document	Page(s)	Excerpt/Topic	Comments/Proposed Changes
22	Resolution No. R9-2011-0021 Attachment A	A-2 & A-3	Restoring Los Penasquitos Lagoon: Three-Step Waterbody Goal	1. Revise title to Reducing Sedimentation and Siltation Load to the Los Penasquitos Lagoon. 2. Delete three-step Waterbody Goal. 3. Strike out and keep the following: ~~Step 1 Intermediate-term Goal:~~ Attain water quality objective for sediment in Los Penasquitos Lagoon and address current Clean Water Act section 303(d) sediment impairment. Overall Strategy Reduce current watershed sediment load to early 1970s watershed sediment load. Delete: ~~Initiate long-term Lagoon monitoring~~ and replace with: Compliance monitoring to assess Lagoon's response to decreasing sediment ~~and overall health~~. Strike out the entire title and paragraph of Step 2 Long-term Goal. Delete the entire title and paragraph of Step 3 Final Goal.

#	Document	Page(s)	Excerpt/Topic	Comments/Proposed Changes
23	Resolution No. R9-2011-0021 Attachment A	A-3	Step 1: Sediment Total Maximum Daily Load for Los Penasquitos	Delete "Step 1" from Title.
24	Resolution No. R9-2011-0021 Attachment A	A-10	Implementation Plan SLRP Requirements	Revise "The SLRP shall contain…" to "The SLRP is recommended to contain…"
25	Resolution No. R9-2011-0021 Attachment A	A-11	SLRP components, item numbers 1A through 1C	Keep only the main headings & delete details: A) Initial BMP Analysis B) Scheduled BMP Implementation C) Scheduled Periodic BMP Assessment and Optimizing Adjustments
26	Resolution No. R9-2011-0021 Attachment A	A-11	SLRP component, item number 1D	Delete "D. Continuous Budget and Funding Efforts- Securing budget and funding for BMP staffing and equipment should be scheduled early and continue until the sediment TMDL is met. The SLRP should include a schedule for staff time, including position and job description, authorized for securing funding for non-structural BMP implementation and maintenance."

#	Document	Page(s)	Excerpt/Topic	Comments/Proposed Changes
27	Resolution No. R9-2011-0021 Attachment A	A-11	SLRP component, item number 2	Delete "2) … and the Lagoon monitoring requirements."
28	Resolution No. R9-2011-0021 Attachment A	A-11	SLRP component, item number 3	Delete "3) Details of the required special studies, including delivery dates for those studies."
29	Resolution No. R9-2011-0021 Attachment A	A-12	CLRP requirements	Revise "The CLRP shall contain…" to "The CLRP is recommended to contain…"
30	Resolution No. R9-2011-0021 Attachment A	A-12	CLRP requirements, item number 2B	Delete item 2B and replace with the following: Develop watershed-based, land use planning policies and approaches each jurisdiction can review and select for use in their planning processes.
31	Resolution No. R9-2011-0021 Attachment A	A-18 & A-19	Adaptive Management	Delete Required Lagoon Monitoring section.

#	Document	Page(s)	Excerpt/Topic	Comments/Proposed Changes
32	Resolution No. R9-2011-0021 Attachment A	A-19	Adaptive Management	Delete Required Special Study on Lagoon Stressors section.
33	Resolution No. R9-2011-0021 Attachment A	A-19	Adaptive Management	Delete Adaptive Management Schedule section.
34	Staff Report	Pg 1	Executive Summary, fourth paragraph	Delete "initiate long-term Lagoon monitoring" and replace with "compliance monitoring." Delete "and overall health."
35	Staff Report	Pg 44	Implementation Plan	Delete three-step Waterbody Goal.
36	Staff Report	Pg 44	Implementation Plan	Delete the following: Accordingly, this Implementation Plan describes both the program of implementation and the adaptive management approach ~~necessary for achieving step 1, the Intermediate-term goal~~.

#	Document	Page(s)	Excerpt/Topic	Comments/Proposed Changes
37	Staff Report	Pg 44	Implementation Plan	Strike out and keep the following: ~~Step 1 Intermediate-term Goal:~~ Attain water quality objective for sediment in Los Penasquitos Lagoon and address current Clean Water Act section 303(d) sediment impairment. Overall Strategy Reduce current watershed sediment load to early 1970s watershed sediment load. Delete: ~~Initiate long-term Lagoon monitoring~~ and replace with: Compliance monitoring to assess Lagoon's response to decreasing sediment ~~and overall health~~.
38	Staff Report	Pg 44	Implementation Plan	Delete Step 2: Long-term Goal Section and Step 3: Final Goal Section
39	Staff Report	Pg 45	8.1.1 San Diego Water Board Actions	Revise …to comply with the total wasteload allocation to reduce 'collective watershed sources' to the following: …to comply with the total wasteload allocation of this TMDL sedimentation.
40	Staff Report	Pg 46	SLRP Requirements	Revise "The SLRP shall contain…" to "The SLRP is recommended to contain…"

#	Document	Page(s)	Excerpt/Topic	Comments/Proposed Changes
41	Staff Report	Pg 47	SLRP Requirements, item numbers 1A through 1C	Keep only the main headings and delete details: A) Initial BMP Analysis B) Scheduled BMP Implementation C) Scheduled Periodic BMP Assessment and Optimizing Adjustments
42	Staff Report	Pg 47	SLRP Requirements, item 1D	Delete "D. Continuous Budget and Funding Efforts- Securing budget and funding for BMP staffing and equipment should be scheduled early and continue until the sediment TMDL is met. The SLRP should include a schedule for staff time, including position and job description, authorized for securing funding for non-structural BMP implementation and maintenance."
43	Staff Report	Pg 47	SLRP Requirements, item 2	Delete "… and the Lagoon monitoring requirements."
44	Staff Report	Pg 47	SLRP Requirements, item 3	Delete "3) Details of the required special studies, including delivery dates for those studies."
45	Staff Report	Pg 48	CLRP Requirements	Revise "The CLRP shall contain…" to "The CLRP is recommended to contain…"
46	Staff Report	Pg 48	CLRP Requirements, item 2B	Delete item 2B and replace with the following: Develop watershed-based, and use planning policies and approaches each jurisdiction can review and select for use in their planning processes.
47	Staff Report	Pg 53-54	8.5.1 Required Lagoon Monitoring	Delete section 8.5.1 Required Lagoon Monitoring

#	Document	Page(s)	Excerpt/Topic	Comments/Proposed Changes
48	Staff Report	Pg 54	8.5.2 Required Special Study on Lagoon Stressors	Delete section 8.5.2 Required Special Study on Lagoon Stressors.
49	Staff Report	Pg 55	8.5.3 Adaptive Management Schedule	Delete section 8.5.3 Adaptive Management Schedule and Table 7.
50	Staff Report	Pg 56-60	Section 9: Environmental Analysis, Environmental Checklist, and Economic Factors	Staff report lists Attachment 5 for the Environmental Analysis and Checklist. However, this document is labeled Attachment 3. Correct inconsistency.
51	Environmental Analysis and Checklist		(General Comment)	The environmental analysis and checklist addresses bacteria issues and not entirely on sediment.
52	Environmental Analysis and Checklist		(General Comment)	The SED should provide the level of detail as required in an EIR.
53	Environmental Analysis and Checklist	3-42	Environmental Checklist and Analysis	Cumulative impacts are not addressed in the environmental analysis.
54	Environmental Analysis and Checklist		Environmental Checklist and Analysis	The project has an inadequate impact analysis because there are less than significant impacts with mitigations not properly addressed and analyzed, such as cultural resources and land use.

#	Document	Page(s)	Excerpt/Topic	Comments/Proposed Changes
55	Environmental Analysis and Checklist	3-51 Through 3-53	Environmental Analysis and Findings	Provide findings as described in State CEQA Guidelines section 15091 for significant environmental effects identified in an environmental impact report, and if the project as adopted will result in the occurrence of significant effects that are not avoided or substantially lessened, provide the specific reasons to support its action based on the final EIR and/or other information in the record described in State CEQA Guidelines section 15093 for similar significant effects identified in an environmental impact report.
56	Environmental Analysis and Checklist		Environmental Analysis and Findings	The Statement of Overriding Considerations does not explain how the project benefits outweigh the environmental effects.
57	Environmental Analysis and Checklist		(General Comment)	The above mentioned following require significant changes and recirculation of the Substitute Environmental Documentation.

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Ms. Cathryn Henning
California Regional Water Quality Control Board,
San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340.

Subject: Comments on Los Peñasquitos Lagoon Sedimentation TMDL

Dear Ms. Henning:

Below are comments/ questions on the proposed TMDL.

1. Finding #`9 on page 4 of Tentative Resolution No. R9-2011-0021 (attached) states:

> Non-point sources: In this project, the "collective watershed sources" also include all the *non-point sources located in the watershed* such as agriculture (1 percent of current land use area) and open space (43 percent of current land use area). This is the case because virtually the entire Los Peñasquitos watershed is drained through the Phase I MS4 collection systems and therefore these sources, although nonpoint in origin, are considered by the San Diego Water Board to be "controllable" point sources. For this reason the Phase I MS4s can be thought of as the primary and ultimate point sources of sediment to the Lagoon.

Hanson Aggregates operates an aggregate and concrete operation know as Carroll Canyon. Stormwater from this operation flows direcly into Carroll Canyon Creek withour first entering a public storm drain. Does Finding #9 mean our site's discharge could be part of the collective watershed TMDL allocation of 2,580 tons/year described in Finding # 12 of the Tentative Resolution? If no, how would a sediment load be assigned to our site?

We request that sediment load allocations be discussed with dischargers such as Hanson Aggregates before they are finalzied. These discussions would include review of the feasiblity of the load allocation.

2. A primary concern is what are the RWQCB's expectations when there are extraordinary rain events such as a 100-year storm? These events could generate the most significant sediment loading to the lagoon, but it may be infeasible to adequately control the waste load. The draft Industrial Stormwater Permit expects BMP's to be designed to a compliance storm event. RWQCB staff stated at a workshop that if the compliance storm event is exceeded, then the discharger is not expected to comply with the NAL's and NEL's. Would there be similar provisions with the TMDL?

3. If our sites are assigned an effluent limit/ allocation in response to the TMDL, then how will run-on from offsite properties be accounted for? For example, assume a creek that drains a large (e.g. 10 square miles) upgradient watershed cannot handle a storm event, overflows onto our parcel, and then causes excessive sedimentation. Does this sediment apply towards our effluent limit/ allocation?

Regards,

Steve Zacks

Steve Zacks
Environmental Manager

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

May 23, 2011

David Gibson
Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Dear Mr. Gibson,

Thank you for the opportunity to comment on the Los Peñasquitos Lagoon Sedimentation TMDL Staff Report and Draft Basin Plan Amendment (BPA), dated April 22, 2011. We have reviewed both documents in accordance with Section 303(d) of the Clean Water Act and EPA's implementing regulations at 40 C.F.R. Part 130 which describe the statutory and regulatory requirements for approvable TMDLs. EPA finds serious concerns with several TMDL elements in the draft documents which may result in our disapproval of the TMDL. Below we describe the sections which require modification and addition of the appropriate technical support and regulatory language.

Numeric Target & Linkage Analysis

The TMDL must identify appropriate numeric water quality targets that provide a quantitative measure to show attainment with applicable water quality standard(s) in Los Peñasquitos Lagoon. Specifically, the TMDL is interpreting a narrative water quality objective and therefore it is essential to establish numeric measures that will define the narrative condition for protecting the beneficial uses. According to EPA's guidelines for reviewing TMDLs under existing regulations, the TMDL submittal should describe the method used to establish the cause-and-effect relationship between the numeric target and the identified pollutant sources.

The staff report clearly described the beneficial uses and impact of sedimentation to the Lagoon:

"The beneficial use that is most sensitive to increased sedimentation is estuarine habitat. Estuarine uses may include preservation or enhancement of estuarine habitats, vegetation, fish, shellfish, or wildlife (such as marine mammals or shorebirds)…….Impacts associated with increased and rapid sedimentation include: reduced tidal mixing within Lagoon channels, degraded and (in some cases) net loss of riparian and salt marsh vegetation, increased vulnerability to flooding for surrounding urban and industrial developments, increased turbidity

associated with siltation in Lagoon channels, and constricted wildlife corridors." (p. 9 of Staff Report & p14 of Attachment 1)

As such, the focus of the TMDL should identify the physical, chemical and biological factors influencing the estuarine habitat caused by sedimentation and siltation. Since the applicable water quality objective is a narrative objective for sediment, the TMDL should identify numeric targets that will provide the basis for evaluating if the water quality objectives and beneficial uses have been attained in Los Peñasquitos Lagoon. In similar sediment TMDLs adopted within the State, multiple targets for the water column and habitat have been included to provide a clear evaluation to determine if water quality objectives and beneficial uses are attained (e.g., tidal prism volume, turbidity, %fines, % gravel, % salt marsh habitat, etc.). In this TMDL, sedimentation has presumably caused estuarine habitat loss which is critical for the protection of rare, threatened and endangered species and spawning habitat. Specifically, sedimentation within the Lagoon restricts the tidal prism, or exchange between the ocean and the Lagoon, and degrades critical salt marsh habitats through various processes. This important information should be used to define the appropriate numeric targets. For example, Attachment 1 of the staff report carefully identified that 180 acres of 510 habitat acres have been directly impacted by sedimentation. And yet, this information was not utilized in the definition of the numeric targets or in other sections of the TMDL staff report.

Instead, this TMDL defined a single numeric target based on historical conditions and calculated a historic sediment load of 12, 360 tons per critical wet period. The numeric target is appropriate in providing the load reduction required by the point sources; however, it does not provide a measure to evaluate whether the Lagoon itself has attained the water quality objectives and protection of the beneficial uses. We require the inclusion of other numeric targets that directly assess the condition of the Lagoon to ensure a clear linkage between allocations, numeric targets and the restoration goal of the TMDL.

Source Assessment

In our review, we did not find a complete analysis of all possible sources in the BPA and staff report. Attachment 1 of the Staff report (p37) discussed impacts of railroad-related construction activities and the railroad berm as causing sedimentation in the Lagoon. However, this source was not identified in the TMDL staff report or the BPA as a potential source to be addressed. The TMDL should identify all point and nonpoint sources of the pollutant of concern, including location of the source(s) and the quantity of the loading, e.g., lbs/per day.

This TMDL document identified wave action from the ocean as a Load Allocation. Since the ocean is defined as a "non-controllable" background source, please appropriately identify this as a background source and not a Load Allocation. Clear sources that are due to natural background tidal exchange processes should be noted and evaluated as part of the background sources portion of the TMDL budget. If human activities are leading to increasing wave action or disrupting the sedimentation rate, a wasteload allocation should be considered.

Margin of Safety

The CWA statute and corresponding federal regulations require that a TMDL include a margin of safety (MOS) to account for any lack of knowledge concerning the relationship between load and wasteload allocations and water quality (CWA §303(d)(1)(C), 40 C.F.R. §130.7(c)(1)). In our view, this TMDL includes huge uncertainties in the calculation of the loading capacity, including the linkage between the WLA and the numeric targets and the water quality objectives. The implicit MOS does not adequately provide a sufficient measure of protection in accounting for the large level of uncertainties. In addition, the conservative assumptions in the analysis and calculation of the wasteload allocation should be clearly defined and included to better evaluate the level of implicit or explicit MOS. We strongly recommend the TMDL include an explicit MOS unless greater clarity is provided in detailing out the assumptions and areas of conservative measures.

Implementation Plan

This TMDL outlines a three step process to restore Los Peñasquitos Lagoon. A phased approach outlining the implementation plan for achieving the TMDL's final wasteload allocations and numeric targets is appropriate. However, this TMDL does not clearly outline the framework nor the detail actions required for each step to show with reasonable assurance that the wasteload allocations and numeric targets to support protection of beneficial uses will be achieved. The current three step goals only describes the overall strategy and regulatory actions; the content of the strategy and actions are limited in scope and do not provide the detailed actions, measures and milestones to define how the TMDL and its goals will be achieved.

Overall, EPA finds these TMDL and BPA documents, as presented, do not provide reasonable and sufficient technical information and therefore do not appear to meet regulatory requirements for addressing excessive sedimentation in the Los Peñasquitos lagoon. More importantly, the TMDL must include clear quantitative measures that will result in direct evaluation of the Lagoon to show water quality improvements and restoration of the impaired beneficial uses.

We recommend the appropriate information be included in the TMDL documents to fulfill the statute and regulatory requirements of an approvable TMDL. If you have any questions, please contact me at (213) 244-1803.

Sincerely yours,

Cindy Lin
TMDL Liaison, Water Division

County of San Diego

DEPARTMENT OF PUBLIC WORKS

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May 23, 2011

Dave Gibson, Executive Officer
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

SEDIMENT TMDL FOR LOS PENASQUITOS LAGOON

Dear Mr. Gibson:

Thank you for the opportunity to comment on the *Sediment TMDL for Los Penasquitos Lagoon*. We have provided extensive comments on the Tentative Resolution (including Attachment A – the proposed Basin Plan Amendment) as well as the Draft Staff Report and Attachment 3 (Environmental Analysis and Checklist) in the enclosed table.

If you have questions please contact Todd Snyder, Watershed Planning Manager, at (858) 694-3482 or by e-mail at todd.snyder@sdcounty.ca.gov.

Sincerely,

CID TESORO
LUEG Program Manager

CT:ti

Enclosure

County of San Diego - Los Peñasquitos Sediment TMDL Comments

#	Document	Page(s)	Excerpt/Topic	Comments/Proposed Changes
1	Tentative Resolution	5	Item 15. Final Compliance within 10 years.	Please add after Basin Plan Amendment, "or within 20 years if a Comprehensive Load Reduction Plan (LRP) is developed for the watershed." The compliance timelines identified in the Resolution should be consistent with those identified in the Attachment (see A-10). We agree that the option for an extended compliance timeline is appropriate for a LRP that addresses multiple pollutants. This will also ensure consistency with the recently adopted Bacteria TMDL for Beaches and Creeks, which also impacts the Los Penasquitos Watershed.
2	Tentative Resolution	5	Item 16. TMDL Project Objective and Waterbody Goal	Please delete the last sentence. This TMDL is for sediment and should remain focused on sediment. "Full attainment of all water quality objectives ... and restoration to functional healthy estuarine ecosystem" is beyond the scope of this TMDL.
3	Tentative Resolution	5	Item 17. Scientific Peer Review.	Several responses (>17%) to the peer review questions state that "due to time constraints, no changes were made at this time." Additional time should be devoted to making all changes to the TMDL that are appropriate based on peer review.
4	Tentative Resolution	6	Item 18. "For CEQA Purposes, the 'project' is both the adoption of the Basin Plan Amendment and all of the implementation activities…"	The CEQA analysis does not address any of the implementation actions that will result from this TMDL. If it did, more specific mitigation and alternatives would need to be included in the Staff Report.
5	Tentative Resolution	6	Item 19 second paragraph. "The San Diego Water Board only considers the reasonably foreseeable feasible environmental impacts of those methods of compliance, and the reasonably foreseeable mitigation measures which would avoid or eliminate the identified impacts."	The substitute environmental documents do not identify the reasonably forseeable mitigation measures which would avoid, reduce, or eliminate impacts identified as "significant".
6	Tentative Resolution	6-7	Item 20. "Possible alternatives and mitigation are described in the CEQA environmental analysis, specifically the Staff Report and the environmental checklist."	There is little to no specific mitigation identified or alternatives proposed that would mitigate the "project". The supporting documents currently identify that most if not all impacts from the project are the responsibility of other agencies. The Staff Report and the Environmental Analysis include three alternatives, none of which specifically identify which, if any, potential environmental impacts that the alternative address.

#	Document	Page(s)	Excerpt/Topic	Comments/Proposed Changes
7	Tentative Resolution	7	Item 22. Economic Analysis	The Water Boards' economic analysis generally discusses the range of costs involved with construction of a few types of compliance measures. However, it does not provide an analysis of the costs required to operate and maintain these measures, the cumulative number of BMPs expected to be necessary over the life of the project, nor does it analyze the requirement for the responsible parties to identify additional staffing in the LRP. Without this information, there is no way to make a direct comparison between the anticipated economic impacts of implementing the TMDL and the environmental benefits to be achieved. Therefore, it is unclear how the Water Board has reached the conclusion that anticipated economic impacts are acceptable. These comments apply equally to Page 59, Section 9.6 in the Draft Staff Report.
8	Attachment A	A-9, A-10	Attachment A, page A-9, states it is the responsibility of the Phase I MS4s (County of San Diego and Cities of San Diego, Del Mar, and Poway) to assume the lead role in coordinating and carrying out the responsible party actions, compliance monitoring, and adaptive management required under this TMDL project.	Each of the listed responsible parties (Phase I MS4s, Phase II MS4s, Caltrans, and the General Construction/Industrial Stormwater Permittees) should have equal responsibility for developing, implementing, and complying with the TMDL.
9	Attachment A	A-10	Develop and Submit a Load Reduction Plan	Last paragraph replace "and" with "or" in first sentence.
10	Attachment A	A-10, A-11	SLRP Requirements	It is not feasible to identify a detailed schedule for construction of BMPs and additional staffing within the timeline allowed for submittal of the SLRP. Realistically, it can take several years once a candidate project is identified to confirm implementation feasibility. Some of the issues that need to be resolved before a BMP can be constructed include: identifying funding, analyzing environmental impacts, and (in some cases) acquiring land. In general, there is too much specificity required in the SLRP.
11	Attachment A	A-12	Item 6. "Parties should review and modify their jurisdictional ordinances…"	This statement contradicts findings made in the Initial Study (see page 3-34 Land Use), which states that the project would not conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project.
12	Attachment A	A-13	Implement Load Reduction Plan	Does the language here imply that the CLRP is acceptable to the Water Board if no comments are provided on the content of the Plan?

#	Document	Page(s)	Excerpt/Topic	Comments/Proposed Changes
13	Attachment A	A-13	Reasonablely Foreseeable Methods of Compliance by RPs	It would be better to make this section more general since there are likely other foreseeable methods of compliance not included on the list provided.
14	Attachment A	A-15	Compliance Determination – Weight of Evidence	This section contains contradictory language. It first says "Attainment of the 1970s loading rate will be demonstrated by measuring and reporting on *any combination of* the following individual lines of evidence …". It then says "*Each line of evidence* must establish the early 1970s condition and the existing condition in the SLRP or CLRP, such that progress can be quantified as a percent." It is more appropriate to some, but not all, lines of evidence to be used because it will be difficult or impossible to determine progress on many of the potential lines of evidence listed. For example, IBI and CRAM were either not completed or were not available in the 1970's and require in field measurements that cannot be recreated. Also, while vegetation maps may be available for portions of the lagoon and the watershed, there is no complete vegetation coverage available for the entire watershed with specific detail for the vegetation types listed.
15	Attachment A	A-16, A-17	Compliance Schedule	It is problematic to establish load reduction targets (both interim and final) that assess sediment loading on an annual basis. Sediment loading can be highly variable across years due to changes in rainfall amounts, intensities, etc. over the course of a year. It may be more appropriate to use a 10-year running average to factor out years have abnormally high loading due to hydrologic variability. Responsible parties should be given the opportunity to propose an alternative compliance schedule that is subject to review and acceptance by the Water Board. Currently, responsible parties are only allowed to propose "additional" interim milestones and final compliance schedules.
16	Attachment A	A-18, A-19	Required Lagoon Monitoring/ Required Special Studies	While the stated objective of the TMDL is to reduce sediment loads, it appears that much of these two programs will take us immediately into Step 2 and 3. Monitoring required by the TMDL should be limited to assessing the goal of Step 1 – sediment load reduction. The last sentence under required Lagoon Monitoring starting with "One of the SD Water Board …" should be deleted from this section. It might fit into the Staff Report but does not belong in the Resolution or the Basin Plan Amendment.

#	Document	Page(s)	Excerpt/Topic	Comments/Proposed Changes
17	Attachment A	A-19	Adaptive Management Schedule	Special studies are required to be carried out within 4 years of OAL approval. The compliance timeline requires 30% of the total load reduction to be achieved by this time. If the conclusion of the special studies is that sediment is a minor factor affecting Lagoon health, the TMDL proposes that the project shift focus to other more important factors controlling lagoon health. It would be more effective from an economic perspective to conduct the special studies first, then define the appropriate regulatory approach based on the results. There is much opportunity for wasted time and money in the approach proposed by the TMDL. These comments apply equally to Section 8.5.2 and 8.5.3 in the Draft Staff Report.
18	Draft Staff Report - April 2011	2, 13	Sources and Responsible Parties	Staff Report should clearly state that the land use coverage used is not the "current" or "existing" state of the watershed and should indicate why the 2000 LU coverage was selected to define existing conditions.
19	Draft Staff Report - April 2011	5	Implementation of TMDL	Language in this section indicates that Phase II MS4s and General Industrial and Construction Permit holders "may" be required to develop SLRPs. It is unclear from the staff report whether existing requirements for Phase II MS4s and Construction/Industrial Storm Water Permit holders are sufficient to support achievement of the load reductions required in this TMDL. The Water Board should specify the criteria that will be used to assess whether these parties will have to implement SLRPs. There are properties in the watershed, such as sand mining operations, that discharge directly to the creek or other receiving water that do not first enter an MS4 controlled by a Phase I MS4 permittee.
20	Draft Staff Report - April 2011	10	According to California State Parks, the lagoon consists of approximately 510 acres of wetland habitats… remaining 180 acres of salt marsh and brackish marsh vegetation are impaired by excessive sedimentation.	180 acres of impaired habitats is significantly less than the original estimate under the 1996 listing of 469 acres. There is a lack of discussion regarding the severity of the effect of sediment on the Estuarine Beneficial Use and the 1996 TMDL listing. Delisting should be included as a feasible alternative for portions of the Lagoon.
21	Draft Staff Report - April 2011	15	First Paragraph states " Currently the lagoon mouth is open throughout most of the year …Mechanical dredging is used only when needed"	This is contradictory to statements in the Initial Study Attachment 3 page 3-4 which states "a permanent mouth opening to ocean cannot be naturally maintained… therefore channel is "often" dredged to alleviate danger…"
22	Draft Staff Report - April 2011	19	First paragraph states "These sediment deposits have gradually built-up over the years.."	This is contradictory to the findings that sedimentation is the leading cause in the "rapid loss" of salt marsh habitat as stated on page 10 and 19 of the Staff Report. Furthermore, Section 4.1 page 21 states "Gradual Sediment accumulation in the lagoon has created areas of higher elevation." Findings in these documents should be consistent.

#	Document	Page(s)	Excerpt/Topic	Comments/Proposed Changes
23	Draft Staff Report - April 2011	30	Phase II MS4 discussion	The Resolution and accompanying documents indentify that Phase II MS4 are responsible parties to this TMDL. Page 30 of the Staff Report indicates that there are no Phase II MS4 entities enrolled under Order No. 2003-0005-DWQ in this watershed. This section should identify the potential Phase II entities within the watershed that are subject to future enrollment.
24	Draft Staff Report - April 2011	56	Section 9	This section should cite all the relevant sections of CEQA that are appropriate.
25	Draft Staff Report - April 2011	56	Attachment 5 citation	Attachment 3 – Environmental Analysis and Checklist (Incorrectly cited as Attachment 5)
26	Draft Staff Report - April 2011	60	Section 9.7 Reasonable Alternatives to the proposed activity	Section 9.7 only identifies 2 of 3 alternatives discussed in the Initial Study 3-47 through 3-49. Per Section 15126.6 of CEQA, it should identify the basic objectives of the Sediment TMDL and then provide a reasonable range of alternatives that would achieve some or all objectives of the proposed project. These should be based on a goal to reduce some or all of the potentially significant environmental effects of the project. One such alternative would be the delisting of the lagoon for sediment (if appropriate). Another would be to conduct special studies first to identify the primary cause(s) of degraded lagoon health, then to pursue the regulatory approach that most efficiently addresses the impairment.
27	Attachment 3 Environmental Analysis and Checklist	3-3	Title	Page 3-3 identifies this as Attachment 5. This should be changed to Attachment 3. This analysis and checklist should list appropriate sections of CEQA as necessary.
28	Attachment 3 Environmental Analysis and Checklist	3-3	Project Description	The project description lacks sufficient detail to provide a basis for the responses in the environmental checklist.
29	Attachment 3 Environmental Analysis and Checklist	3-3 through 3-5	Environmental Setting	This section does not include any information on habitats (types, acres, location, etc) found within the watershed or the lagoon upon which to base conclusions reached in the checklist.
30	Attachment 3 Environmental Analysis and Checklist	3-4	Third Paragraph last sentence.	Add “in part” after the word “due”. The TMDL documents clearly state that while sediment and siltation are a problem for the loss of beneficial uses in the lagoon, they may not be the only reason for the loss of the estuarine beneficial use.

#	Document	Page(s)	Excerpt/Topic	Comments/Proposed Changes
31	Attachment 3 Environmental Analysis and Checklist	3-4 through 3-5	Sensitive Species	This list should include sensitive species of plants and animals associated with the lagoon/estuary. Most of these species are riparian and upland species. This discussion should also cite references used to determine the list of species.
32	Attachment 3 Environmental Analysis and Checklist	3-5, 3-6	Section 1.2 Existing Local, Specific, and Regional Plans, and Habitat Conservation Plans	While it is not clear as to the extent of what types of plans should be included in this section, there should be at least some discussion of the MSCP and the appropriate approved Subarea Plans for this watershed. Further, there should be some discussion on specific stormwater related ordinances that each of the Responsible Parties have adopted to control stormwater problems.
33	Attachment 3 Environmental Analysis and Checklist	3-6	Project Clean Water	Project Clean Water is not a program. It is a website that provides a forum for sharing information regarding water quality and watersheds in the County. It is not appropriate to reference Project Clean Water in this section.
34	Attachment 3 Environmental Analysis and Checklist	3-10	Section 4 Reasonably Foreseeable Methods of Compliance.	This section would better support the discussions, conclusions, and findings in later sections and the Checklist if the section focused on different general methods for sediment control and runoff (for example structural vs. non-structural; site design vs. source control vs. treatment control; and/or short term (construction related) vs. long term (permanent) BMPs). Specific types of BMPs discussions i.e. sediment basins, silt fences and energy dissipaters should be listed under each of the site specific (land use) sections. See section specific comments below. As it is presented in Section 4 on page 3-10, the BMP list is not really reflected in the separate site specific discussions. For example, rain barrels are discussed on page 3-16 but are not listed on page 3-10.
35	Attachment 3 Environmental Analysis and Checklist	3-11	Section 4-1 Reasonably Foreseeable Methods of Compliance at Specific Sites	Much of this section appears to refer to the Bacteria TMDL for Beaches and Creeks, which is entirely inappropriate and leads one to question the appropriateness of the conclusions reached in sections 4.2 through 4.6 and the specific impact analysis in the Environmental Checklist Section 5.

#	Document	Page(s)	Excerpt/Topic	Comments/Proposed Changes
36	Attachment 3 Environmental Analysis and Checklist	3-12	Section 4.2 BMP's For Construction Sites	This section provides one of the more informative discussions regarding site specific BMPs and their potential impacts. Each of the following sections would benefit from a similar analysis. It should be noted that regardless of land use (commercial, industrial, and residential), construction BMPs on raw land (undeveloped) may be more intensive than that for developed land, which may present additional constraints on types used. This discussion should also note the temporal aspects of many of these BMPs in that they are used only during the construction phase of the development (i.e. silt fences, fiber rolls and temporary detention basis). Whereas the longer term (permanent type BMP's) should be designed to control flow, intensity and volume of runoff. However, discussions of the specific types would logically fit under the specific land use discussed in later sections. This analysis should also discuss that disturbance of the land (grading and brushing) has the potential to result in the greatest direct impacts related to sediment generation in excess of natural background. After construction (discussed in other sections) sediment generation is an indirect impact as a result of increased intensity and volume of runoff.
37	Attachment 3 Environmental Analysis and Checklist	3-13	Section 4.3 Potential BMP's for Residential Areas.	This section incorrectly correlates high density to sediment generation. Sediment generation is mostly the result of land disturbance (discussed above) not the particular land use or density. High density, regardless of specific land use, can be associated with increased imperviousness leading to increase volume, intensity, and duration of runoff. However, many studies actually show that higher densities when coupled with appropriate site design and open space protection actually reduces the overall imperviousness at a watershed level.
38	Attachment 3 Environmental Analysis and Checklist	3-15	Section 4.4 BMP's for Park and Recreation Areas	According to the SANDAG 2000 Land Use data, these two land uses comprised approximately 3.3 percent of the watershed. There is little support that these parks or recreation areas are located in areas that would support the type of BMPs discussed in this section or would be located to effectively reduce sediment or runoff. A more important feature of this watershed is the large percentage of the watershed that was defined as Open (43%). Much of this area will remain as open space as it is designated as part of the MSCP preserve area, which includes most of the 3 major canyons as well as the lagoon and estuary. Construction and other development would be precluded in much of these areas which would limit the type and amount of BMPs that could be utilized.

#	Document	Page(s)	Excerpt/Topic	Comments/Proposed Changes
39	Attachment 3 Environmental Analysis and Checklist	3-16, 3-17	Section 4.5 Potential BMPs for Commercial/Institutional Areas Section 4.6 Potential BMPs for Industrial and Transportation Areas	As stated above for Residential, it is not clear from these discussions why population densities have any direct effect on sediment generation rates. This assumption, if true, should be supported by evidence.
40	Attachment 3 Environmental Analysis and Checklist	3-17	Section 5 Environmental Checklist	Appendix G of CEQA provides a list of 9 factors that should be used when evaluating impacts associated with projects. Of particular concern in this checklist is evaluation factor 9, it is apparent from the list that the Regional Board has not clearly established thresholds in which to measure the level of significance, furthermore there is a lack of connection with many of the mitigations listed with the specific impact identified.
41	Attachment 3 Environmental Analysis and Checklist	Applies to all	Section 5 Environmental Checklist	Page 6 of the Tentative Resolution states "For CEQA purposes, the "project" is both the adoption of a Basin Plan Amendment establishing a TMDL for sediment, in the Lagoon and <u>all</u> (emphasis added) of the implementation activities undertaken by the responsible parties to comply with the TMDL." This appears to conflict with the project descriptions found elsewhere which generally state "Adoption of the Basin Plan Amendment". Furthermore, discussions of BMP's (structural or non-structural) are not specific to type of BMP but rather general in nature and therefore provide little support for conclusions reached in the checklist.

#	Document	Page(s)	Excerpt/Topic	Comments/Proposed Changes
42	Attachment 3 Environmental Analysis and Checklist	Multiple	I. Aesthetics: a), c) II. Agriculture and Forest Resources: a) III. Air Quality: a) through d) IV. Biological Resources: a) through f) V. Cultural Resource: VI. Geology and Soil: b) VII. Greenhouse Gas Emissions: a) VIII. Hazards and Hazardous Material IX. Hydrology and Water Quality: b), e) X. Land Use and Planning XI. Mineral Resources XII. Noise XIII. Population and Housing XIV. Public Services XV. Recreation XVI. Transportation/Traffic XVII. Utilities and Service Systems XVIII. Mandatory Findings of Significance: a)	References and resources used to determine the level of impact should be cited in the discussions and included in a reference section used for the environmental checklist. While references and resources are important for each of the resources listed they are most important for those resources where a determination of "Potentially Significant" or "Less Than Significant with Mitigation" has been made. These references and resources should be used to identify the level of significance and to determine appropriate and feasible mitigation. Furthermore, they should provide the basis for making a determination whether the impact will remain significant after mitigation occurs that would require specific overriding considerations by the approving body. Additionally, even though the SED has identified that mitigation would be the responsibility of others, this does not obviate the requirement for the Checklist to identify the appropriate mitigation necessary to reduce significant impacts to a level of less than significance.

#	Document	Page(s)	Excerpt/Topic	Comments/Proposed Changes
43	Attachment 3 Environmental Analysis and Checklist	3-17	I. Aesthetics: a) c)	These two evaluations identify one reference, the City of San Diego General Plan, to determine that Mira Mesa is a Public Vantage Point for the Los Peñasquitos Canyon. The discussion also identifies LP Lagoon as a scenic resource but there is no specific reference as to why this is included. Are scenic resources in the watershed limited to these two areas? The main purpose of this section should focus on whether or not implementation of the project will have any direct/indirect impact on the identified Aesthetic resources. Aesthetic impacts from the project itself should be considered in section c). The two mitigation measures that are referenced in this section, screening and undergrounding, do not appear to be feasible when considering the list of Potential Compliance Methods listed in Section 4. Mitigation provided should have the ability to mitigate impacts associated with these types of compliance methods. Finally, consideration should be given to existing protections that would preclude the placing of structural BMPs within existing aesthetic resource areas. Staff should review these existing protections: the City of San Diego General Plan and MSCP and include specific discussion how these could reduce impacts.
44	Attachment 3 Environmental Analysis and Checklist	3-17	I. Aesthetics: b)	There are four state highways that occur in the project area, Interstate 5, Interstate 805, Interstate 15 and State Route 56. Please reference the resources used to determine that these four highways are not considered "scenic".
45	Attachment 3 Environmental Analysis and Checklist	3-19	II. Agricultural And Forest Resources a) through e)	The Checklist includes specific references that could be used to determine whether the project will have an impact on these resources. It does not appear that any of these resources were utilized to assess the level of impact.
46	Attachment 3 Environmental Analysis and Checklist	3-20	III. Air Quality	The level of impact should not be determined simply because the SDAPCP states the County of San Diego is not compliant. There needs to be additional determination as to whether impacts associated with implementing BMP's structural and non-structural will conflict or obstruct implementation of the plan. What is the connection between non structural BMPs and increased traffic? Would this traffic be in addition to planned traffic levels within the watershed? Would implementation of structural BMPs or other types of BMPs have a similar affect on traffic?
47	Attachment 3 Environmental Analysis and Checklist	3-21	III. Air Quality b), c), d)	Please cite specific reasons why these are considered as potentially significant. Also, if these are potentially significant, what mechanisms does the SDAPCP require to reduce the impacts to acceptable levels?

#	Document	Page(s)	Excerpt/Topic	Comments/Proposed Changes
48	Attachment 3 Environmental Analysis and Checklist	3-22	IV. Biological Resources	Please cite the references used to determine the presence of habitat for and/or presence of Special Status Species found in the watershed. What thresholds were used to determine level of significance of the actions proposed? This section seems to shift focus from BMP impact analysis to the Basin Plan Amendment. Specific impacts to resources would occur at the BMP implementation portion of the project versus the Basin Plan Amendment portion. Discussions should be modified to reflect that the Water Board has considered the whole of the action involved in the project.
49	Attachment 3 Environmental Analysis and Checklist	3-22	IV. Biological Resources	a) The finding is that the project impact is potentially significant; however, the discussion indicates that all of the local, state, and federal agencies involved with species and habitat protection would need to review and approve (or deny) any project that could impact sensitive species. In all cases, projects would be denied if impacts remained significant after mitigation. Discussion should list potential mitigation required from these agencies and should include a discussion of the local MSCP. This program provides "take" authorization for the 85 species covered by the program.
50	Attachment 3 Environmental Analysis and Checklist	3-22	IV. Biological Resources	The discussion under Biological Resources states that the Regional Board would have authority to review and approve any project that impacts waters of the state including habitat and species associated with these projects. Therefore, since the Regional Board has this regulatory authority, specific mitigation required by the Regional Board should be identified here. Furthermore, there needs to be a clear finding regarding the level of impact after implementation of these mitigation measures.
51	Attachment 3 Environmental Analysis and Checklist	3-22	IV. Biological Resources	e) No level of significance is identified.
52	Attachment 3 Environmental Analysis and Checklist	3-22	IV. Biological Resources	f) This section has two impact levels listed. In the discussion on page 3-25, the Regional Board "asserts" that agencies listed would require effective mitigation as appropriate. If this is the case, the Regional Board should identify the specific mitigation that would reduce impacts. Also, if this is a factual conclusion, it would appear that the finding should be "Less than significant with mitigation".

#	Document	Page(s)	Excerpt/Topic	Comments/Proposed Changes
53	Attachment 3 Environmental Analysis and Checklist	3-25	V. Cultural Resources	This section indicates that there is a "less than significant impact" to all cultural, historical and/or paleontological resources in the watershed as a result of this project. However, it also states that each of these resources are reasonably expected to occur in the watershed and that earth moving may, in fact, impact each of these resources. Neither the EA nor the Checklist provides adequate information upon which to make this finding. Any impact to these resources would require mitigation either through complete avoidance, grading monitoring, data recovery, and/or curation.
54	Attachment 3 Environmental Analysis and Checklist	3-26	VI. Geology and Soils b), c)	It is not clear what resources were used to make the determination regarding the level of significance related to these resources. Were highly erosive soils or unstable geologic units or soils identified in the watershed?
55	Attachment 3 Environmental Analysis and Checklist	3-29	VII. Greenhouse Gas Emissions a)	Staff should review pertinent sections of CEQA to determine the appropriate level of impact and potential mitigation for Greenhouse Gas Emissions as a result of the project. Specific sections of CEQA that provide guidance are: § 21083.05, § 21097, § 21155, §15064(h)(3), §15064.4, §15125(d), §15126.4(c), §15130 (B)(d), §15150 (e)(4), §15183(g)(8), §15183.5, §15364.5
56	Attachment 3 Environmental Analysis and Checklist	3-30	VIII. Hazards and Hazardous Materials e), f)	While the statement that there are no airports (public or private) within the watershed is accurate, it should be noted that the watershed is in the Airport influence zone of the Miramar Military Airport. It should also be noted that there are several private heliports in the watershed.
57	Attachment 3 Environmental Analysis and Checklist	3-34	X. Land Use Planning	This section seems to focus on the Basin Plan amendment, which does not include all of the subsequent implementation actions. Staff should analyze the different compliance measures and determine the level of impact. There are at least 3 cities and the County of San Diego that have General Plans, Zoning Ordinances, regulations and Habitat Conservation Plans that should be referenced when making the determinations in this section.
58	Attachment 3 Environmental Analysis and Checklist	3-35	XI. Mineral Resources	No references are cited. Are there any known valuable mineral resources in the watershed? What effect would implementation of this TMDL have on the ability to mine those resources? The land use in the watershed includes the mining of sand and rock. At a minimum, this section should recognize that the use exists and that the sediment TMDL might have an impact on these operations.

#	Document	Page(s)	Excerpt/Topic	Comments/Proposed Changes
59	Attachment 3 Environmental Analysis and Checklist	3-35	XII. Noise	As noted above, there is no discussion regarding resources used to determine the level of significance. Furthermore, if there are regulations and other mitigation available for impacts considered to be significant, they should be listed, regardless of whether another agency has the responsibility to implement.
60	Attachment 3 Environmental Analysis and Checklist	3-37	XIII. Population and Housing	The discussion for b) and c) should be expanded to explain why some housing may need to be displaced to install BMPs and why this would not result in displacement of a substantial number of people or create the need for replacement housing.
61	Attachment 3 Environmental Analysis and Checklist	3-39	XVI. Transportation/Traffic	a) Should reevaluate what the question is asking. b) Reference included is the county congestion management agency, who exactly are you referring to? d) Would the project substantially increase the number of large slow construction vehicles on local streets?
62	Attachment 3 Environmental Analysis and Checklist	3-40	XVII. Utilities and Service Systems	As stated in many of the previous sections, if these impacts are considered significant, specific mitigation needs to be listed that addresses the impact regardless of the agency responsible for carrying out the mitigation.
63	Attachment 3 Environmental Analysis and Checklist	3-41	XVIII. Mandatory Findings of Significance	a) The discussion in this section is not consistent with the finding of "Potentially Significant". This section should not be treated lightly as it is the basis for determining whether or not an EIR, Mitigated ND, or ND would be required. Based on these findings, it should be expected that the SED would provide the review and analysis that would normally be found in an EIR, including resource specific technical reports to identify resources and to detail the impacts and to provide specific mitigation for any significant direct and indirect impacts.
64	Attachment 3 Environmental Analysis and Checklist	3-41	XVIII. Mandatory Findings of Significance	b) The discussion is not consistent with the finding of "less than significant impact". There has not been any Cumulative Impact Analysis for any of the affected resources listed in the Checklist. CEQA §15130 discusses the components of an adequate Cumulative Review. The SED should be revised to include such a discussion.

#	Document	Page(s)	Excerpt/Topic	Comments/Proposed Changes
65	Attachment 3 Environmental Analysis and Checklist	3-42	Section 6 Economic Factors	The section appears to contradict the responsibility of the Regional Board to prepare an economic analysis of its actions. The citations provided include Water Code §13241 and §13141 it is not clear that either of these sections of the water code apply to the whole of this project. However, CEQA §15124(c) requires the project description to include a general description of the project's technical, economic, and environmental characteristics. Other sections of CEQA that may apply include §15131 Economic and Social Effects, which provides guidance on what this may include. §15187 (d) The environmental analysis shall take into account a reasonable range of environmental, economic, and technical factors, population and geographic areas, and specific sites.
66	Attachment 3 Environmental Analysis and Checklist	3-44	Section 6.2 TMDL Implementation Costs	Sections references bacteria reduction. Section should be revised as appropriate to evaluate sediment/runoff reduction.
67	Attachment 3 Environmental Analysis and Checklist	3-44	Section 6.3 Cost Estimates of Typical Controls for Urban Runoff Discharges	Discussions are mostly limited to initial costs for construction of a typical BMP. Other cost factors that should be considered would be the overall cost, the cost of acquiring land, environmental review required for specific projects, the cost involved with the operation and maintenance of BMPs, and staffing required for the 10-20 year life of the TMDL.
68	Attachment 3 Environmental Analysis and Checklist	3-45	Stream and Lagoon Restoration	Delete discussions regarding the Wind River. It would be more appropriate to discuss projects that have occurred in Southern California.
69	Attachment 3 Environmental Analysis and Checklist	3-46	Sand Filters	Delete discussion. Sand Filters would not be considered as a reasonable or feasible BMP for the removal, reduction or treatment of sediment.
70	Attachment 3 Environmental Analysis and Checklist	3-47	Section 7 Reasonable Alternatives to the Proposed Activities	Introductory paragraph cites the Bacteria TMDL. Revise as necessary for Sediment.

#	Document	Page(s)	Excerpt/Topic	Comments/Proposed Changes
71	Attachment 3 Environmental Analysis and Checklist	3-47	Section 7 Reasonable Alternatives to the Proposed Activities	CEQA §21002 states that public agencies should not approve projects as proposed if there are feasible alternatives or feasible mitigation measures available which would substantially lessen the significant environmental effects of such projects, and that the procedures required by this division are intended to assist public agencies in systematically identifying both the significant effects of proposed projects and the feasible alternatives or feasible mitigation measures which will avoid or substantially lessen such significant effects. The project description should be the factual basis for determining a reasonable range of alternatives. Feasible alternatives should at least meet some of the goals and objects of the project and or reduce some or all of the significant impacts associated with the projects. Section 7.4 of the EA states "the previous three alternatives … are not expected to attain the basic objective of the project". This statement attests to the lack of a reasonable range of alternatives.
72	Attachment 3 Environmental Analysis and Checklist	3-49	Section 8.1 Statement of Overriding Considerations	CEQA §15093 requires the decision-making agency to balance, as applicable, the economic, legal, social, technological, or other benefits, including region-wide or statewide environmental benefits, of a proposed project against its unavoidable environmental risks when determining whether to approve the project. If the specific economic, legal, social, technological, or other benefits, including region-wide or statewide environmental benefits, of a proposed project outweigh the unavoidable adverse environmental effects, the adverse environmental effects may be considered "acceptable." The EA should identify the specific impacts that cannot be mitigated or that will remain significant after mitigation. For each of these, there should be a statement that identifies the economic, legal social… benefits that outweigh the unavoidable environmental risks.

#	Document	Page(s)	Excerpt/Topic	Comments/Proposed Changes
73	Attachment 3 Environmental Analysis and Checklist	3-51	Section 8.2 Findings	CEQA §15091 requires findings for each significant impact. According to the Checklist, there are significant impacts to 8 Resources (several of which have multiple findings of significance). Section 8.2 only covers 5. These findings must be based on substantial evidence in the record. Since there are relatively few resources provided upon which to substantiate the conclusions reached in the Checklist, it cannot be shown that findings were based on substantial evidence in the record. Findings that such changes or alterations are within the responsibility and jurisdiction of another public agency and not the agency making the finding are not adequate. The EA does not provide any discussion of what mitigation is available or could be implemented by that agency; therefore, these conclusions are not supported by evidence in the record. Since there is a Statement of Overriding Consideration provided in Section 8.1, findings pursuant to 15091(a)(c) need to be included here.

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May 23, 2011

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ATTN: Cathryn Henning

The California Department of Transportation (Caltrans) appreciates the opportunity to comment on the proposed amendment to the Water Quality Control Plan for the San Diego Region (Basin Plan) to incorporate a Total Maximum Daily Load (TMDL) for Sediment in the Los Peñasquitos Lagoon. Caltrans supports the Regional Board's efforts to protect human health and achieve the highest standard of water quality possible. The Caltrans statewide National Pollutant Discharge Elimination System (NPDES) permit is currently going through the process of being renewed (Tentative Order No. 2011-XX-DWQ; NPDES No. CAS000003). The Tentative Order and the State Construction General Permit (CGP) are the mechanisms for Caltrans to implement consistent sediment controls statewide. Caltrans has a stringent program in place to control sediment and to comply with the permit requirements. Caltrans has reviewed the TMDL and Basin Plan Amendment (BPA) and has concerns in the following areas.

1. ***TMDL Project Objective and Waterbody Goal***

Beginning on page A-2 of the TMDL Resolution, three steps are described that are envisioned by the Regional Board to completely restore the Los Peñasquitos Lagoon. The TMDL documents released by the Regional Board focus on Step 1 of the waterbody goal for restoring the Los Peñasquitos Lagoon. This step is to attain the water quality objective for sediment in the Lagoon and the analysis included in this TMDL focuses on the impacts of sediment loads.

The current version of the TMDL requires the responsible parties to develop and submit either a Sediment Load Reduction Plan (SLRP) for sediment or a Comprehensive Load Reductions Plan (CLRP) for all pollutants causing impairment to the Lagoon. The plan must be submitted within 18 months of the effective date of the TMDL. The TMDL does not include the necessary analysis to understand the impacts of the other pollutants of concern that would play a critical role in the development of the CLRP. These include the evaluation of sources and the linkage analysis to evaluate how the discharges from these sources impact the water body.

Without these elements, the development of the CLRP to ensure the final goals of attainment of all water quality objectives, protection of beneficial uses, and restoration of the Lagoon to a functional healthy estuarine ecosystem may be difficult. All requirements in the TMDL under the SLRP option should specifically address sediment, as this is the only pollutant that the Regional Board has evaluated for this TMDL. If the necessary analyses are made available to understand the impacts of the other pollutants of concern, then these elements could be incorporated into a comprehensive plan at that time.

Caltrans requests that the TMDL allow stakeholders the option to submit an SLRP to meet the initial TMDL deadlines, and, if the necessary analyses are made available to understand the impacts of the other pollutants of concern, then the responsible parties should be allowed the option to transition from the SLRP to a CLRP.

2. ***Individual or Group Compliance***

The TMDL Resolution places collective responsibility for compliance with the TMDL on all of the named responsible parties. The TMDL also requires the Phase I MS4 owners and Caltrans to "jointly prepare and submit" the SLRP or CLRP to the Regional Board (page A-10). Caltrans impervious facilities in the watershed account for less than one percent of the total watershed area.

Caltrans specifically requests that the Resolution allow Caltrans the option to act individually to comply with the TMDL and develop and submit TMDL deliverables or to act collectively with the other stormwater permittees.

3. ***Required Lagoon Monitoring and Restoration***

The TMDL Resolution requires that the named responsible parties conduct Lagoon monitoring. Lagoon monitoring is beyond the scope of the TMDL. During the meeting that was held on February 3, 2010, Regional Board staff informed the responsible parties that this would not be a requirement of the TMDL. Page A-18 of Attachment A to the TMDL resolution states "The specific purpose of the Lagoon monitoring results will be to serve as a "trigger" to indicate the need for, and timing of, further follow-up regulatory actions by the San Diego Water Board and further restorative actions by the responsible parties." This statement as well as this section implies that any monitoring conducted would determine the need for additional requirements outside the scope of this sediment TMDL. All requirements in this TMDL under the SLRP option should specifically address sediment, since the necessary analyses have not been performed to understand the impacts of other pollutants of concern. Any restorative actions outside of this TMDL would require separate analyses and compliance and should be clearly described in the TMDL Resolution.

Caltrans requests that the TMDL requirement for Lagoon monitoring be removed. In addition, Caltrans requests that the TMDL language include a clear description of any actions that would be required as a result of either the SLRP or CLRP monitoring approach. Any actions taken should also include a clear and quantifiable link toward compliance with the waste load allocations (WLAs).

4. ***Comparison of Historic Conditions***

Page A-11 of Attachment A to the TMDL resolution requires that the responsible parties include in the SLRP "Data sufficient to complete the side-by-side comparison of historic conditions (early 1970s) and current conditions (2000-current) to inform the lines of evidence necessary to determine compliance." Due to the limited information available about conditions in the early 1970s, any comparison to historic conditions would likely need to be performed using the watershed and lake models developed for this TMDL. However, we have serious concerns with the accuracy of the model:

a) The deposition and resuspension from bed sediments does not appear to have been evaluated by the model. This limits the ability to evaluate and account for the interaction

between watershed-associated sediments and salt-pan silts in the Lagoon.

b) The modeled volumes and flows were higher in general than those observed in the watershed (as shown in Table 14 and Figure 30 of the modeling report). This concern was corroborated by Dr. Kirk Barrett in his peer review comments (comment no. 9 from Peer Review Comments and Responses, dated April 22, 2011).

c) The average difference between the modeled and measured event mean concentrations (EMCs) are significant. These are reported for CC, LPC, and CCC, to be 83%, 51%, and 65%, respectively. In addition, the modeled event mean concentrations (with the exception of one) that are shown in figure 36 of the modeling report are higher than observed concentrations. Our concern was also corroborated by Dr. Kirk Barrett (comment no. 10 from Peer Review Comments and Responses, dated April 22, 2011).

In addition, Dr. Rockwell Geyer expressed significant concerns with the model results and the exclusion of important data from the TMDL documents in the peer review comment letter. The commenter notes that "the TMDL that comes out of this study should be viewed as provisional, and it should be revised as the data allows a more accurate assessment of the actual loading rate and its impact on the receiving waters" (from Peer Review Comments and Responses, dated April 22, 2011). This statement causes serious concern, and additional evaluation of the model is necessary. The Regional Board staff often cites limited time as the reason that additional verification for model and TMDL WLA assumptions was not included in the TMDL documents. This is not a satisfactory response, as it is critical to the responsible parties that the TMDL be as accurate as possible. Otherwise funds could be spent on actions that may not be effective or could even be counterproductive. Although Caltrans supports the incorporation of an adaptive management approach into the TMDL, this does not provide a satisfactory response to address our concerns.

The WLAs are based on the model sediment load estimates for 1972. However, the watershed model hydrology was calibrated for 1993 to 2008. There is a twenty year gap between the period that the model was calibrated for and the period for which the WLAs were estimated. There is no validation described in the TMDL modeling report that proves that the model load estimates are accurate for 1972.

Caltrans requests that, if the model is to be used to estimate the WLAs or required to perform the side-by-side comparison, the model should undergo a full review and these concerns must be addressed. Additional support should then be provided to demonstrate the accuracy of the model. Alternatively, the Regional Board could consider development of other methods to be used by the responsible parties.

5. ***Scheduled Continuous Budget and Funding Efforts***

Part D of the SLRP Requirements in Attachment A to the TMDL Resolution requires that the responsible parties secure "budget and funding for BMP staffing and equipment" early and until the sediment TMDL is met (page A-11). Furthermore, it states that "the SLRP should include a schedule for staff time, including position and job description, authorized for securing funding for non-structural BMP implementation and maintenance. " Due to the current California state budget deficit, Caltrans is facing a lack of resources to address the TMDL outside of the funding allocated to applicable highway projects, and Caltrans does not have the authority to impose user or utility fees to pay for the TMDL implementation.

Caltrans requests that this requirement be removed from the TMDL and that language be added to allow for flexibility in implementation during times of funding challenges.

6. ***Implement Load Reduction Plan***

The TMDL Resolution requires that the SLRP or CLRP "must be implemented immediately upon receipt of Water Board comments and recommendation, but in any event, no later than 60 days after submittal to the San Diego Water Board". The responsible parties to the TMDL would likely need time to adjust to any significant comments or recommendations from the Regional Board. This requirement does not allow any time for this.

Caltrans requests revising to allow the responsible parties to have 90 days after the receipt of comments and recommendations from the Regional Board to implement the plan.

7. ***Special Study***

Page A-19 of Attachment A to the TMDL resolution, states

> "Because sediment is not the only stressor to Lagoon health, and this TMDL is likely only a first step toward achieving the Three-Step Waterbody Goal, the responsible parties are required to quantify the magnitude and extent of impacts caused by all stressors to Lagoon health."

In addition, Attachment A states

> "The study should be developed in coordination with other monitoring programs. Any monitoring program developed as part of this study must include the same elements identified in Compliance Monitoring."

This special study requirement requires monitoring of all stressors (water quality objectives) on the Lagoon. The SLRP option in the TMDL should only require assessment of the impacts to the Lagoon due to sediment, not all water quality objectives.

Caltrans requests that the requirement to evaluate the impacts to the Lagoon of other pollutants be removed from this TMDL.

We hope these comments are helpful. If you have any questions or concerns, please contact Keith Jones at (916) 653-4947.

Joyce Brenner for Scott McGowen

G. Scott McGowen
Chief Environmental Engineer
Division of Environmental Analysis

c: Joyce Brenner, Keith Jones
Department of Transportation Headquarters Division of Environmental Analysis

Constantine Kontaxis , Department of Transportation, District 11

Commenter ID 6

May 23, 2011

Ms. Cathryn Henning
California Regional Water Quality Control Board
San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

RE: Basin Plan Amendment to Incorporate Sediment Total Maximum Daily Load for Los Peñasquitos Lagoon

Dear Ms. Henning,

Thank you for the opportunity to comment on the Draft Staff Report (March 3, 2011) regarding the Basin Plan Amendment to Incorporate Sediment Total Maximum Daily Load (TMDL) for Los Peñasquitos Lagoon. California State Parks (CSP) is the owner of most of the estuary as part of Torrey Pines State Natural Reserve (Reserve). CSP appreciates the work the Stakeholder Group and Regional Water Quality Control Board (Board) has expended in producing the TMDL and associated processes. Reducing the effects of hydromodification and associated sedimentation within and above the Los Peñasquitos estuary is a complex task. To date the TMDL's greatest accomplishment is that it has given the various stakeholders a process to begin making improvements to the estuary. CSP is anxious to further develop this partnership by implementing projects to improve the health and sustainability of the Los Peñasquitos estuary.

Several items within the Staff Report (and Technical Report) need to be corrected or further developed: misleading or unclear statements regarding losses to riparian habitat, clarification regarding the definitions of impaired and unimpaired with the respect to historical changes in vegetation communities, and a lack of specificity regarding monitoring parameters.

Throughout the document (for example, page 1, pp. 4; page 8, pp. 4; page 17, pp. 1; page 18, pp.1) there are references to "losses of riparian habitat" or "unimpaired" freshwater habitats. While there is much evidence showing losses to tidal and alkali habitats there is little evidence of losses to riparian or other freshwater habitats. Prior to urbanization of the watershed (circa 1972) there was very little freshwater or riparian vegetation within the Los Penasquitos estuary. Since then, much of the area that formerly supported saltmarsh, saltflat, and alkali marsh has been converted to freshwater habitats. These habitats support dense native vegetation and when compared to non-estuarine riparian systems and do not appear to be impaired. They are, however, a symptom of the impairment or destruction of the tidal and alkali habitats that preceded them. The tidal and alkali systems are rarer and of higher value in southern California than freshwater riparian wetlands and are a priority for habitat restoration within the estuary.

CSP support's the historic analysis approach to the sediment load modeling and the TMDL development, and is looking forward to the efforts to reduce the sediment deposition within the estuary to pre-urbanization levels. An important element of this effort is to monitor the reduction in sediment loads and to objectively assess the effects upon the estuarine habitats. This assessment should focus on measuring the accumulation of sediments within wetland habitats (particularly vegetated habitats, saltflat and mudflat), measuring the changes in the spatial extent of habitats, and measuring their species composition. The amount and velocity of freshwater flows (and potentially soil salinity) should also be carefully monitored to provide a control for the relative contribution of freshwater flows when sediment control measures are implemented.

The Los Peñasquitos Lagoon Foundation, State Coastal Conservancy, the Southwest Wetlands Interpretive Association, and CSP are currently working on an enhancement plan for the Los Peñasquitos estuary. Part of this process will include monitoring important environmental parameters including detailed habitat and sensitive species maps, and vegetation sampling). Additionally, this plan will develop a framework for enhancement projects to repair the estuary. This is an opportunity for the Stakeholders, Board, CSP, and others to consolidate a partnership to share resources and expertise to begin effecting large-scale improvement on the function and sustainability of the Los Peñasquitos estuary.

Thank you for the opportunity to comment on the *TMDL* Documents. Please feel free to contact Darren Smith (619-952-3895) for further discussion of our concerns.

Sincerely,

Darren Scott Smith, Natural Resources Program Manager, San Diego Coast District

Cc Clay Phillips, Acting San Diego Coast District Superintendent
William Mennell, District Specialist Manager
Brian Ketterer, North Sector Superintendent
Reading File

City of Del Mar

May 23, 2011
Via e-mail

Ms. Cathryn Henning, Water Resource Control Engineer
California Regional Water Quality Control Board
San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

City of Del Mar Comments on Tentative Resolution No. R9-2011-0021, to Amend the Water Quality Control Plan for the San Diego Basin (9) to Incorporate the Total Maximum Daily Load for Sedimentation in Los Peñasquitos Lagoon

Dear Ms. Henning:

The City of Del Mar (City) appreciates the opportunity to provide comments on the Tentative Resolution No. R9-2011-0021 (Resolution) to amend the San Diego Basin Plan to incorporate the Total Maximum Daily Loads (TMDL) for Sedimentation in Los Peñasquitos Lagoon (Lagoon) being considered by the San Diego Regional Water Quality Control Board (Regional Board) on June 8, 2011. The City understands the importance of this TMDL, and is especially cognizant of the importance of water quality protections.

The City has participated in the two-year collaborative third party effort to develop the TMDL. At the request of the Regional Board, the City of San Diego led and funded the effort, with input from other Responsible Parties, and guidance from the Regional Board, US Environmental Protection Agency, and other stakeholders. The Responsible Parties (City of San Diego, County of San Diego, City of Poway, Caltrans, and the City of Del Mar) dedicated staff time to the development of the TMDL by preparing and reviewing documents and attending frequent meetings. However, the City has specific concerns about approaches taken in the proposed TMDL. As such, the City is submitting the following comments for consideration by the Regional Board and its staff. The strikethrough text represents recommended deletions and the underline text represents recommended additions.

1) The Los Peñasquitos Lagoon is designated as an impaired water body for sedimentation pursuant to Clean Water Act section 303(d); however, the Lagoon is not listed for any other pollutants at this time (303(d) list dated 1/27/2010). The objective of this TMDL is to attain the sediment water quality objective in the Los Peñasquitos Lagoon, not all of the potential pollutants and issues of the lagoon. The City believes that the "Restoring Los Peñasquitos Lagoon: Three Step Waterbody Goal" approach presented in this TMDL, goes beyond the scope of this sedimentation TMDL for the lagoon. For example, it is stated on page A-2 of the TMDL "Although a return to pristine conditions is not expected, a holistic watershed restoration effort is expected to eventually result in the attainment of all applicable water quality standards in Los Peñasquitos Lagoon as well as in each of its three tributary creeks". Furthermore, Step 3 Final Goal of this TMDL is to attain all water quality objectives and protect all beneficial uses – restore lagoon to functional healthy estuarine ecosystem.

While the City agrees that attaining water quality objectives and protection of all beneficial uses is of great importance, the Sedimentation TMDL is not the appropriate mechanism to address all beneficial uses in the Lagoon.

Therefore, the City recommends that the language on page 5 of the Resolution Item 16 be revised to state the following:

16. TMDL Project Objective~~ and Waterbody Goal:~~ *The objective of this TMDL project is to attain the sediment water quality objective in the Los Peñasquitos Lagoon.* ~~*This is considered an essential first step towards achievement of the ultimate waterbody goal. The final goal for the Los Peñasquitos Lagoon is full attainment of all water quality objectives, protection of all beneficial uses, and restoration to a functional healthy estuarine ecosystem.*~~

The City also recommends the following language changes on page A-2 of the Resolution:

Restoring Los Peñasquitos Lagoon~~: Three Step Waterbody Goal~~

Los Peñasquitos Lagoon is one of the few remaining and irreplaceable coastal lagoons in Southern California providing valuable estuarine habitat as well as numerous other important beneficial uses. Over the course of the 20th century, the lagoon has incurred a number of important anthropogenic disturbances which, cumulatively, have resulted in excessive sedimentation and the gradual degradation and loss of estuarine habitat.

Restoration of the Lagoon is a high priority for the San Diego Water Board. Acknowledging the environmental and political complexities, as well as the time and financial resources needed to restore a coastal lagoon, the San Diego Water Board has established this Sediment TMDL for the Los Peñasquitos Lagoon as the first step in addressing the impairment and beneficial uses of the lagoon. The overall strategy is to reduce the current watershed sediment load to early 1970s watershed sediment load and determine if there is a response to the salt marsh habitat of the Lagoon. ~~*a three-step Waterbody Goal for Los Peñasquitos Lagoon. Although a return to pristine conditions is not expected, a holistic watershed restoration effort is expected to eventually result in the attainment of all applicable water quality standards in Los Peñasquitos Lagoon as well as in each of its three tributary creeks.*~~ ~~***Accordingly, the Sediment TMDL for Los Peñasquitos Lagoon, see section {insert section #}, addresses Step 1, Intermediate-term Goal.***~~

~~***Step 1 Intermediate Goal:***~~

~~***Attain water quality objective for sediment in Los Peñasquitos Lagoon and address current Clean Water Act section 303(d) sediment impairment***~~

~~Overall Strategy~~

~~Reduce current watershed sediment load to early 1970s watershed sediment load.~~

~~Initiate long-term Lagoon monitoring to assess Lagoon's response to decreasing sediment loads and overall health.~~

~~Regulatory Action~~

~~Adopt and implement sediment TMDL~~

~~***Step 2 Long-term Goal***~~

~~***Stop degradation and loss of Los Peñasquitos Lagoon's salt marsh habitat. Restore to condition of early 1970s salt marsh in terms of extent and quality.***~~

~~Overall Strategy~~
~~To monitor, assess, and implement appropriate regulatory mechanism.~~
~~Regulatory Action~~
~~To be determined based on results of Lagoon monitoring.~~

~~***Step 3 Final Goal:***~~
~~***Attain all water quality objectives and protect all beneficial uses. Restore Lagoon to functional healthy estuarine ecosystem.***~~
~~Overall Strategy~~
~~To monitor, assess, and implement appropriate regulatory mechanism.~~
~~Regulatory Action~~
~~To be determined based on results of Lagoon monitoring.~~

~~**Step 1:**~~ **Sediment Total Maximum Daily Load for Los Peñasquitos Lagoon**

2) Required Lagoon Monitoring and Required Special Study on Lagoon Stressors
   a. The City does not believe the lagoon monitoring and special studies should be requirements in this Resolution. These would be more appropriately addressed by the Responsible Parties in the Load Reduction Plan.

   b. The Adaptive Management Schedule has inappropriate timing and should not be included. As stated on page A-18 of the TMDL, "The Long-Term Lagoon monitoring is required to measure and assess the Lagoon's response to the sediment load reductions required under this TMDL over time. The specific purpose of the Lagoon monitoring results will be to serve as a 'trigger' to indicate the need for, and timing of, further follow-up regulatory actions by the San Diego Water Board and further restorative actions by the responsible parties".

      The Adaptive Management Schedule included for this special study has prescribed management decisions triggered as a result of the Special Studies on Lagoon Stressors within a six-year timeframe. If the TMDL has a Comprehensive Load Reduction Plan, the responsible parties are required to meet a 20% reduction within five-years. However, Waterbody Goals 2 and 3 have the potential to be required as a result of the Special Study within six years. The timeline does not provide the responsible parties the opportunity to meet the TMDL compliance timelines prior to significant activities being required by the TMDL.

      The City requests that the Required Special Studies and Adaptive Management Schedule included on pages A-18 and A-19 of this TMDL be removed, and the following language be inserted on page A-10 under "Develop and Submit a Load Reduction Plan" after the second paragraph:

      "The responsible parties need to develop special studies including a monitoring program to measure and assess the Lagoon's response to the sediment load reductions over time as part of their Load Reduction Plans."

3) The City also requests that the following language from Resolution No. R9-2010-0001 (Bacteria TMDL) be added to this TMDL on page A-9 after the third full paragraph under the "Responsible Parties Identification" heading:
"The municipal MS4s may demonstrate that their discharges are not causing the exceedances in lagoon by providing data from their discharge points to the lagoon, by providing data collected at jurisdictional boundaries, and/or by using other methods accepted by the San Diego Water Board".

4) Additionally, the City requests that the following language similar to Resolution No. R9-2010-0001 (Bacteria TMDL) be included in this TMDL on page A-17 in the Adaptive Management Section:
"As the implementation of these TMDLs progress, the San Diego Water Board recognized that revisions to the Basin Plan may be necessary in the future. The San Diego Water Board will initiate a Basin Plan amendment project to revise the requirements and/or provisions for implementing these TMDLs within 8 years from the effective date of this Basin Plan amendment or earlier if all of the following conditions are met:
   - *Sufficient data are collected to provide the basis for the Basin Plan amendment.*
   - *A report is submitted to the San Diego Water Board documenting the findings from the collected data*
   - *A request is submitted to the San Diego Water Board with specific revisions proposed to the Basin Plan, and the documentation supporting such revisions.*

   The San Diego Water Board will work with project proponents to ensure that the data and documentation will be adequate for the initiation of the Basin Plan amendment. The San Diego Water Board will be responsible for taking the Basin Plan amendment project through the administrative and regulatory process for adoption by the San Diego Water Board, and approval by the State Water Board, OAL, and USEPA.

   If no Basin Plan amendment has been initiated within 8 years of the effective date of this TMDL Basin Plan Amendment, and the Executive Officer determines, with Regional Board concurrence, that insufficient data exist to support the initiation of a Basin Plan amendment, a subsequent Basin Plan amendment to revise the requirements and/or provisions for the implementation of these TMDLs, will not be initiated until the Executive Officer determines the conditions specified above are met."

5) SLRP and CLRP Requirements – The City requests that the requirements are revised to match the language in Resolution No. R9-2010-0001, Bacteria TMDL. The Bacteria TMDL lists recommended SLRP and CLRP components rather than explicitly requiring them. This requested change is important for consistency amongst potential CLRP documents. Additionally, Load Reduction Plan requirements call for scheduled Best Management Plan (BMP) implementation with a construction schedule, adjustments to staff scheduling and resources. As a governmental agency, our resources and staffing are based upon City Council approval. Only tentative schedules can be developed for such long-term plans as the CLRP.

The City recommends the following changes to the SLRP and CLRP requirements:

a. Page A-10:
SLRP Recommended Components ~~Requirements~~
The SLRP ~~shall~~ should contain~~, at a minimum~~ the following components:

b. Page A-12:
CLRP Recommended Components ~~Requirements~~
The CLRP should ~~shall~~ contain~~, at a minimum,~~ the following components:

6) The City requests the following changes be made to the TMDL:

a. Page A-13, under the "Implement Load Reduction Plan" heading:
"The SLRP or CLRP must be implemented immediately upon receipt of Water Board ~~comments and recommendation~~ comments, recommendation and supporting justification for any recommended program/activity changes, but in any event, no later than 60 days after submittal to the San Diego Water Board".

b. Page A-15 under the "Weight of Evidence Approach" heading:
"Each line of evidence must establish the early 1970s or equivalent condition derived as applicable and the existing condition in the SLRP and CLRP, such that progress can be quantified as a percent. In addition, all lines of evidence must be weighted".

c. Page 5 – Item 15:
"Final compliance with this TMDL must be achieved, as soon as possible, but no later than ten years if the SLRP is chosen or 20 years if the CLRP is chosen from the effective date of the Basin Plan Amendment".

7) The City requests that Section 4.1, Reasonably Foreseeable Methods of Compliance at Specific Sites, of Attachment 3, Environmental Analysis and Checklist, be revised. This section is addressing bacteria rather than sediment.

If you should have any questions regarding these comments please contact me directly at (619) 994-7074, or by email at cleanwater@delmar.ca.us.

Sincerely,

Mikhail Ogawa
Clean Water Manager
City of Del Mar

KB:MO

0 Attachment(s)
cc:
File

CITY OF POWAY

DON HIGGINSON, Mayor
JIM CUNNINGHAM, Deputy Mayor
MERRILEE BOYACK, Councilmember
DAVE GROSCH, Councilmember
JOHN MULLIN, Councilmember

May 23, 2011

Electronic Delivery to: chenning@waterboards.ca.gov

Cathryn Henning, Water Resource Control Engineer
California Regional Water Quality Control Board
San Diego Region
9174 Sky Park Court, Suite 100
San Diego, California 92123

Subject: Comments on Tentative Resolution No. R9-2011-0021, to Amend the Water Quality Control Plan for the San Diego Basin (9) to Incorporate the Total Maximum Daily Load for Sedimentation in Los Peñasquitos Lagoon

Dear Ms. Henning:

The City of Poway would like to thank the San Diego Regional Water Quality Control Board (Regional Board) for the opportunity to comment on the Tentative Resolution No. R9-2011-0021 (Resolution) to amend the San Diego Basin Plan to incorporate the Total Maximum Daily Load (TMDL) for Sedimentation in Los Peñasquitos Lagoon (Lagoon).

During the past two years, the City of Poway has been an active participant in the third party development of the TMDL. The City and Responsible Parties spent countless hours working closely with the Regional Board and other stakeholders to develop this TMDL. Numerous options and various perspectives were discussed by all parties regarding the development of the TMDL. It was a collaborative effort up until the tentative resolution was released to the Public for review. Significant changes were observed and directives to measure and address additional items other than sediment loading have been made. The Regional Board gave direction to the City of Poway and other Responsible Parties to concentrate on sediment and not surrogate measures in the Lagoon.

The City of Poway is concerned that the directive goes above and beyond a sedimentation TMDL. In addition to addressing sedimentation, the TMDL is requiring other potential pollutants to be addressed as part of the proposed second and third step waterbody goal.

Furthermore, introduction of a second and third step water body goal is a new concept to the Responsible Parties. This is the first time this information has been presented to the City of Poway and other Responsible Parties. It is not very clear how these steps/goals tie into the compliance schedule.

Moreover, prescriptive language requiring special study on lagoon stressors in the resolution should be left to the dischargers to develop as part of their load reduction plans.

Lastly, the load reduction plan requirements included BMP implementation schedules, staffing and resources. These requirements should not be a requirement of the Load Reduction Plan as municipalities such as Poway cannot easily provide this information without council approval.

The City appreciates the opportunity to provide general comments on the Tentative Resolution. It is our understanding that additional comments will be accepted up until the public hearing on June 8, 2011. Again, the City would like to request that the TMDL is focused on sediment only and not all of the potential pollutants of the lagoon. Should you have any questions, please feel free to contact me at (858) 668-4653.

Sincerely,

Malik Tamimi

Malik Tamimi
Stormwater Program Administrator

cc: Bob Manis, Director of Development Services
Steve Crosby, City Engineer
File

May 23, 2011

Cathryn Henning
Water Resource Control Engineer
Monitoring, Assessment & Research Unit
San Diego Water Board
9174 Sky Park Ct #100
San Diego, CA 92123-4353

Subject: Comment Letter – Draft Sediment TMDL for Los Peñasquitos Lagoon

Dear Ms. Henning,

On behalf of the Los Peñasquitos Lagoon Foundation, I am submitting my comments regarding the proposed Sediment TMDL for Los Peñasquitos Lagoon (LPL). Overall, I believe the TMDL was presented in fair and logical way to achieve both compliance with the Clean Water Act and protection of the lagoon's beneficial uses. However, given the last minute changes to the approach for achieving compliance and protection, the date for TMDL adoption by the State Water Board should be delayed to allow the discharges adequate time to submit comments and have these comments adequately addressed by Water Board staff. With that being said, I am also aware that this delay will most likely not be granted before the June date set for this decision as the State must comply with federal timelines for certifying and implementing TMDLs. Below are my comments related to the documents circulated for review.

1. **The Sediment TMDL for LPL and pending amendment to the Basin Plan needs to include focus on bed load sediment, the processes that affect it (e.g. sediment transport) and it's contribution to impacts related to sedimentation both in and around lagoon channels, as well as associated lagoon uplands.**
    a. The water quality objective for sediment in the Basin Plan states, "The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses." This water quality objective should also reference bed load sediment, as "suspended sediment load" tends to focus only on silts and clays. Bed load sediment can, at times of elevated sediment transport, produce more significant impacts to the lagoon's beneficial uses by burying habitat and/or raising elevations within the lagoon and the lagoon/watershed interface. Even

Los Peñasquitos Lagoon Foundation
P.O. Box 940 Cardiff by the Sea, CA 92007

slight changes in elevation in coastal salt marshes can have significant impacts as it can dramatically reduce exposure to or negate tidal mixing, especially in the eastern portion of the lagoon.

b. Bed load sediment needs to be monitored in order to calibrate the watershed model. According to State Water Board staff responses to peer review, the LSPC watershed model does account for bed load sediment and its transport based on established algorithms inherent in the model. However, there has not been adequate monitoring of bed load transport or downstream accretion of bed load sediment to calibrate the model. Give the discrepancies between modeled and observed results in the model for other factors (e.g. TSS, water levels) it can only be assumed that such discrepancies would exist for the modeled results for bed load sediment. Perhaps a solution would be to include both survey transects and grain size analysis at select locations within the lagoon AND the lagoon/watershed interface, where much of this sediment is deposited as flow rates quickly decrease due to both "natural structures" (i.e. vegetation) and anthropogenic structures (e.g. railway berm). Surveys along lagoon channels should also be used to account for the inability for the lagoon model to account for bank erosion within lagoon channels, which occur after large storm events or series of events as witnessed over the last 10 years.

2. **Preservation of Biological Habitats of Special Significance (BIOL) should be elevated to the same status or higher than Estuarine (EST) with regard to prioritizing beneficial uses to be protected in LPL and the focus of the Sediment TMDL.** LPL is a dedicated Salt Marsh Preserve by the State of California with the staff report and associated literature citing the need to protect this vanishing habitat type. While the Estuarine beneficial use is an extremely important beneficial use afforded by LPL, it tends to ignore the fact that the lagoon has lost (and is still losing) coastal salt marsh habitat to conversion to brackish and riparian habitats. Unfortunately, all three of these habitat types fit under the definition of estuarine habitat resulting in the potential further loss of coastal salt marsh due to increases in brackish and riparian habitats in the lagoon and associated uplands, even with apparent TMDL compliance. Both brackish (e.g. cattails) and riparian (e.g. willows) vegetation types can act as temporary or permanent sediment sinks that could mask the true impacts of sedimentation on the beneficial uses of LPL as well as inaccurately display success in load reductions.

a. Compliance/success criteria, as well as associated monitoring needs to focus on habitat type and conversion rates over time, as they related to sedimentation. This measure was presented by the State Water Board as a means to assess "weight of evidence" and should be used to show compliance to the TMDL and protection/future restoration of LPL's beneficial uses. Currently the Los Peñasquitos Lagoon Foundation plans on using this method in updating their lagoon enhancement plan, following a phased approach of protecting existing coastal salt marsh (short-term), restoring recently converted habitat back to coastal salt marsh (mid-term) and expanding coastal salt marsh to areas historically having this habitat type (long-term).

3. **Monitoring needs to account for more than TSS within the surface water and use precipitation rates from localized sources (not Lindbergh Field)**
   a. Total Suspended Solids does not accurately portray sedimentation trends and impacts within the watershed and lagoon, as it can be highly inaccurate (e.g. included organic matter within the sample) and does not measure bed load sediment.
   b. Topographical surveys should be included as a necessary component to water quality surveys in surface waters. Much of the indirect impacts to water quality are caused by sediment deposition in the lagoon/watershed interface. Unfortunately, the linkages between the two models does not seem to accurately describe what is occurring in this area, located mostly in the western reaches of the LSPC model.
   c. Precipitation levels within the watershed need to be accurate as this is a highly influential variable for determining sediment loading from the watershed. Precipitation during storm events in San Diego can vary widely by location with some nearby areas experiencing intense, prolonged rainfall while other nearby locations have little to no measurable precipitation. Therefore, weather stations within the watershed should be used rather than taking rainfall amounts from more established locations like Lindbergh Field.

4. **Monitoring should be conducted in conjunction with established monitoring programs in LPL.** Biological monitoring has been conducted for the past 26 years at LPL and channel surveys since 1995. This information should be used to assess

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success of the sediment TMDL. Too often monitoring programs conducted by municipalities or agencies (e.g. Caltrans) do not capture the real processes occurring in the lagoon and watershed and consultants are given too short of a timeframe to collect data and extrapolate trends for these narrow data sets. Monitoring at LPL is currently being conducted by the Southwest Wetland Interpretive Association. This monitoring team, led by Dr. Jeff Crooks, is often consulted by both the State Water Board and the Southern California Coastal Water Research Project (SCCWRP) with regard to lagoon processes and impacts caused by urbanization at LPL and other coastal lagoons in Southern California. It is therefore, logical to consult Dr. Crooks with regards to any monitoring program created to characterize lagoon health and impacts from anthropogenic sources and structures.

5. **How will the monitoring programs include climate change variables?** The monitoring and modeling aspects of the TMDL should look at climate change as it affects both intensity and duration of storm events, instead of assuming the most significant sediment loading will occur during El Niño years. The recent storm events in late December 2010 that lead to, by some expert speculation, to a 100-year flood event occurred during a winter that was characterized as being a La Niña.

Thank you for all of your hard work in pushing the Sediment TMDL forward. LPLF looks forward to working with the State Water Board and all of the other stakeholders in the next phase of the process. If you have any questions, please contact me at (760) 271-0574.

Sincerely,

Mike Hastings

Mike Hastings, Executive Director
Los Peñasquitos Lagoon Foundation

CAL
California Construction and
Industrial Materials Association

Friday, May 20, 2011

Ms. Cathryn Henning
California Regional Water Quality Control Board,
San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Re: Comment Letter – Clarification Los Pensaquitos TMDL.

Dear Ms. Henning:

These comments are offered on behalf of the California Construction and Industrial Materials Association (CalCIMA). CalCIMA is a statewide trade association representing the construction aggregate, ready mix concrete and industrial minerals industries in California. Our members operate over 500 facilities statewide providing the raw materials to fuel California's infrastructure needs as well as the needs of the construction, manufacturing and industrial sectors. Several of our members are Industrial Stormwater Permit holders within the Los Penasquitos watershed. We appreciate this opportunity to comment on the proposed TMDL as well as the time your staff took to talk with us over our questions regarding the action.

We believe many of our questions were answered by staff as we had some initial confusion over the two versions of the tentative resolution on the Boards website. The draft that was set for peer review did not include industrial permit holders as responsible parties within the waste load allocation and was of concern to us as it seemed to preclude industrial permit holders from discharging. We appreciate the clarifications which were added to the tentative resolution in the 4-22-11 release version which clearly includes both construction and industrial permit holders as responsible parties under the overall waste load allocation. We believe it was important to recognize our members facilities were not precluded from discharging within the watershed.

In order to ensure we properly understand our obligations under the plan we are seeking clarification on a few issues. Under item 15 of the tentative resolution it notes that responsible parties are required to develop and implement a Sediment Load Reduction Plan (SLRP). Our review of the Implementation Plan indicates that this requirement was scheduled to apply as in Section 8.1.3;

> The Phase I MS4 owners (City of San Diego, City of Del Mar, City of Poway, and County of San Diego) and Caltrans are required to **jointly** prepare and submit for San Diego Water

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www.calcima.org
www.distancematters.org

> Board review, comment, and revision, a Sediment Load Reduction Plan (SLRP) that demonstrates how they will comply with the required wasteload reductions in this TMDL. If the Phase I MS4s and Caltrans choose to address impairments due to loads from multiple pollutants, in addition to sediment, then they will be required to jointly prepare and submit a Comprehensive Load Reduction Plan in lieu of a SLRP.

The implementation plan in the staff report seems to define the SLRP is a "joint" document while item 15 of the interim resolution could be read to require each responsible party to submit a SLRP. Likewise, page 5 notes "Industrial and construction storm water permittees will also be required to comply with existing requirements under their respective permits. In addition, Phase II MS4s and Construction and Industrial Storm Water Permit holders may be required to submit Sediment Load Reduction Plans outlining a proposed BMP program that will be capable of achieving the necessary load reductions required to attain the TMDL in the Lagoon."

We would appreciate clarification of this issue. Is there one SLRP submitted jointly, one by the phase 1 MS4's and Caltrans with the possibility of permit holders and phase II MS4's also needing to submit one? We believe the intent is one overarching SLRP and would note that it is important that industrial permit holders be included as stakeholders in discussions of such a SLRP. We certainly are willing to work with the Board and the MS4's as such plans are developed to help ensure the accuracy and feasibility of considered actions and timeframes.

From our discussions we realize this action is the start of a multi year process where multiple components from monitoring to BMP development will occur to create a phased reduction towards meeting the assigned WLA. We recognize the importance of maintaining the beneficial uses of water of the Los Penasquitos Lagoon and want to be participants within those processes.

Respectfully,

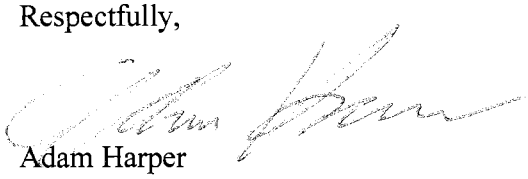

Adam Harper
Director of Policy Analysis

INDUSTRIAL ENVIRONMENTAL ASSOCIATION
Leaders of Environmental Responsibility

June 8, 2011

Ms. Cathryn Henning
California Regional Water Quality Control Board,
San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Re: Tentative Resolution No. R9-2011-0021: A Resolution Amending the Water Quality Control Plan for the San Diego Basin (9) to Incorporate the Total Maximum Daily Load for Sedimentation in Los Peñasquitos Lagoon

Dear Chairman Destache and Board Members:

The Industrial Environmental Association is an organization representing manufacturing, technology and research and development companies throughout San Diego County. Thank you for the opportunity to comment on this draft Total Maximum Daily Load (TMDL) for Sedimentation in Los Peñasquitos Lagoon (the "Draft TMDL"). We believe the following issues need to be clarified in the Draft TMDL.

- **The term "Responsible Parties" is used with different meanings throughout the document and needs to be clarified:**

The term "Responsible Parties" is used throughout the document but is given different meanings in different sections, leading to confusion. This needs to be corrected.

Finding 11 (Responsible Parties Identification) on pg. 4 defines Responsible Parties as "…the owners and operators of the collective watershed sources" and includes the Phase I copermittees (cities of San Diego, Poway, Del Mar, and the County of San Diego), Phase II MS4 permittees, Caltrans, and the General Construction and General Industrial Storm Water Permittees.

In contrast, on pg. A-10 (Develop and Submit a Load Reduction Plan) it identifies a subset of the "Responsible Parties" (i.e., the Phase I MS4 owners and Caltrans) that are required to jointly prepare and submit the Sediment Load Reduction Plan (or "SLRP") to the Regional Board as opposed to all of the responsible parties.

Another distinction on the role of the various "Responsible Parties is made on pg. A-9 of Attachment A where it states it is the "…expectation and responsibility of the Phase I MS4 copermittees to assume the lead role in coordinating and carrying out the responsible party actions, compliance monitoring, and adaptive management required under this TMDL project".

Other references to “Responsible Parties” in the Appendix (e.g., SLRP Requirements, Compliance Monitoring, Compliance Determination, Weight of Evidence Approach, Required Lagoon Monitoring, Required Special Study on Lagoon Stressors, Adaptive Management Schedule) should clarify whether they are referring to all the “Responsible Parties” (Finding 11), the subset of “Responsible Parties” identified in pg. A-10 or the Phase I MS4 copermittees identified on pg. A-9. Most of these tasks appear to be more appropriately the responsibility of the Phase I MS4 copermittees, not the other “Responsible Parties”, and this should be clarified in the Draft TMDL.

- **The Load Allocation for Construction Projects Subject to the SWRCB’s Storm Water Construction General Permit (CGP) Should be Compliance with the CGP:**

Construction projects are dissimilar from facilities and operations with long-term discharges in that their discharges are intermittent and occur over relatively short durations. Additionally, construction projects typically do not have a baseline to which they can compare sediment loadings which means that assigning load reductions would be problematic. The assessment of overall load reductions (which would include construction projects) can be accomplished by the studies the MS4s conduct. Therefore, the Draft TMDL should specify that adherence to a SWPPP that meets the requirements of the CGP will be consistent with the approved TMDL.

- **The Draft TMDL Should Specify that the Phase I MS4 Copermittees Need to Provide the Draft Plans Required by the Draft TMDL to All Responsible Parties for Input:**

The proposed plans (e.g., SLRP) required by the Draft TMDL should be provided to all of the “Responsible Parties” for input and they should be allowed to participate in the development process of the plans.

Thank you for your consideration of our comments.

Sincerely,

Patti Krebs

Patti Krebs
Executive Director

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

RESOLUTION NO. R9-2014-0020

RESOLUTION OF COMMITMENT TO AN ALTERNATIVE PROCESS FOR ACHIEVING WATER QUALITY OBJECTIVES FOR BIOSTIMULATORY SUBSTANCES IN LOMA ALTA SLOUGH

WHEREAS:

As described herein, the San Diego Water Board began development of a Total Maximum Daily Load (TMDL) in 2006 for the eutrophication impairment in Loma Alta Slough. The Board, in May 2013, issued a revised municipal separate storm sewer system (MS4) permit, Order No. R9-2013-0001 (Regional MS4 Permit). Compliance with the prohibitions and requirements of the Regional MS4 Permit will result in the desired environmental outcome for Loma Alta Slough by 2023. Therefore, the Board will postpone concluding the TMDL process in favor of the prohibitions and approach specified in Order No. R9-2013-0001.

1. The Loma Alta Creek watershed encompasses approximately 6,400 acres, of which approximately 70 percent includes urban development. Development is predominantly residential, with smaller portions of commercial and industrial development, utilities, and public facilities. Approximately 95 percent of the watershed is within the City of Oceanside. The remaining area is within the City of Vista and the County of San Diego. These municipalities are covered under the Regional MS4 Permit.

2. Loma Alta Slough is a 3-acre coastal estuarine wetland located at the terminus of Loma Alta Creek at Buccaneer Beach. The physical features of the Slough have undergone significant changes due to development encroaching upon all sides. Modifications include filling the open water portions of the Slough, straightening banks, and hardening the bed and/or banks. Buccaneer Park is located on the southwestern portion of the Slough and affords the public opportunities for non-contact water recreation such as picnicking, sightseeing, bird watching, and aesthetic enjoyment.

3. Loma Alta Slough is located within the Carlsbad Hydrologic Unit, Loma Alta Hydrologic Area, Basin Number 904.10. The *Water Quality Control Plan for the San Diego Basin (9)* (Basin Plan) designates six existing beneficial uses for the Loma Alta Slough.

a. Contact Water Recreation
b. Non-Contact Water Recreation
c. Estuarine Habitat
d. Wildlife Habitat
e. Rare, Threatened, or Endangered Species
f. Marine Habitat

4. The Basin Plan contains Water Quality Objectives (WQOs) developed to protect the most sensitive beneficial uses designated for a water body. The WQO for biostimulatory substances includes a narrative WQO and a numeric interpretation.

   a. Narrative WQO: Inland surface waters, bays and estuaries and coastal lagoon waters shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses.

   b. Numeric Interpretation: The numeric interpretation of the biostimulatory substances WQO for inland surface waters, enclosed bays and estuaries, and coastal lagoons is:

      i. Concentrations of nitrogen and phosphorus, by themselves or in combination with other nutrients, shall be maintained at levels below those which stimulate algae and emergent plant growth.

      ii. Threshold total phosphorus (P) concentrations shall not exceed 0.05 milligrams per liter (mg/l) in any stream at the point where it enters any standing body of water, nor 0.025 mg/l in any standing body of water. A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/l total P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the San Diego Water Board.

      iii. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used.

5. Algal blooms sometime occur naturally; however, they are often the result of waste discharges or nonpoint source pollutants. Algal blooms directly and indirectly depress the dissolved oxygen content of water. A direct depression of dissolved oxygen occurs during the night when the lack of sunlight causes algae to consume oxygen for respiration, while no longer producing oxygen from photosynthesis. An indirect depression of dissolved oxygen occurs when the algae die and the biomass is decomposed by aerobic bacteria which consumes

dissolved oxygen. Depressed dissolved oxygen content can result in fish kills and increased turbidity. This general process is known as eutrophication.

6. Excessive algal growth also results in floating algal scum and algal mats that are aesthetically unpleasant. Under these conditions the quality of surface water impairs the beneficial use of contact and non-contact water recreation.

7. Excessive eutrophic conditions result in water quality that does not support the designated beneficial uses of Loma Alta Slough.

8. Loma Alta Slough was placed on the Clean Water Act (CWA) Section 303(d) list of Water Quality Limited Segments in 1996 for impairments related to eutrophication. The beneficial uses of the Slough that are most sensitive to eutrophic condition are estuarine and marine habitat. Eutrophication also adversely affects contact and non-contact water recreation.

9. The CWA section 303(d) requires the State to establish a TMDL for pollutants at a level necessary to implement the applicable water quality standards. Section 303(d)(3) requires the State to establish TMDLs for all other waters.

10. A TMDL is a calculation of the maximum loading capacity of the impaired water body for each impairing pollutant. A TMDL is a planning tool for restoring water quality conditions that support designated beneficial uses by identifying capacity, estimating uncontrollable load allocations, and assigning waste load allocations. A TMDL implementation plan identifies and guides the actions needed to meet the TMDL and achieve water quality standards.

TMDL DEVELOPMENT

11. The San Diego Water Board initiated TMDL development for Loma Alta Slough in 2006 with Investigation Order No. R9-2006-076[1] that identified elements for a Monitoring Program Workplan for Loma Alta Slough with special studies to characterize dry weather flow and storm flow-influenced water quality in order to complete development of a TMDL, load and waste load allocations, and identify necessary reductions. The workplan was submitted in June 2007.[2] The State Water Resources Control Board and the United States Environmental Protection Agency (USEPA) funded development of data compilation and model

[1] Investigation Order No. R9-2006-076 to Owners and Operators of Municipal Separate Storm Sewer Systems, California Department of Transportation, Hale Avenue Resource Recovery Facility, and North County Transit District Responsible for the Discharge of Bacteria, Nutrients, Sediment, and Total Dissolved Solids into Impaired Lagoons, Adjacent Beaches, and Agua Hedionda Creek. The Order was amended three times, the last of which occurred in October 2007.

[2] San Diego Coastal Lagoons TMDL Monitoring Workplan, June 2007. Prepared by Karen McLaughlin, Martha Sutula, and Ken Schiff, Southern California Coastal Water Research Project.

configuration in 2008.[3] The eutrophication impairment was confirmed using monitoring data collected between 2007 and 2009.

12. A TMDL stakeholder process from 2007-2013 informed decision-making by identifying and discussing scientific, regulatory, and management questions and data, and ultimately selecting numeric targets that represent attainment of the biostimulatory water quality objective for Loma Alta Slough.

13. The TMDL calculations are based upon the best available science and data and are summarized in a draft TMDL Report, *Phosphorus Total Maximum Daily Load for Loma Alta Slough, Oceanside, California (Draft May 2014)*. This process included conducting USEPA-funded special studies; presentations by nationally-recognized experts in the fields of nutrient numeric endpoints, aquatic geochemistry, and the hydrodynamics of coastal estuarine systems; establishing numeric targets based on nutrient numeric endpoints; and hydrodynamic and water quality modeling of Loma Alta Slough used to calculate the TMDL, allocations and reductions.

14. The draft TMDL Report prepared by San Diego Water Board staff following the stakeholder process includes all elements required by USEPA for TMDLs, including the following:

    a. Problem Statement: The Loma Alta Slough eutrophication impairment occurs during the dry season months (May through October) when the Slough mouth is closed, watershed flows are insufficient to maintain an opening to the ocean, and atmospheric conditions in conjunction with nutrient loading in the Slough result in excessive algal growth.

    b. Source and Linkage Analysis: The primary sources of the impairment in Loma Alta Slough are dry-weather discharges from irrigation runoff and other illicit dry-weather discharges conveyed by the MS4 to Loma Alta Slough. Smaller contributions occur from groundwater infiltration. Loading of nutrients, specifically phosphorus, into the Slough associated with dry weather flows results in excessive algal growth

    c. Numeric Targets: The numeric targets for Loma Alta Slough, established by a consensus of the stakeholders, uses macroalgal biomass and percent cover as valid interpretations of the narrative WQO for biostimulatory substances. The selected macroalgal biomass and percent cover targets are shown in Table 1.

[3] San Diego Region Lagoon TMDLs Phase I – Data Compilation and Model Configuration, June 2008. Prepared for: San Diego Regional Water Quality Control Board and United States Environmental Protection Agency Region IX, Prepared by: Tetra Tech, Inc.

Table 1
Numeric Targets for Loma Alta Slough
(from the Draft TMDL Report)

Metric	Target	Applicable Season
Surface Water Macroalgal Biomass	Less than 90 grams per cubic meter	Dry-weather season, May through October
Surface Water Macroalgal Cover	Less than 50 percent	Dry-weather season, May through October

d. TMDL Calculation: The TMDL calculated for Loma Alta Slough to achieve the water quality objective for biostimulatory substances is 31.5 grams of total phosphorus per month from May through October.

e. Allocation of the TMDL: The load allocation and waste load allocation are 19.7 grams of phosphorus per month and 11.8 grams of phosphorus per month, respectively.

f. Attainment Date: The recommended attainment date, the date when the numeric targets will be reached in Loma Alta Slough, is 2023.

g. Implementation Plan: To achieve necessary reductions in phosphorus loading, the Implementation Plan relies on the existing Regional MS4 Permit (Order No. R9-2013-0001), specifically the prohibitions on dry-weather discharges and development and implementation of a Water Quality Improvement Plan for the Loma Alta Creek watershed.

REGIONAL MUNICIPAL STORM WATER PERMIT APPROACH

15. Order No. R9-2013-0001, *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region*[4] (Regional MS4 Permit) was adopted by the San Diego Water Board in May 2013.

16. The Regional MS4 Permit includes revisions to the prior MS4 Permit (Order No. R9-2007-0001) that require effective elimination of non-storm water discharges to the MS4 system. As discussed in the linkage analysis of the draft TMDL Report, elimination of unauthorized non-storm water discharges to the MS4 system will result in the attainment of the macroalgal numeric targets. These new provisions as of 2013 include both a prohibition on discharges into the MS4 from over-

[4] A copy is available at: http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/docs/updates052313/2013-0523_Order_No._R9-2013-0001_COMPLETE.pdf

irrigation and requirements to develop and implement a Water Quality Improvement Plan for priority water bodies. Further, a prohibition on contaminated groundwater infiltration remains in the Regional MS4 Permit.

a. Provision A.1.b, states that "*non-storm water discharges into the MS4s are to be effectively prohibited, through the implementation of Provision II. E.2, unless such discharges are authorized by a separate NPDES permit.*" Pursuant to Provision II.E.2, each Copermittee[5] must implement a program to actively detect and eliminate illicit discharges into the MS4. Provision II.E.2.a requires each Copermittee to address all non-storm water discharges as illicit discharges unless a non-storm water discharge is either identified as a discharge authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed according to specific requirements.

b. Pursuant to Provision E.2.a.(3) states that groundwater infiltration into the MS4 must also be addressed as an illicit discharge if either the Copermittee or the San Diego Water Board identifies the discharge as a source of pollutants to receiving waters. Studies indicate that groundwater may be a source of pollutants entering the MS4. Therefore, groundwater discharges into the MS4 are identified as a source of pollutants entering the MS4 and may also need to be addressed as illicit discharges and eliminated.

c. Provision II.B requires the development and implementation of a Water Quality Improvement Plan to ultimately comply with the prohibitions and limitations presented under Provision A. The Water Quality Improvement Plan is the backbone of the Regional MS4 Permit requirements. Provision B provides the guidance, criteria, and minimum expectations and requirements for the elements of the Water Quality Improvement Plan to be developed and implemented by the Copermittees.

d. The Water Quality Improvement Plan also incorporates a program to monitor and assess the progress of the Copermittees' jurisdictional runoff management programs toward improving the quality of discharges from the MS4s, as well as tracking improvements to the quality of receiving waters.

17. The Water Quality Improvement Plans require the implementation of pollution controls and water quality management actions which can result in the attainment of water quality standards in water bodies impaired by discharges from the Copermittees' MS4s. The Water Quality Improvement Plans also include requirements that are expected to attain water quality standards in a reasonable period of time.

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[5] For the purposes of the Regional MS4 Permit, Copermittees are the entities enrolled in the permit. These entities may include municipalities (such as the City of Oceanside) and special districts.

18. The Water Quality Improvement Plans are commitments by the Copermittees to develop, plan, budget for, and implement pollution controls that will attain water quality standards in receiving waters in a reasonable period of time, or as soon as possible.

19. Pursuant to Provision B.2.a. of the Regional MS4 Permit, Copermittees must identify the water quality priorities within each Watershed Management Area that will be addressed by the Water Quality Improvement Plan. Watershed Management Areas may be separated into subwatersheds to focus water quality prioritization and jurisdictional runoff management program implementation efforts by receiving water. And, Loma Alta Slough meets four of the criteria to be used to identify water quality impacts:

    a) Loma Alta Slough is listed as impaired on the CWA Section 303(d) List (Provision B.2.a.1).

    b) A TMDL for Loma Alta Slough is under development by the San Diego Water Board (Provision B.2.a.1).

    c) Receiving water monitoring data indicates an impairment in Loma Alta Slough (Provision B.2.a.6).

    d) There is evidence of adverse impacts to the chemical, physical, and biological integrity of the water in Loma Alta Slough (Provision B.2.a.8).

20. The City of Oceanside, as a Copermittee covered by the Regional MS4 Permit, intends to take appropriate actions within the context of the Regional MS4 Permit to address the impairment of Loma Alta Slough.[6] In response to tentative Investigative Order R9-2014-0022[7] the City indicated that:

    a. The City will use the numeric targets, developed through the stakeholder process and incorporated in the draft TMDL Report, as numeric goals in the Water Quality Improvement Plan for the Loma Alta Creek Watershed.

    b. The City will incorporate the slough monitoring requirements proposed in Tentative Investigative Order No. R9-2014-0022 into the Water Quality Improvement Plan.

    c. The City will develop and implement a Water Quality Improvement Plan to effectively prohibit the City's non-storm water discharges to the MS4 system.

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[6] Letter titled, *Comment Letter – Tentative Investigative Order No. R9-2014-0020*, dated May 5, 2014.
[7] Tentative Investigative Order was released for public review on March 14, 2014. Staff agreed with stakeholder comments that a more effective and efficient approach to realizing water quality outcomes would be to rely on the existing prohibitions and requirements of the Regional MS4 Permit and replaced the tentative Investigative Order with this Resolution.

d. The City considers nutrients in the Loma Alta Hydrologic Area as one of the highest priority projects for the development of the Water Quality Improvement Plan.

e. The City, as provided in a detailed schedule for development and implementation of the Water Quality Improvement Plan (Table 2), estimates that attainment of the numeric goals and restoration of the beneficial uses of Loma Alta Slough will be achieved by the end of 2023.

Table 2
City of Oceanside's Tentative Proposed Schedule to Address the Eutrophication Impairment in Loma Alta Slough

Activity	*Year*
City continues implementation of current programs addressing non-stormwater discharges under the MS4 Permit	2014
City develops Goals, Strategies, and Schedules for the Water Quality Improvement Plan that are aligned with the draft TMDL Report	
Submission of the Water Quality Improvement Plan goals, strategies, and schedules to the San Diego Water Board	2015
Updates to the City's Jurisdictional Runoff Management Program (JRMP) to implement Water Quality Improvement Plan Strategies	
Submission of Water Quality Improvement Plan, include the Loma Alta Slough Monitoring Plan to the San Diego Water Board	
San Diego Water Board approval of the Water Quality Improvement Plan	
City begins implementation of the strategies in the Water Quality Improvement Plan through revised JRMP	2016
City implements Monitoring Program for Slough – Year 1	
Submission of Water Quality Improvement Plan Annual Report for FY15-16 (includes the Annual Monitoring Report for Loma Alta Slough)	2017
City implements Monitoring Program for Slough – Year 2	
City implements JRMP in support of Water Quality Improvement Planning strategies	
Submission of Water Quality Improvement Plan Annual Report for FY16-17 (includes the Annual Monitoring Report for Loma Alta Slough)	2018
Assessment of progress towards meeting the interim numeric goals developed in the Water Quality Improvement Plan	
City and San Diego Water Board assesses effectiveness of actions to date (including potential revisions to numeric goals, strategies, responsible parties, and schedules)	
City implements Monitoring Program for Slough – Year 3	
City continues implementation of Monitoring Plan, Water Quality Improvement Plan Strategies, and JRMP	2019 – 2022
Continued Water Quality Improvement Plan Annual Reporting (including the Annual Monitoring Report for the Slough)	

Activity	Year
Projected attainment of Final Numeric Goals under the Water Quality Improvement Plan	2023
City and San Diego Water Board assess effectiveness of actions to date (including potential revisions to numeric goals, strategies, and schedules)	

21. The Regional MS4 Permit provides the regulatory structure that allows the reclassification of 303(d) listed waterbodies from Category 5 (evidence shows at least one use not supported and a TMDL is needed) to Category 4b (evidence shows at least one use not supported, but a TMDL is not needed as an *existing regulatory program is expected to result in the attainment of the water quality standard within a reasonable, specified time frame* [italic added for emphasis]).

22. As required by State Law and in alignment with Chapter 4 Proactive Public Outreach and Communication of the San Diego Water Board's Practical Vision, a robust stakeholder and public participation process was conducted for the draft TMDL. Interested persons and the public have had reasonable opportunity to participate in development and review of the draft TMDL Report and to review this Resolution. Notices for all meetings were sent to known interested persons and the municipalities with jurisdiction in the Loma Alta watershed. All of the written comments submitted to the San Diego Water Board during the review and comment periods have been considered. Efforts to solicit public review and comment included:

    a. A multi-year process where meetings with stakeholders and the public were held to develop the draft TMDL.

    b. Distribution of a Tentative Investigative Order and draft TMDL Report to stakeholders and the public on March 14, 2014.

    c. A 45-day public comment period during which stakeholders and the public were provided the opportunity to submit written comments to the San Diego Water Board.

    d. A public workshop to discuss and receive comments from stakeholders and the public on April 24, 2014.

    e. A public meeting on June 26, 2014 where stakeholders and the public where provided the opportunity to provide oral comment to the Board about the draft TMDL Report and the tentative Resolution.

23. This action advances the values and the Monitoring and Assessment chapter of the San Diego Water Board's Practical Vision.

24. The San Diego Water Board has notified all known interested persons and the public of its intent to consider adoption of this Resolution in accordance with applicable statutes and regulations.

THEREFORE, BE IT RESOLVED THAT:

1. Consistent with the San Diego Water Board's Practical Vision[8] and USEPA's *Long-Term Vision for Assessment, Restoration, and Protection under the Clean Water Act Section 303(d) Program*[9], the Board will postpone concluding the Loma Alta Slough Phosphorus TMDL process to address the eutrophication impairment in favor of implementation of the prohibitions and Water Quality Improvement Plan framework specified in the Regional MS4 Permit, Order No. R9-2013-0001.

2. The Regional MS4 Permit provides a more efficient regulatory pathway towards compliance and implementation actions, and the desired environmental outcomes (i.e. numeric targets), than continuing work toward completing the TMDL process, while simultaneously preserving transparency and accountability.

3. The Board supports the approach proposed by the City of Oceanside and believes that using the Water Quality Improvement Plan, as required by the Regional MS4 Permit, will result in attainment of the numeric goals by the end of 2023.

4. If follow-up actions and effectiveness monitoring do not show progress and final achievement of the TMDL stakeholder-derived numeric targets, then the San Diego Water Board will reinitiate the process of considering adoption of the Phosphorus TMDL for Loma Alta Slough.

I, David W. Gibson, Executive Officer, do herby certify that the foregoing is a full, true, and correct copy of a resolution adopted by the California Regional Water Quality Control Board, San Diego Region, on June 26, 2014.

David W. Gibson
Executive Officer

Attachment: Phosphorus Total Daily Maximum Load for Loma Alta Slough, Oceanside, California, prepared by the California Regional Water Quality Control Board – San Diego Region, (Draft) May 2014.

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[8] http://www.waterboards.ca.gov/sandiego/water_issues/Practical_Vision/index.shtml

[9] http://water.epa.gov/lawsregs/lawsguidance/cwa/tmdl/upload/vision_303d_program_dec_2013.pdf

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

PHOSPHORUS TOTAL DAILY MAXIMUM LOAD FOR LOMA ALTA SLOUGH, OCEANSIDE, CALIFORNIA

DRAFT MAY 2014

Phosphorus Total Daily Maximum Load Loma Alta Slough, Oceanside, California

Cover Photograph by Barry Pulver

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and technical support provided by the Loma Alta TMDL Stakeholder Group:

CalTrans
City of Oceanside
City of Vista
County of San Diego
Coastal Monitoring Associates
Friends of Loma Alta Creek
MACTEC
Tetra Tech, Inc.
Southern California Coastal Water Research Project
United States Environmental Protection Agency

EXECUTIVE SUMMARY

Water Body	Loma Alta Slough
Impaired Uses	Contact Water Recreation Non-Contact Water Recreation Estuarine Habitat Wildlife Habitat Rare, Threatened, or Endangered Species Marine Habitat
Clean Water Act 303(d) Listing	Eutrophic Conditions
Causative Pollutant	Phosphorus
Sources	Non-storm water and illicit flows into the MS4.
Total Maximum Daily Load	31.5 grams per month of phosphorus
Numeric Targets: Apply during the summer dry season only	*Surface Water Macroalgal Biomass:* Less than 90 grams dry weight per cubic meter. *Surface Water Macroalgal Cover:* Less than 50 percent.
Load and Waste Load Allocations for Phosphorus	Load Allocation: 19.7 grams per month Waste Load: 11.8 grams per month Margin of Safety: implicit
Implementation Mechanisms	Implementation of existing effluent-based discharge limitations and prohibitions, including those in the Regional MS4 Permit (Order No. R9-2013-0001
Estimated Attainment of Numeric Targets and Beneficial Uses	2023

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1 INTRODUCTION

Excessive eutrophic conditions within the Loma Alta Slough (Slough) restrict the ability of its water to support the beneficial uses designated in the *Water Quality Control Plan for the San Diego Basin (9)* (Basin Plan). As a result, the Slough was placed on the 1996 Clean Water Act (CWA) section 303(d) list of impaired water bodies. The impairment is limited to the summer-dry weather season when natural sand accretion at the ocean inlet restricts the mixing of freshwater and saltwater/ocean water, non-storm water and illicit discharges add nutrients to the Slough, and weather conditions foster excessive algal growth.

In accordance with CWA section 303(d) and State Water Board Resolution 2005-0050, "*Water Quality Control Policy for Addressing Impaired Waters: Regulatory Structure and Options*," the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), the United States Environmental Protection Agency (USEPA), and local stakeholders investigated the conditions, sources of pollutants, loading capacity, and existing control requirements affecting the eutrophic conditions with the purpose of developing the Total Maximum Daily Load (TMDL) for the pollutants affecting the eutrophic conditions in the Slough and an implementation plan to achieve the TMDL.

The purpose of the TMDL and implementation plan is to restore water quality in the Slough so that it supports its beneficial uses as defined in the Basin Plan. After these beneficial uses are restored the Slough can be removed from the CWA 303(d) list for eutrophication.

The pollutant driver for the eutrophication is phosphorus. Sources of phosphorus into the Slough include non-storm water flows and groundwater. This Report presents the TMDL for phosphorus. The TMDL is the maximum amount of phosphorus that the Slough can assimilate and maintain water quality sufficient to meet its beneficial uses. The implementation plan to achieve the TMDL is for the City of Oceanside (City) to comply with existing permits that prohibit the discharge of non-storm water and illicit discharges into the City's municipal separate storm sewer system (MS4).

2 THE TMDL PROCESS

The purpose of a TMDL is to attain Water Quality Objectives (WQOs) that support beneficial uses in the water body. A TMDL is the maximum amount of a pollutant that a water body can assimilate and maintain water quality sufficient to meet its beneficial uses. The TMDL load is allocated to point sources as wasteload allocations (WLA), to non-point sources as load allocations (LA), and to a margin of safety (MOS) to account for uncertainties and unknowns. Mathematically, the TMDL can be expressed as:

$$TMDL = WLA + LA + MOS.$$

The TMDL also includes a strategy for meeting WQOs by allocating quantitative limits for point and nonpoint pollution sources. Once the total maximum pollutant load has been calculated, it is allocated among contributing sources in the watershed.

The TMDL process begins with the development of a technical analysis which includes the following seven components:

1) *Problem Statement* – generally describes impairment (Section 4)

2) *Numeric Targets* – identifies the numeric target(s) which when achieved will result in attainment of the WQOs and protection of beneficial uses (Section 5)

3) *Source Assessment* – identifies all of the known point sources and nonpoint sources of the impairing pollutant in the watershed (Section 6)

4) *Linkage Analysis* – establishes the relationship between pollutant sources and receiving water conditions and calculates the loading capacity of the waterbody, which is the maximum load of the pollutant that may be discharged to the water body without causing exceedances of WQOs and impairment of beneficial uses (Section 7)

5) *Margin of Safety (MOS)* – accounts for uncertainties in the analysis (Section 8)

6) *Seasonal Variation and Critical Conditions* – describes how these factors are accounted for in the TMDL determination (Section 9)

7) *Allocation of the TMDL* – division of the TMDL among each of the contributing sources in the watershed; wasteload allocations (WLAs) for point sources and load allocations (LAs) for nonpoint and background sources (Section 10)

The USEPA provides additional guidance regarding the statutory and regulatory requirements for establishing TMDLs.[1] Table 1 lists these requirements and locations where the information is provided.

TABLE 1
USEPA TMDL ELEMENTS

USEPA TMDL ELEMENT	SECTION/COMMENTS
The name and geographic location of the impaired waterbody for which the TMDL is being established and the names and geographic locations of the waterbodies upstream of the impaired waterbody that contribute significant amounts of the pollutant for which the TMDL is being established.	Section 3
Identification of the pollutant for which the TMDL is being established and quantification of the pollutant load that may be present in the waterbody and still ensure attainment and maintenance of water quality standards.	Sections 4.3 and 5
Identification of the amount, or degree, by which the current pollutant load in the waterbody deviates from the pollutant load needed to attain or maintain water quality standards.	Section 4 and 5
Identification of the source categories, source subcategories, or individual sources of the pollutant for which the wasteload allocations and load allocations are being established.	Section 4
Wasteload allocations to each industrial and municipal point source permitted under § 402 of the Clean Water Act discharging the pollutant for which the TMDL is being established; wasteload allocations for storm water, combined sewer overflows, abandoned mines, combined animal feeding operations, or any other discharges subject to a general permit may be allocated to categories of sources, subcategories of sources or individual sources; pollutant loads that do not need to be allocated to attain or maintain water quality standards may be included within a category of sources, subcategory of sources or considered as part of background loads; and supporting technical analyses demonstrating that wasteload allocations when implemented, will attain and maintain water quality standards.	Sections 6 and 10

[1] http://water.epa.gov/lawsregs/lawsguidance/cwa/tmdl/TMDL-ch3.cfm

USEPA TMDL ELEMENT	SECTION/COMMENTS
Load allocations, ranging from reasonable accurate estimates to gross allotments, to nonpoint sources of a pollutant, including atmospheric deposition or natural background sources; if possible, a separate load allocation must be allocated to each source of natural background or atmospheric deposition; load allocations may be allocated to categories of sources, subcategories of sources or individual sources; pollutant loads that do not need to be allocated may be included within a category of sources, subcategory of sources or considered as part of background loads; and supporting technical analyses demonstrating that load allocations, when implemented, will attain and maintain water quality standards.	Section 10
A margin of safety expressed as unallocated assimilative capacity or conservative analytical assumptions used in establishing the TMDL; e.g., derivation of numeric targets, modeling assumptions, or effectiveness of proposed management actions which ensures attainment and maintenance of water quality standards for the allocated pollutant.	Section 8
Consideration of seasonal variation such that water quality standards for the allocated pollutant will be met during all seasons of the year.	Section 9
An allowance for future growth which accounts for reasonably foreseeable increases in pollutant loads.	Section 8.1
An implementation plan.	Section 11

The USEPA has also provided guidance on the requirements for a TMDL implementation plan. Table 2 presents the Implementation Plan Elements and where they can be found.

TABLE 2
USEPA IMPLEMENTATION PLAN ELEMENTS

USEPA IMPLEMENTATION PLAN ELEMENT	SECTION/COMMENTS
A description of the control actions and/or management measures which will be implemented to achieve the wasteload allocations and load allocations, and a demonstration that the control actions and/or management measures are expected to achieve the required pollutant loads	Section 11.1
A time line, including interim milestones, for implementing the control actions and/or management measures, including when source-specific activities will be undertaken for categories and subcategories of individual sources and a schedule for revising NPDES permits.	Section 11.2
A discussion of your reasonable assurances that wasteload allocations and load allocations will be implemented.	Section 11.1
A description of the legal authorities under which the control actions will be carried out.	Section 11.1
An estimate of the time required to attain and maintain water quality standards and discussion of the basis for that estimate.	Section 11.2
A monitoring and/or modeling plan designed to determine the effectiveness of the control actions and/or management measures and whether allocations are being met.	Section 11.3
A description of measurable, incremental milestones for the pollutant for which the TMDL is being established for determining whether the control actions and/or management measures are being implemented and whether water quality standards are being attained.	Section 12
A description of the process for revising TMDLs if the milestones are not being met and projected progress toward attaining water quality standards is not demonstrated.	Section 11.1.3

3 BACKGROUND INFORMATION

3.1 Description of the Loma Alta Slough

The Loma Alta Slough (Figure 1) is a relatively small (approximately 3 acres) and highly modified coastal estuarine wetland located within the City of Oceanside. The Slough is considered small in comparison to other regional coastal wetlands. The Slough is approximately 1,600 feet in length and extends from the Pacific Coast Highway to Buccaneer Beach at the Pacific Ocean.

FIGURE 1
AERIAL VIEW OF LOMA ALTA SLOUGH AND LOWER LOMA ALTA CREEK

Development has encroached upon on all sides of the Slough, with the open water portions experiencing fill, straightening, and conversion to hardened bed and/or banks. The historic terminus of Loma Alta Creek and the beginning of the Slough was at the current location of Interstate 5, with wetlands spanning much of the valley bottom (Grossinger et al. 2011). Commercial, industrial, and residential development resulted in significant infill of former estuary areas, and modification of the estuarine system from a coastal lagoon and wetland to a straightened river-mouth lagoon with a hardened bank system. Concrete bed and banks now extend from Interstate 5 west through the former estuary, transitioning to hardened banks with partial bed armoring upstream of the Pacific Coast Highway. Bank armoring extends to where the Slough meets the ocean at the beach (Figures 2, 3, and 4).

FIGURE 2
VIEW OF CONCRETE LINED SECTION OF LOMA ALTA CREEK
View to east (upstream). Photograph taken at Pacific Coast Highway.

FIGURE 3
VIEW OF SHOTCRETE-LINED SECTION OF LOMA ALTA CREEK
View to east (upstream). Photograph taken south of Pacific Coast Highway.

FIGURE 4
VIEW OF RIP-RAP ARMORED BANKS OF LOMA ALTA SLOUGH
View to east (upstream). Photograph taken at Slough near S. Pacific Street.

During the summer season, natural processes result in the development of a sand berm that, except for periods of high tide, separates the Slough from the ocean. During this time period the Slough is no longer connected to the Pacific Ocean and all flow to the ocean and tidal flushing ceases.

The City operates the Loma Alta Slough Ultraviolet Treatment Facility (FETD) during the summer-dry season to treat water in the Slough to meet contact bacteria standards before it is returned to the beach. This eliminates beach closures at Buccaneer Beach due to bacterial contamination from Loma Alta Creek during the summer months (Hammond 2010). The FETD extracts water at an inlet near the western edge of the Slough at a rate ranging between 300 to 700 gallons per minute (432,000 to 1,008,000 gallons per day), treats the water using an ultraviolet light, and discharges the treated water to the ocean (Hammond 2010, CMA and SCCWRP 2013). The extraction of water by the FETD maintains the water level in the Slough at an elevation to prevent flooding of adjacent properties.

3.2 Description of the Loma Alta Watershed

The Loma Alta Watershed is a small coastal drainage, with an area of approximately 6,400 acres and peak watershed elevation of 492 feet above mean sea level (Figure 5). The watershed is heavily urbanized, with over 70 percent of the watershed consisting of developed lands (City of Oceanside et al. 2011, Tetra Tech 2013). Development is predominantly residential, with smaller portions of commercial and industrial developments, utilities, and public facilities.

FIGURE 5
REGIONAL MAP SHOWING THE LOMA ALTA WATERSHED

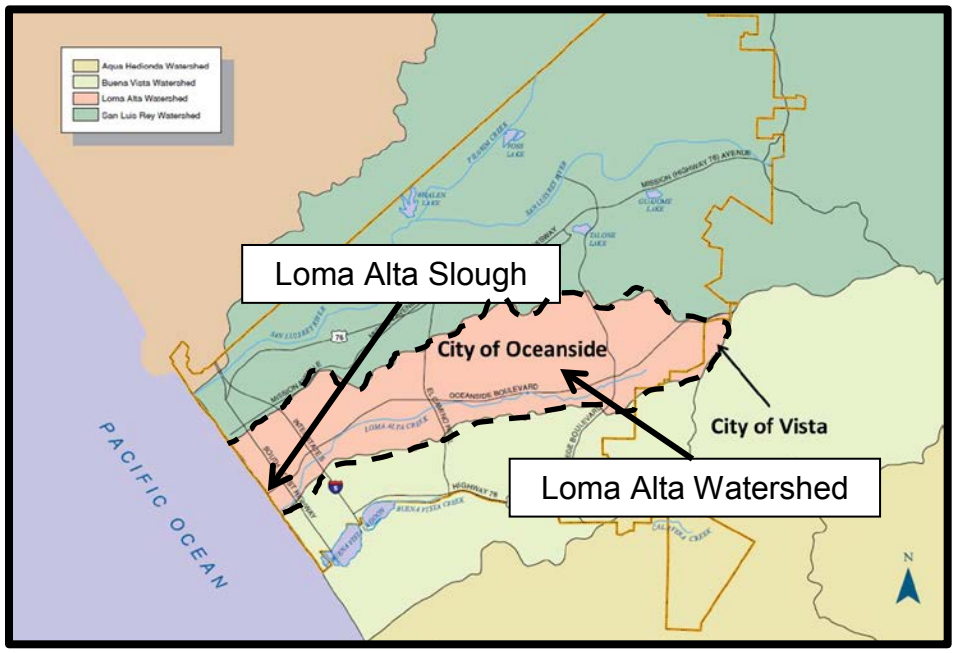

The majority (95 percent) of the Loma Alta Watershed is within the City of Oceanside. The remaining area lies within the City of Vista and the County of San Diego. Special districts also have jurisdiction in the watershed; most notably the North County Transit District (NCTD) which has right-of-ways and rail facilities adjacent to Loma Alta Creek and other facilities that cross the Slough.

Based on a review of data in the Geotracker database,[2] groundwater generally occurs at a depth of approximately seven feet below ground surface along Oceanside Boulevard between the Coast Highway and Melrose Drive. Oceanside Boulevard is typically adjacent and parallel to Loma Alta Creek for much of the watershed.

3.3 Water Quality Standards

CWA section 303 and section 13240 of the California Water Code (Water Code) require the San Diego Water Board to establish water quality standards for each water body within its region. Water quality standards include beneficial uses, water quality objectives (WQOs), and the antidegradation policy. The water quality standards applicable for the Loma Alta Slough are presented in the Basin Plan and the Water Quality Control Plan for Ocean Waters of California (Ocean Plan). The Basin Plan contains implementation programs to achieve water quality standards.

[2] https://geotracker.waterboards.ca.gov/

3.3.1 Beneficial Uses

The Loma Alta Slough is located within the Loma Alta Hydrologic Area (901.41) of the Carlsbad Hydrologic Unit (904.00). The Basin Plan designates the following existing beneficial uses for the Slough:

i. *Contact Water Recreation (REC 1):* Waters that support recreational activities where ingestion of water is possible. REC 1 activities include swimming, wading, water-skiing, skin and SCUBA diving, surfing, and fishing.

ii. *Non-Contact Water Recreation (REC 2):* Waters that support recreational activities not normally involving water contact or ingestion of water. REC 2 activities include sightseeing, aesthetic enjoyment of the water body alone or in conjunction with other activities such as bird watching, picnicking, sunbathing and hiking.

iii. *Estuarine Habitat (EST):* Waters that support estuarine ecosystems.

iv. *Wildlife Habitat (WILD):* Waters that support terrestrial ecosystems.

v. *Rare, Threatened, or Endangered Species (RARE):* Waters that support habitats.

vi. *Marine Habitat (MAR):* Waters that support marine ecosystems.

3.3.2 Water Quality Objectives

The Basin Plan contains WQOs developed to protect the most sensitive beneficial uses designated for a water body. The WQO for biostimulatory substances includes both a narrative WQO and a numeric interpretation.

i. <u>Narrative WQO:</u> The narrative WQO for biostimulatory substances for inland surface waters, enclosed bays and estuaries, and coastal lagoons is:

Inland surface waters, bays and estuaries and coastal lagoon waters shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses.

ii. Numeric Interpretation of the WQO: The numeric interpretation of the WQO for biostimulatory substances for inland surface waters, enclosed bays and estuaries, and coastal lagoons is:

Concentrations of nitrogen and phosphorus, by themselves or in combination with other nutrients, shall be maintained at levels below those which stimulate algae and emergent plant growth. Threshold phosphorus (P) concentrations shall not exceed 0.05 milligrams per liter (mg/l) in any stream at the point where it enters any standing body of water, nor 0.025 mg/l in any standing body of water. A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/l total P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the San Diego Water Board.

Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used.

4 PROBLEM STATEMENT

Eutrophic conditions at the Slough occur during the summer-dry season. Excessive eutrophication causes adverse ecological effects and creates a condition of public nuisance. This condition results in an impairment of water quality and limits the ability of the Slough to support the REC-1, REC-2, EST, WILD, MAR, and RARE beneficial uses. As a result, the Slough was placed on the 1996 CWA section 303(d) list of impaired water bodies. The impairment was confirmed during investigations conducted between 2007 and 2012 through funding by the State Water Resources Control Board, USEPA, and under San Diego Water Board Order No. R9-2006-0076 (see MACTEC 2009, McLaughlin et al. 2011, CMA & SCCWRP 2013).

4.1 Impairment of EST, WILD, MAR, and RARE Beneficial Uses

Eutrophication in the Slough is the result of the restriction of tidal flushing and continued watershed loading of non-storm water flows during the summer-dry season. The loading of nutrients to the Slough, combined with elimination of tidal flushing due to the buildup of a sand berm at the mouth of the Slough, higher water temperatures, lower salinity, and longer daylight promote excessive algal growth. The decay of the algae is an aerobic bacterial process which reduces the oxygen content of the Slough. A healthy aquatic habitat cannot be supported when dissolved oxygen is reduced to below 2 milligrams per liter (mg/l), a condition called hypoxia, and the Basin Plan requires much higher levels of dissolved oxygen be present to protect beneficial uses (Baird et al. 2004, San Diego Water Board).

4.2 Impairment of REC-1 and REC-2 Beneficial Uses

The Slough's wetland includes freshwater, marsh, mule fat scrub, and southern willow scrub and provides refuge, foraging areas, and breeding grounds for several threatened and endangered species as well as coastal marine species. The Slough and Creek also serve as habitats for approximately 100 species of wildlife including the federally listed as threatened California gnatcatcher, migratory birds, and raptors (City of Oceanside, 2013). Extensive urbanization along the coast has reduced these habitats and the public's ability to enjoy.

As shown in Figure 6, during the critical summer dry-weather period, the Slough experiences excess growth of algal mats, sometime stretching from bank to bank. At these times the Slough does not present a pleasant visual area and severely limits the public's ability to enjoy the activities such as sightseeing, aesthetic enjoyment of the water body, bird watching, picnicking, sunbathing and hiking.

FIGURE 6
VIEW OF LOMA ALTA SLOUGH DURING THE SUMMER DRY-WEATHER PERIOD
View to north. Photograph taken between the railroad bridge
and Pacific Coast Highway.

4.3 Causes of the Impairment

The loading of nutrients associated with non-storm water dry weather flows into the Slough, the effect of urban development and physical modification of the Slough, and the closing the mouth of the Slough due to sand accretion and berm buildup are the driving components in the eutrophication of the Slough. Phosphorus is the limiting factor in algal growth within the Slough (McLaughlin et al. 2011, CMA and SCCWRP 2013). While additional pollutants may be associated with the discharge of phosphorus, the TMDL addresses phosphorus as the causative pollutant for eutrophication.

The environmental processes that support estuarine and wetland habitats have been altered by urban development with an increase in volume of freshwater, an increase in runoff due to increased impervious cover, non-storm water flows, and an increase in nutrient loading. In addition, the ability of the Slough and Loma Alta Creek to assimilate nutrient loading is greatly diminished by the concrete lining and straightening of Loma Alta Creek to control flooding of urban properties within the Loma Alta Creek floodplain.

The management of both bacteria and eutrophication in the Slough can lead to opposing decisions to remedy each problem. Buccaneer Beach, which is adjacent to the mouth of Loma Alta Slough, is a popular swimming beach. The mouth of the Slough is typically closed during the swimming season which prevents bacterial contamination of the beach from the Slough and watershed. This management plan is detrimental to the Slough because the standing water does not circulate, and additional freshwater inflows, especially non-storm water flows during the critical summer months, from the watershed provide increased loading of nutrients. These conditions lead to excessive algae growth and biomass and low dissolved oxygen in the Slough. Reducing the non-storm water dry weather flows, which contain both bacteria and nutrients, from the watershed will reduce the management conflict within the mouth of the Slough as both concerns will be addressed.

The effect of an open berm on water levels and algal growth within the Slough and the Creek is shown on Figures 7a, 7b, 8a, and 8c. Figures 7a and 7b were taken at the same approximate location in July 2013 and October 2013, respectively. Figure 7a was taken when the berm was in place. Figure 7b was taken after the berm was open. Comparison of these two figures illustrates how water levels decreased. They also illustrate that the excessive algal growth occurs during the summer dry-weather period.

FIGURE 7A
LOMA ALTA CREEK IN JULY 2013
View to east (upstream). Photograph taken near Pacific Coast Highway

FIGURE 7B
LOMA ALTA CREEK IN OCTOBER 2013
View to east (upstream). Photograph taken at same approximate location as Figure 7A.

Figures 8a and 8b not only illustrate the effect of an open berm on the Slough but also how beneficial uses improve when the algal growth is reduced. Figures 8a and 8b were taken at the approximate same location in July 2013 and October 2013, respectively. Figure 8a shows the condition of the Slough when the berm is closed during the summer. The water level is high due to the closure of the Slough and algal mats cover most of the water area. Only one bird is seen in this photograph.

FIGURE 8A
LOMA ALTA SLOUGH IN JULY 2013
View to north. Photograph taken on the east side of the railroad bridge.

FIGURE 8B
LOMA ALTA SLOUGH IN OCTOBER 2013
View to north. Photograph taken at same approximate location as Figure 8A.

Figure 8b shows the condition when the berm is open. Water levels are lower and algal mats are not visible. Additionally, several birds, representing three species can be seen in the water. This condition also allows the public to enjoy the beneficial uses of the Slough.

5 NUMERIC TARGETS AND THE TOTAL MAXIMUM DAILY LOAD

A numeric target is an interpretation of existing water quality standards; it is not a water quality standard, and therefore, the process required when adopting such standards, including application of Water Code section 13241, does not apply (OCC, 2002). The Basin Plan's biostimulatory WQO is a narrative objective with a numeric interpretation. This TMDL uses a numeric target to translate that narrative objective.

5.1 Total Daily Maximum Load

The TMDL for Loma Alta Slough is the mass of phosphorus per month that the Slough is able to assimilate and still meet the numeric targets. Because phosphorus is the limiting pollutant for algal production within the Slough, the Slough TMDL is specific to phosphorus loading. Once those numeric targets are achieved the water quality of the Slough will be sufficient to support all designated beneficial uses. At that point the impairment due to eutrophic conditions will no longer exist and the Slough may be removed from the 303(d) list.

The phosphorus load that the Slough can assimilate is calculated by the San Diego Water Board to be 31.5 grams of phosphorus per month during the impairment period (May through October). The basis for this calculation is as follows:

1. Modeling conducted by Coastal Monitoring Associates and Southern California Coastal Waters Research Project (CMA and SCCWRP 2013) indicates that a 96.1 percent load reduction is needed to meet the numeric targets.

2. During the impairment period, flow into the Slough averaged 0.55 cubic feet per second (355,100 gallons per day) and the concentration of phosphorus entering the Slough averaged 0.02 mg/l (see MACTEC 2009, CMA and SCCWRP 2013). Using the flow and concentration data, the estimated existing phosphorus load into the Slough during the impairment period is 807 grams per month.

3. The TMDL is 31.5 grams per month. The TMDL was derived from the following calculation.

   (0.961 reduction) x (807 g/month) = 776 g/m reduction
   (807 g/month) – (776 g/month) = 31.5 g/month maximum load

5.2 Numeric Targets

The numeric targets were selected through a stakeholder process (see Section 5.2.3).

5.2.1 Potential Numeric Targets

There are several potential numeric targets applicable for eutrophication impairment, for example:

- The Basin Plan's WQO for dissolved oxygen can be a numeric target because it is a frequent symptom of eutrophication.
- The Basin Plan's WQOs for nitrogen and phosphorus can be potential numeric targets because they represent nutrients needed for macroalgae and phytoplankton growth, whose blooms often drive eutrophication.
- Macroalgae biomass and cover and phytoplankton biomass themselves are measurable biological symptoms of eutrophication that can be appropriate numeric targets.

The numeric biostimulatory WQOs in the Basin Plan are based upon the hydrologic status of the surface water. For standing bodies of water, the objective is 0.05 mg/l of total phosphorus and 0.5 mg/l of total nitrogen. For flowing bodies of water, the objective is 0.1 mg/l of total phosphorus and 1.0 mg/l of total nitrogen. The hydrological status of the Slough is variable and dependent upon precipitation events and the status of the sand berm at the beach.

5.2.2 Selection of Numeric Targets

The stakeholders selected macroalgal biomass and percent surface algal cover (also referred to as macroalgal mats) as numeric targets (Table 3). These numeric targets are a valid interpretation of the Basin Plan's WQOs for biostimulatory substances. These numeric targets are a function of the growth of macroalgae and their responses as primary producers to nutrient loading of the Slough and the resultant eutrophic condition.

These numeric targets represent alternative numeric targets to Basin Plan WQOs. The inclusion of alternative numeric targets is supported by the USEPA (Creager et al. 2006). Macroalgal blooms are well documented in the literature as primary indicators of eutrophic conditions and drive subsequent habitat type changes within estuaries (Valiela et al. 1997).

TABLE 3
NUMERIC TARGETS FOR LOMA ALTA SLOUGH EUTROPHICATION TMDL

Metric	Target	Season
Surface Water Macroalgal Biomass	Less than 90 grams dry weight per cubic meter	May through October
Surface Water Macroalgal Cover	Less than 50 percent	May through October

Macroalgal biomass and percent cover are ecological-based numeric targets suitable for coastal sloughs (Creager et al. 2006 and Sutula et al. 2007). The numeric targets of benthic biomass of less than 90 grams dry weight per cubic meter (g dw/m^3) and percent cover of less than 50 percent were the consensus of stakeholders through a process that included responsible parties, interested parties including non-governmental organizations, the USEPA, and the San Diego Water Board.

These values are scientifically founded in research conducted by the European Union Water Framework Directive[3] and by research documenting reference conditions and lowest observed adverse effects (see Sutula et al. 2012) for various ecological conditions. A moderate ecological condition was used for this analysis.

Ecological conditions represent a qualitative spectrum from very high to very low (see Table 4). The selection of a "Moderate Ecological Condition" is appropriate as it recognizes that due to historic hydromodification of the Loma Alta Creek and Slough pristine conditions of a "Very High Ecological Condition" could not be achieved, and there is a reasonable expectation that the Slough can attain a "Moderate Ecological Condition" and still support the designated beneficial uses.

TABLE 4
ECOLOGICAL CONDITIONS

Very High	Good	Moderate	Low	Very Low
Non-Eutrophic Nearly Undisturbed	Non-Eutrophic Slight Change in Composition and Biomass	Non- to Eutrophic Moderate Change in Composition and Biomass	Eutrophic Major Change in Biological Communities	Non-Eutrophic Severe Change in Biological Communities

[3] See CMA and SCCWP 2013 (Appendix 1) section 6.1.2 for a full discussion

While some level of uncertainty is present, the initial threshold of adverse effects is expected to lie between 30-90 grams dry weight per square meter (g dw/m^2), which has been converted to a volumetric value for the Slough. Table 5 presents the ecological condition classification,[4] expressed as a function of percent cover and biomass, used during the stakeholder process.

TABLE 5
MACROALGAL CONDITIONAL CLASSIFICATION
(SCANLAN ET AL. 2007, CMA AND SCCWRP 2013)

Biomass (g dw m^{-3})	Percent Cover				
	<5%	5% to 15%	15% to 25%	25% to 75%	> 75 %
>530	Moderate	Low	Very Low	Very Low	Very Low
175-530	Moderate	Moderate	Low	Very Low	Very Low
90-175	Good	Moderate	Moderate	Low	Low
10-90	Very High	Good	Good	Moderate	Low
<10	Very High	Good	Good	Moderate	Moderate

As specified in CMA and SCCWRP (2013), when levels of percent cover reach 50-80 percent cover, studies have found recreational activities to be undesirable. These multiple lines of evidence were discussed by the stakeholder group, which determined a worst case scenario of 90 g dw/m^3 and a percent cover of less than 50 percent would attain both a sufficient ecological condition and protect beneficial uses associated with recreation.

Nutrient concentrations were dismissed as numeric targets for the TMDL. Nutrient concentrations were modeled to determine if load reductions would be needed to meet the Basin Plan's numeric interpretation of the biostimulatory WQO. While nutrient concentrations and loading are critical indicators of eutrophication, they can be misleading when the samples are collected where, or downstream of where, algae are actively consuming nutrients. This condition was evident in the Slough during the summer of 2008 when some of the highest algal biomass levels found in the Southern California Bight was recorded in the Slough while surface water nutrient concentrations generally met the Basin Plan's numeric interpretation of the biostimulatory WQO (McLaughlin et al. 2011, CMA and SCCWRP 2013). Modeling confirmed this, finding no reduction in total phosphorus was needed for Slough waters to meet the Basin Plan's numeric interpretation of the biostimulatory WQO (CMA and SCCWRP 2013).

[4] Ecological conditions presented in Table 4 ranges from Very High to Very Low. Very High results in near pristine water quality conditions with the water body supports its beneficial uses and Very Low indicates a severely stressed water body that fails to support its beneficial uses.

Dissolved oxygen was also dismissed by the Stakeholder Group due to the following reasons.

1. The complexity of bar-built estuaries presents challenges of where, when, and how to measure dissolved oxygen to provide a reliable evaluation of estuary condition. For example:

    a. High macroalgal abundance can result in high levels of dissolved oxygen during peak periods of photosynthesis (D'Avanzo et al 1996).

    b. Relatively unimpacted bar-built estuaries will experience low dissolved oxygen levels in deeper areas due to gradients from residual saline waters (Largier et al. 1997, Sutula et al. 2012). As a result, where, when, and how to sample dissolved oxygen to best represent eutrophic conditions for the purpose of the Slough model is complex and would require additional assumptions.

2. No reference study for bar-built river mouth estuaries in southern California exists to determine appropriate parameters spatially and temporally by which to accurately model eutrophic conditions using dissolved oxygen.

5.2.3 Summary of Stakeholder Process in Development of the Numeric Targets

Numeric targets were developed through a collaborative stakeholder process that considered conditions specific to the Loma Alta watershed coupled with the latest scientific research. Between 2010 and 2012 discussions were held during stakeholder meetings where scientific information regarding the proposed numeric targets was presented.

Stakeholder meetings first focused on the analysis of historic and on-going monitoring data for the Loma Alta Slough related to all potential numeric targets, and how they might be applied or used as biostimulatory indicators in a TMDL setting. For example, at the June 22, 2010 meeting chlorophyll a data was discussed, and monitoring results showed chlorophyll a was an unlikely candidate due to a lack of phytoplankton within the system during impairment.

Analysis of Slough data showed that nutrients might not be a useful candidate in the context of the Basin Plan Objectives, and that a more refined target, such as macroalgae, was needed. Potential numeric targets considered at that point included nutrients, dissolved oxygen, and macroalgae.

The watershed and Slough models were validated for nutrients and eutrophication in 2012. Further stakeholder discussion was required to determine how to set and evaluate numeric targets for the purpose of the TMDL for model runs and scenario development. During the March 6, 2012 stakeholder meeting a consensus was reached on the macroalgal numeric targets used in this TMDL.

It was agreed that macroalgae constitutes a valid numeric target for the Slough, and further discussion and agreement was reached on specific macroalgal metrics, including weight/volume expression, sampling design for the target, and timing. Discussions were also held on the use, and issues, for dissolved oxygen and nutrients as numeric targets. While dissolved oxygen and nutrients were identified as numeric targets to run in the applicable models, several issues in their interpretation were identified for future discussion. Dissolved oxygen was also identified as having poor validation for watershed and Slough models. Table 6 presents the names of the Stakeholders and Participants present at the March 6, 2012 Stakeholder Meeting.

TABLE 6
STAKEHOLDERS AND PARTICIPANTS PRESENT AT THE MARCH 6, 2012 STAKEHOLDER MEETING

Name	Organization
Alison Witheridge	City of Oceanside
Alyssa Muto	NCTD (BRG Consulting)
Anthony Cotts	Weston Solutions
Chad Loflen	San Diego Water Board
Cindy Lin	USEPA Region 9
Con Contaxis	CalTrans
Cynthia Gorham	San Diego Water Board
David Pohl	Weston Solutions
JoAnn Weber	County of San Diego
Martha Sutula	SCCWRP
Mo Lahsaiezadeh	City of Oceanside
Paul Harman	City of Vista
Pei-Fang Wang	Coastal Monitoring Associates
Roshan Sirimanne	MACTEC
Scott Norris	County of San Diego

The use of dissolved oxygen and nutrients and numeric targets in the Slough model was discussed during the March 27, 2012 stakeholder meeting. The Stakeholders agreed that dissolved oxygen not be used as a primary numeric target, but be used in some format as a secondary indicator for Slough condition and improvement, pending improved understanding of reference condition and/or further model refinement. It was also agreed that nutrients be uses as numeric targets for compare with modeling done using macroalgal numeric targets.

The stakeholder group discussed the model results on August 29, 2012. For the macroalgae targets, phosphorus load reductions of over 90 percent were required to meet the numeric targets of macroalgal biomass and percent cover. In contrast, models showed that no load reduction was needed to meet a numeric target of phosphorus concentration in the Slough, as the numeric interpretation of the biostimulatory WQO was already being met.

Following the presentation of these results, the San Diego Water Board received a letter, dated September 13, 2012, from the City of Oceanside regarding the August 29, 2012 Stakeholder Meeting. The letter states that it represents the following Stakeholders: Cities of Oceanside and Vista, County of San Diego, and Caltrans (City of Oceanside 2012). The letter requests that that macroalgae not be used as a numeric target for TMDL development due to the level of uncertainty and lack of adoption or vetting of the State of California's Nutrient Numeric Endpoint process. The letter requests that the existing numerical interpretation of the Basin Plan's WQO for biostimulatory substances be used as numeric targets for the Slough.

While it would be convenient to rely on the numeric interpretations of the biostimulatory substances WQO, the science and evidence informing the original stakeholder agreement to use a biological indicator outweighs any uncertainty with the precision of the selected macroalgae numeric targets. Therefore, the numeric targets selected through the Stakeholder process are used in this TMDL. The rationale for this decision is as follows:

1. The science supporting the numeric targets was thoroughly reviewed and agreed upon by the Stakeholders.

2. The macroalgal condition used to set the numeric targets is reasonable. It represents "moderate conditions." The numeric targets do not require actions to restore the Slough to pristine conditions.

3. The consensus on the numeric targets was made based on the science and the outcome of reaching a moderate condition. It is improper to question the science and/or the expected outcome because of the required reductions in phosphorus loading.

4. The implementation plan for the TMDL requires the City to comply with existing Order No. R9-2013-0001, *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region* (Regional MS4 Permit) and effectively eliminate all non-storm water and illicit flows into the MS4. There should be no loading of phosphorus into the Slough during the summer dry season, and therefore the reductions would be required regardless of the selected numeric targets.

6 SOURCE ANALYSIS

Both point and non-point sources of phosphorus have been identified. Data analysis, modeling, and conclusions from the following references were used to make to make and support this conclusion.

- Investigative Order No. R9-2006-0076, *Owners and Operators of Municipal Separate Storm Sewer Systems, California Department of Transportation, Hale Avenue Resource Recovery Facility, and North County Transit District Responsible for the Discharge of Bacteria, Nutrients, Sediment, and Total Dissolved Solids into Impaired Lagoons, Adjacent Beaches, and Agua Hedionda Creek* (Lagoon Order);

- MACTEC 2009: *Carlsbad Hydrologic Unit Lagoon Monitoring Report. Prepared for the City of Carlsbad, City of Encinitas, City of Oceanside, City of San Marcos, City of Solana Beach, City of Vista, County of San Diego, California Department of Transportation, and the Hale Avenue Resource Recovery Facility;*

- City of Oceanside et al. 2011, *Technical Memorandum: Loma Alta Creek Watershed Wet Weather Definition;*

- McLaughlin et al. 2011: *Eutrophication and Nutrient Cycling in Loma Alta Slough, Oceanside, California. Technical Report 630*;

- CMA and SCCWRP 2013: *Watershed Loading, Hydrodynamic, and Water Quality Modeling in Support of the Loma Alta Slough Bacteria and Nutrient TMDL, Technical Report 666*; and,

- Tetra Tech 2013: *Loma Alta Creek DO Study Final Technical Memorandum May 2013.*

Additional data reviewed during the TMDL development included non-storm water MS4 outfall monitoring results collected by the City pursuant to Order Nos. R9-2009-0002, R9-2010-0016, and R9-2013-0001.

6.1 Point Sources

Point sources typically discharge at a specific location from pipes, outfalls, and conveyance channels from, for example, municipal wastewater treatment plants or MS4s. Current point source loading during the impairment period is estimated to be 787 grams per month of phosphorus (or 97.6 percent of the total load).

Point sources include non-storm water discharges from MS4 systems within the watershed (Figure 9). Monitoring data collected by the City under Order No. R9-2007-0001, shows that MS4 outfalls in the watershed are a significant source of flow and phosphorus to Loma Alta Creek. More recent inspections conducted by the San Diego Water Board also have confirmed dry season discharges of nutrient-enriched flows in the City's MS4 (San Diego Water Board, August 2, 2013).

Figure 9
Loma Alta MS4 Outfall with Non-Storm Water Discharge
Photograph Taken August 2013

The monitoring data collected by the City is also consistent with data analyzed under San Diego Water Board Order Nos. R9-2009-0002, R9-2010-0016, and R9-2013-0001, which found non-storm water discharges, specifically associated with inefficient landscape irrigation application, to be significant sources of pollutants to waters of the State. This is also consistent with a study conducted in an area of similar population and land uses in Orange County that measured nutrient discharges from landscaped areas (MWDOC 2008).

Other sources of irrigation runoff include areas where recycled water is discharged for landscape irrigation purposes. State Water Board Order No. 2009-0006-DWQ finds that nutrients are a pollutant of concern in recycled water and requires application that does not exceed the ability of landscape plants to use the nutrients, or discharge from the area of application. Runoff of landscape irrigation into the City's MS4 system is prohibited by Order No. R9-2013-0001, the Regional MS4 Permit.[5] And, discharges of irrigation runoff at Caltrans sites are prohibited by State Board Order No. 2012-0011-DWQ.

6.2 Non-Point Sources

Studies by the Cities of Oceanside and Vista have suggested that groundwater may be infiltrating into sections of the MS4 system. Concentrations of phosphorus detected in the suspected groundwater were reported to be below that found in MS4 discharges and below the numeric interpretation of the biostimulatory substances WQO (Tetra Tech 2013).

Order No. R9-2013-0001 requires the City to address groundwater infiltration into the MS4 system. To date, no source analysis for suspected groundwater discharges has been conducted near the Slough or upstream of the mass loading station.

Studies by the City of Oceanside[6] (see Tetra Tech 2013) stated that suspected groundwater discharges accounted for 20 percent of the total flow in a tributary downstream of the mass emission station. The suspected groundwater was reported to have an average phosphorus concentration of 0.038 mg/l, well below the Basin Plan's numeric interpretation of the Biostimulatory WQO of 0.1 mg/l. Non-storm water MS4 discharges from the City's storm drains and Loma Alta Creek receiving waters have shown phosphorus levels consistently between 0.1 and 0.5 mg/l, with some concentrations over 1.0 mg/L (City of Oceanside 2010, City of Oceanside 2012). That concentration level is at least one order of magnitude higher than that observed in suspected groundwater. The levels of phosphorus loading at the mass emission station are also over an order of magnitude higher than that found in potential groundwater sources Tetra Tech (2013).

Evidence to date fails to confirm that groundwater-based phosphorus has a significant impact, if any at all, on the eutrophication impairment of Loma Alta Slough.

[5] http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/docs/updates052313/2013-0523_Order_No._R9-2013-0001_COMPLETE.pdf

[6] The submitted groundwater studies were limited in scope and were not sufficient to meet the minimum requirements needed to determine the magnitude and extent of nutrients loading to the MS4 via groundwater. Additionally, the reports were not conducted under the direct supervision of a licensed Professional Engineer or Professional Geologist as required by the California Business and Professions Code. The raw data presented in these reports were used to calculate the TMDL and TMDL Allocations.

The San Diego Water Board also considers the groundwater investigation reported in Tetra Tech 2013 to be insufficient to demonstrate that significant amount of the phosphorus loading from the MS4 is from uncontrollable groundwater sources. The San Diego Water Board expects that the City will conduct future groundwater studies to determine the impact of phosphorus loading via groundwater infiltration to the MS4.

The Tetra Tech 2013 investigation did not cover the entire tributary of Loma Alta Slough, did not attempt to identify whether the sampled "groundwater" was groundwater infiltrating into the MS4 system or surface water entering the MS4 system, and did not account for all observed flows within the channel. In addition, no groundwater source investigations have been conducted for flows at or above the mass emission station. Furthermore, as required by the California Professions Code[7], the study was not done under the direct supervision of a licensed Professional Engineer or Professional Geologist.

While the groundwater data is considered by the San Diego Water Board to be highly limited in scope and duration, it is the only data available for non-point sources. Consequently, the following conservative assumptions were used when estimating the load allocation:

- The lower tributary is representative of the entire watershed's groundwater source loading and concentration; and

- All observed groundwater flows are naturally occurring.

Using an estimate of groundwater contributing 20 percent of the flow at 10 percent of the point source concentration level of monitored MS4 discharges, the existing non-point source loading is estimated as no greater than 2 percent of the existing total load, or 16.4 grams per month, of phosphorus during the impairment period.

Lastly, in its letter dated September 13, 2012, the City recommends using an implicit margin of safety to account for potential groundwater sources while further running models with the addition of groundwater sources. The letter also acknowledges that additional data collection on groundwater is needed. Indeed, there is a lack of groundwater data and further need for identification of contributions in a future modeling scenario. The model could be re-run in the future after additional groundwater data is collected.

[7] California Business and Professions Code sections 6730, 6730.2, 6735, and 7835.

6.3 Other Sources

TMDL-related source investigations identified the MS4 system and potentially groundwater as the only two sources of nutrients into the Slough during the dry-weather season. There are a number of other potential sources, including ones with NPDES permits and others with discharge prohibitions. None of the permitted discharges are considered to be significant sources of phosphorus in the dry season impairment period. Similarly, none of the prohibited discharges, other than ones from the MS4 system, are considered significant sources at this time. The following sections describe how existing permits have adequate requirements and effluent limitations to achieve water quality objectives that support the beneficial uses of the Slough.

6.3.1 Existing Permits with Effluent Limitations and/or Prohibitions

The following is a list of the water board permits that regulate potentially significant sources of phosphorus in the watershed. Each of these permits includes control limits sufficient to protect water quality within Loma Alta Slough.

1. *Municipal Storm Water Permit (Order No. R9-2013-0001)*

   Order No. R9-2013-0001 prohibits non-storm water discharges into the MS4s. Pursuant to CWA 402(p)(3)(B)(ii), MS4 permits must include a requirement to effectively prohibit non-storm water discharges into the MS4s unless specifically exempted and not a source of pollutants. Non-storm water discharges resulting from over-irrigation have been found to be a source of several types of pollutants (e.g., nutrients, bacteria, pesticides, sediment) in receiving waters. Under Order No. R9-2013-0001, the San Diego Water Board and the MS4 Copermittees have identified categories of non-storm water discharges associated with over-irrigation as a source of nutrients, including phosphorus and nitrogen, to the MS4 and waters of the United States. Over-irrigation discharges are no longer considered conditionally-exempted municipal storm water discharges. Dry weather flows from the MS4 into Loma Alta Creek and the Slough are prohibited unless specifically exempted, and not a source of pollutants.

2. *Caltrans Storm Water Permit (Order No. 2012-0011-DWQ)*

   This NPDES permit includes a requirement to effectively prohibit non-storm water discharges into the MS4s. In addition, this Order requires Caltrans to design all landscapes to comply with the California Department of Water Resources Water Efficient Landscape Ordinance. Where the California Department of Water Resources Water Efficient Landscape Ordinance conflicts with a local water conservation ordinance, the Department shall comply with the local ordinance (see section 6.3.2 for a summary of local ordinances).

3. *WDRs for the Use of Reclaimed Water by the City of Oceanside (Order No. 93-07)*

   This order regulates use of recycled water by the City of Oceanside. Provision D.i prohibits reclaimed water used for irrigation from leaving the property on which it is applied.

4. *WDRs for Use of Recycled Water (Order No. 2009-0006-DWQ)*

   This order regulates the use of recycled water in the watershed, which includes use for irrigation at sites such as certain Caltrans facilities. This Order prohibits non-incidental discharges of recycled water.

5. *Hydrostatic Testing and Potable Water (Order No. R9-2010-0003)*

   This NPDES permit regulates discharges of hydrostatic test water and potable water to surface waters and storm drains or other conveyance systems within the San Diego region. Potable water is not a suspected significant source of phosphorus.

6. *Groundwater Extraction (Order No. R9-2008-0002)*

   This NPDES permit regulates groundwater extraction and similar discharges to surface waters within the San Diego region except for San Diego Bay. It requires effluent to comply with the discharge limits that are protective of water quality. Enrollees are typically temporary construction sites that require excavation and dewatering. There are no permanent dewatering discharges regulated by this permit in the Loma Alta watershed. Since 1996, there has only been one discharge that has violated the permit's discharge criteria by more than 40 percent.

7. *Construction Storm Water Permit (Order No. R9-2009-0009-DWQ)*

   This is the NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities. Non-storm water discharges, other than potable water line flushing are generally prohibited. Potable water is not a suspected significant source of phosphorus. Potable water line flushing is subject to technology-based BMP requirements to meet water quality standards.

8. *Sanitary Sewer Collection Systems (State Water Board Order No. 2006-0003-DWQ and San Diego Water Board Order No.R9-2007-0005)*

   These orders establish waste discharge requirements for sanitary sewer collection systems. Both prohibit the discharge of untreated sewage to waters of the State. The San Diego Water Board Order further prohibits the discharge of untreated sewage at any point upstream of a sewage treatment plant. Records of spills in the Loma Alta Slough watershed are available on-line at:

   http://www.waterboards.ca.gov/water_issues/programs/ciwqs/publicreports.shtml#sso

Aside from dischargers regulated by the MS4 permit, none were identified as a significant source of phosphorus to the Slough during the summer impairment period. Most other discharges are of infrequent duration (e.g., sewage spills) or occur outside of and do not affect the seasonal impairment (e.g., storm water).

Furthermore, no evidence has been provided to the San Diego Water Board to indicate that there are any other point sources in Loma Alta Watershed, permitted or otherwise, that are discharging significant loads of nutrients during the impairment period.

6.3.2 City of Oceanside's Water Efficient Landscape Regulation

The City's Ordinance No. 10-OR0412-1 (adopted in May 2010)[8] amends Chapter 37 of the Oceanside City Code by including Article VII – Water Efficient Landscape Regulation. This Ordinance includes specific water saving requirements for new construction, and prohibits irrigation runoff from entering the City's MS4.[9]

7 LINKAGE ANALYSIS

The elimination of anthropogenic loading of nutrients, consistent with existing permit requirements, will encourage the restoration of degraded areas, prevention of excessive algae buildup, and the resulting eutrophication within the Slough. The linkage between source contributions and receiving water response was documented by, models that simulate source loadings and transport of nutrients into the Slough and associated algal response (CMA and SCCWRP 2013). The models provide an important tool to evaluate algal response in multiple scenarios and to calculate TMDL load reductions. This provides the linkage between pollutant loading from identified sources and the response of the water body. Modeling demonstrating the linkage can be found in CMA and SCCWRP 2013.

[8] http://www.waterconservationsummit.com/Oceanside_Water_Efficient_Landscaping_Ordinance_10-OR0412-1.pdf

[9] Section 37.137.a, states that "no person shall use water for irrigation that due to runoff, low head discharge, overspray or other similar condition, water flows onto adjacent property, non-irrigated areas, structures, walkways, roadways or other paved areas."

The Slough has been altered into a confined river mouth estuarine system that cannot assimilate current anthropogenic loading. The Slough exhibits classic symptoms of channel modification (see Avoine 1986, Kennish 2002, Zaikowski et al. 2008), which include a lack of sedimentation, reduced freshwater residence time, and seaward migration of salinity.

7.1 Wet Weather Loading of Phosphorus is not a Primary Contributor to the Summer-Dry Season Eutrophic Conditions in the Slough

McLaughlin et al. (2011) determined that wet weather accumulation and deposition of organic material and sediment is not a potential contribution as a “source” of phosphorus for dry weather algal blooms. This is critical to develop management strategies because organic matter and sediment deposited during the wet weather period can, in other systems, provide additional nutrient loading and promote low dissolved oxygen conditions during impairment periods.

To determine the significance of benthic contributions to the dry weather impairment, McLaughlin et al. (2011) examined sediment bulk characteristics, solid phase and pore water nutrients, and Berylium-7 radioisotope on a seasonal basis. Results found wet weather benthic contributions of nutrients to be low, as was sediment percent fines and organic carbon. Sediment oxygen demand was low during all seasons. Despite some of the highest biomass of macroalgae documented in southern California, this biomass did not accumulate in Slough sediments from season to season.

The historic conversion of the Slough to a river mouth estuary reduces sediment retention and organic deposition within the Slough during storm events, actually making the Slough **less** (emphasis added) susceptible to eutrophication than prior to development when the berm is not in place (McLaughlin et al. 2011). Slough eutrophication and co-occurring hypoxia were found to be driven primarily by “new” nutrients rather than “recycled” nutrient efflux from the sediments. The closing of the mouth Slough during the dry season prevents tidal flushing, and coupled with the existing dry weather loading, creates the condition that promotes algal growth and the resulting eutrophic condition.
Modeling has determined that reducing point source watershed loads will provide an appropriate hydrologic balance for the Slough (CMA and SCCWRP 2013). Reduction of dry weather loading will reduce the amounts of nutrients entering the Slough which will reduce algal biomass and cover, and increase the trophic productivity of the Slough.

7.2 Phosphorus Loading from Non-Storm Water Discharges to the MS4 is the Primary Contributor to the Summer-Dry Season Eutrophic Conditions in the Slough

Phosphorus is the limiting factor for macroalgal production, and watershed loads are the primary source of phosphorus loading.[10] The dominant source of phosphorus loading from the watershed to the Slough is non-storm water discharges from the City's MS4 system. The City's monitoring effort has found non-storm water discharges to contain high concentrations and loads of phosphorus, with some discharges containing orthophosphate-P concentrations over 2.4 mg/L (City of Oceanside 2010, 2012). Non-storm water discharges from the MS4 into receiving waters, including discharges causing eutrophic conditions, were observed during an August 2013 inspection by the San Diego Water. The San Diego Water Board has not received any data that shows other NPDES and/or Waste Discharge Requirement point sources in the watershed are violating permit requirements and contributing to the impairment of the Slough.

Investigations conducted between 2007 and 2012, when the City's non-storm water discharges to the MS4 were regulated under NPDES Order No. R9-2007-0001 (2007 MS4 Permit), confirmed the impairment of the Slough. While the 2007 MS4 Permit required the City to effectively prohibit all types of non-storm water discharges, certain categories of non-storm water discharges were not prohibited unless identified by the Copermittee or the San Diego Water Board as a source of pollutants.

The 2007 MS4 Permit also required the City to have a non-storm water *Illicit Discharge/Illicit Connection Detection and Elimination Program* (IC/ID Program) to educate staff and the public, conduct non-storm water monitoring, and take necessary actions to prevent and stop unpermitted non-storm water MS4 discharges. Under this program the City found "the prevailing source of historical ponded and flowing water is from residential and commercial over-irrigation" (City of Oceanside 2010). The program found the majority of staff and public IC/ID Program complaints were related to irrigation. Figure 10 presents the distribution of these complaints.

[10] Microgalgae also is a primary producer that can contribute to the condition of eutrophication as does macroaglae. Because the Numeric Targets have been set using macroaglae as a biological indicator of the health of the waterbody the analysis presented is based on the growth of macroalgae.

Figure 10
City of Oceanside IC/ID Urban Runoff Hotline Calls 2009-10

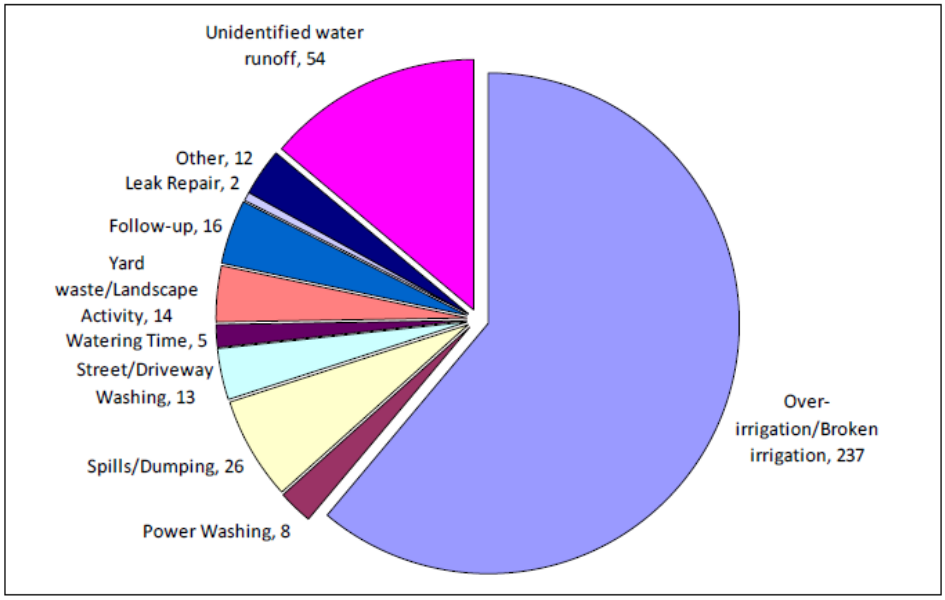

Figure 7-1. Summary of Urban Runoff Hotline Calls during the 2009-2010 Reporting Year.

7.3 The Regional MS4 Permit Provides Additional Prohibitions against Non-Storm Water Discharges to the MS4 and Provides the Mechanism for the City to Identify and Terminate Prohibited Discharges

Order No. 2013-0001 (Regional MS4 Permit) was adopted by the San Diego Water Board in May 2013 to replace the 2007 MS4 Permit. The Regional MS4 Permit removes several categories of non-storm water discharges, including landscape irrigation, irrigation water, and lawn watering, from prohibition exemptions. As described in the Regional MS4 Permit, the San Diego Water Board and MS4 Copermittees have identified these non-storm water discharges as sources of nutrients to receiving waters in the San Diego Region.[11] The Regional MS4 Permit states:

"Elevated dry-weather storm drain flows, composed primarily … of landscape irrigation water wasted as runoff, carry pollutants that impair recreational use and aquatic habitats all along Southern California's urbanized coastline. Storm drain systems carry the wasted water, along with landscape derived pollutants such as bacteria, nutrients and pesticides, to local creeks and the ocean. Given the local Mediterranean climate, excessive perennial dry season stream flows are an unnatural hydrologic pattern, causing species shifts in local riparian communities and warm, unseasonal contaminated freshwater plumes in the near-shore marine environment."

[11] See Attachment F, Section VIII.E of Order No. 2013-0001

The Regional MS4 Permit removes the prohibition exemption for these discharges, and requires more stringent non-storm water programs to investigate and eliminate non-storm water discharges. For example, under the 2007 MS4 Permit the City used an "action level" by which they would conduct follow-up investigation of non-storm water discharges. The 2007 MS4 Permit action level for orthophosphate-P was 2.0 mg/L, a level that well exceeds the Basin Plan's numeric interpretation of the WQO of total phosphorus of 0.1 mg/L. The Regional MS4 Permit's removal of exempted categories and its more explicit monitoring and response requirements provide a reasonable assurance that loading to the Slough will be reduced and the impairment restored.

The Regional MS4 Permit also requires the City to monitor non-storm water discharges and track reductions over time as part of its Water Quality Improvement Plans. The Regional MS4 Permit states:

> "The Copermittees must develop and conduct a program to monitor the discharges from the MS4 outfalls in each Watershed Management Area during dry weather and wet weather. Following San Diego Water Board acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct MS4 outfall discharge monitoring during implementation of the Water Quality Improvement Plan to assess the effectiveness of their jurisdictional runoff management programs toward effectively prohibiting non-storm water discharges into the MS4…"

The Water Quality Improvement Plan, which is required to be submitted to the San Diego Water Board by June 2015, requires Copermittees to develop Water Quality Improvement Goals, Strategies and Schedules to improve water quality. Numeric goals must be incorporated into the plan and used to assess progress. The Water Quality Improvement Plan must also provide a schedule with interim and final dates for achieving numeric goals, and serves as a mechanism for the City to demonstrate compliance with the Regional MS4 Permit and restoration of Slough's Beneficial Uses.

Lastly, section D.2.a of the Regional MS4 Permit requires the City to conduct Transitional MS4 Outfall Discharge Monitoring while the Water Quality Improvement Plan is being developed. The Transitional MS4 Outfall Discharge Monitoring requires the City to inventory its MS4 outfalls and conduct field screening and monitoring in order to begin the identification and prioritization process for non-storm water discharges in the Loma Alta Watershed. At the February 20, 2014, Loma Alta TMDL stakeholder meeting, City staff stated that the transitional monitoring was already underway and that new MS4 discharges and outfalls in the watershed had been identified.

8 MARGIN OF SAFETY

An implicit Margin of Safety (MOS) is used in the TMDL calculation. The use of an implicit MOS is acceptable because of the conservative assumption, the closed slough mouth due to the sand berm during the summer-dry season, used in the model to calculate load reductions. This is a worst-case condition because it allows for no flushing of the Slough with ocean water and continued loading of nutrients from non-storm water discharge into the Slough from the MS4 during the critical summer dry-

weather season. This is the critical season for algal growth and the resulting eutrophication when atmospheric conditions (i.e. length of day, sun angle, and air and water temperature) results in increased algal growth. Furthermore, using an alternative MOS would not affect the load allocations currently needed to meet the 96.1 percent reduction in phosphorus loading to the Slough.

8.1 Consideration of Future Development in the Loma Alta Watershed

Future development in the Loma Alta Watershed could result in changed conditions affecting the loading of nutrients into the MS4 and could be accounted for in the MOS. There are two existing regulatory instruments that contain prohibitions against non-storm water discharges from entering the MS4 System.

1. The Regional MS4 Permit requires new and re-development to include design plans to effectively eliminate non-storm water discharges, with associated nutrient loads, into the MS4.

2. The City's Ordinance No. 10-OR0412- Water Efficient Landscape Regulation requires all new developments be designed and constructed to minimize the use of irrigation water and pursuant to Sec. 37.137.a, prohibits the use of water for irrigation that due to runoff, low head drainage, overspray or other similar condition flows onto adjacent property, non-irrigated areas, structures, walkways, roadways or other paved areas, and prohibits the discharge if irrigation water from flowing.

Therefore, the MOS does not need to address future growth in the Loma Alta Watershed because future development would not have a significant effect on loading of nutrients in the MS4.

9 SEASONAL VARIATIONS AND CRITICAL CONDITIONS

Allocations and reductions are limited to the summer dry-season, May through October, seasonal time period as described in earlier sections. The TMDL can be exceeded during the wet season while the Slough and Ocean are exchanging water via natural hydrologic connections (i.e., tides, waves, and surface flows between the Slough and the Ocean). This does not affect existing permit limitations, nor imply that existing requirements should be relaxed during the wet season.

10 LOAD ALLOCATIONS AND REDUCTIONS

Load Allocations and necessary reductions were calculated using water quality data collected from 2008 – 2011 and the Slough modeling results (MACTEC 2009, CMA and SCCWRP 2013). The assimilative capacity and resulting allocations are based upon a modeled scenario featuring sand berm closure during the dry-weather season. This is a worst-case condition as it allows for no flushing of the Slough with ocean water and continued loading of nutrients from non-storm water discharge into the MS4.

Modeling under a scenario in which the berm was open would likely result in a higher TMDL for phosphorus during the dry-weather season. Therefore, a recalculation of the TMDL may be warranted in the future when the risk of pathogen effects to recreational beach users diminishes and if actions may be taken to maintain an open berm during the summer-dry season which would effectively increase tidal flushing of the Slough.

The phosphorus TMDL during the summer season is 31.5 grams per month. This value was calculated using water quality data collected in 2008 and 2011 and Slough monitoring. During the summer-dry season an estimated 807.46 grams of phosphorus enters the Slough each month. Modeling results indicate that a 96.1 percent reduction of existing flow, and thus existing loading, is needed to meet the Numeric Target during summer closure. Therefore, 3.9 percent of the existing mass load of phosphorus, 31.5 grams per month, is available for allocation to point and nonpoint sources. The allocation was derived by first giving the existing estimated natural groundwater loads a contribution. The remaining assimilative capacity was then assigned to waste load allocations.

TABLE 7

ALLOWABLE PHOSPHORUS LOADING FOR LOMA ALTA SLOUGH EUTROPHICATION TMDL DURING THE DRY SEASON IMPAIRMENT MAY THROUGH OCTOBER

Allocation/Source	Year 2008 Monthly Loading (grams/month)	Percent Reduction Required	Allowable phosphorus Loading (grams/month)
Load Allocation - Groundwater	19.70	0	16.4
Waste Load Allocation -NPDES permits and WDRs	787.76	98.51	15.1
Margin of Safety	Implicit	Implicit	n/a
Total	**807.46**	**96.1**	**31.5**

10.1 Allowable Phosphorus Loading - Groundwater

The allowable phosphorus loading from groundwater is 16.4 grams/month. This represents the best estimate of current loading via groundwater to the Slough. Because rising groundwater can be a natural background source, load reductions are not required for natural uncontaminated rising groundwater within surface waters. These calculations are based upon the assumptions by the City that its monitored flows were groundwater (Tetra Tech 2013).

Because the estimates of natural sources of flow and nutrients from groundwater is based on limited information, additional investigations could help to better understand and quantify the amount of groundwater loading that can be included in the load allocation. Consistent with Regional MS4 Permit requirements to investigate persistently flowing storm drains, the City is expected to conduct additional and more robust groundwater investigations that could better quantify the load allocations assigned to groundwater.

10.2 Allowable Phosphorus Loading – NPDES Permits and WDRs

The allowable phosphorus loading from NPDES permits and WDRs is 15.1 grams/month. Existing NPDES permits and WDRs authorize the discharge of nutrients directly or indirectly into the Slough. These permits are protective during the impairment period, however, because they typically either prohibit the discharge of dry-weather (i.e., non-storm water) flows or require water quality-based numeric effluent limitations, generally derived from the California Toxics Rule. Other pollution control requirements effectively prohibit potential sources.

10.3 Load Reductions and Other Considerations

Compliance with current permit requirements will attain and maintain the allowable phosphorus loading. The existing load is well over the required 15.1 grams per month. The MS4 has been identified as the only significant point source of nutrients to the Slough during the dry season. Non-storm water dry weather discharges are generally prohibited by the existing MS4 Permit requirements (Order No. R9-2013-0001). However, other regulated potential discharges, should they occur during the seasonal impairment period, are subject to regulatory requirements stringent enough to address the impairment of the Slough.

The estimation of phosphorus loading into the Slough from groundwater, which impacts the WLA estimation, was based on a limited study. Additional source investigation, including the estimation of phosphorus loading from groundwater in the upper watershed, would be useful to refine the assumptions and verify the load allocation.

The Loma Alta watershed has been highly modified by development, with extensive losses of estuarine habitat during the 1950s and early 1960s through fill and channelization, and modification of the upstream riparian cover (Tetra Tech 2013). This partially influenced the stakeholder group's decision to establish a "moderate," rather than "good" or "very good," condition target. Nonetheless, the historic loss and modification of aquatic and floodplain habitat within the Loma Alta watershed may limit the Slough's assimilative capacity even when the load reductions are realized. Should that be demonstrated, then other measures, such as habitat restoration within the Slough and watershed or changes to the active management of the sand berm may be necessary to provide capacity to achieve the numeric target.

11 IMPLEMENTATION, MONITORING, AND COMPLIANCE

The source analyses identified the MS4 system and groundwater as the two sources contributing nutrients into the Slough. Because the current MS4 permit contains control limits adequate to achieve the WLA, no modifications to its discharge limits are necessary to meet the TMDL. The numeric targets should be met as soon as the City eliminates controllable dry-weather sources of phosphorus in its MS4. Once the numeric targets are met, the San Diego Water Board will take the necessary actions to delist the Slough from the 303(d) list for eutrophic conditions.

The Regional MS4 Permit provides the regulatory structure that allows the reclassification of 303(d) listed waterbodies from Category 5 (evidence shows at least one use not supported and a TMDL is needed) to Category 4b (evidence shows at least one use not supported, but a TMDL is not needed as an *existing regulatory program is expected to result in the attainment of the water quality standard within a reasonable, specified time frame [italic added for emphasis]*).

Impaired water bodies can be included in Category 4b if there are acceptable "pollution control requirements" required by a local, state or federal authority stringent enough to implement applicable water quality standards within a reasonable period of time (e.g., a compliance date is set). When evaluating whether a particular set of pollution controls are "requirements," the USEPA considers a number of factors, including:

a. The authority (local, state, and federal) under which the controls are required and will be implemented with respect to sources contributing to the water quality impairment (examples may include: self-executing state or local regulations, permits, and contracts and grant/funding agreements that require implementation of necessary controls).

c. Existing commitments made by the sources and completion or soon to be completed implementation of the controls (including an analysis of the amount of actual implementation that has already occurred).

d. The certainty of dedicated funding for the implementation of the controls.

e. Other relevant factors as determined by USEPA depending on case-specific circumstances.

Water Quality Improvement Plans require the implementation of pollution controls and water quality management actions which will result in the attainment of water quality standards in water bodies impaired by discharges from the Copermittees' MS4s. Water Quality Improvement Plans also include requirements that are expected to attain water quality standards in a reasonable period of time.

Water Quality Improvement Plans are a commitment by the *Copermittees to develop, plan, budget for, and implement pollution controls that will attain water quality standards in receiving waters in a reasonable period of time, or as soon as possible [italic added for emphasis]*. The results of the Copermittees' efforts in implementing the Water Quality Improvement Plans can be used to re-evaluate the condition of the impaired water bodies during the next update to the 303(d) List.

11.1 Implementation

The San Diego Water Board began development of a TMDL in 2006 for the eutrophication impairment in Loma Alta Slough. In May 2013, the Board reissued a revised municipal storm water permit, Order No. R9-2013-0001, which will result in the desired environmental outcome for Loma Alta Slough by 2023. Therefore, the Board will postpone concluding the TMDL in favor of the prohibitions and approach specified in Order No. R9-2013-0001.

The TMDL can be achieved by focusing on identifying and eliminating controllable and illicit dry-weather sources of phosphorus discharging into the City of Oceanside's MS4, which can include groundwater discharges into the MS4, and discharges from the MS4 to the Loma Alta Slough watershed. These actions are required by Order No. R9-2013-0001 (Regional MS4 Permit).

Provision II.A.1.b of the Regional MS4 Permit, states that "non-storm water discharges into the MS4s are to be effectively prohibited, through the implementation of Provision E.2, unless such discharges are authorized by a separate NPDES permit." Pursuant to Section II.E.2, the City must implement a program to actively detect and eliminate illicit discharges into the MS4. Provision II.E.2.a requires the City to address all non-storm water discharges as illicit discharges unless a non-storm water discharge is either identified as a discharge authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that must be addressed according to specific requirements.

Pursuant to Provision II.E.2.a.(3), groundwater infiltration into the MS4 must also be addressed as an illicit discharge if either the City, or the San Diego Water Board, identifies the discharge as a source of pollutants to receiving waters. Tetra Tech (May 2013) concluded that groundwater phosphorus loading via groundwater occurs. Therefore, groundwater discharges identified as a source of phosphorus into the MS4 may also need to be addressed as illicit discharges and eliminated.

Additional investigations by the City are necessary to determine the portion of flows discharging from its MS4 system that are uncontrollable and/or unpolluted groundwater sources. With that information, the City will be able to focus its illicit discharge and detection program on the sources driving eutrophication in Loma Alta Slough.

11.1.1 Means of Compliance – Compliance with Existing Permits

The Regional MS4 Permit includes several requirements for the City to comply with, including the prohibitions against non-storm water discharges and illicit discharges. Pursuant to Provision II.E.2 - Illicit Discharge Detection and Elimination, the City is required to implement a program to actively detect and eliminate illicit discharges into the MS4. Specific requirements include:

- Provision II.E.2.d.(2): The City must implement procedures to investigate and inspect portions of its MS4 that, based on reports or notifications, field screening, or other appropriate information, indicate a reasonable potential of receiving, containing, or discharging pollutants due to illicit discharges, illicit connections, or other sources of non-storm water.

- Provision II.E.2.d.(3): The City must initiate the implementation of procedures, in a timely matter, to eliminate all detected and identified illicit discharges and connections within its jurisdiction.

- Provision II.E.2.d.(3)(b): If the City identifies the source as a controllable source of non-storm water or illicit discharge or connection, the City must implement its Enforcement Response Plan pursuant to Provision E.6 of the Regional MS4 Permit and enforce its legal authority to prohibit and eliminate illicit discharges to its MS4.

  The Regional MS4 Permit also includes requirements for the City to participate in the development and implementation of a plan to improve water quality in its MS4 discharges and receiving waters within the Carlsbad Watershed Management Area. The mechanism for this action is the preparation of a Water Quality Improvement Plan (Provision II.B). The purpose of the Water Quality Improvement Plan is to further the Clean Water Act's objective to protect, preserve, enhance, and restore the water quality and designated beneficial uses of waters of the United States. Specific requirements include:

  - Provision II.B.2(d): The City must identify known and suspected sources of storm water and non-storm water pollutants and/or other stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified in Provision B.2.c of the Regional MS4 Permit.

  - Provision II.B.3: The City must identify potential strategies that can result in improvements to water quality in MS4 discharges and/or receiving waters within the Watershed Management Area.

11.1.2 Means of Compliance – Loma Alta Slough Monitoring[12]

Development and implementation of a Loma Alta Slough Monitoring Program (Slough Monitoring Program) is needed to assess the attainment of the numeric targets and TMDL, and must be included in the Water Quality Improvement Plan. The Slough Monitoring Program must provide (1) documentation that the required loading reductions are achieved, and (2) confirmation that the numeric targets and TMDL are met. The Slough Monitoring Program must be designed to answer the following monitoring questions:

1. Are watershed flows and the loading of phosphorous to the Slough reduced to levels required to meet the macroalgal numeric targets?

2. Are the numeric targets for macroalgal cover and biomass in the Slough achieved?

The tasks needed to conduct the Monitoring Program will be developed by the City and submitted with the Water Quality Improvement Plan to the San Diego Water Board for review. A likely scope of work to answer the monitoring questions may include:

1. A Slough Monitoring Work Plan and Quality Assurance Project Plan.

2. A minimum of two 75 meter long transects to assess macroalgal cover.

3. Monitoring of watershed loading into the Slough.

4. Monitoring dissolved oxygen within the Slough.

5. Submittal of annual monitoring reports.

6. Conducting the Slough Monitoring Program for a minimum of seven years.

A cost estimate was developed based on the assumption presented above. The actual cost will be based on the scope of work developed by the City. Table 8 provides a summary of the anticipated costs.

[12] Further discussion on the Slough Monitoring Program is included in section 12.1

TABLE 8

ESTIMATED COSTS ASSOCIATED TO DEVELOP AND CONDUCT SLOUGH MONITORING

Task	Estimated Yearly Monitoring and Reporting Cost	Estimated Cost for Eight Years of Monitoring and Reporting
Prepare Workplan and QAPP	One Time Cost	$9,370
Field Work	$10,800	$86,400
Laboratory Analysis, Materials, Supplies	$5,319	$42,552
Report Preparation	$13,580	$108,640
Estimated Total	$29,699	$246,962

The information provided by the Slough Monitoring Program will be used by the City to evaluate the effectiveness of its efforts to eliminate non-storm water discharges into the MS4 during the summer-dry season, develop cost-effective plans to eliminate the prohibited flows into the MS4, and take any actions to achieve the numeric targets for the Slough.

11.1.3 Means of Compliance – Process for Revising the TMDL

The TMDL calculations and milestones may be revised following the San Diego Water Board's approval of amendments to the Water Quality Improvement Plan.

11.1.4 Means of Compliance – Other Considerations

Compliance with the existing conditions of Order No. R9-2013-0001 will restore the beneficial uses of the Slough through the elimination of non-storm water and illicit discharges into the MS4. However, the City could consider taking additional actions to restore the water quality within the Slough to allow the public to fully enjoy the designated beneficial uses. To this end, the City is encouraged to explore additional actions such as:

- Maintaining an open connection between the Slough and the ocean. This will allow for healthy flushing of the Slough and allowing nutrient laden water from flowing out of the Slough. This management action may be inconsistent with the City's action to address indicator bacteria in the Slough. To address the indicator bacteria the intake of the FETD could potentially be relocated to allow treated water to be discharged in the Slough and flow to the ocean.

- Restoring and/or creating wetlands to restore the natural assimilative capacity.

- Algae harvesting to reduce the macroalgal biomass and percent cover within the Slough.

12 Schedule

A detailed schedule for the implementation of the TMDL and attainment of the numeric targets has been developed by the San Diego Water Board using input from the City.[13] Additional specificity, including additional milestones will be provided in the Water Quality Improvement Plan to be submitted by the City. The schedule of activities needed to achieve the numeric targets by 2023 are presented on the following Table.

TABLE 9
SCHEDULE

Activity	*Year*
City continues implementation of current programs addressing non-storm water discharges under the MS4 Permit	2014
City develops Goals, Strategies, and Schedules for the Water Quality Improvement Plan that are aligned with the draft TMDL Report	
Submission of the Water Quality Improvement Plan goals, strategies, and schedules to the San Diego Water Board	2015
Updates to the City's Jurisdictional Runoff Management Program (JRMP) to implement Water Quality Improvement Plan Strategies	
Submission of Water Quality Improvement Plan, include the Loma Alta Slough Monitoring Plan	
San Diego Water Board approval of the Water Quality Improvement Plan	
City begins implementation of the strategies in the Water Quality Improvement Plan through revised JRMP	2016
City implements Monitoring Program for Slough – Year 1	
Submission of Water Quality Improvement Plan Annual Report for FY15-16 (includes the Annual Monitoring Report for Loma Alta Slough)	2017
City implements Monitoring Program for Slough – Year 2	
City implements JRMP in support of Water Quality Improvement Planning strategies	
Development and Submission of the Report of Waste Discharge under the MS4 Permit (all San Diego Copermittees)	
Submission of Water Quality Improvement Plan Annual Report for FY16-17 (includes the Annual Monitoring Report for Loma Alta Slough)	2018
Assessment of progress towards meeting the interim numeric goals developed in the Water Quality Improvement Plan	
City and San Diego Water Board assesses effectiveness of actions to date (including potential revisions to numeric goals (Table 1), strategies, responsible parties, and schedules)	
Renewal of Order R9-2013-0001	
City implements Monitoring Program for Slough – Year 3	

[13] Comment Letter – Tentative Investigative Order No. R9-2014-0020, prepared by the City of Oceanside, dated May 5, 2014.

Activity	*Year*
City implements JRMP in support of Water Quality Improvement Planning strategies	
City continues implementation of Monitoring Plan, Water Quality Improvement Plan Strategies, and JRMP	2019 – 2022
Continued Water Quality Improvement Plan Annual Reporting (including the Annual Monitoring Report for the Slough)	
Projected attainment of Final Numeric Goals under the Water Quality Improvement Plan	2023
City and San Diego Water Board assess effectiveness of actions to date (including potential revisions to numeric goals, strategies, and schedules)	

12.1 Compliance Monitoring

Compliance monitoring is required to assess progress towards achieving assigned waste load allocations and must be included in the Water Quality Improvement Plan. The following presents the minimum standards that must be in the design and implementation of a monitoring program to evaluate compliance with the dry-weather prohibition within the MS4 permit and demonstrate that the TMDL and numeric targets are achieved.

Numeric target monitoring will demonstrate whether the targets have been achieved by 2023. Monitoring may be suspended, lessened, or ceased by the San Diego Water Board if there is sufficient data to indicate that the efforts taken by the City to eliminate all illicit discharges to the MS4 and the Slough have worked and that the numeric targets will be reached sooner than 2023.

Numeric target monitoring requires the development of a Slough Monitoring Plan, with a minimum long term monitoring plan for eight years. Monitoring of the Slough is required to insure the Slough's numeric targets are being met and beneficial uses are restored commensurate with reduced watershed loading into the Slough. Long term monitoring will allow for documentation of macroalgal response to reduced load conditions. Appropriate macroalgal monitoring methodologies were agreed upon by the stakeholder group during the March 06, 2012, meeting. It was agreed upon that macroalgae would be assessed as follows:

1. Average of transect level macroalgal biomass and cover estimates.

2. Use two 75 meter transects to assess macroalgal cover (calculated separately and averaged).

3. Average of two consecutive sampling periods – July and August.

It was also agreed that transects should occur on the eastern and western side of the railroad crossing, since monitoring has documented higher levels of macroalgae in the eastern portion of the Slough.

The Slough Monitoring Plan requires continued monitoring of watershed loading into the Slough. The continued monitoring of macroalgal conditions and watershed loading will allow for the City to further refine algal modeling efforts, should it choose to do so. This will also allow for further exploration of the dissolved oxygen dynamics within the Slough in relation to loading.

Lastly, the Slough Monitoring Plan requires the monitoring of dissolved oxygen within the Slough. Dissolved oxygen modeling results were insufficient to estimate expected requirements to meet numeric targets. Concentrations were found to be highly diurnal, which implies a strong link to algal productivity when there is limited ocean interchange (CMA and SCCWRP 2013). As dissolved oxygen is a critical component of the eutrophication impairment, monitoring is required to determine how dissolved oxygen responds to load reduction and macroalgal target achievement. The stakeholders also agreed with the approach, recommending dissolved oxygen as a secondary target at the March 27, 2012 meeting.

13 OTHER CONSIDERATIONS

13.1 Incorporating the TMDL Into the Basin Plan is Not Required

In accordance with State Board Resolution 2005-0050 and the associated guidance document "*A Process for Addressing Impaired Waters in California*, (Impaired Waters Guidance Document)" the implementation plan developed to address the impairment (use of the prohibitions and requirements of the Regional MS4 Permit), does not require a Basin Plan Amendment.

13.2 Scientific Peer Review is Not Required

This TMDL does not require a scientific peer review because no rulemaking is occurring to adopt or implement it. Section 57004 of the California Health and Safety Code requires the submission of the scientific basis for any rulemaking to an external peer review for evaluation prior to taking an action on the proposed rule. Section 57004 defines a rule as a regulation or a policy adopted by the State Water Resources Control Board that has the effect of a regulation or adopted to implement or make effective a regulation. The TMDL implements an existing standard and relies on existing requirements for implementation. Therefore it does not meet the conditions that require a scientific peer review.

13.3 California Environmental Quality Act Requirements are Not Required

The California Environmental Quality Act (CEQA) is codified at Public Resources Code Section 21000 et seq. The CEQA Guidelines are codified at Title 14 California Code of Regulations section 15000 et seq.

The TMDL is an action to assure the restoration of beneficial uses in Loma Alta Slough by enforcing the laws, regulations, and standards administered by the San Diego Water Board.[14] As such, it is categorically exempt from the provisions of CEQA pursuant to Public Resources Code sections 15308 (for Class 8 exemptions) and 15321 (for Class 21 exemptions).

- Class 8 consists of actions taken by regulatory agencies, as authorized by state or local ordinance, to assure the maintenance, restoration, enhancement, or protection of the environment where the regulatory process involves procedures for protection of the environment. Construction activities and relaxation of standards allowing environmental degradation are not included in this exemption.

- Class 21(a) consists of actions by regulatory agencies to enforce or revoke a lease, permit, license, certificate, or other entitlement for use issued, adopted, or prescribed by the regulatory agency or enforcement of a law, general rule, standard, or objective, administered or adopted by the regulatory agency.

An exemption is justified because no standards will be relaxed to allow environmental degradation and there is no reasonable possibility that the investigative projects or activities will have a significant negative effect on the environment. Therefore, this action is also exempt from CEQA provisions in accordance with section 15061(b)(3) of Chapter 3, Title 14 of the California Code of Regulations because it can be seen with certainty that there is no possibility that the activity in question may have a significant negative effect on the environment. CEQA will be complied with as necessary when and if remedial actions are proposed.

13.4 Stakeholder and Public Participation

Opportunities for stakeholders and the public to participate in the TMDL process began in 2010 and continued through 2012. Multiple stakeholder meetings were held to discuss topics such as monitoring activities and the development of the modeling effort used to develop the TMDL. An additional stakeholder meeting was held in February 2014 to discuss the action to be taken by the San Diego Water Board to address the impairment of the Slough. A Public Workshop to discuss Tentative Investigative Order No. R9-2014-0020 and this TMDL Report was held on April 24, 2014. The public was provided with a 45-day comment period. All comments were considered by the San Diego Water Board. The public was provided the opportunity to give the San Diego

[14] State Water Board implementation regulations are in 23 CCR Chapter 27, §3720 et seq. and available at: http://www.waterboards.ca.gov/laws_regulations/docs/wrregs.pdf

Water Board oral testimony during the June 26, 2014 Public Hearing for consideration of adoption of Resolution No. R9-2014-0020.

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Appendix 1

Watershed Loading, Hydrodynamic, and Water Quality Modeling in Support of the Loma Alta Slough Bacteria and Nutrient TMDL

Prepared by:

Coastal Monitoring Associates and Southern California Coastal Waters Research Project

Watershed Loading, Hydrodynamic, and Water Quality Modeling in Support of the Loma Alta Slough Bacteria and Nutrient TMDL

Submitted to:

San Diego Regional Water Quality Control Board

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April 2013

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1 INTRODUCTION

Loma Alta Slough is a small coastal estuarine wetland located at the mouth of Loma Alta Creek next to Buccaneer Beach Park and is entirely within the City of Oceanside in north San Diego County, California. It has intermittent connection to the Pacific Ocean due to natural closing and opening of the mouth of the Estuary. The Estuary provides refuge, foraging areas, and breeding grounds for coastal marine species, including threatened and endangered species. The watershed also serves as habitat for approximately 100 species of wildlife including migratory birds, raptors, and the federally threatened California gnatcatcher (City of Oceanside 2003). The Estuary receives freshwater inputs from an approximately 25.4 sq. km watershed, of which 95% is within the City of Oceanside, while the remaining 5% is within the City of Vista, the California Department of Transportation (Caltrans), North County Transit District, and the County of San Diego.

Loma Alta Slough was placed on the Section 303(d) list of Water Quality Limited Segments in 1996 for eutrophic conditions and indicator bacteria with an estimated affected area affected of 3.3 hectares out of a total of 43.3 hectares. To meet water quality standards, the Slough is subject to the development of a total maximum daily load (TMDL) to restore appropriate beneficial uses (USEPA 2009).

1.1 Loma Alta Slough and Watershed Background

Loma Alta Slough (Figure 1.1), located north of Highway 78, in Oceanside, California, is an engineered estuarine system with the main reach of the slough extending about 400 m from the Pacific Ocean shoreline to Pacific Coast Highway with nearly a constant width of 14 m. The listed portion of the Slough is downstream of the railroad bridge. Loma Alta Creek (Figure 1.2) is the main tributary to the slough and extends about seven miles inland. Commonly, because the slough looks and acts more like a river system, the entire reach of Loma Alta, including the slough, is referred to as Loma Alta Creek. The focus area for this study is the lower 400-m reach and will be referred to as Loma Alta Slough in this document. References to the entire main stem of the creek, including to the slough, will be referred to as Loma Alta Creek.

Loma Alta Slough receives freshwater inflows from the watershed (Figure 1.1 and Figure 1.2), which extends from the mouth of the slough upstream and encompasses approximately 25.4 sq. km. Freshwater runoff is highly seasonal and generally associated with incoming Pacific storms. In general, the wet season runs from about October to April with the rest of the year as dry season. Stream gauge data collected at the Mass Emission Station (MES; Figure 1.2) in the slough shows that the freshwater inflows are generally low, less than 1 cfs during the dry season, whereas inflows generally range from 20 to several hundred cfs during the wet season, and large storms can generate river runoff inflow as high as 600-700 cfs. In addition to receiving seasonal freshwater inflows, the slough flow is also influenced by the flux and exchange of the ocean water through the ocean inlet (Figure 1.2).

Figure 1.1. Location map for the Loma Alta Slough and watershed in southern California.

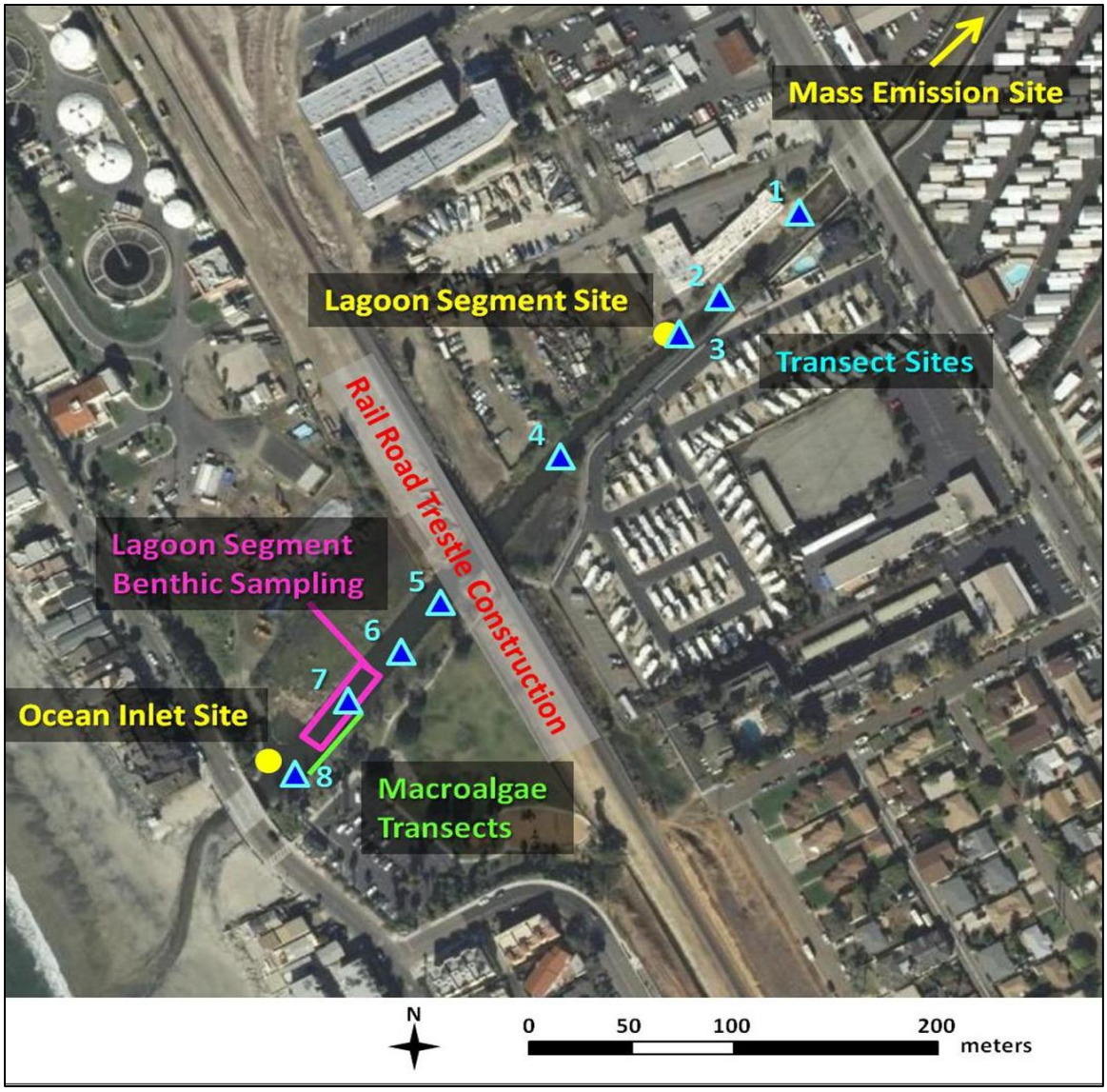

Figure 1.2. Detail map of Loma Alta Slough (or Lagoon) showing inlet to the ocean and the location of sampling stations.

Complex natural sediment transport and morphological changes take place year round in the slough and, in particular, near the ocean inlet, where the slough interacts with the ocean water when the inlet is open. During the wet season (Oct-Apr), the inlet generally remains open, but closes intermittently in highly irregular cycles. In general, this opening and closing of the inlet is influenced by the river flow dynamics from the storms and the beach sand movement. Observations from local residents suggest that the inlet could remain open for a few days after storms, and then becomes closed by the sand berms formed by natural accumulation of sand from the ocean, which was reinforced by construction by the City of Oceanside. The exact timing and nature of the closing and opening during the wet season is variable. Local observations of the mouth dynamics illustrate that in the beginning of the wet season, the mouth can open and

shut, but once the groundwater table rises due to repeated precipitation, it flows consistently until the beginning of the dry weather season (A. Witheridge, personal communication). It is clear that, during the seasons, the slough water intermittently exchanges with the ocean through channels generated by the complex dynamics of sand/sediment transport. During the dry season from May-Oct, the inlet naturally closes as flows from the watershed are reduced and tidal action causes the natural build-up of the sand berm. Inlet closing results in stagnation of the slough flows and degradation of the water quality, and in particular, enhancement of eutrophication in the slough. During this period, the slough is like a pond with excessive nutrient loads and elevated summer water temperatures, which produce favorable conditions for eutrophication and resulting degradation of water quality in the slough. On the north side of the slough, the City manages a UV treatment facility that withdrawals water via a pump from a downstream location of the slough processes it through the UV facility, and discharges the treated water to the Pacific Ocean south of Buccaneer Beach. The facility began operation in 2009. The treatment is variable during the summer as it depends on the flow coming from the watershed. Regularly there is not enough flow to keep the pumps running continuously.

1.2 Modeling Approach

Hydrodynamic and water quality models have become important tools in aiding decisions about water quality management. Models provide the ability to evaluate water quality under a range of expected conditions, to establish loadings required to meet water quality criteria, to evaluate potential management scenarios, and to identify key knowledge gaps to focus future monitoring and research. For this study, watershed loading, hydrodynamic transport, and estuary water quality models were linked to establish nutrient and bacteria TMDLs, and to evaluate potential management scenarios. An integrated modeling approach was developed to investigate the relationships between the bacteria, eutrophication, and the pollutant loads received from the watershed. The watershed model, Hydrological Simulation Program in Fortran (HSPF), was used to simulate freshwater inflows and pollutant loads from the watershed for the period from 10/1/2007 through 10/31/2008. The inflows and loads from HSPF were used as input to the Environmental Fluid Dynamics Code (EFDC) model, which was configured to simulate the hydrodynamics and transport of water and bacteria for the 400-m stretch of the Slough. The simulated hydrodynamics was stored in a link file (LomaAlta.hyd) that links to WASP7.4, which was then used to simulate the water quality and eutrophication condition of the river.

This report summarizes the application of this integrated model to Loma Alta Slough including: 1) the methods and results of calibration and validation of the Loma Alta Creek watershed loading, and estuary hydrodynamic and water quality models for bacteria and nutrients and 2) the results of management scenario analyses conducted to assist stakeholders in their consideration of implementation scenarios.

2 WATERSHED LOADING MODEL CALIBRATION AND VALIDATION

This section summarizes the development, calibration, and validation of the watershed loading model for the Loma Alta Slough watershed. This includes identification and description of the watershed characteristics and types of data that were utilized for the model, as well as the approach that was followed for constructing, calibrating, and verifying the hydrologic model for the Loma Alta Slough watershed.

2.1 Methods

2.1.1 Data Sources to Support Model Development

The physical, watershed, meteorological, and hydrological data that were utilized to support hydrologic simulation of the Loma Alta Slough watershed are summarized below.

Physical Data

Physical watershed–specific data relevant to hydrologic model deployment were obtained from Geographic Information Systems (GIS) databases, field observations, and engineering specifications. The Environmental Systems Research Institute, Inc. (ESRI) ArcGIS and ArcView GIS software packages were utilized for mapping and evaluation of GIS data at multiple scales. Physical watershed–specific data for the Loma Alta Slough watershed, in a GIS ready format, were obtained from:

1. A United States Geological Survey (USGS) 10-m resolution National Elevation Dataset Digital Elevation Model (DEM) (Figure 2.1) SANDAG Land Use and Land Cover (LULC) data representative of watershed land surface conditions for approximately 2009 (Figure 2.2). The LULC data shown in Figure 2.1 are for the delineated Loma Alta Slough watershed area.
2. The Soil Survey Geographic (SSURGO) database for San Diego County, California (
3. Figure 2.3). The soils data shown in
4. Figure 2.3 are for the delineated Loma Alta Slough watershed area.

Meteorological Data

The meteorological time series data requirements for the hydrologic model included precipitation and potential evapotranspiration. Observed precipitation data, collected at the mass emission station (see Figure 2.1 through

Figure 2.3 for the location of the mass emission station (black dot) relative to the delineated Loma Alta Slough watershed) was provided by SCCWRP. The period of record for the observed precipitation data set was 10/01/2007 00:30:00 through 10/31/2008 12:30:00. Observed hourly precipitation data for CIMIS (The California Irrigation Management Information System, http://wwwcimis.water.ca.gov/cimis/welcome.jsp) stations 150 and 173 (see Figure 2.4) were also collected for the period January 2007 through October 2007. Daily maximum temperature, minimum temperature, dew point temperature, wind movement, and solar radiation data was

collected for calendar years 2007 through 2009 for CIMIS stations 147, 150, 153, 173, and 184 (see Figure 2.4).

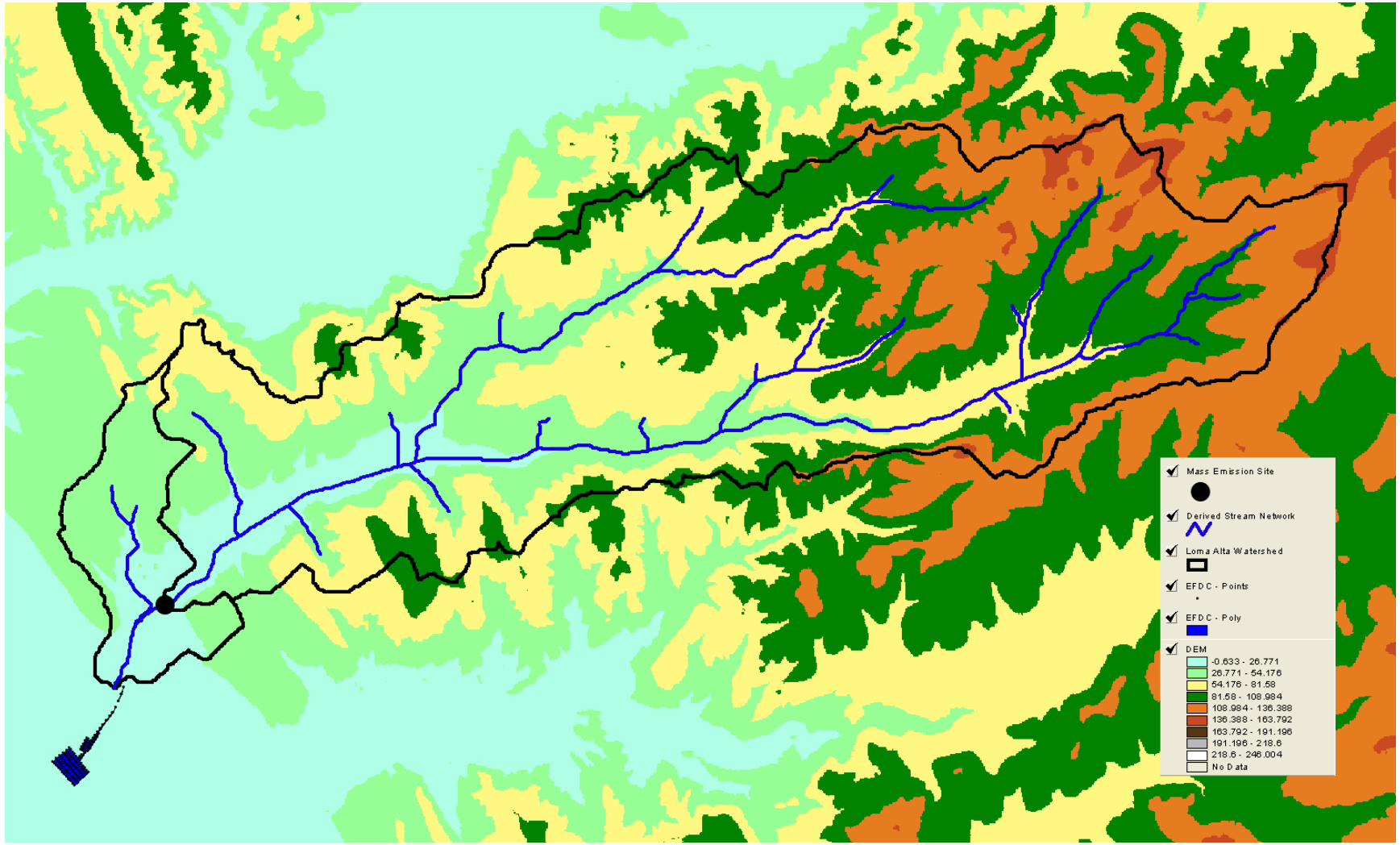

Figure 2.1. Digital Elevation Model (DEM) used for the Loma Alta Slough watershed hydrologic model.

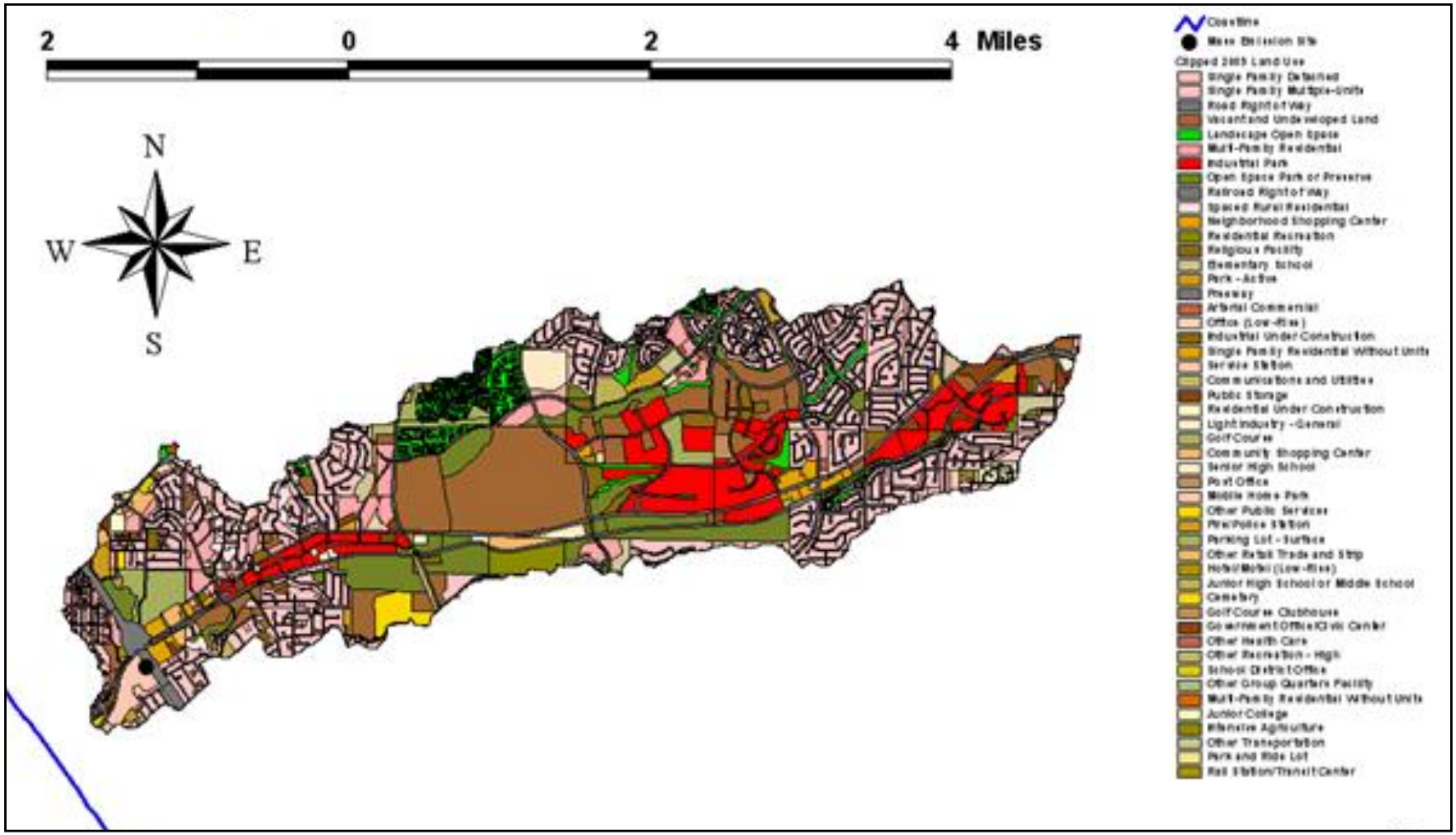

Figure 2.2. SANDAG 2009 LULC data, clipped to the delineated area of the Loma Alta Slough watershed.

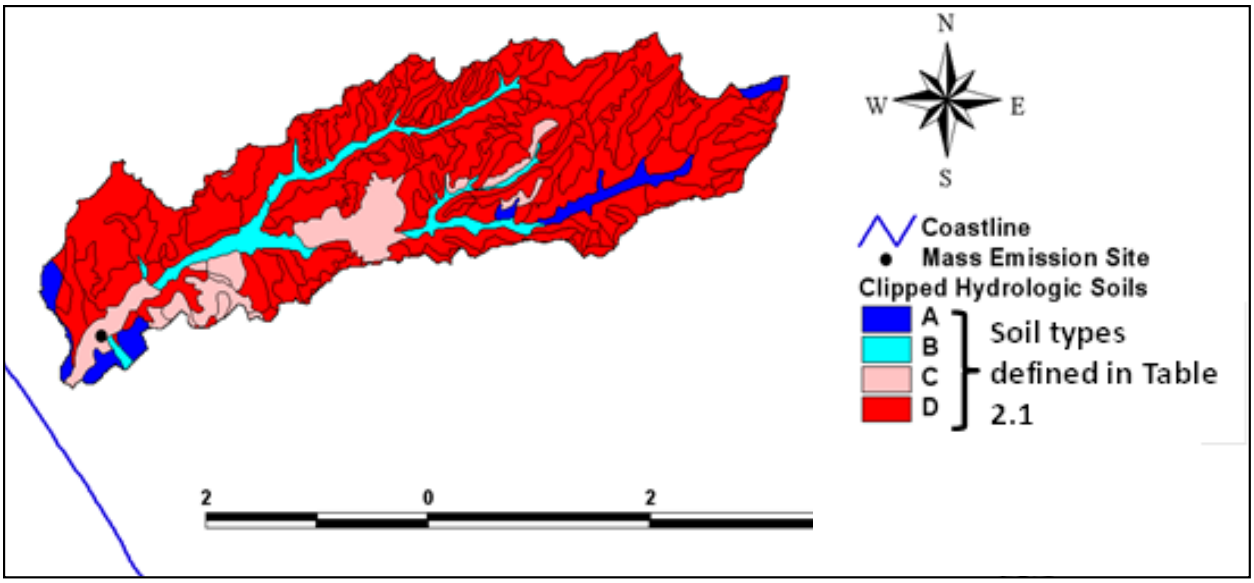

Figure 2.3. SSURGO hydrologic soils group data, clipped to the delineated Loma Alta Slough watershed.

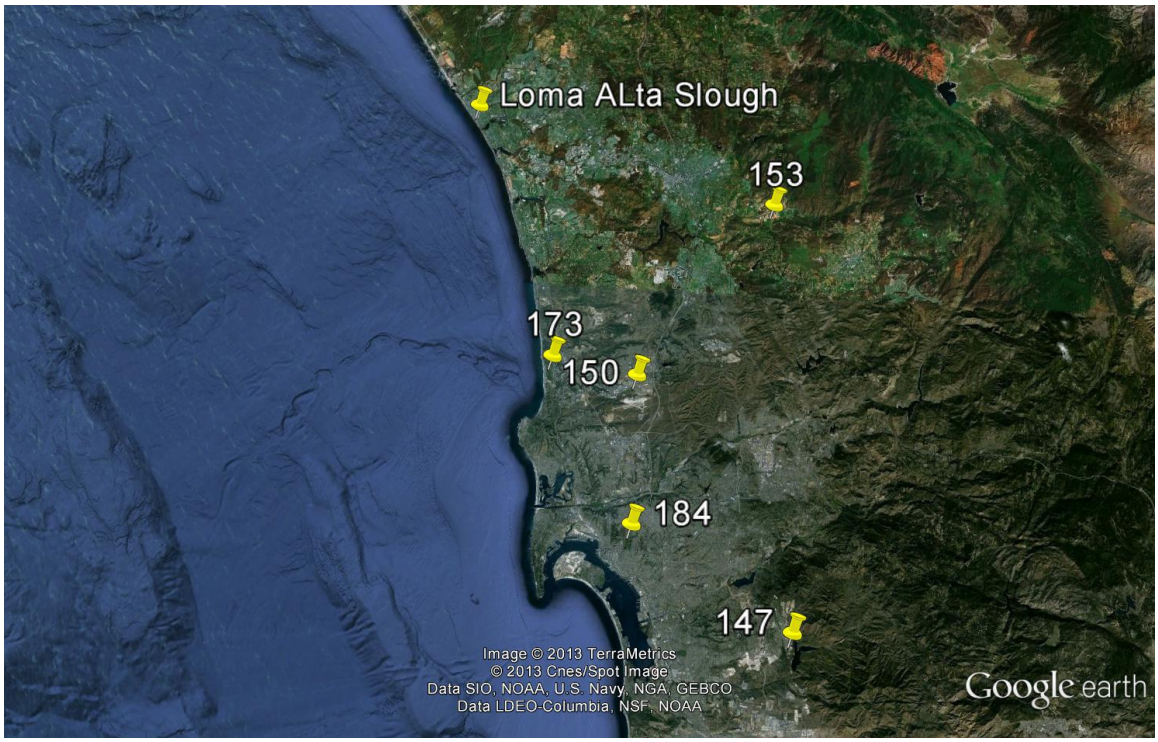

Figure 2.4. Location of CIMIS stations 150 and 173 relative to the Loma Alta Slough.

Hydrological Data

Data required to calibrate and verify processes simulated by a hydrological model are summarized below. Model calibration and verification data were not used as input to the hydrological model, but rather were used to support parameter estimation, evaluation of model performance, and prediction.

Stream Discharge Data. Observed stream discharge data, collected at the mass emission station (see Figure 2.1 through

Figure 2.3 for the location of the mass emission station relative to the delineated Loma Alta Slough watershed), was provided by SCCWRP. The period of record for this observed stream discharge data set was 10/01/2007 00:00:00 through 10/31/2008 23:00:00.

Literature Search. A literature search was conducted to identify additional data, beyond the observed stream discharge data, that could be used to improve the calibration and validation of the hydrological model for the Loma Alta Slough watershed.

Hydrological Response. The San Diego Hydrology model was identified as a source of additional (synthetic) data set for hydrological model validation. In particular, the San Diego Hydrology Model parameter set provided a basis for the creation of multiple model simulated synthetic datasets related to the partition of precipitation at the land surface (viz., summed direct surface runoff, interflow runoff, base flow runoff, and evapotranspiration for the period 10/01/2007 through 10/31/2008) for uniquely defined pervious and impervious land areas represented within the Loma Alta Slough watershed. Within the San Diego Hydrology Model documentation, preferred parameter values are explicitly specified for sixty pervious land area types and seventeen impervious land area types. The sixty pervious land area types are a function of land use and land cover, soils, and percent slope; whereas, the seventeen impervious land area types are a function of land use and land cover and percent slope. In particular, Table 2.1 and 2.2 list the sixty pervious land area types and seventeen impervious land area types expressed in the San Diego Hydrology Model.

Table 2.1. SDHM pervious land types (PERLND = pervious land area).

PERLND No.	Soil	Vegetation/Surface	Slope
1	A	Forest	Flat (0-5%)
2	A	Forest	Moderate (5-10%)
3	A	Forest	Steep (10-20%)
4	A	Forest	Very Steep (>20%)
5	A	Shrub	Flat (0-5%)
6	A	Shrub	Moderate (5-10%)
7	A	Shrub	Steep (10-20%)
8	A	Shrub	Very Steep (>20%)
9	A	Grass	Flat (0-5%)
10	A	Grass	Moderate (5-10%)
11	A	Grass	Steep (10-20%)
12	A	Grass	Very Steep (>20%)
13	A	Dirt	Flat (0-5%)

PERLND No.	Soil	Vegetation/Surface	Slope
14	A	Dirt	Moderate (5-10%)
15	A	Dirt	Steep (10-20%)
16	A	Dirt	Very Steep (>20%)
17	A	Urban	Flat (0-5%)
18	A	Urban	Moderate (5-10%)
19	A	Urban	Steep (10-20%)
20	A	Urban	Very Steep (>20%)
21	B	Forest	Flat (0-5%)
22	B	Forest	Moderate (5-10%)
23	B	Forest	Steep (10-20%)
24	B	Forest	Very Steep (>20%)
25	B	Shrub	Flat (0-5%)
26	B	Shrub	Moderate (5-10%)
27	B	Shrub	Steep (10-20%)
28	B	Shrub	Very Steep (>20%)
29	B	Grass	Flat (0-5%)
30	B	Grass	Moderate (5-10%)
31	B	Grass	Steep (10-20%)
32	B	Grass	Very Steep (>20%)
33	B	Dirt	Flat (0-5%)
34	B	Dirt	Moderate (5-10%)
35	B	Dirt	Steep (10-20%)
36	B	Dirt	Very Steep (>20%)
37	B	Urban	Flat (0-5%)
38	B	Urban	Moderate (5-10%)
39	B	Urban	Steep (10-20%)
40	B	Urban	Very Steep (>20%)
41	C/D	Forest	Flat (0-5%)
42	C/D	Forest	Moderate (5-10%)
43	C/D	Forest	Steep (10-20%)
44	C/D	Forest	Very Steep (>20%)
45	C/D	Shrub	Flat (0-5%)
46	C/D	Shrub	Moderate (5-10%)
47	C/D	Shrub	Steep (10-20%)
48	C/D	Shrub	Very Steep (>20%)
49	C/D	Grass	Flat (0-5%)
50	C/D	Grass	Moderate (5-10%)
51	C/D	Grass	Steep (10-20%)
52	C/D	Grass	Very Steep (>20%)
53	C/D	Dirt	Flat (0-5%)
54	C/D	Dirt	Moderate (5-10%)
55	C/D	Dirt	Steep (10-20%)
56	C/D	Dirt	Very Steep (>20%)
57	C/D	Urban	Flat (0-5%)
58	C/D	Urban	Moderate (5-10%)
59	C/D	Urban	Steep (10-20%)
60	C/D	Urban	Very Steep (>20%)

Table 2.2. SDHM impervious land types (IMPLND = impervious land area).

IMPLND No.	Surface	Slope
1	Roads	Flat (0-5%)
2	Roads	Moderate (5-10%)
3	Roads	Steep (10-20%)
4	Roads	Very Steep (>20%)
5	Roof Area	All
6	Driveways	Flat (0-5%)
7	Driveways	Moderate (5-10%)
8	Driveways	Steep (10-20%)
9	Driveways	Very Steep (>20%)
10	Sidewalks	Flat (0-5%)
11	Sidewalks	Moderate (5-10%)
12	Sidewalks	Steep (10-20%)
13	Sidewalks	Very Steep (>20%)
14	Parking	Flat (0-5%)
15	Parking	Moderate (5-10%)
16	Parking	Steep (10-20%)
17	Parking	Very Steep (>20%)

Water Quality Data

Data required to calibrate and verify water quality processes simulated by the watershed model are summarized below. Model calibration and verification data were used to support parameter estimation, evaluation of model performance, and prediction.

Ideally in a watershed water quality modeling application, data are collected from small catchments within the watershed to reflect the pollutant export from individual land uses. That data is used to calibrate the model. The model is then validated against data collected from a much larger area, integrating the runoff from multiple land uses. In this study, data was only available from a single mass emission monitoring point at the bottom of the watershed; no other data on the catchment scale were available. This necessitated that data from other sources be identified to characterize the land use runoff conditions.

***Mass Emission Monitoring*.** Three storms were monitored during 2008 at the mass emission station in the Loma Alta Slough by Mactec Engineering & Consulting, Inc. (Mactec). Eight to 12 individual pollutograph samples were taken throughout the course of a storm so that a characteristic event mean concentration was calculated for each constituent for each storm. The monitoring methods and results of those efforts are detailed in Mactec (2009). The EMC bacteria and nutrient concentration for each of the three monitored storms are shown in Table 2.3. Daily loading data for Enterococcus, fecal coliform, and total coliform, in G-org (Giga (10^9)-Organisms) unit and associated with the mass emission station (see Figure 2.1 through

Figure 2.3 for the location of the mass emission station relative to the delineated Loma Alta Slough watershed), was obtained from Appendix D-3 of the CHU Lagoon Monitoring Report dated June 2009 prepared by Mactec. The period of record for the daily loading data sets was 11/01/2007 through 10/31/2008.

Table 2.3. Loma Alta Slough mass emission monitoring results.

Parameter	1/7/2008	1/24/2008	2/3/2008	Average
Enterococcus (CFU/100mL)	21,712	11,862	13,000	15,525
Fecal Coliform (MPN/100mL)	9,273	29,658	1,700	13,544
Total Coliform (MPN/100mL)	55,021	86,468	35,000	58,830
Ammonia (mg L^{-1})	0.10	0.12	0.45	0.22
Nitrate-Nitrite (mg L^{-1})	0.61	0.48	0.27	0.45
Total Nitrogen (mg L^{-1})	1.40	1.28	No Data	1.34
Dissolved Phosphorous (mg L^{-1})	0.29	0.17	0.19	0.22
Phosphorous (mg L^{-1})	0.38	0.23	0.30	0.30

***Land Use Runoff Characterization*.** Because of the paucity of land use monitoring data in the Loma Alta Slough watershed, data from other sources were used to characterize the land use runoff. Land use monitoring from the regional stormwater monitoring programs has been characterized by Ackerman and Schiff (2003). In that study, land use monitoring throughout southern California were compiled with 10th percentile, median, and 90th percentile concentrations calculated for broad land use categories (**Error! Not a valid bookmark self-reference.**4).

Not all of the nutrient species were analyzed in the land use monitoring. Relationships between total nitrogen and nitrite-nitrate and total dissolved phosphorous and total phosphorous and phosphate are empirically developed (

Table 2.4). These relationships were used to define the characteristic stormwater bacteria concentration from each land use type (Table 2.5).

Table 2.4. Stormwater nutrient noncentration from land uses in Ackerman and Schiff (2003) and Sengupta et al. (in review).

Land Use Type	TN (mg L^{-1})	TP (mg L^{-1})	Ammonia (mg L^{-1})	Nitrate (mg L^{-1})	Phosphate (mg L^{-1})
Agriculture	10.41	11.30	1.34	7.31	3.27
Commercial	3.56	0.56	0.45	1.30	0.09
Industrial	3.55	1.33	0.34	1.29	0.32
Open	2.46[a]	0.35[b]	0.04	0.34	0.03
Residential	3.96	1.10	0.42	1.65	0.25

Table 2.5. Stormwater bacteria concentrations from land uses.

Land Use	Concentration (Count 100 ml^{-1})		
	Fecal Coliform	Total Coliform	Enterococcus
Agriculture	13,381	80,292	93,664
Commercial	13,477	80,868	94,336
High Density Residential	80,858	166,026	67,383
Industrial	1,063	7,012	3,394
Low Density Residential	9,403	23,389	30,702
Open	25	609	81
Open-Recreational	8,446	21,994	27,557
Transportation	2,115	8,261	4,127

2.1.2 Processing of Time Series Data

Precipitation Data

The observed precipitation data collected at the mass emission station (see Figure 2.1 through

Figure 2.3 for the location of the mass emission station relative to the delineated Loma Alta Slough watershed) were provided by SCCWRP. The data had to be processed into a usable format by interpolating the original data to a continuous record at an hourly time step and then subsequently further processed to interface the data with the watershed model to support simulation. The public domain time series processor TSPROC (see Doherty 2004) was used to interpolate the precipitation accumulation data. The precipitation accumulation data were subsequently differenced to create precipitation rate data and converted from millimeters to inches during the process. A final step was performed to verify that the processed continuous hourly precipitation data yielded the same summary values as expressed in Table 4-44 in the June 2009 Mactec report. While monthly totals were the same, there were some minor discrepancies with daily totals which were attributed to the interpolation process.

The average hourly precipitation rate was computed using the hourly precipitation data from CIMIS stations 150 and 173 for the period 01/01/2007 00:00:00 through 10/01/2007 12:00:00. Combining this hourly precipitation dataset with the processed continuous hourly precipitation data associated with the mass emission station allowed for watershed simulation at an hourly time step for the period 01/01/2007 through 10/31/2008.

Evaporation Data

The daily maximum temperature, minimum temperature, dew point temperature, wind movement, and solar radiation data collected for calendar years 2007 through 2009 for CIMIS stations 147, 150, 153, 173, and 184 (see Figure 2.4) were processed into a single representative station to accommodate the fact that each of the datasets contained missing data records and the watershed model requires complete and continuous records. Subsequently, the processed daily maximum temperature, minimum temperature, mean dew point temperature, mean wind speed, and solar radiation data were utilized to compute Penman pan evaporation rates for the period January 1, 2007 through December 31, 2009

using the public domain data processing WDMUtil software system. WDMUtil was subsequently used to disaggregate the computed daily Penman pan evaporation data to an hourly time step.

Stream Discharge Data

The observed stream discharge data collected at the mass emission station (see Figure 2.1 through Figure 2.3 for the location of the mass emission station relative to the delineated Loma Alta Slough watershed) and provided by SCCWRP was interpolated to an hourly time step using the public domain time series processor TSPROC (Doherty 2004). Discharge totals at the monthly and daily time scale were compared with those reported in Table 4-45 in the June 2009 Mactec report. As with the processed precipitation data comparisons, the differences were relatively minor and were attributed to the interpolation.

Plots of the original (i.e., as provided) observed stream discharge data (see Figure 2.5) showed that observed flows during the dry weather (base flow) maintained at 1 to 2 cfs levels with some oscillations throughout the period. These dry weather base flow rates measured during the dry weather (no rain within 48 hours) posed problems when they were compared with other independent data. First, the watershed model predicted much lower flow rates (~0.01 cfs) during the corresponding dry weather period, although the watershed model is only designed to simulate wet weather flow rates. Second, and most importantly, the watershed flows, including the dry weather flow rate, were used to drive and calibrate the receiving water hydrodynamic and eutrophication model. As discussed in detail in Section 3.1, watershed flow rate was calibrated to maintain a base flow at 0.495 cfs during the dry weather period. Due to these inconsistencies associated with measured dry weather flow rates, it was suspected that the flow rates measured during dry weather in 2008 were potentially erroneous. As such, flow rates during July-August 2011 (representative of dry weather) were measured using a new set of flow gauge. The average dry weather flow rate during the two months was 0.495 cfs, exactly the same as what the calibration of the hydrodynamic model produces.

Hydrologic Response Data. Upon completion of watershed model development (see Section 4), a simulation was performed using the SDHM parameter set, and simulated direct surface runoff (SURO), interflow runoff (IFWO), base flow runoff (AGWO), and evapotranspiration (TAET) were saved for each of SDHM's sixty pervious land area and seventeen impervious land area types that were appropriately represented into the final Loma Alta Slough watershed model. The processing and management of this hydrologic response data was performed using the public domain time series data processor TSPROC (see Doherty 2004 for details about TSPROC). The TSPROC input data file that was prepared in part to process and manage the synthetic model simulated observations that were used to supplement the model calibration is provided in Appendix 1.

Error! Reference source not found.**Figure 2.5. Plot of observed stream discharge data associated with mass emission station. Top and bottom panels represent different months as examples of flow patterns.**

2.1.3 Methodology to Develop and Calibrate Hydrologic Model

Model Development

Relevant features of the development process for the hydrologic model that was developed for the Loma Alta Slough watershed are summarized below.

Basin Delineation. The deterministic eight-neighbor digital elevation model processing algorithm TOPAZ (for Topographic Parameterization), as encapsulated in the Watershed Modeling System, was utilized to delineate the Loma Alta Slough watershed using the 10-m resolution digital elevation model. The delineated watershed and derived stream network, both obtained using WMSTOPAZ, are shown in Figure 2.5. As indicated in Figure 2.5, the Loma Alta Slough watershed was discretized into two sub-basins, with the upper basin draining to the mass emission station, and the main basin outlet just upstream of the EFDC hydrodynamic model grid.

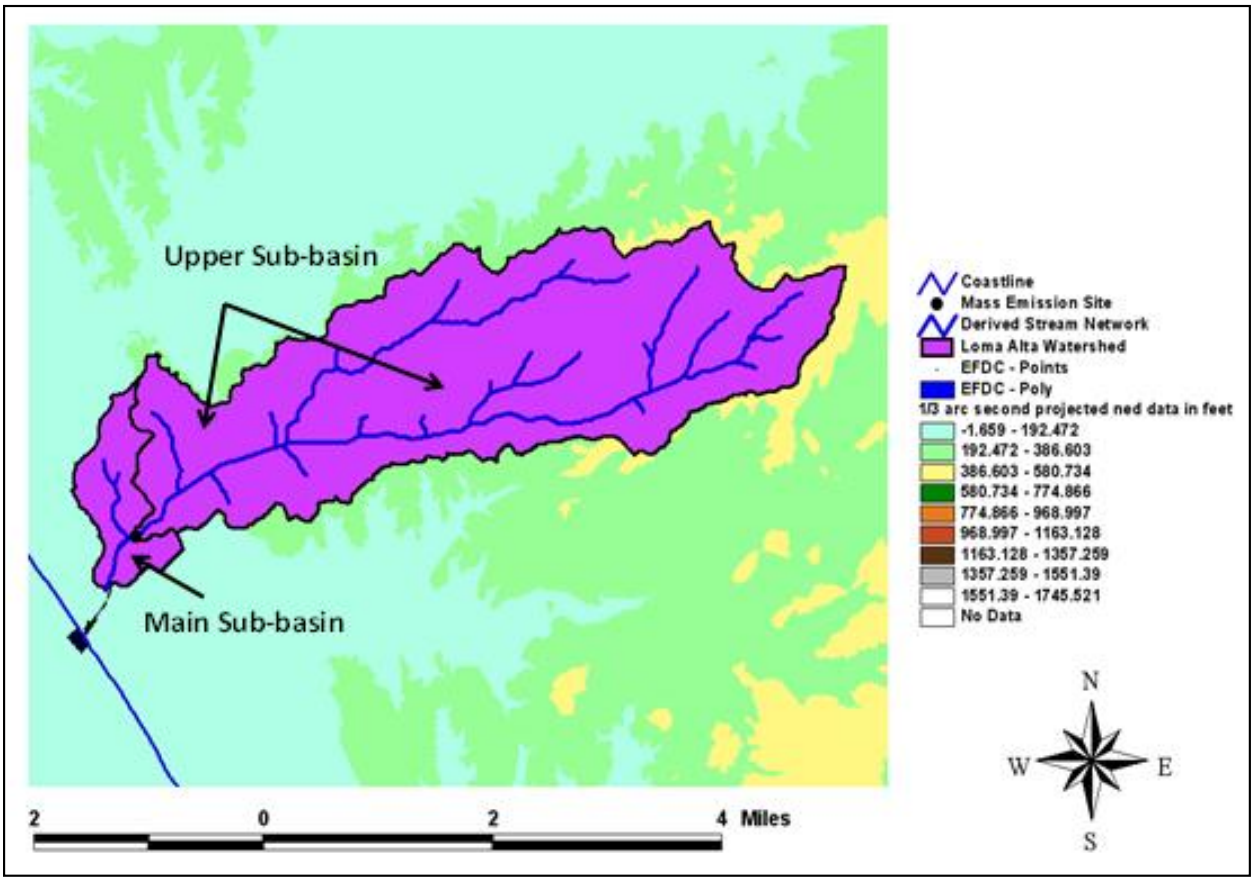

Figure 2.5. Delineated Loma Alta Slough watershed and derived stream network.

Landscape Features. Based on the SDHM parameter set, landscape features incorporated into the model included a cross product of a remapping of the 2009 SANDAG land use and land cover data (see Figure 2.2) to the SDHM vegetation/surface types, hydrologic soils group data (see

Figure 2.3), and percent slope (see

Figure 2.6). This product was determined using GIS analysis. The remapping of the 2009 SANDAG land use and land cover data (see Figure 2.2) to the SDHM vegetation/surface types is summarized in Table 2.6. The remapped pervious and impervious land cover areas for the Loma Alta Slough watershed drainage area above the mass emission station and for the remaining drainage area below the mass emission station and above the main basin outlet located at the most upstream point of the EFDC model grid are presented in Table 2.7 and 2.8. With the watershed model, IMPLND area refers to directly connected impervious land area. To account for the potential overestimation of IMPLND roof area, a simple multiplicative parameter for reducing its total area within each of the two modeled sub-watersheds was employed, and the reduced roof area was then increased for the urban landscaped vegetation types, distributed to those PERLND types based on their originally determined distribution in each sub-basin.

Stage-discharge relationships for the reach within each delineated sub-watershed were specified based on application of Manning's equation and information encapsulated in BASINS Technical Note 1 (http://water.epa.gov/scitech/datait/models/basins/upload/2009_04_13_BASINSs_tecnote1.pdf).

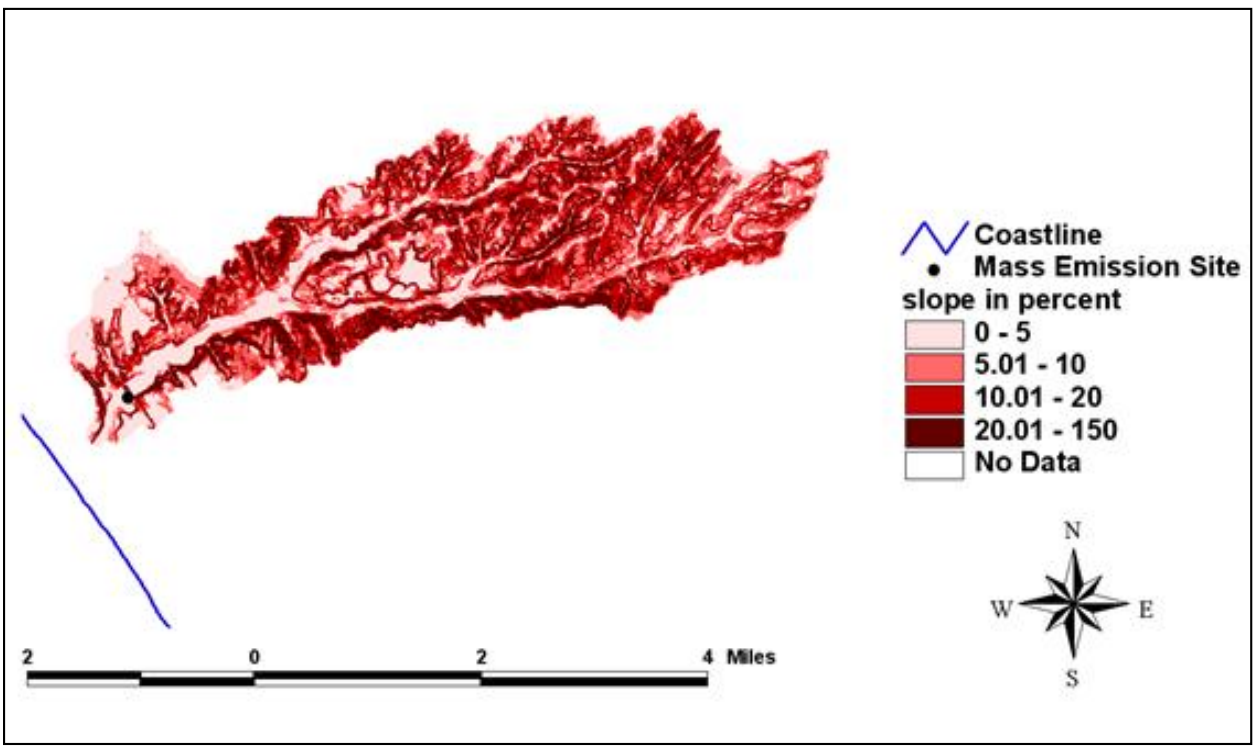

Figure 2.6. Percent slope derived from 10-m resolution DEM for the Loma Alta watershed.

Table 2.6. Mapping from 2009 SANDAG LULC data to SDHM vegetation/surface types.

SANDAG GIS 2009 Landuse Data	SDHM LU Classifications - %s									
	PERLNDS					IMPLNDS				
	natural vegetation				urban veg.					
LANDUSE	Forest	native shrub	non-turf grass	Dirt	Urban landscaped veg. (lawns, flowers, planted shrubs and trees	Roads	Roof area	Driveways	Sidewalks	Parking
Mobile Home Park	0.00%	0.00%	0.00%	0.00%	20.00%	10.00%	50.00%	10.00%	10.00%	0.00%
Single Family Detached	0.00%	0.00%	0.00%	0.00%	30.00%	0.00%	65.00%	5.00%	0.00%	0.00%
Road Right of Way	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%	0.00%
Vacant and Undeveloped Land	0.00%	50.00%	0.00%	50.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Single Family Multiple-Units	0.00%	0.00%	0.00%	0.00%	15.00%	0.00%	70.00%	5.00%	5.00%	5.00%
Park - Active	0.00%	0.00%	0.00%	10.00%	65.00%	0.00%	5.00%	0.00%	5.00%	15.00%
Communications and Utilities	0.00%	0.00%	0.00%	10.00%	30.00%	10.00%	40.00%	0.00%	0.00%	10.00%
Other Transportation	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	50.00%	0.00%	0.00%	50.00%
Multi-Family Residential	0.00%	0.00%	0.00%	0.00%	5.00%	0.00%	70.00%	0.00%	5.00%	20.00%
Freeway	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%	0.00%
Other Public Services	0.00%	0.00%	0.00%	0.00%	20.00%	0.00%	50.00%	0.00%	0.00%	30.00%
Multi-Family Residential Without Units	0.00%	33.34%	33.33%	33.33%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Single Family Residential Without Units	0.00%	33.34%	33.33%	33.33%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Other Group Quarters Facility	0.00%	0.00%	0.00%	0.00%	20.00%	0.00%	50.00%	0.00%	5.00%	25.00%
Hotel/Motel (Low-Rise)	0.00%	0.00%	0.00%	0.00%	5.00%	0.00%	65.00%	0.00%	0.00%	30.00%
Service Station	0.00%	0.00%	0.00%	0.00%	5.00%	0.00%	70.00%	0.00%	0.00%	25.00%
Railroad Right of Way	0.00%	0.00%	0.00%	25.00%	75.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Elementary School	0.00%	0.00%	0.00%	0.00%	20.00%	0.00%	50.00%	0.00%	5.00%	25.00%
Other Retail Trade and Strip	0.00%	0.00%	0.00%	0.00%	5.00%	0.00%	70.00%	0.00%	0.00%	25.00%
Cemetery	0.00%	0.00%	0.00%	0.00%	80.00%	10.00%	0.00%	0.00%	0.00%	10.00%
Senior High School	0.00%	0.00%	0.00%	0.00%	20.00%	0.00%	50.00%	0.00%	5.00%	25.00%
Industrial Park	0.00%	0.00%	0.00%	0.00%	10.00%	0.00%	65.00%	0.00%	0.00%	25.00%
Public Storage	0.00%	0.00%	0.00%	0.00%	0.00%	20.00%	75.00%	0.00%	0.00%	5.00%
Light Industry - General	0.00%	0.00%	0.00%	0.00%	10.00%	0.00%	65.00%	0.00%	0.00%	25.00%
Rail Station/Transit Center	0.00%	0.00%	0.00%	0.00%	20.00%	0.00%	60.00%	0.00%	0.00%	20.00%
Open Space Park or Preserve	0.00%	50.00%	10.00%	40.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Arterial Commercial	0.00%	0.00%	0.00%	0.00%	5.00%	0.00%	85.00%	0.00%	5.00%	5.00%
Residential Recreation	0.00%	0.00%	0.00%	0.00%	65.00%	0.00%	20.00%	0.00%	5.00%	10.00%
Spaced Rural Residential	0.00%	0.00%	0.00%	0.00%	25.00%	0.00%	70.00%	5.00%	0.00%	0.00%
Landscape Open Space	0.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Office (Low-Rise)	0.00%	0.00%	0.00%	0.00%	5.00%	0.00%	65.00%	0.00%	5.00%	25.00%
Community Shopping Center	0.00%	0.00%	0.00%	0.00%	5.00%	0.00%	50.00%	0.00%	5.00%	40.00%
Neighborhood Shopping Center	0.00%	0.00%	0.00%	0.00%	5.00%	0.00%	50.00%	0.00%	5.00%	40.00%
Religious Facility	0.00%	0.00%	0.00%	0.00%	10.00%	0.00%	50.00%	0.00%	5.00%	35.00%
Junior High School or Middle School	0.00%	0.00%	0.00%	0.00%	20.00%	0.00%	50.00%	0.00%	5.00%	25.00%
Other Health Care	0.00%	0.00%	0.00%	0.00%	5.00%	0.00%	65.00%	0.00%	0.00%	30.00%
School District Office	0.00%	0.00%	0.00%	0.00%	5.00%	0.00%	65.00%	0.00%	5.00%	25.00%
Government Office/Civic Center	0.00%	0.00%	0.00%	0.00%	5.00%	0.00%	65.00%	0.00%	5.00%	25.00%
Junior College	0.00%	0.00%	0.00%	0.00%	20.00%	0.00%	50.00%	0.00%	5.00%	25.00%
Fire/Police Station	0.00%	0.00%	0.00%	0.00%	5.00%	0.00%	70.00%	0.00%	5.00%	20.00%
Post Office	0.00%	0.00%	0.00%	0.00%	5.00%	0.00%	70.00%	0.00%	0.00%	25.00%
Park and Ride Lot	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%
Other Recreation - High	0.00%	0.00%	0.00%	0.00%	10.00%	0.00%	50.00%	0.00%	5.00%	35.00%
Golf Course	0.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Golf Course Clubhouse	0.00%	0.00%	0.00%	0.00%	5.00%	0.00%	60.00%	0.00%	5.00%	30.00%
Residential Under Construction	0.00%	0.00%	0.00%	50.00%	0.00%	0.00%	50.00%	0.00%	0.00%	0.00%
Industrial Under Construction	0.00%	0.00%	0.00%	50.00%	0.00%	0.00%	50.00%	0.00%	0.00%	0.00%
Parking Lot - Surface	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%
Intensive Agriculture	0.00%	0.00%	0.00%	50.00%	50.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Table 2.7. Areas for the unique SDHM Vegetation/Surface types represented in the Loma Alta Slough watershed model for the drainage area above the mass emission station.

Drainage Area Above Mass Emission Station

PERLNDS

	sq. ft.	acre
1	0	0
2	0	0
3	0	0
4	0	0
5	83409.91	1.914828
6	241418.8	5.542213
7	127464.4	2.926181
8	31131.87	0.714689
9	7753.597	0.177998
10	15742.15	0.36139
11	13862.49	0.318239
12	5404.022	0.124059
13	112662.1	2.586366
14	331113.8	7.601328
15	209640.8	4.812691
16	31895.48	0.732219
17	286824.3	6.584581
18	563956.7	12.94666
19	466801.8	10.71629
20	115305.4	2.647047
21	0	0
22	0	0
23	0	0
24	0	0
25	1299315	29.82817
26	546276.1	12.54077
27	243181	5.582667
28	181504.7	4.166774
29	193487.5	4.441862
30	97977.27	2.249249
31	44172.01	1.01405
32	24905.49	0.571751
33	1242455	28.52285
34	534234.6	12.26434
35	266148.1	6.109919
36	163412.9	3.751445
37	1061890	24.37765
38	511972.4	11.75327
39	379808.8	8.71921
40	97331.14	2.234415
41	0	0
42	0	0
43	0	0
44	0	0
45	4594985	105.4863
46	5256195	120.6656
47	7398420	169.8444
48	7764170	178.2408
49	111761.4	2.565689
50	177235.9	4.068778
51	437686.2	10.04789
52	751746.5	17.25772
53	4830765	110.8991
54	5751543	132.0373
55	8242680	189.2259
56	8041714	184.6123
57	6566533	150.7469
58	10886168	249.912
59	15015957	344.7189
60	8809026	202.2274

IMPLNDS

	sq. ft.	acre
1	6812240	156.3875
2	9808535	225.173
3	11018214	252.9434
4	4864325	111.6695
5	75716635	1738.215
6	474144.2	10.88485
7	908286.9	20.8514
8	1132730	26.0039
9	713800.8	16.38661
10	435023.8	9.986772
11	404655.5	9.289613
12	390734.3	8.970025
13	224971.8	5.164642
14	3588564	82.3821
15	4136661	94.96468
16	4206914	96.57745
17	2823543	64.81962

Table 2.8. Areas for the unique SDHM Vegetation/Surface types represented in the Loma Alta Slough watershed model for the drainage area below the mass emission station and above the main basin outlet located at the most upstream point of the EFDC model grid.

Drainage Area Above Main Basin Outlet

PERLNDS

	sq. ft.	acre
1	0	0
2	0	0
3	0	0
4	0	0
5	28195.13	0.647271
6	35439.58	0.813581
7	12335.27	0.283179
8	3524.362	0.080908
9	1174.67	0.026967
10	783.1133	0.017978
11	0	0
12	0	0
13	32541.49	0.74705
14	40960.84	0.940332
15	15154.76	0.347905
16	5051.586	0.115968
17	632388.1	14.51763
18	237542	5.453214
19	72131.95	1.655922
20	26961.37	0.618948
21	0	0
22	0	0
23	0	0
24	0	0
25	0	0
26	0	0
27	0	0
28	0	0
29	0	0
30	0	0
31	0	0
32	0	0
33	0	0
34	0	0
35	0	0
36	0	0
37	34186.31	0.78481
38	2819.49	0.064727
39	352.4361	0.008091
40	0	0
41	0	0
42	0	0
43	0	0
44	0	0
45	273138.1	6.270387
46	143911.5	3.303752
47	203434.2	4.670206
48	312689.9	7.178372
49	15507.19	0.355996
50	20088.86	0.461177
51	25218.69	0.578941
52	32737.1	0.75154
53	338280	7.765841
54	158655	3.642219
55	206136	4.73223
56	308166	7.074518
57	1662677	38.1698
58	666868.1	15.30918
59	615353.6	14.12658
60	319366	7.331634

IMPLNDS

	sq. ft.	acre
1	2829475	64.95582
2	918566.3	21.08738
3	962855.8	22.10413
4	544161.5	12.49223
5	6626800	152.1304
6	303271.4	6.962153
7	77477.23	1.778632
8	28606.07	0.656705
9	25257.93	0.579842
10	330350.2	7.583798
11	63262.3	1.452303
12	25845.32	0.593327
13	17563.07	0.403193
14	1004502	23.06019
15	149080.5	3.422418
16	113014.5	2.594457
17	39649.08	0.910218

Methodology for Watershed Hydraulic Loading Model Calibration

The hydrologic model that was developed for the Loma Alta Slough watershed was subsequently interfaced with the model–independent parameter estimation tool PEST (Doherty 2004) to support computer-based model calibration and prediction. The PEST software is comprehensively described in Doherty (2004). An integral part of the watershed model - PEST interface process involved the development of the TSPROC input data file that is presented in Appendix 1. In effect, that file is the basis for characterizing the objection function; viz., the quantitative measure of model to measurement misfit. For the Loma Alta Slough watershed model calibration, the perceptual model was to fit:

1. The hard data (i.e., the observed flow data), and
2. Expectations (based on the SDHM hydrologic model parameter set) for the partition of total summed precipitation for the period 10/01/2007 through 10/31/2008 across direct surface runoff, interflow runoff, base flow runoff, and evapotranspiration for each land use / land cover represented in the model, as noted in Section 4.2.

Due to the errors associated with the observed stream discharge data (see Section 3.3), it was determined that any computer-based model calibration work (or manual for that matter) would have to be based on the identification of specific precipitation-runoff events rather than a simple comparison of a complete continuous section of the observed hydrograph record with its model simulated counterpart. The following events/time periods were identified (based on manual inspection of the observed hydrograph) as a basis for comparing observed stream discharge data with their model simulated counterparts in support of model calibration:

Two hundred and twenty-six additional (synthetic) data observations were also included as part of the objective function for the noted period of 10/01/2007 through 10/31/2008; viz., summed SURO, IFWO, AGWO, and TAET for the forty-eight unique (SDHM-based and defined) PERLNDs represented in the model and SURO and TAET for the seventeen (SDHM-based and defined) IMPLNDs also represented in the Loma Alta Slough watershed model. This resulted in a total of 503 observations for use in the hydrologic calibration process for the Loma Alta Slough watershed.

2.1.4 Methodology to Develop and Validate Watershed Nutrient and Bacteria Loading Model

Model Development

This section discusses the processes that were used to simulate loads of nutrients including ammonia (NH_3), nitrite-nitrate (NO_3-NO_2), total nitrogen (Total-N), dissolved phosphorous (PO_4), and total phosphorous (Total-P) and bacteria (fecal coliform, total coliform, enterococcus) from the Loma Alta Slough watersheds. The calibrated HSPF hydrology was used to simulate the hydrology of the watershed and the how stormwater transports those constituents to the Slough. Results from the water quality loading model were compared with the observed nutrient and bacteria concentrations measured in the three monitored storms from January and February 2008.

Water Quality Model Validation

The water quality model application required a slightly different approach than the hydrologic model. With the hydrologic model, the lands were divided into pervious and impervious areas (with soil type,

slope, etc. characterized). Since water quality varies by land use type, it was necessary to slightly modify how the different land use types were represented (while maintaining the hydrologic calibration). The water quality model simulated eight land use type: agriculture, commercial, high density residential, industrial, low density residential, open, open-recreation, transportation. The percent imperviousness for each of those land uses is shown in Table 2.9

Table 2.9. Percent imperviousness for the water quality watershed model (Ackerman and Schiff 2003).

Land Use	Percent Impervious
Agriculture	0
Commercial	90
High Density Residential	90
Industrial	50
Low Density Residential	15
Open	0
Open-Recreational	12
Transportation	95

Because of a paucity of land use stormwater monitoring data in the Loma Alta Slough watershed, a rigorous calibration and validation of the model was not feasible. A weight of evidence approach was selected to maximize the utility of the available data. The water quality model output for each eight land uses simulated 26 years of stormwater runoff (WY1980-2006). The model build up/wash off parameters were adjusted to approximate the observed land use concentrations in the 26 years of model output while maintaining a 30-day maximum build-up rate.

The Loma Alta Slough watershed model was run in a similar manner to the land use calibration to characterize its predictive ability relative to the three monitored storms at the mass emission station. The watershed model simulated the stormwater runoff between WY1980 and 2006. It should be noted that the model was developed only to characterize the surface stormwater runoff water quality and not the base flow conditions.

4.2 Results and Discussion of Watershed Hydraulic Loading Model Calibration and Validation

A series of PEST inversion runs were carried out to calibrate the Loma Alta Slough watershed model. As previously mentioned, to account for the potential overestimation of IMPLND roof area, a simple multiplicative parameter was specified to allow for reducing its total area within each of the two modeled sub-watersheds, with the reduced IMPLND roof area then increased for the urban landscaped vegetation types, distributed to those PERLND types based on their originally determined distribution in each sub-basin. The first two runs simply involved executing the model once, with the model fixed at the SDHM preferred parameter set, with the IMPLND roof area reduction factor set at effectively zero and

0.25, respectively. Least squares objective function values of 178.5 and 180.1 were obtained, respectively. It should be noted that for each of these two cases, the comparison of the observed and modeled synthetic data observations were identical since the parameter set was fixed at the SDHM preferred parameter set. Hence, the noted objective function values were solely due to stream discharge model to measurement misfit.

The third model calibration experiment involved a Levenberg-Marquardt (LM) supervised local search (see Skahill et al. 2009) for details regarding the Levenberg-Marquardt method of computer-based model calibration) wherein the initial estimate was at the SDHM preferred parameter set and the IMPLND roof area reduction factor initially set at 0.05. For this third model calibration experiment, 198 parameters were specified as adjustable (see Appendix 2 for the list of adjustable model parameters for this experiment, their names, initial values and specified lower and upper bounds). In order to better accommodate scaling issues resulting from the use of different units for different parameters, and in an attempt to decrease the degree of nonlinearity of the parameter estimation problem, the logs of these parameters were estimated instead of their native values; past experience has demonstrated that greater efficiency and stability of the parameter estimation process can often be achieved through this means (Skahill and Doherty 2006).

The third model calibration experiment, an actual inversion run (Levenberg-Marquardt based local search) terminated after 1596 model calls, and it resulted in reducing the objective function from a starting value of 178.4 to a final value of 143.9. Final objective function values are listed in Appendix 3 for the third model calibration experiment. Upon inspection of the parameter sensitivity file (see Doherty (2004) for a description of the various capabilities associated with the PEST tool) at the end of the third model calibration experiment inverse model run, it was apparent that specified adjustable model parameters associated with PERLNDs 1-4, 21-24, and 41-44 impaired the model identification process.

The fourth model calibration experiment also involved a Levenberg-Marquardt (LM) supervised local search wherein the initial estimate was at the SDHM preferred parameter set and the IMPLND roof area reduction factor initially set at 0.05. For this third model calibration experiment, 354 parameters were specified as adjustable (see Appendix 4 for the list of adjustable model parameters for this experiment, their names, initial values and specified lower and upper bounds). As with the third experiment, in order to better accommodate scaling issues resulting from the use of different units for different parameters, and in an attempt to decrease the degree of nonlinearity of the parameter estimation problem, the logs of these parameters were estimated instead of their native values. The fourth model calibration experiment, also an actual inversion run (Levenberg-Marquardt based local search) terminated after 3197 model calls, and it resulted in reducing the objective function from a starting value of 178.4 to a final value of 176.9. Final objective function values are listed in Appendix 5 for the fourth model calibration experiment. As with the third experiment, parameter insensitivity impaired the estimation process.

In light of the impaired LM-based inverse model runs, due to the observed parameter insensitivities, associated with the third and fourth model calibration experiments, a fifth model calibration experiment was performed using Truncated Single Valued Decomposition (TSVD) as a means to stabilize the inverse

model (see Skahill and Doherty 2006) for a brief discussion on TSVD). The adjustable model parameters, their initial values, and their lower and upper bounds were identical to those specified for the fourth model calibration experiment. The fifth experiment terminated after 17372 model calls, reducing the initial objective function value of 178.4 to a final value of 91.56. See Appendix 6 for the final objective function values associated with the fifth model calibration experiment.

While there was a notable objective function reduction with the TSVD run, relative to the two LM runs, plots of the hydrographs, most importantly, but also the costs associated with TSVD-based regularization (1. see Skahill and Doherty (2006) for a brief discussion on TSVD; 2. viz., biased and potentially unrealistic model due to potential overfitting) resulted in a final model selection to be the second model calibration experiment wherein there is an exact fit to the synthetic observations and comparable fits, with the other experiments, to the hard data (i.e., the observed flow data). Hence, the final model is simply the SDHM model with the one new parameter, red, specified the value of 0.25. Appendix 7 lists summary statistics associated with the final model calibration for the six periods identified for comparing stream flow observations with their model simulated counterparts. Figure 2.7 (a,b,c) provide the comparisons between simulated and measured flow rates for the six storms listed in Table 2..

Table 2.10. Six storms for hydrological model calibration/validation.

Storm Number	Start Time/Date	End Time/Date
1	11/30/2007 00:00:00	12/01/2007 23:00:00
2	12/07/2007 00:00:00	12/09/2007 12:00:00
3	01/05/2008 00:00:00	01/07/2008 23:00:00
4	01/27/2008 00:00:00	01/28/2008 23:00:00
5	02/03/2008 00:00:00	02/03/2008 23:00:00
6	02/24/2008 00:00:00	02/24/2008 23:00:00

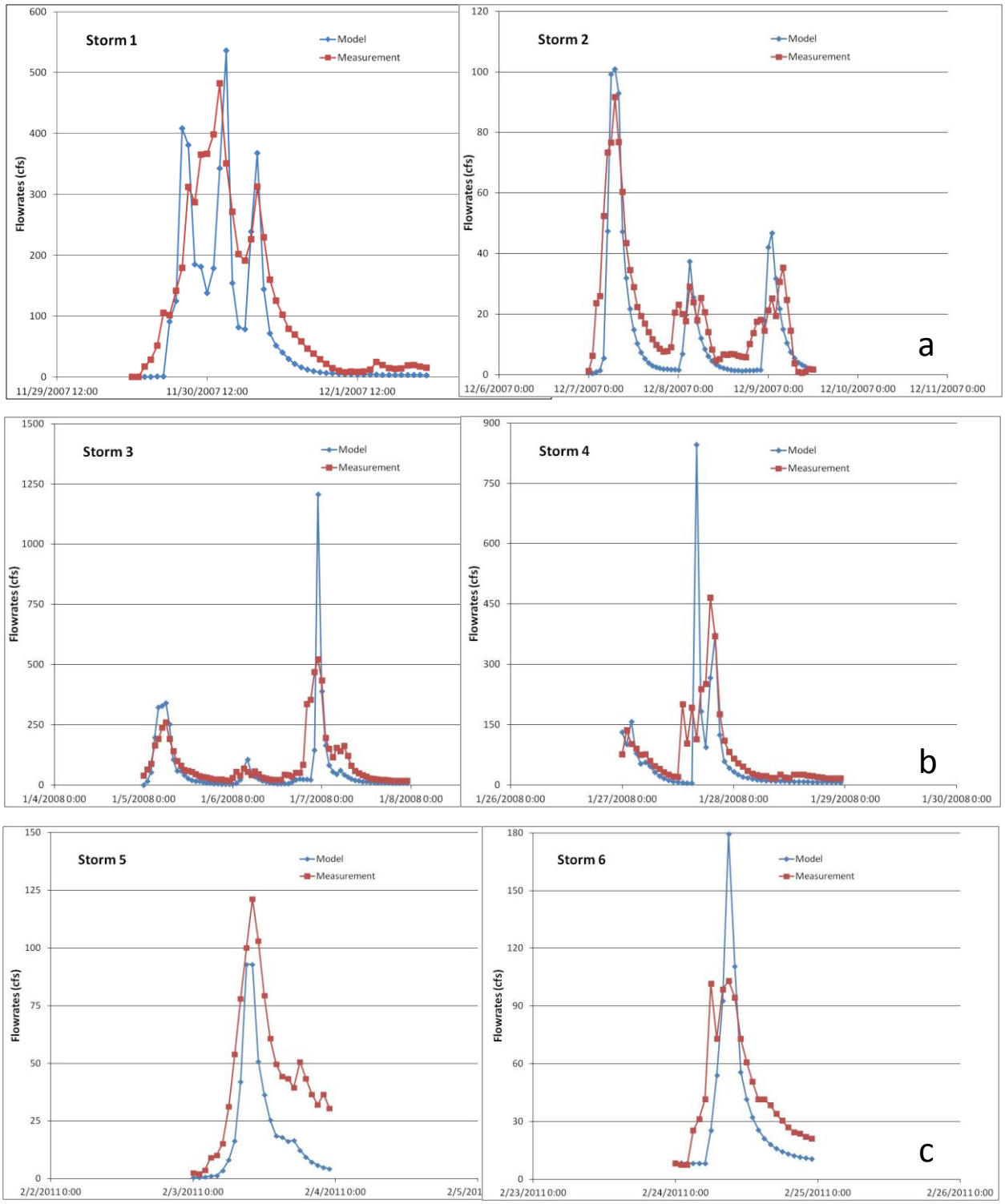

Figure 2.7. Plots of simulated (red) and measured (blue) hydrographs for Storms 1 and 2 (a), Storms 3 and 4 (b), and Storms 5 and 6 (c); see Table 2.10 calibration/validation dates.

2.3 Results and Discussion of Watershed Nutrient and Bacteria Loading Model Validation

2.3.1 Nutrients

Over the long term, the watershed model captured the observed nutrient and bacteria levels at the mass emission station. The observed ammonia levels were characterized by the model. The median model nitrite-nitrate concentrations were slightly greater than the measured but the observed concentrations were within the range of predicted values at the10th percentile. The simulated total nitrogen showed greater range than the ammonia and nitrite-nitrate. The measured total nitrogen levels were in the lower range of the simulated but within the 25th percentile confidence intervals (Figure 2.8).

The model reproduced the observed range of dissolved and total phosphorous concentrations. The modeled median phosphate concentration were within 0.05 mg L^{-1} of the average observed dissolved phosphorous concentrations and median total phosphorous predicted was within 0.01 mg L^{-1} of the observed average. The range in observed variability was reproduced by the model at the 25th and 75th percentile intervals (Figure 2.9).

2.3.2 Bacteria

The greatest variability and difference between modeled and measured concentrations were in the bacterial predictions. Because of a paucity of bacterial land use runoff data within the modeled watershed, land use coefficients from a previous regional study (Tetra Tech) were used to characterize the land use export. Model coefficients were globally adjusted to approximate the observed bacteria levels in the watershed.

The model generally characterized the range of observed bacteria concentrations in the stormwater runoff. The model did not capture the lower fecal coliform and enterococcus levels measured during one storm. Another storm had total and fecal coliform concentrations greater than the 90th percentile confidence interval. Because the model over- and under-predicts bacteria levels, a systemic inaccuracy in the error was likely not present. The variability may more likely be reflective of episodic flushing from the system that would likely be difficult to be captured during land use stormwater monitoring. However, both the model and measured bacteria levels are more than an order of magnitude than the water quality standards and significant management actions will be required to mitigate those levels (Figure 2.10).

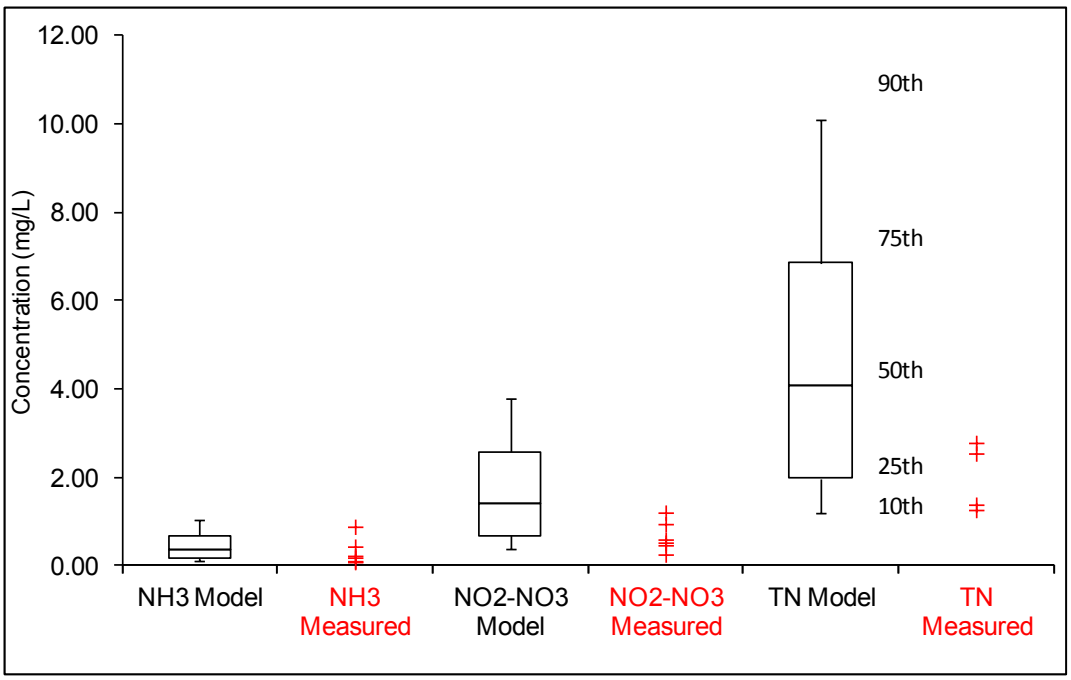

Figure 2.8. Comparison of measured and modeled stormwater bacteria from the Loma Alta Slough watershed (10th, 25th, 50th, 75th, and 90th simulated percentiles are shown).

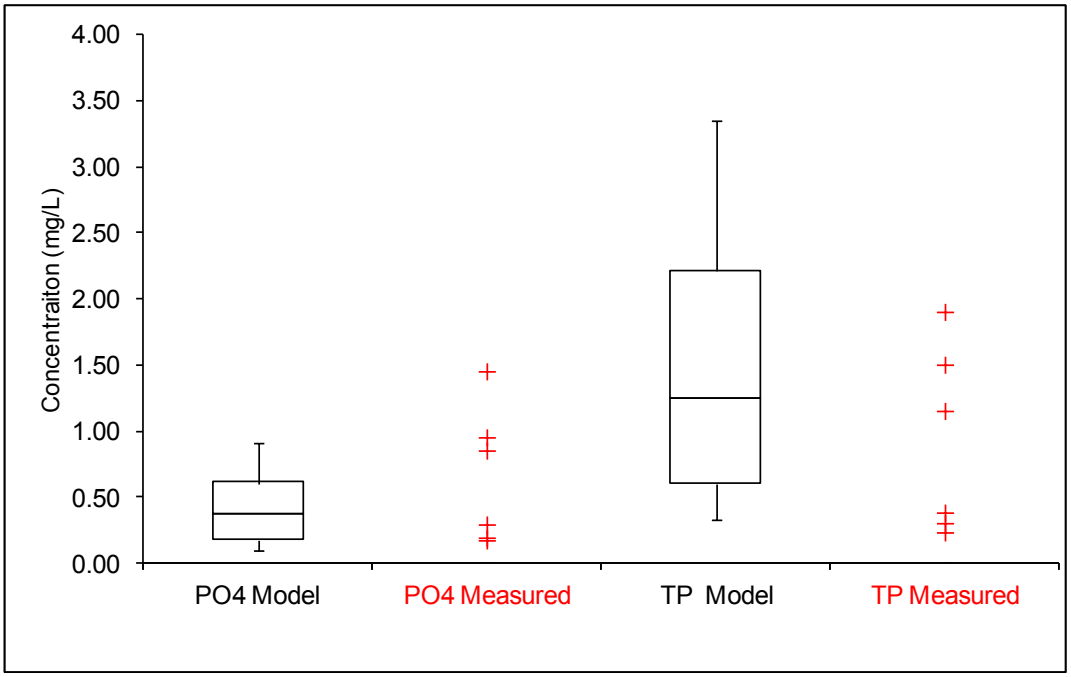

Figure 2.9. Comparison of measured and modeled stormwater nutrients from the Loma Alta Slough watershed.

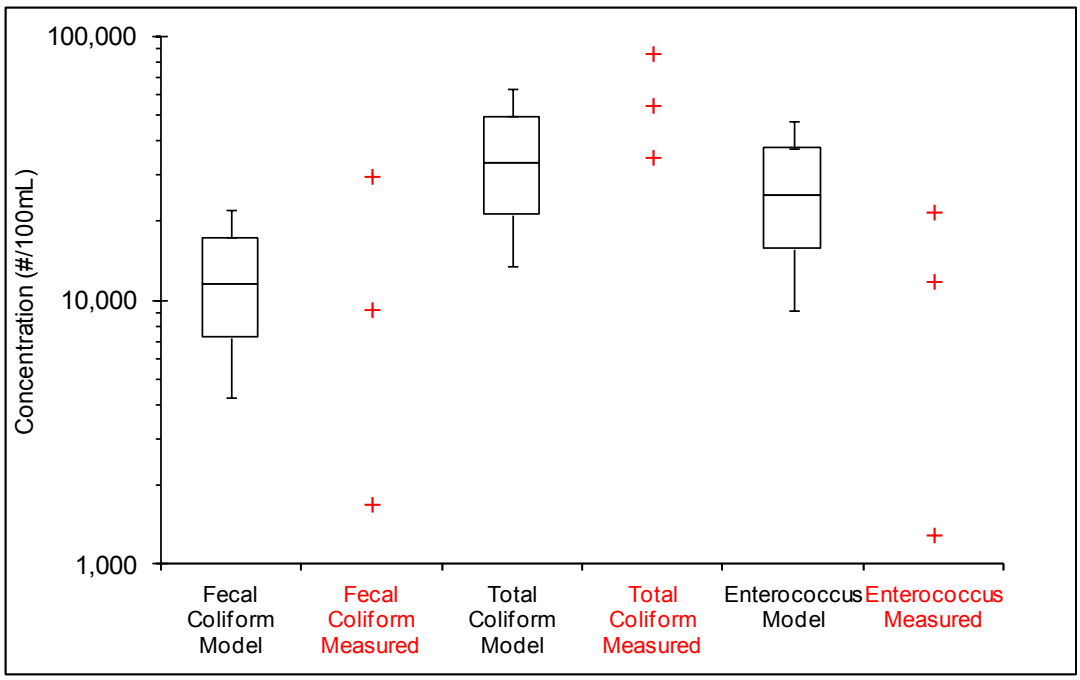

Figure 2.10. Comparison of measured and modeled stormwater bacteria from the Loma Alta Slough watershed.

2.4 Uncertainties in Watershed Loading Model Results

Data compilation, analysis, and model calibration and validation were conducted to support development of a watershed loading model for the Loma Alta Slough watershed. The effort included identification and description of the watershed characteristics and types of spatial and time series data that were collected, processed, and utilized for the model. An approach was developed and applied for constructing, calibrating, and verifying the hydrologic model for the Loma Alta Slough watershed. The calibrated and verified hydrologic model was shown to be of predictive value, and capable of simulating hydrologic response based on land use and land cover, soils, and percent slope, and that capability is valid insofar as the SDHM model (which is well accepted by the hydrologic model practice community) is representative of the real world system.

While not performed, the existing Loma Alta Slough hydrologic model could rather easily be modified into the most identifiable hydrologic model representation possible , and then subsequently interfaced with stochastic global optimization capabilities encapsulated in the PEST tool (see Skahill and Doherty 200) and Skahill et al. 2009) to yield an upper bound in terms of the level of model to measurement misfit (solely focusing on stream discharge data for quantify misfit) that is possible with the given forcing and observation data.

For the Loma Alta Slough watershed model, simulation of the indicator bacteria enterococcus, fecal coliform, and total coliform was established by calibrating against the daily loading data listed in Appendix D-3 of the 2009 CHU Lagoon Monitoring Report prepared by Mactec. Fits obtained indicated

that all three bacteria loading models are predictive. In retrospect, log transformation of the loading data that was used for model calibration, and their model simulated counterparts, prior to objective function calculation, could be an avenue to pursue in attempts to ensure that the model is not biased towards over-fitting the higher loading values at the expense of the lower daily bacteria loading values.

2.5 Watershed Modeling Summary

Data compilation, analysis, and model calibration and validation were conducted to support development of a watershed loading model for the Loma Alta Slough watershed. The effort included identification and description of the watershed characteristics and types of spatial and time series data that were collected, processed, and utilized for the model. An approach was developed and applied for constructing, calibrating, and verifying the hydrologic model for the Loma Alta Slough watershed. The calibrated and verified hydrologic model was shown to be of predictive value, and capable of simulating hydrologic response based on land use and land cover, soils, and percent slope, and that capability is valid insofar as the SDHM model (which is well accepted by the hydrologic model practice community) is representative of the real world system.

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3 ESTUARY HYDRODYNAMIC MODEL CALIBRATION AND VALIDATION

This section summarizes the development, calibration, and validation of the estuary hydrodynamic model for Loma Alta Slough. This includes identification and description of the data that were utilized for the model, as well as the approach that was followed for constructing, calibrating, and verifying the model for Loma Alta Slough.

3.1 METHODS

3.1.1 Previous Work

In 2008, Tetra Tech completed a report on initial data compilation and model configuration for the 7 listed lagoons in San Diego County (Tetra Tech 2008). Previous work consisted of setup of the LSPC (Loading Simulation Program in C++) model and EFDC (Environmental Fluid Dynamics Code) model for simulating the watershed runoff and the slough flow hydrodynamics, respectively. Some of the LSPC model input files were given to CMA by Tetra Tech, and used as a starting point for the modeling. The LSPC model uses streamlined algorithms of HSPF, and since we had to re-create some of the incomplete input files, we set up the complete HSPF model for the watershed loading simulations. The EFDC model was not received, and no details about the model setup or input data or model parameters were available in the report. A coarse model grid for the EFDC model was shown, which was proven to be inadequate to resolve the strong depth gradient in the slough.

3.1.2 Model Selection

The hydrodynamic model Environmental Fluid Dynamics Code (EFDC) was selected to model the hydrodynamics and bacteria in Loma Alta Slough. Its governing hydrodynamic equations are three-dimensional (i.e. it addresses water movement up and down stream, vertically in the water column, and horizontally across the channel). The model balances water pressure while allowing water density and water surface elevation (WSE) to change with turbulence-averaged equations. It is a three-dimensional sigma-coordinate model, meaning that there are a constant number of layers throughout the model domain each with a specified percentage of total depth and thus, the thickness of those layers changes with WSE (Tetra Tech 2002). EFDC has been used extensively throughout the United States with applications including the Los Angeles Harbor/San Pedro Bay and Dominguez Channel.

There exist many versions of the EFDC models, and not all of these versions are suitable for this study. We acquired an updated version of EFDC source code from EPA Region IV, Atlanta, GA in July 2010, which has been configured for the current study. We set up the model by generation of a model grid, specifications of model boundary conditions, model test and diagnostic runs, problem identification, debugging, and solving, and finally model simulations for the study.

WASP Version 7.4 (Water Quality Analysis Simulation Program V7.4) was used to simulate the transport and fate of nutrients in Loma Alta Slough. EFDC output is stored in a link file (LomaAlta.hyd) that links to WASP7.4, which simulates the water quality and eutrophication condition of the Slough. The EFDC model also is required to be linked with WASP, for which, hydrodynamic output from EFDC is generated as a stand-alone binary file for the entire simulation period (LomaAlta.hyd). The configured water

quality model (e.g., WASP7.4) then links with the hydrodynamic file to drive the transport and eutrophication runs for the slough.

3.1.3 Data Sources

Data were collected to characterize the model domain, inputs and the conditions within the estuary. Data sources used for the study are summarized below.

Physical Setting

Merged bathymetry and topography was derived from LiDAR data, which covered from approximately 150 m off the ocean beach to the railroad bridge. Based on the LiDAR data, bottom elevations and slope of the Slough were generated and extended from the railroad upstream passing the Coastal Highway Bridge (Figure 3.1).

Atmospheric Conditions

Meteorology data was used in the simulation of WSE (barometric pressure) and temperature (atmospheric temperature). EFDC requires the following meteorological data:

- air temperature
- relative humidity
- solar radiation
- dew point
- wind speed
- evaporation rate
- cloud coverage

Meteorological daily data measured at Torrey Pines was used for EFDC. In addition, temperature boundary conditions need to be prescribed at the upstream riverine segment and downstream oceanic segments. The measured temperature time series at ME was used as the riverine boundary condition, and temperature at the ocean was assumed to vary linearly from 15 to 16°C from Jan-May.

Oceanic Conditions

The oceanic WSE was needed to drive the simulation of tidal circulation within the Slough Tide gauge data for tidal conditions at or near the Slough is lacking. NOAA's tide records at La Jolla (http://NOAA-tide.gov) are the closest tide data and were used for setting up the ocean boundaries for the study. The scattered surf and tide data (high and low tides) at Oceanside were compared with NOAA's tide gauge data and revealed that, while there is a phase lag of about 15 minutes between La Jolla and Oceanside, the magnitudes of high and low tides are very close at these two locations. Therefore, NOAA's tidal records at La Jolla for 10/1/2007 through 10/31/2008 were used for this study.

Like the oceanic WSE boundary, no temperature or salinity data was available for the nearshore area adjacent to the mouth of LAS. Temperature and salinity data are necessary to define conditions at the boundary of the region being modeled. Therefore, data from the Scripps Pier in La Jolla, which is the closest monitoring station to the LAS were used (www.sccoos.org).

Inputs

Loma Alta Creek is the major source of freshwater discharging to LAS. Groundwater inputs are unquantified. Flow data were obtained to calibrate and validate the wet weather watershed loading model (Section 2) and to quantify the daily dry weather average flow into the LAS. Flow data, temperature, conductivity, bacteria (enterococcus, fecal coliform, total coliform), and total and dissolved inorganic nitrogen and phosphorus, and biological oxygen demand were obtained from Mactec (2009), data collected in support of the SDRWQCB Monitoring Order # R9-2006-0076 for Loma Alta Slough and other 303(d) listed estuaries. Discharge data measured at the ME station were used to drive the EFDC hydrodynamic simulations for both the wet period (1/1/2008-4/1/2008) and dry period (5/1/28-10/21/2008). Salinity and temperature measured at the ME station were used as the riverine boundary conditions.

Slough Hydrodynamic Data and Continuous Water Quality Data

Data from in situ instruments deployed by Mactec (2009) at two stations including Segment 1 and the Ocean Inlet Stations were used to the simulate WSE, salinity, temperature, and dissolved oxygen within the Slough.

Additional Observations

Site visits to the Slough were conducted three times in April, October 9 and October 15, 2010 to observe how the Slough water exchanges with the ocean. During the April trip, it was observed the incoming tides flushed through a narrow channel of the Ocean Inlet into the slough. It was also observed the apparent movement of ocean water into the slough during the two-hour period. On October 9, two days after a major storm, a new channel was formed in the north side of the Ocean Inlet that drained the slough water into the ocean. On the third trip of October 15, the site was observed during both high and low tides. During the high tide (11:23 AM), the slough was almost separated from the ocean by the high sand berm near the Ocean Inlet. Only the highest tides could find its way through the very shallow "channel" on the south side of the inlet over the sand berm into the slough. During the low tide in the afternoon (~5:00 PM), the sand berm remained intact. The slough water was separated from the ocean, and could not be flushed out with the low tide. Observations from the three field trips show three different scenes regarding the dynamic nature of the water exchange near the Ocean Inlet.

3.1.4 Model Set Up and Development

Grid Generation

Initially, a model grid, similar to that shown in the Phase I (Tetra Tech 2008), was generated. There were about 20 segments along the main stretch of the creek, with an average of 30 m long for each segment. During the diagnostic runs, this model grid shows inadequate resolutions along the river stretch and therefore, a second and current grid was generated. This grid increases the creek-stretch resolutions, in particular, near the Ocean Inlet where bathymetry varies greatly from the deepest Ocean Inlet to the shallowest sand berm near the bridge. As a result, the total number of segments along the creek increases from 24 to 28 (Figure 3.1).

The LiDAR data and measured bathymetry at two locations, including Ocean Inlet and Segment 1, in the slough were used to define the bathymetry of the study area. The LiDAR data covers regions about 150 m from the coastlines to the railroad bridge. The bottom elevations upstream of the railroad bridge to the river boundary segment (Segment Station # 8) were generated by extrapolating the bottom slope from the LiDAR data between the Ocean Inlet and the railroad bridge (Segment Stations #11-18; Figure 3.1).

Figure 3.1. The EFDC model grid for Loma Alta Slough.

Boundary Conditions

There are two boundaries for the model grid, the upstream boundary and downstream ocean boundary (Figure 3.2). The upstream boundary (Segment #28) receives freshwater inflows and contaminant loads from the watershed. For this study, freshwater discharges measured at the ME station during 1/1/2008-10/31/2008 is used for input at the river boundary. The downstream boundary connects and receives forcing from the ocean tide. The NOAA's ocean tide data measured at La Jolla is used to at this boundary. It is noted that the NOAA's tide data are based on MLLW and NAVD, which are only different by ~5 cm sec^{-1}. We used the tide data with reference to NAVD at the ocean boundary.

Salinity and temperature data measured at the ME site, 1/1/2008-10/31/2008 are used to act as the boundary condition for the transport simulation of these two water quality parameters. The downstream boundary conditions at the ocean are set to be fixed constants of 36 ppt for salinity and 15^0C degree for temperature throughout the simulation periods. Meteorological data measured at Santa Barbara is used as the boundary conditions over the surface of the creek for heat balance (temperature) calculation in the model.

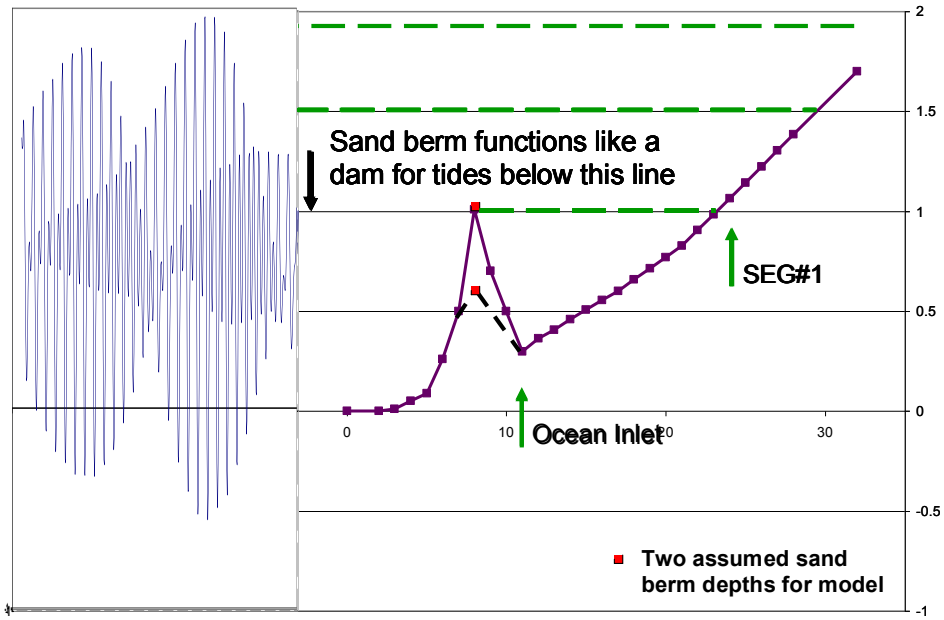

Figure 3.2. Schematic model cross sections, depths, sand berm, riverine and ocean boundaries.

Model Linkage

EFDC simulates hydrodynamic current and water surface elevation, which are then linked to EPA's water quality model, WASP7.4, to drive the eutrophication and water quality modeling. We acquired and configured EPA's newest version of eutrophication model, WASP 7.4 for Loma Alta Slough. The water quality configuration includes two parts, model parameterization and assignment of constants and forcing terms, and assignment of hydrodynamic transport. WASP7.4 has two options of using hydrodynamic transport. WASP can assign the flows and water model segment volumes internally in the model input file. WASP7.4 can also use an externally-generated hydrodynamic file, such as the LomaAlta.hyd generated by EFDC, to drive the model runs. Based on the requirement for this study, the EFDC-generated hydrodynamic file, LomaAlta.hyd is linked with WASP7.3 for eutrophication modeling study.

Implications of Railroad Trestle Construction Activities

Construction by Amtrak to replace and double-track the railroad crossing over the slough took place between August 2007 and August 2008. During construction a berm of imported sediment and gravel with four large corrugated metal pipes to allow flow was created under the trestles spanning from the

north to the south bank. Construction activities were documented (www.arema.org/files/library/2009_Conference_Proceedings/The_Oceanside_Passing_Track_and_Bridge_Replacement_Project.pdf). It was observed that the sand berm seemed to hinder and slow down the water from flowing downstream across the berm during high creek discharges and/or low tidal stages. During high tides, slough water reversed its direction, flowing upstream the creek. Since these conditions were unique to the construction timeframe, the simulation and characteristics of flows without the sand berm/culvert were based on two assumptions. The first assumption was that the 2008 construction was only a one-time event, not a normal condition for the slough. The second assumption was that even with the construction, the culvert and the sand berm hindered and slowed down the flow downstream, but they did not stop the flow. Therefore, modeling results with the culvert should be applicable to interpret measured water surface elevations and salinities during the period.

Model Calibration and Validation

Model calibration and validation compared model output to measurements made in the Slough. The first comparison was between measured and modeled water surface elevation at the Ocean Inlet (OI) and Segment 1 (Segment 1; Figure 1.2). Next, the measured and simulated temperature and salinity in the lower portion of the waters at the same sites were compared.

The model was calibrated and validated for bacteria and nutrients by comparing model output against the data collected at the *in situ* sampling locations throughout 2008. Model output was compared against measured constituents for bacteria, nutrients, and algal biomass.

Sensitivity Analysis

Model performance is influenced by confidence in the input data used for model development and calibration. Sensitivity analysis is an important step of the model development process; it quantifies the effects of specific data sets, including their uncertainty level, on model results. The results of the sensitivity analysis can also be used to identify priorities for future data collection.

Sensitivity of the LAS model was evaluated by altering key model parameters and assessing the relative effect on model predictions.

Resolution of Issues Identified with Dry Weather Flow Data

Although wet weather events constituted most of the loading of flows and bacteria to the slough water, dry weather flows are equally (if not more) important in governing transport and dilution in the slough water. This is because during wet weather, the inlet was open and large watershed runoffs flushed the slough from the upstream to the ocean fairly fast, with traveling time estimated to be less than one day for each storm. In contrast, dry weather condition constituted a large portion of the entire study periods including the periods when the inlet was open and when the inlet was closed. As such, dry weather base flows are significant and pivotal in determining the dilution and transport patterns in the slough during the dry weather condition.

During the study period, we identified potential errors in both the magnitude and behavior of the original measured dry weather base flow (Mactec 2009). The magnitude of the measured base flow was

suspected to be over predicted (measured) by an order of magnitude before the inlet was closed (May, 2008) and under predicted (measured) by an order of magnitude during the period when the inlet was closed. Meanwhile, during the dry weather period, there was moderate precipitation on May 24, 2008, and no signal of such precipitation event was reflected in the measured flow. Measured flow shows significant pulses during the end of October 2008 when there was not any precipitation during the period. These over and under measured flow rates before and after the inlet was closed, in conjunction with the inconsistencies between the measured flows and precipitation have put validity of the measured dry weather base flow in question.

Through model calibration, we estimated that dry weather base flow would need to be 0.495 cfs in order to achieve best matches of salinity and temperature between model prediction and measurement. This 0.495 cfs would need to persist throughout the dry weather period (spring and summer). In Figure 3.3 and Figure 3.4, the originally calibrated flow (dashed line) includes both wet weather flow (most in Jan-Feb, 2008) and dry weather base flow. Prior to Jun 1, the revised flow predicted by the watershed model coincides with the originally calibrated flow. For Jun 1-October 31, 2008, we used measured flow which is one order of magnitude less than that of the originally calibrated flow.

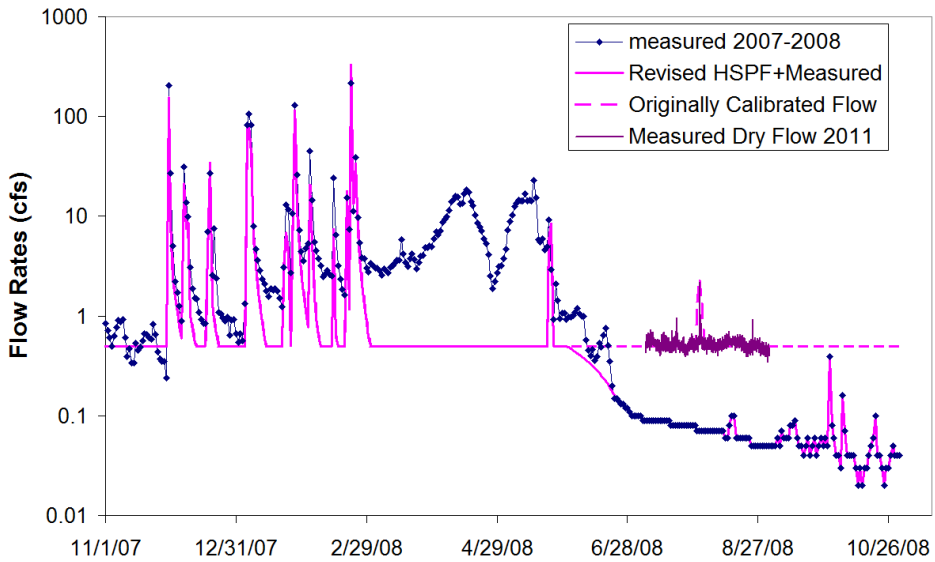

Figure 3.3. Dry weather base flows (newly measured dry based flow for July 7-Aug 31, 2011 are plotted with the same months/dates for 2008).

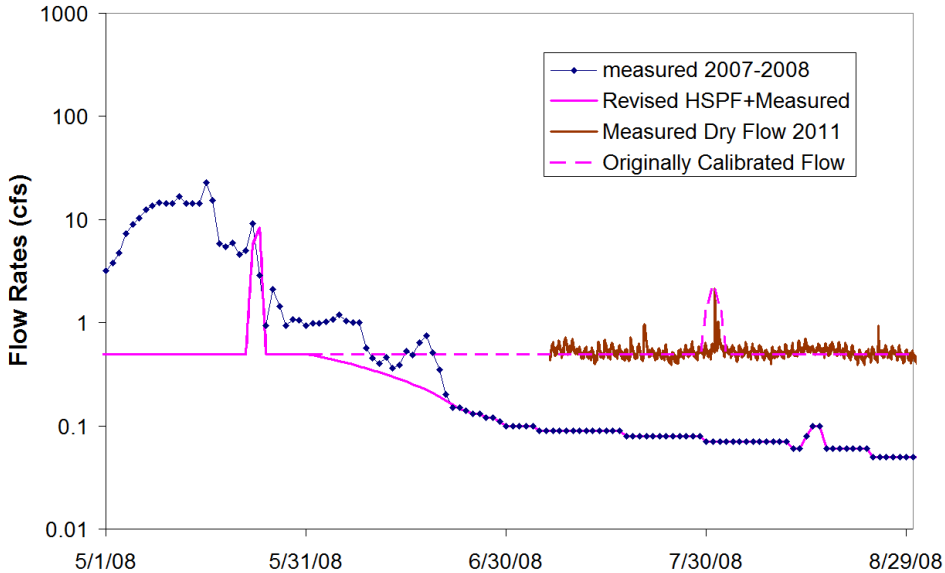

Figure 3.4. Close-up look of dry weather base flows (newly measured dry based flow for July 7-Aug 31, 2011 are plotted with the same months/dates for 2008).

All of these issues discussed above were reported and discussed during the stakeholders' meetings and decisions were made to re-sample dry weather base flow during the summer of 2011. On Sep 17, 2011, we received measured dry weather base flow for Jul 6-Aug 31, 2011, which is plotted with the 2008 flows for the same months/dates with the year assumed to be 2008. During the period of Jul 6-Aug 31, 2011, dry weather base flow maintained relatively constant values with a mean of ~ 0.55 cfs, which is coupled with some fluctuations with amplitudes of about 0.05 cfs. These patterns of the newly measured dry weather base flow are much more consistent with those in the originally calibrated flow. The difference of the calibrated and newly measured mean flow is about 10% and both flows tend to persist throughout the entire dry weather period.

It is believed that the newly measured dry weather base flow behaves much more in line with the model calibrated flow. These new flow data were used in all simulations for water quality.

3.2 Results and Discussion of the Estuary Hydrodynamic Model

3.2.1 Wet Season (January-May 2008)

During the period of 1/1/2008-10/31/2008, water surface elevations, salinity and temperature were measured at two locations: Ocean Inlet (OI) and Segment 1 within the creek. EFDC model simulations over the two seasons, the wet season from 1/1-5/31/2008, and the dry season, 6/1-10/31/2008, were conducted and results are compared with the measurements. During the wet season, 1/1-5/31/2008, the OI is assumed to remain open with the sand berm at the OI assumed to be at two heights, 100 and 60 cm with the NAVD reference. As discussed previously, formation and evolution of the sand berms is highly dynamic with different time scales involved, which is outside the scope of the current study. As

such, we assume two heights for the sand berm for the EFDC model to simulate the hydrodynamics and flow conditions.

Water Surface Elevation

EFDC was set up and simulations over the period of 152 days (1/1-5/31, 2008) were conducted. Model results are presented and analyzed by each month from Jan-April for the sake of clarity, since much data and information is involved. Table 3.1 and Figure 3. show the statistics of simulated and measured water surface elevation (WSE) at OI and Segment 1 stations Jan-Apr 2008 (Figure 3.5). Monthly means and Root Mean Square (RMS) are shown in Table 3.1.

Table 3.1. Summary statistics for water surface elevations (means and root mean square error) between model and measurement 2008.

	WSE at OI (meter)			WSE at Segment 1 (meter)		
	Model	**Measured**	**RMS**	**Model**	**Measured**	**RMS**
Jan-08	0.95	0.94	0.34	1.02	0.98	0.26
Feb-08	0.97	0.9	0.34	1.04	0.95	0.27
Mar-08	0.95	1.03	0.41	1.02	1.09	0.29
Apr-08	0.98	1.02	0.29	1.03	1.08	0.23

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Figure 3.5. Simulated water surface elevations during different tidal and river discharge conditions (vertical dimensions are up to the scale, horizontal dimension of the river stretch are off the scale distance from Segment Station #7 to Segment Station #28 is about 400 m).

Figure 3.6 shows simulated water surface elevations over the model axis of the slough during various tidal stages. In general, regions near the upstream boundary tend to function as a river with ocean tides come and go and downstream regions are more influenced by the ocean tides. These similar but different flow and transport patterns are reflected in the salinity variations, which will be discussed later. In general, model simulated water surface elevations are smooth and reasonable throughout the simulation periods.

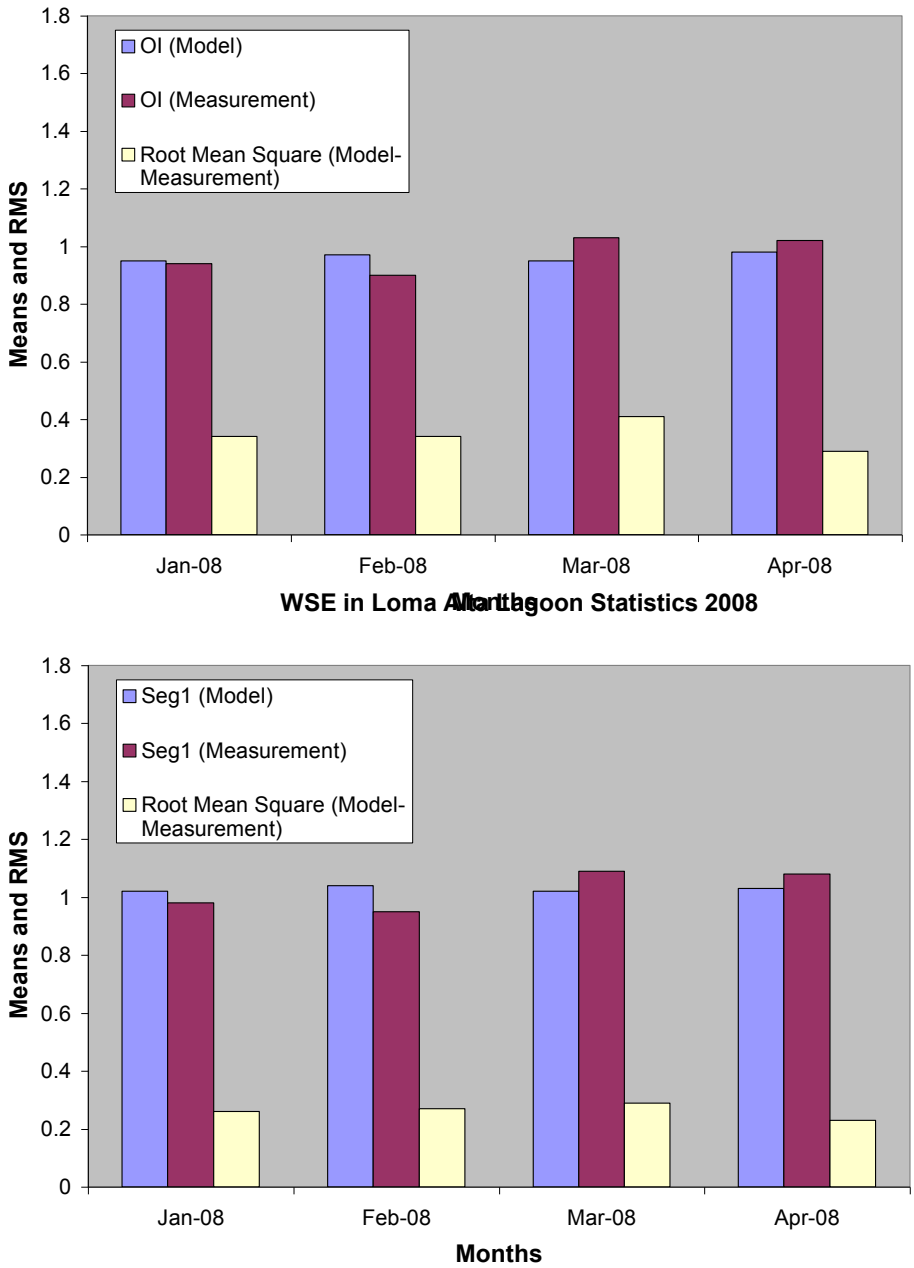

Figure 3.6. Means and RMS of WSE at OI (above) and Segment 1 (bottom).

Figure 3.5 shows the measured and simulated water surface elevations at OI for January 2008. Two modeled water surface elevations were generated for the two sand berm heights of 100 cm and 60 cm, respectively. In general, simulated WSE at OI fluctuates with the ocean tides, attaining heights during flooding tides and receding during ebbing tide, which is regulated by the sand berms. The small time lag (~40 minutes) between the model and measurements, coupled with the time lag of ~15 minutes of the ocean tide between La Jolla and Oceanside, suggests that there is a time lag of about one hour between the model and measurement. It is not clear at this stage what might have caused this one-hour time discrepancy. During flooding tides, in particular, the spring tides, ocean water flushes into the creek through the sand berm, therefore, peak water surface elevations at OI are in line with the ocean tidal stages, as predicted by the model. As the tides are subsiding and ebbing, the creek water starts to flow out until the ocean tidal height is below the sand berm and the creek water is blocked by the sand berm from flowing out. Thereafter, the water surface elevations remain at the height regulated by the sand berm.

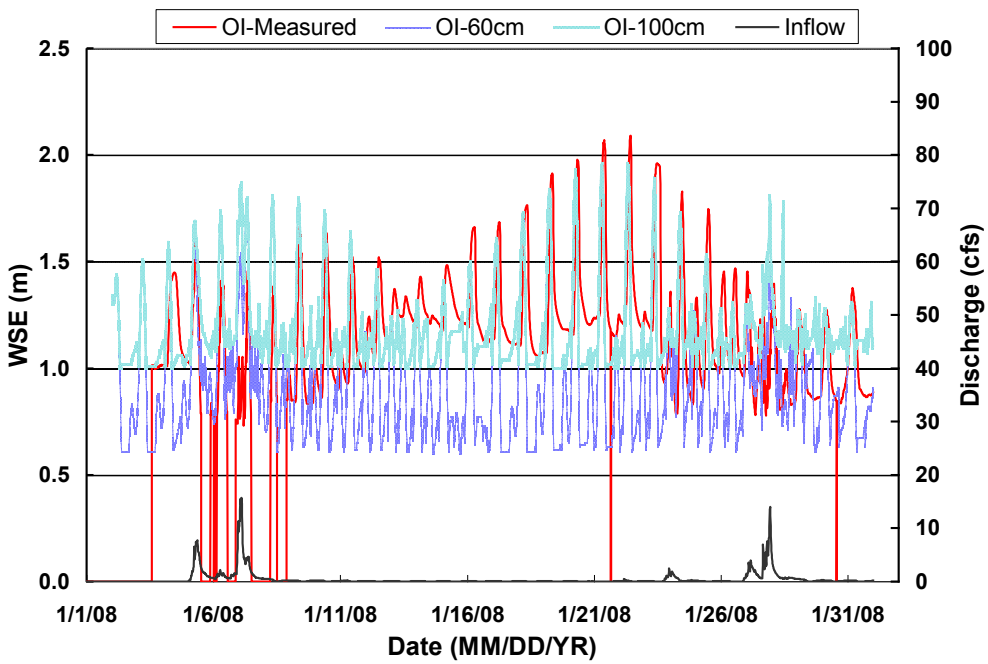

Figure 3.5. Comparisons of measured (red) and modeled (blue for 60 cm and green for 100 cm berm heights) water surface elevations at OI, with runoff discharge in black for January, 2008.

Water surface elevations at SEG#1 show interesting phenomena (Figure 3.6). During the simulation period, construction took place below the railroad bridge. A “dam” wall with a culvert was built and the flow across was hindered or regulated. An effect of the culvert is to regulate and reduce flows across the two sides of the culvert. For example, the flooding tides will increase the water surface on two sides of the culvert. During ebbing tides, water upstream of culvert will be regulated to recede at a slow rate due to the culvert.

The 2008 construction was a rare event, not a normal situation. For normal situations, model simulated water surface elevations at SEG#1 are analyzed and compared with measurements, knowing that conditions for model simulations and measurements were not the same.

For SEG#1, water surface elevations were flooded during high tide, similar to those at OI. During ebbing tide, the water surface elevation can be reduced only to the height of the sand berm or the bottom at SEG#1, the larger of the two. For our scenario, it is the bottom of SEG#1. According to the LiDAR data, depths east of OI are sloping up with water depths decreasing toward SEG#1 and further upstream. Therefore, initial depth at SEG#1 (~0.6 m) is less than that at OI (~1.4 m). When the ocean tide is below the sand berm (~1 m and 0.6 m, NAVD), SEG#1 gets exposed and becomes dry. The model assigns a minimum depth (~15cm) as the cell becomes dry, which may get re-wetted when ambient flows advected through. Therefore, the water surface elevation at SEG#1 is dictated by the flooding during high tide and getting the bottom dry during low tide. Communication with Mr. Honma reveals that depth at SEG#1 may not be shallower than depth at OI. If this is true, we will have to question how representative the LiDAR data, which is a snapshot survey in the past, is and what kind of bathymetry data we should use in order to fully describe reality.

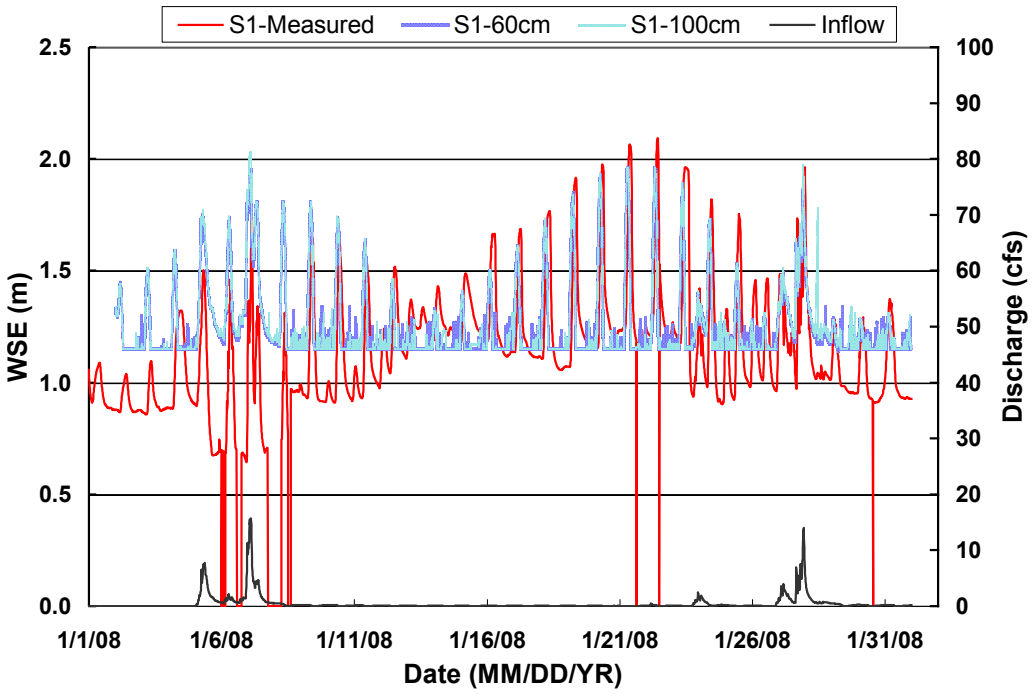

Figure 3.6. Comparisons of measured (red) and modeled (blue for 60 cm and green for 100 cm berm heights) water surface elevations at SEG#1, with runoff discharge in black for January, 2008.

In general, measured and model predicted WSE are both oscillatory both in line with the tides. In particular, the WSE peaks between model and measurement are in the same oscillatory trends dictated by both diurnal and spring/neap tidal cycles. Such close matching between model and measurement of the peaks of WSE exists for both OI and Segment 1 throughout the wet season (1/1-4/1/2008), except

for March 21-30, 2008. During this 1-week period, the model under-predicts the WSE by about 25 cm at both OI and Segment 1. The model predicted WSE are in line with the ocean tides at the end of the spring tide and beginning of the neap tide, whereas the measured WSE still maintained the same levels during the three week period of 3/11-3/31/2008.

While the peaks of WSE between the model and measurement are in line with each other throughout the period, the low WSE (trough) are governed by the height of the sand berm near OI and the water depth at Segment 1. For the modeling study, two sand berm heights are assumed (100 cm and 60 cm). Troughs of measured WSE seem to fluctuate between these two values. The dynamics and temporal variations of the low WSE reflect those of sand berm height and local water depth. In particular, effect from the dynamics of sand berm height is more pronounced at OI than that at Segment 1. WSE at Segment 1 is governed by the wet (flood tide) and dry (ebb tide) of the local depth.

Salinity

Salinity is a conservative material often used to calibrate a hydrodynamic model and to check validity of hydrodynamics and transport of the model. In general, salinity is expressed as a unit in ppt (parts per thousands). In practice, sometimes salinity is measured in the unit of conductivity (mS cm^{-1}, or µS cm^{-1}), which is a function of salt concentration (e.g., ppt) and temperature, and therefore, becomes a non-conservative in its measurement. Therefore, to simulate and compare salinity results, conductivities measured at the three stations, including OI and Segment 1 and the ME stations, are first converted into salinities in ppt unit. EFDC model is set up with an initial salinity of 15 ppt assigned to all model grid cells with the river boundary condition assigned from the measured salinity. The downstream ocean-side boundary is assigned with 36 ppt.

Figure 3.7 shows the comparisons of salinities at OI and Segment 1 for Jan/2008 between the measurements and model simulation results using the measured discharge data and model simulated runoff, respectively. For each comparison, a set of three time series were used, including measured salinity, simulated salinity at the surface and bottom layer. In addition, the watershed runoff discharge time series is also plotted using the secondary (right) y-axis.

In general salinity at OI fluctuates with tidal variations. Salinities in the OI regions increase during high tides when ocean water floods into the creek. Salinities decrease when the tides subside. The creek water is subject to the actions and interactions from both boundaries, including freshwater inflows upstream and saline ocean water downstream. The amplitudes of tidal oscillation in salinity are obvious, which are smaller than those of the water surface elevations.

Differences of simulated salinities between the surface and bottom layers are on the order of 0 to 15 ppt, which also fluctuate with tides and river discharges. In general, the fluctuation amplitudes of simulated salinity using the measured discharge data are on the order of 15 to 20 ppt, which is greater than those of ~10 ppt by the measurements. In other words, river discharges seem to have greater effects on salinities at OI predicted by the model than the measurements. Amplitudes of EFDC-predicted salinity using the model-simulated discharge data are on the same level as those of the measurement (~10 ppt). In general, riverine effects on salinity at OI seem to exist on a daily basis, which can only be

offset by the tidal flooding during high tides. In general, EFDC-predicted salinities using the measured discharge data are in agreement with measured salinity only qualitatively, whereas, EFDC-predicted salinities using the watershed model-predicted discharge data are in excellent agreement with the measured salinities throughout the wet season.

The creek water is characterized by the sudden drop of salinity during the storms. This can be seen in Figure 3.7, where drop in salinity occurs for nearly all the storms, during which the creek water is totally flushed by the freshwater from the watershed runoff. The runoff flush extends from the upstream all the way to downstream regions, including the OI station. As such flows and salinity variations show characteristics of river flows during the period, ocean tides are not strong enough to offset the freshwater flushing.

Figure 3.7 also shows model-measurement comparison of salinity for the ocean inlet and SEG1 for the months of March and April, 2008, respectively. In general, model results suggest that salinities at SEG1 are governed by two processes, high ocean salinity during the high tides, and low river salinity during the low tides. At low tides, bottom elevation at SEG1 is slightly below the sand berm height which is assumed to be at 100 cm and 60 cm, respectively. Therefore, SEG1 is characterized by the sloped river flow when the water surface elevation is reduced to the same height as the sand berm, and salinity is dictated by the river (upstream) flow. Such salinity variations and characterization at SEG1 exist for all the wet season periods.

Significance of the low base flows in March and April of 2008 is reflected in the salinity data. Under prediction of salinity using the measured discharge data is greatly and significantly improved by using the modified dry weather inflows. The model-measurement comparison and analysis results seem to suggest that the use of modified discharge data is preferred over the use of measured discharges for EFDC, since the simulated discharge data produces better simulated salinities at OI and SEG1 throughout the wet season (Jan -Apr, 2008).

Temperature

Figure 3.8 shows model-measured comparisons of temperature at OI and Segment 1 for the months of Jan, Feb, Mar and Apr, 2008, respectively. In general, the amplitudes of oscillation of the simulated temperature are smaller than those of the measured temperature. This is because we used daily meteorological data for the model, whereas oscillations in measured temperature are driven by the diurnal cycle of meteorological data. Such diurnal oscillations are not adequately simulated in the model due to the use of daily meteorological data. From the figures, it shows that simulated temperature at OI and Segment 1 follows the measured temperature both in trend and magnitude. Measured temperature is within the range enveloped by the simulated temperatures in the surface and bottom layers. During Jan-Feb, simulated temperature in both the surface and bottom layers is about of the same magnitude. Starting from Mar to Apr when solar radiation and air temperature started to arise, simulated temperature in the surface layer started to be elevated, deviating away from the bottom temperature. However, large differences of temperature up to 5^0 C were observed between model and measurement with periods of 3-7 days during Mar 11, Apr 16 and Apr 30. This is probably due to the fact that temperature was measured at a deeper section of the Slough where water was

retained during low tide and the small amount of water is subject to the solar heat at fast rates. This phenomenon and interpretation between model and measurement is similar to those for salinity at SEG1, as was discussed previously. With temperature, the phenomenon is more pronounced due to the non-conservative nature associated with temperature.

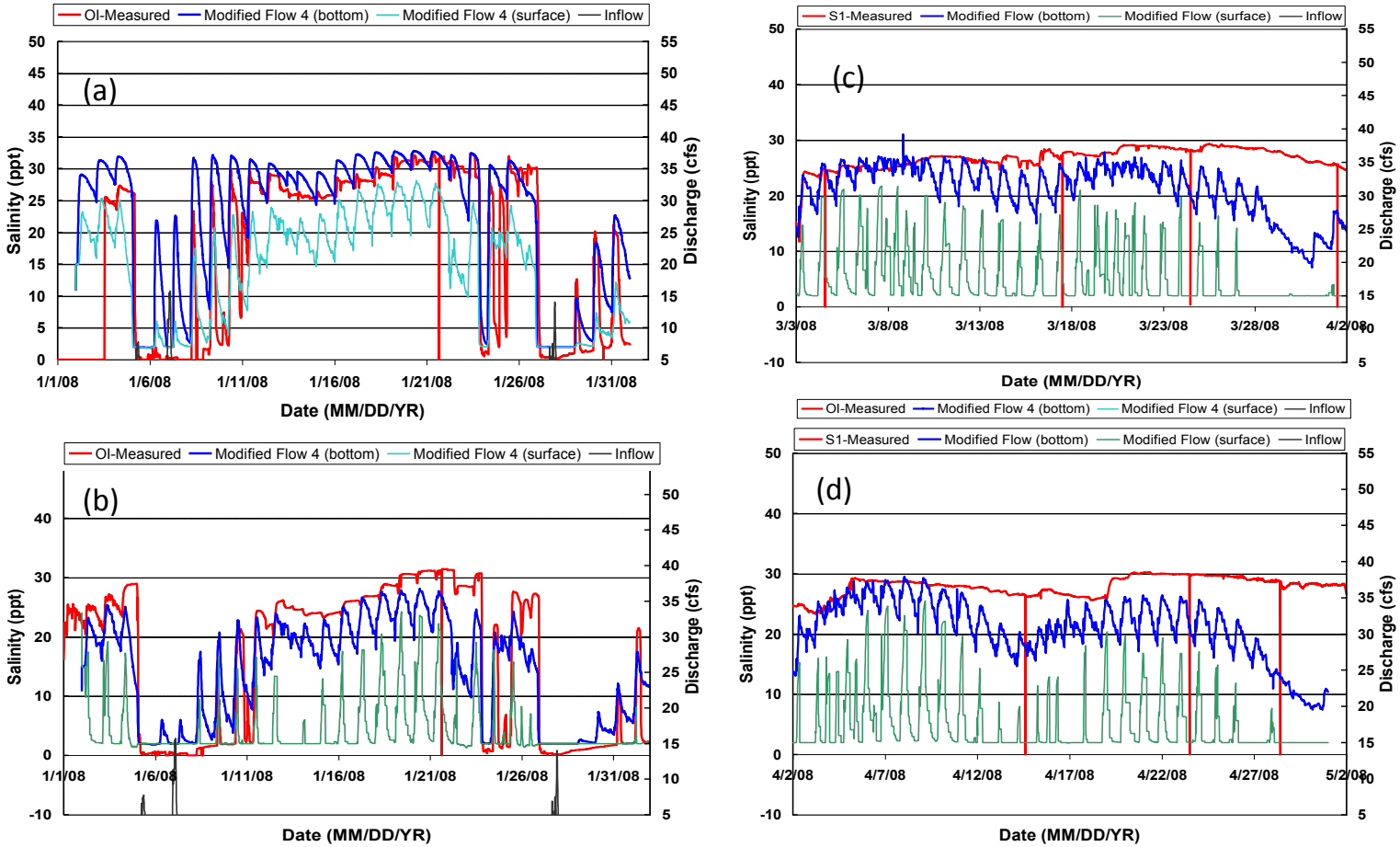

Figure 3.7. Comparison of measured (red) and modeled (blue for bottom and green for surface layer) (a) salinities at OI, using adjusted runoff discharge (in black) for Jan, 2008, (b) salinities at Segment 1, using simulated runoff discharge (in black) for Jan, 2008, (c) salinities at SEG1, using modified discharge (in black) for Mar, 2008, and (d) salinities at SEG1, using modified discharge (in black) for Apr, 2008.

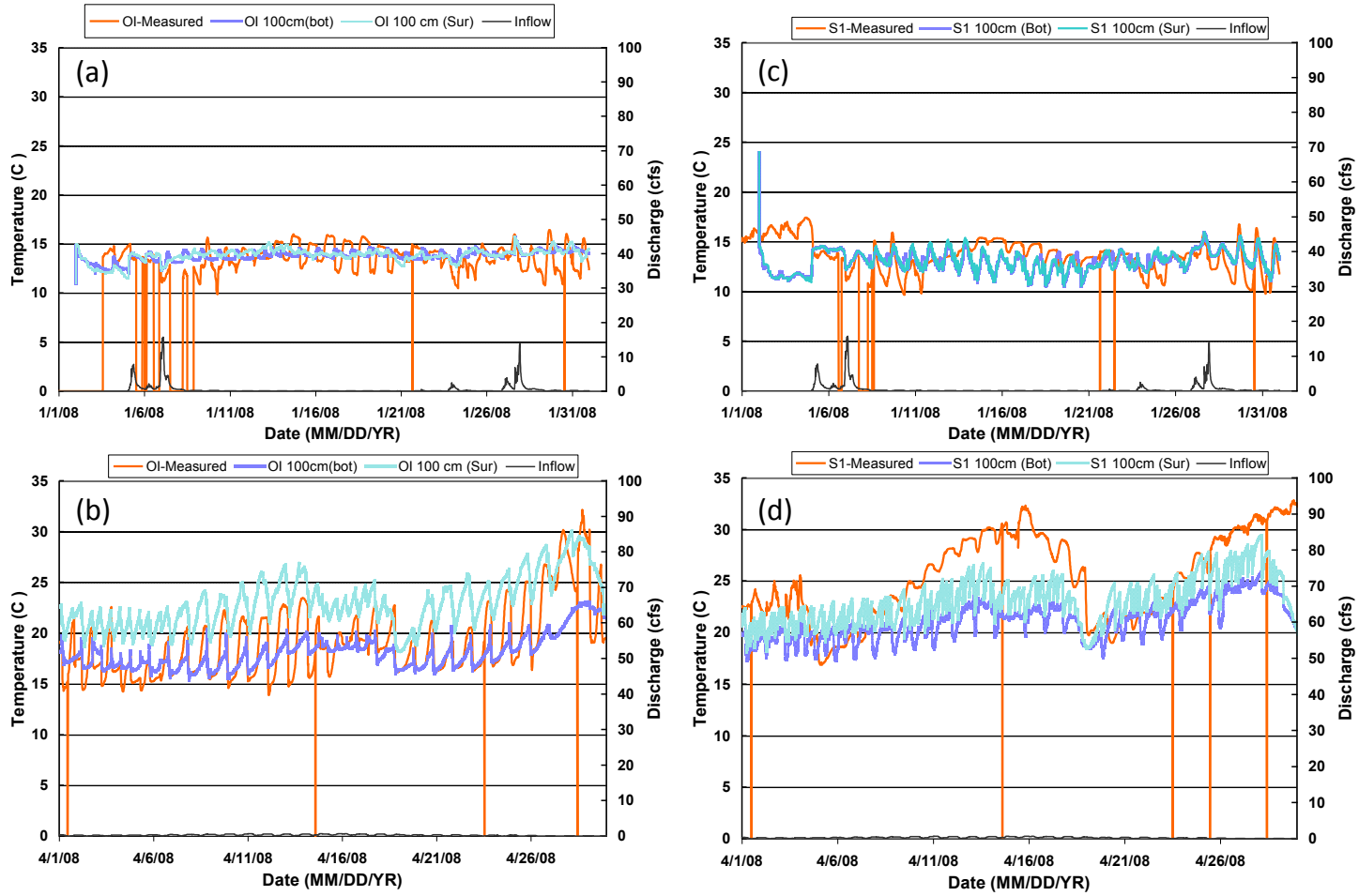

Figure 3.8. Comparisons of measured (red) and modeled (blue for bottom and green for surface layer) (a) temperature at OI for Jan, 2008, (b) temperature at OI for Apr, 2008, (c) temperature at SEG1 for Jan, 2008, and (d) temperature at SEG1 for Apr, 2008.

3.2.2 Dry Season (May –October 2008)

During this dry season, the inlet was closed and the surface water exchange of the slough water and ocean water ceased. The slough functioned like a pond, receiving and accumulating water that flowed in from the upstream watershed. An examination of the measured WSE (Figure 3.9) shows that the slough water maintained relatively constant water surface level during the entire dry season with some small fluctuations which are in line with the tidal height. Since there is no apparent sink for the slough water, except evaporation and seepage through the sand barrier at the OI, the continuous freshwater inflows did not result in obvious increase of WSE in the slough. A close examination of the field data is needed in order to better understand the source-sink balance and possible reason(s) for the phenomena.

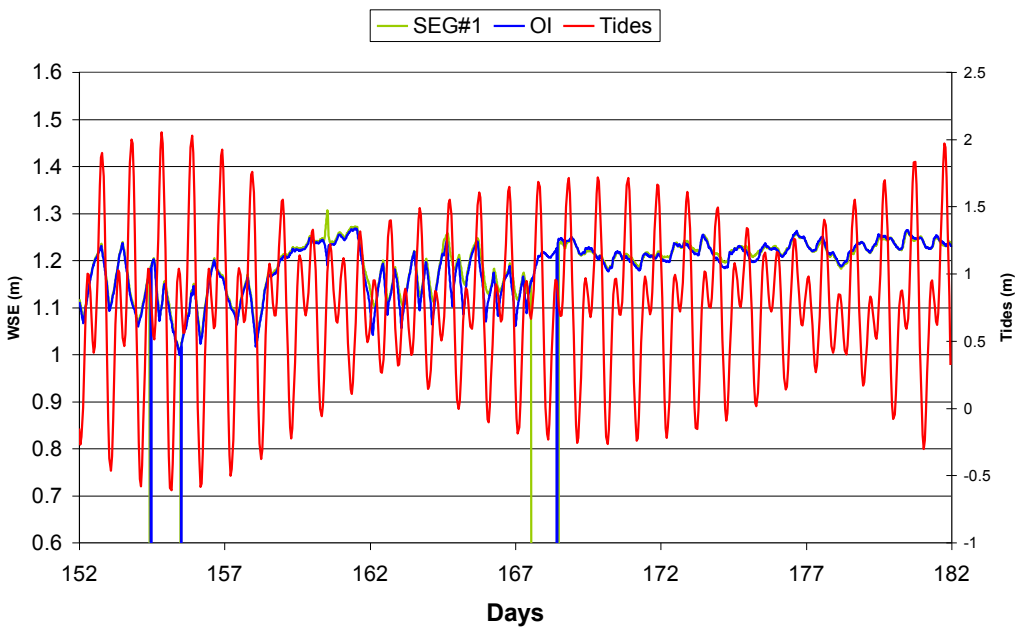

Figure 3.9. Water surface elevation in Loma Alta Slough during the dry season (ocean tides are in red for comparison).

To account for the possibility of seepage, we observed that measured WSE data at OI have oscillations which are in line with the tidal fluctuation in frequency. The average amplitudes of these oscillations are ~3 to 5 cm, all less than 10 cm. Very likely, temporal variations of water surface elevation during the dry season result from the water seepage and exchange through the sand barrier during tidal cycles (same fluctuation frequency). It is estimated that during each tidal cycle, a total of ~500 m^3 of water is exchanged between the ocean and the slough, which is equivalent to an average of 0.4 to 0.8 mm sec^{-1} of seepage velocity through the sand barrier during the 12 hour period, which is in the reasonable conductivity range of 0.3 to 1.0 mm sec^{-1} for groundwater seepage through sand.

The order of magnitude analysis for the source and sink terms helps to identify possible reason or explanation for the behaviors of measurements and model results. More field data is needed to validate the assumptions made for the analysis. Another possibility is associated with the uncertainty in using the

measured discharge data as our boundary condition. This include two possibilities, one being the measured discharge data has errors or bias and the other being there is un-identified sink/loss term between the model's upstream boundary condition grid cell and the ME station where the discharge data were measured.

We have discussed and analyzed the significance of an accurate estimation of flow rates during the wet and, in particular, the dry seasons. With EFDC, the hydrodynamics of the slough water during the dry season is near stagnant with minimum freshwater inflows. The minimum freshwater inflows are balanced with evaporation, which is estimated to be less than 1 cm day^{-1}, and tidal exchange with the ocean water by seepage through the sand barriers near the OI station. Presently, EFDC cannot handle such seepage flows with tidal stages. Modification of the code would be required to simulate this process.

Analysis of Overtopping of Ocean Water

During the dry season, the slough was closed by the elevated sand berm, which separated and prohibited the exchange between the ocean water and the slough water. The closing date is not clear was estimated to have taken place between May 15 and 23, 2008. During the closure, the slough continued to receive dry season base flow from the watershed, however, the slough water elevation remained at relative constant height, which should result from the balance among the freshwater base flow from the watershed, evaporation and seepage between the ocean and slough through the sand berm. The measured average water surface elevation is about 1.2 m based on NAVD, which is almost identical to the water surface elevation during the low tide when the slough was open. As such the water surface elevation of 1.2 m seemed to be at equilibrium during both wet and dry season, that is the water surface elevation of the slough tends to maintain at relative constant heights, except during high tides when the slough was open.

Figure 3.10 shows both measured and simulated salinities during the period of Jan 1-July 19, 2008. While simulated salinities match well with the measurement during Jan-April 30 when the slough was open, simulated salinities resembled to measured salinities during the slough closure period, when the salinities started to decrease rapidly due to dilution from the watershed dry base flow with no saline water exchange from the ocean. During June 4 and July 4, salinities at Ocean Inlet station increased significantly, which coincidently took place during the two peak spring tides (Figure 3.11). A berm height of 1.54 m is obtained through calibration to best match salinities between the model and measurement. As such, it is estimated the berm height was around 1.54 m during June 4 and July 4, and possibly the rest of the closure period of 2008. With the calibrated sand berm height of 1.54 m, simulated salinities match well with the measurements.

Figure 3.14 shows tidal heights relative to NAVD during Jan-Oct 2008 with three references, including the existing condition with the sand berm height of 1.54 m and Mean Lower High Water of 1.04 m, both relative to NAVD. These references will be used for managerial scenarios runs for bacteria study, which will be discussed in the next section.

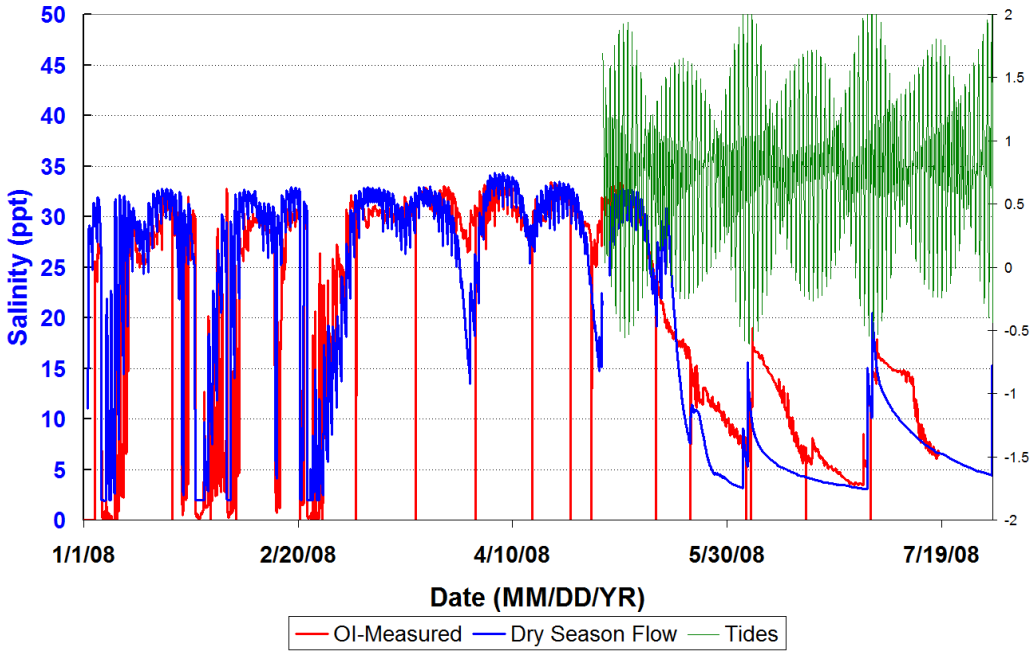

Figure 3.10. Measured and simulated salinities during slough open period (Jan-Apr 2008) and slough closure period (May 15-July 30, 2008) with tides plotted in the background.

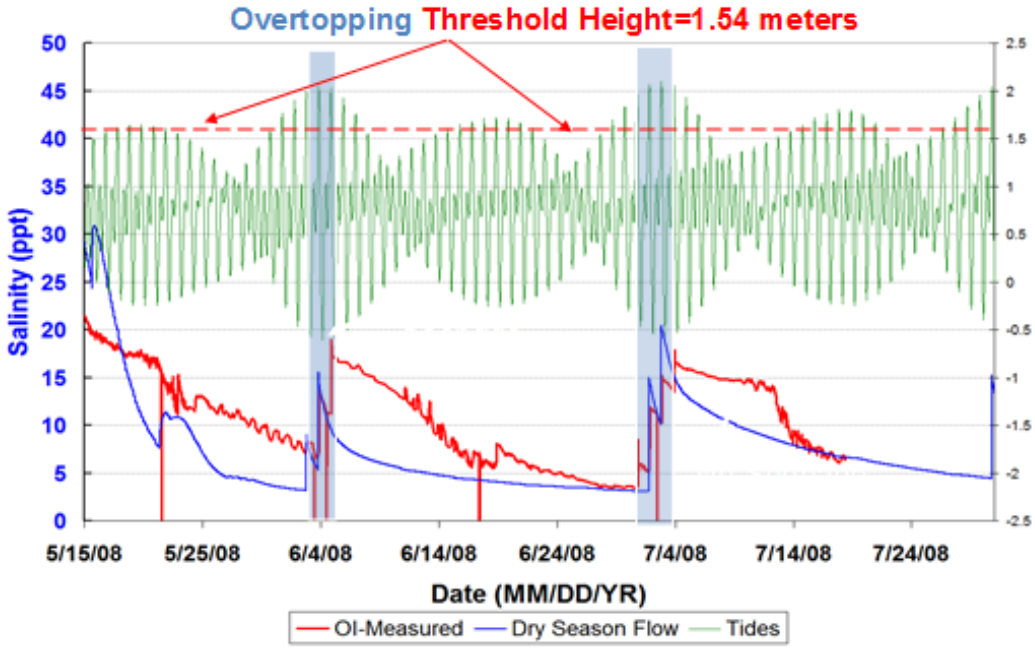

Figure 3.11. Close-up comparison between simulated and measured salinities and tides during the closure period. Salinities peaked up during June 4 and July 4 from overtopping of the tides and sand berm of 1.54 m is obtained by calibration.

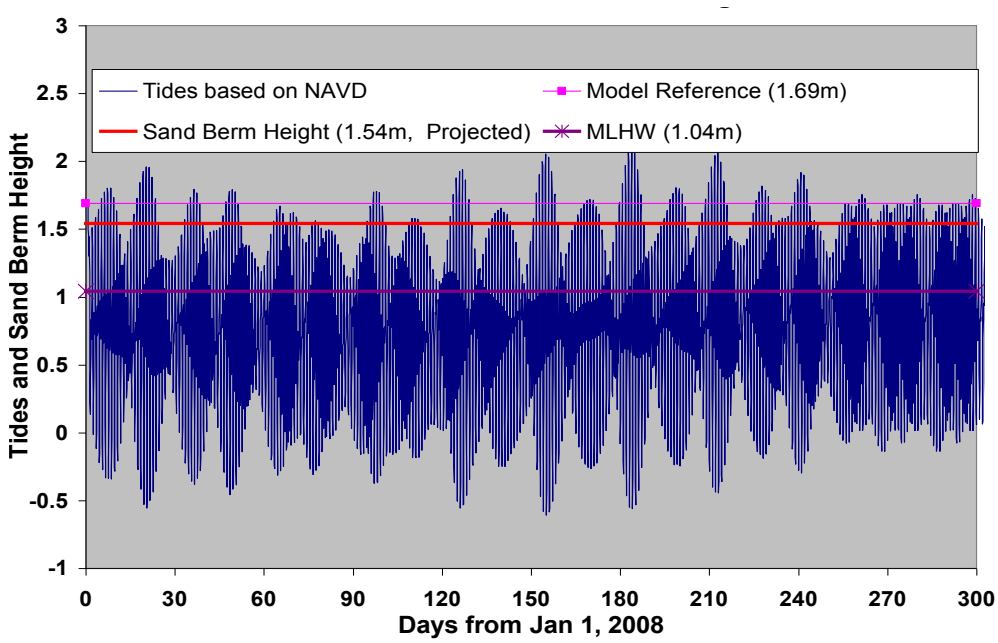

Figure 3.14. Tides during Jan-Oct 2008 with references to 1) NAVD, 2) Model reference (1.69 m), 3) Existing sand berm height during slough closure (1.54 m), and 4) Mean Lower High Water (MLHW).

3.3 Estuary Hydrodynamic Modeling Uncertainties

Uncertain in estuary hydrodynamic modeling arises from several factors. This section summarizes these uncertainties.

Overall, uncertainty in model performance is low. For example, measured versus observed WSE showed a model fit of R = 0.96, with a slope of 1.003, indicating less than 1% error.

Uncertainty in dry weather flows from the watershed is another source of uncertainty. This uncertainty was addressed with additional monitoring conducted in 2010. However, it should be noted that utilization of 2010 data in the calibration of 2008 hydrology and water quality results introduces unquantifiable uncertainty.

Berm height is variable in the Slough, arising from the combination of natural forcing of freshwater flow versus. Our solution to choose fix berm heights representative of the calibration and validation periods is an acceptable solution to a modeling problem, but the lack of data on the average berm height over periods of years, particularly during wet weather and winter dry weather is a source of uncertainty to results. This uncertainty is not quantifiable.

Exchange of the Slough water with the ocean through the sand berm and with groundwater is also another source of uncertainty in the modeling. Using existing data, we were able to achieve good model validation. However, the net effect of ocean and groundwater exchange on the Slough water quality (FIB and nutrients) is not quantifiable. These uncertainties are discussed in later sections of the report.

3.4 Summary of Estuary Hydrodynamic Modeling

Simulation of water surface elevation, salinity and temperature illustrate that the hydrodynamic model is working well during wet weather, winter dry weather (when the mouth is open) and summer dry weather (when the Slough mouth is closed). The good performance of the hydrodynamic model provides us with a measure of confidence to use the model for water quality applications.

4 ESTUARY BACTERIA MODEL CALIBRATION AND VALIDATION

This section summarizes the development, calibration, and validation of the estuary bacteria model for Loma Alta Slough. This includes identification and description of the data that were utilized for the model, as well as the approach that was followed for constructing, calibrating, and verifying the model for Loma Alta Slough.

4.1 Methods

4.1.1 Data Sources

Model Inputs

Loma Alta Creek is the major source of freshwater discharging to LAS. Groundwater inputs are un-quantified. Flow data modified based on calibration using salinity data were used to calibrate and validate the wet weather watershed loading model (Section 2) and to quantify the daily dry weather average flow into the LAS (see Section 3 for discussion). Flow data, temperature, conductivity, bacteria (enterococcus, fecal coliform, total coliform), and total and dissolved inorganic nitrogen and phosphorus, and biological oxygen demand were obtained from Mactec (2009), data collected in support of the SDRWQCB Monitoring Order # R9-2006-0076 for Loma Alta Slough and other 303(d) listed estuaries. Discharge data measured at ME station were used to drive the EFDC hydrodynamic simulations for both the wet period (1/1/2008-4/1/2008) and dry period (5/1/2008-10/21/2008). Salinity and temperature measured at ME station were used as the riverine boundary conditions.

Slough Bacteria Concentrations

Slough enteric bacteria concentrations (enterococcus, fecal and total coliform) used for model calibration and validation were derived from Mactec (2009) for three wet weather events (January 5, January 24, and February 4 of 2008) and five index periods in Loma Alta Slough:

- Jan 14, 15, 16
- Feb 7, 8, 21
- Mar 24, 25, 26, 31
- Apr 1 (2 samplings), 17
- October 7, 8, 9, 13, 14, 15

Concentrations of bacteria were measured at ME station and the slough stations at Segment 1 and Ocean Inlet during both the wet weather conditions (precipitation greater than 0.1 in during 72 hours) and the dry weather condition (precipitation less than 0.1 in during 72 hours).

4.1.2 Model Development

Boundary Conditions

There are two boundaries for the model grid, the upstream boundary and downstream ocean boundary (Figure 3.2). The upstream boundary (Segment Station #28) receives freshwater inflows and bacteria loads from the watershed. For this study, modified freshwater discharges calibrated to match salinity in the Slough were utilized during 1/1/2008-10/31/2008 as input at the river boundary. When using empirical concentrations to compare against modeled output, concentrations of bacteria are multiplied by discharge to obtain bacteria loads from the watershed. Bacteria concentrations assigned to "nearest neighbor" months when no data were available (rather than a linear interpolation). The modified flow data were used to make these calculations. These bacteria loads are assigned as boundary conditions for freshwater loads entering the Slough.

Model Parameterization -Bacteria

In general, bacteria, including the three species of Enterococci, Fecal Coliform and Total Coliform, are not conservative substance, they die with die-off rates as a function of salinity, temperature and solar light. In most modeling studies, the die-off rates empirically obtained by Mancini (1976) have been used widely. Mancini's equation can be expressed by the following equation:

$$K = (0.8 + 0.006S)1.07^{T-20} + \frac{I_0}{K_e H}\left(1 - e^{-K_e H}\right)$$

where S is the % of sea water, T is the temperature. I_0 is the sunlight energy at water surface (Cal cm^{-2} - hr), K_e is the light extinctive coefficient and H is the water depth.

Macini's equation was obtained empirically using a large amount of bacterial datasets. In spite of the fact that it contains a high level of uncertainty, it is the most commonly used formula for bacterial die-off rates. For this study, the stakeholders and SDRWQCB decided that the three bacteria species should be treated as conservative substances, meaning that the die-off rates should be assumed to be zero. The EFDC code was implemented to simulate the three bacteria species as conservative substances. Boundary conditions were assigned with the bacteria concentrations measured at the ME station. Bacteria die-off rate was turned off (set to zero).

4.2 RESULTS AND DISCUSSION OF BACTERIA SIMULATION MODEL

4.2.1 Model Calibration for Wet Weather

Simulated bacteria concentrations were compared with measured values at Segment 1 and Ocean Inlet stations during the wet weather conditions (Figure 4.1 through Figure 4.3). Concentrations measured at ME station (loading) were also used for comparison.

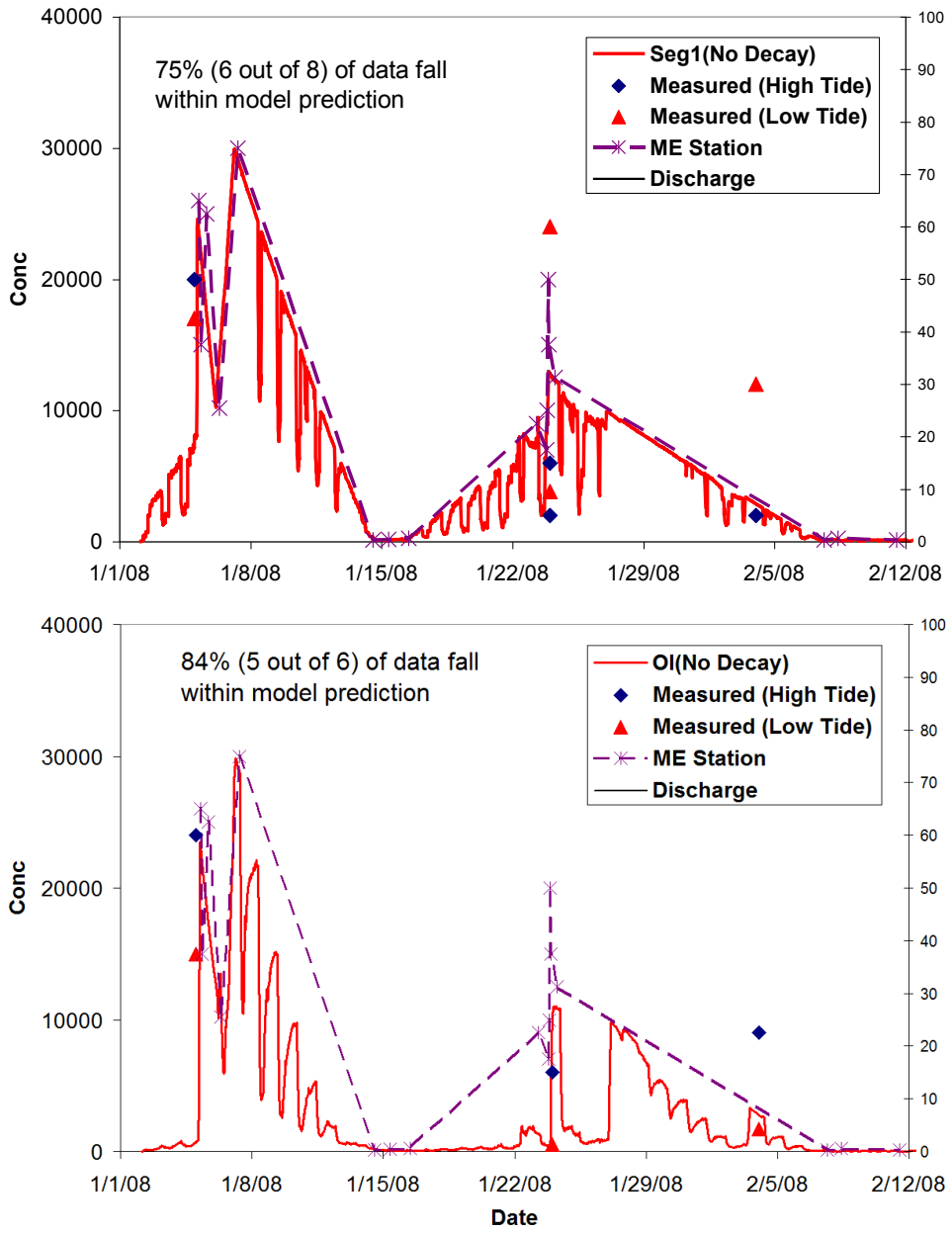

Figure 4.1. Model/measurement comparisons for enterococci during the 2008 wet weather at Segment 1 (above) and Ocean Inlet (bottom).

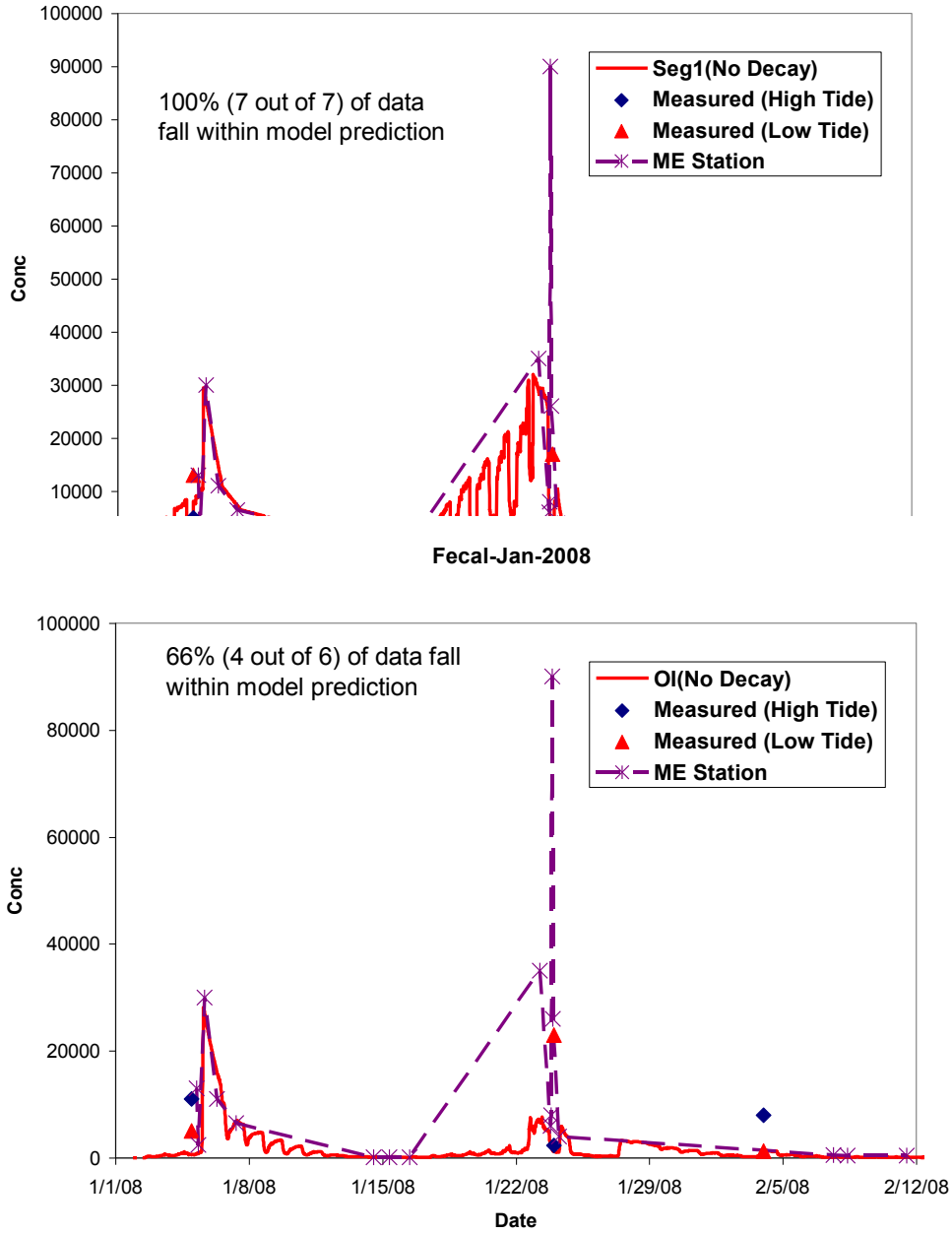

Figure 4.2. Model/measurement comparisons for fecal coliform during the 2008 wet weather at Segment 1 (above) and Ocean Inlet (bottom).

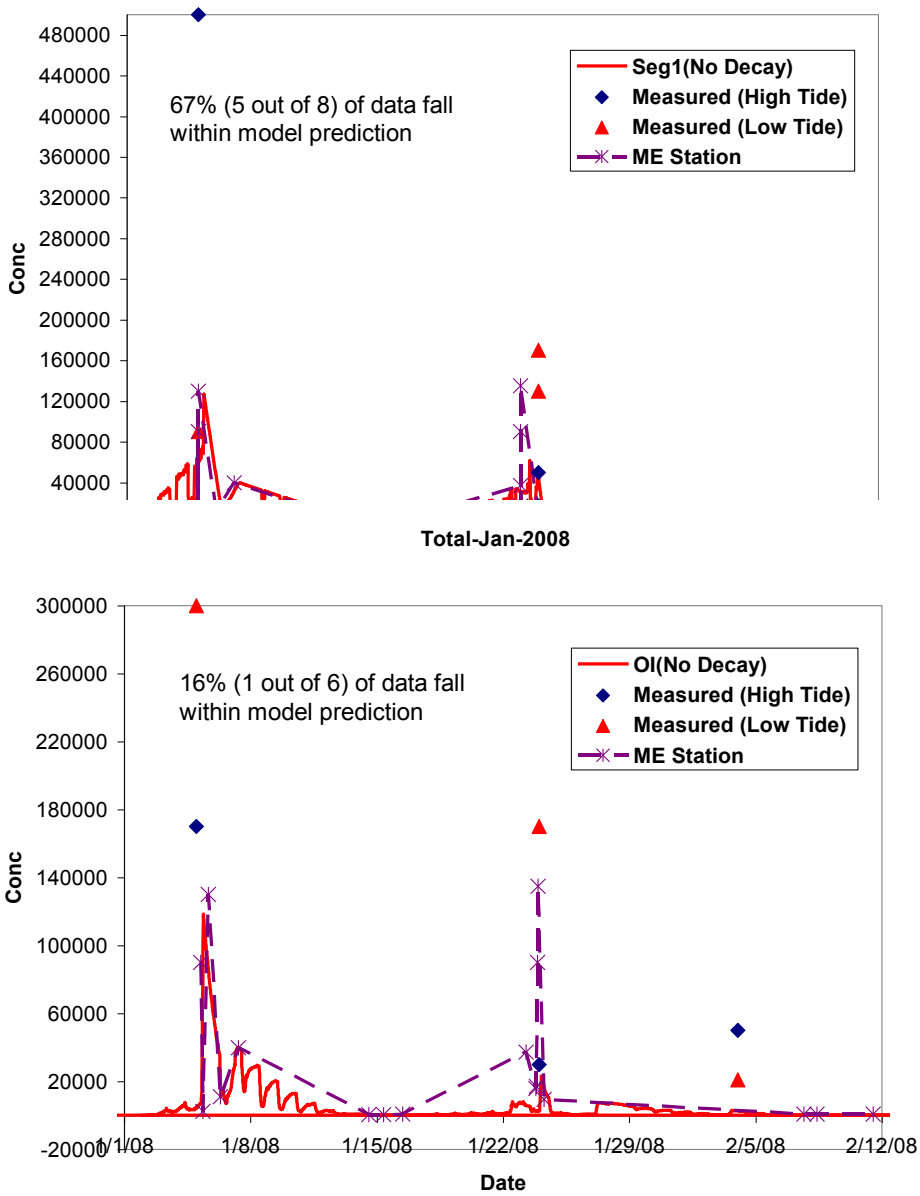

Figure 4.3. Model/measurement comparisons for total coliform during the 2008 wet weather at Segment 1 (above) and Ocean Inlet (bottom)

Results show that during the wet weather of November 2007-October 2008, bacteria loads from the watershed constituted the major source that were flushed downstream. Bacteria concentrations in the slough were close to the loading concentrations measured at the ME station. This is reflected by the simulated results showing that 71 % of the measured bacteria concentrations during wet weather are within the model predicted range, which indicates strong diurnal variations resulting from interactions of strong freshwater flows and flushing from the ocean water. In total, 12 out of 42 field data are outside of the model range. Results show that additional bacteria sources may exist near the Ocean Inlet

station, since some of the measured concentrations at the 12 “out of range” data points are higher than load concentrations measured at ME stations, which violates the assumption that upstream load is the only source. Therefore, more future work is needed to better identify and quantify the “additional source” which is unknown.

4.2.2 Model Calibration for Dry Weather

In contrast to the wet weather, data were measured more frequently during dry weather (Table 4.1). Simulated bacteria were compared with measurements for Segment 1 station (Figure 4.4) and Ocean Inlet station (Figures 4.5), respectively. Model appears to be performing adequately for prediction of dry weather bacteria concentrations. Simulated bacteria concentrations compare well at Seg#1 for all the scenarios. Simulated bacteria concentrations under predicted at OI for most index periods. This is consistent with the results from wet weather study, for which underprediction by the model suggest that additional source(s) may be present. In addition, it should be reminded that model predictions are based on model grid resolution, meaning that concentrations are assumed to be uniform within each model grid cell, which is about 30mX40m in size on average. Measurements are based on water samples taken at specific locations, and therefore, difference may exist due to the uniformity of the model prediction versus measurement at fixed point.

Table 4.1. Summary of validation data for wet weather bacteria concentrations.

	Total Number of Samples	Measured Data within Simulated Daily Range
Segment 1 Station		
Enterococci	**8**	**75%**
Fecal Coliform	**8**	**100%**
Total Coliform	**8**	**67%**
Ocean Inlet Station		
Enterococci	**6**	**84%**
Fecal Coliform	**6**	**66%**
Total Coliform	**6**	**16%**

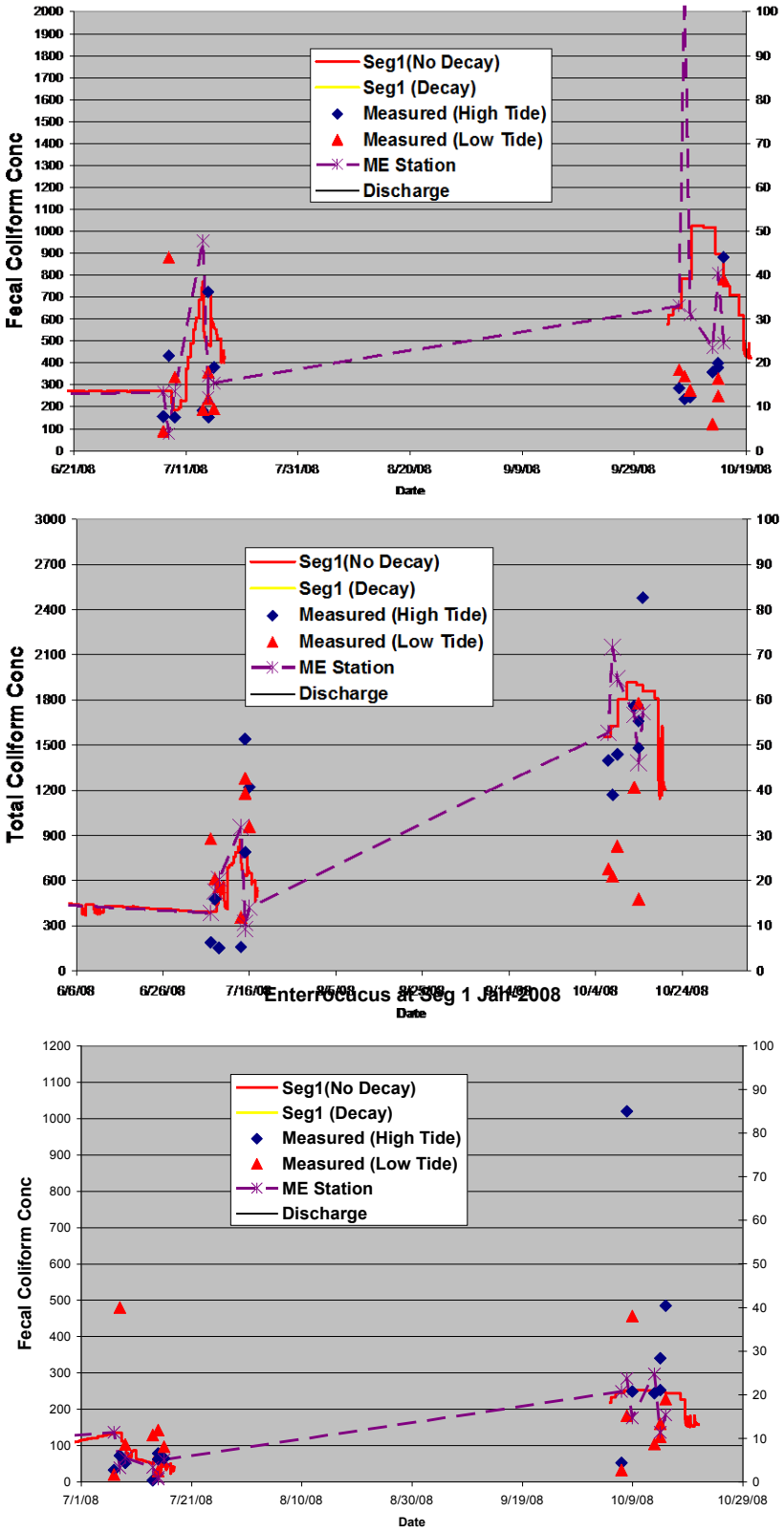

Figure 4.4. Model/measurement comparisons of fecal coliform (top), total coliform, enterococcus at Segment 1 for the 2008 dry season).

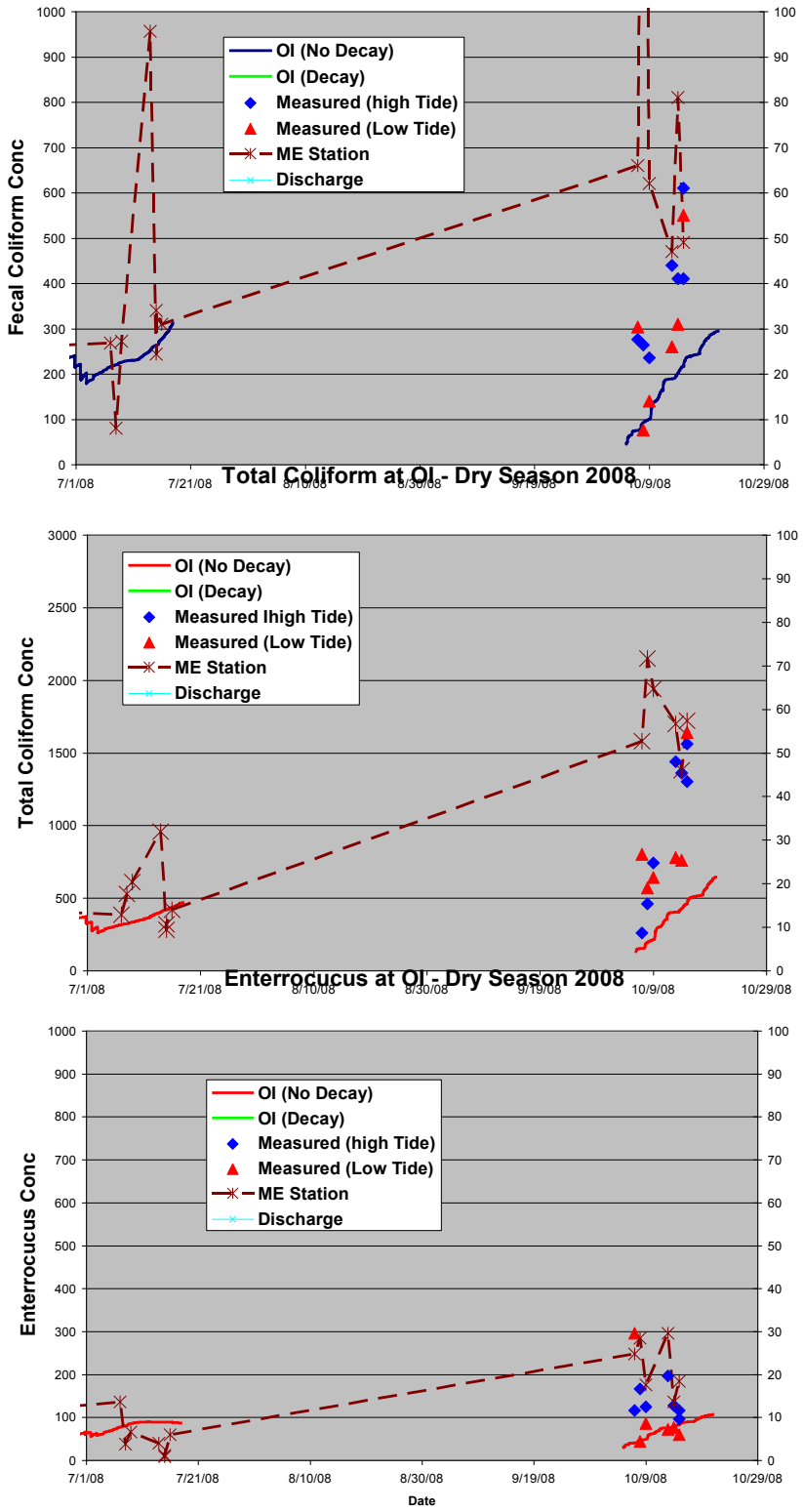

Figure 4.5. Model/measurement comparisons of Fecal coliform, total coliform and enterococcus at Ocean Inlet for the 2008 dry season.

4.3 Uncertainties in Bacteria Simulation Modeling

Uncertainties in bacteria simulation modeling come from two major factors.

First, the frequency of wet (3 storms) and dry weather (4 index periods) FIB load monitoring was low. The use of either modeling results or empirical data as boundary conditions to the Slough modeling study introduces uncertainty because bacteria concentrations are known to be highly variable over time, either as a function of storm event or during dry weather conditions.

The second source of uncertainty arises from the indication that, while the MES loading explains the majority of variability in Slough FIB concentrations, there appears to be an additional source to the Slough. This will likely cause the model to underpredict the number of exceedance days relative to TMDL numeric targets.

4.4 Summary of Bacteria Simulation Modeling

Simulation of bacteria during wet weather and dry weather illustrate that: 1) the FIB water quality model is performing adequately during wet and dry weather conditions and 2) watershed loads explain the majority of the measured variability in Slough FIB bacteria. During wet weather, Slough FIB concentrations closely approximated that of the MES, but approximately 33% of grabs over 3 storms were outside of modeled range, indicating that an additional bacteria sources may exist near within the lower Creek or within the Slough. A similar result was found during dry weather, particularly within the ocean inlet station. Therefore, more future work is needed to better identify and quantify this “additional source”.

5 ESTUARY EUTROPHICATION MODEL CALIBRATION AND VALIDATION

This section summarizes the development, calibration, and validation of the estuary eutrophication model for Loma Alta Slough. This review includes identification and description of data that were utilized for the model, as well as the approach that was followed for constructing, calibrating, and verifying the model for Loma Alta Slough.

5.1 Methods

5.1.1 Data Sources

Inputs

Loma Alta Creek is the major source of freshwater discharging to LAS. Groundwater inputs are unquantified. Flow data modified based on model calibration using the salinity data were used to calibrate and validate the wet weather watershed loading model (Section 2) from January through April 2008. New flow data were used to substitute modified flow data from May through October 2008. Total and dissolved inorganic nitrogen and phosphorus, and biological oxygen demand were obtained from Mactec (2009), data collected in support of the SDRWQCB Monitoring Order for Loma Alta Slough and other 303(d) listed estuaries. When using empirical concentrations to compare against modeled output, concentrations of wet and dry weather nutrients are multiplied by discharge to obtain bacteria loads from the watershed. Concentrations were assigned to "nearest neighbor" months, rather than employing linear interpretation, when no data were available. These nutrient loads are considered boundary conditions for freshwater inputs entering the Slough.

Slough Continuous Water Quality Data

Data from *in situ* instruments deployed by Mactec (2009) at two stations in Segment 1 and at the Ocean Inlet stations were used to the simulate dissolved oxygen within the Slough.

Slough Nutrients and Eutrophication

Within Slough concentration of total and dissolved inorganic nitrogen and phosphorus during the three wet weather events and four dry weather index periods were taken from Mactec (2009). Macroalgal biomass and percent cover, benthic fluxes of nutrients, and denitrification rates during the four index periods were taken from McLaughlin et al. (2010;

Table 5.1).

Table 5.1. Summary of the timing of data collection for eutrophication in Loma Alta Slough by time period, types of sampling event, and organization

Period	Event	Organization	Date
Wet Weather Monitoring	Storm Sampling (3 storm events)	MACTEC	1/5-1/7/08 1/23-1/24/08 2/3-2/4/08
Wet Weather Monitoring	Post Storm Sediment Sampling	MACTEC	1/14/08
Continuous Monitoring	Water Quality Monitoring	MACTEC	1/1/08- 10/21/08
Index Period 1	Ambient Sampling	MACTEC	1/14-1/16/08, 2/7- 2/8, 2/11/08
	Transect Sampling	MACTEC	1/14/08
	Benthic Chamber Study	SCCWRP	1/10/08
	Porewater Peeper Deployment	SCCWRP	1/7-1/21/08
	Sediment Core	SCCWRP	1/21/08
	Macroalgae Monitoring	UCLA	1/7-1/21/08
Index Period 2	Ambient Sampling	MACTEC	3/24-3/26/08, 3/31-4/1/08, 4/7/08
	Transect Sampling	MACTEC	3/24/08
	Benthic Chamber Study	SCCWRP	3/20/08
	Porewater Peeper Deployment	SCCWRP	3/18-4/3/08
	Sediment Core	SCCWRP	4/3/08
	Macroalgae Monitoring	UCLA	3/18-4/3/08
Index Period 3	Ambient Sampling	MACTEC	7/7-7/9/08, 7/14-7/16/08
	Transect Sampling	MACTEC	7/8/08
	Benthic Chamber Study	SCCWRP	7/7/08
	Porewater Peeper Deployment	SCCWRP	7/3-7/23/08
	Sediment Core	SCCWRP	7/23/08
	Macroalgae Monitoring	UCLA	7/3-7/23/08
Index Period 4	Ambient Sampling	MACTEC	10/7-10/9/08, 10/13-10/15/08
	Transect Sampling	MACTEC	10/7/08
	Benthic Chamber Study	SCCWRP	9/15/08
	Porewater Peeper Deployment	SCCWRP	9/12-9/29/08
	Sediment Core	SCCWRP	9/29/08
	Macroalgae Monitoring	UCLA	9/12-9/29/08

5.1.2 Supplemental Data Sources for Calibration and Validation

Two supplemental data sources were also used to improve our modeling studies of dissolved oxygen in the Slough. This section describes these two additional data sources.

After field data collection was completed in 2008, analysis of dissolved oxygen data illustrated chronic hypoxia and anoxia in Slough bottom waters. SCCWRP identified the need for additional DO data collection in the Slough to improve understanding of the vertical profile of DO in the Slough. City of Oceanside contracted with Merkel and Assoc. to collect continued dissolved oxygen concentrations in the surface and bottoms waters of Segment 1 and Segment 2 (Merkel 2010). These 2010 data were used to compare model output from the equivalent month in 2008 to better understand to what extent the model was representing DO conditions in the Slough, albeit during a different year and presumably algal conditions.

The second data set were collected by EPA Region 9 (Tetra Tech 2013) during 24 hours (2 days) of Aug 6-7,2012 for the purposes of better quantifying BOD, nutrient and DO loading to the Slough at a site just upstream of the estuary. These hourly data during Aug 6-7, 2012 were used to test whether Slough simulations of dissolved oxygen differed as a result of using these data.

5.1.3 Model Development

The EFDC hydrodynamic model was run at every one second over Jan-Oct 2008. Hydrodynamic and transport results, including water volume, current velocity, salinity and temperature of each model segment were stored at every two seconds as the .hyd file. The .hyd file was linked within the water quality model, WASP7.1, to drive the transport and water quality kinetics for the simulation of Jan-Apr 2008, the period when the inlet was open, and May-Oct 2008, the period when the inlet was closed.

The eutrophication sub model, EUTRO, was used for the Water Analysis Simulation Program (WASP 7.1). It is the recommended EPA standard model for dynamic water quality analysis and is supported and updated by the U.S. EPA Center for Exposure Assessment Modeling in Athens, GA and Region IV in Atlanta, GA. EUTRO simulates key processes, and the interactions among them, governing eutrophication and dissolved oxygen. A total of eight variables, including ammonia, nitrate and nitrite, organic nitrogen, orthophosphate, organic phosphorus, carbonaceous biological oxygen demand, phytoplankton and dissolved oxygen (Figure 5.1). These variables and the associated processes constitute four interacting systems, including phytoplankton kinetics, nitrogen cycle, and phosphorus cycle and dissolved oxygen.

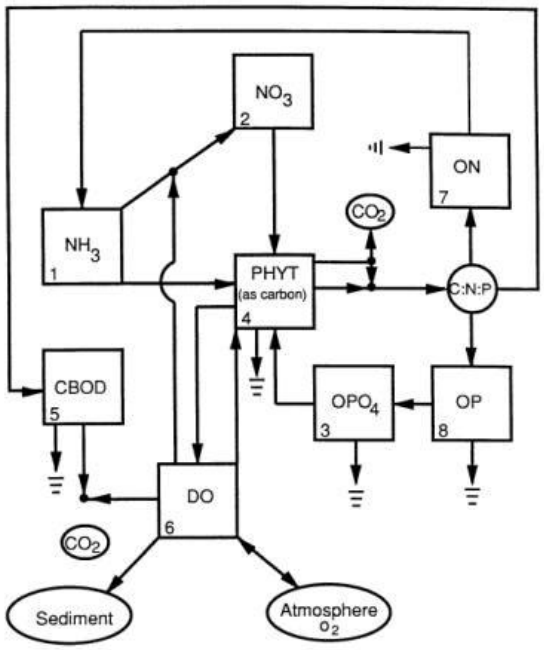

Figure 5.1. Processes and state variables simulated in the WASP 7.1 model.

WASP 7.1 uses the same model grid as that for EFDC, with the same boundary loading cells. Water quality loads measured at the ME station were assigned at the upstream boundary for the WASP 7.1 model. Figure 5.2 shows the time series of four water quality variables. The loading data were measured sparsely over the Nov 2007-Oct 2008 period, with only two sets of measurement during the May-Oct 2008 period when the inlet was closed, which is also the period for model simulation. Loadings were linearly interpolated among the measured data.

Table 5.2 shows key parameters used in the WASP7 model. Since site specific data are not available, most of these parameters are obtained from published literature (Wang et al. 1998).

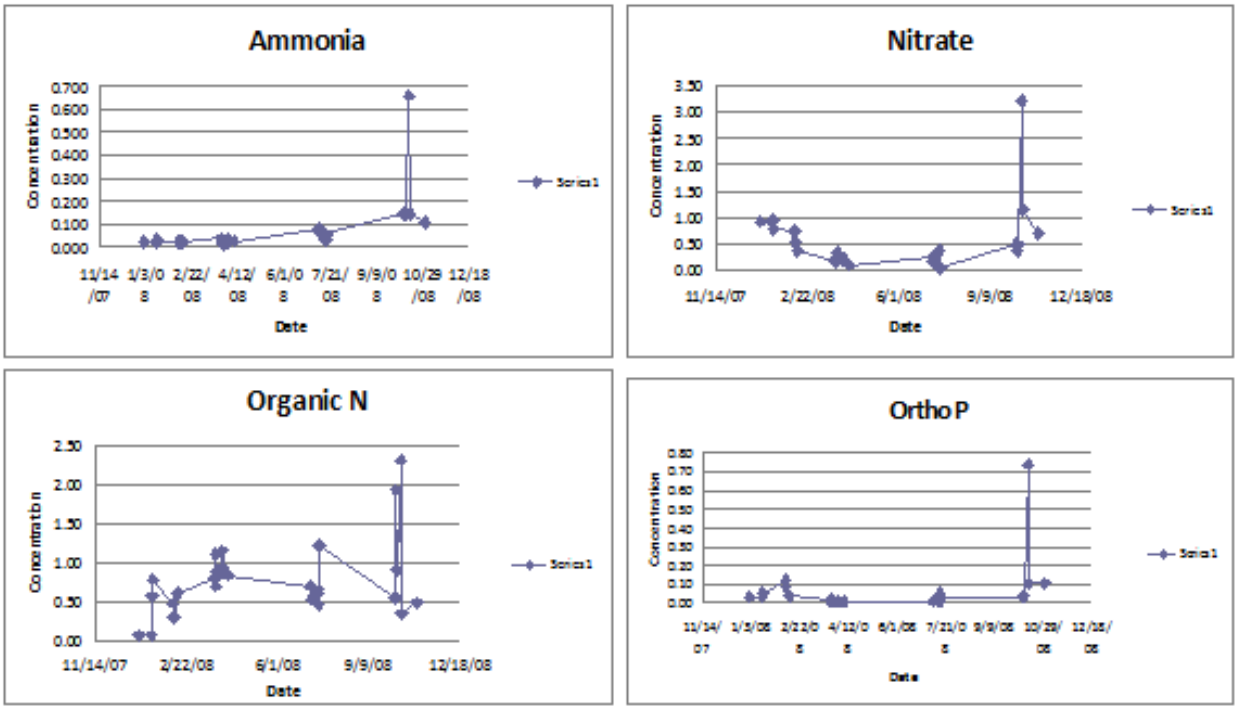

Figure 5.2. Loading concentrations measured at ME station.

Table 5.2. WASP model parameters and values.

Parameters	Units	Values
Benthic Ammonia Flux	$Mg/m^2/day$	0.2
Benthic Phosphorus Flux	$Mg/m^2/day$	1
Sediment Oxygen Demand	$g/m^2/day$	1
Sediment Oxygen Demand Temperature Correction Factor	Unitless	1.08
Nitrification Rate Constant @20 °C	/day	0.15
Nitrification Temperature Coefficient		1
Half Saturation Constant for Nitrification Oxygen Limit	Mg-O/L	1
Denitrification Rate Constant @20 °C	/day	0.09
Denitrification Temperature Coefficient	Unitless	1.08
Half Saturation Constant for Denitrification Oxygen Limit	Mg-O/L	0.1
Dissolved Organic Nitrogen Mineralization Rate Constant @20 °C	/day	0.005
Dissolved Organic Nitrogen Mineralization Temperature Coefficient	Unitless	1.02
Mineralization Rate Constant for Dissolved Organic P @20 °C	/day	0.03
Dissolved Organic Phosphorus Mineralization Temperature Coefficient	Unitless	1.02
Phytoplankton Maximum Growth Rate Constant @20 °C	/day	1.8
Phytoplankton Growth Temperature Coefficient	Unitless	1.07
Phytoplankton Self Shading Extinction (Dick Smith Formulation)	Unitless	0.017
Phytoplankton Carbon to Chlorophyll Ratio	Unitless	30
Phytoplankton Half-Saturation Constant for Nitrogen Uptake	Mg-N/L	0.025
Phytoplankton Half-Saturation Constant for Phosphorus Uptake	Mg-P/L	0.001
Phytoplankton Endogenous Respiration Rate Constant @20 °C	/day	0.08
Phytoplankton Respiration Temperature Coefficient	Unitless	1.07
Phytoplankton Death Rate Constant (Non-Zooplankton Predation)	/day	0.01
Phytoplankton Phosphorus to Carbon Ratio	Unitless	0.025
Phytoplankton Nitrogen to Carbon Ratio	Unitless	0.1
Phytoplankton Maximum Quantum Yield Constant	Unitless	720
Phytoplankton Optimal Light Saturation	Unitless	200
Oxygen to Carbon Stoichiometric Ratio	Unitless	2.67

5.1.4 Model Simulations

Simulations were conducted for May 1-Oct 31, 2008. Simulated time series were produced for dissolved oxygen, nutrient concentrations, and macroalgal biomass and compared with measured values. Measured DO data are at every 15 minutes, which were processed with a 24-hour running window to remove the diurnal oscillations. Model simulation results are at every 1.2 hours. There were no measurements during Jun 2008 for Segment 1 and during Jul-Sep 2008 at OI.

Simulations were conducted with new data acquired by Tetra Tech just upstream of the head of estuary, with the intent that these data would be more representative of the true inputs into Slough. These data

consistent of hourly measurements from August 6 midnight to August 7 23:00, 2012. These new boundary data includes DO, BOD, and nutrients. Simulations of DO with the 2012 boundary condition were conducted and compared with those with the 2008 boundary condition. Results are plotted in the same year (2008) for comparison.

5.2 Results and Discussion of Eutrophication Model

5.2.1 Dissolved Oxygen

Overall, the dissolved oxygen simulations show that the model is not adequately capturing the mean or diurnal variation of measured dissolved oxygen. During the period of Jan-April 2008, the model underpredicted period of non-compliance by approximately 15% at the ocean inlet and overpredicted percentage of non-compliance by 16% at Segment 1 (Table 5.3). During May – October, the model underpredicted percentage of time in non-compliance by32% in the Ocean Inlet and 20% at Segment 1. Simulated DO concentrations exhibit diurnal fluctuation cycles throughout the dry and wet weather periods, whereas measured DO concentration exhibit diurnal cycle only during the wet weather period, but for dry weather, measured DO show extremely low values over extended periods at both OI and Segment 1 stations.

Table 5.3. Dissolved oxygen model validation: Percentages of time DO <5 mg L^{-1} by field and model data Jan-Oct 2008 and Sept-Oct 2010.

Location	Jan-Apr 2008		May-Oct 2008		
	Field Data	Model	Field Data		Model 2008
			May-Oct 2008	Sep-Oct 2010	
Ocean Inlet	15.1 (bot)	0.01(top) 0.01(bottom)	82.9 (bottom)	No Data	49.1 (top) 49.6 (bottom)
Segment 1	4.2 (bot)	21.2 (top) 21.5 (bottom)	85.7 (bottom)	63.4 (top) 74.9 (bottom)	58.2 (top) 65.4 (bottom)

Figures 5.3 and 5.4 show the comparison between model simulation and measurement Segment 1 and Ocean Inlet for the period Jan-May and May-October 2008, respectively. Predicted DO concentrations at the surface layer are higher than those near the bottom. Dissolved oxygen concentrations measured every 15 minutes exhibited strong diurnal oscillation, which reflects the effects of macroalgae on source/sink of DO. Predicted and measured daily DO concentrations. At Segment 1, except during June 2008 when there were no measurements, predicted DO concentrations match well with measured daily DO concentrations in Jul-Sep 2008. Model underpredicted DO concentrations for May 2008 and overpredicted DO concentrations for Oct 2008.

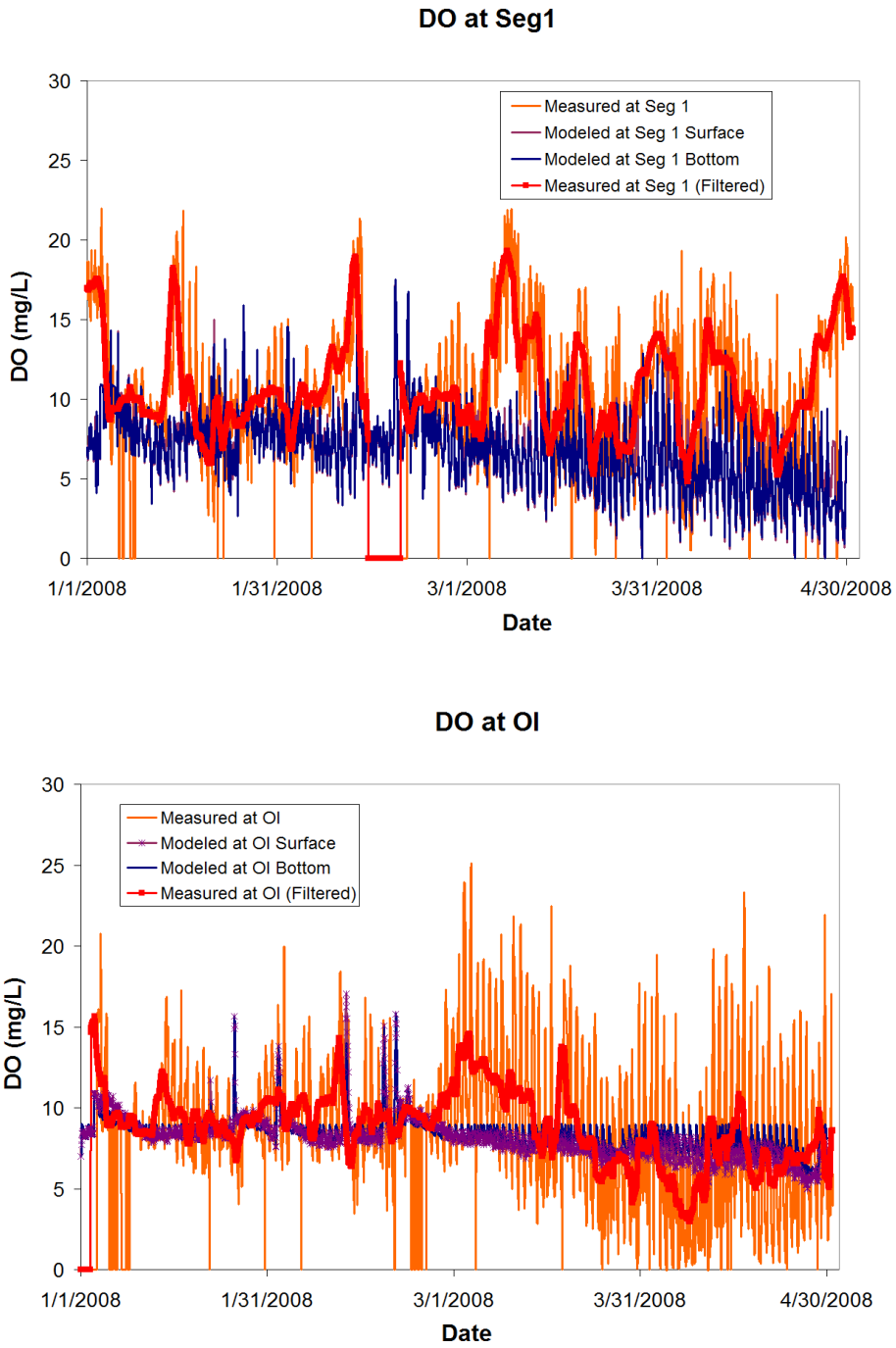

Figure 5.3. Dissolved oxygen model/data comparison between Segment 1 (top) and Ocean Inlet (bottom) for the period of January-May 2008.

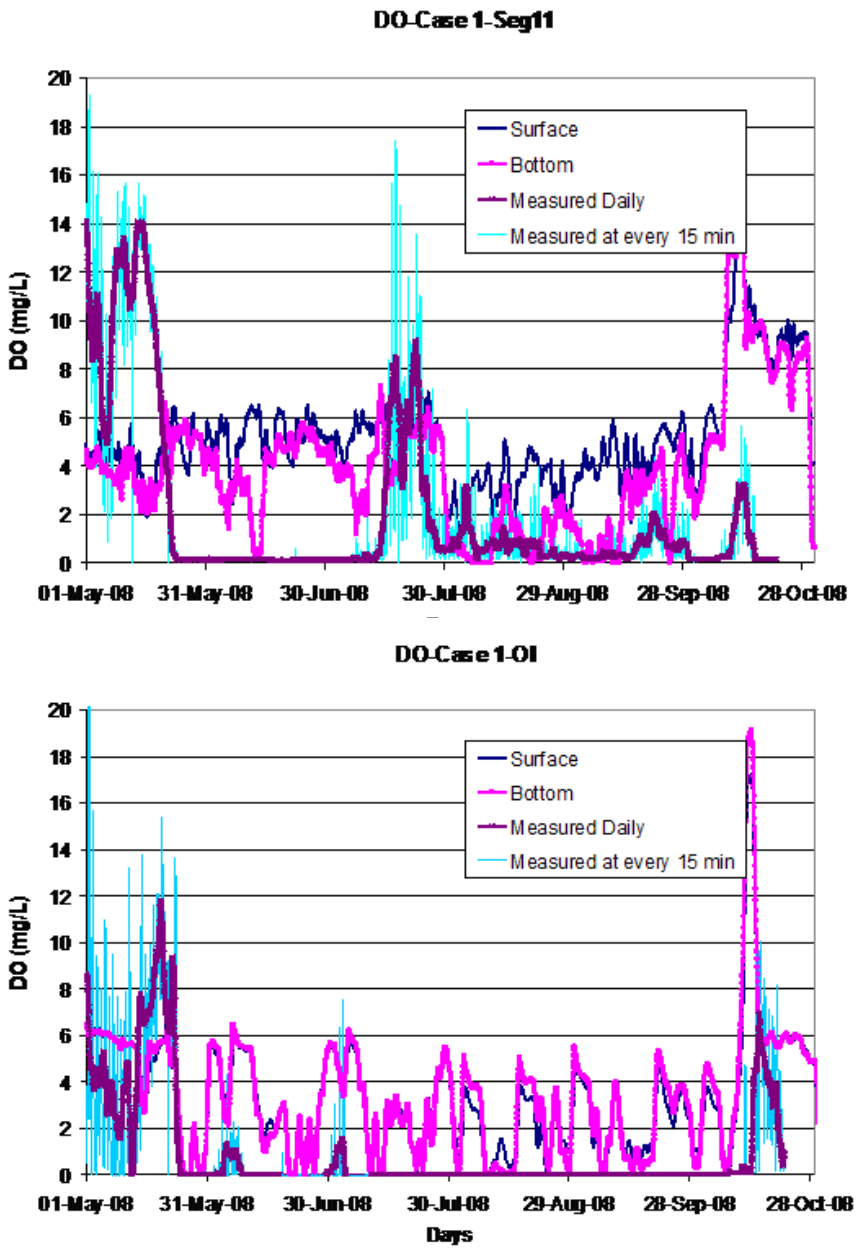

Figure 5.4. Dissolved oxygen model/data comparison between Segment 1 (top) and Ocean Inlet (bottom) for the period of May-October 2008.

Predicted DO concentrations during these two months (and the rest of the period) match well with the external nutrient loadings, which maintained relative low magnitudes May-September 2008 and increased sharply by 5- to 10-fold on October 13, 2008 (Figure 5.5). Component analysis shows the algae photosynthesis constituted a major source for DO and algae respiration a major sink for DO (5.6). Dissolved oxygen is also influenced by loading from two boundaries: upstream loading boundary and re-aeration from the air. The current model structure prevents us from doing a full source/sink analysis of DO.

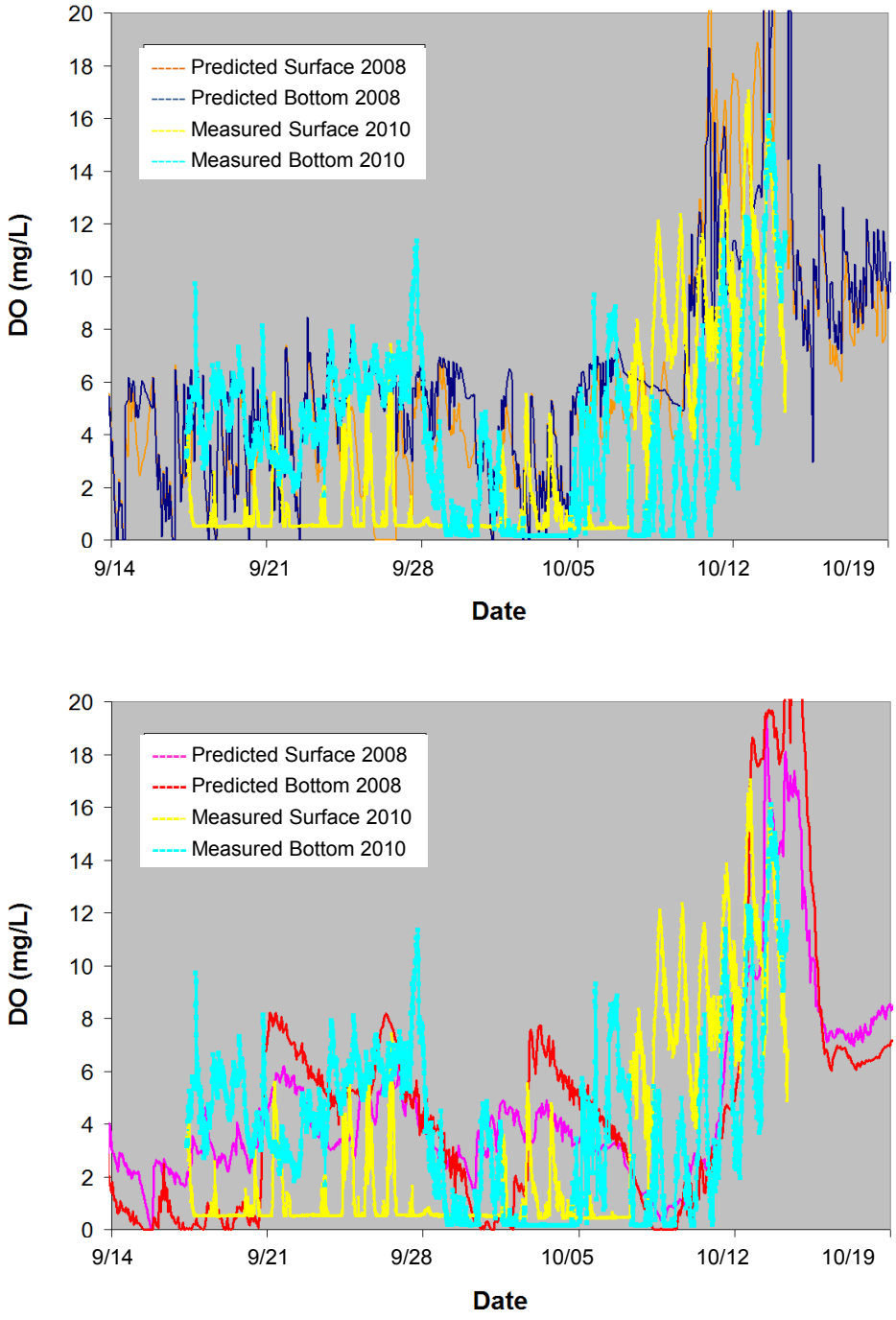

Figure 5.5. Comparison of predicted surface and bottom water dissolved oxygen based on 2008 input data with measured surface and bottom water data in 2010 for Segment 1 (top) and Ocean Inlet (bottom).

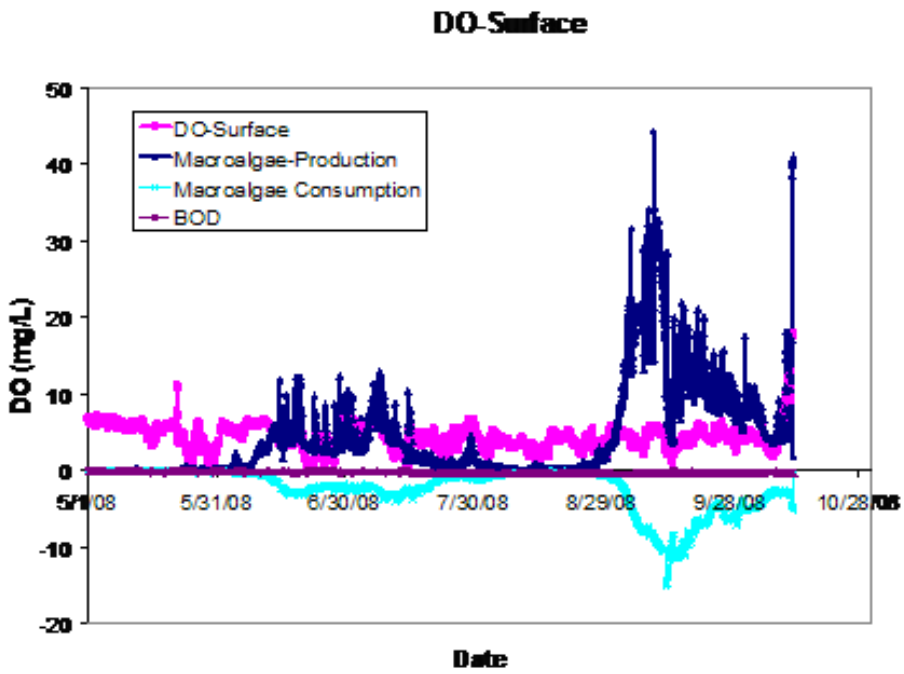

Figure 5.6. Predicted DO concentrations and contributions from macroalgae DO production and consumption and CBOD.

5.2.2 Simulations of DO New Boundary Data for August 6-7, 2012

The 2012 boundary DO and BOD concentrations are similar to the 2008 DO data both in diurnal pattern and magnitude with the 2012 DO concentrations slightly larger than the 2008 data (Figure 5.7a and b). The 2012 DO concentrations are higher than the 2008 data by less than 2 mg L^{-1} at peaks (over-saturation during the afternoon) and by less than 1 mg L^{-1} at troughs (anoxia before dawn or early morning).

Figures 5.8a-d show simulated DO concentrations at Segment 1 and OI for the surface and bottom layers using 2008 and 2012 measured DO data at the boundary. Dissolved oxygen concentrations at Segment 1 are influenced by the boundary conditions, both in timing and magnitude. Since the 2012 DO data were measured only during the 48 hours of August 6-7, simulated DO at Segment 1 are also immediately influenced by the DO forcing at the upstream boundary. Simulated DO concentrations using the 2012 boundary data are higher than those using the 2008 boundary data, with maximum difference less than 2 mg L^{-1}, similar to the magnitude of difference between the two sets of boundary DO data.

Compared to DO concentrations at Segment 1, simulated DO concentrations at OI are similar in pattern, but with less differences between the 2008 and 2012 boundary conditions. Differences of simulated DO concentrations at OI between the 2008 and 2012 boundary conditions start to take place late August 7, about 42 hours lagging that at Segment 1.

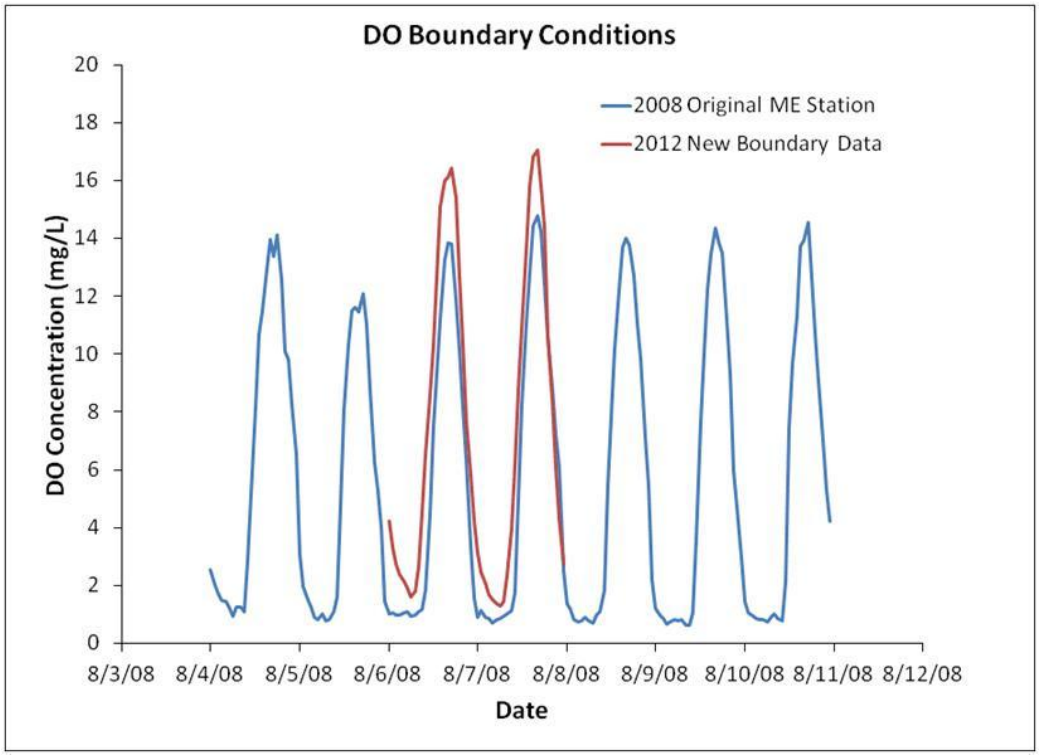

Figure 5.7a. Measured boundary condition for DO during August 6-7 between 2008 and 2012.

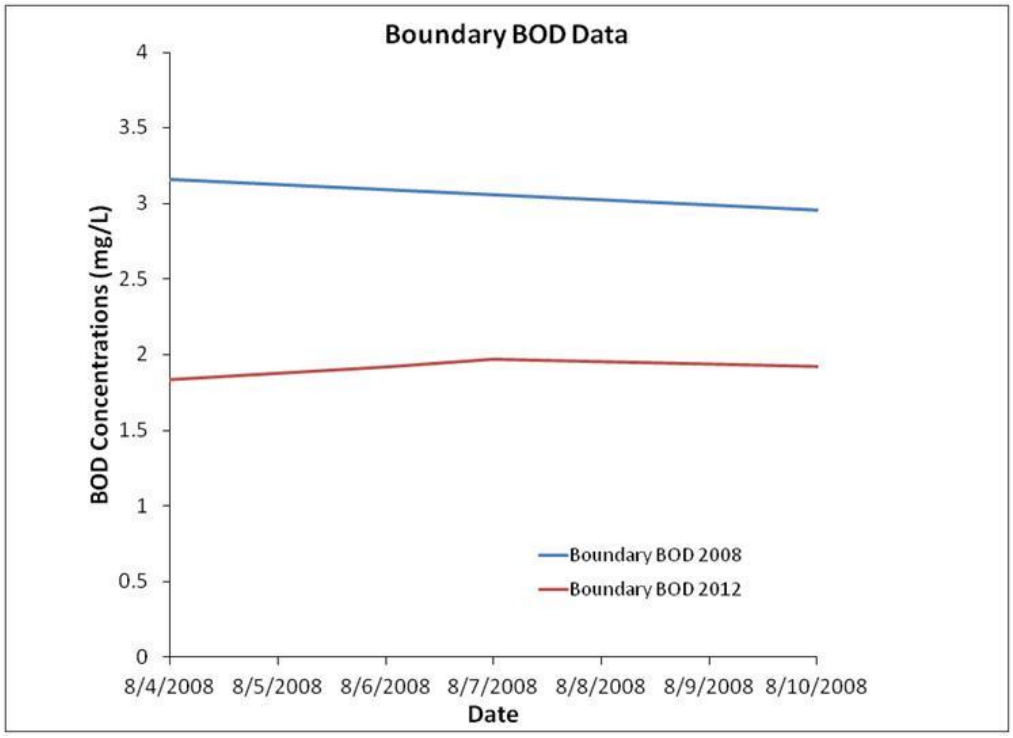

Figure 5.7b. Measured boundary condition for BOD during August 6-7 between 2008 and 2012.

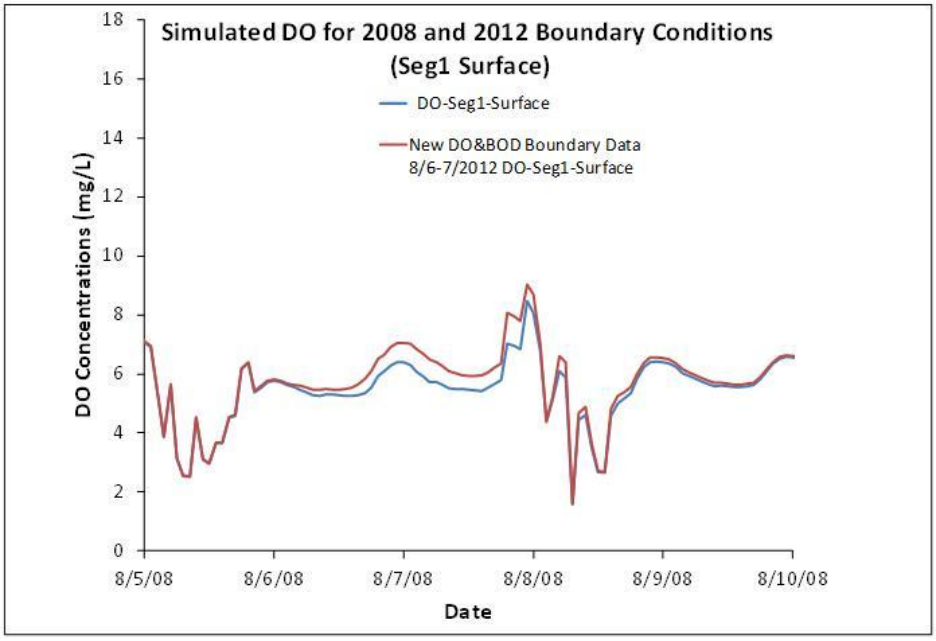

Figure 5.8a. Simulated DO at surface Segment 1 between the 2008 (blue) and the new 2012 DO data (red) at the boundary.

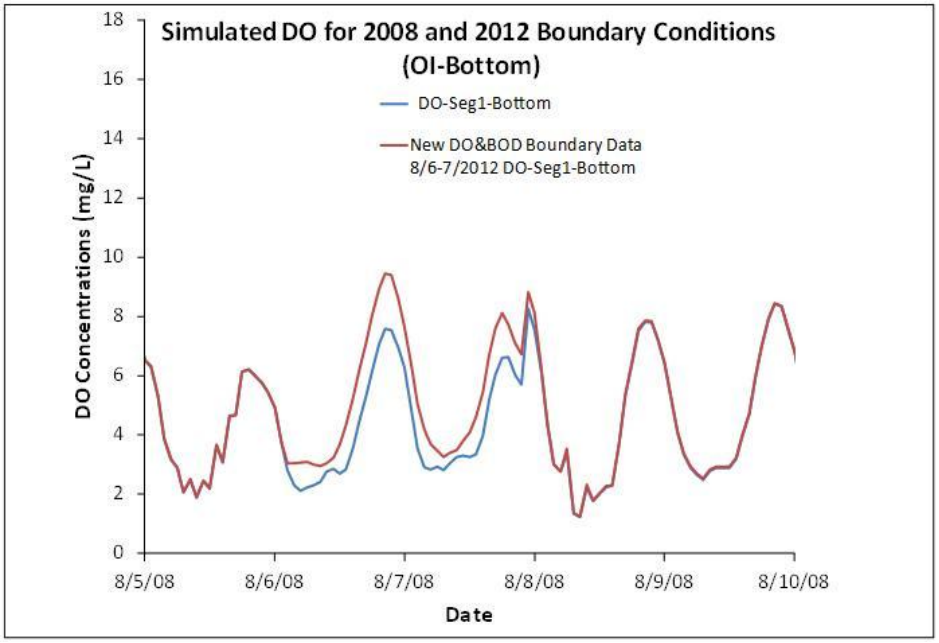

Figure 5.8b. Simulated DO at bottom Segment 1 (blue) between the 2008 and the new 2012 DO (red) data at the boundary.

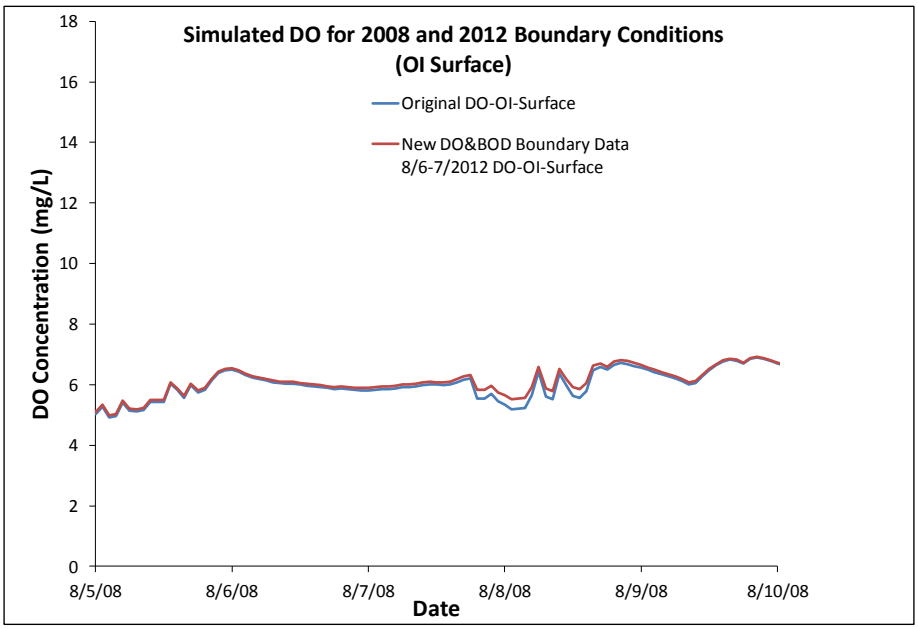

Figure 5.8c. Simulated DO at surface (OI) between the 2008 (red) and the new 2012 DO data (blue) at the boundary.

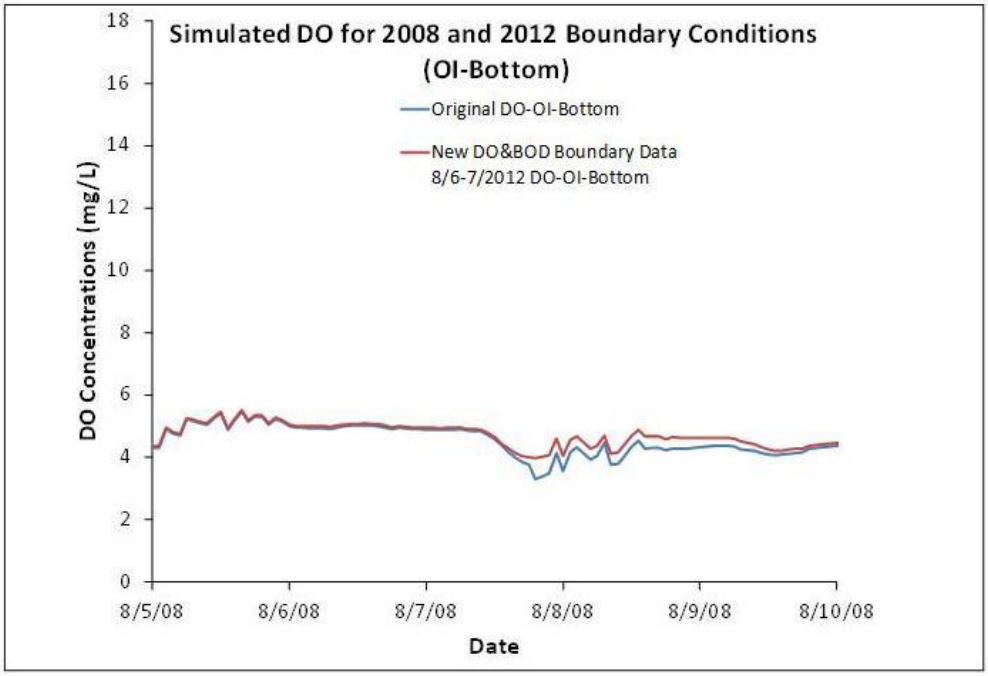

Figure 5.8d. Simulated DO at bottom (OI) between the 2008 (red) and the new 2012 DO data (blue) at the boundary.

5.3 Sensitivity Analysis

Dissolved oxygen plays a central role in its relationship with a number of processes, such as re-aeration, primary producer respiration, mineralization, and decaying processes from BOD, SOD, nitrification, etc. Of these processes, we have selected the following key processes for sensitivity analysis to identify and highlight potential processes that govern DO variation in the Slough:

- BOD decay rate
- Macroalgal biomass
- Primary producer respiration
- Mineralization rate
- Creek DO Load
- Creek BOD
- Nutrient load
- SOD

Simulated DO concentrations in the Slough are not sensitive to rates of BOD decay, mineralization or respiration of primary producer when these rates are increased to twice the baseline values (Figure 5.9a). However, changes in simulated DO concentrations and respiration rate are observed when the BOD decay rate increases 10-fold during algal bloom periods (early October 2008; Figure 5.9b).

Macroalgae affects DO in two ways: over-growth resulting in over-saturation from photosynthesis during peak sunlight and anoxia resulting from increased respiration during non-sunlight period. The effects are evaluated by scenarios with and without the existence of macroalgae. Figure 5.10 shows that differences in simulated DO concentrations between the two scenarios are not pronounced, except during the algae blooms period (late October 2008).

Figure 5.11 shows the effect of DO loads from the upstream boundary conditions on in-slough DO concentration. Similar to the 2008/2012 boundary DO data analysis made previously, upstream DO concentrations have some effects on in-slough DO concentrations. However, these effects decrease as slough water is advected downstream, during which DO is gradually governed more by the dynamics of processes shown in Figure 5.1.

In general, reduction of nutrient loads elevates DO concentrations in the Slough (Figure 5.12). However, increased DO concentration from reduced nutrient loads is not significant for minor or moderate nutrient load reduction.

In the new 2012 boundary data file provided by TetraTech, SOD was analytically projected to have a value of - 4.5 g O2 m^{-2} d^{-1} SOD. A sensitivity analysis was conducted that used -4.5 g O2 m^{-2} d^{-1} SOD for the slough water, compared to -1 g O2 m^{-2} d^{-1} SOD for the baseline condition (2008). Simulations were conducted for May 1 to Oct 30, 2008 and results are compared with the baseline conditions (2008; Figures 5.13a-d). Using the 4.5 g O2 m^{-2} d^{-1} projected by the new boundary data file, simulated DO concentrations at both OI and Segment 1 remained very low (0 to 2 mg L^{-1}) at the bottom layers. Dissolved oxygen concentrations of 0 take place more frequently at OI than at Segment 1. These new DO patterns using the SOD = 4.5 g O2 m^{-2} d^{-1} seem to match well with measured values. Note that values measured by McLaughlin et al. (2011) in the Slough were <u>a net positive flux</u> (release of O2 to the surface waters) during July and September of +1.6 to +3.84 g O2 m^{-2} d^{-1}. Dark chamber fluxes ranged from 0 in July to -2.84 g O2 m^{-2} d^{-1} in September. They note that the benthic chambers were positioned on a sand

bar "bench", not at the thalweg of the channel. This bench was higher in the water column and is likely to have a more active microphytobenthos community than the thalweg of the channel. Therefore, there is considerable uncertainty in the true SOD in Loma Alta Slough.

In conclusion, it may be possible that this is the source of the discrepancy between measured and modeled values in 2008. Alternatively, there may be some other within-Slough source of oxygen demand that is driving down bottom water DO. Regardless, based on the new head-of-estuary DO and BOD values, it is clear that the watershed only contributes to the DO fluctuations in the Slough but is not responsible for the chronic hypoxia that was measured in the Slough.

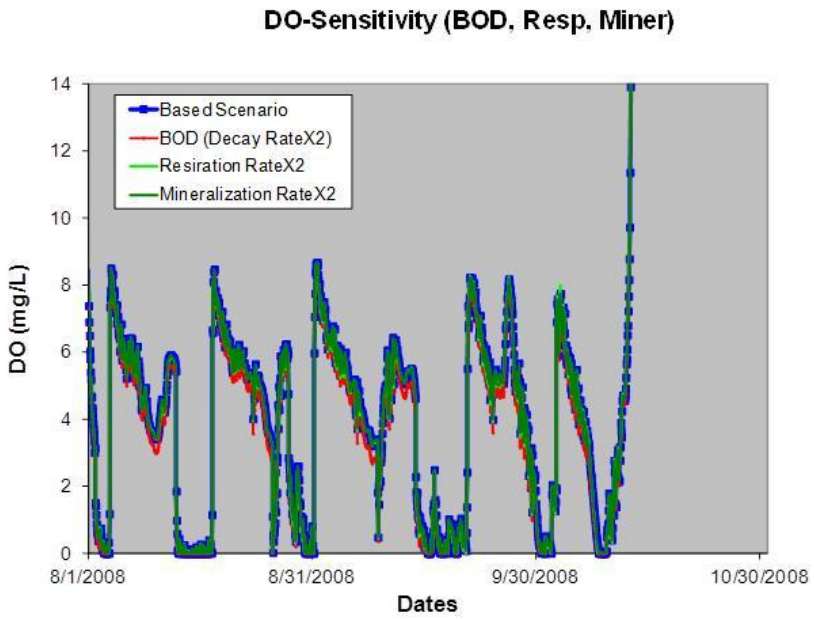

Figure 5.9a. Sensitivity analysis of DO concentrations for 2X the rates of BOD decay, respiration and mineralization.

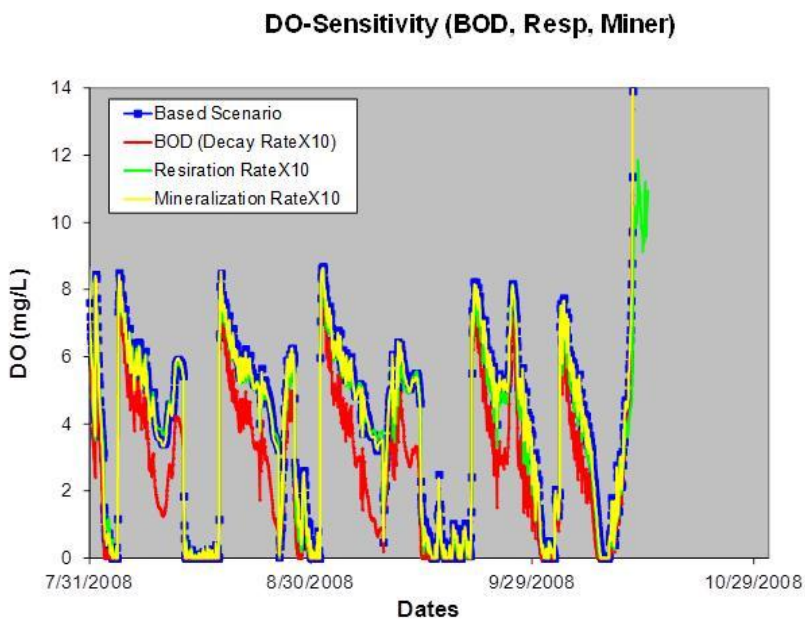

Figure 5.9b. Sensitivity analysis of DO concentrations for 10X the rates of BOD decay, respiration, and mineralization.

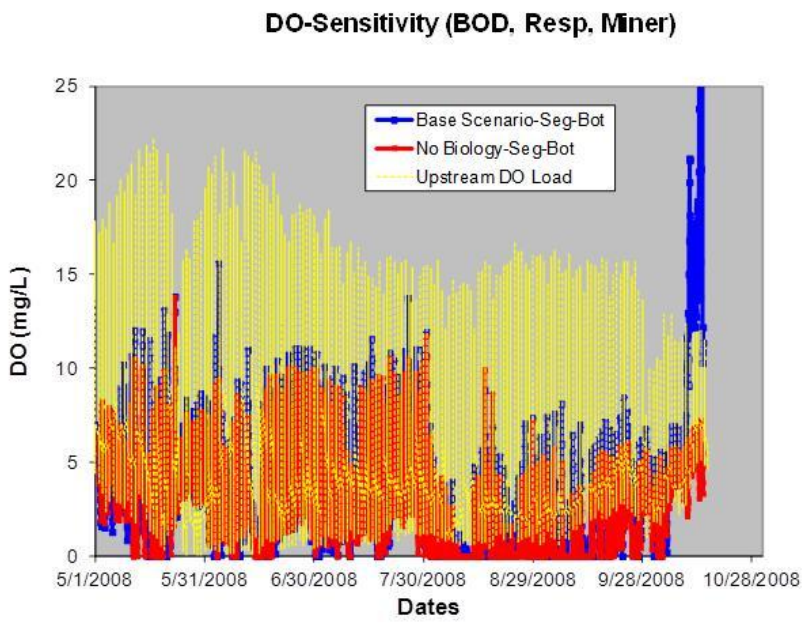

Figure 5.10. Sensitivity analysis for DO concentrations with and without macroalgae effects.

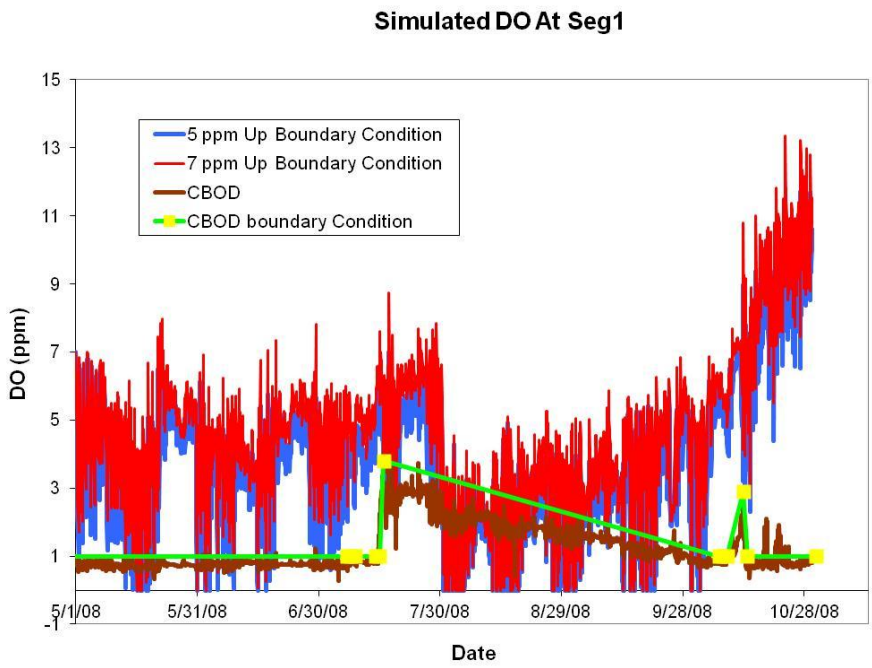

Figure 5.11. Sensitivity analysis for DO concentrations with upstream boundary conditions for DO = 5 mg L^{-1} and 7 mg L^{-1}.

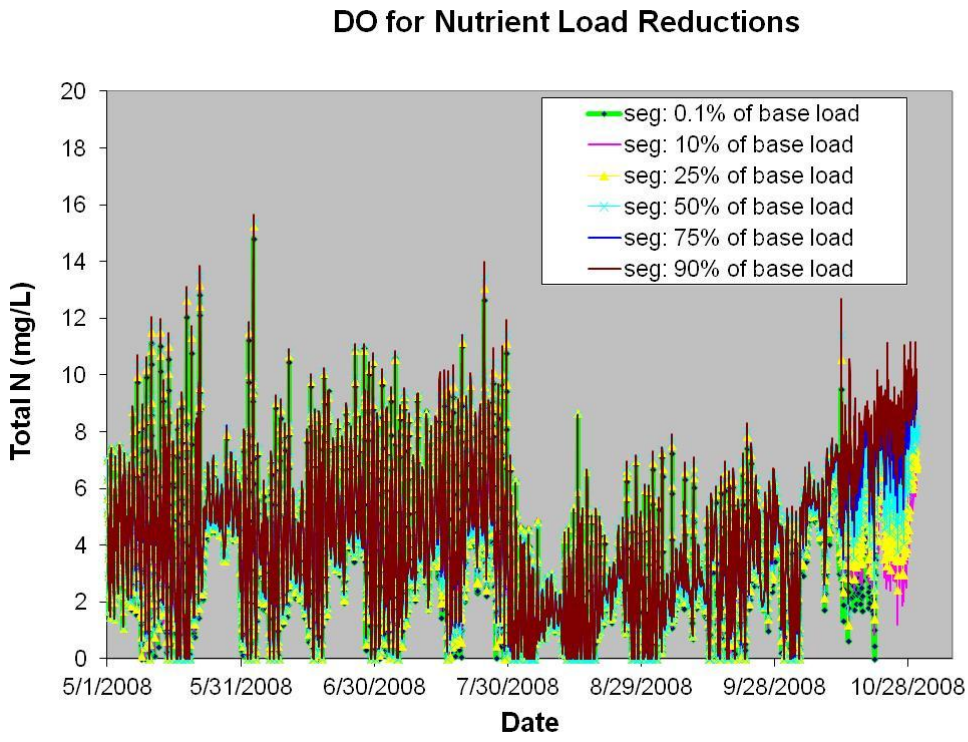

Figure 5.12. Sensitivity analysis for DO reduction of nutrient loads.

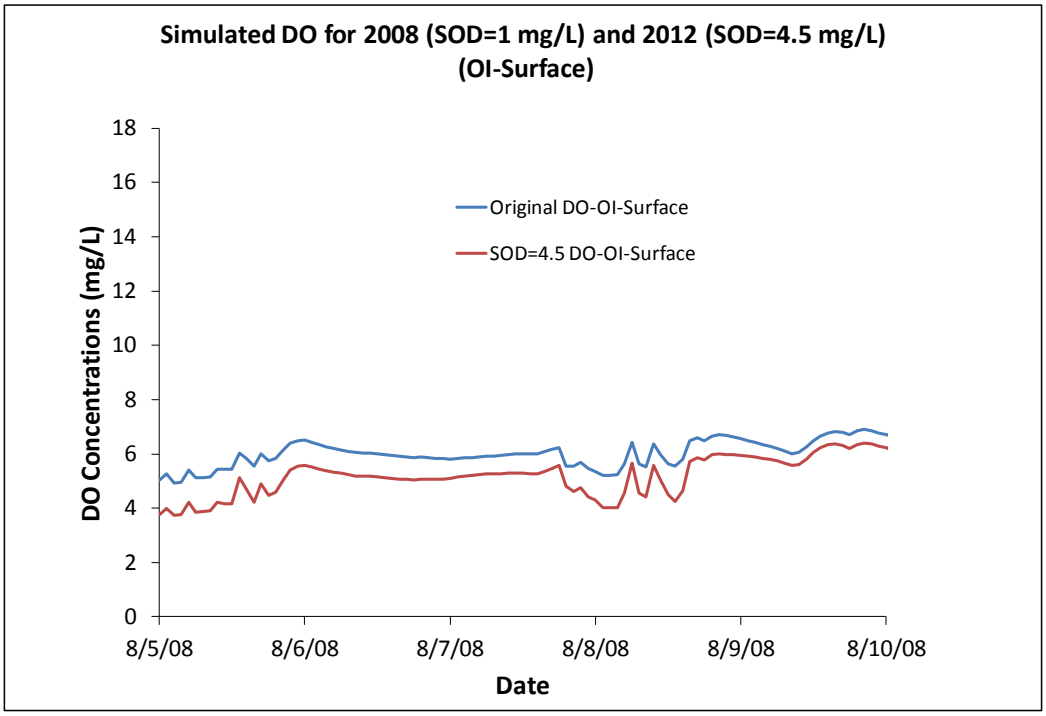

Figure 5.13a. Sensitivity analysis for DO at OI surface 2008 and 2012.

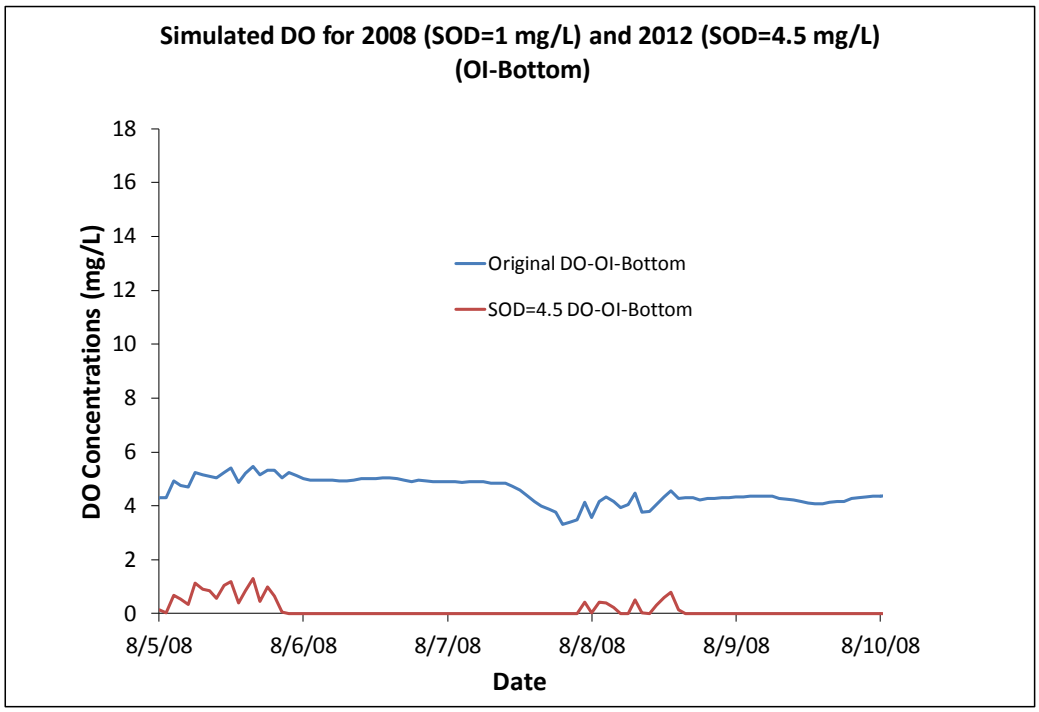

Figure 5.13b. Sensitivity analysis for DO at OI bottom 2008 and 2012.

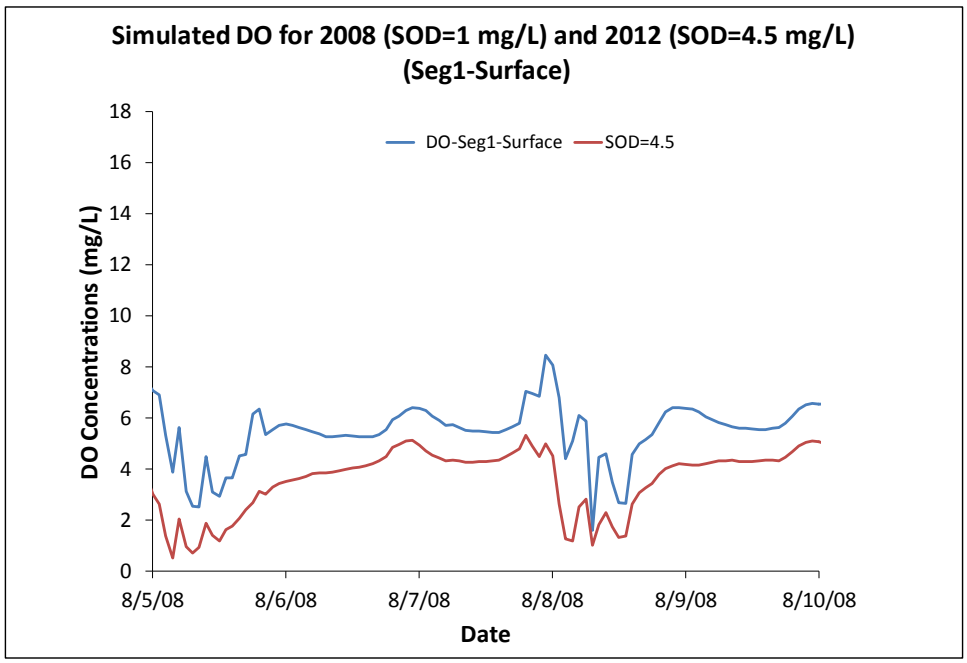

Figure 5.13c. Sensitivity analysis for DO at Segment 1 surface 2008 and 2012.

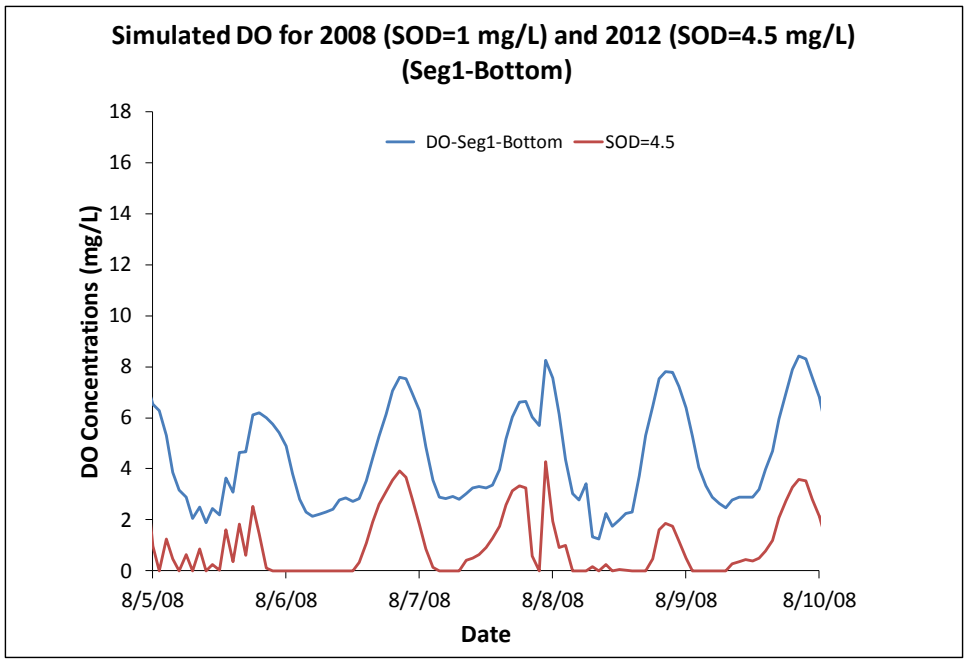

Figure 5.13d. Sensitivity analysis for DO at Segment 1 bottom 2008 and 2012.

5.3.1 Calibration and Sensitivity Analysis for Macroalgae

Calibration

The advance eutrophication module of WASP simulates three species of microalgae, including periphyton. Macroalgae is not directly simulated in WASP, because it is assumed that macroalgae has a life cycle similar to that of microalgae. However, macroalgae in Loma Alta Slough were observed to be stationary (immobile) most of the time, unlike microalgae which is transported by ambient water. Therefore, the advective and dispersive processes associated with microalgae were turned off to mimic the immobility of macroalgae.

Based on spatially averaged field and modeled biomass, the model shows good accuracy (estimated 3% error) and fit (R2 = 0.63). Figure 5.14 shows simulated macroalgae concentrations (g-C m^{-2}) at OI. Since algae simulated by WASP are in the unit of µg chlorophyll-a/L, a unit conversion was performed in order to compare with measured values in g-C m^{-2}. Two carbon to chlorophyll-a ratios, namely 30 and 120, were used, both of which are within the literature-reported values; 30:1 showed the best fit and was used for further simulations. Figure 5.15 shows simulated macroalgae biomass at OI during the 2008. Macroalgae biomass concentration was low before May when the inlet was open and exchange of the freshwater flows and the ocean water kept the slough adequately flushed with low macroalgae biomass. When the inlet is closed from May to end of October, relatively abundant nutrient accumulation increased macroalgae to growth. .

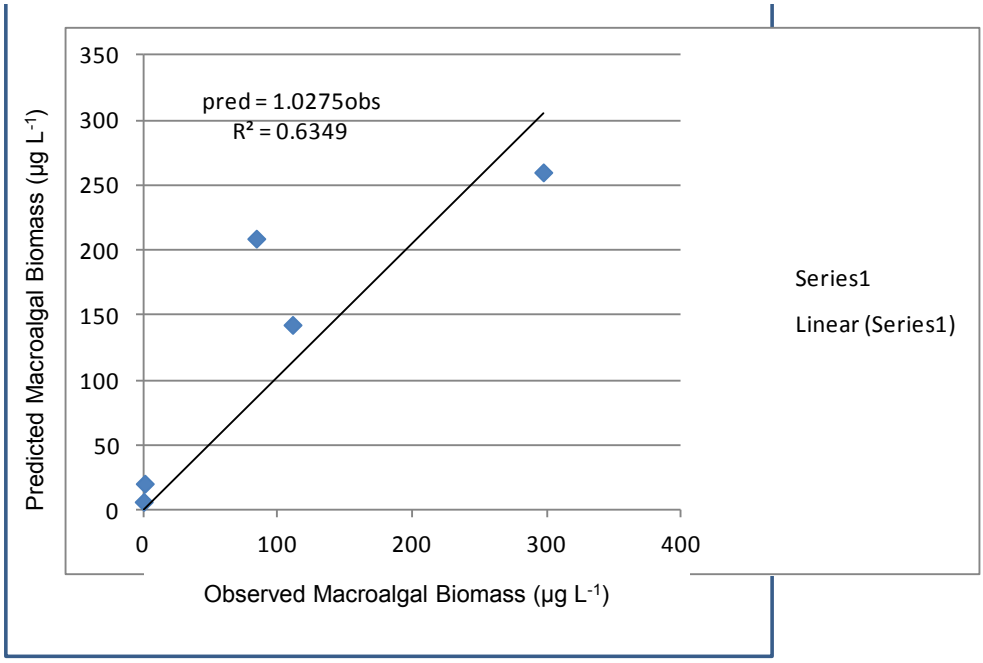

Figure 5.14. Comparison between predicted and measured macroalgae biomass at OI.

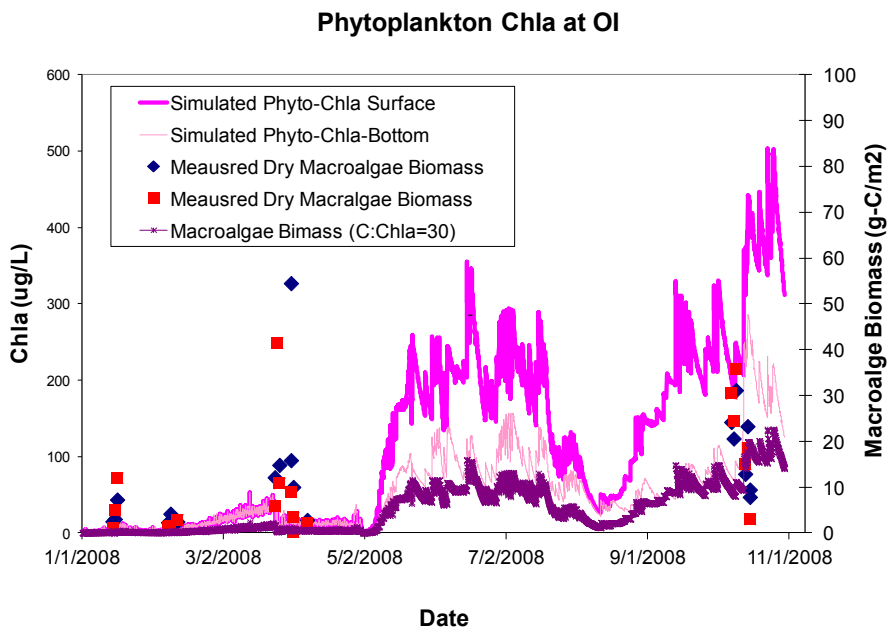

Figure 5.15. Predicted and measured macroalgae concentrations during 2008.

Sensitivity Analysis

Key parameters governing macroalgae biomass in the Slough include biomass growth rate and death rate. The following parameters supplied by SCCWRP were used in the base model runs (Table 5.4). For the base scenario (Scenario #1), macroalgae growth rate and death rate were 1.8 and 0.01 day^{-1}, respectively. Death rate increased 10-fold to 0.1 day^{-1} for Scenario #2 and growth rate increased to 2.3 day^{-1} for Scenario #3.

Table 5.4. Growth and death rates for macroalgae biomass sensitivity analysis simulations.

	Base Value day^{-1} **(Scenario #1)**	**Scenario #2** (day^{-1})	**Scenario #3** (day^{-1})
Growth Rate	1.8	1.8	2.3
Death Rate	0.01	0.1	0.01

In WASP, growth of macroalgae is defined as:

$$G = G_{Max} L_L L_N L_P$$

where G¬Max is the growth rate specified in Table 1, LL, LN, LP, are growth limitation factors by the available light, in-organic nitrogen and phosphorus, respectively. Figure 16 shows the time series of the

three growth limitation factors. In general, the growth is limited by light, and phosphorus for most of the May-Oct 2008 period. Nitrogen has it limitation on growth only during mid-July to mid-August.

Sensitivity analysis was conducted to evaluate effects of growth and death rates on macroalgae biomass. Due to the current structure of WASP, a full scale of sensitivity analysis is difficult to conduct. We used and defined the base values of growth rate and death rate as Scenario #1. For Scenario #2, the death rate was increased from the base value of 0.01 day^{-1} by 10-fold to 0.1 day^{-1}. For Scenario #3, the growth rate was increased from the base value of 1.8 day^{-1} to 2.3 day^{-1}, while the death rate remains at the base value of 0.01 day^{-1}.

Figure 5.16 shows results of simulated macroalgae biomass concentrations for the three scenarios. In general, predicted macroalgae biomass maintains highest magnitude for Scenario #3 (highest growth rate), followed by Scenario #1 (base values), and Scenario #2 with higher death rate produced lowest biomass in the slough water. Algal growth rate is the most important parameter that directly governs biomass concentration. A 30% increase of the growth rate (from 1.8 to 2.3 day^{-1} for Scenario #1 to #3) resulted in increase of biomass concentration about 2-fold. This drastic increase from 30 to 200% in the growth rate of biomass reflects the first-order characteristics of macroalgae growth. An increase in death rate resulted in reduced biomass concentrations. However, compared to growth rate, death rate has a secondary impact on biomass concentration; a 10-fold increase in the death rate (from 0.01 to 1 day^{-1} for Scenarios #1 and #2) resulted in an approximate 2-fold decrease in biomass concentration.

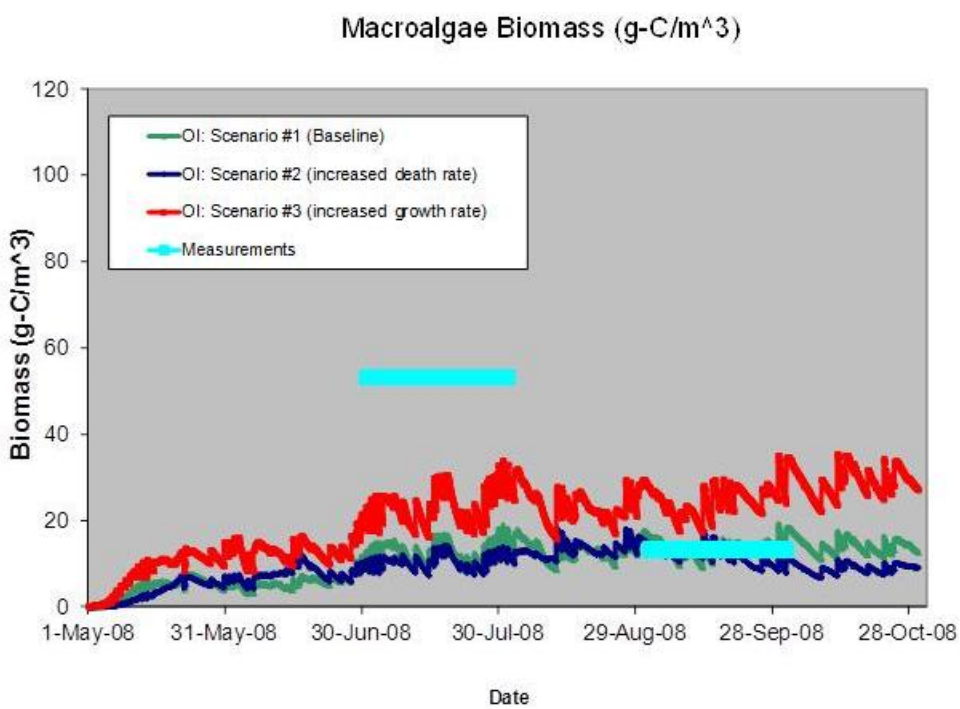

Figure 5.16a. Simulated results of baseline condition, increased growth rate and increased death rate on macroalgae biomass at OI.

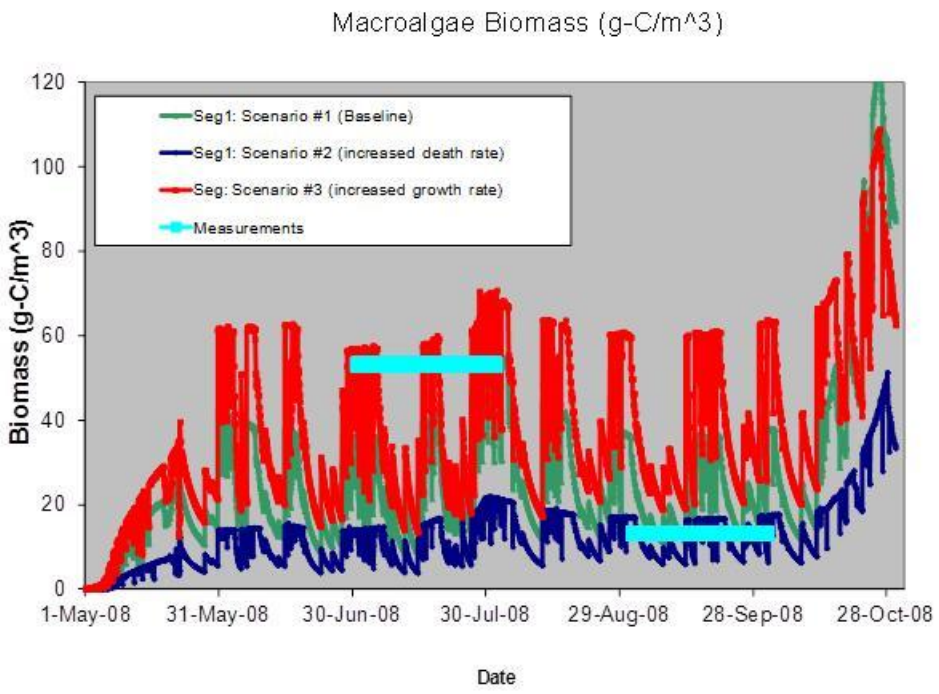

Figure 5.16b. Simulated results of baseline condition, increased growth rate and increased death rate on macroalgae biomass at Segment 1.

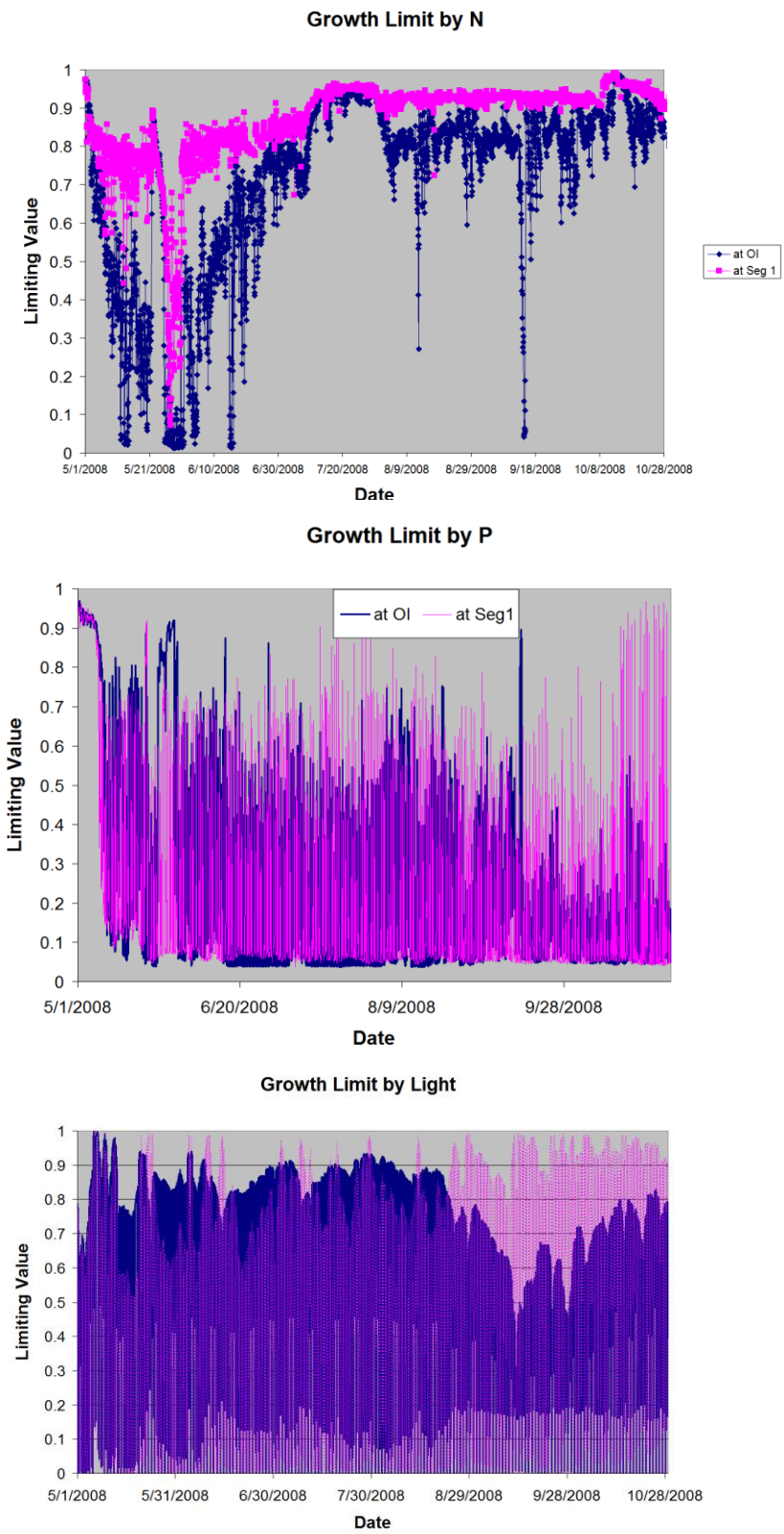

Figure 5.17. Time series of growth limitation functions for nitrogen, phosphorus and light.

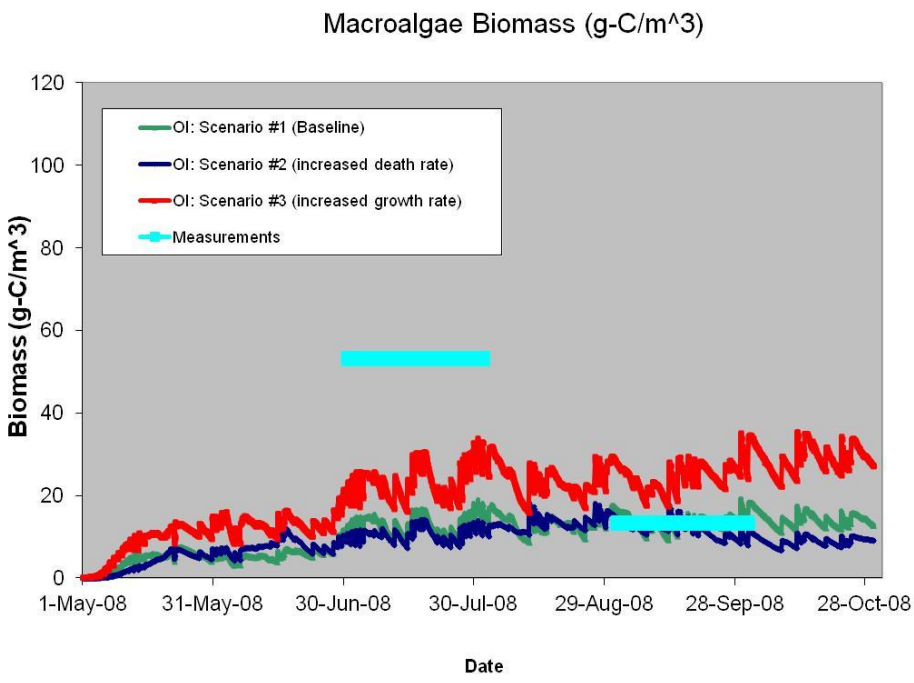

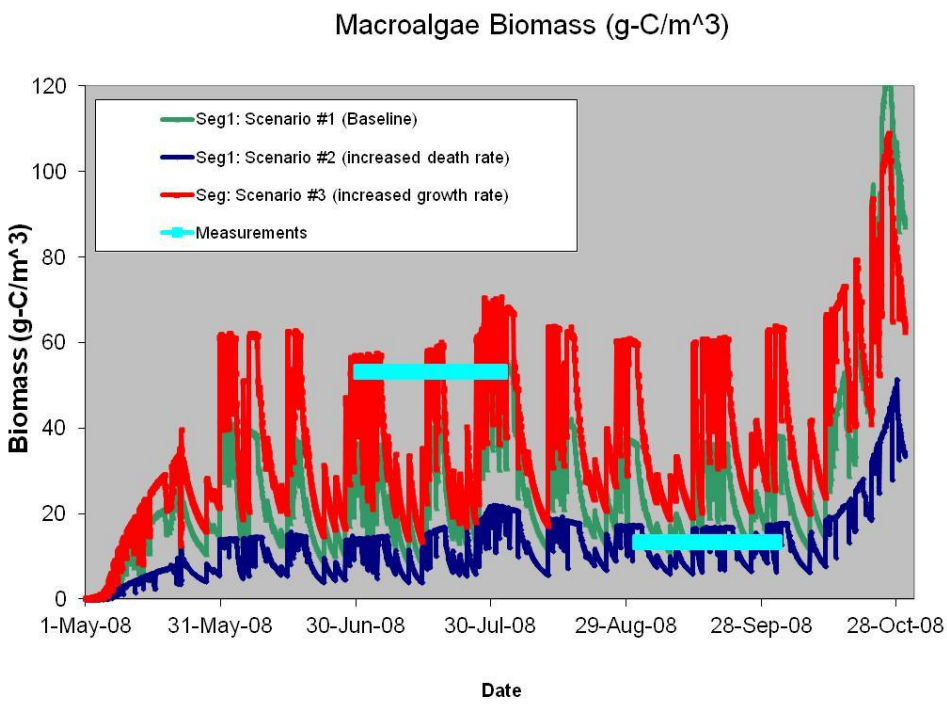

Figure 5.18. Simulated macroalgae concentrations for the three scenarios defined in Table 5.2 (measurements were taken during July and September 2008).

Sensitivity analysis was conducted between macroalgae biomass and nutrient load reduction. Figures 5.19a and 5.19b show simulated macroalgae biomass for 6 reduced nutrient loads ranging from 0.1, 10, 25, 50, 75, and 90% of the base loads. Macroalgae biomass decreases with reduced load, and vice versa. However, biomass is not linearly proportional to nutrient load. There are multiple reasons why linearity does not hold. The primary reason is that dependence of macroalgae growth on nutrient is a nonlinear relationship. Furthermore, the threshold nutrient concentrations play another important role in determining at what concentrations, do nutrients become limiting. Another possible reason is related to the first-order characteristics of macroalgae growth, which has in-direct influence on the relationship between macroalgae biomass and nutrient loads.

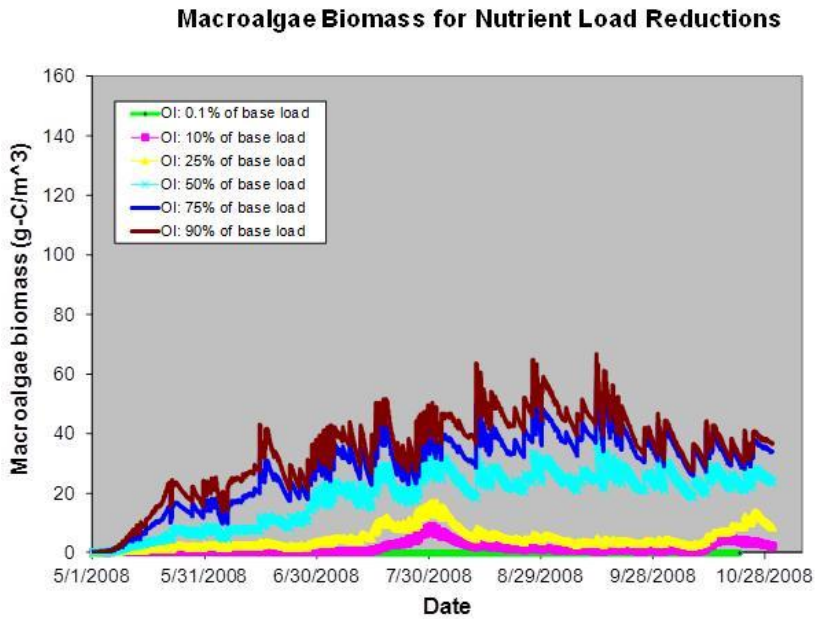

Figure 5.19a. Macroalgae biomass at OI for nutrient load reduction scenarios.

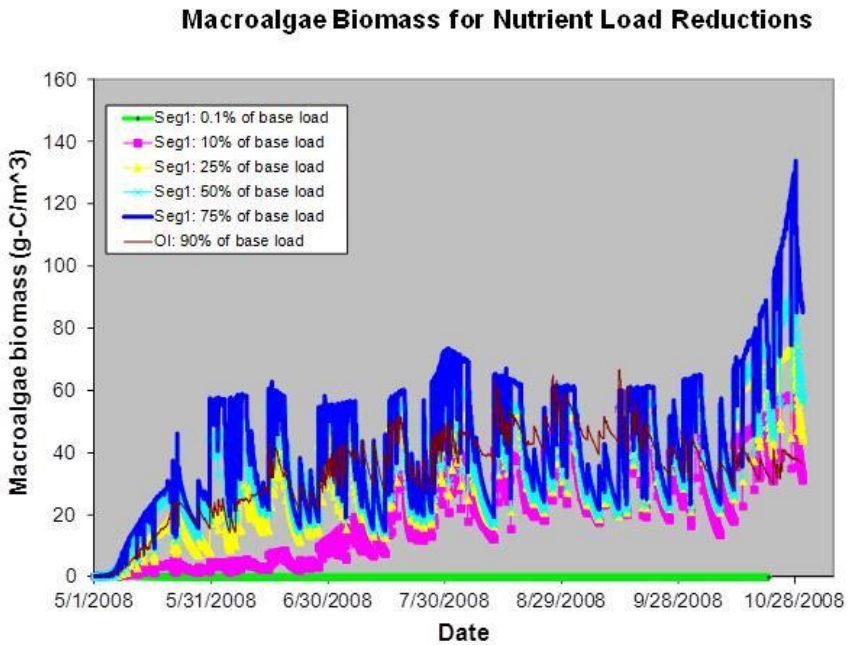

Figure 5.19b. Macroalgae biomass at OI for nutrient load reduction scenarios.

In summary, simulation of macroalgae biomass in the dynamic Loma Alta Slough was challenging because of existing data gaps for the growth cycle of macroalgae and no current model to simulate rafting macroalgae. With the released EPA's most recent water quality model, WASP, we eliminated advection and dispersion processes and used the same growth/death cycle for microalgae to simulate macroalgae biomass.

In general, model-simulated macroalgae biomass resembled that of measurements both in concentration magnitude and trend. Differences between modeled and measured biomass concentrations were generally within 3% for spatially averaged data. Sensitivity analysis also shows that a number of key model parameters govern macroalgae biomass. First, macroalgae growth rate plays a predominant role in governing macroalgae biomass, and death rate plays only a secondary role. Nutrient loads also directly impact biomass. However, the relationship between nutrient load and algal growth is not linear, which is further complicated by the nutrient-limiting factor.

5.3.2 Calibration and Validation of Slough Nutrient Concentrations

Nutrient loads enter the study domain from the upstream boundary (ME Station) as the boundary conditions are identified by four different forms: ammonia-N, nitrate-N, ortho-phosphorous-P, organic N and organic P. Once entering the slough, these nutrient loads interact with macroalgae dynamics and dissolved oxygen dynamics (Figure 5.1). Nutrient data were measured only during the periods of Oct 7-9 and 13-15 for the OI station (Figure 5.20), and during the periods of Jul 7-9, 14-16 and the periods of Oct 7-9 and 13-15 for Segment 1 (Figure 5.21).

Figures 5.20-5.22 show that all model results are in the same ranges as the measured values for all the three nutrient indicators, though the model is generally under-predicting nutrient concentrations by roughly 30% for TN and TP and 50% for DIN. Total phosphorus concentrations were less than those of total nitrogen concentrations by an order of magnitude. Both simulated and measured total-P and total-N do not include contributions from macroalgal N and P.

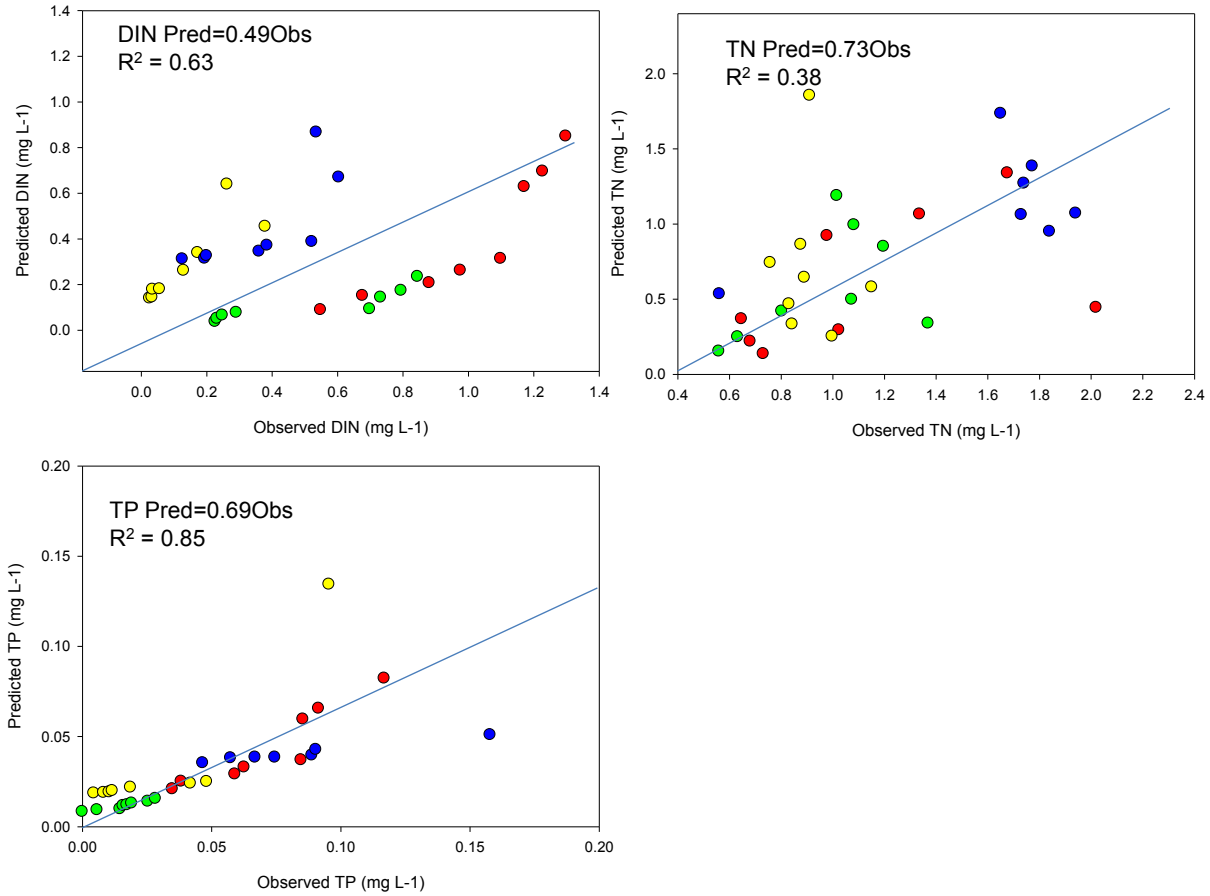

Figure 5.20. Comparison of observed versus predicted DIN (ammonium + NOX; top left panel), total N (top right panel) and total P (bottom left). Predicted = X Observed is the linear regression model of observed versus predicted, no intercept, where X is the model slope. R^2 represents model fit. Color of dot represent sampling period, where blue = January, yellow = April, green= July and red = October 2008.

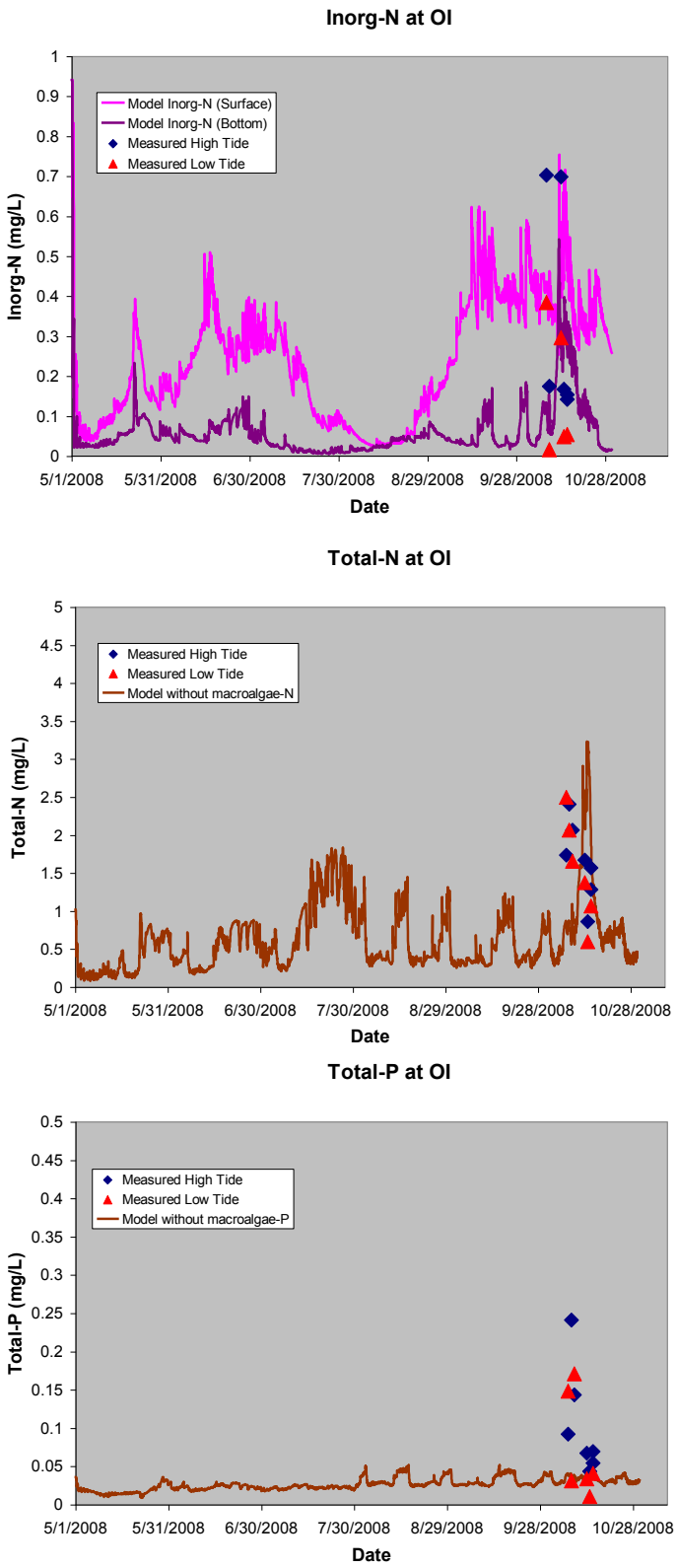

Figure 5.21. Simulated and measured total inorganic-N (above), total-N (middle) and total-P (bottom) at OI station.

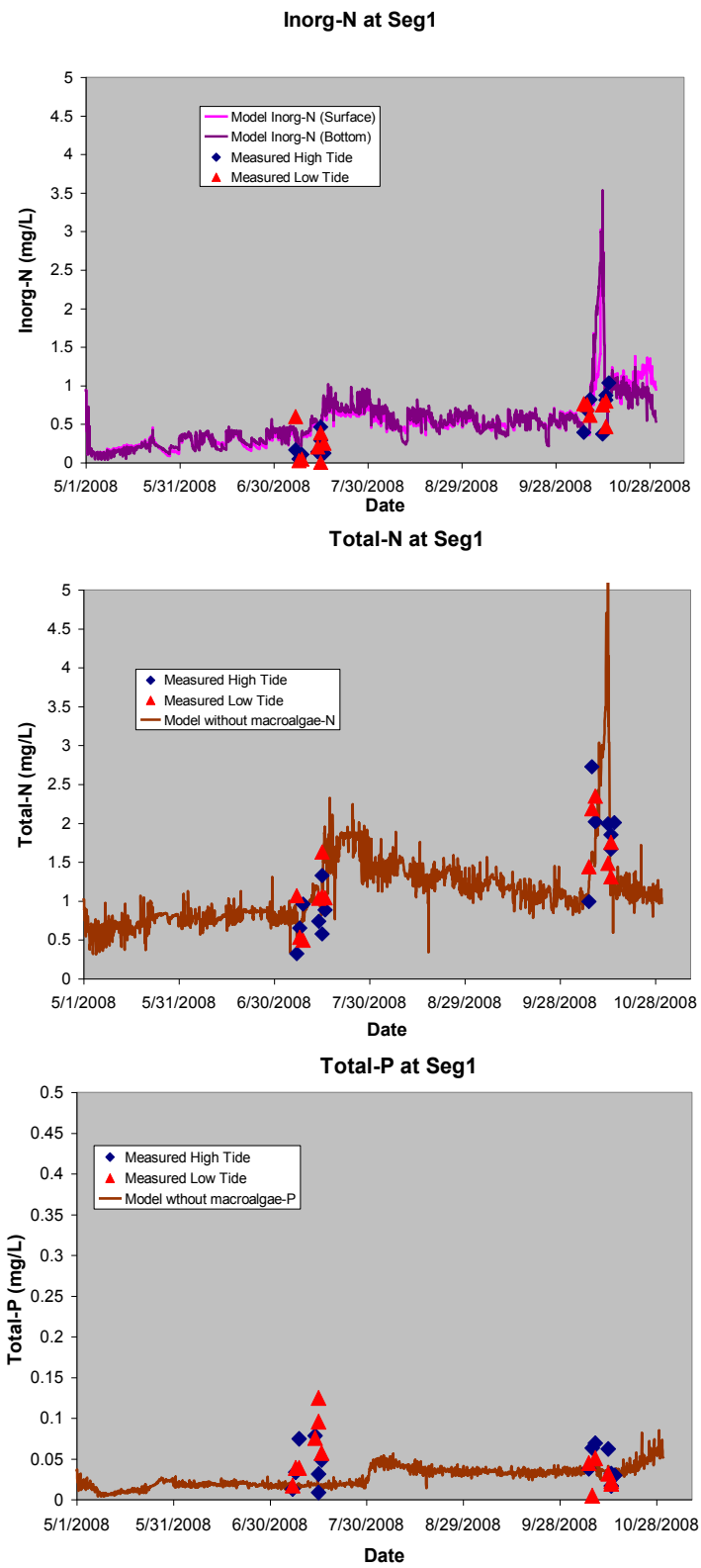

Figure 5.22. Simulated and measured total inorganic-N (above), total-N (middle) and total-P (bottom) at OI station.

5.4 Uncertainties in Eutrophication Modeling

5.4.1 Dissolved Oxygen

Based on the sensitivity analysis conducted above, DO is most sensitive to SOD. This is not only reflected directly from the model run scenario where simulated DO is inversely related to the SOD prescribed. Simulated DO in the slough seem to always exhibit diurnal fluctuation, whereas measured DO exhibits both a diurnal cycle and an extended period of very low (close to zero) DO concentration. Effects on DO concentration related to the upstream boundary condition are decreased in the downstream Slough. Dissolved oxygen concentrations in the Slough seem to be less sensitive to all the other processes, with only respiration rates become relatively important during the algal bloom periods. It is noted that DO concentrations are not very sensitive to external nutrient loads, which suggests that DO concentrations are buffered from direct nutrient loading.

5.4.2 Macroalgae

Macroalgae biomass in the Slough is directly governed by growth and death rates. These two rates seem to dictate macroalgae biomass in a non-linear fashion, which is further complicated by the nutrient limiting process. Comparatively, macroalgae growth is most limited by phosphorus, least by nitrogen (except during the late May of 2008 when nitrogen is at its low values), and moderately by light following the diurnal cycle. Therefore, when nutrient concentrations are close to the threshold values, macroalgae biomass is sensitive to the external nutrient loads.

5.4.3 Nutrient Concentrations

Nutrient concentrations in the Slough are directly linked to nutrient loads from the upstream boundary. Based on the weak diurnal variations, uptake of nutrients by macroalgae and/or mineralization from dead algae does not constitute an important sink/source for in-slough nutrients.

5.5 Summary of Eutrophication Modeling

Eutrophication for Loma Alta Slough was studied by the use of the linked EFDC+WASP model. While we were able to simulate the entire year of Nov 2007-Oct 2008, model results were presented and analyzed only for May-Oct 2008 when the inlet was closed and the water was most eutrophic. This was identified by the Regional Board and stakeholders as the critical condition.

Overall, the model performed well for simulation of macroalgae and nutrient concentrations. Macroalgae simulations had high accuracy (+/- 3%), while nutrient concentrations were underpredicted by 30%. Model results show that macroalgae growth during the period was limited by light throughout the simulation period, followed by limitation of phosphorus. Availability of inorganic nitrogen produced least limitation on growth. Similar to the growth rate, death rate is also a key parameter in governing macroalgae biomass in the Slough. Simulated macroalgae concentrations and measured values (only two data) are of the same order of magnitude.

Dissolved oxygen, which is believed to be the key indicator of eutrophic condition, was simulated and compared with measurements. Simulated DO and measured DO near the bottom were compared for both OI and Segment 1 for most of the May-Oct 2008 period. During Jul-Sep, 2008, the model did not capture the mean nor the diurnal variability of measured bottom water data. Modeled DO concentrations were persistently higher than measured values.

Additional data on DO and BOD loading were collected at the headwaters of the Slough during 2012 to discern whether the chronic hypoxia in the Slough was due to the higher BOD load and lower DO at the headwaters versus the mass emission station. Comparison of measured 2008 at the MES versus 2012 data at the head of the estuary illustrates that the DO loading between these stations was comparable and the BOD was actually lower at the headwaters.

Additional sensitivity analysis conducted on SOD illustrated that chronic hypoxia could be simulated with very high SOD (4.5 g m^{-2} d^{-1}) in Loma Alta Slough. These rates do not compare with measured values in the Slough, although McLaughlin et al. (2011) note that there is considerable uncertainty in the measured values.

In conclusion, it may be possible that SOD this is the source of the discrepancy between measured and modeled values in 2008. Alternatively, there may be some other within-Slough source of oxygen demand that is driving down bottom water DO. Regardless, based on the new head-of-estuary DO and BOD values, it is clear that the watershed only contributes to the daily DO fluctuations in the Slough but is not responsible for the chronic hypoxia that was measured in the Slough.

6 MODEL APPLICATION

The purpose of this section is to describe how the watershed loading and Slough hydrodynamic and water quality models were used to support decision-making on the nutrient and bacteria TMDL. The model was used in four types of applications:

- Calculation of numeric targets
- Calculation of total maximum daily loads
- Calculation of land-used based sources of bacteria and nutrients
- Analysis of implementation scenarios to meet TMDL numeric targets

6.1 Use of Models to Calculate Numeric Targets

The estuary hydrodynamic and water quality models were used to support decision-making on numeric targets for bacteria and eutrophication. A summary of discussions and relevant background material are presented below.

6.1.1 Bacteria

Basin Plan Objectives

The SDRWQCB has established numeric targets for fecal indicator bacteria in the Bacteria I TMDL. The Basin Plan allows a 22% exceedance frequency of these objectives for wet weather and 0% exceedance for dry weather (SWRCB Basin Plan).

Table 6.1. Numeric targets used for model scenario study. Targets are given in #/100 ml

Numeric Targets	Enterococci	Fecal Coliform	Total Coliform
Single Sample (Daily Data)	104	400	10,000
Geomean 30-day running	35	200	1000

Calculation of Bacteria Numeric Targets

At the May 12, 2011 stakeholder meeting, the stakeholders, the SDRWQCB , and EPA Region 9 staff discussed temporal and spatial aggregation of data. Three options for temporal aggregation of data were discussed: 1) daily maximum, 2) daily average and 3) 8 a.m. sample for both single sample exceedance and 30-day geomean. Two options for spatial averaging were discussed (Slough average, Slough maximum). Stakeholders and regulatory staff achieved consensus on how to use model output to calculate compliance with numeric targets, given below. Stakeholders and the regulatory staff agreed this approach was “balanced” (neither overly conservative or liberal).

1. Simulated concentrations need to be spatially averaged between the sand berm (Ocean Inlet Station) and the railroad bridge. The time series of the simulated concentrations will be based on the daily mean (Figure 6.1).

2. A 30-day geo-mean running window needs to be imposed on the time series. Both the geo-means and single sample concentrations will be compared with the corresponding criteria for each of the three bacteria
3. Days of exceedance will be used for comparison between simulated bacteria concentrations and the criteria over a one-year period.
4. Exceedance days will be imposed for wet weather (defined as a rain event greater than 0.1" for the day of the storm plus 72 hours.

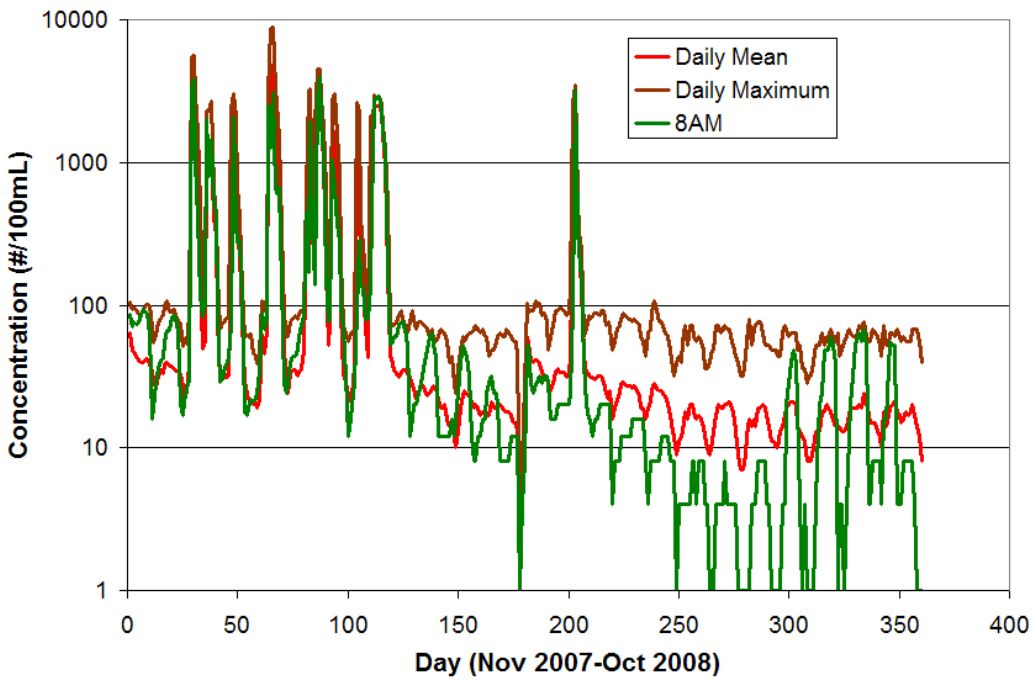

Figure 6.1. Examples of three options for temporal aggregation of FIB data: daily mean, daily maximum an 8 a.m. options.

Subsequent to the meeting, the stakeholders also proposed to regulatory staff that the definition of wet weather be consistent with the reference study (0.1" or greater) rather than what the Department of Public Health uses (0.2", City of Oceanside 2003). The regulatory staff accepted this definition.

The number of days in which the Slough exceeds the basin plan objectives was then compared with those allowed by application of the beach bacteria reference study, which allows a 22% exceedance frequency for wet weather and 0% exceedance for dry weather, SWRCB Basin Plan XXXX).

Stakeholders discussed the need for an estuary reference study with the regulatory staff and it was agreed that this could be proposed as a special study for reopening the TMDL, once it had been promulgated.

6.1.2 Eutrophication

Eutrophication is defined as the acceleration of the delivery and/or *in situ* production and accumulation of organic matter in a waterbody (Nixon 1995), typically from the overgrowth of algae and aquatic plants. While some waterbodies may have the tendency to accumulate organic matter over time, "eutrophication" signals the acceleration in this process. Eutrophication results in a wide range of effects including harmful algal blooms, hypoxia, and impacts on aquatic food webs. One of the main causes of eutrophication in estuaries is nutrient over-enrichment (nitrogen, phosphorus and silica). However, other factors influence primary producer growth and the build-up of nutrient concentrations, and hence modify (or buffer) the response of a system to increased nutrient loads (hereto referred to as **co-factors**). These co-factors include hydrologic residence times, mixing characteristics, water temperature, light climate, grazing pressure, etc.

Existing SD Regional Water Quality Basin Plan Objective Relating to Nutrients and/or Eutrophication

The SDRWQCB Basin Plan includes two objectives that have applicability towards eutrophication in enclosed bays and estuaries: 1) dissolved oxygen, and 2) biostimulatory substances (Table 6.2).

Table 6.2. SDRWQCB Basin Plan objectives for oxygen and biostimulatory substances (SDRWQCB Basin Plan).

Indicator	Objectives
Dissolved Oxygen	Dissolved oxygen levels shall not be less than 5.0 mg L^{-1} in inland surface waters with designated MAR or WARM beneficial uses or less than 6.0 mg L^{-1} in waters with designated COLD beneficial uses. The annual mean dissolved oxygen concentration shall not be less than 7 mg L^{-1} more than 10% of the time.
Bio-stimulatory Substances	Inland surface waters, bays and estuaries and coastal lagoon waters shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. Threshold total phosphorus (P) concentrations shall not exceed 0.05 mg L^{-1} in any stream at the point where it enters any standing body of water, nor 0.025 mg L^{-1}in any standing body of water. A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg L^{-1} total P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1 , on a weight to weight basis shall be used. Note - Certain exceptions to the above water quality objectives are described in Section 4 in the subsections titled Discharges to Coastal Lagoons from Pilot Water Reclamation Projects and Discharges to Inland Surface Waters.

Alternative Numeric Targets for Eutrophication

The purpose of this section is to provide information on alternative numeric targets to address eutrophication in Loma Alta Slough.

Several studies have demonstrated the shortcomings of using ambient nutrient concentrations alone to predict eutrophication, in streams (Welch et al. 1989, Fevold 1998, Chetelat et al. 1999, Heiskary and Markus 2001, Dodds et al. 2002) and estuaries (Cloern 2001, Dettman et al. 2001, Kennison et al. 2003).

Use of ambient, surface water nutrient concentrations is generally not effective for assessing eutrophication and the subsequent impact on beneficial use because ambient concentrations reflect the biological processing that has already occurred. For example, macroalgae can take up nutrients with such high efficiency that they leave near non-detectable concentrations in the surface waters. In Loma Alta Slough, this phenomenon was evident as during the summer 2008 when some of the highest biomass levels found in the Southern California Bight were recorded in the Slough, while surface water nutrient concentrations generally met basin plan objectives.

Over the past decade, US EPA Region 9 and the California State Water Resources Control Board (SWRCB) have been developing a science-based approach to translate narrative water quality objectives for nutrients and biostimulatory substances to numeric targets for lakes and streams (EPA 2006). The SWRCB staff strategy is to develop a narrative objective for nutrients and biostimulatory objectives, plus numeric guidance that would be incorporated by default into the Basin Plans of the Regional Water Quality Control Boards. This numeric guidance is referred to as the Nutrient Numeric Endpoint (NNE) Framework. The NNE framework consists of two key tenets:

1) Use of ecological response indicators rather than nutrients to assess risk to beneficial uses from eutrophication,
2) Models to link response indicator endpoints to site-specific nutrient targets.

Numeric endpoints are developed for indicators of the ecological response of the waterbody to eutrophication (e.g. algal biomass, dissolved oxygen, pH), rather than nutrients. Though NNE assessment framework is not yet adopted, two reports and two journal articles (Green et al. (in review) and Sutula et al. (in press) completed by that project are useful as a starting point discussions on numeric targets for Loma Alta Slough. The two reports include:

- A comprehensive review of ecological response indicators and science to support decisions on numeric thresholds (Sutula 2011).
- A review of science supporting dissolved oxygen objectives in estuaries (Sutula et al. 2012).

Selection of NNE indicators and applicable thresholds for Loma Alta Slough must map on to the relevant beneficial uses affected by eutrophication. Table 6.3 lists the applicable estuarine beneficial uses for Loma Alta Slough and their definitions.

Sutula (2011) and Sutula et al. (2012) provide a comprehensive review of candidate indicators and science available to support threshold selection. Sutula et al. (2011) used an explicit set of review criteria to determine whether an indicator was suitable for use to assess eutrophication. They also provide background on classification of California estuaries and key habitat types relevant to California estuaries. Based on this information, Loma Alta Slough would be classified as an intermittently tidal river mouth estuary. When open, the Slough is dominated by macroalgae; when closed, the Slough has a combination of macroalgae and phytoplankton (Figure 2; McLaughlin et al. 2010).

Table 6.3. Definition of estuarine beneficial uses applicable to selection of E-NNE indicators.

Estuarine Habitat (EST) -Uses of water that support estuarine ecosystems including, but not limited to, preservation or enhancement of estuarine habitats, vegetation, fish, shellfish, or wildlife (e.g., estuarine mammals, waterfowl, shorebirds).
Warm Freshwater Habitat (WARM) – Uses of water that support warm water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish or wildlife, including invertebrates.
Contact Water Recreation (REC-1) – Uses of water for recreational activities involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water-skiing, skin and SCUBA diving, surfing, white water activities, fishing, or use of natural hot springs.
Non-contact Water Recreation (REC-2) – Uses of water for recreational activities involving proximity to water, but not normally involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tidepool and marine life study, hunting, sightseeing, or aesthetic enjoyment inconjunction with the above activities.

A simple conceptual model of estuarine ecological response to eutrophication can be described. The increased nutrient loads and alterations in co-factors can result in three types of ecological response: 1) changes to aquatic primary producers, 2) altered water and sediment biogeochemistry, and 3) altered community structure of secondary (invertebrates) and tertiary consumers (fish, birds, mammals). These ecological responses include adverse effects on both ecological and human endpoints of concern. This cascade of effects has a direct effect on the ecosystem services and beneficial uses an estuary provides, including reduced: 1) Habitat for aquatic life (including EST, MAR, WILD), 2) Protection of biodiversity including rare, threatened and endangered species and migratory and spawning habitat (RARE, SPWN, MIGR), 3) Productivity of commercial and recreational fisheries (SHELL, COMM, AQUA), 4) Good aesthetics and lack of odors (REC2), and 5) Maintenance of good water quality and taste (REC1, COMM, AQUA, SHELL).

Of these indicator reviewed, three subgroups are recommended for further development under the NNE framework: 1) dissolved oxygen, 2) macroalgae, 3) and phytoplankton. The applicability of these indicators groups is given as a function of whether the estuary is “open” or “closed” to tidal influence and habitat type. The status of the estuary as “open” or “closed” maps back to estuarine class, specifically with respect to its designation as perennially, intermittently, or ephemerally tidal. Thus a perennially tidal estuary is “open” year round, while an intermittently or ephemerally tidal estuary is “open” for some time period and “closed” for others. Thus in Loma Alta Slough, applicable indicators would include macroalgae and dissolved oxygen when the Slough is “open” or “closed” to tidal exchange. Though phytoplankton may be an applicable indicator in Loma Alta Slough, field observations indicate that phytoplankton biomass is small relative to macroalgae (McLaughlin et al. 2010).

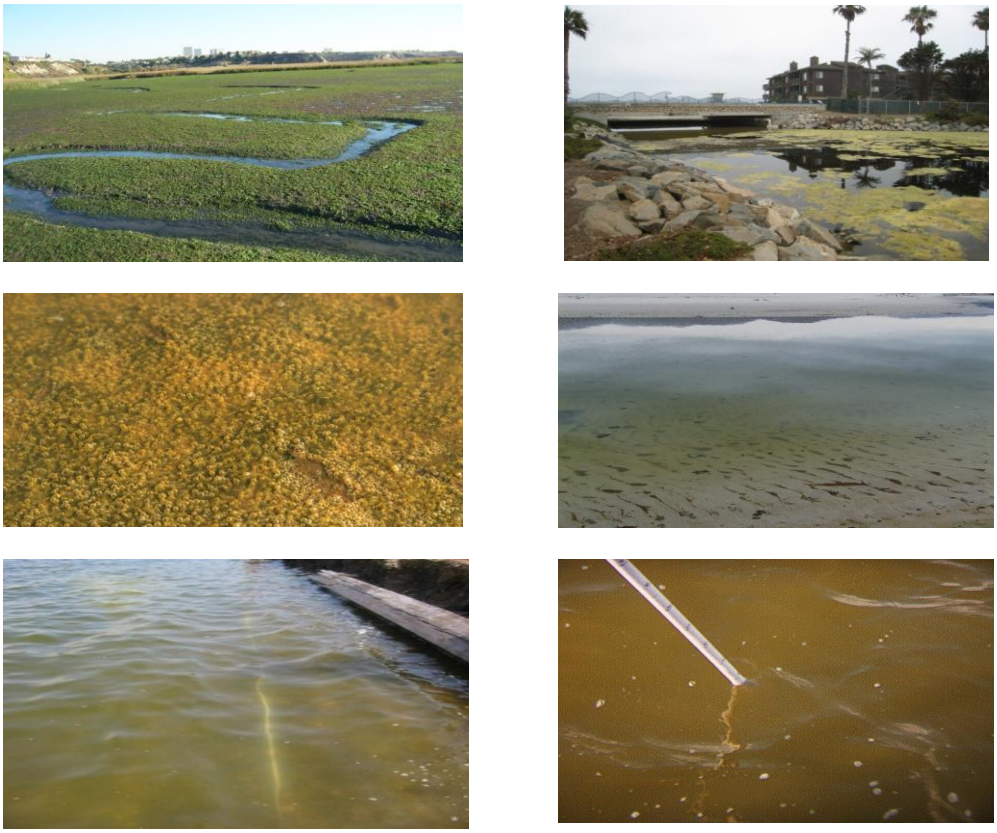

Figure 6.2. Examples of three types of primary producers found in Loma Alta Slough: macroalgae on tidal flats (top left) and floating macroalgae during a closed inlet (top right), microphytobenthos (mid panel) and phytoplankton (bottom panel).

Literature Review Supporting Numeric Targets for Dissolved Oxygen and Macroalgae

***Dissolved Oxygen*.** The San Diego RWQCB has existing dissolved oxygen objectives for estuaries (www.waterboards.ca.gov). Sutula et al. (2012) recently completed a review of science supporting dissolved oxygen objectives in California estuaries. Sutula et al. (2012) found that there were insufficient data to derive criteria for native California species. Ultimately, by using data from surrogate and introduced species, the minimum data requirements for calculation of acute and chronic criteria were met. In addition, there was sufficient species representation to derive separate *acute* criteria for northern and southern California for both estuaries open to tidal exchange and intermittently closed systems. Conversely, there were insufficient data to derive separate *chronic* criteria based on region or estuary type. Thus, while the report may ultimately help to move all Regional Boards towards a similar approach to setting dissolved oxygen objectives, the report has not undergone sufficient review to consider alternative numeric thresholds at this time. Two issues raised in this report however are relevant for considering how the existing DO basin plan objective is interpreted. First, the report notes that hypoxia in bottom waters is a natural occurrence in bar-built estuaries, particularly when the mouth is closed, due to due to salinity stratification. Therefore application of the DO basin plan objective throughout the water column may be unreasonable. Second, the report recommends that acquiring

data from a reference estuary to better establish the percentage of time in which existing basin plan objectives would be exceeded. A dissolved oxygen reference study for Loma Alta Slough is under discussion.

***Macroalgae*.** Sutula et al. (2011) provides a complete synthesis of the status of science to develop numeric endpoints for macroalgae. The EU Water Framework Directive has proposed class limits for macroalgal biomass and cover (Scalan et al 2007; Zaldivar et al. 2008), with consideration of percent cover and biomass separately (Table 6.4). In intertidally dominanted estuaries, macroalgae is typically assessed on intertidal flats or shallow subtidal habitat, and are therefore expressed on an areal basis (g dw m^{-2}). As an index area in the intertidal zone, macroalgae Is typically assessed on a transect at MLHW or 0.75 m Below Mean Low Tide (MTL).

Table 6.3. EU WDF proposed classification of macroalgal abundance as a function of dry weight weight biomass and percent cover (from Scanlan et al. 2007). Scanlan et al. (2007) wet weight values were transformed to dry weight using Bight 08 Eutrophication Assessment data (McLaughlin et al., in press). Combination of biomass are cover are ranked from low macroalgal abundance = very high ecological condition (blue) to high macroalgal abundance = very low ecological condition (red).

Biomass (g dw m^{-2})	Percent Cover				
	<5%	5 to 15%	15 to 25%	25 to 75%	>75%
> 400	Moderate	Low	Very Low	Very Low	Very Low
130 to 400	Moderate	Moderate	Low	Very Low	Very Low
70 to 130	Good	Moderate	Moderate	Low	Low
10 to 70	Very High	Good	Good	Moderate	Low
< 10	Very High	Good	Good	Moderate	Moderate

Additional studies were funded by the SWRCB to support the establishment of regulatory thresholds (Sutula et al. in press; Green et al, in review). Sutula et al. (2012) found an envelope of reference conditions in eight California estuaries of 3 to 15 g dw m^{-2}. Lowest observed adverse effects were documented experimentally by Green et al. (in review) at 110 to 120 g dw m^{-2} after a duration of 2 to 6 weeks. This value was similar to that documented by Bona (2006) of 90 g m^{-2} via benthic camera survey at which larger bivalves and surface deposit feeders were lost. Sutula et al. (in press) documented severe adverse effects at 175 to 190 g dw m^{-2}, similar levels to that found by Green (2011) in a field experiment which produces high porewater sulfide (190 g dw m^{-2}). Two studies provide some information on "no effect" thresholds. A field experiment by Cardoso et al. (2004) found a positive effect on invertebrate diversity and abundance at approximately 30 g dw m^{-2} (Cardoso et al. 2004). Similarly, Green (2011) found that levels approximating 30 g dw m^{-2}; our confidence that this finding represents a no-effect benchmark is low, as in either study the treatment was not a continuous application. Nevertheless these latter two studies help to narrow the uncertainty in where an initial threshold of adverse effects likely lie (i.e., >30 g dw m^{-2} but <90 g dw m^{-2}).

In estuaries were rafting macroalgae is found in subtidal habitat, it is necessary to expressed macroalgal biomass as a volumetric number. In order to translate areal thresholds to volumetric numbers, the areal biomass is divided by 0.75 m, representing the average water depth that a transect of macroalgae assessed at MLHW, the location in which macroalgae is typically assessed in field surveys and experiments (Sutula et al. in press, Green et al. submitted; Table 6.4)

Table 6.4 EU WDF proposed classification of macroalgal abundance as a function of volumetric dry weight weight biomass and percent cover (from Scanlan et al. 2007). Volumetric biomass was transformed by dividing areal biomass (Table 7) by 0.75 m.

Biomass ($g\ dw\ m^{-3}$)	**Percent Cover**				
	<5%	**5% to 15%**	**15% to 25%**	**25% to 75%**	**> 75 %**
>530	Moderate	Low	Very Low	Very Low	Very Low
175-530	Moderate	Moderate	Low	Very Low	Very Low
90-175	Good	Moderate	Moderate	Low	Low
10-90	Very High	Good	Good	Moderate	Low
<10	Very High	Good	Good	Moderate	Moderate

With respect to % cover, Bona (2006) establish cover > 60% associated with adverse effects. Scanlan et al. (2007) adopted <5% cover of opportunistic macroalgae as a reference level (equivalent to High quality status) and propose <15% (=5–15%) cover of opportunistic macroalgae as a threshold level for acceptable cover where biomass is also low . It considers >75% cover as seriously affecting an area, and this could possibly form a threshold for Poor/Bad status with 25–75% delineating a Moderate/Poor band, and 15–25% Moderate.

While there is no published information on % cover of floating algae in estuaries that becomes undesirable from a recreational perspective, several studies have been done on streams in New Zealand and Montana, indicating that when macroalgae reaches levels of 50-80% cover, the stream becomes undesirable to recreate (Biggs 2000, Supplee et al. 2009).

Calculation of Numeric Targets for Dissolved Oxygen, Macroalgae, and Nutrient Concentrations

At the March 6 and 27, 2012 meetings, the stakeholders, the SDRWQCB , and EPA Region 9 staff discussed temporal and spatial aggregation of data for interpretation of dissolved oxygen, macroalgae and surface water nutrient concentrations. For macroalgae and nutrient concentrations, model output was used to inform these discussions. A synopsis of the discussion is presented below.

Stakeholders and regulatory staff acknowledged that TMDLs calculated using existing biostimulatory objectives versus the macroalgal NNE target would be different. The group consensus was to run the

numbers to calculate the TMDL and compare using the two types of numeric targets. The decision on what to use would be presented in the staff report

Dissolved Oxygen. Discussion and consensus on the dissolved oxygen numeric target revolved around five points:

- *What are the appropriate numeric target?* Consensus on the Basin Plan Objectives: Use 5 mg L^{-1}, ignore 7 mg L-1 average annual. All agreed that these endpoints could be revised in a reopener when a reference study is completed.
- *Should the objectives apply equally to wet versus dry weather, winter dry versus summer dry*? There was consensus that objectives should apply to all periods, though a reference study could help to better define permissible periods of non-compliance.
- *Should model output or monitoring data be used surface water only, bottom water only, or surface and bottom water averaged?* There was consensus on applying the objective in the surface water only, with reopener after reference study.
- *Should model output or monitoring data be used as instantaneous or averaged?* There was agreement, though not consensus, to monitor on continuous basis. Data should be processed to provide hourly running average of data.
- *Should some period of non-compliance be granted?* There was agreement on using 10th percentile to determine allowable compliance, with reopener after reference study.
- *Where should DO be monitored?* It was suggested and most agreed that DO be monitored for compliance at the boundary condition

Macroalgae. At the March 6, 2012 meeting, stakeholders discussed and make made recommendations (or counter points) to EPA and RB 9 recommendations on the following issues regarding the use of macroalgae as a numeric target. Discussion and consensus on the macroalgal numeric target revolved around six points:

- *Should target be expressed as wet weight or dry weight?* Consensus was on the use of dry weight rather than wet weight.
- *Should numeric target be expressed as g m^{-2} or g m^{-3}?* Stakeholder consensus was to use as subtidal only (volumetric); no impairment for algae when the Slough is open, so no numeric target needed for intertidal.
- *What is the appropriate numeric target for biomass and cover?* Regulators recommended 90 g m^{-3} for subtidal habitats. All agreed that this threshold should be subject to a reopener after the completion of a reference study. Regulators recommended less than 30% cover; stakeholders countered that <70% would be preferred and more reasonable based on a REC 2 threshold. Consensus was reached at <90 g m^{-3} and <50% cover.
- *How should quadrat data be managed to generate transect level biomass and cover estimates?* Consensus was to use average of quadrat data.
- *How should the transect data be used to generate the biomass and cover estimates for a segment?* Use two transects approximately 70-100 m in length to cover above and below the railroad bridge. Maintain the data for the transects separate (e.g. can fail for any transect).

- *How should bloom duration be taken into account?* Use the average of two consecutive sampling periods: July and August

Slough Surface Water Nutrient Concentrations. Discussion focused on interpretation of existing basin plan biostimulatory objectives.

- *What are the appropriate numeric target? The Basin Plan Objectives?* Unless site-specific number is generated as part of TMDL, the regulators recommend: 1) > 0.05 mg L^{-1} TP + 0.5 mg L^{-1} TN when Slough closed; 0.1 mg L^{-1} TP + 1 mg L^{-1} TN when Slough open. Stakeholders disagreed with the recommended numbers for when the Slough is closed, arguing that the Slough is not really a standing body of water. Group agreed to have both 0.05 and 0.1 mg L^{-1} TP and translation to TN numbers to see what the comparison is with the TMDL generated to meet the macroalgal numeric target.
- *Where in the Slough? Entire Slough? Index area?* Group decided that they wanted to see at the head of estuary.
- *Should the objectives apply equally to wet versus dry weather, winter dry versus summer dry?*

  Apply during dry weather only, no distinction between winter and summer dry.
- *Should model output or monitoring data be used surface water only, bottom water only, or surface and bottom water averaged?* Stakeholder consensus on surface and bottom water averaged.
- *Should model output or monitoring data be used as instantaneous or averaged?* Stakeholder consensus on monthly average.
- *Should some period of non-compliance be granted?* Stakeholder consensus was on the 10th percentile allowable exceedance.

6.2 Use of Models to Calculate Total Maximum Daily Loads

The purpose of this section is to use the bacteria and eutrophication water quality models to calculate the total maximum daily loads required to meet the numeric targets. This calculation does not margin of safety.

6.2.1 Approach to Estimate TMDL

The approach used to calculate the TMDL was to run the model to reduce the wet weather (bacteria only) and dry weather (bacteria and nutrients) flow to a 0%, 10%, 25%, 50%, 90 and 99.9% reduction in freshwater flow measured in October 2007-2008 for bacteria and nutrients and May-October 2008 for macroalgae. A regression equation was used to fit the relationship between flow (dry weather) or load (wet weather) versus the numeric target.

Bacteria

For FIB, model output was averaged spatially from the ocean inlet to the railroad bridge. These data were then used to generate for the 8 a.m. sample, daily mean and 30-day geomean for dry weather and the 8 a.m. sample and daily mean for wet weather.

Over a course of 325 dry days per year, the data were used to generate the maximum, 95thile and 90thile, of bacteria concentrations, corresponding to 0%, 5% and 10% allowable exceedance frequency respectively for each of the ways of calculating the standard (8 a.m. grab, daily mean, 30-day geomean of the daily mean) for each of flow reduction scenarios (no change (100%), 90, 75, 50, 10, and 0.1% of flow).

For the 40 wet weather days, a similar calculation was performed. The data were used to generate 78thile of bacteria concentrations, corresponding to 22% allowable exceedance frequency for each of the ways of calculating the single grab standard (8 a.m. grab, daily mean) for each of flow reduction scenarios (no change (100%), 90, 75, 50, 10, and 0.1% of flow).

Eutrophication

Dissolved oxygen in the Slough was not responsive to nutrient loads (Section 5). Therefore it was not be used in the calculation of the TMDL. For macroalgae, used average flow from May through October.

Macroalgae and Nutrients

Macroalgae and nutrient concentrations were simulated over a course 325 dry days per year. The data were used to generate the 0 and 10 % allowable exceedance of biostimulatory objectives for each of flow reduction scenarios (no change (0%), 10, 25, 50, 90 and 99.9% reduction in dry weather flow). For macroalgae, data were processed only during the dry season (May-October), the designated critical period for macroalgal overgrowth.

6.2.2 Results and Discussion

Bacteria

Generally, analysis of the bacteria TMDL calculations show that the single grab standard for enterococcus would drives the TMDL allocation for both wet and dry weather. For dry weather, assuming a 0% allowable exceedance frequency, a dry weather diversion of 99.5 % of the freshwater flow from Loma Alta Creek would be required to meet the enterococcus numeric target(Table 6.5). The percent reduction required was no different between the daily mean and 8 a.m. grab sample. For fecal The range of flow reduction for fecal coliform ranged from 97% for fecal coliform to 85% for total coliform. Figures 6.3-6.5 show the linear regression relationship between flow reduction and FIB concentration using different methods of calculating the numeric target, including single sample (8 a.m. grab, daily mean) and 30-day geomean of the daily mean.

Similarly for wet weather, a 99.9% load reduction would be required to meet the enterococcus single grab standard in the Slough. A 97% reduction would be required to meet the fecal coliform standard, while an 80% reduction would be required to meet the total coliform standard. Figure 6.7 shows the linear regression relationship between FIB load reduction and Slough FIB concentration using different methods of calculating the numeric target, including 8 a.m. grab and daily mean.

Table 6.5. Table of % reduction in dry weather flow required to meet FIB TMDL numeric targets. Slope (b) and y-intercept (a) refer to regression relationship used to extrapolate fow reduction required to meet Slough FIB numeric targets. Ent = enterococcus, FC = fecal coliform, and TC = total coliform. Exceedance rate refers to allowable exceedance rate based (currently at 0%).

FIB	Exceed-ance Rate	8:00 a.m. Grab			Daily Mean			30-day Geomean of Daily Mean		
		b	a	% Reduction	b	a	% Reduction	b	a	% Reduction
Ent	0%	-175.0	17506	**99.5**	-184.0	18408	**99.5**	-38.4	3859	**97.7**
	5%	-72.0	7212	**98.7**	-68.2	6832	**98.7**	-12.2	1266	**94.6**
	10%	-14.6	1484	**94.7**	-29.5	2972	**97.2**	-11.1	1137	**93.5**
FC	0%	-154.5	15495	**97.7**	-154.1	15448	**97.6**	-79.1	7943	**97.9**
	5%	-66.6	6704	**94.6**	-67.7	6816	**94.7**	-65.6	6592	**97.4**
	10%	-66.1	6652	**94.5**	-66.2	6656	**94.5**	-65.4	6568	**97.4**
TC	0%	-664.6	66481	**85.0**	-664.0	66411	**85.0**	-188.9	18922	**94.9**
	5%	-253.4	25398	**60.8**	-287.8	28814	**65.4**	-109.3	10963	**91.2**
	10%	-88.8	8919	**N/A**	-111.8	11233	**11.0**	-93.1	9343	**89.6**

Table 6.6. Table of % reduction in wet weather FIB loads required to meet FIB TMDL numeric targets. Slope (b) and y-intercept (a) refer to regression relationship used to extrapolate load reduction required to meet Slough FIB numeric targets. %Reduction refers to reduction in FIB load.

FIB Numeric Target	8:00 a.m. Grab			Daily Mean		
	b	a	% Reduction	b	a	% Reduction
Total Coliform	-480.3	48056	**79.2**	-509.5	50976	**80.4**
Fecal Coliform	-111.3	11173	**96.8**	-104.6	10503	**96.5**
Enterococcus	-114.2	11651	**99.9**	-120.1	12108	**99.9**

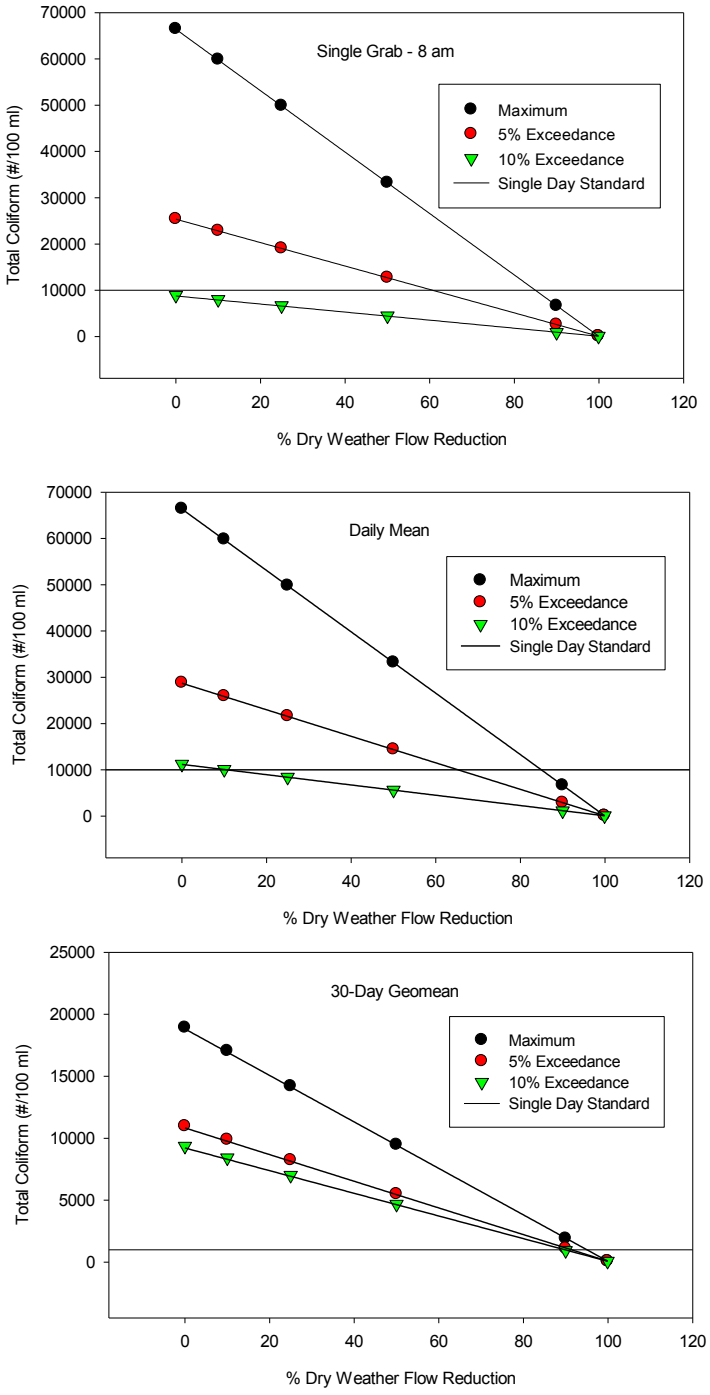

Figure 6.3. Graphs showing analysis decline in total coliform concentration in Loma Alta Slough as a function of % reduction in dry weather flow for an 8:00 a.m. single grab event (top panel), daily mean (middle panel, and 30-day geomean (bottom panel). Graphs show allowable exceedance days at 0% (black), 5% (red) and 10% (green) of dry days per year.

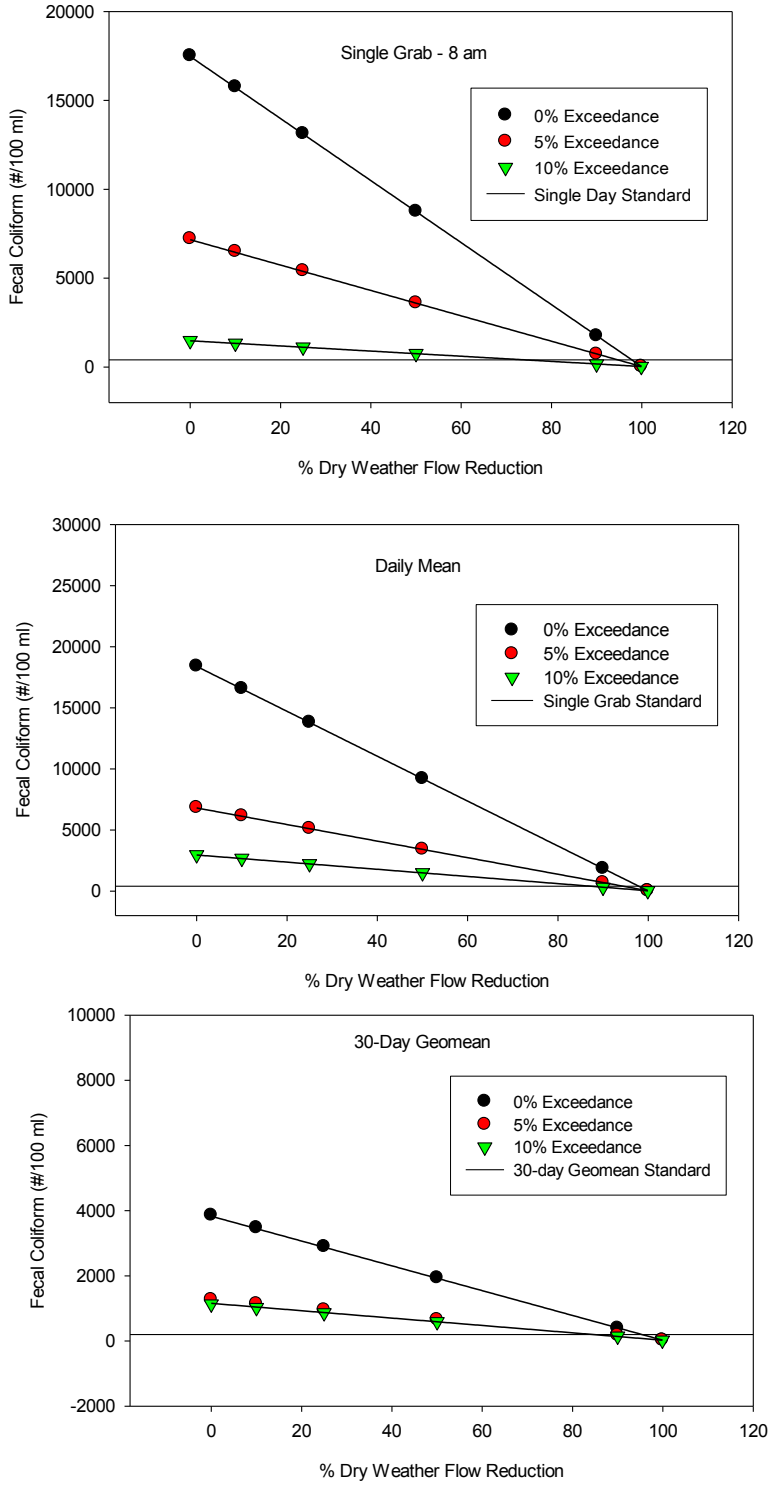

Figure 6.4. Graphs showing analysis decline in fecal coliform concentration in Loma Alta Slough as a function of % reduction in dry weather flow for an 8:00 a.m. single grab event (top panel), daily mean (middle panel, and 30-day geomean (bottom panel). Graphs show allowable exceedance days at 0% (black), 5% (red) and 10% (green) of dry days per year.

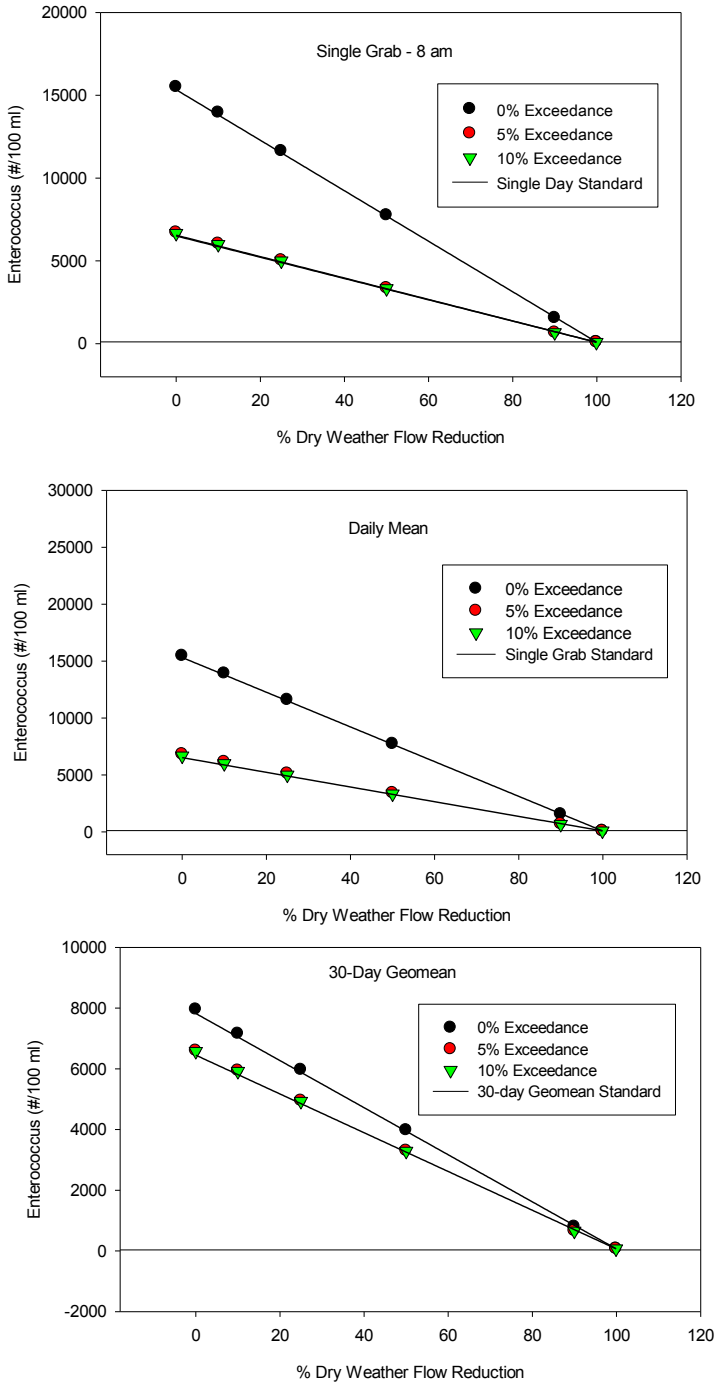

Figure 6.5. Graphs showing analysis decline in enterococcus concentration in Loma Alta Slough as a function of % reduction in dry weather flow for an 8:00 a.m. single grab event (top panel), daily mean (middle panel), and 30-day geomean of daily mean (bottom panel). Graphs show allowable exceedance days at 0% (black), 5% (red) and 10% (green) of dry days per year.

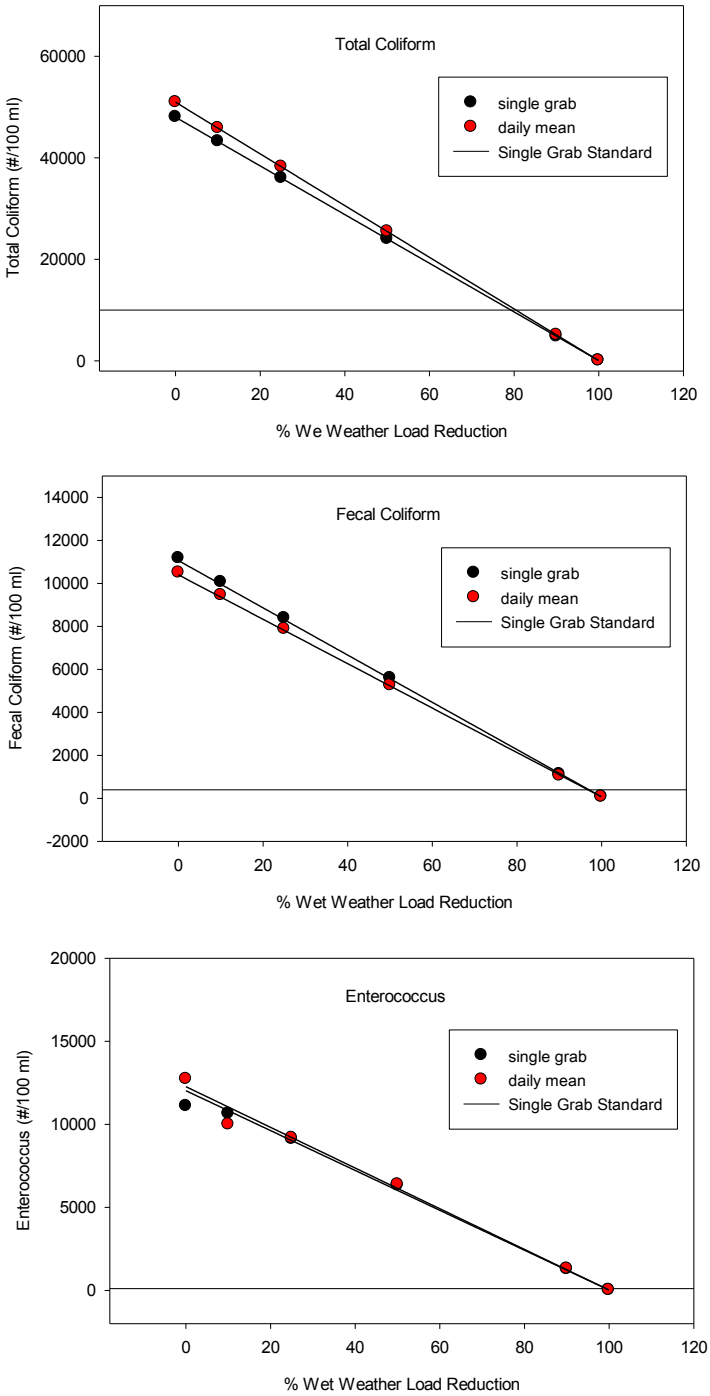

Figure 6.6. Graphs showing analysis of decline of FIB concentration in Loma Alta Slough as a function of % reduction in wet weather FIB loads for an 8:00 a.m. single grab event (black) and daily mean (red) for total coliform (top panel), fecal coliform (middle panel) and enterococcus (bottom panel).

Macroalgae and Nutrients

We estimate that a 81-96% reduction in TP and TN loads to the Slough during May –October are required to meet macroalgae numeric targets discussed in Section 6.1 (Table 6.7). Stakeholders and regulatory staff discussed how these targets should be met and specified that compliance should be met at both the upstream (Segment 1) and downstream (Segment 2) section of the Slough. However, the eutrophication model does not capture the drifting and spatial redistribution of algae (see Section 5). Therefore, we recommend that the Slough wide average be used to calculate the %load reduction required. Steep declines in the biomass are achieved with load reduction up to approximately 75%. After that, declines are more gradual.

Table 6.7. Table of percent reduction in dry weather TN and TP loads required to meet macroalgal numeric target discussed in Section 6.1. Slope and y-intercept refer to regression relationship used to extrapolate fow reduction required to meet the numeric target. Ocean inlet refers to the section downstream of the railroad bridge. Segiment 1 (upstream) refers to the section of the Slough upstream of the railroad bridge to the Coast Highway.

Segment Calculated	Slope	Intercept	% Load Reduction
Ocean Inlet (Downstream)	-0.207	99.9	81.3
Segment 1 (Upstream)	-0.0423	99.9	96.1
Average	-0.076	99.9	93.0

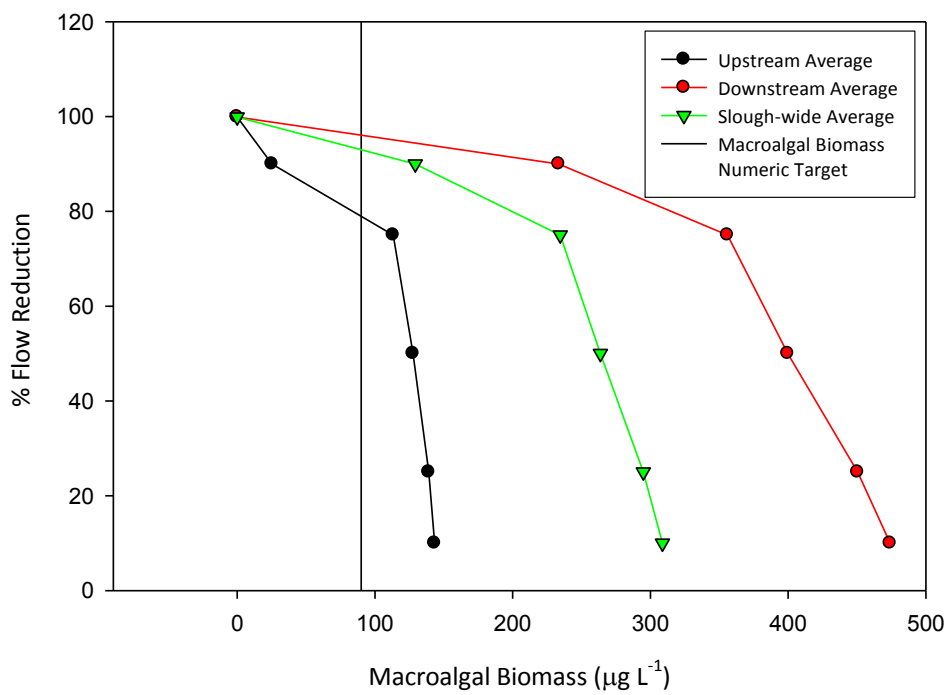

Figure 6.7. Graphs showing analysis of decline in floating macroalgal biomass in Loma Alta Slough as a function of % reduction in dry weather flow, relative to the macroalgal biomass numeric target = 90 µg L^{-1}).

For nutrient concentration-based numeric targets, the load reduction is require to meet TN concentration targets (3-15% for TN = 1 mg L-1 and 46-57% for TN = 0.5 mg L-1) was substantially less than that required to meet a macroalgal numeric target (Table 6.8: Figure 6.8). No reduction in TP loads would be required to meet TP numeric targets, regardless of the interpretation of the Basin Plan Biostimulatory Objective (Table 6.9, Figure 6.8); this problematic, recognizing that the Slough is P-limited for during the May-October critical period (McLaughlin et al. 2011).

Table 6.8 Table of percent reduction in dry weather TN loads required to meet the TN numeric target based on a flowing waters (TN = 1 mg L^{-1}) and standing water (TN =0.5 mg L^{-1}) interpretation of the Basin Plan Biostimulatory Objective. Ocean inlet refers to the section downstream of the railroad bridge. Segiment 1 (upstream) refers to the section of the Slough upstream of the railroad bridge to the Coast Highway.

Slough Segment	Slope	Intercept	% Reduction Required	
			TN = 1 mg L^{-1}	TN = 0.5 mg L^{-1}
Ocean inlet average	-99.4	96.5	**NR**	**46.8**
Segment 1 average	-92.3	100.7	**8.4**	**54.5**
Slough –wide Average	-86.7	101.9	**15.1**	**58.5**
Last four grid cells of model upstream	-95.9	98.7	**2.9**	**50.8**

Table 6.9 Table of percent reduction in dry weather TN and TP loads required to meet the TN and TP numeric targets based on a flowing waters (TP = 0.1 mg L^{-1}) and standing water (TP = 0.05 mg L^{-1}) interpretation of the Basin Plan Biostimulatory Objective. Ocean inlet refers to the section downstream of the railroad bridge. Segiment 1 (upstream) refers to the section of the Slough upstream of the railroad bridge to the Coast Highway.

Slough Segment	Slope	Intercept	% Reduction Required	
			TP = 0.1 mg L^{-1}	TP = 0.05 mg L^{-1}
Ocean inlet average	-4939.3	139.4	**NR**	**NR**
Segment 1 average	-4009.6	122.5	**NR**	**NR**
Slough –wide Average	-2822.5	112.6	**NR**	**NR**
Last four grid cells of model upstream	-4455.5	130.5	**NR**	**NR**

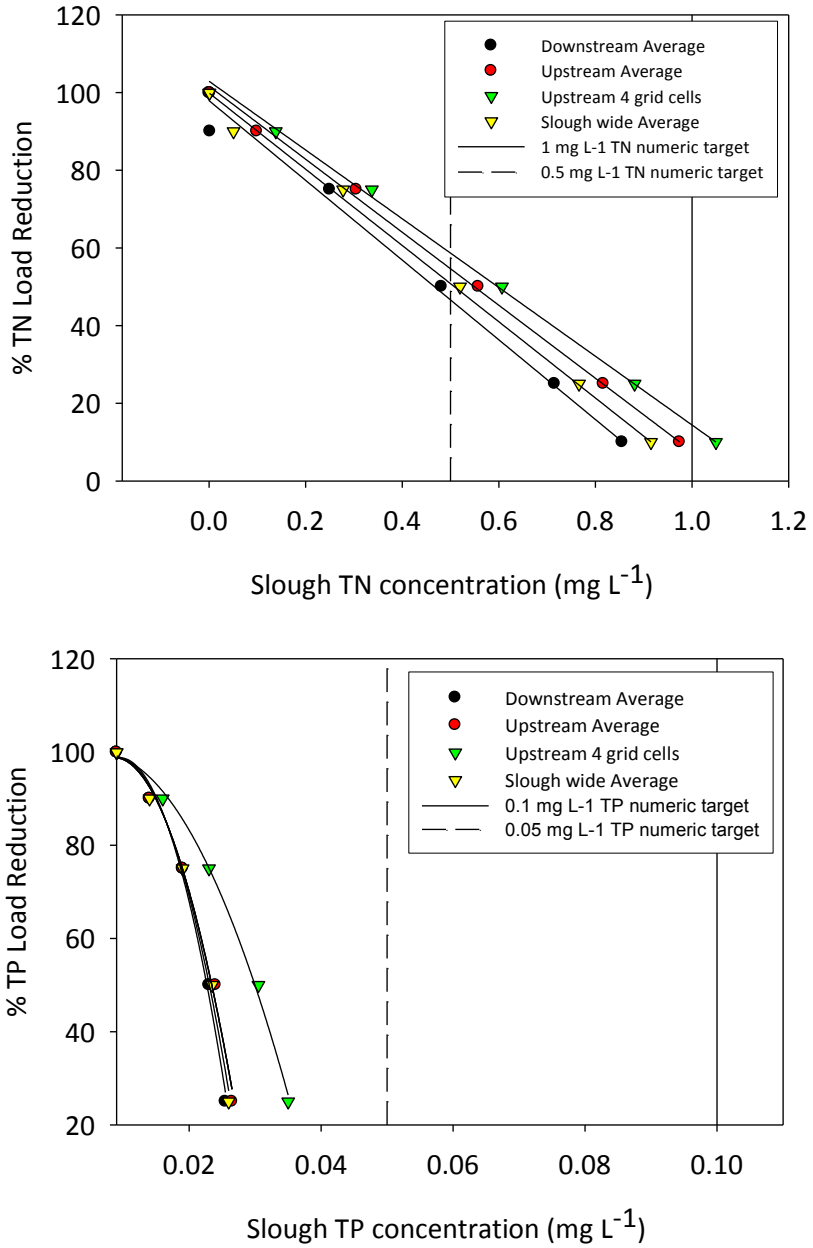

Figure 6.8. Graphs showing analysis of decline in TN (top panel) and TP (bottom panel) in Loma Alta Slough as a function of % reduction in dry weather TN or TP loads, relative to the numeric targets for flowing waters (1 mg L^{-1} TN and 0.1 mg L^{-1} TP) and standing waters (0.5 mg L^{-1} TN and 0.05 mg L^{-1} TP).

6.3 Use of Models to Estimate Sources of Bacteria and Nutrients from Land Use

One utility of a watershed stormwater runoff model is the ability to determine which land uses have the greatest nutrient and bacteria export. Since the watershed loading model was calibrated and validated for wet weather only, these results are applicable to wet weather load allocations. Additional source identification work is required in order to attribute nutrient and bacteria work to specific land uses within the Loma Alta Slough watershed.

6.3.1 Methods

To determine which land use has the greatest relative contribution (and thus the highest concentrations in surface runoff) a flux was calculated. This analysis was performed using the land use-specific runoff concentrations from Table 2.7 (nutrients) and Table 2.8 (bacteria) to drive the watershed load model for wet weather events during the 2007-2008 hydrological year. The loads attributable to each land use were derived and divided by modeled area to calculate flux (lb/ac/yr).

6.3.2 Results and Discussion

While the developed land uses had a higher nutrient overall loading in the watershed due to the greater runoff from impervious areas, the flux from the undeveloped areas were often at, or greater than the developed areas (Table 6.). Conversely, the bacterial flux from undeveloped areas were orders of magnitude lower than the developed with commercial and high density residential having the greatest outflow of bacteria (

Table 6.).

If the land use within the Loma Alta Slough watershed were to change from the modeled, the flux measurements could be used to estimate the typical loads from those lands.

Table 6.7. Nutrient Land Use Flux (lb/ac/yr).

Land Use	Ammonia	Nitrite-Nitrate	Total Nitrogen	Dissolved Phosphorous	Total Phosphorous
Agriculture*	4.42	30.45	45.67	7.13	31.68
Commercial	0.69	1.95	5.51	0.29	0.92
High Density Residential	0.62	2.49	6.19	0.48	1.67
Industrial	0.33	1.63	6.23	0.47	1.58
Low Density Residential	0.25	1.58	7.57	0.41	1.08
Open	0.14	1.31	7.89	0.40	0.95
Open-Recreational	0.13	1.19	7.25	0.37	0.88
Transportation	0.51	1.85	5.52	0.58	2.14

Table 6.8. Bacteria Land Use Flux (10^9/ac/yr).

Land Use	Fecal Coliform	Total Coliform	Enterococcus
Agriculture*	0.30	7.47	1.00
Commercial	78.5	471.7	550
High Density Residential	471	963	393
Industrial	5.31	29.9	13.6
Low Density Residential	16.3	45.6	53.2
Open	0.30	7.47	1.00
Open-Recreational	13.1	38.0	42.7
Transportation	12.8	50.1	24.9

* assumed to be equal to open

6.4 Use of Model to Analyze Implementation Scenarios

The purpose of this section is to present the results of management scenarios on modeled loads and/or concentrations of bacteria, nutrients and algal biomass.

6.4.1 Methods

Scenarios to Address FIB Impairment

During the a series of stakeholders meeting, seven scenarios were identified for implementation for the bacteria modeling studies:

- Scenario #1. Existing condition (Inlet was open Nov 2007-May 2008 and closed May-Oct 2008)
- Scenario #2. Inlet is assumed to be open year-round (open from Nov 2007-Oct 2008)
- Scenario #3. Similar to Scenario #1, except with the sand berm height equal to the Mean Lower High Water (MLHW)
- Scenario #4. Watershed loads are reduced by 45% for wet weather loads and by 60% for dry weather loads
- Scenario #5. Combining Scenarios #2 and #4, open inlet with reduced loads
- Scenario #6. Replication of the effect of the existing UV treatment facility. Dilution under the existing condition when the inlet is closed. Slough water is withdrawn, treated and discharged to the ocean at rate of 300 gpm until the depth is decreased to 1 m. Then withdrawal stops and seepage from the ocean water continue to fill up the slough and withdrawal/seepage cycle continues. This process aims to, partially if not completely, replace or help alleviate the existing UV treatment facility.
- Scenario #7. Dilution scenarios, as described in Scenario #6 with reduced loads as described in Scenario #4

Methodology to simulate scenarios 6 and 7 require additional explanation. For Scenario, the downstream slough water is withdrawn at a rate of 300 gpm, which is then treated and discharged to the ocean. It is estimated to take 3-4 days to for the depth near Ocean Inlet dropping low to 1 m when the withdrawal ceases. Seepage from the ocean will refill the slough water back to its equilibrium water depth in three days. Once equilibrium water depth is reached, withdrawal of the slough water starts again and the withdrawal/seepage cycles continue. Figure 6.9 shows conceptual flow dilution for Scenario 6.

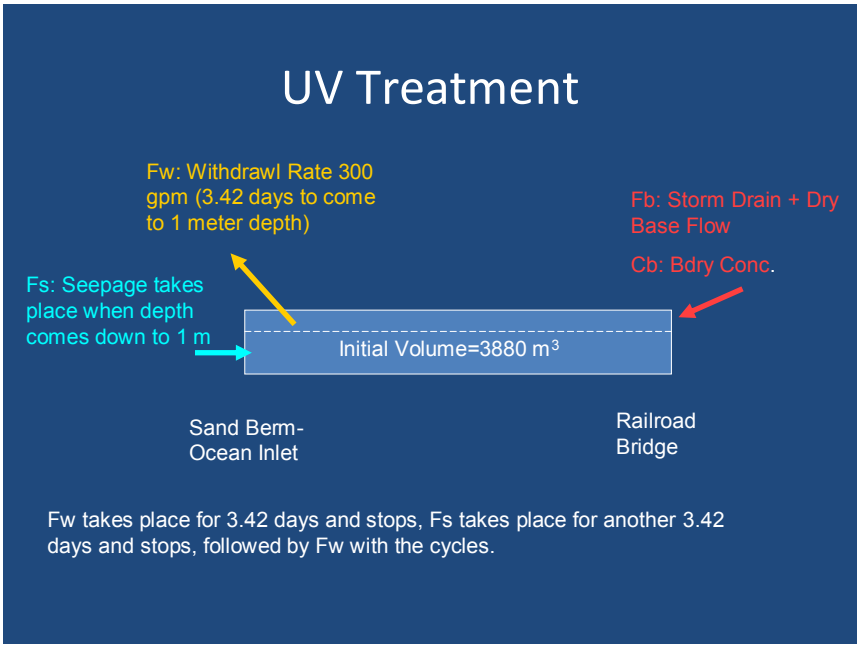

Figure 6.9. Conceptual model for the scenario of dilution by withdrawal of slough water.

The scenario can be defined and formulated by imposing the conservation laws to the volume and bacteria mass of the slough water, as shown in the following:

Conservation of water volume in the slough

$$\frac{\partial V(t)}{\partial t} = F_B - F_W + F_S$$

Conservation of bacteria in the slough water

$$\frac{\partial M(t)}{\partial t} = F_B C_B - F_W C$$

$$M(t) = V(t)C(t)$$

$$\frac{\partial C(t)}{\partial t} = \frac{F_B C_B - F_W C - C\frac{\partial V(t)}{\partial t}}{V(t)}$$

where V(t) is the volume of the slough water, F_B, F_W, and F_S represent the dry season base flow, withdrawal rate of the slough water, and flow rate of seepage water from the ocean, respectively. M(t) and C(t) represent the total mass and the corresponding concentration of the slough water.

Scenarios to Address Eutrophication

Berm Height/Inlet Closure. Reduction of macroalgae biomass and total nutrient concentrations of the lagoon water is considered by way of adjusting closure/openness of the inlet in combination of load reduction during the May-Oct 2008 period. The following scenarios are defined in the stakeholder meeting and simulated. The results of concentrations of total-N, total-P and macroalgae biomass compared.

- Scenario #1: Current Condition (inlet closed)
- Scenario #2: Inlet is open
- Scenario #3: Inlet is open with berm height at Mean Lower Low Water (MLLW)
- Scenario #4: Inlet is closed with reduced load
- Scenario #5: Inlet is open with reduced load

6.4.2 Results and Discussion of Scenario Analyses

Bacteria Scenarios

Simulation results as time series with and without a 30-day running window for scenarios #1-#5 are shown in Figures 6.9-6.12 and the days of exceedance based on the two criteria for single sample (wet and dry) and geomean of 30-d geomean (dry weather only) are calculated and shown in Table 6. -6.6. The exceedance days are generally the most for enterococcus. Scenario #5 (open inlet with reduced load) is the scenario in which the least amount of exceedance days were observed. However, the results illustrate that none of the scenarios would help the watershed achieve compliance with numeric targets.

Table 6.9. Summary of scenario effects on number of exceedence days for enterococcus. Numbers incorporate the 22% allowable exceedence days for wet weather (n = 38 days) and 0% exceedance allowance for dry weather.

Scenario	Dry Weather		Wet Weather
	SS Daily Mean	30-Day Geomean	SS Daily Mean
Current condition	187	365	187
Scenario #1: Current Condition (inlet closed)	254	365	254
Scenario #2: Inlet is open	95	264	95
Scenario #3: Inlet is open with berm height at Mean Lower Low Water (MLLW)	130	365	130
Scenario #4: Inlet is closed with reduced load	238	365	238
Scenario #5: Inlet is open with reduced load	86	264	86

Table 6.10. Summary of scenario effects on number of exceedence days for enterococcus. Numbers incorporate the 22% allowable exceedence days for wet weather (n = 38 days) and 0% exceedance allowance for dry weather.

Scenario	Dry Weather		Wet Weather
	SS Daily Mean	30-Day Geomean	SS Daily Mean
Current condition	128	365	88
Scenario #1: Current Condition (inlet closed)	254	365	214
Scenario #2: Inlet is open	95	272	55
Scenario #3: Inlet is open with berm height at Mean Lower Low Water (MLLW)	169	316	129
Scenario #4: Inlet is closed with reduced load	228	297	188
Scenario #5: Inlet is open with reduced load	87	270	47

Table 6.11. Summary of scenario effects on number of exceedence days for enterococcus. Numbers incorporate the 22% allowable exceedence days for wet weather (n = 38 days) and 0% exceedance allowance for dry weather.

Scenario	Dry Weather		Wet Weather
	SS Daily Mean	30-Day Geomean	SS Daily Mean
Current condition	48	209	9
Scenario #1: Current Condition (inlet closed)	57	294	19
Scenario #2: Inlet is open	52	151	14
Scenario #3: Inlet is open with berm height at Mean Lower Low Water (MLLW)	55	154	16
Scenario #4: Inlet is closed with reduced load	40	292	12
Scenario #5: Inlet is open with reduced load	36	150	13

The results for Scenario #6 and #7 are shown in Figure 6.155 - Figure 6.16, respectively. These figures illustrate that the simulations start the dilution process by withdrawing slough water and two initial concentrations were assumed for two simulation scenarios. For the first simulation, the initial concentrations of the slough water are set to be equal to the concentration when the inlet was closed (May 23, 2008). For the second simulation, the initial concentration is set to be equal to the loading concentration from the upstream boundary condition. For both simulation scenarios, slough water concentrations gradually converge to equilibrium concentrations after 90 days (in August, 2008). The equilibrium concentrations are 84% of the loading concentrations from the upstream watershed. That means that the dilution of the slough water is a physical process that exchanges and dilutes the slough water with ocean water through withdrawal and seepage processes. The dilution rate of 84% is irrelevant of the concentrations at the boundary conditions.

Scenario #7 assumes the combined use of reduced loads defined previously, and the dilution by withdrawing the slough water. Dilution rate of 84% of the reduced loads produces an equilibrium concentration less than those of the existing loading condition. Therefore, operation of the Slough dewatering and UV treatment result in 16% reduction in the FIB concentrations in the Slough.

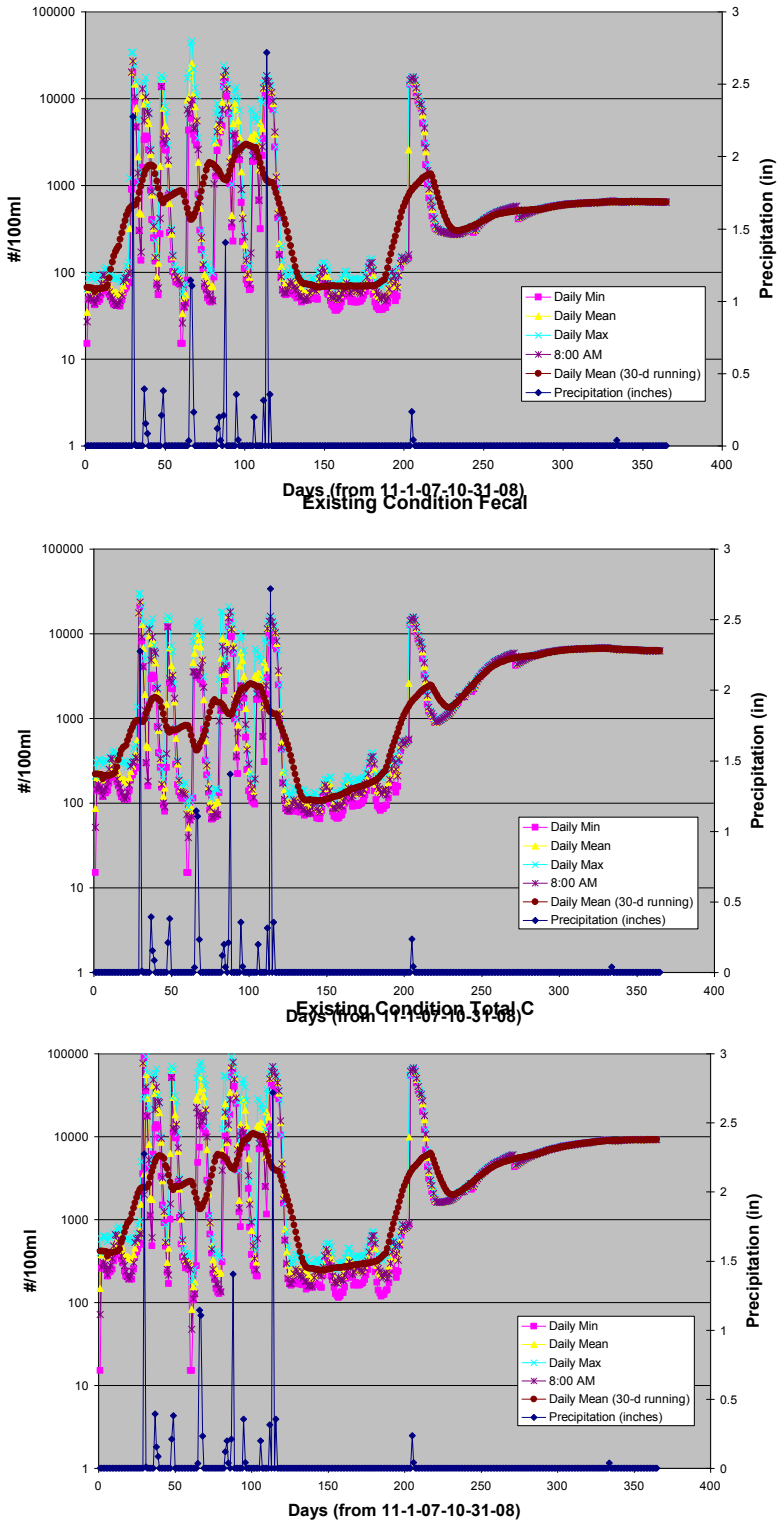

Figure 6.10. Scenario #1 Model Results: Enterococci (Above), Fecal Coliform (middle) and Total Coliform (bottom).

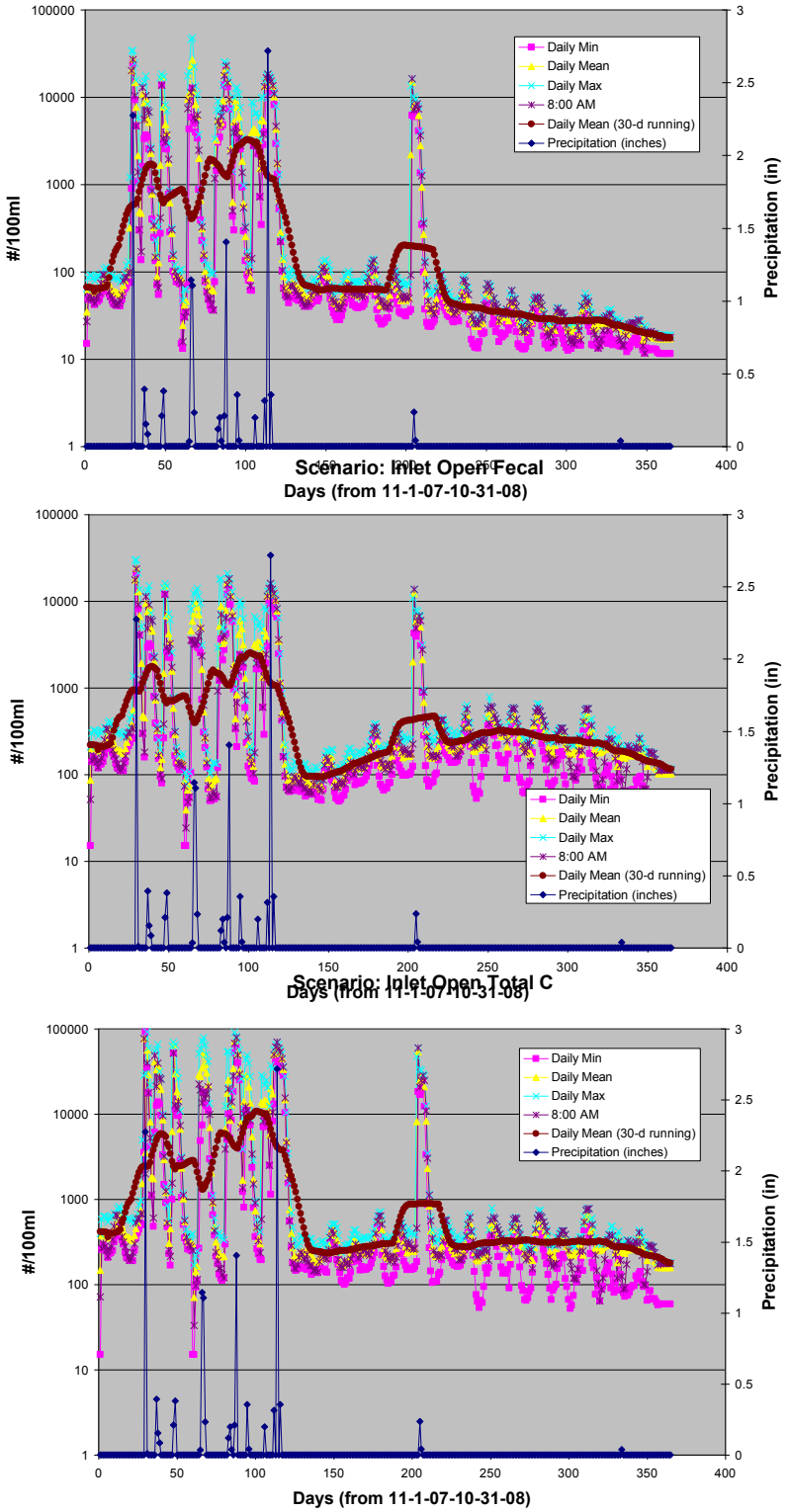

Figure 6.11. Scenario #2 Model Results: Enterococci (Above), Fecal Coliform (middle) and Total Coliform (bottom).

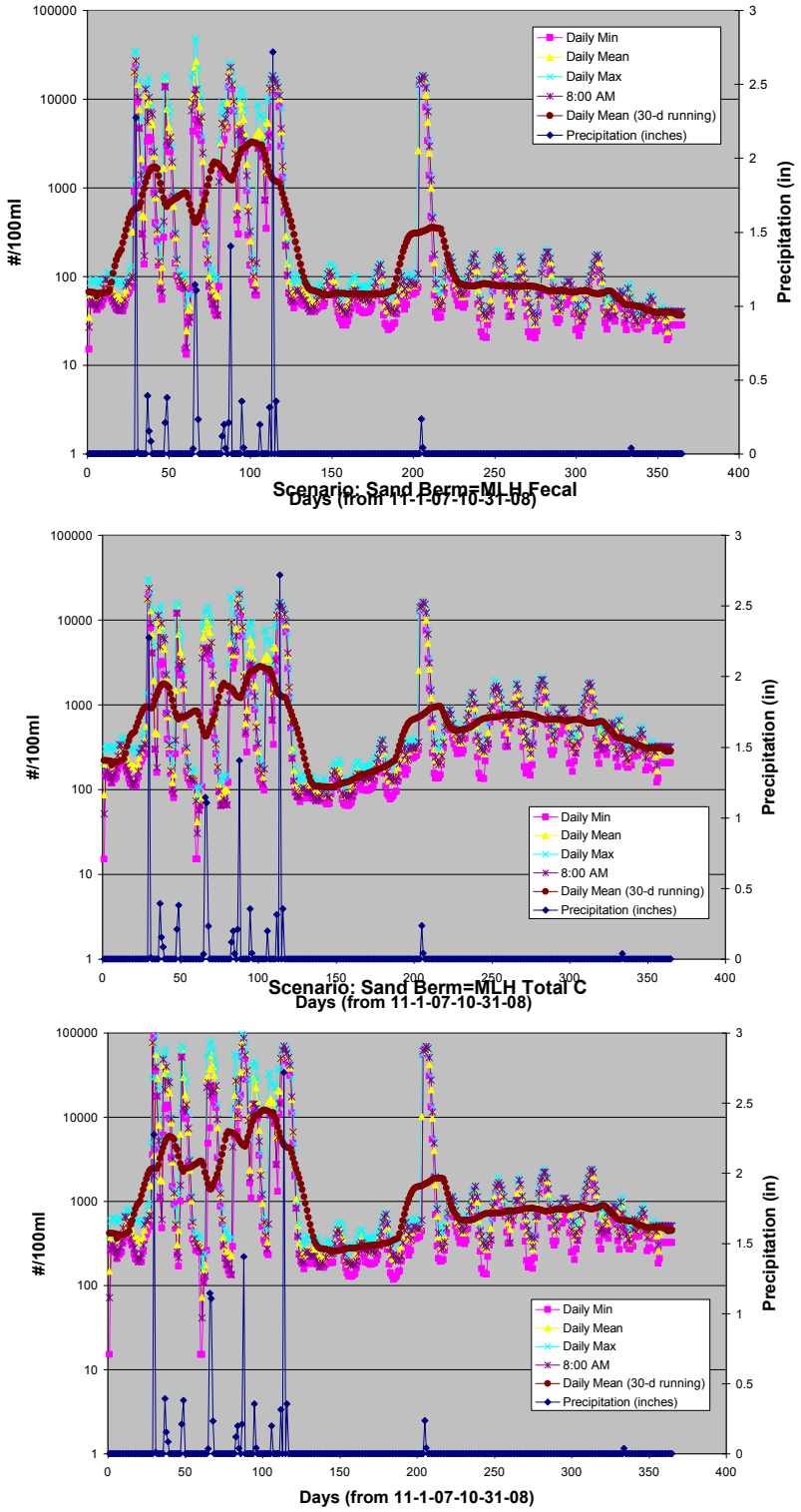

Figure 6.12. Scenario #3 Model Results: Enterococci (Above), Fecal Coliform (middle) and Total Coliform (bottom).

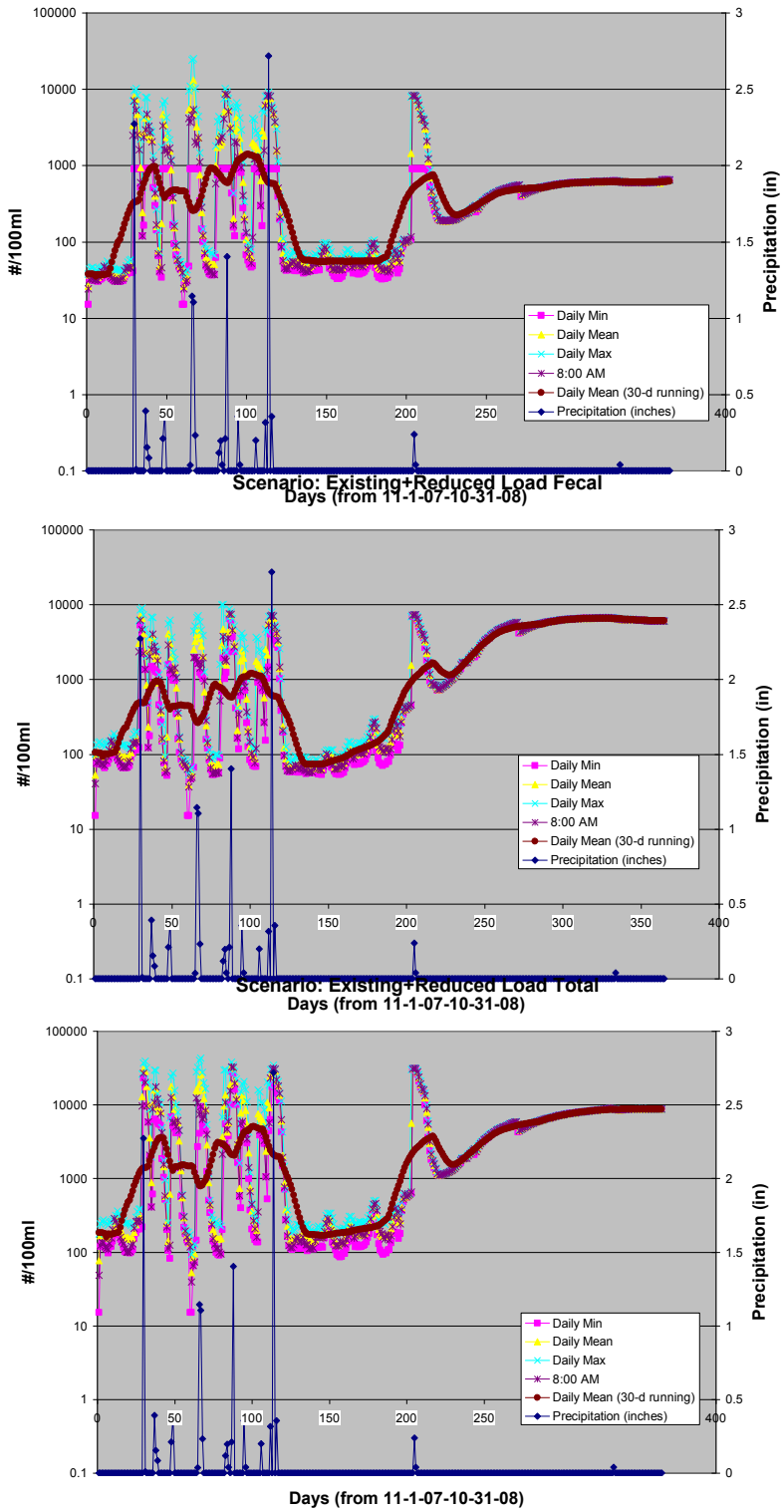

Figure 6.13. Scenario #4 Model Results: Enterococci (Above), Fecal Coliform (middle) and Total Coliform (bottom).

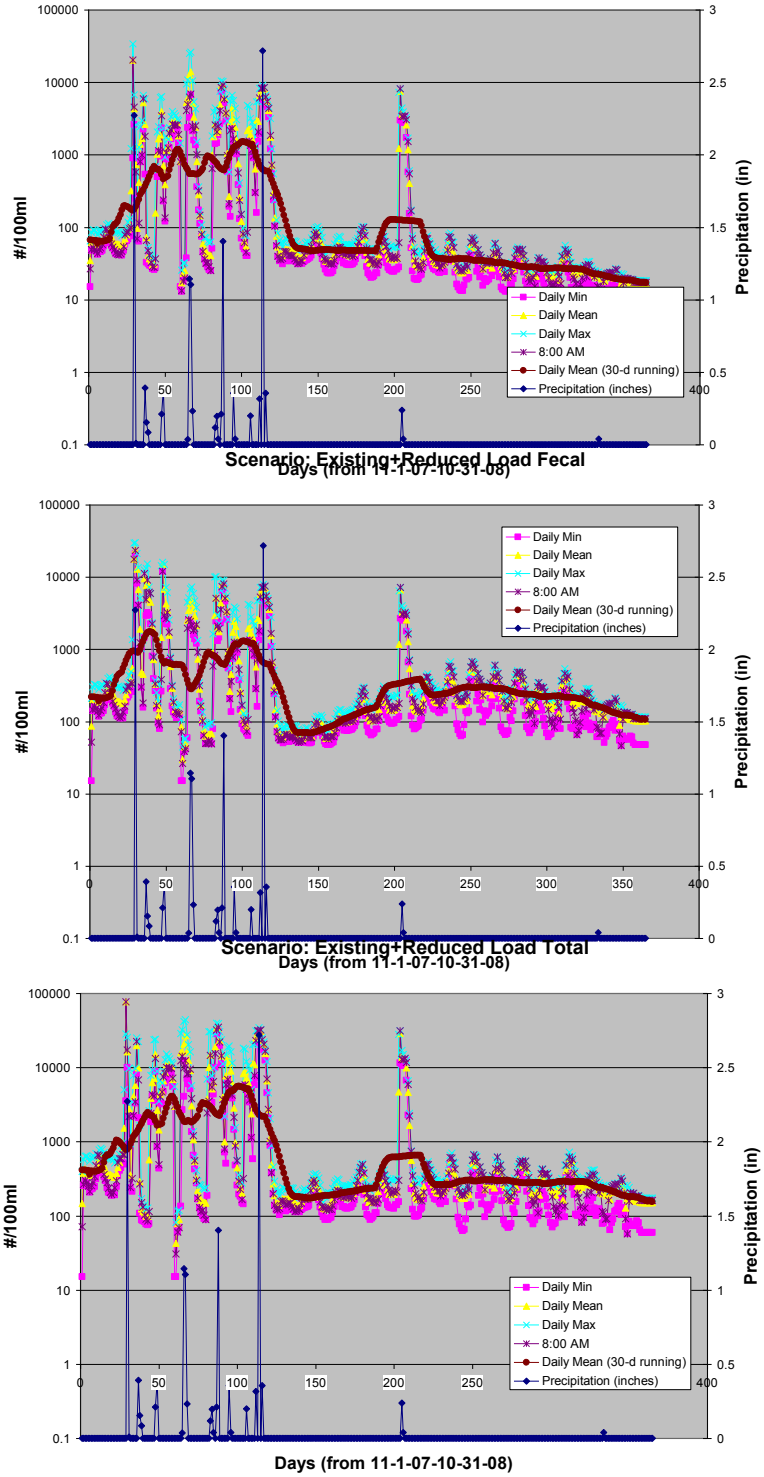

Figure 6.14. Scenario #5 Model Results: Enterococci (Above), Fecal Coliform (middle) and Total Coliform (bottom).

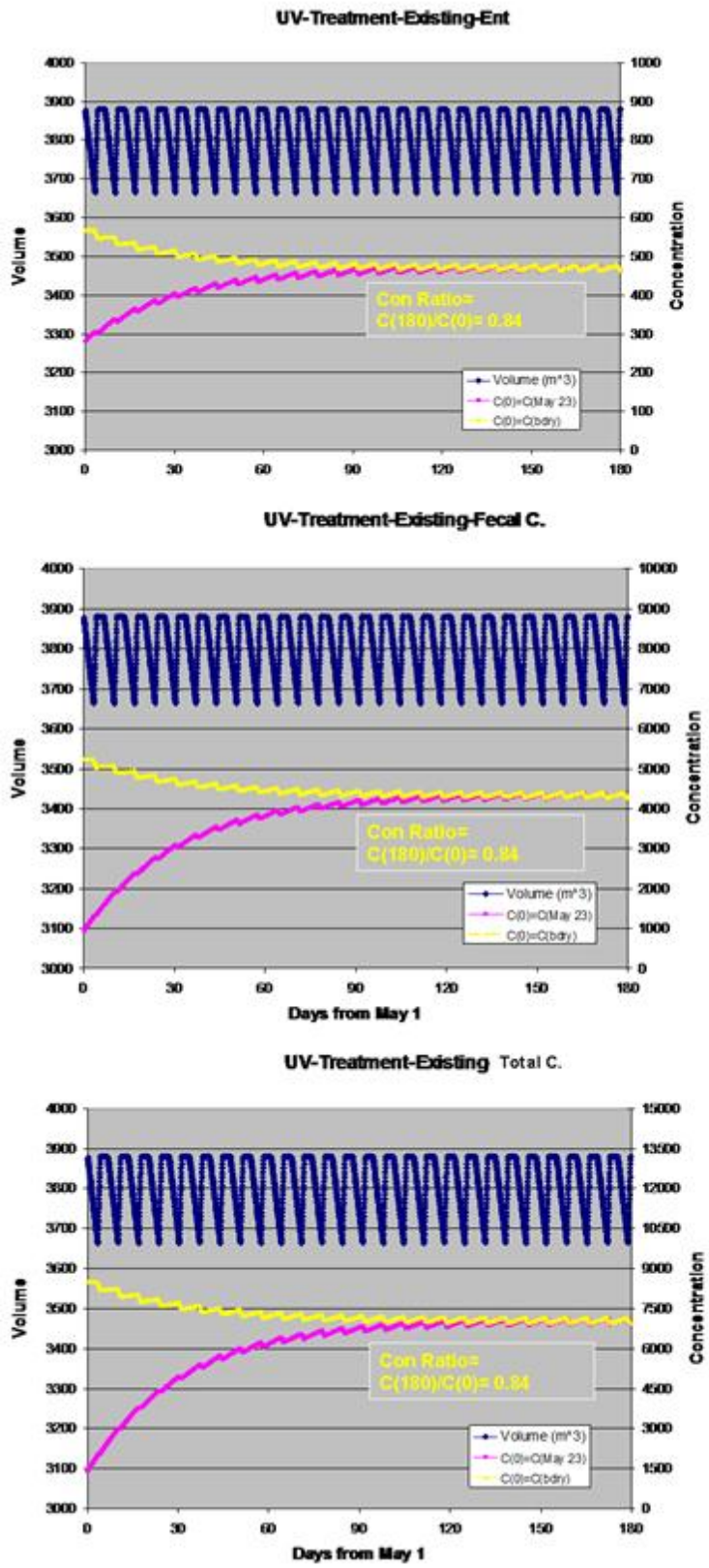

Figure 6.15. Concentrations for equilibrium for Scenario #6.

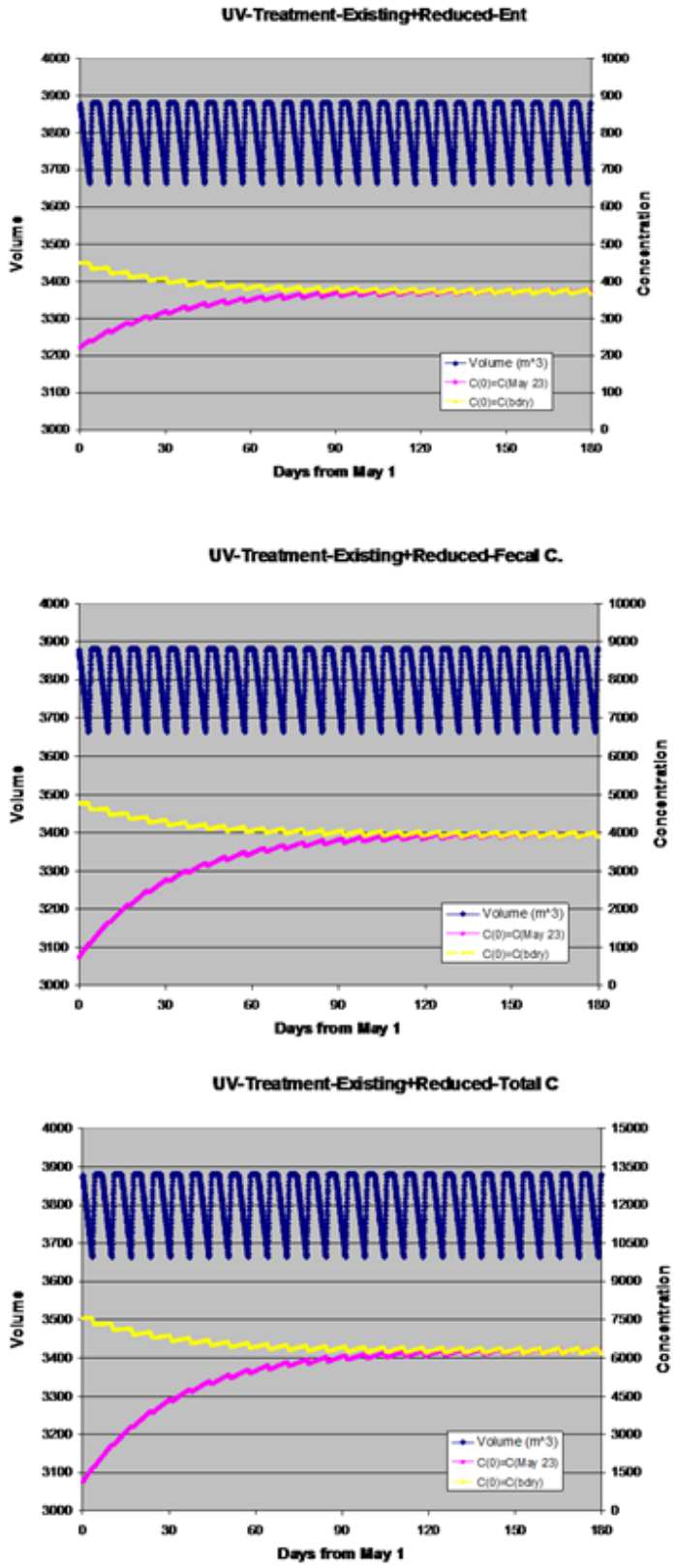

Figure 6.16. Concentrations for equilibrium for Scenario #7.

6.4.3 Results and Discussion of Eutrophication Scenarios

Figure 6. and Figure 6.17 show that out of the 5 scenarios, Scenario #2 (open inlet), #3 (berm height lowered and maintained at MHLW) and #5 (open inlet with reduced load) result in the lowest macroalgae biomass and total-N and total-P concentrations and would meet the TN and TP concentration as well as the macroalgal biomass numeric targets. In general, opening of the inlet, either fully open or half open at MLLH produces the most favorable conditions (least macroalgae biomass and lowest total nutrient concentrations. Load reduction was not sufficient to meet macroalgal numeric targets (see Section 6.2).

6.4.4 Summary of Implementation Scenario Analysis For Bacteria and Nutrients

In summary, the implementation scenario analysis demonstrated:

- Current bacteria loads at ME exceed the FIB numeric target year round (365 days), with the largest number of exceedance days for enterococci , followed by fecal coliform and total coliform. The implementation scenarios analyzed illustrate that none of the scenarios would help the watershed achieve compliance with FIB numeric targets. Furthermore, operation of the Slough dewatering and UV treatment result in 16% reduction in the FIB concentrations in the Slough.

- For impairment from macroalgae, opening of the Slough or maintenance of the berm would the bring macroalgal biomass and nutrient concentration numeric targets. Load reduction alone would require a 93% reduction in dry weather flow in order to meet macroalgal biomass.

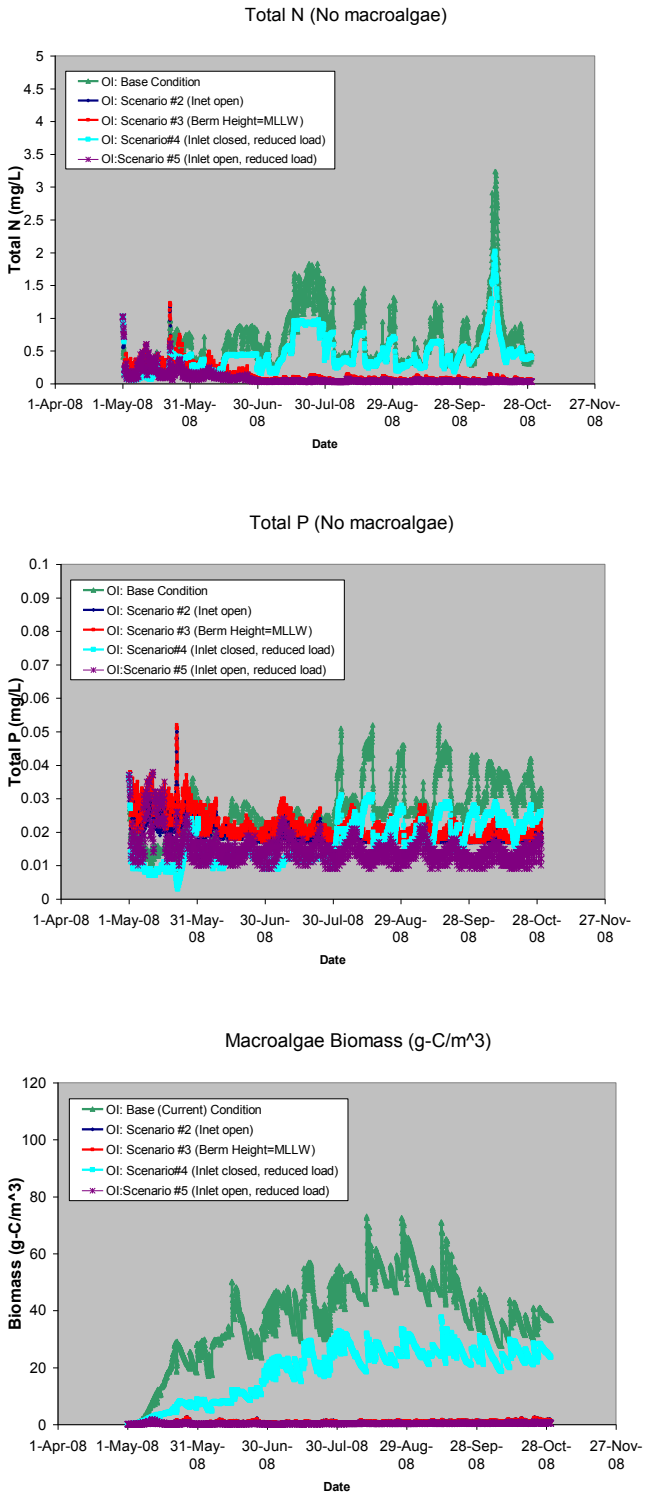

Figure 6.16. Simulated total-N, total-P and macroalgae biomass at OI for inlet openness and load reduction scenarios(C/Chla ratio = 120).

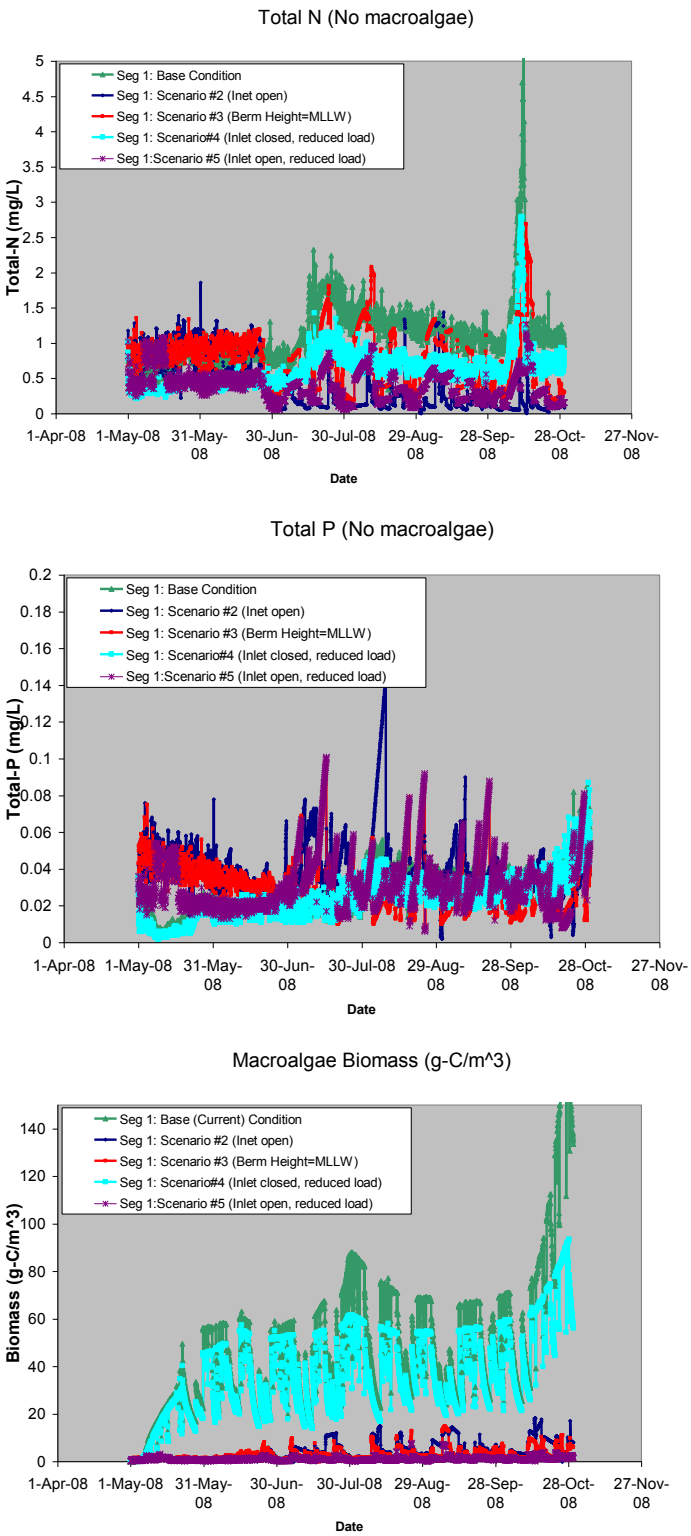

Figure 6.17. Simulated total-N, total-P and macroalgae biomass at Segment 1 for inlet openness and load reduction scenarios (C/Chla ratio = 120).

7 SUMMARY OF MODELING WORK AND RECOMMENDATIONS

7.1 Summary of Model Calibration and Validation

Watershed Modeling. Data compilation, analysis, and model calibration and validation were conducted to support development of a watershed loading model for the Loma Alta Slough watershed. The calibrated and verified hydrologic model was shown to be of predictive value, and capable of simulating hydrologic response based on land use and land cover, soils, and percent slope, and that capability is valid insofar as the SDHM model (which is well accepted by the hydrologic model practice community) is representative of the real world system.

For the Loma Alta Slough watershed model, simulation of the indicator bacteria enterococcus, fecal coliform, and total coliform was established by calibrating against the daily loading data listed in Appendix D-3 of the 2009 CHU Lagoon Monitoring Report prepared by Mactec. Fits obtained indicated that all three bacteria loading models are predictive. In retrospect, log transformation of the loading data that was used for model calibration, and their model simulated counterparts, prior to objective function calculation, could be an avenue to pursue in attempts to ensure that the model is not biased towards over-fitting the higher loading values at the expense of the lower daily bacteria loading values.

Estuary Hydrodynamic Model. Simulation of water surface elevation, salinity and temperature illustrate that the hydrodynamic model is working well during wet weather, winter dry weather (when the mouth is open) and summer dry weather (when the Slough mouth is closed). Measured versus observed WSE showed a model fit of R = 0.96, with a slope of 1.003, indicating less than 1% error. The good performance of the hydrodynamic model provides us with a measure of confidence to use the model for water quality applications.

Uncertainty in dry weather flows from the watershed is a source of uncertainty. This uncertainty was partially addressed with additional monitoring conducted in 2010. Utilization of 2010 data in the calibration of 2008 hydrology and water quality results introduces additional uncertainty in water quality model runs for bacteria and nutrients.

Berm height is variable in the Slough, arising from the combination of natural forcing of freshwater flow versus. Our solution to choose fix berm heights representative of the calibration and validation periods is an acceptable solution to a modeling problem, but the lack of data on the average berm height over periods of years, particularly during wet weather and winter dry weather is a source of uncertainty to results. Exchange of the Slough water with the ocean through the sand berm and with groundwater is also another source of uncertainty in the modeling. Using existing data, we were able to achieve good model validation. However, the net effect of ocean and groundwater exchange on the Slough water quality (FIB and nutrients) has not been quantified.

Slough Bacteria Modeling. Simulation of bacteria during wet weather and dry weather illustrate that: 1) the FIB water quality model is performing adequately during wet and dry weather conditions and 2) watershed loads explain the majority of the measured variability in Slough FIB bacteria. During wet weather, Slough FIB concentrations closely approximated that of the MES, but approximately 33% of grabs over 3 storms were outside of modeled range, indicating that an additional bacteria sources may exist near within the lower Creek or within the Slough. A similar result was found during dry weather, particularly within the ocean inlet station. Therefore, more future work is needed to better identify and quantify this "additional source".

Uncertainties in bacteria simulation modeling come from two major factors. First, the frequency of wet (3 storms) and dry weather (4 index periods) FIB load monitoring was low. The use of either modeling results or empirical data as boundary conditions to the Slough modeling study introduces uncertainty because bacteria concentrations are known to be highly variable over time, either as a function of storm event or during dry weather conditions. The second source of uncertainty arises from the indication that, while the MES loading explains the majority of variability in Slough FIB concentrations, there appears to be an additional source to the Slough. This will likely cause the model to underpredict the number of exceedance days relative to TMDL numeric targets.

Slough Eutrophication Modeling. Eutrophication for Loma Alta Slough was studied by the use of the linked EFDC+WASP model. While we were able to simulate the entire year of Nov 2007-Oct 2008, model results were presented and analyzed only for May-Oct 2008 when the inlet was closed and the water was most eutrophic. This was identified by the Regional Board and stakeholders as the critical condition.

Overall, the model performed well for simulation of macroalgae and nutrient concentrations. Macroalgae simulations had high accuracy (+/- 3%), while nutrient concentrations were underpredicted by 30%. Model results show that macroalgae growth during the period was limited by light throughout the simulation period, followed by limitation of phosphorus.

Dissolved oxygen was simulated and compared with measurements. Simulated DO and measured DO near the bottom were compared for both OI and Segment 1 for most of the May-Oct 2008 period. During this period, the model did not capture the mean nor the diurnal variability of measured bottom water data. Modeled DO concentrations were persistently higher than measured values.

Additional data on DO and BOD loading were collected at the headwaters of the Slough during 2012 to discern whether the chronic hypoxia in the Slough was due to the higher BOD load and lower DO at the headwaters versus the mass emission station. Comparison of measured 2008 at the MES versus 2012 data at the head of the estuary illustrates that the DO loading between these stations was comparable and the BOD was actually lower at the headwaters.

Additional sensitivity analysis conducted on SOD illustrated that chronic hypoxia could be simulated with very high SOD (4.5 g m^{-2} d^{-1}) in Loma Alta Slough. These rates do not compare with measured values in the Slough, although McLaughlin et al. (2011) note that there is considerable uncertainty in the measured values.

In conclusion, it may be possible that SOD this is the source of the discrepancy between measured and modeled values in 2008. Alternatively, there may be some other within-Slough source of oxygen demand that is driving down bottom water DO. Regardless, based on the new head-of-estuary DO and BOD values, it is clear that the watershed only contributes to the daily DO fluctuations in the Slough but is not responsible for the chronic hypoxia that was measured in the Slough.

7.2 Use of the Model to Facilitate Discussion on the Nutrient and Bacteria TMDL

The watershed loading and Slough hydrodynamic and water quality models were used to support decision-making on the nutrient and bacteria TMDL. The model was used in four types of applications:

- Calculation of numeric targets
- Calculation of total maximum daily loads
- Calculation of land-used based sources of bacteria and nutrients
- Analysis of implementation scenarios to meet TMDL numeric targets

Calculation of Numeric Targets. For bacteria, stakeholders and regulatory staff achieved consensus on how to use model output to calculate the bacteria TMDL numeric targets, using the bacteria TMDL I numeric targets.

For nutrients, model simulations showed that DO was insensitive to nutrient loads, so discussion focused on comparison of the existing biostimulatory objectives (i.e. TN and TP objectives) versus the alternative NNE indicator -- macroalgae. The stakeholders and regulatory staff used a summary of existing literature used to come to consensus on a numeric target and how to how to use the model output to calculate the numeric target.

Calculation of TMDLs. FIB. For dry weather, assuming a 0% allowable exceedance frequency, a diversion of 99.5 % of the freshwater flow from Loma Alta Creek would be required to meet the enterococcus numeric target(Table 6.5). For coliform standards, the range of flow reduction ranged from 97% for fecal coliform to 85% for total coliform. For wet weather, a 99.9% load reduction would be required to meet the enterococcus single grab standard in the Slough. A 97% reduction would be required to meet the fecal coliform standard, while an 80% reduction would be required to meet the total coliform standard.

Nutrients and Macroalgae. A 81-96% reduction in TP and TN loads to the Slough during May –October are required to meet the agreed upon macroalgae numeric targets. Stakeholders and regulatory staff discussed how these targets should be met and specified that compliance should be met at both the upstream (Segment 1) and downstream (Segment 2) section of the Slough. However, the eutrophication model does not capture the drifting and spatial redistribution of algae. Therefore, we recommend that the Slough wide average be used to calculate the %load reduction required. Steep declines in the biomass are achieved with load reduction up to approximately 75%. After that, declines are more gradual.

For nutrient concentration-based numeric targets, the load reduction is require to meet TN concentration targets (3-15% for TN = 1 mg L-1 and 46-57% for TN = 0.5 mg L-1) was substantially less than that required to meet a macroalgal numeric target. No reduction in TP loads would be required to meet TP numeric targets, regardless of the interpretation of the Basin Plan Biostimulatory Objective; this problematic, recognizing that the Slough is P-limited for during the May-October critical period (McLaughlin et al. 2011).

Implementation Scenario Analysis. The implementation scenario analysis demonstrated:

- Current bacteria loads at ME exceed the FIB numeric target year round (365 days), with the largest number of exceedance days for enterococci , followed by fecal coliform and total coliform. The implementation scenarios analyzed illustrate that none of the scenarios would help the watershed achieve compliance with FIB numeric targets. Furthermore, operation of the Slough dewatering and UV treatment result in 16% reduction in the FIB concentrations in the Slough.
- For impairment from macroalgae, opening of the Slough or maintenance of the berm would the bring macroalgal biomass and nutrient concentration numeric targets. Load reduction alone would require up to a 96% reduction in dry weather flow in order to meet macroalgal biomass numeric targets.

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Water Quality Control Plan

FOR THE SAN DIEGO BASIN

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

WATER QUALITY CONTROL PLAN
FOR THE SAN DIEGO BASIN (9)

SEPTEMBER 8, 1994

(with amendments effective on or before April 4, 2011)

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD

SAN DIEGO REGION

WATER QUALITY CONTROL PLAN FOR THE SAN DIEGO BASIN (9)

Adopted by the
California Regional Water Quality Control Board
San Diego Region
on September 8, 1994

Approved by the
State Water Resources Control Board
on December 13, 1994
and the
Office of Administrative Law
on April 26, 1995

(with amendments effective on or before April 4, 2011)

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FOREWORD

The most basic goal of the California Regional Water Quality Control Board, San Diego Region (Regional Board) is to preserve and enhance the quality of water resources in the San Diego Region for the benefit of present and future generations. The federal Clean Water Act and the California Porter-Cologne Water Quality Control Act require that the Regional Board adopt a water quality control plan to guide and coordinate the management of water quality in the Region. The purpose of the plan is to: (1) designate beneficial uses of the Region's surface and ground waters; (2) designate water quality objectives for the reasonable protection of those uses; and (3) establish an implementation plan to achieve the objectives. In conformance with this legislative mandate, the Regional Board adopted the *Comprehensive Water Quality Control Plan for the San Diego Basin* (Basin Plan) in 1975. The Regional Board subsequently adopted numerous amendments modifying specific Basin Plan water quality standards and policies to reflect current water quality conditions and priorities.

Over twenty years have passed since the Basin Plan was published in 1975. In the ensuing years the San Diego Region population has continued to grow and approaches to water quality management have changed. Water quality management has become a complex mix of public input, environmental legislation and regulations, regulatory programs, research, and litigation. Pollution from point source discharges such as sewage treatment plants and industry has largely been controlled through stringent pollution control laws and the efforts of the Regional Board and other agencies. The focus of the Regional Board's regulatory efforts in the coming years will be surface water bottom sediment contamination, ground water contamination and nonpoint sources of pollution. These concerns are the greatest remaining threats to water quality. To address these remaining challenges, pollution prevention needs to be emphasized and the cumulative effects of pollution on entire watersheds must be considered. These changes in the complexity and emphasis of the Regional Board's water quality program have resulted in the need for a major update and rewrite of the 1975 Basin Plan.

This Basin Plan, the *Water Quality Control Plan for the San Diego Basin* (9) was adopted by the Regional Board on September 8, 1994. It supersedes the previous 1975 Basin Plan and its amendments. Public involvement was extensive in the development and adoption of this Basin Plan. The Regional Board held several public hearings and workshops to allow interested persons, organizations, and governmental agencies an opportunity to comment on the content and adequacy of the Basin Plan prior to its adoption. All comments were responded to in writing and the Regional Board carefully considered them in developing the final Basin Plan. The Regional Board appreciates the efforts of all those who contributed a substantial amount of time and effort in commenting on the earlier administrative drafts.

The six chapters of this Basin Plan together comprise the "*blueprint*" plan the Regional Board will use for water quality management and control in the San Diego Region. Chapter 1 provides a summary overview of the physical features of the San Diego Region, the functions of the State and Regional Board, and the legal basis and authority for the Basin Plan. Chapter 2 designates the beneficial uses of surface and ground waters to be protected. Chapter 3 designates the water quality objectives necessary to ensure the reasonable protection of the beneficial uses. Chapter 4 describes the implementation plan for achieving and maintaining the beneficial uses and water quality objectives. The implementation plan describes the key Regional Board regulatory programs and policies the Board uses to manage and control water quality. The implementation plan also designates certain conditions and areas where waste discharges are prohibited. Chapter 5 describes applicable statewide water quality policies and plans developed by the State Water Resources Control Board. Finally, Chapter 6 provides a summary description of the Regional Board water quality monitoring and surveillance program.

This Basin Plan is a dynamic rather than fixed document and is always subject to modification based on changing needs and circumstances. Accordingly, the Regional Board will periodically consider changes to this Basin Plan as necessary and at a minimum of every three years. The Regional Board will continue to place a high priority on keeping the Basin Plan current with respect to applicable laws, policies, technologies, water quality conditions, and priorities in the Region.

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INTRODUCTION

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1. INTRODUCTION

INTRODUCTION

In California, the regulation, protection and administration of water quality are carried out by the State Water Resources Control Board (State Board) and nine California Regional Water Quality Control Boards. The State Board consists of five full-time members appointed by the Governor for four year terms. In general, the State Board has overall responsibility for setting statewide policy on the administration of water rights and water quality control in California. The work of the State Board is carried out by a technical, legal, and administrative staff supervised by an executive director.

In recognition of the regional differences in water quality and quantity, the State is divided into nine regions (see Figure 1-1) for the purposes of regional administration of California's water quality control program. Each of the nine regions has a California Regional Water Quality Control Board (Regional Board) comprised of nine part-time members who are appointed by the Governor for four year terms. The regional boards are responsible for adoption and implementation of water quality control plans, issuance of waste discharge requirements, and performing other functions concerning water quality control within their respective regions, subject to State Board review or approval. The work of each regional board is carried out by a technical and administrative staff supervised by an executive officer.

Each of the nine regional boards is required to adopt a Water Quality Control Plan, or Basin Plan, which recognizes and reflects regional differences in existing water quality, the beneficial uses of the Region's ground and surface waters, and local water quality conditions and problems. This document is called the *Water Quality Control Plan for the San Diego Basin (9)*. (The terms Water Quality Control Plan and Basin Plan are used interchangeably throughout this document.)

There are two types of Water Quality Control Plans, Regional Board Basin Plans such as this document and statewide Water Quality Control Plans such as the *Ocean Plan* and *Thermal Plan*. Statewide plans are discussed in Chapter 5, *Plans and Policies*. Key terms and abbreviations used throughout this Basin Plan are included as a glossary and acronyms respectively, in Appendix A.

FUNCTION OF THE BASIN PLAN

The San Diego Regional Board's Basin Plan is designed to preserve and enhance water quality and protect the beneficial uses of all regional waters. Specifically, the Basin Plan: (1) designates beneficial uses for surface and ground waters; (2) sets narrative and numerical objectives that must be attained or maintained to protect the designated beneficial uses and conform to the state's antidegradation policy; (3) describes implementation programs to protect the beneficial uses of all waters in the Region; and (4) describes surveillance and monitoring activities to evaluate the effectiveness of the Basin Plan [California Water Code sections 13240 thru 13244, and section 13050(j)]. Additionally, the Basin Plan incorporates by reference all applicable State and Regional Board plans and policies.

The goal of the Regional Board is to achieve a balance between the competing needs of mankind for water of varying quality. Often times the constituents and quality of water needed to protect various beneficial uses will be different. The Basin Plan is the Regional Board's plan for achieving the balance between competing uses of surface and ground waters in the San Diego Region. Accordingly, this Basin Plan establishes or designates beneficial uses and water quality objectives for all the ground and surface waters of the Region. Beneficial uses are the uses of water necessary for the survival and well being of man, plants and wildlife. These uses of water serve to promote the tangible and intangible economic, social, and environmental goals of mankind. Water quality objectives are the levels of water quality constituents or characteristics which must be met to protect the beneficial uses. This Basin Plan also establishes an implementation program describing the actions by the Regional Board and others that are necessary to achieve and maintain the designated beneficial uses and water quality objectives of the Region's waters.

The Regional Board regulates waste discharge and reclaimed water use to minimize and control adverse effects on the quality and beneficial uses of the Region's ground and surface waters.

VICINITY MAP, BASIN PLANNING AREAS

Figure 1 - 1.

The Regional Board issues permits, called *"waste discharge requirements"* and "*master reclamation permits*" which require that waste and reclaimed water not be discharged in a manner that would cause an exceedance of applicable water quality objectives or adversely affect beneficial uses designated in the Basin Plan. The Regional Boards enforce these permits through a variety of administrative means.

GEOGRAPHICAL SETTING

The geographical setting of the San Diego Region results in a number of physiographic and environmental characteristics. A discussion of each of the major elements is presented in the following subsections.

PHYSIOGRAPHY

The San Diego Region occurs within the Peninsula Range Physiographic Province of California. One of the most prominent physical features in the region is the northwest-trending Peninsula Range which includes from north to south, the Santa Ana, Agua Tibia, Palomar, Volcan, Cuyamaca and Laguna mountains. The region exhibits a gently sloping dissected western surface and a steep eastern slope and is separated from the West Colorado River area (Region 7A) by abrupt fault scarps of marked relief.

The San Diego Region is divided into a coastal plain area, a central mountain-valley area, and an eastern mountain valley area. The coastal plain area comprises a series of wave cut benches covered by thin terrace deposits. This terraced surface has been deeply dissected by streams draining to the sea, and has been smoothed and rounded by local erosion. The surface of this area ranges from sea level to about 1,200 feet (ft) and extends from the coast inland in a band of about 10 miles in width. The central mountain-valley area is characterized by ridges and intermontane basins which extend from the coastal plain, northeastward to the Elsinore fault zone. The basins or valleys range in elevation from 500 to about 5,000 ft and are generally of fault block origin modified by erosion. The floors of the intermontane valleys are generally underlain by moderate thicknesses of alluvium and residuum; notable examples occur near El Cajon, Escondido and Ramona which range in elevation from about 500 to 1,500 ft above sea level. At higher elevations plateau surfaces have been developed in the central mountain-valley area. These surfaces are probably also of erosional origin; they occur at elevations ranging from 2,000 to 6,000 ft near the Laguna mountains, Santa Ysabel and Valley Center.

To the northeast of the Elsinore fault zone, the region has been designated as the eastern mountain-valley area. The area contains broad, relatively flat valleys which are structurally of block fault origin. Locally, the grabens contain thick sections of alluvial deposits. These valleys generally rise to the southeast from about 1,000 ft elevations near Temecula to the rolling plateaus of Glenoak, Lewis and Reed valleys which range from 3,000 to 3,500 ft in elevation. Surrounding mountains including Red mountain, Cahuilla mountain and Bachelor mountain, attain elevations ranging from 4,000 to 7,500 ft.

CLIMATE

The San Diego Region's coastal climate is generally mild. Temperatures average about 65 degrees Fahrenheit (° F) and precipitation averages 10 to 13 inches. Proceeding inland, as elevations increase, average temperatures decline to 57° F in the Laguna mountain area and precipitation increases to more than 45 inches in the Palomar mountain area. Most of the precipitation falls during November through February. Temperature and rainfall intensity variations are larger in the inland portions. The maximum rainfall intensity was recorded as 11.5 inches in 90 minutes, at Campo on August 12, 1891. Precipitation occurs principally as rain, with snow common only in the high mountains. Runoff in the Region results mainly from rainfall. The melting of snowpack and surfacing ground water springs also contribute small additional amounts of runoff. The flow of surface and ground waters in the Region is in an east to west direction toward the Pacific Ocean.

LAND USE / POPULATION

Land use within the Region varies considerably. The regional growth forecast for various land uses within the Region, for the San Diego Association of Governments', and for the Southern California Association of Governments' sphere of influence are shown in Appendix B-1 and B-2, respectively. The San Diego Association of Governments' regional growth forecast by hydrologic unit (HU) is shown in Appendix B-3.

The Region is experiencing and is expected to continue to experience population growth. Table 1-1 shows population projections for San Diego, Riverside, and Orange counties.

REGIONAL BOUNDARIES

Shorebirds at Tijuana Estuary shoreline

The San Diego Region forms the southwest corner of California and occupies approximately 3,900 square miles of surface area. The western boundary of the Region consists of the Pacific Ocean coastline which extends approximately 85 miles north from the United States and Mexico border. The northern boundary of the Region is formed by the hydrologic divide starting near Laguna Beach and extending inland through El Toro and easterly along the ridge of the Elsinore Mountains into the Cleveland National Forest. The eastern boundary of the Region is formed by the Laguna Mountains and other lesser known mountains located in the Cleveland National Forest. The southern boundary of the Region is formed by the United States and Mexico border.

The San Diego Region encompasses most of San Diego county, parts of southwestern Riverside county and southwestern Orange county. The Region is divided into 11 major hydrologic units (HUs),[1] 54 hydrologic areas (HAs),[2] and 147 hydrologic subareas (HSAs).[3] The geographic boundaries and names of these HUs are shown in Table 1-2 and Figure 1-2.[4] A larger scale map of these HAs is contained in the rear pocket of this Basin Plan. The boundaries were initially designated by the State Department of Water Resources (DWR) and described in the report Names and Areal Code Numbers of Hydrologic areas in the Southern District which was published in April, 1964. The HUs, HAs and HSAs were subsequently enumerated by the State Board in the early 1970's. In accordance with the early DWR definitions, HUs are the entire watershed of one or more streams; HAs are major tributaries and/or major groundwater basins within the HU; and HSAs are major subdivisions of HAs including both water-bearing and nonwater-bearing formations.

San Juan Hydrologic Unit (1.00)

The San Juan HU is a generally trapezoid-shaped area of 500 square miles. Laguna Beach, San Juan Capistrano, Dana Point, and San Clemente are other major population centers. Several smaller towns are scattered along the coast.

The two major natural surface water bodies of the unit are San Juan Creek and San Mateo Creek. San Juan Creek divides the unincorporated communities of Dana Point and Capistrano Beach in Orange county, and enters the Pacific Ocean at Doheny Beach State Park. The mouth of the creek is normally open to the ocean. Usually, the water at the mouth of the creek is essentially the same as that of the adjacent coastal waters. The mouth of San Mateo Creek forms a salt water tidal marsh and is entirely within the Camp Pendleton Naval Reservation.

The San Juan HU is comprised of the following five HAs; the Laguna, Mission Viejo, San Clemente, San Mateo, and San Onofre HAs.

TABLE 1-1. POPULATION PROJECTIONS FOR THE STATE OF CALIFORNIA AND SAN DIEGO, RIVERSIDE, AND ORANGE COUNTIES

Location	Year 1990	1995	2000	2005	2010	2015
San Diego County	2,421,233	2,677,058	2,915,692	3,143,155	3,373,422	3,618,554
Riverside County	1,195,400	1,493,558	1,771,276	2,076,538	2,402,889	2,759,172
Orange County	2,415,269	2,667,706	2,862,106	2,992,855	3,099,374	3,193,64
Total for California	29,777,448	32,958,921	36,214,623	39,194,880	42,178,903	45,344,961

TABLE 1 –2. HYDROLOGIC UNITS, AREAS AND SUBAREAS OF THE SAN DIEGO REGION

BASIN NUMBER	HYDROLOGIC BASIN	
1.00	SAN JUAN HYDROLOGIC UNIT	
1.10	Laguna	HA
1.11	San Joaquin Hills	HSA
1.12	Laguna Beach	HSA
1.13	Aliso	HSA
1.14	Dana Point	HSA
1.20	Mission Viejo	HA
1.21	Oso	HSA
1.22	Upper Trabuco	HSA
1.23	Middle Trabuco	HSA
1.24	Gobernadora	HSA
1.25	Upper San Juan	HSA
1.26	Middle San Juan	HSA
1.27	Lower San Juan	HSA
1.28	Ortega	HSA
1.30	San Clemente	HA
1.31	Prima Deshecha	HSA
1.32	Segunda Deshecha	HSA
1.40	San Mateo Canyon	HA
1.50	San Onofre	HA
1.51	San Onofre Valley	HSA
1.52	Las Pulgas	HSA
1.53	Stuart	HSA
2.00	SANTA MARGARITA HYDROLOGIC UNIT	
2.10	Ysidora	HA
2.11	Lower Ysidora	HSA
2.12	Chappo	HSA
2.13	Upper Ysidora	HSA
2.20	DeLuz	HA
2.21	DeLuz Creek	HSA
2.22	Gavilan	HSA
2.23	Vallecitos	HSA
2.30	Murrieta	HA
2.31	Wildomar	HSA
2.32	Murrieta	HSA
2.33	French	HSA
2.34	Lower Domenigoni	HSA
2.35	Domenigoni	HSA
2.36	Diamond	HSA
2.40	Auld	HA
2.41	Bachelor Mountain	HSA
2.42	Gertrudis	HSA
2.43	Lower Tucalota	HSA
2.44	Tucalota	HSA
2.50	Pechanga	HA
2.51	Pauba	HSA
2.52	Wolf	HSA
2.60	Wilson	HA
2.61	Lancaster Valley	HSA
2.62	Lewis	HSA
2.63	Reed Valley	HSA
2.70	Cave Rocks	HA
2.71	Lower Coahuila	HSA
2.72	Upper Coahuila	HSA
2.73	Anza	HSA
2.74	Burnt	HSA
2.80	Aguanga	HA
2.81	Vail	HSA
2.82	Devils Hole	HSA
2.83	Redec	HSA
2.84	Tule Creek	HSA
2.90	Oakgrove	HA
2.91	Lower Culp	HSA
2.92	Previtt Canyon	HSA
2.93	Dodge	HSA
2.94	Chihuahua	HSA
3.00	SAN LUIS REY HYDROLOGIC UNIT	
3.10	Lower San Luis	HA
3.11	Mission	HSA
3.12	Bonsall	HSA
3.13	Moosa	HSA
3.14	Valley Center	HSA
3.15	Woods	HSA
3.16	Rincon	HSA
3.20	Monserate	HA
3.21	Pala	HSA
3.22	Pauma	HSA
3.23	La Jolla Amago	HSA
3.30	Warner Valley	HA
3.31	Warner	HSA
3.32	Combs	HSA
4.00	CARLSBAD HYDROLOGIC UNIT	
4.10	Loma Alta	HA
4.20	Buena Vista Creek	HA
4.21	El Salto	HSA
4.22	Vista	HSA
4.30	Agua Hedionda	HA
4.31	Los Monos	HSA
4.32	Buena	HSA
4.40	Encinas	HA
4.50	San Marcos	HA
4.51	Batiquitos	HSA
4.52	Richland	HSA
4.53	Twin Oaks	HSA
4.60	Escondido Creek	HA
4.61	San Elijo	HSA
4.62	Escondido	HSA
4.63	Lake Wohlford	HSA
5.00	SAN DIEGUITO HYDROLOGIC UNIT	
5.10	Solana Beach	HA
5.11	Rancho Santa Fe	HSA
5.12	La Jolla	HSA
5.20	Hodges	HA
5.21	Del Dios	HSA
5.22	Green	HSA
5.23	Felicita	HSA
5.24	Bear	HSA

TABLE 1 –2. HYDROLOGIC UNITS, AREAS AND SUBAREAS OF THE SAN DIEGO REGION

BASIN NUMBER	HYDROLOGIC BASIN	
5.30	San Pasqual	HA
5.31	Highland	HSA
5.32	Las Lomas Muertas	HSA
5.33	Reed	HSA
5.34	Hidden	HSA
5.35	Guejito	HSA
5.36	Vineyard	HSA
5.40	Santa Maria Valley	HA
5.41	Ramona	HSA
5.42	Lower Hatfield	HSA
5.43	Wash Hollow	HSA
5.44	Upper Hatfield	HSA
5.45	Ballena	HSA
5.46	East Santa Teresa	HSA
5.47	West Santa Teresa	HSA
5.50	Santa Ysabel	HA
5.51	Boden	HSA
5.52	Pamo	HSA
5.53	Sutherland	HSA
5.54	Witch Creek	HSA
6.00	PENASQUITOS HYDROLOGIC UNIT	
6.10	Miramar Reservoir	HA
6.20	Poway	HA
6.30	Scripps	HA
6.40	Miramar	HA
6.50	Tecolote	HA
7.00	SAN DIEGO HYDROLOGIC UNIT	
7.10	Lower San Diego	HA
7.11	Mission San Diego	HSA
7.12	Santee	HSA
7.13	El Cajon	HSA
7.14	Coches	HSA
7.15	El Monte	HSA
7.20	San Vicente	HA
7.21	Fernbrook	HSA
7.22	Kimball	HSA
7.23	Gower	HSA
7.24	Barona	HSA
7.30	El Capitan	HA
7.31	Conejos Creek	HSA
7.32	Glen Oaks	HSA
7.33	Alpine	HSA
7.40	Boulder Creek	HA
7.41	Inaja	HSA
7.42	Spencer	HSA
7.43	Cuyamaca	HSA
8.00	PUEBLO SAN DIEGO HYDROLOGIC UNIT	
8.10	Point Loma	HA
8.20	San Diego Mesa	HA
8.21	Lindbergh	HSA
8.22	Chollas	HSA
8.30	National City	HA
8.31	El Toyan	HSA
8.32	Paradise	HSA
9.00	SWEETWATER HYDROLOGIC UNIT	
9.10	Lower Sweetwater	HA
9.11	Telegraph	HSA
9.12	La Nacion	HSA
9.20	Middle Sweetwater	HA
9.21	Jamacha	HSA
9.22	Hillsdale	HSA
9.23	Dehesa	HSA
9.24	Galloway	HSA
9.25	Sequan	HSA
9.26	Alpine Heights	HSA
9.30	Upper Sweetwater	HA
9.31	Loveland	HSA
9.32	Japatul	HSA
9.33	Viejas	HSA
9.34	Descanso	HSA
9.35	Garnet	HSA
10.00	OTAY HYDROLOGIC UNIT	
10.10	Coronado	HA
10.20	Otay Valley	HA
10.30	Dulzura	HA
10.31	Savage	HSA
10.32	Proctor	HSA
10.33	Jamul	HSA
10.34	Lee	HSA
10.35	Lyon	HSA
10.36	Hollenbeck	HSA
10.37	Engineer Springs	HSA
11.00	TIJUANA HYDROLOGIC UNIT	
11.10	Tijuana Valley	HA
11.11	San Ysidro	HSA
11.12	Water Tanks	HSA
11.20	Potrero	HA
11.21	Marron	HSA
11.22	Bee Canyon	HSA
11.23	Barrett	HSA
11.24	Round Potrero	HSA
11.25	Long Potrero	HSA
11.30	Barrett Lake	HA
11.40	Monument	HA
11.41	Pine	HSA
11.42	Mount Laguna	HSA
11.50	Morena	HA
11.60	Cottonwood	HA
11.70	Cameron	HA
11.80	Campo	HA
11.81	Tecate	HSA
11.82	Canyon City	HSA
11.83	Clover Flat	HSA
11.84	Hill	HSA
11.85	Hipass	HSA

Figure 1-2. San Diego Region Hydrologic Units, Areas and Subareas.

0 4 8 16 Miles

1:760,000

Derived from an edited version of Calwater 2.21 to comply with the 1994 Basin Plan
Map created October 2004
State Water Resources Control Board

Santa Margarita Hydrologic Unit (2.00)

Arroyo chub at Rainbow Creek

The Santa Margarita HU is a rectangular area of about 750 square miles. Included in it are portions of Camp Pendleton as well as the civilian population centers of Murrieta, Temecula and part of Fallbrook.

The unit is drained largely by the Santa Margarita River, Murrieta Creek and Temecula River. The only coastal lagoon of the unit is the Santa Margarita Lagoon which lies totally within the Camp Pendleton Naval Reservation of the U.S. Marine Corps. The slough at the mouth of the river is normally closed off from the ocean by a sandbar.

The major surface water storage areas are Vail Lake and O'Neill Lake. Annual precipitation ranges from less than 12 inches near the coast to more than 45 inches inland near Palomar mountain.

The San Margarita HU is comprised of the following nine HAs; the Ysidora, Deluz, Murrieta, Auld, Pechanga, Wilson, Cave Rocks, Aguanga, and Oak Grove HAs.

San Luis Rey Hydrologic Unit (3.00)

San Luis Rey HU is a rectangular area of about 565 square miles, and includes the population centers of Oceanside, and Valley Center, and portions of Fallbrook and Camp Pendleton. In addition there are several Indian reservations in the unit. The major stream system, the San Luis Rey River, is interrupted by Lake Henshaw, one of the largest water storage areas in the San Diego Region. Annual precipitation is heavier than in other units, ranging from less than 12 inches near the ocean to 45 inches near Palomar mountain.

The San Luis Rey Unit contains two coastal lagoon areas, the mouth of the San Luis Rey River and Loma Alta Slough. The mouth of the San Luis Rey River is entirely within the city of Oceanside and is adjacent to the city's northern boundary. The slough area at the mouth of the river is contiguous with Oceanside Harbor. Loma Alta Slough is entirely within the city of Oceanside and is the mouth of Loma Alta Creek. The slough is normally blocked off from the ocean by a sandbar.

The San Luis Rey HU is comprised of the following three HAs; the Lower San Luis, Monserate and Warner Valley Hydrologic areas.

Carlsbad Hydrologic Unit (4.00)

Shore crab at
Scripps Coastal Reserve

Carlsbad HU is a roughly triangular-shaped area of about 210 square miles, extending from Lake Wohlford on the east to the Pacific ocean on the west, and from Vista on the north to Cardiff-by-the-Sea on the south. The unit includes the cities of Oceanside, Carlsbad, Leucadia, Encinitas, Cardiff-by-the-Sea, Vista, and Escondido. The area is drained by Buena Vista, Agua Hedionda, San Marcos and Escondido creeks.

The Carlsbad HU contains four major coastal lagoons; Buena Vista, Agua Hedionda, Batiquitos and San Elijo. Buena Vista lies between the cities of Carlsbad and Oceanside, and is partially within each city. A sandbar occasionally forms across the mouth forming an ocean beach. The water level in the lagoon is maintained by an inflow of rising groundwater and return irrigation water from the area upstream on Vista Creek. A portion of the lagoon has been designated as a bird sanctuary.

Agua Hedionda Lagoon, at the mouth of Agua Hedionda Creek, is within the city of Carlsbad. The lagoon is routinely dredged to keep it open to the ocean. The lagoon serves as an integral part of a utility's power plant cooling water intake system and also provides a reserve cooling water supply. The easterly portion of the lagoon is used for water oriented recreation.

Batiquitos Lagoon, at the mouth of San Marcos Creek, enters the Pacific Ocean between the city of Carlsbad and the unincorporated community of Leucadia. San Elijo Lagoon is the tidal marsh at the mouth of Escondido Creek. The marsh is normally closed off from the ocean but is subject to tidal fluctuations.

The Carlsbad HU is comprised of the following six HAs; the Loma Alta, Buena Vista Creek,

Agua Hedionda, Encinas, San Marcos and Escondido Creek HAs.

San Dieguito Hydrologic Unit (5.00)

San Dieguito HU is a rectangular-shaped area of about 350 square miles. It includes the San Dieguito River and its tributaries, along with Santa Ysabel and Santa Maria creeks.

The unit contains two major reservoirs - Lake Hodges and Sutherland, and a smaller facility, the San Dieguito Reservoir.

The unit contains one coastal lagoon, the San Dieguito Slough, located at the mouth of the San Dieguito River, which forms the northerly edge of the city of Del Mar. The lagoon is normally closed off from the ocean by a sandbar.

The San Dieguito HU is divided into five HAs; the Solana Beach, Hodges, San Pasqual, Santa Maria Valley and Santa Ysabel HAs.

Penasquitos Hydrologic Unit (6.00)

Penasquitos HU is a triangular-shaped area of about 170 square miles, extending from Poway on the east to La Jolla on the west. There are no major streams in this unit although it is drained by numerous creeks. Miramar Reservoir, a major storage facility, contains imported Colorado River water.

The unit contains two coastal lagoons, Sorrento Lagoon and Mission Bay. Sorrento Lagoon is the mouth of Penasquitos Creek and empties into the ocean near the northerly boundary of the city of San Diego. Mission Bay and the mouth of the San Diego River form a 4,000 acre aquatic park. Water quality within Mission Bay generally is lower than that of the coastal ocean water due to the poor flushing characteristics of the bay and the input of nutrient material from storm runoff. Sludge from the city of San Diego's Point Loma plant is piped to an island in Mission Bay (Fiesta Island) for use as a soil conditioner and fertilizer.

Annual precipitation in the unit ranges from less than 8 inches along the ocean to 18 inches inland. Poway, and La Jolla are the major population centers.

The Penasquitos HU is comprised of the following five HAs; the Miramar Reservoir, Poway, Scripps, Miramar, and Tecolote HAs.

Grunion spawning at Ocean Beach

San Diego Hydrologic Unit (7.00)

San Diego HU is a long, triangular-shaped area of about 440 square miles drained by the San Diego River. El Capitan, San Vicente, Cuyamaca, Jennings, and Murray reservoirs are the major storage facilities. San Vicente Reservoir, Murray Reservoir, Jennings, and Murray Reservoir store mainly Colorado River water, whereas, El Capitan mainly stores local runoff and some Colorado River water. Cuyamaca Reservoir stores only local runoff.

Much of the impounded water is used to serve major population centers, including a portion of the San Diego metropolitan area and the communities of El Cajon, Santee, Lakeside, Alpine and Julian. Annual precipitation ranges from less than 11 inches at the coast to about 35 inches around Cuyamaca and El Capitan Reservoir. The San Diego HU is comprised of the following four HAs; Lower San Diego, San Vicente, El Capitan and Boulder Creek HAs.

Pueblo San Diego Hydrologic Unit (8.00)

Pueblo San Diego HU is a triangular-shaped area of about 60 square miles with no major stream system. It is bordered to the north, by the watershed of the San Diego River and on the south, in part, by that of the Sweetwater River. The major population center is the city of San Diego. The unit is relatively dry with an annual precipitation of less than 11 inches to 13 inches. The Pueblo San Diego HU is comprised of the following three HAs; the Point Loma, San Diego Mesa and National City HAs.

San Diego Bay lies offshore of this unit. The bay is approximately 13 miles long and varies from ½ to 1½ miles in width.

Sweetwater Hydrologic Unit (9.00)

Sweetwater HU is an elongated northeasterly trending strip with an area of about 230 square miles. It is traversed along its length by the Sweetwater River. The annual precipitation varies from less than 11 inches at the coast to about 35 inches inland.

The Sweetwater HU is comprised of the following three HAs; the Lower Sweetwater, Middle Sweetwater, and Upper Sweetwater HAs.

Otay Hydrologic Unit (10.00)

Otay HU is a club-shaped area of about 160 square miles. The major stream system traversing the area is the Otay River and its tributaries. The Lower Otay Reservoir is the terminus of the second San Diego Aqueduct. Major population centers include the communities of Imperial Beach in the coastal area and Dulzura inland. The annual precipitation generally increases landward from the coast and varies from less than 11 to 19 inches.

The Coronado, Otay, and Dulzura HAs comprise the Otay HU. The Coronado HA is composed of the North Island Naval Air Station, the city of Coronado and the Silver Strand.

Tijuana Hydrologic Unit (11.00)

Tijuana HU is a triangular-shaped area that is drained by Cottonwood and Campo creeks, which are tributaries to the Tijuana River. It covers an area of about 470 square miles and lies mainly in the mountain-valley section.

The unit's only coastal lagoon is the Tijuana Estuary which occupies approximately 2,000 acres and is generally open to the ocean. Most of the area can be classified as a salt water marsh with a number of arms of open water. Water quality is generally the same as that of the sea water except during periods of runoff when a variety of wastes, which originate in Mexico, are carried into the lagoon from the surface flow in the Tijuana River.

Willet at Tijuana Estuary shoreline

The unit is sparsely populated with the major population centers at San Ysidro and Campo. Annual precipitation varies from less than 11 inches near the coast to more than 25 inches farther inland near Laguna mountain. Runoff is captured by Morena Reservoir and Barrett Lake on Cottonwood Creek.

The Tijuana HU is comprised of the following eight HAs; the Tijuana Valley, Potrero, Barrett Lake, Monument, Morena, Cottonwood, Cameron and Campo HAs. The Tijuana Valley Hydrologic Area (HA) is arbitrarily divided by the United States - Mexico boundary. Surface water quality has been adversely affected by runoff coming across the border from Mexico. Ground water quality has been affected by seawater intrusion and waste discharges in both the United States and Mexico.

WATER RESOURCES

The water resources in the San Diego Region are classified as coastal waters, surface waters, ground waters, imported surface waters, and reclaimed water. Fresh water supplied within the Region is obtained from local surface and ground water development projects and imported surface water programs.

Gray whale

COASTAL WATERS

Coastal waters in the Region include bays, harbors, estuaries, beaches, and open ocean. Deep draft commercial harbors include San Diego Bay and Oceanside Harbor. Shallower small craft harbors include Mission Bay and Dana Point Harbor. Important estuaries are represented by coastal lagoons such as Tijuana Estuary, Sweetwater Marsh, San Diego River flood control channel, Kendall-Frost wildlife reserve, San Dieguito River Estuary, San Elijo Lagoon, Batiquitos Lagoon, Agua Hedionda Lagoon, Buena Vista Lagoon, San Luis Rey River Estuary, and Santa Margarita River Estuary.

SURFACE WATERS

The San Diego Region has thirteen principal stream systems originating in the western highlands which flow to the Pacific Ocean. From north to south these stream systems are Aliso Creek, San Juan Creek, San Mateo Creek,

San Onofre Creek, Santa Margarita River, San Luis Rey River, San Marcos Creek, Escondido Creek, San Dieguito River, San Diego River, Sweetwater River, Otay River, and the Tijuana River. Most of the streams of the San Diego Region are interrupted in character having both perennial and ephemeral components due to the rainfall pattern and the development of surface water impoundments. Surface water impoundments capture flow from nearly all the Region's major surface water streams. Many of the major surface water impoundments are a blend of natural runoff and imported water.

GROUND WATERS

All major drainage basins in the San Diego Region contain ground water basins. The basins are relatively small in area and usually shallow. Although these ground water basins are limited in size, the ground water yield from the basins has been historically important to the development of the Region. A number of the larger ground water basins can be of future significance in the Region for storage of both imported waters and reclaimed wastewaters. Nearly all of the local ground waters of the Region have been intensively developed for municipal and agricultural supply purposes.

IMPORTED SURFACE WATERS

The San Diego Region receives all of its imported water supplies from the Metropolitan Water District of Southern California (MWD). The MWD was created by the California State Legislature as a special district in 1928. MWD distributes wholesale water through 27 member agencies (cities and water districts) in portions of Los Angeles, Orange, Riverside, San Bernardino, San Diego and Ventura Counties. The MWD serves more than one-half of the drinking water supply used by 16 million persons in the coastal plain of Southern California.

The MWD supplies water to the following five member agencies in the San Diego Region: (1) Coastal Municipal Water District, (2) Municipal Water District of Orange County, (3) Western Municipal Water District of Riverside County, (4) Eastern Municipal Water District and (5) San Diego County Water Authority. The San Diego County Water Authority, the largest purveyor of MWD water in the San Diego Region, allocates water supplies to member agencies in San Diego County. The MWD obtains its water supplies from the Colorado River Aqueduct and the State Water Project.

The Colorado River Aqueduct is owned and operated by the MWD. Construction of the aqueduct began in 1931 and the first deliveries of imported water to member agencies took place in 1941. This aqueduct transports water from Lake Havasu on the Colorado River, 242 miles to its terminus at Lake Matthews in Riverside County. The aqueduct has an annual maximum capacity of 1.3 million acre-feet.

In 1964, the United States Supreme Court limited California's annual diversions from the Colorado River on a dependable basis to 4.4 million acre-feet in the case Arizona vs. California. As a result of the Supreme Court's decision, MWD's annual diversions from the Colorado River were limited to approximately 550,000 acre-feet. The United States Department of the Interior has the discretion to allow California to use any water that Arizona and Nevada have available from the Colorado River, but do not use. During declarations of surplus, MWD has the highest priority of any California contractor to divert surplus waters from the Colorado River.

MWD's other primary source of water is the State Water Project (SWP). The SWP is owned by the State of California and operated by the California Department of Water Resources. SWP water originates from Lake Oroville on the Feather River and surplus flows in the Sacramento - San Joaquin Delta in northern California. The project transports water from the Sacramento-San Joaquin Delta via the 444-mile long California Aqueduct to 29 contract agencies in the State.

The MWD has an annual entitlement to SWP water of 2,011,500 acre-feet out of a total maximum contractual entitlement of 4.2 million acre-feet for the 29 contractors. The current firm yield of the SWP, 2.4 million acre-feet, falls below the total SWP contractor requests of approximately 3.6 million acre-feet. The current firm yield of the SWP is based on the average annual water supplies available if the hydrologic conditions during the years 1928 - 1934 reoccurred. The firm yield of the SWP can supply only about one-half of the contract entitlement due to the lack of sufficient SWP water conveyance facilities. The demand for SWP water is expected

to increase to 4.2 million acre-feet by the year 2010. MWD water supply from the SWP will be subject to limitations unless SWP supplies are increased.

Steadily increasing demands for water have led to the need to import water from the Colorado River and the State Water Project. In November 1947, construction was completed on the first pipeline of the San Diego Aqueduct to deliver Colorado River water into the Region. The pipeline was constructed by the U.S. Navy to meet the increased demand for water caused by accelerated population and industrial growth during the World War II years of 1941 - 1945. Additional pipelines to convey imported water were constructed in subsequent years. Beginning in 1978, State Water Project water from Lake Oroville on the Feather River and surplus flows in the Sacramento - San Joaquin Delta in northern California were blended with the Colorado River water.

In the recent past the MWD water supplies consisted of approximately seventy percent from the Colorado River and thirty percent from the State Water Project. In 1993, the drought reduced the availability of State Water Project waters during the year and MWD water supplies consisted of approximately ninety-three percent from the Colorado River and seven percent from the State Water Project. The San Diego Region is highly dependent upon imported water supplies to meet the residential, industrial, commercial, agricultural, and public water demand. Imported water (i.e., Colorado River and State Water Project) supplies about ninety percent of the demand; surface runoff into local reservoirs and local ground water supplies the remaining ten percent.

The delivery of the maximum amount of SWP water benefits the Region in the following ways:

- SWP water improves the potential for conjunctive uses of water resources.
- SWP water enhances and maintains designated beneficial uses of the Region's surface and ground waters;
- SWP water improves the potential for attainment of water quality objectives;
- SWP water improves the viability of recharge of ground water basins;
- SWP water increases the potential for water reclamation.

The effective implementation of water reclamation in the Region is contingent on the availability of supply waters with relatively low salinity, or total dissolved solids (TDS) concentration. The Colorado River has a high TDS concentration of 600 - 750 milligrams per liter (mg/l). When this water is used for urban needs the TDS increases by about 300 mg/l to 900 -1050 mg/l. This quality of water is, at best, marginal for agricultural and ground water recharge uses of reclaimed water. In contrast, TDS concentrations in State Water Project waters are approximately 250 mg/l except during drought periods. The lower TDS concentrations found in State Water Project waters enables water supply agencies to blend SWP waters with Colorado River water supplies to meet drinking water quality standards and reclaimed water discharge limitations.

Water supply demand is expected to continue to increase as a result of population growth in the Region. To meet the projected water demand, water supply agencies are working to increase both the capacity and flexibility of conveyance systems and to intensify development of local water supplies through wastewater reclamation, ground water management, and desalination of seawater. The increased use of local supplies is expected to meet eighteen percent of the total water supply needed by the year 2010. The remaining eighty-two percent of the demand will have to be met by imported water.

RECLAIMED WATER

Reclaimed water is an important and growing component of the Region's water supply. Reclaimed water is obtained through extensive treatment of municipal wastewater to produce a safe and reliable water supply for non-potable uses. Reclaimed water is used to irrigate parks, agriculture, planned community greenbelt areas, golf courses and freeway landscaping. Reclaimed water use to the maximum extent feasible is important because it reduces dependence on imported water supply and leaves the Region less vulnerable to imported water supply shortages. The use of reclaimed water in the Region is expanding. For example, the San Diego County Water Authority reported that in Fiscal Year 1993, the total volume of reclaimed water used in the Authority's service area was

9,713 acre-feet; this represented a 24 percent increase in reclaimed water use over the previous year. The Authority estimates that the total reclaimed water use volume in their service area will increase to 50,000 acre-feet per year when currently planned water reclamation projects are completed in the year 2010.

REGIONAL BOARD WATER QUALITY MANAGEMENT POLICY

The five policy statements in this section form the Regional Board's Water Quality Management Policy for the San Diego Region. Following each principle policy statement are interpretations and examples of applications of the policy. In certain instances the Regional Board may find it necessary to exercise discretion in applying these policies within the interpretations presented.

POLICY ONE

Water quality objectives, beneficial uses, and water quality control plans and policies adopted by the State Water Resources Control Board and the Regional Water Quality Control Board shall be an integral part of the basis for water quality management.

★ Whenever the existing water quality exceeds the water quality objectives contained in the *Water Quality Control Plan for the San Diego Basin (9),* such existing high quality shall be maintained until it has been demonstrated to the Regional Board that any change will be consistent with maximum benefit to the people of the State, will not unreasonably affect present and anticipated beneficial uses of such water, and will not result in water quality less than that described in the *Water Quality Control Plan for the San Diego Basin (9).*[5]

★ Any waste discharged to existing high quality water will be required to meet waste discharge requirements that will result in the best practicable treatment or control of the discharge necessary to assure that pollution will not occur and the highest water quality consistent with maximum benefit to the people of the State will be maintained.[5]

POLICY TWO

Water shall be reclaimed and reused to the maximum extent feasible.

★ The Regional Board will encourage and recommend funding for water reclamation projects that meet the following conditions and that do not adversely affect vested water rights, unreasonably impair instream beneficial uses, or place an unreasonable burden on present water supply systems: [6]

- √ Beneficial uses will be made of wastewater that would otherwise be discharged to marine or brackish receiving water or evapotranspiration ponds.
- √ Reclaimed water will be used to replace or supplement the use of fresh water or better quality water.
- √ Reclaimed water will be used to preserve, restore, or enhance instream beneficial uses that include but are not limited to, fish, wildlife, recreation, and aesthetics associated with any surface water body or wetlands.

★ The Regional Board will encourage and promote water reclamation while taking into consideration the Regional Board's responsibility of protecting and enhancing beneficial uses and recognizing the need to protect the public health and environment.

★ The Regional Board will require wastewater treatment facilities to provide for appropriate disposal or storage of surplus reclaimed water.

POLICY THREE

Point sources and nonpoint sources of pollution shall be controlled to protect designated beneficial uses of water.[7]

★ Treatment levels at least as stringent as those defined in the federal Clean Water Act will be required of municipal and industrial point sources which are subject to regulation under the Clean Water Act.[8]

★ Sewage collection agencies shall implement a comprehensive pretreatment program

including industrial waste ordinances to control the quality and quantity of pollutants which may adversely affect the operation of a municipal wastewater treatment facility, or which may cause the effluent limitations for the facility to be exceeded, or which may pass through the treatment works or will otherwise be incompatible with such works.

★ Nonpoint sources will be controlled in conformance with the Clean Water Act and the Coastal Zone Act Reauthorization Amendments. Nonpoint source control programs will generally be the responsibility of federal, state, and local agencies, and individuals having land management responsibilities. Such controls will be implemented preferably through best management practices,[9] (BMPs). If BMPs fail, controls will be implemented through waste discharge requirements or other regulatory actions.[7]

POLICY FOUR

Instream beneficial uses shall be maintained, and when practical, restored, and enhanced.

★ Coordination shall be encouraged among local agencies with regard to all aspects of planning and land use control.

★ Plans for future development and management of the State's water resource must assure adequate protection of existing instream beneficial uses, and where feasible, include measures to enhance these uses.

★ Instream uses for recreation, fish, wildlife, and related purposes shall be balanced with other uses.

★ The need for water to be impounded must be demonstrated, taking full account of instream values.

★ Reservoir operations shall involve careful consideration of instream uses, even where such uses satisfy altered or enhanced instream values.

POLICY FIVE

A detailed and comprehensive knowledge of the beneficial uses, water quality and activities affecting water quality throughout the Region shall be maintained.

★ The development of a modern comprehensive information gathering, storing, and retrieval system to effectively aid in evaluating water quality throughout the Region shall be encouraged.

LEGAL BASIS AND AUTHORITY

Federal and state laws have been enacted which establish the requirements for adequate planning, implementation, management and enforcement, for the control of water quality. The principal federal and state laws pertaining to the regulation of water quality are known respectively as, the 1972 Federal Water Pollution Control Act (also known as the Clean Water Act) and Division 7 of the 1969 California Water Code (also known as the Porter-Cologne Water Quality Control Act). The laws are similar in many ways. The fundamental purpose of both laws is to protect the beneficial uses of water. An important distinction between the two is that the Porter-Cologne Water Quality Control Act addresses both ground and surface waters while the Clean Water Act addresses surface water only.

In addition, federal and state regulations and policies have been developed to augment and clarify the laws and to provide detail not included in the law.

FEDERAL LAWS AND REGULATIONS

The basic federal law dealing with surface water quality control is the Federal Water Pollution Control Act of 1972 (Clean Water Act). Certain statutory provisions in two other federal laws, the National Environmental Policy Act of 1969 and the Endangered Species Act, supplement the Clean Water Act. Federal regulations implementing the Clean Water Act provisions for water quality planning and management are contained in 40 CFR 130, *EPA Requirements for Water Quality Planning and Management* and 40 CFR 131, *EPA Procedures for Approving State Water Quality Standards*.

FEDERAL WATER POLLUTION CONTROL ACT

The Federal Water Pollution Control Act was amended in 1972 and is commonly referred to as the Clean Water Act. The objective of the Clean Water Act is to "*restore and maintain the chemical, physical and biological integrity of the Nation's waters*" to make all surface waters "*fishable*" and "*swimmable*". The seven goals set forth in the law to achieve this objective are to:

(1) Eliminate the discharge of pollutants to navigable waters by 1985;

(2) Provide water quality which protects and fosters propagation of fish, shellfish and wildlife and allows recreation in and on the water by 1983;

(3) Prohibit discharge of toxic pollutants in toxic amounts;

(4) Provide financial assistance to construct publicly owned treatment systems;

(5) Develop and implement areawide waste treatment management plans;

(6) Develop technology necessary to carry out these goals; and

(7) Develop and implement programs for control of nonpoint sources of pollution.

In 1972, five titles were added as amendments to the Clean Water Act. Title 1 provides for research and related programs, Title 2 provides grants for construction of treatment works, Title 3 provides for standards and enforcement, Title 4 provides for permits and licenses, and Title 5 provides for general provisions.

Clean Water Act sections 106, 205(j), 205(g), 208, 303 and 305 establish requirements for state water quality planning, management, and implementation in regard to surface waters. The Clean Water Act requires that states adopt water quality standards to protect public health or welfare, enhance the quality of water, and serve the purposes of the Clean Water Act. "*Serve the purposes of the Act*" (as defined in sections 101(a), 101(a)(2), and 303(c) of the Act) means that water quality standards:

- Include provisions for restoring and maintaining the chemical, physical, and biological integrity of state waters;

- Whenever attainable, achieve a level of water quality that provides for the protection and propagation of fish, shellfish, and wildlife, and recreation in and on the water ("*fishable*" and "*swimmable*"); and

- Consider the use and value of state waters for public water supplies, propagation of fish and wildlife, recreation, agriculture and industrial purposes, and navigation.

The states are also required to have a continuing planning process called the Triennial Review process, which includes public hearings at least once every three years to review the water quality standards and revise them if necessary.

NATIONAL ENVIRONMENTAL POLICY ACT OF 1969

The National Environmental Policy Act (NEPA) declares a national environmental policy and its goals. The overall objectives of NEPA are: (1) to ensure that environmental factors are considered in the decision making process of any federal action and (2) to provide full public disclosure of any federal action. Accordingly, NEPA requires that an Environmental Impact Statement (EIS) shall be "*included in every recommendation or report on proposals for legislation and other major federal actions significantly affecting the quality of the human environment*". Federal actions include the operation of programs; the construction of facilities; the provision of funding to others; and a federal agency's decision on whether to grant its required permission for activities of others, such as private businesses or state or local governments.

NEPA establishes a continuing policy for all levels of government and concerned public and private organizations to create and maintain conditions under which man and nature can exist in productive harmony and fulfill the social, economic and other requirements of present and future generations. NEPA directs an interdisciplinary approach to ensure integrated use of all talents in planning and decision making having impact on the environment (section 102). Each report or recommendation must be

accompanied by a detailed statement prepared by the responsible official on:

- The environmental impact of the proposed action;
- Any adverse environmental effects which cannot be avoided if the action is taken;
- Alternatives to the action;
- Relationship between local short-term uses of the environment, and maintenance and enhancement of long-term productivity; and
- Any irreversible and irretrievable commitments of resources if the proposed action is taken.

Appropriate alternatives to proposed actions must be studied and developed when conflicts in use of available resources are encountered.

NEPA directs the preservation of acceptable environments and the restoration of those that have been degraded. The spirit of the Act is also carried into the State reviews of proposed actions upon the environment. (See discussion on the California Environmental Quality Act later in this chapter).

ENDANGERED SPECIES ACT

The federal Endangered Species Act (ESA) establishes federal policy regarding protection of endangered and threatened species. The ESA is directed specifically at projects subject to the NEPA which may adversely affect endangered and threatened species. Section 7 of the federal ESA requires all federal agencies, in consultation with the Fish and Wildlife Service and the National Marine Fisheries Service, ensure that their actions do not jeopardize the existence of threatened or endangered species or result in the destruction or adverse modification of critical habitat. The definition of a federal action is very broad and covers almost every water program administered by the United States Environmental Protection Agency (USEPA). All aspects of the USEPA's surface water quality criteria and standards adoption and implementation process are subject to the consultation process. The overriding goal of the consultation process is to provide for the protection and recovery of threatened and endangered species and the ecosystems on which they depend.

APPLICABLE FEDERAL REGULATIONS

The federal regulations, promulgated by the USEPA to implement the Clean Water Act provisions for water quality planning and management, are contained in 40 CFR 130, EPA Requirements for Water Quality Planning and Management and 40 CFR 131, EPA Procedures for Approving State Water Quality Standards. The regulations contained in 40 CFR 131 require states to:

- Designate appropriate beneficial uses for surface waters;
- Establish narrative and numeric criteria to protect beneficial uses;
- Establish an antidegradation policy to protect and maintain existing beneficial uses and the water quality necessary to protect those uses; and
- Hold a public hearing to review surface water quality standards at least once every three years and revise them if appropriate.

The regulations contained in 40 CFR 130 require states to also develop and follow a water quality planning and management system consisting of the following elements:

- Monitoring methods and procedures to compile and analyze data on surface waters;
- Identification of surface waters that are "*water quality limited*" or not meeting water quality standards;
- A ranking of surface water bodies based on severity of pollution and beneficial uses of the waters. The surface water body ranking must also include a determination of how best to utilize available resources to solve the water quality problems; and
- Pollutant loading allocations to ensure that water quality standards are not exceeded.

These regulations are discussed in detail in Chapters 2 and 3.

CALIFORNIA LAWS AND REGULATIONS

State of California laws that directly affect water resources planning are contained principally in the California Water Code. Certain statutory provisions in the Water Resources Code, Health and Safety Code, Public Resources Code, Fish and Game Code, Food and Agriculture Code, Government Code, Harbors and Navigation Code, California Environmental Quality Act, and the California Endangered Species Act supplement the water quality provisions of the California Water Code. The chief state regulations in the CCR pertaining to water quality are contained in Title 22 and Title 23.

CALIFORNIA WATER CODE

The California Water Code contains provisions which control almost every consideration of water and its use. Division 2 of the Water Code provides that the State Board shall consider and act upon all applications for permits to appropriate waters. The State Board's authority includes water quality considerations in granting a water right. Division 3 deals with dams and reservoirs; Division 5 pertains to flood control; Division 6 controls conservation, development and utilization of the state water resources; Division 7, covers water quality protection and management; and Divisions 11 through 21 provide for the organization, operation, and financing of municipal, county and local, water-oriented agencies.

ADJUDICATIONS TO PROTECT THE QUALITY OF GROUND WATER (DIVISION 2 OF THE CALIFORNIA WATER CODE)

California Water Code section 2100 provides that the State Board may make a formal determination or judgment in order to protect ground water quality. Thus, the State Board, upon a finding of existing or threatened irreparable damage, may file an action in the Superior Court to restrict pumping or to impose physical solutions, or both, to the extent necessary to prevent destruction of, or irreparable injury to, the quality of ground water. The State Board may take such action only if an affected local agency charged with this responsibility fails to take appropriate action.

PORTER-COLOGNE WATER QUALITY CONTROL ACT

Division 7 of the California Water Code is the basic water quality control law for California. This law is titled the Porter-Cologne Water Quality Control Act (Porter-Cologne Act). The Porter-Cologne Act establishes a regulatory program to protect water quality and to protect beneficial uses of the state waters.

The Porter-Cologne Act section 13000 provides that:

- The quality of all waters of the state shall be protected for the use and enjoyment by the people of the state; and
- Activities and factors which may affect the quality of the waters of the state shall be regulated to attain the highest water quality that is reasonable, considering all demands being made or to be made and the total values involved, beneficial and detrimental, economic and social, tangible and intangible.

The Porter-Cologne Act establishes the State Board and the regional boards as the principle state agencies responsible for control of water quality. The State Board is responsible for:

- Issuing rights for the appropriation of surface water;
- Preventing waste and unreasonable use of water;
- Adjudicating water rights at the request of water users or the courts;
- Adopting state-wide water quality control policy;
- Reviewing actions of regional boards;
- Implementing the federal Clean Water Act; and
- Operation of a grants and loan program for the construction of sewage treatment plants.

The regional boards are responsible for:

- Issuance of waste discharge requirements to regulate the discharge of waste to surface and ground waters;

- Enforcement of the waste discharge requirements by the issuance of cease and desist orders, cleanup and abatement orders, administrative civil liability orders, and court action;

- Water quality control planning within their region; and

- Surveillance and monitoring to detect new sources of pollution and to ensure that ongoing discharges are in compliance with waste discharge requirements.

The Porter-Cologne Act empowers the regional boards to formulate and adopt, for all areas within the regions, a Water Quality Control Plan (Basin Plan) which designates beneficial uses and establishes such water quality objectives as in its judgment will ensure reasonable protection of beneficial uses. Each regional board establishes water quality objectives that will insure the reasonable protection of beneficial uses and the prevention of nuisance. The California Water Code provides flexibility for some change in water quality provided that beneficial uses are not adversely affected. The factors which are to be considered by the Regional Board in establishing water quality objectives are described in Chapter 3, Water Quality Objectives, (page 3-1).

The State Board may adopt water quality control plans for surface waters that overlap Regional Board boundaries, are statewide in scope, or are otherwise considered significant. Statewide plans supersede Regional Water Quality Control Plans where conflict occurs. The Regional Water Quality Control Plans are required to conform with policies of the State Board.

The California Water Code also requires that each regional board include an implementation plan in the Basin Plan. Implementation plans must include as a minimum:

- A description of the nature of the actions necessary to achieve the water quality objectives, including recommendations for appropriate actions by any entity, public or private;

- A time schedule for the actions to be taken; and

- A description of the surveillance to be undertaken to determine compliance with the water quality objectives.

CALIFORNIA ENVIRONMENTAL QUALITY ACT OF 1973

The California Environmental Quality Act (CEQA) is a very important and expansive environmental protection law in California. It was enacted by the state legislature in 1973 and is contained in the Public Resources Code sections 21000 through 21177. CEQA is the state-level equivalent of the federal NEPA.

The overall objectives of both laws, NEPA and CEQA, are to provide full public disclosure of a project and to ensure that environmental factors are considered in the decision making process. CEQA requires all state agencies, boards and commissions to include in any report on any project having significant effect on the environment an Environmental Impact Report (EIR). The EIR records the scope of the applicant's proposal and analyzes all its known environmental effects. The EIR must discuss any significant environmental effects which cannot be avoided if the proposal is implemented, proposed mitigative measures to minimize the impact of the project and alternatives to the project. Also the EIR must discuss the relationship between local short-term uses of the environment and the maintenance and enhancement of long-term productivity and the growth-inducing impacts of the proposed project. The EIR is circulated to interested agencies and members of the public who request a copy. The public has a 45 day period for review during which comments on the EIR are accepted.

State agencies cannot approve a project for which alternatives or mitigation measures exist which would significantly reduce the environmental impacts, unless overriding social and/or economic considerations apply.

Activities of the State and Regional Boards subject to CEQA include adoption of Basin Plans and amendments thereto, issuance of National Pollutant Discharge Elimination System

(NPDES) permits, and Waste Discharge Requirements (WDRs). The basin planning process however, has been certified by the Secretary of Resources as being exempt from CEQA's requirement for preparation of an EIR or negative declaration and initial study CCR Title 14, section 15251). Under the basin planning process, a plan amendment, as well as a technical report and backup materials, serve as a functional equivalent to an EIR or negative declaration and initial study. The CEQA Notice of Filing, Environmental Checklist Form, and Notice of Decision must be filed to comply with CEQA.

CALIFORNIA ENDANGERED SPECIES ACT

The California Endangered Species Act (CESA) as amended in 1987 (California Fish and Game Code, sections 2050 thru 2098) establishes state policy regarding protection of endangered and threatened species. CESA is directed specifically at projects subject to the CEQA which may adversely affect endangered and threatened species.

Pursuant to CESA, the Regional Board must consult with the California Department of Fish and Game (DFG) to determine if the Basin Plan would jeopardize the continued existence of any endangered or threatened species or adversely affect the habitat of the species. CESA requires the DFG to issue written findings regarding whether or not Regional Board adoption of the Basin Plan will cause jeopardy to endangered or threatened species.

CESA policy requires that the Regional Board not approve a Basin Plan, which in DFG's opinion, would jeopardize endangered or threatened species. CESA also requires the Regional Board to adopt reasonable and prudent alternatives in the Basin Plan which would minimize any adverse effects identified by DFG to endangered or threatened species. If the alternatives are infeasible, the Regional Board is required to adopt reasonable mitigation and enhancement measures in the Basin Plan.

OTHER STATE STATUTES

Certain statutory provisions contained in the Health and Safety Code, Fish and Game Code, Harbors and Navigation Code, and the Food and Agriculture Code, supplement the water quality provisions of the California Water Code. The Health and Safety Code has statutory provisions providing for the regulation of hazardous waste, hazardous materials, surface impoundments containing hazardous waste, underground and aboveground storage of hazardous substances, and underground injection of toxic substances and the discharge of cancer causing chemicals to sources of drinking water. The Harbors and Navigation Code has statutory provisions to prevent the unauthorized discharges of waste from vessels to surface waters. The Food and Agriculture Code has statutory provisions providing for the prevention of pollution of ground water which may be used for drinking water supplies. The Fish and Game Code has statutory provisions to prevent unauthorized diversions of any surface water body as well as waste discharges deleterious to fish, plant, animal, or bird life. The Government Code requires the Governor to establish a state oil spill and toxic disaster contingency plans.

CALIFORNIA CODE OF REGULATIONS

The administrative procedures of the State Board and regional boards and regulations relating to many facets of water rights and water quality are contained in Title 23, (WATERS) Division 3, (Water Resources Control Board) Chapters 3, 4, 15, and 16 California Code of Regulations (CCR). Requirements for quality of water for domestic uses, wastewater reclamation criteria, and hazardous waste management are contained in Title 22, Division 4 (Environmental Health).

HISTORY OF BASIN PLANNING IN THE SAN DIEGO REGION

The Dickey Act, enacted by the State of California in 1949, established nine Regional Water Pollution Control Boards in California. Regional Water Pollution Control Boards were directed to establish water quality objectives in order to protect the quality of receiving waters from adverse impacts of discharges. During the first few years, the San Diego Regional Water Pollution Control Board only established narrative objectives for discharges. By 1952, the San Diego Regional Water Pollution Control Board began including numerical limits in requirements for discharges and adopting water quality objectives for receiving waters.

In the late 1960's the San Diego Regional Board conducted an extensive investigation to define water quality objectives for the entire San Diego

Region. A report was prepared for each major hydrologic unit of the Region. These reports described the following topics for each hydrologic unit:

- Geology and land use;
- Precipitation and runoff;
- Water quality;
- Surface and ground water use;
- Imported water use;
- Waste disposal;
- Beneficial uses;
- Water quality objectives; and
- The water quality implementation program.

These early reports led to the definition and designation of beneficial uses for the surface and ground waters of the Region. The beneficial uses defined in the early reports have remained intact, for the most part, to the present day.

With the enactment of the Porter-Cologne Water Quality Act in 1969, the names of the Regional Water Pollution Control Boards were changed to Regional Water Quality Control Boards, and their authority was broadened. Furthermore, the Act required the Regional Water Quality Control Boards to initiate development of comprehensive regional Water Quality Control Plans.

In 1971, the San Diego Regional Board adopted an Interim Water Quality Control Plan (Interim Plan) which expanded the number of beneficial uses designated for inland surface waters, and coastal waters subject to tidal action. The Interim Plan was prepared to satisfy state and federal requirements for grant programs for sewage treatment plant construction. In addition, the Interim Plan satisfied the Porter-Cologne Act requirements that each regional board adopt a Water Quality Control Plan. As the term "*interim*" implies, the document was adopted as the first step towards development of a comprehensive fully developed Water Quality Control Plan. The Interim Plan was amended in 1972 to designate a beneficial use for clamming and shellfish harvesting at various locations in coastal waters.

In 1975, the San Diego Regional Board adopted the Comprehensive Water Quality Control Plan Report for the San Diego Region that compiled all of the existing beneficial uses, water quality objectives, and policies into one document and rescinded all individually-adopted objectives and policies. The 1975 Basin Plan was amended by the Regional Board on numerous occasions since 1975. A summary of Basin Plan amendments adopted by the Regional Board between 1979 and 2005 and approved by the State Board, Office of Administrative Law, and USEPA is presented in Chapter 5 (Plans and Policies) of this Basin Plan.

Since 1975, progress has been made toward the control of a number of water quality problems identified in the 1975 Basin Plan, including the control of point source discharges and the development of new programs to address nonpoint source pollution issues in the Region. At the same time, many new issues and areas of concern have arisen as health scientists have identified increasingly lower concentrations of toxic substances as health risks. Furthermore, advancing analytical technology enables detection of contaminants at increasingly lower concentrations. The State and Regional Board's Continuing Planning Process, based on the latest scientific information, addresses both "*old*" and "*new*" water quality issues.

CONTINUING PLANNING PROCESS

As part of the State's continuing planning process, components of the Basin Plan are reviewed as new data and information become available or as specific needs arise. Comprehensive updates of the Basin Plan occur in response to state and federal legislative requirements and as funding becomes available. In addition, State Board and other governmental entities' (federal, state, and local) plans, which can affect water quality, are incorporated into the planning process. The Basin Plan provides consistent long-term standards and program guidance for the Region.

BASIN PLAN REVIEW AND AMENDMENT PROCESS

The following discussion applies to the review and amendment process for any Water Quality Control Plan, (i.e., a Statewide Plan or a Regional Board Basin Plan).

TRIENNIAL REVIEW

Statewide plans and Regional Board Basin Plans are flexible documents which must be reviewed and revised regularly to adapt to changing conditions. A major review of both types of Plans is performed every three years as part of the update process for the "*Triennial Review*". The Triennial Review is required by the federal Clean Water Act [section 303(c)(1)]. In addition, state law requires that water quality control plans be reviewed periodically (California Water Code section 13240), and that the State Board review statewide plans at least every three years (California Water Code sections 13170 and 13170.2). These reviews are comprehensive and include a public scoping hearing to identify the issues and water quality standards to be addressed. The review identifies standards which are appropriate and, therefore, require no revisions. Information on new or existing water quality objectives comes from monitoring data, compliance inspections, discharger reports, and public complaints. Monitoring data provides information on background conditions which are used to set water quality objectives.

The State or Regional Board evaluates all available information and determines whether revisions to water quality standards are needed and the nature of any necessary revisions. A work plan is prepared which identifies appropriate revisions. These revisions, and a time schedule for implementation, are then incorporated into the Statewide Plan or Regional Board Basin Plan by way of the amendment process discussed below.

BASIN PLAN AMENDMENT PROCESS

Whenever a Statewide Plan or Regional Board Basin Plan for surface waters is to be revised, public participation requirements must be met, as called for in 40 CFR Part 25 (Public Participation in Programs Under the Resource Conservation and Recovery Act and the Clean Water Act). When water quality standards are changed, a public hearing must be held. Notice for the public hearing generally must be given 45 days prior to the hearing, and the documents to be considered at the hearing must be available to the public 30 days prior to the hearing. After the hearing, a summary of comments received and responses to those comments must be prepared before action is taken.

For Regional Board adoption of a Basin Plan amendment, a quorum of Board members must be present (five of the nine members). For State Board approval of a proposed Regional Board amendment, a quorum must also be present (three of the five members). In both cases the vote of a majority of the quorum is required to take action. If a State Board hearing is being held regarding a Statewide Plan or to review an amendment proposed by a Regional Board, one or more members of the State Board may conduct the hearing upon authorization of the State Board. In cases where such a hearing is conducted, any final action must be taken by a majority of all members of the State Board (i.e., 3 votes). Usually State Board hearings are of a controversial nature and most, if not all, Board members elect to attend. The State Board may approve a Basin Plan amendment proposed by a Regional Board or return it to the Regional Board for further consideration. Upon resubmission, the State Board may either approve or, after a public hearing in the affected region, revise and approve such plan (California Water Code section 13245).

Basin planning is also influenced by several federal administrative guidance documents, such as USEPA's Technical Support Document for Water Quality-Based Toxics Control, the Water Quality Standards Handbook, and "*Gold Book*" Quality Criteria for Water, 1986 and waste load allocation manuals.

Basin Plan amendments are generally initiated by the appropriate Regional Board, and Statewide Plan amendments are initiated by the State Board. Amendments may also be initiated by any other interested parties. In this case, the proposed amendment submitted by the interested party is reviewed by Regional Board to determine if the information is adequate to support the requested change to the Basin Plan. The Regional Board will review the technical information and may either accept it as complete or reject it as incomplete. Whenever new or revised water quality standards are proposed in a Regional Board Basin Plan amendment, the standards must be approved by the State Board before the amendment becomes effective. A proposed standard revision to a statewide plan or Regional Board Basin Plan takes effect upon approval by the Office of Administrative Law (OAL). A standard contained in a Regional Basin Plan amendment which relates to surface waters

or a standard in a statewide plan must be submitted to the United States Environmental Protection Agency (USEPA) for approval [40 CFR section 131.20 (c)] following State Board review. If the standard revision is disapproved by the USEPA, the original standard remains in effect until revised by the basin planning process, or the USEPA promulgates its own rule which supersedes the standard revision [40 CFR section 131.21 (c)].

BASIN PLAN AMENDMENT PROCEDURES

(1) Advance notice of plan amendments is required (California Water Code §13244) and must be advertised for hearings. For amendments that include a prohibition, a public notice must be published for three consecutive days in a newspaper of wide circulation in the area of the prohibition. For other actions, notice must be published for one day in a newspaper of wide circulation. Usually, the hearing notice must be published at least 45 days prior to the hearing (40 CFR section 25.5).

A CEQA Notice of Filing must be circulated at least 45 days prior to State and Regional Board action on a proposed amendment. Where the hearing(s) process is completed and adoption is scheduled for a regularly scheduled State or Regional Board Meeting, a ten-day notice requirement for agenda items applies (Government Code section 11125).

(2) For controversial and/or complex amendments, comments should be requested from interested persons prior to drafting an amendment. This step would be informal by written correspondence or in a workshop session (the public can attend such workshops, which are not "*public hearings*" and would precede the hearing notice in number 3 below). Comments received would be considered in the initial draft of the amendment and the alternatives.

(3) The hearing notice must be specific enough to allow an effective opportunity for public participation. Although it is preferable to include the draft plan amendment and technical report with the hearing notice, as indicated above, these documents can be made available at a later date that is at least 30 days before the hearing (40 CFR section 25.5). The notice should include:

(a) The general area to be regulated;
(b) The specific proposed plan amendment and a statement of the availability of a technical report and backup material;
(c) Either of the following,
  (i) Alternatives to the proposal or
  (ii) A statement that additional rules, consistent with the general purpose of the plan amendment and complementary to the specific proposed rules, are under consideration.
(d) A statement as to whether action on the amendment will be taken immediately at the close of the hearing.

(4) A copy of the hearing notice should be sent to:

(a) Those who normally receive notices of plan review or those who, in the judgment of staff, would be interested in the proposed amendment(s).
(b) Those who have commented on the plan review or amendment.
(c) Those federal, state and local agencies who have jurisdiction by law or who have expertise with respect to the subject(s) of the proposed amendment(s).
(d) Specific interested parties affected by the proposed action.

(5) The State or Regional Board(s) may require that written testimony or other evidence be submitted in advance of the public hearing (Title 23 CCR section 649.4). If this option is chosen, the hearing notice should specify the details. Charts, graphs, and other testimony which are presented as evidence must be left with the State or Regional Board(s) in order to be considered as part of the record.

(6) The hearing notice can state that more than one hearing is scheduled and list the dates for each in order to save processing time. Alternatively, the notice may state that action on the amendment could take place following the close of the hearing. Some delays may also be avoided by

having special hearings on dates other than regularly scheduled State or Regional Board meetings.

(7) The State or Regional Board(s) must prepare written responses to comments received at least 15 days before the State or Regional Board intends to take action. Copies of responses will be available at the State or Regional Board meeting for any person to review. Late comments should be responded to at the State or Regional Board meeting. If appropriate, the Environmental Checklist Form may be revised based on a review of comments received.

(8) The State or Regional Board(s) must prepare a summary report including:
   (a) A brief description of the proposed activity;
   (b) Reasonable alternatives to the proposed activity; and
   (c) Mitigation measures to minimize any potential significant adverse environmental impacts of the proposed activity identified in the Environmental Checklist Form. Conclusions must be made as to what, if any, potential significant adverse impacts, feasible alternatives, and feasible mitigation measures exist. These conclusions must be accompanied by a statement of supporting facts. In adopting proposed amendments, the State or Regional Board must mandate those feasible alternatives or feasible mitigation measures which are within its jurisdiction. The State or Regional Board cannot approve the proposed amendment if there are feasible alternatives or feasible mitigation measures which would substantially lessen the potential significant adverse environmental impacts (Public Resource Code section 21080.5).

(9) The hearing must, at a minimum, be recorded electronically (Title 23 CCR section 647.4). Controversial matters usually are recorded by a stenographic reporter.

(10) At the hearing, all interested persons are given an opportunity to be heard. Reasonable limitations on public participation are appropriate and may be indicated in an opening statement (i.e., impose time limits on testimony, encourage groups to designate a spokesperson, and require witnesses to summarize written testimony). There is no right to cross-examination at the hearings. Persons wishing clarification of prior evidence or comments may request the same from the State or Regional Board.

Cross-examination must be allowed when an amendment takes on quasi-judicial features; for example, when considering a prohibition against increasing existing discharges from a relatively small number of dischargers. Cross-examination may also be allowed at the discretion of the Chairperson, if it appears that the cross-examination will assist the State or Regional Board in its deliberations.

(11) At the close of the hearing, it may be desirable to leave the record open to provide interested persons an additional opportunity to submit written comments. If the record is left open, all interested persons will be told at the hearing that they may review and respond to written comments received during the time that the record is left open. For example, the record could be left open ten days for written submittals and an additional five days for written comments in response to these submittals. Once the record is closed, no additional evidence will be received at the State or Regional Board meeting to consider adoption of the amendment; however, brief comments on the proposal will be allowed.

(12) After the close of the hearing and any comment period, the amendment may be adopted as proposed. If the draft amendment is to be modified, based on the hearing, and the notice is adequate as outlined in number 3 above, a final plan amendment may be adopted when the product is a logical outgrowth of the draft amendment or a statement in the notice. Where changes in the final draft are not a logical outgrowth of the original proposal, an additional notice, hearing, and opportunity to comment will be provided. When changes are proposed by the State or Regional Board, the procedure is:

(a) For each proposed change, consideration is given as to whether the change is a logical outgrowth of the original proposal. If the change was (1) not contemplated in the technical report, notice, or draft amendment and (2) not discussed during the hearing(s) or in written comments received, it is not a logical outgrowth of the original proposal; and an additional notice and comment period will be provided. When the issues are complex, controversial, or confusing, an additional comment period on a new draft amendment is often allowed (even if it can be argued that the changes are a logical outgrowth of the original proposal).

(b) If the change is a logical outgrowth of the original draft amendment, it may be voted upon without an additional notice and comment period. If the vote on the amendment is delayed so that the full amendment can be retyped, etc., normal meeting notice requirements may be followed (Title 23 CCR section 647.2).

(c) If the change is not a logical growth, a motion may be made to incorporate it into the draft amendment. If this motion passes, consideration of the amendment should be continued so that the revisions can be circulated for comments as provided in number 4 above.

(13) Revisions to plan amendments are based on the evidence developed at the hearing. This requirement does not preclude the State or Regional Board(s) from adopting an amendment immediately after the hearing if all evidence has been considered.

(14) If a Basin Plan amendment is quasi-judicial (focused on the rights and duties of a limited number of individuals such as in a small isolated prohibition area), the State or Regional Board resolution adopting the plan amendment will contain findings that are adequate to enable another interested person to "*bridge the analytical gap*" between the evidence the amendment itself.

(15) When a Regional Board amendment is adopted, it must then be forwarded to the State Board for approval. The State Board will review the proposed amendment with extensive evaluation of technical, policy, and legal consistency considerations. The State Board is required to act upon submission of a water quality control plan or revision within 60 days after the Regional Board has submitted the plan, or 90 days after resubmission of the plan (California Water Code section 13246). A Basin Plan revision adopted by a Regional Board is not effective until it is approved by State Board (California Water Code section 13245) and the Office of Administrative Law. An amendment package to be processed for approval must include all of the following:

(a) A memorandum of transmittal including a list of all material that was part of the Regional Board record, staff contact person, and request date for State Board action. If expeditious treatment is requested, the reason for this request should be stated.

(b) A copy of the certified Regional Board resolution including adopted amendments as it will be incorporated into the appropriate Basin Plan and a copy of all documents which were considered by the Regional Board prior to adoption of the Basin Plan amendment.

(c) The Regional Board technical report with detailed rationale for changes, any technical support documentation or background information, and information regarding any relevant State Board or Regional Board actions.

(d) An environmental document and any related CEQA documents.

(e) Copies of written public comments and written Regional Board responses.

(f) A responsiveness summary of any verbal responses to comments received after written comment deadline.

(g) A tape recording or transcript of the public hearing.

(h) Two sets of interested persons mailing lists, typed on self-adhesive address labels or pre-addressed envelopes, plus a typed interested persons list for State Board files.

(16) State Board review of a proposed plan amendment may result in approval or return to the Regional Board for consideration and resubmission. Upon resubmission, the State Board may approve, or, after a public hearing in the affected region, revise and approve the proposed plan amendment (California Water Code section 13245).

(17) Following State Board approval of the plan amendment, there is a 30-working day review period by the Office of Administrative Law. The Regional Board is responsible for preparing the administrative record (Items 15 b, c, d, e, f, and g above), a clear and concise summary, and a summary of necessity for review by the Office of Administrative Law. The summary of necessity is normally contained in the technical report. The Office of Chief Counsel at the State Board prepares a certification that the action was taken in compliance with all applicable requirements of Porter-Cologne.

(18) When the proposed Regional Board amendment has been approved by the Office of Administrative Law, the Regional Board must post a CEQA Notice of Decision with the Secretary of Resources for at least 30 days following Office of Administrative Law approval. When the State Board adopts a Statewide Plan amendment, the State Board must post the 30-day Notice of Decision.

(19) If water quality standards for surface waters are revised in the plan update, the revised plan must be submitted to the USEPA for approval, pending an USEPA determination that the standards meet the requirements of the Clean Water Act (40 CFR 130.10). The amendments must be forwarded to USEPA within 30 days of adoption by the State Board.

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ENDNOTES

1. Hydrologic Unit - A classification embracing one of the following features which are defined by surface drainage divides: (1) In general, the total watershed area, including water- bearing and non - water bearing formations, such as the total drainage area of the San Diego River Valley; and (2) in coastal areas, two or more small contiguous watersheds having similar hydrologic characteristics, each watershed being directly tributary to the ocean and all watersheds emanating from one mountain body located immediately adjacent to the ocean.

2. Hydrologic Area - A major logical subdivision of a hydrologic unit which includes both water- bearing and nonwater - bearing formations. It is best typified by a major tributary of a stream, a major valley, or a plain along a stream containing one or more ground water basins and having closely related geologic, hydrologic, and topographic characteristics. Area boundaries are based primarily on surface drainage boundaries. However, where strong subsurface evidence indicates that a division of ground water exists, the area boundary may be based on subsurface characteristics.

3. Hydrologic Subarea - A major logical subdivision of a hydrologic area which includes both water- bearing and nonwater - bearing formations.

4. On February 10, 1994 the Regional Board adopted Resolution No. 94-25, A Resolution Adopting Amendments to the Comprehensive Water Quality Control Plan for the San Diego Region for the Laguna (1.10), Mission Viejo (1.20), and San Clemente (1.30), Hydrologic Areas. These hydrologic subareas are: Oso (1.21), Upper Trabuco (1.22), Middle Trabuco (1.23), Upper San Juan (1.25), Middle San Juan (1.26), Lower San Juan (1.27) and Ortega (1.28). The San Clemente Hydrologic Area (1.30) is broken into two hydrologic subareas: Prima Deshecha (1.31) and Segunda Deshecha (1.32).

5. State Water Resources Control Board Resolution No. 68-16, Statement of Policy with Respect to Maintaining High Quality of Waters in California.

6. State Water Resources Control Board Resolution No. 77-1, Policy with Respect to Water Reclamation in California.

7. Point sources of pollution refer to pollutants discharged to water through any discernible, confined, and discrete conveyance. Nonpoint sources of pollution refer to pollutants from diffuse sources that reach water through means other than a discernable, confined, and discrete conveyance.

8. State Board Policy for Regulating Point and Nonpoint Sources of Pollution in Accordance with the Federal Water Pollution Control Act.

9. Best Management Practices are defined as the practice, or combination of practices, that are determined to be the most effective, practicable means of preventing or reducing the amount of pollution generated by nonpoint sources to a level compatible with water quality goals (including technological, economic, and institutional consideration.

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2. BENEFICIAL USES

INTRODUCTION

The purpose of this chapter is to designate the beneficial uses for all surface and ground waters in the San Diego Region. Beneficial uses form the cornerstone of water quality protection under the Basin Plan. Once beneficial uses are designated, appropriate water quality objectives can be established and programs that maintain or enhance water quality can be implemented to ensure the protection of beneficial uses.

Beneficial uses are defined as the uses of water necessary for the survival or well being of man, plants and wildlife. These uses of water serve to promote the tangible and intangible economic, social and environmental goals of mankind. Examples include drinking, swimming, industrial and agricultural water supply, and the support of fresh and saline aquatic habitats.

Section 303 of the federal Clean Water Act (33 U.S.C. section1313) defines the term water quality standards as both the uses of the surface (navigable) waters and the water quality criteria which are applied to protect those uses. A water quality standard defines the water quality goals for a water body by designating the use or uses to be made of the water body, by setting criteria to protect the uses, and by protecting water quality through antidegradation provisions. Under the Porter-Cologne Water Quality Control Act (California Water Code, Division 7, Chapter 2 section13050), these concepts are defined separately as beneficial uses and water quality objectives. Beneficial uses and water quality objectives are required to be established for all waters of the State, both surface and ground waters. Beneficial uses of the surface and ground waters of the San Diego Region are discussed in this chapter; water quality objectives and water quality criteria are discussed in Chapter 3. Numerous key terms used throughout this chapter are defined in the Glossary which is included as Appendix A of this Basin Plan.

BENEFICIAL USES

The designation of beneficial uses must satisfy all of the applicable requirements of the California Water Code, Division 7 and the federal Clean Water Act. California Water Code, Division 7 is also known as the Porter-Cologne Water Quality Control Act. These two names are used interchangeably.

The designation of beneficial uses for the waters of the State by the Regional Board is mandated under California Water Code section 13240. The Clean Water Act, section 303 requires that the State adopt designated beneficial uses for surface waters. The requirements of both Acts applicable to the designation of beneficial uses are summarized below.

BENEFICIAL USE DESIGNATION UNDER THE PORTER-COLOGNE WATER QUALITY CONTROL ACT

The Porter-Cologne Act establishes a comprehensive program for the protection of beneficial uses of the waters of the state. California Water Code section 13050(f) describes the beneficial uses of surface and ground waters that may be designated by the State or Regional Board for protection as follows:

"*Beneficial uses of the waters of the state that may be protected against quality degradation include, but are not necessarily limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves.*"

Significant points regarding the designation of beneficial uses are:

(1) Fish, plants, and other wildlife, as well as humans, use water beneficially. Designation of beneficial uses often includes subcategories of the above beneficial uses cited in California Water Code section 13050(f).

(2) Waste transport or waste assimilation in the state's surface and ground waters may not be designated as beneficial uses under the Porter-Cologne Act. The direction of the Act is to protect surface and ground waters against the adverse effects of waste constituents. (California Water Code section 13000, section 13241, and section

13263). Surface or ground waters may be used for waste disposal or waste assimilation if designated beneficial uses are protected. In authorizing the discharge of waste, the Regional Board need not authorize utilization of the full waste assimilation capacities of the receiving waters [California Water Code section 13263(d)]. All discharges of waste into waters of the state are privileges not rights [California Water Code section 13263(g)].

(3) Designated beneficial uses may include potential beneficial uses if existing water quality will support the use or if the necessary level of water quality can reasonably be achieved. [Water Code section13241 (a) and (c)]. Potential and existing uses are defined later in this chapter.

(4) An existing beneficial use ordinarily must be designated for protection unless another beneficial use requiring more stringent objectives is designated. The existing beneficial use designation is necessary to comply with the statutory policy in California Water Code section 13000, which provides in part that "*...the quality of all waters in the state shall be protected for use and enjoyment by the people of the state.*"

(5) California Water Code section 13000 provides in part that: "*The Legislature ...finds and declares that activities and factors which may affect the quality of the waters of the state shall be regulated to attain the highest possible water quality that is reasonable, considering all demands being made and to be made on those waters and the total values involved, beneficial and detrimental, economic and social, tangible and intangible.*" This policy establishes a general principal of nondegradation, with flexibility to allow some change in water quality which is in the best interests of the state. Changes in water quality are allowed only where beneficial uses are not unreasonably affected.

(6) The designation of beneficial uses must take into account the constitutional prohibition of waste and unreasonable waste of water. Designation of a beneficial use for protection should not require a waste of water pursuant to the California Constitution, article X, section 2.

(7) The protection and enhancement of beneficial uses require that certain quality and quantity objectives be met for surface and ground waters.

BENEFICIAL USE DESIGNATION UNDER THE CLEAN WATER ACT

Beneficial uses for surface waters are designated under the Clean Water Act section 303 in accordance with regulations contained in 40 CFR 131. The State is required to specify appropriate water uses to be achieved and protected. The beneficial use designation of surface waters of the state must take into consideration the use and value of water for public water supplies, protection and propagation of fish, shellfish and wildlife, recreation in and on the water, agricultural, industrial and other purposes including navigation.

Significant points regarding the designation of beneficial uses under the Clean Water Act are:

(1) Existing beneficial uses are those uses actually attained in the water body on or after November 28, 1975 [40 CFR 131.3(e)].

(2) States are prohibited from adopting waste transport or waste assimilation as a designated use for surface waters [40 CFR 131.10(a)].

(3) The water quality standards of downstream waters must be considered and maintained [40 CFR 131.10(b)].

(4) States may adopt sub-categories of a use and set the appropriate criteria to reflect the varying needs of such sub-categories of uses. For example criteria should be set to differentiate between cold water and warm water fisheries [40 CFR 131.10(c)].

(5) At a minimum, uses are deemed attainable if they can be achieved by the imposition of effluent limits required under Clean Water Act, sections 301(b) and 306 and cost effective and reasonable best management practices for nonpoint source control [40 CFR 131.10(d)].

(6) States may adopt seasonal uses as an alternative to redesignation of the beneficial uses of a water body to uses requiring less stringent water quality criteria [40 CFR 131.10(f)].

(7) States may remove a designated beneficial use or substitute sub-categories of a use only if (a) the use is not an existing use and (b) the state can demonstrate that attaining the designated use is not feasible for one of the following reasons [40 CFR 131.10(g)]:

- naturally occurring pollutant concentrations prevent the attainment of the use; or
- natural, ephemeral, intermittent or low flow conditions or water levels prevent the attainment of the use; or
- human caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied or would cause more environmental damage to correct than to leave in place; or
- dams, diversions, or other types of hydrologic modifications preclude the attainment of the use, and it is not feasible to restore the water body to its original condition or to operate such modification in a way that would result in the attainment of the use; or
- physical conditions related to the natural features of the water body, such as the lack of a proper substrate, cover, flow, depth, pools, riffles, and the like, unrelated to water quality, preclude attainment of aquatic life protection uses; or
- controls more stringent than the controls for effluent limitations in Clean Water Act sections 301 (b) and 306 would result in substantial and widespread economic and social impact.

(8) States may not remove designated uses if (a) they are existing uses, unless a use requiring more stringent criteria is added, or (b) such uses will be attained by implementing effluent limits under Clean Water Act sections 301 (b) and 306 and by implementing best management practices for nonpoint source control [40 CFR 131.10(h)].

(9) If existing uses are higher than those specified in water quality standards, a state must revise its standards to reflect the uses actually being attained [40 CFR 131.10(i)].

(10) If the designated uses do not include the uses specified in section 101(a) (2) of the Clean Water Act, or if the state wants to remove a use specified in section 101 (a) (2), the state must conduct a "*use attainability analysis*" [40 CFR 131.10(j)]. A use attainability analysis is defined in 40 CFR 131.3(g) as a "*structured scientific assessment of the factors affecting the attainment of the use which may include physical, chemical, biological, and economic factors.*" The uses listed in section 101 (a)(2) are protection and propagation of fish, shellfish, and wildlife, and recreation (i.e., fishable/ swimmable uses).

BENEFICIAL USE DEFINITIONS

In 1972, the State Board adopted a uniform list and description of beneficial uses to be applied throughout all basins of the State. During the 1994 Basin Plan update, beneficial use definitions were revised and some new beneficial uses were added. Overall, the following twenty-three beneficial uses are now defined statewide and are designated within the San Diego Region:

Municipal and Domestic Supply (MUN) - Includes uses of water for community, military, or individual water supply systems including, but not limited to, drinking water supply.

Agricultural Supply (AGR) - Includes uses of water for farming, horticulture, or ranching including, but not limited to, irrigation, stock watering, or support of vegetation for range grazing.

Industrial Process Supply (PROC) - Includes uses of water for industrial activities that depend primarily on water quality.

Industrial Service Supply (IND) - Includes uses of water for industrial activities that do not depend primarily on water quality including, but not limited to, mining, cooling water supply, hydraulic conveyance, gravel washing, fire protection, or oil well re-pressurization.

Ground Water Recharge (GWR) - Includes uses of water for natural or artificial recharge of ground water for purposes of future extraction, maintenance of water quality, or halting of saltwater intrusion into freshwater aquifers.

Freshwater Replenishment (FRSH) - Includes uses of water for natural or artificial maintenance of surface water quantity or quality (e.g., salinity).

Navigation (NAV) - Includes uses of water for shipping, travel, or other transportation by private, military, or commercial vessels.

Hydropower Generation (POW) - Includes uses of water for hydropower generation.

Beachgoers at La Jolla Shores

Contact Water Recreation (REC-1) - Includes uses of water for recreational activities involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water-skiing, skin and SCUBA diving, surfing, white water activities, fishing, or use of natural hot springs.

Non-contact Water Recreation (REC-2) - Includes the uses of water for recreational activities involving proximity to water, but not normally involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tidepool and marine life study, hunting, sightseeing, or aesthetic enjoyment in conjunction with the above activities.

Commercial and Sport Fishing (COMM) - Includes the uses of water for commercial or recreational collection of fish, shellfish, or other organisms including, but not limited to, uses involving organisms intended for human consumption or bait purposes.

Aquaculture (AQUA) - Includes the uses of water for aquaculture or mariculture operations including, but not limited to, propagation, cultivation, maintenance, or harvesting of aquatic plants and animals for human consumption or bait purposes.

Warm Freshwater Habitat (WARM) - Includes uses of water that support warm water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish or wildlife, including invertebrates.

Cold Freshwater Habitat (COLD) - Includes uses of water that support cold water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish or wildlife, including invertebrates.

Inland Saline Water Habitat (SAL) - Includes uses of water that support inland saline water ecosystems including, but not limited to, preservation or enhancement of aquatic saline habitats, vegetation, fish, or wildlife, including invertebrates.

Estuarine Habitat (EST) - Includes uses of water that support estuarine ecosystems including, but not limited to, preservation or enhancement of estuarine habitats, vegetation, fish, shellfish, or wildlife (e.g., estuarine mammals, waterfowl, shorebirds).

Los Penasquitos Lagoon

Marine Habitat (MAR) - Includes uses of water that support marine ecosystems including, but not limited to, preservation or enhancement of marine habitats, vegetation such as kelp, fish, shellfish, or wildlife (e.g., marine mammals, shorebirds).

Wildlife Habitat (WILD) - Includes uses of water that support terrestrial ecosystems including, but not limited to, preservation and enhancement of terrestrial habitats, vegetation, wildlife (e.g., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources.

Kelp on beach at
San Diego – La Jolla Ecological Reserve

Preservation of Biological Habitats of Special Significance (BIOL) - Includes uses of water that support designated areas or habitats, such as established refuges, parks, sanctuaries, ecological reserves, or Areas of Special Biological Significance (ASBS), where the preservation or enhancement of natural resources requires special protection.

The following coastal waters have been designated as ASBS and State Water Quality Protection Areas (SWQPAs) in the San Diego Region. SWQPAs are a nonterrestrial marine or estuarine area designed to protect marine species or biological communities from an undesirable alteration in natural water quality, including, but not limited to, ASBS that have been designated by the State Water Resources Control Board through its water quality planning process. ASBS are a subset of State Water Quality Protection Areas (SWQPAs). For detailed descriptions of the boundaries of SWQPAs/ASBS, see the discussion on SWQPAs/ASBS in Chapter 5, Plans and Policies:

- Irvine Coast, Orange County
- Heisler Park, Orange County
- La Jolla, San Diego County
- San Diego-Scripps, San Diego County

The following areas are designated Marine Life Refuges. A legal description of the boundaries of each marine life refuge is contained in the Fish and Game Code of California, Division 7 (Refuges), Chapter 2 (Specific Refuge Boundaries), Article 6 (Marine Life Refuge):

- Irvine Coast Marine Life Refuge, Orange County
- Laguna Beach Marine Life Refuge, Orange County
- South Laguna Beach Marine Life Refuge, Orange County
- Niguel Marine Life Refuge, Orange County
- Dana Point Marine Life Refuge, Orange County
- Doheny Beach Marine Life Refuge, Orange County
- City of Encinitas Marine Life Refuge, San Diego County
- San Diego Marine Life Refuge, San Diego County

The following coastal waters have been designated by the California legislature as Marine Protected Areas. Marine Protected Areas are named discrete geographic areas designated to protect and conserve marine life and habitat. All State Marine Parks, State Marine Reserves, and/or State Marine Conservation Areas are classified as Marine Protected Areas. A coastal water may be designated with more than one classification. A legal description of the boundaries of each Marine Protected Area can be found at California Department of Fish and Game, Marine Region, 20 Lower Ragsdale Drive, Suite 100, Monterey, CA 93940.

The following areas are designated State Marine Parks:

- Irvine Coast State Marine Park, Orange County
- Laguna Beach State Marine Park, Orange County
- South Laguna Beach State Marine Park, Orange County
- Niguel State Marine Park, Orange County
- Dana Point State Marine Park, Orange County
- Doheny Beach State Marine Park, Orange County
- Buena Vista Lagoon State Marine Park, San Diego County
- Batiquitos Lagoon State Marine Park, San Diego County
- San Elijo Lagoon State Marine Park, San Diego County
- San Dieguito Lagoon State Marine Park, San Diego County

The following areas are designated State Marine Reserves:

- Heisler Park State Marine Reserve, Orange County
- Agua Hedionda Lagoon State Marine Reserve, San Diego County

The following areas are designated State Marine Conservation Areas:

- Crystal Cove State Marine Conservation Area, Orange County
- Doheny State Marine Conservation Area, Orange County
- Encinitas State Marine Conservation Area, San Diego County
- Cardiff and San Elijo State Marine Conservation Area, San Diego County
- San Diego – Scripps State Marine Conservation Area, San Diego County
- La Jolla State Marine Conservation Area, San Diego County
- Mia J. Tegner State Marine Conservation Area, San Diego County

The following areas are designated Ecological Reserves by the Fish and Game Commission (California Code of Regulations, Title 14, section 630). A legal description of the boundaries of each ecological reserve is on file at the California Department of Fish and Game headquarters, 1416 Ninth Street, Sacramento, CA 95814, and at California Department of Fish and Game, Lands and Facilities Branch, 1812 Ninth Street, Sacramento, CA 95814:

- Agua Hedionda Lagoon Ecological Reserve, San Diego County
- Batiquitos Lagoon Ecological Reserve, San Diego County
- Blue Sky Ecological Reserve, San Diego County
- Boden Canyon Ecological Reserve, San Diego County
- Boulder Creek/Rutherford Ranch, San Diego County
- Buena Vista Lagoon Ecological Reserve, San Diego County
- Carlsbad Highlands Ecological Reserve, San Diego County
- Crestridge Ecological Reserve, San Diego County
- Dairy Mart Ponds Ecological Reserve, San Diego County
- Del Mar Mesa/ Lopez Ridge Ecological Reserve, San Diego County
- Heisler Park Ecological Reserve, Orange County
- Laguna Laurel Ecological Reserve, Orange County
- Lake Hodges Ecological Reserve, San Diego County
- McGinty Mountain Ecological Reserve, San Diego County
- Meadowbrook Ecological Reserve, San Diego County
- Otay Mountain Ecological Reserve, San Diego County
- Pilgrim Creek Ecological Reserve, San Diego County
- Plaisted Creek Ecological Reserve, San Diego County
- Rancho Jamul Ecological Reserve, including the Headquarters Unit, San Diego County
- San Diego - La Jolla Ecological Reserve, San Diego County
- San Diego River Ecological Reserve, San Diego County
- San Dieguito Lagoon Ecological Reserve, San Diego County
- San Elijo Lagoon Ecological Reserve, San Diego County
- San Luis Rey River Ecological Reserve, San Diego County
- Santa Rosa Plateau Ecological Reserve, Riverside County
- Sycuan Peak Ecological Reserve, San Diego County

The following area is designated a Wildlife Area by the Fish and Game Commission (California Code of Regulations, Title 14, section 630). A legal description of the boundaries of the wildlife area is on file at the California Department of Fish and Game headquarters, 1416 Ninth Street, Sacramento 95814, and at California Department of Fish and Game, Lands and Facilities Branch, 1812 Ninth Street, Sacramento, CA 95814:

- Hollenbeck Canyon Wildlife Area, San Diego County

The following areas are designated Natural Preserves by the State Park and Recreation Commission (Public Resources Code, Division 5, Chapter 1, Article 1.7 section 5019.71). A legal description of each natural preserve is on file at the California Department of Parks and Recreation headquarters, 1416 Ninth Street, Sacramento, CA 95814:

- Trestles Wetlands Natural Preserve, San Diego County
- Los Penasquitos Marsh Natural Preserve, San Diego County
- Ellen Browning Scripps Natural Preserve, San Diego County
- Silver Strand Natural Preserve, San Diego County
- Tijuana Estuary Natural Preserve, San Diego County

The following area is designated a National Estuarine Research Reserve by the National Oceanic and Atmospheric Administration (NOAA) (Coastal Zone Management Act of 1972 as amended section 315, 16 USC 1461). A legal description of the boundaries of the national estuarine research reserve is on file at the NOAA headquarters, Office of Ocean and Coastal Resource Management, NOAA, Washington, D.C., 20235:

- Tijuana River National Estuarine Research Reserve, San Diego County

Tijuana River mouth
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California Coastal Records Project, www.californiacoastline.org

The following areas are managed by the U.S. Fish and Wildlife Service as part of the National Wildlife Refuge System A legal description of the boundaries of each National Wildlife Refuge is on file at the San Diego National Wildlife Refuge Complex, 6010 Hidden Valley Road, Carlsbad, CA 92011:

- San Diego National Wildlife Refuge, San Diego County
  - Otay – Sweetwater Unit
  - Vernal Pool Unit
- San Diego Bay National Wildlife Refuge, San Diego County
  - South San Diego Bay Unit
  - Sweetwater Marsh Unit
- Tijuana Slough National Wildlife Refuge, San Diego County

Rare, Threatened, or Endangered Species (RARE) - Includes uses of water that support habitats necessary, at least in part, for the survival and successful maintenance of plant or animal species established under state or federal law as rare, threatened or endangered.

Migration of Aquatic Organisms (MIGR) - Includes uses of water that support habitats necessary for migration, acclimatization between fresh and salt water, or other temporary activities by aquatic organisms, such as anadromous fish.

Spawning, Reproduction, and/or Early Development (SPWN) - Includes uses of water that support high quality habitats suitable for reproduction, early development and sustenance of marine fish and/or cold freshwater fish.

Shellfish Harvesting (SHELL) - Includes uses of water that support habitats suitable for the collection of filter-feeding shellfish (e.g., clams, oysters and mussels) for human consumption, commercial, or sport purposes.

EXISTING AND POTENTIAL BENEFICIAL USES

The water resources of the San Diego Region have been extensively developed over the years and today's existing beneficial uses will probably continue into the future. Since the adoption of the Basin Plan in 1975, changes in land use patterns and resultant changes in water quality have led to some subsequent modifications of beneficial use designations. Minor modifications have also been also made to clarify the definition of some of the beneficial use designations.

The beneficial use designations described in this chapter are categorized as "*existing*" or "*potential*" beneficial uses. An existing beneficial use can be established by demonstrating that:

- Fishing, swimming, or other uses have actually occurred since November 28, 1975; or
- The water quality and quantity is suitable to allow the use to be attained.

Existing beneficial uses were originally determined as part of a use survey of water resources in the Region described in Chapter 1, *History of Basin Planning in the San Diego Region.* Beneficial use designations have also been determined using additional information gathered since 1975. Beneficial uses are

designated as "*potential*" for a variety of reasons, including:

- Plans are proposed to put the water to a future use;
- Potential exists to put the water to a future use;
- The public desires to put the water to future use;
- The water is potentially suitable for municipal or domestic water supply under the terms of the *Sources of Drinking Water* Policy (State Board Resolution No. 88-63); or
- The Regional Board has designated a beneficial use as a regional water quality goal.

BENEFICIAL USES FOR SPECIFIC WATER BODIES

Designated beneficial uses are summarized in the tables at the end of this chapter as follows:

Table 2-2 Inland Surface Waters,

Table 2-3 Coastal Waters,

Table 2-4 Reservoirs and Lakes, and

Table 2-5 Ground Water.

In the tables, a "●" indicates an existing beneficial use that was actually attained in the surface or ground water on or after November 28, 1975. A "O" indicates a potential beneficial use that may develop in future years. A "+" indicates that the water body has been exempted by the Regional Board from the municipal use designation under the terms and conditions of State Board Resolution No. 88-63, *Sources of Drinking Water* Policy.

Designated beneficial uses are generally, but not always, present throughout the entire reach of a particular hydrologic unit, area, subarea, or water body. Designated beneficial uses may not be present throughout the year. Specific beneficial uses near or below discharges will be carefully evaluated by the Regional Board during the development of waste discharge requirements or enforcement orders.

Beneficial uses are designated for (a) native waters and (b) imported waters stored in a reservoir. They do not represent the use of water directly imported into the hydrologic basin, unless storage of the imported water occurs within the basin. The lack of a beneficial use listed for any given area does not rule out the possibility of existing or future beneficial uses. Existing beneficial uses which have not been formally designated in this Basin Plan are protected as well as designated uses.

DESIGNATION OF RARE BENEFICIAL USE

The RARE beneficial use designation was based, in large part, on the information contained within RareFind. RareFind is the personal computer application of the California Department of Fish and Game's (DFG's) Natural Diversity Data Base (NDDB). The NDDB tracks the location and condition of California's rare, threatened, endangered, and sensitive plants, animals and natural communities. The NDDB is the most complete single source of information on California's rare, endangered, threatened and sensitive species, and natural communities. However, the absence of a special animal, plant or natural community from the RareFind report does not necessarily mean that they are absent from the area in question, only that no occurrence data are currently entered in the NDDB inventory.

Under the Fish and Game Code, as well as the California Environmental Quality Act, a state lead agency is required to consult with the Department of Fish and Game (DFG) to determine whether a project under consideration (e.g., the Basin Plan or a permitting process) will adversely affect any threatened or endangered species. The consultation process is important in identifying bodies of water that support threatened or endangered species. During the Basin Plan consultation process in 1994, the DFG provided recent sightings of the bald eagle (*Haliaeetus leucocephalus*). The U.S. Fish and Wildlife Service provided recent surveys for the least Bell's vireo (*Vireo belli pusillus*) and southwestern willow flycatcher (*Empidonax trailli extimus*). These and other information sources are listed in the references for this chapter.

To ensure the applicability of the RareFind information, only current sightings (i.e., those sightings since November 28, 1975) were used. In addition, consideration was given to the frequency, abundance, and occurrence history

for each sighting(s), and how recent the sighting was. The RARE designation has been added where there is substantial evidence that the water body supports threatened or endangered species. By definition, water bodies with a RARE designation support habitats necessary, at least in part, for the survival and successful maintenance of plant or animal species established under state or federal law as rare, threatened or endangered. Those plant or animal species which were used in the designation of specific water bodies with the RARE beneficial use are shown in Table 2-1. The Regional Board can provide specific information about the sighting(s) used to designate the RARE beneficial use. However, it is the responsibility of the lead agency or project sponsor to provide adequate information as to whether a proposed project will affect fish and wildlife (including plants) and their habitats.

The RARE beneficial use is generally, but not always, present throughout the entire reach of a particular waterbody. Also, the RARE beneficial use may not be present throughout the year. The RARE designation is placed on bodies of water where the protection of a threatened or endangered species depends on the water either directly, or to support its habitat. The purpose of the RARE designation for a particular water body is to highlight the existence of the threatened or endangered species. This will ensure that, absent extraordinary circumstances, they are not placed in jeopardy by the quality of the discharges to those water bodies.

Recognition that a water body is used by threatened or endangered species (RARE designation) does not necessarily mean that any particular suite of water quality objectives will be applied to the water body. In the absence of species specific or site specific objectives, the Regional Board would rely on objectives for WARM and COLD to implement the RARE designation. The existing WARM and COLD beneficial use designations are believed to be stringent enough to protect threatened or endangered species. If these issues arise in the future, they will be decided on a case-by-case basis, considering the most recent scientific data, site-specific factors, and other beneficial uses.

DESIGNATION OF COLD FRESHWATER HABITAT BENEFICIAL USE

Water bodies with a "*Cold Freshwater Habitat*" (COLD) beneficial use designation support cold freshwater ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.

In the San Diego Region, the cold freshwater fish used for the COLD designation is the rainbow trout. The rainbow trout, *Oncorhynchus mykiss*, is native to the Region. Rainbow trout which migrate from fresh water to the ocean are known as steelhead and those which remain in fresh water are known as a resident population. In addition, hatchery stocked rainbow trout have been planted throughout the Region since the 1880's. Some of these hatchery stocked trout have developed wild populations, and some have hybridized with native trout populations. Other species of trout may have been stocked from time to time, by various mechanisms into the Region's water bodies. (One of these trout is the European brown trout, *Salmo trutta*. At the present time, the brown trout is no longer stocked due to concern for its impacts on fishery resources and the fact that it is picivorous.)

Cold fresh water bodies are usually below 70° F, contain well-oxygenated water, and contain cold freshwater aquatic habitat suitable for cold freshwater fish. Optimum temperatures for growth and for most life stages of rainbow trout are 56 to 70° F (Moyle, 1976). The temperature tolerance for rainbow trout is reported to be from about 32° F to the mid-80's depending on the oxygen content of the water, size of fish, and the degree of acclimation. To survive at the higher water temperatures, trout require a gradual acclimation and water that is saturated with oxygen. Also, smaller trout may withstand the higher temperatures better than the larger fish.

Rainbow trout prefer well-oxygenated water but can survive at very low oxygen levels, the level tending to be less at lower temperatures and longer periods of acclimation. For example, mean lethal oxygen concentrations range from 1.05 part per million (ppm) at 52° F to 1.51 ppm at 68° F for rainbow trout averaging 3.8 inches in length (McAfee, 1966).

Rainbow trout do well in waters of pH from 7 to 8 and have adapted to waters of varying pH, ranging from at least 5.8 to 9.6 (Sigler, 1987).

Table 2 - 1. Water - Dependent Threatened or Endangered Species Which Were Considered in the RARE Beneficial Use Designation

NAME	STATUS*	TYPE	HABITAT REMARKS
Blue whale *Balaenoptera musculus*	FE	Mammal	Ocean
Western snowy plover *Charadrius alexandrinus nivosus* (breeding)	FE, CSC	Shore bird	Beaches, Estuarine Salt Ponds
Pacific green sea turtle *Chelonia mydas*	FE	Reptile	Marine
Salt-marsh bird's beak *Cordylanthus maritimus* ssp. *maritimus*	SE, FE	Plant	Salt Marsh
Southwestern willow flycatcher *Empidonax traillii extimus*	SE, Proposed FE	Bird	Riparian Woodland Habitat
Tidewater goby *Eucyclogobius newberryi* (Girard)	FE	Fish	Shallow Marine Waters, and in the Lower Reaches of Streams
Bald eagle *Haliaeetus leucocephalus*	SE, FT, CP	Bird	Lake
Humpback whale *Megaptera novaeangliae*	FE	Mammal	Ocean
Willowy monardella *Monardella linoides* ssp. *viminea*	SE, C2	Plant	Riparian Scrub Habitat
Belding's savannah sparrow *Passerculus sandwichensis beldingi*	SE, C2	Bird	Coastal Wetlands
California brown pelican *Pelecanus occidentalis californicus*	SE, FE	Bird	Estuarine, Marine, Subtidal, and Marine Pelagic Waters
Light-footed clapper rail *Rallus longirostris levipes*	FE, CP	Bird	Coastal Marshes, Mudflats
California least tern *Sterna antillarum browni*	SE, FE	Bird	Marine, Coastal Area Waters
Least Bell's vireo *Vireo bellii pusillus*	SE, FE	Bird	Riparian Woodland Habitat

Status *

Federally threatened (FT) or endangered (FE) species are defined under section 3 of the federal Endangered Species Act of 1973 (50 CFR 17). An endangered species is any species, including subspecies and varieties, "*in danger of extinction throughout all or a significant portion of its range*." A threatened species is any species "*likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range*." Threatened and endangered species have been the subject of a proposed and final rule (or regulation) published in the Federal Register. Thus, these species are also referred to as listed species. Proposed species are species proposed for listing as a threatened or endangered species for which a proposed rule, but not a final rule, has been published in the Federal Register.

Proposed species are granted limited protection under the federal Endangered Species Act. These species must be addressed by federal agencies in biological assessments (section 7), and are given special management consideration by regulatory agencies. Candidate species are species under consideration for listing, but have not been subject to a proposed rule. Categories for candidate species relate solely to the level of biological information available and not to the degree of threat. Candidate species are not protected under the federal Endangered Species Act.

Candidate species however, are afforded special management consideration due to their status and sensitivity. The U.S. Fish and Wildlife Service provides technical assistance to Federal, State and local agencies on the conservation and management of candidate species. Candidate species in category 1 (C1) are those taxa that seem to conform to the State definition of threatened or endangered species and should be added to the offical list. Candidate species in category 2 (C2) are those taxa that have populations that are low, scattered, or highly localized. Their populations have declined in abundance in recent years and so require management to prevent them from becoming threatened species.

The definitions of state threatened (ST) or endangered (SE) species under the California Endangered Species Act are the same as under the federal Endangered Species Act. Under the State Act, all animals previously listed as Rare have been "*grandfathered*" into the State Act as threatened. All plants previously listed as Rare have been kept as Rare. All plants now listed under the State Act are listed as threatened or endangered.

California Species of Special Concern (CSC) are animal species that have no specific status as a state listed species, but which appear to be vulnerable to extinction because of declining populations, limited ranges, or rarity. CSC meet the criteria for state listing and are commonly addressed under the California Environmental Quality Act. The category of California Fully Protected Species (CP) was established by the California legislature and prohibits the possession or taking of sensitive animals, or parts thereof (sections 3511, 4700, 5050, and 5515, Fish and Game Code).

In cold fresh water bodies, where the water body is free-flowing, such as in a river, stream or creek, the habitat usually supports a diversity of aquatic insects, including those aquatic insects which require a high quality of water. Typically, there is overhanging cover and shade, provided by a variety of aquatic plants, terrestrial plants, and trees. Another characteristic is that the bottom substrate usually contains structure, provided by tree root wads, logs, boulders, or gravel.

DESIGNATION OF SPAWNING, REPRODUCTION, AND/ OR EARLY DEVELOPMENT BENEFICIAL USE

In the San Diego Region, the 'spawning, reproduction and/or early development' (SPWN) beneficial use designation is assigned only to water bodies with MAR and/ or COLD beneficial uses. The marine fish used for the SPWN designation includes any marine fish. The cold freshwater fish used for the SPWN designation is the rainbow trout. Rainbow trout usually spawn in the Spring, and require spawning areas with gravel and cool, free-flowing, well-oxygenated water. Rainbow trout prefer to spawn in rivers, streams and creeks with a moderate gradient and containing riffles, however some populations of rainbow trout are also known to successfully spawn in lake inlets and outlets. The fry of rainbow trout need suitable nurseries, which allow protection from predators, such as the slow, shallow areas adjacent to riffles, with shade from bank vegetation. The fry also require an abundance of aquatic insects for forage.

SOURCES OF DRINKING WATER POLICY

Clouds

In November 1986, the Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65) was approved by the California voters. Proposition 65 prohibits the discharge of toxic substances into "*sources of drinking water*". The State Board has defined the term "*sources of drinking water*" in Resolution No. 88-63, *Sources of Drinking Water* Policy. This policy specifies that, except under specifically defined conditions, all surface and ground waters of the state are to be protected as existing or potential sources of municipal and domestic water supply. The exceptions include where:

- The total dissolved solids concentration of surface and ground waters exceed 3,000 milligrams per liter (mg/l);
- The water source has a low sustainable yield of less than 200 gallons per day for a single well;
- There is contamination that cannot reasonably be treated for domestic use with either best management practices or best economically available treatment practices;
- The surface waters are in particular municipal, industrial, and agricultural conveyance and holding facilities; and
- The ground waters are regulated geothermal energy ground waters.

Resolution No. 88-63 provides that any water body designated with an existing or potential municipal and domestic supply (MUN) beneficial use is also defined as a suitable or potentially suitable source of drinking water. The policy also allows a water body to retain beneficial use designations assigned prior to the State Board's adoption of the "*Sources of Drinking Water*" Policy.

EXCEPTIONS TO THE "SOURCES OF DRINKING WATER" POLICY

In 1989 the Regional Board adopted Resolution No. 89-33, *'Incorporation of "Sources of Drinking Water"* Policy into the Water Quality Control Plan (Basin Plan) of the San Diego Region'. Resolution No. 89-33 incorporates the State Board's "*Sources of Drinking Water*" Policy into the Basin Plan. Resolution No. 89-33 also provides an initial list of surface and ground water hydrologic units (HUs), areas (HAs), and subareas (HSAs) which the Regional Board has previously determined do not support the MUN or "*Sources of Drinking Water*" designation. Since 1989, additional areas have also been identified as exceptions to the "*Sources of Drinking Water*" Policy. These ground and surface water HUs, HAs, and HSAs are identified in Tables 2-2 and 2-5 with a "+" indicating that the water body has been exempted by the Regional Board from the municipal use designation under the terms and conditions of State Board Resolution No. 88-63, "*Sources of Drinking Water*" Policy.

Arroyo chub

INLAND SURFACE WATERS

Inland surface waters consist of all waters in the Region exclusive of the waters of the Pacific Ocean, enclosed bays and estuaries, coastal lagoons, and ground waters. The existing and potential beneficial uses of inland surface waters and their tributaries in the Region are presented in Table 2-2. Hydrologic unit, area, and subarea numbers are noted in Table 2-2 as a cross reference to the classification system developed by the California Department of Water Resources. For those surface water bodies that cross into other hydrologic units, such water bodies appear more than once in a table. In Table 2-2, starting from the north and proceeding towards the south within the Region, watersheds are listed by the direction of flow from the headwaters downstream to the outlet. Within a particular watershed, the mainstream water body is listed first and is placed flush left in the table, the upstream tributaries are listed below the mainstream water body and placed to the right. In most instances, surface waters are subdivided into reaches at hydrologic subarea boundaries. Those waters not specifically listed (generally smaller tributaries) are designated with the same beneficial uses as the streams, lakes, or reservoirs to which they are tributary.

Although most free flowing streams in the Region are essentially interrupted in character having both perennial and ephemeral components, several beneficial uses, including aesthetic enjoyment and habitats for fish and wildlife, are made of these surface waters. Beneficial uses of inland surface waters generally include REC-1 (swimmable) and WARM or COLD. Additionally, inland waters are usually designated as IND, PRO, REC-2, WILD, and are sometimes designated as BIOL and RARE. Inland surface waters that meet the criteria mandated by the *Sources of Drinking Water* Policy are designated MUN. Unless otherwise designated by the Regional Board, all inland surface waters in the Region are considered suitable or potentially suitable as a municipal and domestic water supply.

COASTAL WATERS

Coastal waters discussed in this section may be defined as waters subject to tidal action and include the water bodies defined below. Beneficial uses of coastal waters in the region generally include REC-1, REC-2, EST, WILD, RARE, and MAR. The Pacific Ocean and San Diego Bay also include NAV.

- ***Ocean Waters***

Ocean Waters are the territorial marine waters of the Region as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons.

- ***Enclosed Bays***

Enclosed bays are indentations along the coast which enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays includes all bays where the narrowest difference between the headlands or outermost harbor works is less than 75% of the greatest dimension of the enclosed portion of the bay. Enclosed bays do not include inland surface waters or ocean waters.

- ***Estuaries***

Estuaries means waters, including coastal lagoons, located at the mouths of streams which serve as areas of mixing for fresh and ocean waters. Coastal lagoons and mouths of streams which are temporarily separated from the ocean by sandbars are considered estuaries. Estuarine waters are considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and sea water. Estuaries do not include inland surface waters or ocean waters.

Beneficial uses for these coastal waters provide habitat for marine life and are used extensively for recreation, boating, shipping, and commercial and sport fishing. Coastal waters in the San Diego Region have as many as fourteen designated beneficial uses.

All coastal lagoons of the Region are included in the category "*Coastal Waters*". The mouths of most of the rivers and creeks are continually

affected by tidal action and present a relatively stable environment for wildlife and vegetation. Other coastal lagoons may be separated from tidal action by earthen deposits and thus present an environment with major seasonal variations. Such conditions result in the development of a unique biologic community highly specific to that area. Occasionally, the mouths of these coastal lagoons are opened, subjecting the lagoons to tidal flushing to enhance their value for recreational use. This action would not alter the categories of beneficial uses of the coastal lagoons.

A listing of coastal waters in the San Diego Region and the existing and potential beneficial uses of each are summarized in Table 2-3.

Lower Otay Reservoir

RESERVOIRS AND LAKES

The water resources with the greatest diversity of beneficial uses in the Region are the man-made water storage reservoirs and lakes. Located in nearly all of the Region's hydrologic units, these reservoirs and lakes intercept surface runoff and store imported water supplies. As such, the storage reservoirs serve as: (1) sources of supply for municipalities, agricultural areas, and industrial operations; (2) recreational bodies; and (3) habitats for fish and wildlife. In a few cases, such as reservoirs used primarily for drinking water, REC-1 uses can be restricted or prohibited by the entities that manage these waters. Many of these reservoirs, however, are designated as potential for REC-1, reflecting federal Clean Water Act goals.

A listing of existing and potential beneficial uses of major reservoirs and lakes in the San Diego Region is given in Table 2-4.

GROUND WATERS

Ground water is defined as subsurface water that occurs beneath the water table in soils and geologic formations that are fully saturated. Ground water bearing formations sufficiently permeable to transmit and yield significant quantities of water are called aquifers (Bouwer, 1978). A ground water basin is defined as a hydrogeologic unit containing one large aquifer or several connected and interrelated aquifers (Todd, 1980).

The principal ground water basins in the San Diego Region are small and shallow. Only a small portion of the Region is underlain by permeable geologic formations that can accept, transmit and yield appreciable quantities of ground water. In many parts of the Region, usable ground water occurs outside of the principal ground water basins. There are ground water bearing geologic formations in the Region that do not meet the definition of an aquifer. Accordingly, the term "*ground water*" for basin planning and regulatory purposes, includes all subsurface waters that occur in fully saturated zones within soils, and other geologic formations. Subsurface waters are considered ground water even if the waters do not occur in an aquifer or an identified ground water basin.

Ground waters in the San Diego Region can have as many as six designated beneficial uses including: (1) municipal and domestic; (2) agricultural; (3) industrial service supply; (4) industrial process supply; (5) ground water recharge; and (6) freshwater replenishment. Nearly all of the ground water development in the Region has been for the purpose of municipal and agricultural supply. Ground water uses in some hydrologic units have been expanded to include industrial uses, especially gravel and sand washing. The fresh water replenishment designation has been assigned to ground water basins that are utilized for supplying water to a lake or stream. The ground water recharge designation has been applied to ground water hydrologic units which are used to recharge another hydrologic unit.

Most of the ground waters in the Region have been extensively developed; the availability of potential future uses of ground water resources is limited. Further development of ground water resources would probably necessitate ground

water recharge programs to maintain adequate ground water table elevations.

Ground waters that meet the criteria mandated by the *Sources of Drinking Water* Policy are designated MUN. Unless otherwise designated by the Regional Board all ground waters in the Region are considered suitable or potentially suitable as sources of drinking water.

The Regional Board has deleted beneficial use designations in portions of certain hydrologic ground water units, areas or subareas. Available information indicated that the beneficial uses in portions of these hydrologic ground water basins did not occur and were not likely to occur in the future. The Regional Board will issue waste discharge requirements and enforcement orders in these basins in conformance with the terms and conditions of State Board Resolution No. 68-16, *Statement of Policy With Respect to Maintaining High Quality of Waters in California*. It is the Regional Board's intent that water quality be maintained in conformance with the terms and conditions of Resolution No. 68-16.

A listing of the beneficial uses of the ground waters in the Region is presented in Table 2-5.

BENEFICIAL USE TABLES

Designated beneficial uses are summarized in the tables at the end of this chapter as follows:

Table 2-2 Inland Surface Waters;
Table 2-3 Coastal Waters;
Table 2-4 Reservoirs and Lakes; and
Table 2-5 Ground Water.

In the tables, a "●" indicates an existing beneficial use that was actually attained in the surface or ground water on or after November 28, 1975. A "○" indicates a potential beneficial use that will probably develop in future years through the implementation of various control measures. Potential uses also include uses that have been developed in the past but have been abandoned for reasons other than water quality. A "+" indicates that the water body has been exempted by the Regional Board from the municipal use designation under the terms and conditions of State Board Resolution No. 88-63, *Sources of Drinking Water* Policy.

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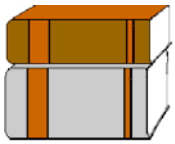

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Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
Orange County Coastal Streams																
Moro Canyon	1.11	+	●						○	●		●		●		
unnamed intermittent coastal streams	1.11	+	●						○	●		●		●		
Emerald Canyon	1.11	+	●						○	●		●		●		
Boat Canyon	1.11	+	●						○	●	●	●		●		
Laguna Canyon	1.12	+	●						○	●		●		●		
Blue Bird Canyon	1.12	+	●						○	●		●		●		
Rim Rock Canyon	1.12	+	●						○	●		●		●		
unnamed intermittent coastal streams	1.13	+	●						○	●		●		●		
Hobo Canyon	1.13	+	●						○	●		●		●		
Aliso Creek Watershed																
Aliso Creek [3]	1.13	+	●						○	●		●		●		
English Canyon	1.13	+	●						○	●		●		●		
Sulphur Creek	1.13	+	●						○	●		●		●		
Wood Canyon	1.13	+	●						○	●		●		●		
Aliso Creek Mouth	1.13	See Coastal Waters – Table 2-3														

● Existing Beneficial Use

○ Potential Beneficial Use

\+ Excepted from MUN (See Text)

[1] Waterbodies are listed multiple times if they cross hydrologic area or sub area boundaries.

[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

[3] Aliso Creek, San Juan Creek, Tecolote Creek, Forrester Creek, San Diego River (lower), and Chollas Creek are designated as water quality limited segments for indicator bacteria pursuant to Clean Water Act section 303(d). Total Maximum Daily Loads have been adopted to address these impairments. See Chapter 3, *Water Quality Objectives,* Bacteria –Total Coliform, Fecal Coliform, *E. Coli*, and Enterococci, and Chapter 7, *Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)*.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
Dana Point Watershed																
unnamed intermittent coastal streams	1.14	+	●						○	●		●		●		
Salt Creek	1.14	+	●						○	●		●		●		
San Juan Canyon	1.14	+	●						○	●		●		●		
Arroyo Salada	1.14	+	●						○	●		●		●		
San Juan Creek Watershed																
San Juan Creek [3]	1.25	+	●	●					●	●		●	●	●		
Morrell Canyon	1.25	+	●	●					●	●		●	●	●		
Decker Canyon	1.25	+	●	●					●	●		●	●	●		
Long Canyon	1.25	+	●	●					●	●		●	●	●		
Lion Canyon	1.25	+	●	●					●	●		●	●	●		●
Hot Spring Canyon	1.25	+	●	●					●	●		●	●	●		●
Cold Spring Canyon	1.25	+	●	●					●	●		●	●	●		
Lucas Canyon	1.25	+	●	●					●	●		●	●	●		
Aliso Canyon	1.25	+	●	●					●	●		●	●	●		
Verdugo Canyon	1.25	+	●	●					●	●		●	●	●		
Bell Canyon	1.25	+	●	●					●	●		●	●	●		
Fox Canyon	1.25	+	●	●					●	●		●	●	●		

● Existing Beneficial Use

○ Potential Beneficial Use

\+ Excepted from MUN (See Text)

[1] Waterbodies are listed multiple times if they cross hydrologic area or sub area boundaries.

[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

[3] Aliso Creek, San Juan Creek, Tecolote Creek, Forrester Creek, San Diego River (lower), and Chollas Creek are designated as water quality limited segments for indicator bacteria pursuant to Clean Water Act section 303(d). Total Maximum Daily Loads have been adopted to address these impairments. See Chapter 3, *Water Quality Objectives,* Bacteria -Total Coliform, Fecal Coliform, *E. Coli*, and Enterococci, and Chapter 7, *Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)*.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
San Juan Creek Watershed – continued																
Dove Canyon	1.24	+	●	●					●	●		●	●	●		
Crow Canyon	1.25	+	●	●					●	●		●	●	●		
San Juan Creek	1.26	+	●	●					●	●		●	●	●		
Trampas Canyon	1.26	+	●	●					●	●		●	●	●		
Canada Gobernadora	1.24	+	●	●					●	●		●	●	●		
Canada Chiquita	1.24	+	●	●					●	●		●	●	●		
San Juan Creek	1.28	+	●	●					●	●		●	●	●		
San Juan Creek	1.27	+	●	●					●	●		●	●	●		
Horno Creek	1.27	+	●	●					●	●		●	●	●		
Arroyo Trabuco Creek	1.22	+	●	●					●	●		●	●	●		●
Holy Jim Canyon	1.22	+	●	●					●	●		●	●	●		●
Falls Canyon	1.22	+	●	●					●	●		●	●	●		
Rose Canyon	1.22	+	●	●					●	●		●	●	●		
Hickey Canyon	1.22	+	●	●					●	●		●	●	●		
Live Oak Canyon	1.22	+	●	●					●	●		●	●	●		
Arroyo Trabuco Creek	1.23	+	●	●					●	●		●	●	●		
Tijeras Canyon	1.23	+	●	●					●	●		●	●	●		

● Existing Beneficial Use

+ Excepted from MUN (See Text)

[1] Waterbodies are listed multiple times if they cross hydrologic area or sub area boundaries.

[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
San Juan Creek Watershed – continued																
Arroyo Trabuco Creek	1.27	+	●	●					●	●		●	●	●		
Oso Creek	1.21	+	●	●					●	●		●	●	●		
La Paz Creek	1.21	+	●	●					●	●		●	●	●		
San Juan Creek Mouth	1.27	See Coastal Waters – Table 2-3														
Orange County Coastal Streams																
Prima Deshecha Canada	1.31	+	●						○	●		●		●		
unnamed intermittent coastal streams	1.30	+	●						○	●		●		●		
Segunda Deshecha Canada	1.32	+	●						○	●		●		●		
San Mateo Creek Watershed																
San Mateo Creek	1.40	+							○	●		●	●	●	●	●
Devil Canyon Creek	1.40	+							○	●		●	●	●		●
Cold Spring Canyon	1.40	+							○	●		●	●	●		
San Mateo Canyon	1.40	+							○	●		●	●	●	●	●
Los Alamos Canyon	1.40	+							○	●		●	●	●		●
Wildhorse Canyon	1.40	+							○	●		●	●	●		
Tenaja Canyon	1.40	+							○	●		●	●	●		●
Bluewater Canyon	1.40	+							○	●		●	●	●		

● Existing Beneficial Use

○ Potential Beneficial Use

\+ Excepted from MUN (See Text)

[1] Waterbodies are listed multiple times if they cross hydrologic area or sub area boundaries.

[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
San Mateo Creek Watershed – continued																
Nickel Canyon	1.40	+							○	●		●	●	●		
Christianitos Creek	1.40	+							○	●		●	●	●		
Gabino Canyon	1.40	+							○	●		●	●	●		
La Paz Canyon	1.40	+							○	●		●	●	●		
Blind Canyon	1.40	+							○	●		●	●	●		
Talega Canyon	1.40	+							○	●		●	●	●		
San Mateo Creek Mouth	1.40	See Coastal Waters – Table 2-3														
San Onofre Creek Watershed																
San Onofre Creek	1.51	+	●						●	●		●	●	●		●
San Onofre Canyon North Fork	1.51	+	●						●	●		●	●	●		●
Jardine Canyon	1.51	+	●						●	●		●	●	●		
San Onofre Canyon	1.51	+	●						●	●		●	●	●		●
San Onofre Canyon South Fork	1.51	+	●						●	●		●	●	●	●	
San Onofre Creek Mouth	1.51	See Coastal Waters – Table 2-3														
unnamed intermittent coastal streams	1.51	+	●						●	●		●		●		
Foley Canyon	1.51	+	●						●	●		●		●		
Horno Canyon	1.51	+	●						●	●		●		●		

● Existing Beneficial Use

○ Potential Beneficial Use

\+ Excepted from MUN (See Text)

[1] Waterbodies are listed multiple times if they cross hydrologic area or sub area boundaries.

[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
San Onofre Creek Watershed – continued																
Las Flores Creek	1.52	+	●						●	●		●	●	●	●	
Piedra de Lumbre Canyon	1.52	+	●						●	●		●	●	●	●	
unnamed intermittent coastal streams	1.52	+	●						●	●		●		●		
Aliso Canyon	1.53	+	●						●	●		●	●	●	●	
French Canyon	1.53	+	●						●	●		●		●	●	
Cockleburr Canyon	1.53	+	●						●	●		●		●		
Santa Margarita River Watershed																
Santa Margarita River	2.22	●	●	●					●	●		●	●	●	●	
Murrieta Creek	2.31	●	●	●	●				○	●		●		●		
Bundy Canyon	2.31	●	●	●	●				○	●		●		●		
Slaughterhouse Canyon	2.31	●	●	●	●				○	●		●		●		
Murrieta Creek	2.32	●	●	●	●				○	●		●		●		
Murrieta Creek	2.52	●	●	●	●	●			○	●		●		●		
Cole Canyon	2.32	●	●	●	●				○	●	●	●		●		
Miller Canyon	2.32	●	●	●	●				○	●		●		●		
Warm Springs Creek	2.36	●	●	●	●				○	●		●		●		
Diamond Valley	2.36	●	●	●	●				○	●		●		●		

● Existing Beneficial Use

○ Potential Beneficial Use

\+ Excepted from MUN (See Text)

[1] Waterbodies are listed multiple times if they cross hydrologic area or sub area boundaries.

[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
Santa Margarita River Watershed - continued																
Goodhart Canyon	2.36	●	●	●	●				○	●		●		●		
Pixley Canyon	2.36	●	●	●	●				○	●		●		●		
Warm Springs Creek	2.35	●	●	●	●				○	●		●		●		
Domenigoni Valley	2.35	●	●	●	●				○	●		●		●		
Warm Springs Creek	2.34	●	●	●	●				○	●		●		●		
Warm Springs Creek	2.33	●	●	●	●				○	●		●		●		
French Valley	2.33	●	●	●	●				○	●		●		●		
Santa Gertrudis Creek	2.42	●	●	●	●	○			●	●		●		●		
Long Valley	2.42	●	●	●	●	○			●	●		●		●		
Glenoak Valley	2.42	●	●	●	●	○			●	●		●	●	●		
Tucalota Creek	2.43	●	●	●	●	○			●	●		●	●	●		
Willow Canyon	2.44	●	●	●	●	○			●	●		●	●	●		
Lake Skinner	2.41	See Reservoirs & Lakes – Table 2-4														
Tucalota Creek	2.41	●	●	●	●	○			●	●		●		●		
Crown Valley	2.41	●	●	●	●	○			●	●		●	●	●		
Rawson Canyon	2.41	●	●	●	●	○			●	●		●	●	●		
Tucalota Creek	2.42	●	●	●	●	○			●	●		●		●		

● Existing Beneficial Use

○ Potential Beneficial Use

[1] Waterbodies are listed multiple times if they cross hydrologic area or sub area boundaries.

[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
Santa Margarita River Watershed - continued																
Santa Gertrudis Creek	2.32	●	●	●	●				○	●		●		●		
Long Canyon	2.32	●	●	●	●				○	●		●		●		
Temecula Creek	2.93	●	●	●	●	●			○	●		●		●		
Kohler Canyon	2.93	●	●	●	●	●			○	●		●	●	●		
Rattlesnake Creek	2.93	●	●	●	●	●			○	●		●	●	●		
Temecula Creek	2.92	●	●	●	●	●			○	●		●		●		
Chihuahua Creek	2.94	●	●	●	●	●			○	●		●		●		
Chihuahua Creek	2.92	●	●	●	●	●			○	●		●		●		
Cooper Canyon	2.92	●	●	●	●	●			○	●		●		●		
Iron Spring Canyon	2.92	●	●	●	●	●			○	●		●		●		
Temecula Creek	2.91	●	●	●	●	●			○	●		●		●		
Culp Valley	2.91	●	●	●	●	●			○	●		●		●		
Temecula Creek	2.84	●	●	●	●	●			●	●		●	●	●		●
Tule Creek	2.84	●	●	●	●	●			●	●		●	●	●		
Million Dollar Canyon	2.84	●	●	●	●	●			●	●		●	●	●		
Cottonwood Creek	2.84	●	●	●	●	●			●	●		●	●	●		●
Temecula Creek	2.83	●	●	●	●	●			●	●		●	●	●		●

● Existing Beneficial Use

○ Potential Beneficial Use

[1] Waterbodies are listed multiple times if they cross hydrologic area or sub area boundaries.

[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
Santa Margarita River Watershed - continued																
Long Canyon	2.83	●	●	●	●	●			●	●		●	●	●		●
Vail Lake	2.81	See Reservoirs & Lakes – Table 2-4														
Wilson Creek	2.63	●	●	●	●	●			○	●		●		●		
Wilson Creek	2.61	●	●	●	●	●			○	●		●		●		
Cahuilla Creek	2.73	●	●	●	●	●			○	●		●		●		
Hamilton Creek	2.74	●	●	●	●	●			○	●		●		●		
Hamilton Creek	2.73	●	●	●	●	●			○	●		●		●		
Cahuilla Creek	2.72	●	●	●	●	●			○	●		●		●		
Cahuilla Creek	2.71	●	●	●	●	●			○	●		●		●		
Elder Creek	2.71	●	●	●	●	●			○	●		●		●		
Cahuilla Creek	2.61	●	●	●	●	●			○	●		●		●		
Wilson Creek	2.81	●	●	●	●	●			●	●		●	●	●		
Lewis Valley	2.62	●	●	●	●	●			○	●		●		●		
Arroyo Seco Creek	2.81	●	●	●	●	●			●	●		●	●	●		
Arroyo Seco Creek	2.82	●	●	●	●	●			●	●		●	●	●		●
Kolb Creek	2.81	●	●	●	●	●			●	●		●	●	●		
Temecula Creek	2.81	●	●	●	●	●			●	●		●	●	●		●

● Existing Beneficial Use

○ Potential Beneficial Use

[1] Waterbodies are listed multiple times if they cross hydrologic area or sub area boundaries.

[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
Santa Margarita River Watershed - continued																
Temecula Creek	2.51	●	●	●	●	●			○	●		●		●		
Temecula Creek	2.52	●	●	●	●	●			○	●		●		●		
Pechanga Creek	2.52	●	●	●	●	●			○	●		●		●		
Rainbow Creek[3]	2.23	●	●	●					●	●		●	●	●		●
Rainbow Creek[3]	2.22	●	●	●					●	●		●	●	●		●
Sandia Canyon	2.22	●	●	●					●	●		●	●	●		●
Walker Basin	2.22	●	●	●					●	●		●	●	●		
Santa Margarita River	2.21	●	●	●					●	●		●	●	●	●	
DeLuz Creek	2.21	●	●	●					●	●		●	●	●	●	●
Cottonwood Creek	2.21	●	●	●					●	●		●	●	●		
Camps Creek	2.21	●	●	●					●	●		●	●	●		●
Fern Creek	2.21	●	●	●					●	●		●	●	●		●
Roblar Creek	2.21	●	●	●					●	●		●	●	●		
O'Neill Lake	2.13	See Reservoirs & Lakes – Table 2-4														
Santa Margarita River	2.13	●	●	●	●				●	●		●	●	●	●	
Wood Canyon	2.13	●	●	●	●				●	●		●		●		
Santa Margarita River	2.12	●	●	●	●				●	●		●	●	●	●	

● Existing Beneficial Use

○ Potential Beneficial Use

[1] Waterbodies are listed multiple times if they cross hydrologic area or sub area boundaries.

[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

[3] Rainbow Creek is designated as an impaired water body for total nitrogen and total phosphorus pursuant to Clean Water Act section 303(d). Total Maximum Daily Loads (TMDLs) have been adopted to address these impairments. See Chapter 3, Water Quality Objectives for Biostimulatory Substances and Chapter 7, Total Maximum Daily Loads.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
Santa Margarita River Watershed - continued																
Santa Margarita River	2.11	●	●	●	●				●	●		●	●	●	●	
Pueblitos Canyon	2.11	●	●	●	●				●	●		●		●	●	
Newton Canyon	2.11	●	●	●	●				●	●		●		●		
Santa Margarita Lagoon	2.11	See Coastal Waters – Table 2-3														
San Luis Rey River Watershed																
San Luis Rey River	3.32	●	●	●			●	●	●	●		●	●	●		
Johnson Canyon	3.32	●	●	●			●	●	●	●		●	●	●		
San Luis Rey River	3.31	●	●	●			●	●	●	●		●	●	●		
Canada Aguanga	3.31	●	●	●			●	●	●	●		●	●	●		
Dark Canyon	3.31	●	●	●			●	●	●	●		●	●	●		
Bear Canyon	3.31	●	●	●			●	●	●	●		●	●	●		
Cow Canyon	3.31	●	●	●			●	●	●	●		●	●	●		
Blue Canyon	3.31	●	●	●			●	●	●	●		●	●	●		
Rock Canyon	3.31	●	●	●			●	●	●	●		●	●	●		
Agua Caliente Creek	3.31	●	●	●			●	●	●	●		●	●	●		
unnamed Tributary	3.31	●	●	●			●	●	●	●		●	●	●		●
Canada Agua Caliente	3.31	●	●	●			●	●	●	●		●	●	●		

● Existing Beneficial Use

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[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
San Luis Rey River Watershed- continued																
Canada Verde	3.31	●	●	●			●	●	●	●		●	●	●		
Ward Canyon	3.31	●	●	●			●	●	●	●		●	●	●		
Lake Henshaw	3.31	See Reservoirs & Lakes – Table 2-4														
West Fork San Luis Rey River	3.31	●	●	●			●	●	●	●		●	●	●		●
Fry Creek	3.31	●	●	●			●	●	●	●		●	●	●		
Iron Springs Creek	3.31	●	●	●			●	●	●	●		●	●	●		●
Buena Vista Creek	3.31	●	●	●			●	●	●	●		●	●	●		
Cherry Canyon	3.31	●	●	●			●	●	●	●		●		●		
Bertha Canyon	3.31	●	●	●			●	●	●	●		●		●		
Hoover Canyon	3.31	●	●	●			●	●	●	●		●		●		
Buck Canyon	3.31	●	●	●			●	●	●	●		●		●		
Bergstrom Canyon	3.31	●	●	●			●	●	●	●		●		●		
San Ysidro Creek	3.31	●	●	●			●	●	●	●		●		●		
Matagual Creek	3.31	●	●	●			●	●	●	●		●	●	●		
Carrizo Creek	3.31	●	●	●			●	●	●	●		●	●	●		
Carrista Creek	3.31	●	●	●			●	●	●	●		●		●		
Kumpohui Creek	3.31	●	●	●			●	●	●	●		●		●		

● Existing Beneficial Use

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Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
San Luis Rey River Watershed - continued																
San Luis Rey River	3.31	●	●	●			●	●	●	●		●	●	●		
San Luis Rey River	3.23	●	●	●				●	●	●		●	●	●		●
Wigham Creek	3.23	●	●	●				●	●	●		●	●	●		
Prisoner Creek	3.23	●	●	●				●	●	●		●	●	●		
Lusardi Canyon	3.23	●	●	●				●	●	●		●	●	●		
Cedar Creek	3.23	●	●	●				●	●	●		●	●	●		
San Luis Rey River	3.22	●	●	●				●	●	●		●	●	●		
Bee Canyon	3.22	●	●	●				●	●	●		●	●	●		
Paradise Creek	3.22	●	●	●				●	●	●		●	●	●		
Hell Creek	3.22	●	●	●				●	●	●		●	●	●		
Horsethief Canyon	3.22	●	●	●				●	●	●		●	●	●		
Potrero Creek	3.22	●	●	●				●	●	●		●	●	●		
Plaisted Creek	3.22	●	●	●				●	●	●	●	●	●	●		
Yuima Creek	3.22	●	●	●				●	●	●		●	●	●		
Sycamore Canyon	3.22	●	●	●				●	●	●		●	●	●		
Pauma Creek	3.22	●	●	●				●	●	●		●	●	●		●
Doane Creek	3.22	●	●	●				●	●	●		●	●	●		●

● Existing Beneficial Use

[1] Waterbodies are listed multiple times if they cross hydrologic area or sub area boundaries.

[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
San Luis Rey River Watershed - continued																
Chimney Creek	3.22	●	●	●				●	●	●		●	●	●		
French Creek	3.22	●	●	●				●	●	●		●	●	●		●
Lion Creek	3.22	●	●	●				●	●	●		●	●	●		●
Harrison Canyon	3.22	●	●	●				●	●	●		●	●	●		
Jaybird Creek	3.22	●	●	●				●	●	●		●	●	●		
Frey Creek	3.22	●	●	●				●	●	●		●	●	●		
Agua Tibia Creek	3.22	●	●	●				●	●	●		●	●	●		●
San Luis Rey River	3.21	●	●	●					●	●		●	●	●		
Marion Canyon	3.21	●	●	●					●	●		●	●	●		
Magee Creek	3.21	●	●	●					●	●		●	●	●		
Castro Canyon	3.21	●	●	●					●	●		●	●	●		
Trujillo Creek	3.21	●	●	●					●	●		●	●	●		
Pala Creek	3.21	●	●	●					●	●		●	●	●		●
Gomez Creek	3.21	●	●	●					●	●		●	●	●		
Couser Canyon	3.21	●	●	●					●	●		●	●	●		
Double Canyon	3.21	●	●	●					●	●		●	●	●		
Rice Canyon	3.21	●	●	●					●	●		●	●	●		

● Existing Beneficial Use

[1] Waterbodies are listed multiple times if they cross hydrologic area or sub area boundaries.

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Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
San Luis Rey River Watershed – continued																
San Luis Rey River	3.12	+	●	●					●	●	●	●		●	●	
Live Oak Creek	3.12	+	●	●					●	●		●		●	●	
Keys Creek	3.12	+	●	●					●	●		●		●		
Moosa Canyon	3.15	+	●	●					●	●		●		●		
unnamed intermittent streams	3.16	+	●	●					●	●		●		●		
Moosa Canyon	3.14	+	●	●					●	●		●		●		
Moosa Canyon	3.13	+	●	●					●	●		●		●		
Turner Lake	3.13	See Reservoirs & Lakes – Table 2-4														
South Fork Moosa Canyon	3.13	+	●	●					●	●		●		●		
Moosa Canyon	3.12	+	●	●					●	●		●		●		
Gopher Canyon	3.12	+	●	●					●	●		●		●		
South Fork Gopher Canyon	3.12	+	●	●					●	●		●		●		
San Luis Rey River	3.11	+	●	●					●	●		●		●	●	
Pilgrim Creek	3.11	+	●	●					●	●	●	●	●	●	●	
Windmill Canyon	3.11	+	●	●					●	●		●	●	●		
Tuley Canyon	3.11	+	●	●					●	●		●		●		
Lawerence Canyon	3.11	+	●	●					●	●		●		●		
Mouth of San Luis Rey River	3.11	See Coastal Waters – Table 2-3														

● Existing Beneficial Use

+ Excepted from MUN (See Text)

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Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
San Diego County Coastal Streams																
Loma Alta Creek	4.10	+							○	●		●		●		
Loma Alta Slough	4.10	See Coastal Waters – Table 2-3														
Buena Vista Lagoon	4.21	See Coastal Waters – Table 2-3														
Buena Vista Creek	4.22	+	●	●					●	●		●		●		
Buena Vista Creek	4.21	+	●	●					●	●		●		●	●	
Agua Hedionda	4.31	See Coastal Waters – Table 2-3														
Agua Hedionda Creek	4.32	●	●	●					●	●		●		●		
Buena Creek	4.32	●	●	●					●	●		●		●		
Agua Hedionda Creek	4.31	●	●	●					●	●	●	●		●		
Letterbox canyon	4.31	●	●	●					●	●		●		●		
Canyon de las Encinas	4.40	+							○	●		●		●		
Cottonwood Creek	4.51	+	●						●	●		●		●		
Moonlight Creek	4.51	+	●						●	●		●		●		

● Existing Beneficial Use

○ Potential Beneficial Use

\+ Excepted from MUN (See Text)

[1] Waterbodies are listed multiple times if they cross hydrologic area or sub area boundaries.

[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
San Marcos Creek Watershed																
Batiquitos Lagoon	4.51	See Coastal Waters – Table 2-3														
San Marcos Creek	4.52	+	●						●	●		●		●		
unnamed intermittent streams	4.53	+	●						●	●		●		●		
San Marcos Creek	4.51	+	●						●	●		●		●		
Encinitas Creek	4.51	+	●						●	●		●		●		
Escondido Creek Watershed																
San Elijo Lagoon	4.61	See Coastal Waters – Table 2-3														
Escondido Creek	4.63	●	●	○				●	●	●		●	●	●		
Lake Wohlford	4.63	See Reservoirs & Lakes – Table 2-4														
Lake Dixon	4.62	See Reservoirs & Lakes – Table 2-4														
Escondido Creek	4.62	●	●	○					●	●		●	●	●		
Reidy Canyon	4.62	●	●	○					●	●		●	●	●		
Escondido Creek	4.61	●	●	○					●	●	●	●	●	●		

● Existing Beneficial Use

○ Potential Beneficial Use

\+ Excepted from MUN (See Text)

[1] Waterbodies are listed multiple times if they cross hydrologic area or sub area boundaries.

[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
San Dieguito Creek Watershed																
Santa Ysabel Creek	5.54	●	●	●	●				●	●		●	●	●		●
Dan Price Creek	5.54	●	●	●	●				●	●		●	●	●		
Santa Ysabel Creek	5.53	●	●	●	●				●	●		●	●	●		
Witch Creek	5.53	●	●	●	●				●	●		●	●	●		●
Sutherland Lake	5.53	See Reservoirs & Lakes – Table 2-4														
Bloomdale Creek	5.53	●	●	●	●				●	●		●	●	●		
Santa Ysabel Creek	5.52	●	●	●	●				●	●		●	●	●	●	
Lake Poway	5.52	See Reservoirs & Lakes – Table 2-4														
Black Canyon	5.52	●	●	●	●				●	●		●	●	●		●
Scholder Creek	5.52	●	●	●	●				●	●		●	●	●		
Temescal Creek	5.52	●	●	●	●				●	●		●	●	●		
Bear Creek	5.52	●	●	●	●				●	●		●	●	●		
Quail Canyon	5.52	●	●	●	●				●	●		●	●	●		
Carney Canyon	5.52	●	●	●	●				●	●		●	●	●		
Santa Ysabel Creek	5.51	●	●	●	●				●	●	●	●	●	●		
Boden Canyon	5.51	●	●	●	●				●	●	●	●	●	●		
Clevenger Canyon	5.51	●	●	●	●				●	●	●	●	●	●		

● Existing Beneficial Use

○ Potential Beneficial Use

[1] Waterbodies are listed multiple times if they cross hydrologic area or sub area boundaries.

[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
San Dieguito River Watershed – continued																
Santa Ysabel Creek	5.32	●	●	●	●				○	●		●		●	●	
Tims Canyon	5.32	●	●	●	●				○	●		●		●		
Schoolhouse Canyon	5.32	●	●	●	●				○	●		●		●		
Rockwood Canyon	5.35	●	●	●	●				○	●		●		●		
Guejito Creek	5.35	●	●	●	●				○	●		●		●		
unnamed intermittent streams	5.36	●	●	●	●				○	●		●		●		
Rockwood Canyon	5.32	●	●	●	●				○	●		●		●		
Santa Maria Creek	5.41	●	●	●	●				●	●		●		●		
Hatfield Creek	5.45	●	●	●	●				●	●		●		●		
Hatfield Creek	5.44	●	●	●	●				●	●		●		●		
Wash Hollow Creek	5.43	●	●	●	●				●	●		●		●		
Wash Hollow Creek	5.44	●	●	●	●				●	●		●		●		
Hatfield Creek	5.42	●	●	●	●				●	●		●		●		
Santa Teresa Valley	5.46	●	●	●	●				●	●		●		●		
unnamed intermittent streams	5.47	●	●	●	●				●	●		●		●		
Hatfield Creek	5.41	●	●	●	●				●	●		●		●		

● Existing Beneficial Use

○ Potential Beneficial Use

[1] Waterbodies are listed multiple times if they cross hydrologic area or sub area boundaries.

[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
San Dieguito River Watershed – continued																
Santa Maria Creek	5.32	●	●	●	●				○	●		●		●		
unnamed intermittent streams	5.33	●	●	●	●				○	●		●		●		
unnamed intermittent streams	5.34	●	●	●	●				○	●		●		●		
San Dieguito River	5.32	●	●	●	●				○	●		●		●	●	
Cloverdale Creek	5.32	●	●	●	●				○	●		●		●	●	
San Dieguito River	5.21	●	●	●	●				●	●	●	●	●	●	●	
Highland Valley	5.31	●	●	●	●				○	●		●		●		
Lake Hodges	5.21	See Reservoirs & Lakes – Table 2-4														
Kit Carson Creek	5.21	●	●	●	●	○			●	●		●		●	●	
West Branch Kit Carson Creek	5.24	●	●	●	●	○			●	●		●		●		
East Branch Kit Carson Creek	5.24	●	●	●	●	○			●	●		●		●		
Green Valley Creek	5.21	●	●	●	●	○			●	●		●		●		
Green Valley Creek	5.22	●	●	●	●	○			●	●		●		●		
Felicita Creek	5.23	●	●	●	●	○			●	●		●		●		
West Fork Felicita Creek	5.23	●	●	●	●	○			●	●		●		●		
East Fork Felicita Creek	5.23	●	●	●	●	○			●	●		●		●		

● Existing Beneficial Use

○ Potential Beneficial Use

[1] Waterbodies are listed multiple times if they cross hydrologic area or sub area boundaries.

[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
San Dieguito River Watershed - continued																
San Dieguito Reservoir	5.21	See Reservoirs & Lakes – Table 2-4														
Warren Canyon	5.21	●	●	●	●				●	●	●	●	●	●		
San Bernardo Valley	5.21	●	●	●	●				●	●		●		●	●	
unnamed intermittent streams	5.24	●	●	●	●				●	●		●		●		
unnamed intermittent streams	5.23	●	●	●	●				●	●		●		●		
unnamed intermittent streams	5.22	●	●	●	●				●	●		●		●		
San Dieguito River	5.11	+	○	○					●	●		●	●	●		●
Lusardi Creek	5.12	+	○	○					●	●		●		●		
Lusardi Creek	5.11	+	○	○					●	●		●		●		
La Zanja Canyon	5.11	+	○	○					●	●		●		●		
Gonzales Canyon	5.11	+	○	○					●	●		●		●		
San Dieguito Lagoon	5.11	See Coastal Waters – Table 2-3														
Los Penasquitos Creek Watershed																
Los Penasquitos Lagoon	6.10	See Coastal Waters – Table 2-3														
Soledad Canyon	6.10	+	●	●					○	●		●	●	●		
Carol Canyon	6.10	+	●	●					○	●		●	●	●	●	

● Existing Beneficial Use

○ Potential Beneficial Use

+ Excepted from MUN (See Text)

[1] Waterbodies are listed multiple times if they cross hydrologic area or sub area boundaries.

[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
Los Penasquitos Creek Watershed – continued																
Miramar Reservoir	6.10	See Reservoirs & Lakes – Table 2-4														
Los Penasquitos Creek	6.20	+	●	○					●	●		●	●	●		
Rattlesnake Creek	6.20	+	●	○					●	●		●	●	●		
Poway Creek	6.20	+	●	○					●	●		●		●		
Beeler Creek	6.20	+	●	○					●	●		●		●		
Chicarita Creek	6.20	+	●	○					●	●		●		●		
Cypress Canyon	6.20	+	●	○					●	●		●		●		
Los Penasquitos Creek	6.10	+	●	●					○	●	●	●		●		
unnamed tributary	6.10	+	●	●					○	●		●		●	●	
Carmel Valley	6.10	+	●	●					○	●		●		●		
Deer Canyon	6.10	+	●	●					○	●		●		●		
McGonigle Canyon	6.10	+	●	●					○	●		●		●		
Bell Valley	6.10	+	●	●					○	●		●		●		
Shaw Valley	6.10	+	●	●					○	●		●		●		
San Diego County Coastal Streams																
unnamed intermittent coastal streams	6.30	+							○	●		●		●		

● Existing Beneficial Use

○ Potential Beneficial Use

\+ Excepted from MUN (See Text)

[1] Waterbodies are listed multiple times if they cross hydrologic area or sub area boundaries.

[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
Rose Canyon Watershed																
Rose Canyon	6.40	+		○					●	●		●		●		
San Clemente Canyon	6.40	+		○					●	●		●	●	●	●	●
Tecolote Creek Watershed																
Tecolote Creek [3]	6.50	+							○	●		●		●		
San Diego River Watershed																
San Diego River	7.41	●	●	●	●				●	●		●	●	●		
Coleman Creek	7.42	●	●	●	●				●	●		●	●	●		
Eastwood Creek	7.42	●	●	●	●				●	●		●	●	●		
Jim Green Creek	7.42	●	●	●	●				●	●		●	●	●		
Mariette Creek	7.42	●	●	●	●				●	●		●	●	●		
Boring Creek	7.42	●	●	●	●				●	●		●	●	●		
Bailey Creek	7.42	●	●	●	●				●	●		●	●	●		
Coleman Creek	7.41	●	●	●	●				●	●		●	●	●		
Setenec Creek	7.42	●	●	●	●				●	●		●	●	●		
Setenec Creek	7.41	●	●	●	●				●	●		●	●	●		
Temescal Creek	7.41	●	●	●	●				●	●		●	●	●		
Paine Bottom	7.41	●	●	●	●				●	●		●	●	●		

● Existing Beneficial Use

○ Potential Beneficial Use

\+ Excepted from MUN (See Text)

[1] Waterbodies are listed multiple times if they cross hydrologic area or sub area boundaries.

[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

[3] Aliso Creek, San Juan Creek, Tecolote Creek, Forrester Creek, San Diego River (lower), and Chollas Creek are designated as water quality limited segments for indicator bacteria pursuant to Clean Water Act section 303(d). Total Maximum Daily Loads have been adopted to address these impairments. See Chapter 3, *Water Quality Objectives*, Bacteria -Total Coliform, Fecal Coliform, *E. Coli*, and Enterococci, and Chapter 7, *Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)*.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
San Diego River Watershed – continued																
Orinoco Creek	7.41	●	●	●	●				●	●		●	●	●		
Iron Springs Canyon	7.41	●	●	●	●				●	●		●	●	●		
Dye Canyon	7.41	●	●	●	●				●	●		●	●	●		
Richie Creek	7.41	●	●	●	●				●	●		●	●	●		
Cedar Creek	7.41	●	●	●	●				●	●		●	●	●		●
Sandy Creek	7.41	●	●	●	●				●	●		●	●	●		
Dehr Creek	7.41	●	●	●	●				●	●		●	●	●		●
Kelly Creek	7.41	●	●	●	●				●	●		●	●	●		
Cuyamaca Reservoir	7.43	See Reservoirs & Lakes – Table 2-4														
Little Stonewall Creek	7.43	●	●	●	●				●	●		●	●	●		●
Boulder Creek	7.41	●	●	●	●				●	●		●	●	●		●
Azalea Creek	7.41	●	●	●	●				●	●		●	●	●		
Johnson Creek	7.41	●	●	●	●				●	●		●	●	●		
Sheep Camp Creek	7.41	●	●	●	●				●	●		●	●	●		
San Diego River	7.31	●	●	●	●				●	●		●	●	●		
El Capitan Reservoir	7.31	See Reservoirs & Lakes – Table 2-4														
Isham Creek	7.31	●	●	●	●				●	●		●	●	●		

● Existing Beneficial Use

[1] Waterbodies are listed multiple times if they cross hydrologic area or sub area boundaries.

[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
San Diego River Watershed – continued																
Sand Creek	7.31	●	●	●	●				●	●		●	●	●		
Conejos Creek	7.31	●	●	●	●				●	●		●	●	●		●
King Creek	7.31	●	●	●	●				●	●		●	●	●		
West Fork King Creek	7.31	●	●	●	●				●	●		●	●	●		
Echo Valley	7.31	●	●	●	●				●	●		●	●	●		
Peutz Valley	7.31	●	●	●	●				●	●		●	●	●		
Chocolate Canyon	7.32	●	●	●	●				●	●		●	●	●		
Alpine Creek	7.33	●	●	●	●				●	●		●	●	●		
Chocolate Canyon	7.31	●	●	●	●				●	●		●	●	●		
San Diego River	7.15	○		●					●	●		●		●	●	
San Diego River	7.12	○		●					●	●		●		●	●	
Lake Jennings	7.12	See Reservoirs & Lakes – Table 2-4														
Quail Canyon	7.12	○		●					●	●		●		●		
Wildcat Canyon	7.12	○		●					●	●		●		●		
San Vicente Creek	7.23	●	●	●	●				●	●		●		●		
Swartz Canyon	7.23	●	●	●	●				●	●		●		●		
Klondike Creek	7.23	●	●	●	●				●	●		●		●		

● Existing Beneficial Use

○ Potential Beneficial Use

[1] Waterbodies are listed multiple times if they cross hydrologic area or sub area boundaries.

[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
San Diego River Watershed – continued																
San Vicente Creek	7.22	●	●	●	●				●	●		●		●		
Darney Canyon	7.22	●	●	●	●				●	●		●		●		
Longs Gulch	7.22	●	●	●	●				●	●		●		●		
San Vicente Reservoir	7.21	See Reservoirs & Lakes – Table 2-4														
West Branch San Vicente Creek	7.21	●	●	●	●				●	●		●		●		
Aqueduct Arm Creek	7.21	●	●	●	●	○			●	●		●		●		
Padre Barona Creek	7.24	●	●	●	●				●	●		●		●		
Wright Canyon	7.24	●	●	●	●				●	●		●		●		
Featherstone Canyon	7.24	●	●	●	●				●	●		●		●		
Padre Barona Creek	7.12	○		●					●	●		●		●		
Foster Canyon	7.21	●	●	●	●				●	●		●		●		
San Vicente Creek	7.12	○		●					●	●		●		●		
Slaughterhouse Canyon	7.12	○		●					●	●		●		●		
Los Coches Creek	7.14	○		●					●	●		●		●		
Rios Canyon	7.14	○		●					●	●	●	●		●		
Los Coches Creek	7.12	○		●					●	●		●		●		
Forrester Creek [3]	7.13	○		●					●	●		●		●		

● Existing Beneficial Use

○ Potential Beneficial Use

\+ Excepted from MUN (See Text)

[1] Waterbodies are listed multiple times if they cross hydrologic area or sub area boundaries.

[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

[3] Aliso Creek, San Juan Creek, Tecolote Creek, Forrester Creek, San Diego River (lower), and Chollas Creek are designated as water quality limited segments for indicator bacteria pursuant to Clean Water Act section 303(d). Total Maximum Daily Loads have been adopted to address these impairments. See Chapter 3, *Water Quality Objectives*, Bacteria -Total Coliform, Fecal Coliform, *E. Coli*, and Enterococci, and Chapter 7, *Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)*.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
San Diego River Watershed - continued																
Forrester Creek [3]	7.12	○		●					●	●		●		●		
Sycamore Canyon	7.12	+	●	●					●	●		●		●	●	
unnamed tributary	7.12	+	●	●					●	●		●		●	●	
Clark Canyon	7.12	+	●	●					●	●		●		●	●	
West Sycamore Canyon	7.12	+	●	●					●	●		●		●		
Quail Canyon	7.12	+	●	●					●	●		●		●		
Little Sycamore Canyon	7.12	+	●	●					●	●		●		●		
Spring Canyon	7.12	+	●	●					●	●		●		●	●	
Oak Canyon	7.12	+	●	●					●	●		●		●		
San Diego River [3]	7.11	+	●	●					●	●	●	●		●	●	
unnamed tributary	7.11	+	●	●					●	●		●		●	●	
Alvarado Canyon	7.11	+	●	●					●	●		●		●		
Lake Murray	7.11	See Reservoirs & Lakes – Table 2-4														
Murphy Canyon	7.11	+	●	●					●	●		●		●	●	
Shepherd Canyon	7.11	+	●	●					●	●		●		●		
Murray Canyon	7.11	+	●	●					●	●		●		●		
Mouth of San Diego River	7.11	See Coastal Waters – Table 2-3														

● Existing Beneficial Use

○ Potential Beneficial Use

\+ Excepted from MUN (See Text)

[1] Waterbodies are listed multiple times if they cross hydrologic area or sub area boundaries.

[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

[3] Aliso Creek, San Juan Creek, Tecolote Creek, Forrester Creek, San Diego River (lower), and Chollas Creek are designated as water quality limited segments for indicator bacteria pursuant to Clean Water Act section 303(d). Total Maximum Daily Loads have been adopted to address these impairments. See Chapter 3, *Water Quality Objectives*, Bacteria -Total Coliform, Fecal Coliform, *E. Coli*, and Enterococci, and Chapter 7, *Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)*.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
Pueblo San Diego Watershed																
unnamed intermittent coastal streams	8.10	+							○	●		●		●		
Powerhouse Canyon	8.21	+							○	●		●		●		
Chollas Creek [3,4]	8.22	+							○	●		●		●		
South Chollas Valley	8.22	+							○	●		●		●		
unnamed intermittent streams	8.31	+							○	●		●		●		
Paradise Creek	8.32	+							○	●		●		●		
Paradise Valley	8.32	+							○	●		●		●		
Sweetwater River Watershed																
Sweetwater River	9.35	●	●	●	●				●	●		●	●	●		●
Stonewall Creek	9.35	●	●	●	●				●	●		●	●	●		●
Harper Creek	9.35	●	●	●	●				●	●		●	●	●		●
Cold Stream	9.35	●	●	●	●				●	●		●	●	●		●
Japacha Creek	9.35	●	●	●	●				●	●		●	●	●		●
Juaquapin Creek	9.35	●	●	●	●				●	●		●	●	●		●
Arroyo Seco	9.35	●	●	●	●				●	●		●	●	●		
Sweetwater River	9.34	●	●	●	●				●	●		●	●	●		●

● Existing Beneficial Use

○ Potential Beneficial Use

\+ Excepted from MUN (See Text)

[1] Waterbodies are listed multiple times if they cross hydrologic area or sub area boundaries.

[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

[3] Chollas Creek is designated as an impaired water body for copper, lead and zinc pursuant to Clean Water Act Section 303(d). A Total Maximum Daily Load (TMDL) has been adopted to address this impairment. See Chapter 3, Water Quality Objectives for Toxicity and Toxic Pollutants and Chapter 7, Total Maximum Daily Loads

[4] Aliso Creek, San Juan Creek, Tecolote Creek, Forrester Creek, San Diego River (lower), and Chollas Creek are designated as water quality limited segments for indicator bacteria pursuant to Clean Water Act section 303(d). Total Maximum Daily Loads have been adopted to address these impairments. See Chapter 3, *Water Quality Objectives*, Bacteria -Total Coliform, Fecal Coliform, *E. Coli*, and Enterococci, and Chapter 7, *Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)*.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
Sweetwater River Watershed - continued																
Descanso Creek	9.34	●	●	●	●				●	●		●	●	●		
Samagatuma Creek	9.34	●	●	●	●				●	●		●	●	●		
Sweetwater River	9.31	●	●	●	●				●	●		●	●	●		●
Viejas Creek	9.33	●	●	●	●				●	●		●	●	●		
Viejas Creek	9.31	●	●	●	●				●	●		●	●	●		
Loveland Reservoir	9.31	See Reservoirs & Lakes – Table 2-4														
Taylor Creek	9.31	●	●	●	●				●	●		●		●		
Japatul Valley	9.32	●	●	●	●				●	●		●		●		
Sweetwater River	9.21	●	●	●	●				●	●	●	●		●	●	
unnamed tributary	9.21	●	●	●	●				●	●	●	●		●	●	
Lawson Creek	9.21	●	●	●	●				●	●	●	●		●		
Beaver Canyon	9.21	●	●	●	●				●	●		●		●		
Wood Valley	9.21	●	●	●	●				●	●		●		●		
Sycuan Creek	9.25	●	●	●	●				●	●		●		●		
North Fork Sycuan Creek	9.26	●	●	●	●				●	●		●		●		
North Fork Sycuan Creek	9.25	●	●	●	●				●	●		●		●		
Dehesa Valley	9.23	●	●	●	●				●	●		●		●		
Harbison Canyon	9.23	●	●	●	●				●	●		●		●		

● Existing Beneficial Use

[1] Waterbodies are listed multiple times if they cross hydrologic area or sub area boundaries.

[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
Sweetwater River Watershed - continued																
Galloway Valley	9.24	●	●	●	●				●	●		●		●		
Mexican Canyon	9.21	●	●	●	●				●	●		●		●		
unnamed intermittent streams	9.22	●	●	●	●				●	●		●		●		
Steel Canyon	9.21	●	●	●	●				●	●		●		●		
Sweetwater Reservoir	9.21	See Reservoirs & Lakes – Table 2-4														
Coon Canyon	9.21	●	●	●	●				●	●		●		●		
Sweetwater River	9.12	+		●					○	●		●		●		
Spring Valley	9.12	+		●					○	●		●		●		
Wild Mans Canyon	9.12	+		●					○	●		●		●		
Long Canyon	9.12	+		●					○	●		●		●		
Rice Canyon	9.12	+		●					○	●		●		●		
Telegraph Canyon	9.11	+		●					○	●		●		●		
San Diego County Coastal Streams																
unnamed intermittent coastal streams	10.10	+							○			●				

● Existing Beneficial Use

○ Potential Beneficial Use

+ Excepted from MUN (See Text)

[1] Waterbodies are listed multiple times if they cross hydrologic area or sub area boundaries.

[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
Otay River Watershed																
Jamul Creek	10.34	●	●	●	●				●	●		●		●		
Jamul Creek	10.33	●	●	●	●				●	●	●	●		●		
Jamul Creek	10.36	●	●	●	●				●	●	●	●		●		
Dulzura Creek	10.37	●	●	●	●				●	●		●		●		
Dulzura Creek	10.36	●	●	●	●				●	●	●	●		●	●	
Dutchman Canyon	10.36	●	●	●	●				●	●		●		●		
Pringle Canyon	10.36	●	●	●	●				●	●		●		●		
Sycamore Canyon	10.36	●	●	●	●				●	●	●	●		●		
Hollenbeck Canyon	10.36	●	●	●	●				●	●	●	●		●		
Lyons Valley	10.35	●	●	●	●				●	●		●		●		
Cedar Canyon	10.36	●	●	●	●				●	●	●	●	●	●		●
Little Cedar Canyon	10.36	●	●	●	●				●	●	●	●	●	●		
Jamul Creek	10.31	●	●	●	●				●	●		●		●	●	
Lower Otay Reservoir	10.31	See Reservoirs & Lakes – Table 2-4														
unnamed tributary	10.31	●	●	●	●				●	●	●	●		●	●	
Upper Otay Reservoir	10.32	See Reservoirs & Lakes – Table 2-4														
Proctor Valley	10.32	●	●	●	●				●	●	●	●		●		

● Existing Beneficial Use

[1] Waterbodies are listed multiple times if they cross hydrologic area or sub area boundaries.

[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
Otay River Watershed – continued																
Otay River	10.20	+	●	○					○	●		●		●	●	
O'Neal Canyon	10.20	+	●	○					○	●		●		●		
Salt Creek	10.20	+	●	○					○	●		●		●		
Johnson Canyon	10.20	+	●	○					○	●		●		●		
Wolf Canyon	10.20	+	●	○					○	●		●		●		
Dennery Canyon	10.20	+	●	○					○	●		●		●		
Poggi Canyon	10.20	+	●	○					○	●		●		●		
Tijuana River Watershed																
Tijuana River	11.11	+		○					○	●	●	●		●	●	
Moody Canyon	11.11	+		○					○	●		●		●		
Smugglers Gulch	11.11	+		○					○	●		●		●		
Goat Canyon	11.11	+		○					○	●		●		●		
Tijuana River Estuary	11.11	See Coastal Waters – Table 2-3														
Spring Canyon	11.12	+	●	○					○	●		●		●		
Dillon Canyon	11.12	+	●	○					○	●		●		●		
Finger Canyon	11.12	+	●	○					○	●		●		●		
Wruck Canyon	11.12	+	●	○					○	●		●		●		

● Existing Beneficial Use

○ Potential Beneficial Use

\+ Excepted from MUN (See Text)

[1] Waterbodies are listed multiple times if they cross hydrologic area or sub area boundaries.

[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
Tijuana River Watershed - continued																
unnamed intermittent streams	11.12	+	●	○					○	●		●		●		
unnamed intermittent streams	11.21	+							●	●		●		●		
Tijuana River	11.21	+							●	●		●		●		
Tecate Creek	11.23	+							●	●		●		●		
Cottonwood Creek	11.60	●	●	●	●		●		○	●		●	●	●	●	
Kitchen Creek	11.60	●	●	●	●		●		○	●		●	●	●		●
Long Canyon	11.60	●	●	●	●		●		○	●		●	●	●		●
Troy Canyon	11.60	●	●	●	●		●		○	●		●	●	●		●
Fred Canyon	11.60	●	●	●	●		●		○	●		●	●	●		
Horse Canyon	11.60	●	●	●	●		●		○	●		●	●	●		
La Posta Creek	11.70	●	●	●	●		●		●	●		●	●	●		
Simmons Canyon	11.70	●	●	●	●		●		●	●		●	●	●		
La Posta Creek	11.60	●	●	●	●		●		○	●		●	●	●		
Morena Reservoir	11.50	See Reservoirs & Lakes – Table 2-4														
Morena Creek	11.50	●	●	●	●		●		●	●		●	●	●		●
Long Valley	11.50	●	●	●	●		●		●	●		●	●	●		
Bear Valley	11.50	●	●	●	●		●		●	●		●		●		

● Existing Beneficial Use

○ Potential Beneficial Use

\+ Excepted from MUN (See Text)

[1] Waterbodies are listed multiple times if they cross hydrologic area or sub area boundaries.

[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
Tijuana River Watershed - continued																
Cottonwood Creek	11.30	●	●	●	●		●		●	●		●	●	●	●	●
Hauser Creek	11.30	●	●	●	●		●		●	●		●	●	●		●
Salazar Canyon	11.30	●	●	●	●		●		●	●		●	●	●		
Barrett Lake	11.30	See Reservoirs & Lakes – Table 2-4														
Boneyard Canyon	11.30	●	●	●	●		●		●	●		●	●	●		
Skye Valley	11.30	●	●	●	●		●		●	●		●	●	●		
Pine Valley Creek	11.41	●	●	●	●		●		●	●		●	●	●		●
Indian Creek	11.41	●	●	●	●		●		●	●		●	●	●		
Lucas Creek	11.41	●	●	●	●		●		●	●		●	●	●		
Noble Canyon	11.41	●	●	●	●		●		●	●		●	●	●		●
Los Rasalies Ravine	11.42	●	●	●	●		●		●	●		●	●	●		
Paloma Ravine	11.42	●	●	●	●		●		●	●		●	●	●		
Bonita Ravine	11.42	●	●	●	●		●		●	●		●	●	●		
Chico Ravine	11.42	●	●	●	●		●		●	●		●	●	●		
Madero Ravine	11.42	●	●	●	●		●		●	●		●	●	●		
Los Gatos Ravine	11.42	●	●	●	●		●		●	●		●	●	●		
Boiling Spring Ravine	11.42	●	●	●	●		●		●	●		●	●	●		

● Existing Beneficial Use

[1] Waterbodies are listed multiple times if they cross hydrologic area or sub area boundaries.

[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
Tijuana River Watershed - continued																
Agua Dulce Ravine	11.42	●	●	●	●		●		●	●		●	●	●		
Escondido Ravine	11.42	●	●	●	●		●		●	●		●	●	●		
Scove Canyon	11.41	●	●	●	●		●		●	●		●	●	●		
Pine Valley Creek	11.30	●	●	●	●		●		●	●		●	●	●		●
Oak Valley	11.30	●	●	●	●		●		●	●		●	●	●		●
Nelson Canyon	11.30	●	●	●	●		●		●	●		●	●	●		
Secret Canyon	11.30	●	●	●	●		●		●	●		●	●	●		
Horsethief Canyon	11.30	●	●	●	●		●		●	●		●	●	●		
Espinosa Creek	11.30	●	●	●	●		●		●	●		●	●	●		
Wilson Creek	11.30	●	●	●	●		●		●	●		●	●	●		●
Pats Canyon	11.30	●	●	●	●		●		●	●		●	●	●		
Cottonwood Creek	11.23	+							●	●		●		●		
Dry Valley	11.23	+							●	●		●		●		
Bob Owens Canyon	11.23	+							●	●		●		●		
McAlmond Canyon	11.24	+							●	●		●		●		
McAlmond Canyon	11.23	+							●	●		●		●		

● Existing Beneficial Use

+ Excepted from MUN (See Text)

[1] Waterbodies are listed multiple times if they cross hydrologic area or sub area boundaries.

[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
Tijuana River Watershed - continued																
Rattlesnake Canyon	11.23	+							●	●		●		●		
Potrero Creek	11.25	+							●	●		●		●		
Little Potrero Creek	11.25	+							●	●		●		●		
Potrero Creek	11.23	+							●	●		●		●		
Grapevine Creek	11.23	+							●	●		●		●		
Bee Canyon	11.22	+							●	●		●		●		
Bee Creek	11.23	+							●	●		●		●		
Mine Canyon	11.21	+							●	●		●		●		
unnamed intermittent streams	11.81	+							●	●		●		●		
unnamed intermittent streams	11.82	+							●	●		●		●		
Campo Creek	11.84	+							●	●		●	●	●		
Diablo Canyon	11.84	+							●	●		●		●		
Campo Creek	11.83	+							●	●		●		●		
Miller Creek	11.83	+							●	●		●		●		
Campo Creek	11.82	+							●	●		●		●		
Smith Canyon	11.82	+							●	●		●		●		
unnamed intermittent streams	11.85	+							●	●		●		●		

● Existing Beneficial Use

\+ Excepted from MUN (See Text)

[1] Waterbodies are listed multiple times if they cross hydrologic area or sub area boundaries.

[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

Table 2-3. BENEFICIAL USES OF COASTAL WATERS

Coastal Waters	Hydrologic Unit Basin Number	BENEFICIAL USE														
		IND	NAV	REC1	REC2	COMM	BIOL	EST	WILD	RARE	MAR	AQUA	MIGR	SPWN	WARM	SHELL
Pacific Ocean[1]		●	●	●	●	●	●		●	●	●	●	●	●		●
Dana Point Harbor[2]		●	●	●	●	●			●	●	●		●	●		●
Del Mar Boat Basin		●	●	●	●	●			●	●	●		●	●		●
Mission Bay		●		●	●	●		●	●	●	●		●	●		●
Oceanside Harbor		●	●	●	●	●			●	●	●		●	●		●
San Diego Bay [3,4,5]		●	●	●	●	●	●	●	●	●	●		●	●		●

[1] Certain Pacific Ocean shoreline segments of the following Hydrological Units, Areas, and Subareas are designated as water quality limited segments for indicator bacteria pursuant to Clean Water Act section 303(d): San Joaquin Hills HSA 901.11 and Laguna Beach HAS 901.12, Aliso Creek HSA 901.13, Dana Point HSA 901.14, Lower San Juan HSA 901.27, San Clemente HA 901.30, San Luis Rey HU 903.00, San Marcos HA 904.50, San Dieguito HU 905.00, Miramar Reservoir HA 906.10, Scripps HA 906.30, and Mission San Diego HSA 907.11 and Santee HSA 907.12. Total Maximum Daily Loads have been adopted to address these impairments. See Chapter 3, *Water Quality Objectives*, Bacteria - Total Coliform, Fecal Coliform, *E. Coli* and Enterococci, and Chapter 7, *Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)*.

[2] The shoreline segment along Baby Beach within Dana Point Harbor is designated as a water quality limited segment for indicator bacteria pursuant to Clean Water Act section 303(d). Total Maximum Daily Loads have been adopted to address these impairments. See Chapter 7, *Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay*.

[3] Includes the tidal prisms of the Otay and Sweetwater Rivers.

[4] The Shelter Island Yacht Basin portion of San Diego Bay is designated as an impaired water body for dissolved copper pursuant to Clean Water Act section 303(d). A Total Maximum Daily Load (TMDL) has been adopted to address this impairment. See Chapter 3, Water Quality Objectives for Pesticides, Toxicity and Toxic Pollutants and Chapter 7, Total Maximum Daily Loads.

[5] The shoreline segment along Shelter Island Shoreline Park within San Diego Bay is designated as a water quality limited segment for indicator bacteria pursuant to Clean Water Act section 303(d). Total Maximum Daily Loads have been adopted to address these impairments. See Chapter 7, *Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay*.

● Existing Beneficial Use

Table 2-3. BENEFICIAL USES OF COASTAL WATERS

Coastal Waters	Hydrologic Unit Basin Number	BENEFICIAL USE														
		IND	NAV	REC1	REC2	COMM	BIOL	EST	WILD	RARE	MAR	AQUA	MIGR	SPWN	WARM	SHELL
Coastal Lagoons																
Tijuana River Estuary	11.11			●	●	●	●	●	●	●	●		●	●		●
Mouth of San Diego River[6]	7.11			●	●	●		●	●	●	●		●	●		●
Famosa Slough and Channel	7.11			●	●	●		●	●	●	●		●	●		●
Los Penasquitos Lagoon [7]	6.10			●	●		●	●	●	●	●		●	●		●
San Dieguito Lagoon	5.11			●	●		●	●	●	●	●		●	●		
Batiquitos Lagoon	4.51			●	●		●	●	●	●	●		●	●		
San Elijo Lagoon	4.61			●	●		●	●	●	●	●		●	●		
Agua Hedionda Lagoon	4.31	●		●	●	●	●	●	●	●	●	●	●	●		●

[6] The mouth of San Diego River is designated as a water quality limited segment for indicator bacteria pursuant to Clean Water Act section 303(d). Total Maximum Daily Loads have been adopted to address these impairments. See Chapter 3, *Water Quality Objectives*, Bacteria - Total Coliform, Fecal Coliform, *E. Coli*, and Enterococci, and Chapter 7, *Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)*.

[7] Fishing from shore or boat permitted, but other water contact recreational (REC-1) uses are prohibited.

● Existing Beneficial Use

○ Potential Beneficial Use

Table 2-3. BENEFICIAL USES OF COASTAL WATERS

Coastal Waters	Hydrologic Unit Basin Number	BENEFICIAL USE														
		IND	NAV	REC1	REC2	COMM	BIOL	EST	WILD	RARE	MAR	AQUA	MIGR	SPWN	WARM	SHELL
Coastal Lagoons – continued																
Buena Vista Lagoon[8]	4.21			●	●		●	○	●	●	●				●	
Loma Alta Slough	4.10			●	●			●	●	●	●					
Mouth of San Luis Rey River[9]	3.11			●	●				●	●	●		●			
Santa Margarita Lagoon	2.11			●	●			●	●	●	●		●	●		

[8] Fishing from shore or boat permitted, but other water contact recreational (REC-1) uses are prohibited.

[9] The mouth of San Luis Rey River is designated as a water quality limited segment for indicator bacteria pursuant to Clean Water Act section 303(d). Total Maximum Daily Loads have been adopted to address these impairments. See Chapter 3, *Water Quality Objectives*, Bacteria - Total Coliform, Fecal Coliform, *E. Coli*, and Enterococci, and Chapter 7, *Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek).*

● Existing Beneficial Use

○ Potential Beneficial Use

Table 2-3. BENEFICIAL USES OF COASTAL WATERS

Coastal Waters	Hydrologic Unit Basin Number	BENEFICIAL USE														
		IND	NAV	REC1	REC2	COMM	BIOL	EST	WILD	RARE	MAR	AQUA	MIGR	SPWN	WARM	SHELL
Coastal Lagoons – continued																
Aliso Creek Mouth[10]	1.13			●	●				●	●	●					
San Juan Creek Mouth[11]	1.27			●	●				●	●	●		●			●
San Mateo Creek Mouth	1.40			●	●		●		●	●	●		●	●		
San Onofre Creek Mouth	1.51			●	●				●	●	●		●	●		

[10] The mouth of Aliso Creek is designated as a water quality limited segment for indicator bacteria pursuant to Clean Water Act section 303(d). Total Maximum Daily Loads have been adopted to address these impairments. See Chapter 3, *Water Quality Objectives*, Bacteria - Total Coliform, Fecal Coliform, *E. Coli*, and Enterococci, and Chapter 7, *Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek).*

[11] The mouth of San Juan Creek is designated as a water quality limited segment for indicator bacteria pursuant to Clean Water Act section 303(d). Total Maximum Daily Loads have been adopted to address these impairments. See Chapter 3, *Water Quality Objectives*, Bacteria - Total Coliform, Fecal Coliform, *E. Coli*, and Enterococci, and Chapter 7, *Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek).*

● Existing Beneficial Use

○ Potential Beneficial Use

Table 2-4. BENEFICIAL USES OF RESERVOIRS AND LAKES

Reservoirs & Lakes	Hydrologic Unit Basin Number	BENEFICIAL USE												
		MUN	AGR	IND	PROC	GWR	FRSH	REC1	REC2	WARM	COLD	WILD	RARE	POW
O'Neill Lake	2.13	●	●	●	●			●	●	●	●	●	●	
Diamond Valley Lake	2.35 & 2.36	●	●	●	●	●		●[1]	●	●	●	●		●
Lake Skinner	2.42	●	●	●	●	○		●[1]	●	●		●		
Vail Lake	2.81	●	●	●	●	●		●[1]	●	●		●		
Turner Lake	3.13	●	●	●				○	●	●				
Lake Henshaw	3.31	●	●	●	●		●	●[1]	●	●		●	●	●
Olivenhain Reservoir	5.21	●		●				●[1]	●	●	●	●		●
San Dieguito Reservoir	5.21	●	●	○				●	●	●	●	●		
Lake Dixon	4.62	●	●	○				●[1]	●	●	●	●		
Lake Wohlford	4.63	●	●	○				●[1]	●	●	●	●		●
Lake Hodges	5.21	●	●	●	●			●[1]	●	●	●	●	●	
Lake Poway	5.52	●	●	●	●			●[1]	●	●	●	●		
Sutherland Lake	5.53	●	●	●	●			●[1]	●	●	●	●	●	
Miramar Reservoir	6.10	●		●				●[1]	●	●		●		●
Lake Murray	7.11	●		●				●[1]	●	●	●	●		●
Lake Jennings	7.12	●		●				●	●	●	●	●		

[1] Fishing from shore or boat permitted, but other water contact recreational (REC-1) uses are prohibited.

● Existing Beneficial Use

○ Potential Beneficial Use

Table 2-4. BENEFICIAL USES OF RESERVOIRS AND LAKES

Reservoirs & Lakes	Hydrologic Unit Basin Number	BENEFICIAL USE												
		MUN	AGR	IND	PROC	GWR	FRSH	REC1	REC2	WARM	COLD	WILD	RARE	POW
San Vicente Reservoir	7.21	●	●	●	●			●[1]	●	●	●	●		
El Capitan Reservoir	7.31	●	●	●	●			●[1]	●	●	●	●	●	
Cuyamaca Reservoir	7.43	●	●	●	●			●[1]	●	●	●	●	●	
Sweetwater Reservoir	9.21	●	●	●	●			●	●	●		●		
Loveland Reservoir	9.31	●	●	●	●			●	●	●	●	●		
Lower Otay Reservoir	10.31	●	●	●	●			●[1]	●	●	●	●		
Upper Otay Reservoir	10.32	●	●	●	●			●	●	●	●	●		
Lake Barrett	11.30	●	●	●	●		●	●	●	●	●	●	●	
Morena Reservoir	11.50	●	●	●	●		●	●[1]	●	●	●	●	●	

[1] Fishing from shore or boat permitted, but other water contact recreational (REC-1) uses are prohibited.

● Existing Beneficial Use

Table 2-5. BENEFICIAL USES OF GROUND WATERS

Ground Water		Hydrologic Unit Basin Number	BENEFICIAL USE					
			MUN	AGR	IND	PROC	FRSH	GWR
SAN JUAN HYDROLOGIC UNIT		1.00						
Laguna	HA	1.10						
San Joaquin Hills	HSA [1]	1.11	●	●				
Laguna Beach	HSA [1]	1.12	●	●				
Aliso	HSA [2]	1.13	●	●				
Dana Point	HSA [1]	1.14	+	●				
Mission Viejo	HA	1.20						
Oso	HSA	1.21	●	●	●			
Upper Trabuco	HSA	1.22	●	●	●			
Middle Trabuco	HSA	1.23	●	●	●			
Gobernadora	HSA	1.24	●	●	●			
Upper San Juan	HSA	1.25	●	●	●			
Middle San Juan	HSA	1.26	●	●	●			

1 These beneficial uses do not apply to all lands on the coastal side of the inland boundary of the right-of-way of Pacific Coast Highway 1, and this area is excepted from the sources of drinking water policy. The beneficial uses for the remainder of HA 1.10 are as shown.

2 These beneficial uses do not apply westerly of the right-of-way of Interstate 5 and this area is excepted from the sources of drinking water policy. The beneficial uses for the remainder of the hydrologic area are as shown.

● Existing Beneficial Use

+ Excepted from MUN (see text)

Table 2-5. BENEFICIAL USES OF GROUND WATERS

Ground Water			Hydrologic Unit Basin Number	BENEFICIAL USE					
				MUN	AGR	IND	PROC	FRSH	GWR
SAN JUAN HYDROLOGIC UNIT - continued			1.00						
Lower San Juan	HSA	3	1.27	●	●	●			
Ortega	HSA		1.28	●	●	●			
San Clemente	HA		1.30						
Prima Deshecha	HSA	2	1.31	●	●				
Segunda Deshecha	HSA		1.32	+					
San Mateo Canyon	HA	2	1.40	●	●	●			
San Onofre	HA	2	1.50	●	●				

2 These beneficial uses do not apply westerly of the easterly boundary of the right-of-way of Interstate 5 and this area is excepted from the sources of drinking water policy. The beneficial uses for the remainder of the hydrologic area are as shown.

3 These beneficial uses do not apply to all lands on the coastal side of the inland boundary of the right-of-way of Pacific Coast Highway 1 west of the San Juan Creek channel and this area is excepted from the sources of drinking water policy. The beneficial uses for the remainder of HA 1.20 are as shown.

● Existing Beneficial Use

\+ Excepted from MUN (see text)

Table 2-5. BENEFICIAL USES OF GROUND WATERS

Ground Water		Hydrologic Unit Basin Number	BENEFICIAL USE					
			MUN	AGR	IND	PROC	FRSH	GWR
SANTA MARGARITA HYDROLOGIC UNIT		2.00						
Ysidora	HA [2]	2.10	●	●	●	●		
DeLuz	HA	2.20	●	●	●			
Murrieta	HA	2.30	●	●	●	●		
Auld	HA	2.40	●	●	●			
Pechanga	HA	2.50	●	●	●			
Wilson	HA	2.60	●	●	○			
Cave Rocks	HA	2.70	●	●				
Aguanga	HA	2.80	●	●	●			
Oakgrove	HA	2.90	●	●				

2 These beneficial uses do not apply westerly of the right-of-way of Interstate 5 and this area is excepted from the sources of drinking water policy. The beneficial uses for the remainder of the hydrologic area are as shown.

● Existing Beneficial Use

○ Potential Beneficial Use

Table 2-5. BENEFICIAL USES OF GROUND WATERS

Ground Water		Hydrologic Unit Basin Number	BENEFICIAL USE					
			MUN	AGR	IND	PROC	FRSH	GWR
SAN LUIS REY HYDROLOGIC UNIT		3.00						
Lower San Luis	HA [2]	3.10	●	●	●			
Monserate	HA	3.20						
Pala	HSA	3.21	●	●	●			
Pauma	HSA	3.22	●	●	●			
La Jolla Amago	HSA	3.23	●	●	●	●		
Warner Valley	HA	3.30						
Warner	HSA	3.31	●	●	●		●	
Combs	HSA	3.32	●	●	●			

2 These beneficial uses do not apply westerly of the right-of-way of Interstate 5 and this area is excepted from the sources of drinking water policy. The beneficial uses for the remainder of the hydrologic area are as shown.

● Existing Beneficial Use

Table 2-5. BENEFICIAL USES OF GROUND WATERS

Ground Water			Hydrologic Unit Basin Number	BENEFICIAL USE					
				MUN	AGR	IND	PROC	FRSH	GWR
CARLSBAD HYDROLOGIC UNIT			4.00						
Loma Alta	HA	2	4.10	+		●			
Buena Vista Creek	HA		4.20						
El Salto	HSA	2	4.21	●	●	○			
Vista	HSA		4.22	●	●	●			
Agua Hedionda	HA		4.30						
Los Monos	HSA	2	4.31	●	●	●			
Los Monos	HSA	5	4.31	○	○	○			
Los Monos	HSA	6	4.31	○	●	○			
Buena	HSA		4.32	●	●	●			

2 These beneficial uses do not apply westerly of the easterly boundary of the right-of-way of Interstate 5 and this area is excepted from the sources of drinking water policy. The beneficial uses for the remainder of the hydrologic area are as shown.

5 These beneficial uses designations apply to the portion of HSA 4.31 bounded on the west by the easterly boundary of Interstate Highway 5 right-of-way; on the east by the easterly boundary of El Camino Real; and on the north by a line extending along the southerly edge of Agua Hedionda Lagoon to the easterly end of the lagoon, thence in an easterly direction to Evans Point, thence easterly to El Camino Real along the ridge lines separating Letterbox Canyon and the area draining to the Marcario Canyon.

6 These beneficial uses apply to the portion of HSA 4.31 tributary to Agua Hedionda Creek downstream from the El Camino Real crossing, except lands tributary to Marcario Canyon (located directly southerly of Evans Point, land directly south of Agua Hedionda Lagoon, and areas west of Interstate Highway 5.

● Existing Beneficial Use

○ Potential Beneficial Use

+ Excepted from MUN (see text)

Table 2-5. BENEFICIAL USES OF GROUND WATERS

Ground Water			Hydrologic Unit Basin Number	BENEFICIAL USE					
				MUN	AGR	IND	PROC	FRSH	GWR
CARLSBAD HYDROLOGIC UNIT - continued			4.00						
Encinas	HA		4.40	+					
San Marcos	HA		4.50						
Batiquitos	HSA	2,7	4.51	●	●	●			
Batiquitos	HSA	8	4.51	○	○	○			
Richland	HSA	2,7	4.52	●	●	●			
Twin Oaks	HSA	2,7	4.53	●	●	●			
Escondido	HA		4.60						
San Elijo	HSA	2	4.61	○	●	●			
Escondido	HSA		4.62	●	●	●			
Lake Wohlford	HSA		4.63	●	●	●			

2 These beneficial uses do not apply westerly of easterly boundary of the right-of-way of Interstate 5 and this area is excepted from the sources of drinking water policy. The beneficial uses for the remainder of the hydrologic area are as shown.

7 These beneficial uses do not apply to HSA 4.51 and HSA 4.52 between Highway 78 and El Camino Real and to all lands which drain to Moonlight Creek, Cottonwood Creek and to Encinitas Creek and this area is excepted from the sources of drinking water policy. The beneficial uses for the remainder of the subarea are as shown.

8 These beneficial uses apply to the portion of HSA 4.51 bounded on the south by the north shore of Batiquitos Lagoon, on the west by the easterly boundary of the Interstate Highway 5 right-of-way, on the north by the subarea boundary and on the east by the easterly boundary of El Camino Real.

● Existing Beneficial Use

○ Potential Beneficial Use

+ Excepted from MUN (see text)

Table 2-5. BENEFICIAL USES OF GROUND WATERS

Ground Water		Hydrologic Unit Basin Number	BENEFICIAL USE					
			MUN	AGR	IND	PROC	FRSH	GWR
SAN DIEGUITO HYDROLOGIC UNIT		5.00						
Solana Beach	HA [2]	5.10	●	●	●			
Hodges	HA	5.20	●	●	●			
San Pasqual	HA	5.30	●	●	●			
Santa Maria Valley	HA	5.40						
Ramona	HSA	5.41	●	●	●	●		
Lower Hatfield	HSA	5.42	●	●	●			
Wash Hallow	HSA	5.43	●	●	●			
Upper Hatfield	HSA	5.44	●	●	●			
Ballena	HSA	5.45	●	●	●			
East Santa Teresa	HSA	5.46	●	●	●			
West Santa Teresa	HSA	5.47	●	●	●			
Santa Ysabel	HA	5.50	●	●				

2 These beneficial uses do not apply westerly of the easterly boundary of the right-of-way of Interstate Highway 5 and this area is excepted from the sources of drinking water policy. The beneficial uses for the remainder of the hydrologic area are as shown.

● Existing Beneficial Use

Table 2-5. BENEFICIAL USES OF GROUND WATERS

Ground Water			Hydrologic Unit Basin Number	BENEFICIAL USE					
				MUN	AGR	IND	PROC	FRSH	GWR
PENASQUITOS HYDROLOGIC UNIT			6.00						
Miramar Reservoir	HA	2, 9	6.10	●	●	●			
Poway	HA		6.20	●	●	○			
Scripps	HA		6.30	+					
Miramar	HA	10	6.40	+		○			
Tecolote	HA		6.50	+					

2 These beneficial uses do not apply westerly of the easterly boundary of the right-of-way of Interstate Highway 5 and this area is excepted from the sources of drinking water policy. The beneficial uses for the remainder of the hydrologic area are as shown.

9 These beneficial uses do not apply to all lands which drain to Los Penasquitos Canyon from 1.5 miles west of Interstate Highway 15 and this area is excepted from the sources of drinking water policy. The beneficial uses for the remainder of the hydrologic area are as shown.

10 These beneficial uses do not apply west of Interstate Highway 15. The beneficial uses for the remainder of the hydrologic area are as shown.

● Existing Beneficial Use

○ Potential Beneficial Use

+ Excepted from MUN (see text)

Table 2-5. BENEFICIAL USES OF GROUND WATERS

Ground Water		Hydrologic Unit Basin Number	BENEFICIAL USE					
			MUN	AGR	IND	PROC	FRSH	GWR
SAN DIEGO HYDROLOGIC UNIT		7.00						
Lower San Diego	HA	7.10						
Mission San Diego	HSA [2]	7.11	○	●	●	●		
Santee	HSA	7.12	●	●	●	●		
El Cajon	HSA	7.13	●	●	○	○		
Coches	HSA	7.14	●	●	●	○		
El Monte	HSA	7.15	●	●	●	○		
San Vicente	HA	7.20	●	●				
El Capitan	HA	7.30	●	●				
Boulder Creek	HA	7.40	●	●				

2 These beneficial uses do not apply westerly of the easterly boundary of the right-of-way of Interstate 5 and this area is excepted from the sources of drinking water policy. The beneficial uses for the remainder of the hydrologic area are as shown.

● Existing Beneficial Use

○ Potential Beneficial Use

Table 2-5. BENEFICIAL USES OF GROUND WATERS

Ground Water		Hydrologic Unit Basin Number	BENEFICIAL USE					
			MUN	AGR	IND	PROC	FRSH	GWR
PUEBLO SAN DIEGO HYDROLOGIC UNIT		8.00						
Point Loma	HA	8.10	+					
San Diego Mesa	HA	8.20	+					
National City	HA [2]	8.30	●					
SWEETWATER HYDROLOGIC UNIT		9.00						
Lower Sweetwater	HA	9.10						
Telegraph	HSA	9.11	○	●	○			
La Nacion	HSA	9.12	●	●	●			
Middle Sweetwater	HA	9.20	●	●	●			
Upper Sweetwater	HA	9.30	●	●				

2 These beneficial uses do not apply westerly of the easterly boundary of the right-of-way of Interstate 5 and this area is excepted from the sources of drinking water policy. The beneficial uses for the remainder of the hydrologic area are as shown.

● Existing Beneficial Use

○ Potential Beneficial Use

+ Excepted from MUN (see text)

Table 2-5. BENEFICIAL USES OF GROUND WATERS

Ground Water		Hydrologic Unit Basin Number	BENEFICIAL USE					
			MUN	AGR	IND	PROC	FRSH	GWR
OTAY HYDROLOGIC UNIT		10.00						
Coronado	HA	10.10	+					
Otay Valley	HA	10.20	●	●	●			
Otay Valley	HA [11]	10.20	+		●			
Dulzura	HA	10.30	●	●	●			

11 This beneficial use designation applies to the portion of Otay HA (10.20), limited to lands within and tributary to Salt Creek on the east and Poggi Canyon on the west and including the several smaller drainage courses between these tributaries of the Otay River.

● Existing Beneficial Use

\+ Excepted from MUN (see text)

Table 2-5. BENEFICIAL USES OF GROUND WATERS

Ground Water		Hydrologic Unit Basin Number	BENEFICIAL USE					
			MUN	AGR	IND	PROC	FRSH	GWR
TIJUANA HYDROLOGIC UNIT		11.00						
Tijuana Valley	HA	11.10						
San Ysidro	HSA [12]	11.11	●	●	●			
Water Tanks	HSA	11.12	○	○	○			
Potrero	HA	11.20	●	●	●			
Barrett Lake	HA	11.30	●	●				
Monument	HA	11.40	●	●				
Morena	HA	11.50	●	●				
Cottonwood	HA	11.60	●	●				
Cameron	HA	11.70	●	●				
Campo	HA	11.80	●	●	●			

12 These beneficial uses do not apply west of Hollister Street and this area is excepted from the sources of drinking water policy. The beneficial uses for the remainder of the hydrologic area are as shown.

● Existing Beneficial Use

○ Potential Beneficial Use

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CHAPTER 3
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3. WATER QUALITY OBJECTIVES

INTRODUCTION

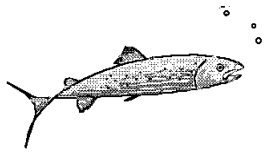

The purpose of this chapter is to designate the water quality objectives for all surface and ground waters in the Region. These water quality objectives are necessary to protect the beneficial uses designated in Chapter 2.

California Water Code (Water Code) section 13050(h) defines "*water quality objectives*" as follows:

"*The limits or levels of water quality constituents or characteristics which are established for the reasonable protection of beneficial uses of water or the prevention of nuisance within a specific area.*"

By definition, water quality objectives must protect the most sensitive of the beneficial uses which have been designated for a water body. Water quality objectives may be numerical values for water quality constituents or narrative descriptions. Water quality objectives must be based upon sound scientific water quality criteria needed to protect the most sensitive of the beneficial uses which have been designated for a water body. Water quality objectives must be as stringent or more stringent than water quality criteria. Numerous key terms used throughout this chapter are defined in the Glossary which is included as Appendix A of this Basin Plan.

WATER QUALITY OBJECTIVES

Like the designation of beneficial uses, the designation of water quality objectives must satisfy all of the applicable requirements of the Water Code, Division 7 (Porter-Cologne Act) and the Clean Water Act. Water Code section 13241 provides that each Regional Water Quality Control Board shall establish water quality objectives for the waters of the state i.e. (ground and surface waters) which, in the Regional Board's judgment, are necessary for the reasonable protection of beneficial uses and for the prevention of nuisance. The Clean Water Act section 303 requires that the State adopt water quality objectives (called water quality criteria) for surface waters. The requirements of both Acts applicable to the designation of water quality objectives are summarized below.

WATER QUALITY OBJECTIVE DESIGNATION UNDER THE PORTER-COLOGNE WATER QUALITY CONTROL ACT

Significant points regarding the designation of water quality objectives for waters of the state under the Porter-Cologne Act are:

- Water quality objectives must ensure the reasonable protection of beneficial uses and the prevention of nuisance, recognizing that it may be possible for the quality of the water to be changed to some degree without unreasonably affecting beneficial uses. (Water Code section 13241)

- Protection of beneficial uses may not require that water quality objectives protect the existing quality of water. However, water quality objectives cannot be set at a level that would permit water quality to change to such a degree that the beneficial uses designated for protection are unreasonably affected. (Water Code section 13241)

- Water quality objectives must ensure that the water will be suitable for the beneficial uses which have been designated for protection. (Water Code section 13241)

- In establishing water quality objectives, the Regional Board must provide for the reasonable protection of all beneficial uses which are designated for protection, taking into account existing water quality, environmental and economic considerations. Water Code section 13241 provides that the Regional Board shall consider, but is not limited to, the following factors in establishing water quality objectives:

  - Past, present, and probable future beneficial uses of water;

  - Environmental characteristics of the hydrographic unit under consideration, including the quality of water available thereto;

- Water quality conditions that could reasonably be achieved through the coordinated control of all factors which affect water quality in the area;
- Economic considerations;
- The need for developing housing within the region; and
- The need to develop and use recycled water.

WATER QUALITY OBJECTIVE DESIGNATION UNDER THE CLEAN WATER ACT

Section 303 of the Clean Water Act requires the State to submit to the U.S. Environmental Protection Agency (USEPA) for approval, all new or revised water quality standards which are established for surface and ocean waters. Under federal terminology, water quality standards consist of the beneficial uses enumerated in Chapter 2 and the water quality objectives contained in this chapter. Significant points regarding the designation of water quality objectives for surface waters pursuant to the Clean Water Act are:

- Water quality objectives are called water quality criteria in the Clean Water Act.
- Water quality criteria (i.e., water quality objectives) are defined as constituent concentrations, levels, or narrative statements, representing a quality of water that supports a particular surface water use. Water quality criteria are qualitative or quantitative estimates of the concentration of a water constituent which, when not exceeded, will ensure water quality sufficient to protect a designated beneficial use. Water quality criteria should reflect the latest scientific knowledge on the identifiable effects of pollutants on public health and welfare, aquatic life, and recreation [40 CFR 131.3(b)].
- States must adopt water quality criteria (i.e., water quality objectives) that protect designated surface water beneficial uses. For surface waters with multiple beneficial use designations, the water quality criteria shall support the most sensitive beneficial use [40 CFR 131.11(a)(1)].
- States must adopt water quality criteria (i.e., water quality objectives) for surface waters which are based upon USEPA guidance documents or other scientifically defensible methods. Economics are not considered in the development of water quality criteria for surface waters under the Clean Water Act [40 CFR 131.11(b)].
- Water quality criteria (i.e., water quality objectives) for surface waters can be either numeric or narrative specifications for water quality based on physical, chemical and toxicological data, and scientific judgment. Where numerical specifications cannot be established, narrative criteria must be established based upon biomonitoring methods [40 CFR 131.11(b)].
- The term "*water quality criteria*" has two meanings under the federal Clean Water Act. In one context, water quality criteria is equivalent to water quality objectives. In other words, water quality criteria is the standard that a state must impose to protect a surface water beneficial use. In another context, the term "*water quality criteria*" refers to scientific information USEPA has developed on the relationship that the effect of a constituent concentration has on human health, aquatic life, or other uses of water. USEPA has published information in documents such as the "*Gold Book*" (USEPA, 1986) and in various individual criteria documents.

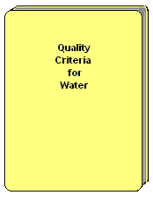

STATE AND FEDERAL ANTIDEGRADATION POLICIES

Water quality objectives must also conform to USEPA regulations covering antidegradation (40 CFR section 131.12) and State Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality of Waters in California*. Application of the antidegradation provisions to the standard setting process requires supporting documentation and appropriate findings whenever a standard (water quality objective or beneficial use) is made

less restrictive to accommodate the discharge of pollutants or other activities of man.

Elegant tern

FEDERAL ANTIDEGRADATION POLICY

USEPA water quality standards regulations mandated under the Clean Water Act require that each state have an "*antidegradation*" policy for surface waters [40 CFR 131.6(d)]. Each state's policy must, at a minimum, be consistent with the following three principles (hereinafter referred to as the "*federal antidegradation policy*" set forth in 40 CFR 131.12(a):

(1) The first principle requires that all existing instream water uses shall be maintained and protected.

(2) The second principle protects waters whose quality exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water. For these waters, limited water quality degradation may be allowed if necessary to accommodate important economic or social development in the area in which the waters are located and if the water quality is adequate to protect existing uses fully.

(3) The third principle requires maintenance and protection of all high quality waters which constitute an outstanding national resource.

The federal antidegradation policy serves as a "*catchall*" water quality standard, to be applied where other water quality standards are not specific enough for a particular water body or where other water quality standards do not address a particular pollutant. The policy also serves to provide guidance for standard setting and for other regulatory decisions, to determine when additional control measures should be required to maintain instream beneficial uses or to maintain high quality surface waters. The federal antidegradation policy is not an absolute bar to reductions in surface water quality. Rather, the policy requires that reductions in water quality be justified as necessary to accommodate important social and economic development.

STATE ANTIDEGRADATION POLICY

Water quality objectives for waters of the state must conform to State Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality of Waters in California*. Under State Board Resolution No. 68-16, which applies to all waters of the State, the Regional Board and the State Board must have sufficient grounds to adopt findings which demonstrate that any water quality degradation will:

(1) Be consistent with the maximum benefit to the people of the State;

(2) Not unreasonably affect existing and potential beneficial uses of such water; and

(3) Not result in water quality less than described in the Basin Plan.

Resolution No. 68-16 establishes a general principle of nondegradation, with flexibility to allow some changes in water quality which is in the best interests of the State. Changes in water quality are allowed only where it is in the public interest and beneficial uses are not unreasonably affected. The State Board has interpreted Resolution No. 68-16 as incorporating the three part principles set forth in the federal antidegradation policy. The terms and conditions of Resolution No. 68-16 serve as a general narrative water quality objective in all state water quality control plans. A reprint of Resolution No. 68-16 is provided in the back of this Chapter on page 3-35.

DESIGNATED WATER QUALITY OBJECTIVES

The water quality objectives designated for the waters of the San Diego Region are listed below. These water quality objectives are necessary to protect existing and potential beneficial uses described in Chapter 2 and to protect existing high quality waters of the State.

The water quality objectives will be achieved primarily through the establishment of waste discharge requirements, and through the implementation of this water quality control plan.

The Regional Board, in establishing waste discharge requirements, will consider potential effects on beneficial uses within the area of influence of the discharge, the existing quality of receiving waters, and the appropriate water quality objectives. The Regional Board will make a finding as to the beneficial uses to be protected within the area of influence of the discharge and establish waste discharge requirements to protect those uses and to meet water quality objectives.

The water quality objectives are stated in italics and arranged first by the water body type to which they apply (e.g., all waters; all ocean waters; and all inland surface, enclosed bay and estuaries, coastal lagoons, and ground waters). Within each water body type, the water quality objectives are alphabetized by constituent.

In most cases the water quality objective is preceded by a general description of the constituent limited by the objective. The objectives vary in applicability and scope, reflecting the variety of beneficial uses of water which have been identified. Where numerical limits are specified, they represent the maximum levels of constituents that will allow the beneficial use to continue unimpaired. In other cases, an objective may tolerate natural or "*background*" levels of certain substances or characteristics but no increases over those values, or may express a limit in terms of not adversely affecting beneficial uses. An adverse effect or impact on a beneficial use occurs where there is an actual or threatened loss or impairment of that beneficial use.

GENERAL ANTIDEGRADATION OBJECTIVE

The following objective shall apply to all waters of the State within the Region.

General Antidegradation Water Quality Objective: *Wherever the existing quality of water is better than the quality of water established herein as objectives, such existing quality shall be maintained unless otherwise provided by the provisions of the State Water Resources Control Board Resolution No. 68-16, "Statement of Policy with Respect to Maintaining High Quality of Waters in California," including any revisions thereto, or the federal Antidegradation Policy, 40 CFR 131.12 (for surface waters only).*

Pacific bonito

OCEAN WATERS

The following objectives shall apply to all ocean waters of the State within the Region:

OCEAN PLAN AND THERMAL PLAN

Ocean Plan and Thermal Plan Water Quality Objective:

The terms and conditions of the State Board's "Water Quality Control Plan for Ocean Waters of California" (Ocean Plan), "Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California" (Thermal Plan), and any revisions thereto are incorporated into this Basin Plan by reference. The terms and conditions of the Ocean Plan and Thermal Plan apply to the ocean waters within this Region.

The shoreline segment along Baby Beach within Dana Point Harbor is designated as a water quality limited segment for indicator bacteria pursuant to Clean Water Act section 303(d). Total Maximum Daily Loads have been adopted to address these impairments. See Chapter 2, Table 2-3, *Beneficial Uses of Coastal Waters,* Footnote 2, and Chapter 7, *Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay*.

Certain Pacific Ocean shoreline segments of the following Hydrological Units, Areas, and Subareas are designated as water quality limited segments for indicator bacteria pursuant to Clean Water Act section 303(d): San Joaquin Hills HSA 901.11 and Laguna Beach HAS 901.12, Aliso Creek HSA 901.13, Dana Point HSA 901.14, Lower San Juan HSA 901.27, San Clemente HA 901.30, San Luis Rey HU 903.00, San Marcos HA 904.50, San Dieguito HU 905.00, Miramar Reservoir HA 906.10, Scripps HA 906.30, and Mission San Diego HSA 907.11 and Santee HSA 907.12. Total Maximum Daily Loads have been adopted to address these impairments. See

Chapter 2, Table 2-3, *Beneficial uses of Coastal Waters, Footnotes 1, 6, 9, 10, and 11,* and Chapter 7, *Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)*.

Total Maximum Daily Load (TMDL) Implementation Provisions:

For the purposes of a TMDL, the water quality objectives for total coliform, fecal coliform, and/or enterococcus bacteria in ocean waters designated for contact recreation may be implemented using a reference system and antidegradation approach or natural sources exclusion approach.

See Chapter 4 (Implementation) for further discussion of this implementation provision.

DISSOLVED OXYGEN

Adequate dissolved oxygen is vital for aquatic life. Depression of dissolved oxygen levels can lead to fish kills and odors resulting from anaerobic decomposition. Dissolved oxygen content in water is a function of water temperature and salinity.

Water Quality Objective for Dissolved Oxygen:

The dissolved oxygen concentration in ocean waters shall not at any time be depressed more than 10 percent from that which occurs naturally, as the result of the discharge of oxygen demanding waste materials.

HYDROGEN ION CONCENTRATION (pH)

The hydrogen ion concentration of water is called "*pH*". The acidity or alkalinity of water is measured by the pH factor. The pH scale ranges from 1 to 14, with 1 to 6.9 being acid, 7.1 to 14 being alkaline, and 7.0 being neutral. Ranges (pH) of 6.5 to 9.0 are considered harmless. A change of one point on this scale represents a ten-fold increase in acidity or alkalinity. Many pollutants can alter the pH, raising or lowering it excessively. In some cases even small changes in pH can harm aquatic biota. The pH changes can alter the chemical form of certain constituents, thereby increasing their bioavailability and toxicity. For example a decrease in pH can result in an increase in dissolved metal concentrations. Ammonia, which is a major component of sewage discharges, can be completely safe at pH 7.0 and extremely toxic to fish at pH 8.5 for the same total ammonia concentration.

Water Quality Objective for pH:

The pH value shall not be changed at any time more than 0.2 pH units from that which occurs naturally.

INLAND SURFACE WATERS, ENCLOSED BAYS AND ESTUARIES, COASTAL LAGOONS AND GROUND WATERS

The following objectives apply to all inland surface waters, enclosed bays and estuaries, coastal lagoons, and ground waters of the Region as specified below.

THERMAL PLAN

Thermal Plan Water Quality Objective:

The terms and conditions of the State Board's "Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California" (Thermal Plan) and any revisions thereto are incorporated into this Basin Plan by reference. The terms and conditions of the Thermal Plan apply to the Inland Surface Waters, Enclosed Bays and Estuaries, and Coastal Lagoons within this Region.

AGRICULTURAL SUPPLY BENEFICIAL USE

Water Quality Objective for Agricultural Supply:

Waters designated for use as agricultural supply (AGR) shall not contain concentrations of chemical constituents in amounts that adversely affect such beneficial use.

AMMONIA, UN-IONIZED

Ammonia is a pungent, colorless, gaseous alkaline compound of nitrogen and hydrogen that is highly soluble in water. Un-ionized ammonia (NH_3) is toxic to fish and other aquatic organisms. In water, NH_3 exists in equilibrium with ammonium (NH_4^+) and hydroxide (OH^-) ions.

The proportions of each change as the temperature, pH, and salinity of the water change.

Water Quality Objective for Un-ionized Ammonia:

The discharge of wastes shall not cause concentrations of un-ionized ammonia (NH_3) to exceed 0.025 mg/l (as N) in inland surface waters, enclosed bays and estuaries and coastal lagoons.

BACTERIA - TOTAL COLIFORM, FECAL COLIFORM, E.COLI, AND ENTEROCOCCI

Total coliform, fecal coliform, *Escherichia coli* (*E. coli*), and enterococci bacteria are used to indicate the likelihood of pathogens of fecal origin in surface waters. Fecal bacteria (e.g., fecal coliform, *E. coli*, and enterococci) are part of the intestinal biota of warm-blooded animals. Their presence in surface waters is an indicator of potential pollution. Total coliform numbers can include non-fecal bacteria, so additional testing is often done to confirm the presence and numbers of fecal bacteria. Water quality objectives for numbers of total coliform, fecal coliform, *E.coli*, and enterococci vary with the beneficial uses of the water, as described below. The water quality objectives for bacteria are expressed in units of organisms per 100 milliliters of water.

The shoreline segment along Shelter Island Shoreline Park within San Diego Bay is designated as a water quality limited segment for indicator bacteria pursuant to Clean Water Act section 303(d). Total Maximum Daily Loads have been adopted to address these impairments. See Chapter 2, Table 2-3, *Beneficial Uses of Coastal Waters,* Footnote 5, and Chapter 7, *Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay*.

Aliso Creek, San Juan Creek, Tecolote Creek, Forrester Creek, San Diego River (lower), and Chollas Creek are designated as water quality limited segments for indicator bacteria pursuant to Clean Water Act section 303(d). Total Maximum Daily Loads have been adopted to address these impairments. See Chapter 2, Table 2-2, *Beneficial Uses of Inland Surface Waters, Footnote 3* and Chapter 7*, Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)*.

Surfer at Ocean Beach, San Diego County

(1) Waters Designated for Contact Recreation (REC-1) Beneficial Use

Fecal Coliform Water Quality Objective for Contact Recreation:

The fecal coliform concentration, based on a minimum of not less than five samples for any 30-day period, shall not exceed a log mean of 200 organisms per 100 ml.

In addition, the fecal coliform concentration shall not exceed 400 organisms per 100 ml for more than 10 percent of the total samples during any 30-day period.

Enterococci and E. Coli Water Quality Objectives for Contact Recreation:

The USEPA published E. coli and enterococci bacteriological criteria applicable to waters designated for contact recreation (REC-1) in the Federal Register, Vol. 51, No. 45, Friday, March 7, 1986, 8012-8016.

USEPA BACTERIOLOGICAL CRITERIA FOR WATER CONTACT RECREATION [1,2]
(in colonies per 100 ml)

	Freshwater		*Saltwater*
	Enterococci	*E.coli*	*Enterococci*
Steady State			
(all areas)	*33*	*126*	*35*
Maximum			
(designated beach)	*61*	*235*	*104*
(moderately or lightly used area)	*108*	*406*	*276*
(infrequently used area)	*151*	*576*	*500*

Total Coliform Water Quality Objective for Contact Recreation for Bays and Estuaries:

In bays and estuaries, the most probable number of total coliform organisms in the upper 60 feet of the water column shall be less than 1,000 organisms per 100 ml (10 organisms per ml); provided that not more than 20 percent of the samples at any sampling station, in any 30-day period, may exceed 1,000 organisms per 100 ml (10 per ml); and provided further that no single sample as described below is exceeded.

The most probable number of total coliform organisms in the upper 60 feet of the water column in no single sample when verified by a repeat sample taken within 48 hours shall exceed 10,000 organisms per 100 ml (100 organisms per ml).

(2) Waters Designated for Non-Contact Recreation (REC-2) Beneficial Use

Fecal Coliform Water Quality Objective for Non-contact Recreation:

In waters designated for non-contact recreation (REC-2) and not designated for contact recreation (REC-1), the average fecal coliform concentrations for any 30-day period, shall not exceed 2,000 organisms per 100 ml nor shall more than 10 percent of samples collected during any 30-day period exceed 4,000 organisms per 100 ml.

(3) Waters Where Shellfish May Be Harvested for Human Consumption (SHELL and COMM) Beneficial Use

Total Coliform Water Quality Objective for Shellfish Harvesting:

In waters where shellfish harvesting for human consumption, commercial or sports purposes is designated (SHELL and COMM), the median total coliform concentration throughout the water column for any 30-day period shall not exceed 70 organisms per 100 ml nor shall more than 10 percent of the samples collected during any 30-day period exceed 230 organisms per 100 ml for a five-tube decimal dilution test or 330 organisms per 100 ml when a three-tube decimal dilution test is used.

(4) San Diego Bay Waters Used for Whole Fish Handling

E. Coli Water Quality Objective for Whole Fish Handling for San Diego Bay:

In San Diego Bay where bay waters are used for whole fish handling, the density of E. coli shall not exceed 7 organisms per ml in more than 20 percent of any 20 daily consecutive samples of bay water.

(5) Total Maximum Daily Load (TMDL) Implementation Provisions

For the purposes of a TMDL, the following provisions may be used to implement bacteria water quality objectives:

The water quality objectives for fecal coliform bacteria for contact recreation may be implemented using a reference system and

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[1] *The criteria were published in the Federal Register, Vol. 51, No. 45/Friday, March 7, 1986/8012-8016. The criteria are based on:*

Cabelli, V. J. 1983. Health Effects Criteria for Marine Recreational Waters. U. S. Environmental Protection Agency, EPA 600/1-80-031, Cincinnati, Ohio.

Dufour, A. P. 1984. Health Effects Criteria for Fresh Recreational Waters. U. S. Environmental Protection Agency, EPA 600/1-84-004, Cincinnati, Ohio.

[2] *The EPA criteria apply to water contact recreation only. The criteria provide for a level of protection based on the frequency of usage of a given water contact recreation area. The criteria may be employed in special studies within this Region to differentiate between pollution sources or to supplement the current coliform objectives for water contact recreation.*

antidegradation approach or natural sources exclusion approach.

The water quality objectives for enterococci and/or *E. coli* in freshwater and/or saltwater may be implemented using a reference system and antidegradation approach or natural sources exclusion approach.

The water quality objectives for coliform organisms in bays and estuaries may be implemented using a reference system and antidegradation approach or natural sources exclusion approach.

The water quality objectives for fecal coliform bacteria for non-contact recreation may be implemented using a reference system and antidegradation approach or natural sources exclusion approach.

See Chapter 4 (Implementation) for a further discussion of this implementation provision.

BIOSTIMULATORY SUBSTANCES

Excessive growth of algae and/or other aquatic plants can degrade water quality. Algal blooms sometimes occur naturally; however, they are often the result of waste discharges or nonpoint source pollutants. Algal blooms depress the dissolved oxygen content of water and can result in fish kills. Algal blooms can also lead to problems with taste, odors, color, and increased turbidity. Floating algal scum and algal mats are also an aesthetically unpleasant nuisance. This general condition is known as eutrophication.

Water Quality Objectives for Biostimulatory Substances:

Inland surface waters, bays and estuaries and coastal lagoon waters shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses.

Concentrations of nitrogen and phosphorus, by themselves or in combination with other nutrients, shall be maintained at levels below those which stimulate algae and emergent plant growth. Threshold total phosphorus (P) concentrations shall not exceed 0.05 mg/l in any stream at the point where it enters any standing body of water, nor 0.025 mg/l in any standing body of water. A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/l total P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1 , on a weight to weight basis shall be used.

Inland surface waters shall not contain biostimulatory substances in concentrations in excess of the numerical objectives described in Table 3-2.

Rainbow Creek is designated as an impaired water body for total nitrogen and total phosphorus pursuant to Clean Water Act section 303(d). Total Maximum Daily Loads (TMDLs) have been adopted to address these impairments. See Chapter 2, Beneficial Uses Table 2-2. Beneficial Uses of Inland Surface Waters, Santa Margarita River Watershed, Rainbow Creek, Hydrologic Unit Basin Numbers 2.23 and 2.22, Footnote 3 and Chapter 7, Total Maximum Daily Loads.

Note - Certain exceptions to the above water quality objectives are described in Chapter 4 in the sections titled Discharges to Coastal Lagoons from Pilot Water Reclamation Projects and Discharges to Inland Surface Waters.

BORON

Boron occurs as sodium borate (borax) or as calcium borate (colemanite) in mineral deposits and natural waters of southern California. Boron is not considered harmful in drinking waters in concentrations up to 30 mg/l. Boron is an essential element for the growth of plants but there is no evidence that it is required by animals. Naturally occurring concentrations of boron should have no effect on aquatic life. Concentrations of boron in irrigation waters in excess of 0.75 (milligrams per liter) mg/l may be deleterious to sensitive plants such as citrus. The maximum safe concentration of boron for even the most tolerant

Oranges

plants is about 4.0 mg/l. The United States Environmental Protection Agency (USEPA) has established a water quality criterion for boron of 0.75 mg/l for long term-term irrigation on sensitive crops. This criterion is found in *Quality Criteria for Water, 1986* - the "*Gold Book*". Additional information regarding boron concentrations in irrigation waters is presented in Table 3-1.

Water Quality Objectives for Boron:

Inland surface waters shall not contain boron in concentrations in excess of the numerical objectives described in Table 3-2.

Ground waters shall not contain boron in concentrations in excess of the numerical objectives described in Table 3-3.

Table 3-1. Guidelines for Interpretation of Water Quality for Irrigation[a]

Potential Irrigation Problem	Units	Degree or Restriction on use		
		None	Slight to Moderate	Severe
Salinity (affects crop water availability)				
Electrical Conductivity (EC_w[b])	ds/m or mmho/cm	< 0.7	0.7 - 3.0	> 3.0
TDS	mg/l	< 450	450 – 2,000	> 2,000
Permeability (affects infiltration rate of water into soil. Evaluate using EC_w and Sodium Adsorption Ratio (SAR) together) [c, d]				
SAR =			**and EC_w =**	
0 - 3		> 0.7	0.7 - 0.2	< 0.2
3 - 6		> 1.2	1.2 - 0.3	< 0.3
6 - 12		> 1.9	1.9 - 0.5	< 0.5
12 - 20		> 2.9	2.9 - 1.3	< 1.3
20 - 40		> 5.0	5.0 - 2.9	< 2.9
Specified ion toxicity (affects sensitive crops)				
Sodium (Na) [e,f]				
surface irrigation	SAR	< 3	3 - 9	> 9
sprinkler irrigation	mg/l	< 70	> 70	-----
Chloride (Cl) [e,f]				
surface irrigation	mg/l	< 140	140 - 350	> 350
sprinkler irrigation	mg/l	< 100	> 100	-----
Boron (B)	mg/l	< 0.7	0.7 - 3.0	> 3.0
Miscellaneous effects (affects susceptible crops)				
Nitrogen (Total-N) [g]	mg/l	< 5	5 - 30	> 30
Bicarbonate (HCO_3) (overhead sprinkler only)	mg/l	< 90	90 - 500	> 500
pH		normal range	6.5 - 8.4	
Residual chlorine (overhead sprinkler only)	mg/l	< 1.0	1.0 - 5.0	> 5.0

Endnotes for Table 3-1

a. Interpretations are based on possible effects of constituents on crops and/or soils. Guidelines are flexible and should be modified when warranted by local experience or special conditions of crop, soil, and method of irrigation. Table 3-1 is based on Table 3-4 contained in "*Irrigation with Reclaimed Municipal Wastewater, A Guidance Manual,*" California State Water Resources Control Board, Report Number 84-1, July 1984.

b. EC_w means electrical conductivity of the irrigation water, reported in mmho/cm or ds/m. TDS means total dissolved solids, reported in mg/l.

c. SAR means sodium adsorption ratio. SAR is sometimes reported as R_{Na}. At a given SAR, infiltration rate increases as salinity (EC_w) increases. Evaluate the potential permeability problem by SAR and EC_w in combination.

$$SAR = \frac{Na}{\sqrt{\frac{(Ca + Mg)}{2}}}$$

Where Na, Ca, and Mg are in milliequivalents per liter.

d. For wastewaters, it is recommended that the SAR be adjusted to include a more correct estimate of calcium in the soil water following an irrigation. The adjusted sodium adsorption ratio (adj RNa) calculated by this product is to be substituted for the SAR value.

$$SAR = \frac{Na}{\sqrt{\frac{(Ca_x + Mg)}{2}}}$$

Where Na, Ca, and Mg are in milliequivalents per liter.

Ca_x is a modified Ca value calculated using Table 3-2, contained in "*Irrigation with Reclaimed Municipal Wastewater, A Guidance Manual.*"

e. Most tree crops and woody ornamentals are sensitive to sodium and chloride; use the values shown. Most annual crops are not sensitive; use the salinity tolerance tables. For boron sensitivity, refer to boron tolerance tables.

f. With overhead sprinkler irrigation and low humidity (<30%), sodium or chloride greater than 70 or 100 mg/l, respectively, have resulted in excessive leaf absorption and crop damage to sensitive crops.

g. Total nitrogen should include nitrate-nitrogen, ammonia-nitrogen, and organic-nitrogen. Although forms of nitrogen in wastewater vary, the plant responds to the total nitrogen.

Table 3-2. Water Quality Objectives

Concentrations not to be exceeded more than 10% of the time during any one year period.

Inland Surface Waters			Hydrologic Unit Basin Number	Constituent (mg/L or as noted)												
				TDS	Cl	SO_4	%Na	N&P	Fe	Mn	MBAS	B	ODOR	Turb NTU	Color Units	F
SAN JUAN HYDROLOGIC UNIT			**901.00**													
Laguna	HA		1.10	1,000	400	500	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Mission Viejo	HA		1.20	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
San Clemente	HA		1.30	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
San Mateo Canyon	HA		1.40	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
San Onofre	HA		1.50	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
SANTA MARGARITA HYDROLOGIC UNIT			**902.00**													
Ysidora	HA		2.10	750	300	300	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Deluz	HA		2.20	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Deluz Creek	HSA	b	2.21	750	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Gavilan	HSA	b	2.22	750	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Murrieta	HA		2.30	750	300	300	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Auld	HA		2.40	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Pechanga	HA		2.50	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Wolf	HSA	b	2.52	750	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Wilson	HA		2.60	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Cave Rocks	HA		2.70	750	300	300	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Aguanga	HA		2.80	750	300	300	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Oakgrove	HA		2.90	750	300	300	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0

HA – Hydrologic Area

HSA – Hydrologic Sub Area (Lower case letters indicate endnotes following the table).

Table 3-2. Water Quality Objectives (continued)

Concentrations not to be exceeded more than 10% of the time during any one year period.

Inland Surface Waters		Hydrologic Unit Basin Number	Constituent (mg/L or as noted)												
			TDS	Cl	SO_4	%Na	N&P	Fe	Mn	MBAS	B	ODOR	Turb NTU	Color Units	F
SAN LUIS REY HYDROLOGIC UNIT		**903.00**													
Lower San Luis	HA	3.10	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Monserat	HA	3.20	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Warner Valley	HA	3.30	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
CARLSBAD HYDROLOGIC UNIT		**904.00**													
Loma Alta	HA	4.10	-	-	-	-	-	-	-	-	-	none	20	20	1.0
Buena Vista Creek	HA	4.20	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Agua Hedionda	HA	4.30	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Encinas	HA	4.40	-	-	-	-	-	-	-	-	-	none	20	20	1.0
San Marcos	HA	4.50	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Escondido Creek	HA	4.60	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
SAN DIEGUITO HYDROLOGIC UNIT		**905.00**													
Solana Beach	HA	5.10	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Hodges	HA	5.20	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
San Pasqual	HA	5.30	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Santa Maria Valley	HA	5.40	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Santa Ysabel	HA	5.50	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0

HA – Hydrologic Area

HSA – Hydrologic Sub Area (Lower case letters indicate endnotes following the table).

Table 3-2. Water Quality Objectives (continued)

Concentrations not to be exceeded more than 10% of the time during any one year period.

Inland Surface Waters		Hydrologic Unit Basin Number	Constituent (mg/L or as noted)												
			TDS	Cl	SO_4	%Na	N&P	Fe	Mn	MBAS	B	ODOR	Turb NTU	Color Units	F
PENASQUITOS HYDROLOGIC UNIT		**906.00**													
Miramar Reservoir	HA	6.10	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Poway	HA	6.20	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Scripps	HA	6.30	-	-	-	-	a	-	-	-	-	none	20	20	-
Miramar	HA	6.40	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Tecolote	HA	6.50	-	-	-	-	a	-	-	-	-	none	20	20	-
SAN DIEGO HYDROLOGIC UNIT		**907.00**													
Lower San Diego	HA	7.10	1,000	400	500	60	a	0.3	0.05	0.5	1.0	none	20	20	-
Mission San Diego	HSA	7.11	1,500	400	500	60	a	1.0	1.00	0.5	1.0	none	20	20	-
Santee	HSA c	7.12	1,000	400	500	60	a	1.0	1.00	0.5	1.0	none	20	20	-
Santee	HSA d	7.12	1,500	400	500	60	a	1.0	1.00	0.5	1.0	none	20	20	-
San Vicente	HA	7.20	300	50	65	60	a	0.3	0.05	0.5	1.0	none	20	20	1.0
El Capitan	HA	7.30	300	50	65	60	a	0.3	0.05	0.5	1.0	none	20	20	1.0
Boulder Creek	HA	7.40	300	50	65	60	a	0.3	0.05	0.5	1.0	none	20	20	1.0
PUEBLO SAN DIEGO HYDROLOGIC UNIT		**908.00**													
Point Loma	HA	8.10	-	-	-	-	-	-	-	-	-	none	20	20	-
San Diego Mesa	HA	8.20	-	-	-	-	-	-	-	-	-	none	20	20	-
National City	HA	8.30	-	-	-	-	-	-	-	-	-	none	20	20	-
SWEETWATER HYDROLOGIC UNIT		**909.00**													
Lower Sweetwater	HA	9.10	1,500	500	500	60	a	0.3	0.05	0.5	0.75	none	20	20	-
Middle Sweetwater	HA	9.20	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Upper Sweetwater	HA	9.30	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0

HA – Hydrologic Area

HSA – Hydrologic Sub Area (Lower case letters indicate endnotes following the table).

Table 3-2. Water Quality Objectives (continued)

Concentrations not to be exceeded more than 10% of the time during any one year period.

Inland Surface Waters		Hydrologic Unit Basin Number	Constituent (mg/L or as noted)												
			TDS	Cl	SO_4	%Na	N&P	Fe	Mn	MBAS	B	ODOR	Turb NTU	Color Units	F
OTAY HYDROLOGIC UNIT		**910.00**													
Coronado	HA	10.10	-	-	-	-	-	-	-	-	-	-	-	-	-
Otay Valley	HA	10.20	1,000	400	500	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Dulzura	HA	10.30	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
TIJUANA HYDROLOGIC UNIT		**911.00**													
Tijuana Valley	HA	11.10	-	-	-	-	-	-	-	-	-	-	-	-	-
San Ysidro	HSA	11.11	2,100	-	-	-	a	-	-	-	-	none	20	20	-
Potrero	HA	11.20	500	250	250	60	a	0.3	0.05	0.5	1.0	none	20	20	1.0
Barrett Lake	HA	11.30	500	250	250	60	a	0.3	0.05	0.5	1.0	none	20	20	1.0
Monument	HA	11.40	500	250	250	60	a	0.3	0.05	0.5	1.0	none	20	20	1.0
Morena	HA	11.50	500	250	250	60	a	0.3	0.05	0.5	1.0	none	20	20	1.0
Cottonwood	HA	11.60	500	250	250	60	a	0.3	0.05	0.5	1.0	none	20	20	1.0
Cameron	HA	11.70	500	250	250	60	a	0.3	0.05	0.5	1.0	none	20	20	1.0
Campo	HA	11.80	500	250	250	60	a	0.3	0.05	0.5	1.0	none	20	20	1.0

HA – Hydrologic Area

HSA – Hydrologic Sub Area (Lower case letters indicate endnotes following the table).

Endnotes for Table 3-2

a Concentrations of nitrogen and phosphorus, by themselves or in combination with other nutrients, shall be maintained at levels below those which stimulate algae and emergent plant growth. Threshold total Phosphorus (P) concentrations shall not exceed 0.05 mg/l in any stream at the point where it enters any standing body of water, nor 0.025 mg/l in any standing body of water. A desired goal in order to prevent plant nuisances in streams and other flowing waters appears to be 0.1 mg/l total P. These values are not to be exceeded more than 10% of the time unless studies of the specific body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N: P=10:1 shall be used. Note - Certain exceptions to the above water quality objectives are described in Chapter 4 in the sections titled Discharges to Coastal Lagoons from Pilot Water Reclamation Projects and Discharges to Surface Waters.

b These objectives apply to the lower portion of Murrieta Creek in the Wolf HSA (2.52) and the Santa Margarita River from it's beginning at the confluence of Murrieta and Temecula Creeks, through the Gavilan HSA (2.22) and DeLuz HSA (2.21), to where it enters the Upper Ysidora HSA (2.13).

c Sycamore Canyon Subarea, a portion of the Santee Hydrologic Subarea, includes the watersheds of the following north-south trending canyons: Oak Creek, Spring Canyon, Little Sycamore Canyon, Quail Canyon, and Sycamore Canyon. The Sycamore Canyon subarea extends eastward from the Mission San Diego HSA to the confluence of the San Diego River and Forester Creek, immediately south of the Santee Lakes.

d These objectives apply to the Lower Sycamore Canyon portion of the Santee Hydrologic Subarea described as all of the Sycamore Canyon watershed except that part which drains north of the boundary between sections 28 and 33, Township 14 South, Range 1 West.

Table 3-3. Water Quality Objectives

Concentrations not to be exceeded more than 10% of the time during any one year period.

Ground Water		Hydrologic Basin Unit Number	Constituent (mg/L or as noted)												
			TDS	Cl	SO4	%Na	NO3	Fe	Mn	MBAS	B	ODOR	Turb NTU	Color Units	F
SAN JUAN HYDROLOGIC UNIT		**901.00**													
Laguna	HA	1.10													
San Joaquin Hills	HSA	1.11	1,200	400	500	60	10	0.3	0.05	0.5	0.75	none	5	15	1.0
Laguna Beach	HSA	1.12	1,200	400	500	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0
Aliso	HSA	1.13	1,200	400	500	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0
Dana Point	HSA	1.14	1,200	400	500	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0
Mission Viejo	HA	1.20													
Oso	HSA	1.21	1,200	400	500	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0
Upper Trabuco	HSA	1.22	500	250	250	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0
Middle Trabuco	HSA	1.23	750	375	375	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0
Gobernadora	HSA	1.24	1,200	400	500	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0
Upper San Juan	HSA	1.25	500	250	250	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0
Middle San Juan	HSA	1.26	750	375	375	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0
Lower San Juan	HSA	1.27	1,200	400	500	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0
Ortega	HSA	1.28	1,100	375	450	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0
San Clemente	HA	1.30													
Prima Deshecha	HSA	1.31	1,200	400	500	60	10	0.3	0.05	0.5	0.75	none	5	15	1.0
Segunda Deshecha	HSA	1.32	1,200	400	500	60	10	0.3	0.05	0.5	0.75	none	5	15	1.0
San Mateo Canyon	HA [a]	1.40	500 [b]	250	250 [b]	60	45 [b]	0.3 [b]	0.05 [b]	0.5	0.75 [b]	none	5	15	1.0
San Onofre	HA [a]	1.50	500 [b]	250	250 [b]	60	45 [b]	0.3 [b]	0.05 [b]	0.5	0.75 [b]	none	5	15	1.0
SANTA MARGARITA HYDROLOGIC UNIT		**902.00**													
Ysidora	HA [a]	2.10	750 [c]	300 [c]	300 [c]	60	10 [c]	0.3 [c]	0.05 [c]	0.5	0.75 [c]	none	5	15	1.0
Deluz	HA	2.20	500	250	250	60	10	0.3	0.05	0.5	0.75	none	5	15	1.0

HA - Hydrologic Area

HSA - Hydrologic Sub Area (Lower case letters indicate endnotes following the table.)

Table 3-3. Water Quality Objectives (continued)

Concentrations not to be exceeded more than 10% of the time during any one year period.

Ground Water			Hydrologic Basin Unit Number	Constituent (mg/L or as noted)												
				TDS	Cl	SO4	%Na	NO3	Fe	Mn	MBAS	B	ODOR	Turb NTU	Color Units	F
Deluz Creek	HSA	m	2.21	750	250	250	60	10	0.3	0.05	0.5	0.75	none	5	15	1.0
Gavilan	HSA	m	2.22	750	250	250	60	10	0.3	0.05	0.5	0.75	none	5	15	1.0
Murrieta	HA		2.30	750 c	300 c	300 c	60	10 c	0.3 c	0.05 c	0.5	0.75 c	none	5	15	1.0
Domenigoni	HSA		2.35	2,000	-	-	-	-	-	-	-	-	-	-	-	-
Auld	HA		2.40	500	250	250	60	10	0.3	0.05	0.5	0.75	none	5	15	1.0
Pechanga	HA		2.50	500	250	250	60	10	0.3	0.05	0.5	0.75	none	5	15	1.0
Pauba	HSA	o	2.51	750	250	250	60	10	0.3	0.05	0.5	0.75	none	5	15	1.0
Wolf	HSA	p	2.52	750	250	250	60	10	0.3	0.05	0.5	0.75	none	5	15	1.0
Wilson	HA		2.60	500	250	250	60	10	0.3	0.05	0.5	0.75	none	5	15	1.0
Cave Rocks	HA		2.70	500	250	250	60	10	0.3	0.05	0.5	0.75	none	5	15	1.0
Aguanga	HA		2.80	500	250	250	60	10	0.3	0.05	0.5	0.75	none	5	15	1.0
Oakgrove	HA		2.90	500	250	250	60	10	0.3	0.05	0.5	0.75	none	5	15	1.0
SAN LUIS REY HYDROLOGIC UNIT			**903.00**													
Lower San Luis	HA		3.10	800 r	300	400	60	10	0.3	0.05	0.5	0.75	none	5	15	1.0
Mission	HSA	a	3.11	1,500 cd	500 cd	500 cd	60	45 cd	0.85 cd	0.15 cd	0.5 d	0.75 cd	none	5	15 d	1.0 d
Bonsall	HSA		3.12	1,500 cd	500 cd	500 cd	60	45 cd	0.85 cd	0.15 cd	0.5 d	0.75 cd	none	5	15 d	1.0 d
Moosa	HSA		3.13	1,200 r	300	400	60	10	0.3	0.05	0.5	0.75	none	5	15	1.0
Valley Center	HSA		3.14	1,100 r	300	400	60	10	0.3	0.05	0.5	0.75	none	5	15	1.0
Monserate	HA		3.20													
Pala	HSA		3.21	900 c	300 c	500 c	60	15 c	0.3 c	0.05 c	0.5	0.75	none	5	15	1.0
Pauma	HSA		3.22	800 c	300 c	400 c	60	10 c	0.3 c	0.05 c	0.5	0.75	none	5	15	1.0
La Jolla Amago	HSA		3.23	500	250	250	60	5	0.3	0.05	0.5	0.75	none	5	15	1.0
Warner Valley	HA		3.30	500	250	250	60	5	0.3	0.05	0.5	0.75	none	5	15	1.0
CARLSBAD HYDROLOGIC UNIT			**904.00**													
Loma Alta	HA		4.10	-	-	-	-	-	-	-	-	-	-	-	-	-

HA - Hydrologic Area

HSA - Hydrologic Sub Area (Lower case letters indicate endnotes following the table).

Table 3-3. Water Quality Objectives (continued)

Concentrations not to be exceeded more than 10% of the time during any one year period.

Ground Water			Hydrologic Basin Unit Number	Constituent (mg/L or as noted)												
				TDS	Cl	SO4	%Na	NO3	Fe	Mn	MBAS	B	ODOR	Turb NTU	Color Units	F
Buena Vista Creek	HA		4.20													
El Salto	HSA	a	4.21	3,500	800	500	60	45	0.3	0.05	0.5	2.0	none	5	15	1.0
Vista	HSA	a	4.22	1,000 b	400 b	500 b	60	10 b	0.3 b	0.05 b	0.5	0.75 b	none	5	15	1.0
Agua Hedionda	HA	a	4.30	1,200	500	500	60	10	0.3	0.05	0.5	0.75	none	5	15	1.0
Los Monos	HSA	a j	4.31	3,500	800	500	60	45	0.3	0.05	0.5	2.0	none	5	15	1.0
Encinas	HA	a	4.40	3,500 b	800 b	500 b	60	45 b	0.3 b	0.05 b	0.5	2.0 b	none	5	15	1.0
San Marcos	HA	a e	4.50	1,000	400	500	60	10	0.3	0.05	0.5	0.75	none	5	15	1.0
Batiquitos	HSA	a e k	4.51	3,500	800	500	60	45	0.3	0.05	0.5	2.0	none	5	15	1.0
Escondido Creek	HA	a	4.60	750	300	300	60	10	0.3	0.05	0.5	0.75	none	5	15	1.0
San Elijo	HSA	a	4.61	2,800	700	600	60	45	0.3	0.05	0.5	1.0	none	5	15	1.0
Escondido	HSA		4.62	1,000	300	400	60	10	0.3	0.05	0.5	0.75	none	5	15	1.0
SAN DIEGUITO HYDROLOGIC UNIT			**905.00**													
Solana Beach	HA	a	5.10	1,500 b	500 b	500 b	60	45 b	0.85 b	0.15 b	0.5	0.75 b	none	5	15	1.0
Hodges	HA		5.20	1,000 b	400 b	500 b	60	10 b	0.3 b	0.05 b	0.5	0.75 b	none	5	15	1.0
San Pasqual	HA		5.30	1,000 b	400 b	500 b	60	10 b	0.3 b	0.05 b	0.5	0.75 b	none	5	15	1.0
Santa Maria Valley	HA		5.40	1,000	400	500	60	10	0.3	0.05	0.5	0.75	none	5	15	1.0
Santa Ysabel	HA		5.50	500	250	250	60	5	0.3	0.05	0.5	0.75	none	5	15	1.0
PENASQUITOS HYDROLOGIC UNIT			**906.00**													
Miramar Reservoir	HA	a f	6.10	1,200	500	500	60	10	0.3	0.05	0.5	0.75	none	5	15	1.0
Poway	HA		6.20	750 q	300	300	60	10	0.3	0.05	0.5	0.75	none	5	15	1.0
Scripps	HA		6.30	-	-	-	-	-	-	-	-	-	-	-	-	-
Miramar	HA	g	6.40	750	300	300	60	10	0.3	0.05	0.5	0.75	none	5	15	1.0
Tecolote	HA		6.50	-	-	-	-	-	-	-	-	-	-	-	-	-

HA - Hydrologic Area

HSA - Hydrologic Sub Area (Lower case letters indicate endnotes following the table.)

Table 3-3. Water Quality Objectives (continued)

Concentrations not to be exceeded more than 10% of the time during any one year period.

Ground Water		Hydrologic Basin Unit Number	Constituent (mg/L or as noted)												
			TDS	Cl	SO4	%Na	NO3	Fe	Mn	MBAS	B	ODOR	Turb NTU	Color Units	F
SAN DIEGO HYDROLOGIC UNIT		**907.00**													
Lower San Diego	HA	7.10													
Mission San Diego	HSA [a]	7.11	3,000 [b]	800 [b]	600 [b]	60	45 [b]	0.3 [b]	0.05 [b]	0.5	2.0 [b]	none	5	15	1.0
Santee	HSA	7.12	1,000 [b]	400 [b]	500 [b]	60	45 [b]	0.3 [b]	0.05 [b]	0.5	0.75 [b]	none	5	15	1.0
Santee (alluvial aquifer for lower Sycamore Canyon)	HSA [n]	7.12	2,000 [b]	800 [b]	600 [b]	60	45 [b]	0.3 [b]	0.05 [b]	0.5	2.0 [b]	none	5	15	1.0
El Cajon	HSA	7.13	1,200 [b]	250 [b]	500 [b]	60	45 [b]	0.3 [b]	0.05 [b]	0.5	0.75 [b]	none	5	15	1.0
Coches	HSA	7.14	600 [b]	250 [b]	250 [b]	60	5 [b]	0.3 [b]	0.05 [b]	0.5	0.75 [b]	none	5	15	1.0
El Monte	HSA	7.15	600 [b]	250 [b]	250 [b]	60	5 [b]	0.3 [b]	0.05 [b]	0.5	0.75 [b]	none	5	15	1.0
San Vicente	HA	7.20	600	250	250	60	5	0.3	0.05	0.5	0.75	none	5	15	1.0
El Capitan	HA	7.30	1,000	400	500	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0
Conejos Creek	HSA	7.31	350	60	60	60	5	0.3	0.05	0.5	0.75	none	5	15	1.0
Boulder Creek	HA	7.40	350	60	60	60	5	0.3	0.05	0.5	0.75	none	5	15	1.0
PUEBLO SAN DIEGO HYDROLOGIC UNIT		**908.00**													
Point Loma	HA [i]	8.10	-	-	-	-	-	-	-	-	-	-	-	-	-
San Diego Mesa	HA [i]	8.20	-	-	-	-	-	-	-	-	-	-	-	-	-
National City	HA [i]	8.30	750	250	250	60	10	0.3	0.05	0.5	0.75	none	5	15	1.0
SWEETWATER HYDROLOGIC UNIT		**909.00**													
Lower Sweetwater	HA	9.10													
Telegraph	HSA	9.11	3,000 [b]	750 [b]	500 [b]	60	45 [b]	0.3 [b]	0.05 b	0.5	2.0 [b]	none	5	15	1.0
La Nacion	HSA	9.12	1,500 [b]	500 [b]	500 [b]	60	45 [b]	0.3 [b]	0.15 b	0.5	0.75 [b]	none	5	15	1.0
Middle Sweetwater	HA	9.20	1,000	400	500	60	10	0.3	0.05	0.5	0.75	none	5	15	1.0
Upper Sweetwater	HA	9.30	500	250	250	60	10	0.3	0.05	0.5	0.75	none	5	15	1.0

HA - Hydrologic Area

HSA - Hydrologic Sub Area (Lower case letters indicate endnotes following the table.)

Table 3-3. Water Quality Objectives (continued)

Concentrations not to be exceeded more than 10% of the time during any one year period.

Ground Water		Hydrologic Basin Unit Number	Constituent (mg/L or as noted)												
			TDS	Cl	SO4	%Na	NO3	Fe	Mn	MBAS	B	ODOR	Turb NTU	Color Units	F
OTAY HYDROLOGIC UNIT		**910.00**													
Coronado	HA	10.10	-	-	-	-	-	-	-	-	-	-	-	-	-
Otay Valley	HA	10.20	1,500 [b]	500 [b]	500 [b]	60	10 [b]	0.3 [b]	0.05 [b]	0.5	0.75 [b]	none	5	15	1.0
Otay Valley	HA [l]	10.20	-	-	-	-	-	-	-	-	-	none	-	-	-
Dulzura	HA	10.30	1,000	400	500	60	10	0.3	0.05	0.5	0.75	none	5	15	1.0
TIJUANA HYDROLOGIC UNIT		**911.00**													
Tijuana Valley	HA [h]	11.10	2,500 [b]	550 [b]	900 [b]	70	-	-	-	-	2.0 [b]	none	-	-	-
Potrero	HA	11.20	500	250	250	60	45	0.3	0.05	0.5	1.0	none	5	15	1.0
Barrett Lake	HA	11.30	500	250	250	60	45	0.3	0.05	0.5	1.0	none	5	15	1.0
Monument	HA	11.40	500	250	250	60	45	0.3	0.05	0.5	1.0	none	5	15	1.0
Morena	HA	11.50	500	250	250	60	45	0.3	0.05	0.5	1.0	none	5	15	1.0
Cottonwood	HA	11.60	500	250	250	60	45	0.3	0.05	0.5	1.0	none	5	15	1.0
Cameron	HA	11.70	500	250	250	60	45	0.3	0.05	0.5	1.0	none	5	15	1.0
Campo	HA	11.80	500	250	250	60	45	0.3	0.05	0.5	1.0	none	5	15	1.0

HA - Hydrologic Area

HSA - Hydrologic Sub Area (Lower case letters indicate endnotes following the table.)

Endnotes for Table 3-3

a The water quality objectives do not apply westerly of the easterly boundary of Interstate Highway 5. The objectives for the remainder of the Hydrologic Area (Subarea) are as shown.

b Detailed salt balance studies are recommended for this area to determine limiting mineral concentration levels for discharge. On the basis on existing data, the tabulated objectives would probably be maintained in most areas. Upon completion of the salt balance studies, significant water quality objective revisions may be necessary. In the interim period of time, projects of ground water recharge with water quality inferior to the tabulated numerical values may be permitted following individual review and approval by the Regional Board if such projects do not degrade existing ground water quality to the aquifers affected by the recharge.

Endnotes for Table 3-3 (continued)

c The recommended plan would allow for measurable degradation of ground water in this basin to permit continued agricultural land use. Point sources, however, would be controlled to achieve effluent quality corresponding to the tabulated numerical values. In future years demineralization may be used to treat ground water to the desired quality prior to use.

d A portion of the Upper Mission Basin is being considered as an underground potable water storage reservoir for treated imported water. The area is located north of Highway 76 an the boundary of hydrologic subareas 3.11 and 3.12. If this program is adopted, local objectives approaching the quality of the imported water would be set and rigorously pursued.

e The water quality objectives do not apply to hydrologic subareas 4.51 and 4.52 between Highway 78 and El Camino Real and to all lands which drain to Moonlight Creek, Cottonwood Creek and Encinitas Creek. The objectives for the remainder of the Hydrologic Area are as shown.

f The water quality objectives do not apply to all lands which drain to Los Penasquitos Canyon from 1.5 miles west of Interstate Highway 15. The objectives for the remainder of the Hydrologic Area are as shown.

g The water quality objectives do not apply west of Interstate Highway 15. The objectives for the remainder of the Hydrologic Area are as shown.

h The water quality objectives do not apply west of Hollister Street. The objectives for the remainder of the Hydrologic Area are as shown.

i No significant amount of ground water in this unit.

j The water quality objectives apply to the portion of Subarea 4.31 bounded on the west by the easterly boundary of the Interstate 5 right-of-way and on the east by the easterly boundary of El Camino Real.

k The water quality objectives apply to the portion of Subarea 4.51 bounded on the south by the north shore of Batiquitos Lagoon, on the west by the easterly boundary of the Interstate 5 right-of-way and on the east by the easterly boundary of El Camino Real.

l The water quality objectives apply to the portion of the Otay HA 10.20 limited to lands within and tributary to Salt Creek on the east and Poggi Canyon on the west and including the several smaller drainage courses between these tributaries of the Otay River.

m These objectives apply to the alluvial ground water beneath the Santa Margarita River from the confluence of Murrieta and Temecula Creeks through the Gavilan and DeLuz HSAs to a depth of 100 feet and a lateral distance equal to the area of the floodplain covered by a 10 year flood event. These objectives do not apply to ground water in any of the basins beneath DeLuz, Sandia, and Rainbow Creeks and other unnamed creeks, which are tributaries of the Santa Margarita River.

Endnotes for Table 3-3 (continued)

n These objectives apply for only the alluvial aquifer in the Lower Sycamore Canyon portion of the Santee Hydrologic Subarea described as all of the Sycamore Canyon watershed except that part which drains north of the boundary between sections 28 and 33, Township 14 South, Range 1 West.

o These objectives apply to ground waters within 250 feet of the surface for the most downstream 4,200 acres of the Pauba HSA (2.51) which drain directly to the most downstream 2.7 mile segment of Temecula Creek. Excluded from this area are all lands upgradient from a point 0.5 miles east of the intersection of Butterfield Stage Road and Highway 79.

p These objectives apply to ground waters within 250 feet of the surface for the most downstream 2,800 acres of the Wolf HSA (2.52) including those portions of the HSA which drain directly to the most downstream 1.5 mile segment of Pechanga Creek. Excluded from this area are all lands of HSA 2.52 which are upgradient of the intersection of Pala Road and Via Eduardo.

q These objectives apply to ground waters of the Poway HSA (6.2) that lie east of the San Diego County Water Authority's (SDCWA) First Aqueduct. Ground water quality objectives west of the SDCWA First Aqueduct are 1,000 mg/l.

r The total dissolved solids (TDS) objective for the alluvial aquifer in the Moosa Hydrologic Subarea (903.13) is 1,200 mg/l. The TDS objective for the alluvial aquifer in the Valley Center Hydrologic Subarea (903.14) is 1,100 mg/l.

CHLORIDES

Most waters contain chlorides because they are present in many rock types and are very soluble in water. Chlorides may be of natural mineral origin or derived from (a) seawater intrusion of ground water supplies, (b) salts spread on fields for agricultural purposes, (c) human or animal sewage or (d) industrial wastes. Chlorides may impart a salty taste to drinking water in concentrations between 100 - 700 mg/l. The secondary drinking water standard for chlorides is 500 mg/l. Elevated chloride concentrations in waters used for industrial process and supply can significantly increase the corrosion rate of steel and aluminum. High chloride concentrations can be toxic to plant life. A safe concentration of chloride for irrigation water is considered to be in the range of 100 - 140 mg/l. Irrigation with water containing 140 - 350 mg/l of chloride may cause slight to moderate plant injury. Additional information regarding chloride concentrations in irrigation waters is presented in Table 3-1.

Water Quality Objectives for Chlorides:

Inland surface waters shall not contain chlorides in concentrations in excess of the numerical objectives described in Table 3-2.

Ground waters shall not contain chlorides in concentrations in excess of the numerical objectives described in Table 3-3.

COLOR

Color in water may arise naturally, such as from minerals, plant matter, or algae, or may be caused by industrial pollutants. Color is primarily an aesthetic consideration, although it can discolor clothes and food. The secondary drinking water standard for color is 15 color units.

Water Quality Objectives for Color:

Waters shall be free of coloration that causes nuisance or adversely affects beneficial uses.

The natural color of fish, shellfish or other resources in inland surface waters, coastal lagoon or bay and estuary shall not be impaired.

Inland surface waters shall not contain color in concentrations in excess of the numerical objectives described in Table 3-2.

Ground waters shall not contain color in concentrations in excess of the numerical objectives described in Table 3-3.

DISSOLVED OXYGEN

Adequate dissolved oxygen levels are vital for aquatic life. Depression of dissolved oxygen levels can lead to fish kills and odors resulting from anaerobic decomposition. Dissolved oxygen content in water is a function of water temperature and salinity.

Water Quality Objective for Dissolved Oxygen:

Dissolved oxygen levels shall not be less than 5.0 mg/l in inland surface waters with designated MAR or WARM beneficial uses or less than 6.0 mg/l in waters with designated COLD beneficial uses. The annual mean dissolved oxygen concentration shall not be less than 7 mg/l more than 10% of the time.

FLOATING MATERIAL

Floating material is an aesthetic nuisance as well as a substrate for algae and insect vectors.

Water Quality Objective for Floating Material:

Waters shall not contain floating material, including solids, liquids, foams, and scum in concentrations which cause nuisance or adversely affect beneficial uses.

FLUORIDE

Fluoride does not naturally occur in high concentrations in surface waters, but may occur in detrimental concentrations in ground waters. Fluoride, in sufficient quantities, can adversely affect waters used as industrial process or supply in food, beverages, and pharmaceutical industries. The presence of optimal concentrations of fluoride in drinking water supplies can reduce dental decay, especially among children. However, fluoride concentrations in excess of approximately 1.0 mg/l can increase the risk of mottled enamel in children and dental fluorosis in adults.

Water Quality Objectives for Fluoride:

Inland surface waters shall not contain fluoride in concentrations in excess of the numerical objectives described in Table 3-2.

Ground waters shall not contain fluoride in concentrations in excess of the numerical objectives described in Table 3-3.

HYDROGEN ION CONCENTRATION (pH)

The hydrogen ion concentration of water is called "pH". The acidity or alkalinity of water is measured by the pH factor. The pH scale ranges from 1 to 14, with 1 to 6.9 being acid, 7.1 to 14 being alkaline, and 7.0 being neutral. Ranges (pH) of 6.5 to 9.0 are considered harmless. A change of one point on this scale represents a ten-fold increase in acidity or alkalinity. Many pollutants can alter the pH, raising or lowering it excessively. In some cases even small changes in pH can harm aquatic biota. The pH changes can alter the chemical form of certain constituents, thereby increasing their bioavailability and toxicity. For example, a decrease in pH can result in an increase in dissolved metal concentrations. Ammonia, which is a major component of sewage discharges, can be completely safe at pH 7.0 and extremely toxic to fish at pH 8.5 for the same total ammonia concentration.

Water Quality Objectives for pH:

Changes in normal ambient pH levels shall not exceed 0.2 units in waters with designated marine (MAR), or estuarine (EST), or saline (SAL) beneficial uses. Changes in normal ambient pH levels shall not exceed 0.5 units in fresh waters with designated cold freshwater habitat (COLD) or warm freshwater habitat (WARM) beneficial uses.

In bays and estuaries the pH shall not be depressed below 7.0 nor raised above 9.0.

In inland surface waters the pH shall not be depressed below 6.5 nor raised above 8.5.

INORGANIC CHEMICALS - PRIMARY STANDARDS

Water Quality Objective for Domestic or Municipal supply:

Waters designated for use as domestic or municipal supply (MUN) shall not contain concentrations of inorganic chemicals in excess of the maximum contaminant levels set forth in California Code of Regulations, Title 22, Table 64431-A of section 64431 (Inorganic Chemicals) which is incorporated by reference into this plan. This incorporation by reference is prospective including future changes to the incorporated provisions as the changes take effect. (See Table 3-4).

Table 3-4. Maximum Contaminant Levels for Inorganic Chemicals specified in Table 64431-A of section 64431 of Title 22 of the California Code of Regulations as amended June 12, 2003.

Chemical	Maximum Contaminant Level, mg/l
Aluminum	1.
Antimony	0.006
Arsenic	0.05
Asbestos	7 MFL*
Barium	1.
Beryllium	0.004
Cadmium	0.005
Chromium	0.05
Cyanide	0.15
Fluoride	2.0
Mercury	0.002
Nickel	0.1
Nitrate (as NO_3)	45.
Nitrate + Nitrite (sum as nitrogen)	10.
Nitrite (as nitrogen)	1.
Selenium	0.05
Thallium	0.002

MFL = million fibers per liter, MCL for fibers exceeding 10 um in length.

IRON

Iron may be present in water due to natural origin, corrosion of metallic iron and its alloys by water in the presence of oxygen, and industrial waste discharges containing iron. Iron is undesirable in domestic water supplies because it causes unpleasant tastes, deposits on food during cooking, stains and discolors laundry and plumbing fixtures. The secondary drinking water standard for iron is 0.3 mg/l.

Water Quality Objectives for Iron:

Inland surface waters shall not contain iron in concentrations in excess of the numerical objectives described in Table 3-2.

Ground waters shall not contain iron in concentrations in excess of the numerical objectives described in Table 3-3.

MANGANESE

Manganese is undesirable in domestic water supplies because it causes unpleasant tastes, deposits on food during cooking, stains and discolors laundry and plumbing fixtures, and fosters the growth of some microorganisms in reservoirs, filters, and distribution systems. The secondary drinking water standard for manganese is 0.05 mg/l.

Water Quality Objectives for Manganese:

Inland surface waters shall not contain manganese in concentrations in excess of the numerical objectives described in Table 3-2.

Ground waters shall not contain manganese in concentrations in excess of the numerical objectives described in Table 3-3.

METHYLENE BLUE - ACTIVATED SUBSTANCES

The methylene blue-activated substances (MBAS) test measures the presence of anionic surfactant (commercial detergent) in water. Positive test results can be used to indicate the presence of domestic wastewater. The secondary drinking water standard for MBAS is 0.5 mg/l.

Water Quality Objectives for MBAS:

Inland surface waters shall not contain MBAS in concentrations in excess of the numerical objectives described in Table 3-2.

Ground waters shall not contain MBAS in concentrations in excess of the numerical objectives described in Table 3-3.

NITRATE

High nitrate concentrations in domestic water supplies can be toxic to human life. Infants are particularly susceptible and may develop methemoglobinemia (blue baby syndrome). The primary drinking water standard for nitrate as NO_3 is 45 mg/l.

Water Quality Objectives for Nitrate:

Inland surface waters shall not contain nitrate (as NO_3) in concentrations in excess of the numerical objectives described in Table 3-2.

Ground waters shall not contain nitrate (as NO_3) in concentrations in excess of the numerical objectives described in Table 3-3.

OIL AND GREASE

Oil and grease can be present in water as a result of the discharge of treated wastes and the accidental or intentional dumping of wastes into sinks and storm drains. Oils and related materials have a high surface tension and are not soluble in water, therefore forming a film on the water's surface. This film can result in nuisance conditions because of offensive odors and visual impacts. Oil and grease can coat birds and aquatic organisms, adversely affecting respiration and/or thermoregulation.

Water Quality Objective for Oils, Grease, Waxes or other Materials:

Waters shall not contain oils, greases, waxes, or other materials in concentrations which result in a visible film or coating on the surface of the water or on objects in the water, or which cause nuisance or which otherwise adversely affect beneficial uses.

ORGANIC CHEMICALS - PRIMARY STANDARDS

Water Quality Objectives:

Water designated for use as domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels specified in California Code of Regulations, Title 22, Table 64444-A of section 64444 (Organic Chemicals) which is incorporated by reference into this plan. This incorporation by reference is prospective including future changes to the incorporated provisions as the changes take effect. (See Table 3-5).

Table 3-5. Maximum Contaminant Levels for Organic Chemicals specified in Table 64444-A of section 64444 of Title 22 of the California Code of Regulations as amended June 12, 2003.

Chemical	Maximum Contaminant Level, mg/l
(a) Volatile Organic Chemicals (VOCs)	
Benzene	0.001
Carbon Tetrachloride	0.0005
1,2-Dichlorobenzene	0.6
1,4-Dichlorobenzene	0.005
1,1-Dichloroethane	0.005
1,2-Dichloroethane	0.0005
1,1-Dichloroethylne	0.006
cis-1,2-Dichloroethylene	0.006
trans-1,2-Dichloroethylene	0.01
Dichloromethane	0.005
1,2-Dichloropropane	0.005
1,3-Dichloropropene	0.0005
Ethylbenzene	0.3
Methyl-*tert*-butyl ether	0.013
Monochlorobenzene	0.07
Styrene	0.1
1,1,2,2-Tetrachloroethane	0.001
Tetrachloroethylene	0.005
Toluene	0.15
1,2,4-Trichlorobenzene	0.005
1,1,1-Trichloroethane	0.200
1,1,2-Trichloroethane	0.005
Trichloroethylene	0.005
Trichlorofluoromethane	0.15
1,1,2-Trichloro-1,2,2-Trifluoroethane	1.2
Vinyl Chloride	0.0005
Xylenes	1.750*
(b) Non-Volatile Synthetic Organic Chemicals (SOCs)	
Alachlor	0.002
Atrazine	0.001
Bentazon	0.018
Benzo(a)pyrene	0.0002
Carbofuran	0.018
Chlordane	0.0001
2,4-D	0.07
Dalapon	0.2
Dibromochloropropane	0.0002
Di(2-ethylhexyl)adipate	0.4
Di(2-ethylhexyl)phthalate	0.004
Dinoseb	0.007
Diquat	0.02
Endothall	0.1
Endrin	0.002
Ethylene Dibromide	0.00005
Glyphosate	0.7
Heptachlor	0.00001
Heptachlor Epoxide	0.00001
Hexachlorobenezene	0.001
Hexachlorocyclopentadiene	0.05
Lindane	0.0002
Methoxychlor	0.03
Molinate	0.02
Oxamyl	0.05
Pentachlorophenol	0.001
Picloram	0.5
Polychlorinated Biphenyls	0.0005
Simazine	0.004
Thiobencarb	0.07
Toxaphene	0.003
2,3,7,8-TCDD (Dioxin)	3×10^{-8}
2,3,5-TP (Silvex)	0.05

* MCL is for either a single isomer or the sum of the isomers.

PERCENT SODIUM AND ADJUSTED SODIUM ADSORPTION RATIO

Excess concentrations of sodium in irrigation water reduce soil permeability to water and air. The deterioration of sodium in irrigation water is cumulative and is accelerated by poor drainage.

Table 3-1 shows concentration guidelines for sodium, boron, chloride and other chemical constituents present in irrigation waters.

The specific water quality objective for sodium in the Basin Plan is expressed as percent sodium. Percent sodium is calculated as follows:

$$\% Na = \frac{Na}{Na + Ca + Mg + K} \times 100\ \%$$

where sodium (Na), Calcium (Ca), Magnesium (Mg), and Potassium (K) are expressed in milliequivalent per liter (me/l).

The percent sodium objective was developed for the protection of agricultural uses from the potential hazard due to sodium in irrigation waters. The value of 60% sodium is based upon *Water Quality Criteria*, by McKee and Wolf, 1963.

McKee and Wolf note that because of all the variables involved, the classification of waters for irrigation use must be somewhat arbitrary and

the limits set cannot be too rigid. The three general classifications of irrigation waters are:

CLASS	%SODIUM	DESCRIPTION
I	<30 - 60%	Excellent to good, or suitable for most plants under most conditions.
II	30 - 75%	Good to injurious, harmful to some plants under conditions of soil, climate and practices.
III	70 - 75%	Injurious to unsatis-factory, unsuitable under most conditions.

Since the publication of the percent sodium criteria, technical research has resulted in the development of more applicable criteria for addressing the potential sodium hazard in irrigation water.

The sodium adsorption ratio (SAR) and adjusted sodium adsorption ratios ($Adj.\ SAR$) are measures of the potential hazard in soils due to sodium. SAR and $Adj.\ SAR$ are similar to percent sodium in that their calculated values provide an indication of a soil's potential for permeability and potential aeration problems. However, by taking into consideration the soil's sodicity and the exchange phases between Ca, Na and Mg, the SAR and $Adj.\ SAR$ predict potential sodium build up in soils. The $Adj.\ SAR$ calculation further takes into account the effects of carbonate and bicarbonate ion concentrations of a soil. $Adj.\ SAR$ is the most common method for determining sodium hazard in irrigation water at the present time.

The calculation for SAR is as follows:

$$SAR = \frac{Na}{\sqrt{\frac{(Ca + Mg)}{2}}}$$

where Na, Ca and Mg are in me/l.
The calculation for $Adj.\ SAR$ is as follows:

$$Adj.\ SAR = \frac{Na}{\sqrt{\frac{(Ca_x + Mg)}{2}}}$$

where Na and Mg are in me/l.

Ca_x is a modified Ca value, calculated using the Suarez table (Table 3-3, contained in *Irrigation with Reclaimed Municipal Wastewater, A Guidance Manual*, California State Water Resources Control Board, Report Number 84-1, July 1984). Ca_x takes into account salinity (EC_w), the HCO_3/CO_3 ratio (me/l) and the estimated partial pressure of CO_2 in the top few millimeters of the soil ($P_{CO_2} = 0.0007$ atmospheres).

Water Quality Objectives for Sodium:

Inland surface waters shall not contain percent sodium in excess of the numerical objectives described in Table 3-2.

Ground waters shall not contain percent sodium in excess of the numerical objectives described in Table 3-3.

In some cases, adjusted sodium adsorption ratio may be a better indicator of the potential sodium hazard in irrigation water than percent sodium. The Regional Board Executive Officer may authorize the use of adjusted sodium absorption ratio instead of percent sodium to indicate the potential sodium hazard. In such cases, the adjusted sodium adsorption ratio shall not exceed the slight to moderate range of values referenced in Table 3-1 "Guidelines for Interpretation of Water Quality for Irrigation".

PESTICIDES

Pesticides can enter surface and ground waters directly through industrial process discharges, agricultural discharge, spillage and illegal dumping. Pesticides can also enter surface and ground waters indirectly by drifting away from areas where pesticides are being sprayed, through surface runoff from treated fields, and by leaching or return flows from irrigation. Pesticides can concentrate in plant or animal tissues and many are considered to be carcinogenic to humans. Although many pesticides are designed to deteriorate rapidly when exposed to sunlight and air, they may persist for months or years in water.

California Code of Regulations, Title 22, Table 64444-A of section 64444 (Organic Chemicals) establishes maximum contaminant levels for pesticides in drinking water. (See water quality objective for Organic Chemicals).

Water Quality Objectives for Pesticides:

No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.

Water designated for use as domestic or municipal supply (MUN) shall not contain concentrations of pesticides in excess of the maximum contaminant levels specified in California Code of Regulations, Title 22, Table 64444-A of section 64444 (Organic Chemicals) which is incorporated by reference into this plan. This incorporation by reference is prospective including future changes to the incorporated provisions as the changes take effect. (See Table 3-5).

The Shelter Island Yacht Basin portion of San Diego Bay is designated as an impaired water body for dissolved copper pursuant to Clean Water Act section 303(d). A Total Maximum Daily Load (TMDL) has been adopted to address this impairment. See Chapters 2, Table 2-3, Beneficial Uses of Coastal Waters, San Diego Bay, footnote 3 and Chapter 7, Total Maximum Daily Loads.

PHENOLIC COMPOUNDS

Phenolic compounds are in widespread use as industrial and agricultural chemical intermediates for the preparation of other chemicals. These organic compounds are byproducts of petroleum refining, tanning, and textile, dye, and resin manufacturing. Low concentrations cause taste and odor problems in water, higher concentrations can kill aquatic life and humans. Phenol is occasionally referred to as "*carbolic acid*".

Water Quality Objectives for Phenolic Compounds:

Water designated for use as domestic or municipal supply (MUN) shall not contain concentrations of phenolics in excess of 1.0 ug/l.

Should there be any conflict between this limit and those described under the Organic Chemicals objective the more stringent standards shall apply at all times.

RADIOACTIVITY

Water Quality Objective for Radioactivity:

Radionuclides shall not be present in concentrations that are deleterious to human, plant, animal, or aquatic life nor that result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal or aquatic life.

Water Quality Objective for Radionuclides:

Waters designated for use as domestic or municipal supply (MUN) shall not contain concentrations of radionuclides in excess of the levels specified in section 64441 of Title 22 of the California Code of Regulations (Natural Radioactivity) which is incorporated by reference into this plan. This incorporation by reference is prospective including future changes to the incorporated provisions as the changes take effect.

SECONDARY DRINKING WATER STANDARDS

Water Quality Objective for Domestic or Municipal Supply Water:

Water designated for use as domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels specified in Table 64449-A of section 64449 of Title 22 of the California Code of Regulations (Secondary Maximum Contaminant Levels, Consumer Acceptance Limits) which is incorporated by reference into this plan. This incorporation by reference is prospective including future changes to the incorporated provisions as the changes take effect. (See Table 3-6).

Table 3-6. Secondary Maximum Contaminant Levels for Consumer Acceptance Limits specified in Table 64449-A of section 64449 of Title 22 of the California Code of Regulations as amended January 7, 1999.

Constituent	Maximum Contaminant Levels
Aluminum	0.2 mg/l
Color	15 units
Copper	1.0 mg/l
Corrosivity	Noncorrosive
Foaming Agents (MBAS)	0.5 mg/l
Iron	0.3 mg/l
Manganese	0.05 mg/l
Methyl-*tert*-butyl ether (MTBE)	0.005 mg/l
Odor Threshold	3 units
Silver	0.1 mg/l
Thiobencarb	0.001 mg/l
Turbidity	5 units
Zinc	5.0 mg/l

SEDIMENT

Suspended sediment in surface waters can cause harm to aquatic organisms by abrasion of surface membranes, interference with respiration, and sensory perception in aquatic fauna. Suspended sediment can reduce photosynthesis in and survival of aquatic flora by limiting the transmittance of light.

Water Quality Objective for Sediment:

The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.

SUSPENDED AND SETTLEABLE SOLIDS

Suspended and settleable solids are deleterious to benthic organisms and may cause the formation of anaerobic conditions. They can clog fish gills and interfere with respiration in aquatic fauna. They also screen out light, hindering photosynthesis and normal aquatic plant growth and development.

Water Quality Objective for Suspended and Settleable Solids:

Waters shall not contain suspended and settleable solids in concentrations of solids that cause nuisance or adversely affect beneficial uses.

SULFATE

The most important sources of sulfate in native waters of the San Diego Region are the gypsiferous deposits and sulfide minerals associated with crystalline rocks. Excessive sulfate concentrations in drinking water can cause laxative effects to new users of the water supply. The recommended secondary drinking water standard for sulfate is 250 mg/l with a upper limit of 500 mg/l.

Water Quality Objectives for Sulfate:

Inland surface waters shall not contain sulfate in concentrations in excess of the numerical objectives described in Table 3-2.

Ground waters shall not contain sulfate in concentrations in excess of the numerical objectives described in Table 3-3.

TASTES AND ODORS

Undesirable tastes and odors in water may be a nuisance and may indicate the presence of pollutants. The secondary drinking water standard for odor (threshold) is 3 odor units.

Water Quality Objectives for Taste and Odor:

Waters shall not contain taste or odor producing substances at concentrations which cause a nuisance or adversely affect beneficial uses.

The natural taste and odor of fish, shellfish or other Regional water resources used for human consumption shall not be impaired in inland surface waters and bays and estuaries.

Inland surface waters shall not contain odors in concentrations in excess of the numerical objectives described in Table 3-2.

Ground waters shall not contain odors in concentrations in excess of the numerical objectives described in Table 3-3.

TEMPERATURE

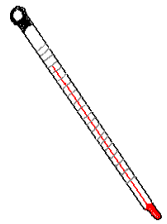

Waste discharges can cause temperature changes in the receiving waters which adversely affect the aquatic biota. Discharges most likely to cause these temperature effects are cooling water discharges from power plants.

Water Quality Objectives for Temperature:

The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Board that such alteration in temperature does not adversely affect beneficial uses.

At no time or place shall the temperature of any COLD water be increased more than 5°F above the natural receiving water temperature.

TOTAL DISSOLVED SOLIDS

Dissolved solids in natural waters may consist of carbonates, bicarbonates, chlorides, sulfates, phosphates, nitrates, magnesium, sodium, iron, manganese and other substances. The recommended secondary drinking water standard for total dissolved solids is 500 mg/l with a upper limit of 1000 mg/l due to taste considerations. High total dissolved solids concentrations in irrigation waters can be deleterious to plants directly, or indirectly through adverse effects on soil permeability. A classification of irrigation waters with respect to total dissolved solids concentration is described in Table 3-1.

Water Quality Objectives for Total Dissolved Solids:

Inland surface waters shall not contain total dissolved solids in concentrations in excess of the numerical objectives described in Table 3-2.

Ground waters shall not contain total dissolved solids in concentrations in excess of the numerical objectives described in Table 3-3.

TOXICITY

Toxicity is the adverse response of organisms to chemicals or physical agents.

Water Quality Objectives for Toxicity:

All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.

The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge or, when necessary, for other control water that is consistent with requirements specified in USEPA, State Water Resources Control Board or other protocol authorized by the Regional Board. As a minimum, compliance with this objective as stated in the previous sentence shall be evaluated with a 96-hour acute bioassay.

In addition, effluent limits based upon acute bioassays of effluents will be prescribed where appropriate, additional numerical receiving water objectives for specific toxicants will be established as sufficient data become available, and source control of toxic substances will be encouraged.

The Shelter Island Yacht Basin portion of San Diego Bay is designated as an impaired water body for dissolved copper pursuant to Clean Water Act section 303(d). A Total Maximum Daily Load (TMDL) has been adopted to address this impairment. See Chapters 2, Table 2-3, Beneficial Uses of Coastal Waters, San Diego Bay, footnote 3 and Chapter 7, Total Maximum Daily Loads.

Chollas Creek is designated as a water quality limited segment for dissolved copper, lead, and zinc pursuant to Clean Water Act section 303(d). Total Maximum Daily Loads have been adopted to address these impairments. See Chapters 2, Table 2-2, Beneficial Uses of Inland Surface Waters, Footnote 3 and Chapter 7, Total Maximum Daily Loads.

TOXIC POLLUTANTS

The USEPA promulgated a final rule prescribing water quality criteria for toxic pollutants in inland surface waters, enclosed bays, and estuaries in California on May 18, 2000 (The California Toxics Rule or "CTR;" [40 CFR 131.38]). CTR criteria constitute applicable water quality criteria in California. In addition to the CTR, certain criteria for toxic pollutants in the National Toxics Rule [40 CFR 131.36] constitute applicable water quality criteria in California as well.

The Shelter Island Yacht Basin portion of San Diego Bay is designated as an impaired water body for dissolved copper pursuant to Clean Water Act section 303(d). A Total Maximum Daily Load (TMDL) has been adopted to address this impairment. See Chapters 2, Table 2-3, Beneficial Uses of Coastal Waters, San Diego Bay, footnote 3 and Chapter 7, Total Maximum Daily Loads.

Chollas Creek is designated as a water quality limited segment for dissolved copper, lead, and zinc pursuant to Clean Water Act section 303(d). Total Maximum Daily Loads have been adopted to address these impairments. See Chapters 2, Table 2-2, *Beneficial Uses of Inland Surface Waters, Footnote 3* and Chapter 7, Total Maximum Daily Loads.

TRIHALOMETHANES

Chlorine is the dominant chemical agent used to disinfect treated water and wastewater. Trihalomethanes are formed when chlorine reacts with aquatic organic material found in water and wastewater. Trihalomethanes are a group of light weight chlorinated hydrocarbons which are suspected carcinogens. The USEPA has established a maximum contaminant level for total trihalomethanes of 0.1 mg/l in *Title 40, Code of Federal Regulations, Part 141.12, (40 CFR 141.12), EPA National Primary Drinking Water Regulations (§141.12 revised at 57 FR 31838, July 17, 1992).* Total trihalomethanes are the sum of the concentrations of bromodichloromethane, dibromochloromethane, tribromomethane (bromoform) and trichloromethane (chloroform). The federal regulations on trihalomethanes are incorporated by reference into CCR, Title 22, Chapter 15, Articles 4.5, sections 64439.

Water Quality Objective for Trihalomethanes:

Waters designated for use as domestic or municipal supply (MUN) shall not contain concentrations of trihalomethanes in excess of the criteria set forth in California Code of Regulations, Title 22, section 64439 which is incorporated by reference into this plan. This incorporation by reference is prospective including future changes to section 64439 as the changes take effect.

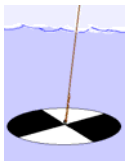

TURBIDITY

The turbidity of water is attributable to suspended and colloidal matter, the effect of which is to disturb clearness and diminish the penetration of light. High turbidity levels can adversely affect the use of water for drinking. By interfering with the penetration of light, turbidity can adversely affect photosynthesis which aquatic organisms depend upon for survival. High concentrations of particulate matter that produce turbidity can be directly lethal to aquatic life.

Water Quality Objectives for Turbidity:

Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses.

Inland surface waters shall not contain turbidity in excess of the numerical objectives described in Table 3-2.

Ground waters shall not contain turbidity in excess of the numerical objectives described in Table 3-3.

The transparency of waters in lagoons and estuaries shall not be less than 50% of the depth at locations where measurement is made by means of a standard Secchi disk, except where lesser transparency is caused by rainfall runoff from undisturbed natural areas and dredging projects conducted in conformance with waste discharge requirements of the Regional Board. With these two exceptions, increases in turbidity attributable to controllable water quality factors shall not exceed the following limits:

Natural Turbidity	***Maximum Increase***
0-50 NTU	*20% over natural turbidity level*
50-100 NTU	*10 NTU*
Greater than 100 NTU	*10% over natural turbidity level*

In addition, within San Diego Bay, the transparency of bay waters, insofar as it may be influenced by any controllable factor, either directly or through induced conditions, shall not be less than 8 feet in more than 20 percent of the readings in any zone, as measured by a standard Secchi disk. Wherever the water is less than 10 feet deep, the Secchi disk reading shall not be less than 80 percent of the depth in more than 20 percent of the readings in any zone.

WATER QUALITY OBJECTIVES OF INLAND SURFACE WATERS

Specific numerical water quality objectives for inland surface waters are presented by hydrologic area and subarea and watershed in Table 3-2.

The water quality objectives for inland surface water designations described in this table correspond with the beneficial use designations previously described in Chapter 2. Water Quality Objective variations occur in some of the hydrologic areas, subareas and stream reaches. Water quality variations from the objectives may also occur within a given hydrologic area subarea or stream reach. Such local variations will be evaluated when waste discharge requirements, NPDES permits, Cleanup and Abatement Orders, and Cease and Desist Orders are being developed for a given discharger.

The omission of mineral objectives for some areas corresponds to the lack of beneficial uses (AGR, MUN, IND) requiring such objectives.

WATER QUALITY OBJECTIVES OF GROUND WATERS

Specific numerical water quality objectives for ground waters are presented by hydrologic area and subarea in Table 3-3.

A footnote for some ground water basins is listed to show that some water quality objectives are considered tentative until detailed salt balance studies are conducted.

In 1978 the Regional Board, in Resolution No. 78-6, deleted water quality objectives and beneficial uses for certain portions of basins 1.10, 1.20, 1.30, 1.40, 1.50, 2.10, 3.10, 4.10, 4.20, 4.30, 4.40, 4.50, 4.60, 5.10, 6.10, 7.10, and 11.10. Table footnotes are included to identify these basins. The Regional Board elected to delete beneficial uses in portions of these basins, where the uses of ground water were marginal or nonexistent, to promote wastewater reclamation by sewage treatment plants. The deletion of beneficial uses in these areas was based upon a determination that the loss of ground water supplies was outweighed by the long-term increase in wastewater reclamation made possible by allowing reclaimed water discharges which are high in total dissolved solids. It is the Regional Board's intent to protect the water quality in these basins under the terms of State Board Resolution No. 68-16.

For purposes of intrusion barrier formation or ground water recharge, the water quality objective qualifications footnoted in Table 3-3 allow, with approval of the Regional Board, discharge of reclaimed water in areas of equal or poorer ground water quality. Relatively poor quality water could also be used for intrusion barrier formation along the coast.

WATER QUALITY CRITERIA

The literature contains many different water quality criteria designed to protect specific beneficial uses of water. A summary of the specific numerical water quality criteria considered by the Regional Board for designation as water quality objectives is described in Appendix C. The water quality criteria described in Appendix C are not enforceable water quality objectives. The purpose of presenting the information summarized in these tables is to allow interested persons to compare available water quality criteria to the specific water quality objectives designated by the Regional Board described earlier in this Chapter.

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REPRINT OF RESOLUTION NO. 68-16

STATE WATER RESOURCES CONTROL BOARD
RESOLUTION NO. 68-16

STATEMENT OF POLICY WITH RESPECT TO
MAINTAINING HIGH QUALITY OF WATERS IN CALIFORNIA

WHEREAS the California Legislature has declared that it is the policy of the State that the granting of permits and licenses for unappropriated water and the disposal of wastes into the waters of the State shall be so regulated as to achieve highest water quality consistent with maximum benefit to the people of the State and shall be controlled so as to promote the peace, health, safety and welfare of the people of the State; and

WHEREAS water quality control policies have been and are being adopted for waters of the State; and

WHEREAS the quality of some waters of the State is higher than that established by the adopted policies and it is the intent and purpose of this Board that such higher quality shall be maintained to the maximum extent possible consistent with the declaration of the Legislature;

NOW, THEREFORE, BE IT RESOLVED:

1. Whenever the existing quality of water is better than the quality established in policies as of the date on which such policies become effective, such existing high quality will be maintained until it has been demonstrated to the State that any change will be consistent with maximum benefit to the people of the State, will not unreasonably affect present and anticipated beneficial use of such water and will not result in water quality less than that prescribed in the policies.

2. Any activity which produces or may produce a waste or increased volume or concentration of waste and which discharges or proposes to discharge to existing high quality waters will be required to meet waste discharge requirements which will result in the best practicable treatment or control of the discharge necessary to assure that (a) a pollution or nuisance will not occur and (b) the highest water quality consistent with maximum benefit to the people of the State will be maintained.

3. In implementing this policy, the Secretary of the Interior will be kept advised and will be provided with such information as he will need to discharge his responsibilities under the Federal Water Pollution Control Act.

BE IT FURTHER RESOLVED that a copy of this resolution be forwarded to the Secretary of the Interior as part of California's water quality control policy submission.

CERTIFICATION

The undersigned, Executive Officer of the State Water Resources Control Board, does hereby certify that the foregoing is a full, true, and correct copy of a resolution duly and regularly adopted at a meeting of the State Water Resources Control Board held on October 24, 1968.

Dated: October 28, 1968
Original signed by
Kerry W. Mulligan, Executive Officer
State Water Resources Control Board

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4. IMPLEMENTATION

INTRODUCTION

Elegant tern

The purpose of this chapter is to describe actions that are necessary to protect the beneficial uses described in Chapter 2 and achieve the water quality objectives specified in Chapter 3. One of the elements in a Water Quality Control Plan as defined in California Water Code (Water Code) section 13050(j) is the implementation program for achieving water quality objectives. This chapter describes the Regional Board's implementation program.

Water Code section 13242 requires that the implementation program have the following elements:

- A description of the actions which are necessary to achieve water quality objectives. (This may include recommendations for appropriate action directed to any entity, public or private);
- A time schedule for the actions to be taken; and
- A description of surveillance to be undertaken to determine compliance with the water quality objectives.

The Regional Board's mission is to achieve and maintain water quality objectives that are necessary to protect all beneficial uses of the waters in the Region. Depending on the nature of the water quality problem, several different strategies, as outlined below, are employed to accomplish this mission.

This Chapter is divided into four sections, Control of Point Source Pollutants, Control of Nonpoint Source Pollutants, Remediation of Pollution, and Other Programs as shown below. Areas of overlap between the point and nonpoint source categories are described later in this Chapter.

★ **Control of Point Source Pollutants:** Pollutants from point sources are discharged to waterbodies from discrete conveyance systems (e.g., pipes and channels) in controlled flows at well-defined locations. Examples of point sources include waste discharges from municipal and industrial wastewater treatment facilities.

Programs that protect water quality from point source pollutants are primarily regulatory in nature. Waste discharge permitting programs such as California's Waste Discharge Requirements (WDRs) and the federal National Pollutant Discharge Elimination System (NPDES) are examples of key regulatory point source control programs. Significant progress toward the control of point source pollutants has been made through these permitting programs.

★ **Control of Nonpoint Source Pollutants:** Pollutants from nonpoint sources are diffuse, both in terms of their origin and mode of transport to surface and ground waters. Unlike pollutants from point sources, nonpoint source pollutants often enter waters in sudden episodic surges and large quantities. This occurs as rain, irrigation, and other types of runoff mobilizes and transports contaminants into surface and ground waters. Nationwide, pollutants from nonpoint sources represent the greatest threat to water quality. Examples of nonpoint sources in southern California include lawn and garden chemicals transported by storm water or water from irrigation sprinklers; household and automotive care products dumped or drained on streets and into storm drains; fertilizers and pesticides washed from agricultural fields by rain or irrigation waters; sediment that erodes from construction sites; and various pollutants deposited by atmospheric deposition.

Nonpoint source pollutants are more difficult to control than point source pollutants, and require different control strategies. For example, traditional permitting programs are neither a practical nor effective means of water quality protection from lawn and garden chemicals. Accordingly, the Regional Board integrates non-regulatory programs with regulatory programs in order to control pollutants from nonpoint sources. Through public outreach (an example of a non-regulatory program), residents are informed of threats to the quality of the waters in their communities and are encouraged to voluntarily implement Best Management Practices (BMPs) that eliminate or reduce

nonpoint sources of pollution. Emphasis is placed on pollution prevention though careful management of resources, as opposed to cleaning up the waterbody after the fact. Local governments play a key role in the control of nonpoint sources by adopting and enforcing ordinances and by supplementing the Regional Board's public outreach efforts. This flexible approach can be an effective means of controlling pollutants from many nonpoint sources.

★ **Remediation of Pollution:** The Regional Board oversees remediation of both ground and surface waters through the investigation of polluted waters and enforcement of corrective actions needed to restore water quality. These activities are managed through the following programs, namely: Underground Storage Tanks; Spills, Leaks, Investigations and Cleanups (SLIC); Aboveground Petroleum Storage Tanks; NPDES Program, Chapter 15 and Non Chapter 15 Regulatory Programs; US Department of Defense (DoD) and Department of Energy (DOE) Sites; Toxic Pits Cleanup Act; and Bay Protection and Toxic Cleanup.

These programs are designed to return polluted sites to productive use by identifying and eliminating the sources of pollutants, preventing the spread of pollution, and restoring water quality.

★ **Other Programs:** The Regional Board is involved with the investigation, assessment and protection of water quality through other programs which are discussed in this Basin Plan. These include California's Clean Water Act section 303(d) process and California's water quality assessment program.

CONTROL OF POINT SOURCE POLLUTANTS

DEFINITION OF POINT SOURCE

Waste loads from point sources are those that are generally associated with pollutant discharges from an identifiable location to waters of the state. A point source is any discernable, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharged. Point source wastes can be generated by residential, commercial, industrial, agricultural, certain recreational and solid waste disposal activities and/or practices. Other wastes are considered under the category of nonpoint source waste loads and are discussed in appropriate sections of this chapter. Many of the water quality problems in the San Diego region have been attributable to point source discharges.

The Regional Board regulates most point source discharges of waste through the issuance of waste discharge requirements and NPDES permits. Certain surface water discharges of waste described in 40 Code of Federal Regulations (CFR) 122.3 do not require NPDES permits. The need to obtain waste discharge requirements for certain categories of waste discharges to land may be waived by the Regional Board where such waiver is not against the public interest. The waste discharge requirements and the NPDES permits establish terms and conditions such as effluent limitations to ensure that point source waste discharges comply with applicable water quality objectives and ensure protection of beneficial uses.

EFFLUENT LIMITATIONS

Effluent limitations for discharge of treated point source wastes are developed for individual point sources and are included in the waste discharge requirements or NPDES permits. The effluent limitations are placed on the quality and quantity of the waste discharge or effluent and can be either numeric and/or narrative limitations. Effluent limitations are based on applicable water quality objectives, United States Environmental Protection Agency (USEPA) effluent guidelines and standards, beneficial uses for the area of effluent disposal, and applicable state and federal regulations and policies.

POINT SOURCE CONTROL CATEGORIES

Waste discharge requirements for waste discharges to land are issued for reclaimed water discharges, sanitary landfills, subsurface waste disposal by septic tank systems, dredge spoil disposal projects, sewage treatment plants and a variety of other activities which can affect ground water quality. NPDES permits are issued for waste discharges to surface waters from facilities such as power plants, sewage treatment plants, shipyards, boatyards, dewatering operations, ground water cleanups and a variety of other activities which can affect surface water quality.

Table 4-1 contains a summary listing of facility types regulated under waste discharge requirements and NPDES permits as of July 1994.

Table 4-2 contains examples of pollutants found in industrial and municipal point source discharges to surface and ground waters.

REGIONAL BOARD PERMITTING PROGRAMS

The Regional Board's primary means of protecting the Region's water resources is through the issuance of WDRs, Water Reclamation Requirements (WRRs), and Master Reclamation Permits (MRP) for each individual discharger. The WDRs impose conditions which protect water quality, implement the Water Quality Control Plan, and when the discharge is to waters of the United States, meet the requirements of the Clean Water Act. The WDRs impose limits on the quality and quantity of waste discharges and specify conditions to be maintained in the receiving waters. WRRs impose conditions for all reuses of treated wastewater. In addition, because the USEPA has delegated responsibility to the State and regional boards for implementation of the federal NPDES program, WDRs for discharges to surface waters also serve as NPDES permits. These programs are the legal means to regulate controllable discharges. It is illegal to discharge wastes into any waters of the State and to reuse treated wastewater without obtaining appropriate WDRs, WRRs, or NPDES permits.

Any person who discharges or proposes to discharge wastes to waters in the Region (other than into a community sanitary sewage system) must describe the quantity and nature of the proposed discharge in a report of waste discharge (RWD) or an NPDES permit application. The RWD must contain information required by the Regional Board. The filing of the RWD with the Regional Board is mandatory unless waived by the Board on the grounds that the waiver is not against the public interest. Such waivers are conditional and can be revoked by the Regional Board at any time. Upon review of the RWD or NPDES permit application and all other pertinent information (including comments received at a public hearing), the Regional Board will hold a public hearing to consider issuance of WDRs containing appropriate measures and limitations to protect public health and water quality. The basic elements of WDRs or NPDES permits include:

- Effluent limitations on the quality and quantity of the waste discharge. The effluent standards or limitations are designed to implement water quality control plans, protect beneficial uses, and prevent nuisance;
- Standard terms and conditions and discharge prohibitions to ensure compliance with applicable provisions of state and federal law; and
- A monitoring and reporting program requiring the discharger to collect and analyze samples and submit monitoring reports to the Regional Board on a prescribed schedule.

Water Code section 13263 provides that in prescribing WDRs the Regional Board need not authorize the utilization of the waste assimilation capacities of the receiving waters. No discharge of waste into waters of the state creates a vested right to continue the discharge. All discharges of waste into waters of the state are privileges, not rights.

Waste discharges are categorized according to their threat to water quality and operational complexity (Table 4-3). Additionally, discharges to surface waters are categorized as major or minor discharges. Filing and annual fees are based on these categories. WDRs or WRRs do not have an expiration date but are reviewed periodically on a schedule based on the level of threat to water quality. NPDES permits are adopted for a five-year period.

Table 4-1. National Pollutant Discharge Elimination System Permitted Facilities In the San Diego Region (as of July 28, 1994)[1]

Facility Type	Number Regulated
Above Ground Tanks	2
Boatyards	7
Ground Water Cleanup	7
Ground Water Dewatering	9
Industrial	8
Military	13
Power Plants	7
Sewage Treatment Plants	24
Shipyards	4
Storm Water (Construction)	542
Storm Water (Industrial)	619
Storm Water (Municipal)	34
Water Softener / Brine Treatment	6
Total	**1283**

Table 4-1. Waste Discharge Requirement Permitted Facilities in the San Diego Region (as of July 28, 1994)[2]

Facility Type	Number Regulated
Campgrounds	59
Dairy	25
Dredging	5
Ground Water Cleanup	3
Industrial	4
Landfills	29
Miscellaneous	5
Nursery	1
Private Sewage Treatment Plants	7
Sand and Gravel	33
Sewage Treatment Plants	42
Sludge Treatment	1
Water Reclamation Requirements	16
Water Softener / Brine Treatment	1
Winery	3
Total	**234**

[1] The list of regulated facilities under NPDES permits is updated periodically and is available at the Regional Board office.
[2] The list of regulated facilities under WDR permits is updated periodically and is available at the Regional Board office.

Table 4-2. Examples of Industrial and Municipal Point Source Discharges to Surface and Ground Waters.

Discrete Discharge	Examples of Pollutants	Examples of Affected Waterbodies
Municipal wastewater treatment plants (See Table 4-4 for more information).	Biological oxygen demand (BOD), chemical oxygen demand (COD), TDS, chlorides, sulfates, nutrients, ammonia (NH_3), residual chlorine, metals, organic chemicals	Most inland waters, Pacific Ocean, various ground water basins
Power generation plants	Temperature, chemical additives, minerals	San Diego Bay, Pacific Ocean
Waste water discharge from remediation or construction de-watering projects	TDS; chlorides; sulfates; volatile organic chemicals (VOCs); BTEX (e.g., benzene, toulene, ethylbenzene, xylene) and other petroleum hydrocarbons	Surface waters region-wide
Underground Storage Tanks	TDS; chlorides; sulfates; VOC's; BTEX and other petroleum hydrocarbons	Ground waters region-wide
Shipyard, boatyard wastes	Oil and grease, metals [lead (Pb), chromium (Cr), copper (Cu) and zinc (Zn)], suspended solids, settleable solids, tributyltin (TBT), temperature, chemical additives	San Diego Bay, Mission Bay, Dana Point, Oceanside Harbor
Sand and gravel	TDS, turbidity, sedimentation	San Diego River, Otay River, San Luis Rey River, Temecula Creek, San Dieguito River, Aliso Creek, San Clemente Canyon Creek, San Vicente Creek, Trabuco Canyon Creek, El Toro Creek, Carroll Canyon Creek or their tributaries.
Dairies	BOD, TDS, bacteria, nutrients	Various groundwater basins
Dredging	Suspended solids, turbidity	San Diego Bay, Mission Bay, Oceanside Harbor, Dana Point
Landfills	Metals; TDS; chlorides; sulfates; VOC's; BTEX and other petroleum hydrocarbons	Various groundwater basins
Recreational Vehicle (RV) Campgrounds	Formaldehyde, phenols, zinc, chlorides, aluminum sulfates	Various groundwater basins

Table 4-3. "Threat to Water Quality" and "Complexity" Definition.

CATEGORY & THREAT TO WATER QUALITY	DEFINITION	EXAMPLE
Category I (Major threat)	Those discharges which could cause the long-term loss of a designated beneficial use of the receiving water, render unusable a ground water or surface water resource used as a significant drinking water supply, require closure to an area used for contact recreation, result in long-term deleterious effects on shellfish spawning or growth areas of aquatic resources, or directly expose the public to toxic substances.	Loss of a drinking water supply
Category II (Moderate threat)	Those discharges of waste which could cause short-term violations of water quality objective, cause secondary drinking water standards to be violated, or cause a nuisance. The discharge could have a major adverse impact on receiving biota, cause aesthetic impairment to a significant human population, or render unusable a potential domestic or municipal supply.	Aesthetic impairment from nuisance from a waste treatment facility.
Category III (Minor threat)	Those discharges of waste which could degrade water quality without violating water quality objectives, or cause a minor impairment of designated beneficial uses compared with Category I and Category II.	Small pulses of water from low volume discharges.
COMPLEXITY		
Category "a"	Any major NPDES discharger, and any discharge of toxic wastes; any small volume discharge containing toxic waste or having numerous discharge points or ground water monitoring; any Class I waste management unit.	Small volume complex discharger with numerous discharge points, leak detection systems or ground water monitoring wells.
Category "b"	Any discharger not include above which has a physical, chemical, or biological treatment system (except for septic systems with subsurface disposal), or any Class II or Class III waste management unit.	Marinas with petroleum products, solid wastes or sewage pump-out facilities.
Category "c"	Any discharger for whom WDRs have been or would be prescribed pursuant to section 13263 of the Water Code not included as a Category "a" or Category "b" as described above.	Discharges having no waste treatment systems or that must comply with BMPs, discharges having passive treatment and disposal systems, or discharges having waste storage system with land disposal such as dairy waste ponds.
NPDES		
Major	Publicly owned treatment works with a yearly average flow of over 0.5 million gallons per day (MGD) or an industrial source with a yearly average flow of over 0.1 MGD and those with lesser flows but with acute or potential adverse environmental impacts.	
Minor	All other dischargers that are not categorized as a major.	

Most WDRs and NPDES permits establish conditions tailored to specific discharges. In some cases, discharges can be regulated under general WDRs or NPDES permits (General Permits) which simplify the permit process for certain types of discharges. These General Permits are issued administratively to the discharger after a completed Notice of Intent or appropriate application has been filed and, if necessary, the Regional Board Executive Officer has determined that the discharger meets the conditions specified in the General Permit. The Regional Board plans to increase the use of General Permits for regulating similar categories of waste discharges in the future. The use of General Permits is a step towards permit streamlining and the reduction of permitting delays. The Regional Board will use the following principles in issuing or reviewing General Permits:

- The General Permit will have a streamlined process for obtaining coverage with adequate protective measures to assure compliance.
- The General Permit will focus on constituents of environmental concern for which there is a reasonable likelihood the constituent is, or may be, present in the discharge.
- The General Permits should be flexible to the extent practicable, and should allow for different testing, monitoring, and reporting requirements recognizing various significance levels of discharges.
- Duration, volume, and dilution of discharge should be considered in determining the significance of a discharge.

WASTE DISCHARGE REQUIREMENTS

WDRs are permits for waste discharges to land which could primarily affect ground water quality and beneficial uses. All waste discharges, whether to land or water, are subject to Water Code section 13263. Furthermore unless exempt, discharges to land (e.g., landfills) are also subject to Title 23, California Code of Regulations (CCR), Chapter 15. Examples of such waste discharges include:

- Sewage treatment plants with discharges to land;
- On-site disposal systems (septic tank systems);
- Sanitary landfills;
- Industrial discharges;
- Land treatment units (bioremediation);
- Dairies; and
- A variety of other activities which can affect ground water quality.

Some types of dredging operations in surface waters are also regulated under WDRs. WDRs may also protect surface waters in those instances where surfacing ground water may adversely affect surface water quality or beneficial uses.

A standard WDR permit typically includes the following elements:

- **Findings:** Official description of the facility, processes, type and quantity of wastes, existing WDRs, enforcement actions, public notice and applicable Water Quality Control Plans, beneficial uses and water quality objectives;
- **Effluent limitations:** Narrative and numerical limits for effluent and discharge prohibitions;
- **Receiving water limitations:** Narrative and numerical objectives for the receiving waters;
- **Provisions:** Standard provisions required by the Regional Board and by state and federal law;
- **Compliance schedules:** Time schedules for completion of activities to achieve compliance with permit conditions;
- **Sludge requirements:** Sludge monitoring and control requirements, if necessary; and a
- **Monitoring and reporting program:** Specific locations of monitoring stations and sampling frequency for all constituents limited in the permit, including flow, and other constituents that may be required by the Board.

Any person proposing to discharge waste, other than to a community sanitary sewage system, must file a report of waste discharge (application) to obtain WDRs at least 120-days prior to commencing the discharge.

The Water Code, Division 7, Chapter 4, Article 4 authorizes the Regional Board to issue WDRs, review self-monitoring reports submitted by the discharger, and perform independent compliance checking. The Regional Board is authorized to take a variety of enforcement actions to obtain compliance with WDRs. Enforcement of WDRs is done through the issuance of cleanup and abatement orders, cease and desist orders, administrative civil liability orders and court action. The Regional Board is also authorized to update and review WDRs periodically.

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

Waste Discharge Requirements that implement federal National Pollutant Discharge Elimination System (NPDES) regulations ("NPDES requirements" or "NPDES permits") are issued to regulate discharges of "pollutants" from point sources to "waters of the United States" to ensure that the quality and quantity of such discharges does not adversely affect surface water quality or beneficial uses. The phrase "waters of the United States" is defined in Title 40, CFR, Parts 122.2, 230.3 and 232.3. The definition of "waters of the United States" emphasizes protection of a broad range of surface waters, including interstate and intrastate lakes, creeks, streams, wetlands, rivers, bays, and ocean waters. Ephemeral creeks, and streams are considered to be "waters of the United States" for the purpose of issuing NPDES permits. In this Basin Plan the term "waters of the United States" is used interchangeably with the term "surface waters".

NPDES permits are authorized by section 402 of the Clean Water Act and section 13370 of the Water Code. Permit conditions and the issuance process are described in Title 40, CFR, Part 122 (40 CFR 122) and CCR, Title 23, Chapters 3 and 4. The responsibility for issuing NPDES permits in California has been delegated to the regional boards, subject to review and approval by the Regional Administrator (USEPA Region IX, San Francisco). NPDES permits issued by the Regional Board are also "waste discharge requirements" issued under the authority of the Water Code, Chapter 5.5.

A standard NPDES permit typically includes the following elements:

- **Findings:** Official description of the facility, processes, type and quantity of wastes, existing NPDES permits, enforcement actions, public notice and applicable USEPA effluent guidelines and standards, Water Quality Control Plans, beneficial uses and water quality objectives;

- **Effluent limitations:** Narrative and numerical limits for effluent and discharge prohibitions;

- **Receiving water limitations:** Narrative and numerical objectives for the receiving waters;

- **Provisions:** Standard provisions required by the Regional Board and by state and federal law, expiration date of permit;

- **Compliance schedules:** Time schedules for completion of activities to achieve compliance with permit conditions;

- **Pretreatment requirements:** Standard pretreatment requirements for municipal facilities (see below);

- **Sludge requirements:** Sludge monitoring and control requirements, if necessary; and a

- **Monitoring and reporting program:** Specific locations of monitoring stations and sampling frequency for all constituents limited in the permit, including flow, and other constituents that may be required by the Regional Board.

The NPDES permit regulates discharges of wastes for the purpose of limiting the quantity of pollutants and volume of waste discharged to surface waters. NPDES permits contain prerequisite conditions which must be met by dischargers to ensure protection of beneficial uses of the receiving water as described in the Regional Board's Water Quality Control Plan, Statewide Water Quality Control Plans, and other water quality control policies.

Any person proposing to discharge pollutants into surface waters must submit a report of waste discharge in application for an NPDES permit at least 180-days in advance of the date on which it is desired to commence the proposed discharge. Certain discharges do not require an NPDES permit. The following discharges are exempt from the requirements for NPDES coverage pursuant to 40 CFR 122.3:

- Any discharge of sewage from vessels, effluent from properly functioning marine engines, laundry, shower, and galley sink wastes, or any other discharge incidental to the normal operation of a vessel;
- Discharges of dredged or fill material into waters of the United States which are regulated under the Clean Water Act, section 404;
- The introduction of sewage, industrial wastes, or other pollutants into publicly owned treatment works by indirect dischargers;
- Any discharge in compliance with the instructions of an On-Scene Coordinator pursuant to 40 CFR 300 (The National Oil and Hazardous Substances Pollution Contingency Plan) or 33 CFR 153.10(e) (Pollution by Oil and Hazardous Substances);
- Any introduction of pollutants from nonpoint source agricultural and silvicultural activities, including storm water runoff from orchards, cultivated crops, pastures, range lands, and forest lands;
- Return flows from irrigated agriculture; and
- Discharges into a privately owned treatment works.

NPDES permits are issued for a term of five years or less. The terms and conditions of the permit are regularly updated as necessary. NPDES permits can be revoked for cause by the Regional Board.

The Water Code, Division 7, Chapter 5.5, Article 6 authorizes the Regional Board to issue NPDES permits, review self-monitoring reports submitted by the discharger, and perform independent compliance checking. The Regional Board is authorized to take a variety of enforcement actions to obtain compliance with an NPDES permit. Enforcement of NPDES permits is done through the issuance of cleanup and abatement orders, cease and desist orders, administrative civil liability orders and court action.

The Regional Board will consider the establishment of mixing zones for inland surface waters and enclosed bays and estuaries on a case-by-case basis. Criteria to be established for mixing zones will be specified in the waste discharge requirements established for the discharge.

In addition to regulating discharges of wastewater to surface waters, NPDES permits also require municipal sewage treatment plants having a design capacity greater than 5 MGD to conduct pretreatment programs. Smaller municipal treatment systems may be required to conduct pretreatment programs if there are significant industrial users of their systems. Pretreatment is discussed in more detail later in this chapter.

COMPLIANCE TIME SCHEDULES

The Regional Board may establish compliance time schedules in NPDES requirements where the Regional Board determines that, for an existing discharger[1], achieving immediate compliance in a discharge with new or more stringent water quality based effluent limitations or receiving water limitations that implement new, revised, or newly interpreted water quality objectives,[2] and/or that resulted from new knowledge on the characteristics and impacts of the discharge is infeasible.[3] New knowledge about the

[1] "*Existing discharger*" means any discharger that is not a new discharger. An existing discharger includes an increasing discharger (i.e., an existing facility with treatment systems in place for its current discharge that is or will be expanding, upgrading, or modifying its existing permitted discharge after a new, revised, or newly interpreted water quality objective becomes applicable). A "*new discharger*" is defined as any building, structure, facility, or installation from which there is or may be a "*discharge of pollutants*" (as defined in 40 CFR section 122.2) to surface waters of the San Diego Region, the construction of which commences after a new, revised, or newly interpreted water quality objective becomes applicable.

[2] "*New, revised, or newly interpreted water quality objectives*" means objectives as defined in section 13050(h) of Porter-Cologne, issued, revised or newly interpreted after November 9, 2005. Objectives may be narrative or numeric.

[3] "*Infeasible*" means that discharger compliance cannot be accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social and technological factors.

characteristics and impacts of the discharge that can result in new or more stringent WQBELs or receiving water limitations include, but are not limited to, the following situations:

- Pollutants previously unregulated in an existing discharge are newly regulated because the new information indicates a reasonable potential for the discharge to exceed an applicable water quality objective in the receiving water;
- Pollutants are newly detected in an existing discharge due to improved analytical techniques;
- The point of compliance for a receiving water limitation is changed; and
- The dilution allowance for an existing discharge is changed.

Compliance time schedules are authorized by this provision only for new or more stringent effluent and/or receiving water limitations that implement water quality objectives issued, revised, or newly interpreted after November 9, 2005, or that resulted from new knowledge on the characteristics and impacts of the discharge for any pollutant for which a water quality objective was issued, revised, or newly interpreted after July 1, 1977.

The compliance time schedule shall include a time schedule for completing or achieving specific actions (including interim effluent limitations) that demonstrate reasonable progress toward compliance with water quality based effluent limitations or receiving water limitations and, thereby, attainment of water quality objectives. The compliance time schedule shall contain a final compliance date, based on the shortest practicable time (determined by the Regional Board at a public hearing after considering the factors identified below) required to achieve compliance. In addition, in all cases, the findings of the NPDES requirements shall specify the final effluent limitations.

Compliance time schedules in NPDES requirements shall be as short as practicable but in no case exceed five years from the date of order issuance, reissuance, or modification. The Regional Board may grant an additional extension of up to five years, but only where the discharger has demonstrated satisfactory progress toward achieving compliance with applicable water quality based effluent limitations and receiving water limitations and the Regional Board concurs with the demonstration. In no case, shall a compliance time schedule for these discharges exceed ten years from the date of adoption, revision, or interpretation of the applicable water quality objective, whichever is the shorter period of time.

Nothing in this provision limits the Regional Board's authority (1) to develop alternate implementation provisions for water quality objectives adopted or revised in the future, or (2) to rely on alternate implementation provisions authorized pursuant to State Board policies for water quality control, State regulations, or federal regulations. Compliance time schedules to meet WQBELs and receiving water limitations that implement California Toxics Rule criteria will be limited by the provisions of the State Board "Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California."

To document the need for and justify the duration of any such compliance time schedule, a discharger must submit the following information, at a minimum: (1) the results of a diligent effort to quantify pollutant levels in the discharge and the sources of the pollutant(s) in the waste stream; (2) Identification of the sources of the pollutant in the waste stream, documentation of source control efforts currently underway or completed, including compliance with any pollution prevention programs that have been established, and a proposed schedule for additional source control measures or waste treatment needed to meet the WQBELs and/or receiving water limitations; (3) evidence that the discharge quality is the highest that can reasonably be achieved until final compliance is attained; and (4) a demonstration that the proposed schedule is as short as practicable, taking into account economic, technical and other relevant factors. The need for additional information and analyses will be determined by the Regional Board on a case-by-case basis. The need for and justification of the duration of any such compliance time schedule will be subject to Regional Board review and approval.

CONDITIONAL WAIVERS OF WASTE DISCHARGE REQUIREMENTS

The Regional Board may waive issuance of waste discharge requirements and/or the requirement to file reports of waste discharge for a specific discharge or specific types of discharge pursuant to Water Code section 13269 if such waiver is determined to be consistent with the Basin Plan and in the public interest.

The waiver of adoption of waste discharge requirements is not applicable to discharges subject to federal NPDES regulations. The federal Clean Water Act does not provide for a waiver of the need to obtain an NPDES permit for point source discharges of pollutants to surface waters.

Amendments to Water Code section 13269, effective January 1, 2003 provided that waivers may not exceed five years duration and must be conditional. Under these amendments the regional boards were required to:

- Renew waivers every five years;
- Review the terms, conditions and effectiveness of each waiver at a public hearing;
- Determine if general or individual waste discharge requirements should be issued for ongoing discharges where waivers have been terminated; and,
- Require compliance with waiver conditions.

A waiver of waste discharge requirements is conditional and may be terminated at any time by the Regional Board for any specific discharge or any specific type of discharge. A conditional waiver is not required to be used by the Regional Board. Even if a discharger complies with all the conditions of a conditional waiver, the Regional Board may still choose to regulate any specific discharge with waste discharge requirements.

The Regional Board has determined that a waiver of adoption of waste discharge requirements for a specific type of discharge would not be against the public interest under one or more of the following circumstances:

- The type of discharge is effectively regulated by other public agencies; or
- The type of discharge does not adversely affect the quality or the beneficial uses of the waters of the state; or
- The type of discharge is not readily amenable to regulation through adoption of waste discharge requirements but warrants Regional Board oversight to insure compliance with mandated conditions.

On October 10, 2007, the Regional Board conditionally waived adoption of waste discharge requirements for certain specific types of discharges described in Table 4-4. These conditional waivers took effect on January 1, 2008 and expire on January 1, 2013.

The following general conditions apply to all discharge types described in Table 4-4:

- The discharge shall not create a nuisance or pollution as defined in the Water Code; and
- The discharge shall not cause a violation of any applicable water quality standard for the receiving waters adopted by the Regional Board, or the State Water Resources Control Board, as required by the Clean Water Act; and
- The discharge of any substance in concentrations toxic to animal or plant life is prohibited.

In addition, the discharges must satisfy the specific conditions described in Table 4-4 and Appendix D.

Table 4-4. Types of Discharges Eligible for Conditional Waivers of Waste Discharge Requirements

Conditional Waiver No.	Discharge Classification	Types of Discharge Included in Conditional Waiver Discharge Classification	Conditions
1	Discharges from on-site disposal systems	a) Discharges from conventional septic tank/subsurface disposal systems for residential units b) Discharges from conventional septic tank/subsurface disposal systems for commercial/industrial establishments c) Discharges from alternative individual sewerage systems d) Discharges from conventional septic tank/subsurface disposal systems for campgrounds e) Discharges from on-site graywater disposal systems	See Appendix D
2	"Low threat" discharges to land	a) Discharges from construction and test pumping of water wells to land b) Discharges of air conditioner condensate and non-contact cooling water to land c) Swimming pool discharges to land d) Discharges from short-term construction dewatering operations to land e) "Low Threat" discharges to land and/or groundwater including the following: - Groundwater pumped from drinking water wells - Groundwater from foundation drains, crawl space pumps, and footing drains - Discharges from flushing water lines - Discharges from washing vehicles, pavement, buildings, etc. - Infiltration from residential/commercial/industrial/recreational facility landscape and lawn irrigation using groundwater or municipal supply water - Infiltration from structural infiltration-based BMPs	See Appendix D

Table 4-4 (continued). Types of Discharges Eligible for Conditional Waivers of Waste Discharge Requirements

Conditional Waiver No.	Discharge Classification	Types of Discharge Included in Conditional Waiver Discharge Classification	Conditions
3	Discharges from animal operations	a) Discharges from medium animal feeding operations (300-999 animal units, where 1 animal unit is equivalent to 1 cow or 1,000 animal pounds) b) Discharges from small animal feeding operations (less than 300 animal units) c) Discharges of storm water runoff d) Discharge/application of manure to soil as an amendment or mulch e) Discharges from grazing lands	See Appendix D
4	Discharges from agricultural and nursery operations	a) Discharges of plant crop residues to land b) Discharges of storm water runoff c) Discharge/application of amendments or mulches to soil d) Discharges of agricultural irrigation return water e) Discharges of nursery irrigation return water	See Appendix D
5	Discharges from silvicultural operations	a) Discharges of storm water runoff b) Discharges from timber harvesting projects c) Discharges from wildfire suppression and fuels management activities	See Appendix D
6	Discharges of dredged or fill materials nearby or within surface waters	a) Discharges from sand and gravel mining operations b) Discharges from dredging projects c) Discharges from stream channel alternation projects d) Other projects proposing to discharge dredged or fill material nearby or within surface waters of the state	See Appendix D
7	Discharges of recycled water to land	a) Discharges to land from short-term recycled water projects (without permanent recycled water delivery and/or distribution systems, not to exceed 365 days) b) Discharges to land from permanent recycled water projects (with permanent recycled water delivery and/or distribution systems, limited to the period prior to the discharge being authorized and regulations under WDRs, WRRs, and/or MRP, not to exceed 365 days)	See Appendix D

Table 4-4 (continued). Types of Discharges Eligible for Conditional Waivers of Waste Discharge Requirements

Conditional Waiver No.	Discharge Classification	Types of Discharge Included in Conditional Waiver Discharge Classification	Conditions
8	Discharges/ disposal of solid wastes to land	a) Discharges of plant crop residues to land b) Discharge/application of amendments and mulches to soil c) Discharges of inert wastes to solid waste disposal facilities accepting only inert wastes d) Discharges of soils containing wastes to temporary waste piles e) Discharge/disposal/reuse of soils characterized as inert from contaminated sites to land	See Appendix D
9	Discharges of slurries to land	a) Discharges of on-site drilling mud to land b) Discharges of concrete grinding residues to land	See Appendix D
10	Discharges of emergency/ disaster related wastes	a) Incidental discharges of oil and oily water within a response area during an oil spill response in marine waters b) Discharges of disaster related waste to temporary waste piles and surface impoundments c) Discharges of mass mortality wastes to temporary waste piles and emergency landfills d) Other discharges of emergency/disaster related wastes	See Appendix D
11	Aerially discharged wastes over land	a) Discharges of wastes related to fireworks displays over land b) Other wastes discharged aerially over land that may adversely affect the quality of the groundwaters of the state, but determined to be "low threat" by the San Diego Water Board	See Appendix D

WATER RECLAMATION REQUIREMENTS

Reclaimed water is water that, as a result of treatment, is suitable for a direct beneficial use or a controlled use that would otherwise not occur. Reclaimed water uses in the Region include, but are not limited to, landscape irrigation, crop irrigation, freeway landscape irrigation, groundwater recharge, soil compaction at construction sites, and for recreational lakes.

The Regional Board may prescribe water reclamation requirements to reclaimed water producers and those governing the use of reclaimed water, which the Regional Board has determined are necessary to protect public health, safety, and welfare pursuant to Water Code, Division 7, Chapter 7, sections 13500-13556 "Water Reclamation Law". Water Reclamation Law provides that no person shall reclaim water or use reclaimed water for any purpose subject to Title 22 criteria until water reclamation requirements have been established or the Regional Board determines no requirements are necessary. The Regional Board may not deny issuance of water reclamation requirements to a project which violates only a salinity standard in the Basin Plan.

In lieu of issuing water reclamation requirements pursuant to Water Code, section 13523, for each user of reclaimed water, the Regional Board establishes master reclamation requirements as part of the waste discharge requirements which are issued to a supplier or distributor, or both, of reclaimed water. Reclamation requirements must include the following components:

- A requirement that the permittee comply with the uniform statewide reclamation criteria established pursuant to section 13521. Permit conditions for a use of reclaimed water not addressed by the uniform statewide reclamation criteria shall be considered on a case-by-case basis;

- A requirement that the permittee establish and enforce rules or regulations for reclaimed water users, governing the design and construction of reclaimed water use facilities and the use of reclaimed water, in accordance with the uniform statewide reclamation criteria established pursuant to section 13521;

- A requirement that the permittee submit a quarterly report summarizing reclaimed water use, including the total amount of reclaimed water supplied, the total number of reclaimed water use sites, and the locations of those sites, including the names of the hydrologic areas underlying the reclaimed water use sites;

- A requirement that the permittee conduct periodic inspections of the facilities of the reclaimed water users to monitor compliance by users with the uniform statewide reclamation criteria and the requirements of the master reclamation permit; and

- Any other requirements determined to be appropriate by the Regional Board.

The "Rules and Regulations for Reclaimed Water Users" that must be issued and enforced by the permittee govern the design and construction of reclaimed water use facilities and the use of reclaimed water. The rules and regulations must have the following elements:

- Provisions implementing Title 22, Division 4, Chapter 3, Wastewater Reclamation Criteria; and Title 17, Division 1, Chapter 5, Group 4, Articles 1 & 2, of the CCR;

- Provisions implementing the State Department of Health Services (DHS) "Guidelines For Use of Reclaimed Water and Guidelines for Use of Reclaimed Water for Construction Purposes" and measures that are deemed necessary for protection of public health, such as the "American Water Works Association (AWWA) California/Nevada Section, Guidelines for the Distribution of Non-Potable Water" or alternate measures, acceptable to DHS, providing equivalent protection of public health;

- Provisions authorizing the Regional Board, the discharger/producer, or an authorized representative of these parties, upon presentation of proper credentials, to inspect the facilities of any reclaimed water user to ascertain whether the user is complying with

the discharger/producer's rules and regulations;

- Provision for written notification, in a timely manner, to the discharger/producer by the reclaimed water user of any material change or proposed change in the character of the use of reclaimed water;

- Provision for submission of a preconstruction report to the discharger/producer by the reclaimed water user in order to enable the discharger/producer to determine whether the user will be in compliance with the discharger/producer's rules and regulations;

- Provision requiring reclaimed water users to designate a reclaimed water supervisor responsible for the reclaimed water system at each use area under the user's control. Reclaimed water supervisors should be responsible for the installation, operation, and maintenance of the irrigation system, enforcement of the discharger/producer's reclaimed water user rules and regulations, prevention of potential hazards, and maintenance of the reclaimed water distribution system plans in "as built" form;

- Provision authorizing the discharger/ producer to cease supplying reclaimed water to any person who uses, transports, or stores such water in violation of the discharger/producer's rules and regulations;

- Provision requiring notification and concurrence of the State DHS and the local county health department for new reclaimed water users. The notification of the county health department shall include a site distribution plan for new and retrofit facilities and a cross-connection control inspection plan for sites containing both potable and reclaimed water distribution lines;

- Provision requiring all windblown spray and surface runoff of reclaimed water applied for irrigation onto property not owned or controlled by the discharger or reclaimed water user to be prevented by implementation of BMPs;

- Provision requiring all reclaimed water storage facilities owned and/or operated by reclaimed water users to be protected against erosion, overland runoff, and other impacts resulting from a 100-year frequency storm, 24 hour storm. This requirement may be waived if the discharger submits information demonstrating that releases from the storage facilities caused by storm events of less than 100-year frequency will not cause violation of the Basin Plan water quality standards;

- Provision requiring all reclaimed water storage facilities owned and/or operated by reclaimed water users to be protected against 100-year frequency peak stream flows as defined by the local flood control agency. However, if information is made available to the Regional Board which shows that a reclaimed water storage facility presents no potential impairment to the beneficial uses, the Regional Board may exempt requirements for 100-year flood protection on a case-by-case basis;

- Provision for notification to reclaimed water users that the Regional Board may initiate enforcement action against any reclaimed water user who discharges reclaimed water in violation of any applicable discharge prohibitions prescribed by the Regional Board or in a manner which creates, or threatens to create conditions of pollution, contamination, or nuisance, as defined in Water Code section 13050; and

- Provision for notification to reclaimed water users that the Regional Board may initiate enforcement action against the discharger/producer, which may result in the termination of the reclaimed water supply, if any person uses, transports, or stores such water in violation of the discharger/ producer's rules and regulations or in a manner which creates, or threatens to create conditions of pollution, contamination, or nuisance, as defined in Water Code section 13050.

WASTE DISCHARGE PROHIBITIONS

Water Code section 13243 provides that a Regional Board, in a water quality control plan, may specify certain conditions or areas where the discharge of waste, or certain types of waste is not permitted. The following discharge prohibitions are applicable to any person,

as defined by section 13050(c) of the Water Code, who is a citizen, domiciliary, or political agency or entity of California whose activities in California could affect the quality of waters of the state within the boundaries of the San Diego Region.

(1) The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in Water Code section 13050, is prohibited.

(2) The discharge of waste to land, except as authorized by WDRs or the terms described in Water Code section 13264 is prohibited.

(3) The discharge of pollutants or dredged or fill material to waters of the United States except as authorized by an NPDES permit or a dredged or fill material permit (subject to the exemption described in Water Code section 13376) is prohibited.

(4) Discharges of recycled water to lakes or reservoirs used for municipal water supply or to inland surface water tributaries thereto are prohibited, unless this Regional Board issues a NPDES permit authorizing such a discharge; the proposed discharge has been approved by the State DHS and the operating agency of the impacted reservoir; and the discharger has an approved fail-safe long-term disposal alternative.

(5) The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the Regional Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

(6) The discharge of waste in a manner causing flow, ponding, or surfacing on lands not owned or under the control of the discharger is prohibited, unless the discharge is authorized by the Regional Board.

(7) The dumping, deposition, or discharge of waste directly into waters of the state, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the Regional Board.

(8) Any discharge to a storm water conveyance system that is not composed entirely of "storm water" is prohibited unless authorized by the Regional Board. [The federal regulations, 40 CFR 122.26(b)(13), define storm water as storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from fire fighting activities.] [Section 122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

(9) The unauthorized discharge of treated or untreated sewage to waters of the state or to a storm water conveyance system is prohibited.

(10) The discharge of industrial wastes to conventional septic tank/ subsurface disposal systems, except as authorized by the terms described in Water Code section 13264, is prohibited.

(11) The discharge of radioactive wastes amenable to alternative methods of disposal into the waters of the state is prohibited.

(12) The discharge of any radiological, chemical, or biological warfare agent into waters of the state is prohibited.

(13) The discharge of waste into a natural or excavated site below historic water levels is prohibited unless the discharge is authorized by the Regional Board.

(14) The discharge of sand, silt, clay, or other earthen materials from any activity, including land grading and construction, in quantities which cause deleterious bottom deposits, turbidity or discoloration in waters of the state or which unreasonably affect,

or threaten to affect, beneficial uses of such waters is prohibited.

(15) The discharge of treated or untreated sewage from vessels to Mission Bay, Oceanside Harbor, Dana Point Harbor, or other small boat harbors is prohibited.

(16) The discharge of untreated sewage from vessels to San Diego Bay is prohibited.

(17) The discharge of treated sewage from vessels to portions of San Diego Bay that are less than 30 feet deep at MLLW is prohibited.

(18) The discharge of treated sewage from vessels, which do not have a properly functioning USCG certified Type I or Type II marine sanitation device, to portions of San Diego Bay that are greater than 30 feet deep at MLLW is prohibited.

WATER QUALITY CERTIFICATION (SECTION 401)

In addition to the issuance of NPDES permits or WDRs, the Regional Board acts to protect the quality of surface waters through water quality certification pursuant to section 401 of the Clean Water Act. Section 401 requires that any person applying for a federal permit or license which may result in a discharge of pollutants into waters of the United States, must obtain a state water quality certification that the activity complies with all applicable water quality standards, limitations, and restrictions.

No license or permit may be issued by a federal agency until certification required by section 401 has been granted or waived by the state. Further, no license or permit may be issued if certification has been denied by the state. The activity must also meet the requirements of the Coastal Nonpoint Pollution Control Program required under the Coastal Zone Act Reauthorization Amendments (CZARA).

The following permits or licenses are subject to section 401 of the Clean Water Act:

- NPDES permits issued by the USEPA under section 402 of the Clean Water Act;
- Clean Water Act, section 404 permits issued by the United States Army Corps of Engineers (USACOE);
- Permits issued under sections 9 and 10 of the Rivers and Harbors Act (for activities which may affect navigation);
- Licenses for hydroelectric power plants issued by the federal Energy Regulatory Commission under the Federal Power Act; and
- Licenses issued by the Nuclear Regulatory Commission.

The Regional Board's water quality certification activities have focused on applications for permits for the discharge of dredged or fill material to surface waters. These permits are issued by the USACOE (Clean Water Act, section 404 permits) subject to any conditions imposed by the Regional Board pursuant to section 401.

The section 404 program is administered at the federal level by the USACOE and the USEPA. The US Fish and Wildlife Service and the National Marine Fisheries Service have important advisory roles. The USACOE has the primary responsibility for the permit program and is authorized, after notice and opportunity for a public hearing, to issue permits for the discharge of dredged or fill material. USEPA develops the regulations under which permits may be granted.

The Regional Board evaluates the projects for which section 404 permits are requested and determines whether to deny water quality certification, issue a certification with or without conditions, or waive the certification pursuant to regulations in Article 4, Title 23. Regional Board certification is dependent upon assurance that the project will not reduce water quality below applicable standards as defined in the Clean Water Act (i.e., the water quality objectives established and the beneficial uses which have been designated for the surface waters). A certification is usually denied if the proposed activity does not meet water quality standards. If the activity may violate standards, a conditional certification is given. If the activity does not violate any standards, a section 401 waiver may be given. The Executive Director of the State Board may issue a water quality certification after review of the application,

all relevant data, and taking into consideration any recommendations from the Regional Board.

SELF MONITORING, COMPLIANCE MONITORING, AND INSPECTIONS

Compliance with NPDES permits and WDRs is generally self-monitored by each individual discharger, with oversight by the Regional Board. Dischargers are required to report and take necessary corrective actions when they discover that they are not in compliance with the permit effluent limits. The Regional Board conducts periodic inspections and compliance monitoring and, as necessary, will take enforcement actions to ensure compliance.

Self Monitoring Program: WDRs and NPDES permits issued by the Regional Board include requirements for the discharger to collect samples of the waste discharge. In some cases, the receiving waters must also be monitored by the dischargers. The results of the "self monitoring" programs are reported to the Board and are used to determine compliance with the WDRs. (Additional information on this topic is presented in Chapter 6, Surveillance and Monitoring).

Compliance Monitoring and Inspections: Regional Board staff can conduct unannounced inspections (including collection of samples) to determine the status of compliance with NPDES permit or WDRs / WRRs requirements. All major dischargers are inspected at least once a year. (Additional information on this topic is presented in Chapter 6, Surveillance and Monitoring).

ENFORCEMENT

The Regional Board is committed to the maintenance of a strong and uniform enforcement program. Appropriate and timely response to instances of noncompliance with Regional Board NPDES permits, WDRs, waste discharge prohibitions and enforcement orders is necessary to ensure protection of the quality of surface and ground waters in the Region.

Regional Board response to noncompliance incidents include the establishment of a specific time frame for compliance and or correction. All dischargers are expected to correct violations in the shortest time frame possible. With the exception of special circumstances, failure to terminate, comply, or complete corrective actions on a noncompliance incident in a specified time frame will result in the escalation of the matter to a higher level enforcement action.

Regional Board responses to instances of violation correspond to the following enforcement action level sequence, unless circumstances warrant a more expeditious escalation to a higher level.

LEVEL A ENFORCEMENT ACTION

In this action level the Regional Board staff requests the discharger, by telephone or letter, to correct the problem and prevent recurrence. Regional Board staff may also request the discharger to correct the problem during routine compliance inspections.

LEVEL B ENFORCEMENT ACTION

In this action level the Regional Board Executive Officer issues a notice of violation to the discharger for failure to comply with a compliance schedule for corrective action.

LEVEL C ENFORCEMENT ACTION

In this action level the Regional Board may take a variety of formal higher level enforcement actions. The Water Code provides the Regional Board with a number of enforcement remedies for violations of requirements. These remedies include time schedules, cease and desist orders, cleanup and abatement orders, and administrative civil liability orders.

Time Schedule Orders

When a discharge is taking place or threatening to occur that will cause a violation of a Regional or State Board requirement, a discharger may be required to submit a detailed list of specific actions the discharger will take to correct or prevent the violation. (Water Code section 13300). These schedules may also be required when the waste collection, treatment, or disposal facility of a discharger are approaching capacity. Time schedule orders are adopted by the Board after a public hearing or issued by the Executive Officer pursuant to authority delegated by the Regional Board.

Cleanup and Abatement Orders

The Regional Board may issue a cleanup and abatement order to any person who has discharged, is discharging or is threatening to discharge wastes that will result in a violation of WDRs or other order or prohibition of the State or Regional Board. The Regional Board may also issue a cleanup and abatement order to any person who discharges or has discharged waste to waters of the state and causes, or threatens to cause, a condition of pollution or nuisance. The cleanup and abatement order may require the waste discharger(s) to cleanup and abate the effects of the discharge or to take other appropriate remedial action (Water Code section 13304). A cleanup and abatement order is issued if a pollutant can actually be cleaned up or the pollutant effects abated. The Regional Board has delegated issuance of these orders to the Executive Officer. Cleanup and abatement orders do not require Board adoption, but may be brought before the Regional Board for consideration at the request of the discharger.

Cease and Desist Orders

If discharge prohibitions or requirements of the State Board or Regional Board are violated or threatened, the Regional Board may adopt a cease and desist order (Water Code section 13301) requiring the discharger to comply forthwith, to comply in accordance with a time schedule, or if the violation is threatened, to take appropriate remedial or preventive action. Cease and desist orders may restrict or prohibit the volume, type or concentration of waste added to community sewer systems, if existing or threatened violations of waste discharge requirements occur. Cease and desist orders may specify interim time schedules as well as limitations that must be complied with until full compliance is achieved. Cease and desist orders are adopted by the Regional Board after a public hearing.

Administrative Civil Liability

Administrative civil liability complaints and orders may be issued by the Regional Board for certain categories of violations. In this process the Regional Board may impose monetary penalties on dischargers. The Regional Board (or the Executive Officer) may issue Administrative Civil Liability complaints (ACLs) to persons who intentionally or negligently violate enforcement orders of the Board, or who intentionally or negligently discharge wastes in violation of any order, prohibition, or requirement of the Board where the discharge causes conditions of pollution or nuisance (Water Code section 13350). ACLs may also be issued in cases where a person fails to submit reports requested by the Board (Water Code sections 13261 and 13268) or when a person discharges waste without first having filed the appropriate RWD (Water Code section 13265). ACLs may be issued pursuant to Water Code section 13385 for violations of any Regional Board prohibition or requirement implementing specified sections of the Clean Water Act, or any requirement in an approved pretreatment program. Amounts of administrative civil liability that the Board can impose range up to $10,000 per day of violation. The Water Code also provides that a superior court may impose civil liability assessments in substantially higher amounts. The Regional Board may conduct a hearing if a discharger contests the imposition of the Administrative Civil Liability.

LEVEL D ENFORCEMENT ACTION

Referral to the Attorney General or District Attorney

Judicial Civil Liability: The Water Code provides that a Regional Board may request the State Attorney General to petition a superior court to enforce orders and complaints issued by the Board and impose civil monetary remedies. The monetary remedies may be in excess of the administrative civil liability penalties that the Regional Board is authorized to impose. The court imposed fines and or imprisonment vary depending upon the seriousness of the violation.

Injunctive Relief: The Regional Board may also request that the Attorney General seek injunctive relief in specific situations, such as violations of cease and desist orders or discharges which cause or threaten to cause a nuisance or pollution that could result in a public health emergency (Water Code section 13331 and section 13340).

Criminal Penalties: The Regional Board may also refer violations to the District Attorney to seek criminal penalties by judicial action in the county where the discharge occurred. The court imposed fines and or imprisonment vary depending upon the seriousness of the violation.

SELECTION OF APPROPRIATE ENFORCEMENT ACTION

The following criteria are considered by the Regional Board in selecting the appropriate enforcement action in response to an incident of noncompliance:

- Degree of water quality impairment and/or threat to the public health including the degree of toxicity of the discharge;
- Past history of discharge violations;
- Degree of cooperation or recalcitrance shown by the discharger;
- Culpability of the discharger;
- Financial resources of the discharger;
- Whether the circumstances leading to the noncompliance have been corrected;
- Whether the discharge violations are likely to continue in the future;
- Whether the discharge can be cleaned up;
- The need to take immediate cleanup action;
- Any economic benefit realized by the discharger as a result of the noncompliance; and
- Other actions as justice may require.

STATE WATER RESOURCES CONTROL BOARD PLANS AND POLICIES

The State Water Resources Control Board (State Board) has adopted a number of plans and policies for statewide water quality management. The Regional Board implements these plans through WDRs, NPDES permits, and any necessary enforcement actions. These policies are explained in more detail in Chapter 5, Plans and Policies.

HAZARDOUS WASTE SOURCE REDUCTION

The Department of Toxic Substance Control (DTSC) has adopted regulations regarding hazardous waste source reduction pursuant to the Hazardous Waste Source Reduction and Management Review Act of 1989 (Article 11.9, starting with section 25244.12 of the Health and Safety Code). These regulations are contained in sections 67100.1 through sections 67100.14 of Title 22 of the CCR. These regulations require that each generator of hazardous or extremely hazardous waste within the limits set by the regulations conduct a source reduction evaluation review and plan, plan summary, hazardous waste management performance report, and report summary on or before September 1, 1991 and every four years thereafter. Every generator is required to retain a copy of the current review and plan, plan summary, report, report summary, progress report, and compliance checklist at each site, at a public library, or at a local governmental agency. The Regional Board supports these efforts of hazardous waste source reduction because any successes achieved will mean less hazardous waste which could pollute California's waters.

MUNICIPAL AND DOMESTIC WASTEWATER

Municipal wastewater in the San Diego Region consists primarily of domestic sewage and minor quantities of industrial wastes in some of the more highly urbanized and industrialized areas. Facilities to control municipal wastewater include wastewater collection systems, pumping stations, transport pipelines, treatment plants, storage ponds and ocean outfalls. These facilities are sometimes collectively referred to by the term Publicly Owned Treatment Works (POTW).

Municipal wastewater treatment in the San Diego Region is generally at the secondary treatment level. Secondary treatment results in the removal of more than 85 percent of the biochemical oxygen demand and suspended solids found in municipal wastewater. Tertiary (advanced) wastewater treatment is used at some treatment plants for additional removal of pollutants to reclaim wastewater for beneficial reuse. Effluent from the wastewater treatment plants is disposed of by various means including:

- Discharge to the Pacific Ocean via long deep ocean outfalls;
- Percolation into the soil; and
- Reclamation and reuse in conformance with uniform reclamation criteria (CCR, Title 22, Division 4, Chapter 3).

Sludge disposal at most major municipal wastewater treatment plants in the Region consists of aerobic or anaerobic digestion and land disposal. Dried sludge is either disposed of at landfills or made available to the public as a soil conditioner. Some treatment plants, located upstream of major regional wastewater treatment plants discharge sludge to the sewage collection system for treatment at a "downstream" regional wastewater plant. The term municipal sewage treatment plant and Publicly Owned Treatment Works are used interchangeably in the Basin Plan.

The Regional Board regulates wastewater discharges from municipal wastewater treatment plants through either the issuance of NPDES permits where the discharge is to surface waters or through WDRs where the discharge is to land.

Discharges of wastewater to surface water must meet the effluent limitations prescribed in the NPDES permit issued by the Regional Board. Effluent limitations are based on the following criteria:

- Secondary treatment effluent limitations defined by USEPA contained in 40 CFR 133, unless a waiver to the secondary treatment standards is obtained (more stringent effluent limitations than secondary treatment may be imposed by the Regional Board if necessary);
- Applicable water quality objectives and beneficial uses contained in the Basin Plan and State Board Water Quality Control Plans;
- Applicable public health protection standards for total and fecal coliform;
- Assimilative capacity of the receiving water;
- The terms and conditions of the federal Antidegradation Policy (40 CFR 131.12) and the State Antidegradation Policy (Resolution No. 68-16) (See Chapter 3);
- Anti-backsliding provisions described in Clean Water Act section 404; and
- Land disposal or recycling of sludge as a soil amendment.

Discharges of wastewater onto land must meet the effluent limitations in the waste discharge requirements prescribed by the Regional Board through the issuance of WDRs. The WDRs contain effluent limitations based on the following criteria:

- The treatment capability of the treatment process employed by the dischargers;
- Applicable water quality objectives and beneficial uses contained in the Basin Plan;
- Applicable public health protection standards for total and fecal coliform;
- Assimilative capacity of the receiving water;
- The terms and conditions of the State Antidegradation Policy (Resolution No. 68-16) (See Chapter 3); and
- Land disposal or recycling of sludge as a soil amendment.

CLEAN WATER GRANTS AND LOANS

From 1972 until 1988 the State Board assisted the USEPA in administering the multibillion dollar Clean Water Grants Program in California to finance the construction of municipal wastewater treatment facilities. This program ended in 1988. The Clean Water Act provides for the creation of a State Revolving Fund (SRF) Loan Program capitalized in part by federal funds. The Clean Water Act authorizes loan funding for construction of Publicly Owned Treatment Works (POTWs), for implementation of a nonpoint source pollution control management program, and for the development and implementation of an estuary conservation and management program. The State Board converted the Clean Water Grant Program to a Grants and Loans program on October 1, 1988, and ultimately replaced this completely with the State Revolving Fund Loan Program on June 30, 1989.

INDIVIDUAL DOMESTIC SUBSURFACE DISPOSAL SYSTEMS

Some areas in the Region rely on subsurface disposal systems for disposal of domestic household sewage. The most common type of subsurface disposal system is the septic tank-leach field disposal system. Seepage pits are sometimes used when site conditions are not suitable for leachfields. Occasionally, alternatives to conventional septic tank/leachfield or seepage pit systems are proposed for individual residences. Alternatives that have been proposed but not necessarily approved in the Region have included mound systems, evapotranspiration (ET), evapotranspiration/ infiltration (ETI), small in-house package treatment facilities, sand filters, and other innovative approaches.

The purpose of a septic tank system is to treat household wastes so that the discharge will readily percolate into the soil. Treatment or conditioning of the waste is achieved by the removal of solids through settling and decomposition of some of the soluble organic chemicals in the tank portion of the system. Further treatment of organic chemicals, nutrients, and bacteria occurs as the effluent released from the tank percolates through the soil. Proper construction of septic systems is imperative. Poorly designed and constructed systems will not function properly and can result in pollution of surface or ground waters. Septic tank systems used in undersized lots or unsuitable soils are subject to failure, and can lead to untreated or poorly treated sewage seeping into yards, roadside ditches, streams, lagoons, or into ground water, thus creating a public nuisance and health hazard. Even well-functioning septic systems can pollute ground water under adverse conditions.

Nitrogen compounds, which are typically present in effluent from septic systems, are highly soluble and stable in aqueous environments. When not denitrified by bacteria or assimilated into organic growth in the unsaturated zone, these nitrogen compounds are easily transported to ground water. Although there is controversy about the possible health effects of nitrate on adults, it has been shown that high levels of nitrate cause methemoglobinemia (blue-baby syndrome) in infants. Both the federal drinking water standard of 10 mg/l nitrate plus nitrite (expressed as nitrogen) and the equivalent state drinking water standard of 45 mg/l nitrate (expressed as NO_3) is based on this relationship.

The Water Code, Chapter 4, Article 5, sets forth criteria for regulating on-site disposal systems. In the past, the Regional Board placed certain types of septic tank systems under individual waste discharge requirements. However, the regulatory process for establishing and enforcing waste discharge requirements for individual disposal systems is cumbersome and for the most part overlaps the regulatory process of local agencies. Consequently, the Regional Board has deferred regulation of most single-family dwellings and certain commercial septic tank disposal systems to the local health departments. The Regional Board has asserted its authority with multiple-dwelling units, some larger developments in problem areas, non-domestic septic tank systems, and any situation which is creating, or has the potential to create, a water quality problem.

In the past, the Regional Board staff reviewed all proposals of individual sewerage systems for residential subdivisions involving more than five family units and for all commercial and industrial establishments. As part of this review, the Regional Board staff evaluated the adequacy of the consultants' field tests, the conformance of the design proposal with the criteria of the appropriate county regulatory agency, and in most instances, the cumulative impacts of the discharges on nitrate concentrations in the groundwater. Letters were forwarded to the appropriate local health agency approving those projects that demonstrated: (a) surfacing sewage from the proposed disposal systems will not take place either adjacent to, or within, the project boundaries; (b) the historic high groundwater and the effects of the discharge will not result in groundwater rising within 5 feet below the base of the disposal system; and (c) the cumulative impacts of the discharges will not cause nitrate concentrations in the ground water to exceed water quality standards.

Generally, project proponents have been able to address water quality issues by completing the routine field investigations required by the local health agencies. Regional Board staff review of the investigation reports often duplicated the review efforts of the local agencies. On occasion, the Regional Board staff has required further investigations to address concerns regarding the cumulative impacts of the

discharges. These investigations are not part of the local agencies' normal review process and the criteria for conducting these investigations are not specified by local regulations. On these occasions, significant staff resources are expended evaluating the technical information submitted by the project proponents.

In 1990, Regional Board staff suspended review of all proposed subsurface disposal system projects in order to direct staff resources to more critical water quality issues. In lieu of reviewing individual projects, staff prepared interim screening procedures for implementation by the appropriate local agencies. The objective of the procedures is to assist the local agencies in identifying those projects with potential for causing degradation of ground water quality. Only those projects would then be referred to the Regional Board staff.

The determination by Regional Board staff to require project proponents to conduct an investigation of the cumulative impacts of the individual systems has been on a case-by-case basis. Staff considers factors such as the location of proposed project, the number of proposed lots, and the density of the development. However, without written review criteria, staff decisions requiring project proponents to conduct further investigations has been inconsistent.

GUIDELINES FOR NEW COMMUNITY AND INDIVIDUAL SEWERAGE FACILITIES

Background

The Regional Board adopted Guidelines for New Community and Individual Sewerage Facilities (Resolution No. 79-44) on June 25, 1979. By the mid-1980s, the Regional Board recognized the need to update the 1979 guidelines to simplify the regulatory process by providing local agencies with the necessary review criteria for addressing cumulative impacts from individual systems. Those projects complying with the criteria would not be directly subject to the Regional Board regulatory process.

As part of the Clean Water Act section 205(j) Basin Plan update project, the Regional Board contracted a study to review the portion of the 1979 guidelines pertaining to subsurface disposal and to recommend any changes that would result in a more effective and efficient regulatory program. The contractor was directed to conduct file research and literature review regarding the impacts of subsurface disposal on ground water quality and to interview the staff of responsible regulatory agencies in San Diego, Riverside, and Orange Counties to incorporate their concerns and recommendations into a revised set of subsurface disposal guidelines. A report, entitled "Review Of Subsurface Wastewater Disposal Policy, San Diego Regional Water Quality Control Board" discusses phosphates, nitrate contamination, sources of nitrates in the ground water, reasons for septic systems failure, local and regional water table rises, and the implications of regulatory restrictions.

The report recommends that:

- The Regional Board should delegate the authority for review and approval of all septic systems and seepage pits to appropriate county regulatory agencies, eliminating the duplicative review function of the board staff.

- Effort currently directed toward review of subsurface disposal applications should be redirected to investigation of basin-specific limitations on subsurface disposal. These studies should be undertaken in cooperation with county regulatory agencies.

- The Regional Board should establish guidelines for the county regulatory agencies at the time that authority for review is delegated. These guidelines should:

  - ✓ Specify a continuation of existing design criteria for leachline length, spacing, setback, and slope requirements.

  - ✓ Increase minimum unsaturated soil thickness below the leachlines to 9 feet for soils with good percolation rates, 12 feet for moderate percolation rates, and 14 feet for soils with poor percolation rates for individual systems.

  - ✓ Require hydrogeological studies in areas of imported domestic water if the minimum lot size is not met, or if significant downslope accumulation of effluent is likely, or if septic systems discharge to a basin with restricted outflow.

Figure 4-1. Required Recharge Rates to Maintain 10 mg/l N Nitrate Standard.

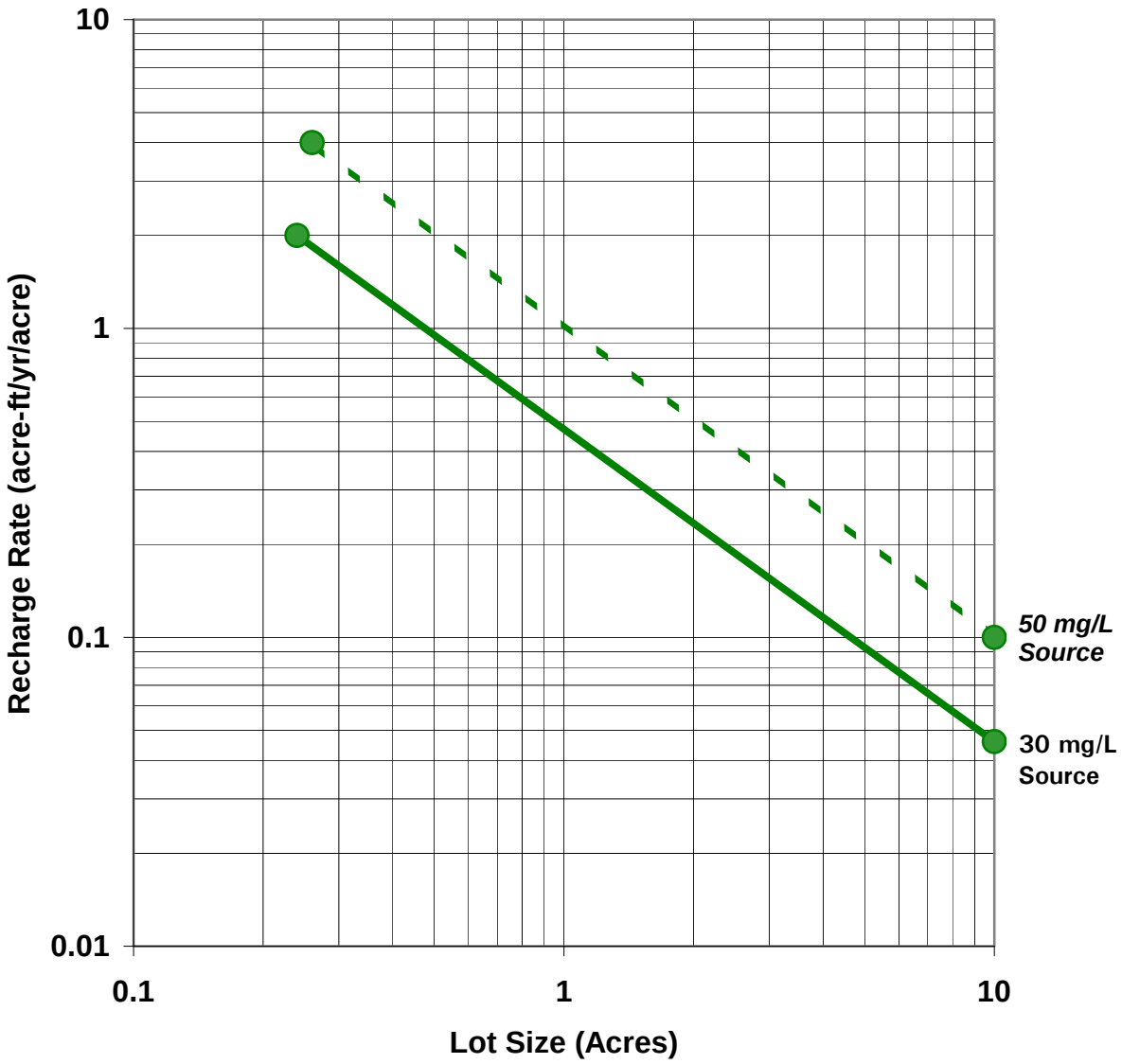

- ✓ Restrict septic system densities to those indicated in Figure 4-1 in those areas where ground water is a significant source of drinking water.

The policy described below update and supersedes Resolution No. 79-44. The policy incorporated current practice and conclusion based upon the above recommendations to improve the efficiency of the review process, to eliminate unnecessary Regional Board regulation, and to improve protection of ground water quality.

Principles

The following management principles are designed to ensure that the goals of the Basin Plan are implemented:

- Sewerage systems must be designed, constructed, and installed so as to be capable of preventing pollution or contamination of the waters of the State or creating nuisance for the duration of the development.

- Sewerage systems must be operated, maintained and monitored so as to continually prevent pollution or contamination of the waters of the State and the creation of a nuisance.

- The responsibility for both of the above must be clearly and legally assumed by an entity with the financial and legal capability to assure that the system provides protection to the quality of the waters of the State for the duration of the development.

Purpose

The purpose of the guidelines below is to provide guidance to proponents of projects involving new discharges of wastes from community or individual sewerage facilities. However, the Regional Board may exercise discretion and approve exceptions to these guidelines if it is demonstrated that conformance with the above principles will be achieved. The Regional Board recognizes that there are certain actions which are best undertaken by local governments to minimize the potential water quality problems resulting from new community and individual sewerage systems. The guidelines are based on the assumption that it is desirable that city and county governments:

- Prohibit the use of new community and individual sewerage systems where existing community sewerage systems are reasonably available. The determination of whether or not existing systems are reasonably available should be the responsibility of the local agency or agencies having jurisdiction over the project.

- Prohibit the use of new individual disposal systems for any subdivision of land unless the governing body having jurisdiction determines that the use of individual disposal systems will be in the best public interest.

- Assure that individual disposal systems are maintained to the satisfaction of the responsible health officer. This could be accomplished through establishment of special maintenance districts, by the amendment of existing ordinances to assure adequate maintenance documented through periodic inspections, or other alternatives as deemed appropriate by the local health officer.

- Consider the cumulative impacts of individual disposal system discharges as a part of the approval process for development.

Community Sewerage Systems

The Regional Board will regulate all discharges of wastes from community sewerage systems. The Regional Board will require a RWD to be filed for all proposed waste discharges which involve the use of new community sewerage systems. Before the Board will consider the RWD to be complete, the following requirements must be met:

- A public entity must assume legal authority and responsibility for the ownership, operation, and maintenance of the proposed wastewater treatment and disposal system. The RWD must be submitted by the public entity.

- The RWD must include the following:

  - ✓ A final Environmental Impact Report or Negative Declaration covering the total project, unless categorically exempt,

prepared and approved by the local lead agency pursuant to the California Environmental Quality Act (CEQA) of 1970 (as amended) and Chapter 3, Division 6, Title 14, of the CCR (as amended). In the approval process the Environmental Impact Report or Negative Declaration must be circulated through the State Clearinghouse; and

✓ Operation, maintenance, revenue and contingency plans for the wastewater treatment and disposal facilities or a commitment by the public entity to prepare such plans and submit them to the Regional Board at least 60-days prior to the initiation of discharge.

In the absence of a satisfactory RWD, the discharge will be prohibited.

Individual Sewerage Systems

Projects Involving Five Family Units or Less - Conventional Septic Tank/Subsurface Disposal

When individual sewerage systems consisting of conventional septic tanks and leach fields or seepage pits would be provided to serve each dwelling for projects of five family units or less, or to serve to dispose domestic waste from commercial or industrial projects with a design flow of equal to or less than 1,200 gallons per day, the Regional Board will defer the authority to regulate the discharge of domestic wastes to the appropriate county health officer.

Projects Involving More Than Five Family Units - Conventional Septic Tank/Subsurface Disposal

The above deferral of authority to the appropriate county health officer to regulate the discharge of domestic wastes will also apply when individual sewerage systems consisting of conventional septic tanks and leach fields or seepage pits would be provided to: (1) serve dwellings involving more than five family units in a single project or (2) dispose of domestic waste from commercial or industrial projects with a design flow of more than 1,200 gallons per day. The deferral will apply if the project proponent demonstrates to the satisfaction of the appropriate county health officers that the following conditions are met:

- The use of new individual subsurface disposal systems for any subdivision of land will be in the best public interest; and

- Individual disposal systems will comply with all existing county design criteria including but not limited to percolation testing, minimum required leachline length, leachline spacing, setback and slope requirements; and

- Individual disposal systems will meet the minimum unsaturated soil thickness between the bottom of leachlines or the bottom of seepage pits and the historic high ground water level. The minimum unsaturated soil thickness is 9 ft for soils with good percolation rates [less than 15 minutes per inch (mpi)], or 12 ft for soils with moderate percolation rates (15 to 40 mpi), or 14 ft for soils with poor percolation rates (greater than 40 mpi). However, exceptions to the unsaturated soil thickness criteria may be allowed by the appropriate county health officer, based upon knowledge of local site conditions; and

- The cumulative impact from proposed individual disposal system(s) or from new commercial and/or industrial development(s) will not cause adverse impacts to the beneficial uses of ground water.

If it is determined that the discharge could cause a significant water quality problem, then a RWD must be filed with the Regional Board and waste discharge requirements must be obtained prior to final subdivision map recording.

For any discharge of industrial wastes a RWD must be filed with the Regional Board and waste discharge requirements must be obtained prior to recording of the final map and/or issuance of a building permit.

Alternative Systems

When an ET, or an ETI, or a mound system is proposed to serve a single residential project, Regional Board defers regulation of the discharge to the appropriate county health officers provided that the project proponents demonstrate to the satisfaction of appropriate county health officers that the following conditions are met:

- ET, or ETI, or mound systems will comply with all conditions for conventional

subsurface disposal systems as noted above; and

- The design, construction, and installation of an ET or ETI system will comply with the criteria approved by this Regional Board Resolution No. 80-84 and the criteria contained in the State Board, Guidelines for Evapotranspiration Systems dated January 1980. The design, construction, and installation of mound systems will comply with criteria contained in the State Board, Guidelines for Mound Systems dated January 1980; and

- The ET, or ETI, or mound systems will be for domestic waste only; and

- The ET, or ETI, or mound systems will be used for single family dwelling on a single lot which has previously undergone a proper satisfactory CEQA process; and

- The ET, or ETI, or mound systems will not be used as a waste discharge method for new subdivisions; and

- The ET, or ETI, or mound systems will not be used as a group collection system; and

- The ET, or ETI, or mound systems is considered experimental, and will be monitored for at least three years.

As the counties develop and adopt standards for alternative systems, the Regional Board may, in the future, defer regulation of additional types of individual sewerage systems to the appropriate county health officer in much the same manner as is now done for conventional septic tank/subsurface disposal systems.

Report of Waste Discharge Submission

The Regional Board will review specific proposals not meeting the above criteria at the request of the appropriate county authority. For such proposals, a RWD must be filed with the Regional Board and WDRs must be obtained or waived by the Regional Board prior to recordation of the final map and/or issuance of a building permit. Before the Regional Board considers the RWD to be complete, the following technical information must be submitted:

- A hydrogeologic study which will, using accepted ground water hydrologic techniques and practices, assess the probable rise in the water table associated with the project, including effects of septic system recharge, landscape irrigation, and ground water pumpage. The study will additionally address the impact of the projected water table rise or fall on the operation of new and existing septic systems.

- A nitrate study which will, using an acceptable mass balance method, demonstrate that the proposed project will not cause the basin plan objective for nitrate to be exceeded.

In addition to the technical information submitted, the following conditions must be met:

- In most instances a public entity must assume legal authority and responsibility for the operation and maintenance of the proposed individual wastewater treatment and disposal systems;

- In some instances, such as commercial/industrial establishments, or projects involving only a single homesite, or special extenuating circumstances, the public entity condition may be set aside;

- A final Environmental Impact Report or Negative Declaration must be included covering the total project, unless categorically exempt, prepared and approved by the local lead agency pursuant to the California Environmental Quality Act of 1970 (as amended) and Chapter 3, Division 6, Title 14, of the California Administrative Code (as amended). In the approval process the Environmental Impact Report or Negative Declaration must be circulated through the State Clearinghouse;

- Operation, maintenance, revenue, and contingency plans must be submitted for the wastewater treatment and disposal facilities or a commitment must be made by the public entity to prepare such plans and submit them to the Regional Board at least 60-days prior to the initiation of discharge; and

- In the absence of a satisfactory Report of Waste Discharge, the discharge will be prohibited without prejudice.

WATER RECLAMATION AND REUSE

Water reclamation is a process consisting of the following elements:

- Treatment of wastewater to a level of quality suitable for reuse;
- Transportation of reclaimed water to reuse areas; and
- Application of reclaimed water to an actual use.

Reclaimed water use typically falls into the following seven broad categories:

- Agricultural irrigation;
- Landscape irrigation (including highway landscape and golf courses);
- Impoundments for landscape, recreational or wildlife uses, wetland and wildlife enhancement;
- Industrial and Construction processes (e.g., cooling water, process water, washdown water or for dust control);
- Ground water recharge.
- Flushing of toilet and urinals in non-residential buildings; and
- Stream enhancement.

The State of California has a strong interest in promoting the conservation and efficient use of water through water reclamation. The California Constitution, Article X, section 2 provides that:

> "...Water resources of the state be put to beneficial use to the fullest extent of which they are capable, and that waste or unreasonable use of water be prevented, and that conservation of such waters is to be exercised with a view to the reasonable and beneficial use thereof in the interest of the people and for the public welfare..."

The State interest in the conservation and efficient use of its waters is further emphasized by Water Code section 13510 which deals specifically with water reclamation. Section 13510 provides that:

> "It is hereby declared that the people of the state have a primary interest in the development of facilities to reclaim water containing waste to supplement existing surface water and underground water supplies and to assist in meeting the future water requirements of the state."

In addition, Water Code section 13241 provides that the Regional Board consider the need to develop and use reclaimed water when establishing water quality objectives.

The State Board adopted the "Policy with Respect to Water Reclamation In California" and the related "Action Plan for Water Reclamation in California" in 1977 (State Board Resolution No. 77-1). The policy directs the State Board and Regional Boards to encourage reclamation and reuse of water, and to promote water reclamation projects which preserve, restore, or enhance instream beneficial uses. The policy also states that the State and Regional Boards recognize the need to protect public health and the environment in the implementation of reclamation projects.

The Porter-Cologne Water Quality Control Act also requires the State DHS to establish statewide reclamation criteria (see Table 4-5) for each type of reclaimed water use to protect public health. Any person proposing to discharge reclaimed water must file a report of waste discharge containing appropriate information related to the discharge with the Regional Board. The Regional Board, after consultation with DHS, may adopt waste discharge requirements for the reclaimed water discharge.

When reviewing potential reclamation projects, the Regional Board must also consider potential impacts from reclamation on ground and surface water quality. It is common for the use of reclaimed water to cause an increase in total dissolved solids concentration in the receiving ground waters due to the effects of evapotranspiration. A variety of techniques can be employed to protect the beneficial uses of the receiving waters. Where well controlled irrigation is practiced, nitrate problems in the dry season will be controlled. Vegetative uptake will utilize soluble nitrates which could otherwise migrate into ground water. Demineralization techniques or source control of total dissolved solids may be necessary in some inland areas where ground waters have been or may be degraded. Presence of excessive salts, boron, or sodium could be the basis for rejection of proposals to irrigate cropland with effluent.

Table 4 - 5. Permitted Uses and California Title 22 Health Requirements for Reclaimed Water.

Permitted Use of Reclaimed Water	Summary of Title 22 (sections 60303 et. seq.) Health Requirements
Spray irrigation of food crops	Reclaimed water used for spray irrigation of food crops shall be at all times adequately disinfected, oxidized, coagulated, clarified, filtered wastewater. The wastewater shall be considered adequately disinfected if at some location in the treatment process, the median number of coliform organisms does not exceed 23 per 100 milliliters (ml) in more than one sample within any 30-day period. The median value shall be determined from the bacteriological results of the last 7-days for which analyses have been completed.
Surface irrigation of food crops	Reclaimed water used for surface irrigation of food crops shall be at all times an adequately disinfected, oxidized wastewater. The wastewater shall be considered adequately disinfected if at some location in the treatment process, the median number of coliform organisms does not exceed 2.2 per 100 ml as determined from the bacteriological results of the last 7-days for which analyses have been completed. Orchards and vineyards may be surface irrigated with reclaimed water that has the quality at least equivalent to that of primary effluent provided that no fruit is harvested that has come in contact with the irrigating water or the ground. Exceptions to the quality requirements for reclaimed water used for irrigation of food crops may be considered by the State Department of Health on an individual basis where the reclaimed water is to be used to irrigate a food crop which must undergo extensive commercial, physical or chemical processing sufficient to destroy pathogenic agents before it is suitable for human consumption.
Irrigation of fodder, fiber and seed crops	Reclaimed water used for the surface or spray irrigation of fodder, fiber, and seed crops shall have a level of quality no less than that of primary effluent.
Irrigation of pasture for milking animals	Reclaimed water used for the irrigation of pasture to which milking cows or goats have access shall be at all times an adequately disinfected, oxidized wastewater. The wastewater shall be considered adequately disinfected if at some location in the treatment process the median number of coliform organisms does not exceed 23 per 100 ml, as determined from the bacteriological results of the last 7-days for which analyses have been completed.
Landscape irrigation of golf courses, cemeteries, freeway landscapes and similar areas	Reclaimed water used for the irrigation of golf courses, cemeteries, freeway landscapes, and landscapes in other areas where the public has similar access or exposure shall be at all times adequately disinfected oxidized wastewater. The wastewater shall be considered adequately disinfected if the median number of coliform organisms in the effluent does not exceed 23 per 100 ml as determined from the bacteriological results of the last 7-days for which analyses have been completed, and the number of coliform organisms does not exceed 240 per 100 ml in any two consecutive samples.
Permitted Use of Reclaimed Water	Summary of Title 22 (sections 60303 et. seq.) Health Requirements

Table 4 - 5 (continued). Permitted Uses and California Title 22 Health Requirements for Reclaimed Water.

Permitted Use of Reclaimed Water	Summary of Title 22 (sections 60303 et. seq.) Health Requirements
Irrigation of parks, playgrounds, schoolyards and similar areas	Reclaimed water used for irrigation of parks, playgrounds, schoolyards, and other areas where the public has similar access or exposure shall be at all times adequately disinfected, oxidized, coagulated, clarified, filtered wastewater or a wastewater treated by sequence of unit processes that will assure an equivalent degree of treatment and reliability. The wastewater shall be considered adequately disinfected if the median number of coliform organisms in the effluent does not exceed 2.2 per 100 ml, as determined from the bacteriological results of the last 7-days for which analyses have been completed.
Nonrestricted recreational impoundment (no limitations are imposed on body-contact sport activities)	Reclaimed water used as a source of supply in a nonrestricted recreational impoundment shall be at all times adequately disinfected, oxidized, coagulated, clarified, filtered wastewater. The wastewater shall be considered adequately disinfected if at some location in the treatment process, the median number of coliform organisms in the effluent does not exceed 23 per 100 ml in more than one sample within any 30 day period. The median value shall be determined from the bacteriological results of the last 7-days for which analyses have been completed.
Restricted recreation impoundment (recreation is limited to fishing, boating, and other non-body-contact water recreation activities)	Reclaimed water used as a source of supply in a restricted recreational impoundment shall be at all times an adequately disinfected, oxidized wastewater. The wastewater shall be considered adequately disinfected if at some location in the treatment process the median number of coliform organisms does not exceed 23 per 100 ml, as determined from the bacteriological results of the last 7-days for which analyses have been completed.
Landscape impoundment (aesthetic enjoyment or other function but no body-contact is allowed)	Reclaimed water used as a source of supply in a landscape impoundment shall be at all times an adequately disinfected, oxidized wastewater. The wastewater shall be considered adequately disinfected if at some location in the treatment process the median number of coliform organisms does not exceed 23 per 100 ml, as determined from the bacteriological results of the last 7-days for which analyses have been completed.
Groundwater recharge of domestic water supply aquifers	Recharge water requirements are made on a case-by-case basis to ensure that the water is of such quality that fully protects public health at all times. Factors considered include treatment provided, effluent quality and quantity, spreading operations, soil characteristics, hydrogeology, residence time, receiving water quality and distance to withdrawal.
Other uses (toilet flush, industrial cooling water, process water, seawater intrusion barrier)	User must demonstrate that methods of treatment and reliability features will assure an equal degree of treatment and reliability.

WATER RECLAMATION PROJECTS IN THE SAN DIEGO REGION

The water supply in the San Diego Region is largely dependent upon water imported from northern California and the Colorado River. Future increases from these sources may be limited due to environmental concerns, contractual agreements, and over all capital costs. In light of the limited possibilities for future water sources, the need to develop water supply alternatives is important. For many water uses, reclaimed water is a viable alternative water supply.

The status of water reclamation projects in the San Diego Region during March 1993 is shown is shown in Table 4-6. For each water reclamation agency and/or facility in the San Diego Region, the table shows the permitted flow in MGD, the average effluent flow (in MGD), the average effluent flow reused (in MGD), the annual volume reused in million of gallons (MG) and acre-feet (AC-FT), the treatment process and disposal method, the type of use for the reclaimed water, the reclaimed water user and the status of the project. In the San Diego Region, a total of about 175 MGD of reclaimed water flow is permitted. About 16 MGD is reused from an average effluent flow of about 79 MGD. The annual volume reused is about 5,859 MG (18,597 AC-FT).

REGIONAL BOARD ACTION PLAN ON WATER RECLAMATION

The Regional Board supports water reclamation and reuse to the maximum extent feasible to help meet the growing water needs of the Region. It has long been a policy of the Regional Board to encourage and promote water reclamation while taking into consideration the need to protect beneficial uses of surface and ground waters and protect the public health.

On March 24, 1986 the Regional Board adopted Resolution No. 86-06 which amended the Basin Plan to include an action plan for water reclamation. The policy described below updates and supercedes Resolution No. 86-06:

(1) The Regional Board will consider special amendments to the Basin Plan to encourage water reclamation.

(2) The Regional Board will consider comprehensive water quality monitoring programs for confirmation of original hydrogeological predictions, and an accurate measure of adverse ground water quality effects. These monitoring programs will be considered where water reclamation is not expected to result in adverse ground water quality impacts, and where ground water quality impacts are very difficult to predict.

(3) The Regional Board will consider projects involving stream and lagoon replenishment with reclaimed water where, as a minimum, a water quality management plan would be implemented and conformance with the Department of Health Services wastewater reclamation criteria for nonrestricted recreational use would be achieved.

(4) The Regional Board will encourage use of ephemeral streams, that are not used for domestic water supply, for the conveyance of reclaimed water for beneficial uses during periods of need.

(5) The Regional Board will consider the possibilities for the buyout of a beneficial use that is only minimally realized, and that if protected, would stand in the way of a water reclamation project.

(6) The Regional Board will continue efforts to seek the most recent and accurate environmental and technical information for the purpose of reviewing Basin Plan standards pertaining to the discharge of reclaimed water.

(7) The Regional Board will require all ocean and inland dischargers, having the potential to produce reclaimed water, to develop water reclamation plans.

(8) The Regional Board will encourage economic incentives for using reclaimed water, such as rebates by the San Diego County Water Authority and the Metropolitan Water District of Southern California to water suppliers engaged in water reclamation.

Table 4-6. Water Reclamation Projects as of March 1993.

Name of Agency/ Facility	Hydro-logic Unit	Permit Flow MGD	Average Effluent Flow MGD	Average Effluent Flow Reused MGD	Annual Volume Reused MG	Annual Volume Reused AC-FT	Treatment Process and Disposal	Type of Use	Reclaimed Water User	Status
ORANGE COUNTY										
Joplin Youth Center	1.20	0.0075	0.0067	0.0067	2.45	7.50	AS, PB	Landscape Irrigation, Groundwater Recharge		Operating
San Clemente, City of San Clemente WRP	1.20 1.30	7.00	3.996	0.610	222.65	683.28	AS, PB, CH, SF, OF	Golf Course Irrigation, Construction	Municipal GC, Arvida Co, Talega, Pacific GC	Operating
SOUTH ORANGE COUNTY RECLAMATION AUTHORITY SERVICE AREA										
El Toro WD	1.13	5.50	0.000	0.000	0.00	0.00	AS, OF	Landscape Irrigation		Proposed
Los Alisos WD	1.13	5.50	0.000	0.000	0.00	0.00	AS, OF	Landscape Irrigation		Proposed
Moulton Niguel WD Plant 3A STP	1.20	2.40	0.484	0.484	176.66	542.15	AS, CH	Golf Course & Landscape Irrigation	Mission Viejo Country Club	Operating
Laguna Niguel (AWMA/MNWD) Joint Regional WRF	1.13 1.14	12.00	5.191	0.278	100.67	308.93	AS, F, CL, OF	Landscape Irrigation	El Niguel Country Club	Operating
Santa Margarita WD Oso Creek STP	1.13 1.20	3.00	1.693	1.693	617.95	1896.39	AT, F, CH, Of	Landscape Irrigation	Oso Valley Asn. CALTRANS	Operating
Nichols Institute	1.20	0.04	0.032	0.025	9.13	28.00		Property landscaping	Nichols Inst.	Operating
Chiquita WRF	1.20 1.30	3.50	2.103	0.016	5.92	18.18	CH,F	Nursery, Construction, Dust Control	SeaTree Nursery Los Flores Dev. Desecha Landfill	Operating
South Coast County WD	1.12 1.13 1.14	2.61	0.738	0.738	269.19	826.10	AS, F, CH, OF	Irrigation of parks, greenbelt, golf course	AVCO Community De Ben Brown GC Orange County Parks	Operating
Trabuco Canyon WD Trabuco WRP	1.13 1.20	0.25	0.459	0.561	204.77	628.40	OD, F, CH, PB	Golf Course Irrigation	Dove Canyon GC	Operating
RIVERSIDE COUNTY										
Eastern Municipal WD Rancho Calif. STP	2.51	5.00	4.800	1.210	441.65	1355.4	AS, PB	Irrigation Sod Farm	Ralph Daily Sod Farm	Operating
Rancho California WD Joaquin Ranch STP	2.31	0.60	0.575	0.376	137.24	421.2	OD, F, CH, PB	Golf Course Irrigation	Bear Creek Golf Course	Operating
Santa Rosa SBR WRF	2.51	1.00	0.345	0.345	125.93	386.4	F, CH	Groundwater Recharge		Operating

TREATMENT PROCESS: AQ = aquaculture, AS = activated sludge, CH = chlorination, EA = extended aeration, F = filtration, MS = microscreen, OD = oxidation ditch, OF = ocean outfall, OP = oxidation pond, PB = percolation pond or bed, PS = primary sedimentation, RBC = rotating biological contactor, RO = reverse osmosis, TF = trickling filter

Table 4-6 (continued). Water Reclamation Projects as of March 1993

Name of Agency/ Facility	Hydro-logic Unit	Permit Flow MGD	Average Effluent Flow MGD	Average Effluent Flow Reused MGD	Annual Volume Reused MG	Annual Volume Reused AC-FT	Treatment Process and Disposal	Type of Use	Reclaimed Water User	Status
SAN DIEGO COUNTY										
Buena Sanitation Dist. Shadow Ridge WRP	4.32	1.10	0.809	0.062	22.63	69.4	MS, RBC, F, RO, CH, OF	Irrigation	Shadow Ridge Golf Course	Operating
Encina	4.40	22.50	19.000	0.001	0.37	1.1	AS, CH, OP	Landscape Irrigation	Caltrans	Operating
Escondido WRP	4.52 5.21	5.00	0.003	0.003	1.10	3.4	AS, CH	Internal Use, Landscape Irrigation, Golf Course	Escondido San Marcos	Operating
Fairbanks Ranch WRP	5.12	0.28	0.180	0.180	65.70	201.6	EA, PB	Groundwater Recharge		Operating
Fallbrook WD Plants 1 & 2	2.13	3.10	1.720	0.160	58.40	179.2	PS, EA, CH, OF	Landscape Irrigation (I-5 Freeway)	Caltrans Nurseries	Operating
4-S Ranch 4-S Ranch WRP	9.31	0.60	0.062	0.038	13.69	42.0	CH	Compaction Irrigation	Construction Pasture	Operating
Leucadia Water Dist. F.R. Gafner WRF	4.51	0.75	0.000	0.000	0.00	0.0	TF, PS, CH, OF	Aviara and La Costa Country Club Irrigation	La Costa & Aviara Country Clubs	Operating
Oceanside, City of N. San Luis Rey STP	3.12	10.50	8.700	0.020	7.30	22.4	AS, CL, OF, PB	Golf Course Irrigation, Groundwater Recharge	Oceanside Golf Course	Operating
La Salina	4.10	0.50	0.000	0.000	0.00	0.00	EA, AS, CH	Landscape Irrigation	Oceanside	Operating
Otay Municipal WD Ralph W Chapman WRF	9.21	1.30	0.900	0.900	328.50	1008.1	EA, F, RO, CH, OF	Landscape Irrigation	Eastlake Development	Operating
Otay Estates Hidden Valley Estates	9.11	0.15	0.000	0.000	0.00	0.0	AS, CH	Landscape Irrigation		Operating
Padre Dam Municipal WD Water Reclamation Pl	7.12	1.00	0.521	0.521	190.17	583.6	AS, PS, OP, CH, OF	Recreational Lakes & Park Irrigation	Santee Lakes	Operating
Pauma Valley	4.63	0.00	0.000	0.000	0.00	0.0	EA, CH	Groundwater Recharge		Proposed
Ramona Municipal WD Santa Maria WWTP	5.41	1.00	0.600	0.600	219.00	672.1	EA, PB	Irrigation, Pasture Groundwater Recharge	Ramona WD site	Operating
San Vicente STP	7.23	0.60	0.541	0.541	197.47	606.0	OD, CH, F, RO, PB	Avocado Grove Irrig. Groundwater Recharge	Solk Ranch	Operating
Rancho Santa Fe	4.61	0.45	0.220	0.220	80.30	246.4	AS, EA, CH, PB	Golf Course Irrigation	Rancho Santa Fe Golf Course	Operating
San Diego, County of Descanso STP	9.31	0.04	0.026	0.026	9.56	29.3	AS, PB	Landscape Irrigation	Descanso Facil.	Operating
Julian	7.43	0.04	0.035	0.035	12.78	39.20	OP	Irrigation (cattle feed)		Operating
Mount Woodson SD	5.11	0.08	0.000	0.000	0.00	0.0	CH	Irrigation	Golf Course	Operating
Rancho Cielo SD	5.11	0.20	0.000	0.000	0.00	0.0		Landscape Irrigation		Operating
Whispering Palms CSD	5.11	0.40	0.175	0.175	63.88	196.0	EA, CH, PB	Ground Water Recharge	Del Rayo Prop.	Operating
San Diego, City of Water Utilities Dept San Pasqual WAP STP	5.31	1.00	0.0190	0.0190	6.94	21.3	AS, CH, PB	Irrigation & Animal Stock Watering	Wild Animal Park	Operating

TREATMENT PROCESS: AQ = aquaculture, AS = activated sludge, CH = chlorination, EA = extended aeration, F = filtration, MS = microscreen, OD = oxidation ditch, OF = ocean outfall, OP = oxidation pond, PB = percolation pond or bed, PS = primary sedimentation, RBC = rotating biological contactor, RO = reverse osmosis, TF = trickling filter

Name of Agency/ Facility	Hydro-logic Unit	Permit Flow MGD	Average Effluent Flow MGD	Reused MGD	Annual Volume Reused MG	AC-FT	Treatment Process and Disposal	Type of Use	Reclaimed Water User	Status
SAN DIEGO COUNTY CONTINUED										
Mission Valley Pilot Aquaculture Project	7.11	1.00	0.026	0.025	9.13	28.0	AQ, QF	Freeway Landscaping (I-15 & I-8)	Caltrans	Operating
North City	6.10	30.00	0.000	0.000	0.00	0.0		Landscape Irrigation	Caltrans	Operating
San Elijo JPA	4.51	3.68	0.000	0.000	0.00	0.0	CH, AS	Landscape Irrigation	Encinitas, Del Mar	Operating
US Marine Corps Base, Camp Pendleton Plant No. 1	2.13	1.50	0.429	0.687	247.54	759.7	TF, CH, PB	Groundwater Recharge	Camp Pendleton	Operating
Plant No. 2	2.11	0.92	0.309	0.694	253.13	776.8	TF, CH, PB	Golf Course Irrigation	Camp Pendleton	Operating
Plant No. 3	2.12	1.10	0.492	0.753	274.66	842.9	TF, CH, PB	Groundwater Recharge	Camp Pendleton	Operating
Plant No. 8	1.51	0.59	0.074	0.296	107.86	331.0	TF, CH, PB	Groundwater Recharge	Camp Pendleton	Operating
Plant No. 9	1.52	1.10	0.142	0.357	130.34	400.0	TF, CH, PB	Groundwater Recharge	Camp Pendleton	Operating
Plant No. 10	1.51	0.85	0.325	0.378	138.08	423.7	TF, CH, PB	Groundwater Recharge	Camp Pendleton	Operating
Plant No. 11	1.51	0.85	0.836	1.088	397.01	1218.4	TF, CH, PB	Groundwater Recharge	Camp Pendleton	Operating
Plant No.12	1.40	0.85	0.142	0.420	153.37	470.7	TF, CH, PB	Groundwater Recharge	Camp Pendleton	Operating
Plant No. 13	2.11	2.50	1.397	1.225	447.16	1372.3	TF, CH, PB	Groundwater Recharge	Camp Pendleton	Operating
Plant No. 16	1.53	0.03	0.008	0.008	2.74	8.4	EA, PB	Groundwater Recharge	Camp Pendleton	Operating
Vallecitos WD Meadowlark WRP	4.51	2.00	0.995	0.525	191.63	588.1	MS, RBC, F, CH, OF	Golf Course Irrigation	La Costa GC Carlsbad City	Operating
Valley Center MWD Lower Moosa Canyon WRP	3.13	0.50	0.250	0.250	91.25	280.0	AS, CH, PB	Golf Course Irrigation Groundwater Recharge	Circle R GC Valley Center MWD	Operating

TREATMENT PROCESS: AQ = aquaculture, AS = activated sludge, CH = chlorination, EA = extended aeration, F = filtration, MS = microscreen, OD = oxidation ditch, OF = ocean outfall, OP = oxidation pond, PB = percolation pond or bed, PS = primary sedimentation, RBC = rotating biological contactor, RO = reverse osmosis, TF = trickling filter

Summary of San Diego Region Water Reclamation Projects as of March 1993

COUNTY SUBTOTALS	PERMIT FLOW (MGD)	AVERAGE EFFLUENT FLOW GENERATED (MGD)	AVERAGE EFFLUENT FLOW REUSED (MGD)	ANNUAL VOLUME REUSED (MG)	ANNUAL VOLUME REUSED (AC-FT)
Orange	41.81	14.70	4.41	1,609.37	4,938.94
Riverside	35.20	25.532	1.997	728.91	2,236.9
San Diego	98.05	38.94	10.20	3,721.65	11,421.24
REGION TOTALS	175.06	79.171	16.603	6,059.9	18,597

(9) The Regional Board will seek funding for studies to evaluate the potential of water reclamation in various areas of the Region including streams and coastal lagoons.

(10) The Regional Board will take appropriate actions, recommend legislation, and recommend actions by other planning agencies (county, federal, etc.) in the areas of (1) planning, (2) project funding, (3) regulation and enforcement, (4) research and demonstration, and (5) public involvement and information.

(11) The Regional Board will encourage and support measures which conserve the water resources of the San Diego Region.

(12) The Regional Board will encourage other agencies to assist in implementing this policy.

(13) As mitigation against potential nuisance odors and health hazards resulting from reclaimed water use, the Regional Board will continue to adopt and enforce waste discharge requirements containing prohibitions against nuisance odors and implementing the State DHS' Wastewater Reclamation Criteria.

(14) The Regional Board will prepare Basin Plan amendments necessary for implementation of water reclamation projects in compliance with state policy for water quality control and, to the extent surface waters will be affected, with Environmental Protection Agency water quality standards regulations. Site specific environmental impacts will be evaluated in conformance with the California Environmental Quality Act (CEQA) for specific Basin Plan amendments.

FACTORING WATER SUPPLY CONSIDERATIONS INTO THE REGIONAL BOARD REGULATION OF WATER RECLAMATION PROJECTS

Conventional reclamation facilities are not designed to reduce mineral constituents. Consequently, the mineral effluent quality is dependent on the composition of the water supply plus the mineral pickup during its use. Historically, water supply TDS concentrations have varied significantly. For example, concentrations of TDS of the blended water stored in Lake Skinner ranged from below 400 milligrams per liter (mg/l) to above 700 mg/l between 1985 and 1995.

Residential wastewater discharges will typically be 250 to 300 mg/l higher in TDS than their water supply source. Self-regenerating water softeners, brine from industrial dischargers, and ground water infiltration can further increase TDS concentrations in wastewater effluent. Many wastewater management agencies within the region are implementing programs to minimize the incremental pickup of minerals from these sources. These programs have had varying degrees of success.

Effective water conservation measures that are being implemented within the region may result in higher mineral and other constituent concentrations in wastewater effluent. Although the volume of wastewater is reduced by water conservation, the mineral and organic loading from its use remains nearly constant. As a result, the strength of the wastewater influent becomes stronger. In some cases, the characteristics of the wastewater influent may range briefly above the design parameters of the treatment plant.

In recognition of the variables in wastewater quality that are beyond the control of the discharger, the Regional Board authorizes the Executive Officer to suspend formal enforcement action, when a discharger submits an initial technical report with subsequent quarterly updates, that demonstrate to the satisfaction of the Executive Officer, compliance with the following conditions:

1. The discharge is not subject to regulation by means of a NPDES Permit; and

2. The enforcement action is only for violations of discharge specifications for mineral constituents, total suspended solids (TSS), biological oxygen demand (BOD) or carbonaceous biological oxygen demand (CBOD); and

3. The effluent violations are due solely to changes in the quality of the imported water supply and/or to water conservation measures being implemented within the service area tributary to the treatment plant; and

4. The discharge does not result in a mass loading of TSS, BOD and CBOD that exceeds the loading prior to implementation of water conservation measures; and

5. The discharge will not cause Basin Plan water quality objectives to be exceeded, in the long term; and

6. The discharge will not cause a violation of any applicable section from Title 22 of the CCR or any requirement specified by either the State DHS or the appropriate county health officer for the protection of public health; and

7. The discharge does not contain a concentration of TDS exceeding 1,500 mg/l, or the concentration in the water supply plus 500 mg/l, whichever is less, with comparable adjustments for other mineral constituents; and

8. The discharger implements a program to identify major sources of the mineral constituents of concern in the discharge, including but not limited to water softener regeneration brine; and to determine the average contribution of each major source and the best available options for reducing levels in the discharge; and to identify any negative effects on the potential for water reclamation caused by the failure to control the constituents of concern in the discharge. The program should include a time schedule to reduce mineral constituents in the discharge as necessary to assure that the potential for water reclamation will be realized to the maximum extent practicable.

RECLAIMED WATER CONFORMANCE WITH WATER QUALITY OBJECTIVES

The Regional Board has established various policies concerning the compliance of reclaimed water discharges with applicable Basin Plan water quality objectives. These policies are described below:

DISCHARGES TO COASTAL LAGOONS FROM PILOT WATER RECLAMATION PROJECTS

The Regional Board may grant an exception to the "Biostimulatory Substances" water quality objective described in Chapter 3 to provide for discharges to coastal lagoons from pilot water reclamation projects. The project proponent must demonstrate that the pilot water reclamation project is consistent with the conditions described in the Principles of the State Water Resources Control Board's Policy and Action Plan for Water Reclamation in California. The Policy and Action Plan for Water Reclamation in California was adopted by the State Board in January 1977 and is summarized below. In addition, the proponent must demonstrate that the threat of eutrophication as a result of the addition of nitrogen and/or phosphorus is reduced as a consequence of one or more of the following factors:

- Waters of the coastal lagoon are highly laden with natural silts or colors which reduce the penetration of sunlight needed for photosynthesis;

- The coastal lagoon is characterized by morphometric features of steep banks, great depths, and substantial flows which have contributed to a history of no plant problems;

- The coastal lagoon is managed primarily for waterfowl or other wildlife;

- An identified element other than nitrogen or phosphorus is limiting to plant growth in the coastal lagoon, and the level and nature of the limiting element would not be expected to increase to an extent that would influence eutrophication; or

- Control of nitrogen and/or phosphorus in the coastal lagoon cannot be sufficiently effective under present technology to make phosphorus or nitrogen the limiting nutrient.

The Principles of the Policy and Action Plan for Water Reclamation in California provide, in part, that water reclamation projects shall be encouraged which do not adversely impact

vested water rights or unreasonably impair instream beneficial uses or place an unreasonable burden on present water supply systems, and which meet the following additional conditions:

- Beneficial use will be made of wastewaters that would otherwise be discharged to marine or brackish receiving waters or evaporation ponds;

- Reclaimed water will replace or supplement the use of fresh water or better quality water; or

- Reclaimed water will be used to preserve, restore, or enhance instream beneficial uses which include, but are not limited to, fish, wildlife, recreation, and aesthetics associated with any surface water or wetlands.

Exceptions to the numerical water quality objectives will be made only when a pilot reclamation project meets the following criteria:

- Need for the reclaimed water is demonstrated;

- Alternative disposal facilities are available in the event discharge to a coastal lagoon proves unfeasible;

- Conformance with the State Board's Water Quality Control Policy for the Enclosed Bays and Estuaries of California is demonstrated;

- Data will be generated that will be useful and timely for Regional Board review of water quality objectives for nutrients; and

- The project will include a lagoon management plan addressing the proposed methods of identifying and eliminating any pollution, contamination, or nuisance problems resulting from the proposed discharge and clearly identifying management responsibilities and capabilities.

DISCHARGES TO INLAND SURFACE WATERS

Regional Board Resolutions Nos. 90-53 and 91-23 established an alternate method of conformance with the biostimulatory substances water quality objectives for portions of the San Diego River and Santa Margarita River. The Policy presented below supersedes Resolutions Nos. 90-53 and 91-23 and is applicable to all inland surface waters of the San Diego Region at a point downstream of lakes or reservoirs used for municipal water supply.

The Regional Board has developed an alternate method of showing compliance with the biostimulatory substances water quality objective contained in Chapter 3 to:

- Promote water reclamation;

- Enhance opportunities for reclaimed water discharges to inland surface waters; and

- Protect and enhance existing inland surface water beneficial uses through the greater use of reclaimed water.

The alternate method of compliance described below is applicable to reclaimed water discharges to inland surface waters at a point downstream of lakes or reservoirs used for municipal water supply. The alternate method of compliance is meant to encourage reclaimed water discharges into inland surface waters without degradation of the ambient water quality or adverse effects on beneficial uses.

Compliance Methods

The Regional Board will establish appropriate effluent limitations for nitrogen and phosphorus in waste discharge requirements for discharges of reclaimed water to surface waters using one of the following methodologies:

- The Regional Board may use the goal for phosphorus concentration in flowing water contained in the Biostimulatory Substances objective as guidance in establishing appropriate effluent limitations; or

- Alternatively, the Regional Board may determine compliance with the narrative objective based upon the following four factors:

  - ✓ measurement of ambient concentrations of nitrogen and phosphorus;

  - ✓ the dissolved oxygen requirements of downstream beneficial uses;

- ✓ use of best available technology (BAT) economically feasible for the removal of nutrients; and

- ✓ the development and implementation of a watercourse monitoring and management plan.

Best available technology for the removal of nutrients includes biological and chemical removal. The extent to which the Regional Board may require additional removal of nutrients through chemical addition processes will be based upon an evaluation of the economic feasibility of this additional treatment in concert with an evaluation of the effectiveness of the watercourse monitoring management plan.

The watercourse monitoring and management plan shall include:

- A comprehensive program for chemical monitoring in receiving waters and effluent that will generate adequate data on ammonia nitrogen, nitrate nitrogen, nitrite nitrogen, organic nitrogen, total phosphate, ortho phosphate, dissolved oxygen (including vertical and diurnal dissolved oxygen profiles), pH, turbidity, biochemical oxygen demand (BOD) and other appropriate constituents and properties which may contribute to, or result from, nutrient related problems and impact beneficial uses.

- A comprehensive program for physical and biological monitoring in the receiving waters that will generate adequate data on chlorophyll 'a', corrected chlorophyll 'a', pheophyton 'a'; temperature (including diurnal and vertical temperature profiles); acute and chronic toxicity; the diversity and numbers of microinvertebrates, macroinvertebrates, and fish; the dynamics of the aquatic flora (macroalgae, phytoplankton, and emergent vegetation) and the related dissolved oxygen regime; substrate composition; frequency of nuisance conditions; flow rate; and other appropriate constituents and properties which may contribute to nutrient related problems and impact beneficial uses.

- A comprehensive program for physical and biological monitoring of the effluent that will generate adequate data on flow, temperature, chronic and acute toxicity, and other appropriate constituents which may contribute to nutrient related problems and impact beneficial uses.

- A procedure for evaluating the data collected under items (1), (2), and (3) above and determining the potential for nutrient related problems that may impact beneficial uses.

- Development and implementation of preventive and corrective actions that will ensure that a discharge containing nutrients will not adversely impact beneficial uses. These preventative and corrective actions may include, but are not limited to, the following:

  - ✓ Achievement of more stringent effluent limits for nutrient constituents discharged to the watercourse, through additional chemical treatment methods at the treatment facility, to further reduce nutrient loading to the river,

  - ✓ Maintenance of minimum reclaimed water flows discharged to the watercourse to prevent stagnant areas subject to nutrient related problems and to maintain the aquatic and riparian habitat beneficial uses that have been enhanced and/or created by such a discharge,

  - ✓ Effective measures for the instream chemical treatment of surface waters to prevent nutrient and stagnant water related nuisance problems that can adversely impact aquatic habitat beneficial uses, where this instream treatment will not adversely impact beneficial uses,

  - ✓ Effective measures for the physical management of the watercourse channel and vegetation,

  - ✓ Effective source control measures to reduce the amount of nutrient constituents in the reclaimed water, and

  - ✓ Other measures deemed appropriate and necessary by the Regional Board to ensure compliance with the Basin Plan narrative objective for nutrients and for the protection of beneficial uses.

Additional Mitigation

As mitigation against adverse impacts of nuisance odors and health hazards resulting from use of reclaimed water, the Regional Board will continue to adopt and enforce waste discharge requirements containing prohibitions against creation of nuisance odors and implementing the State DHS' Water Reclamation Criteria.

Additionally, as mitigation measures against degradation of ground and surface water quality resulting from an inland reclaimed water discharge, the Regional Board will require well head treatment or treatment at the point of use, or other appropriate measures acceptable to the Board, adequate to maintain the existing quality of ground and surface waters and the beneficial uses for all ground and surface waters adversely impacted by a discharge. The Regional Board will require monitoring of all ground water wells and legal direct diversions of surface water prior to permitting a discharge in order to establish the baseline quality that must be maintained.

As mitigation against any adverse effects to instream or downstream surface or ground water quality and the environment resulting from the discharge of reclaimed water, the Regional Board will require the discharger to establish and implement a comprehensive river monitoring and management program. The implementation of the watercourse monitoring and management plan will often require close coordination between many different public and private entities. The Regional Board shall recognize an agency to implement the watercourse monitoring and management plan and such recognition shall be made part of the provisions of appropriate waste discharge requirements for the discharge.

The watercourse monitoring and management plan, and all the associated requirements, shall apply to all downstream waters, including rivers, lagoons, estuaries, and bays, which may be impacted by the reclaimed water discharge. The Regional Board will regulate the volume of reclaimed water discharged into all inland surface waters to those levels which do not significantly and adversely alter the salinity regimes of downstream lagoons, estuaries, or bays. This regulation of flows will include a prohibition of fresh water flows that could result in the conversion of a lagoon, estuary, or bay from a saline environment to a fresh water environment. Salt marsh habitats are to be considered an integral part of the lagoon, estuary, or bay to which they are associated, and therefore shall be fully protected from conversion.

Implementation of Ground Water Quality Objectives for Reclaimed Water Discharges

In order to facilitate water reclamation in the Region, the Regional Board, adopted Resolution No. 90-61 on November 5, 1990. Resolution No. 90-61 established a methodology for determining reclaimed water effluent limits. The policy described below updates and supersedes Resolution No. 90-61.

The Regional Board shall regulate discharges of reclaimed water by establishing effluent limitations designed to protect beneficial uses and ensure compliance with State Board Resolution No. 68-16. Use of adequately treated reclaimed water for irrigation or ground water recharge shall be encouraged in basins where reuse is clearly beneficial. Regulation of discharges of reclaimed water, where the reclaimed water displaces the use of imported water, or ground water having a quality exceeding the ground water quality objective, shall be in the following manner:

- For discharges upgradient of municipal water supply reservoirs the Regional Board shall adopt numerical effluent limitations for constituents at levels no lower than the quality of the basin's water supply but no higher than the Basin Plan ground water quality objective.

- In ground water basins not upgradient of municipal water supply reservoirs the Regional Board shall adopt numerical effluent limitations for constituents at levels no lower than the quality of the basin's water supply concentration plus an incremental increase equal to the typical incremental increase added to the water supply as a result of domestic use. The effluent limitations shall be no higher than the Basin Plan ground water quality objective.

- For discharges where the discharger has demonstrated sufficient assimilative capacity exists and ground water quality objectives will not be exceeded, the Regional Board may consider adoption of numerical effluent limitations for constituents based on the

discharge quality and assimilative capacity analysis results.

- The Regional Board shall also require the implementation of effective salinity source control measures to ensure a reclaimed water quality that is suitable for long-term agricultural and landscape irrigation.

WATER RECLAMATION UNDER RESOLUTION NO. 81-16

On March 23, 1981 the Regional Board adopted Resolution No. 81-16 which modified the water quality standards by relaxing the ground water objectives and modifying the beneficial use designations for portions of the Aliso Hydrologic Subarea (HSA) 1.13, Carlsbad HSA 4.21, Agua Hedionda HSA 4.31, Batiquitos HSA 4.51, and Telegraph HSA 9.11. These areas are described in Table 3-3. The terms and conditions of Resolution No. 81-16 are incorporated in this Basin Plan; accordingly Resolution No. 81-16 is superseded. The use of reclaimed water in these areas is subject to the following provisions:

- Notwithstanding the water quality objectives, the Regional Board will regulate waste discharges in the affected portions of Hydrologic Subareas 4.21 and 4.31 in a manner that will protect the waters produced by the existing operating wells. A presently existing ground water use will be considered terminated when the well has been abandoned pursuant to County of San Diego Water Well Standards.

- In applying the modified standards, the Regional Board will condition waste discharge requirements for discharges of domestic and municipal wastewater to require that the wastewater be reclaimed and reused in a manner that will displace the need for approximately equal volumes of imported potable water.

WATER RECLAMATION AS AN ALTERNATIVE TO OCEAN DISPOSAL

The State Board in Order No. WQ 84-7 concluded that water reclamation should be carefully considered by persons proposing to discharge substantial quantities of once-used wastewater to the ocean particularly in a water short area where water is imported. Order No. WQ 84-7 directs the regional boards to require persons applying for permits to discharge once-used wastewater to the ocean in water-short areas to justify as part of each report of waste discharge why the wastewater is not being reclaimed.

The San Diego Region water supply is primarily imported water and the Region is clearly a water short area. Pursuant to State Board Order No. 84-7, the Regional Board will require persons proposing a discharge of once-used wastewater into the ocean to:

- Carefully analyze as an alternative, or partial alternative, the feasibility of reclaiming the wastewater for a beneficial use in lieu of ocean disposal.

- Submit, with the report of waste discharge in application for waste discharge requirements, sufficient information to justify why any wastewater proposed for discharge to the ocean after a single use is not being reclaimed for a beneficial use.

Reports of waste discharge which do not contain the water reclamation feasibility analysis described above, to the satisfaction of the Regional Board Executive Officer, will be considered incomplete and the Regional Board will not issue waste discharge requirements for the proposed discharge.

RECLAIMED WATER STORAGE REQUIREMENTS

During the winter season, wet weather, and other periods when there is little or no demand, treatment plants continue to operate at normal flows and the excess treated effluent must either be: (1) discharged to storage facilities until such time as the irrigation demand requires the use of the stored water; (2) discharged through a fail-safe land outfall connection to an ocean outfall under the terms of an NPDES permit; or (3) discharged to inland surface waters for ground water recharge and/or stream replenishment under the terms of an NPDES permit. Theoretical water balance calculations for disposal of reclaimed water at golf courses and other reuse sites in the Region indicate that storage facilities should be sized for 84-days of storage. (1975 Comprehensive Water Quality Control Plan Report, Page II-16-32). In situations

where reclaimed water storage ponds are necessary, the Regional Board will require reclaimed water producers to:

- Provide 84-days of storage capacity; or

- Provide storage capacity based upon water balance calculation procedures such as described in:

  USEPA. 1981. Process Design Manual for Land Treatment of Municipal Wastewater. Center for Environmental Research Information. Cincinnati, OH. EPA 625/1-81-013 (COE EM1110-1-501).

INDUSTRIAL WASTE

PRETREATMENT PROGRAM FOR INDUSTRIES

It is generally recognized that the discharge of industrial pollutants can be controlled most economically at their source. This is particularly true for industries discharging waste to municipal wastewater treatment plants (commonly called "POTWs" for "publicly owned treatment works"). On that basis USEPA has developed pretreatment requirements (40 CFR 403) for many industries and has developed minimum standards for POTW pretreatment programs. A POTW is required to implement a pretreatment program as a condition of its NPDES permit if its design flow is greater than five MGD or there are significant industrial users discharging to the POTW. POTWs with design flows less than 5 MGD may also be required to establish a pretreatment program if nondomestic waste causes upsets, sludge contamination, or violations of NPDES permit conditions, or if industrial users are subject to national pretreatment standards.

The goal of the USEPA's National Pretreatment Program is to protect municipal treatment plants and the environment from the adverse impact that may occur when hazardous or toxic wastes are discharged into a sewer system. This protection is achieved mainly by regulating nondomestic users of POTWs that discharge toxic wastes or unusually strong conventional wastes. Local pretreatment programs are required to fulfill the following objectives:

- Prevent the introduction of pollutants into POTWs which will interfere with the operation of a POTW, including interference with its use or disposal of municipal sludge;

- Prevent the introduction of pollutants into POTWs which will pass through the treatment works or otherwise be incompatible with such works;

- Improve opportunities to recycle and reclaim municipal and industrial wastewaters and sludges; and

- Prevent exposure of POTW personnel from chemical hazards and poisonous gases.

The general pretreatment regulations establish industrial pretreatment standards to control industrial pollutant discharges into wastewater collection systems and treatment plants. The discharge standards apply to all industrial and commercial establishments discharging waste to wastewater collection systems tributary to POTWs. The standards prohibit the discharge of pollutants that may damage the POTW's facilities, disrupt operations or expose workers to hazards. Categorical pretreatment standards are numerical effluent limits which apply to industrial and commercial discharges in 25 specific industrial categories determined to be the most significant sources of toxic pollutants. All firms regulated by a particular pretreatment standard are required to comply with these standards. One hundred and twenty-six toxic pollutants are regulated in the 25 categorical standards. Prohibited discharges into POTW plants, besides toxic substances, include:

- Substances that create a fire or explosion hazard in the plant or sewer system;

- Discharges that are corrosive (have a pH < 5.0);

- Discharges that obstruct flow in the sewer system or interfere with plant operation;

- Discharges that upset the treatment process or cause a violation of the POTW's permit;

- Discharges that increase the temperature of the wastewater entering the treatment plant to above 104° F (40° C);

- Oil based products in amounts that will cause interference or pass through;

- Substances which cause toxic gases, vapors or fumes in a quantity which may cause worker health or safety problem(s); and

- Trucked or hauled pollutants, except at discharge points designated by the POTW.

Municipalities are required to use and enforce these standards as well as locally developed standards, to control nondomestic users discharging to their wastewater collection and treatment systems. The federal regulations require all states that administer NPDES programs to POTW operators to develop local pretreatment programs. The California pretreatment program includes the same general elements which parallel the pretreatment compliance schedule activities specified in most POTWs' NPDES permits. Pretreatment programs are required to contain the following elements:

- Identification and evaluation of the nondomestic discharges to a treatment system.

- The POTW must operate under a legal authority that will enable it to apply and enforce the requirements of pretreatment regulations and other state and local rules needed to control nondomestic discharges.

- The POTW must establish local industrial effluent limits to protect treatment plant operation, receiving water quality and sludge quality.

- The POTW must develop procedures for monitoring its industrial users to determine compliance and non-compliance.

- The POTW must develop administrative procedures to implement its pretreatment program.

- The POTW must have sufficient resources (funds, equipment, personnel) to operate an effective and ongoing program.

STEAM ELECTRIC POWER PLANTS

The Region has five steam electric power plants, four are operated by San Diego Gas and Electric Company (SDG&E) and one by Southern California Edison (SCE). Each of the SDG&E plants has one cooling water intake and one outfall structure. A separate NPDES permit has been issued for each SDG&E plant. The SCE plant, called the San Onofre Nuclear Generation Station (SONGS) has three power generating units, each with its own cooling water intake and outfall structure, and a separate NPDES permit has been issued for each of the three power generating units. All of these plants obtain cooling water from the ocean or San Diego Bay.

The SDG&E power plants are conventional fossil-fuel burning electrical generating facilities. The SDG&E plants are located in San Diego County, three of them are adjacent to San Diego Bay and one is adjacent to the Pacific Ocean. The San Onofre Nuclear Generating Station is located adjacent to the Pacific Ocean in northern San Diego County and consists of three nuclear fueled electrical generating units.

The cooling water discharges from the power plants are regulated under the provisions of the Thermal Plan, which incorporates provisions of Section 316(a) of the Clean Water Act. All of the plants employ a once-through cooling water system. Seawater is pumped into the facility and used to cool the condensers, which results in an increase in the cooling water temperature of approximately 20 degrees Fahrenheit above the ambient seawater temperature. The cooling water is then discharged to marine waters, where the heat accumulated in the cooling water is dissipated.

The power plant NPDES permits establish effluent limitations for the discharge of cooling water and other wastes generated at the facilities. The effluent limitations are based upon applicable state water quality objectives and USEPA effluent guidelines and standards for steam electric power plants contained in 40 CFR 423. Each facility has a unique arrangement and thus a unique set of waste streams. Other wastewater discharges regulated by power plant NPDES permits, in addition to the cooling water discharge, include boiler blowdown, evaporator blowdown, floor drain

discharges, chemical cleaning wastes and boiler wash.

Each power plant is required under the terms and conditions of its NPDES permit to comply with federal Clean Water Act sections 316(a) and (b). Section 316(a) addresses the control of the thermal component of a discharge and its effects on fish population and wildlife. Section 316(b) requires that the location, design, construction, and capacity of cooling water intake structures reflect the best available technology for minimizing adverse impacts to the environment.

SUBSURFACE DISPOSAL FROM CAMPGROUNDS AND RECREATIONAL VEHICLE PARKS

Since the early 1970's, the Regional Board has been issuing waste discharge requirements to campgrounds and/or recreational vehicle (RV) parks that discharge wastewater to subsurface disposal systems. Chemical preservatives in RV holding tanks increase the threat to ground water quality from these facilities. At one time, the WDRs specified that wastes other than domestic sewage shall be excluded from the discharge. Consequently, the requirements prohibited the discharge of water softener regeneration brine and RV holding tank waste to the septic tank and leach line systems and required the discharger to provide impervious storage tanks for RV holding tank wastes. In order to comply with the WDRs adopted by the Regional Board prior to 1978, the RV campground managers required RVs to empty their holding tank wastes into the campground's dump station if the RV would be provided with sewer hookups. WDRs adopted after 1978 do not require the installation of impervious holding tanks at RV parks nor are RVs required to dispose of RV holding tank wastes to impervious tanks. Currently, most campgrounds and/or RV parks in the Region do not have impervious storage tanks for RV holding tank wastes.

In 1978, the Regional Board adopted Resolution No. 78-24, suspending all ground water monitoring requirements at the campgrounds until such time as a study by the State Board on RV waste disposal was completed and reviewed by the Regional Board staff. In June 1980, the Sanitary Engineering Research Laboratory at University of California, Berkeley published a report for the State Board entitled, "*Recreational Vehicle Waste Disposal in Roadside Rest Septic Tank Systems*". This report however, did not address the requirements for ground water monitoring.

The Regional Board "Waiver Policy" described earlier in this Chapter provides for waivers of WDR adoption for campgrounds where no facilities are provided for recreational vehicles to connect to the campground sewerage system. Consequently, the Regional Board has deferred to the county health departments regulation of campgrounds and/or RV parks that do not provide sewer connections for recreational vehicles. The policy also waives WDRs for residential, commercial, industrial, and individual subsurface disposal systems subject to the conditions set forth in the Guidelines for New Community and Individual Sewerage Facilities described earlier in this Chapter.

A common problem with community systems is that individual property owners and homeowners associations often deny responsibility for system failure and necessary repairs. Additional problems result when private entities operate community systems and do not have sufficient funds available to correct problems. Consequently, prior to approval of projects proposing community subsurface disposal systems, the Regional Board requires as part of the Report of Waste Discharge, documentation from the proponent that demonstrates that adequate funding is available to operate and maintain the disposal systems.

VESSELS (RECREATIONAL, COMMERCIAL, AND NAVAL) AND MARINAS

Vessels of all types and sizes including recreational, commercial, and Naval craft, and the marinas (or other facilities) in which they berth can have serious impacts on water quality. This section will describe the most important waste categories, pollutants, and other water quality problems associated with vessels and marinas. A description of BMPs and applicable regulations is also included. Although presented below, it should be noted that vessels and marinas are typically considered a nonpoint source category.

San Diego Bay sailboat

VESSELS AND MARINAS IN THE SAN DIEGO REGION

There are approximately 8,400 boat slips in San Diego Bay, 2,400 in Mission Bay, over 1,000 in Oceanside Harbor, and over 1,500 in Dana Point Harbor. In addition to boats with assigned slips, there are several hundred additional boats moored at a variety of "free" anchorages. In San Diego Bay, the San Diego Unified Port District has organized two of its free anchorages into formal anchorages which have shoreside showers, rest rooms, and docking facilities. Boat owners are required to pay fees for these services. In 1986, the San Diego Unified Port District was granted permission by the Coast Guard to establish additional formal anchorages in San Diego Bay. Because of the reluctance of some boat owners to pay fees for mooring in the bay, many have elected to move their boats to new free anchorages. Such anchorages can be especially important sources of human pathogens from vessel sewage releases. In addition to the vessels normally maintained in the water, there are several thousand additional "trailer" boats using San Diego's boat harbors. In total, approximately 55,000 vessels are registered in San Diego County.

NAVY VESSELS IN THE SAN DIEGO REGION

Home port to approximately one hundred US Navy vessels, San Diego Bay is one of the largest Naval ports on the west coast of the United States. As described above, Navy vessels are responsible for the same types of water quality impacts as other vessels. They are also subject to the same regulations and requirements as other vessels except that discharges from Naval vessels under certain circumstances are not subject to NPDES permits. A description of this exclusion (as found in Title 40, CFR, Part 122.3) was discussed earlier in this Chapter.

If enforcement action is necessary, operators of Naval vessels are subject to all of the same enforcement mechanisms outlined previously in this Chapter with one exception; the Navy is not subject to Administrative Civil Liability.

VESSEL WASTES

The most significant waste categories associated with vessels include:

- hull maintenance related wastes;
- sewage;
- marine engine related wastes; and
- trash.

Of these categories, hull maintenance related wastes, and particularly antifouling paint, is believed to pose the greatest potential threat to water quality. This is because of its high degree of toxicity. Antifouling paint, which is applied to vessel hulls, is specifically designed to prevent the growth and attachment of marine organisms by continuously releasing toxic substances into the surrounding water. Cuprous oxide and tributyltin fluoride or tributyltin oxide are the principal toxicants in copper-based and organotin-based paints, respectively. Although the use of TBT is now significantly limited, leaching pollutants from antifouling paints remains a widespread and serious concern especially in areas of high vessel density and low hydrologic flushing.

Antifouling paint may pose an even greater water quality threat during and after its removal from vessel hulls since the pollutants in the paint chip wastes may continue to leach into receiving waters. In most cases, because paint removal activities on ships are conducted in ship repair yards, responsibility for the paint chip wastes is transferred from the vessel owner to the shipyard. (See shipyards and boatyards discussion). The same is generally true for recreational craft serviced at boatyards. However small craft can also obtain some hull maintenance services directly in the water by underwater hull cleaners. In addition to paint, other examples of hull maintenance wastes include strippers, cleaners, and cathodic protection products. Although a variety of pollutants can be released during hull maintenance activities, metals are the pollutants of greatest concern.

Sewage is often intentionally discharged directly into receiving waters due to the lack of pumpout stations, inconvenience or inoperation of pumpout stations, or the irresponsibility or ignorance of vessel operators. Human pathogens present in sewage include a variety of fecal bacteria and viruses. Today sewage

discharges in recreational marinas are believed to be more significant than at Naval berthing areas. This is because all US Navy vessels are currently equipped to connect to pumpout facilities while in port.

Marine engine related wastes such as fuels, oils, lubricants, antifreeze, solvents, and polluted bilge water are commonly released from vessels into receiving waters. The pollutants of greatest concern for marine engine wastes are metals and petroleum hydrocarbons. PAHs are a particular concern because they tend to accumulate and persist in aquatic sediments for years, poisoning benthic organisms. Garbage and trash are also discharged from vessels.

Each of the above waste categories can be, and frequently are, washed, spilled, scraped, dumped, and pumped directly into receiving waters. As a result, each of the wastes can take a major toll on water quality and beneficial uses. The marine habitat and shellfish harvesting beneficial uses are particularly sensitive to vessel wastes.

Furthermore each of the waste categories is relevant to all vessel types and sizes including recreational boats as well as commercial and Naval ships. However, because of a ship's greater size and corresponding greater magnitude, variety, and toxicity of wastes generated, ships (particularly Navy ships) are generally believed to pose a greater threat to water quality than boats. For example, Navy vessels are typically drydocked for hull maintenance only once every five or more years and spend more time in port or at anchor than underway. Fouling organisms attach more readily when a ship is stationary. For these reasons, Navy coating systems are required to be effective for longer periods of time than those applied to commercial and recreational vessels. Accordingly, Navy vessels are blasted to "white metal" meaning all paint is removed to bare metal and the surface is abraded in preparation for adherence of a complete new coating system. Additionally antifouling paints used on Navy vessels contain higher levels of toxicants than those used on commercial and recreational vessels.

Nevertheless, there is a formidable set of water quality impacts associated with small craft and small craft marinas as described below.

Oceanside Harbor
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MARINAS

Marinas and other boat berthing facilities typically have high boat densities and low hydrologic flushing. As a consequence of these characteristics, the following significant water quality problems often result within marinas:

- increased pollutants in the water column;
- decreased dissolved oxygen in the water column;
- increased pollutants in aquatic sediment;
- increased toxicity in the water column and sediments;
- increased pollutants in the tissues of aquatic organisms; and
- physical alteration or destruction of aquatic habitat.

The physical disruption, or destruction of wetlands, sediment, and other aquatic habitat is an especially troublesome impact. It is a result of both the original construction of the marina, ramps, and related facilities, as well as their ongoing use, operation, and maintenance.

Although most of the water quality problems listed above arise from the direct discharge of wastes by vessels, pollutants can also be transported into marina waters by way of storm water runoff from parking lots, docks, and other impervious surfaces.

CZARA(G) GUIDANCE FOR MARINAS

Most of the impacts listed above can be mitigated by utilizing best possible siting and design criteria for each marina. Construction and operation and maintenance practices are also crucial to protecting water quality. Recognizing the importance of this, USEPA developed fifteen specific management measures (BMPs) to protect coastal waters from nonpoint pollution from marinas and recreational boating.

The management measures for marinas which are grouped into two broad headings, (1) siting and design; and (2) operation and maintenance, were developed pursuant to section 6217 of the Coastal Zone Act Reauthorization Amendments of 1990 and are incorporated into the (g) guidance. As with all nonpoint source pollution protection measures, the key to protecting water quality in marinas is pollution prevention.

REGULATION OF VESSELS AND MARINAS

Management measures related to preventing pollutants, such as sewage, fuel and oil leaks, toxics, fish wastes, and hull scrapings from entering coastal waters are primarily the responsibility of the Regional Board. The Regional Board prohibits the discharge of these wastes through a variety of Basin Plan discharge prohibitions. The Board also encourages and participates in public education/awareness campaigns. The Harbors and Navigation Code section 151 prohibits the intentional or negligent discharge of oil to the waters of the state. Penal Code section 374(e) as amended in 1970 provides that any person who litters or places waste matter into any bay, lagoon, channel, river, creek, slough, canal or reservoir or body of water is guilty of a misdemeanor.

Local governments have significant authority to carry out these CZARA management measures through their zoning ordinances, and by using their police, fire, or building departments to ensure implementation.

The California Department of Pesticide Regulation regulates the application of antifouling paints. Regulations for organotin-based paints have been established which limit the TBT release rate, require application by certified commercial applicators, and allow application only on vessels at least 25 meters in length and/or aluminum hulls and parts. As described earlier, tributyltin fluoride or tributyltin oxide are the principal toxicants in organotin-based paints.

The Health and Safety Code section 4425 prohibits a vessel with a toilet from operating upon the waters of any lake, reservoir, or fresh water impoundment of this State unless the toilet is designed so that no human sewage can be discharged in such waters. This code section does not apply to rivers, estuaries or saltwater areas of California. Section 312 of the Clean Water Act provides that marine sanitation devices on board new or existing vessels must be designed to prevent the discharge of untreated or inadequately treated sewage into or upon the navigable waters of the United States (see discussion below on "No Discharge Zone"). The Marine Sanitation (section 775) of the Harbors and Navigation Code declares that every vessel terminal shall be equipped with vessel pumpout facilities for the transfer and disposal of sewage from marine sanitation devices in order to protect water quality.

NO DISCHARGE ZONE

Division 7 of the Water Code authorizes the Regional Board to regulate any discharge of waste, including sewage, to waters of the state. The federal Clean Water Act however partially preempts the state's authority to regulate vessel sewage discharges. Section 312 of the Clean Water Act provides that no state or local entity may adopt or enforce any laws regarding the design, manufacture, installation or use of marine sanitation devices (MSDs). Instead, USEPA must adopt federal standards of performance for MSDs which must be enforced and implemented through regulations adopted by the United States Coast Guard (USCG).

Marine sanitation devices either retain sewage or discharge treated sewage. If sewage is discharged, the effluent must meet USCG specified effluent standards described in 33 CFR 159, Coast Guard Regulations on Marine Sanitation Devices. Types I and II MSDs are flow-through systems which treat and discharge sewage. Type I MSDs produce an effluent having a fecal coliform bacteria count not greater than 1,000 per 100 ml and no visible floating solids. Type II MSDs produce an effluent having a fecal coliform bacteria count not greater than 200 per 100 ml and suspended

solids not greater than 150 mg/l. Type III MSDs are holding tanks only and prevent the overboard discharge of treated or untreated sewage.

There is one significant exception to the federal preemption of a state's regulation of vessel sewage discharges. Clean Water Act section 312 (f) allows states to completely prohibit vessel sewage discharges into waters requiring greater water quality protection, provided that USEPA determines that adequate vessel sewage pumpout facilities are available for these waters.

In 1976 the State of California petitioned USEPA, pursuant to section 312 (f)(3) of the Clean Water Act, for a determination that adequate pump-out facilities were reasonably available for that portion of San Diego Bay that is less than 30 feet deep at MLLW; and for all of Mission Bay, Oceanside Harbor, and Dana Point Harbor (41 Federal Register 21516 May 26, 1976). On August 6, 1976, USEPA made the requested determination (41 Federal Register 34453 August 6, 1976).

As a result, the discharge of all sewage, treated or untreated, from all vessels is completely prohibited in all portions of Mission Bay, Oceanside Harbor, and Dana Point Harbor (regardless of vessel size or water depth). Mission Bay, Oceanside Harbor, and Dana Point Harbor are, in their entirety, "No Discharge Zones". (Note that this prohibition includes discharges from a properly functioning USCG certified MSD).

The discharge of all sewage, treated or untreated, from all vessels is completely prohibited in all portions of San Diego Bay that are less than 30 feet deep at MLLW. The No Discharge Zone in San Diego Bay is defined as all portions of the bay having a depth of less than 30 feet MLLW. In the absence of the no discharge zone (i.e., in those portions of San Diego Bay having a depth of 30 feet or greater), discharge of treated sewage through a properly functioning USCG certified Type I or II marine sanitation device is allowed. (USCG certification provides that the specified effluent limitations will be met). The discharge of untreated sewage from a Type III holding tank is not allowed under any condition in any portion of San Diego Bay (regardless of depth).

Because of dilution and circulation in San Diego Bay, it is assumed that the discharge of treated sewage into waters deeper than 30 feet from a properly functioning USCG certified Type I or II MSD will not degrade the bay's beneficial uses. Additionally, with the exception of a few recent uses (such as jet skiing and sail boarding), the REC I designated beneficial use occurs in shallow waters (i.e., in waters less than 30 feet). This supports the need for a complete prohibition in such shallow waters.

Furthermore, as a practical matter, it is not possible to regulate sewage discharges from all vessels in San Diego Bay. For example, some foreign vessels may not be equipped to use the existing pump-out facilities. Since the no discharge designation is conditioned upon the existence of adequate pump-out facilities, it was necessary to make an allowance in the prohibition for such vessels. These vessels require berthing accommodations outside of the designated area. (All US Navy vessels are equipped to connect to pump-out barges or pier-side sewage facilities).

Most small pleasure craft are equipped with either a Type I or II flow-through treatment device or a Type III holding tank, but rarely both. Those vessels equipped with only a flow-through treatment device must secure their device while in a No Discharge Zone in order to prevent overboard sewage discharges. Those vessels equipped with only a holding tank are required to utilize pump-out facilities at all times and may not discharge into any portion of any bay. In other words, a vessel in San Diego Bay with a holding tank may not move into water greater than 30 feet and discharge sewage from its holding tank.

A study of the levels of coliform and Enterococcus bacteria caused by vessel discharges is needed to allow the Regional Board to make decisions based on measured levels. The Regional Board could then advise the county health officer, the Port District, and the Coast Guard so appropriate actions could be taken to abate the effects of sewage discharges from vessels.

SHIPYARDS

This section contains a general discussion of shipyards, their threat to water quality, and regulatory complexity. A discussion specific to San Diego Bay shipyards is included near the end of this section.

Shipyard activities may result in the discharge of wastes to receiving waters. The presence of elevated concentrations of pollutants, primarily heavy metals, in the sediment adjacent to shipyards nationwide is well documented in the literature (see references). Although there are numerous other potential threats, the single most significant threat to water quality posed by shipyards is the potential discharge of abrasive blast waste to receiving waters.

SHIPYARD THREAT TO WATER QUALITY

From the perspective of protecting beneficial uses, a discharger's threat to water quality is critically important and plays a role in virtually all regulatory decisions. By definition, the basis of a discharger's threat to water quality is the effect the discharger would have on the receiving water if discharges occurred in violation of its NPDES permit. In other words, a discharger's threat to water quality is its potential for degrading water quality. The following six characteristics are relevant in evaluating a shipyard's threat to water quality: (1) primary activities; (2) facilities; (3) industrial processes; (4) materials used; (5) wastes generated; and (6) waste discharges to receiving waters (actual and potential). A discussion of each follows.

PRIMARY ACTIVITIES AT SHIPYARDS

The shipbuilding and repair industry is engaged in the construction, conversion, alteration, repair, and maintenance of all types of military and commercial ships and vessels. Shipbuilding and repair encompasses a large number and variety of activities and industrial processes including, but not limited to, formation and assembly of steel hulls; application of paint (coating) systems; installation and repair of a large variety of mechanical, electrical, and hydraulic systems and equipment; repair of damaged vessels; removal and replacement of expended or failed paint (coating) systems; and provision of entire utility/support systems to ships (and crew) during repair.

The list of occupations required to conduct these activities is also extensive, including sandblasters, painters, shipfitters, machinists, metalsmiths, welders/burners, blacksmiths, boilermakers, chemists, carpenters, coppersmiths, electricians, electronic technicians, joiners and patternmakers, laborers, riggers, pipefitters, and foundrymen. Not all occupations are present at all shipyards.

SHIPYARD FACILITIES

There are four major types of building/repair facilities at shipyards, which together with cranes, enable ships to be assembled, launched, or repaired. These facilities are graving docks/shipbuilding ways, floating drydocks, marine railways, and berths/piers. With the exception of berths and piers, the basic purpose of each facility is to separate the vessel from the bay and provide access to parts of the ship normally underwater.

Each facility type presents its own unique set of environmental concerns. Depending on size and capabilities, a single shipyard will generally have a combination of two or more of these facilities.

In addition to these facilities, shipyards must also conduct the wide range of support or complementary activities previously described. Many of these activities require their own facility, space, or shop; for example concrete platens (for steel fabrication), machine shop, pipe shop, electroplating shop, weld shop, sheet metal shop, electrical shop, coppersmith shop, blacksmith shop, carpentry shop, and boiler shop, etc. Not all facilities are present at all shipyards.

SHIPYARD INDUSTRIAL PROCESSES

The primary activities described above involve a multitude of industrial processes, many of which must be conducted over water or very close to the waterfront. Because they typically represent the greatest threat to water quality, the following discussion will focus primarily on the industrial processes conducted inside graving docks or floating drydocks.

Surface Preparation and Paint Removal: Methods of surface preparation and paint removal include dry abrasive blasting, wet abrasive or slurry blasting, hydroblasting, and chemical paint stripping. Each paint removal method has a unique purpose and poses its own set of water quality risks.

Dry abrasive blasting is the preferred method of preparing steel surfaces for application of a new paint (coating) system for saltwater immersion. It is used for most exterior hull work and virtually all interior tank work (e.g., fuel, bilge, ballast tanks etc). Dry abrasive blasting is the process in which blasting abrasive is conveyed in a medium of high pressure air, through a nozzle at velocities up to 450 feet per second resulting in very large quantities of solid waste and airborne particulates (dust). Although the most efficient of the paint removal methods, dry blasting produces the largest quantity of airborne particulates.

Wet abrasive or slurry blasting is the process in which water replaces air as the abrasive propellant. The use of water significantly reduces airborne particulate emissions but generates large quantities of wet residue and wastewater.

Hydroblasting is a process in which water under very high pressure is used instead of abrasive. Hydroblasting produces large amounts of wastewater and is primarily used at shipyards to remove marine growth, not to remove existing coatings. Chemical paint stripping is uncommon in drydocks and used primarily for removable parts.

Paint (coating) Application: After preparation, surfaces are painted. Most painting occurring in a drydock involves the ship hull and internal tanks. Painting is also conducted in other locations throughout a shipyard including piers and berths. Paint application is accomplished by way of air or airless spraying equipment.

Tank Cleaning: Tank cleaning operations utilize steam to remove dirt and sludge from internal tanks, particularly fuel tanks and bilges. Detergents, cleaners, and hot water may be injected into the steam supply hoses. Wastewater is generated.

Other Industrial Processes (graving docks/drydocks): Other industrial processes conducted inside graving docks or floating drydocks include mechanical repair, maintenance, installation; structural repair, alteration, assembly; and integrity/ hydrostatic testing. Hydrostatic or strength testing (flushing) is conducted on hull, tanks, or pipe repairs and on new systems during ship construction phases. Hydrostatic testing generates significant water flow.

Other Industrial Processes (elsewhere): Numerous other industrial processes take place at numerous other locations throughout a typical shipyard, including activities at a variety of repair and specialty shops. Examples include paint equipment cleaning; engine repair/ maintenance/ installation; pipe fitting; steel fabrication and machining; electrical repair/ maintenance/ installation; hydraulic repair/ maintenance/ installation; tank emptying; fueling; pattern making; shipfitting; boiler cleaning; carpentry; refurbishing/ modernization/ cleaning; air conditioning/ refrigeration repair; sheet metal fabrication; fiberglass repair; electroplating/ metal finishing; blacksmithing; zinc primer application; printing; and photo processing. As a result of these processes, an assortment of wastes are generated, many of which are hazardous.

MATERIALS USED AT SHIPYARDS

Materials commonly used at shipyards are described below beginning with those utilized during graving dock or floating drydock operations.

Abrasive Grit: Abrasive grit is typically slag from the smelting of copper ore and consists principally of iron. Trace elements such as copper, zinc and titanium may also be present in the slag. Sand, cast iron, or steel shot are also used as abrasives. Very large amounts of abrasive are needed to remove paint to bare metal. For example, removing paint from a 15,000 square foot hull can take up to 6-days and consume 87 tons of grit. Grit is needed in all dry and wet (slurry) abrasive blasting.

Fresh Paints: Fresh paints contain copper, zinc, chromium, and lead (all priority pollutants) as well as numerous hydrocarbons. The two major types of paints used on ship hulls are anticorrosive paints and antifouling paints. Anticorrosive paint (primers) include vinyl, vinyl-lead, or epoxy based coatings. Others contain zinc chromate and lead oxide.

(Although newer paint formulations no longer include chromium and lead, such constituents may be present in shipyard wastes due to the removal of older coating systems).

Antifouling paints are designed to prevent growth and attachment of marine organisms by continuously releasing toxic substances into the water. Cuprous oxide and tributyltin fluoride or tributyltin oxide are the principal toxicants in copper-based and organotin-based paints, respectively.

Other Materials: Other materials used include oils (engine, cutting, and hydraulic); lubricants, grease; fuels; weld rod; detergents, cleaners; rust inhibitors; paint thinners; hydrocarbon and chlorinated solvents; degreasers; acids; caustics; resins; adhesives/ cement/ sealants; cyanide; zinc (e.g., zinc dust); chlorine; and mercury.

WASTES GENERATED AT SHIPYARDS

The major categories of wastes commonly generated by shipyard industrial processes are discussed below. Wastes resulting from graving or floating drydock operations are presented first.

Abrasive Blast Waste: Abrasive blast waste, consisting of spent grit, spent paint, marine organisms, and rust is generated in very large quantities during all dry or wet abrasive blasting procedures. The constituent of greatest concern with regard to toxicity is the spent paint, particularly the copper and tributyltin antifouling components, which are designed to be toxic and designed to continuously leach into the water column. Other priority pollutants in paint include zinc, chromium, and lead. Although the grit itself is not highly toxic, it is a major component in the large solid waste load and is settleable. As a result, its deposition can degrade the benthic community and increase the need for dredging. Abrasive blast waste can be conveyed by water flows, become airborne (especially during dry blasting), or fall directly into receiving waters. Wet abrasive blasting of a Naval DDG class destroyer (437-536 feet long; 47-67 feet wide; 15-20 feet draft) can generate up to 180 tons of solid wet abrasive waste.

Paint Losses: Paint losses, or paint which ends up somewhere other than its intended location (e.g., drydock floor, bay, worker's clothing), results from spills, drips, and overspray. Typical overspray losses are estimated at approximately 5% for air spraying and 1-2% for airless spraying.

Bilge Waste/Other Oily Wastewater: This is generated during tank emptying, leakages, and cleaning operations (bilge, ballast, fuel tanks). In addition to petroleum products (fuel, oil), tank washwater may also contain detergents or cleaners (nitrogen and phosphorus compounds) and can be generated in large quantities.

Blast Wastewater: Wet abrasive (slurry) blasting and hyroblasting generates large quantities of wastewater. Wet abrasive blasting of a Naval DDG class destroyer can generate up to 500,000 gallons of contaminated water. In addition to suspended and settleable solids (spent abrasive, paint, rust, and marine organisms) and water, blast wastewater may also contain rust inhibitors such as diammonium phosphate and sodium nitrite.

Other Wastes: These include oils (engine, cutting, and hydraulic); lubricants, grease; fuels; waste paints/ sludge/ solvents/ thinners; construction/ repair wastes and trash; asbestos (from ship refurbishing/ modernization); sewage (black and grey water from vessels or docks); boiler blowdown, condensate, discard; spent hydrocarbon or chlorinated solvents; electroplating/ metal finishing wastes; acid wastes; caustic wastes; and aqueous wastes (with and without metals).

SHIPYARD WASTE DISCHARGES TO RECEIVING WATERS

Actual and potential waste discharges to receiving waters from typical shipyard operations are discussed below. Most are either the direct result of an industrial process (drydock, marine railway, or berth operations) or, more commonly, the result of water coming into contact with wastes, typically spent abrasive blast waste. There are numerous sources of water at a shipyard including: industrial processes; building or repair facilities (e.g., drydock); vessels under repair (e.g., cooling water); bay water (e.g., due to tidal influence or wave action); storm water; or other sources.

Actual and potential waste discharges to receiving waters include: floating drydock deballasting (tanks); floating drydock submergence/ emergence (platform); floating drydock operations; graving dock dewatering;

gate leakage; hydrostatic relief flows; shipbuilding ways dewatering/ gate leakage/ relief flows; marine railway operations; berth and pier operations; storm water; integrity/ hydrostatic testing discharge (new vessels); boiler and cogeneration feedwater; fire protection system discharge; cooling water; and miscellaneous water flows.

SHIPYARD COMPLEXITY

From a regulatory and environmental control standpoint, shipyards present a unique and difficult problem. Traditional NPDES dischargers generate or intake wastewater, treat it to specified effluent limits, and discharge treated effluent, often by way of a single pipe. Unlike traditional dischargers, shipyards are significantly more complex in all respects: numerous and diverse industrial processes; numerous discharge mechanisms, waste streams, and discharge points; and Best Management Practices Plan based permits. Each is discussed below.

Numerous and Diverse Industrial Processes

As described previously, shipyards conduct a large number and broad range of industrial processes which require a wide range of facilities and substantial workforce.

Numerous Discharge Mechanisms, Waste Streams, and Discharge Points

Shipyards are complex to regulate because they have numerous discharge mechanisms, discharge points, and waste streams. A less complex discharger will typically have a single or small number of each. A discussion of abrasive blast waste with respect to discharge mechanisms, discharge points, and waste streams follows. Abrasive blast waste is discharged primarily as a result of graving dock flooding, drydock immersion, drainage, or runoff. In other words, at shipyards, the principle mechanism by which wastes are conveyed to receiving waters is via the contact of wastes with water, both of which occur in large quantities. For this reason, storm water and storm drain inlets are of particular concern at shipyards. Abrasive blast waste can also become subject to tidal or wave action. Airborne releases represent another important discharge mechanism. Because abrasive blast waste is generated in part as airborne particulates, such releases to receiving waters pose a significant threat to water quality. Furthermore, and because of their proximity to receiving waters, a third discharge mechanism exits at shipyards. Direct discharges from shipyards occur when wastes are allowed to fall directly into receiving waters (off the end drydock, edge of pier, between gratings, etc).

In summary, because abrasive blast waste can be washed, hosed, pushed, blown, become subject to tidal/wave action, and be directly or otherwise discharged, the potential for abrasive blast waste from shipyards to enter receiving waters is great. In addition to multiple discharge mechanisms, numerous waste streams, and discharge points also exist at shipyards. The discharges described above can potentially enter receiving waters from numerous shipyard worksites including graving docks, drydocks, marine railways, piers, repair/ specialty shops, as well as via storm drains and sheet flow runoff.

Best Management Practices Based Permits

Unlike traditional NPDES discharges which are regulated by numerical effluent limits, the control of waste discharges from shipyards is accomplished by the implementation of BMP plans. The purpose of a BMP plan is to prevent, reduce, or eliminate the spillage or illicit discharge of pollutants into receiving waters and can include any number of preventive controls or measures. Due to the types of activities and multiple discharge pathways, numerical effluent limitations are not practical at shipyards. The evaluation of the effectiveness of BMP Plans from a regulatory standpoint is more complicated and resource intensive than comparison of end-of-pipe monitoring results to numerical effluent limitations.

LONG-TERM EFFECTS OF SHIPYARD DISCHARGES ON WATER QUALITY AND BENEFICIAL USES

Unlike short lived pollutants (e.g., BOD and bacteria) the type of pollutants present in shipyard discharges are typically long-lasting. Shipyard pollutants, such as heavy metals and PAHs are persistent in the marine environment, in part, because they can become attached to sediment particles and can accumulate to high concentrations in both sediments and in marine organisms. Once incorporated into sediment and tissues, these pollutants are very difficult to remove and may recycle in the marine system indefinitely.

Because sediment cleanup projects are difficult, expensive, and lengthy, contaminated sediment can remain in place, adversely affecting beneficial uses and water quality, for many years.

SAN DIEGO BAY SHIPYARDS

The following discussion is specific to San Diego Bay shipyards.

NPDES Permits

There are currently four commercial shipyards in the San Diego Region, all of which are located adjacent to San Diego Bay. All of the shipyards are currently regulated under individual NPDES permits which are BMP based, rather than based on effluent limits. The shipyard permits also include standard receiving water limitations and discharge prohibitions. Additionally, all of the shipyards are also subject to the statewide General Industrial Storm Water Permit.

Threat to Water Quality and Best Management Practices

Although the discussion above was intended as a general description of the shipyard industry as a whole, the majority of the information is applicable to the San Diego Bay shipyards. One notable exception is that wet abrasive or slurry blasting and chemical paint stripping are currently not conducted at San Diego Bay shipyards.

By definition a discharger's threat to water quality is its potential to cause damage to water quality and beneficial uses under worst case conditions, i.e., assuming all BMPs and treatment measures fail. For this reason, the general shipyard discussion on threat to water quality focuses on potential risks rather than on BMPs. As described, a shipyard's potential risks to water quality are significant in many respects. BMPs are specifically designed to reduce those risks and are therefore extremely important for shipyards. Hence, the second reason to focus on potential risks is to emphasize the need for effective BMPs at shipyards.

San Diego shipyards report strict adherence to a large number of BMPs to control water and airborne wastes during a variety of industrial processes. Such BMPs include physical and procedural controls. Physical controls isolate runoff pathways from contact with abrasive blast wastes through the use of shrouding, sealing of drains, and diversion of sump discharge pathways. Procedural control methods include dock sweeping and elimination of sources of runoff during blasting operations. The shipyards also report the effective management of their wastes including treatment, recycling, and disposal in compliance with the San Diego County Hazardous Materials Management Division, their San Diego Metropolitan Industrial Waste Program permits, and the San Diego County Air Pollution Control District.

Contaminated San Diego Bay Sediment and Mussels

Regional Board staff has reviewed the results of sediment samples collected adjacent to the shipyards in San Diego Bay. Elevated concentrations of copper, tributyltin, and zinc exist in these sediments. Copper, tributyltin and zinc are contained in both the materials used by San Diego Bay shipyards as well as in the wastes which they generate. Furthermore elevated concentrations of copper, tributyltin, and zinc have also been measured in the tissues of mussels collected from stations located adjacent to San Diego Bay shipyards.

Although this data may suggest that the BMPs employed by San Diego Bay shipyards are not effective, it may also represent historical discharges which occurred at a time when BMPs were not carefully implemented. Regional Board staff plans to investigate the matter further. The existence of contaminated sediment adjacent to the shipyards serves to further underscore the importance of shipyard BMPs.

SHIPYARDS – GENERAL CONCLUSIONS

In summary, shipyards typically pose a significant threat to water quality for the following reasons. Relative to other regulated dischargers, shipyards conduct a large number and wide variety of activities and industrial processes. The conduct of these industrial processes requires numerous physical facilities and a large number, amount, and variety of materials. As a result, a large number, amount, and variety of wastes are generated and are, or may be, discharged to receiving waters. Shipyard discharges have the potential to cause

the long-term loss of a designated beneficial use in receiving waters.

From a regulatory perspective, shipyards are complex. Toxic pollutants are, or could be, present in wastes discharged to receiving waters from shipyards. They have numerous discharge points and are regulated by permits which do not contain numeric effluent limits. Shipyards are typically "major" NPDES dischargers and require a high level of regulatory effort.

In conclusion, because shipyards pose a significant threat to water quality and are complex to regulate, the BMPs which they employ (to reduce or eliminate the discharge of wastes to receiving waters) are extremely important. It is critical that shipyard BMPs are effective and diligently implemented.

BOATYARDS

There are currently 12 boat building and boat repair facilities (commonly called boatyards) adjacent to receiving waters in the San Diego Region. Most of the boatyards are located adjacent to San Diego Bay, while Mission Bay, Oceanside Harbor, and Dana Point Harbor are serviced each by a single boatyard. Additional boatyards are located in inland areas of the Region. Seven of the boatyards located adjacent to receiving waters are currently regulated under an individual NPDES permit. Eventually all of the waterfront boatyards will be regulated under an individual NPDES permit. Additionally, all of the boatyards in the Region are currently subject to the statewide General Industrial Storm Water Permit. Like the shipyard permits, boatyard permits do not contain numeric effluent limits but are based instead on BMPs.

The most significant waste categories associated with boatyards include hull maintenance related wastes and marine engine related wastes. Hull maintenance related wastes, and particularly antifouling paints, are believed to pose the greatest threat to water quality from boatyard operations. Cuprous oxide (copper) and TBT fluoride or TBT oxide are the principle toxicants in antifouling paint used at boatyards. Marine engine related wastes include fuels, oils, lubricants, antifreeze, solvents, and bilge water. The pollutants of concern from marine engine wastes are metals and petroleum hydrocarbons. PAHs are of particular concern because they persist in the marine environment. Implementation of BMPs is the key to controlling boatyard waste discharges to receiving waters.

GROUND WATER DEWATERING

A number of dewatering operations are associated with construction projects for foundations, bridges, roads, etc. Other dewatering operations are ground water remediation projects which are required under Cleanup and Abatement Orders issued by the Regional Board. Many of the proposed dewatering operations are located where petroleum or other pollutants plumes exist. Petroleum or other pollutants may be pumped from the ground water and discharged to a storm drain and subsequently to a water of the United States.

Since the mid-1980's, the Regional Board has regulated dewatering operations under the NPDES permit process. Two general NPDES permits have been adopted by the Regional Board which regulate discharges from ground water remediation projects and discharges from ground water dewatering operations to surface waters of the United States.

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The first permit, Order No. 2000-90, NPDES No. CAG919001 regulates temporary ground water extraction and similar waste discharges to San Diego Bay and storm drains or other conveyance systems tributary thereto. This Order prohibits groundwater extraction waste discharges to San Diego Bay from new permanent groundwater extraction operations.

The second permit, Order No. 2001-96, NPDES No. CAG919002 regulates groundwater extraction waste discharges from construction, remediation, and permanent groundwater extraction projects to surface waters within the San Diego Region except for San Diego Bay.

In addition, the Waiver Policy described earlier in this Chapter waives WDRs for short-term construction dewatering operations where there is no discharge to surface waters.

DREDGING AND DISPOSAL OF DREDGE SPOIL

REGULATORY FRAMEWORK FOR DREDGED MATERIAL DISPOSAL

FEDERAL STATUTES AND REGULATION

The regulation of dredged material disposal in waters of the United States (US) on a federal level is a responsibility shared by the USEPA and the USACOE. The Marine Protection, Research and Sanctuaries Act, also called the Ocean Dumping Act, is the primary federal environmental statute governing the discharge of dredged material to the ocean. The Clean Water Act is the primary federal statute governing the discharge of dredged and/or fill material into US waters. Material dredged from waters of the US and disposed in the territorial sea is evaluated under the Marine Protection, Research and Sanctuaries Act unless the material discharged is for the primary purpose of fill (e.g., beach replenishment, island creation, or underwater berms), in which case the disposal is evaluated under the Clean Water Act [33 CFR 336.0(b)]. Other applicable federal statutes and regulations include:

- **The Rivers and Harbors Act of 1899:** The Rivers and Harbors Act of 1899 (33 USC 401 et. seq.) requires a USACOE permit for any work or structure, including fill material discharges, in navigable waters of the United States. The primary purpose of section 10 of this act is to ensure that structures (i.e., disposal berms, piers, pipelines, bridges, wharfs) constructed in navigable waters do not adversely affect federal interstate navigation.

- **The Fish and Wildlife Coordination Act of 1958:** The Fish and Wildlife Coordination Act requires that, for any proposed federal project or permit that may affect a stream or other body of water, the USACOE must first consult with federal and state fish and wildlife agencies. This consultation addresses the prevention of damages to wildlife resources and provides for the development and improvement of wildlife resources.

- **The Endangered Species Act of 1973:** Section 7(a)(2) of the Endangered Species Act (ESA), as amended (16 USC 1531 et. seq.) requires federal agencies, in consultation with the Secretaries of Interior (represented by the US Fish and Wildlife Service) and Commerce (represented by the National Marine Fisheries Service), to insure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered or threatened species, or result in the destruction or adverse modification of the critical habitat of such species.

- **The Coastal Zone Management Act of 1972:** The Coastal Zone Management Act (16 United States Code (USC) 1451 et. seq.) authorizes a federal program for the effective management, beneficial use, protection and development of the coastal zone. The act requires the USACOE to coordinate permit review and federal projects with all state level coastal zone review agencies. Under this act, coastal states are required to formulate a management program for the land and water resources of its coastal zone, which extends out to the seaward limit of the territorial sea, and submit it for approval to the Secretary of Commerce. In 1977, the California Coastal Management Program was approved.

California tree frog

Overview of the Clean Water Act

Section 404 of the Clean Water Act requires the USEPA, in conjunction with the USACOE, to promulgate guidelines for the discharge of dredged or other fill material to ensure that such proposed discharge will not result in unacceptable adverse environmental impacts to waters of the United States. Section 404 assigns to the USACOE the responsibility for authorizing all such proposed discharges, and requires application of the guidelines in assessing the environmental acceptability of the proposed action. The USACOE and the USEPA also have authority under section 230.80 to specify, in advance, sites that are either suitable or unsuitable for the discharge of dredged or fill material in US waters. In addition, Clean Water Act section 401 provides the States

a certification role as to project compliance with applicable water quality standards.

Clean Water Act, Section 401 Certification State of California

The Clean Water Act, section 401 gives the states authority to grant, deny, or waive certification for a federally permitted or licensed activity that may result in a discharge to waters of the United States. Any applicant for a federal permit which conducts any activity which may result in any discharge into the navigable waters of the State must present to the permitting agency a certification (or waiver of certification) from the State that any such discharge will comply with the applicable Clean Water Act provisions of section 301, 302, 303, 306, and 307. The certification issued by the State should establish relevant effluent limitations, monitoring requirements, and standards or performance which become conditions of the federal permit. In California, the responsibility for section 401 certification is assigned to the State Board and regional boards. After review of data submitted by an applicant, and any other information available as to whether the proposed activity will comply with all applicable water quality standards, limitations and restrictions, the Regional Board may:

- Waive water quality certification;
- Issue waste discharge requirements; or,
- Recommend approval with or without conditions, or denial of water quality certification, to the State Board.

In order to grant section 401 certification, the State Board must certify that the proposed discharge will not result in unacceptable adverse environmental impacts to waters of the United States.

For a project to proceed, a waiver of certification or waste discharge requirements must be obtained from the Regional Board or a certification with or without conditions must be obtained from the State Board, indicating the Board's concurrence with the decision that the proposed action is not expected to cause a violation of the State's water quality standards.

STATE STATUTES AND REGULATIONS

The State of California has several programs that parallel or overlap many of the listed federal Acts. Relevant state statutes and regulations include the following:

- Water Code, Division 7 (Porter-Cologne Water Quality Control Act);
- State Board and Regional Water Quality Control Board Plans and Policies;
- Water Code, Division 4 (California Bay Protection and Toxic Cleanup Act);
- California Fish and Game Code;
- California Environmental Quality Act; and
- California Coastal Zone Management Act.

The primary statutory state law pertaining to the regulation of water quality and sediment control issues is the Porter-Cologne Water Quality Control Act which is contained in Division 7 of the Water Code.

California Water Code, Division 7 (Porter-Cologne Water Quality Control Act)

Dredging and dredged material disposal is an ongoing activity at harbors within the San Diego Region. The discharge of dredged or fill material which comes within the purview of section 404 of the federal Clean Water Act is not subject to regulation under the NPDES permit program (Clean Water Act section 402). However, if the project involves the discharge or potential discharge of waste (e.g. dredge spoils, dredge spoil return water, etc.) which may adversely impact water quality, then the discharge may be regulated through the issuance of WDRs. WDRs are issued by the Regional Board pursuant to the Porter-Cologne Water Quality Control Act.

The Regional Board is concerned with turbidity, dissolved oxygen depletion, and other physical, chemical, and biological parameters in the receiving waters which are impacted by dredge/fill projects. In recent years, there has also been concern about the concentrations of chemicals in the material to be dredged. Harbor areas may contain high levels of contaminants in

bottom sediments due to navigational use, and due to wastes from urban, industrial, and riverine sources. The Regional Board Waiver Policy described earlier in this chapter waives establishing WDRs for projects which involve dredging 5,000 cubic yards or less of material and are not expected to have any adverse impact on the environment. For projects involving dredging of more than 5,000 cy of material, or dredging of potentially or known contaminated material, the proponent is required to submit a Report of Waste Discharge (RWD) in application for WDRs. The RWD must include a characterization of the material to be removed to determine whether the proposed project is expected to meet all applicable water quality standards, limitations, restrictions and discharge prohibitions. The decision to issue or waive WDRs for dredging projects is made on a case-by-case basis regardless of dredge spoil volume. Disposal of dredge material at authorized open-ocean disposal sites (e.g., LA-5 Ocean Dredged Material Disposal Site) fall under the jurisdiction of the USEPA and the USACOE. However, because of the potential threat to water quality due to dredging operations, the Regional Board may still issue a WDR for the actual dredging portion of the project.

Adopted WDRs typically require monitoring for dissolved oxygen, turbidity and, where concentrations of chemicals in the sediments are high, monitoring for chemical constituents. Monitoring may be required of the receiving water at the dredge site or at the disposal site(s), and of the dredge spoil return water if applicable.

Enforcement Process for Contaminated Sediment

Dredging is often part of the remediation process for contaminated sediments in marine waters. The Regional Board under the authority of the Water Code section 13304 may issue a cleanup and abatement order to require an identified responsible party which caused the discharge of chemical constituent(s) present in a contaminated sediment to remediate or effect cleanup of the contaminated sediment.

Specific directives of cleanup and abatement orders issued for remediation or cleanup of contaminated sediments typically direct the responsible party to:

- Quantify the lateral and vertical extent of the contaminated sediment;
- Examine the engineering feasibility of the following alternative sediment cleanup/ remediation strategies;
  - ✓ Complete removal of all contaminated sediment;
  - ✓ Removal or remediation of contaminated sediment to a level that will conform with water quality objectives and protect/ restore beneficial uses; and
  - ✓ No action alternative level - The "no action" alternative level involves reliance upon natural processes for the remediation of contaminated sediment sites;
- Examine the cost of sediment cleanup/ remediation to various cleanup/ remediation levels; and
- Examine the environmental consequences of sediment cleanup/ remediation to various cleanup/remediation levels.

State Water Resources Control Board and Regional Water Resources Control Board Plans and Policies

State plans and policies which affect dredging and disposal of dredge spoil include the Ocean Plan, the (Resolution No. 74-43), the Basin Plan, and any other applicable plans or policies.

Ocean Plan: The Ocean Plan establishes general requirements for waste discharges which could affect state ocean waters. For dredge/fill projects, this may include discharges associated with dredging operations, dredge spoils disposal including beach replenishment, or discharge of dredge spoil return water. The Ocean Plan requirements are incorporated into WDRs issued by the Regional Board for dredge/fill projects.

Water Quality Control Policy for the Enclosed Bays and Estuaries of California: This policy requires that dredge spoils to be disposed of in bay and estuarine waters must comply with federal criteria for determining the acceptability of dredged spoils to marine waters, and must be certified by the State Board or Regional Board as in compliance with state plans

and policies. Dredging must also comply with applicable discharge prohibitions contained in the policy (i.e., the policy prohibits the direct or indirect discharge of silt, sand, soil, clay, or other earthen materials from onshore operations including mining, construction, agriculture, and lumbering, in quantities which unreasonably affect or threaten to affect beneficial uses).

California Bay Protection and Toxic Cleanup Act

The California Bay Protection and Toxic Cleanup Act (Water Code, Division 4, Chapter 5.6, sections 13390-13396) requires the Regional Board to identify and characterize toxic hot spots in bays and estuaries and ocean waters of the state and plan for cleanup or remediation of the sites. Furthermore, CWC section 13396 states that no person shall dredge or otherwise disturb a toxic hot spot without first obtaining Clean Water Act section 401 certification or WDRs. Dredging projects involving removal or disturbances of sediments at toxic hot spots must meet the following conditions to the satisfaction of the Regional Board:

- The polluted sediment will be removed in a manner that prevents or minimizes water quality degradation.

- Polluted dredge spoils will not be deposited in a location that may cause significant adverse effects to aquatic life, fish, shellfish, or wildlife or may harm the beneficial uses of the receiving waters, or does not create maximum benefit to the people of the state.

- The project or activity will not cause significant adverse impacts upon a federal sanctuary, recreational area, or other waters of significant national importance.

California Coastal Zone Management Act

The California Coastal Zone Management Act requires that the dredging of coastal waters and estuaries be limited where feasible to maintaining navigational depths [section 30233(a)(2)]. Section 30233(b) further encourages the transportation of dredged material so generated and determined to be suitable for beach replenishment to appropriate beaches or into suitable long shore current systems.

California Fish and Game Code

Dredging operations and the disposal of dredge spoil and dredge spoil return water are subject to applicable sections of the California Fish and Game Code, especially those pertaining to:

- Water pollution (Division 6, Chapter 2, section 5650);

- Endangered species (Division 3, Chapter 1.5, sections 2050 - 2098); and/ or the

- Alteration of any river, stream or lake (Division 2, Chapter 6, section 1601 and section 1603).

California Environmental Quality Act of 1973

The Regional Board may not adopt WDRs for a dredge/fill project until the California Environmental Quality Act (CEQA; P.R.C. 21000-21177) requirements have been satisfied. CEQA requires full public disclosure of a project and the assurance that environmental factors are considered in the decision making process. CEQA requires one of the following:

- an Environmental Impact Report;
- a Categorical Exemption; or
- a Negative Declaration.

San Diego Bay bridge

HISTORY OF DREDGE AND FILL PROJECTS

SAN DIEGO BAY

Dredging of San Diego Bay has occurred for a variety of reasons. San Diego Bay is a major port for commercial and military vessels. In order to provide adequate water depths for navigation and berthing of vessels, dredging projects are required from time-to-time to maintain existing water depths or to increase depths to accommodate these vessels. Significant dredging first occurred within San Diego Bay in the early 1900's.

The volume of material dredged from San Diego Bay over the years is estimated to be between 180 and 190 million cubic yards (mcy) (Smith, 1977 from US Navy, Sept. 1992). About

5 to 8 mcy was disposed at ocean dumping sites, about 35 mcy was placed along Silver Strand beach, and about 147 mcy was used around the Bay as fill. Most of this material was placed prior to 1970. During 1992 and 1993, there were a total of fifteen recent, ongoing, and future dredge and fill projects in San Diego Bay for a total volume of about 3.7 mcy. The US Navy anticipates dredging an additional 13 mcy through 1998.

Mission Bay and San Diego River
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OTHER AREAS

There is on-going maintenance dredging in other areas throughout the San Diego region.

These areas include:

- Agua Hedionda Lagoon;
- Mission Bay; and
- Oceanside Harbor.

Additional areas which have dredging projects scheduled include the following:

- Batiquitos Lagoon;
- Murrieta Creek;
- San Marcos Creek; and
- Santa Margarita River.

DISPOSAL OF DREDGED MATERIAL

Disposal of dredged material is a necessity whenever a dredging project is undertaken. There are alternatives for disposal available within the San Diego Region, including several which can yield significant environmental benefits. However, disposal of dredged material can be a significant problem when there is toxic contamination of the dredged materials. Prior to dredging, physical, chemical, and biological testing of the sediment have been required in order to determine the appropriate alternative for disposal of the dredged material. Potential alternatives for the disposal of dredged material from San Diego Bay include:

- Beach replenishment;
- Habitat restoration/ enhancement;
- Ocean disposal;
- Incineration;
- Upland disposal without treatment;
- Upland disposal with treatment;
- Confined aquatic disposal; and
- Reuse sites such as capping.

Physical Characteristics of Dredged Material

Evaluation of the physical characteristics of sediments proposed for discharge is necessary to determine potential environmental impacts of disposal, the need for additional chemical or biological testing, as well as potential beneficial use of the dredged material. The physical characteristics of the dredged material include: particle-size distribution, water content or percent solids, specific gravity of solids, and plasticity characteristics. The sediment physical characteristics should also be evaluated from the standpoint of compatibility with different kinds of biological communities likely to develop for the disposal environments under consideration.

Chemical Characteristics of Dredged Material

The initial screening for contamination is designed to determine, based on available information, if the sediments to be dredged contain any contaminants in forms and concentrations that are likely to cause unacceptable impacts to the environment. During this screening procedure, specific contaminants of concern are identified in a site-specific sediment so that any subsequent evaluation is focused on the most pertinent contaminants.

Physical behavior of the material at the disposal site

Physical testing and assessment should focus on both the short-term and long-term physical behavior of the material. For open-water alternatives, these assessments might include an analysis of water-column dispersion, mound development, and long-term mound stability or

dispersion. For confined alternatives, these assessments might include an analysis of solids retention and storage requirements during disposal and long-term consolidation behavior in the confined disposal facility.

Any contaminant testing should focus on those contaminant pathways where contaminants may be of environmental concern, and the testing should be tailored to the available disposal site. For open-water alternatives, contaminant problems may be related to either the water column or benthic environment, and the appropriate testing and assessments would include required Clean Water Act or MPRSA testing. For confined sites, potential contaminant problems may be either water quality related (return water effluent, surface runoff, and groundwater leachate), contaminant uptake related (plant or animal), or air related (gaseous release).

Traditional locations for disposal of non-contaminated dredged material have included nearshore ocean waters along Silver Strand, in-bay waters of the Naval Amphibious Base Coronado, and the LA-5 Ocean Dredged Material Disposal Site (LA-5).

Dredging permits issued during the past twenty years have allowed about 10 mcy of material to be disposed either on Silver Strand beaches or LA-5. Chemical testing data for projected future US Navy projects suggest that 92 percent of the material planned to be dredged from San Diego Bay will qualify for placement at either habitat enhancement sites, Silver Strand beaches or at LA-5.

Material which is not physically compatible with the receiving disposal site may qualify to be disposed of at LA-5. Material which cannot meet either the 404(b)(1) Guidelines or the USEPA ocean dumping criteria must be disposed in a different manner.

Beach Replenishment

Shore erosion is a major concern along the coast of the San Diego Region. Beach replenishment is usually accomplished by dredging sand from inshore or offshore locations and transporting the sand by truck, by split-hull hopper dredge, or by hydraulic pipeline to an eroding beach (e.g., Silver Strand beach). These operations may result in displacement of the substrate, changes in the topography or bathymetry of the borrow and replenishment areas, and destruction of nonmotile benthic communities. However, a well-planned beach nourishment operation can minimize these effects by taking advantage of the resiliency of the beach and nearshore environment and its associated biota, and by avoiding sensitive resources. When dredged material is used for beach replenishment it should closely match the sediment composition of the eroding beach and be low in fine sediments, organic material, and pollutants. The USACOE requires that dredged sediments proposed for placement on a beach must be:

- Particles mostly greater than 74 microns (i.e., sand, gravel or rock);
- Compatible with sediments on the receiving beach; and
- Substantially the same as the disposal site.

Generally, the disposal of clean, sandy material on beaches poses no present problem in terms of sediment quality, quantity, or feasibility. In fact, to be consistent with the California Coastal Management Plan, every effort must be made to beneficially use sandy material for beach nourishment or habitat restoration/ enhancement.

Habitat Restoration/ Enhancement

Restoration/ enhancement of wetlands is an alternative that can benefit the environment. In general, restoration of a former wetland is more likely to be successful than creation of a new wetland where none had existed previously. In selecting a site, alteration of substrate and changes in circulation and sedimentation patterns should be considered. In general, the material used for wetland restoration should remain water-saturated, reduced, and near neutral in pH. These characteristics have a great influence on the environmental activity of any chemical contaminants which may be present.

Ocean Disposal

The ocean water disposal technique involves placing the dredged sediment in open ocean waters at an USEPA approved site. The suitability of dredged sediment for open-water disposal is evaluated by effects-based testing as there are no sediment criteria.

In situations where the contaminated sediment will not meet USEPA's or the Corps of Engineers' criteria for ocean disposal, the sediment must be treated to meet those criteria by physical, chemical, biological, or thermal treatment methods.

LA-5 Ocean Dredged Material Disposal Site: LA-5 received final designation from the USEPA in 1991. This site has been used for the disposal of dredged material since the 1970's and has no capacity or dumping rate restrictions. About 4 mcy were disposed there by the USACOE between 1977 and 1987. About 2.5 mcy were deposited by the US Navy, the National Steel and Shipbuilding Corporation, and Southwest Marine, Inc. during that same period (USEPA, 1988). The LA-5 site is a non-dispersive open water disposal site. Most of the material placed here is intended to remain on the bottom following placement. This site is located 11 km (5.4 nm) southwest of Point Loma on the continental shelf in 147 to 200 m (80 to 110 fm) of water. The center coordinates of the site are 32° 36' 83" North latitude and 117° 20' 67" West longitude, with a radius of 910 m (1,000 yd).

Upland (Landfill) Disposal without treatment

Upland disposal is the process of placing dredged material into or onto a designated solid waste disposal facility or landfill, or into a structure specifically designed to accept dredged material. This upland disposal alternative is used when the dredged material does not qualify for any aquatic disposal alternative.

Upland (Landfill) Disposal with treatment

The landfill disposal with treatment technique refers to situations where the contaminated sediment will not meet state criteria for landfill disposal without the employment of physical, chemical, biological or thermal treatment methods.

Confined disposal

Confined disposal is placement of dredged material within diked nearshore or upland confined disposal facilities via pipeline or other means. Confined disposal facilities are designed and operated to provide adequate storage capacity for meeting dredging requirements and to maximize efficiency in retaining the solids. If contaminants are present in the dredged material, then control of contaminant releases is important in the design and operation of the confined disposal facility. In most cases confined disposal facilities must be used over a period of many years, storing material dredged periodically over the design life. Long-term storage capacity of these confined disposal facilities is therefore a major factor in design and management. Once water is drained from the confined disposal facility following active disposal operations, natural drying forces begin to dewater the dredged material, adding additional storage capacity.

Reuse Sites – Capping

Capping can be done in place or through the controlled accurate placement of contaminated material at an open water disposal site. Capping in place is a type of non-removal action and refers to the placement of a clean cover material over the contaminated sediment. Capping can also be done by the accurate placement of contaminated material at an open water disposal site followed by a covering or cap of clean isolating material.

In both cases, the purpose of the cover material is to minimize or prevent the migration of contaminants from the sediment to the water column. In remedial actions involving capping, monitoring is needed to ensure that the integrity of the cap is maintained. The key elements of the monitoring program may include the monitoring of:

- Changes in cap thickness;
- Erosion around cap boundaries; and/ or
- Possible leakage of contaminants from the cap.

PROBLEMS POSED BY DREDGING SEDIMENT / CONTAMINATED SEDIMENT

Many chemical substances discharged into marine waters tend to become attached to sediment particles and thus accumulate to high concentrations in benthic sediments. The dredging process can disturb bottom sediments leading to the release of pollutants into the water column by resuspension of contaminated sediment particles; dispersal of interstitial water in the sediment pores; and desorption of

chemicals from the contaminated sediment. Common toxic constituents of many sediments include ammonia, low dissolved oxygen and hydrogen sulfide.

ENVIRONMENTAL THREAT ASSOCIATED WITH CONTAMINATED SEDIMENTS

Benthic marine sediments support biological communities which reside there (e.g., clams, worms, bottom feeding fish), and provide spawning habitat for many pelagic species (e.g., invertebrates and fish). Elevated concentrations of chemicals in the sediment may cause acute mortality or affect the reproductive behavior, egg hatching characteristics, and early life development of these organisms. In addition to causing acute mortality and abnormal development, contaminated sediments can also lead to the accumulation of contaminants in organisms due to the effects of bioaccumulation. In addition, biomagnification of the contaminants can occur in the food chain when small contaminated organisms are consumed by higher trophic level species including man.

The threat to the public health from contaminated sediments centers around three principal pathways of exposure:

- Consumption of fish and shellfish contaminated by chemicals in the sediment through the processes of bioaccumulation and biomagnification;
- Direct contact with contaminated sediments by people; and
- Incidental ingestion of contaminated sediment or associated waters by people.

DISPOSAL OF CONTAMINATED MATERIAL DREDGE SPOIL RETURN WATER

After removal of the contaminated material from the water, the contaminated material must be separated from the slurry to attain two distinct waste streams, the concentrated contaminated material and the dredge spoil return water. The methods for separating the material solids from the water include the use of settling basins, clarifiers, impoundment basins, screens and cyclones. The dredge spoil return water consists of a substantially liquid waste stream that may need to be subsequently treated by physical, chemical or biological methods for removal of dissolved and suspended pollutants.

Waste

DISCHARGES OF WASTE TO LAND

Discharges of solid, semi-solid, and liquid wastes to landfills, waste piles, surface impoundments, pits, trenches, tailings ponds, natural depressions and land treatment facilities (collectively called "waste management units") have potential to create significant pollution sources affecting water quality. Unlike surface waters, which often have capacity to assimilate waste discharges, ground waters have little or no assimilative capacity. This is due to slow contaminant migration rates, lack of aeration, minimal biological activity, and laminar flow patterns. Waste containing elevated pollutant concentrations can require containment in waste management units or active treatment for extended periods to prevent waste migration and impairment of the underlying ground water quality. The pollutants may continue to affect water quality long after the discharge has ceased, either because of continued leachate or gas discharges from the unit, or because pollutants have accumulated in underlying soils from which they are gradually released to ground water.

Landfills for disposal of municipal or industrial solid waste (solid waste disposal sites) are the major categories of waste management units in the Region. Surface impoundment are also used for storage or evaporative treatment of liquid wastes, waste piles for the storage of solid wastes, and land treatment units for the biological treatment of semi-solid sludge from wastewater treatment facilities. Sumps, trenches, and soil depressions have been used in the past for liquid waste disposal. The Regional Board issues waste discharge requirements to ensure that these discharges are properly contained to protect the Region's water resources from degradation, and to ensure that dischargers undertake effective monitoring to verify continued compliance with requirements.

Waste Management Units are subject to concurrent regulation by other state and local agencies responsible for land use planning, solid

waste management, and hazardous waste management. "Local enforcement agencies" implement the State's solid waste management laws and local ordinances governing the siting, design, and operation of solid waste disposal facilities (usually landfills) with the concurrence of the California Integrated Waste Management Board (CIWMB). The CIWMB also has direct responsibility for review and approval of plans for closure and post-closure maintenance of solid waste landfills. The Department of Toxic Substances Control (DTSC) issues permits for all hazardous waste management treatment, storage, and disposal facilities (which include incinerators, tanks, and warehouses where hazardous wastes are stored in drums as well as landfills, waste piles and surface impoundments). The State Board, regional boards, CIWMB, and DTSC have entered into a Memorandum of Understanding to coordinate their respective roles in the concurrent regulation of these discharges.

The laws and regulations governing discharges of hazardous and non-hazardous wastes have been revised and strengthened in the last few years. The discharge of municipal solid wastes to land are closely regulated and monitored; however, some water quality problems have been detected and are being addressed. Recent monitoring efforts under the State and Regional Boards' Chapter 15 and SWAT programs have revealed that discharges of municipal solid wastes to unlined landfills have resulted in ground water degradation and pollution by volatile organic constituents (VOCs) and other waste constituents. VOCs are components of many household hazardous wastes and certain industrial wastes that are present within municipal solid waste streams. VOCs can easily migrate from landfills either in leachate or by vapor-phase transport. Clay liners and natural clay formations between discharged wastes and ground waters are largely ineffective in preventing water quality impacts from municipal solid waste constituents. In a recently adopted policy for water quality control, the State Board found that "research on liner systems for landfills indicates that (a) single clay liners will only delay, rather than preclude, the onset of leachate leakage, and (b) the use of composite liners represents the most effective approach for reliably containing leachate and landfill gas" (State Board Resolution No. 93-62, Policy for Regulation of Discharges of Municipal Solid Waste).

The USEPA has adopted new regulations under Subtitle D of the Resource Conservation and Recovery Act (RCRA) which require the containment of municipal solid wastes by composite liners and leachate collection systems. Composite liners consist of a flexible synthetic membrane component placed above and in intimate contact with a compacted low-permeability soil component. This liner system enhances the effectiveness of the leachate collection and removal system and provides a barrier to vapor-phase transport of VOCs from the unit. Regional Boards and the CIWMB are implementing these new regulations in California under a policy described in State Board Resolution No. 93-62 and new regulations from CIWMB. The State Board is in the process of developing revised regulations under 23 CCR, Division 3, Chapter 15, Discharges of Waste to Land, to fully implement water quality-related portions of the RCRA Subtitle D federal regulations. While a single composite liner of the type that can be approved under Subtitle D regulations is a significant improvement over past municipal solid waste containment systems, it should be noted that single composite liners will not necessarily provide complete protection for ground water resources.

CALIFORNIA CODE OF REGULATIONS TITLE 23, CHAPTER 15

Chapter 15 includes regulations governing discharges of waste to land for treatment, storage, or disposal. The regulations cover landfills, surface impoundments, waste piles, land treatment units, mining waste management units and confined animal facilities. In addition, actions to clean up and abate conditions of pollution or nuisance at contaminated sites are covered by relevant portions of the regulations where contaminated materials are taken off-site for treatment, storage, or disposal and, as feasible, where wastes are contained or remain on-site at the completion of cleanup actions. The regulations classify wastes according to their threat to water quality, classify waste management units according to the degree of protection that they provide for water quality, and provide siting, construction, monitoring, corrective action, closure and post closure maintenance criteria. Chapter 15 requirements are minimum standards for

proper management of each waste category. These regulations require the complete containment of wastes which, if discharged to land for treatment, storage or disposal, have the potential to degrade the quality of water resources. The Regional Board may impose more stringent requirements to accommodate regional and site-specific conditions.

Some subcategories of Chapter 15 include:

Article 2 - Waste Classification and Management;

Article 3 - Waste Management Unit Classification and Siting;

Article 4 - Construction Standards;

Article 5 - Water Quality Monitoring for Classified Waste Management Units;

Article 6 - Confined Animal Facilities;

Article 7 - Mining Waste Regulations;

Article 8 - Closure and Post-Closure Maintenance; and

Article 9 - Compliance Procedures.

Chapter 15 defines waste types including hazardous wastes, designated wastes, nonhazardous wastes and inert wastes as shown in Table 4-7.

Chapter 15 requires the review and update of waste discharge requirements for all nonhazardous waste treatment, storage, and disposal sites by July 1, 1994. As of 1994 the San Diego Region has no hazardous waste disposal sites. Designated wastes, nonhazardous solid wastes and inert wastes are regulated by the Regional Board.

The regulation of nonhazardous solid waste disposal sites (Class III) has been ongoing by the Regional Board since the early 1960's. Many of the small older sites have closed, and waste is now being disposed at large regional sanitary landfills. The Board's main actions at nonhazardous solid waste facilities are the review and revision of waste discharge requirements for the active sites to assure consistency with the current regulations. These actions include defining the levels of designated wastes, the upgrading of ground water monitoring systems to identify if water quality protection standards are violated, the establishment of corrective action programs where standards are violated, and review and oversight of the development and implementation of facility closure plans.

The criteria for determining whether a nonhazardous waste is a designated waste are based on water quality objectives in the vicinity of the site, the containment features of the solid waste facility, and the solubility/mobility of the waste constituents. Therefore, all owners and operators of active nonhazardous municipal solid waste facilities in the San Diego Region who wish to receive wastes other than municipal solid waste or inert waste must propose waste constituent concentration criteria above which wastes will be considered designated waste and therefore, not suitable for disposal at their site.

In addition, waste discharge requirements are to be revised to incorporate reclassification and retrofitting requirements and a revised monitoring program. Closed, abandoned and inactive landfills and other nonhazardous solid waste disposal sites are also subject to the provisions of Chapter 15.

Persons responsible for such sites may be required to develop and implement monitoring, to comply with closure and post-closure maintenance requirements, and to comply with reporting, notification, and record keeping requirements.

Waste Classification

Contaminated soil and other material must be treated or properly disposed in order to minimize threat to the quality of surface or ground waters.

Waste is classified in California by two separate California Environmental Protection Agency (Cal-EPA) agencies with separate regulatory authority. The California Department of Toxic Substances Control (DTSC) classifies waste as hazardous or non-hazardous based on the threat to public health. The State Board, together with the regional boards, classifies non-hazardous waste as "designated", "nonhazardous", or "inert" based on the threat that each poses to the beneficial uses of ground and surface waters, as required by the Porter-Cologne Water Quality Control Act and regulations, water quality control

plans and policies set forth by the Regional Board.

As shown in Figure 4-2, the Chapter 15 regulations divide waste into four categories which in turn, determine the classes of waste management units to which their discharge is permitted for treatment, storage or disposal. Detailed criteria are contained in Title 22 of the CCR, Division 4.5, Chapter 11, for determining whether a waste falls into the hazardous category. These criteria fall under the headings of toxicity, ignitability, reactivity, corrosivity, and listing under the Resource Conservation and Recovery Act (RCRA). Hazardous waste may be discharged only to Class I waste management units which provide both natural geologic and engineered containment features to isolate the wastes from the environment, unless a specific variance has been granted by DTSC from California's hazardous waste management requirements.

"Nonhazardous solid waste" (see Table 4-7) is the regulatory term for "municipal solid waste" or "refuse" and is characterized as having a significant proportion of putrescible (degradable) matter, stringent moisture limitations, and prohibitions against inclusion of "designated" or "hazardous" wastes. "Nonhazardous solid waste" may be discharged to Class III landfills that protect beneficial uses of nearby waters, but do not provide complete waste containment. The only threat to water quality posed by wastes in the "inert" category is siltation. Paving fragments and non-degradable construction debris are examples of "inert waste". Wastes in this category may be discharged to unclassified waste management units that are located and managed to keep the wastes from entering surface waters or drainage courses.

"Designated waste" is defined in the Chapter 15 regulations and is described in Table 4-7. The second part of the definition refers to those wastes granted a variance by DTSC from Class I disposal.

Dischargers are required to submit an initial analysis of the material by a state-certified laboratory. If the material is deemed hazardous, the discharger is referred to the California Department of Toxic Substances Control. For non-hazardous materials, general WDRs can be issued on a case-by-case basis. All permitted treatment or disposal includes monitoring and reporting requirements.

Remediation treatment includes biodegradation (by a land treatment process) for hydrocarbon contaminated soil found on a site and a fixation process for metals contaminated soils. In-situ disposal (without treatment) can be allowed, on a case-by-case basis, for material that is not considered to be a threat to surface or ground water.

Table 4 - 7. Landfill Classifications

Disposal Site Classification	Definitions of Waste Types (California Code of Regulations, Title 23, Division 3, Chapter 15, sections 2521 et. seq.)	Examples
Class I Hazardous Waste	(a) Hazardous waste is any waste which, under section 66300 of Title 22, is required to be managed according to Chapter 30 of Division 4 of Title 22. (b) Hazardous waste shall be discharged only at Class I waste management units which comply with the applicable provisions unless wastes qualify for a variance under section 66310 of Title 22. (c) Waste which have been designated as restricted wastes by DHS pursuant to section 66900, of Title 22 shall not be discharged to waste management units after the restriction dates established by section 66905 of Title 23 unless: (1) Such discharge is for retrievable storage, and (2) DHS has granted a variance from restrictions against land disposal of the waste under section 66930 of Title 22.	Materials that contain high concentrations of pesticides, certain solvents, and PCBs are examples of hazardous wastes.
Class II Designated Waste	(a) Designated waste is defined as: (1) Nonhazardous waste which consists of or contains pollutants which, under ambient environmental conditions at the waste management unit, could be released at concentrations in excess of applicable water quality objectives, or which could cause degradation of waters of the state. (2) Hazardous waste which has been granted a variance from hazardous waste management requirements pursuant to section 66310 of Title 22. (b) Wastes in this category shall be discharged only at Class I waste management units or at Class II waste management units which comply with the applicable provisions of Chapter 15 and have been approved for containment of the particular kind of waste to be discharged. Decomposable wastes in this category may be discharged to Class I or II land treatment waste management units.	Materials with high concentrations of biological oxygen demand (BOD), hardness, or chloride. Inorganic salts and heavy metals are "manageable" hazardous wastes.
Class III Nonhazardous Solid Waste	(a) Nonhazardous solid waste means all putrescible and nonputrescible solid, semi-solid, and liquid wastes, including garbage, trash, refuse, paper, rubbish, ashes, industrial wastes, demolition and construction wastes, abandoned vehicles and parts thereof, discarded home and industrial appliances, manure, vegetable or animal solid and semi-solid wastes and other discarded solid or semi-solid waste: provided that such wastes do not contain wastes which must be managed as hazardous wastes, or wastes which contain soluble pollutants in concentrations which exceed applicable water quality objectives, or could cause degradation of waters of the state (i.e., designated waste).	Garbage, trash, refuse, paper, demolition and construction wastes, manure, vegetable or animal solid and semisolid wastes.

Disposal Site Classification	Definitions of Waste Types (California Code of Regulations, Title 23, Division 3, Chapter 15, sections 2521 et. seq.)	Examples
Class III Nonhazardous Solid Waste **(continued)**	(b) Except as provided in Subsection 2520(d) of Chapter 15, nonhazardous solid waste may be discarded at any classified landfill which is authorized to accent such waste, provided that: (1) The discharger shall demonstrate that co-disposal of nonhazardous solid waste with other waste shall not create conditions which could impair the integrity of containment features and shall not render designated waste hazardous (e.g., by mobilizing hazardous constituents); (2) A periodic load-checking program approved by DHS and Regional Boards shall be implemented to ensure that hazardous materials are not discharged at Class III landfills. (c) Dewatered sewage or water treatment sludge may be discharged at a Class III landfill under the following conditions, unless DHS determines that the waste must be managed as a hazardous waste: (1) The landfill is equipped with a leachate collection and removal system; (2) The sludge contains at least 20 percent solids by weight if primary sludge, or at least 15 percent solids if secondary sludge, mixtures of primary and secondary sludges, or water treatment sludge; and (3) A minimum solids-to-liquid ration of 5:1 by weight shall be maintained to ensure that the co-disposal will not exceed the initial moisture-holding capacity of the nonhazardous solid wastes. The actual ratio required by the Regional Board shall be based on site-specific conditions. (d) Incinerator ash may be discharged at Class III landfill unless DHS determines that the waste must be managed as hazardous waste.	Garbage, trash, refuse, paper, demolition and construction wastes, manure, vegetable or animal solid and semisolid wastes.
Unclassified /Inert	(a) Inert waste does not contain hazardous waste or soluble pollutants at concentrations in excess of applicable water quality objectives. It does not contain significant quantities of decomposable waste. (b) Inert waste do not need to be discharged to classified management units. (c) Regional Boards may prescribe individual or general waste discharge requirements for discharges of inert wastes.	Concrete, rock, asphalt, plaster, brick, vehicle tires, uncontamin-ated soils.

Figure 4-2. Waste Classification Process

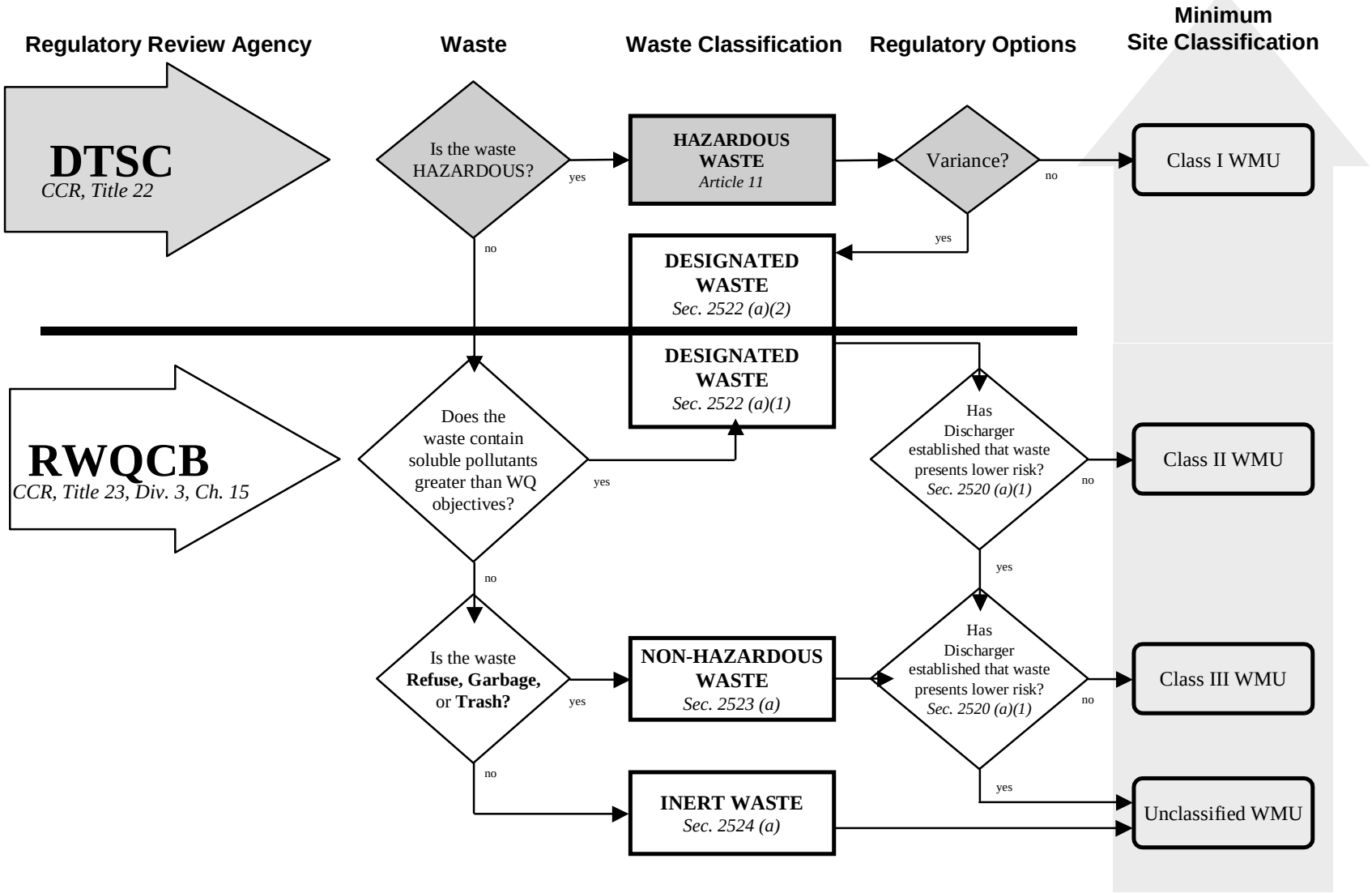

RESOURCE CONSERVATION AND RECOVERY ACT OF 1976

The Resource Conservation and Recovery Act (RCRA) is the federal law regarding the treatment, storage and disposal of hazardous waste. The State implements RCRA's Subtitle C through the Department of Toxic Substance Control (DTSC) and the Regional Boards. In August 1992, the USEPA formally delegated RCRA Subtitle C program implementation authority to DTSC. As described above, regulation of hazardous waste discharges is also included in CCR Title 23, Chapter 15 (Chapter 15). Chapter 15 monitoring requirements were amended in 1991 to be equivalent to RCRA requirements. These monitoring requirements are implemented through the adoption of WDRs for hazardous waste sites covered by RCRA. The discharge requirements are then a part of a state RCRA permit issued by DTSC.

Federal regulations required by the RCRA's Subtitle D have been adopted for municipal solid waste landfills (40 CFR Parts 257 & 258). The California Integrated Waste Management Board (CIWMB) is the State lead agency for Subtitle D implementation. The State Board and the CIWMB are applying to the USEPA for State program approval. It is important to note that certain federal regulatory requirements will be effective unless and until the State program is approved. Delegation of authority for the State Board to implement Subtitle I (Underground Storage Tanks) will occur after USEPA approves the State's program application.

SOLID WASTE ASSESSMENT TEST (SWAT)

The Regional Board administers the Solid Waste Assessment Test (SWAT) Program in the Region. The SWAT program requires owners of active or inactive non-hazardous solid waste disposal sites to evaluate the possible migration of hazardous waste or leachate to waters of the state. The SWAT program was initiated with the enactment of Water Code section 13273 in 1985. In addition to requiring site evaluations, the SWAT program also:

- Provides deadlines for implementation of water quality monitoring systems at active solid waste disposal sites;
- Requires the State Board to develop a ranked list of all solid waste disposal sites, on the basis of the threat which they may pose to water quality; and
- Requires operators of active and inactive solid waste disposal sites to implement a water quality monitoring system to verify that the solid waste disposal site has not been affected by leakage, and if there is leakage to take remedial actions under the Chapter 15 program.

Program funding was eliminated in 1991, reducing Regional Board review to SWAT sites under regulation due to higher priority work in other Regional Board programs. All sites eventually will be required to complete a SWAT and more sites will be reviewed if more program funding becomes available.

SLUDGE USE AND DISPOSAL

Sludge is a residual by-product of sewage treatment, water treatment, and certain industrial processes. The higher the degree of wastewater treatment, the larger the residue of sludge that must be handled. The treatment and disposal of sludge can be the single most complex and costly operation in a municipal wastewater treatment system. The sludge is made of materials settled from the wastewater - such as rags, sticks, and organic solids - and of solids generated in the wastewater treatment processes - such as the excess activated sludge created by aeration or the chemical sludge created by a tertiary treatment process.

The quantities of sludge involved are significant. For primary treatment the quantities of sludge may be 2,500 to 3,500 gallons per MG of wastewater treated. When treatment is upgraded to activated sludge, the quantities increase by 15,000 to 20,000 gallons per MG of wastewater treated. Use of chemicals can add another 10,000 gallons. For a typical activated sludge municipal wastewater treatment plant, the amount of sludge to be disposed of is typically about one ton per MG or about 20 pounds per month per home.

Raw sludge usually contains 93 to 99.5 percent water before it is treated further or dewatered. It contains organic solids and dissolved nutrients (e.g., nitrogen and phosphorus), making it useful

as a supplement to chemical fertilizers and soil conditioners. Other typical constituents are inorganic ions, such as iron and zinc. While trace amounts of these inorganic ions are used by plants and organisms, some heavy metals that may be present in sewage sludge from household or commercial and industrial sources can be toxic to plants, animals, and humans. Untreated sludge also contains disease-causing organisms (e.g., bacteria, viruses, protozoa, and eggs of parasitic worms). In addition, sewage sludge may contain toxic chemicals from household, commercial, and manufacturing activities that use the sewer system to dispose of these liquid wastes.

Most wastewater treatment plants treat the sludge prior to ultimate use or disposal. Normally this treatment consists of some combination of the following processes:

- **Conditioning:** treatment of the sludge with chemicals or heat so that the water may be readily separated.

- **Thickening:** separation of as much water as possible by gravity or flotation process by subjecting the sludge to vacuum pressure, or other drying processes.

- **Stabilization:** stabilization of the organic solids so that they may be handled or used as soil conditioners without causing a nuisance or health hazard through processes referred to as "digestion".

- **Reduction:** reduction of solids to a stable form by wet oxidation processes or incineration.

The disposal point alternatives for municipal wastewater sludge in the San Diego Region are limited. Since treated and untreated sludge can contain high concentrations of toxic metals and significant amounts of toxic organic pollutants and pathogens, the USEPA and the Regional Board do not allow the direct discharge of sludge to the ocean or any other surface waters. Air pollution regulations have strict requirements on sludge incineration processes. Sludge disposal to land must be carefully controlled because of potential impacts on ground and surface water quality.

Sludge handling and disposal is regulated under 40 CFR Part 503 as a self-implementing program enforced by USEPA; the State does not have delegated authority for implementing the sludge program. Uses of sludge or sludge by-products and sludge disposal in the Region include:

- Sludge digester methane gas as fuel in gas boilers to generate electricity;

- Sludge as a soil amendment: composting dewatered sludge (pathogens are killed at composting temperatures);

- Sludge as a nutrient source for non-edible crops: direct application to agricultural crops not meant for direct human consumption (mixing, tilling, or injecting sludge into soil);

- Sludge disposal directly in certain landfills;

- Sludge disposal in-situ; and

- Incineration.

Prior to disposal of sludge, an initial analysis by a state certified laboratory is required to determine if there are any hazardous substances in the sludge. Nonhazardous sludge can be disposed of in the above ways, usually under WDRs. Disposal of nonhazardous sludge at Class III landfills is regulated under WDRs and must meet criteria listed in Table 4-7. Landfills are required to report the quantity and chemical composition of all accepted sludge as part of their individual WDRs.

Currently, the Regional Board can regulate handling and disposal of sludge pursuant to Chapter 15 and Department of Health Services standards. The USEPA has promulgated a policy of promoting those municipal sludge management practices that provide for the beneficial use of sludge while maintaining or improving environmental quality and protecting public health. USEPA is currently developing sludge use and disposal criteria. The USEPA has also proposed a rule which requires states to develop a program to assure compliance with the Federal criteria. The State Board will be developing a state sludge management program consistent with the USEPA policy and criteria.

AUTO SHREDDER WASTE

There is a significant volume of auto shredder waste generated in California every year. In 1985, 166,500 tons of auto shredder waste was produced. There was one producer of auto shredder waste in the San Diego Region as of February, 1994. Auto shredder waste is the material that remains after articles such as auto bodies, appliances and sheet metal are shredded and have had their metals removed. The majority of auto shredder waste is being treated to nonhazardous levels, but a significant portion of the waste must be disposed of in a hazardous waste landfill. Eight metal compounds, which include cadmium, total and hexavalent chromium, lead, copper, mercury, nickel and zinc, plus PCBs may cause auto shredder waste to be classified as hazardous. Senate Bill 976 was passed in 1985 which required Regional Boards to prepare a list of Class III, nonhazardous waste landfills as authorized to accept and dispose of auto shredder waste. There are only four landfills which currently accept auto shredder waste in California. They are West Contra Costa, Altamount, BKK landfill and Prima Deshecha.

SHREDDER WASTE POLICY (RESOLUTION NO. 85-92)

The Regional Board adopted Resolution No. 85-92, the Designation of Class III Landfills within the San Diego Region to Accept Shredder Wastes as Required by section 25143.6 of the Health and Safety Code (Shredder Waste Policy) on December 16, 1985. The Shredder Waste Policy, required by section 25143.6 of the Health and Safety Code, designates three landfills, the City of San Diego's West Miramar Solid Waste Disposal Facility, the County of San Diego's Otay Annex Sanitary Landfill, and the County of Orange's Prima Deshecha Canada Sanitary Landfill, as being authorized to dispose of shredder wastes as required by section 25143.6 of the Health and Safety Code. These three landfills are subject to the following conditions:

The appropriate agency of the City of San Diego, the County of San Diego, and the County of Orange shall, prior to the start of such an operation, submit a report of waste discharge and obtain revised waste discharge requirements for the disposal of shredder wastes. The report of waste discharge shall contain sufficient information demonstrating conformance with Item "i" or, alternatively, Item "ii" listed below to their satisfaction of the Regional Board.

i. The report of waste discharge shall demonstrate that shredder waste will be discharged to a Class I or Class II waste management unit in accordance with the criteria stated in Chapter 15, Title 23 of the CCR.

ii. The report of waste discharge shall demonstrate that under section 2520 (a)(l), Chapter 15, Title 23, CCR, the shredder waste contains a particular waste constituent or combination of constituents which present a lower risk of water quality degradation than indicated by its classification as a designated waste.

Upon application for modification of waste discharge requirements, other landfills within the San Diego Region may be authorized by the Regional Board to accept and dispose of shredder wastes, subject to the restrictions discussed above.

CONTROL OF NONPOINT SOURCE POLLUTION

CHRONOLOGY OF NONPOINT SOURCE POLLUTION CONTROL MEASURES

To implement nonpoint source pollution control, several regulatory measures have been taken by federal, state, regional and local government. The following chronology shows the applicable regulatory measure, responsible governmental agency, and year when each measure was enacted or adopted. These regulatory measures will be discussed in the pages that follow.

Regulatory Measure	Responsible Agency	Year
RB Resolution No. 79-25	RB	1979

Regulatory Measure	Responsible Agency	Year
RB Resolution No. 87-91	RB	1987
CWA, section 201(g)(1)(b)	USEPA	1987
CWA, section 205(j)(5)	USEPA	1987
CWA, section 319(h)	USEPA	1987
CWA, section 402(p)	USEPA	1987
CWA, section 603(c)(2)	USEPA	1987
CZARA, section 6217	USEPA	1990
RB Resolution No. 92-21	RB	1992

THE NEED FOR NONPOINT SOURCE POLLUTION CONTROL

Efforts to improve water quality under the NPDES program have traditionally focused on reducing pollutants from the major point sources, namely municipal sewage and industrial process wastewater. Point sources are defined as discrete conveyances, from which pollutants are, or may be discharged. These point sources received early emphasis because they were obvious sources of pollution and easily linked to degraded water quality conditions. However, as the permitting effort proceeded and control measures for municipal sewage and industrial wastewater were implemented, it became increasingly clear that control and reduction of nonpoint source pollution was also needed in order to restore and protect the nation's waters.

DEFINITION OF NONPOINT SOURCE POLLUTION

In contrast to point sources, nonpoint sources of water pollution are generally defined as sources which are diffuse in nature, usually associated with man's uses of land, and are not subject to the federal NPDES permitting program. Diffuse sources originate over a wide area rather than from a definable point. They often enter receiving waters in the form of surface runoff but are not conveyed by way of pipes or discrete conveyances. By definition, nonpoint sources (like discharges to ground water) are exempt from the federal NPDES permitting program which regulates point sources to surface waters.

CATEGORIES OF NONPOINT SOURCE POLLUTION

Nonpoint source pollution is primarily the result of man's uses of land such as urbanization, roads and highways, vehicles, agriculture, construction, industry, mineral extraction, physical habitat alteration (dredging/ filling), hydromodification (diversion, impoundment, channelization), silviculture (logging), and other activities which disturb land. Additional categories of nonpoint sources include agricultural return water, marinas and recreational boating, confined animal facilities, resource extraction, channel erosion, resuspension of pollutants from contaminated aquatic sediments, waste disposal sites, septic systems (onsite or subsurface disposal), atmospheric deposition, acid precipitation, seawater intrusion, and geothermal development.

OVERLAPS BETWEEN NONPOINT & POINT SOURCES

The distinction between point source and nonpoint sources is not always clear. As a result, there have always been overlaps and ambiguities between programs designed to control nonpoint sources and those designed to control point sources of pollution. The most important example of such an overlap involves urban runoff and storm water which are clearly diffuse and nonpoint in origin, but become channelized and are ultimately discharged through discrete point source conveyance systems to receiving waters. Because it becomes channelized, urban runoff is legally considered a point source discharge. However, because it originates as nonpoint source, urban runoff and storm water are discussed in the Nonpoint Source section.

SEVERITY OF NONPOINT SOURCE PROBLEM

According to the 1988 National Water Quality Inventory, nonpoint source pollution has become the largest single factor preventing the attainment of water quality standards. The inventory reported over 40% of the nation's rivers and streams are impaired due to siltation and 25% are impaired due to nutrients (such as phosphorus and nitrogen) from nonpoint sources.

Agricultural runoff was reported as the major nonpoint pollution source affecting over 50% of impaired rivers. Also, over half of the states reported threats to ground water from nonpoint pollution sources.

NONPOINT SOURCE FUNDING

Innovative ways of financing and implementing nonpoint source projects have been developed. Prior to the 1987 amendments to the Clean Water Act, states used section 106 and 205(j) monies to fund limited nonpoint source activities. The primary federal funding for current nonpoint source program development and implementation includes section 104(b)(3), 205(j)(5), 319(h), 201(g)(1)(b), 603(c)(2), and 604(b) monies as described below.

Section 104(b)(3): This section established grants for state water pollution control agencies and others for the purpose of conducting and promoting research and investigations related to the causes, effects, extent, prevention, reduction, and elimination of pollution. Such research and investigations are to be carried out in cooperation with federal, state, and local agencies.

Section 205(j)(5): This section established a set-aside of construction grants for the purposes of carrying out activities under section 319, including program development and the preparation of state assessment reports and management plans. These funds were used for assessment and development activities for California's program through fiscal year 1989.

Section 319(h): Grant funds authorized by this section can be used for the implementation of nonpoint source management programs but cannot be used for assessment activities. States must have an USEPA approved Assessment and Management Plan before qualifying for these monies. This grant program funds both State and Regional Board programs and provides competitive grants for other agencies to use in implementing nonpoint source measures around the state. These grants include a "non-federal" match of 40 percent which illustrates the intent of Congress and USEPA to have the states make a financial commitment to implementing nonpoint source programs.

Section 201(g)(1)(b): The 1987 amendments to the Clean Water Act added this section that established a new purpose for which 201 funds could be used - "...any purpose for which a grant can be made under section 310(h) and (i)". These funds can be used for either nonpoint source development or implementation projects.

Section 603(c)(2): The 1987 amendments added Title VI to the Clean Water Act establishing a State Water Pollution Control Revolving Fund Program (SRF). This program provides funding in the form of loans, refinancing, and bond insurance which can be used for (1) construction of publicly owned treatment works, (2) the implementation of state nonpoint source management programs, and (3) the development and implementation of state estuary conservation and management plans. The State and Regional Boards encourage local agencies to apply for these low-interest loans to implement nonpoint source demonstration projects and programs in the Region.

Section 604(b): States must set aside one percent of their Title VI allotments or $100,000, whichever is greater, to carry out planning programs under 205(j) and 303(e) of the Clean Water Act. These funds can be used under 205(j) planning for nonpoint source related activities. This can become an important source of funding for nonpoint source planning and assessment tasks since these types of activities cannot be carried out under section 319.

SECTION 319 NONPOINT SOURCE MANAGEMENT PROGRAM

To address the nonpoint source pollution problem, Congress added section 319 to the Clean Water Act in 1987. Section 319 requires each state to develop and implement a Nonpoint Source Management Program and to conduct an inventory of the waterbodies in the State which are impaired due to nonpoint source pollution. To fulfill these requirements, the State Board adopted the Nonpoint Source Management Plan (NPSMP) in 1988 which is discussed in Chapter 5 and the Water Quality Assessment in 1990 which is discussed later in this chapter.

The NPSMP established a statewide policy for managing nonpoint source inputs to California's waters and is incorporated by reference into this Basin Plan. The objective of the Nonpoint Source Management Program in California is to measurably improve water quality through the implementation of various BMPs.

Unlike end of pipe treatment for point sources (which is impractical and cost prohibitive for nonpoint sources), the key to managing nonpoint source pollution is pollution prevention. Pollution prevention means stopping the generation of pollution at its source by reducing the use of products containing pollutants. Once pollutants have been generated, pollution control BMPs must be employed to prevent the existing pollution from coming into contact with the waters of the State. BMPs are defined as the schedules of activities, prohibitions, procedures, or other management practices designed to prevent or reduce the discharge of pollutants into receiving waters.

The State and Regional Board(s) believe that the voluntary and widespread application of BMPs is the most effective means by which nonpoint source pollution can be reduced. Accordingly the following three general management options are adopted in the Nonpoint Source Management Plan to address nonpoint source problems. In general, the least stringent option that successfully protects or restores water quality is employed. More stringent options are only required if water quality improvements are not achieved.

(1) **Voluntary implementation of BMPs**: Voluntary implementation of BMPs is encouraged through financial assistance, education, training, technical assistance, and demonstration projects. Grants and loans provide incentives.

(2) **Regulatory based encouragement of BMPs:** Regional Boards require waste discharge requirements for nonpoint sources but waive the requirement if BMPS are effectively implemented. Regional Boards can also enter into management agency agreements (MAAs) with other agencies which specify acceptable BMPs and their implementation. The MAAs are referenced in Regional Board basin plans and become the primary basis for evaluation of compliance. (The State Board has existing MAAs with the US Forest Service, the California Board of Forestry and Department of Forestry).

In either case, the Regional Board will generally refrain from imposing effluent requirements on dischargers who are implementing BMPs in accordance with a waiver of waste discharge requirements or an approved management agency agreement. In both cases, the BMPs become the primary mechanism for meeting water quality standards.

(3) **Issuance of permits**: Adopt and enforce waste discharge requirements which set effluent limits on the discharge of specific pollutants.

The State Board has also established four program objectives for its Nonpoint Source Management Program, each of which are being implemented in the San Diego Region as follows:

(1) Implementation of Nonpoint Source Management Plan: This includes integration of the Coastal Nonpoint Pollution Control Program (which is required under the CZARA and is described below) into the NPSMP.

(2) Outreach Activities: Regional Board outreach activities primarily center around the industrial, construction, and municipal participants in the NPDES Storm Water Permit Program (described in a later section). Other activities include participation in Resource Conservation District, technical advisory and planning committee, and lagoon foundation meetings.

(3) Watershed Assessment Projects: San Diego's target watershed is Escondido Creek and San Elijo Lagoon.

(4) Project Tracking and Participation: The Regional Board has two nonpoint source program contracts. The first contract is entitled the Chollas Creek Watershed Protection Plan project. The Chollas Creek contract has been completed. However, the watershed remains a high priority for the toxic substances monitoring program and for chronic and acute toxicity monitoring. These monitoring programs may identify changes in the water quality due to the education program funded by this contract.

(5) The second project involves a nitrate contamination project in the Rainbow Creek watershed. Although the USEPA funded study has not been formally initiated, the Flynn-Rainbow Nursery has converted to a complete tailwater recovery and reuse system. This conversion resulted in a

reduction of nitrate loads to the creek. The Rainbow Creek contract will be modified to study other nurseries and sources of nutrients.

ALL NONPOINT SOURCE DISCHARGES ARE CURRENTLY REGULATED

Despite the overlaps between point and nonpoint sources, all nonpoint source discharges are currently regulated under one of two relatively new statutory requirements. These requirements are the NPDES Storm Water Permitting Program required under section 402(p) of the Clean Water Act and the Coastal Nonpoint Pollution Control Program required under section 6217 of the CZARA.

Although the two programs are complementary and exclusive of each other (i.e., one program applies to any discharge that the other does not), their recent implementation has heightened the confusion about point source verses nonpoint source program applicability.

Both the programs are fully discussed in later sections, and a brief overview is included here. In its simplest form, the Clean Water Act section 402(p) program, which is an NPDES permitting program, is designed to regulate storm water and urban runoff (i.e., the nonpoint source discharges that become point sources). Virtually all other nonpoint sources are subject to the Coastal Nonpoint Pollution Control Program under CZARA. Although there are a few minor complications which are also discussed later, the essential concept is that all nonpoint source discharges are currently subject to regulation under either the NPDES Storm Water Program or the Coastal Nonpoint Pollution Control Program.

NPDES STORM WATER PROGRAM

SECTION 402(P) CLEAN WATER ACT

Pursuant to the federal Clean Water Act, many municipalities and most industries in the United States are now required to obtain coverage under an NPDES permit for discharges of storm water runoff. NPDES storm water permits authorize only the discharge of storm water into storm water conveyance systems and prohibit all non-storm water discharges.

DEFINITION OF STORM WATER

The federal regulations (40 CFR 122, 123, 124, November 1990) define storm water as surface runoff from rain or snow melt, including sheet flow. This is a narrow definition which is meant to include the runoff of precipitation only. Storm water does not include water which originates from any source other than precipitation such as process wastewater, cooling waters, and wash waters. These are examples of non-storm water discharges and are not allowed in the storm water conveyance system. A non-storm water discharge is any discharge that is not composed entirely of storm water. Also unacceptable for discharge into the storm water conveyance system is precipitation runoff which has come in contact with pollutants.

THE PROBLEM

Although storm water runoff is part of the natural hydrologic cycle, human activities, particularly urbanization, can result in significant and problematic changes to the natural hydrology of an area. Under conditions of minimal urbanization, water is percolated through pervious surfaces in which soil filtration and biological action remove pollutants. During urbanization, pervious surfaces (i.e., vegetated and natural ground cover) are converted to impervious surfaces (i.e., rooftops and roads) decreasing the infiltration capacity of the soil for both water and pollutants.

As a result, when rain falls on and drains through urban freeways, industries, construction sites, and neighborhoods it picks up a multitude of pollutants. The pollutants can be dissolved in the runoff and quickly transported by gravity flow through a vast network of concrete channels and underground pipes referred to as storm water conveyance systems.

Such systems ultimately discharge the polluted runoff, without treatment, into the nation's creeks, rivers, estuaries, bays, and oceans. In short, urbanization results in a dramatic increase in the volume, velocity, and especially in the pollutant load carried by storm water runoff to receiving waters.

Pollutants typically found in urban runoff include sediment, nutrients (e.g., fertilizers), oxygen-demanding substances (e.g., decaying vegetation), bacteria, viruses, heavy metals, synthetic organics (e.g., fuels, oils, solvents, lubricants), pesticides, and other toxics. These pollutants severely degrade the beneficial uses of surface waters, and threaten the health of both humans and aquatic organisms.

In addition to the pollutants contributed by precipitation runoff, dry weather flows also cause serious degradation of receiving water quality. Dry weather flows, which can be substantial, consist of flows from illicit connections and illegal discharges to the storm water conveyance system. Common examples of the latter include illegally disposed used motor oil and antifreeze.

Studies, most notably the Nationwide Urban Runoff Program (NURP), found pollutants in urban runoff to be similar to those found in sewage and industrial wastewater discharges. Similar concentrations were also observed. Thirty-eight states report urban runoff as a major cause of impaired water quality. Locally, the closure of Southern California beaches following major storm events due to high bacteriological levels in ocean waters is a common occurrence. Clearly urban runoff is a significant water quality problem which deserves attention.

STATUTORY AUTHORITY

To address the storm water/urban runoff problem, Congress added section 402(p) to the Clean Water Act in 1987. This section, and the federal regulations which implement it (40 CFR 122, 123, and 124; November 1990), require NPDES permits for storm water/ urban runoff discharges from municipalities and industries, including construction.

The distinction between point source and nonpoint sources of pollution begins to fade with the requirement for NPDES permits for storm water discharges. Although storm water is clearly diffuse and nonpoint source in origin, it is quickly channelized and ultimately discharged through discrete point source conveyance systems to receiving waters. Because of this, storm water is legally considered a point source discharge and as such is subject to the NPDES permitting program under section 402(p).

MUNICIPAL, INDUSTRIAL, AND CONSTRUCTION PERMITS -- COMMON CHARACTERISTICS

As a result of the 1987 Clean Water Act amendments, there are currently three types of storm water permits in California: municipal, industrial, and construction. The municipal permits are areawide permits which were issued by the Regional Board. The industrial and construction permits are statewide general permits which were issued by the State Board. There are three important characteristics which all storm water permits have in common.

Permit Objective

The overall objective of the entire storm water program and all three types of permits is to reduce or eliminate the discharge of pollutants into the storm water conveyance system. Section 402(p) of the Clean Water Act does however establish different performance standards for municipal and industrial discharges. Municipalities must reduce pollutant discharges to the maximum extent practicable, or MEP (see discussion below). Industries (including construction) must implement Best Available Technology (BAT) and Best Conventional Pollutant Control Technology (BCT) to reduce pollutants.

Best Management Practices

Pollution Prevention

The permit objective is achieved by way of pollution prevention. To eliminate pollutants in storm water, one can either clean it up by removing pollutants or prevent it from becoming polluted in the first place. Because of the overwhelming volume of storm water and the enormous costs associated with pollutant removal, pollution prevention is the only approach that makes sense. Pollution prevention which means stopping the generation of pollution at its source by reducing the use of products containing pollutants, is in fact, the basis of the entire storm water program. Once pollutants have been generated, pollution control BMPs must be employed to prevent the existing pollution from coming into contact with the water of the State. It is important to point out that this approach is distinctly different from the

conventional end-of-pipe treatment approach commonly used in water quality regulation.

Pollution prevention is accomplished by way of BMPs which are defined as schedules of activities, prohibitions, procedures, or other management practices designed to prevent or reduce the discharge of pollutants to storm water.

Source control BMPs include practices that eliminate or reduce pollutants at their point of generation, or source, so that they can not come into contact with storm water. Source controls are non-structural, inexpensive, and can be extremely effective. Because source control BMPs are site specific, they vary widely depending on the application. For example, regulatory powers and land use planning are important BMPs for municipalities. Berming and covering storage areas are excellent BMPs at industrial facilities; reduced vegetation removal and phased development planning are effective at construction sites.

Two source control BMPs are common to all three applications (municipalities, industries, and construction), namely good housekeeping practices (cleaning up and immediately disposing of wastes properly) and most importantly, education (employee and public). Education, which ultimately results in a change in behavior and increased public awareness, is the key to pollution prevention. Many people think that street gutters are plumbed to the sanitary sewage treatment plant and do not realize that they flow instead directly to the bays and ocean without treatment. Education should be conducted in two directions: (1) prevent the discharge of pollutants and (2) reduce the use of materials which are the sources of pollution.

No Numeric Effluent Limits

None of the three types of storm water permits contain numeric effluent limits at this time. The permits are intended to be BMP based and instead contain narrative receiving water limitations.

AREAWIDE MUNICIPAL STORM WATER PERMITS

Under section 402(p) of the Clean Water Act and the federal regulations implementing it, operators of large and medium sized municipal storm water conveyance systems are required to obtain NPDES permits for their storm water conveyance systems at this time. Large and medium sized municipal storm water conveyance systems are defined as those serving populations greater than 250,000 and 100,000, respectively. Smaller municipalities (those under serving populations less than 100,000) have until late 1994 to obtain coverage but may be required to do so earlier if it is determined that (1) they are significant contributors of pollutants to receiving waters or (2) if their storm water conveyance systems are "interrelated" to larger municipal systems. In the municipal permits the Regional Board made a finding that all of the smaller municipalities in the San Diego Region meet both of these criteria (Order No. 90-42). All the municipalities contribute to the condition of water quality impairment (see Table 4-8) and the storm water discharges are "interrelated" in that they jointly and cumulatively contribute significant pollutants to the near coastal waters of San Diego County. Consequently, in July 1990, the Regional Board adopted an areawide Municipal Storm Water Permit for each of the three counties in the Region, San Diego, Riverside, and Orange as follows:

(1) Order No. 90-42 (NPDES Permit No. CA 0108758), Waste Discharge Requirements for Storm Water and Urban Runoff from the County of San Diego and Incorporated Cities of San Diego County and the San Diego Unified Port District.

(2) Order No. 90-46 (NPDES Permit No. CA 0108766), Waste Discharge Requirements for Storm Water and Urban Runoff from the Riverside County Flood Control and Water Conservation District, the County of Riverside and the Incorporated Cities of Riverside County within the San Diego Region.

(3) Order No. 90-38 (NPDES Permit No. CA 0108740), Waste Discharge Requirements for Storm Water and Urban Runoff from the County of Orange, the Orange County Flood Control District and the Incorporated Cities of Orange County within the San Diego Region.

Included as co-permittees in the above permits are all of the land use regulatory agencies; the county, all incorporated cities within the county, and special districts. For this reason, the

municipal permits are referred to as "areawide" permits. As it moves from inland to coastal areas, storm water does not recognize jurisdictional boundaries. Since all municipalities contribute to the cumulative storm water pollution problem, a coordinated, "areawide" approach to managing it is essential, more effective, and far less expensive than numerous individual efforts.

Objective

The objective of an areawide municipal storm water permit is to reduce pollutants in storm water discharges to the maximum extent practicable (MEP). This is a standard used by USEPA for municipal discharges of storm water. Although not specifically defined in the federal regulations, the intent of MEP is to reduce as much as possible the discharge of pollutants. Thus, the municipal dischargers are required to employ whatever BMPs are feasible (i.e., are likely to be effective and are not cost prohibitive). Where a choice is made between two BMPs which provide generally comparative effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs which address a pollutant source or to pick a BMP based solely on cost, which would be clearly less effective. In order to reduce pollutants to the MEP many factors including technical feasibility and effectiveness, as well as economic factors, must be taken into consideration.

Permit Requirements

Municipal Storm Water Permits contain the following two major requirements:

(1) Prohibit non-storm water discharges; and

(2) Develop/implement a comprehensive storm water management program. The comprehensive storm water management program must include the following five components:

- BMP program;
- Monitoring and reporting program;
- Illicit connection/ illegal discharge detection program;
- Storm water ordinance or code; and a funding source.

Ultimate Responsibility for Quality of Storm Water Discharges (Municipal Regulation of Industry)

Under an areawide municipal storm water permit, municipalities are ultimately held responsible for the quality of discharges from their storm water conveyance systems, including contributions from industrial and construction activities. This provides important incentive for municipalities to regulate these activities occurring within their jurisdiction.

As called for in the federal storm water regulations, the regulation of industrial storm water discharges (including construction) into municipal storm water conveyance systems should be accomplished by a cooperative effort between the Regional Board and the local municipality. Under a municipal storm water permit, municipalities are required to adopt and enforce ordinances (including ordinances for erosion control) which prohibit the discharge of pollutants to storm water conveyance systems. In order for the municipalities to be in compliance with their municipal permit, it is essential that the municipalities rigorously enforce their ordinances and grading permits and conduct inspections for compliance with both. They are further authorized to impose additional requirements on industry as necessary to ensure compliance with their municipal permit.

Table 4 - 8. Receiving Waters Impacted by Pollution from Stormwater and Urban Runoff (Order No. 90-42)

IMPACTED RECEIVING WATER	REFERENCES	PARAMETERS	MUNICIPALITIES / JURISDICTION
San Diego Bay	WQLS, NPSI	PET, TRA, SYN, COL, DEB, MET	City of San Diego, Coronado, National City, Chula Vista, Imperial Beach, La Mesa, Lemon Grove, County of San Diego, San Diego Unified Port District
Mission Bay	WQLS, NPSI	COL, MET	City of San Diego
Santa Margarita Lagoon	WQLS, NPSI	NUT	Camp Pendleton, County of San Diego, County of Riverside, Temecula
Oceanside Harbor	NPSI	TRA, SYN	Camp Pendleton, Oceanside
Buena Vista Lagoon	NPSI	NUT, SED	Oceanside, Vista, Carlsbad, County of San Diego
Agua Hedionda Lagoon	SDHSR	COL	Carlsbad, San Marcos
Batiquitos Lagoon	WQLS, NPSI	NUT, SED	Carlsbad, Encinitas, San Marcos, County of San Diego
San Elijo Lagoon	WQLS, NPSI	NUT, SED	Encinitas, Escondido, Solana Beach, County of San Diego
San Dieguito Lagoon	NPSI, TSMP	SED, TRA	City of San Diego, Del Mar, Solana Beach, County of San Diego, Escondido
Los Penasquitos Lagoon	WQLS, NPSI	NUT, SED	City of San Diego, Del Mar, Poway, County of San Diego
Tijuana River Estuary	WQLS, NPSI	TRA, SYN, DOX, NUT	Tijuana, Mexico, City of San Diego, Imperial Beach
San Diego River	NPSI	SYN, PES, SED	City of San Diego, La Mesa, El Cajon, Santee, County of San Diego
Forester Creek	NPSI	TRA	El Cajon, Santee
Tijuana River	WQLS, NPSI	NUT, DEB, COL, DOX, SYN, PES, TRA	Tijuana, City of San Diego
Lake Hodges	NPSI	NUT, DIS	City of San Diego, Escondido, Poway

*** Abbreviations for Table 4-8:**

REFERENCES

- **WQLS** **Water Quality Limited Segment**
- **NPSI** Nonpoint Source Inventory Report
- **SDHSR** State DHS Report on Shellfish Contamination in Agua Hedionda Lagoon
- **TSMP** Toxic Substances Monitoring Program elevated values

PARAMETERS

- **COL** Coliform bacteria or other microbes
- **DEB** Debris
- **DIS** Dissolved Solids
- **DOX** Low dissolved oxygen, except when associated with algal blooms caused by nutrients
- **MET** Metals, except trace elements
- **NUT** Nutrients, macro- and micro-nutrients, including algal bloom-low dissolved oxygen syndrome
- **PES** Pesticides, except trace elements, including insecticides, nematocides, herbicides, and fungicides
- **PET** Petroleum distillates
- **SED** Sedimentation/turbidity, including habitat alteration due to sedimentation
- **SYN** Synthetic organics, except herbicides and pesticides
- **TRA** Trace elements: aluminum, beryllium, cadmium, chromium, copper, lead, mercury, manganese, molybdenum, nickel, selenium, silver, titanium, and zinc.

GENERAL INDUSTRIAL STORM WATER PERMIT

To reduce the administrative burden of issuing individual permits to the overwhelming number of industries now subject to NPDES storm water permitting, USEPA has initiated a four-tiered strategy for regulating industries. The first tier involves the use of a small number of "general" permits. A general permit is a single permit under which many facilities can obtain coverage (for example, all of the industries in a given type). Under the tiered strategy, the permitting process begins general and becomes increasingly more specific and rigorous over time. Subsequent tiers target specific watersheds, industry types, and finally individual facilities.

Consistent with the tiered approach, the statewide General Industrial Storm Water Permit entitled, "Waste Discharge Requirement (WDR) for Discharges of Storm Water Associated with Industrial Activities excluding Construction Activities, Order No. 91-13 (General Permit No. CAS 000001)" was adopted by the State Board on November 19, 1991.

Industries Requiring Coverage

As shown below, the federal regulations identify eleven categories of industrial facilities which are required to obtain coverage under an NPDES storm water permit. Ten of the eleven categories are covered under the statewide General Industrial Storm Water Permit. Category x, construction activities, is covered under a separate permit, which will be discussed in a later section. Categories i through ix are considered "mandatory industries" and are required to obtain coverage under the General Industrial Storm Water Permit whether or not they have materials and activities exposed to storm water. Category xi, "conditional industries," are only required to obtain coverage under the general permit if they have materials, equipment, or activities exposed to storm water. Six of the categories are defined by narrative descriptions of the industrial activity. The remaining five categories are defined by Standard Industrial Classification (SIC) codes.

(i) Facilities Listed Under 40 CFR Subchapter N
(ii) (Heavy) Manufacturing Facilities
(iii) Oil and Gas/ Mining Facilities
(iv) Hazardous Waste Treatment, Storage, or Disposal Facilities
(v) Landfill, Land Application sites and Open Dumps
(vi) Recycling Facilities
(vii) Steam Electric Power Generation Facilities
(viii) Transportation Facilities
(ix) Sewage or Wastewater Treatment Works
(x) Construction Activities
(xi) (Light) Manufacturing Facilities (with exposure)

In addition to private industry, industrial facilities owned or operated by governmental entities (including federal, state, and municipal facilities) are also required to obtain permit coverage.

When Is Coverage Not Needed

If a facility discharges all of its storm water to a municipal sanitary sewer system or to evaporation ponds, percolation ponds, or dry wells, and if there is no discharge to surface water under any circumstances, coverage under the general permit may not be required.

Permit Requirements

The General Industrial Storm Water Permit and General Construction Storm Water Permit both contain the following three major requirements:

(1) Eliminate non-storm water discharges;

(2) Develop and implement a Storm Water Pollution Prevention Plan. A Storm Water Pollution Prevention Plan (SWPPP) is a site specific plan consisting of all BMPs which will be implemented at a facility to reduce or eliminate the discharge of pollutants to storm water. (It is the most important requirement and the key to source controls); and

(3) Develop and implement Monitoring and Reporting program (in accordance with the general permit).

GENERAL CONSTRUCTION STORM WATER PERMIT

Although it is one of eleven industrial categories specified in the federal regulations, construction activities are regulated under a separate general permit in California. The statewide General Construction Storm Water Permit entitled, "Waste Discharge Requirements (WDRs) for Discharges of Storm Water Runoff Associated with Construction Activity, Order No. 92-08-DWQ (General Permit No. CAS 000002)," was adopted by the State Board on August 20, 1992.

Definition of Construction

Construction activity includes, but is not limited to clearing, grading, and excavation, as well as building and reconstruction. Construction activity does not include routine maintenance to maintain original line and grade, hydraulic capacity, or original purpose of the facility.

Who Needs Coverage?

In California at this time, discharges of storm water associated with construction activities that result in the disturbance of five acres or more of total land are required to obtain coverage under the general permit. Construction activities disturbing less than five acres are also required to obtain coverage under the permit if they are part of a larger common plan of development or sale. Because of a recent court ruling, it is important to note that the current five acre exemption is subject to change.

Erosion - The Major Construction Concern

Natural erosion processes are greatly accelerated when protective ground cover is removed during construction activities. Studies reveal that the rate of erosion on land where construction activities are occurring is approximately 2,000 times greater than on timber land that has not been logged.

Erosion results in not only the loss of productive soil, which is essentially irreplaceable, but also in severe impacts to water quality. Twenty-one states, including California, report construction site runoff as a major cause of water quality impairment. "Clean sediment" alone is by definition, a pollutant because of its ability to degrade water quality. Although there are many water quality impacts associated with clean sediment, the two most important ones include: (1) increased turbidity and corresponding decreased light transmittance (resulting in reduced biological productivity and adverse effects on aesthetic value); and (2) direct suffocation of benthic (bottom dwelling) communities due to excessive sediment deposition. In addition to these problems, sediment also provides a major transport mechanism for countless other pollutants. First priority should be placed on soil stabilization and erosion prevention, not sediment interception.

Permit Requirements

The General Construction Storm Water Permit contains the same three requirements as the General Industrial Storm Water Permit (see discussion above).

Industries/Construction Are Subject To Municipal Regulation

There is a "double" system of regulation for industrial storm water which is discharged through municipal conveyance systems. Such discharges are regulated by both the statewide general permit (industrial or construction) issued to the discharger and by the municipality subject to the areawide Municipal Storm Water Permit. It is the Regional Board's responsibility to enforce the general permits and the areawide Municipal Storm Water Permit. It is the responsibility of the municipality to enforce its own ordinances. The statewide general permits (industrial and construction) specifically require dischargers to comply with the lawful requirements of local agencies regarding discharges to storm water conveyance systems within their jurisdiction.

Highway

HIGHWAY RUNOFF CONTROL PROGRAM

Cars, trucks, and other vehicles are the major contributors to highway runoff pollution. Landscaping, highway maintenance, and highway construction also contribute to highway runoff pollution (see Table 4-9). An essential component of the NPDES storm water program is the implementation of practices for maintaining

public highways that reduce impacts on receiving waters from highway runoff.

However, cities and counties (permittees) do not have jurisdiction over public highways controlled by the California Department of Transportation (Caltrans). To comply with the requirements of the NPDES storm water program, Caltrans must either actively participate as an entity in the Area Wide storm water program, or obtain a separate NPDES permit for storm water discharges for highways under its jurisdiction. Such a program for Caltrans shall include a Storm Water Management Plan which addresses the design, construction, and maintenance of highway facilities relative to reducing pollutants in highway discharges to the maximum extent practicable. The Plan shall include:

- a characterization of Caltrans highway systems, including pollutants, highway layout, and drainage control system in the area;
- a description of existing highway runoff control measures;
- a description of additional highway runoff control measures to enhance pollutant removal; and
- a plan for monitoring the effectiveness of control measures and highway runoff water quality and pollutant loads.

The highway runoff management plan shall specifically address litter control, proper pesticide/ herbicide management, reduction of direct discharges, reduction of runoff velocity, landscape over-watering, use of grassed channels, curb elimination, catch basin maintenance, appropriate street cleaning, establishing and maintaining vegetation, infiltration practices, and detention/ retention practices. Caltrans shall coordinate its urban runoff program with local agencies and existing programs related to the reduction of pollutants in highway runoff.

Table 4-9. Highway Runoff Constituents and their Primary Sources

CONSTITUENT	PRIMARY SOURCES
Particulates	Pavement wear, vehicles, maintenance
Nitrogen, Phosphorus	Atmosphere, roadside fertilizer application
Lead	Tire wear (lead oxide filler material, lubricating oil and grease, bearing wear)
Zinc	Tire wear (filler material), motor oil (stabilizing additive), grease
Iron	Auto body rust, steel highway structures (guard rails, bridges, etc.), moving engine parts
Copper	Metal plating, bearing and bushing wear, moving engine parts, brake lining wear, fungicides and insecticides
Cadmium	Tire wear (filler material), insecticide application
Chromium	Metal plating, moving engine parts, brake lining wear
Nickel	Diesel fuel and gasoline (exhaust), lubricating oil, metal plating, bushing wear, brake lining wear, asphalt paving
Manganese	Moving engine parts
Cyanide	Anticake compound used to keep deicing salt granular (ferric ferrocyanide, sodium ferrocyanide, yellow prussiate of soda)
Sodium, Calcium, Chloride	Deicing salts
Sulfate	Roadway beds, fuel, deicing salts
Petroleum	Spills, leaks or blow-by of motor lubricants, antifreeze and hydraulic fluids, asphalt surface leachate

COASTAL NONPOINT POLLUTION CONTROL PROGRAM

COASTAL ZONE ACT REAUTHORIZATION AMENDMENTS

Imperial Beach

In 1990, Congress amended the Coastal Zone Management Act (CZMA). The amendments are referred to as the Coastal Zone Act Reauthorization Amendments (CZARA). Section 6217, "Protecting Coastal Waters", of CZARA established the Coastal Nonpoint Pollution Control Program. Section 6217 of CZARA requires USEPA to develop, and states to implement, enforceable "management measures" (i.e., BMPs) to control nonpoint source pollution in coastal waters. The definition of the "coastal zone" in California was expanded to encompass the entire state.

Like the NPDES storm water permitting program, implementation of the Coastal Nonpoint Pollution Control Program is still evolving. As of the 1994 Basin Plan update, USEPA has published management measures, which are collectively referred to as the "(g) guidance", pursuant to section 6217(g) of the CZARA. There are six major categories of nonpoint sources addressed by the (g) guidance, including: agriculture sources, forestry, urban areas, marinas, hydromodification projects and wetlands.

The storm water NPDES permitting program under the Clean Water Act and the Coastal Nonpoint Pollution Control Program section under CZARA are intended to be complimentary but exclusive of each other. In other words, the Coastal Nonpoint Pollution Control Program applies only to nonpoint sources that are not currently regulated under an NPDES storm water permit. This includes all of the traditional non-urban nonpoint sources such as agriculture and silviculture and those urban sources which are not currently subject to the NPDES storm water permitting program. Examples of the latter in 1994 include some municipalities with populations under 100,000; construction sites disturbing less than 5 acres; and storm water discharges from wholesale, retail, service, or commercial activities.

The key concept is that all nonpoint pollution sources, both urban and non-urban (including those that become point sources), are currently subject to regulation under either the NPDES Storm Water Permitting Program required under section 402 (p) of the Clean Water Act or the Coastal Nonpoint Pollution Control Program required under section 6217 of the CZARA.

AGRICULTURE

In the San Diego Region, agriculture ranks as the forth largest industry in the economy and accounts for 1.7 percent of the Region's economy. The coastal and inland valley areas of the county possess a moderate and virtually frost-free climate able to support a variety of sub-tropical crops, making the San Diego area a unique agricultural region. The primary crops being grown for the national and international markets are avocados, citrus, cut flowers, and nursery products. To a lesser extent, local fresh market crops and livestock are produced in the area.

The San Diego County Water Authority (Authority) is the largest agricultural water consuming agency within Metropolitan Water District (MWD), requiring approximately 50 percent of MWD's total agricultural water supply each year. Agricultural water use within the Authority is concentrated mainly in north county agencies such as Rainbow MWD, Valley Center MWD, Fallbrook PUD and Yuima MWD.

Pursuant to the CZARA section 6217 (g), USEPA has identified management measures to protect coastal waters from sources of nonpoint pollution from agriculture. Specifically, the (g) Guidance for agriculture contains management measures to address erosion from cropland, applying nutrients to cropland, applying pesticides to cropland, confined animal facilities, land used for grazing, and cropland irrigation. The three most significant water quality impacts from agriculture in the San Diego Region are:

- erosion of agricultural soils;
- agricultural irrigation return water (salt loading and applied chemicals); and
- confined animal facilities.

Basic information on each impact is summarized below.

EROSION CONTROL

Erosion is a problem, not only in terms of the loss of agricultural production, but also because it degrades important aquatic habitat. Eroded soils can bury benthic communities, cover spawning grounds, destabilize channel banks and fill sensitive wetland areas. Furthermore, other pollutants are often bound to eroded soils. Under certain conditions, these pollutants may be remobilized into the water column causing problems for human health, wildlife, and aquatic resources.

The State and Regional Boards have adopted narrative standards that prohibit the impairment of aquatic habitat from erosion. However, no specific numeric standard limiting sediment loads has been established. Implementation of effective management practices to control erosion is typically accomplished through the combined efforts of several agencies working with landowners. Local Resource Conservation Districts, with technical assistance from the U.S. Soil Conservation Service, help landowners prevent erosion problems. The University of California, Agricultural Extension Service also assists in developing management practices and informing growers of optimum strategies for soil fertility and stabilization. Additionally, the U.S. Agricultural Stabilization and Conservation Service provides grants and low interest loans to farmers for improvements which retain valuable topsoil in cultivated areas.

AGRICULTURAL IRRIGATION RETURN WATER

Agricultural irrigation return water is the wastewater which runs off or leaches through an irrigated area. The two major concerns with agricultural irrigation return water are salt loading and the release of applied chemicals.

SALT LOADING

Since the water supply in the San Diego Region is generally quite high in salts and the climate is dry, irrigation with this relatively saline water causes salt accumulation in the soil. Crop roots absorb only essentially pure water while leaving dissolved salts behind. If these salts are not leached out by regularly applying more irrigation water than is needed for evapotranspiration, salts accumulate in the root zone and the land eventually becomes too salty for agriculture. However, the saline soils may be reclaimed by leaching. The percolation of the water used to leach salts from the soil can be a serious source of ground water degradation.

The actual effect of irrigation return water on ground water quality in the Region is difficult to determine without further study. The construction of irrigation return water drain tiles to collect and transport return flows is a possible remedial measure that could be implemented in certain portions of the Region. This has not been considered necessary to date and no plans for such construction are presently pending.

APPLIED CHEMICALS

Modern agriculture is based on the extensive use of applied chemicals such as fertilizers, pesticides, and herbicides to obtain high crop yields. The improper use of these applied chemicals may lead to serious degradation of both ground water and surface water quality. Some of the chemicals applied to farm land move down with deep-percolation water from crop root zones and can contaminate underlying ground water. Surface waters are primarily contaminated by the runoff of irrigated agriculture containing sediments, nutrients such as phosphorus and nitrogen, pesticides, and other pollutants.

The release of applied chemicals, into surface and ground waters can have adverse effects on the quality of those waters and the beneficial uses supported by them. Aquatic toxicity, as measured by toxicity bioassay tests, has been found in many waters within the State. The application of agricultural chemicals, in some cases, has been linked directly to this toxicity and is suspect in many other impaired waterbodies. In addition to degradation of the aquatic environment, the contamination of ground and surface waters by pesticides and

fertilizers is believed to also pose a threat to human health. Pesticides for example are known to bioaccumulate.

The Basin Plan contains a water quality objective requiring that all waters be maintained free of toxic substances in concentrations that are toxic to human, plant, animal, or aquatic life. The Basin Plan also contains a water quality objective for pesticides requiring that no individual pesticide or combination of pesticides be present in the water column, sediments, or biota at concentrations that adversely affect beneficial uses.

Although the Department of Pesticide Regulation (DPR) controls the application and use of agricultural pesticides, regulation of the quality of agricultural runoff waters is the responsibility of the State and regional boards. The regional boards have adopted water quality standards that apply to all surface waters of the State. Although standards for certain metals and some older pesticides have been adopted, standards for the majority of currently used agricultural chemicals do not exist. Generally, narrative standards which prohibit toxicity and degradation of waterbodies apply to agricultural discharges as do specific toxicity standards. To implement these standards, the regional boards have relied on a number of voluntary efforts and a concerted effort to educate growers on the need to protect waterbodies from the adverse effects of farm chemicals. The State Board also uses grant funds to support implementation of projects which demonstrate improved management practices.

In coordination with DPR, the regional boards have begun to put restrictions on the use of certain agricultural chemicals to address water quality problems. DPR has the responsibility to condition the use of any agricultural chemical to ensure its safe use. Where DPR has been convinced of the significant potential to cause environmental problems, it has established restrictions on the application, release, or timing of pesticide applications. DPR also encourages changes in formulations or in the combinations of pesticides applied in order to minimize water quality problems. An overall integrated pest management program for each agricultural site, rather than sole reliance on pesticides is needed.

There are other reasons to be concerned with the judicious use of agricultural chemicals (in addition to environmental issues). These interests are often concerned with questions of production and profit. To the extent that the application of agricultural chemicals are limited for cost control reasons, these concerns often result in benefits for water quality as well.

The narrative and/or numeric nutrient objectives presented in this Basin Plan are also applicable to irrigation return water. The State Board may require the use of pollutant control techniques to implement irrigation water management in its water rights permits or through Nonpoint Source Management Plan.

Irrigation water management may be implemented through reducing the use of fertilizers and pesticides to levels which minimize their presence in irrigation return water, as well as through the implementation of irrigation systems which reduce the volume of return water.

IRRIGATION WATER

In 1992, two laws were passed which require agricultural water suppliers delivering more than 50,000 AF/Y to prepare water management plans (CWC, sections 10800 and 10904). The plans are to focus on water conservation measures, improved irrigation efficiency, and environmental enhancement. The Department of Water Resources has established an advisory committee to review and study irrigation practices for these purposes. The implementation of conservation plans will likely have a side benefit of reduced erosion as irrigation efficiency improves.

Dairy

DAIRIES – CONFINED ANIMAL FACILITIES

Problems associated with dairy operations in the San Diego Region include ground water mineralization, the addition of nitrates to ground water, surface runoff of biodegradable and suspended material, nuisance odors, the addition of nutrients to adjacent surface water streams and other miscellaneous problems. All dairies in the Region are regulated under waste discharge requirements. These waste discharge requirements implement the regulations for confined animal facilities contained in CCR,

Title 23, Division 3, Chapter 15, Article 6, sections 2560-2565.

The major requirements contained in waste discharge requirements for dairies are as follows:

(1) Dairies must be designed and constructed to retain all facility wastewater generated, together with all precipitation on, and drainage through manured areas during a 25-year, 24-hour storm.

(2) All precipitation and surface drainage outside of manured areas, including that collected from roofed areas, and runoff from tributary areas during the storm events described in subsection (1) of this section, shall be diverted away from manured areas, unless such drainage is fully retained.

(3) Retention ponds and manured areas at dairies must be protected from inundation or washout by overflow from any stream channel during 20-year peak stream flows. Existing facilities that are protected against 100-year peak stream flows must continue to provide such protection.

(4) New facilities shall be protected against 100-year peak stream flows.

(5) Retention ponds shall be lined with or underlain by soils which contain at least 10 percent clay and not more than 10 percent gravel or artificial materials of equivalent impermeability.

(6) Facility wastewater, collected precipitation and drainage may be discharged to properly operated use or disposal fields or to wastewater treatment facilities approved by the Regional Board.

Regional Board Dairy Waste Management Policy (Resolution No. 87-71)

The Regional Board adopted Resolution No. 87-71, "A Resolution Adopting Amendments to the Comprehensive Water Quality Control Plan for the San Diego Region" (Regional Board Dairy Waste Management Policy) on November 16, 1987. On March 17, 1988, the State Board adopted Resolution No. 88-35 approving the Regional Board Dairy Waste Management Policy with a few minor changes. The Regional Board Dairy policy contained in Resolution No. 87-71 is incorporated below; accordingly Resolution No. 87-71 is superseded.

The Regional Board regulatory program on dairy waste disposal is designed to be a part of the Basin Plan. The program is based upon the following principles to ensure that the goals of the Basin Plan are implemented:

(1) The Regional Board is committed to the reasonable protection of present and future beneficial uses of ground water.

(2) Coordination among state, federal, and local agricultural and regulatory agencies, the dairy industry, local planning and land-use agencies is necessary to resolve potential water quality problems associated with dairies.

(3) Cooperation between this Regional Board and the dairy industry is required when developing and implementing measures to achieve conformance with the Basin Plan ground water objectives.

(4) Comprehensive assessments of salt loading on the ground water basins in the San Diego Region are necessary to develop reasonable and cost effective water quality protection measures for all nonpoint and point sources of waste.

(5) An interim dairy wasteload regulatory program is necessary until the assessment studies noted in Principle 4 are completed. The interim program should provide a simple, region-wide approach to controlling dairy wasteloads, that may be reviewed on a case-by-case basis if necessary. The program should be easy to understand, easy to implement and enforce and provide greater protection of water quality than present practices.

As part of an overall program of dairy waste management, the following measures shall be implemented:

(1) The Regional Board shall continue to enforce all State and Federal water quality laws, and regulations regarding dairy waste treatment and disposal, including Chapter 15, Title 23 CCR and USEPA Effluent Guidelines and Standards for

feedlots point source category (40 CFR 412).

(2) The Regional Board shall continue to seek funding to conduct the necessary studies and develop computer models to provide an accurate assessment of existing and projected wasteloads in the various ground water basins.

(3) Based upon the results of the studies described in item 2, the Regional Board will revise Basin Plan ground water objectives if warranted and specify or revise wasteload limits that will be appropriate for the point and nonpoint sources of waste, including dairies if necessary.

(4) For an interim period, until the necessary ground water assimilative capacity and wasteload assessment studies are completed, the Regional Board shall limit the disposal of corral manure to dairy disposal land to no more than 3 tons dry weight or 10 cubic yards per acre per year, and to cropland where crops are grown and harvested twice annually, to no more than 12 tons dry weight per acre per year. The Regional Board shall consider manure application higher than the 12 tons per acre per year limit upon demonstration that the crops require the increased manure loadings.

(5) The U.S. Department of Agriculture, Soil Conservation Service, University of California at Riverside, the State and County Departments of Agriculture and other governmental and educational institutions are encouraged to provide dairy operators with the latest technical information regarding waste disposal practices that would result in additional water quality protection.

(6) The local land use and planning agencies are encouraged to conduct long-term planning for addressing water quality issues of new and expanded dairies in the region. The dairy industry is encouraged to provide accurate five-year projections of dairy herds at existing dairies and potential locations for new dairies to the planning agencies and to the Regional Board, so that the Board may include the required Basin Plan studies as part of the Board's triennial review process.

(7) The Regional Board will continue to obtain and review technical information regarding the hydrologic basins and to recommend the update of Basin Plan standards if warranted.

(8) The Regional Board encourages the implementation of water conservation measures at dairies, and the beneficial reuse of dairy farm wastewater that would replace the use of imported water.

EROSION AND SEDIMENT CONTROL

Currently erosion and sediment control is accomplished primarily by way of the municipal and construction storm water permits (see previous discussion).

In 1987, the San Diego Regional Water Quality Control Board implemented a policy for the control of human induced erosion and sedimentation. This policy is presented below. The Regional Board deferred the implementation of regulatory programs for erosion and sedimentation control to local government agencies. The local Resource Conservation Districts have agreements with the Regional Board regarding erosion and sediment control.

Santa Margarita River

Soil erosion resulting from a wide variety of causes, including construction, hillside cultivation and other agricultural activities, non-maintained roads, and off road vehicles may result in serious water quality impacts. The goal of the policy is the protection of water quality through the reduction and prevention of accelerated (man-caused) erosion to the level necessary to restore and protect beneficial uses of receiving waters now significantly impaired or threatened by impairment due to sedimentation through the implementation of

the Best Soil Management Practices (BMPs). Construction sites can contribute runoff into storm drains at rates 100 to 2,000 times greater than non-developed sites, due to the large amounts of soil that are usually uncovered. Property owners are held responsible for all activities and practices that may cause an adverse impact on water quality due to waste discharges and surface runoff from their lands.

Sediment and erosion control is particularly important in areas with, or that drain into, delicate habitats such as lagoons, floodplains and some waterways. Lagoons are particularly sensitive to influx of silts and nutrients, which may cause severe turbidity and eutrophication problems. Severe amounts of silt may cause a lagoon to eventually become infilled. Siltation also damages tributaries and riparian corridors leading to the lagoons.

Poor agricultural grading practices may cause significant erosion of the soil, causing heavy sediment, nutrient and possibly herbicide and pesticide runoff loads to be discharged into nearby surface waters.

In most cases, the adverse results of man's activities can be reduced and in some instances eliminated through the use of both structural and non-structural measures of various types that are properly employed at the appropriate time. The high cost of lost resources, resource replenishment and after-the-fact repair and maintenance make both pre-project erosion control planning and preventive maintenance necessary.

EROSION AND SEDIMENT CONTROL PROGRAM (RESOLUTION NO. 87-91)

Regional Board Resolution No. 87-91 entitled, "A Resolution Adopting Amendments to the Comprehensive Water Quality Control Plan for the San Diego Region" (Erosion and Sediment Control Program) was adopted on December 21, 1987. The Regional Board Erosion and Sediment Control Program contained in Resolution No. 87-91 is incorporated below; accordingly Resolution No. 87-91 is superseded.

GOAL OF PROGRAM

The goal of the Regional Board's erosion control program is the protection of water quality through the reduction and prevention of accelerated (man-caused) erosion to the level necessary to restore and protect beneficial uses of receiving waters now significantly impaired, or threatened by impairment, by sediment.

MANAGEMENT PRINCIPLES

(1) Property owners are considered ultimately responsible for all activities and practices that could result in adverse affects on water quality from waste discharges and from surface runoff.

(2) Local units of government should have the lead role in controlling land use and construction activities that cause erosion and may, as necessary, impose further conditions, restrictions, or limitations on waste disposal and other activities that might degrade the quality of waters of the State.

(3) BMPs should be implemented to reduce erosion and sedimentation and minimize adverse affects on water quality.

REGIONAL BOARD IMPLEMENTATION MEASURES

(1) Local governments shall be encouraged to develop effective erosion and sedimentation control ordinances and regulatory programs that are at least equivalent to the model ordinance in the "Erosion and Sediment Control Handbook" published by the California Department of Conservation, May 1981.

(2) If necessary, a Memorandum of Understanding (MOU) or Management Agreement could be adopted to more clearly define the cooperative roles between the local units of government and the Regional Board.

(3) The Regional Board may participate with other concerned agencies such as the California Department of Fish and Game, the Resource Conservation Districts, the various lagoon foundations, etc., to identify watersheds, coastal lagoons and estuaries

with critical erosion and sediment problems. The Regional Board may assist in the assessment of such problems and causes, and assist in the development of alternative measures to prevent future problems.

(4) As time and resources permit, the Regional Board will review existing local grading ordinances to determine the adequacy of the ordinances to provide effective erosion control. The Regional Board may then recommend specific improvements to the ordinances for consideration by the local agencies. If necessary, the Regional Board may request a report on the implementation of the Board's recommendation.

(5) If necessary, the Regional Board may request periodic status reports of construction and grading activities from local agencies to determine the effectiveness and potential problems with the implementation of local erosion and sediment control program.

(6) The Regional Board shall encourage the Resource Conservation Districts to review and update if necessary, their erosion control ordinances in order to develop more effective programs for erosion and sediment control for agricultural activities. Local units of government are encouraged to take a more active role in addressing erosion problems from agricultural activities.

THE ELSINORE-MURRIETA-ANZA RESOURCE CONSERVATION DISTRICT SEDIMENT CONTROL ORDINANCE (RESOLUTION NO. 79-25) AND THE RESOURCE CONSERVATION DISTRICTS OF SAN DIEGO COUNTY EROSION AND SEDIMENT CONTROL POLICY (RESOLUTION NO. 92-21)

The Elsinore-Murrieta-Anza Resource Conservation District and the Resource Conservation Districts (RCDs) of San Diego County were established to provide for the conservation of soil and water resources and for the prevention and control of soil erosion and sediment damage due to agricultural and other land use activities.

The RCDs establish guidelines for land management programs by adopting BMPs such as those presented in the Soil Conservation Service Technical Guide covering San Diego County. Currently, farmers and other land owners contact the RCDs on a voluntary basis for assistance in developing individual erosion and sediment control programs which conform to the BMPs.

In order to assure that all farmers and other land owners operate under the Resource Conservation Districts BMP guidelines, and to better address the existing and potential water pollution problems caused by agriculture and other land uses, the RCDs have adopted sediment control ordinances and policies (e.g., Elsinore-Murrieta-Anza Resource Conservation District Sediment Control Ordinance and the Resource Conservation Districts of San Diego County Erosion and Sediment Control Policy). These documents formally adopt the Soil Conservation Service's BMPs and define the existing and expanded functions and responsibilities of the RCDs. These documents also suggest means by which the California Regional Water Quality Control Board, San Diego Region, can assist the RCDs in implementation of the policy.

The Resource Conservation District Sediment Control Ordinance, and the Erosion and Sediment Control Policy establish the duties of the Regional Board and the RCD's as outlined below. The Resource Conservation Districts will implement these documents as follows:

(1) Continue to assist farmers and other land owners in establishing management programs which comply with BMPs.

(2) Authorize any of its directors to file a formal complaint against any person who is causing or permitting any accelerated erosion and sediment damage.

(3) Take action against any person causing or permitting any accelerated erosion and sediment damage.

(A) Receive complaints from RCD directors, land occupiers, or city, state and county officials responsible for the maintenance of water quality in the jurisdictions.

(B) Conduct hearings of the Resource Conservation District Board of Directors

on complaints. If the complaint is valid, the "land disturber" is allowed two months to develop and implement a voluntary conservation plan.

(C) Request action by the Regional Board if compliance schedules are not followed or if further noncompliance occurs, when such noncompliance results in the intentional or negligent discharge or deposition of any waste where it is, or probably will be discharged into the waters of the state or creates or threatens to create a condition of pollution or nuisance.

The Regional Board will assist the Resource Conservation Districts in implementing the Erosion and Sediment Control Policy by doing the following:

(1) Inform the appropriate RCD of instances when the staff of the Regional Board finds that accelerated erosion damage has occurred or is likely to occur as a result of violations of the BMP guidelines.

(2) Receive requests for action on complaints from the RCDs when compliance schedules have not been met or when further noncompliance has occurred, and consider appropriate enforcement action pursuant to section 13304 (a) of the Porter-Cologne Water Quality Control Act.

RESOURCE EXTRACTION

SAND, GRAVEL AND RELATED OPERATIONS

The sand and gravel related processing industry represents one of the largest single classes of industry in the San Diego Region. Construction activities in the Region will require a continuing need for sand and gravel products. The industry can generally be classified as follows:

- Sand and gravel processing (including rock crushing);
- Concrete batching;
- Asphalt batching;
- Asphalt product manufacturing;
- Concrete product manufacturing; and
- Clay and clay product processing.

The largest volume of waste from sand and gravel processing operations results from product washing. Many of the sedimentary deposits mined for sand and gravel in the San Diego Region contain a high percentage of silt and clay. Extensive washing is required to remove the fine material. Other waste includes cement truck wash water, sediment separated from the wash water, and rejected product (broken brick, block, pipe etc).

Recycled wash waters are discharged to storage ponds and can contain high concentrations of total dissolved solids because of evaporation and leaching from product materials. The percolation of these recycled waters can adversely affect ground water quality. It is recognized that the permeability of the ponds receiving the wash waters is low because of the sealing effects of silts and clay sediments in the wash water. Sediment and wash water discharged to surface waters can adversely affect aquatic life through sediment deposition and increases in turbidity.

Many sand and gravel operations are regulated with waste discharge requirements (WDR). The waste discharge requirements prohibit the discharge of sand and gravel wash water to surface waters. The requirements also require that waste holding ponds have 100-year frequency flood protection. Resolution No. 83-21 entitled, "A Resolution Conditionally Waiving Adoption of Waste Discharge Requirements for Certain Specific Types of Discharges" conditionally waives WDRs for sand and gravel mining operations not conducted in flowing streams. Sand and gravel mining operations are subject to regulation under section 404 of the Clean Water Act. Before a section 404 permit can be obtained, the discharger must obtain water quality certification pursuant to section 401 of the Clean Water Act. See previous discussion of Water Quality Certification (section 401).

Many mining operations are subject to California's Surface Mining and Reclamation Act (SMARA) of 1975 and the federal Surface Mining Control and Reclamation Act (SMCRA) of 1977. These laws, which have similar provisions, require reclamation of mined lands in order to protect public health and safety and to prevent or minimize adverse environmental effects such as water quality degradation, flooding, erosion, and sedimentation. Additionally, SMCRA requires mine operators to establish baseline hydrologic

conditions; in the event that adjacent waters are contaminated, diminished, or interrupted, SMCRA further requires mine operators to replace the water supply.

Under SMARA regulations (California Public Resources Code (section 3505, Article 1), mining operators must:

- Control soil erosion by minimizing removal of vegetation and overburden, managing stockpiles, and constructing erosion control facilities;

- Control water quality by constructing settling ponds and basins and conducting operations in such a way as to prevent siltation of ground water recharge areas;

- Protect fish and wildlife habitat by taking "reasonable measures";

- Protect natural drainage ways by proper placement and control of mine waste rock and overburden piles or dumps; and

- Control erosion and drainage by grading and revegetation, and construction of basins to impound surface runoff, and protection of spillways from erosion.

FLOOD CONTROL

In a natural setting, the dynamic nature of water creates an ever changing stream channel within the floodplain. In the San Diego Region, where rainfall is extremely variable, flood plains which appear to be dry one year, may contain tremendous torrents the following year. Sometimes the dry appearance of the flood plain has made people mistakenly think flood waters do not occur there. The dry appearance of a portion of the flood plain is deceptive. Floods are a natural part of any flood plain. Flood plains cannot be fully protected against floods.
In the past, developments clustered near or within the flood plain. Flood control channels were constructed to protect these properties. Flood control channels were built to constrict the flood plain and to allow maximum development on adjacent lands. These developments increased the amount of impervious area (roads, buildings, parking lots and other structures) and increased local storm runoff. Storm water, which prior to development would have been absorbed into the soil, instead filled local storm drains. Thus, the precipitation which might at one time have caused local flooding caused intensified downstream flooding.

Today, many flood plains have been channelized to protect property. There are a variety of channel designs which have been built. Channel designs vary in range from completely natural to entirely concrete lined with concrete bottoms. Other channel types include natural channels modified to contain a low-flow channel with or without side filling or riprap or concrete; and with or without encroachment by agriculture and/or urban areas.

Rose Canyon Creek

IMPACTS OF CHANNELIZATION

To the degree that a natural watercourse is channelized, the negative impacts to the watershed are increased. The following impacts occur with channelization:

(1) Channel modification and channelization of streams induces changes in land use practices. The resulting change in land use practices often results in detrimental changes to surface water quality.

(2) With future increases in the urbanization of an area, the impervious area increases, contributing additional storm water runoff. Flood channels were built to contain a certain design flow and the design flow can be exceeded by additional storm water runoff.

(3) As the flood plain is constricted and confined within a channel, the potential damage from storm runoff is increased.

(4) Channelization reduces ground water recharge.

(5) Impervious channels designed to remove the runoff quickly also transport pollutants down the flood control system just as quickly. Most of the surface water runoff from urban areas flows into flood control channels without any mechanism to control the input of toxics.

(6) Channelization results in the direct loss of instream habitat. Fish and other aquatic life are totally dependent upon the surface waters within floodplains.

(7) Channelization results in the loss of riparian habitat.

(8) Channelization causes an increase in ambient stream temperatures within and downstream from the channelized section. The rise in stream temperature may degrade the habitat for aquatic life.

(9) The loss of riparian areas through channelization results in the loss of wildlife. Riparian areas are the most important habitat for the majority of western wildlife species, and are essential for many wildlife species.

(10) Loss of riparian areas results in a loss of the buffering capacity of the riparian vegetation to moderate flows.

(11) Loss of the riparian areas results in a loss of the natural filtering capacity that these areas provide. The natural filtering capacity of riparian areas reduces the concentration of potentially toxic constituents in storm water runoff. Riparian areas provide an improvement in the quality of water produced from the watershed.

(12) Stream and riparian habitats are needed to provide corridors for fish and wildlife resources. A highly modified concrete channel may not allow for fish or wildlife passage. Even a limited section of concrete channel can disconnect habitats. The separation of habitats reduces the viability of fish and wildlife populations.

CONCLUSION

Channel modifications need to be evaluated for their ultimate consequences for the watershed. In California's past there was inadequate consideration towards the retention of wetlands, riparian systems, and natural flood plains. The economic assessment of flood control alternatives should consider any proposed project in its entirety. Wetlands, riparian systems and natural flood plains accommodate natural stream meandering, aggradation, degradation and overbank flow better than those lands directly encroached upon by development.

Consideration and utilization of methods to reduce storm water runoff and allow infiltration and percolation of storm waters are needed. Methods should include minimizing the further construction of flood control channels, particularly concrete channels, and the retention of riparian areas within floodplains. Riparian areas within flood plains need to be protected in order to allow the natural filtering capacity of the riparian area to improve the quality of storm water produced from the watershed; and to preserve alluvial percolation capacity and aquatic habitat values. When possible riparian areas need to be restored.

Riparian and stream habitats provide natural beauty which is appreciated and valued by people. Riparian and stream habitats, especially in urban areas, are vital to enhancing our quality of life. People are far more likely to respect and be stewards of "natural" reaches of streams than channelized or artificially modified reaches. Riparian lands represent a significant value to society.

Noble Canyon Creek

FUTURE DIRECTION: WATERSHED - BASED WATER QUALITY CONTROL

The concept of comprehensive watershed level management of water resources is currently being incorporated into various elements of the State's Nonpoint Source Management Program. The watershed protection approach is an integrated strategy for more effectively protecting and restoring beneficial uses of state waters. By looking at an entire watershed, one can more clearly identify critical areas and practices which need to be targeted for pollution prevention and corrective actions. This approach not only addresses the waterbody itself, but the geographic area which drains to the watercourse. This strategy also integrates both surface and ground waters, inland and coastal waters, and point and nonpoint sources of pollution. Point sources have received most of the regulatory attention in the past, however, significant improvements in point sources, coupled with continued water quality impairments, have necessitated that the water resources community look at a more integrated approach which considers impacts from both point and nonpoint sources of pollutants.

The Watershed Protection Approach is built on the following three main principles:

- The target watersheds should be those where pollution poses the greatest risk to human health, ecological resources, desirable uses of the water, or a combination of these;

- All parties with a stake in the specific local situation should participate in the analysis of the problems and the creation of solutions; and

- The actions undertaken should draw on the full range of methods and tools available, integrating them into a coordinated, multi-organizational attack on the problems.

Many agencies and organizations concerned with water resources have come to recognize that this type of approach can be very effective in realistically assessing cumulative impacts and formulating workable mitigation strategies. The CZARA, USEPA guidance, and various legislative proposals clearly state the need to consider the implications of land use on water quality. USEPA program managers are re-thinking their approach to the allocation of resources (especially within the Nonpoint Source Program) and will be primarily funding studies that are part of a watershed planning and implementation effort.

The traditional approach to managing pollutant discharges into streams, lakes, and the ocean has evolved over time, often with separate programs to address various aspects of the total water quality problem. Some of these programs have different, overlapping, or conflicting priorities. Moving from the more facility-specific controls of the past to management of water quality on a watershed basis, will entail some growing pains. Many of the programs at our disposal will need to be reshaped and integrated at the watershed level. Some programs will need to be reoriented and integrated, while other programs may not be amenable to the watershed approach. Nonetheless, public agencies and private organizations concerned with water resources have come to recognize that a comprehensive evaluation of pollutant contributions on a watershed scale is the only way to realistically assess cumulative impacts and formulate workable strategies to truly protect our water resources. Both water pollution and habitat degradation problems can best be solved by following a basin-wide approach.

REMEDIATION OF POLLUTION

Underground storage tank

The Regional Board allocates substantial resources to the investigation of polluted waters and enforcement of corrective actions needed to restore water quality. Specific remediation programs include:

- Underground Storage Tanks Program including the Local Oversight Program;

- Spills, Leaks, Investigation and Cleanup Program (SLIC);

- Aboveground Petroleum Storage Tank Program; and

- DoD Site Investigations.

The Regional Board sets cleanup goals based on the State's Antidegradation Policy set forth in State Board Resolution No. 68-16 and Resolution No. 92-49 Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under Water Code section 13304 and the Cleanup and Abatement Policy discussed later in this chapter. Under these policies, whenever the existing quality of water is better than that needed to protect present and potential beneficial uses, such existing quality will be maintained, with certain exceptions (as described in Chapter 5, Plans and Policies). Accordingly, the Regional Board prescribes cleanup goals that are based upon background concentrations. For those cases where dischargers have demonstrated that cleanup goals based on background concentrations cannot be attained due to technological and economic limitations, the Antidegradation Policy sets forth policy for cleanup and abatement based on the protection of beneficial uses. The Regional Board can, on a case-by-case basis, set cleanup goals as close to background as technologically and economically feasible. Such goals must at a minimum, restore and protect all designated beneficial uses of the waters.

Furthermore, such cleanup levels cannot result in water quality less than that prescribed in the Basin Plan and policies adopted by the State and Regional Board, and must be consistent with maximum benefit to the people of the State.

Naval Base Pont Loma (submarine facility)
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UNDERGROUND STORAGE TANKS

The Underground Storage Tank Program was enacted in 1983 and took effect January 1, 1984. The authority for the program is found in the Health and Safety Code, Division 20, Chapter 6.7, and the regulations for the program are found in the CCR, Title 23, Division 3, Chapter 16. The regulations are designed to ensure the integrity of all underground storage tanks (UST), and to detect any leaks.

There are approximately 2,000 known cases of leaking underground storage tanks in the Region. Approximately 35 percent of the cases involve instances where only soil contamination is present, 35 percent involve instances where ground water contamination has been confirmed, and the remaining 30 percent are cases which have been closed. The majority of the releases from these underground storage tanks are gasoline and the constituent of most concern is benzene, a known carcinogen. A smaller percentage of the underground storage tank releases involve chlorinated industrial solvents, which are suspected carcinogens. As anticipated, the majority of the sites where these releases have occurred are automotive service stations. Tanks from industrial facilities contribute a smaller but significant minority. To date, these ground water impacts have affected only a few drinking water supply wells. The Regional Board maintains and regularly updates the Leaking Underground Storage Tank Information System (LUSTIS) database, which identifies all known underground storage tank release sites in the Region.

Implementation of the underground storage tank program includes direct Regional Board oversight of leaking underground storage tank cleanups. It also involves coordination of oversight activities with local agencies under contract with the State Board through the Local Oversight Program. Local agencies have the authority, pursuant to section 25297.1 of the Health and Safety Code to act on behalf of the Regional Board in requiring investigations and cleanup of underground tank cases. The local agencies also implement the permitting, construction, inspections and monitoring portion of the Underground Tank Regulations. The Orange County Health Care Agency, the County of Riverside Department of Environmental Health and San Diego County Department of Health Services, Environmental Health Services handle the vast majority of the active cases in the Region.

Title 23, Division 3, Chapter 16, Article 11 provides that corrective action of releases from

underground storage tanks includes one or more of the following phases:

- Preliminary Site Assessment Phase: This includes, at a minimum, initial site investigation, initial abatement actions and initial site characterization.

- Soil and Water Investigation Phase: This includes the collection and analysis of data necessary to assess the nature and vertical and lateral extent of the unauthorized release to determine a cost-effective method of cleanup.

- Corrective Action Plan Implementation Phase: This consists of carrying out the cost-effective alternative selected during the Soil and Water Investigation Phase for remediation or mitigation of the actual or potential adverse effects of the unauthorized release.

- Verification Monitoring Phase: This includes all activities required to verify implementation of the Corrective Action Plan and evaluate its effectiveness.

Cleanup levels for soil and ground water pollution resulting from leaking underground storage tanks will be established based on the Cleanup and Abatement Policy described later in this chapter.

UNDERGROUND STORAGE TANK CLEANUP FUND

The State Board, Division of Clean Water Programs, administers the Underground Storage Tank Cleanup Fund. The Cleanup Fund can be used as a mechanism to satisfy federal financial responsibility requirements and pay for corrective action and third party liability costs resulting from a leaking petroleum underground storage tank. The Fund can also pay for direct cleanup (by local agency or regional board) of underground storage tank sites requiring emergency and prompt action on abandoned or recalcitrant sites. This Fund, collected by the Board of Equalization, is supported by a 0.6 cent per gallon fee for gasoline. The Fund has been established to provide reimbursement to tank owners or operators for costs of cleanup of the effects of unauthorized releases of petroleum. Up to one million dollars ($1,000,000) can be provided per site, with the first ten thousand dollars ($10,000) being provided by the claimant. With certain qualifications, expenditures made to remediate an unauthorized petroleum release since January 1, 1988 can be reimbursed and letters of credit can be issued for the funding of ongoing remediation activities.

Owners/ operators of petroleum USTs as defined in section 25281(x) of the California Health and Safety Code and owners of petroleum USTs located on residential property who meet the following requirements are eligible for the fund:

- There has been an unauthorized release of petroleum from the UST reported to and confirmed by the regulatory agency.

- As a result of this unauthorized release, the owner/ operator must take corrective action as required by a regulatory agency.

- The owner/ operator must be in compliance with any applicable financial responsibility requirements and any UST requirements.

Regional boards provide technical support to both applicants who file claims against the underground storage tank Cleanup Fund and State Board staff members who verify the corrective action work that the claims cover. For claims that involve future work, the Regional Board will oversee site investigation and cleanup on cases for which they are the lead agency.

SPILLS, LEAKS, INVESTIGATION AND CLEANUP

Reports of unauthorized discharges, such as spills and leaks from above ground storage tanks are investigated through the Regional Board's Spills, Leaks, Investigation and Cleanup (SLIC) Program. This program is not restricted to particular pollutants or environments; rather, the program covers all types of pollutants (such as solvents, petroleum fuels, and heavy metals) and all environments (including surface and ground water, and the vadose zone). Upon confirming that an unauthorized discharge is polluting or threatens to pollute regional waterbodies, the Regional Board oversees site investigation and corrective action. Statutory authority for the program is derived from the Water Code, Division 7, section 13304. Guidelines for site investigation and remediation are promulgated in State Board Resolution No. 92-49 as amended on April 21, 1994

entitled "Policies and Procedures For Investigation and Cleanup and Abatement of Discharges Under Water Code Section 13304". Cleanup levels for soil and ground water pollution resulting from sites investigated through the SLIC Program will be established based on the Cleanup and Abatement Policy described later in this chapter.

ABOVEGROUND PETROLEUM STORAGE TANKS

In order to prevent unauthorized discharges from aboveground petroleum storage tanks, the State of California has enacted legislation designed to lower the risk of spills and leaks. The state's Aboveground Petroleum Storage Act was enacted in 1989 and amended in 1991. The Act became effective on January 1, 1990 (Health and Safety Code, Chapter 6.67, section 25270 et. seq.) The Act requires owners or operators of above ground petroleum storage tanks to file a storage statement with the State Board and implement spill prevention measures. Examples of such measures include daily visual inspections of any storage tanks containing crude oil or its fractions, the installation of secondary containment for all tanks with sufficient capacity to hold the contents of the largest tank at the facility plus sufficient volume for rainfall to avoid the overflow, and development of a "Spill Prevention Control and Countermeasure Plan." In the event of an unauthorized release, the owner or operator must notify the Regional Board officials and undertake appropriate monitoring and corrective action. Additionally, annual fees are levied on tank owners. The Regional Board uses these fees to fund aboveground petroleum tank inspections and enforcement.

DEPARTMENT OF DEFENSE FACILITIES

There are twenty-two major Department of Defense (DoD) facilities in the San Diego Region. The following is a list of DoD facilities and the corresponding lead agency for the facility in the Region.

Department of Defense Facility	Lead Agency
United States Marine Corps Base, Camp Pendleton	USEPA
Coronado Navy Amphibious Base	DTSC
Imperial Beach Auxiliary Landing Field	DTSC
Naval Air Station Miramar	DTSC
North Island Naval Aviation Depot	DTSC
Naval Air Station North Island	DTSC
San Diego Fleet Anti-Submarine Warfare Training Center	DTSC
San Diego Fleet Combat Training Center	DTSC
Marine Corp Recruit Depot, San Diego	DTSC
Naval Command, Control and Ocean Surveillance Center	DTSC
San Diego Naval Computer and Telecommunications Station	DTSC
San Diego Naval Electronics Systems Engineering Center	DTSC
San Diego Naval Hospital	DTSC
32 Street Naval Station, San Diego	DTSC
Naval Submarine Base, San Diego	DTSC
Fleet Industrial Supply Center	DTSC
San Diego Naval Training Center	DTSC
San Diego Public Works Center	DTSC
San Diego Shore Intermediate Maintenance Activity	DTSC
Air Force Plant # 19, San Diego	DTSC
Fallbrook Naval Weapons Station	DTSC
Search, Evade, Resist, Escape Camp, Warner Springs	DTSC

Significant ground water contamination has been detected at a number of these facilities. Contamination is severe enough at one of these facilities to have it placed on USEPA's National Priorities List (NPL) for remediation under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, commonly referred to as Superfund).

For the National Priority List facility (Camp Pendleton), the USEPA is the lead environmental regulatory agency for oversight of investigation and cleanup. CERCLA requires USEPA to consider applicable or relevant and appropriate state laws and regulations when establishing cleanup standards for remedial activities. To ensure that the state's concerns are properly addressed, two Cal-EPA agencies, the Regional Board and the Department of Toxic Substances Control (DTSC), also perform a significant oversight role in the investigations and cleanup of these facilities.

The USEPA, DoD, DTSC and the Regional Board have signed Federal Facility Agreements (FFA) for the National Priorities List facility. The intent of the FFA is to ensure that: (1) environmental impacts are investigated; (2) remedial actions are defined; (3) procedural framework or schedules are established; (4) cooperation among agencies is facilitated; (5) adequate assessment is performed; and (6) compromise is reached.

The USEPA is not involved in the investigation and cleanup of DoD facilities that are not on the National Priority List (DoD facilities other than Camp Pendleton). However, many of the facilities potentially have significant contamination. In these cases, the Regional Board and DTSC enter into Federal Facility Site Remediation Agreements (FFSRA) with DoD. Federal Facility Site Remediation Agreements are very similar to the above-mentioned Federal Facility Agreements, with the exception that USEPA is not a party.

In the table above showing the DoD in the San Diego Region, the DTSC has been identified as the "lead" agency, and the Regional Board is the "support" agency. A Memorandum of Understanding has been signed by the State Board and DTSC which describes the roles of each agency. The Regional Board's oversight role is with regard to the investigation and cleanup of water resources that have been impacted, or are threatened, by waste discharges from the facilities. The Regional Board's responsibility also extends to source areas (landfills, contaminated soil, etc.) that currently, or may in the future, pose a threat to water quality. DTSC's role is to address all other environmental aspects including health risk assessment, air emissions, community relations, etc.

The State Board and DTSC have entered into a two-year cooperative agreement with the DoD for cleanup and oversight reimbursement. All work performed by the State agencies with regard to the investigation and cleanup of environmental problems at these facilities is fully reimbursed by DoD.

Cleanup levels for soil and ground water pollution resulting from DoD facilities will be established based on the Cleanup and Abatement Policy described later in this chapter.

CLEANUP AND ABATEMENT POLICY

I. CONTAMINATED SOIL AND GROUND WATER

The Regional Board has identified numerous sites where unauthorized waste discharges have resulted in soil and ground water pollution. The majority of these sites have been identified as a result of the Regional Board's implementation of the remediation programs described previously in this Chapter. The unauthorized waste discharges at many of these sites have resulted in adverse effects on water quality and beneficial uses. In some cases the polluted sites pose a threat to the public health. It is the responsibility of the Regional Board to establish cleanup and abatement goals and objectives for the protection of water quality and the beneficial uses of waters of the state in this Region which are consistent with applicable state and federal statutes and regulations.

Water Code section 13304 authorizes the Regional Board to require cleanup and abatement of soil and ground water pollution. The Cleanup and Abatement Policy described below shall apply to all types of discharges subject to Water Code section 13304.

II. PURPOSE OF POLICY

The purpose of this Cleanup and Abatement Policy is to provide:

A. Guidance to dischargers involved in the investigation, cleanup and abatement of soil and ground water pollution sites to ensure these activities are in conformance with applicable state and federal laws, regulations and policies;

B. Guidance to dischargers on Regional Board methodology for determining cleanup levels at soil and ground water pollution sites; and

C. Consistency and uniformity in Regional Board requirements for investigation, cleanup and abatement of analogous discharges that involve similar wastes, site characteristics, and water quality considerations.

III. CLEANUP AND ABATEMENT PRINCIPLES

A. The Cleanup and Abatement Policy is guided on the following principles, which are based on Water Code sections 13000 and 13304, CCR, Title 23, Division 3, Chapter 15 (hereinafter Chapter 15), CCR, Title 23, Division 3, Chapter 16 (hereinafter Chapter 16), and applicable State Board policies. The Regional Board shall require:

1. Cleanup and abatement actions to conform with the provisions of State Board Resolution No. 68-16 (Statement of Policy with Respect to Maintaining High Quality Waters in California) provided that under no circumstances shall these provisions be interpreted to require cleanup and abatement which achieves water quality conditions that are better than "natural" background conditions.

2. Cleanup and abatement actions to conform with the provisions of State Board Resolution No. 92-49, Policies and Procedures for Investigation and Cleanup and Abatement of Discharges under Water Code section 13304;

3. Cleanup and abatement actions to conform with applicable or relevant provisions of Chapter 15 to the extent feasible;

4. Cleanup and abatement actions to implement the applicable provisions of Chapter 16 for investigations and cleanup of hazardous substances from underground storage tanks; and
5. Dischargers to cleanup and abate the effects of discharges in a manner that promotes attainment of either background water quality, or the best water quality which is reasonable if background levels of water quality cannot be restored, considering all demands being made and to be made on those waters and the total values involved, beneficial and detrimental, economic and social, tangible and intangible. Any alternative cleanup levels less stringent than background shall apply section 2550.4 of Chapter 15, or, for cleanup and abatement associated with underground storage tanks, apply section 2725 of Chapter 16, provided that the Regional Board considers the conditions set forth in section 2550.4 of Chapter 15 in setting alternative cleanup levels pursuant to section 2725 of Chapter 16. Any such alternative cleanup level shall:

   a. Be consistent with maximum benefit to the people of the State;

   b. Not unreasonably affect present and anticipated beneficial use of such water; and

   c. Not result in water quality less than prescribed in the Water Quality Control Plans and Policies adopted by the State and this Regional Board.

IV. CLEANUP AND ABATEMENT INVESTIGATIONS

A. The Regional Board shall apply the guidelines described in IV.B. below in overseeing investigations to determine the nature and extent of a discharge and appropriate cleanup and abatement measures. The level and complexity of the investigations, assessments, and feasibility studies of cleanup and abatement alternatives required below shall be determined by the discharge type, the extent of pollution, and any other applicable site-specific characteristic(s).

B. The Regional Board shall require dischargers to:

1. Investigate the nature and extent of the discharge or threatened discharge to ensure that adequate cleanup plans are proposed. The goal of the investigation shall be to adequately characterize the pollutants in the discharge and determine the vertical and horizontal extent of pollution in soil and ground water. The investigation shall determine where concentrations of pollutants reach background levels. The investigation shall extend off-site to any location necessary to determine the source and assess the vertical and horizontal extent of the discharge.

2. Take immediate action to remove, treat, or contain pollution source(s) to the maximum extent practicable. Sources of pollution may include:

   a. Ongoing sources of discharge from storage or distribution systems for wastes or hazardous materials;

   b. Soils or ground water which are polluted with mobile or immobile concentrations of non-aqueous phase liquids (NAPLs);

   c. Soils which are polluted with leachable concentrations of soluble pollutants;

   d. Polluted soils which are eroded and transported to storm drains, abandoned or active wells, surface waters, or lands beyond the control of the discharger.

3. Submit the following information for consideration in establishing cleanup levels in accordance with the conditions set forth in Chapter 15, section 2550.4:

   a. An assessment of the adverse effects on ground water quality and beneficial uses;

   b. A risk assessment to determine impacts and threats to human health and the environment; and

   c. A feasibility study of cleanup alternatives which compares effectiveness, relative cost, and time to attain the following alternative cleanup levels;

      (1) background levels; levels

      (2) levels which meet all applicable water quality objectives and do not pose significant risks to health or the environment, and

      (3) an alternate cleanup level in between the cleanup levels described in (1) and (2) above which meets the requirements as specified in section III.A.5. of this Cleanup and Abatement Policy.

4. Provide documentation that plans and reports are prepared by professionals qualified to prepare such reports, and that all investigative, and cleanup and abatement activities are conducted under the direction of appropriately qualified professionals. Professionals should be qualified, licensed where applicable, and competent and proficient in the fields pertinent to the required activities. A statement of qualifications of the responsible lead professionals shall be included in all plans and reports submitted by the discharger.

V. APPROVAL of CLEANUP LEVELS

A. The Regional Board shall approve soil and ground water cleanup levels through the adoption or affirmation of cleanup and abatement orders; or

B. The Executive Officer or a local agency may approve cleanup levels as appropriately delegated by the Regional Board.

VI. GROUND WATER CLEANUP LEVELS

A. Ground water cleanup levels shall be based on:

1. The provisions of State Board Resolution No. 68-16, Statement of Policy with Respect to Maintaining High Quality of Waters in California, State Board Resolution No. 88-63, Sources of Drinking Water, and State Board Resolution No. 92-49, Policies and Procedures for Investigation and Cleanup and Abatement of Discharges under Water Code section 13304;

2. Applicable narrative and numerical water quality objectives and beneficial uses described in Chapters 2 and 3 of this Basin Plan;

3. Pollutant concentrations which do not pose a significant threat to human health or the environment. Threat to human health and the environment shall be determined through a risk assessment.

   a. The Regional Board is not the lead agency for specifying risk assessment procedures. The risk assessment shall be conducted using the most current procedures authorized by the DTSC, Office of Environmental Health Hazard Assessment or the USEPA. The Regional Board will assist the discharger, as necessary, in obtaining the appropriate, most current, procedures from these agencies.

   b. In the absence of scientifically valid data to the contrary, theoretical risks from chemical constituents shall be considered additive across all media of exposure, and shall be considered additive for all chemicals having similar toxicological effects or having carcinogenic effects;

   c. The Regional Board is not the lead agency for reviewing risk assessments. The Regional Board will rely on the California Department of Toxic Substances Control, Office of Environmental Health Hazard Assessment, or appropriately designated regulatory local health agencies to review and evaluate the adequacy of risk assessments.

   d. The discharger shall submit the risk assessment to the Regional Board in accordance with section IV.B.3.b. of this policy. The Regional Board will coordinate the review of the risk assessment in accordance with the following hierarchy:

      (1) The Regional Board will first seek the assistance of any appropriate supporting health agency currently involved with the cleanup of the site.

      (2) If unsuccessful, the Regional Board will seek the assistance of previously uninvolved appropriate health agencies.

      (3) If unsuccessful, the Regional Board will seek the assistance of the DTSC in accordance with the terms and conditions of the *MEMORANDUM OF UNDERSTANDING BETWEEN THE DEPARTMENT OF HEALTH SERVICES AND THE STATE WATER RESOURCES CONTROL BOARD, THE REGIONAL WATER QUALITY CONTROL BOARDS FOR THE CLEANUP OF HAZARDOUS WASTE SITES. AUGUST 1, 1990.*

4. Applicable state and federal statutes and regulations;

5. Relevant standards, criteria, and advisories adopted by other state and federal agencies;

6. Technical and economic feasibility of attaining background concentrations and of attaining concentrations lower than defined

by 2 and 3 above. Technical and economic feasibility shall be determined in accordance with the following criteria:

a. Technical feasibility shall be determined by assessing the availability of technologies which have been shown to be effective in reducing the pollutant concentrations to the established cleanup levels. Bench-scale and/or pilot-scale studies may be necessary to make this feasibility assessment.

b. Economic feasibility refers to the objective balancing of the incremental benefit of attaining more stringent cleanup levels compared with the incremental cost of achieving those levels. Economic feasibility does not refer to the subjective measurement of the discharger's ability to pay the costs of cleanup.

c. Applicable factors to be considered in the establishment of cleanup levels greater than background are listed in Chapter 15, section 2550.4.

d. The discharger's ability to pay is one factor to be considered in determining whether the cleanup level is reasonable. However, availability of economic resources to the discharger is primarily considered in establishing reasonable schedules for compliance with cleanup levels.

B. The Regional Board shall set ground water cleanup levels to attain background water quality, unless the discharger demonstrates that it is either technically or economically infeasible to attain background water quality. If the discharger makes such a demonstration to the satisfaction of the Regional Board, cleanup levels are set between background water quality concentrations and concentrations that meet all criteria in items A.2 and A.3 above. Within this concentration range, cleanup levels will be set at the lowest concentrations that are technically and economically feasible to achieve. In no case will cleanup levels be established below natural background conditions.

C. Compliance with cleanup levels must occur at all points throughout the plume or area of contamination to protect potential beneficial uses of water resources as required by Water Code sections 13000 and 13244 and Health and Safety Code section 25356.1 (c).

D. The Regional Board may consider relaxing ground water cleanup levels that were previously established at levels more stringent than applicable water quality objectives, only when a final remedial action plan has been pursued in good faith and all of the following conditions are met:

1. Modified cleanup levels meet the conditions listed in VI.A.1., VI.A.2., and VI.A.3. above; and

2. An approved cleanup program has been fully implemented and operated for a period of time which is adequate to understand the hydrogeology of the site, pollutant dynamics, and the effectiveness of available cleanup technologies; and

3. Adequate source removal and/or isolation is undertaken to eliminate or significantly reduce future migration of pollutants to ground water; and

4. The discharger has demonstrated that no significant pollutant migration will occur to other underlying or adjacent aquifers; and

5. Ground water pollutant concentrations have reached asymptotic levels (i.e., pollutant concentration reductions are no longer significant) using appropriate technology; and

6. Alternative remediation techniques for achieving cleanup levels have been evaluated and are inappropriate or not economically feasible.

VII. SOIL CLEANUP LEVELS

A. Soil pollution can present a health risk and a threat to water quality. The Regional Board designates soil cleanup levels for the unsaturated zone based upon threat to water quality and risk to human health or the environment. Guidance from the USEPA, DTSC, or the Office of Health Hazard Assessment is considered in determining health and environmental risks. Cleanup levels for contaminated soils which threaten water quality, shall be established in accordance with the following criteria:

1. Concentrations of the residual leachable/mobile pollutants shall be equal to background concentrations unless background levels are technically or economically infeasible to achieve.

2. Where background levels are technically or economically infeasible to achieve, soil cleanup levels shall be established to ensure that residual leachable/mobile pollutants will not cause, or threaten to cause, exceedances of applicable ground water cleanup levels or water quality objectives, and do not pose significant risks to health or the environment.

3. Soil cleanup levels less stringent than background may be based on site specific technical evaluations of pollutant fate and transport processes, human health and environmental risk assessment methods as long as such methods are based on site specific field data, technically sound principles, and the criteria described in VII.A.2. above.

B. Where residual leachable/mobile soil pollutants which threaten water quality remain on site the discharger shall:

1. Implement measures as necessary to ensure that soils with residual pollutants are covered or otherwise managed to minimize pollution of surface waters or exposure to the public; and

2. Implement the applicable provisions of Chapter 15 to the extent that it is technologically or economically feasible to do so as described in State Board Resolution No. 92 - 49. This may include, but is not limited to, subsurface barriers or other containment systems, pollutant immobilization, toxicity reduction, and financial assurances.

C. The Regional Board shall generally require sampling to verify soil cleanup and may also require follow-up ground water monitoring. The degree of monitoring will reflect the amount of uncertainty associated with the soil cleanup level selection process. Follow-up ground water monitoring may be limited where residual concentrations of leachable/mobile pollutants in soils are not expected to adversely affect ground water quality.

VIII. TIME SCHEDULES

The Regional Board shall determine schedules for investigation, and cleanup and abatement, taking into account the following factors:

A. The degree of threat or impact of the discharge on water quality and beneficial uses;

B. The obligation to achieve timely compliance with cleanup and abatement goals and objectives that implement the applicable Water Quality Control Plans and Policies adopted by the State and Regional Board;

C. The financial and technical resources available to the discharger; and

D. Minimizing the likelihood of imposing a burden on the people of the state with the expense of cleanup and abatement, where feasible.

TOTAL MAXIMUM DAILY LOADS

A total maximum daily load (TMDL) is the amount of a pollutant that can be discharged into a waterbody and still maintain its water quality standards (i.e., the designated beneficial uses and the adopted water quality objectives that support the beneficial uses). A TMDL must account for seasonal variations and include a margin of safety (MOS) to account for any lack of knowledge concerning the relationship between pollutant loadings and receiving water quality.

Pollutant loadings in excess of the TMDL are expected to have an adverse effect on water quality by causing exceedances of the applicable water quality standards. Allowable pollutant loadings are calculated and assigned to all point source and nonpoint source discharges to ensure that the applicable water quality standards are not exceeded in the receiving water.

A portion of the TMDL may be held explicitly in reserve as the MOS (e.g., MOS = 10 percent of TMDL), or the MOS may be implicitly included (i.e., MOS = 0) by incorporating conservative assumptions in the calculation of the TMDL (i.e., assumptions result in a lower calculated TMDL). The portion of the TMDL not in the MOS is assigned to point sources and nonpoint sources.

Point sources are assigned wasteload allocations (WLAs) and nonpoint sources (including natural and background sources) are assigned load allocations (LAs). The WLAs and LAs may differ for each pollutant source, but the TMDL and MOS do not change. The TMDL for a pollutant in the receiving water, and the WLAs and LAs for a pollutant discharged from different sources into a waterbody are calculated at levels that, when each are met, are expected to result in the attainment of the associated water quality objectives for the pollutant and protection of the applicable beneficial uses in the receiving water.

Establishing TMDLs for waters is required under section 303(d) of the Clean Water Act. Clean Water Act section 303(d) requires that the State establish a priority ranking of waters that do not meet water quality standards after application of technology based controls. The USEPA strongly encourages states to include the priority ranking as part of the Biennial Clean Water Act Sections 303(d), 305(b) and 314 Integrated Report, which is discussed in more detail in Chapter 6.

Waters identified under section 303(d) (a.k.a. the 303(d) List) are designated as Water Quality Limited Segments (WQLSs). In accordance with the priority ranking, TMDLs must be established for pollutants suitable for such calculations. For the purpose of developing information for all waters not identified as WQLSs, states are also required to estimate the TMDLs with seasonal variations and margin of safety.

One or more numeric targets are typically required to calculate TMDLs at levels necessary to attain and maintain applicable narrative and numerical water quality standards in WQLSs. Numeric targets interpret the existing water quality standards (i.e., beneficial uses and the water quality objectives established at levels sufficient to support those uses). After identifying the impaired beneficial uses of a waterbody, the numeric targets are often based on the water quality objectives in Chapter 3. Chapter 3 contains numeric and narrative water quality objectives. If applicable water quality objectives are numeric, the numeric water quality objectives can serve as the basis for the numeric targets. If applicable water quality objectives are narrative, one or more quantifiable target values or measurable indicators must be selected to measure progress and evaluate final attainment and maintenance of the narrative water quality objectives. In WQLSs, when numeric targets are met in the waterbody, the water quality standards should be attained and restored. While numeric targets and TMDLs interpret water quality standards, *numeric targets and TMDLs are not water quality standards*.

TMDLs are not self-implementing or directly enforceable for sources in the watershed. Instead, TMDLs must be implemented through the programs or authorities of the San Diego Water Board and/or other entities to compel dischargers responsible for controllable sources to achieve the pollutant load reductions identified by a TMDL analysis to attain the water quality objectives that will support the designated beneficial uses of a waterbody.

The authorities that are available to the San Diego Water Board to implement TMDLs are given under the Porter-Cologne Water Quality Control Act (Division 7 of the Water Code). The

available regulatory authorities include incorporating discharge prohibitions in to the Basin Plan, issuing individual or general waste discharge requirements (WDRs), or issuing individual or general conditional waivers of WDRs. The San Diego Water Board has the authority to enforce Basin Plan prohibitions, WDRs, or conditional waivers of WDRs through the issuance of enforcements actions (e.g., time schedule orders, cleanup and abatement orders, cease and desist orders, administrative civil liabilities). The San Diego Water Board also has the authority to require monitoring and/or technical reports from dischargers, which may be used to support the development, refinement, and/or implementation of TMDLs, WLAs, and/or LAs.

Additionally, the USEPA has delegated responsibility to the State and Regional Boards for implementation of the federal National Pollutant Discharge Elimination System (NPDES) program, which specifically regulates discharges of "pollutants" from point sources to "waters of the United States." The San Diego Water Board regulates discharges from point sources to surface waters with WDRs that implement federal NPDES regulations (NPDES requirements). Federal regulations require that NPDES requirements incorporate water quality based effluent limitations (WQBELs) that must be consistent with the requirements and assumptions of any available WLAs. WQBELs may be expressed as numeric effluent limitations, when feasible, and/or as a best management practice (BMP) program of expanded or better-tailored BMPs.

Upon establishment of TMDLs by the state or U.S. Environmental Protection Agency (USEPA), the state is required to incorporate TMDLs into the state water quality management plan. This Basin Plan and applicable statewide plans serve as the water quality management plan for the watersheds under the jurisdiction of the Regional Board. TMDLs are programs for the implementation of existing water quality standards, and are established in the Basin Plan subject to the requirements of Water Code section 13242. TMDLs incorporated into the Basin Plan, therefore, are required to include 1) a description of the actions (i.e., programs or authorities) of the Regional Board and/or other entities necessary to achieve the TMDLs, 2) a compliance time schedule by which the TMDLs, and thereby the restoration of the beneficial uses in the receiving waters, are to be achieved, and 3) a description of the monitoring program that is required to determine compliance with TMDLs, WLAs, and LAs in the receiving waters. These elements are referred to as the TMDL Implementation Plan.

TMDLs that have been established for the San Diego Region are provided in Chapter 7.

IMPLEMENTATION PROVISIONS FOR INDICATOR BACTERIA WATER QUALITY OBJECTIVES IN THE CONTEXT OF A TMDL

Water quality objectives for indicator bacteria shall be strictly applied except when otherwise provided for in a TMDL. Within the context of a TMDL, the Regional Board may implement the indicator bacteria water quality objectives by using a “reference system and antidegradation approach” or a “natural sources exclusion approach,” as described in Chapter 3 (Water Quality Objectives).

There are natural sources of bacteria which may cause or contribute to exceedances of water quality objectives for indicator bacteria. It is not the intent of the Regional Board to require treatment or diversion of natural water bodies or to require treatment of natural sources of bacteria. Such requirements, if imposed by the Regional Board, could adversely affect valuable aquatic life and wildlife beneficial uses supported by water bodies in the Region.

Implementation of indicator bacteria water quality objectives using the reference system and antidegradation approach requires control of indicator bacteria from anthropogenic sources so that bacteriological water quality in the targeted waterbody is consistent with that of a reference system. The reference system and antidegradation approach also requires that no degradation of existing bacteriological water quality in the targeted water body occurs when the existing bacteriological water quality is better than that of a water body in a reference system. A reference system is a watershed and the beach to which the watershed discharges that is minimally impacted by anthropogenic activities that can affect bacterial densities in the water body. Under the reference system and antidegradation approach, a certain frequency of

exceedances of the indicator bacteria water quality objectives is allowed. The allowed frequencies of exceedances are either the observed frequency of exceedances in the selected reference system or the targeted water body, whichever is less.

Under the natural sources exclusion approach, dischargers must demonstrate they have implemented all appropriate best management practices to control all anthropogenic sources of indicator bacteria to the target water body such that they do not cause or contribute to exceedances of the indicator bacteria water quality objectives. The requirement to control all sources of anthropogenic indicator bacteria does not mean the complete elimination of all anthropogenic sources of bacteria as this is both impractical as well as impossible. Dischargers must also demonstrate that the residual indicator bacteria densities are not indicative of a human health risk. After all anthropogenic sources of indicator bacteria have been controlled such that they do not cause exceedances of the indicator bacteria water quality objectives, and natural sources have been identified and quantified, exceedances of the indicator bacteria water quality objectives may be allowed based on the residual exceedances in the target water body. The residual exceedances shall define the background level of exceedance due to natural sources.

The Regional Board will evaluate the appropriateness of these approaches and the specific exceedances or exceedance frequencies to be allowed under each within the context of TMDL development or recalculation for a specific water body. If appropriate, the Regional Board may select to use one or both of these approaches during initial TMDL calculation or during subsequent recalculation following TMDL implementation.

These implementation provisions may only be used within the context of a TMDL addressing municipal storm water (including discharges regulated under statewide municipal NPDES waste discharge requirements), discharges from concentrated animal feeding operations, and discharges from non-point sources. These implementation provisions shall not be applied within the context of a TMDL addressing individual industrial storm water discharges, or general industrial and construction storm water discharges.

OTHER PROGRAMS

GROUND WATER MANAGEMENT

Ground water management programs can both enhance water quality and protect beneficial uses of ground water in the larger basins of the San Diego Region. These management programs consist of measures for the periodic monitoring and assessment of ground water levels and quality; the planned extraction and export of poor quality ground water with recharge of better quality water from an outside source; controls established on the use of ground water within the basin; and controls on inflow of poor quality water from outside the basin.

Because of the limited amount of natural recharge, the use of reclaimed water for ground water recharge must be considered in any effective ground water management program in the San Diego Region. For this reason, agencies involved in wastewater disposal play a vital role in the development of these programs. Several local and state agencies, as well as some private consultants have been studying ways to encourage this approach for protecting the Region's ground water basins. Proponents have noted that there are many advantages in storing water and reclaimed water in ground water aquifers as opposed to surface water reservoirs. Underground facilities are less costly than surface storage facilities and they are less land intensive than surface water reservoirs. Also, the ground water aquifers can serve as distribution systems, minimizing the need for surface water transport facilities. In addition, reclaimed water stored in ground water aquifers are not subject to evaporative losses.

Filtration through the soils in the basin can provide additional treatment of the reclaimed water, and injection of reclaimed water along the coastal strip can be used to help combat seawater intrusion.

Ninety percent of the potable water supply for the San Diego Region comes from two major sources of imported water. Water from the Colorado River is imported through the Colorado River Aqueduct and water from northern California is imported through the State Water Project. Both sources are blended to form San Diego Region's water supply. Additionally, approximately ten percent of the water supply comes from local reservoirs. The quality of the imported water has been showing increases in mineral content, particularly boron, percent sodium and TDS. Direct use of this supply reflects the mineral content of Colorado River water. Each additional use of the water (reclaimed from this supply) for irrigation and ground water recharge incrementally increases the dissolved mineral content.

Water reclamation activities should, then, be focused on local benefits and impacts on ground water quality. Proposed projects should be examined in terms of:

- Areas with high reclaimed water demands;
- Constituent concentrations in relation to basin plan objectives;
- Assimilative capacity of receiving basins; and
- Potential for improving ground water quality in near-surface and deep aquifers.

The major basins in San Diego County that have been studied for the implementation of a ground water management plan are the San Pasqual Valley, the Lower San Luis Rey Valley, Lower San Dieguito River Valley, Santee Basin, Lower Sweetwater River Basin, Lower Tijuana River Basin, Upper Santa Margarita River Basin, and the San Juan Creek Basin. A goal of these management plans is to rejuvenate the quality of the ground water in these basins to meet basin objectives. The general plan is to pump the poor quality ground water from these basins to the ocean, and recharge the basins with reclaimed and natural run off waters, which will then be extracted for beneficial use when water quality objectives are met. The following is a description of the proposed programs.

SAN PASQUAL VALLEY

The San Pasqual ground water management plan would utilize between 5,000 and 8,000 AF/Y of reclaimed water for agricultural irrigation and ground water recharge, thus reducing the need for this amount of imported water. The reclaimed water is available from the City of Escondido Hale Avenue Wastewater treatment plant, which presently discharges directly to the ocean. The City of San Diego owns 7,436 acres of land in the San Pasqual Valley which has been set aside as an agricultural preserve. There is 38,000 acre-feet of usable ground water in the valley. The western portion of the valley has degraded ground water quality, and has been

designated as the reclamation basin. There is a plan to pump this poor quality ground water to the ocean and recharge the basin with reclaimed water of higher quality, to provide a positive salt balance. When the ground water quality improves, it will be used for irrigation of parks and golf courses, the Wild Animal Park and for landscape and freeway irrigation. There is a large and continued demand for irrigation water in the area. The eastern portion of the basin is designated as potable, and efforts will be made to keep the quality of the ground water from degrading. A third part of the basin, called the Narrows, is located between the San Pasqual reclamation basin and the Hodges basin. It has a very small capacity and will be used to prevent surface and ground water flows of reclaimed water from entering Lake Hodges Reservoir, a potable storage reservoir for the City of San Diego.

LOWER SAN LUIS REY VALLEY

Imported water comprises almost the entire supply for this basin. Ground water use is limited due to deteriorated water quality. There are four operating wastewater treatment facilities in this basin that could supply over 12,000 acre-feet per year (AF/Y) of treated wastewater that could be used for ground water recharge or other beneficial uses. At the present time reclaimed water is only being used for freeway landscape irrigation. Many springs and wells that used to be ephemeral, now flow all year long with imported irrigation return water. In many areas of this basin, reclaimed water is of higher quality than the existing ground water quality. Use of reclaimed water can be utilized to improve the conditions of the ground water quality.

LOWER SAN DIEGUITO RIVER VALLEY

The San Dieguito ground water management plan includes the utilization of approximately 2,000 to 4,000 AF/Y of recharge of reclaimed water. The reclaimed water will initially be used for irrigation, rejuvenation of non-potable ground water resources and for creating a fresh water barrier near Interstate 5. Water from the City of Escondido's Hale Avenue Reclamation Facility will be treated to tertiary treatment standards and pumped to the reclamation area in the San Dieguito Valley, where it will undergo recharge to replace poor quality water pumped to the ocean or desalted and treated to potable water standards. This reclaimed water will be used for agriculture and landscape irrigation. As the ground water quality improves, this basin could supply water to areas outside the basin, such as La Jolla Valley and North City West for landscape irrigation. The San Dieguito Basin lacks a centralized wastewater collection system. Water services are provided by four different governmental agencies, and sewer service is provided by eight governmental agencies. There are plans to interconnect the existing and proposed treatment facilities into an integrated system which can supply reclaimed water throughout the basin. The benefits of a ground water management plan in this basin include inexpensive storage and distribution of excess reclaimed water flows available during low irrigation months. This ground water management plan will result in improved ground water quality and will provide an efficient use of available water resources.

SANTEE

The Padre Dam Municipal Water District is reviewing the feasibility of a comprehensive ground water management plan for Santee basin. Ground water from the eastern part of the basin is used for domestic, agricultural and stock watering purposes, and generally has TDS concentrations of 260-1,310 mg/l. The ground water in the main portion of the Santee basin has TDS concentrations of up to 2,990 mg/l. In times of drought, this water could supplement imported water supplies. At the present time, reclaimed water is used only for recreational purposes at Santee Lakes Campground, and Park. The Padre Dam Municipal Water Districts 1.0 MGD tertiary and 2.0 MGD secondary capacity treatment facility provides 1,200 AC/Y of reclaimed water which is used for the Santee Lakes. Water from Lake No. 1 is used to irrigate the landscaping of the surrounding the lakes. Currently only 1 MGD of the plant's capacity is being utilized. All flows over 1 MGD are sent to the Metropolitan Sewer System. Future water reuse projects include another 1,200 AF/Y projected need for the Santee Town Center and city park and approximately 1,400 AF/Y for industrial use. High quality reclaimed water could provide a potential source for recharging the ground water basin and improve existing water quality. Careful management of the basin could mitigate impacts of a high water table to prevent resurfacing of reclaimed water.

LOWER SWEETWATER RIVER BASIN

The Sweetwater Authority completed initial ground water basin studies of the Lower Sweetwater River Basin in June, 1993. As part of the agency's water resources program, the Sweetwater Authority is reviewing the feasibility of using ground water from the Lower Sweetwater Basin to augment its potable water supply.

The Lower Sweetwater Basin extends along the Sweetwater River from the Sweetwater Reservoir Dam approximately eight miles to San Diego Bay. It consists of an alluvial aquifer and the underlying San Diego Formation aquifer. Current use of ground water within the basin is limited, with turf irrigation the predominate use. The Basin is recharged from natural runoff and water from the upstream urban runoff diversion system which, in part, surrounds the Sweetwater Reservoir and spills over the Sweetwater Dam. Water quality data indicate that the ground water is moderately saline with TDS concentrations averaging 1,400 mg/l.

The Sweetwater Authority is currently evaluating the feasibility of constructing ground water extraction wells, a water treatment facility, a brackish water pipeline from each well to the treatment facility, a product water delivery pipeline and pump station, and a brine disposal pipeline. Preliminary findings indicate that extraction and treatment (to potable water standards) of 1,600 to 3,600 AF/Y of ground water from the Lower Sweetwater River Basin is feasible. Some additional production and/or ground water storage may be available in the San Diego Formation aquifer. San Diego Formation hydrogeological studies are ongoing; however preliminary findings indicate that the managed storage potential in the aquifer may be significant.

LOWER TIJUANA RIVER BASIN

The Tijuana Valley County Water District adopted a Resolution of Intention to prepare a Ground Water Management Plan in accordance with Water Code sections 10750 - 10755 in February, 1993. The stated goals of the District are summarized as follows:

- Protect ground water quality and quantity in the Tijuana River Basin for existing and future property owners, agricultural and recreational users;
- Develop the ground water basin into a sub-regional water supply reservoir;
- Provide water to Valley customers and sell excess ground water to customers outside the Basin;
- Implement measures for ground water recharge with surface floodwater containment and runoff control facilities, and reclaimed water, if available; and
- Work with the City and County of San Diego and appropriate state and federal agencies, to propose a workable international floodwater and wastewater control solution for the Valley.

The District's current plans include development of ground water management alternatives for the production and treatment of approximately 2,500 AF/Y of potable ground water.

UPPER SANTA MARGARITA RIVER BASIN

In Riverside County, the upper Santa Margarita River Basin contains several million acre-feet of high quality ground water in the Pauba/ Temecula aquifer system. The Rancho California Water District is considering a plan that will implement the use of reclaimed water for beneficial uses and for ground water recharge. Some changes in basin plan water quality objectives are needed to develop this project. The Santa Rosa SBR Water Reclamation Facility, near Temecula, percolates reclaimed waters through highly permeable alluvium, which recharge and mix with ground water in an upper aquifer. A tentative projection calls for 5 MGD of reclaimed water production by the year 2000.

SAN JUAN CREEK

In Orange County, a management plan is underway in the San Juan Creek Basin. Ground water supplies are limited in this basin due to low recharge and poor quality. The capacity of the San Juan Creek Basin is approximately 90,000 acre-feet. With proper management of the ground water basin, approximately 50,000 AF/Y could be utilized. The basin

currently provides approximately 5,000 AF/Y of usable ground water - less than 2,000 AF/Y is used for urban supply and approximately 3,000 AF/Y is used for agricultural and irrigation purposes. The only ground water that meets drinking water standards and most agricultural requirements is found in the highlands of the northeasternmost portion of the basin. Ground water quality data indicate that the TDS concentration ranges from 300 mg/l (in the northeasternmost portion of the basin) to 1,850 mg/l (in the lower and western portion of the basin). Approximately 3.0 MGD of treated wastewater is being reclaimed for irrigation of a golf course, park, greenbelt and landscaping. In addition, reuse is proposed for effluent from Moulton-Niguel Water District's Water Reclamation Plant 3A, which has been expanded from a capacity of 0.5 MGD to 2.4 MGD, and for effluent from Trabuco Canyon Water District's Robinson Ranch Wastewater Reclamation Plant, which has a capacity of 0.25 MGD. The TDS concentration in secondary effluent in the basin ranges from 500 to 900 mg/l. Reclaimed water could be used to enhance surface water flows and quality or to improve ground water quality in the lower and western parts of the basin. The use of reclaimed water for urban or agricultural irrigation could help reduce demands for ground and imported water. A ground water monitoring plan for the San Juan Creek Basin has been proposed by the Department of Water Resources which would identify any basinwide changes that may occur in water quality that could affect current and potential beneficial uses. This program would provide an early warning that ground water supplies may be endangered.

SALT BALANCE

Salt balance is a theoretical concept where the total mass of dissolved minerals entering a ground water basin system from all sources is equal to the total mass of dissolved minerals leaving the system, either through extraction or natural outflow. It is preferable to have a balance of the salt inflows and outflows to maintain water quality in a basin.

Utilizing the following management measures would enhance the prospects for salt balance for ground water basins in the Region. These measures include:

- Limiting ground water extractions from basins to perennial-yield levels;
- Increasing the efficiency of irrigation practices;
- Reducing fertilizer application;
- Improving the quality of imported water used for irrigation;
- Use storm water runoff for ground water recharge, since storm water is low in TDS;
- Extract and demineralize poor quality ground water when this option becomes economically feasible; and
- Utilize intrusion barriers and regulate ground water pumpage to prevent and reverse problems of salt water intrusion.

SOLE SOURCE AQUIFER PROGRAM

The Safe Drinking Water Act of 1974 provides for a sole source aquifer program. Under this program, USEPA may designate an aquifer as a sole source if it provides more than half of the drinking water for a given area, and no other affordable sources of drinking water exist. The Act provides that, when certain criteria are met, a group may petition the USEPA to designate a sole source aquifer. Thus, in May of 1993, a local citizens' group, Backcountry Against Dumps petitioned the USEPA to designate the Campo/ Cottonwood Creek aquifer as the sole source of drinking water in a 400 square-mile area. The Campo/Cottonwood aquifer is bordered by Mexico to the south, and includes within its borders reservations for the Campo, La Posta, Manzanita, and Cuyapaipe Indian tribes. The aquifer lies about 20 miles east of El Cajon, California. This designation means the USEPA may review proposed projects in the aquifer area which receive partial federal funding and which could contaminate the aquifer or endanger public health. Examples of projects potentially subject to review include construction or renovation of housing projects, airports, and highways. Projects that do not receive some federal funds would not be reviewed.

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5. PLANS AND POLICIES

INTRODUCTION

The State Board has adopted several statewide Water Quality Control Plans that are incorporated by reference into the Regional Board Basin Plan. Additionally, both the State and Regional Boards adopt policies, separate from the plans, that provide detailed direction on the implementation of certain plan provisions. In the event that inconsistencies exist among various plans and policies, the more stringent provisions apply.

This update of the San Diego Region's Basin Plan has been revised to be consistent with all State and Regional Board plans and policies adopted to date. All of the Regional Board plans and policies which implement, interpret, or make specific the Basin Plan and which are listed later in this chapter have been incorporated in this Basin Plan and are superseded. Following are summaries of these plans and policies.

STATE BOARD PLANS AND POLICIES

ANTIDEGRADATION POLICY (STATE BOARD RESOLUTION NO. 68-16)

One of the most significant water quality control policies with respect to the protection of water quality is the *Statement of Policy with Respect to Maintaining High Quality of Waters in California (State Board Resolution No. 68-16*), also known as the State Antidegradation Policy. This policy was adopted on October 28, 1968. It satisfies the federal Clean Water Act antidegradation policy requirement (40 Code of Federal Regulations (CFR) 131.12). The State Antidegradation Policy requires that high quality waters of the state are maintained to the maximum extent possible, even where that quality is better than needed to protect beneficial uses. Specific findings must be made in order to allow any changes in water quality. Changes in water quality are allowed only if the change is consistent with maximum benefit to the people of the State, does not unreasonably affect present and anticipated beneficial uses, and does not result in water quality less than that prescribed in water quality control plans or policies.

Actions which may adversely affect surface water quality must satisfy both Resolution No. 68-16 and the federal antidegradation policy (40 CFR 131.12). The requirements of the two policies are similar: the federal policy requires that existing instream uses and the level of water quality necessary to protect them must be maintained and protected. In addition, a reduction in water quality can be allowed only if there is a demonstration that such a reduction is necessary to accommodate important economic or social development.

STATE POLICY FOR WATER QUALITY CONTROL

The *State Policy for Water Quality Control* serves as the general basis for water quality control policies and was adopted by the State Board on July 6, 1972. The policy declares the State Board's intent to protect water quality through the implementation of water resources management programs.

The policy provides that water quality control plans adopted by the State Board will include minimum requirements for effluent quality. Water quality control plans will also specifically define the maximum constituent levels acceptable for discharge to various waters of the State. However, the policy allows discretion in the application of the latest available technology for the design and operation of wastewater treatment systems. The policy states that secondary treatment systems are the minimum acceptable level of treatment and that advanced treatment systems will be required where necessary to meet water quality objectives.

The policy contains twelve general principles to implement the provisions and intent of the Porter-Cologne Act. These principles are listed below:

(1) Water rights and quality control decisions must assure protection of available fresh water and marine water resources for maximum beneficial use.

(2) Municipal, agricultural, and industrial wastewaters must be considered as a potential integral part of the total available fresh water resource.

(3) Coordinated management of water supplies and wastewaters on a regional basis must be promoted to achieve efficient utilization of water.

(4) Efficient wastewater management is dependent upon a balanced program of source control of environmentally hazardous substances, treatment of wastewaters, reuse of reclaimed water, and proper disposal of effluents and residuals.

(5) Substances not amenable to removal by treatment systems presently available or planned for the immediate future must be prevented from entering sewer systems in quantities which would be harmful to the aquatic environment, adversely affect beneficial uses of water, or affect treatment plant operation. Persons responsible for the management of waste collection, treatment, and disposal systems must actively pursue the implementation of their objective of source control for environmentally hazardous substances. Such substances must be disposed of such that environmental damage does not result.

(6) Wastewater treatment systems must provide sufficient removal of environmentally hazardous substances which cannot be controlled at the source to assure against adverse effects on beneficial uses and aquatic communities.

(7) Wastewater collection and treatment facilities must be consolidated in all cases where feasible and desirable to implement sound water quality management programs based upon long-range economic and water quality benefits to an entire basin.

(8) Institutional and financial programs for implementation of consolidated wastewater management systems must be tailored to serve each particular area in an equitable manner.

(9) Wastewater reclamation and reuse systems which assure maximum benefit from available fresh water resources shall be encouraged. Reclamation systems must be an appropriate integral part of the long-range solution to the water resource needs of an area and incorporate provisions for salinity control and disposal of nonreclaimable residues.

(10) Wastewater management systems must be designed and operated to achieve maximum long-term benefit from the funds expended.

(11) Water quality control must be based on the latest scientific findings. Criteria must be continually refined as additional knowledge becomes available.

(12) Monitoring programs must be provided to determine the effects of discharges on all beneficial water uses including effects on aquatic life and its diversity and seasonal fluctuations.

STATE WATER QUALITY PROTECTION AREAS / AREAS OF SPECIAL BIOLOGICAL SIGNIFICANCE

The Regional Boards were required to select areas in coastal waters which contain "*biological communities of such extraordinary, even though unquantifiable, value that no acceptable risk of change in their environments as a result of man's activities can be entertained.*" These areas are known as 'Areas of Special Biological Significance' (ASBS).

ASBS are those areas designated by the State Water Board as ocean areas requiring protection of species or biological communities to the extent that alteration of natural water quality is undesirable. All ASBS are also classified as subset of State Water Quality Protection Areas (SWQPAs).

SWQPAs are defined in Public Resources Code, section 36700(f) as "a nonterrestrial marine or estuarine area designated to protect marine species or biological communities from an undesirable alteration in natural water quality, including, but not limited to, areas of special

biological significance that have been designated by the State Water Resources Control Board through its water quality control planning process."

In the San Diego Region, Areas of Special Biological Significance ASBS/SWQPAs include the following:

- ***La Jolla, San Diego County:*** Ocean waters within the boundaries of the City of San Diego, County of San Diego, State of California, as follows: beginning at the most northerly point of Goldfish Point as shown on La Jolla Park Map No. 352 filed in the office of the County Recorder of said county, thence in a northerly direction to a point being the intersection of longitude 117° 16' 15" west with the easterly prolongation of the southerly line of Pueblo Lot 1298 as shown on the map of Pueblo Lands of San Diego made by James Pascoe known as miscellaneous map No. 36 filed in the office of the County Recorder as said county, thence easterly along said prolongation of the southerly line of Pueblo Lot 1298 to the intersection with the mean high tide line, thence in a generally southerly direction along said mean high tide line to the point of beginning.

- ***Heisler Park, Orange County:*** Ocean waters within a line beginning at the intersection of the line of mean high tide with the westerly boundary line of Heisler Park, as described in a deed to the City of Laguna Beach, recorded in book 1666, page 144, Official Records Orange County, California; thence south 16° 21' west 800 feet more or less to the line of the Laguna Beach Marine Life Refuge, as per Division 7, Chapter 1, Article 2, section 10904, State of California Fish and Game Code; thence along said marine life refuge south 73° 39' east, 2,400 feet more or less to the easterly boundary of said refuge; thence along said easterly boundary north 14° 58' west, 700 feet more or less to the line of mean high tide in a westerly direction to the point of beginning.

- ***San Diego - Scripps, San Diego County:*** Ocean waters within that portion of Fish and Game District 19 consisting of that certain strip of land lying between the westerly edge of Pueblo Lot No. 1298 of the Pueblo Lands of the City of San Diego, according to the official map of said pueblo lands as made by James Pascoe, and filed in the office of the County Recorder of said County of San Diego, and the mean high tide line opposite to and west of said pueblo lot, which said strip of land is bounded on the north by the northerly boundary line of said pueblo lot extended westerly and on the south by the southerly boundary line of said pueblo lot extended westerly; together with the state waters of the State of California adjacent thereto, being those state waters which lie between said extended northerly and southerly boundaries of said pueblo lot and extend westerly from said mean high tide line for a distance of 1,000 feet.

- *Irvine Coast, Orange County:* Ocean waters within that portion of California state tide and submerged lands adjoining the Newport Beach Marine Life Refuge bounded by a line beginning at the intersection of the southwesterly extension of Lot 141, Tract No. 3357, as shown on a map recorded in Book 107, Page 1 of Miscellaneous Maps on file in the office of the County Recorder, Orange County and the line of ordinary high tide; thence, southeasterly along the line of ordinary high tide approximately 20,000 feet to its intersection with the southwesterly extension of the northwesterly boundary line of the City of Laguna Beach; thence, southwesterly along such southwesterly extension 1,000 feet or to the 100-foot isobath, whichever distance from shore is greater; thence northwesterly along a line parallel to and 1,000 feet or to the 100-foot isobath, whichever distance from shore is greater southwesterly of the line of ordinary high tide to the southwesterly extension of said Lot 141; thence northeasterly along such southwesterly extension to the point of beginning.

The impact of the adoption of ASBS and SWQPAs on the Basin Plan is that discharges of wastewaters and/or heat must be sufficiently removed spatially from these areas to assure the maintenance of natural water quality conditions in these areas. Existing wastewater and/or heat discharges which influence the natural water quality in these areas shall be prohibited and phased out as promptly as possible, or limited by the imposition of special conditions in accordance with the Porter-Cologne Water Quality Control Act and implementing

regulations, including, but not limited to the California Ocean Plan and the California Thermal Plan.

ENCLOSED BAYS AND ESTUARIES POLICY (RESOLUTION NO. 74-43)

San Diego Bay

The *Water Quality Control Policy for Enclosed Bays and Estuaries of California* (Enclosed Bays and Estuaries Policy) was adopted by State Board Resolution No. 74-43 on May 16, 1974. This policy is designed to prevent water quality degradation and protect beneficial uses in enclosed bays and estuaries. The policy outlines water quality principles and guidelines to achieve these objectives. Decisions by the Regional Board must be consistent with the provisions designed to prevent water quality degradation.

The policy lists principles of management that include the State Board's desire to phase out all discharges of municipal wastewaters and industrial process waters (exclusive of cooling waters) to enclosed bays and estuaries as soon as practicable. Exceptions to this provision may be granted by a Regional Board only when the Regional Board finds that the wastewater in question would consistently be treated and discharged in such a manner that it would enhance the quality of the receiving waters above that which would occur in the absence of the discharge. Discharge prohibitions are placed on the following:

- New discharges of municipal wastewaters and industrial process waters (exclusive of cooling water, treated ballast water and innocuous nonmunicipal wastewater discharges, such as clear brines, wash water and pool drains) which are not consistently treated and discharged in a manner that would enhance the quality of the receiving waters as defined in the Policy;

- Municipal and industrial waste sludge and untreated sludge digester supernatant, centrate, or filtrate;

- Rubbish or refuse into surface waters or at any place where they would be eventually transported to enclosed bays and estuaries;

- Silt, sand, soil, clay, or other earthen materials from onshore operations including mining, construction, and lumbering in quantities which unreasonably affect or threaten to affect beneficial uses;

- Materials of petroleum origin in sufficient quantities to be visible or in violation of waste discharge requirements (except for scientific purposes);

- Radiological, chemical, or biological warfare agent or high-level radioactive waste; and

- Discharge or by-pass of untreated waste.

POLICY ON THE USE AND DISPOSAL OF INLAND WATERS USED FOR POWERPLANT COOLING (RESOLUTION NO. 75-58)

The *Water Quality Control Policy on the Use and Disposal of Inland Waters Used for Powerplant Cooling* (Policy on the Use and Disposal of Inland Waters Used for Powerplant Cooling) was adopted by State Board Resolution No. 75-58 on June 19, 1975. The purpose of the policy is to provide consistent statewide water quality principles and guidance for adoption of discharge requirements, and implementation actions for powerplants which depend upon inland waters for cooling. In addition, this policy is intended to protect the beneficial uses of the State's water resources by keeping the consumptive use of freshwater for powerplant cooling to a minimum. The Regional Board is responsible for the enforcement of this policy.

The policy is based on the seven principles listed below:

(1) It is the State Board's position that from a water quantity and quality standpoint the source of powerplant cooling water should come from the following sources in this order of priority depending on site specifics such as environmental, technical, and economic feasibility consideration:

- Wastewater being discharged to the ocean;
- Ocean;
- Brackish water from natural sources or irrigation return flow;
- Inland wastewaters of low TDS; and
- Other inland waters.

(2) Where the State Board has jurisdiction, use of fresh inland waters for powerplant cooling will be approved by the Board only when it is demonstrated that the use of other water supply sources or other methods of cooling would be environmentally undesirable or economically unsound.

(3) In considering issuance of a permit or license to appropriate water for powerplant cooling, the Board will consider the reasonableness of the proposed water use when compared with other present and future needs for the water source and when viewed in the context of alternative water sources that could be used for the purpose. The Board will give great weight to the results of studies made pursuant to the Warren-Alquist State Energy Resources Conservation and Development Act and carefully evaluate studies by the Department of Water Resources made pursuant to sections 237 and 462, Division 1 of the California Water Code.

(4) The discharge of blowdown water from cooling towers or return flows from once-through cooling shall not cause a violation of water quality objectives or waste discharge requirements established by the Regional Boards.

(5) The use of unlined evaporation ponds to concentrate salts from blowdown waters will be permitted only at salt sinks approved by the Regional and State Boards. Proposals to utilize unlined evaporation ponds for final disposal of blowdown waters must include studies of alternative methods of disposal. These studies must show that the geologic strata underlying the proposed ponds or salt sink will protect usable groundwater.

(6) Studies of availability of inland waters for use in powerplant cooling facilities to be constructed in Central Valley basins, the South Coastal Basins or other areas which receive supplemental water from Central Valley streams as for all major new uses must include an analysis of the impact of such use on Delta outflow and Delta water quality objectives. The studies associated with powerplants should include an analysis of the cost and water use associated with the use of alternative cooling facilities employing dry, or wet/dry modes of operation.

(7) The State Board encourages water supply agencies and power generating utilities and agencies to study the feasibility of using wastewater for powerplant cooling. The State Board encourages the use of wastewater for powerplant cooling where it is appropriate. Furthermore, section 25601(d) of the Warren-Alquist Energy Resources Conservation and Development Act directs the water and other advances in powerplant cooling and section 462 of the Waste Water Reuse Law directs the Department of Water Resources to "*...conduct studies and investigations on the availability and quality of waste water and uses of reclaimed waste water for beneficial purposes including, but not limited to ... and cooling for thermal electric powerplants*."

In addition, the policy contains three discharge prohibitions. The prohibitions are listed below:

(1) The discharge to land disposal sites of blowdown waters from inland powerplant cooling facilities shall be prohibited except to salt sinks or to lined facilities approved by the Regional and State Boards for the reception of such wastes.

(2) The discharge of wastewaters from once-through inland powerplant cooling facilities shall be prohibited unless the discharger can show that such a practice will maintain the existing water quality and aquatic environments of the State's water resources.

(3) The Regional Boards may grant exceptions to these discharge prohibitions on a case-by-case basis in accordance with exception procedures included in the *Water Quality Control Plan for Control of Temperature In the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California.*

THERMAL PLAN (RESOLUTION NO. 75-89)

The *Water Quality Control Plan for the Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California* (Thermal Plan) was adopted by the State Board in 1971, revised in 1972 and revised again on September 18, 1975. The Thermal Plan specifies water quality objectives and general water quality provisions for new and existing discharges into enclosed bays, estuaries, cold interstate waters, warm interstate waters and coastal waters. The State and Regional Boards administer the plan by establishing waste discharge requirements for elevated temperature wastes. Existing and future dischargers of thermal waste are required to conduct studies to define the effect of the discharge on beneficial uses and, for existing discharges, determine design and operating changes which would be necessary to achieve compliance with the provisions of the Thermal Plan.

Existing waste discharge requirements are required to be reviewed to determine any necessary revisions, changes in monitoring programs and the need for studies of the effect of the thermal discharge on beneficial uses. Proposed thermal dischargers may be required to submit studies prior to the establishment of WDRs. Appropriate post discharge studies are also required by the Regional Board. The Thermal Plan specifies that the Regional Board shall outline the scope and design of any necessary studies to include the following as applicable:

(1) Existing conditions in the aquatic environment;

(2) Effects of the existing discharge on beneficial uses;

(3) Predicted conditions in the aquatic environment with waste discharge facilities designed and operated in compliance with the provisions of the plan;

(4) Predicted effects of the proposed discharge on beneficial uses;

(5) An analysis of costs and benefits of various design alternatives; and

(6) The extent to which intake and outfall structures are located and designed so that the intake of planktonic organisms is at a minimum, waste plumes are prevented from touching the ocean substrate or shorelines, and the waste is dispersed into an area of pronounced along-shore or offshore currents.

The Thermal Plan further specifies that WDRs adopted for discharges of thermal wastes shall be monitored in order to determine compliance with effluent or receiving water temperature requirements. For significant thermal discharges, the State or Regional Boards shall require expanded monitoring programs to assess whether the thermal discharge continues to provide adequate protection to the beneficial uses of the water. The State or Regional Board may require the discharger(s) to pay a public agency or other appropriate person an amount sufficient to carry out the expanded monitoring program if:

(1) The discharger has previously failed to carry out a monitoring program satisfactory to the State or Regional Board; or

(2) More than a single facility, under separate ownerships, may significantly affect the thermal characteristics of the body of water, and the owners of such facilities are unable to reach agreement on a cooperative program within a reasonable time period specified by the State or Regional Board.

POLICY WITH RESPECT TO WATER RECLAMATION IN CALIFORNIA (RESOLUTION NO. 77-1)

The *Policy with Respect to Water Reclamation in California* (Reclamation Policy) was adopted by the State Board on January 6, 1977. The Reclamation Policy provides that the water resources of the State be put to beneficial use to the fullest extent of which they are capable. The policy provides that water resources shall not be wasted, nor be put to an unreasonable use, nor be used in an unreasonable method.

This policy commits both the State and Regional Board to support reclamation and to undertake all possible steps to encourage the development of water reclamation facilities to reclaim water to

supplement existing surface and ground water supplies. It requires the Regional Board to conduct reclamation surveys and specifies actions to be implemented by the State and Regional Board and other agencies.

The State Board adopted the four following principles in order to implement the Reclamation Policy. These principles are listed below:

(1) The State and Regional Boards shall encourage, and consider or recommend for funding, water reclamation projects which meet the conditions below and which do not adversely impact vested water rights or unreasonably impair instream beneficial uses or place a unreasonable burden on present water supply systems:

(A) Beneficial use will be made of wastewaters that would otherwise be discharged to marine or brackish receiving waters or evaporation ponds,

(B) Reclaimed water will replace or supplement the use of fresh water or better quality water,

(C) Reclaimed water will be used to preserve, restore, or enhance instream beneficial uses which include, but are not limited to, fish, wildlife, recreation, and aesthetics associated with any surface water or wetlands.

(2) The State and Regional Boards shall encourage reclamation and reuse of water in water-short areas of the State, encourage water conservation measures which further extend the water resources of the State, and encourage other agencies, in particular the Department of Water Resources, to assist in implementing this policy.

(3) The State and Regional Boards recognize the need to protect the public health including potential vector problems and the environment in the implementation of reclamation projects.

(4) In implementing these principles, the State and/or Regional Board shall take appropriate actions, recommend legislation, and recommend actions by other agencies in the areas of planning, project funding, water rights, regulation and enforcement, research and demonstration, and public involvement and information.

This resolution has been reprinted at the end of this Chapter.

POLICY ON THE DISPOSAL OF SHREDDER WASTE (RESOLUTION NO. 87-22)

The *Policy on the Disposal of Shredder Wastes* (Shredder Waste Disposal Policy) was adopted on March 19, 1987. This policy permits the disposal of shredded wastes produced by the mechanical destruction of car bodies, old appliances and similar castoffs, into certain landfills under specific conditions designated and enforced by the Regional Boards. Hazardous and nonhazardous shredder waste may be disposed of in appropriate Class III landfills where doing so would not cause water quality impairment. The policy specifies the shredder waste must not exceed PCB levels of 50 milligrams per kilogram (mg/kg). Also, the shredder waste must be disposed on the last and highest lift in a closed disposal cell or in an isolated cell solely designated for the disposal of shredder waste.

Drinking Water

SOURCES OF DRINKING WATER POLICY (RESOLUTION NO. 88-63)

The *Sources of Drinking Water Policy* was adopted by the State Board on May 19, 1988. The policy provides that all surface and ground waters of the State are considered to be suitable or potentially suitable for municipal or domestic water supply and should be so designated by the Regional Boards. Those waters excepted under the policy include the following:

(1) Surface or ground waters where the total dissolved solids exceed 3,000 milligrams per liter (mg/l) and it is not reasonably expected by the Regional Boards to supply a public water system;

(2) Surface or ground waters which have been contaminated and can not be reasonably treated for domestic use using either Best

Management Practices or best economically achievable treatment practices;

(3) Surface or ground waters which do not provide sufficient water for extraction of 200 gallons per day;

(4) Surface waters which are in systems designed or modified to carry municipal, industrial, agricultural or mining wastewaters, or storm water runoff.

(5) Surface waters in systems designed or modified for the primary purpose of conveying or holding agricultural drainage waters, provided that the discharge from such systems is monitored to assure compliance with all relevant water quality objectives as required by the Regional Boards.

(6) Ground waters where the aquifer is regulated as a geothermal energy producing source or has been exempted administratively pursuant to 40 CFR, section 146.4 for the purpose of underground injection of fluids associated with the production of hydrocarbon or geothermal energy, provided that these fluids do not constitute a hazardous waste under 40 CFR, section 261.3. This resolution has been reprinted at the end of this Chapter.

NONPOINT SOURCE MANAGEMENT PLAN (RESOLUTION NO. 88-123)

The *Nonpoint Source Management Plan* was adopted by the State Board on November 15, 1988, pursuant to section 319 of the federal Clean Water Act. Section 319 requires each state to prepare a Nonpoint Source Management Plan and to conduct an assessment of the impact nonpoint sources have on the state's waterbodies. In response to these requirements, the State Board adopted the Nonpoint Source Management Plan (NPSMP) in 1988 and the Water Quality Assessment in 1990. The NPSMP established a statewide policy for managing polluted runoff in California. The plan identifies three management approaches which are used by the State and Regional Boards to address nonpoint source problems:

(1) Voluntary implementation of best management practices;

(2) Regulatory-based encouragement of best management practices; and

(3) Effluent requirements.

The primary goal of the program is to measurably improve water quality and/or implementation of Best Management Practices by meeting several objectives specified in the plan.

The Nonpoint Source Management Plan outlines steps to initiate systematic management of nonpoint sources in California. These steps include:

(1) An explicit long-term commitment by the State and Regional Board;

(2) More effective coordination of existing State and Regional Board nonpoint-source related programs;

(3) Greater use of Regional Board regulatory authorities coupled with non-regulatory programs;

(4) Stronger links between the local, State and Federal agencies which have powers that can be used to manage nonpoint sources;

(5) Development of new funding sources; and

(6) Implementation of the requirements of the 1990 Reauthorization of the Coastal Zone Management Act (CZMA) which requires the State Board and the California Coastal Commission to develop and implement an enforceable nonpoint source program in the coastal zone.

The reauthorization of the CZMA, together with specific guidance from the USEPA and the National Oceanic & Atmospheric Administration (NOAA), requires coastal states to develop coastal nonpoint pollution control programs. These programs are to implement management measures for the control of land uses which contribute nonpoint source pollution to coastal waters. Management measures, which include specific measures for mitigating water quality impacts, are specified for the following land uses: agriculture; grazing; confined animal facilities; forestry; urban development;

roads; marinas and recreational boating; hydromodification; and mines. The state's coastal program is to be considered for approval by the USEPA and NOAA in July 1995.

Revision of the State Nonpoint Source Management Plan (NPSMP) has been initiated. The State Board intends to consider the requirements of the Coastal Zone Act Reauthorization Amendments (CZARA) during the review and revision of the NPSMP. There will also be more of an emphasis placed on watershed based nonpoint source controls in the revised NPSMP. To develop these management measures, the State Board is forming Task Force Committees composed of experts in the various nonpoint source categories. The management measures developed by the Task Force Committees will be reviewed by an Oversight Committee made up of State and Regional Board staff prior to inclusion in the revised NPSMP. The anticipated date of completion of the revised NPSMP is in 1995.

The plan describes an implementation project entitled the *"Southern California Coastal Lagoon Urban Runoff Management."* This project requires land developers to incorporate low flow sand filters into project designs and to implement street sweeping programs. The performance of the filters and programs are monitored to incorporate design modifications as needed to improve performance.

Other implementation actions specified in the plan for Region 9 include the following regulatory and non-regulatory program(s):

Regulatory Programs

- ***Dairies:*** The Regional Board issues Waste Discharge Requirements which limit the amount of manure that can be applied per acre to agricultural land.

- ***Erosion Control:*** The Regional Board implements policies requiring cities and counties to adopt erosion control ordinances. Thus, the Regional Board adopted Resolution No. 92-21, A Resolution Concerning the Agreement Between the California Regional Water Quality Control Board, San Diego Region, and the Resource Conservation Districts of San Diego County Regarding the Erosion and Sediment Control Policy (Resource Conservation Districts of San Diego County Erosion and Sediment Control Policy. In addition, staff reviews ordinances and assists with enforcement.

- ***Subsurface Disposal Policy:*** Regional Board staff will develop criteria for minimum lot sizes for septic systems.

Non-regulatory program

- ***San Diego Bay Study:*** The Regional Board will continue a five year study to identify the sources and extent of water quality pollution in San Diego Bay. Possible nonpoint sources such as storm water runoff and past point source pollutants now bound to bottom sediments will be investigated.

Pacific Ocean, Scripps Pier

CALIFORNIA OCEAN PLAN (RESOLUTION NO. 90-27)

The *Water Quality Control Plan for Ocean Waters of California* (California Ocean Plan) was adopted by the State Board in 1972, and later revised in 1978, 1983, 1988 and 1990. The revision in effect at the time of this writing is Resolution No. 90-27, which was adopted by the State Board on March 22, 1990. The California Ocean Plan is applicable to all point source discharges to the ocean.

The California Ocean Plan is designed to protect the quality of the ocean waters for use and enjoyment by the people through the control of waste discharges to the ocean. The plan sets forth water quality objectives for ocean waters which impose limits on bacteriological, physical, chemical, biological, toxic, and radioactive characteristics for ocean waters in numerical and descriptive terms to ensure the reasonable protection of beneficial uses and the prevention of nuisance. Also, the plan describes requirements for management and design of systems discharging wastewaters to the ocean and effluent quality requirements for discharges. Systems must be designed and operated in a manner that will maintain the indigenous marine life and a healthy and diverse marine community. In addition, discharge prohibitions are placed on hazardous substances, warfare agents and high level radioactive wastes, sludge and digester supernatant, and bypassed untreated waste discharges. Furthermore, the plan states that

"*Areas of Special Biological Significance*" shall be designated by the State Board. In these areas the maintenance of natural water quality conditions must be assured. Waste discharges to ASBS are prohibited unless the State Board finds that there would be no adverse impact to beneficial uses. Lastly, discharge requirements within the California Ocean Plan include the maximum allowable monthly mass emission rates for each effluent quality constituent included therein.

The California Ocean Plan declares the State Board's intent to require continual monitoring of the marine environment to assure that the California Ocean Plan reflects the latest available data and that the water quality objectives are adequate to fully protect indigenous marine species and to protect human health.

CALIFORNIA WETLANDS CONSERVATION POLICY

The California Wetlands Conservation Policy was established by the Governor on August 23, 1993. The goal of the California Wetlands Conservation Policy is to establish a policy framework and strategy that will:

- Ensure no overall net loss and achieve a long-term net gain in the quantity, quality, and permanence of wetlands acreage and values in California in a manner that fosters creativity, stewardship, and respect for private property;

- Reduce procedural complexity in the administration of State and Federal wetlands conservation programs; and

- Encourage partnerships to make landowner incentive programs and cooperative planning efforts the primary focus of wetlands conservation and restoration.

Three measures are identified to achieve these objectives, these include: (1) statewide policy initiatives; (2) regional strategies; and an (3) interagency wetlands task force.

Statewide policy initiatives: These policy initiatives include a statewide wetlands inventory, support for wetlands planning, improved administration of existing wetland's regulatory programs, development and adoption of a consistent wetlands definition for state regulatory programs, development and adoption of a state policy regarding Army Corps of Engineers nationwide permits, development and adoption of consistent wetlands standards and guidelines, enhancing efficiency of and coordination in the wetland permitting process, encouragement of regulatory flexibility in situations in which wetlands are created unintentionally or incidentally to other activities, encouragement of regulatory flexibility to allow public agencies and water districts to create wetlands but later remove them if the wetlands are found to conflict with the primary purpose to which the property is devoted, strengthened landowner incentives to protect wetlands, support for mitigation banking, development and expansion of other wetlands programs, and integration of wetlands policy and planning with other environmental and land use processes.

Regional strategies: These include three geographically based regional strategies in which wetlands programs can be implemented, refined, and combined in unique ways to achieve the goals and objectives of the wetlands policy. These three strategies are to be implemented in the Central Valley, the San Francisco Bay area, and Southern California. For Southern California, the regional strategy is to initiate better coordination and communication among diverse interests in southern California by establishing a "*Southern California Wetlands Joint Venture*." This group would set long-term goals and priorities for the conservation of wetlands and develop a policy to achieve those goals, and would encourage a variety of demonstration projects designed to enhance the State's ability to constructively address regional wetlands issues.

Interagency wetlands task force: This task force is to be created to direct and coordinate administration and implementation of the Wetlands Policy. This task force will be advisory to the Governor and help resolve inter-agency conflicts on wetlands. The task force will appoint an advisory committee of stakeholders and may seek additional technical advice as necessary.

CLEANUP AND ABATEMENT POLICIES AND PROCEDURES (RESOLUTION NO. 92-49)

The *Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under Water Code section 13304* (Cleanup and Abatement Policies and Procedures)(the Policy) was adopted by State Board Resolution No. 92-49 on June 18, 1992, and amended on April 21, 1994. The Policy describes the procedures the State Board and the Regional Board follow in making decisions on investigations to determine the vertical and horizontal extent of a discharge, and the appropriate cleanup and abatement methods. The Policy applies to all investigations and cleanup and abatement activities, for all types of discharges subject to California Water Code (Water Code) section 13304.

Section 13304 applies to any person who discharges or who has discharged waste into waters of the State in violation of any waste discharge requirement or other order or prohibition issued by a Regional Board or the State Board, or who has caused or permitted, causes or permits, or threatens to cause or permit any waste to be discharged or deposited where it is, or probably will be, discharged into the waters of the State and creates, or threatens to create, a condition of pollution or nuisance. Section 13304 authorizes the Regional Board to require complete cleanup of all waste discharged and to require restoration of affected water to background conditions (i.e., the water quality that existed before the discharge). The Policy requires dischargers to clean up and abate the effects of discharges in a manner that promotes attainment of either background water quality, or the best water quality which is reasonable, if background levels of water quality cannot be restored. Cleanup levels prescribed by the State Board or Regional Boards must:

- Be consistent with maximum benefit to the people of the State; and
- Be established in a manner consistent with CCR, Title 23, Chapter 15 regulations.

Dischargers are required to carry out a phased investigation to determine the nature and extent of soil and ground water pollution at a site. The Policy describes various procedures to ensure that dischargers have the opportunity to select cost-effective methods, for detecting discharges, and for cleanup and abatement. The Policy also contains criteria for development of reasonable schedules for investigation and cleanup and abatement, or other remedial action at a site.

For further details about the Policy, the reader should refer to State Board Resolution No. 92-49.

REGIONAL BOARD RESOLUTIONS

The San Diego Regional Board has adopted many resolutions which, in addition to the State Board Resolutions described previously, are important to the Regional Board's implementation of the Basin Plan. All of the Regional Board Resolutions which implement, interpret, or make specific the Basin Plan and which are listed below have been incorporated in this Basin Plan and are therefore superseded by this Basin Plan.

Resolution No. 78-6. Adopted February 27, 1978. *A Resolution Adopting Amendments to the Comprehensive Water Quality Control Plan for the San Diego Region. This resolution deleted water quality objectives and beneficial uses for certain portions of basins 1.10, 1.20, 1.30, 1.40, 1.50, 2.10, 3.10, 4.10, 4.20, 4.30, 4.40, 4.50, 4.60, 5.10, 6.10, 7.10, and 11.10.*

Resolution No. 79-25. Adopted March 26, 1979. *A Resolution Concerning the 'Agreement Between the California Regional Water Quality Control Board, San Diego Region and the Elsinore-Murrieta-Anza Resource Conservation District Regarding the Sediment Control Ordinance.'*

Resolution No. 79-44. Adopted June 25, 1979. *A Resolution Concerning 'Guidelines for New Community and Individual Sewerage Facilities.'*

Resolution No. 80-48. Adopted September 22, 1980. *A Resolution Concerning the San Diego County Department of Health Services Minimum Criteria for the Design and Construction of Evapotranspiration and Evapotranspiration-Infiltration Systems.*

Resolution No. 81-16. Adopted March 23, 1981. *A Resolution Adopting Amendments to the Comprehensive Water Quality Control Plan for the San Diego Region. This resolution amended the beneficial uses and water quality objectives for the Aliso, Carlsbad, Agua Hedionda, Batiquitos and Telegraph hydrographic subareas.*

Resolution No. 83-04. Adopted January 24, 1983. *A Resolution Adopting an Amendment to the Comprehensive Water Quality Control Plan for the San Diego Region*. This resolution amended the water quality objectives for nutrients in coastal lagoons.

Resolution No. 83-21. Adopted July 18, 1983. *A Resolution Conditionally Waiving Adoption of Waste Discharge Requirements for Certain Specific Types of Discharges.*

Resolution No. 83-21, Addendum No 1. Adopted November 15, 1993. *An Addendum Conditionally Waiving Adoption of Waste Discharge Requirements for Temporary Discharge of Specified Contaminated Soils.*

Resolution No. 83-21, Addendum No 2. Adopted November 15, 1993. *An Addendum Conditionally Waiving Adoption of Waste Discharge Requirements for Disposal / Reuse of Dredge Spoils in Industrial or Commercial Applications.*

Resolution No. 83-21, Addendum No 3. Adopted November 15, 1993. *An Addendum Conditionally Waiving Adoption of Waste Discharge Requirements for Green Waste Composting Facilities.*

Resolution No. 83-27. Adopted October 3, 1983. *A Resolution Adopting Amendments to the Comprehensive Water Quality Control Plan for the San Diego Region, San Elijo Hydrographic Subarea*.

Resolution No. 83-28. Adopted August 29, 1983. *A Resolution Supporting the County of San Diego's Moratorium on Subsurface Disposal Systems in the Valley Center Area.*

Resolution No. 84-20. Adopted August 27, 1984. *A Resolution Adopting Amendments to the Comprehensive Water Quality Control Plan for the San Diego Region, Mission San Diego Hydrographic Subarea*.

Resolution No. 85-89. Adopted December 16, 1985. *A Resolution Adopting Amendments to the Comprehensive Water Quality Control Plan for the San Diego Region, Mission San Diego Hydrographic Subarea and Sycamore Canyon Subarea, and a portion of the Santee Hydrographic Subarea.*

Resolution No. 85-92. Adopted December 16, 1985. *Designation of Class III Landfills Within the San Diego Region to Accept Shredder Wastes as Required by Section 25143.6 of the Health and Safety Code.*

Resolution No. 86-06. Adopted March 24, 1986. *A Resolution Adopting Amendments to the Comprehensive Water Quality Control Plan for the San Diego Region. This resolution established a goal and action plan for encouraging and promoting water reclamation.*

Resolution No. 87-71. Adopted November 16, 1987. *A Resolution Adopting Amendments to the Comprehensive Water Quality Control Plan for the San Diego Region. This resolution established a policy on dairy waste management.*

Resolution No. 87-91. Adopted December 21, 1987. *A Resolution Adopting Amendments to the Comprehensive Water Quality Control Plan for the San Diego Region. This resolution established a policy on erosion and sediment control.*

Resolution No. 88-25. Adopted March 14, 1988. A Resolution Regarding the Proposed State Water Resources Control Board Policy for Water Quality Control Defining '*Sources of Drinking Water*' for the Purposes of Discharge Prohibitions.

Resolution No. 88-49. Adopted April 25, 1988. *A Resolution Adopting Amendments to the Comprehensive Water Quality Control Plan for the San Diego Region for a Portion of the Otay Hydrographic Subunit.*

Resolution No. 88-97. Adopted October 3, 1988. *A Resolution Supporting the Proposed Interim Solution to the Tijuana Sewage Problem Consisting of a Sewage Treatment Plant Within the United States and an Ocean Outfall.*

Resolution No. 89-33. Adopted April 10, 1989. *Incorporation of 'Sources of Drinking Water' Policy into the Water Quality Control Plan (Basin Plan) of the San Diego Region.*

Resolution No. 89-53. Adopted July 10, 1989. *Addition of Portions of the Otay Valley Hydrologic Area to the List of Waters Excepted From the 'Sources of Drinking Water' Policy.*

Resolution No. 90-27. Adopted April 23, 1990. *A Resolution Adopting Amendments to the Comprehensive Water Quality Control Plan for the San Diego Region, for the Mission San Diego and a Portion of the Santee Hydrologic Subareas. This resolution establishes a biostimulatory substances water quality compliance methodology for part of the San Diego River.*

Resolution No. 90-28. Adopted March 12, 1990 April 23, 1990. *A Resolution Adopting Amendments to the Comprehensive Water Quality Control Plan for the San Diego Region, for a Portion of the San Clemente Hydrologic Subunit.*

Resolution No. 90-53. Adopted September 24, 1990. *A Resolution Adopting Amendments to the Comprehensive Water Quality Control Plan for Portions of the Santa Margarita Hydrologic Unit (2.00), San Diego Region. This resolution establishes a biostimulatory substances water quality compliance methodology for part of the Santa Margarita River.*

Resolution No. 90-61. Adopted November 5, 1990. *A Resolution Amending Resolution No. 90-40, A Regionwide Groundwater Amendment to the Comprehensive Water quality Control Plan for the San Diego Region.'* This resolution revised the language regarding use of reclaimed water contained in Resolution No. 90-40, *A Resolution Reconsidering and Amending Resolution No. 90-26, 'A Regionwide Groundwater Amendment to the Comprehensive Water Quality control Plan for the San Diego Region',* and Resolution No. 90-26, *A Resolution Adopting A Regionwide Groundwater Amendment to the Comprehensive Water Quality Control Plan for the San Diego Region.*

Resolution No. 91-23. Adopted March 11, 1991. A Resolution Amending Resolution No. 90-27, *'A Resolution Adopting Amendments to the Comprehensive Water Quality Control Plan for the San Diego Region, for the Mission San Diego and a Portion of the Santee Hydrologic Subareas.'*

Resolution No. 91-46. Adopted May 20, 1991. *A Resolution Rescinding and Replacing Resolution No. 88-91 and Addenda, and Establishing a Regional Board Drought Policy.*

Resolution No. 91-79. Adopted December 9, 1991. *A Resolution Amending Resolution No. 90-55, 'Adopting Amendments to the Comprehensive Water Quality Control Plan for the San Diego Region.' This resolution establishes revised Basin Plan chapters for beneficial uses and water quality objectives.*

Resolution No. 92-21. Adopted April 6, 1992. *A Resolution Concerning the Agreement Between the California Regional Water Quality Control Board, San Diego Region, and the Resource Conservation Districts of San Diego County Regarding the Erosion and Sediment Control Policy*.

Resolution No. 93-02. Adopted February 1, 1993. *A Resolution Adopting Amendments to the Comprehensive Water Quality Control Plan for the San Diego Region for the Escondido Hydrologic Subarea (4.62).*

Resolution No. 94-09. Adopted February 10, 1994. *A Resolution Adopting Amendments to the Comprehensive Water Quality Control Plan for the San Diego Region, Portions of the Pauba (2.51) and Wolf (2.52) Hydrologic Subareas*.

Resolution No. 94-25. Adopted February 10, 1994. *A Resolution Adopting Amendments to the Comprehensive Water Quality Control Plan for the San Diego Region for the Laguna (1.10), Mission Viejo (1.20), and San Clemente (1.30) Hydrologic Areas.*

Resolution No. 94-139. Adopted October 13, 1994. *A Resolution Adopting Amendments to the Water Quality Control Plan for a portion of the Poway Hydrologic Area (6.20).*

Regional Board Water Quality Management Policy. This policy consists of five general water quality policy statements and is described in Chapter 1 of this Basin Plan.

NEW REGIONAL BOARD RESOLUTIONS

The following Basin Plan amendments have been adopted since the September 8, 1994 update.

Resolution No. 95-48. Adopted May 16, 1995. *A Resolution Adopting Amendments to the Water Quality Control Plan for the Alluvial Aquifer of the Moosa (903.13) and the Valley Center (903.14) Hydrologic Subareas.*

Resolution No. 95-95. Adopted October 12, 1995. *A Resolution Adopting An Amendment to the Water Quality Control Plan, San Diego Region. Types of Discharges Identified for Conditional Waiver of Waste Discharge Requirements.* (See Appendix D).

Resolution No. 95-115. Adopted October 12, 1995. *A Resolution Adopting Amendments to the Water Quality Control Plan for the San Diego Basin (9), Table 4-4. Types of Discharges Identified for Conditional Waiver of Waste Discharge Requirements.* (See Appendix D).

Resolution No. 96-30. Adopted May 9, 1996. *A Resolution Adopting an Amendment to the Water Quality Control Plan for the San Diego Region Providing an Exception to the Prohibition of Discharges of Recycled Wastewater to Surface Water Bodies Used for Municipal Water Supply.* (See pages 4-16 thru 4-17).

Resolution No. 96-34. Adopted August 8, 1996. *A Resolution Adopting an Amendment to the Water Quality Control Plan for the San Diego Region, Table 4-4, Item 24, Composting and Processing, Mulching, or Grinding Waste Management Units.* (See Appendix D).

Resolution No. 97-04: Adopted March 12, 1997. *A Resolution Adopting Amendments to the Water Quality Control Plan for the San Diego Basin for the Designation of COLD and SPWN Beneficial Uses.* (See pages 2-9, 2-11, and 2-16 thru 2-55).

Resolution No. R9-2002-0123: Adopted August 14, 2002. *Total Maximum Daily Load (TMDL) for Diazinon in Chollas Creek Watershed, San Diego County.* (See Chapter 7).

Resolution No. R9-2002-0186: Adopted September 11, 2002. *Amendment to the Water Quality Control Plan for the San Diego Region (9) to Incorporate a Waste Discharge Requirement Waiver Policy for Certain Specific Types of Discharges.* (See pages 4-11 thru 4-14).

Resolution No. R9-2005-0019: Adopted February 9, 2005. *Total Maximum Daily Load for Dissolved Copper in the Shelter Island Yacht Basin, San Diego Bay.* (See Chapter 7).

REPRINT OF RESOLUTION NO. 77-1

STATE WATER RESOURCES CONTROL BOARD
RESOLUTION NO. 77-1
POLICY WITH RESPECT TO WATER RECLAMATION IN CALIFORNIA

WHEREAS:

1. The California Constitution provides that the water resources of the State be put to beneficial use to the fullest extent of which they are capable, and that waste or unreasonable use or unreasonable method of use of water be prevented, and that conservation of such waters is to be exercised with a view to the reasonable and beneficial use thereof in the interest of the people and for the public welfare;

2. The California Legislature has declared that the State Water Resources Control Board and each Regional Water Quality Control Board shall be the principal state agencies with primary responsibility for the coordination and control of water quality;

3. The California Legislature has declared that the people of the State have a primary interest in the development of facilities to reclaim water containing waste to supplement existing surface and underground water supplies;

4. The California Legislature has declared that the State shall undertake all possible steps to encourage the development of water reclamation facilities so that reclaimed water may be made available to help meet the growing water requirements of the State;

5. The Board has reviewed the document entitled "*Policy and Action Plan for Water Reclamation in California*," dated December 1976. This document recommends a variety of actions to encourage the development of water reclamation facilities and the use of reclaimed water. Some of these actions require direct implementation by the Board; others require implementation by the Executive Officer and the Regional Boards. In addition, this document recognizes that action by many other state, local, and federal agencies and the California State Legislature would also encourage construction of water reclamation facilities and the use of reclaimed water. Accordingly, the Board recommends for its consideration a number of actions intended to coordinate with the program of this Board;

6. The Board must concentrate its efforts to encourage and promote reclamation in water-short areas of the State where reclaimed water can supplement or replace other water supplies without interfering with water rights or instream beneficial uses or placing an unreasonable burden on present water supply systems; and

7. In order to coordinate the development of reclamation potential in California, the Board must develop a data collection, research, planning, and implementation Program for water reclamation and reclaimed water uses.

THEREFORE, BE IT RESOLVED:

1. That the State Board adopts the following Principles:

   I. The State Board and the Regional Boards shall encourage, and consider or recommend for funding, water reclamation projects which meet Condition 1, 2, or 3 below and which do not adversely impact vested water rights or unreasonably impair instream beneficial uses or place an unreasonable burden on present water supply systems;

      (1) Beneficial use will be made of wastewaters that would otherwise be discharged to marine or brackish receiving waters or evaporation ponds,

      (2) Reclaimed water will replace or supplement the use of fresh water or better quality water,

(3) Reclaimed water will be used to preserve, restore, or enhance instream beneficial uses which include, but are not limited to, fish, wildlife, recreation and esthetics associated with any surface water or wetlands.

II. The State Board and the Regional Boards shall (1) encourage reclamation and reuse of water in water-short areas of the State, (2) encourage water conservation measures which further extend the water resources of the State, and (3) encourage other agencies, in particular the Department of Water Resources, to assist in implementing this policy.

III. The State Board and the Regional Boards recognize the need to protect the public health including potential vector problems and the environment in the implementation of reclamation projects.

IV. In implementing the foregoing Principles, the State Board or the Regional Boards, as the case may be, shall take appropriate actions, recommend legislation, and recommend actions by other agencies in the areas of (1) planning, (2) project funding, (3) water rights, (4) regulation and enforcement, (5) research and demonstration, and (6) public involvement and information.

2. That, in order to implement the foregoing Principles, the State Board:

(a) Approves Planning Program Guidance Memorandum No. 9, "*PLANNING FOR WASTEWATER RECLAMATION*,"

(b) Adopts amendments and additions to Title 23, California Administrative Code sections 654.4, 761, 764.9, 783, 2101, 2102, 2107, 2109, 2109.1, 2109.2, 2119, 2121, 2133(b)(2), and 2133(b)(3),

(c) Approves Grants Management Memorandum No. 9.01, "*WASTEWATER RECLAMATION*,"

(d) Approves the Division of Planning and Research, Procedures and Criteria for the Selection of Wastewater Reclamation Research and Demonstration Project,

(e) Approves "*GUIDELINES FOR REGULATION OF WATER RECLAMATION*,"

(f) Approves the Plan of Action contained in Part III of the document identified in Finding Five above,

(g) Directs the Executive Officer to establish an Interagency Water Reclamation Policy Advisory Committee. Such Committee shall examine trends, analyze implementation problems, and report annually to the Board the results of the implementation of this policy, and

(h) Authorizes the Chairperson of the Board and directs the Executive Officer to implement the foregoing Principles and the Plan of Action contained in Part III of the document identified in Finding Five above, as appropriate.

3. That not later than July 1, 1978, the Board shall review this policy and actions taken to implement it, along with the report prepared by the Interagency Water Reclamation Policy Advisory Committee, to determine whether modifications to this policy are appropriate to more effectively encourage water reclamation in California.

4. That the Chairperson of the Board shall transmit to the California Legislature a complete copy of the "*Policy and Action Plan for Water Reclamation in California*."

CERTIFICATION

The undersigned, Executive Officer of the State Water Resources Control Board, does hereby certify that the foregoing is a full, true, and correct copy of a resolution duly and regularly adopted at a special meeting of the State Water Resources Control Board held on January 6, 1977.

Original signed by
Bill B. Dendy
Executive Officer
State Water Resources Control Board

REPRINT OF RESOLUTION NO. 88-63

STATE WATER RESOURCES CONTROL BOARD
RESOLUTION NO. 88-63
ADOPTION OF POLICY ENTITLED "*SOURCES OF DRINKING WATER*"

WHEREAS:

1. California Water Code section 13140 provides that the State Board shall formulate and adopt State Policy for Water Quality Control; and,

2. California Water Code section 13240 provides that Water Quality Control Plans "*shall conform*" to any State Policy for Water Quality Control; and,

3. The Regional Boards can conform the Water Quality Control Plans to this policy by amending the plans to incorporate the policy; and,

4. The State Board must approve any conforming amendments pursuant to Water Code section 13245; and,

5. "*Sources of drinking water*" shall be defined in Water Quality Control Plans as those water bodies with beneficial uses designated as suitable, or potentially suitable, for municipal or domestic water supply (MUN); and,

6. The Water Quality Control Plans do not provide sufficient detail in the description of water bodies designated MUN to judge clearly what is, or is not, a source of drinking water for various purposes.

THEREFORE BE IT RESOLVED:
All surface and ground waters of the state are considered to be suitable, or potentially suitable, for municipal or domestic water supply and should be so designated by the Regional Boards 1 with the exception of:

1. <u>Surface and ground waters where</u>:
   a. The total dissolved solids (TDS) exceed 3,000 mg/l (5,000 μS/cm, electrical conductivity) and it is not reasonably expected by Regional Boards to supply a public water system, or

   b. There is contamination, either by natural processes or by human activity (unrelated to a specific pollution incident), that cannot reasonably be treated for domestic use using either Best Management Practices or best economically achievable treatment practices, or

   c. The water source does not provide sufficient water to supply a single well capable of producing an average sustained yield of 200 gallons per day.

2. <u>Surface waters where</u>:
   a. The water is in systems designed or modified to collect or treat municipal or industrial wastewaters, process waters, mining wastewaters, or storm water runoff, provided that the discharge from such systems is monitored to assure compliance with all relevant water quality objectives as required by the Regional Boards; or,

   b. The water is in systems designed or modified for the primary purpose of conveying or holding agricultural drainage waters, provided that the discharge from such systems is monitored to assure compliance with all relevant water quality objectives as required by the Regional Boards.

3. <u>Ground water where</u>:
   The aquifer is regulated as a geothermal energy producing source or has been exempted administratively pursuant to 40 CFR, section 146.4 for the purpose of underground injection of fluids associated with the production of hydrocarbon or geothermal energy, provided that these fluids do not constitute a hazardous waste under 40 CFR, section 261.3.

4. Regional Board Authority to Amend Use Designations:
Any body of water which has a current specific designation previously assigned to it by a Regional Board in Water Quality Control Plans may retain that designation at the Regional Board's discretion. Where a body of water is not currently designated as MUN but, in the opinion of a Regional Board, is presently or potentially suitable for MUN, the Regional Board shall include MUN in the beneficial use designation.

The Regional Boards shall also assure that the beneficial uses of municipal and domestic supply are designated for protection wherever those uses are presently being attained, and assure that any changes in beneficial use designations for waters of the State are consistent with all applicable regulations adopted by the Environmental Protection Agency.

The Regional Boards shall review and revise the Water Quality Control Plans to incorporate this policy.

CERTIFICATION

The undersigned, Administrative Assistant to the Board, does hereby certify that the foregoing is a full, true, and correct copy of a policy duly and regularly adopted at a meeting of the State Water Resources Control Board held on May 19, 1988.

Original signed by
Maureen Marche
Administrative Assistant to the Board

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[1] This policy does not affect any determination of what is a potential source of drinking water for the limited purposes of maintaining a surface impoundment after June 30, 1988, pursuant to section 25208.4 of the Health and Safety Code.

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CHAPTER 6
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6. SURVEILLANCE, MONITORING AND ASSESSMENT

INTRODUCTION

Laboratory

California's well-being is linked to the health of its water. To protect and preserve this basic resource, the State Board and the Regional Board closely monitor water quality throughout the state. A comprehensive surveillance and monitoring program provides basic information needed to evaluate the effectiveness of California's water quality control program.

Historically, a wide variety of interested state, federal, and local agencies have sampled, analyzed, and tracked water quality. The State Board monitoring program coordinates existing information, and supplements it where necessary to meet data needs.

The Porter-Cologne Water Quality Control Act delegates primary responsibility for coordination and control of water quality in California to the State Board. Section 13163 of the Act states that in conducting this mission, the State Board shall coordinate water quality investigations, recognizing that other state agencies may have primary statutory responsibility for such investigations, and shall consult with the concerned Regional Boards in implementing this section.

Pursuant to these mandates, the State Board in 1976 established a coordinated Primary Water Quality Monitoring Network for California. Participants in the coordinated Primary Network included the California Departments of Fish and Game (DFG), Water Resources (DWR), and Health Services (DHS) as well as the Federal Bureau of Reclamation, United States Geologic Survey (USGS), and the United States Environmental Protection Agency (USEPA).

The goal of the Primary Network has been to provide an overall, continuous assessment of water quality in the State. This goal is to be achieved by statewide monitoring of water quality parameters that can affect beneficial uses of state waters.

This chapter contains a discussion of the objectives and various elements of the State and Regional Board's surveillance and monitoring programs. Not all of these programs are currently active in the San Diego Region, as many are unfunded at this time.

STATE SURVEILLANCE AND MONITORING PROGRAMS

The State's surveillance and monitoring programs are designed to assure the collection of data necessary to:

- Establish and review water quality standards, goals, and objectives;
- Determine maximum daily loadings, waste load allocations, and effluent limitations;
- Perform segment classifications and ranking; and
- Establish the relationship between water quality and individual point and nonpoint sources of pollutants.

These data must be verified and properly interpreted to evaluate water quality trends and to make the necessary changes in the enforcement and/or planning programs to carry out program objectives. Output based upon data obtained from this program is used to prepare reports satisfying the requirements of federal Clean Water Act, sections 104, 106, 208, 301, 303, 304, 305, 307, 308, 314, 402, and the applicable portions of the State's Porter-Cologne Water Quality Control Act.

The overall objectives of the State's surveillance and monitoring program are:

- To measure the achievement of water quality goals and objectives specified in the Basin Plan;
- To measure specific effects of water quality changes on the established beneficial uses;

- To measure background conditions of water quality and determine long-term trends in water quality;

- To locate and identify sources of water pollution that pose an acute, accumulative, and/or chronic threat to the environment;

- To provide information needed to relate receiving water quality to mass emissions of pollutants by waste dischargers;

- To provide data for determining compliance with permit conditions;

- To provide the documentation necessary to support the enforcement of permit conditions and waste discharge requirements;

- To measure waste loads discharged to receiving waters and to identify the limits of their effects, and in water quality limited segments, to prepare waste load allocations necessary to achieve water quality control;

- To provide data needed to carry on the continuing planning process;

- To provide a clearinghouse for the collection and dissemination of water quality data gathered by other agencies and private parties cooperating in the program;

- To measure the effects of water rights decisions on water quality and to guide the State Board in its responsibility to regulate unappropriated water for the control of quality; and

- To prepare reports on water quality conditions as required by federal and state regulations and other users requesting water quality data.

The surveillance and monitoring program is designed to meet the objectives set forth above. An optimum surveillance and monitoring program requires flexibility and must be able to respond to needs specified in the Basin Plan as it is implemented and revised. To ensure that the surveillance and monitoring program is flexible and adapts to change, statewide water quality assessments are performed every two years to provide a timely cycle to evaluate the program's effectiveness and make appropriate changes.

The surveillance and monitoring program provides for collection and analysis of samples and the reporting of water quality data. It includes laboratory support and quality assurance, storage of data for rapid and systematic retrieval, and preparation of reports and data summaries. Most importantly, it includes interpretation and evaluation of data leading to recommendations for action.

Surveillance and monitoring at the State level is made up of three programs. These are the Toxic Substance Monitoring, State Mussel Watch and Bay Protection and Toxic Cleanup Programs.

San Mateo Creek steelhead trout

TOXIC SUBSTANCE MONITORING PROGRAM

One method of monitoring for toxic substances (toxic elements and organic compounds) is to collect and analyze water samples. A major problem with this approach is that toxic discharges are likely to occur in an intermittent fashion and thus are likely to be missed with "*grab*" sampling of the water. Another limitation to analyzing water samples is that generally, harmful toxicants are present in low concentrations in the water. Toxicants are concentrated through the aquatic food chain through the process of bioaccumulation. Thus, in the Toxic Substances Monitoring Program, the flesh of fish and other aquatic organisms is analyzed for toxic metals and synthetic organic compounds.

Streams and lakes in the region are sampled according to their importance to the State in terms of water quality. Priority is given to waters where contaminants are suspected and/or to waters where no other source of water quality information is available. Routine chemical and biological water monitoring is performed by the DWR and/or USGS; and toxic substances monitoring of resident organisms is performed by the DFG.

The objectives of the Toxic Substance Monitoring program are:

- To develop statewide baseline data and to demonstrate trends in the occurrence of toxic elements and organic substances in the aquatic biota;
- To assess impacts of accumulated toxicant upon the usability of State waters by man;
- To assess impacts of accumulated toxicant upon the aquatic biota; and
- Where problem concentrations of toxicant are detected, to attempt to identify sources of toxicant and to relate concentrations found in the biota to concentrations found in the water.

The samples collected in the Toxic Substance Monitoring program are benthic invertebrates and fish. The flesh of bivalve mollusks or crayfish tailflesh and fish livers are analyzed for important metals, including arsenic, cadmium, chromium, copper, lead, nickel, silver, and zinc; fish flesh is analyzed for mercury. In addition, both invertebrate and fish flesh samples are analyzed for 55 synthetic organic compounds, most of which are pesticides. Toxic Substance Monitoring reports have been published annually since 1977.

STATE MUSSEL WATCH PROGRAM

The State Mussel Watch (Mussel Watch) program provides documentation of the quality of coastal marine and estuarine waters. The Mussel Watch program fulfills the goal of providing the state with long-term trends in the quality of these waters. Mussels were chosen as the indicator organism for trace metals and synthetic organic compounds in the coastal and estuarine waters. Although the mussel populations of bays and estuaries are of a different species than those found in the open coast; their suitability as sentinels for monitoring the presence of toxic pollutants stems from several factors including: (1) their ubiquity along the California coast; (2) their ability to concentrate pollutants above ambient sea water levels and to provide a time-averaged sample; and (3) their non-motile nature which permits a localized measurement of water quality. The trace metals analyzed for in mussel tissues include aluminum, cadmium, chromium, copper, lead, manganese, mercury, nickel, silver, and zinc. Synthetic organic compounds analyzed for are summarized in Table 6-1.

TABLE 6 - 1. SYNTHETIC ORGANIC COMPOUNDS ANALYZED IN THE STATE MUSSEL WATCH AND TOXIC SUBSTANCES MONITORING PROGRAMS

Aldrin	P, P'- DDE	Endosulfan [2]	Methyl Parathion
Chlorbenside	O, P'- DDE	Endosulfan Sulfate	Oxadiazon [2]
alpha Chlordane	P, P'- DDD	Total Endosulfan	PCB 1248
gamma Chlordane	O, P'- DDD	Ethyl Parathion	PCB 1254
cis Chlordane	P, P'- DDMS	Heptachlor	PCB 1260
trans Chlordane	P, P'- DDMU	Heptachlor Epoxide	Total PCB
Oxychlordane	O, P'- DDT	Heptachlorobenzene	Pentachlorophenol [1]
Total Chlordane	P, P'- DDT	alpha Lindane	Phenol [1]
cis Nonachlor	Total DDT	beta Lindane	Ronnel [1]
trans Nonachlor	Diazinon	gamma Lindane	Tetrachlorphenol [1]
Chlorpyrifos	Dieldrin	delta Lindane	Tetradifon [1]
Dacthal	Endrin	Total Lindane [2]	Toxaphene
Dicofol [2]	Endosulfan [1]	Methoxychlor	Tributylin [1]

[1] These constituents only sampled in the State Mussel Watch Program.
[2] These constituents only sampled in the Toxic Substances Monitoring Program.

When compared with alternative sampling designs such as seawater and sediment sampling, the Mussel Watch program is a more cost effective program. Mussel Watch reports have been published annually since 1978.

During the 1977 and 1978 sampling periods, the focus of the Mussel Watch program was, for the most part, on open coast monitoring of sites outside the vicinity of known pollutant sources. Monitoring of water quality in the State Board's designated Areas of Special Biological Significance (ASBS), to establish baseline conditions relating to the range of typical conditions in water, sediment and biota, was given prime importance in the early years of the program.

Based on the identification of "*hot spot*" areas during 1977 and 1978, intensive sampling of these areas was implemented in 1979. Such a sampling strategy was intended to confirm previous findings, establish the magnitude of the potential problem and identify pollutant sources. The program has since evolved to include transplanting *Mytilus californianus* mussels into select California bays and estuaries at selected sites to confirm potential toxic substance pollution (i.e., in the vicinity of dischargers).

San Diego Bay

BAY PROTECTION AND TOXIC CLEANUP PROGRAM

California Water Code, Division 7, Chapter 5.6 established a comprehensive program within the State Board to protect the existing and future beneficial uses of California's bays and estuaries. The Bay Protection and Toxic Cleanup Program (BPTCP) provides focus on the State Board and regional boards efforts to control pollution of the State's bays and estuaries. The BPTCP also establishes a program to identify toxic hot spots and plan for their cleanup. Chapter 5.6, sections 13390 through 13396.5 were added to Division 7 of the California Water Code by SB 475 (Stats. 1989, Chapter 269), SB 1845 (Stats. 1990, Chapter 1294), and AB 41 (Stats. 1989, Chapter 1032). New legislation (SB 1084 Calderon; Stats. 1993, Chapter 1157) extends program funding through 1998. The BPTCP is a statewide program which is coordinated with the DFG and California Environmental Protection Agency's (Cal-EPA's) Office of Environmental Health Hazard Assessment. The program was established: (1) to provide protection for existing and future beneficial uses of bay and estuarine waters; (2) to provide a plan for remedial action at toxic hot spots; (3) to further compliance with federal law pertaining to the identification of waters where the protection and propagation of shellfish, fish, and wildlife are threatened by toxic pollutants and contribute to the development of effective strategies to control these pollutants; and (4) to allow these programs to be structured and maintained in a manner which allows the State and Regional Boards to make maximum use of any federal funds which may be available for the program. To attain the goals of the program, the State and Regional Boards are required to do the following:

- Develop and maintain a program to identify toxic hot spots, plan for their cleanup or mitigation, and amend water quality control plans and policies to abate toxic hot spots;
- Formulate and adopt a water quality control plan for enclosed bays and estuaries;
- Review and, if necessary, revise waste discharge requirements to conform to the plan;
- Develop a database of toxic hot spots;
- Develop an ongoing monitoring and surveillance program;
- Develop sediment quality objectives;
- Develop criteria for the assessment and priority ranking of toxic hot spots; and
- Fund the program through fees on point and nonpoint dischargers (Title 17 California Code of Regulations section 2236).

Program accomplishments include:

- Adoption of an approach for establishing sediment quality objectives;
- Installation of a computer system for a consolidated database of information being collected to identify toxic hot spots;

- Implementation of regional monitoring program;

- Development of draft site ranking criteria to be used for priority ranking of toxic hot spots; and

- Implementation of a fee system supporting the program.

The development of regional and statewide cleanup plans is ongoing. For the period July, 1992 through June, 1994 there are two main sediment sampling and analysis efforts for the BPTCP. The first includes toxicity screening where the primary goal is to determine bioassay protocols, establish reference sites and a consolidated database. The second is measurement of the bioeffects associated with toxicants. This includes a survey of sediment contamination and toxicity; two independent toxicity tests including ten-day solid phase amphipod survival, and pore-water test of sea urchin egg fertilization; chemical analyses of sediment samples including trace metals, pesticides, hydrocarbons, tributyltin, acid volatile sulfides and selected normalizers (such as grain size and total organics). Surveillance and monitoring sites in this region are located in the Pacific Ocean, Tijuana River, San Diego Bay, and Mission Bay.

In addition, the San Diego Region BPTCP includes an Underwater Hull Cleaning (UHC) study and a water circulation study for San Diego Bay. The components of the UHC study includes surveys, water sampling and recommendations. The results of the UHC study should assist the Regional Board to determine appropriate regulations for underwater hull cleaners.

REGIONAL SURVEILLANCE AND MONITORING PROGRAMS

The Regional Board participates in the implementation of the following surveillance and monitoring programs:

- Compliance Inspections and Monitoring;
- Complaint Investigation;
- Intensive Surveys;
- Municipal Storm Water Monitoring;
- Water Quality Assessment Activities; and
- Quality Assurance and Quality Control.

COMPLIANCE INSPECTIONS AND MONITORING

The Regional Board ensures compliance with the Water Quality Control Plan, NPDES permits and WDRs through implementation of a comprehensive self monitoring program and compliance inspection program.

COMPLIANCE MONITORING

Compliance monitoring provides data which is used to determine compliance with discharge requirements and receiving water standards and to support enforcement actions. Data are collected from self monitoring reports generated by waste dischargers.

Self monitoring reports submitted to the Regional Board are reviewed, and if violations are noted, appropriate action is taken, ranging from administrative enforcement to judicial abatement depending on the circumstances. Self monitoring data have also been used to develop pollutant loadings and to indicate the general improvement noted in the receiving water.

Self monitoring report requirements are dependent on the type and quantity of effluent discharged. For example, the City of San Diego, Water Utilities Department, conducts an Ocean Monitoring Program as part of the environmental monitoring requirements for the Point Loma Sewage Outfall. The program includes chemical and biological testing of ocean waters, sediments, fish, and benthic infauna. Most of the monitoring stations are in close vicinity to the Point Loma Sewage Outfall; however, stations range geographically from the shoreline to six miles offshore and from La Jolla to the Mexican border.

COMPLIANCE INSPECTIONS

Regional Board staff periodically conducts inspections of all dischargers regulated under an NPDES permit or waste discharge requirements. Treatment, storage, and discharge facilities are inspected to determine compliance with the permit. Compliance inspection reports are written

based on staff inspections of a particular site and include observations made by staff and/or results of analyses performed on samples collected by staff. During the inspections facts and information are gathered to assess the degree of compliance with the following NPDES permit or WDR provisions:

- Effluent and receiving water limitations;
- Self-monitoring reports;
- Record keeping and reporting;
- Compliance time schedules, if applicable;
- Best management plans, if applicable; and
- Other conditions, provisions and prohibitions.

During some inspections, samples are collected to further determine compliance. Inspections can be either announced or unannounced. Announced inspections facilitate direct communication with the discharger to review procedures and operations. Unannounced inspections have the advantage that staff can witness normal day-to-day operations without giving the discharger the opportunity to prepare for the visit. Upon discovery of a noncompliance the procedures discussed in the enforcement section of Chapter 4 are followed to gain correction.

COMPLAINT INVESTIGATIONS

This task involves investigation of complaints of citizens and public or governmental agencies on the discharge of pollutants or creation of nuisance conditions. It is a Regional Board responsibility to prepare reports or letters and follow-up actions to document observed conditions and to institute appropriate corrective actions. In instances where the Regional Board cannot respond to a complaint because of resource limitations, the Regional Board notifies other agencies if it falls within their jurisdiction.

The Regional Board strives to ensure that responses to complaints involving threats to water quality be made in an expedient manner, as resources allow. For the purpose of this policy, response includes the following three components: (1) Thorough documentation of complaints; (2) Appropriate follow-up including site inspections, referral to, or notification of, other regulatory agencies, corrective actions, enforcement actions, etc.; and (3) Notification to complainant, as appropriate, of findings and subsequent actions.

DEFINITION OF ACTIVITIES

Complaint activities include all activities necessary to respond to a complaint or incident including the following: (1) Receiving and documenting complaints/incidents (e.g., spills); (2) Any follow-up activities to gather additional information (e.g., research, telephone contacts, coordination with other agencies, etc.); (3) Preparation for any field inspections necessary to investigate a complaint/incident; (4) Field inspections, including travel; (5) Sampling of spill and/or receiving waters for documentation, if appropriate; and (6) Documenting findings and responding to complainant.

NOTIFICATION TO OTHER AGENCIES

The Regional Board notifies other responsible regulatory agencies (e.g., Public Health, DHS, DFG, Department of Food and Agriculture, Integrated Solid Waste Management Board) of the content of a complaint if it falls within said agency's jurisdiction.

Except for a discharge in compliance with waste discharge requirements, any person who causes or permits any reportable quantity of hazardous substance or sewage to be discharged in or on any waters of the State, or discharged or deposited where it is or probably will be discharged in or on any waters of the State, shall, as soon as possible, notify the Office of Emergency Services of the discharge in accordance with the spill reporting provision of the State toxic disaster contingency plan. The person shall also immediately notify the State Board or appropriate Regional Board of the discharge (Water Code section 13271).

Similarly, any person who discharges any oil or petroleum product under the above-stated conditions shall, as soon as possible, notify the Office of Emergency Services of the discharge in accordance with the spill reporting provision of the State oil spill contingency plan. Immediate notification of an appropriate agency of the federal government, or of the appropriate Regional Board (in accordance with the reporting requirements set under Water Code section 13267 or 13383) shall satisfy the oil spill notification requirements of this paragraph (Water Code section 13272).

REPORTABLE QUANTITIES OF HAZARDOUS WASTE AND SEWAGE DISCHARGES

Water Code section 13271 requires that the State Board and the DHS adopt regulations establishing reportable quantities for substances listed as hazardous wastes or hazardous materials pursuant to section 25140 of the Health and Safety Code. Reportable quantities are those which should be reported because they may pose a risk to public health or the environment if discharged to ground or surface water.

Similarly, the State Board was required to adopt regulations establishing reportable quantities for sewage. These regulations for sewage and hazardous materials discharge do not supercede waste discharge requirements or water quality objectives.

The State Board adopted regulations for reportable quantities are included in subchapter 9.2 of the California Code of Regulations.

INSPECTION IN RESPONSE TO COMPLAINTS

The Regional or State Board may inspect the facilities of any discharger at any time pursuant to Water Code, section 13267. Such inspections should normally be conducted with consent of the occupant and/or owner of the facilities. If an inspection request is refused by any occupant of the premises, an effort to gain access should be made with the owner of the premises. The Clean Water Act and California Water Code provide that a credentialed inspector must be allowed entry to the facilities subject to regulation under these laws. Regional Board staff do not inspect sites which pose a threat to their health or safety. For sites which could involve toxic and hazardous materials field work, a Health Evaluation Plan (HEP) is completed.

If all attempts to obtain consent fail, the inspection may be made pursuant to a warrant in accordance with the procedure set forth in Title 13, section 13267(c). In all cases where an inspection warrant is required, staff of the State Board's Office of Chief Counsel is consulted relative to procedures.

An inspection is permitted without consent and without a warrant when there is an emergency which affects the public health or safety. Advice from the State Board's Office of Chief Counsel is sought before making such an inspection.

When an inspection is done in response to a complaint, and the inspector may be entering an *"unknown"* situation, every safety precaution is taken. Again, in no instance does staff make an inspection of a site which may pose a threat to their health and safety. Thorough notes and documentation are made during the inspection, including photographs, if appropriate. After an inspection is completed, an inspection report is prepared describing what was found.

FINDINGS OF NONCOMPLIANCE

If during the course of a complaint investigation, a noncompliance is discovered, procedures as outlined in the enforcement section of Chapter 4 (Implementation chapter) are followed.

INTENSIVE SURVEYS

Intensive monitoring surveys provide detailed water quality data to locate and evaluate violations of receiving water standards, to develop waste load allocations and to assess the water quality condition.

They usually involve localized, intermittent sampling at a higher than normal frequency. Intensive surveys should be repeated at appropriate intervals depending on the parameters involved, the variability of conditions, and changes in hydrologic or effluent regimes.

MUNICIPAL STORM WATER MONITORING

The storm water permitting program has been established to protect water quality of the water bodies which receive storm water runoff. (For a complete description of this program, refer to Chapter 4, Implementation chapter). Sampling of storm water runoff has indicated that storm water discharges contain significant amounts of pollutants. Therefore, the Region's municipal storm water permits requires the permittee to develop comprehensive management and monitoring programs. Because each permit generally covers a large number of water bodies, the required monitoring program is in two phases.

Phase I requires the discharger to sample storm water discharges and to sample those receiving waters where the beneficial uses are threatened or impaired due to runoff of storm water and urban nuisance water. Phase I requires both a dry and wet weather monitoring program. San Diego copermittees are required to sample two major types of runoff stations: (1) mass loading; and (2) land use stations. The dry weather monitoring program requires periodic colorimetric field tests and visual inspections of the storm water conveyance system to detect non-storm water flows. Under Phase II the dischargers will be required to develop storm water management and monitoring programs for the remaining water bodies included under the permit.

Storm water discharges from urbanized areas consist mainly of surface runoff emanating from residential, commercial, and industrial areas. In addition, there are storm water discharges from agricultural and other land uses. The constituents of concern in these discharges include: total and fecal coliform, *enterococcus*, total suspended solids, biochemical oxygen demand, chemical oxygen demand, total organic carbon, oil and grease, heavy metals, nutrients, base/neutral and acid extractables, pesticides, herbicides, petroleum hydrocarbon products, and/or those causing extremely high or low pH.

The objectives of the storm water monitoring program are to: (1) define the type, magnitude, and sources of pollutants in the storm water discharges within the permittee's jurisdiction so that appropriate pollution prevention and correction measures can be identified; (2) evaluate the effectiveness of pollution prevention and correction measures; and (3) evaluate compliance with water quality objectives established for the storm water system or its components.

Sampling biota

BIENNIAL CLEAN WATER ACT SECTIONS 303(D), 305(B), AND 314 INTEGRATED REPORT

Every two years states are required to provide an assessment of the quality of all their waters and a list of those waters that are impaired or threatened, in accordance with the following sections of the Clean Water Act:

Section 303(d): Requires states to identify waters for which technology based effluent limitation are not stringent enough to meet applicable water quality standards. States must establish a priority ranking for such waters and must establish TMDLs for all such waters in accordance with the priority ranking. Waters identified and prioritized for TMDL development under section 303(d) (a.k.a. the 303(d) List) are designated as Water Quality Limited Segments (WQLSs).

Section 305(b): Requires states to prepare a description of the water quality of all navigable waters of the state; an analysis of the extent to which navigable waters provide protection and propagation of a balanced population of shellfish, fish, and wildlife and allow recreational activities in and on the water; an analysis of the extent to which elimination of the discharge of pollutants has been achieved; an estimate of the environmental impact, the economic, and social costs necessary to achieve the objective of the Clean Water Act, the economic and social benefits of the achievement, and the date of such achievement; and, a description of the nature and the extent of nonpoint sources of pollutants and recommendations as to the programs which must be taken to control them, with estimates of cost.

Section 314: Requires states to identify and classify all publicly owned lakes in the state according to eutrophic condition. States must list and describe those publicly owned lakes known to be impaired and assess the status and trends of water quality. This information is required to be submitted as part of the section 305(b) report.

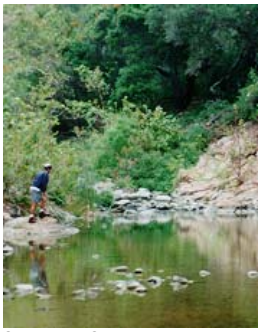
San Mateo Creek

The USEPA strongly encourages states to submit a single Integrated Report that satisfies the reporting requirements for each of these sections. Each Regional Board prepares an Integrated Report for its Region, using data collected by regional planning, permitting, surveillance, and enforcement programs. The regional Integrated Reports contain inventories of the major water bodies in the region, including

rivers and streams, lakes and reservoirs, bays and harbors, estuaries, coastal waters, wetlands, and ground water.

The regional Integrated Report presents the results of the assessment of the waterbodies in the Region, and the waters are categorized as one or more of the following:

Category 1: All designated uses are supported, no use is threatened.

Category 2: Available data and/or information indicate that some, but not all of the designated uses are supported.

Category 3: There are insufficient available data and/or information to make a use support determination.

Category 4: Available data and/or information indicate that at least one designated use is not being supported or is threatened, but a TMDL is not needed.

Category 5: Available data and/or information indicate that at least one designated use is not being supported or is threatened and a TMDL is needed.

Upon adoption of the regional Integrated Reports by respective Regional Boards, the reports are compiled into a statewide report. Upon adoption of this statewide report by the State Board, the report is submitted to the USEPA to satisfy the reporting requirements of Clean Water Act sections 303(d), 305(b) and 314. Subsequently, the USEPA submits the Integrated Reports from the states to the United States Congress, which serves as the primary vehicle for informing Congress and the public about general water quality conditions in the United States.

CLEAN WATER STRATEGY

The Clean Water Strategy (CWS) is a process that the State Board implemented to assure that staff and fiscal resources are directed at the highest priority water quality issues throughout California. The primary objective of the CWS is to more effectively define and respond to priorities as revealed by the best available water quality information.

The CWS relies on the Water Quality Assessment condition ratings to provide the technical information necessary to identify water bodies needing protection or prevention actions, additional assessment, or cleanup activities. In addition to the Water Quality Assessment, the regions determined the relative resource value of their water bodies to recognize the relative importance of individual waters when compared to each other. The regions developed priority water body lists which are based upon the severity of their water quality problems or needs and relative resource values, from which the State Board assembled a statewide priority list based upon the same criteria.

There are six phases involved in implementing the Clean Water Strategy. As of this date, phase 1 and 2 have been completed. The State Board has begun a pilot study to determine the feasibility of phases 3 through 6.

Phase 1: Obtain the best information;

Phase 2: Compare and prioritize water body concerns;

Phase 3: Prioritize actions to address concerns;

Phase 4: Allocate new resources;

Phase 5: Implement strategy goals; and

Phase 6: Review results.

QUALITY ASSURANCE AND QUALITY CONTROL

The statewide Quality Assurance (QA) program was developed to ensure that data generated from environmental studies are technically sound, scientifically valid, and legally defensible. A federal regulation (USEPA Order 5360.1) requiring the State to develop and implement a Quality Assurance Program Plan (QAPP) was adopted in April 1993. The program mandate is identified in 40 CFR 30.503 (July 1, 1987).

The State Board has appointed a QA Program manager to direct, coordinate, and administer the State QAPP. Independently, each Regional Board has appointed a QA officer to administer its Regional responsibilities. The State and Regional Boards jointly administer the program, however the State Board has lead responsibility for managing the overall program and reporting to the USEPA. The duties of the Regional Board QA officer include overseeing and implementing QA procedures conducted in the Regional Board laboratory, interacting with project managers on the required preparation of QA Project Plans, and evaluating compliance inspection data on all major dischargers.

OTHER MONITORING PROGRAMS

In addition to the State's surveillance and monitoring program, several other agencies monitor water quality, complementing the State's efforts. These agencies are usually local health departments or water supply agencies.

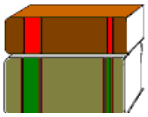

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7. TOTAL MAXIMUM DAILY LOADS

INTRODUCTION

This chapter contains the Total Maximum Daily Loads (TMDLs) that have been adopted by the Regional Water Quality Control Board, San Diego Region (RWQCB), approved by the State Water Resources Control Board (SWRCB) and Office of Administrative Law (OAL), and/or adopted/approved by the United State Environmental Protection Agency (USEPA). Table 7-1 lists the adopted and approved TMDLs that have been incorporated into the Basin Plan.

Table 7-1. Adopted and Approved Total Maximum Daily Loads in the San Diego Region

Total Maximum Daily Load	RWQCB Adoption Date	SWRCB Approval Date	OAL Approval Date	USEPA Approval Date
Total Maximum Daily Load for Diazinon, Chollas Creek Watershed, San Diego County	8/14/02	7/16/03	9/11/03	11/3/03
Total Maximum Daily Load for Dissolved Copper, Shelter Island Yacht Basin, San Diego Bay	2/9/05	9/22/05	12/2/05	2/8/06
Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in the Rainbow Creek Watershed	2/9/05	11/16/05	2/1/06	3/22/06
Total Maximum Daily Loads for Copper, Lead, and Zinc in Chollas Creek	6/13/07	7/15/08	10/22/08	12/18/08
Total Maximum Daily Loads for Indicator Bacteria, Project I – Beaches and Creeks in the San Diego Region	12/17/07	--[a]	--	--
Total Maximum Daily Loads for Indicator Bacteria, Baby Beach and Shelter Island Shoreline Park Shorelines	6/11/08	6/16/09	9/15/09	10/26/09
Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)	2/10/10	12/14/10	4/4/11	6/22/11

[a] Withdrawn by the RWQCB on December 18, 2008 from SWRCB consideration for revision. See Revised Total Maximum Daily Loads for Indicator Bacteria Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek).

TOTAL MAXIMUM DAILY LOAD FOR DIAZINON, CHOLLAS CREEK WATERSHED, SAN DIEGO COUNTY

On August 14, 2002 the Regional Board adopted Resolution No. R9-2002–0123, Total Maximum Daily Load (TMDL) For Diazinon In Chollas Creek Watershed, San Diego County. The terms and conditions of Resolution No. R9-2002–0123 are incorporated into the Basin Plan. This amendment establishes the TMDL of diazinon which Chollas Creek can receive and still attain applicable water quality objectives and support beneficial uses. This TMDL is allocated to all contributing sources of diazinon in the watershed by establishing Waste Load Allocations for all point sources and Load Allocations for all nonpoint sources in the watershed. This TMDL includes a margin of safety. The TMDL Implementation Plan and Monitoring Plan are presented below.

NECESSITY STANDARD [GOVERNMENT CODE SECTION 11353(B)]

Amendment of the Basin Plan to establish and implement a Total Maximum Daily Load for Chollas Creek is necessary because water quality in Chollas Creek cannot satisfy applicable water quality objectives for "Toxicity" and "Pesticides" even with implementation of waste discharge requirements containing technology-based effluent limits or water quality-based effluent limits for discharges of pollutants to Chollas Creek and its tributaries. Clean Water Act section 303(d) requires the Regional Board to develop an implement a TMDL under the conditions that exist in Chollas Creek. This TMDL for diazinon is necessary to ensure attainment of applicable water quality objectives and restoration of beneficial uses designated for Chollas Creek.

CLEAN WATER ACT SECTION 303(d)

Chollas Creek is currently identified on the Clean Water Act section 303(d) list of impaired waters due to toxicity during storm events. Results from toxicity identification evaluations (TIEs) indicate that the insecticide diazinon in Chollas Creek has in part caused the toxicity during storm events.

BENEFICIAL USE IMPAIRMENTS

Chollas Creek supports several beneficial uses. The most sensitive beneficial uses are those designated for protection of aquatic life and aquatic dependent wildlife as described in the Basin Plan definition of the warm freshwater habitat (WARM) and wildlife habitat (WILD) beneficial uses. The WARM and WILD beneficial uses of Chollas Creek are adversely affected by toxicity due to diazinon.

WATER QUALITY OBJECTIVES

Diazinon levels in Chollas Creek cause toxicity during storm events. The Basin Plan does not contain a specific water quality objective for diazinon. The Basin Plan establishes narrative water quality objectives for "Toxicity" and "Pesticides" to ensure the protection of the WARM and WILD beneficial uses.

WATER QUALITY OBJECTIVE VIOLATIONS

Toxicity tests using the water flea *Ceriodaphnia dubia* indicate that Chollas Creek storm water flows are toxic. Toxicity Identification Evaluations (TIEs) show that diazinon is responsible for the toxicity to the water flea. Accordingly diazinon concentrations in Chollas Creek cause violations of the "Toxicity" and "Pesticide" water quality objectives during storm events. The average concentration of diazinon in Chollas Creek during storm events is 0.46 micrograms per liter (μg/L). Chollas Creek waters also contain metals

that are responsible for toxicity to a marine invertebrate. A separate TMDL is under development to address metals in Chollas Creek.

SOURCES OF DIAZINON

Urban storm water flows represent the most significant source of diazinon to the Chollas Creek watershed.

CONCENTRATION-BASED TMDL

Because aquatic toxicity is the most significant adverse effect of diazinon and because aquatic toxicity is a function of water column concentrations, this TMDL is a concentration-based, rather than mass emission-based TMDL. The Numeric Targets, TMDL (Loading Capacity), and Waste Load and Load Allocations are all defined in terms of concentrations.

NUMERIC TARGETS

The TMDL Numeric Targets, which are derived from the water quality objectives, identify the specific water column, sediment, or tissue concentrations (or other endpoints) which equate to attainment of the Basin Plan water quality objectives and the protection of designated beneficial uses. Therefore, if the Numeric Targets are appropriately selected (for all causative pollutants), attainment of the Numeric Targets will result in attainment of the underlying water quality objectives and beneficial use protection.

The Numeric Targets for diazinon in Chollas Creek are set equal to the California Department of Fish and Game freshwater Water Quality Criteria for diazinon. The acute Water Quality Criterion of 0.08 μg/L diazinon protects aquatic life from short-term exposure to diazinon, while the chronic criterion of 0.05 μg/L diazinon protects aquatic life from long-term diazinon exposure.

Table 7-2. Numeric Targets for Diazinon in Chollas Creek [1]

Exposure Duration	Numeric Target	Averaging Period	Frequency of Allowed Exceedance
Acute	0.08 μg/L	One-hour average	Once every three years on the average
Chronic	0.05 μg/L	Four-day average	Once every three years on the average

[1] For the purpose of evaluating if the Numeric Targets have been attained, sample results shall be used as follows:
1. If only one sample is collected during the time period associated with the numeric target (e.g., one-hour average or four-day average), the single measurement shall be used to determine attainment of the numeric target for the entire time period.
2. The one-hour average shall be the moving arithmetic mean of grab samples over the specified one-hour period.
3. The four-day average shall apply to flow-weighted composite samples for the duration of the storm, or shall be the moving arithmetic mean of flow weighted 24-hour composite samples or grab samples.

TOTAL MAXIMUM DAILY LOAD

The term TMDL, or Loading Capacity, is defined as the maximum amount of a pollutant that a waterbody can receive and still attain water quality objectives and protection of designated beneficial uses. The concentration-based Loading Capacity for diazinon in Chollas Creek is set at exactly the same concentrations as the Numeric Targets.

Table 7.3. TMDL (Loading Capacity) for Diazinon in Chollas Creek

Exposure Duration	TMDL	Averaging Period
Acute	0.08 μg/L	One-hour average
Chronic	0.05 μg/L	Four-day average

LINKAGE ANALYSIS

The purpose of the linkage analysis is to confirm that the TMDL will result in the attainment of applicable water quality objectives and beneficial use protection. With respect to diazinon, this TMDL will result in the attainment of the "Toxicity" and "Pesticide" water quality objectives and the restoration of the WARM and WILD beneficial uses in the Chollas Creek watershed.[1] This is because the Numeric Targets are set equal to the diazinon Water Quality Criteria which are based on toxicity testing and are specifically established at levels to ensure the protection of aquatic life from acute and chronic exposure to diazinon. The Water Quality Criteria protect all aquatic life stages including the most sensitive stages.

WASTE LOAD AND LOAD ALLOCATIONS

The concentration-based Waste Load and Load allocations of this TMDL are applied equally to all diazinon discharge sources in the Chollas Creek watershed. All allocations are set at 90% of the Numeric Targets resulting in a diazinon allocation equal to 0.072 μg/L under acute exposure conditions and a diazinon allocation of 0.045 μg/L under chronic exposure conditions. These allocations include an explicit 10% margin of safety to account for uncertainties in the TMDL analysis. This concentration-based TMDL and its allocations apply year-round and will be protective during all flow conditions and seasons.

Table 7.4. Waste Load and Load Allocations for Diazinon in Chollas Creek

Exposure Duration	Numeric Targets	Margin of Safety	Waste Load and Load Allocations
Acute	0.08 μg/L	0.008 μg/L	0.072 μg/L
Chronic	0.05 μg/L	0.005 μg/L	0.045 μg/L

[1] MULTIPLE POLLUTANTS: The attainment of water quality standards is qualified with the words *"with respect to diazinon"* because there are multiple pollutants causing toxicity. Toxicity conditions in Chollas Creek are caused by metals and diazinon. Successful implementation of both the Chollas Creek diazinon TMDL and the Chollas Creek metals TMDL is expected to result in full attainment of the *"Toxicity"* water quality objectives, and of the WARM and WILD beneficial uses.

DIAZINON LOAD REDUCTIONS NEEDED

The current average concentration of diazinon in Chollas Creek measured during storm events was 0.46 μg/L during the monitoring period 1998 through 2001. An 84% reduction of current diazinon concentration–based loads is needed to attain the acute diazinon allocations set forth in this TMDL. A 90% reduction of current diazinon concentration–based loads is needed to attain the chronic diazinon allocations set forth in this TMDL.

Table 7.5 Needed Load Reductions in Chollas Creek

Average Diazinon Concentration	Allocation		Reduction Needed	
	Chronic	Acute	Chronic	Acute
0.46 μg/L	0.045 μg/L	0.072 μg/L	90%	84%

Chollas Creek at Federal Boulevard crossing

Chollas Creek streamside

SEASONAL VARIATIONS AND CRITICAL CONDITIONS

This concentration–based diazinon TMDL and allocations apply year round and will be protective during all flow conditions and seasons.

RESPONSIBLE PARTIES

As dischargers of diazinon in urban storm water flows to Chollas Creek, the City of San Diego, City of Lemon Grove, City of La Mesa, San Diego Unified Port District, County of San Diego, and the California Department of Transportation (Caltrans) are responsible for implementation of this TMDL. These entities are regulated as municipal Copermittees under the San Diego MS4 Permit or the statewide Caltrans MS4 Permit.

TMDL IMPLEMENTATION PLAN

The three most important mechanisms to implement the diazinon waste load reductions required by this TMDL are (1) USEPA's ongoing diazinon phase-out and elimination program; (2) modification of the San Diego Municipal Storm Water Permit (MS4 Permit)[1] as needed for consistency with this TMDL; and (3)

[1] Regional Board Order No. 2001-01 NPDES No. CAS0108758, Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of San Diego, and the San Diego Unified Port District.

activities by the municipal Copermittees in the Chollas Creek watershed to reduce diazinon discharges pursuant to the MS4 Permit and Water Code section 13267.

(1) USEPA's Diazinon Phase-Out and Elimination Program

The single most important action to implement this TMDL is USEPA's national ongoing Diazinon Phase-Out and Elimination Program. In January 2001, USEPA reached an agreement with registrants (manufacturers) of diazinon to phase-out most uses (USEPA 2002). Under the agreement, all indoor uses will be terminated, and all outdoor non-agricultural uses will be phased-out over the next few years.

Specifically, the terms of the agreement implement the following phase out schedules:

- For the indoor household use, the registration will be canceled on March 2001, and all retail sales will stop by December 2002.

- For all lawn, garden and turf uses, manufacturing stops in June 2003; all sales and distribution to retailers ends in August 2003. Further, the manufacturers will implement a product recovery program in 2004 to complete the phase-out of the product.

- Additionally, as part of the phase-out, for all lawn, garden, and turf uses, the agreement ratchets down the manufacturing amounts. Specifically, for 2002, there will be a 25 percent decrease in production; and for 2003, there will be a 50 percent decrease in production.

- Also, the agreement begins the process to cancel around 20 different uses on food crops.

In summary, the phase-out is designed to reduce diazinon use and sales, availability, and to increase its proper disposal. As a result of the phase-out, USEPA expects, on a national basis, that these actions will end over 90% of current diazinon uses. In the Chollas Creek watershed, since agricultural use is negligible, the phase-out should reduce current source loadings of diazinon, and the resulting aquatic toxicity, to negligible levels over time. For these reasons, the diazinon phase-out is by far the single most significant mechanism by which this TMDL will be implemented. The remaining TMDL implementation actions described below are designed to reduce the discharge of diazinon to the Chollas Creek watershed due to interim (during the phase-out) and residual (post phase-out) diazinon sales, use, and disposal. It should be noted that actions taken by the municipalities and other stakeholders to reduce diazinon discharges to the Chollas Creek watershed will likely be effective in reducing the discharges of alternative pesticides in the long-term as well.

(2) Modification of Existing Waste Discharge Requirements / NPDES Permits

The Regional Board's San Diego Municipal Storm Water Permit, also known as the San Diego MS4 Permit (Regional Board Order No. 2001-01 NPDES No. CAS0108758) is the primary broad-based NPDES permit which directly regulates most pollutant discharges, including diazinon, in the Chollas Creek watershed. Federal regulations require that NPDES permits contain effluent limitations that are consistent with Waste Load Allocations developed under a TMDL [40 CFR 122.44 (d)(vii)(B)]. The Regional Board will revise existing waste discharge requirements / NPDES permits to incorporate effluent limitations in conformance with the Waste Load Allocations for diazinon as specified above. Modifications to the MS4 Permit can occur when the permit is reopened or during scheduled permit reissuance.

Compliance with numeric limitations for diazinon will be required in accordance with a phased schedule of compliance. The compliance schedule will be jointly developed by the Regional Board and the Chollas Creek stakeholders and will be finalized no later than one year following adoption of this TMDL by the Regional Board. The phased compliance schedule will apply only to attainment of numeric limitations for diazinon. All other requirements of this TMDL will be immediately effective upon incorporation into applicable NPDES permits.

(3) Activities By Municipal Copermittees Pursuant to MS4 Permit and CWC Section 13267

Pursuant to the MS4 Permit and under the authority of Water Code section 13267, the Regional Board will direct the municipal Copermittees in the Chollas Creek watershed to do the following:

a. **Legal Authority:** Enforce existing local ordinances, or adopt new legal authority, as needed to ensure Copermittee compliance with the Waste Load Allocations specified in this TMDL;

b. **Diazinon Toxicity Control Plan:** Develop and implement a "Diazinon Toxicity Control Plan" to promote Copermittee compliance with the Waste Load Allocations specified in this TMDL. The Plan should consist of pollution prevention and source control BMPs designed to reduce the discharge of diazinon to Chollas Creek.

c. **Diazinon Public Outreach / Education Program:** Develop and implement a focused Public Outreach / Education program designed to reduce the discharge of diazinon to the Chollas Creek watershed. By reducing the discharge of diazinon, the Program will promote Copermittee compliance with the Waste Load Allocations specified in this TMDL. The Program should contain the components described in the Regional Board Technical Report, Total Maximum Daily Load for Diazinon in Chollas Creek Watershed San Diego County, dated August 14, 2002, or equivalent components. The diazinon public outreach / education program may be incorporated into the Diazinon Toxicity Control Plan.

(4) Compliance with MS4 Permit

The municipal Copermittees in the Chollas Creek watershed shall implement the requirements of the MS4 Permit.

(5) Compliance with Existing Waste Discharge Prohibitions

Prohibitions against discharges of waste that cause pollution or nuisance, described in the Basin Plan, including discharges of diazinon that cause or contribute to violation of water quality objectives are applicable to the urban land users and land owners in the Chollas Creek watershed. Dischargers of diazinon in the watershed shall also comply with all other applicable waste discharge prohibitions contained in the Basin Plan.

(6) Enforcement Authority of Regional Board

The Regional Board will use its enforcement authority as necessary to ensure compliance with applicable waste discharge requirements and Basin Plan waste discharge prohibitions.

(7) Modification of Other Existing Waste Discharge Requirements

The State Board has issued three additional NPDES storm water permits that regulate the discharge of pollutants including diazinon in the Chollas Creek watershed. These permits are the statewide Caltrans Municipal Storm Water Permit (State Board Order No. 99-06-DWQ NPDES No. CAS 000003), the statewide General Industrial Storm Water Permit (State Board Order No. 97-03-DWQ NPDES No. CAS 000001), and the statewide General Construction Storm Water Permit (State Board Order No. 99-08-DWQ NPDES No. CAS 000002) which directly regulate discharges from Caltrans owned and operated facilities, and from industrial and construction sites respectively, located within the Chollas Creek watershed. Discharges from industrial and construction sites in the Chollas Creek watershed are also indirectly regulated under the MS4 Permit which holds each municipal Copermittee ultimately responsible for all discharges from industrial and construction sites within its jurisdiction. The Regional Board will request the State Board to amend each of these three statewide permits as needed for consistency with this TMDL. Modifications to waste discharge requirements can occur when permits are reopened or reissued.

In addition to the broad-based regulation of discharges under the MS4 Permit, the discharge of pollutants, including diazinon, from utility companies and utility vaults is directly regulated under the State Board's General Permit for Utility Vaults (State Board Order No. 2001-11-DWQ NPDES No. CAG 990002). The Regional Board will request the State Board to also revise the General Permit for Utility Vaults as needed for consistency with this TMDL.

(8) Adoption of New Waste Discharge Requirements / NPDES Permits

The Regional Board may adopt new waste discharge requirements / NPDES permits for any significant source(s) of diazinon identified by the municipal Copermittees or the Regional Board.

(9) Additional Investigations and Reports Pursuant to CWC Section 13225

The Regional Board may use its authority under Water Code section 13225 to request the municipalities in the Chollas Creek watershed to conduct additional investigations which are beyond the purview of the MS4 permit and to report on the findings of such investigations. Any such investigations will address diazinon-related issues in the Chollas Creek watershed for the ultimate purpose of reducing diazinon discharges to the watershed.

(10) Monitoring Plan

Pursuant to the MS4 permit and under the authority of Water Code section 13267, the Regional Board will direct the municipal Copermittees in the Chollas Creek watershed to develop and implement a Monitoring Plan. The Plan shall be designed to assess the effectiveness of this TMDL, its implementation measures, and progress towards the attainment of applicable water quality standards in the Chollas Creek watershed. The Plan should contain the components described in the Regional Board Technical Report, Total Maximum Daily Load for Diazinon in Chollas Creek Watershed San Diego County, dated August 14, 2002, or equivalent components.

(11) Schedule of Implementation

As described in Provision 2 above, Modification of Existing Waste Discharge Requirements/ NPDES Permits, compliance with numeric limitations for diazinon will be required in accordance with a phased schedule of compliance. All other requirements of this TMDL will be immediately effective upon incorporation into applicable NPDES permits as described below.

Table 7.6. Schedule of Implementation

Schedule of Implementation			
Action	**Description**	**Responsible Parties**	**Due Date**
USEPA cancels registration for indoor household uses of diazinon		USEPA	March 31, 2001
IPM Workshop(s)	Conduct first workshop	Chollas Creek watershed municipal copermitees	Within 1 year after USEPA approves TMDL and annually thereafter
Monitoring Plan	Initiate Monitoring Plan	Chollas Creek watershed municipal copermitees	30-days after USEPA approves TMDL
Diazinon Toxicity Control Plan (DTCP)	Initiate DTCP	Chollas Creek watershed municipal copermittees	30-days after USEPA approves TMDL
Retail sales of diazinon (indoor uses) end		USEPA	December 31, 2002
Manufacturing of diazinon for all lawn, garden and turf uses end		USEPA	June 31, 2003
Sales and distribution to retailers ends		USEPA	August 31, 2003
Phase out and eliminate diazinon usage and sales in the Chollas Creek watershed. Ensure proper disposal.		USEPA	2003 for non-agriculture uses
Modify MS4 permit for consistency with TMDL		Regional Board	No later than 2006
Implement legal authority to reduce diazinon discharges in the Chollas Creek watershed.		Chollas Creek watershed municipal copermittees	6 months after USEPA approves TMDL
Compliance with MS4 permit		Chollas Creek watershed municipal copermittees	Ongoing
Compliance with existing Waste Discharge prohibitions		Diazinon dischargers	Ongoing
Enforcement authority of Regional Board		Regional Board	Ongoing
Modification of other existing Waste Discharge Requirements		Regional and State Board	No later than next reissuance
Adoption of new WDRs / NPDES permits	For significant diazinon sources only.	Regional Board	As needed
Additional investigations and reports pursuant to CWC section 13225		Diazinon dischargers	As needed
Submit Annual Reports	Effectiveness reports and monitoring reports	Chollas Creek watershed municipal copermittees	January 31 of each year.

TOTAL MAXIMUM DAILY LOAD FOR DISSOLVED COPPER, SHELTER ISLAND YACHT BASIN, SAN DIEGO BAY

Shelter Island Yacht Basin, San Diego Bay

On February 9, 2005, the Regional Board adopted Resolution No. R9-2005-0019, *A Resolution Adopting an Amendment to the Water Quality Control Plan for the San Diego Region to Incorporate a Total Maximum Daily Load for Dissolved Copper in the Shelter Island Yacht Basin, San Diego Bay*. The TMDL Basin Plan Amendment was subsequently approved by the State Water Resources Control Board on September 22, 2005, the Office of Administrative Law on December 2, 2005, and the United States Environmental Protection Agency on February 8, 2006. The TMDL is described in the *Total Maximum Daily Load for Dissolved Copper in Shelter Island Yacht Basin, San Diego Bay*, Technical Report dated February 9, 2006.

PROBLEM STATEMENT

Dissolved copper levels in Shelter Island Yacht Basin (SIYB) waters violate water quality objectives for copper, toxicity, and pesticides. Dissolved copper concentrations in SIYB threaten and impair the designated beneficial uses of marine habitat (MAR), and wildlife habitat (WILD).

NUMERIC TARGET

The TMDL Numeric Targets for copper, toxicity and pesticides are set equal to the numeric water quality objectives for dissolved copper as defined in the California Toxics Rule (CTR) and shown below.

Table 7-7. TMDL Numeric Targets

Exposure	Water Quality Objective*	Numeric Target*
Continuous or Chronic (4 day average)	3.1 μg/L** of copper (Cu)	3.1 μg/L** of Cu
Maximum or Acute (1 hour average)	4.8 μg/L** of Cu	4.8 μg/L** of Cu

* Concentrations should not be exceeded more than once every three years.
** micrograms/liter (μg/L)

If the water quality objectives for dissolved copper in SIYB are modified in the future, as in the case of a site-specific objective, then the numeric targets will be set equal to the new water quality objectives.

SOURCE ANALYSIS

Approximately 98 percent of all copper loading to SIYB is attributable to copper-based antifouling paints applied to the hulls of recreational boats. The passive leaching of copper from antifouling paint is 93 percent of the total loading. The remaining five percent of total copper loading results from underwater hull cleaning operations in SIYB.

Table 7-8. Summary of Dissolved Copper Sources to SIYB

Source	Mass Load (kg/year)	Percent Contribution (% Cu)
Passive Leaching	2,000	93
Hull Cleaning	100	5
Urban Runoff	30	1
Background	30	1
Direct Atmospheric Deposition	3	<1
Sediment	0	0
Combined Sources	**2,163**	**100**

TOTAL MAXIMUM DAILY LOAD

The TMDL or loading capacity for dissolved copper discharges into SIYB is 1.6 kilograms/day (kg/day) or 567 kilograms/year (kg/year).

MARGIN OF SAFETY

The TMDL includes an explicit and implicit margin of safety (MOS). Ten percent of the loading capacity was reserved as an explicit MOS and calculated to be 57 kg/year. The implicit MOS was incorporated into the TMDL source analysis through numerous conservative assumptions.

ALLOCATIONS AND REDUCTIONS

A 76 percent overall reduction of residual copper loading to SIYB is required to meet the TMDL of 567 kg/year as shown in the table below. The assigned allocations from each source translate into a percent reduction of dissolved copper from current loading. Loading due to passive leaching must be reduced by 81 percent from current loading. Loading due to underwater hull cleaning must be reduced by 28 percent from current loading. From an overall perspective, passive leaching loading must be reduced by 75 percent from the combined total loading of all sources to SIYB. Underwater hull cleaning loading must be reduced by one percent from the combined total loading of all sources to SIYB.

Table 7-9. TMDL and Allocation Summary

Source	Current Load (kg/year of Cu)	Percent Contribution (% Cu)	Allocation (kg/year of Cu)	Percent Reduction from Current Source Load (%)	Percent Reduction from Total Loading to SIYB (%)
Passive Leaching	2,000	93	375	81	75
Hull Cleaning	100	5	72	28	1
Urban Runoff	30	1	30	0	0
Background	30	1	30	0	0
Direct Atmospheric Deposition	3	<1	3	0	0
Sediment	0	0	0	0	0
Current Mass Load	2,163	100			0
Margin of Safety			57		0
TMDL			567		0
Total Load Reduction				76	76

RECALCULATIONS IF WATER QUALITY OBJECTIVES CHANGE

If the water quality objectives for dissolved copper in SIYB are changed in the future, then the MOS, TMDL and allocations will be recalculated using the method shown below in the section titled, *Method for Recalculation of the Total Maximum Daily Load for Dissolved Copper in the Shelter Island Yacht Basin, San Diego Bay*.

TMDL IMPLEMENTATION PLAN

The TMDL will be implemented as follows:

The Regional Board will coordinate with governmental agencies having legal authority over the use of copper-based antifouling paints to protect water quality from the adverse effects of copper-based antifouling paints in SIYB; and

The Regional Board will regulate discharges of copper to SIYB through the issuance of Waste Discharge Requirements (WDRs), Waivers of WDRs (waivers), or adoption of Waste Discharge Prohibitions. WDRs could build upon pollution control programs developed by discharger organizations or the Port. Likewise, waivers or prohibitions could be conditioned on implementation of pollution control programs through third party agreements between the Regional Board and discharger organizations, and/or other agencies.

The Regional Board will amend Order No. 2001-01, "Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm /Sewer System" to require that discharges of copper into SIYB waters via the City's municipal separate storm/sewer system not exceed a 30 mg/kg wasteload for copper.

The dischargers will be required to monitor SIYB waters and provide monitoring reports to the Regional Board for the purpose of assessing the effectiveness of the alternatives implemented.

COMPLIANCE SCHEDULE

Copper load and wasteload reductions are required over a 17-year staged compliance schedule period. The first stage consists of an initial 2-year orientation period during which no copper load reductions are required. The subsequent 15-year reduction period is comprised of three stages during which incremental copper load and wasteload reductions are required as shown below.

Table 7-10. Interim Loading Targets for Attainment of the TMDL

Stage	Time Period	Percent Reduction from Current Estimated Loading	Reduction to be Attained by End of Year	Estimated Interim Target Loading (kg/year of dissolved Cu)
Stage 1	Years 1-2	0%	N/A	N/A
Stage 2	Years 2-7	10%	7	1,900
Stage 3	Years 7-12	40%	12	1,300
Stage 4	Years 12-17	76%	17	567

METHOD FOR RECALCULATION OF THE TOTAL MAXIMUM DAILY LOAD FOR DISSOLVED COPPER IN THE SHELTER ISLAND YACHT BASIN, SAN DIEGO BAY

This section describes the method for recalculating the Shelter Island Yacht Basin TMDL for dissolved copper if the water quality objectives for dissolved copper are modified in the future.

Numeric Target

The numeric targets are set equal to the new water quality objectives.

Margin of Safety

The explicit margin of safety (MOS) equals ten percent of the loading capacity. The equation to calculate the loading capacity is given below.

Total Maximum Daily Load

The TMDL or loading capacity is recalculated using equations 1 through 4 below.

The loading capacity is recalculated according to equation 1 below:

$$(1) \quad R_S = C_2\left(\frac{KA_c}{\Delta x} + k_L V_2\right) - A_c C_1\left(\frac{eA_s}{A_c} + \frac{K}{\Delta x}\right)$$

where C_1 = average background concentration of copper measured in the area of San Diego Bay adjacent to SIYB, expressed as total copper, (0.05 μg/L)

C_2 = average target concentration for copper in the SIYB (expressed as total copper) when the maximum concentration of copper in SIYB is equal to or less than the numeric target (mass/volume)

K = dispersion coefficient calculated from salinity measurements and mixing length approximation (15.3 m^2/sec)

A_c = cross-sectional area of entrance to SIYB (1,000 m^2)

A_s = surface area of SIYB (740,000 m^2)

Δx = average mixing length between SIYB and adjacent area; estimated distance between the endpoints for S_1 and S_2 (2,000 m)

V_2 = volume of SIYB (31,000,000 m^3)

e = evaporation rate (0.43 cm/day)

k_l = rate of total copper loss to sediment (7%/day)

R_S = loading capacity, expressed as total copper (mass/time); R_S is calculated iteratively to find the maximum possible value that does not cause C_2 to exceed the numeric target.

The dispersion coefficient K is calculated using equation 2 below:

$$(2) \quad K \cong \frac{eA_s S_1 \Delta x}{A_c (S_2 - S_1)}$$

where S_1, S_2 = salinity data obtained in SIYB and San Diego Bay adjoining SIYB (33.62 practical salinity units (psu) and 33.46 psu, respectively).

The average target concentration, C_2, must be lower than the numeric target concentration to ensure that the loading capacity will not cause an exceedance of the numeric target anywhere in SIYB. C_2 is calculated by multiplying the numeric target for chronic exposure by the ratio of the average measured concentration of copper in SIYB to the maximum measured concentration as expressed in equation 3 below:

(3) C_2 = numeric target [average measured concentration/maximum measured concentration]
or,
C_2 = numeric target * [5.45 μg/L / 8 μg/L]

To convert C_2 from dissolved copper concentration to total copper concentration, the number calculated from equation 3 is multiplied by the ratio of dissolved copper to total copper in seawater. If site-specific data are not available, the ratio of 0.83 can be used. This is the USEPA's conversion factor for saltwater acute criteria.[4]

Finally, the TMDL is calculated according to equation 4 below:

(4) TMDL = Rs - MOS

Allocations

Equation 5 is used to determine the new allocation for passive leaching. In equation 5, the only variable is the allocation for passive leaching (Ap), while the other source allocations are constants. The allocation for hull cleaning remains the same, since it was based on the assumption that all of the divers will use Management Practices (MPs) to clean boat hulls that have copper bottom paints. Allocations for the other sources, namely urban runoff, background and sediment will not be recalculated because these sources of copper are insignificant.

(5) TMDL = Wasteload Allocation + Load Allocations + MOS

TMDL = Au + Ap + Ah + As + Ab + Aa + MOS

where:

Au = allocation for urban runoff = 30 kg/year
Ap = allocation for passive leaching
Ah = allocation for hull cleaning = 72 kg/year
As = allocation for sediment = load from sediment = 0 kg/year
Ab = allocation for background = load from background = 30 kg/year
Aa = allocation for direct atmospheric deposition = load from direct atmospheric deposition = 3 kg/year

[4] USEPA. 2000. Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. May 18, 2000.

TOTAL MAXIMUM DAILY LOADS (TMDLS) FOR TOTAL NITROGEN AND TOTAL PHOSPHORUS IN THE RAINBOW CREEK WATERSHED

Rainbow Valley, California

On February 9, 2005, the Regional Board adopted Resolution No. R9-2005-0036, *A Resolution Adopting an Amendment to the Water Quality Control Plan for the San Diego Region (9) to Incorporate Total Maximum Daily Loads (TMDLs) for Total Nitrogen and Total Phosphorus in the Rainbow Creek Watershed, San Diego County*. The Basin Plan amendment was subsequently approved by the State Water Resources Control Board on November 16, 2005, the Office of Administrative Law on February 1, 2006, and the United States Environmental Protection Agency on March 22, 2006. The TMDL is described in the Basin Plan Amendment and Technical Report for Total Nitrogen and Total Phosphorus Total Maximum Daily Loads for Rainbow Creek, dated February 9, 2005.

PROBLEM STATEMENT

Nitrate, total nitrogen, and total phosphorus concentrations in Rainbow Creek exceed the Inorganic Chemicals nitrate and Biostimulatory Substances water quality objectives. These exceedances threaten to unreasonably impair the municipal supply (MUN), warm freshwater habitat (WARM), cold freshwater habitat (COLD), and wildlife habitat (WILD) beneficial uses of Rainbow Creek. Excessive nutrient levels in Rainbow Creek promote the growth of algae in localized areas, creating a nuisance condition, that unreasonably interferes with aesthetics and contact and non-contact water recreation (REC1, REC2) and threatens to impair WARM, COLD and WILD beneficial uses. State highways, agricultural fields and orchards, commercial nurseries, residential and urban areas, and septic tank disposal systems contribute to increased nutrient levels in Rainbow Creek as a result of storm water runoff, irrigation return flows, and ground water contributions to the creek.

NUMERIC TARGETS

The Numeric Targets for nitrate, total nitrogen, and total phosphorus are set equal to the Inorganic Chemicals nitrate water quality objective for municipal water supply and the numeric goals of the Biostimulatory Substances water quality objective as defined in the Basin Plan and shown below.

Table 7-11. Rainbow Creek Nitrate, Total Nitrogen, and Total Phosphorus Numeric Targets

Constituent	Water Quality Objective	Numeric Target
Nitrate (as nitrogen)	10 mg NO_3-N/L	10 mg NO_3-N/L
Total Nitrogen	1.0 mg N/L	1.0 mg N/L
Total Phosphorus	0.1 mg P/L	0.1 mg P/L

If the Inorganic Chemicals nitrate and Biostimulatory Substances water quality objectives in Rainbow Creek are modified in the future then the TMDL will be recalculated and the numeric targets will be set equal to the new water quality objectives.

SOURCE ASSESSMENT

Seventy-nine percent (79%) and seventy percent (70%) of total nitrogen and total phosphorus mass loading, respectively, are attributable to controllable sources, which include certain land use activities, septic tank disposal systems (total nitrogen only), and Interstate 15 (I-15). The land use activities include commercial nurseries, agricultural fields, orchards, residential areas, urban areas, and park areas. Background and direct atmospheric deposition are not considered to be controllable sources.

Table 7-12. Summary of Total Nitrogen and Total Phosphorus Sources to Rainbow Creek

Source	Total Nitrogen Mass Load (kg N/yr)	Percent Contribution (% N)	Total Phosphorus Mass Load (kg P/yr)	Percent Contribution (% P)
Land Uses Runoff	2,662	69	262	66
Background	779	20	116	29
Septic Tank Disposal Systems	200	5	0	0
I-15 Runoff (Caltrans)	153	4	14	4
Direct Atmospheric Deposition	40	1	2	1
Combined Sources	**3,834**	**100**	**394**	**100**

TOTAL MAXIMUM DAILY LOADS OR LOADING CAPACITY

The TMDLs for nutrients in Rainbow Creek are 1,658 kg N/yr for total nitrogen and 165 kg P/yr for total phosphorus in order to attain and maintain the Inorganic Chemicals – Nitrate and Biostimulatory Substances water quality objective in Rainbow Creek waters.

The annual loading limit of total nitrogen and total phosphorus to Rainbow Creek shall be reduced incrementally from the current load of 3,834 kg/yr and 394 kg/yr, respectively, to 1,658 kg/yr and 165 kg/yr, respectively, by no later than December 31, 2021. The annual nutrient loading limits to be attained by December 31, 2021 is listed in Table 7-13.

Table 7-13. Annual Nutrient Loading Capacity and Compliance Date

TMDL	December 31, 2021[1]	
Total Nitrogen – Annual Load	1,658 kg/yr	3,648 lbs/yr
Total Phosphorus – Annual Load	154 kg/yr	365 lbs/yr

[1] Compliance to be achieved no later than this date. The Regional Board may require earlier compliance with these targets when it is reasonable and feasible.

MARGIN OF SAFETY

Explicit and implicit margins of safety (MOS) were considered for these TMDLs. An explicit MOS of 5% is reserved to account for uncertainties and calculated to be 83 kg/year total nitrogen and 8 kg/year total phosphorus. An implicit MOS has been incorporated through conservative assumptions in the analysis.

LOAD ALLOCATIONS AND WASTELOAD ALLOCATIONS

A seventy-four percent (74%) and an eighty-five percent (85%) overall reduction of total nitrogen and total phosphorus loading, respectively, to Rainbow Creek is required to meet the TMDLs described in Table 7.13.

The load allocations for the initial annual loading are provided in Table 7-14 and 7-15, below. A margin of safety (MOS) of 5% is subtracted from this nutrient TMDL to account for unknowns, errors in assumptions, and potential future development in the watershed. This 5% is reserved for unknowns and is not allocated to any source. Allocations (other than for background and margin of safety) will be further reduced by 20% every 4 years until the biostimulatory targets for nitrogen and phosphorus are met. In the event that a nonpoint source becomes a permitted discharge, the portion of the load allocation that is associated with the source can become a wasteload allocation.

Table 7–14. Annual Total Nitrogen Allocations for Rainbow Creek

Source	Annual Total Nitrogen Load Allocations			
	2009 kg/yr[1]	2013 kg/yr[1]	2017 kg/yr[1]	2021 kg/yr[1]
Load Allocations (LA)				
Commercial nurseries	390	299	196	116
Agricultural fields	504	386	253	151
Orchards	607	465	305	182
Park	5	3	3	3
Residential areas	507	390	260	149
Urban areas	40	27	27	27
Septic tank disposal systems	200	100	46	46
Air deposition	40	40	40	40
Wasteload Allocations (WLA)				
Caltrans highway runoff	118	90	59	49
Unidentified & future point sources	33	33	33	33
Total LA & WLA	**2,444**	**1,833**	**1,222**	**796**
Background	779	779	779	779
Margin of Safety (not allocated)	83	83	83	83
Total	**3,306**	**2,695**	**2,084**	**1,658**

[1] To calculate pounds per year, multiply by 2.2.
[2] Background is calculated based on reference concentrations in San Diego streams and Rainbow Creek annual flow volumes.

Table 7-15. Annual Total Phosphorus Allocations for Rainbow Creek

Source	Annual Total Phosphorus Load Allocations			
	2009 kg/yr[1]	2013 kg/yr[1]	2017 kg/yr[1]	2021 kg/yr[1]
Load Allocations (LA)				
Commercial nurseries	20	16	10	3
Agricultural fields	28	21	14	4
Orchards	50	37	24	6
Park	0.15	0.10	0.10	0.10
Residential areas	99	74	47	12
Urban areas	9	6	6	6
Air deposition	2	2	2	2
Wasteload Allocations (WLA)				
Caltrans highway runoff	11	8	5	5
Unidentified & future point sources	3	3	3	3
Total LA & WLA	**223**	**116**	**111**	**41**
Background	116	116	116	116
Margin of Safety (not allocated)	8	8	8	8
Total	**346**	**291**	**235**	**165**

[1] To calculate pounds per year, multiply by 2.2.
[2] Background is calculated based on reference concentrations in San Diego streams and Rainbow Creek annual flow volumes.

RECALCULATIONS IF WATER QUALITY OBJECTIVES CHANGE

If the water quality objectives for Biostimulatory Substances are changed in the future, then the MOS, TMDL and allocations and reductions will be recalculated using the method shown below in the section titled, *Method for Recalculation of the Total Maximum Daily Loads for Nitrogen and Phosphorus in Rainbow Creek*.

TMDL IMPLEMENTATION ACTION PLAN

The necessary actions to implement the TMDLs are described in section 9 of the *Technical Report for Total Nitrogen and Total Phosphorus Total Maximum Daily Loads (TMDLs) in Rainbow Creek*, dated February 9, 2005 and listed below.

A. Regional Board Actions

1. Caltrans – Incorporate Wasteload Allocations in NPDES Storm Water Permit

The Regional Board shall request that the State Water Resources Control Board amend the Caltrans statewide NPDES storm water permit[5] to include the following requirements:

a. MS4 discharges to Rainbow Creek shall not exceed the following wasteloads for nitrogen and phosphorus:

Table 7-16. Wasteloads for nitrogen and phosphorus

Nitrogen Wasteload	Phosphorus Wasteload	Compliance Due Date
118 kg N/yr[1]	11 kg P/yr[1]	Dec. 31, 2009
90 kg N/yr[1]	8 kg P/yr[1]	Dec. 31, 2013
59 kg N/yr[1]	5 kg P/yr[1]	Dec. 31, 2017
49 kg N/yr[1]	5 kg P/yr[1]	Dec. 31, 2021

b. A directive to submit annual progress reports to the Regional Board detailing progress made on attaining the nutrient wasteload reductions in Rainbow Creek. The report shall be due on April 1 of each year shall be incorporated within section 2, Program Management of Caltrans MS4 Order No. 99-06-DWQ, NPDES No. CAS000003. Reporting shall continue on an annual basis until the nutrient water quality objective is attained in Rainbow Creek.

2. County of San Diego – Issue Water Code Governmental Water Quality Investigation Request Order for Nutrient Reduction and Management Plan

The Regional Board shall issue an Order under Water Code section 13225 requiring the County of San Diego to investigate excessive levels of nutrients in Rainbow Creek and feasible management strategies to reduce nutrient loading in Rainbow Creek. A Nutrient Reduction and Management Plan (NRMP) for the Rainbow Creek watershed containing the elements described below in section C, County of San Diego Nutrient Reduction Management Plan Elements, would satisfy such an Order. The County may submit alternative or additional elements equivalent to those described in section C that would result in equivalent protection from, or prevention of, nutrient discharges to Rainbow Creek.

3. County of San Diego – Establish Management Agency Agreement (MAA)

The Regional Board shall consider, following concurrence with the County of San Diego's Nutrient Reduction and Management Plan (NRMP) for Rainbow Creek, entering into a Management Agency Agreement (MAA) with the County of San Diego. The MAA shall set forth the commitment of both parties to undertake various oversight responsibilities for the nonpoint source nutrient load reduction component of this TMDL, and the County's commitments to implement the NRMP.

[5] The term "statewide NPDES storm water permit" refers to Order No. 99-06-DWQ, NPDES No. CAS000003, *National Pollutant Discharge Elimination System Permit, Statewide Storm Water Permit, and Waste Discharge Requirements for the State of California, Department of Transportation (Caltrans)* or subsequent superceding NPDES renewal Orders.

4. **County of San Diego – Issue Water Code Governmental Water Quality Investigation Request for Groundwater Investigation and Characterization Report**
The Regional Board could issue an Order under Water Code section 13225 directing the County of San Diego to prepare and submit a workplan and report described below in section B, County of San Diego Actions, Item 3 Submit Groundwater Investigation and Characterization Workplan and Item 4 Groundwater Investigation and Characterization Report.

5. **California Department of Forestry and Fire Protection – Issue Water Code Section 13267 Order**
The Regional Board shall issue a Water Code section 13267 order directing the California Department of Forestry and Fire Protection, Rainbow Conservation Camp (CDFFP) to submit any additional technical information needed to 1) evaluate whether CDFFP's discharge is surfacing and/or contributing to the impairment of Rainbow Creek; and 2) estimate the actual nutrient load originating from the septic tank and percolation ponds to Rainbow Creek via groundwater flow. Based on the review of this information the Regional Board may further direct the CDFFP to implement an alternate means of wastewater disposal or additional treatment necessary to attain and maintain nutrient water quality objectives in Rainbow Creek.

6. **Establish Memorandum of Understanding (MOU) with Agencies or Organizations**
The Regional Board shall consider entering into a memorandum of understanding (MOU) to document cooperative agreements with other agencies or organizations that are able to provide information, technical assistance, or financial assistance to dischargers to support the Regional Board's goals of attaining the nutrient load reductions required under this TMDL and compliance with the nutrient water quality objective. These agencies and organizations include, but are not limited to, the United States Department of Agriculture, Natural Resources Conservation Service (NRCS), Mission Resource Conservation District (MRCD), and the University of California Cooperative Extension (UCCE).

7. **Adopt Waste Discharge Requirements (WDRs), Waivers, and Discharge Prohibitions**
In conjunction with an MAA or MOU with another third-party representative, organization, or government agency describing an adequate NPS pollution control implementation program, the Regional Board shall adopt individual or general waivers or waste discharge requirements (WDRs) for NPS discharges in the Rainbow Creek watershed. The waivers or WDRs shall require NPS dischargers to either participate in the third party NPS program or, alternatively, submit individual pollution prevention plans that detail how they will comply with the waivers and WDRs. Alternatively, the Regional Board may adopt a discharge prohibition, which includes exceptions for those discharges that are adequately addressed in an acceptable third-party MAA or MOU NPS pollution control implementation program.

8. **Take Enforcement Actions**
The Regional Board shall take enforcement action[6], as necessary, against any discharger failing to comply with applicable waiver conditions, waste discharge requirements (WDRs), discharge prohibitions, or take enforcement action, as necessary, to control the discharge of nutrients to Rainbow Creek, to attain compliance with the nutrient wasteload and load reductions specified in this TMDL, or to attain compliance with the nutrient water quality objectives. The Regional Board may also terminate the applicability of waivers and issue waste discharge requirements or take other appropriate action against any discharger(s) failing to comply with the waiver conditions.

9. **Review and Revise Existing Waste Discharge Requirements**
The Regional Board shall review and, if necessary, update existing waste discharge requirements for discharges to land as well as groundwater in the Rainbow Creek watershed to incorporate effluent

[6] An enforcement action is any formal or informal action taken to address an incidence of actual or threatened noncompliance with existing regulations or provisions designed to protect water quality. Potential enforcement actions include a notice of violation (NOV), notices to comply (NTC), imposition of time schedules (TSO), issuance of cease and desist orders (CDOs) and cleanup and abatement orders (CAOs), administrative civil liability (ACL), and referral to the attorney general (AG) or district attorney (DA). The Regional Board generally implements enforcement through an escalating series of actions to: (1) assist cooperative dischargers in achieving compliance; (2) compel compliance for repeat violations and recalcitrant violators; and (3) provide a disincentive for noncompliance.

limitations for nutrients consistent with applicable nutrient groundwater quality objectives and surface water quality objectives.[7]

10. Recommend High Priority for Grant Funds

The Regional Board shall recommend that the State Board assign a high priority to awarding grant funding[8] for projects to implement the Rainbow Creek nutrient TMDLs. Special emphasis will be given to projects that can achieve quantifiable nutrient load reductions consistent with the specific nutrient TMDL load allocations.

11. Incorporate Water Code Section 13291 Regulations in Basin Plan

The Regional Board shall incorporate regulations currently under development by the State Water Resources Control Board pertaining to onsite wastewater treatment systems[9] into the Basin Plan as soon as practicable upon their adoption by the State Board.[10]

B. County of San Diego Actions

1. Control MS4 Discharges to Rainbow Creek

For nutrient discharges to or from Municipal Separate Storm Sewer Systems (MS4) within the Rainbow Creek watershed, the County has an existing obligation under the NPDES requirements for MS4s in San Diego County[11] to require increasingly stringent best management practices, pursuant to the iterative process described in Receiving Water Limitation C.2.a.[12] of the MS4 Requirements, to reduce nutrients discharges in the Rainbow Creek watershed to the maximum extent practicable and restore compliance with the nutrient water quality objective.

2. Submit Nutrient Reduction and Management Plan (NRMP)

The County of San Diego shall, upon request by the Regional Board pursuant to Water Code section 13225, prepare and submit a NRMP for the Rainbow Creek watershed, consistent with the SWRCB NPS Implementation and Enforcement Policy and containing the elements described in section C, County of San Diego Nutrient Reduction and Management Plan or their equivalent. The County may submit alternative or additional elements equivalent to those described in section C that would result in equivalent protection from, or prevention of, nutrient discharges to Rainbow Creek.

3. Submit and Implement Groundwater Investigation and Characterization Workplan

The County of San Diego shall, upon request by the Regional Board pursuant to Water Code section 13225, undertake an investigation of groundwater quality within the Rainbow Creek watershed, and shall prepare and submit a workplan designed to guide the collection of information to produce the

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[7] There are currently three dischargers in the Rainbow Creek watershed regulated under waste discharge requirements for the discharge of waste to land or groundwaters: Oak Crest Mobile Estates (Order No. 1993-69), Rainbow Conservation Camp (Order No. 1995-20), and Temecula Truck Inspection Facility (Order No. 1992-56). The Rainbow Truck Weigh and Inspection Facility, discharges under the terms of a waiver of waste discharge requirements (Order No. 2000-235).

[8] The State Water Resources Control Board administers the awarding of grants funded from Proposition 13, Proposition 50, Clean Water Act 319(h) and other federal appropriations to projects that can result in measurable improvements in water quality, watershed condition, and/or capacity for effective watershed management. Many of these grant fund programs have specific set-asides for expenditures in the areas of watershed management and TMDL implementation for NPS pollution.

[9] "Onsite wastewater treatment system(s)" (OWTS) is any individual or community onsite wastewater treatment, pretreatment and dispersal system including, but not limited to, a conventional, alternative, or experimental sewage dispersal system such a septic tanks having a subsurface discharge.

[10] Water Code section 13291 directs the Regional Board to incorporate the regulations in the Basin Plan upon their adoption by the State Water Resources Control Board.

[11] The term "MS4 NPDES Storm Water Permit" refers to Order No.2001-001, NPDES No. CAS0108758, *Waste Discharge Requirements For Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of San Diego, the Incorporated Cities Of San Diego County, and the San Diego Unified Port District* or subsequent superceding NPDES renewal Orders.

[12] Groundwater beneath the Rainbow Creek watershed is interpreted to occur in both the alluvial deposits where present and in the fractured rock. The groundwater investigation report shall assess the relative contribution from each aquifer.

technical report described in Item 4, Groundwater Investigation and Characterization Report below. The workplan shall include the following:

a. A schedule for completion of all activities and submission of a final Groundwater Investigation and Characterization Report.
b. A description of proposed actions including drilling methods, analytical methods, sampling locations, and purging and sampling methods.
c. The location of existing monitoring wells and the proposed location of additional monitoring wells needed to characterize nutrient concentrations and their lateral and vertical extent in groundwater.
d. Contingencies for collection of additional samples.
e. Sufficient scope to meet the objectives of assessing nutrient loading from surface sources to groundwater and the contribution of groundwater to the nutrient loading and nutrient concentrations in Rainbow Creek.
f. Consideration of the following elements or factors:
    i. Nutrient mass loading to groundwater in the fractured rock aquifer and the alluvial deposits aquifer[13] from septic systems, deep percolation of applied irrigation water, and any other sources.
    ii. Base flow contribution to Rainbow Creek from the fractured rock aquifer and the alluvial deposits aquifer.
    iii. Mass balance of nutrients in the fractured rock aquifer and alluvial deposits aquifer (nutrient mass loading to groundwater, removals from the groundwater system including denitrification, plant uptake, and groundwater discharge, and change in the load and concentration of nutrients in groundwater.

The County of San Diego shall implement the workplan within sixty (60) days after submission of the workplan, unless otherwise directed in writing by the Regional Board. Before beginning these activities the County shall notify the Regional Board of the intent to initiate the proposed actions included in the workplan submitted; and comply with any conditions set by the Regional Board.

4. Submit Groundwater Investigation and Characterization Report

The County of San Diego shall, on a schedule agreed to in writing by the Regional Board, submit a Groundwater Investigation and Characterization Report containing a technical analysis and interpretation of the data to assess the contribution of groundwater to the nutrient loading and concentrations in Rainbow Creek. The report shall meet the objectives and address the considerations described in the Groundwater Investigation and Characterization Workplan. The report shall also present recommendations to refine assumptions, resolve uncertainties, and improve the scientific foundation of the TMDL with regard to quantifying groundwater nutrient loading to Rainbow Creek.

5. Establish Management Agency Agreement (MAA)

The County of San Diego is requested to enter into a MAA with the Regional Board setting forth the commitment of both parties to undertake various implementation oversight responsibilities for the nonpoint source nutrient load reduction component of this TMDL and the County's commitments to implement the NRMP.

C. County Of San Diego Nutrient Reduction And Management Plan

1. NPS Nutrient Reduction and Management Plan (NRMP)

A NRMP for the Rainbow Creek watershed shall describe the activities the County of San Diego could undertake to oversee discharger efforts to reduce nutrients in the runoff or groundwater discharges from new and existing (1) commercial nurseries; (2) agricultural fields; (3) orchards; (4) parks; (5) residential area; (6) urban areas; and (7) septic tank disposal system land uses (hereinafter referred to as key nutrient sources). A NRMP should include the following elements as provided in items 2 through 17 below or alternative or additional elements equivalent to those described that would result in equivalent protection from, or prevention of, nutrient discharges to Rainbow Creek.

[13] Groundwater beneath the Rainbow Creek watershed is interpreted to occur in both the alluvial deposits where present and in the fractured rock. The groundwater investigation report shall assess the relative contribution from each aquifer.

2. Legal Authority

The County of San Diego should review its legal authority and evaluate its adequacy to mandate compliance with the nutrient load reductions specified in this TMDL through ordinance, statue, permit, contract or similar means. The County, at a minimum, should evaluate its authority to:

a. Control the discharge of nutrients from nonpoint sources; and
b. Prohibit discharges of nutrients which cause or contribute to exceedances of the nutrient load reductions specified in this TMDL or nutrient water quality objectives.

Alternatively the County of San Diego may certify that its existing legal authority is adequate to mandate compliance with the nutrient load reductions specified in this TMDL and prevent increases in nutrient loading to Rainbow Creek.

3. General Plan Modification

The County of San Diego should evaluate the adequacy of its General Plan to ensure that future land use and zoning decisions do not result in an increase in the nutrient loading to Rainbow Creek. The County should also describe the steps it will take to modify the General Plan as necessary. Alternatively the County of San Diego may certify that its existing General Plan is adequate to prevent an increase in nutrient loading to Rainbow Creek.

4. Modify Development Project Approval Process

The County of San Diego should evaluate the adequacy of its development project approval / permitting process as necessary to ensure that discharges from proposed developments in the Rainbow Creek watershed will comply with the nutrient load reductions specified in this TMDL and ensure that nutrient water quality objectives are not exceeded. The County's evaluation should consider the need to ensure that all development in Rainbow Creek watershed will be in compliance with County's storm water ordinances, permits, and all other applicable ordinances and requirements. The County should also describe the steps it will take to modify the development project approval / permitting process as necessary. Alternatively the County of San Diego may certify that its project approval / permitting process is adequate to ensure that discharges from proposed developments in the Rainbow Creek watershed will comply with the nutrients load reductions specified in this TMDL and ensure that nutrient water quality objectives are not exceeded.

5. CEQA Reviews

The County of San Diego should evaluate the adequacy of its environmental review process pursuant to CEQA to ensure that new development in the Rainbow Creek watershed does not contribute to exceedances of the nutrient load allocations specified in this TMDL or violations of the nutrient water quality objective. For example, diligent performance of environmental review under CEQA and requirements for mitigation of the adverse environmental consequences to water quality of new development and detrimental agricultural practices can significantly reduce nutrient loading to Rainbow Creek. The County's evaluation should consider the need to aggressively review proposed projects that have the potential to contribute nitrogen and phosphorus to the Rainbow Creek watershed and require appropriate mitigation. The County should also describe the steps it will take to revise the development project approval / permitting process as necessary. Alternatively the County of San Diego may certify that its environmental review process pursuant to CEQA is adequate to ensure that new development in the Rainbow Creek watershed does not contribute to exceedances of the nutrient load allocations specified in this TMDL or violations of the nutrient water quality objective.

6. Pollution Prevention (Nutrients)

The County of San Diego should describe the steps it will take to implement pollution prevention[14] methods for nutrients at sites owned by the County and require its use by owners or operators of nutrient sources, where appropriate.

[14] Pollution Prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control, treatment, or disposal.

7. **Source Identification (Nutrients)**
   The County of San Diego should describe the steps it will take to develop and update annually an inventory of the individual nutrient sources within the residential, urban, commercial nursery, agricultural field, orchard, park, and septic tank disposal system category of land uses. The use of an automated database system, such as Geographical Information System (GIS) is highly recommended.

8. **Threat to Water Quality Prioritization (Nutrients)**
   The County of San Diego should describe the steps it will take to establish priorities for inspection and oversight activities. Each individual nutrient source in each nonpoint source category should be classified as high, medium, or low threat to water quality. The inventory should include the following minimum information for each site: name; address; SIC codes as appropriate which best reflects the type of site; a narrative description characterizing the nutrient waste generated; and the potential for nutrient discharges to Rainbow Creek.

9. **MP Implementation (Nutrients)**
   The County of San Diego should describe the steps it will take to:
   a. Designate a set of minimum MMs / MPs[15] for the high, medium, and low threat to water quality nutrient sources identified in item 7 above. The designated minimum MPs for the high threat to water quality nutrient sources should be site and source specific as appropriate.
   b. Establish a time line for installation of the designated minimum MPs at each nutrient source within its jurisdiction. If particular minimum MPs are infeasible for any specific site/source the county of San Diego should describe the steps it will take to require the implementation of other equivalent MPs.

10. **Inspection of Sites and Sources (Nutrients)**
    The County of San Diego should describe the steps it will take to inspect high priority sites and sources for compliance with its ordinances and permits as well as nutrient load reductions required under this TMDL. Inspections should include review of MP implementation plans and effectiveness. The County should also describe the steps it will take to implement all inspection follow-up actions, including enforcement actions, as necessary to obtain discharger compliance in implementing MPs.

11. **Enforcement of Sites and Sources (Nutrients)**
    The County of San Diego should describe the steps it will take to enforce its ordinances, statues, permits, and contracts as necessary to attain compliance with the nutrient load reductions specified in this TMDL.

12. **Reporting of Non-compliant Sites (Nutrients)**
    The County of San Diego should describe the steps it will take to provide oral notification to the Regional Board of non-compliant sites that are determined to be recalcitrant in implementing MPs or attaining compliance with nutrient load reductions required under this TMDL within 24 hours of the discovery of noncompliance. The notification process should also include procedures for a follow-up written report to be submitted to the Regional Board within 5 days of the incidence of non-compliance.

13. **Monitoring to Assess Compliance With Nutrient Load Reductions**
    The County of San Diego should describe the steps it will take to conduct, or require nutrient sites or sources to conduct, a monitoring program to assess compliance of runoff or groundwater discharges with the load reductions from each of the land use categories assigned a load reduction. This can be accomplished by placing sampling stations at strategic nodes that would monitor nutrient discharges from individual sources of a common land use category.

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[15] In determining appropriate MPs the County of San Diego is encouraged to consult the State Water Resources Control Board's California Nonpoint Source Encyclopedia (2004) (http://www.waterboards.ca.gov/nps/encyclopedia.html). This publication contains extensive information on nutrient reduction management measures (MMs) and management practices (MPs) applicable to the NPS land use activities in the Rainbow Creek watershed. The County is also encouraged to consult the Regional Board's Watershed Management Approach for the San Diego Region, Nonpoint Source (http://www.waterboards.ca.gov/sandiego/programs/wmc.html) for additional information on management measures.

14. Community Education and Outreach

The County of San Diego should describe the steps it will take to develop a focused educational program to raise community awareness of the nutrient impairment problem, promote pollution prevention, and increase the use of applicable management measures and practices where needed to control and reduce nutrient discharges to Rainbow Creek. Public education, outreach, and training programs should involve applicable user groups and the community.[16]

15. Seek Financial Assistance

The County of San Diego is encouraged to seek grant funding[17] for projects to implement the Rainbow Creek nutrient TMDLs, particularly those that can achieve quantifiable nutrient load reductions consistent with the specific nutrient TMDL load allocations.

16. Nutrient Reduction and Management Plan (NRMP) Effectiveness

The County of San Diego should describe the steps it will take to develop a long-term strategy for assessing the effectiveness of the NRMP. The long-term assessment strategy should identify specific direct and indirect measurements that the County will use to track the long-term progress towards achieving the nutrient load reductions required under this TMDL. Methods used for assessing effectiveness should include the following or their equivalent: surveys, pollutant loading estimations, and receiving water quality monitoring. The long-term strategy shall also discuss the role of monitoring data in substantiating or refining the assessment.

17. Nutrient Reduction and Management Plan (NRMP) Annual Report

The County of San Diego should describe the steps it will take to submit an annual NRMP report to the Regional Board by January 31 of each year following USEPA approval of this TMDL. The reporting period for this annual report should be the previous fiscal year. For example, the report submitted January 31, 2006 would cover the reporting period July 1, 2004 to June 30, 2005. The report should be incorporated in the annual Jurisdictional URMP Annual Report and the Watershed Specific URMP Annual Reports under the County's MS4 NPDES Permit and include the following information:

a. Comprehensive description of all activities conducted by the County of San Diego to oversee implementation of the NRMP.
b. An accounting of all: inspections conducted; enforcement actions taken; and education efforts conducted.
c. An assessment of whether actions to implement designated minimum MPs at each nutrient source were actually carried out by dischargers.
d. An assessment of the compliance of runoff or groundwater discharges with the load reductions from each of the land use categories assigned a load reduction.
e. Identification of water quality improvements or degradation in Rainbow Creek with regard to attainment of the nutrient water quality objectives.
f. An evaluation of the effectiveness of the NRMP in achieving the nutrient load reductions required under this TMDL.

D. Discharger Actions

1. State of California, Department of Transportation (Caltrans) Actions

Caltrans shall take all actions necessary to meet the nutrient wasteload reductions assigned to Caltrans. These nutrient wasteload reductions will eventually be incorporated into Caltrans statewide NPDES storm water permit. It is assumed that compliance with the nutrient wasteload reductions will

[16] Consideration should be given to expanding the County of San Diego's ongoing community and education outreach program under the County's MS4 NPDES Storm Water Permit to address the Rainbow Creek nutrient impairment problem. Additional suggestions for the information to be included in pollution prevention and education programs is contained in the State Water Resources Control Board's *California Nonpoint Source Encyclopedia* (2004) (http://www.waterboards.ca.gov/nps/encyclopedia.html)

[17] Information on available grant funds is contained in the State Water Resources Control Board's California Nonpoint Source Encyclopedia (2004) (http://www.waterboards.ca.gov/nps/encyclopedia.html).

be accomplished through the development and implementation of best management practices (BMPs). Caltrans shall also prepare and submit progress reports in accordance with the Caltrans statewide NPDES storm water permit or as otherwise directed by the Regional Board in a Water Code section 13383 order.

2. **State of California Department of Forestry and Fire Protection (CDFFP) Actions**
   CDFFP shall, upon direction by the Regional Board in a Water Code section 13267 order, undertake an investigation to 1) evaluate whether CDFFP's discharge is surfacing and/or contributing to the impairment of Rainbow Creek; and 2) estimate the actual nutrient load to Rainbow Creek from groundwater flow originating from the septic tank and percolation ponds.

3. **Nonpoint Source Dischargers (NPS Dischargers) Actions**
   NPS discharges of nutrients in the Rainbow Creek watershed result from (1) commercial nurseries; (2) agricultural fields; (3) orchards; (4) parks; (5) residential areas; (6) urban areas; and (7) septic tank disposal system land use activities. Individual landowners and other persons (NPS Dischargers) engaged in these land use activities shall implement pollution prevention[18] methods and increase the use of applicable management measures and practices[19] where needed to control and reduce nutrient discharges to Rainbow Creek and attain nutrient load reductions. Individual landowners and other persons are encouraged to seek grant funding[20] for projects to implement the Rainbow Creek nutrient TMDLs, particularly those that can achieve quantifiable nutrient load reductions consistent with the specific nutrient TMDL load allocations. NPS dischargers will be subject to Regional Board enforcement action for failing to: comply with applicable waiver conditions, waste discharge requirements (WDRs), discharge prohibitions; attain compliance with the nutrient load reductions specified in this TMDL; or attain compliance with the nutrient water quality objectives. The Regional Board may also terminate the applicability of waivers and issue waste discharge requirements to any NPS dischargers failing to comply with waiver conditions.

TMDL IMPLEMENTATION MONITORING PLAN

The necessary actions to monitor TMDL implementation are described in section 10 of the *Technical Report for Total Nitrogen and Total Phosphorus Total Maximum Daily Loads (TMDLs) in Rainbow Creek*, dated February 9, 2005 and listed below.

A. Regional Board Actions

1. **Issue Order to Submit Monitoring Plan to Caltrans and County of San Diego**
   The Regional Board shall issue an Order to Caltrans under Water Code section 13383 and a Governmental Water Quality Investigation Request Order to the County of San Diego under Water Code section 13225, to prepare and submit an Implementation Monitoring Plan containing the elements described in **Section C. Implementation Monitoring Plan Elements** below. The Regional Board may amend this order at any time to include other nutrient dischargers in the Rainbow Creek watershed on a case-by-case basis.

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[18] Pollution Prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control, treatment, or disposal.

[19] In determining appropriate management methods and practices to control nutrient discharges interested persons are encouraged to consult the State Water Resources Control Board's California Nonpoint Source Encyclopedia (2004) (http://www.waterboards.ca.gov/nps/encyclopedia.html. This publication contains extensive information on nutrient reduction management measures (MMs) and management practices (MPs) applicable to the NPS land use activities in the Rainbow Creek watershed. Interested persons are also encouraged to consult the Regional Board's Watershed Management Approach for the San Diego Region, Nonpoint Source (http://www.waterboards.ca.gov/sandiego/programs/wmc.html) for additional information on management measures.

[20] Information on available grant funds is contained in the in the State Water Resources Control Board's *California Nonpoint Source Encyclopedia* (2004) (http://www.waterboards.ca.gov/nps/encyclopedia.html).

2. **Issue Order to Implement Monitoring Plan to Caltrans and County of San Diego**
   Upon concurrence with the County of San Diego's and Caltrans' Implementation Monitoring Plan the Regional Board shall issue an Order to Caltrans under Water Code section 13383 and a Governmental Water Quality Investigation Request Order to the County of San Diego under Water Code section 13225, to implement monitoring. The Regional Board may amend this order at any time to include other nutrient dischargers in the Rainbow Creek watershed on a case-by-case basis.

B. County of San Diego and Caltrans Actions

1. **Prepare and Submit Monitoring Plan**
   The County of San Diego and Caltrans shall collaborate to prepare and submit an Implementation Monitoring Plan for the Rainbow Creek watershed containing the elements described in **Section C. Implementation Monitoring Plan Elements** below, upon direction by the Regional Board in a Water Code section 13225 / Water Code section 13383 Order. The number of monitoring stations in Rainbow Creek assigned to Caltrans should be based on the number of stations needed by Caltrans to demonstrate compliance with the nutrient wasteload allocation and the success of the TMDL in attaining the nutrient water quality objective in the portion of Rainbow Creek affected by its discharge. The Implementation Monitoring Plan shall be modified as requested by the Regional Board.

2. **Implement Monitoring Plan**
   The County of San Diego and Caltrans shall implement the Implementation Monitoring Plan upon direction by the Regional Board pursuant to a Water Code section 13225 / section 13383 Order. The Regional Board may amend this order at any time to include other nutrient dischargers in the Rainbow Creek watershed on a case-by case basis.

C. Implementation Monitoring Plan Elements

The Implementation Monitoring Plan shall contain the following elements:

1. **Surface Water Monitoring Stations**
   Monitoring stations shall be proposed that best serve the monitoring objectives described above in section 10.2 Monitoring Objectives. Previously monitored locations that shall be considered include Jubilee, Hines Nursery, Oak Crest, Rainbow Glen Tributary, Margarita Glen Tributary, Willow Glen-4, Willow Glen Tributary, Riverhouse, Via Milpas Tributary, and Stage Coach (See Figure A-3, in Appendix A). An additional sampling location between Oak Crest and Willow Glen-4 should also be considered. For instance, a monitoring location might be placed downstream of Oak Crest Mobile Estates to assess nutrient loading from this property. Monitoring stations shall also be considered at strategic nodes in Rainbow Creek and its tributaries that would monitor nutrient discharges from individual sources of a common land use category.

2. **Groundwater Monitoring Stations**
   The location of existing wells and the proposed location of additional monitoring wells needed to define nutrient concentration trends in groundwater. Methods for purging and sampling monitoring wells to provide representative samples for the waste constituents of interest should be described.

3. **Surface Water Monitoring Frequency**
   Monitoring frequencies of the various monitoring parameters shall be proposed that best serve the monitoring objectives described above in section 10.2 Monitoring Objectives. The frequencies should be adequate to evaluate ambient conditions and address any impact from low dissolved oxygen concentrations and algal growth.

4. **Groundwater Monitoring Frequency**
   Monitoring frequencies of the various monitoring parameters shall be proposed that best serve the monitoring objectives described above section 10.2 Monitoring Objectives. The magnitude and timing of nutrient variability may vary significantly in monitoring wells that are located varying distances from nutrient sources. Sampling these wells will likely obtain water from varying depths in the aquifer. To

define the nitrate variability at each well, the network will be sampled quarterly for two years. The observed variability will serve as a basis for determining the long-term sampling frequency for the network.

5. **Surface Water Quality Parameters**
   Surface Water Quality Parameters shall include nitrogen (including nitrate, nitrite, ammonia and total Kjeldahl nitrogen (TKN), phosphorus (including orthophosphate and total), dissolved oxygen, pH, turbidity, and temperature.

6. **Groundwater Quality Parameters**
   Groundwater Quality Parameters shall include total nitrogen, nitrate, ammonia, nitrites, TKN, orthophosphate, total phosphorus, pH, dissolved oxygen and TDS.

7. **Hydrology**
   Flow rate measurements shall be taken to calculate nutrient loading, to provide additional information about the hydrology of the watershed, and to identify patterns in algal growth.

8. **Algal Biomass**
   Characterization of algal species composition is needed to provide a more reliable indicator of trophic status and evidence of nutrient condition (USEPA, 2000). The growth of algae is stimulated principally by nutrients such as nitrogen and phosphorus, but also requires adequate water temperature, light, flow, and dissolved oxygen. It is assumed at this time that both factors are co-limiting. Characterization of algal species composition may give a better understanding of the relationships between all the factors that affect algal growth, including sunlight, nitrogen, phosphorus, temperature, and dissolved oxygen. Algal biomass should be quantified by mass and/or by % cover of bottom. Collection and measurement of algal biomass should be performed uniformly or by a standardized method.

9. **Biological Assessment Monitoring**
   It is recommended that biological assessment monitoring of benthic microinvertebrates be performed at a minimum of three stations on Rainbow Creek and a reference stream. Biological assessment monitoring should be performed in accordance with the California Stream Bioassessment Methods Manual (Harrington and Born, 2000). Changes in the stream's biological integrity (e.g., an increase or decrease in diversity and abundance of sensitive species) could be used as an indicator of changes in the health of the creek. Sampling done in 1998-99 for the San Diego Ambient Bioassessment Program (CDFG, 2000) indicates that benthic macroinvertebrate communities vary seasonally. The seasonal trend could be due in part to rainfall and consequent streamflow conditions (e.g., scouring). Thus, sites should be sampled for benthic macroinvertebrates at least twice each year: once during the spring (i.e., May), and again in the fall (preferably in October).

10. **Monitoring Reports**
    Monitoring reports shall be submitted in both electronic and paper formats and include the following information:
    a. An executive summary addressing all sections of the monitoring report, comprehensive interpretations and conclusions, and recommendations for future actions.
    b. A description of monitoring station locations by latitude and longitude coordinates, frequency of sampling, quality assurance / quality control procedures and sampling and analysis protocols.
    c. The data/results, methods of evaluating the data, graphical summaries of the data, and an explanation / discussion of the data.
    d. An assessment of the compliance of runoff characteristics with the required load reductions from each of the land use categories assigned a load reduction.
    e. Identification and analysis of trends in surface and groundwater quality and assessment of compliance with nutrient water quality objectives.
    f. An evaluation of the effectiveness of the TMDL implementation actions and the need for revisions to improve the implementation action plan.

Table 7-17. Required Monitoring Parameters

Parameter	Type of Sample[1]
Surface Water Monitoring	
Total nitrogen, nitrate, ammonia[2], nitrates, TKN, orthophosphate, and total phosphorus concentrations.	Grab
Temperature	In situ
pH	In situ
Dissolved oxygen	In situ
Turbidity	In situ
TDS	Grab
Flow rate	Field measurement
Algal biomass (% cover of bottom and/or Chl a/ash free dry weight (AFDM))	In situ and / or grab
Benthic macroinvertebrate community analysis (recommended)	Grab
Groundwater Monitoring	
Total nitrogen, nitrate, ammonia[2], nitrites, TKN, orthosphosphate, and total phosphorus concentrations	Grab
pH	Grab or In situ
Dissolved Oxygen	Grab or In situ
TDS	Grab or In situ

1. A California certified laboratory should be used with an approved QA/QC plan.
2. All laboratory detection limits should be sufficient to determine compliance with the water quality objective. For example, un-ionized ammonia in surface waters (25 μg/L).

11. Quality Assurance/ Quality Control Plan

The monitoring program shall develop and implement a QA/QC plan for field and laboratory operations to ensure that data collected are of adequate quality given the monitoring objectives[21]. The QA/QC plan for field operations shall cover the following, at a minimum:

a. Quality assurance objectives;
b. Sample container preparation, labeling and storage;
c. Chain-of-custody tracking;
d. Field setup;
e. Sampler equipment check and setup;
f. Sample collection;
g. Use of field blanks to assess field contamination;
h. Use of field duplicate samples;
i. Transportation to the laboratory;
j. Training of field personnel; and
k. Evaluation, and enhancement if needed of the QA/QC plan.

The QA/QC plan for laboratory operations shall cover the following, at a minimum:

a. Quality assurance objectives;
b. Organization of laboratory personnel, their education, experience, and duties;
c. Sample procedures;
d. Sample custody;
e. Calibration procedures and frequency;
f. Analytical procedures;
g. Data reduction, validation, and reporting;
h. Internal quality control procedures;
i. Performance and system audits;

[21] For more information on QA/QC activities, including guidelines and example QA/QC documents, refer to http://www.waterboards.ca.gov/swamp/qapp.html

j. Preventive maintenance;
k. Assessment of accuracy and precision;
l. Correction actions; and
m. Quality assurance report.

12. Reporting Period

Annual reports should cover the period of October 1 through September 30. The reports should be submitted to the Regional Board by January 31 of the following year and should be incorporated within the annual receiving water monitoring reports required under the County of San Diego's MS4 NPDES Permit Receiving Waters Monitoring and Reporting Program.[22]

13. Reporting Frequency

The first report shall be due in the first January following initiation of the monitoring program. Reporting shall continue on an annual basis until the nutrient water quality objective has been attained and maintained in Rainbow Creek.

Compliance Schedule

Total nitrogen and total phosphorus reductions are required over a 16-year phased compliance schedule period during which incremental load and wasteload reductions are required as shown in Table 7-18, below. Twenty percent (20%) reductions are required every fourth year for the first three phases (by the end of year 12). The last (fourth) phase requires the remaining 14% total nitrogen reduction and 25% total phosphorus reduction needed to meet the TMDLs.

Table 7-18. Total Nitrogen and Total Phosphorus Phased Load Reduction Compliance Schedule

Compliance Date	Total Nitrogen		Total Phosphorus	
	Current Load & Annual Loads (LA + WLA) kg N/yr	Cumulative % Reduction	Current Load & Annual Loads (LA + WLA) kg P/yr	Cumulative % Reduction
	3,055[1]		278[1]	
12/31/2009	2,444	20	222	20
12/31/2013	1,833	40	167	40
12/31/2017	1,222	60	111	60
12/31/2021	796	74	41	85

1. Current annual nutrient loads from identified point and nonpoint sources (See Table 7-12). This value does not include the contribution for background.

Regardless of what actions are taken to achieve load and wasteload reductions, there may not be an immediate response in the water quality or biological condition of Rainbow Creek. For example, there may be significant time lags between when actions are taken to reduce nutrient loads and resulting changes in nutrient concentrations in Rainbow Creek. This is especially likely if nutrients from past activities are tightly bound to sediments or if nutrient-contaminated groundwater has a long residence time before its release to Rainbow Creek waters. A three-year response time is projected for Rainbow Creek to attain compliance with nutrient water quality objectives after reaching the desired nutrient wasteload and load reductions in 2021. Accordingly the projected date when Rainbow Creek will attain and maintain compliance with nutrient water quality objectives is December 31, 2024.

[22] The term "MS4 NPDES Storm Water Permit" currently refers to Order No.2001-001, NPDES No. CAS0108758, Waste Discharge Requirements For Discharges Of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of San Diego, the Incorporated Cities Of San Diego County, and the San Diego Unified Port District or subsequent superceding NPDES renewal Orders. Attachment B to this Order contains the Receiving Waters Monitoring and Reporting Program for Order No. 2001-01. The annual receiving water monitoring report is described in Table 6, Item 28, page 51 of Order No. 2001-01.

AGRICULTURAL PROGRAM COSTS AND POTENTIAL SOURCES OF FINANCING

Pursuant to Water Code section 13141 the Regional Board has estimated the TMDL Implementation Program cost for agricultural water quality control in Table 7-19.

Table 7-19. Cost of Implementing Agricultural Water Quality Control

	Initial Capital Costs $ per Operation		Annual Operational Costs $ per Operation	
	Low	High	Low	High
Commercial Nurseries	$26	$41,075	$3	$4,108
Orchards	$26	$57,705	$3	$5,771
Agricultural Fields	$26	$57,705	$3	$5,771

Potential sources of financing include:

- Federal Clean Water Act Section 319(h) grants.
- Federal Clean Water Act Section 205(j) grants.
- State of California Proposition 13 funded grants.
- Small Communities Grants for Water Reclamation and Wastewater Treatment Facilities.
- Other state, federal and business loans, grants, and other assistance programs. These may include assistance from U.S. Small Business Administration and from conservation programs through various agencies such as the U.S. Department of Agriculture and Natural Resource Conservation Service.
- Various secured and unsecured loans, including home equity loans and business loans.

METHOD FOR RECALCULATION OF THE TOTAL MAXIMUM DAILY LOADS FOR NITROGEN AND PHOSPHORUS IN RAINBOW CREEK

This section describes the method for recalculating Rainbow Creek TMDLs for nitrogen and phosphorus if the water quality objectives are modified in the future.

Numeric Target

The numeric targets are set equal to the new water quality objectives.

Margin of Safety

The explicit margin of safety (MOS) equals five percent of the loading capacity. The equation to calculate the loading capacity is given below.

Loading Capacity

The annual total nitrogen loading capacity is determined by multiplying the flow volume (in ft^3/yr) by the new water quality objective (in mg N/L) that will allow the creek to attain water quality standards. The equations below also use terms to convert milligrams to kilograms and cubic feet to liters. The loading capacity for nitrogen is as follows:

Low Flow (0-2.9 cfs)
17,764 * 1 e−3 ft^3/yr * **new water quality objective** in mg N/L * 28.32 L/ft^3 * 1 e −6 kg/mg
= **new low flow loading capacity** in kg N/yr

Moderate – High Flow (3 – 39 cfs)
40,775 * 1 e−3 ft^3/yr * **new water quality objective** in mg N/L * 28.32 L/ft^3 * 1 e −6 kg/mg
= **new moderate - high flow loading capacity** in kg N/yr

Total Annual Nitrogen Loading Capacity = sum of low flow and moderate - high flow loading capacity

Similarly, the annual total loading capacity for phosphorus is as follows:

Low Flow (0-2.9 cfs)
17,764 * 1 e−3 ft^3/yr * **new water quality objective** in mg P/L * 28.32 L/ft^3 * 1 e −6 kg/mg
= **new low flow loading capacity** in kg P/yr

Moderate – High Flow (3 – 39 cfs)
40,775 * 1e−3 ft^3/yr * **new water quality objective** in mg P/L * 28.32 L/ft^3 * 1 e −6 kg/mg
= **new moderate-high flow loading capacity** in kg P/yr

Total Annual Phosphorus Loading Capacity = sum of low flow and moderate - high flow loading capacity

Total Maximum Daily Load

The TMDLs for nitrogen and phosphorous are set equal to the total annual loading capacity for each pollutant. The allocations in Table 7-20 below use the following equation to determine the total load allocations for nonpoint sources (LA) by subtracting background, the margin of safety (MOS), and the point source waste load allocations (WLA) from the TMDL.

$$TMDL = \sum(WLA) + \sum(LA) + Background + MOS$$

Allocations

The allocations of the total annual nitrogen and phosphorous loading capacities to the margin of safety, background, and various point and non-point sources are presented in Table 7-20.

Table 7-20. Total Nitrogen and Phosphorus Allocations for Rainbow Creek TMDL

Source	Nitrogen Allocation	Phosphorus Allocation
Margin of Safety (MOS)	5%[1]	5%[1]
Background	779 kg	116 kg
Caltrans (WLA)	New WQO * volume of Caltrans runoff	New WQO * volume of Caltrans runoff
Unidentified and Future Point Sources (WLA)	2%[1]	2%[1]
Total Allocation for Nonpoint Sources (LA) = Total Annual Loading Capacity – MOS – Background – Caltrans – Unidentified and Future Point Sources		
Commercial nurseries	16%[2]	9%[2]
Agricultural fields	21%[2]	12%[2]
Orchards	25%[2]	18%[2]
Park	0.4%	0.3%
Residential areas	21%[2]	36%[2]
Urban areas	4%[2]	18%[2]
Septic tank disposal systems	6%[2]	0%[2]
Air deposition	6%[2]	6%[2]

[1] percent of the total annual nitrogen and phosphorus loading capacity

[2] percent of the total allocation for nonpoint sources

TOTAL MAXIMUM DAILY LOADS (TMDLS) FOR COPPER, LEAD, AND ZINC IN CHOLLAS CREEK

On June 13, 2007, the Regional Board adopted Resolution No. R9-2007-0043, *Amendment to the Water Quality Control Plan for the San Diego Region to Incorporate Total Maximum Daily Loads for Dissolved Copper, Lead and Zinc in Chollas Creek, Tributary to San Diego Bay*. The TMDL Basin Plan Amendment was subsequently approved by the State Water Resources Control Board on July 15, 2008, the Office of Administrative Law on October 22, 2008, and the USEPA on December 18, 2008.

Problem Statement

Dissolved copper, lead and zinc concentrations in Chollas Creek violate numeric water quality criteria for copper, lead, and zinc promulgated in the California Toxics Rule, and the narrative objective for toxicity. Concentrations of these metals in Chollas Creek threaten and impair the designated beneficial uses of warm freshwater habitat (WARM), and wildlife habitat (WILD).

Numeric Targets

The TMDL numeric targets for copper, lead, and zinc are set equal to the numeric water quality criteria as defined in the California Toxics Rule (CTR) and shown below. Because the concentration of a dissolved metal causing a toxic effect varies significantly with hardness, the water quality criteria are expressed in the CTR as hardness based equations. The numeric targets are equal to the loading capacity of these metals in Chollas Creek.

Table 7-21. Water Quality Criteria /Numeric Targets for dissolved metals in Chollas Creek

Metal	Numeric Target for Acute Conditions: Criteria Maximum Concentration	Numeric Target for Chronic Conditions: Criteria Continuous Concentration
Copper	(1) * (0.96) * {e^ [0.9422 * ln (hardness) - 1.700]}	(1) * (0.96) * {e^[0.8545 * ln (hardness) - 1.702]}
Lead	(1) * {1.46203 – [0.145712 * ln (hardness)]} * {e^ [1.273 * ln (hardness) - 1.460]}	(1) * {1.46203 – [0.145712 * ln hardness)]} * {e^[1.273 * ln (hardness) - 4.705]}
Zinc	(1) * (0.978) * {e^ [0.8473 * ln (hardness) + 0.884]}	(1) * (0.986) * {e^[0.8473 * ln (hardness) + 0.884]}

Source Analysis

The vast majority of metals loading to Chollas Creek are believed to come through the storm water conveyance system. An analysis of source contributions reveals many land uses and activities associated with urbanization to be potential sources of copper, lead and zinc to Chollas Creek. Modeling efforts point toward freeways and commercial/industrial land uses as the major contributors.

Total Maximum Daily Loads

The TMDLs for dissolved copper, lead and zinc in Chollas Creek are concentration-based and set equal to 90 percent of the numeric targets/loading capacity.

Margin of Safety

The TMDL includes an explicit margin of safety (MOS). Ten percent of the loading capacity was reserved as an explicit MOS.

Allocations and Reductions

The source analysis showed that nonpoint sources and background concentrations of metals are insignificant, and thus, were set equal to zero in the TMDL calculations. The wasteload allocations are set equal to 90 percent of the numeric targets/loading capacity. Concentrations of dissolved copper, lead and zinc require significant reductions from current concentrations to meet the loading capacity.

TMDL Implementation Plan

Persons whose point source discharges contribute to exceedance of Water Quality Criteria (WQC) for copper, lead, and zinc in Chollas Creek will be required to meet the WLA hardness dependant concentrations in their urban runoff discharges before it is discharged to Chollas Creek. Actions to meet the WLAs in discharges to Chollas Creek will be required in WDRs that regulate MS4 discharges, industrial facility and construction activity stormwater discharges, and groundwater extraction discharges in the Chollas Creek watershed. The following orders may be reissued or revised by the Regional Board to include requirements to meet the WLAs. Alternatively, the Regional Board may issue new WDRs to meet the WLAs.

Order No. 2007-0001, NPDES No. CAS0108758, *Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego County, and the San Diego Unified Port District*, or subsequent superceding NPDES renewal orders.

Order No. 2000-90, NPDES No. CAG19001, *General Waste Discharge Requirements for Temporary Groundwater Extraction and Similar Waste Discharges to San Diego Bay and Storm Drains or other Conveyance Systems Tributary Thereto*, or subsequent superceding NPDES renewal orders.

Order No. 2001-96, NPDES No. CAG 919002, *General Waste Discharge Requirements for Groundwater Extraction Waste Discharges from Construction, Remediation and Permanent Groundwater Extraction Projects to Surface Waters within the San Diego Region Except for San Diego Bay* or subsequent superceding NPDES renewal orders.

Order No. 97-11, *General Waste Discharge Requirements for Post-Closure Maintenance of Inactive Nonhazardous Waste Landfills within the San Diego Region* or subsequent superceding NPDES renewal orders.

The Regional Board shall request the State Water Resources Control Board amend the following statewide orders:

Order No. 99-06-DWQ, NPDES No. CAS000003, *National Pollutant Discharge Elimination System (NPDES) Permit, Statewide Storm Water Permit, and Waste Discharge Requirements (WDRs) for the State of California, Department of Transportation (Caltrans)*, or subsequent superceding NPDES renewal orders.

Order No. 97-03-DWQ, NPDES No. CAS 000001, *Waste Discharge Requirements for Discharges of Storm Water Associated with Industrial Activities Excluding Construction Activities*, or subsequent superceding NPDES renewal orders.

Order No. 2003-0005-DWQ, NPDES No. CAS000004, *Waste Discharge Requirements for Storm Water Discharges from Small Municipal Separate Storm Sewer Systems*, or subsequent superceding NPDES renewal orders.

Order No. 99-08-DWQ, NPDES No. CAS000002, *General Permit for Storm Water Discharges Associated with Construction Activity*, or subsequent superceding NPDES renewal orders.

The Regional Board shall require the U.S. Navy to submit a Notice of Intent to enroll the Naval Base San Diego facility under statewide Order No. 2003-005-DWQ or subsequent superseding NPDES renewal orders.

Implementation Monitoring Plan

The dischargers will be required to monitor Chollas Creek and provide monitoring reports to the Regional Board for the purpose of assessing the effectiveness of the management practices implemented to meet the TMDL allocations. The Regional Board shall amend the following order to include a requirement that the cities of San Diego, Lemon Grove, and La Mesa, the County of San Diego, the San Diego Unified Port District, and CalTrans investigate excessive levels of metals in Chollas Creek and feasible management strategies to reduce metal loadings in Chollas Creek, and conduct additional monitoring to collect the data necessary to refine the watershed wash-off model to provide a more accurate estimate of the mass loads of copper, lead and zinc leaving Chollas Creek each year.

Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed, San Diego, California.*

Schedule of Compliance

Concentrations of metals in urban runoff shall only be allowed to exceed the WLAs by a certain percentage for the first nineteen years after initiation of this TMDL. Allowable concentrations shall decrease as shown in Table 7-22. For example, if the measured hardness in year ten dictates the WLA for copper in urban runoff is 10 μg/l, the maximum allowable measured copper concentration would be 12.0 μg/L. By the end of the twentieth year of this TMDL, the WLAs of this TMDL shall be met. This will ensure that copper, lead and zinc water quality objectives are being met at all locations in the creek during all times of the year.

Table 7-22. Interim goals for achieving Wasteload Allocations

	Allowable Exceedance of the WLAs (allowable percentage above)		
Compliance Year	**Copper**	**Lead**	**Zinc**
1	100%	100%	100%
10	20%	20%	20%
20	0%	0%	0%

Compliance with the interim goals in this schedule can be assessed by showing that dissolved metals concentrations in the receiving water exceed the WQC for copper, lead, and zinc by no more than the allowable exceedances for WLAs shown in the table above. Regulated groundwater discharges to Chollas Creek must meet the WLAs at the initiation of the discharge. No schedule to meet interim goals will be allowed in the case of groundwater discharges.

The compliance schedule for implementation of the TMDLs shall be as follows in Table 7-23.

Table 7-23. Compliance Schedule

Item	Implementation Action	Responsible Parties	Date
1	Effective date of Chollas Creek Metals TMDL Waste Load Allocations.	San Diego Water Board, Municipal Dischargers, Caltrans, Navy, Industrial Stormwater Dischargers, Construction Stormwater Dischargers, Landfill Stormwater Dischargers	October 22, 2008[23]
2	Recommend High Priority for grant funds.	San Diego Water Board	Immediately after effective date
3	Submit annual Progress Report to San Diego Water Board due January 1 of each year.	Municipal Dischargers	Annually after reissue of NPDES WDRs.
4	Submit annual Progress Report to San Diego Water Board due April 1 of each year.	Caltrans	Annually after reissue of NPDES WDRs.
5	Submit annual Progress Report to San Diego Water Board due July 1 of each year.	Industrial Stormwater Dischargers	Annually after reissue of NPDES WDRs.
6	Submit annual Progress Report to San Diego Water Board due July 1 of each year.	Construction Stormwater Dischargers	Annually after reissue of NPDES WDRs.
7	Municipal NPDES WDRs shall be issued, reissued, or revised to include WQBELs consistent with the assumptions and requirements of the Chollas Creek WLAs.	San Diego Water Board	Within 5 years of effective date
8	Caltrans NPDES WDRs shall be issued, reissued, or revised to include WQBELs consistent with the assumptions and requirements of the Chollas Creek WLAs.	State Water Board	Within 5 years of effective date
9	Construction NPDES WDRs shall be issued, reissued, or revised to include WQBELs consistent with the assumptions and requirements of the Chollas Creek WLAs.	State Water Board	Within 5 years of effective date
10	Industrial NPDES WDRs shall be issued, reissued, or revised to include WQBELs consistent with the assumptions and requirements of the Chollas Creek WLAs.	State Water Board	Within 5 years of effective date
11	Amend Orders No. 2000-90, and No. 2001-96 (or superseding renewal orders) which regulates temporary groundwater extraction discharges to San Diego Bay and its tributaries to include WQBELs consistent with the assumptions and requirements of the Chollas Creek WLAs.	San Diego Water Board	Within 5 years of effective date
12	Municipal and Navy WDR Order No. R9-2004-0277 shall amended to require additional monitoring for metals and hardness.	San Diego Water Board	Within 5 years of effective date
13	Landfill NPDES WDR Order No. 97-11 (or superseding renewal orders) shall be issued, reissued, or revised to monitor for metals and hardness.	San Diego Water Board	Within 5 years of effective date
14	Navy and all other Phase II small MS4 permittees in the Chollas Creek watershed shall be enrolled in Order No. 2003-0005-DWQ (or superseding renewal orders).	San Diego Water Board	Immediately after effective date.

[23] Upon approval of by Office of Administrative Law.

Item	Implementation Action	Responsible Parties	Date
15	Take enforcement actions	San Diego Water Board	As needed after effective date.
16	Meet 80% Chollas Creek Metals TMDL WLA reductions.	Municipal Dischargers, Caltrans, Navy, Industrial Stormwater Dischargers, Construction Stormwater Dischargers, Landfill Stormwater Dischargers	10 years after effective date.
17	Meet 100% Chollas Creek Metals TMDL WLA reductions.	Municipal Dischargers, Caltrans, Navy, Industrial Stormwater Dischargers, Construction Stormwater Dischargers, Landfill Stormwater Dischargers	20 years after effective date.

TOTAL MAXIMUM DAILY LOADS FOR INDICATOR BACTERIA, BABY BEACH AND SHELTER ISLAND SHORELINE PARK SHORELINES

On June 11, 2008, the San Diego Water Board adopted Resolution No. R9-2008-0027, *A Resolution Amending the Water Quality Control Plan for the San Diego Region (9) to Incorporate Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay*. The TMDL Basin Plan Amendment was subsequently approved by the State Water Resources Control Board on June 16, 2009, the Office of Administrative Law on September 15, 2009, and the USEPA on October 26, 2009.

PROBLEM STATEMENT

Bacteria densities along the shoreline segments of Baby Beach within Dana Point Harbor and Shelter Island Shoreline Park within San Diego Bay violate water quality objectives (WQOs) for indicator bacteria. Bacteria densities in waters at these shoreline segments unreasonably impair and threaten to impair the water quality needed to support designated beneficial uses of contact recreation (REC-1)[24].

The federal Clean Water Act requires the establishment of Total Maximum Daily Loads (TMDLs) for pollutants that exceed water quality objectives needed to support designated beneficial uses, i.e., that cause or contribute to violation of state "water quality standards."

NUMERIC TARGETS

When calculating TMDLs, numeric targets are established to meet WQOs and subsequently ensure the protection of beneficial uses. The numeric targets for these TMDLs consist of the REC-1 WQOs for indicator bacteria contained in the Basin Plan. TMDLs were calculated for each impaired waterbody, for each indicator bacteria, for wet and dry weather. The numeric targets used in the TMDL calculations were equal to the WQOs for bacteria for REC-1.

Different dry weather and wet weather numeric targets were used for load calculations because the bacteria transport mechanisms to receiving waters are different under wet and dry weather conditions.

Single sample maximum WQOs were used as wet weather numeric targets. Dry weather numeric targets are typically best represented by geometric mean WQOs. However, due to extreme diurnal variations in bacteria densities that can result from tidal effects, in some cases the maximum hourly concentration could regularly exceed the single sample maximum WQOs. Therefore, both the REC-1 30-day geometric mean and single sample maximum WQOs were selected as numeric targets for dry weather. The numeric targets were equal to the total coliform, fecal coliform and *Enterococcus* WQOs for REC-1 in all cases.

The numeric targets for the scenarios described above are listed in the following tables:

[24] Water quality objectives for indicator bacteria in waters with non-water-contact recreation (REC-2) are less stringent than the water quality objectives for REC-1, therefore, attainment of REC-1 objectives through the implementation of TMDLs will, *a fortiori,* provide the requisite water quality for REC-2.

Table 7-24. Wet Weather Numeric Targets

Basis for Numeric Target	Total Coliform (MPN/100mL)	Fecal Coliform (MPN/100mL)	Enterococcus (MPN/100mL)
Beneficial Use	**REC-1**	**REC-1**	**REC-1**
Single sample maximum	10,000	400	104

Table 7-25. Dry Weather Numeric Targets

Basis for Numeric Target	Total Coliform (MPN/100mL)	Fecal Coliform (MPN/100mL)	Enterococcus (MPN/100mL)
Beneficial Use	**REC-1**	**REC-1**	**REC-1**
30-day geometric mean	1,000	200	35
Single sample maximum	10,000	400	104

SOURCE ANALYSIS

Sources of bacteria are the same under both wet weather and dry weather conditions. Bacteria can enter surface waters from both nonpoint and point sources. Nonpoint sources are typically diffuse sources that have multiple routes of entry into surface waters. Point sources typically discharge at a specific location from pipes, outfalls, and conveyance channels.

The only nonpoint sources identified to potentially affect the waterbodies addressed by these TMDLs were natural sources (e.g., direct inputs from birds, terrestrial and aquatic animals, wrack line and aquatic plants, sediments, or other unidentified or unquantified sources within the receiving waters), homeless encampments, or other background sources (e.g., "ambient" bacteria that may be influenced by illegal discharges from boats). Because the homeless encampments are illegal, these loads are not allowed and must be eliminated. Due to lack of data, bacteria loads from natural sources or other background sources could not be specifically identified or quantified for TMDL development. Until more information is obtained through further study to provide identification of the relative loading from each of these potential sources, they were combined into a single natural and background source for each shoreline segment.

The point sources identified to potentially affect the waterbodies addressed in this study were discharges from municipal separate storm sewer systems (MS4s) and illegal discharges from boats and/or wastewater collection systems and treatment plants. Because the Basin Plan includes waste discharge prohibitions specifically for the discharge of treated or untreated sewage from vessels to Dana Point Harbor and San Diego Bay and the unauthroized discharge of treated or untreated sewage to waters of the state, illegal discharges from boats and wastewater collection systems and treatment plants are not allowed must be eliminated. The watersheds that drain into the receiving waters at the impaired shoreline segments are wholly located within urbanized areas. Therefore, the only allowable point source identified was urban runoff discharged from MS4s, although other point sources may exist.

For both wet weather and dry weather conditions, there are natural and background sources of bacteria within the receiving waters at the impaired shoreline segments. However, for sources of bacteria that originate from the watersheds draining into the receiving waters, the method of transport for the two conditions is very different. Wet weather loading originating from the watersheds is dominated by episodic storm flows that wash off bacteria that build up on the surface of all land use types in the watershed during dry periods. Dry weather loading originating from the watersheds is dominated by nuisance flows from urban land use activities such as car washing, sidewalk washing, and lawn over-irrigation, which pick up bacteria and deposit it into receiving waters.

TOTAL MAXIMUM DAILY LOADS AND ALLOCATIONS

The TMDLs are equal to the assimilative or loading capacity of each shoreline segment for each pollutant. TMDLs for each type of indicator bacteria were developed for each impaired waterbody. TMDLs are defined as the maximum amount of a pollutant the waterbody can receive and still attain water quality objectives and protection of designated beneficial uses. Once calculated, a TMDL is set equal to the sum of all individual Waste Load Allocations (WLAs) for point sources and Load Allocations (LAs) for nonpoint sources. The TMDL includes a margin of safety (MOS) that takes into account any uncertainties in the TMDL calculation, which may be explicit or implicit. For these TMDLs, an implicit margin of safety is included via conservative estimates and assumptions used throughout the TMDL calculations. Separate TMDLs were calculated for wet weather and dry weather conditions to account for seasonal variations, and because the transport mechanism, flow, and bacteria loads from the watersheds draining to the receiving waters are different between dry and wet weather conditions.

Calibrated models were used to simulate flow and bacteria densities from the watersheds draining into the receiving waters and within the receiving waters of the shoreline segments. The models were used to calculate the existing bacteria loads, as well as TMDLs for each impaired shoreline segment. The modeled existing loads were compared to the TMDLs to calculate the necessary load reductions needed to achieve the TMDLs in the waterbodies. The TMDLs were allocated among point sources (WLAs) and nonpoint sources (LAs). The only allowable point source identified was urban runoff discharged from MS4s, which was assigned a WLA for each watershed. The only allowable nonpoint sources identified were natural or background sources, such as direct inputs from birds, terrestrial and aquatic animals, wrack line and aquatic plants, sediments, or other unidentified and unquantified sources within the receiving waters, which were lumped together and assigned a LA. Because only the point sources are considered controllable, a load reduction was only calculated for the bacteria loads from the MS4s. Bacteria loads from sources of illegal discharges were assigned WLAs and LAs of zero. The TMDLs, LAs for natural and background sources, WLAs for municipal MS4s, and load reductions for municipal MS4s are shown below in Tables 7-26 through 7-31.

MARGIN OF SAFETY

There are two ways to incorporate the MOS (USEPA, 1991): (1) implicitly incorporate the MOS using conservative model assumptions to develop allocations; and/or, (2) explicitly specify a portion of the total TMDL as the MOS and use the remainder for allocations. Throughout the TMDL development process, conservative assumptions were employed. Based on the incorporation of all these conservative assumptions, no explicit MOS was necessary.

Table 7-26. REC-1 Wet Weather TMDLs for Total Coliform for Baby Beach and Shelter Island Shoreline Park Shoreline Segments

Waterbody	Shoreline Segment/Area	Hydrologic Descriptor	Model Sub-watershed	TMDL (Billion MPN/ 30 days)	Load Allocations (LAs)	Wasteload Allocations (WLAs)	Existing Wasteloads	Percent Reduction of Municipal MS4 Existing Wasteload[2]
					Natural/Background (Billion MPN/ 30 days)[1]	Municipal MS4 (Billion MPN/ 30 days)	Municipal MS4 (Billion MPN/ 30 days)	
Dana Point Harbor	Baby Beach	Dana Point HSA (901.14)	2101,2102 2103,2104	166,111	162,857	3,254	3,254	0%
San Diego Bay	Shelter Island Shoreline Park	Point Loma HA (908.10)	2201	482,598	482,400	198	198	0%

Abbreviations/Acronyms:
TMDL: total maximum daily load
LA: load allocation for nonpoint source
WLA: wasteload allocation for point source
MS4: Municipal Separate Storm Sewer System
MPN: most probable number

Notes:
[1] Calculated by dry weather EFDC model analysis (Dry weather LA from Table 7-29 multiplied by 30 days). No reduction required for natural/background sources.
[2] Percent Reduction of Existing Municipal MS4 Wasteload = (Existing Municipal MS4 Wasteload – Municipal MS4 WLA) ÷ (Existing Municipal MS4 Wasteload) x 100%

Table7-27. REC-1 Wet Weather TMDLs for Fecal Coliform for Baby Beach and Shelter Island Shoreline Park Shoreline Segments

Waterbody	Shoreline Segment/Area	Hydrologic Descriptor	Model Sub-watershed	TMDL (Billion MPN/ 30 days)	Load Allocations (LAs)	Wasteload Allocations (WLAs)	Existing Wasteloads	Percent Reduction of Municipal MS4 Existing Wasteload[2]
					Natural/Background (Billion MPN/ 30 days)[1]	Municipal MS4 (Billion MPN/ 30 days)	Municipal MS4 (Billion MPN/ 30 days)	
Dana Point Harbor	Baby Beach	Dana Point HSA (901.14)	2101,2102 2103,2104	32,585	32,473	112	112	0%
San Diego Bay	Shelter Island Shoreline Park	Point Loma HA (908.10)	2201	41,408	41,400	8	8	0%

Abbreviations/Acronyms:
TMDL: total maximum daily load
LA: load allocation for nonpoint source
WLA: wasteload allocation for point source
MS4: Municipal Separate Storm Sewer System
MPN: most probable number

Notes:
[1] Calculated by dry weather EFDC model analysis (Dry weather LA from Table 7-30 multiplied by 30 days). No reduction required for natural/background sources.
[2] Percent Reduction of Existing Municipal MS4 Wasteload = (Existing Municipal MS4 Wasteload – Municipal MS4 WLA) ÷ (Existing Municipal MS4 Wasteload) x 100%

Table7-28. REC-1 Wet Weather TMDLs for *Enterococcus* for Baby Beach and Shelter Island Shoreline Park Shoreline Segments

Waterbody	Shoreline Segment/Area	Hydrologic Descriptor	Model Sub-watershed	TMDL (Billion MPN/ 30 days)	Load Allocations (LAs)	Wasteload Allocations (WLAs)	Existing Wasteloads	Percent Reduction of Municipal MS4 Existing Wasteload[2]
					Natural/Background (Billion MPN/ 30 days)[1]	Municipal MS4 (Billion MPN/ 30 days)	Municipal MS4 (Billion MPN/ 30 days)	
Dana Point Harbor	Baby Beach	Dana Point HSA (901.14)	2101,2102 2103,2104	5,730	5,616	114	301	62.2%
San Diego Bay	Shelter Island Shoreline Park	Point Loma HA (908.10)	2201	10,556	10,530	26	26	0%

Abbreviations/Acronyms:
TMDL: total maximum daily load
LA: load allocation for nonpoint source
WLA: wasteload allocation for point source
MS4: Municipal Separate Storm Sewer System
MPN: most probable number

Notes:
[1] Calculated by dry weather EFDC model analysis (Dry weather LA from Table 7-31 multiplied by 30 days). No reduction required for natural/background sources.
[2] Percent Reduction of Existing Municipal MS4 Wasteload = (Existing Municipal MS4 Wasteload – Municipal MS4 WLA) ÷ (Existing Municipal MS4 Wasteload) x 100%

Table7-29. REC-1 Dry Weather TMDLs for Total Coliform for Baby Beach and Shelter Island Shoreline Park Shoreline Segments

Waterbody	Shoreline Segment/Area	Hydrologic Descriptor	Model Sub-watershed	TMDL (Billion MPN/ day)	Load Allocations (LAs)	Wasteload Allocations (WLAs)	Existing Wasteloads	Percent Reduction of Municipal MS4 Existing Wasteload[2]
					Natural/Background (Billion MPN/ day)[1]	Municipal MS4 (Billion MPN/ day)	Municipal MS4 (Billion MPN/ day)	
Dana Point Harbor	Baby Beach	Dana Point HSA (901.14)	2101,2102 2103,2104	5,430	5,429	0.86	9.0	90.4%
San Diego Bay	Shelter Island Shoreline Park	Point Loma HA (908.10)	2201	16,080	16,080	0	0	0%

Abbreviations/Acronyms:
TMDL: total maximum daily load
LA: load allocation for nonpoint source
WLA: wasteload allocation for point source
MS4: Municipal Separate Storm Sewer System
MPN: most probable number

Notes:
[1] Calculated by dry weather EFDC model analysis. No reduction required for natural/background sources.
[2] Percent Reduction of Existing Municipal MS4 Wasteload = (Existing Municipal MS4 Wasteload – Municipal MS4 WLA) ÷ (Existing Municipal MS4 Wasteload) x 100%

Table7-30. REC-1 Dry Weather TMDLs for Fecal Coliform for Baby Beach and Shelter Island Shoreline Park Shoreline Segments

Waterbody	Shoreline Segment/Area	Hydrologic Descriptor	Model Sub-watershed	TMDL (Billion MPN/ day)	Load Allocations (LAs)	Wasteload Allocations (WLAs)	Existing Wasteloads	Percent Reduction of Municipal MS4 Existing Wasteload[2]
					Natural/Background (Billion MPN/ day)[1]	Municipal MS4 (Billion MPN/ day)	Municipal MS4 (Billion MPN/ day)	
Dana Point Harbor	Baby Beach	Dana Point HSA (901.14)	2101,2102 2103,2104	1,083	1,082	0.17	1.0	82.7%
San Diego Bay	Shelter Island Shoreline Park	Point Loma HA (908.10)	2201	1,380	1,380	0	0	0%

Abbreviations/Acronyms:
TMDL: total maximum daily load
LA: load allocation for nonpoint source
WLA: wasteload allocation for point source
MS4: Municipal Separate Storm Sewer System
MPN: most probable number

Notes:
[1] Calculated by dry weather EFDC model analysis. No reduction required for natural/background sources.
[2] Percent Reduction of Existing Municipal MS4 Wasteload = (Existing Municipal MS4 Wasteload – Municipal MS4 WLA) ÷ (Existing Municipal MS4 Wasteload) x 100%

Table7-31. REC-1 Dry Weather TMDLs for *Enterococcus* for Baby Beach and Shelter Island Shoreline Park Shoreline Segments

Waterbody	Shoreline Segment/Area	Hydrologic Descriptor	Model Sub-watershed	TMDL (Billion MPN/ day)	Load Allocations (LAs)	Wasteload Allocations (WLAs)	Existing Wasteloads	Percent Reduction of Municipal MS4 Existing Wasteload[2]
					Natural/Background (Billion MPN/ day)[1]	Municipal MS4 (Billion MPN/ day)	Municipal MS4 (Billion MPN/ day)	
Dana Point Harbor	Baby Beach	Dana Point HSA (901.14)	2101,2102 2103,2104	187	187	0.03	0.8	96.2%
San Diego Bay	Shelter Island Shoreline Park	Point Loma HA (908.10)	2201	351	351	0	0	0%

Abbreviations/Acronyms:
TMDL: total maximum daily load
LA: load allocation for nonpoint source
WLA: wasteload allocation for point source
MS4: Municipal Separate Storm Sewer System
MPN: most probable number

Notes:
[1] Calculated by dry weather EFDC model analysis. No reduction required for natural/background sources.
[2] Percent Reduction of Existing Municipal MS4 Wasteload = (Existing Municipal MS4 Wasteload – Municipal MS4 WLA) ÷ (Existing Municipal MS4 Wasteload) x 100%

TMDL IMPLEMENTATION PLAN

By design, waste load allocations and load allocations are established at levels that when met, will result in the full attainment of water quality standards. For this reason, the San Diego Water Board expects that at the end of the TMDL compliance period, applicable load and waste load allocations, as well as the water quality objectives will be met at all times in the receiving water. In the event that water quality objectives are not met at the end of the compliance period, the Board will require the dischargers to conduct an investigation to identify the specific source(s) responsible for the failure to meet water quality objectives. If the source is found to be anthropogenic, the San Diego Water Board will initiate enforcement or other regulatory action as appropriate to correct the problem. If the source is natural, and if all of the conditions for using the natural sources exclusion approach (NSEA) have been met, the Board will consider the application of the NSEA, including the recalculation of the TMDLs to account for the natural sources. The necessary actions to implement the TMDLs are described in section 10 of the Technical Report entitled *Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay*, dated June 11, 2008, and listed below.

(A) Specific Implementation Objectives

Since 2002, the dischargers have implemented several non-structural best management practice (BMP) programs and structural BMPs that have resulted in noticeable improvements in water quality at the impaired shoreline segments. The County of Orange has already conducted numerous studies and implemented a variety of non-structural and structural BMPs in an effort to reduce bacteria levels at Baby Beach since before 2002. These efforts have included installing seasonal plugs in storm drains, increased street sweeping efforts, expedited trash collection to control birds, the installation of bird netting under the pier, public education efforts against bird-feeding at the beach, artificial circulation of water at Baby Beach, a dry weather flow diversion structure and media filter system on the west end of the beach, catch basin filters, and the collection and disposal of bird fecal droppings from the exposed intertidal areas of the beach. The San Diego Unified Port District has also implemented several non-structural BMP programs since 2002. Water quality data from 2002 to 2006 indicate that bacteria levels in the waters at Baby Beach and Shelter Island Shoreline Park have shown significant improvements in water quality since 2002.

As shown in Tables 7-26 through 7-31, the modeling results indicate that no load reductions are required for total coliform, fecal coliform, and *Entercoccus* indicator bacteria for Shelter Island Shoreline Park during wet weather or dry weather conditions. Additionally, the modeling results indicate only *Entercoccus* indicator bacteria wet weather load reductions are required for Baby Beach and no wet weather load reductions are required for total coliform and fecal coliform indicator bacteria. For dry weather, Baby Beach requires between approximately 83 percent and 96 percent wasteload reductions for total coliform, fecal coliform, and *Entercoccus* indicator bacteria. However, based only on the water quality data collected during 2006, the number of samples that exceed the REC-1 water quality objectives are less than the allowable number of exceedances for recommending removal from the 303(d) List. This trend implies that the past and current BMPs that have been implemented are effective in reducing bacteria loads to the receiving waters and that water quality in the impaired shoreline segments already meet REC-1 water quality objectives during dry weather. However, additional monitoring is required to confirm this trend, and additional BMPs may be needed to meet the REC-1 water quality objectives during wet weather.

While the Bacteria Load Reduction Plans (BLRPs), as described below, will still be required from the dischargers, if current trends continue, monitoring and permanent implementation of the current programs and BMPs may be adequate for meeting the wet weather and dry weather TMDLs. If the REC-1 water quality objectives cannot be met in the receiving waters by the end of the compliance schedules, and if natural and background sources appear to be the sole source of continued impairment, application of the natural sources exclusion approach (NSEA) to revise the TMDLs, as described below, may be appropriate.[25]

[25] After adoption of a Basin Plan amendment authorizing the use of the Natural Sources Exclusion Approach by the San Diego Water Board and approval by the Office of Administrative Law.

Therefore, if the water quality data support delisting before the NPDES requirement revisions are considered, specific objectives of this Implementation Plan are as follows:

1. Persons responsible for monitoring the impaired shoreline segments of Baby Beach and Shelter Island Shoreline Park for bacteria will continue with the monitoring program to ensure REC-1 water quality objectives are maintained.

2. If REC-1 water quality objectives are exceeded, actions outlined in Attachment B of Order Nos. R9-2007-0001 and R9-2002-0001 in section II.C, Coastal Storm Drain Outfall Monitoring, and any subsequent amendment or renewal, will be implemented.

3. If sources of bacteria persist at levels that exceed water quality standards, then the persons responsible will take appropriate actions to identify and eliminate the controllable source or sources of the chronic contamination. If natural and background sources appear to be the sole source of the impairment, application of the NSEA to revise the TMDLs may be appropriate.

If the impaired shoreline segments of BB and SISP remain on or are put back on the List during subsequent iterations of the 303(d) listing process due to impacts from controllable sources of bacteria, the San Diego Water Board will revise the current NPDES requirements and/or issue additional waste discharge requirements to be consistent with these TMDLs.

(B) San Diego Water Board Actions

The San Diego Water Board regulates discharges of waste by issuing waste discharge prohibitions, waste discharge requirements, or conditional waivers of waste discharge requirements. Violation of a waste discharge prohibition, waste discharge requirement, or waiver condition is subject to enforcement actions. This section describes the actions that the San Diego Water Board will take to implement the TMDLs.

(1) Process and Schedule for Issuing NPDES Requirements

The TMDLs will be implemented primarily by reissuing or revising the existing NPDES waste discharge requirements for MS4 discharges to include water quality based effluent limitations (WQBELs) that are consistent with the assumptions and requirements of the bacteria WLAs for MS4 discharges, though there may be other or new point sources.

NPDES requirements should be issued, reissued, or revised "as expeditiously as practicable" to incorporate WQBELs derived from the TMDL WLAs. "As expeditiously as practicable" means the following:

1. **New point sources.** "New" point sources previously unregulated by NPDES requirements must obtain their NPDES requirements before they can lawfully discharge pollutants. For point sources receiving NPDES requirements for the first time, "as expeditiously as practicable" means that the San Diego Water Board incorporates WQBELs that are consistent with the assumptions and requirements of the WLAs into the NPDES requirements and requires compliance with the WQBELs upon the commencement of the discharge.

2. **Point Sources Currently Regulated Under NPDES Requirements.** For point sources currently regulated under NPDES requirements, "as expeditiously as practicable" means that:

    a. WQBELs that are consistent with the assumptions and requirements of the WLAs should be incorporated into NPDES requirements during their 5-year term, prior to expiration, in accordance with the applicable NPDES requirement reopening provisions, taking into account factors such as available NPDES resources, staff and budget constraints, and other competing priorities.

b. In the event the NPDES requirement revisions cannot be considered during the 5-year term, the San Diego Water Board will incorporate WQBELs that are consistent with the assumptions and requirements of the WLAs into the NPDES requirements at the end of the 5-year term.

(2) Actions with Respect to Phase I Municipal Dischargers

The Phase I Municipal Dischargers in San Diego and Orange County are required under Receiving Water Limitations A.3.a.1 and C.2[26] of Orders No. R9-2007-0001 and R9-2002-0001, respectively (San Diego County and Orange County MS4 NPDES requirements), and any subsequent amendment or renewal, to implement additional BMPs to reduce bacteria discharges in impaired watersheds to the maximum extent practicable and to restore compliance with the bacteria water quality objectives. This obligation is triggered when either the discharger or the San Diego Water Board determines that MS4 discharges are causing or contributing to an exceedance of an applicable water quality objective, in this case the REC-1 indicator bacteria water quality objectives. Designation of the shoreline segments in San Diego Bay and Dana Point Harbor as water quality limited segments under Clean Water Act section 303(d) and the TMDL analysis provided sufficient evidence that that MS4 discharges may be causing or contributing to the violation of water quality standards. Thus, the Municipal Dischargers should be, and have been implementing the provisions of Receiving Water Limitation C.2 with respect to bacteria discharges into water quality limited segments.

In addition to enforcing the provisions of Receiving Water Limitation C.2, the San Diego Water Board shall reissue or revise Orders No. R9-2007-0001 and R9-2002-0001, to incorporate WQBELs consistent with the assumptions and requirements of the bacteria WLAs, and requirements for monitoring and reporting. In those orders, the Phase I Municipal Dischargers are referred to as "Copermittees."[27] WQBELs and other requirements implementing the TMDLs can be incorporated into these NPDES requirements upon the normal renewal cycle or sooner, if appropriate. The requirements implementing the TMDLs shall include the following:

a. WQBELs consistent with the requirements and assumptions of the bacteria WLAs described in Tables 7-26 through 7-31 and a schedule of compliance applicable to the MS4 discharges into the impaired shoreline segments described in Tables 7-32 through 7-34. At a minimum, WQBELs shall include a BMP program to attain the WLAs.

b. If the WQBELs consist of BMP programs, then the reporting requirements shall consist of annual progress reports on BMP planning, implementation, and effectiveness in attaining the WQOs in impaired shoreline segments, and annual water quality monitoring reports. The first progress report shall consist of a Bacteria Load Reduction Plan (BLRP), which may be included as part of the annual NPDES reporting requirements. BLRPs must be specific to each impaired waterbody.

   To provide guidance to the dischargers in preparing BLRPs, the following bullets describe components that should be considered for incorporation in the BLRPs.

[26] Receiving Water Limitations A.3.a.1 and C.2.a provide that "[u]pon a determination by either the Copermittee or the San Diego Water Board that MS4 discharges are causing or contributing to an exceedance of an applicable water quality standard, the Copermittee shall promptly notify and thereafter submit a report to the San Diego Water Board that describes BMPs that are currently being implemented and additional BMPs that will be implemented to prevent or reduce any pollutants that are causing or contributing to the exceedance of water quality standards. The report may be incorporated in the annual update to the Jurisdictional URMP unless the San Diego Water Board directs an earlier submittal. The report shall include an implementation schedule. The San Diego Water Board may require modification to the report." Additional requirements are included in sections C.2.b-d.

[27] Copermittees own or operate MS4s through which urban runoff discharges into waters of the U.S. within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the United States.

Comprehensive Watershed Approach

- Dischargers should identify the Lead Watershed Contact for their BLRPs. The Lead Watershed Contact should serve as liaison between all other common watershed dischargers and the San Diego Water Board, where appropriate.

- Dischargers should describe a program for encouraging collaborative, watershed-based, land-use planning in their jurisdictional plans.

- Dischargers should develop and periodically update a map of the BLRP watershed, to facilitate planning, assessment, and collaborative decision-making. As appropriate, the map should include features such as receiving waters; Clean Water Act section 303(d) impaired receiving waters; water quality projects; land uses; MS4s; major highways; jurisdictional boundaries; and inventoried commercial, industrial, and municipal sites.

- Dischargers should annually assess the water quality of the impaired water body in their BLRPs in order to identify all water quality problems within the impaired water body. This assessment should use applicable water quality data, reports, and analysis generated in accordance with the requirements of the applicable NPDES MS4 monitoring and reporting programs, as well as applicable information available from other public and private organizations.

- Dischargers should develop and implement a collective watershed BLRP strategy to meet the bacteria TMDL. The strategy should guide dischargers in developing a Bacteria Compliance Schedule (BCS) which includes BMP planning and scheduling as outlined below.

- Dischargers should collaborate to develop and implement the BLRPs. The BLRP should include a proposal for regularly scheduled meetings among the dischargers in the impaired watershed.

- Because water quality data will ultimately determine if a waterbody will be delisted from the 303(d) List, the BLRP should include a monitoring and reporting program that contains the following elements:
  - Locations of water quality sampling sites that are spatially representative of the waterbody and appropriate for identifying potential sources, including, at a minimum, the monitoring stations currently used to monitor water quality.
  - Schedule of water quality sampling that is temporally representative of both wet weather and dry weather conditions. Wet weather samples are collected during storms of 0.2 inches of rainfall and the 72 hour period after the storm. Dry weather samples are collected from during times when rain has not fallen for the preceding 72 hours.
  - Presentation of past and present water quality data that have been collected.
  - Analysis of water quality data compared to the applicable Basin Plan water quality objectives. Dry weather water quality data are compared to long-term (e.g., geometric mean, mean, or median) water quality objectives, as well as short-term (e.g., single sample maximum) water quality objectives. Wet weather water quality data are compared to short-term (e.g., single sample maximum) water quality objectives.
  - Analysis of water quality data to correlate noticeable improvements in water quality with past and current BMPs that have been implemented and are effective.
  - Analysis of water quality data to correlate elevated bacteria levels with known or suspected sewage spills from wastewater collection systems and treatment plants or boats.
  - Recommendations for increased or decreased water quality sampling based on water quality data analyses.

- Each BLRP and BCS should be reviewed annually to identify needed modifications and improvements. The dischargers should develop and implement a plan and schedule, included in the BCS, to address the identified modifications and improvements. All updates to the BLRP should be documented in the BLRP, and submitted to the San Diego Water Board. Individual

dischargers should also review and modify their jurisdictional ordinances and activities as necessary so that they are consistent with the requirements of the BLRP.

Bacteria Compliance Schedule - BMP Planning and Scheduling

The BCS should identify the BMPs/water quality projects that have been implemented or are planned for implementation and provide an implementation schedule for each BMP/water quality project. The BCS should demonstrate how the BMPs/water quality projects will address all the bacteria TMDLs. The BCS, at a minimum, should include scheduling for the following:

Non-structural BMP phasing:

- Completed Non-Structural BMP Analysis – Information should be provided regarding the non-structural BMPs completed and/or currently in practice, a timeline of BMP implementation and maintenance, and an assessment of effectiveness.

If the Completed Non-Structural BMP Analysis indicates additional non-structural BMPs are necessary, the following should be included in the BCS:

- New Non-Structural BMP Analysis - Watershed data should be analyzed to identify new effective non-structural BMPs for implementation. This should be completed and included in the BCS.

- Scheduled Annual Non-structural BMP Implementation - The above analysis should be used to identify BMPs that have and will be implemented and to develop an aggressive non-structural BMP implementation schedule. The BCS should include a schedule of the current BMP staffing for each impaired area, and provide a discussion on adjustments to staff scheduling to meet possible new non-structural BMP demands. Schedules should be realistic and justifiable.

- Scheduled Annual BMP Assessment and Optimizing Adjustments - As the non-structural BMPs are implemented, a scheduled in-depth assessment of the non-structural BMPs' performance should follow. Non-structural BMPs that are found to be ineffective should be modified to incorporate optimizing adjustments to improve performance or be replaced by other effective non-structural BMPs. The results from this assessment should also be used to determine structural BMP selection and the schedule for structural BMP implementation. The BCS should include an annual schedule for in-depth non-structural BMP assessment and optimizing adjustments.

- Scheduled Continuous Budget and Funding Efforts- Securing budget and funding for non-structural BMP staffing and equipment should be scheduled early and continue until the bacteria TMDLs are met. The BCS should include a schedule for staff time, including position and job description, authorized for securing budget and funding for non-structural BMP implementation.

Structural BMP phasing:

- Completed Structural BMP Analysis – Information should be provided regarding the structural BMPs completed and/or currently in practice, a timeline of BMP implementation and maintenance, and an assessment of effectiveness.

If the Completed Structural BMP Analysis indicates additional structural BMPs are necessary, the following should be included in the BCS:

- Scheduled New Structural BMP Analysis– Structural BMP analysis should utilize all available information, including the non-structural BMP assessment and existing structural BMP assessment, to identify, locate, design and build possible new structural BMPs, or a train of

BMPs, to meet the these bacteria TMDLs. The BCS should include a schedule for structural BMP analysis.

- Scheduled Annual BMP Construction - The BCS should include a projected general construction schedule with a realistic and justifiable timeline for possible new BMP construction.

- Scheduled Annual BMP Assessment, Optimization Adjustments, and Maintenance - Assessment for structural BMPs should begin immediately upon initial BMP completion, followed by continuously scheduled BMP assessment, optimization adjustments, and maintenance, to both the individual structural BMPs and the structural BMP program as a whole. The BCS should include an annual schedule for in-depth structural BMP assessment.

- Scheduled Continuous Budget and Funding Effort - Securing budget and funding for structural BMPs and additional maintenance staff should be scheduled early and continue until the bacteria TMDLs are met. The BCS should include a schedule for staff time, including position and job description, authorized for securing budget and funding for structural BMP implementation.

Subsequent reports should assess and describe the effectiveness of implementing the Bacteria Load Reduction Plan. Effectiveness assessments should be based on a program effectiveness assessment framework, such as the one developed by the California Stormwater Quality Association (CASQA, 2005). Using the CASQA framework as an example, the assessments should address the framework's outcome levels 1-5 on an annual basis, and outcome level 6 once every five years.[28] Methods used for assessing effectiveness should include the following or their equivalent: surveys, pollutant loading estimations, and receiving water quality monitoring. The long-term strategy should also discuss the role of monitoring data in substantiating or refining the assessment. Once water quality objectives have been attained, or the anthropogenic sources have been eliminated and pollutant loads can be attributed to only natural and background sources, a reduced level of monitoring may be appropriate.

In addition to these requirements, if load-based numerical WQBELs are included in the NPDES requirements, the monitoring requirements should include flow and bacteria density measurements to determine if bacteria loads in effluent are in compliance with WQBELs.

The BLRPs are the municipal dischargers' opportunity to propose methods for assessing compliance with WQBELs that implement TMDLs. The monitoring components included in the BLRPs should be formulated according to particular compliance assessment strategies. The monitoring components are expected to be consistent with, and support whichever compliance assessment methods are proposed. The San Diego Water Board will coordinate with the municipal dischargers during the development of their proposed monitoring components and associated compliance assessment methods.

If NPDES requirements are not likely to be issued, reissued or revised within 6 months of Office of Administrative Law approval of these TMDLs, the San Diego Water Board may issue an investigative/monitoring order to dischargers pursuant to sections 13267 or 13383 of the Water Code. This order would require assessment of current BMPs, possible planning for additional BMPs, and receiving water quality monitoring in adherence to performance measures described above.

The BLRPs may be re-evaluated at set intervals (such as 5-year renewal cycles for NPDES requirements, or upon request from named dischargers, as appropriate and in accordance with the San Diego Water Board priorities). Plans may be iterative and adaptive according to assessments and any special studies.

[28] Outcome level 1 assesses compliance with activity-based permit requirements. Outcome level 2 assesses changes in attitudes, knowledge, and awareness. Outcome level 3 assesses behavioral change and BMP implementation. Outcome level 4 assesses pollutant load reductions. Outcome level 5 assesses changes in urban runoff and discharge water quality. Outcome level 6 assesses changes in receiving water quality. See CASQA "An Introduction to Stormwater Program Effectiveness Assessment."

(3) Actions with Respect to Wastewater Collection Systems and Treatment Plants

The San Diego Water Board will conduct surveillance of and enforce the provisions of State Water Board Order No. 2006-0003-DWQ, and San Diego Water Board Order No. R9-2007-0005 as needed to ensure that collection systems for wastewater treatment plants do not overflow, leak, or otherwise discharge into MS4s or surface waters. If necessary, San Diego Water Board Order No. R9-2007-0005 can be revised to require more aggressive collection system monitoring, maintenance, and repair schedules.

(4) Actions with Respect to Marinas and Boats

If discharges from boats are shown to be a significant source of bacteria contributing to exceedances of water quality objectives, the San Diego Water Board will enforce the waste discharge prohibitions in the Basin Plan to ensure that illegal discharges from boats to surface waters do not occur. This may require issuing enforcement actions, such as Cease and Desist Orders, or issuing NPDES requirements or waste discharge requirements to the marina and harbor operators and/or the muncipalities requiring implementation of BMPs (e.g., public education and outreach, enforcing ordinances, and/or requiring dye tabs in boat sewage holding tanks) to eliminate illegal discharges of sewage, in addition to water quality monitoring and reporting.

(5) Additional Actions

Take Enforcement Actions

The San Diego Water Board shall consider enforcement actions,[29] as necessary and appropriate, against any discharger failing to comply with applicable waste discharge requirements or discharge prohibitions. Enforcement actions may be taken, as necessary and appropriate, to control the discharge of bacteria to impaired shorelines to attain compliance with the bacteria WLAs specified in Tables 7-26 through 7-31, or to attain compliance with the applicable water quality objectives.

Recommend High Priority for Grant Funds

The San Diego Water Board shall recommend that the State Water Board assign a high priority to awarding grant funding[30] for projects to implement the bacteria TMDLs. Special emphasis will be given to projects that can achieve quantifiable bacteria load reductions consistent with the specific bacteria TMDL WLAs and LAs.

Apply the Natural Sources Exclusion Approach[31]

Under the Natural Sources Exclusion Approach (NSEA), all anthropogenic sources of indicator bacteria to the water bodies subject to an indicator bacteria TMDL must be controlled. Dischargers must also demonstrate that all anthropogenic sources of indicator bacteria to the target water body are controlled and that residual indicator bacteria densities do not indicate a health risk.

Once control of all anthropogenic sources and demonstration of appropriate health risk levels have been achieved, the residual indicator bacteria loads in the waterbodies attributable to uncontrollable sources can be identified and measured. Likewise, the frequency that uncontrollable sources cause

[29] An enforcement action is any formal or informal action taken to address an incidence of actual or threatened noncompliance with existing regulations or provisions designed to protect water quality. Potential enforcement actions including notices of violation (NOVs), notices to comply (NTCs), imposition of time schedules (TSO), issuance of cease and desist orders (CDOs) and cleanup and abatement orders (CAOs), administrative civil liability (ACL), and referral to the attorney general (AG) or district attorney (DA). The San Diego Water Board generally implements enforcement through an escalating series of actions to: (1) assist cooperative dischargers in achieving compliance; (2) compel compliance for repeat violations and recalcitrant violators; and (3) provide a disincentive for noncompliance.

[30] In most cases, the State Water Board administers the awarding of grants funded from Proposition 13, Proposition 50, Clean Water Act section 319(h) and other federal appropriations to projects that can result in measurable improvements in water quality, watershed condition, and/or capacity for effective watershed management. Many of these grant fund programs have specific set-asides for expenditures in the areas of watershed management and TMDL project implementation for non-point source pollution.

[31] After adoption of a Basin Plan amendment authorizing the use of the Natural Sources Exclusion Approach by the San Diego Water Board and approval by the Office of Administrative Law.

exceedances of indicator bacteria water quality objectives in the water body can be identified. The information can be used to establish an allowable indicator bacteria WQO exceedance frequency in the impaired water body based upon the residual exceedance frequency observed. This information can then be used to recalculate the TMDLs, WLAs, and LAs.

The use of the NSEA is contingent upon demonstration of control of all anthropogenic sources of indicator bacteria to the waterbodies subject to an indicator bacteria TMDL. Since this task is likely to be formidable, use of the NSEA is not expected to occur immediately. Rather, the NSEA would be used to recalculate TMDLs at some point after their initial adoption, following demonstration of control of all anthropogenic sources.

The dischargers are responsible for collecting and providing the data to support the application of the NSEA. If the data support the application of the NSEA, the San Diego Water Board will recalculate the TMDLs, WLAs, and LAs to allow for the exceedances of the REC-1 indicator bacteria WQOs due to uncontrollable sources.

(C) Coordination and Execution of Special Studies

The San Diego Water Board recognizes that coordination and execution of special studies by dischargers and other interested persons could result in improved TMDL analyses that more accurately protect beneficial uses. Areas of study that could benefit TMDL analysis include collection of data that can be used to improve model output, improved understanding of bacteria levels and the relationship to health effects, and identification of an appropriate and affordable method(s) to measure pathogens directly. Additionally, studies designed to measure BMP effectiveness and bacteria source identification will be useful for dischargers in identifying appropriate strategies to meet the requirements of this TMDL.

(1) Collect Data Useful for Model Improvement

Calibration and validation of the computer models used for TMDL analysis was based on limited data (water quality and/or flow) and assumed values for input parameters such as rates for bacteria die-off and re-growth. Limited data are available related to fecal bacteria that can be attributed to natural and background sources (e.g., waterfowl, terrestrial and aquatic wildlife, wrack line and aquatic plants, sediments, and other unidentified and unquantified sources within the waters). Studies designed to collect additional data that can be used for model improvement will result in more detailed TMDL results and allocations. Also, actual flow and loading data from each watershed and expanded receiving water data can be used to construct models that can more accurately reflect site-specific conditions.

(2) Improve Understanding Between Bacteria Levels and Health Effects

The San Diego Water Board recognizes that there are potential problems associated with using indicator bacteria WQOs to indicate the presence of human pathogens in receiving waters free of sewage discharges. The indicator bacteria WQOs were developed, in part, based on epidemiological studies in waters with sewage inputs. The risk of contracting a water-born illness from contact with urban runoff devoid of sewage, or human-source bacteria is not known. Some pathogens, such as *giardia* and *cryptosporidium* can be contracted from animal hosts. Likewise, domestic animals can pass on human pathogens through their feces. These and other uncertainties need to be addressed through special studies and, as a result, revisions to the TMDLs may be appropriate.

As information is gathered, initiating special studies to understand the uncertainties between bacteria levels and bacteria sources within the watersheds may be useful. Specifically, continuing research may be helpful to answer the following questions:

- What is the risk of illness from swimming in water contaminated with urban/stormwater runoff devoid of sewage?

- Do exceedances of the bacteria water quality objectives from animal sources (wildlife and domestic) increase the risk of illness?
- Are there other, more appropriate surrogates for measuring the risk of illness than the indicator bacteria WQOs currently used?

Addressing these uncertainties is needed to maximize effectiveness of strategies to reduce the risk of illness, which is currently measured by indicator bacteria densities. Dischargers may work with the San Diego Water Board to determine if such special studies are appropriate.

(3) Identification of Method for Direct Pathogen Measurement

Ultimately, the San Diego Water Board supports the idea of measuring pathogens (the agents causing impairment of beneficial uses) or an acceptable alternative indicator, rather than indicator bacteria (surrogates for pathogens). However, as stated previously, indicator bacteria have been used to measure water quality historically because measurement of pathogens is both difficult and costly. The San Diego Water Board is supportive of any efforts by the scientific community to perform epidemiological studies and/or investigate the feasibility of measuring pathogens directly. The San Diego Water Board further supports subsequent modification of WQOs as a result of such studies. Ultimately, TMDLs will be recalculated if WQOs are modified due to results from future studies.

(D) Compliance Schedule

Baby Beach Compliance Schedule

According to Tables 7-26 and 7-27, no wet weather wasteload reductions are required for total and fecal coliform indicator bacteria. This means that according to the wet weather models for Baby Beach, REC-1 water quality objectives for total and fecal coliform indicator bacteria are not expected to be exceeded due to discharges from the MS4s. The only wet weather wasteload reductions required for MS4s discharging into the receiving waters along the shoreline at Baby Beach is for *Enterococcus* indicator bacteria. The compliance schedule for Baby Beach to achieve wet weather TMDLs is as shown in Table 7-32.

Table7-32. Compliance Schedule for Baby Beach to Achieve Wet Weather TMDLs

Year (after OAL Approval)	Required Wasteload Reduction	TMDL Compliance Action
1	No reduction required	▪ Water Quality Monitoring ▪ Implement BMPs
2	Same as above	▪ Water Quality Monitoring ▪ Implement BMPs
3	Same as above	▪ Water Quality Monitoring ▪ Implement BMPs
4	Same as above	▪ Water Quality Monitoring ▪ Implement BMPs
5	Same as above	▪ Water Quality Monitoring ▪ Implement BMPs
6	Same as above	▪ Water Quality Monitoring ▪ Implement BMPs
7	50 percent *Enterococcus* reduction	▪ Water Quality Monitoring ▪ Implement BMPs
8	Same as above	▪ Water Quality Monitoring ▪ Implement BMPs
9	Same as above	▪ Water Quality Monitoring ▪ Implement BMPs
10	100 percent *Enterococcus* reduction	▪ Water Quality Monitoring ▪ Implement BMPs ▪ Submit request for removal from 303(d) List (if not requested and removed earlier)
10+	Same as above	▪ Water Quality Monitoring ▪ Implement BMPs ▪ Submit request for TMDL revisions based on Natural Sources Exclusion Approach if supported by data (if not requested and recalculated earlier) ▪ Submit request for removal from 303(d) List (if not requested and removed earlier)

At this time, control of bacteria loads for MS4s during wet weather is inherently difficult because the MS4 systems are traditionally designed to convey water quickly for flood control purposes. However, new approaches to storm water runoff management and BMP implementation can reduce the storm water runoff flow and associated pollutant loads. The phased compliance schedule to achieve wet weather TMDLs will provide the MS4 dischargers time to identify sources, develop plans and implement enhanced and expanded BMPs capable of achieving the mandated decreases in bacteria densities at the Baby Beach shoreline.

According to Tables 7-29, 7-30, and 7-31, dry weather wasteload reductions are required for total coliform, fecal coliform, and Enterococcus indicator bacteria. The trend in the water quality data from Baby Beach indicate that the number of exceedances of the REC-1 water quality objectives have declined significantly beginning in 2006. If the current trend continues, the San Diego Water Board expects that the dry weather TMDLs for Baby Beach can be achieved within the next 5 years. The compliance schedule for Baby Beach to achieve dry weather TMDLs is as shown in Table 7-33.

Table 7-33. Compliance Schedule for Baby Beach to Achieve Dry Weather TMDLs

Year (after OAL Approval)	Required Wasteload Reduction	TMDL Compliance Action
1	No reduction required	▪ Water Quality Monitoring ▪ Implement BMPs
2	Same as above	▪ Water Quality Monitoring ▪ Implement BMPs
3	50 percent reduction	▪ Water Quality Monitoring ▪ Implement BMPs
4	Same as above	▪ Water Quality Monitoring ▪ Implement BMPs
5	100 percent reduction	▪ Water Quality Monitoring ▪ Implement BMPs ▪ Submit request for removal from 303(d) List (if not requested and removed earlier)
5+	Same as above	▪ Water Quality Monitoring ▪ Implement BMPs ▪ Submit request for TMDL revisions based on Natural Sources Exclusion Approach if supported by data (if not requested and recalculated earlier) ▪ Submit request for removal from 303(d) List (if not requested and removed earlier)

For both of the Baby Beach compliance schedules, if the REC-1 water quality objectives cannot be met in the receiving waters, and if natural and background sources appear to be the sole source of continued impairment, the natural sources exclusion approach (NSEA) may be applied. However, the Municipal Dischargers are responsible for collecting the data to support the application of the NSEA to recalculate the TMDL.

Shelter Island Shoreline Park Compliance Schedule

According to Tables 7-26 through 7-31, there are no wasteload reductions required for MS4s discharging into the receiving waters along the shoreline at Shelter Island Shoreline Park under both wet weather and dry weather conditions. This means that according to the wet weather and dry weather models for Shelter Island Shoreline Park, REC-1 water quality objectives are not expected to be exceeded due to discharges from the MS4s.

Given that the modeled wasteload reductions for both wet weather and dry weather conditions for all indicator bacteria are zero percent, no compliance schedules were developed to meet wasteload reductions for Shelter Island Shoreline Park. However the existing wasteload cannot exceed the WLA and Shelter Island Shoreline Park will remain on the 303(d) List until enough data are collected to support removing it from the 303(d) List. Therefore, in order to comply with these TMDLs, the responsible municipalities must continue implementing BMPs and collecting data until there are enough data to support and maintain the removal of SISP from the 303(d) List. In addition, the reporting requirements for

the Shelter Island Shoreline Park TMDL must also include a periodic demonstration, no less often than every 2 years, that wasteload allocations and water quality objectives are being met.

The trend in the water quality data from Shelter Island Shoreline Park indicate that the number of REC-1 WQO exceedances have declined significantly since 2003. If the current trend continues, the San Diego Water Board expects that Shelter Island Shoreline Park will have enough data to support removal of Shelter Island Shoreline Park from the 303(d) List by 2010, and no later than 2012. The compliance schedule for SISP to achieve wet weather and dry weather TMDLs is as shown in Table 7-34.

Table 7-34. Compliance Schedule for Shelter Island Shoreline Park to Achieve Wet Weather and Dry Weather TMDLs

Year	TMDL Compliance Action
2012	▪ Water Quality Monitoring ▪ Implement BMPs ▪ Submit request for TMDL revisions based on Natural Sources Exclusion Approach if supported by data (if not requested and recalculated earlier) ▪ Submit request for removal from 303(d) List (if not requested and removed earlier)

If the REC-1 water quality objectives cannot be met in the receiving waters by 2012, and if natural and background sources appear to be the source of continued impairment, the NSEA may be applied. However, the Municipal Dischargers are responsible for collecting the data to support the application of the NSEA to recalculate the TMDLs.

(E) TMDL Implementation Milestones

Accomplishing the goals of the implementation plan will be achieved by cooperative participation from all responsible parties, including the San Diego Water Board. Major milestones are described below in Table 7-35.

Table **7-35**. TMDL Implementation Milestones

Item	Implementation Action	Responsible Parties	Date
1	Effective date of Baby Beach and Shelter Island Shoreline Park Bacteria TMDL Waste Load Allocations (WLAs).	▪ San Diego Water Board ▪ Phase I Municipal Dischargers	Effective date*
2	Issue, reissue, or revise Phase I Municipal NPDES WDRs to include WQBELs consistent with the WLAs.	▪ San Diego Water Board	Within 5 years of effective date
3	Submit annual Progress Report to San Diego Water Board.	▪ Phase I Municipal Dischargers	Annually after reissue of NPDES WDRs
4	Recommend TMDL-related projects as high priority for grant funds.	▪ San Diego Water Board	As needed after effective date
5	Coordination and execution of special studies.	▪ San Diego Water Board ▪ Phase I Municipal Dischargers	As needed after effective date
6	Meet 50% wasteload reductions.	▪ Baby Beach Phase I Municipal Dischargers	3 years after effective date for dry weather 7 years after effective date for wet weather
		▪ Shelter Island Shoreline Park Phase I Municipal Dischargers	No load reductions required. Removal from 303(d) List by 2012.
7	Meet 100% wasteload reductions.	▪ Baby Beach Phase I Municipal Dischargers	5 years after effective date for dry weather 10 years after effective date for wet weather
		▪ Shelter Island Shoreline Park Phase I Municipal Dischargers	No load reductions required. Removal from 303(d) List by 2012.
8	Take enforcement actions to attain compliance with the WLAs.	▪ San Diego Water Board	As needed after effective date
9	Issue NPDES requirements or waste discharge requirements to marina and harbor operators and/or the muncipalities to eliminate sewage discharges from boats	▪ San Diego Water Board	As needed after effective date
10	Apply NSEA and recalculate TMDLs	▪ Baby Beach Phase I Municipal Dischargers	As appropriate after effective date, if data are available to support the action.
		▪ Shelter Island Shoreline Park Phase I Municipal Dischargers	

* Effective date is date of approval of these TMDLs by the Office of Administrative Law

REVISED TOTAL MAXIMUM DAILY LOADS FOR INDICATOR BACTERIA, PROJECT I – TWENTY BEACHES AND CREEKS IN THE SAN DIEGO REGION (INCLUDING TECOLOTE CREEK)

On February 10, 2010, the San Diego Water Board adopted Resolution No. R9-2010-0001, *A Resolution Amending the Water Quality Control Plan for the San Diego Region (9) to Incorporate Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)* (referred to hereafter as Revised Bacteria TMDLs Project I). The TMDL Basin Plan Amendment was subsequently approved by the State Water Resources Control Board (SWRCB)on December 14, 2010, the Office of Administrative Law on April 4, 2011, and the USEPA on June 22, 2011.

Bacteria TMDLs have been established for the following 20 waterbodies listed on the 2002 Clean Water Act Section 303(d) List of Water Quality Limited Segments:

Table 7-36. Beaches and Creeks Addressed by Revised Bacteria TMDLs Project I

Watershed	Type of Listing	Waterbody Name [a,c]	Number of Listings
San Joaquin Hills HSA (901.11)/ Laguna Beach HSA (901.12)	Shoreline	Pacific Ocean Shoreline, San Joaquin Hills HSA [b]	2
	Shoreline	Pacific Ocean Shoreline, Laguna Beach HSA [b]	
Aliso HSA (901.13)	Creek	Aliso Creek	3
	Estuary	Aliso Creek (mouth)	
	Shoreline	Pacific Ocean Shoreline, Aliso HSA [b]	
Dana Point HSA (901.14)	Shoreline	Pacific Ocean Shoreline, Dana Point HSA [b]	1
Lower San Juan HSA (901.27)	Creek	San Juan Creek	3
	Estuary	San Juan Creek (mouth)	
	Shoreline	Pacific Ocean Shoreline, Lower San Juan HSA [b]	
San Clemente HA (901.30)	Shoreline	Pacific Ocean Shoreline, San Clemente HA [b]	1
San Luis Rey HU (903.00)	Shoreline	Pacific Ocean Shoreline, San Luis Rey HU [b]	1
San Marcos HA (904.50)	Shoreline	Pacific Ocean Shoreline, San Marcos HA [b]	1
San Dieguito HU (905.00)	Shoreline	Pacific Ocean Shoreline, San Dieguito HU [b]	1
Miramar Reservoir HA (906.10)	Shoreline	Pacific Ocean Shoreline, Miramar Reservoir HA [b]	1
Scripps HA (906.30)	Shoreline	Pacific Ocean Shoreline, Scripps HA [b]	1
Tecolote HA (906.50)	Creek	Tecolote Creek	1
Mission San Diego HSA (907.11)/ Santee HSA (907.12)	Creek	Forester Creek	3
	Creek	San Diego River (Lower)	
	Shoreline	Pacific Ocean Shoreline, San Diego HU [b]	
Chollas HSA (908.22)	Creek	Chollas Creek.	1
Total Number of Listings on 2002 303(d) List in Revised Bacteria TMDLs Project I			**20**

Note: HSA = hydrologic subarea; HA = hydrologic area; HU = hydrologic unit

[a] Listed as impaired due to exceedances of REC-1 WQOs for fecal coliform, and/or total coliform, and/or enterococci.

[b] On the 2002 303(d) List, the Pacific Ocean Shoreline for a HSA, HA, or HU is listed, and specific beaches are noted under the listing. Beginning with the 2008 303(d) List, specific beaches are listed.

[c] Listings on the 2006 and 2008 303(d) List compared to listing shown above are provided in Appendix T to the Technical Report.

The TMDLs that have been developed for the Pacific Ocean shorelines are applicable to all the beaches located on the shorelines of the hydrologic subareas (HSAs), hydrologic areas (HAs), and hydrologic units (HUs) listed above. Beginning with the 2008 303(d) List, specific beach segments of the Pacific Ocean shoreline are listed individually. Specific beach segments from some of the Pacific Ocean shorelines listed in the above table have been delisted from the 2008 303(d) list that was approved by the San Diego Board on December 16, 2009, and therefore are not subject to any further action as long as monitoring data continues to support compliance with water quality standards.

(a) Problem Statement

Bacteria densities in the Pacific Ocean at various beach and coastal creek mouth segments (referred to hereafter as "beaches") exceed water quality objectives (WQOs) for indicator bacteria. Bacteria densities in ocean water at these beaches unreasonably impair and threaten to impair the water quality needed to support the contact water recreation (REC-1)[32] designated beneficial use.

Bacteria densities in the waters of Aliso Creek, San Juan Creek, Tecolote Creek, Forrester Creek, the (lower) San Diego River, and Chollas Creek exceed WQOs for indicator bacteria. Bacteria densities in these creeks unreasonably impair and threaten to impair the water quality needed to support REC-1.

The federal Clean Water Act requires the establishment of Total Maximum Daily Loads (TMDLs) for pollutants that exceed the WQOs needed to support designated beneficial uses, i.e., that cause or contribute to exceedances of state "water quality standards."

Aliso Beach, Orange County

(b) Numeric Target

When calculating TMDLs, one or more numeric targets are required. Numeric targets are typically selected based on water quality standards, which include beneficial uses and the WQOs that are established at levels sufficient to protect those beneficial uses. The numeric targets for these TMDLs are based primarily on the REC-1 WQOs for indicator bacteria contained in the Ocean Plan and/or Basin Plan.

Different REC-1 WQOs were used as the basis for wet weather[33] and dry weather[34] allowable load (i.e., TMDL) calculations because the bacteria transport mechanisms to receiving waters are different under wet and dry weather conditions. Because wet weather conditions, or storm flow, are episodic and short in duration, and characterized by rapid wash-off and transport of high bacteria loads, with short residence times, from all land use types to receiving waters, the single sample maximum WQOs were appropriate for use as wet weather numeric targets. For dry weather conditions, because dry weather runoff is not generated from storm flows, is not uniformly linked to every land use, and is more uniform than stormflow, with lower flows, lower loads, and slower transport, making die-off and/or amplification processes more important, the geometric mean WQOs were appropriate for use as dry weather numeric targets. Wet weather TMDL calculations were

[32] Water quality objectives for indicator bacteria in waters with non-water-contact recreation (REC-2) are less stringent than the water quality objectives for REC-1, therefore, attainment of REC-1 objectives through the implementation of TMDLs will, *a fortiori,* provide the requisite water quality for REC-2.

[33] Wet weather days defined as days with rainfall events of 0.2 inches or greater and the following 72 hours.

[34] Dry weather days defined as days with less than 0.2 inch of rainfall observed on each of the previous 3 days.

based on the REC-1 single sample maximum WQOs while dry weather TMDL calculations were based on REC-1 geometric mean WQOs.

It is not the intent of these TMDLs to require treatment or diversion of natural waterbodies or to require treatment of natural sources of indicator bacteria. The Basin Plan authorizes the use of a reference system and antidegradation approach (RSAA) or natural sources exclusion approach (NSEA) during implementation of indicator bacteria water quality objectives within the context of a TMDL.

For these indicator bacteria TMDLs, the RSAA has been incorporated in the numeric targets as an allowable frequency that the REC-1 WQOs can be exceeded (i.e., allowable exceedance frequency). The purpose of the allowable exceedance frequency is to account for the natural, and largely uncontrollable sources of bacteria (e.g., bird and wildlife feces), which have been shown can, by themselves, cause exceedances of the REC-1 WQOs. The RSAA also incorporates antidegradation principles in that, if water quality is better than that of the reference system in a particular location, no degradation of existing bacteriological water quality is permitted.

Therefore, in addition to the REC-1 WQOs, the numeric targets used to calculate the indicator bacteria TMDLs include an allowable exceedance frequency. The numeric targets used to calculate of the wet weather TMDLs include a 22 percent allowable exceedance frequency of the REC-1 single sample maximum WQOs.[35] The numeric targets used to calculate dry weather TMDLs include a zero percent allowable exceedance frequency of the REC-1 geometric mean WQOs.[36]

The allowable load (i.e., TMDL) that is calculated based on these numeric targets consists of the sum of two parts: 1) the bacteria load that is calculated with the REC-1 WQOs and, 2) the bacteria load that is associated with the allowable exceedance frequency, calculated using the existing load in exceedance of the REC-1 WQOs on the allowable exceedance days. Allowable exceedance days are calculated based on the allowable exceedance frequency and total number of wet days in a year.

Different enterococci REC-1 WQOs were used to calculate TMDLs in watersheds modeled with the inland freshwater creeks (i.e., San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek, (lower) San Diego River, and Chollas Creek) and watersheds modeled only with coastal saltwater beaches. The WQOs applicable to ocean waters are provided in the Ocean Plan. The Ocean Plan is applicable only to ocean waters and does not apply to marine bays, estuaries and lagoons. The WQOs applicable to all other surface waters in the San Diego Region (e.g., marine bays, estuaries and lagoons, and freshwater inland surface waters) are contained in the Basin Plan.

There are different enterococci REC-1 WQOs in the Ocean Plan compared to the Basin Plan. Specifically, the Ocean Plan contains REC-1 single sample maximum and 30-day geometric mean WQOs for ocean waters that do not vary. In the Basin Plan, however, the REC-1 single sample maximum WQOs for enterococci are dependent upon the type (e.g., freshwater or saltwater) and usage frequency (e.g., designated beach, moderately or lightly used area, or infrequently used area) of the waterbody, and the REC-1 geometric mean WQOs are dependent of the type (e.g.,

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[35] In the calculation of the wet weather TMDLs, the San Diego Regional Board chose to apply the 22 percent allowable exceedance frequency as determined for Leo Carillo Beach in Los Angeles County. At the time the wet weather watershed model was developed, the 22 percent exceedance frequency from Los Angeles County was the only reference beach exceedance frequency available. The 22 percent allowable exceedance frequency used to calculate the wet weather TMDLs is justified because the San Diego Region watersheds' exceedance frequencies will likely be close to the value calculated for Leo Carillo Beach, and is consistent with the exceedance frequency that was applied by the Los Angeles Regional Board.

[36] Available water quality data from San Diego Region reference systems indicate that exceedances of the single sample WQOs during dry weather conditions are uncommon. Furthermore, if the exceedance of the single sample WQOs during dry weather is unlikely, exceedances of the geometric mean are even more unlikely.

freshwater or saltwater) of waterbody. The enterococci saltwater REC-1 WQOs in the Basin Plan, for waters designated with "designated beach" usage frequency, are the same as the enterococci REC-1 WQOs in the Ocean Plan.

For the application of the Basin Plan's enterococci REC-1 WQOs, unless otherwise specified in the Basin Plan, all waterbodies in the San Diego Region designated with REC-1 beneficial use are assumed to have a "designated beach" usage frequency. The "designated beach" usage frequency has the lowest and most stringent enterococci REC-1 WQOs in the Basin Plan. The enterococci REC-1 single sample maximum WQOs in the Basin Plan are more stringent for freshwater (61 MPN/100mL) than for saltwater (104 MPN/100mL) waterbodies. The enterococci REC-1 geometric mean WQOs in the Basin Plan are also more stringent for freshwater (33 MPN/100mL) than for saltwater (35 MPN/100mL) waterbodies. Since coastal saltwater beaches are downstream of inland freshwater creeks, TMDLs for coastal saltwater beaches are calculated using the more conservative enterococci REC-1 WQOs applicable to freshwater creeks (i.e., 61 MPN/100mL and 33 MPN/100mL). The numeric targets used in the calculation of the TMDLs for Tecolote Creek and Chollas Creek are also based on the enterococci REC-1 WQOs applicable to freshwater creeks.

In some cases, the "designated beach" category may be over-protective of water quality because of the infrequent recreational use in the impaired freshwater creeks. The recreational usage frequency in these freshwater creeks may correspond to the "moderately to lightly used areas" category, which has an enterococci freshwater REC-1 single sample maximum WQO of 108 MPN/100mL. In such cases, the "designated beach" enterococci saltwater REC-1 single sample maximum WQO (104 MPN/100mL) would also be protective of the "moderately to lightly used area" freshwater creek.

Before the less stringent enterococci single sample maximum saltwater REC-1 WQO may be applied to a freshwater creek, the Basin Plan must be amended to designate a lower usage frequency (i.e., "moderately to lightly used area") for each freshwater creek. If information and evidence are provided to justify the "moderately to lightly used area" usage frequency for a freshwater creek, and the designated usage frequency of the freshwater creek is amended to "moderately to lightly used area" in the Basin Plan, the wet weather TMDLs that were calculated in a watershed that was modeled with a freshwater creek using the enterococci saltwater REC-1 WQOs can be implemented instead.

The numeric targets for the scenarios described above are summarized in the following tables.

Table 7-37. Wet Weather Numeric Targets

Indicator Bacteria	Numeric Target (MPN/100mL)	Allowable Exceedance Frequency [a]
Fecal coliform	400 [b]	22%
Total coliform	10,000 [c]	22%
Enterococci	104[d] / 61[e]	22%

a. Percent of wet days (i.e., rainfall events of 0.2 inches or greater and the following 72 hours) allowed to exceed the wet weather numeric targets. Exceedance frequency based on reference system in the Los Angeles Region.
b. Fecal coliform single sample maximum WQO for REC-1 use in creeks and at beaches.
c. Total coliform single sample maximum WQO for REC-1 use at beaches and the point in creeks that discharges to beaches.
d. Enterococci single sample maximum WQO for REC-1 use in creeks established and designated as "moderately or lightly used" in the Basin Plan and at beaches downstream of those creeks, as well as all other beaches.
e. Enterococci single sample maximum WQO for REC-1 use in creeks not established and designated as "moderately or lightly used" in the Basin Plan and at beaches downstream of those creeks ("designated beach" frequency of use; applicable to San Juan Creek and downstream beach, Aliso Creek and downstream beach, Tecolote Creek, Forrester Creek, San Diego River and downstream beach, and Chollas Creek).

Table 7-38. Dry Weather Numeric Targets

Indicator Bacteria	Numeric Target (MPN/100mL)	Allowable Exceedance Frequency [a]
Fecal coliform	200 [b]	0%
Total coliform	1,000 [c]	0%
Enterococci	35 [d] / 33[e]	0%

a. Percent of dry days (i.e., days with less than 0.2 inch of rainfall observed on each of the previous 3 days) allowed to exceed the dry weather numeric targets.
b. Fecal coliform 30-day geometric mean WQO for REC-1 use in creeks and at beaches.
c. Total coliform 30-day geometric mean WQO for REC-1 at beaches and the point in creeks that discharges to beaches.
d. Enterococci 30-day geometric mean WQO for REC-1 at beaches.
e. Enterococci 30-day geometric mean WQO for REC-1 use in impaired creeks and beaches downstream of those creeks (applicable to San Juan Creek and downstream beach, Aliso Creek and downstream beach, Tecolote Creek, Forrester Creek, San Diego River and downstream beach, and Chollas Creek).

(c) Source Analysis

Sources of bacteria are the same under both wet weather and dry weather conditions. Bacteria build up on the land surface as a result of various anthropogenic land uses (e.g., urban development and agriculture) and natural processes (e.g., birds and wildlife). Bacteria are washed off the land surface by surface runoff. In urban areas, bacteria are washed off the land surface by dry weather and wet weather flows and transported through pipes and conveyance channels of the municipal separate storm sewer systems (MS4s) to surface waters. Other significant point sources of bacteria include municipal wastewater treatment plants and industrial waste treatment facilities. In rural and undeveloped areas, bacteria are washed off the land surface primarily by wet weather flows directly to surface waters. Discharges from rural areas are typically considered nonpoint sources. These diffuse nonpoint sources (e.g., undeveloped land, agriculture, livestock, and horse ranch facilities) have multiple routes of entry into surface waters.

Nonpoint sources were separated into controllable and uncontrollable categories. Controllable nonpoint sources are identified by land use types and coverages. Controllable nonpoint sources include land uses associated with agriculture, dairy/intensive livestock, and horse ranches (collectively referred to as agriculture land uses). These were considered controllable because the land uses are anthropogenic in nature, and load reductions can be reasonably expected with the implementation of suitable management measures. Uncontrollable nonpoint sources include loads from open recreation, open space, and water land uses (collectively referred to as open space land uses). Loads from these areas are considered uncontrollable because they come from mostly natural sources (e.g. bird and wildlife feces).

In order to quantify bacteria loading from these various sources and transport mechanisms, 13 land-use types were identified in the TMDL analysis: Low Density Residential, High Density Residential, Commercial/Institutional, Industrial/Transportation, Military, Parks/Recreation, Open Recreation, Agriculture, Dairy/Intensive Livestock, Horse Ranches, Open Space, Water, and Transitional (Construction Activities). In the technical TMDL analysis, the 13 land use types were grouped into the following four land use categories: 1) owners/operators of municipal separate storm sewers (Municipal MS4s); 2) Caltrans (separated from other Municipal MS4s); 3) Agriculture; and 4) Open Space. Bacteria loads discharged from Low Density Residential, High Density Residential, Commercial/Institutional, Industrial/Transportation, Military, Parks/Recreation, and Transitional land use types are included in the Municipal MS4s category, which is considered a controllable point source. Bacteria loads discharged from the Industrial/Transportation land use type associated with Caltrans were separated into the Caltrans category, which is considered a controllable point source. Bacteria loads discharged from Agriculture, Dairy/Intensive Livestock, and Horse Ranch land use types are included in the Agriculture category, which is considered a controllable nonpoint source. Bacteria loads discharged from Open Recreation, Open Space, and Water land use types are included in the Open Space category, which is associated with natural and undeveloped areas and considered an uncontrollable nonpoint source.

(d) Critical Conditions

The critical conditions are a set of environmental conditions for which controls designed to protect water quality will ensure attainment of the numeric targets for all other conditions. The critical conditions include the location and the period of time in which the waterbody is expected to exhibit the highest vulnerability.

To ensure that numeric targets are met throughout the impaired waterbodies, a critical location consisting of a node at the base of the watershed as it discharges to the ocean or bay was used as the point where the allowable load (i.e., TMDL) is calculated. A critical period associated with extreme rainfall conditions (i.e., critical wet year), and thus the highest potential bacteria load at the critical location, was selected for watershed modeling analysis. The year 1993 was selected as the critical wet period for assessment of extreme wet weather loading conditions because this year was the wettest year of the 12 years of record (1990 through 2002).

(e) Linkage Analysis

The purpose of the linkage analysis is to quantify the “existing” bacteria loads that are currently generated by the pollutant sources in the watershed under the critical conditions, and quantify the maximum allowable bacteria loading to each impaired waterbody that will result in attainment of numeric targets under the same critical conditions. This maximum allowable bacteria loading is, in other words, the TMDL.

The linkage analysis used mathematical modeling approaches to quantify the “existing” and allowable bacteria loadings for each impaired waterbody. Separate modeling approaches were used for the calculation of the wet weather TMDLs and dry weather TMDLs.

For the calculation of the wet weather TMDLs, the wet weather modeling approach chosen for the linkage analysis is based on the application of the USEPA's Loading Simulation Program in C++ (LSPC) model to estimate bacteria loading from streams and assimilation within the waterbodies. LSPC is a recoded C++ version of the USEPA's Hydrological Simulation Program–FORTRAN (HSPF) that relies on fundamental (and USEPA-approved) algorithms. In the wet weather linkage analysis, it is assumed that storm water flows wash off bacteria loads from the surface of all 13 land use types into the receiving waters. The LSPC model was used to predict flows and bacteria densities at the critical location during the wet days of the critical wet year, which were used to calculate the mass-based annual existing wet weather bacteria loads. The LSPC model-predicted wet weather flows at the critical location during the wet days of the critical wet year in combination with the numeric targets were used to calculate the mass-based annual allowable wet weather bacteria loads, or mass-based wet weather TMDLs.

For the calculation of the dry weather TMDLs, the dry weather modeling approach chosen for the linkage analysis consists of a steady-state mass balance model that was developed to simulate transport of bacteria in the impaired creeks and the creeks flowing to impaired shorelines. This predictive model represents the streams as a series of plug-flow reactors, with each reactor having a constant, steady-state flow and bacteria load. In the dry weather linkage analysis, it is assumed that dry weather non-storm water flows generated by anthropogenic activities wash off bacteria loads from the surface of specific land use types into the receiving waters. The dry weather steady-state model was used to predict flows and bacteria densities at the critical location during the dry weather days of the critical wet year, which were used to calculate the mass-based monthly existing dry weather bacteria loads. The dry weather steady-state model-predicted flows at the critical location during the dry days of the critical wet year in combination with the dry weather numeric targets were used to calculate the mass-based monthly allowable dry weather bacteria loads, or mass-based dry weather TMDLs.

(f) Total Maximum Daily Loads and Allocations

TMDLs can be expressed as mass per time (i.e., mass-loading basis), or other appropriate measure (e.g., as a concentration).[37] For these TMDLs, the wet weather and dry weather TMDLs are expressed both in terms of concentration and on a mass loading basis. The concentration based TMDLs will be used to determine compliance with the TMDLs in the receiving waters. Mass-load based TMDLs were calculated for the impaired waterbodies in each watershed. The mass-load based TMDLs were allocated to the identified point and nonpoint sources and used to identify the controllable sources that need to reduce their bacteria loads in order for the concentration based TMDLs to be met in the receiving waters. The concentration based TMDLs, mass-load based TMDLs, and allocations are discussed below.

(1) Concentration Based TMDLs

The wet weather and dry weather concentration based TMDLs are based on meeting the numeric targets (i.e., numeric WQOs and allowable exceedance frequencies) in the receiving waters. The numeric WQOs for REC-1 beneficial uses are the basis of the numeric targets used to calculate the TMDLs, expressed as number of bacteria colonies per volume. An allowable exceedance frequency is included as part of the numeric target to allow for exceedances that may be caused by natural sources, based on a reference system. Tables 7-39 and 7-40 summarize the concentration based TMDLs, which are expressed as numeric objectives and allowable exceedance frequencies in the receiving waters for each watershed, for wet weather and dry weather, respectively. Meeting the concentration based TMDLs in the receiving waters will be used to determine compliance with the TMDLs.

[37] Code of Federal Regulations Title 40 section 130.2(1) [40CFR130.2(i)]

(2) Mass-Load Based TMDLs

The numeric targets were used to calculate the TMDLs on a mass loading basis under a set of critical conditions. The TMDLs that were calculated in terms of mass loading were used to identify the bacteria loads from controllable sources that need to be reduced in order for the numeric targets to be met in the receiving waters.

On a mass loading basis, TMDLs are defined as the maximum mass of a pollutant the waterbody can receive and still protect the designated beneficial uses. Separate mass-load based TMDLs were calculated for wet weather and dry weather conditions to account for seasonal variations, and because the transport mechanism, flow, and bacteria loads are different between dry and wet weather conditions.

On a mass-loading basis, the TMDLs are expressed as number of bacteria colonies per unit time. The wet weather mass-load based TMDLs are expressed as "annual loads" in terms of number of bacteria colonies per year (billion MPN/yr). The dry weather mass-load based TMDLs are expressed as "monthly loads" in terms of number of bacteria colonies per month (billion MPN/mth). In order for bacteria loading to be calculated, both flow rates and bacteria densities must be measured at a point in time and location. When multiplied together, these two parameters result in bacteria mass loading, or the number of bacteria colonies measured per unit time.

$$Bacteria\ Loading = flow\ rate\,(volume / time) \times bacteria\ density\,(number\ of\ colonies / volume)$$

Calibrated models were used to simulate flow and bacteria densities. This information was used to calculate the "existing" mass of bacteria loads to, and allowable mass of bacteria loads (i.e., mass-load based TMDLs) for, each impaired segment under critical conditions (i.e., worst case loading conditions). The existing mass loads that were calculated represent the worst case flows and bacteria densities that are expected from the watershed during the critical wet year. The mass-load based TMDLs were calculated with the numeric targets and modeled flows expected during the critical wet year. Existing mass loads were compared to the mass-load based TMDLs. The difference between the existing mass loads and the mass-load based TMDLs is the load reduction required to meet the REC-1 WQOs and allowable exceedance frequencies in the receiving water.

Existing mass loads and mass-load based TMDLs were calculated for wet weather and dry weather. The calculation of the mass-load based TMDLs included the use of an allowable exceedance frequency of the REC-1 WQOs. The purpose of the exceedance frequency is to account for the natural, and largely uncontrollable sources of bacteria (e.g., bird and wildlife feces) generated in the watersheds and at the beaches, which can, by themselves, cause exceedances of WQOs.

All of the wet weather mass-load based TMDLs were calculated using a 22 percent allowable exceedance frequency.[38] All of the dry weather mass-load based TMDLs were calculated using a 0 percent allowable exceedance frequency. These allowable exceedance frequencies were used to calculate the number of wet and dry weather allowable exceedance days during the critical wet year.

The mass-load based TMDLs are calculated as the sum of the allowable load associated with the numeric REC-1 WQO and the allowable load associated with the allowable exceedance frequency during the critical wet year. Tables 7-39 and 7-40 summarize the calculated existing bacteria mass

[38] In the calculation of the wet weather TMDLs, the San Diego Regional Board chose to apply the 22 percent allowable exceedance frequency as determined for Leo Carillo Beach in Los Angeles County. At the time the wet weather watershed model was developed, the 22 percent exceedance frequency from Los Angeles County was the only reference beach exceedance frequency available. The 22 percent allowable exceedance frequency used to calculate the wet weather TMDLs is justified because the San Diego Region watersheds' exceedance frequencies will likely be close to the value calculated for Leo Carillo Beach, and is consistent with the exceedance frequency that was applied by the Los Angeles Regional Board.

loads, allowable mass loads based on the numeric REC-1 WQOs, allowable exceedance frequencies and days, allowable mass loads based on the allowable exceedance frequencies, and mass-load based TMDLs for each watershed, for wet weather and dry weather, respectively.

(3) Allocation of Mass-Load Based TMDLs

The mass-load based TMDLs were allocated among point sources (WLAs) and nonpoint sources (LAs) in each watershed. WLAs were assigned to discharges originating from urban land use areas (i.e., MS4s and Caltrans), all of which are considered controllable. LAs were assigned to discharges from rural and undeveloped land use areas (i.e., Agriculture and Open Space). Discharges from rural and undeveloped land use areas are separated into controllable and uncontrollable nonpoint sources. Agricultural land uses (e.g., agriculture, horse ranches, and intensive livestock) are considered controllable nonpoint source land use areas. Open space land uses (e.g., open space and open recreation) are considered uncontrollable nonpoint source land use areas.

Sources that are not identified are assumed to be assigned a zero allowable load as part of the mass-load based TMDL (i.e., WLA = 0 or LA = 0). In other words, discharges of pollutant loads from these sources are not allowed as part of the TMDLs. Sources that are assigned an allowable mass load equal to the existing mass load (i.e., WLA or LA = existing mass load) are not allowed to increase their pollutant loads over time.

Allocations of the mass-load based TMDLs were different for wet weather TMDLs and dry weather TMDLs, as discussed below.

(A) Wet Weather TMDL Allocations

The wet weather mass-load based TMDLs were divided and assigned to point sources as WLAs and nonpoint sources as LAs based on land uses. The portions of the wet weather mass-load based TMDLs assigned to WLAs and LAs were calculated based on the percent of the TMDL mass load generated by the urban, rural, and undeveloped land uses in each watershed as determined by the wet weather models under critical conditions.

The allocation of the wet weather mass-load based TMDLs assumes surface runoff discharge occurs from all land use categories, and allocated according to the following steps:

1) Sources are separated in to controllable and uncontrollable sources. Discharges from Municipal MS4, Caltrans, and Agriculture land use categories are assumed to be controllable (i.e., subject to regulation), and discharges from Open Space land use categories are assumed to be uncontrollable (i.e., not subject to regulation).
2) Because discharges from Open Space land use categories are uncontrollable (i.e., not subject to regulation), the LAs for Open Space land use categories are set equal to the existing mass loads calculated under the critical conditions.
3) For discharges from controllable land use categories that do not contribute more than 5 percent of the total existing mass load for all three indicator bacteria, the WLA or LA is set equal to the existing mass loads from those land uses calculated under the critical conditions.
4) After the WLAs and LAs are assigned based on steps 2 and 3, the remaining portion of the mass-load based TMDL is assigned to discharges from controllable land use categories that contribute more than 5 percent of the total existing mass load for all three indicator bacteria. The allowable mass load for each source (WLA or LA) is calculated based on the ratio of the existing mass loads from those sources relative to each other.

The total watershed wet weather existing mass loads and mass-load based TMDLs, point source existing mass loads and mass-load based WLAs, nonpoint source existing mass loads

and mass-load based LAs, and load reductions required to achieve the mass-load based TMDLs, WLAs, and LAs are shown below in Tables 7-41, 7-42 and 7-43.

In comments, the municipal dischargers pointed out that, for the impaired creeks, the "designated beach" usage frequency WQO for enterococci may be over-protective of water quality because of the infrequent recreational use in the impaired creeks. The dischargers claim that the recreational usage frequency in these inland freshwater creeks more likely corresponds to the "moderately to lightly used area" category in the Basin Plan, which has an enterococci WQO of 108 MPN/100mL. In these cases, using a less stringent numeric target, based on the saltwater enterococci WQO of 104 MPN/100 mL ("designated beaches" usage frequency) would result in wet weather TMDLs protective of REC-1 uses in the inland freshwater creeks and at the downstream coastal saltwater beaches.[39] Therefore, the "moderately to lightly used area" usage frequency may be appropriate for the six impaired creeks, and the enterococci saltwater REC-1 single sample maximum WQO of 104 MPN/100 mL could be used as basis of the numeric target for the enterococci wet weather TMDLs.

The six creeks included in these TMDLs, however, have not been designated in the Basin Plan as "moderately to lightly used area" waterbodies as of the adoption of these TMDLs. If the Basin Plan does not specify the usage frequency of a waterbody, the most stringent and conservative WQOs are appropriate and applicable. For enterococci, the most stringent and conservative WQOs for the freshwater creeks are associated with the "designated beach" usage frequency and freshwater waterbody type. Thus, the enterococci WQOs associated with the freshwater "designated beach" usage frequency are applicable until sufficient evidence is provided to warrant an amendment to the Basin Plan that designates a lower usage frequency to one or more of the six creeks addressed by these TMDLs (San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek, San Diego River, and Chollas Creek).

According to the federal regulations,[40] usage frequencies are defined as follows:

- Designated Beach Area: those recreation waters that, during the recreation season, are heavily used (based upon a comparison of use within the state) and may have a lifeguard, bathhouse facilities, or public parking for beach access. States may include any other waters in this category even if the waters do not meet these criteria.

- Moderate Full Body Contact Recreation: those recreation waters that are not designated bathing beach waters but typically, during the recreation season, are used by at least half of the number of people as at typical designated bathing beach waters within the state. States may also include light use or infrequent use coastal recreation waters in this category.

- Lightly Used Full Body Contact Recreation: those recreation waters that are not designated bathing beach waters but typically, during the recreation season, are used by less than half of the number of people as at typical designated bathing beach waters within the state, but are more than infrequently used. States may also include infrequent use coastal recreation waters in this category.

[39] The enterococci WQOs in the Basin Plan are structured to reflect the frequency of recreational use. The enterococci freshwater REC-1 single sample maximum WQO for a "designated beach" area is 61 MPN/100 mL. For a "moderately or lightly used area," the REC-1 single sample maximum WQO is 108 MPN/100 mL. The saltwater REC-1 single sample maximum WQO for "designated beach" area is 104 MPN/100 mL. Where the "moderately or lightly used area" designation is appropriate for creeks, the saltwater REC-1 single sample maximum WQO of 104 MPN/100 mL could be used as the numeric target because it is also protective of both the freshwater creek and the downstream marine beach.

[40] Code of Federal Regulations Title 40 section 131.41 [40CFR131.41]

- Infrequently Used Full Body Contact: those recreation waters that are rarely or occasionally used.

If sufficient evidence can be provided to the San Diego Water Board that can demonstrate the usage frequency for one or more of the six impaired creeks falls under the "Lightly Used Full Body Contact Recreation" or "Infrequently Used Full Body Contact" usage frequency, the Basin Plan may be amended to designate one or more of the creeks with the "moderately to lightly used area" usage frequency.

If one or more of the six creeks (San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek, San Diego River, and/or Chollas Creek) are designated in the Basin Plan with the "moderately to lightly used area" usage frequency, the enterococci wet weather TMDLs, WLAs, and LAs based on the 104 MPN/100mL (Table 7-44) can be implemented. Otherwise, the more stringent and conservative enterococci wet weather TMDLs, WLAs, and LAs based on the freshwater "designated beach" usage frequency WQO of 61 MPN/100mL (Table 7-43) must be implemented.

(B) Dry Weather TMDL Allocations

The dry weather mass-load based TMDLs were assigned entirely to discharges from MS4 land uses because the runoff that transports bacteria loads to surface waters during dry weather are expected to occur only in urban areas. The allocation of the dry weather mass-load based TMDLs assumes that no surface runoff discharge to receiving waters occurs from Caltrans, Agriculture, or Open Space land use categories (i.e., $WLA_{Caltrans} = 0$, $LA_{Agriculture} = 0$, and $LA_{OpenSpace} = 0$), meaning the entire dry weather mass-load based TMDL (i.e., allowable mass load) is allocated to Municipal MS4 land use categories (i.e., WLA_{MS4} = TMDL).

The total watershed dry weather existing mass loads and mass-load based TMDLs, point source existing mass loads and mass-load based WLAs, nonpoint source existing mass loads and mass-load based LAs, and load reductions required to achieve the mass-load based TMDLs, WLAs, and LAs are shown below in Tables 7-45, 7-46, and 7-47.

Because the wet weather and dry weather modeling approaches used to calculate the mass-load based TMDLs, WLAs, LAs, and existing mass wasteloads and loads were based on critical conditions (i.e., worst case loading scenario), the mass-loading numbers (i.e., existing mass loads, and mass-load based TMDLs, WLAs, and LAs expressed in terms of billion MPN/year for wet weather and billion MPN/month for dry weather) presented in Tables 7-39 through 7-47 represent conservative mass-load estimates expected to be protective of the beneficial uses under extreme conditions. The mass-loading numbers also provide a tool for identifying bacteria sources that need to be controlled and existing bacteria loads that need to be reduced to meet the TMDLs in the receiving waters.

Ultimately, controllable point and nonpoint sources must reduce their anthropogenic loads so the concentration based wet weather and dry weather TMDLs, which are based on the numeric REC-1 WQOs in the Basin Plan and allowable exceedance frequencies, can be met during wet weather and dry weather conditions during each year. Meeting the wet weather and dry weather numeric targets in the discharge and/or receiving water will indicate the TMDLs, WLAs, and/or LAs have been met.

(g) Margin of Safety

The numeric targets used for the mass-load based and concentration based TMDLs are assumed to be conservative by utilizing the most stringent REC-1 WQOs contained in the Ocean Plan and/or Basin Plan. Additionally, the mass-load based TMDLs were calculated under a set of critical conditions that assumed the highest potential mass loading would occur at a critical point during a

critical wet year, which is expected to be protective of beneficial uses during extreme conditions. The conservative assumptions that were used result in conservative mass-load based and concentration based TMDLs that are expected to restore and protect the beneficial uses of the receiving waters.

Because bacteria in wet weather runoff and streamflows have a quick travel time, and therefore, a short residence time in the waterbodies, the REC-1 single-sample maximum WQOs were determined to be most appropriate for calculating the wet weather TMDLs. The numeric targets used for the wet weather mass-load based and concentration based TMDLs are assumed to be conservative by utilizing the most stringent REC-1 single sample maximum WQOs contained in the Ocean Plan and/or Basin Plan.

Because dry weather conditions have flows and bacteria loads much smaller in magnitude than wet weather conditions, do not occur from all land use types, and are more uniform than stormflow, the REC-1 30-day geometric mean WQOs were determined to be most appropriate for the dry weather TMDLs. The numeric targets used for the dry weather mass-load based and concentration based TMDLs are assumed to be conservative by utilizing the most stringent REC-1 30 day geometric mean WQOs contained in the Ocean Plan and/or Basin Plan.

Because of the numeric targets and critical conditions that were included in the calculation of the TMDLs, there was no explicit margin of safety included. Instead, the TMDLs include an implicit margin of safety (MOS). The implicit MOS is included via conservative estimates and assumptions (meaning worst-case scenarios were assumed in terms of existing bacteria loading) throughout the calculations and not as a separate, additional factor.

Table 7-39. Summary of Wet Weather Existing and Allowable Indicator Bacteria Loads

Watershed - Impaired Waterbody	Indicator Bacteria	Existing Bacteria Load (Billion MPN/year)	Single Sample Maximum Objective (MPN/100mL)	Allowable Numeric Objective Load (Billion MPN/year)	Total Wet Days in Critical Year	Allowable Exceedance Frequency	Allowable Wet Exceedance Days in Critical Year	Allowable Exceedance Load (Billion MPN/year)	Total Allowable Load [=TMDL] (Billion MPN/year)
San Joaquin Hills HSA (901.11)	Fecal Coliform	705,015	**400**	16,043				648,591	664,634
and Laguna Hills HSA (901.12)	Total Coliform	8,221,901	**10,000**	401,049	69	**22%**	15	7,044,601	7,445,649
- Pacific Ocean Shoreline	Enterococcus	852,649	**104**	4,175				778,624	782,799
Aliso HSA (901.13)	Fecal Coliform	1,752,096	**400**	84,562				1,494,512	1,579,073
- Pacific Ocean Shoreline - Aliso Creek	Total Coliform	23,210,774	**10,000**	2,109,600	69	**22%**	15	18,081,198	20,190,798
- Aliso Creek mouth	Enterococcus	2,230,206	**104***	22,682				1,929,834	1,952,517
		2,230,206	**61**	13,644				1,937,321	1,950,964
Dana Point HSA (901.14)	Fecal Coliform	403,911	**400**	14,894				362,419	377,313
- Pacific Ocean Shoreline	Total Coliform	6,546,962	**10,000**	372,328	69	**22%**	15	5,659,144	6,031,472
	Enterococcus	501,526	**104**	3,875				458,431	462,306
Lower San Juan HSA (901.27)	Fecal Coliform	15,304,790	**400**	358,410				14,356,423	14,714,833
- Pacific Ocean Shoreline - San Juan Creek	Total Coliform	130,258,863	**10,000**	8,947,114	76	**22%**	17	113,932,076	122,879,189
- San Juan Creek mouth	Enterococcus	12,980,098	**104***	95,357				12,063,781	12,159,138
		12,980,098	**61**	56,119				12,096,327	12,152,446
San Clemente HA (901.30)	Fecal Coliform	1,441,723	**400**	36,481				1,342,450	1,378,931
- Pacific Ocean Shoreline	Total Coliform	16,236,606	**10,000**	911,994	73	**22%**	16	14,235,609	15,147,603
	Enterococcus	1,663,100	**104**	9,491				1,553,696	1,563,187
San Luis Rey HU (903.00)	Fecal Coliform	33,120,012	**400**	640,595				31,803,647	32,444,242
- Pacific Ocean Shoreline	Total Coliform	231,598,677	**10,000**	15,993,384	90	**22%**	20	208,157,151	224,150,535
	Enterococcus	18,439,920	**104**	167,152				17,296,466	17,463,618
San Marcos HA (904.50)	Fecal Coliform	20,886	**400**	1,559				15,665	17,224
- Pacific Ocean Shoreline	Total Coliform	515,278	**10,000**	38,984	49	**22%**	11	386,099	425,083
	Enterococcus	40,558	**104**	406				32,559	32,966
San Dieguito HU (905.00)	Fecal Coliform	21,286,910	**400**	425,968				20,675,680	21,101,649
- Pacific Ocean Shoreline	Total Coliform	163,541,133	**10,000**	10,637,225	98	**22%**	22	149,176,959	159,814,184
	Enterococcus	14,796,210	**104**	113,253				14,193,834	14,307,087
Miramar Reservoir HA (906.10)	Fecal Coliform	10,392	**400**	312				9,943	10,256
- Pacific Ocean Shoreline	Total Coliform	212,986	**10,000**	7,809	94	**22%**	21	202,371	210,180
	Enterococcus	11,564	**104**	81				11,323	11,405

Table 7-39. Summary of Wet Weather Existing and Allowable Indicator Bacteria Loads (Cont'd)

Watershed - Impaired Waterbody	Indicator Bacteria	Existing Bacteria Load (Billion MPN/year)	Single Sample Maximum Objective (MPN/100mL)	Allowable Numeric Objective Load (Billion MPN/year)	Total Wet Days in Critical Year	Allowable Exceedance Frequency	Allowable Wet Exceedance Days in Critical Year	Allowable Exceedance Load (Billion MPN/year)	Total Allowable Load [=TMDL] (Billion MPN/year)
Scripps HA (906.30)	Fecal Coliform	204,057	**400**	10,329				166,578	176,907
- Pacific Ocean Shoreline	Total Coliform	5,029,519	**10,000**	258,228	57	**22%**	13	4,098,745	4,356,973
	Enterococcus	377,839	**104**	2,686				321,347	324,032
Tecolote HA (906.50)	Fecal Coliform	261,966	**400**	25,080				204,241	229,322
- Tecolote Creek	Total Coliform	7,395,789	**10,000**	626,414	57	**22%**	13	5,753,355	6,379,770
	Enterococcus	708,256	**104***	6,522				597,659	604,180
		708,256	**61**	3,825				599,936	603,761
Mission San Diego HSA (907.11)	Fecal Coliform	4,932,380	**400**	310,820				4,370,018	4,680,838
and Santee HSA (907.12)	Total Coliform	72,757,569	**10,000**	7,752,284	86	**22%**	19	58,352,938	66,105,222
- Forrester Creek - San Diego River (lower) - Pacific Ocean Shoreline	Enterococcus	7,255,759	**104***	80,899				6,514,309	6,595,208
		7,255,759	**61**	47,479				6,543,487	6,590,966
Chollas HSA (908.22)	Fecal Coliform	603,863	**400**	55,516				464,924	520,440
- Chollas Creek	Total Coliform	15,390,608	**10,000**	1,386,037	65	**22%**	14	11,861,589	13,247,626
	Enterococcus	1,371,972	**104***	15,008				1,138,590	1,153,599
		1,371,972	**61**	9,073				1,143,572	1,152,645

* Total Maximum Daily Load calculated using a Enterococcus numeric target of 61 MPN/mL that is conservatively protective of the REC-1 "designated beach" usage frequency for freshwater creeks and downstream beaches. If the usage frequency of the freshwater creeks can be established as "moderately to lightly used" in the Basin Plan, alternative Total Maximum Daily Loads calculated using an Enterococcus numeric target of 104 MPN/ml may be used.

Existing Bacteria Load = Predicted existing bacteria load discharged from the watershed calculated by the Loading Simulation Program in C++ (LSPC) model using modeled flows and bacteria densities for all wet days during the critical year 1993

Single Sample Maximum Objective = Target bacteria densities based on numeric single sample maximum water quality objectives that are protective of REC-1 beneficial uses
Allowable Numeric Objective Load = Allowable load from the watershed calculated by the LSPC model using modeled flows and the numeric single sample maximum water quality objective bacteria densities for all wet days during the critical year 1993

Total Wet Days in Critical Year = Number of wet days (i.e., rainfall events of 0.2 inches or greater and the following 72 hours) in the critical year 1993 (i.e., wettest year between 1990 and 2002)
Allowable Exceedance Frequency = Assumed to be 22 percent exceedance frequency. In the calculation of the wet weather TMDLs, the San Diego Regional Board chose to apply the 22 percent allowable exceedance frequency as determined for Leo Carillo Beach in Los Angeles County. At the time the wet weather watershed model was developed, the 22 percent exceedance frequency from Los Angeles County was the only reference beach exceedance frequency available. The 22 percent allowable exceedance frequency used to calculate the wet weather TMDLs is justified because the San Diego Region watersheds' exceedance frequencies will likely be close to the value calculated for Leo Carillo Beach, and is consistent with the exceedance frequency that was applied by the Los Angeles Regional Board.
Allowable Wet Exceedance Days = (Total Wet days in Critical Year) X (Allowable Exceedance Frequency)
Allowable Exceedance Load = Sum of exceedance loads from the allowable exceedance days with the highest exceedance loads calculated by the LSPC model using modeled flows and bacteria densities for all wet days during the critical year 1993

Total Allowable Load [i.e. TMDL] = (Allowable Numeric Objective Load) + (Allowable Exceedance Load)

Table 7-40. Summary of Dry Weather Existing and Allowable Indicator Bacteria Loads

Watershed - Impaired Waterbody	Indicator Bacteria	Existing Bacteria Load (Billion MPN/mth)	30-Day Geometric Mean Objective (MPN/100mL)	Allowable Numeric Objective Load (Billion MPN/mth)	Total Dry Days in Critical Year	Allowable Exceedance Frequency	Allowable Dry Exceedance Days in Critical Year	Allowable Exceedance Load (Billion MPN/mth)	Total Allowable Load [=TMDL] (Billion MPN/mth)
San Joaquin Hills HSA (901.11)	Fecal Coliform	2,741	**200**	227				0	227
and Laguna Hills HSA (901.12)	Total Coliform	13,791	**1,000**	1,134	296	**0%**	0	0	1,134
- Pacific Ocean Shoreline	Enterococcus	2,321	**35**	40				0	40
Aliso HSA (901.13)	Fecal Coliform	5,470	**200**	242				0	242
- Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	Total Coliform	26,639	**1,000**	1,208	296	**0%**	0	0	1,208
	Enterococcus	4,614	**33***	40				0	40
Dana Point HSA (901.14)	Fecal Coliform	1,851	**200**	92				0	92
- Pacific Ocean Shoreline	Total Coliform	9,315	**1,000**	462	296	**0%**	0	0	462
	Enterococcus	1,567	**35**	16				0	16
Lower San Juan HSA (901.27)	Fecal Coliform	6,455	**200**	1,665				0	1,665
- Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	Total Coliform	30,846	**1,000**	8,342	289	**0%**	0	0	8,342
	Enterococcus	5,433	**33***	275				0	275
San Clemente HA (901.30)	Fecal Coliform	3,327	**200**	192				0	192
- Pacific Ocean Shoreline	Total Coliform	16,743	**1,000**	958	292	**0%**	0	0	958
	Enterococcus	2,817	**35**	33				0	33
San Luis Rey HU (903.00)	Fecal Coliform	1,737	**200**	1,058				0	1,058
- Pacific Ocean Shoreline	Total Coliform	8,549	**1,000**	5,289	275	**0%**	0	0	5,289
	Enterococcus	1,466	**35**	185				0	185
San Marcos HA (904.50)	Fecal Coliform	149	**200**	26				0	26
- Pacific Ocean Shoreline	Total Coliform	751	**1,000**	129	316	**0%**	0	0	129
	Enterococcus	126	**35**	5				0	5
San Dieguito HU (905.00)	Fecal Coliform	1,631	**200**	1,293				0	1,293
- Pacific Ocean Shoreline	Total Coliform	7,555	**1,000**	6,468	267	**0%**	0	0	6,468
	Enterococcus	1,368	**35**	226				0	226
Miramar Reservoir HA (906.10)	Fecal Coliform	205	**200**	7				0	7
- Pacific Ocean Shoreline	Total Coliform	1,030	**1,000**	36	271	**0%**	0	0	36
	Enterococcus	173	35	1				0	1

Table 7-40. Summary of Dry Weather Existing and Allowable Indicator Bacteria Loads (Cont'd)

Watershed - Impaired Waterbody	Indicator Bacteria	Existing Bacteria Load (Billion MPN/mth)	30-Day Geometric Mean Objective (MPN/100mL)	Allowable Numeric Objective Load (Billion MPN/mth)	Total Dry Days in Critical Year	Allowable Exceedance Frequency	Allowable Dry Exceedance Days in Critical Year	Allowable Exceedance Load (Billion MPN/mth)	Total Allowable Load [=TMDL] (Billion MPN/mth)
Scripps HA (906.30)	Fecal Coliform	3,320	**200**	119				0	119
- Pacific Ocean Shoreline	Total Coliform	16,707	**1,000**	594	308	**0%**	0	0	594
	Enterococcus	2,811	**35**	21				0	21
Tecolote HA (906.50)	Fecal Coliform	4,329	**200**	234				0	234
- Tecolote Creek	Total Coliform	21,349	**1,000**	1,171	308	**0%**	0	0	1,171
	Enterococcus	3,657	**33***	39				0	39
Mission San Diego HSA (907.11)	Fecal Coliform	4,928	**200**	1,506				0	1,506
and Santee HSA (907.12)	Total Coliform	28,988	**1,000**	7,529	279	**0%**	0	0	7,529
- Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles) - Pacific Ocean Shoreline	Enterococcus	4,106	**33***	248				0	248
Chollas HSA (908.22)	Fecal Coliform	5,068	**200**	398				0	398
- Chollas Creek	Total Coliform	25,080	**1,000**	1,991	300	**0%**	0	0	1,991
	Enterococcus	4,283	**33***	66				0	66

* Total Allowable Load [=TMDL] calculated using a Enterococcus numeric target of 33 MPN/mL that is conservatively protective of the REC-1 "designated beach" usage frequency for watersheds with impaired freshwater creeks.

Existing Bacteria Load = Predicted existing bacteria load discharged from the watershed calculated by the plug-flow reactor model using estimated flows and bacteria densities for 30 dry days during the critical year 1993

30-Day Geometric Mean Objective = Target bacteria densities based on numeric 30-day geometric mean water quality objectives that are protective of REC-1 beneficial uses
Allowable Numeric Objective Load = Allowable load from the watershed calculated by the plug-flow reactor model using estimated flows and the numeric 30-day geometric mean water quality objective bacteria densities for 30 dry days during the critical year 1993

Total Dry Days in Critical Year = Number of dry days (i.e., day not including rainfall events of 0.2 inches or greater and the following 72 hours) in the critical year 1993 (i.e., wettest year between 1990 and 2002)
Allowable Exceedance Frequency = Assumed to be zero; data collected from reference systems generally do not show exceedances of REC-1 water quality objectives
Allowable Wet Exceedance Days = (Total Dry Days in Critical Year) X (Allowable Exceedance Frequency)
Allowable Exceedance Load = Sum of exceedance loads from the allowable exceedance days for all dry days during the critical year 1993

Total Allowable Load [i.e. TMDL] = (Allowable Numeric Objective Load) + (Allowable Exceedance Load) for a 30-day period

Table 7-41. Wet Weather Fecal Coliform Bacteria Existing Loads, TMDLs, WLA, LAs Expressed as Annual Loads (Billion MPN/year)

Watershed	Total Watershed		Point Sources						Nonpoint Sources					
			Municipal MS4			Caltrans			Agriculture			Open		
	Existing Load	TMDL*	Existing Load	WLA*	Reduction Required	Existing Load	WLA*	Reduction Required	Existing Load	LA*	Reduction Required	Existing Load	LA*	Reduction Required
San Joaquin Hills/ Laguna Hills HSAs (901.11 and 901.12)	705,015	664,634	77,548	37,167	52.07%	179	179	0.00%	7,346	7,346	0.00%	619,942	619,942	0.00%
Aliso HSA (901.13)	1,752,096	1,579,073	650,092	477,069	26.62%	260	260	0.00%	26,508	26,508	0.00%	1,075,237	1,075,237	0.00%
Dana Point HSA (901.14)	403,911	377,313	179,043	152,446	14.86%	13	13	0.00%	0	0	0.00%	224,854	224,854	0.00%
Lower San Juan HSA (901.27)	15,304,790	14,714,833	1,326,469	1,156,419	12.82%	1,713	1,713	0.00%	3,275,477	2,855,570	12.82%	10,701,131	10,701,131	0.00%
San Clemente HA (901.30)	1,441,723	1,378,931	255,445	192,653	24.58%	335	335	0.00%	366	366	0.00%	1,185,577	1,185,577	0.00%
San Luis Rey HU (903.00)	33,120,012	32,444,242	943,501	914,026	3.12%	1,537	1,537	0.00%	20,687,954	20,041,659	3.12%	11,487,019	11,487,019	0.00%
San Marcos HA (904.50_	20,886	17,224	8,095	6,558	18.98%	8	8	0.00%	11,199	9,073	18.98%	1,585	1,585	0.00%
San Dieguito HU (905.00)	21,286,910	21,101,649	810,008	798,175	1.46%	1,310	1,310	0.00%	11,872,240	11,698,811	1.46%	8,603,352	8,603,352	0.00%
Miramar Reservoir HA (906.10)	10,392	10,256	6,839	6,703	1.99%	0	0	0.00%	0	0	0.00%	3,552	3,552	0.00%
Scripps HA (906.30)	204,057	176,907	128,403	101,253	21.14%	0	0	0.00%	0	0	0.00%	75,654	75,654	0.00%
Tecolote HA (906.5)	261,966	229,322	159,449	126,806	20.47%	553	553	0.00%	0	0	0.00%	101,963	101,963	0.00%
Mission San Diego/ Santee HSAs (907.11 and 907.12)	4,932,380 +1,302**	4,680,838 +1,302*	472,660	221,117	53.22%	1,009	1,009	0.00%	414,721	414,721	0.00%	4,043,991	4,043,991	0.00%
Chollas HSA (908.22)	603,863	520,440	335,901	252,479	24.84%	892	892	0.00%	0	0	0.00%	267,070	267,070	0.00%

* TMDLs, WLAs, and LAs calculated based on numeric targets consisting of the single sample maximum WQO for fecal coliform (400 MPN/100mL) and a 22 percent allowable exceedance frequency. Meeting the numeric targets in the discharge and/or receiving water indicate the TMDLs, WLAs, and/or LAs have been met.

** Permitted existing fecal coliform bacteria load from Padre Dam Municipal Water District Water Reclamation Plant (Padre Dam), assigned as a separate point source wasteload allocation for discharges from Padre Dam equal to the permitted existing load

Watershed Existing Load = Predicted existing fecal coliform bacteria loads discharged from all land use categories in the watershed calculated by the Loading Simulation Program in C++ (LSPC) model using modeled flows and bacteria densities for all wet days during the critical year 1993

Watershed TMDL = Total Maximum Daily Load (TMDL) or total allowable load (Allowable Numeric Objective Load + Allowable Exceedance Load) that can be discharged from all land uses in the watershed on an annual basis

MS4 Existing Load = Predicted exiting fecal coliform bacteria loads discharged from Municipal Separate Storm Sewer System (MS4) land use categories in the watershed (i.e., commercial/institutional, high density residential, low density residential, parks/recreation, military, transitional, and industrial/transportation, not including Caltrans transportation) calculated by the LSPC model

MS4 WLA = Point source wasteload allocation (WLA) for discharges from Municipal MS4 land uses

MS4 Reduction Required = Percent of the MS4 Existing Load that must be reduced to meet the MS4 WLA = (MS4 Existing Load – MS4 WLA)/(MS4 Existing Load)

Caltrans Existing Load = Predicted exiting fecal coliform bacteria loads discharged from Caltrans land use areas in the watershed calculated as a fraction of the discharge from industrial/transportation land use category area

Caltrans WLA = Point source wasteload allocation (WLA) for discharges from Caltrans land uses, assumed to be equal to Caltrans Existing Load

Caltrans Reduction Required = Percent of the Caltrans Existing Load that must be reduced to meet the Caltrans WLA = (Caltrans Existing Load – Caltrans WLA)/(Caltrans Existing Load)

Agriculture Existing Load = Predicted exiting fecal coliform bacteria loads discharged from Agriculture land use categories in the watershed (i.e., agriculture, dairy/livestock, horse ranch) calculated by the LSPC model

Agriculture LA = Non-point source load allocation (LA) for discharges from Agriculture land uses, assumed to be equal to Agriculture Existing Load in watersheds with existing bacteria load contributions for all three indicator bacteria of less than 5 percent; calculated as a relative load percent of the TMDL minus Caltrans WLA and Open Space LA, based on existing load contributions from MS4 and Agriculture land use categories in watersheds with existing bacteria load contributions for all three indicator bacteria of greater than 5 percent

Agriculture Reduction Required = Percent of the Agriculture Existing Load that must be reduced to meet the Agriculture LA = (Agriculture Existing Load – Agriculture LA)/(Agriculture Existing Load)

Open Existing Load = Predicted exiting fecal coliform bacteria loads discharged from Open Space land use categories in the watershed (i.e., open space, open recreation, water) calculated by the LSPC model

Open LA = Non-point source load allocation (LA) for discharges from Open Space land uses, assumed to be equal to the Open Space Existing Load

Open Reduction Required = Percent of the Open Space Existing Load that must be reduced to meet the Open Space LA = (Open Space Existing Load – Open Space LA)/(Open Space Existing Load)

Table 7-42. Wet Weather Total Coliform Bacteria Existing Loads, TMDLs, WLA, LAs Expressed as Annual Loads (Billion MPN/year)

	Total Watershed		Point Sources						Nonpoint Sources					
			Municipal MS4			Caltrans			Agriculture			Open		
Watershed	Existing Load	TMDL*	Existing Load	WLA*	Reduction Required	Existing Load	WLA*	Reduction Required	Existing Load	LA*	Reduction Required	Existing Load	LA*	Reduction Required
San Joaquin Hills/ Laguna Hills HSAs (901.11 and 901.12)	8,221,901	7,445,649	1,656,904	880,652	46.85%	7,722	7,722	0.00%	50,774	50,774	0.00%	6,506,501	6,506,501	0.00%
Aliso HSA (901.13)	23,210,774	20,190,798	11,943,241	8,923,264	25.29%	11,003	11,003	0.00%	179,828	179,828	0.00%	11,076,702	11,076,702	0.00%
Dana Point HSA (901.14)	6,546,962	6,031,472	3,919,497	3,404,008	13.15%	634	634	0.00%	0	0	0.00%	2,626,830	2,626,830	0.00%
Lower San Juan HSA (901.27)	130,258,863	122,879,189	19,919,322	16,093,160	19.21%	60,480	60,480	0.00%	18,499,884	14,946,372	19.21%	91,779,178	91,779,178	0.00%
San Clemente HA (901.30)	16,236,606	15,147,603	4,566,742	3,477,739	23.85%	13,534	13,534	0.00%	2,370	2,370	0.00%	11,653,960	11,653,960	0.00%
San Luis Rey HU (903.00)	231,598,677	224,150,535	15,229,456	14,373,954	5.62%	54,508	54,508	0.00%	117,360,800	110,768,160	5.62%	98,953,913	98,953,913	0.00%
San Marcos HA (904.50_	515,278	425,083	366,021	298,430	18.47%	533	533	0.00%	122,414	99,809	18.47%	26,311	26,311	0.00%
San Dieguito HU (905.00)	163,541,133	159,814,184	17,406,569	16,660,538	4.29%	47,969	47,969	0.00%	69,551,416	66,570,499	4.29%	76,535,178	76,535,178	0.00%
Miramar Reservoir HA (906.10)	212,986	210,180	174,243	171,436	1.61%	9	9	0.00%	0	0	0.00%	38,734	38,734	0.00%
Scripps HA (906.30)	5,029,519	4,356,973	4,120,310	3,447,764	16.32%	0	0	0.00%	0	0	0.00%	909,209	909,209	0.00%
Tecolote HA (906.5)	7,395,789	6,379,770	6,152,484	5,136,598	16.51%	27,095	27,095	0.00%	0	0	0.00%	1,216,077	1,216,077	0.00%
Mission San Diego/ Santee HSAs (907.11 and 907.12)	72,757,569	66,105,222	17,442,867	10,790,520	38.14%	53,141	53,141	0.00%	3,495,960	3,495,960	0.00%	51,765,601	51,765,601	0.00%
Chollas HSA (908.22)	15,390,608	13,247,626	12,023,766	9,880,784	17.82%	45,652	45,652	0.00%	0	0	0.00%	3,321,191	3,321,191	0.00%

* TMDLs, WLAs, and LAs calculated based on numeric targets consisting of the single sample maximum WQO for total coliform (10,000 MPN/100mL) and a 22 percent allowable exceedance frequency. Meeting the numeric targets in the discharge and/or receiving water indicate the TMDLs, WLAs, and/or LAs have been met.

Watershed Existing Load = Predicted existing total coliform bacteria loads discharged from all land use categories in the watershed calculated by the Loading Simulation Program in C++ (LSPC) model using modeled flows and bacteria densities for all wet days during the critical year 1993

Watershed TMDL = Total Maximum Daily Load (TMDL) or total allowable load (Allowable Numeric Objective Load + Allowable Exceedance Load) that can be discharged from all land uses in the watershed on an annual basis

MS4 Existing Load = Predicted exiting total coliform bacteria loads discharged from Municipal Separate Storm Sewer System (MS4) land use categories in the watershed (i.e., commercial/institutional, high density residential, low density residential, parks/recreation, military, transitional, and industrial/transportation, not including Caltrans transportation) calculated by the LSPC model

MS4 WLA = Point source wasteload allocation (WLA) for discharges from Municipal MS4 land uses

MS4 Reduction Required = Percent of the MS4 Existing Load that must be reduced to meet the MS4 WLA = (MS4 Existing Load – MS4 WLA)/(MS4 Existing Load)

Caltrans Existing Load = Predicted exiting total coliform bacteria loads discharged from Caltrans land use areas in the watershed calculated as a fraction of the discharge from industrial/transportation land use category area

Caltrans WLA = Point source wasteload allocation (WLA) for discharges from Caltrans land uses, assumed to be equal to Caltrans Existing Load

Caltrans Reduction Required = Percent of the Caltrans Existing Load that must be reduced to meet the Caltrans WLA = (Caltrans Existing Load – Caltrans WLA)/(Caltrans Existing Load)

Agriculture Existing Load = Predicted exiting total coliform bacteria loads discharged from Agriculture land use categories in the watershed (i.e., agriculture, dairy/livestock, horse ranch) calculated by the LSPC model

Agriculture LA = Non-point source load allocation (LA) for discharges from Agriculture land uses, assumed to be equal to Agriculture Existing Load in watersheds with existing bacteria load contributions for all three indicator bacteria of less than 5 percent; calculated as a relative load percent of the TMDL minus Caltrans WLA and Open Space LA, based on existing load contributions from MS4 and Agriculture land use categories in watersheds with existing bacteria load contributions for all three indicator bacteria of greater than 5 percent

Agriculture Reduction Required = Percent of the Agriculture Existing Load that must be reduced to meet the Agriculture LA = (Agriculture Existing Load – Agriculture LA)/(Agriculture Existing Load)

Open Existing Load = Predicted exiting total coliform bacteria loads discharged from Open Space land use categories in the watershed (i.e., open space, open recreation, water) calculated by the LSPC model

Open LA = Non-point source load allocation (LA) for discharges from Open Space land uses, assumed to be equal to the Open Space Existing Load

Open Reduction Required = Percent of the Open Space Existing Load that must be reduced to meet the Open Space LA = (Open Space Existing Load – Open Space LA)/(Open Space Existing Load)

Table 7-43. Wet Weather Enterococcus Bacteria Existing Loads, TMDLs, WLA, LAs Expressed as Annual Loads (Billion MPN/year)

	Total Watershed		Point Sources						Nonpoint Sources					
			Municipal MS4			Caltrans			Agriculture			Open		
Watershed	Existing Load	TMDL*	Existing Load	WLA*	Reduction Required	Existing Load	WLA*	Reduction Required	Existing Load	LA*	Reduction Required	Existing Load	LA*	Reduction Required
San Joaquin Hills/ Laguna Hills HSAs (901.11 and 901.12)	852,649	782,799	136,267	66,417	51.26%	365	365	0.00%	3,201	3,201	0.00%	712,816	712,816	0.00%
Aliso HSA (901.13)	2,230,206	1,950,964**	1,014,732	735,490	27.52%	516	516	0.00%	11,245	11,245	0.00%	1,203,713	1,203,713	0.00%
Dana Point HSA (901.14)	501,526	462,306	258,747	219,528	15.16%	25	25	0.00%	0	0	0.00%	242,753	242,753	0.00%
Lower San Juan HSA (901.27)	12,980,098	12,152,446**	1,900,520	1,385,094	27.12%	2,823	2,823	0.00%	1,151,266	839,040	27.12%	9,925,490	9,925,490	0.00%
San Clemente HA (901.30)	1,663,100	1,563,187	395,581	295,668	25.26%	635	635	0.00%	148	148	0.00%	1,266,736	1,266,736	0.00%
San Luis Rey HU (903.00)	18,439,920	17,463,618	1,472,296	1,300,235	11.69%	2,397	2,397	0.00%	6,881,755	6,077,514	11.69%	10,083,473	10,083,473	0.00%
San Marcos HA (904.50_	40,558	32,966	29,784	23,771	20.19%	26	26	0.00%	7,825	6,246	20.19%	2,923	2,923	0.00%
San Dieguito HU (905.00)	14,796,210	14,307,087	1,911,170	1,763,603	7.72%	2,288	2,288	0.00%	4,423,566	4,082,010	7.72%	8,459,187	8,459,187	0.00%
Miramar Reservoir HA (906.10)	11,564	11,405	8,269	8,109	1.93%	0	0	0.00%	0	0	0.00%	3,295	3,295	0.00%
Scripps HA (906.30)	377,839	324,032	285,842	232,035	18.82%	0	0	0.00%	0	0	0.00%	91,997	91,997	0.00%
Tecolote HA (906.5)	708,256	603,761**	575,708	471,211	18.15%	1,266	1,266	0.00%	0	0	0.00%	131,284	131,284	0.00%
Mission San Diego/ Santee HSAs (907.11 and 907.12)	7,255,759	6,590,966*	1,555,411	890,617	42.74%	2,430	2,430	0.00%	213,149	213,149	0.00%	5,484,770	5,484,770	0.00%
Chollas HSA (908.22)	1,371,972	1,152,645**	1,022,245	802,918	21.46%	2,062	2,062	0.00%	0	0	0.00%	347,665	347,665	0.00%

* TMDLs, WLAs, and LAs calculated based on numeric targets consisting of the single sample maximum WQO for enterococcus (104 MPN/100mL or 61 MPN/100mL) and a 22 percent allowable exceedance frequency. Meeting the numeric targets in the discharge and/or receiving water indicate the TMDLs, WLAs, and/or LAs have been met.

** Total Maximum Daily Load calculated using a Enterococcus numeric target of 61 MPN/mL that is conservatively protective of the REC-1 "designated beach" usage frequency for freshwater creeks and downstream beaches. If the usage frequency of the freshwater creeks can be established as "moderately to lightly used," alternative Total Maximum Daily Loads calculated using an Enterococcus numeric target of 104 MPN/ml presented in Table 7-44 may be used.

Watershed Existing Load = Predicted existing Enterococcus bacteria loads discharged from all land use categories in the watershed calculated by the Loading Simulation Program in C++ (LSPC) model using modeled flows and bacteria densities for all wet days during the critical year 1993

Watershed TMDL = Total Maximum Daily Load (TMDL) or total allowable load (Allowable Numeric Objective Load + Allowable Exceedance Load) that can be discharged from all land uses in the watershed on an annual basis

MS4 Existing Load = Predicted exiting Enterococcus bacteria loads discharged from Municipal Separate Storm Sewer System (MS4) land use categories in the watershed (i.e., commercial/institutional, high density residential, low density residential, parks/recreation, military, transitional, and industrial/transportation, not including Caltrans transportation) calculated by the LSPC model

MS4 WLA = Point source wasteload allocation (WLA) for discharges from Municipal MS4 land uses

MS4 Reduction Required = Percent of the MS4 Existing Load that must be reduced to meet the MS4 WLA = (MS4 Existing Load – MS4 WLA)/(MS4 Existing Load)

Caltrans Existing Load = Predicted exiting Enterococcus bacteria loads discharged from Caltrans land use areas in the watershed calculated as a fraction of the discharge from industrial/transportation land use category area

Caltrans WLA = Point source wasteload allocation (WLA) for discharges from Caltrans land uses, assumed to be equal to Caltrans Existing Load

Caltrans Reduction Required = Percent of the Caltrans Existing Load that must be reduced to meet the Caltrans WLA = (Caltrans Existing Load – Caltrans WLA)/(Caltrans Existing Load)

Agriculture Existing Load = Predicted exiting Enterococcus bacteria loads discharged from Agriculture land use categories in the watershed (i.e., agriculture, dairy/livestock, horse ranch) calculated by the LSPC model

Agriculture LA = Non-point source load allocation (LA) for discharges from Agriculture land uses, assumed to be equal to Agriculture Existing Load in watersheds with existing bacteria load contributions for all three indicator bacteria of less than 5 percent; calculated as a relative load percent of the TMDL minus Caltrans WLA and Open Space LA, based on existing load contributions from MS4 and Agriculture land use categories in watersheds with existing bacteria load contributions for all three indicator bacteria of greater than 5 percent

Agriculture Reduction Required = Percent of the Agriculture Existing Load that must be reduced to meet the Agriculture LA = (Agriculture Existing Load – Agriculture LA)/(Agriculture Existing Load)

Open Existing Load = Predicted exiting Enterococcus bacteria loads discharged from Open Space land use categories in the watershed (i.e., open space, open recreation, water) calculated by the LSPC model

Open LA = Non-point source load allocation (LA) for discharges from Open Space land uses, assumed to be equal to the Open Space Existing Load

Open Reduction Required = Percent of the Open Space Existing Load that must be reduced to meet the Open Space LA = (Open Space Existing Load – Open Space LA)/(Open Space Existing Load))

Table 7-44. Alternative Wet Weather Enterococcus Bacteria Existing Loads, TMDLs, WLA, LAs Expressed as Annual Loads (Billion MPN/year)

Watershed	Total Watershed		Point Sources						Nonpoint Sources					
			Municipal MS4			Caltrans			Agriculture			Open		
	Existing Load	TMDL*	Existing Load	WLA*	Reduction Required	Existing Load	WLA*	Reduction Required	Existing Load	LA*	Reduction Required	Existing Load	LA*	Reduction Required
Aliso HSA (901.13)	2,230,206	1,952,517**	1,014,732	737,042	27.37%	516	516	0.00%	11,245	11,245	0.00%	1,203,713	1,203,713	0.00%
Lower San Juan HSA (901.27)	12,980,098	12,159,138**	1,900,520	1,389,261	26.90%	2,823	2,823	0.00%	1,151,266	841,564	26.90%	9,925,490	9,925,490	0.00%
Tecolote HA (906.50)	708,256	604,180**	575,708	471,630	18.08%	1,266	1,266	0.00%	0	0	0.00%	131,284	131,284	0.00%
Mission San Diego/ Santee HSAs (907.11 and 907.12)	7,255,759	6,595,208**	1,555,411	894,859	42.47%	2,430	2,430	0.00%	213,149	213,149	0.00%	5,484,770	5,484,770	0.00%
Chollas HSA (908.22)	1,371,972	1,153,599**	1,022,245	803,871	21.36%	2,062	2,062	0.00%	0	0	0.00%	347,665	347,665	0.00%

* TMDLs, WLAs, and LAs calculated based on numeric targets consisting of the single sample maximum WQO for enterococcus (104 MPN/100mL) and a 22 percent allowable exceedance frequency. Meeting the numeric targets in the discharge and/or receiving water indicate the TMDLs, WLAs, and/or LAs have been met.

** Total Maximum Daily Load calculated using a Enterococcus numeric target of 104 MPN/ml protective of the REC-1 "moderately to lightly used area" usage frequency that is protective freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered "moderately to lightly used areas" must be provided before these alternative wet weather TMDLs, WLAs, and LAs can be implemented in these watersheds.

Watershed Existing Load Predicted existing Enterococcus bacteria loads discharged from all land use categories in the watershed calculated by the Loading Simulation Program in C++ (LSPC) model using modeled flows and bacteria densities for all wet days during the critical year 1993
Watershed TMDL = Total Maximum Daily Load (TMDL) or total allowable load (Allowable Numeric Objective Load + Allowable Exceedance Load) that can be discharged from all land uses in the watershed on an annual basis

MS4 Existing Load = Predicted exiting Enterococcus bacteria loads discharged from Municipal Separate Storm Sewer System (MS4) land use categories in the watershed (i.e., commercial/institutional, high density residential, low density residential, parks/recreation, military, transitional, and industrial/transportation, not including Caltrans transportation) calculated by the LSPC model
MS4 WLA = Point source wasteload allocation (WLA) for discharges from Municipal MS4 land uses
MS4 Reduction Required = Percent of the MS4 Existing Load that must be reduced to meet the MS4 WLA = (MS4 Existing Load – MS4 WLA)/(MS4 Existing Load)

Caltrans Existing Load = = Predicted exiting Enterococcus bacteria loads discharged from Caltrans land use areas in the watershed calculated as a fraction of the discharge from industrial/transportation land use category area
Caltrans WLA = Point source wasteload allocation (WLA) for discharges from Caltrans land uses, assumed to be equal to Caltrans Existing Load
Caltrans Reduction Required = Percent of the Caltrans Existing Load that must be reduced to meet the Caltrans WLA = (Caltrans Existing Load – Caltrans WLA)/(Caltrans Existing Load)

Agriculture Existing Load = Predicted exiting Enterococcus bacteria loads discharged from Agriculture land use categories in the watershed (i.e., agriculture, dairy/livestock, horse ranch) calculated by the LSPC model
Agriculture LA = Non-point source load allocation (LA) for discharges from Agriculture land uses, assumed to be equal to Agriculture Existing Load in watersheds with existing bacteria load contributions for all three indicator bacteria of less than 5 percent; calculated as a relative load percent of the TMDL minus Caltrans WLA and Open Space LA, based on existing load contributions from MS4 and Agriculture land use categories in watersheds with existing bacteria load contributions for all three indicator bacteria of greater than 5 percent
Agriculture Reduction Required = Percent of the Agriculture Existing Load that must be reduced to meet the Agriculture LA = (Agriculture Existing Load – Agriculture LA)/(Agriculture Existing Load)

Open Existing Load = Predicted exiting Enterococcus bacteria loads discharged from Open Space land use categories in the watershed (i.e., open space, open recreation, water) calculated by the LSPC model
Open LA = Non-point source load allocation (LA) for discharges from Open Space land uses, assumed to be equal to the Open Space Existing Load
Open Reduction Required = Percent of the Open Space Existing Load that must be reduced to meet the Open Space LA = (Open Space Existing Load – Open Space LA)/(Open Space Existing Load)

Table 7-45. Dry Weather Fecal Coliform Bacteria Existing Loads, TMDLs, WLA, LAs Expressed as Monthly Loads (Billion MPN/month)

	Total Watershed		Point Sources						Nonpoint Sources					
			Municipal MS4			Caltrans			Agriculture			Open		
Watershed	Existing Load	TMDL*	Existing Load	WLA*	Reduction Required	Existing Load	WLA*	Reduction Required	Existing Load	LA*	Reduction Required	Existing Load	LA*	Reduction Required
San Joaquin Hills/ Laguna Hills HSAs (901.11 and 901.12)	2,741	227	2,741	227	91.72%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Aliso HSA (901.13)	5,470	242	5,470	242	95.58%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Dana Point HSA (901.14)	1,851	92	1,851	92	95.03%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Lower San Juan HSA (901.27)	6,455	1,665	6,455	1,665	74.21%	0	0	0.00%	0	0	0.00%	0	0	0.00%
San Clemente HA (901.30)	3,327	192	3,327	192	94.23%	0	0	0.00%	0	0	0.00%	0	0	0.00%
San Luis Rey HU (903.00)	1,737	1,058	1,737	1,058	39.09%	0	0	0.00%	0	0	0.00%	0	0	0.00%
San Marcos HA (904.50_	149	26	149	26	82.55%	0	0	0.00%	0	0	0.00%	0	0	0.00%
San Dieguito HU (905.00)	1,631	1,293	1,631	1,293	20.72%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Miramar Reservoir HA (906.10)	205	7	205	7	96.59%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Scripps HA (906.30)	3,320	119	3,320	119	96.42%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Tecolote HA (906.5)	4,329	234	4,329	234	94.59%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Mission San Diego/ Santee HSAs (907.11 and 907.12)	4,928 +461**	1,506 +461*	4,928	1,506	69.44%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Chollas HSA (908.22)	5,068	398	5,068	398	92.15%	0	0	0.00%	0	0	0.00%	0	0	0.00%

* TMDLs, WLAs, and LAs calculated based on numeric targets consisting of the 30-day geometric mean WQO for fecal coliform (200 MPN/100mL) and a 0 percent allowable exceedance frequency. Meeting the numeric targets in the discharge and/or receiving water indicate the TMDLs, WLAs, and/or LAs have been met.

** Permitted existing fecal coliform bacteria load from Padre Dam Municipal Water District Water Reclamation Plant (Padre Dam), assigned as a separate point source wasteload allocation for discharges from Padre Dam equal to the permitted existing load

Watershed Existing Load = Predicted existing fecal coliform bacteria loads discharged from all land use categories in the watershed calculated by a plug-flow reactor model using estimated flows and bacteria densities for 30 dry days during the critical year 1993
Watershed TMDL = Total Maximum Daily Load (TMDL) or total allowable load (Allowable Numeric Objective Load + Allowable Exceedance Load) that can be discharged from all land uses in the watershed for a 30-day period

MS4 Existing Load = Predicted exiting fecal coliform bacteria loads discharged from Municipal Separate Storm Sewer System (MS4) land use categories in the watershed (i.e., commercial/institutional, high density residential, low density residential, parks/recreation, military, transitional, and industrial/transportation, not including Caltrans transportation) calculated by the plug-flow reactor model
MS4 WLA = Point source wasteload allocation (WLA) for discharges from Municipal MS4 land uses
MS4 Reduction Required = Percent of the MS4 Existing Load that must be reduced to meet the MS4 WLA = (MS4 Existing Load – MS4 WLA)/(MS4 Existing Load)

Caltrans Existing Load = Fecal coliform bacteria loads discharged from Caltrans land use areas in the watershed assumed to be unlikely during dry weather conditions, or zero bacteria load during dry weather
Caltrans WLA = Point source wasteload allocation (WLA) for discharges from Caltrans land uses, assumed to be equal to the Caltrans Existing Load
Caltrans Reduction Required = Percent of the Caltrans Existing Load that must be reduced to meet the Caltrans WLA = (Caltrans Existing Load – Caltrans WLA)/(Caltrans Existing Load)

Agriculture Existing Load = Fecal coliform bacteria loads discharged from Agriculture land use categories in the watershed (i.e., agriculture, dairy/livestock, horse ranch) assumed to be unlikely during dry weather conditions, or zero bacteria load during dry weather
Agriculture LA = Non-point source load allocation (LA) for discharges from Agriculture land uses, assumed to be equal to the Open Space Existing Load
Agriculture Reduction Required = Percent of the Agriculture Existing Load that must be reduced to meet the Agriculture LA = (Agriculture Existing Load – Agriculture LA)/(Agriculture Existing Load)

Open Existing Load = Fecal coliform bacteria loads discharged from Open Space land use categories in the watershed (i.e., open space, open recreation, water) assumed to be unlikely during dry weather conditions, or zero bacteria load during dry weather
Open LA = Non-point source load allocation (LA) for discharges from Open Space land uses, assumed to be equal to the Open Space Existing Load
Open Reduction Required = Percent of the Open Space Existing Load that must be reduced to meet the Open Space LA = (Open Space Existing Load – Open Space LA)/(Open Space Existing Load)

Table 7-46. Dry Weather Total Coliform Bacteria Existing Loads, TMDLs, WLA, LAs Expressed as Monthly Loads (Billion MPN/month)

Watershed	Total Watershed		Point Sources						Nonpoint Sources					
			Municipal MS4			Caltrans			Agriculture			Open		
	Existing Load	TMDL*	Existing Load	WLA*	Reduction Required	Existing Load	WLA*	Reduction Required	Existing Load	LA*	Reduction Required	Existing Load	LA*	Reduction Required
San Joaquin Hills/ Laguna Hills HSAs (901.11 and 901.12)	13,791	1,134	13,791	1,134	91.78%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Aliso HSA (901.13)	26,639	1,208	26,639	1,208	95.47%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Dana Point HSA (901.14)	9,315	462	9,315	462	95.04%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Lower San Juan HSA (901.27)	30,846	8,342	30,846	8,342	72.96%	0	0	0.00%	0	0	0.00%	0	0	0.00%
San Clemente HA (901.30)	16,743	958	16,743	958	94.28%	0	0	0.00%	0	0	0.00%	0	0	0.00%
San Luis Rey HU (903.00)	8,549	5,289	8,549	5,289	38.13%	0	0	0.00%	0	0	0.00%	0	0	0.00%
San Marcos HA (904.50_	751	129	751	129	82.82%	0	0	0.00%	0	0	0.00%	0	0	0.00%
San Dieguito HU (905.00)	7,555	6,468	7,555	6,468	14.39%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Miramar Reservoir HA (906.10)	1,030	36	1,030	36	96.50%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Scripps HA (906.30)	16,707	594	16,707	594	96.44%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Tecolote HA (906.5)	21,349	1,171	21,349	1,171	94.51%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Mission San Diego/ Santee HSAs (907.11 and 907.12)	28,988	7,529	28,988	7,529	74.03%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Chollas HSA (908.22)	25,080	1,991	25,080	1,991	92.06%	0	0	0.00%	0	0	0.00%	0	0	0.00%

* TMDLs, WLAs, and LAs calculated based on numeric targets consisting of the 30-day geometric mean WQO for total coliform (1,000 MPN/100mL) and a 0 percent allowable exceedance frequency. Meeting the numeric targets in the discharge and/or receiving water indicate the TMDLs, WLAs, and/or LAs have been met.

Watershed Existing Load = Predicted existing total coliform bacteria loads discharged from all land use categories in the watershed calculated by a plug-flow reactor model using estimated flows and bacteria densities for 30 dry days during the critical year 1993
Watershed TMDL = Total Maximum Daily Load (TMDL) or total allowable load (Allowable Numeric Objective Load + Allowable Exceedance Load) that can be discharged from all land uses in the watershed for a 30-day period

MS4 Existing Load = Predicted exiting total coliform bacteria loads discharged from Municipal Separate Storm Sewer System (MS4) land use categories in the watershed (i.e., commercial/institutional, high density residential, low density residential, parks/recreation, military, transitional, and industrial/transportation, not including Caltrans transportation) calculated by the plug-flow reactor model
MS4 WLA = Point source wasteload allocation (WLA) for discharges from Municipal MS4 land uses
MS4 Reduction Required = Percent of the MS4 Existing Load that must be reduced to meet the MS4 WLA = (MS4 Existing Load – MS4 WLA)/(MS4 Existing Load)

Caltrans Existing Load = Total coliform bacteria loads discharged from Caltrans land use areas in the watershed assumed to be unlikely during dry weather conditions, or zero bacteria load during dry weather
Caltrans WLA = Point source wasteload allocation (WLA) for discharges from Caltrans land uses, assumed to be equal to the Caltrans Existing Load
Caltrans Reduction Required = Percent of the Caltrans Existing Load that must be reduced to meet the Caltrans WLA = (Caltrans Existing Load – Caltrans WLA)/(Caltrans Existing Load)

Agriculture Existing Load = Total coliform bacteria loads discharged from Agriculture land use categories in the watershed (i.e., agriculture, dairy/livestock, horse ranch) assumed to be unlikely during dry weather conditions, or zero bacteria load during dry weather
Agriculture LA = Non-point source load allocation (LA) for discharges from Agriculture land uses, assumed to be equal to the Open Space Existing Load
Agriculture Reduction Required = Percent of the Agriculture Existing Load that must be reduced to meet the Agriculture LA = (Agriculture Existing Load – Agriculture LA)/(Agriculture Existing Load)

Open Existing Load = Total coliform bacteria loads discharged from Open Space land use categories in the watershed (i.e., open space, open recreation, water) assumed to be unlikely during dry weather conditions, or zero bacteria load during dry weather
Open LA = Non-point source load allocation (LA) for discharges from Open Space land uses, assumed to be equal to the Open Space Existing Load
Open Reduction Required = Percent of the Open Space Existing Load that must be reduced to meet the Open Space LA = (Open Space Existing Load – Open Space LA)/(Open Space Existing Load)

Table 7-47. Dry Weather Enterococcus Bacteria Existing Loads, TMDLs, WLA, LAs Expressed as Monthly Loads (Billion MPN/month)

	Total Watershed		Point Sources						Nonpoint Sources					
			Municipal MS4			Caltrans			Agriculture			Open		
Watershed	Existing Load	TMDL*	Existing Load	WLA*	Reduction Required	Existing Load	WLA*	Reduction Required	Existing Load	LA*	Reduction Required	Existing Load	LA*	Reduction Required
San Joaquin Hills/ Laguna Hills HSAs (901.11 and 901.12)	2,321	40	2,321	40	98.28%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Aliso HSA (901.13)	4,614	40**	4,614	40	99.13%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Dana Point HSA (901.14)	1,567	16	1,567	16	98.98%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Lower San Juan HSA (901.27)	5,433	275**	5,433	275	94.94%	0	0	0.00%	0	0	0.00%	0	0	0.00%
San Clemente HA (901.30)	2,817	33	2,817	33	98.83%	0	0	0.00%	0	0	0.00%	0	0	0.00%
San Luis Rey HU (903.00)	1,466	185	1,466	185	87.38%	0	0	0.00%	0	0	0.00%	0	0	0.00%
San Marcos HA (904.50_	126	5	126	5	96.03%	0	0	0.00%	0	0	0.00%	0	0	0.00%
San Dieguito HU (905.00)	1,368	226	1,368	226	83.48%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Miramar Reservoir HA (906.10)	173	1	173	1	99.42%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Scripps HA (906.30)	2,811	21	2,811	21	99.25%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Tecolote HA (906.5)	3,657	39**	3,657	39	98.94%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Mission San Diego/ Santee HSAs (907.11 and 907.12)	4,106	248**	4,106	248	93.96%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Chollas HSA (908.22)	4,283	66**	4,283	66	98.46%	0	0	0.00%	0	0	0.00%	0	0	0.00%

* TMDLs, WLAs, and LAs calculated based on numeric targets consisting of the 30-day geometric mean WQO for enterococcus (35 MPN/100mL or 33 MPN/100mL) and a 0 percent allowable exceedance frequency. Meeting the numeric targets in the discharge and/or receiving water indicate the TMDLs, WLAs, and/or LAs have been met.

** Total Maximum Daily Load calculated using a Enterococcus numeric target of 33 MPN/mL that is conservatively protective of the REC-1 "designated beach" usage frequency for freshwater creeks and downstream beaches.

Watershed Existing Load = Predicted existing Enterococcus bacteria loads discharged from all land use categories in the watershed calculated by a plug-flow reactor model using estimated flows and bacteria densities for 30 dry days during the critical year 1993
Watershed TMDL = Total Maximum Daily Load (TMDL) or total allowable load (Allowable Numeric Objective Load + Allowable Exceedance Load) that can be discharged from all land uses in the watershed for a 30-day period

MS4 Existing Load = Predicted exiting Enterococcus bacteria loads discharged from Municipal Separate Storm Sewer System (MS4) land use categories in the watershed (i.e., commercial/institutional, high density residential, low density residential, parks/recreation, military, transitional, and industrial/transportation, not including Caltrans transportation) calculated by the plug-flow reactor model
MS4 WLA = Point source wasteload allocation (WLA) for discharges from MS4 land uses
MS4 Reduction Required = Percent of the MS4 Existing Load that must be reduced to meet the MS4 WLA = (MS4 Existing Load – MS4 WLA)/(MS4 Existing Load)

Caltrans Existing Load = Enterococcus bacteria loads discharged from Caltrans land use areas in the watershed assumed to be unlikely during dry weather conditions, or zero bacteria load during dry weather
Caltrans WLA = Point source wasteload allocation (WLA) for discharges from Caltrans land uses, assumed to be equal to the Caltrans Existing Load
Caltrans Reduction Required = Percent of the Caltrans Existing Load that must be reduced to meet the Caltrans WLA = (Caltrans Existing Load – Caltrans WLA)/(Caltrans Existing Load)

Agriculture Existing Load = Enterococcus bacteria loads discharged from Agriculture land use categories in the watershed (i.e., agriculture, dairy/livestock, horse ranch) assumed to be unlikely during dry weather conditions, or zero bacteria load during dry weather
Agriculture LA = Non-point source load allocation (LA) for discharges from Agriculture land uses, assumed to be equal to the Open Space Existing Load
Agriculture Reduction Required = Percent of the Agriculture Existing Load that must be reduced to meet the Agriculture LA = (Agriculture Existing Load – Agriculture LA)/(Agriculture Existing Load)

Open Existing Load = Enterococcus bacteria loads discharged from Open Space land use categories in the watershed (i.e., open space, open recreation, water) assumed to be unlikely during dry weather conditions, or zero bacteria load during dry weather
Open LA = Non-point source load allocation (LA) for discharges from Open Space land uses, assumed to be equal to the Open Space Existing Load
Open Reduction Required = Percent of the Open Space Existing Load that must be reduced to meet the Open Space LA = (Open Space Existing Load – Open Space LA)/(Open Space Existing Load)

(h) TMDL Implementation Plan

The ultimate goal of the Implementation Plan is to restore the impaired beneficial uses of the waterbodies addressed by these TMDLs. Restoring the impaired beneficial uses will be accomplished by achieving the TMDLs in the receiving waters, and the wasteload allocations (WLAs) for point sources and load allocations (LAs) for nonpoint sources. The actions taken by the San Diego Water Board depends on the regulatory authority and the source. The regulatory authorities and actions that the San Diego Water Board will use to compel the controllable sources to implement these TMDLs are as follows.

(1) Basin Plan Waste Discharge Prohibitions

The San Diego Water Board may specify certain conditions or areas where the discharge of waste or certain types of waste is not permitted, known as "waste discharge prohibitions," in the Basin Plan.[41] Basin Plan waste discharge prohibitions that are applicable to the implementation of these TMDLs include the following:

- The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in Water Code section 13050, is prohibited.

- The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the Regional Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

- The dumping, deposition, or discharge of waste directly into waters of the state, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the Regional Board.

- Any discharge to a storm water conveyance system that is not composed entirely of "storm water" is prohibited unless authorized by the Regional Board. [The federal regulations, 40 CFR 122.26(b)(13), define storm water as storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from fire fighting activities.] [Section 122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

- The unauthorized discharge of treated or untreated sewage to waters of the state or to a storm water conveyance system is prohibited.

Existing discharges are violating one or more of these of these Basin Plan prohibitions. The existing Basin Plan prohibitions are consistent with the TMDLs, WLAs, and LAs. If necessary, the San Diego Water Board may amend the Basin Plan to revise current waste discharge prohibitions or include new waste discharge prohibitions. The controllable sources must comply with the Basin Plan waste discharge prohibitions.

(2) Waste Discharge Requirements

The primary regulatory authority used by the San Diego Water Board to protect water resources and water quality in the San Diego Region is the issuance of waste discharge requirements (WDRs).[42] The San Diego Water Board will issue, or revise and re-issue WDRs to point sources and/or nonpoint sources in the San Diego Region to be consistent with the TMDLs, WLAs, and LAs. The controllable sources regulated under WDRs must comply with the requirements to be consistent with the TMDLs, WLAs, and LAs. Specific

[41] Authorized pursuant to Water Code section 13243
[42] Authorized pursuant to Water Code sections 13263 and 13264

San Diego Water Board actions with regard to WDRs for point sources and nonpoint sources are discussed in the following subsections.

(A) Point Sources

The San Diego Water Board regulates discharges from point sources to surface waters with WDRs that implement federal NPDES regulations (NPDES requirements). NPDES requirements must contain water quality-based effluent limitations (WQBELs) consistent with the assumptions and requirements of the WLAs of any applicable TMDL.[43]

When developing WQBELs to be incorporated in to NPDES requirements, the following summarizes the requirements and assumptions included in the calculation of the TMDLs, WLAs, and LAs that should be considered:

Numeric Targets

- The numeric targets consist of the numeric WQOs from the Basin Plan and/or Ocean Plan and an allowable exceedance frequency.
- The numeric targets for the wet weather TMDLs consist of the REC-1 single sample maximum WQOs and a 22 percent allowable exceedance frequency.
- The numeric targets for dry weather TMDLs consist of the REC-1 30-day geometric metric mean WQOs and a 0 percent allowable exceedance frequency.
- The TMDL calculations are based on either the single sample maximum WQO (for wet weather) or 30-day geometric mean WQOs (for dry weather), but both the single sample maximum and 30-day geometric mean numeric WQOs and allowable exceedance frequencies must be met in the receiving waters.
- The TMDLs, and in turn the WLAs for point sources and LAs for nonpoint sources, are assumed to be met when the numeric targets for all three indicator bacteria (fecal coliform, total coliform, and *Enterococcus*) are met in the receiving waters.

Critical Conditions

- The mass-load based TMDLs were calculated under critical conditions consisting of flows generated during a critical wet year and estimation of existing and allowable loads at a critical location.
- The flow from the critical wet year is a "worst case" annual wet weather flow and loading scenario. Actual annual wet weather flow and loading will vary from year to year.
- The mass-load based TMDLs calculated at the critical location are dependent on the flow, which can vary from year to year, but the numeric targets will not vary. When the numeric targets are met in the receiving water, the TMDLs are assumed to be met.
- The mass-load based TMDLs, WLAs, and LAs are calculated for the critical location, but the appropriate numeric targets (based on freshwater and/or saltwater REC-1 WQOs and allowable exceedance frequencies) must be met throughout the waterbodies addressed by these TMDLs.

Linkage Analysis

- The linkage analysis was performed by utilizing calibrated and validated models to predict flow from surface runoff and predict bacteria densities under the critical conditions (i.e., during the critical wet year at the critical location). Existing mass loads and allowable mass loads (i.e., TMDLs) were calculated for each watershed. The existing mass loads were calculated based on model-predicted flow and model-predicted bacteria densities. The allowable mass loads (i.e., TMDLs) were calculated based on model-predicted flow and the numeric targets (i.e., numeric WQOs and allowable exceedance frequencies).
- The wet weather existing mass loads and allowable mass loads (i.e., wet weather mass-load based TMDLs) are calculated assuming surface runoff is generated by rainfall from storm events and discharged from all land use categories to receiving waters.

[43] Code of Federal Regulations Title 40 section 122.44(d)(1)(vii)(B)

- The dry weather existing mass loads and allowable mass loads (i.e., dry weather mass-load based TMDLs) are calculated assuming surface runoff is generated only by anthropogenic activities and discharged from specific land use categories to receiving waters. The possible contribution of subsurface or groundwater flows to bacteria loads in receiving waters during dry weather was not accounted for in any land use category.

Allocations

- Each mass-load based TMDL is allocated to known point sources and nonpoint sources. Wasteload allocations (WLAs) are assigned to point sources, and load allocations (LAs) are assigned to nonpoint sources. WLAs and LAs are the maximum load a source can discharge and still achieve the TMDL in the receiving water.
- The TMDLs, and in turn the WLAs for point sources and LAs for nonpoint sources, are assumed to be met when the numeric targets are met in the receiving waters.
- The sources were identified based on land use and grouped in to Municipal MS4, Caltrans MS4 (Caltrans), Agriculture, and Open Space categories. The Municipal MS4 and Caltrans land use categories are point sources, and the Agriculture and Open Space land use categories are nonpoint sources.
- Sources that are not identified are assumed to be assigned a zero allowable load as part of the mass-load based TMDL (i.e., WLA = 0 or LA = 0). In other words, discharges of pollutant loads from these sources are not expected or allowed as part of the TMDLs.
- Sources that are assigned an allowable load equal to the existing mass load as part of the mass-load based TMDL (i.e., WLA or LA = existing mass load) are not expected or allowed to increase their mass load in the future. In other words, discharges of pollutant loads (i.e., flows and bacteria densities) from these sources are not allowed to increase.
- The allocation of the dry weather mass-load based TMDLs assumes that no surface runoff discharge to receiving waters occurs from Caltrans, Agriculture, or Open Space land use categories (i.e., $WLA_{Caltrans} = 0$, $LA_{Agriculture} = 0$, and $LA_{OpenSpace} = 0$), meaning the entire dry weather mass-load based TMDL (i.e., allowable mass load) is allocated to Municipal MS4 land use categories (i.e., WLA_{MS4} = TMDL) (see Tables 7-45 through 7-47).
- The allocation of the wet weather mass-load based TMDLs assumes surface runoff discharge occurs from all land use categories, and allocated according to the following steps (see Tables 7-41 through 7-44):
  1) Sources are separated in to controllable and uncontrollable sources. Discharges from Municipal MS4, Caltrans, and Agriculture land use categories are assumed to be controllable (i.e., subject to regulation), and discharges from Open Space land use categories are assumed to be uncontrollable (i.e., not subject to regulation).
  2) Because discharges from Open Space land use categories are uncontrollable (i.e., not subject to regulation), the LAs for Open Space land use categories are set equal to the existing mass loads calculated under the critical conditions.
  3) For discharges from controllable land use categories that do not contribute more than 5 percent of the total existing mass load for all three indicator bacteria, the WLA or LA is set equal to the existing mass loads from those land uses calculated under the critical conditions.
  4) After the WLAs and LAs are assigned based on steps 2 and 3, the remaining portion of the mass-load based TMDL is assigned to discharges from controllable land use categories that contribute more than 5 percent of the total existing mass load for all three indicator bacteria. The allowable mass load for each source (WLA or LA) is calculated based on the ratio of the existing mass loads from those sources relative to each other.

Load Reductions

- The load reductions required to meet the mass-load based TMDLs, WLAs, and LAs are based on reducing the loads compared to pollutant loads from 2001 to 2002.
- Load reductions for each source are calculated based on the difference between the existing mass load and the mass-load based WLA or LA for each source (see Tables 7-41 through 7-47).

- WLAs and LAs that are set equal to the existing mass loads do not require load reductions to be calculated, but this also means that existing mass loads from those sources cannot increase over time (i.e., pollutant loads should be less than or equal to pollutant loads relative to 2001 to 2002).
- The load reductions needed to meet the WLAs for point sources and LAs for nonpoint sources are assumed to be achieved when the numeric targets are met in the receiving waters.

The persons identified as responsible for point source discharges causing or contributing to bacteria impairments at the beaches and creeks addressed in these TMDLs include:

- Phase I MS4s,
- Phase II MS4s,
- Caltrans,
- POTWs and wastewater collection systems, and
- CAFOs.

According to Tables 7-41 through 7-47, Municipal (Phase I and Phase II) MS4s and Caltrans are the only point sources that have been assigned WLAs. POTWs,[44] CAFOs, and any other unidentified point sources were not assigned WLAs, which is equivalent to being assigned a WLA of zero. All these identified point sources are subject to NPDES regulations.

In order for the WDRs, NPDES requirements, and discharges from these point sources to be consistent with the TMDLs and WLAs, the San Diego Water Board will issue or revise and re-issue the WDRs for these point sources as follows:

(i) Phase I MS4s

The TMDLs and Municipal MS4 WLAs, with respect to discharges from Phase I MS4s, will be implemented primarily by revising and re-issuing the existing NPDES requirements that have been issued for Phase I MS4 discharges.

The Phase I MS4s subject to these TMDLs are regulated under San Diego Water Board WDRs that implement NPDES requirements.[45] The NPDES requirements regulating the Phase I MS4s include discharge prohibitions and receiving water limitations that are applicable to the implementation of these TMDLs, as summarized below:

- Discharges from MS4s are subject to all Basin Plan prohibitions.

- Discharges from MS4s that cause or contribute to the violation of water quality standards (designated beneficial uses and water quality objectives developed to protect beneficial uses) are prohibited.

- Discharges into and from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance, in waters of the state are prohibited.

- Effectively prohibit all types of non-storm water discharges into the MS4 unless such discharges are either authorized by separate NPDES requirements, or not prohibited (i.e., exempted) by the NPDES requirements regulating the MS4. Exempted non-storm water discharges into the MS4 are not prohibited unless the discharge category is identified as a significant source of pollutants to waters of the United States.

[44] Not including Padre Dam, which has been allocated a fecal coliform TMDL based on the effluent limitations in the WDRs for Padre Dam

[45] Phase I MS4s in Orange County are regulated under San Diego Water Board Order No. R9-2002-0001 or subsequent orders; Phase I MS4s in San Diego County are regulated under San Diego Water Board Order No. R9-2007-0001 or subsequent orders.

The available data reported by the Phase I MS4s and the results of the technical TMDL analysis indicate that discharges into and from MS4s are in violation of the discharge prohibitions and receiving water limitations above. Enforcement of the current discharge prohibitions and receiving water limitations is an action that the San Diego Water Board can immediately implement to compel the MS4s to reduce discharge of bacteria to the receiving waters.

In addition to the discharge prohibitions and receiving water limitations, WQBELs consistent with the assumptions and requirements of the WLAs of any applicable TMDL must also be incorporated into the NPDES requirements. The San Diego Water Board will revise and re-issue the WDRs and NPDES requirements for Phase I MS4s to incorporate the following:

- WQBELs consistent with the requirements and assumptions of the Municipal MS4 WLAs. WQBELs may be expressed as numeric effluent limitations, when feasible, and/or as a BMP program of expanded or better-tailored BMPs.[46]

- If the WQBELs include a BMP program, periodic reporting requirements on BMP planning, implementation, and effectiveness in improving water quality at impaired beaches and creeks (i.e., progress reports). Progress reports will also be required to include water quality monitoring results. Progress reports will be required as long as necessary to ensure that the beneficial uses of the impaired waterbodies have been restored and maintained.

- Compliance schedule for Phase I MS4s to attain the MS4 WLAs and TMDLs in the receiving waters.

The WQBELs will likely consist of receiving water limitations (based on the numeric targets) and require the implementation of a BMP program to achieve the TMDLs in the receiving waters. The Phase I MS4s will be required to submit Bacteria Load Reduction Plans (BLRPs) or Comprehensive Load Reduction Plans (CLRPs) outlining a proposed BMP program that will be capable of achieving the necessary load reductions required to attain the TMDLs in the receiving waters, acceptable to the San Diego Water Board, within 18 months after the effective date of these TMDLs.[47] The San Diego Water Board will require the BLRPs or CLRPs to be developed on a watershed or region wide scale. The BLRPs or CLRPs should be developed and incorporated as part of the Watershed Runoff Management Programs required under the Phase I MS4 NPDES requirements. Ideally, the Phase I MS4s and Caltrans will develop and coordinate the elements of their BLRPs or CLRPs together.

If the receiving water limitations (based on the numeric targets) are met in the receiving waters, the assumption will be that the MS4s have met their WLAs. If, however, the receiving water limitations are not being met in the receiving waters, the Phase I MS4s will be responsible for reducing their bacteria loads and/or demonstrating that controllable anthropogenic discharges from the Phase I MS4s are not causing the exceedances, as outlined below in the Monitoring for TMDL Compliance section below.

(ii) Phase II MS4s

The TMDLs and MS4 WLAs, with respect to discharges from Phase II MS4s, will be implemented primarily by requiring compliance with the existing general WDRs and NPDES requirements that have been issued for Phase II MS4 discharges. Phase II MS4s are subject to regulation under State Water Board general WDRs implementing NPDES requirements.[48]

Owners and operators of Phase II MS4s in the watersheds subject to these TMDLs, identified by the San Diego Water Board as significant sources of bacteria discharging to the receiving waters and/or

[46] Code of Federal Regulations Title 40 section 122.44(k)(2)&(3)
[47] The effective date is the date the Office of Administrative Law approves this Basin Plan amendment.
[48] Phase II MS4s in the San Diego Region are subject to regulation under State Water Board Order No. 2003-0005-DWQ, or subsequent orders.

Phase I MS4s, will be required to submit a Notice of Intent[49] to comply with the NPDES requirements in the State Water Board general WDRs as soon as possible after the effective date of these TMDLs.[50] Once enrolled under the general WDRs, Phase II MS4 owners and operators are required to comply with the provisions of the State Water Board general WDRs and NPDES requirements to reduce the discharge of bacteria as specified in their Stormwater Management Plans/Programs (SWMPs).

For any individual Phase II MS4s that are identified as a significant source of pollutants, the San Diego Water Board may also issue individual WDRs requiring the implementation of WQBELs that are consistent with the requirements and assumptions of the Municipal MS4 WLAs. Upon issuance of such individual WDRs by the San Diego Water Board, the State Water Board general WDRs for Phase II MS4s shall no longer regulate the affected individual Phase II MS4s.[51]

Similarly, for any category of Phase II MS4s that are identified as a significant source of pollutants, the San Diego Water Board may issue general WDRs requiring the implementation of WQBELs that are consistent with the requirements and assumptions of the Municipal MS4 WLAs above. Upon issuance of such general WDRs by the San Diego Water Board, the State Water Board general WDRs for Phase II MS4s shall no longer regulate the affected category of Phase II MS4s.[52]

In the event that the San Diego Water Board issues individual or general WDRs for Phase II MS4s in the San Diego Region, the WQBELs will likely consist of receiving water limitations (based on the numeric targets) and require the implementation of a BMP program to achieve the TMDLs in the receiving waters. The Phase II MS4s will likely be required to submit Bacteria Load Reduction Plans (BLRPs) or Comprehensive Load Reduction Plans (CLRPs) outlining a proposed BMP program that will be capable of achieving the necessary load reductions required to attain the TMDLs in the receiving water, acceptable to the San Diego Water Board. When and where possible, the San Diego Water Board will require the BLRPs or CLRPs to be developed on a watershed or region wide scale and have the Phase II MS4 BMP programs coordinate with the BMPs programs for Phase I MS4s and Caltrans.

If the receiving water limitations (based on the numeric targets) are met in the receiving waters, the assumption will be that the Phase II MS4s have met their WLAs. If, however, the receiving water limitations are not being met in the receiving waters and one or more Phase II MS4 dischargers are identified as sources of bacteria causing exceedances, the specific Phase II MS4s will be responsible for reducing their bacteria loads and/or demonstrating that controllable anthropogenic discharges from those specific Phase II MS4s are not causing the exceedances, as outlined below in the Monitoring for TMDL Compliance section below.

(iii) Caltrans

The TMDLs and Caltrans WLAs will be implemented primarily by revising and re-issuing the existing NPDES requirements that have been issued for Caltrans discharges.

Caltrans is regulated under State Water Board general WDRs that implement NPDES requirements.[53] The San Diego Water Board will request the State Water Board to revise and re-issue the WDRs and NPDES requirements to incorporate the following for Caltrans discharges in the San Diego Region:

- WQBELs consistent with the requirements and assumptions of the Caltrans WLAs. WQBELs may be expressed as numeric effluent limitations, when feasible, and/or as a BMP program of expanded or better-tailored BMPs.[54]

[49] The Notice of Intent, or NOI, is attachment 7 to Order No. 2003-0005-DWQ.
[50] The effective date is the date the Office of Administrative Law approves this Basin Plan amendment.
[51] As authorized under State Water Board Order No. 2003-0005-DWQ, section G.
[52] Ibid.
[53] Caltrans is subject to regulation under State Water Board Order No. 99-06-DWQ, and subsequent orders.
[54] Code of Federal Regulations Title 40 section 122.44(k)(2)&(3)

- If the WQBELs include a BMP program, periodic reporting requirements on BMP planning, implementation, and effectiveness in improving water quality at impaired beaches and creeks (i.e., progress reports). Progress reports will also be required to include water quality monitoring results. Progress reports will be required as long as necessary to ensure that the beneficial uses of the impaired waterbodies have been restored and maintained.

- Compliance schedule for Caltrans to attain the Caltrans WLAs and TMDLs in the receiving waters.

The WQBELs will likely consist of receiving water limitations (based on the numeric targets) and require the implementation of a BMP program to achieve TMDLs in the receiving waters. Caltrans will be required to submit Bacteria Load Reduction Plans (BLRPs) or Comprehensive Load Reduction Plans (CLRPs) outlining a proposed BMP program that will be capable of attaining the TMDLs in the receiving waters, acceptable to the San Diego Water Board, within 18 months after the effective date of these TMDLs.[55] The San Diego Water Board will require the BLRPs or CLRPs to be developed on a watershed or region wide scale. Ideally, Caltrans and the Phase I MS4s will develop and coordinate the elements of their BLRPs or CLRPs together.

If the receiving water limitations (based on the numeric targets) are met in the receiving waters, the assumption will be that Caltrans has met its WLAs. If, however, the receiving water limitations are not being met in the receiving waters, and Caltrans MS4s are identified as a source of bacteria causing exceedances, Caltrans will be responsible for reducing its bacteria loads and/or demonstrating that controllable anthropogenic discharges from the Caltrans MS4s are not causing the exceedances, as outlined below in the Monitoring for TMDL Compliance section below.

(iv) Publicly Owned Treatment Works and Wastewater Collection Systems

The TMDLs, with respect to discharges from POTWs and wastewater collection systems, will be implemented primarily by requiring compliance with any existing individual and/or general WDRs and NPDES requirements that have been issued. POTWs are subject to regulation under individual WDRs that implement NPDES requirements. Wastewater collection systems are subject to regulation under general WDRs issued by the State Water Board and San Diego Water Board.[56]

Because POTWs and wastewater collection systems have been assigned WLAs of zero,[57] no discharges of bacteria are expected or allowed under the wet weather TMDLs or dry weather TMDLs. If discharges of bacteria from POTWs and/or wastewater collection systems do occur as a result of sanitary sewer overflows and result in WQO exceedances, these exceedances will not apply to the compliance status of other dischargers.

If necessary, individual WDRs for POTWs and/or the San Diego Water Board WDRs for wastewater collection systems can be revised to require more aggressive monitoring, maintenance, and repair schedules to ensure discharges of bacteria wasteloads to surface waters are eliminated.

(v) Concentrated Animal Feeding Operations

The TMDLs, with respect to discharges from CAFOs, will be implemented primarily by requiring compliance with any existing individual and/or general WDRs and NPDES requirements that have been issued. CAFOs that discharge to surface waters are subject to regulation under general WDRs that implement NPDES requirements.

Because CAFOs have been assigned WLAs of zero, no discharges of bacteria are expected or allowed under the wet weather TMDLs or dry weather TMDLs.

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[55] The effective date is the date the Office of Administrative Law approves this Basin Plan amendment.
[56] State Water Board Order No. 2006-0003-DWQ and San Diego Water Board Order No. R9-2007-0005
[57] With the exception of Padre Dam, which has a fecal coliform mass-load based WLA that is calculated based on numeric effluent limitations derived from the REC-1 WQOs in the Basin Plan.

If necessary, the general WDRs and NPDES requirements for CAFOs can be revised to require more aggressive monitoring, maintenance, and repair schedules to ensure discharges of bacteria wasteloads to surface waters are minimized and/or eliminated.

(vi) Other Unidentified Point Sources

Unidentified point sources have not been assigned WLAs, which is equivalent to being assigned a WLA of zero. No discharges of bacteria are expected or allowed from unidentified point sources under the wet weather TMDLs or dry weather TMDLs.

Therefore, the TMDLs, with respect to discharges from unidentified point sources to surface waters, will be implemented primarily by issuing WDRs implementing NPDES requirements, or requiring the point sources to cease their discharges.

(B) Nonpoint Sources

The persons identified as responsible for controllable nonpoint source bacteria discharges causing or contributing to bacteria impairments at the beaches and creeks in these watersheds include the owners and operators of the following:

- agricultural facilities,
- nurseries,
- dairy/intensive livestock facilities,
- horse ranches,
- manure composting and soil amendment operations not regulated by NPDES requirements, and
- individual septic systems.

Agriculture (including nurseries), dairy/livestock, and horse ranch land uses (collectively called "agriculture" land uses) are controllable nonpoint sources that have been assigned LAs, as shown in Tables 7-41 through 7-47. Manure composting operations, soil amendment operations, and individual septic systems that are not part of agriculture land uses, and any other unidentified controllable nonpoint sources were not assigned LAs, which is equivalent to being assigned a LA of zero. Any controllable nonpoint source that has not been assigned a LA or has a LA of zero is not expected or allowed to discharge a pollutant load as part of the TMDL.

Controllable nonpoint source discharges are present in most watersheds, however, in only four watersheds do these discharges require load reductions to meet the Agriculture LAs. These watersheds are the Lower San Juan HSA, San Luis Rey HU, San Marcos HA, and San Dieguito HU watersheds (see Tables 7-41 through 7-44).

If individual or general WDRs are developed and issued to controllable nonpoint sources, the WDRs should incorporate one or more the following:

- Effluent limitations that are consistent with the requirements and assumptions of the nonpoint source LAs. Effluent limitations should be expressed as numeric effluent limitations, if feasible, and/or as a BMP program.

- Periodic reporting requirements on BMP planning, implementation, and effectiveness in improving the water quality of discharges from the nonpoint source (i.e., progress reports). Progress reports will also be required to include water quality monitoring results. Progress reports will be required as long as necessary to ensure that the beneficial uses of the impaired waterbodies have been restored and maintained.

- Compliance schedule and/or implementation milestones.

The San Diego Water Board will work with the nonpoint source dischargers and/or stakeholders when developing the WDRs. When and where possible, the San Diego Water Board will have the nonpoint source BMP programs coordinate with the BMPs programs for Phase I MS4s and Caltrans.

If the receiving water limitations (based on the numeric targets) are met in the receiving waters, the assumption will be that controllable nonpoint sources have met their LAs. If, however, the receiving water limitations are not being met in the receiving waters, and one or more controllable nonpoint source dischargers are identified as sources of bacteria causing exceedances, the San Diego Water Board may regulate those identified nonpoint sources, as needed, with WDRs or other enforcement actions, and those nonpoint sources will be responsible for reducing their bacteria loads and/or demonstrating that discharges from those nonpoint sources are not causing the exceedances, as outlined below in the Monitoring for TMDL Compliance section below.

(3) Conditional Waivers of Waste Discharge Requirements

There are several types of point source discharges to land, as well as nonpoint source discharges to land and surface waters that may not have an adverse affect on the quality of the waters of the state, and/or are not readily amenable to regulation under WDRs. For these types of discharge, the San Diego Water Board has the authority to issue conditional waivers of WDRs.[58]

There are controllable nonpoint source land uses (agriculture, horse ranches, and dairies/intensive livestock) that were identified in 8 watersheds that are contributing to the bacteria impairments. Four of the 8 watersheds were identified as requiring load reductions (Lower San Juan HSA, San Luis Rey HU, San Marcos HA, and San Dieguito HU) to meet the assigned wet weather Agriculture LAs.

In general, the San Diego Water Board utilizes conditional waivers of WDRs to address the discharges from controllable nonpoint sources. Development and enforcement of waiver conditions that are protective of water quality will likely be sufficient to implement the Agriculture LAs. The controllable nonpoint sources eligible for conditional waivers must comply with the conditions of the waiver to be consistent with the TMDLs and Agriculture LAs. Controllable nonpoint sources that do not comply with the waiver conditions are no longer eligible for the waiver and must either come into compliance with the waiver conditions, become regulated under WDRs, or cease any discharge of wastes to waters of the state.

Currently, discharges from these controllable nonpoint sources may be eligible for one of the general conditional waivers of WDRs, which are currently provided in the Basin Plan.[59] Conditional waivers of WDRs may not exceed 5 years in duration, but may be revised and renewed, or may be terminated at any time.[60] The San Diego Water Board will implement the conditional waivers of WDRs applicable to the Agriculture land uses to be consistent with the TMDLs and Agriculture LAs.

Because the conditional waivers of WDRs that may be utilized to implement the Agriculture LAs are contained in the Basin Plan, any revision of the conditions will require a Basin Plan amendment. If needed, the San Diego Water Board may amend the Basin Plan to remove these conditional waivers of WDRs from the Basin Plan and re-issue the conditional waivers of WDRs as a general order to reduce the administrative requirements for revising waiver conditions.

As required, the effectiveness of the conditional waivers of WDRs must be evaluated at least once every 5 years. If the conditions in the waivers of WDRs are not sufficient to implement the TMDLs and

[58] Authorized pursuant to Water Code section 13269

[59] The current general conditional waivers in the Basin Plan were adopted under San Diego Water Board Resolution No. R9-2007-0104. These waivers will expire December 31, 2012. Conditional Waiver No. 3 (Animal Operations) and Conditional Waiver No. 4 (Agriculture and Nursery Operations) may be utilized to implement the Agriculture LAs. Future iterations of these conditional waivers may be issued in a separate implementing order and removed from the Basin Plan.

[60] Pursuant to Water Code section 13269(a)(2)

Agriculture LAs, the San Diego Water Board will amend the waiver conditions to include more stringent conditions, including, but not limited to, additional BMP implementation, monitoring, and/or reporting.

If a conditional waiver of WDRs no longer appears to be effective in protecting water quality from discharges from specific nonpoint source facilities or category of nonpoint source facilities, the waiver may be terminated. For nonpoint source facilities that are no longer eligible for a conditional waiver of WDRs, they will need to be regulated under WDRs, or cease any discharges of waste to waters of the state.

(4) Enforcement Actions

The San Diego Water Board shall consider enforcement actions, as necessary, for any discharger failing to comply with applicable waiver conditions, WDRs, or Basin Plan waste discharge prohibitions.[61] Enforcement actions can also be taken, as necessary, to control the discharge of bacteria to impaired beaches and creeks, to attain compliance with the assumptions and requirements of the TMDLs, WLAs, and LAs.

In order for implementation of the TMDLs to begin as soon as possible, the San Diego Water Board may issue enforcement actions, in lieu of or before revising and re-issuing general WDRs and NPDES requirements, for Phase I MS4s and Caltrans, directing them to begin implementing additional measures to restore compliance with the bacteria WQOs. Enforcement actions may also be issued to require the submission of Bacteria Load Reduction Plans (BLRPs) or Comprehensive Load Reduction Plans (CLRPs) to the San Diego Water Board within 18 months after the effective date of these TMDLs,[62] or sooner. The San Diego Water Board will require the BLRPs or CLRPs to be developed on a watershed or region wide scale.

The San Diego Water Board will also issue enforcement actions, as necessary, to any other discharger that is identified by the San Diego Water Board and/or other parties as a significant source causing or contributing to the bacteria impairments in the waterbodies addressed in these TMDLs.

(5) Investigative Orders

The San Diego Water Board has the authority to require any state or local agency to investigate and report on any technical factors involved in water quality control or to obtain and submit analyses of water.[63] The San Diego Water Board has the authority to require technical or monitoring program reports from persons who have discharged or are discharging waste that could affect the quality of the waters in the San Diego Region.[64] The San Diego Water Board also has the authority to establish monitoring and recordkeeping requirements for discharges regulated under NPDES requirements.[65]

Investigative orders may be issued requiring the submission of Bacteria Load Reduction Plans (BLRPs) or Comprehensive Load Reduction Plans (CLRPs), acceptable to the San Diego Water Board, within 18 months after the effective date of these TMDLs,[66] or sooner. The San Diego Water Board will require the BLRPs or CLRPs to be developed on a watershed or region wide scale. The San Diego Water Board may require the Phase I MS4s and Caltrans to develop and coordinate the elements of their BLRPs or CLRPs together. The BLRPs or CLRPs will be incorporated into the WDRs and NPDES requirements.

The San Diego Water Board may issue subsequent investigative orders to confirm items in the BLRPs or CLRPs. The BLRPs or CLRPs must be capable of achieving the WLAs for the bacteria TMDLs. The CLRPs must also be capable of restoring the beneficial uses in receiving waters for other impairing pollutants in

[61] Authorized pursuant to Water Code sections 13300-13304, 13308, 13350, 13385, and/or 13399
[62] The effective date is the date the Office of Administrative Law approves this Basin Plan amendment.
[63] Authorized pursuant to Water Code section 13225
[64] Authorized pursuant to Water Code section 13267
[65] Authorized pursuant to Water Code section 13383
[66] The effective date is the date the Office of Administrative Law approves this Basin Plan amendment.

the watershed, and achieving the goals and objectives of any other water quality improvement projects included in the CLRPs within the time frame of the compliance schedule.

The San Diego Water Board will also issue investigative orders requiring BLRPs or CLRPs, or other technical or monitoring program reports, as necessary, to any other discharger that is identified by the San Diego Water Board or other parties as a significant source causing or contributing to the bacteria impairments in the waterbodies addressed in these TMDLs.

(6) Basin Plan Amendments

As the implementation of these TMDLs progress, the San Diego Water Board recognizes that revisions to the Basin Plan may be necessary in the future. The San Diego Water Board will initiate a Basin Plan amendment project to revise the requirements and/or provisions for implementing these TMDLs within 5 years from the effective date of this Basin Plan amendment or earlier if all the following conditions are met:

- Sufficient data are collected to provide the basis for the Basin Plan amendment.
- A report is submitted to the San Diego Water Board documenting the findings from the collected data.
- A request is submitted to the San Diego Water Board with specific revisions proposed to the Basin Plan, and the documentation supporting such revisions.

The San Diego Water Board will work with the project proponents to ensure that the data and documentation will be adequate for the initiation of the Basin Plan amendment. The San Diego Water Board staff will be responsible for taking the Basin Plan amendment project through the administrative and regulatory processes for adoption by the San Diego Water Board, and approval by the State Water Board, OAL, and USEPA.

If no Basin Plan amendment has been initiated within 5 years of the effective date of this TMDL Basin Plan amendment, and the Executive Officer determines, with Regional Board concurrence, that insufficient data exist to support the initiation of a Basin Plan amendment, a subsequent Basin Plan amendment to revise the requirements and/or provisions for the implementation of these TMDLs will not be initiated until the Executive Officer determines the conditions specified above are met.

(7) Other Actions

For these TMDLs, the San Diego Water Board shall recommend that the State Water Board assign a high priority to awarding grant funding[67] for projects to implement the bacteria TMDLs. Special emphasis will be given to projects that can achieve quantifiable bacteria load reductions consistent with the specific bacteria TMDLs, WLAs, and LAs.

Implementation of these TMDLs by the San Diego Water Board should not require any special studies to be conducted by the dischargers or other entities. The San Diego Water Board, however, will encourage and support any special studies proposed and undertaken by the dischargers or other entities that will provide information to refine and improve the implementation of these TMDLs. The San Diego Water Board may develop agreements (e.g., a Memorandum of Understanding) with one or more entities to support and use the findings from any special studies that may be conducted. Proposing a special study project and initiating an agreement with the San Diego Water Board to use the results of the study to modify this TMDL Implementation Plan is the responsibility of the project proponent(s).

[67] The State Water Board administers the awarding of grants funded from Proposition 13, Proposition 50, Clean Water Act section 319(h) and other federal appropriations to projects that can result in measurable improvements in water quality, watershed condition, and/or capacity for effective watershed management. Many of these grant fund programs have specific set-asides for expenditures in the areas of watershed management and TMDL project implementation for non-point source pollution.

(i) Monitoring for TMDL Compliance and Compliance Assessment

An essential component of implementation is water quality monitoring. Monitoring is needed to evaluate the progress toward attainment of the TMDLs and restoring the beneficial uses in the receiving waters. When all discharges from controllable sources meet their assigned WLAs and LAs, and the numeric targets (i.e., numeric WQOs and allowable exceedance frequencies) are also met in the receiving waters, , compliance with the TMDLs will be achieved. Additionally, sufficient water quality data are necessary to support the removal of a waterbody from the 303(d) List. Water quality data can also be used identify additional regulatory actions that may need to be implemented by the San Diego Water Board to restore and protect beneficial uses.

Monitoring for compliance will initially be conducted by the Phase I MS4s and Caltrans. The minimum components for any monitoring program that will be used to evaluate progress toward attainment of the TMDLs should include the following:

- For beaches addressed by these TMDLs, monitoring locations should consist of, at a minimum, the same locations used to collect data required under MS4 NPDES monitoring requirements and beach monitoring for Health and Safety Code section 115880.[68] If exceedances of the receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations and/or other source identification methods must also be used to demonstrate that the bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

- For creeks addressed by these TMDLs, monitoring locations should consist of, at a minimum, a location at or near the mouth of the creek (e.g., Mass Loading Station or Mass Emission Station) and one or more locations upstream of the mouth (e.g., Watershed Assessment Stations). If exceedances of the receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations and/or other source identification methods must also be used to demonstrate that the bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

- Because there are dry weather and wet weather TMDLs, monitoring under both conditions is needed. Wet weather[69] monitoring should occur at least once within 24 hours of the end of a storm event[70] that occurs during the rainy season (i.e., October 1 through April 30). Dry weather[71] monitoring should occur at least on a monthly basis, and may be required more often during the summer months (e.g., weekly) when the REC-1 and REC-2 beneficial uses occur most frequently in the creeks and at the beaches.

Compliance with the TMDLs, WLAs, and LAs will be assessed primarily by comparing receiving water indicator bacteria results from the monitoring locations outlined above with receiving water limitations expressed in terms of the appropriate numeric REC-1 WQOs and allowable exceedance frequencies of the appropriate numeric REC-1 WQOs. The appropriate numeric WQOs and allowable exceedance frequencies are dependent upon the type of receiving water (i.e., beach or creek) and weather conditions (i.e., dry weather or wet weather), as shown in Tables 7-48 and 7-49.

[68] Commonly referred to as AB 411 monitoring
[69] Defined as days with a storm with at least 0.2 inches of rainfall and the 72 hour period after the storm event
[70] The end of a storm event is when there is no more precipitation
[71] Defined as days with less than 0.2 inches of rainfall on each of the previous three days

Table 7-48. Receiving Water Limitations for Beaches

Indicator Bacteria	Wet Weather Days [a]		Dry Weather Days [b]	
	Wet Weather Numeric Objective [c] (MPN/100mL)	Wet Weather Allowable Exceedance [d] Frequency	Dry Weather Numeric Objective [e] (MPN/100mL)	Dry Weather Allowable Exceedance Frequency
Fecal Coliform	400	22%	200	0%
Total Coliform	10,000	22%	1,000	0%
Enterococcus	104	22%	35	0%

a. Wet weather days defined as days with rainfall events of 0.2 inches or greater and the following 72 hours.
b. Dry weather days defined as days with less than 0.2 inch of rainfall observed on each of the previous 3 days.
c. Wet weather numeric objectives based on the single sample maximum water quality objectives in the California Ocean Plan (2005). Compliance with the wet weather TMDLs in the receiving water is based on the frequency that the wet weather days in any given year exceed the wet weather numeric objective, but 30-day geometric mean must also be met.
d. The wet weather allowable exceedance frequency is set at 22%. In the calculation of the wet weather TMDLs, the San Diego Regional Board chose to apply the 22 percent allowable exceedance frequency as determined for Leo Carillo Beach in Los Angeles County. At the time the wet weather watershed model was developed, the 22 percent exceedance frequency from Los Angeles County was the only reference beach exceedance frequency available. The 22 percent allowable exceedance frequency used to calculate the wet weather TMDLs is justified because the San Diego Region watersheds' exceedance frequencies will likely be close to the value calculated for Leo Carillo Beach, and is consistent with the exceedance frequency that was applied by the Los Angeles Regional Board.
e Dry weather numeric objectives based on the 30-day geometric mean water quality objectives in the California Ocean Plan (2005). Compliance with the dry weather TMDLs in the receiving water is based on the frequency that the dry weather days in any given year exceed the dry weather numeric objective.

Table 7-49. Receiving Water Limitations for Creeks

Indicator Bacteria	Wet Weather Days [a]		Dry Weather Days [b]	
	Wet Weather Numeric Objective [c] (MPN/100mL)	Wet Weather Allowable Exceedance [d] Frequency	Dry Weather Numeric Objective [e] (MPN/100mL)	Dry Weather Allowable Exceedance Frequency
Fecal Coliform	400	22%	200	0%
Enterococcus	61 (104) [f]	22%	33	0%

a. Wet weather days defined as days with rainfall events of 0.2 inches or greater and the following 72 hours.
b. Dry weather days defined as days with less than 0.2 inch of rainfall observed on each of the previous 3 days.
c. Wet weather numeric objectives based on the single sample maximum (or equivalent) water quality objectives in the Water Quality Control Plan for the San Diego Basin (1994). Compliance with the wet weather TMDLs in the receiving water is based on the frequency that the wet weather days in any given year exceed the wet weather numeric objective, but 30-day geometric mean must also be met.
d. The wet weather allowable exceedance frequency is set at 22%. In the calculation of the wet weather TMDLs, the San Diego Regional Board chose to apply the 22 percent allowable exceedance frequency as determined for Leo Carillo Beach in Los Angeles County. At the time the wet weather watershed model was developed, the 22 percent exceedance frequency from Los Angeles County was the only reference beach exceedance frequency available. The 22 percent allowable exceedance frequency used to calculate the wet weather TMDLs is justified because the San Diego Region watersheds' exceedance frequencies will likely be close to the value calculated for Leo Carillo Beach, and is consistent with the exceedance frequency that was applied by the Los Angeles Regional Board.
e. Dry weather numeric objectives based on the 30-day geometric mean (or equivalent) water quality objectives in Water Quality Control Plan for the San Diego Basin (1994). Compliance with the dry weather TMDLs in the receiving water is based on the frequency that the dry weather days in any given year exceed the dry weather numeric objective.
f. A wet weather numeric objective for *Enterococcus* of 104 MPN/100mL may be applied as a receiving water limitation for creeks, instead of 61 MPN/100mL, if one or more of the creeks addressed by these TMDLs (San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek, San Diego River, and/or Chollas Creek) is designated with a "moderately to lightly used area" or less frequent usage frequency in the Basin Plan. Otherwise, the wet weather numeric objective of 61 MPN/100mL for Enterococcus will be used to assess compliance with the wet weather allowable exceedance frequency.

At the end of the TMDL Compliance Schedules, which are given in the following section, the receiving waters must meet the receiving water limitations above to be considered in compliance with these TMDLs, WLAs, and LAs. Determination of compliance with the TMDLs will be assessed differently for dry weather and wet weather as follows:

1. *Compliance with Dry Weather TMDLs*: At the end of the dry weather TMDL compliance schedule, the bacteria densities in the receiving waters for all dry weather days[72] must be less than or equal to the 30-day geometric mean REC-1 WQOs 100 percent of the time (i.e., dry weather days in a 30-day period shall not exceed the 30-day geometric mean REC-1 WQOs more than 0 percent of the time). In addition, the bacteria densities must be consistent with the single sample maximum REC-1 WQOs in the Ocean Plan for beaches, and the Basin Plan for creeks.

   The method and number of samples needed for calculating the 30-day geometric mean should be consistent with the number of samples required by the Ocean Plan for beaches, and the Basin Plan for creeks. Analysis of the monitoring results should also be consistent with the methods given in the Water Quality Control Policy For Developing California's Clean Water Act Section 303(d) List.

   Because the dry weather TMDLs are assigned entirely to the Municipal MS4s as WLAs, the Municipal MS4s are assumed to be the only source of bacteria during dry weather (i.e., dry weather TMDL = MS4 WLA). Discharges from other controllable sources (i.e., Caltrans, Agriculture) during dry weather are not expected and/or not allowed (i.e., WLA = 0 or LA = 0). If at the end of the dry weather TMDL compliance schedule the receiving waters exceed the 30-day geometric mean REC-1 WQOs more than 0 percent of the time, the municipal Phase I MS4s are responsible for demonstrating their discharges into the receiving waters are not causing the exceedances, or they will be considered out of compliance. If controllable sources other than the Phase I MS4s are identified as causing the exceedances, and the Phase I MS4s have demonstrated they are not causing or contributing to the exceedances, the Phase I MS4s will not be considered out of compliance.

   The Phase I MS4s may demonstrate that their discharges are not causing the exceedances in the receiving waters by providing data from their discharge points to the receiving waters, by providing data collected at jurisdictional boundaries, and/or by using other methods accepted by the San Diego Water Board. Otherwise, at the end of the dry weather TMDL compliance schedule, the municipal Phase I MS4s will be held responsible and considered out of compliance unless other information or evidence indicates another controllable or uncontrollable source is responsible for the exceedances in the receiving waters. If controllable sources other than discharges from the municipal Phase I MS4s are identified before or after the end of the dry weather TMDL Compliance Schedule as causing the exceedances, those controllable sources will be responsible for reducing their bacteria loads and/or demonstrating that discharges from those sources are not causing the exceedances. The San Diego Water Board shall implement additional actions (e.g., issue enforcement actions, amend existing NPDES requirements or conditional waivers), as needed, to bring all controllable sources into compliance with the dry weather TMDLs.

2. *Compliance with Wet Weather TMDLs*: At the end of the wet weather TMDL compliance schedule, the bacteria densities in the receiving waters for all wet weather days[73] cannot exceed the single sample maximum REC-1 WQOs more than the allowable exceedance frequency. In addition, the bacteria densities must be less than or equal to the 30-day geometric mean REC-1 WQOs 100 percent of the time (i.e., both dry and wet weather days in a 30-day period shall not exceed the 30-day geometric mean REC-1 WQOs more than 0 percent of the time).

[72] Defined as days with less than 0.2 inches of rainfall on each of the previous three days
[73] Defined as days with a storm with at least 0.2 inches of rainfall and the 72 hour period after the storm event

As described in the minimum monitoring components above, wet weather samples should be collected within 24 hours of the end of a storm event that occurs during the rainy season (i.e., October 1 through April 30). At least one wet weather sample per storm is expected to be collected for each waterbody in each watershed (i.e., Pacific Ocean shoreline, creek mouth, and/or creek). Because of the many issues related to collecting wet weather samples from multiple sites within a short time frame, dischargers are expected to develop a wet weather monitoring and sampling approach in their BLRPs or CLRPs. If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event shall be equal to the results from that one sample. If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all the wet weather days not sampled shall be equal to the highest bacteria density result reported from samples collected. The exceedance frequency shall be calculated by dividing the number of wet weather days that exceed the single sample maximum REC-1 WQOs by the total number of wet weather days during the rainy season. If at the end of the wet weather TMDL Compliance Schedule the receiving waters exceed the single sample maximum REC-1 WQOs more than the allowable exceedance frequency, all controllable sources are responsible for demonstrating their discharges into the receiving waters are not causing the exceedances, or they will be considered out of compliance.

The data collected for compliance with the dry weather TMDLs, described above, shall be used in addition to the data collected for wet weather with the wet weather TMDLs to calculate the wet weather 30-day geometric mean. If at the end of the wet weather TMDL Compliance Schedule the receiving waters exceed the 30-day geometric mean REC-1 WQOs at any time, all controllable sources are responsible for demonstrating their discharges into the receiving waters are not causing the exceedances, or they will be considered out of compliance.

Because the Phase I MS4s are located at the base of the watersheds and have been identified as the most significant controllable source of bacteria, the municipal Phase I MS4s will have the primary responsible for monitoring the receiving waters. Caltrans will also have monitoring responsibilities. Phase II MS4s, agricultural dischargers, and other sources that are identified as significant sources (i.e., causing or contributing to exceedances in the receiving waters) will also be responsible for monitoring the receiving waters. The municipal Phase I MS4s and other dischargers are responsible for reducing their bacteria loads and/or demonstrating their discharges into the receiving waters are not causing the exceedances.

The municipal MS4s may demonstrate that their discharges are not causing the exceedances in the receiving waters by providing data from their discharge points to the receiving waters, by providing data collected at jurisdictional boundaries, and/or by using other methods accepted by the San Diego Water Board. Otherwise, at the end of the wet weather TMDL compliance schedule, the municipal Phase I MS4s will be held responsible and considered out of compliance unless other information or evidence indicates another controllable or uncontrollable source is responsible for the exceedances in the receiving waters. If controllable sources other than discharges from the municipal Phase I MS4s are identified before or after the end of the wet weather TMDL Compliance Schedules as causing the exceedances, those controllable sources will be responsible for reducing their bacteria loads and/or demonstrating that discharges from those sources are not causing the exceedances. If controllable sources other than the Phase I MS4s are identified as causing the exceedances, and the Phase I MS4s have demonstrated they are not causing or contributing to the exceedances, the Phase I MS4s will not be considered out of compliance. The San Diego Water Board shall implement additional actions (e.g., issue enforcement actions, amend existing NPDES requirements or conditional waivers), as needed, to bring all those controllable sources into compliance with the wet weather TMDLs.

Between the effective date of these TMDLs and the end of the TMDL Compliance Schedules, monitoring is also required to demonstrate progress toward achieving and complying with the TMDLs, WLAs, and LAs. Progress can be demonstrated with reductions in exceedance frequencies in the receiving waters

until the allowable exceedance frequencies ultimately are achieved at the end of the TMDL Compliance Schedules. Demonstrating progress toward attaining the TMDLs in the receiving waters will be assessed differently for dry weather and wet weather as follows:

1. *Measuring Progress Toward Attaining Dry Weather TMDLs*: For the dry weather TMDLs, available historical monitoring data from the years 1996-2002 should be used to calculate the "existing" dry weather exceedance frequency of the 30-day geometric mean REC-1 WQOs for each watershed. "Existing" dry weather exceedance frequencies may be calculated separately for each impaired waterbody listed, or an "existing" dry weather exceedance frequency may be calculated that is applicable to the entire watershed.

   The "existing" dry weather exceedance frequencies should be reduced until the final allowable dry weather exceedance frequency is achieved by the end of the dry weather TMDL Compliance Schedule. If the TMDL Compliance Schedules include interim milestones that must be achieved to demonstrate progress toward attaining the dry weather TMDLs, reductions in the exceedance frequencies in the receiving water may be used. For example, if the "existing" dry weather exceedance frequency is 60 percent, the final dry weather exceedance frequency is 0 percent, and an interim milestone requires a 50 percent reduction, the exceedance frequency in the receiving water should be 30 percent or less by the interim milestone date. By the end of the dry weather TMDL Compliance Schedule, the final allowable dry weather exceedance frequency of the 30-day geometric mean REC-1 WQOs is 0 percent in the receiving waters for both beaches and creeks.

2. *Measuring Progress Toward Attaining Wet Weather TMDLs*: For the wet weather TMDLs, the number of wet days and number of wet exceedance days during the critical wet year from the wet weather model were used to calculate the "existing" wet weather exceedance frequency that needs to be reduced to the allowable wet weather exceedance frequency. For example, if a watershed had 69 wet weather days during the critical wet year, and the wet weather model predicted that all the subwatersheds had an average of 41 wet weather exceedance days during the critical wet year, the "existing" wet weather exceedance frequency is 41/69 = 59%. For the watershed addressed by these TMDLs, the number of wet weather exceedance days for each indicator bacteria predicted by the wet weather model for the critical wet year are summarized below in Table 7-50:

Table 7-50. Modeled Estimate of Critical Year "Existing" Wet Weather Exceedance Frequencies by Watershed

Watershed	Number of Wet Days in Critical Wet Year	"Existing" Wet Weather Exceedance Frequency of Single Sample Maximum REC-1 WQO [a]		
		Fecal Coliform	Total Coliform	Enterococcus
San Joaquin Hills HSA/ Laguna Beach HSA	69	52%	54%	55%
Aliso HSA	69	59%	59%	62% (62%) [b]
Dana Point HSA	69	50%	50%	50%
Lower San Juan HSA	76	66%	66%	74% (72%) [b]
San Clemente HA	73	47%	47%	50%
San Luis Rey HU	90	68%	66%	76%
San Marcos HA	49	57%	57%	59%
San Dieguito HU	98	43%	44%	49%
Miramar Reservoir HA	94	30%	30%	30%
Scripps HA	57	52%	52%	52%
Tecolote HA	57	75%	75%	81% (79%) [b]
Mission San Diego HSA/ Santee HSA	86	70%	63%	79% (76%) [b]
Chollas HSA	65	60%	60%	63% (63%) [b]

a. Calculated by taking the average number of wet days that are predicted by the wet weather model to exceed the single sample maximum REC-1 water quality objective (400 MPN/100mL for fecal coliform, 10,000 MPN/100mL for total coliform, and 61 or 104 MPN/100mL) divided by the total number of wet days in the critical wet year (1993).

b. Allowable exceedance frequency calculated based on an *Enterococcus* single sample maximum REC-1 water quality objective of 61 MPN/100mL. Allowable exceedance frequency in parenthesis calculated based on an Enterococcus single sample maximum REC-1 water quality objective of 104 MPN/100mL, which may be applicable if the usage frequency of the creeks in these watersheds are designated as "moderately to lightly used area" or less frequent usage frequency in the Basin Plan.

The "existing" wet weather exceedance frequencies should be reduced until the final allowable wet weather exceedance frequency is achieved by the end of the wet weather TMDL Compliance Schedule. If the TMDL Compliance Schedules include interim milestones that must be achieved to demonstrate progress toward attaining the wet weather TMDLs, reductions in the exceedance frequencies in the receiving water may be used. For example, if the "existing" wet weather exceedance frequency is 59 percent, the final wet weather exceedance frequency is 22 percent, and an interim milestone requires a 50 percent reduction, the exceedance frequency in the receiving water should be 41 percent or less by the interim milestone date. By the end of the wet weather TMDL Compliance Schedule, the allowable wet weather exceedance frequency is 22 percent in the receiving waters for both beaches and creeks.

The specific receiving waters (i.e., specific beaches and creek segments) identified on the 2002 303(d) List are shown in the TMDL Compliance Schedule in the following section. Because the REC-1 WQOs and allowable exceedance frequencies must be met throughout the 20 waterbodies addressed by these bacteria TMDLs, monitoring data from these locations and any other beach segments and/or creek monitoring points in the watersheds addressed by these TMDLs may be used to determine compliance.

Because the municipal MS4s are the most significant controllable sources of bacteria and the Phase I MS4s often discharge directly to the receiving waters addressed by these TMDLs, the municipal Phase I MS4s will be primarily responsible for conducting the monitoring. Caltrans will also have monitoring responsibilities. Phase II MS4s, agricultural dischargers, and other sources that are identified as significant sources (i.e., causing or contributing to exceedances in the receiving waters) will also be responsible for monitoring the receiving waters. Additional monitoring locations and frequency may be required to identify sources that need additional controls to reduce bacteria loads. While this TMDL Implementation

Plan recommends monitoring at one or two locations for each waterbody, monitoring only one or two locations in the receiving waters may not provide the data to differentiate between and locate sources of bacteria in the watershed. Therefore, the municipal Phase I MS4s and other dischargers may wish to establish additional monitoring locations at key jurisdictional boundaries as part of their monitoring programs, especially in watersheds where Caltrans and Agriculture have been identified as sources contributing bacteria loads to the receiving waters.

Investigative orders, enforcement actions, WDRs, or conditional waiver of WDRs issued by the San Diego Water Board should require monitoring program plans that include, as applicable, the minimum monitoring locations and frequencies outlined above, but also provide the dischargers an opportunity to propose additional or alternative monitoring locations and frequency of monitoring events. The San Diego Water Board may also issue investigative orders, enforcement actions, WDRs, or conditional waiver of WDRs that specify additional or alternative monitoring, monitoring locations, and/or frequency of monitoring events.

The San Diego Water Board will coordinate, to the extent possible, the monitoring that is required by the dischargers, to minimize the monitoring resources required and maximize the temporal and spatial coverage of the data collection.

(j) TMDL Compliance Schedule

The purpose of these TMDLs is to restore the impaired beneficial uses of the waterbodies addressed through mandated reductions of bacteria from controllable point and nonpoint sources discharging to impaired waters. The requirements of these TMDLs mandate that the San Diego Water Board require dischargers improve water quality conditions in impaired waters by achieving the assigned WLAs and LAs. After the controllable sources achieve their assigned WLAs and LAs, the TMDLs in the receiving waters will be met and beneficial uses restored.

Until the dischargers achieve their assigned WLAs and LAs, the beneficial uses of the waterbodies addressed by this project will likely remain impaired, and the dischargers will continue violating one or more Basin Plan waste discharge prohibitions. The San Diego Water Board recognizes that restoring the beneficial uses of the waterbodies impaired by elevated bacteria levels will require time and multiple approaches to implement. Therefore, the bacteria TMDLs are expected to be implemented in a phased approach with a monitoring component to identify bacteria sources, determine the effectiveness of each phase, and guide the selection of BMPs, as outlined in the BMP programs proposed in the BLRPs or CLRPs that are accepted by the San Diego Water Board.

(1) Prioritization of Waterbodies

"Impaired" waters were prioritized based on several factors, because the waterbodies included in these TMDLs are numerous and diverse in terms of geographic location, swimmer accessibility and use, and degree of contamination.

Dischargers accountable for attaining load reductions in multiple watersheds may have difficulty providing the same level of effort simultaneously in all watersheds. In order to address these concerns a scheme for prioritizing implementation of bacteria reduction strategies in waterbodies within watersheds was developed. The prioritization scheme is largely based on the following criteria:

- Level of beach (marine or freshwater) swimmer usage;
- Frequency of exceedances of WQOs; and
- Existing programs designed to reduce bacteria loading to surface waters.

Dischargers were placed into one of three groups (North, Central, and South), based on geographic location. Group N consists of dischargers located in watersheds within Orange County, the northernmost region watersheds included in these TMDLs. Group C consists of dischargers located in watersheds in northern San Diego County, outside the City of San Diego limits, the central region watersheds included in

these TMDLs. Group S consists of dischargers who are located in watersheds within and south of the City of San Diego limits, the southernmost region watersheds included in these TMDLs. Table 7-51 shows the dischargers in each of the three groups.

Table 7-51. Responsible Municipalities and Lead Jurisdictions†

Watershed	Waterbody***	Segment or Area**	Responsible Municipalities	Group
San Joaquin Hills HSA (901.11) & Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Dr. - Riviera Way	City of Laguna Beach **County of Orange** Orange County Flood Control District Caltrans Owners/operators of small MS4s*	N
		at Heisler Park – North		
	Pacific Ocean Shoreline	at Main Laguna Beach	City of Aliso Viejo **County of Orange** City of Laguna Beach City of Laguna Woods Orange County Flood Control District Caltrans Owners/operators of small MS4s*	
		Laguna Beach at Ocean Avenue		
		Laguna Beach at Laguna Avenue		
		Laguna Beach at Cleo Street		
		Arch Cove at Bluebird Canyon Road		
		Laguna Beach at Dumond Drive		
Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place/Blue Lagoon Place at Aliso Beach	City of Aliso Viejo City of Laguna Beach City of Laguna Hills City of Laguna Niguel City of Laguna Woods City of Lake Forest City of Mission Viejo **County of Orange** Orange County Flood Control District Caltrans Owners/operators of small MS4s*	N
	Aliso Creek	The entire reach (7.2 miles) and associated tributaries Aliso Hills Channel, English Canyon Creek, Dairy Fork Creek, Sulphur Creek, and Wood Canyon Creek		
	Aliso Creek (mouth)	At creek mouth		
Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	City of Dana Point City of Laguna Beach City of Laguna Niguel **County of Orange** Orange County Flood Control District Caltrans Owners/operators of small MS4s*	N
		Aliso Beach at Table Rock Drive		
		1000 Steps Beach at Pacific Coast Hwy at Hospital (9th Ave)		
		at Salt Creek (large outlet)		
		Salt Creek Beach at Salt Creek service road		
		Salt Creek Beach at Dana Strand Road		

Table 7-51. Responsible Municipalities and Lead Jurisdictions† (Cont'd)

Watershed	Waterbody***	Segment or Area**	Responsible Municipalities	Group
Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	At San Juan Creek	City of San Juan Capistrano City of Mission Viejo City of Laguna Hills City of Laguna Niguel City of Dana Point City of Rancho Santa Margarita **County of Orange** Orange County Flood Control District Caltrans Owners/operators of small MS4s*	N
	San Juan Creek	Lower 1 mile		
	San Juan Creek (mouth)	At creek mouth		
San Clemente HA (901.30)	Pacific Ocean Shoreline	Poche Beach	City of San Clemente **County of Orange** Orange County Flood Control District Dana Point Caltrans Owners/operators of small MS4s*	N
		Ole Hanson Beach Club Beach at Pico Drain		
		San Clemente City Beach at El Portal Street Stairs		
		San Clemente City Beach at Mariposa Street		
		San Clemente City Beach at Linda Lane		
		San Clemente City Beach at South Linda Lane		
		San Clemente City Beach at Lifeguard Headquarters		
		Under San Clemente Municipal Pier		
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)		
		San Clemente State Beach at Riviera Beach		
		San Clemente State Beach at Cypress Shores		
San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River Mouth	**City of Oceanside** City of Vista County of San Diego Caltrans Owners/operators of small MS4s* Controllable nonpoint sources	C

Table 7-51. Responsible Municipalities and Lead Jurisdictions† (Cont'd)

Watershed	Waterbody***	Segment or Area**	Responsible Municipalities	Group
San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	City of Carlsbad **City of Encinitas** City of Escondido City of San Marcos County of San Diego Caltrans Owners/operators of small MS4s* Controllable nonpoint sources	C
San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon Mouth	City of Del Mar **City of Escondido** City of Poway City of San Diego City of Solana Beach County of San Diego Caltrans Owners/operators of small MS4s* Controllable nonpoint sources	C/S
Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	City of Del Mar **City of Poway** City of San Diego County of San Diego Caltrans Owners/operators of small MS4s*	S
Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	**City of San Diego** Owners/operators of small MS4s*	S
		La Jolla Shores Beach at Caminito Del Oro		
		La Jolla Shores Beach at Vallecitos		
		La Jolla Shores Beach at Ave de la Playa		
		at Casa Beach, Children's Pool		
		South Casa Beach at Coast Blvd.		
		Whispering Sands Beach at Ravina Street		
		Windansea Beach at Vista de la Playa		
		Windansea Beach at Bonair Street		
		Windansea Beach at Playa del Norte		
		Windansea Beach at Palomar Ave.		
		at Tourmaline Surf Park		
		Pacific Beach at Grand Ave.		

Table 7-51. Responsible Municipalities and Lead Jurisdictions† (Cont'd)

Watershed	Waterbody***	Segment or Area**	Responsible Municipalities	Group
Tecolote HA (906.50)	Tecolote Creek	Tecolote Creek	**City of San Diego** Owners/operators of small MS4s*	S
Mission San Diego HSA (907.11) & Santee HSA (907.12)	Forrester Creek	Lower 1 mile	**City of El Cajon** City of Santee County of San Diego Caltrans Owners/operators of small MS4s*	S
	San Diego River, Lower	Lower 6 miles	**City of El Cajon** City of La Mesa City of San Diego City of Santee County of San Diego Caltrans Owners/operators of small MS4s* Padre Dam Water Treatment Facility	S
	Pacific Ocean Shoreline	At San Diego River Mouth at Dog Beach		
Chollas HSA (908.22)	Chollas Creek	Lower 1.2 miles	City of La Mesa City of Lemon Grove **City of San Diego** County of San Diego San Diego Unified Port District Caltrans Owners/operators of small MS4s*	S

† Developed based on the 2002 Clean Water Act Section 303(d) List
*Owners/operators of small MS4s are listed in Appendix Q.
** As listed on the 2002 Clean Water Act Section 303(d) List
*** Listings on the 2006 and 2008 303(d) List compared to listing shown above are provided in Appendix T to the Technical Report.

Impaired waters were given a priority number of 1, 2, or 3 with 1 being the highest priority. Priority 1 waters also included waterbodies likely to be removed from the Clean Water Act Section 303(d) List of Water Quality Limited Segments. Priority schemes are designated within watersheds. A prioritized list of impaired beaches and creeks included in this project is shown below in Table 7-52.

Table 7-52. Prioritized List of Impaired Waters for TMDL Implementation

Watershed	Waterbody[b]	Segment or Area[a]	Priority
San Joaquin Hills HSA (901.11) & Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Dr. - Riviera Way	1
		at Heisler Park – North	1
	Pacific Ocean Shoreline	at Main Laguna Beach	1
		Laguna Beach at Ocean Avenue	1
		Laguna Beach at Laguna Avenue	1
		Laguna Beach at Cleo Street	1
		Arch Cove at Bluebird Canyon Road	1
		Laguna Beach at Dumond Drive	1
Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place/Blue Lagoon Place at Aliso Beach	1
	Aliso Creek	The entire reach (7.2 miles) and associated tributaries Aliso Hills Channel, English Canyon Creek, Dairy Fork Creek, Sulphur Creek, and Wood Canyon Creek	3
	Aliso Creek (mouth)	At creek mouth	3
Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	1
		Aliso Beach at Table Rock Drive	1
		1000 Steps Beach at Pacific Coast Hwy at Hospital (9th Ave)	1
		at Salt Creek (large outlet)	1
		Salt Creek Beach at Salt Creek service road	2
		Salt Creek Beach at Dana Strand Road	2
Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	At San Juan Creek	1
	San Juan Creek	Lower 1 mile	3
	San Juan Creek (mouth)	At creek mouth	1

Table 7-52. Prioritized List of Impaired Waters for TMDL Implementation † (Cont'd)

Watershed	Waterbody[b]	Segment or Area[a]	Priority
San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach (large outlet)	1
		Ole Hanson Beach Club Beach at Pico Drain	1
		San Clemente City Beach at Linda Lane	1
		San Clemente State Beach at Riviera Beach	1
		San Clemente City Beach at Mariposa Street	2
		San Clemente State Beach at Cypress Shores	2
		San Clemente City Beach at Lifeguard Headquarters	2
		Under San Clemente Municipal Pier	2
		San Clemente City Beach at El Portal Street Stairs	2
		San Clemente City Beach at South Linda Lane	3
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	3
San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River Mouth	2
San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	1
San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon Mouth	1
Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline[a]	Torrey Pines State Beach at Del Mar (Anderson Canyon)	1
Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	1
		La Jolla Shores Beach at Caminito Del Oro	1
		La Jolla Shores Beach at Vallecitos	1
		La Jolla Shores Beach at Ave de la Playa	1
		at Casa Beach, Children's Pool	1
		South Casa Beach at Coast Blvd.	1
		Whispering Sands Beach at Ravina Street	1
		Windansea Beach at Vista de la Playa	1
		Windansea Beach at Bonair Street	1
		Windansea Beach at Playa del Norte	1
		Windansea Beach at Palomar Ave.	1
		at Tourmaline Surf Park	1
		Pacific Beach at Grand Ave.	1
Tecolote HA (906.10)	Tecolote Creek	The entire reach and associated tributaries	1

Table 7-52. Prioritized List of Impaired Waters for TMDL Implementation † (Cont'd)

Watershed	Waterbody[b]	Segment or Area[a]	Priority
Mission San Diego HSA (907.11) & Santee HSA (907.12)	San Diego River, Lower	Lower 6 miles	3
	Pacific Ocean Shoreline	At San Diego River Mouth at Dog Beach	3
	Forrester Creek	Lower 1 mile	3
Chollas HSA (908.22)	Chollas Creek	Bottom 1.2 miles	3

† Developed based on the 2002 Clean Water Act Section 303(d) List
a As listed on the 2002 Clean Water Act Section 303(d) List
b Listings on the 2006 and 2008 303(d) List compared to listing shown above are provided in Appendix T to the Technical Report.

Beginning with the 2008 303(d) List, specific beach segments of the Pacific Ocean shoreline are listed individually, and may not be identified in the same way as those segments listed in the table above. Several of the segments or areas in the list above have been delisted or redefined in the 2008 303(d) List. In addition, other segments or areas have been added to the Pacific Ocean shorelines listed above. The TMDLs that address the Pacific Ocean shorelines identified in the 2002 303(d) List are assumed to be applicable to all the beaches located on the shorelines of the hydrologic subareas (HSAs), hydrologic areas (HAs), and hydrologic units (HUs) listed above, or as listed individually in the 2008 and future 303(d) Lists.

The prioritized list above recognizes that there are segments or areas where bacterial water quality improvements are most likely to occur first (Priority 1), and segments or areas where bacterial water quality improvements are most likely to require more time to achieve (Priority 3). In some cases, receiving water limitations are already being met, resulting in the delisting of those segments or areas from the 2006 and/or 2008 303(d) Lists. The protection of the REC-1 beneficial use of those delisted segments or areas, however, must also be maintained, and those segments or areas must remain off future iterations of the 303(d) List.

The BLRPs or CLRPs that are developed are expected to focus on implementing BMP programs to reduce bacteria loads to those segments or areas where exceedances of the receiving water limitations continue to occur. The BMP programs that are included in the BLRPs or CLRPs should include short-term and long-term implementation strategies. The short-term strategies should be able to result in bacteria load reductions that can result in achieving the TMDLs for Priority 1 segments or areas. The long-term strategies should be able to result in bacteria load reductions that will result in achieving the TMDLs in all segments or areas by the end of the TMDL compliance schedules and maintain the protection of the REC-1 beneficial use after the end of the TMDL compliance schedules.

In the segments or areas where the receiving water limitations are being met, the BLRPs or CLRPs also need to include a monitoring component to ensure that protection of the REC-1 beneficial use is maintained. If receiving water limitations are exceeded in the future in those locations, the BLRPs or CLRPs must include the implementation of a BMP program that will ensure that the TMDLs will be achieved by the end of the TMDL compliance schedules.

(2) Compliance Schedule

Full implementation of the TMDLs for indicator bacteria shall be completed as soon as possible, but no later than 10 years[74] from the effective date[75] for both the dry weather and wet weather TMDLs, unless an alternative compliance schedule is approved as part of a Comprehensive Load Reduction Plan, as described in the following section. The effective date of these TMDLs is April 4, 2011.

The San Diego Water Board will require the Phase I MS4s to submit Bacteria Load Reduction Plan (BLRPs) outlining a proposed BMP program that will be capable of achieving the necessary load reductions required to attain the bacteria TMDLs in the receiving waters, acceptable to the Regional Board within 18 months after the effective date of these TMDLs. The Phase I MS4 BLRPs should be incorporated into their Watershed Runoff Management Programs. Caltrans will also be required to develop and submit BLRPs outlining a proposed BMP program that will be capable of achieving the necessary load reductions required to attain the TMDLs in the receiving waters, acceptable to the Regional Board, within 18 months after the effective date of these TMDLs. To the extent possible, the Phase I MS4s and Caltrans should develop and coordinate the elements of their BLRPs together. The BLRPs will allow the Phase I MS4s and Caltrans to propose a compliance schedule for WQBELs that implement the bacteria TMDLs. The compliance schedule for the Phase I MS4s and Caltrans to attain their respective WLAs and the TMDLs in the receiving waters will be based on the BMP program proposed in the BLRPs.

For watersheds in Table 7-52 where there are no longer any impairments listed on the 2008 303(d) List, the Phase I MS4s and Caltrans are not required to submit a BLRP or CLRP within 18 months of the effective date of these TMDLs. If, however, any segment of a waterbody for the watershed (Pacific Ocean shoreline, creek, or mouth as shown in Table7-36) is re-listed on a future 303(d) List for any type of indicator bacteria, the Phase I MS4s and Caltrans will be required to submit a BLRP or CLRP within 6 months of the adoption of the 303(d) List by the San Diego Regional Board.

If the Phase I MS4s and Caltrans choose to submit BLRPs that address only bacteria, the proposed schedule for compliance with the wet weather and dry weather TMDLs cannot extend beyond 10 years from the effective date, and must include at least a milestone for achieving a 50 percent exceedance frequency reduction. Additional milestones for achieving exceedance frequency reductions (e.g., 25 and 75 percent) are encouraged, but may also be required by the Regional Board. If the BLRPs do not include a proposed compliance schedule that is acceptable to the Regional Board, the compliance schedule will be as follows.

The compliance schedule for achieving the dry weather and wet weather bacteria TMDLs (Tables 7-53 and 7-54, respectively) are structured in a phased manner, with 100 percent of dry weather exceedance frequency reductions, and 100 percent of wet weather exceedance frequency reductions within 10 years from the effective date. At the end of the dry weather TMDL compliance schedule, the receiving waters must not exceed the 30-day geometric mean REC-1 WQOs more than 0 percent of the time. At the end of the wet weather TMDL compliance schedule, the receiving waters must not exceed the single sample maximum REC-1 WQOs more than the wet weather allowable exceedance frequency. All of these reductions are aimed at restoring water quality to a level that supports REC-1 beneficial uses in the ocean shoreline and in impaired creeks. These reductions required by the compliance schedule vary on the timeline based on the priority scheme described in Table 7-52. Intermediate milestone reductions in bacteria wasteloads are required sooner in the higher priority waters.

[74] If a Comprehensive Load Reduction Plan (CLRP) is developed to address several pollutants, including bacteria, the implementation of the wet weather bacteria TMDLs shall be completed as soon as possible, but no later than 20 years from the effective date. See Alternative Compliance Schedules under section (j)(3).

[75] The effective date is the date the Office of Administrative Law approves this Basin Plan amendment.

Table 7-53. Dry Weather Compliance Schedule and Milestones for Achieving Exceedance Frequency Reductions

Compliance Year (year after OAL approval)	Required Exceedance Frequency Reduction		
	Priority 1	Priority 2	Priority 3
5	50% (All Dry Weather)		
6		50% (All Dry Weather)	
7			50% (All Dry Weather)
10+	100% (All Dry Weather)	100% (All Dry Weather)	100% (All Dry Weather)

Table 7-54. Wet Weather Compliance Schedule and Milestones for Achieving Exceedance Frequency Reductions

Compliance Year (year after OAL approval)	Required Exceedance Frequency Reduction		
	Priority 1	Priority 2	Priority 3
5	50% (All Wet Weather)		
6		50% (All Wet Weather)	
7			50% (All Wet Weather)
10+	100% (All Wet Weather)	100% (All Wet Weather)	100% (All Wet Weather)

The first four years of the compliance schedules above do not require any exceedance frequency reductions from current conditions. These years will provide the dischargers time to identify sources, develop plans and implement enhanced and expanded BMPs capable of achieving the mandated decreases in exceedance frequencies of the REC-1 WQOs in the impaired beaches and creeks. The Regional Board may also include additional milestones for achieving exceedance frequency reductions (e.g., 25 and 75 percent).

If appropriate and acceptable to the Regional Board, the proposed compliance schedules included in the BLRPs will be incorporated into the various TMDL implementing orders, such as the municipal Phase I MS4 stormwater WDRs and NPDES requirements. Otherwise, the compliance schedules given above will be implemented.

(3) Alternative Compliance Schedules

The dischargers to Chollas Creek in the Chollas HSA watershed will have to address reductions from multiple water quality improvement projects in addition to bacteria, namely TMDLs for copper, lead, zinc, and diazinon,[76] and a trash reduction program. Addressing multiple pollutants (in addition to bacteria) will require the development and submittal of a Comprehensive Load Reduction Plan (CLRP) by the Phase I MS4s and Caltrans. The CLRP will allow the Phase I MS4s and Caltrans to propose a compliance schedule to address impairments due to loads from multiple pollutants, including bacteria.

[76] As described in *Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek, Tributary to San Diego Bay*, adopted under Resolution No. R9-2007-0043, and *Total Maximum Daily Load for Diazinon in Chollas Creek Watershed, San Diego County*, adopted under Resolution No. R9-2002-0123.

Full implementation of the TMDLs for indicator bacteria included under the CLRP for the Chollas HSA watershed shall be completed as soon as possible, but cannot extend beyond 10 years for the dry weather bacteria TMDLs and 20 years for the wet weather bacteria TMDLs. The proposed compliance schedules for the bacteria TMDLs included under the CLRP must include at least a milestone for achieving a 50 percent exceedance frequency reduction. Additional milestones for achieving exceedance frequency reductions (e.g., 25 and 75 percent) are encouraged. If the CLRP for the Chollas HSA watershed does not include a proposed compliance schedule, specifically for bacteria, the compliance schedule will be as given in Table 7-55.

Table 7-55. Alternative Compliance Schedule
Chollas Creek

Compliance Year*	Exceedance Frequency Reduction Milestone**
7	50% for dry weather
10	100% for dry weather 50% for wet weather
20	100% for wet weather

* Year after effective date for the TMDL that initiated the development of the CLRP.
** The Regional Board may also include additional milestones for achieving exceedance frequency reductions (e.g., 25 and 75 percent).

Likewise, dischargers in other bacteria-impaired watersheds may also find that undertaking concurrent load reduction programs for other pollutant constituents (e.g. metals, pesticides, trash, nutrients, sediment, etc.) together with the bacteria load reduction requirements in these TMDLs, is more cost effective, and has fewer potential environmental impacts from structural BMP construction. In these cases, the dischargers may develop and submit a CLRP for all constituents of concern in lieu of the BLRP, and to propose an appropriately tailored alternative compliance schedule. Proposed alternative compliance schedules tailored under this provision may not extend beyond 10 years for the dry weather bacteria TMDLs and 20 years for the wet weather bacteria TMDLs from the effective date, and must include at least a milestone for achieving a 50 percent exceedance frequency reduction. Additional milestones for achieving exceedance frequency reductions (e.g., 25 and 75 percent) are encouraged, but may also be required by the Regional Board.

If appropriate and acceptable to the Regional Board, the proposed alternative compliance schedules included in the CLRPs will be incorporated into the various TMDL implementing orders. Otherwise, the alternative compliance schedule given above as an example for Chollas Creek will be implemented for a CLRP that is developed for any other watershed.

(k) TMDL Implementation Milestones

Accomplishing the goals of the implementation plan will be achieved by cooperative participation from all responsible parties, including the San Diego Water Board. Major milestones are described in Table 7-56.

Table 7-56. TMDL Implementation Milestones

Item	Implementation Action	Responsible Parties	Date
1	Obtain approval of Beaches and Creeks Indicator Bacteria TMDLs from the State Water Board, OAL, and USEPA.	San Diego Water Board	Effective date[a] April 4, 2011
2	Issue investigative orders to Phase I MS4s and Caltrans requiring the development and submittal of BLRPs or CLRPs acceptable to the Regional Board within 18 months of effective date	San Diego Water Board	As soon as possible (if necessary)
3	Issue, reissue, or revise general WDRs and NPDES requirements for the Phase I MS4s to incorporate the requirements for complying with the TMDLs and MS4 WLAs.	San Diego Water Board	Within 5 years of effective date[b]
4	Issue, reissue, or revise general WDRs and NPDES requirements for Caltrans to incorporate the requirements for complying with the TMDLs and Caltrans WLAs.	San Diego Water Board, State Water Board	Within 5 years of effective date[b]
5	Issue, reissue, or revise the WDRs and NPDES requirements for POTWs and wastewater collection systems to incorporate new requirements for sewer line surveillance and maintenance, consistent with the zero WLA.	San Diego Water Board	Within 5 years of effective date[b]
6	Meet 50% Dry Weather exceedance frequency reductions required to achieve TMDLs in receiving waters in Priority 1 watersheds.	Municipal Dischargers,[d] Caltrans, Agriculture/Livestock Dischargers	5 years after effective date[b]
7	Meet 50% Wet Weather exceedance frequency reductions required to achieve TMDLs in receiving waters in Priority 1 watersheds.	Municipal Dischargers,[d] Caltrans, Agriculture/Livestock Dischargers	5 years after effective date[b]
8	Meet 50% Dry Weather exceedance frequency reductions required to achieve TMDLs in receiving waters in Priority 2 watersheds.	Municipal Dischargers,[d] Caltrans, Agriculture/Livestock Dischargers	6 years after effective date[b]
9	Meet 50% Wet Weather exceedance frequency reductions required to achieve TMDLs in receiving waters in Priority 2 watersheds.	Municipal Dischargers,[d] Caltrans, Agriculture/Livestock Dischargers	6 years after effective date[b]
10	Meet 50% Dry Weather exceedance frequency reductions required to achieve TMDLs in receiving waters in Priority 3 watersheds.	Municipal Dischargers,[d] Caltrans, Agriculture/Livestock Dischargers	7 years after effective date[b]
11	Meet 50% Wet Weather exceedance frequency reductions required to achieve TMDLs in receiving waters in Priority 3 watersheds.	Municipal Dischargers,[d] Caltrans, Agriculture/Livestock Dischargers	7 years after effective date[b]
12	Meet 100% Dry Weather exceedance frequency reductions required to achieve TMDLs in receiving waters in all watersheds.	Municipal Dischargers,[d] Caltrans, Agriculture/Livestock Dischargers	10 years after effective date[b,c]

13	Meet 100% Wet Weather exceedance frequency reductions required to achieve TMDLs in receiving waters in all watersheds.	Municipal Dischargers,[d] Caltrans, Agriculture/Livestock Dischargers	10 to 20 years after effective date[b,c]
14	Amend discharge conditions of appropriate waivers to be consistent with the requirements for complying with the TMDLs and Agriculture LAs.	San Diego Water Board	As needed after effective date
15	Issue individual or general WDRs or Basin Plan prohibitions consistent with the TMDLs and LAs for controllable nonpoint source discharges not eligible conditional waivers.	San Diego Water Board	As needed after effective date
16	Submit BLRP or CLRP Progress Reports to San Diego Water Board	Phase I MS4s, Phase II MS4s, Caltrans	In accordance with BLRPs or CLRPs accepted by the Regional Board
17	Enroll Phase II MS4s identified as significant sources of bacteria to receiving waters under State Water Board general WDRs and NPDES requirements.	San Diego Water Board	As needed after effective date
18	Issue individual or general WDRs and NPDES requirements consistent with the TMDLs and WLAs for specific Phase II MS4s or category of Phase II MS4s.	San Diego Water Board	As needed after effective date
19	Take enforcement actions against controllable point sources and nonpoint sources to attain compliance with the WLAs and LAs.	San Diego Water Board	As needed after effective date
20	Recommend TMDL-related projects as high priority for grant funds.	San Diego Water Board	As needed after effective date
21	Amend the Basin Plan and/or provisions of these TMDLs (e.g., usage frequency or creeks or watershed-specific allowable exceedance frequency) based on evidence provided by dischargers and/or other entities	San Diego Water Board, Municipal Dischargers,[d] Caltrans, Agriculture/Livestock Dischargers	Within 5 years after effective date [e]

[a] Effective date = date of approval by OAL

[b] May defer to alternative compliance schedule proposed in BLRPs or CLRPs that have been incorporated into implementing orders (e.g., WDRs, cleanup and abatement orders)

[c] Compliance schedules for dry weather and wet weather TMDLs proposed in BLRPs cannot extend beyond 10 years from the effective date. Compliance schedules proposed in CLRPs for dry weather TMDLs cannot extend beyond 10 years and for wet weather TMDLs cannot extend beyond 20 years from the effective date.

[d] Because there are no Phase II MS4s enrolled under the State General Permit for Small MS4s, discharges from Phase II MS4s are not permitted (i.e., WLA = 0) and Municipal Dischargers are only the Phase I MS4s in this Implementation Milestone item. When a Phase II MS4 is enrolled under the State General Permit for Small MS4s or issued an individual NPDES permit, the Municipal Dischargers will be both the Phase I MS4s and Phase II MS4s in this Implementation Milestone item.

[e] If no Basin Plan amendment has been initiated within 5 years of the effective date of this TMDL Basin Plan amendment, and the Executive Officer determines, with Regional Board concurrence, that insufficient data exist to support the initiation of a Basin Plan amendment, a subsequent Basin Plan amendment to revise the requirements and/or provisions for the implementation of these TMDLs will not be initiated until the Executive Officer determines the conditions to initiate a Basin Plan amendment are met.

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APPENDIX A
GLOSSARY

Areas of Special Biological Significance (ASBS) – are those areas designated by the State Board as ocean areas requiring protection of species or biological communities to the extent that alteration of natural water quality is undesirable. All Areas of Special Biological Significance are also classified as a subset of State Water Quality Protection Areas.

Basin Plan - The plan for the protection of water quality prepared by the Regional Water Quality Control Board in response to the Porter-Cologne Water Quality Control Act. The Basin Plan for the San Diego Region is also known as the Water Quality Control Plan for the San Diego Basin (9) and contains Water Quality Standards for the federal Clean Water Act.

Beneficial Uses - The uses of water necessary for the survival or well being of man, plants, and wildlife. These uses of water serve to promote the tangible and intangible economic, social, and environmental goals "Beneficial Uses" of the waters of the State that may be protected against include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. Existing beneficial uses are uses that were attained in the surface or ground water on or after November 28, 1975; and potential beneficial uses are uses that would probably develop in future years through the implementation of various control measures. "Beneficial Uses" are equivalent to "Designated Uses" under federal law. [California Water Code section 13050(f)].

Best Management Practices (BMPs) - The practice or combination of practices that are determined to be the most effective, practicable means of preventing or reducing the amount of pollution generated by nonpoint sources to a level compatible with water quality goals (including technological, economic, and institutional considerations).

Bioaccumulation - The accumulation of contaminants in the tissues of organisms through any route, including respiration, ingestion, or direct contact with contaminated water, sediment, food, or dredged material.

California Water Code, Division 7 - a.k.a. Porter Cologne Water Quality Control Act.

Capping - The controlled, accurate placement of contaminated material at an open-water site, followed by a covering or cap of clean isolating material.

CEQA - California Environmental Quality Act of 1970.

Clean Water Act - a.k.a. Federal Water Pollution Control Act.

Confined disposal - Placement of dredged material within dikes nearshore or upland confined disposal facilities that enclose the disposal area above any adjacent water surface, isolating the dredged material from adjacent waters during placement. Confined disposal does not refer to subaqueous capping or contained aquatic disposal.

Contaminant - A chemical or biological substance in a form that can be incorporated into, onto, or be ingested by and that harms aquatic organisms, consumers of aquatic organisms, or users of the aquatic environment.

Contaminated sediment or contaminated dredged material - Contaminated sediments or contaminated dredged materials are defined as those that have been demonstrated to cause an unacceptable adverse effect on human health or the environment.

Contamination - means an impairment of the quality of the waters of the state by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. "Contamination" includes any equivalent effect resulting from the disposal of waste, whether or not waters of the state are affected.

Dredged material - Material excavated from waters of the United States or ocean waters.

The term dredged material refers to material which has been dredged from a water body, while the term sediment refers to material in a water body prior to the dredging process.

Dredged material discharge - The term dredged material discharge means any addition of dredged material into waters of the United States or ocean waters. The term includes open- water discharges; discharges resulting from unconfined disposal operations (such as beach nourishment or other beneficial uses); discharges from confined disposal facilities that enter waters of the United States (such as effluent, surface runoff, or leachate); and overflow from dredge hoppers, scows, or other transport vessels.

Effluent Limitations - Limitations on the volume of each waste discharge, and the quantity and concentrations of pollutants in the discharge. The limitations are designed to ensure that the discharge does not cause water quality objectives to be exceeded in the receiving water and does not adversely affect beneficial uses.

Ephemeral - Water bodies, or segments thereof, that contain water only for a short period following precipitation events.

Hydrologic Area - A major logical subdivision of a hydrologic unit which includes both water-bearing and nonwater-bearing formations. It is best typified by a major tributary of a stream, a major valley, or a plain along a stream containing one or more ground water basins and having closely related geologic, hydrologic, and topographic characteristics. Area boundaries are based primarily on surface drainage boundaries. However, where strong subsurface evidence indicates that a division of ground water exists, the area boundary may be based on subsurface characteristics.

Hydrologic Subarea - A major logical subdivision of a hydrologic area which includes both water-bearing and nonwater-bearing formations.

Hydrologic Unit - A classification embracing one of the following features which are defined by surface drainage divides: (1) in general, the total watershed area, including water-bearing and nonwater-bearing formations, such as the total drainage area of the San Diego River Valley; and (2) in coastal areas, two or more small contiguous watersheds having similar hydrologic characteristics, each watershed being directly tributary to the ocean and all watersheds emanating from one mountain body located immediately adjacent to the ocean.

Implementation Plan - Basin Plan chapter which describes the actions by the Regional Board and others that are necessary to achieve and maintain the designated beneficial uses and water quality objectives of the Region's waters.

Intermittent - Water bodies, or segments thereof, that contain water for extended periods during the year, but not at all times.

Interrupted - Water bodies or streams that contain perennial segments or pools, with intervening intermittent or ephemeral segments.

Leachate - Water or any other liquid that may contain dissolved (leached) soluble materials, such as organic salts and mineral salts, derived from a solid material. For example, rainwater that percolates through a confined disposal facility and picks up dissolved contaminants is considered leachate.

Major federal action - Includes actions with effects that may be major and that are potentially subject to federal control and responsibility. Major refers to the context (meaning that the action must be analyzed in several contexts, such as the effects on the environment, society, regions, interests, and locality) and intensity (meaning the severity of the impact). It can include (a) new and continuing activities, projects, and programs entirely or partly financed, assisted, conducted, regulated, or approved by federal agencies; (b) new or revised agency rules, regulations, plans, policies, or procedures; and (c) legislative proposals. Action does not include funding assistance solely in the form of general revenue-sharing funds where there is no federal agency control over the subsequent use of such funds. Action does not include judicial or administrative civil or criminal enforcement action.

National Pollution Discharge Elimination System (NPDES) - These permits pertain to the discharge of waste to surface waters only. All State and Federal NPDES permits are also WDRs.

Nonpoint Sources - This refers to pollutants from diffuse sources that reach water through means other than a discernable, confined, and discrete conveyance.

Non-storm Water Discharge - Any discharge to a storm water conveyance system that is not composed entirely of storm water.

Nuisance - means anything which meets all of the following requirements: (1) Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property; (2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal; and (3) Occurs during or as a result of the treatment or disposal of waste.

Open-water disposal - Placement of dredged material in rivers, lakes, estuaries, or oceans via pipeline or surface release from hopper dredges or barges.

Person - Also includes any city, county, district, the state or any department or agency thereof. "*Person*" includes the United States, to the extent authorized by federal law.

pH - Term used to refer to the hydrogen ion concentration of water. The acidity or alkalinity of water is measured by the pH factor.

Point Sources - This refers to pollutants discharged to water through any discernable, confined, and discrete conveyance.

Pollution - means an alteration of the quality of the waters of the state by wastes to a degree which unreasonably affects either of the following: (1) The waters for beneficial uses, or (2) Facilities which serve those beneficial uses. "Pollution" may include "contamination."

Porter-Cologne Water Quality Control Act (Porter-Cologne Act) - This is also known as the California Water Code.

Quality of the Water - or "quality of the waters" refers to chemical, physical, biological, bacteriological, radiological, and other properties and characteristics of water which affect its use.

Reclaimed water - or "recycled water" means water which, as a result of treatment of waste, is suitable for a direct beneficial use or a controlled use that would not otherwise occur and is therefor considered a valuable resource.

Regional Board - a.k.a. California Regional Water Quality Control Board.

Region - a.k.a., San Diego Basin (9).

Sewage, Domestic - Waste and wastewater from humans or household operations that is discharged to or otherwise enters a treatment works. [40 CFR 503.9(g)]

Sewage Sludge - A solid, semi-solid, or liquid residue generated during the treatment of domestic sewage in a treatment works. Sewage sludge includes, but is not limited to, domestic septage; scum or solids removed in primary, secondary, or advanced wastewater treatment processes; and a material derived from sewage sludge. Sewage sludge does not include ash generated during the firing of sewage sludge in a sewage incinerator or grit and screenings generated during preliminary treatment of domestic sewage in a treatment works [40 CFR 503.9(w)].

State Board - a.k.a. State Water Resources Control Board.

State Water Quality Protection Areas (SWQPAs) - are nonterrestrial marine or estuarine areas designated to protect marine species or biological communities from an undesirable alteration in natural water quality. All Areas of Special Biological Significance (ASBS) that were previously designated by the State Board in Resolutions No. 74-28, 74-32, and 75-61 are also classified as a subset of State Water Quality Protection Areas and require special protections afforded by this Plan

Statewide Plan - A water quality control plan adopted by the State Water Resources Control Board in accordance with the provisions of Water Code sections 13240 through 13244, for waters where water quality standards are required by the Federal Water Pollution Control Act. Such plans supersede regional water quality control plans for the same waters to the extent of a conflict [California Water Code section 13170].

Triennial Review - Review of the Basin Plan which is required to be done every three years by the federal Clean Water Act [section 303(c)(1)].

Waste - Includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or

of human or animal origin, or from any producing, manufacturing, or processing operation of whatever nature, including waste placed within containers of whatever nature prior to, and for purposes of, disposal.

Waste Discharge Requirements (WDRs) - The name of permits issued by the Regional Board for the discharge of waste to land. The discharge of waste to land may potentially impact ground water quality. These permits require that waste not be discharged in a manner that would cause an exceedance of applicable water quality objectives or adversely affect beneficial uses designated in the Basin Plan.

Water Quality Criteria - Numerical or narrative limits for constituents or characteristics of water designed to protect specific designated uses of the water. When criteria are met, water quality will generally protect the designated use [40 CFR section 131.3(b)]. This term is also used to describe scientific information on the relationship that the effect of a constituent concentration has on human health, aquatic life, or other uses of water, such as the criteria in the USEPA "Gold Book". California's water quality criteria are called "water quality objectives". See "water quality standard".

Water Quality Control - means the regulation of any activity or factor which may affect the quality of the water of the state and includes the prevention and correction of water pollution and nuisance.

Water Quality Goal - The most stringent, applicable, numerical water quality limit for a constituent or parameter of concern in a specific body of ground or surface water at a specific site that is chosen to protect either (1) existing water quality or (2) beneficial uses of water. In the first case, the water quality goal is set equal to the background level in the body of water. In the second case, the water quality goal is set at the less stringent of either (a) the numerical limit which implements all applicable water quality objectives or (b) the background level.

Water Quality Objectives - Numerical or narrative limits on constituents or characteristics of water designed to protect designated beneficial uses of the water. [California Water Code section 13050(h)]. California's water quality objectives are established by the State and Regional Water Boards in the Water Quality Control Plans. See "water quality standards".

Water Quality Standards - Provisions of State or federal law which consist of a designated use or uses for waters of the United States and water quality criteria for such waters based upon such uses. Water quality standards are to protect the public health or welfare, enhance the quality of water and serve the purposes of the Act [40 CFR section 131.3(i)]. A water quality standard under the Federal Clean Water Act is equivalent to a beneficial use designation plus a water quality objective. In California, water quality standards are promulgated by the State and Regional Water Boards in Water Quality Control Plans. Water quality standards are enforceable limits for the bodies of surface or ground waters for which they are established.

Water Quality Control Plans - There are two types of water quality control plans - Basin Plans and Statewide Plans. Regional Boards adopt Basin Plans for each region based upon surface water hydrologic basin boundaries. The Regional Basin Plans designates or describes (1) existing and potential beneficial uses of ground and surface water; (2) water quality objectives to protect the beneficial uses; (3) implementation programs to achieve these objectives; and (4) surveillance and monitoring activities to evaluate the effectiveness of the water quality control plan. The Statewide Plans address water quality concerns for surface waters that overlap Regional Board boundaries, are statewide in scope, or are otherwise considered significant and contain the same four elements. Statewide Water Quality Control Plans include the Ocean Plan, the Enclosed Bays and Estuaries Plan, the Inland Surface Waters Plan, and the Thermal Plan. A water quality control plan consists of a designation or establishment for the waters within a specified area of (1) beneficial uses to be protected, (2) water quality objectives, and (3) a program of implementation needed for achieving water quality objectives [California Water Code section 13050(j)].

Waters of the State - Any water, surface or underground, including saline waters within the boundaries of the State [California Water Code section 13050(e)].

ACRONYMS

ACL .....Administrative Civil Liability
Adj. SAR .....adjusted sodium adsorption ratio
AF .....acre-foot (acre-feet)
af/y ..... acre-foot (acre-feet) per year
AG ..... attorney general
AGR ..... beneficial use of agricultural supply
AQUA ..... beneficial use of aquaculture
ASBS ..... beneficial use of Area of Special Biological Significance
BAT .....Best Available Technology
BCT ..... Best Control Technology
BEP ..... Bays and Estuaries Plan
BIOL ..... beneficial use of preservation of biological habitats of special significance
BMP ..... Best Management Practice
BOD ..... Biological Oxygen Demand
BPTCP Bay Protection and Toxic Cleanup Program
° C ..... degrees Centigrade
Ca ..... Calcium
Cal-EPA's..... .....California Environmental Protection Agency
CAOs ..... Cleanup and Abatement Orders
CBOD...carbonaceous biochemical oxygen demand
CCR ..... California Code of Regulations
CDFFP ..... California Department of Forestry and Fire Protection, Rainbow Conservation Camp
CDOs ..... Cease and Desist Orders
CEQA .....California Environmental Quality Act
CERCLA ..... Comprehensive, Environmental Response, Compensation, and Liability Act, commonly referred to as Superfund
CFR ..... Code of Federal Regulations
CIWMB ..... California Integrated Waste Management Board
COLD.....Beneficial use of cold freshwater habitat
COMM.....Beneficial use of commercial and sport fishing
CTR ..... California Toxics Rule
Cu ..... copper
CWA ..... federal Clean Water Act
CWS ..... Clean Water Strategy
CZARA..... Coastal Zone Act Reauthorization Amendments
DA ..... district attorney
DDE ..... Dichlorodiphenyldichloroethylene
DDT ..... Dichlorodiphenyltrichloroethane
DFG ..... Department of Fish and Game
DoD ..... Department of Defense
DHS ..... Department of Health Services
DPR ..... Department of Pesticide Regulation
DTSC .... Department of Toxic Substance Control
DWR ..... Department of Water Resources
E. coli ..... *Escherichia coli*
EIR ..... Environmental Impact Report
EIS ..... Environmental Impact Statement
EST ..... beneficial use of estuarine habitat
ET ..... evapotranspiration
ETI ..... evapotranspiration-Infiltration
°F ..... degrees Fahrenheit
FFA ..... Federal Facility Agreement
FRSH .. beneficial use of freshwater replenishment
ft ..... foot (feet)
GIS ..... geographic information system
Gold Book ..... Quality Criteria for Water, 1986
GWR ..... beneficial use of ground water recharge
HA ..... hydrologic area
HCO_3..... bicarbonate
HEP ..... Health Evaluation Plan
HSA ..... hydrologic subarea
HU ..... hydrologic unit
IND ..... beneficial use of industrial service supply
ISWP ..... Inland Surface Waters Plan
K ..... potassium
kg/yr ..... kilogram per year
kg N/yr ..... kilogram nitrogen per year
kg P/yr ..... kilogram phosphorus per year
L ..... liter
LA ..... Load Allocation
m ..... meter(s)
mg ..... milligram
MAA ..... Management Agency Agreement
MAR ..... beneficial use of marine habitat
MBAS ..... Methylene Blue-Activated Substances
MEP ..... Maximum Extent Practicable
mg .....milligram(s)
Mg ..... magnesium
mg/L ..... milligram(s) per liter
mg N/L ..... milligram(s) nitrogen per liter
mg P/L..... milligram(s) phosphorus per liter
MGD ..... Million Gallons per Day
MIGR ..... beneficial use of migration of aquatic organisms
MPRSA.....Marine Protection, Research and Sanctuaries Act of 1972
ml ..... milliliter(s)
MLLW ..... Mean Lower Low Water
MMs ..... Management Measures
MOS ..... Margin of Safety
MOU ..... Memorandum of Understanding
MPs ..... Management Practices

MRCD ..... Mission Resource Conservation District
MS4..... Municipal Separate Storm Sewer System
MSD ..... Marine Sanitation Device
MUN ..... beneficial use of municipal and domestic supply
Mussel Watch ..... State Mussel Watch
MWD ..... Metropolitan Water District of Southern California
NASSCO. National Steel and Shipbuilding Company
Na ..... sodium
NAV ..... beneficial use of navigation
ND .....Negative Declaration
NEPA . National Environmental Policy Act of 1969
ng/l .....nannograms per liter
No ..... number(s)
NO_3.....nitrate
NPDES .... National Pollutant Discharge Elimination System
NPSMP ..... Nonpoint Source Management Plan
NRCS ..... Natural Resources Conservation Service
NRMP... Nutrient Reduction and Management Plan
NOV ..... Notice of Violation
NTO ..... Notice to Comply
NTU .....turbidity unit
O,P'-DDD .... O,P'- Dichlorodiphenyldichloroethane
O,P'-DDE . O,P'- Dichlorodiphenyldichloroethylene
OWTS ..... onsite wastewater treatment system(s)
P,P'-DDD .... P,P'- Dichlorodiphenyldichloroethane
P,P'-DDE ... P,P'- Dichlorodiphenyldichloroethylene
P,P'-DDMS .... P,P'- Dichloro-diphenylmonochlorosaturatedethan
PAH ..... polyaromatic hydrocarbon
PCB ..... polychlorinated biphenyl
pH ..... hydrogen ion concentration
POTW ..... Publicly Owned Treatment Works
POW ..... beneficial use of hydropower generation
ppb .....part(s) per billion (ng/g)
ppm .....part(s) per million (ug/g)
Primary Network ..... Primary Water Quality Monitoring Network
PROC .. beneficial use of industrial process supply
QA ..... Quality Assurance
QAPP ..... Quality Assurance Program Plan
RARE ..... beneficial use of rare, threatened, or endangered species
RCD ..... Resource Conservation District
RCRA ..... Resource Conservation and Recovery Act of 1976
REC-1 .. beneficial use of contact water recreation
REC-2 ..... beneficial use of non-contact water recreation
ROWD ..... Report of Waste Discharge
RV ..... Recreational Vehicle
SAL ... beneficial use of inland saline water habitat
SANDAG . San Diego Association of Governments
SAR ..... sodium adsorbtion ratio
SCE ..... Southern California Edison
SDG&E ..... San Diego Gas and Electric Company
SHELL ..... beneficial use of shellfish harvesting
SIYB..... Shelter Island Yacht Basin
SOCs.....synthetic organic chemicals
SONGS .... San Onofre Nuclear Generating Station
SPWN . beneficial use of spawning, reproduction, and/or early development
SRF ..... State Revolving Fund
SWAT ..... Solid Waste Assessment Test
SWP ..... State Water Project
SWRCB ..... California State Water Resources Control Board
TBT ..... tributyl tin
TDS ..... total dissolved solids
TKN ..... total Kjeldahl nitrogen
TMDL ..... Total Maximum Daily Load
TSM ..... Toxic Substances Monitoring
TSO ..... time schedules
TSS ..... total suspended solids
UCCE ..... University of California Cooperative Extension
µg ..... microgram(s)
µg/l .....micrograms per liter
UHC ..... underwater hull cleaning
USCG ..... United States Coast Guard
USEPA .... United States Environmental Protection Agency
USGS ..... United States Geologic Survey
UST ..... underground storage tank
WARM beneficial use of warm freshwater habitat
WDR ..... Waste Discharge Requirement
WILD ..... beneficial use of wildlife habitat
WLA ..... Waste Load Allocation
WQA ..... Water Quality Assessment
WQLS ..... Water Quality Limited Segment
WQLZ ..... Water Quality Limited Zone
WRR ..... Water Reclamation Requirement

APPENDIX B - 1. Summary of the Regional Growth Forecast for Various Land Uses Within the San Diego Association of Governments' (SANDAG) Sphere of Influence.

HU 901 - 911	Year 1990	Year 2000	Year 2010	Year 2015
TOTAL ACRES	1,895,749	1,895,749	1,895,749	1,895,749
Developed Acres	395,746	428,622	539,895	660,646
Low Density Single Family	52,556	61,663	127,357	227,763
Single Family	141,512	159,132	194,286	207,021
Multiple Family	24,068	26,288	31,139	33,564
Mobile Homes	5,344	5,127	4,774	4,468
Other Residential	1,095	1,095	1,095	1,095
Industrial	35,043	36,167	38,790	40,034
Retail	24,850	25,733	27,238	28,084
Office	2,642	2,756	3,135	3,327
Schools	10,309	10,624	11,130	11,359
Agriculture	3,544	3,546	3,546	3,546
Parks	83,119	83,119	83,119	83,119
Roads & Freeways	11,665	13,372	14,288	17,267

APPENDIX B - 2. Summary of the Regional Growth Forecast for Various Land Uses Within the Southern California Association of Governments' Sphere of Influence.

HU 901 - 911	Year 1994
TOTAL ACRES	460,572
Developed Acres	121,766
Low Density Single Family	3,793
Single Family	24,395
Multiple Family	6,388
Mobile Homes	1,045
Other Residential	9,484
Industrial	3,087
Retail	20,060
Office	1,262
Schools	1,291
Agriculture	46,887
Parks	2,523
Roads & Freeways	1,551

APPENDIX B - 3. Regional Growth Forecast for Various Land Uses Within SANDAG's Sphere of Influence for the San Juan Hydrologic Unit (Hydrologic Unit Basin 901).*

HU 901	Year 1990	Year 2000	Year 2010	Year 2015
TOTAL ACRES	100,823	100,823	100,823	100,823
Developed Acres	6,137	6,137	6,137	6,137
Low Density Single Family	0	0	0	0
Single Family	152	152	152	152
Multiple Family	100	100	100	100
Mobile Homes	142	142	142	142
Other Residential	27	27	27	27
Industrial	2,816	2,816	2,816	2,816
Retail	0	0	0	0
Office	0	0	0	0
Schools	8	8	8	8
Agriculture	0	0	0	0
Parks	2,487	2,487	2,487	2,487
Roads & Freeways	405	405	405	405

Regional Growth Forecast for Various Land Uses Within SANDAG's Sphere of Influence for the Santa Margarita Hydrologic Unit (Hydrologic Unit Basin 902).*

HU 902	Year 1990	Year 2000	Year 2010	Year 2015
TOTAL ACRES	122,902	122,902	122,902	122,902
Developed Acres	8,600	9,011	11,957	13,362
Low Density Single Family	2,090	2,340	5,137	5,965
Single Family	727	879	1,013	1,548
Multiple Family	459	460	464	470
Mobile Homes	61	61	61	61
Other Residential	11	11	11	11
Industrial	4,573	4,580	4,585	4,588
Retail	330	332	337	340
Office	0	0	0	0
Schools	50	50	50	50
Agriculture	0	0	0	0
Parks	148	148	148	148
Roads & Freeways	151	151	151	182

* This is the Regional Growth Forecast for the area within SANDAG's Sphere of Influence only; that portion covered within SCAG's Sphere of Influence is not shown.

APPENDIX B - 3 (continued). Regional Growth Forecast for the Period 1990 through 2015 for the San Luis Rey Hydrologic Unit (Hydrologic Unit Basin 903).

HU 903	Year 1990	Year 2000	Year 2010	Year 2015
TOTAL ACRES	351,640	351,640	351,640	351,640
Developed Acres	37,262	42,289	60,999	79,877
Low Density Single Family	14,985	16,599	29,134	44,539
Single Family	5,019	8,196	13,963	17,066
Multiple Family	1,722	1,889	2,057	2,077
Mobile Homes	620	392	391	391
Other Residential	86	86	86	86
Industrial	1,531	1,543	1,634	1,653
Retail	1,068	1,144	1,295	1,364
Office	60	66	78	75
Schools	360	369	374	384
Agriculture	161	161	161	161
Parks	11,005	11,005	11,005	11,005
Roads & Freeways	646	786	825	1,052

Regional Growth Forecast for the Period 1990 through 2015 for the Carlsbad Hydrologic Unit (Hydrologic Unit Basin 904).

HU 904	Year 1990	Year 2000	Year 2010	Year 2015
TOTAL ACRES	132,554	132,554	132,554	132,554
Developed Acres	56,749	64,927	79,666	92,898
Low Density Single Family	6,834	8,348	12,617	19,299
Single Family	27,365	32,713	40,582	46,007
Multiple Family	5,385	5,863	7,097	7,181
Mobile Homes	1,715	1,715	1,448	1,389
Other Residential	103	103	103	103
Industrial	4,133	4,330	5,059	5,483
Retail	4,274	4,496	4,944	5,183
Office	376	420	556	612
Schools	1,517	1,568	1,759	1,841
Agriculture	274	274	274	274
Parks	3,387	3,387	3,387	3,387
Roads & Freeways	1,386	1,710	1,840	2,140

APPENDIX B - 3 (continued). Regional Growth Forecast for the Period 1990 through 2015 for the San Dieguito Hydrologic Unit (Hydrologic Unit Basin 905).

HU 905	Year 1990	Year 2000	Year 2010	Year 2015
TOTAL ACRES	217,586	217,586	217,586	217,586
Developed Acres	38,210	42,855	62,662	83,105
Low Density Single Family	9,559	12,482	24,900	42,295
Single Family	14,271	15,802	22,695	24,991
Multiple Family	1,146	1,220	1,379	1,492
Mobile Homes	140	140	140	140
Other Residential	8	8	8	8
Industrial	904	941	1,066	1,098
Retail	2,385	2,413	2,468	2,493
Office	142	147	218	269
Schools	442	466	481	488
Agriculture	770	772	772	772
Parks	8,011	8,011	8,011	8,011
Roads & Freeways	432	453	526	1,049

Regional Growth Forecast for the Period 1990 through 2015 for the Penasquitos Hydrologic Unit (Hydrologic Unit Basin 906).

HU 906	Year 1990	Year 2000	Year 2010	Year 2015
TOTAL ACRES	92,823	92,823	92,823	92,823
Developed Acres	47,609	50,663	56,484	61,032
Low Density Single Family	988	1,071	2,110	4,910
Single Family	20,740	22,441	25,240	25,484
Multiple Family	4,081	4,532	5,313	5,786
Mobile Homes	322	333	273	210
Other Residential	67	67	67	67
Industrial	4,736	4,954	5,701	6,051
Retail	3,641	3,882	4,107	4,243
Office	714	726	766	783
Schools	2,628	2,715	2,835	2,888
Agriculture	745	745	745	745
Parks	7,353	7,353	7,353	7,353
Roads & Freeways	1,595	1,844	1,974	2,515

APPENDIX B - 3 (continued). Regional Growth Forecast for the Period 1990 through 2015 for the San Diego Hydrologic Unit (Hydrologic Unit Basin 907).

HU 907	Year 1990	Year 2000	Year 2010	Year 2015
TOTAL ACRES	289,243	289,243	289,243	289,243
Developed Acres	82,095	84,372	99,269	118,659
Low Density Single Family	8,802	9,399	18,364	36,328
Single Family	27,121	26,068	33,000	33,468
Multiple Family	4,187	4,342	4,688	4,959
Mobile Homes	1,178	1,178	1,178	1,170
Other Residential	96	96	96	96
Industrial	5,524	5,524	5,823	6,001
Retail	5,079	5,168	5,347	5,408
Office	713	749	831	877
Schools	2,098	2,124	2,157	2,188
Agriculture	216	216	216	216
Parks	24,521	24,521	24,521	24,521
Roads & Freeways	2,590	2,936	3,049	3,427

Regional Growth Forecast for the Period 1990 through 2015 for the Pueblo San Diego Hydrologic Unit (Hydrologic Unit Basin 908).

HU 908	Year 1990	Year 2000	Year 2010	Year 2015
TOTAL ACRES	44,368	44,368	44,368	44,368
Developed Acres	33,226	33,402	34,177	34,374
Low Density Single Family	0	0	0	0
Single Family	15,950	15,902	15,780	15,548
Multiple Family	3,817	3,967	4,797	5,233
Mobile Homes	151	151	133	102
Other Residential	162	162	162	162
Industrial	4,340	4,373	4,394	4,399
Retail	4,235	4,251	4,289	4,296
Office	415	416	419	421
Schools	1,178	1,179	1,194	1,196
Agriculture	0	0	0	0
Parks	1,641	1,641	1,641	1,641
Roads & Freeways	1,337	1,361	1,368	1,376

APPENDIX B - 3 (continued). Regional Growth Forecast for the Period 1990 through 2015 for the Sweetwater Hydrologic Unit (Hydrologic Unit Basin 909).

HU 909	Year 1990	Year 2000	Year 2010	Year 2015
TOTAL ACRES	147,593	147,593	147,593	147,593
Developed Acres	56,400	59,870	73,470	90,120
Low Density Single Family	5,686	6,262	16,882	32,718
Single Family	22,859	25,084	27,149	27,329
Multiple Family	2,004	2,273	2,686	2,962
Mobile Homes	443	443	436	436
Other Residential	90	90	90	90
Industrial	1,229	1,302	1,364	1,380
Retail	2,380	2,500	2,644	2,712
Office	141	152	174	182
Schools	1,262	1,278	1,356	1,388
Agriculture	164	164	164	164
Parks	19,036	19,036	19,036	19,036
Roads & Freeways	1,104	1,285	1,490	1,723

Regional Growth Forecast for the Period 1990 through 2015 for the Otay Hydrologic Unit (Hydrologic Unit Basin 910).

HU 910	Year 1990	Year 2000	Year 2010	Year 2015
TOTAL ACRES	100,465	100,465	100,465	100,465
Developed Acres	15,762	19,416	30,411	45,290
Low Density Single Family	2,198	2,818	8,514	21,814
Single Family	4,729	6,785	11,040	11,628
Multiple Family	799	1,152	1,849	2,418
Mobile Homes	466	466	466	377
Other Residential	338	338	338	338
Industrial	3,664	3,737	3,897	3,964
Retail	1,044	1,106	1,239	1,354
Office	17	17	32	40
Schools	429	498	523	537
Agriculture	1,155	1,155	1,155	1,155
Parks	665	665	665	665
Roads & Freeways	257	679	692	998

APPENDIX B - 3 (continued). Regional Growth Forecast for the Period 1990 through 2015 for the Tijuana Hydrologic Unit (Hydrologic Unit Basin 911).

HU 911	Year 1990	Year 2000	Year 2010	Year 2015
TOTAL ACRES	295,751	295,751	295,751	295,751
Developed Acres	13,695	15,731	24,661	35,792
Low Density Single Family	1,411	2,344	9,700	19,895
Single Family	2,578	3,109	3,672	3,801
Multiple Family	398	489	710	885
Mobile Homes	108	108	108	51
Other Residential	107	107	107	107
Industrial	1,593	2,016	2,450	2,602
Retail	414	440	569	671
Office	62	63	63	64
Schools	339	370	393	393
Agriculture	57	57	57	57
Parks	4,866	4,866	4,866	4,866
Roads & Freeways	1,763	1,763	1,967	2,399

APPENDIX C
WATER QUALITY CRITERIA

The literature contains many different water quality criteria designed to protect specific beneficial uses of water. A summary of the specific numerical water quality criteria considered by the Regional Board for designation as water quality objectives is described in Table C-1, Water Quality Criteria - Inorganic Constituents; and Table C-2, Water Quality Criteria - Organic Constituents. The water quality criteria summarized in Tables C-1 and C-2 provided the basis for the Regional Board's designation of many of the specific numerical water quality objectives described earlier in this Chapter.

The water quality criteria presented in Tables C-1 and C-2 are not enforceable water quality objectives. The purpose of presenting the information summarized in these tables is to allow interested persons to compare available water quality criteria to the specific water quality objectives designated by the Regional Board described in Chapter 3.

A summary of the available types of numerical water quality criteria considered by the Regional Board for designation as numerical water quality objectives are summarized below.

- ***Maximum Contaminant Levels (MCLs):***

  MCLs are part of the drinking water standards adopted both by the California Department of Health Services (DHS), Office of Drinking Water in Title 22 of the California Code of Regulations (CCR), Division 4, Chapter 15, "*Domestic Water Quality and Monitoring*" and by the USEPA under the Safe Drinking Water Act. The State MCL drinking water standards must be at least as stringent as those adopted by USEPA. Primary MCLs are derived from the one in a million incremental cancer risk estimate for carcinogens and from threshold toxicity levels for non-carcinogens. Secondary MCLs are derived from human welfare considerations (e.g., taste or odor).

- ***Maximum Contaminant Level Goals (MCL Goals):***

  MCL Goals are promulgated by USEPA under the National Primary Drinking Water Regulations as the first step in establishing MCLs. MCL Goals are set at levels which represent no adverse health risks.

- ***State "Action" Levels:***

  Action levels are published by the DHS's Office of Drinking Water and are based mainly on health effects. The 10-6 incremental cancer risk estimates are used for carcinogens and threshold toxicity limits are used for other constituents.

- ***Proposition 65 Regulatory Limits:***

  Proposition 65 limits are established under the California Safe Drinking Water and Toxic Enforcement Act of 1986 for known human carcinogens and reproductive toxins. For carcinogens the No-Significant-Risk-Levels are set at the one-in-100,000 incremental cancer risk level. 1/1000 of the No-Observable-Effect Level (NOEL) is used for reproductive toxicants.

- ***National Ambient Water Quality Criteria:***

  These criteria are published by USEPA under the federal Clean Water Act to protect human health and welfare and freshwater and marine aquatic life. These criteria are found in: *Quality Criteria for Water, 1986* - the "*Gold Book*"; the Ambient Water Quality Criteria volumes (1980, 1984, 1986, 1987, and 1989); Quality Criteria for Water (1976) - the "*Red Book*"; and Water Quality Criteria, 1972 - the "*Blue Book*".

- ***Health Advisories and Water Quality Advisories:***

  These advisories are published by USEPA's Office of Water. Short-term (10 days or less), long-term (7 years or less), and lifetime exposure health advisories for non-carcinogens and suspected human health carcinogens are included where sufficient data exist.

- ***Suggested No-Adverse-Response Levels (SNARLS):***

  These human health-related criteria are published by the National Academy of Sciences in the Drinking Water and Health Volumes. Incremental cancer risk estimates are presented separately for carcinogens.

- ***Water Quality for Agriculture:***

  Water Quality for Agriculture was published by the Food and Agriculture Organization of the United Nations in 1985, which contains criteria protective of agricultural uses of water.

- ***Water Quality Criteria:***

  Water Quality Criteria was written by McKee and Wolf and published by the State Water Resources Control Board in 1963 and 1978. It contains criteria for human health and welfare, aquatic life, agricultural use, industrial use, and various other beneficial uses.

Table C-1. WATER QUALITY CRITERIA - INORGANIC CONSTITUENTS

Inorganic Constituent	BASIN PLAN				Drinking Water Standards (California & Federal) Maximum Contaminant Levels (MCLs)		
	Ocean Waters (1) "‡" = carcinogen	Bays and Estuaries	Inland Surface Waters	Ground Water	California Dept.of Health Services Primary MCL	California Dept.of Health Services Secondary MCL	USEPA Primary MCL
Ammonia	600 (2)	NH_3 not > 0.025 mg/l	NH_3 not > 0025 mg/l				
Antimony	1,200						6 (8)
Arsenic	8				50		50
Beryllium	0.033 ‡						4 (8)
Boron			0.5 mg/l or as noted in Table 3-1	0.5 mg/l or as noted in Table 3-2			
Bromide							
Cadmium	1				10		5
Chloride			250 mg/l or as noted in Table 3-1	60 mg/l or as noted in Table 3-2		250,000 (7)	
Chlorine	2 (3)						
Chromium (III)	190,000						
Chromium (VI)	2 (4)						
Chromium (total)	2 (4)				50		100
Color			20 units or as noted in Table 3-1	15 units or as noted in Table 3-2		15 units	
Copper	3					1,000	1,300 (9)
Cyanide	1						200 (8)
Fluoride			1.0 mg/l or as noted in Table 3-1	1.0 mg/l or as noted in Table 3-2	1,400 to 2,400 (5)		4,000
Iron			0.3 mg/l or as noted in Table 3-1	0.3 mg/l or as noted in Table 3-2		300	
Lead	2				50		15 (9)
Manganese			0.05 mg/l or as noted in Table 3-1	0.05 mg/l or as noted in Table 3-2		50	
Mercury (inorganic)	0.04				2		2
Nickel	5						100 (8)
Nitrate			5 mg/l or as noted in Table 3-1	5 mg/l or as noted in Table 3-2	45,000 (6)		10,000 (10)
Oxygen, dissolved	Shall not be depressed >10%	Shall not be less than 5.0 mg/l with designated MAR. The annual mean DO shall not be less than 7 mg/l more than 10% of the time.	Shall not be less than 5.0 mg/l in inland surface waters with WARM or less than 6.0 m/l in waters with COLD beneficial use The annual mean D.O. conc. shall not be less than 7 mg/l more than 10% of the time.				

Table C-1 -- Values are in ug/l (ppb) unless otherwise indicated. Numbers in parenthesis indicate endnotes following the tables.

Table C-1. WATER QUALITY CRITERIA - INORGANIC CONSTITUENTS

Inorganic Constituent	BASIN PLAN				Drinking Water Standards (California & Federal) Maximum Contaminant Levels (MCLs)		
	Ocean Waters (1) "‡" = carcinogen	Bays and Estuaries	Inland Surface Waters	Ground Water	California Dept.of Health Services Primary MCL	California Dept.of Health Services Secondary MCL	USEPA Primary MCL
pH	Shall not be +/- 0.2 units of natural pH	Shall not be depressed below 7.0; nor raised above 9.0. Changes in normal ambient pH shall not exceed 0.2 units.	Shall not be depressed below 6.5 nor raised above 8.5. Changes in normal ambient pH levels shall not exceed 0.5 units in fresh waters with designated COLD or WARM beneficial uses.				
Phosphorus			Shall not exceed 0.05 mg/l in any steam at the point where it enters any standing body of water, nor 0.025 mg/l in any standing body of water; for flowing waters, shall not exceed 0.1 mgl total P. These values not to be exceeded more than 10% of the time.				
Radioactivity, Gross Alpha					15 pCi/l		15 pCi/l (12)
Radioactivity, Gross Beta					50 pCi/l		4 mrem/yr
Radium 226 + 228					5 pCi/l		5 pCi/l / 20 pCi/l (13)
Selenium	15				10		50
Settleable solids			Shall not contain suspended and settleable solids in concentrations that result in the deposition of solids that cause nuisance or adversely affect beneficial uses.				
Silver	0.7				50		100
Sodium			60% Na; or as noted in Table 3-1	60% Na; or as noted in Table 3-2			
Strontium-90					8 pCi/l		
Sulfate			65 mg/l; or as noted in Table 3-1	60 mg/l; or as noted in Table 3-2		250,000 (7)	400,000 - 500,000 (13)
Total dissolved solids (TDS)			300 mg/l; or as noted in Table 3-1	350 mg/l; or as noted in Table 3-2		500,000 (11)	
Thallium	14						2 (8)
Tritium					20,000 pCi/l		
Turbidity		Shall not be less than 50% of the depth at locations where measurement is made by means of a standard Secchi disk, or as noted in Chapter 3 page 30.	20 NTU; or as noted in Table 3-1. Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses.	5 NTU; or as noted in Table 3-2. Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses.		5 units	1 to 5 units
Uranium					20 pCi/l		20 μg/l = 30 pCi/l (13)
Zinc	20					5,000	

Table C-1 -- Values are in ug/l (ppb) unless otherwise indicated. Numbers in parenthesis indicate endnotes following the tables.

Table C-1. WATER QUALITY CRITERIA - INORGANIC CONSTITUENTS

Inorganic Constituent	Drinking Water Standards (Federal) Maximum Contaminant Levels		California Recommended Public Health Level (RPHL)	Health Advisories or Suggested No-Adverse-Response Levels (SNARLs) for toxicity other than cancer risk		US EPA Integrated Risk Information System (IRIS) Reference Dose as a Water Quality Criterion (16)	One-in-a-Million Incremental Cancer Risk Estimates for Drinking Water			California Proposition 65 Regulatory Level as a Water Quality Criterion (19)	Agricultural Water Quality Goals (21)
	USEPA		Department of Health Services	USEPA	National Academy of Sciences (NAS)		Cal/EPA Cancer Potency Factor as a Water Quality Criterion (17)	USEPA Integrated Risk Information System (IRIS)	USEPA Health Advisory or SNARL		
	Secondary MCL	MCL Goal									
Ammonia				30,000 (14)					(D)		
Antimony		6 (8)		3		2.8			(D)		
Arsenic								0.02	0.02 (A,14)	5	100
Beryllium		4 (8)		4,000 / 20,000 (7-yr,14,15)				0.008	0.008 (B,14)	(18)	100
Boron				600 (14)		630			(D)		750 (22) /700
Bromide					2,300						
Cadmium		5		5	5	3.5	(18)		(D)	(18)	10
Chloride	250,000										106,000
Chlorine						1,050			(D)		
Chromium (III)											
Chromium (VI)							0.083		(A)	(18)	100
Chromium (total)		100		100		35			(D)		
Color	15 units										
Copper	1,000	1,300							(D)		200
Cyanide		200 (8)		200		150			(D)		
Fluoride	2,000	4,000				840			(D)		1,000
Iron	300										5,000
Lead		zero							(B)	0.25 (20)	5,000
Manganese	50					980					200
Mercury (inorganic)		2	2 (13)	2		2.1			(D)		
Nickel		100 (8)		100		140	(18)		(D)	(18)	200
Nitrate		10,000 (2)		10,000 (2)		11,000 (2)			(D)		
Oxygen, dissolved											

Table C-1 -- Values are in ug/l (ppb) unless otherwise indicated. Numbers in parenthesis indicate endnotes following the tables.

Table C-1. WATER QUALITY CRITERIA - INORGANIC CONSTITUENTS

Inorganic Constituent	Drinking Water Standards (Federal) Maximum Contaminant Levels		California Recommended Public Health Level (RPHL)	Health Advisories or Suggested No-Adverse-Response Levels (SNARLs) for toxicity other than cancer risk		US EPA Integrated Risk Information System (IRIS) Reference Dose as a Water Quality Criterion (16)	One-in-a-Million Incremental Cancer Risk Estimates for Drinking Water			California Proposition 65 Regulatory Level as a Water Quality Criterion (19)	Agricultural Water Quality Goals (21)
	USEPA		Department of Health Services	USEPA	National Academy of Sciences (NAS)		Cal/EPA Cancer Potency Factor as a Water Quality Criterion (17)	USEPA Integrated Risk Information System (IRIS)	USEPA Health Advisory or SNARL		
	Secondary MCL	MCL Goal									
pH	6.5 to 8.5 unts										
Phosphorus				0.1 (23)					(D)		
Radioactivity, Gross Alpha		zero							(A)		
Radioactivity, Gross Beta		zero							0.04 mrem/yr (A,14)		
Radium 226 + 228		zero (13)							0.22–0.26 pCi/l (A,14)		
Selenium		50				35					20
Settleable solids											
Silver				100 (14)		35			(D)		
Sodium				2,000 (24)							
Strontium-90									(A)		
Sulfate	250,000	400,000 - 500,000 (13)									
Total dissolved solids (TDS)	500,000										450,000
Thallium		0.5 (8)		0.4		0.5					
Tritium									(A)		
Turbidity											
Uranium		zero (13)			35				1.7 pCi/l (A)		
Zinc	5,000			2,000		2,100			(D)		2,000

Table C-1 -- Values are in ug/l (ppb) unless otherwise indicated. Numbers in parenthesis indicate endnotes following the tables.

Table C-1. WATER QUALITY CRITERIA - INORGANIC CONSTITUENTS

Inorganic Constituent	USEPA National Ambient Water Quality Criteria									
	Health and Welfare Protection			Freshwater Aquatic Life Protection						
				Recommended Criteria				Additional Toxicity Information		
	Non-Cancer Public Health Effects	One-in-a-Million Incremental Cancer Risk Estimate	Taste & Odor or Welfare	Continuous Concentration (4-day Average)	24-hour Average	Maximum Concentration (1-hour Average)	Maximum (Instantaneous)	Acute	Chronic	Other
Ammonia				(26)		(26)				
Antimony	14 / 4300 (25)			30 (13,27)		88 (13,27)		9,000	1,600	610 (42)
Arsenic		0.018 / 0.14 (25)		190 (27)		360 (27)		850 (41)		48 (43)
Beryllium								130	5.3	
Boron										
Bromide										
Cadmium				0.55 (28,29)		1.4 (28,36)				
Chloride	250,000			230,000 (30)		860,000 (30)				
Chlorine				11 (31)		19 (31)				
Chromium (III)				98 (28,32)		820 (28,37)				
Chromium (VI)				11		16				
Chromium (total)										
Color										
Copper			1000	5.4 (28,33)		7.5 (28,38)				
Cyanide	700 / 220,000 (25)			5.2		22				
Fluoride										
Iron			300				1000			
Lead				0.99 (28,34)		25 (28,39)				
Manganese			50							
Mercury (inorganic)	0.14 / 0.15 (25)			0.012		2.4				
Nickel	610 / 4600 (25)			73 (28,35)		653 (28,40)				
Nitrate	10,000 (2)									
Oxygen, dissolved				(22)	(22)					

Table C-1 -- Values are in ug/l (ppb) unless otherwise indicated. Numbers in parenthesis indicate endnotes following the tables.

Table C-1. WATER QUALITY CRITERIA - INORGANIC CONSTITUENTS

Inorganic Constituent	USEPA National Ambient Water Quality Criteria									
	Health and Welfare Protection			Freshwater Aquatic Life Protection						
				Recommended Criteria				Additional Toxicity Information		
	Non-Cancer Public Health Effects	One-in-a-Million Incremental Cancer Risk Estimate	Taste & Odor or Welfare	Continuous Concentration (4-day Average)	24-hour Average	Maximum Concentration (1-hour Average)	Maximum (Instantaneous)	Acute	Chronic	Other
pH			5 to 9 units				6.5 to 9.0 units			
Phosphorus										
Radioactivity, Gross Alpha										
Radioactivity, Gross Beta										
Radium 226 + 228										
Selenium				5		20				
Settleable solids										
Silver				0.12 (13)		0.84 (28,44)			0.12	
Sodium										
Strontium-90										
Sulfate			250,000							
Total dissolved solids (TDS)										
Thallium	1.7 / 6.3 (25)							1,400	40	20 (46)
Tritium										
Turbidity										
Uranium										
Zinc						54 (28,45)				

Table C-1 -- Values are in ug/l (ppb) unless otherwise indicated. Numbers in parenthesis indicate endnotes following the tables.

Table C-1. WATER QUALITY CRITERIA - INORGANIC CONSTITUENTS

Inorganic Constituent	USEPA National Ambient Water Quality Criteria Saltwater Aquatic Life Protection						California Ocean Plan Numerical Water Quality Objectives					
	Recommended Criteria			Additional Toxicity Information			Human Health Protection	Marine Aquatic Life Protection				
	Continuous Concentration (4-day Average)	Maximum Concentration (1-hour)	Maximum (Instantaneous)	Acute	Chronic	Other	(30-day Average) "‡" = carcinogen	6-month Median	30-day Average	7-day Average	Daily Maximum	Instantaneous Maximum
Ammonia	35 (47)	233 (47)						600 (2)			2,400 (2)	6,000 (2)
Antimony	500 (13,27)	1,500 (13,27)					1,200					
Arsenic	36 (27)	69 (27)		2,319 (41)		13 (43)		8			32	80
Beryllium							0.033 ‡					
Boron												
Bromide												
Cadmium	9.3	43						1			4	10
Chloride												
Chlorine	7.5 (48)	13 (48)						2 (3)			8 (3)	60 (3)
Chromium (III)				10,300 (49)			190,000					
Chromium (VI)	50	1,100						2 (4)			8 (4)	20 (4)
Chromium (total)								2 (4)			8 (4)	20 (4)
Color												
Copper	2.9	2.9						3			12	30
Cyanide	1	1						1			4	10
Fluoride												
Iron												
Lead	5.6	140						2			8	20
Manganese			100									
Mercury (inorganic)	0.025	2.1						0.04			0.16	0.4
Nickel	8.3	75						5			20	50
Nitrate												
Oxygen, dissolved												

Table C-1 -- Values are in ug/l (ppb) unless otherwise indicated. Numbers in parenthesis indicate endnotes following the tables.

Table C-1. WATER QUALITY CRITERIA - INORGANIC CONSTITUENTS

Inorganic Constituent	USEPA National Ambient Water Quality Criteria Saltwater Aquatic Life Protection						California Ocean Plan Numerical Water Quality Objectives					
	Recommended Criteria			Additional Toxicity Information			Human Health Protection	Marine Aquatic Life Protection				
	Continuous Concentration (4-day Average)	Maximum Concentration (1-hour)	Maximum (Instantaneous)	Acute	Chronic	Other	(30-day Average) "‡" = carcinogen	6-month Median	30-day Average	7-day Average	Daily Maximum	Instantaneous Maximum
pH			6.5 to 8.5 units									6.0 to 9.0 units
Phosphorus			0.1 (50)									
Radioactivity, Gross Alpha												15 pCi/l (12)
Radioactivity, Gross Beta												50 pCI/l
Radium 226 + 228												5 pCi/l
Selenium	71	300						15			60	150
Settleable solids									1,000	1,500		3,000
Silver	0.92 (13)	2.3						0.7			2.8	7
Sodium												
Strontium-90												8 pCi/l
Sulfate												
Total dissolved solids (TDS)												
Thallium				2,130			14					
Tritium												20,000 pCi/l
Turbidity									75 NTU	100 NTU		225 NTU
Uranium												20 pCi/l
Zinc	86	95						20			80	200

Table C-1 -- Values are in ug/l (ppb) unless otherwise indicated. Numbers in parenthesis indicate endnotes following the tables.

ENDNOTES FOR TABLE C-1 - INORGANICS

(7-day) For exposure of 7 days or less.
(10-day) For exposure of 10 days or less.
(24-hr) For exposure of 24 hours or less.
(7-yr) For "longer-term" exposure (7 years or less, EPA).
(A) Known human carcinogen; sufficient epidemiologic evidence in humans.
(B) Probable human carcinogen; sufficient evidence from animal studies; no or inadequate human data.
(C) Possible human carcinogen; limited evidence from animal studies; no human data.
(D) Not classified as to human carcinogenicity; no data or inadequate evidence.
(E) Evidence of non-carcinogenicity for humans.
(1) Or as noted in the California Ocean Plan (Reference 28)
(2) Expressed as nitrogen.
(3) For total chlorine residual; for intermittent chlorine sources see Reference 26, Chapter IV, Table B.
(4) Value developed for chromium VI; may be applied to total chromium if valence unknown.
(5) MCL varies with air temperature; 2.4 mg/l (S 53.7 °F); 2.2 mg/l (53.8 – 58.3 °F); 2.0 mg/l (58.4 – 63.8 °F); 1.8 mg/l (63.9 – 70.6 °F); 1.6 mg/l (70.0 – 79.2 °F); 1.4 mg/l (79.3 – 90.5 °F).
(6) As NO_3.
(7) Recommended level; Upper level = 500 mg/l; Short-term level = 600 mg/l.
(8) Effective 17 January 1994.
(9) MCL includes this "Action level", to be exceeded in no more than 10 percent of samples.
(10) As nitrogen; in addition, MCL for total nitrate and nitrite = 10,000 µg/l (as N).
(11) Recommended level; Upper level = 1,000; Short-term level = 1,500 mg/l.
(12) Includes Radium 226 but excludes Radon and Uranium.
(13) Proposed.
(14) Draft / tentative / provisional.
(15) Calculated for child / for adult
(16) Assumes 70 kg body weight, 2 liters/day water consumption, and 20% relative source contribution. An additional uncertainty factor of 10 is used for Class C carcinogens.
(17) Assumes 70 kg body weight and 2 liters/day water consumption.
(18) Determined not to pose a risk of cancer through ingestion (Title 22, CCR, Division 2).
(19) Regulatory dose level divided by 2 liters per day average consumption; represents a 1-in-100,000 incremental cancer risk estimate unless otherwise noted.
(20) Based on reproductive toxicity
(21) Reference 19 unless noted otherwise.
(22) See Reference 16.
(23) For white phosphorus.
(24) Guidance level (Reference 3) assumes relative source contribution of 10% from drinking water.
(25) For consumption of water and aquatic organisms / for consumption of aquatic organisms only.
(26) Varies with pH and temperature.
(27) For the trivalent form.
(28) Value based on hardness of 40 mg/l; value increases with increasing hardness.
(29) For hardness in mg/l as CaCO3, criterion = e(0.7852 [ln (hardness)] –3.490) µg/l.
(30) For dissolved chloride associated with sodium; criterion probably will not be adequately protective when chloride is associated with potassium, calcium, or magnesium, rather than sodium.
(31) For total residual chlorine.
(32) For hardness in mg/l as CaCO3, criterion = e(0.8190 [ln (hardness)] + 1.561) µg/l.
(33) For hardness in mg/l as CaCO3, criterion = e(0.8545 [ln (hardness)] – 1.465) µg/l.
(34) For hardness in mg/l as CaCO3, criterion = e(1.273 [ln (hardness)] – 4.705) µg/l.
(35) For hardness in mg/l as CaCO3, criterion = e(0.8460 [ln (hardness)] + 1.1645) µg/l.
(36) For hardness in mg/l as CaCO3, criterion = e(1.128 [ln (hardness)] – 3.828) µg/l.
(37) For hardness in mg/l as CaCO3, criterion = e(0.8190 [ln (hardness)] + 3.688) µg/l.
(38) For hardness in mg/l as CaCO3, criterion = e(0.9422 [ln (hardness)] – 1.464) µg/l.
(39) For hardness in mg/l as CaCO3, criterion = e(1.273 [ln (hardness)] – 1.460) µg/l.
(40) For hardness in mg/l as CaCO3, criterion = e(0.8460 [ln (hardness)] + 3.3612) µg/l.
(41) For the pentavalent form.
(42) Toxicity to algae occurs.
(43) Based on reproductive toxicity.
(44) For hardness in mg/l as $CaCO_3$, criterion = e(1.72 [ln (hardness)] –6.52) µg/l.
(45) For hardness in mg/l as $CaCO_3$, criterion = e(0.8473 [ln (hardness)] + 0.8604) µg/l.
(46) Toxicity to one species of fish after 2,600 hours of exposure.
(47) Unionized ammonia concentrations.
(48) For sum of chlorine-produced oxidants.
(49) EC50 for eastern oyster embryos.
(50) For elemental phosphorus; marine or estuarine.

Table C-2. WATER QUALITY CRITERIA - ORGANIC CONSTITUENTS

Organic Constituent	BASIN PLAN				Drinking Water Standards (California & Federal) Maximum Contaminant Levels (MCLs)					California Recommended Public Health Level (RPHL) Department of Health Services	California State Action Levels Department of Health Services		Other Taste and Odor Thresholds	Health Advisories or Suggested No-Adverse Response Levels (SNARLS) for toxicity other than cancer risk	
	Ocean Waters (1) ‡ = carcinogen	Bays and Estuaries	Inland Surface Waters and Ground Waters		California Dept. of Health Services		US Environmental Protection Agency							USEPA	National Academy of Sciences
			Primary MCL	Secondary MCL	Primary MCL	Secondary MCL	Primary MCL	Secondary MCL	MCL Goal		Toxicity	Taste & Odor			
Acenaphthylene	0.0088 ‡ (2)														
Acenaphthylene	220														
Acrylonitrile	0.10 ‡													1 / 4 (7-yr,13,14)	
Aldrin	0.000022 ‡										0.05 (LOQ)			0.3 (10-day,14)	
Anthracene	0.0088 ‡ (2)														
Atrazine			3		3		3		3	3 (11)				3	150
Bentazon			18		18					18 (11)				20	
Benz(a)anthracene	0.0088 ‡ (2)						0.1 (11)		zero (11)						
Benzene	5.9 ‡		1		1		5		zero	0.35 (11)				200 (10-day)	
Benzidine	0.000069 ‡														
Benzo(b)fluoranthene	0.0088 ‡ (2)						0.2 (11)		zero (11)						
Benzo(k)fluoranthene	0.0088 ‡ (2)						0.2 (11)		zero (11)						
Benzo(g,h,i)perylene	0.0088 ‡ (2)														
Benzo(a)pyrene	0.0088 ‡ (2)						0.2 (12)		zero (12)						
alpha-BHC	0.008 (3)										0.7				500 (7-day,3)
beta-BHC	0.008 (3)										0.3				500 (7-day,3)
Gamma-BHC (Lindane)	0.008 (3)		4		4		0.2		0.2					0.2	500 (7-day,3)
delta-BHC	0.008 (3)														500 (7-day,3)
technical-BHC	0.008 (3)														500 (7-day)
Bis(2-chloroethoxy) methane	4.4														
Bis(2-chloroethyl) ether	0.045 ‡														
Bis(2-chloroisopropyl) ether	1200													300	
Bromodichloromethane	130 ‡ (4)		100 (10)		100 (10)		100 (10)							400 / 1,300 (7-yr,13,14)	
Bromoform	130 ‡ (4)		100 (10)		100 (10)		100 (10)							2,000 (10-day)	
Bromomethane	130 ‡ (4)													10	
Carbofuran			18		18		40		40	18 (11)				40	
Carbon tetrachloride	0.90 ‡		0.5		0.5		5		zero	0.5 (11)				200 (10-day)	200 (7-day)
Catechol	30 (5)														2,200 (24-hr)
Chlordane	0.000023 ‡ (6)		0.1		0.1		2		zero	0.03 (11)				60 (10-day)	
Chlorobenzene	570		30		30		100		100	30 (11)				100	
4-Chloro-m-cresol	1 (7)														
4-Chloro-o-cresol	1 (7)														
6-Chloro-m-cresol	1 (7)														
Chloroform	130 ‡		100 (10)		100 (10)		100 (10)							4,000 (10-day)	
Chloromethane	130 ‡ (4)													3	
2-Chlorophenol	1 (7)													40 (14)	
3-Chlorophenol	1 (7)														
4-Chlorophenol	1 (7)														
Chrysene	0.0088 ‡ (2)						0.2 (11)		zero (11)						
2,4-D			100		100		70		70					70	87.5
DBCP			0.2		0.2		0.2		zero	0.002 (11)				50 (10-day)	
DDD	0.00017 ‡ (8)														
DDE	0.00017 ‡ (8)														
DDT	0.00017 ‡ (8)														
Dibenz(a,h)anthracene	0.0088 ‡ (2)						0.3 (11)		zero (11)						
Dibromochloromethane	130 ‡ (4)		100 (10)		100 (10)		100 (10)							60 (14)	18,000 (24-hr)
Dibutyl phthalate	3,500														770
1,2-Dichlorobenzene	5,100 (9)						600	10 (11)	600		130 (9)	10		600	300 (15)
1,3-Dichlorobenzene	5,100 (9)						600		600		130 (9)	20		600	

Table C-2. WATER QUALITY CRITERIA - ORGANIC CONSTITUENTS

Organic Constituent	BASIN PLAN				Drinking Water Standards (California & Federal) Maximum Contaminant Levels (MCLs)					California Recommended Public Health Level (RPHL) Department of Health Services	California State Action Levels Department of Health Services		Other Taste and Odor Thresholds	Health Advisories or Suggested No-Adverse Response Levels (SNARLS) for toxicity other than cancer risk	
	Ocean Waters (1) ‡ = carcinogen	Bays and Estuaries	Inland Surface Waters and Ground Waters		California Dept. of Health Services		US Environmental Protection Agency							USEPA	National Academy of Sciences
			Primary MCL	Secondary MCL	Primary MCL	Secondary MCL	Primary MCL	Secondary MCL	MCL Goal		Toxicity	Taste & Odor			
1,4-Dichlorobenzene	18 ‡		5		5		75	5 (11)	75	5 (11)				75	94 (15)
3,3'-Dichlorobenzidine	0.0081 ‡														
1,1-Dichloroethane			5		5					5 (11)					
1,2-Dichloroethane	130 ‡		0.5		0.5		5		zero	0.3 (11)				700 (10-day)	
1,1-Dichloroethylene	7,100		6		6		7		7	6 (11)				7	100
cis-1,2-Dichloroethylene			6		6		70		70	6 (11)				70	
trans-1,2-Dichloroethylene			10		10		100		100	10 (11)				100	
Dichloromethane	450 ‡						5 (12)		zero (12)		40			2,000 (10-day)	5000 (7-day)
2,3-Dichlorophenol	1 (7)														
2,4-Dichlorophenol	1 (7)													20	2000 / 7000 (13)
2,5-Dichlorophenol	1 (7)														
2,6-Dichlorophenol	1 (7)														
3,4-Dichlorophenol	1 (7)														
1,2-Dichloropropane			5		5		5		zero	5 (11)				90 (10-day)	
1,3-Dichloropropene	8.9 ‡		0.5		0.5					0.2 (11)				30 (10-day)	
Dieldrin	0.000040 ‡										0.05 (LOQ)			0.5 (10-day)	
Di(2-ethylhexyl)phthalate	3.5 ‡		4		4		6 (12)		zero (12)	4 (11)					4,200
Diethyl phthalate	33,000								5,000 (11)					5,000	
2,4-Dimethylphenol	30 (5)											400			
Dimethyl phthalate	820,000														
4,6-Dinitro-o-cresol	30 (5)														
Dinitrophenol															110
2,4-Dinitrophenol	4														110
2,4-Dinitrotoluene	2.6 ‡													500 (10-day)	
1,2-Diphenylhydrazine	0.16 ‡														
Endosulfan	9 (16)														
Endosulfan sulfate	9 (16)														
Endrin	0.002		0.2		0.2		2 (12) / 0.2		2 (12)					2	
Ethylbenzene	4,100		680		680		700	30 (11)	700	680 (11)			29 (18)	700	
Ethylene dibromide (EDB)			0.02		0.02		0.05		zero	0.01 (11)				8 (10-day)	
Fluoranthene	15														
Fluorene	0.0088 ‡ (2)														
Glyphosate			700		700		700 (12)		700 (12)	700 (11)				700	
Heptachlor	0.00072 ‡ (17)		0.01		0.01		0.4		zero	0.01 (11)				10 (10-day)	
Heptachlor epoxide	0.00072 ‡ (17)		0.01		0.01		0.2		zero	0.007 (11)				0.1 (7-yr)	
Hexachlorobenzene	0.00021 ‡						1 (12)		zero (12)					50 (10-day)	30 (7-day)
Hexachlorobutadiene	14 ‡													1	
Hexachlorocyclopentadiene	58						50 (12)	8 (11)	50 (12)						
Hexachloroethane	2.5 ‡													1	
Indeno(1,2,3-c,d)pyrene	0.0088 ‡ (2)						0.4 (11)		zero (11)						
Isophorone	150,000													100	
Methanes, halo-	130 ‡ (4)						100 (10)								
Methoxychlor			100		100		40		40					40	700
Molinate			20		20					20 (11)					
Nitrobenzene	4.9														5 (7-day)
2-Nitrophenol	30 (5)														290 (7-day,19)
Nitrophenol	30 (5)														290 (7-day)
4-Nitrophenol	30 (5)													60 (14)	290 (7-day,19)

Table C-2. WATER QUALITY CRITERIA - ORGANIC CONSTITUENTS

Organic Constituent	BASIN PLAN				Drinking Water Standards (California & Federal) Maximum Contaminant Levels (MCLs)					California Recommended Public Health Level (RPHL) Department of Health Services	California State Action Levels Department of Health Services		Other Taste and Odor Thresholds	Health Advisories or Suggested No-Adverse Response Levels (SNARLS) for toxicity other than cancer risk	
	Ocean Waters (1) ‡ = carcinogen	Bays and Estuaries	Inland Surface Waters and Ground Waters		California Dept. of Health Services		US Environmental Protection Agency							USEPA	National Academy of Sciences
			Primary MCL	Secondary MCL	Primary MCL	Secondary MCL	Primary MCL	Secondary MCL	MCL Goal		Toxicity	Taste & Odor			
N-Nitrosodimethylamine	7.3 ‡														
N-Nitrosodiphenylamine	2.5 ‡														
trans-Nonachlor	0.000023 ‡ (6)														
Oil & grease	25,000														
Oxychlordane	0.000023 ‡ (6)														
PAHs	0.0088 ‡ (2)						see individual chemicals		see individual chemicals					see individual chemicals	
Pentachlorophenol	1 (7)						1		zero		30			300 (10-day)	6 / 21 (13)
Phenanthrene	0.0088 ‡ (2)														
Phenol	30 (5)											5.0 (22)		4000	
Phenols, chlorinated	1														
Phenols, nitro-	30 (5)														
Phenols, non-chlorinated	30														
Phthalate esters			see individual chemicals		see individual chemicals		see individual chemicals		see individual chemicals					see individual chemicals	see individual chemicals
Phenanthrene	0.0088 ‡ (2)		1												
Phenazopyridine			1												
Phenazopyridine hydrochloride			1												
Phenesterin			1												
Phenobarbital			1												
Phenol	30 (5)		1									5.0 (22)		4,000	
Phenols, chlorinated	1		1												
Phenols, nitro-	30 (5)		1												
Phenols, non-chlorinated	30		1												
Phenoxybenzamine			1												
Phenoxybenzamine hydrochloride			1												
Phenyl glycidyl ether			1												
o-Phenylphenate, sodium			1												
Polychlorinated biphenyls	0.000019 ‡						0.5 (21)		zero (21)						50 (7-day)
Pyrene	0.0088 ‡ (2)														
Resorcinol	30 (5)														500 (7-day)
Simazine			10		10		4 (12)		4 (12)					4	1,505
2,3,7,8-TCDD (Dioxin)	0.0000000039 ‡ (20)						0.00003 (12)		zero (12)					0.0001 (10-day)	0.0007
1,1,2,2-Tetrachloroethane	1,200		1		1					1 (11)					
Tetrachloroethylene (PCE)	99 ‡		5		5		5		zero	0.7 (11)				2,000 (10-day)	
2,3,4,6-Tetrachlorophenol	1 (7)														
2,3,5,6-Tetrachlorophenol	1 (7)														
Thiobencarb			70	1	70	1				70 (11)					
Toluene	85,000						1,000	40 (11)	1,000		100		42 (18)	1,000	340
Toxaphene	0.00021 ‡		5		5		3		zero					40 (10-day)	8.75
2,4,5-TP (Silvex)			10		10		50		50					50	5.25
Tributyltin	0.0014														
1,1,1-Trichloroethane	540,000		200		200		200		200	200 (11)				200	3800
1,1,2-Trichloroethane	43,000		32		32		5 (12)		3 (12)					3	
Trichloroethylene (TCE)	27 ‡		5		5		5		zero	2.5 (11)					
Trichlorofluoromethane			150		150					150 (11)				2,000	8,000 (7-day)
2,4,5-Trichlorophenol	1 (7)														
2,4,6-Trichlorophenol	0.29 ‡														2,500 (7-day)
1,1,2-Trichloro-1,2,2-trifluoroethane			1,200		1,200					1,200 (11)					
Trinitrophenol	30 (5)														200 (7-day)
Vinyl chloride	36 ‡		0.5		0.5		2		zero	0.15 (11)				3,000 (10-day)	
Xylene(s)			1,750		1,750		10,000	20 (11)	10,000	1,750 (11)			17 (18)	10,000	

Table C-2. WATER QUALITY CRITERIA - ORGANIC CONSTITUENTS

Organic Constituent	USEPA Integrated Risk Information System (IRIS) Reference Dose as a Water Quality Criterion (23)	One-in-a-Million Incremental Cancer Risk Estimates for Drinking Water				California Proposition 65 Regulatory Level as a Water Quality Criterion	Agricultural Water Quality Goals (28)	USEPA National Ambient Water Quality Criteria					
								Health and Welfare Protection			Freshwater Aquatic Life Protection Recommended Criteria		
		Cal/EPA Cancer Potency Factor as a Water Quality Criterion (23)	USEPA Integrated Risk Information System (IRIS)	USEPA Health Advisory or SNARL	National Academy of Sciences (NAS) Drinking Water and Health			Non-Cancer Public Health Effects	One-in-a-Million Incremental Cancer Risk Estimate	Taste and Odor or Welfare	Continuous Concentration (4-day Average)	24-hour Average	Maximum Concentration (1-hour Average)
Acenaphthylene													
Acenaphthylene				(C)				320 / 780 (29)					
Acrylonitrile		0.035	0.07	0.07 (B1)	0.38	0.35			0.059 / 0.66 (29)				
Aldrin		0.0021	0.002	0.002 (B2,14)	0.003	0.02			0.00013 / 0.00014 (29)				
Anthracene	2,100			(D)				9,600 / 110,000 (29)					
Atrazine	3.5		0.14	(C)				25 (30)					
Bentazon	18			(D)									
Benz(a)anthracene				(B2)					0.0028 / 0.031 (32)				
Benzene		0.35	1	1.0 (A)		3.5			1.2 / 71 (29)				
Benzidine		0.00007		(A)		0.0005			0.00012 / 0.00054 (29)				
Benzo(b)fluoranthene				(B2)					0.0028 / 0.031 (32)				
Benzo(k)fluoranthene				(B2)					0.0028 / 0.31 (32)				
Benzo(g,h,i)perylene				(D)									
Benzo(a)pyrene		0.0029	0.003	(B2)		0.03			0.0028 / 0.031 (32)				
alpha-BHC					0.33	0.15			0.0039 / 0.013 (29)				
beta-BHC					0.12	0.25			0.014 / 0.046 (29)				
Gamma-BHC (Lindane)	0.2	0.032		0.03 (C)	0.054	0.3			0.019 / 0.063 (29)			0.08	
delta-BHC													
technical-BHC		0.0088				0.1			0.0123				
Bis(2-chloroethoxy) methane													
Bis(2-chloroethyl) ether		0.014			0.42	0.15			0.031 / 1.4 (29)				
Bis(2-chloroisopropyl) ether	280			(D)				1,400 / 170,000 (29)					
Bromodichloromethane		0.27	1.4	0.6 (B2,14)		2.5			0.27 / 22 (29)				
Bromoform			4	4 (B2,14)					4.3 / 360 (29)				
Bromomethane	7			(D)				48 / 4,000 (29)					
Carbofuran	35			(E)									
Carbon tetrachloride		0.23	0.3	0.3 (B2)	4.5	2.5			0.25 / 4.4 (29)				
Catechol													
Chlordane		0.029 / 0.027	0.03	0.03 (B2)	0.028	0.25			0.00057 / 0.00059 (29)			0.0043	
Chlorobenzene	140			(D)	2.3 (25)			680 / 21,000 (29)		20			
4-Chloro-m-cresol										3,000			
4-Chloro-o-cresol										1,800			
6-Chloro-m-cresol										20			
Chloroform		1.1 / 0.43	6	6.0 (B2,14)	0.26 / 5.6 (26)	10			5.7 / 470 (29)				
Chloromethane	2.8			(C)									
2-Chlorophenol	35			(D)						0.1			
3-Chlorophenol										0.1			
4-Chlorophenol										0.1			
Chrysene				(B2)					0.0028 / 0.31 (32)				
2,4-D	70			(D)				100					
DBCP		0.005	0.03	0.03 (B2)	0.051	0.05			0.025				
DDD		0.15				1 (8)			0.00083 / 0.00084 (29)				
DDE		0.1				1 (8)			0.00059 / 0.00059 (29)				
DDT		0.1	0.1	(B2)	0.042	1 (8)			0.00059 / 0.00059 (29)			0.0010	
Dibenz(a,h)anthracene				(B2)		0.1			0.0028 / 0.031 (32)				
Dibromochloromethane	14			(C)	0.6	3.5			0.41 / 34 (29)				
Dibutyl phthalate	700			(D)				2700 / 12,000 (29)					
1,2-Dichlorobenzene	620			(D)				2700 / 17,000 (29)					
1,3-Dichlorobenzene	620			(D)				400 / 2,600 (31)					

Table C-2. WATER QUALITY CRITERIA - ORGANIC CONSTITUENTS

Organic Constituent	USEPA Integrated Risk Information System (IRIS) Reference Dose as a Water Quality Criterion (23)	One-in-a-Million Incremental Cancer Risk Estimates for Drinking Water				California Proposition 65 Regulatory Level as a Water Quality Criterion	Agricultural Water Quality Goals (28)	USEPA National Ambient Water Quality Criteria					
								Health and Welfare Protection			Freshwater Aquatic Life Protection Recommended Criteria		
		Cal/EPA Cancer Potency Factor as a Water Quality Criterion (23)	USEPA Integrated Risk Information System (IRIS)	USEPA Health Advisory or SNARL	National Academy of Sciences (NAS) Drinking Water and Health			Non-Cancer Public Health Effects	One-in-a-Million Incremental Cancer Risk Estimate	Taste and Odor or Welfare	Continuous Concentration (4-day Average)	24-hour Average	Maximum Concentration (1-hour Average)
1,4-Dichlorobenzene	70	0.88		(C)		10		400 / 2,600 (31)					
3,3'-Dichlorobenzidine		0.029				0.3			0.04 / 0.077 (29)				
1,1-Dichloroethane						50							
1,2-Dichloroethane		0.5	0.4	0.4 (B2)	0.71	5			0.38 / 99 (29)				
1,1-Dichloroethylene	6.3		0.06	0.06 (C)					0.057 / 3.2 (29)				
cis-1,2-Dichloroethylene	70			(D)									
trans-1,2-Dichloroethylene	140			(D)									
Dichloromethane		2.5	5	5 (B2)		25			4.7 / 1,600 (29)				
2,3-Dichlorophenol										0.04			
2,4-Dichlorophenol	21			(D)				93 / 790 (29)		0.3			
2,5-Dichlorophenol										0.5			
2,6-Dichlorophenol										0.2			
3,4-Dichlorophenol										0.3			
1,2-Dichloropropane		0.56	0.5	0.5 (B2)									
1,3-Dichloropropene		0.19	0.2	0.2 (B2)	0.45			10 / 1,700 (29)					
Dieldrin		0.0022	0.002	0.002 (B2)	0.0019	0.02			0.00014 / 0.00014 (29)			0.0019	
Di(2-ethylhexyl)phthalate		4.2	3	3 (B2)	2.4	40			1.8 / 5.9 (29)		360 (11)		400 (11)
Diethyl phthalate	5,600			(D)				23,000 / 120,000 (29)					
2,4-Dimethylphenol	140									400			
Dimethyl phthalate				(D)				313,000 / 2,900,000(29)					
4,6-Dinitro-o-cresol								13.4 / 765 (29)					
Dinitrophenol								70					
2,4-Dinitrophenol								70 / 14,000 (29)					
2,4-Dinitrotoluene		0.11	50	0.05 (B2)		1			0.11 / 9.1 (29)				
1,2-Diphenylhydrazine						0.4			0.040 / 0.54 (29)				
Endosulfan								0.93 / 2.0 (29)				0.056	
Endosulfan sulfate								0.93 / 2.0 (29)				0.056 (35)	
Endrin	2.1			(D)				0.76 / 0.81 (33,29)				0.0023	
Ethylbenzene	700			(D)				3,100 / 29,000 (29)					
Ethylene dibromide (EDB)		0.0097	0.0004	0.0004 (B2)	0.055	0.1							
Fluoranthene				(D)				300 / 370 (29)					
Fluorene	280			(D)				1,300 / 14,000 (29)					
Glyphosate	700			(D)									
Heptachlor		0.0061 / 0.0078	0.008	0.008 (B2)	0.012	0.1			0.00021 / 0.00021 (29)			0.0038	
Heptachlor epoxide		0.0027 / 0.0038	0.004	0.004 (B2)		0.04			0.00010 / 0.00011 (29)			0.0038	
Hexachlorobenzene		0.019		0.02 (B2)	0.017	0.2			0.00075 / 0.00077 (29)		3.68 (11)		6 (11)
Hexachlorobutadiene	1.4			(C)					0.44 / 50 (29)				
Hexachlorocyclopentadiene	49			(D)				240 / 17,000 (29)		1			
Hexachloroethane				(C)		10			1.9 / 8.9 (29)				
Indeno(1,2,3-c,d)pyrene				(B2)					0.0028 / 0.031 (32,29)				
Isophorone	140			40 (C)					8.4 / 600 (29)				
Methanes, halo-													
Methoxychlor	35			(D)				100					
Molinate	14												
Nitrobenzene								17 / 1,900 (29)		30			
2-Nitrophenol													
Nitrophenol													
4-Nitrophenol				(D)									

Table C-2. WATER QUALITY CRITERIA - ORGANIC CONSTITUENTS

Organic Constituent	USEPA Integrated Risk Information System (IRIS) Reference Dose as a Water Quality Criterion (23)	One-in-a-Million Incremental Cancer Risk Estimates for Drinking Water				California Proposition 65 Regulatory Level as a Water Quality Criterion	Agricultural Water Quality Goals (28)	USEPA National Ambient Water Quality Criteria					
								Health and Welfare Protection			Freshwater Aquatic Life Protection Recommended Criteria		
		Cal/EPA Cancer Potency Factor as a Water Quality Criterion (23)	USEPA Integrated Risk Information System (IRIS)	USEPA Health Advisory or SNARL	National Academy of Sciences (NAS) Drinking Water and Health			Non-Cancer Public Health Effects	One-in-a-Million Incremental Cancer Risk Estimate	Taste and Odor or Welfare	Continuous Concentration (4-day Average)	24-hour Average	Maximum Concentration (1-hour Average)
N-Nitrosodimethylamine		0.0022				0.02			0.00069 / 8.1 (29)				
N-Nitrosodiphenylamine		3.9				40			5.0 / 16 (29)				
trans-Nonachlor													
Oil & grease													
Oxychlordane													
PAHs									0.0028 / 0.31 (29)				
Pentachlorophenol		1.9	0.3	0.3 (B2)		20			0.28 / 8.2 (29)	30	(34)		(36)
Phenanthrene											6.3 (11)		30 (11)
Phenol	4,200			(D)				21,000 / 4,600,000 (29)		300			
Phenols, chlorinated													
Phenols, nitro-													
Phenols, non-chlorinated													
Phthalate esters				see individual chemicals		see individual chemicals		see individual chemicals					
Phenanthrene											6.3 (11)		30 (11)
Phenazopyridine						2							
Phenazopyridine hydrochloride						2.5							
Phenesterin						0.0025							
Phenobarbital						1							
Phenol	4,200			(D)				21,000 / 4,600,000 (29)		300			
Phenols, chlorinated													
Phenols, nitro-													
Phenols, non-chlorinated													
Phenoxybenzamine						0.1							
Phenoxybenzamine hydrochloride						0.15							
Phenyl glycidyl ether						2.5 (11)							
o-Phenylphenate, sodium						100							
Polychlorinated biphenyls		0.0045	0.005	0.005 (B2)	0.16 (37)	0.045			0.000044/0.000045(29)			0.014	
Pyrene	210 (14)			(D)				960 / 11,000 (29)					
Resorcinol													
Simazine	3.5			(C)									
2,3,7,8-TCDD (Dioxin)		0.00000027	0.0000002	0.0000002 (B2)		0.0000025			1.3E−8 / 1.4E−8 (29)				
1,1,2,2-Tetrachloroethane				(C)		1.5			0.17 / 11 (29)				
Tetrachloroethylene (PCE)		0.69	0.7	0.7 (B2)	3.6	7			0.8 / 8.85 (29)				
2,3,4,6-Tetrachlorophenol										1			
2,3,5,6-Tetrachlorophenol													
Thiobencarb													
Toluene	1,400			(D)		3,500 (38)		6,800 / 200,000 (29)					
Toxaphene		0.029	0.03	0.03 (B2)		0.3			0.00073 / 0.00075 (29)		0.0002		0.73
2,4,5-TP (Silvex)	53			(D)				10					
Tributyltin													
1,1,1-Trichloroethane	250			(D)	17 (25)								
1,1,2-Trichloroethane	2.8		0.6	0.6 (C)		5			0.60 / 42 (29)				
Trichloroethylene (TCE)		2.3 (11)	3	3 (B2)	1.5 (25)	25			2.7 / 81 (29)				
Trichlorofluoromethane	2,100			(D)					0.19				
2,4,5-Trichlorophenol								2,600		1	63 (100)		100 (11)
2,4,6-Trichlorophenol		0.5	3	3 (B2,14)		5			2.1 / 6.5 (29)	2			
1,1,2-Trichloro-1,2,2-trifluoroethane													
Trinitrophenol													
Vinyl chloride		0.13	0.015	0.015 (A)	1.1	1.5			2 / 525 (29)				
Xylene(s)	14,000			(D)									

Table C-2. WATER QUALITY CRITERIA - ORGANIC CONSTITUENTS

Organic Constituent	USEPA Ambient Water Quality Criteria (cont.) Freshwater Aquatic Life Protection (cont.) Recommended Criteria (cont.)				California Ocean Plan Numerical Water Quality Objectives						USEPA National Ambient Water Quality Criteria Saltwater Aquatic Life Protection						
	Maximum (Instantaneous)	Additional Toxicity Information			Human Health Protection (30-day Average)	Marine Aquatic Life Protection					Recommended Criteria				Additional Toxicity Information		
		Acute	Chronic	Other	"‡" = carcinogen	6-month Median	30-day Average	7-day Average	Daily Maximum	Instantaneous Maximum	Continuous Concentration (4-day Average)	24-hour Average	Maximum Concentration (1-hour Average)	Maximum (Instantaneous)	Acute	Chronic	Other
Acenaphthylene					0.0088 ‡ (2)										300 (32)		
Acenaphthylene		68	21		220										55		
Acrylonitrile		7,550		2,600 (44)	0.10 ‡												
Aldrin	3				0.000022 ‡									1.3			
Anthracene					0.0088 ‡ (2)										300 (32)		
Atrazine	1.0 (30)																
Bentazon																	
Benz(a)anthracene					0.0088 ‡ (2)										300 (32)		
Benzene		5,300			5.9 ‡										5,100		700 (47)
Benzidine		2,500			0.000069 ‡												
Benzo(b)fluoranthene					0.0088 ‡ (2)										300 (32)		
Benzo(k)fluoranthene					0.0088 ‡ (2)										300 (32)		
Benzo(g,h,i)perylene					0.0088 ‡ (2)										300 (32)		
Benzo(a)pyrene					0.0088 ‡ (2)										300 (32)		
alpha-BHC						0.004 (3)			0.008 (3)	0.012 (3)							
beta-BHC						0.004 (3)			0.008 (3)	0.012 (3)							
Gamma-BHC (Lindane)	2.0					0.004 (3)			0.008 (3)	0.012 (3)				0.16			
delta-BHC						0.004 (3)			0.008 (3)	0.012 (3)							
technical-BHC		100				0.004 (3)			0.008 (3)	0.012 (3)					0.34		
Bis(2-chloroethoxy) methane					4.4												
Bis(2-chloroethyl) ether		238,000 (39)	122 (43)		0.045 ‡												
Bis(2-chloroisopropyl) ether		238,000 (39)	122 (43)		1200												
Bromodichloromethane		11,000 (40)			130 ‡ (4)										12,000 (40)	6,400 (40)	11,500 (40,48)
Bromoform		11,000 (40)			130 ‡ (4)										12,000 (40)	6,400 (40)	11,500 (40,48)
Bromomethane		11,000 (40)			130 ‡ (4)										12,000 (40)	6,400 (40)	11,500 (40,48)
Carbofuran																	
Carbon tetrachloride		35,200			0.90 ‡										50,000	6,400 (40)	11,500 (40,48)
Catechol						30 (5)			120 (5)	300 (5)							
Chlordane	2.4				0.000023 ‡ (6)							0.004		0.09			
Chlorobenzene		250 (41)		50 (41,45)	570										160 (41)	129 (41)	
4-Chloro-m-cresol		30				1 (7)			4 (7)	10 (7)							
4-Chloro-o-cresol						1 (7)			4 (7)	10 (7)							
6-Chloro-m-cresol						1 (7)			4 (7)	10 (7)							
Chloroform		28,900	1,240		130 ‡										12,000 (40)	6,400 (40)	11,500 (40,48)
Chloromethane		11,000 (40)			130 ‡ (4)										12,000 (40)	6,400 (40)	11,500 (40,48)
2-Chlorophenol		4,380		2,000 (46)		1 (7)			4 (7)	10 (7)							
3-Chlorophenol						1 (7)			4 (7)	10 (7)							
4-Chlorophenol						1 (7)			4 (7)	10 (7)					29,700		
Chrysene					0.0088 ‡ (2)										300 (32)		
2,4-D																	
DBCP																	
DDD		0.6			0.00017 ‡ (8)										3.6		
DDE		1,050			0.00017 ‡ (8)										14		
DDT	1.1				0.00017 ‡ (8)							0.001		0.13			
Dibenz(a,h)anthracene					0.0088 ‡ (2)										300 (32)		
Dibromochloromethane		11,000 (40)			130 ‡ (4)										12,000 (40)	6,400 (40)	11,500 (40,48)
Dibutyl phthalate		940 (42)	3 (42)		3,500										2,944 (42)		3.4 (49,42)
1,2-Dichlorobenzene		1,120 (31)	763 (31)		5,100 (9)										1,970 (31)	129 (41)	
1,3-Dichlorobenzene		1,120 (31)	763 (31)		5,100 (9)										1,970 (31)	129 (41)	

Table C-2. WATER QUALITY CRITERIA - ORGANIC CONSTITUENTS

Organic Constituent	USEPA Ambient Water Quality Criteria (cont.) Freshwater Aquatic Life Protection (cont.) Recommended Criteria (cont.)				California Ocean Plan Numerical Water Quality Objectives						USEPA National Ambient Water Quality Criteria Saltwater Aquatic Life Protection Recommended Criteria						
	Maximum (Instantaneous)	Additional Toxicity Information			Human Health Protection (30-day Average)	Marine Aquatic Life Protection					Continuous Concentration (4-day Average)	24-hour Average	Maximum Concentration (1-hour Average)	Maximum (Instantaneous)	Additional Toxicity Information		
		Acute	Chronic	Other	"‡" = carcinogen	6-month Median	30-day Average	7-day Average	Daily Maximum	Instantaneous Maximum					Acute	Chronic	Other
1,4-Dichlorobenzene		1,120 (31)	763 (31)		18 ‡										1,970 (31)	129 (41)	
3,3'-Dichlorobenzidine					0.0081 ‡												
1,1-Dichloroethane																	
1,2-Dichloroethane		118,000	20,000		130 ‡										113,000		
1,1-Dichloroethylene		11,600 (50)			7100										224,000 (50)		
cis-1,2-Dichloroethylene		11,600 (50)													224,000 (50)		
trans-1,2-Dichloroethylene		11,600 (50)													224,000 (50)		
Dichloromethane		11,600 (50)			450 ‡										12,000 (40)	6,400 (40)	11,500 (40,48)
2,3-Dichlorophenol						1 (7)			4 (7)	10 (7)							
2,4-Dichlorophenol		2,020	365	70 (56)		1 (7)			4 (7)	10 (7)							
2,5-Dichlorophenol						1 (7)			4 (7)	10 (7)							
2,6-Dichlorophenol						1 (7)			4 (7)	10 (7)							
3,4-Dichlorophenol						1 (7)			4 (7)	10 (7)							
1,2-Dichloropropane		23,000 (51)	5,700 (51)												10,300 (51)	3,040 (51)	
1,3-Dichloropropene		6,060 (52)	244 (52)		8.9 ‡										790 (52)		
Dieldrin	2.5				0.000040 ‡							0.0019		0.71			
Di(2-ethylhexyl)phthalate		940 (42)	3 (42)		3.5 ‡						360 (11)		400 (11)		2,944 (42)		3.4 (49,42)
Diethyl phthalate		940 (42)	3 (42)		33,000										2,944 (42)		3.4 (49,42)
2,4-Dimethylphenol		2120				30 (5)			120 (5)	300 (5)							
Dimethyl phthalate		940 (42)	3 (42)		820,000										2,944 (42)		3.4 (49,42)
4,6-Dinitro-o-cresol		230 (53)		150 (49,53)	220	30 (5)			120 (5)	300 (5)					4,850 (53)		
Dinitrophenol		230 (53)		150 (49,53)		30 (5)			120 (5)	300 (5)					4,850 (53)		
2,4-Dinitrophenol		230 (53)		150 (49,53)	4	30 (5)			120 (5)	300 (5)					4,850 (53)		
2,4-Dinitrotoluene		330 (54)	230 (54)		2.6 ‡										590 (54)		370 (54,48)
1,2-Diphenylhydrazine		270 (9)			0.16 ‡												
Endosulfan	0.22					9 (16)			18 (16)	27 (16)		0.0087		0.034			
Endosulfan sulfate						9 (16)			18 (16)	27 (16)		0.0087 (35)					
Endrin	0.18					0.002			0.004	0.006		0.0023		0.037			
Ethylbenzene		32,000			4100										430		
Ethylene dibromide (EDB)																	
Fluoranthene		3,980			15										40	16	
Fluorene					0.0088 ‡ (2)										300 (32)		
Glyphosate																	
Heptachlor	0.52				0.00072 ‡ (17)							0.0036		0.053			
Heptachlor epoxide	0.52				0.00072 ‡ (17)							0.0036		0.053			
Hexachlorobenzene		250 (41)		50 (41,45)	0.00021 ‡										160 (41)	129 (41)	
Hexachlorobutadiene		90	9.3		14 ‡										32		
Hexachlorocyclopentadiene		7.0	5.2		58										7		
Hexachloroethane		980	540		2.5 ‡										940		
Indeno(1,2,3-c,d)pyrene					0.0088 ‡ (2)										300 (32)		
Isophorone		117,000			150,000										12,900		
Methanes, halo-		11,000			130 ‡ (4)										12,000	6,400	11,500 (48)
Methoxychlor	0.03													0.03			
Molinate																	
Nitrobenzene		27,000			4.9										6,680		
2-Nitrophenol		230 (53)		150 (49,53)		30 (5)			120 (5)	300 (5)					4,850 (53)		
Nitrophenol		230 (53)		150 (49,53)		30 (5)			120 (5)	300 (5)					4,850 (53)		
4-Nitrophenol		230 (53)		150 (49,53)		30 (5)			120 (5)	300 (5)					4,850 (53)		

Table C-2. WATER QUALITY CRITERIA - ORGANIC CONSTITUENTS

Organic Constituent	USEPA Ambient Water Quality Criteria (cont.) Freshwater Aquatic Life Protection (cont.) Recommended Criteria (cont.)				California Ocean Plan Numerical Water Quality Objectives						USEPA National Ambient Water Quality Criteria Saltwater Aquatic Life Protection Recommended Criteria						
	Maximum (Instantaneous)	Additional Toxicity Information			Human Health Protection (30-day Average)	Marine Aquatic Life Protection					Continuous Concentration (4-day Average)	24-hour Average	Maximum Concentration (1-hour Average)	Maximum (Instantaneous)	Additional Toxicity Information		
		Acute	Chronic	Other	"‡" = carcinogen	6-month Median	30-day Average	7-day Average	Daily Maximum	Instantaneous Maximum					Acute	Chronic	Other
N-Nitrosodimethylamine		5,850 (55)			7.3 ‡										3,300,000 (55)		
N-Nitrosodiphenylamine		5,850 (55)			2.5 ‡										3,300,000 (55)		
trans-Nonachlor					0.000023 ‡ (6)												
Oil & grease							25,000	40,000		75,000							
Oxychlordane					0.000023 ‡ (6)												
PAHs					0.0088 ‡ (2)										300		
Pentachlorophenol				1.74 (57)		1 (7)			4 (7)	10 (7)	7.9		13				
Phenanthrene					0.0088 ‡ (2)						4.6 (11)		7.7 (11)		300 (32)		
Phenol		10,200	2,560			30 (5)			120 (5)	300 (5)					5,800		
Phenols, chlorinated						1			4	10							
Phenols, nitro-		230		150 (49)		30 (5)			120 (5)	300 (5)					4,850		
Phenols, non-chlorinated						30			120	300							
Phthalate esters		940	3												2,944		3.4 (49,42)
Phenanthrene					0.0088 ‡ (2)						4.6 (11)		7.7 (11)		300 (32)		
Phenazopyridine																	
Phenazopyridine hydrochloride																	
Phenesterin																	
Phenobarbital																	
Phenol		10,200	2,560			30 (5)			120 (5)	300 (5)					5,800		
Phenols, chlorinated						1			4	10							
Phenols, nitro-		230		150 (49)		30 (5)			120 (5)	300 (5)					4,850		
Phenols, non-chlorinated						30			120	300							
Phenoxybenzamine																	
Phenoxybenzamine hydrochloride																	
Phenyl glycidyl ether																	
o-Phenylphenate, sodium																	
Polychlorinated biphenyls		> 2			0.000019 ‡							0.03			>10		
Pyrene					0.0088 ‡ (2)										300 (32)		
Resorcinol						30 (5)			120 (5)	300 (5)							
Simazine	10 (58)																
2,3,7,8-TCDD (Dioxin)					0.0000000039 ‡ (20)												
1,1,2,2-Tetrachloroethane		9,320 (59)	2,400		1,200										9,020		
Tetrachloroethylene (PCE)		5,280	840		99 ‡										10,200	450	
2,3,4,6-Tetrachlorophenol						1 (7)			4 (7)	10 (7)							
2,3,5,6-Tetrachlorophenol						1 (7)			4 (7)	10 (7)					440		
Thiobencarb																	
Toluene		17,000			85,000										6,300	5,000	
Toxaphene					0.00021 ‡						0.0002		0.21				
2,4,5-TP (Silvex)																	
Tributyltin	0.026 (30)				0.0014									0.010 (30)			
1,1,1-Trichloroethane		18,000		200 (60)	540,000										31,200		
1,1,2-Trichloroethane		18,000	9,400		43,000												
Trichloroethylene (TCE)		45,000		21,900 (61)	27 ‡										2,000		
Trichlorofluoromethane		11,000 (40)													12,000 (40)	6,400 (40)	11,500 (40,48)
2,4,5-Trichlorophenol						1 (7)			4 (7)	10 (7)	11 (11)		240 (11)				
2,4,6-Trichlorophenol			970		0.29 ‡	1 (7)			4 (7)	10 (7)							
1,1,2-Trichloro-1,2,2-trifluoroethane																	
Trinitrophenol		230 (53)		150 (49,53)		30 (5)			120 (5)	300 (5)					4,850 (53)		
Vinyl chloride					36 ‡												
Xylene(s)																	

ENDNOTES FOR TABLE C-2 – ORGANICS

(7-day) For exposure of 7 days or less.
(10-day) For exposure of 10 days or less.
(24-hr) For exposure of 24 hours or less.
(7-yr) For "longer-term" exposure (7 years or less, EPA).
(A) Known human carcinogen; sufficient epidemiologic evidence in humans.
(B) Probable human carcinogen; sufficient evidence from animal studies; no or inadequate human data.
(C) Possible human carcinogen; limited evidence from animal studies; no human data.
(D) Not classified as to human carcinogenicity; no data or inadequate evidence.
(E) Evidence of non-carcinogenicity for humans.
(1) For hardness in mg/l as $CaCO_3$, criterion = e(0.8473[ln(hardness)] + 0.8604) µg/l.
(2) For sum of acenaphthylene, anthrancene, benz(a)anthrancene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(g,h,i)perylene, benzo(a)pyrene, chrysene, dibenz(a,h)anthracene, fluorene, indeno(1,2,3-c,d)pyrene, phenanthrene, and pyrene.
(3) For hardness in mg/l as $CaCO_3$, criterion = e(1.273[ln(hardness)] – 1.460) µg/l.
(4) For sum of bromoform, bromomethane, chloromethane, dibromochloromethane, and bromodichloromethane.
(5) For sum of nonchlorinated phenolic compounds.
(6) For the sum of oxychlordane and alpha and gamma isomers of chlordane, chlordene and nonachlor.
(7) For sum of chlorinated phenolic compounds.
(8) Instantaneous maximum.
(9) For sum of 1,2- and 1-3-dichlorobenzenes.
(10) From Reference 30.
(11) Proposed.
(12) Effective 17 January 1994.
(13) For hardness in mg/l as $CaCO_3$, criterion = e(0.8473[ln(hardness)] + 0.7614) µg/l.
(14) MCL varies with air temperature; 2.4 mg/l (Š 53.7°F); 2.2 mg/l (53.8 – 58.3 °F); 2.0 mg/l (58.4 – 63.8°F); 1.8 mg/l (63.9 – 70.6 °F); 1.6 mg/l (70.0 – 79.2°F); 1.4 mg/l (79.3 – 90.5 °F).
(15) Based on organoleptic considerations (taste, odor, color, laundry staining, etc.)
(16) For hardness in mg/l as CaCO3, criterion = e(1.273[ln(hardness)] – 4.705) µg/l.
(17) As $CaCO_3$; minimum concentration except where natural concentrations are less.
(18) Toxicity to algae occurs.
(19) For hardness in mg/l as $CaCO_3$, criterion = e(0.8190[ln(hardness)] + 1.561) µg/l.
(20) For "TCDD equivalents" calculated as the sum of 2,3,7,8-chlorinated dibenzodioxin and dibenzofuran concentrations multiplied by their respective USEPA Toxicity Equivalency Factors.
(21) Expressed as decachlorobiphenyl.
(22) For hardness in mg/l as $CaCO_3$, criterion = e(0.8190 [ln(hardness)] + 3.688) µg/l.
(23) Assumes 70 kg body weight, 2 liters/day water consumption, and 20% relative source contribution. An additional uncertainty factor of 10 is used for Class C carcinogens.
(24) Assumes 70 kg body weight and 2 liters/day water consumption.
(25) For sum of dichloropropanes.
(26) Draft / tentative / provisional.
(27) For sum of halomethanes.
(28) Reference 19 unless noted otherwise.
(29) For the sum of oxychlordane and alpha and gamma isomers of chlordane, chlordene and nonachlor.
(30) For hardness in mg/l as $CaCO_3$, criterion = e(0.7852[ln(hardness)] – 3.490) µg/l.
(31) For hardness in mg/l as $CaCO_3$, criterion = e(1.128[ln(hardness)] – 3.828) µg/l.
(32) For hardness in mg/l as $CaCO_3$, criterion = e(0.9422[ln(hardness)] – 1.464) µg/l.
(33) For sum of dichlorobenzenes.
(34) For total trihalomethanes (sum of bromoform, bromodichloromethane, chloroform and dibromochloromethane); based largely on technology and economics.
(35) Based on endosulfan; USEPA Water Quality Advisory (Reference 13).
(36) Determined not to pose a risk of cancer through ingestion (Title 22, CCR, Division 2).
(37) Includes Radium 226 but excludes Radon and Uranium.
(38) Pentavalent arsenic [As(V)] effects on plants.
(39) Recommended level; Upper level = 500 mg/l; Short-term level = 600 mg/l.
(40) For sum of dichloroethylenes.
(41) For sum of dichloropropenes.
(42) As NO_3.
(43) Effective 17 January 1994.
(44) Toxicity to a fish species exposed for 7.5 days.
(45) Adverse behavioral effects occur to one species.
(46) For hardness in mg/l as $CaCO_3$, criterion = e(1.72 [ln(hardness)] – 6.52) µg/l.
(47) Adverse effects on a fish species exposed for 168 days.
(48) A decrease in the number of algal cells occurs.
(49) Guidance level (Reference 3) assumes reletive source contribution of 10% from drinking water.
(50) For chlorinated systems.
(51) For white phosphorus.
(52) For sum of carcinogenic polynuclear aromatic hydrocarbons.
(53) For sum of nitrophenols.
(54) For hardness in mg/l as $CaCO_3$, criterion = e(0.8460[ln(hardness)] + 3.3612) µg/l.
(55) For total chlorine residual; for intermittent chlorine sources see Reference 26, Chapter IV, Table B.
(56) For consumption of water and aquatic organisms / for consumption of aquatic organisms only.
(57) MCL includes this "Action level," to be exceeded in no more than 10 percent of samples.
(58) For sum of nonchlorinated phenolic compounds.
(59) Recommended level; Upper level = 1,000; Short-term level = 1,500 mg/l.
(60) For sum of tetrachloroethanes.
(61) Calculated from corn oil gavage animal study / from drinking water animal study.

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4. U.S. Environmental Protection Agency, Region 9, Drinking Water Branch, "Drinking Water Standards and Health Advisory Table" (December 1992).

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11. U.S. Environmental Protection Agency, Office of Drinking Water "Health Advisory" documents (various dates).

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13. U.S. Environmental Protection Agency, "Water Quality Advisory" documents (March 1986, September 1987).

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14. California Environmental Protection Agency, Office of Environmental Health Hazard Assessment (OEHHA), California Code of Regulations, Title 22, Division 2, Chapter 3, Articles 7 and 8.

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References 3, 4, 11, 12, and 13.

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18. "California Environmental Protection Agency Criteria for Carcinogens", Office of Environmental Health Hazard Assessment (July 1992).

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19. Ayers, R.S. and D. W. Westcot, "Water Quality for Agriculture", Food and Agriculture Organization of the United Nations – Irrigation and Drainage Paper No. 20, Rev. 1, Rome (1985).

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20. U.S. Environmental Protection Agency, "Water Quality Criteria, 1972" (1973).

21. U.S. Environmental Protection Agency, Federal Register, Volume 55, No. 93, (Monday, 14 May 1990).

22. U.S. Environmental Protection Agency, Federal Register, Volume 57, No. 246 (Tuesday, 22 December 1992).

23. U.S. Environmental Protection Agency, "Ambient Water Quality Criteria" documents (various dates).

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APPENDIX D

CONDITIONS FOR CONDITIONAL WAIVERS OF WASTE DISCHARGE REQUIREMENTS IN TABLE 4-4

In order for the conditional waivers to be consistent with the *Water Quality Control Plan for the San Diego Basin (9)* (Basin Plan), the following general overall conditions apply to each specific type of discharge to be eligible for a conditional waiver:

- The discharge shall not create a nuisance[1] or pollution[2] as defined in the Porter-Cologne Water Quality Control Act (Water Code);
- The discharge shall not cause a violation of any applicable water quality standard for receiving waters adopted by the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), or the State Water Resources Control Board (State Water Board), as required by the Federal Water Pollution Control Act (Clean Water Act); and
- The discharge of any substance in concentrations toxic to animal or plant life is prohibited.

In addition to the general overall conditions listed above, the San Diego Water Board determined that it is consistent with the Basin Plan and in the public interest to issue conditional waivers under one or more of the following circumstances:

- The type of discharge is effectively regulated by other public agencies; or
- The type of discharge does not adversely affect the quality or the beneficial uses of the waters of the state; or
- The type of discharge is not readily amenable to regulation through adoption of waste discharge requirements (WDRs), but warrants San Diego Water Board oversight to ensure compliance with the mandated conditions (e.g., Basin Plan water quality objectives).

There are 35 specific types of discharge that are eligible for a conditional waiver of waste discharge requirements. However, in examining the specific types of discharge that are eligible for a conditional waiver, several of the discharge types are similar and/or related in terms of discharge setting, discharge source, and/or waiver conditions.

Instead of developing conditional waivers for each specific type of discharge, an integrated approach was employed to simplify the conditional waivers. Types of discharge that are similar in nature or originate from a common setting or operation were grouped together into a "discharge classification," as shown in Table D-1. The grouping allows dischargers to easily identify all the waiver conditions that may apply to their operations.

For example, discharge types that typically require a Clean Water Act section 401 Water Quality Certification (401 Certification) were grouped together in Conditional Waiver No. 6. A type of discharge that typically requires a 401 Certification is one where dredged and/or fill material may be discharged to land and/or surface waters. These types of discharge include sand and gravel mining operations, dredging

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[1] "Nuisance" is defined by Water Code section 13050(m) as anything which meets all of the following requirements: (1) Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property; (2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal; and (3) Occurs during, or as a result of, the treatment or disposal of wastes.

[2] "Pollution" is defined by Water Code section 13050(l)(1) as an alteration of the quality of the waters of the state by waste to a degree which unreasonably affects waters for beneficial uses or facilities which serve these beneficial uses. Pollution may include contamination.

project wastes, and stream channel alterations. All of these types of discharge have similar waiver conditions.

There are several types of discharge classified as discharges from agricultural and/or nursery operations in Conditional Waiver No. 4. Discharges of plant crop residues, storm water runoff from agricultural lands, mulches and/or amendment applied to soil, agricultural return water or nursery irrigation return water, and green wastes for composting can all occur on the same site. Many of the proposed waiver conditions are similar, and many, if not all, of these types of discharge are found on nursery or agricultural operations.

Therefore, as in the examples above, the types of discharge eligible for conditional waivers were grouped into 11 discharge classifications. One type of discharge may be included in more than one discharge classification. For example, discharges of plant crop residues are included in both Conditional Waiver No. 4 for discharges from agricultural and nursery operations, and Conditional Waiver No. 8 for discharges/disposal of solid wastes to land.

Table D-1 lists the discharge classifications and associated conditional waiver identification number, and groups the specific types of discharge according to those discharge classifications.

Table D-1 Conditional Waivers and Discharge Classifications

Conditional Waiver No.	Discharge Classification	Types of Discharge Included in Conditional Waiver Discharge Classification
1	Discharges from on-site disposal systems	a) Discharges from conventional septic tank/subsurface disposal systems for residential units b) Discharges from conventional septic tank/subsurface disposal systems for commercial/industrial establishments c) Discharges from alternative individual sewerage systems d) Discharges from conventional septic tank/subsurface disposal systems for campgrounds e) Discharges from on-site graywater disposal systems
2	"Low threat" discharges to land	a) Discharges from construction and test pumping of water wells to land b) Discharges of air conditioner condensate and non-contact cooling water to land c) Swimming pool discharges to land d) Discharges from short-term construction dewatering operations to land e) "Low Threat" discharges to land and/or groundwater including the following: - Groundwater pumped from drinking water wells - Groundwater from foundation drains, crawl space pumps, and footing drains - Discharges from flushing water lines - Discharges from washing vehicles, pavement, buildings, etc. - Infiltration from residential/commercial/industrial/recreational facility landscape and lawn irrigation using groundwater or municipal supply water - Infiltration from structural infiltration-based BMPs
3	Discharges from animal operations	a) Discharges from medium animal feeding operations (300-999 animal units, where 1 animal unit is equivalent to 1 cow or 1,000 animal pounds) b) Discharges from small animal feeding operations (less than 300 animal units) c) Discharges of storm water runoff d) Discharge/application of manure to soil as an amendment or mulch e) Discharges from grazing lands

Table D-1 Conditional Waivers and Discharge Classifications

Conditional Waiver No.	Discharge Classification	Types of Discharge Included in Conditional Waiver Discharge Classification
4	Discharges from agricultural and nursery operations	a) Discharges of plant crop residues to land b) Discharges of storm water runoff c) Discharge/application of amendments or mulches to soil d) Discharges of agricultural irrigation return water e) Discharges of nursery irrigation return water
5	Discharges from silvicultural operations	a) Discharges of storm water runoff b) Discharges from timber harvesting projects c) Discharges from wildfire suppression and fuels management activities
6	Discharges of dredged or fill materials nearby or within surface waters	a) Discharges from sand and gravel mining operations b) Discharges from dredging projects c) Discharges from stream channel alternation projects d) Other projects proposing to discharge dredged or fill material nearby or within surface waters of the state
7	Discharges of recycled water to land	a) Discharges from short-term recycled water projects (without permanent recycled water delivery and/or distribution systems, not to exceed 365 days) b) Discharges from permanent recycled water projects (with permanent recycled water delivery and/or distribution systems, limited to the period prior to the discharge being authorized and regulated under WDRs, WRRs, and/or MRPs, not to exceed 365 days)
8	Discharges/ disposal of solid wastes to land	a) Discharges of plant crop residues to land b) Discharge/application of amendments and mulches to soil c) Discharges of inert wastes to solid waste disposal facilities only accepting inert wastes d) Discharges of soils containing wastes to temporary waste piles e) Discharge/disposal/reuse of soils characterized as inert from contaminated sites to land
9	Discharges of slurries to land	a) Discharges of on-site drilling mud to land b) Discharges of concrete grinding residues to land
10	Discharges of emergency/ disaster related wastes	a) Incidental discharges of oil and oily water within a response area during an oil spill response in marine waters b) Discharges of disaster related wastes to temporary waste piles and surface impoundments c) Discharges of mass mortality waste to temporary waste piles and emergency landfills d) Other discharges of emergency/disaster related wastes
11	Aerially discharged wastes over land	a) Discharges of wastes related to fireworks displays over land b) Other wastes discharged aerially over land that may adversely affect the quality of the groundwaters of the state, but determined to be “low threat” by the San Diego Water Board

For each conditional waiver, General Waiver Conditions were developed that are applicable to a discharger or discharge operation, or all specific types of discharge within a discharge classification. Specific Waiver Conditions were developed that are applicable to specific types of discharge within a discharge classification, when specific conditions were determined to be necessary. The General and Specific Waiver Conditions for Conditional Waiver Nos. 1 through 11 are given in the following pages.

CONDITIONAL WAIVER NO. 1 – DISCHARGES FROM ON-SITE DISPOSAL SYSTEMS

Conditional Waiver No. 1 is for discharges of effluent from on-site disposal systems which are a source of pollutants that can infiltrate to groundwater. Discharges of effluent from on-site disposal systems include domestic wastewater (sewage) and graywater, but not industrial wastewater, which is discharged to the subsurface, located within the property that generated the waste stream.

The following types of discharge not regulated or authorized under waste discharge requirements (WDRs) may be eligible for Conditional Waiver No. 1:

- Discharges from conventional septic tank/subsurface disposal systems for residential units
- Discharges from conventional septic tank/subsurface disposal systems for commercial/industrial establishments
- Discharges from alternative individual sewerage systems
- Discharges from conventional septic tank/subsurface disposal systems for campgrounds
- Discharges from on-site graywater disposal systems

In order to be eligible for Conditional Waiver No. 1, discharges must comply with certain conditions to be protective of water quality. Waiver conditions applicable to discharges from on-site disposal systems include the following:

1.I.A. General Waiver Conditions for On-site Disposal Systems

1.II.A. Specific Waiver Conditions for On-site Septic and Sewerage Systems
1.II.B. Specific Waiver Conditions for On-site Graywater Systems

Discharges from on-site disposal systems that comply with the general and specific waiver conditions in Conditional Waiver No. 1 are not expected to pose a significant threat to the quality of waters of the state.

1.I.A. General Waiver Conditions for On-site Disposal Systems

1. Prevent the direct or indirect discharge of effluent from on-site disposal systems to any surface waters of the state (including ephemeral streams and vernal pools).
2. Effluent from on-site disposal systems must be discharged to the subsurface and cannot surface or pond.
3. Effluent from on-site disposal systems must not adversely affect the quality or beneficial uses underlying groundwater.
4. Effluent from on-site disposal systems must not cause or threaten to cause a condition of contamination, pollution, or nuisance.
5. Effluent from on-site disposal systems must be discharged at least 5 feet above highest known historical or anticipated groundwater level.
6. Effluent from on-site disposal systems must by discharged at least 100 feet away from any surface water body.
7. Effluent from on-site disposal systems must not adversely impact the quality or beneficial uses of groundwater in any water wells.
8. On-site disposal systems must be designed and operated in accordance with applicable regulatory requirements and/or standards as provided in the Specific Conditions.
9. The owner/operator of an on-site disposal system must comply with local, state, and federal ordinances and regulations and obtain any required approvals, permits, certifications, and/or licenses from authorized local agencies. Copies of any approvals, permits, certifications, and/or licenses must be available on site for inspection.
10. The owner/operator of an on-site disposal system must maintain and operate the system in accordance with the design approved by the authorized local agencies.
11. The San Diego Water Board and/or other local regulatory agencies must be allowed reasonable access to the site in order to perform inspections and conduct monitoring.
12. On-site disposal systems can only accept domestic wastes and/or wastewater.

1.II.A. Specific Waiver Conditions for On-site Septic and Sewerage Systems

1. For existing on-site septic or sewerage systems, the following conditions apply:
   a) Existing on-site septic or sewerage systems serving campgrounds must not allow connections from recreational vehicles.
   b) Owners/operators of existing on-site septic or sewerage systems that cause a condition of contamination, pollution, or nuisance must cease the use of the system and repair or replace it with a compliant system, or permanently remove the system from operation.
   c) After adoption of State Water Board on-site wastewater treatment system (OWTS) regulations, any existing on-site septic or sewerage systems that is replaced, requires major repair, pools or discharges to the surface of the ground, or has the reasonable potential to cause a violation of water quality objectives, to impair present or future beneficial uses of water, to cause pollution, nuisance, or contamination of waters of the state must be brought into compliance with new OWTS regulations. Owners/operators of on-site septic or sewerage systems that cannot bring their system into compliance must cease the use of the system and replace it with a compliant system, or permanently remove the system from operation.
2. For new on-site septic or sewerage systems, the following conditions apply:
   a) New on-site septic or sewerage systems installed at campgrounds must not allow connections from recreational vehicles.
   b) New on-site septic or sewerage systems must comply with the conditions set forth in the section entitled *Guidelines for New Community and Individual Sewerage Facilities* in Chapter 4 (Implementation) of the Basin Plan.
   c) New on-site septic or sewerage systems proposed to be constructed in areas where groundwater water quality objectives have been exceeded must be evaluated for potential adverse effects on groundwater quality and beneficial uses to determine if regulating the system with individual WDRs is more appropriate.
   d) New on-site septic or sewerage systems proposed to be constructed within areas designated as Zone A, as defined by the California Department of Public Health's Drinking Water Source Assessment and Protection Program, must be constructed with an adequate setback from the drinking water supply source that will be protective of drinking water quality.
   e) Six (6) months after adoption of State Water Board OWTS regulations, applications received by the authorized local agency for the construction of new on-site septic or sewerage systems must be in compliance with new OWTS regulations for design and installation.

1.II.B. Specific Waiver Conditions for On-site Graywater Systems

1. An on-site graywater system must be permitted by the city, county, or other authorized local agency that has jurisdiction over the installation. The on-site graywater system must be designed and installed, at a minimum, according to the California Plumbing Code (CPC) Graywater Standards.[3] If the city, county, and/or other authorized local agencies have additional requirements, the graywater system must be designed and installed to comply with those requirements.
2. On-site graywater systems proposed to be constructed in areas where groundwater water quality objectives have been exceeded must be evaluated for potential adverse effects on groundwater quality and beneficial uses to determine if regulating the system with individual WDRs is more appropriate.
3. New on-site graywater systems proposed to be constructed within areas designated as Zone A, as defined by the California Department of Public Health's Drinking Water Source Assessment and Protection Program, must be constructed with an adequate setback from the drinking water supply source that will be protective of drinking water quality.

[3] California Code of Regulations Title 24 (also known as the California Building Standards Administrative Code) Part 5 (also known as the California Plumbing Code) Appendix G

CONDITIONAL WAIVER NO. 2 – "LOW THREAT" DISCHARGES TO LAND

Conditional Waiver No. 2 is for "low threat" discharges to land, which can percolate to groundwater. "Low threat" discharges include liquid wastes containing pollutant concentrations that are not expected to adversely impact the quality of waters of the state under ambient conditions. "Low threat" discharges may include potable water or uncontaminated groundwater. Potable water and uncontaminated groundwater are not considered waste when initially discharged. However, when this water comes into contact with pollutants and transports those pollutants in surface runoff or leaches those pollutants into the soil and groundwater, it becomes a waste. "Low threat" discharges to land are not expected to contain significant concentrations of pollutants that can adversely affect the quality of underlying groundwater.

The following types of discharge not regulated or authorized under waste discharge requirements (WDRs) may be eligible for Conditional Waiver No. 2:

- Discharges from the construction and test pumping of water wells to land
- Discharges of air conditioner condensate or non-contact cooling water to land
- Swimming pool discharges to land
- Discharges from short-term construction dewatering operations to land
- "Low Threat" discharges to land and/or groundwater, which may include the following:
  - Groundwater pumped from drinking water wells
  - Groundwater from foundation drains, crawl space pumps, and footing drains
  - Discharges from flushing water lines
  - Discharges from washing vehicles, pavement, buildings, etc.
  - Infiltration from residential/commercial/industrial/recreational facility landscape and lawn irrigation using groundwater or municipal supply water
  - Infiltration from structural infiltration-based best management practices (BMPs)

In order to be eligible for Conditional Waiver No. 2, discharges must comply with certain conditions to be protective of water quality. Waiver conditions applicable to "low threat" discharges to land include the following:

2.I.A. General Waiver Conditions for "Low Threat" Discharges of Water to Land

2.II.A. Specific Waiver Conditions for Air Conditioner Condensate and Non-contact Cooling Water Discharges to Land
2.II.B. Specific Waiver Conditions for Swimming Pool Discharges to Land
2.II.C. Specific Waiver Conditions for Pumping of Groundwater from Wells to Land
2.II.D. Specific Waiver Conditions for Dewatering Operations Discharged to Land
2.II.E. Specific Waiver Conditions for Discharges from Washing Vehicles, Pavement, Buildings, etc. to Land
2.II.F. Specific Waiver Conditions for Discharges from Irrigated Lawns and Landscaping Using Groundwater or Municipal Supply Water
2.II.G. Specific Waiver Conditions for Discharges from Structural BMPs that Require Infiltration

"Low threat" discharges to land that comply with the general and specific waiver conditions in Conditional Waiver No. 2 are not expected to pose a threat to the quality of waters of the state.

2.I.A. General Waiver Conditions for "Low Threat" Discharges of Water to Land

1. Prevent the direct or indirect discharge of "low threat" discharges to any surface waters of the state (including ephemeral streams and vernal pools).
2. "Low threat" discharges must not cause the migration of contaminants such as chlorinated solvents, hydrocarbons, or other toxic or hazardous substances to groundwater.
3. "Low threat" discharges must not come in contact with any material that consists of or is contaminated with chlorinated solvents, hydrocarbons, or other toxic or hazardous substances prior to discharge to land.

4. Any products used to condition or treat "low threat" discharges prior to discharging to land must be in accordance with manufacturer's instructions and guidelines, and must reliably attenuate before infiltrating to underlying groundwater.
5. "Low threat" discharges to land must not adversely affect the quality or beneficial uses of underlying groundwater.
6. "Low threat" discharges to land must not cause or threaten to cause a condition of contamination, pollution, or nuisance.
7. "Low threat" discharges to land must not adversely impact the quality or beneficial uses of groundwater in any water wells.
8. The San Diego Water Board and/or other local regulatory agencies must be allowed reasonable access to the site in order to perform inspections and conduct monitoring.
9. Discharger must submit a Notice of Intent or technical and/or monitoring program reports when directed by the San Diego Water Board.

2.II.A. Specific Waiver Conditions for Air Conditioner Condensate and Non-contact Cooling Water Discharges to Land

1. Discharges must not contain contact cooling water.
2. Discharges of air conditioner condensate and non-contact cooling water to land must not exceed an average of 1,200 gallons per day for any continuous 365-day period, unless the discharger has filed a Notice of Intent containing information about the operator, location, and planned period of and average daily volume of discharge.

2.II.B. Specific Waiver Conditions for Swimming Pool Discharges to Land

1. Discharges of water from each swimming pool to land must not exceed 50,000 gallons during any continuous 365-day period, unless the discharger has filed a Notice of Intent containing information about the swimming pool location and volume, planned period of and frequency of discharge.

2.II.C. Specific Waiver Conditions for Pumping of Groundwater from Wells to Land

1. The discharge of groundwater pumped from any well that is used in a soil and/or groundwater contamination investigation or corrective action may not be discharged to land, unless the discharger has filed a Notice of Intent containing monitoring data demonstrating that the quality of the proposed discharge would not cause the groundwater at the disposal site to exceed water quality objectives.
2. For multiple applications of groundwater from wells pumped to land over a 365-day period, or a continuous 24-hour (or longer) application of groundwater from wells pumped to land within a 365-day period, the discharger must file a Notice of Intent containing information about the operator, location, planned period of and frequency of discharge, and measures that will be taken to minimize or eliminate the discharge of pollutants that might affect surface water and groundwater quality. Sufficient information demonstrating compliance with waiver conditions must be submitted before the discharge may begin.
3. Groundwater cannot originate from an area that contains any contaminated soil or groundwater.

2.II.D. Specific Waiver Conditions for Dewatering Operations Discharged to Land

1. The discharge of groundwater pumped from any well or excavation that is used in a soil and/or groundwater contamination investigation or corrective action may not be discharged to land, unless the discharger has filed a Notice of Intent containing monitoring data demonstrating that the quality of the proposed discharge would not cause the groundwater at the disposal site to exceed water quality objectives.
2. For dewatering operations that discharge an average of 5,000 gallons per day for any continuous 180-day period, the discharger must file a Notice of Intent containing information about the operator, location, planned period and rate of discharge, and measures that will be taken to minimize or eliminate the discharge of pollutants that might affect groundwater

quality. Sufficient information demonstrating compliance with waiver conditions must be submitted before the discharge may begin.

3. Groundwater cannot originate from an area that contains any contaminated soil or groundwater.

2.II.E. Specific Waiver Conditions for Discharges from Washing Vehicles, Pavement, Buildings, etc. to Land

1. Discharges of wash water and similar intermittent discharges must not exceed an average of 1,200 gallons per day for any continuous 30-day period, unless the discharger has filed a Notice of Intent containing information about the operator, location, and planned period of and average daily volume of discharge.

2.II.F. Specific Waiver Conditions for Discharges from Irrigated Lawns and Landscaping Using Groundwater or Municipal Supply Water

1. Products applied to lawns and landscaping must be in accordance with manufacturer's instructions and guidelines, and must reliably attenuate before infiltrating to underlying groundwater.

2.II.G. Specific Waiver Conditions for Discharges from Structural BMPs that Require Infiltration.

1. Installation of structural BMP that utilizes infiltration must comply with the design criteria of the municipality regulated by MS4 WDRs (NPDES storm water permit), **or**, for any discharge that exceeds an average of 1,200 gallons per day for any continuous 365-day period, the discharger must file a Notice of Intent containing documentation demonstrating that the quality of the proposed discharge from infiltration will not cause the groundwater at the disposal site to exceed water quality objectives.
2. Installation of structural BMPs that require infiltration must comply with local, state, and federal ordinances and regulations and obtain any required approvals, permits, certifications, and/or licenses from authorized local agencies.

CONDITIONAL WAIVER NO. 3 – DISCHARGES FROM ANIMAL OPERATIONS

Conditional Waiver No. 3 is for discharges from animal operations, which contain pollutants that can percolate to groundwater or runoff to surface waters. Discharges from animal operations include discharges resulting from animal activities and wastes, and storm water runoff which can also transport pollutants from animal operations to surface waters and groundwater.

The following types of discharge not regulated or authorized under waste discharge requirements (WDRs) may be eligible for Conditional Waiver No. 3:

- Discharges from small animal feeding operations (less than 300 animal units, where 1 animal unit is equivalent to one cow or 1,000 animal pounds)
- Discharges from medium animal feeding operations (300 to 999 animal units)
- Discharges of storm water runoff
- Discharge/application of manure to soil as an amendment or mulch
- Discharges from grazing lands

In order to be eligible for Conditional Waiver No. 3, discharges must comply with certain conditions to be protective of water quality. Waiver conditions applicable to discharges from animal operations include the following:

3.I.A. General Facility Design and Management Waiver Conditions
3.I.B. General Manure Management Waiver Conditions
3.I.C. General Waiver Conditions for Application of Manure from Animal Operations as a Fertilizer, Amendment, or Mulch to Soil
3.I.D. General Inspection and Reporting Waiver Conditions

3.II.A. Specific Waiver Conditions for Small Animal Feeding Operations
3.II.B. Specific Waiver Conditions for Medium Animal Feeding Operations
3.II.C. Specific Waiver Conditions for Grazing Operations

Discharges from animal operations that comply with the general and specific waiver conditions in Conditional Waiver No. 3 are not expected to pose a threat to the quality of waters of the state.

3.I.A General Facility Design and Management Waiver Conditions

1. Animal operations must comply with any local, state, and federal ordinances and regulations and obtain any required approvals, permits, certifications, and/or licenses from authorized local agencies.
2. Animal operations must implement management measures (MMs) and/or best management practices (BMPs) to minimize or eliminate the discharge of pollutants that may adversely impact the quality or beneficial uses of waters of the state. Recommended MMs/BMPs are provided in *Equestrian-Related Waste Quality Best Management Practices* available from the County of San Diego Department of Agriculture, Weights and Measures, and/or the *Field Office Technical Guide* available from the Natural Resource Conservation Service (NRCS), or other sources.
3. Animal operations must prevent direct contact of animals with surface water bodies. Animals should not be allowed to graze directly adjacent to or within stream banks. Animal operations should maintain a buffer zone or riparian filter strip between the animals and any surface waters of the state. The buffer zone must adequately minimize the discharge of pollutants from an animal operation. There should be no direct exposure of a surface water body to an animal.

3.I.B. General Manure Management Waiver Conditions

1. Animal operations must prevent the direct or indirect discharge of animal wastes (manure, urine, soiled bedding) to any surface waters of the state (including ephemeral streams and vernal pools).

2. Animal operations must properly manage the wastes (i.e., manure, urine, soiled bedding) generated by the animals at the facility in accordance with the following guidelines:
   a) Animal wastes should be collected and disposed of regularly (at least once every two weeks).
   b) Animal wastes can be stored temporarily (no longer than two weeks) on site until disposal, unless animal wastes are composted on site. The amount of animal wastes stored in temporary storage area must not exceed the capacity of the storage area. If animal wastes exceed, or threaten to exceed the capacity of the temporary storage area, the animal wastes should be disposed of immediately.
   c) Areas adjacent to temporary storage area for animal wastes should be graded to prevent storm water and surface runoff from reaching the storage area.
   d) Temporary storage area should be on an impervious surface (e.g., concrete pad or plastic tarp) to prevent leaching of pollutants to groundwater.
   e) Temporary storage area should protected with a roof or cover, or at a minimum be covered with plastic sheeting if precipitation is forecast within the next 24 hours, to prevent direct contact between precipitation and animal wastes.
   f) A buffer zone of at least 100 feet should be maintained between the temporary storage area for animal wastes and any surface water body unless sufficient information is provided to demonstrate that a proposed alternative is protective of water quality.
   g) If animal wastes are used as a fertilizer, soil amendment, or mulch on grazing lands, application of animal wastes to soil must comply with the conditions in 3.I.C.

3.I.C. General Waiver Conditions for Application of Manure from Animal Operations as a Fertilizer, Amendment, or Mulch to Soil

1. If fresh and/or uncomposted manure is applied as a fertilizer, amendment, or mulch to soil, manure must be applied to the same property where the manure was generated.
2. Dried, processed, or composted manure may be applied as a fertilizer, amendment, or mulch to soil on sites other than the property where the manure was generated. Dried, processed, or composted manure may also be applied as a fertilizer, amendment, or mulch to soil on the same property where the manure was generated. Use of dried, processed, or composted manure on or off the property where the manure was generated must comply with the waiver conditions in 3.I.C.
3. A buffer zone of at least 100 feet should be maintained between the manure applied to soil and any surface waters of the state, unless sufficient information is provided to demonstrate that a proposed alternative is protective of water quality.
4. The amount of soil amendment or mulch materials that can be applied to soil must be reasonable for the crop or plant, soil, climate, special local situations, management system, and type of soil amendment or mulch. Application rates must take into account storm events during the rainy season (October-May). Application rates must not allow soil amendment or mulch materials to be transported off the property in storm water runoff during the rainy season. Resources are available from the NRCS, University of California Cooperative Extension (UCCE), and other organizations. A copy of the calculations and/or estimate of the application rate must be available on site for inspection.
5. Apply amendment or mulch materials to soil at site-specific rates appropriate to the season (i.e., dry vs. rainy).
6. Implement MMs/BMPs in areas with soil amendment or mulch materials to minimize or eliminate runoff and leachate to surface waters and groundwater.

3.I.D. General Inspection and Reporting Waiver Conditions

1. The San Diego Water Board and/or other local regulatory agencies must be allowed reasonable access to the site in order to perform inspections and conduct monitoring.
2. Animal operations must submit a Notice of Intent or technical and/or monitoring program reports when directed by the San Diego Water Board.

3.II.A. Specific Waiver Conditions for Small Animal Feeding Operations

1. Small animal feeding operations (AFOs) must not discharge any pollutants to waters of the United States through any man-made conveyance, or directly to waters of the United States which originate outside of and pass over, across or through the facility or otherwise come into direct contact with the animals confined in the operation.
2. Small AFOs must be operated and maintained in accordance with the regulations in California Code of Regulations Title 27 sections 22562 through 22565.

3.II.B. Specific Waiver Conditions for Medium Animal Feeding Operations

1. Medium AFOs must not discharge any pollutants to waters of the United States through any man-made conveyance, or directly to waters of the United States which originate outside of and pass over, across or through the facility or otherwise come into direct contact with the animals confined in the operation.
2. Medium AFOs must be operated and maintained in accordance with the regulations in California Code of Regulations Title 27 sections 22562 through 22565.
3. Medium AFO facility owners or operators must file a Notice of Intent with the San Diego Water Board containing, at a minimum, the following information:
   a) Property owner name and address
   b) AFO owner/operator name and address
   c) Number and types of animals
   d) Map of the AFO facility showing the locations of manure stockpiles, nearby surface water bodies, and/or water wells
   e) Description of existing and planned MMs/BMPs for the prevention of erosion and discharges of animal wastes that could affect the quality of waters of the state.

   Sufficient information demonstrating compliance with general and specific waiver conditions must be submitted in order for the medium AFO facility to be eligible for a conditional waiver.

3.II.C. Specific Waiver Conditions for Grazing Operations

1. Grazing operations must manage grazing fields to allow lands to revegetate and minimize topsoil erosion.
2. Owners of pasture and range lands used for grazing, must implement MMs/BMPs to minimize or eliminate any discharge that could adversely affect the quality or beneficial uses of waters of the state.

List of References

The following list of references provides additional information that is available regarding appropriate MMs/BMPs for minimizing pollutants in runoff and other discharges from animal operations.

1. Equestrian-Related Waste Quality Best Management Practices, County of San Diego Department of Agriculture, Weights and Measures
   http://www.sdcounty.ca.gov/awm/docs/equestrian_bmp.pdf

2. Electronic Field Office Technical Guide (eFOTG), United States Department of Agriculture, Natural Resources Conservation Service
   http://www.nrcs.usda.gov/technical/efotg/

3. Agricultural Management Measures, State Water Resources Control Board
   http://www.swrcb.ca.gov/nps/docs/guidance/agricmms.pdf

4. California Nonpoint Source Encyclopedia, State Water Resource Control Board
   http://www.swrcb.ca.gov/nps/docs/encyclopedia/agriculture.pdf

CONDITIONAL WAIVER NO. 4 – DISCHARGES FROM AGRICULTURAL AND NURSERY OPERATIONS

Conditional Waiver No. 4 is for discharges from agricultural and nursery operations, which contain pollutants that can percolate to groundwater or runoff to surface waters. Discharges from agricultural and nursery operations include discharges resulting from growing operations, irrigation return flows, and storm water runoff which can also transport pollutants from agricultural and nursery operations to surface waters and groundwater.

The following types of discharge not regulated or authorized under waste discharge requirements (WDRs) may be eligible for Conditional Waiver No. 4:

- Discharges of plant crop residues to land
- Discharges of storm water runoff
- Discharge/application of amendments or mulches to soil
- Discharges of agricultural irrigation return water
- Discharges of nursery irrigation return water

In order to be eligible for Conditional Waiver No. 4, discharges must comply with certain conditions to be protective of water quality. Waiver conditions applicable to discharges from agricultural and nursery operations include the following:

4.I.A. General Facility Design and Management Waiver Conditions
4.I.B. General Enrollment and Education Waiver Conditions
4.I.C. General Waiver Conditions for Application of Compost as a Fertilizer, Amendment, or Mulch to Soil
4.I.D. General Waiver Conditions for Application of Products Used in Agricultural and Nursery Operations
4.I.E. General Inspection and Reporting Requirements

4.II.A. Specific Waiver Conditions for Agricultural Operations
4.II.B. Specific Waiver Conditions for Nursery Operations

Discharges from agricultural and nursery operations that comply with the general and specific waiver conditions in Conditional Waiver No. 4 are not expected to pose a threat to the quality of waters of the state.

4.I.A. General Facility Design and Management Waiver Conditions

1. Agricultural and nursery operations must comply with any local, state, and federal ordinances and regulations and obtain any required approvals, permits, certifications, and/or licenses.
2. Agricultural and nursery operations must implement management measures (MMs) and/or best management practices (BMPs) to minimize or eliminate the discharge of pollutants that may adversely impact the quality or beneficial uses of waters of the state. Recommended MMs/BMPs are available in the State Water Board's Nonpoint Source (NPS) Program Plan and/or available from University of California Cooperative Extension (UCCE), Natural Resources Conservation Service (NRCS), and/or regional resource conservation districts (RCDs).

4.I.B. General Enrollment and Education Waiver Conditions

1. Agricultural and nursery operators must perform a self assessment to identify the pollutants present on the site and assess the potential for runoff and/or infiltration to adversely affect the quality or beneficial uses of the waters of the state. Annual self assessments must be available on site for inspection. If an agricultural or nursery operator does not have proof available during an inspection, the operator must submit proof to the inspecting agency and the San Diego Water Board within 45 days from the date of inspection. Self assessment questionnaires are available from the UCCE.
2. Agricultural and nursery operators must complete at least 2 hours of water quality management related training annually. Training may include formal classroom training or meetings with a training component. Proof of training must be available on site for inspection.

Agricultural and nursery operators who do not have proof available during an inspection must submit proof to the inspecting agency and the San Diego Water Board within 45 days from the date of inspection.

3. Agricultural and nursery operators must be in regular contact with the local Farm Bureau, UCCE, NRCS, and/or regional RCDs so they can be informed of the latest MMs/BMPs and developments with water quality issues. Proof of contact (e.g., newsletter addressed to facility, NRCS conservation plan, UCCE self assessment) must be available on site for inspection. Agricultural and nursery operators who do not have proof available during an inspection must submit proof to the inspecting agency and the San Diego Water Board within 45 days from the date of inspection.
4. Agricultural and nursery operations must implement MMs/BMPs to minimize or eliminate the discharge of pollutants that may adversely impact the quality or beneficial uses of waters of the state. Recommended MMs/BMPs are available in the State Water Board's NPS Program Plan and/or available from UCCE, NRCS, and/or regional RCDs.
5. Agricultural and nursery operators shall maintain records pertaining to the water quality management efforts for the operation. The records shall include the following information:
   a) Site map showing locations of MMs/BMPs and nearby surface water bodies and/or water wells
   b) List of hazardous materials kept on the property
   c) Location and amount of waste materials (e.g., green wastes, trash) generated and composted and/or reused on site, or disposed of off site
   d) Pesticide use reports and records
   e) Fertilizer, soil amendment, and mulch use records
   f) Irrigation management records (i.e., water use, irrigation system, irrigation schedule, etc.)
   g) Equipment maintenance records
   h) List of MMs/BMPs implemented to minimize and/or eliminate runoff to surface waters and/or infiltration to groundwater
   i) Owner, operator, and employee education and training records
   j) Inspection reports
   k) Self assessments
   l) Contacts with Farm Bureau, UCCE, NRCS, regional RCDs, and/or other organizations
   m) Copies of any permits, licenses, and certifications required for the operation
   n) Water quality monitoring data (if any)

   Recommended water quality record keeping documentation is available from the UCCE. Water quality management records must be available on site for inspection.
6. **No later than December 31, 2010**, agricultural and nursery operations must form or join a monitoring group. The function of the monitoring group is to perform water quality monitoring and report the results to the San Diego Water Board. Monitoring groups will be allowed to divide the costs associated with the water quality monitoring and reporting requirements in 4.I.E among its members. Individual operations not in a monitoring group will be solely responsible for the costs associated with the water quality monitoring and reporting requirements in 4.I.E.
7. **No later than January 1, 2011**, owners/operators of agricultural and nursery operations must file a Notice of Intent, as either an individual operation or as part of a monitoring group, with the San Diego Water Board.
8. A Notice of Intent submitted by a monitoring group on behalf of its members must contain the following information:
   a) Identify the representative(s) authorized to sign reports submitted on behalf of the group.
   b) An electronic list of landowners and/or operators participating in the monitoring group including: (a) assessor parcel number(s), (b) parcel size, (c) parcel owner or operator name, (d) types of crops grown on each parcel, (e) number of irrigated acres, and (f) parcel owner or operator mailing address.
   c) A detailed map of the area included within the monitoring group, preferably in GIS format, identifying individual parcels and/or districts that are participating in the monitoring group.
   d) A detailed description of irrigation, storm water runoff, nutrient, pesticide, erosion control, composting, and other site-specific MMs/BMPs that have been implemented by each

participant in the monitoring group, which must be provided as a written description, on a map, and/or using pictures.

Monitoring group members are not eligible for this waiver until a complete Notice of Intent is filed. The monitoring group must inform the San Diego Water Board when any member ceases to participate in the monitoring group within 30 days of the cessation of participation. Any member who ceases to participate in a monitoring group must file a Notice of Intent as an individual agricultural or nursery operation, in accordance with waiver condition 4.I.B.9, within 30 days of ceasing to participate in the monitoring group.

9. A Notice of Intent filed by an individual agricultural or nursery operation must contain the following information:
   a) Information about the agricultural or nursery operation including: (a) assessor parcel number(s), (b) parcel size, (c) parcel owner and operator name(s), (d) types of crops grown on each parcel, (e) number of irrigated acres, and (f) parcel owner and operator mailing address(es).
   b) A detailed map of the operation, preferably in GIS format, with locations of operation boundaries, nearby surface waters and water wells.
   c) A detailed description of irrigation, storm water runoff, nutrient, pesticide, erosion control, composting, and other site-specific MMs/BMPs that have been implemented by the operation, which must be provided as a written description, on a map, and/or using pictures.

   An individual agricultural or nursery operation is not eligible for this waiver until a complete Notice of Intent is filed.

4.I.C. General Waiver Conditions for Application of Compost as a Fertilizer, Amendment, or Mulch to Soil

1. Prevent the direct or indirect discharge of amendments or mulches to any surface waters of the state (including ephemeral streams and vernal pools).
2. Plant crop residues may be utilized as soil amendment or mulch.
3. Amendments or mulches applied to soil cannot include any of the following additives, unless sufficient information is provided to demonstrate that the waste does not pose a potential threat to water quality: (a) municipal solid wastes; (b) sludges, including sewage sludge, water treatment sludge, and industrial sludge; (c) septage; (d) liquid wastes; (e) oil and grease; and (f) hazardous, designated, and any other wastes determined by the San Diego Water Board to pose a potential threat to water quality.
4. The amount of soil amendment or mulch materials that can be applied to soil must be reasonable for the crop or plant, soil, climate, special local situations, management system, and type of soil amendment or mulch. Application rates must take into account storm events during the rainy season (October-May). Application rates must not allow soil amendment or mulch materials to be transported off the property in storm water runoff during the rainy season. Resources are available from the NRCS, UCCE, and other organizations. A copy of the calculations and/or estimate of the application rate must be available on site for inspection.
5. Apply amendment or mulch materials to soil at site-specific rates appropriate to the season (i.e., dry vs. rainy).
6. Implement MMs/BMPs in areas with soil amendment or mulch materials to minimize or eliminate runoff and leachate to surface waters and groundwater.

4.I.D. General Waiver Conditions for Application of Products Used in Agricultural and Nursery Operations

1. Prevent the direct or indirect discharge of products used in agricultural or nursery operations to any surface waters of the state (including ephemeral streams and vernal pools).
2. The application of any products used in agricultural or nursery operations that contain pollutants that may be transported in surface runoff to surface waters or may infiltrate to groundwater must be applied in accordance with manufacturer instructions and guidelines, and must not have an adverse effect on the quality of any waters of the state.
3. Excessive amounts of any products used in agricultural or nursery operations spilled to land must be contained and properly disposed.
4. Any products used in agricultural or nursery operations applied to land must not adversely impact the quality or beneficial uses of groundwater in any water wells.

4.I.E. General Inspection and Reporting Waiver Conditions

1. The San Diego Water Board and/or other local regulatory agencies must be allowed reasonable access to the site in order to perform inspections and conduct monitoring.
2. Owners/operators must submit a Notice of Intent or technical and/or monitoring program reports when directed by the San Diego Water Board.
3. **By March 31, 2011**, each monitoring group and each individual operation not participating in a monitoring group must contact the San Diego Water Board to begin developing a Monitoring and Reporting Program Plan (MRPP) and a Quality Assurance Project Plan (QAPP).
4. **By January 1, 2012**, each monitoring group and each individual operation not in a monitoring group must submit one MRPP/QAPP to the San Diego Water Board. The MRPP/QAPP must include the monitoring locations, frequency of monitoring, constituents of concern to be monitored, documentation of monitoring protocols, and sufficient information about the agricultural and/or nursery operations to demonstrate that the proposed MRPP/QAPP will adequately document water quality and pollutant loadings, and demonstrate compliance with waiver conditions.
5. **By December 31, 2012**, each monitoring group and each individual operation not participating in a monitoring group must submit one Monitoring Program Report (MRP) to the San Diego Water Board consistent with the MRPP/QAPP.

4.II.A. Specific Waiver Conditions for Agricultural Operations

1. Minimize or eliminate the discharge of any pollutants that could adversely affect the quality or beneficial uses of any waters of the state.
2. Agricultural operators cannot alter surface waters of the state on or off the property, unless the proposed alteration has received a Clean Water Act section 401 Water Quality Certification, individual WDRs, or individual waiver from the San Diego Water Board.

4.II.B. Specific Waiver Conditions for Nursery Operations

1. Prevent the direct or indirect discharge of nursery irrigation return water to any surface waters of the United States.
2. Nursery operations must minimize or eliminate the discharge of any pollutants that could adversely affect the quality or beneficial uses of any waters of the state.
3. Nursery operators cannot alter surface waters of the state on or off the property, unless the proposed alteration has received a Clean Water Act section 401 Water Quality Certification, individual WDRs, or individual waiver from the San Diego Water Board.

List of References

The following list of references provides additional information that is available regarding appropriate MMs/BMPs for minimizing pollutants in runoff and other discharges from agricultural and nursery operations.

1. Industrial Storm Water Program, State Water Resources Control Board
   http://www.swrcb.ca.gov/stormwtr/industrial.html

2. Construction Storm Water Permit, State Water Resources Control Board
   http://www.swrcb.ca.gov/stormwtr/gen_const.html

3. Agricultural Management Measures, State Water Resources Control Board
   http://www.swrcb.ca.gov/nps/docs/guidance/agricmms.pdf

4. California Nonpoint Source Encyclopedia, State Water Resource Control Board
   http://www.swrcb.ca.gov/nps/docs/encyclopedia/agriculture.pdf

5. Developing a Management Plan for Irrigation Runoff, Dept. of Horticultural Sciences, Texas A&M University
http://aggie-horticulture.tamu.edu/greenhouse/nursery/environ/wmplan1.html

6. Management Options for Nonpoint Source Pollution for Greenhouse and Container Crops, UC Cooperative Extension, San Diego
http://commserv.ucdavis.edu/CESanDiego/Stormwater/index.htm

7. BMPs Nurseries And Greenhouses, County of Orange
http://www.ocwatershed.com/StormWater/documents_bmp_existing_development.asp#ind

8. Electronic Field Office Technical Guide (eFOTG), Natural Resources Conservation Service
http://www.nrcs.usda.gov/technical/efotg/

9. Grower Resources (including self assessment questionnaires and water quality record keeping notebook), San Diego County University of California Cooperative Extension
http://cesandiego.ucdavis.edu/Clean%5FWater/Grower_Resources.htm

CONDITIONAL WAIVER NO. 5 – DISCHARGES FROM SILVICULTURAL OPERATIONS

Conditional Waiver No. 5 is for discharges that originate from forest lands, which contains pollutants that can percolate to groundwater or runoff to surface waters. Discharges from forest lands include discharges resulting from timber operations, and storm water runoff which can also transport pollutants from managed forest lands and timber operations to surface waters and groundwater.

The following types of discharge not regulated or authorized under waste discharge requirements (WDRs) may be eligible for Conditional Waiver No. 5:

- Discharges of storm water runoff
- Discharges from timber harvesting projects
- Discharges from wildfire suppression and fuels management activities

In order to be eligible for Conditional Waiver No. 5, discharges must comply with certain conditions to be protective of water quality. Waiver conditions applicable to discharges from silvicultural operations include the following:

5.I.A. General Waiver Conditions for Silvicultural Operations

5.II.A. Specific Waiver Conditions for Timber Operations on Federal Lands
5.II.B. Specific Waiver Conditions for Timber Operations on Non-Federal Lands

Discharges from silvicultural operations that comply with the general and specific waiver conditions in Conditional Waiver No. 5 are not expected to pose a threat to the quality of waters of the state.

5.I.A. General Waiver Conditions for Silvicultural Operations

1. Silvicultural operations (including timber harvesting, timber management, vegetative manipulation, fuels management, road construction, and watershed management) must minimize or eliminate the discharge of any pollutants that could adversely affect the quality or beneficial uses of waters of the state.
2. Silvicultural operations (including timber harvesting, timber management, vegetative manipulation, fuels management, road construction, and watershed management) must comply with any federal, state, or local, state, and federal permitting, licensing, or certification requirements and applicable regulations and ordinances.
3. The San Diego Water Board and/or other local regulatory agencies must be allowed reasonable access to the site in order to perform inspections and conduct monitoring.

5.II.A. Specific Waiver Conditions for Timber Operations on Federal Lands

1. The State Water Board and US Environmental Protection Agency (USEPA) must continue to certify the *Water Quality Management Plan for National Forest System Lands in California*.
2. The US Forest Service (USFS) must maintain: (a) a water quality program consistent with the Basin Plan, and (b) a program to monitor the implementation and effectiveness of management measures (MMs) and/or best management practices (BMPs).
3. The USFS must provide the San Diego Water Board copies of the environmental and decision documents containing information documenting that a multi-disciplinary review of the timber harvest proposal has been conducted, and the proposed MMs/BMPs and additional control measures that will be implemented to protect water quality.
4. The USFS must submit a Notice of Intent or technical and/or monitoring program reports when directed by the San Diego Water Board.

5.II.B. Specific Waiver Conditions for Timber Operations on Non-Federal Lands

1. The State Water Board must continue to certify the *Water Quality Management Plan for Timber Operations on Nonfederal Lands*.
2. Timber operations within 150 feet of existing structures (i.e., "FireSafe" treatments) that are conducted pursuant to a Notice of Exemption approved by the California Department of Forestry (CDF) are not required to provide notice to the San Diego Water Board, but must keep

a copy of the approved Notice of Exemption for at least one year (from the approval date) on site for inspection.

3. For timber operations approved by the CDF pursuant to a Notice of Exemption or Notice of Emergency, a copy of the notice must be provided to the San Diego Water Board.
4. For timber operations with a Timber Harvest Plan (THP) or Non-industrial Timber Management Plan (NTMP) approved by the CDF, a copy of the Plan must be provided to the San Diego Water Board.
5. Owners/operators of non-federal forest lands must submit a Notice of Intent or technical and/or monitoring program reports when directed by the San Diego Water Board.

CONDITIONAL WAIVER NO. 6 – DISCHARGES OF DREDGED OR FILL MATERIALS NEARBY OR WITHIN SURFACE WATERS

Conditional Waiver No. 6 is for discharges of dredged or fill materials nearby or within surface waters of the state. Dredged or fill materials are sources of pollutants that can adversely affect the quality of waters of the state.

The following types of discharge not regulated or authorized under waste discharge requirements (WDRs) may be eligible for Conditional Waiver No. 6:

- Discharges from sand and gravel mining operations
- Discharges from dredging projects
- Discharges from stream channel alteration projects
- Other projects proposing to discharge dredged or fill materials nearby or within surface waters of the state.

In order to be eligible for Conditional Waiver No. 6, discharges must comply with certain conditions to be protective of water quality. Waiver conditions applicable to discharges of dredged or fill materials nearby or within surface waters include the following:

6.I.A. General Waiver Conditions for Projects that Discharge Dredged or Fill Material Nearby or Within Surface Waters Required to Obtain a Surface Mining Permit and/or Federal Permit (River and Harbors Act section 10 or Clean Water Act section 404 Permit), and Clean Water Act section 401 Water Quality Certification

6.II.A. Specific Waiver Conditions for Sand and Gravel Mining Operations

Discharges of dredged or fill materials nearby or within surface waters that comply with the general and specific waiver conditions in Conditional Waiver No. 6 are not expected to pose a threat to the quality of waters of the state.

6.I.A. General Waiver Conditions for Projects that Discharge Dredged or Fill Material Nearby or Within Surface Waters Required to Obtain a Surface Mining Permit and/or Federal Permit (River and Harbors Act Section 10 or Clean Water Act Section 404 Permit) and Clean Water Act Section 401 Water Quality Certification[4]

1. Operators must comply with measures included in the Surface Mining Permit and/or Federal Permit and Clean Water Act section 401 Water Quality Certification to protect surface water and groundwater quality.
2. The San Diego Water Board and/or other local regulatory agencies must be allowed reasonable access to the site in order to perform inspections and conduct monitoring.
3. At least one copy of any permits, licenses, and certifications must be available for on site inspection.
4. Operators must minimize or eliminate the discharge of any pollutants that could adversely affect the quality or beneficial uses of waters of the state.

6.II.A. Specific Waiver Conditions for Sand and Gravel Mining Operations

1. Sand and gravel mining operations cannot be conducted in flowing streams or other water bodies.

[4] For projects that discharge dredged or fill material nearby or within surface waters NOT required to obtain a Surface Mining Permit or Federal Permit (River and Harbors Act section 10 or Clean Water Act section 404 Permit) and Clean Water Act section 401 Water Quality Certification, the discharger must file a Report of Waste Discharge (RoWD) with the San Diego Water Board.

CONDITIONAL WAIVER NO. 7 – DISCHARGES OF RECYCLED WATER TO LAND

Conditional Waiver No. 7 is for discharges of recycled water to land. Discharges of recycled water may contain pollutants that can adversely affect the quality of waters of the state. The application of recycled water to land may result in pollutants being concentrated in soils, which may adversely impact the quality of the waters of the state when those concentrated pollutants are leached out during rainfall events and/or overuse of irrigation water. This waiver is not available or applicable to recycled water projects and users subject to rules and regulations established by master reclamation permits (MRPs), issued pursuant to Water Code section 13523.1, or otherwise regulated under waste discharge requirements (WDRs) or water reclamation requirements (WRRs), issued pursuant to Water Code sections 13260 and 13523, respectively.

The following types of discharge not regulated or authorized under WDRs, WRRs, and/or MRP may be eligible for Conditional Waiver No. 7:

- Discharges to land from short-term recycled water projects (without permanent recycled water delivery and/or distribution systems, not to exceed 365 days)
- Discharges to land from permanent recycled water projects (with permanent recycled water delivery and/or distribution systems, limited to the period prior to the discharge being authorized and regulated under WDRs, WRRs, and/or MRP, not to exceed 365 days)

In order to be eligible for Conditional Waiver No. 7, discharges must comply with certain conditions to be protective of water quality. Waiver conditions applicable to discharges of recycled water to land include the following:

7.I.A. General Waiver Conditions for Recycled Water Projects

7.II.A. Specific Waiver Conditions for Short-term Recycled Water Projects
7.II.B. Specific Waiver Conditions for Permanent Recycled Water Projects

Discharges of recycled water to land that comply with the general and specific waiver conditions in Conditional Waiver No. 7 are not expected to pose a threat to the quality of waters of the state.

7.I.A. General Waiver Conditions for Recycled Water Projects

1. Prevent all windblown spray and surface runoff of recycled water on to property not owned or controlled by the discharger by implementation of management measures (MMs) and/or best management practices (BMPs).
2. Recycled water discharged to land must not adversely affect the quality or beneficial uses of underlying groundwater.
3. The San Diego Water Board and/or other local regulatory agencies must be allowed reasonable access to the site in order to perform inspections and conduct monitoring.
4. The use of recycled water must comply with the requirements of California Code of Regulations Title 22 section 60310(a) through (j), unless sufficient information is provided to demonstrate that a proposed alternative is protective of water quality and human health.
5. Recycled water cannot be used for groundwater recharge unless sufficient information is provided to demonstrate that it will be protective of water quality and human health.

7.II.A. Specific Waiver Conditions for Short-term Recycled Water Projects

1. The operator of a short-term project proposing to discharge recycled water must file a Notice of Intent containing information about the operator, location of the project, source of the recycled water, planned period of and frequency of discharge of recycled water, and the MMs/BMPs or other measures that will be taken to eliminate or minimize the discharge of pollutants that might affect surface water and groundwater quality.
2. The Notice of Intent must include a letter from the permitted recycled water agency supplying the recycled water stating that the project will comply with recycled water regulations in California Code of Regulations Title 22, Division 4, Chapter 3, Articles 1 through 10. The letter shall also specify any monitoring and/or reporting required by the recycled water agency

to demonstrate compliance with California Code of Regulations Title 22, Division 4, Chapter 3, Reclamation Criteria, Articles 2, 3, 4, 5, and 5.1.

3. Sufficient information demonstrating that the operator will comply with waiver conditions and applicable recycled water regulations must be submitted before the discharge may begin.
4. The Notice of Intent is valid for 365 days after the submittal of a complete Notice of Intent. A new Notice of Intent must be filed with the San Diego Water Board if the short-term project will exceed 365 days. A new Notice of Intent must be received by the San Diego Water Board at least 60 days prior to the expiration of the previous Notice of Intent. If no new Notice of Intent is received 60 days prior to the expiration of the previous Notice of Intent, the short-term recycled water project must cease operation 365 days after a complete Notice of Intent has been submitted.

7.II.B. Specific Waiver Conditions for Permanent Recycled Water Projects

1. A recycled water agency proposing to supply and/or distribute recycled water through permanently installed facilities or structures before receiving WDRs must file a Report of Waste Discharge (RoWD) pursuant to Water Code sections 13260 and 13522.5 containing the following:
   a) Sufficient information for the San Diego Water Board to determine that the project will be consistent with the Water Quality Control Plan for the San Diego Basin and any State Water Resources Control Board recycled water policies, and will comply with all applicable recycled water regulations.
   b) A letter from the California Department of Public Health (CDPH) stating that the project will comply with recycled water regulations in California Code of Regulations Title 22, Division 4, Chapter 3, Articles 1 through 10. The letter shall also specify any provisions, monitoring, and/or reporting required by the CDPH to demonstrate compliance with California Code of Regulations Title 22, Division 4, Chapter 3, Reclamation Criteria, Articles 2, 3, 4, 5, and 5.1.
   c) A list of recycled water end users that will be regulated by the recycled water agency, and the proposed monitoring and reporting program the recycled water agency will implement to demonstrate that the end users are complying with the waiver conditions and applicable recycled water regulations.
2. The recycled water agency must submit sufficient information demonstrating that the recycled water agency and its end users will comply with waiver conditions and applicable recycled water regulations before the discharge may begin.
3. The conditional waiver issued to the recycled water agency is valid for 365 days after a completed RoWD has been submitted, or until WDRs are adopted for the project, whichever occurs first. The San Diego Water Board will adopt WDRs at the earliest possible opportunity. If the WDRs cannot be adopted within 365 days after the completed RoWD has been submitted, the recycled water agency must request an extension of the conditional waiver at least 60 days prior to the expiration of the previous conditional waiver. If no request for an extension is received 60 days prior to the expiration of the previous conditional waiver, the permanent recycled water project must cease the discharge of recycled water 365 days after the completed RoWD was submitted.
4. If a recycled water agency that obtains a waiver in accordance with the waiver conditions in 7.II.B proposes to significantly add to or modify the treatment process (e.g., change the disinfection or filtration processes), then the discharger shall submit a new RoWD containing the information listed in 7.II.B.1 above.

CONDITIONAL WAIVER NO. 8 – DISCHARGES/DISPOSAL OF SOLID WASTES TO LAND

Conditional Waiver No. 8 is for discharges of solid wastes to land, which may be a source of pollutants that can adversely affect the quality of waters of the state.

The following types of discharge not regulated or authorized under waste discharge requirements (WDRs) may be eligible for Conditional Waiver No. 8:

- Discharges of plant crop residues to land
- Discharge/application of amendments and/or mulches to soil
- Discharges/disposal of inert wastes to solid waste disposal facilities only accepting inert wastes
- Discharges of soils containing wastes to temporary waste piles
- Discharges/disposal/reuse of soils characterized as inert from known contaminated sites to land

In order to be eligible for Conditional Waiver No. 8, discharges must comply with certain conditions to be protective of water quality. Waiver conditions applicable to discharges of solid wastes to land include the following:

8.I.A. General Waiver Conditions for Discharges of Solid Wastes to Land

8.II.A. Specific Waiver Conditions for Discharges of Plant Crop Residues to Land
8.II.B. Specific Waiver Conditions for Application of Amendments and Mulches to Soil
8.II.C. Specific Waiver Conditions for the Discharge of Soils Containing Wastes to Temporary Waste Piles
8.II.D. Specific Waiver Conditions for Discharges of Inert Wastes to Solid Waste Disposal Facilities Only Accepting Inert Wastes
8.II.E. Specific Waiver Conditions for the Discharge/Disposal/Reuse of Inert Soils and Materials from Contaminated Sites to Land

Discharges of solid wastes to land that comply with the general and specific waiver conditions in Conditional Waiver No. 8 are not expected to pose a threat to the quality of waters of the state.

8.I.A. General Waiver Conditions for Discharges of Solid Wastes to Land

1. Prevent the direct or indirect discharge of solid wastes to any surface waters of the state (including ephemeral streams and vernal pools).
2. Operations or facilities that accept and/or discharge solid wastes to land must comply with local, state, and federal ordinances and regulations and obtain any required permits, certifications, and/or licenses.
3. Solid wastes must not cause or threaten to cause a condition of contamination, pollution, or nuisance.
4. The discharger must minimize or eliminate the discharge of any pollutants that could adversely affect the quality or beneficial uses of waters of the state.
5. The San Diego Water Board and/or other local regulatory agencies must be allowed reasonable access to the site in order to perform inspections and conduct monitoring.
6. Discharger must submit a Notice of Intent or technical and/or monitoring program reports when directed by the San Diego Water Board.

8.II.A. Specific Waiver Conditions for Discharges of Plant Crop Residues to Land

1. Plant crop residues must be managed to prevent transport of pollutants to waters of the state.
2. Plant crop residues may be used as feedstock for composting.
3. Plant crop residues cannot be burned and applied to land.
4. Application of any products (e.g., fertilizers, pesticides) to plants or soil must be used in accordance with manufacturer's guidelines and must not have an adverse effect on the quality of any waters of the state.
5. Concentrations of pesticides and/or herbicides or any other pollutants associated with the plant crop residues must not adversely affect the quality or beneficial uses of underlying groundwater.

6. Implement management measures (MMs) and/or best management practices (BMPs) around areas where plant crop residues have been discharged to land to minimize or eliminate runoff and leachate to surface waters and groundwater.

8.II.B. Specific Waiver Conditions for Application of Amendments and Mulches to Soil

1. Amendments or mulches applied to soil cannot include any of the following additives, unless sufficient information is provided to demonstrate that the waste does not pose a potential threat to water quality: (a) municipal solid wastes; (b) sludges, including sewage sludge, water treatment sludge, and industrial sludge; (c) septage; (d) liquid wastes; (e) oil and grease; and (f) hazardous, designated, and any other wastes determined by the San Diego Water Board to pose a potential threat to water quality.
2. The amount of soil amendment or mulch materials that can be applied to soil must be reasonable for the crop or plant, soil, climate, special local situations, management system, and type of soil amendment or mulch. Application rates must take into account storm events during the rainy season (October-May). Application rates must not allow soil amendment or mulch materials to be transported off the property in storm water runoff during the rainy season. Resources are available from the Natural Resource Conservation Service (NRCS), University of California Cooperative Extension (UCCE), and other organizations. A copy of the calculations and/or estimate of the application rate must be available on site for inspection.
3. Apply amendment or mulch materials to soil at site-specific rates appropriate to the season (i.e., dry vs. rainy).
4. Implement MMs/BMPs in areas with soil amendment or mulch materials to minimize or eliminate runoff and leachate to surface waters and groundwater.

8.II.C. Specific Waiver Conditions for the Discharge of Soils Containing Wastes to Temporary Waste Piles

1. For ***any soils containing wastes*** temporarily stored in waste piles, the following conditions apply:
   a) The discharger must submit a signed/completed Section A of the Temporary Waste Pile Certification form within 30 days of the initial discharge of any waste piles to be eligible for this waiver. The property owner must approve and acknowledge the placement of the waste at the site.
   b) The discharger must submit a signed/completed Section B of the Temporary Waste Pile Certification form within 10 working days of completing removal of all waste and restoring the site to its original condition.
   c) Unless otherwise specified in the applicable conditions, no temporary waste piles may remain on a site for longer than 6 months or 180 days.
   d) The temporary discharge of waste must not (a) cause the occurrence of coliform or pathogenic organisms in waters pumped from the basin; (b) cause the occurrence of objectionable tastes and odors in water pumped from basin; (c) cause waters pumped from the basin to foam; (d) cause the presence of toxic materials in waters pumped from the basin; (e) cause the pH of waters pumped from the basin to fall below 6.0 or rise above 9.0; (f) cause pollution, contamination or nuisance or adversely affect the quality or beneficial uses of groundwater or surface waters of the hydrologic subareas established in the Basin Plan; and/or, (g) cause a violation of any discharge prohibitions in the Basin Plan for the San Diego Region.
   e) The discharger must conduct regular inspections of temporary waste piles and associated MMs/BMPs at least once per week. Corrective actions must be taken as necessary to ensure compliance with the conditions of this waiver.
   f) Surface drainage must be diverted away from the temporary waste piles. For all temporary waste piles, the discharger must implement effective MMs/BMPs to prevent surface water runon and runoff from contacting wastes and to prevent erosion and transport of wastes by surface runoff.
   g) Temporary waste piles must be placed at least 5 feet above the highest historically known or anticipated level of groundwater, and more than 100 feet from any surface water of the state, unless sufficient information is provided to demonstrate that a proposed alternative is protective of water quality.

h) Temporary waste piles must be protected against 100-year peak stream flows as defined by the County flood control agency.
i) Temporary waste piles must be covered by plastic sheeting (not less than 10 mils thick, unless otherwise specified under the applicable Special Conditions) to adequately prevent rainwater infiltration, control fugitive dust, and other nuisances.
j) Temporary waste piles must be underlain by either plastic sheeting (not less than 10 mils thick, unless otherwise specified under the applicable conditions) or a liner of low permeability that will prevent leachate from infiltrating to groundwater.
k) Solid wastes discharged to temporary waste piles, together with any containment materials used at the temporary waste pile, and any underlying geologic materials impacted by the discharge, shall be removed within 180 days, unless otherwise specified under the applicable Special Conditions. Subsequently, the discharger must remove all wastes, treatment facilities, related equipment, and dispose of those items in accordance with applicable regulations. The site must be restored to its original state within 30 days after the temporary waste pile is removed, unless otherwise specified under the applicable Special Conditions.
l) The discharger must post at least one clearly visible sign listing the following minimum information: a) project name, b) name and address of discharger, c) brief project description, and d) 24-hour contact information – name, address, facsimile, and telephone number for the project for as long as the temporary waste pile remains on the site.

2. For ***soils containing petroleum hydrocarbons*** temporarily stored in waste piles, the following conditions apply:
   a) Soils and associated solid waste containing petroleum hydrocarbons discharged into temporary waste piles shall be limited to a maximum time period of 3 months or 90 days on a site.
   b) Soils and associated solid waste containing petroleum hydrocarbons discharged into temporary waste piles under an initial certification report must be derived from only one source (e.g., one unauthorized release site).
   c) Temporary waste piles must be covered by plastic sheeting (not less than 10 mils thick) to adequately prevent rainwater infiltration, control fugitive dust, and other nuisances.
   d) Temporary waste piles must be underlain by either plastic sheeting (not less than 10 mils thick) or a liner of low permeability that will prevent leachate from infiltrating to groundwater.
   e) In addition to the conditions stated herein, temporary waste piles must conform to applicable provisions in the state's local oversight program (LOP) for Orange, Riverside, or San Diego Counties.
   f) The site must be restored to its original state within 30 days after removal of the temporary waste pile from the site.
3. For ***dredged spoils containing heavy metals*** temporarily stored in waste piles, the following conditions apply:
   a) Dredged spoils and associated solid waste containing heavy metals discharged into temporary waste piles shall be limited to a maximum time period of 9 months or 270 days on a site.
   b) Temporary waste piles must be covered by either a plastic sheeting to adequately prevent rainwater infiltration, control fugitive dust, and other nuisances. Alternative control methods may be utilized if sufficient information is provided to demonstrate that the proposed alternative is protective of water quality and human health.
   c) Temporary waste piles must be underlain by plastic sheeting (not less than 20 mils thick) or a liner of lower permeability that will prevent leachate from infiltrating to groundwater. Sufficient information must be provided to the San Diego Water Board demonstrating that the liner and containment facility has been designed to contain all solid wastes and fluids.
   d) Materials used in containment structures must have the appropriate chemical and physical properties to ensure that such structures do not fail to contain waste because of: the stress of installation, pressure gradients, physical contact with the waste or leachate, or chemical reactions with soil and rock.

e) The site must be restored to its original state within 60 days after removal of the temporary waste pile from the site.

8.II.D. Specific Waiver Conditions for Solid Waste Disposal Facilities Accepting Only Inert Wastes[5]

1. Inert solid waste must not contain hazardous waste, or soluble or decomposable constituents to be considered inert waste.
2. Inert waste cannot contain any "free liquids."[6]
3. Owner/operator of disposal facility must secure the disposal site and prevent unauthorized disposal by the public.
4. Inert wastes exclude any wastes determined by the San Diego Water Board to potentially have an adverse affect on the quality or beneficial uses of waters of the state, even if classified as inert waste.

8.II.E. Specific Waiver Conditions for the Discharge/Reuse of Inert Soils and Materials from Contaminated Sites

1. For ***all waste soils characterized as inert (Tier 1 or Tier 2)***, the following conditions apply:
   a) Inert waste soils from known contaminated sites cannot be transported off site and discharged/disposed/reused directly or indirectly to any surface waters of the state (including ephemeral streams and vernal pools).
   b) Inert waste soils from known contaminated sites cannot contain significant quantities of decomposable waste.
   c) Inert waste soils from known contaminated sites cannot contain any "free liquids."[7]
   d) Inert waste soils that are discharged/disposed/reused at any site cannot have any hydrocarbon, chlorinated solvent, or other contaminant-based odor.
   e) Sites that export or import soils characterized as inert from known contaminated sites for use as fill material or any other purpose must comply with an applicable federal, state, or local permitting requirements, regulations, and/or ordinances pertaining to the use of imported soil.
   f) Sites that export or import soils characterized as inert from known contaminated sites for use as fill material or any other purpose must implement MMs/BMPs to eliminate the potential for erosion and transport of sediment off the site.
   g) This conditional waiver does not authorize the discharge/disposal/reuse of soil characterized as inert from known contaminated sites outside the boundaries of the San Diego Region.
   h) Prior to exporting soil characterized as inert from a known contaminated site, the owner/operator of the export site must file a Notice of Intent with the San Diego Water Board. The Notice of Intent must be filed no less than 3 days prior to the beginning of export shipments. The Notice of Intent must include information about the site owner/operator, map of the site showing the locations of excavations, borings and/or stockpiles, MMs/BMPs that will be taken to prevent discharges of waste soil that could affect surface water and groundwater quality, estimated volumes (can be a range of volumes) of inert waste soil that will be generated for use off the site, estimated number (can be a range) and locations of samples that will be collected for characterization, and name of the certified environmental analytical laboratory that will perform the analysis.
   i) Waste soils from a site with a known or discovered unauthorized release must be characterized and certified as inert in order for the soil to be reused off site. Characterization and certification must include the following minimum requirements:
      i) All waste soils generated during remediation or corrective action must be stockpiled on the site in accordance with the waiver conditions for the discharge of specified soils containing wastes to temporary waste piles. Or, waste soils may be sampled and characterized in-situ prior to transport and disposal or reuse off site

[5] According to California Code of Regulations Title 27 section 20230(a) "Inert waste" is defined as "that subset of solid waste that does not contain hazardous waste or soluble pollutants at concentrations in excess of applicable water quality objectives, and does not contain significant quantities of decomposable waste."

[6] "Free liquids" defined by California Code of Regulations Title 27 section 20164 as "liquid which readily separates from the solid portions of waste under ambient temperature and pressure."

[7] "Ibid.

ii) Waste soil must be segregated into 2 categories:
   (A) Soil that is impacted by the unauthorized release must be characterized as hazardous, designated, and/or non-hazardous waste and handled in accordance with regulatory requirements for the disposal of solid wastes. Waste soils that do not visually appear impacted, but smells impacted, must be treated as impacted soil and cannot be characterized as inert.
   (B) Soil that does not appear to be impacted by the unauthorized release, by visual inspection and odor, must be sampled and analyzed to confirm the soil can be characterized as inert waste soil.

iii) Samples must be collected from the waste soil suspected to be inert for laboratory analysis. The minimum number is samples required to characterize the soil is as follows:

Volume of Soil	Required Number of Samples Analyzed
0 to <500 cy	4 samples per 100 cy (12 minimum)
500 to <5,000 cy	1 additional sample per additional 500 cy
5,000 cy or more	1 additional sample per additional 1,000 cy[8]

cy = cubic yards

iv) Samples must be analyzed by a state-certified analytical laboratory using USEPA approved analytical methods for the following constituents:
   (A) Total concentrations of those Title 22 metals identified as contaminants of concern for the export site. For sites identified with burn ash (i.e., a site where solid waste has been burned at low temperature and the residual burn ash pits and burn ash layers are present in soil), the site shall be investigated and the burn ash will be characterized for disposal purposes according to the protocol established by the lead regulatory agency (e.g., Department of Toxic Substances Control, California Integrated Waste Management Board, or others) to identify contaminants of concern at the site. The soil outside of the area of impact of the burn ash shall be tested for the total concentration of those metals identified as contaminants of concern based on the findings of the burn ash investigation technical study.
   (B) Total petroleum hydrocarbons (by USEPA Method 8015 – full scan if export site includes oil or fuel as potential or actual contaminants of concern)
   (C) Polychlorinated biphenyls (if export site includes PCBs as potential or actual contaminants of concern)
   (D) Volatile and semi-volatile organic compounds (if export site includes volatile and semi-volatile organic compounds as potential or actual contaminants of concern)
   (E) Pesticides (if export site includes a known agricultural area, or pesticides as potential or actual contaminants of concern)
   (F) Other constituents (if contaminated portion of the export site is found to contain other pollutants or contaminants)

j) *If analytical results indicate detectable concentrations of constituents other than Title 22 metals, waste soil cannot be characterized as inert*.

[8] Volumes greater than 10,000 cubic yards may rely on fewer samples than 1 per each additional 1,000 cubic yards if characterization complies with SW846 methods for selecting appropriate numbers of samples for waste characterization and statistical analyses. The appropriate number of samples is the least number of samples required to generate a sufficiently representative estimate of the true mean concentration of a chemical contaminant of a waste.

2. For reuse of ***Tier 1 inert waste soils (full unrestricted reuse within the San Diego Region)***, the following conditions apply:
   a) Soil cannot contain any detectable concentrations of contaminants other than Title 22 metals.
   b) For those Title 22 metals that have been identified as contaminants of concern for the export Site, samples shall be analyzed by an SW846 method using the reporting limits set forth in the Table provided in Attachment 1. From these data, the 90 percent upper confidence level (UCL) shall be determined. Prior to calculating the 90 percent UCL, one must determine whether the sample set is normally, lognormally or non-normally distributed. If lognormally distributed, one must determine the 90 percent UCL on the lognormal mean. If non-normally distributed, but sufficiently symmetrical, calculate the 90 percent UCL on the median (50th percentile), instead of the mean. See USEPA SW846 Chapter 9 and the USEPA Guidance for Data Quality Assessment for a discussion of waste characterization and statistical analysis; in particular the guidance on testing for normality, calculating a 90 percent UCL, and handling of non-detected values.[9]

[9] See U.S. Environmental Protection Agency, Office of Solid Waste. 1986. *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods;* http://www.epa.gov/epaoswer/hazwaste/test/pdfs/chap9.pdf; and USEPA 2002, RCRA Waste Sampling Draft Technical Guidance, EPA 530-D-02-002 (Appendix F). Office of Solid Waste.

Tier 1 Soil Screening Levels

Title 22 Metals	Inert Waste Target[a] (mg/kg)	Residential CHHSL[b] (mg/kg)	e-PRG[c] (mg/kg)	Background[d] Mean (mg/kg)	Tier 1 SSL[e,f] (mg/kg)
Antimony	6.0	30	5.0	0.60	**5.0**
Arsenic	50	0.07	9.9	3.5	**3.5**
Barium	1,000	5,200	283	509	**509**
Beryllium	4.0	150	10	1.28	**4.0**
Cadmium	5.0	1.7	4.0	0.36	**1.7**
Chromium, Total	50	NA	0.4	122	**50**
Chromium, Hexavalent	50	17	NA	NA	**17**
Cobalt	NA	660	20	14.9	**20**
Copper	1,300	3,000	60	28.7	**60**
Lead	15	150	40.5	23.9	**15**
Mercury	2.0	18	0.00051	0.26	**0.26**
Molybdenum	NA	380	2.0	1.3	**2.0**
Nickel	100	1,600	30	57	**57**
Selenium	50	380	0.21	0.058	**0.21**
Silver	NA	380	2.0	0.80	**2.0**
Thallium	2.0	5.0	1.0	0.56	**1.0**
Vanadium	50	530	2.0	112	**50**
Zinc	NA	23,000	8.5	149	**149**

a. Calculated using Central Valley Water Board Designated Level Methodology, where the Water Quality Goal is the lower value of the Federal or State drinking water primary maximum contaminant level, the Environmental Attenuation Factor is 10, and the Leachability Factor is 100.

b. Values taken from the California Environmental Protection Agency's *Use of California Human Health Screening Levels (CHHSLs) in Evaluation of Contaminated Properties* (CalEPA 2005).

c. Taken from Oak Ridge National Laboratory's *Preliminary Remediation Goals for Ecological Endpoints* (Efroymson, et al 1997)

d. Taken from Kearney Foundation of Soil Science Division of Agriculture and Natural Resources, University of California *Background Concentrations of Trace and Major Elements in California Soil – Special Report* (Bradford, et al 1996).

e. Tier 1 Soil Screening Level for inert waste soils that can be reused without restriction. Tier I SSLs selected based on the following steps: Step 1) Select lower value of Residential CHHSL or e-PRG; Step 2) Select lower value of Step 1 or Inert Waste Target; and, Step 3) Select higher value of Step 2 and Arithmetic Mean Background.

f. These values are not intended to provide clean up levels for soil remaining on-site. Such values should be established based on the contaminants of concern, the site use, and in conjunction with the regulatory agency providing oversight for the remediation effort.

c) An Inert Waste Certification must be filed with the San Diego Water Board by the owner/operator of the export site within 30 days following completion of export activities. The Inert Waste Certification must include the following information:
   i) Generator name and contact information
   ii) Export site location, owner name and contact information
   iii) Map of the export site showing the location of the excavation, borings, stockpiles, and/or samples collected
   iv) Approximate volume of inert waste soil exported from the site
   v) Description of BMPs implemented to prevent discharge of waste soil off the export site during excavation and transport.
   vi) Laboratory analytical data, including number of samples collected, EPA approved analytical methods used, the 90 percent UCL of the data for the contaminants of concern, and name of certified environmental analytical laboratory that performed the analysis.
   vii) The export site owner, principal executive officer, or authorized representative, and a California registered professional engineer or geologist must sign and certify the Inert Waste Certification. The Inert Waste Certification must include the statement, "*I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment*."

3. For reuse of ***Tier 2 inert waste soils (only for commercial or industrial development purposes within the San Diego Region)***, the following conditions apply:
   a) Soil cannot contain any detectable concentrations of contaminants other than Title 22 metals.
   b) Samples shall be analyzed by an SW846 method using the reporting limits set forth in the Table provided in Attachment 1. From these data, the 90 percent UCL shall be determined. Prior to calculating the 90 percent UCL, one must determine whether the sample set is normally, lognormally or non-normally distributed. If lognormally distributed, one must determine the 90 percent UCL on the lognormal mean. If non-normally distributed, but sufficiently symmetrical, calculate the 90 percent UCL on the median (50th percentile), instead of the mean. See USEPA SW846 Chapter 9 and the USEPA Guidance for Data Quality Assessment for a discussion of waste characterization and statistical analysis; in particular the guidance on testing for normality, calculating a 90 percent UCL, and handling of non-detected values.[10]

[10] See U.S. Environmental Protection Agency, Office of Solid Waste. 1986. *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods;* http://www.epa.gov/epaoswer/hazwaste/test/pdfs/chap9.pdf; and USEPA 2002, RCRA Waste Sampling Draft Technical Guidance, EPA 530-D-02-002 (Appendix F). Office of Solid Waste.

Tier 2 Soil Screening Levels

Pollutant	Inert Waste Target[a] (mg/kg)	Industrial CHHSL[b] (mg/kg)	Background[d]		TTLC[e] (mg/kg)	Tier 2 SSL[f,g] (mg/kg)
			Max (mg/kg)	½ Max (mg/kg)		
Antimony	6.0	380	1.95	0.98	500	**6.0**
Arsenic	50	0.24	11	5.5	500	**5.5**
Barium	1,000	63,000	1,400	700	10,000	**1,000**
Beryllium	4.0	1,700	2.7	1.4	75	**4**
Cadmium	5.0	7.5	1.70	0.85	100	**5**
Chromium, Total	50	100,000	1,579	790	2,500	**790**
Chromium, Hexavalent	50	37	NA	NA	500	**37**
Cobalt	NA	3,200	46.9	23.5	8,000	**3,200**
Copper	1,300	38,000	96.4	48.2	2,500	**1,300**
Lead	15	3,500	97.1	48.6	1,000	**49**
Mercury	2.0	180	0.90	0.45	20	**2**
Molybdenum	NA	4,800	9.6	4.8	3,500	**3,500***
Nickel	100	16,000	509	255	2,000	**255**
Selenium	50	4,800	0.43	0.22	100	**50**
Silver	NA	4,800	8.30	4.2	500	**500***
Thallium	2.0	63	1.10	0.55	700	**2**
Vanadium	50	6,700	288	144	2,400	**144**
Zinc	NA	100,000	236	118	5,000	**5,000***

* None of the analytical results from any samples collected to characterize the waste soil can exceed the Tier 2 Soil Screening Level for this pollutant.

a. Calculated using Central Valley Water Board Designated Level Methodology, where the Water Quality Goal is the lower value of the Federal or State drinking water primary maximum contaminant level, the Environmental Attenuation Factor is 10, and the Leachability Factor is 100.

b. Values taken from the California Environmental Protection Agency's *Use of California Human Health Screening Levels (CHHSLs) in Evaluation of Contaminated Properties* (CalEPA 2005).

c. Taken from Oak Ridge National Laboratory's *Preliminary Remediation Goals for Ecological Endpoints* (Efroymson, et al 1997).

d. Taken from Kearney Foundation of Soil Science Division of Agriculture and Natural Resources, University of California *Background Concentrations of Trace and Major Elements in California Soil – Special Report* (Bradford, et al 1996).

e. Total Threshold Limit Concentration. Concentrations above the TTLC would be classified as hazardous waste.

f. Tier 2 Soil Screening Level for inert waste soils that can be reused only for commercial or industrial land use designation. Tier II SSLs selected based on the following steps: Step 1) Select lower value of Industrial CHHSL or Inert Waste Target; Step 2) Select higher value of Step 1 or ½ Maximum Background; and, Step 3) Select lower value of Step 2 and Total Threshold Limit Concentration.

g. These values are not intended to provide clean up levels for soil remaining on-site. Such values should be established based on the contaminants of concern, the site use, and in conjunction with the regulatory agency providing oversight for the remediation effort.

c) An Inert Waste Certification must be filed with the San Diego Water Board by the owner/operator of the export site within 30 days following export and placement of the soil. The Inert Waste Certification must include the following information:
   i) Generator name and contact information
   ii) Export site location, owner name and contact information
   iii) Approximate volume of inert waste soil exported from the site
   iv) Description of BMPs implemented to prevent discharge of waste soil off the export site during excavation and transport.
   v) Laboratory analytical data, including number of samples collected, EPA approved analytical methods used, the 90 percent UCL of the data for the contaminants of concern, and name of certified environmental analytical laboratory performing analysis
   vi) Import site owner name and contact information, with a map of the site location showing nearby surface water bodies, approximate depth to groundwater, and BMPs that will be implemented to eliminate the potential for discharge of inert waste soils to surface waters.
   vii) The import site owner, principal executive officer, or authorized representative must provide a signature acknowledging the receipt or planned receipt of the inert waste soil.
   viii) The export site owner, principal executive officer, or authorized representative, and a California registered professional engineer or geologist must sign and certify the Inert Waste Certification. The Inert Waste Certification must include the statement, "*I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment*."

d) Tier 2 inert waste soil reused at commercial or industrial development sites must comply with the following conditions:
   i) Tier 2 inert waste soil may only be reused on commercial or industrial sites. It may not be reused at residential, school, or park sites.
   ii) Tier 2 inert waste soil must be placed at least 5 feet above the highest historically known or anticipated level of groundwater. The soil that separates the inert waste soil from groundwater shall have a significant clay content (greater than 5 percent clay material) or an in-situ permeability of less than 10^{-5} cm/sec.
   iii) Tier 2 inert waste shall be placed at least 100 feet from the nearest surface water body.
   iv) Tier 2 inert waste shall be protected against 100-year peak stream flows as defined by the County flood control agency.
   v) Tier 2 inert waste shall be covered by either: 1) engineered materials (e.g. used as road base, fill beneath buildings, bridge abutments), or 2) not less than 2 feet of noncontaminated, clean fill. The cover shall have a permeability of no more than 10^{-5} cm/sec. Placement of a cover on the inert waste soils shall be completed with 30 days of discharging the final load of inert waste soils at the import site.

CONDITIONAL WAIVER NO. 9 – DISCHARGES OF SLURRIES TO LAND

Conditional Waiver No. 9 is for discharges of slurries to land, which may be a source of pollutants that can adversely affect the quality of waters of the state. A slurry typically consists of water and some material to form a liquid mixture.

The following types of discharge not regulated or authorized under waste discharge requirements (WDRs) may be eligible for Conditional Waiver No. 9:

- Discharges of drilling muds to land
- Discharges of concrete grinding residues to land

In order to be eligible for Conditional Waiver No. 9, discharges must comply with certain conditions to be protective of water quality. Waiver conditions applicable to discharges of slurries to land include the following:

9.I.A. General Waiver Conditions for Slurries Discharged to Land

9.II.A. Specific Waiver Conditions for Discharges of Drilling Mud to Land

Discharges of slurries to land that comply with the general and specific waiver conditions in Conditional Waiver No. 9 are not expected to pose a threat to the quality of waters of the state.

9.I.A General Waiver Conditions for Slurries Discharged to Land

1. Prevent the direct or indirect discharge of slurries to any surface waters of the state (including ephemeral streams and vernal pools).
2. Slurries must be contained to eliminate the potential for runoff from the site.
3. If slurries are discharged to land for storage, the storage area or sump must be designed to be fully contained and ensure no overflow during discharge with at least 2 feet of freeboard.
4. The floor of the storage area or sump must be at least 5 feet above the highest known historical or anticipated groundwater level.
5. The walls of the storage area or sump must be at least 100 feet away from any surface water body or municipal water well.
6. Slurries cannot contain any toxic or hazardous constituents.
7. Slurries discharged to land must not adversely affect the quality or beneficial uses of underlying groundwater.
8. Slurries must be removed and disposed of at an appropriate disposal facility prior to restoring the storage area or sump to pre-discharge conditions.
9. The storage area or sump must be filled in and restored to pre-discharge conditions.
10. Discharger must submit a Notice of Intent or technical and/or monitoring program reports when directed by the San Diego Water Board.

9.II.A. Specific Waiver Conditions for Discharge of Drilling Muds

1. Drilling mud cannot be from borings advanced for a soil or groundwater contamination investigation.

CONDITIONAL WAIVER NO. 10 – DISCHARGES OF EMERGENCY/DISASTER RELATED WASTES

Conditional Waiver No. 10 is for discharges of wastes resulting from an emergency or disaster, which may be a source of pollutants that can adversely affect the quality of waters of the state.

The following types of discharge not regulated or authorized under waste discharge requirements (WDRs) may be eligible for Conditional Waiver No. 10:

- Incidental discharges of oil and oily water within a response area during an oil spill response in marine waters
- Discharges of disaster related wastes to temporary waste piles and surface impoundments
- Discharges of mass mortality wastes temporary waste piles and emergency landfills
- Other discharges of emergency/disaster related wastes

In order to be eligible for Conditional Waiver No. 10, discharges must comply with certain conditions to be protective of water quality. Waiver conditions applicable to emergency/disaster related waste discharges include the following:

10.I.A. General Waiver Conditions for Discharges of Emergency/Disaster Related Wastes

10.II.A. Specific Waiver Conditions for Incidental Discharges During an Oil Spill Response
10.II.B. Specific Waiver Conditions for Disaster Related and Mass Mortality Wastes Disposed at Regulated Waste Disposal Facilities
10.II.C. Specific Waiver Conditions for Disaster Related and Mass Mortality Wastes Discharged to Temporary Waste Piles Located at Regulated Waste Disposal Facilities
10.II.D. Specific Waiver Conditions for Disaster Related Wastes Discharged to Temporary Waste Piles NOT Located at Regulated Waste Disposal Facilities
10.II.E. Specific Waiver Conditions for Disaster Related Wastes Discharged to Temporary Surface Impoundments NOT Located at Regulated Waste Disposal Facilities
10.II.F. Specific Waiver Conditions for Mass Mortality Wastes Discharged to Emergency Landfills NOT Located at Regulated Waste Disposal Facilities

Discharges of emergency/disaster related wastes that comply with the general and specific waiver conditions in Conditional Waiver No. 10 should minimize the potential impact and should not pose a significant threat to the quality of waters of the state.

10.I.A. General Waiver Conditions for Discharges of Emergency/Disaster Related Wastes

1. This conditional waiver does not become active and available until one of the following occurs:
   a) The Governor of California issues a proclamation, pursuant to Government Code sections 8625 and 8558(b), identifying a portion of the San Diego Region as being in a state of emergency, and applies only to disaster related waste streams from disaster-impacted areas; or
   b) An oil spill incident occurs in the marine waters of the San Diego Region requiring a response authorized by the Administrator of the Office of Spill Prevention and Response; or
   c) A discharge occurs resulting from emergency activities that are waived of the requirements of Water Code sections 13260(a) and (c), 13263(a), and 13264(a), which are described in Water Code section 13269(c)(1) and (2).
2. This conditional waiver is only in effect temporarily and shall expire under the following conditions:
   a) The state of emergency declared by the Governor expires, or
   b) The San Diego Water Board takes action to terminate enrollment of individual or all dischargers/Units temporarily granted a waiver, or
   c) Six (6) months has elapsed since the Governor issued a declaration of the State of emergency for any portion of the San Diego Region, or the oil spill incident occurred, or emergency activities began, unless otherwise directed by the San Diego Water Board.

3. Emergency/disaster related waste management and cleanup activities must minimize or eliminate the discharge of any pollutants that could adversely affect the quality or beneficial uses of the waters of the state.
4. For all temporary waste piles and surface impoundments used to manage emergency/disaster related waste, the following conditions apply:
   a) Prevent the direct or indirect discharge of emergency/disaster related wastes to any surface waters of the state (including ephemeral streams and vernal pools).
   b) Emergency/disaster related waste management operations shall not be performed in a manner that creates, or contributes to a condition of pollution or nuisance.
   c) Emergency/disaster related waste management operations shall not be performed in a manner that creates, or contributes to conditions which violate the waste discharge prohibitions promulgated in the Basin Plan.
   d) Emergency/disaster related wastes shall not be managed in a manner that causes corrosion, decay, or otherwise reduces or impairs the integrity of containment structures at any waste management unit.[11]
   e) Emergency/disaster related wastes shall not be managed in a manner that mixes or commingles other wastes that can produce a violent reaction (including heat, pressure, fire or explosion), that can produce toxic byproducts, or that can produce any reaction products requiring a higher level of containment, or results in the mixture being classified as a restricted waste.[12]
   f) Liquid hazardous wastes or "restricted hazardous wastes"[13] cannot be discharged to municipal solid waste (MSW) landfills, temporary waste piles, or temporary surface impoundments.
   g) Temporary waste piles must be covered to adequately prevent rainwater infiltration and runoff, and control fugitive dust, vectors, odors, blowing litter and scavenging. The cover shall not consist of or contain material classified as a designated waste.[14]
   h) Inert wastes[15] that are suitable for reuse or recycling do not require permanent disposal at a classified waste management or disposal facility (i.e., permitted landfill).
   i) Waste streams must only originate from disaster-impacted areas of the San Diego Region. These waste streams shall be discharged for treatment and permanent disposal **only** into:
      i) Waste management or treatment units (e.g., liquid wastes into wastewater treatment plants) as allowed by waste discharge requirements (WDRs) issued by the San Diego Water Board, or
      ii) Solid waste management units or disposal facilities (e.g., solid wastes into Class III MSW landfills underlain with engineered composite liners and leachate collection systems and that satisfy the requirements of State Water Board Resolution No. 93-62); or
      iii) Emergency landfills established in accordance with the conditions of this waiver; and
      iv) As allowed by valid WDRs issued by the San Diego Water Board for other categories of waste management units.

10.II.A. Specific Waiver Conditions for Incidental Discharges During an Oil Spill Response

1. Incidental discharges[16] are confined to the response area which is defined by the daily work plan approved under the Incident Command System or Unified Command Structure by the Administrator, Federal On-Scene Coordinator, or State On-Scene Coordinator.
2. Oil spill response must be in marine waters.[17]

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[11] Pursuant to California Code of Regulations Title 27 section 20200(b)(1)
[12] Pursuant to California Code of Regulations Title 27 section 20200(b)(2)
[13] Defined in California Health and Safety Code section 25122.7
[14] Defined in California Code of Regulations Title 27 section 20210
[15] Defined in California Code of Regulations Title 27 section 20230
[16] "Incidental discharge" is defined as "the release of oil and/or oily water within the response area in or proximate to the area in which the oil recovery activities are taking place during and attendant to oil spill response activities. Incidental discharges include, but are not limited to, the decanting of oily water; in order to conserve oil storage capacity, and the wash down of vessels, facilities, and equipment used in the response."
[17] "Marine waters" defined in Government Code section 8670.3(i) as "those waters subject to tidal influence"

10.II.B. Specific Waiver Conditions for Disaster Related and Mass Mortality Wastes Disposed at Regulated Waste Disposal Facilities

1. Waste (not otherwise suitable for recycling or reuse) derived from cleanup of emergency/disaster-impacted areas in the San Diego Region and managed under provisions of this waiver shall only be discharged *for permanent disposal into units that are underlain with an engineered composite liner system and a leachate collection meeting the requirements of State Water Board Resolution No. 93-62*.
2. Wastes derived from cleanup of disaster-impacted areas in the San Diego Region and discharged into regulated waste disposal facilities must be isolated, to the extent practicable, from areas of the facility that are not lined.
3. Food wastes, animal carcasses, and other putrescible wastes derived from cleanup of disaster-impacted areas in the San Diego Region shall be discharged for disposal in compliance with conditions of this waiver and covered expeditiously.
4. Inert wastes contained in mixed emergency wastes derived from cleanup of disaster-impacted areas in the San Diego Region, shall be separated and recycled when appropriate and practicable.
5. The discharger is responsible for accurately classifying disaster related waste streams in accordance with the applicable regulatory requirements.[18]
6. The regulated waste disposal facility owner/operator is responsible for properly identifying disaster related waste streams[19] and identifying wastes that may be suitable for use as alternative daily cover (ADC). Solid wastes that may be used as ADC at a regulated disposal facility are as follows:
   a) Solid wastes that are classified as inert wastes.
   b) Solid wastes that meet the criteria for ADC as prescribed in California Code of Regulations Title 27 sections 20690 to 20705, and.
   c) Other solid wastes identified by the Local Enforcement Agency (LEA) as being suitable for use as ADC; so long as the waste could be accepted at a Class III MSW landfill without special permission from the San Diego Water Board.
7. Disposal of large numbers of animal carcasses, and other high moisture waste streams from mass mortality (e.g., natural disaster, agricultural disease, etc.), may cause wastes to exceed moisture holding capacity at regulated MSW landfills. To limit the impacts from such a large an additional moisture content associated with a mass mortality waste load, the owner/operator responsible for the regulated waste disposal facility should implement the following procedures:
   a) Discharge high-moisture wastes (animal carcasses, animal related wastes, etc.) only in areas of the composite lined unit with a considerable thickness of other waste.
   b) Owner/operator must limit the thickness of the high-moisture waste stream (e.g., animal carcasses, animal related wastes, etc.) to no more than 2 feet.
   c) Owner/operator must cover each layer of high-moisture wastes (e.g., animal carcasses, animal related wastes, etc.) with an even thicker layer of absorbent wastes or soil.
   d) For disaster related mass mortality wastes streams that are in a liquid form (e.g. raw eggs, etc.) reduce the moisture content prior to discharge by mixing with an absorbent material (e.g., saw dust, mulch, soil, etc.).
8. Within 60 days after the expiration of this waiver (see 10.I.A) the owner/operator of the a regulated waste disposal facility that accepted waste from disaster-impacted areas in the San Diego Region must submit an amendment to their Report of Waste Discharge (RoWD) (Joint Technical Document) describing the material change to their discharge, pertaining to the temporary acceptance, management, and disposal of waste derived from cleanup of disaster-impacted areas of the San Diego Region.

10.II.C. Specific Waiver Conditions for Disaster Related and Mass Mortality Wastes Discharged to Temporary Waste Piles Located at Regulated Waste Disposal Facilities

1. Owners/operators of regulated waste management or disposal facilities proposing to accept discharges of waste from disaster-impacted areas in the San Diego Region to a temporary

[18] Requirements are provided in California Code of Regulations Title 27, Title 23 Chapter 15, and/or Title 22 Division 4.5.
[19] Pursuant to California Code of Regulations Title 27 section 20200(c)

waste staging area located at a regulated facility must submit a Notice of Intent to the San Diego Water Board within 30 days of the initial discharge of any disaster related wastes. The Notice of Intent must contain the name and contact information of the owner/operator of the regulated waste management or disposal facility property, facility address and contact information, description of temporary waste management unit, certification, and signature of the owner, operator, and/or authorized representative. The certification must include the statement, "*I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment*."

2. Owners/operators of regulated waste management or disposal facilities must prevent surface runoff/runon from contacting wastes derived from cleanup of disaster-impacted areas in the San Diego Region and shall prevent erosion and transport of soils containing disaster related wastes or waste constituents by surface runoff from all temporary waste piles. The facility owner/operator must implement management measures (MMs) and/or best management practices (BMPs) for storm water conveyance and control.
3. All wastes derived from disaster-impacted areas in the San Diego Region must be placed at least 5 feet above the highest historically known or anticipated level of groundwater, and more than 100 feet from, and at an elevation that is higher than, any surface water of the state.
4. All waste derived from disaster-impacted areas in the San Diego Region must be protected from flooding and inundation, in compliance with the current WDRs for the affected unit, or units, at the regulated facility.
5. Owners/operators of regulated waste management or disposal facilities must manage temporary waste piles for disaster related mass mortality wastes as follows:
   a) Temporary waste piles of mass mortality wastes can only be located in areas underlain by a composite liner system (or approved engineering alternative) and a significant thickness of other types of solid wastes.
   b) Owner/operator must implement a plan to prevent wild animals (e.g., birds, mammals, reptiles, etc.) from coming into contact with mass mortality wastes (e.g., provide and maintain adequate cover for temporary waste piles).
   c) Owner/operator must ensure that all temporary waste piles containing mass mortality wastes are discharged into landfill prior to the end of the working day, unless sufficient information is provided to demonstrate that a proposed alternative is protective of water quality and human health for a given temporary waste pile.
   d) Owner/operator must ensure that all mass mortality wastes are covered with soil or other waste immediately after it is discharged into the landfill.
   e) Owner/operator must ensure that any storm water runoff that comes into contact with the disaster related wastes or containing waste constituents is managed as leachate.
6. Disaster related and mass mortality wastes discharged to temporary waste piles at regulated waste management or disposal facilities temporarily granted a waiver, together with any materials used to contain the temporary waste piles, shall be removed from the site. The site shall be restored to its original state no later than the 60 days after expiration of this waiver (see 10.I.A), or as required by the San Diego Water Board. Alternatively, the facility owner/operator must file an amended RoWD (Joint Technical Document) and obtain amended WDRs from the San Diego Water Board for any waste piles that will continue to exist past the expiration date of this waiver.
7. Owners/operators of regulated waste management or disposal facilities must submit a Notice of Termination to the San Diego Water Board within 10 working days of completing removal of all disaster related wastes and restoring the site to its original condition. The Notice of Termination must contain the name and contact information of the owner/operator ff the regulated facility property, facility address and contact information, description of waste that was temporarily stored/staged in the temporary waste management unit, the final waste disposal location, certification, and signature of the owner, operator, and/or authorized representative. The certification must include the statement, "*I certify under penalty of law*

that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

10.II.D. Specific Waiver Conditions for Disaster Related Wastes Discharged to Temporary Waste Piles NOT Located at Regulated Waste Disposal Facilities

1. Any agency, jurisdiction or person proposing to establish a temporary waste pile not located at a regulated facility must submit a Notice of Intent to the San Diego Water Board within 30 days of the initial discharge of any disaster related wastes. The Notice of Intent must contain the name and contact information of the owner/operator the property where the temporary waste pile facility is located, facility address and contact information, description of temporary waste management unit, certification, and signature of the owner, operator, and/or authorized representative. The certification must include the statement, "*I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."*
2. Owners/operators of temporary waste piles not on regulated facilities must ensure that they are sited, designed, constructed, operated, and maintained to ensure compliance the following minimum prescriptive and performance standards:
   a) The bottom of a temporary waste pile must be placed at least 5 feet above the highest historically known or anticipated level of groundwater, and more than 100 feet from, and at an elevation that is higher than, any surface water of the state.
   b) Temporary waste piles must be protected from inundation or washout due of floods with a 100-year return period.
   c) Temporary waste piles cannot be located on a known Holocene fault.
   d) Temporary waste piles cannot be located in areas of potential rapid geologic change (*e.g.,* landslides, debris flows, flashflood areas, *etc.*).
   e) Temporary waste piles must be underlain by a temporary impermeable barrier (*e.g*., heavy gauge plastic) or located in an area covered by a relatively impermeable surface (*e.g.,* asphalt, concrete, *etc.*). The liner must be installed prior to establishing a temporary waste pile to protect all natural geological materials from contact with the waste and from contact with leachate.
   f) Temporary waste piles must be covered daily with either a heavy gage plastic or material that meets the classification criteria for inert wastes. A material that would be classified as a designated waste cannot be utilized for daily cover at a temporary waste staging area. Cover on the temporary waste piles must be designed, installed and maintained to prevent rainwater infiltration and runoff, and control of fugitive dust, vectors, odors, blowing litter and scavenging.
   g) Temporary waste management operations that include wastes with a liquid content exceeding its moisture-holding capacity and/or containing free liquids, shall comply with requirements for temporary surface impoundments (see 10.II.E).
   h) Temporary waste piles must be designed, constructed and operated to limit, to the greatest extent possible, ponding, infiltration, inundation, erosion, slope failure, and washout. Surface drainage from outside of the temporary waste pile shall be diverted from the location of the temporary waste pile through implementation of MMs/BMPs for storm water control and conveyance.
3. Owners/operators of temporary waste piles not on regulated facilities must submit written notification to the San Diego Board at least 30 days prior to initiating the discharge of return water or ponded water contained within the temporary waste pile if the discharge is to a location other than a sanitary sewer system. Based on the San Diego Water Board determination, the discharger may receive: 1) WDRs; 2) a waiver of WDRs, or 3) written

determination that the disposal of the return water or ponded water is not subject to regulation by the San Diego Water Board.

4. Owners/operators of temporary waste piles not on regulated facilities must post at least one clearly visible sign (in English) listing the following minimum information: a) project name, b) brief project description, and c) operator name and phone number. The discharger must post additional signs as necessary (in languages other than English) to more effectively communicate the minimum contact information (listed above) to the local community. The sign(s) shall be maintained as required to keep them legible and shall remain in place while temporary waste piles remain on site.
5. Solid wastes discharged to temporary waste piles not at regulated waste management or disposal facilities temporarily granted a waiver, together with any materials used to contain the temporary waste piles, shall be removed from the site. The site shall be restored to its original state no later than the 60 days after expiration of this waiver (see 10.I.A), or as required by the San Diego Water Board.
6. Owners/operators of temporary waste piles not on regulated facilities must submit a Notice of Termination to the San Diego Water Board within 10 working days of completing removal of all disaster related wastes and restoring the site to its original condition. The Notice of Termination must contain the name and contact information of the owner/operator the property where the temporary waste pile facility was located, facility address and contact information, description of waste that was temporarily stored/staged in the temporary waste management unit, the final waste disposal location, certification, and signature of the owner, operator, and/or authorized representative. The certification must include the statement, "*I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment*."

10.II.E. Specific Waiver Conditions for Disaster Related Wastes Discharged to Temporary Surface Impoundments NOT Located at Regulated Waste Disposal Facilities

1. Any agency, jurisdiction or person proposing to establish a temporary surface impoundment not located at a regulated facility must submit a Notice of Intent to the San Diego Water Board within 30 days of the initial discharge of any disaster related wastes. The Notice of Intent must contain the name and contact information of the owner/operator the property where the temporary surface impoundment facility is located, facility address and contact information, description of temporary waste management unit, certification, and signature of the owner, operator, and/or authorized representative. The certification must include the statement, "*I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.*"
2. Owners/operators of temporary surface impoundments not on regulated facilities must ensure that they are sited, designed, constructed, operated, and maintained to ensure compliance the following minimum prescriptive and performance standards:
   a) The bottom of a temporary surface impoundment must be placed at least 5 feet above the highest historically known or anticipated level of groundwater, and more than 100 feet from, and at an elevation that is higher than, any surface water of the state.
   b) Temporary surface impoundments must be protected from inundation or washout due of floods with a 100-year return period.
   c) Temporary surface impoundments cannot be located on a known Holocene fault.
   d) Temporary surface impoundments cannot be located in areas of potential rapid geologic change (*e.g.,* landslides, debris flows, flashflood areas, *etc.*).
   e) Temporary surface impoundments must be underlain by a temporary impermeable barrier (*e.g*., heavy gauge plastic) or a relatively impermeable surface (*e.g.,* asphalt, concrete,

etc.). The liner must be installed prior to establishing a temporary surface impoundment to protect all natural geological materials from contact with the waste.

f) Berms and containment structures of temporary surface impoundments must be composed of inert materials that will not cause adverse reactions (*e.g.*, corrosion, decay, or otherwise reduce or impair the integrity of the containment structure) when placed in contact with the liquid wastes stored within the temporary surface impoundment.

g) Temporary surface impoundments must be designed, operated and maintained to ensure that liquid wastes are at least 2 feet below the top of the impoundment (measured vertically from the surface of the liquid up to the point on the surrounding lined berm or dike having the lowest elevation), and must be designed and constructed to prevent overtopping as a results of wind conditions likely to accompany precipitation conditions.

h) Direct pipeline discharges of liquid can occur only into temporary surface impoundments with automatic or manually operated fail-safe systems to prevent overfilling.

i) Temporary surface impoundments must be designed and constructed to prevent scouring of containment structures at points of liquid discharge into the impoundments.

j) Temporary surface impoundments must be designed, constructed and operated to limit, to the greatest extent possible, inundation, erosion, slope failure, and washout. Surface drainage from outside of the temporary surface impoundments shall be diverted from the location of the temporary waste pile through implementation of MMs/BMPs for storm water control and conveyance.

3. Owners/operators of temporary surface impoundments not on regulated facilities must submit written notification to the San Diego Board at least 30 days prior to initiating the discharge of return water or ponded water contained within the temporary waste pile if the discharge is to a location other than a sanitary sewer system. Based on the San Diego Water Board determination, the discharger may receive: 1) WDRs; 2) a waiver of WDRs, or 3) written determination that the disposal of the return water or ponded water is not subject to regulation by the San Diego Water Board.
4. Owners/operators of temporary surface impoundments not on regulated facilities must ensure that only disaster related waste streams are discharged into temporary surface impoundments.
5. All visible portions of synthetic liner systems in temporary surface impoundments must be inspected weekly, or daily as necessary, until all free liquid is removed from the surface impoundment as part of closure.[20] If, during the active life of the temporary surface impoundment, the wastes are removed and the bottom of the impoundment is cleaned down to the liner, an inspection shall be made of the bottom of the liner prior to refilling the impoundment.
6. Owners/operators of temporary surface impoundments not on regulated facilities must post at least one clearly visible sign (in English) listing the following minimum information: a) project name, b) brief project description, and c) operator name and phone number. The facility owner/operator must post additional signs as necessary (in languages other than English) to more effectively communicate the minimum contact information (listed above) to the local community. The sign(s) shall be maintained as required to keep them legible and shall remain in place while temporary surface impoundments remain on site.
7. Solid wastes discharged to temporary surface impoundments not at regulated waste management or disposal facilities, together with any materials used to contain the temporary surface impoundments, shall be removed from the site. The site shall be restored to its original state no later than the 60 days after expiration of this waiver (see 10.I.A), or as required by the San Diego Water Board.
8. Owners/operators of temporary surface impoundments not on regulated facilities must submit a Notice of Termination to the San Diego Water Board within 10 working days of completing removal of all disaster related wastes and restoring the site to its original condition. The Notice of Termination must contain the name and contact information of the owner/operator the property where the temporary surface impoundment facility was located, facility address and contact information, description of waste that was temporarily stored/staged in the temporary waste management unit, the final waste disposal location, certification, and

[20] Pursuant to California Code of Regulations Title 27 section 21400(a)

signature of the owner, operator, and/or authorized representative. The certification must include the statement, "*I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment*."

10.II.F. Specific Waiver Conditions for Mass Mortality Wastes Discharged to Emergency Landfills NOT Located at Regulated Waste Disposal Facilities

1. Any agency, jurisdiction or person proposing to establish an emergency landfill not located at a regulated facility must submit a Notice of Intent to the San Diego Water Board within 30 days of the initial discharge of any disaster related wastes. The Notice of Intent must contain the name and contact information of the owner/operator the property where the emergency landfill facility is located, facility address and contact information, description of emergency waste management unit, certification, and signature of the owner, operator, and/or authorized representative. The certification must include the statement, "*I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.*"
2. Owners/operators of emergency landfills not on regulated facilities must ensure that they are sited, designed, constructed, operated, and maintained to ensure compliance the following minimum prescriptive and performance standards:
   a) The bottom of an emergency landfill must be placed at least 10 feet above the highest historically known or anticipated level of groundwater, and more than 500 feet from any surface water of the state.
   b) Emergency landfills must be protected from inundation or washout due of floods with a 100-year return period.
   c) Emergency landfills cannot be located on a known Holocene fault.
   d) Emergency landfills cannot be located in areas of potential rapid geologic change (*e.g.,* landslides, debris flows, flashflood areas, *etc.*).
   e) Emergency landfills cannot be located in areas underlain by fractured bedrock aquifer or highly permeable soils (*e.g.,* gravels, sands, and loamy sands) or in facilities that are characterized by such deposits (*e.g.,* gravel quarry).
   f) For disaster related mass mortality wastes streams that are in a liquid form (*e.g.* raw eggs, *etc.*) reduce the moisture content prior to discharge by mixing with an absorbent material (*e.g.,* saw dust, mulch, soil, *etc.*).
   g) The thickness of each layer of mass mortality wastes must be limited to less than 2 feet.
   h) Lime (or another liquid abatement material) must be added to each layer to help reduce the generation of liquid by the mass mortality wastes.
   i) Each layer of lime-covered mass mortality wastes must be covered by at least 3 feet of soil before adding another layer of mass mortality wastes.
   j) Mass mortality wastes must be discharged for disposal in compliance with the conditions of this waiver and covered at the end of each working day
   k) The final layer of disaster related mass mortality wastes discharged into the emergency landfill must be overlain by a final layer of not less than 3 feet of soil; or alternatively the unit may be covered by a relatively impermeable engineered surface (*e.g.,* asphalt, concrete, *etc*.). The final soil layer shall be placed in a mound configuration so that the final soil layer: 1) Overlaps the mass mortality wastes by several feet on each edge of the emergency landfill; 2) is at least 3 feet thick over all portions of the mass mortality wastes; and 3) is sloped to provide good drainage that does not impair the integrity of the emergency landfill.

l) Owner/operator should also evaluate, implement, and document other effective waste isolation (and waste moisture reducing methods) in conjunction with the procedures identified above

3. The emergency landfill must be designed, constructed and operated to limit, to the greatest extent possible, ponding, infiltration, inundation, erosion, slope failure, and washout. The owner/operator must protect the integrity of the final cover from adverse impacts by erosion by installing and maintaining MMs/BMPs, including:
   a) Installation of runon control features on the upgradient side of the emergency landfill to divert offsite storm water from the emergency landfill.
   b) Installation of an effective runoff collection and conveyance ditch.
   c) Grading and maintenance of the final cover to eliminate ponding of water over the emergency landfill.
   d) Installation and maintenance of erosion control measures on the cover of the emergency landfill (*e.g.,* install straw mulch and/or a vegetative cover).
   e) Installation of a deer fence around the perimeter of the emergency landfill to discourage access by digging of carnivores.
4. Owners/operators of emergency landfills not on regulated facilities must post at least one clearly visible sign (in English) listing the following minimum information: a) clearly identify the area as an emergency landfill for animal and agricultural wastes, b) a warning against trespass, c) a description of the reason for the emergency landfill (e.g., Exotic Newcastle, Avian Flu, etc.), the type(s) of waste buried at the site (e.g., types of carcasses, egg wastes, manure, etc.), and d) the name and telephone number of the current property owner. The facility owner/operator must post additional signs as necessary (in languages other than English) to more effectively communicate the minimum contact information (listed above) to the local community. The sign(s) shall be maintained as required to keep them legible and shall remain in place while the emergency landfill remains on site.
5. Owners/operators of emergency landfills not on regulated facilities must submit Notice of Termination to the San Diego Water Board within 10 working days of completing removal of all disaster related wastes and restoring the site to its original condition. The Notice of Termination must contain the name and contact information of the owner/operator the property where the temporary waste pile facility was located, facility address and contact information, description of waste that was temporarily stored/staged in the temporary waste management unit, the final waste disposal location, certification, and signature of the owner, operator, and/or authorized representative. The certification must include the statement, "*I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment*."
6. Owners/operators of emergency landfills not on regulated facilities must submit a RoWD to the San Diego Water Board and apply for WDRs (using Form 200). The RoWD and application for WDRs must be provided to the San Diego Water Board within 6 months of creating the emergency landfill for disposal of disaster related mass mortality wastes. At a minimum, the RoWD shall include the following information:
   a) A short description of the emergency conditions that made the emergency landfill necessary.
   b) The identity, physical address, mailing address and telephone number of the current land owner.
   c) Photographs taken to document the location of the emergency landfill, practices used for placement of wastes and soil layers, and the appearance of the emergency landfill after installation of the final cover.
   d) A map showing the location and perimeter of the emergency landfill, its location relative to local topographical, geographical, biological, and cultural features (e.g. roads, streams, etc.), and provide Geographical Information System (GIS) data as available.
   e) A simple cross section of the emergency landfill and a description of the construction (depth, thickness of layers and final cover).

f) An estimate of the amount of wastes (*e.g.,* in pounds or tons) discharged into the emergency landfill.
g) A description of measures taken to ensure that wastes and waste constituents do not migrate outside the emergency landfill.
h) Any other site-specific or discharger related information requested by the San Diego Water Board.

CONDITIONAL WAIVER NO. 11 – AERIALLY DISCHARGED WASTES OVER LAND

Conditional Waiver No. 11 is for discharges of wastes that have been discharged aerially over land, which may be a source of pollutants that can adversely affect the quality of waters of the state.

The following types of discharge not regulated or authorized under waste discharge requirements (WDRs) may be eligible for Conditional Waiver No. 11:

- Discharges of wastes related to fireworks displays over land
- Other wastes discharged aerially over land that may adversely affect the quality of the waters of the state, but determined to be "low threat" by the San Diego Water Board

In order to be eligible for Conditional Waiver No. 11, discharges must comply with certain conditions to be protective of water quality. Waiver conditions applicable to wastes discharged aerially over land include the following:

11.I.A. General Waiver Conditions for Aerially Discharged Wastes Over Land

11.II.A. Specific Waiver Conditions for Discharges of Waste Related to Fireworks Displays Over Land

Wastes discharged aerially over land that comply with the general and specific waiver conditions in Conditional Waiver No. 11 are not expected to pose a threat to the quality of waters of the state.

11.I.A. General Waiver Conditions for Aerially Discharged Wastes Over Land

1. Aerially discharged wastes cannot be discharged directly over and/or into surface waters of the state (including ephemeral streams and vernal pools).
2. Aerially discharged wastes must not cause or threaten to cause a condition of contamination, pollution, or nuisance.
3. Aerially discharged wastes must not impact the quality of groundwater in any water wells or surface water in any drinking water reservoirs.
4. Dischargers must comply with any local, state, and federal ordinances and regulations and obtain any required approvals, permits, certifications, and/or licenses from authorized local agencies.
5. Discharger must submit a Notice of Intent or technical and/or monitoring program reports when directed by the San Diego Water Board.

11.II.A. Specific Waiver Conditions for Discharges of Waste Related to Fireworks Displays Over Land

1. No more than one fireworks display may be conducted from a launch site or within 1.0 mile of another launch site within a 48-hour period.[21] If the organizer will have more than one fireworks display within a 48-hour period, the organizer must file a Notice of Intent containing information about the fireworks to be used, location of launch area and nearby water bodies and groundwater basins, surrounding land uses, planned period of and frequency of discharge, copies of any permits obtained from other public agencies, and measures that will be taken to minimize or eliminate the discharge of pollutants that might affect surface water and groundwater quality. Sufficient information must be submitted before the discharge may begin.
2. All fireworks-related debris must be cleaned up from land surface areas.
3. Launch areas and deposition areas of fireworks displays may not be located within areas designated as Zone A for groundwater source area protection, as defined by the California Department of Public Health's Drinking Water Source Assessment Protection Program. This condition may be waived if the owner or operator of a groundwater drinking water source, through a permit, specifically allows the fireworks display launch area and/or deposition area within an area designated as Zone A for groundwater source area protection.
4. Launch areas and deposition areas of fireworks displays may not be located within areas designated as Zone A for surface water source protection, as defined by the California

[21] This condition is intended to alleviate spatial and temporal accumulation of fireworks-related chemical contaminants.

Department of Public Health's Drinking Water Source Assessment Protection Program. This condition may be waived if the owner or operator of a surface water source reservoir or intake structure, through a permit, specifically allows the fireworks display launch area and/or deposition area within an area designated as Zone A for surface water protection.

5. The fireworks display must be permitted by all relevant public agencies that require permits for fireworks displays (e.g., fire departments, municipal governments, law enforcement, water supply agencies). Copies of any permits must be available on site for inspection.
6. The San Diego Water Board and/or other local regulatory agencies must be allowed reasonable access to the site in order to perform inspections and conduct monitoring.

034456

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
9174 Sky Park Court, Suite 100
San Diego, California 92123-4340

NOTICE OF INTENT

TO COMPLY WITH
CONDITIONAL WAIVERS OF WASTE DISCHARGE REQUIREMENTS
FOR SPECIFIC TYPES OF DISCHARGE WITHIN
THE SAN DIEGO REGION

EXAMPLE

I. PROPERTY/FACILITY INFORMATION

Property/Facility Name:			
Property/Facility Contact:			
Property/Facility Address:			
City:	County:	State:	Zip:
Telephone:	Fax:	Email:	
Assessor Parcel Number(s):		Hydrologic Area/Subarea:	

II. PROPERTY/FACILITY OWNER INFORMATION

Property/Facility Owner Name:			
Property/Facility Owner Mailing Address:			
City:	County:	State:	Zip:
Telephone:	Fax:	Email:	

III. PROPERTY/FACILITY OPERATOR INFORMATION

Property/Facility Operator Name:			
Mailing Address:			
City:	County:	State:	Zip:
Telephone:	Fax:	Email:	

IV. CONDITONAL WAIVER FOR NOTICE OF INTENT

Mark (☒) the conditional waiver proposed for the discharge:

- ☐ Conditional Waiver 1 - Discharges from on-site disposal systems
- ☐ Conditional Waiver 2 - "Low threat" discharges to land
- ☐ Conditional Waiver 3 - Discharges from animal operations
- ☐ Conditional Waiver 4 - Discharges from agricultural and nursery operations
- ☐ Conditional Waiver 5 - Discharges from silvicultural operations
- ☐ Conditional Waiver 6 - Discharges of dredged or fill materials nearby or within surface waters
- ☐ Conditional Waiver 7 - Discharges of recycled water to land
- ☐ Conditional Waiver 8 - Discharges/disposal of solid wastes to land
- ☐ Conditional Waiver 9 - Discharges/disposal of slurries to land
- ☐ Conditional Waiver 10 - Discharges of emergency/ disaster related wastes
- ☐ Conditional Waiver 11 - Aerially discharged wastes

V. DESCRIPTION OF DISCHARGE

Describe the discharge (i.e., source(s) of discharge, pollutants of concern, period and frequency, etc.). Use additional pages as needed. Provide a map of the property/facility if necessary.

VI. DESCRIPTION OF MANAGEMENT MEASURES AND BEST MANAGEMENT PRACTICES

Describe what management measures (MMs) and best management practices (BMPS) will be implemented to minimize or eliminate the discharge of pollutants to waters of the state. Use additional pages as needed. Provide a map of the property/facility showing locations of MMs/BMPs if necessary.

VII. ADDITIONAL INFORMATION

Please provide additional information, as needed or required, about the discharge and/or how the discharger intends to comply with the waiver conditions of the conditional waiver. Use additional pages as needed.

VIII. CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature (Owner or Authorized Representative)	Date
Print Name	Title
Telephone Number	Email

EXAMPLE

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
9174 Sky Park Court, Suite 100
San Diego, California 92123-4340

TEMPORARY WASTE PILE CERTIFICATION

[SECTION A]

EXAMPLE

I. TEMPORARY WASTE PILE GENERATOR INFORMATION

Generator Name:			
Generator Contact and Title:			
Generator Mailing Address:			
City:	County:	State:	Zip:
Telephone:	Fax:	Email:	

II. WASTE INFORMATION

Local Oversight Program Case No.:		San Diego Water Board File No.:	
Waste Type: (check all that apply)	☐ Gasoline	☐ Diesel	☐ Other Petroleum Hydrocarbons
	☐ Other Impacted Dredged Spoils		☐ Other:

Contaminant Concentrations *(Use additional pages as needed)*:

Mean	Mean + 80%CI	Mean	Mean + 80%CI	Mean	Mean + 80%CI	Mean	Mean + 80%CI
Mean	Mean + 80%CI	Mean	Mean + 80%CI	Mean	Mean + 80%CI	Mean	Mean + 80%CI
Mean	Mean + 80%CI	Mean	Mean + 80%CI	Mean	Mean + 80%CI	Mean	Mean + 80%CI

Waste Pile Quantity (yd^3):

Description of Containment Method:

III. TEMPORARY WASTE PILE SITE NFORMATION

Site Property Owner Name:			
Site Address:			
City:	County:	State:	Zip:
Telephone:	Fax:	Email:	
Assessor Parcel Number(s):		Hydrologic Area/Subarea:	

IV. PROPERTY OWNER ACKNOWLEDGMENT

I hereby acknowledge receipt of the waste soil described in section II and that I have reviewed any associated reports. By signing this form I acknowledge that the Generator of this waste has certified that all 8.II.D waiver conditions have been met.

Signature (Owner or Authorized Representative) — Date

Print Name — Title

V. GENERATOR CERTIFICATION

I hereby certify that the information provided regarding soil characterization is a complete and accurate representation of the subject soil, and that the soil is not hazardous waste as defined by California Code of Regulations Title 22 and by the U.S. Environmental Protection Agency (Code of Federal Regulations Title 40), and that all 8.II.D waiver conditions have been met.

Generator Signature — Date

Print Name — Title

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
9174 Sky Park Court, Suite 100
San Diego, California 92123-4340

TEMPORARY WASTE PILE CERTIFICATION

[SECTION B]

and

NOTICE OF TERMINATION

I. FINAL WASTE DISPOSAL INFORMATION

Final Disposition of Waste:	☐ Off-site/Landfill Disposal ☐ Off-site Reuse/Disposal	☐ On-site Reuse/Disposal ☐ Other:_____	
Property Owner/Discharger Name:			
Property Owner/Discharger Contact and Title:			
Property Owner/Discharger Mailing Address:			
City:	County:	State:	Zip:
Telephone:	Fax:	Email:	
Assessor Parcel Number(s):		Hydrologic Area/Subarea:	
Date(s) Waste Disposed:			
Quantity of Waste Disposed: (in cubic yards for each disposal date)			
Disposal Location(s): (for each disposal date)			

II. FINAL DISPOSAL CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

_____ _____
Signature (Owner or Authorized Representative) Date

_____ _____
Print Name Title

EXAMPLE

034460

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
9174 Sky Park Court, Suite 100
San Diego, California 92123-4340

INERT WASTE CERTIFICATION

EXAMPLE

I. INERT WASTE SOIL GENERATOR INFORMATION

Generator Name:			
Generator Contact and Title:			
Generator Mailing Address:			
City:	County:	State:	Zip:
Telephone:	Fax:	Email:	

II. INERT WASTE SOIL EXPORT SITE INFORMATION

Export Site Property Owner Name:			
Export Site Address:			
City:	County:	State:	Zip:
Local Oversight Program Case No.:			
San Diego Water Board File No.:			

III. EXPORTED INERT WASTE SOIL INFORMATION *(Use additional pages as needed.)*

Date(s) Inert Waste Soil Exported:
Quantities of Inert Waste Soil Exported: (in cubic yards for each date of export)
☐ Mark the box (☒) if the inert waste soil was temporarily stockpiled prior to export. If the box is marked, please provide a copy of the Temporary Waste Pile Certification Section A form as required under 8.II.D waiver conditions.
Provide a map of the export site showing the location of the nearby surface water bodies and/or water wells, excavation(s), stockpile(s), samples collected for characterization. Include approximate extent and depths of excavation(s), extent and height of stockpile(s), and depth of samples collected.

IV. DESCRIPTION OF EXPORT SITE BEST MANAGEMENT PRACTICES

Describe what management measures (MMs) and best management practices (BMPS) were implemented at the export site to minimize or eliminate the discharge of pollutants to waters of the state. Use additional pages as needed. Provide a map of the property/facility showing locations of MMs/BMPs if necessary.

V. INERT WASTE SOIL CHARACTERIZATION

Name of Certified Analytical Laboratory:			
Certified Analytical Laboratory Contact:			
Certified Analytical Laboratory Address:			
City:	County:	State:	Zip:
Telephone:	Fax:	Email:	
Number of samples collected for characterization:			
☐ Mark the box (☒) to confirm that no samples collected to characterize waste soil as inert contained detectable concentrations of constituents other than Title 22 metals, as required by waiver condition 8.II.F.1.j.			

Title 22 Metals Contaminant of Concern	EPA Approved Analytical Method	90% UCL Concentration (mg/kg)*

Use additional pages if there are additional contaminants of concern. Attach copy of laboratory analytical report.
* If molybdenum, silver, and/or zinc exceed the Tier 2 SSLs, then the waiver does not apply and a Report of Waste Discharge (RoWD) must be submitted to the San Diego Water Board.

VI. ENROLLMENT FOR REUSE OF TIER 1 or TIER 2 INERT WASTE SOIL

Mark the box (☒) next to the tier that the inert waste soil has been characterized, as supported with data provided in section V.

☐ **Tier 1** (Complete section X) Management of Tier 1 inert waste soils must comply with waiver conditions 8.II.F.1 and 8.II.F.2.	☐ **Tier 2** (Complete sections VII through X) Management of Tier 2 inert waste soils must comply with waiver conditions 8.II.F.1 and 8.II.F.3.

VII. TIER 2 INERT WASTE SOIL IMPORT SITE INFORMATION

Import Site Property Owner Name:			
Import Site Address:			
City:	County:	State:	Zip:
Telephone:	Fax:	Email:	
Assessor Parcel Number(s):		Hydrologic Area/Subarea:	
Provide a map of the import site showing the location of the nearby surface water bodies and/or water wells, and approximate depth to groundwater.			

EXAMPLE

VIII. DESCRIPTION OF IMPORT SITE BEST MANAGEMENT PRACTICES

Describe what management measures (MMs) and best management practices (BMPS) were implemented at the import site to minimize or eliminate the discharge of pollutants to waters of the state. Use additional pages as needed. Provide a map of the property/facility showing locations of MMs/BMPs if necessary.

IX. PROPERTY OWNER ACKNOWLEDGMENT

Mark all the boxes (☒) to acknowledge that the applicable Tier 2 inert waste soil waiver conditions have been or will be met:

- ☐ Import site is designated for commercial or industrial land use.
- ☐ Inert waste soil placed at least 5 feet above highest historically known or anticipated level of groundwater.
- ☐ Soil that separates inert waste soil from groundwater has clay content greater than 5 percent and/or in situ permeability of less than 10^{-5} cm/sec.
- ☐ Inert waste soil placed at least 100 feet from the nearest surface water body.
- ☐ Inert waste soil is protected against 100-year peak storm flows as defined by the county flood control agency.
- ☐ Inert waste soil covered by either: 1) engineered materials (e.g. used as road base, fill beneath buildings, bridge abutments), or 2) not less than 2 feet of noncontaminated, clean fill. The cover has a permeability of no more than 10^{-5} cm/sec.
- ☐ Placement of a cover on the inert waste soils completed within 30 days of discharging the final load of inert waste soils at the import site.

I acknowledge the receipt or planned receipt of the waste soil described in sections V and VI and that the soil will be managed pursuant to the restrictions set forth in waiver conditions 8.II.F.3.

Signature (Owner or Authorized Representative)	Date
Print Name	Title

X. GENERATOR AND CONSULTANT CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Print Name (Generator)	Print Name (Consultant)
Signature (Generator)	Signature (Consultant)
Title (Generator)	Title and Professional Registration No. (Consultant)
Date	Date

EXAMPLE

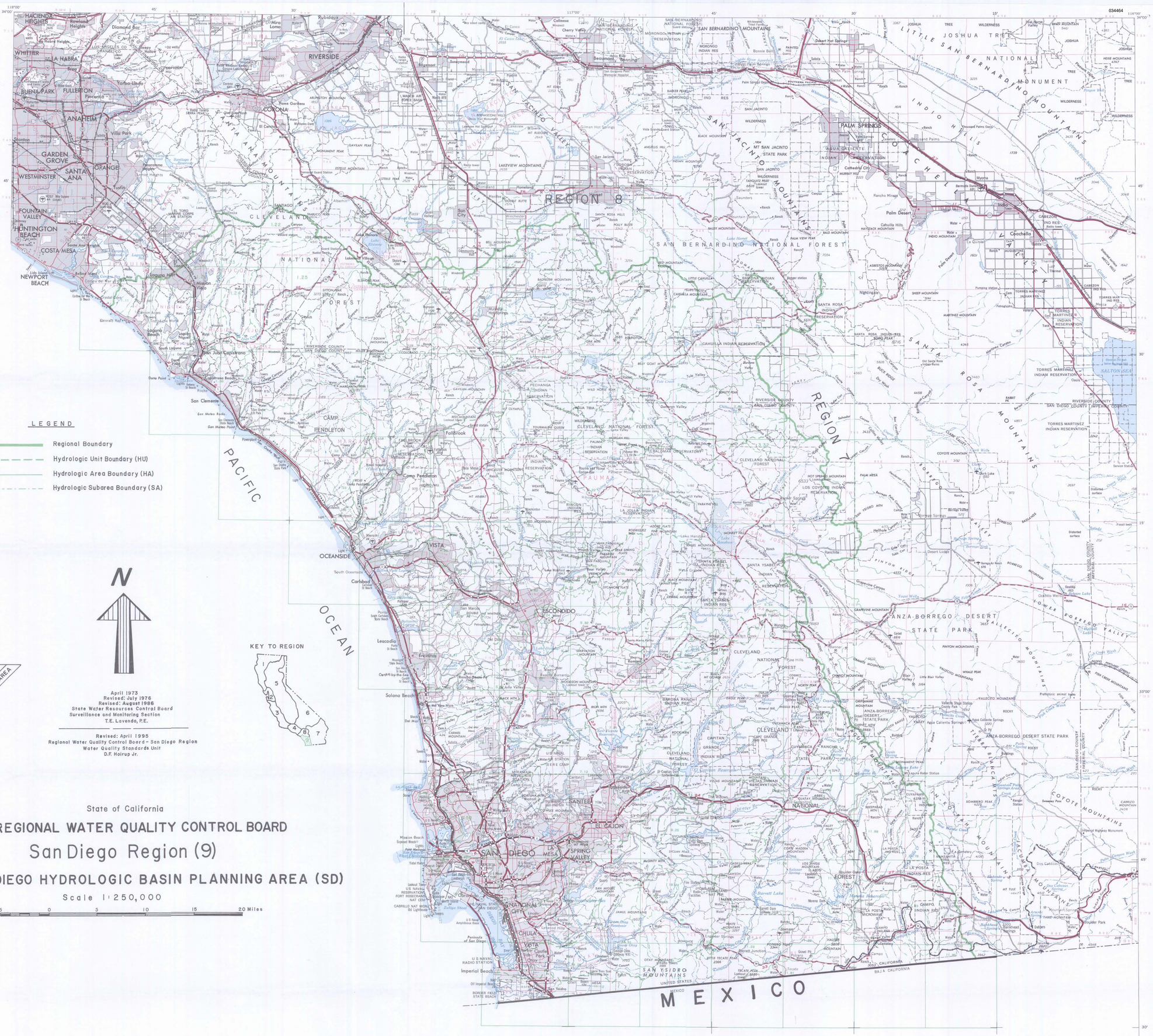

REGION 9 INDEX

901.00	SAN JUAN HYDROLOGIC UNIT	908.00	PUEBLO SAN DIEGO HYDROLOGIC UNIT
901.10	Laguna HA	908.10	Point Loma HA
1.11	San Joaquin Hills HSA	908.20	San Diego Mesa HA
1.12	Laguna Beach HSA	8.21	Lindbergh HSA
1.13	Aliso HSA	8.22	Chollas HSA
1.14	Dana Point HSA	908.30	National City HA
901.20	Mission Viejo HA	8.31	El Toyan HSA
1.21	Oso HSA	8.32	Paradise HSA
1.22	Upper Trabuco HSA		
1.23	Middle Trabuco HSA	909.00	SWEETWATER HYDROLOGIC UNIT
1.24	Gobernadora HSA	909.10	Lower Sweetwater HA
1.25	Upper San Juan HSA	9.11	Telegraph HSA
1.26	Middle San Juan HSA	9.12	La Nacion HSA
1.27	Lower San Juan HSA	909.20	Middle Sweetwater HA
1.28	Ortega HSA	9.21	Jamacha HSA
901.30	San Clemente HA	9.22	Hillsdale HSA
1.31	Prima Deshecha HSA	9.23	Dehesa HSA
1.32	Segunda Deshecha HSA	9.24	Galloway HSA
901.40	San Mateo Canyon HA	9.25	Sequan HSA
901.50	San Onofre HA	9.26	Alpine Heights HSA
1.51	San Onofre Valley HSA	909.30	Upper Sweetwater HA
1.52	Las Pulgas HSA	9.31	Loveland HSA
1.53	Stuart HSA	9.32	Japatul HSA
		9.33	Viejas HSA
902.00	SANTA MARGARITA HYDROLOGIC UNIT	9.34	Descanso HSA
902.10	Ysidora HA	9.35	Garnet HSA
2.11	Lower Ysidora HSA		
2.12	Chappo HSA	910.00	OTAY HYDROLOGIC UNIT
2.13	Upper Ysidora HSA	910.10	Coronado HA
902.20	DeLuz HA	910.20	Otay Valley HA
2.21	DeLuz Creek HSA	910.30	Dulzura HA
2.22	Gavilan HSA	10.31	Savage HSA
2.23	Vallecitos HSA	10.32	Proctor HSA
902.30	Murrieta HA	10.33	Jamul HSA
2.31	Wildomar HSA	10.34	Lee HSA
2.32	Murrieta HSA	10.35	Lyon HSA
2.33	French HSA	10.36	Hollenbeck HSA
2.34	Lower Domenigoni HSA	10.37	Engineer Springs HSA
2.35	Domenigoni HSA		
2.36	Diamond HSA	911.00	TIJUANA HYDROLOGIC UNIT
902.40	Auld HA	911.10	Tijuana Valley HA
2.41	Bachelor Mountain HSA	11.11	San Ysidro HSA
2.42	Gertrudis HSA	11.12	Water Tanks HSA
2.43	Lower Tucalota HSA	911.20	Potrero HA
2.44	Tucalota HSA	11.21	Marron HSA
902.50	Pechanga HA	11.22	Bee Canyon HSA
2.51	Pauba HSA	11.23	Barrett HSA
2.52	Wolf HSA	11.24	Round Potrero HSA
902.60	Wilson HA	11.25	Long Potrero HSA
2.61	Lancaster Valley HSA	911.30	Barrett Lake HA
2.62	Lewis HSA	911.40	Monument HA
2.63	Reed Valley HSA	11.41	Pine HSA
902.70	Cave Rocks HA	11.42	Mount Laguna HSA
2.71	Lower Coahuila HSA	911.50	Morena HA
2.72	Upper Coahuila HSA	911.60	Cottonwood HA
2.73	Anza HSA	911.70	Cameron HA
2.74	Burnt HSA	911.80	Campo HA
902.80	Aguanga HA	11.81	Tecate HSA
2.81	Vail HSA	11.82	Canyon City HSA
2.82	Devils Hole HSA	11.83	Clover Flat HSA
2.83	Redec HSA	11.84	Hill HSA
2.84	Tule Creek HSA	11.85	Hipass HSA
902.90	Oakgrove HA		
2.91	Lower Culp HSA		
2.92	Previtt Canyon HSA		
2.93	Dodge HSA		
2.94	Chihuahua HSA		
903.00	SAN LUIS REY HYDROLOGIC UNIT		
903.10	Lower San Luis HA		
3.11	Mission HSA		
3.12	Bonsall HSA		
3.13	Moosa HSA		
3.14	Valley Center HSA		
3.15	Woods HSA		
3.16	Rincon HSA		
903.20	Monserate HA		
3.21	Pala HSA		
3.22	Pauma HSA		
3.23	La Jolla Amago HSA		
903.30	Warner Valley HA		
3.31	Warner HSA		
3.32	Combs HSA		
904.00	CARLSBAD HYDROLOGIC UNIT		
904.10	Loma Alta HA		
904.20	Buena Vista Creek HA		
4.21	El Salto HSA		
4.22	Vista HSA		
904.30	Agua Hedionda HA		
4.31	Los Monos HSA		
4.32	Buena HSA		
904.40	Encinas HA		
904.50	San Marcos HA		
4.51	Batiquitos HSA		
4.52	Richland HSA		
4.53	Twin Oaks HSA		
904.60	Escondido Creek HA		
4.61	San Elijo HSA		
4.62	Escondido HSA		
4.63	Lake Wohlford HSA		
905.00	SAN DIEGUITO HYDROLOGIC UNIT		
905.10	Solana Beach HA		
5.11	Rancho Santa Fe HSA		
5.12	La Jolla HSA		
905.20	Hodges HA		
5.21	Del Dios HSA		
5.22	Green HSA		
5.23	Felicita HSA		
5.24	Bear HSA		
905.30	San Pasqual HA		
5.31	Highland HSA		
5.32	Las Lomas Muertas HSA		
5.33	Reed HSA		
5.34	Hidden HSA		
5.35	Guejito HSA		
5.36	Vineyard HSA		
905.40	Santa Maria Valley HA		
5.41	Ramona HSA		
5.42	Lower Hatfield HSA		
5.43	Wash Hollow HSA		
5.44	Upper Hatfield HSA		
5.45	Ballena HSA		
5.46	East Santa Teresa HSA		
5.47	West Santa Teresa HSA		
905.50	Santa Ysabel HA		
5.51	Boden HSA		
5.52	Pamo HSA		
5.53	Sutherland HSA		
5.54	Witch Creek HSA		
906.00	PENASQUITOS HYDROLOGIC UNIT		
906.10	Miramar Reservoir HA		
906.20	Poway HA		
906.30	Scripps HA		
906.40	Miramar HA		
906.50	Tecolote HA		
907.00	SAN DIEGO HYDROLOGIC UNIT		
907.10	Lower San Diego HA		
7.11	Mission San Diego HSA		
7.12	Santee HSA		
7.13	El Cajon HSA		
7.14	Coches HSA		
7.15	El Monte HSA		
907.20	San Vicente HA		
7.21	Fernbrook HSA		
7.22	Kimball HSA		
7.23	Gower HSA		
7.24	Barona HSA		
907.30	El Capitan HA		
7.31	Conejos Creek HSA		
7.32	Glen Oaks HSA		
7.33	Alpine HSA		
907.40	Boulder Creek HA		
7.41	Inaja HSA		
7.42	Spencer HSA		
7.43	Cuyamaca HSA		

NOTE:

1. *The names and areas shown on this map are the same as used by the Department of Water Resources (DWR) in their Bulletin 130 Series.*
2. *The numbering system used on this map is an adaption of the numbering system used in the 130 Series.*
3. *The 1986 updated names and boundaries shown on the map are in accordance with an agreement with DWR and US Geological Survey.*
4. *The 1995 revision of this map includes newly recognized hydrologic subareas within the Mission Viejo HA (901.20). Notes 1 & 3 do not apply to these subareas.*

LEGEND

- Regional Boundary
- Hydrologic Unit Boundary (HU)
- Hydrologic Area Boundary (HA)
- Hydrologic Subarea Boundary (SA)

REGION NO. — HYDROLOGIC UNIT — HYDROLOGIC AREA — HYDROLOGIC SUBAREA

9 07.4 1

N

KEY TO REGION

April 1973
Revised: July 1976
Revised: August 1986
State Water Resources Control Board
Surveillance and Monitoring Section
T.E. Lavenda, P.E.

Revised: April 1995
Regional Water Quality Control Board - San Diego Region
Water Quality Standards Unit
D.F. Hoirup Jr.

State of California

REGIONAL WATER QUALITY CONTROL BOARD

San Diego Region (9)

SAN DIEGO HYDROLOGIC BASIN PLANNING AREA (SD)

Scale 1:250,000

5 0 5 10 15 20 Miles

California Regional Water Quality Control Board

San Diego Region

Over 50 Years Serving San Diego, Orange, and Riverside Counties

Recipient of the 2004 Environmental Award for Outstanding Achievement from USEPA

Linda S. Adams
Secretary for Environmental Protection

Arnold Schwarzenegger
Governor

9174 Sky Park Court, Suite 100, San Diego, California 92123-4353
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March 25, 2009

In reply refer to:
Place ID#: 710562
Order Reg Measure ID# 329556
SWU:Ebecker

County of San Diego
Land Development Division
1600 Pacific Highway, Room 212
San Diego, CA 92101

Attn: Chandra L. Wallar
Deputy Chief Administrative Officer

SUBJECT: FINDING OF ADEQUACY FOR THE JANUARY 2, 2009 UPDATED COUNTYWIDE MODEL STANDARD URBAN STORMWATER MITIGATION PLAN (SUSMP) REQUIREMENTS FOR DEVELOPMENT APPLICATIONS

On July 24, 2008, the San Diego Municipal Storm Water Copermittees (Copermittees) submitted an updated Model SUSMP in accordance with Section D.1.d.(8)(b) of California Regional Water Quality Control Board, San Diego Region (Regional Board) Order No. R9-2007-0001 (MS4 Permit). The Model SUSMP defines the minimum Best Management Practices (BMPs) to be incorporated into the Copermittees' priority development projects. In a September 18, 2008 letter, the Regional Board provided comments on the Model SUSMP. The letter also conveyed National Resource Defense Council (NRDC) September 9, 2009 comments on the updated Model SUSMP for the Copermittees to consider and respond to.

The Copermittes resubmitted the Model SUSMP on January 2, 2009 with changes and responses to Regional Board and NRDC comments. The Regional Board has reviewed this updated Model SUSMP and concludes that the Copermittees have adequately addressed relevant comments and that the January 2, 2009 Model SUSMP meets the requirements of the MS4 Permit. Attached to this letter, is NRDC's letter dated February 23, 2009, regarding the January 2, 2009 Model SUSMP. NRDC's additional comments and suggested changes to the Model SUSMP are not reflected in the Model SUSMP, but should be considered by the Copermittees during update of the Copermittees' local SUSMPs.

Prior to March 25, 2010, each Copermittee shall update their local SUSMP to implement the updated requirements in accordance with the MS4 Permit Section D.1.d.(8)(c).

If you have any questions regarding the above, please contact Eric Becker by e-mail at ebecker@waterboards.ca.gov or by phone at (858) 492-1785.

Respectfully,

JOHN H. ROBERTUS
Executive Officer

Attachment: NRDC February 23, 2009 Letter

CC: National Resource Defense Council
1314 Second Street
Santa Monica, CA 90401
Attention: Bart Lounsbury

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NRDC
THE EARTH'S BEST DEFENSE

SAN DIEGO
COASTKEEPER

February 23, 2009

Mr. John Robertus
Executive Officer
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Re: Incorporating a Numeric Performance Standard into the Model SUSMP for San Diego County

Dear Mr. Robertus:

The Natural Resources Defense Council and San Diego Coastkeeper have participated extensively in the 2006-2007 San Diego MS4 permitting process. Thereafter, we have commented on, and sponsored expert technical review of, subsequent proceedings required by the Permit to revise the Model SUSMP. Both before and after Permit adoption, NRDC and Coastkeeper have consistently raised concerns about the lack of clear standards for the implementation of post-construction stormwater management BMPs in general and low impact development ("LID") practices in particular. Unfortunately, we remain extremely concerned that the Model SUSMP, while overall a useful guidance document, fails to specify the necessary performance criteria to ensure that stormwater pollution is, in fact, reduced to the Clean Water Act's "maximum extent practicable" ("MEP") standard.

In January 2007, we submitted comments on the second revised Tentative Order and noted its problematic failure to include specific, numeric performance requirements. In February 2007, we petitioned the State Board to overturn the approval of the San Diego MS4 Permit ("Permit") in large part because of the aforementioned problem. We held our petition in abeyance, however, with the understanding that the Model SUSMP revision process would address our concerns. In April and September 2008, during the drafting of the Model SUSMP, we submitted letters to the County of San Diego and to the Regional Board reiterating the need for specific, numeric performance requirements. We believe, though, that the most recent draft of the Model SUSMP does not adequately set forth such requirements but that, with a few small revisions, it could be brought into line with the MEP standard and with other stormwater regulations around the country. We have detailed these revisions below and urge you to require the County to revise the Model SUSMP accordingly.

I. The Model SUSMP Must Compensate for the Lack of Clear Performance Standards in the Permit and Implement Its Mandate to Maximize LID by Requiring a Robust Numeric Performance Standard for Low Impact Development.

There is an emergent consensus nationwide that LID practices are the most effective stormwater management techniques, besides providing many other benefits, such as reducing the need for imported water, increasing property values, mitigating the urban heat island effect, and creating aesthetically pleasing landscapes. In California, the Ocean Protection Council, for instance, strongly endorsed LID last year by "resolv[ing] to promote the policy that new developments and redevelopments should be designed consistent with LID principles" because "LID is a practicable and superior approach ... to minimize and mitigate increases in runoff and runoff pollutants and the resulting impacts on downstream uses, coastal resources and communities."[1] EPA has also called upon Regional Boards across California to prioritize the implementation of LID, even "recommend[ing] that the [South Orange County draft] permit be revised to put more emphasis on LID [and to] require that LID be woven into the design of specified new development and redevelopment projects."[2] In other MS4 permit contexts, EPA has also specifically endorsed the use of metrics, particularly the EIA approach that NRDC advocated for the San Diego Permit.

It is becoming clear that without requiring the implementation of LID practices designed to satisfy feasible and clear metrics, stormwater permits cannot meet the Clean Water Act's "maximum extent practicable" ("MEP") standard for pollution reduction. Critically, the prioritization of LID practices is insufficient by itself to meet the MEP standard and *must* be paired with a measurable requirement for the implementation of LID. We outlined very similar concerns during the approval process for the South Orange County MS4 Permit, which was rejected by the Regional Board in part because it contained much of the same vague language as the San Diego Permit and Model SUSMP. We have attached our January 24, 2008, letter to reiterate the legal problems that arise from such language (these concerns are also summarized in Section II below).

Since its inception, the MS4 permitting program has been seriously hampered by a pervasive absence of numeric performance standards for the implementation of BMPs such as LID. For this reason, in December 2007, the State Water Resources Control Board commissioned a report which found that "[t]he important concept across all of [the] approaches [described in the report] is that the regulations established a

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[1] California Ocean Protection Council, *Resolution of the California Ocean Protection Council Regarding Low Impact Development* (May 15, 2008). We have enclosed a CD that includes all of the documents referenced in our letter.

[2] Environmental Protection Agency, Comments re Draft MS4 Permit for Southern Orange County (email from Eugene Bromley) (Jan. 24, 2008) (hereinafter "EPA South OC Comments").

performance requirement to limit the volume of stormwater discharges."[3] The report also noted that "[m]unicipal permits have the standard of Maximum Extent Practicable (MEP) which lends itself more naturally to specifying and enforcing a level of compliance for low impact development."[4] EPA has highlighted similar but more specific concerns, remarking that subjective and imprecise language (such as requiring "a portion" of a site to address LID, as in the Permit at D.1(d)(4)) is "vague" and that EPA recommends "more precise requirements."[5]

Various jurisdictions nationwide have begun adopting numeric performance standards for stormwater management, frequently pairing these with requirements to implement LID practices:

- **Pennsylvania:** Capture at least the first two inches of rainfall from all impervious surfaces and retain onsite (through reuse, evaporation, transpiration, and/or infiltration) at least the first one inch of runoff;[6]

- **Anacostia, Washington, D.C.:** Retain onsite the first one inch of rainfall and provide water quality treatment for rainfall up to the two-year storm volume;[7]

- **West Virginia:** Retain onsite the first one inch of rainfall from a 24-hour storm preceded by 48 hours of no measurable precipitation;[8]

- **Georgia:** Treat the runoff from 85% of the storms that occur in an average year (*i.e.*, provide treatment for the runoff that results from a rainfall depth of 1.2 inches);[9]

- **Central Coast, California (RWQCB, Phase II):** Limit effective impervious area ("EIA") at development projects to no more than 5% of total project area (interim criteria); establish an EIA limitation between 3% and 10% in local stormwater management plans (permanent criteria);[10]

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[3] State Water Resources Control Board, *A Review of Low Impact Development Policies: Removing Institutional Barriers to Adoption* at 23 (Dec. 2007) (emphasis added) (hereinafter "SWRCB LID Report").
[4] *Id.* at 4.
[5] EPA South OC Comments.
[6] Pennsylvania Stormwater Best Management Practices Manual, Chapter 3 at 7 (Dec. 30, 2006).
[7] *See* SWRCB LID Report at 20-21.
[8] State of West Virginia, NPDES Permit No. WV0116025 at 13-14.
[9] Georgia Stormwater Management Manual, Unified Stormwater Sizing Criteria at 1.3-1.
[10] Central Coast Regional Water Quality Control Board, Letter from Roger Briggs re Notification to Traditional, Small MS4s on Process for Enrolling under the State's General NPDES Permit for Storm Water Discharges (Feb. 15, 2008) (hereinafter "Central Coast Phase II Letter").

- **All Federal Buildings over 5,000 square feet** (under EPA's draft guidance for implementation of the Energy Independence and Security Act of 2007): Manage onsite (*i.e.*, prevent the offsite discharge of) the 95th percentile storm through infiltration, harvesting, and/or evapotranspiration.

For the reasons outlined above, it is imperative that the Model SUSMP require new development and redevelopment projects to implement LID practices designed in accordance with a clear performance requirement. As detailed below, we recommend that the Model SUSMP include a standard which requires onsite retention, with no surface discharge, of the rainfall from the 85th percentile storm. This approach is not only consistent with practice nationally and in California, but Dr. Richard Horner demonstrated its practicability in the San Diego region in technical analyses prepared prior to adoption of the Permit in 2007 (all of which are part of the administrative record).

This critical element, lacking in the Permit, has not been sufficiently addressed in the Model SUSMP, as we believe the Executive Officer and the Regional Board intended. Such clear regulatory requirements must be included and must be consistent with MEP and related requirements, as well as the mainstream of stormwater control across the country. Indeed, the Permit's requirements for such vague actions as "drain[ing] a portion of impervious areas ... into pervious areas" and "minimiz[ing] the impervious footprint of the project" with no specific numeric performance requirement beyond the SUSMP treatment control sizing criteria are not adequate or consistent with standard practice in the field, nor do they implement the Permit's fundamental requirement—added at the adoption hearing—to ***maximize*** LID. (Permit at D.1(d)(8).)

Unfortunately, the Model SUSMP does not clearly and unambiguously set forth a performance standard for LID, therefore failing to cure the problem with the Permit and failing to comply with the Regional Board's expectation and direction in 2007. As it stands, the Model SUSMP merely outlines a process for choosing and designing LID features and describes the SUSMP treatment control sizing criteria that function as a minimum requirement for stormwater treatment in California. While meeting the minimum SUSMP criteria would be a seriously deficient performance standard because stormwater requirements have advanced significantly since the establishment of these criteria, the Model SUSMP nonetheless allows waivers of these minimum sizing criteria for nebulously defined demonstrations of infeasibility. Requiring that projects simply meet the minimum requirements of the State Board's nine-year-old Order WQ 2000-11, and then allowing waivers of these minimum requirements, is a far cry from *maximizing* the implementation of LID, especially given the numerous more recent and more stringent examples (listed above) from elsewhere in the country. Currently, the Permit and the Model SUSMP stand as examples of the approach that EPA and others have criticized as inadequate. (Permit at D.1(d)(4)-(6).) In order to comply with the State Board's prescription that "[t]he important concept across all of [the] approaches [studied by the State Board] is that the regulations established a *performance requirement* to

limit the volume of stormwater discharges," the changes described in Section III are required.[11]

II. The Permit and the Model SUSMP Are Inconsistent with the Clean Water Act Because They Collectively Do Not Set Forth Legally Adequate BMPs to Implement LID.

The lack of clarity and specific requirements noted above is not only inconsistent with state and national practice, and therefore fails to comply with the MEP requirement, but it also violates the Clean Water Act because the vagueness of the LID provisions prevents them from constituting legally adequate BMPs and from allowing the Regional Board to understand what actions are required by the Permit. NRDC has previously addressed these and related issues in comments in 2008 on the proposed MS4 permit for South Orange County. We attach for your reference these comments and incorporate them herein, since they apply with equal force to this issue. By way of summary, however, BMPs that do not require a reasonably clear and specific performance standard fail to meet the legal definition, and practical function, of a "Best Management Practice." Particularly where, as here, BMPs are intended to serve in part or whole as effluent limits, this vagueness is unlawful and deeply undercuts the effectiveness of the Permit. Among other things, neither staff nor the Regional Board members themselves can understand the level of water quality control required by the Permit and the Model SUSMP now, since neither document contains clear and reasonably specific requirements for LID implementation.

Twenty years after the first adoption of MS4 permits—with water quality problems associated with urban runoff still a serious problem in San Diego—it is far past time for staff or the Regional Board to essentially guess about what the Permit requires or what actions will be taken in order to comply with its terms. We respectfully submit that the edits set forth below are required to cure these key problems and bring the Permit into line with standard practice in the field and applicable legal requirements.

III. The Model SUSMP Can Be Easily Revised to Include the Necessary Numeric Performance Standard and Accompanying Alternative Compliance Requirements.

The Model SUSMP already contains a useful outline of the process of designing stormwater management BMPs to incorporate LID features—it simply needs to establish a clear numeric performance standard that will require the implementation of LID practices to the MEP standard and also allow for alternative compliance where onsite compliance is technically infeasible. The approach that we recommend is consistent with other stormwater management programs across the country, as discussed above. To clarify the primacy of LID implementation and to establish a robust performance

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[11] State Water Resources Control Board, *A Review of Low Impact Development Policies: Removing Institutional Barriers to Adoption* at 23 (Dec. 2007) (emphasis added).

standard, we recommend that the following text be inserted in Chapter 2 after the introductory section on page 14.

Design Standards for Priority Development Projects

To implement the general requirements of Permit Provision D.1.d, the Copermittees have developed the following design standards and alternative compliance criteria for Priority Development Projects. These requirements shall be implemented and constitute requirements of the Permit.

- ***Onsite Volumetric Retention Requirement:*** *All Priority Development Projects must be designed to retain onsite, with no runoff, the volume of water that results from a 24-hour 85th percentile storm event (the "onsite retention volume") as determined from the County of San Diego's 85th Percentile Precipitation Isopluvial Map (rainfall depths vary from 0.55" to 1.55").*

- ***Prioritization of LID:*** *In designing stormwater management BMPs to accommodate the onsite retention volume, project applicants must first utilize LID features to meet the onsite volumetric retention requirement. If the implementation of all technically feasible LID features does not allow a project to retain the full onsite retention volume, project applicants may utilize other stormwater management BMPs to retain the remaining required volume onsite.*

- ***Alternative Compliance and Offsite Mitigation:*** *If exceptional site constraints render compliance with the onsite volumetric retention requirement technically infeasible, project applicants must implement all technically feasible retention features and treat any remaining surface discharge (up to the onsite retention volume) through the practices outlined in this Model SUSMP. When a Copermittee allows a project applicant to exercise this alternative compliance option, the project applicant must either*

  (1) construct an offsite mitigation project or

  (2) provide sufficient funds to the Copermittee for a public project

  that will retain a volume of stormwater (the "offsite retention volume") equivalent to the portion of the onsite retention volume that was not retained onsite times 1.5.[12]

[12] We recommend a ratio of 1:1.5 for the offsite retention volume. This is consistent with the other stormwater regulations mentioned above and with numerous other environmental mitigation programs around the country.

- ***Timing of Offsite Mitigation Projects:*** *Projects addressing the offsite mitigation volume, whether performed by the project applicant or by the Copermittee after collecting in-lieu funds, must be constructed and fully operational within 36 months of the final discretionary approval of the applicant's project by the Copermittee. Funding sufficient to address the offsite mitigation volume must be transferred to the Copermittee (for public offsite mitigation projects) or to an escrow account (for private offsite mitigation projects) within one month of final discretionary approval by the Copermittee. In addition, a specific offsite mitigation project must be identified, and funding allocated to that project, within 18 months of final discretionary approval by the Copermittee.*

To clarify the applicability of this section, the Model SUSMP's section discussing "Waivers from Numeric Sizing Criteria" on page 12 should be revised to reflect the requirement that all projects receiving waivers can only receive a "waiver" from the onsite retention requirement (and thus the section should be renamed "Waivers from the Onsite Volumetric Retention Requirement"), must still treat all surface discharge up to the design volume, and must construct—or provide funds for the construction of—an offsite project that will mitigate the deleterious effects of allowing onsite non-compliance by the project. These recommendations should rectify the shortcomings of the Permit itself and make the Model SUSMP and its requirements consistent with the MEP standard and with stormwater regulations in other locations around the U.S.

IV. Conclusion.

We appreciate the opportunity to comment on the Model SUSMP and the Copermittees' willingness to involve us in this process. We strongly urge you to require the revisions that we have recommended above, as they are necessary to address the legal inadequacies of the Permit by establishing a clear, numeric performance standard that requires the implementation of LID and allows for alternative compliance in situations of technical infeasibility.

Please feel free to contact us with any questions.

Sincerely,

David Beckman
Bart Lounsbury
Natural Resources Defense Council

Gabriel Sohmer
San Diego Coastkeeper

California Regional Water Quality Control Board

San Diego Region

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TO: Chairman Wright and San Diego Regional Water Quality Control Board Members

FROM: Catherine George Hagan, Senior Staff Counsel
Office of Chief Counsel

DATE: 5 November 2009

SUBJECT: **Regulatory Authority for Imposing Numeric Effluent Limits on Dry Weather, Non-Storm Water Discharges, in Municipal Storm Water Permits**

At the July 1, 2009, San Diego Regional Board Meeting, Regional Board members received public comments regarding the inclusion of regulations specific to non-storm water discharges in Tentative Order No. R9-2009-002, the reissuance of National Pollutant Discharge Elimination System (NPDES) Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) draining the watersheds of Orange County within the San Diego Region (South Orange County Municipal Storm Water Requirements). At the July meeting, Regional Board members requested that Board Counsel respond to public comments and Board member questions regarding the Regional Board regulation of non-storm water discharges. Commenters assert that the definition of "storm water" in the federal regulations includes drainage and surface runoff entirely unrelated to precipitation events. They also comment that regardless of whether a discharge is composed entirely of storm water or non-storm water, any pollutants discharged *from* an MS4 are subject to the maximum extent practicable (MEP) standard and related iterative process, despite the Clean Water Act's (CWA) requirement that discharges of non-storm water into an MS4 be "effectively prohibited." As a result, commenters assert that numeric effluent limitations on dry weather, non-storm water discharges are inappropriate. Board members also sought clarity on the claims by copermittees that many provisions in the Tentative Order are unfunded state mandates, requiring reimbursement by the State. This memorandum addresses both the non-storm water and unfunded mandate issues.

I. Regulatory Background

The Clean Water Act (CWA) employs the strategy of prohibiting the discharge of any pollutant from a point source into waters of the United States unless the discharger of the pollutant(s) obtains a NPDES permit pursuant to Section 402 of the Clean Water Act. The 1987 amendment to the CWA includes provision 402(p) that specifically addresses NPDES permitting requirements for storm water discharges from MS4s. Section 402(p) prohibits the discharge of pollutants from specified MS4s to waters of the United States except as authorized by an NPDES permit and identifies two substantive standards for MS4 storm

water permits. MS4 permits (1) "shall include a requirement to effectively prohibit non-stormwater discharges into the storm sewers[ ]" and (2) "shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or State determines appropriate for the control of such pollutants." (CWA Section 402(p)(3)(B)(ii-iii).)

On November 16, 1990, USEPA published regulations addressing storm water discharges from MS4s. (Vol. 55 Federal Register (Fed. Reg.) 47990 and following (Nov. 16, 1990).) The regulations establish minimum requirements for MS4 permits, and generally focus on the requirement that MS4s implement programs to reduce the amount of pollutants found in storm water discharges to the maximum extent practicable. However, the regulations also require the MS4's program to include an element to detect and remove illicit discharges and improper disposal into the storm sewer. (40 CFR § 122.26(d)(2)(iv)(B).) "Illicit discharges" defined in the regulations is the most closely applicable definition of "non-storm water" contained in federal law and the terms are often used interchangeably. The State Water Board has concluded that "U.S. EPA added the illicit discharge program requirement with the stated intent of implementing the Clean Water Act's provision requiring permits to 'effectively prohibit non-storm water discharges.'" (State Board Order WQ 2009-0008 (*County of Los Angeles)*, p. 4.)

II. Definition of Storm Water and Non-Storm Water

Federal regulations define "storm water" as "storm water runoff, snow melt runoff, and surface runoff and drainage." (40 C.F.R. § 122.26(b)(13).) While "surface runoff and drainage" is not defined in federal law, USEPA's preamble to the federal regulations demonstrates that the term is related to precipitation events such as rain and/or snowmelt. (55 Fed. Reg. 47990, 47995-96.) For example, USEPA states: "In response to the comments [on the proposed rule] which requested EPA to define the term 'storm water' broadly to include a number of classes of discharges which are not in any way related to precipitation events, EPA believes that this rulemaking is not an appropriate forum for addressing the appropriate regulation under the NPDES program of such non-storm water discharges . . . . Consequently, the final definition of storm water has not been expanded from what was proposed." (*Ibid.*) The State Water Board recently considered and rejected in its precedential *Los Angeles County* order, WQ 2009-0008, the very arguments made here by commenters that storm water includes dry weather flows, completely unrelated to precipitation events. The State Water Board concluded that "U.S. EPA has previously rejected the notion that 'storm water,' as defined at 40 Code of Federal Regulations section 122.26(b)(13), includes dry weather flows. In U.S. EPA's preamble to the storm water regulations, U.S. EPA rejected an attempt to define storm water to include categories of discharges 'not in any way related to precipitation events.' [Citations.]" (*County of Los Angeles,* Order WQ 2009-0008, p. 7.)

The storm water regulations themselves identify numerous categories of discharges including landscape irrigation, diverted stream flows, discharges from potable water sources, foundation drains, air conditioning condensation, irrigation water, springs, water from crawl space pumps, footing drains, lawn watering, individual residential car washing, and street

wash water as "non-storm water." While these types of discharges may be regulated under storm water permits, they are not considered storm water discharges. (40 CFR § 122.26(d)(2)(iv)(B).) Applicable regulations do not prohibit these and other categories of non-storm water discharges that are not expected to be a source of pollutants. But where, as in the Tentative Permit, certain categories of non-storm water discharges have been identified by the municipality to be sources of pollutants, they are no longer exempt and become subject to the effective prohibition requirement in section 402(p)(3)(B)(ii). This process would be wholly unnecessary if MEP were the governing standard for these non-storm water discharges.

Not only does a review of the storm water regulations and USEPA's discussion of the definition of storm water in its preamble to these regulations strongly support the interpretation that storm water includes only precipitation-related discharges, the Regional Board is bound to follow the State Water Board's interpretation of the definition of "storm water" set forth in the precedential State Water Board Order WQ 2009-0008 which rejects the commenters' interpretation. Therefore, while commenters assert that dry weather, non-precipitation related discharges are nonetheless storm water discharges (and therefore subject to the MEP standard in CWA section 402(p)(3)(B)(iii)), their interpretation is not supported and does not conform to applicable State Water Board precedent.

III. Non-Storm Water Regulation

Oral and written comments received by the Regional Board throughout this proceeding assert that the *discharge* of non-storm water, like storm water, from the MS4 is subject to the MEP standard and may not be regulated appropriately with numeric effluent limitations. Several commenters assert that once pollutants contained in prohibited non-storm water enter the MS4, the MEP standard and related iterative approach to storm water regulation is the most stringent means available to require those discharges to comply with water quality standards. In other words, the commenters assert that it is inappropriate for a Regional Board to regulate non-storm water discharges with numeric effluent limitations. As explained below, this interpretation is incorrect. Building on the effective prohibition against non-storm water discharges, the Clean Water Act requirement to reduce pollutants discharged from the MS4 to the MEP standard necessarily is limited to storm water discharges.

The Clean Water Act's municipal storm water MEP standard does not require storm water discharges to strictly meet water quality standards, as is required for other NPDES permitted discharges. This distinction reflects Congress's recognition that variability in flow and intensity of storm events render difficult strict compliance with water quality standards by MS4 permittees. In describing the controls that permits must include to reduce pollutants in storm water discharges to the MEP, the statute states that the controls shall include: "management practices, control techniques and system, design and engineering methods, and such other provisions as the [permit writer] determines appropriate for the control of such pollutants." (CWA § 402(p)(3)(B)(iii).)

In contrast, non-storm water discharges from the MS4 that are not authorized by separate NPDES permits, nor specifically exempted, are subject to requirements under the NPDES program, including discharge prohibitions, technology-based effluent limitations and water quality-based effluent limitations. (40 C.F.R. § 122.44.) USEPA's preamble to the storm

water regulations also supports the interpretation that regulation of non-storm water discharges through an MS4 is not limited to the MEP standard in CWA section 402(p)(3)(B)(iii):

> "Today's rule defines the term "illicit discharge" to describe any discharge through a municipal separate storm sewer system that is not composed entirely of storm water and that is not covered by an NPDES permit. Such illicit discharges are not authorized under the Clean Water Act. Section 402(p(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit." (55 Fed. Reg. 47990, 47995.)

USEPA has recently affirmed its support for the Tentative Order's regulatory approach to non-storm water discharges in comments submitted in this proceeding. As noted above, the State Water Board concluded in its recent Order WQ 2009-0008 that "U.S. EPA added the illicit discharge program requirement with the stated intent of implementing the Clean Water Act's provision requiring permits to 'effectively prohibit non-storm water discharges.'" (State Board Order WQ 2009-0008 (*County of Los Angeles)*, p. 4.) Along these same lines, the State Water Board also explained that "the Clean Water Act and the federal storm water regulations assign different performance requirements for storm water and non-storm water discharges. These distinctions in the guidance document . . . , the Clean Water Act, and the storm water regulations make it clear that a regulatory approach for storm water - such as the iterative approach we have previously endorsed - is not necessarily appropriate for non-storm water." (State Water Board Order WQ 2009-0008, *County of Los Angeles),* p. 9.)

Some commenters place extensive reliance on various State Water Board water quality orders, the State Water Board's expert storm water panel (also known as the "Blue Ribbon Panel") report entitled, *The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities* (June 2006), and other references, to assert that it is inappropriate to include numeric effluent limitations for dry weather non-storm water discharges from the MS4. It is important to note that the Blue Ribbon Panel neither considered nor made any determination on how non-storm water discharges from MS4s that adversely affect receiving waters are to be addressed. The discussion of the feasibility of numeric and/or narrative water quality-based effluent limitations and the MEP standard within these documents is applicable to discharges of storm water from MS4 systems, and does not pertain to non-storm water discharges from the MS4. Similarly, commenters also identify a superior court ruling in (*Cities of Arcadia, et al., v. State Water Resources Control Board* (Super. Ct. Orange County, 2007, No. 06CC02974)) (*Arcadia II*) to support its interpretation that numeric effluent limitations are not legally appropriate for the non-storm water discharges identified in the Tentative Order. Again, these references pertain to storm water and not non-storm water discharges and are inapposite here.

Federal law mandates that permits issued to MS4s must require management practices that will result in reducing storm water pollutants to the MEP yet at the same time requires that non-storm water discharges be effectively prohibited from entering the MS4.

Consistent with USEPA's position, the State Water Board has clearly indicated that Regional Boards are not limited by the iterative approach to storm water regulations in crafting appropriate regulations for non-storm water discharges. (State Water Board Order WQ 2009-0008, *County of Los Angeles),* p. 9.) The argument that non-storm water discharges, prohibited from entry into the MS4 in the first instance, should be held to comply with only the less stringent MEP standard developed for storm water discharges in recognition of the variable quality of storm events, is contrary to and potentially renders the "effectively prohibit" requirement in section 402(p)(3)(B)(ii) meaningless. While water quality based effluent limits, expressed as numeric effluent limitations, are not *required* to be imposed on dry weather, non-storm water discharges from the MS4, it is legally permissible to do so.[1]

IV. Water Code Section 13241

Many commenters assert that provisions in the Tentative Order, including NELs, storm water action levels (SALs), and implementation of the Baby Beach TMDL requirements, are new permit terms that exceed federal law. Therefore, the commenters argue that the Regional Board is required, but has failed, to consider Water Code section 13241 factors, including economic considerations, prior to approving any of these provisions. The City of Dana Point cites extensively to the California Supreme Court case, *City of Burbank v. State Water Resources Control Board, et al.* ((2005) 35 Cal.4th 613) (*Burbank*), particularly the concurring opinion of Justice Brown, as supportive of its assertions.

The *Burbank* court stated: "[Water Code s]ection 13377 specifies that wastewater discharge permits must meet the federal standards set by federal law. In effect, section 13377 forbids a regional board's consideration of any economic hardship on the part of the permit holder if doing so would result in the dilution of the requirements set by Congress in the Clean Water Act. That act prohibits the discharge of pollutants into the navigable waters of the United States unless there is compliance with federal law (33 U.S.C. § 1322(a)), and publicly operated wastewater treatment plants such as those before us here must comply with the act's clean water standards, regardless of cost [citations]. Because [Water Code] section 13263 cannot authorize what federal law forbids, it cannot authorize a regional board, when issuing a wastewater discharge permit, to use compliance costs to justify pollutant restrictions that do not comply with federal clean water standards." (*Burbank,* 35 Cal.4th at 625.*)*

While the Burbank decision does require an analysis of Water Code section 13241 factors when the state adopts permit conditions that are more stringent than federal law (*id. at 618*) the Tentative Order reflects that all of the challenged provisions are required to implement federal law. Thus, the Regional Board is not required to consider economic information to justify a "dilution of the requirements" established in federal law. Nonetheless, as staff has

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[1] Commenters have also claimed that TMDLs are inappropriately included as numeric effluent limitations on both dry and wet weather discharges. This is not the case. The Tentative Order requires the Copermittees to implement BMPs capable of achieving the interim and final Waste Load Allocations (WLA) and Numeric Targets in the approved TMDL. The BMPs apply to the discharges, while compliance with the WLAs and Numeric Targets occurs in receiving waters. Further, the Copermittees have 10 years to meet the final allocations and targets established for wet weather. Finally, these provisions within the Tentative Order comply with federal regulations [40 CFR 122.33(d)(1)(vii)(B)] by being consistent with the assumptions and requirements of the Waste Load Allocations of an adopted and applicable TMDL.

noted extensively in responses to comments, to the extent that economic information has been provided in connection with compliance and other costs associated with challenged permit provisions, staff has fully considered this information. Under these circumstances, the *Burbank* case does not require more.

V. Unfunded State Mandates

Both prior to and at the July 1, 2009, Regional Board meeting on an earlier version of the Tentative Order, commenters raised the issue of unfunded state mandates in connection with many of the proposed permit provisions. Board members indicated that they would appreciate clarification about the subject of unfunded state mandates. In recently submitted written comments, the City of Dana Point and others again assert that a number of the provisions in the Tentative Order go beyond what is required under federal law and therefore constitute unfunded state mandates that may not be imposed absent necessary funding first being made available to Permittees.

Commenters are correct that one factor to be considered in determining whether a requirement is an unfunded state mandate is whether the requirement goes beyond, or exceeds, what is required by federal law. However, the commenters are incorrect that the provisions in the Tentative Order exceed federal law. Moreover, there are a number of other factors that also must be established before a requirement will be found to be an unfunded state mandate warranting state reimbursement. Finally, unless and until a particular provision is determined by the State of California, Commission on State Mandates (Commission) to be an unfunded state mandate for which reimbursement is required, the Regional Board is not, as some commenters assert, precluded from adopting such provisions.

<u>State Mandate Law</u>

Article XIIIB, Section 6 of the California Constitution requires subvention of funds to reimburse local governments for state-mandated programs in specified situations. The process for establishing that a requirement is subject to reimbursement as an unfunded state mandate involves the filing by a local agency of a Test Claim with the Commission on State Mandates. There are several exceptions and limitations to the subvention requirements that provide bases for the Commission to determine that one or more provisions in a Test Claim are not subject to subvention. Article XIIIB, Section 6 provides, "Whenever the Legislature or any state agency mandates a new program or higher level of service on any local government, the State shall provide a subvention of funds to reimburse that local government for the costs of the program or increased level of service." Implementing statutes clarify that no subvention of funds is required if: (1) the mandate imposes a requirement that is mandated by a federal law or regulation and results in costs mandated by the federal government, unless the statute or executive order mandates costs that exceed the mandate in that federal law or regulation (Govt. Code, § 17556, subd. (c)); or (2) the local agency proposed the mandate (*id.*, subd. (a)); or (3) the local agency has the authority to levy service charges, fees, or assessments sufficient to pay (*id.*, subd. (d)).

Numerous judicial decisions have further defined limitations on the requirements for subvention of funds. Specifically, subvention is only required if expenditure of tax monies is

required, and not if the costs can be reallocated or paid for with fees. *(County of Los Angeles v. Commission on State Mandates* (2003) 110 Cal.App.4th 1176; *Redevelopment Agency v. Commission on State Mandates* (1997) 55 Cal.App.4th 976.) In addition, reimbursement to local agencies is required only for the costs involved in carrying out functions peculiar to government, not for expenses incurred by local agencies as an incidental impact of laws that apply generally to all state residents and entities. Laws of general application are not entitled to subvention. *County of Los Angeles v. State of California* (1987) 43 Cal.3d 46. The fact that a requirement may single out local governments is not dispositive; where local agencies are required to perform the same functions as private industry, no subvention is required. *City of Richmond v. Commission on State Mandates* (1998) 64 Cal.App.4th 1190.

If the Commission determines that provisions in a permit in fact constitute reimbursable state mandates, the determination may be challenged through the judicial process. There also exists a Commission process for determining appropriate reimbursement of state mandates. If a determination that a provision constitutes an unfunded state mandate is upheld, the State likely would decide whether to reimburse the local agency for the program or the Regional Board could decide to withdraw a provision from a permit.

Recent Commission Proceedings

Recently, the Commission issued a Final Statement of Decision in a storm water permit Test Claim filed by the County of Los Angeles and several additional co-permittee test claimants. (*Municipal Storm Water and Urban Runoff Discharges,* 03-TC-04, 03-TC-19, 03-TC-20, and 03-TC-21 (Los Angeles Regional Water Quality Control Board Order No. 01-182 (July 31, 2009) (County of Los Angeles Test Claim).) In the Commission's Statement of Decision, the Commission found that all but one of the challenged provisions issued by the Los Angeles Water Board in its MS4 permit did not qualify as unfunded state mandates as they did "not impose costs mandated by the state within the meaning of article XIII B, section 6 of the California Constitution because the claimants have fee authority (under Cal. Const. article XI, § 7) within the meaning of Government Code section 17556, subdivision (d), sufficient to pay for the activities in those parts of the permit." (County of Los Angeles Test Claim, Statement of Decision, p. 2.)

As you know, on June 20, 2008, the County of San Diego filed a Test Claim with the State of California, Commission on State Mandates (Commission), challenging multiple provisions in Order No. R9-2007-001 (National Pollutant Discharge Elimination System (NPDES) No. CAS0108758), Waste Discharge Requirements for Discharges of Urban Runoff From the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego County, the San Diego Unified Port District, and the San Diego County Regional Airport Authority), adopted on January 24, 2007 (2007 MS4 Permit). The County filed the Test Claim on behalf of 18 of the 20 MS4 Co-permittees (Claimants). Only the San Diego Unified Port District and the San Diego County Regional Airport Authority did not join in the Test Claim. The San Diego Water Board and State Water Board responded to the Test Claim. It is still pending and a draft staff analysis has not yet been issued for comment.

A similar process would need to be followed by the Orange County permittees in order to establish that any of the Tentative Order's provisions constitute unfunded state mandates entitling them to reimbursement by the state.

State of California
Regional Water Quality Control
Board San Diego Region

EXECUTIVE OFFICER SUMMARY REPORT
October 12, 2016

ITEM: 11

SUBJECT: Public Hearing: Resolution Adopting the 2014 Clean Water Act Section 303(d) and 305(b) Integrated Report. (Tentative Resolution No. R9-2016-0196). (Helen Yu and Chad Loflen)

PURPOSE: The San Diego Water Board will conduct a public hearing, hear public testimony on modifications to the draft Clean Water Act (CWA) section 305(b)/303(d) 2014 Integrated Report (Integrated Report) for the San Diego Region, and consider adoption of the tentative Resolution No. R9-2016-0196.

RECOMMENDATIONS: It is recommended that the San Diego Water Board receive public testimony at today's hearing, close the public hearing, and adopt the tentative Resolution.

KEY ISSUES: The following key issues were identified during the preparation of the 2014 Integrated Report and review of public comment letters:

1. Only water quality data through August 2010 were evaluated per State Water Board procedures. This limits the meaningful representation of current waterbody conditions and reinforces the importance for staff to continue to use other data assessments to prioritize work and communicate waterbody conditions to the public.

2. The next Integrated Report for the San Diego Region is scheduled for 2022. Certain stakeholders and/or key Water Board initiatives (such as triennial Basin Plan review projects) may benefit if the Board conducts a targeted "off-cycle" update for priority waterbodies or beneficial uses.

3. The current reporting format required by the California Water Quality Assessment (CalWQA) database focuses on reporting impaired waterbodies, without adequate acknowledgement of waterbodies that support

all or some beneficial uses. For example, San Diego Bay is listed as impaired due to the elevated human health risk from fish consumption, but many beaches in the bay are safe for water contact recreation. The CalWQA database infrastructure defaults to identification of the waterbody impairment and does not allow for identification of where other beneficial uses assessed are met, or if other beneficial uses were assessed.

PRACTICAL VISION: Water quality assessment provides critical information regarding beneficial use status and performance measures of water quality management actions, and thus closely relates to all Practical Vision chapters. Correct understanding of water quality conditions in the San Diego Region through appropriate assessment is essential for the San Diego Water Board to make informed operational and regulatory decisions and to have effective communication with the public and other agencies.

PUBLIC NOTICE: The draft Integrated Report and supporting appendices were posted on the Regional Board web site on July 12, 2016. A Public Notice of the release of the draft Integrated Report and written comment period was sent out through LYRIS email distribution list on July 12, 2016.

Announcement of a public hearing, scheduled for October 12, 2016, was provided to interested parties via the LYRIS email list on August 26, 2016, and posted on the San Diego Water Board website.

DISCUSSION: Resolution R9-2016-0165 (Supporting Document No. 1) approves the 2014 Integrated Report (Supporting Document No. 2), which addresses the CWA Section 305(b) requirement for states to report biennially to USEPA on the water quality conditions of its surface waters and the CWA section 303(d) requirement for states to identify impaired surface water body segments to USEPA. Placement on the 303(d) List generally triggers requirements to develop Total Maximum Daily Loads (TMDLs). The 303(d) List of impaired waters must ultimately be approved by USEPA. This 2014 Integrated Report updates the 2008 San Diego Region Integrated Report and the 303(d) List approved by USEPA in 2010.

A complete copy of the 2014 Integrated Report is available on-line at: http://www.waterboards.ca.gov/sandiego/water_issues/programs/303d_list/

California complies with the federal reporting requirements by integrating the relevant information into one comprehensive report, called the 305(b)/303(d) Integrated Report. The Integrated Report update process is coordinated by the State Water Board, which collates Regional Board reports into a single, statewide list update for submittal to the USEPA. Development of the 303(d) List is done pursuant to *the Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List.*

Facing considerably increasing volumes of data for the preparation of a biennial Integrated Report, the State Water Board, under an agreement with USEPA, decided starting from the 2012 cycle to prepare and submit to USEPA Integrated Reports on a rotating basis with three Regional Boards at once. The San Diego Water Board is in the 2014 listing cycle group.

Data and Results

Pursuant to the State Water Board's directive, data post August 30, 2010 were not included in the 2014 cycle of assessment. Thus, this Integrated Report does not necessarily represent current water quality conditions and cannot be solely relied upon by the Water Board and other parties to prioritize regional water quality protection and restoration efforts.

Nonetheless, whereas prior Integrated Reports focused on the impaired waters portion (the 303(d) List), this 2014 Integrated Report has begun to identify high-quality waters using multiple lines of evidence of biological data in wadeable streams. Additionally, this Integrated Report has included a physical assessment for a subset of waterbodies where benthic macroinvertebrate and chemistry data were also evaluated. This allows for better transparency and understanding of where waterbodies may face challenges from impaired chemistry or physical conditions, alone or in combination. That, in turn, allows for better identification of restoration and protection priorities than afforded by prior Integrated Reports.

For the 2014 assessment, staff evaluated approximately 5,000 waterbody/pollutant combinations (Supporting Document No. 2, Appendix I) resulting in 404 waterbody segments being placed into one or more of five beneficial use support categories, as shown in the following table.

Category	Description	Waterbody Segments*
1	All assessed beneficial uses supported and no beneficial uses known to be impaired.	**116**
2	At least one, but not necessarily all, core beneficial use is supported.	**111****
3	There is insufficient data and/or information to make a beneficial use support determination but information and/or data indicates beneficial uses may be potentially threatened.	**72**
4	At least one beneficial use is not supported but a TMDL is not needed.	
4a	A TMDL has been developed and approved by USEPA for a waterbody-pollutant combination and the approved implementation plan is expected to result in full attainment of the water quality standard within a specified time frame.	**34**
4b	Another regulatory program is reasonably expected to result in attainment of the water quality standard within a reasonable, specified time frame.	**16**
4c	The non-attainment of any applicable water quality standard for the waterbody segment is the result of pollution and not caused by a pollutant.[1]	**29**
5	At least one beneficial use is not supported and a TMDL is needed.	**166**

* In accordance with the U.S. EPA guidance (2005 and 2015), some waterbody segments were placed into more than one category as appropriate.
**See Revised Draft 2014 Integrated Report

Overall, the data supports adding 239 new waterbody/pollutant combinations to the impaired waters list and removing (delisting) 9 waterbody/pollutant combinations (Supporting Document No. 2, Appendix A).

Public Participation and Comments

Public participation began with the initial call for data by the State Water Board in 2010. A public workshop was held on July 19, 2016, and a public comment period on the draft Integrated Report was provided from July 12-August 12, 2016. Fifteen parties submitted written comments (Supporting Document 3 attached CD) during the public comment period. Supporting Document No. 4 includes responses to written comments.

[1] Defined under the CWA as "the man-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of water" (Section 502(19)). Examples of pollution not caused by a pollutant include hydrologic or habitat alteration.

Any changes to the draft Integrated Report in response to public comments since the initial release on July 12, 2016 are highlighted in Supporting Document 5.

State Water Board Public Process
After the three Regional Boards on the 2014 cycle complete their regional Integrated Reports, the State Water Board will compile them into a single, statewide draft CWA Sections 305(b)/303(d) Integrated Report. The State Water Board will conduct a public review and comment period, develop written responses to comments, conduct public workshop(s), and conduct a public hearing(s) to consider adoption of the draft statewide 2014 Integrated Report. The statewide Integrated Report will then be submitted to the USEPA in the form of the State's biennial report on water quality. This information will in turn be submitted by USEPA to Congress pursuant to Section 305 of the Clean Water Act (33 USC 1315).

LEGAL CONCERNS: None

SUPPORTING DOCUMENTS:

1. Tentative Resolution R9-2016-0196.
2. Revised Draft 2014 Integrated Report
   - Appendix A: New and Revised Decisions
   - Appendix B: Category 1 Water Body Segments
   - Appendix C: Category 2 Water Body Segments
   - Appendix D: Category 3 Water Body Segments
   - Appendix E: Category 4A Water Body Segments
   - Appendix F: Category 4B Water Body Segments
   - Appendix G: Category 4C Water Body Segments
   - Appendix H: Category 5 Water Body Segments
   - Appendix I: Supporting Information Fact Sheets for Each Water Body/Pollutant Combination (on CD)
   - Appendix J: Miscellaneous Changes
   - Appendix: K: References
3. Comment Letters
4. Responses to Public Comments
5. Table of Listing Changes to Integrated Report since July 12, 2016

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

RESOLUTION NO. R9-2016-0196

APPROVAL OF THE
2014 INTEGRATED REPORT OF FEDERAL CLEAN
WATER ACT SECTION 305(b) AND SECTION 303(d) LIST
OF WATER QUALITY LIMITED SEGMENTS
FOR THE SAN DIEGO REGION

WHEREAS:

1. Section 305(b) of the federal Clean Water Act (CWA) requires each State to monitor, assess, and submit to the United States Environmental Protection Agency (USEPA) a report on the quality of its waters relative to the designated uses of those waters.

2. Section 303(d)(1) of the CWA requires each State to regularly identify surface waters that do not meet applicable water quality standards after technology-based controls have been implemented (referred to as the section 303(d) List) and prioritize such surface waters for the purposes of developing total maximum daily loads (TMDLs). The states are required to submit their section 303(d) List biennially to the USEPA.

3. The section 303(d) List must include a description of the pollutants causing impairment and a priority ranking for all listed water quality limited segments for the purposes of development of TMDLs.

4. By letter dated July 15, 2013, the State Water Resources Control Board (State Water Board) informed USEPA of its strategy for a more efficient and successful CWA 303(d)/305(b) Integrated Report process for California, which divides California into thirds by Regional Water Quality Control Boards. The State of California Integrated Report now occurs on a rotating basis for three Regional Water Quality Control Boards at once. The San Diego Water Board is in the 2014 listing cycle group.

5. The San Diego Water Board has prepared a 2014 "Integrated Report" that incorporates the information satisfying the requirements of CWA sections 305(b) and 303(d).

6. In developing the 2014 Integrated Report for CWA section 305(b) and section 303(d) list, the San Diego Water Board considered all readily available data and information submitted to the State Water Board during the State Water Board data solicitation period of January 14, 2010 to August 30, 2010.

7. By memo dated November 12, 2013, the State Water Board notified the public and USEPA that it would not solicit new data for the 2014 and 2016 cycles due to the volume of data received during the 2010 data solicitation period.

8. In developing the 2014 Integrated Report, the San Diego Water Board staff followed the *Water Quality Control Policy for Developing California's CWA Section 303(d) List* (Resolution No. 2015-0005, amendment of Resolution No. 2004-0063) to assess data and identify those waterbody segments that do not meet applicable water quality standards, are not expected to meet water quality standards, and/or have been restored to meet water quality standards.

9. Because the data solicitation period for this Integrated Report closed in August 2010 (over six years ago), the assessment of conditions may not entirely reflect the status of each surface water body at this time.

10. The San Diego Water Board may conduct CWA Section 305(b) and/or 303(d) list update(s) "off-cycle" from its next regularly scheduled Integrated Report period. To be efficient, off-cycle updates should be limited to priority waterbodies, pollutants, or combinations thereof as identified by the San Diego Water Board, with reallocation of resources as appropriate.

11. The San Diego Water Board staff provided advanced notice and opportunity for public comment on draft recommendations for the 2014 Integrated Report during a 31-day public comment period between July 12, 2016, and August 12, 2016. Then staff conducted a public workshop on July 19, 2016, to solicit and discuss public comments on the draft 2014 Integrated Report. The San Diego Water Board received many written comments on the proposed 2014 Integrated Report, responded to all written comments received, and made a number of changes to the Integrated Report in response to the comments as appropriate.

12. The San Diego Water Board published notification of its intent to convene a public hearing on August 26, 2016. A revised Integrated Report and supporting appendices were posted on the San Diego Water Board web page on September 28, 2016.

13. On October 12, 2016, the San Diego Water Board convened a public hearing, and at this meeting heard and considered all comments pertaining to its consideration and adoption of the 2014 Integrated Report for the San Diego Region.

14. Upon approving the 2014 303(d) List, the San Diego Water Board is required to submit the water body fact sheets, responses to comments, and all other information it considered during the public hearing to the State Water Board. Upon approval by the State Water Board, the statewide 2014 List shall be submitted to USEPA for approval as required by the Clean Water Act.

    Only the 303(d) List portion of the California Integrated Report requires approval by the State Water Board and USEPA. Neither agency approves the 305(b) Report portion of the California Integrated Report.

15. The State Water Board has established the following process for public comment of its subsequent approval of the San Diego Region 303(d) List:

    The State Water Board will accept comments on the 303(d) List portion of the proposed 2014 California Integrated Report. If any person or entity seeks to have the State Water Board review a listing recommendation made by the San Diego Water Board with respect to one or more waterbodies, the individual or entity must submit a request to the State Water Board to review the specific listing recommendation no later than 30 days after the date of the San Diego Water Board's approval. Send requests for review by emailing the specific listing recommendations and the concerns related to those recommendations to WQAssessment@waterboards.ca.gov (must be no more than 15 megabytes); or mail or hand delivery at:

    Surface Water Quality Assessment Unit
    State Water Resources Control Board, Division of Water Quality
    P.O. Box 100, Sacramento, CA 95812-2000 (mail)
    1001 I Street, 15th Floor, Sacramento, CA 95814 (hand delivery)

    Please also indicate in the subject line, "Request for Review of specific Regional Board listing recommendation – 303(d) List portion of the 2014 California Integrated Report."

    Before the State Water Board approves the 2014 303(d) List, the State Water Board shall provide advance notice and an opportunity for public comment. The public comment will be limited to the listing recommendations that are timely requested for review unless the State Water Board elects to consider recommendations on other waters.

THEREFORE BE IT RESOLVED THAT:

1. The San Diego Water Board approves the 2014 Integrated Report for the San Diego Region.

2. The San Diego Water Board authorizes the Executive Officer to transmit the 2014 Integrated Report for the San Diego Region, and other supporting information included in the Administrative Record to the State Water Board for its consideration and approval.

3. If, during the approval process, the State Water Board or USEPA determine that minor, non-substantive corrections are needed for clarity or consistency, the Executive Officer may make such changes, and shall inform the San Diego Water Board of any such changes.

4. The San Diego Water Board directs the Executive Officer to use this Integrated Report as an additional piece of information in an ongoing prioritization process that also includes the San Diego Water Board Practical Vision, an evaluation of key beneficial uses in key areas, and the identification of efforts to attain meaningful net gains in water quality and beneficial uses.

I, David W. Gibson, Executive Officer, do hereby certify the foregoing is a full, true and correct copy of a Resolution adopted by the California Regional Water Quality Control Board, San Diego Region, on October 12, 2016.

David W. Gibson
Executive Officer

SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD

CLEAN WATER ACT SECTIONS 305(B) AND 303(D) INTEGRATED REPORT FOR THE SAN DIEGO REGION

DRAFT STAFF REPORT

October 12, 2016

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

State of California
Edmund G. Brown Jr., Governor

California Environmental Protection Agency
Matthew Rodriquez, Secretary for Environmental Protection

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This publication is a technical report by staff of the California Regional Water Quality Control Board, San Diego Region. No policy or regulation is expressed nor intended.

CLEAN WATER ACT SECTIONS 305(b) AND 303(d) INTEGRATED REPORT FOR THE SAN DIEGO REGION

Draft Staff Report

September 28, 2016

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REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

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Numerous individuals provided valuable input and support in the development of this report. Staff at the San Diego Regional Water Quality Control Board, Sophie di Campalto, Mike Porter, Alex Cali, and Lauren Bray (former scientific aid) greatly helped with reviewing of lines of evidence, as well as making decisions in the CalWQA database. The Surface Water Quality Assessment Unit at the State Water Resources Control Board tremendously assisted in the development of fact sheets and decisions, and coordinated statewide efforts. David Paradies provided programming assistance which saved staff hundreds of hours of data entry. Jon Marshack's Water Quality Goals compilation was used as a resource for finding available guidelines for the protection of water quality. Credit is also given to all the individuals whose long hours of sample collection, laboratory work and report preparation provided the data and information used as the basis for this report.

Administrative Summary

This Integrated Report includes the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) recommendations for changes to both the Clean Water Act (CWA) Section 303(d) List of Water Quality Limited Waterbodies, and CWA Section 305(b) report on the water quality condition of waterbodies within the San Diego Region. The data period for this Integrated Report cycle encompasses data collected until August 2010.

Chapter one, the Introduction, provides the context and purpose of this report, discussing the legal requirements for the San Diego Water Board to update the CWA Section 303(d) list and Section 305(b) report. Chapter two provides a review of the process of data review and decision making during the preparation of the Integrated Report. San Diego Water Board staff evaluated benthic macroinvertebrate data using the California Stream Condition Index, with the details of the methods and results discussed in Chapter three. Chapter four provides a brief summary and discussion of the data assessed and the resultant updates of the 303(d) listings, with details of the results reported in appendices. Chapter five discusses the path forward for the Integrated Report in terms of public review and board approval. Appendices A through K complete the Integrated 305(b)/303(d) Report with lists of waterbodies in different beneficial use support categories, miscellaneous changes, and other supporting information.

The volume of data submitted for assessment in the 2014 cycle significantly increased (approximately 190 percent) compared to previous cycles. As a result, a total of 4,996 Lines of Evidence were generated and 2,612 new or revised decisions made, including 237 new listing decisions and 9 delisting decisions. Finally, the Integrated Report categorizes water bodies according to their ability to support core beneficial uses (including municipal and domestic drinking water supply, aquatic life, fish consumption, shell fish harvesting, contact recreation, and non-contact recreation). A total of 404 waterbody segments were placed into one or more of five beneficial use support categories based on the evaluation of the available water quality data. In accordance with the USEPA guidance (2005 and 2015), some waterbody segments were placed into more than one categories as appropriate. The categories and numbers of waterbodies in each category are listed below:

1. All assessed beneficial uses supported and no beneficial uses known to be impaired (116 waterbody segments);
2. At least one, but not necessarily all, core beneficial use is supported (111 waterbody segments);
3. There is insufficient data and/or information to make a beneficial use support determination but information and/or data indicates beneficial uses may be potentially threatened (72 waterbody segments);
4. At least one beneficial use is not supported but a TMDL is not needed (82 waterbody segments); and
5. At least one beneficial use is not supported and a TMDL is needed (166 waterbody segments).

Changes to the 303(d) list for the San Diego Region must be considered for approval by the San Diego Water Board during a public meeting and after consideration of public comments. A copy of the draft Integrated Report and all the supporting appendices were available for public review from July 12 through August 12, 2016.

Executive Summary

The Integrated Report includes the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) proposed recommendations for changes to both the Clean Water Act (CWA) Section 303(d) List of Water Quality Limited Waterbodies, and the CWA Section 305(b) report on the water quality condition of waterbodies within the San Diego Region. The Integrated Report should allow the San Diego Water Board the opportunity to assess beneficial use attainment for our Region's waters for regulatory and prioritization purposes and, more importantly, to inform the public.

The San Diego Water Board's Practical Vision highlights the values of leadership, stewardship, communication, and transparency. Given the challenges of the Integrated Reporting process concerning age and amount of data, the San Diego Water Board has focused drafting an Integrated Report to reflect these core values.

Further, a priority of the San Diego Water Board's Practical Vision and values is to focus on the following Core Beneficial Uses:

Is it safe to swim?
Is it safe to eat fish and shellfish?
Is the water safe to drink?
Are ecosystems healthy?

Prior Integrated Reports focused primarily on the impaired waters portion (303(d) list) with less attention and emphases on identifying waterbodies where some or all beneficial uses assessed were supported. Given the objective of the Clean Water Act to ***protect and restore*** waters, good stewardship demands that those waters meeting beneficial uses be identified and protected. Furthermore, communication with the public is needed to identify those waterbodies where beneficial uses are met, including those where conditions are present showing extraordinary high quality. This Integrated Report has begun this process, using multiple lines of evidence of biological data in wadeable streams to identify such waters.

However, a weakness in the relativity of the Integrated Report has been effective communication of impairment and/or lack of impairment for these Core Beneficial Uses. The current reporting process does not allow for identification and communication of how a waterbody is meeting one or more, but not all, Core Beneficial Uses. Instead, the waterbody is traditionally simply identified as "impaired." For example, it may be safe to swim in a waterbody but not safe to consume fish and shellfish. Unfortunately the current system only allows the conveyance of information regarding the impairment. This impedes transparency and effective communication. The San Diego Water Board has begun to address this issue in this Integrated Report. However, much remains to be done to improve statewide data management infrastructure.

A final area of concern addressed by this Integrated Report is regarding the physical and biological aspects of the CWA. This report utilizes benthic macroinvertebrate data for wadeable streams to identify where streams have a degraded biological condition due to pollutants (chemical) and/or or pollution (physical). The identification of physical impairment of waterbodies, such as from habitat degradation and/or hydromodification, has largely been lacking in previous waterbody assessments. This Integrated Report has included a physical assessment for a subset of waterbodies where benthic macroinvertebrate and chemistry data was also evaluated. This allows for better transparency and understanding of where waterbodies may face challenges from impaired chemistry or physical conditions, alone or in combination. This allows for better identification of priorities for regulatory and non-regulatory restoration approaches.

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List of Acronyms and Abbreviations

Basin Plan	Water Quality Control Plan for the San Diego Region
BPTCP	Bay Protection and Toxic Cleanup Program
BMI	Benthic Macroinvertebrates
CalWQA	California Water Quality Assessment (database)
CCAMP	Central Coast Ambient Monitoring Program
CCC	Criteria Continuous Concentration
CCR	California Code of Regulations
CDPH	California Department of Public Health
CFR	Code of Federal Regulations
CMC	Criteria Maximum Concentration
CRAM	California Rapid Assessment Method
CSCI	California Stream Condition Index
CTR	California Toxics Rule
CWA	Clean Water Act
ºC	degrees Celsius
ºF	degrees Fahrenheit
FED	Functional Equivalent Document
DDE	Dichlorodiphenyldichloroethylene
DDT	Dichlorodiphenyltrichloroethane
DFW	Department of Fish and Wildlife, formerly Department of Fish and Game (DFG)
DO	Dissolved oxygen
dw	dry weight
ERM	Effects Range Median
HCH	Hexachlorocyclohexane
HSA	Hydrologic Sub Area
HU	Hydrologic Unit
IBI	Index of Biotic Integrity
ILRP	Irrigated Lands Regulatory Program
IR	Integrated Report
kg	kilogram(s)
Listing Policy	Water Quality Control Policy for Developing California's Section 303(d) List
LOE	Line of Evidence
MCL	Maximum Contaminant Level
MDL	Method Detection Limit
mg/kg	milligrams per kilogram (parts per million)
mg/L	milligrams per liter (parts per million)
µg/g	micrograms per gram (parts per million)
µg/L	micrograms per liter (parts per billion)
MTBE	Methyl tertiary-butyl ether
MTRL	Maximum Tissue Residue Level

NAS	National Academy of Sciences
ng/g	nanograms per gram (parts per billion)
ng/L	nanograms per liter (parts per trillion)
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NTU	Nephelometric Turbidity Unit
oc	organic carbon
OEHHA	Office of Environmental Health Hazard Assessment
PAH	Polynuclear aromatic hydrocarbon
PBDE	Polybrominated diphenyl ethers
PCB	Polychlorinated biphenyl
PEL	Probable Effects Level
pg/L	picograms per liter
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
RBI	Relative Benthic Index
RL	Reporting Level
SAFIT	Southwest Association of Freshwater Invertebrate Taxonomists
SCCWRP	Southern California Coastal Waters Research Project
SFEI	San Francisco Estuary Institute
SMWP	State Mussel Watch Program
SQG	Sediment quality guideline
SWAMP	Surface Water Ambient Monitoring Program
TDS	Total Dissolved Solids
TIE	Toxicity Identification Evaluation
TMDL	Total Maximum Daily Load
TSMP	Toxic Substance Monitoring Program
TSS	Total Suspended Solids
USEPA	US Environmental Protection Agency
USGS	US Geological Survey
WDR	Waste Discharge Requirement
WQO	Water quality objective
WQS	Water quality standard
ww	wet weight

Chapter 1: Introduction

The federal Clean Water Act (CWA) gives states the primary responsibility for protecting and restoring surface water quality. In California, the State Water Resources Control Board (State Water Board) and nine Regional Water Quality Control Boards (Regional Water Boards), collectively referred to as the California Water Boards, serve as the agencies with the primary responsibility for implementing CWA requirements. One such responsibility includes developing and implementing programs to ensure attainment of water quality standards. Water quality standards, pursuant to the CWA, consist of designated beneficial uses of waterbodies, criteria or objectives (numeric and narrative) which are protective of those beneficial uses, and anti-degradation provisions.

Section 305(b) of the CWA requires each state to report biennially to the United States Environmental Protection Agency (USEPA) on the water quality conditions of its surface waters. USEPA compiles these assessments into a biennial “National Water Quality Inventory Report” to Congress. CWA Section 303(d) requires each state to develop, update, and submit to the USEPA for approval, a list of waterbody segments not meeting water quality standards. 40 CFR Section 130.7(d)(1) requires each state to submit the list biennially. This list is commonly referred to as the “303(d) List” or the “List of Impaired Waters.” Waterbody segments placed on the 303(d) list must be addressed through the development of Total Maximum Daily Loads (TMDLs), or an existing regulatory program that is reasonably expected to result in the attainment of the water quality standard within a specified timeframe.

In conformance with USEPA guidance (USEPA, 2005), the State and Regional Water Boards prepare a single Integrated Report that meets the reporting requirements of CWA sections 303(d) and 305(b).

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) is responsible for developing and adopting the 2014 Integrated Report for waters within the San Diego Region. Following adoption by the San Diego Water Board, the 2014 Integrated Report will be transmitted to the State Water Board, where it will be considered by the State Water Board for approval.

The purpose of this staff report is to provide background on the assessment process and summarize San Diego Water Board staff’s recommended updates to the California 303(d) list and 305(b) report (Appendices A-H). Results of the staff analysis are presented in the form of fact sheets (Appendix I) that contain a decision and supporting lines of evidence for each waterbody/pollutant pair assessed.

Chapter 2. Water Quality Assessment

This chapter introduces background information, including and not limited to, the Listing Policy, applicable water quality standards, and the procedures of data evaluation and decision making used in the preparation of the 2014 Integrated Report for the San Diego Region.

Overall Process Review

The water quality assessment process begins with the State Water Board's solicitation for and subsequent database entry of data collected from the monitoring activities in the region for a specified time period. The State Water Board then assigns beneficial use(s), identifies water quality objectives, and conducts an initial assessment of data. The initial screening and entry of data and assignment of beneficial uses and objectives is then analyzed by the Regional Water Board. Regional Water Board staff then assess the data quality assurance and control, spatial and temporal quantity and quality, and subsequent results to determine if a waterbody is meeting or exceeding water quality standards. The determination of whether water quality standards are being met is made by comparing data to objectives, criteria, and guidelines (protective limits).This analysis forms the basis of CWA section 303(d) and 305(b) assessments. Whether or not these protective limits are exceeded determines a water segment's ability to support its assigned beneficial uses and whether to recommend listing, or not listing, the waterbody-pollutant combination on the 303(d) list. Following the updates of the 303(d) list, waterbodies or segments on the 303(d) list must be addressed through the development of TMDLs or by other means as described in the State's Water Quality Control Policy of Addressing Impaired Waters (State Water Board, 2005).

The Listing Policy

The Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List, commonly referred to as the Listing Policy (SWRCB, 2004), provides guidelines for the water quality assessment process and establishes a standardized approach for developing California's 303(d) list. It outlines an approach that provides the procedures for making listing decisions based upon different types of data and establishes a systematic framework for statistical analysis of water quality data. The Listing Policy also establishes requirements for data quality, data quantity, and administration of the listing process. Listing and delisting factors are provided for chemical-specific water quality standards; bacterial water quality standards; health advisories; bioaccumulation of chemicals in aquatic life tissues; nuisance such as trash, odor, and foam; nutrients; water and sediment toxicity; adverse biological response; degradation of aquatic life populations and communities; trends in water quality; and weight of evidence.

The Listing Policy requires the water quality assessments and listing decisions for specific waterbody-pollutant combinations to be documented in waterbody "fact sheets." Fact sheets consist of "lines of evidence" (LOEs) summarizing the applicable standards and the data for a waterbody segment in relation to a specific beneficial use. Staff then recommends "decisions" regarding listing based on beneficial use support. The fact sheets supporting the 2014 Integrated Report for waters in the San Diego Region are provided in Appendix H.

Changes to California's 303(d)/305(b) Integrated Report Reporting Cycle

On June 14, 2013, State Water Board management met with USEPA Division of Water Quality management to discuss strategies to create a more efficient and successful Integrated Report process. The strategy agreed upon includes dividing California into thirds by Regional Water Board and submitting an Integrated Report for three Regional Water Boards per listing cycle. As a result, cycles of Integrated Report have been/will be prepared by the Regional Boards of corresponding cycles (Table 1) to complete the assessment of data obtained during the "Data Solicitation" period (discussed in the following session) for the 2012 cycle:

Table 1. Proposed Reporting Cycles by Region

2012 Integrated Report	the North Coast Regional Water Quality Control Board (Region 1) ; the Lahontan Regional Water Quality Control Board (Region 6); and the Colorado River Basin Regional Water Quality Control Board (Region 7)
2014 Integrated Report	the Central Coast Regional Water Quality Control Board (Region 3); the Central Valley Regional Water Quality Control Board (Region 5); and **the San Diego Regional Water Quality Control Board (Region 9)**
2016 Integrated Report	the San Francisco Bay Regional Water Quality Control Board (Region 2) ; the Los Angeles Regional Water Quality Control Board (Region 4); the Santa Ana Regional Water Quality Control Board (Region 8)

After completing the 2014 Integrated Report, the San Diego Water Board is scheduled to develop the next Integrated Report update in 2020. It is anticipated that the process will allow for those Regional Water Boards that are "off cycle" to still examine high priority data and make decisions related directly to listings and de-listings and submit them for inclusion into the current listing cycle as appropriate.

Data Solicitation

The State Water Board solicited data from the public with a formal "Notice of Public Solicitation of Water Quality Data and Information for the California Integrated Report" sent to interested parties subscribed to the Integrated Report e-mailing list. Data used as part of the 2014 Integrated Report were received January 14, 2010 through August 30, 2010. Data sources include government agencies, municipalities, environmental groups, citizen groups, and receiving water data from the National Pollutant Discharge Elimination System (NPDES) dischargers[1]. Data collected by the Regional and State Water Boards under the Surface Water Ambient Monitoring Program (SWAMP) consisted of the majority of the data used to develop and revise fact sheets for the 2014 Integrated Report.

As the 2014 Integrated Report cycle's data cutoff date was August 30, 2010, a significant amount of data collected between August 2010 and July 2016 is available but cannot be considered by the current Integrated Report. Additional data not included in this cycle of assessment will be assessed in the next update of the 303(d) and 305(b) lists of the San Diego Region scheduled for 2020. Should the San Diego Water Board identify a priority waterbody(ies) for assessment or re-assessment during the interim time period, an off-cycle waterbody or pollutant specific report may be drafted for submittal during another Region's reporting period.

All data and information submitted are available as part of the electronic administrative record (Appendix J). Data and information pertaining to specific waterbody-pollutant assessments are provided in the fact sheets and link directly to the administrative record.

Water Quality Standards Used in the Data Assessment

Beneficial uses for waters in the San Diego Region are identified in Tables 2-2 through 2-4 of the Water Quality Control Plan for the San Diego Basin (Basin Plan). California Water Board staff assessed data using regulatory limits when available. The most common regulatory limits used include water quality objectives in the Basin Plan or any statewide Water Quality Control Plans applicable to the waterbody, and criteria for toxic chemicals promulgated by the USEPA under the California Toxics Rule (40 CFR 131.27). When numeric regulatory limits were not available, evaluation guidelines were used to interpret narrative water quality objectives. Evaluation guidelines are selected in conformance with section 6.1.3 of the Listing Policy. A list of regulatory limits including evaluation guidelines used in the 2014 cycle is presented in Appendix K.

[1] Receiving water data that were previously submitted to the California Integrated Water Quality System (CIWQS) database under NPDES permit but not in readily-assessable formats (e.g.,., in EXCEL or ACCESS worksheets) were requested to be submitted again directly to the State Board in appropriate formats to be assessed for the Integrated Report.

In the preparation of the 2014 Integrated Report, San Diego Water Board staff utilized the California Stream Condition Index (CSCI) to evaluate the biological condition of wadaeble streams in the San Diego Region. Details of the CSCI method are introduced in Chapter three, Explanation of Specific Analyses.

In its criteria guidance published in 2012, USEPA recommends changes of recreational water quality standards, i.e., using the fecal indicator bacteria (FIB) enterococci and Escherichia coli (E. coli) as indicators of fecal contamination for fresh water and enterococci for marine water (USEPA, 2012). While the State Water Board is in the process of updating its California Ocean Plan and Water Quality Control Plan for Enclosed Bays and Estuaries to reflect these changes of standards, the State Water Board staff determined that the 2012 USEPA Criteria would not be applied to data submitted for the 2014 Integrated Report cycle, as the data had already been assessed and lines of evidence developed by the time the criteria were finalized. In the interest of expedience, State Water Board staff directed the Regional Water Boards to move forward with the existing lines of evidence and to utilize the 2012 USEPA criteria for the next Integrated Report cycle. Consequently, water quality standards for FIB in forms of geometric mean (GM) and single sample maximum (SSM) used in the evaluation of FIB data in the 2014 cycle of Integrated Report were, for the most part, consistent with those used in previous cycles (e.g., 2008 through 2012).[2] Additionally, with USEPA recommendation, State Water Board staff directed the Regional Water Boards to adopt listings for the various forms of indicator bacteria under the heading “indicator Bacteria”, instead of each individual form of bacteria. Should indicator bacteria standards be updated, the San Diego Water Board may identify priority waterbody(ies) for assessment or re-assessment off-cycle for submittal during another Region’s reporting period.

Data Processing and Analysis

All readily available data and information in the administrative record was considered in the development of the 2014 Integrated Report. However, only data supported by a Quality Assurance Project Plan or equivalent document was considered high-quality and used to make determinations of water quality standards attainment. In the absence of quality assurance documentation, data is used only as supporting evidence and is not the basis of a listing decision.

[2]One difference with respect to the use of water quality standards (WQSs) for REC-1 activities in 2014 compared to in previous cycles exists for the assessment of inland waters: in 2008/2010, the WQSs corresponding to “moderately used” intensity were used for inland waters; in 2014, values corresponding to the “heavily used” intensity were selected in order to attain state-wide consistency of evaluation, and also due to the fact that the USEPA has dropped the concept of different levels of “use intensities” in its 2012 guidance criteria (USEPA, 2012).

Data were aggregated by waterbody segment following the requirements of section 6.1.5.4 of the Listing Policy, and assessments were performed on the individual segments. Waterbodies were segmented to account for hydrologic features. Some waterbodies may have been re-segmented, split into additional segments, or had a modification to the waterbody name since the last 303(d) list was approved. These and other non-substantive modifications (i.e., modifications that did not change a listing status) are summarized in the Miscellaneous Changes Report (Appendix J). Due to time constraints some waterbodies will be re-segmented during the next listing cycle. Those waterbodies requiring segmentation are called out specifically in this Integrated Report.

Spatial and temporal representation of data were assessed using the requirements and guidance of the Listing Policy. The available data were used to represent concentrations during the averaging period associated with the particular pollutant and water quality objective, as required by Section 6.1.5.6 of the Listing Policy. For example, if only one data point was available during a 4-day period, it was used to represent the four-day average concentration for that period.

During the assessment, data were compared against water quality objectives and/or protective guideline values to determine if waterbodies attain relevant water quality standards. Results of this assessment, including the number of samples collected and how many samples exceed the objective or guideline, as well as other relevant information, are summarized in Lines of Evidence (LOEs). Other relevant information includes the location and time of sampling activity and the pollutant sampled, the beneficial use affected, and the water quality objective or protective guideline value for the relevant beneficial use selected.

Decision recommendations, as documented in fact sheets, were completed by summarizing all relevant LOEs for a waterbody-pollutant combination, and determining if the number of samples exceeding water quality criteria are greater than the allowable exceedance count, which was developed based on statistical evaluations described in the Listing Policy. Most fact sheets and overall beneficial use support determinations were developed in the California Water Quality Assessment (CalWQA) database. Potential sources are only identified in fact sheets for assessments done which directly address a core beneficial use[3]. Core beneficial uses include: municipal and domestic supply, aquatic life support, fish consumption, shellfish harvesting, contact recreation, and non-contact recreation. Otherwise, the potential source was marked “Source Unknown.”

[3] The State Water Board developed the concept of “core” beneficial use by combining the Clean Water Act’s “fishable/swimmable” goal and the State Water Board’s mission. The CWA’s “fishable/swimmable” goal is water quality ”provides for the protection and propagation of fish, shellfish, and wildlife, and recreation in and on the water, wherever attainable” and the State Water Board’s mission statement is “To preserve, enhance, and restore the quality of California’s water resources and drinking water for the protection of the environment, public health, and all beneficial uses, and to ensure proper water resource allocation and efficient use, for the benefit of present and future generations.”

Determination of Beneficial Use Support and Integrated Report Categories

To meet CWA section 305(b) requirements for reporting on water quality conditions, the Integrated Report places each assessed waterbody segment into one or more of five non-overlapping categories based on the overall beneficial use support of the water segment. Water segments were evaluated for at least one of the six core beneficial uses. For each core beneficial use associated with each waterbody segment, a rating of fully supporting, not supporting, or insufficient information was assigned based on the assessment of high-quality data as well as the consideration of other readily available information.

In the 2014 cycle, a total of 404 waterbody segments were evaluated for the San Diego Region. Table 2 below describes each category and summarizes the number of waterbody segments placed in each category. In accordance with the USEPA guidance (2005 and 2015), some waterbody segments were placed into more than one category as appropriate.

Table 2. California Integrated Report Category Summary

Category	Description	Waterbody Segments
1	All assessed beneficial uses supported and no beneficial uses known to be impaired.	**116**
2	At least one, but not necessarily all, core beneficial use is supported.	**111***
3	There is insufficient data and/or information to make a beneficial use support determination but information and/or data indicates beneficial uses may be potentially threatened.	**72***
4	At least one beneficial use is not supported but a TMDL is not needed.	
4a	A TMDL has been developed and approved by USEPA for a waterbody-pollutant combination and the approved implementation plan is expected to result in full attainment of the water quality standard within a specified time frame.	**34**
4b	Another regulatory program is reasonably expected to result in attainment of the water quality standard within a reasonable, specified time frame.	**16**
4c	The non-attainment of any applicable water quality standard for the waterbody segment is the result of pollution and not caused by a pollutant[4].	**29**
5	At least one beneficial use is not supported and a TMDL is needed.	**166**

* specific number of waterbody segments not available at this time due to database limitations for reporting waterbodies in multiple categories

Detailed Category Reports can be found in Appendices B-H. Pursuant to Section 2 of the Listing Policy, waterbodies remain in Category 5 until all 303(d)-listed pollutants are addressed by USEPA-approved TMDLs or by another regulatory program that is expected to result in the reasonable attainment of the water quality standards, at which point the waterbody will be placed into Category 4a or 4b. Impaired waters are placed in Category 4c if the impairment is not caused by a pollutant but rather caused by pollution, such as flow alteration, habitat alteration, or legacy pollution. Waterbodies placed in Category 4c do not require the development of a TMDL, but nonetheless may be a priority for restoration by a Regional Water Board.

[4] Defined under the CWA as "the man-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of water" (Section 502(19)). Examples of pollution not caused by a pollutant include hydrologic or habitat alteration.

Waterbody-pollutant combinations listed in Category 5 (Appendix B) show the TMDL requirement status. If a “TMDL is still needed” for the waterbody-pollutant combination, the TMDL requirement status is labeled 5A. If the waterbody-pollutant combination is “being addressed by a USEPA approved TMDL,” the TMDL requirement status is labeled 5B. If the waterbody-pollutant combination is “being addressed by an action other than a TMDL”, the TMDL requirement status is labeled 5C. These labels were created for internal tracking within the CalWQA Database and are not Integrated Report sub-categories.

If a waterbody segment had no existing or proposed 303(d) listings, it was placed into Category 1, 2, or 3. Additionally, in order to better present water body conditions in terms of their support of aquatic life, water body segments that meet the criteria for “aquatic life support” were placed into Category 1 or 2, as appropriate. Section “Data Assessment for Category 1and 2 Inclusion” of Chapter Three provides details of this approach. Water bodies were additionally categorized only in terms of “aquatic life support” in the 2014 cycle. The San Diego Water Board will continue to apply this approach to the other core beneficial uses in future cycles.

TMDL Scheduling

A TMDL is a determination of the total maximum daily load(s) of a specific pollutant(s) that can be discharged into a given waterbody without impairing water quality standards. Section 5 of the State Water Board Listing Policy requires the San Diego Water Board to include a TMDL completion schedule date for all waterbody-pollutant combinations placed on the 303(d) List. USEPA guidance (1997) states that “schedules should be expeditious and normally extend from eight to thirteen years in length, but could be shorter or slightly longer depending on State-specific factors.” Therefore, the timeline for completing TMDLs for waterbodies listed for the first time as part of the 2014 Integrated Report is estimated to be no longer than thirteen years, which equates to an estimated completion date of 2027. Expected TMDL completion dates are proposed by San Diego Water Board staff in the fact sheets of this report (Appendix I).

While Appendix H includes a TMDL completion schedule for all waterbody-pollutant combinations placed under Category 5, the number of pollutant-waterbody combinations far outweighs the staff resources available for TMDL development and implementation. Instead of working through the Category 5 List on a pollutant-by-pollutant or waterbody-by-waterbody basis, the San Diego Water Board is utilizing USEPA’s Long Term Vision for Assessment, Restoration, and Protection under the Clean Water Act Section 303(d) Program (USEPA Vision). Under the USEPA Vision, the San Diego Waterbody has prioritized:

1) Protection of those waterbodies already meeting beneficial uses, and
2) Meaningful restoration of waterbodies using environmental outcomes and TMDL alternative approaches.

This approach, which is encouraged by the USEPA Vision, is expected to result in meaningful net gains in water quality in a shorter time period at less cost. Where alternative approaches do not result in beneficial use attainment, the traditional TMDL approach may still be warranted and utilized.

Examples of alternative approaches in progress include additional prohibitions on non-stormwater discharges in NPDES permits, issuing Cleanup and Abatement Orders, and facilitating community-generated restoration plans such as Water Quality Improvement Plan for Loma Alta Slough (Resolution R9-2014-0020).

While the USEPA Vision provides a new framework for implementing the CWA 303(d) program, it does not alter state and EPA responsibilities or authorities under the CWA 303(d) regulations. With the recognition that there is not a "one size fits all" approach to restoring and protecting water resources, USEPA is allowing states to be able to develop tailored strategies to implement their CWA 303(d) program responsibilities in the context of their water quality goals.

The USEPA Vision asked states to identify regional priorities for the 2016-2022 period considering both restoration of impaired waters and protection of high quality waters. These would become the focus of reporting to USEPA regarding the 303(d) and TMDL Programs.

In response, the San Diego Water Board identified the following:

1. San Diego Bay, specifically bioaccumulation affecting commercial and sport fishing and shellfish harvesting.
2. Santa Margarita Estuary eutrophication affecting the estuarine and non-contact recreation beneficial uses.
3. Protection of high quality and minimally-impacted freshwater streams supporting the cold- and warm water beneficial uses.

Chapter 3. Explanation of Specific Analyses:

Bioassessment Data for Wadeable Streams

Introduction

While the San Diego Water Board is tasked with protecting the physical, chemical, and biological integrity of surface waters, existing water quality objectives in the San Diego Water Board's Basin Plan emphasize the chemical integrity of waters on a pollutant by pollutant basis, which assumes that water quality objectives for pollutants will, if attained, result in beneficial use attainment and protection. However, the use of chemistry alone may not adequately protect the biological integrity of waters due to the temporal and spatial extent of chemical monitoring, the number of chemicals monitored, cumulative effects, and the inability of chemistry to detect impairment caused by other factors (e.g. habitat modification). The evaluation of the biological integrity of waters is often referred to as bioassessment. The use of bioassessment can give a better indication of the status of a waterbody and if beneficial uses are being protected or impaired.

The State of California has been conducting bioassessment monitoring using stream benthic macroinvertebrates for over fifteen years in the San Diego Region. The State of California's Surface Water Ambient Monitoring Program (SWAMP) has developed standard operating procedures for bioassessment field collection, lab identification, quality assurance/control, and data management. The development of biological scoring tools, often referred to as indices or metrics, has been on-going during that time period, with various regional indices developed throughout the State (e.g. Ode et al. 2005).

In 2014 the State of California released a peer-reviewed statewide California Stream Condition Index (CSCI, Mazor et al. 2016) for use in wadaeble streams throughout the State. The CSCI utilizes a combined reference site approach to determine the site specific benthic community expected to be present at any sampled site.

In prior Integrated Report cycles, the San Diego Water Board utilized benthic macroinvertebrate data and conducted assessments using an Index of Biotic Integrity (IBI) developed for southern California. While the data was entered as LOEs during prior listing cycles, it was not used for listing decision purposes under section 303(d) of the CWA, nor was it used for identifying sites with beneficial uses supported pursuant to section 305(b).

For this Integrated Report the San Diego Water Board is utilizing benthic macroinvertebrate data and the CSCI to assess stream beneficial use attainment pursuant to CWA 303(d) and 305(b).

Bioassessment and Impairment under Categories 4 and 5

Biological Populations and Communities

The assessment for beneficial use impairment under CWA section 303(d) is being conducted in accordance with the State Water Board's Listing Policy. The Listing Policy states the following regarding how bioassessment data should be used for making Listing/Delisting recommendations:

> 3.9 Degradation of Biological Populations and Communities (Listing)
> A water segment shall be placed on the section 303(d) list if the water segment exhibits significant degradation in biological populations and/or communities as compared to reference site(s) and is associated with water or sediment concentrations of pollutants including but not limited to chemical concentrations, temperature, dissolved oxygen, and trash. This condition requires diminished numbers of species or individuals of a single species or other metrics when compared to reference site(s). The analysis should rely on measurements from at least two stations. Comparisons to reference site conditions shall be made during similar season and/or hydrologic conditions. Association of chemical concentrations, temperature, dissolved oxygen, trash, and other pollutants shall be determined using sections 3.1, 3.2, 3.6, 3.7, 6.1.5.9, or other applicable sections.
>
> For population or community degradation related to sedimentation, the water segment shall be placed on the section 303(d) list if degraded populations or communities are identified and effects are associated with clean sediment loads in water or with loads stored in the channel when compared to evaluation guidelines (satisfying the conditions of section 6.1.3) using the binomial distribution as described in section 3.1 or as compared to reference sites. Bioassessment data used for listing decisions shall be consistent with section 6.1.5.8. For bioassessment, measurements at one stream reach may be sufficient to warrant listing provided that the impairment is associated with a pollutant(s) as described in this section.
>
> 4.9 Degradation of Biological Populations and Communities (Delisting)
> Biological populations and communities degradation in the water segment is no longer evident as compared to reference site(s) or associated water or sediment numeric pollutant-specific evaluation guidelines are not exceeded using the binomial distribution as described in section 4.1.

From Section 6 of the Listing Policy (Policy Implementation)
6.1.5.8 Evaluation of Bioassessment Data
When evaluating biological data and information, RWQCBs shall evaluate all readily available data and information and shall:

- Identify appropriate reference sites within water segments, watersheds, or ecoregions.
- Document methods for selection of reference sites.
- Evaluate bioassessment data at reference sites using water segment-appropriate method(s) and index period(s). Document sampling methods, index periods, and Quality Assurance/Quality Control procedures for the habitat being sampled and question(s) being asked.
- Evaluate bioassessment data from other sites, and compare to reference conditions. Evaluate physical habitat data and other water quality data, when available, to support conclusions about the status of the water segment.
- Calculate biological metrics for reference sites and develop Index of Biological Integrity if possible.

California Stream Condition Index and Chemistry/Toxicity

The San Diego Water Board utilized CSCI scores to determine if a waterbody segment exhibits significant degradation in the biological community, with the 10th percentile of reference sites used as a threshold for detection of degradation (Mazor *et al.* 2016). The CSCI meets the requirements set forth in Sections 3.9 and 6.1.5.8 of the Listing Policy by utilizing a reference site approach that is consistent region- and state-wide. Where CSCI scores show degradation at multiple sites in a receiving water, or at a site over multiple years, the San Diego Water Board evaluated additional chemistry and toxicity data to determine if one or more associated pollutants were exceeding water quality standards.

This approach is consistent with the 2010 Integrated Reporting cycle for the Los Angeles Regional Water Quality Control Board, which utilized bioassessment data in accordance with the Listing Policy to place waters on its CWA section 303(d) list for "Benthic Community Effects." These listings for impairment were approved by the Los Angeles Regional Water Quality Control Board, the State Water Resources Control Board, and USEPA.[5]

[5] These Benthic Community Effects listings utilized the Ode et al. 2005 IBI. IBI scores were calculated for this Integrated Report but were not utilized in Listing Decisions.

The water quality chemistry/toxicity and bioassessment data provide a substantial basis that impacts to the benthic macroinvertebrate populations may be caused or contributed to by one or more associated pollutants in the waterbody. The Listing Policy does not specify that a pollutant specific causal relationship be established for listing for Benthic Community Effects. This is consistent with the Integrated Report Guidance from USEPA, which states that when existing and readily available data and information (biological, chemical or physical) are sufficient to determine that a pollutant has caused, is suspected of causing, or is projected to cause the impairment, that receiving water should be listed in Category 5 (USEPA 2002).

Where CSCI scores show degradation at multiple sites in a receiving water, or at a site over multiple years, the San Diego Water Board considered the waterbody to exhibit significant degradation and evaluated additional chemistry and toxicity data to determine if one or more associated pollutants were exceeding water quality standards. Where this was the case, waterbody segments were listed as impaired under Category 5 for Benthic Community Effects (Table 3). If a stream exhibited degradation at multiple sites or over multiple years but chemistry/toxicity data was not associated or was not collected, the stream was evaluated for inclusion under Category 4c. If data and information was insufficient for inclusion in Category 4c, the stream was placed under Category 3 (insufficient information).

California Stream Condition Index and Pollution

Section 3.9 of the Listing Policy states that a water segment shall be placed on the section 303(d) list if the water segment exhibits significant degradation in biological populations and/or communities as compared to reference site(s) and is associated with water or sediment concentrations of pollutants. The focus of prior listing cycles has been on the assessment of pollutants under Category 5. However, water segments often may exhibit significant degradation in biological populations and/or communities that are not associated with concentrations of pollutants, or may exhibit degradation due to concentrations of pollutants combined with other factors not associated with a specific pollutant.

On August 13, 2015, USEPA released additional guidance on Integrated Reporting and Listing Decisions, which included a clarification regarding the assessment and assignment of waters to Category 4c for impairment by "pollution" (USEPA 2015). For stream systems common forms of "pollution" include hydrologic and/or habitat alteration, and USEPA recommends "data and/or *information* documenting significant hydrologic or habitat alteration could be used to make a use attainment decision for an impairment due to pollution not caused by a pollutant and should be collected, evaluated, and reported as appropriate."

In the San Diego Region hydrologic and habitat alteration impacts on streams are widespread. Thus, where a water segment exhibited significant degradation in biological populations and/or communities as compared to reference site(s) the San Diego Water Board assessed the segment for inclusion in Category 4c using data and information as prescribed in USEPA's 2015 Guidance:

> "Category 4C If States have data and/or information that a water is impaired due to pollution not caused by a pollutant (e.g., aquatic life use is not supported due to hydrologic alteration or habitat alteration), those causes should be identified and that water should be assigned to Category 4C. Examples of hydrologic alteration include: a perennial water is dry; no longer has flow; has low flow; has stand-alone pools; has extreme high flows; or has other significant alteration of the frequency, magnitude, duration or rate-of-change of natural flows in a water; or a water is characterized by entrenchment, bank destabilization, or channelization. Where circumstances such as unnatural low flow, no flow or stand-alone pools prevent sampling, it may be appropriate to place that water in Category 4C for impairment due to pollution not caused by a pollutant. In order to simplify and clarify the identification of waters impaired by pollution not caused by a pollutant, States may create further sub-categories to distinguish such waters. While TMDLs are not required for waterbody impairments assigned to Category 4C, States can employ a variety of watershed restoration tools and approaches to address the source(s) of the impairment."

Where in-stream data was lacking, stream segments were evaluated using desktop aerial reconnaissance for potential in-stream habitat and hydrologic alteration associated with channel modifications, stream diversion or augmentation, and to evaluate the level of associated development and use of best management practices to mitigate hydromodification.

It is important to note that USEPA recommended in its 2015 guidance that "States assign all of their surface water segments to **one or more of five reporting categories**" (emphasis added). Specific guidance includes the following:

> "Category 5 If States have data and/or information that a water is impaired due to a pollutant, it would need to be reported in Category 5. This is true even if this segment is also in Category 4C for an impairment due to pollution not caused by a pollutant. In that case, the State should list that water in Category 5 and identify the pollutant causing the impairment (e.g., nutrients) and should also indicate the nature of the pollution (e.g., hydrologic alteration) as a cause of impairment under Category 4C. If the water is later delisted for the pollutant (e.g., nutrients), but pollution (e.g., hydrologic alteration) is still impairing the water's use, then the water should remain in Category 4C. Consistent with previous IR Guidance, if a waterbody is impaired or If assessment of new data and/or information subsequently demonstrates that the impairment is not associated with a pollutant and is due to pollution not caused by a pollutant, the waterbody-pollutant combination would no longer need to be assigned to Category 5 and may be placed into Category 4C."

In the San Diego Water Board's evaluation of bioassessment data and stream segment information, over 96 percent of streams that exhibited biological degradation had both an associated pollutant(s) and supporting information showing pollution from in-stream habitat/hydrologic alteration and/or watershed hydrologic alteration (hydromodification, Table 3).

Table 3. List of Stream Segments under Categories 4 and/or 5 for Impaired Benthic Community Effects

Hydrologic Unit	Waterbody Segment	Category 3	Category 4	Category 5	Category 4 Associated Pollution	Category 5 Associated Pollutant(s)
901	Aliso Creek	No	4c	Yes	Habitat Alteration, Hydromodification	Toxicity, Pesticides, Nutrients, Selenium
901	Arroyo Trabuco Creek*	No	4c	Yes	Habitat Alteration, Hydromodification	Toxicity, Pesticides, Nutrients, Metals
901	English Canyon	No	4c	Yes	Habitat Alteration, Hydromodification	Toxicity, Pesticides, Nutrients, Selenium
901	Laguna Canyon Channel	No	4c	Yes	Habitat Alteration, Hydromodification	Toxicity, Pesticides, Nutrients, Mercury
901	Salt Creek	No	4c	Yes	Habitat Alteration, Hydromodification	Toxicity, Pesticides, Mercury
901	San Juan Creek*	No	4c	Yes	Habitat Alteration, Hydromodification	Toxicity, Pesticides, Nutrients, Selenium, Mercury
901	Segunda Descheca Creek	No	4c	Yes	Habitat Alteration, Hydromodification	Toxicity, Pesticides, Nutrients, Metals
901	Wood Canyon	No	4c	Yes	Habitat Alteration, Hydromodification	Toxicity, Pesticides, Selenium
902	Santa Margarita River Lower	No	4c	Yes	Habitat Alteration, Hydromodification	Toxicity, Pesticides, Nutrients
903	San Luis Rey Lower	No	4c	Yes	Habitat Alteration, Hydromodification	Toxicity, Pesticides, Nutrients, Selenium
904	Agua Hedionda Creek	No	4c	Yes	Habitat Alteration, Hydromodification	Toxicity, Pesticides, Nutrients
904	Buena Vista Creek	No	4c	Yes	Habitat Alteration, Hydromodification	Toxicity, Pesticides, Selenium
904	Cottonwood Creek Encinitas	No	4c	Yes	Habitat Alteration, Hydromodification	Toxicity, Pesticides, Nutrients, Selenium
904	Encinitas Creek	No	4c	Yes	Habitat Alteration, Hydromodification	Toxicity, Nutrients, Selenium
904	Escondido Creek	No	4c	Yes	Habitat Alteration, Hydromodification	Toxicity, Pesticides, Nutrients
904	Loma Alta Creek	No	4c	Yes	Habitat Alteration, Hydromodification	Toxicity, Pesticides, Selenium
904	San Marcos Creek above San Marco Reservoir*	No	4c	Yes	Habitat Alteration, Hydromodification	Toxicity, Pesticides, Nutrients, Selenium
905	Green Valley Creek	No	4c	Yes	Habitat Alteration, Hydromodification	Toxicity, Pesticides, Nutrients

Hydrologic Unit	Waterbody Segment	Category 3	Category 4	Category 5	Category 4 Associated Pollution	Category 5 Associated Pollutant(s)
905	San Dieguito River below Hodges Reservoir	No	4c	Yes	Habitat Alteration, Hydromodification	Toxicity, Nutrients, TDS
906	Carroll Canyon Creek	No	4c	Yes	Habitat Alteration, Hydromodification	Toxicity
906	Los Penasquitos Creek	No	4c	Yes	Habitat Alteration, Hydromodification	Toxicity, Pesticides, Nutrients, Selenium
906	Rose Creek	No	4c	Yes	Habitat Alteration, Hydromodification	Toxicity, Selenium
906	Tecolote Creek	No	4c	Yes	Habitat Alteration, Hydromodification	Toxicity, Pesticides, Nutrients, Selenium, Turbidity
907	Forester Creek	No	4c	Yes	Habitat Alteration, Hydromodification	Nutrients, Selenium, TDS
907	San Diego River Lower	No	4c	Yes	Habitat Alteration, Hydromodification	Toxicity, Pesticides, Nutrients, Cadmium
909	Sweetwater River Above Sweetwater Reservoir	No	4c	Yes	Habitat Alteration, Hydromodification	Toxicity, Pesticides, Nutrients, Selenium, TDS
909	Sweetwater River Below Sweetwater Reservoir	No	4c	Yes	Habitat Alteration, Hydromodification	Nutrients, Aluminum, Selenium
911	Campo Creek Upper*	No	4c	No	Prior Listing: Unknown	None
911	Tijuana River	No	4c	Yes	Habitat Alteration, Hydromodification	Toxicity, Pesticides, Nutrients, Selenium

Stream Segment Footnotes

The following stream segments have the following clarifications regarding segment scores and spatial listings:

- San Juan Creek: The entire segment is currently mapped. Recent CSCI scores suggest a lack of impairment in the upper watershed within the Cleveland National Forest.
- Trabuco Creek: The entire segment is currently mapped. Scores within upper Trabuco Creek within the Cleveland National Forest indicate no degradation when compared to reference.
- San Marcos Creek: The entire stream is currently mapped as one segment. Scores below San Marcos Reservoir do not indicate degradation while those above do.
- Campo Creek: Two sites for this creek were sampled. Downstream scores were not degraded while a subset of upstream scores were. No pollutants are associated with the upstream site, though it was historically listed under Category 4c (unknown pollution). Additional information is needed regarding the segment.

CSCI Score Quality

The San Diego Water Board utilized CSCI scores calculated by the State of California and the Southern California Coastal Waters Research Project (SCCWRP) in accordance with the latest *Guidance for calculating scores using GIS and R* (Mazor *et al.* 2015). The San Diego Water Board followed recommendations for exclusion of samples with low benthic macroinvertebrate counts. The San Diego Water Board did include sites that were identified to SAFIT[6] Level 1. The percent of ambiguous taxa and individual values were examined, followed by a calculation of the best possible CSCI score for the site by assuming the maximum diversity of expected Chironomidae subfamilies at a site was present. This represents an over-estimation bias of the score (e.g. a likely better scored than actually observed). Sites with CSCI scores less than the 10th percentile of reference sites threshold were thus likely over-estimated and still remained in a degraded condition when compared to reference.

Data Assessment for Category 1 and 2 Inclusion

Section 305(b) of the CWA requires the State of California to prepare a report on the quality of waters. While the focus of the Integrated Report is typically on which waters are identified as "impaired," or not meeting water quality standards (Categories 4 and/or 5), less attention is often on which waters have data and information available that indicates water quality standards are being attained for all or some beneficial uses assessed, referred to as Category 1 and 2, respectively. USEPA has drafted and utilizes its own Category definitions for Category 1 and 2. However, because Categories 1-3 are part of the 305(b) report and for informational use only, States and Regions can and do alter those definitions to be consistent with their own integrated reporting purposes.

Category 1

Historically some States and Regions have defined Category 1 as fully supporting all beneficial uses. While the intent of the Integrated Report is to identify those waterbodies supporting beneficial uses, the ability to fully assess a waterbody segment for all beneficial uses to list as Category 1 is largely infeasible and not cost effective, resulting in a lack of waterbody segments identified as meeting beneficial uses. Listing under Category 1 should not be construed as identifying a waterbody as high quality, reference, or pristine. Rather, Category 1 indicates that beneficial uses are met, which is the expected condition for that waterbody segment. Thus, consistent with recommendations from the State Water Board, the San Diego Water Board is utilizing the following to refine the definition for Category 1 from the existing "all core beneficial uses are supported" to "all assessed beneficial uses supported and no beneficial uses are known to be impaired." This approach is consistent with USEPA recommendations on assessment for Category 1 (USEPA 2006). It is possible that waterbodies identified in Category 1 may be more appropriately placed in Category 2 (below), but lack the data to assess other beneficial use impairment during a reporting cycle. Should future assessments identify other beneficial uses as impaired, waterbodies may be reassigned categories.

[6] Southwest Association of Freshwater Invertebrate Taxonomists

Category 2

During the last Listing Cycle (2010) for the Integrated Report in the San Diego Region, the following definition was utilized for placing a waterbody segment in Category 2:

"At least one core beneficial use is supported."

For the 2012 Listing Cycle the State Water Board utilized the following definition for Category 2:

"At least one core beneficial use is supported and none are impaired."

Current State Water Board guidance recommends using:

"There is insufficient information to determine beneficial use support."

For this listing cycle, the San Diego Water Board utilizes the definition of "At least one, but not necessarily all, core beneficial use is supported." This definition, similar to the one used in 2010, was employed due to existing USPEA guidance (USEPA 2005 and 2015), which recommend placing waterbody segments into multiple categories as applicable. Given the core beneficial uses are related to swimming, drinking, fish and shellfish consumption, and ecosystem health, it is important to identify those locations where specific beneficial uses are supported despite potential impairments of other beneficial uses. For example, a waterbody segment in San Diego Bay might be safe to swim though fish tissue pollutant levels impair the commercial and sport fishing (COMM) beneficial use. In this situation staff could place an assessed waterbody segment into **both** Category 2 and 5. The San Diego Water Board contends this distinction is important as the public should be aware of areas where things are meeting beneficial uses as well as where they are not. Unfortunately the current database from the State Water Board makes this distinction largely infeasible when assessing all data received. During this Integrated Report the San Diego Water Board opted to move some Category 1 waterbodies into Category 2 due to evidence received regarding additional impairments.

Category 1 for Wadaeble Streams

To determine if a wadaeble stream qualified for Category 1, the San Diego Water Board utilized a multiple line of evidence approach with a focus on biological endpoints. The best available data and information was used to assess if beneficial uses were being attained for waterbodies during this listing cycle, with a focus on wadaeble streams. For wadaeble streams the CSCI, indices of biotic integrity for Algae (Fetscher *et al.* 2013), and the California Rapid Assessment Method (CRAM) were utilized to assess if aquatic life beneficial uses of WILD and COLD were being met. Water segment data were compared to reference percentiles for the CSCI (30th), indices of biotic integrity for algae (10th), and CRAM (10th). Water chemistry was utilized as a secondary line of evidence. Where multiple lines of evidence were limited (e.g. benthic macroinvertebrate data only), additional information on land use was utilized in order to more fully assess a site's condition (e.g. Ode *et al.* 2015).

It is important to note that the San Diego Water Board is listing a waterbody under Category 1 for beneficial uses assessed, which include WARM and COLD. The beneficial use definitions for WARM and COLD are as follows:

> Warm Freshwater Habitat (WARM) - Includes uses of water that support warm water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish or wildlife, including invertebrates.
>
> Cold Freshwater Habitat (COLD) - Includes uses of water that support cold water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish or wildlife, including invertebrates.

Many waterbodies, including those listed as Category 1 herein, have beneficial uses for which assessments were not specifically done. For example, assessment of the attainment of contact recreation (REC-1) may not be conducted at some water segments, such as wadaeble streams, due to a lack of monitoring data, inadequate spatial and temporal data. This does not necessarily mean the beneficial use is met, nor should a lack of assessment be perceived as a lack of attainment. A similar lack of assessment may be present for other beneficial uses, including, but not limited to, multiple species under RARE, fish consumption in remote locations (COMM), and for non-water contact activities (REC-2).

Figure 1. Category 1 Waterbody: Upper Agua Caliente Creek (photo: C. Loflen)

Category 2 for Wadaeble Streams

The San Diego Water Board received data from the California Department of Fish and Wildlife regarding the attainment of the SPAWN and RARE beneficial use for the endangered Southern California Steelhead (*Oncorhynchus mykiss*) in San Mateo Creek. San Mateo Creek is listed as Critical Habitat for the Southern California Steelhead and was originally included as a Category 1 water segment related to the assessment of stream health and biological condition respective to benthic macroinvertebrates, algae, and riparian habitat for the WARM and COLD beneficial uses. Steelhead were historically present in San Mateo Creek and tributaries, with fish documented as present up until 2002 by the California Department of Fish and Wildlife (Hovey 2004, Clemento et al. 2009). However, more recent repeat surveys of San Mateo Creek by the California Department of Fish and Wildlife, Marine Corps Base at Camp Pendleton, and United States Forest Service provide evidence that invasive species are limiting attainment of RARE and SPAWN for this water segment for steelhead (Hunt 2008, Wilcox 2012). Surveys conducted during the critical period found over 12,700 non-native species dominating over-summering refuge pools, and no steelhead were documented as present (Wilcox 2012, CDFW 2015). The stress from non-native competition in refuge pools can prevent steelhead from surviving thermal stress associated with low or no flow summer conditions (Mathews and Berg 1997,

Spina 2007). In addition, the direct and indirect effects of high densities of non-natives on young-of-year steelhead can prevent their survival and can limit adequate growth for smolt survival (Hovey 2004). Thus, San Mateo Creek will be placed into Category 2 as some core beneficial uses are currently achieved. However, the waterbody segment has simultaneously been placed in Category 5 due to the presence of invasive species causing impairment

The CWA (Section 502) defines pollutant as:
dredged spoil, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, ***biological materials***, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water (emphasis added)

This approach is consistent with prior decisions by Regional Boards for assessment of degradation associated with invasive species as pollutants (e.g. non-native crabs in Bodega Harbor).

The following sites/streams were identified for Listing as Category 1 or 2 for the Integrated Report for Warm Freshwater Habitat and Cold Freshwater Habitat:

Table 4. List of Stream Segments under Categories 1 or 2 for COLD/WARM

Category	Hydrologic Unit	Waterbody
1	901	Upper Arroyo Trabuco
1	901	Hot Spring Canyon Creek
2	901	San Mateo Creek
1	902	Roblar Creek
1	903	Upper Agua Caliente Creek
1	903	Upper Pauma Creek
1	903	Doane Creek
1	903	Fry Creek
1	903	Iron Springs Creek
1	905	Santa Ysabel Creek below Witch Creek
1	905	Carney Canyon Creek
1	905	Boden Canyon Creek
1	905	Temescal Creek above Pamo Road
1	907	Cedar Creek
1	907	Upper San Diego River
1	907	Upper King Creek
1	907	Boulder Creek above Boulder Creek Road
1	909	Japacha Creek above 79
1	909	Sweetwater River above Tanglewood Lane

Category	Hydrologic Unit	Waterbody
1	909	Cold Spring Creek
1	911	Noble Canyon
1	911	Indian Creek
1	911	Pine Valley Creek above Barrett Reservoir
1	911	Kitchen Creek above Kitchen Creek Road
1	911	Long Canyon Creek at Cibbets Flat
1	911	Wilson Creek above Barrett Reservoir

Fish Consumption Advisories in the San Diego Region

The core beneficial use question "Is it safe to eat fish and shellfish" is typically addressed in terms of waterbody impairment in Regional Board Integrated Reports by comparing fish and shellfish tissue data to risk-based chemical thresholds. However, the State of California Office of Environmental Health Hazard Assessment (OEHHA) is the agency responsible for issuance of consumption advisories for specific waterbodies and species. Evaluation by OEHHA weighs factors beyond individual thresholds on a pollutant by pollutant basis, such as synergistic effects. In order to develop consumption advisories OEHHA collects available fish tissue data (e.g. SWAMP data), evaluates data quantity and quality sufficiency, identifies pollutants of concern, and calculates relative risk related to consumption of tissues (primarily fillets) for segments of the general public. This process is similar to the San Diego Water Board evaluation of lines of evidence and subsequent decision making for individual pollutants in the Integrated Report.

The Listing Policy under Section 3.4 states as follows:

> *3.4 Health Advisories*
> *A water segment shall be placed on the section 303(d) list if a health advisory against the consumption of edible resident organisms, or a shellfish harvesting ban has been issued by the Office of Environmental Health Hazard Assessment (OEHHA), or Department of Health Services and there is a designated or existing fish consumption beneficial use for the segment. In addition, water segment-specific data must be available indicating the evaluation guideline for tissue is exceeded.*

On October 22, 2013, OEHHA an individual *Health Advisory and Safe Eating Guidelines for Eating Fish* for both San Diego and Mission Bay. The pollutants used as the basis for both consumption advisories were PCBs and mercury. The data for both advisories was collected by the State of California through the Coastal Fish Contamination Program and SWAMP from 1999 to 2009, consistent with the Integrated Report data time frame period. The water segment-specific data is publically available through the California Environmental Data Exchange Network (CEDEN) and the OEHHA advisories, including evaluation guidelines used for data comparison, are publically available documents[7]. Thus, section 3.4 of the Listing Policy is satisfied for utilizing the OEHHA health advisories for listing purposes for PCBs and Mercury in fish tissue due to impairment of the COMM beneficial use in the San Diego Water Board Basin Plan.

[7] http://oehha.ca.gov/fish

For San Diego Bay, the health advisory against edible resident organisms includes recommendations of no consumption and limited consumption. San Diego Bay is currently listed as impaired for fish consumption due to PCBs. Based on Section 3.4 of the Listing Policy, the OEHHA consumption advisory warrants not delisting San Diego Bay for impairment (Category 5) due to PCBs in fish tissue and listing for impairment due to mercury in fish tissue.

For Mission Bay, the health advisory against resident organisms includes recommendations of limited consumption for the sensitive population. Mission Bay is not currently listed as impaired for fish consumption. Based on section 3.4 of the Listing Policy, the OEHHA consumption advisory warrants listing Mission Bay for impairment (Category 5) due to PCBs and mercury in fish tissue. It is important to note that PCBs were much lower in Mission Bay than San Diego Bay, with elevated levels present in fewer species and at lower concentrations. The San Diego Water Board intends to ask OEHHA to consider a re-assessment of Mission Bay PCBs in fish tissue.

Chapter 4. Discussion of Changes to 303(d) listings of the San Diego Region

Statistics of Data Reviewed

Compared to the previous cycle, the volume of data submitted for review in the 2014 cycle increased roughly 190 percent, resulting in a total number of 4,996 lines of evidence (LOEs) generated, requiring 3,548 decisions. Table 5 shows the comparison of data reviewed, in terms of waterbody segments assessed, LOE generated, and decisions made, in cycles of the Integrated Report from 2006 to 2014.

Table 5. Comparison of Data Reviewed in Integrated Report Cycles 2006 through 2014

Statistics		2014	2010	2006
Total Number of Waterbody Segments		404	274	Not Available
Total Number of (new) LOEs		4996	2635	1424
Total Number of Decisions	Total	3548	1623	935
	New + Revised	2612	724	28
	Original	936	899	907

Source of information: CalWQA database 2010, (search results of 06/26/2016)

Results of 2014 Integrated Report

Results of data assessment show a proposed new listing of 237 and delisting of 9 waterbody/pollutant combinations in the 2014 Integrated Report (Appendix A), with both numbers lower than in the previous cycle of 2010 (345 new listings and 134 delistings). The relatively large number of revised listings in the 2014 cycle is likely due to the significantly increased volume of new water quality data that was submitted for the 2014 cycle, the protective water quality standards applicable to these waterbodies, the correction of errors from the last cycle,[8] and the requirements of the Listing Policy to evaluate all readily available data. Therefore, the number of proposed revised listings does not necessarily reflect an overall decrease in water quality since the previous (2010) listing cycle.

Of all current listings of pollutants (i.e., waterbody/pollutant pairs corresponding to water body segments in Categories 4 and 5) in the San Diego Region, indicator bacteria (21%), nutrients (20%) and metals[9] (20%), are the top three categories of pollutants that collectively account for more than half of all listings. Pesticides and toxicity each account for about eight percent of total listings. The detailed breakdown of listings as a result of the 2014-cycle assessment is presented in Appendix A and Figure 2.

[8] Section 6.7 of the Listing Policy requires nutrients being evaluated as toxicants, for which the allowable exceedance rates are lower than for conventional pollutants. In 2010, nutrients were mistakenly evaluated as conventional pollutants and these errors were corrected in the 2014 cycle.
[9] Including Section 64431 California Code of Regulations Title 22 metals and aluminum, iron, and manganese.

Figure 2. Pollutant Listings by Category

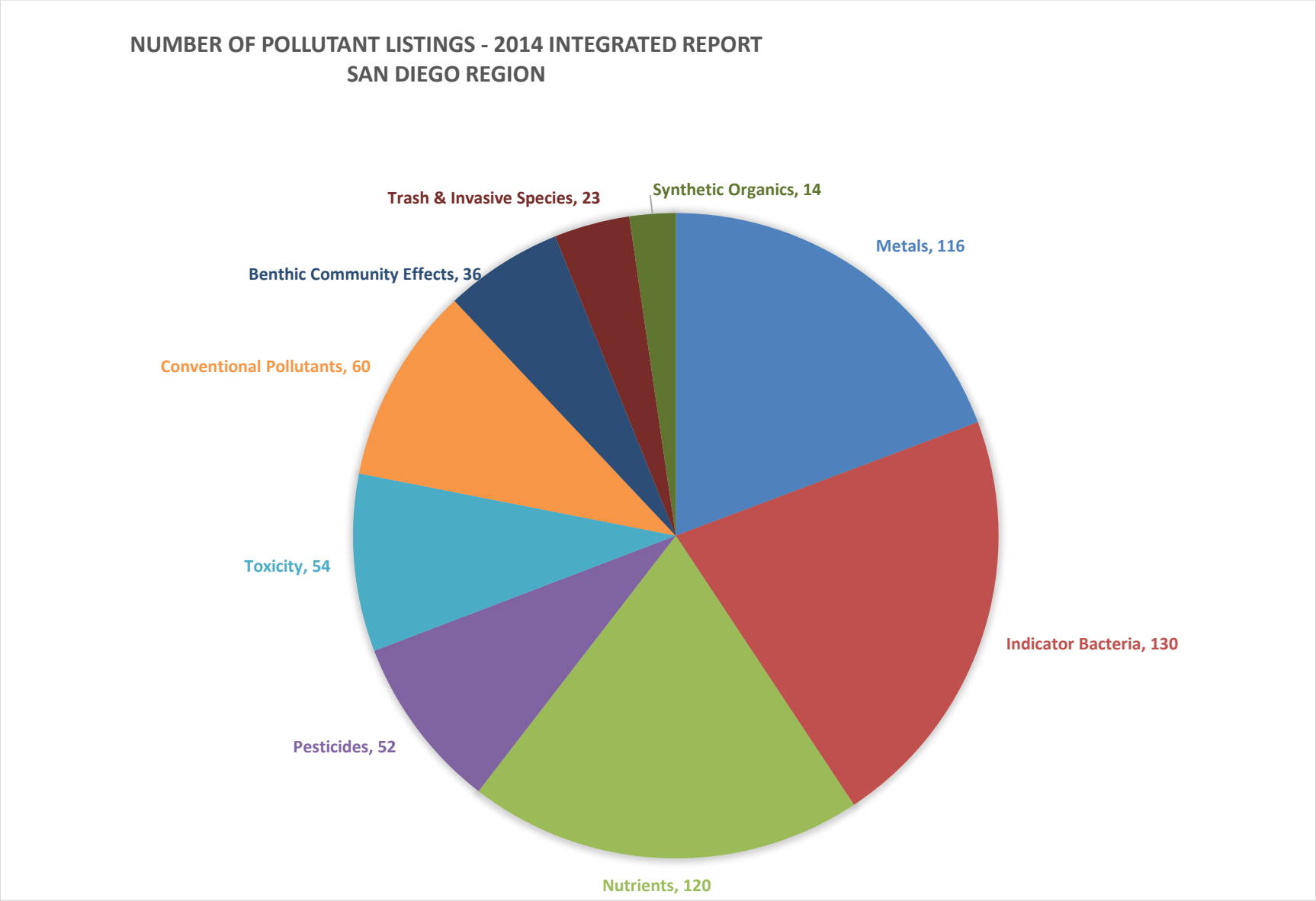

Adopted TMDLs and TMDLs in Progress

Pursuant to Section 2 of the Listing Policy, waterbodies remain in Category 5 until **all 303(d)-listed pollutants** are addressed by USEPA-approved TMDLs or by another regulatory program that is expected to result in the reasonable attainment of the water quality standards ("TMDL Alternative"). Only when all 303(d)-listed pollutants are addressed by TMDLs will the waterbody will be placed into Category 4a (TMDL) or 4b (TMDL Alternative). Thus, those waterbodies with existing TMDLs but with new listings remain in Category 5 and are not easily distinguished as having improved due to a TMDL process. In addition, numerous waterbodies have TMDLs or TMDL Alternatives in progress. These efforts were not wholly captured by the Integrated Report database and should be acknowledged, specifically for TMDL Alternatives in progress as they involve a wide variety of stakeholders and can be implemented in a shorter timeframe than traditional TMDLs, potentially at less cost. For reporting purposes, TMDL Alternatives in progress are identified as Category 5-Alt. This identifies the waterbody as impaired but now provides clarity on the current expected course of action for that waterbody-pollutant combination. Should the TMDL Alternative approach be insufficient these may revert into traditional TMDLs. Existing USEPA approved TMDLs and TMDL Alternatives as well as TMDLs and TMDL Alternatives in progress (5-Alt) are included in Table 6:

Table 6. San Diego Region TMDLs and TMDL Alternatives: Adopted or In Progress

Waterbody	Pollutant	Adopted	In Progress
Chollas Creek	Diazinon	TMDL 2002	-
Chollas Creek	Copper, Lead, Zinc	TMDL 2007	
Rainbow Creek	Nitrogen, Phosphorus	TMDL 2005	-
Shelter Island Yacht Basin	Copper	TMDL 2005	-
20 Beaches and Creeks	Indicator Bacteria	TMDL 2010	-
Baby Beach and Shelter Island Park	Indicator Bacteria	TMDL 2008	-
Los Penasquitos	Sediment	TMDL 2012	-
Loma Alta Slough	Phosphorus	TMDL Alternative 2014 [a]	[a]
Famosa Slough	Eutrophication	-	TMDL Alternative (5-Alt)
Santa Margarita Estuary	Eutrophication	-	TMDL Alternative (5-Alt)
Tijuana River and Estuary	Sediment, Trash	-	TMDL Alternative (5-Alt)[b]
Lake San Marcos	Eutrophication	-	TMDL Alternative (5-Alt)
San Diego Bay Marine Sediments: Multiple Locations	Toxicity, Bioaccumulation	-	TMDL, TMDL Alternative (5-Alt)

[a] Adopted by San Diego Water Board, Water Quality Improvement Plan and USEPA Approval Pending
[b] State Water Board's Trash Policy including Implementation Plan

Approaches for the identified TMDL alternatives include:

1. Loma Alta Slough. The eutrophication impairment will be addressed the Water Quality Improvement Plan for the Carlsbad Watershed Management Area. This strategy was endorsed by the San Diego Water Board via Resolution No. R9-2014-0020 in June 2014.

2. Famosa Slough. The eutrophication impairment will be addressed via the Water Quality Improvement Plan for the San Diego River Management Area. A resolution in support of this strategy is anticipated to be considered by the Water Board in Spring 2017.

3. Tijuana River and Estuary. The sediment and trash impairments will be addressed by the efforts of the Tijuana River Valley Recovery Team. This strategy was endorsed by the San Diego Water Board via Resolution No. R9-2012-0030 in February 2012.

4. Lake San Marcos. The eutrophication impairment may be addressed via a non-TMDL alternative involving responsible parties. The Executive Officer of the San Diego Water Board issued Investigative Order R9-2011-0033 to the Citizens Development Corporation to complement voluntary diagnostic efforts by various other parties. As described in the Investigative Order, subsequent cleanup activities are expected to occur either voluntarily or through enforcement actions, such as a Cleanup and Abatement Order issued by the Water Board under Water Code section 13304.

5. San Diego Bay. Several marine sediment impairments are being addressed by various Investigative Orders issued pursuant to Water Code section 13267 and Cleanup and Abatement Orders issued pursuant to Water Code section 13304.

Chapter 5. Public Review and Board Approval

Pursuant to section 6.2 of the Listing Policy, waterbodies listed in Category 4a, 4b, or 5, require public review and approval by the Regional Water Board during a public Board hearing and are then submitted to the State Water Board for compiling into the California section 303(d) list of impaired waters. Waterbodies listed in Categories 1, 2, 3, or 4c are provided as additional waterbody information and will be submitted to the State Water Board for inclusion into the California Integrated Report. Once compiled, the California Integrated Report is noticed for additional public review and approval by the Executive Director or State Water Board, as outlined in section 6.3 of the Listing Policy. The California Category 5 list (i.e., 303(d)-listed waterbodies) will require final approval by the USEPA. If USEPA determines that changes are needed to the submitted report it will initiate further public review before finalizing and publishing the report.

References

For a complete list of references used in all the assessment fact sheets, see Appendix K.

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			New Listings	New Delistings	Pollutant Name Change	Other Revisions
9	Agua Hedionda Creek	Benthic Community Effects	Y			
		Bifenthrin	Y			
		Chlorpyrifos	Y			
		Cypermethrin	Y			
		Indicator Bacteria			Y	
		Malathion	Y			
		Manganese				
		Nitrogen			Y	
		Phosphorus				
		Selenium				
		Total Dissolved Solids				
		Toxicity				
9	Agua Hedionda Lagoon (eastern)	Toxicity	Y			
9	Aliso Creek	Benthic Community Effects	Y			
		Indicator Bacteria			Y	TMDL status changed from TMDL still required to Being Addressed by Completed TMDL
		Malathion	Y			
		Nitrogen			Y	
		Phosphorus				
		Selenium				
		Toxicity				

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			New Listings	New Delistings	Pollutant Name Change	Other Revisions
9	Aliso Creek (mouth)	Indicator Bacteria				TMDL status changed from TMDL still required to Being Addressed by Completed TMDL
		Toxicity	Y			
9	Alpine Creek	Indicator Bacteria	Y			
9	Alvarado Creek	Nitrogen	Y			
		Selenium				
9	Arroyo Trabuco Creek	Benthic Community Effects	Y			
		~~Diazinon~~		Y		
		Indicator Bacteria	Y			
		Malathion	Y			
		Nitrogen			Y	
		Phosphorus				
		Toxicity				
9	Barrett Lake	Color				
		Manganese				
		Perchlorate				
		Phosphorus	Y			
		Total Nitrogen as N				
		pH				
9	Batiquitos Lagoon	Toxicity	Y			
9	Bell Canyon Creek	Toxicity	Y			

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			New Listings	New Delistings	Pollutant Name Change	Other Revisions
9	Buena Creek	DDT (Dichlorodiphenyltrichloroethane)				
		Indicator Bacteria	Y			
		Nitrate and Nitrite				
		Nitrogen	Y		Y	
		Phosphorus	Y			
9	Buena Vista Creek	Benthic Community Effects	Y			
		Bifenthrin	Y			
		Selenium				
		Toxicity				
9	Buena Vista Lagoon	Indicator Bacteria				
		Nutrients				
		Sedimentation/Siltation				
		Toxicity	Y			
9	Campo Creek	Indicator Bacteria	Y			
9	Carroll Canyon	Benthic Community Effects	Y			
		Toxicity	Y			
9	Chocolate Creek	Indicator Bacteria	Y			
		Nitrogen	Y			
		Phosphorus	Y			
9	Chollas Creek	Bifenthrin	Y			
		Chlorpyrifos	Y			
		Copper				

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			New Listings	New Delistings	Pollutant Name Change	Other Revisions
		Cypermethrin	Y			
		Diazinon				
		Indicator Bacteria				
		Lead				
		Malathion	Y			
		Nitrogen			Y	
		Phosphorus				
		Trash				
		Zinc				
9	Cloverdale Creek	Nitrogen	Y		Y	
		Phosphorus				
		Total Dissolved Solids				
9	Cottonwood Creek (San Marcos Creek watershed)	Benthic Community Effects	Y			
		DDT (Dichlorodiphenyltrichloroethane)				
		Nitrogen	Y		Y	
		Phosphorus	Y			
		Selenium				
		Toxicity				
9	Cottonwood Creek (Tijuana River watershed)	Indicator Bacteria	Y			
		Selenium				

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			New Listings	New Delistings	Pollutant Name Change	Other Revisions
9	Couser Canyon Creek	Indicator Bacteria	Y			
9	Cristianitos Creek	Cadmium	Y			
		Indicator Bacteria	Y			
		Selenium	Y			
9	Dana Point Harbor	Copper				
		Indicator Bacteria	Y		Y	
		Oxygen, Dissolved	Y			
		Toxicity				
		Zinc				
9	De Luz Creek	Iron				
		Manganese				
		Nitrogen				
		Sulfates				
9	East Channel Creek	Indicator Bacteria	Y			
9	El Capitan Lake	Color				
		Manganese				
		Phosphorus				
		Total Nitrogen as N				
		pH				
9	Encinitas Creek	Benthic Community Effects	Y			
		Phosphorus	Y			
		Selenium				
		Toxicity				

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			New Listings	New Delistings	Pollutant Name Change	Other Revisions
9	English Canyon	Benthic Community Effects	Y			
		Benzo[b]fluoranthene				
		Dieldrin				
		Phosphorus	Y			
		Selenium				
		Total Nitrogen as N	Y			
		Toxicity				
9	Escondido Creek	Benthic Community Effects	Y			
		Bifenthrin	Y			
		DDT (Dichlorodiphenyltrichloroethane)				
		Indicator Bacteria				
		Malathion	Y			
		Manganese				
		Nitrogen			Y	
		Phosphate				
		Selenium				
		Sulfates				
		Total Dissolved Solids				
		Toxicity				
9	Eucalyptus Hills Creek	Diazinon	Y			
		Indicator Bacteria	Y			
9	Famosa Slough and Channel	Eutrophic				

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			New Listings	New Delistings	Pollutant Name Change	Other Revisions
9	Felicita Creek	Aluminum				
		Indicator Bacteria	Y			
		Total Dissolved Solids				
9	Felicita Creek (North)	Tricholoroethylene	Y			
		Tetrachloroethylene	Y			
		1,4-dioxance	Y			
9	Forester Creek	Benthic Community Effects	Y			
		Indicator Bacteria			Y	TMDL status changed from TMDL still required to Being Addressed by Completed TMDL
		Nitrogen	Y			
		Phosphorus	Y			
		Selenium				
		Total Dissolved Solids				
		~~pH~~		Y		
9	Gopher Creek	Indicator Bacteria	Y			
9	Green Canyon Creek	Indicator Bacteria	Y			
9	Green Valley Creek	Benthic Community Effects	Y			
		Bifenthrin	Y			
		Chloride				
		Chlorpyrifos	Y			
		Manganese				
		Pentachlorophenol (PCP)				
		Sulfates				

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			New Listings	New Delistings	Pollutant Name Change	Other Revisions
		Total Nitrogen as N	Y			
9	Guajome Lake	Eutrophic				
9	Harbison Canyon	Indicator Bacteria	Y			
9	Hodges, Lake	Color				
		Manganese				
		Mercury				
		Nitrogen				
		Phosphorus				
		Turbidity				
		pH				
9	Jamacha Creek	Indicator Bacteria	Y			
9	Jamul Creek	Toxicity				
9	Keys Creek	Indicator Bacteria	Y			
		Nitrogen	Y			
		Selenium				
9	Kit Carson Creek	Pentachlorophenol (PCP)				
		Total Dissolved Solids				
9	La Zanja Canyon	Indicator Bacteria	Y			
9	Laguna Canyon Channel	Benthic Community Effects	Y			
		Indicator Bacteria	Y			
		Phosphorus	Y			
		Total Nitrogen as N	Y			
		Toxicity				

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			New Listings	New Delistings	Pollutant Name Change	Other Revisions
9	Live Oak Creek (San Diego County)	Indicator Bacteria	Y			
9	Loma Alta Creek	Benthic Community Effects	Y			
		Bifenthrin	Y			
		Selenium				
		Toxicity				
9	Loma Alta Slough	Eutrophic				
		Indicator Bacteria			Y	
9	Long Canyon (Cottonwood wshed) (from 0.2 mile upstream to 0.4 miles downstream of Troy Canyon)	Total Dissolved Solids				
9	Long Canyon Creek (Lower Sweetwater Watershed)	Indicator Bacteria	Y			
9	Long Canyon Creek (tributary to Murrieta Creek)	Chlorpyrifos				
		~~Indicator Bacteria~~		Y	Y	
		Iron				
		Manganese				
		Nitrogen	Y		Y	
		Phosphorus	Y			
9	Los Coches Creek	Indicator Bacteria	Y			
		Nitrogen	Y			
		Phosphorus	Y			
		Selenium				
9	Los Penasquitos Creek	Benthic Community Effects	Y			

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			New Listings	New Delistings	Pollutant Name Change	Other Revisions
		Bifenthrin	Y			
		Chlorpyrifos	Y			
		Indicator Bacteria			Y	There have been changes to assessment information for this pollutant, but the pollutant listing decision has not changed from last 303(d) listing cycle.
		Nitrogen			Y	There have been changes to assessment information for this pollutant, but the pollutant listing decision has not changed from last 303(d) listing cycle.
		Phosphate	Y			
		~~Selenium~~		Y		
		Total Dissolved Solids				
		Toxicity				
9	Los Penasquitos Lagoon	Sedimentation/Siltation				
		Toxicity	Y			
9	Loveland Reservoir	Aluminum				
		Manganese				
		Oxygen, Dissolved				
		pH				
9	Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper)	Indicator Bacteria	Y			

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			New Listings	New Delistings	Pollutant Name Change	Other Revisions
9	Mexican Canyon Creek (western tributary to Sweetwater River, Upper)	Indicator Bacteria	Y			
9	Miramar Reservoir	~~Nitrogen~~		Y		
9	Mission Bay	Mercury	Y			
		PCBs (Polychlorinated biphenyls)	Y			
9	Mission Bay (area at mouth of Rose Creek only)	Eutrophic				
		Lead				
9	Mission Bay (area at mouth of Tecolote Creek only)	Eutrophic				
		Lead				
9	Mission Bay at Quivira Basin	Copper				
9	Mission Bay Shoreline, at Bahia Point	Indicator Bacteria			Y	
9	Mission Bay Shoreline, at Bonita Cove	Indicator Bacteria			Y	
9	Mission Bay Shoreline, at Bonita Cove (eastern shore)	Indicator Bacteria	Y			
9	Mission Bay Shoreline, at Campland	Indicator Bacteria				
9	Mission Bay Shoreline, at De Anza Cove	Indicator Bacteria			Y	
9	Mission Bay Shoreline, at Enchanted Cove	Trash	Y			
9	Mission Bay Shoreline, at Fanual Park	Indicator Bacteria			Y	

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			New Listings	New Delistings	Pollutant Name Change	Other Revisions
9	Mission Bay Shoreline, at Fiesta Island Bridge	Indicator Bacteria			Y	
9	Mission Bay Shoreline, at Leisure Lagoon	Indicator Bacteria			Y	
9	Mission Bay Shoreline, at North Cove Beach at Vacation Isle	Indicator Bacteria	Y			
9	Mission Bay Shoreline, at North Crown Point	Indicator Bacteria			Y	
9	Mission Bay Shoreline, at Ski Beach at Vacation Isle	Indicator Bacteria	Y			
9	Mission Bay Shoreline, at Tecolote Shores	Indicator Bacteria			Y	
9	Mission Bay Shoreline, at Visitors Center	Indicator Bacteria			Y	
9	Moosa Canyon Creek	Indicator Bacteria	Y			
		Nitrogen	Y			
		Phosphorus	Y			
9	Moosa Canyon, South Fork	Indicator Bacteria	Y			
9	Morena Reservoir	Ammonia			Y	
		Color				
		Manganese				
		Nitrogen	Y			
		Phosphorus				
		pH				
9	Moro Canyon Creek	Nitrogen	Y			

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			New Listings	New Delistings	Pollutant Name Change	Other Revisions
		Phosphorus	Y			
		Selenium				
		Toxicity				
9	Murray Reservoir	~~Nitrogen~~		Y		
		~~pH~~		Y		
9	Murrieta Creek	Chlorpyrifos				
		Copper				
		Indicator Bacteria	Y		Y	
		Iron				
		Manganese				
		Nitrogen				
		Phosphorus				
		Toxicity				
9	Oceanside Harbor	Copper				
		Toxicity	Y			
9	Oso Creek (at Mission Viejo Golf Course)	Chloride				
		Sulfates				
		Total Dissolved Solids				
9	Oso Creek (lower)	Nitrogen	Y			
		Phosphorus	Y			
		Selenium				
		Toxicity				
9	Otay Reservoir, Lower	Ammonia				

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			New Listings	New Delistings	Pollutant Name Change	Other Revisions
		Color				
		Iron				
		Manganese				
		Nitrogen				
		Phosphorus	Y			
		pH			Y	
9	Pacific Ocean Shoreline, Aliso HSA, at Aliso Beach - middle	Indicator Bacteria			Y	TMDL status changed from TMDL still required to Being Addressed by Completed TMDL
9	Pacific Ocean Shoreline, Aliso HSA, at Aliso Creek mouth	Indicator Bacteria			Y	
		Toxicity	Y			
	Pacific Ocean Shoreline, Batiquitos HSA, at Moonlight State Beach (Cottonwood Creek outlet)	Indicator Bacteria				
9		Trash	Y			
9	Pacific Ocean Shoreline, Coronado HA, at G Ave, Central Beach	Trash	Y			
	Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at baby beach	Indicator Bacteria				
9	Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at patrol dock	Indicator Bacteria	Y			

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			New Listings	New Delistings	Pollutant Name Change	Other Revisions
9	Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch Beach	Indicator Bacteria			Y	TMDL status changed from TMDL still required to Being Addressed by Completed TMDL
9	Pacific Ocean Shoreline, Imperial Beach Pier	Indicator Bacteria			Y	
		PCBs (Polychlorinated biphenyls)				
		Trash	Y			
9	Pacific Ocean Shoreline, Laguna Beach HSA, at Broadway Creek	Indicator Bacteria	Y			
	Pacific Ocean Shoreline, Loma Alta HSA, at Loma Alta Creek mouth	Indicator Bacteria				
9		Trash	Y			
9	Pacific Ocean Shoreline, Los Monos HSA, Carlsbad State Beach at Tamarack Ave	Trash	Y			
9	Pacific Ocean Shoreline, Lower San Juan HSA, 1000 feet south of outfall	Indicator Bacteria	Y			
9	Pacific Ocean Shoreline, Lower San Juan HSA, 10000 feet south of outfall	Indicator Bacteria	Y			
9	Pacific Ocean Shoreline, Lower San Juan HSA, 2000 feet south of outfall	Indicator Bacteria	Y			
9	Pacific Ocean Shoreline, Lower San Juan HSA, 3000 feet south of outfall	Indicator Bacteria	Y			
9	Pacific Ocean Shoreline, Lower San Juan HSA, 4000 feet south of outfall	Indicator Bacteria	Y			

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			New Listings	New Delistings	Pollutant Name Change	Other Revisions
9	Pacific Ocean Shoreline, Lower San Juan HSA, 5000 feet south of outfall	Indicator Bacteria	Y			
9	Pacific Ocean Shoreline, Lower San Juan HSA, 7500 feet south of outfall	Indicator Bacteria	Y			
9	Pacific Ocean Shoreline, Lower San Juan HSA, at North Beach Creek	Indicator Bacteria			Y	TMDL status changed from TMDL still required to Being Addressed by Completed TMDL
9	Pacific Ocean Shoreline, Lower San Juan HSA, at North Doheny State Park Campground	Indicator Bacteria				
9	Pacific Ocean Shoreline, Lower San Juan HSA, at San Juan Creek	Indicator Bacteria			Y	TMDL status changed from TMDL still required to Being Addressed by Completed TMDL
9	Pacific Ocean Shoreline, Lower San Juan HSA, at South Doheny State Park Campground	Indicator Bacteria	Y		Y	TMDL status changed from TMDL still required to Being Addressed by Completed TMDL
9	Pacific Ocean Shoreline, Lower San Juan HSA, at surfzone outfall at Doheny State Beach	Indicator Bacteria	Y			
9	Pacific Ocean Shoreline, Miramar Reservoir HA, at Los Penasquitos River mouth	Indicator Bacteria			Y	TMDL status changed from TMDL still required to Being Addressed by Completed TMDL
9	Pacific Ocean Shoreline, Mission San Diego HSA, at Ocean Beach pier at Narrangaset	Trash	Y			

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	Pacific Ocean Shoreline, Otay Valey HA, at Carnation Ave and Camp Surf Jetty	Indicator Bacteria				
9	Pacific Ocean Shoreline, Point Loma HA, at Bermuda Ave	Indicator Bacteria			Y	
9	Pacific Ocean Shoreline, Point Loma HA, at Sunset Cliffs and Froude Street	Trash	Y			
9	Pacific Ocean Shoreline, Rancho Santa Fe HSA, at Powerhouse Park	Trash	Y			
9	Pacific Ocean Shoreline, San Clemente HA, at Poche Beach	Indicator Bacteria			Y	TMDL status changed from TMDL still required to Being Addressed by Completed TMDL
9	Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Pier	Indicator Bacteria	Y		Y	TMDL status changed from TMDL still required to Being Addressed by Completed TMDL
9	Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, North Beach	Indicator Bacteria			Y	TMDL status changed from TMDL still required to Being Addressed by Completed TMDL
9	Pacific Ocean Shoreline, San Clemente HA, at South Capistrano Beach at Beach Road	Indicator Bacteria	Y		Y	TMDL status changed from TMDL still required to Being Addressed by Completed TMDL
9	Pacific Ocean Shoreline, San Clemente HA, at South Capistrano County Beach	Indicator Bacteria			Y	

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			New Listings	New Delistings	Pollutant Name Change	Other Revisions
9	Pacific Ocean Shoreline, San Diego HU, at Stub Jetty, south of the San Diego River outlet, near Cape May Avenue	Indicator Bacteria	Y		Y	TMDL status changed from TMDL still required to Being Addressed by Completed TMDL
		Trash	Y			
9	Pacific Ocean Shoreline, San Diego HU, at the San Diego River outlet, at Dog Beach	Indicator Bacteria			Y	TMDL status changed from TMDL still required to Being Addressed by Completed TMDL
9	Pacific Ocean Shoreline, San Dieguito HU, at San Dieguito Lagoon Mouth at San Dieguito River Beach	Indicator Bacteria			Y	TMDL status changed from TMDL still required to Being Addressed by Completed TMDL
9	Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at parking lot entrance	Trash	Y			
9	Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at San Elijo Lagoon	Indicator Bacteria			Y	
9	Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth	Indicator Bacteria			Y	TMDL status changed from TMDL still required to Being Addressed by Completed TMDL
9	Pacific Ocean Shoreline, San Luis Rey HU, Oceanside Pier at Pier View Way	Trash	Y			
9	Pacific Ocean Shoreline, San Mateo Canyon HA, at San Mateo Creek outlet	Indicator Bacteria			Y	
9	Pacific Ocean Shoreline, Scripps HA, at Avenida de la Playa at La Jolla Shores Beach	~~Indicator Bacteria~~		Y	Y	

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			New Listings	New Delistings	Pollutant Name Change	Other Revisions
9	Pacific Ocean Shoreline, Scripps HA, at Belmont Park at Mission Beach (near San Fernando Place)	Trash	Y			
9	Pacific Ocean Shoreline, Scripps HA, at Childrens Pool	Indicator Bacteria			Y	TMDL status changed from TMDL still required to Being Addressed by Completed TMDL
9	Pacific Ocean Shoreline, Scripps HA, at Crystal Pier	Trash	Y			
9	Pacific Ocean Shoreline, Scripps HA, at North Lane at Windansea Beach	Trash	Y			
9	Pacific Ocean Shoreline, Scripps HA, at Pacific Beach Drive, Pacific Beach	Trash	Y			
9	Pacific Ocean Shoreline, Scripps HA, at Pacific Beach Point , Pacific Beach	Indicator Bacteria			Y	
9	Pacific Ocean Shoreline, Scripps HA, at Tourmaline Surf Park, Pacific Beach	Trash	Y			
9	Pacific Ocean Shoreline, Scripps HA, at Vallecitos Court at La Jolla Shores Beach	Indicator Bacteria			Y	
		Trash	Y			
9	Pacific Ocean Shoreline, Tijuana HU, at 3/4 mile North of Tijuana River	Indicator Bacteria			Y	
9	Pacific Ocean Shoreline, Tijuana HU, at Cortez Avenue	Indicator Bacteria				
9	Pacific Ocean Shoreline, Tijuana HU, at end of Seacoast Drive	Indicator Bacteria			Y	

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			New Listings	New Delistings	Pollutant Name Change	Other Revisions
9	Pacific Ocean Shoreline, Tijuana HU, at Monument Road	Indicator Bacteria			Y	
9	Pacific Ocean Shoreline, Tijuana HU, at the US Border	Indicator Bacteria				
9	Pacific Ocean Shoreline, Tijuana HU, at Tijuana River mouth	Indicator Bacteria			Y	
9	Pacific Ocean Shoreline, Torrey Pines State Beach, at North Beach Entrance parking lot	Trash	Y			
9	Paleta Creek	Copper				
		Lead				
9	Paradise Creek, HSA 908.320	Phosphorus	Y			
		Selenium				
9	Pine Valley Creek (Upper)	Indicator Bacteria			Y	
		~~Turbidity~~		Y		
9	Poggi Canyon Creek	Nitrogen	Y		Y	
		Toxicity				
9	Poway Creek	Nitrogen	Y		Y	
		Selenium				
		Toxicity				
9	Prima Deshecha Creek	Cadmium				
		Indicator Bacteria	Y			
		Malathion	Y			
		Nitrogen	Y			
		Phosphorus				

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			New Listings	New Delistings	Pollutant Name Change	Other Revisions
		Turbidity				
9	Rainbow Creek	Aluminum	Y			
		Iron				
		Nitrogen				
		Phosphorus				
		Sulfates				
		Total Dissolved Solids				
9	Redhawk Channel	Chlorpyrifos				
		Copper				
		Diazinon				
		Indicator Bacteria			Y	
		Iron				
		Manganese				
		Nitrogen				
		Phosphorus				
		Total Dissolved Solids				
9	Reidy Canyon Creek	Indicator Bacteria	Y			
		Phosphorus	Y			
9	Rose Creek	Benthic Community Effects	Y			
		Selenium				
		Toxicity				
9	Salt Creek (Orange County)	Benthic Community Effects	Y			
		Malathion	Y			
		Toxicity	Y			

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			New Listings	New Delistings	Pollutant Name Change	Other Revisions
9	San Diego Bay	Mercury	Y			
		PAHs (Polycyclic Aromatic Hydrocarbons)	Y			
		PCBs (Polychlorinated biphenyls)				
9	San Diego Bay Shoreline, 32nd St San Diego Naval Station	Benthic Community Effects				
		Sediment Toxicity				
9	San Diego Bay Shoreline, at Americas Cup Harbor	Copper				
9	San Diego Bay Shoreline, at Bayside Park (J Street)	Indicator Bacteria			Y	
9	San Diego Bay Shoreline, at Coronado Cays	Copper				
9	San Diego Bay Shoreline, at Glorietta Bay	Copper				
9	San Diego Bay Shoreline, at Harbor Island (East Basin)	Copper				
9	San Diego Bay Shoreline, at Harbor Island (West Basin)	Copper				
9	San Diego Bay Shoreline, at Marriott Marina	Copper				
9	San Diego Bay Shoreline, between Sampson and 28th Streets	Copper				
		Mercury				

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			New Listings	New Delistings	Pollutant Name Change	Other Revisions
		PAHs (Polycyclic Aromatic Hydrocarbons)				
		PCBs (Polychlorinated biphenyls)				
		Zinc				
9	San Diego Bay Shoreline, Chula Vista Marina	Copper				
9	San Diego Bay Shoreline, Downtown Anchorage	Benthic Community Effects				
		Sediment Toxicity				
9	San Diego Bay Shoreline, G Street Pier	Indicator Bacteria	Y			
9	San Diego Bay Shoreline, near Chollas Creek	Benthic Community Effects				
		Sediment Toxicity				
9	San Diego Bay Shoreline, near Coronado Bridge	Benthic Community Effects				
		Sediment Toxicity				
9	San Diego Bay Shoreline, near sub base	Benthic Community Effects				
		Toxicity				
9	San Diego Bay Shoreline, near Switzer Creek	Chlordane				
		PAHs (Polycyclic Aromatic Hydrocarbons)				
9	San Diego Bay Shoreline, North of 24th Street Marine Terminal	Benthic Community Effects				

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			New Listings	New Delistings	Pollutant Name Change	Other Revisions
		Sediment Toxicity				
9	San Diego Bay Shoreline, Seventh Street Channel	Benthic Community Effects				
		Sediment Toxicity				
9	San Diego Bay Shoreline, Shelter Island Shoreline Park	Indicator Bacteria			Y	
9	San Diego Bay Shoreline, Tidelands Park	Indicator Bacteria			Y	
9	San Diego Bay Shoreline, Vicinity of B St and Broadway Piers	Benthic Community Effects				
		Indicator Bacteria			Y	There have been changes to assessment information for this pollutant, but the pollutant listing decision has not changed from last 303(d) listing cycle.
		Sediment Toxicity				
9	San Diego Bay, Shelter Island Yacht Basin	Copper, Dissolved				
9	San Diego River (Lower)	Benthic Community Effects	Y			
		Cadmium	Y			
		Indicator Bacteria			Y	TMDL status changed from TMDL still required to Being Addressed by Completed TMDL
		Manganese				
		Nitrogen				
		Oxygen, Dissolved			Y	

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			New Listings	New Delistings	Pollutant Name Change	Other Revisions
		Phosphorus				
		Total Dissolved Solids				
		Toxicity	Y			
9	San Diego River (Upper)	Indicator Bacteria				
		Oxygen, Dissolved	Y			
		Sulfates	Y			
9	San Dieguito River	Benthic Community Effects	Y			
		Indicator Bacteria			Y	
		Nitrogen				
		Phosphorus				
		Total Dissolved Solids				
		Toxicity				
9	San Dieguito River, unnamed tributary below Hodges Dam	Indicator Bacteria	Y			
9	San Elijo Creek (San Diego County)	Indicator Bacteria	Y			
9	San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue	Indicator Bacteria	Y			
9	San Elijo Lagoon	Eutrophic				
		Indicator Bacteria				
		Sedimentation/Siltation				
		Toxicity	Y			
9	San Juan Creek	Benthic Community Effects	Y			

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			New Listings	New Delistings	Pollutant Name Change	Other Revisions
		DDE (Dichlorodiphenyldichloroethylene)				
		Indicator Bacteria				
		Nitrogen				
		Oxygen, Dissolved	Y			
		Phosphorus				
		Selenium				
		Toxicity				
9	San Juan Creek (mouth)	Cadmium	Y			
		Copper	Y			
		Indicator Bacteria				TMDL status changed from TMDL still required to Being Addressed by Completed TMDL
		Nickel	Y			
		Nitrogen, ammonia (Total Ammonia)	Y			
9	San Luis Rey River, Lower (west of Interstate 15)	Benthic Community Effects	Y			
		Bifenthrin	Y			
		Chloride				
		Indicator Bacteria			Y	
		Nitrogen			Y	
		Phosphorus				
		Total Dissolved Solids				

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			New Listings	New Delistings	Pollutant Name Change	Other Revisions
		Toxicity				
9	San Luis Rey River, Upper (east of Interstate 15)	Indicator Bacteria	Y			
		Phosphorus	Y			
		Total Nitrogen as N				
9	San Marcos Creek	Benthic Community Effects	Y			
		DDE (Dichlorodiphenyldichloroethylene)			Y	
		Indicator Bacteria	Y			
		Phosphorus				
		Selenium				There have been changes to assessment information for this pollutant, but the pollutant listing decision has not changed from last 303(d) listing cycle.
		Toxicity			Y	
9	San Marcos Lake	Ammonia as Nitrogen				
		Copper	Y			
		Nutrients				
		Phosphorus	Y			
9	San Marcos, Lake, drain to central southwest fork of lake	Copper	Y			
		Indicator Bacteria	Y			
9	San Mateo Creek (San Diego County)	Indicator Bacteria	Y			

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			New Listings	New Delistings	Pollutant Name Change	Other Revisions
		Invasive Species	Y			
9	San Vicente Creek (San Diego County)	Ammonia as Nitrogen				
		Indicator Bacteria	Y			
		Phosphorus	Y			
		Total Nitrogen as N				
		Toxicity				
9	San Vicente Reservoir	Chloride				
		~~Color~~		Y		
		Sulfates				
9	Sandia Creek	Ammonia (Unionized)	Y			
		Iron				
		Manganese	Y			
		Nitrogen	Y			
		Selenium	Y			
		Silver	Y			
		Sulfates				
		Total Dissolved Solids				
9	Santa Gertrudis Creek	Chlorpyrifos				
		Copper				
		Indicator Bacteria			Y	
		Iron				
		Manganese				
		Nitrogen	Y		Y	
		Phosphorus				

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			New Listings	New Delistings	Pollutant Name Change	Other Revisions
9	Santa Margarita Lagoon	Eutrophic				TMDL status changed from TMDL still required to Being Addressed by Action Other than TMDL
9	Santa Margarita River (Lower)	Benthic Community Effects	Y			
		Chlorpyrifos	Y			
		Indicator Bacteria				
		Nitrogen				There have been changes to assessment information for this pollutant, but the pollutant listing decision has not changed from last 303(d) listing cycle.
		Phosphorus				
		Toxicity	Y			
9	Santa Margarita River (Upper)	Indicator Bacteria	Y			
		Iron	Y			
		Manganese	Y			
		Nitrogen	Y			
		Phosphorus				
		Toxicity				
9	Santa Ysabel Creek (above Sutherland Reservoir)	Toxicity				
9	Segunda Deshecha Creek	Benthic Community Effects	Y			
		Indicator Bacteria	Y			
		Malathion	Y			
		Nitrogen	Y			

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			New Listings	New Delistings	Pollutant Name Change	Other Revisions
		Phosphorus				
		Selenium	Y			
		Toxicity				
		Turbidity				
9	Soledad Canyon	Sediment Toxicity				
		Selenium				
9	Steele Canyon	Indicator Bacteria	Y			
9	Sutherland Reservoir	Color				
		Iron				
		Manganese				
		Nitrogen			Y	
		Phosphorus	Y			
		pH				
9	Sweetwater Reservior	Oxygen, Dissolved				
9	Sweetwater River, Lower (below Sweetwater Reservoir)	Benthic Community Effects	Y			
		Chlorpyrifos	Y			
		Indicator Bacteria				
		Nitrogen				
		Phosphorus				
		Selenium				
		Total Dissolved Solids				
		Toxicity				

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			New Listings	New Delistings	Pollutant Name Change	Other Revisions
9	Sweetwater River, North Fork, unnamed tributary at Tavern Road	Indicator Bacteria	Y			
		Manganese	Y			
9	Sweetwater River, Upper (above Sweetwater Reservoir)	Aluminum	Y			
		Benthic Community Effects	Y			
		Indicator Bacteria	Y			
		Selenium	Y			
		Total Nitrogen as N	Y			
9	Switzer Creek	Copper				
		Lead				
		Zinc				
9	Sycamore Canyon	Oxygen, Dissolved	Y			
9	Tecate Creek	Nitrogen	Y			
		Phosphorus	Y			
		Selenium				
9	Tecolote Creek	Benthic Community Effects	Y			
		Bifenthrin	Y			
		Cadmium				
		Copper				
		Cypermethrin	Y			
		Diazinon	Y			

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			New Listings	New Delistings	Pollutant Name Change	Other Revisions
		Indicator Bacteria			Y	TMDL status changed from TMDL still required to Being Addressed by Completed TMDL
		Lead				
		Nitrogen				There have been changes to assessment information for this pollutant, but the pollutant listing decision has not changed from last 303(d) listing cycle.
		Phosphorus				
		Selenium				
		Toxicity				
		Turbidity				
		Zinc				
9	Tecolote Creek, South Fork	Indicator Bacteria	Y			
9	Telegraph Canyon Creek	Nitrogen	Y			
		Selenium				
9	Temecula Creek	Chlorpyrifos				
		Copper				
		Indicator Bacteria	Y		Y	
		Phosphorus				
		Total Dissolved Solids				
		Toxicity				
9	Tijuana River	Ammonia as Nitrogen	Y			
		Benthic Community Effects				

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			New Listings	New Delistings	Pollutant Name Change	Other Revisions
		Cadmium	Y			
		Chlorpyrifos	Y			
		Diazinon				
		Eutrophic				
		Indicator Bacteria				
		Low Dissolved Oxygen				
		Malathion	Y			
		Pesticides			Y	
		Phosphorus				
		Sedimentation/Siltation				
		Selenium				
		Solids				
		Surfactants (MBAS)				
		Synthetic Organics			Y	
		Total Nitrogen as N				
		Toxicity				
		Trace Elements				
		Trash				
9	Tijuana River Estuary	Eutrophic				
		Lead				
		Low Dissolved Oxygen				
		Nickel				
		Pesticides			Y	
		Thallium				

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			New Listings	New Delistings	Pollutant Name Change	Other Revisions
		Toxicity	Y			
		Trash				
		Turbidity				
9	Warm Springs Creek (Riverside County)	Chlorpyrifos				
		Indicator Bacteria			Y	
		Iron				
		Manganese				
		Nitrogen				
		Phosphorus				
9	Wood Canyon (Orange County)	Benthic Community Effects	Y			
		Diazinon	Y			
		Selenium	Y			

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** Additional listings and delistings can be an artifact created from mapping changes such as the splitting of a water body into additional segments or the merging of water bodies into one single water body. Original 303(d) listings are copied to new segments and then delisted from the old segment. This generates listings and delistings that should not be included in important counts of new listings and delistings.*

2014 CALIFORNIA 303(d) LIST OF WATER QUALITY LIMITED SEGMENTS*

Category 5 criteria: 1) A water segment where standards are not met and a TMDL is required, but not yet completed, for at least one of the pollutants being listed for this segment.

* USGS HUC = US Geological Survey Hydrologic Unit Code. Calwater = State Water Resources Control Board hydrological subunit area or even smaller planning watershed.

** TMDL requirement status definitions for listed pollutants are: A= TMDL still required, B= being addressed by USEPA approved TMDL, C= being addressed by action other than a TMDL, ALT= being addressed by USEPA approved TMDL alternative

*** Dates relate to the TMDL requirement status, so a date for A= TMDL scheduled completion date, B= Date USEPA approved TMDL, and C= Completion date for action other than a TMDL

REGION	WATER BODY NAME	WATER TYPE	WATERSHED* CALWATER / USGS HUC	• POLLUTANT ○ POTENTIAL SOURCES *Relevant Notes*	ESTIMATED AREA ASSESSED	FIRST YEAR LISTED	TMDL REQUIREMENT STATUS**	DATE***
9	Agua Hedionda Creek	River & Stream	90431000 / 18070303	• Benthic Community Effects ○ Source Unknown	7 Miles	2010	5A	2025
				• Manganese ○ Source Unknown	7 Miles	2006	5A	2019
				• Phosphorus ○ Source Unknown	7 Miles	2010	5A	2019
				• Selenium ○ Source Unknown	7 Miles	2006	5A	2019
				• Total Dissolved Solids ○ Source Unknown	7 Miles	2002	5A	2019
				• Toxicity ○ Source Unknown	7 Miles	2010	5A	2019
9	Aliso Creek	River & Stream	90113000 / 18070301	• Benthic Community Effects ○ Source Unknown	19 Miles	2010	5A	2025
				• Indicator Bacteria ○ Source Unknown	19 Miles	2002	5B	2011
				This listing for indicator bacteria applies to the Aliso Creek mainstem and all the major tributaries of Aliso Creek which are Sulphur Creek, Wood Canyon, Aliso Hills Canyon, Dairy Fork, and English Canyon.				
				• Phosphorus ○ Source Unknown	19 Miles	2002	5A	2019
				This listing for phosphorus applies to the Aliso Creek mainstem and all the major tributaries of Aliso Creek which are Sulphur Creek, Wood Canyon, Aliso Hills Canyon, Dairy Fork, and English Canyon.				
				• Selenium ○ Source Unknown	19 Miles	2010	5A	2021
				• Toxicity ○ Source Unknown ○ Unknown Nonpoint Source ○ Unknown Point Source	19 Miles	2002	5A	2019
				This listing for toxicity applies to the Aliso Creek mainstem and all the major tributaries of				

				Aliso Creek which are Sulphur Creek, Wood Canyon, Aliso Hills Canyon, Dairy Fork, and English Canyon.				034,73
9	Aliso Creek (mouth)	Estuary	90113000 / 18070301	• Indicator Bacteria ○ Source Unknown	0.29 Acres	1990	5B	2011
				LOEs 30623, 30625, 30614, 30616, 30619, and 30620 will be linked to this listing decision in the next cycle.				
9	Alvarado Creek	River & Stream	90711000 / 18070304	• Nitrogen ○ Source Unknown	5.1 Miles	2010	5A	2023
				• Selenium ○ Source Unknown	5.1 Miles	2010	5A	2021
9	Arroyo Trabuco Creek	River & Stream	90120000 / 18070202	• Benthic Community Effects ○ Source Unknown	23 Miles	2010	5A	2025
				• Diazinon ○ Source Unknown	23 Miles	2010	5A	2019
				• Phosphorus ○ Natural Sources ○ Source Unknown ○ Urban Runoff/Storm Sewers	23 Miles	2010	5A	2019
				• Toxicity ○ Source Unknown	23 Miles	2010	5A	2019
9	Barrett Lake	Lake & Reservoir	91130000 / 18070305	• Color ○ Source Unknown	125 Acres	2006	5A	2019
				• Manganese ○ Source Unknown	125 Acres	2006	5A	2019
				• Perchlorate ○ Source Unknown	125 Acres	2010	5A	2019
				• Phosphorus ○ Source Unknown	125 Acres	2010	5A	2023
				• Total Nitrogen as N ○ Source Unknown	125 Acres	2010	5A	2019
				• pH ○ Source Unknown	125 Acres	2006	5A	2019
9	Buena Creek	River & Stream	90432000 / 18070303	• DDT (Dichlorodiphenyltrichloroethane) ○ Source Unknown	4.8 Miles	2006	5A	2019
				• Nitrate and Nitrite ○ Source Unknown	4.8 Miles	2006	5A	2019
				• Phosphorus ○ Source Unknown	4.8 Miles	2010	5A	2023
9	Buena Vista	River &	90421000 /	• Benthic Community Effects ○ Source Unknown	11 Miles	2010	5A	2025

	Creek	Stream	18070303				034574	
				• Selenium ◦ Source Unknown	11 Miles	2010	5A	2019
				The exceedance rate in LOE 6549 should be 4 over 4, and this change will be made in the next cycle.				
9	Buena Vista Lagoon	Estuary	90421000 / 18070303	• Indicator Bacteria ◦ Source Unknown	202 Acres	1996	5A	2008
				• Nutrients ◦ Source Unknown	202 Acres	1996	5A	2019
				Estimated size of impairment is 150 acres located in upper portion of lagoon.				
				• Sedimentation/Siltation ◦ Source Unknown	202 Acres	1996	5A	2019
9	Carroll Canyon	River & Stream	90610000 / 18070304	• Benthic Community Effects ◦ Hydromodification ◦ Illicit Connections/Illegal Hook-ups/Dry Weather Flows ◦ Source Unknown ◦ Unknown Nonpoint Source ◦ Unknown Point Source ◦ Urban Runoff/Storm Sewers	12 Miles	2010	5A	2025
9	Chocolate Creek	River & Stream	90733000 / 18070304	• Nitrogen ◦ Source Unknown	4.5 Miles	2010	5A	2025
				• Phosphorus ◦ Source Unknown	4.5 Miles	2010	5A	2023
9	Chollas Creek	River & Stream	90822000 / 18070304	• Copper ◦ Source Unknown	3.5 Miles	1996	5B	2008
				• Diazinon ◦ Source Unknown	3.5 Miles	2002	5B	2003
				• Indicator Bacteria ◦ Source Unknown	3.5 Miles	2002	5B	2011
				• Lead ◦ Source Unknown	3.5 Miles	1996	5B	2008
				• Phosphorus ◦ Source Unknown	3.5 Miles	2010	5A	2019
				• Trash ◦ Source Unknown	3.5 Miles	2010	5A	2021
				• Zinc ◦ Source Unknown	3.5 Miles	1996	5B	2008
9	Cloverdale Creek	River & Stream	90532000 / 18070304	• Phosphorus ◦ Source Unknown	1.2 Miles	2002	5A	2019
				• Total Dissolved Solids ◦ Source Unknown	1.2 Miles	2002	5A	2019

034575

9	Cottonwood Creek (San Marcos Creek watershed)	River & Stream	90451000 / 18070303	• DDT (Dichlorodiphenyltrichloroethane) ◦ Source Unknown	1.9 Miles	2006	5A	2019
				• Phosphorus ◦ Source Unknown	1.9 Miles	2006	5A	2019
				• Selenium ◦ Source Unknown	1.9 Miles	2010	5A	2019
9	Cottonwood Creek (Tijuana River watershed)	River & Stream	91160000 / 18070305	• Selenium ◦ Source Unknown	53 Miles	2010	5A	2019
9	Dana Point Harbor	Bay & Harbor	90114000 / 18070301	• Copper ◦ Marinas and Recreational Boating ◦ Source Unknown ◦ Unknown Nonpoint Source ◦ Urban Runoff/Storm Sewers	119 Acres	2010	5A	2019
				• Indicator Bacteria ◦ Source Unknown *The listed indicator bacteria is total coliform for SHELL.*	119 Acres	2002	5A	2025
				• Toxicity ◦ Source Unknown	119 Acres	2010	5A	2021
				• Zinc ◦ Source Unknown	119 Acres	2010	5A	2027
9	De Luz Creek	River & Stream	90221000 / 18070302	• Iron ◦ Source Unknown	14 Miles	2006	5A	2019
				• Manganese ◦ Source Unknown	14 Miles	2006	5A	2019
				• Nitrogen ◦ Source Unknown	14 Miles	2014	5A	2025
				• Sulfates ◦ Source Unknown	14 Miles	2014	5A	2019
9	El Capitan Lake	Lake & Reservoir	90731000 / 18070304	• Color ◦ Source Unknown	1454 Acres	2006	5A	2019
				• Manganese ◦ Source Unknown	1454 Acres	2006	5A	2019
				• Phosphorus ◦ Source Unknown	1454 Acres	2010	5A	2021
				• Total Nitrogen as N ◦ Source Unknown	1454 Acres	2010	5A	2021

				pH ○ Source Unknown	1454 Acres	2006	5A	2019
9	Encinitas Creek	River & Stream	4904.510000 / 18070303	• Benthic Community Effects ○ Source Unknown	4.6 Miles	2010	5A	2025
				• Phosphorus ○ Source Unknown	4.6 Miles	2006	5A	2019
				• Selenium ○ Source Unknown	4.6 Miles	2010	5A	2019
				• Toxicity ○ Source Unknown	4.6 Miles	2010	5A	2019
9	English Canyon	River & Stream	90113000 / 18070301	• Benzo[b]fluoranthene ○ Source Unknown	3.6 Miles	2006	5A	2019
				• Dieldrin ○ Source Unknown	3.6 Miles	2006	5A	2019
				• Phosphorus ○ Source Unknown	3.6 Miles	2010	5A	2023
				• Selenium ○ Source Unknown	3.6 Miles	2010	5A	2019
				• Total Nitrogen as N ○ Source Unknown	3.6 Miles	2010	5A	2021
9	Escondido Creek	River & Stream	90462000 / 18070303	• Benthic Community Effects ○ Source Unknown	26 Miles	2010	5A	2025
				• DDT (Dichlorodiphenyltrichloroethane) ○ Source Unknown	26 Miles	2006	5A	2019
				• Manganese ○ Source Unknown	26 Miles	2006	5A	2019
				• Phosphate ○ Source Unknown	26 Miles	2006	5A	2019
				• Selenium ○ Source Unknown	26 Miles	2006	5A	2019
				• Sulfates ○ Source Unknown	26 Miles	2006	5A	2019
				• Total Dissolved Solids ○ Source Unknown	26 Miles	2006	5A	2019
				• Toxicity ○ Source Unknown	26 Miles	2010	5A	2019
9	Felicita Creek	River & Stream	90523000 / 18070304	• Aluminum ○ Source Unknown	0.92 Miles	2006	5A	2019
				• Total Dissolved Solids ○ Source Unknown	0.92 Miles	2002	5A	2019

034577

9	Forester Creek	River & Stream	90712000 / 18070304	• Nitrogen ◦ Source Unknown	6.4 Miles	2010	5A	2029
				• Phosphorus ◦ Source Unknown	6.4 Miles	2006	5A	2019
				• Selenium ◦ Source Unknown	6.4 Miles	2010	5A	2019
				• Total Dissolved Solids ◦ Source Unknown	6.4 Miles	2002	5A	2019
				Impairment Located at lower 1 mile.				

9	Green Valley Creek	River & Stream	90521000 / 18070304	• Benthic Community Effects
				  ◦ Hydromodification
				  ◦ Illicit Connections/Illegal Hook-ups/Dry Weather Flows
				  ◦ Source Unknown
				  ◦ Unknown Point Source
				  ◦ Urban Runoff/Storm Sewers
					0.98 Miles	2010	5A	2025

				• Chloride ◦ Source Unknown	0.98 Miles	2006	5A	2019
				• Manganese ◦ Source Unknown	0.98 Miles	2006	5A	2019
				• Pentachlorophenol (PCP) ◦ Source Unknown	0.98 Miles	2006	5A	2019
				• Sulfates ◦ Source Unknown	0.98 Miles	2002	5A	2019
				• Total Nitrogen as N ◦ Source Unknown	0.98 Miles	2010	5A	2025
9	Guajome Lake	Lake & Reservoir	90311000 / 18070303	• Eutrophic ◦ Source Unknown	33 Acres	1996	5A	2019
9	Hodges, Lake	Lake & Reservoir	90521000 / 18070304	• Color ◦ Source Unknown	1104 Acres	2002	5A	2019
				• Manganese ◦ Source Unknown	1104 Acres	2006	5A	2019
				• Mercury ◦ Source Unknown	1104 Acres	2014	5A	2021
				• Nitrogen ◦ Source Unknown	1104 Acres	2002	5A	2019
				• Phosphorus ◦ Source Unknown	1104 Acres	2002	5A	2013
				• Turbidity ◦ Source Unknown	1104 Acres	2006	5A	2019
				• pH ◦ Source Unknown	1104 Acres	2006	5A	2019

034578

9	Jamul Creek	River & Stream	91033000 / 18070304	• Toxicity ◦ Source Unknown	10 Miles	2010	5A	2019
9	Keys Creek	River & Stream	90312000 / 18070303	• Nitrogen ◦ Source Unknown	13 Miles	2010	5A	2025
				• Selenium ◦ Source Unknown	13 Miles	2010	5A	2019
9	Kit Carson Creek	River & Stream	90521000 / 18070304	• Pentachlorophenol (PCP) ◦ Source Unknown	0.99 Miles	2006	5A	2019
				• Total Dissolved Solids ◦ Source Unknown	0.99 Miles	2002	5A	2019
9	Laguna Canyon Channel	River & Stream	90112000 / 18070301	• Phosphorus ◦ Source Unknown	1.6 Miles	2010	5A	2023
				• Total Nitrogen as N ◦ Source Unknown	1.6 Miles	2010	5A	2025
				• Toxicity ◦ Source Unknown	1.6 Miles	2010	5A	2019
9	Loma Alta Creek	River & Stream	90410000 / 18070303	• Benthic Community Effects ◦ Contaminated Sediments ◦ Hydromodification ◦ Illicit Connections/Illegal Hook-ups/Dry Weather Flows ◦ Source Unknown ◦ Unknown Point Source ◦ Urban Runoff/Storm Sewers	7.8 Miles	2010	5A	2025
				• Selenium ◦ Source Unknown *In LOE 8875, the exceedance rate should be 4 over 4, and this change will be updated in next cycle of assessment.*	7.8 Miles	2010	5A	2019
				• Toxicity ◦ Source Unknown	7.8 Miles	2010	5A	2019
9	Long Canyon Creek (tributary to Murrieta Creek)	River & Stream	90232000 / 18070302	• Chlorpyrifos ◦ Source Unknown	8.3 Miles	2010	5A	2019
				• Iron ◦ Source Unknown	8.3 Miles	2010	5A	2019
				• Manganese ◦ Source Unknown	8.3 Miles	2010	5A	2019
				• Phosphorus ◦ Source Unknown	8.3 Miles	2010	5A	2023

9	Los Coches Creek	River & Stream	90714000 / 18070304	• Nitrogen ◦ Source Unknown	8.8 Miles	2010	5A	2027
				• Phosphorus ◦ Source Unknown	8.8 Miles	2010	5A	2023
				• Selenium ◦ Source Unknown	8.8 Miles	2010	5A	2019
9	Los Penasquitos Creek	River & Stream	90610000 / 18070304	• Benthic Community Effects ◦ Contaminated Sediments ◦ Hydromodification ◦ Illicit Connections/Illegal Hook-ups/Dry Weather Flows ◦ Source Unknown ◦ Unknown Nonpoint Source ◦ Unknown Point Source ◦ Urban Runoff/Storm Sewers	12 Miles	2010	5A	2025
				• Phosphate ◦ Source Unknown	12 Miles	2006	5A	2019
				• Total Dissolved Solids ◦ Source Unknown	12 Miles	2006	5A	2019
				• Toxicity ◦ Source Unknown	12 Miles	2010	5A	2023
				See Decision numbers 43909 , 47497 , 47501 , 47517 , 47555 for potential pollutant sources of water toxicity.				
9	Los Penasquitos Lagoon	Estuary	90610000 / 18070304	• Sedimentation/Siltation ◦ Channel Erosion ◦ Channelization ◦ Erosion/Siltation ◦ Flow Alteration/Regulation/Modification ◦ Hydromodification ◦ Illicit Connections/Illegal Hook-ups/Dry Weather Flows ◦ Source Unknown ◦ Streambank Modification/Destabilization ◦ Urban Runoff/Storm Sewers	469 Acres	1992	5B	2014
				On June 13, 2014, the San Diego Water Board conducted a public hearing and adopted the Resolution No. R9-2012-0033 which amended the Basin Plan to include the Los PeÃ±asquitos Sediment TMDL. The State Water Resources Control Board adopted Resolution No. 2014-0001 on January 21, 2014 to incorporate the Los PeÃ±asquitos Sediment TMDL into the Basin Plan. The Office of Administrative Law approved the Los PeÃƒÂ±asquitos Sediment TMDL Basin Plan Amendment on July 14, 2014. The USEPA approved the Los PeÃ±asquitos Sediment TMDL Basin Plan Amendment on October 30, 2014.				
9	Loveland Reservoir	Lake & Reservoir	90931000 / 18070304	• Aluminum ◦ Source Unknown	420 Acres	2006	5A	2019
				• Manganese ◦ Source Unknown	420 Acres	2006	5A	2019
				• Oxygen, Dissolved ◦ Source Unknown	420 Acres	2006	5A	2019

				• pH ◦ Source Unknown *This listing was made by USEPA for 2006.*	420 Acres	2006	5A	2019
9	Mission Bay (area at mouth of Rose Creek only)	Bay & Harbor	90640000 / 18070304	• Eutrophic ◦ Source Unknown	9.2 Acres	1996	5A	2019
				• Lead ◦ Source Unknown	9.2 Acres	1996	5A	2019
9	Mission Bay (area at mouth of Tecolote Creek only)	Bay & Harbor	90650000 / 18070304	• Eutrophic ◦ Source Unknown	3.1 Acres	1996	5A	2019
				• Lead ◦ Source Unknown	3.1 Acres	1996	5A	2019
9	Mission Bay at Quivira Basin	Bay & Harbor	90752000 / 18070304	• Copper ◦ Source Unknown ◦ Unknown Nonpoint Source ◦ Unknown Point Source	65 Acres	2010	5A	2021
9	Moosa Canyon Creek	River & Stream	90313000 / 18070303	• Nitrogen ◦ Source Unknown	18 Miles	2010	5A	2023
				• Phosphorus ◦ Source Unknown	18 Miles	2010	5A	2023
9	Morena Reservoir	Lake & Reservoir	91150000 / 18070305	• Color ◦ Source Unknown	104 Acres	2006	5A	2019
				• Manganese ◦ Source Unknown	104 Acres	2006	5A	2019
				• Nitrogen ◦ Source Unknown	104 Acres	2010	5A	2023
				• Phosphorus ◦ Source Unknown	104 Acres	2010	5A	2021
				• pH ◦ Source Unknown ◦ Unknown Nonpoint Source	104 Acres	2006	5A	2019
9	Moro Canyon Creek	River & Stream	90111000 / 18070301	• Nitrogen ◦ Source Unknown	3.4 Miles	2010	5A	2023
				• Phosphorus ◦ Source Unknown	3.4 Miles	2010	5A	2023

				• Selenium ◦ Source Unknown	3.4 Miles	2010	5A	2021
				• Toxicity ◦ Source Unknown	3.4 Miles	2010	5A	2021
				This decision can be retired since the toxicity can be associated to the other impairments from 2010.				
9	Murrieta Creek	River & Stream	90252000 / 18070302	• Chlorpyrifos ◦ Source Unknown	12 Miles	2010	5A	2021
				• Copper ◦ Source Unknown	12 Miles	2014	5A	2019
				• Iron ◦ Source Unknown	12 Miles	2006	5A	2019
				• Manganese ◦ Source Unknown	12 Miles	2006	5A	2019
				• Nitrogen ◦ Source Unknown	12 Miles	2006	5A	2019
				• Phosphorus ◦ Source Unknown	12 Miles	2002	5A	2019
				• Toxicity ◦ Source Unknown	12 Miles	2010	5A	2021
9	Oceanside Harbor	Bay & Harbor	90211000 / 18070302	• Copper ◦ Source Unknown ◦ Unknown Nonpoint Source ◦ Urban Runoff/Storm Sewers	52 Acres	2010	5A	2021
				• Toxicity ◦ Source Unknown	52 Acres	2010	5A	2027
9	Oso Creek (at Mission Viejo Golf Course)	River & Stream	90120000 / 18070301	• Chloride ◦ Source Unknown	1 Miles	2006	5A	2019
				• Sulfates ◦ Source Unknown	1 Miles	2006	5A	2019
				• Total Dissolved Solids ◦ Source Unknown	1 Miles	2006	5A	2019
9	Oso Creek (lower)	River & Stream	90120000 / 18070301	• Nitrogen ◦ Source Unknown	4 Miles	2010	5A	2023
				• Phosphorus ◦ Source Unknown	4 Miles	2010	5A	2023
				• Selenium ◦ Source Unknown	4 Miles	2010	5A	2021
				• Toxicity ◦ Source Unknown	4 Miles	2010	5A	2021

See decision numbers 43302 , 43534 , 44429 for potential sources of water toxicity.

9	Otay Reservoir, Lower	Lake & Reservoir	91031000 / 18070304	• Ammonia ○ Source Unknown	1050 Acres	2010	5A	2019
				• Color ○ Source Unknown	1050 Acres	2006	5A	2019
				• Iron ○ Natural Sources ○ Source Unknown	1050 Acres	2006	5A	2019
				• Manganese ○ Source Unknown	1050 Acres	2006	5A	2019
				• Nitrogen ○ Source Unknown	1050 Acres	2010	5A	2021
				• Phosphorus ○ Source Unknown	1050 Acres	2010	5A	2023
9	Pacific Ocean Shoreline, Imperial Beach Pier	Coastal & Bay Shoreline	91010000 / 18070305	• PCBs (Polychlorinated biphenyls) ○ Source Unknown	0.42 Miles	2006	5A	2019
9	Pacific Ocean Shoreline, Loma Alta HSA, at Loma Alta Creek mouth	Coastal & Bay Shoreline	90410000 / 18070303	• Indicator Bacteria ○ Natural Sources ○ Nonpoint Source ○ Point Source ○ Source Unknown	0.03 Miles	1998	5A	2019
9	Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at San Elijo Lagoon	Coastal & Bay Shoreline	90461000 / 18070303	• Indicator Bacteria ○ Source Unknown	0.44 Miles	1998	5A	2008
9	Paleta Creek	River & Stream	90831000 / 18070304	• Copper ○ Source Unknown	4.1 Miles	2010	5A	2021
				• Lead ○ Source Unknown	4.1 Miles	2010	5A	2021
9	Paradise Creek, HSA 908.320	River & Stream	90912000 / 18070304	• Phosphorus ○ Source Unknown	2.8 Miles	2010	5A	2023
				• Selenium	2.8 Miles	2010	5A	2021

				Source Unknown				034583
9	Poggi Canyon Creek	River & Stream	91020000 / 18070304	• Toxicity ◦ Source Unknown	7.8 Miles	2010	5A	2021
9	Poway Creek	River & Stream	90620000 / 18070304	• Selenium ◦ Source Unknown	7.3 Miles	2010	5A	2021
				• Toxicity ◦ Source Unknown	7.3 Miles	2010	5A	2021
9	Prima Deshecha Creek	River & Stream	90130000 / 18070301	• Cadmium ◦ Source Unknown	1.2 Miles	2010	5A	2021
				• Phosphorus ◦ Source Unknown	1.2 Miles	2002	5A	2019
				• Turbidity ◦ Source Unknown	1.2 Miles	2002	5A	2019
9	Rainbow Creek	River & Stream	90222000 / 18070302	• Aluminum ◦ Source Unknown	5 Miles	2014	5A	2025
				• Iron ◦ Source Unknown	5 Miles	2006	5A	2019

				• Nitrogen
				  ◦ Agricultural Return Flows
				  ◦ Nonpoint Source
				  ◦ Nurseries
				  ◦ Onsite Wastewater Systems (Septic Tanks)
				  ◦ Other Urban Runoff
				  ◦ Point Source
					5 Miles	2002	5B	2006

				• Phosphorus
				  ◦ Unknown Nonpoint Source
				  ◦ Unknown Point Source
				  ◦ Urban Runoff/Storm Sewers
					5 Miles	2002	5B	2006

				• Sulfates ◦ Source Unknown	5 Miles	2006	5A	2019
				• Total Dissolved Solids ◦ Source Unknown	5 Miles	2006	5A	2019
9	Redhawk Channel	River & Stream	90251000 / 18070302	• Chlorpyrifos ◦ Source Unknown	0.15 Miles	2010	5A	2021
				• Copper ◦ Source Unknown	0.15 Miles	2010	5A	2021
				• Diazinon ◦ Source Unknown	0.15 Miles	2010	5A	2021
				• Iron ◦ Natural Sources	0.15 Miles	2010	5A	2019

				Source Unknown			034584	
				• Manganese ◦ Source Unknown	0.15 Miles	2010	5A	2021
				• Nitrogen ◦ Source Unknown	0.15 Miles	2010	5A	2021
				• Phosphorus ◦ Source Unknown	0.15 Miles	2010	5A	2021
				• Total Dissolved Solids ◦ Source Unknown	0.15 Miles	2010	5A	2021
9	Reidy Canyon Creek	River & Stream	90462000 / 18070303	• Phosphorus ◦ Source Unknown	3.9 Miles	2006	5A	2019

9	Rose Creek	River & Stream	90640000 / 18070304	• Benthic Community Effects
				  ◦ Hydromodification
				  ◦ Illicit Connections/Illegal Hook-ups/Dry Weather Flows
				  ◦ Source Unknown
				  ◦ Unknown Nonpoint Source
				  ◦ Unknown Point Source
				  ◦ Urban Runoff/Storm Sewers
					13 Miles	2010	5A	2025

				• Selenium
				  ◦ Natural Sources
				  ◦ Source Unknown
					13 Miles	2010	5A	2021

				• Toxicity ◦ Source Unknown *Toxicity is linked to Selenium exceedances.*	13 Miles	2010	5A	2021

9	San Diego Bay	Bay & Harbor	91010000 / 18070304	• PCBs (Polychlorinated biphenyls)
				  ◦ Contaminated Sediments
				  ◦ Dredging
				  ◦ Historic Land Management Activities
				  ◦ Illegal dumping
				  ◦ Source Unknown
				  ◦ Spills
				  ◦ Urban Runoff/Storm Sewers
					10783 Acres	2006	5A	2019

9	San Diego Bay Shoreline, 32nd St San Diego Naval Station	Bay & Harbor	90822000 / 18070304	• Benthic Community Effects ◦ Source Unknown	103 Acres	1998	5A	2019
				• Sediment Toxicity ◦ Source Unknown	103 Acres	1998	5A	2019
9	San Diego Bay Shoreline,	Coastal & Bay Shoreline	90912000 / 18070304	• Copper ◦ Source Unknown	0.41 Miles	2006	5A	2019

	Chula Vista Marina						034585	
9	San Diego Bay Shoreline, Downtown Anchorage	Bay & Harbor	90821000 / 18070304	• Benthic Community Effects ◦ Source Unknown	7.4 Acres	1998	5A	2019
				• Sediment Toxicity ◦ Source Unknown	7.4 Acres	1998	5A	2019
9	San Diego Bay Shoreline, G Street Pier	Coastal & Bay Shoreline	90821000 / 18070304	• Indicator Bacteria ◦ Source Unknown *The indicator bacteria listed include total coliform for SHELL.*	0.42 Miles	2002	5A	2025
9	San Diego Bay Shoreline, North of 24th Street Marine Terminal	Bay & Harbor	90832000 / 18070304	• Benthic Community Effects ◦ Source Unknown	9.5 Acres	2002	5A	2019
				• Sediment Toxicity ◦ Source Unknown	9.5 Acres	2002	5A	2019
9	San Diego Bay Shoreline, Seventh Street Channel	Bay & Harbor	90831000 / 18070304	• Benthic Community Effects ◦ Source Unknown	9 Acres	2002	5A	2008
				• Sediment Toxicity ◦ Source Unknown	9 Acres	2002	5A	2008
9	San Diego Bay Shoreline, Tidelands Park	Coastal & Bay Shoreline	91010000 / 18070304	• Indicator Bacteria ◦ Source Unknown *The listed indicator bacteria include enterococcus for REC-1 and total coliform for SHELL.*	0.38 Miles	1800	5A	2021
9	San Diego Bay Shoreline, Vicinity of B St and Broadway Piers	Bay & Harbor	90821000 / 18070304	• Benthic Community Effects ◦ Source Unknown	9.9 Acres	2002	5A	2019
				• Indicator Bacteria ◦ Source Unknown	9.9 Acres	2010	5A	2019
				• Sediment Toxicity				

				◦ Source Unknown	9.9 Acres	2002	5A	2019
9	San Diego Bay Shoreline, at Americas Cup Harbor	Bay & Harbor	90810000 / 18070304	• Copper ◦ Source Unknown	88 Acres	1992	5A	2019
9	San Diego Bay Shoreline, at Coronado Cays	Bay & Harbor	91010000 / 18070304	• Copper ◦ Source Unknown	47 Acres	1992	5A	2019
9	San Diego Bay Shoreline, at Glorietta Bay	Bay & Harbor	91010000 / 18070304	• Copper ◦ Source Unknown	52 Acres	1992	5A	2019
9	San Diego Bay Shoreline, at Harbor Island (East Basin)	Bay & Harbor	90821000 / 18070304	• Copper ◦ Source Unknown	73 Acres	1992	5A	2019
9	San Diego Bay Shoreline, at Harbor Island (West Basin)	Bay & Harbor	90810000 / 18070304	• Copper ◦ Source Unknown	132 Acres	1992	5A	2019
9	San Diego Bay Shoreline, at Marriott Marina	Bay & Harbor	90821000 / 18070304	• Copper ◦ Source Unknown	24 Acres	1992	5A	2019
9	San Diego Bay Shoreline, near Chollas Creek	Bay & Harbor	90822000 / 18070304	• Benthic Community Effects ◦ Source Unknown ◦ Unknown Nonpoint Source ◦ Unknown Point Source	15 Acres	2002	5A	2010
				• Sediment Toxicity ◦ Source Unknown ◦ Unknown Nonpoint Source ◦ Unknown Point Source	15 Acres	2002	5A	2010
9	San Diego Bay Shoreline, near	Bay & Harbor	90822000 / 18070304	• Benthic Community Effects ◦ Source Unknown	37 Acres	2002	5A	2019

	Coronado Bridge						034587	
				• Sediment Toxicity ◦ Source Unknown	37 Acres	2002	5A	2019
				Includes Crosby Street/Cesar Chavez Park area, that will receive additional monitoring.				
9	San Diego Bay Shoreline, near Switzer Creek	Bay & Harbor	90821000 / 18070304	• Chlordane ◦ Source Unknown	5.5 Acres	2002	5A	2019
				• PAHs (Polycyclic Aromatic Hydrocarbons) ◦ Source Unknown	5.5 Acres	2002	5A	2019
9	San Diego Bay Shoreline, near sub base	Bay & Harbor	90810000 / 18070304	• Benthic Community Effects ◦ Source Unknown	16 Acres	2002	5A	2021
				There is not an expected TMDL completion date because the TMDL is for the waterbody and pollutant and the TMDL can not be completed for benthic community effects alone.				
				• Toxicity ◦ Source Unknown	16 Acres	2002	5A	2021
9	San Diego River (Lower)	River & Stream	90711000 / 18070304	• Manganese ◦ Source Unknown	16 Miles	2010	5A	2021
				• Nitrogen ◦ Source Unknown	16 Miles	2010	5A	2029
				• Phosphorus ◦ Source Unknown	16 Miles	2002	5A	2019
				Impairment transcends adjacent Calwater watershed 90712.				
				• Total Dissolved Solids ◦ Source Unknown	16 Miles	2002	5A	2019
				Impairment transcends adjacent Calwater watershed 90712.				
				• Toxicity ◦ Source Unknown	16 Miles	2010	5A	2025
				Up to this time of assessment, sediment toxicity has been observed mostly in samples from the San Diego River Estuary. In the next cycle of assessment, San Diego River Estuary will be separated from the lower portion (i.e., freshwater) portion of San Diego River (lower).				
9	San Diego River (Upper)	River & Stream	90731000 / 18070304	• Sulfates ◦ Source Unknown	32 Miles	2010	5A	2025
9	San Dieguito	River & Stream	90511000 / 18070304	• Benthic Community Effects ◦ Agriculture	19 Miles	2010	5A	2025

	River			◦ Hydromodification ◦ Illicit Connections/Illegal Hook-ups/Dry Weather Flows ◦ Source Unknown ◦ Unknown Nonpoint Source ◦ Unknown Point Source ◦ Urban Runoff/Storm Sewers		034588		
				• Nitrogen ◦ Source Unknown	19 Miles	2010	5A	2021
				• Phosphorus ◦ Source Unknown	19 Miles	2010	5A	2021
				• Total Dissolved Solids ◦ Source Unknown	19 Miles	2010	5A	2021
				• Toxicity ◦ Source Unknown	19 Miles	2010	5A	2021
9	San Elijo Lagoon	Estuary	90461000 / 18070303	• Eutrophic ◦ Source Unknown *Estimated size of impairment is 330 acres.*	566 Acres	1996	5A	2019
				• Indicator Bacteria ◦ Source Unknown *Estimated size of impairment is 150 acres. The listed indicator bacteria are from place holder decision.*	566 Acres	1996	5A	2015
				• Sedimentation/Siltation ◦ Source Unknown *Estimated size of impairment is 150 acres.*	566 Acres	1996	5A	2019
9	San Juan Creek	River & Stream	90120000 / 18070301	• Benthic Community Effects ◦ Agriculture ◦ Contaminated Sediments ◦ Hydromodification ◦ Illicit Connections/Illegal Hook-ups/Dry Weather Flows ◦ Removal of Riparian Vegetation ◦ Source Unknown ◦ Unknown Nonpoint Source ◦ Unknown Point Source ◦ Urban Runoff/Storm Sewers	1 Miles	2010	5A	2025
				• DDE (Dichlorodiphenyldichloroethylene) ◦ Source Unknown	1 Miles	2006	5A	2019
				• Indicator Bacteria ◦ Source Unknown	1 Miles	1992	5A	2019
				• Phosphorus ◦ Source Unknown	1 Miles	2014	5A	2021
				• Selenium ◦ Source Unknown	1 Miles	2010	5A	2021
				• Toxicity ◦ Source Unknown	1 Miles	2010	5A	2021

9	San Juan Creek (mouth)	Estuary	90120000 / 18070301	• Indicator Bacteria ○ Source Unknown	6.3 Acres	1990	5B	2011
9	San Luis Rey River, Lower (west of Interstate 15)	River & Stream	90311000 / 18070303	• Benthic Community Effects ○ Source Unknown	19 Miles	2010	5A	2025
				• Chloride ○ Source Unknown *Impairment located at lower 13 miles.*	19 Miles	2002	5A	2019
				• Phosphorus ○ Source Unknown	19 Miles	2010	5A	2021
				• Total Dissolved Solids ○ Source Unknown	19 Miles	2002	5A	2019
				• Toxicity ○ Source Unknown	19 Miles	2010	5A	2021
9	San Luis Rey River, Upper (east of Interstate 15)	River & Stream	90312000 / 18070303	• Phosphorus ○ Source Unknown	35 Miles	2010	5A	2023
				• Total Nitrogen as N ○ Source Unknown	35 Miles	2010	5A	2021
9	San Marcos Creek	River & Stream	90451000 / 18070303	• Benthic Community Effects ○ Source Unknown	19 Miles	2010	5A	2025
				• DDE (Dichlorodiphenyldichloroethylene) ○ Source Unknown	19 Miles	2006	5A	2019
				• Phosphorus ○ Source Unknown ○ Unknown Nonpoint Source ○ Unknown Point Source ○ Urban Runoff/Storm Sewers	19 Miles	2006	5A	2019
				• Selenium ○ Source Unknown	19 Miles	2010	5A	2021
9	San Marcos Lake	Lake & Reservoir	90452000 / 18070303	• Ammonia as Nitrogen ○ Source Unknown	17 Acres	2006	5A	2019
				• Nutrients ○ Source Unknown	17 Acres	2006	5A	2019
				• Phosphorus ○ Source Unknown	17 Acres	2006	5A	2019

9	San Vicente Creek (San Diego County)	River & Stream	90722000 / 18070304	• Ammonia as Nitrogen ○ Source Unknown	16 Miles	2010	5A	2021
				• Phosphorus ○ Source Unknown	16 Miles	2010	5A	2023
				• Total Nitrogen as N ○ Source Unknown	16 Miles	2010	5A	2021
				• Toxicity ○ Source Unknown	16 Miles	2010	5A	2021
9	San Vicente Reservoir	Lake & Reservoir	90721000 / 18070304	• Chloride ○ Source Unknown ○ Unknown Nonpoint Source ○ Water Diversions	1058 Acres	2006	5A	2019
				• Sulfates ○ Source Unknown	1058 Acres	2006	5A	2019
9	Sandia Creek	River & Stream	90222000 / 18070302	• Iron ○ Source Unknown	1.5 Miles	2006	5A	2025
				• Manganese ○ Source Unknown	1.5 Miles	2006	5A	2025
				• Nitrogen ○ Source Unknown	1.5 Miles	2006	5A	2029
				• Selenium ○ Source Unknown	1.5 Miles	2014	5A	2027
				• Silver ○ Source Unknown	1.5 Miles	2014	5A	2027
				• Sulfates ○ Source Unknown ○ Unknown Nonpoint Source ○ Unknown Point Source ○ Urban Runoff/Storm Sewers	1.5 Miles	2006	5A	2019
				• Total Dissolved Solids ○ Source Unknown	1.5 Miles	2002	5A	2019
9	Santa Gertrudis Creek	River & Stream	90242000 / 18070302	• Chlorpyrifos ○ Source Unknown	12 Miles	2010	5A	2021
				• Copper ○ Source Unknown	12 Miles	2010	5A	2021
				• Iron ○ Source Unknown	12 Miles	2010	5A	2021
				• Manganese ○ Source Unknown	12 Miles	2010	5A	2021
				• Phosphorus ○ Source Unknown	12 Miles	2010	5A	2021

9	Santa Margarita River (Lower)	River & Stream	90211000 / 18070302	• Phosphorus ○ Source Unknown	19 Miles	2010	5A	2021
				• Toxicity ○ Source Unknown	19 Miles	2010	5A	2025
9	Santa Margarita River (Upper)	River & Stream	90222000 / 18070302	• Manganese ○ Source Unknown	18 Miles	2010	5A	2025
				• Phosphorus ○ Source Unknown	18 Miles	2002	5A	2019
				• Toxicity ○ Source Unknown	18 Miles	2010	5A	2025
9	Santa Ysabel Creek (above Sutherland Reservoir)	River & Stream	90553000 / 18070304	• Toxicity ○ Source Unknown	12 Miles	2010	5A	2021
9	Segunda Deshecha Creek	River & Stream	90130000 / 18070301	• Phosphorus ○ Source Unknown	0.92 Miles	2002	5A	2019
				• Toxicity ○ Source Unknown	0.92 Miles	2010	5A	2021
				• Turbidity ○ Source Unknown	0.92 Miles	2002	5A	2019
9	Soledad Canyon	River & Stream	90610000 / 18070304	• Sediment Toxicity ○ Source Unknown	1.7 Miles	2002	5A	2019
				• Selenium ○ Source Unknown ○ Unknown Nonpoint Source ○ Urban Runoff/Storm Sewers	1.7 Miles	2010	5A	2021
9	Sutherland Reservoir	Lake & Reservoir	90553000 / 18070304	• Color ○ Source Unknown	561 Acres	2002	5A	2019
				• Iron ○ Source Unknown	561 Acres	2014	5A	2021
				• Manganese ○ Source Unknown	561 Acres	2006	5A	2019
				• Phosphorus ○ Source Unknown	561 Acres	2010	5A	2023
				• pH	561 Acres	2006	5A	2019

				Source Unknown			034592	
9	Sweetwater Reservoir	Lake & Reservoir	90921000 / 18070304	• Oxygen, Dissolved ○ Source Unknown	925 Acres	2006	5A	2019
9	Sweetwater River, Lower (below Sweetwater Reservoir)	River & Stream	90912000 / 18070304	• Phosphorus ○ Source Unknown	5.3 Miles	2010	5A	2021
				• Selenium ○ Source Unknown	5.3 Miles	2010	5A	2021
				• Total Dissolved Solids ○ Source Unknown	5.3 Miles	2010	5A	2021
				• Toxicity ○ Source Unknown	5.3 Miles	2010	5A	2021
9	Sweetwater River, Upper (above Sweetwater Reservoir)	River & Stream	90921000 / 18070304	• Selenium ○ Source Unknown	43 Miles	2010	5A	2027
				• Total Nitrogen as N ○ Source Unknown	43 Miles	2010	5A	2027
				The listing decision is based on data collected about 10 years old. In future cycles of evaluation, more recent data will be solicited and combined with the existing data to re-evaluate the water body condition as appropriate.				
9	Switzer Creek	River & Stream	90822000 / 18070304	• Copper ○ Source Unknown	1.3 Miles	2010	5A	2021
				• Lead ○ Source Unknown	1.3 Miles	2010	5A	2021
				• Zinc ○ Source Unknown	1.3 Miles	2010	5A	2021
9	Tecate Creek	River & Stream	91123000 / 18070305	• Nitrogen ○ Source Unknown	1.2 Miles	2010	5A	2027
				The listing decision is based on data collected about 10 years old. In future cycles of evaluation, more recent data will be solicited and combined with the existing data to re-evaluate the water body condition as appropriate.				
				• Phosphorus ○ Source Unknown	1.2 Miles	2010	5A	2023
				• Selenium ○ Source Unknown	1.2 Miles	2010	5A	2021
9	Tecolote Creek	River & Stream	90650000 / 18070304	• Benthic Community Effects ○ Hydromodification ○ Illicit Connections/Illegal Hook-	6.6 Miles	2010	5A	2025

				ups/Dry Weather Flows ○ Source Unknown ○ Unknown Point Source ○ Urban Runoff/Storm Sewers				034593
				• Cadmium ○ Source Unknown	6.6 Miles	1996	5A	2019
				• Copper ○ Source Unknown	6.6 Miles	1996	5A	2019
				• Indicator Bacteria ○ Source Unknown	6.6 Miles	1996	5B	2011
				• Lead ○ Source Unknown	6.6 Miles	1996	5A	2019
				• Nitrogen ○ Source Unknown	6.6 Miles	2010	5A	2021
				• Phosphorus ○ Source Unknown	6.6 Miles	2006	5A	2019
				• Selenium ○ Natural Sources ○ Source Unknown	6.6 Miles	2010	5A	2021
				• Toxicity ○ Source Unknown	6.6 Miles	1996	5A	2019
				• Turbidity ○ Source Unknown	6.6 Miles	2006	5A	2019
				• Zinc ○ Source Unknown	6.6 Miles	1996	5A	2019
9	Telegraph Canyon Creek	River & Stream	90911000 / 18070304	• Nitrogen ○ Source Unknown	10 Miles	2010	5A	2027
				The decision of listing is based on data about 10 years old. In future cycles, more recent data will be solicited and evaluated together with existing data for water body condition.				
				• Selenium ○ Source Unknown	10 Miles	2010	5A	2021
9	Temecula Creek	River & Stream	90251000 / 18070302	• Chlorpyrifos ○ Source Unknown	44 Miles	2010	5A	2021
				• Copper ○ Source Unknown ○ Urban Runoff/Storm Sewers	44 Miles	2010	5A	2021
				• Phosphorus ○ Source Unknown	44 Miles	2006	5A	2019
				• Total Dissolved Solids ○ Source Unknown	44 Miles	2006	5A	2019
				• Toxicity ○ Source Unknown	44 Miles	2010	5A	2021

9	Tijuana River	River & Stream	91111000 / 18070305	• Ammonia as Nitrogen ◦ Source Unknown	6 Miles	2010	5Alt	2027
				• Benthic Community Effects ◦ Source Unknown	6 Miles	2010	5Alt	2025
				• Eutrophic ◦ Source Unknown	6 Miles	1996	5Alt	2019
				• Indicator Bacteria ◦ Source Unknown *The indicator bacteria listed include E. Coli. and total coliform.*	6 Miles	1992	5Alt	2010
				• Low Dissolved Oxygen ◦ Source Unknown	6 Miles	1996	5Alt	2019
				• Pesticides ◦ Source Unknown	6 Miles	1996	5Alt	2019
				• Phosphorus ◦ Source Unknown	6 Miles	2010	5Alt	2021
				• Sedimentation/Siltation ◦ Source Unknown	6 Miles	2010	5Alt	2021
				• Selenium ◦ Source Unknown	6 Miles	2010	5Alt	2025
				• Solids ◦ Source Unknown	6 Miles	1996	5Alt	2019
				• Surfactants (MBAS) ◦ Source Unknown	6 Miles	2010	5Alt	2021
				• Synthetic Organics ◦ Source Unknown	6 Miles	1996	5Alt	2019
				• Total Nitrogen as N ◦ Natural Sources ◦ Source Unknown ◦ Unknown Nonpoint Source ◦ Urban Runoff/Storm Sewers	6 Miles	2010	5Alt	2025
				• Toxicity ◦ Source Unknown	6 Miles	2010	5Alt	2025
				• Trace Elements ◦ Source Unknown	6 Miles	1998	5Alt	2019
				• Trash ◦ Source Unknown	6 Miles	1998	4B	2019
9	Tijuana River Estuary	Estuary	91111000 / 18070305	• Eutrophic ◦ Source Unknown *Estimated size of impairment is 1 acre.*	1319 Acres	1996	5Alt	2019
				• Indicator Bacteria ◦ Source Unknown *Estimated size of impairment is 150 acres.*	1319 Acres	1988	5Alt	2010

034595

				• Lead ◦ Source Unknown *Estimated size of impairment is 1 acre.*	1319 Acres	1992	5Alt	2019
				• Low Dissolved Oxygen ◦ Source Unknown	1319 Acres	1988	5Alt	2019
				• Nickel ◦ Source Unknown *Estimated size of impairment is 1 acre.*	1319 Acres	1992	5Alt	2019
				• Pesticides ◦ Source Unknown *Estimated size of impairment is 1 acre.*	1319 Acres	1992	5Alt	2019
				• Thallium ◦ Source Unknown *Estimated size of impairment is 1 acre.*	1319 Acres	1992	5Alt	2019
				• Trash ◦ Source Unknown *Estimated size of impairment is 1 acre.*	1319 Acres	1996	5Alt	2019
				• Turbidity ◦ Source Unknown	1319 Acres	2006	5Alt	2019
9	Warm Springs Creek (Riverside County)	River & Stream	90233000 / 18070302	• Chlorpyrifos ◦ Source Unknown	15 Miles	2010	5A	2021
				• Iron ◦ Source Unknown	15 Miles	2010	5A	2021
				• Manganese ◦ Source Unknown	15 Miles	2010	5A	2021
				• Phosphorus ◦ Source Unknown	15 Miles	2010	5A	2021
9	Wood Canyon (Orange County)	River & Stream	90113000 / 18070301	• Benthic Community Effects ◦ Source Unknown	3.9 Miles	2010	5A	2025

Please also see next page for additional water body segments in Category 5.

9	Felicita Creek (North)	River&Stream	N/A					
			• Trichloroethylene Industry Discharge	0.72 Miles	2016	5A	2027	
			• Tetrachloroethylene Industry Dishcharge	0.72 Miles	2016	5A	2027	
			• 1,4-Dioxane Industry Discharge	0.72 Miles	2016	5A	2027	
9	Famosa Slough and Channel	Estuary	90711000/18070304					
			• Eutrophic Urban runoff	32 Acres	1990	5 Alt	2027	
9	Santa Margarita Lagoon	Estuary	90211000 /18070302					
			• Eutrophic Agriculture-storm runoff 28 Acres 1986 2027	28 Acres	1986	5 Alt	2027	
9	Loma Alta Slough	Estuary	90410000 /18070303					
			• Eutrophic Flow Alteration/Regulation/Modification Groundwater Loadings Hydromodification Illicit Connections/Illegal Hook- ups/Dry Weather Flows Urban Runoff/Storm Sewers *On June 26, 2014 The San Diego Regional Water Quality Control Board (San Diego Water Board) adopted Resolution No. R9-2014-0020 - Resolution of Commitment to an Alternative Process for Achieving Water Quality Objectives for Biostimulatory Substances in Loma Alta Slough which sets the path forward to eliminate the excessive algal growth in Loma Alta Slough in Oceanside by using an existing regional stormwater permit designed to provide safe, cleaner water for the region. With this action, the San Diego Water Board chose a practical, measureable, and timely approach for directing actions to remedy the Slough through a productive collaboration with the community to address an important water quality challenge.*	8.2 Acres	1996	5 Alt	2023	
			• Indicator Bacteria Illicit Connections/Illegal Hook- ups/Dry Weather Flows Urban Runoff/Storm Sewers	8.2 Acres	1996	5 Alt	2023	

Due to mapping issues in the database, some waterbody segments (e.g., eastern Agua Hedionda Lagoon) may not show up in this Appendix, please refer to Appendix A [i.e., proposed changes to 303(d) list] for complete waterbody segments that should be in Categories 4 and/or 5.

034597

2014 CALIFORNIA LIST OF WATER QUALITY LIMITED SEGMENTS

BEING ADDRESSED BY USEPA APPROVED TMDLS

Category 4A Criteria: 1) A water segment where ALL its 303(d) listings are being addressed; and 2) at least one of those listings is being addressed by a USEPA approved TMDL.

* USGS HUC = US Geological Survey Hydrologic Unit Code. Calwater = State Water Resources Control Board hydrological subunit area or even smaller planning watershed.

** "Addressed By" is defined as: B = Being addressed by USEPA approved TMDL and C = Being addressed by action(s) other than a TMDL

WATER BODY NAME	WATER BODY TYPE	COUNTY	COMMEN BENEFICIAL US	ESTIMATED AREA ASSESSED
Mission Bay Shoreline, at Tecolote Shores	Coastal & Bay Shoreline	San Diego	REC-1	0.04 Miles
Pacific Ocean Shoreline, Aliso HSA, at Aliso Beach - middle	Coastal & Bay Shoreline	Orange	REC-1	0.03 Miles
Pacific Ocean Shoreline, Batiquitos HSA, at Moonlight State Beach (Cottonwood Creek outlet)	Coastal & Bay Shoreline	San Diego	REC-1	0.03 Miles
Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at Baby Beach	Coastal & Bay Shoreline	Orange	REC-1	0.03 Miles
Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at patrol dock	Coastal & Bay Shoreline	Orange	REC-1	0.03 Miles
Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch Beach	Coastal & Bay Shoreline	Orange	REC-1	0.03 Miles
Pacific Ocean Shoreline, Laguna Beach HSA, at Broadway Creek	Coastal & Bay Shoreline	Orange	REC-1	0.03 Miles
Pacific Ocean Shoreline, Lower San Juan HSA, 1000 feet south of outfall	Coastal & Bay Shoreline	Orange	REC-1	0.03 Miles
Pacific Ocean Shoreline, Lower San Juan HSA, 10000 feet south of outfall	Coastal & Bay Shoreline	Orange	REC-1	0.03 Miles
Pacific Ocean Shoreline, Lower San Juan HSA, 2000 feet south of outfall	Coastal & Bay Shoreline	Orange	REC-1	0.03 Miles
Pacific Ocean Shoreline, Lower San Juan HSA, 3000 feet south of outfall	Coastal & Bay Shoreline	Orange	REC-1	0.03 Miles
Pacific Ocean Shoreline, Lower San Juan HSA, 4000 feet south of outfall	Coastal & Bay Shoreline	Orange	REC-1	0.03 Miles
Pacific Ocean Shoreline, Lower San Juan HSA, 5000 feet south of outfall	Coastal & Bay Shoreline	Orange	REC-1	0.03 Miles
Pacific Ocean Shoreline, Lower San Juan HSA, 7500 feet south of outfall	Coastal & Bay Shoreline	Orange	REC-1	0.03 Miles
Pacific Ocean Shoreline, Lower San Juan HSA, at North Beach Creek	Coastal & Bay Shoreline	Orange	REC-1	0.03 Miles
Pacific Ocean Shoreline, Lower San Juan HSA, at North Doheny State Park Campground	Coastal & Bay Shoreline	Orange	REC-1	0.03 Miles
Pacific Ocean Shoreline, Lower San Juan HSA, at San Juan Creek	Coastal & Bay Shoreline	Orange	REC-1	0.03 Miles
Pacific Ocean Shoreline, Lower San Juan HSA, at South Doheny State Park Campground	Coastal & Bay Shoreline	Orange	REC-1	0.03 Miles
Pacific Ocean Shoreline, Lower San Juan HSA, at surfzone outfall at Doheny State Beach	Coastal & Bay Shoreline	Orange	REC-1	0.03 Miles
Pacific Ocean Shoreline, Miramar Reservoir HA, at Los Penasquitos River mouth	Coastal & Bay Shoreline	San Diego	REC-1	0.39 Miles
Pacific Ocean Shoreline, San Clemente HA, at Poche Beach	Coastal & Bay Shoreline	Orange	REC-1	0.03 Miles
Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Pier	Coastal & Bay Shoreline	Orange	REC-1	0.03 Miles
Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, North Beach	Coastal & Bay Shoreline	Orange	REC-1	0.03 Miles
Pacific Ocean Shoreline, San Clemente HA, at South Capistrano Beach at Beach Road	Coastal & Bay Shoreline	Orange	REC-1	0.03 Miles
Pacific Ocean Shoreline, San Clemente HA, at South Capistrano County Beach	Coastal & Bay Shoreline	Orange	REC-1	0.03 Miles
Pacific Ocean Shoreline, San Diego HU, at Stub Jetty, south of the San Diego River outlet, near Cape May Avenue	Coastal & Bay Shoreline	San Diego	REC-1	0.03 Miles
Pacific Ocean Shoreline, San Diego HU, at the San Diego River outlet, at Dog Beach	Coastal & Bay Shoreline	San Diego	REC-1	0.03 Miles
Pacific Ocean Shoreline, San Dieguito HU, at San Dieguito Lagoon Mouth at San Dieguito River Beach	Coastal & Bay Shoreline	San Diego	REC-1	0.03 Miles
Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth	Coastal & Bay Shoreline	San Diego	REC-1	0.03 Miles
Pacific Ocean Shoreline, Scripps HA, at Childrens Pool	Coastal & Bay Shoreline	San Diego	REC-1	0.03 Miles
Pacific Ocean Shoreline, Scripps HA, at Pacific Beach Point , Pacific Beach	Coastal & Bay Shoreline	San Diego	REC-1	0.03 Miles
Pacific Ocean Shoreline, Scripps HA, at Vallecitos Court at La Jolla Shores Beach	Coastal & Bay Shoreline	San Diego	REC-1	0.03 Miles
San Diego Bay Shoreline, Shelter Island Shoreline Park	Coastal & Bay Shoreline	San Diego	REC-1	0.42 Miles
San Diego Bay, Shelter Island Yacht Basin	Bay & Harbor	San Diego	Aquatic Life Support	154 Acres

2014 CALIFORNIA LIST OF WATER QUALITY LIMITED SEGMENTS
BEING ADDRESSED BY ACTIONS OTHER THAN TMDLS

Category 4B Criteria: A water segment where ALL its 303(d) listings are being addressed by action(s) other than TMDL.

* USGS HUC = US Geological Survey Hydrologic Unit Code. Calwater = is the State Water Resources Control Board hydrological subunit area or even smaller area delineation.

REGION	WATER BODY NAME	WATER TYPE	WATERSHED* CALWATER / USGS HUC	POLLUTANT / POTENTIAL SOURCES *Relevant Notes*	ESTIMATED AREA ASSESSED	FIRST YEAR LISTED	PROGRAM COMPLETION DATE
9	San Diego Bay Shoreline, between Sampson and 28th Streets	Bay & Harbor	90822000 / 18070304	Copper - Nonpoint Source - Point Source	53 Acres	1992	2015
				Mercury - Major Industrial Point Source	53 Acres	1990	2013
				PAHs (Polycyclic Aromatic Hydrocarbons) - Nonpoint Source - Point Source	53 Acres	1992	2013
				PCBs (Polychlorinated biphenyls) - Major Industrial Point Source - Unknown Nonpoint Source - Unknown Point Source - Urban Runoff/Storm Sewers	53 Acres	1990	2013
				Zinc - Source Unknown - Unknown Nonpoint Source - Unknown Point Source	53 Acres	1990	2013

2014 CALIFORNIA WATERS IMPACTED BY POLLUTION

Category 4C Criteria: A water that is impacted by non-pollutant related cause(s).

* USGS HUC = US Geological Survey Hydrologic Unit Code. Calwater = is the State Water Resources Control Board hydrological subunit area or even smaller area delineation.

REGION	WATER BODY NAME	WATER TYPE	WATERSHED* CALWATER / USGS HUC	POLLUTION	ESTIMATED AREA ASSESSED

WATER BODY NAME	WATER BODY TYPE	COUNTY
Agua Hedionda Creek	River & Stream	San Diego
Aliso Creek	River & Stream	Orange
Arroyo Trabuco Creek	River & Stream	Orange
Buena Vista Creek	River & Stream	San Diego
Campo Creek	River & Stream	San Diego
Carroll Canyon	River & Stream	San Diego
Cottonwood Creek (San Marcos Creek watershed)	River & Stream	San Diego
Encinitas Creek	River & Stream	San Diego
English Canyon	River & Stream	Orange
Escondido Creek	River & Stream	San Diego
Forester Creek	River & Stream	San Diego
Green Valley Creek	River & Stream	San Diego
Laguna Canyon Channel	River & Stream	Orange
Loma Alta Creek	River & Stream	San Diego
Los Penasquitos Creek	River & Stream	San Diego
Rose Creek	River & Stream	San Diego
Salt Creek (Orange County)	River & Stream	Orange | San Diego
San Diego River (Lower)	River & Stream	San Diego
San Dieguito River, unnamed tributary below Hodges Dam	River & Stream	San Diego
San Juan Creek	River & Stream	Orange
San Luis Rey River, Lower (west of Interstate 15)	River & Stream	San Diego
San Marcos Creek	River & Stream	San Diego
Santa Margarita River (Lower)	River & Stream	San Diego
Segunda Deshecha Creek	River & Stream	Orange
Sweetwater River, Lower (below Sweetwater Reservoir)	River & Stream	San Diego
Sweetwater River, Upper (above Sweetwater Reservoir)	River & Stream	San Diego
Tecolote Creek	River & Stream	San Diego
Tijuana River	River & Stream	San Diego
Wood Canyon (Orange County)	River & Stream	Orange

2014 CALIFORNIA WATERS WITH INSUFFICIENT INFORMATION TO ASSESS BENEFICIAL USE SUPPORT

Common Beneficial Uses	Applicable California Beneficial Uses
Aquatic Life Support	Cold Freshwater Habitat, Estuarine Habitat, Fish Migration, Fish Spawning, Freshwater Replenishment, Inland Saline Water Habitat, Limited Warmwater, Marine Habitat, Preservation of Areas of Special Biological Significance, Preservation of Rare & Endangered Species, Warm Freshwater Habitat, Wetland Habitat, Wildlife Habitat
Drinking Water Supply	Municipal & Domestic Supply
Fish Consumption	Commercial or recreational collection of fish, shellfish, or organisms, Subsistence Fishing
Secondary Contact	Non-Contact Recreation
Shellfishing	Shellfish Harvesting
Swimming	Water Contact Recreation

Category 3 Criteria: There is insufficient data and/or information to make a beneficial use support determination but information and/or data indicates beneficial uses may be potentially threatened.

* USGS HUC = US Geological Survey Hydrologic Unit Code. Calwater = State Water Resources Control Board hydrological subunit area or even smaller planning watershed.

REGION	WATER BODY NAME	WATER TYPE	WATERSHED* CALWATER / USGS HUC	• COMMON BENEFICIAL USE ○ *California Beneficial Use* Pollutant Assessed	ESTIMATED AREA ASSESSED
9	Black Canyon	River & Stream	90552000 / 18070304	• Aquatic Life Support ○ *Warm Freshwater Habitat* Benthic Community Effects	4.7 Miles
9	Boden Canyon	River & Stream	90551000 / 18070304	• Aquatic Life Support ○ *Warm Freshwater Habitat* Benthic Community Effects	5.3 Miles
9	Casa de Oro Creek	River & Stream	90912000 / 18070304	• Aquatic Life Support ○ *Warm Freshwater Habitat* Cadmium, Chlorpyrifos, Copper, Diazinon, Lead, Malathion, Zinc	1.5 Miles
9	Chicarita Creek	River & Stream	90620000 / 18070304	• Aquatic Life Support ○ *Warm Freshwater Habitat* Benthic Community Effects	3.4 Miles
9	Conejos Creek	River & Stream	90731000 / 18070304	• Aquatic Life Support ○ *Warm Freshwater Habitat* Benthic Community Effects	11 Miles
9	De Luz Creek, unnamed tributary at De Luz Murrieta Road	River & Stream	90221000 / 18070302	• Aquatic Life Support ○ *Cold Freshwater Habitat* Benthic Community Effects	8.9 Miles

9	Devils Canyon Creek	River & Stream	90140000 / 18070301	Aquatic Life Support 034601 ○ *Warm Freshwater Habitat* Benthic Community Effects	5.5 Miles
9	Dulzura Creek	River & Stream	91036000 / 18070304	• Aquatic Life Support ○ *Warm Freshwater Habitat* Benthic Community Effects	8.5 Miles
9	French Creek (San Diego County)	River & Stream	90322000 / 18070303	• Aquatic Life Support ○ *Warm Freshwater Habitat* Benthic Community Effects	3.2 Miles
9	Gomez Creek	River & Stream	90321000 / 18070303	• Aquatic Life Support ○ *Cold Freshwater Habitat* Temperature, water	5 Miles
9	Hatfield Creek	River & Stream	90544000 / 18070304	• Swimming ○ *Water Contact Recreation* Indicator Bacteria • Drinking Water Supply ○ *Municipal & Domestic Supply* Cadmium, Chlorpyrifos, Copper, Diazinon, Lead, Malathion, Zinc • Aquatic Life Support ○ *Warm Freshwater Habitat* Cadmium, Chlorpyrifos, Copper, Diazinon, Lead, Malathion, Zinc	10 Miles
9	Helix Street Drain	River & Stream	90912000 / 18070304	• Aquatic Life Support ○ *Warm Freshwater Habitat* Cadmium, Chlorpyrifos, Copper, Diazinon, Lead, Malathion, Zinc	0.92 Miles
9	McGonigle Canyon	River & Stream	4906.100000 / 18070304	• Aquatic Life Support ○ *Warm Freshwater Habitat* Arsenic, Benthic Community Effects, Bifenthrin, Cadmium, Chromium, Copper, Cypermethrin, Lead, Nickel, Toxicity, Zinc	7.1 Miles
9	Mission Bay (area at Santa Barbara Cove)	Bay & Harbor	90751000 / 18070304	• Aquatic Life Support ○ *Estuarine Habitat* Copper, Toxicity	43 Acres
9	Mission Bay Shoreline, at Fiesta Island northwest shore	Coastal & Bay Shoreline	90752000 / 18070304	• Shellfishing ○ *Shellfish Harvesting* Indicator Bacteria Swimming	0.03 Miles

9	Mission Bay Shoreline, at Santa Clara Point	Coastal & Bay Shoreline	90751000 / 18070304	◦ *Water Contact Recreation* Indicator Bacteria • Shellfishing ◦ *Shellfish Harvesting* Indicator Bacteria	034602	0.03 Miles
9	Mission Bay at Dana Landing	Bay & Harbor	90752000 / 18070304	• Aquatic Life Support ◦ *Estuarine Habitat* Copper, Toxicity		9.8 Acres
9	Murphy Canyon	River & Stream	90711000 / 18070304	• Aquatic Life Support ◦ *Warm Freshwater Habitat* Arsenic, Benthic Community Effects, Bifenthrin, Cadmium, Chromium, Copper, Cypermethrin, Lead, Nickel, Toxicity, Zinc		4.9 Miles
9	Noble Canyon Creek	River & Stream	91141000 / 18070305	• Drinking Water Supply ◦ *Municipal & Domestic Supply* Oxygen, Dissolved, Total Dissolved Solids, pH • Aquatic Life Support ◦ *Warm Freshwater Habitat* Benthic Community Effects		4.7 Miles
9	Oak Creek (San Diego County)	River & Stream	90714000 / 18070304	• Swimming ◦ *Water Contact Recreation* Indicator Bacteria • Aquatic Life Support ◦ *Cold Freshwater Habitat* Cadmium, Copper, Lead, Zinc		1.8 Miles
9	Olive Vista Creek	River & Stream	91033000 / 18070304	• Swimming ◦ *Water Contact Recreation* Indicator Bacteria • Drinking Water Supply ◦ *Municipal & Domestic Supply* Cadmium, Chlorpyrifos, Copper, Diazinon, Lead, Malathion, Nitrate/Nitrite (Nitrite + Nitrate as N), Nitrogen, Nitrite, Zinc • Aquatic Life Support ◦ *Warm Freshwater Habitat* Cadmium, Chlorpyrifos, Copper, Diazinon, Lead, Malathion, Zinc		4.9 Miles
9	Otay River	River & Stream	91020000 / 18070304	• Aquatic Life Support ◦ *Warm Freshwater Habitat* Benthic Community Effects,		11 Miles

				Temperature, water 034603	
9	Pacific Ocean Shoreline at Dana Point	Coastal & Bay Shoreline	90114000 / 18070301	• Fish Consumption ○ *Commercial or recreational collection of fish, shellfish, or organisms* Arsenic, Cadmium, Chlordane, Chlorpyrifos, Dieldrin, Endosulfan, Endrin, Heptachlor epoxide, Hexachlorobenzene/ HCB, Lindane/gamma Hexachlorocyclohexane (gamma-HCH), Mercury, Mirex, PAHs (Polycyclic Aromatic Hydrocarbons), PCBs (Polychlorinated biphenyls), Selenium, Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD)	0.25 Miles
9	Pacific Ocean Shoreline at Scripps Reef	Coastal & Bay Shoreline	90630000 / 18070304	• Fish Consumption ○ *Commercial or recreational collection of fish, shellfish, or organisms* Arsenic, Cadmium, Chlordane, Chlorpyrifos, Dieldrin, Endosulfan, Endrin, Heptachlor epoxide, Hexachlorobenzene/ HCB, Lindane/gamma Hexachlorocyclohexane (gamma-HCH), Mercury, Mirex, PAHs (Polycyclic Aromatic Hydrocarbons), PCBs (Polychlorinated biphenyls), Selenium, Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD)	0.25 Miles
9	Pacific Ocean Shoreline, Dana Point HSA, at Niguel Marine Life Refuge	Coastal & Bay Shoreline	90114000 / 18070301	• Aquatic Life Support ○ *Marine Habitat* Arsenic, Cadmium, Chlorpyrifos, Copper, Diazinon, Lead, Malathion, Nickel, Nitrogen, ammonia (Total Ammonia), Selenium, Silver, Zinc	0.03 Miles
9	Pacific Ocean Shoreline, Lower Ysidora HSA, north of Santa Margarita River	Coastal & Bay Shoreline	90211000 / 18070302	• Shellfishing ○ *Shellfish Harvesting* Indicator Bacteria	0.03 Miles
9	Pacific Ocean Shoreline, Otay Valley HA, north of Palm Avenue Jetty	Coastal & Bay Shoreline	91020000 / 18070305	• Shellfishing ○ *Shellfish Harvesting* Indicator Bacteria	0.03 Miles
9	Pacific Ocean	Coastal & Bay	90111000 /	• Aquatic Life Support	0.03 Miles

	Shoreline, San Joaquin Hills HSA, at Aster Street	Shoreline	18070301	*Marine Habitat* 034604 Cadmium, Chlorpyrifos, Copper, Diazinon, Lead, Malathion, Nickel, Nitrogen, ammonia (Total Ammonia), Oxygen, Dissolved, Selenium, Silver, Toxicity, Zinc	
9	Pacific Ocean Shoreline, San Onofre Valley HSA, at San Onofre State Beach at Churchs Beach	Coastal & Bay Shoreline	90151000 / 18070301	• Swimming ○ *Water Contact Recreation* Indicator Bacteria • Shellfishing ○ *Shellfish Harvesting* Indicator Bacteria	0.03 Miles
9	Pacific Ocean Shoreline, Scripps HA, at La Jolla Hermosa Park	Coastal & Bay Shoreline	90630000 / 18070304	• Shellfishing ○ *Shellfish Harvesting* Indicator Bacteria	0.03 Miles
9	Pauma Creek	River & Stream	90322000 / 18070303	• Aquatic Life Support ○ *Preservation of Areas of Special Biological Significance* Benthic Community Effects	7.2 Miles
9	Rattlesnake Creek	River & Stream	90620000 / 18070304	• Aquatic Life Support ○ *Warm Freshwater Habitat* Benthic Community Effects • SUPPORTED NON-CORE CA BENEFICIAL USES ○ *Agricultural Supply* Benthic Community Effects, Total Dissolved Solids, Turbidity	5.8 Miles
9	Roblar Creek	River & Stream	90221000 / 18070302	• Aquatic Life Support ○ *Warm Freshwater Habitat* Benthic Community Effects	6.7 Miles
9	San Diego Bay Shoreline, at Bessemer Street	Bay & Harbor	90810000 / 18070304	• Swimming ○ *Water Contact Recreation* Indicator Bacteria • Shellfishing ○ *Shellfish Harvesting* Indicator Bacteria	26 Acres
9	San Diego Bay Shoreline, at South Bay Power Plant	Bay & Harbor	90912000 / 18070304	• Aquatic Life Support ○ *Estuarine Habitat* Oxygen, Dissolved • SUPPORTED NON-CORE CA BENEFICIAL USES	8.2 Acres

				Industrial Service Supply 034605 Chlorine, Copper, Temperature, water	
9	San Marcos Creek, unnamed fork at Twin Oaks Valley Road	River & Stream	90453000 / 18070303	• Swimming ○ *Water Contact Recreation* Indicator_Bacteria • Aquatic Life Support ○ *Warm Freshwater Habitat* Cadmium, Chlorpyrifos, Copper, Diazinon, Lead, Malathion, Zinc	1.2 Miles
9	San Marcos, Lake, drain to central southeast fork of lake	River & Stream	90452000 / 18070303	• Swimming ○ *Water Contact Recreation* Indicator_Bacteria • Aquatic Life Support ○ *Warm Freshwater Habitat* Copper, Lead, Zinc ○ *Cold Freshwater Habitat* Cadmium, Chlorpyrifos, Diazinon, Malathion	0.05 Miles
9	San Miguel Creek	River & Stream	90912000 / 18070304	• Aquatic Life Support ○ *Warm Freshwater Habitat* Cadmium, Chlorpyrifos, Copper, Diazinon, Lead, Malathion, Zinc	0.86 Miles
9	San Vicente Creek (San Diego County), unnamed tributary at Arena Drive	River & Stream	90723000 / 18070304	• Swimming ○ *Water Contact Recreation* Indicator_Bacteria • Drinking Water Supply ○ *Municipal & Domestic Supply* Cadmium, Chlorpyrifos, Copper, Diazinon, Lead, Malathion, Nitrate/Nitrite (Nitrite + Nitrate as N), Nitrogen, Nitrite, Nitrogen, ammonia (Total Ammonia), Zinc • Aquatic Life Support ○ *Warm Freshwater Habitat* Cadmium, Chlorpyrifos, Copper, Diazinon, Lead, Malathion, Zinc	2.5 Miles
9	Santa Maria Creek	River & Stream	90541000 / 18070304	• Swimming ○ *Water Contact Recreation* Indicator_Bacteria • Drinking Water Supply ○ *Municipal & Domestic Supply* Ammonia, Cadmium, Chlorpyrifos, Copper, Diazinon, Lead, Malathion, Nitrogen, Nitrite, Zinc	17 Miles

				• Aquatic Life Support ◦ *Warm Freshwater Habitat* Cadmium, Chlorpyrifos, Copper, Diazinon, Lead, Malathion, Zinc	
9	Spring Valley Creek	River & Stream	90912000 / 18070304	• Secondary Contact ◦ *Non-Contact Recreation* Indicator Bacteria • Aquatic Life Support ◦ *Warm Freshwater Habitat* Arsenic, Azinphos-methyl (Guthion), Cadmium, Chlorpyrifos, Chromium, Copper, Diazinon, Dimethoate, Disulfoton, Ethoprop, Lead, Malathion, Methidathion, Methyl Parathion, Nickel, Parathion, Phorate, Phosmet, Selenium, Zinc	5.1 Miles
9	Sweetwater Flood Control Channel	River & Stream	90912000 / 18070304	• Secondary Contact ◦ *Non-Contact Recreation* Indicator Bacteria • Swimming ◦ *Water Contact Recreation* Indicator Bacteria • Aquatic Life Support ◦ *Estuarine Habitat* 2-Methylnaphthalene, Antimony, Arsenic, Benzo(a)anthracene, Cadmium, Chlordane, Chromium, Chrysene (C1-C4), Copper, Dibenz[a,h]anthracene, Endrin, Lead, Lindane/gamma Hexachlorocyclohexane (gamma-HCH), Mercury, PAHs (Polycyclic Aromatic Hydrocarbons), PCBs (Polychlorinated biphenyls), Phenanthrene, Pyrene, Silver, Zinc	2.1 Miles
9	Tijeras Canyon	River & Stream	90120000 / 18070301	• Aquatic Life Support ◦ *Warm Freshwater Habitat* Ammonia, Arsenic, Benthic Community Effects, Cadmium, Chlorpyrifos, Chromium, Copper, Diazinon, Lead, Malathion, Nickel, Selenium, Silver, Zinc	4.2 Miles
9	Tijuana River, Upper (Cottonwood Creek confluence to 1st border crossing)	River & Stream	91121000 / 18070305	• Aquatic Life Support ◦ *Warm Freshwater Habitat* Benthic Community Effects	1.5 Miles

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9	Viejas Creek	River & Stream	90933000 / 18070304	• Swimming ◦ *Water Contact Recreation* Indicator_Bacteria • Drinking Water Supply ◦ *Municipal & Domestic Supply* Ammonia, Cadmium, Chlorpyrifos, Copper, Diazinon, Lead, Malathion, Nitrogen, Nitrite, Zinc • Aquatic Life Support ◦ *Cold Freshwater Habitat* Cadmium, Chlorpyrifos, Copper, Diazinon, Lead, Malathion, Zinc	8.9 Miles
9	Weaver Creek	River & Stream	90312000 / 18070303	• Aquatic Life Support ◦ *Warm Freshwater Habitat* Benthic Community Effects	3.8 Miles

2014 CALIFORNIA WATERS WITH INSUFFICIENT INFORMATION TO ASSESS BENEFICIAL USE SUPPORT

Common Beneficial Uses	Applicable California Beneficial Uses
Aquatic Life Support	Cold Freshwater Habitat, Estuarine Habitat, Fish Migration, Fish Spawning, Freshwater Replenishment, Inland Saline Water Habitat, Limited Warmwater, Marine Habitat, Preservation of Areas of Special Biological Significance, Preservation of Rare & Endangered Species, Warm Freshwater Habitat, Wetland Habitat, Wildlife Habitat
Drinking Water Supply	Municipal & Domestic Supply
Fish Consumption	Commercial or recreational collection of fish, shellfish, or organisms, Subsistence Fishing
Secondary Contact	Non-Contact Recreation
Shellfishing	Shellfish Harvesting
Swimming	Water Contact Recreation

Category 2 Criteria: At least one, but not necessarily all, core beneficial use is supported

* USGS HUC = US Geological Survey Hydrologic Unit Code. Calwater = State Water Resources Control Board hydrological subunit area or even smaller planning watershed.

REGION	WATER BODY NAME	WATER TYPE	WATERSHED* • CALWATER / USGS HUC	COMMON BENEFICIAL USE ◦ *California Beneficial Use* Pollutant Assessed	ESTIMATED AREA ASSESSED

The Category Two waterbodies are not available due to database limitations at this time.
The Category Two waterbodies will be updated in next cycle.

2014 CALIFORNIA WATERS SUPPORTING ALL ASSESSED BENEFICIAL USES

Common Beneficial Uses	Applicable California Beneficial Uses
Aquatic Life Support	Cold Freshwater Habitat, Estuarine Habitat, Fish Migration, Fish Spawning, Freshwater Replenishment, Inland Saline Water Habitat, Limited Warmwater, Marine Habitat, Preservation of Areas of Special Biological Significance, Preservation of Rare & Endangered Species, Warm Freshwater Habitat, Wetland Habitat, Wildlife Habitat
Drinking Water Supply	Municipal & Domestic Supply
Fish Consumption	Commercial or recreational collection of fish, shellfish, or organisms, Subsistence Fishing
Secondary Contact	Non-Contact Recreation
Shellfishing	Shellfish Harvesting
Swimming	Water Contact Recreation

Category 1 Criteria: 1) A water that fully supports at least one of its California beneficial uses; 2) has other uses that are not assessed or lack sufficient information to be assessed; and 3) No assessed uses are not supported.

* USGS HUC = US Geological Survey Hydrologic Unit Code. Calwater = State Water Resources Control Board hydrological subunit area or even smaller planning watershed.

REGION	WATER BODY NAME	WATER TYPE	WATERSHED* CALWATER / USGS HUC	COMMON BENEFICIAL USE / *California Beneficial Use* / Pollutant Assessed	ESTIMATED AREA ASSESSED
9	Adobe Creek (Riverside County)	River & Stream	90221000 / 18070302	• **Swimming** ○ ***Water Contact Recreation*** Indicator Bacteria • **Aquatic Life Support** ○ ***Cold Freshwater Habitat*** Benthic Community Effects	0.96 Miles
9	Boulder Creek (San Diego County)	River & Stream	90741000 / 18070304	• **Aquatic Life Support** ○ ***Warm Freshwater Habitat*** Benthic Community Effects, Toxicity ○ ***Cold Freshwater Habitat*** Benthic Community Effects	21 Miles
9	Cedar Creek (San Diego County)	River & Stream	90741000 / 18070304	• **Drinking Water Supply** ○ ***Municipal & Domestic Supply*** Aluminum, Arsenic, Cadmium, Chloride, Chromium, Copper, Iron, Manganese, Nickel, Nitrate/Nitrite (Nitrite + Nitrate as N), Nitrogen, Nitrite, Nitrogen, ammonia (Total Ammonia), Selenium, Silver, Specific Conductivity, Sulfates, Total Dissolved Solids, Zinc • **Aquatic Life Support** ○ ***Warm Freshwater Habitat*** Alkalinity as CaCO3, Aluminum, Arsenic, Benthic Community	14 Miles

				Effects, Bifenthrin, Cadmium Chloride, Chromium, Copper, Cyfluthrin, Cyhalothrin, Lambda, Cypermethrin, Deltamethrin, Esfenvalerate/Fenvalerate, Fenpropathrin, Iron, Lead, Manganese, Nickel, Nitrogen, ammonia (Total Ammonia), Oxygen, Dissolved, Permethrin, total, Selenium, Silver, Sulfates, Total Dissolved Solids, Turbidity, Zinc, pH ◦ *Cold Freshwater Habitat* Alkalinity as CaCO3, Aluminum, Arsenic, Benthic Community Effects, Bifenthrin, Cadmium, Chloride, Chromium, Copper, Cyfluthrin, Cyhalothrin, Lambda, Cypermethrin, Deltamethrin, Esfenvalerate/Fenvalerate, Fenpropathrin, Iron, Lead, Manganese, Nickel, Nitrogen, ammonia (Total Ammonia), Oxygen, Dissolved, Permethrin, total, Selenium, Silver, Sulfates, Temperature, water, Total Dissolved Solids, Toxicity, Turbidity, Zinc, pH	
9	Cold Stream (San Diego County)	River & Stream	90935000 / 18070304	• Aquatic Life Support ◦ *Warm Freshwater Habitat* Benthic Community Effects	2.9 Miles
9	Del Dios Creek	River & Stream	90521000 / 18070304	• SUPPORTED NON-CORE CA BENEFICIAL USES ◦ *Agricultural Supply* Chloride, Mercury, Nitrate as Nitrate (NO3), Sulfates, Total Dissolved Solids, Turbidity	1 Miles
9	Doane Creek	River & Stream	90322000 / 18070303	• Aquatic Life Support ◦ *Warm Freshwater Habitat* Benthic Community Effects ◦ *Cold Freshwater Habitat* Temperature, water	2.7 Miles
9	Fry Creek	River & Stream	90331000 / 18070303	• Aquatic Life Support ◦ *Warm Freshwater Habitat* Benthic Community Effects ◦ *Cold Freshwater Habitat* Benthic Community Effects	1.8 Miles
9	Gird Creek	River & Stream	90312000 /	• Aquatic Life Support	2.6 Miles

			18070303	*Warm Freshwater Habitat* 034611 Benthic Community Effects	
9	Hot Spring Canyon Creek (Orange County)	River & Stream	90120000 / 18070301	• Aquatic Life Support ○ *Warm Freshwater Habitat* Chloride, Chromium, Oxygen, Dissolved ○ *Cold Freshwater Habitat* Alkalinity as CaCO3, Aluminum, Arsenic, Benthic Community Effects, Bifenthrin, Cadmium, Chloride, Chromium, Copper, Cyfluthrin, Cyhalothrin, Lambda, Cypermethrin, Deltamethrin, Esfenvalerate/Fenvalerate, Fenpropathrin, Iron, Lead, Manganese, Nickel, Nitrogen, ammonia (Total Ammonia), Oxygen, Dissolved, Permethrin, total, Selenium, Silver, Sulfates, Temperature, water, Total Dissolved Solids, Toxicity, Turbidity, Zinc, pH	8 Miles
9	Indian Creek (San Diego County)	River & Stream	91141000 / 18070305	• Aquatic Life Support ○ *Cold Freshwater Habitat* Benthic Community Effects	3.8 Miles
9	Iron Springs Creek	River & Stream	90331000 / 18070303	• Aquatic Life Support ○ *Warm Freshwater Habitat* Benthic Community Effects ○ *Cold Freshwater Habitat* Benthic Community Effects	4.3 Miles
9	Ironside Creek	River & Stream	4905.540000 / 18070304	• Aquatic Life Support ○ *Cold Freshwater Habitat* Benthic Community Effects	0.51 Miles
9	King Creek	River & Stream	90731000 / 18070304	• Drinking Water Supply ○ *Municipal & Domestic Supply* Aluminum, Arsenic, Cadmium, Chloride, Chromium, Copper, Iron, Manganese, Nickel, Nitrate/Nitrite (Nitrite + Nitrate as N), Nitrogen, Nitrite, Nitrogen, ammonia (Total Ammonia), Selenium, Silver, Specific Conductivity, Sulfates, Total Dissolved Solids, Zinc • Aquatic Life Support ○ *Warm Freshwater Habitat* Alkalinity as CaCO3, Aluminum, Arsenic, Benthic Community Effects, Bifenthrin, Cadmium,	10 Miles

				Chloride, Chromium, Copper, Cyfluthrin, Cyhalothrin, Lambda, Cypermethrin, Deltamethrin, Esfenvalerate/Fenvalerate, Fenpropathrin, Iron, Lead, Manganese, Nickel, Nitrogen, ammonia (Total Ammonia), Oxygen, Dissolved, Permethrin, total, Selenium, Silver, Sulfates, Total Dissolved Solids, Turbidity, Zinc, pH ○ *Cold Freshwater Habitat* Alkalinity as CaCO3, Aluminum, Arsenic, Benthic Community Effects, Bifenthrin, Cadmium, Chloride, Chromium, Copper, Cyfluthrin, Cyhalothrin, Lambda, Cypermethrin, Deltamethrin, Esfenvalerate/Fenvalerate, Fenpropathrin, Iron, Lead, Manganese, Nickel, Nitrogen, ammonia (Total Ammonia), Oxygen, Dissolved, Permethrin, total, Selenium, Silver, Sulfates, Temperature, water, Total Dissolved Solids, Toxicity, Turbidity, Zinc, pH	
9	Kitchen Creek	River & Stream	91160000 / 18070305	• Drinking Water Supply ○ *Municipal & Domestic Supply* Benthic Community Effects, Oxygen, Dissolved, Total Dissolved Solids, Turbidity, pH • Aquatic Life Support ○ *Warm Freshwater Habitat* Benthic Community Effects	9.7 Miles
9	La Posta Creek	River & Stream	91170000 / 18100200	• Drinking Water Supply ○ *Municipal & Domestic Supply* Ammonia as Nitrogen, Metals, Nickel, PAHs (Polycyclic Aromatic Hydrocarbons), Phosphorus, Total Nitrogen as N • Aquatic Life Support ○ *Warm Freshwater Habitat* Benthic Community Effects, PCBs (Polychlorinated biphenyls)	20 Miles
9	Lawson Creek	River & Stream	90921000 / 18070304	• Drinking Water Supply ○ *Municipal & Domestic Supply* Ammonia as Nitrogen, Metals, PCBs (Polychlorinated biphenyls), Phosphorus, Sulfates, Total Nitrogen as N	5.9 Miles

				• **Aquatic Life Support** 034613 ◦ ***Warm Freshwater Habitat*** Benthic Community Effects	
9	Long Canyon (Cottonwood wshed) (from 0.2 mile upstream to 0.4 miles downstream of Troy Canyon)	**River & Stream**	**91160000 / 18070305**	• **Drinking Water Supply** ◦ ***Municipal & Domestic Supply*** Habitat Assessment (Streams), Oxygen, Dissolved, Total Dissolved Solids, pH • **Aquatic Life Support** ◦ ***Warm Freshwater Habitat*** Benthic Community Effects, Total Dissolved Solids ◦ ***Cold Freshwater Habitat*** Benthic Community Effects	**0.54 Miles**
9	Miramar Reservoir	**Lake & Reservoir**	**90610000 / 18070304**	• **Drinking Water Supply** ◦ ***Municipal & Domestic Supply*** 1,1,1-Trichloroethane, 1,1,2,2-Tetrachloroethane, 1,1,2-Trichloroethane, 1,1-Dichloroethylene (DCE)/ Vinylidene Chloride, 1,2,4-Trichlorobenzene, 1,2-Dibromo-3-chloropropane (DBCP), 1,2-Dichloroethane, 1,2-Dichloroethylene,-trans, 1,2-Dichloropropane, Alachlor, Aluminum, Ammonia, Antimony, Arsenic, Atrazine, Barium, Benzene, Benzo(a)pyrene (3,4-Benzopyrene -7-d), Carbofuran, Carbon tetrachloride, Chlordane, Chloride, Chlorobenzene (mono), Chromium, Color, Copper, Endrin, Ethylbenzene, Fluoride, Glyphosate, Heptachlor, Heptachlor epoxide, Hexachlorobenzene/ HCB, Hexachlorocyclopentadiene, Iron, Lindane/gamma Hexachlorocyclohexane (gamma-HCH), Manganese, Methoxychlor, Molinate, Nickel, Oxamyl (Vydate), PCBs (Polychlorinated biphenyls), Pentachlorophenol (PCP), Picloram, Selenium, Simazine, Sodium, Styrene, Sulfates, Tetrachloroethylene/PCE, Toluene, Total Dissolved Solids, Toxaphene, Trichloroethylene/TCE, Trichlorofluoromethane (CFC-11), Turbidity, Uranium, Vinyl chloride, Zinc, cis-1,2-Dichloroethylene, meta-para xylenes, o-Dichlorobenzene, o-Xylene, p-Dichlorobenzene (DCB), pH	**138 Acres**

				• **Aquatic Life Support** ◦ ***Warm Freshwater Habitat*** Nitrogen	034614
9	Mission Bay Shoreline, La Cima Drive at Crown Point Shores	**Coastal & Bay Shoreline**	**90630000 / 18070304**	• **Swimming** ◦ ***Water Contact Recreation*** Indicator Bacteria • **Shellfishing** ◦ ***Shellfish Harvesting*** Indicator Bacteria	**0.03 Miles**
9	Mission Bay Shoreline, at Balboa Court	**Coastal & Bay Shoreline**	**90711000 / 18070304**	• **Swimming** ◦ ***Water Contact Recreation*** Indicator Bacteria • **Shellfishing** ◦ ***Shellfish Harvesting*** Indicator Bacteria	**0.17 Miles**
9	Mission Bay Shoreline, at Fiesta Island Bridge	**Coastal & Bay Shoreline**	**90711000 / 18070304**	• **Swimming** ◦ ***Water Contact Recreation*** Indicator Bacteria • **Shellfishing** ◦ ***Shellfish Harvesting*** Indicator Bacteria	**0.14 Miles**
9	Mission Bay Shoreline, at Sail Bay	**Coastal & Bay Shoreline**	**90751000 / 18070304**	• **Swimming** ◦ ***Water Contact Recreation*** Indicator Bacteria • **Shellfishing** ◦ ***Shellfish Harvesting*** Indicator Bacteria	**0.14 Miles**
9	Mission Bay Shoreline, at Ventura Cove	**Coastal & Bay Shoreline**	**90751000 / 18070304**	• **Swimming** ◦ ***Water Contact Recreation*** Indicator Bacteria • **Shellfishing** ◦ ***Shellfish Harvesting*** Indicator Bacteria	**0.03 Miles**
9	Murray Reservoir	**Lake & Reservoir**	**90711000 / 18070304**	• **Swimming** ◦ ***Water Contact Recreation*** Indicator Bacteria • **Drinking Water Supply** ◦ ***Municipal & Domestic Supply*** 1,1,1-Trichloroethane, 1,1,2,2-Tetrachloroethane, 1,1,2-Trichloroethane, 1,1-Dichloroethylene (DCE)/ Vinylidene	**119 Acres**

				Chloride, 1,2,4-Trichlorobenzene, 1,2-Dibromo-3-chloropropane (DBCP), 1,2-Dichloroethane, 1,2-Dichloroethylene,-trans, 1,2-Dichloropropane, Alachlor, Aluminum, Ammonia, Antimony, Arsenic, Atrazine, Barium, Benzene, Benzo(a)pyrene (3,4-Benzopyrene -7-d), Carbofuran, Carbon tetrachloride, Chlordane, Chloride, Chlorobenzene (mono), Chromium, Color, Copper, Endrin, Ethylbenzene, Fluoride, Glyphosate, Heptachlor, Heptachlor epoxide, Hexachlorobenzene/ HCB, Hexachlorocyclopentadiene, Iron, Lindane/gamma Hexachlorocyclohexane (gamma-HCH), Manganese, Methoxychlor, Molinate, Nickel, Oxamyl (Vydate), Oxygen, Dissolved, PCBs (Polychlorinated biphenyls), Pentachlorophenol (PCP), Picloram, Selenium, Simazine, Styrene, Sulfates, Tetrachloroethylene/PCE, Toluene, Total Dissolved Solids, Toxaphene, Trichloroethylene/TCE, Trichlorofluoromethane (CFC-11), Turbidity, Uranium, Vinyl chloride, Zinc, meta-para xylenes, o-Dichlorobenzene, o-Xylene, p-Dichlorobenzene (DCB), pH • **Aquatic Life Support** ◦ ***Warm Freshwater Habitat*** Nitrogen	
9	Pacific Ocean Shoreline at Cardiff Reef	**Coastal & Bay Shoreline**	**90461000 / 18070304**	• **Swimming** ◦ ***Water Contact Recreation*** Indicator Bacteria • **Shellfishing** ◦ ***Shellfish Harvesting*** Indicator Bacteria • **Fish Consumption** ◦ ***Commercial or recreational collection of fish, shellfish, or organisms*** Arsenic, Cadmium, Chlordane, Chlorpyrifos, Dieldrin, Endosulfan, Endrin, Heptachlor epoxide, Hexachlorobenzene/ HCB, Lindane/gamma Hexachlorocyclohexane (gamma-HCH), Mercury, Mirex, PAHs (Polycyclic Aromatic Hydrocarbons), PCBs (Polychlorinated biphenyls),	**0.25 Miles**

				Selenium, Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD)	
9	Pacific Ocean Shoreline, Aliso HSA, at Aliso Beach - north	Coastal & Bay Shoreline	90113000 / 18070301	• Swimming ○ *Water Contact Recreation* Indicator Bacteria • Shellfishing ○ *Shellfish Harvesting* Indicator Bacteria	0.03 Miles
9	Pacific Ocean Shoreline, Aliso HSA, at Blue Lagoon	Coastal & Bay Shoreline	90113000 / 18070301	• Swimming ○ *Water Contact Recreation* Indicator Bacteria • Shellfishing ○ *Shellfish Harvesting* Indicator Bacteria	0.03 Miles
9	Pacific Ocean Shoreline, Aliso HSA, at Treasure Island Pier	Coastal & Bay Shoreline	90113000 / 18070301	• Swimming ○ *Water Contact Recreation* Indicator Bacteria • Shellfishing ○ *Shellfish Harvesting* Indicator Bacteria	0.03 Miles
9	Pacific Ocean Shoreline, Batiquitos HSA, at South Carlsbad State Beach (Batiquitos Lagoon Outlet)	Coastal & Bay Shoreline	90451000 / 18070303	• Swimming ○ *Water Contact Recreation* Indicator Bacteria • Shellfishing ○ *Shellfish Harvesting* Indicator Bacteria	0.03 Miles
9	Pacific Ocean Shoreline, Batiquitos HSA, at South Carlsbad State Beach (Encina Creek Outlet)	Coastal & Bay Shoreline	90451000 / 18070303	• Swimming ○ *Water Contact Recreation* Indicator Bacteria • Shellfishing ○ *Shellfish Harvesting* Indicator Bacteria	0.03 Miles
9	Pacific Ocean Shoreline, Batiquitos HSA, at South Carlsbad State Beach (near Pointsettia Lane)	Coastal & Bay Shoreline	90451000 / 18070303	• Swimming ○ *Water Contact Recreation* Indicator Bacteria • Shellfishing ○ *Shellfish Harvesting* Indicator Bacteria	0.03 Miles
9	Pacific Ocean	Coastal & Bay	90451000 /	• Swimming	0.03 Miles

	Shoreline, Batiquitos HSA, at South Carlsbad State Beach (near Ponto Drive and Island Way)	Shoreline	18070303	*Water Contact Recreation* Indicator Bacteria • Shellfishing ◦ *Shellfish Harvesting* Indicator Bacteria	034617
9	Pacific Ocean Shoreline, Batiquitos HSA, at Swamis Beach	Coastal & Bay Shoreline	90451000 / 18070303	• Swimming ◦ *Water Contact Recreation* Indicator Bacteria • Shellfishing ◦ *Shellfish Harvesting* Indicator Bacteria	0.03 Miles
9	Pacific Ocean Shoreline, Buena Vista Creek HA, at Buena Vista Lagoon Outlet	Coastal & Bay Shoreline	90421000 / 18070303	• Swimming ◦ *Water Contact Recreation* Indicator Bacteria • Shellfishing ◦ *Shellfish Harvesting* Indicator Bacteria	0.03 Miles
9	Pacific Ocean Shoreline, Buena Vista Creek HA, at Carlsbad State Beach at Carlsbad Village	Coastal & Bay Shoreline	90421000 / 18070303	• Swimming ◦ *Water Contact Recreation* Indicator Bacteria • Shellfishing ◦ *Shellfish Harvesting* Indicator Bacteria	0.03 Miles
9	Pacific Ocean Shoreline, Buena Vista Creek HA, at Carlsbad State Beach at Pine Ave	Coastal & Bay Shoreline	90421000 / 18070303	• Swimming ◦ *Water Contact Recreation* Indicator Bacteria • Shellfishing ◦ *Shellfish Harvesting* Indicator Bacteria	0.03 Miles
9	Pacific Ocean Shoreline, Coronado HA, at Avenida del Sol	Coastal & Bay Shoreline	91010000 / 18070304	• Swimming ◦ *Water Contact Recreation* Indicator Bacteria • Shellfishing ◦ *Shellfish Harvesting* Indicator Bacteria	0.03 Miles
9	Pacific Ocean Shoreline, Coronado HA, at Loma Ave/ Central Beach	Coastal & Bay Shoreline	91010000 / 18070304	• Swimming ◦ *Water Contact Recreation* Indicator Bacteria • Shellfishing ◦ *Shellfish Harvesting* Indicator Bacteria	0.03 Miles

9	Pacific Ocean Shoreline, Coronado HA, at NASNI Beach/North Beach C	Coastal & Bay Shoreline	91010000 / 18070304	• Swimming ○ *Water Contact Recreation* Indicator Bacteria • Shellfishing ○ *Shellfish Harvesting* Indicator Bacteria	0.03 Miles
9	Pacific Ocean Shoreline, Coronado HA, at Navy Fence/Ocean Blvd	Coastal & Bay Shoreline	91010000 / 18070304	• Swimming ○ *Water Contact Recreation* Indicator Bacteria • Shellfishing ○ *Shellfish Harvesting* Indicator Bacteria	0.03 Miles
9	Pacific Ocean Shoreline, Coronado HA, at Silver Strand (north end, Oceanside)	Coastal & Bay Shoreline	91010000 / 18070304	• Swimming ○ *Water Contact Recreation* Indicator Bacteria • Shellfishing ○ *Shellfish Harvesting* Indicator Bacteria	0.03 Miles
9	Pacific Ocean Shoreline, Dana Point HSA, at Aliso Beach - south	Coastal & Bay Shoreline	90114000 / 18070301	• Swimming ○ *Water Contact Recreation* Indicator Bacteria • Shellfishing ○ *Shellfish Harvesting* Indicator Bacteria	0.03 Miles
9	Pacific Ocean Shoreline, Dana Point HSA, at Aliso Beach at West Street	Coastal & Bay Shoreline	90114000 / 18070301	• Swimming ○ *Water Contact Recreation* Indicator Bacteria • Shellfishing ○ *Shellfish Harvesting* Indicator Bacteria	0.03 Miles
9	Pacific Ocean Shoreline, Dana Point HSA, at Camel Point	Coastal & Bay Shoreline	90114000 / 18070301	• Swimming ○ *Water Contact Recreation* Indicator Bacteria • Shellfishing ○ *Shellfish Harvesting* Indicator Bacteria	0.03 Miles
9	Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at guest dock	Coastal & Bay Shoreline	90114000 / 18070301	• Swimming ○ *Water Contact Recreation* Indicator Bacteria • Shellfishing	0.03 Miles

				Shellfish Harvesting Indicator Bacteria	034619
9	Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at harbor entrance	Coastal & Bay Shoreline	90114000 / 18070301	• Swimming ○ *Water Contact Recreation* Indicator Bacteria • Shellfishing ○ *Shellfish Harvesting* Indicator Bacteria	0.03 Miles
9	Pacific Ocean Shoreline, Dana Point HSA, at Dana Strands Surfzone at Dana Strands Rd	Coastal & Bay Shoreline	90114000 / 18070301	• Swimming ○ *Water Contact Recreation* Indicator Bacteria • Shellfishing ○ *Shellfish Harvesting* Indicator Bacteria	0.03 Miles
9	Pacific Ocean Shoreline, Dana Point HSA, at Laguna Lido	Coastal & Bay Shoreline	90114000 / 18070301	• Swimming ○ *Water Contact Recreation* Indicator Bacteria • Shellfishing ○ *Shellfish Harvesting* Indicator Bacteria	0.03 Miles
9	Pacific Ocean Shoreline, Dana Point HSA, at South of Salt Creek outlet at Salt Creek Service Road	Coastal & Bay Shoreline	90114000 / 18070301	• Swimming ○ *Water Contact Recreation* Indicator Bacteria • Shellfishing ○ *Shellfish Harvesting* Indicator Bacteria	0.03 Miles
9	Pacific Ocean Shoreline, Dana Point HSA, at Table Rock Drive	Coastal & Bay Shoreline	90114000 / 18070301	• Swimming ○ *Water Contact Recreation* Indicator Bacteria • Shellfishing ○ *Shellfish Harvesting* Indicator Bacteria	0.03 Miles
9	Pacific Ocean Shoreline, Dana Point HSA, at Thousand Steps Beach	Coastal & Bay Shoreline	90114000 / 18070301	• Swimming ○ *Water Contact Recreation* Indicator Bacteria • Shellfishing ○ *Shellfish Harvesting* Indicator Bacteria	0.03 Miles
9	Pacific Ocean Shoreline, El Salto	Coastal & Bay Shoreline	90421000 / 18070303	• Swimming ○ *Water Contact Recreation*	0.03 Miles

	HSA, Oceanside at Cassidy Street			Indicator Bacteria • Shellfishing ◦ *Shellfish Harvesting* Indicator Bacteria	034620
9	Pacific Ocean Shoreline, El Salto HSA, Oceanside at St Malo Beach	Coastal & Bay Shoreline	90421000 / 18070303	• Swimming ◦ *Water Contact Recreation* Indicator Bacteria • Shellfishing ◦ *Shellfish Harvesting* Indicator Bacteria	0.03 Miles
9	Pacific Ocean Shoreline, Laguna Beach HSA, at Bluebird Canyon	Coastal & Bay Shoreline	90112000 / 18070301	• Swimming ◦ *Water Contact Recreation* Indicator Bacteria • Shellfishing ◦ *Shellfish Harvesting* Indicator Bacteria	0.03 Miles
9	Pacific Ocean Shoreline, Laguna Beach HSA, at Dumond Drive at Victoria Beach	Coastal & Bay Shoreline	90112000 / 18070301	• Swimming ◦ *Water Contact Recreation* Indicator Bacteria • Shellfishing ◦ *Shellfish Harvesting* Indicator Bacteria	0.03 Miles
9	Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Beach at Cleo Street	Coastal & Bay Shoreline	90112000 / 18070301	• Swimming ◦ *Water Contact Recreation* Indicator Bacteria • Shellfishing ◦ *Shellfish Harvesting* Indicator Bacteria	0.03 Miles
9	Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Hotel	Coastal & Bay Shoreline	90112000 / 18070301	• Swimming ◦ *Water Contact Recreation* Indicator Bacteria • Aquatic Life Support ◦ *Marine Habitat* Arsenic, Copper, Lead, Nickel, Nitrogen, ammonia (Total Ammonia), Selenium, Silver, Zinc • Shellfishing ◦ *Shellfish Harvesting* Indicator Bacteria	0.03 Miles
9	Pacific Ocean Shoreline, Laguna	Coastal & Bay Shoreline	90112000 / 18070301	• Swimming ◦ *Water Contact Recreation* Indicator Bacteria	0.03 Miles

	Beach HSA, at Main Beach			• Aquatic Life Support ○ *Marine Habitat* Toxicity • Shellfishing ○ *Shellfish Harvesting* Indicator Bacteria	034621
9	Pacific Ocean Shoreline, Laguna Beach HSA, at Pearl Street	Coastal & Bay Shoreline	90111000 / 18070301	• Swimming ○ *Water Contact Recreation* Indicator Bacteria	0.03 Miles
9	Pacific Ocean Shoreline, Loma Alta HSA, Oceanside at Forester Street	Coastal & Bay Shoreline	90410000 / 18070303	• Swimming ○ *Water Contact Recreation* Indicator Bacteria • Shellfishing ○ *Shellfish Harvesting* Indicator Bacteria	0.03 Miles
9	Pacific Ocean Shoreline, Loma Alta HSA, Oceanside at Wisconsin Street	Coastal & Bay Shoreline	90410000 / 18070303	• Swimming ○ *Water Contact Recreation* Indicator Bacteria • Shellfishing ○ *Shellfish Harvesting* Indicator Bacteria	0.03 Miles
9	Pacific Ocean Shoreline, Los Monos HSA, at Carlsbad State Beach at Warm Water Jetty	Coastal & Bay Shoreline	90431000 / 18070303	• Swimming ○ *Water Contact Recreation* Indicator Bacteria • Shellfishing ○ *Shellfish Harvesting* Indicator Bacteria	0.03 Miles
9	Pacific Ocean Shoreline, Los Monos HSA, at South Carlsbad State Beach (near Cerezo Drive)	Coastal & Bay Shoreline	90431000 / 18070303	• Swimming ○ *Water Contact Recreation* Indicator Bacteria • Shellfishing ○ *Shellfish Harvesting* Indicator Bacteria	0.61 Miles
9	Pacific Ocean Shoreline, Los Monos HSA, at South Carlsbad State Beach (near Palomar Airport Road)	Coastal & Bay Shoreline	90431000 / 18070303	• Swimming ○ *Water Contact Recreation* Indicator Bacteria • Shellfishing ○ *Shellfish Harvesting* Indicator Bacteria	0.03 Miles

034622

9	Pacific Ocean Shoreline, Lower Ysidora HSA, at Camp Pendleton	Coastal & Bay Shoreline	90211000 / 18070302	• Swimming ○ *Water Contact Recreation* Indicator Bacteria • Shellfishing ○ *Shellfish Harvesting* Indicator Bacteria	1.3 Miles
9	Pacific Ocean Shoreline, Mission San Diego HSA, at Newport Ave	Coastal & Bay Shoreline	9071100 / 18070304	• Swimming ○ *Water Contact Recreation* Indicator Bacteria • Shellfishing ○ *Shellfish Harvesting* Indicator Bacteria	0.03 Miles
9	Pacific Ocean Shoreline, Point Loma HA, at Ladera Street	Coastal & Bay Shoreline	90810000 / 18070304	• Swimming ○ *Water Contact Recreation* Indicator Bacteria • Shellfishing ○ *Shellfish Harvesting* Indicator Bacteria	0.03 Miles
9	Pacific Ocean Shoreline, Point Loma HA, at Lighthouse	Coastal & Bay Shoreline	90810000 / 18070304	• Swimming ○ *Water Contact Recreation* Indicator Bacteria • Shellfishing ○ *Shellfish Harvesting* Indicator Bacteria	0.03 Miles
9	Pacific Ocean Shoreline, Point Loma HA, at Point Loma Treatment Plant	Coastal & Bay Shoreline	90810000 / 18070304	• Swimming ○ *Water Contact Recreation* Indicator Bacteria • Shellfishing ○ *Shellfish Harvesting* Indicator Bacteria	0.03 Miles
9	Pacific Ocean Shoreline, Rancho Santa Fe HSA, at Fletcher Cove Beach	Coastal & Bay Shoreline	90461000 / 18070304	• Swimming ○ *Water Contact Recreation* Indicator Bacteria • Shellfishing ○ *Shellfish Harvesting* Indicator Bacteria	0.03 Miles
9	Pacific Ocean Shoreline, San Clemente HA, at Capistrano Shores at North Ole Hanson	Coastal & Bay Shoreline	90130000 / 18070301	• Swimming ○ *Water Contact Recreation* Indicator Bacteria • Shellfishing ○ *Shellfish Harvesting*	0.03 Miles

	Beach			Indicator Bacteria	034623
9	Pacific Ocean Shoreline, San Clemente HA, at Riviera Beach	Coastal & Bay Shoreline	90130000 / 18070301	• Swimming ○ *Water Contact Recreation* Indicator Bacteria • Shellfishing ○ *Shellfish Harvesting* Indicator Bacteria	0.03 Miles
9	Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Linda Lane	Coastal & Bay Shoreline	90130000 / 18070301	• Swimming ○ *Water Contact Recreation* Indicator Bacteria • Shellfishing ○ *Shellfish Harvesting* Indicator Bacteria	0.03 Miles
9	Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Mariposa Lane	Coastal & Bay Shoreline	90130000 / 18070301	• Swimming ○ *Water Contact Recreation* Indicator Bacteria • Shellfishing ○ *Shellfish Harvesting* Indicator Bacteria	0.03 Miles
9	Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Projection of Las Palmeras	Coastal & Bay Shoreline	90140000 / 18070301	• Swimming ○ *Water Contact Recreation* Indicator Bacteria • Shellfishing ○ *Shellfish Harvesting* Indicator Bacteria	0.03 Miles
9	Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at South Trafalgar St Beach	Coastal & Bay Shoreline	90130000 / 18070301	• Swimming ○ *Water Contact Recreation* Indicator Bacteria • Shellfishing ○ *Shellfish Harvesting* Indicator Bacteria	0.03 Miles
9	Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Trafalgar Canyon outlet	Coastal & Bay Shoreline	90130000 / 18070301	• Swimming ○ *Water Contact Recreation* Indicator Bacteria • Shellfishing ○ *Shellfish Harvesting* Indicator Bacteria	0.03 Miles
9	Pacific Ocean Shoreline, San	Coastal & Bay Shoreline	90130000 / 18070301	• Swimming ○ *Water Contact Recreation* Indicator Bacteria	0.03 Miles

	Clemente HA, at San Clemente City Beach, 450 ft North of Pier			• Shellfishing ◦ *Shellfish Harvesting* Indicator Bacteria	034624
9	Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, Trafalgar Street Beach	Coastal & Bay Shoreline	90130000 / 18070301	• Swimming ◦ *Water Contact Recreation* Indicator Bacteria • Shellfishing ◦ *Shellfish Harvesting* Indicator Bacteria	0.03 Miles
9	Pacific Ocean Shoreline, San Clemente HA, at San Clemente State Beach, Projection of Avenida Calafia	Coastal & Bay Shoreline	90130000 / 18070301	• Swimming ◦ *Water Contact Recreation* Indicator Bacteria • Shellfishing ◦ *Shellfish Harvesting* Indicator Bacteria	0.03 Miles
9	Pacific Ocean Shoreline, San Clemente HA, at South Poche Beach at Capistrano Shores	Coastal & Bay Shoreline	90130000 / 18070301	• Swimming ◦ *Water Contact Recreation* Indicator Bacteria • Shellfishing ◦ *Shellfish Harvesting* Indicator Bacteria	0.03 Miles
9	Pacific Ocean Shoreline, San Dieguito HU, at San Dieguito Lagoon Mouth at Seascape Beach Park	Coastal & Bay Shoreline	90511000 / 18070304	• Swimming ◦ *Water Contact Recreation* Indicator Bacteria • Shellfishing ◦ *Shellfish Harvesting* Indicator Bacteria	0.03 Miles
9	Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at Chart House parking	Coastal & Bay Shoreline	90461000 / 18070303	• Swimming ◦ *Water Contact Recreation* Indicator Bacteria • Shellfishing ◦ *Shellfish Harvesting* Indicator Bacteria	0.03 Miles
9	Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at Las Olas (Georges)	Coastal & Bay Shoreline	90461000 / 18070303	• Swimming ◦ *Water Contact Recreation* Indicator Bacteria • Shellfishing ◦ *Shellfish Harvesting* Indicator Bacteria	0.03 Miles

9	Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at Seaside State Park	Coastal & Bay Shoreline	90461000 / 18070303	• Swimming ○ *Water Contact Recreation* Indicator Bacteria • Shellfishing ○ *Shellfish Harvesting* Indicator Bacteria	0.03 Miles
9	Pacific Ocean Shoreline, San Elijo HSA, at San Elijo State Beach (Main Entrance)	Coastal & Bay Shoreline	90461000 / 18070303	• Swimming ○ *Water Contact Recreation* Indicator Bacteria • Shellfishing ○ *Shellfish Harvesting* Indicator Bacteria	0.22 Miles
9	Pacific Ocean Shoreline, San Elijo HSA, at San Elijo State Beach (Pipes area)	Coastal & Bay Shoreline	90461000 / 18070303	• Swimming ○ *Water Contact Recreation* Indicator Bacteria • Shellfishing ○ *Shellfish Harvesting* Indicator Bacteria	0.18 Miles
9	Pacific Ocean Shoreline, San Joaquin Hills HSA, at Crescent Bay Beach	Coastal & Bay Shoreline	90111000 / 18070301	• Swimming ○ *Water Contact Recreation* Indicator Bacteria • Shellfishing ○ *Shellfish Harvesting* Indicator Bacteria	0.03 Miles
9	Pacific Ocean Shoreline, San Joaquin Hills HSA, at Emerald Bay Beach	Coastal & Bay Shoreline	90111000 / 18070301	• Swimming ○ *Water Contact Recreation* Indicator Bacteria • Shellfishing ○ *Shellfish Harvesting* Indicator Bacteria	0.03 Miles
9	Pacific Ocean Shoreline, San Joaquin Hills HSA, at Heisler Park	Coastal & Bay Shoreline	90111000 / 18070301	• Swimming ○ *Water Contact Recreation* Indicator Bacteria	0.03 Miles
9	Pacific Ocean Shoreline, San Luis Rey HU, at Pier at Surfrider Way	Coastal & Bay Shoreline	90311000 / 18070303	• Swimming ○ *Water Contact Recreation* Indicator Bacteria • Shellfishing ○ *Shellfish Harvesting* Indicator Bacteria	0.03 Miles

9	Pacific Ocean Shoreline, San Luis Rey HU, at Pier at Tyson Way	Coastal & Bay Shoreline	90410000 / 18070303	• Swimming ○ *Water Contact Recreation* Indicator Bacteria • Shellfishing ○ *Shellfish Harvesting* Indicator Bacteria	034626	0.03 Miles
9	Pacific Ocean Shoreline, Scripps HA, at Avenida de la Playa at La Jolla Shores Beach	Coastal & Bay Shoreline	90630000 / 18070304	• Swimming ○ *Water Contact Recreation* Indicator Bacteria • Shellfishing ○ *Shellfish Harvesting* Indicator Bacteria		0.03 Miles
9	Pacific Ocean Shoreline, Scripps HA, at Belmont Park at Mission Beach (near Ventura Place)	Coastal & Bay Shoreline	90751000 / 18070304	• Swimming ○ *Water Contact Recreation* Indicator Bacteria • Shellfishing ○ *Shellfish Harvesting* Indicator Bacteria		0.03 Miles
9	Pacific Ocean Shoreline, Scripps HA, at Bonair St at Windansea Beach	Coastal & Bay Shoreline	90630000 / 18070304	• Swimming ○ *Water Contact Recreation* Indicator Bacteria • Shellfishing ○ *Shellfish Harvesting* Indicator Bacteria		0.03 Miles
9	Pacific Ocean Shoreline, Scripps HA, at Coastal Blvd Gazebo	Coastal & Bay Shoreline	90630000 / 18070304	• Swimming ○ *Water Contact Recreation* Indicator Bacteria • Shellfishing ○ *Shellfish Harvesting* Indicator Bacteria		0.03 Miles
9	Pacific Ocean Shoreline, Scripps HA, at El Paseo Grande at La Jolla Shores Beach	Coastal & Bay Shoreline	90630000 / 18070304	• Swimming ○ *Water Contact Recreation* Indicator Bacteria • Shellfishing ○ *Shellfish Harvesting* Indicator Bacteria		0.03 Miles
9	Pacific Ocean Shoreline, Scripps HA, at Grand Ave, Pacific Beach	Coastal & Bay Shoreline	90630000 / 18070304	• Swimming ○ *Water Contact Recreation* Indicator Bacteria • Shellfishing ○ *Shellfish Harvesting*		0.03 Miles

				Indicator Bacteria 034627	
9	Pacific Ocean Shoreline, Scripps HA, at La Jolla Cove	Coastal & Bay Shoreline	90630000 / 18070304	• Swimming ○ *Water Contact Recreation* Indicator Bacteria • Shellfishing ○ *Shellfish Harvesting* Indicator Bacteria • Fish Consumption ○ *Commercial or recreational collection of fish, shellfish, or organisms* Arsenic, Cadmium, Chlordane, Chlorpyrifos, Dieldrin, Endosulfan, Endrin, Heptachlor epoxide, Hexachlorobenzene/ HCB, Lindane/gamma Hexachlorocyclohexane (gamma-HCH), Mercury, Mirex, PAHs (Polycyclic Aromatic Hydrocarbons), PCBs (Polychlorinated biphenyls), Selenium, Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD)	0.03 Miles
9	Pacific Ocean Shoreline, Scripps HA, at Playa del Norte at Windansea Beach	Coastal & Bay Shoreline	90630000 / 18070304	• Swimming ○ *Water Contact Recreation* Indicator Bacteria • Shellfishing ○ *Shellfish Harvesting* Indicator Bacteria	0.03 Miles
9	Pacific Ocean Shoreline, Scripps HA, at Ravina	Coastal & Bay Shoreline	90630000 / 18070304	• Swimming ○ *Water Contact Recreation* Indicator Bacteria • Shellfishing ○ *Shellfish Harvesting* Indicator Bacteria	0.03 Miles
9	Pacific Ocean Shoreline, Scripps HA, at Scripps Pier at La Jolla Shores Beach	Coastal & Bay Shoreline	90630000 / 18070304	• Swimming ○ *Water Contact Recreation* Indicator Bacteria • Shellfishing ○ *Shellfish Harvesting* Indicator Bacteria	0.03 Miles
9	Pacific Ocean Shoreline, Scripps HA, at South Casa Beach	Coastal & Bay Shoreline	90630000 / 18070304	• Swimming ○ *Water Contact Recreation* Indicator Bacteria • Shellfishing	0.03 Miles

				◦ *Shellfish Harvesting* Indicator Bacteria	034628
9	Pacific Ocean Shoreline, Scripps HA, at Vista de la Playa, Windansea Beach	Coastal & Bay Shoreline	90630000 / 18070304	• Swimming ◦ *Water Contact Recreation* Indicator Bacteria • Shellfishing ◦ *Shellfish Harvesting* Indicator Bacteria	0.03 Miles
9	Pacific Ocean Shoreline, Scripps HA, at Whispering Sands Beach, Nicholson Point, La Jolla	Coastal & Bay Shoreline	90630000 / 18070304	• Swimming ◦ *Water Contact Recreation* Indicator Bacteria • Shellfishing ◦ *Shellfish Harvesting* Indicator Bacteria	0.03 Miles
9	Pacific Ocean Shoreline, Torrey Pines State Beach, Anderson Canyon	Coastal & Bay Shoreline	90630000 / 18070304	• Swimming ◦ *Water Contact Recreation* Indicator Bacteria • Shellfishing ◦ *Shellfish Harvesting* Indicator Bacteria	0.03 Miles
9	Pine Valley Creek (Upper)	River & Stream	91141000 / 18070305	• Secondary Contact ◦ *Non-Contact Recreation* Indicator Bacteria • Swimming ◦ *Water Contact Recreation* Indicator Bacteria • Drinking Water Supply ◦ *Municipal & Domestic Supply* Aluminum, Arsenic, Cadmium, Chloride, Chromium, Copper, Iron, Manganese, Nickel, Nitrate/Nitrite (Nitrite + Nitrate as N), Nitrite as Nitrite NO2, Nitrogen, Nitrite, Nitrogen, ammonia (Total Ammonia), Oxygen, Dissolved, Phosphorus, Selenium, Silver, Specific Conductivity, Sulfates, Total Dissolved Solids, Turbidity, Zinc, pH • Aquatic Life Support ◦ *Warm Freshwater Habitat* Benthic Community Effects ◦ *Cold Freshwater Habitat* Alkalinity as CaCO3, Aluminum, Arsenic, Benthic Community Effects, Bifenthrin, Cadmium,	2.9 Miles

				Chloride, Chromium, Copper, Cyfluthrin, Cyhalothrin, Lambda, Cypermethrin, Deltamethrin, Esfenvalerate/Fenvalerate, Fenpropathrin, Iron, Lead, Manganese, Nickel, Nitrogen, ammonia (Total Ammonia), Oxygen, Dissolved, Permethrin, total, Selenium, Silver, Sulfates, Temperature, water, Total Dissolved Solids, Toxicity, Turbidity, Zinc, pH	
9	San Diego Bay Shoreline, at Silver Strand Beach (bayside)	Bay & Harbor	91010000 / 18070304	• Swimming ○ *Water Contact Recreation* Indicator Bacteria • Shellfishing ○ *Shellfish Harvesting* Indicator Bacteria	51 Acres
9	San Diego Bay Shoreline, at Spanish Landing	Bay & Harbor	90821000 / 18070304	• Swimming ○ *Water Contact Recreation* Indicator Bacteria • Shellfishing ○ *Shellfish Harvesting* Indicator Bacteria	47 Acres
9	San Diego Bay Shoreline; Kellogg Street Beach	Coastal & Bay Shoreline	90810000 / 18070304	• Swimming ○ *Water Contact Recreation* Indicator Bacteria • Shellfishing ○ *Shellfish Harvesting* Indicator Bacteria	0.4 Miles
9	San Dieguito Lagoon, Lower Basin	Estuary	90511000 / 18070304	• Aquatic Life Support ○ *Estuarine Habitat* Toxicity	33 Acres
9	Santa Ysabel Creek (below Sutherland Reservoir)	River & Stream	90521000 / 18070304	• Drinking Water Supply ○ *Municipal & Domestic Supply* Aluminum, Ammonia (Unionized), Arsenic, Cadmium, Chloride, Chromium, Copper, Iron, Manganese, Nickel, Nitrate/Nitrite (Nitrite + Nitrate as N), Nitrogen, Nitrate, Nitrogen, Nitrite, PAHs (Polycyclic Aromatic Hydrocarbons), Selenium, Silver, Specific Conductivity, Sulfates, Total Dissolved Solids, Zinc • Aquatic Life Support	21 Miles

				Warm Freshwater Habitat 034630 Alkalinity as CaCO3, Aluminum, Arsenic, Benthic Community Effects, Bifenthrin, Cadmium, Chromium, Copper, Cyfluthrin, Cyhalothrin, Lambda, Cypermethrin, Deltamethrin, Esfenvalerate/Fenvalerate, Fenpropathrin, Iron, Lead, Manganese, Nickel, Oxygen, Dissolved, PAHs (Polycyclic Aromatic Hydrocarbons), Permethrin, total, Selenium, Silver, Sulfates, Total Dissolved Solids, Zinc, pH ◦ ***Cold Freshwater Habitat*** Alkalinity as CaCO3, Aluminum, Ammonia (Unionized), Arsenic, Benthic Community Effects, Bifenthrin, Cadmium, Chloride, Chromium, Copper, Cyfluthrin, Cyhalothrin, Lambda, Cypermethrin, Deltamethrin, Esfenvalerate/Fenvalerate, Fenpropathrin, Iron, Lead, Manganese, Nickel, Oxygen, Dissolved, Permethrin, total, Selenium, Silver, Sulfates, Temperature, water, Total Dissolved Solids, Toxicity, Turbidity, Zinc, pH	
9	**Stone Creek (San Diego County)**	**River & Stream**	**90222000 / 18070302**	• **Aquatic Life Support** ◦ ***Cold Freshwater Habitat*** Benthic Community Effects	**1.9 Miles**
9	**Troy Canyon (to 0.3 mile upstream from confluence w Long Canyon)**	**River & Stream**	**91160000 / 18070305**	• **Aquatic Life Support** ◦ ***Warm Freshwater Habitat*** Benthic Community Effects ◦ ***Cold Freshwater Habitat*** Benthic Community Effects	**0.33 Miles**
9	**Wilson Creek (San Diego County)**	**River & Stream**	**91130000 / 18070305**	• **Aquatic Life Support** ◦ ***Warm Freshwater Habitat*** Benthic Community Effects	**4.1 Miles**

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Dana Point Harbor
Water Body ID: CAB9011400020010831141600
Water Body Type: Bay & Harbor

DECISION ID 43226 **Region 9**
Dana Point Harbor

Pollutant:	**Copper**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Marinas and Recreational Boating | Source Unknown | Unknown Nonpoint Source | Urban Runoff/Storm Sewers
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal from the CWA section 303(d) List under section 4.1 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess pollutant in water. One line of evidence is available for this pollutant in sediment. Forty-five of the ninety-eight water samples exceed the CRITERIA, eleven of the nineteen sediment samples exceed the CRITERIA, and three of the twenty-five sediment toxicity samples exceed the GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Forty-five of ninety-eight water samples exceeded the CRITERIA and this exceeds the allowable frequency listed in Table 4.1 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 43226, Copper **Region 9**
Dana Point Harbor

LOE ID:	26494
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Marine Habitat
Number of Samples:	5
Number of Exceedances:	5
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Five water samples were collected at single water level from five stations. All samples exceed the CTR values for acute and chronic water quality criterion.
Data Reference:	Regional Harbor Monitoring Program Pilot Project 2005-06 Regional Harbor Monitoring Program Pilot Project 2006-07
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan on toxicity, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. From the Basin Plan on pesticides, no individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	From the CTR, the dissolved copper chronic criterion is 3.1 ppb and the acute criterion is 4.8 ppb (U.S. EPA, 2000).
Guideline Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA
Spatial Representation:	Three stations (D1M, D2M, and D3M) were sampled in 2005 and two stations (D106M and D206M) in 2006 from Dana Point Harbor.
Temporal Representation:	Samples were collected on August 15, 2005 and August 21, 2006.
Environmental Conditions:	
QAPP Information:	Weston Solutions. 2005. Quality Assurance Project Plan for San Diego Regional Harbor Monitoring Program Pilot Project. Prepared for the Port of San Diego, City of San Diego, City of Oceanside, and County of Orange.
QAPP Information Reference(s):	Quality Assurance Project Plan for San Diego Regional Harbor Monitoring Program Pilot Project.

Line of Evidence (LOE) for Decision ID 43226, Copper **Region 9**

Dana Point Harbor

LOE ID:	26493
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	15
Number of Exceedances:	15
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	The mean of the 3 samples from the five stations exceed the acute or chronic water quality objective
Data Reference:	Extent and Magnitude of Copper Contamination in Marinas of the San Diego Region, California. Technical Report 483
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	From the Basin Plan on toxicity, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. From the Basin Plan on pesticides, no individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	From the CTR, the dissolved copper chronic criterion is 3.1 ppb and the acute criterion is 4.8 ppb (U.S. EPA, 2000).
Guideline Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA
Spatial Representation:	Five stations were sampled in Dana Point Harbor. Each station was sampled at upper, mid and lower levels within the water column to total of three samples.
Temporal Representation:	All samples were collected on August 15, 2005.
Environmental Conditions:	
QAPP Information:	SCCWRP. 2005. Quality Assurance Project Plan, Marina Copper Monitoring Study. SWRCB Agreement No. 04-236-190-0. Southern California Coastal Water Research Project. August 2005.
QAPP Information Reference(s):	Quality Assurance Project Plan, Marina Copper Monitoring Study. SWRCB Agreement No. 04-236-190-0. A

Line of Evidence (LOE) for Decision ID 43226, Copper **Region 9**

Dana Point Harbor

LOE ID:	73495
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Marine Habitat
Number of Samples:	33
Number of Exceedances:	9
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Thirty-three samples were collected to test for toxicity. Nine of the 33 samples exhibited statistically and biologically significant toxicity. The toxicity tests that exhibited significant toxicity included Mysid biomass and survival and Eohaustorius survival.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control. Additionally, the biological significance of the sample was evaluted by determining whether the sample response was lower than the evaluation threshold.
Guideline Reference:	
Spatial Representation:	The samples were collected at stations DAPTDC, DAPTEB, DAPTLB, DAPTLR, and

	DAPTWB -Dana Point Harbor.	034634
Temporal Representation:	The samples were collected from June 2006 to June 2008.	
Environmental Conditions:		
QAPP Information:	The data collected under the Quality Assurance Management Plan for The Orange County Stormwater Program. The SWAMP measurement quality objectives were followed for toxicity data. The performance of toxicity bioassays and evaluation of reference toxicants were performed using USEPA and Standard Methods.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43226, Copper **Region 9**

Dana Point Harbor

LOE ID:	73481
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	45
Number of Exceedances:	16
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Sixteen of 45 samples exceeded the water quality objective for copper. Samples collected from Dana Point Harbor Shipyard (DAPTLR) and Near Launch Ramp (DAPTLB) were collected within 200 meters and the analytical results were averaged.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 31.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in saltwater for copper at 3.1 ug/L.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected quarterly starting in Fall of 2006 through January of 2008.
Temporal Representation:	Samples were collected from within the Dana Point Harbor at four sample stations: Dana Cove / Ocean Institute (DAPTDC), East Basin (DAPTEB), Dana Point Harbor Shipyard (DAPTLR) and Near Launch Ramp (DAPTLB), and West Basin (DAPTWB).
Environmental Conditions:	
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43226, Copper **Region 9**

Dana Point Harbor

LOE ID:	73496
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None

Beneficial Use:	Marine Habitat	034635
Number of Samples:	25	
Number of Exceedances:	3	
Data and Information Type:	TOXICITY TESTING	
Data Used to Assess Water Quality:	Twenty-five samples were collected to test for sediment toxicity. Three of the 25 samples exhibited statistically and biologically significant toxicity. The toxicity tests that exhibited significant toxicity included Eohaustorius Survival.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control. Additionally, the biological significance of the sample is evaluated by determining whether the sample response is lower than the evaluation threshold.	
Guideline Reference:		
Spatial Representation:	The samples were collected at stations DAPTDC, DAPTEB, DAPTLB, DAPTLR, and DAPTWB -Dana Point Harbor.	
Temporal Representation:	The samples were collected from June 2006 to June 2008.	
Environmental Conditions:		
QAPP Information:	The data collected under the Quality Assurance Management Plan for The Orange County Stormwater Program. The SWAMP measurement quality objectives were followed for toxicity data. The performance of toxicity bioassays and evaluation of reference toxicants were performed using USEPA and Standard Methods.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43226, Copper **Region 9**

Dana Point Harbor

LOE ID:	26488
Pollutant:	Copper
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Marine Habitat
Number of Samples:	5
Number of Exceedances:	5
Data and Information Type:	Chemical monitoring of sediments
Data Used to Assess Water Quality:	Five sediment samples were collected in Dana Point Harbor. All five samples exceed the ERL for copper. One of the five samples exceed the ERM.
Data Reference:	Regional Harbor Monitoring Program Pilot Project 2005-06
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Water Quality Control Plan for the San Diego Basin, 2007 (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Effects Range Median (ERM) and Effects Range Low (ERL) for copper (Long, et, al., 1995).

	The ERM for copper is 270 ug/g dry weight and the ERL is 34 ug/g dry weight
Guideline Reference:	Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuary sediments. Environmental Management. 19, (1): 81-97
Spatial Representation:	Samples were collected both at West Basin Channel and East Basin Channel of Dana Point Harbor
Temporal Representation:	Samples were collected on August 2005 and 2006.
Environmental Conditions:	
QAPP Information:	Weston Solutions. 2005. Quality Assurance Project Plan for San Diego Regional Harbor Monitoring Program Pilot Project. Prepared for the Port of San Diego, City of San Diego, City of Oceanside, and County of Orange.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43226, Copper **Region 9**

Dana Point Harbor

LOE ID:	26483
Pollutant:	Copper
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Marine Habitat
Number of Samples:	14
Number of Exceedances:	6
Data and Information Type:	Chemical monitoring of sediments
Data Used to Assess Water Quality:	Eight samples collected in the West Basin Channel (Area B) and six samples collected in the East Basin Channel (Area C) were used for the analysis. Two of the eight samples exceed the ERL for copper in Area B and four of the six samples collected in area C exceed the ERL for copper. None of the 14 samples exceed the ERM. The composite sample for Area C also exceeded the ERL.
Data Reference:	Regional Harbor Monitoring Program Pilot Project 2005-06
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Water Quality Control Plan for the San Diego Basin, 2007 (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Effects Range Median (ERM) and Effects Range Low (ERL) for copper (Long, et, al., 1995). The ERM for copper is 270 ug/g dry weight and the ERL is 34 ug/g dry weight
Guideline Reference:	Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuary sediments. Environmental Management. 19, (1): 81-97
Spatial Representation:	Samples were collected both at West Basin Channel and East Basin Channel of Dana Point Harbor
Temporal Representation:	Samples were collected on August 23, 2006.
Environmental Conditions:	
QAPP Information:	Kinnetic Laboratories conducts all activities in accordance with formal QA/QC procedures.
QAPP Information Reference(s):	

DECISION ID 42684 **Region 9**

Dana Point Harbor

Pollutant:	**Toxicity**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**

Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)	034637
Revision Status	Revised	
Sources:	Source Unknown	
Expected TMDL Completion Date:	2021	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for removal from the CWA section 303(d) List under section 4.1 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess pollutant. Fourteen of the forty water samples and three of the twenty-five sediment samples exceed the GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Fourteen of forty water samples and three of twenty-five sediment samples exceeded the GUIDELINE and this exceeds the allowable frequency listed in Table 4.1 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 42684, Toxicity **Region 9**

Dana Point Harbor

LOE ID:	73496
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Marine Habitat
Number of Samples:	25
Number of Exceedances:	3
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Twenty-five samples were collected to test for sediment toxicity. Three of the 25 samples exhibited statistically and biologically significant toxicity. The toxicity tests that exhibited significant toxicity included Eohaustorius Survival.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the

	control. Additionally, the biological significance of the sample is evaluated by determining whether the sample response is lower than the evaluation threshold.
Guideline Reference:	
Spatial Representation:	The samples were collected at stations DAPTDC, DAPTEB, DAPTLB, DAPTLR, and DAPTWB -Dana Point Harbor.
Temporal Representation:	The samples were collected from June 2006 to June 2008.
Environmental Conditions:	
QAPP Information:	The data collected under the Quality Assurance Management Plan for The Orange County Stormwater Program. The SWAMP measurement quality objectives were followed for toxicity data. The performance of toxicity bioassays and evaluation of reference toxicants were performed using USEPA and Standard Methods.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 42684, Toxicity **Region 9**

Dana Point Harbor

LOE ID:	26499
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Marine Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Toxicity tests were conducted using composite water column samples on the mussel Mytilus galloprovincialis, mysid shrimp Mysidopsis bahia, and a fish Menidia beryllina. Sediment/water samples were composited and tested from Areas B and Area C. Toxicity was not observed at from either of the Areas.
Data Reference:	Regional Harbor Monitoring Program Pilot Project 2005-06 Regional Harbor Monitoring Program Pilot Project 2006-07
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan on toxicity, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. From the Basin Plan on pesticides, no individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The threshold for toxicity was a No Effect Concentration (NOEC) less than 100 %.
Guideline Reference:	Extent and Magnitude of Copper Contamination in Marinas of the San Diego Region, California. Technical Report 483
Spatial Representation:	Samples were collected both at west basin channel and east basin channel of Dana Point Harbor
Temporal Representation:	All samples were collected on August 23, 2006.
Environmental Conditions:	
QAPP Information:	Kinnetic Laboratories conducts all activities in accordance with formal QA/QC procedures.
QAPP Information Reference(s):	County of Orange. Dredge Material Evaluation, Dana Point Harbor Maintenance Dredging

Line of Evidence (LOE) for Decision ID 42684, Toxicity **Region 9**

Dana Point Harbor 034639

LOE ID:	73495
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Marine Habitat
Number of Samples:	33
Number of Exceedances:	9
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Thirty-three samples were collected to test for toxicity. Nine of the 33 samples exhibited statistically and biologically significant toxicity. The toxicity tests that exhibited significant toxicity included Mysid biomass and survival and Eohaustorius survival.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control. Additionally, the biological significance of the sample was evaluted by determining whether the sample response was lower than the evaluation threshold.
Guideline Reference:	
Spatial Representation:	The samples were collected at stations DAPTDC, DAPTEB, DAPTLB, DAPTLR, and DAPTWB -Dana Point Harbor.
Temporal Representation:	The samples were collected from June 2006 to June 2008.
Environmental Conditions:	
QAPP Information:	The data collected under the Quality Assurance Management Plan for The Orange County Stormwater Program. The SWAMP measurement quality objectives were followed for toxicity data. The performance of toxicity bioassays and evaluation of reference toxicants were performed using USEPA and Standard Methods.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 42684, Toxicity **Region 9**

Dana Point Harbor

LOE ID:	26498
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Marine Habitat
Number of Samples:	5
Number of Exceedances:	5
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Five upper water column water samples were tested for toxicity on mussel Mytilus galloprovincialis. Toxicity was observed at all five sampling locations.
Data Reference:	Regional Harbor Monitoring Program Pilot Project 2005-06

	Regional Harbor Monitoring Program Pilot Project 2006-07	034640

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan on toxicity, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. From the Basin Plan on pesticides, no individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The threshold for toxicity was less than 80% development relative to the control test species (Schiff et al, 2006).
Guideline Reference:	Extent and Magnitude of Copper Contamination in Marinas of the San Diego Region, California. Technical Report 483
Spatial Representation:	Five stations were sampled in Dana Point Harbor.
Temporal Representation:	All samples were collected on August 15, 2005.
Environmental Conditions:	
QAPP Information:	SCCWRP. 2005. Quality Assurance Project Plan, Marina Copper Monitoring Study. SWRCB Agreement No. 04-236-190-0. Southern California Coastal Water Research Project. August 2005.
QAPP Information Reference(s):	Quality Assurance Project Plan, Marina Copper Monitoring Study. SWRCB Agreement No. 04-236-190-0. A

Line of Evidence (LOE) for Decision ID 42684, Toxicity **Region 9**

Dana Point Harbor

LOE ID:	26495
Pollutant:	Sediment Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Marine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Five sediment samples were tested for toxicity using amphipod Eohaustorius estuaris. Toxicity was not observed at all five sampling locations.
Data Reference:	Regional Harbor Monitoring Program Pilot Project 2005-06 Regional Harbor Monitoring Program Pilot Project 2006-07
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan on toxicity, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (RWQCB, 2007). From the Basin Plan on pesticides, no individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The threshold for toxicity was less than 80% survival relative to the control test species

	(Weston, 2006).	034641
Guideline Reference:	Regional Harbor Monitoring Program Pilot Project 2005-06	
Spatial Representation:	Five stations were sampled in Dana Point Harbor.	
Temporal Representation:	Samples were collected on August 31, 2005 and August 21, 2006.	
Environmental Conditions:		
QAPP Information:	Weston Solutions. 2005. Quality Assurance Project Plan for San Diego Regional Harbor Monitoring Program Pilot Project. Prepared for the Port of San Diego, City of San Diego, City of Oceanside, and County of Orange.	
QAPP Information Reference(s):	Quality Assurance Project Plan for San Diego Regional Harbor Monitoring Program Pilot Project.	

DECISION ID 42746 — Region 9

Dana Point Harbor

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2027
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for removal from the CWA section 303(d) List under section 4.1 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess pollutant. Two of the 19 samples exceed the criteria for Zn in sediment for the protection of aquatic life. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Two of the 19 samples exceed the criteria for Zn in sediment for the protection of aquatic life and this exceeds the allowable frequency listed in Table 4.1 of the Listing Policy. 4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 42746, Zinc — Region 9

Dana Point Harbor

LOE ID:	73497
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Marine Habitat

Number of Samples:	45
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Zero of the 45 samples exceeded the water quality objective for zinc. Samples collected from Dana Point Harbor Shipyard (DAPTLR) and Near Launch Ramp (DAPTLB) were collected within 200 meters and the analytical results were averaged.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The CTR Criterion Continuous Concentration (4-Day Average) of Zinc is 81 ug/L to protect aquatic life in marine waters.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected quarterly starting in Fall of 2006 through January of 2008.
Temporal Representation:	Samples were collected from within the Dana Point Harbor at four sample stations: Dana Cove / Ocean Institute (DAPTDC), East Basin (DAPTEB), Dana Point Harbor Shipyard (DAPTLR) and Near Launch Ramp (DAPTLB), and West Basin (DAPTWB).
Environmental Conditions:	
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 42746, Zinc **Region 9**

Dana Point Harbor

LOE ID:	26489
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Marine Habitat
Number of Samples:	5
Number of Exceedances:	2
Data and Information Type:	Chemical monitoring of sediments
Data Used to Assess Water Quality:	Five samples were collected in the Dana Point harbor. Two of the five samples exceed the ERL for zinc. None of the samples exceed the ERM.
Data Reference:	Regional Harbor Monitoring Program Pilot Project 2005-06
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Water Quality Control Plan for the San Diego Basin, 2007 (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Effects Range Median (ERM) and Effects Range Low (ERL) for zinc (Long, et, al., 1995). The ERM for zinc is 410 & 956ug/g dry weight and the ERL is 150 & 956ug/g dry weight
Guideline Reference:	Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuary sediments. Environmental Management. 19, (1): 81-97
Spatial Representation:	Samples were collected both at West Basin Channel and East Basin Channel of Dana Point

	Harbor	034643
Temporal Representation:	Samples were collected on August 2005 and 2006.	
Environmental Conditions:		
QAPP Information:	Kinnetic Laboratories conducts all activities in accordance with formal QA/QC procedures.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 42746, Zinc **Region 9**

Dana Point Harbor

LOE ID:	26490
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Marine Habitat
Number of Samples:	14
Number of Exceedances:	0
Data and Information Type:	Chemical monitoring of sediments
Data Used to Assess Water Quality:	Eight samples collected in the West Basin Channel (Area B) and six samples collected from the East Basin Channel (Area C). None of the 14 samples exceed the ERM or ERL.
Data Reference:	Regional Harbor Monitoring Program Pilot Project 2005-06
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Water Quality Control Plan for the San Diego Basin, 2007 (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Effects Range Median (ERM) and Effects Range Low (ERL) for zinc (Long, et, al., 1995). The ERM for zinc is 410 µg/g dry weight and the ERL is 150 µg/g dry weight
Guideline Reference:	Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuary sediments. Environmental Management. 19, (1): 81-97
Spatial Representation:	Samples were collected both at West Basin Channel and East Basin Channel of Dana Point Harbor
Temporal Representation:	Samples were collected on August 23, 2006.
Environmental Conditions:	
QAPP Information:	Kinnetic Laboratories conducts all activities in accordance with formal QA/QC procedures.
QAPP Information Reference(s):	

DECISION ID **48389** **Region 9**

Dana Point Harbor

Pollutant:	**Ammonia (Unionized)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of 24

samples exceeded the criteria. 034644

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 24 samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 48389, Ammonia (Unionized) **Region 9**

Dana Point Harbor

LOE ID:	73486
Pollutant:	Ammonia (Unionized)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Marine Habitat
Number of Samples:	24
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	None of 24 samples exceeded the water quality objective for unionized ammonia. Data were reported as as total ammonia as nitrogen and were converted to unionized ammonia as nitrogen before being compared with the objective. Samples collected within a seven-day period and within 200 meters were averaged.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The San Diego Basin Plan objective for unionized ammonia is 0.025 mg/L as N.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Dana Cove/Ocean Institute, East Basin, Near Launch Ramp, Dana Point Harbor Shipyard, and West Basin. Samples from Near Launch Ramp were within 200 meters of samples from Dana Point Harbor Shipyard.
Temporal Representation:	Samples were collected from September 2006 to June 2008.
Environmental Conditions:	
QAPP Information:	A signed QAPP was included with the stated goal of ensuring the consistent collection of accurate water quality information that will used to satisfy the objectives of the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID 48400 **Region 9**

Dana Point Harbor 034645

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of 36 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 36 samples exceed the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 48400, Arsenic — Region 9

Dana Point Harbor

LOE ID:	73478
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	36
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the 36 samples exceeded the water quality objective for arsenic. Samples collected from Dana Point Harbor Shipyard (DAPTLR) and Near Launch Ramp (DAPTLB) were collected within 200 meters and the analytical results were averaged.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 31.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average)

	to protect aquatic life in saltwater for arsenic at 36 ug/L. 034646
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected quarterly starting in Fall of 2006 through January of 2008.
Temporal Representation:	Samples were collected from within the Dana Point Harbor at four sample stations: Dana Cove / Ocean Institute (DAPTDC), East Basin (DAPTEB), Dana Point Harbor Shipyard (DAPTLR) and Near Launch Ramp (DAPTLB), and West Basin (DAPTWB).
Environmental Conditions:	
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID 48401 Region 9

Dana Point Harbor

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of 36 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 36 samples exceed the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 48401, Cadmium Region 9

Dana Point Harbor

LOE ID:	73479
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	36

Number of Exceedances:	0	034647
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)	
Data Used to Assess Water Quality:	None of the 36 samples exceeded the water quality objective for cadmium. Samples collected from Dana Point Harbor Shipyard (DAPTLR) and Near Launch Ramp (DAPTLB) were collected within 200 meters and the analytical results were averaged.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 31.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in saltwater for cadmium at 9.3 ug/L.	
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Spatial Representation:	Samples were collected quarterly starting in Fall of 2006 through January of 2008.	
Temporal Representation:	Samples were collected from within the Dana Point Harbor at four sample stations: Dana Cove / Ocean Institute (DAPTDC), East Basin (DAPTEB), Dana Point Harbor Shipyard (DAPTLR) and Near Launch Ramp (DAPTLB), and West Basin (DAPTWB).	
Environmental Conditions:		
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.	
QAPP Information Reference(s):		

DECISION ID	**48402**	**Region 9**
Dana Point Harbor		

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of 36 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 36 samples exceed the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 48402, Chlorpyrifos **Region 9**

Dana Point Harbor

LOE ID:	73480
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	36
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the thirty six samples exceeded the Criteria Continuous Concentration for Chlorpyrifos of 9 ng/L.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The Criteria Continuous Concentration for chlorpyrifos in saltwater is 9 ng/L.
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game
Spatial Representation:	Samples were collected from site DAPTDC, DAPTWB, DAPTEB, DAPTLR, DAPTLB in Dana Point Harbor.
Temporal Representation:	Samples were collected in September 2006; June, September and December 2007; and January 2008.
Environmental Conditions:	According to the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010, samples were collected during the dry season and storm events.
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

DECISION ID **48404** **Region 9**

Dana Point Harbor

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 36 samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 36 samples exceed the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 48404, Diazinon **Region 9**

Dana Point Harbor

LOE ID:	73482
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	36
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the thirty six samples exceeded the maximum concentration for Diazinon criteria of 820.0 ng/L.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The Criteria Continuous Concentration for diazinon in saltwater is 820 ng/L.
Guideline Reference:	Aquatic Life Ambient Water Quality Criteria for Diazinon
Spatial Representation:	Samples were collected from site DAPTEB, DAPTDC, DAPTWB, DAPTLR, DAPTLB in Dana Point Harbor.
Temporal Representation:	Samples were collected in September 2006; June, September and December 2007; and January 2008.
Environmental Conditions:	According to the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010, samples were collected during the dry season and storm events.
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

DECISION ID	48407	Region 9
Dana Point Harbor		

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of 18 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3 Zero of 18 samples exceed the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 48407, Lead	Region 9
Dana Point Harbor	

LOE ID:	73483
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	18
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the 18 samples exceeded the water quality objective for dissolved lead. Samples collected from Dana Point Harbor Shipyard (DAPTLR) and Near Launch Ramp (DAPTLB) were collected within 200 meters and the analytical results were averaged.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 31.36

	(section 131.36 revised at 57 FR 60848, December 22, 1992).	034651
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in saltwater for lead at 8.1 ug/L.	
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Spatial Representation:	Samples were collected quarterly starting in Fall of 2006 through January of 2008.	
Temporal Representation:	Samples were collected from within the Dana Point Harbor at four sample stations: Dana Cove / Ocean Institute (DAPTDC), East Basin (DAPTEB), Dana Point Harbor Shipyard (DAPTLR) and Near Launch Ramp (DAPTLB), and West Basin (DAPTWB).	
Environmental Conditions:		
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.	
QAPP Information Reference(s):		

DECISION ID **48408** **Region 9**

Dana Point Harbor

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of 25 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 25 samples exceed the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 48408, Malathion **Region 9**

Dana Point Harbor

LOE ID:	73484
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total

Beneficial Use:	Marine Habitat
Number of Samples:	25
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the twenty five samples exceeded the maximum concentration for Malathion of 100 ng/L.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The maximum (Instantaneous) concentration for Malathion in saltwater is 100 ng/L.
Guideline Reference:	Quality Criteria for Water. USEPA Office of Water and Hazardous Materials. Washington, D.C
Spatial Representation:	Samples were collected from site DAPTEB, DAPTDC, DAPTWB, DAPTLR, DAPTLB in Dana Point Harbor.
Temporal Representation:	Samples were collected in September 2006; June, September and December 2007; and January 2008.
Environmental Conditions:	According to the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010, samples were collected during the dry season and storm events.
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

DECISION ID	**48405**	**Region 9**
Dana Point Harbor		

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 36 samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 36 samples exceed the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 48405, Nickel **Region 9**

Dana Point Harbor

LOE ID:	73485
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	36
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the 36 samples exceeded the water quality objective for nickel. Samples collected from Dana Point Harbor Shipyard (DAPTLR) and Near Launch Ramp (DAPTLB) were collected within 200 meters and the analytical results were averaged.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California's Ocean Plan Table B lists 6-month median concentration of 5 ug/L to protect aquatic life in marine waters for nickel.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected quarterly starting in Fall of 2006 through January of 2008.
Temporal Representation:	Samples were collected from within the Dana Point Harbor at four sample stations: Dana Cove / Ocean Institute (DAPTDC), East Basin (DAPTEB), Dana Point Harbor Shipyard (DAPTLR) and Near Launch Ramp (DAPTLB), and West Basin (DAPTWB).
Environmental Conditions:	
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID **48406** **Region 9**

Dana Point Harbor

Pollutant:	**Selenium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 36

samples exceed the criteria. 034654

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 36 samples exceed the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 48406, Selenium **Region 9**

Dana Point Harbor

LOE ID:	73489
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Marine Habitat
Number of Samples:	36
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the 36 samples exceeded the water quality objective for selenium. Samples collected from Dana Point Harbor Shipyard (DAPTLR) and Near Launch Ramp (DAPTLB) were collected within 200 meters and the analytical results were averaged.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 31.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in saltwater for selenium at 71 ug/L.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected quarterly starting in Fall of 2006 through January of 2008.
Temporal Representation:	Samples were collected from within the Dana Point Harbor at four sample stations: Dana Cove / Ocean Institute (DAPTDC), East Basin (DAPTEB), Dana Point Harbor Shipyard (DAPTLR) and Near Launch Ramp (DAPTLB), and West Basin (DAPTWB).
Environmental Conditions:	
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID	48409	034655 Region 9
Dana Point Harbor		

Pollutant:	**Silver**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of 36 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 36 samples exceed the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 48409, Silver	**Region 9**
Dana Point Harbor	

LOE ID:	73490
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	36
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the 36 samples exceeded the water quality objective for silver. Samples collected from Dana Point Harbor Shipyard (DAPTLR) and Near Launch Ramp (DAPTLB) were collected within 200 meters and the analytical results were averaged.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 31.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	The 6-Month Median value for Silver is 0.7Ug/L (California Ocean Plan, 2009)
Guideline Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Spatial Representation:	Samples were collected quarterly starting in Fall of 2006 through January of 2008.
Temporal Representation:	Samples were collected from within the Dana Point Harbor at four sample stations: Dana Cove / Ocean Institute (DAPTDC), East Basin (DAPTEB), Dana Point Harbor Shipyard (DAPTLR) and Near Launch Ramp (DAPTLB), and West Basin (DAPTWB).
Environmental Conditions:	
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID 48411 Region 9

Dana Point Harbor

Pollutant:	**pH**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of 50 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 50 samples exceed the criteria and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 48411, pH Region 9

Dana Point Harbor

LOE ID:	73488
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Marine Habitat
Number of Samples:	50

Number of Exceedances:	0	034657

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Zero of 50 samples exceeded the objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In bays and estuaries the pH shall not be depressed below 7.0 nor raised above 9.0.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the DAPTDC, DAPTEB, DAPTLB, DAPTLR, and DAPTWB stations.
Temporal Representation:	Samples were collected approximately thrice semi-annually from September 2006 to September 2008.
Environmental Conditions:	
QAPP Information:	NPDES quality assurance.
QAPP Information Reference(s):	

DECISION ID	**34003**	**Region 9**
Dana Point Harbor		

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. The data collected from 2006 to 2010 show that 256 of 561 geomean samples and 155 of 697 single samples exceed the water quality objective for total coliform for the protection of SHELL.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. The data collected from 2006 to 2010 show that 256 of 561 geomean samples and 155 of 697 single samples exceed the water quality objective for total coliform for the protection of SHELL and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 34003, Indicator Bacteria 034658 Region 9

Dana Point Harbor

LOE ID:	77702
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	156
Number of Exceedances:	88
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Eighty eight of the 156 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The Water Quality Control Plan for the San Diego BasinÂ states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Dana Point Harbor sites Pier and Pilgrim. The results at these sites were averaged because they are within 200 meters of each other.
Temporal Representation:	The samples were collected from April 2005 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 34003, Indicator Bacteria Region 9

Dana Point Harbor

LOE ID:	4450
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Water Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Unspecified	034659
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)	
Evaluation Guideline:	Unspecified	
Guideline Reference:	Placeholder reference pre-2006 303(d)	
Spatial Representation:	Unspecified	
Temporal Representation:	Unspecified	
Environmental Conditions:	Unspecified	
QAPP Information:	Unspecified	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 34003, Indicator Bacteria **Region 9**

Dana Point Harbor

LOE ID:	77704
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	108
Number of Exceedances:	104
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	One hundred and four of the 108 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The Water Quality Control Plan for the San Diego BasinÂ states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Dana Point Harbor, site MDP18.
Temporal Representation:	The samples were collected from July 2006 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 34003, Indicator Bacteria **Region 9**

Dana Point Harbor

LOE ID:	77705
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting

Number of Samples:	149
Number of Exceedances:	53
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Fifty three of the 149 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The Water Quality Control Plan for the San Diego BasinÂ states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Dana Point Harbor, site Youth Dock.
Temporal Representation:	The samples were collected from April 2005 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 34003, Indicator Bacteria **Region 9**

Dana Point Harbor

LOE ID:	77703
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	148
Number of Exceedances:	11
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Eleven of the 148 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The Water Quality Control Plan for the San Diego BasinÂ states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Dana Point Harbor site Fuel dock.
Temporal Representation:	The samples were collected from April 2005 to August 2010.
Environmental Conditions:	

QAPP Information:	The samples were collected for the beach watch program.	034661
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 34003, Indicator Bacteria **Region 9**

Dana Point Harbor

LOE ID:	73494
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	186
Number of Exceedances:	32
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed BW data for Dana Point Harbor to determine beneficial use support and results are as follows: 32 of 186 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The Water Quality Control Plan (Basin Plan 2011)states the following: At all areas where shellfish may be harvested for human consumption, ten percent of the samples collected during any 30-day period shall not exceed 230 MPN/100mL.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Dana Point Harbor was collected at 1 monitoring site [YOUTH DOCK]
Temporal Representation:	Data was collected over the time period 4/21/2005-8/26/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 34003, Indicator Bacteria **Region 9**

Dana Point Harbor

LOE ID:	73493
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	135
Number of Exceedances:	75
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed bw data for Dana Point Harbor to determine beneficial use support and results are as follows: 75 of 135 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The Water Quality Control Plan (Basin Plan 2011)states the following: At all areas where shellfish may be harvested for human consumption, ten percent of the samples collected during any 30-day period shall not exceed 230 MPN/100mL.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Dana Point Harbor was collected at 1 monitoring site [MDP18]
Temporal Representation:	Data was collected over the time period 7/20/2006-8/26/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 34003, Indicator Bacteria **Region 9**

Dana Point Harbor

LOE ID:	73492
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	184
Number of Exceedances:	7
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed BW data for Dana Point Harbor to determine beneficial use support and results are as follows: 7 of 184 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The Water Quality Control Plan (Basin Plan 2011)states the following: At all areas where shellfish may be harvested for human consumption, ten percent of the samples collected during any 30-day period shall not exceed 230 MPN/100mL.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Dana Point Harbor was collected at 1 monitoring site [FUEL DOCK]
Temporal Representation:	Data was collected over the time period 4/21/2005-8/26/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 34003, Indicator Bacteria **Region 9**

Dana Point Harbor

LOE ID:	73491
Pollutant:	Total Coliform

LOE Subgroup:	Pollutant-Water	034663
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Shellfish Harvesting	
Number of Samples:	192	
Number of Exceedances:	41	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed bw data for Dana Point Harbor to determine beneficial use support and results are as follows: 41 of 192 samples exceed the criterion for Coliform, Total.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The Water Quality Control Plan (Basin Plan 2011)states the following: At all areas where shellfish may be harvested for human consumption, ten percent of the samples collected during any 30-day period shall not exceed 230 MPN/100mL.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Dana Point Harbor was collected at 2 monitoring sites [PILGRIM, PIER] The results from these two sites were averaged if sampled on the same day because they are within 200 meters of each other.	
Temporal Representation:	Data was collected over the time period 4/21/2005-8/26/2010.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

DECISION ID	48410	Region 9
Dana Point Harbor		

Pollutant:	**Oxygen, Dissolved**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2029
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Seven of the forty samples exceed the OBJECTIVE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Seven of forty samples exceed the OBJECTIVE and this exceeds the allowable frequency listed in

Table 3.2 of the Listing Policy. 034664
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 48410, Oxygen, Dissolved **Region 9**

Dana Point Harbor

LOE ID:	73487
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	40
Number of Exceedances:	7
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Seven of 40 samples exceeded the objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Dissolved oxygen levels shall not be less than 5.0 mg/l in inland surface waters with designated MAR or WARM beneficial uses. The annual mean dissolved oxygen concentration shall not be less than 7 mg/L more than 10% of the time.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the DAPTDC, DAPTEB, DAPTLB, and DAPTLR stations.
Temporal Representation:	Samples were collected approximately twice semi-annually from September 2006 to June 2008.
Environmental Conditions:	
QAPP Information:	NPDES quality assurance.
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Oceanside Harbor
Water Body ID: CAB9021100019991117130531
Water Body Type: Bay & Harbor

DECISION ID 42666 **Region 9**
Oceanside Harbor

Pollutant:	**Toxicity**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2027
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least one line of evidence is necessary to assess listing status for toxicity, and waters may be placed on the CWA section 303(d) List for toxicity alone.

Two lines of evidence are available in the administrative record to assess this pollutant. Three of three sediment samples exceed the evaluation guideline for toxicity. Zero of two water samples exceed the evaluation guideline for toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Three of three sediment samples exceed the evaluation guideline for toxicity, and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 42666, Toxicity **Region 9**
Oceanside Harbor

LOE ID:	26501
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None

Beneficial Use:	Marine Habitat	034666
Number of Samples:	2	
Number of Exceedances:	0	
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)	
Data Used to Assess Water Quality:	Toxicity tests were conducted using the upper water column sample on the mussel Mytilus galloprovincialis. Toxicity was not observed at either location.	
Data Reference:	Extent and Magnitude of Copper Contamination in Marinas of the San Diego Region, California. Technical Report 483	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan on toxicity, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. From the Basin Plan on pesticides, no individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (RWQCB, 2007).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The threshold for toxicity was less than 80% development relative to the control test species (Schiff et al, 2006)	
Guideline Reference:	Extent and Magnitude of Copper Contamination in Marinas of the San Diego Region, California. Technical Report 483	
Spatial Representation:	Two stations were sampled in Oceanside Harbor. One station was located in the North Harbor, and the other in the South Harbor. Each station was sampled at upper, middle and lower levels within the water column to total three samples. Only the upper sample was used for toxicity testing.	
Temporal Representation:	All samples were collected on August 15, 2005.	
Environmental Conditions:		
QAPP Information:	Quality control conducted according to SCCWRP's Quality Assurance Project Plan for the Marina Copper Monitoring Study.	
QAPP Information Reference(s):	Quality Assurance Project Plan, Marina Copper Monitoring Study. SWRCB Agreement No. 04-236-190-0. A	

Line of Evidence (LOE) for Decision ID 42666, Toxicity **Region 9**

Oceanside Harbor

LOE ID:	74458
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Marine Habitat
Number of Samples:	3
Number of Exceedances:	3
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Three samples were collected to test for toxicity. Three of the three samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius. Each sample is a sediment composites from three different sites.
Data Reference:	Data for Various Pollutants from Ambient Bay and Lagoon, 2003-2005.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates, Second Edition. U.S. Environmental Protection Agency Office of Research and Development, Duluth, MI , U.S. Environmental Protection Agency Office of Water, Washington, DC EPA-600/R-99/064
Spatial Representation:	The samples were collected at 903OH_2003, 903OH_2004, and 903OH_2005. Each of these sample location names consists of a composite from three different sites.
Temporal Representation:	The samples were collected in July 2003, 2004, and 2005.
Environmental Conditions:	
QAPP Information:	The data was collected under the County of San Diego Ambient Bay and Lagoon Monitoring Project 2003-2005. Annual Report for the Receiving Waters and Urban Runoff Monitoring section covered under the San Diego County Municipal National Pollutant Discharge Elimination System (NPDES) Permit (RWQCB-Order NO. R9-2007-0001).
QAPP Information Reference(s):	e-mail clarifying QAPP information

DECISION ID	44036	Region 9
Oceanside Harbor		

Pollutant:	**Copper**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown | Unknown Nonpoint Source | Urban Runoff/Storm Sewers
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Two of the five samples exceed the Basin Plan water quality objective for copper. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Two of the five samples exceed the Basin Plan water quality objective for copper and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 44036, Copper Oceanside Harbor — Region 9

LOE ID:	26500
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Marine Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Water samples were collected from two stations in the Oceanside Harbor at upper, middle, and lower levels. The means of 3 water samples from the two stations did not exceed the acute or chronic water quality objective.
Data Reference:	Extent and Magnitude of Copper Contamination in Marinas of the San Diego Region, California. Technical Report 483
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the CTR, the dissolved copper chronic criterion is 3.1 ppb and the acute criterion is 4.8 ppb.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Two stations were sampled in Oceanside Harbor. One station was located in the North Harbor, and the other in the South Harbor. Each station was sampled at upper, middle, and lower levels within the water column to total three samples.
Temporal Representation:	All samples were collected on August 15, 2005.
Environmental Conditions:	
QAPP Information:	Quality assurance conducted under SCCWRP's Quality Assurance Project Plan for the Marina Copper Monitoring Study.
QAPP Information Reference(s):	Quality Assurance Project Plan, Marina Copper Monitoring Study. SWRCB Agreement No. 04-236-190-0. A

Line of Evidence (LOE) for Decision ID 44036, Copper Oceanside Harbor — Region 9

LOE ID:	26502
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Marine Habitat
Number of Samples:	3
Number of Exceedances:	2

Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants) 034669
Data Used to Assess Water Quality:	Three water samples were collected from three stations in the Oceanside Harbor, two exceeded the acute and chronic water quality criteria.
Data Reference:	Regional Harbor Monitoring Program Pilot Project 2005-06 Regional Harbor Monitoring Program Pilot Project 2006-07
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the CTR, the dissolved copper chronic criterion is 3.1 ppb and the acute criterion is 4.8 ppb (U.S. EPA, 2000)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA
Evaluation Guideline:	
Guideline Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA
Spatial Representation:	One station (O1M) was sampled in 2005 and two stations (O406M and O506M) in 2006 in Oceanside Harbor.
Temporal Representation:	Samples were collected on August 15, 2005 and August 21, 2006.
Environmental Conditions:	
QAPP Information:	Quality assurance conducted according to Weston Solution's Quality Assurance Project Plan for San Diego Regional Harbor Monitoring Program Pilot Project.
QAPP Information Reference(s):	Quality Assurance Project Plan for San Diego Regional Harbor Monitoring Program Pilot Project.

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Mission Bay (area at mouth of Rose Creek only)
Water Body ID: CAB906400002005010418565 9
Water Body Type: Bay & Harbor

DECISION ID 33706 **Region 9**
Mission Bay (area at mouth of Rose Creek only)

Pollutant: Eutrophic
Final Listing Decision: List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: List on 303(d) list (TMDL required list)(2012)
Revision Status Original
Sources: Source Unknown
Expected TMDL Completion Date: 2019
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

303(d) listing decisions made prior to 2006 were not held in an assessment database. The Regional Boards will update this decision when new data and information become available and are assessed.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33706, Eutrophic **Region 9**
Mission Bay (area at mouth of Rose Creek only)

LOE ID: 4676

Pollutant: Eutrophic
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Not Recorded

Beneficial Use: Marine Habitat

Number of Samples: 0
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference: Placeholder reference pre-2006 303(d)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: Unspecified
Objective/Criterion Reference: Placeholder reference pre-2006 303(d)

Evaluation Guideline:	Unspecified
Guideline Reference:	Placeholder reference pre-2006 303(d)
Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

DECISION ID 41989 Region 9

Mission Bay (area at mouth of Rose Creek only)

Pollutant:	**Lead**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. 303(d) listing decisions made prior to 2006 were not held in an assessment database. The Regional Boards will update this decision when new data and information become available and are assessed.
Regional Board Decision Recommendation:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. The Regional Board will update this decision when new data and information become available and are assessed.

Line of Evidence (LOE) for Decision ID 41989, Lead Region 9

Mission Bay (area at mouth of Rose Creek only)

LOE ID:	4677
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Marine Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)

Evaluation Guideline:	Unspecified	034672
Guideline Reference:	Placeholder reference pre-2006 303(d)	

Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Mission Bay (area at mouth of Tecolote Creek only)
Water Body ID: CAB906500002005010419065 1
Water Body Type: Bay & Harbor

DECISION ID 33089 **Region 9**
Mission Bay (area at mouth of Tecolote Creek only)

Pollutant: Eutrophic
Final Listing Decision: Do Not Delist from 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Do Not Delist from 303(d) list (TMDL required list)(2012)
Revision Status Original
Sources: Source Unknown
Expected TMDL Completion Date: 2019
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

One line of evidence is available in the administrative record. Based on the information presented, the water body-pollutant should not be removed from the section 303(d) list because of a lack of available data that demonstrates that standards are being met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33089, Eutrophic **Region 9**
Mission Bay (area at mouth of Tecolote Creek only)

LOE ID: 320

Pollutant: Eutrophic
LOE Subgroup: Testimonial Evidence
Matrix: Not Specified
Fraction: None

Beneficial Use: Estuarine Habitat

Number of Samples: 0
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: From the letter written by the San Diego Baykeeper on 06/14/2004: We recommend continued listing of Mission Bay for eutrophication, lead, and bacterial indicators.

No raw data or other specifics were given.
Data Reference: Placeholder reference 2006 303(d)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters, enclosed bays and estuaries, coastal lagoons, and ground waters, the WQO for Biostimulatory substances states that inland surface waters, bays and estuaries, and coastal lagoon waters shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. Concentrations of nitrogen and phosphorus, by themselves or in combination with other nutrients, shall be maintained at levels below those which stimulate algae and emergent plant growth.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The area is described as Mission Bay. Exact location was not given.
Temporal Representation:	The letter regarding possible impairment was written on 06/14/2004. Dates of studies or sampling events were not given.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

DECISION ID 32712 Region 9

Mission Bay (area at mouth of Tecolote Creek only)

Pollutant:	**Lead**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: One line of evidence is available in the administrative record. Information is not backed with numerical data. Based on the information presented, the water body-pollutant should not be placed on the section 303(d) list because it cannot be determined if the pollutant contribute to or cause a toxicological effect (section 2 of the Listing Policy).
Regional Board Decision Recommendation:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. The Regional Board will update this decision when new data and information become available and are assessed.

Line of Evidence (LOE) for Decision ID 32712, Lead Region 9

Mission Bay (area at mouth of Tecolote Creek only)

LOE ID:	321
Pollutant:	Lead
LOE Subgroup:	Testimonial Evidence
Matrix:	Not Specified
Fraction:	None
Beneficial Use:	Industrial Service Supply
Number of Samples:	0

Number of Exceedances:	0	034675
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	From the letter written by the San Diego Baykeeper on 06/14/2004: We recommend continued listing of Mission Bay for eutrophication, lead, and bacterial indicators (San Diego Baykeeper, 2004) .	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The CTR, saltwater acute standard is 210 ppb and the saltwater chronic standard is 8.1 ppb. The probable effects level for marine and estuary sediment is 112.18 ppm. The Ocean Plan objective for the protection of marine aquatic life 6-month median is 2ppb, the daily maximum is 8 ppb and the instantaneous maximum is 20 ppb.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The area is described as Mission Bay. Exact location was not given.	
Temporal Representation:	The letter regarding possible impairment was written on 06/14/2004. Exact dates of studies or sampling events were not given.	
Environmental Conditions:		
QAPP Information:	QA Info Missing	
QAPP Information Reference(s):		

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: San Diego Bay Shoreline, near sub base
Water Body ID: CAB908100001999021008550 7
Water Body Type: Bay & Harbor

DECISION ID 43380 **Region 9**
San Diego Bay Shoreline, near sub base

Pollutant: **Benthic Community Effects**
Final Listing Decision: **Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not Delist from 303(d) list (TMDL required list)(2012)
Revision Status Revised
Sources: Source Unknown
Expected TMDL Completion Date: 2021
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

This pollutant is being considered for removal from the section 303(d) list under section 4.9 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. None of samples exceeded the water quality criteria for benthic invertebrates.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the section 303(d) list.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the nineteen samples exceeded the water quality criteria for benthic invertebrates and this does not satisfy the minimum sample requirements to de-list according to Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

The data for this site will be reassessed in future listing cycles in accordance with the California Sediment Quality Objectives.

Regional Board Decision Recommendation: Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 43380, Benthic Community Effects **Region 9**
San Diego Bay Shoreline, near sub base

LOE ID:	30045
Pollutant:	Benthic Community Effects
LOE Subgroup:	Pollution
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Marine Habitat
Aquatic Life Use:	Marine Habitat
Number of Samples:	14
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Twelve of the 14 sediment samples had BRI scores less than 31. The remaining two stations had BRI scores of 31.3 and 34.4 which place them in the lower end of Response Level 1. Sample collection was conducted by Space and Naval Warfare Systems Center San Diego in April 2004 at Submarine Base San Diego.
Data Reference:	Sediment Site Assessment Study, Submarine Base, San Diego, Draft Final Report.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The magnitude of disturbance shown by the benthic assemblage at each station was described by the embayment Benthic Response Index (BRI). BRI values in Response Level 2 or greater were consider degraded. Benthic Response Index (BRI) Categories: Reference: < 31 Response Level 1. 31 to 42 Response Level 2: 42 to 53 Response Level 3: 53 to 73 Response Level 4: > 73
Guideline Reference:	Sediment Site Assessment Study, Submarine Base, San Diego, Draft Final Report.
Spatial Representation:	Fourteen sampling stations were layed out in a grid pattern covering approximately 60 acres in around Piers November, Mike, and Sierra. Three of the stations are in the area originally listed as impaired on the current 303d list.
Temporal Representation:	Samples were collected in April 2004.
Environmental Conditions:	
QAPP Information:	Sampling and analysis and quality assurance plans followed the general guidelines from previous San Diego Bay TMDL studies conducted by the Southern California Coastal Water Research Project, U.S. Navy, and the Regional Water Quality Control Board.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43380, Benthic Community Effects **Region 9**

San Diego Bay Shoreline, near sub base

LOE ID:	4707
Pollutant:	Benthic Community Effects

LOE Subgroup:	Population/Community Degradation	034678
Matrix:	Sediment	
Fraction:	Not Recorded	
Beneficial Use:	Marine Habitat	
Number of Samples:	0	
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.	
Data Reference:	Placeholder reference pre-2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:		
Objective/Criterion Reference:		
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Unspecified	
Temporal Representation:	Unspecified	
Environmental Conditions:	Unspecified	
QAPP Information:	Unspecified	
QAPP Information Reference(s):		

DECISION ID 43491 Region 9

San Diego Bay Shoreline, near sub base

Pollutant:	**Arsenic | Cadmium | Chlordane | Chromium (total) | Copper | Lead | Mercury | Nickel | PAHs (Polycyclic Aromatic Hydrocarbons) | PCBs (Polychlorinated biphenyls) | Silver**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

These pollutants are being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 14 sediment samples exceeded the ERM or consensus base guidelines for marine sediment.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 14 sediment samples exceeded the ERM or consensus base guidelines for marine sediment and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 43491, Multiple Pollutants **Region 9**

San Diego Bay Shoreline, near sub base

LOE ID:	30036
Pollutant:	Arsenic | Cadmium | Chlordane | Chromium (total) | Copper | Lead | Mercury | Nickel | PAHs (Polycyclic Aromatic Hydrocarbons) | PCBs (Polychlorinated biphenyls) | Silver
LOE Subgroup:	Pollution
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Marine Habitat
Aquatic Life Use:	Marine Habitat
Number of Samples:	14
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	None of the 14 sediment samples exceeded the ERM or consensus base guidelines for marine sediment. Sample collection was conducted by Space and Naval Warfare Systems Center San Diego on April 2004 at Submarine Base San Diego.
Data Reference:	Sediment Site Assessment Study, Submarine Base, San Diego, Draft Final Report.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Effects Range Median (ERM) for metals. Consensus base guidelines for polynuclear aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), Chlordane, and DDT.
Guideline Reference:	Sediment Site Assessment Study, Submarine Base, San Diego, Draft Final Report. Incidence of Adverse Biological Effects Within Ranges of Chemical Concentrations in Marine and Estuarine Sediments Development and Evaluation of Consensus-based Sediment Effect Concentrations for Polychlorinated Biphenyls Development and Evaluation of Sediment Quality Guidelines for Florida Coastal Waters Consensus Sediment Quality Guidelines for Polycyclic Aromatic Hydrocarbon Mixtures. Environmental Toxicology and Chemistry Sediment Toxicity, Contamination and Amphipod Abundance at a DDT-Dieldrin-Contaminated Site in San Francisco Bay. Environmental Toxicology and Chemistry 13:6 pp. 949-962. 1994
Spatial Representation:	Fourteen sampling stations were layed out in a grid pattern covering approximately 60 acres in around Piers November, Mike, and Sierra. Three of the stations are in the area originally listed as impaired on the current 303d list.
Temporal Representation:	Samples were collected in April 2004.
Environmental Conditions:	
QAPP Information:	Sampling and analysis and quality assurance plans followed the general guidelines from previous San Diego Bay TMDL studies conducted by the Southern California Coastal Water Research Project, U.S. Navy, and the Regional Water Quality Control Board.
QAPP Information Reference(s):	

DECISION ID 43801 **Region 9**

San Diego Bay Shoreline, near sub base

Pollutant:	**Toxicity**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for removal from the section 303(d) list under section 4.1 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status. [In 2006, water toxicity had been included in the Sediment Toxicity listing]

Two lines of evidence are available in the administrative record to assess pollutant. Three of 14 samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the section 303(d) list.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Three of 14 samples exceeded the toxicity water quality objective and this exceeds the allowable frequency listed in Table 4.1 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 43801, Toxicity **Region 9**

San Diego Bay Shoreline, near sub base

LOE ID:	4708
Pollutant:	Sediment Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	Not Recorded
Beneficial Use:	Marine Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference:	Placeholder reference pre-2006 303(d)

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	
Objective/Criterion Reference:	
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43801, Toxicity **Region 9**

San Diego Bay Shoreline, near sub base

LOE ID:	29978
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Marine Habitat
Aquatic Life Use:	Marine Habitat
Number of Samples:	14
Number of Exceedances:	0
Data and Information Type:	Toxicity testing of sediments
Data Used to Assess Water Quality:	None of the 14 sediment samples were statistically significantly different from the control and below the minimum significant difference threshold for marine amphipods. Sample collection was conducted by Space and Naval Warfare Systems Center San Diego in April 2004 at Submarine Base San Diego.
Data Reference:	Sediment Site Assessment Study, Submarine Base, San Diego, Draft Final Report.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The sample is consider toxic if there is statistically significant difference from the control and the minimum significant difference threshold is exceeded for the test species Eohaustorius estuarius.
Guideline Reference:	Sediment Site Assessment Study, Submarine Base, San Diego, Draft Final Report.
Spatial Representation:	Fourteen sampling stations were layed out in a grid pattern covering approximately 60 acres in around Piers November, Mike, and Sierra. Three of the stations are in the area originally listed as impaired on the current 303d list.
Temporal Representation:	Samples were collected in April 2004.
Environmental Conditions:	
QAPP Information:	Sampling and analysis and quality assurance plans followed the general guidelines from previous San Diego Bay TMDL studies conducted by the Southern California Coastal Water Research Project, U.S. Navy, and the Regional Water Quality Control Board.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43801, Toxicity **Region 9**

San Diego Bay Shoreline, near sub base

LOE ID:	30035
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Marine Habitat
Aquatic Life Use:	Marine Habitat
Number of Samples:	14
Number of Exceedances:	3
Data and Information Type:	Toxicity testing of sediments
Data Used to Assess Water Quality:	One of the 14 sediment samples were statistically significantly different from the control and below the minimum significant difference threshold for mussel larvae Mytilus galloprovincialis. Three of the 14 sediment samples were statistically significantly different from the control and below the minimum significant difference threshold for purple sea urchin Strongylocentrotus purpuratus. Sample collection was conducted by Space and Naval Warfare Systems Center San Diego in April 2004 at Submarine Base San Diego.
Data Reference:	Sediment Site Assessment Study, Submarine Base, San Diego, Draft Final Report.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The sample is consider toxic if there is statistically significant difference from the control and the minimum significant difference threshold is exceeded for the test species.
Guideline Reference:	Sediment Site Assessment Study, Submarine Base, San Diego, Draft Final Report.
Spatial Representation:	Fourteen sampling stations were layed out in a grid pattern covering approximately 60 acres in around Piers November, Mike, and Sierra. Three of the stations are in the area originally listed as impaired on the current 303d list.
Temporal Representation:	Samples were collected in April 2004.
Environmental Conditions:	
QAPP Information:	Sampling and analysis and quality assurance plans followed the general guidelines from previous San Diego Bay TMDL studies conducted by the Southern California Coastal Water Research Project, U.S. Navy, and the Regional Water Quality Control Board.
QAPP Information Reference(s):	

DECISION ID 44025 Region 9

San Diego Bay Shoreline, near sub base

Pollutant:	**Cadmium | Chlordane | DDT (Dichlorodiphenyltrichloroethane) | Mercury | PAHs (Polycyclic Aromatic Hydrocarbons) | Tributyltin TBT (Tributylstanne)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the seven samples exceed the OEHHA or USEPA screening value.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the seven samples exceed the OEHHA or USEPA screening value and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 44025, Multiple Pollutants **Region 9**

San Diego Bay Shoreline, near sub base

LOE ID:	30072
Pollutant:	Cadmium | Chlordane | DDT (Dichlorodiphenyltrichloroethane) | Mercury | PAHs (Polycyclic Aromatic Hydrocarbons) | Tributyltin TBT (Tributylstanne)
LOE Subgroup:	Pollution
Matrix:	Tissue
Fraction:	None
Beneficial Use:	Marine Habitat
Aquatic Life Use:	Marine Habitat
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	Toxicity testing of sediments
Data Used to Assess Water Quality:	None of the bioaccumulation composite tissue samples (n = 7) exceeded the tissue screening values for cadmium, mercury, total DDT, total PAHs, tributyltin or total chlordane. Sample collection was conducted by Space and Naval Warfare Systems Center San Diego in April 2004 at Submarine Base San Diego.
Data Reference:	Sediment Site Assessment Study, Submarine Base, San Diego, Draft Final Report.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	OEHHA screening value for cadmium, mercury and total DDT for protection of human health from consumption of fish and shellfish. USEPA screening value for total PAHs, tributyltin and total chlordane for protection of

human health from consumption of fish and shellfish. 034684

Guideline Reference: Guidance for assessing chemical contaminant data for use in fish advisories. Vol. 1: Fish sampling and analysis. Third Edition. EPA 823-B-00-007. Washington, D.C.: Office of Water, USEPA
Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment

Spatial Representation: Fourteen sampling stations were layed out in a grid pattern covering approximately 60 acres in around Piers November, Mike, and Sierra. Of those stations, seven were selected for bioaccumulation studies. Three of the seven stations were in the area originally listed as impaired on the current 303d list.

Temporal Representation: Samples were collected in April 2004.

Environmental Conditions:

QAPP Information: Sampling and analysis and quality assurance plans followed the general guidelines from previous San Diego Bay TMDL studies conducted by the Southern California Coastal Water Research Project, U.S. Navy, and the Regional Water Quality Control Board.

QAPP Information Reference(s):

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: San Diego Bay, Shelter Island Yacht Basin
Water Body ID: CAB908100001999021009103 4
Water Body Type: Bay & Harbor

DECISION ID 35184 **Region 9**
San Diego Bay, Shelter Island Yacht Basin

Pollutant:	**Copper, Dissolved**
Final Listing Decision:	**List on 303(d) list (being addressed by USEPA approved TMDL)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (being addressed by USEPA approved TMDL)(2012)
Revision Status	Original
Sources:	Nonpoint Source | Point Source
TMDL Name:	Shelter Island Yacht Basin Dissolved Copper
TMDL Project Code:	167
Date TMDL Approved by USEPA:	01/01/2003
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for removal from the section 303(d) list under sections 2.2 and 4.1 of the Listing Policy. Under section 4.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. The one sample did not exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the section 303(d) list and placing it in the Being Addressed category because a TMDL was approved by RWQCB and USEPA and is expected to result in attainment of the standard.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. The single sample did not exceed the 3.1 ppb CTR chronic saltwater criteria, but the number of samples is insufficient to determine with the confidence and power of the Listing Policy if standards are met or exceeded.

4. The San Diego Yacht Basin Dissolved Copper TMDL was approved by RWQCB in 2003 and subsequently approved by USEPA in 2003
5. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 35184, Copper, Dissolved **Region 9**
San Diego Bay, Shelter Island Yacht Basin

LOE ID:	323	034686

Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Estuarine Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected in 03/2004 by the RWQCB. One sample was collected and was not in exceedance of the acute or the chronic standards.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the CTR: The dissolved copper acute saltwater criterion is 4.8 ppb. The dissolved copper chronic criterion is 3.1 ppb.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Diego Bay, Shelter Island Yacht Basin, mid-channel off the entrance to the yacht basin (SDRWQCB, 2004c).
Temporal Representation:	Samples were collected on 03/20/2004 at 9:49am.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: San Diego Bay Shoreline, at Harbor Island (West Basin)
Water Body ID: CAB908100002020203061041 10
Water Body Type: Bay & Harbor

DECISION ID 44898 **Region 9**
San Diego Bay Shoreline, at Harbor Island (West Basin)

Pollutant: Copper
Final Listing Decision: List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: List on 303(d) list (TMDL required list)(2012)
Revision Status Original
Sources: Source Unknown
Expected TMDL Completion Date: 2019
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Eight out of Ten samples exceeded the California Toxics Rule Criteria for Copper.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Eight of 10 samples exceeded the 3.1 ppb CTR chronic saltwater criteria and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 44898, Copper **Region 9**
San Diego Bay Shoreline, at Harbor Island (West Basin)

LOE ID: 324

Pollutant: Copper
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Dissolved

Beneficial Use:	Estuarine Habitat	034688
Number of Samples:	10	
Number of Exceedances:	8	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by the RWQCB in 03/2004. Eight of 10 samples were in exceedance of the chronic standards. The samples collected between piers 24 and 25 were in exceedance of chronic criteria and samples collected in the main channel were not in exceedance. The sample collected at mid-channel, south of Tom Ham's was not in exceedance of the chronic standard (SDRWQCB, 2004c).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the CTR: The dissolved copper chronic criterion is 3.1 ppb, and the acute criterion is 4.8 ppb.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at San Diego Bay at Harbor Island in the West Basin at the innermost location near the fence between the park and hotel, between piers 6 and 7, between piers 12 and 13, between piers 18 and 19, between piers 24 and 25, and in the main channel outside of Harbor Island West. On 03/20/2004 a sample was collected at Harbor Island West mid-channel, south of Tom Ham's.	
Temporal Representation:	Samples were collected on 03/15/2004. One sample was also collected on 03/20/2004.	
Environmental Conditions:		
QAPP Information:	QA Info Missing	
QAPP Information Reference(s):		

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: San Diego Bay Shoreline, at Americas Cup Harbor
Water Body ID: CAB9081000020020307124500
Water Body Type: Bay & Harbor

DECISION ID 37281 **Region 9**
San Diego Bay Shoreline, at Americas Cup Harbor

Pollutant: Copper
Final Listing Decision: **List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: List on 303(d) list (TMDL required list)(2012)
Revision Status Original
Sources: Source Unknown
Expected TMDL Completion Date: 2019
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. A large number of samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Two of 5 samples exceeded the 3.1 ppb CTR chronic saltwater criteria and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Based on comments received on the April 19, 2010 State Water Board staff report for the 2010 Integrated Report, State Water Board staff recommended to change the first year listed from 1996 to 1992.

August 4, 2010 the State Water Board approved the State Water Board staff recommendation.

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 37281, Copper **Region 9**
San Diego Bay Shoreline, at Americas Cup Harbor

LOE ID: 325

Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	2
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Two of 5 samples were in exceedance of the dissolved chronic criteria. Samples collected near the entrance, between piers 3 and 4, and at the west corner of the marina near piling 2 and the Shelter Island boatyard were in exceedance of the dissolved chronic criteria (SDRWQCB, 2004c).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the CTR: the dissolved copper chronic criterion is 3.1 ppb, and the acute criterion is 4.8 ppb.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the San Diego Bay, Americas Cup Harbor, near the entrance, between piers 3 and 4, by the bridge and the pier, near piling number 6 and Kettenberg marina, and at the west corner of the marina near piling 2 and the Shelter Island boatyard.
Temporal Representation:	Samples were collected on 03/15/2004.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: San Diego Bay Shoreline, at Bessemer Street
Water Body ID: CAB908100002004120918454 1
Water Body Type: Bay & Harbor

DECISION ID 48316 **Region 9**
San Diego Bay Shoreline, at Bessemer Street

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.3 of the Listing Policy. Under section 3.3 a single line of evidence is necessary to assess listing status.

Five lines of evidence are available in the administrative record to assess this pollutant. Zero of the one sample exceed the Contact Recreation Geomean Objective for Enterococcus, Zero of the one sample exceeded the Contact Recreation Geomean Objective for Fecal Coliform, Three out of Seven samples exceeded the Shellfish Harvesting Single Sample Maximum Objective for Total Coliform, One of the One sample exceeded the Shellfish Harvesting Geomean Objective for Total Coliform, and Zero of the One sample exceeded the Contact Recreation Objective for Total Coliform.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3.Zero of the one sample exceed the Contact Recreation Geomean Objective for Enterococcus, Zero of the one sample exceeded the Contact Recreation Geomean Objective for Fecal Coliform, Three out of Seven samples exceeded the Shellfish Harvesting Single Sample Maximum Objective for Total Coliform, One of the One sample exceeded the Shellfish Harvesting Geomean Objective for Total Coliform, and Zero of the One sample exceeded the Contact Recreation Objective for Total Coliform and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48316, Indicator Bacteria **Region 9**
San Diego Bay Shoreline, at Bessemer Street

LOE ID: 77695

Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	One of the one samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The Water Quality Control Plan for the San Diego BasinÂ states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at San Diego Bay Shoreline, at Bessemer Street.
Temporal Representation:	The samples were collected from July 2008 to July 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 48316, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Bessemer Street

LOE ID:	75631
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 1 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at the Bessemer Street site.	034693
Temporal Representation:	Samples were collected from July 2008 to July 2009.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the beach watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 48316, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Bessemer Street

LOE ID:	75630
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 1 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Bessemer Street site.
Temporal Representation:	Samples were collected from July 2008 to July 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 48316, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Bessemer Street

LOE ID:	75632
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	7
Number of Exceedances:	3
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed BeachWatch data for San Diego Bay Shoreline, at Bessemer Street to determine beneficial use support and results are as follows: 3 of 7 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The Water Quality Control Plan (Basin Plan 2011)states the following: At all areas where shellfish may be harvested for human consumption, ten percent of the samples collected during any 30-day period shall not exceed 230 MPN/100mL.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego Bay Shoreline, at Bessemer Street was collected at 1 monitoring site [Bessemer St]
Temporal Representation:	Data was collected over the time period 7/3/2008-7/27/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 48316, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Bessemer Street

LOE ID:	75633
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 1 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Bessemer Street site.
Temporal Representation:	Samples were collected from July 2008 to July 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: San Diego Bay Shoreline, Downtown Anchorage
Water Body ID: CAB9082100019990210091816
Water Body Type: Bay & Harbor

DECISION ID 35140 **Region 9**
San Diego Bay Shoreline, Downtown Anchorage

Pollutant: **Benthic Community Effects**
Final Listing Decision: **Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Sources: Source Unknown
Expected TMDL Completion Date: 2019
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

303(d) listing decisions made prior to 2006 were not held in an assessment database. This waterbody will be reassessed in next listing cycle in accordance with Sediment Quality Objectives.

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 35140, Benthic Community Effects **Region 9**
San Diego Bay Shoreline, Downtown Anchorage

LOE ID: 4700

Pollutant: Benthic Community Effects
LOE Subgroup: Population/Community Degradation
Matrix: Sediment
Fraction: Not Recorded

Beneficial Use: Marine Habitat

Number of Samples: 0
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference: Placeholder reference pre-2006 303(d)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion:
Objective/Criterion Reference:

Evaluation Guideline: 034696
Guideline Reference:

Spatial Representation: Unspecified
Temporal Representation: Unspecified
Environmental Conditions: Unspecified
QAPP Information: Unspecified
QAPP Information Reference(s):

DECISION ID 35141 Region 9
San Diego Bay Shoreline, Downtown Anchorage

Pollutant: **Sediment Toxicity**
Final Listing Decision: **List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: List on 303(d) list (TMDL required list)(2012)
Revision Status Original
Sources: Source Unknown
Expected TMDL Completion Date: 2019
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

303(d) listing decisions made prior to 2006 were not held in an assessment database. The Regional Boards will update this decision when new data and information become available and are assessed.

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 35141, Sediment Toxicity Region 9
San Diego Bay Shoreline, Downtown Anchorage

LOE ID: 4701

Pollutant: Sediment Toxicity
LOE Subgroup: Toxicity
Matrix: Sediment
Fraction: Not Recorded

Beneficial Use: Marine Habitat

Number of Samples: 0
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference: Placeholder reference pre-2006 303(d)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion:
Objective/Criterion Reference:

Evaluation Guideline:
Guideline Reference:

Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 35141, Sediment Toxicity **Region 9**

San Diego Bay Shoreline, Downtown Anchorage

LOE ID:	4700
Pollutant:	Benthic Community Effects
LOE Subgroup:	Population/Community Degradation
Matrix:	Sediment
Fraction:	Not Recorded
Beneficial Use:	Marine Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	
Objective/Criterion Reference:	
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: San Diego Bay Shoreline, Vicinity of B St and Broadway Piers
Water Body ID: CAB908210001999021009264 0
Water Body Type: Bay & Harbor

DECISION ID 44435 **Region 9**
San Diego Bay Shoreline, Vicinity of B St and Broadway Piers

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.3 of the Listing Policy. Under section 3.3 a single line of evidence is necessary to assess listing status.

Seven lines of evidence are available in the administrative record to assess this pollutant. Data collected from 1999 to 2007 shows that 7 of 40 single samples exceed the water quality objective for total coliform for the protection of SHELL beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Data collected from 1999 to 2007 shows that 7 of 40 single samples exceed the water quality objective for total coliform for the protection of SHELL beneficial use and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 44435, Indicator Bacteria **Region 9**
San Diego Bay Shoreline, Vicinity of B St and Broadway Piers

LOE ID:	30933
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation	034699
Number of Samples:	10	
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Monitoring data was collected by from April 2006 through January 2007. None of the 10 geomeans exceeded the geomean water quality objective.	
Data Reference:	Submittal of Data for B St. Shorelines, Lindbergh Hydrologic Area (908.21)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml;	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Forty samples taken at four different stations along the B St. Pier in San Diego Bay.	
Temporal Representation:	Samples were collected from April 2006 through January 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the Port of San Diego's Quality Assurance Manual.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44435, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, Vicinity of B St and Broadway Piers

LOE ID:	30919
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	40
Number of Exceedances:	7
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Monitoring data was collected by from April 2006 through January 2007. Seven of 40 samples exceeded the single sample water quality objective.
Data Reference:	Submittal of Data for B St. Shorelines, Lindbergh Hydrologic Area (908.21)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005). Comparisons were also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Forty samples taken at four different stations along the B St. Pier in San Diego Bay.
Temporal Representation:	Samples were collected from January 1999 through December 2007.

Environmental Conditions: 034700
QAPP Information: Quality control for the bacteria analysis portion was conducted in accordance with the Port of San Diego's Quality Assurance Manual.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 44435, Indicator Bacteria **Region 9**
San Diego Bay Shoreline, Vicinity of B St and Broadway Piers

LOE ID: 30927

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 40
Number of Exceedances: 0

Data and Information Type: PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality: Shoreline monitoring data was collected from April 2006 through January 2007. None of the 40 single samples exceeded the single sample water quality objective.
Data Reference: Submittal of Data for B St. Shorelines, Lindbergh Hydrologic Area (908.21)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference: Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Forty samples taken at four different stations along the B St. Pier in San Diego Bay
Temporal Representation: Samples were collected from January 1999 through December 2007.
Environmental Conditions:
QAPP Information: Quality control for the bacteria analysis portion was conducted in accordance Port of San Diego's Quality Assurance Manual.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 44435, Indicator Bacteria **Region 9**
San Diego Bay Shoreline, Vicinity of B St and Broadway Piers

LOE ID: 30923

Pollutant: Enterococcus
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 40
Number of Exceedances: 1

Data and Information Type: PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality: Monitoring data was collected from April 2006 through January 2007. One of 40 samples exceeded the single sample water quality objective.

Data Reference:	Submittal of Data for B St. Shorelines, Lindbergh Hydrologic Area (908.21034701
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Forty samples taken at four different stations along the B St. Pier in San Diego Bay
Temporal Representation:	Samples were collected from April 2006 through January 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the Port of San Diego's Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44435, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, Vicinity of B St and Broadway Piers

LOE ID:	4717
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Water Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	Unspecified
Guideline Reference:	Placeholder reference pre-2006 303(d)
Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44435, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, Vicinity of B St and Broadway Piers

LOE ID:	30929

Pollutant:	Total Coliform	034702
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	10	
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Monitoring data was collected by from April 2006 through January 2007. None of the 10 geomeans exceeded the geomean water quality objective.	
Data Reference:	Submittal of Data for B St. Shorelines, Lindbergh Hydrologic Area (908.21)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml;	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Forty samples taken at four different stations along the B St. Pier in San Diego Bay.	
Temporal Representation:	Samples were collected from April 2006 through January 2007	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the Port of San Diego's Quality Assurance Manual.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44435, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, Vicinity of B St and Broadway Piers

LOE ID:	30925
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	10
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the April 2006 through January 2007. None of the 10 geomeans exceeded the geomean water quality objective.
Data Reference:	Submittal of Data for B St. Shorelines, Lindbergh Hydrologic Area (908.21)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Forty samples taken at four different stations along the B St. Pier in San Diego Bay
Temporal Representation:	Samples were collected from April 2006 through January 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the Port of San Diego's Quality Assurance Manual.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44435, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, Vicinity of B St and Broadway Piers

LOE ID:	30931
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	40
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Monitoring data was collected from April 2006 through January 2007. One of 40 samples exceeded the single sample water quality objective.
Data Reference:	Submittal of Data for B St. Shorelines, Lindbergh Hydrologic Area (908.21)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	;
	Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Forty samples taken at four different stations along the B St. Pier in San Diego Bay
Temporal Representation:	Samples were collected from April 2006 through January 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the Port of San Diego's Quality Assurance Manual.
QAPP Information Reference(s):	

DECISION ID 33416 **Region 9**

San Diego Bay Shoreline, Vicinity of B St and Broadway Piers

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

After review of the available data and information, SWRCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because it cannot be determined if applicable water quality standards are exceeded.

One line of evidence is available in the administrative record to assess this pollutant. One of sample exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. The single sample exceeded the 3.1 ppb CTR chronic saltwater criterion, but the number of samples is insufficient to determine with the confidence of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33416, Copper **Region 9**

San Diego Bay Shoreline, Vicinity of B St and Broadway Piers

LOE ID:	326
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Estuarine Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the RWQCB in 03/2004. One sample was collected and was not in exceedance of the acute or chronic standard. (SDRWQCB, 2004c).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the CTR: The dissolved copper acute saltwater criterion is 4.8 ppb. The dissolved copper chronic criterion is 3.1 ppb. This criteria is more stringent or as stringent as the other criteria found.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Sample was collected at the San Diego Bay mid-channel between the Broadway pier and Coronado.
Temporal Representation:	Sample was collected on 03/20/2004 at 1:36pm.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

DECISION ID **34654** 034705 **Region 9**

San Diego Bay Shoreline, Vicinity of B St and Broadway Piers

Pollutant:	**Benthic Community Effects**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. 303(d) listing decisions made prior to 2006 were not held in an assessment database. The Regional Boards will update this decision when new data and information become available and are assessed.
Regional Board Decision Recommendation:	

Line of Evidence (LOE) for Decision ID 34654, Benthic Community Effects **Region 9**

San Diego Bay Shoreline, Vicinity of B St and Broadway Piers

LOE ID:	4716
Pollutant:	Benthic Community Effects
LOE Subgroup:	Population/Community Degradation
Matrix:	Sediment
Fraction:	Not Recorded
Beneficial Use:	Marine Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	
Objective/Criterion Reference:	
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

DECISION ID **34709** **Region 9**

San Diego Bay Shoreline, Vicinity of B St and Broadway Piers

Pollutant:	**Sediment Toxicity**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. 303(d) listing decisions made prior to 2006 were not held in an assessment database. The Regional Boards will update this decision when new data and information become available and are assessed.
Regional Board Decision Recommendation:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

Line of Evidence (LOE) for Decision ID 34709, Sediment Toxicity **Region 9**

San Diego Bay Shoreline, Vicinity of B St and Broadway Piers

LOE ID:	4718
Pollutant:	Sediment Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	Not Recorded
Beneficial Use:	Marine Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	
Objective/Criterion Reference:	
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: San Diego Bay Shoreline, near Switzer Creek
Water Body ID: CAB908210001999021009382 2
Water Body Type: Bay & Harbor

DECISION ID 43693 **Region 9**
San Diego Bay Shoreline, near Switzer Creek

Pollutant: **Lindane/gamma Hexachlorocyclohexane (gamma-HCH)**
Final Listing Decision: **Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Delist from 303(d) list (TMDL required list)(2012)
Revision Status Original
Reason for Delisting: Flaws in original listing
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for removal from the section 303(d) list under section 4.11 of the Listing Policy.

Three lines of evidence are available in the administrative record to assess this pollutant. One of samples exceeded the water quality objective for lindane.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for removing this water segment-pollutant combination from the section 303(d) list.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of the 18 samples exceeded the lindane water quality objective.

The one sample that exceeded the Lindane objective was recorded at 8.2 ug/kg. This value should be treated as an outlier since all other Lindane samples collected in San Diego Bay for the same program had values less than 1.0 ug/kg or were recorded as non-detects. Subsequent sediment sampling that occurred in 2003 and 2004 at the mouth of Switzer Creek all had lindane sediment chemistry values recorded as non-detects.

Toxicity identification evaluations conducted in 2004 at the mouth of Switzer Creek indicate that Chlordane is the most likely pesticide that contributes to the sediment toxicity in that area. Chlordane values exceeded the sediment quality guidelines and 95% upper prediction limits seven out of the eight samples collected in 2004.

All other pesticides, including lindane, were recorded as non detects in all samples collected in July 2003, March 2004, August 2004 and October 2004.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43693, Lindane/gamma Hexachlorocyclohexane (gamma-

HCH) 034708 **Region 9**

San Diego Bay Shoreline, near Switzer Creek

LOE ID:	29916
Pollutant:	Lindane/gamma Hexachlorocyclohexane (gamma-HCH)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Marine Habitat
Aquatic Life Use:	Estuarine Habitat
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	Chemical monitoring of sediments
Data Used to Assess Water Quality:	Nine sediment samples were analyzed and all were recorded as non-detects at a detection limit of 1.0 ng/g dry weight. The three samples were collected in February, August and October 2004 as part of a San Diego Bay study on three TMDL locations.
Data Reference:	TMDL Sediment Quality Assessment Study at the B Street/Broadway Piers, Downtown Anchorage, and Switzer Creek, San Diego PHASE II
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA
Evaluation Guideline:	For lindane the sediment objective is 0.37 ug/g.
Guideline Reference:	An evaluation of methods for calculating mean sediment quality guideline quotients as indicators of contamination and acute toxicity to amphipods by chemical mixtures. Environmental Toxicology and Chemistry. 20(10): 2276-2286
Spatial Representation:	Nine sediment samples were collected near the mouth of Switzer Creek in San Diego Bay.
Temporal Representation:	Samples were collected in February, August and October 2004.
Environmental Conditions:	Samples were collected from the top 5 centimeters of sediment surface layer.
QAPP Information:	Samples were collected in following the guidelines used for Bight 1998 Regional Monitoring surveys.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43693, Lindane/gamma Hexachlorocyclohexane (gamma-HCH) **Region 9**

San Diego Bay Shoreline, near Switzer Creek

LOE ID:	29816
Pollutant:	Lindane/gamma Hexachlorocyclohexane (gamma-HCH)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Marine Habitat
Aquatic Life Use:	Estuarine Habitat
Number of Samples:	2
Number of Exceedances:	0

Data and Information Type:	Chemical monitoring of sediments 034709
Data Used to Assess Water Quality:	Two sediment samples were analyzed and both were recorded as non-detects at a detection limit of 0.2 ng/g dry weight. The samples were collected in 1992 and 1993 for the Bay Protection and Toxic Cleanup Program.
Data Reference:	Status of The Bay Protection and Toxic Cleanup Program Appendices
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA
Evaluation Guideline:	For lindane the sediment objective is 0.37 ug/g.
Guideline Reference:	An evaluation of methods for calculating mean sediment quality guideline quotients as indicators of contamination and acute toxicity to amphipods by chemical mixtures. Environmental Toxicology and Chemistry. 20(10): 2276-2286
Spatial Representation:	Two sediment samples were collected near the mouth of Switzer Creek in San Diego Bay.
Temporal Representation:	Samples were collected in 1992 and 1993
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with State Water Board requirements.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43693, Lindane/gamma Hexachlorocyclohexane (gamma-HCH) **Region 9**

San Diego Bay Shoreline, near Switzer Creek

LOE ID:	29909
Pollutant:	Lindane/gamma Hexachlorocyclohexane (gamma-HCH)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Marine Habitat
Aquatic Life Use:	Estuarine Habitat
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	Chemical monitoring of sediments
Data Used to Assess Water Quality:	Six sediment samples were analyzed and all were recorded as non-detects at a detection limit of 1.0 ng/g dry weight. The samples were collected in February and July 2003 as part of a San Diego Bay study on three TMDL locations.
Data Reference:	Sediment Quality Assessment Study at the B Street/Broadway Piers, Downtown Anchorage, and Switzer Creek, San Diego Bay
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA
Evaluation Guideline:	For lindane the sediment objective is 0.37 ug/g.
Guideline Reference:	An evaluation of methods for calculating mean sediment quality guideline quotients as indicators of contamination and acute toxicity to amphipods by chemical mixtures.

Environmental Toxicology and Chemistry. 20(10): 2276-2286 034710

Spatial Representation:	Six sediment samples were collected near the mouth of Switzer Creek in San Diego Bay.
Temporal Representation:	Samples were collected in February and July 2003.
Environmental Conditions:	Samples were collected from the top 5 centimeters of sediment surface layer.
QAPP Information:	Samples were collected in following the guidelines used for Bight 1998 Regional Monitoring surveys.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43693, Lindane/gamma Hexachlorocyclohexane (gamma-HCH) **Region 9**

San Diego Bay Shoreline, near Switzer Creek

LOE ID:	4710
Pollutant:	Lindane/gamma Hexachlorocyclohexane (gamma-HCH)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	Unspecified
Guideline Reference:	Placeholder reference pre-2006 303(d)
Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43693, Lindane/gamma Hexachlorocyclohexane (gamma-HCH) **Region 9**

San Diego Bay Shoreline, near Switzer Creek

LOE ID:	30105
Pollutant:	Lindane/gamma Hexachlorocyclohexane (gamma-HCH)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Marine Habitat
Aquatic Life Use:	Estuarine Habitat
Number of Samples:	2
Number of Exceedances:	0

Data and Information Type:	Chemical monitoring of sediments	034711
Data Used to Assess Water Quality:	Two sediment samples were analyzed and both were recorded as non-detects at a detection limit of 0.2 ng/g dry weight. The samples were collected in 1992 and 1994 for the Bay Protection and Toxic Cleanup Program.	
Data Reference:	Chemistry Toxicity and Benthic Community Conditions In Sediments of The San Diego Bay Region Final Addendum Report	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA	
Evaluation Guideline:	For lindane the sediment objective is 0.37 ug/g.	
Guideline Reference:	An evaluation of methods for calculating mean sediment quality guideline quotients as indicators of contamination and acute toxicity to amphipods by chemical mixtures. Environmental Toxicology and Chemistry. 20(10): 2276-2286	
Spatial Representation:	Two sediment samples were collected near the mouth of Switzer Creek in San Diego Bay.	
Temporal Representation:	Samples were collected in 1992 and 1994	
Environmental Conditions:		
QAPP Information:	Samples were collected in compliance with State Water Board requirements.	
QAPP Information Reference(s):		

DECISION ID 44920 **Region 9**

San Diego Bay Shoreline, near Switzer Creek

Pollutant:	**Chlordane**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. 303(d) listing decisions made prior to 2006 were not held in an assessment database. The Regional Boards will update this decision when new data and information become available and are assessed.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 44920, Chlordane **Region 9**

San Diego Bay Shoreline, near Switzer Creek

LOE ID:	4709
Pollutant:	Chlordane
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue

Fraction:	Not Recorded	034712
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms	
Number of Samples:	0	
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.	
Data Reference:	Placeholder reference pre-2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Unspecified	
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)	
Evaluation Guideline:	Unspecified	
Guideline Reference:	Placeholder reference pre-2006 303(d)	
Spatial Representation:	Unspecified	
Temporal Representation:	Unspecified	
Environmental Conditions:	Unspecified	
QAPP Information:	Unspecified	
QAPP Information Reference(s):		

DECISION ID 44697 Region 9

San Diego Bay Shoreline, near Switzer Creek

Pollutant:	**PAHs (Polycyclic Aromatic Hydrocarbons)**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. 303(d) listing decisions made prior to 2006 were not held in an assessment database. The Regional Boards will update this decision when new data and information become available and are assessed.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 44697, PAHs (Polycyclic Aromatic Hydrocarbons) Region 9

San Diego Bay Shoreline, near Switzer Creek

LOE ID:	4711
Pollutant:	PAHs (Polycyclic Aromatic Hydrocarbons)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Not Recorded

Beneficial Use:	Marine Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	Unspecified
Guideline Reference:	Placeholder reference pre-2006 303(d)
Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: San Diego Bay Shoreline, at Marriott Marina
Water Body ID: CAB908210002020307102410
Water Body Type: Bay & Harbor

DECISION ID 33165 **Region 9**
San Diego Bay Shoreline, at Marriott Marina

Pollutant: Copper
Final Listing Decision: List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: List on 303(d) list (TMDL required list)(2012)
Revision Status Original
Sources: Source Unknown
Expected TMDL Completion Date: 2019
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Three out of Four samples exceeded the California Toxics Rule Criteria for Copper.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Three of 4 samples exceeded the 3.1 ppb dissolved CTR chronic criteria and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 33165, Copper **Region 9**
San Diego Bay Shoreline, at Marriott Marina

LOE ID: 327

Pollutant: Copper
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Dissolved

Beneficial Use:	Estuarine Habitat	034715
Number of Samples:	4	
Number of Exceedances:	3	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by the RWQCB in 03/2004. Three of 4 samples were in exceedance of the chronic criteria. All samples in exceedance were collected in the Marina. The samples collected in the main channel were not in exceedance of the chronic criteria (SDRWQCB, 2004c).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the CTR: the dissolved copper chronic criterion is 3.1 ppb and the acute criterion is 4.8 ppb.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected in the San Diego Bay at the Marriott Marina and in the Marriott Marina Main Channel. Samples collected at the marina were collected on the west and east sides of the marina and in the middle.	
Temporal Representation:	Samples were collected on 03/115/2004.	
Environmental Conditions:		
QAPP Information:	QA Info Missing	
QAPP Information Reference(s):		

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: San Diego Bay Shoreline, at Harbor Island (East Basin)
Water Body ID: CAB908210002002123011292 6
Water Body Type: Bay & Harbor

DECISION ID 33164 **Region 9**
San Diego Bay Shoreline, at Harbor Island (East Basin)

Pollutant: Copper
Final Listing Decision: List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: List on 303(d) list (TMDL required list)(2012)
Revision Status Original
Sources: Source Unknown
Expected TMDL Completion Date: 2019
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Three out of Three samples exceeded the California Toxics Rule Criteria for Copper.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Three of 3 samples exceeded the 3.1 ppb dissolved CTR chronic saltwater criteria and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 33164, Copper **Region 9**
San Diego Bay Shoreline, at Harbor Island (East Basin)

LOE ID: 328

Pollutant: Copper
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Dissolved

Beneficial Use:	Estuarine Habitat	034717
Number of Samples:	3	
Number of Exceedances:	3	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by the RWQCB in 03/2004. Three of 3 samples (1 sample collected at each location) were in exceedance of the chronic standards (SDRWQCB, 2004c).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the CTR: The dissolved copper chronic criterion is 3.1 ppb and the acute criterion is 4.8 ppb.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at the San Diego Bay, Harbor Island East Basin, off of last pier in innermost marina, off pier no. 6 from entrance, and off pier no. 2 from entrance.	
Temporal Representation:	Samples were collected on 03/15/2004.	
Environmental Conditions:		
QAPP Information:	QA Info Missing	
QAPP Information Reference(s):		

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: San Diego Bay Shoreline, at Spanish Landing
Water Body ID: CAB908210002004120918125 4
Water Body Type: Bay & Harbor

DECISION ID 41588 **Region 9**
San Diego Bay Shoreline, at Spanish Landing

Pollutant: **Indicator Bacteria**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Fourteen lines of evidence are available in the administrative record to assess this pollutant. With the latest data, 3 of 96 geomean samples collected during AB411 period exceed the water quality objective (WQO) for enterococcus for REC-1, and 40 of 301 samples exceed the WQO for total coliform of a SSM of 230/100 ml.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, 3 of 96 geomean samples collected during AB411 period exceed the water quality objective (WQO) for enterococcus for REC-1, and 40 of 301 samples exceed the WQO for total coliform of a SSM of 230/100 ml and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 41588, Indicator Bacteria **Region 9**
San Diego Bay Shoreline, at Spanish Landing

LOE ID: 30777

Pollutant: Fecal Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples:	182
Number of Exceedances:	10
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 188 single samples were collected of which 182 are dry weather (AB411) samples with 10 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Spanish Landing, San Diego, California. Station identification number is EH-160.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 41588, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Spanish Landing

LOE ID:	27276
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	54
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 231 single samples were collected with 54 monthly geomeans calculated. None of the 55 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml

	(SWRCB, 2005). 034720
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Spanish Landing, San Diego, California. Station identification number is EH-160.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 41588, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Spanish Landing

LOE ID:	31316
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	37
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 161 dry month (April through October) single samples were collected with 37 dry month geomeans calculated. Three of the 37 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Spanish Landing, San Diego, California. Station identification number is EH-160.
Temporal Representation:	Samples were collected from April 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 41588, Indicator Bacteria 034721 Region 9

San Diego Bay Shoreline, at Spanish Landing

LOE ID:	30883
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	223
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 231 single samples were collected of which 223 are dry weather (AB411) samples with one of those samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Spanish Landing, San Diego, California. Station identification number is EH-160.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 41588, Indicator Bacteria Region 9

San Diego Bay Shoreline, at Spanish Landing

LOE ID:	30676
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	224
Number of Exceedances:	18

Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 231 single samples were collected of which 224 are dry weather (AB411) samples with 18 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Spanish Landing, San Diego, California. Station identification number is EH-160.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 41588, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Spanish Landing

LOE ID:	31318
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	37
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 161 dry month (April through October) single samples were collected with 37 dry month geomeans calculated. None of the 37 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental

Protection Agency 034723

Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Spanish Landing, San Diego, California. Station identification number is EH-160.
Temporal Representation:	Samples were collected from April 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 41588, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Spanish Landing

LOE ID:	29811
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	91
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were 91 beach advisory days for this section of shoreline. Bacteriological samples are collected on a weekly basis at ocean and bay locations in San Diego County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that an advisory for waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 - December 2007. Data used was the number of days the beach was advisories were issued when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Spatial Representation:	Beach advisories were from Spanish Landing located in San Diego Bay.

Temporal Representation:	The beach advisories covers the time frame of January January 2001 to December 2007.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of San Diego's Quality Assessment/Quality Control document
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 41588, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Spanish Landing

LOE ID:	27278
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	54
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 231 single samples were collected with 54 monthly geomeans calculated. Three of the 54 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Spanish Landing, San Diego, California. Station identification number is EH-160.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 41588, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Spanish Landing

LOE ID:	27274
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation
Number of Samples:	231
Number of Exceedances:	19
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 231 single samples were collected with 19 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Spanish Landing, San Diego, California. Station identification number is EH-160.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 41588, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Spanish Landing

LOE ID:	75646
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	59
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 59 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline: 034726
Guideline Reference:

Spatial Representation: Samples were collected at the Spanish Landing site.
Temporal Representation: Samples were collected from April 2008 to August 2010.
Environmental Conditions:
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 41588, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Spanish Landing

LOE ID: 75645

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Shellfish Harvesting

Number of Samples: 70
Number of Exceedances: 1

Data and Information Type: PATHOGEN MONITORING
Data Used to Assess Water Quality: Water Board staff assessed bw data for San Diego Bay Shoreline, at Spanish Landing to determine beneficial use support and results are as follows: 1 of 70 samples exceed the criterion for Coliform, Total.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The Water Quality Control Plan (Basin Plan 2011)states the following: At all areas where shellfish may be harvested for human consumption, ten percent of the samples collected during any 30-day period shall not exceed 230 MPN/100mL.
Objective/Criterion Reference: Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Data for this line of evidence for San Diego Bay Shoreline, at Spanish Landing was collected at 1 monitoring site [EH-160]
Temporal Representation: Data was collected over the time period 4/2/2008-8/23/2010.
Environmental Conditions: Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 41588, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Spanish Landing

LOE ID: 75644

Pollutant: Fecal Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 59
Number of Exceedances: 0

Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 59 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Spanish Landing site.
Temporal Representation:	Samples were collected from January 2008 to August 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 41588, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Spanish Landing

LOE ID:	75642
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	59
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 59 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Spanish Landing site.
Temporal Representation:	Samples were collected from April 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 41588, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Spanish Landing

LOE ID:	27277	034728
Pollutant:	Fecal Coliform	
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	46	
Number of Exceedances:	1	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 188 single samples were collected and 46 geomeans calculated. One of the 47 geomeans exceeded the geomean water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Spanish Landing, San Diego, California. Station identification number is EH-160.	
Temporal Representation:	Samples were collected from January 1999 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 41588, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Spanish Landing

LOE ID:	27268
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	231
Number of Exceedances:	39
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April1999 through December 2007. A total of 231 single samples were collected with 39 samples exceeded the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005). Comparisons were also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Spanish Landing, San Diego, California. Station identification number is EH-160.
Temporal Representation:	Samples were collected from April1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 41588, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Spanish Landing

LOE ID:	27275
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	7
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 231 single samples were collected with 7 samples correlated with a storm event. One of the 7 samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005). Comparisons are also made for days with matching bacteria and storm event data. A storm event is defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	

Guideline Reference:	034730
Spatial Representation:	Samples were collected at Spanish Landing, San Diego, California. Station identification number is EH-160.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 41588, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Spanish Landing

LOE ID:	31317
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	37
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 161 dry month (April through October) single samples were collected with 37 dry month geomeans calculated. None of the 37 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Spanish Landing, San Diego, California. Station identification number is EH-160.
Temporal Representation:	Samples were collected from April 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 41588, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Spanish Landing

LOE ID:	77698

Pollutant:	Total Coliform	034731
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Shellfish Harvesting	
Number of Samples:	59	
Number of Exceedances:	1	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	One of the 59 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The Water Quality Control Plan for the San Diego BasinÂ states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected at San Diego Bay Shoreline, at Spanish Landing.	
Temporal Representation:	The samples were collected from April 2008 to August 2010.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the beach watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 41588, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Spanish Landing

LOE ID:	27273
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	6
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 188 single samples were collected with 6 samples correlated with a storm event. One of the 6 samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007, AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml;

	Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005). Comparisons are also made only for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Spanish Landing, San Diego, California. Station identification number is EH-160.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 41588, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Spanish Landing

LOE ID:	27272
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	188
Number of Exceedances:	11
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 188 single samples were collected with 11 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Spanish Landing, San Diego, California. Station identification number is EH-160.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.

QAPP Information Reference(s): County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 41588, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Spanish Landing

LOE ID:	27271
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 231 single samples were collected with 8 samples correlated with a storm event. None of the 8 samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005). Comparisons were also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Spanish Landing, San Diego, California. Station identification number is EH-160.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 41588, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Spanish Landing

LOE ID:	27270
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	034734
Beneficial Use:	Water Contact Recreation	
Number of Samples:	231	
Number of Exceedances:	1	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 231 single samples were collected with one sample exceeding the single sample water quality objective.	
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Spanish Landing, San Diego, California. Station identification number is EH-160.	
Temporal Representation:	Samples were collected from January 1999 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 41588, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Spanish Landing

LOE ID:	27269
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	8
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 231 single samples were collected with 8 samples correlated with a storm event. Three of the 8 samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005). Comparisons are also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Spanish Landing, San Diego, California. Station identification number is EH-160.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: San Diego Bay Shoreline, near Chollas Creek
Water Body ID: CAB908220001999021010283 1
Water Body Type: Bay & Harbor

DECISION ID 35142 **Region 9**
San Diego Bay Shoreline, near Chollas Creek

Pollutant: **Benthic Community Effects**
Final Listing Decision: **Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Sources: Source Unknown | Unknown Nonpoint Source | Unknown Point Source
Expected TMDL Completion Date: 2010
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

303(d) listing decisions made prior to 2006 were not held in an assessment database. This waterbody will be reassessed in next listing cycle in accordance with Sediment Quality Objectives.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 35142, Benthic Community Effects **Region 9**
San Diego Bay Shoreline, near Chollas Creek

LOE ID: 4703

Pollutant: Benthic Community Effects
LOE Subgroup: Population/Community Degradation
Matrix: Sediment
Fraction: Not Recorded

Beneficial Use: Marine Habitat

Number of Samples: 0
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference: Placeholder reference pre-2006 303(d)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion:
Objective/Criterion Reference:

Evaluation Guideline:
Guideline Reference:

Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

DECISION ID 33573 Region 9

San Diego Bay Shoreline, near Chollas Creek

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the section 303(d) list under section 3.3 of the Listing Policy. Under section 3.3 a single line of evidence is necessary to assess listing status.

Three lines of evidence are available (one for enterococcus, one for fecal coliform and the other for total coliform) in the administrative record to assess this pollutant. Only one sample in each baterial indicator exceeded water quality standards.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used may satisfy the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Three of 21 samples taken in 1999 exceeded the AB 411 bacterial indicator standards and this does not exceed the allowable frequency listed in Table 3.3 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

Line of Evidence (LOE) for Decision ID 33573, Indicator Bacteria Region 9

San Diego Bay Shoreline, near Chollas Creek

LOE ID:	329
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	6
Number of Exceedances:	1
Data and Information Type:	PATHOGEN MONITORING

Data Used to Assess Water Quality:	Data were collected by the City of San Diego in 1999. There was not enough data to calculate geomeans for any of the bacterial indicators. AB411 Standards: For enterococcus, 1 of 7 single sample concentrations was in exceedance. For fecal coliform, 1 of 8 single sample concentration was in exceedance. For total coliform, where the FC/TC ratio was below 0.1, there were no exceedances. Where the ratio was above 0.1, 1 of 6 samples was in exceedance. Basin Plan standards: For fecal coliform, there was not enough data to calculate geomeans and only single sample concentrations were looked at. Basin Plan stds. for REC2 for fecal coliform deal with 30-day averages, which could not be calculated from this dataset. However, in looking at the dataset, the assessor can comment that 7 of 8 single sample concentrations were below 400 colonies/100 mL, with one concentration being 3000 colonies/100 mL. (City of San Diego, 2004).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters, enclosed bays and estuaries, coastal lagoons, and ground waters with a REC2 beneficial use, the WQO for Fecal Coliform is and average of 2,000 colonies/100mL for any 30-day period. No more than 10% of total samples during any 30-day period should exceed 4,000 colonies per 100 mL. AB411 standards: for fecal coliform: 30-day avg is 200 colonies/100 mL, single sample standard is 400 colonies/100 mL. For total coliform: 30-day avg. is 1,000 colonies/100mL, single sample standard is 10,000 colonies/100 mL. If fecal/total ratio is greater than 0.1, the single sample maximum for total coliform is 1,000 colonies/100 mL.. The AB411 standard for enterococcus for the 30-day avg is 35 colonies/100mL, single sample maximum is 104 colonies/100 mL.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Diego Bay, near Chollas Creek at a "middle" location.
Temporal Representation:	Samples were collected from 02/22/1999 to 08/17/1999.
Environmental Conditions:	Southern California has three distinct weather/hydrological conditions: summer dry weather, winter dry weather, and storm events. The data set used in this analysis includes summer and winter season data. Whether or not storm event samples are included in the data set are not known. For future water quality assessments, the RWQCB may classify bacteria samples as summer dry, winter dry, or storm event samples to ensure adequate representation of all three weather/hydrological conditions.
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

DECISION ID 35199 Region 9

San Diego Bay Shoreline, near Chollas Creek

Pollutant:	**Sediment Toxicity**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown | Unknown Nonpoint Source | Unknown Point Source
Expected TMDL Completion Date:	2010
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

303(d) listing decisions made prior to 2006 were not held in an assessment database. The Regional Boards will update this decision when new data and information become available and are assessed.

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 35199, Sediment Toxicity **Region 9**

San Diego Bay Shoreline, near Chollas Creek

LOE ID:	4704
Pollutant:	Sediment Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	Not Recorded
Beneficial Use:	Marine Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	
Objective/Criterion Reference:	
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 35199, Sediment Toxicity **Region 9**

San Diego Bay Shoreline, near Chollas Creek

LOE ID:	4703
Pollutant:	Benthic Community Effects
LOE Subgroup:	Population/Community Degradation
Matrix:	Sediment
Fraction:	Not Recorded
Beneficial Use:	Marine Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference:	Placeholder reference pre-2006 303(d)

SWAMP Data:	Non-SWAMP	034740

Water Quality Objective/Criterion:
Objective/Criterion Reference:

Evaluation Guideline:
Guideline Reference:

Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: San Diego Bay Shoreline, near Coronado Bridge
Water Body ID: CAB908220002002101508222 3
Water Body Type: Bay & Harbor

DECISION ID 35211 Region 9
San Diego Bay Shoreline, near Coronado Bridge

Pollutant:	**Benthic Community Effects**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. 303(d) listing decisions made prior to 2006 were not held in an assessment database. This waterbody will be reassessed in next listing cycle in accordance with Sediment Quality Objectives.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 35211, Benthic Community Effects Region 9
San Diego Bay Shoreline, near Coronado Bridge

LOE ID:	4705
Pollutant:	Benthic Community Effects
LOE Subgroup:	Population/Community Degradation
Matrix:	Sediment
Fraction:	Not Recorded
Beneficial Use:	Marine Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	
Objective/Criterion Reference:	

Evaluation Guideline:
Guideline Reference:

Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

DECISION ID 35212 Region 9

San Diego Bay Shoreline, near Coronado Bridge

Pollutant:	**Sediment Toxicity**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. 303(d) listing decisions made prior to 2006 were not held in an assessment database. The Regional Boards will update this decision when new data and information become available and are assessed.
Regional Board Decision Recommendation:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

Line of Evidence (LOE) for Decision ID 35212, Sediment Toxicity Region 9

San Diego Bay Shoreline, near Coronado Bridge

LOE ID:	4706
Pollutant:	Sediment Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	Not Recorded
Beneficial Use:	Marine Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	
Objective/Criterion Reference:	
Evaluation Guideline:	

Guideline Reference: 034743

Spatial Representation: Unspecified
Temporal Representation: Unspecified
Environmental Conditions: Unspecified
QAPP Information: Unspecified
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 35212, Sediment Toxicity **Region 9**

San Diego Bay Shoreline, near Coronado Bridge

LOE ID: 4705

Pollutant: Benthic Community Effects
LOE Subgroup: Population/Community Degradation
Matrix: Sediment
Fraction: Not Recorded

Beneficial Use: Marine Habitat

Number of Samples: 0
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference: Placeholder reference pre-2006 303(d)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion:
Objective/Criterion Reference:

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Unspecified
Temporal Representation: Unspecified
Environmental Conditions: Unspecified
QAPP Information: Unspecified
QAPP Information Reference(s):

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: San Diego Bay Shoreline, between Sampson and 28th Streets
Water Body ID: CAB908220002002101508291 6
Water Body Type: Bay & Harbor

DECISION ID 34109 **Region 9**
San Diego Bay Shoreline, between Sampson and 28th Streets

Pollutant:	**Copper**
Final Listing Decision:	**List on 303(d) list (being addressed by action other than TMDL)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (being addressed by action other than TMDL)(2012)
Revision Status	Original
Sources:	Nonpoint Source | Point Source
Expected Attainment Date:	2015
Implementation Action Other than TMDL:	A draft cleanup and abatement order has been issued to two shipyards that occupy the shoreline between Sampson Street and 28th Street.
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. 303(d) listing decisions made prior to 2006 were not held in an assessment database. The Regional Boards will update this decision when new data and information become available and are assessed.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34109, Copper **Region 9**
San Diego Bay Shoreline, between Sampson and 28th Streets

LOE ID:	4695
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Marine Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified

Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)	034745

Evaluation Guideline:	Unspecified
Guideline Reference:	Placeholder reference pre-2006 303(d)

Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

DECISION ID 34200 Region 9

San Diego Bay Shoreline, between Sampson and 28th Streets

Pollutant:	**Mercury**
Final Listing Decision:	**List on 303(d) list (being addressed by action other than TMDL)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (being addressed by action other than TMDL)(2012)
Revision Status	Original
Sources:	Major Industrial Point Source
Expected Attainment Date:	2013
Implementation Action Other than TMDL:	A draft cleanup and abatement order has been issued to two shipyards that occupy the shoreline between Sampson Street and 28th Street.
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. 303(d) listing decisions made prior to 2006 were not held in an assessment database. The Regional Boards will update this decision when new data and information become available and are assessed.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34200, Mercury Region 9

San Diego Bay Shoreline, between Sampson and 28th Streets

LOE ID:	4696
Pollutant:	Mercury
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Not Recorded
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified

Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)	034746

Evaluation Guideline: Unspecified
Guideline Reference: Placeholder reference pre-2006 303(d)

Spatial Representation: Unspecified
Temporal Representation: Unspecified
Environmental Conditions: Unspecified
QAPP Information: Unspecified
QAPP Information Reference(s):

DECISION ID 34260 Region 9

San Diego Bay Shoreline, between Sampson and 28th Streets

Pollutant:	**PAHs (Polycyclic Aromatic Hydrocarbons)**
Final Listing Decision:	**List on 303(d) list (being addressed by action other than TMDL)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (being addressed by action other than TMDL)(2012)
Revision Status	Original
Sources:	Nonpoint Source | Point Source
Expected Attainment Date:	2013
Implementation Action Other than TMDL:	A draft cleanup and abatement order has been issued to two shipyards that occupy the shoreline between Sampson Street and 28th Street.
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. 303(d) listing decisions made prior to 2006 were not held in an assessment database. The Regional Boards will update this decision when new data and information become available and are assessed.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34260, PAHs (Polycyclic Aromatic Hydrocarbons) Region 9

San Diego Bay Shoreline, between Sampson and 28th Streets

LOE ID: 4697

Pollutant: PAHs (Polycyclic Aromatic Hydrocarbons)
LOE Subgroup: Pollutant-Sediment
Matrix: Sediment
Fraction: Not Recorded

Beneficial Use: Marine Habitat

Number of Samples: 0
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference: Placeholder reference pre-2006 303(d)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion:

Objective/Criterion Reference:	034747
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

DECISION ID 41722 — Region 9

San Diego Bay Shoreline, between Sampson and 28th Streets

Pollutant:	**PCBs (Polychlorinated biphenyls)**
Final Listing Decision:	**List on 303(d) list (being addressed by action other than TMDL)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (being addressed by action other than TMDL)(2012)
Revision Status	Original
Sources:	Major Industrial Point Source | Unknown Nonpoint Source | Unknown Point Source | Urban Runoff/Storm Sewers
Expected Attainment Date:	2013
Implementation Action Other than TMDL:	A draft cleanup and abatement order has been issued to two shipyards that occupy the shoreline between Sampson Street and 28th Street.
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. 303(d) listing decisions made prior to 2006 were not held in an assessment database. The Regional Boards will update this decision when new data and information become available and are assessed.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 41722, PCBs (Polychlorinated biphenyls) — Region 9

San Diego Bay Shoreline, between Sampson and 28th Streets

LOE ID:	4698
Pollutant:	PCBs (Polychlorinated biphenyls)
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Not Recorded
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Unspecified	034748
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)	
Evaluation Guideline:	Unspecified	
Guideline Reference:	Placeholder reference pre-2006 303(d)	
Spatial Representation:	Unspecified	
Temporal Representation:	Unspecified	
Environmental Conditions:	Unspecified	
QAPP Information:	Unspecified	
QAPP Information Reference(s):		

DECISION ID 35139 Region 9

San Diego Bay Shoreline, between Sampson and 28th Streets

Pollutant:	**Zinc**
Final Listing Decision:	**List on 303(d) list (being addressed by action other than TMDL)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (being addressed by action other than TMDL)(2012)
Revision Status	Original
Sources:	Source Unknown | Unknown Nonpoint Source | Unknown Point Source
Expected Attainment Date:	2013
Implementation Action Other than TMDL:	A draft cleanup and abatement order has been issued to two shipyards that occupy the shoreline between Sampson Street and 28th Street.
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. 303(d) listing decisions made prior to 2006 were not held in an assessment database. The Regional Boards will update this decision when new data and information become available and are assessed.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 35139, Zinc Region 9

San Diego Bay Shoreline, between Sampson and 28th Streets

LOE ID:	4699
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Unspecified	034749
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)	
Evaluation Guideline:	Unspecified	
Guideline Reference:	Placeholder reference pre-2006 303(d)	
Spatial Representation:	Unspecified	
Temporal Representation:	Unspecified	
Environmental Conditions:	Unspecified	
QAPP Information:	Unspecified	
QAPP Information Reference(s):		

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: San Diego Bay Shoreline, 32nd St San Diego Naval Station
Water Body ID: CAB908310001999021010512 1
Water Body Type: Bay & Harbor

DECISION ID 44918 Region 9
San Diego Bay Shoreline, 32nd St San Diego Naval Station

Pollutant:	**Benthic Community Effects**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	No new data was assessed for this listing cycle. The decision has not changed and is as follows: 303(d) listing decisions made prior to 2006 were not held in an assessment database. The Regional Boards will update this decision when new data and information become available and are assessed.
Regional Board Decision Recommendation:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. No new data were assessed for 2008. The decision has not changed.

Line of Evidence (LOE) for Decision ID 44918, Benthic Community Effects Region 9
San Diego Bay Shoreline, 32nd St San Diego Naval Station

LOE ID:	4693
Pollutant:	Benthic Community Effects
LOE Subgroup:	Population/Community Degradation
Matrix:	Sediment
Fraction:	Not Recorded
Beneficial Use:	Marine Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	
Objective/Criterion Reference:	

Evaluation Guideline:
Guideline Reference:

Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

DECISION ID 34113 Region 9

San Diego Bay Shoreline, 32nd St San Diego Naval Station

Pollutant:	**Sediment Toxicity**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	No new data was assessed for this listing cycle. The decision has not changed and is as follows: 303(d) listing decisions made prior to 2006 were not held in an assessment database. The Regional Boards will update this decision when new data and information become available and are assessed.
Regional Board Decision Recommendation:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. No new data were assessed for 2008. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34113, Sediment Toxicity Region 9

San Diego Bay Shoreline, 32nd St San Diego Naval Station

LOE ID:	4694
Pollutant:	Sediment Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	Not Recorded
Beneficial Use:	Marine Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	
Objective/Criterion Reference:	

Evaluation Guideline: 034752
Guideline Reference:

Spatial Representation: Unspecified
Temporal Representation: Unspecified
Environmental Conditions: Unspecified
QAPP Information: Unspecified
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 34113, Sediment Toxicity **Region 9**

San Diego Bay Shoreline, 32nd St San Diego Naval Station

LOE ID: 4693

Pollutant: Benthic Community Effects
LOE Subgroup: Population/Community Degradation
Matrix: Sediment
Fraction: Not Recorded

Beneficial Use: Marine Habitat

Number of Samples: 0
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference: Placeholder reference pre-2006 303(d)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion:
Objective/Criterion Reference:

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Unspecified
Temporal Representation: Unspecified
Environmental Conditions: Unspecified
QAPP Information: Unspecified
QAPP Information Reference(s):

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: San Diego Bay Shoreline, Seventh Street Channel
Water Body ID: CAB908320001999021010582 9
Water Body Type: Bay & Harbor

DECISION ID 34077 **Region 9**
San Diego Bay Shoreline, Seventh Street Channel

Pollutant: **Benthic Community Effects**
Final Listing Decision: **List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: List on 303(d) list (TMDL required list)(2012)
Revision Status Original
Sources: Source Unknown
Expected TMDL Completion Date: 2008
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

303(d) listing decisions made prior to 2006 were not held in an assessment database. The Regional Boards will update this decision when new data and information become available and are assessed.

Regional Board Decision Recommendation: Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.
A TMDL is in progress for this location.

Line of Evidence (LOE) for Decision ID 34077, Benthic Community Effects **Region 9**
San Diego Bay Shoreline, Seventh Street Channel

LOE ID: 4714

Pollutant: Benthic Community Effects
LOE Subgroup: Population/Community Degradation
Matrix: Sediment
Fraction: Not Recorded

Beneficial Use: Marine Habitat

Number of Samples: 0
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference: Placeholder reference pre-2006 303(d)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion:
Objective/Criterion Reference:

Evaluation Guideline:
Guideline Reference:

Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

DECISION ID 33850 Region 9

San Diego Bay Shoreline, Seventh Street Channel

Pollutant:	**Sediment Toxicity**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2008
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. 303(d) listing decisions made prior to 2006 were not held in an assessment database. The Regional Boards will update this decision when new data and information become available and are assessed.
Regional Board Decision Recommendation:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. A TMDL is in progress for this location.

Line of Evidence (LOE) for Decision ID 33850, Sediment Toxicity Region 9

San Diego Bay Shoreline, Seventh Street Channel

LOE ID:	4715
Pollutant:	Sediment Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	Not Recorded
Beneficial Use:	Marine Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	
Objective/Criterion Reference:	

Evaluation Guideline:
Guideline Reference:

Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33850, Sediment Toxicity **Region 9**

San Diego Bay Shoreline, Seventh Street Channel

LOE ID:	4714
Pollutant:	Benthic Community Effects
LOE Subgroup:	Population/Community Degradation
Matrix:	Sediment
Fraction:	Not Recorded
Beneficial Use:	Marine Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	
Objective/Criterion Reference:	
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: San Diego Bay Shoreline, North of 24th Street Marine Terminal
Water Body ID: CAB908320001999021011042 1
Water Body Type: Bay & Harbor

DECISION ID 34320 **Region 9**
San Diego Bay Shoreline, North of 24th Street Marine Terminal

Pollutant:	**Benthic Community Effects**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. 303(d) listing decisions made prior to 2006 were not held in an assessment database. The Regional Boards will update this decision when new data and information become available and are assessed.
Regional Board Decision Recommendation:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

Line of Evidence (LOE) for Decision ID 34320, Benthic Community Effects **Region 9**
San Diego Bay Shoreline, North of 24th Street Marine Terminal

LOE ID:	4712
Pollutant:	Benthic Community Effects
LOE Subgroup:	Population/Community Degradation
Matrix:	Sediment
Fraction:	Not Recorded
Beneficial Use:	Marine Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	
Objective/Criterion Reference:	

Evaluation Guideline: 034757
Guideline Reference:

Spatial Representation: Unspecified
Temporal Representation: Unspecified
Environmental Conditions: Unspecified
QAPP Information: Unspecified
QAPP Information Reference(s):

DECISION ID 35121 Region 9

San Diego Bay Shoreline, North of 24th Street Marine Terminal

Pollutant: **Sediment Toxicity**
Final Listing Decision: **List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: List on 303(d) list (TMDL required list)(2012)
Revision Status Original
Sources: Source Unknown
Expected TMDL Completion Date: 2019
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

303(d) listing decisions made prior to 2006 were not held in an assessment database. The Regional Boards will update this decision when new data and information become available and are assessed.

Regional Board Decision Recommendation: Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

Line of Evidence (LOE) for Decision ID 35121, Sediment Toxicity Region 9

San Diego Bay Shoreline, North of 24th Street Marine Terminal

LOE ID: 4712

Pollutant: Benthic Community Effects
LOE Subgroup: Population/Community Degradation
Matrix: Sediment
Fraction: Not Recorded

Beneficial Use: Marine Habitat

Number of Samples: 0
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference: Placeholder reference pre-2006 303(d)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion:
Objective/Criterion Reference:

Evaluation Guideline:
Guideline Reference:

Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 35121, Sediment Toxicity **Region 9**

San Diego Bay Shoreline, North of 24th Street Marine Terminal

LOE ID:	4713
Pollutant:	Sediment Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	Not Recorded
Beneficial Use:	Marine Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	
Objective/Criterion Reference:	
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: San Diego Bay Shoreline, at Bayside Park (J Street)
Water Body ID: CAB909110002004120920520 8
Water Body Type: Bay & Harbor

DECISION ID	43599	Region 9
San Diego Bay Shoreline, at Bayside Park (J Street)		

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not Delist from 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Do Not Delist from 303(d) list (TMDL required list)(2012)
Revision Status Revised
Sources: Source Unknown
Expected TMDL Completion Date: 2021
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for removal from the section 303(d) list under section 4.3 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Twelve lines of evidence are available in the administrative record to assess this pollutant. Twelve of 55 samples exceed the Contact Recreation Beneficial use water quality objective enterococcus, Zero out of 57 geo-metric mean samples exceeded the Shellfish Harvesting Beneficial Use Objective for Total Coliform, and 94 out of 331 samples exceeded the Single Sample Maximum Shellfish Harvesting Beneficial Use Objective.

The water body segment is identified as an AB411 beach and data collected during the time frame of April 1st to October 31st (dry weather) is assessed using a four percent exceedance percentage (sections 3.3 and 4.3 of Listing Policy). There are two additional lines of evidence for dry weather single sample and geometric mean calculations. Thirty-nine of 256 dry weather single samples and 12 of 105 geo-metric mean calculations exceeded the recreational use single sample and geo-metric mean criteria for Enterococcus, respectively. This exceeds the allowable limit in Table 4.2 (at a four percent exceedance percentage Â– AB411). Sixteen of 210 dry weather single samples and zero of 97 geometric mean calculations exceeded the Objective for Fecal Coliform for recreational use and this does not exceed the allowable limit based on the application of a four percent exceedance percentage (AB411) to section 4.3 of the Listing Policy. Four of 256 single samples and 3 of 48 geometric mean calculations exceeded the criteria for recreational use for Total Coliform and this does not exceed the allowable limit based on the application of a four percent exceedance percentage (AB411) to section 3.3 of the Listing Policy

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the section 303(d) list. This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Twelve of 55 samples exceed the Contact Recreation Beneficial use water quality objective Enterococcus, Zero out of 57 Geomean samples exceeded the Shellfish Harvesting Beneficial Use Objective for Total Coliform, and 94 out of 331 samples exceeded the Single Sample Maximum Shellfish Harvesting Beneficial Use Objective and this exceeds the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Thirty-nine of 256 samples exceeded the recreational use water quality objective for Enterococcus,

16 out of 210 samples exceeded the objective for fecal Coliform, and Four out of 256 samples exceeded the Objective for Total Coliform, and this exceeds the allowable limit listed in Table 4.2 (at a four percent exceedance percentage Â– AB411) of the Listing Policy
5. Twelve of 105 geo-metric mean calculations exceeded the recreational use geo-metric mean Objective for Enterococcus, Zero out of 97 geo-metric omean samples exceeded the objective for Fecal Coliform, and Three out of 55 geo-metric mean samples exceeded the objective for Total Coliform. This exceeds the allowable limit in Table 4.2 (at a four percent exceedance percentage Â– AB411).
6. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 43599, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Bayside Park (J Street)

LOE ID:	330
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Water Contact Recreation
Number of Samples:	138
Number of Exceedances:	40
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Available data indicate sufficient exceedances of bacterial indicator objectives. There were 36 out of 233 samples exceeding the single sample maximum for enterococci, 40 out of 138 exceedances of the geomean enterococci (40), and 11 out of 188 exceedances of the geomean for total coliform (USEPA, 2007).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Title 17 C.C.R. Section 7958 states that based on a single sample, the density of bacteria in water from each sampling station at a public beach or public water contact sports area shall not exceed: (A) 1,000 total coliform bacteria per 100 milliliters, if the ratio of fecal/total coliform bacteria exceeds 0.1; or (B) 10,000 total coliform bacteria per 100 milliliters; or (C) 400 fecal coliform bacteria per 100 milliliters; or (D) 104 enterococcus bacteria per 100 milliliters. Based on the mean of the logarithms of the results of at least five weekly samples during any 30-day sampling period, the density of bacteria in water from any sampling station at a public beach or public water contact sports area, shall not exceed: (A) 1,000 total coliform bacteria per 100 milliliters; or (B) 200 fecal coliform bacteria per 100 milliliters; or (C) 35 enterococcus bacteria per 100 milliliters (DHS, 1999).
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Station ID # EH120: San Diego Bay Shoreline at J Street.
Temporal Representation:	04/05/2000-10/26/2005.
Environmental Conditions:	

QAPP Information:	Data record: 2000-2005, San Diego County Health Dept.	034761
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43599, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Bayside Park (J Street)

LOE ID:	75629
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	57
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 57 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Bayside Park at J Street (EH-120) site.
Temporal Representation:	Samples were collected from April 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43599, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Bayside Park (J Street)

LOE ID:	75628
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	66
Number of Exceedances:	1
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed bw data for San Diego Bay Shoreline, at Bayside Park (J Street) to determine beneficial use support and results are as follows: 1 of 66 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	The Water Quality Control Plan (Basin Plan 2011)states the following: At all areas where shellfish may be harvested for human consumption, ten percent of the samples collected during any 30-day period shall not exceed 230 MPN/100mL.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego Bay Shoreline, at Bayside Park (J Street) was collected at 1 monitoring site [EH-120]
Temporal Representation:	Data was collected over the time period 4/2/2008-8/23/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43599, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Bayside Park (J Street)

LOE ID:	77694
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	57
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Zero of the 57 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The Water Quality Control Plan for the San Diego BasinÂ states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at San Diego Bay Shoreline, at Bayside Park (J Street).
Temporal Representation:	The samples were collected from April 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43599, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Bayside Park (J Street)

LOE ID:	75625
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water

Matrix:	Water	034763
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	57	
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Zero of the 57 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at the Bayside Park at J Street (EH-120) site.	
Temporal Representation:	Samples were collected from April 2008 to August 2010.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43599, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Bayside Park (J Street)

LOE ID:	75627
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	57
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 57 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Bayside Park at J Street (EH-120) site.
Temporal Representation:	Samples were collected from April 2008 to August 2010.
Environmental Conditions:	

QAPP Information:	The samples were collected for the beach watch program.	034764
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43599, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Bayside Park (J Street)

LOE ID:	27258
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	265
Number of Exceedances:	43
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 265 single samples were collected with 43 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Bayside Park (J Street), San Diego, California. Station identification number is EH-120.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43599, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Bayside Park (J Street)

LOE ID:	27257
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	7
Number of Exceedances:	1

Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 217 single samples were collected with 7 samples correlated with a storm event. One of the 7 samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005). Comparisons are also made only for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Bayside Park (J Street), San Diego, California. Station identification number is EH-120.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43599, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Bayside Park (J Street)

LOE ID:	27256
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	217
Number of Exceedances:	17
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 217 single samples were collected with 17 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml;

	Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Bayside Park (J Street), San Diego, California. Station identification number is EH-120.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43599, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Bayside Park (J Street)

LOE ID:	27255
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	9
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 265 single samples were collected with 9 samples correlated with a storm event. One of the 9 samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005). Comparisons were also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Bayside Park (J Street), San Diego, California. Station identification number is EH-120.
Temporal Representation:	Samples were collected from January 1999 through December 2007.

Environmental Conditions: 034767

QAPP Information: Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.

QAPP Information Reference(s): County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43599, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Bayside Park (J Street)

LOE ID: 27254

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 265
Number of Exceedances: 5

Data and Information Type: PWS pathogen monitoring (ambient water)

Data Used to Assess Water Quality: Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 265 single samples were collected with five samples exceeding the single sample water quality objective.

Data Reference: National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: Geomean: Total coliform density shall not exceed 1,000 per 100ml;

Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).

Objective/Criterion Reference: Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Bayside Park (J Street), San Diego, California. Station identification number is EH-120.

Temporal Representation: Samples were collected from January 1999 through December 2007.

Environmental Conditions:

QAPP Information: Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.

QAPP Information Reference(s): County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43599, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Bayside Park (J Street)

LOE ID: 27253

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use:	Shellfish Harvesting
Number of Samples:	9
Number of Exceedances:	6
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 265 single samples were collected with 9 samples correlated with a storm event. Six of the 9 samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005). Comparisons are also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Bayside Park (J Street), San Diego, California. Station identification number is EH-120.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43599, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Bayside Park (J Street)

LOE ID:	27262
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	55
Number of Exceedances:	12
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 265 single samples were collected with 55 monthly geomeans calculated. Twelve of the 55 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data:	Non-SWAMP	034769
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Bayside Park (J Street), San Diego, California. Station identification number is EH-120.	
Temporal Representation:	Samples were collected from January 1999 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43599, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Bayside Park (J Street)

LOE ID:	27261
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	47
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 217 single samples were collected and 47 geomeans calculated. None of the 47 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Bayside Park (J Street), San Diego, California. Station identification number is EH-120.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the

QAPP Information Reference(s):	County of San Diego, Department Public Health Laboratory Quality Assurance Manual. County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43599, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Bayside Park (J Street)

LOE ID:	27260
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	55
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 265 single samples were collected with 55 monthly geomeans calculated. Three of the 55 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Bayside Park (J Street), San Diego, California. Station identification number is EH-120.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43599, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Bayside Park (J Street)

LOE ID:	27259
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	9	034771
Number of Exceedances:	4	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 265 single samples were collected with 9 samples correlated with a storm event. Four of the 9 samples exceeded the single sample water quality objective.	
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005). Comparisons are also made for days with matching bacteria and storm event data. A storm event is defined as 0.2 inches of rainfall within a 72 hour period.	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Bayside Park (J Street), San Diego, California. Station identification number is EH-120.	
Temporal Representation:	Samples were collected from January 1999 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43599, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Bayside Park (J Street)

LOE ID:	27252
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	265
Number of Exceedances:	93
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April1999 through December 2007. A total of 265 single samples were collected with 93 samples exceeded the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005). Comparisons were also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Bayside Park (J Street), San Diego, California. Station identification number is EH-120.
Temporal Representation:	Samples were collected from April1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43599, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Bayside Park (J Street)

LOE ID:	30673
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	256
Number of Exceedances:	39
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 265 single samples were collected of which 256 are dry weather (AB411) samples with 39 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Bayside Park (J Street), San Diego, California. Station identification number is EH-120.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.

QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

034773

Line of Evidence (LOE) for Decision ID 43599, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Bayside Park (J Street)

LOE ID:	30880
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	256
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 265 single samples were collected of which 256 are dry weather (AB411) samples with four of those samples exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Bayside Park (J Street), San Diego, California. Station identification number is EH-120.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43599, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Bayside Park (J Street)

LOE ID:	30774
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	210
Number of Exceedances:	16
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 217 single samples were collected of which 210 are dry weather (AB411) samples with 16 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Bayside Park (J Street), San Diego, California. Station identification number is EH-120.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43599, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Bayside Park (J Street)

LOE ID:	31328
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	48
Number of Exceedances:	12
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from May 1999 through April 2007. A total of 248 dry month (April through October) single samples were collected with 48 dry month geomeans calculated. Twelve of the 48 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB,

	2005). 034775
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Bayside Park (J Street), San Diego, California. Station identification number is EH-120.
Temporal Representation:	Samples were collected from May 1999 through April 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43599, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Bayside Park (J Street)

LOE ID:	31329
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	40
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from May 1999 through April 2007. A total of 200 dry month (April through October) single samples were collected with 40 dry month geomeans calculated. None of the 40 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Bayside Park (J Street), San Diego, California. Station identification number is EH-120.
Temporal Representation:	Samples were collected from May1999 through April 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43599, Indicator Bacteria 034776 Region 9

San Diego Bay Shoreline, at Bayside Park (J Street)

LOE ID:	31330
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	48
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from May 1999 through April 2007. A total of 248 dry month (April through October) single samples were collected with 48 dry month geomeans calculated. Three of the 48 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Bayside Park (J Street), San Diego, California. Station identification number is EH-120.
Temporal Representation:	Samples were collected from May 1999 through April 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43599, Indicator Bacteria Region 9

San Diego Bay Shoreline, at Bayside Park (J Street)

LOE ID:	29803
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	122
Data and Information Type:	PWS pathogen monitoring (ambient water)

Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were 122 beach advisory days for this section of shoreline. Bacteriological samples are collected on a weekly basis at ocean and bay locations in San Diego County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that an advisory for waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 - December 2007. Data used was the number of days the beach was advisories were issued when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Spatial Representation:	Beach advisories were from Bayside Park (J Street) located in San Diego Bay.
Temporal Representation:	The beach advisory covers the time frame of January January 2001 to December 2007.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of San Diego's Quality Assessment/Quality Control document
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: San Diego Bay Shoreline, at South Bay Power Plant
Water Body ID: CAB9091200020020307125116
Water Body Type: Bay & Harbor

DECISION ID 33342 **Region 9**
San Diego Bay Shoreline, at South Bay Power Plant

Pollutant: Chlorine
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Original
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

One line of evidence is available in the administrative record. Information is not backed with data. Based on the information presented, the water body-pollutant should not be placed on the section 303(d) list because it cannot be determined if the pollutant contribute or cause a toxicological effect (section 2 of the Listing Policy).

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33342, Chlorine **Region 9**
San Diego Bay Shoreline, at South Bay Power Plant

LOE ID: 333

Pollutant: Chlorine
LOE Subgroup: Testimonial Evidence
Matrix: Not Specified
Fraction: None

Beneficial Use: Industrial Service Supply

Number of Samples: 0
Number of Exceedances: 0

Data and Information Type: PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality: From the letter from San Diego Baykeeper, dated 06/14/2004: San Diego Baykeeper, the Environmental Health Coalition, and other local environmental groups have also presented site-specific studies on the area that have shown, year after year, that the beneficial uses in the South Bay are not being protected, and that the waters suffer from impairment by heat, chlorine, and copper. (San Diego Baykeeper, 2004).
Data Reference: Placeholder reference 2006 303(d)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion:	No non-numeric objective is included in the criteria used (Basin Plan, CTR, 347.9)
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The site is South San Diego Bay at South Bay Power Plant.
Temporal Representation:	The letter reporting this exceedance is dated 06/14/2004, and mentions that this has been the case "year after year."
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

DECISION ID 33048 Region 9

San Diego Bay Shoreline, at South Bay Power Plant

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. One line of evidence is available in the administrative record. Information is not backed with data. Based on the information presented, the water body-pollutant should not be placed on the section 303(d) list because it cannot be determined if the pollutant contribute or cause a toxicological effect (section 2 of the Listing Policy).
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33048, Copper Region 9

San Diego Bay Shoreline, at South Bay Power Plant

LOE ID:	334
Pollutant:	Copper
LOE Subgroup:	Testimonial Evidence
Matrix:	Not Specified
Fraction:	None
Beneficial Use:	Industrial Service Supply
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	From the letter from San Diego Baykeeper dated 06/14/2004: San Diego Baykeeper, the Environmental Health Coalition, and other local environmental groups have also presented site-specific studies on the area that have shown, year after year, that the beneficial uses in the South Bay are not being protected, and that the waters suffer from impairment by heat, chlorine, and copper. (San Diego Baykeeper, 2004).
Data Reference:	Placeholder reference 2006 303(d)

SWAMP Data:	Non-SWAMP	034780
Water Quality Objective/Criterion:	Objectives for copper (from CTR) are numeric.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:	From the CTR, saltwater acute standard is 4.8 ppb and the saltwater chronic standard is 3.1 ppb. US Fish and Wildlife Services biological effects criteria for the support of aquatic life is 15 ppm for wet weight. The Effects Range Median for Marine and Estuary Sediment is 270 ppm. From the Ocean Plan, for the protection of Marine Aquatic Life, the 6-month median is 3 ppb, the daily maximum is 12 ppb and the instantaneous maximum is 30 ppb.	
Guideline Reference:	Placeholder reference 2006 303(d)	
Spatial Representation:	The letter from San Diego Baykeeper, written on June 14, 2004, notes that exceedances occur for South San Diego Bay at South Bay Power Plant. The letter does not specifically mention which beneficial uses are not supported by the water quality at this location.	
Temporal Representation:	The letter documenting this problem was dated June 14, 2004.	
Environmental Conditions:		
QAPP Information:	QA Info Missing	
QAPP Information Reference(s):		

DECISION ID 32664 Region 9

San Diego Bay Shoreline, at South Bay Power Plant

Pollutant:	**Oxygen, Dissolved**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: One line of evidence is available in the administrative record. Information is not backed with data. Based on the information presented, the water body-pollutant should not be placed on the section 303(d) list because it cannot be determined if the pollutant contribute or cause a toxicological effect (section 2 of the Listing Policy).
Regional Board Decision Recommendation:	

Line of Evidence (LOE) for Decision ID 32664, Oxygen, Dissolved Region 9

San Diego Bay Shoreline, at South Bay Power Plant

LOE ID:	332
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Testimonial Evidence
Matrix:	Not Specified
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	From San Diego BayKeeper Memo, dated 06/14/2004: We recommend listing for excess

	temperature and low dissolved oxygen, based on a report prepared for the San Diego Bay Council: Recommended Options For Maximum Water Temperature Limits And Minimum Dissolved Oxygen Limits At A Compliance Point For Discharges From The South Bay Power Plant In San Diego Bay, Necessary To Protect Beneficial Uses, Richard F. Ford, Ph.D., Professor Emeritus of Biology at San Diego State University, April, 2003. (San Diego Baykeeper, 2004).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: Dissolved oxygen levels shall not be less than 5.0 mg/l in inland surface waters with designated MAR or WARM beneficial uses or less than 6.0 mg/l in waters with designated COLD beneficial uses. The annual mean dissolved oxygen concentrations shall not be less than 7 mg/l more than 10% of the time.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The area is reported as South San Diego Bay at South Bay Power Plant.
Temporal Representation:	The cited report is dated April 2003. The letter submitted in response to public solicitation is dated June, 14 2004.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

DECISION ID 33408 Region 9

San Diego Bay Shoreline, at South Bay Power Plant

Pollutant:	**Temperature, water**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. One line of evidence is available in the administrative record. Information is not backed with data. Based on the information presented, the water body-pollutant should not be placed on the section 303(d) list because it cannot be determined if the pollutant contribute or cause a toxicological effect (section 2 of the Listing Policy).
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33408, Temperature, water Region 9

San Diego Bay Shoreline, at South Bay Power Plant

LOE ID:	331
Pollutant:	Temperature, water
LOE Subgroup:	Testimonial Evidence
Matrix:	Not Specified
Fraction:	None

Beneficial Use:	Industrial Service Supply	034782
Number of Samples:	0	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Testimonial evidence was provided by the San Diego Bay Keeper. The recommendation for a listing for excess temperature was based on a report prepared for the San Diego Bay Council. This testimony also cites that other studies done by San Diego Baykeeper, the Environmental Health Coalition, and other local environmental groups have also presented site-specific studies on the area that have shown, year after year, that the beneficial uses in the South Bay are not being protected, and that the waters suffer from impairment by heat. (San Diego Baykeeper, 2004).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: The terms and conditions of the State Board's "Water Quality Control Plan for Ocean Waters of California" (Ocean Plan), "Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California" (Thermal Plan), and any revisions thereto are incorporated into the Basin Plan by reference. The terms and conditions of the Ocean Plan and Thermal Plan apply to the ocean waters within this Region.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Testimonial evidence applies to San Diego Bay at the South Bay Power Plant.	
Temporal Representation:	The document in which the testimonial was included was dated June 14, 2004.	
Environmental Conditions:		
QAPP Information:	QA Info Missing	
QAPP Information Reference(s):		

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: San Diego Bay
Water Body ID: CAB910100001999021013242 2
Water Body Type: Bay & Harbor

DECISION ID 33669 **Region 9**
San Diego Bay

Pollutant: **PCBs (Polychlorinated biphenyls)**
Final Listing Decision: **Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Sources: Contaminated Sediments | Dredging | Historic Land Management Activities | Illegal dumping | Source Unknown | Spills | Urban Runoff/Storm Sewers
Expected TMDL Completion Date: 2019
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the section 303(d) list under section 3.5 of the Listing Policy. Two lines of evidence are available in the administrative record to assess this pollutant.

Based on the readily available data and information, the weight of evidence indicates that there is no sufficient justification in favor of removing this water segment-pollutant combination from the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. All samples exceeded the OEHHA Screening Value and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to Section 3.4 of the listing policy, there is a published State of California Office of Environmental Health Hazard Assessment Health Advisory for Eating Fish From San Diego Bay due to PCBs and Mercury.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 33669, PCBs (Polychlorinated biphenyls) **Region 9**
San Diego Bay

LOE ID: 95636

Pollutant: PCBs (Polychlorinated biphenyls)
LOE Subgroup: Pollutant-Tissue
Matrix: Tissue
Fraction: Fish fillet

Beneficial Use: Commercial or recreational collection of fish, shellfish, or organisms

Number of Samples: 0

Number of Exceedances:	0	034784
Data and Information Type:	Fish tissue analysis	
Data Used to Assess Water Quality:	Samples were collected bay-wide as part of the State of California's Coastal Fish Contamination Program (Assembly Bill 2872) and through the Surface Water Ambient Monitoring Program. These data were collected from 1999-2009 and were assessed by State of California staff at the Office of Environmental Health Hazard Assessment. These data are available in the California Environmental Data Exchange Network Database.	
Data Reference:	Toxic Substances Monitoring Program data for years 1992-2002 and Coastal Fish Contamination Program for years 1 and 2. State Water Resources Control Board Contaminants in Fish from the California Coast, 2009-2010: Summary Report on a Two-Year Screening Survey. A Report of the Surface Water Ambient Monitoring Program (SWAMP). California State Water Resources Control Board, Sacramento, CA.	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:	State of California Office of Environmental Health Hazard Assessment Health Advisory and Guidelines for Eating Fish From San Diego Bay. October 2013. Section 3.4 of the Listing Policy Specifically states: "3.4 Health Advisories A water segment shall be placed on the section 303(d) list if a health advisory against the consumption of edible resident organisms, or a shellfish harvesting ban has been issued by the Office of Environmental Health Hazard Assessment (OEHHA), or Department of Health Services and there is a designated or existing fish consumption beneficial use for the segment. In addition, water segment-specific data must be available indicating the evaluation guideline for tissue is exceeded." This waterbody has a health advisory against the consumption of edible resident fish due to elevated levels of PCBs in fillet tissue.	
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Water Quality Criterion for the Protection of Human Health: Methylmercury. Final. United States Environmental Protection Agency Office of Science and Technology Office of Water. EPA-823-R-01-001. January 2001	
Spatial Representation:	Samples were collected bay-wide as part of the State of California's Coastal Fish Contamination Program (Assembly Bill 2872) and Surface Water Ambient Monitoring Program.	
Temporal Representation:	Representative samples of locally abundant species were collected from 1999 to 2009.	
Environmental Conditions:		
QAPP Information:	Samples collected and analyzed by State of California monitoring programs. Data and quality assurance/quality control report for trace metals. Coastal fish contaminant project year 2, 1999-2000. Screening Study of Bioaccumulation on the California Coast Quality Assurance Program Plan 2009.	
QAPP Information Reference(s):	Data and quality assurance/quality control report for trace metals. Coastal fish contaminant project year 2, 1999-2000 Contaminants in Fish from the California Coast, 2009-2010: Summary Report on a Two-Year Screening Survey. A Report of the Surface Water Ambient Monitoring Program (SWAMP). California State Water Resources Control Board, Sacramento, CA.	

Line of Evidence (LOE) for Decision ID 33669, PCBs (Polychlorinated biphenyls) **Region 9**

San Diego Bay

LOE ID:	75622
Pollutant:	PCBs (Polychlorinated biphenyls)
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Shellfish Harvesting
Number of Samples:	2
Number of Exceedances:	2
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The results did exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal. Total PCB was assessed for as follows: PCB aroclors and congeners were summed separately and the sum that yielded the highest value was used for the assessment.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for polychlorinated biphenyls in shellfish tissue is 3.9 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite samples were collected from sites SDCB - San Diego Bay Coronado Bridge and SDHI - San Diego Bay Harbor Island.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 12/5/2007 and 12/10/2007.
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33669, PCBs (Polychlorinated biphenyls) Region 9

San Diego Bay

LOE ID:	336
Pollutant:	PCBs (Polychlorinated biphenyls)
LOE Subgroup:	Pollutant-Tissue

Matrix:	Tissue	034786
Fraction:	Total	
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms	
Number of Samples:	18	
Number of Exceedances:	18	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Eleven out of 11 samples exceeded the screening value. All 11 samples were filet composites. Six out of the 11 samples were spotted sand bass collected at least once at each station. The remaining species included barred sand bass, black surfperch, diamond turbot, and shiner surfperch. All samples exceeded guideline (TSMP, 2002). Seven out of 7 samples exceeded. Whole fish/Halibut. Bight 98 Data (City of San Diego, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	San Diego RWQCB Basin Plan: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:	20 ng/g OEHHA Screening Value (Brodberg & Pollock, 1999).	
Guideline Reference:	Placeholder reference 2006 303(d)	
Spatial Representation:	Four stations were sampled: 5th Avenue Marina Pier, Coronado Pier, J Street Pier - Chula Vista, and Shelter Island Pier.	
Temporal Representation:	Samples were collected in February, March, April, May, November 1999 and March 2000.	
Environmental Conditions:		
QAPP Information:	CFCP 1998 Year 1 QA Summary: Pesticides and PCBs. California Department of Fish and Game. CDFG Fish and Wildlife Water Pollution Control Laboratory Data Quality Assurance Report. 1999 Coastal Fish Contamination Program (CFCP Year 2). California Department of Fish and Game.	
QAPP Information Reference(s):		

DECISION ID	**52947**	**Region 9**
San Diego Bay		

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Two of the two samples exceed the guideline based on an assumption of ten percent of total arsenic being inorganic in form. Additional information regarding this assumption is needed given the small sample size for the waterbody. Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Two of two samples exceed the guideline, and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. This exceedance rate is based on an assumption of ten percent of total arsenic being inorganic in form. The accuracy of this assumption is unknown.
4. Pursuant to section 3.11 of the Listing Policy, additional data and information are available indicating that standards are not met. Additional information regarding the validity of ten percent of total arsenic being in inorganic form is needed, especially given the small sample size for the waterbody (n = 2). There is insufficient information regarding Mytilus arsenic ratios in order to make an accurate beneficial use assessment.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52947, Arsenic **Region 9**

San Diego Bay

LOE ID:	75595
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Shellfish Harvesting
Number of Samples:	2
Number of Exceedances:	2
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	Both samples exceeded the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal. Ten percent of the total arsenic result was used to estimate of the amount of inorganic arsenic in the sample; this number was screened against the guideline.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for arsenic in shellfish tissue is 0.0052 ppm. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; OEHHA, 2004)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Air Toxics Hotspots Program Risk Assessment Guidelines. Part II Technical Support

Document for Describing Available Cancer Potency Values. 034788

Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite samples were collected from sites SDCB - San Diego Bay Coronado Bridge and SDHI - San Diego Bay Harbor Island.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 12/5/2007 and 12/10/2007.
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID 52948 Region 9
San Diego Bay

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the two samples exceed the guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of two samples exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52948, Cadmium Region 9
San Diego Bay

LOE ID:	75600
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue

Fraction:	Shellfish	034789
Beneficial Use:	Shellfish Harvesting	
Number of Samples:	2	
Number of Exceedances:	0	
Data and Information Type:	Shellfish surveys	
Data Used to Assess Water Quality:	The two samples did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.	
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for cadmium in shellfish tissue is 3.3 ppm. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; USEPA, 2000)	
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Guidance for Assessing Chemical Contaminant Data for Use In Fish Advisories Volume 1: Fish Sampling and Analysis	
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite samples were collected from sites SDCB - San Diego Bay Coronado Bridge and SDHI - San Diego Bay Harbor Island.	
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 12/5/2007 and 12/10/2007.	
Environmental Conditions:		
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/	
QAPP Information Reference(s):		

DECISION ID	**52949**	**Region 9**
San Diego Bay		

Pollutant:	**Chlordane**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the two samples exceed the guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of two samples exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52949, Chlordane **Region 9**

San Diego Bay

LOE ID:	75601
Pollutant:	Chlordane
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Shellfish Harvesting
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The results did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal. Chlordane result was calculated by summing the results for chlordane isomers: cis- and trans-nonachlor, alpha- and gamma-chlordane, and oxychlordane.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for total chlordane in shellfish tissue is 6.0 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California

Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment
Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene

Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite samples were collected from sites SDCB - San Diego Bay Coronado Bridge and SDHI - San Diego Bay Harbor Island.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 12/5/2007 and 12/10/2007.
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID 52950 Region 9
San Diego Bay

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the two samples exceed the guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of two samples exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52950, Chlorpyrifos Region 9
San Diego Bay

LOE ID: 75602

Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Shellfish Harvesting
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The results did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for chlorpyrifos in shellfish tissue is 1,000 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; USEPA, 2000)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Guidance for Assessing Chemical Contaminant Data for Use In Fish Advisories Volume 1: Fish Sampling and Analysis
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite samples were collected from sites SDCB - San Diego Bay Coronado Bridge and SDHI - San Diego Bay Harbor Island.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 12/5/2007 and 12/10/2007.
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID	**52951**	**Region 9**
San Diego Bay		

Pollutant:	**Dieldrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision

Revision Status	Revised	034793
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the two samples exceeds the guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of two samples exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52951, Dieldrin **Region 9**

San Diego Bay

LOE ID:	75604
Pollutant:	Dieldrin
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Shellfish Harvesting
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The results did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for dieldrin in shellfish tissue is 0.49 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21

	g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite samples were collected from sites SDCB - San Diego Bay Coronado Bridge and SDHI - San Diego Bay Harbor Island.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 12/5/2007 and 12/10/2007.
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID	52952	Region 9
San Diego Bay		

Pollutant:	**Endosulfan**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the two samples exceeds the guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of two samples exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52952, Endosulfan **Region 9**

LOE ID:	75605
Pollutant:	Endosulfan
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Shellfish Harvesting
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The results did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal. Total Endosulfan result was calculated by summing Endosulfan I and Endosulfan II.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for endosulfan (I and II) in shellfish tissue is 20,000 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; USEPA, 2000)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Guidance for Assessing Chemical Contaminant Data for Use In Fish Advisories Volume 1: Fish Sampling and Analysis
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite samples were collected from sites SDCB - San Diego Bay Coronado Bridge and SDHI - San Diego Bay Harbor Island.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 12/5/2007 and 12/10/2007.
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID **52953** **Region 9**

San Diego Bay

Pollutant:	**Endrin**	034796
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	
Last Listing Cycle's Final Listing Decision:	New Decision	
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the two samples exceeds the guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of two samples exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52953, Endrin **Region 9**

San Diego Bay

LOE ID:	75606
Pollutant:	Endrin
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Shellfish Harvesting
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The results did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.

Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for endrin in shellfish tissue is 1,000 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; USEPA, 2000)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Guidance for Assessing Chemical Contaminant Data for Use In Fish Advisories Volume 1: Fish Sampling and Analysis
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite samples were collected from sites SDCB - San Diego Bay Coronado Bridge and SDHI - San Diego Bay Harbor Island.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 12/5/2007 and 12/10/2007.
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID	52954	Region 9
San Diego Bay		

Pollutant:	**Heptachlor epoxide**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the two samples exceeds the guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of two samples exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and

information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52954, Heptachlor epoxide **Region 9**

San Diego Bay

LOE ID:	75612
Pollutant:	Heptachlor epoxide
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Shellfish Harvesting
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The samples did not exceed the objective. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for heptachlor epoxide in shellfish tissue is 1.4 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; OEHHA, 1999)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Public Health Goal for Heptachlor and Heptachlor Epoxide in Drinking Water
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite samples were collected from sites SDCB - San Diego Bay Coronado Bridge and SDHI - San Diego Bay Harbor Island.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 12/5/2007 and 12/10/2007.
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID **52955** **Region 9**
San Diego Bay

Pollutant:	**Hexachlorobenzene/ HCB**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the two samples exceeds the guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of two samples exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52955, Hexachlorobenzene/ HCB **Region 9**
San Diego Bay

LOE ID:	75613
Pollutant:	Hexachlorobenzene/ HCB
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Shellfish Harvesting
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The results did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for hexachlorobenzene in shellfish tissue is 4.3 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; OEHHA, 2005)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Air Toxics Hotspots Program Risk Assessment Guidelines. Part II Technical Support Document for Describing Available Cancer Potency Values.
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite samples were collected from sites SDCB - San Diego Bay Coronado Bridge and SDHI - San Diego Bay Harbor Island.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 12/5/2007 and 12/10/2007.
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID	**52956**	**Region 9**
San Diego Bay		

Pollutant:	**Lindane/gamma Hexachlorocyclohexane (gamma-HCH)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the two samples exceeds the guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of two samples exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum

of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52956, Lindane/gamma Hexachlorocyclohexane (gamma-HCH) **Region 9**

San Diego Bay

LOE ID:	75614
Pollutant:	Lindane/gamma Hexachlorocyclohexane (gamma-HCH)
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Fish fillet
Beneficial Use:	Shellfish Harvesting
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The results did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for lindane in shellfish tissue is 7.1 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; OEHHA, 2005)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Air Toxics Hotspots Program Risk Assessment Guidelines. Part II Technical Support Document for Describing Available Cancer Potency Values.
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite samples were collected from sites SDCB - San Diego Bay Coronado Bridge and SDHI - San Diego Bay Harbor Island.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 12/5/2007 and 12/10/2007.
Environmental Conditions:	

QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID 52957 Region 9
San Diego Bay

Pollutant:	**Mirex**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the zero samples exceeds the guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of zero samples exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52957, Mirex Region 9
San Diego Bay

LOE ID:	75618
Pollutant:	Mirex
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Shellfish Harvesting
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys

Data Used to Assess Water Quality:	The non detect result was not included in the assessment since the reporting limit was above the evaluation guideline. MDL were provided by NOAA Federal and RL were calculated by multiplying 3.18 by the MDL.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for mirex in shellfish tissue is 0.43 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; OEHHA, 1992)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Expedited Cancer Potency Values and Proposed Regulatory Levels for Certain Proposition 65 Carcinogens.
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite samples were collected from sites SDCB - San Diego Bay Coronado Bridge and SDHI - San Diego Bay Harbor Island.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 12/5/2007
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID	52961	Region 9
San Diego Bay		

Pollutant:	**Selenium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the two samples exceeds the guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section

303(d) List. 034804

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of two samples exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52961, Selenium **Region 9**

San Diego Bay

LOE ID:	75623
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Shellfish Harvesting
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The two samples did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for selenium in shellfish tissue is 11 ppm. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day. A background dietary consuption rate of 0.114 mg/day is applied for this micronutrient. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite samples were collected from sites SDCB - San Diego Bay Coronado Bridge and SDHI - San Diego Bay Harbor Island.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 12/5/2007 and 12/10/2007.

Environmental Conditions:	034805
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID 52962 **Region 9**

San Diego Bay

Pollutant:	**Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the two samples exceeds the guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of two samples exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52962, Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD) **Region 9**

San Diego Bay

LOE ID:	75624
Pollutant:	Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD)
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Shellfish Harvesting
Number of Samples:	2
Number of Exceedances:	0

Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The results did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal. The total DDTs were calculated as the sum of 4,4- and 2,4- isomers of DDT, DDE, and DDD.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for total DDT in shellfish tissue is 23 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite samples were collected from sites SDCB - San Diego Bay Coronado Bridge and SDHI - San Diego Bay Harbor Island.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 12/5/2007 and 12/10/2007.
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID	**53136**	**Region 9**
San Diego Bay		

Pollutant:	**Mercury**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Atmospheric Deposition | Contaminated Sediments | Historic Land Management Activities | Other Urban Runoff | Source Unknown
Expected TMDL Completion Date:	2027
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Pursuant to Section 3.4 of the listing policy, there is a published State of California Office of Environmental Health Hazard Assessment Health Advisory for Eating Fish From San Diego Bay due to PCBs and Mercury.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 53136, Mercury **Region 9**

San Diego Bay

LOE ID:	95630
Pollutant:	Mercury
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Fish fillet
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Fish tissue analysis
Data Used to Assess Water Quality:	Samples were collected bay-wide as part of the State of California's Coastal Fish Contamination Program (Assembly Bill 2872) and through the Surface Water Ambient Monitoring Program. These data were collected from 1999-2009 and were assessed by State of California staff at the Office of Environmental Health Hazard Assessment. These data are available in the California Environmental Data Exchange Network Database.
Data Reference:	Toxic Substances Monitoring Program data for years 1992-2002 and Coastal Fish Contamination Program for years 1 and 2. State Water Resources Control Board Contaminants in Fish from the California Coast, 2009-2010: Summary Report on a Two-Year Screening Survey. A Report of the Surface Water Ambient Monitoring Program (SWAMP). California State Water Resources Control Board, Sacramento, CA.
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	State of California Office of Environmental Health Hazard Assessment Health Advisory and Guidelines for Eating Fish From San Diego Bay. October 2013. Section 3.4 of the Listing Policy Specifically states: "3.4 Health Advisories A water segment shall be placed on the section 303(d) list if a health advisory against the consumption of edible resident organisms, or a shellfish harvesting ban has been issued by the Office of Environmental Health Hazard Assessment (OEHHA), or Department of Health

	Services and there is a designated or existing fish consumption beneficial use for the segment. In addition, water segment-specific data must be available indicating the evaluation guideline for tissue is exceeded."
	This waterbody has a health advisory against the consumption of edible resident fish due to elevated levels of mercury in fillet tissue.
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Water Quality Criterion for the Protection of Human Health: Methylmercury. Final. United States Environmental Protection Agency Office of Science and Technology Office of Water. EPA-823-R-01-001. January 2001
Spatial Representation:	Samples were collected bay-wide as part of the State of California's Coastal Fish Contamination Program (Assembly Bill 2872) and Surface Water Ambient Monitoring Program.
Temporal Representation:	Representative samples of locally abundant species were collected from 1999 to 2009.
Environmental Conditions:	
QAPP Information:	Samples collected and analyzed by State of California monitoring programs. Data and quality assurance/quality control report for trace metals. Coastal fish contaminant project year 2, 1999-2000. Screening Study of Bioaccumulation on the California Coast Quality Assurance Program Plan 2009.
QAPP Information Reference(s):	Data and quality assurance/quality control report for trace metals. Coastal fish contaminant project year 2, 1999-2000 Contaminants in Fish from the California Coast, 2009-2010: Summary Report on a Two-Year Screening Survey. A Report of the Surface Water Ambient Monitoring Program (SWAMP). California State Water Resources Control Board, Sacramento, CA.

Line of Evidence (LOE) for Decision ID 53136, Mercury **Region 9**

San Diego Bay

LOE ID:	75617
Pollutant:	Mercury
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Shellfish Harvesting
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The two samples did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The USEPA 304(a) recommended water quality criterion for concentrations of methylmercury in shellfish tissue (wet weight) is 0.2 ppm. (Brodberg, R.K., and G.A. Pollock, 1999; USEPA, 2001)

Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Water Quality Criterion for the Protection of Human Health: Methylmercury. Final. United States Environmental Protection Agency Office of Science and Technology Office of Water. EPA-823-R-01-001. January 2001
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite samples were collected from sites SDCB - San Diego Bay Coronado Bridge and SDHI - San Diego Bay Harbor Island.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 12/5/2007 and 12/10/2007.
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

034809

DECISION ID	52959	Region 9
San Diego Bay		

Pollutant:	**PAHs (Polycyclic Aromatic Hydrocarbons)**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Two of the two samples exceed the guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Two of two samples exceed the guideline, and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 52959, PAHs (Polycyclic Aromatic Hydrocarbons)	Region 9
San Diego Bay	

LOE ID:	75619
Pollutant:	PAHs (Polycyclic Aromatic Hydrocarbons)
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Shellfish Harvesting
Number of Samples:	2
Number of Exceedances:	2
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The results did exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal. The total PAHs were calculated as the potency equivalency concentration or the sum of the toxic equivalency factors multiplied by the concentrations of: Acenaphthene, Acenaphthylene, Anthracene, Benz[a]anthracene, Benzo[a]pyrene, Benzo[b]fluoranthene, Benzo[g,h,i]perylene, Benzo[k]fluoranthene, Dibenzo[a,h]anthracene, Chrysene, Fluoranthene, Fluorene, Indeno[1,2,3-c,d]pyrene, Phenanthrene, and Pyrene.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for polycyclic aromatic hydrocarbons in shellfish tissue is 1.1 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; USEPA, 2000)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Guidance for Assessing Chemical Contaminant Data for Use In Fish Advisories Volume 1: Fish Sampling and Analysis
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite samples were collected from sites SDCB - San Diego Bay Coronado Bridge and SDHI - San Diego Bay Harbor Island.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 12/5/2007 and 12/10/2007.
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID **33415** **Region 9**

San Diego Bay 034811

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 3 samples exceeded the 3.1 ppb CTR chronic saltwater criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33415, Copper — Region 9

San Diego Bay

LOE ID:	335
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Estuarine Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the RWQCB in 03/20/2004. None of the 3 samples were in exceedance of either the acute or chronic criteria. All 3 samples collected on 03/15/2004 in the ocean channel near ballast point in the middle of the channel between buoys 11 and 12 met both acute and chronic standards. One sample was collected at the same location on 03/20/2004. Both acute and chronic standards were met. (SDRWQCB, 2004c)
Data Reference:	Placeholder reference 2006 303(d)

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the CTR: The dissolved copper acute saltwater criterion is 4.8 ppb. The dissolved copper chronic criterion is 3.1 ppb. This criteria is more stringent or as stringent as the other criteria found.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the San Diego Bay in the open ocean south of buoy 3 and tip of Point Loma. Samples were also collected in the San Diego Bay in the ocean channel near ballast point in the middle of the channel between buoys 11 and 12.
Temporal Representation:	Samples were collected on 03/20/2004 and 03/15/2004.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: San Diego Bay Shoreline, at Glorietta Bay
Water Body ID: CAB910100002004120918533 9
Water Body Type: Bay & Harbor

DECISION ID 43806 **Region 9**
San Diego Bay Shoreline, at Glorietta Bay

Pollutant: **Indicator Bacteria**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the section 303(d) list under section 3.3 of the Listing Policy. Under section 3.3 a single line of evidence is necessary to assess listing status.

Twenty-One lines of evidence are available in the administrative record to assess this pollutant. Four of the 215 samples exceed single sample maximum objective the water quality objective, and Zero out of 113 monthly geomean samples exceeded the water quality objective for enterococcus. Zero of the 178 samples exceeded the Recreational Beneficial use SIngle Sample Maximum Objective, and Zero out of 54 samples exceeded the geomean water quality objective for fecal coliform. Sixteen of the 215 samples exceed the Total Coliform single sample ocean plan water quality objective for Shellfish Harvesting, and Zero out of 107 samples exceeded the Recreational Beneficial use single sample maximum Basin Plan Objective for Total Coliform.

The coastal beach at this water segment is identified as an AB411 beach. To comply with the requirements of AB411 the dry weather data collected during the time frame of April 1st to October 31st is assessed using a four percent exceedance percentage, as described in section 3.3 and 4.3 of the Listing Policy. An assessment for dry weather single sample and the geometric mean calculation was conducted and there are two additional line of evidence available in the administrative record. Four of 209 dry weather single samples and zero of 53 geometric mean calculations exceeded the criteria for recreational use and this does not exceed the allowable limit based on the application of a four percent exceedance percentage (AB411) to section 3.3 of the Listing Policy.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Four of the 215 samples exceed single sample maximum objective the water quality objective, and Zero out of 113 monthly geomean samples exceeded the water quality objective for enterococcus. Zero of the 178 samples exceeded the Recreational Beneficial use SIngle Sample Maximum Objective, and Zero out of 54 samples exceeded the geomean water quality objective for fecal coliform. Sixteen of the 215 samples exceed the Total Coliform single sample ocean plan water quality objective for Shellfish Harvesting, and Zero out of 107 samples exceeded the Recreational Beneficial use single sample maximum Basin Plan Objective for Total Coliform. and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Four of 209 dry weather single samples exceeded the criteria for recreational use and this does not exceed the allowable limit based on the application of a four percent exceedance percentage (AB411) to section 3.3 of the Listing Policy

5. Zero of 53 geometric mean calculations exceeded the criteria for recreational use and this does not exceed the allowable limit based on the application of a four percent exceedance percentage (AB411) to section 3.3 of the Listing Policy.
6. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 43806, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Glorietta Bay

LOE ID:	30881
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	209
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 215 single samples were collected of which 209 are dry weather (AB411) samples with none of those samples exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Glorietta Bay, San Diego, California. Station identification number is EH-080.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43806, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Glorietta Bay

LOE ID:	31327
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	53
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from May 1999 through October 2007. A total of 205 dry month (April through October) single samples were collected with 53 dry month geomeans calculated. None of the 53 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Glorietta Bay, San Diego, California. Station identification number is EH-080.
Temporal Representation:	Samples were collected from May 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43806, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Glorietta Bay

LOE ID:	31326
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	42
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from May 1999 through October 2007. A total of 171 dry month (April through October) single samples were

	collected with 42 dry month geomeans calculated. None of the 42 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Glorietta Bay, San Diego, California. Station identification number is EH-080.
Temporal Representation:	Samples were collected from May 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43806, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Glorietta Bay

LOE ID:	31325
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	53
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from May 1999 through October 2007. A total of 205 dry month (April through October) single samples were collected with 53 dry month geomeans calculated. None of the 53 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	

Guideline Reference:	034817
Spatial Representation:	Samples were collected at Glorietta Bay, San Diego, California. Station identification number is EH-080.
Temporal Representation:	Samples were collected from May 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43806, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Glorietta Bay

LOE ID:	27331
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	215
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 215 single samples were collected with 4 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Glorietta Bay, San Diego, California. Station identification number is EH-080.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43806, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Glorietta Bay

LOE ID:	27327

Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	215
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 215 single samples were collected with zero sample exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Glorietta Bay, San Diego, California. Station identification number is EH-080.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43806, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Glorietta Bay

LOE ID:	30775
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	173
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 178 single samples were collected of which 173 are dry weather (AB411) samples with no sample exceeding the single sample water quality

	objective. 034819
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Glorietta Bay, San Diego, California. Station identification number is EH-080.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43806, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Glorietta Bay

LOE ID:	30674
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	209
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 215 single samples were collected of which 209 are dry weather (AB411) samples with four samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at Glorietta Bay, San Diego, California. Station identification number is EH-080.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43806, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Glorietta Bay

LOE ID:	29804
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	7
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were seven beach advisory days for this section of shoreline. Bacteriological samples are collected on a weekly basis at ocean and bay locations in San Diego County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that an advisory for waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 - December 2007. Data used was the number of days the beach was advisories were issued when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Spatial Representation:	Beach advisories were from Glorietta Bay located in San Diego Bay.
Temporal Representation:	The beach advisories covers the time frame of January January 2001 to December 2007.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of San Diego's Quality

	Assessment/Quality Control document 034821
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43806, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Glorietta Bay

LOE ID:	27326
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	6
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 215 single samples were collected with 6 samples correlated with a storm event. One of the 6 samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005). Comparisons are also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Glorietta Bay, San Diego, California. Station identification number is EH-080.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43806, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Glorietta Bay

LOE ID:	27330
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	034822
Beneficial Use:	Water Contact Recreation	
Number of Samples:	5	
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 178 single samples were collected with 5 samples correlated with a storm event. No sample exceeded the single sample water quality objective.	
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005). Comparisons are also made only for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Glorietta Bay, San Diego, California. Station identification number is EH-080.	
Temporal Representation:	Samples were collected from January 1999 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43806, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Glorietta Bay

LOE ID:	27325
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	215
Number of Exceedances:	16
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 215 single samples were collected with 16 samples exceeded the single sample water quality objective.

Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005). Comparisons were also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Glorietta Bay, San Diego, California. Station identification number is EH-080.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43806, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Glorietta Bay

LOE ID:	75637
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	54
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 54 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Glorietta Bay site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43806, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Glorietta Bay 034824

LOE ID:	75636
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	65
Number of Exceedances:	2
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed bw data for San Diego Bay Shoreline, at Glorietta Bay to determine beneficial use support and results are as follows: 2 of 65 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The Water Quality Control Plan (Basin Plan 2011)states the following: At all areas where shellfish may be harvested for human consumption, ten percent of the samples collected during any 30-day period shall not exceed 230 MPN/100mL.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego Bay Shoreline, at Glorietta Bay was collected at 1 monitoring site [Glorietta Bay]
Temporal Representation:	Data was collected over the time period 1/18/2008-8/23/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43806, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Glorietta Bay

LOE ID:	75635
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	54
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 54 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline: 034825
Guideline Reference:

Spatial Representation: Samples were collected at the Glorietta Bay site.
Temporal Representation: Samples were collected from January 2008 to August 2009.
Environmental Conditions:
QAPP Information: The samples were collected for the beach watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 43806, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Glorietta Bay

LOE ID: 75634

Pollutant: Enterococcus
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 54
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Zero of the 54 geomeans exceeded the objective.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at the Glorietta Bay site.
Temporal Representation: Samples were collected from January 2008 to August 2010.
Environmental Conditions:
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 43806, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Glorietta Bay

LOE ID: 77696

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Shellfish Harvesting

Number of Samples: 54
Number of Exceedances: 0

Data and Information Type: PATHOGEN MONITORING
Data Used to Assess Water Quality: Zero of the 54 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.

Data Reference:	Data for Region 9 Beach Watch.	034826
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The Water Quality Control Plan for the San Diego BasinÂ states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected at San Diego Bay Shoreline, at Glorietta Bay.	
Temporal Representation:	The samples were collected from Jnuary 2008 to August 2010.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the beach watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43806, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Glorietta Bay

LOE ID:	27335
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	59
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 215 single samples were collected with 59 monthly geomeans calculated. None of the 59 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Glorietta Bay, San Diego, California. Station identification number is EH-080.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.

QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43806, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Glorietta Bay

LOE ID:	27334
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	49
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 178 single samples were collected and 49 geomeans calculated. None of the 49 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Glorietta Bay, San Diego, California. Station identification number is EH-080.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43806, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Glorietta Bay

LOE ID:	27333
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	59	034828
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 215 single samples were collected with 59 monthly geomeans calculated. None of the 59 geomeans exceeded the geomean water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Glorietta Bay, San Diego, California. Station identification number is EH-080.	
Temporal Representation:	Samples were collected from January 1999 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43806, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Glorietta Bay

LOE ID:	27332
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 215 single samples were collected with 6 samples correlated with a storm event. None of the 6 samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml.

	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005). Comparisons are also made for days with matching bacteria and storm event data. A storm event is defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Glorietta Bay, San Diego, California. Station identification number is EH-080.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43806, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Glorietta Bay

LOE ID:	27329
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	178
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 178 single samples were collected with no sample exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Glorietta Bay, San Diego, California. Station identification number is EH-080.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	

QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43806, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Glorietta Bay

LOE ID:	27328
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 215 single samples were collected with 6 samples correlated with a storm event. None of the 6 samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005). Comparisons were also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Glorietta Bay, San Diego, California. Station identification number is EH-080.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

DECISION ID 33220 **Region 9**

San Diego Bay Shoreline, at Glorietta Bay

Pollutant:	**Copper**	034831
Final Listing Decision:	**List on 303(d) list (TMDL required list)**	
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)	
Revision Status	Original	
Sources:	Source Unknown	
Expected TMDL Completion Date:	2019	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. An adequate number of samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements in section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Two of 3 samples exceeded the 3.1 ppb CTR chronic saltwater criteria and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33220, Copper **Region 9**

San Diego Bay Shoreline, at Glorietta Bay

LOE ID:	337
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Estuarine Habitat
Number of Samples:	3
Number of Exceedances:	2
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected in 05/2004. Two of 3 samples were in exceedance of the chronic standard. The location where there were no exceedances was next to Buoy 13; near Avenida de las Arenas (SDRWQCB, 2004c).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the CTR, the saltwater chronic standard is 3.1 ppb, and the acute criterion is 4.8 ppb.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)

Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the San Diego Bay Shoreline, Glorietta Bay, in front of Coronado Yacht Club, halfway down the main axis of Glorietta Bay, and next to Buoy 13; near Avenida de las Arenas.
Temporal Representation:	Samples were collected on 05/20/2004.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: San Diego Bay Shoreline, at Silver Strand Beach (bayside)
Water Body ID: CAB910100002004120919050 3
Water Body Type: Bay & Harbor

DECISION ID 44399 **Region 9**

San Diego Bay Shoreline, at Silver Strand Beach (bayside)

Pollutant: **Indicator Bacteria**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Original
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

This pollutant is being considered for placement on the section 303(d) list under section 3.3 of the Listing Policy. Under section 3.3 a single line of evidence is necessary to assess listing status.

Four lines of evidence are available in the administrative record to assess this pollutant. None of the samples exceed the water quality objective for enterococcus.

The coastal beach at this water segment is identified as an AB411 beach. To comply with the requirements of AB411 the dry weather data collected during the time frame of April 1st to October 31st is assessed using a four percent exceedance percentage, as described in section 3.3 and 4.3 of the Listing Policy. An assessment for dry weather single sample and the geometric mean calculation was conducted and there are two additional line of evidence available in the administrative record. Zero of 203 dry weather single samples and zero of 54 geometric mean calculations exceeded the criteria for recreational use and this does not exceed the allowable limit based on the application of a four percent exceedance percentage (AB411) to section 3.3 of the Listing Policy. None of 200 single samples and none of 54 geometric mean calculations exceeded the Total Coliform objective for recreational use and this does not exceed the allowable limit based on the application of a four percent exceedance percentage (AB411) to section 3.3 of the Listing Policy. Zero of 165 dry weather single samples and zero of 43 geometric mean calculations exceeded the Fecal Coliform objective for recreational use and this does not exceed the allowable limit based on the application of a four percent exceedance percentage (AB411) to section 3.3 of the Listing Policy.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of 207samples exceeded the enterococcus water quality objective and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Zero of 203 dry weather single samples exceeded the criteria for recreational use and this does not exceed the allowable limit based on the application of a four percent exceedance percentage (AB411) to section 3.3 of the Listing Policy
5. Zero of 53 geometric mean calculations exceeded the criteria for recreational use and this does not exceed the allowable limit based on the application of a four percent exceedance percentage (AB411) to section 3.3 of the Listing Policy.

6. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 44399, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Silver Strand Beach (bayside)

LOE ID:	27318
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	169
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from May 1999 through December 2007. A total of 169 single samples were collected with no sample exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Silver Strand State Beach(bayside), San Diego, California. Station identification number is EH-090.
Temporal Representation:	Samples were collected from May 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44399, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Silver Strand Beach (bayside)

LOE ID:	75641
Pollutant:	Total Coliform

LOE Subgroup:	Pollutant-Water	034835
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	18	
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Zero of the 18 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at the Silver Strand (bayside) site.	
Temporal Representation:	Samples were collected from April 2008 to September 2008.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44399, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Silver Strand Beach (bayside)

LOE ID:	27316
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	205
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from May1999 through December 2007. A total of 205 single samples were collected with no samples exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental

Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Silver Strand State Beach(bayside), San Diego, California. Station identification number is EH-090.
Temporal Representation:	Samples were collected from May 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44399, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Silver Strand Beach (bayside)

LOE ID:	31323
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	43
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from May 1999 through October 2007. A total of 163 dry month (April through October) single samples were collected with 43 dry month geomeans calculated. None of the 43 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Silver Strand State Beach(bayside), San Diego, California. Station identification number is EH-090.
Temporal Representation:	Samples were collected from May 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44399, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Silver Strand Beach (bayside)

LOE ID:	30776
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	165
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from May 1999 through December 2007. A total of 169 single samples were collected of which 165 are dry weather (AB411) samples with no sample exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Silver Strand State Beach(bayside), San Diego, California. Station identification number is EH-090.
Temporal Representation:	Samples were collected from May 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44399, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Silver Strand Beach (bayside)

LOE ID:	30675
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	203
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from May 1999 through December 2007. A total of 207 single samples were collected of which 203 are dry weather (AB411) samples with no samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program,

	2007. AB 411 monitoring data 1999 to 2007	034838

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Silver Strand State Beach (bayside), San Diego, California. Station identification number is EH-090.
Temporal Representation:	Samples were collected from May 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44399, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Silver Strand Beach (bayside)

LOE ID:	75638
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	18
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 18 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Silver Strand (bayside) site.
Temporal Representation:	Samples were collected from April 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44399, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Silver Strand Beach (bayside) 034839

LOE ID:	75639
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	18
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 18 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Silver Strand (bayside) site.
Temporal Representation:	Samples were collected from April 2008 to September 2008.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44399, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Silver Strand Beach (bayside)

LOE ID:	75640
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	22
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed bw data for San Diego Bay Shoreline, at Silver Strand Beach (bayside) to determine beneficial use support and results are as follows: 0 of 22 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The Water Quality Control Plan (Basin Plan 2011)states the following: At all areas where shellfish may be harvested for human consumption, ten percent of the samples collected during any 30-day period shall not exceed 230 MPN/100mL.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego Bay Shoreline, at Silver Strand Beach (bayside) was collected at 1 monitoring site [Silver Strand (bayside)]
Temporal Representation:	Data was collected over the time period 4/2/2008-9/17/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44399, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Silver Strand Beach (bayside)

LOE ID:	31324
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	54
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from May 1999 through October 2007. A total of 198 dry month (April through October) single samples were collected with 54 dry month geomeans calculated. None of the 54 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Silver Strand State Beach(bayside), San Diego, California. Station identification number is EH-090.
Temporal Representation:	Samples were collected from May 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44399, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Silver Strand Beach (bayside)

LOE ID:	30882

Pollutant:	Total Coliform	034841
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	200	
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from May1999 through December 2007. A total of 205 single samples were collected of which 200 are dry weather (AB411) samples and none of those samples exceeded the single sample water quality objective.	
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Silver Strand State Beach(bayside), San Diego, California. Station identification number is EH-090.	
Temporal Representation:	Samples were collected from May 1999 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44399, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Silver Strand Beach (bayside)

LOE ID:	77697
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	18
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Zero of the eighteen samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.

SWAMP Data:	Non-SWAMP	034842
Water Quality Objective/Criterion:	The Water Quality Control Plan for the San Diego BasinÂ states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected at San Diego Bay Shoreline, at Silver Strand Beach (bayside).	
Temporal Representation:	The samples were collected from April 2008 to September 2008.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the beach watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44399, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Silver Strand Beach (bayside)

LOE ID:	29808
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were no beach advisory days for this section of shoreline. Bacteriological samples are collected on a weekly basis at ocean and bay locations in San Diego County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that an advisory for waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 - December 2007. Data used was the number of days the beach was advisories were issued when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005.

	Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency 034843
Spatial Representation:	Beach advisories were from Glorietta Bay located in San Diego Bay.
Temporal Representation:	The beach advisories covers the time frame of January January 2001 to December 2007.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of San Diego's Quality Assessment/Quality Control document
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44399, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Silver Strand Beach (bayside)

LOE ID:	31322
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	54
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from May 1999 through October 2007. A total of 200 dry month (April through October) single samples were collected with 54 dry month geomeans calculated. None of the 54 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Silver Strand State Beach(bayside), San Diego, California. Station identification number is EH-090.
Temporal Representation:	Samples were collected from May 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44399, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Silver Strand Beach (bayside)

LOE ID:	27315

Pollutant:	Total Coliform	034844
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Shellfish Harvesting	
Number of Samples:	5	
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from May 1999 through December 2007. A total of 205 single samples were collected with 5 samples correlated with a storm event. None of the 5 samples exceeded the single sample water quality objective.	
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Silver Strand State Beach(bayside), San Diego, California. Station identification number is EH-090.	
Temporal Representation:	Samples were collected from May 1999 through December 2007.	
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. Bacteria monitoring data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44399, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Silver Strand Beach (bayside)

LOE ID:	27314
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	205
Number of Exceedances:	16
Data and Information Type:	PWS pathogen monitoring (ambient water)

Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from May 1999 through December 2007. A total of 205 single samples were collected with 16 samples exceeded the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Silver Strand State Beach(bayside), San Diego, California. Station identification number is EH-090.
Temporal Representation:	Samples were collected from May 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44399, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Silver Strand Beach (bayside)

LOE ID:	27321
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from May 1999 through December 2007. A total of 207 single samples were collected with four samples correlated with a storm event. None of the four samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	

Guideline Reference:	034846
Spatial Representation:	Samples were collected at Silver Strand State Beach(bayside), San Diego, California. Station identification number is EH-090.
Temporal Representation:	Samples were collected from May 1999 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. Bacteria monitoring data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44399, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Silver Strand Beach (bayside)

LOE ID:	27320
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	207
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from May 1999 through December 2007. A total of 207 single samples were collected with no samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Silver Strand State Beach (bayside), San Diego, California. Station identification number is EH-090.
Temporal Representation:	Samples were collected from May 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44399, Indicator Bacteria 034847 Region 9

San Diego Bay Shoreline, at Silver Strand Beach (bayside)

LOE ID:	27319
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from May 1999 through December 2007. A total of 169 single samples were collected with four samples correlated with a storm event. None of the samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Silver Strand State Beach(bayside), San Diego, California. Station identification number is EH-090.
Temporal Representation:	Samples were collected from May 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44399, Indicator Bacteria Region 9

San Diego Bay Shoreline, at Silver Strand Beach (bayside)

LOE ID:	27324
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	71
Number of Exceedances:	6

Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from May 1999 through December 2007. A total of 207 single samples were collected with 71 monthly geomeans calculated. Six of the 71 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Silver Strand State Beach(bayside), San Diego, California. Station identification number is EH-090.
Temporal Representation:	Samples were collected from May 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44399, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Silver Strand Beach (bayside)

LOE ID:	27323
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	71
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from May 1999 through December 2007. A total of 169 single samples were collected and 71 geomeans calculated. None of the 71 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:	034849
Guideline Reference:	
Spatial Representation:	Samples were collected at Silver Strand State Beach(bayside), San Diego, California. Station identification number is EH-090.
Temporal Representation:	Samples were collected from May 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44399, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Silver Strand Beach (bayside)

LOE ID:	27322
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	71
Number of Exceedances:	6
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from May 1999 through December 2007. A total of 205 single samples were collected with 71 monthly geomeans calculated. Six of the 71 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Silver Strand State Beach(bayside), San Diego, California. Station identification number is EH-090.
Temporal Representation:	Samples were collected from May 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44399, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, at Silver Strand Beach (bayside)

LOE ID:	27317

Pollutant:	Total Coliform	034850
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	5	
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from May 1999 through December 2007. A total of 205 single samples were collected with 5 samples correlated with a storm event. None of the 5 samples exceeded the single sample water quality objective.	
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Silver Strand State Beach (bayside), San Diego, California. Station identification number is EH-090.	
Temporal Representation:	Samples were collected from May 1999 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: San Diego Bay Shoreline, at Coronado Cays
Water Body ID: CAB910100002004120919185 2
Water Body Type: Bay & Harbor

DECISION ID 33341 **Region 9**
San Diego Bay Shoreline, at Coronado Cays

Pollutant: Copper
Final Listing Decision: List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: List on 303(d) list (TMDL required list)(2012)
Revision Status Original
Sources: Source Unknown
Expected TMDL Completion Date: 2019
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. An adequate number of samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements in section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Seven of 8 samples exceeded the 3.1 ppb CTR chronic saltwater criteria and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33341, Copper **Region 9**
San Diego Bay Shoreline, at Coronado Cays

LOE ID: 338

Pollutant: Copper
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Dissolved

Beneficial Use:	Estuarine Habitat
Number of Samples:	8
Number of Exceedances:	7
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Seven of 8 samples were in exceedance of the chronic standards. The location with no exceedances was at the Southern-most leg (SDRWQCB, 2004c).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the CTR, the saltwater acute standard for copper is 4.8 ppb and the saltwater chronic standard is 3.1 ppb.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the San Diego Bay shoreline, Coronado Cays, at the Southern-most leg, near Blue Anchor Cays street, next to the causeway, mid-area of Coronado Cays-south of causeway, next to sandy beach; NE leg and at the intersection of two waterways; North end of Cays.
Temporal Representation:	Samples were collected on 05/20/2004.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Imperial Beach Pier
Water Body ID: CAC910100002005091817274 5
Water Body Type: Coastal & Bay Shoreline

DECISION ID 43312 **Region 9**
Pacific Ocean Shoreline, Imperial Beach Pier

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal from the CWA section 303(d) List under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Fifteen lines of evidence are available in the administrative record to assess this pollutant. Including the latest data, 83 of the 331 samples exceed the water quality objective for total coliform of a geomean of 70/100 ml in a 30-day period for the protection of SHELL.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Including the latest data, 83 of the 331 samples exceed the water quality objective for total coliform of a geomean of 70/100 ml in a 30-day period for the protection of SHELL and this exceeds the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 43312, Indicator Bacteria **Region 9**
Pacific Ocean Shoreline, Imperial Beach Pier

LOE ID:	27779
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation	034854
Number of Samples:	30	
Number of Exceedances:	16	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from February 2004 through December 2007. A total of 225 single samples were collected with 30 samples correlating with a storm event. Sixteen of the 30 samples exceeded the single sample water quality objective.	
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at the Imperial Beach Pier, Imperial Beach, California. Department of Environmental Health identification number is EH-030.	
Temporal Representation:	Samples were collected from February 2004 through December 2007.	
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43312, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Imperial Beach Pier

LOE ID:	30571
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	195
Number of Exceedances:	9
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 225 single samples were collected of which 195 are dry weather (AB411) samples with 9 samples exceeding the single sample water quality objective.

Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Imperial Beach Pier, Imperial Beach, California. Department of Environmental Health identification number is EH-030.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43312, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Imperial Beach Pier

LOE ID:	27780
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	44
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 225 single samples were collected with 44 monthly geomeans calculated. Four of the 44 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Imperial Beach Pier, Imperial Beach, California. Department of Environmental Health identification number is EH-030.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.

QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

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Line of Evidence (LOE) for Decision ID 43312, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Imperial Beach Pier

LOE ID:	27771
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	224
Number of Exceedances:	69
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 224 single samples were collected with 69 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Pacific Ocean Shoreline at the Imperial Beach Pier, Imperial Beach, California. Department of Environmental Health identification number is EH-030.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43312, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Imperial Beach Pier

LOE ID:	27772
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	30
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)

Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from February 2004 through December 2007. A total of 224 single samples were collected with 30 samples correlated with a storm event. Four of the 30 samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Imperial Beach Pier, Imperial Beach, California. Department of Environmental Health identification number is EH-030.
Temporal Representation:	Samples were collected from February 2004 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43312, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Imperial Beach Pier

LOE ID:	27777
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	30
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 153 single samples were collected and 30 geomeans calculated. Three of the 30 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005.

	Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Imperial Beach Pier, Imperial Beach, California. Department of Environmental Health identification number is EH-030.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43312, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Imperial Beach Pier

LOE ID:	27778
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	225
Number of Exceedances:	25
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 225 single samples were collected with 25 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Imperial Beach Pier, Imperial Beach, California. Department of Environmental Health identification number is EH-030.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43312, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Imperial Beach Pier

LOE ID:	27776

Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	24
Number of Exceedances:	16
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from February 2004 through December 2007. A total of 153 single samples were collected with 24 samples correlated with a storm event. Sixteen of the 24 samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected atthe Imperial Beach Pier, Imperial Beach, California. Department of Environmental Health identification number is EH-030.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43312, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Imperial Beach Pier

LOE ID:	27768
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	224
Number of Exceedances:	8

Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 224 single samples were collected with eight samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Imperial Beach Pier, Imperial Beach, California. Department of Environmental Health identification number is EH-030.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43312, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Imperial Beach Pier

LOE ID:	27773
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	30
Number of Exceedances:	25
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from February 2004 through December 2007. A total of 224 single samples were collected with 30 samples correlating with a storm event. Twenty five of the 30 samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005). Comparisons are also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental

Protection Agency 034861

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at the Imperial Beach Pier, Imperial Beach, California. Department of Environmental Health identification number is EH-030.

Temporal Representation: Samples were collected from February 2004 through December 2007.

Environmental Conditions: Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.

Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.

QAPP Information: Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.

QAPP Information Reference(s): County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43312, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Imperial Beach Pier

LOE ID: 27774

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 44
Number of Exceedances: 0

Data and Information Type: PWS pathogen monitoring (ambient water)

Data Used to Assess Water Quality: Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 224 single samples were collected with 44 monthly geomeans calculated. None of the 44 geomeans exceeded the geomean water quality objective.

Data Reference: Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: Geomean: Total coliform density shall not exceed 1,000 per 100ml;

Objective/Criterion Reference: Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at the Pacific Ocean Shoreline at the Imperial Beach Pier, Imperial Beach, California. Department of Environmental Health identification number is EH-030.

Temporal Representation: Samples were collected from January 2004 through December 2007.

Environmental Conditions:

QAPP Information: Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.

QAPP Information Reference(s): County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43312, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Imperial Beach Pier

LOE ID:	27775
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	153
Number of Exceedances:	31
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 153 single samples were collected with 31 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Imperial Beach Pier, Imperial Beach, California. Department of Environmental Health identification number is EH-030.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43312, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Imperial Beach Pier

LOE ID:	28246
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were three beach advisory days for this section of shoreline. Bacteriological samples are collected on a weekly basis at

	ocean and bay locations in San Diego County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that an advisory for waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 - December 2007. Data used was the number of days the beach was advisories were issued when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Spatial Representation:	Bacteriological monitoring samples were collected at Imperial Beach Fishing Pier, Imperial Beach, CA.
Temporal Representation:	The beach advisory covers the time frame of January January 2001 to December 2007.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of San Diego's Quality Assessment/Quality Control document
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43312, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Imperial Beach Pier

LOE ID:	31290
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	25
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 195 dry month (April through October) single samples were collected with 25 dry month geomeans calculated. Zero of the 25 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Imperial Beach Pier, Imperial Beach, California. Department of Environmental Health identification number is EH-030.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43312, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Imperial Beach Pier

LOE ID:	31291
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	16
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 68 dry month (April through October) single samples were collected with 16 dry month geomeans calculated. One of the 16 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Imperial Beach Pier, Imperial Beach, California. Department of Environmental Health identification number is EH-030.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43312, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Imperial Beach Pier 034865

LOE ID:	31292
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	25
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 116 dry month (April through October) single samples were collected with 25 dry month geomeans calculated. None of the 25 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Pacific Ocean Shoreline at the Imperial Beach Pier, Imperial Beach, California. Department of Environmental Health identification number is EH-030.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43312, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Imperial Beach Pier

LOE ID:	30807
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	194
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 224 single samples were collected of which 194 are dry weather (AB411) samples with four samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program,

	2007. AB 411 monitoring data 1999 to 2007	034866

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Imperial Beach Pier, Imperial Beach, California. Department of Environmental Health identification number is EH-030.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43312, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Imperial Beach Pier

LOE ID:	30693
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	129
Number of Exceedances:	15
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 153 single samples were collected of which 129 are dry weather (AB411) samples with 15 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Imperial Beach Pier, Imperial Beach, California. Department of Environmental Health identification number is EH-030.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.

QAPP Information Reference(s): County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

034867

Line of Evidence (LOE) for Decision ID 43312, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Imperial Beach Pier

LOE ID:	77623
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	90
Number of Exceedances:	21
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Twenty-one of the 90 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, Imperial Beach Pier at stations Imperial Beach Pier and Imperial Beach Boulevard.
Temporal Representation:	The samples were collected from January 2008 through August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43312, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Imperial Beach Pier

LOE ID:	74856
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	90
Number of Exceedances:	6
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Six of the 90 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.

SWAMP Data:	Non-SWAMP	034868
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at the Imperial Beach Pier site.	
Temporal Representation:	Samples were collected from January 2008 to August 2010.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43312, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Imperial Beach Pier

LOE ID:	74857
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	90
Number of Exceedances:	2
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Two of the 90 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Imperial Beach Pier site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43312, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Imperial Beach Pier

LOE ID:	74877
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting

Number of Samples:	107	034869
Number of Exceedances:	14	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed Beach Watch data for Pacific Ocean Shoreline, Imperial Beach Pier to determine beneficial use support and results are as follows: 14 of 107 samples exceed the criterion for Coliform, Total.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Imperial Beach Pier was collected at 2 monitoring sites [Imperial Beach Boulevard, Imperial Beach Pier]	
Temporal Representation:	Data was collected over the time period 1/17/2008-8/9/2010.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43312, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Imperial Beach Pier

LOE ID:	74878
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	90
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 90 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Imperial Beach Pier site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

DECISION ID 49768 Region 9

Pacific Ocean Shoreline, Imperial Beach Pier

034870

Pollutant:	**Trash**
Final Listing Decision:	**List on 303(d) list (being addressed by action other than TMDL)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected Attainment Date:	2029
Implementation Action Other than TMDL:	Collected effort of public, agencies, organizations, and permittees. Methods include street sweeping, education programs on littering, installation of trash-catching devices on storm drains.
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.7 of the Listing Policy. Under this section when all other listing factors do not result in the listing of a water segment but information indicates non-attainment of standards, a water segment shall be evaluated to determine whether the weight of evidence demonstrates that water quality standard is not attained. If the weight of evidence indicates non-attainment, the water segment shall be placed on the CWA section 303(d) List. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for placing this water segment-pollutant combination from the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The following information indicates that the water quality standard is not being attained: Coastkeeper cleanups occurred on 12/8/07, 12/13/08, and 12/12/09 for this water body. The total weight of trash (lbs) collected on these dates was 592. However, using the metric, Coastkeeper classified this water body as high for trash impairment. However, any trash found is an exceedance and needs to be addressed by an action other than a TMDL. 3. This process is scientifically defensible and reproducible.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 49768, Trash — Region 9

Pacific Ocean Shoreline, Imperial Beach Pier

LOE ID:	74879
Pollutant:	Trash
LOE Subgroup:	Pollutant-Nuisance
Matrix:	Not Recorded
Fraction:	None
Beneficial Use:	Non-Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Occurrence of conditions judged to cause impairment
Data Used to Assess Water Quality:	The San Diego Coastkeeper conducts trash cleanups and uses a metric (pounds of trash collected per volunteer) to compare levels of trash across beaches and categorizes beaches as either low, medium, high or severe, based on this metric. Coastkeeper cleanups occurred on 12/8/07, 12/13/08, and 12/12/09 for this water body. The total weight of trash (lbs) collected on these dates was 592. However, using the metric, Coastkeeper classified this water body as high for trash impairment.
Data Reference:	Data for Trash, Nutrients, and Pathogens in Region 9, 2007-2010.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Floating Material Waters shall not contain floating material, including solids, liquids, foams, and scum in concentrations which cause nuisance or adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Imperial Beach Pier.
Temporal Representation:	Three cleanups occurred on 12/8/07, 12/13/08, and 12/12/09.
Environmental Conditions:	
QAPP Information:	San Diego Coastkeeper QAPP was provided.
QAPP Information Reference(s):	

DECISION ID 33949 Region 9

Pacific Ocean Shoreline, Imperial Beach Pier

Pollutant:	**PCBs (Polychlorinated biphenyls)**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.5 of the Listing Policy. One line of evidence is available in the administrative record to assess this pollutant.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Three of the 4 samples exceeded the OEHHA Screening Value and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33949, PCBs (Polychlorinated biphenyls) Region 9

Pacific Ocean Shoreline, Imperial Beach Pier

LOE ID:	390
Pollutant:	PCBs (Polychlorinated biphenyls)
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Total

Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	4
Number of Exceedances:	3
Data and Information Type:	Fish tissue analysis
Data Used to Assess Water Quality:	Three out of 4 samples exceeded. All 4 samples were filet composites. Two samples of barred surfperch and two of walleye surfperch were collected. All exceeded guideline except one walleye sample (TSMP, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	San Diego RWQCB Basin Plan: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	20 ng/g (OEHHA Screening Value).
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	One station was sampled on the Imperial Beach Pier.
Temporal Representation:	Samples were collected in March 1999 and April 2000.
Environmental Conditions:	
QAPP Information:	CFCP 1998 Year 1 QA Summary - Pesticides and PCBs. California Department of Fish and Game. CDFG Fish and Wildlife Water Pollution Control Laboratory Data Quality Assurance Report. 1999 Coastal Fish Contamination Program (CFCP Year 2). California Department of Fish and Game.
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Aliso Creek (mouth)
Water Body ID: CAE9011300019990208095945
Water Body Type: Estuary

DECISION ID 61526 **Region 9**
Aliso Creek (mouth)

Pollutant: Arsenic
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. Zero of the six samples exceed the OBJECTIVE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of six samples exceeded the OBJECTIVE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 61526, Arsenic **Region 9**
Aliso Creek (mouth)

LOE ID: 72978

Pollutant: Arsenic
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Dissolved

Beneficial Use: Warm Freshwater Habitat

Number of Samples: 6

Number of Exceedances:	0	034874

Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the six samples exceed the criteria for arsenic.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The CTR for arsenic is 150 ug/L.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, Aliso HSA, at Aliso Creek mouth (stations ACM-1 and ACM-1d).
Temporal Representation:	Samples were collected from station, ACM-1 on September and December of 2006 and January of 2008. Samples were collected from station, ACM-1d in October 2007, May and December 2008, and April of 2009.
Environmental Conditions:	Approximately 38% of the samples were collected after a storm event.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID	**47591**	**Region 9**
Aliso Creek (mouth)		

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of 8 samples exceed the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 8 samples exceed the water quality objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47591, Cadmium **Region 9**

Aliso Creek (mouth)

LOE ID:	72980
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the eight samples exceed the hardness adjusted criteria for cadmium.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, Aliso HSA, at Aliso Creek mouth (stations ACM-1 and ACM-1d).
Temporal Representation:	Samples were collected from station, ACM-1 on September and December of 2006 and January of 2008. Samples were collected from station, ACM-1d in October 2007, May and December 2008, and April of 2009.
Environmental Conditions:	Approximately 38% of the samples were collected after a storm event.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID **47592** **Region 9**

Aliso Creek (mouth)

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised

Impairment from Pollutant or Pollution:	Pollutant	034876

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 8 samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 8 samples exceed the water quality objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47592, Chromium **Region 9**

Aliso Creek (mouth)

LOE ID:	72981
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the eight samples exceed the hardness adjusted criteria for chromium.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.

Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, Aliso HSA, at Aliso Creek mouth (stations ACM-1 and ACM-1d).
Temporal Representation:	Samples were collected from station, ACM-1 on September and December of 2006 and January of 2008. Samples were collected from station, ACM-1d in October 2007, May and December 2008, and April of 2009.
Environmental Conditions:	Approximately 38% of the samples were collected after a storm event.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

034877

DECISION ID 47593 Region 9

Aliso Creek (mouth)

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a since line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of 8 samples exceed the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 8 samples exceed the water quality objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47593, Copper Region 9

Aliso Creek (mouth)

LOE ID:	72982
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved

Beneficial Use:	Preservation of Rare & Endangered Species	034878
Number of Samples:	8	
Number of Exceedances:	0	
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)	
Data Used to Assess Water Quality:	None of the eight samples exceed the hardness adjusted criteria for copper.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.	
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Spatial Representation:	Samples were collected fromat Aliso Creek mouth (stations ACM-1 and ACM-1d).	
Temporal Representation:	Samples were collected from station, ACM-1 on September and December of 2006 and January of 2008. Samples were collected from station, ACM-1d in October 2007, May, October and December 2008, and April of 2009.	
Environmental Conditions:	Approximately 38% of the samples were collected after a storm event.	
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.	
QAPP Information Reference(s):		

DECISION ID	47594	Region 9
Aliso Creek (mouth)		

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of 8 samples exceeds the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 8 samples exceeds the water quality objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support

rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47594, Lead **Region 9**
Aliso Creek (mouth)

LOE ID:	72983
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the eight samples exceed the hardness adjusted criteria for lead.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, Aliso HSA, at Aliso Creek mouth (stations ACM-1 and ACM-1d).
Temporal Representation:	Samples were collected from station, ACM-1 on September and December of 2006 and January of 2008. Samples were collected from station, ACM-1d in October 2007, May and December 2008, and April of 2009.
Environmental Conditions:	Approximately 38% of the samples were collected after a storm event.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID 47595 **Region 9**
Aliso Creek (mouth)

Pollutant:	**Nickel**	034880
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	
Last Listing Cycle's Final Listing Decision:	New Decision	
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 8 samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 8 samples exceed the water quality objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47595, Nickel **Region 9**

Aliso Creek (mouth)

LOE ID:	72984
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the eight samples exceed the hardness adjusted criteria for nickel.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, Aliso HSA, at Aliso Creek mouth (stations ACM-1 and ACM-1d).
Temporal Representation:	Samples were collected from station, ACM-1 on September and December of 2006 and January of 2008. Samples were collected from station, ACM-1d in October 2007, May and December 2008, and April of 2009.
Environmental Conditions:	Approximately 38% of the samples were collected after a storm event.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID 47596 Region 9

Aliso Creek (mouth)

Pollutant:	**Selenium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. One of 6 samples exceed the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of 6 samples exceed the water quality objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47596, Selenium Region 9

Aliso Creek (mouth)

LOE ID:	72985
Pollutant:	Selenium

LOE Subgroup:	Pollutant-Water	034882
Matrix:	Water	
Fraction:	Total	
Beneficial Use:	Marine Habitat	
Number of Samples:	6	
Number of Exceedances:	0	
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)	
Data Used to Assess Water Quality:	One of the six samples exceeded the criterion for selenium.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California's Ocean Plan Table B lists 6-month median concentration of 15 ug/L to protect aquatic life in marine waters.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, Aliso HSA, at Aliso Creek mouth (stations ACM-1 and ACM-1d).	
Temporal Representation:	Samples were collected from station, ACM-1 on September and December of 2006 and January of 2008. Samples were collected from station, ACM-1d in October 2007, May and December 2008, and April of 2009.	
Environmental Conditions:	Approximately 38% of the samples were collected after a storm event.	
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.	
QAPP Information Reference(s):		

DECISION ID	47597	Region 9
Aliso Creek (mouth)		

Pollutant:	**Silver**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 8 samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 8 samples exceed the water quality objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.

4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47597, Silver Aliso Creek (mouth) **Region 9**

LOE ID:	72986
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the eight samples exceed the hardness adjusted criteria for silver.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion maximum concentrations for silver to protect aquatic life in freshwater (1-hour average). The dissolved silver criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, Aliso HSA, at Aliso Creek mouth (stations ACM-1 and ACM-1d).
Temporal Representation:	Samples were collected from station, ACM-1 on September and December of 2006 and January of 2008. Samples were collected from station, ACM-1d in October 2007, May and December 2008, and April of 2009.
Environmental Conditions:	Approximately 38% of the samples were collected after a storm event.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID 47598 Aliso Creek (mouth) **Region 9**

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**

Last Listing Cycle's Final Listing Decision:	New Decision	034884
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 8 samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 8 samples exceed the water quality objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47598, Zinc **Region 9**

Aliso Creek (mouth)

LOE ID:	72987
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the eight samples exceed the hardness adjusted criteria for zinc.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness

	dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, Aliso HSA, at Aliso Creek mouth (stations ACM-1 and ACM-1d).
Temporal Representation:	Samples were collected from station, ACM-1 on September and December of 2006 and January of 2008. Samples were collected from station, ACM-1d in October 2007, May and December 2008, and April of 2009.
Environmental Conditions:	Approximately 38% of the samples were collected after a storm event.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID 62899 — Region 9

Aliso Creek (mouth)

Pollutant:	**Toxicity**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2027
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. With the latest data, three of three samples exceed the toxicity criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. With the latest data, three of three samples exceed the criteria for toxicity, and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 62899, Toxicity — Region 9

Aliso Creek (mouth)

LOE ID:	95675
Pollutant:	Toxicity
LOE Subgroup:	Toxicity

Matrix:	Water	034886
Fraction:	None	
Beneficial Use:	Marine Habitat	
Number of Samples:	3	
Number of Exceedances:	3	
Data and Information Type:	TOXICITY TESTING	
Data Used to Assess Water Quality:	Six samples were collected to test for toxicity. Three of the nine samples exhibited statistically and biologically significant toxicity. The toxicity tests that exhibited significant toxicity included Mysid biomass and survival and Purple Urchin development and fertilization.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control. Additionally, the biological significance of the sample was evaluted by determining whether the sample response was lower than the evaluation threshold.	
Guideline Reference:		
Spatial Representation:	The samples were collected at station ACM1 in the ocean close to Aliso Creek Mouth.	
Temporal Representation:	The samples were collected from September 2006 to January 2008.	
Environmental Conditions:		
QAPP Information:	The data collected under the Quality Assurance Management Plan for The Orange County Stormwater Program. The SWAMP measurement quality objectives were followed for toxicity data. The performance of toxicity bioassays and evaluation of reference toxicants were performed using USEPA and Standard Methods.	
QAPP Information Reference(s):		

DECISION ID	**34761**	**Region 9**
Aliso Creek (mouth)		

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (being addressed by USEPA approved TMDL)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
TMDL Name:	Bacteria Impaired Waters I (creeks and beach shorelines)
TMDL Project Code:	169
Date TMDL Approved by USEPA:	06/22/2011
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	303(d) listing decisions made prior to 2006 were not held in an assessment database. The Regional Boards will update this decision when new data and information become available and are assessed.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Aliso Creek (mouth)

LOE ID:	4443
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Water Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	Unspecified
Guideline Reference:	Placeholder reference pre-2006 303(d)
Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: San Juan Creek (mouth)
Water Body ID: CAE9012000019990208150457
Water Body Type: Estuary

DECISION ID 62982 **Region 9**
San Juan Creek (mouth)

Pollutant: **Selenium**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 one line(s) of evidence are necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of five samples exceed the water quality criteria for Se for the protection of marine aquatic life.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of five samples exceeded the water quality criteria for Se for the protection of marine aquatic life, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to [SECTION 3.11/4.11] of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 62982, Selenium **Region 9**
San Juan Creek (mouth)

LOE ID: 95676

Pollutant: Selenium
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Dissolved

Beneficial Use: Marine Habitat

Number of Samples:	5	034889
Number of Exceedances:	0	
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)	
Data Used to Assess Water Quality:	None of the five samples exceeded the water quality objective.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California's Ocean Plan Table B lists 6-month median concentration of 15 ug/L to protect aquatic life in marine waters.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from SJC-1 on the Pacific Coast at the mouth of San Juan Creek.	
Temporal Representation:	Samples were collected from SJC-1 on 12/27/06, 10/10/07, 1/24/08, 5/13/08 and 9/30/08	
Environmental Conditions:	Samples were collected from stormwater runoff on 12/27/06 and 1/24/08, the remainder were dry weather samples.	
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.	
QAPP Information Reference(s):		

DECISION ID 62916 Region 9

San Juan Creek (mouth)

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the four samples exceed the CRITERIA. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of four samples exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 62916, Arsenic Region 9

San Juan Creek (mouth) 034890

LOE ID:	95672
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Marine Habitat
Aquatic Life Use:	Wildlife Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Orange County Public Works
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	
Water Quality Objective/Criterion:	Marine Communities shall not be degraded (2009 California Ocean Plan)
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	Califoria's Ocean Plan, Table B, 6-month median concentration, shall not exceed 8 ug/L.
Guideline Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Spatial Representation:	Samples collected from SJC-1 at San Juan Creek mouth.
Temporal Representation:	Samples collected from 12/2006-9/2008.
Environmental Conditions:	
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID **62918** **Region 9**

San Juan Creek (mouth)

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

[One line of evidence is available in the administrative record to assess this pollutant. Zero of the five samples exceed the GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of five samples exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.

4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 62918, Chlorpyrifos **Region 9**

San Juan Creek (mouth)

LOE ID:	95665
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Marine Habitat
Aquatic Life Use:	Wildlife Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Zero of the five samples exceeded the Criteria Continuous Concentration for Chlorpyrifos of 9 ng/L. The reporting limit for the non-detect sample was 10 ng/L which is greater than the evaluation guideline, therefore these data are not of sufficient resolution to determine if water quality standards are being achieved.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Marine communities, including vertebrate, invertebrate, and plant species, shall not be degraded. (2009 CA Ocean Plan)
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The Criteria Continuous Concentration (four day average) for chlorpyrifos in saltwater is 9 ng/L.
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game
Spatial Representation:	Samples were collected at San Juan Creek mouth at SJC1.
Temporal Representation:	Samples were collected at SJC1 in 12/2006 - 9/2008.
Environmental Conditions:	According to the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010, samples were collected during the dry season and storm events.
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

DECISION ID **62919** **Region 9**

San Juan Creek (mouth)

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final	New Decision

Listing Decision:		034892
Revision Status	Original	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. One of the five samples exceed the CRITERIA.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of five samples exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 62919, Chromium **Region 9**

San Juan Creek (mouth)

LOE ID:	95670
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Marine Habitat
Aquatic Life Use:	Wildlife Habitat
Number of Samples:	5
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Orange County Public Works
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	
Water Quality Objective/Criterion:	Marine Communities shall not be degraded (2009 California Ocean Plan)
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	Califoria's Ocean Plan, Table B, 6-month median concentration, shall not exceed 2 ug/L.
Guideline Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Spatial Representation:	Samples collected from SJC-1 at San Juan Creek mouth.
Temporal Representation:	Samples collected from 12/2006-9/2008.
Environmental Conditions:	
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality

QAPP Information Reference(s): Assurance Management Plan for the Orange County Stormwater Program034893

DECISION ID	62921	Region 9
San Juan Creek (mouth)		

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the five samples exceed the GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of five samples exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 62921, Diazinon	**Region 9**
San Juan Creek (mouth)	

LOE ID:	95664
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Marine Habitat
Aquatic Life Use:	Wildlife Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Zero of five samples exceed the maximum concentration for Diazinon criteria of 820.0 ng/L.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Marine communities, including vertebrate, invertebrate, and plant species, shall not be degraded. (2009 CA Ocean Plan)
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The Criteria Continuous Concentration for diazinon in saltwater is 820 ng/L.
Guideline Reference:	Aquatic Life Ambient Water Quality Criteria for Diazinon
Spatial Representation:	One sample was collected at San Juan Creek mouth, at SJC1.
Temporal Representation:	Samples were collected from 12/2006-9/2008.
Environmental Conditions:	According to the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010, samples were collected during the dry season and storm events.
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

DECISION ID 62923 Region 9

San Juan Creek (mouth)

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. One of the five samples exceed the CRITERIA. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of five samples exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 62923, Lead Region 9

San Juan Creek (mouth)

LOE ID:	95663
Pollutant:	Lead

LOE Subgroup:	Pollutant-Water	034895
Matrix:	Water	
Fraction:	Dissolved	
Beneficial Use:	Marine Habitat	
Aquatic Life Use:	Wildlife Habitat	
Number of Samples:	5	
Number of Exceedances:	1	
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)	
Data Used to Assess Water Quality:	One of the five samples exceeded the water quality objective.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California's Ocean Plan Table B lists 6-month median concentration of 2 ug/L to protect aquatic life in marine waters.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The sample was collected from SJC-1 at the mouth of San Juan Creek.	
Temporal Representation:	The sample was collected from SJC-1 from 12/2006 - 9/2008.	
Environmental Conditions:		
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.	
QAPP Information Reference(s):		

DECISION ID	**62924**	**Region 9**
San Juan Creek (mouth)		

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. One of the five samples exceed the GUIDELINE. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of five samples exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision	After review of the available data and information, RWQCB staff concludes that the water body-

Recommendation: pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 62924, Malathion **Region 9**

San Juan Creek (mouth)

LOE ID:	95662
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Marine Habitat
Aquatic Life Use:	Wildlife Habitat
Number of Samples:	5
Number of Exceedances:	1
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	One of five samples exceeded the maximum concentration for Malathion of 100 ng/L.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Marine communities, including vertebrate, invertebrate, and plant species, shall not be degraded. (2009 CA Ocean Plan)
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The maximum (Instantaneous) concentration for Malathion in saltwater is 100 ng/L.
Guideline Reference:	Quality Criteria for Water. USEPA Office of Water and Hazardous Materials. Washington, D.C
Spatial Representation:	Five samples were collected at San Juan Creek (mouth) at SJC1.
Temporal Representation:	Five samples were collected at SJC-1 in December 2006 - September 2008.
Environmental Conditions:	According to the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010, samples were collected during the dry season and storm events.
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

DECISION ID **62942** **Region 9**

San Juan Creek (mouth)

Pollutant:	**Silver**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the five

samples exceed the CRITERIA. 034897

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of five samples exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 62942, Silver **Region 9**
San Juan Creek (mouth)

LOE ID:	95668
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Marine Habitat
Aquatic Life Use:	Wildlife Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the five samples exceeded the water quality objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California's Ocean Plan Table B lists 6-month median concentration of 0.7 ug/L to protect aquatic life in marine waters.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from SJC-1 at the mouth of San Juan Creek.
Temporal Representation:	Samples were collected from SJC-1 on 12/2006-9/2008.
Environmental Conditions:	
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID 62945 **Region 9**
San Juan Creek (mouth)

Pollutant:	**Zinc**	034898
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	
Last Listing Cycle's Final Listing Decision:	New Decision	
Revision Status	Original	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the five samples exceed the CRITERIA.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of five samples exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 62945, Zinc **Region 9**

San Juan Creek (mouth)

LOE ID:	95669
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Marine Habitat
Aquatic Life Use:	Wildlife Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Zero of the five sample exceeded the water quality objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California's Ocean Plan Table B lists 6-month median concentration of 20 ug/L to protect aquatic life in marine waters.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected from SJC-1 at the mouth of San Juan Creek. 034899
Temporal Representation:	Samples were collected from SJC-1 on 12/2006-9/2008..
Environmental Conditions:	Samples were collected from stormwater runoff on 12/27/06 and 1/24/08, the remainder were dry weather samples.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID **62917** **Region 9**

San Juan Creek (mouth)

Pollutant:	**Cadmium**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence are available in the administrative record to assess this pollutant. Two of the five samples exceed the CRITERIA. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Two of five samples exceed the CRITERIA and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 62917, Cadmium **Region 9**

San Juan Creek (mouth)

LOE ID:	95666
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Marine Habitat
Aquatic Life Use:	Wildlife Habitat
Number of Samples:	5
Number of Exceedances:	2

Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Two of the five samples exceeded the water quality objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California's Ocean Plan Table B lists 6-month median concentration of 1 ug/L to protect aquatic life in marine waters.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from SJC-1 at the mouth of San Juan Creek.
Temporal Representation:	Five samples were collected from SJC-1 on 12/2006-9/2008.
Environmental Conditions:	
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID 62920 Region 9

San Juan Creek (mouth)

Pollutant:	**Copper**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Two of the five samples exceed the CRITERIA. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Two of five samples exceed the CRITERIA and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 62920, Copper Region 9

San Juan Creek (mouth)

LOE ID:	95671
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Marine Habitat
Aquatic Life Use:	Wildlife Habitat
Number of Samples:	5
Number of Exceedances:	2
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Orange County Public Works
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	
Water Quality Objective/Criterion:	Marine Communities shall not be degraded (2009 California Ocean Plan)
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	Califoria's Ocean Plan, Table B, 6-month median concentration, shall not exceed 3 ug/L.
Guideline Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Spatial Representation:	Samples collected from SJC-1 at San Juan Creek mouth.
Temporal Representation:	Samples collected from 12/2006-9/2008.
Environmental Conditions:	
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID	62927	Region 9
San Juan Creek (mouth)		

Pollutant:	**Nickel**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

[NUMBER] lines of evidence are available in the administrative record to assess this pollutant. Five of the five samples exceed the CRITERIA.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Five of five samples exceed the CRITERIA and this exceeds the allowable frequency listed in Table

3.1 of the Listing Policy. 034902
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 62927, Nickel **Region 9**

San Juan Creek (mouth)

LOE ID:	95667
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Marine Habitat
Aquatic Life Use:	Wildlife Habitat
Number of Samples:	5
Number of Exceedances:	5
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Five of the five samples exceeded the water quality objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California's Ocean Plan Table B lists 6-month median concentration of 5 ug/L total nickel to protect aquatic life in marine waters.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from SJC-1 at the mouth of San Juan Creek.
Temporal Representation:	Samples were collected from SJC-1 on 12/2006 - 9/2008.
Environmental Conditions:	Samples were collected from stormwater runoff on 12/27/06 and 1/24/08, the remainder were dry weather samples.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID **62928** **Region 9**

San Juan Creek (mouth)

Pollutant:	**Nitrogen, ammonia (Total Ammonia)**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Six of the six samples exceed the OBJECTIVE. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Six of six samples exceed the OBJECTIVE and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 62928, Nitrogen, ammonia (Total Ammonia) **Region 9**

San Juan Creek (mouth)

LOE ID:	95661
Pollutant:	Nitrogen, ammonia (Total Ammonia)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Marine Habitat
Aquatic Life Use:	Wildlife Habitat
Number of Samples:	6
Number of Exceedances:	6
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Six of six sample medians exceeded the water quality objective for total ammonia.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Basin Plan, Objectives for inland waters, including coastal lagoons
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	0.025 mg/L NH3 as N
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at station SJC1.
Temporal Representation:	Samples were collected from December 2006 to September 2008.
Environmental Conditions:	
QAPP Information:	A signed QAPP was included with the stated goal of ensuring the consistent collection of accurate water quality information that will used to satisfy the objectives of the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID **34549** **Region 9**

San Juan Creek (mouth) 034904

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (being addressed by USEPA approved TMDL)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
TMDL Name:	Bacteria Impaired Waters I (creeks and beach shorelines)
TMDL Project Code:	169
Date TMDL Approved by USEPA:	06/22/2011
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	303(d) listing decisions made prior to 2006 were not held in an assessment database. The Regional Boards will update this decision when new data and information become available and are assessed.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34549, Indicator Bacteria — Region 9

San Juan Creek (mouth)

LOE ID:	4727
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Water Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	Unspecified
Guideline Reference:	Placeholder reference pre-2006 303(d)
Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Santa Margarita Lagoon
Water Body ID: CAE9021100019990209155924
Water Body Type: Estuary

DECISION ID 34567 **Region 9**
Santa Margarita Lagoon

Pollutant:	**Eutrophic**
Final Listing Decision:	**Do Not Delist from 303(d) list (being addressed with action other than TMDL)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Agriculture-storm runoff
Expected Attainment Date:	2027
Implementation Action Other than TMDL:	Active stake holder process ongoing to address the pollutant.
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2014 or 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. 303(d) listing decisions made prior to 2006 were not held in an assessment database. The Regional Boards will update this decision when new data and information become available and are assessed.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34567, Eutrophic **Region 9**
Santa Margarita Lagoon

LOE ID:	4730
Pollutant:	Eutrophic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Estuarine Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified

Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)	034906

Evaluation Guideline: Unspecified
Guideline Reference: Placeholder reference pre-2006 303(d)

Spatial Representation: Unspecified
Temporal Representation: Unspecified
Environmental Conditions: Unspecified
QAPP Information: Unspecified
QAPP Information Reference(s):

DECISION ID 47977 Region 9
Santa Margarita Lagoon

Pollutant: **2-Methylnaphthalene**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the objective. Zero of one samples exhibited sediment toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the one sample exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47977, 2-Methylnaphthalene Region 9
Santa Margarita Lagoon

LOE ID: 78327

Pollutant: 2-Methylnaphthalene
LOE Subgroup: Pollutant-Sediment
Matrix: Sediment
Fraction: Total

Beneficial Use: Estuarine Habitat

Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Santa Margarita Lagoon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for 2-Methylnaphthalene.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for 2-Methylnaphthalene is 201.28 ng/g dry weight (MacDonald et al., 1996).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for Santa Margarita Lagoon was collected at 1 monitoring site [902_6308]
Temporal Representation:	Data was collected on a single day 8/29/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID	**47980**	**Region 9**
Santa Margarita Lagoon		

Pollutant:	**Antimony**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the objective. Zero of one samples exhibited sediment toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the one sample exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47980, Antimony **Region 9**

Santa Margarita Lagoon

LOE ID:	78329
Pollutant:	Antimony
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Santa Margarita Lagoon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Antimony.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Antimony is 25 ug/g dry weight (Long and Morgan, 1990).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for Santa Margarita Lagoon was collected at 1 monitoring site [902_6308]
Temporal Representation:	Data was collected on a single day 8/29/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID **47990** **Region 9**

Santa Margarita Lagoon

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing

status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the objective. Zero of one samples exhibited sediment toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the one sample exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47990, Arsenic **Region 9**

Santa Margarita Lagoon

LOE ID:	78330
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Santa Margarita Lagoon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Arsenic is 70 ug/g dry weight (Long et al., 1995).
Guideline Reference:	Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuary sediments. Environmental Management. 19, (1): 81-97
Spatial Representation:	Data for this line of evidence for Santa Margarita Lagoon was collected at 1 monitoring site [902_6308]
Temporal Representation:	Data was collected on a single day 8/29/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.

QAPP Information Reference(s): Quality Assurance Project Plan from Southern California Bight. 034910

DECISION ID	48004	Region 9
Santa Margarita Lagoon		

Pollutant:	**Benzo(a)anthracene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the objective. Zero of one samples exhibited sediment toxicity. Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the one sample exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48004, Benzo(a)anthracene	**Region 9**
Santa Margarita Lagoon	

LOE ID:	78331
Pollutant:	Benzo(a)anthracene
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Santa Margarita Lagoon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Benzo(a)anthracene.
Data Reference:	Data for Various Pollutants from Bight, 2008.

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for Benzo(a)anthracene is 692.53 ng/g dry weight (MacDonald et al., 1996).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for Santa Margarita Lagoon was collected at 1 monitoring site [902_6308]
Temporal Representation:	Data was collected on a single day 8/29/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID 48011 Region 9

Santa Margarita Lagoon

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the objective. Zero of one samples exhibited sediment toxicity. Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the one sample exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48011, Cadmium Region 9

Santa Margarita Lagoon 034912

LOE ID:	78334
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Santa Margarita Lagoon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for Cadmium is 4.21 ng/g dry weight (MacDonald et al., 1996).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for Santa Margarita Lagoon was collected at 1 monitoring site [902_6308]
Temporal Representation:	Data was collected on a single day 8/29/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID **48012** **Region 9**

Santa Margarita Lagoon

Pollutant:	**Chlordane**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the objective. Zero of one samples exhibited sediment toxicity. Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the one sample exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48012, Chlordane **Region 9**

Santa Margarita Lagoon

LOE ID:	78335
Pollutant:	Chlordane
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Santa Margarita Lagoon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chlordane, Total.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Total Chlordane is 6 ng/g dry weight (Long and Morgan, 1990).
Guideline Reference:	The potential for biological effects of sediment-sorbed contaminants tested in the National Status of Trends Program. NOAA Technical Memorandum NOS OMA 52. Seattle, WA: National Oceanic and Atmospheric Administration
Spatial Representation:	Data for this line of evidence for Santa Margarita Lagoon was collected at 1 monitoring site [902_6308]
Temporal Representation:	Data was collected on a single day 8/29/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID **48013** **Region 9**

Santa Margarita Lagoon

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the objective. Zero of one samples exhibited sediment toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the one sample exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48013, Chromium **Region 9**

Santa Margarita Lagoon

LOE ID:	78336
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Santa Margarita Lagoon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Chromium is 370 ug/g dry weight (Long et al., 1995).
Guideline Reference:	Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuary sediments. Environmental Management. 19, (1): 81-97
Spatial Representation:	Data for this line of evidence for Santa Margarita Lagoon was collected at 1 monitoring site [902_6308]
Temporal Representation:	Data was collected on a single day 8/29/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID 48016 Region 9

Santa Margarita Lagoon

Pollutant:	**Chrysene (C1-C4)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the objective. Zero of one samples exhibited sediment toxicity. Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the one sample exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48016, Chrysene (C1-C4) Region 9

Santa Margarita Lagoon

LOE ID:	78337
Pollutant:	Chrysene (C1-C4)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total

Beneficial Use:	Estuarine Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Santa Margarita Lagoon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chrysene.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for Chrysene is 845.98 ng/g dry weight (MacDonald et al., 1996).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for Santa Margarita Lagoon was collected at 1 monitoring site [902_6308]
Temporal Representation:	Data was collected on a single day 8/29/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID **48110** **Region 9**

Santa Margarita Lagoon

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the objective. Zero of one samples exhibited sediment toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the one sample exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available

indicating that standards are not met. 034917

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48110, Copper **Region 9**

Santa Margarita Lagoon

LOE ID:	78338
Pollutant:	Copper
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Santa Margarita Lagoon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Copper is 270 ug/g dry weight (Long et al., 1995).
Guideline Reference:	Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuary sediments. Environmental Management. 19, (1): 81-97
Spatial Representation:	Data for this line of evidence for Santa Margarita Lagoon was collected at 1 monitoring site [902_6308]
Temporal Representation:	Data was collected on a single day 8/29/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID **48129** **Region 9**

Santa Margarita Lagoon

Pollutant:	**Dibenz[a,h]anthracene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing

status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the objective. Zero of one samples exhibited sediment toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the one sample exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48129, Dibenz[a,h]anthracene **Region 9**

Santa Margarita Lagoon

LOE ID:	78339
Pollutant:	Dibenz[a,h]anthracene
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Santa Margarita Lagoon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Dibenzo(a, h)anthracene.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Dibenzo(a, h)anthracene is 260 ng/g dry weight (Long et al., 1995).
Guideline Reference:	Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuary sediments. Environmental Management. 19, (1): 81-97
Spatial Representation:	Data for this line of evidence for Santa Margarita Lagoon was collected at 1 monitoring site [902_6308]
Temporal Representation:	Data was collected on a single day 8/29/2008.

Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID 48130 Region 9

Santa Margarita Lagoon

Pollutant:	**Endrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the objective. Zero of one samples exhibited sediment toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the one sample exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48130, Endrin Region 9

Santa Margarita Lagoon

LOE ID:	78340
Pollutant:	Endrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Santa Margarita Lagoon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Endrin.

Data Reference:	Data for Various Pollutants from Bight, 2008.	034920
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In marine and estuarine sediments the sediment quality guideline (predictive of sediment toxicity for sediment-dwelling organisms) for Endrin is 0.76 ug/g oc (Fairey et al., 2001).	
Guideline Reference:	Technical basis for deriving sediment criteria for nonionic organic contaminants for the protection of benthic organisms by using equilibrium partitioning. EPA822-R-93-011. Washington, D.C.: Office of Water, USEPA	
Spatial Representation:	Data for this line of evidence for Santa Margarita Lagoon was collected at 1 monitoring site [902_6308]	
Temporal Representation:	Data was collected on a single day 8/29/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.	

DECISION ID	50566	Region 9
Santa Margarita Lagoon		

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Four lines of evidence are available in the administrative record to assess this pollutant. Zero of the One samples exceed the contact recreation objective for Enterococcus, Zero out of one samples exceeded the contact and non contact recreation objective for Fecal Coliform, and Zero out of one samples exceeded the contact recreation objective for Total Coliform. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the One samples exceed the contact recreation objective for Enterococcus, Zero out of one samples exceeded the contact and non contact recreation objective for Fecal Coliform, and Zero out of one samples exceeded the contact recreation objective for Total Coliform and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50566, Indicator Bacteria **Region 9**

Santa Margarita Lagoon

LOE ID:	76468
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Santa Margarita Lagoon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the total coliform concentration shall not exceed 10000 MPN/100 ml (California Ocean Plan 2009).
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita Lagoon was collected at 1 monitoring site [Santa Margarita Estuary]
Temporal Representation:	Data was collected on a single day 8/29/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 50566, Indicator Bacteria **Region 9**

Santa Margarita Lagoon

LOE ID:	76484
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Non-Contact Recreation
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Santa Margarita Lagoon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Coliform, Fecal.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	In waters designated for non contact recreation (REC 2), the fecal coliform concentration shall not exceed 4000 MPN/100 ml (Basin Plan).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita Lagoon was collected at 1 monitoring site [Santa Margarita Estuary]
Temporal Representation:	Data was collected on a single day 8/29/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 50566, Indicator Bacteria **Region 9**

Santa Margarita Lagoon

LOE ID:	76460
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Santa Margarita Lagoon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Coliform, Fecal.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the fecal coliform concentration shall not exceed 400 MPN/100 ml.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita Lagoon was collected at 1 monitoring site [Santa Margarita Estuary]
Temporal Representation:	Data was collected on a single day 8/29/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 50566, Indicator Bacteria **Region 9**

Santa Margarita Lagoon

LOE ID:	76483
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Santa Margarita Lagoon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Enterococci.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Samples shall not exceed 104 organisms per 100 ml for enterococcus in waters designated for REC I beneficial use (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita Lagoon was collected at 1 monitoring site [Santa Margarita Estuary]
Temporal Representation:	Data was collected on a single day 8/29/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID **48133** **Region 9**

Santa Margarita Lagoon

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the objective. Zero of one samples exhibited sediment toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the one sample exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision

After review of the available data and information, RWQCB staff concludes that the water body-

Recommendation:	pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48133, Lead **Region 9**

Santa Margarita Lagoon

LOE ID:	78305
Pollutant:	Lead
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Santa Margarita Lagoon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for Lead is 112.18 ug/g dry weight (MacDonald et al., 1996).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for Santa Margarita Lagoon was collected at 1 monitoring site [902_6308]
Temporal Representation:	Data was collected on a single day 8/29/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID **48137** **Region 9**

Santa Margarita Lagoon

Pollutant:	**Lindane/gamma Hexachlorocyclohexane (gamma-HCH)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the objective. Zero of one samples exhibited sediment toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the one sample exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48137, Lindane/gamma Hexachlorocyclohexane (gamma-HCH) **Region 9**

Santa Margarita Lagoon

LOE ID:	78306
Pollutant:	Lindane/gamma Hexachlorocyclohexane (gamma-HCH)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Santa Margarita Lagoon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for HCH, Gamma.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the sediment quality guideline (predictive of sediment toxicity for sediment-dwelling organisms) for HCH, gamma(Lindane; BHC, gamma) is 0.37 ug/g oc (Fairey et al., 2001).
Guideline Reference:	An evaluation of methods for calculating mean sediment quality guideline quotients as indicators of contamination and acute toxicity to amphipods by chemical mixtures. Environmental Toxicology and Chemistry. 20(10): 2276-2286
Spatial Representation:	Data for this line of evidence for Santa Margarita Lagoon was collected at 1 monitoring site [902_6308]
Temporal Representation:	Data was collected on a single day 8/29/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.

QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was found.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID **48138** **Region 9**

Santa Margarita Lagoon

Pollutant:	**Mercury**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the objective. Zero of one samples exhibited sediment toxicity. Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the one sample exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48138, Mercury **Region 9**

Santa Margarita Lagoon

LOE ID:	78308
Pollutant:	Mercury
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Santa Margarita Lagoon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Mercury.
Data Reference:	Data for Various Pollutants from Bight, 2008.

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the sediment quality guideline (predictive of sediment toxicity for sediment-dwelling organisms) for Mercury is 2.1 ug/g (PTI Environmental Services, 1991).
Guideline Reference:	Pollutants of concern in Puget Sound. EPA 910/9-91-003. Seattle, WA: U.S. Environmental Protection Agency
Spatial Representation:	Data for this line of evidence for Santa Margarita Lagoon was collected at 1 monitoring site [902_6308]
Temporal Representation:	Data was collected on a single day 8/29/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID 48140 Region 9

Santa Margarita Lagoon

Pollutant:	**PAHs (Polycyclic Aromatic Hydrocarbons)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Three lines of evidence are available in the administrative record to assess this pollutant. Zero of the three samples exceed the objective. Zero of the three samples exhibit sediment toxicity. Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the three samples exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48140, PAHs (Polycyclic Aromatic Hydrocarbons) Region 9

Santa Margarita Lagoon 034928

LOE ID:	78311
Pollutant:	PAHs (Polycyclic Aromatic Hydrocarbons)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Santa Margarita Lagoon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for PAH, Low molecular weight.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Low molecular weight PAHs is 1442 ng/g dry weight (Long et al., 1995).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for Santa Margarita Lagoon was collected at 1 monitoring site [902_6308]
Temporal Representation:	Data was collected on a single day 8/29/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 48140, PAHs (Polycyclic Aromatic Hydrocarbons) **Region 9**

Santa Margarita Lagoon

LOE ID:	78312
Pollutant:	PAHs (Polycyclic Aromatic Hydrocarbons)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Santa Margarita Lagoon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for PAHs (Polycyclic Aromatic Hydrocarbons).
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the sediment quality guideline (predictive of sediment toxicity for sediment-dwelling organisms) for Total PAHs is 1800 ug/g (Fairey et al., 2001).
Guideline Reference:	An evaluation of methods for calculating mean sediment quality guideline quotients as indicators of contamination and acute toxicity to amphipods by chemical mixtures. Environmental Toxicology and Chemistry. 20(10): 2276-2286
Spatial Representation:	Data for this line of evidence for Santa Margarita Lagoon was collected at 1 monitoring site [902_6308]
Temporal Representation:	Data was collected on a single day 8/29/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 48140, PAHs (Polycyclic Aromatic Hydrocarbons) Region 9

Santa Margarita Lagoon

LOE ID:	78309
Pollutant:	PAHs (Polycyclic Aromatic Hydrocarbons)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Santa Margarita Lagoon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for PAH, High molecular weight.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for High molecular weight PAHs is 9600 ng/g dry weight (Long et al., 1995).
Guideline Reference:	Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuary sediments. Environmental Management. 19, (1): 81-97
Spatial Representation:	Data for this line of evidence for Santa Margarita Lagoon was collected at 1 monitoring site [902_6308]
Temporal Representation:	Data was collected on a single day 8/29/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID 48143 Region 9

Santa Margarita Lagoon 034930

Pollutant:	**PCBs (Polychlorinated biphenyls)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the objective. Zero of one samples exhibited sediment toxicity. Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the one sample exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48143, PCBs (Polychlorinated biphenyls) Region 9

Santa Margarita Lagoon

LOE ID:	78313
Pollutant:	PCBs (Polychlorinated biphenyls)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Santa Margarita Lagoon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for PCB, Total.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.

Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	034931
Evaluation Guideline:	In marine and estuarine sediments the sediment quality guideline (predictive of sediment toxicity for sediment-dwelling organisms) for Total PCBs is 400 ng/g (MacDonald et al., 2000b).	
Guideline Reference:	Development and evaluation of consensus-based sediment effect concentrations for polychlorinated biphenyls. Environmental Toxicology and Chemistry. 19(5): 1403-1413	
Spatial Representation:	Data for this line of evidence for Santa Margarita Lagoon was collected at 1 monitoring site [902_6308]	
Temporal Representation:	Data was collected on a single day 8/29/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.	

DECISION ID 48144 — Region 9

Santa Margarita Lagoon

Pollutant:	**Phenanthrene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the objective. Zero of one samples exhibited sediment toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the one sample exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48144, Phenanthrene — Region 9

Santa Margarita Lagoon

LOE ID:	78315
Pollutant:	Phenanthrene
LOE Subgroup:	Pollutant-Sediment

Matrix:	Sediment	034932
Fraction:	Total	
Beneficial Use:	Estuarine Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Santa Margarita Lagoon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Phenanthrene.	
Data Reference:	Data for Various Pollutants from Bight, 2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for Phenanthrene is 543.53 ng/g dry weight (MacDonald et al., 1996).	
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278	
Spatial Representation:	Data for this line of evidence for Santa Margarita Lagoon was collected at 1 monitoring site [902_6308]	
Temporal Representation:	Data was collected on a single day 8/29/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.	

DECISION ID	**48147**	**Region 9**
Santa Margarita Lagoon		

Pollutant:	**Pyrene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the objective. Zero of one samples exhibited sediment toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the one sample exceed the objective and this sample size is insufficient to determine, with

the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48147, Pyrene **Region 9**
Santa Margarita Lagoon

LOE ID:	78316
Pollutant:	Pyrene
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Santa Margarita Lagoon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Pyrene.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for Pyrene is 1397.4 ng/g dry weight (MacDonald et al., 1996).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for Santa Margarita Lagoon was collected at 1 monitoring site [902_6308]
Temporal Representation:	Data was collected on a single day 8/29/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID **48148** **Region 9**
Santa Margarita Lagoon

Pollutant:	**Silver**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or	Pollutant

Pollution: 034934

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the objective. Zero of one samples exhibited sediment toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the one sample exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48148, Silver **Region 9**

Santa Margarita Lagoon

LOE ID:	78319
Pollutant:	Silver
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Santa Margarita Lagoon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Silver.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for Silver is 1.77 ug/g dry weight (MacDonald et al., 1996).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for Santa Margarita Lagoon was collected at 1 monitoring site [

	902_6308]	034935
Temporal Representation:	Data was collected on a single day 8/29/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.	

DECISION ID 48149 — Region 9

Santa Margarita Lagoon

Pollutant:	**Toxicity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the eight sample exceed the objective. Zero of one samples exhibited sediment toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the eight samples exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48149, Toxicity — Region 9

Santa Margarita Lagoon

LOE ID:	95680
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING

Data Used to Assess Water Quality:	Three samples were collected to test for toxicity. None of the three samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius. Each sample is a sediment composites from three different sites. tr11a
Data Reference:	Data for Various Pollutants from Ambient Bay and Lagoon, 2003-2005.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL. SL is defined as the result being significant compared to the negative control based on a statistical test, less than stated the alpha level, AND less than the evaluation threshold.
Guideline Reference:	Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates, Second Edition. U.S. Environmental Protection Agency Office of Research and Development, Duluth, MI , U.S. Environmental Protection Agency Office of Water, Washington, DC EPA-600/R-99/064
Spatial Representation:	The samples were collected at stations 902SME_2003 a composite of 902_SME1L1_2003, 902_SME2L2_2003, and 902_SME2R1_2003. Station 902SME_2004 a composite of 902_SME1R1_2004, 902_SME2M1_2004, and 902_SME2R2_2004. Station 902SME_2005, a composite of 902_SME2M1_2005, 902_SME2R5_2005, 902_SME3R5_2005.
Temporal Representation:	The samples were collected in July 2003, 2004, and 2005.
Environmental Conditions:	
QAPP Information:	The data was collected under the County of San Diego Ambient Bay and Lagoon Monitoring Project 2003-2005. Annual Report for the Receiving Waters and Urban Runoff Monitoring section covered under the San Diego County Municipal National Pollutant Discharge
QAPP Information Reference(s):	Quality Assurance Project Plan from Enviromatrix Analyticial Rev. 18.

Line of Evidence (LOE) for Decision ID 48149, Toxicity **Region 9**

Santa Margarita Lagoon

LOE ID:	95679
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Four samples were collected to test for toxicity. Zero of the samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius and percent normal of Mytilus galloprovincialis.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the

	control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected from sites 902_6303, 902_6311, 902_6314, 902_6317 Santa Margarita Estuary.
Temporal Representation:	The samples were collected in August 2008.
Environmental Conditions:	
QAPP Information:	This data was collected under the Southern California Bight 2008 Regional Marine Monitoring Survey Quality Assurance Plan.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 48149, Toxicity **Region 9**

Santa Margarita Lagoon

LOE ID:	76469
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to test for toxicity. None of the samples exhibited statistically and biologically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius and percent normal of Mytilus galloprovincialis.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control. Additionally, the biological significance of the sample is evaluted by determining whether the sample response is lower than the evaluation threshold.
Guideline Reference:	
Spatial Representation:	The samples were collected from site 902_6308 Santa Margarita Estuary.
Temporal Representation:	The samples were collected in August 2008.
Environmental Conditions:	
QAPP Information:	This data was collected under the Southern California Bight 2008 Regional Marine Monitoring Survey Quality Assurance Plan.
QAPP Information Reference(s):	e-mail clarifying QAPP information

DECISION ID **48150** **Region 9**

Santa Margarita Lagoon

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**

Last Listing Cycle's Final Listing Decision:	New Decision	034938
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the objective. Zero of one samples exhibited sediment toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the one sample exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48150, Zinc **Region 9**

Santa Margarita Lagoon

LOE ID:	78320
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Santa Margarita Lagoon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Zinc is 410 ug/g dry weight (Long et al., 1995).

Guideline Reference:	Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuary sediments. Environmental Management. 19, (1): 81-97 034939
Spatial Representation:	Data for this line of evidence for Santa Margarita Lagoon was collected at 1 monitoring site [902_6308]
Temporal Representation:	Data was collected on a single day 8/29/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Loma Alta Slough
Water Body ID: CAE90410000199911171505 20
Water Body Type: Estuary

DECISION ID 34649 **Region 9**
Loma Alta Slough

Pollutant: Eutrophic
Final Listing Decision: Do Not Delist from 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Sources: Urban Runoff/Storm Sewers
Expected TMDL Completion Date: 2027
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

303(d) listing decisions made prior to 2006 were not held in an assessment database. The Regional Boards will update this decision when new data and information become available and are assessed.

Regional Board Decision Recommendation: Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. The Regional Board will update this decision when new data and information become available and are assessed.

Line of Evidence (LOE) for Decision ID 34649, Eutrophic **Region 9**
Loma Alta Slough

LOE ID: 4454

Pollutant: Eutrophic
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Not Recorded

Beneficial Use: Marine Habitat

Number of Samples: 0
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference: Placeholder reference pre-2006 303(d)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: Unspecified
Objective/Criterion Reference: Placeholder reference pre-2006 303(d)

Evaluation Guideline:	Unspecified
Guideline Reference:	Placeholder reference pre-2006 303(d)
Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

DECISION ID **44598** **Region 9**

Loma Alta Slough

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Urban Runoff/Storm Sewers
Expected TMDL Completion Date:	2027
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the section 303(d) list under section 3.3 of the Listing Policy. Under section 3.3 a single line of evidence is necessary to assess listing status.

Thirteen lines of evidence are available in the administrative record to assess this pollutant. Seven of 186 samples exceed the Contact Recreation Single Sample maximum objective and One out of 34 sample exceeded the contact recreation geomean objective for Enterococcus. Seven out of 186 samples exceeded the Contact Recretion Single Sample Maximum Objective and Zero of the 34 samples exceeded the Contact Recreation Geomean Objective for Fecal Coliform. Fifteen out of 134 samples exceeded the Shellfish Harvesting Single Sample Maximum Objective for Total Coliform. Zero of the 186 samples exceeded the Contact Recreation Single Sample Maximum Objective and Zero of the 34 samples exceeded the Contact Recreation Geomean Objective for Total Coliform.

The coastal beach at this water segment is identified as an AB411 beach. To comply with the requirements of AB411 the dry weather data collected during the time frame of April 1st to October 31st is assessed using a four percent exceedance percentage, as described in section 3.3 and 4.3 of the Listing Policy. An assessment for dry weather single sample and the geometric mean calculation was conducted and two additional lines of evidence are available in the administrative record. One of 171 dry weather single samples and one of 25 geometric mean calculations exceeded the Contact Recreation Enterococcus Objective, Zero out of 25 samples exceeded the Contact Recreation dry weather geomean objective for fecal coliform, and Zero of the 25 samples exceeded the Contact Recreation dry weather geomean objective for Fecal Coliform and this does not exceed the allowable limit based on the application of a four percent exceedance percentage (AB411) to section 3.3 of the Listing Policy.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Seven of 186 samples exceed the Contact Recreation Single Sample maximum objective and One out of 34 sample exceeded the contact recreation geomean objective for Enterococcus. Seven out of 186 samples exceeded the Contact Recretion Single Sample Maximum Objective and Zero of the 34 samples exceeded the Contact Recreation Geomean Objective for Fecal Coliform. Fifteen out of 134 samples exceeded the Shellfish Harvesting Single Sample Maximum Objective for Total Coliform. Zero of the 186 samples exceeded the Contact Recreation Single Sample Maximum Objective and Zero of

the 34 samples exceeded the Contact Recreation Geomean Objective for Total Coliform and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. One of 171 dry weather single samples and one of 25 geometric mean calculations exceeded the Contact Recreation Enterococcus Objective, Zero out of 25 samples exceeded the Contact Recreation dry weather geomean objective for fecal coliform, and Zero of the 25 samples exceeded the Contact Recreation dry weather geomean objective for Fecal Coliform and this does not exceed the allowable limit based on the application of a four percent exceedance percentage (AB411) to section 3.3 of the Listing Policy. and this does not exceed the allowable limit based on the application of a four percent exceedance percentage (AB411) to section 3.3 of the Listing Policy
6. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 44598, Indicator Bacteria **Region 9**

Loma Alta Slough

LOE ID:	26879
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	15
Number of Exceedances:	7
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2006. A total of 15 single samples were collected with 12 samples correlated with a storm event. From the 12 samples only one exceeded single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005). Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, 500 feet north of Loma Alta outlet in the Loma Alta HA.
Temporal Representation:	Samples were collected one to five times annually for a period of three years from October 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44598, Indicator Bacteria — Region 9

Loma Alta Slough

LOE ID:	30542
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	171
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from Januray 2004 through December 2007. A total of 186 single samples were collected of which 171 are dry weather (AB411) samples and one sample exceeded the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, 500 feet north of Loma Alta outlet in the Loma Alta HA.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44598, Indicator Bacteria — Region 9

Loma Alta Slough

LOE ID:	27110
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	186
Number of Exceedances:	7
Data and Information Type:	PWS pathogen monitoring (ambient water)

Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 186 single samples were collected with 7 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, 500 feet north of Loma Alta outlet in the Loma Alta HA.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44598, Indicator Bacteria **Region 9**

Loma Alta Slough

LOE ID:	27138
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Non-Contact Recreation
Number of Samples:	34
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from Januray 2004 through December 2007. A total of 186 single samples were collected with 34 monthly geomeans calculated. Only one of the 34 geomeans exceed the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected 500 feet north of the Loma Alta Slough outlet. 034945
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44598, Indicator Bacteria **Region 9**

Loma Alta Slough

LOE ID:	27142
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	34
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 186 single samples were collected with 34 monthly geomeans calculated. Only one of the 34 geomeans exceed the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, 500 feet north of Loma Alta outlet in the Loma Alta HA.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44598, Indicator Bacteria **Region 9**

Loma Alta Slough

LOE ID:	27122
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation
Number of Samples:	15
Number of Exceedances:	5
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 186 single samples were collected with 15 samples correlated with a storm event. Five of the samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005). Comparisons to water quality objectives were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, 500 feet north of Loma Alta outlet in the Loma Alta HA.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44598, Indicator Bacteria **Region 9**

Loma Alta Slough

LOE ID:	26902
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	134
Number of Exceedances:	15
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. The number of samples collected for total coliform analysis was 134. Of the 134 samples, 15 exceeded the single sample maximum total coliform standard for shellfish harvesting.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan, the median total coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, 500 feet north of Loma Alta outlet in the Loma Alta HA.
Temporal Representation:	Samples were collected weekly from June 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44598, Indicator Bacteria **Region 9**

Loma Alta Slough

LOE ID:	26903
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	34
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. The number of samples collected for total coliform analysis was 186. None of the 34 samples exceeded the single sample geomean maximum total coliform standard.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005). Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, 500 feet north of Loma Alta outlet in the Loma Alta HA.
Temporal Representation:	Samples were collected almost monthly from January 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance

	with the County of San Diego's Quality beach monitoring program. 034948
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44598, Indicator Bacteria **Region 9**

Loma Alta Slough

LOE ID:	27137
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	186
Number of Exceedances:	7
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from Januray 2004 through December 2007. A total of 186 single samples were collected with 7 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, 500 feet north of Loma Alta outlet in the Loma Alta HA.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44598, Indicator Bacteria **Region 9**

Loma Alta Slough

LOE ID:	27140
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	15
Number of Exceedances:	6

Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from October 2004 through December 2007. A total of 186 single samples were collected with 15 samples correlated with a storm event. Six of the 15 single samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005). Comparisons to water quality objectives were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, 500 feet north of Loma Alta outlet in the Loma Alta HA.
Temporal Representation:	Samples were collected from October 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44598, Indicator Bacteria **Region 9**

Loma Alta Slough

LOE ID:	27136
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	34
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from Januray 2004 through December 2007. A total of 186 single samples were collected with 34 geomeans calculated. None of the geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).

Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, 500 feet north of Loma Alta outlet in the Loma Alta HA.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44598, Indicator Bacteria **Region 9**

Loma Alta Slough

LOE ID:	31337
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	25
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 103 dry month (April through October) single samples were collected with 25 dry month geomeans calculated. One of the 25 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, 500 feet north of Loma Alta outlet in the Loma Alta HA.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44598, Indicator Bacteria **Region 9**

Loma Alta Slough 034951

LOE ID:	31339
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	25
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 103 dry month (April through October) single samples were collected with 25 dry month geomeans calculated. None of the 25 geomeans exceeded the geomean water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005). Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, 500 feet north of Loma Alta outlet in the Loma Alta HA.
Temporal Representation:	Samples were collected weekly from June 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44598, Indicator Bacteria **Region 9**

Loma Alta Slough

LOE ID:	31338
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	25
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through

	October 2007. A total of 103 dry month (April through October) single samples were collected with 25 dry month geomeans calculated. None of the 25 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, 500 feet north of Loma Alta outlet in the Loma Alta HA.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44598, Indicator Bacteria **Region 9**

Loma Alta Slough

LOE ID:	27061
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	15
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from June 2004 through December 2007. The number of samples collected for total coliform analysis was 186 with 15 samples correlated with a storm event. Only 3 of the 15 samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005). Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	

Guideline Reference:	034953
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, 500 feet north of Loma Alta outlet in the Loma Alta HA.
Temporal Representation:	Samples were collected weekly from June 2004 through December 2007.
Environmental Conditions:	Comparisons were also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44598, Indicator Bacteria **Region 9**

Loma Alta Slough

LOE ID:	4455
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Water Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	Unspecified
Guideline Reference:	Placeholder reference pre-2006 303(d)
Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44598, Indicator Bacteria **Region 9**

Loma Alta Slough

LOE ID:	27055
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	186
Number of Exceedances:	0

Data and Information Type:	PWS pathogen monitoring (ambient water) 034954
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from June 2004 through December 2007. The number of samples collected for total coliform analysis was 186 with 34 monthly geomeans calculated. None of the geomeans exceeded the geomean water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005). Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, 500 feet north of Loma Alta outlet in the Loma Alta HA.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Buena Vista Lagoon
Water Body ID: CAE9042100019990209090045
Water Body Type: Estuary

DECISION ID 48184 **Region 9**
Buena Vista Lagoon

Pollutant: Toxicity
Final Listing Decision: List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Sources: Source Unknown
Expected TMDL Completion Date: 2027
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least one line of evidence is necessary to assess listing status for toxicity in sediment, and waters may be placed on the CWA section 303(d) List for toxicity alone.

One line of evidence is available in the administrative record to assess sediment toxicity. Three of the three samples exhibited sediment toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Three of the three samples exhibited sediment toxicity, and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 48184, Toxicity **Region 9**
Buena Vista Lagoon

LOE ID: 73079

Pollutant: Toxicity
LOE Subgroup: Toxicity
Matrix: Sediment
Fraction: None

Beneficial Use: Warm Freshwater Habitat

Number of Samples:	3
Number of Exceedances:	3
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Three samples were collected to test for toxicity. Three of the three samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius. Each sample is a sediment composites from three different sites. tr11a
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected at 904BVL_2003, 904BVL_2004, and 904BVL_2005. Each of these sample location names consists of a composite from three different sites.
Temporal Representation:	The samples were collected in 2003, 2004, and 2005.
Environmental Conditions:	
QAPP Information:	The data was collected under the County of San Diego Ambient Bay and Lagoon Monitoring Project 2003-2005. Annual Report for the Receiving Waters and Urban Runoff Monitoring section covered under the San Diego County Municipal National Pollutant Discharge Elimination System (NPDES) Permit (RWQCB-Order NO. R9-2007-0001).
QAPP Information Reference(s):	e-mail clarifying QAPP information

DECISION ID 34484 Region 9

Buena Vista Lagoon

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2008
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	303(d) listing decisions made prior to 2006 were not held in an assessment database. The Regional Boards will update this decision when new data and information become available and are assessed.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34484, Indicator Bacteria Region 9

Buena Vista Lagoon

LOE ID:	4444

Pollutant:	Indicator Bacteria	034957
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	Not Recorded	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	0	
Number of Exceedances:	0	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.	
Data Reference:	Placeholder reference pre-2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Unspecified	
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)	
Evaluation Guideline:	Unspecified	
Guideline Reference:	Placeholder reference pre-2006 303(d)	
Spatial Representation:	Unspecified	
Temporal Representation:	Unspecified	
Environmental Conditions:	Unspecified	
QAPP Information:	Unspecified	
QAPP Information Reference(s):		

DECISION ID 34498 Region 9

Buena Vista Lagoon

Pollutant:	**Nutrients**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	303(d) listing decisions made prior to 2006 were not held in an assessment database. The Regional Boards will update this decision when new data and information become available and are assessed.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 34498, Nutrients Region 9

Buena Vista Lagoon

LOE ID:	4445
Pollutant:	Nutrients
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	Not Recorded	034958
Beneficial Use:	Marine Habitat	
Number of Samples:	0	
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.	
Data Reference:	Placeholder reference pre-2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Unspecified	
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)	
Evaluation Guideline:	Unspecified	
Guideline Reference:	Placeholder reference pre-2006 303(d)	
Spatial Representation:	Unspecified	
Temporal Representation:	Unspecified	
Environmental Conditions:	Unspecified	
QAPP Information:	Unspecified	
QAPP Information Reference(s):		

DECISION ID 42423 Region 9

Buena Vista Lagoon

Pollutant:	**Sedimentation/Siltation**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: 303(d) listing decisions made prior to 2006 were not held in an assessment database. The Regional Boards will update this decision when new data and information become available and are assessed.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 42423, Sedimentation/Siltation Region 9

Buena Vista Lagoon

LOE ID:	4446
Pollutant:	Sedimentation/Siltation
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded

Beneficial Use:	Marine Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	Unspecified
Guideline Reference:	Placeholder reference pre-2006 303(d)
Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Agua Hedionda Lagoon
Water Body ID: CAE904310001999020915402 2
Water Body Type: Estuary

DECISION ID 34464 **Region 9**
Agua Hedionda Lagoon

Pollutant: **Indicator Bacteria**
Final Listing Decision: **Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Delist from 303(d) list (TMDL required list)(2012)
Revision Status Revised
Reason for Delisting: Applicable WQS attained; reason for recovery unspecified
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 4.2 of the Listing Policy. Under section 4.2 a single line(s) of evidence are necessary to assess listing status.

Thirteen lines of evidence are available in the administrative record to assess this pollutant. Three.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Twelve lines of evidence have fully supporting use ratings with an amount of samples and exceedences that satisfy the the minimum samples for application of the binomial test in table 3.2, however 0 of 5 samples exceed the water quality objective for fecal coliform for the protection of the non-contact recreation beneficial use. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be removed from the section 303(d) list because applicable water quality standards for the pollutant are not being exceeded.

Line of Evidence (LOE) for Decision ID 34464, Indicator Bacteria **Region 9**
Agua Hedionda Lagoon

LOE ID: 72901

Pollutant: Enterococcus
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples:	5	034961
Number of Exceedances:	0	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Agua Hedionda Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Enterococci.	
Data Reference:	Data for Various Pollutants from Bight, 2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Samples shall not exceed 104 organisms per 100 ml for enterococcus in waters designated for REC I beneficial use (Water Quality Control Plan for the San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Agua Hedionda Lagoon was collected at 5 monitoring sites [Agua Hedionda Lagoon, Agua Hedionda Lagoon, Agua Hedionda Lagoon, Agua Hedionda Lagoon, Agua Hedionda Lagoon]	
Temporal Representation:	Data was collected on a single day 7/8/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.	

Line of Evidence (LOE) for Decision ID 34464, Indicator Bacteria **Region 9**

Agua Hedionda Lagoon

LOE ID:	72902
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Non-Contact Recreation
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Agua Hedionda Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Coliform, Fecal.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters designated for non contact recreation (REC 2), the fecal coliform concentration shall not exceed 4000 MPN/100 ml (Basin Plan).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Agua Hedionda Lagoon was collected at 5 monitoring sites [Agua Hedionda Lagoon, Agua Hedionda Lagoon, Agua Hedionda Lagoon, Agua Hedionda Lagoon, Agua Hedionda Lagoon]
Temporal Representation:	Data was collected on a single day 7/8/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.

QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.	034962

Line of Evidence (LOE) for Decision ID 34464, Indicator Bacteria **Region 9**

Agua Hedionda Lagoon

LOE ID:	72903
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Agua Hedionda Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Coliform, Fecal.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the fecal coliform concentration shall not exceed 400 MPN/100 ml.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Agua Hedionda Lagoon was collected at 5 monitoring sites [Agua Hedionda Lagoon, Agua Hedionda Lagoon, Agua Hedionda Lagoon, Agua Hedionda Lagoon, Agua Hedionda Lagoon]
Temporal Representation:	Data was collected on a single day 7/8/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 34464, Indicator Bacteria **Region 9**

Agua Hedionda Lagoon

LOE ID:	72911
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Agua Hedionda Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Various Pollutants from Bight, 2008.

SWAMP Data:	Non-SWAMP	034963
Water Quality Objective/Criterion:	In waters where shellfish harvesting for human consumption, commercial or sports purposes is designated the total coliform concetration shall not exceed 230 per 100 ml (Basin Plan).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Agua Hedionda Lagoon was collected at 5 monitoring sites [Agua Hedionda Lagoon, Agua Hedionda Lagoon, Agua Hedionda Lagoon, Agua Hedionda Lagoon, Agua Hedionda Lagoon]	
Temporal Representation:	Data was collected on a single day 7/8/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.	

Line of Evidence (LOE) for Decision ID 34464, Indicator Bacteria **Region 9**

Agua Hedionda Lagoon

LOE ID:	30332
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollution
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	27
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected from January 2008 through October 2008. A total 27 geomeans were calculated with two exceeding the objective.
Data Reference:	Bacteria Monitoring Data for Agua Hedionda Lagoon. July 22, 2009
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml.
Objective/Criterion Reference:	SWRCB. 2005. Water Quality Control Plan, Ocean Waters of California (Ocean Plan). California Environmental Protection Agency, State Water Resources Control Board. February 14, 2006
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	The area of concern is 6.8 acres from the outer lagoon. There were four monitoring stations in the outer lagoon and two stations in the inner lagoon. Station Transect 1, Transect 2, Trasect 3, and Inlet 1 are in the outer lagoon and Inlet 2 and Segment 1 in the inner portion.
Temporal Representation:	The bacteria monitoring occurred from January 2008 through October 2008
Environmental Conditions:	The outer lagoon is dredged approximately every two years to support the operation of the Encina Power Station.
QAPP Information:	Water quality samples collected in accordance with the City of Encinitas quality assurance plan
QAPP Information Reference(s):	Carlsbad Hydrologic Unit, SDRWQCB Investigative Order R9-2006-076, Lagoon Monitoring. Quality Assurance Plan. September 1, 2007

Line of Evidence (LOE) for Decision ID 34464, Indicator Bacteria **Region 9**

Agua Hedionda Lagoon

LOE ID:	30331	034964

Pollutant:	Fecal Coliform
LOE Subgroup:	Pollution
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	93
Number of Exceedances:	5
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the from January 2008 through October 2008. A total 93 samples were collected with five exceeding the single sample objective.
Data Reference:	Bacteria Monitoring Data for Agua Hedionda Lagoon, July 22, 2009
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml.
Objective/Criterion Reference:	SWRCB. 2005. Water Quality Control Plan, Ocean Waters of California (Ocean Plan). California Environmental Protection Agency, State Water Resources Control Board. February 14, 2006
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	The area of concern is 6.8 acres from the outer lagoon. There were four monitoring stations in the outer lagoon and two stations in the inner lagoon. Station Transect 1, Transect 2, Trasect 3, and Inlet 1 are in the outer lagoon and Inlet 2 and Segment 1 in the inner portion.
Temporal Representation:	The bacteria monitoring occurred from January 2008 through October 2008
Environmental Conditions:	The outer lagoon is dredged approximately every two years to support the operation of the Encina Power Station.
QAPP Information:	Water quality samples collected in accordance with the City of Encinitas quality assurance plan
QAPP Information Reference(s):	Carlsbad Hydrologic Unit, SDRWQCB Investigative Order R9-2006-076, Lagoon Monitoring. Quality Assurance Plan. September 1, 2007

Line of Evidence (LOE) for Decision ID 34464, Indicator Bacteria **Region 9**

Agua Hedionda Lagoon

LOE ID:	4438
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Water Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)

Evaluation Guideline:	Unspecified
Guideline Reference:	Placeholder reference pre-2006 303(d)
Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 34464, Indicator Bacteria **Region 9**

Agua Hedionda Lagoon

LOE ID:	30327
Pollutant:	Total Coliform
LOE Subgroup:	Pollution
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	93
Number of Exceedances:	10
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected from January 2008 through October 2008. A total of 93 single samples were collected with 10 samples exceeded the single sample water quality objective.
Data Reference:	Bacteria Monitoring Data for Agua Hedionda Lagoon. July 22, 2009
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin SWRCB. 2005. Water Quality Control Plan, Ocean Waters of California (Ocean Plan). California Environmental Protection Agency, State Water Resources Control Board. February 14, 2006
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	The area of concern is 6.8 acres from the outer lagoon. There were four monitoring stations in the outer lagoon and two stations in the inner lagoon. Station Transect 1, Transect 2, Trasect 3, and Inlet 1 are in the outer lagoon and Inlet 2 and Segment 1 in the inner portion.
Temporal Representation:	The bacteria monitoring occurred from January 2008 through October 2008
Environmental Conditions:	The outer lagoon is dredged approximately every two years to support the operation of the Encina Power Station.
QAPP Information:	Water quality samples collected in accordance with the City of Encinitas quality assurance plan
QAPP Information Reference(s):	Carlsbad Hydrologic Unit, SDRWQCB Investigative Order R9-2006-076, Lagoon Monitoring, Quality Assurance Plan. September 1, 2007

Line of Evidence (LOE) for Decision ID 34464, Indicator Bacteria **Region 9**

Agua Hedionda Lagoon

LOE ID:	30330
Pollutant:	Total Coliform
LOE Subgroup:	Pollution

Matrix:	Water	034966
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	27	
Number of Exceedances:	3	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected from January 2008 through October 2008. A total 27 geomeans were calculated with three exceeding the objective.	
Data Reference:	Bacteria Monitoring Data for Agua Hedionda Lagoon. July 22, 2009	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml.	
Objective/Criterion Reference:	SWRCB. 2005. Water Quality Control Plan, Ocean Waters of California (Ocean Plan). California Environmental Protection Agency, State Water Resources Control Board. February 14, 2006	
Evaluation Guideline:		
Guideline Reference:	Water Quality Control Plan for the San Diego Basin	
Spatial Representation:	The area of concern is 6.8 acres from the outer lagoon. There were four monitoring stations in the outer lagoon and two stations in the inner lagoon. Station Transect 1, Transect 2, Trasect 3, and Inlet 1 are in the outer lagoon and Inlet 2 and Segment 1 in the inner portion.	
Temporal Representation:	The bacteria monitoring occurred from January 2008 through October 2008	
Environmental Conditions:	The outer lagoon is dredged approximately every two years to support the operation of the Encina Power Station.	
QAPP Information:	Water quality samples collected in accordance with the City of Encinitas quality assurance plan	
QAPP Information Reference(s):	Carlsbad Hydrologic Unit, SDRWQCB Investigative Order R9-2006-076, Lagoon Monitoring. Quality Assurance Plan. September 1, 2007	

Line of Evidence (LOE) for Decision ID 34464, Indicator Bacteria **Region 9**

Agua Hedionda Lagoon

LOE ID:	30333
Pollutant:	Enterococcus
LOE Subgroup:	Pollution
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	93
Number of Exceedances:	9
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected from January 2008 through October 2008. A total of 93 single samples were collected with nine samples exceeding the single sample objective.
Data Reference:	Bacteria Monitoring Data for Agua Hedionda Lagoon. July 22, 2009
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml.
Objective/Criterion Reference:	SWRCB. 2005. Water Quality Control Plan, Ocean Waters of California (Ocean Plan). California Environmental Protection Agency, State Water Resources Control Board. February 14, 2006
Evaluation Guideline:	

Guideline Reference:	Water Quality Control Plan for the San Diego Basin	034967
Spatial Representation:	The area of concern is 6.8 acres from the outer lagoon. There were four monitoring stations in the outer lagoon and two stations in the inner lagoon. Station Transect 1, Transect 2, Trasect 3, and Inlet 1 are in the outer lagoon and Inlet 2 and Segment 1 in the inner portion.	
Temporal Representation:	The bacteria monitoring occurred from January 2008 through October 2008	
Environmental Conditions:	The outer lagoon is dredged approximately every two years to support the operation of the Encina Power Station.	
QAPP Information:	Water quality samples collected in accordance with the City of Encinitas quality assurance plan	
QAPP Information Reference(s):	Carlsbad Hydrologic Unit, SDRWQCB Investigative Order R9-2006-076, Lagoon Monitoring. Quality Assurance Plan. September 1, 2007	

Line of Evidence (LOE) for Decision ID 34464, Indicator Bacteria **Region 9**

Agua Hedionda Lagoon

LOE ID:	30329
Pollutant:	Total Coliform
LOE Subgroup:	Pollution
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	93
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected from January 2008 through October 2008. A total of 93 single samples were collected with no samples exceeded the single sample water quality objective.
Data Reference:	Bacteria Monitoring Data for Agua Hedionda Lagoon. July 22, 2009
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin SWRCB. 2005. Water Quality Control Plan, Ocean Waters of California (Ocean Plan). California Environmental Protection Agency, State Water Resources Control Board. February 14, 2006
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	The area of concern is 6.8 acres from the outer lagoon. There were four monitoring stations in the outer lagoon and two stations in the inner lagoon. Station Transect 1, Transect 2, Trasect 3, and Inlet 1 are in the outer lagoon and Inlet 2 and Segment 1 in the inner portion.
Temporal Representation:	The bacteria monitoring occurred from January 2008 through October 2008
Environmental Conditions:	The outer lagoon is dredged approximately every two years to support the operation of the Encina Power Station.
QAPP Information:	Water quality samples collected in accordance with the City of Encinitas quality assurance plan
QAPP Information Reference(s):	Carlsbad Hydrologic Unit, SDRWQCB Investigative Order R9-2006-076, Lagoon Monitoring. Quality Assurance Plan. September 1, 2007

Line of Evidence (LOE) for Decision ID 34464, Indicator Bacteria **Region 9**

Agua Hedionda Lagoon

LOE ID:	30334

Pollutant:	Enterococcus	034968
LOE Subgroup:	Pollution	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	27	
Number of Exceedances:	3	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected from January 2008 through October 2008. A total of 27 geomeans were calculated with three exceeding the objective.	
Data Reference:	Bacteria Monitoring Data for Agua Hedionda Lagoon. July 22, 2009	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml.	
Objective/Criterion Reference:	SWRCB. 2005. Water Quality Control Plan, Ocean Waters of California (Ocean Plan). California Environmental Protection Agency, State Water Resources Control Board. February 14, 2006	
Evaluation Guideline:		
Guideline Reference:	Water Quality Control Plan for the San Diego Basin	
Spatial Representation:	The area of concern is 6.8 acres from the outer lagoon. There were four monitoring stations in the outer lagoon and two stations in the inner lagoon. Station Transect 1, Transect 2, Trasect 3, and Inlet 1 are in the outer lagoon and Inlet 2 and Segment 1 in the inner portion.	
Temporal Representation:	The bacteria monitoring occurred from January 2008 through October 2008	
Environmental Conditions:	The outer lagoon is dredged approximately every two years to support the operation of the Encina Power Station.	
QAPP Information:	Water quality samples collected in accordance with the City of Encinitas quality assurance plan	
QAPP Information Reference(s):	Carlsbad Hydrologic Unit, SDRWQCB Investigative Order R9-2006-076, Lagoon Monitoring. Quality Assurance Plan. September 1, 2007	

Line of Evidence (LOE) for Decision ID 34464, Indicator Bacteria **Region 9**

Agua Hedionda Lagoon

LOE ID:	72912
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Agua Hedionda Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the total coliform concentration shall not exceed 10000 MPN/100 ml (California Ocean Plan 2009).
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation:	Data for this line of evidence for Agua Hedionda Lagoon was collected at 5 monitoring sites [Agua Hedionda Lagoon, Agua Hedionda Lagoon, Agua Hedionda Lagoon, Agua Hedionda Lagoon, Agua Hedionda Lagoon]
Temporal Representation:	Data was collected on a single day 7/8/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID 47483 — Region 9

Agua Hedionda Lagoon

Pollutant:	**2-Methylnaphthalene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6, two lines of evidence are necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of 5 samples exceed the evaluation guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 5 samples exceeded the evaluation guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47483, 2-Methylnaphthalene — Region 9

Agua Hedionda Lagoon

LOE ID:	78195
Pollutant:	2-Methylnaphthalene
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat

Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Agua Hedionda Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for 2-Methylnaphthalene.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for 2-Methylnaphthalene is 201.28 ng/g dry weight (MacDonald et al., 1996).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for Agua Hedionda Lagoon was collected at 5 monitoring sites [904_6269, 904_6270, 904_6271, 904_6280, 904_6282]
Temporal Representation:	Data was collected on a single day 7/8/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 47483, 2-Methylnaphthalene **Region 9**

Agua Hedionda Lagoon

LOE ID:	72909
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Five samples were collected to test for toxicity. One of the samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius and percent normal of Mytilus galloprovincialis.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.

Guideline Reference:	034971
Spatial Representation:	The samples were collected from sites 904_6269, 904_6270, 904_6271, 904_6280, 904_6282 Agua Hedionda Lagoon.
Temporal Representation:	The samples were collected in July 2008.
Environmental Conditions:	
QAPP Information:	This data was collected under the Southern California Bight 2008 Regional Marine Monitoring Survey Quality Assurance Plan.
QAPP Information Reference(s):	e-mail clarifying QAPP information

DECISION ID 47484 Region 9

Agua Hedionda Lagoon

Pollutant:	**Ammonia (Unionized)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. One of 86 samples exceed the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of 86 samples exceed the water quality objective and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 47484, Ammonia (Unionized) Region 9

Agua Hedionda Lagoon

LOE ID:	72884
Pollutant:	Ammonia (Unionized)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	86
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality:	One of the samples exceeded 0.025 mg/l un-ionized ammonia (NH3) in coastal lagoon.
Data Reference:	Data for Various Pollutants in the Agua Hedionda Lagoon and Navy Storm Water, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The discharge of wastes shall not cause concentrations of un-ionized ammonia (NH3) to exceed 0.025 mg/l (as N) in inland surface waters, enclosed bays and estuaries and coastal lagoons.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Sample was collected at Agua Hedionda Lagoon.
Temporal Representation:	Samples were collected from 11/2001 to 12/2008.
Environmental Conditions:	
QAPP Information:	No quality assurance information was provided.
QAPP Information Reference(s):	

DECISION ID 47485 Region 9

Agua Hedionda Lagoon

Pollutant:	**Antimony**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6, two lines of evidence are necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of 5 samples exceed the evaluation guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 5 samples exceed the evaluation guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47485, Antimony Region 9

Agua Hedionda Lagoon

LOE ID:	78196

Pollutant:	Antimony
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Agua Hedionda Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Antimony.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Antimony is 25 ug/g dry weight (Long and Morgan, 1990).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for Agua Hedionda Lagoon was collected at 5 monitoring sites [904_6269, 904_6270, 904_6271, 904_6280, 904_6282]
Temporal Representation:	Data was collected on a single day 7/8/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 47485, Antimony **Region 9**

Agua Hedionda Lagoon

LOE ID:	72909
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Five samples were collected to test for toxicity. One of the samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius and percent normal of Mytilus galloprovincialis.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.

Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	034974
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.	
Guideline Reference:		
Spatial Representation:	The samples were collected from sites 904_6269, 904_6270, 904_6271, 904_6280, 904_6282 Agua Hedionda Lagoon.	
Temporal Representation:	The samples were collected in July 2008.	
Environmental Conditions:		
QAPP Information:	This data was collected under the Southern California Bight 2008 Regional Marine Monitoring Survey Quality Assurance Plan.	
QAPP Information Reference(s):	e-mail clarifying QAPP information	

DECISION ID 47491 Region 9

Agua Hedionda Lagoon

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1, 3.5, and 3.6 of the Listing Policy. Under section 3.6 two lines of evidence are necessary to assess listing status, and a single line of evidence is necessary to assess listing status under section 3.5. Three lines of evidence are available in the administrative record to assess this pollutant. Zero of 5 samples exceed the evaluation guideline in sediment and 1 of 1 sample exceeds the evaluation guideline in tissue. Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 5 samples exceeded the evaluation guideline in sediment and 0 of 1 sample exceeds the evaluation guideline in tissue and these sample size are insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples are needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47491, Arsenic Region 9

Agua Hedionda Lagoon

LOE ID:	72885

Pollutant:	Arsenic	034975
LOE Subgroup:	Pollutant-Tissue	
Matrix:	Tissue	
Fraction:	Fish fillet	
Beneficial Use:	Shellfish Harvesting	
Number of Samples:	1	
Number of Exceedances:	1	
Data and Information Type:	Shellfish surveys	
Data Used to Assess Water Quality:	The one sample did exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal. Ten percent of the total arsenic result was used to estimate of the amount of inorganic arsenic in the sample; this number was screened against the guideline.	
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for arsenic in shellfish tissue is 0.0052 ppm. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; OEHHA, 2004)	
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Air Toxics Hotspots Program Risk Assessment Guidelines. Part II Technical Support Document for Describing Available Cancer Potency Values.	
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from AHLG.	
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/20/2008	
Environmental Conditions:		
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 47491, Arsenic **Region 9**

Agua Hedionda Lagoon

LOE ID:	78197
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total

Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Agua Hedionda Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Arsenic.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Arsenic is 70 ug/g dry weight (Long et al., 1995).
Guideline Reference:	Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuary sediments. Environmental Management. 19, (1): 81-97
Spatial Representation:	Data for this line of evidence for Agua Hedionda Lagoon was collected at 5 monitoring sites [904_6269, 904_6270, 904_6271, 904_6280, 904_6282]
Temporal Representation:	Data was collected on a single day 7/8/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 47491, Arsenic **Region 9**

Agua Hedionda Lagoon

LOE ID:	72909
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Five samples were collected to test for toxicity. One of the samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius and percent normal of Mytilus galloprovincialis.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.

Guideline Reference:	034977
Spatial Representation:	The samples were collected from sites 904_6269, 904_6270, 904_6271, 904_6280, 904_6282 Agua Hedionda Lagoon.
Temporal Representation:	The samples were collected in July 2008.
Environmental Conditions:	
QAPP Information:	This data was collected under the Southern California Bight 2008 Regional Marine Monitoring Survey Quality Assurance Plan.
QAPP Information Reference(s):	e-mail clarifying QAPP information

DECISION ID 47492 Region 9

Agua Hedionda Lagoon

Pollutant:	**Benzo(a)anthracene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 two line(s) of evidence are necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of 5 samples exceed the evaluation guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 5 samples exceeded the evaluation guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47492, Benzo(a)anthracene Region 9

Agua Hedionda Lagoon

LOE ID:	78201
Pollutant:	Benzo(a)anthracene
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5

Number of Exceedances:	0	034978

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Agua Hedionda Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Benzo(a)anthracene.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for Benzo(a)anthracene is 692.53 ng/g dry weight (MacDonald et al., 1996).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for Agua Hedionda Lagoon was collected at 5 monitoring sites [904_6269, 904_6270, 904_6271, 904_6280, 904_6282]
Temporal Representation:	Data was collected on a single day 7/8/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 47492, Benzo(a)anthracene **Region 9**

Agua Hedionda Lagoon

LOE ID:	72909
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Five samples were collected to test for toxicity. One of the samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius and percent normal of Mytilus galloprovincialis.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	

Spatial Representation:	The samples were collected from sites 904_6269, 904_6270, 904_6271, 904_6280, 904_6282 Agua Hedionda Lagoon.
Temporal Representation:	The samples were collected in July 2008.
Environmental Conditions:	
QAPP Information:	This data was collected under the Southern California Bight 2008 Regional Marine Monitoring Survey Quality Assurance Plan.
QAPP Information Reference(s):	e-mail clarifying QAPP information

DECISION ID 47495 Region 9

Agua Hedionda Lagoon

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.5 and 3.6 of the Listing Policy. Under section 3.6 two lines of evidence are necessary to assess listing status. Three lines of evidence are available in the administrative record to assess this pollutant. Zero of 5 samples exceed the evaluation guideline for sediment and 0 of 1 sample exceeds the evaluation guideline for tissue. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 5 samples exceed the evaluation guideline for sediment and 0 of 1 sample exceeds the evaluation guideline for tissue and these sample sizes are insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47495, Cadmium Region 9

Agua Hedionda Lagoon

LOE ID:	72909
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	1

Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Five samples were collected to test for toxicity. One of the samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius and percent normal of Mytilus galloprovincialis.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected from sites 904_6269, 904_6270, 904_6271, 904_6280, 904_6282 Agua Hedionda Lagoon.
Temporal Representation:	The samples were collected in July 2008.
Environmental Conditions:	
QAPP Information:	This data was collected under the Southern California Bight 2008 Regional Marine Monitoring Survey Quality Assurance Plan.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 47495, Cadmium **Region 9**

Agua Hedionda Lagoon

LOE ID:	72888
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Fish fillet
Beneficial Use:	Shellfish Harvesting
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The sample did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for cadmium in shellfish tissue is 3.3 ppm. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; USEPA, 2000)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California

	Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Guidance for Assessing Chemical Contaminant Data for Use In Fish Advisories Volume 1: Fish Sampling and Analysis
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from AHLG.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/20/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 47495, Cadmium **Region 9**

Agua Hedionda Lagoon

LOE ID:	78202
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Agua Hedionda Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Cadmium.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for Cadmium is 4.21 ng/g dry weight (MacDonald et al., 1996).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for Agua Hedionda Lagoon was collected at 5 monitoring sites [904_6269, 904_6270, 904_6271, 904_6280, 904_6282]
Temporal Representation:	Data was collected on a single day 7/8/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID	47496	034982 Region 9
Agua Hedionda Lagoon		

Pollutant:	**Chlordane**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1, 3.5, and 3.6 of the Listing Policy. Under section 3.6 two lines of evidence are necessary to assess listing status, and a single line of evidence is necessary to assess listing status under section 3.5. Three lines of evidence are available in the administrative record to assess this pollutant. Zero of 5 samples exceed the evaluation guideline in sediment and 1 of 1 sample exceeds the evaluation guideline in tissue. Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 5 samples exceeded the evaluation guideline in sediment and 0 of 1 sample exceeds the evaluation guideline in tissue and these sample size are insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples are needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47496, Chlordane	**Region 9**
Agua Hedionda Lagoon	

LOE ID:	72909
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Five samples were collected to test for toxicity. One of the samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius and percent normal of Mytilus galloprovincialis.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected from sites 904_6269, 904_6270, 904_6271, 904_6280, 904_6282 Agua Hedionda Lagoon.
Temporal Representation:	The samples were collected in July 2008.
Environmental Conditions:	
QAPP Information:	This data was collected under the Southern California Bight 2008 Regional Marine Monitoring Survey Quality Assurance Plan.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 47496, Chlordane **Region 9**

Agua Hedionda Lagoon

LOE ID:	78198
Pollutant:	Chlordane
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Agua Hedionda Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Chlordane, Total.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Total Chlordane is 6 ng/g dry weight (Long and Morgan, 1990).
Guideline Reference:	The potential for biological effects of sediment-sorbed contaminants tested in the National Status of Trends Program. NOAA Technical Memorandum NOS OMA 52. Seattle, WA: National Oceanic and Atmospheric Administration
Spatial Representation:	Data for this line of evidence for Agua Hedionda Lagoon was collected at 5 monitoring sites [904_6269, 904_6270, 904_6271, 904_6280, 904_6282]
Temporal Representation:	Data was collected on a single day 7/8/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

LOE ID:	72886
Pollutant:	Chlordane
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Fish fillet
Beneficial Use:	Shellfish Harvesting
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The one sample did not exceed the objective. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal. Chlordane result was calculated by summing the results for chlordane isomers: cis- and trans-nonachlor, alpha- and gamma-chlordane, and oxychlordane.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for total chlordane in shellfish tissue is 6.0 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from AHLG.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/20/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID 47506 Region 9
Agua Hedionda Lagoon

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line(s) of evidence are necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 1 sample exceeds the evaluation guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 1 sample exceeds the evaluation guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47506, Chlorpyrifos **Region 9**

Agua Hedionda Lagoon

LOE ID:	72887
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Fish fillet
Beneficial Use:	Shellfish Harvesting
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The one sample did not exceed the objective. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or

aquatic organisms. 034986

Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline: The modified OEHHA Fish Contaminant Goal for chlorpyrifos in shellfish tissue is 1,000 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; USEPA, 2000)

Guideline Reference: Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment
Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene
Guidance for Assessing Chemical Contaminant Data for Use In Fish Advisories Volume 1: Fish Sampling and Analysis

Spatial Representation: Samples are collected by hand from three sub-locations for each site. The composite sample was collected from AHLG.

Temporal Representation: Representative samples of locally abundant species were collected during the winter on 1/20/2008

Environmental Conditions:

QAPP Information: Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/

QAPP Information Reference(s):

DECISION ID	47508	Region 9
Agua Hedionda Lagoon		

Pollutant: **Chromium**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 5 samples exceed the evaluation guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 5 samples exceed the evaluation guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47508, Chromium **Region 9**

Agua Hedionda Lagoon

LOE ID:	78199
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Agua Hedionda Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Chromium.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Chromium is 370 ug/g dry weight (Long et al., 1995).
Guideline Reference:	Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuary sediments. Environmental Management. 19, (1): 81-97
Spatial Representation:	Data for this line of evidence for Agua Hedionda Lagoon was collected at 5 monitoring sites [904_6269, 904_6270, 904_6271, 904_6280, 904_6282]
Temporal Representation:	Data was collected on a single day 7/8/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 47508, Chromium **Region 9**

Agua Hedionda Lagoon

LOE ID:	72909
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING

Data Used to Assess Water Quality:	Five samples were collected to test for toxicity. One of the samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius and percent normal of Mytilus galloprovincialis.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected from sites 904_6269, 904_6270, 904_6271, 904_6280, 904_6282 Agua Hedionda Lagoon.
Temporal Representation:	The samples were collected in July 2008.
Environmental Conditions:	
QAPP Information:	This data was collected under the Southern California Bight 2008 Regional Marine Monitoring Survey Quality Assurance Plan.
QAPP Information Reference(s):	e-mail clarifying QAPP information

DECISION ID	47509	Region 9
Agua Hedionda Lagoon		

Pollutant:	**Chrysene (C1-C4)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of 5 samples exceed the evaluation guideline. Based on the readily available data and information, the weight of evidence indicates that there issufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 5 samples exceed the evaluation guideline and this sample size isinsufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the

applicable beneficial use support rating. 034989

Line of Evidence (LOE) for Decision ID 47509, Chrysene (C1-C4) **Region 9**

Agua Hedionda Lagoon

LOE ID:	78200
Pollutant:	Chrysene (C1-C4)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Agua Hedionda Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Chrysene.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for Chrysene is 845.98 ng/g dry weight (MacDonald et al., 1996).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for Agua Hedionda Lagoon was collected at 5 monitoring sites [904_6269, 904_6270, 904_6271, 904_6280, 904_6282]
Temporal Representation:	Data was collected on a single day 7/8/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 47509, Chrysene (C1-C4) **Region 9**

Agua Hedionda Lagoon

LOE ID:	72909
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Five samples were collected to test for toxicity. One of the samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius and percent

	normal of Mytilus galloprovincialis.	034990
Data Reference:	Data for Various Pollutants from Bight, 2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.	
Guideline Reference:		
Spatial Representation:	The samples were collected from sites 904_6269, 904_6270, 904_6271, 904_6280, 904_6282 Agua Hedionda Lagoon.	
Temporal Representation:	The samples were collected in July 2008.	
Environmental Conditions:		
QAPP Information:	This data was collected under the Southern California Bight 2008 Regional Marine Monitoring Survey Quality Assurance Plan.	
QAPP Information Reference(s):	e-mail clarifying QAPP information	

DECISION ID	47510	Region 9
Agua Hedionda Lagoon		

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of 5 samples exceed the evaluation guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 5 samples exceed the evaluation guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47510, Copper **Region 9**

Agua Hedionda Lagoon

LOE ID:	72909
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Five samples were collected to test for toxicity. One of the samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius and percent normal of Mytilus galloprovincialis.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected from sites 904_6269, 904_6270, 904_6271, 904_6280, 904_6282 Agua Hedionda Lagoon.
Temporal Representation:	The samples were collected in July 2008.
Environmental Conditions:	
QAPP Information:	This data was collected under the Southern California Bight 2008 Regional Marine Monitoring Survey Quality Assurance Plan.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 47510, Copper **Region 9**

Agua Hedionda Lagoon

LOE ID:	78206
Pollutant:	Copper
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Agua Hedionda Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Copper.

Data Reference:	Data for Various Pollutants from Bight, 2008.	034992
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Copper is 270 ug/g dry weight (Long et al., 1995).	
Guideline Reference:	Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuary sediments. Environmental Management. 19, (1): 81-97	
Spatial Representation:	Data for this line of evidence for Agua Hedionda Lagoon was collected at 5 monitoring sites [904_6269, 904_6270, 904_6271, 904_6280, 904_6282]	
Temporal Representation:	Data was collected on a single day 7/8/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.	

DECISION ID 47512 — Region 9

Agua Hedionda Lagoon

Pollutant:	**Dibenz[a,h]anthracene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of 5 samples exceed the evaluation guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 5 samples exceed the evaluation guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47512, Dibenz[a,h]anthracene — Region 9

Agua Hedionda Lagoon 034993

LOE ID:	72909
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Five samples were collected to test for toxicity. One of the samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius and percent normal of Mytilus galloprovincialis.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected from sites 904_6269, 904_6270, 904_6271, 904_6280, 904_6282 Agua Hedionda Lagoon.
Temporal Representation:	The samples were collected in July 2008.
Environmental Conditions:	
QAPP Information:	This data was collected under the Southern California Bight 2008 Regional Marine Monitoring Survey Quality Assurance Plan.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 47512, Dibenz[a,h]anthracene **Region 9**

Agua Hedionda Lagoon

LOE ID:	78207
Pollutant:	Dibenz[a,h]anthracene
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Agua Hedionda Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Dibenzo(a, h)anthracene.
Data Reference:	Data for Various Pollutants from Bight, 2008.

SWAMP Data:	Non-SWAMP	034994
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Dibenzo(a, h)anthracene is 260 ng/g dry weight (Long et al., 1995).	
Guideline Reference:	Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuary sediments. Environmental Management. 19, (1): 81-97	
Spatial Representation:	Data for this line of evidence for Agua Hedionda Lagoon was collected at 5 monitoring sites [904_6269, 904_6270, 904_6271, 904_6280, 904_6282]	
Temporal Representation:	Data was collected on a single day 7/8/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.	

DECISION ID 47513 Region 9

Agua Hedionda Lagoon

Pollutant:	**Dieldrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line(s) of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of 1 sample exceeds the evaluation guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 1 sample exceeds the evaluation guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47513, Dieldrin Region 9

Agua Hedionda Lagoon

LOE ID:	72898

Pollutant:	Dieldrin
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Fish fillet
Beneficial Use:	Shellfish Harvesting
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The results did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for dieldrin in shellfish tissue is 0.49 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from AHLG.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/20/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID **47514** **Region 9**

Agua Hedionda Lagoon

Pollutant:	**Endosulfan**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or	Pollutant

Pollution: 034996

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line(s) of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 1 sample exceeds the evaluation guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 1 sample exceeds the evaluation guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples are needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47514, Endosulfan **Region 9**

Agua Hedionda Lagoon

LOE ID:	72899
Pollutant:	Endosulfan
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Fish fillet
Beneficial Use:	Shellfish Harvesting
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The one sample did not exceed the objective. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal. Total Endosulfan result was calculated by summing Endosulfan I and Endosulfan II.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for endosulfan (I and II) in shellfish tissue is 20,000 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R.

	Brodberg, 2008; USEPA, 2000) 034997
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Guidance for Assessing Chemical Contaminant Data for Use In Fish Advisories Volume 1: Fish Sampling and Analysis
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from AHLG.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/20/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID	47515	Region 9
Agua Hedionda Lagoon		

Pollutant:	**Endrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 and 3.6 of the Listing Policy. Under section 3.5, a single line of evidence is necessary to determine listing status and under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Three lines of evidence are available in the administrative record to assess this pollutant. Zero of the 5 samples exceed the evaluation guideline in sediment, and 0 of 1 sample exceed the evaluation guideline in tissue. Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the 5 samples exceed the evaluation guideline in sediment, and 0 of 1 sample exceed the evaluation guideline in tissue and these sample sizes are insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the

applicable beneficial use support rating. 034998

Line of Evidence (LOE) for Decision ID 47515, Endrin **Region 9**

Agua Hedionda Lagoon

LOE ID:	72900
Pollutant:	Endrin
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Fish fillet
Beneficial Use:	Shellfish Harvesting
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The one sample did not exceed the objective. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for endrin in shellfish tissue is 1,000 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; USEPA, 2000)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Guidance for Assessing Chemical Contaminant Data for Use In Fish Advisories Volume 1: Fish Sampling and Analysis
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from AHLG.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/20/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 47515, Endrin **Region 9**

Agua Hedionda Lagoon 034999

LOE ID:	72909
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Five samples were collected to test for toxicity. One of the samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius and percent normal of Mytilus galloprovincialis.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected from sites 904_6269, 904_6270, 904_6271, 904_6280, 904_6282 Agua Hedionda Lagoon.
Temporal Representation:	The samples were collected in July 2008.
Environmental Conditions:	
QAPP Information:	This data was collected under the Southern California Bight 2008 Regional Marine Monitoring Survey Quality Assurance Plan.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 47515, Endrin **Region 9**

Agua Hedionda Lagoon

LOE ID:	78208
Pollutant:	Endrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Agua Hedionda Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Endrin.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the sediment quality guideline (predictive of sediment toxicity for sediment-dwelling organisms) for Endrin is 0.76 ug/g oc (Fairey et al., 2001).
Guideline Reference:	Technical basis for deriving sediment criteria for nonionic organic contaminants for the protection of benthic organisms by using equilibrium partitioning. EPA822-R-93-011. Washington, D.C.: Office of Water, USEPA
Spatial Representation:	Data for this line of evidence for Agua Hedionda Lagoon was collected at 5 monitoring sites [904_6269, 904_6270, 904_6271, 904_6280, 904_6282]
Temporal Representation:	Data was collected on a single day 7/8/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID 47516 Region 9

Agua Hedionda Lagoon

Pollutant:	**Heptachlor epoxide**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of 1 sample exceeds the evaluation guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 1 sample exceeds the evaluation guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples are needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47516, Heptachlor epoxide Region 9

Agua Hedionda Lagoon

LOE ID: 72904

Pollutant:	Heptachlor epoxide	035001
LOE Subgroup:	Pollutant-Tissue	
Matrix:	Tissue	
Fraction:	Fish fillet	
Beneficial Use:	Shellfish Harvesting	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	Shellfish surveys	
Data Used to Assess Water Quality:	The sample did not exceed the objective. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.	
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for heptachlor epoxide in shellfish tissue is 1.4 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; OEHHA, 1999)	
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Public Health Goal for Heptachlor and Heptachlor Epoxide in Drinking Water	
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from AHLG.	
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/20/2008	
Environmental Conditions:		
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/	
QAPP Information Reference(s):		

DECISION ID	47521	Region 9
Agua Hedionda Lagoon		

Pollutant:	**Hexachlorobenzene/ HCB**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or	Pollutant

Pollution: 035002

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line(s) of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 1 sample exceed the evaluation guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 1 sample exceed the evaluation guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47521, Hexachlorobenzene/ HCB **Region 9**

Agua Hedionda Lagoon

LOE ID:	72905
Pollutant:	Hexachlorobenzene/ HCB
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Fish fillet
Beneficial Use:	Shellfish Harvesting
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for hexachlorobenzene in shellfish tissue is 4.3 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A.

	Pollock, 1999; Klasing, S., and R. Brodberg, 2008; OEHHA, 2005) 035003
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Air Toxics Hotspots Program Risk Assessment Guidelines. Part II Technical Support Document for Describing Available Cancer Potency Values.
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from AHLG.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/20/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID	47526	Region 9
Agua Hedionda Lagoon		

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of 5 samples exceed the evaluation guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 5 samples exceed the evaluation guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47526, Lead 035004 Region 9

Agua Hedionda Lagoon

LOE ID:	78209
Pollutant:	Lead
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Agua Hedionda Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Lead.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for Lead is 112.18 ug/g dry weight (MacDonald et al., 1996).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for Agua Hedionda Lagoon was collected at 5 monitoring sites [904_6269, 904_6270, 904_6271, 904_6280, 904_6282]
Temporal Representation:	Data was collected on a single day 7/8/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 47526, Lead Region 9

Agua Hedionda Lagoon

LOE ID:	72909
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Five samples were collected to test for toxicity. One of the samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius and percent normal of Mytilus galloprovincialis.
Data Reference:	Data for Various Pollutants from Bight, 2008.

SWAMP Data:	Non-SWAMP	035005
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.	
Guideline Reference:		
Spatial Representation:	The samples were collected from sites 904_6269, 904_6270, 904_6271, 904_6280, 904_6282 Agua Hedionda Lagoon.	
Temporal Representation:	The samples were collected in July 2008.	
Environmental Conditions:		
QAPP Information:	This data was collected under the Southern California Bight 2008 Regional Marine Monitoring Survey Quality Assurance Plan.	
QAPP Information Reference(s):	e-mail clarifying QAPP information	

DECISION ID	47527	Region 9
Agua Hedionda Lagoon		

Pollutant:	**Lindane/gamma Hexachlorocyclohexane (gamma-HCH)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 and 3.6 of the Listing Policy. Under section 3.5, a single line of evidence is necessary to determine listing status and under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Three lines of evidence are available in the administrative record to assess this pollutant. Zero of the 5 samples exceed the evaluation guideline in sediment, 1 of 5 samples exceed the water quality objective for toxicity in sediment, and 0 of 1 sample exceed the evaluation guideline in tissue. Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the 5 samples exceed the evaluation guideline in sediment, and 0 of 1 sample exceed the evaluation guideline in tissue and these sample sizes are insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47527, Lindane/gamma Hexachlorocyclohexane (gamma-HCH)

Region 9

Agua Hedionda Lagoon

LOE ID:	72906
Pollutant:	Lindane/gamma Hexachlorocyclohexane (gamma-HCH)
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Fish fillet
Beneficial Use:	Shellfish Harvesting
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for lindane in shellfish tissue is 7.1 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; OEHHA, 2005)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Air Toxics Hotspots Program Risk Assessment Guidelines. Part II Technical Support Document for Describing Available Cancer Potency Values.
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from AHLG.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/20/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 47527, Lindane/gamma Hexachlorocyclohexane (gamma-HCH)

Region 9

Agua Hedionda Lagoon

035007

LOE ID:	78210
Pollutant:	Lindane/gamma Hexachlorocyclohexane (gamma-HCH)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Agua Hedionda Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for HCH, Gamma.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the sediment quality guideline (predictive of sediment toxicity for sediment-dwelling organisms) for HCH, gamma(Lindane; BHC, gamma) is 0.37 ug/g oc (Fairey et al., 2001).
Guideline Reference:	An evaluation of methods for calculating mean sediment quality guideline quotients as indicators of contamination and acute toxicity to amphipods by chemical mixtures. Environmental Toxicology and Chemistry. 20(10): 2276-2286
Spatial Representation:	Data for this line of evidence for Agua Hedionda Lagoon was collected at 5 monitoring sites [904_6269, 904_6270, 904_6271, 904_6280, 904_6282]
Temporal Representation:	Data was collected on a single day 7/8/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 47527, Lindane/gamma Hexachlorocyclohexane (gamma-HCH)

Region 9

Agua Hedionda Lagoon

LOE ID:	72909
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Five samples were collected to test for toxicity. One of the samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius and percent normal of Mytilus galloprovincialis.
Data Reference:	Data for Various Pollutants from Bight, 2008.

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected from sites 904_6269, 904_6270, 904_6271, 904_6280, 904_6282 Agua Hedionda Lagoon.
Temporal Representation:	The samples were collected in July 2008.
Environmental Conditions:	
QAPP Information:	This data was collected under the Southern California Bight 2008 Regional Marine Monitoring Survey Quality Assurance Plan.
QAPP Information Reference(s):	e-mail clarifying QAPP information

DECISION ID **47529** **Region 9**

Agua Hedionda Lagoon

Pollutant:	**Mercury**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 and 3.6 of the Listing Policy. Under section 3.5, a single line of evidence is necessary to determine listing status and under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Three lines of evidence are available in the administrative record to assess this pollutant. Zero of the 5 samples exceed the evaluation guideline in sediment, 1 of 5 samples exceed the water quality objective for toxicity in sediment, and 0 of 1 sample exceed the evaluation guideline in tissue.

Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the 5 samples exceed the evaluation guideline in sediment, and 0 of 1 sample exceed the evaluation guideline in tissue and these sample sizes are insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47529, Mercury **Region 9**

Agua Hedionda Lagoon

LOE ID:	72909
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Five samples were collected to test for toxicity. One of the samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius and percent normal of Mytilus galloprovincialis.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected from sites 904_6269, 904_6270, 904_6271, 904_6280, 904_6282 Agua Hedionda Lagoon.
Temporal Representation:	The samples were collected in July 2008.
Environmental Conditions:	
QAPP Information:	This data was collected under the Southern California Bight 2008 Regional Marine Monitoring Survey Quality Assurance Plan.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 47529, Mercury **Region 9**

Agua Hedionda Lagoon

LOE ID:	78211
Pollutant:	Mercury
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Agua Hedionda Lagoon to determine beneficial

	use support and results are as follows: 0 of 5 samples exceed the criterion for Mercury.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the sediment quality guideline (predictive of sediment toxicity for sediment-dwelling organisms) for Mercury is 2.1 ug/g (PTI Environmental Services, 1991).
Guideline Reference:	Pollutants of concern in Puget Sound. EPA 910/9-91-003. Seattle, WA: U.S. Environmental Protection Agency
Spatial Representation:	Data for this line of evidence for Agua Hedionda Lagoon was collected at 5 monitoring sites [904_6269, 904_6270, 904_6271, 904_6280, 904_6282]
Temporal Representation:	Data was collected on a single day 7/8/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 47529, Mercury **Region 9**

Agua Hedionda Lagoon

LOE ID:	72907
Pollutant:	Mercury
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Fish fillet
Beneficial Use:	Shellfish Harvesting
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The sample did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The USEPA 304(a) recommended water quality criterion for concentrations of methylmercury in shellfish tissue (wet weight) is 0.2 ppm. (Brodberg, R.K., and G.A. Pollock, 1999; USEPA, 2001)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Water Quality Criterion for the Protection of Human Health: Methylmercury. Final. United States Environmental Protection Agency Office of Science and Technology Office of Water. EPA-823-R-01-001. January 2001

Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from AHLG.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/20/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID 47533 Region 9

Agua Hedionda Lagoon

Pollutant:	**Mirex**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line(s) of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of 0 samples exceed the evaluation guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 0 samples exceed the evaluation guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47533, Mirex Region 9

Agua Hedionda Lagoon

LOE ID:	72908
Pollutant:	Mirex
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Fish fillet
Beneficial Use:	Shellfish Harvesting

Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The detected not quantifiable result was not included in the assessment since the reporting limit was above the evaluation guideline. MDL were provided by NOAA Federal and RL were calculated by multiplying 3.18 by the MDL.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for mirex in shellfish tissue is 0.43 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; OEHHA, 1992)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Expedited Cancer Potency Values and Proposed Regulatory Levels for Certain Proposition 65 Carcinogens.
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from AHLG.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/20/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID	**47535**	**Region 9**
Agua Hedionda Lagoon		

Pollutant:	**PAHs (Polycyclic Aromatic Hydrocarbons)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.5 and 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Under section 3.5, at

least one single line of evidence is necessary to determine listing status. 035013

Five lines of evidence are available in the administrative record to assess this pollutant. Zero of the 5 samples exceed the evaluation guideline in sediment for low molecular PAHs, 0 of 5 samples exceed the evaluation guideline for high molecular weight PAHs, 0 of 5 samples exceed the evaluation guideline for Total PAHs, 0 of 1 sample exceeds the evaluation guideline for PAHs in tissue. One of 5 samples exhibited sediment toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the 5 samples exceed the evaluation guideline in sediment for low molecular PAHs, 0 of 5 samples exceed the evaluation guideline for high molecular weight PAHs, 0 of 5 samples exceed the evaluation guideline for Total PAHs, 0 of 1 sample exceeds the evaluation guideline for PAHs in tissue and these sample sizes are insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47535, PAHs (Polycyclic Aromatic Hydrocarbons) Region 9

Agua Hedionda Lagoon

LOE ID:	77213
Pollutant:	PAHs (Polycyclic Aromatic Hydrocarbons)
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Fish fillet
Beneficial Use:	Shellfish Harvesting
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The one sample did not exceed the objective. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal. The total PAHs were calculated as the potency equivalency concentration or the sum of the toxic equivalency factors multiplied by the concentrations of: Acenaphthene, Acenaphthylene, Anthracene, Benz[a]anthracene, Benzo[a]pyrene, Benzo[b]fluoranthene, Benzo[g,h,i]perylene, Benzo[k]fluoranthene, Dibenzo[a,h]anthracene, Chrysene, Fluoranthene, Fluorene, Indeno[1,2,3-c,d]pyrene, Phenanthrene, and Pyrene.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.

Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	035014
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for polycyclic aromatic hydrocarbons in shellfish tissue is 1.1 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; USEPA, 2000)	
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Guidance for Assessing Chemical Contaminant Data for Use In Fish Advisories Volume 1: Fish Sampling and Analysis	
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from AHLG.	
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/20/2008	
Environmental Conditions:		
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 47535, PAHs (Polycyclic Aromatic Hydrocarbons) Region 9

Agua Hedionda Lagoon

LOE ID:	78203
Pollutant:	PAHs (Polycyclic Aromatic Hydrocarbons)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Agua Hedionda Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for PAH, Low molecular weight.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Low molecular weight PAHs is 1442 ng/g dry weight (Long et al., 1995).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278

Spatial Representation:	Data for this line of evidence for Agua Hedionda Lagoon was collected at 5 monitoring sites [904_6269, 904_6270, 904_6271, 904_6280, 904_6282]
Temporal Representation:	Data was collected on a single day 7/8/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 47535, PAHs (Polycyclic Aromatic Hydrocarbons) Region 9

Agua Hedionda Lagoon

LOE ID:	72909
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Five samples were collected to test for toxicity. One of the samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius and percent normal of Mytilus galloprovincialis.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected from sites 904_6269, 904_6270, 904_6271, 904_6280, 904_6282 Agua Hedionda Lagoon.
Temporal Representation:	The samples were collected in July 2008.
Environmental Conditions:	
QAPP Information:	This data was collected under the Southern California Bight 2008 Regional Marine Monitoring Survey Quality Assurance Plan.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 47535, PAHs (Polycyclic Aromatic Hydrocarbons) Region 9

Agua Hedionda Lagoon

LOE ID:	78204
Pollutant:	PAHs (Polycyclic Aromatic Hydrocarbons)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat

Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Agua Hedionda Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for PAHs (Polycyclic Aromatic Hydrocarbons).
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the sediment quality guideline (predictive of sediment toxicity for sediment-dwelling organisms) for Total PAHs is 1800 ug/g (Fairey et al., 2001).
Guideline Reference:	An evaluation of methods for calculating mean sediment quality guideline quotients as indicators of contamination and acute toxicity to amphipods by chemical mixtures. Environmental Toxicology and Chemistry. 20(10): 2276-2286
Spatial Representation:	Data for this line of evidence for Agua Hedionda Lagoon was collected at 5 monitoring sites [904_6269, 904_6270, 904_6271, 904_6280, 904_6282]
Temporal Representation:	Data was collected on a single day 7/8/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 47535, PAHs (Polycyclic Aromatic Hydrocarbons) Region 9

Agua Hedionda Lagoon

LOE ID:	78212
Pollutant:	PAHs (Polycyclic Aromatic Hydrocarbons)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Agua Hedionda Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for PAH, High molecular weight.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for High molecular weight PAHs is 9600 ng/g dry weight (Long et al., 1995).
Guideline Reference:	Incidence of adverse biological effects within ranges of chemical concentrations in marine

and estuary sediments. Environmental Management. 19, (1): 81-97 035017

Spatial Representation:	Data for this line of evidence for Agua Hedionda Lagoon was collected at 5 monitoring sites [904_6269, 904_6270, 904_6271, 904_6280, 904_6282]
Temporal Representation:	Data was collected on a single day 7/8/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID 47559 Region 9

Agua Hedionda Lagoon

Pollutant:	**PCBs (Polychlorinated biphenyls)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.5 and 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Three lines of evidence are available in the administrative record to assess this pollutant. Zero of 5 samples exceed the evaluation guideline in sediment and 0 of 1 sample exceeds the evaluation guideline in tissue. One of 5 samples exhibited sediment toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 5 samples exceed the evaluation guideline in sediment and 0 of 1 sample exceeds the evaluation guideline in tissue and these sample sizes are insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47559, PCBs (Polychlorinated biphenyls) Region 9

Agua Hedionda Lagoon

LOE ID:	72909
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat

Number of Samples:	5
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Five samples were collected to test for toxicity. One of the samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius and percent normal of Mytilus galloprovincialis.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected from sites 904_6269, 904_6270, 904_6271, 904_6280, 904_6282 Agua Hedionda Lagoon.
Temporal Representation:	The samples were collected in July 2008.
Environmental Conditions:	
QAPP Information:	This data was collected under the Southern California Bight 2008 Regional Marine Monitoring Survey Quality Assurance Plan.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 47559, PCBs (Polychlorinated biphenyls) Region 9

Agua Hedionda Lagoon

LOE ID:	72896
Pollutant:	PCBs (Polychlorinated biphenyls)
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Fish fillet
Beneficial Use:	Shellfish Harvesting
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The sample did not exceed the objective. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal. Total PCB was assessed for as follows: PCB aroclors and congeners were summed separately and the sum that yielded the highest value was used for the assessment.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for polychlorinated biphenyls in shellfish tissue is 3.9 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from AHLG.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/20/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 47559, PCBs (Polychlorinated biphenyls) Region 9

Agua Hedionda Lagoon

LOE ID:	78205
Pollutant:	PCBs (Polychlorinated biphenyls)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Agua Hedionda Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for PCB, Total.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the sediment quality guideline (predictive of sediment toxicity for sediment-dwelling organisms) for Total PCBs is 400 ng/g (MacDonald et al., 2000b).
Guideline Reference:	Development and evaluation of consensus-based sediment effect concentrations for polychlorinated biphenyls. Environmental Toxicology and Chemistry. 19(5): 1403-1413
Spatial Representation:	Data for this line of evidence for Agua Hedionda Lagoon was collected at 5 monitoring sites [904_6269, 904_6270, 904_6271, 904_6280, 904_6282]
Temporal Representation:	Data was collected on a single day 7/8/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.

QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was found.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID 47560 Region 9

Agua Hedionda Lagoon

Pollutant:	**Phenanthrene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 5 samples exceed the evaluation guideline. One of 5 samples exhibited sediment toxicity. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the 5 samples exceed the evaluation guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47560, Phenanthrene Region 9

Agua Hedionda Lagoon

LOE ID:	78214
Pollutant:	Phenanthrene
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Agua Hedionda Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for

	Phenanthrene.	035021
Data Reference:	Data for Various Pollutants from Bight, 2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for Phenanthrene is 543.53 ng/g dry weight (MacDonald et al., 1996).	
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278	
Spatial Representation:	Data for this line of evidence for Agua Hedionda Lagoon was collected at 5 monitoring sites [904_6269, 904_6270, 904_6271, 904_6280, 904_6282]	
Temporal Representation:	Data was collected on a single day 7/8/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.	

Line of Evidence (LOE) for Decision ID 47560, Phenanthrene **Region 9**

Agua Hedionda Lagoon

LOE ID:	72909
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Five samples were collected to test for toxicity. One of the samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius and percent normal of Mytilus galloprovincialis.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected from sites 904_6269, 904_6270, 904_6271, 904_6280, 904_6282 Agua Hedionda Lagoon.
Temporal Representation:	The samples were collected in July 2008.
Environmental Conditions:	
QAPP Information:	This data was collected under the Southern California Bight 2008 Regional Marine

QAPP Information Reference(s):	Monitoring Survey Quality Assurance Plan. e-mail clarifying QAPP information	035022

DECISION ID	47573	Region 9
Agua Hedionda Lagoon		

Pollutant:	**Pyrene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 5 samples exceed the evaluation guideline. One of 5 samples exhibited sediment toxicity. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the 5 samples exceed the evaluation guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47573, Pyrene	**Region 9**
Agua Hedionda Lagoon	

LOE ID:	72909
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Five samples were collected to test for toxicity. One of the samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius and percent

	normal of Mytilus galloprovincialis.	035023
Data Reference:	Data for Various Pollutants from Bight, 2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.	
Guideline Reference:		
Spatial Representation:	The samples were collected from sites 904_6269, 904_6270, 904_6271, 904_6280, 904_6282 Agua Hedionda Lagoon.	
Temporal Representation:	The samples were collected in July 2008.	
Environmental Conditions:		
QAPP Information:	This data was collected under the Southern California Bight 2008 Regional Marine Monitoring Survey Quality Assurance Plan.	
QAPP Information Reference(s):	e-mail clarifying QAPP information	

Line of Evidence (LOE) for Decision ID 47573, Pyrene **Region 9**

Agua Hedionda Lagoon

LOE ID:	78215
Pollutant:	Pyrene
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Agua Hedionda Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Pyrene.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for Pyrene is 1397.4 ng/g dry weight (MacDonald et al., 1996).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for Agua Hedionda Lagoon was collected at 5 monitoring sites [904_6269, 904_6270, 904_6271, 904_6280, 904_6282]
Temporal Representation:	Data was collected on a single day 7/8/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.

QAPP Information Reference(s): Quality Assurance Project Plan from Southern California Bight. 035024

DECISION ID	47572	Region 9
Agua Hedionda Lagoon		

Pollutant:	**Selenium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line(s) of evidence are necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of 1 sample exceeds the evaluation guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3.Zero of 1 sample exceeds the evaluation guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47572, Selenium	**Region 9**
Agua Hedionda Lagoon	

LOE ID:	72910
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Fish fillet
Beneficial Use:	Shellfish Harvesting
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The sample did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board

SWAMP Data:	Non-SWAMP	035025
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for selenium in shellfish tissue is 11 ppm. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day. A background dietary consuption rate of 0.114 mg/day is applied for this micronutrient. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008)	
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene	
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from AHLG.	
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/20/2008	
Environmental Conditions:		
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/	
QAPP Information Reference(s):		

DECISION ID	**47575**	**Region 9**
Agua Hedionda Lagoon		

Pollutant:	**Silver**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of 5 samples exceed the water quality objective. One of 5 samples exhibited sediment toxicity. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 5 samples exceed the water quality objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.

4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47575, Silver **Region 9**

Agua Hedionda Lagoon

LOE ID:	78216
Pollutant:	Silver
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Agua Hedionda Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Silver.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for Silver is 1.77 ug/g dry weight (MacDonald et al., 1996).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for Agua Hedionda Lagoon was collected at 5 monitoring sites [904_6269, 904_6270, 904_6271, 904_6280, 904_6282]
Temporal Representation:	Data was collected on a single day 7/8/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 47575, Silver **Region 9**

Agua Hedionda Lagoon

LOE ID:	72909
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	5

Number of Exceedances:	1	035027
Data and Information Type:	TOXICITY TESTING	
Data Used to Assess Water Quality:	Five samples were collected to test for toxicity. One of the samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius and percent normal of Mytilus galloprovincialis.	
Data Reference:	Data for Various Pollutants from Bight, 2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.	
Guideline Reference:		
Spatial Representation:	The samples were collected from sites 904_6269, 904_6270, 904_6271, 904_6280, 904_6282 Agua Hedionda Lagoon.	
Temporal Representation:	The samples were collected in July 2008.	
Environmental Conditions:		
QAPP Information:	This data was collected under the Southern California Bight 2008 Regional Marine Monitoring Survey Quality Assurance Plan.	
QAPP Information Reference(s):	e-mail clarifying QAPP information	

DECISION ID	47576	Region 9
Agua Hedionda Lagoon		

Pollutant:	**Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5, a single line(s) of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of 1 sample exceeds the evaluation guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 1 sample exceeds the evaluation guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and

information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47576, Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD) **Region 9**

Agua Hedionda Lagoon

LOE ID:	72913
Pollutant:	Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD)
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Fish fillet
Beneficial Use:	Shellfish Harvesting
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The one sample did not exceed the objective. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal. The total DDTs were calculated as the sum of 4,4- and 2,4- isomers of DDT, DDE, and DDD.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for total DDT in shellfish tissue is 23 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from AHLG.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/20/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID **47579** **Region 9**

Agua Hedionda Lagoon

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of 5 samples exceed the evaluation guideline. One of 5 samples exhibited sediment toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 5 samples exceed the evaluation guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47579, Zinc **Region 9**

Agua Hedionda Lagoon

LOE ID:	78213
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Agua Hedionda Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Zinc.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Zinc is 410 ug/g dry weight (Long et al., 1995).
Guideline Reference:	Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuary sediments. Environmental Management. 19, (1): 81-97
Spatial Representation:	Data for this line of evidence for Agua Hedionda Lagoon was collected at 5 monitoring sites [904_6269, 904_6270, 904_6271, 904_6280, 904_6282]
Temporal Representation:	Data was collected on a single day 7/8/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 47579, Zinc **Region 9**

Agua Hedionda Lagoon

LOE ID:	72909
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Five samples were collected to test for toxicity. One of the samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius and percent normal of Mytilus galloprovincialis.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected from sites 904_6269, 904_6270, 904_6271, 904_6280, 904_6282 Agua Hedionda Lagoon.
Temporal Representation:	The samples were collected in July 2008.
Environmental Conditions:	
QAPP Information:	This data was collected under the Southern California Bight 2008 Regional Marine Monitoring Survey Quality Assurance Plan.
QAPP Information Reference(s):	e-mail clarifying QAPP information

DECISION ID 47580 Region 9

Agua Hedionda Lagoon 035031

Pollutant:	**pH**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. One of 60 samples exceeds the basin plan objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of 60 samples exceeds the basin plan objective and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 47580, pH — Region 9

Agua Hedionda Lagoon

LOE ID:	72897
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Estuarine Habitat
Number of Samples:	60
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	One of the 60 samples exceeded the objective.
Data Reference:	Data for Various Pollutants in the Agua Hedionda Lagoon and Navy Storm Water, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In bays and estuaries the pH shall not be depressed below 7.0 nor raised above 9.0.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the "intake" station.

Temporal Representation:	Samples were collected monthly from January 2004 to December 2008. 035032
Environmental Conditions:	
QAPP Information:	No quality assurance information was provided.
QAPP Information Reference(s):	

DECISION ID	47577	Region 9
Agua Hedionda Lagoon		

Pollutant:	**Toxicity**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2027
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Waters may also be placed on the section 303(d) list for toxicity alone.

One line of evidence are available in the administrative record to assess this pollutant. Three of the eight samples exceed the objective. Three of eight samples exhibited sediment toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Three of the eight samples exceed the objective and this sample size is sufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 47577, Toxicity	Region 9
Agua Hedionda Lagoon	

LOE ID:	72909
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	1

Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Five samples were collected to test for toxicity. One of the samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius and percent normal of Mytilus galloprovincialis.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected from sites 904_6269, 904_6270, 904_6271, 904_6280, 904_6282 Agua Hedionda Lagoon.
Temporal Representation:	The samples were collected in July 2008.
Environmental Conditions:	
QAPP Information:	This data was collected under the Southern California Bight 2008 Regional Marine Monitoring Survey Quality Assurance Plan.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 47577, Toxicity **Region 9**

Agua Hedionda Lagoon

LOE ID:	72914
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	3
Number of Exceedances:	2
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Three samples were collected to test for toxicity. Two of the three samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius. Each sample is a sediment composites from three different sites.
Data Reference:	Data for Various Pollutants from Ambient Bay and Lagoon, 2003-2005.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, Fifth Edition. EPA-821-R-02-012

Spatial Representation:	The samples were collected at station 904AHL_2003 - composite from 904_AHL2L_2003, 904_AHL2M_2003, 904_AHL3L_2003, 904_AHL3M_2003. Station 904AHL_2004 - composite from 904_AHL2L2_2004, 904_AHL3L1_2004, 904_AHL3R1_2004, and Station 904AHL_2005 - composite from 904_AHL3L1_2005, 904_AHL3M1_2005, 904_AHL3R1_2005.
Temporal Representation:	The samples were collected in July 2003, 2004, and 2005.
Environmental Conditions:	
QAPP Information:	The data was collected under the County of San Diego Ambient Bay and Lagoon Monitoring Project 2003-2005. Annual Report for the Receiving Waters and Urban Runoff Monitoring section covered under the San Diego County Municipal National Pollutant Discharge Elimination System (NPDES) Permit (RWQCB-Order NO. R9-2007-0001).
QAPP Information Reference(s):	e-mail clarifying QAPP information

DECISION ID 43540 — Region 9

Agua Hedionda Lagoon

Pollutant:	**Sedimentation/Siltation**
Final Listing Decision:	**Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Original
Reason for Delisting:	Flaws in original listing
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for removal from the section 303(d) list under section 4.2 of the Listing Policy.

Based on the readily available information, the weight of evidence indicates that there is sufficient justification for removing this water segment-pollutant combination from the section 303(d) list.

This conclusion is based on the staff findings that:
1.No data could be found to confirm sedimentation is causing impairment.

The delisting the Agua Hedionda Lagoon, for impairment by sedimentation/siltation, is warranted based upon the following observations:
1) The lagoon is an engineered system that is artificially kept open and includes settling basins that are expected to require maintenance to remove sediment,
2) There is a significant lack of data to support the original sedimentation listing on the 1992 WQA,
3) The historical listings of the lagoon (1992 to 2006) apparently were limited to the outer lagoon,
4) The curtailed sandbar formation in the middle and inner lagoon since the 1998 dredging work in the outer, middle, and inner lagoon,
5) The outer lagoon continues to be dredged every 1 to 3 years, and
6) The apparent effective reduction in sediment build up in the inner lagoon settling basin.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43540, Sedimentation/Siltation — Region 9

Agua Hedionda Lagoon

LOE ID:	30326
Pollutant:	Sedimentation/Siltation
LOE Subgroup:	Testimonial Evidence
Matrix:	Sediment

Fraction:	None	035035
Beneficial Use:	Marine Habitat	
Aquatic Life Use:	Estuarine Habitat	
Number of Samples:		
Number of Exceedances:		
Data and Information Type:	Visual observation, may not quantify some parameters; single season; by prof.	
Data Used to Assess Water Quality:	Agua Hedionda Lagoon is a lagoon that has been extensively modified/improved to create a man-made lagoon to support the operation of the Encina Power Station. Under natural conditions, the lagoon was originally a Â“silt-chokedÂ” marsh that was only occasionally open to the ocean. The lagoon system configuration that was originally dredged in 1954 included two settling basins Â– one in the outer lagoon (~20 feet below MSL) to trap sands carried in through the ocean inlet, and one at the eastern end of the inner lagoon (~17 feet below MSL) to trap sediments from Agua Hedionda Creek, which discharges in to the lagoon. As of 2009, the lagoon system is essentially an engineered system that was built in 1954 and was expected to require some maintenance to remove sediment from the settling basins. The documentation to support the original basis for listing Agua Hedionda Lagoon as an impaired water quality segment, on the 1992 WQA, could not be found. The 1992 WQA listing of Agua Hedionda Lagoon is based primarily on the elevated levels of bacteria in shellfish muscle tissue rather than upon bacteria or sediment in the water column. This seems to be consistent with the 1992 WQA listing being limited to 1 of 400 acres, presumably associated with the shellfish growing area in the outer lagoon. The 1996 WQA increased the area affected to 5 acres, which still is limited to the shellfish growing area in the outer lagoon. In the 1998 303(d) List, the area affected is still shown as 5 acres. The 2002 and 2006 303(d) Lists show the area affected as 6.8 acres. In every listing, the area affected appears to be limited to the outer lagoon. In regards to the basis for listing Agua Hedionda Lagoon for sedimentation, data is not available to support the listing. The available information suggests that the original listing was likely based on the observation of sandbars that had formed in the outer, middle, and western part of the inner lagoon. The sandbars were first noticed in 1960, just 6 years after the intial dredging that formed the lagoon. The formation of the sandbars in the middle and inner lagoon appeared to be a result of the higher than expected flow rates required to operate the Encina Power Station, which greatly increased the sediment discharge into the lagoon from the ocean inlet during flood tides, and reduced the effectiveness of sediment removal out of the lagoon during the ebb tides. In 1998, the outer, middle, and inner Agua Hedionda Lagoon was dredged to conform to a remedial measure proposed by Jenkins and Wasyl (1996). Since the 1998 dredging, the formation of sandbars in the middle and inner lagoon do not appear to be re-occurring. The outer lagoon continues to be dredged approximately every 2 years. The overall impacts of the past dredging projects seems to have improved water circulation and reduced the sediment deposition in the settling basin in the eastern part of the inner lagoon as compared to the time period from 1954 to 1998. The Encina Power Station continues to monitor the sediment build up in the outer, middle, and inner lagoon.	
Data Reference:	Proposal to Remove/Delist Agua Hedionda Lagoon from the Clean Water Act Section 303(d) List of Water Quality Limited Segments for Sedimentation. Memorandum from Wayne Chiu to Alan Monji. July 28, 2009	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	Evidence of siltation.	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin	

Spatial Representation:	The area of concern is 6.8 acres from the outer lagoon.
Temporal Representation:	The narrative covers a period from 1992 to present
Environmental Conditions:	The outer lagoon is dredged approximately every two years to support the operation of the Encina Power Station.
QAPP Information:	None necessary
QAPP Information Reference(s):	

DECISION ID 34302 Region 9

Agua Hedionda Lagoon

Pollutant:	**Invasive Species**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.10 of the Listing Policy. Under section 3.10 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Caulerpa taxifolia was first discovered at Agua Hedionda Lagoon on 6-12-00. Third year monitoring results, to summer 2003 detected no presence of C. taxifolia.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1) Third year monitoring of C. taxifolia occurred from fall 2002 to summer 2003.
2) Baseline data was established from the first and second year monitoring results.
3) Third year monitoring for winter 2002 and spring 2003 were not conducted lagoon-wide, but focused on areas previously known to support C. taxifolia.
4) During the Fall 2002, Winter 2002, Spring 2003 and Summer 2003 surveys no Caulerpa taxifolia was found in the Agua Hedionda Lagoon. None has been discovered since 9/11/02, during the summer survey for the second year monitoring.
5) It cannot be determined if the trend in water quality is expected to meet water standards by the next listing cycle.
6) Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34302, Invasive Species Region 9

Agua Hedionda Lagoon

LOE ID:	641
Pollutant:	Invasive Species
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None

Beneficial Use:	Estuarine Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Caulerpa taxifolia was found in Aqua Hedionda Lagoon on 6-12-00. A second infestation was also located at Huntington Harbor, Orange County, CA. It is possible that Caulerpa taxifolia has been in the Lagoon for at least four years (as early as 1996) prior to its first discovery there. During the Fall 2002, Winter 2002, Spring 2003 and Summer 2003 surveys no Caulerpa taxifolia was found in the Agua Hedionda Lagoon. (Anderson, 2005).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Third year monitoring of Caulerpa taxifolia at Aqua Hedionda Lagoon, Carlsbad, California. The amount of Caulerpa taxifolia in June 2000 was approximately 1,047 meters squared, but by the end of the second year of eradication the amount had been reduced to 0.4 meters squared. Surveys were conducted lagoon-wide, covering the west, central and east basin, however the spring 2003 and winter 2002 surveys were limited to high-risk areas previously known to support Caulerpa taxifolia.
Temporal Representation:	During the third year of eradication, survey work involved four surveys conducted quarterly from fall 2002 to the end of summer 2003. No Caulerpa taxifolia was located in the Lagoon during these surveys for the third year monitoring.
Environmental Conditions:	Changes in relative diversity and abundance of native species may also be driven by habitat alteration, flow changes, or hydromodification.
QAPP Information:	Peer Reviewed Journal Article.
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Batiquitos Lagoon
Water Body ID: CAE9045100019991117143917
Water Body Type: Estuary

DECISION ID 47817 **Region 9**
Batiquitos Lagoon

Pollutant: 2-Methylnaphthalene
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the 5 samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the 5 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47817, 2-Methylnaphthalene **Region 9**
Batiquitos Lagoon

LOE ID: 78217

Pollutant: 2-Methylnaphthalene
LOE Subgroup: Pollutant-Sediment
Matrix: Sediment
Fraction: Total

Beneficial Use: Estuarine Habitat

Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Batiquitos Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for 2-Methylnaphthalene.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for 2-Methylnaphthalene is 201.28 ng/g dry weight (MacDonald et al., 1996).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for Batiquitos Lagoon was collected at 5 monitoring sites [904_6250, 904_6251, 904_6252, 904_6253, 904_6264]
Temporal Representation:	Data was collected on a single day 7/29/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID	**47818**	**Region 9**
Batiquitos Lagoon		

Pollutant:	**Antimony**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the 5 samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 5 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47818, Antimony **Region 9**

Batiquitos Lagoon

LOE ID:	78218
Pollutant:	Antimony
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Batiquitos Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Antimony.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Antimony is 25 ug/g dry weight (Long and Morgan, 1990).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for Batiquitos Lagoon was collected at 5 monitoring sites [904_6250, 904_6251, 904_6252, 904_6253, 904_6264]
Temporal Representation:	Data was collected on a single day 7/29/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID **47819** **Region 9**

Batiquitos Lagoon

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing

status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the 5 samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 5 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47819, Arsenic **Region 9**

Batiquitos Lagoon

LOE ID:	78219
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Batiquitos Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Arsenic.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Arsenic is 70 ug/g dry weight (Long et al., 1995).
Guideline Reference:	Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuary sediments. Environmental Management. 19, (1): 81-97
Spatial Representation:	Data for this line of evidence for Batiquitos Lagoon was collected at 5 monitoring sites [904_6250, 904_6251, 904_6252, 904_6253, 904_6264]
Temporal Representation:	Data was collected on a single day 7/29/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.

QAPP Information Reference(s): Quality Assurance Project Plan from Southern California Bight. 035042

DECISION ID	47820	Region 9
Batiquitos Lagoon		

Pollutant:	**Benzo(a)anthracene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the 5 samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 5 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47820, Benzo(a)anthracene	Region 9
Batiquitos Lagoon	

LOE ID:	78220
Pollutant:	Benzo(a)anthracene
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Batiquitos Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Benzo(a)anthracene.
Data Reference:	Data for Various Pollutants from Bight, 2008.

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for Benzo(a)anthracene is 692.53 ng/g dry weight (MacDonald et al., 1996).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for Batiquitos Lagoon was collected at 5 monitoring sites [904_6250, 904_6251, 904_6252, 904_6253, 904_6264]
Temporal Representation:	Data was collected on a single day 7/29/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID 47821 — Region 9

Batiquitos Lagoon

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of the 5 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 5 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47821, Cadmium — Region 9

Batiquitos Lagoon 035044

LOE ID:	78221
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Batiquitos Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Cadmium.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for Cadmium is 4.21 ng/g dry weight (MacDonald et al., 1996).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for Batiquitos Lagoon was collected at 5 monitoring sites [904_6250, 904_6251, 904_6252, 904_6253, 904_6264]
Temporal Representation:	Data was collected on a single day 7/29/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID **47822** **Region 9**

Batiquitos Lagoon

Pollutant:	**Chlordane**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of the 5 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 5 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47822, Chlordane **Region 9**

Batiquitos Lagoon

LOE ID:	78222
Pollutant:	Chlordane
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Batiquitos Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Chlordane, Total.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Total Chlordane is 6 ng/g dry weight (Long and Morgan, 1990).
Guideline Reference:	The potential for biological effects of sediment-sorbed contaminants tested in the National Status of Trends Program. NOAA Technical Memorandum NOS OMA 52. Seattle, WA: National Oceanic and Atmospheric Administration
Spatial Representation:	Data for this line of evidence for Batiquitos Lagoon was collected at 5 monitoring sites [904_6250, 904_6251, 904_6252, 904_6253, 904_6264]
Temporal Representation:	Data was collected on a single day 7/29/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID **47823** **Region 9**

Batiquitos Lagoon

Pollutant:	**Chromium**	035046
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	
Last Listing Cycle's Final Listing Decision:	New Decision	
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the 5 samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 5 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47823, Chromium **Region 9**

Batiquitos Lagoon

LOE ID:	78223
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Batiquitos Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Chromium.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Chromium is 370 ug/g dry weight (Long et al., 1995).
Guideline Reference:	Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuary sediments. Environmental Management. 19, (1): 81-97
Spatial Representation:	Data for this line of evidence for Batiquitos Lagoon was collected at 5 monitoring sites [904_6250, 904_6251, 904_6252, 904_6253, 904_6264]
Temporal Representation:	Data was collected on a single day 7/29/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID 47824 Region 9

Batiquitos Lagoon

Pollutant:	**Chrysene (C1-C4)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of the 5 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 5 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47824, Chrysene (C1-C4) Region 9

Batiquitos Lagoon

LOE ID:	78224
Pollutant:	Chrysene (C1-C4)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total

Beneficial Use:	Estuarine Habitat	035048
Number of Samples:	5	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Batiquitos Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Chrysene.	
Data Reference:	Data for Various Pollutants from Bight, 2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for Chrysene is 845.98 ng/g dry weight (MacDonald et al., 1996).	
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278	
Spatial Representation:	Data for this line of evidence for Batiquitos Lagoon was collected at 5 monitoring sites [904_6250, 904_6251, 904_6252, 904_6253, 904_6264]	
Temporal Representation:	Data was collected on a single day 7/29/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.	

DECISION ID	**47825**	**Region 9**
Batiquitos Lagoon		

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the 5 samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the 5 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47825, Copper **Region 9**

Batiquitos Lagoon

LOE ID:	78225
Pollutant:	Copper
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Batiquitos Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Copper.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Copper is 270 ug/g dry weight (Long et al., 1995).
Guideline Reference:	Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuary sediments. Environmental Management. 19, (1): 81-97
Spatial Representation:	Data for this line of evidence for Batiquitos Lagoon was collected at 5 monitoring sites [904_6250, 904_6251, 904_6252, 904_6253, 904_6264]
Temporal Representation:	Data was collected on a single day 7/29/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID **47826** **Region 9**

Batiquitos Lagoon

Pollutant:	**Dibenz[a,h]anthracene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with

sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. 035050

One line of evidence is available in the administrative record to assess this pollutant. Zero of the 5 samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the 5 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47826, Dibenz[a,h]anthracene **Region 9**

Batiquitos Lagoon

LOE ID:	78226
Pollutant:	Dibenz[a,h]anthracene
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Batiquitos Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Dibenzo(a, h)anthracene.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Dibenzo(a, h)anthracene is 260 ng/g dry weight (Long et al., 1995).
Guideline Reference:	Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuary sediments. Environmental Management. 19, (1): 81-97
Spatial Representation:	Data for this line of evidence for Batiquitos Lagoon was collected at 5 monitoring sites [904_6250, 904_6251, 904_6252, 904_6253, 904_6264]
Temporal Representation:	Data was collected on a single day 7/29/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.

QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was found.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID 47827 Region 9

Batiquitos Lagoon

Pollutant:	**Endrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of the 2 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the 2 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47827, Endrin Region 9

Batiquitos Lagoon

LOE ID:	78227
Pollutant:	Endrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Batiquitos Lagoon to determine beneficial use support and results are as follows: a total of 5 samples were collected and they were all non-detect, however 3 samples were not used in analysis because when the method

	detection limit was organic carbon normalized, the results were above the guideline and therefore could not be quanitified with the level of certainty required by the Listing Policy.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the sediment quality guideline (predictive of sediment toxicity for sediment-dwelling organisms) for Endrin is 0.76 ug/g oc (Fairey et al., 2001).
Guideline Reference:	Technical basis for deriving sediment criteria for nonionic organic contaminants for the protection of benthic organisms by using equilibrium partitioning. EPA822-R-93-011. Washington, D.C.: Office of Water, USEPA
Spatial Representation:	Data for this line of evidence for Batiquitos Lagoon was collected at 5 monitoring sites [904_6250, 904_6251, 904_6252, 904_6253, 904_6264]
Temporal Representation:	Data was collected on a single day 7/29/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID	**47828**	**Region 9**
Batiquitos Lagoon		

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of the 5 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 5 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47828, Lead — Region 9

Batiquitos Lagoon

LOE ID:	78228
Pollutant:	Lead
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Batiquitos Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Lead.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for Lead is 112.18 ug/g dry weight (MacDonald et al., 1996).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for Batiquitos Lagoon was collected at 5 monitoring sites [904_6250, 904_6251, 904_6252, 904_6253, 904_6264]
Temporal Representation:	Data was collected on a single day 7/29/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID 47829 — Region 9

Batiquitos Lagoon

Pollutant:	**Lindane/gamma Hexachlorocyclohexane (gamma-HCH)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of the 5 samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 5 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47829, Lindane/gamma Hexachlorocyclohexane (gamma-HCH) **Region 9**

Batiquitos Lagoon

LOE ID:	78229
Pollutant:	Lindane/gamma Hexachlorocyclohexane (gamma-HCH)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Batiquitos Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for HCH, Gamma.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the sediment quality guideline (predictive of sediment toxicity for sediment-dwelling organisms) for HCH, gamma(Lindane; BHC, gamma) is 0.37 ug/g oc (Fairey et al., 2001).
Guideline Reference:	An evaluation of methods for calculating mean sediment quality guideline quotients as indicators of contamination and acute toxicity to amphipods by chemical mixtures. Environmental Toxicology and Chemistry. 20(10): 2276-2286
Spatial Representation:	Data for this line of evidence for Batiquitos Lagoon was collected at 5 monitoring sites [904_6250, 904_6251, 904_6252, 904_6253, 904_6264]
Temporal Representation:	Data was collected on a single day 7/29/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID	47830	035055 Region 9
Batiquitos Lagoon		

Pollutant:	**Mercury**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of the 5 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 5 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47830, Mercury	**Region 9**
Batiquitos Lagoon	

LOE ID:	78230
Pollutant:	Mercury
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Batiquitos Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Mercury.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be

	maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the sediment quality guideline (predictive of sediment toxicity for sediment-dwelling organisms) for Mercury is 2.1 ug/g (PTI Environmental Services, 1991).
Guideline Reference:	Pollutants of concern in Puget Sound. EPA 910/9-91-003. Seattle, WA: U.S. Environmental Protection Agency
Spatial Representation:	Data for this line of evidence for Batiquitos Lagoon was collected at 5 monitoring sites [904_6250, 904_6251, 904_6252, 904_6253, 904_6264]
Temporal Representation:	Data was collected on a single day 7/29/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID	47831	Region 9
Batiquitos Lagoon		

Pollutant:	**PAHs (Polycyclic Aromatic Hydrocarbons)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Three lines of evidence are available in the administrative record to assess this pollutant. Zero of 5 samples exceed the criteria for total, high molecular weight, and low molecular weight PAHs. Two of 5 samples exhibited sediment toxicity. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 5 samples exceed the criteria for total, high molecular weight, and low molecular weight PAHs and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47831, PAHs (Polycyclic Aromatic Hydrocarbons)	Region 9
Batiquitos Lagoon	

LOE ID:	78233	035057

Pollutant:	PAHs (Polycyclic Aromatic Hydrocarbons)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Batiquitos Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for PAHs (Polycyclic Aromatic Hydrocarbons).
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the sediment quality guideline (predictive of sediment toxicity for sediment-dwelling organisms) for Total PAHs is 1800 ug/g (Fairey et al., 2001).
Guideline Reference:	An evaluation of methods for calculating mean sediment quality guideline quotients as indicators of contamination and acute toxicity to amphipods by chemical mixtures. Environmental Toxicology and Chemistry. 20(10): 2276-2286
Spatial Representation:	Data for this line of evidence for Batiquitos Lagoon was collected at 5 monitoring sites [904_6250, 904_6251, 904_6252, 904_6253, 904_6264]
Temporal Representation:	Data was collected on a single day 7/29/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 47831, PAHs (Polycyclic Aromatic Hydrocarbons) Region 9

Batiquitos Lagoon

LOE ID:	78231
Pollutant:	PAHs (Polycyclic Aromatic Hydrocarbons)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Batiquitos Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for PAH, High molecular weight.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be

	maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for High molecular weight PAHs is 9600 ng/g dry weight (Long et al., 1995).
Guideline Reference:	Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuary sediments. Environmental Management. 19, (1): 81-97
Spatial Representation:	Data for this line of evidence for Batiquitos Lagoon was collected at 5 monitoring sites [904_6250, 904_6251, 904_6252, 904_6253, 904_6264]
Temporal Representation:	Data was collected on a single day 7/29/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 47831, PAHs (Polycyclic Aromatic Hydrocarbons) Region 9

Batiquitos Lagoon

LOE ID:	78232
Pollutant:	PAHs (Polycyclic Aromatic Hydrocarbons)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Batiquitos Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for PAH, Low molecular weight.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Low molecular weight PAHs is 1442 ng/g dry weight (Long et al., 1995).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for Batiquitos Lagoon was collected at 5 monitoring sites [904_6250, 904_6251, 904_6252, 904_6253, 904_6264]
Temporal Representation:	Data was collected on a single day 7/29/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID 47893 Region 9

Batiquitos Lagoon

Pollutant:	**PCBs (Polychlorinated biphenyls)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the 5 samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 5 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47893, PCBs (Polychlorinated biphenyls) **Region 9**

Batiquitos Lagoon

LOE ID:	78234
Pollutant:	PCBs (Polychlorinated biphenyls)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Batiquitos Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for PCB, Total.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	In marine and estuarine sediments the sediment quality guideline (predictive of sediment toxicity for sediment-dwelling organisms) for Total PCBs is 400 ng/g (MacDonald et al., 2000b).
Guideline Reference:	Development and evaluation of consensus-based sediment effect concentrations for polychlorinated biphenyls. Environmental Toxicology and Chemistry. 19(5): 1403-1413
Spatial Representation:	Data for this line of evidence for Batiquitos Lagoon was collected at 5 monitoring sites [904_6250, 904_6251, 904_6252, 904_6253, 904_6264]
Temporal Representation:	Data was collected on a single day 7/29/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID 47894 — Region 9

Batiquitos Lagoon

Pollutant:	**Phenanthrene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the 5 samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 5 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47894, Phenanthrene — Region 9

Batiquitos Lagoon

LOE ID:	78235
Pollutant:	Phenanthrene
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment

Fraction:	Total	035061
Beneficial Use:	Estuarine Habitat	
Number of Samples:	5	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Batiquitos Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Phenanthrene.	
Data Reference:	Data for Various Pollutants from Bight, 2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for Phenanthrene is 543.53 ng/g dry weight (MacDonald et al., 1996).	
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278	
Spatial Representation:	Data for this line of evidence for Batiquitos Lagoon was collected at 5 monitoring sites [904_6250, 904_6251, 904_6252, 904_6253, 904_6264]	
Temporal Representation:	Data was collected on a single day 7/29/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.	

DECISION ID	**47895**	**Region 9**
Batiquitos Lagoon		

Pollutant:	**Pyrene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the 5 samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 5 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.

	4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47895, Pyrene **Region 9**

Batiquitos Lagoon

LOE ID:	78236
Pollutant:	Pyrene
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Batiquitos Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Pyrene.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for Pyrene is 1397.4 ng/g dry weight (MacDonald et al., 1996).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for Batiquitos Lagoon was collected at 5 monitoring sites [904_6250, 904_6251, 904_6252, 904_6253, 904_6264]
Temporal Representation:	Data was collected on a single day 7/29/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID **47897** **Region 9**

Batiquitos Lagoon

Pollutant:	**Silver**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of the 5 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 5 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47897, Silver Batiquitos Lagoon **Region 9**

LOE ID:	78237
Pollutant:	Silver
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Batiquitos Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Silver.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for Silver is 1.77 ug/g dry weight (MacDonald et al., 1996).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for Batiquitos Lagoon was collected at 5 monitoring sites [904_6250, 904_6251, 904_6252, 904_6253, 904_6264]
Temporal Representation:	Data was collected on a single day 7/29/2008.

Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID 47898 Region 9

Batiquitos Lagoon

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the 5 samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 5 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47898, Zinc Region 9

Batiquitos Lagoon

LOE ID:	78238
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Batiquitos Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Zinc.

Data Reference:	Data for Various Pollutants from Bight, 2008.	035065
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Zinc is 410 ug/g dry weight (Long et al., 1995).	
Guideline Reference:	Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuary sediments. Environmental Management. 19, (1): 81-97	
Spatial Representation:	Data for this line of evidence for Batiquitos Lagoon was collected at 5 monitoring sites [904_6250, 904_6251, 904_6252, 904_6253, 904_6264]	
Temporal Representation:	Data was collected on a single day 7/29/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.	

DECISION ID 47899 Region 9

Batiquitos Lagoon

Pollutant:	**Toxicity**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2027
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least one line of evidence is necessary to assess listing status for toxicity in sediment, and waters may be placed on the CWA section 303(d) List for toxicity alone.

Two lines of evidence are available in the administrative record to assess sediment toxicity. Five of the eight samples exhibited sediment toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Five of the eight samples exhibited sediment toxicity, and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 47899, Toxicity Region 9

Batiquitos Lagoon 035066

LOE ID:	73041
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	2
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Five samples were collected to test for toxicity. Two of the samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius and percent normal of Mytilus galloprovincialis.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected from sites 904_6250, 904_6251, 904_6252, 904_6253, 904_6264 Batiquitos Lagoon.
Temporal Representation:	The samples were collected in July 2008.
Environmental Conditions:	
QAPP Information:	This data was collected under the Southern California Bight 2008 Regional Marine Monitoring Survey Quality Assurance Plan.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 47899, Toxicity **Region 9**

Batiquitos Lagoon

LOE ID:	73040
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	3
Number of Exceedances:	3
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Three samples were collected to test for toxicity. Three of the three samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius. Each sample is a sediment composites from three different sites.
Data Reference:	Data for Various Pollutants from Ambient Bay and Lagoon, 2003-2005.

SWAMP Data:	Non-SWAMP	035067
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.	
Guideline Reference:		
Spatial Representation:	The samples were collected at 904BL_2003, 904BL_2004, and 904BL_2005. Each of these sample location names consists of a composite from three different sites.	
Temporal Representation:	The samples were collected in July 2003, 2004, and 2005.	
Environmental Conditions:		
QAPP Information:	The data was collected under the County of San Diego Ambient Bay and Lagoon Monitoring Project 2003-2005. Annual Report for the Receiving Waters and Urban Runoff Monitoring section covered under the San Diego County Municipal National Pollutant Discharge Elimination System (NPDES) Permit (RWQCB-Order NO. R9-2007-0001).	
QAPP Information Reference(s):	e-mail clarifying QAPP information	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: San Elijo Lagoon
Water Body ID: CAE904610001999020916192 7
Water Body Type: Estuary

DECISION ID	34573	Region 9
San Elijo Lagoon		

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not Delist from 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Sources: Source Unknown
Expected TMDL Completion Date: 2015
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.3 of the Listing Policy. Under section 3.3 a single line of evidence is necessary to assess listing status.

Five lines of evidence are available in the administrative record to assess this pollutant.
Enterococcus
0 of 5 samples exceed the single sample objective for water contact recreation.
Fecal coliform
0 of 5 samples exceed the single sample objective for water contact recreation.
0 of 5 samples exceed the single sample objective for non-contact recreation.
Total coliform
0 of 5 samples exceed the single sample objective for water contact recreation.
Indicator bacteria
This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Samples and exceedences are as follows:
Enterococcus
0 of 5 samples exceed the single sample objective for water contact recreation.
Fecal coliform
0 of 5 samples exceed the single sample objective for water contact recreation.
0 of 5 samples exceed the single sample objective for non-contact recreation.
Total coliform
0 of 5 samples exceed the single sample objective for water contact recreation.
Indicator bacteria
303(d) listing decisions made prior to 2006 were not held in an assessment database.

The decision to list the water body is based on a placeholder LOE of an assessment made prior to 2006. The Regional Boards will update this decision when an adequate amount of new data and information become available and are assessed.
4. Pursuant to section 3.1 of the Listing Policy, no additional data and information are available

indicating that standards are not met. 035069

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 34573, Indicator Bacteria **Region 9**

San Elijo Lagoon

LOE ID:	4724
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Water Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	Unspecified
Guideline Reference:	Placeholder reference pre-2006 303(d)
Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 34573, Indicator Bacteria **Region 9**

San Elijo Lagoon

LOE ID:	75669
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Elijo Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Enterococci.
Data Reference:	Data for Various Pollutants from Bight, 2008.

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Samples shall not exceed 104 organisms per 100 ml for enterococcus in waters designated for REC I beneficial use (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Elijo Lagoon was collected at 5 monitoring sites [San Elijo Lagoon, San Elijo Lagoon, San Elijo Lagoon, San Elijo Lagoon, San Elijo Lagoon]
Temporal Representation:	Data was collected over the time period 7/15/2008-7/22/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 34573, Indicator Bacteria **Region 9**

San Elijo Lagoon

LOE ID:	75679
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Elijo Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the total coliform concentration shall not exceed 10000 MPN/100 ml (California Ocean Plan 2009).
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Elijo Lagoon was collected at 5 monitoring sites [San Elijo Lagoon, San Elijo Lagoon, San Elijo Lagoon, San Elijo Lagoon, San Elijo Lagoon]
Temporal Representation:	Data was collected over the time period 7/15/2008-7/22/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 34573, Indicator Bacteria **Region 9**

San Elijo Lagoon

LOE ID:	75671
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water

Matrix:	Water	035071
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	5	
Number of Exceedances:	0	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Elijo Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Coliform, Fecal.	
Data Reference:	Data for Various Pollutants from Bight, 2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the fecal coliform concentration shall not exceed 400 MPN/100 ml.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for San Elijo Lagoon was collected at 5 monitoring sites [San Elijo Lagoon, San Elijo Lagoon, San Elijo Lagoon, San Elijo Lagoon, San Elijo Lagoon]	
Temporal Representation:	Data was collected over the time period 7/15/2008-7/22/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.	

Line of Evidence (LOE) for Decision ID 34573, Indicator Bacteria **Region 9**

San Elijo Lagoon

LOE ID:	75670
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Non-Contact Recreation
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Elijo Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Coliform, Fecal.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters designated for non contact recreation (REC 2), the fecal coliform concentration shall not exceed 4000 MPN/100 ml (Basin Plan).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Elijo Lagoon was collected at 5 monitoring sites [San Elijo Lagoon, San Elijo Lagoon, San Elijo Lagoon, San Elijo Lagoon, San Elijo Lagoon]

Temporal Representation:	Data was collected over the time period 7/15/2008-7/22/2008.	035072
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.	

DECISION ID 48449 **Region 9**

San Elijo Lagoon

Pollutant:	**2-Methylnaphthalene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of the five samples exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the five samples exceed the objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48449, 2-Methylnaphthalene **Region 9**

San Elijo Lagoon

LOE ID:	78298
Pollutant:	2-Methylnaphthalene
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for San Elijo Lagoon to determine beneficial use

	support and results are as follows: 0 of 5 samples exceed the criterion for 2-Methylnaphthalene.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for 2-Methylnaphthalene is 201.28 ng/g dry weight (MacDonald et al., 1996).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for San Elijo Lagoon was collected at 5 monitoring sites [904_6239, 904_6242, 904_6243, 904_6244, 904_6245]
Temporal Representation:	Data was collected over the time period 7/15/2008-7/22/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID	53351	Region 9
San Elijo Lagoon		

Pollutant:	**Antimony**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of the five samples exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the five samples exceed the objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53351, Antimony **Region 9**

San Elijo Lagoon

LOE ID:	78299
Pollutant:	Antimony
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for San Elijo Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Antimony.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Antimony is 25 ug/g dry weight (Long and Morgan, 1990).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for San Elijo Lagoon was collected at 5 monitoring sites [904_6239, 904_6242, 904_6243, 904_6244, 904_6245]
Temporal Representation:	Data was collected over the time period 7/15/2008-7/22/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID **53353** **Region 9**

San Elijo Lagoon

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of the five samples exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the five samples exceed the objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53353, Arsenic **Region 9**

San Elijo Lagoon

LOE ID:	78300
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for San Elijo Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Arsenic.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Arsenic is 70 ug/g dry weight (Long et al., 1995).
Guideline Reference:	Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuary sediments. Environmental Management. 19, (1): 81-97
Spatial Representation:	Data for this line of evidence for San Elijo Lagoon was collected at 5 monitoring sites [904_6239, 904_6242, 904_6243, 904_6244, 904_6245]
Temporal Representation:	Data was collected over the time period 7/15/2008-7/22/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID **53354** **Region 9**

San Elijo Lagoon

Pollutant:	**Benzo(a)anthracene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the five samples exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the five samples exceed the objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53354, Benzo(a)anthracene **Region 9**

San Elijo Lagoon

LOE ID:	78301
Pollutant:	Benzo(a)anthracene
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for San Elijo Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Benzo(a)anthracene.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.

Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	035077
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for Benzo(a)anthracene is 692.53 ng/g dry weight (MacDonald et al., 1996).	
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278	
Spatial Representation:	Data for this line of evidence for San Elijo Lagoon was collected at 5 monitoring sites [904_6239, 904_6242, 904_6243, 904_6244, 904_6245]	
Temporal Representation:	Data was collected over the time period 7/15/2008-7/22/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.	

DECISION ID 53355 Region 9

San Elijo Lagoon

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of the five samples exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the five samples exceed the objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53355, Cadmium Region 9

San Elijo Lagoon

LOE ID:	78302
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Sediment

Matrix:	Sediment	035078
Fraction:	Total	
Beneficial Use:	Estuarine Habitat	
Number of Samples:	5	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for San Elijo Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Cadmium.	
Data Reference:	Data for Various Pollutants from Bight, 2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for Cadmium is 4.21 ng/g dry weight (MacDonald et al., 1996).	
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278	
Spatial Representation:	Data for this line of evidence for San Elijo Lagoon was collected at 5 monitoring sites [904_6239, 904_6242, 904_6243, 904_6244, 904_6245]	
Temporal Representation:	Data was collected over the time period 7/15/2008-7/22/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.	

DECISION ID	53356	Region 9
San Elijo Lagoon		

Pollutant:	**Chlordane**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the five samples exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the five samples exceed the objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum

of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53356, Chlordane **Region 9**

San Elijo Lagoon

LOE ID:	78303
Pollutant:	Chlordane
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for San Elijo Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Chlordane, Total.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Total Chlordane is 6 ng/g dry weight (Long and Morgan, 1990).
Guideline Reference:	The potential for biological effects of sediment-sorbed contaminants tested in the National Status of Trends Program. NOAA Technical Memorandum NOS OMA 52. Seattle, WA: National Oceanic and Atmospheric Administration
Spatial Representation:	Data for this line of evidence for San Elijo Lagoon was collected at 5 monitoring sites [904_6239, 904_6242, 904_6243, 904_6244, 904_6245]
Temporal Representation:	Data was collected over the time period 7/15/2008-7/22/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID **53357** **Region 9**

San Elijo Lagoon

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or	Pollutant

Pollution: 035080

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the five samples exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the five samples exceed the objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53357, Chromium **Region 9**

San Elijo Lagoon

LOE ID:	78304
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for San Elijo Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Chromium.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Chromium is 370 ug/g dry weight (Long et al., 1995).
Guideline Reference:	Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuary sediments. Environmental Management. 19, (1): 81-97
Spatial Representation:	Data for this line of evidence for San Elijo Lagoon was collected at 5 monitoring sites

	[904_6239, 904_6242, 904_6243, 904_6244, 904_6245]	035081
Temporal Representation:	Data was collected over the time period 7/15/2008-7/22/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.	

DECISION ID **53358** **Region 9**

San Elijo Lagoon

Pollutant:	**Chrysene (C1-C4)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the five samples exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the five samples exceed the objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53358, Chrysene (C1-C4) **Region 9**

San Elijo Lagoon

LOE ID:	78283
Pollutant:	Chrysene (C1-C4)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality:	Water Board staff assessed Bight data for San Elijo Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Chrysene.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for Chrysene is 845.98 ng/g dry weight (MacDonald et al., 1996).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for San Elijo Lagoon was collected at 5 monitoring sites [904_6239, 904_6242, 904_6243, 904_6244, 904_6245]
Temporal Representation:	Data was collected over the time period 7/15/2008-7/22/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID	53350	Region 9
San Elijo Lagoon		

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of the five samples exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the five samples exceed the objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53350, Copper **Region 9**

San Elijo Lagoon

LOE ID:	78284
Pollutant:	Copper
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for San Elijo Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Copper.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Copper is 270 ug/g dry weight (Long et al., 1995).
Guideline Reference:	Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuary sediments. Environmental Management. 19, (1): 81-97
Spatial Representation:	Data for this line of evidence for San Elijo Lagoon was collected at 5 monitoring sites [904_6239, 904_6242, 904_6243, 904_6244, 904_6245]
Temporal Representation:	Data was collected over the time period 7/15/2008-7/22/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID **53359** **Region 9**

San Elijo Lagoon

Pollutant:	**Dibenz[a,h]anthracene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the five samples exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is

sufficient justification against placing this water segment-pollutant combination on the 2004 section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the five samples exceed the objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53359, Dibenz[a,h]anthracene **Region 9**

San Elijo Lagoon

LOE ID:	78285
Pollutant:	Dibenz[a,h]anthracene
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for San Elijo Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Dibenzo(a, h)anthracene.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Dibenzo(a, h)anthracene is 260 ng/g dry weight (Long et al., 1995).
Guideline Reference:	Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuary sediments. Environmental Management. 19, (1): 81-97
Spatial Representation:	Data for this line of evidence for San Elijo Lagoon was collected at 5 monitoring sites [904_6239, 904_6242, 904_6243, 904_6244, 904_6245]
Temporal Representation:	Data was collected over the time period 7/15/2008-7/22/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID **53360** **Region 9**

San Elijo Lagoon 035085

Pollutant:	**Endrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the four samples exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the four samples exceed the objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53360, Endrin — Region 9

San Elijo Lagoon

LOE ID:	78286
Pollutant:	Endrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for San Elijo Lagoon to determine beneficial use support and results are as follows: a total of 5 samples were collected and they were all non-detect, however 1 sample was not used in analysis because when the method detection limit was organic carbon normalized, the result was above the guideline and therefore could not be quanitified with the level of certainty required by the Listing Policy.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the sediment quality guideline (predictive of sediment toxicity for sediment-dwelling organisms) for Endrin is 0.76 ug/g oc (Fairey et al., 2001).
Guideline Reference:	Technical basis for deriving sediment criteria for nonionic organic contaminants for the protection of benthic organisms by using equilibrium partitioning. EPA822-R-93-011. Washington, D.C.: Office of Water, USEPA
Spatial Representation:	Data for this line of evidence for San Elijo Lagoon was collected at 5 monitoring sites [904_6239, 904_6242, 904_6243, 904_6244, 904_6245]
Temporal Representation:	Data was collected over the time period 7/15/2008-7/22/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID 53361 Region 9

San Elijo Lagoon

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of the five samples exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the five samples exceed the objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53361, Lead Region 9

San Elijo Lagoon

LOE ID:	78290

Pollutant:	Lead
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for San Elijo Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Lead.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for Lead is 112.18 ug/g dry weight (MacDonald et al., 1996).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for San Elijo Lagoon was collected at 5 monitoring sites [904_6239, 904_6242, 904_6243, 904_6244, 904_6245]
Temporal Representation:	Data was collected over the time period 7/15/2008-7/22/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID	**53362**	**Region 9**
San Elijo Lagoon		

Pollutant:	**Lindane/gamma Hexachlorocyclohexane (gamma-HCH)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the five samples exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.

2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 935088
3. Zero of the five samples exceed the objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53362, Lindane/gamma Hexachlorocyclohexane (gamma-HCH) **Region 9**

San Elijo Lagoon

LOE ID:	78291
Pollutant:	Lindane/gamma Hexachlorocyclohexane (gamma-HCH)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for San Elijo Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for HCH, Gamma.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the sediment quality guideline (predictive of sediment toxicity for sediment-dwelling organisms) for HCH, gamma(Lindane; BHC, gamma) is 0.37 ug/g oc (Fairey et al., 2001).
Guideline Reference:	An evaluation of methods for calculating mean sediment quality guideline quotients as indicators of contamination and acute toxicity to amphipods by chemical mixtures. Environmental Toxicology and Chemistry. 20(10): 2276-2286
Spatial Representation:	Data for this line of evidence for San Elijo Lagoon was collected at 5 monitoring sites [904_6239, 904_6242, 904_6243, 904_6244, 904_6245]
Temporal Representation:	Data was collected over the time period 7/15/2008-7/22/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID **53363** **Region 9**

San Elijo Lagoon

Pollutant:	**Mercury**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**

Last Listing Cycle's Final Listing Decision:	New Decision	035089
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the five samples exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the five samples exceed the objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53363, Mercury **Region 9**

San Elijo Lagoon

LOE ID:	78293
Pollutant:	Mercury
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for San Elijo Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Mercury.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the sediment quality guideline (predictive of sediment toxicity for sediment-dwelling organisms) for Mercury is 2.1 ug/g (PTI Environmental

	Services, 1991). 035090
Guideline Reference:	Pollutants of concern in Puget Sound. EPA 910/9-91-003. Seattle, WA: U.S. Environmental Protection Agency
Spatial Representation:	Data for this line of evidence for San Elijo Lagoon was collected at 5 monitoring sites [904_6239, 904_6242, 904_6243, 904_6244, 904_6245]
Temporal Representation:	Data was collected over the time period 7/15/2008-7/22/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID 53364 Region 9

San Elijo Lagoon

Pollutant:	**PAHs (Polycyclic Aromatic Hydrocarbons)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of the five samples exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the five samples for each PAH type (high/low/total) exceed the objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53364, PAHs (Polycyclic Aromatic Hydrocarbons) Region 9

San Elijo Lagoon

LOE ID:	78294
Pollutant:	PAHs (Polycyclic Aromatic Hydrocarbons)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total

Beneficial Use:	Estuarine Habitat	035091
Number of Samples:	5	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for San Elijo Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for PAH, High molecular weight.	
Data Reference:	Data for Various Pollutants from Bight, 2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for High molecular weight PAHs is 9600 ng/g dry weight (Long et al., 1995).	
Guideline Reference:	Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuary sediments. Environmental Management. 19, (1): 81-97	
Spatial Representation:	Data for this line of evidence for San Elijo Lagoon was collected at 5 monitoring sites [904_6239, 904_6242, 904_6243, 904_6244, 904_6245]	
Temporal Representation:	Data was collected over the time period 7/15/2008-7/22/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.	

Line of Evidence (LOE) for Decision ID 53364, PAHs (Polycyclic Aromatic Hydrocarbons) Region 9

San Elijo Lagoon

LOE ID:	78296
Pollutant:	PAHs (Polycyclic Aromatic Hydrocarbons)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for San Elijo Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for PAHs (Polycyclic Aromatic Hydrocarbons).
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the sediment quality guideline (predictive of sediment toxicity for sediment-dwelling organisms) for Total PAHs is 1800 ug/g (Fairey et al., 2001).
Guideline Reference:	An evaluation of methods for calculating mean sediment quality guideline quotients as

	indicators of contamination and acute toxicity to amphipods by chemical mixtures. Environmental Toxicology and Chemistry. 20(10): 2276-2286
Spatial Representation:	Data for this line of evidence for San Elijo Lagoon was collected at 5 monitoring sites [904_6239, 904_6242, 904_6243, 904_6244, 904_6245]
Temporal Representation:	Data was collected over the time period 7/15/2008-7/22/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 53364, PAHs (Polycyclic Aromatic Hydrocarbons) Region 9

San Elijo Lagoon

LOE ID:	78295
Pollutant:	PAHs (Polycyclic Aromatic Hydrocarbons)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for San Elijo Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for PAH, Low molecular weight.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Low molecular weight PAHs is 1442 ng/g dry weight (Long et al., 1995).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for San Elijo Lagoon was collected at 5 monitoring sites [904_6239, 904_6242, 904_6243, 904_6244, 904_6245]
Temporal Representation:	Data was collected over the time period 7/15/2008-7/22/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID 53366 Region 9

San Elijo Lagoon

Pollutant:	**PCBs (Polychlorinated biphenyls)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or	Pollutant

Pollution: 035093

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the five samples exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the five samples exceed the objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53366, PCBs (Polychlorinated biphenyls) **Region 9**

San Elijo Lagoon

LOE ID:	78297
Pollutant:	PCBs (Polychlorinated biphenyls)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for San Elijo Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for PCB, Total.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the sediment quality guideline (predictive of sediment toxicity for sediment-dwelling organisms) for Total PCBs is 400 ng/g (MacDonald et al., 2000b).
Guideline Reference:	Development and evaluation of consensus-based sediment effect concentrations for polychlorinated biphenyls. Environmental Toxicology and Chemistry. 19(5): 1403-1413

Spatial Representation:	Data for this line of evidence for San Elijo Lagoon was collected at 5 monitoring sites [904_6239, 904_6242, 904_6243, 904_6244, 904_6245]
Temporal Representation:	Data was collected over the time period 7/15/2008-7/22/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID 53367 Region 9

San Elijo Lagoon

Pollutant:	**Phenanthrene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the five samples exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the five samples exceed the objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53367, Phenanthrene Region 9

San Elijo Lagoon

LOE ID:	78287
Pollutant:	Phenanthrene
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	035095
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for San Elijo Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Phenanthrene.	
Data Reference:	Data for Various Pollutants from Bight, 2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for Phenanthrene is 543.53 ng/g dry weight (MacDonald et al., 1996).	
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278	
Spatial Representation:	Data for this line of evidence for San Elijo Lagoon was collected at 5 monitoring sites [904_6239, 904_6242, 904_6243, 904_6244, 904_6245]	
Temporal Representation:	Data was collected over the time period 7/15/2008-7/22/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.	

DECISION ID	**53368**	**Region 9**
San Elijo Lagoon		

Pollutant:	**Pyrene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of the five samples exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the five samples exceed the objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53368, Pyrene **Region 9**

San Elijo Lagoon

LOE ID:	78288
Pollutant:	Pyrene
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for San Elijo Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Pyrene.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for Pyrene is 1397.4 ng/g dry weight (MacDonald et al., 1996).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for San Elijo Lagoon was collected at 5 monitoring sites [904_6239, 904_6242, 904_6243, 904_6244, 904_6245]
Temporal Representation:	Data was collected over the time period 7/15/2008-7/22/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID **53369** **Region 9**

San Elijo Lagoon

Pollutant:	**Silver**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of the five samples exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the five samples exceed the objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53369, Silver **Region 9**
San Elijo Lagoon

LOE ID:	78289
Pollutant:	Silver
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for San Elijo Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Silver.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for Silver is 1.77 ug/g dry weight (MacDonald et al., 1996).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for San Elijo Lagoon was collected at 5 monitoring sites [904_6239, 904_6242, 904_6243, 904_6244, 904_6245]
Temporal Representation:	Data was collected over the time period 7/15/2008-7/22/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID **53370** **Region 9**
San Elijo Lagoon

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the five samples exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the five samples exceed the objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53370, Zinc **Region 9**

San Elijo Lagoon

LOE ID:	78292
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for San Elijo Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Zinc.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Zinc is 410 ug/g dry weight (Long et al., 1995).
Guideline Reference:	Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuary sediments. Environmental Management. 19, (1): 81-97
Spatial Representation:	Data for this line of evidence for San Elijo Lagoon was collected at 5 monitoring sites [904_6239, 904_6242, 904_6243, 904_6244, 904_6245]
Temporal Representation:	Data was collected over the time period 7/15/2008-7/22/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID 53371 Region 9

San Elijo Lagoon

Pollutant:	**Toxicity**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least one line of evidence is necessary to assess listing status for toxicity in sediment, and waters may be placed on the CWA section 303(d) List for toxicity alone. Two lines of evidence are available in the administrative record to assess sediment toxicity. Six of the eight samples exhibited sediment toxicity. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Six of the eight samples exhibited sediment toxicity, and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 53371, Toxicity Region 9

San Elijo Lagoon

LOE ID:	75680
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None

Beneficial Use:	Estuarine Habitat
Number of Samples:	3
Number of Exceedances:	3
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Three samples were collected to test for toxicity. Three of the three samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius. Each sample is a sediment composites from three different sites.
Data Reference:	Data for Various Pollutants from Ambient Bay and Lagoon, 2003-2005.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected at 9904SEL_2003, 904SEL_2004, and 904SEL_2005. Each of these sample location names consists of a composite from three different sites.
Temporal Representation:	The samples were collected in 2003, 2004, and 2005.
Environmental Conditions:	
QAPP Information:	The data was collected under the County of San Diego Ambient Bay and Lagoon Monitoring Project 2003-2005. Annual Report for the Receiving Waters and Urban Runoff Monitoring section covered under the San Diego County Municipal National Pollutant Discharge Elimination System (NPDES) Permit (RWQCB-Order NO. R9-2007-0001).
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 53371, Toxicity **Region 9**

San Elijo Lagoon

LOE ID:	75681
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	3
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Five samples were collected to test for toxicity. Three of the samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius and percent normal of Mytilus galloprovincialis.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected from sites 904_6239, 904_6242, 904_6243, 904_6244, 904_6245 San Elijo Lagoon.
Temporal Representation:	The samples were collected in August 2008.
Environmental Conditions:	
QAPP Information:	This data was collected under the Southern California Bight 2008 Regional Marine Monitoring Survey Quality Assurance Plan.
QAPP Information Reference(s):	e-mail clarifying QAPP information

DECISION ID 34554 Region 9

San Elijo Lagoon

Pollutant:	**Eutrophic**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. 303(d) listing decisions made prior to 2006 were not held in an assessment database. This is a placeholder decision for a 303(d) listing made in a previous assessment cycle. The Regional Boards will update this decision when new data and information become available and are assessed.
Regional Board Decision Recommendation:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. The Regional Board will update this decision when new data and information become available and are assessed.

Line of Evidence (LOE) for Decision ID 34554, Eutrophic Region 9

San Elijo Lagoon

LOE ID:	4723
Pollutant:	Eutrophic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference:	Placeholder reference pre-2006 303(d)

SWAMP Data:	Non-SWAMP	035102

Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	Unspecified
Guideline Reference:	Placeholder reference pre-2006 303(d)
Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

DECISION ID 34744 Region 9

San Elijo Lagoon

Pollutant:	**Sedimentation/Siltation**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. 303(d) listing decisions made prior to 2006 were not held in an assessment database. The Regional Boards will update this decision when new data and information become available and are assessed.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34744, Sedimentation/Siltation Region 9

San Elijo Lagoon

LOE ID:	4725
Pollutant:	Sedimentation/Siltation
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	Unspecified
Guideline Reference:	Placeholder reference pre-2006 303(d)
Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Los Penasquitos Lagoon
Water Body ID: CAE9061000019990209152610
Water Body Type: Estuary

DECISION ID 52865 **Region 9**
Los Penasquitos Lagoon

Pollutant: 2-Methylnaphthalene
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Three of eight samples (sediment toxicity) and zero of five samples (sediment) exceeded the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Three of eight samples (sediment toxicity) and zero of five samples (sediment) exceeded the water quality objective. The level of toxicity in sediments indicates that the beneficial use is not fully supported. The applicable sediment quality standard for this pollutant is not being exceeded and is insufficient to determine use support.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that though this water body is impaired for sediment toxicity, this water body-pollutant combination should not be placed on the section 303(d) list because applicable the water or sediment quality standards for these pollutants are not being exceeded or are insufficient to determine use support.

Line of Evidence (LOE) for Decision ID 52865, 2-Methylnaphthalene **Region 9**
Los Penasquitos Lagoon

LOE ID: 78239

Pollutant: 2-Methylnaphthalene
LOE Subgroup: Pollutant-Sediment
Matrix: Sediment
Fraction: Total

Beneficial Use:	Estuarine Habitat	035105
Number of Samples:	5	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Los Penasquitos Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for 2-Methylnaphthalene.	
Data Reference:	Data for Various Pollutants from Bight, 2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for 2-Methylnaphthalene is 201.28 ng/g dry weight (MacDonald et al., 1996).	
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278	
Spatial Representation:	Data for this line of evidence for Los Penasquitos Lagoon was collected at 5 monitoring sites [906_6228, 906_6229, 906_6230, 906_6232, 906_6236]	
Temporal Representation:	Data was collected on a single day 7/17/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.	

Line of Evidence (LOE) for Decision ID 52865, 2-Methylnaphthalene **Region 9**

Los Penasquitos Lagoon

LOE ID:	74214
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Five samples were collected to test for toxicity. One of the samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius and percent normal of Mytilus galloprovincialis.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the

control. 035106

Guideline Reference:

Spatial Representation: The samples were collected from sites 906_6228, 906_6229, 906_6230, 906_6232, 906_6236 Los Penasquitos Lagoon.

Temporal Representation: The samples were collected in July 2008.

Environmental Conditions:

QAPP Information: This data was collected under the Southern California Bight 2008 Regional Marine Monitoring Survey Quality Assurance Plan.

QAPP Information Reference(s): e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 52865, 2-Methylnaphthalene **Region 9**

Los Penasquitos Lagoon

LOE ID: 74213

Pollutant: Toxicity

LOE Subgroup: Toxicity

Matrix: Sediment

Fraction: None

Beneficial Use: Estuarine Habitat

Number of Samples: 3

Number of Exceedances: 2

Data and Information Type: TOXICITY TESTING

Data Used to Assess Water Quality: Three samples were collected to test for toxicity. Two of the three samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius. Each sample is a sediment composites from three different sites.

Data Reference: Data for Various Pollutants from Ambient Bay and Lagoon, 2003-2005.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life

Objective/Criterion Reference: Water Quality Control Plan for the San Diego Basin

Evaluation Guideline: Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.

Guideline Reference:

Spatial Representation: The samples were collected at 906LPL_2003, 906LPL_2004, and 906LPL_2005. Each of these sample location names consists of a composite from three different sites.

Temporal Representation: The samples were collected in 2003, 2004, and 2005.

Environmental Conditions:

QAPP Information: The data was collected under the County of San Diego Ambient Bay and Lagoon Monitoring Project 2003-2005. Annual Report for the Receiving Waters and Urban Runoff Monitoring section covered under the San Diego County Municipal National Pollutant Discharge Elimination System (NPDES) Permit (RWQCB-Order NO. R9-2007-0001).

QAPP Information Reference(s): e-mail clarifying QAPP information

DECISION ID **52866** **Region 9**

Los Penasquitos Lagoon

Pollutant: **Antimony**

Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**

Last Listing Cycle's Final New Decision

Listing Decision:		035107
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Three of eight samples (sediment toxicity) and zero of five samples (sediment) exceeded the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Three of eight samples (sediment toxicity) and zero of five samples (sediment) exceeded the water quality objective. The level of toxicity in sediments indicates that the beneficial use is not fully supported. The applicable sediment quality standard for this pollutant is not being exceeded and is insufficient to determine use support.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that though this water body is impaired for sediment toxicity, this water body-pollutant combination should not be placed on the section 303(d) list because applicable the water or sediment quality standards for these pollutants are not being exceeded or are insufficient to determine use support.

Line of Evidence (LOE) for Decision ID 52866, Antimony **Region 9**

Los Penasquitos Lagoon

LOE ID:	74214
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Five samples were collected to test for toxicity. One of the samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius and percent normal of Mytilus galloprovincialis.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the

	control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected from sites 906_6228, 906_6229, 906_6230, 906_6232, 906_6236 Los Penasquitos Lagoon.
Temporal Representation:	The samples were collected in July 2008.
Environmental Conditions:	
QAPP Information:	This data was collected under the Southern California Bight 2008 Regional Marine Monitoring Survey Quality Assurance Plan.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 52866, Antimony **Region 9**

Los Penasquitos Lagoon

LOE ID:	78240
Pollutant:	Antimony
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Los Penasquitos Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Antimony.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Antimony is 25 ug/g dry weight (Long and Morgan, 1990).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for Los Penasquitos Lagoon was collected at 5 monitoring sites [906_6228, 906_6229, 906_6230, 906_6232, 906_6236]
Temporal Representation:	Data was collected on a single day 7/17/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 52866, Antimony **Region 9**

Los Penasquitos Lagoon

LOE ID:	74213
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment

Fraction:	None	035109
Beneficial Use:	Estuarine Habitat	
Number of Samples:	3	
Number of Exceedances:	2	
Data and Information Type:	TOXICITY TESTING	
Data Used to Assess Water Quality:	Three samples were collected to test for toxicity. Two of the three samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius. Each sample is a sediment composites from three different sites.	
Data Reference:	Data for Various Pollutants from Ambient Bay and Lagoon, 2003-2005.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.	
Guideline Reference:		
Spatial Representation:	The samples were collected at 906LPL_2003, 906LPL_2004, and 906LPL_2005. Each of these sample location names consists of a composite from three different sites.	
Temporal Representation:	The samples were collected in 2003, 2004, and 2005.	
Environmental Conditions:		
QAPP Information:	The data was collected under the County of San Diego Ambient Bay and Lagoon Monitoring Project 2003-2005. Annual Report for the Receiving Waters and Urban Runoff Monitoring section covered under the San Diego County Municipal National Pollutant Discharge Elimination System (NPDES) Permit (RWQCB-Order NO. R9-2007-0001).	
QAPP Information Reference(s):	e-mail clarifying QAPP information	

DECISION ID	**52867**	**Region 9**
Los Penasquitos Lagoon		

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Three of eight samples (sediment toxicity) and zero of five samples (sediment) exceeded the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.

3. Three of eight samples (sediment toxicity) and zero of five samples (sediment) exceeded the water quality objective. The level of toxicity in sediments indicates that the beneficial use is not fully supported. The applicable sediment quality standard for this pollutant is not being exceeded and is insufficient to determine use support.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that though this water body is impaired for sediment toxicity, this water body-pollutant combination should not be placed on the section 303(d) list because applicable the water or sediment quality standards for these pollutants are not being exceeded or are insufficient to determine use support.

Line of Evidence (LOE) for Decision ID 52867, Arsenic **Region 9**

Los Penasquitos Lagoon

LOE ID:	74214
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Five samples were collected to test for toxicity. One of the samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius and percent normal of Mytilus galloprovincialis.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected from sites 906_6228, 906_6229, 906_6230, 906_6232, 906_6236 Los Penasquitos Lagoon.
Temporal Representation:	The samples were collected in July 2008.
Environmental Conditions:	
QAPP Information:	This data was collected under the Southern California Bight 2008 Regional Marine Monitoring Survey Quality Assurance Plan.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 52867, Arsenic **Region 9**

Los Penasquitos Lagoon

LOE ID:	78241
Pollutant:	Arsenic

LOE Subgroup:	Pollutant-Sediment	035111
Matrix:	Sediment	
Fraction:	Total	
Beneficial Use:	Estuarine Habitat	
Number of Samples:	5	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Los Penasquitos Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Arsenic.	
Data Reference:	Data for Various Pollutants from Bight, 2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Arsenic is 70 ug/g dry weight (Long et al., 1995).	
Guideline Reference:	Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuary sediments. Environmental Management. 19, (1): 81-97	
Spatial Representation:	Data for this line of evidence for Los Penasquitos Lagoon was collected at 5 monitoring sites [906_6228, 906_6229, 906_6230, 906_6232, 906_6236]	
Temporal Representation:	Data was collected on a single day 7/17/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.	

Line of Evidence (LOE) for Decision ID 52867, Arsenic **Region 9**

Los Penasquitos Lagoon

LOE ID:	74213
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	3
Number of Exceedances:	2
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Three samples were collected to test for toxicity. Two of the three samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius. Each sample is a sediment composites from three different sites.
Data Reference:	Data for Various Pollutants from Ambient Bay and Lagoon, 2003-2005.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there

	is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected at 906LPL_2003, 906LPL_2004, and 906LPL_2005. Each of these sample location names consists of a composite from three different sites.
Temporal Representation:	The samples were collected in 2003, 2004, and 2005.
Environmental Conditions:	
QAPP Information:	The data was collected under the County of San Diego Ambient Bay and Lagoon Monitoring Project 2003-2005. Annual Report for the Receiving Waters and Urban Runoff Monitoring section covered under the San Diego County Municipal National Pollutant Discharge Elimination System (NPDES) Permit (RWQCB-Order NO. R9-2007-0001).
QAPP Information Reference(s):	e-mail clarifying QAPP information

DECISION ID	52868	Region 9
Los Penasquitos Lagoon		

Pollutant:	**Benzo(a)anthracene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Two lines of evidence are available in the administrative record to assess this pollutant. Three of eight samples (sediment toxicity) and zero of five samples (sediment) exceeded the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Three of eight samples (sediment toxicity) and zero of five samples (sediment) exceeded the water quality objective. The level of toxicity in sediments indicates that the beneficial use is not fully supported. The applicable sediment quality standard for this pollutant is not being exceeded and is insufficient to determine use support. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that though this water body is impaired for sediment toxicity, this water body-pollutant combination should not be placed on the section 303(d) list because applicable the water or sediment quality standards for these pollutants are not being exceeded or are insufficient to determine use support.

Line of Evidence (LOE) for Decision ID 52868, Benzo(a)anthracene	Region 9
Los Penasquitos Lagoon	

LOE ID:	78242
Pollutant:	Benzo(a)anthracene
LOE Subgroup:	Pollutant-Sediment

Matrix:	Sediment	035113
Fraction:	Total	
Beneficial Use:	Estuarine Habitat	
Number of Samples:	5	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Los Penasquitos Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Benzo(a)anthracene.	
Data Reference:	Data for Various Pollutants from Bight, 2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for Benzo(a)anthracene is 692.53 ng/g dry weight (MacDonald et al., 1996).	
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278	
Spatial Representation:	Data for this line of evidence for Los Penasquitos Lagoon was collected at 5 monitoring sites [906_6228, 906_6229, 906_6230, 906_6232, 906_6236]	
Temporal Representation:	Data was collected on a single day 7/17/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.	

Line of Evidence (LOE) for Decision ID 52868, Benzo(a)anthracene **Region 9**

Los Penasquitos Lagoon

LOE ID:	74213
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	3
Number of Exceedances:	2
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Three samples were collected to test for toxicity. Two of the three samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius. Each sample is a sediment composites from three different sites.
Data Reference:	Data for Various Pollutants from Ambient Bay and Lagoon, 2003-2005.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the

	control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected at 906LPL_2003, 906LPL_2004, and 906LPL_2005. Each of these sample location names consists of a composite from three different sites.
Temporal Representation:	The samples were collected in 2003, 2004, and 2005.
Environmental Conditions:	
QAPP Information:	The data was collected under the County of San Diego Ambient Bay and Lagoon Monitoring Project 2003-2005. Annual Report for the Receiving Waters and Urban Runoff Monitoring section covered under the San Diego County Municipal National Pollutant Discharge Elimination System (NPDES) Permit (RWQCB-Order NO. R9-2007-0001).
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 52868, Benzo(a)anthracene **Region 9**

Los Penasquitos Lagoon

LOE ID:	74214
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Five samples were collected to test for toxicity. One of the samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius and percent normal of Mytilus galloprovincialis.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected from sites 906_6228, 906_6229, 906_6230, 906_6232, 906_6236 Los Penasquitos Lagoon.
Temporal Representation:	The samples were collected in July 2008.
Environmental Conditions:	
QAPP Information:	This data was collected under the Southern California Bight 2008 Regional Marine Monitoring Survey Quality Assurance Plan.
QAPP Information Reference(s):	e-mail clarifying QAPP information

DECISION ID **52869** **Region 9**

Los Penasquitos Lagoon

Pollutant:	**Cadmium (sediment)**	035115
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	
Last Listing Cycle's Final Listing Decision:	New Decision	
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Three of eight samples (sediment toxicity) and zero of five samples (sediment) exceeded the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Three of eight samples (sediment toxicity) and zero of five samples (sediment) exceeded the water quality objective. The level of toxicity in sediments indicates that the beneficial use is not fully supported. The applicable sediment quality standard for this pollutant is not being exceeded and is insufficient to determine use support.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that though this water body is impaired for sediment toxicity, this water body-pollutant combination should not be placed on the section 303(d) list because applicable the water or sediment quality standards for these pollutants are not being exceeded or are insufficient to determine use support.

Line of Evidence (LOE) for Decision ID 52869, Cadmium (sediment) **Region 9**

Los Penasquitos Lagoon

LOE ID:	74214
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Five samples were collected to test for toxicity. One of the samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius and percent normal of Mytilus galloprovincialis.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.

Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	035116
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.	
Guideline Reference:		
Spatial Representation:	The samples were collected from sites 906_6228, 906_6229, 906_6230, 906_6232, 906_6236 Los Penasquitos Lagoon.	
Temporal Representation:	The samples were collected in July 2008.	
Environmental Conditions:		
QAPP Information:	This data was collected under the Southern California Bight 2008 Regional Marine Monitoring Survey Quality Assurance Plan.	
QAPP Information Reference(s):	e-mail clarifying QAPP information	

Line of Evidence (LOE) for Decision ID 52869, Cadmium (sediment) **Region 9**

Los Penasquitos Lagoon

LOE ID:	74213
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	3
Number of Exceedances:	2
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Three samples were collected to test for toxicity. Two of the three samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius. Each sample is a sediment composites from three different sites.
Data Reference:	Data for Various Pollutants from Ambient Bay and Lagoon, 2003-2005.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected at 906LPL_2003, 906LPL_2004, and 906LPL_2005. Each of these sample location names consists of a composite from three different sites.
Temporal Representation:	The samples were collected in 2003, 2004, and 2005.
Environmental Conditions:	
QAPP Information:	The data was collected under the County of San Diego Ambient Bay and Lagoon Monitoring Project 2003-2005. Annual Report for the Receiving Waters and Urban Runoff Monitoring section covered under the San Diego County Municipal National Pollutant Discharge Elimination System (NPDES) Permit (RWQCB-Order NO. R9-2007-0001).
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 52869, Cadmium (sediment) **Region 9**

Los Penasquitos Lagoon

LOE ID:	78243
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Los Penasquitos Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Cadmium.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for Cadmium is 4.21 ng/g dry weight (MacDonald et al., 1996).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for Los Penasquitos Lagoon was collected at 5 monitoring sites [906_6228, 906_6229, 906_6230, 906_6232, 906_6236]
Temporal Representation:	Data was collected on a single day 7/17/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID	52870	Region 9
Los Penasquitos Lagoon		

Pollutant:	**Chlordane**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Two lines of evidence are available in the administrative record to assess this pollutant. Three of eight samples (sediment toxicity) and zero of five samples (sediment) exceeded the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that: 035118
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Three of eight samples (sediment toxicity) and zero of five samples (sediment) exceeded the water quality objective. The level of toxicity in sediments indicates that the beneficial use is not fully supported. The applicable sediment quality standard for this pollutant is not being exceeded and is insufficient to determine use support.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that though this water body is impaired for sediment toxicity, this water body-pollutant combination should not be placed on the section 303(d) list because applicable the water or sediment quality standards for these pollutants are not being exceeded or are insufficient to determine use support.

Line of Evidence (LOE) for Decision ID 52870, Chlordane **Region 9**

Los Penasquitos Lagoon

LOE ID:	78244
Pollutant:	Chlordane
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Los Penasquitos Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Chlordane, Total.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Total Chlordane is 6 ng/g dry weight (Long and Morgan, 1990).
Guideline Reference:	The potential for biological effects of sediment-sorbed contaminants tested in the National Status of Trends Program. NOAA Technical Memorandum NOS OMA 52. Seattle, WA: National Oceanic and Atmospheric Administration
Spatial Representation:	Data for this line of evidence for Los Penasquitos Lagoon was collected at 5 monitoring sites [906_6228, 906_6229, 906_6230, 906_6232, 906_6236]
Temporal Representation:	Data was collected on a single day 7/17/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 52870, Chlordane **Region 9**

Los Penasquitos Lagoon

LOE ID:	74214	035119

Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Five samples were collected to test for toxicity. One of the samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius and percent normal of Mytilus galloprovincialis.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected from sites 906_6228, 906_6229, 906_6230, 906_6232, 906_6236 Los Penasquitos Lagoon.
Temporal Representation:	The samples were collected in July 2008.
Environmental Conditions:	
QAPP Information:	This data was collected under the Southern California Bight 2008 Regional Marine Monitoring Survey Quality Assurance Plan.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 52870, Chlordane **Region 9**

Los Penasquitos Lagoon

LOE ID:	74213
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	3
Number of Exceedances:	2
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Three samples were collected to test for toxicity. Two of the three samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius. Each sample is a sediment composites from three different sites.
Data Reference:	Data for Various Pollutants from Ambient Bay and Lagoon, 2003-2005.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected at 906LPL_2003, 906LPL_2004, and 906LPL_2005. Each of these sample location names consists of a composite from three different sites.
Temporal Representation:	The samples were collected in 2003, 2004, and 2005.
Environmental Conditions:	
QAPP Information:	The data was collected under the County of San Diego Ambient Bay and Lagoon Monitoring Project 2003-2005. Annual Report for the Receiving Waters and Urban Runoff Monitoring section covered under the San Diego County Municipal National Pollutant Discharge Elimination System (NPDES) Permit (RWQCB-Order NO. R9-2007-0001).
QAPP Information Reference(s):	e-mail clarifying QAPP information

DECISION ID **52871** **Region 9**

Los Penasquitos Lagoon

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Two lines of evidence are available in the administrative record to assess this pollutant. Three of eight samples (sediment toxicity) and zero of five samples (sediment) exceeded the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Three of eight samples (sediment toxicity) and zero of five samples (sediment) exceeded the water quality objective. The level of toxicity in sediments indicates that the beneficial use is not fully supported. The applicable sediment quality standard for this pollutant is not being exceeded and is insufficient to determine use support. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that though this water body is impaired for sediment toxicity, this water body-pollutant combination should not be placed on the section 303(d) list because applicable the water or sediment quality standards for these pollutants are not being exceeded or are insufficient to determine use support.

Line of Evidence (LOE) for Decision ID 52871, Chromium **Region 9**

Los Penasquitos Lagoon 035121

LOE ID:	78245
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Los Penasquitos Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Chromium.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Chromium is 370 ug/g dry weight (Long et al., 1995).
Guideline Reference:	Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuary sediments. Environmental Management. 19, (1): 81-97
Spatial Representation:	Data for this line of evidence for Los Penasquitos Lagoon was collected at 5 monitoring sites [906_6228, 906_6229, 906_6230, 906_6232, 906_6236]
Temporal Representation:	Data was collected on a single day 7/17/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 52871, Chromium **Region 9**

Los Penasquitos Lagoon

LOE ID:	74213
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	3
Number of Exceedances:	2
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Three samples were collected to test for toxicity. Two of the three samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius. Each sample is a sediment composites from three different sites.
Data Reference:	Data for Various Pollutants from Ambient Bay and Lagoon, 2003-2005.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or

	that produce detrimental physiological responses in human, plant, animal, or aquatic life 03522
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected at 906LPL_2003, 906LPL_2004, and 906LPL_2005. Each of these sample location names consists of a composite from three different sites.
Temporal Representation:	The samples were collected in 2003, 2004, and 2005.
Environmental Conditions:	
QAPP Information:	The data was collected under the County of San Diego Ambient Bay and Lagoon Monitoring Project 2003-2005. Annual Report for the Receiving Waters and Urban Runoff Monitoring section covered under the San Diego County Municipal National Pollutant Discharge Elimination System (NPDES) Permit (RWQCB-Order NO. R9-2007-0001).
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 52871, Chromium **Region 9**

Los Penasquitos Lagoon

LOE ID:	74214
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Five samples were collected to test for toxicity. One of the samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius and percent normal of Mytilus galloprovincialis.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected from sites 906_6228, 906_6229, 906_6230, 906_6232, 906_6236 Los Penasquitos Lagoon.
Temporal Representation:	The samples were collected in July 2008.
Environmental Conditions:	
QAPP Information:	This data was collected under the Southern California Bight 2008 Regional Marine Monitoring Survey Quality Assurance Plan.
QAPP Information Reference(s):	e-mail clarifying QAPP information

DECISION ID	52872	035123 Region 9
Los Penasquitos Lagoon		

Pollutant:	**Chrysene (C1-C4)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Three of eight samples (sediment toxicity) and zero of five samples (sediment) exceeded the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Three of eight samples (sediment toxicity) and zero of five samples (sediment) exceeded the water quality objective. The level of toxicity in sediments indicates that the beneficial use is not fully supported. The applicable sediment quality standard for this pollutant is not being exceeded and is insufficient to determine use support.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that though this water body is impaired for sediment toxicity, this water body-pollutant combination should not be placed on the section 303(d) list because applicable the water or sediment quality standards for these pollutants are not being exceeded or are insufficient to determine use support.

Line of Evidence (LOE) for Decision ID 52872, Chrysene (C1-C4)	**Region 9**
Los Penasquitos Lagoon	

LOE ID:	78246
Pollutant:	Chrysene (C1-C4)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Los Penasquitos Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Chrysene.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for Chrysene is 845.98 ng/g dry weight (MacDonald et al., 1996).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for Los Penasquitos Lagoon was collected at 5 monitoring sites [906_6228, 906_6229, 906_6230, 906_6232, 906_6236]
Temporal Representation:	Data was collected on a single day 7/17/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 52872, Chrysene (C1-C4) **Region 9**

Los Penasquitos Lagoon

LOE ID:	74214
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Five samples were collected to test for toxicity. One of the samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius and percent normal of Mytilus galloprovincialis.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected from sites 906_6228, 906_6229, 906_6230, 906_6232, 906_6236 Los Penasquitos Lagoon.
Temporal Representation:	The samples were collected in July 2008.
Environmental Conditions:	
QAPP Information:	This data was collected under the Southern California Bight 2008 Regional Marine Monitoring Survey Quality Assurance Plan.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 52872, Chrysene (C1-C4) **Region 9**

Los Penasquitos Lagoon 035125

LOE ID:	74213
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	3
Number of Exceedances:	2
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Three samples were collected to test for toxicity. Two of the three samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius. Each sample is a sediment composites from three different sites.
Data Reference:	Data for Various Pollutants from Ambient Bay and Lagoon, 2003-2005.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected at 906LPL_2003, 906LPL_2004, and 906LPL_2005. Each of these sample location names consists of a composite from three different sites.
Temporal Representation:	The samples were collected in 2003, 2004, and 2005.
Environmental Conditions:	
QAPP Information:	The data was collected under the County of San Diego Ambient Bay and Lagoon Monitoring Project 2003-2005. Annual Report for the Receiving Waters and Urban Runoff Monitoring section covered under the San Diego County Municipal National Pollutant Discharge Elimination System (NPDES) Permit (RWQCB-Order NO. R9-2007-0001).
QAPP Information Reference(s):	e-mail clarifying QAPP information

DECISION ID **52873** **Region 9**

Los Penasquitos Lagoon

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Two lines of evidence are available in the administrative record to assess this pollutant. Three of eight samples (sediment toxicity) and zero of five samples (sediment) exceeded the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Three of eight samples (sediment toxicity) and zero of five samples (sediment) exceeded the water quality objective. The level of toxicity in sediments indicates that the beneficial use is not fully supported. The applicable sediment quality standard for this pollutant is not being exceeded and is insufficient to determine use support.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that though this water body is impaired for sediment toxicity, this water body-pollutant combination should not be placed on the section 303(d) list because applicable the water or sediment quality standards for these pollutants are not being exceeded or are insufficient to determine use support.

Line of Evidence (LOE) for Decision ID 52873, Copper **Region 9**

Los Penasquitos Lagoon

LOE ID:	74213
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	3
Number of Exceedances:	2
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Three samples were collected to test for toxicity. Two of the three samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius. Each sample is a sediment composites from three different sites.
Data Reference:	Data for Various Pollutants from Ambient Bay and Lagoon, 2003-2005.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected at 906LPL_2003, 906LPL_2004, and 906LPL_2005. Each of these sample location names consists of a composite from three different sites.
Temporal Representation:	The samples were collected in 2003, 2004, and 2005.
Environmental Conditions:	
QAPP Information:	The data was collected under the County of San Diego Ambient Bay and Lagoon Monitoring Project 2003-2005. Annual Report for the Receiving Waters and Urban Runoff Monitoring section covered under the San Diego County Municipal National Pollutant Discharge Elimination System (NPDES) Permit (RWQCB-Order NO. R9-2007-0001).
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 52873, Copper **Region 9**

Los Penasquitos Lagoon

LOE ID:	74214
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Five samples were collected to test for toxicity. One of the samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius and percent normal of Mytilus galloprovincialis.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected from sites 906_6228, 906_6229, 906_6230, 906_6232, 906_6236 Los Penasquitos Lagoon.
Temporal Representation:	The samples were collected in July 2008.
Environmental Conditions:	
QAPP Information:	This data was collected under the Southern California Bight 2008 Regional Marine Monitoring Survey Quality Assurance Plan.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 52873, Copper **Region 9**

Los Penasquitos Lagoon

LOE ID:	78247
Pollutant:	Copper
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Los Penasquitos Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Copper.

Data Reference:	Data for Various Pollutants from Bight, 2008.	035128
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Copper is 270 ug/g dry weight (Long et al., 1995).	
Guideline Reference:	Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuary sediments. Environmental Management. 19, (1): 81-97	
Spatial Representation:	Data for this line of evidence for Los Penasquitos Lagoon was collected at 5 monitoring sites [906_6228, 906_6229, 906_6230, 906_6232, 906_6236]	
Temporal Representation:	Data was collected on a single day 7/17/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.	

DECISION ID	52874	Region 9
Los Penasquitos Lagoon		

Pollutant:	**Dibenz[a,h]anthracene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Two lines of evidence are available in the administrative record to assess this pollutant. Three of eight samples (sediment toxicity) and zero of five samples (sediment) exceeded the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Three of eight samples (sediment toxicity) and zero of five samples (sediment) exceeded the water quality objective. The level of toxicity in sediments indicates that the beneficial use is not fully supported. The applicable sediment quality standard for this pollutant is not being exceeded and is insufficient to determine use support. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that though this water body is impaired for sediment toxicity, this water body-pollutant combination should not be placed on the section 303(d) list because applicable the water or sediment quality standards for these pollutants are not being exceeded or are insufficient to determine use support.

Line of Evidence (LOE) for Decision ID 52874, Dibenz[a,h]anthracene **Region 9**

Los Penasquitos Lagoon 035129

LOE ID:	74213
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	3
Number of Exceedances:	2
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Three samples were collected to test for toxicity. Two of the three samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius. Each sample is a sediment composites from three different sites.
Data Reference:	Data for Various Pollutants from Ambient Bay and Lagoon, 2003-2005.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected at 906LPL_2003, 906LPL_2004, and 906LPL_2005. Each of these sample location names consists of a composite from three different sites.
Temporal Representation:	The samples were collected in 2003, 2004, and 2005.
Environmental Conditions:	
QAPP Information:	The data was collected under the County of San Diego Ambient Bay and Lagoon Monitoring Project 2003-2005. Annual Report for the Receiving Waters and Urban Runoff Monitoring section covered under the San Diego County Municipal National Pollutant Discharge Elimination System (NPDES) Permit (RWQCB-Order NO. R9-2007-0001).
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 52874, Dibenz[a,h]anthracene **Region 9**

Los Penasquitos Lagoon

LOE ID:	78248
Pollutant:	Dibenz[a,h]anthracene
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Los Penasquitos Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Dibenzo(a, h)anthracene.
Data Reference:	Data for Various Pollutants from Bight, 2008.

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Dibenzo(a, h)anthracene is 260 ng/g dry weight (Long et al., 1995).
Guideline Reference:	Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuary sediments. Environmental Management. 19, (1): 81-97
Spatial Representation:	Data for this line of evidence for Los Penasquitos Lagoon was collected at 5 monitoring sites [906_6228, 906_6229, 906_6230, 906_6232, 906_6236]
Temporal Representation:	Data was collected on a single day 7/17/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 52874, Dibenz[a,h]anthracene **Region 9**

Los Penasquitos Lagoon

LOE ID:	74214
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Five samples were collected to test for toxicity. One of the samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius and percent normal of Mytilus galloprovincialis.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected from sites 906_6228, 906_6229, 906_6230, 906_6232, 906_6236 Los Penasquitos Lagoon.
Temporal Representation:	The samples were collected in July 2008.
Environmental Conditions:	
QAPP Information:	This data was collected under the Southern California Bight 2008 Regional Marine Monitoring Survey Quality Assurance Plan.
QAPP Information Reference(s):	e-mail clarifying QAPP information

DECISION ID	52875	Region 9
Los Penasquitos Lagoon		

Pollutant:	**Endrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Two lines of evidence are available in the administrative record to assess this pollutant. Three of eight samples (sediment toxicity) and zero of five samples (sediment) exceeded the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Three of eight samples (sediment toxicity) and zero of five samples (sediment) exceeded the water quality objective. The level of toxicity in sediments indicates that the beneficial use is not fully supported. The applicable sediment quality standard for this pollutant is not being exceeded and is insufficient to determine use support. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that though this water body is impaired for sediment toxicity, this water body-pollutant combination should not be placed on the section 303(d) list because applicable the water or sediment quality standards for these pollutants are not being exceeded or are insufficient to determine use support.

Line of Evidence (LOE) for Decision ID 52875, Endrin	**Region 9**
Los Penasquitos Lagoon	

LOE ID:	78249
Pollutant:	Endrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Los Penasquitos Lagoon to determine beneficial use support and results are as follows: a total of 5 samples were collected and they were all non-detect, however 2 samples were not used in analysis because when the method detection limit was organic carbon normalized, the results were above the guideline and

	therefore could not be quanitified with the level of certainty required by the Listing Policy.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the sediment quality guideline (predictive of sediment toxicity for sediment-dwelling organisms) for Endrin is 0.76 ug/g oc (Fairey et al., 2001).
Guideline Reference:	Technical basis for deriving sediment criteria for nonionic organic contaminants for the protection of benthic organisms by using equilibrium partitioning. EPA822-R-93-011. Washington, D.C.: Office of Water, USEPA
Spatial Representation:	Data for this line of evidence for Los Penasquitos Lagoon was collected at 5 monitoring sites [906_6228, 906_6229, 906_6230, 906_6232, 906_6236]
Temporal Representation:	Data was collected on a single day 7/17/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 52875, Endrin **Region 9**

Los Penasquitos Lagoon

LOE ID:	74213
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	3
Number of Exceedances:	2
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Three samples were collected to test for toxicity. Two of the three samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius. Each sample is a sediment composites from three different sites.
Data Reference:	Data for Various Pollutants from Ambient Bay and Lagoon, 2003-2005.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected at 906LPL_2003, 906LPL_2004, and 906LPL_2005. Each of these sample location names consists of a composite from three different sites.
Temporal Representation:	The samples were collected in 2003, 2004, and 2005.
Environmental Conditions:	
QAPP Information:	The data was collected under the County of San Diego Ambient Bay and Lagoon Monitoring Project 2003-2005. Annual Report for the Receiving Waters and Urban Runoff Monitoring

	section covered under the San Diego County Municipal National Pollutant Discharge Elimination System (NPDES) Permit (RWQCB-Order NO. R9-2007-0001).
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 52875, Endrin **Region 9**

Los Penasquitos Lagoon

LOE ID:	74214
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Five samples were collected to test for toxicity. One of the samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius and percent normal of Mytilus galloprovincialis.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected from sites 906_6228, 906_6229, 906_6230, 906_6232, 906_6236 Los Penasquitos Lagoon.
Temporal Representation:	The samples were collected in July 2008.
Environmental Conditions:	
QAPP Information:	This data was collected under the Southern California Bight 2008 Regional Marine Monitoring Survey Quality Assurance Plan.
QAPP Information Reference(s):	e-mail clarifying QAPP information

DECISION ID **53454** **Region 9**

Los Penasquitos Lagoon

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2, one line of evidence are necessary to assess listing status.

Five lines of evidence are available in the administrative record to assess this pollutant. With data collected in 2008, zero of five single samples exceed the water quality objective for enterococcus for the protection of REC-1, one of five single samples exceed the water quality objective for total coliform of a SSM of 230/100ml for the protection of SHELL.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With data collected in 2008, zero of five single samples exceed the water quality objective for enterococcus for the protection of REC-1, one of five single samples exceed the water quality objective for total coliform of a SSM of 230/100ml for the protection of SHELL and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to [SECTION 3.11/4.11] of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 53454, Indicator Bacteria **Region 9**

Los Penasquitos Lagoon

LOE ID:	74184
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Los Penasquitos Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Coliform, Fecal.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the fecal coliform concentration shall not exceed 400 MPN/100 ml.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Los Penasquitos Lagoon was collected at 5 monitoring sites [Los Penasquitos Lagoon, Los Penasquitos Lagoon, Los Penasquitos Lagoon, Los Penasquitos Lagoon, Los Penasquitos Lagoon]
Temporal Representation:	Data was collected on a single day 7/17/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.

QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.	035135

Line of Evidence (LOE) for Decision ID 53454, Indicator Bacteria **Region 9**

Los Penasquitos Lagoon

LOE ID:	74183
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Non-Contact Recreation
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Los Penasquitos Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Coliform, Fecal.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters designated for non contact recreation (REC 2), the fecal coliform concentration shall not exceed 4000 MPN/100 ml (Basin Plan).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Los Penasquitos Lagoon was collected at 5 monitoring sites [Los Penasquitos Lagoon, Los Penasquitos Lagoon, Los Penasquitos Lagoon, Los Penasquitos Lagoon, Los Penasquitos Lagoon]
Temporal Representation:	Data was collected on a single day 7/17/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 53454, Indicator Bacteria **Region 9**

Los Penasquitos Lagoon

LOE ID:	74182
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Los Penasquitos Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Enterococci.
Data Reference:	Data for Various Pollutants from Bight, 2008.

SWAMP Data:	Non-SWAMP	035136
Water Quality Objective/Criterion:	Samples shall not exceed 104 organisms per 100 ml for enterococcus in waters designated for REC I beneficial use (Water Quality Control Plan for the San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Los Penasquitos Lagoon was collected at 5 monitoring sites [Los Penasquitos Lagoon, Los Penasquitos Lagoon, Los Penasquitos Lagoon, Los Penasquitos Lagoon, Los Penasquitos Lagoon]	
Temporal Representation:	Data was collected on a single day 7/17/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.	

Line of Evidence (LOE) for Decision ID 53454, Indicator Bacteria **Region 9**

Los Penasquitos Lagoon

LOE ID:	74212
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Los Penasquitos Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the total coliform concentration shall not exceed 10000 MPN/100 ml (California Ocean Plan 2009).
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Los Penasquitos Lagoon was collected at 5 monitoring sites [Los Penasquitos Lagoon, Los Penasquitos Lagoon, Los Penasquitos Lagoon, Los Penasquitos Lagoon, Los Penasquitos Lagoon]
Temporal Representation:	Data was collected on a single day 7/17/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 53454, Indicator Bacteria **Region 9**

Los Penasquitos Lagoon

LOE ID:	74201
Pollutant:	Total Coliform

LOE Subgroup:	Pollutant-Water	035137
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Shellfish Harvesting	
Number of Samples:	5	
Number of Exceedances:	1	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Los Penasquitos Lagoon to determine beneficial use support and results are as follows: 1 of 5 samples exceed the criterion for Coliform, Total.	
Data Reference:	Data for Various Pollutants from Bight, 2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	In waters where shellfish harvesting for human consumption, commercial or sports purposes is designated the total coliform concetration shall not exceed 230 per 100 ml (Basin Plan).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Los Penasquitos Lagoon was collected at 5 monitoring sites [Los Penasquitos Lagoon, Los Penasquitos Lagoon, Los Penasquitos Lagoon, Los Penasquitos Lagoon, Los Penasquitos Lagoon]	
Temporal Representation:	Data was collected on a single day 7/17/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.	

DECISION ID	**52876**	**Region 9**
Los Penasquitos Lagoon		

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Three of eight samples (sediment toxicity) and zero of five samples (sediment) exceeded the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Three of eight samples (sediment toxicity) and zero of five samples (sediment) exceeded the water quality objective. The level of toxicity in sediments indicates that the beneficial use is not fully supported. The applicable sediment quality standard for this pollutant is not being exceeded and is

insufficient to determine use support. 035138
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that though this water body is impaired for sediment toxicity, this water body-pollutant combination should not be placed on the section 303(d) list because applicable the water or sediment quality standards for these pollutants are not being exceeded or are insufficient to determine use support.

Line of Evidence (LOE) for Decision ID 52876, Lead **Region 9**

Los Penasquitos Lagoon

LOE ID:	78250
Pollutant:	Lead
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Los Penasquitos Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Lead.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for Lead is 112.18 ug/g dry weight (MacDonald et al., 1996).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for Los Penasquitos Lagoon was collected at 5 monitoring sites [906_6228, 906_6229, 906_6230, 906_6232, 906_6236]
Temporal Representation:	Data was collected on a single day 7/17/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 52876, Lead **Region 9**

Los Penasquitos Lagoon

LOE ID:	74214
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat

Number of Samples:	5
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Five samples were collected to test for toxicity. One of the samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius and percent normal of Mytilus galloprovincialis.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected from sites 906_6228, 906_6229, 906_6230, 906_6232, 906_6236 Los Penasquitos Lagoon.
Temporal Representation:	The samples were collected in July 2008.
Environmental Conditions:	
QAPP Information:	This data was collected under the Southern California Bight 2008 Regional Marine Monitoring Survey Quality Assurance Plan.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 52876, Lead Los Penasquitos Lagoon **Region 9**

LOE ID:	74213
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	3
Number of Exceedances:	2
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Three samples were collected to test for toxicity. Two of the three samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius. Each sample is a sediment composites from three different sites.
Data Reference:	Data for Various Pollutants from Ambient Bay and Lagoon, 2003-2005.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.

Guideline Reference:	035140
Spatial Representation:	The samples were collected at 906LPL_2003, 906LPL_2004, and 906LPL_2005. Each of these sample location names consists of a composite from three different sites.
Temporal Representation:	The samples were collected in 2003, 2004, and 2005.
Environmental Conditions:	
QAPP Information:	The data was collected under the County of San Diego Ambient Bay and Lagoon Monitoring Project 2003-2005. Annual Report for the Receiving Waters and Urban Runoff Monitoring section covered under the San Diego County Municipal National Pollutant Discharge Elimination System (NPDES) Permit (RWQCB-Order NO. R9-2007-0001).
QAPP Information Reference(s):	e-mail clarifying QAPP information

DECISION ID **52877** **Region 9**

Los Penasquitos Lagoon

Pollutant:	**Lindane/gamma Hexachlorocyclohexane (gamma-HCH)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Two lines of evidence are available in the administrative record to assess this pollutant. Three of eight samples (sediment toxicity) and zero of five samples (sediment) exceeded the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Three of eight samples (sediment toxicity) and zero of five samples (sediment) exceeded the water quality objective. The level of toxicity in sediments indicates that the beneficial use is not fully supported. The applicable sediment quality standard for this pollutant is not being exceeded and is insufficient to determine use support. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that though this water body is impaired for sediment toxicity, this water body-pollutant combination should not be placed on the section 303(d) list because applicable the water or sediment quality standards for these pollutants are not being exceeded or are insufficient to determine use support.

Line of Evidence (LOE) for Decision ID 52877, Lindane/gamma Hexachlorocyclohexane (gamma-HCH) **Region 9**

Los Penasquitos Lagoon

LOE ID:	74213
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment

Fraction:	None	035141
Beneficial Use:	Estuarine Habitat	
Number of Samples:	3	
Number of Exceedances:	2	
Data and Information Type:	TOXICITY TESTING	
Data Used to Assess Water Quality:	Three samples were collected to test for toxicity. Two of the three samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius. Each sample is a sediment composites from three different sites.	
Data Reference:	Data for Various Pollutants from Ambient Bay and Lagoon, 2003-2005.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.	
Guideline Reference:		
Spatial Representation:	The samples were collected at 906LPL_2003, 906LPL_2004, and 906LPL_2005. Each of these sample location names consists of a composite from three different sites.	
Temporal Representation:	The samples were collected in 2003, 2004, and 2005.	
Environmental Conditions:		
QAPP Information:	The data was collected under the County of San Diego Ambient Bay and Lagoon Monitoring Project 2003-2005. Annual Report for the Receiving Waters and Urban Runoff Monitoring section covered under the San Diego County Municipal National Pollutant Discharge Elimination System (NPDES) Permit (RWQCB-Order NO. R9-2007-0001).	
QAPP Information Reference(s):	e-mail clarifying QAPP information	

Line of Evidence (LOE) for Decision ID 52877, Lindane/gamma Hexachlorocyclohexane (gamma-HCH) **Region 9**

Los Penasquitos Lagoon

LOE ID:	78251
Pollutant:	Lindane/gamma Hexachlorocyclohexane (gamma-HCH)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Los Penasquitos Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for HCH, Gamma.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.

Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	035142
Evaluation Guideline:	In marine and estuarine sediments the sediment quality guideline (predictive of sediment toxicity for sediment-dwelling organisms) for HCH, gamma(Lindane; BHC, gamma) is 0.37 ug/g oc (Fairey et al., 2001).	
Guideline Reference:	An evaluation of methods for calculating mean sediment quality guideline quotients as indicators of contamination and acute toxicity to amphipods by chemical mixtures. Environmental Toxicology and Chemistry. 20(10): 2276-2286	
Spatial Representation:	Data for this line of evidence for Los Penasquitos Lagoon was collected at 5 monitoring sites [906_6228, 906_6229, 906_6230, 906_6232, 906_6236]	
Temporal Representation:	Data was collected on a single day 7/17/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.	

Line of Evidence (LOE) for Decision ID 52877, Lindane/gamma Hexachlorocyclohexane (gamma-HCH) **Region 9**

Los Penasquitos Lagoon

LOE ID:	74214
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Five samples were collected to test for toxicity. One of the samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius and percent normal of Mytilus galloprovincialis.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected from sites 906_6228, 906_6229, 906_6230, 906_6232, 906_6236 Los Penasquitos Lagoon.
Temporal Representation:	The samples were collected in July 2008.
Environmental Conditions:	
QAPP Information:	This data was collected under the Southern California Bight 2008 Regional Marine Monitoring Survey Quality Assurance Plan.
QAPP Information Reference(s):	e-mail clarifying QAPP information

DECISION ID 52878 Region 9

Los Penasquitos Lagoon 035143

Pollutant:	**Mercury**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Two lines of evidence are available in the administrative record to assess this pollutant. Three of eight samples (sediment toxicity) and zero of five samples (sediment) exceeded the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Three of eight samples (sediment toxicity) and zero of five samples (sediment) exceeded the water quality objective. The level of toxicity in sediments indicates that the beneficial use is not fully supported. The applicable sediment quality standard for this pollutant is not being exceeded and is insufficient to determine use support. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that though this water body is impaired for sediment toxicity, this water body-pollutant combination should not be placed on the section 303(d) list because applicable the water or sediment quality standards for these pollutants are not being exceeded or are insufficient to determine use support.

Line of Evidence (LOE) for Decision ID 52878, Mercury — Region 9

Los Penasquitos Lagoon

LOE ID:	74213
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	3
Number of Exceedances:	2
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Three samples were collected to test for toxicity. Two of the three samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius. Each sample is a sediment composites from three different sites.
Data Reference:	Data for Various Pollutants from Ambient Bay and Lagoon, 2003-2005.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or

	that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected at 906LPL_2003, 906LPL_2004, and 906LPL_2005. Each of these sample location names consists of a composite from three different sites.
Temporal Representation:	The samples were collected in 2003, 2004, and 2005.
Environmental Conditions:	
QAPP Information:	The data was collected under the County of San Diego Ambient Bay and Lagoon Monitoring Project 2003-2005. Annual Report for the Receiving Waters and Urban Runoff Monitoring section covered under the San Diego County Municipal National Pollutant Discharge Elimination System (NPDES) Permit (RWQCB-Order NO. R9-2007-0001).
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 52878, Mercury **Region 9**

Los Penasquitos Lagoon

LOE ID:	78252
Pollutant:	Mercury
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Los Penasquitos Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Mercury.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the sediment quality guideline (predictive of sediment toxicity for sediment-dwelling organisms) for Mercury is 2.1 ug/g (PTI Environmental Services, 1991).
Guideline Reference:	Pollutants of concern in Puget Sound. EPA 910/9-91-003. Seattle, WA: U.S. Environmental Protection Agency
Spatial Representation:	Data for this line of evidence for Los Penasquitos Lagoon was collected at 5 monitoring sites [906_6228, 906_6229, 906_6230, 906_6232, 906_6236]
Temporal Representation:	Data was collected on a single day 7/17/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 52878, Mercury **Region 9**

Los Penasquitos Lagoon

LOE ID:	74214
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Five samples were collected to test for toxicity. One of the samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius and percent normal of Mytilus galloprovincialis.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected from sites 906_6228, 906_6229, 906_6230, 906_6232, 906_6236 Los Penasquitos Lagoon.
Temporal Representation:	The samples were collected in July 2008.
Environmental Conditions:	
QAPP Information:	This data was collected under the Southern California Bight 2008 Regional Marine Monitoring Survey Quality Assurance Plan.
QAPP Information Reference(s):	e-mail clarifying QAPP information

DECISION ID **52879** **Region 9**

Los Penasquitos Lagoon

Pollutant:	**PAHs (Polycyclic Aromatic Hydrocarbons) | Toxicity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Three of eight samples (sediment toxicity) and zero of five samples (sediment) exceeded the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section

303(d) List. 035146

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Three of eight samples (sediment toxicity) and zero of five samples (sediment) exceeded the water quality objective for each type of PAHs. The level of toxicity in sediments indicates that the beneficial use is not fully supported. The applicable sediment quality standard for this pollutant is not being exceeded and is insufficient to determine use support.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that though this water body is impaired for sediment toxicity, this water body-pollutant combination should not be placed on the section 303(d) list because applicable the water or sediment quality standards for these pollutants are not being exceeded or are insufficient to determine use support.

Line of Evidence (LOE) for Decision ID 52879, Multiple Pollutants **Region 9**

Los Penasquitos Lagoon

LOE ID:	78255
Pollutant:	PAHs (Polycyclic Aromatic Hydrocarbons)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Los Penasquitos Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for PAHs (Polycyclic Aromatic Hydrocarbons).
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the sediment quality guideline (predictive of sediment toxicity for sediment-dwelling organisms) for Total PAHs is 1800 ug/g (Fairey et al., 2001).
Guideline Reference:	An evaluation of methods for calculating mean sediment quality guideline quotients as indicators of contamination and acute toxicity to amphipods by chemical mixtures. Environmental Toxicology and Chemistry. 20(10): 2276-2286
Spatial Representation:	Data for this line of evidence for Los Penasquitos Lagoon was collected at 5 monitoring sites [906_6228, 906_6229, 906_6230, 906_6232, 906_6236]
Temporal Representation:	Data was collected on a single day 7/17/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 52879, Multiple Pollutants **Region 9**

Los Penasquitos Lagoon

LOE ID:	74213
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	3
Number of Exceedances:	2
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Three samples were collected to test for toxicity. Two of the three samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius. Each sample is a sediment composites from three different sites.
Data Reference:	Data for Various Pollutants from Ambient Bay and Lagoon, 2003-2005.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected at 906LPL_2003, 906LPL_2004, and 906LPL_2005. Each of these sample location names consists of a composite from three different sites.
Temporal Representation:	The samples were collected in 2003, 2004, and 2005.
Environmental Conditions:	
QAPP Information:	The data was collected under the County of San Diego Ambient Bay and Lagoon Monitoring Project 2003-2005. Annual Report for the Receiving Waters and Urban Runoff Monitoring section covered under the San Diego County Municipal National Pollutant Discharge Elimination System (NPDES) Permit (RWQCB-Order NO. R9-2007-0001).
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 52879, Multiple Pollutants **Region 9**

Los Penasquitos Lagoon

LOE ID:	78253
Pollutant:	PAHs (Polycyclic Aromatic Hydrocarbons)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Los Penasquitos Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for PAH, High molecular weight.
Data Reference:	Data for Various Pollutants from Bight, 2008.

SWAMP Data:	Non-SWAMP	035148
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for High molecular weight PAHs is 9600 ng/g dry weight (Long et al., 1995).	
Guideline Reference:	Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuary sediments. Environmental Management. 19, (1): 81-97	
Spatial Representation:	Data for this line of evidence for Los Penasquitos Lagoon was collected at 5 monitoring sites [906_6228, 906_6229, 906_6230, 906_6232, 906_6236]	
Temporal Representation:	Data was collected on a single day 7/17/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.	

Line of Evidence (LOE) for Decision ID 52879, Multiple Pollutants **Region 9**

Los Penasquitos Lagoon

LOE ID:	78254
Pollutant:	PAHs (Polycyclic Aromatic Hydrocarbons)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Los Penasquitos Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for PAH, Low molecular weight.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Low molecular weight PAHs is 1442 ng/g dry weight (Long et al., 1995).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for Los Penasquitos Lagoon was collected at 5 monitoring sites [906_6228, 906_6229, 906_6230, 906_6232, 906_6236]
Temporal Representation:	Data was collected on a single day 7/17/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 52879, Multiple Pollutants **Region 9**

Los Penasquitos Lagoon 035149

LOE ID:	74214
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Five samples were collected to test for toxicity. One of the samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius and percent normal of Mytilus galloprovincialis.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected from sites 906_6228, 906_6229, 906_6230, 906_6232, 906_6236 Los Penasquitos Lagoon.
Temporal Representation:	The samples were collected in July 2008.
Environmental Conditions:	
QAPP Information:	This data was collected under the Southern California Bight 2008 Regional Marine Monitoring Survey Quality Assurance Plan.
QAPP Information Reference(s):	e-mail clarifying QAPP information

DECISION ID **52880** **Region 9**

Los Penasquitos Lagoon

Pollutant:	**PCBs (Polychlorinated biphenyls)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Two lines of evidence are available in the administrative record to assess this pollutant. Three of eight samples (sediment toxicity) and zero of five samples (sediment) exceeded the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is

sufficient justification against placing this water segment-pollutant combination on the section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Three of eight samples (sediment toxicity) and zero of five samples (sediment) exceeded the water quality objective. The level of toxicity in sediments indicates that the beneficial use is not fully supported. The applicable sediment quality standard for this pollutant is not being exceeded and is insufficient to determine use support.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that though this water body is impaired for sediment toxicity, this water body-pollutant combination should not be placed on the section 303(d) list because applicable the water or sediment quality standards for these pollutants are not being exceeded or are insufficient to determine use support.

Line of Evidence (LOE) for Decision ID 52880, PCBs (Polychlorinated biphenyls) Region 9

Los Penasquitos Lagoon

LOE ID:	74214
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Five samples were collected to test for toxicity. One of the samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius and percent normal of Mytilus galloprovincialis.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected from sites 906_6228, 906_6229, 906_6230, 906_6232, 906_6236 Los Penasquitos Lagoon.
Temporal Representation:	The samples were collected in July 2008.
Environmental Conditions:	
QAPP Information:	This data was collected under the Southern California Bight 2008 Regional Marine Monitoring Survey Quality Assurance Plan.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 52880, PCBs (Polychlorinated biphenyls) Region 9

Los Penasquitos Lagoon 035151

LOE ID:	74213
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	3
Number of Exceedances:	2
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Three samples were collected to test for toxicity. Two of the three samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius. Each sample is a sediment composites from three different sites.
Data Reference:	Data for Various Pollutants from Ambient Bay and Lagoon, 2003-2005.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected at 906LPL_2003, 906LPL_2004, and 906LPL_2005. Each of these sample location names consists of a composite from three different sites.
Temporal Representation:	The samples were collected in 2003, 2004, and 2005.
Environmental Conditions:	
QAPP Information:	The data was collected under the County of San Diego Ambient Bay and Lagoon Monitoring Project 2003-2005. Annual Report for the Receiving Waters and Urban Runoff Monitoring section covered under the San Diego County Municipal National Pollutant Discharge Elimination System (NPDES) Permit (RWQCB-Order NO. R9-2007-0001).
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 52880, PCBs (Polychlorinated biphenyls) **Region 9**

Los Penasquitos Lagoon

LOE ID:	78256
Pollutant:	PCBs (Polychlorinated biphenyls)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Los Penasquitos Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for PCB, Total.
Data Reference:	Data for Various Pollutants from Bight, 2008.

SWAMP Data:	Non-SWAMP	035152
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In marine and estuarine sediments the sediment quality guideline (predictive of sediment toxicity for sediment-dwelling organisms) for Total PCBs is 400 ng/g (MacDonald et al., 2000b).	
Guideline Reference:	Development and evaluation of consensus-based sediment effect concentrations for polychlorinated biphenyls. Environmental Toxicology and Chemistry. 19(5): 1403-1413	
Spatial Representation:	Data for this line of evidence for Los Penasquitos Lagoon was collected at 5 monitoring sites [906_6228, 906_6229, 906_6230, 906_6232, 906_6236]	
Temporal Representation:	Data was collected on a single day 7/17/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.	

DECISION ID 52881 Region 9

Los Penasquitos Lagoon

Pollutant:	**Phenanthrene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Two lines of evidence are available in the administrative record to assess this pollutant. Three of eight samples (sediment toxicity) and zero of five samples (sediment) exceeded the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Three of eight samples (sediment toxicity) and zero of five samples (sediment) exceeded the water quality objective. The level of toxicity in sediments indicates that the beneficial use is not fully supported. The applicable sediment quality standard for this pollutant is not being exceeded and is insufficient to determine use support. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that though this water body is impaired for sediment toxicity, this water body-pollutant combination should not be placed on the section 303(d) list because applicable the water or sediment quality standards for these pollutants are not being exceeded or are insufficient to determine use support.

Line of Evidence (LOE) for Decision ID 52881, Phenanthrene Region 9

Los Penasquitos Lagoon 035153

LOE ID:	78257
Pollutant:	Phenanthrene
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Los Penasquitos Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Phenanthrene.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for Phenanthrene is 543.53 ng/g dry weight (MacDonald et al., 1996).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for Los Penasquitos Lagoon was collected at 5 monitoring sites [906_6228, 906_6229, 906_6230, 906_6232, 906_6236]
Temporal Representation:	Data was collected on a single day 7/17/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 52881, Phenanthrene **Region 9**

Los Penasquitos Lagoon

LOE ID:	74213
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	3
Number of Exceedances:	2
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Three samples were collected to test for toxicity. Two of the three samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius. Each sample is a sediment composites from three different sites.
Data Reference:	Data for Various Pollutants from Ambient Bay and Lagoon, 2003-2005.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected at 906LPL_2003, 906LPL_2004, and 906LPL_2005. Each of these sample location names consists of a composite from three different sites.
Temporal Representation:	The samples were collected in 2003, 2004, and 2005.
Environmental Conditions:	
QAPP Information:	The data was collected under the County of San Diego Ambient Bay and Lagoon Monitoring Project 2003-2005. Annual Report for the Receiving Waters and Urban Runoff Monitoring section covered under the San Diego County Municipal National Pollutant Discharge Elimination System (NPDES) Permit (RWQCB-Order NO. R9-2007-0001).
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 52881, Phenanthrene **Region 9**

Los Penasquitos Lagoon

LOE ID:	74214
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Five samples were collected to test for toxicity. One of the samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius and percent normal of Mytilus galloprovincialis.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected from sites 906_6228, 906_6229, 906_6230, 906_6232, 906_6236 Los Penasquitos Lagoon.
Temporal Representation:	The samples were collected in July 2008.
Environmental Conditions:	
QAPP Information:	This data was collected under the Southern California Bight 2008 Regional Marine Monitoring Survey Quality Assurance Plan.
QAPP Information Reference(s):	e-mail clarifying QAPP information

DECISION ID	52882	Region 9
Los Penasquitos Lagoon		

Pollutant:	**Pyrene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Three of eight samples (sediment toxicity) and zero of five samples (sediment) exceeded the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Three of eight samples (sediment toxicity) and zero of five samples (sediment) exceeded the water quality objective. The level of toxicity in sediments indicates that the beneficial use is not fully supported. The applicable sediment quality standard for this pollutant is not being exceeded and is insufficient to determine use support.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that though this water body is impaired for sediment toxicity, this water body-pollutant combination should not be placed on the section 303(d) list because applicable the water or sediment quality standards for these pollutants are not being exceeded or are insufficient to determine use support.

Line of Evidence (LOE) for Decision ID 52882, Pyrene	**Region 9**
Los Penasquitos Lagoon	

LOE ID:	74213
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	3
Number of Exceedances:	2
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Three samples were collected to test for toxicity. Two of the three samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius. Each sample is a sediment composites from three different sites.
Data Reference:	Data for Various Pollutants from Ambient Bay and Lagoon, 2003-2005.

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected at 906LPL_2003, 906LPL_2004, and 906LPL_2005. Each of these sample location names consists of a composite from three different sites.
Temporal Representation:	The samples were collected in 2003, 2004, and 2005.
Environmental Conditions:	
QAPP Information:	The data was collected under the County of San Diego Ambient Bay and Lagoon Monitoring Project 2003-2005. Annual Report for the Receiving Waters and Urban Runoff Monitoring section covered under the San Diego County Municipal National Pollutant Discharge Elimination System (NPDES) Permit (RWQCB-Order NO. R9-2007-0001).
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 52882, Pyrene **Region 9**

Los Penasquitos Lagoon

LOE ID:	74214
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Five samples were collected to test for toxicity. One of the samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius and percent normal of Mytilus galloprovincialis.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected from sites 906_6228, 906_6229, 906_6230, 906_6232, 906_6236 Los Penasquitos Lagoon.
Temporal Representation:	The samples were collected in July 2008.
Environmental Conditions:	
QAPP Information:	This data was collected under the Southern California Bight 2008 Regional Marine

	Monitoring Survey Quality Assurance Plan.	035157
QAPP Information Reference(s):	e-mail clarifying QAPP information	

Line of Evidence (LOE) for Decision ID 52882, Pyrene **Region 9**

Los Penasquitos Lagoon

LOE ID:	78258
Pollutant:	Pyrene
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Los Penasquitos Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Pyrene.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for Pyrene is 1397.4 ng/g dry weight (MacDonald et al., 1996).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for Los Penasquitos Lagoon was collected at 5 monitoring sites [906_6228, 906_6229, 906_6230, 906_6232, 906_6236]
Temporal Representation:	Data was collected on a single day 7/17/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID **52883** **Region 9**

Los Penasquitos Lagoon

Pollutant:	**Silver**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Three of eight

samples (sediment toxicity) and zero of five samples (sediment) exceeded the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Three of eight samples (sediment toxicity) and zero of five samples (sediment) exceeded the water quality objective. The level of toxicity in sediments indicates that the beneficial use is not fully supported. The applicable sediment quality standard for this pollutant is not being exceeded and is insufficient to determine use support.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that though this water body is impaired for sediment toxicity, this water body-pollutant combination should not be placed on the section 303(d) list because applicable the water or sediment quality standards for these pollutants are not being exceeded or are insufficient to determine use support.

Line of Evidence (LOE) for Decision ID 52883, Silver Los Penasquitos Lagoon **Region 9**

LOE ID:	74213
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	3
Number of Exceedances:	2
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Three samples were collected to test for toxicity. Two of the three samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius. Each sample is a sediment composites from three different sites.
Data Reference:	Data for Various Pollutants from Ambient Bay and Lagoon, 2003-2005.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected at 906LPL_2003, 906LPL_2004, and 906LPL_2005. Each of these sample location names consists of a composite from three different sites.
Temporal Representation:	The samples were collected in 2003, 2004, and 2005.
Environmental Conditions:	
QAPP Information:	The data was collected under the County of San Diego Ambient Bay and Lagoon Monitoring Project 2003-2005. Annual Report for the Receiving Waters and Urban Runoff Monitoring section covered under the San Diego County Municipal National Pollutant Discharge

	Elimination System (NPDES) Permit (RWQCB-Order NO. R9-2007-0001).035159
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 52883, Silver **Region 9**

Los Penasquitos Lagoon

LOE ID:	78259
Pollutant:	Silver
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Los Penasquitos Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Silver.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for Silver is 1.77 ug/g dry weight (MacDonald et al., 1996).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for Los Penasquitos Lagoon was collected at 5 monitoring sites [906_6228, 906_6229, 906_6230, 906_6232, 906_6236]
Temporal Representation:	Data was collected on a single day 7/17/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 52883, Silver **Region 9**

Los Penasquitos Lagoon

LOE ID:	74214
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Five samples were collected to test for toxicity. One of the samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius and percent normal of Mytilus galloprovincialis.

Data Reference:	Data for Various Pollutants from Bight, 2008.	035160
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.	
Guideline Reference:		
Spatial Representation:	The samples were collected from sites 906_6228, 906_6229, 906_6230, 906_6232, 906_6236 Los Penasquitos Lagoon.	
Temporal Representation:	The samples were collected in July 2008.	
Environmental Conditions:		
QAPP Information:	This data was collected under the Southern California Bight 2008 Regional Marine Monitoring Survey Quality Assurance Plan.	
QAPP Information Reference(s):	e-mail clarifying QAPP information	

DECISION ID	52884	Region 9
Los Penasquitos Lagoon		

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Two lines of evidence are available in the administrative record to assess this pollutant. Three of eight samples (sediment toxicity) and zero of five samples (sediment) exceeded the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Three of eight samples (sediment toxicity) and zero of five samples (sediment) exceeded the water quality objective. The level of toxicity in sediments indicates that the beneficial use is not fully supported. The applicable sediment quality standard for this pollutant is not being exceeded and is insufficient to determine use support. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that though this water body is impaired for sediment toxicity, this water body-pollutant combination should not be placed on the section 303(d) list because applicable the water or sediment quality standards for these pollutants are not being exceeded or are insufficient to determine use support.

Line of Evidence (LOE) for Decision ID 52884, Zinc **Region 9**

Los Penasquitos Lagoon

LOE ID:	74214
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Five samples were collected to test for toxicity. One of the samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius and percent normal of Mytilus galloprovincialis.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected from sites 906_6228, 906_6229, 906_6230, 906_6232, 906_6236 Los Penasquitos Lagoon.
Temporal Representation:	The samples were collected in July 2008.
Environmental Conditions:	
QAPP Information:	This data was collected under the Southern California Bight 2008 Regional Marine Monitoring Survey Quality Assurance Plan.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 52884, Zinc **Region 9**

Los Penasquitos Lagoon

LOE ID:	74213
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	3
Number of Exceedances:	2
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Three samples were collected to test for toxicity. Two of the three samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius.

	Each sample is a sediment composites from three different sites. 035162
Data Reference:	Data for Various Pollutants from Ambient Bay and Lagoon, 2003-2005.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected at 906LPL_2003, 906LPL_2004, and 906LPL_2005. Each of these sample location names consists of a composite from three different sites.
Temporal Representation:	The samples were collected in 2003, 2004, and 2005.
Environmental Conditions:	
QAPP Information:	The data was collected under the County of San Diego Ambient Bay and Lagoon Monitoring Project 2003-2005. Annual Report for the Receiving Waters and Urban Runoff Monitoring section covered under the San Diego County Municipal National Pollutant Discharge Elimination System (NPDES) Permit (RWQCB-Order NO. R9-2007-0001).
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 52884, Zinc **Region 9**

Los Penasquitos Lagoon

LOE ID:	78260
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Los Penasquitos Lagoon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Zinc.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Zinc is 410 ug/g dry weight (Long et al., 1995).
Guideline Reference:	Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuary sediments. Environmental Management. 19, (1): 81-97
Spatial Representation:	Data for this line of evidence for Los Penasquitos Lagoon was collected at 5 monitoring sites [906_6228, 906_6229, 906_6230, 906_6232, 906_6236]
Temporal Representation:	Data was collected on a single day 7/17/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.

QAPP Information Reference(s): Quality Assurance Project Plan from Southern California Bight. 035163

DECISION ID	52885	Region 9
Los Penasquitos Lagoon		

Pollutant:	**Toxicity**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2027
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least one line of evidence is necessary to assess listing status for toxicity in sediment, and waters may be placed on the CWA section 303(d) List for toxicity alone.

Two lines of evidence are available in the administrative record to assess sediment toxicity. Three of the eight samples exhibited sediment toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Three of the eight samples exhibited sediment toxicity, and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 52885, Toxicity	Region 9
Los Penasquitos Lagoon	

LOE ID:	74213
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	3
Number of Exceedances:	2
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Three samples were collected to test for toxicity. Two of the three samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius. Each sample is a sediment composites from three different sites.
Data Reference:	Data for Various Pollutants from Ambient Bay and Lagoon, 2003-2005.

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected at 906LPL_2003, 906LPL_2004, and 906LPL_2005. Each of these sample location names consists of a composite from three different sites.
Temporal Representation:	The samples were collected in 2003, 2004, and 2005.
Environmental Conditions:	
QAPP Information:	The data was collected under the County of San Diego Ambient Bay and Lagoon Monitoring Project 2003-2005. Annual Report for the Receiving Waters and Urban Runoff Monitoring section covered under the San Diego County Municipal National Pollutant Discharge Elimination System (NPDES) Permit (RWQCB-Order NO. R9-2007-0001).
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 52885, Toxicity **Region 9**

Los Penasquitos Lagoon

LOE ID:	74214
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Five samples were collected to test for toxicity. One of the samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius and percent normal of Mytilus galloprovincialis.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected from sites 906_6228, 906_6229, 906_6230, 906_6232, 906_6236 Los Penasquitos Lagoon.
Temporal Representation:	The samples were collected in July 2008.
Environmental Conditions:	
QAPP Information:	This data was collected under the Southern California Bight 2008 Regional Marine

	Monitoring Survey Quality Assurance Plan.	035165
QAPP Information Reference(s):	e-mail clarifying QAPP information	

DECISION ID	36260	Region 9
Los Penasquitos Lagoon		

Pollutant:	**Sedimentation/Siltation**
Final Listing Decision:	**List on 303(d) list (being addressed by USEPA approved TMDL)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Channel Erosion | Channelization | Erosion/Siltation | Flow Alteration/Regulation/Modification | Hydromodification | Illicit Connections/Illegal Hook-ups/Dry Weather Flows | Source Unknown | Streambank Modification/Destabilization | Urban Runoff/Storm Sewers
TMDL Name:	Los Penasquitos Lagoon Sedimentation
TMDL Project Code:	695
Date TMDL Approved by USEPA:	10/30/2014
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. 303(d) listing decisions made prior to 2006 were not held in an assessment database. The Regional Boards will update this decision when new data and information become available and are assessed.
Regional Board Decision Recommendation:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. The Regional Board will update this decision when new data and information become available and are assessed.

Line of Evidence (LOE) for Decision ID 36260, Sedimentation/Siltation	Region 9
Los Penasquitos Lagoon	

LOE ID:	4456
Pollutant:	Sedimentation/Siltation
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Estuarine Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	Unspecified
Guideline Reference:	Placeholder reference pre-2006 303(d)

Spatial Representation:	Unspecified	035166
Temporal Representation:	Unspecified	
Environmental Conditions:	Unspecified	
QAPP Information:	Unspecified	
QAPP Information Reference(s):		

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Famosa Slough and Channel
Water Body ID: CAE9071100019990209122340
Water Body Type: Estuary

DECISION ID 34004 **Region 9**
Famosa Slough and Channel

Pollutant: Eutrophic
Final Listing Decision: Do Not Delist from 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Sources: Urban Runoff/Storm Sewers
Expected TMDL Completion Date: 2027
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

303(d) listing decisions made prior to 2006 were not held in an assessment database. The Regional Boards will update this decision when new data and information become available and are assessed.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34004, Eutrophic **Region 9**
Famosa Slough and Channel

LOE ID: 4451

Pollutant: Eutrophic
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Not Recorded

Beneficial Use: Marine Habitat

Number of Samples: 0
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference: Placeholder reference pre-2006 303(d)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: Unspecified
Objective/Criterion Reference: Placeholder reference pre-2006 303(d)

Evaluation Guideline:	Unspecified
Guideline Reference:	Placeholder reference pre-2006 303(d)
Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Tijuana River Estuary
Water Body ID: CAE9111100019990208143032
Water Body Type: Estuary

DECISION ID 34382 **Region 9**
Tijuana River Estuary

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not Delist from 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Sources: Source Unknown
Expected TMDL Completion Date: 2010
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for removal from the CWA section 303(d) List under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Six lines of evidence are available in the administrative record to assess this pollutant. Whereas the latest data from five stations on July 16, 2008 (from Bight 08 program) show 0 of 5 samples exceed the water quality objectives for their respective single sample maximum thresholds for enterococcus, fecal coliform, and total coliform, place-holder LOE from pre-2006 data conclude that REC-1 is not supported.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. place-holder LOE from pre-2006 data conclude that REC-1 is not supported
and this exceeds the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 34382, Indicator Bacteria **Region 9**
Tijuana River Estuary

LOE ID: 76803

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use:	Shellfish Harvesting
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Tijuana River Estuary to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters where shellfish harvesting for human consumption, commercial or sports purposes is designated the total coliform concetration shall not exceed 230 per 100 ml (Basin Plan).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Tijuana River Estuary was collected at 5 monitoring sites [Tijuana River Estuary, Tijuana River Estuary, Tijuana River Estuary, Tijuana River Estuary, Tijuana River Estuary]
Temporal Representation:	Data was collected on a single day 7/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 34382, Indicator Bacteria **Region 9**

Tijuana River Estuary

LOE ID:	76804
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Tijuana River Estuary to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the total coliform concentration shall not exceed 10000 MPN/100 ml (California Ocean Plan 2009).
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Tijuana River Estuary was collected at 5 monitoring sites [Tijuana River Estuary, Tijuana River Estuary, Tijuana River Estuary, Tijuana River Estuary, Tijuana River Estuary]

Temporal Representation:	Data was collected on a single day 7/16/2008.	035171
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.	

Line of Evidence (LOE) for Decision ID 34382, Indicator Bacteria **Region 9**

Tijuana River Estuary

LOE ID:	76842
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Tijuana River Estuary to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Enterococci.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Samples shall not exceed 104 organisms per 100 ml for enterococcus in waters designated for REC I beneficial use (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Tijuana River Estuary was collected at 5 monitoring sites [Tijuana River Estuary, Tijuana River Estuary, Tijuana River Estuary, Tijuana River Estuary, Tijuana River Estuary]
Temporal Representation:	Data was collected on a single day 7/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 34382, Indicator Bacteria **Region 9**

Tijuana River Estuary

LOE ID:	76843
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Non-Contact Recreation
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Tijuana River Estuary to determine beneficial use support and results are as follows: 0 of 5 samples exceed the

	criterion for Coliform, Fecal.	035172
Data Reference:	Data for Various Pollutants from Bight, 2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	In waters designated for non contact recreation (REC 2), the fecal coliform concentration shall not exceed 4000 MPN/100 ml (Basin Plan).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Tijuana River Estuary was collected at 5 monitoring sites [Tijuana River Estuary, Tijuana River Estuary, Tijuana River Estuary, Tijuana River Estuary, Tijuana River Estuary]	
Temporal Representation:	Data was collected on a single day 7/16/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.	

Line of Evidence (LOE) for Decision ID 34382, Indicator Bacteria **Region 9**

Tijuana River Estuary

LOE ID:	4670
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Water Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Unspecified
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	Unspecified
Guideline Reference:	Placeholder reference pre-2006 303(d)
Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 34382, Indicator Bacteria **Region 9**

Tijuana River Estuary

LOE ID:	76844
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	035173
Beneficial Use:	Water Contact Recreation	
Number of Samples:	5	
Number of Exceedances:	0	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Tijuana River Estuary to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Coliform, Fecal.	
Data Reference:	Data for Various Pollutants from Bight, 2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the fecal coliform concentration shall not exceed 400 MPN/100 ml.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Tijuana River Estuary was collected at 5 monitoring sites [Tijuana River Estuary, Tijuana River Estuary, Tijuana River Estuary, Tijuana River Estuary, Tijuana River Estuary]	
Temporal Representation:	Data was collected on a single day 7/16/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.	

DECISION ID	41510	Region 9
Tijuana River Estuary		

Pollutant:	**Lead**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for removal from the CWA section 303(d) List under section 4.1 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. One line of evidence is the 303(d) listing decision made prior to 2006, which was to place this water segment-pollutant combination on the CWA section 303(d) List. A second line of evidence is more recent data, and zero of five sediment samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of five sediment samples exceeded the criteria, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A

minimum of 28 samples is needed to determine if a beneficial use is fully supported using Table 4.1. 4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 41510, Lead **Region 9**

Tijuana River Estuary

LOE ID:	78368
Pollutant:	Lead
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Tijuana River Estuary to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Lead.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for Lead is 112.18 ug/g dry weight (MacDonald et al., 1996).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for Tijuana River Estuary was collected at 5 monitoring sites [911_6012, 911_6010, 911_6009, 911_6004, 911_6001]
Temporal Representation:	Data was collected on a single day 7/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 41510, Lead **Region 9**

Tijuana River Estuary

LOE ID:	4671
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Estuarine Habitat

Number of Samples:	0	035175
Number of Exceedances:	0	

Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Unspecified
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	Unspecified
Guideline Reference:	Placeholder reference pre-2006 303(d)
Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

DECISION ID **52218** **Region 9**

Tijuana River Estuary

Pollutant:	**2-Methylnaphthalene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the five samples exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of five samples exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52218, 2-Methylnaphthalene **Region 9**

Tijuana River Estuary 035176

LOE ID:	78357
Pollutant:	2-Methylnaphthalene
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Tijuana River Estuary to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for 2-Methylnaphthalene.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for 2-Methylnaphthalene is 201.28 ng/g dry weight (MacDonald et al., 1996).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for Tijuana River Estuary was collected at 5 monitoring sites [911_6012, 911_6010, 911_6009, 911_6004, 911_6001]
Temporal Representation:	Data was collected on a single day 7/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID **52226** **Region 9**

Tijuana River Estuary

Pollutant:	**Antimony**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of the five samples exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d)

List. 035177

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the five samples exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52226, Antimony **Region 9**

Tijuana River Estuary

LOE ID:	78358
Pollutant:	Antimony
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Tijuana River Estuary to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Antimony.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Antimony is 25 ug/g dry weight (Long and Morgan, 1990).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for Tijuana River Estuary was collected at 5 monitoring sites [911_6012, 911_6010, 911_6009, 911_6004, 911_6001]
Temporal Representation:	Data was collected on a single day 7/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID 52237 **Region 9**

Tijuana River Estuary

Pollutant:	**Benzo(a)anthracene**	035178
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	
Last Listing Cycle's Final Listing Decision:	New Decision	
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the five samples exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the five samples exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52237, Benzo(a)anthracene **Region 9**

Tijuana River Estuary

LOE ID:	78360
Pollutant:	Benzo(a)anthracene
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Tijuana River Estuary to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Benzo(a)anthracene.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for Benzo(a)anthracene is 692.53 ng/g dry weight (MacDonald et al., 1996).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for Tijuana River Estuary was collected at 5 monitoring sites [911_6012, 911_6010, 911_6009, 911_6004, 911_6001]
Temporal Representation:	Data was collected on a single day 7/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID 52241 Region 9

Tijuana River Estuary

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.5 and 3.6 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status for pollutants in tissue; under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of one sample (shellfish tissue) and zero of five samples (sediment) exceeded the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample (tissue) and zero of five samples (sediment) exceeded the water quality objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52241, Cadmium Region 9

Tijuana River Estuary

LOE ID:	78361
Pollutant:	Cadmium

LOE Subgroup:	Pollutant-Sediment	035180
Matrix:	Sediment	
Fraction:	Total	
Beneficial Use:	Estuarine Habitat	
Number of Samples:	5	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Tijuana River Estuary to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Cadmium.	
Data Reference:	Data for Various Pollutants from Bight, 2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for Cadmium is 4.21 ng/g dry weight (MacDonald et al., 1996).	
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278	
Spatial Representation:	Data for this line of evidence for Tijuana River Estuary was collected at 5 monitoring sites [911_6012, 911_6010, 911_6009, 911_6004, 911_6001]	
Temporal Representation:	Data was collected on a single day 7/16/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.	

Line of Evidence (LOE) for Decision ID 52241, Cadmium **Region 9**

Tijuana River Estuary

LOE ID:	76816
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Shellfish Harvesting
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The sample did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for cadmium in shellfish tissue is 3.3 ppm. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; USEPA, 2000)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Guidance for Assessing Chemical Contaminant Data for Use In Fish Advisories Volume 1: Fish Sampling and Analysis
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site TJRE.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 12/10/2007
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID	**52243**	**Region 9**
Tijuana River Estuary		

Pollutant:	**Chlordane**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.5 and 3.6 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status for pollutants in tissue; under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of one sample (shellfish tissue) and zero of five samples (sediment) exceeded the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample (tissue) and zero of five samples (sediment) exceeded the water quality objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52243, Chlordane **Region 9**

Tijuana River Estuary

LOE ID:	78362
Pollutant:	Chlordane
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Tijuana River Estuary to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Chlordane, Total.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Total Chlordane is 6 ng/g dry weight (Long and Morgan, 1990).
Guideline Reference:	The potential for biological effects of sediment-sorbed contaminants tested in the National Status of Trends Program. NOAA Technical Memorandum NOS OMA 52. Seattle, WA: National Oceanic and Atmospheric Administration
Spatial Representation:	Data for this line of evidence for Tijuana River Estuary was collected at 5 monitoring sites [911_6012, 911_6010, 911_6009, 911_6004, 911_6001]
Temporal Representation:	Data was collected on a single day 7/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 52243, Chlordane **Region 9**

Tijuana River Estuary

LOE ID:	76820
Pollutant:	Chlordane
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Shellfish Harvesting
Number of Samples:	1
Number of Exceedances:	0

Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal. Chlordane result was calculated by summing the results for chlordane isomers: cis- and trans-nonachlor, alpha- and gamma-chlordane, and oxychlordane.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for total chlordane in shellfish tissue is 6.0 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site TJRE.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 12/10/2007
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID	**52244**	**Region 9**
Tijuana River Estuary		

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceeds the objective.

	Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one samples exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52244, Chlorpyrifos **Region 9**

Tijuana River Estuary

LOE ID:	76821
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Shellfish Harvesting
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for chlorpyrifos in shellfish tissue is 1,000 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; USEPA, 2000)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Guidance for Assessing Chemical Contaminant Data for Use In Fish Advisories Volume 1: Fish Sampling and Analysis

Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site TJRE.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 12/10/2007
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID 52263 Region 9

Tijuana River Estuary

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of the five samples exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the five samples exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52263, Chromium Region 9

Tijuana River Estuary

LOE ID:	78363
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment

Fraction:	Total	035186
Beneficial Use:	Estuarine Habitat	
Number of Samples:	5	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Tijuana River Estuary to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Chromium.	
Data Reference:	Data for Various Pollutants from Bight, 2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Chromium is 370 ug/g dry weight (Long et al., 1995).	
Guideline Reference:	Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuary sediments. Environmental Management. 19, (1): 81-97	
Spatial Representation:	Data for this line of evidence for Tijuana River Estuary was collected at 5 monitoring sites [911_6012, 911_6010, 911_6009, 911_6004, 911_6001]	
Temporal Representation:	Data was collected on a single day 7/16/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.	

DECISION ID	**52267**	**Region 9**
Tijuana River Estuary		

Pollutant:	**Chrysene (C1-C4)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the five samples exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the five samples exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available

indicating that standards are not met. 035187

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52267, Chrysene (C1-C4) **Region 9**

Tijuana River Estuary

LOE ID:	78364
Pollutant:	Chrysene (C1-C4)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Tijuana River Estuary to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Chrysene.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for Chrysene is 845.98 ng/g dry weight (MacDonald et al., 1996).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for Tijuana River Estuary was collected at 5 monitoring sites [911_6012, 911_6010, 911_6009, 911_6004, 911_6001]
Temporal Representation:	Data was collected on a single day 7/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID **52274** **Region 9**

Tijuana River Estuary

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of

the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the five samples exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the five samples exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52274, Copper **Region 9**

Tijuana River Estuary

LOE ID:	78365
Pollutant:	Copper
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Tijuana River Estuary to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Copper.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Copper is 270 ug/g dry weight (Long et al., 1995).
Guideline Reference:	Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuary sediments. Environmental Management. 19, (1): 81-97
Spatial Representation:	Data for this line of evidence for Tijuana River Estuary was collected at 5 monitoring sites [911_6012, 911_6010, 911_6009, 911_6004, 911_6001]
Temporal Representation:	Data was collected on a single day 7/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.

QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID	52276	Region 9
Tijuana River Estuary		

Pollutant:	**Dibenz[a,h]anthracene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of the five samples exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of the five samples exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52276, Dibenz[a,h]anthracene	**Region 9**
Tijuana River Estuary	

LOE ID:	78366
Pollutant:	Dibenz[a,h]anthracene
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Tijuana River Estuary to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Dibenzo(a, h)anthracene.

Data Reference:	Data for Various Pollutants from Bight, 2008.	035190
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Dibenzo(a, h)anthracene is 260 ng/g dry weight (Long et al., 1995).	
Guideline Reference:	Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuary sediments. Environmental Management. 19, (1): 81-97	
Spatial Representation:	Data for this line of evidence for Tijuana River Estuary was collected at 5 monitoring sites [911_6012, 911_6010, 911_6009, 911_6004, 911_6001]	
Temporal Representation:	Data was collected on a single day 7/16/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.	

DECISION ID 52277 Region 9

Tijuana River Estuary

Pollutant:	**Dieldrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52277, Dieldrin Region 9

Tijuana River Estuary

LOE ID:	76833
Pollutant:	Dieldrin
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Shellfish Harvesting
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The results did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for dieldrin in shellfish tissue is 0.49 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site TJRE.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 12/10/2007
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID	**52280**	**Region 9**
Tijuana River Estuary		

Pollutant:	**Endosulfan**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision

Revision Status	Revised	035192
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceeds the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52280, Endosulfan **Region 9**

Tijuana River Estuary

LOE ID:	76837
Pollutant:	Endosulfan
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Shellfish Harvesting
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal. Total Endosulfan result was calculated by summing Endosulfan I and Endosulfan II.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for endosulfan (I and II) in shellfish tissue is

	20,000 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; USEPA, 2000)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Guidance for Assessing Chemical Contaminant Data for Use In Fish Advisories Volume 1: Fish Sampling and Analysis
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site TJRE.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 12/10/2007
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID	**52286**	**Region 9**
Tijuana River Estuary		

Pollutant:	**Heptachlor epoxide**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceeds the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

LOE ID:	76845
Pollutant:	Heptachlor epoxide
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Shellfish Harvesting
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for heptachlor epoxide in shellfish tissue is 1.4 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; OEHHA, 1999)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Public Health Goal for Heptachlor and Heptachlor Epoxide in Drinking Water
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site TJRE.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 12/10/2007
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID 52291 Region 9
Tijuana River Estuary

Pollutant:	**Hexachlorobenzene/ HCB**	035195
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	
Last Listing Cycle's Final Listing Decision:	New Decision	
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one samples exceeds the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52291, Hexachlorobenzene/ HCB **Region 9**

Tijuana River Estuary

LOE ID:	76846
Pollutant:	Hexachlorobenzene/ HCB
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Shellfish Harvesting
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.

Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	035196
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for hexachlorobenzene in shellfish tissue is 4.3 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; OEHHA, 2005)	
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Air Toxics Hotspots Program Risk Assessment Guidelines. Part II Technical Support Document for Describing Available Cancer Potency Values.	
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site TJRE.	
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 12/10/2007	
Environmental Conditions:		
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/	
QAPP Information Reference(s):		

DECISION ID	**52296**	**Region 9**
Tijuana River Estuary		

Pollutant:	**Lindane/gamma Hexachlorocyclohexane (gamma-HCH)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.5 and 3.6 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status for pollutants in tissue; under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of one sample (shellfish tissue) and zero of five samples (sediment) exceeded the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample (tissue) and zero of five samples (sediment) exceeded the water quality objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available

indicating that standards are not met. 035197

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52296, Lindane/gamma Hexachlorocyclohexane (gamma-HCH) **Region 9**

Tijuana River Estuary

LOE ID:	78369
Pollutant:	Lindane/gamma Hexachlorocyclohexane (gamma-HCH)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Tijuana River Estuary to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for HCH, Gamma.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the sediment quality guideline (predictive of sediment toxicity for sediment-dwelling organisms) for HCH, gamma(Lindane; BHC, gamma) is 0.37 ug/g oc (Fairey et al., 2001).
Guideline Reference:	An evaluation of methods for calculating mean sediment quality guideline quotients as indicators of contamination and acute toxicity to amphipods by chemical mixtures. Environmental Toxicology and Chemistry. 20(10): 2276-2286
Spatial Representation:	Data for this line of evidence for Tijuana River Estuary was collected at 5 monitoring sites [911_6012, 911_6010, 911_6009, 911_6004, 911_6001]
Temporal Representation:	Data was collected on a single day 7/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 52296, Lindane/gamma Hexachlorocyclohexane (gamma-HCH) **Region 9**

Tijuana River Estuary

LOE ID:	76850
Pollutant:	Lindane/gamma Hexachlorocyclohexane (gamma-HCH)
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish

Beneficial Use:	Shellfish Harvesting	035198
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	Shellfish surveys	
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.	
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for lindane in shellfish tissue is 7.1 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; OEHHA, 2005)	
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Air Toxics Hotspots Program Risk Assessment Guidelines. Part II Technical Support Document for Describing Available Cancer Potency Values.	
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site TJRE.	
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 12/10/2007	
Environmental Conditions:		
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/	
QAPP Information Reference(s):		

DECISION ID	**52298**	**Region 9**
Tijuana River Estuary		

Pollutant:	**Mercury**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.5 and 3.6 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status

for pollutants in tissue; under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of one sample (shellfish tissue) and zero of five samples (sediment) exceeded the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample (tissue) and zero of five samples (sediment) exceeded the water quality objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52298, Mercury **Region 9**

Tijuana River Estuary

LOE ID:	78370
Pollutant:	Mercury
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Tijuana River Estuary to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Mercury.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the sediment quality guideline (predictive of sediment toxicity for sediment-dwelling organisms) for Mercury is 2.1 ug/g (PTI Environmental Services, 1991).
Guideline Reference:	Pollutants of concern in Puget Sound. EPA 910/9-91-003. Seattle, WA: U.S. Environmental Protection Agency
Spatial Representation:	Data for this line of evidence for Tijuana River Estuary was collected at 5 monitoring sites [911_6012, 911_6010, 911_6009, 911_6004, 911_6001]

Temporal Representation:	Data was collected on a single day 7/16/2008. 035200
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 52298, Mercury **Region 9**

Tijuana River Estuary

LOE ID:	76853
Pollutant:	Mercury
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Shellfish Harvesting
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The sample did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The USEPA 304(a) recommended water quality criterion for concentrations of methylmercury in shellfish tissue (wet weight) is 0.2 ppm. (Brodberg, R.K., and G.A. Pollock, 1999; USEPA, 2001)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Water Quality Criterion for the Protection of Human Health: Methylmercury. Final. United States Environmental Protection Agency Office of Science and Technology Office of Water. EPA-823-R-01-001. January 2001
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site TJRE.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 12/10/2007
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID 52301 **Region 9**

Tijuana River Estuary

Pollutant:	**Mirex**	035201
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	
Last Listing Cycle's Final Listing Decision:	New Decision	
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of zero samples exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of zero samples exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52301, Mirex **Region 9**

Tijuana River Estuary

LOE ID:	76785
Pollutant:	Mirex
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Shellfish Harvesting
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The non detect result was not included in the assessment since the reporting limit was above the evaluation guideline. MDL were provided by NOAA Federal and RL were calculated by multiplying 3.18 by the MDL.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.

Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for mirex in shellfish tissue is 0.43 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; OEHHA, 1992)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Expedited Cancer Potency Values and Proposed Regulatory Levels for Certain Proposition 65 Carcinogens.
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site TJRE.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 12/10/2007
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID	52305	Region 9
Tijuana River Estuary		

Pollutant:	**PAHs (Polycyclic Aromatic Hydrocarbons)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.5 and 3.6 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status for pollutants in tissue; under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of one sample (shellfish tissue) and zero of five samples (sediment) exceeded the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample (tissue) and zero of five samples (sediment) exceeded the water quality objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52305, PAHs (Polycyclic Aromatic Hydrocarbons) **Region 9**

Tijuana River Estuary

LOE ID:	76786
Pollutant:	PAHs (Polycyclic Aromatic Hydrocarbons)
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Shellfish Harvesting
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The result did exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal. The total PAHs were calculated as the potency equivalency concentration or the sum of the toxic equivalency factors multiplied by the concentrations of: Acenaphthene, Acenaphthylene, Anthracene, Benz[a]anthracene, Benzo[a]pyrene, Benzo[b]fluoranthene, Benzo[g,h,i]perylene, Benzo[k]fluoranthene, Dibenzo[a,h]anthracene, Chrysene, Fluoranthene, Fluorene, Indeno[1,2,3-c,d]pyrene, Phenanthrene, and Pyrene.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for polycyclic aromatic hydrocarbons in shellfish tissue is 1.1 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; USEPA, 2000)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Guidance for Assessing Chemical Contaminant Data for Use In Fish Advisories Volume 1: Fish Sampling and Analysis
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site TJRE.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 12/10/2007
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends

	(NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 52305, PAHs (Polycyclic Aromatic Hydrocarbons) Region 9

Tijuana River Estuary

LOE ID:	78351
Pollutant:	PAHs (Polycyclic Aromatic Hydrocarbons)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Tijuana River Estuary to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for PAHs (Polycyclic Aromatic Hydrocarbons).
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the sediment quality guideline (predictive of sediment toxicity for sediment-dwelling organisms) for Total PAHs is 1800 ug/g (Fairey et al., 2001).
Guideline Reference:	An evaluation of methods for calculating mean sediment quality guideline quotients as indicators of contamination and acute toxicity to amphipods by chemical mixtures. Environmental Toxicology and Chemistry. 20(10): 2276-2286
Spatial Representation:	Data for this line of evidence for Tijuana River Estuary was collected at 5 monitoring sites [911_6012, 911_6010, 911_6009, 911_6004, 911_6001]
Temporal Representation:	Data was collected on a single day 7/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 52305, PAHs (Polycyclic Aromatic Hydrocarbons) Region 9

Tijuana River Estuary

LOE ID:	78349
Pollutant:	PAHs (Polycyclic Aromatic Hydrocarbons)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Tijuana River Estuary to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for PAH, High molecular weight.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for High molecular weight PAHs is 9600 ng/g dry weight (Long et al., 1995).
Guideline Reference:	Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuary sediments. Environmental Management. 19, (1): 81-97
Spatial Representation:	Data for this line of evidence for Tijuana River Estuary was collected at 5 monitoring sites [911_6012, 911_6010, 911_6009, 911_6004, 911_6001]
Temporal Representation:	Data was collected on a single day 7/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 52305, PAHs (Polycyclic Aromatic Hydrocarbons) Region 9

Tijuana River Estuary

LOE ID:	78350
Pollutant:	PAHs (Polycyclic Aromatic Hydrocarbons)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Tijuana River Estuary to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for PAH, Low molecular weight.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Low molecular weight PAHs is 1442 ng/g dry weight (Long et al., 1995).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for Tijuana River Estuary was collected at 5 monitoring sites [

	911_6012, 911_6010, 911_6009, 911_6004, 911_6001] 035206
Temporal Representation:	Data was collected on a single day 7/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID 52813 Region 9

Tijuana River Estuary

Pollutant:	**PCBs (Polychlorinated biphenyls)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.5 and 3.6 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status for pollutants in tissue; under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Two lines of evidence are available in the administrative record to assess this pollutant. One of one sample (shellfish tissue) and zero of five samples (sediment) exceeded the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of one sample (tissue) and zero of five samples (sediment) exceeded the water quality objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52813, PCBs (Polychlorinated biphenyls) Region 9

Tijuana River Estuary

LOE ID:	78352
Pollutant:	PCBs (Polychlorinated biphenyls)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Tijuana River Estuary to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for PCB, Total.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the sediment quality guideline (predictive of sediment toxicity for sediment-dwelling organisms) for Total PCBs is 400 ng/g (MacDonald et al., 2000b).
Guideline Reference:	Development and evaluation of consensus-based sediment effect concentrations for polychlorinated biphenyls. Environmental Toxicology and Chemistry. 19(5): 1403-1413
Spatial Representation:	Data for this line of evidence for Tijuana River Estuary was collected at 5 monitoring sites [911_6012, 911_6010, 911_6009, 911_6004, 911_6001]
Temporal Representation:	Data was collected on a single day 7/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 52813, PCBs (Polychlorinated biphenyls) Region 9

Tijuana River Estuary

LOE ID:	76795
Pollutant:	PCBs (Polychlorinated biphenyls)
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Shellfish Harvesting
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The result did exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal. Total PCB was assessed for as follows: PCB aroclors and congeners were summed separately and the sum that yielded the highest value was used for the assessment.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for polychlorinated biphenyls in shellfish tissue is 3.9 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008)

Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site TJRE.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 12/10/2007
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

035208

DECISION ID	52814	Region 9
Tijuana River Estuary		

Pollutant:	**Phenanthrene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of the five samples exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the five samples exceed the objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	

Line of Evidence (LOE) for Decision ID 52814, Phenanthrene	Region 9
Tijuana River Estuary	

LOE ID:	78353

Pollutant:	Phenanthrene
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Tijuana River Estuary to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Phenanthrene.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for Phenanthrene is 543.53 ng/g dry weight (MacDonald et al., 1996).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for Tijuana River Estuary was collected at 5 monitoring sites [911_6012, 911_6010, 911_6009, 911_6004, 911_6001]
Temporal Representation:	Data was collected on a single day 7/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID	**52815**	**Region 9**
Tijuana River Estuary		

Pollutant:	**Pyrene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the five samples exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.

2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the five samples exceed the objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52815, Pyrene **Region 9**
Tijuana River Estuary

LOE ID:	78354
Pollutant:	Pyrene
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Tijuana River Estuary to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Pyrene.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for Pyrene is 1397.4 ng/g dry weight (MacDonald et al., 1996).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for Tijuana River Estuary was collected at 5 monitoring sites [911_6012, 911_6010, 911_6009, 911_6004, 911_6001]
Temporal Representation:	Data was collected on a single day 7/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID **52816** **Region 9**
Tijuana River Estuary

Pollutant:	**Selenium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision

Revision Status	Revised	035211
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one samples exceeds the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52816, Selenium **Region 9**

Tijuana River Estuary

LOE ID:	76799
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Shellfish Harvesting
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The sample did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for selenium in shellfish tissue is 11 ppm. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day. A background dietary consuption rate of 0.114 mg/day is applied for this micronutrient. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008)

Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site TJRE.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 12/10/2007
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID 52817 Region 9

Tijuana River Estuary

Pollutant:	**Silver**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of the five samples exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the five samples exceed the objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52817, Silver Region 9

Tijuana River Estuary

LOE ID:	78355
Pollutant:	Silver
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Tijuana River Estuary to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Silver.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for Silver is 1.77 ug/g dry weight (MacDonald et al., 1996).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for Tijuana River Estuary was collected at 5 monitoring sites [911_6012, 911_6010, 911_6009, 911_6004, 911_6001]
Temporal Representation:	Data was collected on a single day 7/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID	**52818**	**Region 9**
Tijuana River Estuary		

Pollutant:	**Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceeds the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.

3. Zero of one sample exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52818, Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD) **Region 9**

Tijuana River Estuary

LOE ID:	76805
Pollutant:	Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD)
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Shellfish Harvesting
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal. The total DDTs were calculated as the sum of 4,4- and 2,4- isomers of DDT, DDE, and DDD.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for total DDT in shellfish tissue is 23 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site TJRE.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 12/10/2007
Environmental Conditions:	

QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID 52820 Region 9

Tijuana River Estuary

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of the five samples exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the five samples exceed the objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52820, Zinc Region 9

Tijuana River Estuary

LOE ID:	78356
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Tijuana River Estuary to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Zinc.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Zinc is 410 ug/g dry weight (Long et al., 1995).
Guideline Reference:	Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuary sediments. Environmental Management. 19, (1): 81-97
Spatial Representation:	Data for this line of evidence for Tijuana River Estuary was collected at 5 monitoring sites [911_6012, 911_6010, 911_6009, 911_6004, 911_6001]
Temporal Representation:	Data was collected on a single day 7/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID	**52819**	**Region 9**
Tijuana River Estuary		

Pollutant:	**Toxicity**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least one line of evidence is necessary to assess listing status for toxicity in sediment, and waters may be placed on the CWA section 303(d) List for toxicity alone. Two lines of evidence are available in the administrative record to assess sediment toxicity. Four of the eight samples exhibited sediment toxicity. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Four of the eight samples exhibited sediment toxicity, and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 52819, Toxicity **Region 9**

Tijuana River Estuary

LOE ID:	76811
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	4
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Five samples were collected to test for toxicity. Four of the samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius and percent normal of Mytilus galloprovincialis.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected from sites 911_6001, 911_6004, 911_6009, 911_6010, 911_6012 Tijuana River Estuary.
Temporal Representation:	The samples were collected in July 2008.
Environmental Conditions:	
QAPP Information:	This data was collected under the Southern California Bight 2008 Regional Marine Monitoring Survey Quality Assurance Plan.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 52819, Toxicity **Region 9**

Tijuana River Estuary

LOE ID:	76806
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Three samples were collected to test for toxicity. None of the three samples exhibited

	statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius. Each sample is a sediment composites from three different sites.
Data Reference:	Data for Various Pollutants from Ambient Bay and Lagoon, 2003-2005.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected at 911TRE_2003, 911TRE_2004, and 911TRE_2005. Each of these sample location names consists of a composite from three different sites.
Temporal Representation:	The samples were collected in 2003, 2004, and 2005.
Environmental Conditions:	
QAPP Information:	The data was collected under the County of San Diego Ambient Bay and Lagoon Monitoring Project 2003-2005. Annual Report for the Receiving Waters and Urban Runoff Monitoring section covered under the San Diego County Municipal National Pollutant Discharge Elimination System (NPDES) Permit (RWQCB-Order NO. R9-2007-0001).
QAPP Information Reference(s):	e-mail clarifying QAPP information

DECISION ID	33318	Region 9
Tijuana River Estuary		

Pollutant:	**Low Dissolved Oxygen**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. There were 18219 of 42308 samples that exceeded the Basin Plan criteria, and these exceed the allowable frequency of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33318, Low Dissolved Oxygen 035219 Region 9

Tijuana River Estuary

LOE ID:	647
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	19949
Number of Exceedances:	7624
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the Tijuana River NERR in 1997 and 1998. There were 7624 of 19949 samples that were below the minimum standard.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: Dissolved oxygen levels shall not be less than 5.0 mg/l in inland surface waters with designated MAR or WARM beneficial uses or less than 6.0 mg/l in waters with designated COLD beneficial uses. The annual mean dissolved oxygen concentrations shall not be less than 7 mg/l more than 10% of the time.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Tijuana River Estuary site OS.
Temporal Representation:	Samples were collected in 30 minute intervals from 04/01/1997 to 09/29/1997 and 01/01/1998 to 12/31/1998. Samples were collected from 04/1997 to 09/1997 and during every month in 1998, and at least 2-3 days per month are represented. Samples were not always collected daily.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33318, Low Dissolved Oxygen Region 9

Tijuana River Estuary

LOE ID:	646
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	1375
Number of Exceedances:	378
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the Tijuana River NERR in 1999. There were 378 of 1375 samples that were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	From the Basin Plan: Dissolved oxygen levels shall not be less than 5.0 mg/l in inland surface waters with designated MAR or WARM beneficial uses or less than 6.0 mg/l in waters with designated COLD beneficial uses. The annual mean dissolved oxygen concentrations shall not be less than 7 mg/l more than 10% of the time.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Tijuana River Estuary site OS.
Temporal Representation:	Samples were collected every 30 minutes from 03/01/1999 to 03/29/1999.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33318, Low Dissolved Oxygen **Region 9**

Tijuana River Estuary

LOE ID:	645
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	20879
Number of Exceedances:	10212
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the Tijuana River NERR in 1997-1998. There were 10212 of 20879 samples that were below the minimum standard.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: Dissolved oxygen levels shall not be less than 5.0 mg/l in inland surface waters with designated MAR or WARM beneficial uses or less than 6.0 mg/l in waters with designated COLD beneficial uses. The annual mean dissolved oxygen concentrations shall not be less than 7 mg/l more than 10% of the time.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Tijuana River Estuary site TL.
Temporal Representation:	Samples were collected every 30 minutes from 05/23/1997 to12/27/1998. During each month, some data were missing, often only over the course of a day of two. Overall, that majority of days per month are represented. Sampling did not occur in 09/1997.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33318, Low Dissolved Oxygen **Region 9**

Tijuana River Estuary

LOE ID:	643
Pollutant:	Oxygen, Dissolved

LOE Subgroup:	Pollutant-Water	035221
Matrix:	Water	
Fraction:	Dissolved	
Beneficial Use:	Marine Habitat	
Number of Samples:	93	
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 1997 and 1998. Ninety-three of 93 samples were in below the minimum standard. All 8 reported averages for 1997 and 1998 were in exceedance.	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: Dissolved oxygen levels shall not be less than 5.0 mg/l in inland surface waters with designated MAR or WARM beneficial uses or less than 6.0 mg/l in waters with designated COLD beneficial uses. The annual mean dissolved oxygen concentrations shall not be less than 7 mg/l more than 10% of the time.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at the Tijuana River Estuary. Exact sample location was not reported.	
Temporal Representation:	Samples were collected 5-31 times per month from 01/03/1998 to 05/31/1998. Samples were also collected in May, July and August 1997 and June-November, 1998, but only monthly averages were reported with the data set.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33318, Low Dissolved Oxygen **Region 9**

Tijuana River Estuary

LOE ID:	642
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Testimonial Evidence
Matrix:	Not Specified
Fraction:	None
Beneficial Use:	Marine Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	From the letter from San Diego Baykeeper written on 06/14/2004: We recommend continued listing of this area for impairment by bacteria, low dissolved oxygen, eutrophication, pesticides, solids, synthetic organics, lead, nickel, thallium, and trash. Submittal was narrative. There is insufficient information given to determine which beneficial uses may or may not be supported.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: Dissolved oxygen levels shall not be less than 5.0 mg/l in inland

	surface waters with designated MAR or WARM beneficial uses or less than 6.0 mg/l in waters with designated COLD beneficial uses. The annual mean dissolved oxygen concentrations shall not be less than 7 mg/l more than 10% of the time.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The reported area is the Tijuana River Estuary. Exact location was not given.
Temporal Representation:	The letter regarding impairment was written on 06/14/2004. A more specific time of impairment was not reported.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33318, Low Dissolved Oxygen **Region 9**

Tijuana River Estuary

LOE ID:	644
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	12
Number of Exceedances:	5
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the Tijuana National Estuarine Research Reserve in 1998. Five of 12 averages were below the minimum standard.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: Dissolved oxygen levels shall not be less than 5.0 mg/l in inland surface waters with designated MAR or WARM beneficial uses or less than 6.0 mg/l in waters with designated COLD beneficial uses. The annual mean dissolved oxygen concentrations shall not be less than 7 mg/l more than 10% of the time.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Tijuana River Estuary. Exact sampling location was not reported.
Temporal Representation:	Samples were collected from 01/1998 to 12/1998. Only monthly averages were reported.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **52234** **Region 9**

Tijuana River Estuary

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision

Revision Status	Original	035223
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.5 and 3.6 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status for pollutants in tissue; under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. One of one sample (shellfish tissue) and zero of five samples (sediment) exceeded the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of one sample (tissue) and zero of five samples (sediment) exceeded the water quality objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52234, Arsenic **Region 9**

Tijuana River Estuary

LOE ID:	78359
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Tijuana River Estuary to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Arsenic.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Arsenic is 70 ug/g dry weight (Long et al., 1995).

Guideline Reference:	Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuary sediments. Environmental Management. 19, (1): 81-97
Spatial Representation:	Data for this line of evidence for Tijuana River Estuary was collected at 5 monitoring sites [911_6012, 911_6010, 911_6009, 911_6004, 911_6001]
Temporal Representation:	Data was collected on a single day 7/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 52234, Arsenic **Region 9**

Tijuana River Estuary

LOE ID:	76815
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Shellfish Harvesting
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The one sample did exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal. Ten percent of the total arsenic result was used to estimate of the amount of inorganic arsenic in the sample; this number was screened against the guideline.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for arsenic in shellfish tissue is 0.0052 ppm. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; OEHHA, 2004)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Air Toxics Hotspots Program Risk Assessment Guidelines. Part II Technical Support Document for Describing Available Cancer Potency Values.
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site TJRE.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 12/10/2007
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends

(NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/

QAPP Information Reference(s):

DECISION ID	52282	Region 9
Tijuana River Estuary		

Pollutant:	**Endrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.5 and 3.6 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status for pollutants in tissue; under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of one sample (shellfish tissue) and zero of two samples (sediment) exceeded the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample (shellfish tissue) and zero of two samples (sediment) exceeded the water quality objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52282, Endrin	**Region 9**
Tijuana River Estuary	

LOE ID:	76838
Pollutant:	Endrin
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Shellfish Harvesting
Number of Samples:	1
Number of Exceedances:	0

Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for endrin in shellfish tissue is 1,000 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; USEPA, 2000)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Guidance for Assessing Chemical Contaminant Data for Use In Fish Advisories Volume 1: Fish Sampling and Analysis
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site TJRE.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 12/10/2007
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 52282, Endrin **Region 9**

Tijuana River Estuary

LOE ID:	78367
Pollutant:	Endrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Tijuana River Estuary to determine beneficial use support and results are as follows: a total of 5 samples were collected and they were all non-detect, however 3 samples were not used in analysis because when the method

	detection limit was organic carbon normalized, the results were above the guideline and therefore could not be quanitified with the level of certainty required by the Listing Policy.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the sediment quality guideline (predictive of sediment toxicity for sediment-dwelling organisms) for Endrin is 0.76 ug/g oc (Fairey et al., 2001).
Guideline Reference:	Technical basis for deriving sediment criteria for nonionic organic contaminants for the protection of benthic organisms by using equilibrium partitioning. EPA822-R-93-011. Washington, D.C.: Office of Water, USEPA
Spatial Representation:	Data for this line of evidence for Tijuana River Estuary was collected at 5 monitoring sites [911_6012, 911_6010, 911_6009, 911_6004, 911_6001]
Temporal Representation:	Data was collected on a single day 7/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID 41464 Region 9

Tijuana River Estuary

Pollutant:	**Solids**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: One line of evidence is available in the administrative record. The Information is based on visual observations and not supported by numerical data. Visual observation information alone is insufficient to place a water body segment pollutant combination on the section 303(d) list because it cannot be quantitatively determined if applicable water quality standards are met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 41464, Solids Region 9

Tijuana River Estuary

LOE ID:	658
Pollutant:	Solids
LOE Subgroup:	Testimonial Evidence
Matrix:	Not Specified
Fraction:	None
Beneficial Use:	Estuarine Habitat

Number of Samples:	0	035228
Number of Exceedances:	0	

Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	From a letter from San Diego Baykeeper, dated 06/14/2004: We recommend continued listing of this area for impairment by bacteria, low dissolved oxygen, eutrophication, pesticides, solids, synthetic organics, lead, nickel, thallium, and trash.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No objectives could be found for solids in an estuary. Objectives were available (in the Basin Plan and CTR) only for inland surface waters.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The impaired area is identified as the Tijuana River Estuary. Exact location was not given.
Temporal Representation:	The letter was dated 06/14/2004. A specific time for the impairment was not given.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

DECISION ID 40563 Region 9

Tijuana River Estuary

Pollutant:	**Synthetic Organics**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	303(d) listing decisions made prior to 2006 were not held in an assessment database. This is a placeholder decision for a CWA section 303(d) Listing made in a previous assessment cycle. The Regional Boards will update this decision when new data and information become available and are assessed.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 40563, Synthetic Organics Region 9

Tijuana River Estuary

LOE ID:	659
Pollutant:	Synthetic Organics
LOE Subgroup:	Testimonial Evidence
Matrix:	Not Specified
Fraction:	None
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	0
Number of Exceedances:	0

Data and Information Type:	Not Specified	035229
Data Used to Assess Water Quality:	From a letter from San Diego Baykeeper, dated 06/14/2004:We recommend continued listing of this area for impairment by bacteria, low dissolved oxygen, eutrophication, pesticides, solids, synthetic organics, lead, nickel, thallium, and trash.	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No objective is available for the sum of synthetic organics.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The impaired area is identified as the Tijuana River Estuary. Exact location was not given.	
Temporal Representation:	The letter was dated 06/14/2004. A specific time for the impairment was not given.	
Environmental Conditions:		
QAPP Information:	QA Info Missing	
QAPP Information Reference(s):		

DECISION ID 33747 Region 9

Tijuana River Estuary

Pollutant:	**pH**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. There were 3,413 of 33,657 samples that were in exceedance of the water quality objective for pH and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33747, pH Region 9

Tijuana River Estuary

LOE ID:	653
Pollutant:	pH

LOE Subgroup:	Pollutant-Water	035230
Matrix:	Water	
Fraction:	Total	
Beneficial Use:	Marine Habitat	
Number of Samples:	14281	
Number of Exceedances:	555	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Data were collected by the Tijuana River NERR in 1997-1998. 555 of 14281 samples were in exceedance (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For bays and estuaries and all beneficial uses, the WQO for pH is 7.0 (minimum) to 9.0 (maximum).	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at the Tijuana River Estuary site TL.	
Temporal Representation:	Samples were collected every 30 minutes from 05/23/1997to 12/27/1998. During each month, a day or two worth of data was often missing, but the majority of days/times were represented. pH samples were not collected in 09/1997, 04/1998, 05/1998, 08/1998, 09/1998.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33747, pH **Region 9**

Tijuana River Estuary

LOE ID:	652
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Marine Habitat
Number of Samples:	1375
Number of Exceedances:	68
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the Tijuana River NERR in 1999. Sixty-eight of 1375 samples were in exceedance (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For bays and estuaries and all beneficial uses, the WQO for pH is 7.0 (minimum) to 9.0 (maximum).
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Tijuana River Estuary site OS.

Temporal Representation:	Samples were collected every 30 minutes from 03/01/1999 to 03/29/1999.035231
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33747, pH **Region 9**

Tijuana River Estuary

LOE ID:	654
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Marine Habitat
Number of Samples:	18001
Number of Exceedances:	2790
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the Tijuana River NERR in 1997 and 1998. There were 2790 of 18001 samples that did not meet standards. The majority of samples that did not meet standards were below the minimum standard (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For bays and estuaries and all beneficial uses, the WQO for pH is 7.0 (minimum) to 9.0 (maximum).
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Tijuana River Estuary site OS.
Temporal Representation:	Samples were collected in 30 minute intervals from 04/01/1997 to 09/29/1997 and 01/28/1998 to 12/31/1998. Samples were collected on at least 2-3 days per sampling month. Data for several days per month were missing, but the majority of every month was represented.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **34508** **Region 9**

Tijuana River Estuary

Pollutant:	**Eutrophic**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

303(d) listing decisions made prior to 2006 were not held in an assessment database. The Regional Boards will update this decision when new data and information become available and are assessed.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34508, Eutrophic **Region 9**

Tijuana River Estuary

LOE ID:	4669
Pollutant:	Eutrophic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Estuarine Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Unspecified
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	Unspecified
Guideline Reference:	Placeholder reference pre-2006 303(d)
Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

DECISION ID **33828** **Region 9**

Tijuana River Estuary

Pollutant:	**Nickel**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

303(d) listing decisions made prior to 2006 were not held in an assessment database. The Regional Boards will update this decision when new data and information become available and are assessed.

Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33828, Nickel **Region 9**

Tijuana River Estuary

LOE ID:	4672
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Estuarine Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Unspecified
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	Unspecified
Guideline Reference:	Placeholder reference pre-2006 303(d)
Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

DECISION ID **34064** **Region 9**

Tijuana River Estuary

Pollutant:	**Pesticides**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	303(d) listing decisions made prior to 2006 were not held in an assessment database. This is a placeholder decision for a CWA section 303(d) Listing made in a previous assessment cycle. The Regional Boards will update this decision when new data and information become available and are assessed.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not

changed. 035234

Line of Evidence (LOE) for Decision ID 34064, Pesticides **Region 9**

Tijuana River Estuary

LOE ID:	4673
Pollutant:	Pesticides
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Estuarine Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Unspecified
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	Unspecified
Guideline Reference:	Placeholder reference pre-2006 303(d)
Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

DECISION ID **34079** **Region 9**

Tijuana River Estuary

Pollutant:	**Thallium**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: 303(d) listing decisions made prior to 2006 were not held in an assessment database. The Regional Boards will update this decision when new data and information become available and are assessed.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34079, Thallium — Region 9

Tijuana River Estuary

LOE ID:	4674
Pollutant:	Thallium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Unspecified
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	
Objective/Criterion Reference:	
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

DECISION ID 33705 — Region 9

Tijuana River Estuary

Pollutant:	**Trash**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: 303(d) listing decisions made prior to 2006 were not held in an assessment database. The Regional Boards will update this decision when new data and information become available and are assessed.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33705, Trash — Region 9

Tijuana River Estuary 035236

LOE ID:	4675
Pollutant:	Trash
LOE Subgroup:	Visual
Matrix:	Not Specified
Fraction:	Not Recorded
Beneficial Use:	Non-Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Unspecified
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	Unspecified
Guideline Reference:	Placeholder reference pre-2006 303(d)
Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

DECISION ID **33667** **Region 9**

Tijuana River Estuary

Pollutant:	**Turbidity**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. There were 4965 of 28167 samples that exceeded the Basin Plan criteria, and these exceed the allowable frequency of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33667, Turbidity **Region 9**

Tijuana River Estuary

LOE ID:	649
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Marine Habitat
Number of Samples:	1375
Number of Exceedances:	
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the Tijuana River NERR in 1999. There were 1,372 of 1,375 samples that ranged from 0-35 NTU. Three of 1,375 samples were between 206 and 992 NTU.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For lagoons and estuaries and all beneficial uses, the maximum increase when Natural Turbidity is 0-50 NTU is 20 % over natural turbidity. The Maximum Increase when Natural Turbidity is 50-100 NTU is 20 NTU. The Maximum Increase when Natural Turbidity is >100 NTU is 10 % over natural turbidity.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	The transparency of waters in lagoons and estuaries shall not be less than 50% of the depth at locations where measurement is made by means of standard Secchi disk, except where lesser transparency is caused by rainfall runoff from undisturbed natural areas and dredging projects conducted in conformance with waste discharge requirements of the Regional Board. With these two exceptions, increases in turbidity attributable to controllable water quality factors shall not exceed the above limits.
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	Samples were collected at Tijuana River Estuary site OS.
Temporal Representation:	Samples were collected every 30 minutes from 03/01/1999 to 03/29/1999.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33667, Turbidity **Region 9**

Tijuana River Estuary

LOE ID:	650
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Marine Habitat
Number of Samples:	8559

Number of Exceedances:	035238
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the Tijuana River NERR in 1998. There were 7,055 of 8,559 samples that were 20 ntu or lower. There were 1,601 of 8,559 samples that were above 21 NTU. The highest turbidity recorded was 1,388 ntu. Some negative turbidity were recorded as well.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For lagoons and estuaries and all beneficial uses, the maximum increase when Natural Turbidity is 0-50 NTU is 20 % over natural turbidity. The Maximum Increase when Natural Turbidity is 50-100 NTU is 20 NTU. The Maximum Increase when Natural Turbidity is >100 NTU is 10 % over natural turbidity.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	The transparency of waters in lagoons and estuaries shall not be less than 50% of the depth at locations where measurement is made by means of standard Secchi disk, except where lesser transparency is caused by rainfall runoff from undisturbed natural areas and dredging projects conducted in conformance with waste discharge requirements of the Regional Board. With these two exceptions, increases in turbidity attributable to controllable water quality factors shall not exceed the above limits.
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	Samples were collected at the Tijuana River Estuary site TL.
Temporal Representation:	Samples were collected every 30 minutes from 01/01/1998 to 12/27/1998. During the sampling months, data for some day were not recorded. During the months in which samples were collected, at least 2-3 days worth of data were recorded. Samples were not recorded in 08/1997, 09/1997, 03/1998, 04/1998, 08/1998, and 09/1998.
Environmental Conditions:	Possible storm event(s) occurred during some sampling months.
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33667, Turbidity **Region 9**

Tijuana River Estuary

LOE ID:	648
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Marine Habitat
Number of Samples:	5
Number of Exceedances:	
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the San Diego RWQCB in 1997 and 1998. Five monthly averages were reported. Average turbidity levels ranged from 23-130.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For lagoons and estuaries and all beneficial uses, the maximum increase when Natural Turbidity is 0-50 NTU is 20 % over natural turbidity. The Maximum Increase when Natural Turbidity is 50-100 NTU is 20 ntu. The Maximum Increase when Natural Turbidity is >100 NTU is 10 % over natural turbidity.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)

Evaluation Guideline:	The transparency of waters in lagoons and estuaries shall not be less than 50% of the depth at locations where measurement is made by means of standard Secchi disk, except where lesser transparency is caused by rainfall runoff from undisturbed natural areas and dredging projects conducted in conformance with waste discharge requirements of the Regional Board. With these two exceptions, increases in turbidity attributable to controllable water quality factors shall not exceed the above limits.
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	Samples were collected at Tijuana River Estuary. Exact sample location was not reported.
Temporal Representation:	Samples were collected in 12/1997 and 02-04/1998 and 10/1998. Only averages were reported.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33667, Turbidity **Region 9**

Tijuana River Estuary

LOE ID:	651
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Marine Habitat
Number of Samples:	18228
Number of Exceedances:	
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the Tijuana River NERR in 1997 and 1998. There were 14,872 of 18228 samples that had turbidity levels of 20 NTU or lower. There were 3,356 of the 18,228 samples that had turbidity levels of 21 NTU or higher. The highest turbidity reading occurred in 02/1998 with a reading of 998 NTU.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For lagoons and estuaries and all beneficial uses, the maximum increase when Natural Turbidity is 0-50 NTU is 20 % over natural turbidity. The Maximum Increase when Natural Turbidity is 50-100 NTU is 20 NTU. The Maximum Increase when Natural Turbidity is >100 NTU is 10 % over natural turbidity.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	The transparency of waters in lagoons and estuaries shall not be less than 50% of the depth at locations where measurement is made by means of standard Secchi disk, except where lesser transparency is caused by rainfall runoff from undisturbed natural areas and dredging projects conducted in conformance with waste discharge requirements of the Regional Board. With these two exceptions, increases in turbidity attributable to controllable water quality factors shall not exceed the above limits.
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	Samples were collected at the Tijuana River Estuary site OS.
Temporal Representation:	Samples were collected in 30 minute intervals from 04/01/1997 to 09/29/1997 and 02/13/1998 to 12/31/1998. Samples were collected from 04/1997 to 09/1997 and during every month in 1998 except 01/1998 and 05/1998. Sampling represents at least 2 days in each sampling month, and usually were not collected during all days in the month.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Guajome Lake
Water Body ID: CAL9031100019990208142145
Water Body Type: Lake & Reservoir

DECISION ID 34647 **Region 9**
Guajome Lake

Pollutant: Eutrophic
Final Listing Decision: List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: List on 303(d) list (TMDL required list)(2012)
Revision Status Original
Sources: Source Unknown
Expected TMDL Completion Date: 2019
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

303(d) listing decisions made prior to 2006 were not held in an assessment database. The Regional Boards will update this decision when new data and information become available and are assessed.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34647, Eutrophic **Region 9**
Guajome Lake

LOE ID: 4453

Pollutant: Eutrophic
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Not Recorded

Beneficial Use: Warm Freshwater Habitat

Number of Samples: 0
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference: Placeholder reference pre-2006 303(d)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: Unspecified
Objective/Criterion Reference: Placeholder reference pre-2006 303(d)

Evaluation Guideline:	Unspecified
Guideline Reference:	Placeholder reference pre-2006 303(d)
Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: San Marcos Lake
Water Body ID: CAL9045200019991117152408
Water Body Type: Lake & Reservoir

DECISION ID 50511 **Region 9**
San Marcos Lake

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.3 of the Listing Policy. Under section 3.3 a single line of evidence is necessary to assess listing status.

Four lines of evidence are available in the administrative record to assess this pollutant. Zero of the Three samples exceed the Water Quality Objective for Enterococcus, Zero of the the Three samples exceeded the Water Quality Objective for Escherichia coli (E. coli), Zero of the Three samples exceeded the Water Quality Objective for Fecal Coliform, and Zero of the Three samples exceeded the Water Quality Objective for Total Coliform.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3.Zero of the Three samples exceed the Water Quality Objective for Enterococcus, Zero of the the Three samples exceeded the Water Quality Objective for Escherichia coli (E. coli), Zero of the Three samples exceeded the Water Quality Objective for Fecal Coliform, and Zero of the Three samples exceeded the Water Quality Objective for Total Coliform and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50511, Indicator Bacteria **Region 9**
San Marcos Lake

LOE ID: 76020

Pollutant: Enterococcus

LOE Subgroup:	Pollutant-Water	035243
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	3	
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	None of the three samples exceeded the enterococcus objective.	
Data Reference:	Data for Various Pollutants in Region 9, 2002-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The enterococcus concentration shall not exceed more than 235/100 ml.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Stations 2, 5, and 6.	
Temporal Representation:	Samples were collected on May 18, 2009.	
Environmental Conditions:		
QAPP Information:	No QAPP documents were included with the Regional Board Lab data.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 50511, Indicator Bacteria **Region 9**

San Marcos Lake

LOE ID:	76021
Pollutant:	Escherichia coli (E. coli)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	None of the three samples exceeded the E. Coli objective.
Data Reference:	Data for Various Pollutants in Region 9, 2002-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The E. Coli concentration shall not exceed more than 235/100 ml.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Stations 2, 5, and 6.
Temporal Representation:	Samples were collected on May 18, 2009.
Environmental Conditions:	
QAPP Information:	No QAPP documents were included with the Regional Board Lab data.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 50511, Indicator Bacteria **Region 9**

San Marcos Lake 035244

LOE ID:	76022
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	None of the three samples exceeded the fecal coliform objective.
Data Reference:	Data for Various Pollutants in Region 9, 2002-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The fecal coliform concentration shall not exceed more than 235/100 ml.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Stations 2, 5, and 6.
Temporal Representation:	Samples were collected on May 18, 2009.
Environmental Conditions:	
QAPP Information:	No QAPP documents were included with the Regional Board Lab data.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 50511, Indicator Bacteria **Region 9**

San Marcos Lake

LOE ID:	76027
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	None of the three samples exceeded the total coliform objective.
Data Reference:	Data for Various Pollutants in Region 9, 2002-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The total coliform concentration shall not exceed more than 235/100 ml.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Stations 2, 5, and 6.
Temporal Representation:	Samples were collected on May 18, 2009.
Environmental Conditions:	

QAPP Information:	No QAPP documents were included with the Regional Board Lab data.	035245
QAPP Information Reference(s):		

DECISION ID **50512** **Region 9**

San Marcos Lake

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. One of the Two samples exceed the Water Quality Criteria for Lead. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of Two samples exceeded the Water Quality Criteria for Lead and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50512, Lead **Region 9**

San Marcos Lake

LOE ID:	76023
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	1
Data and Information Type:	Non-fixed station physical/chemical (conventional + toxicants)
Data Used to Assess Water Quality:	One of two samples exceeded the hardness adjusted criteria. One non-detect result was not included in the assessment because the reporting limit was not provided.
Data Reference:	Data for Various Pollutants in Region 9, 2002-2009.

SWAMP Data:	Non-SWAMP	035246
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.	
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Spatial Representation:	Four samples were collected from Lake San Marcos at Sites 2 and 4(near Dam), Site 5 (near picnic area) and Site 6 (near Marina). Sites 2 and 4 were averaged prior to assessment.	
Temporal Representation:	Samples were collected on 5/18/2009.	
Environmental Conditions:		
QAPP Information:	The samples were collected and analyzed by the San Diego Regional Water Quality Control Board.	
QAPP Information Reference(s):		

DECISION ID	50513	Region 9
San Marcos Lake		

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the Three samples exceed the Water Quality Criteria for Nickel. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Three samples exceeded the Water Quality Criteria for Nickel and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50513, Nickel 035247 Region 9

San Marcos Lake

LOE ID:	76024
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	Non-fixed station physical/chemical (conventional + toxicants)
Data Used to Assess Water Quality:	None of the three samples exceeded the hardness adjusted criteria.
Data Reference:	Data for Various Pollutants in Region 9, 2002-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Four samples were collected from Lake San Marcos at Sites 2 and 4(near Dam), Site 5 (near picnic area) and Site 6 (near Marina). Sites 2 and 4 were averaged prior to assessment.
Temporal Representation:	Samples were collected on 5/18/2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed by the San Diego Regional Water Quality Control Board.
QAPP Information Reference(s):	

DECISION ID 50514 Region 9

San Marcos Lake

Pollutant:	**Oxygen, Dissolved**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the Three samples exceed the Basin Plan Objective for Oxygen, Dissolved.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Three samples exceeded the Basin Plan Objective for Oxygen, Dissolved and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50514, Oxygen, Dissolved **Region 9**

San Marcos Lake

LOE ID:	76025
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Zero of 3 samples exceeded the objective.
Data Reference:	Data for Various Pollutants in Region 9, 2002-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Dissolved oxygen levels shall not be less than 5.0 mg/l in inland surface waters with designated MAR or WARM beneficial uses. The annual mean dissolved oxygen concentration shall not be less than 7 mg/l more than 10% of the time.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from stations 2, 5, and 6.
Temporal Representation:	Samples were collected thrice in 2009.
Environmental Conditions:	
QAPP Information:	NPDES quality assurance.
QAPP Information Reference(s):	

DECISION ID **50515** **Region 9**

San Marcos Lake

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**

Last Listing Cycle's Final Listing Decision:	New Decision	035249
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the Zero samples exceed the Water Quality Criteria for Zinc.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Zero samples exceeded the Water Quality Criteria for Zinc and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50515, Zinc **Region 9**

San Marcos Lake

LOE ID:	76043
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Non-fixed station physical/chemical (conventional + toxicants)
Data Used to Assess Water Quality:	The reporting limits were not provided so these data could not be assessed.
Data Reference:	Data for Various Pollutants in Region 9, 2002-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were

available, a value of 100 mg/L was used. 035250

Guideline Reference: Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition

Spatial Representation: Four samples were collected from Lake San Marcos at Sites 2 and 4(near Dam), Site 5 (near picnic area) and Site 6 (near Marina). Sites 2 and 4 were averaged prior to assessment.

Temporal Representation: Samples were collected on 5/18/2009.

Environmental Conditions:

QAPP Information: The samples were collected and analyzed by the San Diego Regional Water Quality Control Board.

QAPP Information Reference(s):

DECISION ID 50516 Region 9

San Marcos Lake

Pollutant: **pH**

Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**

Last Listing Cycle's Final Listing Decision: New Decision

Revision Status Revised

Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Three of the Three samples exceed the Water Quality Objective for pH.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Three of Three samples exceeded the Water Quality Objective for pH and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50516, pH Region 9

San Marcos Lake

LOE ID: 76026

Pollutant: pH

LOE Subgroup: Pollutant-Water

Matrix: Water

Fraction: Dissolved

Beneficial Use:	Warm Freshwater Habitat	035251
Number of Samples:	3	
Number of Exceedances:	3	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Numeric data generated from 3 minimums and maximums of pH data had 3 exceedences.	
Data Reference:	Data for Various Pollutants in Region 9, 2002-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The pH of all inland surface waters shall not be depressed below 6.5 or raised above 8.5 as a result of waste discharges.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from stations 2, 5, and 6.	
Temporal Representation:	Samples were collected thrice in May 2009.	
Environmental Conditions:		
QAPP Information:	NPDES quality assurance.	
QAPP Information Reference(s):		

DECISION ID **44877** **Region 9**

San Marcos Lake

Pollutant:	**Ammonia as Nitrogen**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for removal from the section 303(d) list under section 3.1 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess pollutant. Three of three of samples exceed the Basin Plan water quality objective for ammonia.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the section 303(d) list.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Three of three of samples exceed the Basin Plan water quality objective for ammonia, and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 44877, Ammonia as Nitrogen **Region 9**

San Marcos Lake

LOE ID:	774
Pollutant:	Fish Kills
LOE Subgroup:	Narrative Description Data
Matrix:	Not Specified
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Fish tissue analysis
Data Used to Assess Water Quality:	There is no numeric data concerning low dissolved oxygen. Information that low dissolved oxygen is potentially a problem was found in the conversation with D. Gibson on 10/2/01 (Lake San Marcos Community Association, 2001).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The dissolved oxygen concentration in ocean waters shall not at any time be depressed more than 10 percent from that which occurs naturally, as the result of the discharge of oxygen demanding waste materials.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The comments from citizens do not give a specific location on the lake.
Temporal Representation:	The notes concerning low DO are from a conversation on 10/2/01.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44877, Ammonia as Nitrogen **Region 9**

San Marcos Lake

LOE ID:	775
Pollutant:	Fish Kills
LOE Subgroup:	Narrative Description Data
Matrix:	Not Specified
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Fish tissue analysis
Data Used to Assess Water Quality:	There was no numerical data pertaining to dissolved oxygen submitted. Information from the Lake San Marcos Community Association concerning a fish kill in the lake was dated May 9, 2001. The letter says that several fish kills occurred during summer months and that representatives from the California Fish and Game and the San Diego County Department of Health have confirmed that the fish kill was due to a lack of oxygen (Lake San Marcos Community Association, 2001).

Data Reference:	Placeholder reference 2006 303(d)	035253
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The dissolved oxygen concentration in ocean waters shall not at any time be depressed more than 10 percent from that which occurs naturally, as the result of the discharge of oxygen demanding waste materials.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	No specific locations of the lake were reported in the document.	
Temporal Representation:	The document is dated May 9, 2001.	
Environmental Conditions:		
QAPP Information:	QA Info Missing	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44877, Ammonia as Nitrogen **Region 9**

San Marcos Lake

LOE ID:	776
Pollutant:	Abnormal Fish deformities, erosions, lesions, tumors (DELTS)
LOE Subgroup:	Adverse Biological Responses
Matrix:	Not Specified
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Fish tissue analysis
Data Used to Assess Water Quality:	A photo of an abnormal growth on a fish gill plate was taken on April 15, 2001 and submitted in a letter dated May 9, 2001 by the Lake San Marcos Community Association. Other data concerning nutrients and solids was collected and analyzed in May 2001 (Lake San Marcos Community Association, 2001).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	
Objective/Criterion Reference:	
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	No specific location is given as to where the fish was caught.
Temporal Representation:	The fish with an abnormal gill was caught on April 15, 2001.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44877, Ammonia as Nitrogen **Region 9**

San Marcos Lake

LOE ID:	768
Pollutant:	Ammonia as Nitrogen
LOE Subgroup:	Pollutant-Water

Matrix:	Water	035254
Fraction:	Total	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	3	
Number of Exceedances:	3	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Three out of 3 samples were in exceedance. Samples were collected at the San Marcos Lake in May 2001, by the Lake San Marcos Community Association. Three samples were analyzed for Ammonia as N by Enviromatrix Analytical Inc. (Lake San Marcos Community Association, 2001).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Ammonia, unionized. Maximum 0.025 mg/L. Discharge of wastes shall not cause concentrations of NH3 to exceed this limit (as N) in these waters.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Three stations: outfall, cross bridge, and park dock were sampled.	
Temporal Representation:	All samples were taken on one day in May 2001.	
Environmental Conditions:		
QAPP Information:	QA Info Missing	
QAPP Information Reference(s):		

DECISION ID	**50505**	**Region 9**
San Marcos Lake		

Pollutant:	**Copper**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2027
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Two of the Three samples exceed the Water Quality Criteria for Copper.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Two of Three samples exceed the Water Quality Criteria for Copper and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 50505, Copper **Region 9**

San Marcos Lake

LOE ID:	76009
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	2
Data and Information Type:	Non-fixed station physical/chemical (conventional + toxicants)
Data Used to Assess Water Quality:	Two of the three samples exceeded the hardness adjusted criteria.
Data Reference:	Data for Various Pollutants in Region 9, 2002-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Four samples were collected from Lake San Marcos at Sites 2 and 4(near Dam), Site 5 (near picnic area) and Site 6 (near Marina). Sites 2 and 4 were averaged prior to assessment.
Temporal Representation:	Samples were collected on 5/18/2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed by the San Diego Regional Water Quality Control Board.
QAPP Information Reference(s):	

DECISION ID **44428** **Region 9**

San Marcos Lake

Pollutant:	**Phosphorus**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2019

Impairment from Pollutant or Pollution:	Pollutant	035256
Regional Board Conclusion:	Regional Board Conclusion: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. All three of the samples exceed the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. All samples exceed the phosphorus and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.	
Regional Board Decision Recommendation:		

Line of Evidence (LOE) for Decision ID 44428, Phosphorus **Region 9**

San Marcos Lake

LOE ID:	769
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	3
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Three out of 3 samples were in exceedance. The three samples were collected by the Lake San Marcos Community Association on May 9, 2001. The data was analyzed on May 12, 2001 by Enviromatrix Analytical, Inc. (Lake San Marcos Community Association, 2001).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan. Total Phosphorus: The maximum, threshold - not to be exceeded more than 10% of the time is 0.025 mg/L for inland surface waters-any standing body of water.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	From the Basin Plan: Use unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board.
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	One sample was taken at each of three locations on the lake: Outfall, Cross Bridge, and Park Dock.
Temporal Representation:	Samples were collected on one day, May 9, 2001.

Environmental Conditions: 035257
QAPP Information: QA Info Missing
QAPP Information Reference(s):

DECISION ID	43066	Region 9
San Marcos Lake		

Pollutant:	**Foam/Flocs/Scum/Oil Slicks**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for listing under sections 2.1, 3.6, and 3.10 of the Listing Policy.

Under section 3.6, a single line of evidence is necessary to assess listing status while under section 3.10, a minimum of two lines of evidence are needed to assess listing status. One line of evidence is required are available in the administrative record to assess foams, flocculants, and oil slicks. Two lines of evidence are required for scum.

Scum data is not backed by any nutrient data and therefore cannot be used as the basis for a listing on its own (section 2 of the Listing Policy).

Based on the information presented, the water body-pollutant should not be placed on the section 303(d) list because it cannot be determined if the pollutant contribute or cause a toxicological effect (section 2 of the Listing Policy).

Two photos taken by a citizen that were submitted by the Lake San Marcos Community Association were used. They show white foam and oil discoloration on the surface of the water. These photos are not enough information to list this waterbody for these pollutants.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43066, Foam/Flocs/Scum/Oil Slicks	Region 9
San Marcos Lake	

LOE ID:	777
Pollutant:	Foam/Flocs/Scum/Oil Slicks
LOE Subgroup:	Visual
Matrix:	Not Specified
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Two photos taken by a citizen, submitted by the Lake San Marcos Community Association were used. They show white foam and oil discoloration on the surface of the water. (Lake San Marcos Community Association, 2001).

Data Reference:	Placeholder reference 2006 303(d)	035258
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Waters shall not contain floating material, including solids, liquids, foams, and scum in concentrations which cause nuisance or adversely affect beneficial uses. Waters shall not contain oils, greases, waxes, or other materials in concentrations which result in a visible film or coating on the surface of the water or on objects in the water, or which cause nuisance or which otherwise adversely affect beneficial uses.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The location of both photos is at the lake inlet.	
Temporal Representation:	Both photos were taken in February 2001.	
Environmental Conditions:		
QAPP Information:	QA Info Missing	
QAPP Information Reference(s):		

DECISION ID **32744** **Region 9**

San Marcos Lake

Pollutant:	**Total Dissolved Solids**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Three of three samples exceed the Basin Plan water quality objective for total dissolved solids. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Three of three samples exceed the Basin Plan water quality objective for total dissolved solids, and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32744, Total Dissolved Solids **Region 9**

San Marcos Lake

LOE ID:	770
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Sediment
Matrix:	Water
Fraction:	Total
Beneficial Use:	Agricultural Supply
Number of Samples:	3
Number of Exceedances:	3
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Three out of 3 samples were in exceedance. Samples were collected by the Lake San Marcos Community Association on May 9, 2001. The samples were analyzed by Enviromatrix Analytical, Inc on May 14, 2001 (Lake San Marcos Community Association, 2001).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: Total Dissolved Solids: 500 units
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	Concentration not to be exceeded more than 10% of the time during any one year period.
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	Three samples were collected on the lake, one each at West Discovery Bridge, LMS Side Discovery Bridge, and LMS Wake Bridge.
Temporal Representation:	Samples were collected once on May 9, 2001.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

DECISION ID **32745** **Region 9**

San Marcos Lake

Pollutant:	**Nutrients**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

This pollutant is being considered for removal from the section 303(d) list under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. Six of six samples exceed the Basin Plan water quality objective for nutrients.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the section 303(d) list.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Three of three samples exceed the Basin Plan water quality objective for nutrients, and this exceeds the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation:

Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

This is a decision made by the State Water Resources Control Board and approved by the USEPA in 2006 . No new data were assessed by the Regional Board for 2008. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32745, Nutrients **Region 9**

San Marcos Lake

LOE ID:	772
Pollutant:	Nutrients
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	3
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Three out of 3 samples were in exceedance. Samples were collected at the San Marcos Lake in May 2001, by the Lake San Marcos Community Association. Three samples were analyzed for Ammonia as N by Enviromatrix Analytical Inc. (Lake San Marcos Community Association, 2001).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Ammonia, unionized. Maximum 0.025 mg/L. Discharge of wastes shall not cause concentrations of NH3 to exceed this limit (as N) in these waters.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Three stations: outfall, cross bridge, and park dock were sampled
Temporal Representation:	All samples were taken on one day in May 2001.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 32745, Nutrients **Region 9**

San Marcos Lake

LOE ID:	771
Pollutant:	Nutrients
LOE Subgroup:	Narrative Description Data
Matrix:	Not Specified
Fraction:	None

Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	The data include notes from a conversation with D. Gibson on 10/1/01 and a note from a citizen (Thielen), submitted by the Lake San Marcos Community Association (Lake San Marcos Community Association, 2001).Information includes notes from a conversation with D. Gibson and a note from a citizen concerning nutrients and their sources. Notes mention that the water is potentially impaired but there doesn't appear to be enough data to support that it is impaired.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: Inland surface waters, bays and estuaries, and coastal lagoon waters shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. Concentrations of nitrogen and phosphorus, by themselves or in combination with other nutrients, shall be maintained at levels below those which stimulate algae and emergent plant growth.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Descriptions seem to include the entire lake.
Temporal Representation:	Descriptions are dated from February 2001 to around November 2001.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 32745, Nutrients **Region 9**

San Marcos Lake

LOE ID:	773
Pollutant:	Nutrients
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	3
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Three out of 3 samples were in exceedance. The three samples were collected by the Lake San Marcos Community Association on May 9, 2001. The data was analyzed on May 12, 2001 by Enviromatrix Analytical, Inc. (Lake San Marcos Community Association, 2001).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan. Total Phosphorus: The maximum, threshold - not to be exceeded more than 10% of the time is 0.025 mg/L for inland surface waters-any standing body of water.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)

Evaluation Guideline:	From the Basin Plan: Use unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board.
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	One sample was taken at each of three locations on the lake: Outfall, Cross Bridge, and Park Dock.
Temporal Representation:	Samples were collected on one day, May 9, 2001.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Hodges, Lake
Water Body ID: CAL9052100020010925094906
Water Body Type: Lake & Reservoir

DECISION ID 33417 **Region 9**
Hodges, Lake

Pollutant: **Aluminum**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. One of the Fifteen samples exceed the Basin Plan Objective for Aluminum.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of Fifteen samples exceeded the Basin Plan Objective for Aluminum and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 33417, Aluminum **Region 9**
Hodges, Lake

LOE ID: 778

Pollutant: Aluminum
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples:	15	035264
Number of Exceedances:	1	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data was collected at site HGA-0 by the City of San Diego Water Dept. between January 1996 and September 2000. One of 15 samples was in exceedance. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For all inland surface waters the WQO for Aluminum for a BU of MUN is 0.2 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at site HGA-0.	
Temporal Representation:	Samples were collected on a somewhat quarterly basis between January 1996 and September 2000. Two to 4 samples were collected each year.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID	44169	Region 9
Hodges, Lake		

Pollutant:	**Ammonia as Nitrogen**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. An unknown number of the eighteen samples exceed the water quality objective for ammonia. The wrong methology was used to assess the data previously. The data has been re-assessed and there is insufficient information available to calculate, with the power and confidence of the Listing Policy, the amount of un-ionized ammonia. The available information does not allow for an accurate determination of the correct pH and temperature for the calculation.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. An unknown number of the eighteen samples exceed the water quality objective for ammonia.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and

information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 44169, Ammonia as Nitrogen **Region 9**

Hodges, Lake

LOE ID:	6159
Pollutant:	Ammonia as Nitrogen
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	18
Number of Exceedances:	13
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	City of San Diego, 2007a. Water Department, Water Quality Monitoring Data for Drinking Source Water Reservoirs. January 2005 to December 2006.
Data Reference:	Water Department, Water Quality Monitoring Data for Drinking Source Water Reservoirs. January 2005 to December 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan the WQO for un-ionized ammonia (NH3) for inland surface waters is 0.025mg/L (as N) (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	One surface water sample was collected per sampling event at Lake Hodges at a standard location designated Â“Station AÂ”.
Temporal Representation:	Samples were collected once or twice a month from January 2005 to December 2006.
Environmental Conditions:	
QAPP Information:	Samples were collected and analyzed according to the Water Quality LaboratoryÂ's Quality Assurance Manual. Applicable field and laboratory Standard Operating Procedures were also provided by the San Diego Water Department.
QAPP Information Reference(s):	

DECISION ID **46365** **Region 9**

Hodges, Lake

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the Eight samples exceed the Basin Plan Objective for Chromium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Eight samples exceeded the Basin Plan Objective for Chromium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 46365, Chromium **Region 9**

Hodges, Lake

LOE ID:	785
Pollutant:	Chromium (total)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Samples were collected at site HGA-0 by the City of San Diego Water Dept. between January 1996 and March 2000. None of the 8 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with municipal beneficial uses, the WQO for chromium is 0.05 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at site HGA-0.
Temporal Representation:	Samples were collected between January 1996 and March 2000. 1-4 samples were collected per year. There are no measurements listed for 1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33093** **Region 9**

Hodges, Lake

Pollutant:	**Total Dissolved Solids**	035267
Final Listing Decision:	**Delist from 303(d) list (TMDL required list)**	
Last Listing Cycle's Final Listing Decision:	Delist from 303(d) list (TMDL required list)(2012)	
Revision Status	Original	
Reason for Delisting:	Other	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

One line of evidence is available in the administrative record to assess this pollutant. 10 of the 10 samples exceed the Basin Plan criteria, but the number of samples is insufficient to determine with the confidence and power required by the Listing Policy. At the October 25th Water Board meeting, comments were received concerning total dissolved solids in terminal reservoirs in the San Diego region. The Board concluded that it was inappropriate to list these water bodies based on secondary MCLs when the TDS values of the incoming supplying waters were higher than the MCLs. Narrative standards are therefore met.

Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification against removing this water segment-pollutant combination from the section 303(d) list.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33093, Total Dissolved Solids **Region 9**

Hodges, Lake

LOE ID:	800
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	10
Number of Exceedances:	10
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected at site HGA-0 by the City of San Diego Water Dept. from September 1998 to December 2000. Ten of the 10 samples were in exceedance. At the October 25th Water Board meeting, comments were received concerning total dissolved solids in terminal reservoirs in the San Diego region. The Board concluded that it was inappropriate to list these water bodies based on secondary MCLs when the TDS values of the incoming supplying waters were higher than the MCLs. Narrative standards are therefore met.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for TDS is 500 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at site HGA-0.
Temporal Representation:	Samples were collected from September 1998 to December 2000. Samples were collected quarterly in 1999 and 2000. Two samples were collected in 1998, 1 in September, and 1 in December.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 33448 Region 9

Hodges, Lake

Pollutant:	**Color**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the section 303(d) list. This conclusion is based on the staff findings that: 1. Twenty out of 20 samples exceeded the Basin Plan objective. Even though more data is needed to determine if the water quality objective is exceeded with the confidence and power required by the Listing Policy, a minimum of 122 samples would be needed before 20 exceedances would result in a delisting. 2. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33448, Color Region 9

Hodges, Lake

LOE ID:	786
Pollutant:	Color
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	20
Number of Exceedances:	20
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected at site HGA-0 by the City of San Diego Water Dept. from March 1996 to

	December 2000. Twenty of 20 samples were in exceedance.	035269
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for color is 15 units.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at site HGA-0.	
Temporal Representation:	Samples were collected quarterly from March 1996 to December 2000.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID 32608 Region 9

Hodges, Lake

Pollutant:	**Nitrogen**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows (with update to table 3.1):

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.Two lines of evidence are available in the administrative record to assess this pollutant. Twenty-five of 98 samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Twenty three of the 98 samples from two combined lines of evidence exceeded the Basin Plan Criteria.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 32608, Nitrogen Region 9

Hodges, Lake

LOE ID:	809	035270

Pollutant:	Nitrogen
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	81
Number of Exceedances:	8
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected at site HGA at several depths by the City of San Diego Water Dept. from January 1997 to July 2001. Eight of the 81 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters, enclosed bays and estuaries, coastal lagoons, and ground waters with all beneficial uses, analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used. For this assessment, the N:P ratio was used.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Hodges Reservoir site HGA at depths of 0m, 3m, 12m, and 1ft above the bottom.
Temporal Representation:	Samples were collected on a quarterly basis from January 1997 to July 2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment. QA=?
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 32608, Nitrogen **Region 9**

Hodges, Lake

LOE ID:	808
Pollutant:	Nitrogen
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	17
Number of Exceedances:	17
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected by the City of San Diego Water Dept. from March 1997 to July 2001. Seventeen of the 17 samples exceeded the N:P ratio of 10:1. In addition, the phosphorus samples were all in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters, enclosed bays and estuaries, coastal lagoons, and ground waters with all beneficial uses, analogous threshold values have not

	been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used. For this assessment, the N:P ratio was used.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Hodges Reservoir at HG Rec Area Delivery Point.
Temporal Representation:	Samples were collected on a quarterly basis from March 1997 to July 2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 32607 — Region 9
Hodges, Lake

Pollutant:	**Phosphorus**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2013
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Sixty of the 97 samples from two combined lines of evidence exceeded the Basin Plan Criteria, and these exceed the allowable frequency listed in Table 4.1 of the Listing Policy. 4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32607, Phosphorus — Region 9
Hodges, Lake

LOE ID:	807
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	80
Number of Exceedances:	44
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected at site HGA at several depths by the City of San Diego Water Dept. from January 1997 to July 2001. Forty-four of the 80 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters - any standing body of water, and all beneficial uses, the WQO for total phosphorus is 0.025 mg/L. This is the maximum, threshold - not to be exceeded more than 10% of the time.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	Use unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board.
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	Samples were collected at Hodges Reservoir at HG Station A at depths of 0m, 3m, 12m, and 1ft. from the bottom.
Temporal Representation:	Samples were collected on a quarterly basis from January 1997 to July 2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 32607, Phosphorus **Region 9**

Hodges, Lake

LOE ID:	806
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	17
Number of Exceedances:	16
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected by the City of San Diego Water Dept. from March 1997 to July 2001. Sixteen of the 17 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters - any standing body of water, and all beneficial uses, the WQO for total phosphorus is 0.025 mg/L. This is the maximum, threshold - not to be exceeded more than 10% of the time.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	Use unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board.
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	Samples were collected at Hodges Reservoir at the HG Rec Area Delivery Point.
Temporal Representation:	Samples were collected on a quarterly basis from March 1997 to July 2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.

QAPP Information Reference(s): 035273

DECISION ID	46366	Region 9
Hodges, Lake		

Pollutant:	**1,1,1-Trichloroethane**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 20 samples exceeded the Basin Plan objective and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 46366, 1,1,1-Trichloroethane	Region 9
Hodges, Lake	

LOE ID:	810
Pollutant:	1,1,1-Trichloroethane
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	20
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected by the City of San Diego Water Dept. from January 1997 to August 2001. None of the 20 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,1,1-Trichloroethane is 0.200 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	

Guideline Reference:	035274
Spatial Representation:	Samples were collected at Hodges Reservoir site HG Station A at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from January 1997 to August 2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 33481 Region 9

Hodges, Lake

Pollutant:	**1,1,2,2-Tetrachloroethane**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 20 samples exceeded the Basin Plan objective and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33481, 1,1,2,2-Tetrachloroethane Region 9

Hodges, Lake

LOE ID:	811
Pollutant:	1,1,2,2-Tetrachloroethane
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	20
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected by the City of San Diego Water Dept. from January 1997 to August 2001. None of the 20 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,1,2,2-Tetrachloroethane is 0.001 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Hodges Reservoir site HG Station A at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from January 1997 to August 2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 33401 Region 9

Hodges, Lake

Pollutant:	**1,1,2-Trichloroethane**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 20 samples exceeded the Basin Plan objective and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33401, 1,1,2-Trichloroethane Region 9

Hodges, Lake

LOE ID:	812
Pollutant:	1,1,2-Trichloroethane
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	20
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	035276
Data Used to Assess Water Quality:	Data was collected by the City of San Diego Water Dept. from January 1997 to August 2001. None of the 20 samples were in exceedance. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,1,2-Trichloroethane is 0.005 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Hodges Reservoir site HG Station A at the surface.	
Temporal Representation:	Samples were collected on a quarterly basis from January 1997 to August 2001.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID 46321 Region 9

Hodges, Lake

Pollutant:	**1,1-Dichloroethylene (DCE)/ Vinylidene Chloride**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 20 samples exceeded the Basin Plan objective and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 46321, 1,1-Dichloroethylene (DCE)/ Vinylidene Chloride Region 9

Hodges, Lake

LOE ID:	813
Pollutant:	1,1-Dichloroethylene (DCE)/ Vinylidene Chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total

Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	20
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected by the City of San Diego Water Dept. from January 1997 to August 2001. None of the 20 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,1-Dichloroethane is 0.005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Hodges Reservoir site HG Station A at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from January 1997 to August 2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 32609 Region 9

Hodges, Lake

Pollutant:	**1,2,4-Trichlorobenzene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 20 samples exceeded the Basin Plan objective and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32609, 1,2,4-Trichlorobenzene Region 9

Hodges, Lake

LOE ID:	814	035278

Pollutant:	1,2,4-Trichlorobenzene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	20
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected by the City of San Diego Water Dept. from January 1997 to August 2001. None of the 20 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,2,4-Trichlorobenzene is 0.07 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Hodges Reservoir at site HG Station A at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from January 1997 to August 2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID	46318	Region 9
Hodges, Lake		

Pollutant:	**1,2-Dibromo-3-chloropropane (DBCP)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 20 samples exceeded the Basin Plan objective and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 46318, 1,2-Dibromo-3-chloropropane (DBCP) Region 9
Hodges, Lake

LOE ID:	815
Pollutant:	1,2-Dibromo-3-chloropropane (DBCP)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	20
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from January 1997 to August 2001. None of the 20 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,2-Dibromo-3-chloropropane (DBCP) is 0.0002 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Hodges Reservoir at site HG Station A at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from January 1997 to August 2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 33622 Region 9
Hodges, Lake

Pollutant:	**1,2-Dichloroethane**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 20 samples exceeded the Basin Plan objective and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.

4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33622, 1,2-Dichloroethane **Region 9**

Hodges, Lake

LOE ID:	816
Pollutant:	1,2-Dichloroethane
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	20
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected by the City of San Diego Water Dept. from January 1997 to August 2001. None of the 20 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,2-Dichloroethane is 0.0005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Hodges Reservoir site HG Station A at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from January 1997 to August 2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment. QA=?
QAPP Information Reference(s):	

DECISION ID **33074** **Region 9**

Hodges, Lake

Pollutant:	**1,2-Dichloroethylene,-trans**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 20 samples exceeded the Basin Plan objective and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33074, 1,2-Dichloroethylene,-trans **Region 9**

Hodges, Lake

LOE ID:	831
Pollutant:	1,2-Dichloroethylene,-trans
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	20
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from January 1997 to August 2001. None of the 20 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for trans-1,2-Dichloroethylene is 0.01 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Hodges Reservoir site HG Station A at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from January 1997 to August 2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **46376** **Region 9**

Hodges, Lake

Pollutant:	**1,2-Dichloropropane**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the

2010 listing cycle. 035282

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 20 samples exceeded the Basin Plan objective and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 46376, 1,2-Dichloropropane **Region 9**
Hodges, Lake

LOE ID:	817
Pollutant:	1,2-Dichloropropane
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	20
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected by the City of San Diego Water Dept. from January 1997 to August 2001. None of the 20 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,2-Dichloropropane is 0.005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Hodges Reservoir site HG Station A at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from January 1997 to August 2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33446** **Region 9**
Hodges, Lake

Pollutant:	**Alachlor**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final	Do Not List on 303(d) list (TMDL required list)(2012)

Listing Decision:		035283
Revision Status	Original	
Impairment from Pollutant or Pollution:	Pollution	

Regional Board Conclusion:

Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

One line of evidence is available in the administrative record to assess this pollutant. None of the 15 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33446, Alachlor **Region 9**

Hodges, Lake

LOE ID:	833
Pollutant:	Alachlor
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	15
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from February 1997 to July 2001. None of the 15 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for alachlor is 0.002 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Hodges Reservoir site HG Station A at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from February 1997 to July 2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33418** **Region 9**

Hodges, Lake

Pollutant: **Antimony**

Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	035284
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)	
Revision Status	Original	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the Ten samples exceed the Basin Plan Objective for Antimony.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Ten samples exceeded the Basin Plan Objective for Antimony and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33418, Antimony **Region 9**

Hodges, Lake

LOE ID:	779
Pollutant:	Antimony
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	10
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected at site HGA-0 by the City of San Diego Water Dept. between January 1996 and September 1999. None of the 10 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for Antimony is 0.006 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at site HGA-0.

Temporal Representation:	Samples were collected between January 1996 and September 1999. Samples for 1996 and 1997 were collected on a quarterly basis, while for 1998 and 1999, there was one sample per year.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment
QAPP Information Reference(s):	

DECISION ID 33394 Region 9

Hodges, Lake

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of 19 samples exceeded the Basin Plan's water quality objective and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33394, Arsenic Region 9

Hodges, Lake

LOE ID:	780
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	19
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected at site HGA-0 by the City of San Diego Water Dept. between January 1996 and September 2000. None of the 19 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for arsenic is 0.05 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at site HGA-0.
Temporal Representation:	Samples were collected on a quarterly basis from January 1996 to September 2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 33447 Region 9

Hodges, Lake

Pollutant:	**Atrazine**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. One line of evidence is available in the administrative record to assess this pollutant. None of the 12 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33447, Atrazine Region 9

Hodges, Lake

LOE ID:	834
Pollutant:	Atrazine
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from February 1997 to July 2001. None of the 12 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)

SWAMP Data:	Non-SWAMP	035287
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Atrazine is 0.003 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Hodges Reservoir site HG Station A at the surface.	
Temporal Representation:	Samples were collected on a somewhat quarterly basis from February 1997 to July 2001.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID 33407 Region 9

Hodges, Lake

Pollutant:	**Barium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 18 samples exceeded the Basin Plan's water quality objective and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33407, Barium Region 9

Hodges, Lake

LOE ID:	781
Pollutant:	Barium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	18
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected at site HGA-0 by the City of San Diego Water Dept. between January 1996 and September 2000. None of the 18 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Barium is 1.0 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at site HGA-0.
Temporal Representation:	Samples were collected on a quarterly basis between January 1996 and September 2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 46375 **Region 9**

Hodges, Lake

Pollutant:	**Benzene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 20 samples exceeded the Basin Plan objective and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 46375, Benzene **Region 9**

Hodges, Lake

LOE ID:	818
Pollutant:	Benzene
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	Total	035289
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	20	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data was collected by the City of San Diego Water Dept. from January 1997 to August 2001. None of the 20 samples were in exceedance. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Benzene is 0.001mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at the Hodges Reservoir site HG Station A at the surface.	
Temporal Representation:	Samples were collected on a quarterly basis from January 1997 to August 2001.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID 33677 Region 9

Hodges, Lake

Pollutant:	**Benzo(a)pyrene (3,4-Benzopyrene -7-d)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. One line of evidence is available in the administrative record to assess this pollutant. None of the 15 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33677, Benzo(a)pyrene (3,4-Benzopyrene -7-d) Region 9

Hodges, Lake

LOE ID:	835
Pollutant:	Benzo(a)pyrene (3,4-Benzopyrene -7-d)

LOE Subgroup:	Pollutant-Water	035290
Matrix:	Water	
Fraction:	Total	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	15	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from February 1997 to July 2001. None of the 15 samples were in exceedance. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Benzo(a)pyrene is 0.0002 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Hodges Reservoir site HG Station A at the surface.	
Temporal Representation:	Samples were collected on a quarterly basis from February 1997 to July 2001.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID 33113 Region 9

Hodges, Lake

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. One line of evidence is available in the administrative record to assess this pollutant. The single sample did not exceed the Basin Plan criteria, but the number of samples is insufficient to determine with the confidence and power required by the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33113, Cadmium Region 9

Hodges, Lake

LOE ID: 782

Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected at site HGA-0 by the City of San Diego Water Dept. on June 3, 1996. One sample was collected. It was not in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for cadmium is 0.005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at site HGA-0.
Temporal Representation:	One sample was collected on June 3, 1996.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **32674** **Region 9**

Hodges, Lake

Pollutant:	**Carbofuran**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 17 samples exceeded the Basin Plan objective and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32674, Carbofuran **Region 9**

Hodges, Lake

LOE ID:	845
Pollutant:	Carbofuran
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 03/1997 to 07/2001. None of the 17 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Carbofuran is 0.018 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Hodges Reservoir site HG Station A at the surface.
Temporal Representation:	Samples were collected on a somewhat quarterly basis from 03/1997 to 07/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33091** **Region 9**

Hodges, Lake

Pollutant:	**Carbon tetrachloride**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of 20 samples exceeded the Basin Plan objective and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available

indicating that standards are met. 035293

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33091, Carbon tetrachloride **Region 9**

Hodges, Lake

LOE ID:	819
Pollutant:	Carbon tetrachloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	20
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected by the City of San Diego Water Dept. from January 1997 to August 2001. None of the 20 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Carbon tetrachloride is 0.0005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Hodges Reservoir site HG Station A at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from January 1997 to August 2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33315** **Region 9**

Hodges, Lake

Pollutant:	**Chlordane**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

One line of evidence is available in the administrative record to assess this pollutant. None of the 8 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy.

	Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33315, Chlordane **Region 9**

Hodges, Lake

LOE ID:	844
Pollutant:	Chlordane
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 02/1997 to 07/2001. None of the 8 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for total chlordane is 0.0001 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Hodges Reservoir site HG Station A at the surface.
Temporal Representation:	Samples were collected between 1 and 4 times per year from 02/1997 to 07/2001. No samples were collected in 2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33316** **Region 9**

Hodges, Lake

Pollutant:	**Chloride**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the

Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.Two lines of evidence are available in the administrative record to assess this pollutant. None of 40 samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of 40 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33316, Chloride **Region 9**

Hodges, Lake

LOE ID:	784
Pollutant:	Chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	18
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected by the City of San Diego Water Dept. from March 1997 to June 2001. None of the 18 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: The WQO for chloride for inland surface waters is 500 mg/L
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at site HG Rec Area Delivery Point.
Temporal Representation:	Samples were collected on a quarterly basis from March 1997 to June 2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33316, Chloride **Region 9**

Hodges, Lake

LOE ID:	783
Pollutant:	Chloride

LOE Subgroup:	Pollutant-Water	035296
Matrix:	Water	
Fraction:	Total	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	22	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data was collected at site HGA-0 by the City of San Diego Water Dept. between March 1996 and June 2001. None of the 22 samples were in exceedance. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQo for chloride is 250 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at site HGA-0.	
Temporal Representation:	Samples were collected on a quarterly basis from March 1996 and June 2001.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID	**33325**	**Region 9**
Hodges, Lake		

Pollutant:	**Chlorobenzene (mono)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 20 samples exceeded the Basin Plan objective and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33325, Chlorobenzene (mono) 035297 **Region 9**

Hodges, Lake

LOE ID:	820
Pollutant:	Chlorobenzene (mono)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	20
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected by the City of San Diego Water Dept. from January 1997 to August 2001. None of the 20 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal benficial use, the WQO for Chlorobenzene (mono) is 0.07mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Hodges Reservoir site HG Station A at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from January 1997 to August 2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33449** **Region 9**

Hodges, Lake

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. One line of evidence is available in the administrative record to assess this pollutant. None of the 8 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33449, Copper **Region 9**
Hodges, Lake

LOE ID:	787
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected at site HGA-0 by the City of San Diego Water Dept. between January 1996 and June 2000. None of the 8 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for copper is 1.0 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at site HGA-0.
Temporal Representation:	Samples were collected from January 1996 to June 2000. 1-4 samples were collected per year. There are no measurements reported for 1999.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **43315** **Region 9**
Hodges, Lake

Pollutant:	**Dissolved oxygen saturation**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Four of the 27 samples exceed the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list

in the Water Quality Limited Segments category. 035299

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Four of 27 samples exceeded the Basin Plan objective for Dissolved Oxygen and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 43315, Dissolved oxygen saturation **Region 9**

Hodges, Lake

LOE ID:	6160
Pollutant:	Dissolved oxygen saturation
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Aquatic Life Use:	Warm Freshwater Habitat
Number of Samples:	27
Number of Exceedances:	4
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Four of twenty seven surface water samples are below the water quality objective. The annual mean in 2005 is 8.96 mg/L and in 2006 is 6.39 mg/L. These exceed the objective 37 percent of the time. Data was collected by the City of San Diego Water Department for monitoring of their drinking source water reservoirs. Sampling occurred from January 2005 to December 2006.
Data Reference:	Water Department, Water Quality Monitoring Data for Drinking Source Water Reservoirs. January 2005 to December 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Dissolved oxygen levels shall not be less than 5.0 mg/L in waters with designated WARM beneficial uses or less than 6.0 mg/l in waters with designated COLD beneficial uses . The annual mean shall not be less than 7 mg/L more than 10 percent of the time (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	One surface water sample was collected per sampling event at Lake Hodges at a standard location designated Â“Station AÂ”. Dissolve oxygen depth profile data was collected during sampling however only the uppermost subsurface sample was used in this data review.
Temporal Representation:	Samples were collected once or twice a month from January 2005 to December 2006.
Environmental Conditions:	
QAPP Information:	Samples were collected and analyzed according to the Water Quality LaboratoryÂ's Quality Assurance Manual.
QAPP Information Reference(s):	Water Quality Laboratory. Quality Assurance Manual

DECISION ID **33691** **Region 9**

Hodges, Lake 035300

Pollutant:	**Endrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. One line of evidence is available in the administrative record to assess this pollutant. None of the 14 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33691, Endrin — Region 9

Hodges, Lake

LOE ID:	836
Pollutant:	Endrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	14
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from February 1997 to July 2001. None of the 14 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Endrin is 0.002 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Hodges Reservour site HG Station A at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from February 1997 to July 2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment. QA=?
QAPP Information Reference(s):	

DECISION ID	33741	035301 Region 9
Hodges, Lake		

Pollutant:	**Ethylbenzene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 20 samples exceeded the Basin Plan objective and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33741, Ethylbenzene	**Region 9**
Hodges, Lake	

LOE ID:	821
Pollutant:	Ethylbenzene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	20
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected by the City of San Diego Water Dept. from January 1997 to August 2001. None of the 20 samples were in exceedance. (SWRCB, 2003)
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Ethylbenzene is 0.7 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Hodges Reservoir site HG Station A at the surface.

Temporal Representation:	Samples were collected on a quarterly basis from January 1997 to August 2000
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID	33460	Region 9
Hodges, Lake		

Pollutant:	**Fluoride**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 19 samples exceeded the Basin Plan objective, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33460, Fluoride	Region 9
Hodges, Lake	

LOE ID:	788
Pollutant:	Fluoride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	19
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected at site HGA-0 by the City of San Diego Water Dept. between March 1996 and September 2000. None of the 19 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Fluoride is 2.4 mg/L when Annual Average of Maximum Daily Air Temperature is <53.8F,

	2.2 mg/L when Annual Average of Maximum Daily Air Temperature is 53.8F-58.3F, 2.0 mg/L when Annual Average of Maximum Daily Air Temperature is 58.4F-63.8F, 1.8 mg/L when Annual Average of Maximum Daily Air Temperature is 63.9F-70.6F, 1.6 mg/L when Annual Average of Maximum Daily Air Temperature is 70.7F-79.2F, and 1.4 mg/L when Annual Average of Maximum Daily Air Temperature is 79.3F-90.5F. For inland surface water with all other beneficial uses the WQO for fluoride is 1.0 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at site HGA-0.
Temporal Representation:	SAmples were collected on a quarterly basis from March 1996 to September 2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID	32732	Region 9
Hodges, Lake		

Pollutant:	**Glyphosate**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 17 samples exceeded the Basin Plan objective and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32732, Glyphosate	**Region 9**
Hodges, Lake	

LOE ID:	848
Pollutant:	Glyphosate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	17	035304
Number of Exceedances:	0	

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 03/1997 to 07/2001. None of the 17 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municpal beneficial use, the WQO for Glyphosate is 0.7 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Hodges Reservoir site HG Station A at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from 03/1997 to 07/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 46374 Region 9

Hodges, Lake

Pollutant:	**Heptachlor**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

One line of evidence is available in the administrative record to assess this pollutant. None of the 14 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 46374, Heptachlor Region 9

Hodges, Lake

LOE ID:	838
Pollutant:	Heptachlor
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total

Beneficial Use:	Municipal & Domestic Supply	035305
Number of Samples:	14	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from February 1997 to July 2001. None of the 14 samples were in exceedance. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Heptachlor is 0.00001 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Hodges Reservoir site HG Station A at the surface.	
Temporal Representation:	Samples were collected on a quarterly basis from February 1997 to July 2001.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID 33191 Region 9

Hodges, Lake

Pollutant:	**Heptachlor epoxide**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. One line of evidence is available in the administrative record to assess this pollutant. None of the 14 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33191, Heptachlor epoxide Region 9

Hodges, Lake

LOE ID:	837
Pollutant:	Heptachlor epoxide
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	Total	035306
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	14	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from February 1997 to July 2001. None of the 14 samples were in exceedance. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Heptachlor epoxide is 0.00001 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Hodges Reservoir site HG Station A at the surface.	
Temporal Representation:	Samples were collected on a quarterly basis from February 1997 to July 2001.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID 33237 Region 9

Hodges, Lake

Pollutant:	**Hexachlorobenzene/ HCB**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. One line of evidence is available in the administrative record to assess this pollutant. None of the 14 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33237, Hexachlorobenzene/ HCB Region 9

Hodges, Lake

LOE ID:	839
Pollutant:	Hexachlorobenzene/ HCB

LOE Subgroup:	Pollutant-Water	035307
Matrix:	Water	
Fraction:	Total	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	14	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from February 1997 to July 2001. None of the 14 samples were in exceedance. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Hexachlorobenzene is 0.001 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Hodges Reservoir site HG Station A at the surface.	
Temporal Representation:	Samples were collected on a quarterly basis from February 1997 to July 2001.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment. QA=?	
QAPP Information Reference(s):		

DECISION ID 33238 Region 9

Hodges, Lake

Pollutant:	**Hexachlorocyclopentadiene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. One line of evidence is available in the administrative record to assess this pollutant. None of the 14 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33238, Hexachlorocyclopentadiene Region 9

Hodges, Lake

LOE ID:	840

Pollutant:	Hexachlorocyclopentadiene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	14
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from February 1997 to July 2001. None of the 14 smaples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Hexachlorocyclopentadiene is 0.05 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Hodges Reservoir site HG Station A at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from February 1997 to July 2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 33461 Region 9

Hodges, Lake

Pollutant:	**Iron**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. One line of evidence is available in the administrative record to assess this pollutant. One of the 5 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33461, Iron Region 9

Hodges, Lake

LOE ID:	789
Pollutant:	Iron
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	5
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected by City of San Diego Water Dept. between March 1998 and December 2000. One of the 5 samples was in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for iron is 0.3mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at site HGA-0.
Temporal Representation:	Samples were collected between March 1998 and December 2000. One to 3 samples was collected per year.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID	33397	Region 9
Hodges, Lake		

Pollutant:	**Methoxychlor**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. One line of evidence is available in the administrative record to assess this pollutant. None of the 14 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33397, Methoxychlor 035310 **Region 9**

Hodges, Lake

LOE ID:	841
Pollutant:	Methoxychlor
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	14
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from February 1997 to July 2001. None of the 14 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Methoxychlor is 0.04 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Hodges Reservoir site HG Station A at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from February 1997 to July 2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **32675** **Region 9**

Hodges, Lake

Pollutant:	**Molinate**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. One line of evidence is available in the administrative record to assess this pollutant. None of the 8 samples exceed the Basin Plan criteria and this does not exceed the allowable frequency of the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32675, Molinate **Region 9**

Hodges, Lake

LOE ID:	846
Pollutant:	Molinate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 03/1997 to 11/2000. None of the 8 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Molinate is 0.02 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Hodges Reservoir site HG Station A at the surface.
Temporal Representation:	Samples were collected from 03/1997 to 11/2000. Three to four samples were collected in 1997 and 1998 and 1 sample was collected in 2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33371** **Region 9**

Hodges, Lake

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

One line of evidence is available in the administrative record to assess this pollutant. None of the 9 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33371, Nickel **Region 9**

Hodges, Lake

LOE ID:	792
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected at site HGA-0 by the City of San Diego Water Dept. between June 1996 and June 1999. None of the 9 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use the WQO for nickel is 0.1 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at site HGA-0.
Temporal Representation:	Samples were collected between June 1996 and June 1999. Two to three samples were collected per year.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33680** **Region 9**

Hodges, Lake

Pollutant:	**Nitrate as Nitrate (NO3)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.035313
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 97 samples from two combined lines of evidence exceeded the Basin Plan criteria, and these do not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 33680, Nitrate as Nitrate (NO3) **Region 9**

Hodges, Lake

LOE ID:	805
Pollutant:	Nitrate as Nitrate (NO3)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected by the City of San Diego Water Dept. from March 1997 to July 2001. None of the 17 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Nitrate as NO3 is 45 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at HG Rec Area Delivery Point.
Temporal Representation:	Samples were collected on a quarterly basis from March 1997 to July 2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33680, Nitrate as Nitrate (NO3) **Region 9**

Hodges, Lake

LOE ID:	804
Pollutant:	Nitrate as Nitrate (NO3)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	80
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	035314
Data Used to Assess Water Quality:	Data was collected by the City of San Diego Water Dept. from January 1996 to July 2001. None of the 80 samples were in exceedance. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Nitrate as NO3 is 45 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at site HGA on the surface and at depths of 3m, 12m, and 1 ft above the bottom.	
Temporal Representation:	Samples were collected between January 1996 and December July 2001.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID 32595 — Region 9

Hodges, Lake

Pollutant:	**Nitrite as Nitrite NO2**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 30 samples exceeded the Basin Plan criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 32595, Nitrite as Nitrite NO2 — Region 9

Hodges, Lake

LOE ID:	793
Pollutant:	Nitrite as Nitrite NO2
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total

Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	30
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected at site HGA-0 by the City of San Diego Water Dept. between January 1996 and March 1999. Thirty samples were collected, 0 were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Nitrite (as N) is 1.0 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at site HGA-0.
Temporal Representation:	Samples were collected between January 1996 and March 1999. Eight to ten samples were collected throughout the year from 1996 to 1998. Three samples were collected in 1999, one each in January, February, and March.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID	32718	Region 9
Hodges, Lake		

Pollutant:	**Oxamyl (Vydate)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 17 samples exceeded the Basin Plan objective and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32718, Oxamyl (Vydate) **Region 9**

Hodges, Lake 035316

LOE ID:	847
Pollutant:	Oxamyl (Vydate)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 03/1997 to 07/2001. None of the 17 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Oxamyl is 0.2 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Hodges Reservoir site HG Station A at the surface.
Temporal Representation:	Samples were collected on a somewhat quarterly basis from 03/1997 to 07/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment. QA=?
QAPP Information Reference(s):	

DECISION ID **46373** **Region 9**

Hodges, Lake

Pollutant:	**PCBs (Polychlorinated biphenyls)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. One line of evidence is available in the administrative record to assess this pollutant. None of the 10 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 46373, PCBs (Polychlorinated biphenyls) 035317 Region 9
Hodges, Lake

LOE ID:	832
Pollutant:	PCBs (Polychlorinated biphenyls)
LOE Subgroup:	Adverse Biological Responses
Matrix:	-N/A
Fraction:	Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	10
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. on February 4, 1997 and May 6, 1997. None of the 10 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Polychlorinated Biphenyls is 0.0005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Hodges Reservoir site HG Station A at the surface.
Temporal Representation:	Samples were once on each day on February 4, 1997 and May 6, 1997.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 46319 Region 9
Hodges, Lake

Pollutant:	**Pentachlorophenol (PCP)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. One line of evidence is available in the administrative record to assess this pollutant. None of the 7 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 46319, Pentachlorophenol (PCP) — Region 9

Hodges, Lake

LOE ID:	842
Pollutant:	Pentachlorophenol (PCP)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 05/1997 to 03/2001. None of the 8 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Pentachlorophenol is 0.001 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Hodges Reservoir site HG Station A at the surface.
Temporal Representation:	Samples were collected from 05/1997 to 03/2001. Two samples were collected per year from 05/1997 to 09/2000. One sample was collected in 2001, and one was collected on 03/03/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 46368 — Region 9

Hodges, Lake

Pollutant:	**Picloram**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

One line of evidence is available in the administrative record to assess this pollutant. None of the 4 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 46368, Picloram — Region 9

Hodges, Lake

LOE ID:	795
Pollutant:	Picloram
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected at site HGA-0 by the City of San Diego Water Dept. between December 1998 and June 2000. None of the 4 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for picloram is 0.5 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at site HGA-0.
Temporal Representation:	Samples were collected from December 1998 to June 2000. One to two samples were collected per year.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 32550 — Region 9

Hodges, Lake

Pollutant:	**Selenium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

One line of evidence is available in the administrative record to assess this pollutant. None of the 9 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy.

	Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32550, Selenium **Region 9**

Hodges, Lake

LOE ID:	796
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected by the City of San Diego Water Dept. from January 1996 to December 1998. None of the 9 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for selenium is 0.05 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at site HGA-0.
Temporal Representation:	Samples were collected from January 1996 to December 1998. Quarterly samples were collected in 1996 and 1997. Only one sample is reported for 1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33103** **Region 9**

Hodges, Lake

Pollutant:	**Silver**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. One line of evidence is available in the administrative record to assess this pollutant. One sample was

collected and it did not exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33103, Silver Hodges, Lake **Region 9**

LOE ID:	797
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected at site HGA-0 by the City of San Diego Water Dept. on September 12, 2000. One sample was collected. It was not in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all inland surface waters with a municipal beneficial use, the WQO for silver is 0.1 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at site HGA-0.
Temporal Representation:	One sample was collected on September 12, 2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 33398 Hodges, Lake **Region 9**

Pollutant:	**Simazine**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

One line of evidence is available in the administrative record to assess this pollutant. None of the 12 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33398, Simazine **Region 9**

Hodges, Lake

LOE ID:	843
Pollutant:	Simazine
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	13
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 06/03/1996 to 07/2001. None of the 13 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Simazine is 0.004 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Hodges Reservoir site HG Station A at the surface.
Temporal Representation:	Samples were collected between 06/03/1996 and 07/2001. One to three samples were collected per year. One sample was collected on 06/03/1996.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **32554** **Region 9**

Hodges, Lake

Pollutant:	**Styrene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 20 samples exceeded the Basin Plan objective and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32554, Styrene **Region 9**

Hodges, Lake

LOE ID:	823
Pollutant:	Styrene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	20
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. between January 1997 and August 2001. None of the 20 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Styrene is 0.1 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Hodges Reservoir site HG Station A at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from January 1997 to August 2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33412** **Region 9**

Hodges, Lake

Pollutant:	**Sulfates**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**

Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)	035324
Revision Status	Original	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

Two lines of evidence are available in the administrative record to assess this pollutant. Based on Table 3.1 in the Policy, the number of exceedences of this pollutant is below the minimum number of measured exceedences needed to place a water segment on the section 303(d) list for toxicants. None of the 40 samples exceeded the Basin Plan criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33412, Sulfates — Region 9

Hodges, Lake

LOE ID:	799
Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	18
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected by the City of San Diego Water Dept. from March 1997 to July 2001. None of the 18 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for sulfate is 250 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at site HG Rec Area Delivery Point.
Temporal Representation:	Samples were collected on a quarterly basis from March 1997 to July 2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33412, Sulfates — Region 9

Hodges, Lake

LOE ID:	798
Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	22
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected at site HGA-0 by the City of San Diego Water Dept. from March 1996 to June 2001. None of the 22 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for sulfate is 250 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at site HGA-0.
Temporal Representation:	Samples were collected on a quarterly basis from March 1996 to June 2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment. QA=?
QAPP Information Reference(s):	

DECISION ID	32602	Region 9
Hodges, Lake		

Pollutant:	**Tetrachloroethylene/PCE**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 20 samples exceeded the Basin Plan objective and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are met.
Regional Board Decision	This is a decision previously approved by the State Water Resources Control Board and the USEPA.

Recommendation: No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32602, Tetrachloroethylene/PCE **Region 9**

Hodges, Lake

LOE ID:	824
Pollutant:	Tetrachloroethylene/PCE
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	20
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected by the City of San Diego Water Dept. from January 1997 to August 2001. None of the 20 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Tetrachloroethylene is 0.005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Hodges Reservoir site HG Station A at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from January 1997 to August 2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **46320** **Region 9**

Hodges, Lake

Pollutant:	**Toluene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.

3. None of the 20 samples exceeded the Basin Plan objective and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 46320, Toluene **Region 9**

Hodges, Lake

LOE ID:	825
Pollutant:	Toluene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	20
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from January 1997 to August 2001. None of the 20 samples were in exceedance. (SWRCB, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Toluene is 0.15 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Hodges Reservoir site HG Station A at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from January 1997 to August 2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **32546** **Region 9**

Hodges, Lake

Pollutant:	**Toxaphene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

One line of evidence is available in the administrative record to assess this pollutant. None of the 14

samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32546, Toxaphene **Region 9**

Hodges, Lake

LOE ID:	849
Pollutant:	Toxaphene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	14
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 03/1997 to 08/2001. None of the 14 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Toaxaphene is 0.003 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Hodges Reservoir site HG Station A at the surface.
Temporal Representation:	One to four samples were collected per year from 03/1997 to 08/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33375** **Region 9**

Hodges, Lake

Pollutant:	**Trichloroethylene/TCE**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 20 samples exceeded the Basin Plan objective and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33375, Trichloroethylene/TCE **Region 9**
Hodges, Lake

LOE ID:	826
Pollutant:	Trichloroethylene/TCE
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	20
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from January 1997 to August 2001. None of the 20 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Trichloroethylene is 0.005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Hodges Reservoir site HG Station A at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from January 1997 to August 2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33376** **Region 9**
Hodges, Lake

Pollutant:	**Trichlorofluoromethane (CFC-11)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original

Impairment from Pollutant or Pollution:	Pollutant	035330
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 20 samples exceeded the Basin Plan objective and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are met.	
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.	

Line of Evidence (LOE) for Decision ID 33376, Trichlorofluoromethane (CFC-11) **Region 9**

Hodges, Lake

LOE ID:	827
Pollutant:	Trichlorofluoromethane (CFC-11)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	20
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from January 1997 to August 2001. None of the 20 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Trichlorofluoromethane is 0.15 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Hodges Reservoir site HG Station A at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from January 1997 to August 2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33065** **Region 9**

Hodges, Lake

Pollutant:	**Uranium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the 3 samples exceed the Basin Plan objective for Uranium. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 3 samples exceeded the Basin Plan objective for Uranium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33065, Uranium **Region 9**

Hodges, Lake

LOE ID:	802
Pollutant:	Uranium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected by the City of San Diego Water Dept. in May, June, and October 1998. Three samples were collected. None were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all inland surface waters with a municipal beneficial use, the WQO for uranium is 20 pCi/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at site HGA-0.
Temporal Representation: One sample per month was collected in May, June and October 1998.
Environmental Conditions:
QAPP Information: Data used in 2002 assessment.
QAPP Information Reference(s):

DECISION ID 33384 Region 9
Hodges, Lake

Pollutant: **Vinyl chloride**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Original
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 20 samples exceeded the Basin Plan objective and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33384, Vinyl chloride Region 9
Hodges, Lake

LOE ID: 828

Pollutant: Vinyl chloride
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 20
Number of Exceedances: 0

Data and Information Type: PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality: Data were collected by the City of San Diego Water Dept. from January 1997 to August 2001. None of the 20 samples were in exceedance. (SWRCB, 2003).
Data Reference: Placeholder reference 2006 303(d)

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for vinyl chloride is 0.0005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Hodges Reservoir site HG Station A at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from January 1997 to August 2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 33066 Region 9
Hodges, Lake

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the 6 samples exceed the OBJECTIVE. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 6 samples exceeded the OBJECTIVE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33066, Zinc Region 9
Hodges, Lake

LOE ID:	803
Pollutant:	Zinc

LOE Subgroup:	Pollutant-Water	035334
Matrix:	Water	
Fraction:	Total	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	6	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data was collected at site HGA-0 by the City of San Diego Water Dept. from January 1996 to March 1998. None of the 6 samples were in exceedance. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for zinc is 5.0 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at site HGA-0.	
Temporal Representation:	Samples were collected from January 1996 to March 1998. 1996 samples were collected quarterly. One sample each was collected in March 1997 and 1998.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID	**33385**	**Region 9**
Hodges, Lake		

Pollutant:	**cis-1,2-Dichloroethylene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 20 samples exceeded the Basin Plan objective and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33385, cis-1,2-Dichloroethylene 035335 Region 9
Hodges, Lake

LOE ID:	829
Pollutant:	cis-1,2-Dichloroethylene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	20
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from January 1997 to August 2001. None of the 20 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for cis-1,2-Dichloroethylene is 0.006 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Hodges Reservoir site HG Station A at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from January 1997 to August 2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 33386 Region 9
Hodges, Lake

Pollutant:	**meta-para xylenes**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 20 samples exceeded the Basin Plan objective and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33386, meta-para xylenes **Region 9**

Hodges, Lake

LOE ID:	830
Pollutant:	meta-para xylenes
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	20
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from January 1997 to August 2001. None of the 20 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Xylenes is 1.750 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	MCL is for either a single isomer or the sum of the isomers. Incorporations by reference are prospective including future changes to the incorporated provisions as the changes take effect.
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	Samples were collected at Hodges Reservoir site HG Station A at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from January 1997 to August 2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **32553** **Region 9**

Hodges, Lake

Pollutant:	**o-Xylene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 20 samples exceeded the Basin Plan objective and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32553, o-Xylene **Region 9**

Hodges, Lake

LOE ID:	822
Pollutant:	o-Xylene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	20
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from January 1997 to August 2001. None of the 20 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Xylenes is 1.750 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	MCL is for either a single isomer or the sum of the isomers. Incorporations by reference are prospective including future changes to the incorporated provisions as the changes take effect.
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	Samples were collected at Hodges Reservoir site HG Station A at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from January 1997 to August 2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **32735** **Region 9**

Hodges, Lake

Pollutant:	**Manganese**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion	2019

Date:	035338
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Nine of 19 samples exceeded the Basin Plan criteria and all 5 years had samples which exceeded 0.05 mg/L more than 10% of the time. These exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32735, Manganese **Region 9**

Hodges, Lake

LOE ID:	790
Pollutant:	Manganese
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	19
Number of Exceedances:	9
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected at site HGA-0 by the City of San Diego Water Department between January 1996 and September 2000. Nine of 19 samples were in exceedance. All 5 years had samples which exceeded 0.05 mg/L more than 10% of the time.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The water quality objective for manganese in Hodges Lake is 0.05 milligrams/liter (mg/L) according to Basin Plan, Table 3-2 entitled, Water Quality Objectives. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at site HGA-0.
Temporal Representation:	Samples were collected on a quarterly basis from January 1996 to September 2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID	32549	Region 9
Hodges, Lake		

Pollutant:	**Mercury**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant.Four of the samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Four of 14 samples exceed the water quality objective and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32549, Mercury	**Region 9**
Hodges, Lake	

LOE ID:	30998
Pollutant:	Mercury
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Fish fillet
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	13
Number of Exceedances:	3
Data and Information Type:	Fish tissue analysis
Data Used to Assess Water Quality:	Fish were collected for tissue analysis at one location from Lake Hodges. A total of 13 sample composites were generated from two species: Largemouth Bass (11) and Common Carp (2). Details of the compositing protocol can be found in the March 2009 report entitiled: "Contaminants in Fish from California Lakes and Reservoirs: Technical Report on Year One

	of a Two-Year Screening Study" (SWAMP, 2009). A total of 3 out of 13 samples exceeded the OHHEA fish tissue screening value for human health.
Data Reference:	Data associated with report entitled: Contaminants in Fish from California Lakes and Reservoirs: Technical Report on Year One of a Two-Year Screening Survey. A Report of the Surface Water Ambient Monitoring Program (SWAMP). California State Water Resources Control Board, Sacramento, CA Contaminants in Fish from California Lakes and Reservoirs: Technical Report on Year One of a Two-Year Screening Survey. A Report of the Surface Water Ambient Monitoring Program (SWAMP). California State Water Resources Control Board, Sacramento, CA Cruise Report for the Surface Waters Ambient Monitoring Program (SWAMP) Bioaccumulation Screening Study in California Lakes and Reservoirs, Sampling Dates: June 2007- March 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Office of Environmental Health Hazard Assessment (OEHHA) Screening Value of 0.3 mg/kg to protect human health when consuming fish (OEHHA, 1999).
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment
Spatial Representation:	Samples were collected from one location in Lake Hodges. As discussed in the Lakes and Reserviors Report (SWAMP, 2009), individual sample locations consisted of an area within a given waterbody with an approximate one-mile diameter, from which multiple fish tissue samples were collected. The number of sample locations per waterbody was based on the overall size of the waterbody. Specifics of individual sampling locations can be found in the supplemental report entitled "Cruise Report for the Surface Waters Ambient Monitoring Program (SWAMP) Bioaccumulation Screening Study in California Lakes and Reservoirs, Sampling Dates: June 2007- March 2008" (SWAMP, 2008).
Temporal Representation:	Samples were collected on August 28, 2007
Environmental Conditions:	There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.
QAPP Information:	Samples were collected, processed, and analyzed in accordance with the methods described in "Quality Assurance Project Plan Screening Study of Bioaccumulation in California Lakes and Reservoirs." (SWAMP, 2008).
QAPP Information Reference(s):	Quality Assurance Project Plan Screening Study of Bioaccumulation in California Lakes and Reservoirs. Moss Landing Marine Labs. Prepared for SWAMP BOG, 49 pages plus appendices and attachments

Line of Evidence (LOE) for Decision ID 32549, Mercury Hodges, Lake **Region 9**

LOE ID:	791
Pollutant:	Mercury
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected at site HGA-0 by the City of San Diego Water Dept. on December 8, 1998. One sample was collected. It was in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for mercury is 0.002mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at site HGA-0.
Temporal Representation:	One sample was collected on December 8, 1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 33094 Region 9

Hodges, Lake

Pollutant:	**Turbidity**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Eleven of the 20 samples exceeded the Basin Plan criteria, and these exceed the allowable frequency listed in Table 3.2 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33094, Turbidity Region 9

Hodges, Lake

LOE ID:	801
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total

Beneficial Use:	Municipal & Domestic Supply	035342
Number of Samples:	20	
Number of Exceedances:	11	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data was collected at site HGA-0 by the City of San Diego Water Department from March 1996 to December 2000. Eleven of 20 samples were in exceedance of the WQO for municipal beneficial uses.	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for turbidity is 5 units. For inland surface waters with all other beneficial uses, the WQO for turbidity is 20 ntu.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at site HGA-0.	
Temporal Representation:	Samples were collected on a quarterly basis from March 1996 to December 2000.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID	33305	Region 9
Hodges, Lake		

Pollutant:	**pH**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Fourteen of the 20 samples exceeded the Basin Plan criteria, and these exceed the allowable frequency listed in Table 3.2 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	

Line of Evidence (LOE) for Decision ID 33305, pH	Region 9

Hodges, Lake

035343

LOE ID:	794
Pollutant:	pH (high)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	20
Number of Exceedances:	14
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected at site HGA-0 by the City of San Diego Water Dept. from March 1996 to December 2000. Fourteen of the 20 samples exceeded the maximum pH standard of 8.5.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with all beneficial uses, the WQO for pH is 6.5 (minimum) to 8.5 (maximum).
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data was collected at site HGA-0.
Temporal Representation:	Samples were collected on a quarterly basis between March 1996 and December 2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Sutherland Reservoir
Water Body ID: CAL9055300020010925095919
Water Body Type: Lake & Reservoir

DECISION ID 43643 **Region 9**
Sutherland Reservoir

Pollutant: **Aluminum**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. One of the 14 samples exceeds the Basin Plan water quality objective for aluminum.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of the 14 samples exceeds the Basin Plan water quality objective for aluminum and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1 .
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 43643, Aluminum **Region 9**
Sutherland Reservoir

LOE ID: 851

Pollutant: Aluminum
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples:	14	035345
Number of Exceedances:	1	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Data was collected at sample site SUA-0 by the City of San Diego Water Dept. from January 1996 to September 2000. One of 14 samples was in exceedance. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for aluminum is 0.2 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at site SUA-0 on the water's surface.	
Temporal Representation:	Two to 4 samples per year were collected between January 1996 and September 2000.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID 43651 Region 9

Sutherland Reservoir

Pollutant:	**Nitrogen**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Natural Sources | Source Unknown | Unknown Nonpoint Source
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. All of the nine samples exceed the Basin Plan water quality objective for total nitrogen as N.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. All of the nine samples exceed the Basin Plan water quality objective for total nitrogen as N and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 43651, Nitrogen Region 9

Sutherland Reservoir 035346

LOE ID:	6180
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Aquatic Life Use:	Warm Freshwater Habitat
Number of Samples:	9
Number of Exceedances:	9
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	City of San Diego, 2007a. Water Department, Water Quality Monitoring Data for Drinking Source Water Reservoirs. January 2005 to December 2006.
Data Reference:	Water Department, Water Quality Monitoring Data for Drinking Source Water Reservoirs. January 2005 to December 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. (RWQCB, 2007)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	A desired goal in order to prevent plant nuisance in any standing body of water is 0.025 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used. (RWQCB, 2007)
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	One surface water sample was collected per sampling event at Sutherland Reservoir at a standard location designated Â“Station AÂ”.
Temporal Representation:	Samples were collected approximately once a month from January 2005 to December 2006; however, some months were not sampled.
Environmental Conditions:	
QAPP Information:	Samples were collected and analyzed according to the Water Quality LaboratoryÂ's Quality Assurance Manual. Applicable field and laboratory Standard Operating Procedures were also provided by the San Diego Water Department.
QAPP Information Reference(s):	

DECISION ID **43121** **Region 9**

Sutherland Reservoir

Pollutant:	**Phosphorus**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2023
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Four of the nine samples exceed the Basin Plan water quality objective for phosphorus.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Four of the nine samples exceed the Basin Plan water quality objective for phosphorus and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 43121, Phosphorus **Region 9**

Sutherland Reservoir

LOE ID:	6181
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Aquatic Life Use:	Warm Freshwater Habitat
Number of Samples:	9
Number of Exceedances:	4
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	City of San Diego, 2007a. Water Department, Water Quality Monitoring Data for Drinking Source Water Reservoirs. January 2005 to December 2006.
Data Reference:	Water Department, Water Quality Monitoring Data for Drinking Source Water Reservoirs. January 2005 to December 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. (RWQCB, 2007)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	AWater Quality Control Plan for the San Diego Basin Goal of 0.025 mg/L for total phosphorus in any standing body of water. (RWQCB, 2007)
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	One surface water sample was collected per sampling event at Sutherland Reservoir at a standard location designated Â“Station AÂ”.
Temporal Representation:	Samples were collected approximately once a month from January 2005 to December 2006; however, some months were not sampled.
Environmental Conditions:	
QAPP Information:	Samples were collected and analyzed according to the Water Quality LaboratoryÂ's Quality

Assurance Manual. Applicable field and laboratory Standard Operating Procedures were also provided by the San Diego Water Department.

QAPP Information Reference(s):

DECISION ID	44395	Region 9
Sutherland Reservoir		

Pollutant:	**Color**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for removal from the section 303(d) list under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

One lines of evidence is available in the administrative record to assess this pollutant. Twenty-one of 21 samples exceed the Basin Plan water quality objective for color.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the section 303(d) list.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Twenty-one of 21 samples exceed the Basin Plan water quality objective for color and this exceeds the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 44395, Color	Region 9
Sutherland Reservoir	

LOE ID:	858
Pollutant:	Color
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	21
Number of Exceedances:	21
Data and Information Type:	Not Specified

Data Used to Assess Water Quality:	Data was collected at site SUA-0 by the City of San Diego Water Dept. between March 1996 and December 2000. Twenty-one of 21 samples were in exceedance of the WQO for municipal waters.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for color is 15 units. For other beneficial uses, the WQO is 20 units.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at site SUA-0 at the water surface.
Temporal Representation:	Samples were collected on a quarterly basis between March 1996 and December 2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 44275 Region 9

Sutherland Reservoir

Pollutant:	**Antimony**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. None of the 4 samples exceed the Basin Plan water quality objective for antimony. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 4 samples exceed the Basin Plan water quality objective for antimony and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 44275, Antimony Region 9

Sutherland Reservoir 035350

LOE ID:	852
Pollutant:	Antimony
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data was collected at site SUA-0 by the City of San Diego Water Dept. from September 1996 to June 2000. Four samples were collected, none were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for antimony is 0.006 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at site SUA-0 at the water's surface in the Sutherland Reservoir.
Temporal Representation:	Samples were collected between September 1996 and June 2000. One sample was collected in 1996, two in 1997 and one in 2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33009** **Region 9**

Sutherland Reservoir

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 16 samples exceed the Basin Plan water quality objective for arsenic.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.035351
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 16 samples exceed the Basin Plan water quality objective for arsenic and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33009, Arsenic **Region 9**
Sutherland Reservoir

LOE ID:	853
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	16
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data was collected at site SUA-0 by the City of San Diego Water Dept. between January 1996 and September 2000. None of the 16 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for arsenic is 0.05 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at sample site SUA-0 at the surface in the Sutherland Reservoir.
Temporal Representation:	Samples were collected on a quarterly basis from January 1996 to September 2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33154** **Region 9**
Sutherland Reservoir

Pollutant:	**Barium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 19 samples exceed the Basin Plan water quality objective for barium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 19 samples exceed the Basin Plan water quality objective for barium and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33154, Barium **Region 9**

Sutherland Reservoir

LOE ID:	854
Pollutant:	Barium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	19
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data was collected at site SUA-0 by the City of San Diego Water Dept. from January 1996 to September 2000. Nineteen samples were collected, with no exceedances. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for barium is 1.0 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from site SUA-0 at the water surface.
Temporal Representation:	Samples were collected on a quarterly basis from January 1996 to September 2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33111** **Region 9**

Sutherland Reservoir 035353

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 2 samples exceed the Basin Plan water quality objective for cadmium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 2 samples exceed the Basin Plan water quality objective for cadmium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33111, Cadmium — Region 9

Sutherland Reservoir

LOE ID:	855
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected at site SUA-0 by the City of San Diego Water Dept. on January 2, 1996 and June 3, 1996. Of 2 samples, none were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for cadmium is 0.005 mg/L.

Objective/Criterion Reference:	Placeholder reference 2006 303(d)	035354
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at site SUA-0 at the water's surface.	
Temporal Representation:	One sample was collected on January 2, 1996 and one was collected on June 3, 1996.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID 43727 Region 9

Sutherland Reservoir

Pollutant:	**Chloride**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. None of the 22 samples exceed the Basin Plan water quality objective for chloride. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 22 samples exceed the Basin Plan water quality objective for chloride and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43727, Chloride Region 9

Sutherland Reservoir

LOE ID:	856
Pollutant:	Chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	22	035355
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data was collected at site SUA-0 by the City of San Diego Water Dept. between March 1996 and December 2000. Twenty-two samples were collected, none were in exceedance. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Chloride is 250 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at site SUA-0 at the water surface.	
Temporal Representation:	Samples were collected on a quarterly basis from March 1996 to December 2000.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID	**33242**	**Region 9**
Sutherland Reservoir		

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. None of the 6 samples exceed the California Toxics Rule: freshwater chronic maximum (hardness dependent) water quality objective for chromium. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 6 samples exceed the California Toxics Rule: freshwater chronic maximum (hardness dependent) water quality objective for chromium. The sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 33242, Chromium **Region 9**
Sutherland Reservoir

LOE ID:	857
Pollutant:	Chromium (total)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected at site SUA-0 by the City of San Diego Water Dept. between January 1996 and March 2000. None of the 6 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for chromium is 0.05 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at site SUA-0 at the water's surface.
Temporal Representation:	Samples were collected between January 1996 and March 2000. 2 samples were collected in 1996, two in 1997, one in 1999 and one in 2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **37862** **Region 9**
Sutherland Reservoir

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. None of the 8 samples exceed the Basin Plan water quality objective for copper. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list

in the Water Quality Limited Segments category. 035357

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 8 samples exceed the Basin Plan water quality objective for copper and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 37862, Copper **Region 9**
Sutherland Reservoir

LOE ID:	859
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected at site SUA-0 by the City of San Diego Water Dept. from January 1996 to December 1998. None of the 8 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for copper is 1.0 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at site SUA-0 at the water surface.
Temporal Representation:	Samples were collected between January 1996 and December 1998. There are four samples for 1996, one for 1997 and three for 1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33234** **Region 9**
Sutherland Reservoir

Pollutant:	**Fluoride**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)

Revision Status	Original	035358
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 19 samples exceed the Basin Plan water quality objective for fluoride.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 19 samples exceed the Basin Plan water quality objective for fluoride and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33234, Fluoride **Region 9**

Sutherland Reservoir

LOE ID:	860
Pollutant:	Fluoride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	19
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data was collected at site SUA-0 by the City of San Diego Water Dept. between March 1996 and September 2000. None of the 19 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Fluoride is 2.4 mg/L when Annual Average of Maximum Daily Air Temperature = <53.8F, 2.2 mg/L when Annual Average of Maximum Daily Air Temperature = 53.8F-58.3F, 2.0 mg/L when Annual Average of Maximum Daily Air Temperature = 58.4F-63.8F, 1.8 mg/L when Annual Average of Maximum Daily Air Temperature = 63.9F-70.6F, 1.6 mg/L when Annual Average of Maximum Daily Air Temperature = 70.7F-79.2F, and 1.4 mg/L when Annual Average of Maximum Daily Air Temperature = 79.3F-90.5F. For inland surface water with all other beneficial uses the WQO for fluoride is 1.0 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)

Evaluation Guideline:		035359
Guideline Reference:		
Spatial Representation:	Samples were collected at site SUA-0 near the water surface.	
Temporal Representation:	Samples were collected on a quarterly basis from March 1996 to September 2000.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID 33051 Region 9

Sutherland Reservoir

Pollutant:	**Mercury**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. The single sample did not exceed the Basin Plan water quality objective for mercury.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. The single sample did not exceed the Basin Plan water quality objective for mercury and this sample size is insufficient to determine with the power and confidence of the Listing Policy if standards are not met. A minimum of 16 samples is needed determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33051, Mercury Region 9

Sutherland Reservoir

LOE ID:	863
Pollutant:	Mercury
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	1	035360
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data was collected at site SUA-0 by the City of San Diego Water Dept. on March 8, 1999. One sample was collected. It was not in exceedance. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for mercury is 0.002mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The sample was collected at site SUA-0 near the water's surface.	
Temporal Representation:	The sample was collected on March 8, 1999.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID **37892** **Region 9**

Sutherland Reservoir

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. None of the 4 samples exceed the Basin Plan water quality objective for nickel. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 4 samples exceed the Basin Plan water quality objective for nickel and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 37892, Nickel **Region 9**

Sutherland Reservoir

LOE ID:	864
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected at site SUA-0 by the City of San Diego Water Dept. from December 1996 to March 2000. Four samples were collected, none were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for nickel is 0.1 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at site SUA-0 near the surface.
Temporal Representation:	Samples were collected between December 1996 and March 2000. There was one sample for each year, excluding 1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33182** **Region 9**

Sutherland Reservoir

Pollutant:	**Pentachlorophenol (PCP)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. The single sample did not exceed the Basin Plan water quality objective for pentachlorophenol.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list

in the Water Quality Limited Segments category. 035362

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. The single sample did not exceed the Basin Plan water quality objective for pentachlorophenol and this sample size is insufficient to determine with the power and confidence of the Listing Policy if standards are not met. A minimum of two samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33182, Pentachlorophenol (PCP) **Region 9**

Sutherland Reservoir

LOE ID:	850
Pollutant:	Pentachlorophenol (PCP)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data was collected at site SUA-0 by the City of San Diego Water Dept. on December 1, 1997. One sample was collected. It was not in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for pentachlorophenol is 0.001mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data was collected at sample site SUA-0 in the Sutherland Reservoir. Sample was collected at the water's surface.
Temporal Representation:	The PCP sample comes from one sampling day, December 1, 1997.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **43623** **Region 9**

Sutherland Reservoir

Pollutant:	**Picloram**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)

Revision Status	Original	035363
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 3 samples exceed the Basin Plan water quality objective for picloram.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 3 samples exceed the Basin Plan water quality objective for picloram and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43623, Picloram **Region 9**

Sutherland Reservoir

LOE ID:	866
Pollutant:	Picloram
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data was collected at site SUA-0 by the City of San Diego Water Dept. between December 1998 and June 2000. Three samples were collected, 0 were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for picloram is 0.5 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at site SUA-0 near the water's surface. 035364
Temporal Representation:	Samples were collected between December 1998 and June 2000. There was one sample for each year.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 37963 Region 9

Sutherland Reservoir

Pollutant:	**Selenium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. None of the 2 samples exceed the Basin Plan water quality objective for selenium. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 2 samples exceed the Basin Plan water quality objective for selenium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 37963, Selenium Region 9

Sutherland Reservoir

LOE ID:	867
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected at site SUA-0 by the City of San Diego Water Dept. on March 3, 1997 and September 2, 1997. None of the 2 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for selenium is 0.05 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at site SUA-0 near the water surface.
Temporal Representation:	Samples were collected on March 3, 1997 and September 2, 1997. One sample was collected each day.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **43151** **Region 9**

Sutherland Reservoir

Pollutant:	**Sulfates**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 22 samples exceed the Basin Plan water quality objective for sulfates.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 22 samples exceed the Basin Plan water quality objective for sulfates and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43151, Sulfates 035366 **Region 9**

Sutherland Reservoir

LOE ID:	868
Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	22
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected at site SUA-0 by the City of San Diego Water Dept. from March 1996 to December 2000. Twenty-two samples were collected. None were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for sulfate is 250 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at site SUA-0 near the water's surface.
Temporal Representation:	Samples were collected on a quarterly basis from March 1996 to December 2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33104** **Region 9**

Sutherland Reservoir

Pollutant:	**Toluene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 3 samples exceed the Basin Plan water quality objective for toluene.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 3 samples exceed the Basin Plan water quality objective for toluene and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33104, Toluene **Region 9**

Sutherland Reservoir

LOE ID:	870
Pollutant:	Toluene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data was collected by the City of San Diego Water Dept. on June 1, 1998, February 8, 1999, and May 3, 1999. Of the 3 samples, none were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Toluene is 0.15 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at site SUA-0 near the surface.
Temporal Representation:	One sample each was collected on June 1, 1998, February 8, 1999, and May 3, 1999.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **44674** **Region 9**

Sutherland Reservoir

Pollutant:	**Total Dissolved Solids**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. One of the 10 samples exceeds the Basin Plan water quality objective for total dissolved solids.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of the 10 samples exceeds the Basin Plan water quality objective for total dissolved solids and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 44674, Total Dissolved Solids **Region 9**

Sutherland Reservoir

LOE ID:	869
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	10
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected at site SUA-0 by the City of San Diego Water Dept. between September 1998 and December 2000. One of 10 samples was in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for TDS is 500 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at site SUA-0 near the water surface.
Temporal Representation:	Samples were collected from September 1998 to December 2000. Two to 5 samples were collected each year.

Environmental Conditions:		035369
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID 33105 Region 9
Sutherland Reservoir

Pollutant:	**Turbidity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Four of the 21 samples exceed the Basin Plan water quality objective for turbidity.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Four of the 21 samples exceed the Basin Plan water quality objective for turbidity and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33105, Turbidity Region 9
Sutherland Reservoir

LOE ID:	871
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	21
Number of Exceedances:	4
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Samples were collected at site SUA-0 by the City of San Diego Water Dept. between March 1996 and December 2000. Four of 21 samples were in exceedance of the WQO for a municipal beneficial use. (SWRCB, 2003).

Data Reference:	Placeholder reference 2006 303(d)	035370
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for turbidity is 5 units. For all other beneficial uses, the WQO is 20 ntu.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at site SUA-0 near the surface.	
Temporal Representation:	Samples were collected on a quarterly basis between March 1996 and December 2000.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID 33118 **Region 9**

Sutherland Reservoir

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the 6 samples exceed the Basin Plan objective for Zinc.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 6 samples exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. The Regional Board will update this decision when new data and information become available and are assessed.

Line of Evidence (LOE) for Decision ID 33118, Zinc **Region 9**

Sutherland Reservoir

LOE ID: 872

Pollutant:	Zinc	035371
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	Total	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	6	
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Data was collected at site SUA-0 by the City of San Diego Water Dept. between January 1996 and March 1999. None of the 6 samples were in exceedance. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for zinc is 5.0 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at site SUA-0 near the surface.	
Temporal Representation:	Samples were collected between January 1996 and March 1999. Four samples were collected in 1996, one in 1998, and one in 1999.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID	44516	Region 9
Sutherland Reservoir		

Pollutant:	**Iron**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Regional Board Conclusion: This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Three of the 23 samples exceed the Basin Plan water quality objective for iron. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.

2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 935372
3. Three of the 23 samples exceed the Basin Plan water quality objective for iron and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

State Board Review and Conclusion:
The Regional Board staff incorrectly assessed iron as a conventional pollutant and applied table 3.2 of the listing Policy. Iron is a toxicant and should be assessed using Table 3.1 . State Water Board staff has corrected this error and revised the recommendation to List for iron. The revised recommendation is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Three of the 23 samples exceed the Basin Plan water quality objective for iron.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Three of the 23 samples exceed the Basin Plan water quality objective for iron and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 44516, Iron **Region 9**

Sutherland Reservoir

LOE ID:	861
Pollutant:	Iron
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	15
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected at site SUA-0 by the City of San Diego Water Dept. from January 1996 to December 2000. One of 15 samples was in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for iron is 0.3 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)

Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at site SUA-0 near the water surface.
Temporal Representation:	Samples were collected between January 1996 and December 2000. There were 2-4 samples per year.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44516, Iron **Region 9**

Sutherland Reservoir

LOE ID:	6179
Pollutant:	Iron
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	2
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	City of San Diego, 2007a. Water Department, Water Quality Monitoring Data for Drinking Source Water Reservoirs. January 2005 to December 2006.
Data Reference:	Water Department, Water Quality Monitoring Data for Drinking Source Water Reservoirs. January 2005 to December 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, inland surface waters designated as domestic or municipal supply, shall not contain concentrations of iron in excess of the secondary maximum contaminant level 0.3 mg/L (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	One surface water sample was collected per sampling event at Sutherland Reservoir at a standard location designated Â“Station AÂ”.
Temporal Representation:	Samples were collected approximately once a month from January 2005 to December 2006; however, some months were not sampled.
Environmental Conditions:	
QAPP Information:	Samples were collected and analyzed according to the Water Quality LaboratoryÂ's Quality Assurance Manual. Applicable field and laboratory Standard Operating Procedures were also provided by the San Diego Water Department.
QAPP Information Reference(s):	

DECISION ID **33050** **Region 9**

Sutherland Reservoir

Pollutant:	**Manganese**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original

Sources:	Source Unknown	035374
Expected TMDL Completion Date:	2019	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess the pollutant. Seven of 19 samples exceed the Basin Plan water quality objective for manganese.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Seven of 19 samples exceed the Basin Plan water quality objective for manganese and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33050, Manganese **Region 9**

Sutherland Reservoir

LOE ID:	862
Pollutant:	Manganese
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	19
Number of Exceedances:	7
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data was collected at site SUA-0 by the City of San Diego Water Dept. from January 1996 to September 2000. Seven of 19 samples were in exceedance and the criteria was exceeded more than 10% of the time in all 5 years.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The water quality objective for manganese in Sutherland Reservoir is 0.05 milligrams/liter (mg/l) according to Basin Plan, Table 3-2 entitled, Water Quality Objectives. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at site SUA-0 near the water's surface.
Temporal Representation:	Samples were collected on a quarterly basis between January 1996 and September 2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 33064 Region 9
Sutherland Reservoir

Pollutant:	**pH**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Ten of 19 samples exceeded the Basin Plan water quality objective for pH.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Ten of 19 samples exceeded the Basin Plan water quality objective for pH and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33064, pH Region 9
Sutherland Reservoir

LOE ID:	865
Pollutant:	pH (high)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	19

Number of Exceedances:	10	035376
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data was collected at site SUA-0 by the City of San Diego Water Dept. between March 1996 and December 2000. Ten of 19 samples were in exceedance.	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for pH is 6.5 (minimum) to 8.5 (maximum).	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at site SUA-0 near the water surface.	
Temporal Representation:	Samples were collected on a quarterly basis between March 1996 and December 2000.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Miramar Reservoir
Water Body ID: CAL9061000020011005142514
Water Body Type: Lake & Reservoir

DECISION ID 43118 **Region 9**
Miramar Reservoir

Pollutant: Nitrogen
Final Listing Decision: Delist from 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Reason for Delisting: Other
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Twenty-six of the 28 samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Twenty-six of the 28 samples exceed the Basin Plan objective and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, additional data and information are available indicating that standards are met.
5. Pursuant to section 6.1.5.3 of the listing policy, data from this Integrated Report cycle is not temporally representative of current conditions within these reservoirs, and thus insufficient information is available to support listing these reservoirs as impaired due to biostimulation from elevated nitrogen. In 2007, as a result of the reservoirsÂ' imported source water, Dreissenid mussels (Â"quaggaÂ") were introduced, resulting drastic changes in reservoir ecosystems and management, including the drafting of management response plans in 2009. The impact of Dreissenid mussels on reservoir ecosystem dynamics, especially nutrient pools and cycling, is dramatic and well documented in the scientific literature. Impacts of Dreissend mussel colonization can vary depending on reservoir dynamics, but typically results in the stripping of nutrients from the phytoplankton and promotion of macrophytes due to increased water clarity. Thus, data collected prior to Dreissenid introduction and management for listing purposes should be further considered as insufficient to make a decision determination.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 43118, Nitrogen **Region 9**
Miramar Reservoir

LOE ID:	6162
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Aquatic Life Use:	Warm Freshwater Habitat
Number of Samples:	28
Number of Exceedances:	26
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Data was collected by the City of San Diego for their Water Quality Monitoring for Drinking Source Water Reservoirs program. Sampling was monthly from January 2005 to December 2006. Twenty eight samples were collected with 26 exceeding the water quality objective.
Data Reference:	Water Department, Water Quality Monitoring Data for Drinking Source Water Reservoirs. January 2005 to December 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. A desired goal in order to prevent plant nuisance in any standing body of water is 0.025 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used. (RWQCB, 2007)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	One surface water sample was collected per sampling event at Miramar Reservoir at a standard location designated Â“Station AÂ”.
Temporal Representation:	Samples were collected approximately once a month from January 2005 to December 2006.
Environmental Conditions:	
QAPP Information:	Samples were collected and analyzed according to the Water Quality LaboratoryÂ's Quality Assurance Manual. Applicable field and laboratory Standard Operating Procedures were also provided by the San Diego Water Department.
QAPP Information Reference(s):	Water Quality Laboratory. Quality Assurance Manual

DECISION ID	**33547**	**Region 9**
Miramar Reservoir		

Pollutant:	**1,1,1-Trichloroethane**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 17 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33547, 1,1,1-Trichloroethane **Region 9**

Miramar Reservoir

LOE ID:	931
Pollutant:	1,1,1-Trichloroethane
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept from 1997 to 2001. None of the 17 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,1,1-Trichloroethane is 0.200 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-0 at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from 01/1997 to 05/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 303(d) assessment.
QAPP Information Reference(s):	

DECISION ID **33926** **Region 9**

Miramar Reservoir

Pollutant: **1,1,2,2-Tetrachloroethane**

Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	035380
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)	
Revision Status	Original	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 17 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33926, 1,1,2,2-Tetrachloroethane — Region 9

Miramar Reservoir

LOE ID:	932
Pollutant:	1,1,2,2-Tetrachloroethane
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 17 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,1,2,2-Tetrachloroethane is 0.001mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-0 at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from 01/1997 to 05/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33199** **Region 9**

Miramar Reservoir

Pollutant:	**1,1,2-Trichloroethane**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 17 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33199, 1,1,2-Trichloroethane **Region 9**

Miramar Reservoir

LOE ID:	933
Pollutant:	1,1,2-Trichloroethane
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 17 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,1,2-Trichloroethane is 0.005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-0 at the surface 035382
Temporal Representation:	Samples were collected on a quarterly basis from 01/1997 to 05/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 34089 Region 9
Miramar Reservoir

Pollutant:	**1,1-Dichloroethylene (DCE)/ Vinylidene Chloride**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 17 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34089, 1,1-Dichloroethylene (DCE)/ Vinylidene Chloride Region 9
Miramar Reservoir

LOE ID:	934
Pollutant:	1,1-Dichloroethylene (DCE)/ Vinylidene Chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept from 1997 to 2001. None of the 17 samples were in exceedance (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for

	1,1-DCE is 0.006 mg/L.	035383
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-0 at the surface.	
Temporal Representation:	Samples were collected on a quarterly basis from 01/1997 to 05/2001.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID 34035 Region 9

Miramar Reservoir

Pollutant:	**1,2,4-Trichlorobenzene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 17 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34035, 1,2,4-Trichlorobenzene Region 9

Miramar Reservoir

LOE ID:	935
Pollutant:	1,2,4-Trichlorobenzene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the

	17 samples were in exceedance.	035384
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,2,4-Trichlorobenzene is 0.07 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-0 at the surface.	
Temporal Representation:	Samples were collected on a quarterly basis from 01/1997 to 05/2001.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID 35101 Region 9

Miramar Reservoir

Pollutant:	**1,2-Dibromo-3-chloropropane (DBCP)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 33 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 35101, 1,2-Dibromo-3-chloropropane (DBCP) Region 9

Miramar Reservoir

LOE ID:	937
Pollutant:	1,2-Dibromo-3-chloropropane (DBCP)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	16
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected from 1997 to 2001 by the City of San Diego Water Dept. None of the 16 samples were in exceedance. EPA method 504 or 505 was used for sample analysis.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface water with a municipal beneficial use, the WQO for 1,2-Dibromo-3-chloropropane is 0.0002 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-0 at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from 03/1997 to 05/2001, except for 09/1999, in which no samples were collected.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 35101, 1,2-Dibromo-3-chloropropane (DBCP) Region 9

Miramar Reservoir

LOE ID:	936
Pollutant:	1,2-Dibromo-3-chloropropane (DBCP)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept from 1997 to 2001. None of the 17 samples were in exceedance. EPA Method 524.2 was used for sample analysis.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface water with a municipal beneficial use, the WQO for 1,2-Dibromo-3-chloropropane is 0.0002 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-0 at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from 01/1997 to 05/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 33771 Region 9

Miramar Reservoir 035386

Pollutant:	**1,2-Dichloroethane**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 17 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33771, 1,2-Dichloroethane — Region 9

Miramar Reservoir

LOE ID:	939
Pollutant:	1,2-Dichloroethane
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 17 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,2-Dichloroethane is 0.0005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-0 at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from 01/1997 to 05/2001.
Environmental Conditions:	

QAPP Information:	Data used in 2002 assessment.	035387
QAPP Information Reference(s):		

DECISION ID	33956	Region 9
Miramar Reservoir		

Pollutant:	**1,2-Dichloroethylene,-trans**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 17 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33956, 1,2-Dichloroethylene,-trans	Region 9
Miramar Reservoir	

LOE ID:	954
Pollutant:	1,2-Dichloroethylene,-trans
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 17 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for trans-1,2-Dichloroethylene is 0.01 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)

Evaluation Guideline:		035388
Guideline Reference:		

Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-0 at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from 01/1997 to 05/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 34630 Region 9

Miramar Reservoir

Pollutant:	**1,2-Dichloropropane**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 17 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34630, 1,2-Dichloropropane Region 9

Miramar Reservoir

LOE ID:	940
Pollutant:	1,2-Dichloropropane
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 17 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)

SWAMP Data:	Non-SWAMP	035389
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,2-Dichloropropane is 0.005 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-0 at the surface.	
Temporal Representation:	Samples were collected on a quarterly basis from 01/1997 to 05/2001.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID 33650 Region 9

Miramar Reservoir

Pollutant:	**Alachlor**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 25 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33650, Alachlor Region 9

Miramar Reservoir

LOE ID:	909
Pollutant:	Alachlor
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	16
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 16 samples were in exceedance. Samples were analyzed using EPA method 525.2 (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Alachlor is 0.002 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-0 at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from 05/1997 to 07/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33650, Alachlor **Region 9**

Miramar Reservoir

LOE ID:	910
Pollutant:	Alachlor
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 9 samples were in exceedance. EPA method 507 was used to analyze samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Alachlor is 0.002 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-0 at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from 03/1997 to 08/1998. 1 sample was collected in 11/2000, and 1 on 02/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 42337 **Region 9**

Miramar Reservoir 035391

Pollutant:	**Aluminum**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 18 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 42337, Aluminum — Region 9

Miramar Reservoir

LOE ID:	873
Pollutant:	Aluminum
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	18
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. None of the 18 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Aluminum is 0.2 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-0.
Temporal Representation:	Samples were collected on a quarterly basis from 01/02/1996 to 09/05/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **43107** **Region 9**

Miramar Reservoir

Pollutant:	**Ammonia**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. An unknown number of the 23 samples exceed the water quality objective for ammonia. The wrong methology was used to assess the data for the listing. The data will be re-assessed in the next listing cycle. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. An unknown number of the 23 samples exceed the water quality objective for ammonia. The wrong methology was used to assess the data for the listing. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43107, Ammonia **Region 9**

Miramar Reservoir

LOE ID:	6161
Pollutant:	Ammonia as Nitrogen
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	23
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Samples were collected by the City of San Diego's Water Quality Monitoring for Drinking Source Water Reservoirs. January 2005 to December 2006. A total of 23 samples were collected with 10 exceeding the water quality objective. The remaining 13 samples were reported as non-detects with a method detection limit of 0.031 mg/l and therefore not used in this line of evidence.
Data Reference:	Water Department, Water Quality Monitoring Data for Drinking Source Water Reservoirs. January 2005 to December 2006

SWAMP Data:	Non-SWAMP	035393
Water Quality Objective/Criterion:	U.S. EPA, 1999 Update of Ambient Water Quality Criteria for Ammonia, EPA-822-R-99-014, December 1999.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	One surface water sample was collected per sampling event at Miramar Reservoir at a standard location designated Â“Station AÂ”.	
Temporal Representation:	Samples were collected approximately once a month from January 2005 to December 2006.	
Environmental Conditions:		
QAPP Information:	Samples were collected and analyzed according to the Water Quality LaboratoryÂ's Quality Assurance Manual. Applicable field and laboratory Standard Operating Procedures were also provided by the San Diego Water Department.	
QAPP Information Reference(s):	Water Quality Laboratory. Quality Assurance Manual	

DECISION ID 33690 Region 9

Miramar Reservoir

Pollutant:	**Antimony**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. One line of evidence is available in the administrative record to assess this pollutant. None of the 9 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33690, Antimony Region 9

Miramar Reservoir

LOE ID:	874
Pollutant:	Antimony
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	035394
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 1998. None of the 9 samples were in exceedance.	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for Antimony is 0.006 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Mirarmar Reservoir site MMA-0.	
Temporal Representation:	Samples were collected on a quarterly basis from 01/02/1996 to 03/03/1998.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID 32986 **Region 9**

Miramar Reservoir

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 19 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32986, Arsenic **Region 9**

Miramar Reservoir

LOE ID:	875
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total

Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	19
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. None of the 19 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for Arsenic is 0.05 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Miramar Reservoir at site MMA-0.
Temporal Representation:	Samples were collected on a quarterly basis from 01/1996 to 09/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 33651 — Region 9

Miramar Reservoir

Pollutant:	**Atrazine**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 22 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33651, Atrazine — Region 9

Miramar Reservoir

LOE ID:	911	035396

Pollutant:	Atrazine
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	13
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 13 samples were in exceedance. EPA method 525.2 was used for sample analysis (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Atrazine is 0.003 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-0 at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from 05/1997 to 12/1998, and once per month in 03/2000, 06/2000, 09/2000,03/2001, 06/2001, and 07/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33651, Atrazine **Region 9**

Miramar Reservoir

LOE ID:	912
Pollutant:	Atrazine
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 9 samples were in exceedance. EPA method 507 was used for sample analysis.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Atrazine is 0.003 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-0 at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from 03/1997 to 08/1998. 1 sample each was also collected in 11/2000, and 02/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 34623 Region 9

Miramar Reservoir

Pollutant:	**Barium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 19 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34623, Barium Region 9

Miramar Reservoir

LOE ID:	876
Pollutant:	Barium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	19
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. None of the 19 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for Barium is 1.0 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Miramar Reservoir site MMA-0.
Temporal Representation:	Samples were collected form 01/02/1996 to 09/05/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 33707 Region 9

Miramar Reservoir

Pollutant:	**Benzene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 17 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33707, Benzene Region 9

Miramar Reservoir

LOE ID:	942
Pollutant:	Benzene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	17
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	035399
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 17 samples were in exceedance.	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Benzene is 0.001 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-0 at the surface.	
Temporal Representation:	Samples were collected on a quarterly basis from 01/1997 to 05/2001.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID 33017 Region 9

Miramar Reservoir

Pollutant:	**Benzo(a)pyrene (3,4-Benzopyrene -7-d)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 17 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33017, Benzo(a)pyrene (3,4-Benzopyrene -7-d) Region 9

Miramar Reservoir

LOE ID:	913
Pollutant:	Benzo(a)pyrene (3,4-Benzopyrene -7-d)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total

Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept from 1997 to 2001. None of the 17 samples were in exceedance (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Benzo(a)pyrene is 0.0002 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-0 at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from 02/04/1997 to 07/10/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 33878 — Region 9

Miramar Reservoir

Pollutant:	**Carbofuran**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 17 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33878, Carbofuran — Region 9

Miramar Reservoir

LOE ID:	955	035401

Pollutant:	Carbofuran
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 17 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Carbofuran is 0.018 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-0 at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from 03/1997 to 07/2001, except for 12/1998 and 06/2000, during which no samples were collected.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment. QA=?
QAPP Information Reference(s):	

DECISION ID	43060	Region 9
Miramar Reservoir		

Pollutant:	**Carbon tetrachloride**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 17 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not

changed. 035402

Line of Evidence (LOE) for Decision ID 43060, Carbon tetrachloride **Region 9**

Miramar Reservoir

LOE ID:	943
Pollutant:	Carbon tetrachloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 17 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Carbon tetrachloride is 0.0005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-0 at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from 01/1997 to 05/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33544** **Region 9**

Miramar Reservoir

Pollutant:	**Chlordane**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 18 samples exceeded the Basin Plan criteria, and this does not exceed the allowable

frequency listed in Table 3.1 of the Listing Policy. 035403
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33544, Chlordane **Region 9**

Miramar Reservoir

LOE ID:	930
Pollutant:	Chlordane
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	10
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 10 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Total Chlordane is 0.0001 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-0 at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from 03/1997 to 03/1998 and once each in 08/1998, 12/1999, 02/2000, 02/2001, and 05/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment. QA=?
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33544, Chlordane **Region 9**

Miramar Reservoir

LOE ID:	929
Pollutant:	Chlordane
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2003. None of the 8 samples were in exceedance. EPA method 525.2 was used for sample analysis.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Total Chlordane is 0.0001 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-0 at the surface.
Temporal Representation:	Data were collected on a quarterly basis from 09/1997 to 12/1998, and once each in 06/2000 and 09/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 43838 Region 9

Miramar Reservoir

Pollutant:	**Chloride**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. None of 21 samples exceed the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 21 samples exceeded the Basin Plan criteria, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43838, Chloride Region 9

Miramar Reservoir

LOE ID:	877
Pollutant:	Chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	21
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. None of the 21 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for Chloride is 250 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data were collected at Miramar Reservoir site MMA-0.
Temporal Representation:	Samples were collected on a quarterly basis from 01/17/1996 to 12/05/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID	33335	Region 9
Miramar Reservoir		

Pollutant:	**Chlorobenzene (mono)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 17 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision	This is a decision previously approved by the State Water Resources Control Board and the USEPA.

Recommendation:	No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33335, Chlorobenzene (mono) **Region 9**

Miramar Reservoir

LOE ID:	944
Pollutant:	Chlorobenzene (mono)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 17 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Chlorobenzene (mono) is 0.07 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-0 st the surface.
Temporal Representation:	Samples were collected on a quarterly basis from 01/1997 to 05/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **32988** **Region 9**

Miramar Reservoir

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	One line of evidence is available in the administrative record to assess this pollutant. None of the 9 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not

changed. 035407

Line of Evidence (LOE) for Decision ID 32988, Chromium **Region 9**

Miramar Reservoir

LOE ID:	878
Pollutant:	Chromium (total)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. None of the 9 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for Chromium is 0.05 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Miramar Reservoir site MMA-0.
Temporal Representation:	Samples were collected 1-3 times per year from 01/02/1996 to 09/05/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33980** **Region 9**

Miramar Reservoir

Pollutant:	**Color**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 255 samples exceeded the Basin Plan criteria, and this does not exceed the allowable

frequency listed in Table 3.2 of the Listing Policy. 035408
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33980, Color **Region 9**

Miramar Reservoir

LOE ID:	880
Pollutant:	Color
LOE Subgroup:	Pollutant-Nuisance
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	61
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. None of the 61 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Color is 15 units.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-GA52.
Temporal Representation:	Samples were collected once in 07/1996, once in 10/1998, once per month from 01/1999 to 12/1999, and 2-4 times per month from 01/2000 to 12/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33980, Color **Region 9**

Miramar Reservoir

LOE ID:	879
Pollutant:	Color
LOE Subgroup:	Pollutant-Nuisance
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	20
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. None of the 20 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Color is 15 units.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Miramar Reservoir site MMA-0.
Temporal Representation:	Samples were collected on a quarterly basis from 03/05/1996 to 12/05/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33980, Color **Region 9**

Miramar Reservoir

LOE ID:	882
Pollutant:	Color
LOE Subgroup:	Pollutant-Nuisance
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	60
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. None of the 60 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Color is 15 units.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-GA81.
Temporal Representation:	Samples were collected once each in 07/1996 and 10/1998, once monthly in 1999 (except for February and July), and 2-5 times monthly in 2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33980, Color **Region 9**

Miramar Reservoir

LOE ID:	881
Pollutant:	Color

LOE Subgroup:	Pollutant-Nuisance	035410
Matrix:	Water	
Fraction:	Total	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	61	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. None of the 61 samples were in exceedance.	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Color is 15 units.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-GA66.	
Temporal Representation:	Samples were collected once in 07/1996, once in 10/1998, once monthly in 1999 (except for February) and 2-5 times per month from 01/2000 to 12/2000.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33980, Color **Region 9**

Miramar Reservoir

LOE ID:	883
Pollutant:	Color
LOE Subgroup:	Pollutant-Nuisance
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	53
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1999 to 2000. None of the 53 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Color is 15 units.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-GA96.
Temporal Representation:	Samples were collected 1-5 times monthly from 04/1999 to 11/2000, except for 11/1999.
Environmental Conditions:	

QAPP Information:	Data used in 2002 assessment.	035411
QAPP Information Reference(s):		

DECISION ID	33654	Region 9
Miramar Reservoir		

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 28 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33654, Copper	Region 9
Miramar Reservoir	

LOE ID:	885
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 2000. None of the 2 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for copper is 1.0 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)

Evaluation Guideline: 035412
Guideline Reference:

Spatial Representation: Samples were collected at Miramar Reservoir station MMA-GA52.
Temporal Representation: One sample each was collected on 05/12/200 and 05/14/2000.
Environmental Conditions:
QAPP Information: Data used in 2002 assessment.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 33654, Copper **Region 9**
Miramar Reservoir

LOE ID: 884

Pollutant: Copper
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 20
Number of Exceedances: 0

Data and Information Type: PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality: Data were collected by the City of San Diego Water Dept. from 1996 to 2000. None of the 20 samples were in exceedance.
Data Reference: Placeholder reference 2006 303(d)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for copper is 1.0 mg/L.
Objective/Criterion Reference: Placeholder reference 2006 303(d)

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Miramar Reservoir at site MMA-0.
Temporal Representation: Samples were collected on a quarterly basis from 01/02/1996 to 09/05/2000.
Environmental Conditions:
QAPP Information: Data used in 2002 assessment.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 33654, Copper **Region 9**
Miramar Reservoir

LOE ID: 886

Pollutant: Copper
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 2
Number of Exceedances: 0

Data and Information Type: PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality: Data were collected by the City of San Diego Water Dept. in 05/2000. None of the 2

samples were in exceedance. 035413

Data Reference: Placeholder reference 2006 303(d)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for copper is 1.0 mg/L.

Objective/Criterion Reference: Placeholder reference 2006 303(d)

Evaluation Guideline:

Guideline Reference:

Spatial Representation: Samples were collected at Miramar Reservoir station MMA-GA66.

Temporal Representation: Samples were collected once each on 05/12/2000 and 05/14/2000.

Environmental Conditions:

QAPP Information: Data used in 2002 assessment.

QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 33654, Copper **Region 9**

Miramar Reservoir

LOE ID: 888

Pollutant: Copper

LOE Subgroup: Pollutant-Water

Matrix: Water

Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 2

Number of Exceedances: 0

Data and Information Type: PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality: Data were collected by the City of San Diego Water Dept in 05/2000. None of the 2 samples were in exceedance.

Data Reference: Placeholder reference 2006 303(d)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for copper is 1.0 mg/L.

Objective/Criterion Reference: Placeholder reference 2006 303(d)

Evaluation Guideline:

Guideline Reference:

Spatial Representation: Samples were collected at Miramar Reservoir station MMA-GA96.

Temporal Representation: One sample each was collected on 05/12/2000 and 05/14/2000.

Environmental Conditions:

QAPP Information: Data used in 2002 assessment.

QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 33654, Copper **Region 9**

Miramar Reservoir

LOE ID: 887

Pollutant: Copper

LOE Subgroup: Pollutant-Water

Matrix: Water

Fraction:	Total	035414
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	2	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 05/2000. None of the 2 samples were in exceedance.	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for copper is 1.0 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-GA81.	
Temporal Representation:	Samples were collected once each on 05/12/2000 and 05/14/2000.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID 33029 Region 9

Miramar Reservoir

Pollutant:	**Endrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 31 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33029, Endrin Region 9

Miramar Reservoir

LOE ID:	914
Pollutant:	Endrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	16
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 16 samples were in exceedance. Samples were analyzed using EPA method 525.2.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Endrin is 0.002 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-0 at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from 05/1997 to 07/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33029, Endrin **Region 9**

Miramar Reservoir

LOE ID:	915
Pollutant:	Endrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	15
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 15 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Endrin is 0.002 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-0 at the surface 035416
Temporal Representation:	Samples were collected on a quarterly basis from 03/1997 to 05/2001 except for 05/2000 and 11/2000, during which months samples were not collected.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 33937 Region 9

Miramar Reservoir

Pollutant:	**Ethylbenzene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 17 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33937, Ethylbenzene Region 9

Miramar Reservoir

LOE ID:	945
Pollutant:	Ethylbenzene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 17 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Ethylbenzene is 0.7 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-0 at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from 01/1997 to 05/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 33655 **Region 9**

Miramar Reservoir

Pollutant:	**Fluoride**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 19 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33655, Fluoride **Region 9**

Miramar Reservoir

LOE ID:	889
Pollutant:	Fluoride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	19
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. None of the 19 samples were in exceedance (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for Fluoride is 1.0 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Miramar Reservoir site MMA-0.
Temporal Representation:	Samples were collected on a quarterly basis from 03/05/1996 to 09/05/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 34034 Region 9

Miramar Reservoir

Pollutant:	**Glyphosate**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 17 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34034, Glyphosate Region 9

Miramar Reservoir

LOE ID:	956
Pollutant:	Glyphosate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total

Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 17 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Glyphosate is 0.7 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-0 at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from 03/1997 to 07/2001, except for 09/1998 and 06/1999, during which months no samples were collected.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 33021 Region 9

Miramar Reservoir

Pollutant:	**Heptachlor**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 29 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33021, Heptachlor Region 9

Miramar Reservoir

LOE ID:	919
Pollutant:	Heptachlor
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	14
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 14 samples were in exceedance. EPA method 504 or 505 was used for sample analysis.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Heptachlor is 0.00001 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-0 at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from 03/1997 to 05/1999 and once each in 12/1999, 02/2000, 02/2001, and 05/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33021, Heptachlor **Region 9**

Miramar Reservoir

LOE ID:	918
Pollutant:	Heptachlor
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	15
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 15 samples were in exceedance. EPA method 525.2 was used for sample analysis.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Heptachlor is 0.00001 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-0 at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from 05/1997 to 06/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 33076 Region 9

Miramar Reservoir

Pollutant:	**Heptachlor epoxide**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 29 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33076, Heptachlor epoxide Region 9

Miramar Reservoir

LOE ID:	917
Pollutant:	Heptachlor epoxide
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	14
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 14 samples were in exceedance. EPA method 504 or 505 was used for sample analysis.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Heptachlor epoxide is 0.00001 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-0 at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from 03/1997 to 05/1999, and once each in 12/1999, 02/2000, 02/2001, and 05/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33076, Heptachlor epoxide **Region 9**

Miramar Reservoir

LOE ID:	916
Pollutant:	Heptachlor epoxide
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	15
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 15 samples were in exceedance. Samples were analyzed using EPA method 525.2.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municpal beneficial use, the WQO for Heptachlor epoxide is 0.00001 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-0 at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from 05/1997 to 06/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **34099** **Region 9**

Miramar Reservoir

Pollutant:	**Hexachlorobenzene/ HCB**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 29 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34099, Hexachlorobenzene/ HCB **Region 9**

Miramar Reservoir

LOE ID:	920
Pollutant:	Hexachlorobenzene/ HCB
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	14
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 14 samples were in exceedance. EPA method 525.2 was used for sample analysis (SWRCB, 2003) .
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Hexachlorobenzene is 0.001 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-0 at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from 05/1997 to 03/2000, and once each in 09/2000, 03/2001, 06/2001, and 07/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 34099, Hexachlorobenzene/ HCB **Region 9**

Miramar Reservoir

LOE ID:	921

Pollutant:	Hexachlorobenzene/ HCB
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	15
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 15 samples were in exceedance. EPA method 504 or 505 was used in sample analysis (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Hexachlorobenzene is 0.001 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-0 at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from 03/1997 to 02/2000 and once each in 02/2001 and 05/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **34100** **Region 9**

Miramar Reservoir

Pollutant:	**Hexachlorocyclopentadiene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 30 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not

changed. 035425

Line of Evidence (LOE) for Decision ID 34100, Hexachlorocyclopentadiene **Region 9**

Miramar Reservoir

LOE ID:	922
Pollutant:	Hexachlorocyclopentadiene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	15
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 15 samples were in exceedance. EPA method 525.2 was used for sample analysis.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Hexachlorocyclopentadiene is 0.05 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-0 at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from 05/1997 to 07/2001, except for 12/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 34100, Hexachlorocyclopentadiene **Region 9**

Miramar Reservoir

LOE ID:	923
Pollutant:	Hexachlorocyclopentadiene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	15
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 15 samples were in exceedance. EPA method 504 or 505 was used for sample analysis.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for

	Hexachlorocyclopentadiene is 0.05 mg/L.	035426
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-0 at the surface.	
Temporal Representation:	Samples were collected on a quarterly basis from 03/1997 to 02/2000 and once each in 02/2001 and 05/2001.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID 33531 **Region 9**

Miramar Reservoir

Pollutant:	**Iron**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. One line of evidence is available in the administrative record to assess this pollutant. None of the 11 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33531, Iron **Region 9**

Miramar Reservoir

LOE ID:	890
Pollutant:	Iron
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	11
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. None of the 11 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)

SWAMP Data:	Non-SWAMP	035427
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for iron is 0.3 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Miramar Reservoir site MMA-0.	
Temporal Representation:	Samples were collected on a quarterly basis from 07/16/1996 to 09/05/2000.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID	35100	Region 9
Miramar Reservoir		

Pollutant:	**Lindane/gamma Hexachlorocyclohexane (gamma-HCH)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: One line of evidence is available in the administrative record to assess this pollutant. None of the 7 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 35100, Lindane/gamma Hexachlorocyclohexane (gamma-HCH)	**Region 9**
Miramar Reservoir	

LOE ID:	959
Pollutant:	Lindane/gamma Hexachlorocyclohexane (gamma-HCH)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1999 to 2001. None of the 7 samples were in exceedance.

Data Reference:	Placeholder reference 2006 303(d)	035428
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Lindane is 0.0002 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-0 at the surface.	
Temporal Representation:	Samples were collected on a quarterly basis from 02/1999 to 02/2000 and once each in 02/2001 and 05/2001.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID 33750 Region 9

Miramar Reservoir

Pollutant:	**Manganese**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of the 22 samples exceeded the Basin Plan criteria and one year had exceedances more than 10% of the time. This does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33750, Manganese Region 9

Miramar Reservoir

LOE ID:	891
Pollutant:	Manganese
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	22
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. One of the 22 samples was in exceedance. One year had samples which exceeded 0.05 mg/L more than 10% of the time.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The water quality objective for manganese in Miramar Reservoir is 0.05 milligrams/liter (mg/l) according to Basin Plan, Table 3-2 entitled, Water Quality Objectives. This concentration is not be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Miramar Reservoir site MMA-0.
Temporal Representation:	Samples were collected from 01/02/1996 to 09/05/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 33617 — Region 9

Miramar Reservoir

Pollutant:	**Methoxychlor**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 31 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33617, Methoxychlor — Region 9

Miramar Reservoir

LOE ID:	924	035430

Pollutant:	Methoxychlor
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	16
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 16 samples were in exceedance. EPA method 525.2 was used for sample analysis.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Methoxychlor is 0.04 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-0 at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from 05/1997 to 07/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33617, Methoxychlor **Region 9**

Miramar Reservoir

LOE ID:	925
Pollutant:	Methoxychlor
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	15
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2000. None of the 15 samples were in exceedance. Samples were analyzed using EPA method 504 or 505.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Methoxychlor is 0.04 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-0 at the surface.

Temporal Representation:	Samples were collected on a quarterly basis from 03/1997 to 02/2000 and once each in 02/2001 and 05/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 34020 Region 9

Miramar Reservoir

Pollutant:	**Molinate**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: One line of evidence is available in the administrative record to assess this pollutant. None of the 9 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34020, Molinate Region 9

Miramar Reservoir

LOE ID:	958
Pollutant:	Molinate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of 9 samples were in exceedance. EPA method 507 was used for sample analysis.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Molinate is 0.02 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	

Guideline Reference:	035432
Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-0 at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from 03/1997 to 08/1998. One sample each was collected in 11/2000 and 02/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 33802 Region 9

Miramar Reservoir

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: One line of evidence is available in the administrative record to assess this pollutant. None of the 13 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33802, Nickel Region 9

Miramar Reservoir

LOE ID:	892
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	13
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 1999. None of the 13 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for Nickel is 0.1 mg/L.

Objective/Criterion Reference:	Placeholder reference 2006 303(d)	035433
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Miramar Reservoir site MMA-0.	
Temporal Representation:	Samples were collected on a quarterly basis from 01/02/1996 to 06/08/1999.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID 34043 — Region 9

Miramar Reservoir

Pollutant:	**Oxamyl (Vydate)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 17 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34043, Oxamyl (Vydate) — Region 9

Miramar Reservoir

LOE ID:	957
Pollutant:	Oxamyl (Vydate)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 17 samples were in exceedance.

Data Reference:	Placeholder reference 2006 303(d)	035434
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Oxamyl is 0.2 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-0 at the surface.	
Temporal Representation:	Samples were collected on a quarterly basis from 02/1997 to 07/2001, except for 12/1998 and 06/2000, during which months, no samples were collected.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID 33649 Region 9

Miramar Reservoir

Pollutant:	**PCBs (Polychlorinated biphenyls)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: One line of evidence is available in the administrative record to assess this pollutant. None of the 11 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33649, PCBs (Polychlorinated biphenyls) Region 9

Miramar Reservoir

LOE ID:	908
Pollutant:	PCBs (Polychlorinated biphenyls)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	11
Number of Exceedances:	0

Data and Information Type:	Not Specified	035435
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 1997. A total of 11 samples were collected. Eight different PCBs were sampled. No single PCB levels exceeded the standard, nor did the sum of the PCB measurements exceed the standard. Samples were analyzed using EPA method 525.2.	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for PCBs is 0.0005 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-0 at the surface.	
Temporal Representation:	Samples were collected on both 02/04/1997 and 05/06/1997 or just 05/06/1997.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID	32982	Region 9
Miramar Reservoir		

Pollutant:	**Pentachlorophenol (PCP)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the eight samples exceed the Basin Plan Water Quality Objective for Pentachlorophenol (PCP). Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the eight samples exceeded the Basin plan Water Quality Objective for Pentachlorophenol (PCP) and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32982, Pentachlorophenol (PCP) 035436 **Region 9**

Miramar Reservoir

LOE ID:	926
Pollutant:	Pentachlorophenol (PCP)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 8 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Pentachlorophenol is 0.001 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-0 at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from 05/1997 to 06/1998, and once each in 12/1998, 03/2000, and 09/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **32887** **Region 9**

Miramar Reservoir

Pollutant:	**Picloram**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: One line of evidence is available in the administrative record to assess this pollutant. A single sample was collected and it did not exceed the Basin Plan criteria, but the number of samples is insufficient to determine with the confidence and power required by the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not

changed. 035437

Line of Evidence (LOE) for Decision ID 32887, Picloram **Region 9**

Miramar Reservoir

LOE ID:	894
Pollutant:	Picloram
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 12/1998. One sample was collected, it was not in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Picloram is 0.5 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-0.
Temporal Representation:	One sample was collected on 12/08/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **34038** **Region 9**

Miramar Reservoir

Pollutant:	**Selenium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

One line of evidence is available in the administrative record to assess this pollutant. None of the 13 samples exceed the Basin Plan criteria, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34038, Selenium — Region 9

Miramar Reservoir

LOE ID:	895
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	13
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. None of the 13 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for Selenium is 0.05 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-0.
Temporal Representation:	Samples were collected on a quarterly basis from 01/02/1996 to 09/05/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 33618 — Region 9

Miramar Reservoir

Pollutant:	**Simazine**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.035439
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 21 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33618, Simazine **Region 9**

Miramar Reservoir

LOE ID:	927
Pollutant:	Simazine
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 12 samples were in exceedance. EPA method 525.2 was used for sample analysis.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Simazine is 0.004 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-0 at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from 02/1997 to 12/1998. Samples were also collected once each in 06/2000, 09/2000, 03/2001, and 07/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33618, Simazine **Region 9**

Miramar Reservoir

LOE ID:	928
Pollutant:	Simazine
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9

Number of Exceedances:	0	035440
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 9 samples were in exceedance.	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Simazine is 0.004 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-0 at the surface.	
Temporal Representation:	Samples were collected on a quarterly basis from 03/1997 to 11/1999, and once each in 11/2000 and 02/2001.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID 34039 Region 9

Miramar Reservoir

Pollutant:	**Sodium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 17 samples exceeded the Basin Plan criteria, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34039, Sodium Region 9

Miramar Reservoir

LOE ID:	896

Pollutant:	Sodium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. None of the 17 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for Sodium is 60%. This percent is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	Percent sodium was calculated according to the Basin Plan, using measured sodium, magnesium, calcium and potassium concentrations.
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-0.
Temporal Representation:	Percent Sodium was calculated using samples collected on a quarterly basis from 06/04/1996 to 09/05/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID	**43034**	**Region 9**
Miramar Reservoir		

Pollutant:	**Styrene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 17 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision	This is a decision previously approved by the State Water Resources Control Board and the USEPA.

Recommendation: No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43034, Styrene — Region 9

Miramar Reservoir

LOE ID:	947
Pollutant:	Styrene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 17 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Styrene is 0.1 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-0 at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from 01/1997 to 05/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 33533 — Region 9

Miramar Reservoir

Pollutant:	**Sulfates**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Two of the 21 samples exceed the Basin Plan Objective for Sulfates.

Based on the readily available data and information, the weight of evidence indicates that there is

sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Two of 21 samples exceeded the Basin Plan Objective for Sulfates and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33533, Sulfates **Region 9**

Miramar Reservoir

LOE ID:	897
Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	21
Number of Exceedances:	2
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. Two of 21 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for Sulfate is 250 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-0.
Temporal Representation:	Samples were collected on a quarterly basis from 01/17/1996 to 12/05/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33854** **Region 9**

Miramar Reservoir

Pollutant:	**Tetrachloroethylene/PCE**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final	Do Not List on 303(d) list (TMDL required list)(2012)

Listing Decision:		035444
Revision Status	Original	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 17 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33854, Tetrachloroethylene/PCE **Region 9**

Miramar Reservoir

LOE ID:	948
Pollutant:	Tetrachloroethylene/PCE
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 17 samples were in exceedance (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Tetrachloroethylene is 0.005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-0 at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from 01/1997 to 05/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33611** **Region 9**

Miramar Reservoir 035445

Pollutant:	**Toluene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 18 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33611, Toluene — Region 9

Miramar Reservoir

LOE ID:	900
Pollutant:	Toluene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 17 samples were in exceedance. Samples were analyzed using EPA method 524.2.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Toluene is 0.15 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-0 at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from 01/1997 to 05/2001.
Environmental Conditions:	

QAPP Information:	Data used in 2002 assessment.	035446
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33611, Toluene **Region 9**

Miramar Reservoir

LOE ID:	899
Pollutant:	Toluene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 02/1999. One sample was collected, it was not in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Toluene is 0.15 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-0.
Temporal Representation:	One sample was collected on 02/02/1999.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33519** **Region 9**

Miramar Reservoir

Pollutant:	**Total Dissolved Solids**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.

3. Seven of 13 samples exceeded the Basin Plan criteria, and these exceed the allowable frequency listed in Table 3.2 of the Listing Policy. At the October 25th Water Board meeting, comments were received concerning total dissolved solids in terminal reservoirs in the San Diego region. The Board concluded that it was inappropriate to list these water bodies based on secondary MCLs when the TDS values of the incoming supplying waters were higher than the MCLs. Narrative standards are therefore met.
4. On October 25, 2006, the State Water Board decided that narrative standards are met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33519, Total Dissolved Solids **Region 9**

Miramar Reservoir

LOE ID:	898
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	13
Number of Exceedances:	7
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1998 to 2001. Seven of the 13 samples were in exceedance. At the October 25th Water Board meeting, comments were received concerning total dissolved solids in terminal reservoirs in the San Diego region. The Board concluded that it was inappropriate to list these water bodies based on secondary MCLs when the TDS values of the incoming supplying waters were higher than the MCLs. Narrative standards are therefore met.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for TDS is 500 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-0.
Temporal Representation:	Samples were collected on a quarterly basis from 09/01/1998 to 07/10/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **34021** **Region 9**

Miramar Reservoir

Pollutant:	**Toxaphene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)

Revision Status	Original	035448
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the 12 samples exceed the Basin Plan Objective for Toxaphene.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 12 samples exceeded the Basin Plan Objective for Toxaphene and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34021, Toxaphene **Region 9**

Miramar Reservoir

LOE ID:	960
Pollutant:	Toxaphene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 12 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO forToxaphene is 0.003 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-0 at the surface.

Temporal Representation:	Samples were collected on a quarterly basis from 03/1997 to 03/1998 and once each in 08/1998, 02/1999, 09/1999, 12/1999, 02/2000, 02/2001, and 05/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID	33914	Region 9
Miramar Reservoir		

Pollutant:	**Trichloroethylene/TCE**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 17 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33914, Trichloroethylene/TCE	Region 9
Miramar Reservoir	

LOE ID:	949
Pollutant:	Trichloroethylene/TCE
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 17 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for

	Trichloroethylene is 0.005 mg/L.	035450
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-0 at the surface.	
Temporal Representation:	Samples were collected on a quarterly basis from 01/1997 to 05/2001.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID 33915 Region 9

Miramar Reservoir

Pollutant:	**Trichlorofluoromethane (CFC-11)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 17 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33915, Trichlorofluoromethane (CFC-11) Region 9

Miramar Reservoir

LOE ID:	950
Pollutant:	Trichlorofluoromethane (CFC-11)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the

	17 samples were in exceedance.	035451
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Trichlorofluoromethane is 0.15 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-0 at the surface.	
Temporal Representation:	Samples were collected on a quarterly basis from 01/1997 to 05/2001.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID 33612 — Region 9

Miramar Reservoir

Pollutant:	**Turbidity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 420 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33612, Turbidity — Region 9

Miramar Reservoir

LOE ID:	905
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	54
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1999 to 2000. None of the 54 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Turbidity is 5 ntu.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-GA96.
Temporal Representation:	Samples were collected 1-5 times monthly from 04/1999 to 11/2000 (except for 11/1999).
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33612, Turbidity **Region 9**

Miramar Reservoir

LOE ID:	904
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	115
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. None of the 115 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Turbidity is 5 ntu.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-GA81.
Temporal Representation:	Samples were collected 1-5 times per month from 01/1996 to 12/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33612, Turbidity **Region 9**

Miramar Reservoir

LOE ID:	901
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	20
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. None of the 20 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Turbidity is 5 ntu.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-0.
Temporal Representation:	Samples were collected on a quarterly basis from 03/05/1996 ro 12/05/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33612, Turbidity **Region 9**

Miramar Reservoir

LOE ID:	902
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	116
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. None of the 116 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Turbidity is 5 ntu.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-GA52. 035454
Temporal Representation:	Samples were collected 1-5 times monthly from 01/04/1996 to 12/12/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33612, Turbidity **Region 9**

Miramar Reservoir

LOE ID:	903
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	115
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. None of the 115 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Turbidity is 5 ntu.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-GA66.
Temporal Representation:	Samples were collected 1-5 times per month from 01/1996 to 12/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 34419 **Region 9**

Miramar Reservoir

Pollutant:	**Uranium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the 3 samples exceed the Basin Plan objective for Uranium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 3 samples exceeded the Basin Plan objective for Uranium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34419, Uranium **Region 9**

Miramar Reservoir

LOE ID:	906
Pollutant:	Uranium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 1998. None of the 3 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Uranium is 20 pCi/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-0.
Temporal Representation:	Samples were collected once each in May, July and October 1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33548** **Region 9**

Miramar Reservoir

Pollutant:	**Vinyl chloride**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final	Do Not List on 303(d) list (TMDL required list)(2012)

Listing Decision:		035456
Revision Status	Original	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 17 samples exceeded the Basin Plan objectives, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33548, Vinyl chloride **Region 9**

Miramar Reservoir

LOE ID:	951
Pollutant:	Vinyl chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 17 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Vinyl Chloride is 0.0005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-0 at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from 01/1997 to 05/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33613** **Region 9**

Miramar Reservoir 035457

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the 3 samples exceed the objective for Zinc. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 3 samples exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33613, Zinc — Region 9

Miramar Reservoir

LOE ID:	907
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 1996 and 1997. None of the 3 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal benefical use, the WQO for zinc is 5.0 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Miramar Reservoir station MMA-0.
Temporal Representation: Three samples were collected, one in 01/1996, one in 09/1996, and one in 09/1997.
Environmental Conditions:
QAPP Information: Data used in 2002 assessment.
QAPP Information Reference(s):

DECISION ID 33549 Region 9
Miramar Reservoir

Pollutant: **cis-1,2-Dichloroethylene**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Original
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 17 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33549, cis-1,2-Dichloroethylene Region 9
Miramar Reservoir

LOE ID: 952

Pollutant: cis-1,2-Dichloroethylene
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 17
Number of Exceedances: 0

Data and Information Type: PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality: Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 17 samples were in exceedance.
Data Reference: Placeholder reference 2006 303(d)

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for cis-1,2-Dichloroethylene is 0.006 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-0 at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from 01/1997 to 05/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 33639 Region 9

Miramar Reservoir

Pollutant:	**meta-para xylenes**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 17 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33639, meta-para xylenes Region 9

Miramar Reservoir

LOE ID:	953
Pollutant:	meta-para xylenes
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	17

Number of Exceedances:	0	035460
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 17 samples were in exceedance.	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Xylenes is 1.750 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:	MCL is for either a single isomer or the sum of the isomers. Incorporations by reference are prospective including future changes to the incorporated provisions as the changes take effect.	
Guideline Reference:	Placeholder reference 2006 303(d)	
Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-0 at the surface.	
Temporal Representation:	Samples were collected on a quarterly basis from 01/1997 to 05/2001.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID 34025 Region 9

Miramar Reservoir

Pollutant:	**o-Dichlorobenzene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 17 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34025, o-Dichlorobenzene Region 9

Miramar Reservoir

LOE ID:	938

Pollutant:	o-Dichlorobenzene	035461
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	Total	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	17	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 17 samples were in exceedance.	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,2-dichlorobenzene is 0.6 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-0 at the surface.	
Temporal Representation:	Samples were collected on a quarterly basis from 01/1997 to 05/2001.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID	**33853**	**Region 9**
Miramar Reservoir		

Pollutant:	**o-Xylene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 17 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33853, o-Xylene 035462 **Region 9**

Miramar Reservoir

LOE ID:	946
Pollutant:	o-Xylene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 17 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Xylenes is 1.750 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	MCL is for either a single isomer or the sum of the isomers. Incorporations by reference are prospective including future changes to the incorporated provisions as the changes take effect.
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-0 at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from 01/1997 to 05/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **32987** **Region 9**

Miramar Reservoir

Pollutant:	**p-Dichlorobenzene (DCB)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 17 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.

4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32987, p-Dichlorobenzene (DCB) **Region 9**

Miramar Reservoir

LOE ID:	941
Pollutant:	p-Dichlorobenzene (DCB)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 17 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for p-Dichlorobenzene is 0.005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Miramar Reservoir station MMA-0 at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from 01/1997 to 05/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33684** **Region 9**

Miramar Reservoir

Pollutant:	**pH**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.

2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 935464
3. None of the 20 samples exceeded the Basin Plan criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 33684, pH **Region 9**

Miramar Reservoir

LOE ID:	893
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	20
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. None of the 20 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for pH is 6.5 (minimum) to 8.5 (maximum).
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Miramar Reservoir site MMA-0.
Temporal Representation:	Samples were collected on a quarterly basis from 03/05/1996 to 12/05/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Murray Reservoir
Water Body ID: CAL9071100020011005142858
Water Body Type: Lake & Reservoir

DECISION ID 42320 **Region 9**
Murray Reservoir

Pollutant: Nitrogen
Final Listing Decision: Delist from 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Reason for Delisting: Other
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Twenty-two of the twenty eight samples exceed the Basin Plan water quality objective for total nitrogen as N.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Twenty-two of the twenty eight samples exceed the Basin Plan water quality objective for total nitrogen as N from 2005 to 2006 and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, additional data and information are available indicating that standards are met.
5. Pursuant to section 6.1.5.3 of the listing policy, data from this Integrated Report cycle is not temporally representative of current conditions within these reservoirs, and thus insufficient information is available to support listing these reservoirs as impaired due to biostimulation from elevated nitrogen. In 2007, as a result of the reservoirsÂ' imported source water, Dreissenid mussels (Â"quaggaÂ") were introduced, resulting drastic changes in reservoir ecosystems and management, including the drafting of management response plans in 2009. The impact of Dreissenid mussels on reservoir ecosystem dynamics, especially nutrient pools and cycling, is dramatic and well documented in the scientific literature. Impacts of Dreissend mussel colonization can vary depending on reservoir dynamics, but typically results in the stripping of nutrients from the phytoplankton and promotion of macrophytes due to increased water clarity. Thus, data collected prior to Dreissenid introduction and management for listing purposes should be further considered as insufficient to make a decision determination.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 42320, Nitrogen **Region 9**

Murray Reservoir 035466

LOE ID:	6169
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Aquatic Life Use:	Warm Freshwater Habitat
Number of Samples:	28
Number of Exceedances:	22
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Samples were collected by the City of San Diego's Water Quality Monitoring Data for their Drinking Source Water Reservoirs program. Sampling period was from January 2005 to December 2006. Twenty two of the 28 samples exceeded the water quality objective.
Data Reference:	Water Department, Water Quality Monitoring Data for Drinking Source Water Reservoirs. January 2005 to December 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. A desired goal in order to prevent plant nuisance in any standing body of water is 0.025 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used. (RWQCB, 2007)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	One surface water sample was collected per sampling event at Lake Murray Reservoir at a standard location designated Â“Station AÂ”.
Temporal Representation:	Samples were collected once or twice a month from January 2005 to December 2006.
Environmental Conditions:	
QAPP Information:	Samples were collected and analyzed according to the Water Quality LaboratoryÂ's Quality Assurance Manual. Applicable field and laboratory Standard Operating Procedures were also provided by the San Diego Water Department.
QAPP Information Reference(s):	Water Quality Laboratory. Quality Assurance Manual

DECISION ID **33495** **Region 9**

Murray Reservoir

Pollutant:	**pH**
Final Listing Decision:	**Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Reason for Delisting:	Flaws in original listing

Impairment from Pollutant or Pollution:	Pollutant	035467
Regional Board Conclusion:	This pollutant is being considered for removal from the CWA section 303(d) List under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status. Nine lines of evidence are available in the administrative record to assess this pollutant. Fourteen of the 88 samples exceeded the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for removing this water segment-pollutant combination from the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Fourteen of 88 samples exceeded the objective, and this does not exceed the allowable frequency listed in Table 4.2 of the Listing Policy. 4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.	
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be removed from the section 303(d) list because applicable water quality standards for the pollutant are not being exceeded.	

Line of Evidence (LOE) for Decision ID 33495, pH **Region 9**

Murray Reservoir

LOE ID:	981
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. on 09/25/1997 and 01/29/1998. None of the 6 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for pH is 6.5 (maximum) to 8.5 (minimum).
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected in the Murray Watershed, drainage MURDS, station MUR5B.
Temporal Representation:	Samples were collected on 09/25/1997 at 12:58pm and on 01/29/1998 from 15:13-15:16pm.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33495, pH **Region 9**

Murray Reservoir 035468

LOE ID:	982
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	10
Number of Exceedances:	3
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 03/1997 and 05/1997. Three of 10 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for pH is 6.5 (maximum) to 8.5 (minimum).
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected in the Murray Watershed, drainage MURDS, station MUR7.
Temporal Representation:	Samples were collected on 03/12/1997 at 14:47 and 14:48pm and on 05/28/1997 at 8:41-8:48pm.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33495, pH **Region 9**

Murray Reservoir

LOE ID:	983
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	25
Number of Exceedances:	10
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 09/1997 to 02/1998. Ten of 25 samples were in exceedance. The samples collected in 09/18/1997 and in 01/1998 were in exceedance, but those collected on all other days met standards.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for pH is 6.5 (maximum) to 8.5 (minimum).
Objective/Criterion Reference:	Placeholder reference 2006 303(d)

Evaluation Guideline:	035469
Guideline Reference:	
Spatial Representation:	Samples were collected in Murray Watershed, drainage MURDS, station MUR8b.
Temporal Representation:	Samples were collected on 09/18/1997 and 09/25/1997. Samples were also collected on 12/10/1997, 01/29/1998, and 02/04/1998.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33495, pH **Region 9**

Murray Reservoir

LOE ID:	984
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 1998. None of the 8 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for pH is 6.5 (maximum) to 8.5 (minimum).
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murray Reservoir stations 2a and 2b.
Temporal Representation:	Samples were collected on 01/29/1998 and on 02/04/1998. On each day, 3-5 samples were collected within 5 minutes.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33495, pH **Region 9**

Murray Reservoir

LOE ID:	976
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	18
Number of Exceedances:	1

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	035470
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. One of 18 samples was in exceedance.	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for pH is 6.5 (maximum) to 8.5 (minimum).	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Murray Reservoir site MUA-0.	
Temporal Representation:	Samples were collected 2-4 times per year from 03/1996 to 12/2000.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33495, pH **Region 9**

Murray Reservoir

LOE ID:	977
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 09/1997. None of the 3 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for pH is 6.5 (maximum) to 8.5 (minimum).
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murray watershed, drainage MURDS, station MBP5.
Temporal Representation:	Samples were collected on 09/25/1997 at 13:41.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33495, pH **Region 9**

Murray Reservoir

LOE ID:	978
Pollutant:	pH

LOE Subgroup:	Pollutant-Water	035471
Matrix:	Water	
Fraction:	Total	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	6	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 05/1997. None of the 6 samples were in exceedance.	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for pH is 6.5 (maximum) to 8.5 (minimum).	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Murray watershed, drainage MURDS, station MUR1A.	
Temporal Representation:	Samples were collected on 05/28/1997 from 07:35am to 07:42am.	
Environmental Conditions:		
QAPP Information:	QA Info Missing	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33495, pH **Region 9**

Murray Reservoir

LOE ID:	979
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 09/1997. None of the 3 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for pH is 6.5 (maximum) to 8.5 (minimum).
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Murray watershed, drainage MURDS, station MUR1B.
Temporal Representation:	Samples were collected on 09/26/1997 at 12:28pm.
Environmental Conditions:	
QAPP Information:	QA Info Missing

QAPP Information Reference(s): 035472

Line of Evidence (LOE) for Decision ID 33495, pH **Region 9**

Murray Reservoir

LOE ID:	980
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 03/1997 and 05/1997. None of the 9 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for pH is 6.5 (maximum) to 8.5 (minimum).
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected in the Murray Watershed, drainage MURDS, station MUR4A.
Temporal Representation:	Samples were collected on 03/12/1997 at 13:54 and 13:55 and 05/28/1997 from 8:03am to 8:08am.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

DECISION ID **32589** **Region 9**

Murray Reservoir

Pollutant:	**1,1,1-Trichloroethane**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. None of the 18 samples exceed the Basin Plan water quality objective for 1,1,1-Trichloroethane . Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list

in the Water Quality Limited Segments category. 035473

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 18 samples exceed the Basin Plan water quality objective for 1,1,1-Trichloroethane and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32589, 1,1,1-Trichloroethane **Region 9**

Murray Reservoir

LOE ID:	1013
Pollutant:	1,1,1-Trichloroethane
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	18
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 18 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,1,1-Trichloroethane is 0.200 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murray Reservoir station A at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from 01/1997 to 08/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33632** **Region 9**

Murray Reservoir

Pollutant:	**1,1,2,2-Tetrachloroethane**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 18 samples exceed the Basin Plan water quality objective for 1,1,2,2-Tetrachloroethane.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 18 samples exceed the Basin Plan water quality objective for 1,1,2,2-Tetrachloroethane and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33632, 1,1,2,2-Tetrachloroethane **Region 9**

Murray Reservoir

LOE ID:	1014
Pollutant:	1,1,2,2-Tetrachloroethane
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	18
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 18 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,1,2,2-Tetrachloroethane is 0.001 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murray Reservoir station A at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from 01/1997 to 08/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33941** **Region 9**

Murray Reservoir

Pollutant:	**1,1,2-Trichloroethane**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. None of the 18 samples exceed the Basin Plan water quality objective for 1,1,2-Trichloroethane. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 18 samples exceed the Basin Plan water quality objective for 1,1,2-Trichloroethane and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33941, 1,1,2-Trichloroethane **Region 9**

Murray Reservoir

LOE ID:	1015
Pollutant:	1,1,2-Trichloroethane
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	18
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 18 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for

	1,1,2-Trichloroethane is 0.005 mg/L.	035476
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Murray Reservoir station A at the surface.	
Temporal Representation:	Samples were collected on a quarterly basis from 01/1997 to 08/2001.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID 34019 Region 9

Murray Reservoir

Pollutant:	**1,1-Dichloroethylene (DCE)/ Vinylidene Chloride**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 18 samples exceed the Basin Plan water quality objective for 1,1-Dichloroethylene.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 18 samples exceed the Basin Plan water quality objective for 1,1-Dichloroethylene and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34019, 1,1-Dichloroethylene (DCE)/ Vinylidene Chloride Region 9

Murray Reservoir

LOE ID:	1016
Pollutant:	1,1-Dichloroethylene (DCE)/ Vinylidene Chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	18
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 18 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1.1-DCE is 0.006 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murray Reservoir station A at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from 01/1997 to 08/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **44631** **Region 9**

Murray Reservoir

Pollutant:	**1,2,4-Trichlorobenzene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 18 samples exceed the Basin Plan water quality objective for 1,2,4-Trichlorobenzene.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 18 samples exceed the Basin Plan water quality objective for 1,2,4-Trichlorobenzene and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 44631, 1,2,4-Trichlorobenzene 035478 Region 9

Murray Reservoir

LOE ID:	1017
Pollutant:	1,2,4-Trichlorobenzene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	18
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 18 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,2,4-Trichlorobenzene is 0.07 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murray Reservoir station A at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from 01/1997 to 08/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 34082 Region 9

Murray Reservoir

Pollutant:	**1,2-Dibromo-3-chloropropane (DBCP)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. None of the 34 samples exceed the Basin Plan water quality objective for 1,2-Dibromo-3-chloropropane.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.035479
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 34 samples exceed the Basin Plan water quality objective for 1,2-Dibromo-3-chloropropane and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34082, 1,2-Dibromo-3-chloropropane (DBCP) **Region 9**

Murray Reservoir

LOE ID:	1019
Pollutant:	1,2-Dibromo-3-chloropropane (DBCP)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	16
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 16 samples were in exceedance. EPA methods 504 and/or 505 were used for sample analysis. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,2-Dibromo-3-chloropropane is 0.0002 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murray Reservoir station A at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from 03/1997 to 05/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 34082, 1,2-Dibromo-3-chloropropane (DBCP) **Region 9**

Murray Reservoir

LOE ID:	1018
Pollutant:	1,2-Dibromo-3-chloropropane (DBCP)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	18	035480
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 18 samples were in exceedance. EPA method 524.2 was used for sample analysis. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,2-Dibromo-3-chloropropane is 0.0002 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Murray Reservoir station A at the surface.	
Temporal Representation:	Samples were collected on a quarterly basis from 01/1997 to 08/2001.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID	43965	Region 9
Murray Reservoir		

Pollutant:	**1,2-Dichloroethane**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. None of the 18 samples exceed the Basin Plan water quality objective for 1,2-Dichloroethane. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 18 samples exceed the Basin Plan water quality objective for 1,2-Dichloroethane and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43965, 1,2-Dichloroethane 035481 Region 9

Murray Reservoir

LOE ID:	1021
Pollutant:	1,2-Dichloroethane
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	18
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 18 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,2-Dichloroethane is 0.0005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murray Reservoir station A at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from 01/1997 to 08/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 33287 Region 9

Murray Reservoir

Pollutant:	**1,2-Dichloroethylene,-trans**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 18 samples exceed the Basin Plan water quality objective for trans-1,2-Dichloroethylene.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.035482
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 18 samples exceed the Basin Plan water quality objective for trans-1,2-Dichloroethylene and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33287, 1,2-Dichloroethylene,-trans **Region 9**

Murray Reservoir

LOE ID:	1036
Pollutant:	1,2-Dichloroethylene,-trans
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	18
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 18 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for trans-1,2-Dichloroethylene is 0.01 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murray Reservoir station A at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from 01/07/1997 to 08/07/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33521** **Region 9**

Murray Reservoir

Pollutant:	**1,2-Dichloropropane**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 18 samples exceed the Basin Plan water quality objective for 1,2-Dichloropropane.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 18 samples exceed the Basin Plan water quality objective for 1,2-Dichloropropane and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33521, 1,2-Dichloropropane **Region 9**

Murray Reservoir

LOE ID:	1022
Pollutant:	1,2-Dichloropropane
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	18
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 18 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,2-Dichloropropane is 0.005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murray Reservoir station A at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from 01/1997 to 08/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33619** **Region 9**

Murray Reservoir

Pollutant:	**Alachlor**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. None of the 25 samples exceed the Basin Plan water quality objective for Alachlor.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 25 samples exceed the Basin Plan water quality objective for Alachlor and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33619, Alachlor **Region 9**

Murray Reservoir

LOE ID:	1038
Pollutant:	Alachlor
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	16
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 16 samples were in exceedance. Samples were analyzed using EPA method 525.2. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Alachlor is 0.002 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)

Evaluation Guideline:		035485
Guideline Reference:		
Spatial Representation:	Samples were collected at Murray Reservoir station A at the surface.	
Temporal Representation:	Samples were collected on a quarterly basis from 05/02/1997 to 07/10/2001.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33619, Alachlor **Region 9**

Murray Reservoir

LOE ID:	1039
Pollutant:	Alachlor
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2000. None of the 9 samples were in exceedance. Samples were analyzed using EPA methods 507 and/or 531.1. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Alachlor is 0.002 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murray Reservoir station A at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from 03/1997 to 08/1998 and twice in 2000 (once in August and once in November).
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **32688** **Region 9**

Murray Reservoir

Pollutant:	**Aluminum**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 15 samples exceed the Basin Plan water quality objective for aluminum.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 15 samples exceed the Basin Plan water quality objective for aluminum and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32688, Aluminum **Region 9**

Murray Reservoir

LOE ID:	961
Pollutant:	Aluminum
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	15
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. None of the 15 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Aluminmum is 0.2 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murray Reservoir site MUA-0.
Temporal Representation:	Samples were collected 3-4 times per year from 01/1996 to 09/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **44560** **Region 9**

Murray Reservoir

Pollutant:	**Ammonia**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**

Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)	035487
Revision Status	Original	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. An unknown number of the 10 samples exceed the water quality objective for ammonia as N. The wrong methology was used to assess the data. The data will be assessed for exceedences of the water quality objective during the next listing cycle.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Ten of the 10 samples exceed the water quality objective for ammonia as N. The wrong methodology was used to assess the data.
4. Pursuant to section 4.11 of the Listing Policy, additional data and information are available indicating that standards are met.
5. Pursuant to section 6.1.5.3 of the listing policy, data from this Integrated Report cycle is not temporally representative of current conditions within these reservoirs, and thus insufficient information is available to support listing these reservoirs as impaired due to elevated nitrogen. In 2007, as a result of the reservoirsÂ' imported source water, Dreissenid mussels (Â"quaggaÂ") were introduced, resulting drastic changes in reservoir ecosystems and management, including the drafting of management response plans in 2009. The impact of Dreissenid mussels on reservoir ecosystem dynamics, especially nutrient pools and cycling, is dramatic and well documented in the scientific literature. Impacts of Dreissend mussel colonization can vary depending on reservoir dynamics, but typically results in the stripping of nutrients from the phytoplankton and promotion of macrophytes due to increased water clarity. Thus, data collected prior to Dreissenid introduction and management for listing purposes should be further considered as insufficient to make a decision determination.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 44560, Ammonia **Region 9**

Murray Reservoir

LOE ID:	6167
Pollutant:	Ammonia as Nitrogen
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	10
Number of Exceedances:	10
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Samples were collected by the City of San Diego for their Water Quality Monitoring Data for Drinking Source Water Reservoirs report. Sampling period was from January 2005 to December 2006.

	A total of 23 samples were collected. Thirteen samples were recorded as non detects but the method detection limits were above the water quality objective. The remaining 10 samples were all above the objective.
Data Reference:	Water Department, Water Quality Monitoring Data for Drinking Source Water Reservoirs. January 2005 to December 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan the WQO for un-ionized ammonia (NH3) for inland surface waters is 0.025mg/L (as N) (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	One surface water sample was collected per sampling event at Murray Reservoir at a standard location designated Â“Station AÂ”.
Temporal Representation:	Samples were collected once or twice a month from January 2005 to December 2006.
Environmental Conditions:	
QAPP Information:	Samples were collected and analyzed according to the Water Quality LaboratoryÂ's Quality Assurance Manual. Applicable field and laboratory Standard Operating Procedures were also provided by the San Diego Water Department.
QAPP Information Reference(s):	Water Quality Laboratory. Quality Assurance Manual

DECISION ID	**32689**	**Region 9**
Murray Reservoir		

Pollutant:	**Antimony**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. None of the six samples exceed the Basin Plan water quality objective for antimony. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the six samples exceed the Basin Plan water quality objective for antimony and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not

changed. 035489

Line of Evidence (LOE) for Decision ID 32689, Antimony **Region 9**

Murray Reservoir

LOE ID:	962
Pollutant:	Antimony
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 1997. None of the 6 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for Antimony is 0.006 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murray Reservoir site MUA-0.
Temporal Representation:	Three samples were collected per year from 01/1996 to 09/1997.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **42762** **Region 9**

Murray Reservoir

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 15 samples exceed the Basin Plan water quality objective for arsenic.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list

in the Water Quality Limited Segments category. 035490

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 15 samples exceed the Basin Plan water quality objective for arsenic and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 42762, Arsenic **Region 9**

Murray Reservoir

LOE ID:	963
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	15
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. None of the 15 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for arsenic is 0.05 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murray Reservoir site MUA-0.
Temporal Representation:	Two of the 4 samples were collected per year from 01/1996 to 09/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33799** **Region 9**

Murray Reservoir

Pollutant:	**Atrazine**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original

Impairment from Pollutant or Pollution:	Pollutant	035491
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. None of the 23 samples exceed the Basin Plan water quality objective for atrazine. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 23 samples exceed the Basin Plan water quality objective for atrazine and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.	
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.	

Line of Evidence (LOE) for Decision ID 33799, Atrazine **Region 9**

Murray Reservoir

LOE ID:	1040
Pollutant:	Atrazine
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	14
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of 14 samples were in exceedance. Samples were analyzed using EPA method 525.5. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Atrazine is 0.003 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murray Reservoir station A at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from 05/02/1997 to 07/10/2001, with the exception of 03/1999 and 12/1999 samples (which were not collected).

Environmental Conditions: 035492
QAPP Information: Data used in 2002 assessment.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 33799, Atrazine **Region 9**
Murray Reservoir

LOE ID: 1041

Pollutant: Atrazine
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 9
Number of Exceedances: 0

Data and Information Type: PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality: Data were collected by the City of San Diego Water Dept. from 1997 to 2000. None of the 9 samples were in exceedance. Analyses were conducted using EPA methods 507 and/or 531.1. (SWRCB, 2003).
Data Reference: Placeholder reference 2006 303(d)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Atrazine is 0.003 mg/L.
Objective/Criterion Reference: Placeholder reference 2006 303(d)

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Murray Reservoir station A at the surface.
Temporal Representation: Samples were collected on a quarterly basis from 03/1997 to 08/1998. One sample was collected in 08/2000, and one in 11/2000.

Environmental Conditions:
QAPP Information: Data used in 2002 assessment.
QAPP Information Reference(s):

DECISION ID 32650 **Region 9**
Murray Reservoir

Pollutant: **Barium**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Original
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 17 samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 17 samples exceed the water quality objective and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32650, Barium **Region 9**
Murray Reservoir

LOE ID:	964
Pollutant:	Barium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. None of the 17 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for Barium is 1.0 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murray Reservoir site MUA-0.
Temporal Representation:	Two of 4 samples were collected per year from 01/1996 to 09/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33665** **Region 9**
Murray Reservoir

Pollutant:	**Benzene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original

Impairment from Pollutant or Pollution:	Pollutant	035494
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. None of the 18 samples exceed the Basin Plan water quality objective for benzene. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 18 samples exceed the Basin Plan water quality objective for benzene and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.	
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.	

Line of Evidence (LOE) for Decision ID 33665, Benzene **Region 9**

Murray Reservoir

LOE ID:	1024
Pollutant:	Benzene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	18
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 18 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Benzene is 0.001 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murray Reservoir station A at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from 01/1997 to 08/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.

QAPP Information Reference(s): 035495

DECISION ID **44561** **Region 9**

Murray Reservoir

Pollutant:	**Benzo(a)pyrene (3,4-Benzopyrene -7-d)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 14 samples exceed the Basin Plan water quality objective for benzo(a)pyrene.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 14 samples exceed the Basin Plan water quality objective for benzo(a)pyrene and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 44561, Benzo(a)pyrene (3,4-Benzopyrene -7-d) **Region 9**

Murray Reservoir

LOE ID:	1042
Pollutant:	Benzo(a)pyrene (3,4-Benzopyrene -7-d)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	14
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 14 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Benzo(a)pyrene is 0.0002 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murray Reservoir at station A at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from 02/04/1997 to 07/10/2001, except for 12/1999, 12/2000, and 03/2001 (in which months samples were not collected).
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 33608 Region 9

Murray Reservoir

Pollutant:	**Carbofuran**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 15 samples exceed the Basin Plan water quality objective for carbofuran.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 15 samples exceed the Basin Plan water quality objective for carbofuran and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33608, Carbofuran Region 9

Murray Reservoir

LOE ID:	1060

Pollutant:	Carbofuran
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	15
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 15 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Carbofuran is 0.018 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murray Reservoir station A at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from 03/1997 to 07/2001, except for 08/1998, 11/1999, 08/2000, and 11/2000, for which months samples measurements were not reported.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID	33812	Region 9
Murray Reservoir		

Pollutant:	**Carbon tetrachloride**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 18 samples exceed the Basin Plan water quality objective for carbon tetrachloride.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 18 samples exceed the Basin Plan water quality objective for carbon tetrachloride and

this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 035498
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33812, Carbon tetrachloride **Region 9**

Murray Reservoir

LOE ID:	1025
Pollutant:	Carbon tetrachloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	18
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 18 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Carbon Tetrachloride is 0.0005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murray Reservoir station A at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from 01/1997 to 08/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33607** **Region 9**

Murray Reservoir

Pollutant:	**Chlordane**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. None of the 20 samples exceed the Basin Plan water quality objective for chlordane.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 20 samples exceed the Basin Plan water quality objective for chlordane and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33607, Chlordane **Region 9**

Murray Reservoir

LOE ID:	1058
Pollutant:	Chlordane
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2000. None of the 9 samples were in exceedance. EPA method 525.2 was used for sample analysis. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Total Chlordane is 0.0001 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murray Reservoir station A at the surface.
Temporal Representation:	Samples were collected 2-4 times per year from 09/1997 to 12/2000. No samples were collected in 1999.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33607, Chlordane **Region 9**

Murray Reservoir

LOE ID:	1059

Pollutant:	Chlordane
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	11
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 11 samples were in exceedance. EPA methods 504 and/or 505 were used for sample analysis. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Total Chlordane is 0.0001 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murray Reservoir station A at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from 03/1997 to 08/1998. One sample each was collected in 12/1999, 02/2000, 02/2001, and 05/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **32652** **Region 9**

Murray Reservoir

Pollutant:	**Chloride**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 22 samples exceed the Basin Plan water quality objective for chloride.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 22 samples exceed the Basin Plan water quality objective for chloride and this sample

size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32652, Chloride **Region 9**

Murray Reservoir

LOE ID:	965
Pollutant:	Chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	22
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2001. None of the 22 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters in HA 907.11 with a municipal beneficial use, the WQO for chloride is 400 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murray Reservoir site MUA-0.
Temporal Representation:	Samples were collected 2-5 times per year from 03/1996 to 06/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **34065** **Region 9**

Murray Reservoir

Pollutant:	**Chlorobenzene (mono)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 18 samples exceed the Basin Plan water quality objective for chlorobenzene (mono).

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 18 samples exceed the Basin Plan water quality objective for chlorobenzene (mono) and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34065, Chlorobenzene (mono) **Region 9**

Murray Reservoir

LOE ID:	1026
Pollutant:	Chlorobenzene (mono)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	18
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 18 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Chlorobenzene (mono) is 0.07 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murray Reservoir station A at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from 01/1997 to 08/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **32881** **Region 9**

Murray Reservoir

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the eight samples exceed the Basin Plan water quality objective for chromium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the eight samples exceed the Basin Plan water quality objective for chromium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 32881, Chromium **Region 9**

Murray Reservoir

LOE ID:	966
Pollutant:	Chromium (total)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. None of the 8 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for chromium is 0.05 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at Murray Reservoir site MUA-0.	035504
Temporal Representation:	Samples were collected twice per year from 01/1996 to 09/2000. No samples were collected in 1999.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID	32819	Region 9
Murray Reservoir		

Pollutant:	**Color**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. Four lines of evidence are available in the administrative record to assess this pollutant. None of the 190 samples exceed the Basin Plan water quality objective for color. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 190 samples exceed the Basin Plan water quality objective for color and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32819, Color	Region 9
Murray Reservoir	

LOE ID:	967
Pollutant:	Color
LOE Subgroup:	Pollutant-Nuisance
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. None of 17 samples was in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Color is 15 units.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murray Reservoir site MUA-0.
Temporal Representation:	Samples were collected 2-4 times per year from 03/1996 to 12/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 32819, Color **Region 9**

Murray Reservoir

LOE ID:	968
Pollutant:	Color
LOE Subgroup:	Pollutant-Nuisance
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	57
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. None of the 57 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Color is 15 units.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murray Reservoir site MUA-GA49.
Temporal Representation:	One to 2 samples per year were collected in 1996-1998. Five samples were collected in 1999, and samples were collected 3-4 times monthly for the entire year in 2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment. QA=?
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 32819, Color **Region 9**

Murray Reservoir

LOE ID:	969
Pollutant:	Color

LOE Subgroup:	Pollutant-Nuisance	035506
Matrix:	Water	
Fraction:	Total	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	58	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. None of the 58 samples were in exceedance. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Color is 15 units.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Murray Reservoir site MUA-GA62.	
Temporal Representation:	One to 2 samples per year were collected in 1996-1998. 5 samples were collected in 1999, and samples were collected 3-4 times monthly for the entire year in 2000.	
Environmental Conditions:		
QAPP Information:	QA Info Missing	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 32819, Color **Region 9**

Murray Reservoir

LOE ID:	970
Pollutant:	Color
LOE Subgroup:	Pollutant-Nuisance
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	58
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. None of the 58 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Color is 15 units.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murray Reservoir site MUA-GA75.
Temporal Representation:	One to 2 samples per year were collected in 1996-1998. Five samples were collected in 1999, and samples were collected 3-4 times monthly for the entire year in 2000.

Environmental Conditions: 035507
QAPP Information: Data used in 2002 assessment.
QAPP Information Reference(s):

DECISION ID	32820	Region 9
Murray Reservoir		

Pollutant: **Copper**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Original
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 14 samples exceed the Basin Plan water quality objective for copper.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 14 samples exceed the Basin Plan water quality objective for copper and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32820, Copper	Region 9
Murray Reservoir	

LOE ID: 971

Pollutant: Copper
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 14
Number of Exceedances: 0

Data and Information Type: PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality: Data were collected by the City of San Diego Water Dept. from 1996 to 2000. None of the

	14 samples were in exceedance. (SWRCB, 2003).	035508
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for copper is 1.0 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Murray Reservoir site MUA-0.	
Temporal Representation:	Samples were collected 1-4 times per year from 01/1996 to 09/2000.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID	33610	Region 9
Murray Reservoir		

Pollutant:	**Endrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. None of the 28 samples exceed the Basin Plan water quality objective for endrin. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 28 samples exceed the Basin Plan water quality objective for endrin and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33610, Endrin	Region 9
Murray Reservoir	

LOE ID:	1043

Pollutant:	Endrin	035509
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	Total	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	15	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 15 samples were in exceedance. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Endrin is 0.002 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Murray Reservoir station A at the surface.	
Temporal Representation:	Samples were collected on a quarterly basis from 05/02/1997 to 07/10/2001, except for 03/2001, in which no samples were collected.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33610, Endrin **Region 9**

Murray Reservoir

LOE ID:	1044
Pollutant:	Endrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	13
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 13 samples were in exceedance. EPA methods 504 and/or 505 were used for sample analysis. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Endrin is 0.002 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murray Reservoir station A at the surface.

Temporal Representation:	Samples were collected on a quarterly basis from 03/1997 to 02/1999. One sample each was collected in 12/1999, 02/2000, 02/2001, and 05/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 34066 Region 9

Murray Reservoir

Pollutant:	**Ethylbenzene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. None of the 18 samples exceed the Basin Plan water quality objective for ethylbenzene. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 18 samples exceed the Basin Plan water quality objective for ethylbenzene and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34066, Ethylbenzene Region 9

Murray Reservoir

LOE ID:	1027
Pollutant:	Ethylbenzene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	18
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the

	18 samples were in exceedance. (SWRCB, 2003).	035511
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Ethylbenzene is 0.7 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Murray Reservoir station A at the surface.	
Temporal Representation:	Samples were collected on a quarterly basis from 01/1997 to 08/2001.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID 32703 Region 9

Murray Reservoir

Pollutant:	**Fluoride**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 17 samples exceed the Basin Plan water quality objective for flouride.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 17 samples exceed the Basin Plan water quality objective for flouride and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32703, Fluoride Region 9

Murray Reservoir

LOE ID: 972

Pollutant:	Fluoride	035512
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	Total	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	17	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. None of the 17 samples was in exceedance. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for Fluoride is 1.0 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Murray Reservoir site MUA-0.	
Temporal Representation:	Two to 4 samples were collected per year from 03/1996 to 09/2000.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID **32586** **Region 9**

Murray Reservoir

Pollutant:	**Glyphosate**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence available in the administrative record to assess this pollutant. None of the 16 samples exceed the Basin Plan water quality objective for glyphosate.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 16 samples exceed the Basin Plan water quality objective for glyphosate and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available

indicating that standards are not met. 035513

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32586, Glyphosate **Region 9**

Murray Reservoir

LOE ID:	1012
Pollutant:	Glyphosate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	16
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 16 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for glyphosate is 0.7 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murray Reservoir, station A at the surface.
Temporal Representation:	Samples were collected 2-4 times per year (on a somewhat quarterly basis) from 03/1997 to 07/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **43568** **Region 9**

Murray Reservoir

Pollutant:	**Heptachlor**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. None of the 27 samples exceed the Basin Plan water quality objective for Heptachlor.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 27 samples exceed the Basin Plan water quality objective for Heptachlor and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43568, Heptachlor **Region 9**

Murray Reservoir

LOE ID:	1048
Pollutant:	Heptachlor
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	13
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 13 samples were in exceedance. EPA methods 504 and/or 505 were used for sample analysis. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Heptachlor is 0.00001 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murray Reservoir station A at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from 03/1997 to 02/1999. One sample each was collected in 12/1999, 02/2000, 02/2001, and 05/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43568, Heptachlor **Region 9**

Murray Reservoir

LOE ID:	1047

Pollutant:	Heptachlor
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	14
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 14 samples were in exceedance. EPA method 525.2 was used for sample analysis. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Heptachlor is 0.00001 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murray Reservoir station A at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from 05/1997 to 03/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33625** **Region 9**

Murray Reservoir

Pollutant:	**Heptachlor epoxide**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. None of the 27 samples exceed the Basin Plan water quality objective heptachlor epoxide.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 27 samples exceed the Basin Plan water quality objective heptachlor epoxide and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.

4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33625, Heptachlor epoxide **Region 9**

Murray Reservoir

LOE ID:	1045
Pollutant:	Heptachlor epoxide
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	14
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 14 samples were in exceedance. EPA method 525.2 was used for sample analysis. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Heptachlor epoxide is 0.00001 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murray Reservoir station A at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from 05/1997 to 03/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33625, Heptachlor epoxide **Region 9**

Murray Reservoir

LOE ID:	1046
Pollutant:	Heptachlor epoxide
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	13
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the

	13 samples were in exceedance. EPA methods 504 and/or 505 were used for sample analysis.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Heptachlor epoxide is 0.00001 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murray Reservoir station A at the surface. (SWRCB, 2003).
Temporal Representation:	Samples were collected on a quarterly basis from 03/1997 to 02/1999. One sample each was collected in 12/1999, 02/2000, 02/2001, and 05/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID	**44034**	**Region 9**
Murray Reservoir		

Pollutant:	**Hexachlorobenzene/ HCB**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. None of the 28 samples exceed the Basin Plan water quality objective for hexachlorobenzene. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 28 samples exceed the Basin Plan water quality objective for hexachlorobenzene and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 44034, Hexachlorobenzene/ HCB	**Region 9**
Murray Reservoir	

LOE ID:	1049	035518

Pollutant:	Hexachlorobenzene/ HCB
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	15
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 15 samples were in exceedance. EPA method 525.2 was used for sample analysis. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Hexachlorobenzene is 0.001 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murray Reservoir station A at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from 05/1997 to 07/2001, except for 06/2000, in which no samples were reported.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44034, Hexachlorobenzene/ HCB **Region 9**

Murray Reservoir

LOE ID:	1050
Pollutant:	Hexachlorobenzene/ HCB
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	13
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 13 samples were in exceedance. EPA methods 504 and/or 505 were used for sample analysis. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Hexachlorobenzene is 0.001 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	

Guideline Reference:	035519
Spatial Representation:	Samples were collected at Murray Reservoir station A at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from 03/1997 to 02/1999. One sample each was collected in 12/1999, 02/2000, 02/2001, and 05/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 33876 Region 9

Murray Reservoir

Pollutant:	**Hexachlorocyclopentadiene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. None of the 29 samples exceed the Basin Plan water quality objective for hexachlorocyclopentadiene. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 29 samples exceed the Basin Plan water quality objective for hexachlorocyclopentadiene and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33876, Hexachlorocyclopentadiene Region 9

Murray Reservoir

LOE ID:	1052
Pollutant:	Hexachlorocyclopentadiene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	13

Number of Exceedances:	0	035520

Data and Information Type: PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality: Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 13 samples were in exceedance. EPA methods 504 and/or 505 were used for sample analysis. (SWRCB, 2003).
Data Reference: Placeholder reference 2006 303(d)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Hexachlorocyclopentadiene is 0.05 mg/L.
Objective/Criterion Reference: Placeholder reference 2006 303(d)

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Murray Reservoir station A at the surface.
Temporal Representation: Samples were collected on a quarterly basis from 03/1997 to 02/1999. One sample each was collected in 12/1999, 02/2000, 02/2001, and 05/2001.
Environmental Conditions:
QAPP Information: Data used in 2002 assessment.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 33876, Hexachlorocyclopentadiene **Region 9**

Murray Reservoir

LOE ID: 1051

Pollutant: Hexachlorocyclopentadiene
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 16
Number of Exceedances: 0

Data and Information Type: PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality: Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 16 samples were in exceedance. EPA method 525.2 was used for sample analysis. (SWRCB, 2003).
Data Reference: Placeholder reference 2006 303(d)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Hexachlorocyclopentadiene is 0.05 mg/L.
Objective/Criterion Reference: Placeholder reference 2006 303(d)

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Murray Reservoir station A at the surface.
Temporal Representation: Samples were collected on a quarterly basis from 05/1997 to 07/2001.
Environmental Conditions:
QAPP Information: Data used in 2002 assessment.
QAPP Information Reference(s):

DECISION ID 42321 **Region 9**

Murray Reservoir 035521

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Three of the 24 samples exceed the Basin Plan water quality objective for fresh water geomean density for E. coli and one of the 99 samples exceed the Basin Plan water quality objective for fresh water designated as a moderately or lightly used area, single sample maximum allowable density for E. coli.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Three of the 24 samples exceed the Basin Plan water quality objective for fresh water geomean density for E. coli and one of the 99 samples exceed the Basin Plan water quality objective for fresh water designated as a moderately or lightly used area, single sample maximum allowable density for E. coli and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 42321, Indicator Bacteria — Region 9

Murray Reservoir

LOE ID:	26989
Pollutant:	Escherichia coli (E. coli)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	24
Number of Exceedances:	3
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Samples were collected by the City of San Diego for their Water Quality Monitoring Data for Drinking Source Water Reservoirs. Samples were collected from January 2005 to December 2006. Of the 24 geomeans, three exceeded the water quality objective.
Data Reference:	Water Department, Water Quality Monitoring Data for Drinking Source Water Reservoirs.

	January 2005 to December 2006	035522

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In fresh water the geometric mean shall not exceed 126 per 100 mL.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	One surface water sample was collected per sampling event at Murray Reservoir at a standard location designated Â“Station AÂ”.
Temporal Representation:	Samples were collected once or twice a month from January 2005 to December 2006.
Environmental Conditions:	
QAPP Information:	Samples were collected and analyzed according to the Water Quality LaboratoryÂ's Quality Assurance Manual. Applicable field and laboratory Standard Operating Procedures were also provided by the San Diego Water Department.
QAPP Information Reference(s):	Water Quality Laboratory. Quality Assurance Manual

Line of Evidence (LOE) for Decision ID 42321, Indicator Bacteria **Region 9**

Murray Reservoir

LOE ID:	6168
Pollutant:	Escherichia coli (E. coli)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	99
Number of Exceedances:	1
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Samples were collected by the City of San Diego for their Water Quality Monitoring Data for Drinking Source Water Reservoirs. Samples were collected from January 2005 to December 2006. Of the 99 single samples collected, only one exceeded the water quality objective.
Data Reference:	Water Department, Water Quality Monitoring Data for Drinking Source Water Reservoirs. January 2005 to December 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In fresh water designated as a moderately or lightly used area, the single sample maximum allowable density for E. coli is 406 per 100 mL.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	One surface water sample was collected per sampling event at Murray Reservoir at a standard location designated Â“Station AÂ”.
Temporal Representation:	Samples were collected once or twice a month from January 2005 to December 2006.
Environmental Conditions:	
QAPP Information:	Samples were collected and analyzed according to the Water Quality LaboratoryÂ's Quality Assurance Manual. Applicable field and laboratory Standard Operating Procedures were also provided by the San Diego Water Department.
QAPP Information Reference(s):	Water Quality Laboratory. Quality Assurance Manual

DECISION ID	32704	035523 Region 9
Murray Reservoir		

Pollutant:	**Iron**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. One of the 15 samples exceed the Basin Plan water quality objective for iron. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of the 15 samples exceed the Basin Plan water quality objective for iron and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32704, Iron	**Region 9**
Murray Reservoir	

LOE ID:	973
Pollutant:	Iron
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	15
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. One of the 15 samples was in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for iron is 0.3 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murray Reservoir site MUA-0.
Temporal Representation:	Two of 4 samples were collected per year from 06/1996 to 12/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 33844 Region 9

Murray Reservoir

Pollutant:	**Lindane/gamma Hexachlorocyclohexane (gamma-HCH)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the five samples exceed the Basin Plan water quality objective for lindane.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the five samples exceed the Basin Plan water quality objective for lindane and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33844, Lindane/gamma Hexachlorocyclohexane (gamma-HCH) Region 9

Murray Reservoir

LOE ID:	1063
Pollutant:	Lindane/gamma Hexachlorocyclohexane (gamma-HCH)
LOE Subgroup:	Pollutant-Water

Matrix:	Water	035525
Fraction:	Total	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	5	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1999 to 2001. None of the 5 samples were in exceedance. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Lindane is 0.0002 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Murray Reservoir station A at the surface.	
Temporal Representation:	Samples were collected 2 times in 1999 (once in February and once in December), once in 02/2000, and twice in 2001 (once in February and once in May).	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID	43050	Region 9
Murray Reservoir		

Pollutant:	**Manganese**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 21 samples exceed the Basin Plan water quality objective for manganese.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 21 samples exceed the Basin Plan water quality objective for manganese and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43050, Manganese **Region 9**

Murray Reservoir

LOE ID:	974
Pollutant:	Manganese
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	21
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. None of the 21 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The water quality objective for manganese in Murray Reservoir is 0.05 milligrams/liter (mg/l) according to Basin Plan, Table 3-2 entitled, Water Quality Objectives. This concentration is not be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murray Reservoir site MUA-0.
Temporal Representation:	Two to 7 samples were collected per year form 01/1996 to 09/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33666** **Region 9**

Murray Reservoir

Pollutant:	**Methoxychlor**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. None of the 27 samples exceed the Basin Plan water quality objective for methoxychlor.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 27 samples exceed the Basin Plan water quality objective for methoxychlor and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33666, Methoxychlor **Region 9**

Murray Reservoir

LOE ID:	1053
Pollutant:	Methoxychlor
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	14
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 14 samples were in exceedance. EPA method 525.2 was used for sample analysis. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Methoxychlor is 0.04 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murray Reservoir station A at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from 05/1997 to 07/2001, except for 12/200 and 03/2001, in which months samples were not reported.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33666, Methoxychlor **Region 9**

Murray Reservoir

LOE ID:	1054
Pollutant:	Methoxychlor
LOE Subgroup:	Pollutant-Water

Matrix:	Water	035528
Fraction:	Total	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	13	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 13 samples were in exceedance. EPA methods 504 and/or 505 were used in sample analysis. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Methoxychlor is 0.04 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Murray Reservoir station A at the surface.	
Temporal Representation:	Samples were collected on a quarterly basis from 03/1997 to 02/1999. One sample each was collected in 12/1999, 02/2000, 02/2001, and 05/2001.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID	**33823**	**Region 9**
Murray Reservoir		

Pollutant:	**Molinate**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the nine samples exceed the Basin Plan water quality objective for molinate.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the nine samples exceed the Basin Plan water quality objective for molinate and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.

4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33823, Molinate **Region 9**

Murray Reservoir

LOE ID:	1061
Pollutant:	Molinate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2000. None of the 9 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Molinate is 0.02 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murray Reservoir station A at the surface.
Temporal Representation:	Samples were collected from 1997 to 2000. Samples were collected on a quarterly basis from 03/1997 to 08/1998, and once in 08/2000 and 11/2000. No samples were reported for 1999.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **32518** **Region 9**

Murray Reservoir

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the

Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. 03/31/10

One line of evidence is available in the administrative record to assess this pollutant. None of the 11 samples exceed the Basin Plan water quality objective for nickel.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 11 samples exceed the Basin Plan water quality objective for nickel and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32518, Nickel **Region 9**

Murray Reservoir

LOE ID:	975
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	11
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 1998. None of the 11 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for Nickel is 0.1 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murray Reservoir site MUA-0.
Temporal Representation:	Samples were collected 3-4 times per year from 01/1996 to 12/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **43339** **Region 9**

Murray Reservoir 035531

Pollutant:	**Oxamyl (Vydate)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 15 samples exceed the Basin Plan water quality objective for oxamyl.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 15 samples exceed the Basin Plan water quality objective for oxamyl and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43339, Oxamyl (Vydate) — Region 9

Murray Reservoir

LOE ID:	1062
Pollutant:	Oxamyl (Vydate)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	15
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 15 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Oxamyl is 0.2 mg/L.

Objective/Criterion Reference:	Placeholder reference 2006 303(d)	035532
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Murray Reservoir station A at the surface.	
Temporal Representation:	Samples were collected from 1997 to 2001. Samples were collected on a quarterly basis from 03/1997 to 06/1998. One sample each was also collected in 09/1998, 03/1999, 12/1999, 03/2000, and 09/2000. One sample was collected every 1-2 months from 12/2000 to 07/2001.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID 42730 Region 9

Murray Reservoir

Pollutant:	**Oxygen, Dissolved**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Eight lines of evidence are available in the administrative record to assess this pollutant. Nine of the 70 samples exceed the Basin Plan water quality objective for dissolved oxygen.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Nine of the 70 samples exceed the Basin Plan water quality objective for dissolved oxygen and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 42730, Oxygen, Dissolved Region 9

Murray Reservoir

LOE ID:	1009
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved

Beneficial Use:	Municipal & Domestic Supply	035533
Number of Samples:	10	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 03/1997 and 05/1997. None of the 10 samples were in exceedance. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: Dissolved oxygen levels shall not be less than 5.0 mg/l in inland surface waters with designated MAR or WARM beneficial uses or less than 6.0 mg/l in waters with designated COLD beneficial uses. The annual mean dissolved oxygen concentrations shall not be less than 7 mg/l more than 10% of the time.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected in the Murray Watershed, drainage MURDS, station MUR7.	
Temporal Representation:	Samples were collected on 03/12/1997 at 14:47 and 14:48pm and 05/28/1997 from 8:41 to 8:48am.	
Environmental Conditions:		
QAPP Information:	QA Info Missing	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 42730, Oxygen, Dissolved **Region 9**

Murray Reservoir

LOE ID:	1008
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 09/1997 and 01/1998. None of the 6 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: Dissolved oxygen levels shall not be less than 5.0 mg/l in inland surface waters with designated MAR or WARM beneficial uses or less than 6.0 mg/l in waters with designated COLD beneficial uses. The annual mean dissolved oxygen concentrations shall not be less than 7 mg/l more than 10% of the time.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected in the Murray watershed at drainage MURDS, station MUR5b.
Temporal Representation:	Samples were collected on 09/25/1997 at 12:58 pm and on 01/29/1998 from 15:13to 15:16pm.

Environmental Conditions: 035534
QAPP Information: QA Info Missing
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 42730, Oxygen, Dissolved **Region 9**

Murray Reservoir

LOE ID: 1007

Pollutant: Oxygen, Dissolved
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Dissolved

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 9
Number of Exceedances: 9

Data and Information Type: PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality: Data were collected by the City of San Diego Water Dept. in 03/1997 and 05/1997. Nine of 9 samples were in exceedance, 2 of 2 averages were in exceedance (when the average of the samples in each day is calculated). (SWRCB, 2003).
Data Reference: Placeholder reference 2006 303(d)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: From the Basin Plan: Dissolved oxygen levels shall not be less than 5.0 mg/l in inland surface waters with designated MAR or WARM beneficial uses or less than 6.0 mg/l in waters with designated COLD beneficial uses. The annual mean dissolved oxygen concentrations shall not be less than 7 mg/l more than 10% of the time.
Objective/Criterion Reference: Placeholder reference 2006 303(d)

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected in the Murray Watershed, drainage MURDS, station MUR4A.
Temporal Representation: Samples were collected on 03/12/1997 at 13:54 and 13:55 and on 05/28/1997 from 8:03am to 8:08am.
Environmental Conditions:
QAPP Information: QA Info Missing
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 42730, Oxygen, Dissolved **Region 9**

Murray Reservoir

LOE ID: 1006

Pollutant: Oxygen, Dissolved
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Dissolved

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 3
Number of Exceedances: 0

Data and Information Type: PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality: Data were collected by the City of San Diego Water Dept. in 09/1997. None of the 3 samples were in exceedance. (SWRCB, 2003).

Data Reference:	Placeholder reference 2006 303(d)	035535
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: Dissolved oxygen levels shall not be less than 5.0 mg/l in inland surface waters with designated MAR or WARM beneficial uses or less than 6.0 mg/l in waters with designated COLD beneficial uses. The annual mean dissolved oxygen concentrations shall not be less than 7 mg/l more than 10% of the time.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Murray watershed, drainage MURDS, station MUR1A.	
Temporal Representation:	Samples were collected on 09/25/1997 at 12:28 pm.	
Environmental Conditions:		
QAPP Information:	QA Info Missing	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 42730, Oxygen, Dissolved **Region 9**

Murray Reservoir

LOE ID:	1004
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 09/1997. None of the 3 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: Dissolved oxygen levels shall not be less than 5.0 mg/l in inland surface waters with designated MAR or WARM beneficial uses or less than 6.0 mg/l in waters with designated COLD beneficial uses. The annual mean dissolved oxygen concentrations shall not be less than 7 mg/l more than 10% of the time.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected in the Murray Watershed, drainage MURDS, station MBP5.
Temporal Representation:	Samples were collected on 09/25/1997 at 13:41.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 42730, Oxygen, Dissolved **Region 9**

Murray Reservoir

LOE ID:	1005

Pollutant:	Oxygen, Dissolved	035536
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	Dissolved	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	6	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 05/1997. None of the 6 samples were in exceedance. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: Dissolved oxygen levels shall not be less than 5.0 mg/l in inland surface waters with designated MAR or WARM beneficial uses or less than 6.0 mg/l in waters with designated COLD beneficial uses. The annual mean dissolved oxygen concentrations shall not be less than 7 mg/l more than 10% of the time.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Murray Watershed, drainage MURDS, station MUR1A.	
Temporal Representation:	Samples were collected on 05/27/1997 from 07:35am to 07:42am.	
Environmental Conditions:		
QAPP Information:	QA Info Missing	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 42730, Oxygen, Dissolved **Region 9**

Murray Reservoir

LOE ID:	1010
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	25
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 09/1997 to 02/1998. None of the 25 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: Dissolved oxygen levels shall not be less than 5.0 mg/l in inland surface waters with designated MAR or WARM beneficial uses or less than 6.0 mg/l in waters with designated COLD beneficial uses. The annual mean dissolved oxygen concentrations shall not be less than 7 mg/l more than 10% of the time.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected in Murray Watershed, drainage MURDS, station MUR8b.
Temporal Representation:	Samples were collected on 09/18/1997 from 12:50 to 13:46pm, on 09/25/1997 at 13:17 and 13:18pm, on 12/10/1997 from 11:48-11:57am, 01/08/1998 from 15:34 to 15:38pm, 01/29/1998 from 15:30 to 15:32 om, and 02/04/1998 from 15:25-15:28pm.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 42730, Oxygen, Dissolved **Region 9**

Murray Reservoir

LOE ID:	1011
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected in 1998 by the City of San Diego Water Dept. None of the 8 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: Dissolved oxygen levels shall not be less than 5.0 mg/l in inland surface waters with designated MAR or WARM beneficial uses or less than 6.0 mg/l in waters with designated COLD beneficial uses. The annual mean dissolved oxygen concentrations shall not be less than 7 mg/l more than 10% of the time.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murray Reservoir sites 2a and 2b. (These sites are most likely within 200 m of each other).
Temporal Representation:	Samples were collected on 01/29/1998 (at 2b) and on 02/04/1998 (at 2a).
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

DECISION ID **44413** **Region 9**

Murray Reservoir

Pollutant:	**PCBs (Polychlorinated biphenyls)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 12 samples exceed the Basin Plan water quality objective for polychlorinated biphenyls.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 12 samples exceed the Basin Plan water quality objective for polychlorinated biphenyls and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 44413, PCBs (Polychlorinated biphenyls) **Region 9**

Murray Reservoir

LOE ID:	1037
Pollutant:	PCBs (Polychlorinated biphenyls)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 1997 and 1998. A total of 12 samples were collected for 9 different PCBs. No samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for PCBs is 0.0005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murray Reservoir station A at the surface.
Temporal Representation:	One to 2 samples were collected for each PCB. Samples were collected on 02/04/1997, 05/02/1997, and/or 12/02/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **44344** **Region 9**

Murray Reservoir

Pollutant:	**Pentachlorophenol (PCP)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the eight samples exceed the Basin Plan water quality objective for pentachlorophenol.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the eight samples exceed the Basin Plan water quality objective for pentachlorophenol and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 44344, Pentachlorophenol (PCP) **Region 9**

Murray Reservoir

LOE ID:	1055
Pollutant:	Pentachlorophenol (PCP)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2000. None of the 8 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Pentachlorophenol is 0.001 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murray Reservoir station A at the surface.
Temporal Representation:	Samples were collected 2-3 times per year in 1997, 1998 and 2000. Samples were collected in spring, summer, and winter months.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 42501 Region 9

Murray Reservoir

Pollutant:	**Picloram**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. The one sample did not exceed the Basin Plan water quality objective for picloram. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. The one sample did not exceed the Basin Plan water quality objective for picloram and this sample size is insufficient to determine with the power and confidence of the Listing Policy if standards are not met. A minimum of two samples is needed for application of table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 42501, Picloram Region 9

Murray Reservoir

LOE ID:	985
Pollutant:	Picloram
LOE Subgroup:	Pollutant-Water

Matrix:	Water	035541
Fraction:	Total	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. on 12/02/1998. One sample was collected, it was not in exceedance. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for PIcloram is 0.5 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Murray Reservoir site MUA-0.	
Temporal Representation:	One sample was collected on 12/02/1998.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID	**43357**	**Region 9**
Murray Reservoir		

Pollutant:	**Selenium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the eight samples exceed the Basin Plan water quality objective for selenium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the eight samples exceed the Basin Plan water quality objective for selenium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43357, Selenium **Region 9**

Murray Reservoir

LOE ID:	986
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 1996 and 1997. None of the 8 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for Selenium is 0.05 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murray Reservoir site MUA-0.
Temporal Representation:	Samples were collected 4 times per year from 01/1996 to 12/1997.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **34601** **Region 9**

Murray Reservoir

Pollutant:	**Simazine**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. None of the 21 samples exceed the Basin Plan water quality objective for simazine.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 21 samples exceed the Basin Plan water quality objective for simazine and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34601, Simazine **Region 9**

Murray Reservoir

LOE ID:	1056
Pollutant:	Simazine
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 12 samples were in exceedance. Analysis was conducted using EPA method 525.2. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Simazine is 0.004 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murray Reservoir station A at the surface.
Temporal Representation:	Samples were collected 2-4 times per year from 02/1997 to 07/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 34601, Simazine **Region 9**

Murray Reservoir

LOE ID:	1057
Pollutant:	Simazine
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	Total	035544
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	9	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2000. None of the 9 samples were in exceedance. Sample analysis was conducted using EPA methods 507 and/or 531.1. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Simazine is 0.004 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Murray Reservoir station A at the surface.	
Temporal Representation:	Samples were collected on a quarterly basis from 03/1997 to 08/1998. One sample was collected in 08/2000 and one in 11/2000.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID **43554** **Region 9**

Murray Reservoir

Pollutant:	**Styrene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 18 samples exceed the Basin Plan water quality objective for styrene.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 18 samples exceed the Basin Plan water quality objective for styrene and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43554, Styrene **Region 9**

Murray Reservoir

LOE ID:	1029
Pollutant:	Styrene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	18
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. fron 1997 to 2001. None of the 18 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Styrene is 0.1 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murray Reservoir station A at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from 01/07/1997 to 08/07/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **43078** **Region 9**

Murray Reservoir

Pollutant:	**Sulfates**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. None of the 22 samples exceed the Basin Plan water quality objective for sulfates.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 22 samples exceed the Basin Plan water quality objective for sulfates and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 12 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43078, Sulfates **Region 9**

Murray Reservoir

LOE ID:	987
Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	22
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2001. None of the 22 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters in the 907.11 HA and all beneficial uses, the WQO for sulfate is 500 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murray Reservoir site MUA-0.
Temporal Representation:	Samples were collected 2-5 times per year from 03/1996 to 06/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment. QA=?
QAPP Information Reference(s):	

DECISION ID **44331** **Region 9**

Murray Reservoir

Pollutant:	**Tetrachloroethylene/PCE**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**

Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)	035547
Revision Status	Original	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 18 samples exceed the Basin Plan water quality objective for tetrachloroethylene.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 18 samples exceed the Basin Plan water quality objective for tetrachloroethylene and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 44331, Tetrachloroethylene/PCE **Region 9**

Murray Reservoir

LOE ID:	1030
Pollutant:	Tetrachloroethylene/PCE
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	18
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 18 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Tetrachloroethylene is 0.005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murray Reservoir station A at the surface.

Temporal Representation:	Samples were collected on a quarterly basis from 01/07/1997 to 08/07/2001
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 34770 Region 9

Murray Reservoir

Pollutant:	**Toluene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. None of the 19 samples exceed the Basin Plan water quality objective for toluene. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 19 samples exceed the Basin Plan water quality objective for toluene and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34770, Toluene Region 9

Murray Reservoir

LOE ID:	997
Pollutant:	Toluene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. on 12/02/1997. One sample was collected, it was not in exceedance. (SWRCB, 2003).

Data Reference:	Placeholder reference 2006 303(d)	035549
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Toluene is 0.15 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Murray Reservoir site MUA-0.	
Temporal Representation:	One sample was collected on 12/02/1997.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessmnet.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 34770, Toluene **Region 9**

Murray Reservoir

LOE ID:	1031
Pollutant:	Toluene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	18
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 18 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Toluene is 0.15 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murray Reservoir station A at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from 01/07/1997 to 08/07/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 asessment.
QAPP Information Reference(s):	

DECISION ID **33281** **Region 9**

Murray Reservoir

Pollutant:	**Total Dissolved Solids**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original

Impairment from Pollutant or Pollution:	Pollutant	035550

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Nine lines of evidence are available in the administrative record to assess this pollutant. Thirty-nine of the 64 samples exceed the Basin Plan water quality objective for total dissolved solids.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Thirty-nine of the 64 samples exceed the Basin Plan water quality objective for total dissolved solids, and these exceed the allowable frequency listed in Table 3.2 of the Listing Policy. At the October 25th, 2006 Water Board meeting, comments were received concerning total dissolved solids in terminal reservoirs in the San Diego region. The Board concluded that it was inappropriate to list these water bodies based on secondary MCLs when the TDS values of the incoming supplying waters were higher than the MCLs. Narrative standards are therefore met.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33281, Total Dissolved Solids **Region 9**

Murray Reservoir

LOE ID:	991
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 09/1997. None of the 3 samples were in exceedance. At the October 25th Water Board meeting, comments were received concerning total dissolved solids in terminal reservoirs in the San Diego region. The Board concluded that it was inappropriate to list these water bodies based on secondary MCLs when the TDS values of the incoming supplying waters were higher than the MCLs. Narrative standards are therefore met.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for TDS is 500 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.

Objective/Criterion Reference:	Placeholder reference 2006 303(d)	035551
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected in the Murray watershed, drainage MURDS, station MUR1B.	
Temporal Representation:	Samples were collected on 09/25/1997 at 12:28pm.	
Environmental Conditions:		
QAPP Information:	QA Info Missing	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33281, Total Dissolved Solids **Region 9**

Murray Reservoir

LOE ID:	990
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	6
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 05/1997. Six of 6 samples were in exceedance. At the October 25th Water Board meeting, comments were received concerning total dissolved solids in terminal reservoirs in the San Diego region. The Board concluded that it was inappropriate to list these water bodies based on secondary MCLs when the TDS values of the incoming supplying waters were higher than the MCLs. Narrative standards are therefore met.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for TDS is 500 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Murray watershed, drainage MURDS, station MUR1A.
Temporal Representation:	Samples were collected on 05/28/1997 from 7:35am to 7:42am.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33281, Total Dissolved Solids **Region 9**

Murray Reservoir

LOE ID:	995
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved

Beneficial Use:	Municipal & Domestic Supply	035552
Number of Samples:	20	
Number of Exceedances:	14	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 09/1997 to 02/1998. Fourteen of 20 samples were in exceedance. Samples collected on 09/18/1997, 12/10/1997, and 02/04/1998 were in exceedance and those collected on other days were not. At the October 25th Water Board meeting, comments were received concerning total dissolved solids in terminal reservoirs in the San Diego region. The Board concluded that it was inappropriate to list these water bodies based on secondary MCLs when the TDS values of the incoming supplying waters were higher than the MCLs. Narrative standards are therefore met.	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for TDS is 500 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected in the Murray Watershed, drainage MURDS, station MUR8b.	
Temporal Representation:	Samples were collected on 09/18/1997 from 12:50 to 13:46pm and on 09/25/1997 at 13:17 and 13:18pm. Samples were also collected 3-6 times within 10 minutes on 12/10/1997, 01/29/1998, and 02/04/1998.	
Environmental Conditions:		
QAPP Information:	QA Info Missing	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33281, Total Dissolved Solids **Region 9**

Murray Reservoir

LOE ID:	994
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	2
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 03/1997 and 05/1997. Ten of 10 samples were in exceedance. Two of 2 averages were in exceedance (where averages were calculated for all samples collected each day. For 2 sampling days, 1 average was calculated for each day). At the October 25th Water Board meeting, comments were received concerning total dissolved solids in terminal reservoirs in the San Diego region. The Board concluded that it was inappropriate to list these water bodies based on secondary MCLs when the TDS values of the incoming supplying waters were higher than the MCLs. Narrative standards are therefore met.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for TDS is

	500 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected in the Murray watershed, drainage MURDS, station MUR7.
Temporal Representation:	Samples were collected on 03/12/1997 at 14:47 and 14:48pm and 05/28/1997 at 8:41-8:48am.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33281, Total Dissolved Solids **Region 9**

Murray Reservoir

LOE ID:	993
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 09/1997 and 01/1998. None of the 6 samples were in exceedance. At the October 25th Water Board meeting, comments were received concerning total dissolved solids in terminal reservoirs in the San Diego region. The Board concluded that it was inappropriate to list these water bodies based on secondary MCLs when the TDS values of the incoming supplying waters were higher than the MCLs. Narrative standards are therefore met.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for TDS is 500 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected in the Murray watershed, drainage MURDS, station MUR5B.
Temporal Representation:	Samples were collected on 09/25/1997 at 12:58 pm and 01/29/1998 at 15:13-15:16pm.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33281, Total Dissolved Solids **Region 9**

Murray Reservoir

LOE ID:	992
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water

Matrix:	Water	035554
Fraction:	Total Dissolved	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	9	
Number of Exceedances:	9	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 03/1997 and 05/1997. Nine of 9 samples were in exceedance. Two of 2 averages were in exceedance (when averages are calculated for each the samples collected on each sampling day). At the October 25th Water Board meeting, comments were received concerning total dissolved solids in terminal reservoirs in the San Diego region. The Board concluded that it was inappropriate to list these water bodies based on secondary MCLs when the TDS values of the incoming supplying waters were higher than the MCLs. Narrative standards are therefore met.	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for TDS is 500 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected in the Murray Watershed, drainage MURDS, station MUR4A.	
Temporal Representation:	Samples were collected on 03/12/1997 at 13:54 and 13:55 and on 05/28/1997 from 8:03am to 8:08am.	
Environmental Conditions:		
QAPP Information:	QA Info Missing	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33281, Total Dissolved Solids **Region 9**

Murray Reservoir

LOE ID:	988
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	3
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1998 to 2000. Three of 7 samples were in exceedance. At the October 25th Water Board meeting, comments were received concerning total dissolved solids in terminal reservoirs in the San Diego region. The Board concluded that it was inappropriate to list these water bodies based on secondary MCLs when the TDS values of the incoming supplying waters were higher than the MCLs. Narrative standards are therefore met.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for TDS is

	500 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murray Reservoir site MUA-0.
Temporal Representation:	Samples were collected 1-4 times per year from 09/1998 to 12/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33281, Total Dissolved Solids **Region 9**

Murray Reservoir

LOE ID:	989
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept in 09/1997. None of the 3 samples were in exceedance. At the October 25th Water Board meeting, comments were received concerning total dissolved solids in terminal reservoirs in the San Diego region. The Board concluded that it was inappropriate to list these water bodies based on secondary MCLs when the TDS values of the incoming supplying waters were higher than the MCLs. Narrative standards are therefore met.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for TDS is 500 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected in the Murray Watershed, MURDS drainage, station MBP5.
Temporal Representation:	Samples were collected on 09/25/1997 at 13:41.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33281, Total Dissolved Solids **Region 9**

Murray Reservoir

LOE ID:	996
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	Total Dissolved	035556
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	8	
Number of Exceedances:	5	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 1998. Five of 8 samples (1 of 2 averages) were in exceedance. At the October 25th Water Board meeting, comments were received concerning total dissolved solids in terminal reservoirs in the San Diego region. The Board concluded that it was inappropriate to list these water bodies based on secondary MCLs when the TDS values of the incoming supplying waters were higher than the MCLs. Narrative standards are therefore met.	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for TDS is 500 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Murray Reservoir sites 2a and 2b.	
Temporal Representation:	Samples were collected on 01/29/1998 and 02/04/1998 3-5 times within 5 minutes.	
Environmental Conditions:		
QAPP Information:	QA Info Missing	
QAPP Information Reference(s):		

DECISION ID **42737** **Region 9**

Murray Reservoir

Pollutant:	**Toxaphene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 11 samples exceed the Basin Plan water quality objective for toxaphene.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 11 samples exceed the Basin Plan water quality objective for toxaphene and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable

beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 42737, Toxaphene **Region 9**

Murray Reservoir

LOE ID:	1064
Pollutant:	Toxaphene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	11
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 11 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Toxaphene is 0.003 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murray Reservoir station A.
Temporal Representation:	Samples were collected on a quarterly basis from 03/1997 to 08/1998. One sample was collected in 12/1999, 1 in 02/2000, and 2 in 2001 (one in February and one in May).
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33232** **Region 9**

Murray Reservoir

Pollutant:	**Trichloroethylene/TCE**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 18 samples exceed the Basin Plan water quality objective for trichloroethylene.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 18 samples exceed the Basin Plan water quality objective for trichloroethylene and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33232, Trichloroethylene/TCE **Region 9**

Murray Reservoir

LOE ID:	1032
Pollutant:	Trichloroethylene/TCE
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	18
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 18 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Trichloroethylene is 0.005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murray Reservoir station A at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from 01/07/1997 to 08/07/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **44054** **Region 9**

Murray Reservoir

Pollutant:	**Trichlorofluoromethane (CFC-11)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 18 samples exceed the Basin Plan water quality objective for trichlorofluoromethane.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 18 samples exceed the Basin Plan water quality objective for trichlorofluoromethane and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 44054, Trichlorofluoromethane (CFC-11) **Region 9**

Murray Reservoir

LOE ID:	1033
Pollutant:	Trichlorofluoromethane (CFC-11)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	18
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 18 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Trichlorofluoromethane is 0.15 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	

Guideline Reference:	035560
Spatial Representation:	Samples were collected at Murray Reservoir station A at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from 01/07/1997 to 08/07/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 33282 Region 9

Murray Reservoir

Pollutant:	**Turbidity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Four lines of evidence are available in the administrative record to assess this pollutant. None of the 385 samples exceed the Basin Plan water quality objective for turbidity.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 385 samples exceed the Basin Plan water quality objective for turbidity and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33282, Turbidity Region 9

Murray Reservoir

LOE ID:	999
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	122
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	035561
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. None of the 122 samples were in exceedance. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Turbidity is 5 ntu.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Murray Reservoir site MUA-GA49.	
Temporal Representation:	Samples were collected from 01/1996 to 12/2000. Two to 5 samples were collected per month from 01/1996-12/1996. One sample was collected monthly in 1997 and 1998. One sample was collected per sampling month for 6 months in 1999. Two to 5 samples were collected per month from 01/2000 to 12/2000.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33282, Turbidity **Region 9**

Murray Reservoir

LOE ID:	1000
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	122
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. None of the 122 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Turbidity is 5 ntu.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murray Reservoir site MUA-GA62.
Temporal Representation:	Samples were collected from 01/1996 to 12/2000. Two to 5 samples were collected per month from 01/1996-12/1996. One sample was collected monthly in 1997 and 1998. One sample was collected per sampling month for 6 months in 1999. Two to 5 samples were collected per month from 01/2000 to 12/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33282, Turbidity **Region 9**

Murray Reservoir 035562

LOE ID:	1001
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	123
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. None of the 123 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Turbidity is 5 ntu.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murray Reservoir site MUA-GA75.
Temporal Representation:	Samples were collected from 01/1996 to 12/2000. Two to 5 samples were collected per month from 01/1996-12/1996. One sample was collected monthly in 1997 and 1998. One sample was collected per sampling month for 6 months in 1999. Two to 5 samples were collected per month from 01/2000 to 12/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33282, Turbidity **Region 9**

Murray Reservoir

LOE ID:	998
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	18
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. None of the 18 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Turbidity is 5 ntu.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Murray Reservoir site MUA-0.
Temporal Representation: Samples were collected 2-4 times per year from 03/1996 to 12/2000.
Environmental Conditions:
QAPP Information: Data used in 2002 assessment.
QAPP Information Reference(s):

DECISION ID 43208 Region 9
Murray Reservoir

Pollutant: **Uranium**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Original
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the 3 samples exceed the Basin Plan objective for Uranium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 3 samples exceeded the Basin Plan objective for Uranium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43208, Uranium Region 9
Murray Reservoir

LOE ID: 1002

Pollutant: Uranium
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 1998. None of the 3 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Uranium is 20 pCi/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murray Reservoir site MUA-0.
Temporal Representation:	Samples were collected once each in 1998 in April, July, and October.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID	33077	Region 9
Murray Reservoir		

Pollutant:	**Vinyl chloride**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. None of the 18 samples exceed the Basin Plan water quality objective for vinyl chloride. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 18 samples exceed the Basin Plan water quality objective for vinyl chloride and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33077, Vinyl chloride 035565 Region 9

Murray Reservoir

LOE ID:	1034
Pollutant:	Vinyl chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	18
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 18 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Vinyl Chloride is 0.0005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murray Reservoir station A at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from 01/07/1997 to 08/07/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 32535 Region 9

Murray Reservoir

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle.

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the 3 samples exceed the Basin Plan objective for Zinc.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.035566
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 3 samples exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32535, Zinc **Region 9**

Murray Reservoir

LOE ID:	1003
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 1998. None of the 3 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Zinc is 5.0 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murray Reservoir site MUA-0.
Temporal Representation:	Samples were collected once each in April, July, and October 1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33852** **Region 9**

Murray Reservoir

Pollutant:	**meta-para xylenes**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the

current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 18 samples exceed the Basin Plan water quality objective for xylenes.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 18 samples exceed the Basin Plan water quality objective for xylenes and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33852, meta-para xylenes **Region 9**

Murray Reservoir

LOE ID:	1035
Pollutant:	meta-para xylenes
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	18
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 18 samples were in exceedance. No sums of isomers (where isomers were measured on the same day) were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for xylenes is 1.750 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	MCL is for either a single isomer or the sum of the isomers. Incorporations by reference are prospective including future changes to the incorporated provisions as the changes take effect.
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	Samples were collected at Murray Reservoir station A at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from 01/07/1997 to 08/07/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID	34083	Region 9
Murray Reservoir		

Pollutant:	**o-Dichlorobenzene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 18 samples exceed the Basin Plan water quality objective for o-dichlorobenzene.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 18 samples exceed the Basin Plan water quality objective for o-dichlorobenzene and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34083, o-Dichlorobenzene	**Region 9**
Murray Reservoir	

LOE ID:	1020
Pollutant:	o-Dichlorobenzene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	18
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2000. None of the 18 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for o-Dichlorobenzene is 0.6 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murray Reservoir station A at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from 01/1997 to 08/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 33602 Region 9

Murray Reservoir

Pollutant:	**o-Xylene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 18 samples exceed the Basin Plan water quality objective for xylenes.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 18 samples exceed the Basin Plan water quality objective for xylenes and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33602, o-Xylene Region 9

Murray Reservoir

LOE ID:	1028
Pollutant:	o-Xylene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total

Beneficial Use:	Municipal & Domestic Supply	035570
Number of Samples:	18	
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 18 samples were in exceedance. There were no exceedances where isomer concentrations were summed (where samples for m, p, o-xylenes were collected on the same day). (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for xylenes is 1.750 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:	MCL is for either a single isomer or the sum of the isomers. Incorporations by reference are prospective including future changes to the incorporated provisions as the changes take effect.	
Guideline Reference:	Placeholder reference 2006 303(d)	
Spatial Representation:	Samples were collected at Murray Reservoir station A at the surface.	
Temporal Representation:	Samples were collected on a quarterly basis from 01/1997 to 08/2001.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID	**42765**	**Region 9**
Murray Reservoir		

Pollutant:	**p-Dichlorobenzene (DCB)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 18 samples exceed the Basin Plan water quality objective for p-dichlorobenzene.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 18 samples exceed the Basin Plan water quality objective for p-dichlorobenzene and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 42765, p-Dichlorobenzene (DCB) **Region 9**

Murray Reservoir

LOE ID:	1023
Pollutant:	p-Dichlorobenzene (DCB)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	18
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2000. None of the 18 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for p-Dichlorobenzene is 0.005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murray Reservoir station A at the surface.
Temporal Representation:	Samples were collected on a quarterly basis from 01/1997 to 08/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: San Vicente Reservoir
Water Body ID: CAL9072100020011025093029
Water Body Type: Lake & Reservoir

DECISION ID 42880 **Region 9**
San Vicente Reservoir

Pollutant: Color
Final Listing Decision: Delist from 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Reason for Delisting: Other
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for removal from the section 303(d) list under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Seven-hundred-one of 1,841 samples exceed the Basin Plan water quality objective for color.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the section 303(d) list.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Seven-hundred-one of 1,841 samples exceed the Basin Plan water quality objective for color, and this exceeds the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 6.1.5.3 of the listing policy, data from this Integrated Report cycle is not temporally representative of current conditions within these reservoirs, and thus insufficient information is available to support listing these reservoirs as impaired due to color. In 2007, as a result of the reservoirsÂ' imported source water, Dreissenid mussels (Â"quaggaÂ") were introduced, resulting drastic changes in reservoir ecosystems and management, including the drafting of management response plans in 2009. The impact of Dreissenid mussels on reservoir ecosystem dynamics, especially nutrient pools and cycling, is dramatic and well documented in the scientific literature. Impacts of Dreissend mussel colonization can vary depending on reservoir dynamics, but typically results in the stripping of nutrients from the phytoplankton and promotion of macrophytes due to increased water clarity. Thus, data collected prior to Dreissenid introduction and management for listing purposes should be further considered as insufficient to make a decision determination.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 42880, Color **Region 9**

San Vicente Reservoir 035573

LOE ID:	1080
Pollutant:	Color
LOE Subgroup:	Pollutant-Nuisance
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	64
Number of Exceedances:	42
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 1999. Forty-two of 64 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Color is 15 units.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Vicente Reservoir site SVA-GA170.
Temporal Representation:	Three to 5 samples were collected monthly from 01/1996 to 02/1999.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 42880, Color **Region 9**

San Vicente Reservoir

LOE ID:	1081
Pollutant:	Color
LOE Subgroup:	Pollutant-Nuisance
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	236
Number of Exceedances:	130
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. There were 130 out of 236 samples that were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Color is 15 units.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at San Vicente Reservoir site SVA-GA50.
Temporal Representation:	One to 5 samples were collected monthly from 01/1996 to 12/2000.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 42880, Color **Region 9**

San Vicente Reservoir

LOE ID:	1082
Pollutant:	Color
LOE Subgroup:	Pollutant-Nuisance
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	92
Number of Exceedances:	36
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 1999. Thirty-six of 92 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Color is 15 units.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Vicente Reservoir site SVA-GA70.
Temporal Representation:	One to 5 samples were collected per month from 01/1996 to 02/1999.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 42880, Color **Region 9**

San Vicente Reservoir

LOE ID:	1079
Pollutant:	Color
LOE Subgroup:	Pollutant-Nuisance
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	109
Number of Exceedances:	68
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 1999. Sixty-eight of 109 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Color is 15 units.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Vicente Reservoir site SVA-GA160.
Temporal Representation:	Three to 5 samples were collected monthly from 01/1996 to 02/1999.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 42880, Color **Region 9**

San Vicente Reservoir

LOE ID:	1078
Pollutant:	Color
LOE Subgroup:	Pollutant-Nuisance
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	236
Number of Exceedances:	66
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. Sixty-six of 236 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Color is 15 units.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Vicente Reservoir site SVA-GA140.
Temporal Representation:	One to 5 samples were collected monthly from 01/1996 to 12/2000.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 42880, Color **Region 9**

San Vicente Reservoir

LOE ID:	1073
Pollutant:	Color
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total

Beneficial Use:	Municipal & Domestic Supply	035576
Number of Samples:	189	
Number of Exceedances:	75	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. There were 75 out of 189 samples that were in exceedance.	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Color is 15 units.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at San Vicente Reservoir at site SVA-0.	
Temporal Representation:	Samples were collected from 01/02/1996 to 12/04/2000. Samples were collected on a monthly basis, with multiple samples being collected in some months.	
Environmental Conditions:		
QAPP Information:	QA Info Missing	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 42880, Color **Region 9**

San Vicente Reservoir

LOE ID:	1076
Pollutant:	Color
LOE Subgroup:	Pollutant-Nuisance
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	235
Number of Exceedances:	43
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. Forty-three of 235 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Color is 15 units.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Vicente Reservoir site SVA-GA110.
Temporal Representation:	Four to 5 samples were collected per month, monthly from 01/1996 to 12/2000.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 42880, Color **Region 9**

San Vicente Reservoir 035577

LOE ID:	1075
Pollutant:	Color
LOE Subgroup:	Pollutant-Nuisance
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	195
Number of Exceedances:	48
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. Forty-eight of 195 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Color is 15 units.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected in San Vicente Reservoir site SVA-GA100.
Temporal Representation:	Samples were collected 4-5 times per month, monthly from 01/1996 to 09/2000.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 42880, Color **Region 9**

San Vicente Reservoir

LOE ID:	1074
Pollutant:	Color
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	74
Number of Exceedances:	48
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 1999. Forty-eight of 74 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Color is 15 units.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at San Vicente Reservoir site SVA-GA160.
Temporal Representation:	Multiple samples were collected per month, monthly from 01/29/1996 to 02/16/1999.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 42880, Color **Region 9**
San Vicente Reservoir

LOE ID:	1083
Pollutant:	Color
LOE Subgroup:	Pollutant-Nuisance
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	236
Number of Exceedances:	87
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. There were 87 out of 236 samples that were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Color is 15 units.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Vicente Reservoir site SVA-GA80.
Temporal Representation:	One to 5 samples were collected monthly from 01/1996 to 12/2000.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 42880, Color **Region 9**
San Vicente Reservoir

LOE ID:	1077
Pollutant:	Color
LOE Subgroup:	Pollutant-Nuisance
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	175
Number of Exceedances:	58
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. Fifty-eight of 175 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Color is 15 units.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Vicente Reservoir site SVA-GA130.
Temporal Representation:	Four to 5 samples were collected monthly from 01/1996 to 03/2000.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

DECISION ID	37158	Region 9
San Vicente Reservoir		

Pollutant:	**Nitrogen**
Final Listing Decision:	**Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Reason for Delisting:	Other
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. Thirty-two of the 37 samples exceed the Basin Plan water quality objective for total nitrogen as N.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Thirty-two of the 37 samples exceed the Basin Plan water quality objective for total nitrogen as N and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, additional data and information are available indicating that standards are met.
5. Pursuant to section 6.1.5.3 of the listing policy, data from this Integrated Report cycle is not temporally representative of current conditions within these reservoirs, and thus insufficient information is available to support listing these reservoirs as impaired due to biostimulation from elevated nitrogen. In 2007, as a result of the reservoirsÂ' imported source water, Dreissenid mussels (Â"quaggaÂ") were introduced, resulting drastic changes in reservoir ecosystems and management, including the drafting of management response plans in 2009. The impact of Dreissenid mussels on reservoir ecosystem dynamics, especially nutrient pools and cycling, is dramatic and well documented in the scientific literature. Impacts of Dreissend mussel colonization can vary depending on reservoir dynamics, but typically results in the stripping of nutrients from the phytoplankton and promotion of macrophytes due to increased water clarity. Thus, data collected prior to Dreissenid introduction and management for listing purposes should be further considered as insufficient to make a decision determination.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 37158, Nitrogen **Region 9**

San Vicente Reservoir

LOE ID:	6173
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Aquatic Life Use:	Warm Freshwater Habitat
Number of Samples:	37
Number of Exceedances:	32
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Thirty two of thirty seven samples exceed the water quality objective of 0.25 mg/L for total nitrogen according to results in Water Quality Monitoring Data for Drinking Water Reservoirs, San Diego January 2005 to December 2006. Samples were collected once or twice a month from January 2005 to December 2006.
Data Reference:	Water Department, Water Quality Monitoring Data for Drinking Source Water Reservoirs. January 2005 to December 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. (RWQCB, 2007)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	A desired goal in order to prevent plant nuisance in any standing body of water is 0.025 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used. (RWQCB, 2007)
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	One surface water sample was collected per sampling event at San Vicente Reservoir at a standard location designated Â“Station AÂ”.
Temporal Representation:	Samples were collected once or twice a month from January 2005 to December 2006.
Environmental Conditions:	
QAPP Information:	Samples were collected and analyzed according to the Water Quality LaboratoryÂ's Quality Assurance Manual. Applicable field and laboratory Standard Operating Procedures were also provided by the San Diego Water Department.
QAPP Information Reference(s):	

DECISION ID **43569** **Region 9**

San Vicente Reservoir

Pollutant:	**Ammonia**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised

Impairment from Pollutant or Pollution:	Pollutant	035581

Regional Board Conclusion:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. An unknown number of the 24 samples exceed the water quality objective for ammonia as N. The wrong methodology was used for the analysis of unionized ammonia data.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. An unknown number of the 24 samples exceed the water quality objective for un-ionized ammonia as N.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because it cannot be determined if applicable water quality standards are not being exceeded.

The wrong methodology was used for the analysis of unionized ammonia data. The data will be re-assessed during the next listing cycle.

Line of Evidence (LOE) for Decision ID 43569, Ammonia **Region 9**

San Vicente Reservoir

LOE ID:	6174
Pollutant:	Ammonia as Nitrogen
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	24
Number of Exceedances:	4
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Four of twenty four samples exceed the water quality objective according to results in Water Quality Monitoring Data for Drinking Water Reservoirs, San Diego, January 2005 to December 2006. Samples were collected once or twice a month from January 2005 to December 2006.
Data Reference:	Water Quality Control Plan for the San Diego Basin
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan the WQO for un-ionized ammonia (NH3) for inland surface waters is 0.025mg/L (as N) (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	

Guideline Reference:	035582
Spatial Representation:	One surface water sample was collected per sampling event at San Vicente Reservoir at a standard location designated Â“Station AÂ”.
Temporal Representation:	Samples were collected once or twice a month from January 2005 to December 2006.
Environmental Conditions:	
QAPP Information:	Samples were collected and analyzed according to the Water Quality LaboratoryÂ's Quality Assurance Manual. Applicable field and laboratory Standard Operating Procedures were also provided by the San Diego Water Department.
QAPP Information Reference(s):	

DECISION ID 33311 Region 9

San Vicente Reservoir

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. None of the nine samples exceed the California Toxic Rule water quality objective for chromium. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of nine samples exceeded the CTR criterion and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 33311, Chromium Region 9

San Vicente Reservoir

LOE ID:	1072
Pollutant:	Chromium (total)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9

Number of Exceedances:	0	035583
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. None of the 9 samples were in exceedance. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for total chromium is 0.05 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at San Vicente Reservoir at site SVA-0.	
Temporal Representation:	Samples were collected from 09/09/1996 to 09/06/2000. 1-3 samples were collected per year, with 0 samples being collected in 1997.	
Environmental Conditions:		
QAPP Information:	QA Info Missing	
QAPP Information Reference(s):		

DECISION ID	43570	Region 9
San Vicente Reservoir		

Pollutant:	**Phosphorus**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Six of the 37 samples exceed the Basin Plan water quality objective for phosphorus.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Six of the 37 samples exceed the Basin Plan water quality objective for phosphorus and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, additional data and information are available indicating that standards are met.
5. Pursuant to section 6.1.5.3 of the listing policy, data from this Integrated Report cycle is not temporally representative of current conditions within these reservoirs, and thus insufficient information is available to support listing these reservoirs as impaired due to biostimulation from elevated nitrogen. In 2007, as a result of the reservoirsÂ' imported source water, Dreissenid mussels (Â"quaggaÂ") were introduced, resulting drastic changes in reservoir ecosystems and management, including the drafting of management response plans in 2009. The impact of Dreissenid mussels on reservoir ecosystem dynamics, especially nutrient pools and cycling, is dramatic and well documented in the scientific literature. Impacts of Dreissend mussel colonization can vary depending on reservoir dynamics, but typically results in the stripping of nutrients from the phytoplankton and promotion of macrophytes due to increased water clarity. Thus, data collected prior to Dreissenid introduction and management for

listing purposes should be further considered as insufficient to make a decision determination. 01558

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 43570, Phosphorus **Region 9**

San Vicente Reservoir

LOE ID:	6176
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Aquatic Life Use:	Warm Freshwater Habitat
Number of Samples:	37
Number of Exceedances:	6
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Six of thirty seven samples exceed the water quality objective according to results in Water Quality Monitoring Data for Drinking Water Reservoirs, San Diego January 2005 to December 2006. Samples were collected once or twice a month from January 2005 to December 2006.
Data Reference:	Water Department, Water Quality Monitoring Data for Drinking Source Water Reservoirs. January 2005 to December 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. (RWQCB, 2007) Water Quality Control Plan for the San Diego Basin Goal of 0.025 mg/L for total phosphorus in any standing body of water. (RWQCB, 2007)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	One surface water sample was collected per sampling event at San Vicente Reservoir at a standard location designated Â“Station AÂ”.
Temporal Representation:	Samples were collected once or twice a month from January 2005 to December 2006.
Environmental Conditions:	
QAPP Information:	Samples were collected and analyzed according to the Water Quality LaboratoryÂ's Quality Assurance Manual. Applicable field and laboratory Standard Operating Procedures were also provided by the San Diego Water Department.
QAPP Information Reference(s):	

DECISION ID **32754** **Region 9**

San Vicente Reservoir

Pollutant:	**Manganese**
Final Listing Decision:	**Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Original

Reason for Delisting:	Flaws in original listing	035585
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for removal from the section 303(d) list under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Seven of 55 samples exceeded the Basin Plan water quality objective for manganese.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for removing this water segment-pollutant combination from the section 303(d) list.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Seven of 55 samples exceeded the Basin Plan water quality objective for manganese, and this does not exceed the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32754, Manganese **Region 9**

San Vicente Reservoir

LOE ID:	1087
Pollutant:	Manganese
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	55
Number of Exceedances:	7
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. Seven of 55 samples were in exceedance. Three of the 5 years had exceedances more than 10% of the time.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The water quality objective for manganese in San Vicente Reservoir is 0.05 milligrams/liter (mg/l) according to Basin Plan, Table 3-2 entitled, Water Quality Objectives. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Vicente Reservoir site SVA-0.

Temporal Representation:	Samples were collected on a monthly basis from 01/02/1996 to 09/06/2000 35586
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

DECISION ID **44566** **Region 9**

San Vicente Reservoir

Pollutant:	**pH**
Final Listing Decision:	**Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Reason for Delisting:	Other
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Twenty-eight of the 60 samples exceed the Basin Plan water quality objective for pH.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Twenty-eight of the 60 samples exceed the Basin Plan water quality objective for pH and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 6.1.5.3 of the listing policy, data from this Integrated Report cycle is not temporally representative of current conditions within these reservoirs, and thus insufficient information is available to support listing these reservoirs as impaired due to pH. In 2007, as a result of the reservoirsÂ' imported source water, Dreissenid mussels (Â"quaggaÂ") were introduced, resulting drastic changes in reservoir ecosystems and management, including the drafting of management response plans in 2009. The impact of Dreissenid mussels on reservoir ecosystem dynamics, especially nutrient pools and cycling, is dramatic and well documented in the scientific literature. Impacts of Dreissend mussel colonization can vary depending on reservoir dynamics, but typically results in the stripping of nutrients from the phytoplankton and promotion of macrophytes due to increased water clarity. Thus, data collected prior to Dreissenid introduction and management for listing purposes should be further considered as insufficient to make a decision determination.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 44566, pH **Region 9**

San Vicente Reservoir

LOE ID:	1091
Pollutant:	pH (high)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	60
Number of Exceedances:	28
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. Twenty-eight of 60 samples were in exceedance of the maximum standard.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for pH is 6.5 (minimum) to 8.5 (maximum).
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Vicente Reservoir site SVA-0.
Temporal Representation:	Samples were collected on a monthly basis from 01/1996 to 12/2000.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

DECISION ID 43170 Region 9

San Vicente Reservoir

Pollutant:	**Aluminum**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Two of the 46 samples exceed the Basin Plan water quality objective for aluminum.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Two of the 46 samples exceed the Basin Plan water quality objective for aluminum, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 43170, Aluminum Region 9

San Vicente Reservoir

LOE ID:	1066
Pollutant:	Aluminum
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	46
Number of Exceedances:	2
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. Two of 46 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Aluminum is 0.2 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Vicente Reservoir site SVA-0.
Temporal Representation:	Samples were collected from 01/02/1996 to 11/06/2000 on a monthly-bimonthly basis.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

DECISION ID **37221** **Region 9**

San Vicente Reservoir

Pollutant:	**Antimony**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. One of the nine samples exceed the California Toxics Rule water quality objective for antimony.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of the nine samples exceed the California Toxics Rule water quality objective for antimony, and

this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 37221, Antimony **Region 9**
San Vicente Reservoir

LOE ID:	1067
Pollutant:	Antimony
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	1
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. One of 9 samples was in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all surface waters with a municipal beneficial use, the WQO for antimony is 0.006 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Vicente Reservoir site SVA-0.
Temporal Representation:	Samples were collected from 06/03/1996 to 06/05/2000. One to 3 samples were collected per year.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

DECISION ID 37222 **Region 9**
San Vicente Reservoir

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 29 samples exceed the California Toxics Rule water quality objective for arsenic.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 29 samples exceed the California Toxics Rule water quality objective for arsenic, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 37222, Arsenic **Region 9**

San Vicente Reservoir

LOE ID:	1068
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	29
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. None of the 29 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for Arsenic is 0.05 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Vicente Reservoir at site SVA-0.
Temporal Representation:	Samples were collected from 01/02/1996 to 11/06/2000. Five to 7 samples were collected per year during different months.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

DECISION ID **33309** **Region 9**

San Vicente Reservoir 035591

Pollutant:	**Barium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. None of the 32 samples exceed the Basin Plan water quality objective for barium. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 32 samples exceed the Basin Plan water quality objective for barium, and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33309, Barium — Region 9

San Vicente Reservoir

LOE ID:	1069
Pollutant:	Barium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	32
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996-2000. None of the 32 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for Barium is 1.0 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)

Evaluation Guideline:	035592
Guideline Reference:	
Spatial Representation:	Samples were collected at San Vicente Reservoir at site SVA-0.
Temporal Representation:	Samples were collected from 01/02/1996 to 11/06/2000. Five to 9 samples were collected per year during separate months.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

DECISION ID **33310** **Region 9**

San Vicente Reservoir

Pollutant:	**Benzene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Neither of the two samples exceed the California Toxic Rule water quality objective for benzene. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Neither of the two samples exceed the California Toxic Rule water quality objective for benzene, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33310, Benzene **Region 9**

San Vicente Reservoir

LOE ID:	1070
Pollutant:	Benzene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 1997 and 2000. None of the 2 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Benzene is 0.001 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Vicente Reservoir site SVA-0.
Temporal Representation:	One sample per day was collected on 06/02/1997 and 08/07/2000.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

DECISION ID **33486** **Region 9**

San Vicente Reservoir

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. None of the 28 samples exceed the California Toxics Rule water quality objective for copper. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 28 samples exceed the California Toxics Rule water quality objective for copper, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33486, Copper 035594 **Region 9**

San Vicente Reservoir

LOE ID:	1084
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	28
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. None of the 28 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Copper is 1.0 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Vicente Reservoir site SVA-0.
Temporal Representation:	Samples were collected from 01/02/1996 to 09/06/2000. One to 10 samples were collected per year. For years except 1997, multiple months are represented.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

DECISION ID **32600** **Region 9**

San Vicente Reservoir

Pollutant:	**Fluoride**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 59 samples exceed the Basin Plan water quality objective for fluoride.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that: 035595
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of 59 samples exceeded the water quality objective and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32600, Fluoride **Region 9**

San Vicente Reservoir

LOE ID:	1085
Pollutant:	Fluoride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	59
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. None of the 59 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for Fluoride is 1.0 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Vicente Reservoir site SVA-0.
Temporal Representation:	Samples were collected on a monthly basis from 01/02/1996 to 11/06/2000.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

DECISION ID **43159** **Region 9**

San Vicente Reservoir

Pollutant:	**Iron**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. None of the 14 samples exceed the Basin Plan water quality objective for iron. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 14 samples exceed the Basin Plan water quality objective for iron and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43159, Iron **Region 9**

San Vicente Reservoir

LOE ID:	1086
Pollutant:	Iron
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	14
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. None of the 14 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for iron is 0.3 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Vicente Reservoir site SVA-0.
Temporal Representation:	Samples were collected from 02/05/1996 to 12/04/2000. Multiple samples were collected per year.
Environmental Conditions:	
QAPP Information:	QA Info Missing

QAPP Information Reference(s): 035597

DECISION ID	36873	Region 9
San Vicente Reservoir		

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One lines of evidence is available in the administrative record to assess this pollutant. Neither of the two samples exceed the Basin Plan water quality objective for nickel. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Neither of the two samples exceed the Basin Plan water quality objective for nickel, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 36873, Nickel	**Region 9**
San Vicente Reservoir	

LOE ID:	1089
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 1997 and 1999. None of the 2 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Nickel is 0.1 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Vicente Reservoir site SVA-0.
Temporal Representation:	One sample per day was collected on 12/01/1997 and 06/01/1999.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

DECISION ID 43714 Region 9
San Vicente Reservoir

Pollutant:	**Pentachlorophenol (PCP)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1, one line(s) of evidence are necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. One of one sample exceed the California Toxics Rule water quality objective for Pentachlorophenol.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of one sample exceed the California Toxics Rule water quality objective for Pentachlorophenol, and this sample size is insufficient to determine with the power and confidence of the Listing Policy if standards are not met. A minimum of two samples is needed for application of table 3.1.
4. Pursuant to [SECTION 3.11/4.11] of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43714, Pentachlorophenol (PCP) Region 9
San Vicente Reservoir

LOE ID:	1065
Pollutant:	Pentachlorophenol (PCP)

LOE Subgroup:	Pollutant-Water	035599
Matrix:	Water	
Fraction:	Total	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	1	
Number of Exceedances:	1	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. on 03/06/2000. One sample was collected. It was in exceedance. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Pentachlorophenol is 0.001 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data were collected at San Vicente Reservoir site SVA-0.	
Temporal Representation:	One sample was collected on 03/06/2000.	
Environmental Conditions:		
QAPP Information:	QA Info Missing	
QAPP Information Reference(s):		

DECISION ID	32619	Region 9
San Vicente Reservoir		

Pollutant:	**Picloram**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Neither of the two samples exceed the Basin Plan water quality objective for Picloram.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Neither of the two samples exceed the Basin Plan water quality objective for Picloram, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available

indicating that standards are not met. 035600

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32619, Picloram **Region 9**

San Vicente Reservoir

LOE ID:	1092
Pollutant:	Picloram
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 1998 and 1999. None of the 2 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for picloram is 0.5 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Vicente Reservoir site SVA-0.
Temporal Representation:	One sample per day was collected on 12/07/1998 and 12/06/1999.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

DECISION ID **33658** **Region 9**

San Vicente Reservoir

Pollutant:	**Selenium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the eight

samples exceed the California Toxics Rule water quality objective for selenium. 035601

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the eight samples exceed the California Toxic Rule water quality objective for selenium, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33658, Selenium **Region 9**

San Vicente Reservoir

LOE ID:	1093
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. None of the 8 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for Selenium is 0.05 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Vicente Reservoir site SVA-0.
Temporal Representation:	Samples were collected once per sampling day from 09/1996 to 11/2000. Sample measurements were reported for two events in 1996, 1 each in 1997 and 1998 and 4 events in 2000.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

DECISION ID **34629** **Region 9**

San Vicente Reservoir

Pollutant:	**Silver**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1of the Listing Policy. Under section 3.1, one line(s) of evidence are necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. The one sample collected did not exceed the California Toxics Rule water quality objective for silver.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. The one sample collected did not exceed the California Toxics Rule water quality objective for silver and this sample size is insufficient to determine with the power and confidence of the Listing Policy if standards are not met. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34629, Silver **Region 9**

San Vicente Reservoir

LOE ID:	1094
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. 06/05/2000. The single sample collected was not in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for silver is 0.1 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)

Evaluation Guideline:
Guideline Reference:

Spatial Representation:	Samples were collected at San Vicente Reservoir site SVA-0.
Temporal Representation:	One sample was collected on 06/05/2000.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

DECISION ID 37277 Region 9
San Vicente Reservoir

Pollutant:	**Simazine**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Neither of the two samples exceed the Basin Plan water quality objective for simazine.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Neither of the two samples exceed the Basin Plan water quality objective for simazine, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 37277, Simazine Region 9
San Vicente Reservoir

LOE ID:	1095
Pollutant:	Simazine
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 1997 and 2000. None of the 2 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for simazine is 0.004 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Vicente Reservoir site SVA-0.
Temporal Representation:	One sample per day was collected on 02/03/1997 and 03/06/2000.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

DECISION ID	33576	Region 9
San Vicente Reservoir		

Pollutant:	**Thallium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. A single sample was collected and it did exceed the Basin Plan water quality objective for thallium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. A single sample was collected and it did exceed the Basin Plan water quality objective for thallium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33576, Thallium **Region 9**
San Vicente Reservoir

LOE ID:	1098
Pollutant:	Thallium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. on 06/05/2000. One sample was collected, it was in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for thallium is 0.002 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Vicente Reservoir site SVA-0.
Temporal Representation:	One sample was collected on 06/05/2000.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

DECISION ID **34012** **Region 9**
San Vicente Reservoir

Pollutant:	**Toluene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the four samples exceed the California Toxics Rule water quality objective for toluene.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the four samples exceed the California Toxics Rule water quality objective for toluene, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34012, Toluene **Region 9**

San Vicente Reservoir

LOE ID:	1099
Pollutant:	Toluene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. None of the 4 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Toluene is 0.15 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Vicente Reservoir site SVA-0.
Temporal Representation:	Samples were collected once per year in 1996, 1997, 1999, and 2000.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

DECISION ID **43578** **Region 9**

San Vicente Reservoir

Pollutant:	**Total Dissolved Solids**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Twenty-nine of 30 of the samples exceed the Basin Plan water quality objective for total dissolved solids.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Twenty-nine of 30 of the samples exceed the Basin Plan water quality objective for total dissolved solids, and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
At the October 25, 2006 Water Board meeting, comments were received concerning total dissolved solids in terminal reservoirs in the San Diego region. The Board concluded that it was inappropriate to list these water bodies based on secondary MCLs when the TDS values of the incoming supplying waters (from other river basins) were higher than the MCLs. Narrative standards are therefore met.

4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43578, Total Dissolved Solids **Region 9**

San Vicente Reservoir

LOE ID:	1097
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	30
Number of Exceedances:	29
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. form 1998 to 2000. Twenty-nine of 30 samples were in exceedance. At the October 25th Water Board meeting, comments were received concerning total dissolved solids in terminal reservoirs in the San Diego region. The Board concluded that it was inappropriate to list these water bodies based on secondary MCLs when the TDS values of the incoming supplying waters were higher than the MCLs. Narrative standards are therefore met.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters in the San Vicente HA, with all beneficial uses, the WQO for TDS is 300 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at San Vicente Reservoir site SVA-0.
Temporal Representation: Samples were collected monthly from 07/06/1998 to 12/04/2000.
Environmental Conditions:
QAPP Information: QA Info Missing
QAPP Information Reference(s):

DECISION ID 32692 Region 9
San Vicente Reservoir

Pollutant: **Turbidity**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Original
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Two-hundred-fifty-five of the 1874 samples exceed the Basin Plan water quality objective for turbidity.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Two-hundred-fifty-five of the 1874 samples exceed the Basin Plan water quality objective for turbidity, and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32692, Turbidity Region 9
San Vicente Reservoir

LOE ID: 1105

Pollutant: Turbidity
LOE Subgroup: Pollutant-Sediment
Matrix: Water
Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 234

Number of Exceedances:	5	035609

Data and Information Type: PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality: Data were collected by the City of San Diego Water Dept. from 1996 to 2000. Five of 234 samples were in exceedance. (SWRCB, 2003).
Data Reference: Placeholder reference 2006 303(d)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Turbidity is 5.0 ntu.
Objective/Criterion Reference: Placeholder reference 2006 303(d)

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at San Vicente Reservoir site SVA-GA140.
Temporal Representation: One to 4 samples were collected monthly from 01/1996 to 12/2000.
Environmental Conditions:
QAPP Information: QA Info Missing
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 32692, Turbidity **Region 9**

San Vicente Reservoir

LOE ID: 1104

Pollutant: Turbidity
LOE Subgroup: Pollutant-Sediment
Matrix: Water
Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 173
Number of Exceedances: 11

Data and Information Type: PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality: Data were collected by the City of San Diego Water Dept. from 1996 to 2000. Eleven of 173 samples were in exceedance. (SWRCB, 2003).
Data Reference: Placeholder reference 2006 303(d)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Turbidity is 5.0 ntu.
Objective/Criterion Reference: Placeholder reference 2006 303(d)

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at San Vicente Reservoir site SVA-GA130.
Temporal Representation: Four to 5 samples were collected monthly from 01/1996 to 03/2000.
Environmental Conditions:
QAPP Information: QA Info Missing
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 32692, Turbidity **Region 9**

San Vicente Reservoir

LOE ID: 1103

Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Sediment
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	323
Number of Exceedances:	16
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. Sixteen of 232 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Turbidity is 5.0 ntu.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Vicente Reservoir site SVA-GA110.
Temporal Representation:	Four to 5 samples were collected monthly from 01/1996 to 12/2000.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 32692, Turbidity **Region 9**

San Vicente Reservoir

LOE ID:	1102
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Sediment
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	193
Number of Exceedances:	35
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. Thirty-five of 193 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Turbidity is 5.0 ntu.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Vicente Reservoir site SVA-GA100.
Temporal Representation:	Samples were collected 4-5 times per month, monthly from 01/1996 to 09/2000.

Environmental Conditions: 035611
QAPP Information: QA Info Missing
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 32692, Turbidity **Region 9**

San Vicente Reservoir

LOE ID: 1101

Pollutant: Turbidity
LOE Subgroup: Pollutant-Sediment
Matrix: Water
Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 52
Number of Exceedances: 2

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Data were collected by the City of San Diego Water Dept. from 1996 to 1998. Two of 52 samples were in exceedance. (SWRCB, 2003).
Data Reference: Placeholder reference 2006 303(d)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Turbidity is 5.0 ntu.
Objective/Criterion Reference: Placeholder reference 2006 303(d)

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at SVA-GA160.
Temporal Representation: Samples were collected multiple times per month, monthly from 01/1996 to 11/1998.
Environmental Conditions:
QAPP Information: QA Info Missing
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 32692, Turbidity **Region 9**

San Vicente Reservoir

LOE ID: 1109

Pollutant: Turbidity
LOE Subgroup: Pollutant-Sediment
Matrix: Water
Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 69
Number of Exceedances: 16

Data and Information Type: PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality: Data were collected by the City of San Diego Water Dept. from 1996 to 1998. Sixteen of 69 samples were in exceedance. (SWRCB, 2003).
Data Reference: Placeholder reference 2006 303(d)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Turbidity is 5.0 ntu.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Vicente Reservoir site SVA-GA70.
Temporal Representation:	One to 5 samples were collected per month from 01/1996 to 11/1998.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 32692, Turbidity **Region 9**

San Vicente Reservoir

LOE ID:	1108
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Sediment
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	232
Number of Exceedances:	97
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. Ninety-seven of 232 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Turbidity is 5.0 ntu.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Vicente Reservoir site SVA-GA50.
Temporal Representation:	One to 5 samples were collected monthly from 01/1996 to 12/2000.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 32692, Turbidity **Region 9**

San Vicente Reservoir

LOE ID:	1106
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Sediment
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	108

Number of Exceedances:	2	035613

Data and Information Type: PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality: Data were collected by the City of San Diego Water Dept. from 1996 to 1999. Two of 108 samples were in exceedance. (SWRCB, 2003).
Data Reference: Placeholder reference 2006 303(d)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Turbidity is 5.0 ntu.
Objective/Criterion Reference: Placeholder reference 2006 303(d)

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at San Vicente Reservoir site SVA-GA160.
Temporal Representation: Three to 5 samples were collected monthly from 01/1996 to 02/1999.
Environmental Conditions:
QAPP Information: QA Info Missing
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 32692, Turbidity **Region 9**

San Vicente Reservoir

LOE ID: 1107

Pollutant: Turbidity
LOE Subgroup: Pollutant-Sediment
Matrix: Water
Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 62
Number of Exceedances: 3

Data and Information Type: PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality: Data were collected by the City of San Diego Water Dept. from 1996 to 1999. Three of 62 samples were in exceedance. (SWRCB, 2003).
Data Reference: Placeholder reference 2006 303(d)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Turbidity is 5.0 ntu.
Objective/Criterion Reference: Placeholder reference 2006 303(d)

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at San Vicente Reservoir site SVA-GA170.
Temporal Representation: Three to 5 samples were collected monthly from 01/1996 to 02/1999.
Environmental Conditions:
QAPP Information: QA Info Missing
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 32692, Turbidity **Region 9**

San Vicente Reservoir

LOE ID: 1110

Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	234
Number of Exceedances:	64
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. Sixty-four of 234 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Turbidity is 5.0 ntu.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Vicente Reservoir site SVA-GA80.
Temporal Representation:	One to 5 samples were collected per month from 01/1996 to 12/2000.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 32692, Turbidity **Region 9**

San Vicente Reservoir

LOE ID:	1100
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Sediment
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	194
Number of Exceedances:	4
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. Four of 194 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Turbidity is 5.0 ntu.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Vicente Reservoir site SVA-0.
Temporal Representation:	Samples were collected 4-5 times per month, monthly from 01/02/1996 to 12/04/2000.

Environmental Conditions: 035615
QAPP Information: QA Info Missing
QAPP Information Reference(s):

DECISION ID	43692	Region 9
San Vicente Reservoir		

Pollutant:	**Uranium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the 3 samples exceed the Basin Plan objective for Uranium. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 3 samples exceeded the Basin Plan objective for Uranium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43692, Uranium	Region 9
San Vicente Reservoir	

LOE ID:	1111
Pollutant:	Uranium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 1998. None of the 2 samples

	were in exceedance. (SWRCB, 2003).	035616
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Uranium is 20 pCi/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at San Vicente Reservoir site SVA-0.	
Temporal Representation:	One sample per day was collected on 08/27/1998 and 10/05/1998.	
Environmental Conditions:		
QAPP Information:	QA Info Missing	
QAPP Information Reference(s):		

DECISION ID	38025	Region 9
San Vicente Reservoir		

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the 12 samples exceed the Basin Plan objective for Zinc. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 12 samples exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 38025, Zinc	Region 9
San Vicente Reservoir	

LOE ID:	1112

Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. None of the 12 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for zinc is 5.0 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Vicente Reservoir site SVA-0.
Temporal Representation:	Samples were collected from 02/05/1996 to 03/06/2000. 3-5 samples were collected per year from 1996-1998. 0 samples were collected in 1999, and 1 sample was collected in 2000.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

DECISION ID **41463** **Region 9**

San Vicente Reservoir

Pollutant:	**meta-para xylenes**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 3 samples exceed the Basin Plan water quality objective for meta-para xylenes.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 3 samples exceed the Basin Plan water quality objective for meta-para xylenes and this

sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 41463, meta-para xylenes **Region 9**

San Vicente Reservoir

LOE ID:	1088
Pollutant:	meta-para xylenes
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 06/1997, 05/1999, and 08/2000. None of the 3 samples were in exceedance. The sum of all measured xylene concentrations (summed on days in which m, p, and o-xylenes were all measured) was not in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for xylenes is 1.750 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	MCL is for either a single isomer or the sum of the isomers. Incorporations by reference are prospective including future changes to the incorporated provisions as the changes take effect.
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	Samples were collected at San Vicente Reservoir site SVA-0.
Temporal Representation:	None sample was collected per sampling day on 06/02/1997, 05/03/1999, and 08/07, 2000.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

DECISION ID **43715** **Region 9**

San Vicente Reservoir

Pollutant:	**o-Xylene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 4 samples exceed the Basin Plan water quality objective for o-xylene.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 4 samples exceed the Basin Plan water quality objective for o-xylene and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43715, o-Xylene **Region 9**

San Vicente Reservoir

LOE ID:	1090
Pollutant:	o-Xylene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996-2000. None of the 4 samples were in exceedance. The sum of all measured xylenes (meta, para, ortho) on days in which all were measured, was not in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Xylenes is 1.750 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	MCL is for either a single isomer or the sum of the isomers. Incorporations by reference are prospective including future changes to the incorporated provisions as the changes take effect.
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	Samples were collected at San Vicente Reservoir site SVA-0.

Temporal Representation:	One sample per day was collected on 06/03/1996, 06/02/1997, 05/03/1999, 08/07/2000.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

DECISION ID	43115	Region 9
San Vicente Reservoir		

Pollutant:	**Chloride**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown | Unknown Nonpoint Source | Water Diversions
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Fifty-six of 60 samples exceed the Basin Plan water quality objective for chloride. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the section 303(d) list. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Fifty-six of 60 samples exceed the Basin Plan water quality objective for chloride, and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 43115, Chloride	**Region 9**
San Vicente Reservoir	

LOE ID:	1071
Pollutant:	Chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	60
Number of Exceedances:	56
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. Fifty-six of 60

samples were in exceedance. 035621

Data Reference: Placeholder reference 2006 303(d)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: From the Basin Plan: For inland surface waters in San Vicente HA and all beneficial uses, the WQO for Chloride is 50 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.

Objective/Criterion Reference: Placeholder reference 2006 303(d)

Evaluation Guideline:

Guideline Reference:

Spatial Representation: Samples were collected at San Vicente Reservoir site SVA-0.

Temporal Representation: Samples were collected on a monthly basis from 01/02/1996 to 12/04/2000.

Environmental Conditions:

QAPP Information: QA Info Missing

QAPP Information Reference(s):

DECISION ID 44819 Region 9

San Vicente Reservoir

Pollutant: **Sulfates**

Final Listing Decision: **List on 303(d) list (TMDL required list)**

Last Listing Cycle's Final Listing Decision: List on 303(d) list (TMDL required list)(2012)

Revision Status Original

Sources: Source Unknown

Expected TMDL Completion Date: 2019

Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for removal from the section 303(d) list under section 3.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Fifty-seven of 60 samples exceed the Basin Plan water quality objective for sulfates.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the section 303(d) list.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Fifty-seven of 60 samples exceed the Basin Plan water quality objective for sulfates, and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 44819, Sulfates Region 9

San Vicente Reservoir 035622

LOE ID:	1096
Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	60
Number of Exceedances:	57
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. Fifty-seven of 60 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters in the San Vicente HA and all beneficial uses, the WQO for sulfate is 65 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Vicente Reservoir site SVA-0.
Temporal Representation:	Samples were collected on a monthly basis from 01/02/1996 to 12/04/2000.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: El Capitan Lake
Water Body ID: CAL9073100020011025093211
Water Body Type: Lake & Reservoir

DECISION ID 34602 **Region 9**
El Capitan Lake

Pollutant: **1,1,1-Trichloroethane**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Original
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 17 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34602, 1,1,1-Trichloroethane **Region 9**
El Capitan Lake

LOE ID: 1113

Pollutant: 1,1,1-Trichloroethane
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 17
Number of Exceedances: 0

Data and Information Type: PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality: Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 17 samples were in exceedance. EPA method 524.2 was used for sample analysis.

Data Reference:	Placeholder reference 2006 303(d)	035624
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,1,1-Trichloroethane is 0.200 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.	
Temporal Representation:	Samples were collected on a quarterly basis from 01/1997 to 02/2001.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID 34689 Region 9

El Capitan Lake

Pollutant:	**1,1,2,2-Tetrachloroethane**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 17 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34689, 1,1,2,2-Tetrachloroethane Region 9

El Capitan Lake

LOE ID:	1114
Pollutant:	1,1,2,2-Tetrachloroethane
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	17	035625
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 17 samples were in exceedance. EPA method 524.2 was used for sample analysis.	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,1,2,2-Tetrachloroethane is 0.001 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.	
Temporal Representation:	Samples were collected on a quarterly basis from 01/1997 to 02/2001.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID 33882 **Region 9**

El Capitan Lake

Pollutant:	**1,1,2-Trichloroethane**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 17 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33882, 1,1,2-Trichloroethane **Region 9**

El Capitan Lake

LOE ID:	1115
Pollutant:	1,1,2-Trichloroethane

LOE Subgroup:	Pollutant-Water	035626
Matrix:	Water	
Fraction:	Total	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	17	
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 17 samples were in exceedance. EPA method 524.2 was used for sample analysis.	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,1,2-Trichloroethane is 0.005 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.	
Temporal Representation:	Samples were collected on a quarterly basis from 01/1997 to 02/2001.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID	33657	Region 9
El Capitan Lake		

Pollutant:	**1,1-Dichloroethylene (DCE)/ Vinylidene Chloride**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 17 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33657, 1,1-Dichloroethylene (DCE)/ Vinylidene Chloride **Region 9**

El Capitan Lake 035627

LOE ID:	1116
Pollutant:	1,1-Dichloroethylene (DCE)/ Vinylidene Chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept from 1997 to 2001. None of the 17 samples collected were in exceedance. EPA method 524.2 was used for sample analysis.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,1-Dichloroethane is 0.005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.
Temporal Representation:	Samples were collected on a quarterly basis from 01/1997 to 02/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33532** **Region 9**

El Capitan Lake

Pollutant:	**1,2,4-Trichlorobenzene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 17 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision	This is a decision previously approved by the State Water Resources Control Board and the USEPA.

Recommendation: No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33532, 1,2,4-Trichlorobenzene — Region 9

El Capitan Lake

LOE ID:	1117
Pollutant:	1,2,4-Trichlorobenzene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 17 samples were in exceedance. EPA method 524.2 was used for sample analysis.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,2,4-Trichlorobenzene is 0.07 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.
Temporal Representation:	Samples were collected on a quarterly basis from 01/1997 to 02/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 33781 — Region 9

El Capitan Lake

Pollutant:	**1,2-Dibromo-3-chloropropane (DBCP)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.

3. None of the 33 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33781, 1,2-Dibromo-3-chloropropane (DBCP) Region 9

El Capitan Lake

LOE ID:	1118
Pollutant:	1,2-Dibromo-3-chloropropane (DBCP)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 17 samples were in exceedance. EPA method 524.2 was used for sample analysis.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for DBCP is 0.0002 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.
Temporal Representation:	Samples were collected on a quarterly basis from 01/1997 to 02/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33781, 1,2-Dibromo-3-chloropropane (DBCP) Region 9

El Capitan Lake

LOE ID:	1119
Pollutant:	1,2-Dibromo-3-chloropropane (DBCP)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	16
Number of Exceedances:	0
Data and Information Type:	Not Specified

Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept from 1997 to 2001. None of the 16 samples were in exceedance. EPA method 504 or 505 was used for sample analysis.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for DBCP is 0.0002 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.
Temporal Representation:	Samples were collected on a quarterly basis from 03/1997 to 06/2001, with the exception of 09/1999.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 33653 **Region 9**

El Capitan Lake

Pollutant:	**1,2-Dichloroethane**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 17 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33653, 1,2-Dichloroethane **Region 9**

El Capitan Lake

LOE ID:	1121
Pollutant:	1,2-Dichloroethane
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total

Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 17 samples were in exceedance. EPA method 524.2 was used for sample analysis.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,2-dichloroethane is 0.0005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.
Temporal Representation:	Samples were collected on a quarterly basis from 01/1997 to 02/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 33845 Region 9

El Capitan Lake

Pollutant:	**1,2-Dichloroethylene,-trans**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 17 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33845, 1,2-Dichloroethylene,-trans Region 9

El Capitan Lake

LOE ID:	1137	035632

Pollutant:	1,2-Dichloroethylene,-trans
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 17 samples were in exceedance. EPA method 524.2 was used for sample analysis.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for trans-1,2-dichloroethylene is 0.01 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.
Temporal Representation:	Samples were collected on a quarterly basis from 01/1997 to 02/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID	34058	Region 9
El Capitan Lake		

Pollutant:	**1,2-Dichloropropane**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 17 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34058, 1,2-Dichloropropane — Region 9

El Capitan Lake

LOE ID:	1122
Pollutant:	1,2-Dichloropropane
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept from 1997 to 2001. None of the 17 samples were in exceedance. EPA method 524.2 was used for sample analysis.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,2-dichloropropane is 0.005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.
Temporal Representation:	Samples were collected on a quarterly basis from 01/1997 to 02/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 34625 — Region 9

El Capitan Lake

Pollutant:	**Alachlor**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 24 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.

4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34625, Alachlor **Region 9**

El Capitan Lake

LOE ID:	1140
Pollutant:	Alachlor
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2000. None of the 9 samples were in exceedance. EPA method 507 was used for sample analysis.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Alachlor is 0.002 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.
Temporal Representation:	Samples were collected on a quarterly basis from 03/1997 to 08/1998, and once each in 08/2000 and 11/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 34625, Alachlor **Region 9**

El Capitan Lake

LOE ID:	1139
Pollutant:	Alachlor
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	15
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the

	15 samples were in exceedance. EPA method 525.2 was used for sample analysis. 03/03/05
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Alachlor is 0.002 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.
Temporal Representation:	Samples were collected on a quarterly basis from 05/1997 to 06/2001, except for the year 1999, when only one sample was collected in 12/1999.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 33554 Region 9

El Capitan Lake

Pollutant:	**Aluminum**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of the 51 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33554, Aluminum Region 9

El Capitan Lake

LOE ID:	1168
Pollutant:	Aluminum
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	51
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. on a monthly basis from 1996 to 2000. One of the 51 samples was in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Aluminum is 0.2 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.
Temporal Representation:	Samples were collected monthly from 01/1996 to 09/2000, with the exception of 01/1997, 01/1999, 04/1999, and 01/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **34106** **Region 9**

El Capitan Lake

Pollutant:	**Antimony**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used does not satisfy the data quantity requirements of section 6.1.5 of the Policy.
3. Three of 97 samples exceeded the Basin Plan criteria, and these do not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34106, Antimony **Region 9**

El Capitan Lake 035637

LOE ID:	1169
Pollutant:	Antimony
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	97
Number of Exceedances:	3
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1995 to 2005. Three of 97 samples were in exceedance (City of San Diego, 2006).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for Antimony is 0.006 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.
Temporal Representation:	Samples were collected several times per year from 04/12/95 to 11/9/05.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

DECISION ID **33838** **Region 9**

El Capitan Lake

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of the 27 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision	This is a decision previously approved by the State Water Resources Control Board and the USEPA.

Recommendation: No new data were assessed by the Regional Board for the current cycle. The decision basis not changed.

Line of Evidence (LOE) for Decision ID 33838, Arsenic — Region 9

El Capitan Lake

LOE ID:	1170
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	27
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. One of 27 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for Arsenic is 0.05 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.
Temporal Representation:	Samples were collected 4-7 times per year, during separate months, from 01/1996 to 11/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 33163 — Region 9

El Capitan Lake

Pollutant:	**Atrazine**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.

2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 23 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

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Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33163, Atrazine **Region 9**

El Capitan Lake

LOE ID:	1141
Pollutant:	Atrazine
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	14
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 14 samples were in exceedance. EPA method 525.2 was used for sample analysis.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Atrazine is 0.003 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.
Temporal Representation:	Samples were collected on a quarterly basis from 05/1997 to 07/2001, except for in 1999 when no samples were reported.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33163, Atrazine **Region 9**

El Capitan Lake

LOE ID:	1142
Pollutant:	Atrazine
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0

Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2000. None of the 9 samples were in exceedance. EPA method 507 was used for sample analysis.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Atrazine is 0.003 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.
Temporal Representation:	Samples were collected on a quarterly basis from 03/1997 to 08/1998 and and in 08/2000 and 11/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 33918 Region 9

El Capitan Lake

Pollutant:	**Barium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 31 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33918, Barium Region 9

El Capitan Lake

LOE ID:	1171
Pollutant:	Barium
LOE Subgroup:	Pollutant-Water

Matrix:	Water	035641
Fraction:	Total	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	31	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. None of the 31 samples were in exceedance.	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for Barium is 1.0 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.	
Temporal Representation:	Samples were collected 5-9 times per year, during separate months, from 01/1996 to 11/2000.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID 33645 Region 9

El Capitan Lake

Pollutant:	**Benzene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 17 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33645, Benzene Region 9

El Capitan Lake 035642

LOE ID:	1124
Pollutant:	Benzene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept from 1997 to 2000. None of the 17 samples were in exceedance. EPA method 524.2 was used for sample analysis.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Benzene is 0.001 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.
Temporal Representation:	Samples were collected on a quarterly basis from 01/1997 to 02/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment. QA=?
QAPP Information Reference(s):	

DECISION ID **34626** **Region 9**

El Capitan Lake

Pollutant:	**Benzo(a)pyrene (3,4-Benzopyrene -7-d)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. One line of evidence is available in the administrative record to assess this pollutant. None of the 15 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34626, Benzo(a)pyrene (3,4-Benzopyrene -7-d) 035643 Region 9
El Capitan Lake

LOE ID:	1143
Pollutant:	Benzo(a)pyrene (3,4-Benzopyrene -7-d)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	15
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 15 samples were in exceedance. EPA method 525.2 was used in sample analysis.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Benzo(a)pyrene is 0.0002 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.
Temporal Representation:	Samples were collected on a quarterly basis from 02/1997 to 12/2000, except for 1999, when 1 sample was collected that year in 12/1999, and in 06/2001 and 07/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 32525 Region 9
El Capitan Lake

Pollutant:	**Beryllium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.

	2. The data used does not satisfy the data quantity requirements of section 6.1.5 of the Policy. 3. Three of 87 samples exceeded the Basin Plan criteria, and these do not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32525, Beryllium **Region 9**

El Capitan Lake

LOE ID:	1172
Pollutant:	Beryllium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	87
Number of Exceedances:	3
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1995 to 2005. Three of 87 samples were in exceedance (City of San Diego, 2006).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for Beryllium is 0.004 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.
Temporal Representation:	Samples were collected once each in 12/4/95 to 9/11/05.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

DECISION ID **33599** **Region 9**

El Capitan Lake

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

	One line of evidence is available in the administrative record to assess this pollutant. A single sample was collected and it did exceed the Basin Plan criteria, but the number of samples is insufficient to determine with the confidence and power required by the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33599, Cadmium **Region 9**

El Capitan Lake

LOE ID:	1174
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 2000. One sample was collected and was in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for cadmium is 0.005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected in El Capitan Reservoir station ECA-0.
Temporal Representation:	One sample was collected in 05/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33730** **Region 9**

El Capitan Lake

Pollutant:	**Carbofuran**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the

2010 listing cycle. 035646

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 17 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33730, Carbofuran **Region 9**

El Capitan Lake

LOE ID:	1162
Pollutant:	Carbofuran
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 17 samples were in exceedance. Samples were analyzed using either EPA method 531.1 or 547.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for carbofuran is 0.018 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.
Temporal Representation:	Samples were collected on a quarterly basis from 05/1997 to 07/2001, except for 12/1998 and 06/2000, in which samples were not collected.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33646** **Region 9**

El Capitan Lake

Pollutant: **Carbon tetrachloride**

Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	035647
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)	
Revision Status	Original	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 17 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33646, Carbon tetrachloride — Region 9

El Capitan Lake

LOE ID:	1125
Pollutant:	Carbon tetrachloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 17 samples were in exceedance. EPA method 524.2 was used for sample analysis.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for carbon tetrachloride is 0.0005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.
Temporal Representation:	Samples were collected on a quarterly basis from 01/1997 to 02/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID	33604	035648 Region 9
El Capitan Lake		

Pollutant:	**Chlordane**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 20 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33604, Chlordane	**Region 9**
El Capitan Lake	

LOE ID:	1161
Pollutant:	Chlordane
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	11
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 11 samples were in exceedance. EPA method 504 or 505 was used for sample analysis.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for total chlordane is 0.0001 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.

Temporal Representation:	Samples were collected on a quarterly basis from 03/1997 to 08/1998, and once each in 12/1999, 02/2000, 02/2001, and 06/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33604, Chlordane **Region 9**

El Capitan Lake

LOE ID:	1160
Pollutant:	Chlordane
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2000. None of the 9 samples were in exceedance. EPA method 525.2 was used for sample analysis.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for total chlordane is 0.0001 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.
Temporal Representation:	Samples were collected on a quarterly basis from 09/1997 to 12/1998, and once each in 06/2000, 09/2000, and 12/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **46163** **Region 9**

El Capitan Lake

Pollutant:	**Chloride**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Three of 59 samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Three of the 59 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 46163, Chloride **Region 9**
El Capitan Lake

LOE ID:	1173
Pollutant:	Chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	59
Number of Exceedances:	3
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. Three of 59 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses in the El Capitan HA, the WQO for Chloride is 50 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.
Temporal Representation:	Samples were collected monthly from 01/1996 to 12/2000, with the exception of 01/1997.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33598** **Region 9**
El Capitan Lake

Pollutant:	**Chlorobenzene (mono)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)

Revision Status	Original	035651
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 17 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33598, Chlorobenzene (mono) **Region 9**

El Capitan Lake

LOE ID:	1126
Pollutant:	Chlorobenzene (mono)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 17 samples were in exceedance. EPA method 524.2 was used for sample analysis.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for chlorobenzene(mono) is 0.07 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.
Temporal Representation:	Samples were collected on a quarterly basis from 01/1997 to 02/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33600** **Region 9**

El Capitan Lake 035652

Pollutant:	**Chromium (total)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3.One of the 17 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33600, Chromium (total) Region 9

El Capitan Lake

LOE ID:	1175
Pollutant:	Chromium (total)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	17
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. One of 17 samples was in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for total Chromium is 0.05 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.
Temporal Representation:	Samples were collected 1-7 times per year from 01/1996 to 09/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.

QAPP Information Reference(s): 035653

DECISION ID	33797	Region 9
El Capitan Lake		

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. None of the 33 samples exceeded the Basin Plan water quality objective for copper. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 33 samples exceeded the Basin Plan water quality objective for copper and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33797, Copper	**Region 9**
El Capitan Lake	

LOE ID:	1187
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	33
Number of Exceedances:	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. None of the 33 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for copper is 1.0 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.
Temporal Representation:	Samples were collected monthly in 1996, 1997 (except for 01/1997 and 12/1997), and 2000 (from January to July). Samples were collected 5 times in 1998 and 3 times in 1999.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 34627 Region 9

El Capitan Lake

Pollutant:	**Endrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. None of the 29 samples exceed the Basin Plan water quality objective for endrin. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 29 samples exceed the Basin Plan water quality objective for endrin and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34627, Endrin Region 9

El Capitan Lake

LOE ID:	1145
Pollutant:	Endrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	Total	035655
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	15	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2000. None of the 15 samples were in exceedance. ECA method 504 or 505 was used for sample analysis.	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Endrin is 0.002 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.	
Temporal Representation:	Samples were collected on a quarterly basis from 03/1997 to 06/2001, except for 05/2000 and 11/2000.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 34627, Endrin **Region 9**

El Capitan Lake

LOE ID:	1144
Pollutant:	Endrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	14
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 14 samples were in exceedance. EPA method 525.2 was used for sample analysis.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Endrin is 0.002 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.
Temporal Representation:	Samples were collected on a quarterly basis from 05/1997 to 07/2001, except for 1999, in which only one yearly sample was collected in 12/1997, and 2001, in which no samples were collected in 05/2001.
Environmental Conditions:	

QAPP Information:	Data used in 2002 assessment.	035656
QAPP Information Reference(s):		

DECISION ID	33938	Region 9
El Capitan Lake		

Pollutant:	**Ethylbenzene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. None of the 17 samples exceed the Basin Plan water quality objective for ethylbenzene. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 17 samples exceed the Basin Plan water quality objective for ethylbenzene and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33938, Ethylbenzene	**Region 9**
El Capitan Lake	

LOE ID:	1127
Pollutant:	Ethylbenzene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 17 samples were in exceedance. EPA method 524.2 was used for sample analysis.
Data Reference:	Placeholder reference 2006 303(d)

SWAMP Data:	Non-SWAMP	035657
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for ethylbenzene is 0.7 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.	
Temporal Representation:	Samples were collected on a quarterly basis from 01/1997 to 02/2001.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment. QA=?	
QAPP Information Reference(s):		

DECISION ID 33526 Region 9

El Capitan Lake

Pollutant:	**Fluoride**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. None of the 58 samples exceeded the Basin Plan water quality objective for flouride. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 58 samples exceeded the Basin Plan water quality objective for flouride and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33526, Fluoride Region 9

El Capitan Lake

LOE ID:	1188
Pollutant:	Fluoride
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	Total	035658
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	58	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. None of the 58 samples were in exceedance.	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for Fluoride is 1.0 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.	
Temporal Representation:	Samples were collected on a monthly basis from 01/1996 to 11/2000, with the exception of 01/1997.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID	**33539**	**Region 9**
El Capitan Lake		

Pollutant:	**Glyphosate**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 17 samples exceed the Basin Plan water quality objective for glyphosate.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 17 samples exceed the Basin Plan water quality objective for glyphosate and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33539, Glyphosate **Region 9**

El Capitan Lake

LOE ID:	1163
Pollutant:	Glyphosate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 17 samples were in exceedance. EPA method 531.1 or 547 was used for sample analysis.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for glyphosate is 0.7 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.
Temporal Representation:	Samples were collected on a quarterly basis from 03/1997 to 07/2001, except for 09/1998 and 09/1999, in which no samples were collected.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **43605** **Region 9**

El Capitan Lake

Pollutant:	**Heptachlor**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. None of the 28 samples exceeded the Basin Plan water quality objective for heptachlor.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 28 samples exceeded the Basin Plan water quality objective for heptachlor and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43605, Heptachlor **Region 9**

El Capitan Lake

LOE ID:	1148
Pollutant:	Heptachlor
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	14
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 14 samples were in exceedance. EPA method 525.2 was used for sample analysis.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Heptachlor is 0.00001 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.
Temporal Representation:	Samples were collected on a quarterly basis from 05/1997 to 06/2001, except for 12/1999, in which only one sample was collected for the year 1999.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43605, Heptachlor **Region 9**

El Capitan Lake

LOE ID:	1149
Pollutant:	Heptachlor
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	Total	035661
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	14	
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 14 samples were in exceedance. EPA method 504 or 505 was used for sample analysis.	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Heptachlor is 0.00001 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.	
Temporal Representation:	Samples were collected on a quartely basis from 03/1997 to 06/2001, with the exception of 09/1999, 05/2000, and 11/2000.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment. QA=?	
QAPP Information Reference(s):		

DECISION ID	34608	Region 9
El Capitan Lake		

Pollutant:	**Heptachlor epoxide**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. None of the 28 samples from the two lines of evidence exceed the Basin Plan water quality objective for heptachlor epoxide.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 28 samples from the two lines of evidence exceed the Basin Plan water quality objective for heptachlor epoxide and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34608, Heptachlor epoxide **Region 9**

El Capitan Lake

LOE ID:	1147
Pollutant:	Heptachlor epoxide
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	14
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 14 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Heptachlor epoxide is 0.00001 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.
Temporal Representation:	Samples were collected on a quarterly basis from 03/1997 to 06/2001, with the exception of 09/1999, 05/2000, and 11/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 34608, Heptachlor epoxide **Region 9**

El Capitan Lake

LOE ID:	1146
Pollutant:	Heptachlor epoxide
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	14
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 14 samples were in exceedance. EPA method 525.2 was used for sample analysis.
Data Reference:	Placeholder reference 2006 303(d)

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Heptachlor epoxide is 0.00001 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.
Temporal Representation:	Samples were collected on a quarterly basis from 05/1997 to 06/2001, expect for 1999, in which only one yearly sample was collected in 12/1999.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 43646 Region 9

El Capitan Lake

Pollutant:	**Hexachlorobenzene/ HCB**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. None of the 29 samples exceed the Basin Plan water quality objective for hexachlorobenzene. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 29 samples exceed the Basin Plan water quality objective for hexachlorobenzene and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43646, Hexachlorobenzene/ HCB Region 9

El Capitan Lake

LOE ID:	1150
Pollutant:	Hexachlorobenzene/ HCB

LOE Subgroup:	Pollutant-Water	035664
Matrix:	Water	
Fraction:	Total	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	14	
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 14 samples were in exceedance. EPA method 525.2 was used for sample analysis.	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for hexachlorobenzene is 0.001 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.	
Temporal Representation:	Samples were collected on a quarterly basis from 05/1997 to 07/2001, except for 12/1999, in which one year sample was collected, and in 06/2000, in which no samples were collected.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43646, Hexachlorobenzene/ HCB **Region 9**

El Capitan Lake

LOE ID:	1151
Pollutant:	Hexachlorobenzene/ HCB
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	15
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 15 samples were in exceedance. EPA method 504 or 505 was used for sample exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for hexachlorobenzene is 0.001 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.

Temporal Representation:	Samples were collected on a quarterly basis from 03/1997 to 06/2001, with the exception of 05/2000 and 11/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 43394 — Region 9

El Capitan Lake

Pollutant:	**Hexachlorocyclopentadiene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. None of the 30 samples from the two lines of evidence exceed the Basin Plan water quality objective for Hexachlorocyclopentadiene.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 30 samples from the two lines of evidence exceed the Basin Plan water quality objective for Hexachlorocyclopentadiene and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43394, Hexachlorocyclopentadiene — Region 9

El Capitan Lake

LOE ID:	1152
Pollutant:	Hexachlorocyclopentadiene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	15
Number of Exceedances:	0

Data and Information Type:	Not Specified	035666
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of 15 samples were in exceedance. EPA method 525.2 was used for sample analysis.	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface water with a municipal beneficial use, the WQO for hexachlorocyclopentadiene is 0.05 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.	
Temporal Representation:	Samples were collected on a quarterly basis from 05/1997 to 07/2001, except for 12/1999, in which only one yearly sample was collected for 1999.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43394, Hexachlorocyclopentadiene **Region 9**

El Capitan Lake

LOE ID:	1153
Pollutant:	Hexachlorocyclopentadiene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	15
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of 15 samples were in exceedance. EPA method 504 or 505 was used in sample analysis.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface water with a municipal beneficial use, the WQO for hexachlorocyclopentadiene is 0.05 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.
Temporal Representation:	Samples were collected on a quarterly basis from 03/1997 to 06/2001, except for 05/2000 and 11/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 34795 **Region 9**

El Capitan Lake

Pollutant:	**Iron**	035667
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)	
Revision Status	Original	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. One of the 37 samples exceeds the Basin Plan water quality objective for iron.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of the 37 samples exceeds the Basin Plan water quality objective for iron and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34795, Iron **Region 9**

El Capitan Lake

LOE ID:	1189
Pollutant:	Iron
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	37
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. One of 37 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for iron is 0.3 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.
Temporal Representation:	Samples were collected 3-10 times per year from 01/1996 to 07/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33652** **Region 9**

El Capitan Lake

Pollutant:	**Lindane/gamma Hexachlorocyclohexane (gamma-HCH)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 7 samples exceed the Basin Plan water quality objective for lindane/gamma hexachlorocyclohexane.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One line of evidence is available in the administrative record to assess this pollutant. None of the 7 samples exceed the Basin Plan water quality objective for lindane/gamma hexachlorocyclohexane and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33652, Lindane/gamma Hexachlorocyclohexane (gamma-HCH) **Region 9**

El Capitan Lake

LOE ID:	1166
Pollutant:	Lindane/gamma Hexachlorocyclohexane (gamma-HCH)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0

Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1999 to 2001. None of the 7 samples were in exceedance. EPA method 504 or 505 was used for sample analysis.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for LIndane is 0.0002 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.
Temporal Representation:	Samples were collected on a quarterly basis from 02/1999 to 02/2000, and in 02/2001 and 06/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 43192 Region 9

El Capitan Lake

Pollutant:	**Mercury**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. A single sample was collected and it did not exceed the Basin Plan water quality objective for mercury.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. A single sample was collected and it did not exceed the Basin Plan water quality objective for mercury and this sample size is insufficient to determine with the power and confidence of the Listing Policy if standards are not met. A minimum of two samples is needed for application of table 3.1.
4. Pursuant to [SECTION 3.11/4.11] of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43192, Mercury Region 9

El Capitan Lake 035670

LOE ID:	1191
Pollutant:	Mercury
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 2000. One sample was collected and was not in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for mercury is 0.002 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.
Temporal Representation:	One sample was collected on 04/05/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33534** **Region 9**

El Capitan Lake

Pollutant:	**Methoxychlor**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. None of the 29 samples exceed the Basin Plan water quality objective for methoxychlor.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.

3. None of the 29 samples exceed the Basin Plan water quality objective for methoxychlor and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33534, Methoxychlor **Region 9**

El Capitan Lake

LOE ID:	1155
Pollutant:	Methoxychlor
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	15
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 15 samples were in exceedance. EPA method 504 or 505 was used for sample analysis.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for methoxychlor is 0.04 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.
Temporal Representation:	Samples were collected on a quarterly basis from 05/1997 to 06/2001, except for 02/2000 and 11/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33534, Methoxychlor **Region 9**

El Capitan Lake

LOE ID:	1154
Pollutant:	Methoxychlor
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	14
Number of Exceedances:	0

Data and Information Type:	Not Specified	035672
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 14 samples were in exceedance. EPA method 525.2 was used for sample analysis.	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for methoxychlor is 0.04 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.	
Temporal Representation:	Samples were collected 1-4 times per year from 05/1997 to 07/2001.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID	43613	Region 9
El Capitan Lake		

Pollutant:	**Molinate**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. None of the 9 samples exceed the Basin Plan water quality objective for molinate. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 9 samples exceed the Basin Plan water quality objective for molinate and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43613, Molinate	Region 9
El Capitan Lake	

LOE ID:	1165	035673

Pollutant:	Molinate
LOE Subgroup:	Pollutant-Tissue
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2000. None of the 9 samples were in exceedance. EPA method 507 was used for sample analysis.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municpal beneficial use, the WQO for Molinate is 0.02 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.
Temporal Representation:	Samples were collected on a quarterly basis from 03/1997 to 08/1998 and in 08/2000 and 11/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID	46329	Region 9
El Capitan Lake		

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 5 samples exceed the Basin Plan water quality objective for nickel.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 5 samples exceed the Basin Plan water quality objective for nickel and this does not

exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 035674
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 46329, Nickel **Region 9**

El Capitan Lake

LOE ID:	1192
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2000. None of the 5 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for Nickel is 0.1 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.
Temporal Representation:	Samples were collected once each in 12/1996, 12/1997, 06/1999, 09/1999, and 05/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33697** **Region 9**

El Capitan Lake

Pollutant:	**Odor threshold number**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

This pollutant is being considered for placement on the section 303(d) list under section 3.7 of the Listing Policy. Under section 3.7 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. One of four samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of four samples exceed the water quality objective and this sample size is insufficient to determine with the power and confidence of the Listing Policy if standards are not met. A minimum of five samples is needed for application of table 3.2.
4. Pursuant to [SECTION 3.11/4.11] of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33697, Odor threshold number **Region 9**
El Capitan Lake

LOE ID:	1215
Pollutant:	Odor threshold number
LOE Subgroup:	Pollutant-Nuisance
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 1996. One of 4 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Odor is 3 units.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-GA177.
Temporal Representation:	Samples were collected once each on 4 days in January 1996.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33320** **Region 9**
El Capitan Lake

Pollutant: **Oxamyl (Vydate)**

Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	035676
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)	
Revision Status	Original	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 17 samples exceeded the Basin Plan water quality objective for Oxamyl (Vydate).

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 17 samples exceeded the Basin Plan water quality objective for Oxamyl (Vydate) and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33320, Oxamyl (Vydate) **Region 9**

El Capitan Lake

LOE ID:	1164
Pollutant:	Oxamyl (Vydate)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 17 samples were in exceedance. EPA method 531.1 or 547 was used for sample analysis.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for oxamyl is 0.2 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0. 035677
Temporal Representation:	Samples were collected on a quarterly basis from 03/1997 to 07/2001, except for 12/1998 and 06/2000, in which no samples were collected.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 43749 Region 9

El Capitan Lake

Pollutant:	**PCBs (Polychlorinated biphenyls)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 13 samples exceed the Basin Plan water quality objective for polychlorinated byphenyls.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 13 samples exceed the Basin Plan water quality objective for polychlorinated byphenyls and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43749, PCBs (Polychlorinated biphenyls) Region 9

El Capitan Lake

LOE ID:	1138
Pollutant:	PCBs (Polychlorinated biphenyls)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	13
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 1997. None of the 13 samples were in exceedance. Samples were collected for 8 PCBs. Neither a single PCB, nor the sum of the PCBs were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Polychlorinated Biphenyls is 0.0005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.
Temporal Representation:	Samples were collected either on both 02/05/1997 and 05/07/1997, or on just 05/07/1997. One sample was collected each sampling day.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 33603 Region 9

El Capitan Lake

Pollutant:	**Pentachlorophenol (PCP)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. None of the 10 samples exceed the Basin Plan water quality objective for Pentachlorophenol. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 10 samples exceed the Basin Plan water quality objective for Pentachlorophenol and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33603, Pentachlorophenol (PCP) Region 9

El Capitan Lake

LOE ID:	1157
Pollutant:	Pentachlorophenol (PCP)
LOE Subgroup:	Pollutant-Tissue
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 1998. One sample was collected and was not in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Pentachlorophenol is 0.001 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.
Temporal Representation:	One sample was collected on 03/04/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33603, Pentachlorophenol (PCP) Region 9

El Capitan Lake

LOE ID:	1156
Pollutant:	Pentachlorophenol (PCP)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept from 1997 to 2000. None of the 9 samples were in exceedance. EPA method 525.2 was used for sample analysis.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Pentachlorophenol is 0.001 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0. 035680
Temporal Representation:	Samples were collected on a quarterly basis from 02/1997 to 06/1998, and twice per year in 1998 and 2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 32560 Region 9

El Capitan Lake

Pollutant:	**Picloram**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. None of the 3 samples exceed the Basin Plan water quality objective for picloram. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 3 samples exceed the Basin Plan water quality objective for picloram and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32560, Picloram Region 9

El Capitan Lake

LOE ID:	1194
Pollutant:	Picloram
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	Not Specified

Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1998 to 1999. None of the 3 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for picloram is 0.5 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.
Temporal Representation:	Samples were collected once each in 12/1998, 09/1999, and 12/1999.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 43537 **Region 9**

El Capitan Lake

Pollutant:	**Selenium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. One of the 9 samples exceeded the Basin Plan water quality objective for selenium. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of the 9 samples exceed the Basin Plan water quality objective for selenium and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43537, Selenium **Region 9**

El Capitan Lake

LOE ID:	1195

Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. One of 9 samples was in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for Selenium is 0.05 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.
Temporal Representation:	Samples were collected 1-4 times per year from 01/1996 to 05/2000, except for 1999, in which no samples were collected.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **43091** **Region 9**

El Capitan Lake

Pollutant:	**Silver**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. A single sample was collected and it did not exceed the Basin Plan water quality objective for silver.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. A single sample was collected and it did not exceed the Basin Plan water quality objective for silver and this sample size is insufficient to determine with the power and confidence of the Listing Policy if

standards are not met. A minimum of two samples is needed for application of table 3.1 4. Pursuant to [SECTION 3.11/4.11] of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43091, Silver El Capitan Lake **Region 9**

LOE ID:	1196
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 2000. One sample was collected and was not in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for silver is 0.1 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.
Temporal Representation:	One sample was collected in 05/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 43037 Region 9
El Capitan Lake

Pollutant:	**Simazine**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. None of the 21 samples exceed the Basin Plan water quality objective for simazine.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 21 samples exceed the Basin Plan water quality objective for simazine and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43037, Simazine **Region 9**

El Capitan Lake

LOE ID:	1158
Pollutant:	Simazine
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept from 1997 to 2001. None of the 12 samples were in exceedance. EPA method 525.2 was used for sample analysis.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for simazine is 0.004 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.
Temporal Representation:	Samples were collected on a quarterly basis from 02/1997 to 12/1998, and twice per year in 2000 and 2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43037, Simazine **Region 9**

El Capitan Lake

LOE ID:	1159

Pollutant:	Simazine	035685
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	Total	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	9	
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1998 to 2000. None of the 9 samples were in exceedance. EPA method 507 was used for sample analysis.	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for simazine is 0.004 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.	
Temporal Representation:	Samples were collected on a quarterly basis from 03/1997 to 08/1998 and in 08/2000 and 11/2000.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID	**42872**	**Region 9**
El Capitan Lake		

Pollutant:	**Styrene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. None of the 17 samples exceeded the Basin Plan water quality objective for styrene.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 17 samples exceeded the Basin Plan water quality objective for styrene and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available

indicating that standards are not met. 035686

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 42872, Styrene **Region 9**

El Capitan Lake

LOE ID:	1129
Pollutant:	Styrene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 17 samples were in exceedance. EPA method 524.2 was used for sample analysis.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Styrene is 0.1 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.
Temporal Representation:	Samples were collected on a quarterly basis from 01/1997 to 02/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **32353** **Region 9**

El Capitan Lake

Pollutant:	**Sulfates**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 59

samples exceed the Basin Plan water quality objective for sulfates. 035687

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 59 samples exceed the Basin Plan water quality objective for sulfates and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32353, Sulfates **Region 9**

El Capitan Lake

LOE ID:	1197
Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	59
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. None of 59 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses in the El Capitan HA, the WQO for sulfate is 65 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.
Temporal Representation:	Samples were collected on a monthly basis from 01/1996 to 12/2000, with the exception of 01/1997.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33866** **Region 9**

El Capitan Lake

Pollutant: **Tetrachloroethylene/PCE**

Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	035688
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)	
Revision Status	Original	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 17 samples exceed the Basin Plan water quality objective for tetrachloroethylene (PCE).

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 17 samples exceed the Basin Plan water quality objective for tetrachloroethylene (PCE) and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33866, Tetrachloroethylene/PCE **Region 9**

El Capitan Lake

LOE ID:	1130
Pollutant:	Tetrachloroethylene/PCE
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 17 samples were in exceedance. EPA method 524.2 was used for sample analysis.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Tetrachloroethylene is 0.005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.	035689
Temporal Representation:	Samples were collected on a quarterly basis from 01/1997 to 02/2001.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID **44006** **Region 9**

El Capitan Lake

Pollutant:	**Thallium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. A single sample was collected and it exceeded the Basin Plan water quality objective for thallium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. A single sample was collected and it exceeded the Basin Plan water quality objective for thallium and this sample size is insufficient to determine with the power and confidence of the Listing Policy if standards are not met. A minimum of two samples is needed for application of table 3.1.
4. Pursuant to [SECTION 3.11/4.11] of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 44006, Thallium **Region 9**

El Capitan Lake

LOE ID:	1199
Pollutant:	Thallium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 2000. One sample was collected and was in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for Thallium is 0.002 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.
Temporal Representation:	One sample was collected on 05/03/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 43972 **Region 9**

El Capitan Lake

Pollutant:	**Toluene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. None of the 17 samples exceed the Basin Plan water quality objective for toluene. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 17 samples exceed the Basin Plan water quality objective for toluene and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43972, Toluene **Region 9**

El Capitan Lake

LOE ID:	1131

Pollutant:	Toluene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 17 samples were in exceedance. EPA method 524.2 was used for sample analysis.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Toluene is 0.15 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.
Temporal Representation:	Samples were collected on a quarterly basis from 01/1997 to 02/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID	32438	Region 9
El Capitan Lake		

Pollutant:	**Total Dissolved Solids**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Seven of 30 samples exceeded the Basin Plan water quality objective for total dissolved solids.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Seven of 30 samples exceeded the Basin Plan criteria, and these exceed the allowable frequency listed in Table 3.2 of the Listing Policy. At the October 25th Water Board meeting, comments were received concerning total dissolved solids in terminal reservoirs in the San Diego region. The Board

concluded that it was inappropriate to list these water bodies based on secondary MCLs when the TDS values of the incoming supplying waters were higher than the MCLs. Narrative standards are therefore met.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32438, Total Dissolved Solids **Region 9**

El Capitan Lake

LOE ID:	1198
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	30
Number of Exceedances:	7
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1998 to 2000. Seven of 30 samples were in exceedance. At the October 25th Water Board meeting, comments were received concerning total dissolved solids in terminal reservoirs in the San Diego region. The Board concluded that it was inappropriate to list these water bodies based on secondary MCLs when the TDS values of the incoming supplying waters were higher than the MCLs. Narrative standards are therefore met.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for TDS is 300 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.
Temporal Representation:	Samples were collected monthly from 07/1998 to 12/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33791** **Region 9**

El Capitan Lake

Pollutant:	**Total Suspended Solids (TSS)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or	Pollutant

Pollution: 035693

Regional Board Conclusion: Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. All 7 samples from two lines of evidence showed measurable values but there is no quantitative evaluation guideline with which to measure these values so it cannot be determined whether or not standards are being exceeded.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33791, Total Suspended Solids (TSS) **Region 9**

El Capitan Lake

LOE ID:	1213
Pollutant:	Total Suspended Solids (TSS)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 1996. Three samples were collected, with measurable concentrations between 5.7 and 6.1 mg/L.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, for Solids, Suspended and Settleable, waters shall not contain suspended and settleable solids in concentrations of solids that cause nuisance or adversely affect beneficial uses.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECB-0.
Temporal Representation:	Samples were collected once in 02/1996 and twice in 03/1996.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33791, Total Suspended Solids (TSS) **Region 9**

El Capitan Lake

LOE ID:	1214
Pollutant:	Total Suspended Solids (TSS)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 1996. All 4 samples showed measurable values, which ranged from 1.3 to 7.0 mg/L.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, for Solids, Suspended and Settleable, waters shall not contain suspended and settleable solids in concentrations of solids that cause nuisance or adversely affect beneficial uses.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECC-0.
Temporal Representation:	Two samples were collected in 02/1996 and 2 were collected in 03/1996.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment. QA=?
QAPP Information Reference(s):	

DECISION ID	33673	Region 9
El Capitan Lake		

Pollutant:	**Toxaphene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 13 samples exceed the Basin Plan water quality objective for toxaphene.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.

3. None of the 13 samples exceed the Basin Plan water quality objective for toxaphene and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33673, Toxaphene **Region 9**

El Capitan Lake

LOE ID:	1167
Pollutant:	Toxaphene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	13
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 13 samples were in exceedance. EPA method 504 ar 505 was used in sample analysis.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Total Toxaphene is 0.003 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.
Temporal Representation:	Samples were collected 1-4 times per year from 03/1997 to 06/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **43426** **Region 9**

El Capitan Lake

Pollutant:	**Trichloroethylene/TCE**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the

Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. 035496

One line of evidence is available in the administrative record to assess this pollutant. None of the 17 samples exceed the Basin Plan water quality objective for Trichloroethylene.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 17 samples exceed the Basin Plan water quality objective for Trichloroethylene and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43426, Trichloroethylene/TCE **Region 9**

El Capitan Lake

LOE ID:	1132
Pollutant:	Trichloroethylene/TCE
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 17 samples were in exceedance. EPA method 524.2 was used for sample analysis.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Trichloroethylene is 0.005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.
Temporal Representation:	Samples were collected on a quarterly basis from 01/1997 to 02/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33687** **Region 9**

El Capitan Lake

Pollutant:	**Trichlorofluoromethane (CFC-11)**	035697
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)	
Revision Status	Original	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 17 samples exceed the Basin Plan water quality objective for trichlorofluoromethane.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 17 samples exceed the Basin Plan water quality objective for trichlorofluoromethane and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33687, Trichlorofluoromethane (CFC-11) **Region 9**

El Capitan Lake

LOE ID:	1133
Pollutant:	Trichlorofluoromethane (CFC-11)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 17 samples were in exceedance. EPA method 524.2 was used for sample analysis.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Trichlorofluoromethane is 0.15 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.
Temporal Representation:	Samples were collected on a quarterly basis from 01/1997 to 02/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33215** **Region 9**

El Capitan Lake

Pollutant:	**Turbidity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. Eleven lines of evidence are available in the administrative record to assess this pollutant. Of the 1726 samples, 135 exceed the Basin Plan water quality objective for turbidity. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Of the 1726 samples, 135 exceed the Basin Plan water quality objective for turbidity and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33215, Turbidity **Region 9**

El Capitan Lake

LOE ID:	1201
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	161
Number of Exceedances:	19
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 1999. Nineteen of 161 samples were in exceedance of 5 ntu. No samples exceeded 20 ntu.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Turbidity is 5 ntu. For inland surface waters and all beneficial uses, the WQO for turbidity is 20 ntu.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-GA102.
Temporal Representation:	Samples were collected 3-5 times per month from 01/1996 to 02/1999.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33215, Turbidity **Region 9**

El Capitan Lake

LOE ID:	1206
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	62
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 1998. None of the 62 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Turbidity is 5 ntu. For inland surface waters and all beneficial uses, the WQO for turbidity is 20 ntu.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-GA157.
Temporal Representation:	Samples were collected 3-5 times per month from 01/1996 to 10/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33215, Turbidity **Region 9**

El Capitan Lake

LOE ID:	1203

Pollutant:	Turbidity	035700
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	Total	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	135	
Number of Exceedances:	8	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 1999. Eight of 135 samples were in exceedance of 5 ntu. No samples exceeded 20 ntu.	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Turbidity is 5 ntu. For inland surface waters and all beneficial uses, the WQO for turbidity is 20 ntu.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-GA127.	
Temporal Representation:	Samples were collected 3-5 times per month from 01/1996 to 02/1999.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33215, Turbidity **Region 9**

El Capitan Lake

LOE ID:	1202
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	241
Number of Exceedances:	15
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. Fifteen of 241 samples exceeded 5 ntu. No samples exceeded 20 ntu.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Turbidity is 5 ntu. For inland surface waters and all beneficial uses, the WQO for turbidity is 20 ntu.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-GA107.

Temporal Representation:	Samples were collected 1-5 times per month from 01/1996 to 12/2000.	035701
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33215, Turbidity **Region 9**

El Capitan Lake

LOE ID:	1209
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	213
Number of Exceedances:	22
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. Twenty-two of 213 samples exceeded 5 ntu. Three of 213 samples exceeded 20 ntu.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Turbidity is 5 ntu. For inland surface waters and all beneficial uses, the WQO for turbidity is 20 ntu.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.
Temporal Representation:	Samples were collected 2-5 times per month from 01/1996 to 09/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33215, Turbidity **Region 9**

El Capitan Lake

LOE ID:	1208
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	241
Number of Exceedances:	40
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. Forty of 241 samples exceeded 5 ntu. Seven of 241 samples exceeded 20 ntu.
Data Reference:	Placeholder reference 2006 303(d)

SWAMP Data:	Non-SWAMP	035702
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Turbidity is 5 ntu. For inland surface waters and all beneficial uses, the WQO for turbidity is 20 ntu.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-GA57.	
Temporal Representation:	Samples were collected 1-5 times per month from 01/1996 to 12/2000.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33215, Turbidity **Region 9**

El Capitan Lake

LOE ID:	1207
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 1996. None of the 6 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Turbidity is 5 ntu. For inland surface waters and all beneficial uses, the WQO for turbidity is 20 ntu.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-GA177.
Temporal Representation:	Samples were collected 6 times (once each day) from 01/03/1996 to 02/07/1996.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33215, Turbidity **Region 9**

El Capitan Lake

LOE ID:	1210
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total

Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	241
Number of Exceedances:	20
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. Twenty of 241 samples exceeded 5 ntu. Two of 241 samples exceeded 20 ntu.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Turbidity is 5 ntu. For inland surface waters and all beneficial uses, the WQO for turbidity is 20 ntu.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-GA82.
Temporal Representation:	Samples were collected 1-5 times per month from 01/1996 to 12/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33215, Turbidity **Region 9**

El Capitan Lake

LOE ID:	1204
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	154
Number of Exceedances:	7
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 1999. Seven of 154 samples exceeded 5 ntu. No samples exceeded 20 ntu.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Turbidity is 5 ntu. For inland surface waters and all beneficial uses, the WQO for turbidity is 20 ntu.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-GA132.
Temporal Representation:	Samples were collected 3-5 times per month from 01/1996 to 08/1999.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33215, Turbidity **Region 9**

El Capitan Lake

LOE ID:	1200
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	197
Number of Exceedances:	3
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. Three of 197 samples exceeded 5 ntu.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Turbidity is 5 ntu. For inland surface waters and all beneficial uses, the WQO for turbidity is 20 ntu.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.
Temporal Representation:	Samples were collected 1-7 times per month from 1/1996 to 12/2000. Duplicate samples were collected on some days.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33215, Turbidity **Region 9**

El Capitan Lake

LOE ID:	1205
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	80
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 1999. One of 80 samples was in exceedance of 5 ntu. None of the samples exceeded 20 ntu.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for

	Turbidity is 5 ntu. For inland surface waters and all beneficial uses, the WQO for turbidity is 20 ntu.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-GA152.
Temporal Representation:	Samples were collected 3-5 times per month from 01/1996 to 01/1999.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 33724 Region 9

El Capitan Lake

Pollutant:	**Uranium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. None of the 2 samples exceed the Basin Plan water quality objective for uranium. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 2 samples exceeded the Basin Plan objective for Uranium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33724, Uranium Region 9

El Capitan Lake

LOE ID:	1211
Pollutant:	Uranium
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	Total	035706
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	2	
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 1998. None of the 2 samples were in exceedance.	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for uranium is 20 pCi/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.	
Temporal Representation:	Samples were collected once each in 04/1998 and 10/1998.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID 43443 Region 9

El Capitan Lake

Pollutant:	**Vinyl chloride**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 17 samples exceeded the Basin Plan objectives, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43443, Vinyl chloride Region 9

El Capitan Lake

LOE ID:	1134
Pollutant:	Vinyl chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 17 samples were in exceedance. EPA method 524.2 was used for sample analysis.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for vinyl chloride is 0.0005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.
Temporal Representation:	Samples were collected on a quarterly basis from 01/1997 to 02/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33536** **Region 9**

El Capitan Lake

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle.

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 16 samples exceeded the Basin Plan objectives, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available

indicating that standards are not met. 035708

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33536, Zinc **Region 9**

El Capitan Lake

LOE ID:	1212
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	16
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. None of the 16 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Zinc is 5.0 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.
Temporal Representation:	Samples were collected 1-5 times per year 04/1996 to 07/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33895** **Region 9**

El Capitan Lake

Pollutant:	**cis-1,2-Dichloroethylene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that: 035709
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 17 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33895, cis-1,2-Dichloroethylene **Region 9**
El Capitan Lake

LOE ID:	1135
Pollutant:	cis-1,2-Dichloroethylene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 17 samples were in exceedance. EPA method 524.2 was used for sample analysis.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for cis-1,2-Dichloroethylene is 0.006 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.
Temporal Representation:	Samples were collected on a quarterly basis from 01/1997 to 02/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 33896 **Region 9**
El Capitan Lake

Pollutant:	**meta-para xylenes**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the

2010 listing cycle. 035710

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 17 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33896, meta-para xylenes **Region 9**

El Capitan Lake

LOE ID:	1136
Pollutant:	meta-para xylenes
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 17 samples were in exceedance. the sums of the isomers met standards. EPA method 524.2 was used for sample analysis.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for xylenes is 1.750 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	MCL is for either a single isomer or the sum of the isomers. Incorporations by reference are prospective including future changes to the incorporated provisions as the changes take effect.
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.
Temporal Representation:	Samples were collected on a quarterly basis from 01/1997 to 02/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33782** **Region 9**

El Capitan Lake

Pollutant:	**o-Dichlorobenzene**	035711
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)	
Revision Status	Original	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 17 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33782, o-Dichlorobenzene **Region 9**

El Capitan Lake

LOE ID:	1120
Pollutant:	o-Dichlorobenzene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 17 samples were in exceedance. EPA method 524.2 was used for sample analysis.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for o-dichlorobenzene is 0.6 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.
Temporal Representation:	Samples were collected on a quarterly basis from 01/1997 to 02/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID	33955	Region 9
El Capitan Lake		

Pollutant:	**o-Xylene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 17 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33955, o-Xylene	Region 9
El Capitan Lake	

LOE ID:	1128
Pollutant:	o-Xylene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of 17 samples were in exceedance. The sums of xylene isomers met standards.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for xylenes is 1.750 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	MCL is for either a single isomer or the sum of the isomers. Incorporations by reference are prospective including future changes to the incorporated provisions as the changes take

effect. 035713

Guideline Reference: Placeholder reference 2006 303(d)

Spatial Representation: Samples were collected at El Capitan Reservoir station ECA-0.
Temporal Representation: Samples were collected on a quarterly basis from 01/1997 to 02/2001.
Environmental Conditions:
QAPP Information: Data used in 2002 assessment.
QAPP Information Reference(s):

DECISION ID 43391 — Region 9

El Capitan Lake

Pollutant: **p-Dichlorobenzene (DCB)**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Original
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 17 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43391, p-Dichlorobenzene (DCB) — Region 9

El Capitan Lake

LOE ID: 1123

Pollutant: p-Dichlorobenzene (DCB)
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 17
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Data were collected by the City of San Diego Water Dept. from 1997 to 2001. None of the 17 samples were in exceedance. EPA method 524.2 was used for sample analysis.
Data Reference: Placeholder reference 2006 303(d)

SWAMP Data:	Non-SWAMP	035714
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for p-dichlorobenzene is 0.005 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.	
Temporal Representation:	Samples were collected on a quarterly basis from 01/1997 to 02/2001.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID 33601 Region 9

El Capitan Lake

Pollutant:	**Color**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. There were 1,376 out of 1,726 samples exceeding the Basin Plan objective, and these exceed the allowable frequency listed in Table 3.2 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33601, Color Region 9

El Capitan Lake

LOE ID:	1179
Pollutant:	Color
LOE Subgroup:	Pollutant-Nuisance
Matrix:	Water
Fraction:	Total

Beneficial Use:	Municipal & Domestic Supply	035715
Number of Samples:	135	
Number of Exceedances:	110	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 1999. There were 110 out of 135 samples that were in exceedance of 15 color units.	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Color is 15 units.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-GA127.	
Temporal Representation:	Samples were collected 3-5 times per month from 01/1996 to 02/1999.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33601, Color **Region 9**

El Capitan Lake

LOE ID:	1176
Pollutant:	Color
LOE Subgroup:	Pollutant-Nuisance
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	192
Number of Exceedances:	155
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. There were 155 out of 192 samples that were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Color is 15 units.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.
Temporal Representation:	Samples were collected 1-6 times per month from 01/1996 to 12/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33601, Color **Region 9**

El Capitan Lake 035716

LOE ID:	1177
Pollutant:	Color
LOE Subgroup:	Pollutant-Nuisance
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	162
Number of Exceedances:	140
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 1999. There were 140 out of 162 samples that were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Color is 15 units.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-GA102.
Temporal Representation:	Samples were collected 3-5 times per month from 01/1996 to 02/1999.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33601, Color **Region 9**

El Capitan Lake

LOE ID:	1178
Pollutant:	Color
LOE Subgroup:	Pollutant-Nuisance
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	241
Number of Exceedances:	171
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. There were 171 out of 241 samples in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Color is 15 units.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-GA107.
Temporal Representation:	Samples were collected 1-5 times per month from 01/1996 to 12/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33601, Color **Region 9**

El Capitan Lake

LOE ID:	1186
Pollutant:	Color
LOE Subgroup:	Pollutant-Nuisance
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	241
Number of Exceedances:	179
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. There were 179 out of 241 samples that were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Color is 15 units.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-GA82.
Temporal Representation:	Samples were collected 1-5 times per month from 01/1996 to 12/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33601, Color **Region 9**

El Capitan Lake

LOE ID:	1180
Pollutant:	Color
LOE Subgroup:	Pollutant-Nuisance
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	154
Number of Exceedances:	121
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 1999. There were 121 out of 154 samples that were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Color is 15 units.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-GA132.
Temporal Representation:	Samples were collected 3-5 times per month from 01/1996 to 08/1999.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33601, Color **Region 9**

El Capitan Lake

LOE ID:	1181
Pollutant:	Color
LOE Subgroup:	Pollutant-Nuisance
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	80
Number of Exceedances:	65
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 1999. Sixty-five of 80 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Color is 15 units.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-GA152.
Temporal Representation:	Samples were collected 3-5 times each month from 01/1996 to 01/1999.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33601, Color **Region 9**

El Capitan Lake

LOE ID:	1182
Pollutant:	Color
LOE Subgroup:	Pollutant-Nuisance
Matrix:	Water
Fraction:	Total

Beneficial Use:	Municipal & Domestic Supply	035719
Number of Samples:	62	
Number of Exceedances:	55	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 1998. Fifty-five of 62 samples were in exceedance.	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Color is 15 units.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-GA157.	
Temporal Representation:	Samples were collected 3-5 times per month from 01/1996 to 10/1998.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment. QA=?	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33601, Color **Region 9**

El Capitan Lake

LOE ID:	1183
Pollutant:	Color
LOE Subgroup:	Pollutant-Nuisance
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	6
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 1996. Six of 6 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Color is 15 units.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-GA177.
Temporal Representation:	Samples were collected 6 times (once each on different days) from 01/03/1996 to 02/07/1996.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33601, Color **Region 9**

El Capitan Lake 035720

LOE ID:	1184
Pollutant:	Color
LOE Subgroup:	Pollutant-Nuisance
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	241
Number of Exceedances:	202
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. There were 202 out of 241 samples that were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Color is 15 units.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-GA57.
Temporal Representation:	Samples were collected 1-5 times per month from 01/1996 to 12/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33601, Color **Region 9**

El Capitan Lake

LOE ID:	1185
Pollutant:	Color
LOE Subgroup:	Pollutant-Nuisance
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	212
Number of Exceedances:	122
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. One hundred and seventy-two out of 212 samples were in exceedance. An exceedance of standards occurred during all sampling years.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Color is 15 units.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	

Guideline Reference:	035721
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.
Temporal Representation:	Samples were collected 2-5 times per month from 01/1996 to 09/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 42774 Region 9

El Capitan Lake

Pollutant:	**Manganese**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Thirteen of 64 samples exceeded the Basin Plan water quality objective for manganese and 4 out of 5 years had exceedances more than 10% of the time. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Thirteen of 64 samples exceeded the Basin Plan water quality objective for manganese. Four out of 5 years had exceedances more than 10% of the time and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 42774, Manganese Region 9

El Capitan Lake

LOE ID:	1190
Pollutant:	Manganese
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	64	035722
Number of Exceedances:	13	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. Thirteen of 64 samples were in exceedance of 0.05 mg/L. Four out of 5 years had exceedances more than 10% or the time.	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The water quality objective for manganese in El Capitan Lake is 0.05 milligrams/liter (mg/l) according to Basin Plan, Table 3-2 entitled, Water Quality Objectives. This concentration is not to be exceeded more than 10% of the time during any one year period.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.	
Temporal Representation:	Samples were collected 1-2 times monthly from 01/1996 to 11/2000, with the exception of 01/1997.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID	**44703**	**Region 9**
El Capitan Lake		

Pollutant:	**Phosphorus**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Six of the seven samples exceed the Basin Plan water quality objective for phosphorus.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Six of the seven samples exceed the Basin Plan water quality objective for phosphorus and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 44703, Phosphorus **Region 9**

El Capitan Lake

LOE ID:	6158
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Aquatic Life Use:	Warm Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	6
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Six of seven samples exceeded the water quality objective. Data was collected by the City of San Diego's Water Department, Water Quality Monitoring Data for Drinking Source Water Reservoirs between January 2005 to December 2006.
Data Reference:	Water Department, Water Quality Monitoring Data for Drinking Source Water Reservoirs. January 2005 to December 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. (RWQCB, 2007),. A desired goal in order to prevent plant nuisance in any standing body of water is 0.025 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used. (RWQCB, 2007)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	One surface water sample was collected per sampling event at El Capitan Lake at a standard location designated Â“Station AÂ”.
Temporal Representation:	Samples were collected once or twice a month from January 2005 to December 2006.
Environmental Conditions:	
QAPP Information:	Samples were collected and analyzed according to the City of San Diego's Water Quality Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	Water Quality Laboratory. Quality Assurance Manual

DECISION ID **43926** **Region 9**

El Capitan Lake

Pollutant:	**Total Nitrogen as N**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**

Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)	035724
Revision Status	Original	
Sources:	Source Unknown	
Expected TMDL Completion Date:	2021	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. (with update to table 3.1)

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Thirty of the thirty-five samples exceed the Basin Plan water quality objective for total nitrogen as N.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Thirty of the thirty-five samples exceed the Basin Plan water quality objective for total nitrogen as N and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 43926, Total Nitrogen as N **Region 9**

El Capitan Lake

LOE ID:	6157
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Aquatic Life Use:	Warm Freshwater Habitat
Number of Samples:	35
Number of Exceedances:	30
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Thirty of 35 samples exceeded the water quality objective. Data was collected by the City of San Diego's Water Department, Water Quality Monitoring Data for Drinking Source Water Reservoirs from January 2005 to December 2006.
Data Reference:	Water Department, Water Quality Monitoring Data for Drinking Source Water Reservoirs, January 2005 to December 2006
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. (RWQCB, 2007). A desired goal in order to prevent plant nuisance in any standing body of water is 0.025 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used. (RWQCB, 2007)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	One surface water sample was collected per sampling event at El Capitan Lake at a standard location designated Â“Station AÂ”.
Temporal Representation:	Samples were collected once or twice a month from January 2005 to December 2006.
Environmental Conditions:	
QAPP Information:	Samples were collected and analyzed according to the City of San Diego's Water Quality Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	Water Quality Laboratory. Quality Assurance Manual

DECISION ID 32680 Region 9

El Capitan Lake

Pollutant:	**pH**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Ten of the 57 samples exceeded the Basin Plan objective, and these exceed the allowable frequency listed in Table 3.2 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. The Regional Board will update this decision when new data and information become available and are assessed.

Line of Evidence (LOE) for Decision ID 32680, pH Region 9

El Capitan Lake

035726

LOE ID:	1193
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	57
Number of Exceedances:	10
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. Ten of 57 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for pH is 6.5 (minimum) to 8.5 (maximum).
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Capitan Reservoir station ECA-0.
Temporal Representation:	Samples were collected monthly from 01/1996 to 12/2000, except for 01/1997.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Sweetwater Reservoir
Water Body ID: CAL9092100019991117112141
Water Body Type: Lake & Reservoir

DECISION ID 37545 **Region 9**
Sweetwater Reservoir

Pollutant: **Alachlor**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 89 samples exceeded the Basin Plan criteria, and these do not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 37545, Alachlor **Region 9**
Sweetwater Reservoir

LOE ID: 1393

Pollutant: Alachlor
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 12
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Data were collected by the USGS from 09/1998 to 09/1999. None of the 12 samples were in exceedance (USGS, 2002).
Data Reference: Placeholder reference 2006 303(d)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Alachlor is 0.002 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the center of the minimum pool.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 09/20/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 37545, Alachlor **Region 9**

Sweetwater Reservoir

LOE ID:	1398
Pollutant:	Alachlor
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	16
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by RWQCB9 from 07/1997 to 01/2001. None of the 16 samples were in exceedance (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Alachlor is 0.002 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir. Exact location was not reported.
Temporal Representation:	Samples were collected from 07/1997 to 01/2001. Samples were collected in 07/1997, 11/1997, on a quarterly basis from 1998-2000, and in 01/2001. Samples were collected once per sampling day.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 37545, Alachlor **Region 9**

Sweetwater Reservoir

LOE ID:	1391
Pollutant:	Alachlor
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	Total	035729
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	13	
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 13 samples were in exceedance (USGS, 2002).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Alachlor is 0.002 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Sweetwater Reservoir near the pump tower.	
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 09/20/1999.	
Environmental Conditions:		
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 37545, Alachlor **Region 9**

Sweetwater Reservoir

LOE ID:	1397
Pollutant:	Alachlor
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 7 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Alachlor is 0.002 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir near Gum Tree Cove Pond.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	

QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 37545, Alachlor **Region 9**

Sweetwater Reservoir

LOE ID:	76873
Pollutant:	Alachlor
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	All seven samples analyzed did not exceed the water quality objective for alachlor thought to be protective of drinking water.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water designated for use as domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels specified in California Code of Regulations, Title 22, Table 64444-A of section 64444 (Organic Chemicals) which is incorporated by reference into this plan. This incorporation byreference is prospective including future changes to the incorporated provisions as the changes take effect. (See Table 3-5).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California primary MCL for alachlor is 2 ug/L for drinking water.
Guideline Reference:	
Spatial Representation:	The seven samples were collected from Sweetwater Reservoir.
Temporal Representation:	The samples was collected between Jan. 11, 2006 and July 10, 2007.
Environmental Conditions:	No environmental conditions were reported.
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 37545, Alachlor **Region 9**

Sweetwater Reservoir

LOE ID:	1395
Pollutant:	Alachlor
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0

Data and Information Type:	Not Specified	035731
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 8 samples were in exceedance (USGS, 2002).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Alachlor is 0.002 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the minimum pool boundary east.	
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.	
Environmental Conditions:		
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 37545, Alachlor **Region 9**

Sweetwater Reservoir

LOE ID:	1394
Pollutant:	Alachlor
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	10
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 10 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Alachlor is 0.002 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir near the recreation area.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 37545, Alachlor **Region 9**

Sweetwater Reservoir

LOE ID:	1396
Pollutant:	Alachlor
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 7 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Alachlor is 0.002 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the east end reservoir fill boundary.
Temporal Representation:	Samples were collected once per day on one day every other month from 09/09/1998 to 09/20/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 37545, Alachlor **Region 9**

Sweetwater Reservoir

LOE ID:	1392
Pollutant:	Alachlor
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 9 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Alachlor is 0.002 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	

Guideline Reference:	035733
Spatial Representation:	Samples were collected at Sweetwater Reservoir near Vista del Lago station.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

DECISION ID 43042 Region 9

Sweetwater Reservoir

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. None of the five samples exceed the water quality objective for chromium. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the five samples exceed the water quality objective for chromium and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 43042, Chromium Region 9

Sweetwater Reservoir

LOE ID:	1451
Pollutant:	Chromium (total)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	5
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	035734
Data Used to Assess Water Quality:	Data were collected by RWQCB9 from 02/1998 to 02/2000. None of the 5 samples were in exceedance (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Total Chromium is 0.05 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Sweetwater Reservoir. Exact location was not reported.	
Temporal Representation:	Samples were collected once per day on 5 days from 02/1998 to 02/2000. Samples were also collected in 08/1998 , 02/1999, and 07/1999.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment. QA=?	
QAPP Information Reference(s):		

DECISION ID	50167	Region 9
Sweetwater Reservoir		

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of seven samples did not exceed the guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of seven samples did not exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50167, Diazinon	Region 9
Sweetwater Reservoir	

LOE ID:	76875	035735

Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	This data is not of sufficient resolution to determine if standards are being achieved: the detection limit is greater than the criteria used to determine if water quality standards are being met.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	The samples were collected from Sweetwater Reservoir.
Temporal Representation:	The samples was collected between Jan. 11, 2006 and July 10, 2007.
Environmental Conditions:	No environmental conditions were reported.
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.
QAPP Information Reference(s):	

DECISION ID	50198	Region 9
Sweetwater Reservoir		

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.3 of the Listing Policy. Under section 3.3 a single line of evidence are necessary to assess listing status. Ten lines of evidence are available in the administrative record to assess this pollutant. Enterococcus 163 of 1836 samples exceed the single sample objective for water contact recreation. 166 of 1794 sample exceed the geometric mean objective for water contact recreation. Escherichia coli 26 of 1837 samples exceed the single sample objective for water contact recreation. 3 of 1975 samples exceed the geometric mean objective for water contact recreation.

Total coliform 035736
0 of 1000 samples exceeds the single sample objective for water contact recreation.
116 of 771 samples exceed the geometric mean objective for water contact recreation.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
Enterococcus
163 of 1836 samples exceed the single sample objective for water contact recreation.
166 of 1794 sample exceed the geometric mean objective for water contact recreation.
Escherichia coli
26 of 1837 samples exceed the single sample objective for water contact recreation.
3 of 1975 samples exceed the geometric mean objective for water contact recreation.
Total coliform
0 of 1000 samples exceeds the single sample objective for water contact recreation.
116 of 771 samples exceed the geometric mean objective for water contact recreation.
The samples do not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.1 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 50198, Indicator Bacteria **Region 9**

Sweetwater Reservoir

LOE ID:	76896
Pollutant:	Escherichia coli (E. coli)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	1837
Number of Exceedances:	26
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Twenty-six of the 1837 samples exceeded the E.coli objective of 235/100 ml. When the results for the nine sites are averaged on the same day, the results are 6 exceedances out of 361. The exceedances were not grouped at any particular site.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The E. coli criteria applicable to waters designated for contact recreation of 235/100ml. ref 2539 Region 9 Basin Plan
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at nine different locations in Sweetwater Reservoir.
Temporal Representation:	Samples were collected from January 2006 to December 2009.
Environmental Conditions:	
QAPP Information:	Sampling was conducted under the Sweetwater Authority Water Quality Monitoring Plan and analysis under the Sweetwater Authority Laboratory QA Manual.

QAPP Information Reference(s): 035737

Line of Evidence (LOE) for Decision ID 50198, Indicator Bacteria **Region 9**

Sweetwater Reservoir

LOE ID:	76876
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	1836
Number of Exceedances:	163
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	One hundred sixty-three of the 1835 samples exceeded the enterococcus objective. When the results for the nine sites are averaged on the same day, the results are 44 exceedances out of 361. The exceedances were not grouped at any particular site.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The enterococcus concentration shall not exceed 61/100ml. Region 9 Basin Plan EPA
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at nine different locations in Sweetwater Reservoir.
Temporal Representation:	Samples were collected from January 2006 to December 2009.
Environmental Conditions:	
QAPP Information:	Sampling was conducted under the Sweetwater Authority Water Quality Monitoring Plan and analysis under the Sweetwater Authority Laboratory QA Manual.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 50198, Indicator Bacteria **Region 9**

Sweetwater Reservoir

LOE ID:	76895
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	1794
Number of Exceedances:	166
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	One hundred sixty-six of the 1794 samples exceeded the enterococcus geomean objective.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geometric mean: The enterococcus concentration shall not exceed 33/100ml. Region 9 Basin Plan EPA

Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	035738
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at nine different locations in Sweetwater Reservoir.	
Temporal Representation:	Samples were collected from January 2006 to December 2009.	
Environmental Conditions:		
QAPP Information:	Sampling was conducted under the Sweetwater Authority Water Quality Monitoring Plan and analysis under the Sweetwater Authority Laboratory QA Manual.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 50198, Indicator Bacteria **Region 9**

Sweetwater Reservoir

LOE ID:	76918
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	1000
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of 1000 samples exceeded the total coliform objective. There is an additional 837 samples with the result reported as >2419.6. These could not be compared to the objective because detection limit was not adequate. These 837 samples may not be meeting the objective since the result was reported as >2419.6.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Total coliform shall not exceed 10,000/100ml. Guidance for Fresh Water Beaches CDPH, 2006. ref 2531
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.
Spatial Representation:	Samples were collected at nine different locations in Sweetwater Reservoir.
Temporal Representation:	Samples were collected from January 2006 to December 2009.
Environmental Conditions:	
QAPP Information:	Sampling was conducted under the Sweetwater Authority Water Quality Monitoring Plan and analysis under the Sweetwater Authority Laboratory QA Manual.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 50198, Indicator Bacteria **Region 9**

Sweetwater Reservoir

LOE ID:	76897
Pollutant:	Escherichia coli (E. coli)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation
Number of Samples:	1795
Number of Exceedances:	3
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Three of the 1795 samples exceeded the E. coli geomean objective.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Geometric mean: The E. coli criteria applicable to waters designated for contact recreation of 126/100ml. Region 9 Basin Plan EPA
Guideline Reference:	Ambient Water Quality Criteria for Bacteria - 1986. EPA440/5-84-002
Spatial Representation:	Samples were collected at nine different locations in Sweetwater Reservoir.
Temporal Representation:	Samples were collected from January 2006 to December 2009.
Environmental Conditions:	
QAPP Information:	Sampling was conducted under the Sweetwater Authority Water Quality Monitoring Plan and analysis under the Sweetwater Authority Laboratory QA Manual.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 50198, Indicator Bacteria **Region 9**

Sweetwater Reservoir

LOE ID:	76917
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	771
Number of Exceedances:	116
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	One hundred and sixteen of the 771 samples exceeded the total coliform geometric mean objective. There is an additional 837 samples that were not included in the geomean calculation with the result reported as >2419.6. These 837 samples may not be meeting the objective.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Geomean: Total coliform shall not exceed 1000/100ml. Guidance for Fresh Water Beaches CDPH, 2006. ref 2531
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.
Spatial Representation:	Samples were collected at nine different locations in Sweetwater Reservoir.

Temporal Representation:	Samples were collected from January 2006 to December 2009.	035740
Environmental Conditions:		
QAPP Information:	Sampling was conducted under the Sweetwater Authority Water Quality Monitoring Plan and analysis under the Sweetwater Authority Laboratory QA Manual.	
QAPP Information Reference(s):		

DECISION ID 52010 Region 9

Sweetwater Reservoir

Pollutant:	**Nitrogen, Nitrate**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of 16 samples exceeded the objective, but the data are of uncertain quality (no QAPP). Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used do not satisfy the data quality requirements of section 6.1.4 of the Policy (no QAPP). 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 16 samples exceeded the objective, though the data are of uncertain quality. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52010, Nitrogen, Nitrate Region 9

Sweetwater Reservoir

LOE ID:	76901
Pollutant:	Nitrogen, Nitrate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Eight samples were collected with no samples detecting nitrite as N. However, it cannot be determined whether the reporting limit was below the water quality objective and therefore whether samples met the water quality objective.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	San Diego Region Basin Plan: Water designated for use as MUN shall not contain concentrations of inorganic chemicals in excess of the MCL set in the California Code of Regulations. The California MCL for nitrite as N is 1 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater River Influent.
Temporal Representation:	Samples were collected biannually from 2006 to 2009.
Environmental Conditions:	
QAPP Information:	Data was submitted with an unsigned water quality monitoring plan.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 52010, Nitrogen, Nitrate **Region 9**

Sweetwater Reservoir

LOE ID:	76900
Pollutant:	Nitrogen, Nitrate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Eight samples were collected with no samples detecting nitrite as N. However, it cannot be determined whether the reporting limit was below the water quality objective and therefore whether samples met the water quality objective.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	San Diego Region Basin Plan: Water designated for use as MUN shall not contain concentrations of inorganic chemicals in excess of the MCL set in the California Code of Regulations. The California MCL for nitrite as N is 1 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Lake Surface.
Temporal Representation:	Samples were collected biannually from 2006 to 2009.
Environmental Conditions:	
QAPP Information:	Data was submitted with an unsigned water quality monitoring plan.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 52010, Nitrogen, Nitrate **Region 9**

Sweetwater Reservoir

LOE ID:	76898
Pollutant:	Nitrogen, Nitrate
LOE Subgroup:	Pollutant-Water

Matrix:	Water	035742
Fraction:	Total	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	8	
Number of Exceedances:	0	
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)	
Data Used to Assess Water Quality:	0 of 8 samples exceed the objective for nitrate (as N) at 10 mg/L. 7 of the 8 samples are reported as non-detects. These non-detects are less than or equal to the water quality standard, the value will be considered as meeting the water quality standard, objective, criterion, or evaluation guideline.	
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan, San Diego Region (2011): Waters designated for MUN shall not contain concentrations of chemical constituents in excess of the MCL specified in Title 22 of the California Code of Regulations. The nitrate (as N) MCL is 10 mg/L.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR	
Spatial Representation:	Samples were collected at Sweetwater Lake Surface.	
Temporal Representation:	Samples were collected biannually from 2006 to 2009.	
Environmental Conditions:		
QAPP Information:	Data was submitted with an unsigned water quality monitoring plan.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 52010, Nitrogen, Nitrate **Region 9**

Sweetwater Reservoir

LOE ID:	76899
Pollutant:	Nitrogen, Nitrate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	0 of 8 samples exceed the objective for nitrate (as N) at 10 mg/L. 7 of 8 samples are reported as non-detects. These non-detects are less than or equal to the water quality standard, the value will be considered as meeting the water quality standard, objective, criterion, or evaluation guideline.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan, San Diego Region (2011): Waters designated for MUN shall not contain concentrations of chemical constituents in excess of the MCL specified in Title 22 of the California Code of Regulations. The nitrate (as N) MCL is 10 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR

Spatial Representation:	Samples were collected at Sweetwater River Influent.
Temporal Representation:	Samples were collected biannually from 2006 to 2009.
Environmental Conditions:	
QAPP Information:	Data was submitted with an unsigned water quality monitoring plan.
QAPP Information Reference(s):	

DECISION ID 33084 Region 9

Sweetwater Reservoir

Pollutant:	**Simazine**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Nine lines of evidence are available in the administrative record to assess this pollutant. None of the 97 samples exceeded the Basin Plan water quality objective for simazine. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 97 samples exceeded the Basin Plan water quality objective for simazine and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 33084, Simazine Region 9

Sweetwater Reservoir

LOE ID:	1432
Pollutant:	Simazine
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	10
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 10 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Simazine is 0.004 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir near the recreation area.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33084, Simazine **Region 9**

Sweetwater Reservoir

LOE ID:	76916
Pollutant:	Simazine
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	16
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	All sixteen samples analyzed for Simazine were not detected above the method detection limit.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The concentrations of toxic substances in the water column, sediments or biota shall not adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Maximum Contamination Limit for Simazine in drinking water is 4 ug/L.
Guideline Reference:	
Spatial Representation:	The sample was collected from Low Flow Barrier at Sweetwater River, Upper (above Sweetwater Reservoir).
Temporal Representation:	The sample was collected on January 15th 2007..
Environmental Conditions:	No environmental conditions were reported.
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33084, Simazine **Region 9**

Sweetwater Reservoir

LOE ID:	1434

Pollutant:	Simazine
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 6 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Simazine is 0.004 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the east end reservoir fill boundary.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 09/20/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33084, Simazine **Region 9**

Sweetwater Reservoir

LOE ID:	1433
Pollutant:	Simazine
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 8 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Simazine is 0.004 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at Sweetwater Reservoir at the minimum pool boundary east.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33084, Simazine **Region 9**

Sweetwater Reservoir

LOE ID:	1431
Pollutant:	Simazine
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 12 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Simazine is 0.004 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir near the center of the minimum pool.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 09/20/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33084, Simazine **Region 9**

Sweetwater Reservoir

LOE ID:	1430
Pollutant:	Simazine
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	Not Specified

Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 90 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Simazine is 0.004 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir near Vista del Lago station.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33084, Simazine **Region 9**

Sweetwater Reservoir

LOE ID:	1436
Pollutant:	Simazine
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	16
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by RWQCB9 from 07/1997 to 01/2001. None of the 16 samples were in exceedance. Most samples except 2 were reported as non-detect. However, the 2 detectable samples were still below the WQO (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Simazine is 0.004 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir. Exact location was not reported.
Temporal Representation:	Samples were collected from 07/1997 to 01/2001. Samples were collected in 07/1997, 11/1997, on a quarterly basis from 1998-2000, and in 01/2001. Samples were collected once per sampling day.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33084, Simazine **Region 9**

Sweetwater Reservoir

LOE ID:	1435
Pollutant:	Simazine
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 7 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Simazine is 0.004 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir near Gum Tree Cove Pond.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33084, Simazine **Region 9**

Sweetwater Reservoir

LOE ID:	1429
Pollutant:	Simazine
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	13
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 13 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Simazine is 0.004 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	

Guideline Reference:	035749
Spatial Representation:	Samples were collected at Sweetwater Reservoir near the pump tower.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 09/20/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

DECISION ID 43969 Region 9

Sweetwater Reservoir

Pollutant:	**1,1,1-Trichloroethane**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 70 samples exceeded the Basin Plan objective for 1,1,1-Trichloroethane.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 70 samples exceeded the California Toxics Rule objective for 1,1,1-Trichloroethane, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43969, 1,1,1-Trichloroethane Region 9

Sweetwater Reservoir

LOE ID:	1232
Pollutant:	1,1,1-Trichloroethane
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	13

Number of Exceedances:	0	035750

Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 13 samples were in exceedance. All samples were below the detection limit (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,1,1-Trichloroethane is 0.200 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Sweetwater Reservoir near the pump tower.
Temporal Representation:	Samples were collected twice per day on one day, every other month for a year from 09/09/1998 to 09/20/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43969, 1,1,1-Trichloroethane **Region 9**

Sweetwater Reservoir

LOE ID:	1239
Pollutant:	1,1,1-Trichloroethane
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 08/1998, 08/1999, 09/2000, and 10/2000. None of the 4 samples were in exceedance (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,1,1-Trichloroethane is 0.200 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir. Exact location was not reported.
Temporal Representation:	Samples were collected on 08/11/1998, 08/24/1999, 09/5/2000, 10/04/2000. One sample was collected each day.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43969, 1,1,1-Trichloroethane **Region 9**

Sweetwater Reservoir 035751

LOE ID:	1237
Pollutant:	1,1,1-Trichloroethane
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 7 samples was in exceedance. All samples were below the detection limit (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,1,1-Trichloroethane is 0.200 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the east end reservoir fill boundary.
Temporal Representation:	Samples were collected once per day on one day every other month from 09/10/1998 to 09/20/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43969, 1,1,1-Trichloroethane **Region 9**

Sweetwater Reservoir

LOE ID:	1236
Pollutant:	1,1,1-Trichloroethane
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 8 samples were in exceedance. All samples were below the detection limit (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,1,1-Trichloroethane is 0.200 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)

Evaluation Guideline: 035752
Guideline Reference:

Spatial Representation: Samples were collected at Sweetwater Reservoir at the minimum pool boundary east.
Temporal Representation: Samples were collected 1-2 times per day on one day every other month for 10 months from 09/20/1998 to 07/12/1999.
Environmental Conditions:
QAPP Information: USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 43969, 1,1,1-Trichloroethane **Region 9**
Sweetwater Reservoir

LOE ID: 1234

Pollutant: 1,1,1-Trichloroethane
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 12
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Data were collected by the USGS from 09/1998 to 09/1999. None of the 12 samples were in exceedance. All samples were below the detection limit (USGS, 2002).
Data Reference: Placeholder reference 2006 303(d)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,1,1-Trichloroethane is 0.200 mg/L.
Objective/Criterion Reference: Placeholder reference 2006 303(d)

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Sweetwater Reservoir at the center of the minimum pool.
Temporal Representation: Samples were collected 2 times per day on one day every other month for a year from 09/09/1998 to 09/20/1998.
Environmental Conditions:
QAPP Information: USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 43969, 1,1,1-Trichloroethane **Region 9**
Sweetwater Reservoir

LOE ID: 1233

Pollutant: 1,1,1-Trichloroethane
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 9

Number of Exceedances:	0	035753

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Data were collected by the USGS from 09/1998 to 07/1999. None of the 9 samples were in exceedance. All samples were below the detection limit (USGS, 2002).
Data Reference: Placeholder reference 2006 303(d)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,1,1-Trichloroethane is 0.200 mg/L.
Objective/Criterion Reference: Placeholder reference 2006 303(d)

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at the Sweetwater Reservoir near Vista del Lago station.
Temporal Representation: Samples were collected 1-2 times per day, one day every other month for 10 months from 09/20/1998 to 07/12/1999.

Environmental Conditions:
QAPP Information: USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 43969, 1,1,1-Trichloroethane **Region 9**

Sweetwater Reservoir

LOE ID: 1238

Pollutant: 1,1,1-Trichloroethane
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 7
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Data were collected by the USGS from 09/1998 to 07/1999. None of the 7 samples were in exceedance. All samples were below the detection limit (USGS, 2002).
Data Reference: Placeholder reference 2006 303(d)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,1,1-Trichloroethane is 0.200 mg/L.
Objective/Criterion Reference: Placeholder reference 2006 303(d)

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Sweetwater Reservoir near Gum Tree Cover Pond.
Temporal Representation: Samples were collected 1-2 times on one day every other month from 09/10/1998 to 07/12/1999.

Environmental Conditions:
QAPP Information: USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 43969, 1,1,1-Trichloroethane **Region 9**

Sweetwater Reservoir 035754

LOE ID:	1235
Pollutant:	1,1,1-Trichloroethane
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	10
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 10 samples were in exceedance. All samples were below the detection limit (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,1,1-Trichloroethane is 0.200 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Sweetwater Reservoir near the recreation area.
Temporal Representation:	Samples were collected twice per day on one day every other month for 10 months from 09/10/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

DECISION ID **37843** **Region 9**

Sweetwater Reservoir

Pollutant:	**1,1,2,2-Tetrachloroethane**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 70 samples exceeded the Basin Plan criteria, and these do not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 37843, 1,1,2,2-Tetrachloroethane **Region 9**

Sweetwater Reservoir

LOE ID:	1311
Pollutant:	1,1,2,2-Tetrachloroethane
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	13
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 13 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,1,2,2-Tetrachloroethane is 0.001 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir near the pump tower.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 09/20/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 37843, 1,1,2,2-Tetrachloroethane **Region 9**

Sweetwater Reservoir

LOE ID:	1315
Pollutant:	1,1,2,2-Tetrachloroethane
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 8 samples were in exceedance (USGS, 2002).

Data Reference:	Placeholder reference 2006 303(d)	035756
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,1,2,2-Tetrachloroethane is 0.001 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the minimum pool boundary east.	
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.	
Environmental Conditions:		
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 37843, 1,1,2,2-Tetrachloroethane **Region 9**

Sweetwater Reservoir

LOE ID:	1318
Pollutant:	1,1,2,2-Tetrachloroethane
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 08/1998, 08/1999, 09/2000, and 10/2000. None of the 4 samples were in exceedance (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,1,2,2-Tetrachloroethane is 0.001 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir. Exact location was not reported.
Temporal Representation:	Samples were collected on 08/11/1998, 08/24/1999, 09/5/2000, 10/04/2000. One sample was collected each day.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 37843, 1,1,2,2-Tetrachloroethane **Region 9**

Sweetwater Reservoir

LOE ID:	1317
Pollutant:	1,1,2,2-Tetrachloroethane

LOE Subgroup:	Pollutant-Water	035757
Matrix:	Water	
Fraction:	Total	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	7	
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 7 samples were in exceedance (USGS, 2002).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,1,2,2-Tetrachloroethane is 0.001 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Sweetwater Reservoir near Gum Tree Cove Pond.	
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.	
Environmental Conditions:		
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 37843, 1,1,2,2-Tetrachloroethane **Region 9**

Sweetwater Reservoir

LOE ID:	1316
Pollutant:	1,1,2,2-Tetrachloroethane
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 7 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,1,2,2-Tetrachloroethane is 0.001 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the east end reservoir fill boundary.
Temporal Representation:	Samples were collected once per day on one day every other month from 09/09/1998 to

09/20/1999. 035758

Environmental Conditions:
QAPP Information: USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 37843, 1,1,2,2-Tetrachloroethane **Region 9**

Sweetwater Reservoir

LOE ID: 1314

Pollutant: 1,1,2,2-Tetrachloroethane
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 10
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Data were collected by the USGS from 09/1998 to 07/1999. None of the 10 samples were in exceedance (USGS, 2002).
Data Reference: Placeholder reference 2006 303(d)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,1,2,2-Tetrachloroethane is 0.001 mg/L.
Objective/Criterion Reference: Placeholder reference 2006 303(d)

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Sweetwater Reservoir near the recreation area.
Temporal Representation: Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:
QAPP Information: USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 37843, 1,1,2,2-Tetrachloroethane **Region 9**

Sweetwater Reservoir

LOE ID: 1313

Pollutant: 1,1,2,2-Tetrachloroethane
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 12
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Data were collected by the USGS from 09/1998 to 09/1999. None of the 12 samples were in exceedance (USGS, 2002).

Data Reference:	Placeholder reference 2006 303(d)	035759
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,1,2,2-Tetrachloroethane is 0.001 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the center of the minimum pool.	
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 09/20/1999.	
Environmental Conditions:		
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 37843, 1,1,2,2-Tetrachloroethane **Region 9**

Sweetwater Reservoir

LOE ID:	1312
Pollutant:	1,1,2,2-Tetrachloroethane
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 9 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,1,2,2-Tetrachloroethane is 0.001 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir near the Vista del Lago station.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

DECISION ID **32660** **Region 9**

Sweetwater Reservoir

Pollutant: **1,1,2-Trichloroethane**

Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	035760
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)	
Revision Status	Original	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 70 samples exceeded the Basin Plan criteria (all were 'non-detects'), and these do not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32660, 1,1,2-Trichloroethane — Region 9

Sweetwater Reservoir

LOE ID:	1246
Pollutant:	1,1,2-Trichloroethane
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 7 samples were in exceedance. All samples were below the detection limit (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,1,2-Trichloroethane is 0.005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the center of the minimum pool.
Temporal Representation:	Samples were collected 1-2 times per day, one day every other month from 09/10/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.

QAPP Information Reference(s): 035761

Line of Evidence (LOE) for Decision ID 32660, 1,1,2-Trichloroethane **Region 9**

Sweetwater Reservoir

LOE ID:	1244
Pollutant:	1,1,2-Trichloroethane
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 8 samples were in exceedance. All samples were below the detection limit (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,1,2-Trichloroethane is 0.005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the minimum pool boundary east.
Temporal Representation:	Samples were collected 1-2 times per day, one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 32660, 1,1,2-Trichloroethane **Region 9**

Sweetwater Reservoir

LOE ID:	1245
Pollutant:	1,1,2-Trichloroethane
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 7 samples were in exceedance. All samples were below the detection limit (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,1,2-Trichloroethane is 0.005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the east end of the reservoir fill boundary.
Temporal Representation:	Samples were collected once per day, one day every other month from 09/09/1998 to 09/20/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 32660, 1,1,2-Trichloroethane **Region 9**

Sweetwater Reservoir

LOE ID:	1240
Pollutant:	1,1,2-Trichloroethane
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	13
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 13 samples were in exceedance. All samples were below the detection limit (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,1,2-Trichloroethane is 0.005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir near the pump tower.
Temporal Representation:	Samples were collected 1-2 times per day every other month from 09/1998 to 09/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 32660, 1,1,2-Trichloroethane **Region 9**

Sweetwater Reservoir

LOE ID:	1243
Pollutant:	1,1,2-Trichloroethane
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total

Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	10
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 10 samples were in exceedance. All samples were below the detection limit (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,1,2-Trichloroethane is 0.005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir near the recreation area.
Temporal Representation:	Samples were collected 1-2 times per day, one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 32660, 1,1,2-Trichloroethane **Region 9**

Sweetwater Reservoir

LOE ID:	1242
Pollutant:	1,1,2-Trichloroethane
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 12 samples were in exceedance. All samples were below the detection limit (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,1,2-Trichloroethane is 0.005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the center of the minimum pool.
Temporal Representation:	Samples were collected 1-2 times per day, one day every other month from 09/09/1998 to 09/20/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring

Study. 035764

QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 32660, 1,1,2-Trichloroethane **Region 9**

Sweetwater Reservoir

LOE ID:	1247
Pollutant:	1,1,2-Trichloroethane
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 08/1998, 08/1999, 09/2000, and 10/2000. None of the 4 samples were in exceedance (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,1,2-Trichloroethane is 0.005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir. Exact location was not reported.
Temporal Representation:	Samples were collected on 08/11/1998, 08/24/1999, 09/5/2000, 10/04/2000. One sample was collected each day.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 32660, 1,1,2-Trichloroethane **Region 9**

Sweetwater Reservoir

LOE ID:	1241
Pollutant:	1,1,2-Trichloroethane
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 9 samples were in exceedance. All samples were below the detection limit (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,1,2-Trichloroethane is 0.005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir near Vista del Lago station.
Temporal Representation:	Samples were collected 1-2 times per day, one day every other month from 09/10/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

DECISION ID 33042 Region 9

Sweetwater Reservoir

Pollutant:	**1,1-Dichloroethylene (DCE)/ Vinylidene Chloride**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 70 samples exceeded the Basin Plan criteria (all were 'non-detects'), and these do not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33042, 1,1-Dichloroethylene (DCE)/ Vinylidene Chloride Region 9

Sweetwater Reservoir

LOE ID:	1253
Pollutant:	1,1-Dichloroethylene (DCE)/ Vinylidene Chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0

Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 7 samples were in exceedance. All samples were below the detection limit (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,1- Dichloroethylene is 0.006 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the east end reservoir fill boundary.
Temporal Representation:	Samples were collected once per day, on one day every other month from 09/09/1998 to 09/20/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33042, 1,1-Dichloroethylene (DCE)/ Vinylidene Chloride **Region 9**

Sweetwater Reservoir

LOE ID:	1252
Pollutant:	1,1-Dichloroethylene (DCE)/ Vinylidene Chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 8 samples were in exceedance. All samples were below the detection limit (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,1- Dichloroethylene is 0.006 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the minimum pool boundary east.
Temporal Representation:	Samples were collected 1-2 times per day, on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33042, 1,1-Dichloroethylene (DCE)/ Vinylidene Chloride **Region 9**

Sweetwater Reservoir 035767

LOE ID:	1250
Pollutant:	1,1-Dichloroethylene (DCE)/ Vinylidene Chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 12 samples were in exceedance. All samples were below the detection limit (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,1- Dichloroethylene is 0.006 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the center of the minimum pool.
Temporal Representation:	Samples were collected 1-2 times per day, on one day every other month from 09/09/1998 to 09/20/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33042, 1,1-Dichloroethylene (DCE)/ Vinylidene Chloride **Region 9**

Sweetwater Reservoir

LOE ID:	1251
Pollutant:	1,1-Dichloroethylene (DCE)/ Vinylidene Chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	10
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 10 samples were in exceedance. All samples were below the detection limit (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,1- Dichloroethylene is 0.006 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)

Evaluation Guideline: 035768
Guideline Reference:

Spatial Representation: Samples were collected at Sweetwater Reservoir near the recreation area.
Temporal Representation: Samples were collected 1-2 times per day, on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:
QAPP Information: USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 33042, 1,1-Dichloroethylene (DCE)/ Vinylidene Chloride Region 9
Sweetwater Reservoir

LOE ID: 1249

Pollutant: 1,1-Dichloroethylene (DCE)/ Vinylidene Chloride
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 9
Number of Exceedances: 0

Data and Information Type: PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality: Data were collected by the USGS from 09/1998 to 07/1999. None of the 9 samples were in exceedance. All samples were below the detection limit (USGS, 2002).
Data Reference: Placeholder reference 2006 303(d)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,1- Dichloroethylene is 0.006 mg/L.
Objective/Criterion Reference: Placeholder reference 2006 303(d)

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Sweetwater Reservoir near Vista del Lago station.
Temporal Representation: Samples were collected 1-2 times per day, on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:
QAPP Information: USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 33042, 1,1-Dichloroethylene (DCE)/ Vinylidene Chloride Region 9
Sweetwater Reservoir

LOE ID: 1255

Pollutant: 1,1-Dichloroethylene (DCE)/ Vinylidene Chloride
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 4

Number of Exceedances:	0	035769

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 08/1998, 08/1999, 09/2000, and 10/2000. None of the 4 samples were in exceedance (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,1- Dichloroethylene is 0.006 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir. Exact location was not reported.
Temporal Representation:	Samples were collected on 08/11/1998, 08/24/1999, 09/5/2000, 10/04/2000. One sample was collected each day.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33042, 1,1-Dichloroethylene (DCE)/ Vinylidene Chloride **Region 9**

Sweetwater Reservoir

LOE ID:	1248
Pollutant:	1,1-Dichloroethylene (DCE)/ Vinylidene Chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	13
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 13 samples were in exceedance. All samples were below the detection limit (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,1- Dichloroethylene is 0.006 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir near the pump tower.
Temporal Representation:	Samples were collected 1-2 times per day, on one day every other month from 09/09/1998 to 09/20/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33042, 1,1-Dichloroethylene (DCE)/ Vinylidene Chloride **Region 9**

Sweetwater Reservoir 035770

LOE ID:	1254
Pollutant:	1,1-Dichloroethylene (DCE)/ Vinylidene Chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 7 samples were in exceedance. All samples were below the detection limit (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,1- Dichloroethylene is 0.006 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir near Gum Tree Cove Pond.
Temporal Representation:	Samples were collected 1-2 times per day, on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

DECISION ID **37173** **Region 9**

Sweetwater Reservoir

Pollutant:	**1,2,4-Trichlorobenzene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 70 samples exceeded the Basin Plan criteria (all were 'non-detects'), and these do not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 37173, 1,2,4-Trichlorobenzene **Region 9**

Sweetwater Reservoir

LOE ID:	1269
Pollutant:	1,2,4-Trichlorobenzene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 7 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,2,4-Trichlorobenzene is 0.07 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the east end reservoir fill boundary.
Temporal Representation:	Samples were collected once per day on one day every other month from 09/09/1998 to 09/20/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 37173, 1,2,4-Trichlorobenzene **Region 9**

Sweetwater Reservoir

LOE ID:	1265
Pollutant:	1,2,4-Trichlorobenzene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 9 samples were in exceedance. All samples were below the detection limit (USGS, 2002).

Data Reference:	Placeholder reference 2006 303(d)	035772
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,2,4-Trichlorobenzene is 0.07 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Sweetwater Reservoir near Vista del Lago station.	
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.	
Environmental Conditions:		
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 37173, 1,2,4-Trichlorobenzene **Region 9**

Sweetwater Reservoir

LOE ID:	1270
Pollutant:	1,2,4-Trichlorobenzene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 7 samples were in exceedance. All samples were below the detection limit (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,2,4-Trichlorobenzene is 0.07 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir near Gum Tree Cove Pond.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 37173, 1,2,4-Trichlorobenzene **Region 9**

Sweetwater Reservoir

LOE ID:	1271

Pollutant:	1,2,4-Trichlorobenzene	035773
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	Total	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	4	
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 08/1998, 08/1999, 09/2000, and 10/2000. None of the 4 samples were in exceedance (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,2,4-Trichlorobenzene is 0.07 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Sweetwater Reservoir. Exact location was not reported.	
Temporal Representation:	Samples were collected on 08/11/1998, 08/24/1999, 09/5/2000, 10/04/2000. One sample was collected each day.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 37173, 1,2,4-Trichlorobenzene **Region 9**

Sweetwater Reservoir

LOE ID:	1264
Pollutant:	1,2,4-Trichlorobenzene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	13
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 13 samples were in exceedance. All samples were below the detection limit (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,2,4-Trichlorobenzene is 0.07 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir near the pump tower.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to

09/20/1999. 035774

Environmental Conditions:
QAPP Information: USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 37173, 1,2,4-Trichlorobenzene **Region 9**

Sweetwater Reservoir

LOE ID: 1268

Pollutant: 1,2,4-Trichlorobenzene
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 8
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Data were collected by the USGS from 09/1998 to 07/1999. None of the 8 samples were in exceedance. All samples were below the detection limit (USGS, 2002).
Data Reference: Placeholder reference 2006 303(d)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,2,4-Trichlorobenzene is 0.07 mg/L.
Objective/Criterion Reference: Placeholder reference 2006 303(d)

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Sweetwater Reservoir at the minimum pool boundary east.
Temporal Representation: Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:
QAPP Information: USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 37173, 1,2,4-Trichlorobenzene **Region 9**

Sweetwater Reservoir

LOE ID: 1266

Pollutant: 1,2,4-Trichlorobenzene
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 12
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Data were collected by the USGS from 09/1998 to 09/1999. None of the 12 samples were in exceedance. All samples were below the detection limit (USGS, 2002).

Data Reference:	Placeholder reference 2006 303(d)	035775
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,2,4-Trichlorobenzene is 0.07 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the center of the minimum pool.	
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 09/20/1999.	
Environmental Conditions:		
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 37173, 1,2,4-Trichlorobenzene **Region 9**

Sweetwater Reservoir

LOE ID:	1267
Pollutant:	1,2,4-Trichlorobenzene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	10
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 10 samples were in exceedance. All samples were below the detection limit (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,2,4-Trichlorobenzene is 0.07 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir near the recreation area.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

DECISION ID **37788** **Region 9**

Sweetwater Reservoir

Pollutant: **1,2-Dichloroethane**

Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	035776
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)	
Revision Status	Original	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

One line of evidence is available in the administrative record to assess this pollutant. None of the 4 samples exceed the Basin Plan objective, and this does not exceed the allowable frequency of the Listing Policy.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Four samples exceeded the Basin Plan Objective for 1,2-Dichloroethane, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 37788, 1,2-Dichloroethane **Region 9**

Sweetwater Reservoir

LOE ID:	1466
Pollutant:	1,2-Dichloroethane
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 08/1998, 08/1999, 09/2000, and 10/2000. None of the 4 samples were in exceedance (SWRCB, 2003), (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,2-Dichloroethane is 0.0005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at Sweetwater Reservoir. Exact location was not reported.
Temporal Representation:	Samples were collected on 08/11/1998, 08/24/1999, 09/5/2000, 10/04/2000. One sample was collected each day.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 33492 Region 9

Sweetwater Reservoir

Pollutant:	**1,2-Dichloroethylene,-trans**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 70 samples exceeded the Basin Plan criteria (all were 'non-detects'), and these do not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33492, 1,2-Dichloroethylene,-trans Region 9

Sweetwater Reservoir

LOE ID:	1259
Pollutant:	1,2-Dichloroethylene,-trans
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	10
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 10 samples were in exceedance. All samples were below the detection limit (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for trans-1,2- Dichloroethylene is 0.01 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Sweetwater Reservoir near the recreation area.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1998.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33492, 1,2-Dichloroethylene,-trans **Region 9**

Sweetwater Reservoir

LOE ID:	1258
Pollutant:	1,2-Dichloroethylene,-trans
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 12 samples were in exceedance. All samples were below the detection limit (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for trans-1,2- Dichloroethylene is 0.01 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Sweetwater Reservoir at the center of the minimum pool.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 09/20/1998.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33492, 1,2-Dichloroethylene,-trans **Region 9**

Sweetwater Reservoir

LOE ID:	1260
Pollutant:	1,2-Dichloroethylene,-trans
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total

Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 0971999. None of the 8 samples were in exceedance. All samples were below the detection limit (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for trans-1,2- Dichloroethylene is 0.01 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Sweetwater Reservoir at the minimum pool boundary east.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1998.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33492, 1,2-Dichloroethylene,-trans **Region 9**

Sweetwater Reservoir

LOE ID:	1256
Pollutant:	1,2-Dichloroethylene,-trans
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	13
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 13 samples were in exceedance. All samples were below the detection limit (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for trans-1,2- Dichloroethylene is 0.01 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Sweetwater Reservoir near the pump tower.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 09/20/1998.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring

	Study.	035780
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33492, 1,2-Dichloroethylene,-trans **Region 9**

Sweetwater Reservoir

LOE ID:	1257
Pollutant:	1,2-Dichloroethylene,-trans
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 9 samples were in exceedance. All samples were below the detection limit (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for trans-1,2- Dichloroethylene is 0.01 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Sweetwater Reservoir near Vista del Lago station.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1998.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33492, 1,2-Dichloroethylene,-trans **Region 9**

Sweetwater Reservoir

LOE ID:	1263
Pollutant:	1,2-Dichloroethylene,-trans
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by RWQCB 9 in 08/1998, 08/1999, 09/2000, and 10/2000. None of the 4 samples were in exceedance (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for trans-1,2- Dichloroethylene is 0.01 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir. Exact location was not reported.
Temporal Representation:	Samples were collected on 08/11/1998, 08/24/1999, 09/5/2000, 10/04/2000. One sample was collected each day.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33492, 1,2-Dichloroethylene,-trans **Region 9**

Sweetwater Reservoir

LOE ID:	1262
Pollutant:	1,2-Dichloroethylene,-trans
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 7 samples were in exceedance. All samples were below the detection limit (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for trans-1,2- Dichloroethylene is 0.01 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Sweetwater Reservoir near Gum Tree Cove Pond.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1998.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33492, 1,2-Dichloroethylene,-trans **Region 9**

Sweetwater Reservoir

LOE ID:	1261
Pollutant:	1,2-Dichloroethylene,-trans
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total

Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 7 samples were in exceedance. All samples were below the detection limit (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for trans-1,2- Dichloroethylene is 0.01 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Sweetwater Reservoir at the east end reservoir fill boundary.
Temporal Representation:	Samples were collected once per day on one day every other month from 09/09/1998 to 09/20/1998.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

DECISION ID **37697** **Region 9**

Sweetwater Reservoir

Pollutant:	**1,2-Dichloropropane**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

One line of evidence is available in the administrative record to assess this pollutant. None of the 4 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Four samples exceeded the Basin Plan Objective for 1,2-Dichloropropane, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision

This is a decision previously approved by the State Water Resources Control Board and the USEPA.

Recommendation:	No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 37697, 1,2-Dichloropropane **Region 9**

Sweetwater Reservoir

LOE ID:	1467
Pollutant:	1,2-Dichloropropane
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 08/1998, 08/1999, 09/2000, and 10/2000. None of the 4 samples were in exceedance (USGS, 2002), (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,2-Dichloropropane is 0.005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir. Exact location was not reported.
Temporal Representation:	Samples were collected on 08/11/1998, 08/24/1999, 09/5/2000, 10/04/2000. One sample was collected each day.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **37677** **Region 9**

Sweetwater Reservoir

Pollutant:	**Aluminum**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the four samples exceed the basin plan objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of four samples exceeded the objective and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 37677, Aluminum **Region 9**

Sweetwater Reservoir

LOE ID:	1445
Pollutant:	Aluminum
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	1
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by RWQCB9 on 4 days from 12/1997 to 02/24/2000. One of 4 samples was in exceedance (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Aluminum is 0.2 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir. No exact location was given.
Temporal Representation:	Samples were collected 4 times from 12/1997 to 02/2000. One sample was collected each year.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33374** **Region 9**

Sweetwater Reservoir

Pollutant:	**Antimony**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

One line of evidence is available in the administrative record to assess this pollutant. None of the 5 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Five samples exceeded the Basin Plan Objective for Antimony, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33374, Antimony **Region 9**

Sweetwater Reservoir

LOE ID:	1446
Pollutant:	Antimony
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by RWQCB9 from 02/1998 to 02/2000. None of the 5 samples were in exceedance (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Antimony is 0.006 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir. The exact location was not reported.
Temporal Representation:	Five samples were collected from 02/1998 to 02/2000. Samples were collected in 02/1998, 08/1998, 02/1999, 07/1999, and 02/2000. One sample was collected per sampling day.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID	33388	Region 9
Sweetwater Reservoir		

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 6 samples exceed the Basin Plan water quality objective for arsenic.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 6 samples exceed the Basin Plan water quality objective for arsenic and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33388, Arsenic	Region 9
Sweetwater Reservoir	

LOE ID:	1447
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by RWQCB9 from 02/1998 to 02/2000. None of the 6 samples were in exceedance (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)

SWAMP Data:	Non-SWAMP	035787
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Arsenic is 0.05 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Sweetwater Reservoir. Exact location was not reported.	
Temporal Representation:	One sample per day was collected on 6 days from 02/1998 to 02/2000. Samples were collected in 02/1998, 05/1998, 08/1998, 02/1999, 07/1999, and 02/2000.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID 33454 Region 9

Sweetwater Reservoir

Pollutant:	**Atrazine**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Nine lines of evidence are available in the administrative record to assess this pollutant. 2006: None of the 82 samples exceed the Basin Plan water quality objective of 0.003 mg/l for atrazine. 2014: None of the seven samples exceed the Basin Plan water quality objective of 0.001 mg/l for atrazine. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 89 samples exceed the Basin Plan water quality objective for atrazine and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 33454, Atrazine Region 9

Sweetwater Reservoir

LOE ID:	1402
Pollutant:	Atrazine
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	Total	035788
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	10	
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 10 samples were in exceedance (USGS, 2002).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Atrazine is 0.003 mg/	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Sweetwater Reservoir near the recreation area.	
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.	
Environmental Conditions:		
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33454, Atrazine **Region 9**

Sweetwater Reservoir

LOE ID:	76874
Pollutant:	Atrazine
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	All seven samples analyzed did not exceed the water quality objective for atrazine thought to be protective of drinking water.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water designated for use as domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels specified in California Code of Regulations, Title 22, Table 64444-A of section 64444 (Organic Chemicals) which is incorporated by reference into this plan. This incorporation byreference is prospective including future changes to the incorporated provisions as the changes take effect. (See Table 3-5).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California primary MCL for Atrazine in drinking water is 1 ug/L.
Guideline Reference:	

Spatial Representation:	The seven samples were collected from Sweetwater Reservoir.	035789
Temporal Representation:	The samples was collected between Jan. 11, 2006 and July 10, 2007.	
Environmental Conditions:	No environmental conditions were reported.	
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33454, Atrazine **Region 9**

Sweetwater Reservoir

LOE ID:	1406
Pollutant:	Atrazine
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	16
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by RWQCB9 from 07/1997 to 01/2001. None of the 16 samples were in exceedance (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Atrazine is 0.003 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir. Exact location was not reported.
Temporal Representation:	Samples were collected from 07/1997 to 01/2001. Samples were collected in 07/1997, 11/1997, on a quarterly basis from 1998-2000, and in 01/2001. Samples were collected once per sampling day.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33454, Atrazine **Region 9**

Sweetwater Reservoir

LOE ID:	1404
Pollutant:	Atrazine
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0

Data and Information Type:	Not Specified	035790
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 7 samples were in exceedance (USGS, 2002).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Atrazine is 0.003 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the east end reservoir fill boundary.	
Temporal Representation:	Samples were collected once per day on one day every other month from 09/09/1998 to 09/20/1999.	
Environmental Conditions:		
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33454, Atrazine **Region 9**

Sweetwater Reservoir

LOE ID:	1403
Pollutant:	Atrazine
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 8 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Atrazine is 0.003 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the minimum pool boundary east.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33454, Atrazine **Region 9**

Sweetwater Reservoir

LOE ID:	1401
Pollutant:	Atrazine
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 12 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Atrazine is 0.003 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the center of the minimum pool.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 09/20/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33454, Atrazine **Region 9**

Sweetwater Reservoir

LOE ID:	1400
Pollutant:	Atrazine
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 9 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Atrazine is 0.003 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	

Guideline Reference:	035792
Spatial Representation:	Samples were collected at Sweetwater Reservoir near Vista del Lago station.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33454, Atrazine **Region 9**

Sweetwater Reservoir

LOE ID:	1399
Pollutant:	Atrazine
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	13
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 13 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Atrazine is 0.003 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir near the pump tower.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 09/20/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33454, Atrazine **Region 9**

Sweetwater Reservoir

LOE ID:	1405
Pollutant:	Atrazine
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0

Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 7 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Atrazine is 0.003 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir near Gum Tree Cove Pond.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

DECISION ID **33389** **Region 9**

Sweetwater Reservoir

Pollutant:	**Barium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the four samples exceed the Basin Plan water quality objective for Barium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the four samples exceed the Basin Plan water quality objective for Barium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33389, Barium **Region 9**
Sweetwater Reservoir

LOE ID:	1448
Pollutant:	Barium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by RWQCB9 from12/1997 to 02/2000. None of the 4 samples were in exceedance (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Barium is 1.0 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir. Exact location was not reported.
Temporal Representation:	Samples were collected once per day on 4 days from12/1997 to 02/2000. Samples were also collected in 06/1998 and 07/1999.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33278** **Region 9**
Sweetwater Reservoir

Pollutant:	**Benzene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Eight lines of evidence are available in the administrative record to assess this pollutant. None of the 70 samples exceed the Basin Plan water quality objective for benzene. All samples were 'non-detects'. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 70 samples exceed the Basin Plan water quality objective for benzene. All samples were 'non-detects'. This does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33278, Benzene **Region 9**

Sweetwater Reservoir

LOE ID:	1288
Pollutant:	Benzene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 9 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Benzene is 0.001 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir near Vista del Lago station.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33278, Benzene **Region 9**

Sweetwater Reservoir

LOE ID:	1289
Pollutant:	Benzene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 12 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Benzene is 0.001 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the center of the minimum pool.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 09/20/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33278, Benzene **Region 9**

Sweetwater Reservoir

LOE ID:	1290
Pollutant:	Benzene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	10
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 10 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Benzene is 0.001 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir near the recreation area.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33278, Benzene **Region 9**

Sweetwater Reservoir

LOE ID:	1292
Pollutant:	Benzene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 7 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Benzene is 0.001 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the east end reservoir fill boundary.
Temporal Representation:	Samples were collected once per day on one day every other month from 09/09/1998 to 09/20/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33278, Benzene **Region 9**

Sweetwater Reservoir

LOE ID:	1293
Pollutant:	Benzene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 7 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for

	Benzene is 0.001 mg/L.	035798
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Sweetwater Reservoir near Gum Tree Cove Pond.	
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.	
Environmental Conditions:		
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33278, Benzene **Region 9**

Sweetwater Reservoir

LOE ID:	1287
Pollutant:	Benzene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	13
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 13 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Benzene is 0.001 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir near the pump tower.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 09/20/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33278, Benzene **Region 9**

Sweetwater Reservoir

LOE ID:	1294
Pollutant:	Benzene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total

Beneficial Use:	Municipal & Domestic Supply	035799
Number of Samples:	4	
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 08/1998, 08/1999, 09/2000, and 10/2000. None of the 4 samples were in exceedance (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Benzene is 0.001 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Sweetwater Reservoir. Exact location was not reported.	
Temporal Representation:	Samples were collected on 08/11/1998, 08/24/1999, 09/5/2000, 10/04/2000. One sample was collected each day.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33278, Benzene **Region 9**

Sweetwater Reservoir

LOE ID:	1291
Pollutant:	Benzene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 8 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Benzene is 0.001 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the minimum pool boundary east.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

DECISION ID	33443	Region 9
Sweetwater Reservoir		

Pollutant:	**Beryllium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 5 samples exceed the Basin Plan water quality objective for beryllium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 5 samples exceed the Basin Plan water quality objective for beryllium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33443, Beryllium	Region 9
Sweetwater Reservoir	

LOE ID:	1449
Pollutant:	Beryllium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by RWQCB9 from 02/1998 to 02/2000. None of the 5 samples were in exceedance (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)

SWAMP Data:	Non-SWAMP	035801
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Beryllium is 0.004 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Sweetwater Reservoir. Exact location was not recorded.	
Temporal Representation:	Samples were collected once per day on 5 days from 02/1998 to 02/2000. Samples were also collected in 08/1998, 02/1999, and 07/1999.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID	33102	Region 9
Sweetwater Reservoir		

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. None of the 5 samples exceed the Basin Plan water quality objective for cadmium. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 5 samples exceed the Basin Plan water quality objective for cadmium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33102, Cadmium	Region 9
Sweetwater Reservoir	

LOE ID:	1450

Pollutant:	Cadmium	035802
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	Total	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	5	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by RWQCB9 from 02/1998 to 02/2000. None of the 5 samples were in exceedance (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for cadmium is 0.005 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Sweetwater Reservoir. Exact location was not reported.	
Temporal Representation:	Samples were collected once per day on 5 days form 02/1998 to 02/2000. Samples were also collected in 08/1998, 02/1999, 07/1999, and 02/2000.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID	32734	Region 9
Sweetwater Reservoir		

Pollutant:	**Carbofuran**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Seven lines of evidence are available in the administrative record to assess this pollutant. None of the 65 samples exceed the Basin Plan water quality objective carbofuran.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 65 samples exceed the Basin Plan water quality objective carbofuran and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available

indicating that standards are not met. 035803

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32734, Carbofuran **Region 9**

Sweetwater Reservoir

LOE ID:	1411
Pollutant:	Carbofuran
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 8 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Carbofuran is 0.018 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the minimum pool boundary east.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 32734, Carbofuran **Region 9**

Sweetwater Reservoir

LOE ID:	1412
Pollutant:	Carbofuran
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 6 samples were in

exceedance (USGS, 2002). 035804

Data Reference: Placeholder reference 2006 303(d)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Carbofuran is 0.018 mg/L.

Objective/Criterion Reference: Placeholder reference 2006 303(d)

Evaluation Guideline:

Guideline Reference:

Spatial Representation: Samples were collected at Sweetwater Reservoir at the east end reservoir fill boundary.

Temporal Representation: Samples were collected once per day on one day every other month from 09/09/1998 to 09/20/1999.

Environmental Conditions:

QAPP Information: USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study

QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 32734, Carbofuran **Region 9**

Sweetwater Reservoir

LOE ID: 1413

Pollutant: Carbofuran

LOE Subgroup: Pollutant-Water

Matrix: Water

Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 7

Number of Exceedances: 0

Data and Information Type: Not Specified

Data Used to Assess Water Quality: Data were collected by the USGS from 09/1998 to 07/1999. None of the 7 samples were in exceedance (USGS, 2002).

Data Reference: Placeholder reference 2006 303(d)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Carbofuran is 0.018 mg/L.

Objective/Criterion Reference: Placeholder reference 2006 303(d)

Evaluation Guideline:

Guideline Reference:

Spatial Representation: Samples were collected at Sweetwater Reservoir near Gum Tree Cove Pond.

Temporal Representation: Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.

Environmental Conditions:

QAPP Information: USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.

QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 32734, Carbofuran **Region 9**

Sweetwater Reservoir

LOE ID: 1409

Pollutant:	Carbofuran
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 12 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Carbofuran is 0.018 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the center of the minimum pool.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 09/20/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 32734, Carbofuran **Region 9**

Sweetwater Reservoir

LOE ID:	1407
Pollutant:	Carbofuran
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	13
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 13 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Carbofuran is 0.018 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at Sweetwater Reservoir near the pump tower. 035806
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 09/20/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 32734, Carbofuran **Region 9**

Sweetwater Reservoir

LOE ID:	1408
Pollutant:	Carbofuran
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 9 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Carbofuran is 0.018 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir near Vista del Lago station.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 32734, Carbofuran **Region 9**

Sweetwater Reservoir

LOE ID:	1410
Pollutant:	Carbofuran
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	10
Number of Exceedances:	0
Data and Information Type:	Not Specified

Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 10 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Carbofuran is 0.018 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir near the recreation area.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

DECISION ID	33049	Region 9
Sweetwater Reservoir		

Pollutant:	**Carbon tetrachloride**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. None of the four samples exceed the Basin Plan water quality objective for carbon tetrachloride. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the four samples exceed the Basin Plan water quality objective for carbon tetrachloride and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33049, Carbon tetrachloride	Region 9

Sweetwater Reservoir 035808

LOE ID:	1468
Pollutant:	Carbon tetrachloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 08/1998, 08/1999, 09/2000, and 10/2000. None of the 4 samples were in exceedance (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Carbon tetrachloride is 0.0005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir. Exact location was not reported.
Temporal Representation:	Samples were collected on 08/11/1998, 08/24/1999, 09/5/2000, 10/04/2000. One sample was collected each day.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33217** **Region 9**

Sweetwater Reservoir

Pollutant:	**Chloride**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 8 samples exceed the Basin Plan water quality objective for chloride.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.

2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.935809
3. None of the 8 samples exceed the Basin Plan water quality objective for chloride and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33217, Chloride **Region 9**

Sweetwater Reservoir

LOE ID:	1464
Pollutant:	Chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by RWQCB9 from 07/1997 to 11/2000. None of the 8 samples were in exceedance (RWQCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for Chloride is 250 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir. Exact location was not reported.
Temporal Representation:	Samples were collected from 07/1997 to 11/2000 once per day on 8 days during this time span. Samples were collected during the summer and winter months.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment. QA=?
QAPP Information Reference(s):	

DECISION ID **33264** **Region 9**

Sweetwater Reservoir

Pollutant:	**Chlorobenzene (mono)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Eight lines of evidence are available in the administrative record to assess this pollutant. None of the 70 samples exceed the Basin Plan water quality objective for chlorobenzene (mono).

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 70 samples exceed the Basin Plan water quality objective for chlorobenzene (mono) and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33264, Chlorobenzene (mono) **Region 9**

Sweetwater Reservoir

LOE ID:	1297
Pollutant:	Chlorobenzene (mono)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 12 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Chlorobenzene (mono) is 0.07 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the center of the minimum pool.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 09/20/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.

QAPP Information Reference(s): 035811

Line of Evidence (LOE) for Decision ID 33264, Chlorobenzene (mono) **Region 9**

Sweetwater Reservoir

LOE ID:	1301
Pollutant:	Chlorobenzene (mono)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 7 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Chlorobenzene (mono) is 0.07 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir near Gum Tree Cove Pond.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33264, Chlorobenzene (mono) **Region 9**

Sweetwater Reservoir

LOE ID:	1299
Pollutant:	Chlorobenzene (mono)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 8 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Chlorobenzene (mono) is 0.07 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the minimum pool boundary east.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33264, Chlorobenzene (mono) Region 9

Sweetwater Reservoir

LOE ID:	1300
Pollutant:	Chlorobenzene (mono)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 7 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Chlorobenzene (mono) is 0.07 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the east end reservoir fill boundary.
Temporal Representation:	Samples were collected once per day on one day every other month from 09/09/1998 to 09/20/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33264, Chlorobenzene (mono) Region 9

Sweetwater Reservoir

LOE ID:	1295
Pollutant:	Chlorobenzene (mono)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total

Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	13
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 13 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Chlorobenzene (mono) is 0.07 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir near the pump tower.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 09/20/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33264, Chlorobenzene (mono) **Region 9**

Sweetwater Reservoir

LOE ID:	1302
Pollutant:	Chlorobenzene (mono)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 08/1998, 08/1999, 09/2000, and 10/2000. None of the 4 samples were in exceedance (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Chlorobenzene (mono) is 0.07 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir. Exact location was not reported.
Temporal Representation:	Samples were collected on 08/11/1998, 08/24/1999, 09/5/2000, 10/04/2000. One sample was collected each day.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.

QAPP Information Reference(s): 035814

Line of Evidence (LOE) for Decision ID 33264, Chlorobenzene (mono) **Region 9**

Sweetwater Reservoir

LOE ID:	1296
Pollutant:	Chlorobenzene (mono)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 9 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Chlorobenzene (mono) is 0.07 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir near Vista del Lago station.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33264, Chlorobenzene (mono) **Region 9**

Sweetwater Reservoir

LOE ID:	1298
Pollutant:	Chlorobenzene (mono)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	10
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 10 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Chlorobenzene (mono) is 0.07 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir near the recreation area.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

DECISION ID 33150 Region 9

Sweetwater Reservoir

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. None of the 4 samples exceed the Basin Plan water quality objective for copper. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 4 samples exceed the Basin Plan water quality objective for copper and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33150, Copper Region 9

Sweetwater Reservoir

LOE ID:	1452
Pollutant:	Copper

LOE Subgroup:	Pollutant-Water	035816
Matrix:	Water	
Fraction:	Total	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	4	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by RWQCB9 from 12/1997 to 02/2000. None of the 4 samples were in exceedance (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Copper is 1.0 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Sweetwater Reservoir. Exact location was not reported.	
Temporal Representation:	Samples were collected once per day on 12/15/1997, 06/17/1997, 07/15/1999, and 02/24/2000.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID	**38119**	**Region 9**
Sweetwater Reservoir		

Pollutant:	**Dichloromethane**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Eight lines of evidence are available in the administrative record to assess this pollutant. None of the 69 samples exceed the Basin Plan water quality objective for dichloromethane.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 69 samples exceed the Basin Plan water quality objective for dichloromethane and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 38119, Dichloromethane **Region 9**

Sweetwater Reservoir

LOE ID:	1332
Pollutant:	Dichloromethane
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 7 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Dichloromethane is 0.005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the east end reservoir fill boundary.
Temporal Representation:	Samples were collected once per day on one day every other month from 09/09/1998 to 09/20/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 38119, Dichloromethane **Region 9**

Sweetwater Reservoir

LOE ID:	1333
Pollutant:	Dichloromethane
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 7 samples were in exceedance (USGS, 2002).

Data Reference:	Placeholder reference 2006 303(d)	035818
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Dichloromethane is 0.005 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Sweetwater Reservoir near Gum Tree Cove Pond.	
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.	
Environmental Conditions:		
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 38119, Dichloromethane **Region 9**

Sweetwater Reservoir

LOE ID:	1328
Pollutant:	Dichloromethane
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 9 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Dichloromethane is 0.005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir near Vista del Lago station.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 38119, Dichloromethane **Region 9**

Sweetwater Reservoir

LOE ID:	1327

Pollutant:	Dichloromethane	035819
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	Total	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	13	
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 13 samples were in exceedance (USGS, 2002).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Dichloromethane is 0.005 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Sweetwater Reservoir near the pump tower.	
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 09/20/1999.	
Environmental Conditions:		
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 38119, Dichloromethane **Region 9**

Sweetwater Reservoir

LOE ID:	1330
Pollutant:	Dichloromethane
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	10
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 10 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Dichloromethane is 0.005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir near the recreation area.

Temporal Representation: Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.

Environmental Conditions:

QAPP Information: USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.

QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 38119, Dichloromethane **Region 9**

Sweetwater Reservoir

LOE ID: 1331

Pollutant: Dichloromethane
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 8
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Data were collected by the USGS from 09/1998 to 07/1999. None of the 8 samples were in exceedance.
Data Reference: Placeholder reference 2006 303(d)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Dichloromethane is 0.005 mg/L.
Objective/Criterion Reference: Placeholder reference 2006 303(d)

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Sweetwater Reservoir at the minimum pool boundary east.
Temporal Representation: Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.

Environmental Conditions:

QAPP Information: USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.

QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 38119, Dichloromethane **Region 9**

Sweetwater Reservoir

LOE ID: 1334

Pollutant: Dichloromethane
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 3
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Data were collected by RWQCB9 in 08/1998, 08/1999, and 10/2000. None of the 3 samples

	were in exceedance (RWQCB, 2003).	035821
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Dichloromethane is 0.005 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Sweetwater Reservoir. Exact location was not reported.	
Temporal Representation:	Samples were collected on 08/11/1998, 08/24/1999, 10/04/2000. One sample was collected each day.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 38119, Dichloromethane **Region 9**

Sweetwater Reservoir

LOE ID:	1329
Pollutant:	Dichloromethane
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 12 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Dichloromethane is 0.005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the center of the minimum pool.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 09/20/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

DECISION ID **33079** **Region 9**

Sweetwater Reservoir

Pollutant: **Ethylbenzene**

Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	035822
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)	
Revision Status	Original	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Eight lines of evidence are available in the administrative record to assess this pollutant. None of the 70 samples exceed the Basin Plan water quality objective for ethylbenzene.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 70 samples exceed the Basin Plan water quality objective for ethylbenzene and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33079, Ethylbenzene **Region 9**

Sweetwater Reservoir

LOE ID:	1321
Pollutant:	Ethylbenzene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 12 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Ethylbenzene is 0.7 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at Sweetwater Reservoir at the center of the minimum pool.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 09/20/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33079, Ethylbenzene **Region 9**

Sweetwater Reservoir

LOE ID:	1322
Pollutant:	Ethylbenzene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	10
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 10 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Ethylbenzene is 0.7 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir near the recreation area.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33079, Ethylbenzene **Region 9**

Sweetwater Reservoir

LOE ID:	1323
Pollutant:	Ethylbenzene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	Not Specified

Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 8 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Ethylbenzene is 0.7 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the minimum pool boundary east.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33079, Ethylbenzene **Region 9**

Sweetwater Reservoir

LOE ID:	1320
Pollutant:	Ethylbenzene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 9 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Ethylbenzene is 0.7 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir near Vista del Lago station.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33079, Ethylbenzene **Region 9**

Sweetwater Reservoir

LOE ID:	1325	035825

Pollutant:	Ethylbenzene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 7 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Ethylbenzene is 0.7 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir near Gum Tree Cove Pond.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33079, Ethylbenzene **Region 9**

Sweetwater Reservoir

LOE ID:	1326
Pollutant:	Ethylbenzene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 08/1998, 08/1999, 09/2000, and 10/2000. None of the 4 samples were in exceedance (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Ethylbenzene is 0.7 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at Sweetwater Reservoir. Exact location was not reported.
Temporal Representation:	Samples were collected on 08/11/1998, 08/24/1999, 09/5/2000, 10/04/2000. One sample was collected each day.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33079, Ethylbenzene **Region 9**

Sweetwater Reservoir

LOE ID:	1319
Pollutant:	Ethylbenzene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	13
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 13 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Ethylbenzene is 0.7 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir near the pump tower.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 09/20/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33079, Ethylbenzene **Region 9**

Sweetwater Reservoir

LOE ID:	1324
Pollutant:	Ethylbenzene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	Not Specified

Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of 7 the samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Ethylbenzene is 0.7 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the east end reservoir fill boundary.
Temporal Representation:	Samples were collected once per day on one day every other month from 09/09/1998 to 09/20/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

DECISION ID	33162	Region 9
Sweetwater Reservoir		

Pollutant:	**Fluoride**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. None of the 8 samples exceed the Basin Plan water quality objective for flouride. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 8 samples exceed the Basin Plan water quality objective for flouride and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33162, Fluoride	Region 9

Sweetwater Reservoir 035828

LOE ID:	1463
Pollutant:	Fluoride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by RWQCB9 from 07/1997 to 11/2000. None of the 8 samples were in exceedance (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for Fluoride is 1.0 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir. Exact location was not reported.
Temporal Representation:	Samples were collected from 07/1997 to 11/2000 once per day on 8 days in the time span. Samples were collected during winter and summer months.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **37698** **Region 9**

Sweetwater Reservoir

Pollutant:	**Glyphosate**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 13 samples exceed the Basin Plan water quality objective for glyphosate.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.035829
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 13 samples exceed the Basin Plan water quality objective for glyphosate and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 37698, Glyphosate **Region 9**
Sweetwater Reservoir

LOE ID:	1469
Pollutant:	Glyphosate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	13
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by RWQCB9 from 07/1997 to 01/2001. None of the 13 samples were in exceedance (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Glyphosate is 0.7 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir. Exact location was not reported.
Temporal Representation:	Samples were collected from 07/1997 to 01/2001. One sample per month was collected in 07/1997, 11/1997,08/1998, 10/1998, and 01/2001. Samples were collected on a quarterly basis in 1999 and 2000. Samples were collected once per sampling day.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **38106** **Region 9**
Sweetwater Reservoir

Pollutant:	**Iron**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or	Pollutant

Pollution: 035830

Regional Board Conclusion: This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. One of the 4 samples exceed the Basin Plan water quality objective for iron.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of the 4 samples exceed the Basin Plan water quality objective for iron and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 38106, Iron **Region 9**

Sweetwater Reservoir

LOE ID:	1453
Pollutant:	Iron
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by RWQCB9 from 12/1997 to 02/2000. One of 4 samples was in exceedance (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Iron is 0.3 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir. Exact location was not reported.
Temporal Representation:	Samples were collected once per day on 12/15/1997, 06/17/1998, 07/15/1999, and 02/24/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID	33260	Region 9
Sweetwater Reservoir		

Pollutant:	**Lindane/gamma Hexachlorocyclohexane (gamma-HCH)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Seven lines of evidence are available in the administrative record to assess this pollutant. None of the 65 samples exceed the water quality objective for lindane/gamma hexachlorocyclohexane.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 65 samples exceed the water quality objective for lindane/gamma hexachlorocyclohexane and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33260, Lindane/gamma Hexachlorocyclohexane (gamma-HCH)	**Region 9**
Sweetwater Reservoir	

LOE ID:	1414
Pollutant:	Lindane/gamma Hexachlorocyclohexane (gamma-HCH)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	13
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 13 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Lindane is 0.0002 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir near the pump tower.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 09/20/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33260, Lindane/gamma Hexachlorocyclohexane (gamma-HCH) **Region 9**

Sweetwater Reservoir

LOE ID:	1415
Pollutant:	Lindane/gamma Hexachlorocyclohexane (gamma-HCH)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 9 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Lindane is 0.0002 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir near Vista del Lago station.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33260, Lindane/gamma Hexachlorocyclohexane (gamma-HCH) **Region 9**

Sweetwater Reservoir

LOE ID:	1416
Pollutant:	Lindane/gamma Hexachlorocyclohexane (gamma-HCH)

LOE Subgroup:	Pollutant-Water	035833
Matrix:	Water	
Fraction:	Total	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	12	
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 12 samples were in exceedance (USGS, 2002).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Lindane is 0.0002 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the center of the minimum pool.	
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 09/20/1999.	
Environmental Conditions:		
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33260, Lindane/gamma Hexachlorocyclohexane (gamma-HCH) **Region 9**

Sweetwater Reservoir

LOE ID:	1420
Pollutant:	Lindane/gamma Hexachlorocyclohexane (gamma-HCH)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 7 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Lindane is 0.0002 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir near Gum Tree Cove Pond.

Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33260, Lindane/gamma Hexachlorocyclohexane (gamma-HCH) **Region 9**

Sweetwater Reservoir

LOE ID:	1418
Pollutant:	Lindane/gamma Hexachlorocyclohexane (gamma-HCH)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 8 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Lindane is 0.0002 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the minimum pool boundary east.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33260, Lindane/gamma Hexachlorocyclohexane (gamma-HCH) **Region 9**

Sweetwater Reservoir

LOE ID:	1419
Pollutant:	Lindane/gamma Hexachlorocyclohexane (gamma-HCH)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0

Data and Information Type:	Not Specified	035835
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 6 samples were in exceedance (USGS, 2002).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Lindane is 0.0002 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the east end reservoir fill boundary.	
Temporal Representation:	Samples were collected once per day on one day every other month from 09/09/1998 to 09/20/1999.	
Environmental Conditions:		
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33260, Lindane/gamma Hexachlorocyclohexane (gamma-HCH) **Region 9**

Sweetwater Reservoir

LOE ID:	1417
Pollutant:	Lindane/gamma Hexachlorocyclohexane (gamma-HCH)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	10
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 10 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Lindane is 0.0002 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir near the recreation area.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

DECISION ID 37761 Region 9

Sweetwater Reservoir 035836

Pollutant:	**Manganese**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. One of the four samples exceed the Basin Plan water quality objective for manganese. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of the four samples exceed the Basin Plan water quality objective for manganese and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 37761, Manganese — Region 9

Sweetwater Reservoir

LOE ID:	1454
Pollutant:	Manganese
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	1
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by RWQCB9 from 12/1997 to 02/2000. One of 4 samples was in exceedance (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The water quality objective for manganese in Sweetwater Reservoir is 0.05 milligrams/liter (mg/l) according to Basin Plan, Table 3-2 entitled, Water Quality Objectives. This

	concentration is not be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir. Exact location was not reported.
Temporal Representation:	Samples were collected once per day on 12/15/1997, 06/17/1998, 07/15/1999, and 02/24/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 33225 Region 9

Sweetwater Reservoir

Pollutant:	**Mercury**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. None of the 5 samples exceed the Basin Plan water quality objective for Mercury. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 5 samples exceed the Basin Plan water quality objective for Mercury and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33225, Mercury Region 9

Sweetwater Reservoir

LOE ID:	1455
Pollutant:	Mercury
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	Total	035838
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	5	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by RWQCB9 from 02/1998 to 02/2000. None of the 5 samples were in exceedance (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Mercury is 0.002 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Sweetwater Reservoir. Exact location was not reported.	
Temporal Representation:	Samples were collected once per day on 02/25/1998, 08/04/1998, 02/09/1999, 07/15/1999, and 02/24/2000.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID	33083	Region 9
Sweetwater Reservoir		

Pollutant:	**Molinate**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Eight lines of evidence are available in the administrative record to assess this pollutant. None of the 81 samples exceed the Basin Plan water quality objective for molinate.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 81 samples exceed the Basin Plan water quality objective for molinate and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision

This is a decision previously approved by the State Water Resources Control Board and the USEPA.

Recommendation: No new data were assessed by the Regional Board for the current cycle. The decision has not changed. 33083

Line of Evidence (LOE) for Decision ID 33083, Molinate **Region 9**

Sweetwater Reservoir

LOE ID:	1425
Pollutant:	Molinate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 8 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Molinate is 0.02 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the minimum pool boundary east.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33083, Molinate **Region 9**

Sweetwater Reservoir

LOE ID:	1422
Pollutant:	Molinate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 9 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)

SWAMP Data:	Non-SWAMP	035840
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Molinate is 0.02 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Sweetwater Reservoir near Vista del Lago station.	
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 07/12/1998 to 07/12/1999.	
Environmental Conditions:		
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33083, Molinate **Region 9**

Sweetwater Reservoir

LOE ID:	1427
Pollutant:	Molinate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 7 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Molinate is 0.02 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir near Gum Tree Cove Pond.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33083, Molinate **Region 9**

Sweetwater Reservoir

LOE ID:	1428
Pollutant:	Molinate
LOE Subgroup:	Pollutant-Water

Matrix:	Water	035841
Fraction:	Total	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	16	
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Data were collected by RWQCB9 from 07/1997 to 01/2001. None of the 16 samples were in exceedance (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Molinate is 0.02 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Sweetwater Reservoir. Exact location was not reported.	
Temporal Representation:	Samples were collected from 07/1997 to 01/2001. Samples were collected in 07/1997, 11/1997, on a quarterly basis from 1998-2000, and in 01/2001. Samples were collected once per sampling day.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33083, Molinate **Region 9**

Sweetwater Reservoir

LOE ID:	1421
Pollutant:	Molinate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	13
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 13 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Molinate is 0.02 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir near the pump tower.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 09/20/1999.

Environmental Conditions: 035842
QAPP Information: USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 33083, Molinate **Region 9**
Sweetwater Reservoir

LOE ID: 1424

Pollutant: Molinate
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 10
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Data were collected by the USGS from 09/1998 to 07/1999. None of the 10 samples were in exceedance (USGS, 2002).
Data Reference: Placeholder reference 2006 303(d)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Molinate is 0.02 mg/L.
Objective/Criterion Reference: Placeholder reference 2006 303(d)

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Sweetwater Reservoir near the recreation area.
Temporal Representation: Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:
QAPP Information: USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 33083, Molinate **Region 9**
Sweetwater Reservoir

LOE ID: 1423

Pollutant: Molinate
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 12
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Data were collected by the USGS from 09/1998 to 09/1999. None of the 12 samples were in exceedance (USGS, 2002).
Data Reference: Placeholder reference 2006 303(d)

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Molinate is 0.02 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the center of the minimum pool.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 09/20/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33083, Molinate **Region 9**

Sweetwater Reservoir

LOE ID:	1426
Pollutant:	Molinate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 6 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Molinate is 0.02 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the east end reservoir fill boundary.
Temporal Representation:	Samples were collected once per day on one day every other month from 09/09/1998 to 09/20/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

DECISION ID **33226** **Region 9**

Sweetwater Reservoir

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**

Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)	035844
Revision Status	Original	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the five samples exceed the Basin Plan water quality objective for nickel.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the five samples exceed the Basin Plan water quality objective for nickel and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33226, Nickel **Region 9**

Sweetwater Reservoir

LOE ID:	1456
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by RWQCB9 from 02/1998 to 02/2000. None of the 5 samples were in exceedance (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for nickel is 0.1 mg/L
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at Sweetwater Reservoir. The exact location was not reported.
Temporal Representation:	Samples were collected once per day on 02/25/2998, 08/04/1998, 02/09/1999, 07/15/1999, and 02/24/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 44469 Region 9

Sweetwater Reservoir

Pollutant:	**Selenium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 5 samples exceed the Basin Plan water quality objective for selenium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 5 samples exceed the Basin Plan water quality objective for selenium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 44469, Selenium Region 9

Sweetwater Reservoir

LOE ID:	1457
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	5

Number of Exceedances:	0	035846
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by RWQCB9 from 02/1998 to 02/2000. None of the 5 samples were in exceedance (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Selenium is 0.05 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Sweetwater Reservoir. The exact location was not reported.	
Temporal Representation:	Samples were collected once per day on 02/25/1998, 08/04/1998, 02/09/1999, 07/15/1999, and 02/24/2000.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID	33227	Region 9
Sweetwater Reservoir		

Pollutant:	**Silver**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 4 samples exceed the Basin Plan water quality objective for silver.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 4 samples exceed the Basin Plan water quality objective for silver and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33227, Silver Sweetwater Reservoir — Region 9

LOE ID:	1458
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by RWQCB9 from 12/1997 to 02/2000. None of the 4 samples were in exceedance (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Silver is 0.1 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir. Exact location was not reported.
Temporal Representation:	Samples were collected once per day on 12/15/1997, 06/17/1998, 07/15/1999, and 02/24/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 33038 — Region 9
Sweetwater Reservoir

Pollutant:	**Styrene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Eight lines of evidence are available in the administrative record to assess this pollutant. None of the 70 samples exceeded the Basin Plan water quality objective for styrene.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 70 samples exceeded the Basin Plan water quality objective for styrene and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33038, Styrene **Region 9**

Sweetwater Reservoir

LOE ID:	1355
Pollutant:	Styrene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 8 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Styrene is 0.1 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the minimum pool boundary east.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33038, Styrene **Region 9**

Sweetwater Reservoir

LOE ID:	1358
Pollutant:	Styrene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 08/1998, 08/1999, 09/2000, and 10/2000. None of the 4 samples were in exceedance (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Styrene is 0.1 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir. Exact location was not reported.
Temporal Representation:	Samples were collected on 08/11/1998, 08/24/1999, 09/5/2000, 10/04/2000. One sample was collected each day.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33038, Styrene **Region 9**

Sweetwater Reservoir

LOE ID:	1354
Pollutant:	Styrene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	10
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 10 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Styrene is 0.1 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir near the recreation area.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33038, Styrene 035850 Region 9

Sweetwater Reservoir

LOE ID:	1353
Pollutant:	Styrene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 12 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Styrene is 0.1 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the center of the minimum pool.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 09/20/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33038, Styrene Region 9

Sweetwater Reservoir

LOE ID:	1351
Pollutant:	Styrene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	13
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 13 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Styrene is 0.1 mg/L.

Objective/Criterion Reference:	Placeholder reference 2006 303(d)	035851
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Sweetwater Reservoir near the pump tower.	
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 09/20/1999.	
Environmental Conditions:		
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33038, Styrene **Region 9**

Sweetwater Reservoir

LOE ID:	1352
Pollutant:	Styrene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 9 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Styrene is 0.1 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir near Vista del Lago station.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33038, Styrene **Region 9**

Sweetwater Reservoir

LOE ID:	1357
Pollutant:	Styrene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 7 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Styrene is 0.1 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir near the Gum Tree Cove Pond.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33038, Styrene **Region 9**

Sweetwater Reservoir

LOE ID:	1356
Pollutant:	Styrene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 7 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Styrene is 0.1 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the east end reservoir fill boundary.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 09/20/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

DECISION ID	33362	Region 9
Sweetwater Reservoir		

Pollutant:	**Sulfates**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 8 samples exceed the Basin Plan water quality objective for sulfates.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 8 samples exceed the Basin Plan water quality objective for sulfates and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33362, Sulfates	Region 9
Sweetwater Reservoir	

LOE ID:	1465
Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by RWQCB9 from 07/1997 to 11/2000. None of the 8 samples were in exceedance (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)

SWAMP Data:	Non-SWAMP	035854
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Sulfate is 250 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Sweetwater Reservoir. Exact location was not reported.	
Temporal Representation:	Samples were collected from 07/1997 to 11/2000 once per day on 8 days during this time span. Samples were collected during the summer and winter months.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID 38041 Region 9

Sweetwater Reservoir

Pollutant:	**Tetrachloroethylene/PCE**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Eight lines of evidence are available in the administrative record to assess this pollutant. None of the 70 samples exceeded the Basin Plan water quality objective for tetrachloroethylene/PCE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 70 samples exceeded the Basin Plan water quality objective for tetrachloroethylene/PCE and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 38041, Tetrachloroethylene/PCE Region 9

Sweetwater Reservoir

LOE ID:	1362
Pollutant:	Tetrachloroethylene/PCE

LOE Subgroup:	Pollutant-Water	035855
Matrix:	Water	
Fraction:	Total	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	10	
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 10 samples were in exceedance (USGS, 2002).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Tetrachloroethylene is 0.005 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Sweetwater Reservoir near the recreation area.	
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.	
Environmental Conditions:		
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 38041, Tetrachloroethylene/PCE **Region 9**

Sweetwater Reservoir

LOE ID:	1361
Pollutant:	Tetrachloroethylene/PCE
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 12 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Tetrachloroethylene is 0.005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the center of the minimum pool.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to

	09/20/1999.	035856
Environmental Conditions:		
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 38041, Tetrachloroethylene/PCE **Region 9**

Sweetwater Reservoir

LOE ID:	1364
Pollutant:	Tetrachloroethylene/PCE
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 7 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Tetrachloroethylene is 0.005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the east end reservoir fill boundary.
Temporal Representation:	Samples were collected once per day on one day every other month from 09/09/1998 to 09/20/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 38041, Tetrachloroethylene/PCE **Region 9**

Sweetwater Reservoir

LOE ID:	1366
Pollutant:	Tetrachloroethylene/PCE
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 08/1998, 08/1999, 09/2000, and 10/2000. None of the 4 samples were in exceedance (SWRCB, 2003).

Data Reference:	Placeholder reference 2006 303(d)	035857
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Tetrachloroethylene is 0.005 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Sweetwater Reservoir. Exact location was not reported.	
Temporal Representation:	Samples were collected on 08/11/1998, 08/24/1999, 09/5/2000, 10/04/2000. One sample was collected each day.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 38041, Tetrachloroethylene/PCE **Region 9**

Sweetwater Reservoir

LOE ID:	1365
Pollutant:	Tetrachloroethylene/PCE
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 7 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Tetrachloroethylene is 0.005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir near Gum Tree Cove Pond.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 38041, Tetrachloroethylene/PCE **Region 9**

Sweetwater Reservoir

LOE ID:	1360
Pollutant:	Tetrachloroethylene/PCE

LOE Subgroup:	Pollutant-Water	035858
Matrix:	Water	
Fraction:	Total	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	9	
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 9 samples were in exceedance (USGS, 2002).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Tetrachloroethylene is 0.005 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Sweetwater Reservoir near Vista del Lago station.	
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.	
Environmental Conditions:		
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 38041, Tetrachloroethylene/PCE **Region 9**

Sweetwater Reservoir

LOE ID:	1359
Pollutant:	Tetrachloroethylene/PCE
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	13
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 13 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Tetrachloroethylene is 0.005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir near the pump tower.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to

	09/20/1999.	035859
Environmental Conditions:		
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 38041, Tetrachloroethylene/PCE **Region 9**

Sweetwater Reservoir

LOE ID:	1363
Pollutant:	Tetrachloroethylene/PCE
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 8 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Tetrachloroethylene is 0.005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the minimum pool boundary east.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

DECISION ID **33477** **Region 9**

Sweetwater Reservoir

Pollutant:	**Thallium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 5 samples exceed the Basin Plan water quality objective for thallium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 5 samples exceed the Basin Plan water quality objective for thallium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33477, Thallium **Region 9**

Sweetwater Reservoir

LOE ID:	1459
Pollutant:	Thallium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by RWQCB9 from 02/1998 to 02/2000. None of the 5 samples were in exceedance (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Thallium is 0.002 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir. Exact location was not reported.
Temporal Representation:	Samples were collected once per day on 02/24/1998, 08/04/1998, 02/09/1999, 07/15/1999, and 02/24/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33075** **Region 9**

Sweetwater Reservoir

Pollutant:	**Thiobencarb/Bolero**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Eight lines of evidence are available in the administrative record to assess this pollutant. None of the 81 samples exceed the Basin Plan water quality objective for thiobencarb/bolero.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 81 samples exceed the Basin Plan water quality objective for thiobencarb/bolero and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33075, Thiobencarb/Bolero **Region 9**

Sweetwater Reservoir

LOE ID:	1438
Pollutant:	Thiobencarb/Bolero
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 9 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Thiobencarb is 0.07 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	

Guideline Reference:	035862
Spatial Representation:	Samples were collected at Sweetwater Reservoir near the Vista del Lago station.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33075, Thiobencarb/Bolero **Region 9**

Sweetwater Reservoir

LOE ID:	1437
Pollutant:	Thiobencarb/Bolero
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	13
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 13 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Thiobencarb is 0.07 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir near the pump tower.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 09/20/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33075, Thiobencarb/Bolero **Region 9**

Sweetwater Reservoir

LOE ID:	1444
Pollutant:	Thiobencarb/Bolero
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	16
Number of Exceedances:	0

Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by RWQCB9 from 07/1997 to 01/2001. None of the 16 samples were in exceedance (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Thiobencarb is 0.07 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir. Exact location was not reported.
Temporal Representation:	Samples were collected from 07/1997 to 01/2001. Samples were collected in 07/1997, 11/1997, on a quarterly basis from 1998-2000, and in 01/2001. Samples were collected once per sampling day.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33075, Thiobencarb/Bolero **Region 9**

Sweetwater Reservoir

LOE ID:	1443
Pollutant:	Thiobencarb/Bolero
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 7 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Thiobencarb is 0.07 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir near Gum Tree Cove Pond.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33075, Thiobencarb/Bolero **Region 9**

Sweetwater Reservoir 035864

LOE ID:	1442
Pollutant:	Thiobencarb/Bolero
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 6 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Thiobencarb is 0.07 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the east end reservoir fill boundary.
Temporal Representation:	Samples were collected once per day on one day every other month from 09/09/1998 to 09/20/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33075, Thiobencarb/Bolero **Region 9**

Sweetwater Reservoir

LOE ID:	1441
Pollutant:	Thiobencarb/Bolero
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 8 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Thiobencarb is 0.07 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)

Evaluation Guideline:	035865
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the minimum pool boundary east.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33075, Thiobencarb/Bolero **Region 9**

Sweetwater Reservoir

LOE ID:	1439
Pollutant:	Thiobencarb/Bolero
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 12 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Thiobencarb is 0.07 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the center of the minimum pool.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 09/20/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33075, Thiobencarb/Bolero **Region 9**

Sweetwater Reservoir

LOE ID:	1440
Pollutant:	Thiobencarb/Bolero
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	10

Number of Exceedances:	0	035866
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 10 samples were in exceedance (USGS, 2002).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Thiobencarb is 0.07 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Sweetwater Reservoir near the recreation area.	
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.	
Environmental Conditions:		
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.	
QAPP Information Reference(s):		

DECISION ID	**33224**	**Region 9**
Sweetwater Reservoir		

Pollutant:	**Toluene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Eight lines of evidence are available in the administrative record to assess this pollutant. None of the 70 samples exceed the Basin Plan water quality objective for toluene. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 70 samples exceed the Basin Plan water quality objective for toluene and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33224, Toluene 035867 Region 9

Sweetwater Reservoir

LOE ID:	1372
Pollutant:	Toluene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 7 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Toluene is 0.15 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the east end reservoir fill boundary.
Temporal Representation:	Samples were collected once per day on one day every other month from 09/09/1998 to 09/20/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33224, Toluene Region 9

Sweetwater Reservoir

LOE ID:	1367
Pollutant:	Toluene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	13
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 13 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Toluene is 0.15 mg/L.

Objective/Criterion Reference:	Placeholder reference 2006 303(d)	035868

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Sweetwater Reservoir near the pump tower.
Temporal Representation: Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 09/20/1999.

Environmental Conditions:
QAPP Information: USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.

QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 33224, Toluene **Region 9**

Sweetwater Reservoir

LOE ID: 1368

Pollutant: Toluene
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 9
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Data were collected by the USGS from 09/1998 to 07/1999. None of the 9 samples were in exceedance (USGS, 2002).
Data Reference: Placeholder reference 2006 303(d)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Toluene is 0.15 mg/L.
Objective/Criterion Reference: Placeholder reference 2006 303(d)

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Sweetwater Reservoir near Vista del Lago station.
Temporal Representation: Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.

Environmental Conditions:
QAPP Information: USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.

QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 33224, Toluene **Region 9**

Sweetwater Reservoir

LOE ID: 1369

Pollutant: Toluene
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 12 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Toluene is 0.15 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the center of the minimum pool.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 09/20/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33224, Toluene **Region 9**

Sweetwater Reservoir

LOE ID:	1370
Pollutant:	Toluene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	10
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 10 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Toluene is 0.15 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir near the recreation area.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33224, Toluene **Region 9**

Sweetwater Reservoir

LOE ID:	1373
Pollutant:	Toluene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 7 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Toluene is 0.15 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir near Gum Tree Cove Pond.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33224, Toluene **Region 9**

Sweetwater Reservoir

LOE ID:	1374
Pollutant:	Toluene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 08/1998, 08/1999, 09/2000, and 10/2000. None of the 4 samples were in exceedance (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for

	Toluene is 0.15 mg/L.	035871
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Sweetwater Reservoir. Exact location was not reported.	
Temporal Representation:	Samples were collected on 08/11/1998, 08/24/1999, 09/5/2000, 10/04/2000. One sample was collected each day.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33224, Toluene **Region 9**

Sweetwater Reservoir

LOE ID:	1371
Pollutant:	Toluene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 8 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Toluene is 0.15 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the minimum pool boundary east.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study
QAPP Information Reference(s):	

DECISION ID **33032** **Region 9**

Sweetwater Reservoir

Pollutant:	**Total Dissolved Solids**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. Six of 8 samples exceed the Basin Plan water quality objective.
Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Six of 8 samples exceeded the Basin Plan criteria, and these exceed the allowable frequency listed in Table 3.2 of the Listing Policy. At the October 25th Water Board meeting, comments were received concerning total dissolved solids in terminal reservoirs in the San Diego region. The Board concluded that it was inappropriate to list these water bodies based on secondary MCLs when the TDS values of the incoming supplying waters were higher than the MCLs. Narrative standards are therefore met.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. The Regional Board will update this decision when new data and information become available and are assessed.

Line of Evidence (LOE) for Decision ID 33032, Total Dissolved Solids **Region 9**

Sweetwater Reservoir

LOE ID:	1462
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	6
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by RWQCB9 from 07/1997 to 11/2000. Six of 8 samples were in exceedance. At the October 25th Water Board meeting, comments were received concerning total dissolved solids in terminal reservoirs in the San Diego region. The Board concluded that it was inappropriate to list these water bodies based on secondary MCLs when the TDS values of the incoming supplying waters were higher than the MCLs. Narrative standards are therefore met.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses is 500 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at Sweetwater Reservoir. Exact location was not reported.
Temporal Representation:	Samples were collected from 07/1997 to 11/2000 once per day on 8 days during this time span. Samples were collected mostly during the winter and summer months.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 33459 Region 9

Sweetwater Reservoir

Pollutant:	**Trichloroethylene/TCE**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Eight lines of evidence are available in the administrative record to assess this pollutant. None of the 70 samples exceed the Basin Plan water quality objective for trichloroethylene.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 70 samples exceed the Basin Plan water quality objective for trichloroethylene and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33459, Trichloroethylene/TCE Region 9

Sweetwater Reservoir

LOE ID:	1378
Pollutant:	Trichloroethylene/TCE
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	10
Number of Exceedances:	0
Data and Information Type:	Not Specified

Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 10 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Trichloroethylene is 0.005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir near the recreation area.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33459, Trichloroethylene/TCE **Region 9**

Sweetwater Reservoir

LOE ID:	1379
Pollutant:	Trichloroethylene/TCE
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 8 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Trichloroethylene is 0.005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the minimum pool boundary east.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33459, Trichloroethylene/TCE **Region 9**

Sweetwater Reservoir

LOE ID:	1380	035875

Pollutant:	Trichloroethylene/TCE
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 7 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Trichloroethylene is 0.005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the east end reservoir fill boundary.
Temporal Representation:	Samples were collected once per day on one day every other month from 09/09/1998 to 09/20/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33459, Trichloroethylene/TCE **Region 9**

Sweetwater Reservoir

LOE ID:	1375
Pollutant:	Trichloroethylene/TCE
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	13
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 13 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Trichloroethylene is 0.005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at Sweetwater Reservoir near the pump tower.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 09/20/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33459, Trichloroethylene/TCE **Region 9**

Sweetwater Reservoir

LOE ID:	1382
Pollutant:	Trichloroethylene/TCE
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 08/1998, 08/1999, 09/2000, and 10/2000. None of the 4 samples were in exceedance (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Trichloroethylene is 0.005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir. Exact location was not reported.
Temporal Representation:	Samples were collected on 08/11/1998, 08/24/1999, 09/5/2000, 10/04/2000. One sample was collected each day.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33459, Trichloroethylene/TCE **Region 9**

Sweetwater Reservoir

LOE ID:	1381
Pollutant:	Trichloroethylene/TCE
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	Not Specified

Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 70 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Trichloroethylene is 0.005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir near Gum Tree Cove Pond.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33459, Trichloroethylene/TCE **Region 9**

Sweetwater Reservoir

LOE ID:	1377
Pollutant:	Trichloroethylene/TCE
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 12 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Trichloroethylene is 0.005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the center of the minimum pool.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 09/20/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33459, Trichloroethylene/TCE **Region 9**

Sweetwater Reservoir

LOE ID:	1376	035878

Pollutant:	Trichloroethylene/TCE
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 9 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Trichloroethylene is 0.005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir near Vista del Lago station.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

DECISION ID	**33472**	**Region 9**
Sweetwater Reservoir		

Pollutant:	**Vinyl chloride**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Eight lines of evidence are available in the administrative record to assess this pollutant. None of the 70 samples exceeded the Basin Plan water quality objective for vinyl chloride.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.

3. None of the 70 samples exceeded the Basin Plan water quality objective for vinyl chloride and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33472, Vinyl chloride **Region 9**

Sweetwater Reservoir

LOE ID:	1388
Pollutant:	Vinyl chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 7 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Vinyl Chloride is 0.0005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the east end reservoir fill boundary.
Temporal Representation:	Samples were collected once per day on one day every other month from 09/09/1998 to 09/20/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33472, Vinyl chloride **Region 9**

Sweetwater Reservoir

LOE ID:	1387
Pollutant:	Vinyl chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 8 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Vinyl Chloride is 0.0005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the minimum pool boundary east.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33472, Vinyl chloride **Region 9**

Sweetwater Reservoir

LOE ID:	1386
Pollutant:	Vinyl chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	10
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 10 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Vinyl Chloride is 0.0005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir near the recreation area.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33472, Vinyl chloride **Region 9**

Sweetwater Reservoir 035881

LOE ID:	1385
Pollutant:	Vinyl chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 12 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Vinyl Chloride is 0.0005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the center of the minimum pool.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 09/20/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33472, Vinyl chloride **Region 9**

Sweetwater Reservoir

LOE ID:	1384
Pollutant:	Vinyl chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 9 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Vinyl Chloride is 0.0005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)

Evaluation Guideline: 035882
Guideline Reference:

Spatial Representation: Samples were collected at Sweetwater Reservoir near Vista del Lago station.
Temporal Representation: Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:
QAPP Information: USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 33472, Vinyl chloride **Region 9**
Sweetwater Reservoir

LOE ID: 1383

Pollutant: Vinyl chloride
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 13
Number of Exceedances: 0

Data and Information Type: PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality: Data were collected by the USGS from 09/1998 to 09/1999. None of the 13 samples were in exceedance (USGS, 2002).
Data Reference: Placeholder reference 2006 303(d)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Vinyl Chloride is 0.0005 mg/L.
Objective/Criterion Reference: Placeholder reference 2006 303(d)

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Sweetwater Reservoir near the pump tower.
Temporal Representation: Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 09/20/1999.
Environmental Conditions:
QAPP Information: USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 33472, Vinyl chloride **Region 9**
Sweetwater Reservoir

LOE ID: 1389

Pollutant: Vinyl chloride
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 7

Number of Exceedances:	0	035883
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 7 samples were in exceedance (USGS, 2002).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Vinyl Chloride is 0.0005 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Sweetwater Reservoir near Gum Tree Cove Pond.	
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.	
Environmental Conditions:		
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33472, Vinyl chloride **Region 9**

Sweetwater Reservoir

LOE ID:	1390
Pollutant:	Vinyl chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 08/1998, 08/1999, 09/2000, and 10/2000. None of the 4 samples were in exceedance (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Vinyl Chloride is 0.0005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir. Exact location was not reported.
Temporal Representation:	Samples were collected on 08/11/1998, 08/24/1999, 09/5/2000, 10/04/2000. One sample was collected each day.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 32662 Region 9

Sweetwater Reservoir 035884

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the 4 samples exceed the Basin Plan objective for Zinc. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 4 samples exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32662, Zinc — Region 9

Sweetwater Reservoir

LOE ID:	1460
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by RWQCB 9 from 12/1997 to 02/2000. None of the 4 samples were in exceedance (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for zinc is 5.0 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Sweetwater Reservoir. Exact location was not reported.
Temporal Representation: Samples were collected once per day on 12/15/1997, 06/17/1998, 07/15/1999, and 02/24/2000.

Environmental Conditions:
QAPP Information: Data used in 2002 assessment.
QAPP Information Reference(s):

DECISION ID 33323 Region 9
Sweetwater Reservoir

Pollutant: **cis-1,2-Dichloroethylene**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Original
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Eight lines of evidence are available in the administrative record to assess this pollutant. None of the 70 samples exceed the Basin Plan water quality objective for cis-1,2-dichloroethylene.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 70 samples exceed the Basin Plan water quality objective for cis-1,2-dichloroethylene and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33323, cis-1,2-Dichloroethylene Region 9
Sweetwater Reservoir

LOE ID: 1304

Pollutant: cis-1,2-Dichloroethylene
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples:	9	035886
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 9 samples were in exceedance (USGS, 2002).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for cis-1,2-Dichloroethylene is 0.006 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Sweetwater Reservoir near Vista del Lago station.	
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.	
Environmental Conditions:		
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33323, cis-1,2-Dichloroethylene **Region 9**

Sweetwater Reservoir

LOE ID:	1303
Pollutant:	cis-1,2-Dichloroethylene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	13
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 13 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for cis-1,2-Dichloroethylene is 0.006 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir near the pump tower.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 09/20/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33323, cis-1,2-Dichloroethylene 035887 Region 9

Sweetwater Reservoir

LOE ID:	1309
Pollutant:	cis-1,2-Dichloroethylene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 7 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for cis-1,2-Dichloroethylene is 0.006 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir near Gum Tree Cove Pond.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33323, cis-1,2-Dichloroethylene Region 9

Sweetwater Reservoir

LOE ID:	1306
Pollutant:	cis-1,2-Dichloroethylene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	10
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 10 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for cis-1,2-Dichloroethylene is 0.006 mg/L.

Objective/Criterion Reference:	Placeholder reference 2006 303(d)	035888

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Sweetwater Reservoir near the recreation area.
Temporal Representation: Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:
QAPP Information: USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 33323, cis-1,2-Dichloroethylene **Region 9**

Sweetwater Reservoir

LOE ID: 1305

Pollutant: cis-1,2-Dichloroethylene
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 12
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Data were collected by the USGS from 09/1998 to 09/1999. None of the 12 samples were in exceedance (USGS, 2002).
Data Reference: Placeholder reference 2006 303(d)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for cis-1,2-Dichloroethylene is 0.006 mg/L.
Objective/Criterion Reference: Placeholder reference 2006 303(d)

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Sweetwater Reservoir at the center of the minimum pool.
Temporal Representation: Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 09/20/1999.
Environmental Conditions:
QAPP Information: USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 33323, cis-1,2-Dichloroethylene **Region 9**

Sweetwater Reservoir

LOE ID: 1308

Pollutant: cis-1,2-Dichloroethylene
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 7 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for cis-1,2-Dichloroethylene is 0.006 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the east end reservoir fill boundary.
Temporal Representation:	Samples were collected once per day on one day every other month from 09/09/1998 to 09/20/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33323, cis-1,2-Dichloroethylene **Region 9**

Sweetwater Reservoir

LOE ID:	1307
Pollutant:	cis-1,2-Dichloroethylene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 8 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for cis-1,2-Dichloroethylene is 0.006 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the minimum pool boundary east.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33323, cis-1,2-Dichloroethylene **Region 9**

Sweetwater Reservoir

LOE ID:	1310
Pollutant:	cis-1,2-Dichloroethylene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by RWQCB 9 in 08/1998, 08/1999, 09/2000, and 10/2000. None of the 4 samples were in exceedance (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for cis-1,2-Dichloroethylene is 0.006 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir. Exact location was not reported.
Temporal Representation:	Samples were collected on 08/11/1998, 08/24/1999, 09/5/2000, 10/04/2000. One sample was collected each day.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33087** **Region 9**

Sweetwater Reservoir

Pollutant:	**meta-para xylenes**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Eight lines of evidence are available in the administrative record to assess this pollutant. None of the 70 samples exceed the Basin Plan water quality objective for meta-para xylenes. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 70 samples exceed the Basin Plan water quality objective for meta-para xylenes and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33087, meta-para xylenes **Region 9**

Sweetwater Reservoir

LOE ID:	1338
Pollutant:	meta-para xylenes
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	10
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 10 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Xylenes is 1.750 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	MCL is for either a single isomer or the sum of the isomers. Incorporations by reference are prospective including future changes to the incorporated provisions as the changes take effect.
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	Samples were collected at Sweetwater Reservoir near the recreation area.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33087, meta-para xylenes **Region 9**

Sweetwater Reservoir

LOE ID:	1339
Pollutant:	meta-para xylenes
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total

Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 8 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Xylenes is 1.750 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	MCL is for either a single isomer or the sum of the isomers. Incorporations by reference are prospective including future changes to the incorporated provisions as the changes take effect.
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the minimum pool boundary east.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33087, meta-para xylenes **Region 9**

Sweetwater Reservoir

LOE ID:	1337
Pollutant:	meta-para xylenes
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 12 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Xylenes is 1.750 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	MCL is for either a single isomer or the sum of the isomers. Incorporations by reference are prospective including future changes to the incorporated provisions as the changes take effect.
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the center of the minimum pool.

Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 09/20/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33087, meta-para xylenes **Region 9**

Sweetwater Reservoir

LOE ID:	1340
Pollutant:	meta-para xylenes
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 7 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Xylenes is 1.750 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	MCL is for either a single isomer or the sum of the isomers. Incorporations by reference are prospective including future changes to the incorporated provisions as the changes take effect.
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the east end reservoir fill boundary.
Temporal Representation:	Samples were collected once per day on one day every other month from 09/09/1998 to 09/20/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33087, meta-para xylenes **Region 9**

Sweetwater Reservoir

LOE ID:	1341
Pollutant:	meta-para xylenes
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0

Data and Information Type:	Not Specified	035894
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 7 samples were in exceedance (USGS, 2002).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Xylenes is 1.750 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:	MCL is for either a single isomer or the sum of the isomers. Incorporations by reference are prospective including future changes to the incorporated provisions as the changes take effect.	
Guideline Reference:	Placeholder reference 2006 303(d)	
Spatial Representation:	Samples were collected at Sweetwater Reservoir near Gum Tree Cove Pond.	
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.	
Environmental Conditions:		
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33087, meta-para xylenes **Region 9**

Sweetwater Reservoir

LOE ID:	1336
Pollutant:	meta-para xylenes
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 9 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Xylenes is 1.750 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	MCL is for either a single isomer or the sum of the isomers. Incorporations by reference are prospective including future changes to the incorporated provisions as the changes take effect.
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	Samples were collected at Sweetwater Reservoir near Vista del Lago station.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33087, meta-para xylenes **Region 9**

Sweetwater Reservoir

LOE ID:	1335
Pollutant:	meta-para xylenes
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	13
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 13 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Xylenes is 1.750 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	MCL is for either a single isomer or the sum of the isomers. Incorporations by reference are prospective including future changes to the incorporated provisions as the changes take effect.
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	Samples were collected at Sweetwater Reservoir near the pump tower.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 09/20/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33087, meta-para xylenes **Region 9**

Sweetwater Reservoir

LOE ID:	1342
Pollutant:	meta-para xylenes
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by RWQCB 9 in 08/1998, 08/1999, 09/2000, and 10/2000. None of the 4 samples were in exceedance (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Xylenes is 1.750 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	MCL is for either a single isomer or the sum of the isomers. Incorporations by reference are prospective including future changes to the incorporated provisions as the changes take effect.
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	Samples were collected at Sweetwater Reservoir. Exact location was not reported.
Temporal Representation:	Samples were collected on 08/11/1998, 08/24/1999, 09/5/2000, 10/04/2000. One sample was collected each day.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 38290 Region 9

Sweetwater Reservoir

Pollutant:	**o-Dichlorobenzene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Seven lines of evidence are available in the administrative record to assess this pollutant. None of the 66 samples exceed the Basin Plan water quality objective for o-Dichlorobenzene; all were 'non-detects'. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 66 samples exceed the Basin Plan water quality objective for o-Dichlorobenzene; (all were 'non-detects'), and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 38290, o-Dichlorobenzene Region 9

Sweetwater Reservoir

LOE ID:	1286

Pollutant:	o-Dichlorobenzene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 7 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for o-Dichlorobenzene is 0.6 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir near Gum Tree Cove Pond.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 38290, o-Dichlorobenzene **Region 9**

Sweetwater Reservoir

LOE ID:	1280
Pollutant:	o-Dichlorobenzene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	13
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 13 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for o-Dichlorobenzene is 0.6 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at Sweetwater Reservoir near the pump tower. 035898
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 09/20/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 38290, o-Dichlorobenzene **Region 9**

Sweetwater Reservoir

LOE ID:	1281
Pollutant:	o-Dichlorobenzene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 9 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for o-Dichlorobenzene is 0.6 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir near Vista del Lago station.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 38290, o-Dichlorobenzene **Region 9**

Sweetwater Reservoir

LOE ID:	1282
Pollutant:	o-Dichlorobenzene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	Not Specified

Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 12 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for o-Dichlorobenzene is 0.6 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the center of the minimum pool.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 09/20/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 38290, o-Dichlorobenzene **Region 9**

Sweetwater Reservoir

LOE ID:	1283
Pollutant:	o-Dichlorobenzene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	10
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 10 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for o-Dichlorobenzene is 0.6 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir near the recreation area.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 38290, o-Dichlorobenzene **Region 9**

Sweetwater Reservoir

LOE ID:	1284	035900

Pollutant:	o-Dichlorobenzene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 8 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for o-Dichlorobenzene is 0.6 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the minimum pool boundary east.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 38290, o-Dichlorobenzene **Region 9**

Sweetwater Reservoir

LOE ID:	1285
Pollutant:	o-Dichlorobenzene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 7 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for o-Dichlorobenzene is 0.6 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at Sweetwater Reservoir at the east end reservoir fill boundary.
Temporal Representation:	Samples were collected once per day on one day every other month from 09/09/1998 to 09/20/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

DECISION ID 44545 Region 9

Sweetwater Reservoir

Pollutant:	**o-Xylene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Eight lines of evidence are available in the administrative record to assess this pollutant. None of the 70 samples exceed the Basin Plan water quality objective for o-xylene.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 70 samples exceed the Basin Plan water quality objective for o-xylene and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 44545, o-Xylene Region 9

Sweetwater Reservoir

LOE ID:	1350
Pollutant:	o-Xylene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0

Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by RWQCB 9 in 08/1998, 08/1999, 09/2000, and 10/2000. None of the 4 samples were in exceedance. The sum of the 4 samples did not exceed 1.750 mg/L (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Xylenes is 1.750 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	MCL is for either a single isomer or the sum of the isomers. Incorporations by reference are prospective including future changes to the incorporated provisions as the changes take effect.
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	Samples were collected at Sweetwater Reservoir. Exact location was not reported.
Temporal Representation:	Samples were collected on 08/11/1998, 08/24/1999, 09/5/2000, 10/04/2000. One sample was collected each day.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44545, o-Xylene **Region 9**

Sweetwater Reservoir

LOE ID:	1343
Pollutant:	o-Xylene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	13
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 13 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Xylenes is 1.750 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	MCL is for either a single isomer or the sum of the isomers. Incorporations by reference are prospective including future changes to the incorporated provisions as the changes take effect
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	Samples were collected at Sweetwater Reservoir near the pump tower.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 09/20/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.

QAPP Information Reference(s): 035903

Line of Evidence (LOE) for Decision ID 44545, o-Xylene **Region 9**

Sweetwater Reservoir

LOE ID:	1344
Pollutant:	o-Xylene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 9 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Xylenes is 1.750 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	MCL is for either a single isomer or the sum of the isomers. Incorporations by reference are prospective including future changes to the incorporated provisions as the changes take effect
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	Samples were collected at Sweetwater Reservoir near Vista del Lago station.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44545, o-Xylene **Region 9**

Sweetwater Reservoir

LOE ID:	1345
Pollutant:	o-Xylene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 12 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)

SWAMP Data:	Non-SWAMP	035904
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Xylenes is 1.750 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:	MCL is for either a single isomer or the sum of the isomers. Incorporations by reference are prospective including future changes to the incorporated provisions as the changes take effect	
Guideline Reference:	Placeholder reference 2006 303(d)	
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the center of the minimum pool.	
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 09/20/1999.	
Environmental Conditions:		
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44545, o-Xylene **Region 9**

Sweetwater Reservoir

LOE ID:	1346
Pollutant:	o-Xylene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	10
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 10 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Xylenes is 1.750 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	MCL is for either a single isomer or the sum of the isomers. Incorporations by reference are prospective including future changes to the incorporated provisions as the changes take effect
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	Samples were collected at Sweetwater Reservoir near the recreation area.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44545, o-Xylene **Region 9**

Sweetwater Reservoir

LOE ID:	1347	035905

Pollutant:	o-Xylene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 8 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Xylenes is 1.750 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	MCL is for either a single isomer or the sum of the isomers. Incorporations by reference are prospective including future changes to the incorporated provisions as the changes take effect
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the minimum pool boundary east.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44545, o-Xylene **Region 9**

Sweetwater Reservoir

LOE ID:	1348
Pollutant:	o-Xylene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 7 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Xylenes is 1.750 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)

Evaluation Guideline:	MCL is for either a single isomer or the sum of the isomers. Incorporations by reference are prospective including future changes to the incorporated provisions as the changes take effect
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the east end reservoir fill boundary.
Temporal Representation:	Samples were collected once per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44545, o-Xylene **Region 9**

Sweetwater Reservoir

LOE ID:	1349
Pollutant:	o-Xylene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 7 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Xylenes is 1.750 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	MCL is for either a single isomer or the sum of the isomers. Incorporations by reference are prospective including future changes to the incorporated provisions as the changes take effect
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	Samples were collected at Sweetwater Reservoir near Gum Tree Cove Pond.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

DECISION ID **32729** **Region 9**

Sweetwater Reservoir

Pollutant:	**p-Dichlorobenzene (DCB)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original

Impairment from Pollutant or Pollution:	Pollutant	035907

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Eight lines of evidence are available in the administrative record to assess this pollutant. None of the 70 samples exceed the Basin Plan water quality objective for p-Dichlorobenzene.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 70 samples exceed the Basin Plan water quality objective for p-Dichlorobenzene and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32729, p-Dichlorobenzene (DCB) **Region 9**

Sweetwater Reservoir

LOE ID:	1277
Pollutant:	p-Dichlorobenzene (DCB)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 7 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for p-Dichlorobenzene is 0.005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the east end reservoir fill boundary.
Temporal Representation:	Samples were collected once per day on one day every other month from 09/09/1998 to 09/20/1999.
Environmental Conditions:	

QAPP Information: USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 32729, p-Dichlorobenzene (DCB) Region 9
Sweetwater Reservoir

LOE ID: 1279

Pollutant: p-Dichlorobenzene (DCB)
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 4
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Data were collected by RWQCB9 in 08/1998, 08/1999, 09/2000, and 10/2000. None of the 4 samples were in exceedance (SWRCB, 2003).
Data Reference: Placeholder reference 2006 303(d)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for p-Dichlorobenzene is 0.005 mg/L.
Objective/Criterion Reference: Placeholder reference 2006 303(d)

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Sweetwater Reservoir. Exact location was not reported.
Temporal Representation: Samples were collected on 08/11/1998, 08/24/1999, 09/5/2000, 10/04/2000. One sample was collected each day.
Environmental Conditions:
QAPP Information: Data used in 2002 assessment. QA=?
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 32729, p-Dichlorobenzene (DCB) Region 9
Sweetwater Reservoir

LOE ID: 1276

Pollutant: p-Dichlorobenzene (DCB)
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 8
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Data were collected by the USGS from 09/1998 to 07/1999. None of the 8 samples were in exceedance (USGS, 2002).
Data Reference: Placeholder reference 2006 303(d)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for p-Dichlorobenzene is 0.005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the minimum pool boundary east.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 32729, p-Dichlorobenzene (DCB) Region 9

Sweetwater Reservoir

LOE ID:	1275
Pollutant:	p-Dichlorobenzene (DCB)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	10
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 10 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for p-Dichlorobenzene is 0.005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir near the recreation area.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 32729, p-Dichlorobenzene (DCB) Region 9

Sweetwater Reservoir

LOE ID:	1274
Pollutant:	p-Dichlorobenzene (DCB)
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	Total	035910
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	12	
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 12 samples were in exceedance (USGS, 2002).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for p-Dichlorobenzene is 0.005 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the center of the minimum pool.	
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 09/20/1999.	
Environmental Conditions:		
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 32729, p-Dichlorobenzene (DCB) Region 9

Sweetwater Reservoir

LOE ID:	1273
Pollutant:	p-Dichlorobenzene (DCB)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 9 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for p-Dichlorobenzene is 0.005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir near Vista del Lago station.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12//1999.
Environmental Conditions:	

QAPP Information: USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study

QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 32729, p-Dichlorobenzene (DCB) Region 9

Sweetwater Reservoir

LOE ID: 1278

Pollutant: p-Dichlorobenzene (DCB)
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 7
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Data were collected by the USGS from 09/1998 to 07/1999. None of the 7 samples were in exceedance (USGS, 2002).
Data Reference: Placeholder reference 2006 303(d)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: From the Basin Plan: For inland surface waters with a municial beneficial use, the WQO for p-Dichlorobenzene is 0.005 mg/L.
Objective/Criterion Reference: Placeholder reference 2006 303(d)

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Sweetwater Reservoir near Gum Tree Cove Pond.
Temporal Representation: Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 07/12/1999.
Environmental Conditions:
QAPP Information: USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.

QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 32729, p-Dichlorobenzene (DCB) Region 9

Sweetwater Reservoir

LOE ID: 1272

Pollutant: p-Dichlorobenzene (DCB)
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 13
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Data were collected by the USGS from 09/1998 to 09/1999. None of the 13 samples were in exceedance (USGS, 2002).
Data Reference: Placeholder reference 2006 303(d)

SWAMP Data:	Non-SWAMP	035912
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for p-Dichlorobenzene is 0.005 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Sweetwater Reservoir near the pump tower.	
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/09/1998 to 09/20/1999.	
Environmental Conditions:		
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.	
QAPP Information Reference(s):		

DECISION ID 33018 Region 9

Sweetwater Reservoir

Pollutant:	**pH**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. Eight lines of evidence are available in the administrative record to assess this pollutant. Forty-nine of 456 samples exceed the Basin Plan water quality objective for pH. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Forty-nine of 456 samples exceed the Basin Plan water quality objective for pH and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33018, pH Region 9

Sweetwater Reservoir

LOE ID:	1461
Pollutant:	pH

LOE Subgroup:	Pollutant-Water	035913
Matrix:	Water	
Fraction:	Total	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	8	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by RWQCB 9 from 07/1997 to 11/2000. None of the 8 samples were in exceedance (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for pH is 6.5 (minimum) to 8.5 (maximum).	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Sweetwater Reservoir. Exact location was no reported.	
Temporal Representation:	Samples were collected from 07/1997 to 11/2000. Samples were collected once per day on 8 days during this time span. Samples were collected mostly in the winter and summer months.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33018, pH **Region 9**

Sweetwater Reservoir

LOE ID:	1226
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	58
Number of Exceedances:	6
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the USGS on one day every other month for 10 months. Six of 58 samples were in exceedance of the maximum standard. No samples were below the minimum standard (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for pH is 6.5 (minimum) to 8.5 (maximum).
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir near Vista del Lago station at depths of

	0.1-12.0 meters. 035914
Temporal Representation:	Samples were collected on one day every other month for 10 months from 09/10/1998 to 07/12/1999. There were 11-12 samples collected per day.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Report.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33018, pH **Region 9**

Sweetwater Reservoir

LOE ID:	1231
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	57
Number of Exceedances:	6
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the USGS on one day evrey other month for 10 months. Samples were not collected in 11/1998. There were 57 samples were collected, 6 were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for pH is 6.5 (minumum) to 8.5 (maximum).
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir near Gum Tree Cove Pond at depths of 0.1 to 13.3 meters.
Temporal Representation:	Samples were collected on one day every other month for 10 months from 09/10/1998 to 07/12/1999. 5-15 samples were collected per sampling day.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33018, pH **Region 9**

Sweetwater Reservoir

LOE ID:	1230
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	27
Number of Exceedances:	8

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the USGS on one day every other month for a year. Samples were not collected in 11/1998. There were 27 samples were collected, 8 were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for pH is 6.5 (minimum) to 8.5 (maximum).
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir east end reservoir fill boundary at depths of 0.1 to 5.7 meters.
Temporal Representation:	Samples were collected on one day every other month for a year from 09/10/1998 to 09/20/1999. 2-7 samples were collected per sampling day.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33018, pH **Region 9**

Sweetwater Reservoir

LOE ID:	1229
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	67
Number of Exceedances:	11
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the USGS on one day every other month for 10 months. Samples were not collected in 11/1998. There were 67 samples were collected, 11 were in exceedance of the maximum standard.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for pH is 6.5 (minimum) to 8.5 (maximum).
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir minimum pool boundary East at depths of 0.1 to 13.5 meters.
Temporal Representation:	Samples were collected on one day every other month for 10 months from 09/10/1998 to 07/12/1999. Approximately 15 samples were collected per sampling day.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.

QAPP Information Reference(s): 035916

Line of Evidence (LOE) for Decision ID 33018, pH **Region 9**

Sweetwater Reservoir

LOE ID:	1228
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	73
Number of Exceedances:	5
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the USGS on one day every other month for 10 months. Samples were not collected in 11/1998. There were 73 samples were collected, 5 were above the maximum standard (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for pH is 6.5 (minimum) to 8.5 (maximum).
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir near the recreation area at depths of 0.1 to 16.0 meters.
Temporal Representation:	Samples were collected on one day every other month for 10 months from 09/10/1998 to 07/12/1999. 10-16 samples were collected on each sampling day.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used by USGS in Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33018, pH **Region 9**

Sweetwater Reservoir

LOE ID:	1227
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	96
Number of Exceedances:	9
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the USGS on one day every other month for a year. Samples were not collected in 11/1998. 96 samples were collected, 9 were in exceedance of the maximum standard (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for pH is 6.5 (minimum) to 8.5 (maximum).
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the center of minimum pool at depths ranging from 0.1 to 17.0 meters.
Temporal Representation:	Samples were collected on one day every other month for a year from 09/09/1998 to 09/20/1999. Approximately 15 samples were collected per sample day.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33018, pH **Region 9**

Sweetwater Reservoir

LOE ID:	1225
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	70
Number of Exceedances:	4
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by USGS on one day every other month for a year. Of 70 samples, 4 were in exceedance of the maximum standard (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for pH is 6.5 (minimum) to 8.5 (maximum).
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir near the pump tower. Samples were collected at depths of 0.1 to 16.5 meters.
Temporal Representation:	Samples were collected on one day every other month for a year from 09/09/1998 to 09/20/1999. Five to 20 samples were collected per sampling day. Samples were not collected in November 1998.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data is from USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

DECISION ID 33235 **Region 9**

Sweetwater Reservoir

Pollutant:	**Oxygen, Dissolved**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal from the section 303(d) list under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Nine lines of evidence are available in the administrative record to assess this pollutant. There were 324 out of 552 samples that exceeded the Basin Plan water quality objective for dissolved oxygen.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the section 303(d) list.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. There were 324 out of 552 samples that exceeded the Basin Plan water quality objective for dissolved oxygen and this exceeds the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 33235, Oxygen, Dissolved **Region 9**

Sweetwater Reservoir

LOE ID:	1219
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	68
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by USGS from 09/1998 to 07/1999. All samples collected in 1998 were below the minimum standard. Samples collected in 1999 all met the standard within at least the top 3 m, but DO measurements decreased to below the minimum standard as the sample depth increased. Overall, with samples at all depths included, 41 of 68 samples were below the minimum standard. All samples that met the standard were within the top 5 m (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: Dissolved oxygen levels shall not be less than 5.0 mg/l in inland

	surface waters with designated MAR or WARM beneficial uses or less than 6.0 mg/l in waters with designated COLD beneficial uses. The annual mean dissolved oxygen concentrations shall not be less than 7 mg/l more than 10% of the time.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir near Vista del Lago Station at depths from 0.1 to 12.0 meters.
Temporal Representation:	Samples were collected once every other month from 09/10/1998 to 07/12/1999. Multiple (10-15) samples were collected per day.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data is from a USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33235, Oxygen, Dissolved **Region 9**

Sweetwater Reservoir

LOE ID:	1220
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	112
Number of Exceedances:	72
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the USGS one day every other month for a year. For all sampling days , except 11/3/1998, at least the top 3 meters of sample depth showed DO samples above the minimum standard. For all sampling days, DO concentration declined as the sample depth increased. Overall, with all sample depths included, 72 of 112 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: Dissolved oxygen levels shall not be less than 5.0 mg/l in inland surface waters with designated MAR or WARM beneficial uses or less than 6.0 mg/l in waters with designated COLD beneficial uses. The annual mean dissolved oxygen concentrations shall not be less than 7 mg/l more than 10% of the time.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir at the center of minimum pool. Samples were collected at depths of 0.1-17.0 meters.
Temporal Representation:	Samples were collected on one day every other month for a year from 09/09/1998 to 09/20/1999. There were 15-20 samples collected per day.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data is from a USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33235, Oxygen, Dissolved **Region 9**

Sweetwater Reservoir 035920

LOE ID:	1222
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	80
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the USGS on one day every other month for 10 months. All samples, except those collected on 11/0/1998 showed that at shallower depths, the DO concentrations were above the minimum standard. All samples collected on 11/03/1998 were below the minimum standard. All sampling days showed that as depth increased, the DO concentration decreased. Samples collected in September and July showed more dramatic decreases in DO concentration as the depth increased. Overall, with all sampling depths included, 46 of 80 samples were below the minimum standard (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: Dissolved oxygen levels shall not be less than 5.0 mg/l in inland surface waters with designated MAR or WARM beneficial uses or less than 6.0 mg/l in waters with designated COLD beneficial uses. The annual mean dissolved oxygen concentrations shall not be less than 7 mg/l more than 10% of the time.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir minimum pool boundary East. Samples were collected at depths of 0.1 to 13.5 meters.
Temporal Representation:	Samples were collected on one day every other month for 10 months from 09/10/1998 to 07/12/1999. Approximately 12 samples were collected per sampling day.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data is from USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33235, Oxygen, Dissolved **Region 9**

Sweetwater Reservoir

LOE ID:	1218
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the USGS once every two months for a year. At this location, all samples from 09/1998, 11/1998, and 09/1999 were at or below the standard. Samples

	collected in 01/1999, 03/1999, 05/1999, and 07/1999 showed DO levels above the standard at depths of less than 5 m. January samples showed DO levels meeting the WQO from 0.1 to 13.6 meters deep. In some cases, at depths deeper than 5.0 m, there is a more dramatic drop in DO. Overall, with samples at all depths included, 54 of 86 were below the minimum standard for dissolved oxygen (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with all beneficial uses except From the Basin Plan: Dissolved oxygen levels shall not be less than 5.0 mg/l in inland surface waters with designated MAR or WARM beneficial uses or less than 6.0 mg/l in waters with designated COLD beneficial uses. The annual mean dissolved oxygen concentrations shall not be less than 7 mg/l more than 10% of the time.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir near the pump tower at depths ranging from 0.1-16.0 m.
Temporal Representation:	Samples were collected once every 2 months from 09/09/1998 to 09/20/1999. 5-20 samples were collected per day.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data is from USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33235, Oxygen, Dissolved **Region 9**

Sweetwater Reservoir

LOE ID:	1216
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	2
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by Sweetwater Authority from 07/2000 to 06/2001. At a depth of 0 ft., none of the 6 samples were below the standard. At 5 ft., 2 of 6 samples were below the standard, and at 10 ft., one of 6 samples were below the standard (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: Dissolved oxygen levels shall not be less than 5.0 mg/L in inland surface waters with designated MAR or WARM beneficial uses or less than 6.0 mg/L in waters with designated COLD beneficial uses. The annual mean dissolved oxygen concentrations shall not be less than 7 mg/L more than 10% of the time.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Lake at the Log Boom.
Temporal Representation:	Samples were collected 07/18/2000 to 06/20/2001. Samples were collected a total of 6

	times, 3 in 2000 and 3 in 2001. Multiple seasons are represented.	035922
Environmental Conditions:		
QAPP Information:	QA Info Missing	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33235, Oxygen, Dissolved **Region 9**

Sweetwater Reservoir

LOE ID:	1217
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by Sweetwater Authority from 07/2000 to 06/2001. At a depth of 0 ft., 0 of 6 samples were below the standard. At 5 ft. in depth, one of 6 samples were below the standard, and at 10 ft. down, one of 6 samples was below the standard (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: Dissolved oxygen levels shall not be less than 5.0 mg/l in inland surface waters with designated MAR or WARM beneficial uses or less than 6.0 mg/l in waters with designated COLD beneficial uses. The annual mean dissolved oxygen concentrations shall not be less than 7 mg/l more than 10% of the time.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Lake at the Intake Tower.
Temporal Representation:	Samples were collected 07/18/2000 to 06/20/2001. Samples were collected a total of 6 times, 3 in 2000 and 3 in 2001. Multiple seasons are represented.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33235, Oxygen, Dissolved **Region 9**

Sweetwater Reservoir

LOE ID:	1223
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	31
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the USGS on one day every other month for a year. The samples

	collected in this set all met the standard except for those collected on 11/03/1998. Also, in 09/1998, as sample depth increased, the DO concentration decreased to below the minimum standard. This is the only sampling day on which there is an obvious trend that DO concentration decreases as depth increases. For other sampling days, samples were not collected at depths deeper than 5.7 meters, making it difficult to see an obvious trend of a decrease in DO concentration with an increase in sampling depth. Overall, with all sample depths included, 7 of 31 samples were below the minimum standard (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: Dissolved oxygen levels shall not be less than 5.0 mg/l in inland surface waters with designated MAR or WARM beneficial uses or less than 6.0 mg/l in waters with designated COLD beneficial uses. The annual mean dissolved oxygen concentrations shall not be less than 7 mg/l more than 10% of the time.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir east end reservoir fill boundary. Samples were collected at depths of 0.1-5.7 meters.
Temporal Representation:	Samples were collected on one day every other month for a year from 09/10/1998 to 09/20/1999. Approximately 5 samples were collected per sampling day.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data used in USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33235, Oxygen, Dissolved **Region 9**

Sweetwater Reservoir

LOE ID:	1224
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	70
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the USGS on one day every other month for 10 months. All samples collected in 1998 were below the minimum standard. Samples collected in 1999 met the standards at sampling depths of at least 3m and shallower (often samples at 5 and 6 m still met standards), but showed a decrease in DO concentration to below the minimum standard as the sample depth increased. Overall, with all sampling depths included, 40 of 70 samples were below the minimum WQO (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: Dissolved oxygen levels shall not be less than 5.0 mg/L in inland surface waters with designated MAR or WARM beneficial uses or less than 6.0 mg/L in waters with designated COLD beneficial uses. The annual mean dissolved oxygen concentrations shall not be less than 7 mg/L more than 10% of the time.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	

Guideline Reference:	035924
Spatial Representation:	Samples were collected at Sweetwater Reservoir near Gum Tree Cove Pond. Samples were collected at depths of 0.1-13.0 meters.
Temporal Representation:	Samples were collected on one day every other month for 10 months from 09/10/1998 to 07/12/1999. 12-15 samples were collected per sampling day.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data is from USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33235, Oxygen, Dissolved **Region 9**

Sweetwater Reservoir

LOE ID:	1221
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	87
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the USGS on one day every other month for 10 months. No samples collected in 1998 were above the minimum standard. Samples collected in 1999 showed that at shallower sample depths, DO levels met the standard, but that as depth increased, DO levels decreased. Overall, with all sample depths included, 59 of 87 samples were below the minimum standard (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: Dissolved oxygen levels shall not be less than 5.0 mg/l in inland surface waters with designated MAR or WARM beneficial uses or less than 6.0 mg/l in waters with designated COLD beneficial uses. The annual mean dissolved oxygen concentrations shall not be less than 7 mg/l more than 10% of the time.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sweetwater Reservoir near the recreation area. Samples were collected at depths of 0.1 to 16.0 meters.
Temporal Representation:	Samples were collected one day per month, every other month from 09/10/1998 to 07/12/1999. There were 10-17 samples collected per sampling day.
Environmental Conditions:	
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data is from USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Loveland Reservoir
Water Body ID: CAL9093100020011025093606
Water Body Type: Lake & Reservoir

DECISION ID 33045 **Region 9**
Loveland Reservoir

Pollutant: Aluminum
Final Listing Decision: Do Not Delist from 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Sources: Source Unknown
Expected TMDL Completion Date: 2019
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. 2 of the 4 samples exceed the objective for the protection of the MUN beneficial use. One of 8 samples exceed the objective for the protection of the Aquatic Life Beneficial Use

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Two of 4 samples exceed the OBJECTIVE for MUN and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. One of Eight samples exceed the WARM beneficial use which is insufficient to determine beneficial use support using Table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 33045, Aluminum **Region 9**
Loveland Reservoir

LOE ID: 1529

Pollutant: Aluminum
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use:	Municipal & Domestic Supply	035926
Number of Samples:	4	
Number of Exceedances:	2	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Data were collected by Sweetwater Authority from 1997 to 2000, with one sample being collected per year. Two of the 4 samples were in exceedance.	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Aluminum is 0.2 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Loveland Reservoir. Exact location was not reported.	
Temporal Representation:	Samples were collected in 12/1997, 06/1998, 07/1999, and 02/2000. One sample was collected per year.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33045, Aluminum **Region 9**

Loveland Reservoir

LOE ID:	74253
Pollutant:	Aluminum
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	1
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	One of the eight samples tested for aluminum exceeded the numeric criteria of 0.087 mg/L to protect warm freshwater habitat.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	National Recommended Water Quality Criteria Continuous Concentrations are intended protect aquatic organisms from chronic exposures (expressed as 4-day average concentration) in freshwater. The numeric criteria for aluminum is 0.087 mg/L. ref2557
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Loveland Reservoir at approximately 32.782N/ -116.79W.
Temporal Representation:	From 2006-2009, samples were collected biannually during the months of January and June/July.
Environmental Conditions:	

QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.
QAPP Information Reference(s):	

DECISION ID 33046 Region 9
Loveland Reservoir

Pollutant:	**Antimony**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the two samples exceed the GUIDELINE. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of two samples exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 33046, Antimony Region 9
Loveland Reservoir

LOE ID:	1530
Pollutant:	Antimony
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by Sweetwater Authority in 1999 and 2000. None of the 2 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for Antimony is 0.006 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Loveland Reservoir. Exact location was not reported.
Temporal Representation:	One sample was collected in 07/1999 and one sample was collected in 02/2000. One sample was collected per year, giving a total of 2 samples.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33046, Antimony **Region 9**

Loveland Reservoir

LOE ID:	74254
Pollutant:	Antimony
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	The reporting limits for the eight non-detect samples were greater than the MCL, therefore these data could not be used in this assessment.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The CA Department of Health Services maximum contamination level (MCL) thought to be protective of drinking water for antimony is 6 ug/L.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Loveland Reservoir at approximately 32.782N/ -116.79W.
Temporal Representation:	From 2006-2009, samples were collected biannually during the months of January and June/July.
Environmental Conditions:	
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.
QAPP Information Reference(s):	

DECISION ID **33205** **Region 9**

Loveland Reservoir

Pollutant: **Arsenic**

Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	035929
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)	
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollution	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 one line(s) of evidence are necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. Zero of four samples exceed the OBJECTIVEfor protection of the MUN beneficial use. Zero of eight samples exceed the objectives for the protection of the Aquatic Life beneficial uses.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 4 and Zero of eight samples exceeded the OBJECTIVEs and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 33205, Arsenic **Region 9**

Loveland Reservoir

LOE ID:	1531
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the Sweetwater Authority in 1999 and 2000. None of the 2 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Arsenic is 0.05 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at Loveland Reservoir. Exact location was not reported.
Temporal Representation:	Samples were collected once per year in 1999 and 2000, in 07/1999 and 02/2000. A total of 2 samples were collected.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33205, Arsenic **Region 9**

Loveland Reservoir

LOE ID:	74239
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the eight samples tested for Arsenic exceeded the CTR criteria of 0.15 mg/L.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule lists criterion continuous concentrations (expressed as a 4-day average) for arsenic to protect aquatic life in freshwater. The CTR criteria for arsenic is 0.15 mg/L. ref2557
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Loveland Reservoir at approximately 32.782N/ -116.79W.
Temporal Representation:	From 2006-2009, samples were collected biannually during the months of January and June/July.
Environmental Conditions:	
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33205, Arsenic **Region 9**

Loveland Reservoir

LOE ID:	74240
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Both detected results were below the MCL. The reporting limits for the six non-detect samples were greater than the PHG, therefore these data could not be used in this assessment.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the water quality objective base on the California primary maximum contaminant level (MCL) for Arsenic is 0.05 mg/L.
Guideline Reference:	Water Quality Control Plan for the San Diego Basin Public Health Goal for Arsenic in Drinking Water
Spatial Representation:	Samples were collected from Loveland Reservoir at approximately 32.782N/ -116.79W.
Temporal Representation:	From 2006-2009, samples were collected biannually during the months of January and June/July.
Environmental Conditions:	
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.
QAPP Information Reference(s):	

DECISION ID	33047	Region 9
Loveland Reservoir		

Pollutant:	**Barium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 one line(s) of evidence are necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of 12 samples exceed the OBJECTIVEfor protection of the MUN beneficial use. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 12 samples exceeded the OBJECTIVE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 33047, Barium — Region 9

Loveland Reservoir

LOE ID:	1532
Pollutant:	Barium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the Sweetwater Authority from 1997 to 2000. None of the 4 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all water with a municipal beneficial use, the WQO for Barium is 1.0 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Loveland Reservoir. Exact location was not reported.
Temporal Representation:	Samples were collected from 1997 to 2000. One sample was collected per year in 12/1997, 06/1998, 07/1999, and 02/2000. A total of 4 samples were collected.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33047, Barium — Region 9

Loveland Reservoir

LOE ID:	74241
Pollutant:	Barium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the eight samples exceeded the MCL.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The CA Department of Health Services maximum contamination level (MCL) thought to be protective of drinking water for barium is 1,000 ug/L.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Loveland Reservoir at approximately 32.782N/ -116.79W.
Temporal Representation:	From 2006-2009, samples were collected biannually during the months of January and June/July.
Environmental Conditions:	
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.
QAPP Information Reference(s):	

DECISION ID 33357 Region 9

Loveland Reservoir

Pollutant:	**Beryllium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 one line(s) of evidence are necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of 10 samples exceed the OBJECTIVEfor protection of the MUN beneficial use. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 10 samples exceeded the OBJECTIVE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 33357, Beryllium Region 9

Loveland Reservoir

LOE ID:	1533

Pollutant:	Beryllium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the Sweetwater Authority in 1999 and 2000. None of the 2 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for Beryllium is 0.004 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Loveland Reservoir. Exact location was not recorded.
Temporal Representation:	Samples were collected in 07/1999 and 02/2000. One sample was collected per year.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33357, Beryllium **Region 9**

Loveland Reservoir

LOE ID:	74242
Pollutant:	Beryllium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the eight samples exceeded the MCL.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The CA Department of Health Services maximum contamination level(MCL) thought to be protective of drinking water for beryllium is 4 ug/L.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Loveland Reservoir at approximately 32.782N/ -116.79W.
Temporal Representation:	From 2006-2009, samples were collected biannually during the months of January and June/July.

Environmental Conditions: 035935

QAPP Information: Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.

QAPP Information Reference(s):

DECISION ID 44020 Region 9

Loveland Reservoir

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 one line(s) of evidence are necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. Zero of 10 samples exceed the OBJECTIVEfor protection of the MUN beneficial use. Zero of eight samples exceed the objectives for the protection of the Aquatic Life beneficial uses.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 10 and Zero of eight samples exceeded the OBJECTIVEs and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 44020, Cadmium Region 9

Loveland Reservoir

LOE ID:	1534
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0

Data and Information Type:	Not Specified	035936
Data Used to Assess Water Quality:	Data were collected by the Sweetwater Authority in 1999 and 2000. None of the 2 samples were in exceedance.	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Cadmium is 0.005 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Loveland Reservoir. Exact location was not reported.	
Temporal Representation:	Samples were collected in 07/1999 and 02/2000. One sample per year was collected, giving a total of 2 samples.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44020, Cadmium **Region 9**

Loveland Reservoir

LOE ID:	74243
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the eight samples tested for Cadmium exceeded the hardness adjusted CTR criteria.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. ref2557
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Loveland Reservoir at approximately 32.782N/ -116.79W.
Temporal Representation:	From 2006-2009, samples were collected biannually during the months of January and June/July.
Environmental Conditions:	
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of

drinking water. 035937

QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 44020, Cadmium **Region 9**

Loveland Reservoir

LOE ID:	74244
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	The 8 non detect samples had a detection limit below the objective and therefore meet the objective.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Total cadmium levels should not exceed the California Department of Public Health Primary MCL of .005 mg/l in inland surface waters designated with the MUN beneficial use.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Loveland Reservoir at approximately 32.782N/ -116.79W.
Temporal Representation:	From 2006-2009, samples were collected biannually during the months of January and June/July.
Environmental Conditions:	
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.
QAPP Information Reference(s):	

DECISION ID **33295** **Region 9**

Loveland Reservoir

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 one line(s) of evidence are necessary to assess listing status. Three lines of evidence are available in the administrative record to assess this pollutant. Zero of 10 samples exceed the OBJECTIVEfor protection of the MUN beneficial use. Zero of eight samples exceed the objectives for the protection of the Aquatic Life beneficial uses.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 10 and Zero of eight samples exceeded the OBJECTIVEs and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 33295, Chromium **Region 9**

Loveland Reservoir

LOE ID:	1535
Pollutant:	Chromium (total)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the Sweetwater Authority in 1999 and 2000. None of the 2 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For waters with a municipal beneficial use, the WQO for total chromium is 0.05 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Loveland Reservoir. Exact location was not reported.
Temporal Representation:	Samples were collected once per year in 07/1999 and 02/2000. A total of 2 samples were collected.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33295, Chromium **Region 9**

Loveland Reservoir

LOE ID:	74245

Pollutant:	Chromium	035939
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	Not Recorded	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	8	
Number of Exceedances:	0	
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)	
Data Used to Assess Water Quality:	None of the eight samples exceeded the MCL.	
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The CA Department of Health Services maximum contamination level (MCL) thought to be protective of drinking water for chromium, total is 50 ug/L.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Loveland Reservoir at approximately 32.782N/ -116.79W.	
Temporal Representation:	From 2006-2009, samples were collected biannually during the months of January and June/July.	
Environmental Conditions:		
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33295, Chromium **Region 9**

Loveland Reservoir

LOE ID:	74246
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the eight samples tested for Chromium exceeded the hardness adjusted CTR criteria.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies

	based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. ref2557
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Loveland Reservoir at approximately 32.782N/ -116.79W.
Temporal Representation:	From 2006-2009, samples were collected biannually during the months of January and June/July.
Environmental Conditions:	
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.
QAPP Information Reference(s):	

DECISION ID **32730** **Region 9**

Loveland Reservoir

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 one line(s) of evidence are necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of four samples exceed the OBJECTIVEfor protection of the MUN beneficial use. Zero of seven samples exceed the objectives for the protection of the Aquatic Life beneficial uses. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 4 and Zero of seven samples exceeded the OBJECTIVEs and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 32730, Copper **Region 9**

Loveland Reservoir

LOE ID:	74247
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water

Matrix:	Water	035941
Fraction:	Not Recorded	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	7	
Number of Exceedances:	0	
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)	
Data Used to Assess Water Quality:	None of the seven samples tested for Copper exceeded the hardness adjusted CTR criteria.	
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. ref2557	
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Spatial Representation:	Samples were collected from Loveland Reservoir at approximately 32.782N/ -116.79W.	
Temporal Representation:	From 2006-2009, samples were collected biannually during the months of January and June/July.	
Environmental Conditions:		
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 32730, Copper **Region 9**

Loveland Reservoir

LOE ID:	1536
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Samples were collected by Sweetwater Authority once per year from 1997 to 2000. None of the 4 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin plan: For inland surface waters with a municipal beneficial use, the WQO for Copper is 1.0 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)

Evaluation Guideline:	035942
Guideline Reference:	
Spatial Representation:	Samples were collected at Loveland Reservoir. Exact location was not reported.
Temporal Representation:	Samples were collected in 12/1997, 06/1998, 07/1999, and 02/2000. One sample was collected per year, giving a total of 4 samples.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 47881 Region 9

Loveland Reservoir

Pollutant:	**Cyanide**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the seven samples exceed the CRITERION. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 7 samples exceeded the CRITERION and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47881, Cyanide Region 9

Loveland Reservoir

LOE ID:	74248
Pollutant:	Cyanide
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	0

Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	All seven samples were reported as non-detect. The reporting limits were larger than the criteria of 5.2 ug/L used to assess water quality.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	National Toxics Rule lists criterion continuous concentrations (expressed as a 4-day average) for cyanide to protect aquatic life in freshwater. The criteria for cyanide is 5.2 ug/L. ref2557
Guideline Reference:	Staff Report Regarding Russian River Bacterial Water Quality Monitoring in the Vicinity of Fitch Mountain Sonoma County, California. April through September, 1995. North Coast Regional Water Quality Control Board
Spatial Representation:	Samples were collected from Loveland Reservoir at approximately 32.782N/ -116.79W.
Temporal Representation:	From 2006-2009, samples were collected biannually during the months of January and June/July.
Environmental Conditions:	
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.
QAPP Information Reference(s):	

DECISION ID	**47887**	**Region 9**
Loveland Reservoir		

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 and 3.3 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 201 samples exceed the OBJECTIVE for e.coli and zero of the 175 samples exceed the objective for total coliform. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 201 samples and zero of 175 exceeded the objectives and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision	After review of the available data and information, RWQCB staff concludes that the water body-

Recommendation: pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 47887, Indicator Bacteria **Region 9**

Loveland Reservoir

LOE ID:	74249
Pollutant:	Escherichia coli (E. coli)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	201
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 201 samples exceeded the E. coli objective of 235/100 ml.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The Escherichia coli concentration shall not exceed 235/100ml.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected on Lake Loveland 600 feet east of Loveland Dam.
Temporal Representation:	Samples were collected from January 2006 to December 2009.
Environmental Conditions:	
QAPP Information:	Sampling was conducted under the Sweetwater Authority Water Quality Monitoring Plan and analysis under the Sweetwater Authority Laboratory QA Manual.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 47887, Indicator Bacteria **Region 9**

Loveland Reservoir

LOE ID:	74263
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	175
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of 175 samples exceeded the total coliform objective of 10,000/100 ml. There are 203 sample results in this data set but 28 of those samples could not be compared to the objective because detection limit was not adequate. These 28 samples may not be meeting the objective since the result was reported as >2419.6.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Total coliform shall not exceed 10,000/100ml. Guidance for Fresh Water Beaches CDPH, 2006. ref 2531
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.
Spatial Representation:	Samples were collected on Lake Loveland 600 eet east of Loveland Dam.
Temporal Representation:	Samples were collected from January 2006 to December 2009.
Environmental Conditions:	
QAPP Information:	Sampling was conducted under the Sweetwater Authority Water Quality Monitoring Plan and analysis under the Sweetwater Authority Laboratory QA Manual.
QAPP Information Reference(s):	

DECISION ID **33381** **Region 9**

Loveland Reservoir

Pollutant:	**Iron**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 one line(s) of evidence are necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. One of four samples exceed the OBJECTIVEfor protection of the MUN beneficial use. Zero of eight samples exceed the objectives for the protection of the Aquatic Life beneficial uses. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of 4 and Zero of eight samples exceeded the OBJECTIVEs and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 33381, Iron **Region 9**

Loveland Reservoir

LOE ID:	74250

Pollutant:	Iron	035946
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	Not Recorded	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	8	
Number of Exceedances:	0	
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)	
Data Used to Assess Water Quality:	None of the eight samples tested for iron exceeded the numeric criteria of 1 mg/L to protect warm freshwater habitat.	
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	National Recommended Water Quality Criteria Continuous Concentrations are intended protect freshwater aquatic organisms from chronic exposures and are expressed as 4-day average concentrations. The numeric criteria for iron is 1 mg/L. Ref16	
Guideline Reference:	National recommended water quality criteria: 2002. EPA-822-R-02-047 Washington, D.C. USEPA	
Spatial Representation:	Samples were collected from Loveland Reservoir at approximately 32.782N/ -116.79W.	
Temporal Representation:	From 2006-2009, samples were collected biannually during the months of January and June/July.	
Environmental Conditions:		
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33381, Iron **Region 9**

Loveland Reservoir

LOE ID:	1537
Pollutant:	Iron
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	1
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the Sweetwater Authority once per year from 1997 to 2000. One of the 4 samples was in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for iron is 0.3 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)

Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Loveland Reservoir. Exact location was not reported.
Temporal Representation:	Samples were collected in 12/1997, 06/1998, 07/1999, and 02/2000. One sample was collected each year.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 47891 Region 9
Loveland Reservoir

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the seven samples exceed the CRITERION. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 7 samples exceeded the CRITERION and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47891, Lead Region 9
Loveland Reservoir

LOE ID:	74251
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8

Number of Exceedances:	0	035948
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)	
Data Used to Assess Water Quality:	None of the eight samples tested for Lead exceeded the hardness adjusted CTR criteria.	
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. ref2557	
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Spatial Representation:	Samples were collected from Loveland Reservoir at approximately 32.782N/ -116.79W.	
Temporal Representation:	From 2006-2009, samples were collected biannually during the months of January and June/July.	
Environmental Conditions:		
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 47891, Lead **Region 9**

Loveland Reservoir

LOE ID:	74252
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	The reporting limits for the eight non-detect samples were greater than the PHG, therefore these data could not be used in this assessment.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Office of Environmental Hazard and Heath Assessment, Public Health Goal (PHG) for lead is 0.2 ug/L.
Guideline Reference:	Public Health Goal for Lead in Drinking Water
Spatial Representation:	Samples were collected from Loveland Reservoir at approximately 32.782N/ -116.79W.
Temporal Representation:	From 2006-2009, samples were collected biannually during the months of January and

June/July. 035949

Environmental Conditions:

QAPP Information: Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.

QAPP Information Reference(s):

DECISION ID 44409 Region 9

Loveland Reservoir

Pollutant:	**Mercury**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 one line(s) of evidence are necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. Zero of two samples exceed the OBJECTIVEfor protection of the MUN beneficial use. Zero of seven samples exceed the objectives for the protection of the Aquatic Life beneficial uses.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 2 and Zero of seven samples exceeded the OBJECTIVEs and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 44409, Mercury Region 9

Loveland Reservoir

LOE ID:	74255
Pollutant:	Mercury
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	0

Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the eight samples tested for mercury exceeded the numeric criteria of 0.77 ug/L, promulgated to protect warm freshwater habitat.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	National Recommended Water Quality Criteria Continuous Concentrations are intended protect freshwater aquatic organisms from chronic exposures and are expressed as 4-day average concentrations. Criterion derived from data for inorganic mercury (II), but is applied to total mercury. It will probably be underprotective if a substantial portion of mercury in the water column is methylmercury. Derivation of criterion did not consider exposure through the diet, which is probably important for aquatic life occupying upper trophic levels. The numeric criteria for mercury is 0.77 ug/L. ref13
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Samples were collected from Loveland Reservoir at approximately 32.782N/ -116.79W.
Temporal Representation:	From 2006-2009, samples were collected biannually during the months of January and June/July.
Environmental Conditions:	
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44409, Mercury **Region 9**

Loveland Reservoir

LOE ID:	1539
Pollutant:	Mercury
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the Sweetwater Authority in 1999 and 2000. None of the 2 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for Mercury is 0.002 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Loveland Reservoir. Exact location was not reported.

Temporal Representation:	Samples were collected in 07/1999 and 02/2000. One sample was collected per year.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44409, Mercury **Region 9**

Loveland Reservoir

LOE ID:	74256
Pollutant:	Mercury
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	The reporting limits for the eight non-detect samples were greater than the criteria, therefore these data could not be used in this assessment.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	National Toxics Rule criteria to protect human health exposure to elemental mercury is 0.05 ug/L.
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Samples were collected from Loveland Reservoir at approximately 32.782N/ -116.79W.
Temporal Representation:	From 2006-2009, samples were collected biannually during the months of January and June/July.
Environmental Conditions:	
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.
QAPP Information Reference(s):	

DECISION ID **33383** **Region 9**

Loveland Reservoir

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 one line(s) of evidence are necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. Zero of two samples exceed the OBJECTIVEfor protection of the MUN beneficial use. Zero of eight samples exceed the objectives for the protection of the Aquatic Life beneficial uses.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 2 and Zero of eight samples exceeded the OBJECTIVEs and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 33383, Nickel **Region 9**

Loveland Reservoir

LOE ID:	1540
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the Sweetwater Authority in 1999 and 2000. None of the 2 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for Nickel is 0.1 mg/L
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Loveland Reservoir. Exact location was not reported.
Temporal Representation:	Samples were collected in 07/1999 and 02/2000. One sample was collected per year.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33383, Nickel **Region 9**

Loveland Reservoir

LOE ID:	74257
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the eight samples tested for Nickel exceeded the hardness adjusted CTR criteria.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. ref2557
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Loveland Reservoir at approximately 32.782N/ -116.79W.
Temporal Representation:	From 2006-2009, samples were collected biannually during the months of January and June/July.
Environmental Conditions:	
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.
QAPP Information Reference(s):	

DECISION ID **47892** **Region 9**

Loveland Reservoir

Pollutant:	**Nitrogen, Nitrate**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the eight samples exceed the CRITERION. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 8 samples exceeded the CRITERION and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47892, Nitrogen, Nitrate **Region 9**

Loveland Reservoir

LOE ID:	74258
Pollutant:	Nitrogen, Nitrate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	0 of 8 samples exceed the objective for nitrate (as N) at 10 mg/L. 4 of the 8 samples are reported as non-detects. These non-detects are less than or equal to the water quality standard, the value will be considered as meeting the water quality standard, objective, criterion, or evaluation guideline.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan, San Diego Region (2011): Waters designated for MUN shall not contain concentrations of chemical constituents in excess of the MCL specified in Title 22 of the California Code of Regulations. The nitrate (as N) MCL is 10 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Spatial Representation:	Samples were collected at Lake Loveland.
Temporal Representation:	Samples were collected biannually from 2006 to 2009.
Environmental Conditions:	
QAPP Information:	Data was submitted with an unsigned water quality monitoring plan.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 47892, Nitrogen, Nitrate **Region 9**

Loveland Reservoir

LOE ID:	74259
Pollutant:	Nitrogen, Nitrate
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	Total	035955
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	0	
Number of Exceedances:	0	
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)	
Data Used to Assess Water Quality:	Eight samples were collected with no samples detecting nitrite as N. It cannot be determined whether the reporting limit was below the water quality objective therefore it cannot be determined whether the samples met the water quality standards.	
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The Water Quality Control Plan, San Diego Basin, Objective for Municipal and Domestic Supply uses of inland surface waters states the following: waters shall not contain concentrations of inorganic chemicals in excess of the limits specified in California Code of Regulations, Title 22, Table 64431-A of section 64431 (Inorganic Chemicals). The maximum contaminant level listed in Table 64431-A for Nitrite as N is 1.0 mg/L.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Lake Loveland.	
Temporal Representation:	Samples were collected biannually from 2006 to 2009.	
Environmental Conditions:		
QAPP Information:	Data was submitted with an unsigned water quality monitoring plan.	
QAPP Information Reference(s):		

DECISION ID	33378	Region 9
Loveland Reservoir		

Pollutant:	**Selenium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the eight samples exceed the CRITERION for protection of the aquatic life beneficial use. Zero of two samples exceed the criterion for protection of the MUN beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 8 samples and zero of 2 samples exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available

indicating that standards are not met. 035956

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 33378, Selenium **Region 9**

Loveland Reservoir

LOE ID:	74260
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the eight samples tested for Selenium exceeded the CTR criteria of 0.005 mg/L.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The CTR criteria for selenium is 0.005 mg/L. ref2557
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Loveland Reservoir at approximately 32.782N/ -116.79W.
Temporal Representation:	From 2006-2009, samples were collected biannually during the months of January and June/July.
Environmental Conditions:	
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33378, Selenium **Region 9**

Loveland Reservoir

LOE ID:	1541
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	2	035957
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Data were collected by Sweetwater Authority in 1999 and 2000. None of the 2 samples were in exceedance.	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for Selenium is 0.05 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Loveland Reservoir. Exact location was not reported.	
Temporal Representation:	Samples were collected in 07/1999 and 02/2000. One sample was collected each year.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID	32665	Region 9
Loveland Reservoir		

Pollutant:	**Silver**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the eight samples exceed the CRITERION for protection of the aquatic life beneficial use. Zero of four samples exceed the criterion for protection of the MUN beneficial use. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 8 samples and zero of 4 samples exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 32665, Silver Loveland Reservoir

035958 **Region 9**

LOE ID:	1542
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the Sweetwater Authority from 1997 to 2000. None of the 4 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for silver is 0.1 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Loveland Reservoir. Exact location was not reported.
Temporal Representation:	Samples were collected in 12/1997, 06/1998, 07/1999, and 02/2000. One sample was collected each year.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 32665, Silver Loveland Reservoir

Region 9

LOE ID:	74261
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	All eight samples were reported as non-detect. The reporting limits were larger than the criteria used to assess water quality.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).

Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	035959
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion maximum concentrations for silver to protect aquatic life in freshwater (1-hour average). The disolved silver criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used. ref2557	
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Spatial Representation:	Samples were collected from Loveland Reservoir at approximately 32.782N/ -116.79W.	
Temporal Representation:	From 2006-2009, samples were collected biannually during the months of January and June/July.	
Environmental Conditions:		
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.	
QAPP Information Reference(s):		

DECISION ID **32666** **Region 9**

Loveland Reservoir

Pollutant:	**Thallium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the nine samples exceed the CRITERION for protection of the aquatic life beneficial use. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 9 samples exceeded the CRITERION and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 32666, Thallium **Region 9**

Loveland Reservoir

LOE ID:	1543

Pollutant:	Thallium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by Sweetwater Authority in 1999 and 2000. None of the 2 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for Thallium is 0.002 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Loveland Reservoir. Exact location was not reported.
Temporal Representation:	Samples were collected in 07/1999 and 02/2000. One sample was collected each year.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 32666, Thallium **Region 9**

Loveland Reservoir

LOE ID:	74262
Pollutant:	Thallium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the seven samples exceeded the MCL. The reporting limits for one of the non-detect samples was greater than the MCL, therefore this data could not be used in this assessment.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The CA Department of Health Services maximum contamination level (MCL) thought to be protective of drinking water for thallium is 2 ug/L.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Loveland Reservoir at approximately 32.782N/ -116.79W.

Temporal Representation:	From 2006-2009, samples were collected biannually during the months of January and June/July.
Environmental Conditions:	
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.
QAPP Information Reference(s):	

DECISION ID 32709 Region 9

Loveland Reservoir

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the eight samples exceed the CRITERION for protection of the aquatic life beneficial use. Zero of four samples exceed the criterion for protection of the MUN beneficial use. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 8 samples and zero of 4 samples exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 32709, Zinc Region 9

Loveland Reservoir

LOE ID:	74264
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8

Number of Exceedances:	0	035962
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)	
Data Used to Assess Water Quality:	None of the eight samples tested for Zinc exceeded the hardness adjusted CTR criteria.	
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. ref2557	
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Spatial Representation:	Samples were collected from Loveland Reservoir at approximately 32.782N/ -116.79W.	
Temporal Representation:	From 2006-2009, samples were collected biannually during the months of January and June/July.	
Environmental Conditions:		
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 32709, Zinc **Region 9**

Loveland Reservoir

LOE ID:	1544
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by Sweetwater Authority from 1997 to 2000. None of the 4 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for zinc is 5.0 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Loveland Reservoir. Exact location was not reported.
Temporal Representation:	Samples were collected in 12/1997, 06/1998, 07/1999, and 02/2000. One sample was collected each year.

Environmental Conditions: 035963
QAPP Information: Data used in 2002 assessment.
QAPP Information Reference(s):

DECISION ID 33151 Region 9
Loveland Reservoir

Pollutant: **1,1,1-Trichloroethane**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Original
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 21 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33151, 1,1,1-Trichloroethane Region 9
Loveland Reservoir

LOE ID: 1476

Pollutant: 1,1,1-Trichloroethane
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 9
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Data were collected by the USGS from 09/1998 to 07/1999. None of the 9 samples were in exceedance. (USGS, 2002).
Data Reference: Placeholder reference 2006 303(d)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,1,1-Trichloroethane is 0.200 mg/L.
Objective/Criterion Reference: Placeholder reference 2006 303(d)

Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Loveland Reservoir at the east end near the source inlet site 2.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/1998 to 07/1999.
Environmental Conditions:	
QAPP Information:	USGS :http://water.usgs.gov/owq/FieldManual/Data is from USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33151, 1,1,1-Trichloroethane **Region 9**

Loveland Reservoir

LOE ID:	1475
Pollutant:	1,1,1-Trichloroethane
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 12 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,1,1-Trichloroethane is 0.200 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Loveland Reservoir near dam site 1.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/1998 to 09/1999.
Environmental Conditions:	
QAPP Information:	USGS :http://water.usgs.gov/owq/FieldManual/Data is from USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

DECISION ID **33465** **Region 9**

Loveland Reservoir

Pollutant:	**1,1,2,2-Tetrachloroethane**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 21 samples exceeded the Basin Plan criteria, and these do not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33465, 1,1,2,2-Tetrachloroethane **Region 9**

Loveland Reservoir

LOE ID:	1496
Pollutant:	1,1,2,2-Tetrachloroethane
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 9 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,1,2,2-Tetrachloroethane is 0.001 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Loveland Reservoir at the east end near the source inlet site 2.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/1998 to 07/1999.
Environmental Conditions:	
QAPP Information:	USGS :http://water.usgs.gov/owq/FieldManual/Data is from USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33465, 1,1,2,2-Tetrachloroethane **Region 9**

Loveland Reservoir

LOE ID:	1495

Pollutant:	1,1,2,2-Tetrachloroethane
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 12 samples were in exceedance. (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,1,2,2-Tetrachloroethane is 0.001 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Loveland Reservoir near the dam site 1.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/1998 to 09/1999.
Environmental Conditions:	
QAPP Information:	USGS :http://water.usgs.gov/owq/FieldManual/Data is from USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

DECISION ID	33216	Region 9
Loveland Reservoir		

Pollutant:	**1,1,2-Trichloroethane**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 21 samples exceeded the Basin Plan criteria, and these do not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not

changed. 035967

Line of Evidence (LOE) for Decision ID 33216, 1,1,2-Trichloroethane **Region 9**

Loveland Reservoir

LOE ID:	1478
Pollutant:	1,1,2-Trichloroethane
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. 0 of 9 samples were in exceedance. (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,1,2-Trichloroethane is 0.005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Loveland Reservoir at the east end near source inlet site 2.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/1998 to 07/1999.
Environmental Conditions:	
QAPP Information:	USGS :http://water.usgs.gov/owq/FieldManual/Data is from USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33216, 1,1,2-Trichloroethane **Region 9**

Loveland Reservoir

LOE ID:	1477
Pollutant:	1,1,2-Trichloroethane
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 12 samples were in exceedance. (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,1,2-Trichloroethane is 0.005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Loveland Reservoir near dam site 1.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/1998 to 07/1999.
Environmental Conditions:	
QAPP Information:	USGS :http://water.usgs.gov/owq/FieldManual/Data is from USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

DECISION ID 33168 Region 9
Loveland Reservoir

Pollutant:	**1,1-Dichloroethylene (DCE)/ Vinylidene Chloride**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 21 samples exceeded the Basin Plan criteria, and these do not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33168, 1,1-Dichloroethylene (DCE)/ Vinylidene Chloride Region 9
Loveland Reservoir

LOE ID:	1479
Pollutant:	1,1-Dichloroethylene (DCE)/ Vinylidene Chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	12

Number of Exceedances:	0	035969

Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 12 samples were in exceedance. (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,1-DCE is 0.006 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Loveland Reservoir near dam site 1.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/1998 to 09/1999.
Environmental Conditions:	
QAPP Information:	USGS :http://water.usgs.gov/owq/FieldManual/Data is from USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33168, 1,1-Dichloroethylene (DCE)/ Vinylidene Chloride **Region 9**

Loveland Reservoir

LOE ID:	1480
Pollutant:	1,1-Dichloroethylene (DCE)/ Vinylidene Chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 9 samples were in exceedance. (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,1-DCE is 0.006 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Loveland Reservoir at the east end near the source inlet site 2.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/1998 to 07/1999.
Environmental Conditions:	
QAPP Information:	USGS :http://water.usgs.gov/owq/FieldManual/Data is from USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

DECISION ID	33219	035970 Region 9
Loveland Reservoir		

Pollutant:	**1,2,4-Trichlorobenzene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 21 samples exceeded the Basin Plan criteria, and these do not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33219, 1,2,4-Trichlorobenzene	**Region 9**
Loveland Reservoir	

LOE ID:	1484
Pollutant:	1,2,4-Trichlorobenzene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 9 samples were in exceedance. (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,2,4-Trichlorobenzene is 0.07 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Loveland Reservoir at the east end near the source inlet site 2.

Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/1998 to 07/1999.
Environmental Conditions:	
QAPP Information:	USGS :http://water.usgs.gov/owq/FieldManual/Data is from USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33219, 1,2,4-Trichlorobenzene **Region 9**

Loveland Reservoir

LOE ID:	1483
Pollutant:	1,2,4-Trichlorobenzene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 12 samples were in exceedance. (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 1,2,4-Trichlorobenzene is 0.07 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Loveland Reservoir near dam site 1.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/1998 to 09/1999.
Environmental Conditions:	
QAPP Information:	USGS :http://water.usgs.gov/owq/FieldManual/Data is from USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

DECISION ID **33169** **Region 9**

Loveland Reservoir

Pollutant:	**1,2-Dichloroethylene,-trans**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list

in the Water Quality Limited Segments category. 035972

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 21 samples exceeded the Basin Plan criteria, and these do not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33169, 1,2-Dichloroethylene,-trans **Region 9**

Loveland Reservoir

LOE ID:	1482
Pollutant:	1,2-Dichloroethylene,-trans
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 9 samples were in exceedance. (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for trans-1,2-Dichloroethylene is 0.01 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Loveland Reservoir at the east end near the source inlet site 2.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/1998 to 07/1999.
Environmental Conditions:	
QAPP Information:	USGS :http://water.usgs.gov/owq/FieldManual/Data is from USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33169, 1,2-Dichloroethylene,-trans **Region 9**

Loveland Reservoir

LOE ID:	1481
Pollutant:	1,2-Dichloroethylene,-trans
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total

Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 12 samples were in exceedance. (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for trans-1,2-Dichloroethylene is 0.01 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Loveland Reservoir near dam site 1.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/1998 to 09/1999.
Environmental Conditions:	
QAPP Information:	USGS :http://water.usgs.gov/owq/FieldManual/Data is from USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

DECISION ID **32654** **Region 9**

Loveland Reservoir

Pollutant:	**Alachlor**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 21 samples exceeded the Basin Plan criteria, and these do not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32654, Alachlor **Region 9**

Loveland Reservoir 035974

LOE ID:	1516
Pollutant:	Alachlor
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 9 samples were in exceedance. (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Alachlor is 0.002 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Loveland Reservoir at the east end near the source inlet site 2.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/1998 to 07/1999.
Environmental Conditions:	
QAPP Information:	USGS :http://water.usgs.gov/owq/FieldManual/Data is from USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 32654, Alachlor **Region 9**

Loveland Reservoir

LOE ID:	1515
Pollutant:	Alachlor
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 12 samples were in exceedance. (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Alachlor is 0.002 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at the Loveland Reservoir near the dam site 1.
Temporal Representation: Samples were collected 1-2 times per day on one day every other month from 09/1998 to 09/1999.

Environmental Conditions:
QAPP Information: USGS :http://water.usgs.gov/owq/FieldManual/Data is from USGS Water Quality Monitoring Study.

QAPP Information Reference(s):

DECISION ID 33509 Region 9
Loveland Reservoir

Pollutant: **Atrazine**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Original
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 21 samples exceeded the Basin Plan criteria, and these do not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33509, Atrazine Region 9
Loveland Reservoir

LOE ID: 1517

Pollutant: Atrazine
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 12
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Data were collected by the USGS from 09/1998 to 09/1999. None of the 12 samples were in

exceedance. (USGS, 2002). 035976

Data Reference: Placeholder reference 2006 303(d)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Atrazine is 0.003 mg/L.

Objective/Criterion Reference: Placeholder reference 2006 303(d)

Evaluation Guideline:

Guideline Reference:

Spatial Representation: Samples were collected at the Loveland Reservoir near the dam site 1.

Temporal Representation: Samples were collected 1-2 times per day on one day every other month from 09/1998 to 09/1999.

Environmental Conditions:

QAPP Information: USGS :http://water.usgs.gov/owq/FieldManual/Data is from USGS Water Quality Monitoring Study.

QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 33509, Atrazine **Region 9**

Loveland Reservoir

LOE ID: 1518

Pollutant: Atrazine

LOE Subgroup: Pollutant-Water

Matrix: Water

Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 9

Number of Exceedances: 0

Data and Information Type: Not Specified

Data Used to Assess Water Quality: Data were collected by the USGS from 09/1998 to 07/1999. None of the 9 samples were in exceedance. (USGS, 2002).

Data Reference: Placeholder reference 2006 303(d)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Atrazine is 0.003 mg/L.

Objective/Criterion Reference: Placeholder reference 2006 303(d)

Evaluation Guideline:

Guideline Reference:

Spatial Representation: Samples were collected at the Loveland Reservoir at the east end near the source inlet site 2.

Temporal Representation: Samples were collected 1-2 times per day on one day every other month from 09/1998 to 07/1999.

Environmental Conditions:

QAPP Information: USGS :http://water.usgs.gov/owq/FieldManual/Data is from USGS Water Quality Monitoring Study.

QAPP Information Reference(s):

DECISION ID 33279 **Region 9**

Loveland Reservoir

Pollutant:	**Benzene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 21 samples exceeded the Basin Plan criteria, and these do not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33279, Benzene **Region 9**

Loveland Reservoir

LOE ID:	1489
Pollutant:	Benzene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 12 samples were in exceedance. (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Benzene is 0.001 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Loveland Reservoir near the dam, site 1.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/1998 to 09/1999.
Environmental Conditions:	

QAPP Information: USGS :http://water.usgs.gov/owq/FieldManual/Data is from USGS Water Quality Monitoring Study.

QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 33279, Benzene **Region 9**

Loveland Reservoir

LOE ID: 1490

Pollutant: Benzene
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 9
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Data were collected by the USGS from 09/1998 to 07/1999. None of the 9 samples were in exceedance. (USGS, 2002).
Data Reference: Placeholder reference 2006 303(d)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Benzene is 0.001 mg/L.
Objective/Criterion Reference: Placeholder reference 2006 303(d)

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Loveland Reservoir at the east end near the source inlet site 2.
Temporal Representation: Samples were collected 1-2 times per day on one day every other month from 09/1998 to 07/1999.

Environmental Conditions:
QAPP Information: USGS :http://water.usgs.gov/owq/FieldManual/Data is from USGS Water Quality Monitoring Study.

QAPP Information Reference(s):

DECISION ID **33510** **Region 9**

Loveland Reservoir

Pollutant: **Carbofuran**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Original
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.035979
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 21 samples exceeded the Basin Plan criteria, and these do not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33510, Carbofuran **Region 9**

Loveland Reservoir

LOE ID:	1519
Pollutant:	Carbofuran
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 12 samples were in exceedance. (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Carbofuran is 0.018 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Loveland Reservoir near the dam site 1.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/1998 to 09/1999.
Environmental Conditions:	
QAPP Information:	USGS :http://water.usgs.gov/owq/FieldManual/Data is from USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33510, Carbofuran **Region 9**

Loveland Reservoir

LOE ID:	1520
Pollutant:	Carbofuran
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	9	035980
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 9 samples were in exceedance. (USGS, 2002).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Carbofuran is 0.018 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at the Loveland Reservoir at the east end near the source inlet site 2.	
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/1998 to 07/1999.	
Environmental Conditions:		
QAPP Information:	USGS :http://water.usgs.gov/owq/FieldManual/Data is from USGS Water Quality Monitoring Study.	
QAPP Information Reference(s):		

DECISION ID	**44021**	**Region 9**
Loveland Reservoir		

Pollutant:	**Chloride**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: One line of evidence is available in the administrative record to assess this pollutant. None of the 8 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of eight samples exceeded the water quality objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 44021, Chloride **Region 9**

Loveland Reservoir

LOE ID:	1548
Pollutant:	Chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by Sweetwater Authority from 1997 to 2000. None of the 8 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for chloride is 250 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Loveland Reservoir. Exact location was not reported.
Temporal Representation:	Samples were collected from 1997 to 2000. One to three samples were collected per year. Samples were collected during the winter and summer months.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33280** **Region 9**

Loveland Reservoir

Pollutant:	**Chlorobenzene (mono)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.

3. None of the 21 samples exceeded the Basin Plan criteria, and these do not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33280, Chlorobenzene (mono) **Region 9**

Loveland Reservoir

LOE ID:	1491
Pollutant:	Chlorobenzene (mono)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 12 samples were in exceedance. (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Chlorobenzene (mono) is 0.07 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Loveland Reservoir near the dam site 1.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/1998 to 09/1999.
Environmental Conditions:	
QAPP Information:	USGS :http://water.usgs.gov/owq/FieldManual/Data is from USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33280, Chlorobenzene (mono) **Region 9**

Loveland Reservoir

LOE ID:	1492
Pollutant:	Chlorobenzene (mono)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0

Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 9 samples were in exceedance. (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Chlorobenzene (mono) is 0.07 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Loveland Reservoir at the east end near the source inlet site 2.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/1998 to 07/1999.
Environmental Conditions:	
QAPP Information:	USGS :http://water.usgs.gov/owq/FieldManual/Data is from USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

DECISION ID 33236 Region 9

Loveland Reservoir

Pollutant:	**Dichloromethane**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 21 samples exceeded the Basin Plan criteria, and these do not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33236, Dichloromethane Region 9

Loveland Reservoir

LOE ID:	1500
Pollutant:	Dichloromethane

LOE Subgroup:	Pollutant-Water	035984
Matrix:	Water	
Fraction:	Total	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	9	
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 9 samples were in exceedance. (USGS, 2002).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Dichloromethane is 0.005 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Loveland Reservoir at the east end near the the source inlet site 2.	
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/1998 to 07/1999.	
Environmental Conditions:		
QAPP Information:	USGS :http://water.usgs.gov/owq/FieldManual/Data is from USGS Water Quality Monitoring Study.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33236, Dichloromethane **Region 9**

Loveland Reservoir

LOE ID:	1499
Pollutant:	Dichloromethane
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 12 samples were in exceedance. (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Dichloromethane is 0.005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Loveland Reservoir near the dam site 1.

Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/1998 to 09/1999.
Environmental Conditions:	
QAPP Information:	USGS :http://water.usgs.gov/owq/FieldManual/Data is from USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

DECISION ID	33466	Region 9
Loveland Reservoir		

Pollutant:	**Ethylbenzene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 21 samples exceeded the Basin Plan criteria, and these do not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33466, Ethylbenzene	**Region 9**
Loveland Reservoir	

LOE ID:	1498
Pollutant:	Ethylbenzene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 9 samples were in exceedance. (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Ethylbenzene is 0.7 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Loveland Reservoir at the east end near the source inlet site 2.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/1998 to 07/1999.
Environmental Conditions:	
QAPP Information:	USGS :http://water.usgs.gov/owq/FieldManual/Data is from USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33466, Ethylbenzene **Region 9**

Loveland Reservoir

LOE ID:	1497
Pollutant:	Ethylbenzene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 12 samples were in exceedance. (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Ethylbenzene is 0.7 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Loveland Reservoir near the dam site 1.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/1998 to 09/1999.
Environmental Conditions:	
QAPP Information:	USGS :http://water.usgs.gov/owq/FieldManual/Data is from USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

DECISION ID **33431** **Region 9**

Loveland Reservoir

Pollutant:	**Fluoride**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original

Impairment from Pollutant or Pollution:	Pollutant	035987
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the eight samples exceed the Basin Plan Objective for Fluoride. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of eight samples exceeded the Basin Plan Objective for Fluoride and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.	
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.	

Line of Evidence (LOE) for Decision ID 33431, Fluoride **Region 9**

Loveland Reservoir

LOE ID:	1547
Pollutant:	Fluoride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by Sweetwater Authority from 1997 to 2000. None of the 8 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for Fluoride is 1.0 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Loveland Reservoir. Exact location was not reported.
Temporal Representation:	Samples were collected from 1997 to 2000. One to three samples were collected per year. Samples were collected during the winter and summer months.
Environmental Conditions:	

QAPP Information:	Data used in 2002 assessment.	035988
QAPP Information Reference(s):		

DECISION ID	33511	Region 9
Loveland Reservoir		

Pollutant:	**Lindane/gamma Hexachlorocyclohexane (gamma-HCH)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 21 samples exceeded the Basin Plan criteria, and these do not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33511, Lindane/gamma Hexachlorocyclohexane (gamma-HCH)	Region 9
Loveland Reservoir	

LOE ID:	1521
Pollutant:	Lindane/gamma Hexachlorocyclohexane (gamma-HCH)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 12 samples were in exceedance. (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Lindane is 0.0002 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at the Loveland Reservoir near the dam site 1.
Temporal Representation: Samples were collected 1-2 times per day on one day every other month from 09/1998 to 09/1999.
Environmental Conditions:
QAPP Information: USGS :http://water.usgs.gov/owq/FieldManual/Data is from USGS Water Quality Monitoring Study.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 33511, Lindane/gamma Hexachlorocyclohexane (gamma-HCH) **Region 9**

Loveland Reservoir

LOE ID: 1522

Pollutant: Lindane/gamma Hexachlorocyclohexane (gamma-HCH)
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 9
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Data were collected by the USGS from 09/1998 to 07/1999. None of the 9 samples were in exceedance. (USGS, 2002).
Data Reference: Placeholder reference 2006 303(d)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Lindane is 0.0002 mg/L.
Objective/Criterion Reference: Placeholder reference 2006 303(d)

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at the Loveland Reservoir at the east end near the source inlet site 2.
Temporal Representation: Samples were collected 1-2 times per day on one day every other month from 09/1998 to 07/1999.
Environmental Conditions:
QAPP Information: USGS :http://water.usgs.gov/owq/FieldManual/Data is from USGS Water Quality Monitoring Study.
QAPP Information Reference(s):

DECISION ID **33487** **Region 9**

Loveland Reservoir

Pollutant: **Molinate**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Original
Impairment from Pollutant or Pollutant

Pollution: 035990

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 21 samples exceeded the Basin Plan criteria, and these do not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33487, Molinate — Region 9

Loveland Reservoir

LOE ID:	1523
Pollutant:	Molinate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 12 samples were in exceedance. (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Molinate is 0.02 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Loveland Reservoir near the dam site 1.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/1998 to 09/1999.
Environmental Conditions:	
QAPP Information:	USGS :http://water.usgs.gov/owq/FieldManual/Data is from USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33487, Molinate — **Region 9**

Loveland Reservoir

LOE ID:	1524
Pollutant:	Molinate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 9 samples were in exceedance. (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Molinate is 0.02 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Loveland Reservoir at the east end near the source inlet site 2.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/1998 to 07/1999.
Environmental Conditions:	
QAPP Information:	USGS :http://water.usgs.gov/owq/FieldManual/Data is from USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

DECISION ID	32962	Region 9
Loveland Reservoir		

Pollutant:	**Simazine**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 19 samples exceeded the Basin Plan criteria, and these do not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32962, Simazine **Region 9**

Loveland Reservoir

LOE ID:	1525
Pollutant:	Simazine
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 12 samples were in exceedance. (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Simazine is 0.004 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Loveland Reservoir near the dam site 1.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/1998 to 09/1999.
Environmental Conditions:	
QAPP Information:	USGS :http://water.usgs.gov/owq/FieldManual/Data is from USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 32962, Simazine **Region 9**

Loveland Reservoir

LOE ID:	1526
Pollutant:	Simazine
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 7 samples were in exceedance. (USGS, 2002).

Data Reference:	Placeholder reference 2006 303(d)	035993
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Simazine is 0.004 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at the Loveland Reservoir at the east end near the source inlet site 2.	
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/1998 to 07/1999.	
Environmental Conditions:		
QAPP Information:	USGS :http://water.usgs.gov/owq/FieldManual/Data is from USGS Water Quality Monitoring Study.	
QAPP Information Reference(s):		

DECISION ID 33450 Region 9

Loveland Reservoir

Pollutant:	**Styrene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 21 samples exceeded the Basin Plan criteria, and these do not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33450, Styrene Region 9

Loveland Reservoir

LOE ID:	1505
Pollutant:	Styrene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total

Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 12 samples were in exceedance. (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Styrene is 0.1 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Loveland Reservoir near the dam site 1.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/1998 to 09/1999.
Environmental Conditions:	
QAPP Information:	USGS :http://water.usgs.gov/owq/FieldManual/Data is from USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33450, Styrene **Region 9**

Loveland Reservoir

LOE ID:	1506
Pollutant:	Styrene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 9 samples were in exceedance. (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Styrene is 0.1 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Loveland Reservoir at the east end near the source inlet site 2.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/1998 to 07/1999.
Environmental Conditions:	

QAPP Information: USGS :http://water.usgs.gov/owq/FieldManual/Data is from USGS Water Quality Monitoring Study.

QAPP Information Reference(s):

DECISION ID	33350	Region 9
Loveland Reservoir		

Pollutant: **Sulfates**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Original
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the eight samples exceed the Basin Plan Water Quality Objective for sulfates.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of eight samples exceeded the Basin Plan Objective for sulfates and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33350, Sulfates	Region 9
Loveland Reservoir	

LOE ID: 1549

Pollutant: Sulfates
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 8
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Data were collected by Sweetwater Authority from 1997 to 2000. None of the 8 samples

	were in exceedance.	035996
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for sulfate is 250 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Loveland Reservoir. Exact location was not reported.	
Temporal Representation:	Samples were collected from 1997 to 2000. One to three samples were collected per year. Samples were collected during the winter and summer months.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID 33451 Region 9

Loveland Reservoir

Pollutant:	**Tetrachloroethylene/PCE**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 21 samples exceeded the Basin Plan criteria, and these do not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33451, Tetrachloroethylene/PCE Region 9

Loveland Reservoir

LOE ID:	1508
Pollutant:	Tetrachloroethylene/PCE
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total

Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 9 samples were in exceedance. (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Tetrachloroethylene is 0.005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Loveland Reservoir at the east end near the source inlet site 2.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/1998 to 07/1999.
Environmental Conditions:	
QAPP Information:	USGS :http://water.usgs.gov/owq/FieldManual/Data is from USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33451, Tetrachloroethylene/PCE **Region 9**

Loveland Reservoir

LOE ID:	1507
Pollutant:	Tetrachloroethylene/PCE
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 12 samples were in exceedance. (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Tetrachloroethylene is 0.005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Loveland Reservoir near the dam site 1.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/1998 to 09/1999.
Environmental Conditions:	

QAPP Information:	USGS :http://water.usgs.gov/owq/FieldManual/Data is from USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

DECISION ID 33467 Region 9

Loveland Reservoir

Pollutant:	**Thiobencarb/Bolero**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 21 samples exceeded the Basin Plan criteria, and these do not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33467, Thiobencarb/Bolero Region 9

Loveland Reservoir

LOE ID:	1527
Pollutant:	Thiobencarb/Bolero
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 12 samples were in exceedance. (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Thiobencarb is 0.07 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)

Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Loveland Reservoir near the dam site 1.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/1998 to 09/1999.
Environmental Conditions:	
QAPP Information:	USGS :http://water.usgs.gov/owq/FieldManual/Data is from USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33467, Thiobencarb/Bolero **Region 9**

Loveland Reservoir

LOE ID:	1528
Pollutant:	Thiobencarb/Bolero
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 9 samples were in exceedance. (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Thiobencarb is 0.07 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Loveland Reservoir at the east end near the source inlet site 2.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/1998 to 07/1999.
Environmental Conditions:	
QAPP Information:	USGS :http://water.usgs.gov/owq/FieldManual/Data is from USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

DECISION ID **44351** **Region 9**

Loveland Reservoir

Pollutant:	**Toluene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 21 samples exceeded the Basin Plan criteria, and these do not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 44351, Toluene **Region 9**

Loveland Reservoir

LOE ID:	1509
Pollutant:	Toluene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 12 samples were in exceedance. (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Toluene is 0.15 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Loveland Reservoir near the dam site 1.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/1998 to 09/1999.
Environmental Conditions:	
QAPP Information:	USGS :http://water.usgs.gov/owq/FieldManual/Data is from USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44351, Toluene **Region 9**

Loveland Reservoir

LOE ID:	1510	036001

Pollutant:	Toluene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 9 samples were in exceedance. (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Toluene is 0.15 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Loveland Reservoir at the east end near the source inlet site 2.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/1998 to 07/1999.
Environmental Conditions:	
QAPP Information:	USGS :http://water.usgs.gov/owq/FieldManual/Data is from USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

DECISION ID	**33365**	**Region 9**
Loveland Reservoir		

Pollutant:	**Total Dissolved Solids**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the eight samples exceed the Basin Plan Objective for Total Dissolved Solids.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.

2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.936002
3. Zero of eight samples exceeded the Basin Plan Objective for Total Dissolved Solids, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33365, Total Dissolved Solids **Region 9**

Loveland Reservoir

LOE ID:	1546
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by Sweetwater Authority from 1997 to 2000. None of the 8 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for TDS is 500. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Loveland Reservoir. Exact location was not reported.
Temporal Representation:	Samples were collected from 1997 to 2000. One to three samples were collected per year. Samples were collected during the winter and summer months.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33291** **Region 9**

Loveland Reservoir

Pollutant:	**Trichloroethylene/TCE**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 21 samples exceeded the Basin Plan criteria, and these do not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33291, Trichloroethylene/TCE **Region 9**

Loveland Reservoir

LOE ID:	1511
Pollutant:	Trichloroethylene/TCE
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 12 samples were in exceedance. (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Trichloroethylene is 0.005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Loveland Reservoir near the dam site 1.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/1998 to 09/1999.
Environmental Conditions:	
QAPP Information:	USGS :http://water.usgs.gov/owq/FieldManual/Data is from USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33291, Trichloroethylene/TCE **Region 9**

Loveland Reservoir

LOE ID:	1512	036004

Pollutant:	Trichloroethylene/TCE
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 9 samples were in exceedance. (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Trichloroethylene is 0.005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Loveland Reservoir at the east end near the source inlet site 2.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/1998 to 07/1999.
Environmental Conditions:	
QAPP Information:	USGS :http://water.usgs.gov/owq/FieldManual/Data is from USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

DECISION ID	**33292**	**Region 9**
Loveland Reservoir		

Pollutant:	**Vinyl chloride**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 21 samples exceeded the Basin Plan objective, and these do not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33292, Vinyl chloride **Region 9**

Loveland Reservoir

LOE ID:	1514
Pollutant:	Vinyl chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 9 samples were in exceedance. (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for vinyl chloride is 0.0005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Loveland Reservoir at the east end near the source inlet site 2.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/1998 to 07/1999.
Environmental Conditions:	
QAPP Information:	USGS :http://water.usgs.gov/owq/FieldManual/Data is from USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33292, Vinyl chloride **Region 9**

Loveland Reservoir

LOE ID:	1513
Pollutant:	Vinyl chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 12 samples were in exceedance. (USGS, 2002).

Data Reference:	Placeholder reference 2006 303(d)	036006
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for vinyl chloride is 0.0005 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at the Loveland Reservoir near the dam site 1.	
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/1998 to 09/1999.	
Environmental Conditions:		
QAPP Information:	USGS :http://water.usgs.gov/owq/FieldManual/Data is from USGS Water Quality Monitoring Study.	
QAPP Information Reference(s):		

DECISION ID 33328 Region 9

Loveland Reservoir

Pollutant:	**cis-1,2-Dichloroethylene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 21 samples exceeded the Basin Plan criteria, and these do not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33328, cis-1,2-Dichloroethylene Region 9

Loveland Reservoir

LOE ID:	1493
Pollutant:	cis-1,2-Dichloroethylene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total

Beneficial Use:	Municipal & Domestic Supply	036007
Number of Samples:	12	
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 12 samples were in exceedance. (USGS, 2002).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for cis-1,2-Dichloroethylene is 0.006 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Loveland Reservoir near the dam, site 1.	
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/1998 to 09/1999.	
Environmental Conditions:		
QAPP Information:	USGS :http://water.usgs.gov/owq/FieldManual/Data is from USGS Water Quality Monitoring Study.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33328, cis-1,2-Dichloroethylene **Region 9**

Loveland Reservoir

LOE ID:	1494
Pollutant:	cis-1,2-Dichloroethylene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 9 samples were in exceedance. (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for cis-1,2-Dichloroethylene is 0.006 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Loveland Reservoir at the east end near the source inlet site 2.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/1998 to 07/1999.
Environmental Conditions:	
QAPP Information:	USGS :http://water.usgs.gov/owq/FieldManual/Data is from USGS Water Quality Monitoring Study.

QAPP Information Reference(s): 036008

DECISION ID	43035	Region 9
Loveland Reservoir		

Pollutant:	**meta-para xylenes**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 21 samples exceeded the Basin Plan criteria, and these do not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43035, meta-para xylenes	**Region 9**
Loveland Reservoir	

LOE ID:	1502
Pollutant:	meta-para xylenes
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 9 samples were in exceedance. (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Xylenes is 1.750 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	MCL is for either a single isomer or the sum of the isomers. Incorporations by reference are

	prospective including future changes to the incorporated provisions as the changes take effect.
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	Samples were collected at the Loveland Reservoir at the east end near the source inlet site 2.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/1998 to 07/1999.
Environmental Conditions:	
QAPP Information:	USGS :http://water.usgs.gov/owq/FieldManual/Data is from USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43035, meta-para xylenes **Region 9**

Loveland Reservoir

LOE ID:	1501
Pollutant:	meta-para xylenes
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 12 samples were in exceedance. (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with municipal beneficial uses, the WQO for Xylenes is 1.750 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	MCL is for either a single isomer or the sum of the isomers. Incorporations by reference are prospective including future changes to the incorporated provisions as the changes take effect.
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	Samples were collected at the Loveland Reservoir near the dam site 1.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/1998 to 09/1999.
Environmental Conditions:	
QAPP Information:	USGS :http://water.usgs.gov/owq/FieldManual/Data is from USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

DECISION ID **33427** **Region 9**

Loveland Reservoir

Pollutant:	**o-Dichlorobenzene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original

Impairment from Pollutant or Pollution:	Pollutant	036010
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 21 samples exceeded the Basin Plan criteria, and these do not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.	
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.	

Line of Evidence (LOE) for Decision ID 33427, o-Dichlorobenzene **Region 9**

Loveland Reservoir

LOE ID:	1487
Pollutant:	o-Dichlorobenzene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 12 samples were in exceedance. (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for o-Dichlorobenzene is 0.6 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Loveland Reservoir near the dam site 1.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/1998 to 09/1999.
Environmental Conditions:	
QAPP Information:	USGS :http://water.usgs.gov/owq/FieldManual/Data is from USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33427, o-Dichlorobenzene **Region 9**

Loveland Reservoir 036011

LOE ID:	1488
Pollutant:	o-Dichlorobenzene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 9 samples were in exceedance. (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for o-Dichlorobenzene is 0.6 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Loveland Reservoir at the east end near the source inlet site 2.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/1998 to 07/1999.
Environmental Conditions:	
QAPP Information:	USGS :http://water.usgs.gov/owq/FieldManual/Data is from USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

DECISION ID **44692** **Region 9**

Loveland Reservoir

Pollutant:	**o-Xylene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 21 samples exceeded the Basin Plan criteria, and these do not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 44692, o-Xylene **Region 9**

Loveland Reservoir

LOE ID:	1503
Pollutant:	o-Xylene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 12 samples were in exceedance. (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with municipal beneficial uses, the WQO for Xylenes is 1.750 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	MCL is for either a single isomer or the sum of the isomers. Incorporations by reference are prospective including future changes to the incorporated provisions as the changes take effect.
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	Samples were collected at the Loveland Reservoir near the dam site 1.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/1998 to 09/1999.
Environmental Conditions:	
QAPP Information:	USGS :http://water.usgs.gov/owq/FieldManual/Data is from USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44692, o-Xylene **Region 9**

Loveland Reservoir

LOE ID:	1504
Pollutant:	o-Xylene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	Not Specified

Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 90 samples were in exceedance. (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with municipal beneficial uses, the WQO for Xylenes is 1.750 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	MCL is for either a single isomer or the sum of the isomers. Incorporations by reference are prospective including future changes to the incorporated provisions as the changes take effect.
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	Samples were collected at the Loveland Reservoir at the east end near the source inlet site 2.
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/1998 to 07/1999.
Environmental Conditions:	
QAPP Information:	USGS :http://water.usgs.gov/owq/FieldManual/Data is from USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

DECISION ID **33482** **Region 9**

Loveland Reservoir

Pollutant:	**p-Dichlorobenzene (DCB)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 21 samples exceeded the Basin Plan criteria, and these do not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33482, p-Dichlorobenzene (DCB) **Region 9**

Loveland Reservoir

LOE ID:	1486

Pollutant:	p-Dichlorobenzene (DCB)	036014
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	Total	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	9	
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. None of the 9 samples were in exceedance. (USGS, 2002).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for p-Dichlorobenzene is 0.005 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Loveland Reservoir at the east end near the source inlet site 2.	
Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/1998 to 07/1999.	
Environmental Conditions:		
QAPP Information:	USGS :http://water.usgs.gov/owq/FieldManual/Data is from USGS Water Quality Monitoring Study.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33482, p-Dichlorobenzene (DCB) **Region 9**

Loveland Reservoir

LOE ID:	1485
Pollutant:	p-Dichlorobenzene (DCB)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. None of the 12 samples were in exceedance. (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for p-Dichlorobenzene is 0.005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Loveland Reservoir near the dam, site 1.

Temporal Representation:	Samples were collected 1-2 times per day on one day every other month from 09/1998 to 09/1999.
Environmental Conditions:	
QAPP Information:	USGS :http://water.usgs.gov/owq/FieldManual/Data is from USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

DECISION ID	33382	Region 9
Loveland Reservoir		

Pollutant:	**Manganese**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Two of the 4 samples exceeded the Basin Plan criteria, and these exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33382, Manganese	Region 9
Loveland Reservoir	

LOE ID:	1538
Pollutant:	Manganese
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	2
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by Sweetwater Authority from 1997 to 2000. Two of the 4 samples were in exceedance. Two years had samples which exceeded 0.05 mg/L more than 10% of the time.

Data Reference:	Placeholder reference 2006 303(d)	036016
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The water quality objective for manganese in Loveland Reservoir is 0.05 milligrams/liter (mg/l) according to Basin Plan, Table 3-2 entitled, Water Quality Objectives. This concentration is not to be exceeded more than 10% of the time during any one year period.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Loveland Reservoir. Exact location was not reported.	
Temporal Representation:	Samples were collected in 12/1997, 06/1998, 07/1999, and 02/2000. One sample was collected each year.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID 33159 **Region 9**

Loveland Reservoir

Pollutant:	**Oxygen, Dissolved**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Forty-five of the 72 samples exceeded the Basin Plan criteria, and these exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33159, Oxygen, Dissolved **Region 9**

Loveland Reservoir

LOE ID:	1470
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved

Beneficial Use:	Municipal & Domestic Supply	036017
Number of Samples:	0	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by the USGS every other month from 09/1998 to 09/1999. For all sampling dates, dissolved oxygen concentration decreased as the depth increased. For all sampling days except 01/07/1999, at least the top 4 meters had DO concentrations that met standards. For samples in 09/1998, standards were not met at depths greater than 4m. For 11/1998, standards were not met in water deeper than 10m. Standards were not met in 01/1999. Standards were met until the water reached 26m deep in 03/1999. In 05/1999, standards were not met in water deeper than 7m. Waters deeper than 5m did not meet standards in 07/1999 sampling. In 09/1999, waters deeper than 8m did not meet standards (USGS, 2002).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with all beneficial uses except MAR, WARM, and COLD , the WQO for Dissolved Oxygen is 7.0 (minimum) mg/L. The annual mean concentration is not to be less than this more than 10% of the time.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Loveland Reservoir near the dam. Samples were collected at depths of 0.1m to 50m.	
Temporal Representation:	Samples were collected on one day, every other month from 09/10/1998 to 09/21/1999.	
Environmental Conditions:		
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data is from USGS Water Quality Monitoring Study.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33159, Oxygen, Dissolved **Region 9**

Loveland Reservoir

LOE ID:	1471
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	72
Number of Exceedances:	45
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the USGS every other month from 09/1998 to 07/1999. For all sampling days, the DO concentration decreased as the water depth increased. For all sampling days, the dissolved oxygen concentration met standards at more shallow depths, but not in deeper waters. For all days, the top at least 3 meters met standards. Overall, including all depths, 45 of 72 samples were in exceedance (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with all beneficial uses except MAR, WARM, and COLD, the WQO for Dissolved Oxygen is 7.0 (minimum) mg/L. The annual mean

	concentration is not to be less than this more than 10% of the time.	036018
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Loveland Reservoir at the east end near the source inlet. Samples were collected at depths of 0.1m to 18.0 m.	
Temporal Representation:	Samples were collected on one day, every other month from 09/10/1998 to 07/13/1999.	
Environmental Conditions:		
QAPP Information:	USGS: http://water.usgs.gov/owq/FieldManual/Data is from USGS Water Quality Monitoring Study.	
QAPP Information Reference(s):		

DECISION ID 33463 — Region 9

Loveland Reservoir

Pollutant:	**pH**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. However, USEPA has decided to place this water body-pollutant combination on the 303(d) list of Water Quality Limited Segments. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Thirty one of the 194 samples exceeded the Basin Plan criteria, and these do not exceed the allowable frequency listed in Table 3.2 of the Listing Policy. However, USEPA conducted their own assessment and found that there were greater than 10% exceedences of the Basin Plans numeric WQO for pH (35 out of 212) samples. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33463, pH — Region 9

Loveland Reservoir

LOE ID:	1545
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Municipal & Domestic Supply	036019
Number of Samples:	8	
Number of Exceedances:	4	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by Sweetwater Authority from 1997 to 2000. Four of the 8 samples were in exceedance.	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for pH is 6.5 (minimum) to 8.5 (maximum).	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Loveland Reservoir. Exact location was not reported.	
Temporal Representation:	Samples were collected from 1997 to 2000. 1-3 samples were collected per year. Samples were collected during the winter and summer months.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33463, pH **Region 9**

Loveland Reservoir

LOE ID:	1474
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	212
Number of Exceedances:	35
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Available data indicate greater than 10% exceedences of Basin Plan numeric WQO for pH (35 out of 212) samples (USEPA, 2007).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for pH is 6.5 (minimum) to 8.5 (maximum).
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Loveland Reservoir near the dam. Samples were collected at depths of 0.1m to 50m.
Temporal Representation:	Samples were collected on one day, every other month, except for November from 09/10/1998 to 09/21/1999.
Environmental Conditions:	
QAPP Information:	Data record: 1997-2000, USGS and Sweetwater Authority
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33463, pH **Region 9**

Loveland Reservoir

LOE ID:	1472
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	141
Number of Exceedances:	16
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 09/1999. For all sampling days, there was a slight decrease in pH as the water depth increased. Overall, including samples at all recorded depths, 16 of 141 samples were in exceedance of the maximum standard. None of the samples were below the minimum standard (USGS, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for pH is 6.5 (minimum) to 8.5 (maximum).
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Loveland Reservoir near the dam. Samples were collected at depths of 0.1m to 50m.
Temporal Representation:	Samples were collected on one day, every other month, except for November from 09/10/1998 to 09/21/1999.
Environmental Conditions:	
QAPP Information:	USGS :http://water.usgs.gov/owq/FieldManual/Data is from USGS Water Quality Monitoring Study.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33463, pH **Region 9**

Loveland Reservoir

LOE ID:	1473
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	53
Number of Exceedances:	15
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the USGS from 09/1998 to 07/1999. For all sampling days, there was a slight decrease in pH as the water depth increased. Overall, including samples at all recorded depths, 15 of 53 samples were in exceedance of the maximum standard. None of the samples were below the minimum standard (USGS, 2002).

Data Reference:	Placeholder reference 2006 303(d)	036021
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for pH is 6.5 (minimum) to 8.5 (maximum).	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Loveland Reservoir at the east end near the source inlet. Samples were collected at depths of 0.1m to 18.0m.	
Temporal Representation:	Samples were collected on one day every other month, except for November, from 09/1998 to 07/1999.	
Environmental Conditions:		
QAPP Information:	USGS :http://water.usgs.gov/owq/FieldManual/Data is from USGS Water Quality Monitoring Study.	
QAPP Information Reference(s):		

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Otay Reservoir, Lower
Water Body ID: CAL910310001999111715594 3
Water Body Type: Lake & Reservoir

DECISION ID 43242 **Region 9**
Otay Reservoir, Lower

Pollutant: Phosphorus
Final Listing Decision: List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Sources: Source Unknown
Expected TMDL Completion Date: 2023
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Three of the 28 samples exceed the Basin Plan water quality objective for total phosphorus as P.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Three of the 28 samples exceed the Basin Plan water quality objective for total phosphorus as P and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 43242, Phosphorus **Region 9**
Otay Reservoir, Lower

LOE ID: 6171

Pollutant: Phosphorus
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Warm Freshwater Habitat
Aquatic Life Use: Warm Freshwater Habitat

Number of Samples:	28
Number of Exceedances:	3
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Three of the 28 samples exceeded the water quality objective. Monitoring data collected by the City of San Diego's Water Quality Monitoring for Drinking Source Water Reservoirs. Sampling period covered January 2005 to December 2006.
Data Reference:	Water Department, Water Quality Monitoring Data for Drinking Source Water Reservoirs. January 2005 to December 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Water Quality Control Plan for the San Diego Basin Goal of 0.025 mg/L for total phosphorus in any standing body of water.
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	One surface water sample was collected per sampling event at Otay Reservoir, Lower at a standard location designated Â“Station AÂ”.
Temporal Representation:	Samples were collected once or twice a month from January 2005 to December 2006.
Environmental Conditions:	
QAPP Information:	Samples were collected and analyzed according to the Water Quality LaboratoryÂ's Quality Assurance Manual. Applicable field and laboratory Standard Operating Procedures were also provided by the San Diego Water Department.
QAPP Information Reference(s):	Water Quality Laboratory. Quality Assurance Manual

DECISION ID	32800	Region 9
Otay Reservoir, Lower		

Pollutant:	**Color**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for removal from the section 303(d) list under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. There were 223 out of 423 samples that exceeded the Basin Plan water quality objective for color.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the section 303(d) list.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.

3. There were 223 out of 423 samples that exceeded the Basin Plan water quality objective for color and this exceeds the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32800, Color **Region 9**

Otay Reservoir, Lower

LOE ID:	1560
Pollutant:	Color
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	423
Number of Exceedances:	223
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Color data was collected at sample site OTA-0 by the City of San Diego Water. Dept. from March 1996 to December 2000. For the MUN beneficial use, there were 223 out of 423 samples in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: The WQO for color in inland surface waters with a municipal beneficial use is 15 units.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at sample site OTA-0 in the Lower Otay Reservoir near the outlet tower. Samples were collected at the water's surface and at depths of 106 ft., 117ft., 84ft., and 95ft. above the streambed. Depth samples were also collected near the outlet tower.
Temporal Representation:	Samples were collected on a quarterly basis from January 1996 to December 2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33178** **Region 9**

Otay Reservoir, Lower

Pollutant:	**1,2-Dibromo-3-chloropropane (DBCP)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the

current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 18 samples exceed the Basin Plan water quality objective for 1,2-Dibromo-3-chloropropane (DBCP); all 18 samples were 'non-detects'.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 18 samples exceed the Basin Plan water quality objective for 1,2-Dibromo-3-chloropropane (DBCP); all 18 samples were 'non-detects' and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33178, 1,2-Dibromo-3-chloropropane (DBCP) Region 9

Otay Reservoir, Lower

LOE ID:	1582
Pollutant:	1,2-Dibromo-3-chloropropane (DBCP)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	18
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data was collected at site OTA-0 by the City of San Diego Water Dept. from March 1997 to May 2001. 0 of 18 samples were in exceedance. All 18 samples were non detect. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all inland surface waters with a municipal beneficial use, the WQO for DBCP is 0.0002 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at samples site OTA-0 in the Lower Otay Reservoir near the outlet tower.
Temporal Representation:	Samples were collected on a quarterly basis from March 1997 to May 2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.

QAPP Information Reference(s): 036026

DECISION ID	32676	Region 9
Otay Reservoir, Lower		

Pollutant:	**Aluminum**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. One of the 22 samples exceed the Basin Plan water quality objective for aluminum. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used is of 'unknown' quality which does not satisfy the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of the 22 samples exceed the Basin Plan water quality objective for aluminum and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32676, Aluminum	Region 9
Otay Reservoir, Lower	

LOE ID:	1553
Pollutant:	Aluminum
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	22
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected by the City of San Diego Water Dept. from January 1996 to February 2000. One of 22 samples was in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all inland surface waters the WQO for Aluminum for a BU of MUN

is 0.2 mg/L. 036027

Objective/Criterion Reference: Placeholder reference 2006 303(d)

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at a sample site labeled OTA-0 in Lower Otay Reservoir near the outlet tower.

Temporal Representation: Samples were collected approximately every 3 months from January 1996 to February 2000. Quarterly samples.

Environmental Conditions:
QAPP Information: Data used in 2002 assessment.
QAPP Information Reference(s):

DECISION ID 43097 Region 9

Otay Reservoir, Lower

Pollutant: **Antimony**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Original
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 22 samples exceed the Basin Plan water quality objective for antimony.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 22 samples exceed the Basin Plan water quality objective for antimony and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43097, Antimony Region 9

Otay Reservoir, Lower

LOE ID: 1555

Pollutant: Antimony
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	22
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected by the City of San Diego Water Dept. from January 1996 to June 2001. There were no exceedances out of 22 samples (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for Antimony is 0.006 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at sample site OTA-0 in the Lower Otay Reservoir near the outlet tower.
Temporal Representation:	Data was collected from January 1996 to June 2001. Samples appear to have been collected on a quarterly basis.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **32978** **Region 9**

Otay Reservoir, Lower

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 22 samples exceed the Basin Plan water quality objective for arsenic.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 22 samples exceed the Basin Plan water quality objective for arsenic and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision

This is a decision previously approved by the State Water Resources Control Board and the USEPA.

Recommendation: No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32978, Arsenic — Region 9

Otay Reservoir, Lower

LOE ID:	1556
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	22
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected by the City of San Diego Water Dept. from January 1996 to September 2000 at sample site OTA-0. None of the 22 samples were in exceedance (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for arsenic is 0.05 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at sample site OTA-0 in Lower Otay Reservoir near the outlet tower.
Temporal Representation:	Samples were collected from January 1996 to September 2000. They appear to be quarterly samples.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 32979 — Region 9

Otay Reservoir, Lower

Pollutant:	**Barium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 22 of the samples exceed the Basin Plan water quality objective for barium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 22 of the samples exceed the Basin Plan water quality objective for barium and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32979, Barium **Region 9**

Otay Reservoir, Lower

LOE ID:	1557
Pollutant:	Barium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	22
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data was collected by the City of San Diego Water Dept. at sample site OTA-0 from January 1996 to June 2001. None of the 22 samples were in exceedance (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Barium is 1.0 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at sample site OTA-0 in the Lower Otay Reservoir near the outlet tower.
Temporal Representation:	Quarterly samples were collected between January 1996 and June 2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33228** **Region 9**

Otay Reservoir, Lower

Pollutant:	**Beryllium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)

Revision Status	Original	036031
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 22 samples exceed the Basin Plan water quality objective for beryllium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 22 samples exceed the Basin Plan water quality objective for beryllium and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33228, Beryllium **Region 9**

Otay Reservoir, Lower

LOE ID:	1576
Pollutant:	Beryllium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	22
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Beryllium data was collected at site OTA-0 by the City of San Diego Water Dept. from March 1997 to June 2001. None of the 22 samples were in exceedance (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for beryllium is 0.004 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at sample site OTA-0 in the Lower Otay Reservoir near the outlet tower.
Temporal Representation:	Samples were collected on a quarterly basis from March 1997 to June 2001.

Environmental Conditions:		036032
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID 33030 Region 9

Otay Reservoir, Lower

Pollutant:	**Boron**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. The one sample did not exceed the Basin Plan water quality objective for boron.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. The one sample did not exceed the Basin Plan water quality objective for boron and this sample size is insufficient to determine with the power and confidence of the Listing Policy if standards are not met. A minimum of five samples is needed for application of table 3.2.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33030, Boron Region 9

Otay Reservoir, Lower

LOE ID:	1577
Pollutant:	Boron
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Boron data was collected at sample site OTA-0 by the City of San Diego Water Dept. on March 8, 2001. One sample was collected, and it was not in exceedance (SWRCB, 2003).

Data Reference:	Placeholder reference 2006 303(d)	036033
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for boron is 0.75 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The sample was collected at site OTA-0 in the Lower Otay Reservoir near the outlet tower.	
Temporal Representation:	One sample was collected on March 8, 2001.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID 33125 **Region 9**

Otay Reservoir, Lower

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 22 samples exceed the Basin Plan water quality objective for cadmium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 22 samples exceed the Basin Plan water quality objective for cadmium and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33125, Cadmium **Region 9**

Otay Reservoir, Lower

LOE ID:	1578
Pollutant:	Cadmium

LOE Subgroup:	Pollutant-Water	036034
Matrix:	Water	
Fraction:	Total	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	22	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Cadmium data was collected at site OTA-0 by the City of San Diego Water Dept. from march 1997 to June 2001. Of 22 samples, none were in exceedance (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for cadmium is 0.005 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at sample site OTA-0 in Lower Otay Reservoir near the outlet tower.	
Temporal Representation:	Samples were collected on a quarterly basis from March 1997 to June 2001.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID	**33152**	**Region 9**
Otay Reservoir, Lower		

Pollutant:	**Chlordane**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 16 samples exceed the Basin Plan water quality objective for chlordane; all 16 samples were non-detect.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 16 samples exceed the Basin Plan water quality objective for chlordane; all 16 samples were non-detect and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available

indicating that standards are not met. 036035

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33152, Chlordane **Region 9**

Otay Reservoir, Lower

LOE ID:	1590
Pollutant:	Chlordane
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	16
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Samples were collected at site OTA-0 by the City of San Diego Water Dept. from March 1997 to May 2001. None of the 16 samples were in exceedance. All 16 samples were non-detects (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for total chlordane is 0.0001mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at site OTA-0 in Lower Otay Reservoir near the outlet tower.
Temporal Representation:	Samples were collected between March 1997 and May 2001. There are 2-4 samples per year.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **44138** **Region 9**

Otay Reservoir, Lower

Pollutant:	**Chloride**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 25 samples exceed the Basin Plan water quality objective for chloride.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 25 samples exceed the Basin Plan water quality objective for chloride and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 44138, Chloride **Region 9**

Otay Reservoir, Lower

LOE ID:	1558
Pollutant:	Chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	25
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected by the City of San Diego Water Dept. from February 1996 to December 2000 at sample site OTA-0. There were no exceedances out of 25 samples (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: The WQO for chloride for inland surface waters is 500 mg/L
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at sample site OTA-0 in Lower Otay Reservoir near the outlet tower.
Temporal Representation:	Samples were collected from February 1996 to December 2000. Samples appear to have been taken quarterly.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **32799** **Region 9**

Otay Reservoir, Lower

Pollutant:	**Chromium**	036037
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)	
Revision Status	Original	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 20 samples exceed the Basin Plan water quality objective for chromium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 20 samples exceed the Basin Plan water quality objective for chromium and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32799, Chromium **Region 9**

Otay Reservoir, Lower

LOE ID:	1559
Pollutant:	Chromium (total)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	20
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Chromium data was collected at site OTA-0 by the City of San Diego Water Dept. from January 1996 to June 2000. There were no exceedances out of 20 samples (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: The Chromium WQO for inland surface waters with a municipal beneficial use is 0.05 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at site OTA-0 in Lower Otay Reservoir near the outlet tower.

Temporal Representation:	Samples were collected from January 1996 to June 2000. Two to 3 samples per year were collected.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 32696 Region 9

Otay Reservoir, Lower

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. One line of evidence is available in the administrative record to assess this pollutant. None of the 22 samples exceed the Basin Plan water quality objective for copper. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 22 samples exceed the Basin Plan water quality objective for copper and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32696, Copper Region 9

Otay Reservoir, Lower

LOE ID:	1561
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	22
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	036039
Data Used to Assess Water Quality:	Samples were collected at sample site OTA-0 by the City of San Diego Water Dept. from January 1996 to June 2001. There were no exceedances out of 22 samples (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: The WQO for copper for inland surface waters with a municipal beneficial use is 1.0 mg/L	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at sample site OTA-0 in Lower Otay Reservoir near the outlet tower.	
Temporal Representation:	Samples were collected from January 1996 to June 2001. Samples were collected on a quarterly basis.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID 43559 Region 9

Otay Reservoir, Lower

Pollutant:	**Endrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 16 samples exceed theBasin Plan water quality objective for endrin; all samples were non-detect.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 16 samples exceed theBasin Plan water quality objective for endrin; all samples were non-detect. And, this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43559, Endrin Region 9

Otay Reservoir, Lower 036040

LOE ID:	1583
Pollutant:	Endrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	16
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Endrin samples were collected at site OTA-0 by the City of San Diego Water Dept. from March 1997 to May 2001. None of the 16 samples were in exceedance. All samples were non-detect (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for endrin is 0.002 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at sample site OTA-0 in the Lower Otay Reservoir near the outlet tower.
Temporal Representation:	Samples were collected on a somewhat quarterly basis from March 1997 to May 2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **42797** **Region 9**

Otay Reservoir, Lower

Pollutant:	**Fluoride**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 19 samples exceed the Basin Plan water quality objective for fluoride.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.036041
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 19 samples exceed the Basin Plan water quality objective for fluoride and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 42797, Fluoride **Region 9**

Otay Reservoir, Lower

LOE ID:	1562
Pollutant:	Fluoride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	19
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Fluoride data was collected by the City of San Diego Water Dept. at sample site OTA-0 from March 1996 to September 2000. There were no exceedances out of 19 samples. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: The WQO for Fluoride for inland surface waters with a municipal WQO is 1.0 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at sample site OTA-0 in Lower Otay Reservoir near the outlet tower.
Temporal Representation:	Quarterly samples were collected from March 1996 to September 2000.
Environmental Conditions:	
QAPP Information:	Data used for 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **41520** **Region 9**

Otay Reservoir, Lower

Pollutant:	**Glyphosate**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. None of 18 samples exceed the Basin Plan water quality objective for glyphosate; all 18 samples were non-detect. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of 18 samples exceed the Basin Plan water quality objective for glyphosate; all 18 samples were non-detect and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 41520, Glyphosate **Region 9**

Otay Reservoir, Lower

LOE ID:	1592
Pollutant:	Glyphosate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	18
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Samples were collected at site OTA-0 by the City of San Diego Water Dept. from March 1997 to July 2001. None of 18 samples were in exceedance. All 18 samples were non-detect. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for glyphosate is 0.7 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at sample site OTA-0 in Lower Otay Reservoir near the outlet tower.
Temporal Representation:	Samples were collected on a quarterly basis from March 1997 to July 2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.

QAPP Information Reference(s): 036043

DECISION ID	33243	Region 9
Otay Reservoir, Lower		

Pollutant:	**Heptachlor**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 16 samples exceed the Basin Plan water quality objective for heptachlor; all 16 samples were non-detect.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 16 samples exceed the Basin Plan water quality objective for heptachlor; all 16 samples were non-detect and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33243, Heptachlor	Region 9
Otay Reservoir, Lower	

LOE ID:	1585
Pollutant:	Heptachlor
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	16
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data was collected at sample site OTA-0 by the City of San Diego Water Dept. from March 1997 to May 2001. None of the 16 samples were in exceedance. All 16 samples were non-detect. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for heptachlor is 0.00001mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at sample site OTA-0 in the Lower Otay Reservoir near the outlet tower.
Temporal Representation:	Samples were collected on a somewhat quarterly basis from March 1997 to May 2001. There are 2-4 samples per year.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 33132 Region 9

Otay Reservoir, Lower

Pollutant:	**Heptachlor epoxide**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. None of the 16 samples exceed the Basin Plan water quality objective for heptachlor epoxide; all 16 samples were non-detect. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 16 samples exceed the Basin Plan water quality objective for heptachlor epoxide; all 16 samples were non-detect and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33132, Heptachlor epoxide Region 9

Otay Reservoir, Lower

LOE ID:	1584	036045

Pollutant:	Heptachlor epoxide
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	16
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data was collected at site OTA-0 by the City of San Diego Water Dept. from March 1997 to May 2001. None of the 16 samples were in exceedance. All 16 samples were non-detect. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for heptachlor epoxide is 0.00001mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at sample site OTA-0 in Lower Otay Reservoir near the outlet tower.
Temporal Representation:	Samples were collected on a somewhat quarterly basis from March 1997 to May 2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID	33185	Region 9
Otay Reservoir, Lower		

Pollutant:	**Hexachlorobenzene/ HCB**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 16 samples exceed the Basin Plan water quality objective for hexachlorobenzene (HCB); all 16 samples were non-detect.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.

2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 16 samples exceed the Basin Plan water quality objective for hexachlorobenzene (HCB); all 16 samples were non-detect and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33185, Hexachlorobenzene/ HCB **Region 9**

Otay Reservoir, Lower

LOE ID:	1586
Pollutant:	Hexachlorobenzene/ HCB
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	16
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data was collected at sample site OTA-0 by the City of San Diego Water Dept. from March 1997 to May 2001. None of the 16 samples were in exceedance. All 16 samples were non-detect. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for hexachlorobenzene is 0.001mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at site OTA-0 in Lower Otay Reservoir near the outlet tower.
Temporal Representation:	Samples were collected on a somewhat quarterly basis from March 1997 to May 2001. There were 2-4 samples per year.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33186** **Region 9**

Otay Reservoir, Lower

Pollutant:	**Hexachlorocyclopentadiene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. None of the 16 samples exceed the Basin Plan water quality objective for hexachlorocyclopentadiene; all samples were non-detect. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 16 samples exceed the Basin Plan water quality objective for hexachlorocyclopentadiene; all samples were non-detect and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33186, Hexachlorocyclopentadiene **Region 9**

Otay Reservoir, Lower

LOE ID:	1587
Pollutant:	Hexachlorocyclopentadiene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	16
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data was collected at site OTA-0 by the City of San Diego Water Dept. from March 1997 to May 2001. None of the 16 samples were in exceedance. All 16 samples were non-detect. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Hexachlorocyclopentadiene is 0.05 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from site OTA-0 in Lower Otay Reservoir near the outlet tower.
Temporal Representation:	Samples were collected somewhat quarterly from March 1997 to May 2001. there are 2-4 samples per year.
Environmental Conditions:	

QAPP Information: Data used in 2002 assessment. 036048
QAPP Information Reference(s):

DECISION ID	42756	Region 9
Otay Reservoir, Lower		

Pollutant:	**Lindane/gamma Hexachlorocyclohexane (gamma-HCH)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. None of the 8 samples exceed the Basin Plan water quality objective for lindane. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 8 samples exceed the Basin Plan water quality objective for lindane and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 42756, Lindane/gamma Hexachlorocyclohexane (gamma-HCH)	Region 9
Otay Reservoir, Lower	

LOE ID:	1588
Pollutant:	Lindane/gamma Hexachlorocyclohexane (gamma-HCH)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data was collected at site OTA-0 by the City of San Diego Water Dept. from February 1999

	to May 2001. None of the 8 samples were in exceedance. All 8 samples were non-detect. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for lindane is 0.0002 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at sample site OTA-0 in the Lower Otay Reservoir near the outlet tower.
Temporal Representation:	Samples were collected between February 1999 and May 2001. There were 2-4 samples per year.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID	33052	Region 9
Otay Reservoir, Lower		

Pollutant:	**Mercury**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. None of the 18 samples exceed the Basin Plan water quality objective for mercury. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 18 samples exceed the Basin Plan water quality objective for mercury and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33052, Mercury	Region 9
Otay Reservoir, Lower	

LOE ID:	1579
Pollutant:	Mercury
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	18
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Mercury data was collected at site OTA-0 by the City of San Diego Water Dept. from March 1997 to June 2001. Of 18 samples, none were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a beneficial use, the WQO for mercury is 0.002 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at sample site OTA-0 in Lower Otay Reservoir near the outlet tower.
Temporal Representation:	Samples were collected on a quarterly basis from march 1997 to June 2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **44505** **Region 9**

Otay Reservoir, Lower

Pollutant:	**Methoxychlor**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 16 samples exceed the Basin Plan water quality objective for methoxychlor; all samples were non-detect.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.

3. None of the 16 samples exceed the Basin Plan water quality objective for methoxychlor, all samples were non-detect and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 44505, Methoxychlor **Region 9**

Otay Reservoir, Lower

LOE ID:	1589
Pollutant:	Methoxychlor
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	16
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data was collected at site OTA-0 by the City of San Diego Water Dept. from March 1997 to May 2001. None of the 16 samples were in exceedance. All 16 samples were non-detect. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for methoxychlor is 0.04 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at site OTA-0 in the Lower Otay Reservoir near the outlet tower.
Temporal Representation:	Samples were collected from March 1997 to May 2001. Two to 4 samples per year were collected.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **32805** **Region 9**

Otay Reservoir, Lower

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the

current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 20 samples exceed the Basin Plan water quality objective for nickel.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 20 samples exceed the Basin Plan water quality objective for nickel and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32805, Nickel **Region 9**

Otay Reservoir, Lower

LOE ID:	1566
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	20
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Nickel data was collected at site OTA-0 by the City of San Diego Water Dept. from September 1996 to June 2001. None of the 20 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use the WQO for nickel is 0.1 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data was collected at sample site OTA-0 in Lower Otay Reservoir near the outlet tower.
Temporal Representation:	Samples were collected from September 1996 to June 2001. There is approximately one sample per year.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID	32383	Region 9
Otay Reservoir, Lower		

Pollutant:	**Picloram**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 3 samples exceed the Basin Plan water quality objective for picloram.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 3 samples exceed the Basin Plan water quality objective for picloram andthis sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32383, Picloram	Region 9
Otay Reservoir, Lower	

LOE ID:	1569
Pollutant:	Picloram
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Picloram data was collected at sire OTA-0 by the City of San Diego Water Dept. from December 1998 to December 1999. None of the 3 samples were in exceedance of the standards. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)

SWAMP Data:	Non-SWAMP	036054
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for picloram is 0.5 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at sample site OTA-0 in Lower Otay Reservoir near the outlet tower.	
Temporal Representation:	One sample each was collected in December 1998, September 1999, and December 1999.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID 32964 Region 9

Otay Reservoir, Lower

Pollutant:	**Selenium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 21 samples exceed the Basin Plan water quality objective for selenium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 21 samples exceed the Basin Plan water quality objective for selenium and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32964, Selenium Region 9

Otay Reservoir, Lower

LOE ID:	1570
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water

Matrix:	Water	036055
Fraction:	Total	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	21	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Selenium data was collected at site OTA-0 by the City of San Diego Water Dept. from June 1996 to June 2001. None of the 21 samples were in exceedance. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for selenium is 0.05 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at site OTA-0 in the Lower Otay Reservoir near the outlet tower.	
Temporal Representation:	Samples were collected between June 1996 and June 2001. Samples were collected on a quarterly basis.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID 33177 Region 9

Otay Reservoir, Lower

Pollutant:	**Silver**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 18 samples exceeded the Basin Plan criteria. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33177, Silver Region 9

Otay Reservoir, Lower 036056

LOE ID:	1580
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	18
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Silver data was collected at site OTA-0 by the City of San Diego Water Dept. from March 1997 to June 2001. Of 18 samples, none were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all inland surface waters with a municipal beneficial use, the WQO for silver is 0.1 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at sample site OTA-0 in Lower Otay Reservoir near the outlet tower.
Temporal Representation:	Samples were collected on a quarterly basis from March 1997 to June 2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **32579** **Region 9**

Otay Reservoir, Lower

Pollutant:	**Sulfates**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 24 samples exceed the Basin Plan water quality objective for sulfate.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 24 samples exceed the Basin Plan water quality objective for sulfate and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable

beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32579, Sulfates **Region 9**

Otay Reservoir, Lower

LOE ID:	1571
Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	24
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Sulfate data was collected at site OTA-0 by the City of San Diego Water Dept. from February 1996 to December 2000. None of the 24 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters for all beneficial uses, the WQO for sulfate is 250 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at site OTA-0 in the Lower Otay Reservoir near the outlet tower.
Temporal Representation:	Samples were collected on a quarterly basis from February 1996 to December 2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **42750** **Region 9**

Otay Reservoir, Lower

Pollutant:	**Thallium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 18 samples exceed the Basin Plan water quality objective for thallium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 18 samples exceed the Basin Plan water quality objective for thallium and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 42750, Thallium **Region 9**

Otay Reservoir, Lower

LOE ID:	1581
Pollutant:	Thallium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	18
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Thallium data was collected at site OTA-0 by the City of San Diego Water Dept. from March 1997 to June 2001. Of 18 samples, none were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for thallium is 0.002 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at OTA-0 in Lower Otay Reservoir near the outlet tower.
Temporal Representation:	Samples were collected on a quarterly basis from March 1997 to June 2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **32630** **Region 9**

Otay Reservoir, Lower

Pollutant:	**Toluene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**

Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)	036059
Revision Status	Original	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 2 samples exceed the Basin Plan water quality objective for toluene.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 2 samples exceed the Basin Plan water quality objective for toluene and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32630, Toluene **Region 9**

Otay Reservoir, Lower

LOE ID:	1573
Pollutant:	Toluene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Toluene data was collected at sample site OTA-0 by the City of San Diego Water Dept. in February 1999 and February 2000. None of the 2 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use the MCL for Toluene is 0.15 mg/L (From Table 3-6 in Basin Plan). A less stringent WQO for Toluene for inland surface waters with a municipal beneficial use is 1.0 mg/L from Table 3-10 of the Basin Plan.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at site OTA-0 in the Lower Otay Reservoir near the outlet tower.
Temporal Representation:	One sample was collected in February 1999 and one sample was collected in February 2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 32618 Region 9

Otay Reservoir, Lower

Pollutant:	**Total Dissolved Solids**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One line of evidence are available in the administrative record to assess this pollutant. None of the 10 samples exceed the Basin Plan water quality objective for total dissolved solids. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 10 samples exceed the Basin Plan water quality objective for total dissolved solids and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32618, Total Dissolved Solids Region 9

Otay Reservoir, Lower

LOE ID:	1572
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	10
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	TDS data was collected at site OTA-0 by the City of San Diego Water Dept. from September

	1998 to December 2000. None of the 10 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for total dissolved solids is 500. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at site OTA-0 in the Lower Otay Reservoir near the outlet tower.
Temporal Representation:	Samples were collected from September 1998 to December 2000 for what appears to be quarterly sampling.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID	**33153**	**Region 9**
Otay Reservoir, Lower		

Pollutant:	**Toxaphene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. None of the 16 samples exceeded the Basin Plan water quality objective for toxaphene; all samples were non-detect. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 16 samples exceeded the Basin Plan water quality objective for toxaphene; all samples were non-detect and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33153, Toxaphene	**Region 9**
Otay Reservoir, Lower	

LOE ID:	1591

Pollutant:	Toxaphene	036062
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	Total	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	16	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data was collected at site OTA-0 by the City of San Diego Water Dept. from March 1997 to May 2001. None of the 16 samples were in exceedance. All 16 samples were non-detect. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for toxaphene is 0.003 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at site OTA-0 in the Lower Otay Reservoir near the outlet tower.	
Temporal Representation:	Samples were collected from March 1997 to May 2001. There are 2-4 samples per year.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID	**33053**	**Region 9**
Otay Reservoir, Lower		

Pollutant:	**Turbidity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Ninety-three of the 979 samples exceed the Basin Plan water quality objective for turbidity. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Ninety-three of the 979 samples exceed the Basin Plan water quality objective for turbidity and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision	This is a decision previously approved by the State Water Resources Control Board and the USEPA.

Recommendation:	No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33053, Turbidity **Region 9**

Otay Reservoir, Lower

LOE ID:	1574
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	979
Number of Exceedances:	93
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Turbidity data was collected at site OTA-0 by the City of San Diego Water Dept. from January 1996 to December 2000. Ninety-three of 979 samples was in exceedance of the municipal beneficial use WQO of 5 units. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for turbidity is 5 units. For inland surface waters with all other beneficial uses, the WQO for turbidity is 20 ntu.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data was collected at site OTA-0 in the Lower Otay Reservoir near the outlet tower. Samples were collected at the water's surface and at depths of 106 ft., 117ft., 84ft., and 95ft. above the stream bed. Depth samples were also collected near the outlet tower.
Temporal Representation:	Samples were collected on a quarterly basis between January 1996 and December 2000. Samples at some depths were collected multiple times each month.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33054** **Region 9**

Otay Reservoir, Lower

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. None of the 19 samples exceed the Basin Plan water quality objective for zinc.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 19 samples exceed the Basin Plan water quality objective for zinc and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33054, Zinc **Region 9**

Otay Reservoir, Lower

LOE ID:	1575
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	19
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Zinc data was collected at OTA-0 by the City of San Diego Water Dept. from January 1996 to June 2001. None of the 19 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for zinc is 5.0 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at site OTA-0 at the Lower Otay Reservoir near the outlet tower.
Temporal Representation:	Samples were collected on a quarterly basis from march 1997 to June 2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **42751** **Region 9**

Otay Reservoir, Lower

Pollutant:	**meta-para xylenes**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original

Impairment from Pollutant or Pollution:	Pollutant	036065
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. None of the two samples exceed the Basin Plan water quality objective for xylenes. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the two samples exceed the Basin Plan water quality objective for xylenes and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.	
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.	

Line of Evidence (LOE) for Decision ID 42751, meta-para xylenes **Region 9**

Otay Reservoir, Lower

LOE ID:	1565
Pollutant:	meta-para xylenes
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	M-p xylene data was collected at site OTA-0 by the City of San Diego Water Dept. in February 1999 and February 2000. None of the 2 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: The MCL for Xylenes for all inland surface waters with a municipal beneficial use is 1.750 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	MCL is for either a single isomer or the sum of the isomers. Incorporations by reference are prospective including future changes to the incorporated provisions as the changes take effect.
Guideline Reference:	Placeholder reference 2006 303(d)

Spatial Representation:	Samples were collected at site OTA-0 in Lower Otay Reservoir near the outlet tower.
Temporal Representation:	Samples were collected in February 1999 and February 2000. One sample was collected each year.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 43145 Region 9

Otay Reservoir, Lower

Pollutant:	**o-Xylene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the two samples exceed the Basin Plan water quality objective for xylenes.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the two samples exceed the Basin Plan water quality objective for xylenes and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43145, o-Xylene Region 9

Otay Reservoir, Lower

LOE ID:	1567
Pollutant:	o-Xylene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2

Number of Exceedances:	0	036067
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Xylene data was collected at site OTA-0 by the City of San Diego Water Dept. in February 1999 and February 2000. There were no exceedances out of 2 samples. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For all inland surface waters with a municipal beneficial use, the WQO is 1.750 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:	MCL is for either a single isomer or the sum of the isomers. Incorporations by reference are prospective including future changes to the incorporated provisions as the changes take effect.	
Guideline Reference:	Placeholder reference 2006 303(d)	
Spatial Representation:	Samples were collected at site OTA-0 in the Lower Otay Reservoir near the outlet tower.	
Temporal Representation:	One sample was collected in February 1999 and one sample was collected in February 2000.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID	**32559**	**Region 9**
Otay Reservoir, Lower		

Pollutant:	**Ammonia**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for removal from the section 303(d) list under section 4.1 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Fifty-six of 104 samples exceed the Basin Plan water quality objective for ammonia. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the section 303(d) list. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Fifty-six of 104 samples exceed the Basin Plan water quality objective for ammonia and this exceeds the allowable frequency listed in Table 4.1 of the Listing Policy. 4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32559, Ammonia **Region 9**

Otay Reservoir, Lower

LOE ID:	1554
Pollutant:	Nitrogen, ammonia (Total Ammonia)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	104
Number of Exceedances:	56
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected by the City of San Diego Water Dept. from December 1996 to July 2001. Fifty-six of 104 samples are in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: 0.025 mg/L
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from one location in the reservoir labeled OTA-0 in Lower Otay Reservoir near the outlet tower.
Temporal Representation:	Samples were collected from December 1996 to July 2001. Samples were collected monthly.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **32878** **Region 9**

Otay Reservoir, Lower

Pollutant:	**Iron**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Natural Sources | Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for removal from the section 303(d) list under section 3.1 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess pollutant. Fourty-four of 103 samples exceed the Basin Plan water quality objective for iron.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of adding this water segment-pollutant combination to the section 303(d) list.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Fourty-four of 103 samples exceed the Basin Plan water quality objective for iron and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32878, Iron **Region 9**

Otay Reservoir, Lower

LOE ID:	1563
Pollutant:	Iron
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	103
Number of Exceedances:	44
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Iron data was collected by the City of San Diego Water Department at site OTA-0 from January 1996 to July 2001. Of 103 samples, 44 were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: The WQO for iron for inland surface waters with a municipal beneficial use is 0.3 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at site OTA-0 in the Lower Otay reservoir near the outlet tower. Samples were collected at the water's surface and at depths of 106 ft., 117ft., 84ft., and 95ft. above the streambed. Depth samples were also collected near the outlet tower.
Temporal Representation:	Samples were collected from January 1996 to July 2001. Samples were collected monthly.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **32804** **Region 9**

Otay Reservoir, Lower

Pollutant:	**Manganese**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final	List on 303(d) list (TMDL required list)(2012)

Listing Decision:		036070
Revision Status	Original	
Sources:	Source Unknown	
Expected TMDL Completion Date:	2019	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for removal from the section 303(d) list under section 3.1 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Nine of 26 samples exceed the Basin Plan water quality objective for manganese.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of adding this water segment-pollutant combination to the section 303(d) list.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Nine of 26 samples exceed the Basin Plan water quality objective for manganese and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32804, Manganese **Region 9**

Otay Reservoir, Lower

LOE ID:	1564
Pollutant:	Manganese
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	26
Number of Exceedances:	9
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Manganese data was collected at site OTA-0 by the City of San Diego Water Dept. from January 1996 to June 2001. Nine of 26 samples were in exceedance and the criteria was exceeded more than 10% of the time on 4 of the years.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The water quality objective for manganese in Lower Otay Reservoir is 0.05 milligrams/liter (mg/l) according to Basin Plan, Table 3-2 entitled, Water Quality Objectives. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)

Evaluation Guideline:	036071
Guideline Reference:	
Spatial Representation:	Samples were collected at sample site OTA-0 in the Lower Otay Reservoir near the outlet tower. Samples were collected at the water's surface and at depths of 106 ft., 117ft., 84ft., and 95ft. above the streambed. Depth samples were also collected near the outlet tower.
Temporal Representation:	Samples were collected on a quarterly basis from January 1996 to June 2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 43345 **Region 9**

Otay Reservoir, Lower

Pollutant:	**Nitrogen**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Twenty seven of the 27 samples exceed the Basin Plan water quality objective for total nitrogen as N.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Twenty seven of the 27 samples exceed the Basin Plan water quality objective for total nitrogen as N and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43345, Nitrogen **Region 9**

Otay Reservoir, Lower

LOE ID:	6170
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	27	036072
Number of Exceedances:	27	
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)	
Data Used to Assess Water Quality:	All 27 samples exceeded the water quality objective. Water quality data collected by the City of San Diego's for their Water Quality Monitoring for Drinking Source Water Reservoirs. Samples were collected from January 2005 to December 2006.	
Data Reference:	Water Department, Water Quality Monitoring Data for Drinking Source Water Reservoirs. January 2005 to December 2006	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. A desired goal in order to prevent plant nuisance in any standing body of water is 0.025 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used. (RWQCB, 2007)	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	One surface water sample was collected per sampling event at Otay Reservoir, Lower at a standard location designated Â“Station AÂ”.	
Temporal Representation:	Samples were collected once or twice a month from January 2005 to December 2006.	
Environmental Conditions:		
QAPP Information:	Samples were collected and analyzed according to the Water Quality LaboratoryÂ's Quality Assurance Manual. Applicable field and laboratory Standard Operating Procedures were also provided by the San Diego Water Department.	
QAPP Information Reference(s):	Water Quality Laboratory. Quality Assurance Manual	

DECISION ID	**32382**	**Region 9**
Otay Reservoir, Lower		

Pollutant:	**pH**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for removal from the section 303(d) list under section 3.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Ten of 24 samples exceeded 8.5 pH units. None of 24 samples were below 6.5 pH units. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the section 303(d) list.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Ten of 24 samples exceeded 8.5 pH units. None of 24 samples were below 6.5 pH units and this exceeds the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation: Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. The Regional Board will update this decision when new data and information become available and are assessed.

Line of Evidence (LOE) for Decision ID 32382, pH **Region 9**

Otay Reservoir, Lower

LOE ID:	1568
Pollutant:	pH (high)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	24
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	pH data was collected at site OTA-0 by the City of San Diego Water Dept. from March 1996 to December 2000. Ten of 24 samples exceeded 8.5 pH units. None of 24 samples were below 6.5 pH units.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with all beneficial uses, the WQO for pH is 6.5 (minimum) to 8.5 (maximum).
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at site OTA-0 in the Lower Otay Reservoir near the outlet tower. Samples were collected at the water's surface and at depths of 106 ft., 117ft., 84ft., and 95ft. above the streambed. Depth samples were also collected near the outlet tower.
Temporal Representation:	Samples were collected on a quarterly basis from March 1996 to December 2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Barrett Lake
Water Body ID: CAL9113000019980803101540
Water Body Type: Lake & Reservoir

DECISION ID 42328 **Region 9**
Barrett Lake

Pollutant: Phosphorus
Final Listing Decision: List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Sources: Source Unknown
Expected TMDL Completion Date: 2023
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. Four of the 9 samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Four of the 9 samples exceeded the Basin Plan objective and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 42328, Phosphorus **Region 9**
Barrett Lake

LOE ID: 6154

Pollutant: Phosphorus
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Warm Freshwater Habitat
Aquatic Life Use: Warm Freshwater Habitat

Number of Samples:	9	036075
Number of Exceedances:	4	

Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Four of the nine samples collected exceeded water quality standards. Samples were collected by the City of San Diego's Water Department. Samples were collected from January 2005 to December 2006.
Data Reference:	Water Department, Water Quality Monitoring Data for Drinking Source Water Reservoirs. January 2005 to December 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. (RWQCB, 2007)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Water Quality Control Plan for the San Diego Basin Goal of 0.025 mg/L for total phosphorus in any standing body of water. (RWQCB, 2007)
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	One surface water sample was collected per sampling event at Barrett Lake at a standard location designated Â“Station AÂ”.
Temporal Representation:	Samples were collected approximately once a month from January 2005 to December 2006; however some months were not sampled.
Environmental Conditions:	The Horse Fire burned north of Barrett Lake in the Cleveland National Forest from July 23 - 31, 2006. Both exceedances occurred before the onset of the fire.
QAPP Information:	Samples were collected and analyzed according to the Water Quality LaboratoryÂ's Quality Assurance Manual. Applicable field and laboratory Standard Operating Procedures were also provided by the San Diego Water Department.
QAPP Information Reference(s):	

DECISION ID 33636 — Region 9

Barrett Lake

Pollutant:	**Aluminum**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	One line of evidence is available in the administrative record to assess this pollutant. One of the 14 samples exceed the Basin Plan criteria and this does not exceed the allowable frequency of the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33636, Aluminum — Region 9

Barrett Lake

LOE ID:	1593

Pollutant:	Aluminum
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	14
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. One of 14 samples was in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Aluminum is 0.2 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Barrett Reservoir at station BAA-0.
Temporal Representation:	Samples were collected on a quarterly basis from 01/1996 to 12/1998 and once each in 06/1999 and 03/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 33868 Region 9

Barrett Lake

Pollutant:	**Antimony**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: One line of evidence is available in the administrative record to assess this pollutant. None of the 3 samples exceed the Basin Plan criteria and this does not exceed the allowable frequency of the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33868, Antimony Region 9

Barrett Lake 036077

LOE ID:	1594
Pollutant:	Antimony
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept in 1996 and 1997. None of the 3 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for Antimony is 0.006 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Barrett Reservoir at station BAA-0.
Temporal Representation:	One sample each was collected in 01/1996, 06/1996, and 03/1997.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33869** **Region 9**

Barrett Lake

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 19 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision	This is a decision previously approved by the State Water Resources Control Board and the USEPA.

Recommendation: No new data were assessed by the Regional Board for the current cycle. The decision has not changed. 33073

Line of Evidence (LOE) for Decision ID 33869, Arsenic — Region 9

Barrett Lake

LOE ID:	1595
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	19
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. None of the 19 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for Arsenic is 0.05 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Barrett Reservoir station BAA-0.
Temporal Representation:	Samples were collected on a quarterly basis from 01/1996 to 09/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 45728 — Region 9

Barrett Lake

Pollutant:	**Barium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.

3. None of the 19 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 45728, Barium **Region 9**

Barrett Lake

LOE ID:	1596
Pollutant:	Barium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	19
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. None of the 19 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for Barium is 1.0 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Barrett Reservoir station BAA-0.
Temporal Representation:	Samples were collected on a quarterly basis from 01/1996 to 09/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33870** **Region 9**

Barrett Lake

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

One line of evidence is available in the administrative record to assess this pollutant. A single sample

was collected and it did not exceed the Basin Plan criteria, but the number of samples is insufficient to determine with the confidence and power required by the Listing Policy.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33870, Cadmium **Region 9**

Barrett Lake

LOE ID:	1597
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected in 1996 by the City of San Diego Water Dept. The single collected sample was in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for cadmium is 0.005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Barrett Reservoir station BAA-0.
Temporal Representation:	One sample was collected on 06/05/1996.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33303** **Region 9**

Barrett Lake

Pollutant:	**Chloride**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One line of evidence are available in the administrative record to assess this pollutant. None of 20 samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 20 samples exceeded the Basin Plan criteria, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33303, Chloride **Region 9**

Barrett Lake

LOE ID:	1598
Pollutant:	Chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	20
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept from 1996 to 2000. None of the 20 samples was in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for Chloride is 250 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Barrett Reservoir station BAA-0.
Temporal Representation:	Samples were collected on a quarterly basis from 03/1996 to 12/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID	33304	036082 Region 9
Barrett Lake		

Pollutant:	**Chromium (total)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	One line of evidence is available in the administrative record to assess this pollutant. None of the 11 samples exceed the Basin Plan criteria and this does not exceed the allowable frequency of the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33304, Chromium (total)	Region 9
Barrett Lake	

LOE ID:	1599
Pollutant:	Chromium (total)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	11
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. None of the 11 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for Chromium is 0.05 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Barrett Reservoir station BAA-0.
Temporal Representation:	Samples were collected 1-3 times per year from 01/1996 to 03/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID	33916	Region 9

Barrett Lake 036083

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: One line of evidence is available in the administrative record to assess this pollutant. None of the 6 samples exceed the Basin Plan criteria and this does not exceed the allowable frequency of the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33916, Copper — Region 9

Barrett Lake

LOE ID:	1601
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. None of the 6 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for copper is 1.0 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Barrett Reservoir station BAA-0.
Temporal Representation:	Samples were collected 1-2 times per year from 01/1996 to 03/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID	33951	036084 Region 9
Barrett Lake		

Pollutant:	**Ethylbenzene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: One line of evidence is available in the administrative record to assess this pollutant. A single sample was collected and it did not exceed the Basin Plan criteria, but the number of samples is insufficient to determine with the confidence and power required by the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33951, Ethylbenzene	**Region 9**
Barrett Lake	

LOE ID:	1602
Pollutant:	Ethylbenzene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 1996. One sample was collected. It was not in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for ethylbenzene is 0.7 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Barrett Reservoir station BAA-0.
Temporal Representation:	One sample was collected on 09/09/1996.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID	33670	Region 9
Barrett Lake		

Pollutant:	**Fluoride**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 19 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33670, Fluoride	**Region 9**
Barrett Lake	

LOE ID:	1603
Pollutant:	Fluoride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	19
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. None of the 19 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for Fluoride is 1.0 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	

Guideline Reference:	036086
Spatial Representation:	Samples were collected at Barrett Reservoir station BAA-0.
Temporal Representation:	Samples were collected on a quarterly basis from 03/1996 to 09/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment. QA=?
QAPP Information Reference(s):	

DECISION ID 43068 Region 9

Barrett Lake

Pollutant:	**Iron**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: One line of evidence is available in the administrative record to assess this pollutant. None of the 3 samples exceed the Basin Plan criteria and this does not exceed the allowable frequency of the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43068, Iron Region 9

Barrett Lake

LOE ID:	1604
Pollutant:	Iron
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 1997-2000. None of the 3 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for iron is 0.3 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Barrett Reservoir station BAA-0.
Temporal Representation: Samples were collected once each in 12/1997, 03/1998, and 12/2000.
Environmental Conditions:
QAPP Information: Data used in 2002 assessment. QA=?
QAPP Information Reference(s):

DECISION ID 33897 Region 9
Barrett Lake

Pollutant: **Mercury**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Original
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

One line of evidence is available in the administrative record to assess this pollutant. A single sample was collected and it did not exceed the Basin Plan criteria, but the number of samples is insufficient to determine with the confidence and power required by the Listing Policy.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33897, Mercury Region 9
Barrett Lake

LOE ID: 1606

Pollutant: Mercury
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 1
Number of Exceedances: 0

Data and Information Type: PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality: Data were collected by the City of San Diego Water Dept. in 03/1999. One sample was collected. It was not in exceedance.
Data Reference: Placeholder reference 2006 303(d)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: From the Basin Plan: For all waters with a municipal beneficial use, the WQO for mercury is

	0.002 mg/L.	036088
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Barrett Reservoir station BAA-0.	
Temporal Representation:	One sample was collected on 03/04/1999.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID 33847 — Region 9

Barrett Lake

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: One line of evidence is available in the administrative record to assess this pollutant. None of the 2 samples exceed the Basin Plan criteria and this does not exceed the allowable frequency of the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33847, Nickel — Region 9

Barrett Lake

LOE ID:	1607
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 1996 and 1999. None of the 2 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for Nickel is 0.1 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Barrett Reservoir station BAA-0.
Temporal Representation:	Samples were collected once each in 06/1996 and 06/1999.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 33963 Region 9

Barrett Lake

Pollutant:	**Picloram**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: One line of evidence is available in the administrative record to assess this pollutant. None of the 4 samples exceed the Basin Plan criteria and this does not exceed the allowable frequency of the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33963, Picloram Region 9

Barrett Lake

LOE ID:	1609
Pollutant:	Picloram
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1998 to 2000. None of 4 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Picloram is 0.5 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Barrett Reservoir station BAA-0.
Temporal Representation:	Samples were collected once each in 12/1998, 09/1999, 12/1999, and 06/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 33964 Region 9
Barrett Lake

Pollutant:	**Selenium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: One line of evidence is available in the administrative record to assess this pollutant. None of the 4 samples exceed the Basin Plan criteria and this does not exceed the allowable frequency of the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33964, Selenium Region 9
Barrett Lake

LOE ID:	1610
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 1997. None of 4

samples were in exceedance. 036091

Data Reference: Placeholder reference 2006 303(d)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: From the Basin Plan: For all waters with a municipal beneficial use, the WQO for selenium is 0.05 mg/L.

Objective/Criterion Reference: Placeholder reference 2006 303(d)

Evaluation Guideline:

Guideline Reference:

Spatial Representation: Samples were collected at Barrett Reservoir station BAA-0.

Temporal Representation: Samples were collected once each in 09/1996, 03/1997, 09/1997, and 12/1997.

Environmental Conditions:

QAPP Information: Data used in 2002 assessment.

QAPP Information Reference(s):

DECISION ID 43247 Region 9

Barrett Lake

Pollutant: **Sodium**

Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**

Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)

Revision Status Original

Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Five of the samples exceed the water quality objective. The exceedances may have been the result of the 2006 Horse Fire and further data should verify this.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Five of 8 samples exceeded the AGR standard, however this may have been the result of 2006 Horse Fire.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43247, Sodium Region 9

Barrett Lake

LOE ID: 6151

Pollutant:	Sodium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Agricultural Supply
Number of Samples:	8
Number of Exceedances:	5
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Five of the eigh samples collected exceeded water quality standards. Samples were collected by the City of San Diego's Water Department. Samples were collected from January 2005 to December 2006.
Data Reference:	Water Department, Water Quality Monitoring Data for Drinking Source Water Reservoirs, January 2005 to December 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, the percent sodium objective was developed for the protection of agricultural uses from the potential hazard due to sodium in irrigation waters. The value of 60 percent sodium is based upon Water Quality Criteria, by McKee and Wolf, 1963 (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	One surface water sample was collected per sampling event at Barrett Lake at Â“Station A".
Temporal Representation:	Samples were collected approximately once a month from January 2005 to December 2006; however some months were not sampled.
Environmental Conditions:	The Horse Fire burned north of Barrett Lake in the Cleveland National Forest from July 23 - 31, 2006.
QAPP Information:	Samples were collected and analyzed according to the Water Quality LaboratoryÂ's Quality Assurance Manual. Applicable field and laboratory Standard Operating Procedures were also provided by the San Diego Water Department.
QAPP Information Reference(s):	

DECISION ID **34022** **Region 9**

Barrett Lake

Pollutant:	**Sulfates**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 20 samples exceeded the Basin Plan criteria, and this sample size is insufficient to

determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34022, Sulfates **Region 9**

Barrett Lake

LOE ID:	1611
Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	20
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. None of the 20 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for sulfate is 250 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Barrett Reservoir station BAA-0.
Temporal Representation:	Samples were collected on a quarterly basis from 03/1996 to 12/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33961** **Region 9**

Barrett Lake

Pollutant:	**Toluene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

One line of evidence is available in the administrative record to assess this pollutant. None of the 2 samples exceed the Basin Plan criteria and this does not exceed the allowable frequency of the Listing Policy.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33961, Toluene **Region 9**

Barrett Lake

LOE ID:	1613
Pollutant:	Toluene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 1996. None of the 2 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For Inland surface waters with a municipal beneficial use, the WQO for Toluene is 0.15 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Barrett Reservoir station BAA-0.
Temporal Representation:	Samples were collected once each in 03/1996 and 09/1996.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **34037** **Region 9**

Barrett Lake

Pollutant:	**Total Dissolved Solids**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the

current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

One line of evidence is available in the administrative record to assess this pollutant. None of the 10 samples exceed the Basin Plan criteria and this does not exceed the allowable frequency of the Listing Policy.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34037, Total Dissolved Solids **Region 9**

Barrett Lake

LOE ID:	1612
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	10
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1998 to 2000. None of the 10 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for TDS is 500 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Barrett Reservoir station BAA-0.
Temporal Representation:	Samples were collected on a quarterly basis from 09/1998 to 12/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **43001** **Region 9**

Barrett Lake

Pollutant:	**Total Trihalomethane (TTHM)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or	Pollutant

Pollution: 036096

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 8 samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of 8 samples exceeded the drinking water MCL standard and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43001, Total Trihalomethane (TTHM) **Region 9**

Barrett Lake

LOE ID:	6155
Pollutant:	Total Trihalomethane (TTHM)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	All eight samples collected exceeded water quality standards. Samples were collected by the City of San Diego's Water Department. Samples were collected from January 2005 to December 2006.
Data Reference:	Water Department, Water Quality Monitoring Data for Drinking Source Water Reservoirs. January 2005 to December 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The US EPA has established a maximum contaminant level for trihalomethanes of an average annual concentration of 0.08 mg/L (U.S. EPA, 2008).
Objective/Criterion Reference:	Information Collection Rule, Trihalomethans (THM)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	One surface water sample was collected per sampling event at Barrett Lake at a standard

	location designated Â“Station AÂ”. 036097
Temporal Representation:	Samples were collected approximately once a month from January 2005 to December 2006; however some months were not sampled.
Environmental Conditions:	The Horse Fire burned north of Barrett Lake in the Cleveland National Forest from July 23 - 31, 2006. Both exceedances occurred before the onset of the fire.
QAPP Information:	Samples were collected and analyzed according to the Water Quality LaboratoryÂ's Quality Assurance Manual. Applicable field and laboratory Standard Operating Procedures were also provided by the San Diego Water Department.
QAPP Information Reference(s):	

DECISION ID 33962 Region 9

Barrett Lake

Pollutant:	**Turbidity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: One line of evidence is available in the administrative record to assess this pollutant. One of the 20 samples exceed the Basin Plan criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33962, Turbidity Region 9

Barrett Lake

LOE ID:	1614
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	20
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept from 1996 to 2000. One of 20 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for turbidity is 5 ntu.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Barrett Reservoir station BAA-0.
Temporal Representation:	Samples were collected on a quarterly basis from 03/1996 to 12/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 45726 Region 9

Barrett Lake

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the 2010 listing cycle. No new data were assessed for the 2014 listing cycle. This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the two samples exceed the OBJECTIVE. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 2 samples exceeded the OBJECTIVE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 45726, Zinc Region 9

Barrett Lake

LOE ID:	1615
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total

Beneficial Use:	Municipal & Domestic Supply	036099
Number of Samples:	2	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 1996 and 1997. None of the 2 samples were in exceedance.	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Zinc is 5.0 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Barrett Reservoir station BAA-0.	
Temporal Representation:	Samples were collected once each on 06/05/1996 and 03/03/1997.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID 33584 Region 9

Barrett Lake

Pollutant:	**Color**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Nine of 20 samples exceeded the Basin Plan criteria, and these exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33584, Color Region 9

Barrett Lake 036100

LOE ID:	1600
Pollutant:	Color
LOE Subgroup:	Pollutant-Nuisance
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	20
Number of Exceedances:	9
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept from 1996 to 2000. Nine of the 20 samples were in exceedance and 4 of 20 samples measured color levels at 15 color units.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for color is 15 units.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Barrett Reservoir station BAA-0.
Temporal Representation:	Samples were collected on a quarterly basis from 03/1996 to 12/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33542** **Region 9**

Barrett Lake

Pollutant:	**Manganese**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Seven of the nineteen samples exceed the OBJECTIVE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.

3. Seven of nineteen samples exceed the OBJECTIVE and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 33542, Manganese **Region 9**

Barrett Lake

LOE ID:	1605
Pollutant:	Manganese
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	19
Number of Exceedances:	7
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. Seven of 19 samples exceeded 0.05 mg/L. This concentration was exceeded more than 10% of the time during the years 1996, 1997, 1998 and 1999.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The water quality objective for manganese in Barrett Lake is 0.05 milligrams/liter (mg/l) according to Basin Plan, Table 3-2 entitled, Water Quality Objectives. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Barrett Reservoir site BAA-0.
Temporal Representation:	Samples were collected on a quarterly basis from 01/1996 to 09/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **42336** **Region 9**

Barrett Lake

Pollutant:	**Perchlorate**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Two of the 17 samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Two of the17 samples exceed the Secondary MCL drinking water standard for perchlorate and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 42336, Perchlorate **Region 9**

Barrett Lake

LOE ID:	6152
Pollutant:	Perchlorate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	17
Number of Exceedances:	2
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Two of the 17 samples collected exceeded water quality standards. Samples were collected by the City of San Diego's Water Department. Samples were collected from January 2005 to December 2006.
Data Reference:	Water Department, Water Quality Monitoring Data for Drinking Source Water Reservoirs, January 2005 to December 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Waters designated for use as domestic or municipal supply shall not contain concentrations of inorganic chemicals in excess of the maximum contaminant levels (MCL) (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The primary MCL for perchlorate is 6 ug/L (CDHP, 2007).
Guideline Reference:	Perchlorate in California Drinking Water: Update and Overview
Spatial Representation:	One surface water sample was collected per sampling event at Barrett Lake at station designated Â“Station AÂ”.
Temporal Representation:	Samples were collected approximately once a month from January 2005 to December 2006;

however some months were not sampled. 036103

Environmental Conditions: The Horse Fire burned north of Barrett Lake in the Cleveland National Forest from July 23 - 31, 2006. Both exceedances occurred before the onset of the fire.

QAPP Information: Samples were collected and analyzed according to the Water Quality LaboratoryÂ's Quality Assurance Manual. Applicable field and laboratory Standard Operating Procedures were also provided by the San Diego Water Department.

QAPP Information Reference(s):

DECISION ID 45902 Region 9

Barrett Lake

Pollutant:	**Total Nitrogen as N**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows (with update to table 3.1):

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Eight of the 9 samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Eight of 9 samples exceed the Basin Plan objective for total nitrogen as N and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 45902, Total Nitrogen as N Region 9

Barrett Lake

LOE ID:	6153
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Aquatic Life Use:	Warm Freshwater Habitat

Number of Samples:	9
Number of Exceedances:	8
Data and Information Type:	Non-fixed-station monitoring (conventional during key seasons and flows)
Data Used to Assess Water Quality:	Eight of the nine samples collected exceeded water quality standards. Samples were collected by the City of San Diego's Water Department. Samples were collected from January 2005 to December 2006.
Data Reference:	Water Department, Water Quality Monitoring Data for Drinking Source Water Reservoirs. January 2005 to December 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. (RWQCB, 2007)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	A desired goal in order to prevent plant nuisance in any standing body of water is 0.025 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used. (RWQCB, 2007)
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	One surface water sample was collected per sampling event at Barrett Lake at a standard location designated Â“Station AÂ”.
Temporal Representation:	Samples were collected approximately once a month from January 2005 to December 2006; however some months were not sampled.
Environmental Conditions:	The Horse Fire burned north of Barrett Lake in the Cleveland National Forest from July 23 - 31, 2006. Both exceedances occurred before the onset of the fire.
QAPP Information:	Samples were collected and analyzed according to the Water Quality LaboratoryÂ's Quality Assurance Manual. Applicable field and laboratory Standard Operating Procedures were also provided by the San Diego Water Department.
QAPP Information Reference(s):	

DECISION ID **33940** **Region 9**

Barrett Lake

Pollutant:	**pH**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Ten of 20 samples exceeded the Basin Plan objective, and these exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33940, pH **Region 9**

Barrett Lake

LOE ID:	1608
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	20
Number of Exceedances:	10
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1996 to 2000. Ten of 20 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for pH is 6.5 (minimum) to 8.5 (maximum).
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Barrett Reservoir station BAA-0.
Temporal Representation:	Samples were collected on a quarterly basis from 03/1996 to 12/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Morena Reservoir
Water Body ID: CAL9115000020011025092811
Water Body Type: Lake & Reservoir

DECISION ID 44184 **Region 9**
Morena Reservoir

Pollutant:	**Nitrogen**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2023
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Seven of the seven samples exceed the OBJECTIVE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Seven of seven samples exceed the OBJECTIVE and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 44184, Nitrogen **Region 9**
Morena Reservoir

LOE ID:	6165
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Aquatic Life Use:	Warm Freshwater Habitat

Number of Samples:	7
Number of Exceedances:	7
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Water samples were collected by the City of San Diego for their Water Quality Monitoring Data for Drinking Source Water Reservoirs. Sampling period was January 2005 to December 2006. All seven samples exceeded the water quality objective.
Data Reference:	Water Department. Water Quality Monitoring Data for Drinking Source Water Reservoirs. January 2005 to December 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. A desired goal in order to prevent plant nuisance in any standing body of water is 0.025 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used. (RWQCB, 2007)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	One surface water sample was collected per sampling event at Morena Reservoir at a standard location designated Â“Station AÂ”.
Temporal Representation:	Samples were collected approximately once a month from January 2005 to December 2006; however, some months were not sampled.
Environmental Conditions:	The Horse Fire burned west of Morena Reservoir in the Cleveland National Forest from July 23 - 31, 2006.
QAPP Information:	Samples were collected and analyzed according to the Water Quality LaboratoryÂ's Quality Assurance Manual. Applicable field and laboratory Standard Operating Procedures were also provided by the San Diego Water Department.
QAPP Information Reference(s):	Water Quality Laboratory. Quality Assurance Manual

DECISION ID	**33815**	**Region 9**
Morena Reservoir		

Pollutant:	**Aluminum**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 16 samples exceeded the sediment guideline, and these do not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The benthic community in this water body is not

impacted. 036108
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33815, Aluminum **Region 9**

Morena Reservoir

LOE ID:	1616
Pollutant:	Aluminum
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	16
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected at site MOA-0 by the City of San Diego Water Dept. between January 1996 and September 2000. None of the 16 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for aluminum is 0.2 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at site MOA-0.
Temporal Representation:	Samples were collected on a quarterly basis from January 1996 to September 2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002. assessment.
QAPP Information Reference(s):	

DECISION ID **33540** **Region 9**

Morena Reservoir

Pollutant:	**Antimony**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. Zero of the six samples exceed the Basin Plan water quality objective for antimony.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the six samples exceed the Basin Plan water quality objective for antimony and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33540, Antimony **Region 9**

Morena Reservoir

LOE ID:	1617
Pollutant:	Antimony
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected at site MOA-0 by the City of San Diego Water Dept. between January 1996 and September 1997. None of the 6 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for antimony is 0.006 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at site MOA-0.
Temporal Representation:	Samples were collected between January 1996 and September 1997. Three samples per year were collected.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33541** **Region 9**

Morena Reservoir

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 19 samples exceed the Basin Plan water quality objective for Arsenic.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 19 samples exceed the Basin Plan water quality objective for Arsenic and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33541, Arsenic **Region 9**

Morena Reservoir

LOE ID:	1618
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	19
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected at site MOA-0 by the City of San Diego Water Dept. between January 1996 and September 2000. None of the 19 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for arsenic is 0.05 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	

Guideline Reference:	036111
Spatial Representation:	Samples were collected at site MOA-0.
Temporal Representation:	Samples were collected on a quarterly basis from January 1996 to September 2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 33233 Region 9

Morena Reservoir

Pollutant:	**Barium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. None of the 19 samples exceed the Basin Plan water quality objective for Barium. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 19 samples exceed the Basin Plan water quality objective for Barium and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33233, Barium Region 9

Morena Reservoir

LOE ID:	1619
Pollutant:	Barium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	19
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	036112
Data Used to Assess Water Quality:	Data was collected at site MOA-0 by the City of San Diego Water Dept. between January 1996 and September 2000. None of 19 samples were in exceedance.	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for barium is 1.0 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at site MOA-0.	
Temporal Representation:	Samples were collected on a quarterly basis between January 1996 and September 2000.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID 33172 **Region 9**

Morena Reservoir

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. The one sample did not exceed the Basin Plan water quality objective for Cadmium. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. The one sample did not exceed the Basin Plan water quality objective for Cadmium and this sample size is insufficient to determine with the power and confidence of the Listing Policy if standards are not met. A minimum of two samples is needed for application of table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33172, Cadmium **Region 9**

Morena Reservoir

LOE ID:	1620
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected at site MOA-0 by the City of San Diego Water Dept. on June 5, 1996. One sample was collected. It was not in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for cadmium is 0.005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The sample was collected at site MOA-0.
Temporal Representation:	One sample was collected on 1 day, June 5, 1996.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33212** **Region 9**

Morena Reservoir

Pollutant:	**Chloride**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 20 samples exceed the Basin Plan water quality objective for chloride.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 20 samples exceed the Basin Plan water quality objective for chloride and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.

	4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33212, Chloride **Region 9**

Morena Reservoir

LOE ID:	1621
Pollutant:	Chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	20
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected at site MOA-0 by the City of San Diego Water Dept. between March 1996 and December 2000. None of the 20 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Chloride is 250 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at site MOA-0.
Temporal Representation:	Samples were collected on a quarterly basis from March 1996 to December 2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33681** **Region 9**

Morena Reservoir

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. None of the eight samples exceed the Basin Plan water quality objective for chromium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the eight samples exceed the Basin Plan water quality objective for chromium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33681, Chromium **Region 9**

Morena Reservoir

LOE ID:	1622
Pollutant:	Chromium (total)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected at site MOA-0 by the City of San Diego Water Dept. between January 1996 and June 2000. None of the 8 samples were in exceedance (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for chromium is 0.05 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at site MOA-0.
Temporal Representation:	Samples were collected between January 1996 and June 2000. One to two samples were collected per year.
Environmental Conditions:	
QAPP Information:	Data used for 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33190** **Region 9**

Morena Reservoir

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**

Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)	036116
Revision Status	Original	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the seven samples exceed the Basin Plan water quality objective for copper.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the seven samples exceed the Basin Plan water quality objective for copper and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33190, Copper **Region 9**

Morena Reservoir

LOE ID:	1624
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected at site MOA-0 by the City of San Diego Water Dept. from January 1996 to September 2000. None of the 7 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for copper is 1.0 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at site MOA-0.
Temporal Representation:	Data was collected from January 1996 to September 2000. Four samples were collected in 1996, 1 in 1997, and 2 in 2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 32404 Region 9

Morena Reservoir

Pollutant:	**Fluoride**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. None of the 19 samples exceed the Basin Plan water quality objective for flouride. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 19 samples exceed the Basin Plan water quality objective for flouride and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32404, Fluoride Region 9

Morena Reservoir

LOE ID:	1625
Pollutant:	Fluoride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	19
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	036118
Data Used to Assess Water Quality:	Data was collected at site MOA-0 by the City of San Diego Water Dept. between march 1996 and September 2000. None of 19 samples were in exceedance. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Fluoride is 2.4 mg/L when Annual Average of Maximum Daily Air Temperature is <53.8F, 2.2 mg/L when Annual Average of Maximum Daily Air Temperature is 53.8F-58.3F, 2.0 mg/L when Annual Average of Maximum Daily Air Temperature is 58.4F-63.8F, 1.8 mg/L when Annual Average of Maximum Daily Air Temperature is 63.9F-70.6F, 1.6 mg/L when Annual Average of Maximum Daily Air Temperature is 70.7F-79.2F, and 1.4 mg/L when Annual Average of Maximum Daily Air Temperature is 79.3F-90.5F. For inland surface water with all other beneficial uses the WQO for fluoride is 1.0 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data was collected at site MOA-0.	
Temporal Representation:	Samples were collected on a quarterly basis between March 1996 and September 2000.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID	32405	Region 9
Morena Reservoir		

Pollutant:	**Iron**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the five samples exceed the Basin Plan water quality objective for iron.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the five samples exceed the Basin Plan water quality objective for iron and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision

Recommendation: 036119

Line of Evidence (LOE) for Decision ID 32405, Iron **Region 9**

Morena Reservoir

LOE ID:	1626
Pollutant:	Iron
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected at site MOA-0 by the City of San Diego Water Dept. between December 1998 and September 2000. None of the 5 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for iron is 0.3 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at site MOA-0.
Temporal Representation:	Samples were collected between December 1998 and September 2000. Two samples were collected in 1998 and 3 were collected in 2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **43032** **Region 9**

Morena Reservoir

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the four samples exceed the Basin Plan water quality objective for nickel.

Based on the readily available data and information, the weight of evidence indicates that there is

sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the four samples exceed the Basin Plan water quality objective for nickel and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43032, Nickel **Region 9**

Morena Reservoir

LOE ID:	1628
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected at site MOA-0 by the City of San Diego Water Dept. from June 1996 to March 1999. None of 4 samples were in exceedance (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use the WQO for nickel is 0.1 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at site MOA-0.
Temporal Representation:	Samples were collected from June 1996 to March 1999. 3 samples were collected in 1996, and 1 in 1999.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **42301** **Region 9**

Morena Reservoir

Pollutant:	**Oxygen, Dissolved**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final	Do Not List on 303(d) list (TMDL required list)(2012)

Listing Decision:		036121
Revision Status	Original	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Four of the 17 samples exceed the Basin Plan water quality objective for dissolved oxygen.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Four of 17 samples exceeded the Basin Plan water quality objective for dissolved oxygen and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 42301, Oxygen, Dissolved **Region 9**

Morena Reservoir

LOE ID:	6164
Pollutant:	Dissolved oxygen saturation
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Aquatic Life Use:	Warm Freshwater Habitat
Number of Samples:	17
Number of Exceedances:	4
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Samples were collected by the City of San Diego for their Water Quality Monitoring Data for Drinking Source Water Reservoirs. Sampling period was from January 2005 to December 2006. Four of the 17 samples were below 5.0 mg/l objective. The mean of the 17 samples was 7.9 mg/l.
Data Reference:	Water Department, Water Quality Monitoring Data for Drinking Source Water Reservoirs. January 2005 to December 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Dissolved oxygen levels shall not be less than 5.0 mg/L in waters with designated WARM beneficial uses. The annual mean shall not be less than 7 mg/L more than 10 percent of the time.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	One surface water sample was collected per sampling event at Morena Reservoir at a standard location designated Â“Station AÂ”.
Temporal Representation:	Samples were collected approximately once a month from January 2005 to December 2006; however, some months were not sampled.
Environmental Conditions:	
QAPP Information:	Samples were collected and analyzed according to the Water Quality LaboratoryÂ's Quality Assurance Manual. Applicable field and laboratory Standard Operating Procedures were also provided by the San Diego Water Department.
QAPP Information Reference(s):	Water Quality Laboratory. Quality Assurance Manual

DECISION ID 32655 Region 9

Morena Reservoir

Pollutant:	**Picloram**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. None of the three samples exceed the Basin Plan water quality objective for picloram. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the three samples exceed the Basin Plan water quality objective for picloram and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32655, Picloram Region 9

Morena Reservoir

LOE ID:	1630
Pollutant:	Picloram
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total

Beneficial Use:	Municipal & Domestic Supply	036123
Number of Samples:	3	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data was collected at site MOA-0 by the City of San Diego Water Dept. on December 3, 1998, September 15, 1999 and December 8, 1999. None of the 3 samples were in exceedance. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for picloram is 0.5 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at site MOA-0.	
Temporal Representation:	One sample was collected per day on December 3, 1998, September 15, 1999, and December 8, 1999.	
Environmental Conditions:		
QAPP Information:	Data used for 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID	33122	Region 9
Morena Reservoir		

Pollutant:	**Selenium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the three samples exceed the Basin Plan water quality objective for Selenium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the three samples exceed the Basin Plan water quality objective for Selenium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33122, Selenium **Region 9**

Morena Reservoir

LOE ID:	1631
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected at site MOA-0 by the City of San Diego Water Dept. from September 1996 to December 1997. None of the 3 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for selenium is 0.05 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at site MOA-0.
Temporal Representation:	One sample was collected each day on September 10, 1996, December 3, 1996, and December 3, 1997.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33170** **Region 9**

Morena Reservoir

Pollutant:	**Sulfates**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. None of the 20 samples exceed the Basin Plan water quality objective sulfates.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 20 samples exceed the Basin Plan water quality objective sulfates and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33170, Sulfates **Region 9**

Morena Reservoir

LOE ID:	1632
Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	20
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected at site MOA-0 by the City of San Diego Water Dept. between March 1996 and December 2000. None of the 20 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters for all beneficial uses, the WQO for sulfate is 250 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at site MOA-0.
Temporal Representation:	Samples were collected on a quarterly basis between March 1996 and December 2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33498** **Region 9**

Morena Reservoir

Pollutant:	**Toluene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final	Do Not List on 303(d) list (TMDL required list)(2012)

Listing Decision:		036126
Revision Status	Original	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. The one sample did not exceed the Basin Plan water quality objective for toluene.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. The one sample did not exceed the Basin Plan water quality objective for toluene and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33498, Toluene **Region 9**

Morena Reservoir

LOE ID:	1634
Pollutant:	Toluene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected at site MOA-0 by the City of San Diego Water Dept. on August 4, 1999. One sample was collected. It was not in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use the MCL for Toluene is 0.15 mg/L (From Table 3-6 in Basin Plan). A less stringent WQO for Toluene for inland surface waters with a municipal beneficial use is 1.0 mg/L from Table 3-10 of the Basin Plan.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	

Guideline Reference:	036127
Spatial Representation:	Samples were collected at site MOA-0.
Temporal Representation:	One sample was collected on August 4, 1999.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 32658 Region 9

Morena Reservoir

Pollutant:	**Total Dissolved Solids**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the ten samples exceed the Basin Plan water quality objective for total dissolved solids.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the ten samples exceed the Basin Plan water quality objective for total dissolved solids and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32658, Total Dissolved Solids Region 9

Morena Reservoir

LOE ID:	1633
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	10

Number of Exceedances:	0	036128
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data was collected at site MOA-0 by the City of San Diego Water Dept. between September 1998 and December 2000. None of the 10 samples were in exceedance. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for total dissolved solids is 500. This concentration is not to be exceeded more than 10% of the time during any one year period.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at site MOA-0.	
Temporal Representation:	Samples were collected on a quarterly basis from September 1998 to December 2000.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID	42687	Region 9
Morena Reservoir		

Pollutant:	**Turbidity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Three of the 20 samples exceed the Basin Plan water quality objective for turbidity.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Three of the 20 samples exceed the Basin Plan water quality objective for turbidity and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 42687, Turbidity **Region 9**

Morena Reservoir

LOE ID:	1635
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	20
Number of Exceedances:	3
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected at site MOA-0 by the City of San Diego Water Dept. between March 1996 and December 2000. Three of the 20 samples were in exceedance of the WQO for municipal waters. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for turbidity is 5 units. For inland surface waters with all other beneficial uses, the WQO for turbidity is 20 ntu.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data was collected at site MOA-0.
Temporal Representation:	Data was collected on a quarterly basis from March 1996 to December 2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **42718** **Region 9**

Morena Reservoir

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the 2 samples exceed the Basin Plan objective for Zinc.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list

in the Water Quality Limited Segments category. 036130

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 2 samples exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 42718, Zinc **Region 9**

Morena Reservoir

LOE ID:	1636
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected at site MOA-0 by the City of San Diego Water Dept. on June 5 1996 and December 3, 1996. None of the 2 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for zinc is 5.0 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data was collected at site MOA-0.
Temporal Representation:	One sample was collected each day on June 5, 1996 and December 3, 1996.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **44098** **Region 9**

Morena Reservoir

Pollutant:	**Ammonia**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown

Expected TMDL Completion Date:	2019	036131
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Six of the six samples exceed the Basin Plan water quality objective for un-ionized ammonia (NH3).

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3.Six of the six samples exceed the Basin Plan water quality objective for un-ionized ammonia (NH3) and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 44098, Ammonia **Region 9**

Morena Reservoir

LOE ID:	6163
Pollutant:	Ammonia as Nitrogen
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	6
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Data was collected by the City of San Diego Water Quality Monitoring Data for their Drinking Source Water Reservoirs report. Six samples were collected between January 2005 to December 2006. All six samples exceeded the water quality objective.
Data Reference:	Water Department, Water Quality Monitoring Data for Drinking Source Water Reservoirs. January 2005 to December 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan the WQO for un-ionized ammonia (NH3) for inland surface waters is 0.025mg/L (as N) (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	One surface water sample was collected per sampling event at Morena Reservoir at a standard location designated Â“Station AÂ”.

Temporal Representation:	Samples were collected approximately once a month from January 2005 to December 2006; however, some months were not sampled.
Environmental Conditions:	
QAPP Information:	Samples were collected and analyzed according to the Water Quality LaboratoryÂ's Quality Assurance Manual. Applicable field and laboratory Standard Operating Procedures were also provided by the San Diego Water Department.
QAPP Information Reference(s):	Water Quality Laboratory. Quality Assurance Manual

DECISION ID 33682 Region 9

Morena Reservoir

Pollutant:	**Color**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for removal from the section 303(d) list under section 3.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Eleven of 20 samples exceed the Basin Plan water quality objective for color.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the section 303(d) list.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Eleven of 20 samples exceed the Basin Plan water quality objective for color
and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33682, Color Region 9

Morena Reservoir

LOE ID:	1623
Pollutant:	Color
LOE Subgroup:	Pollutant-Nuisance
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	20	036133
Number of Exceedances:	11	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data was collected at site MOA-0 by the City of San Diego Water Dept. between March 19996 and December 2000. Eleven of 20 samples were in exceedance.	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for color is 15 units.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at site MOA-0.	
Temporal Representation:	Samples were collected on a quarterly basis between March 1996 and December 2000.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID	33445	Region 9
Morena Reservoir		

Pollutant:	**Manganese**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for removal from the section 303(d) list under section 4.1 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess pollutant. Five of 19 samples exceed the Basin Plan water quality objective for Manganese and all five years had exceedances of 0.05 mg/L more than 10% of the time. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the section 303(d) list. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Five of 19 samples exceed the Basin Plan water quality objective for Manganese and all five years had exceedances of 0.05 mg/L more than 10% of the time and this exceeds the allowable frequency listed in Table 4.1 of the Listing Policy. 4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33445, Manganese **Region 9**

Morena Reservoir

LOE ID:	1627
Pollutant:	Manganese
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	19
Number of Exceedances:	5
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected at site MOA-0 by the City of San Diego Water Dept. between January 1996 and September 2000. Five of 19 samples were in exceedance and all five years had exceedances of 0.05 mg/L more than 10% of the time.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The water quality objective for manganese in Morena Reservoir is 0.05 milligrams/liter (mg/l) according to Basin Plan, Table 3-2 entitled, Water Quality Objectives. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at site MOA-0.
Temporal Representation:	Samples were collected on a quarterly basis between January 1996 and September 2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **42720** **Region 9**

Morena Reservoir

Pollutant:	**Phosphorus**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Five of the five samples exceed the Basin Plan water quality objective for phosphorus as P.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Five of the five samples exceed the Basin Plan water quality objective for phosphorus as P and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 42720, Phosphorus **Region 9**

Morena Reservoir

LOE ID:	6166
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Aquatic Life Use:	Warm Freshwater Habitat
Number of Samples:	5
Number of Exceedances:	5
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Samples were collected by the City of San Diego for their Water Quality Monitoring Data for Drinking Source Water Reservoirs report. Sampling period was January 2005 to December 2006. All five samples exceeded the water quality objective. Two samples were recorded as non detects but not used in the assessment because the detection limits were not low enough.
Data Reference:	Water Department, Water Quality Monitoring Data for Drinking Source Water Reservoirs. January 2005 to December 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. Water Quality Control Plan for the San Diego Basin Goal of 0.025 mg/L for total phosphorus in any standing body of water. (RWQCB, 2007)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	One surface water sample was collected per sampling event at Morena Reservoir at a standard location designated Â“Station AÂ”.
Temporal Representation:	Samples were collected approximately once a month from January 2005 to December 2006; however, some months were not sampled.
Environmental Conditions:	The Horse Fire burned west of Morena Reservoir in the Cleveland National Forest from July 23 - 31, 2006.
QAPP Information:	Samples were collected and analyzed according to the Water Quality LaboratoryÂ's Quality Assurance Manual. Applicable field and laboratory Standard Operating Procedures were

	also provided by the San Diego Water Department.	036136
QAPP Information Reference(s):	Water Quality Laboratory. Quality Assurance Manual	

DECISION ID **33491** **Region 9**

Morena Reservoir

Pollutant:	**pH**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown | Unknown Nonpoint Source
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for addition to the section 303(d) list under section 3.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Ten of 19 samples exceed the Basin Plan water quality objective for pH.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of adding this water segment-pollutant combination from the section 303(d) list.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Ten of 19 samples exceed the Basin Plan water quality objective for pH and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 33491, pH **Region 9**

Morena Reservoir

LOE ID:	1629
Pollutant:	pH (high)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	19
Number of Exceedances:	10
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected at site MOA-0 by the City of San Diego Water Dept. between March 1996 and December 2000. Ten of 19 samples were in exceedance.

Data Reference:	Placeholder reference 2006 303(d)	036137
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with all beneficial uses, the WQO for pH is 6.5 (minimum) to 8.5 (maximum).	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at site MOA-0.	
Temporal Representation:	Samples were collected on a quarterly basis between March 1996 and December 2000.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Laguna Canyon Channel
Water Body ID: CAR9011200020011025105029
Water Body Type: River & Stream

DECISION ID 43324 **Region 9**
Laguna Canyon Channel

Pollutant: **Toxicity**
Final Listing Decision: **Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Sources: Source Unknown
Expected TMDL Completion Date: 2019
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least one line of evidence is necessary to assess listing status.

Seven lines of evidence are available in the administrative record to assess this pollutant. Twelve of the 24 samples exceed the exhibited water toxicity and Two of Six samples exhibited sediment toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is Sufficient justification FOR placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Twelve of the 24 samples exhibited water toxicity and Two of Six samples exhibited sediment toxicity and this sample size is sufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 43324, Toxicity **Region 9**
Laguna Canyon Channel

LOE ID: 7736

Pollutant: Toxicity
LOE Subgroup: Toxicity
Matrix: Water
Fraction: None

Beneficial Use:	Warm Freshwater Habitat	036139
Number of Samples:	5	
Number of Exceedances:	0	
Data and Information Type:	Ambient toxicity testing (chronic)	
Data Used to Assess Water Quality:	Selenastrum Algae Growth- None of the five samples exhibited NOECÂ's less than 100%. Ceriodaphnia dubia -Survival- None of the five samples exhibited NOECÂ's less than 100%. Ceriodaphnia dubia -Reproduction- None of the five samples collected exhibited NOECÂ's less than 100%. Hyalella azteca survival- None of the five samples exhibited NOECÂ's less than 100% according to results in the Orange County Storm Water Annual Progress Reports from 2002 through 2006. Samples were collected from February 2003 through March 2005.	
Data Reference:	Orange County Stormwater Program. 2004-2007. Unified Annual Progress Reports. Program Effectiveness Assessment (San Diego Region)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be sustain free from toxic substances in concentrations that are toxic to, or that produce harmful physiological responses in human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	Samples were found to exhibit toxicity when the No Observed Effect Concentration (NOEC) or median lethal concentration (LC50) for any given species was estimated to be less than 100% of the test sample concentration.	
Guideline Reference:	Waste Discharge Requirements for Discharges of Urban Runoff From the Municipal Separate Storm Sewer Systems Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego, the San Diego Unified Port District, and the San Diego County Regional Airport. Order No. R9-2007-0001	
Spatial Representation:	Samples were collected at the mass loading station in Laguna Canyon Wash along Highway 133.	
Temporal Representation:	Samples were collected from February 2003 through March 2005.	
Environmental Conditions:	Samples were collected during wet weather.	
QAPP Information:	QA/QC conducted according to the County of Orange's quality control plan.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual. February 2004	

Line of Evidence (LOE) for Decision ID 43324, Toxicity **Region 9**

Laguna Canyon Channel

LOE ID:	74126
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate water toxicity. The sample exhibited significant toxicity. The toxicity test included survival and reproduction of Ceriodaphnia dubia. One sample can have multiple toxicity test results but will be counted only once. One sample is

	defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL, Significant compared to negative control based on statistical test, less than stated alpha level, AND less than the evaluation threshold (both criteria are met).
Guideline Reference:	
Spatial Representation:	The sample was collected at station 901S00531.
Temporal Representation:	The sample was collected in May 2009.
Environmental Conditions:	
QAPP Information:	Data quality is good. Data results were recorded in the SWAMP database and followed SWAMP protocols.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43324, Toxicity **Region 9**

Laguna Canyon Channel

LOE ID:	74125
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	4
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Six samples were collected to test for toxicity. Four of the six samples exhibited statistically and biologically significant toxicity. The toxicity tests that exhibited significant toxicity included Purple Urchin development and fertilization and Mysid Biomass and survival.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control. Additionally, the biological significance of the sample was evaluted by determining whether the sample response was lower than the evaluation threshold.
Guideline Reference:	
Spatial Representation:	The sample was collected at station LCWI02 Laguna Canyon Channel.
Temporal Representation:	The sample was collected from November 2006 to February 2009.
Environmental Conditions:	

QAPP Information:	The data collected under the Quality Assurance Management Plan for The Orange County Stormwater Program. The SWAMP measurement quality objectives were followed for toxicity data. The performance of toxicity bioassays and evaluation of reference toxicants were performed using USEPA and Standard Methods.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43324, Toxicity **Region 9**

Laguna Canyon Channel

LOE ID:	74124
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	3
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Either samples were collected to evaluate water toxicity. Three of the nine samples exhibited statistical and biological significant toxicity. The toxicity tests that exhibited significant toxicity included Ceriodaphnia reproduction and survival, Hyallela survival and Selenastrum.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Toxic substances shall not be discharged at levels that will bioaccumulate in aquatic resources to levels which are harmful to human health.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control. Additionally, the biological significance of the sample is evaluated by determining if the sample response is lower than the evaluation threshold.
Guideline Reference:	
Spatial Representation:	The samples were collected at stations LC-133 Laguna Canyon Channel.
Temporal Representation:	The samples were collected approximately quarterly from June 2006 to November 2009.
Environmental Conditions:	
QAPP Information:	The data collected under the Quality Assurance Management Plan for The Orange County Stormwater Program. The SWAMP measurement quality objectives were followed for toxicity data. The performance of toxicity bioassays and evaluation of reference toxicants were performed using USEPA and Standard Methods.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43324, Toxicity **Region 9**

Laguna Canyon Channel

LOE ID:	2994
Pollutant:	Sediment Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	4
Number of Exceedances:	2
Data and Information Type:	Toxicity testing of sediments
Data Used to Assess Water Quality:	Two out of four samples displayed statistically significant toxicity in the survival endpoint when compared to the negative control based on a statistical test with alpha of less than 5%. All samples were tested using the 10-day Hyallela azteca test. All data points had no associated QA qualifiers (SWAMP, 2004).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the Regional Board (Region 9 Basin Plan, pages 3-15 to 3-16; September 8, 1994).
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	All samples were collected from one station, Laguna Canyon Creek 2.
Temporal Representation:	Samples were collected from October 2002 through May 2003. Toxicity in the survival endpoint was detected in samples collected on October 29, 2002 and January 14, 2003.
Environmental Conditions:	
QAPP Information:	SWAMP QAPP.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43324, Toxicity **Region 9**

Laguna Canyon Channel

LOE ID:	21399
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Four samples were collected at Laguna Canyon Creek station 901SJLAG2 from October 2002 to May 2003. The samples showed significant toxicity levels (SL) in the following tests: Selenastrum algae growth test - four out of four samples were toxic. Ceriodaphnia dubia survival/reproductive test - Three of the four samples were toxic.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control

values less than the evaluation threshold (EPA, 2002). 036143

Guideline Reference: Monitoring data for Region 9

Spatial Representation: Water samples were collected at Laguna Canyon Creek 2station 901SJLAG2. (Latitude 33.5726, Longitude -117.7629).

Temporal Representation: Water samples were collected on October 2002, January 2003, April 2003, and May 2003.

Environmental Conditions:

QAPP Information: Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.

QAPP Information Reference(s): 2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 43324, Toxicity **Region 9**

Laguna Canyon Channel

LOE ID: 26542

Pollutant: Sediment Toxicity

LOE Subgroup: Toxicity

Matrix: Sediment

Fraction: None

Beneficial Use: Warm Freshwater Habitat

Number of Samples: 2

Number of Exceedances: 0

Data and Information Type: Ambient toxicity testing (chronic)

Data Used to Assess Water Quality: Four samples were collected at Laguna Canyon Creek station 901SJLAG2 from October 2002 to May 2003. Two of the four samples had quality assurance issues and not used for this line of evidence.

Neither of the two samples showed significant toxicity levels in the sediment tests with Hyalella azteca according to results in the Surface Water Ambient Monitoring program report.

Data Reference: Monitoring data for Region 9

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.

Objective/Criterion Reference: Water Quality Control Plan for the San Diego Basin

Evaluation Guideline: According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.

Guideline Reference: Monitoring data for Region 9

Spatial Representation: Water samples were collected at Laguna Canyon Creek 2station 901SJLAG2. (Latitude 33.5726, Longitude -117.7629).

Temporal Representation: Water samples were collected on October 2002, January 2003, April 2003, and May 2003.

Environmental Conditions:

QAPP Information: Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.

QAPP Information Reference(s): 2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

DECISION ID 48176 **Region 9**

Laguna Canyon Channel

Pollutant:	**Alkalinity as CaCO3**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the One samples exceed the Water Quality Criteria for Alkalinity, Carbonate as CaCO3.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Water Quality Criteria for Alkalinity, Carbonate as CaCO3 and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48176, Alkalinity as CaCO3 **Region 9**

Laguna Canyon Channel

LOE ID:	74130
Pollutant:	Alkalinity as CaCO3
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Laguna Canyon Channel to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Alkalinity as CaCO3.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	The Alkalinity as CaCO3 criteria for the protection of freshwater aquatic life is 20000 ug/L (National Recommended Water Quality Criteria, 2009).
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for Laguna Canyon Channel was collected at 1 monitoring site [Laguna Canyon ~1.5mi above Mouth - 901S00531]
Temporal Representation:	Data was collected on a single day 5/7/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 48177 Region 9

Laguna Canyon Channel

Pollutant:	**Aluminum**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the One samples exceed the Water Quality Criteria for Aluminum. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Water Quality Criteria for Aluminum and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48177, Aluminum Region 9

Laguna Canyon Channel

LOE ID:	74080
Pollutant:	Aluminum
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved

Beneficial Use:	Warm Freshwater Habitat	036146
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Laguna Canyon Channel to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Aluminum.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The National Recommended Water Quality Critiera for the protection of aquatic life from aluminum is the chronic continuous concentration (expressed as a 4-day average) of 87 ug/L.	
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology	
Spatial Representation:	Data for this line of evidence for Laguna Canyon Channel was collected at 1 monitoring site [Laguna Canyon ~1.5mi above Mouth - 901S00531]	
Temporal Representation:	Data was collected on a single day 5/7/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID	**48179**	**Region 9**
Laguna Canyon Channel		

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the thirteen samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the thirteen samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48179, Arsenic **Region 9**

Laguna Canyon Channel

LOE ID:	74084
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the 12 samples exceeded the water quality objective. Most samples were taken over the duration of storm events with individuals within a composite analyzed.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The CTR for arsenic is 150 ug/L.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from site LCWI02 at Laguna Canyon Channel at Woodland Avenue and site LC-133 at Laguna Canyon Road.
Temporal Representation:	The samples were collected from November 2006 to February 2009.
Environmental Conditions:	Approximately 78 percent of the samples are representative of wet weather conditions.
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Mass Emissions Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 48179, Arsenic **Region 9**

Laguna Canyon Channel

LOE ID:	74082
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Laguna Canyon Channel to determine

	beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The dissolved arsenic criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved arsenic is 0.150 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Laguna Canyon Channel was collected at 1 monitoring site [Laguna Canyon ~1.5mi above Mouth - 901S00531]
Temporal Representation:	Data was collected on a single day 5/7/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID	48182	Region 9
Laguna Canyon Channel		

Pollutant:	**Bifenthrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the One samples exceed the Water Quality Criteria for Bifenthrin. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Water Quality Criteria for Bifenthrin and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48182, Bifenthrin **Region 9**

Laguna Canyon Channel 036149

LOE ID:	74086
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Laguna Canyon Channel to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Bifenthrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Bifenthrin does not exceed 0.0006 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Laguna Canyon Channel was collected at 1 monitoring site [Laguna Canyon ~1.5mi above Mouth - 901S00531]
Temporal Representation:	Data was collected on a single day 5/7/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **48185** **Region 9**

Laguna Canyon Channel

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. One of the 34 samples exceed the California Toxics Rule Objective for Cadmium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.

2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of 34 samples exceeded the California Toxics Rule Objective for Cadmium and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

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Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48185, Cadmium **Region 9**

Laguna Canyon Channel

LOE ID:	74087
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Laguna Canyon Channel to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Cadmium to protect aquatic life in freshwater. The dissolved Cadmium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Laguna Canyon Channel was collected at 1 monitoring site [Laguna Canyon ~1.5mi above Mouth - 901S00531]
Temporal Representation:	Data was collected on a single day 5/7/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 48185, Cadmium **Region 9**

Laguna Canyon Channel

LOE ID:	74089
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	036151
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	33	
Number of Exceedances:	1	
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)	
Data Used to Assess Water Quality:	One of the 33 samples exceeded the water quality objective.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected from site LCWI02 at Laguna Canyon Channel at Woodland Avenue, site SMC00531 at Laguna Canyon Channel, and site LC-133 at Laguna Canyon Road.	
Temporal Representation:	The samples were collected from November 2006 to February 2009.	
Environmental Conditions:	Approximately 78 percent of the samples are representative of wet weather conditions.	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Mass Emissions Monitoring Program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 48185, Cadmium **Region 9**

Laguna Canyon Channel

LOE ID:	74088
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	33
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Zero of the 33 samples (7 at LC-133, 25 at LCWI02, 1 at SMC00531) exceeded the water quality objective for cadmium.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The concentrations of toxic pollutants in the water column, sediments or biota shall not adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Total cadmium levels should not exceed the California Department of Public Health Primary MCL of 5 ug/L
Guideline Reference:	

Spatial Representation:	Samples were collected at the following stations: LC-133-Laguna Canyon Road LCWI02-Woodland Avenue SMC00531-1.5 miles above mouth
Temporal Representation:	Samples were collected between 2006 and 2009.
Environmental Conditions:	
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID 48646 Region 9

Laguna Canyon Channel

Pollutant:	**Chloride**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the One samples exceed the Basin Plan Objective for Chloride. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Basin Plan Objective for Chloride and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48646, Chloride Region 9

Laguna Canyon Channel

LOE ID:	74090
Pollutant:	Chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Laguna Canyon Channel to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chloride.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Chloride objective for the protection of aquatic life according to Table 3-2 for Laguna Canyon Channel within the San Juan Hydrologic Unit is 400 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Laguna Canyon Channel was collected at 1 monitoring site [Laguna Canyon ~1.5mi above Mouth - 901S00531]
Temporal Representation:	Data was collected on a single day 5/7/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 48649 Region 9

Laguna Canyon Channel

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 34 samples exceed the California Toxics Rule Objective for Chromium. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 34 samples exceeded the California Toxics Rule Objective for Chromium and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 48649, Chromium Region 9

Laguna Canyon Channel

LOE ID:	74092	036154

Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	33
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the 33 samples exceeded the water quality objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from site LCWI02 at Laguna Canyon Channel at Woodland Avenue, site SMC00531 at Laguna Canyon Channel, and site LC-133 at Laguna Canyon Road.
Temporal Representation:	The samples were collected from November 2006 to February 2009.
Environmental Conditions:	Approximately 78 percent of the samples are representative of wet weather conditions.
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Mass Emissions Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 48649, Chromium **Region 9**

Laguna Canyon Channel

LOE ID:	74091
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Laguna Canyon Channel to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium. Since the chromium species was not identified, the data point(s) were assessed using both the Chromium III criteria which is hardness-dependent, and the criterion continuous concentration (4-day average) to protect aquatic life in freshwater for chromium VI which is 11 ug/L and is not hardness dependent.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009

SWAMP Data:	SWAMP	036155
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Chromium to protect aquatic life in freshwater. The dissolved Chromium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Laguna Canyon Channel was collected at 1 monitoring site [Laguna Canyon ~1.5mi above Mouth - 901S00531]	
Temporal Representation:	Data was collected on a single day 5/7/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID 48654 Region 9

Laguna Canyon Channel

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 34 samples exceed the California Toxics Rule Objective for Copper. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 34 samples exceeded the California Toxics Rule Objective for Copper and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 48654, Copper Region 9

Laguna Canyon Channel

LOE ID:	74093
Pollutant:	Copper

LOE Subgroup:	Pollutant-Water	036156
Matrix:	Water	
Fraction:	Dissolved	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Laguna Canyon Channel to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Copper to protect aquatic life in freshwater. The dissolved Copper criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Laguna Canyon Channel was collected at 1 monitoring site [Laguna Canyon ~1.5mi above Mouth - 901S00531]	
Temporal Representation:	Data was collected on a single day 5/7/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 48654, Copper **Region 9**

Laguna Canyon Channel

LOE ID:	74094
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	33
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the 33 samples exceeded the water quality objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition

Evaluation Guideline:
Guideline Reference:

Spatial Representation:	The samples were collected from site LCWI02 at Laguna Canyon Channel at Woodland Avenue, site SMC00531 at Laguna Canyon Channel, and site LC-133 at Laguna Canyon Road.
Temporal Representation:	The samples were collected from November 2006 to February 2009.
Environmental Conditions:	Approximately 78 percent of the samples are representative of wet weather conditions.
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Mass Emissions Monitoring Program.
QAPP Information Reference(s):	

DECISION ID 48714 Region 9

Laguna Canyon Channel

Pollutant:	**Cyfluthrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the One samples exceed the Water Quality Criteria for Cyfulthrin. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Water Quality Criteria for Cyfulthrin and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48714, Cyfluthrin Region 9

Laguna Canyon Channel

LOE ID:	74095
Pollutant:	Cyfluthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total

Beneficial Use:	Warm Freshwater Habitat	036158
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Laguna Canyon Channel to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cyfluthrin, total.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of lambda-cyhalothrin does not exceed 0.0005 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Mixtures of lambda-cyhalothrin and other pyrethroids should be considered in an additive manner. (Fojut et al. 2012)Â	
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.	
Spatial Representation:	Data for this line of evidence for Laguna Canyon Channel was collected at 1 monitoring site [Laguna Canyon ~1.5mi above Mouth - 901S00531]	
Temporal Representation:	Data was collected on a single day 5/7/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID	48716	Region 9
Laguna Canyon Channel		

Pollutant:	**Cyhalothrin, Lambda**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a Single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the One samples exceed the Water Quality Criteria for Cyhalothrin, Lambda.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Water Quality Criteria for Cyhalothrin, Lambda and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available

indicating that standards are not met. 036159

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 48716, Cyhalothrin, Lambda **Region 9**

Laguna Canyon Channel

LOE ID:	74096
Pollutant:	Cyhalothrin, Lambda
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Laguna Canyon Channel to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cyhalothrin, lambda, total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Cyhalothrin, lambda, total does not exceed 0.0005 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Laguna Canyon Channel was collected at 1 monitoring site [Laguna Canyon ~1.5mi above Mouth - 901S00531]
Temporal Representation:	Data was collected on a single day 5/7/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **48717** **Region 9**

Laguna Canyon Channel

Pollutant:	**Cypermethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a Single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the One samples exceed the Water Quality Criteria for Cypermethrin.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Water Quality Criteria for Cypermethrin and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 48717, Cypermethrin **Region 9**

Laguna Canyon Channel

LOE ID:	74097
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	One of one sample result was not used in the assessment because the laboratory data was non-detect and the method detection limit was above the guideline and therefore the results could not be quantified with the level of certainty required by the Listing Policy
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of cypermethrin does not exceed 0.0002 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Fojut et al. 2012)
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Laguna Canyon Channel was collected at 1 monitoring site [Laguna Canyon ~1.5mi above Mouth - 901S00531]
Temporal Representation:	Data was collected on a single day 5/7/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID	48719	Region 9
Laguna Canyon Channel		

Pollutant:	**Deltamethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a Single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Deltamethrin.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Evaluation Guideline for Deltamethrin and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48719, Deltamethrin	**Region 9**
Laguna Canyon Channel	

LOE ID:	74098
Pollutant:	Deltamethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Laguna Canyon Channel to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Deltamethrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP

Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for Deltamethrin is the maximum acceptable toxicant concentration (MATC) of 0.02 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Laguna Canyon Channel was collected at 1 monitoring site [Laguna Canyon ~1.5mi above Mouth - 901S00531]
Temporal Representation:	Data was collected on a single day 5/7/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 48720 Region 9

Laguna Canyon Channel

Pollutant:	**Esfenvalerate/Fenvalerate**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a Single line of evidence is necessary to assess listing status. Single lines of evidence are available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Esfenvalerate/Fenvalerate. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Evaluation Guideline for Esfenvalerate/Fenvalerate and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48720, Esfenvalerate/Fenvalerate Region 9

Laguna Canyon Channel

LOE ID:	74101
Pollutant:	Esfenvalerate/Fenvalerate

LOE Subgroup:	Pollutant-Water	036163
Matrix:	Water	
Fraction:	Total	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Laguna Canyon Channel to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Esfenvalerate/Fenvalerate, total.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	According to the USEPA Office of Pesticide Programs Ecotoxicity database, the aquatic life EC50 for Esfenvalerate/Fenvalerate is 0.9 ug/L.	
Guideline Reference:	OPP Pesticide Ecotoxicity Database.	
Spatial Representation:	Data for this line of evidence for Laguna Canyon Channel was collected at 1 monitoring site [Laguna Canyon ~1.5mi above Mouth - 901S00531]	
Temporal Representation:	Data was collected on a single day 5/7/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID	48742	Region 9
Laguna Canyon Channel		

Pollutant:	**Fenpropathrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Fenpropathrin.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Evaluation Guideline for Fenpropathrin and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.

	4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48742, Fenpropathrin **Region 9**

Laguna Canyon Channel

LOE ID:	74104
Pollutant:	Fenpropathrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Laguna Canyon Channel to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Fenpropathrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for Fenpropathrin is the median lethal concentration (LC50; 2.2 ug/L).
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Laguna Canyon Channel was collected at 1 monitoring site [Laguna Canyon ~1.5mi above Mouth - 901S00531]
Temporal Representation:	Data was collected on a single day 5/7/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **48743** **Region 9**

Laguna Canyon Channel

Pollutant:	**Iron**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of

the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the One samples exceed the Basin Plan Objective for Iron.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Basin Plan Objective for Iron and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48743, Iron **Region 9**

Laguna Canyon Channel

LOE ID:	74105
Pollutant:	Iron
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Laguna Canyon Channel to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Iron.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Iron objective for the protection of aquatic life according to Table 3-2 for Laguna Canyon Channel within the San Juan Hydrologic Unit is 0.3 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Laguna Canyon Channel was collected at 1 monitoring site [Laguna Canyon ~1.5mi above Mouth - 901S00531]
Temporal Representation:	Data was collected on a single day 5/7/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.

QAPP Information Reference(s): Surface Water Ambient Monitoring Program Quality Assurance Program R036 036166

DECISION ID	48744	Region 9
Laguna Canyon Channel		

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 34 samples exceed the California Toxics Rule Objective for Lead.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 34 samples exceeded the California Toxics Rule Objective for Lead and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48744, Lead	Region 9
Laguna Canyon Channel	

LOE ID:	74106
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Laguna Canyon Channel to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP

Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Lead to protect aquatic life in freshwater. The dissolved Lead criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Laguna Canyon Channel was collected at 1 monitoring site [Laguna Canyon ~1.5mi above Mouth - 901S00531]
Temporal Representation:	Data was collected on a single day 5/7/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 48744, Lead **Region 9**

Laguna Canyon Channel

LOE ID:	74107
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	33
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the 33 samples exceeded the water quality objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from site LCWI02 at Laguna Canyon Channel at Woodland Avenue, site SMC00531 at Laguna Canyon Channel, and site LC-133 at Laguna Canyon Road.
Temporal Representation:	The samples were collected from November 2006 to February 2009.
Environmental Conditions:	Approximately 78 percent of the samples are representative of wet weather conditions.
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Mass Emissions Monitoring Program.
QAPP Information Reference(s):	

DECISION ID 48745 **Region 9**

Laguna Canyon Channel

Pollutant:	**Manganese**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the One samples exceed the Basin Plan Objective for Manganese.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Basin Plan Objective for Manganese and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48745, Manganese **Region 9**

Laguna Canyon Channel

LOE ID:	74108
Pollutant:	Manganese
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Laguna Canyon Channel to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Manganese.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Manganese objective for the protection of aquatic life according to Table 3-2 for Laguna Canyon Channel within the San Juan Hydrologic Unit is 0.05 mg/L.

Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	036169
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Laguna Canyon Channel was collected at 1 monitoring site [Laguna Canyon ~1.5mi above Mouth - 901S00531]	
Temporal Representation:	Data was collected on a single day 5/7/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID 62900 Region 9

Laguna Canyon Channel

Pollutant:	**Mercury**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1, one line(s) of evidence are necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceed the Objective Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3.Zero of one samples exceeded the Objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1 4. Pursuant to [SECTION 3.11/4.11] of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 62900, Mercury Region 9

Laguna Canyon Channel

LOE ID:	74109
Pollutant:	Mercury
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1

Number of Exceedances:	0	036170
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)	
Data Used to Assess Water Quality:	Zero of one sample exceeded the water quality objective.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	National Recommended Water Quality Criteria Continuous Concentrations (4-day average concentrations) for freshwater aquatic organisms exposure to elemental mercury is 0.77 ug/L.	
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology	
Spatial Representation:	The sample was collected from site LCWI02 at Laguna Canyon Channel at Woodland Avenue.	
Temporal Representation:	The samples was collected on 11/04/2008.	
Environmental Conditions:	The sample was collected from a storm event.	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Mass Emissions Monitoring Program.	
QAPP Information Reference(s):		

DECISION ID	**48746**	**Region 9**
Laguna Canyon Channel		

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 34 samples exceed the California Toxics Rule Objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 34 samples exceeded the California Toxics Rule Objective for Nickel and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48746, Nickel 036171 Region 9

Laguna Canyon Channel

LOE ID:	74110
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Laguna Canyon Channel to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Nickel to protect aquatic life in freshwater. The dissolved Nickel criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Laguna Canyon Channel was collected at 1 monitoring site [Laguna Canyon ~1.5mi above Mouth - 901S00531]
Temporal Representation:	Data was collected on a single day 5/7/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 48746, Nickel Region 9

Laguna Canyon Channel

LOE ID:	74111
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	33
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the 33 samples exceeded the water quality objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from site LCWI02 at Laguna Canyon Channel at Woodland Avenue, site SMC00531 at Laguna Canyon Channel, and site LC-133 at Laguna Canyon Road.
Temporal Representation:	The samples were collected from November 2006 to February 2009.
Environmental Conditions:	Approximately 78 percent of the samples are representative of wet weather conditions.
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Mass Emissions Monitoring Program.
QAPP Information Reference(s):	

DECISION ID 48747 Region 9

Laguna Canyon Channel

Pollutant:	**Nitrogen, ammonia (Total Ammonia)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the One samples exceed the Water Quality Criteria for Nitrogen, ammonia (Total Ammonia). Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Water Quality Criteria for Nitrogen, ammonia (Total Ammonia) and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48747, Nitrogen, ammonia (Total Ammonia) Region 9

Laguna Canyon Channel

LOE ID:	74081	036173

Pollutant:	Nitrogen, ammonia (Total Ammonia)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Laguna Canyon Channel to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Ammonia as N, Total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Aquatic Life Ambient Water Quality Criteria for Ammonia â€“ Freshwater (USEPA 2013): the 30-day rolling average concentration (criterion continuous concentration or CCC) of total ammonia nitrogen(in mg TAN/L) in freshwater are not to be exceeded more than once every three years on average. The CCC values are based on pH and temperature. The CCC formula is found on page 46 and the table of CCC values is on page 49.
Guideline Reference:	Aquatic Life Ambient Water Quality Criteria for Ammonia - Freshwater 2013
Spatial Representation:	Data for this line of evidence for Laguna Canyon Channel was collected at 1 monitoring site [Laguna Canyon ~1.5mi above Mouth - 901S00531]
Temporal Representation:	Data was collected on a single day 5/7/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID	**48748**	**Region 9**
Laguna Canyon Channel		

Pollutant:	**Oxygen, Dissolved**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 14 samples exceed the Basin Plan Objective for Oxygen, Dissolved. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.036174
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 14 samples exceeded the Basin Plan Objective for Oxygen, Dissolved and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48748, Oxygen, Dissolved **Region 9**

Laguna Canyon Channel

LOE ID:	74112
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Laguna Canyon Channel to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Oxygen, Dissolved.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan, San Diego Basin, Warm Water Habitat Objective, Chapter III, General Objectives for all Inland Surface Waters, Enclosed Bays and Estuaries states the following: The dissolved oxygen concentration for warm water habitats shall not be reduced below 5.0 mg/l at any time.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Laguna Canyon Channel was collected at 1 monitoring site [Laguna Canyon ~1.5mi above Mouth - 901S00531]
Temporal Representation:	Data was collected on a single day 5/7/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 48748, Oxygen, Dissolved **Region 9**

Laguna Canyon Channel

LOE ID:	74113
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water

Matrix:	Water	036175
Fraction:	Dissolved	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	13	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Zero of 13 samples exceeded the objective.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Dissolved oxygen levels shall not be less than 5.0 mg/l in inland surface waters with designated MAR or WARM beneficial uses. The annual mean dissolved oxygen concentration shall not be less than 7 mg/l more than 10% of the time.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from the LC-133 and LCWI02 stations.	
Temporal Representation:	Samples were collected approximately four times semi-annually from September 2006 to April 2009.	
Environmental Conditions:		
QAPP Information:	NPDES quality assurance.	
QAPP Information Reference(s):		

DECISION ID **48751** **Region 9**

Laguna Canyon Channel

Pollutant:	**Permethrin, total**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the Zero samples exceed the Water Quality Criteria for Permethrin.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Zero samples exceeded the Water Quality Criteria for Permethrin and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision

After review of the available data and information, RWQCB staff concludes that the water body-

Recommendation: pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48751, Permethrin, total **Region 9**

Laguna Canyon Channel

LOE ID:	74114
Pollutant:	Permethrin, total
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	One of one sample result was not used in the assessment because the laboratory data was detected, but not quantified, and the reporting limit was above the guideline and therefore the results could not be quantified with the level of certainty required by the Listing Policy.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Permethrin does not exceed 0.002 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Laguna Canyon Channel was collected at 1 monitoring site [Laguna Canyon ~1.5mi above Mouth - 901S00531]
Temporal Representation:	Data was collected on a single day 5/7/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **48749** **Region 9**

Laguna Canyon Channel

Pollutant:	**Selenium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. One of the 16

samples exceed the California Toxics Rule Objective for Selenium. 036177

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of 14 samples exceeded the California Toxics Rule Objective for Selenium and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 48749, Selenium **Region 9**

Laguna Canyon Channel

LOE ID:	74118
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	15
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the fifteen samples exceeded the water quality objective. The reporting limits for 18 of the 32 non-detect samples exceeded the objective and were not used in this assessment.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The CTR for selenium is 5.0 ug/L.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from site LCWI02 at Laguna Canyon Channel at Woodland Avenue, site SMC00531 at Laguna Canyon Channel, and site LC-133 at Laguna Canyon Road.
Temporal Representation:	The samples were collected from November 2006 to February 2009.
Environmental Conditions:	Approximately 78 percent of the samples are representative of wet weather conditions.
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Mass Emissions Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 48749, Selenium **Region 9**

Laguna Canyon Channel

LOE ID:	74117	036178

Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Laguna Canyon Channel to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Selenium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The selenium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater is 0.005 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Laguna Canyon Channel was collected at 1 monitoring site [Laguna Canyon ~1.5mi above Mouth - 901S00531]
Temporal Representation:	Data was collected on a single day 5/7/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID	**48750**	**Region 9**
Laguna Canyon Channel		

Pollutant:	**Silver**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the One samples exceed the California Toxics Rule Objective for Silver.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the California Toxics Rule Objective for Silver and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial

use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48750, Silver Laguna Canyon Channel **Region 9**

LOE ID:	74119
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Laguna Canyon Channel to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Silver.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Silver to protect aquatic life in freshwater. The dissolved Silver criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Laguna Canyon Channel was collected at 1 monitoring site [Laguna Canyon ~1.5mi above Mouth - 901S00531]
Temporal Representation:	Data was collected on a single day 5/7/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 48752 **Region 9**
Laguna Canyon Channel

Pollutant:	**Sulfates**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or	Pollutant

Pollution: 036180

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Basin Plan Objective for Sulfates.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Basin Plan Objective for Sulfates and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48752, Sulfates **Region 9**

Laguna Canyon Channel

LOE ID:	74120
Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Laguna Canyon Channel to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Sulfate.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Sulfate objective for the protection of aquatic life according to Table 3-2 for Laguna Canyon Channel within the San Juan Hydrologic Unit is 500 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Laguna Canyon Channel was collected at 1 monitoring site [Laguna Canyon ~1.5mi above Mouth - 901S00531]

Temporal Representation:	Data was collected on a single day 5/7/2009.	036181
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID 48753 Region 9

Laguna Canyon Channel

Pollutant:	**Total Dissolved Solids**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. One of the One samples exceed the Basin Plan Objective for Total Dissolved Solids. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of One samples exceeded the Basin Plan Objective for Total Dissolved Solids and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48753, Total Dissolved Solids Region 9

Laguna Canyon Channel

LOE ID:	74123
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Laguna Canyon Channel to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for

	Dissolved Solids.	036182
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Dissolved Solids objective for the protection of aquatic life according to Table 3-2 for Laguna Canyon Channel within the San Juan Hydrologic Unit is 1000 mg/L.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Laguna Canyon Channel was collected at 1 monitoring site [Laguna Canyon ~1.5mi above Mouth - 901S00531]	
Temporal Representation:	Data was collected on a single day 5/7/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID 48755 Region 9

Laguna Canyon Channel

Pollutant:	**Turbidity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the One samples exceed the Basin Plan Objective for Turbidity. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Basin Plan Objective for Turbidity and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48755, Turbidity Region 9

Laguna Canyon Channel

LOE ID:	74127
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Laguna Canyon Channel to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Turbidity(NTU).
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Turbidity(NTU) objective for the protection of aquatic life according to Table 3-2 for Laguna Canyon Channel within the San Juan Hydrologic Unit is 20 NTU.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Laguna Canyon Channel was collected at 1 monitoring site [Laguna Canyon ~1.5mi above Mouth - 901S00531]
Temporal Representation:	Data was collected on a single day 5/7/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID	**48756**	**Region 9**
Laguna Canyon Channel		

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the 34 samples exceed the California Toxics Rule Objective for Zinc. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.

3. Zero of 34 samples exceeded the California Toxics Rule Objective for Zinc and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48756, Zinc **Region 9**

Laguna Canyon Channel

LOE ID:	74129
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	33
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the 33 samples exceeded the water quality objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from site LCWI02 at Laguna Canyon Channel at Woodland Avenue, site SMC00531 at Laguna Canyon Channel, and site LC-133 at Laguna Canyon Road.
Temporal Representation:	The samples were collected from November 2006 to February 2009.
Environmental Conditions:	Approximately 78 percent of the samples are representative of wet weather conditions.
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Mass Emissions Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 48756, Zinc **Region 9**

Laguna Canyon Channel

LOE ID:	74128
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water

Matrix:	Water	036185
Fraction:	Dissolved	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Laguna Canyon Channel to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Zinc to protect aquatic life in freshwater. The dissolved Zinc criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Laguna Canyon Channel was collected at 1 monitoring site [Laguna Canyon ~1.5mi above Mouth - 901S00531]	
Temporal Representation:	Data was collected on a single day 5/7/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID	48758	Region 9
Laguna Canyon Channel		

Pollutant:	**pH**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. One of the Seven samples exceed the Basin Plan Objective for pH.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of Seven samples exceeded the Basin Plan Objective for pH and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.

4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48758, pH **Region 9**

Laguna Canyon Channel

LOE ID:	74115
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Laguna Canyon Channel to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for pH.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	In inland surface waters the pH shall not be depressed below 6.5 nor raised above 8.5.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Laguna Canyon Channel was collected at 1 monitoring site [Laguna Canyon ~1.5mi above Mouth - 901S00531]
Temporal Representation:	Data was collected on a single day 5/7/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 48758, pH **Region 9**

Laguna Canyon Channel

LOE ID:	74116
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	One of 6 samples exceeded the objective.

Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	036187
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The pH of all inland surface waters shall not be depressed below 6.5 or raised above 8.5 as a result of waste discharges.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from the LC-133 station.	
Temporal Representation:	Samples were collected approximately twice semi-annually from September 2006 to April 2009.	
Environmental Conditions:		
QAPP Information:	NPDES quality assurance.	
QAPP Information Reference(s):		

DECISION ID	**48645**	**Region 9**
Laguna Canyon Channel		

Pollutant:	**Benthic Community Effects**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Benthic Community Effects is being considered for placement on the CWA section 303(d) List under sections 3.9 and 3.1 of the Listing Policy. Under section 3.9, an additional line of evidence associating Benthic Community Effects with a water or sediment concentration of pollutant(s) is necessary to assess listing status. Based on the readily available data and information, the weight of evidence provides sufficient justification for placing Benthic Community Effects in this water segment on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Pursuant to section 3.9 of the Listing Policy, the water exhibits significant degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index. 4. Pursuant to section 3.9 of the Listing Policy, the water segment has associated pollutant(s) samples that exceed water quality objectives. 5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are being met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant(s) contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 48645, Benthic Community Effects	**Region 9**
Laguna Canyon Channel	

LOE ID:	21399	036188
Pollutant:	Toxicity	
LOE Subgroup:	Toxicity	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	4	
Number of Exceedances:	4	
Data and Information Type:	Ambient toxicity testing (chronic)	
Data Used to Assess Water Quality:	Four samples were collected at Laguna Canyon Creek station 901SJLAG2 from October 2002 to May 2003. The samples showed significant toxicity levels (SL) in the following tests: Selenastrum algae growth test - four out of four samples were toxic. Ceriodaphnia dubia survival/reproductive test - Three of the four samples were toxic.	
Data Reference:	Monitoring data for Region 9	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold (EPA, 2002).	
Guideline Reference:	Monitoring data for Region 9	
Spatial Representation:	Water samples were collected at Laguna Canyon Creek 2station 901SJLAG2. (Latitude 33.5726, Longitude -117.7629).	
Temporal Representation:	Water samples were collected on October 2002, January 2003, April 2003, and May 2003.	
Environmental Conditions:		
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.	
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA	

Line of Evidence (LOE) for Decision ID 48645, Benthic Community Effects **Region 9**

Laguna Canyon Channel

LOE ID:	2994
Pollutant:	Sediment Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	2
Data and Information Type:	Toxicity testing of sediments
Data Used to Assess Water Quality:	Two out of four samples displayed statistically significant toxicity in the survival endpoint when compared to the negative control based on a statistical test with alpha of less than 5%. All samples were tested using the 10-day Hyallela azteca test. All data points had no associated QA qualifiers (SWAMP, 2004).
Data Reference:	Placeholder reference 2006 303(d)

SWAMP Data:	SWAMP	036189
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the Regional Board (Region 9 Basin Plan, pages 3-15 to 3-16; September 8, 1994).	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	All samples were collected from one station, Laguna Canyon Creek 2.	
Temporal Representation:	Samples were collected from October 2002 through May 2003. Toxicity in the survival endpoint was detected in samples collected on October 29, 2002 and January 14, 2003.	
Environmental Conditions:		
QAPP Information:	SWAMP QAPP.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 48645, Benthic Community Effects **Region 9**

Laguna Canyon Channel

LOE ID:	80738
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	4
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Of seven samples collected at two stations, four samples were below the 0.79 threshold, and therefore exceeding the water quality objective for the aquatic life beneficial use. Three samples did not have scores calculated due to low organism counts.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009 Data for Various Waterbodies in Region 8 and Region 9, 2006-2009. Region 9 CSCI Scores & Water Body Information
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.

Guideline Reference:	The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.
Spatial Representation:	Samples were collected at stations LC-133 and 901S00531
Temporal Representation:	The samples were collected from 2006 to 2009.
Environmental Conditions:	
QAPP Information:	Data collected following SWAMP QA protocols for the County of Orange NPDES MS4 Copermittees Receiving Waters Monitoring and Reporting Program and the SWAMP RWB9 Stormwater Monitoring Council CY 2009 following SWAMP protocols and stored in the SWAMP database.
QAPP Information Reference(s):	RWB9 Stormwater Monitoring Council CY 2009 Quality Assurance Project Plan for the Orange County Stormwater Program.

Line of Evidence (LOE) for Decision ID 48645, Benthic Community Effects **Region 9**

Laguna Canyon Channel

LOE ID:	74124
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	3
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Either samples were collected to evaluate water toxicity. Three of the nine samples exhibited statistical and biological significant toxicity. The toxicity tests that exhibited significant toxicity included Ceriodaphnia reproduction and survival, Hyallela survival and Selenastrum.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Toxic substances shall not be discharged at levels that will bioaccumulate in aquatic resources to levels which are harmful to human health.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control. Additionally, the biological significance of the sample is evaluated by determining if the sample response is lower than the evaluation threshold.
Guideline Reference:	
Spatial Representation:	The samples were collected at stations LC-133 Laguna Canyon Channel.
Temporal Representation:	The samples were collected approximately quarterly from June 2006 to November 2009.
Environmental Conditions:	
QAPP Information:	The data collected under the Quality Assurance Management Plan for The Orange County Stormwater Program. The SWAMP measurement quality objectives were followed for toxicity data. The performance of toxicity bioassays and evaluation of reference toxicants were performed using USEPA and Standard Methods.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 48645, Benthic Community Effects **Region 9**

Laguna Canyon Channel

LOE ID:	74125

Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	4
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Six samples were collected to test for toxicity. Four of the six samples exhibited statistically and biologically significant toxicity. The toxicity tests that exhibited significant toxicity included Purple Urchin development and fertilization and Mysid Biomass and survival.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control. Additionally, the biological significance of the sample was evaluted by determining whether the sample response was lower than the evaluation threshold.
Guideline Reference:	
Spatial Representation:	The sample was collected at station LCWI02 Laguna Canyon Channel.
Temporal Representation:	The sample was collected from November 2006 to February 2009.
Environmental Conditions:	
QAPP Information:	The data collected under the Quality Assurance Management Plan for The Orange County Stormwater Program. The SWAMP measurement quality objectives were followed for toxicity data. The performance of toxicity bioassays and evaluation of reference toxicants were performed using USEPA and Standard Methods.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 48645, Benthic Community Effects **Region 9**

Laguna Canyon Channel

LOE ID:	74126
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate water toxicity. The sample exhibited significant toxicity. The toxicity test included survival and reproduction of Ceriodaphnia dubia. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009

SWAMP Data:	SWAMP	036192
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL, Significant compared to negative control based on statistical test, less than stated alpha level, AND less than the evaluation threshold (both criteria are met).	
Guideline Reference:		
Spatial Representation:	The sample was collected at station 901S00531.	
Temporal Representation:	The sample was collected in May 2009.	
Environmental Conditions:		
QAPP Information:	Data quality is good. Data results were recorded in the SWAMP database and followed SWAMP protocols.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 48645, Benthic Community Effects **Region 9**

Laguna Canyon Channel

LOE ID:	72794
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	6
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Six out of the six samples collected had IBI scores below 40. The samples were collected from one site over four years. The scores are fall 2006 22.9, spring 2007 12.9, fall 2007 21.5, spring 2008 5.7, fall 2008 21.5, and spring 2009 8.6.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the State or Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	Development of a Benthic Index of Biotic Integrity (B-IBI) for Wadeable Streams in Northern Coastal California and its Application to Regional 305(b) Assessment
Spatial Representation:	Samples were collected at station LC-133 Laguna Canyon Channel.
Temporal Representation:	The samples were collected in the fall and spring from 2006 to 2009.

Environmental Conditions: 036193

QAPP Information: The taxonomic analysis followed the guidelines of the Southern California Freshwater and Marine Invertebrate Taxonomic Associations (SAFIT, SCAMIT). All stream bioassessment sample collection and taxonomic analysis follow the Southern California Regional

QAPP Information Reference(s): Quality Assurance Project Plan for the Orange County Stormwater Program.

Line of Evidence (LOE) for Decision ID 48645, Benthic Community Effects **Region 9**

Laguna Canyon Channel

LOE ID: 74085

Pollutant: Benthic-Macroinvertebrate Bioassessments
LOE Subgroup: Population/Community Degradation
Matrix: Water
Fraction: None

Beneficial Use: Warm Freshwater Habitat

Number of Samples: 1
Number of Exceedances: 1

Data and Information Type: Benthic macroinvertebrate surveys

Data Used to Assess Water Quality: The IBI score for this water body was 3 which indicates that this water body may be considered to have impaired conditions.

Data Reference: RWB9 Stormwater Monitoring Council CY 2009

SWAMP Data: SWAMP

Water Quality Objective/Criterion: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.

Objective/Criterion Reference: Water Quality Control Plan for the San Diego Basin

Evaluation Guideline: The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.

Guideline Reference: A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13

Spatial Representation: Samples were collected at the following station: 901S00531-Laguna Canyon ~1.5mi above Mouth.

Temporal Representation: Surveys done May 7, 2009.

Environmental Conditions:

QAPP Information: Data collected following SWAMP QA protocols for the Southern California Stormwater Monitoring Coalition Project.

QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 48645, Benthic Community Effects **Region 9**

Laguna Canyon Channel

LOE ID: 74109

Pollutant: Mercury
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Warm Freshwater Habitat

Number of Samples: 1

Number of Exceedances:	0	036194

Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Zero of one sample exceeded the water quality objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	National Recommended Water Quality Criteria Continuous Concentrations (4-day average concentrations) for freshwater aquatic organisms exposure to elemental mercury is 0.77 ug/L.
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	The sample was collected from site LCWI02 at Laguna Canyon Channel at Woodland Avenue.
Temporal Representation:	The samples was collected on 11/04/2008.
Environmental Conditions:	The sample was collected from a storm event.
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Mass Emissions Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 48645, Benthic Community Effects **Region 9**

Laguna Canyon Channel

LOE ID:	9091
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	2
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Four water samples were collected at Laguna Canyon Creek Station 2 (901SJLAG2) on October 2002, January 2003, April 2003, and May 2003 for California's Surface Water Ambient Monitoring Program. Two of the four samples showed excessive nitrogen concentrations (SWAMP, 2007).
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses (RWQCB, 2007) A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used (RWQCB, 2007)

Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	036195
Evaluation Guideline:		
Guideline Reference:	Water Quality Control Plan for the San Diego Basin	
Spatial Representation:	Water samples were collected at Laguna Canyon Creek 2 Station (901SJLAG2). (Latitude 33.5726, Longitude -117.7628).	
Temporal Representation:	Samples were collected on October 2002, January 2003, April 2003, and May 2003.	
Environmental Conditions:		
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.	
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA	

Line of Evidence (LOE) for Decision ID 48645, Benthic Community Effects **Region 9**

Laguna Canyon Channel

LOE ID:	9092
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Four water samples were collected at Laguna Canyon Creek Station 2 (901SJLAG2) on October 2002, January 2003, April 2003, and May 2003 for California's Surface Water Ambient Monitoring Program. All four samples showed excessive phosphorus concentrations (SWAMP, 2007).
Data Reference:	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses (RWQCB, 2007) Water Quality Control Plan for the San Diego Basin Goal of 0.1 mg/L for total phosphorus in streams and other flowing waters (RWQCB, 2007)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Water samples were collected at Laguna Canyon Creek 2 Station (901SJLAG2). (Latitude 33.5726, Longitude -117.7628).
Temporal Representation:	Samples were collected on October 2002, January 2003, April 2003, and May 2003.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

DECISION ID **48801** **Region 9**

Laguna Canyon Channel 036196

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.3 of the Listing Policy. Under section 3.3 a single line of evidence is necessary to assess listing status.

Six lines of evidence are available in the administrative record to assess this pollutant. Fifteen of the 15 samples exceed the Single Sample Maximum Objective and One out of One samples exceeded the Geomean objective for Enterococcus. Eight out of Fifteen samples exceeded the Single Sample Maximum Objective and One out of One samples exceeded the Geomean Objective for Fecal Coliform.
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Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Fifteen of the 15 samples exceed the Single Sample Maximum Objective and One out of One samples exceeded the Geomean objective for Enterococcus. Eight out of Fifteen samples exceeded the Single Sample Maximum Objective and One out of One samples exceeded the Geomean Objective for Fecal Coliform, and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 48801, Indicator Bacteria — Region 9

Laguna Canyon Channel

LOE ID:	74100
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	The one geomean exceeded the enterococcus objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	The geometric mean enterococcus concentration shall not exceed more than 33/100ml. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from site LCWI02, Laguna Canyon Channel at Woodland Avenue.
Temporal Representation:	The samples were collectedin November 2006 to February 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Mass Emissions Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 48801, Indicator Bacteria **Region 9**

Laguna Canyon Channel

LOE ID:	74103
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	The one geomean exceeded the fecal coliform objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean fecal coliform concentration shall not exceed more than 200/100ml. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from site LCWI02, Laguna Canyon Channel at Woodland Avenue.
Temporal Representation:	The samples were collectedin November 2006 to February 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Mass Emissions Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 48801, Indicator Bacteria **Region 9**

Laguna Canyon Channel

LOE ID:	74102
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation	036198
Number of Samples:	15	
Number of Exceedances:	8	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Eight of the fifteen samples exceeded the fecal coliform objective.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The single sample fecal coliform concentration shall not exceed more than 400/100ml. Region 9 Basin Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected from site LCWI02, Laguna Canyon Channel at Woodland Avenue.	
Temporal Representation:	The samples were collectedin November 2006 to February 2009.	
Environmental Conditions:		
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Mass Emissions Monitoring Program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 48801, Indicator Bacteria **Region 9**

Laguna Canyon Channel

LOE ID:	74099
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	15
Number of Exceedances:	15
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Fifteen of the fifteen samples exceeded the enterococcus objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample enterococcus concentration shall not exceed more than 61/100ml. Region 9 Basin Plan. Ambient Water Quality Criteria USEPA.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from site LCWI02, Laguna Canyon Channel at Woodland Avenue.
Temporal Representation:	The samples were collectedin November 2006 to February 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Mass Emissions Monitoring Program.
QAPP Information Reference(s):	

DECISION ID **43194** **Region 9**

Laguna Canyon Channel

Pollutant:	**Phosphorus**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2023
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the section 303(d) list under sections 3.1 and 3.6 of the Listing Policy. Under sections 3.1 and 3.6 a single line of evidence is necessary to assess listing status.

Two line of evidence is available in the administrative record to assess this pollutant. Four of the 4 samples exceed the water quality objective and Four of the Four samples exhibited water toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Four of the 4 samples exceed the water quality objective and Four of the Four samples exhibited water toxicity and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 43194, Phosphorus **Region 9**

Laguna Canyon Channel

LOE ID:	21399
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Four samples were collected at Laguna Canyon Creek station 901SJLAG2 from October 2002 to May 2003. The samples showed significant toxicity levels (SL) in the following tests: Selenastrum algae growth test - four out of four samples were toxic. Ceriodaphnia dubia survival/reproductive test - Three of the four samples were toxic.
Data Reference:	Monitoring data for Region 9

SWAMP Data:	Non-SWAMP	036200
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold (EPA, 2002).	
Guideline Reference:	Monitoring data for Region 9	
Spatial Representation:	Water samples were collected at Laguna Canyon Creek 2station 901SJLAG2. (Latitude 33.5726, Longitude -117.7629).	
Temporal Representation:	Water samples were collected on October 2002, January 2003, April 2003, and May 2003.	
Environmental Conditions:		
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.	
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA	

Line of Evidence (LOE) for Decision ID 43194, Phosphorus **Region 9**

Laguna Canyon Channel

LOE ID:	9092
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Four water samples were collected at Laguna Canyon Creek Station 2 (901SJLAG2) on October 2002, January 2003, April 2003, and May 2003 for California's Surface Water Ambient Monitoring Program. All four samples showed excessive phosphorus concentrations (SWAMP, 2007).
Data Reference:	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses (RWQCB, 2007) Water Quality Control Plan for the San Diego Basin Goal of 0.1 mg/L for total phosphorus in streams and other flowing waters (RWQCB, 2007)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Water samples were collected at Laguna Canyon Creek 2 Station (901SJLAG2). (Latitude 33.5726, Longitude -117.7628).
Temporal Representation:	Samples were collected on October 2002, January 2003, April 2003, and May 2003.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance

	with the California's Surface Water Ambient Monitoring Program. 036201
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

DECISION ID 43329 Region 9

Laguna Canyon Channel

Pollutant:	**Total Nitrogen as N**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Two of the Four samples exceed the Basin Plan Objective for Total Nitrogen as N. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Two of Four samples exceed the Basin Plan Objective for Total Nitrogen as N and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 43329, Total Nitrogen as N Region 9

Laguna Canyon Channel

LOE ID:	9091
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	2
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Four water samples were collected at Laguna Canyon Creek Station 2 (901SJLAG2) on October 2002, January 2003, April 2003, and May 2003 for California's Surface Water Ambient Monitoring Program. Two of the four samples showed excessive nitrogen

concentrations (SWAMP, 2007). 036202

Data Reference: Monitoring data for Region 9

SWAMP Data: SWAMP

Water Quality Objective/Criterion: Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses (RWQCB, 2007)

A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used (RWQCB, 2007)

Objective/Criterion Reference: Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:

Guideline Reference: Water Quality Control Plan for the San Diego Basin

Spatial Representation: Water samples were collected at Laguna Canyon Creek 2 Station (901SJLAG2). (Latitude 33.5726, Longitude -117.7628).

Temporal Representation: Samples were collected on October 2002, January 2003, April 2003, and May 2003.

Environmental Conditions:

QAPP Information: Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.

QAPP Information Reference(s): 2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Aliso Creek
Water Body ID: CAR9011300019990208093130
Water Body Type: River & Stream

DECISION ID 43129 **Region 9**
Aliso Creek

Pollutant: Selenium
Final Listing Decision: Do Not Delist from 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Sources: Source Unknown
Expected TMDL Completion Date: 2021
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for removal from the CWA section 303(d) List under section 4.1 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess pollutant. Twelve of the 15 samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Twelve of the 15 samples exceed the water quality objective and this exceeds the allowable frequency listed in Table 4.1 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 43129, Selenium **Region 9**
Aliso Creek

LOE ID: 9076

Pollutant: Selenium
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Dissolved

Beneficial Use: Warm Freshwater Habitat

Number of Samples:	4	036204
Number of Exceedances:	3	
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)	
Data Used to Assess Water Quality:	Four water samples were collected at Aliso Creek station 901SJALC6 on October 2002, January, April, May 2003, three showed excessive selenium concentrations. Results are from California's Surface Water Ambient Monitoring Program Report, 2007.	
Data Reference:	Monitoring data for Region 9	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	CTR Freshwater Chronic (CCC) 5 ug/L. (U.S. EPA, 2000).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA	
Evaluation Guideline:		
Guideline Reference:	Water Quality Control Plan for the San Diego Basin	
Spatial Representation:	Water samples were collected at Aliso Creek station (901SJALC6).	
Temporal Representation:	Data was collected on October 2002, January 2003, April 2003, May 2003.	
Environmental Conditions:	Samples were collected during wet weather.	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.	
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA	

Line of Evidence (LOE) for Decision ID 43129, Selenium **Region 9**

Aliso Creek

LOE ID:	72947
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Aliso Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Selenium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The selenium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater is 0.005 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Aliso Creek was collected at 1 monitoring site [Aliso Creek ~0.7mi above Aliso Cr. Rd. - 901S01811]
Temporal Representation:	Data was collected on a single day 5/7/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.

QAPP Information:	The SWAMP QAPP (2008) was followed.	036205
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 43129, Selenium **Region 9**

Aliso Creek

LOE ID:	72948
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	10
Number of Exceedances:	8
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Eight of the ten samples exceed the criteria for selenium.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The CTR for selenium is 5.0 ug/L.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Aliso Creek at Camino Capistrano (AC-CCR), at Aliso / Wood Canyon Wilderness Park (ACJ01), and at Pacific Park (AC-PPD).
Temporal Representation:	Samples were collected intermittently from stations: AC-CCR from May 2007 through May 2009, ACJ01 from September 2006 through February 2009, and from AC-PPD from September 2006 through April 2009.
Environmental Conditions:	Approximately 50% of the samples were collected after a storm event.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID **46397** **Region 9**

Aliso Creek

Pollutant:	**Toxicity**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown | Unknown Nonpoint Source | Unknown Point Source
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:	This pollutant is being considered for removal from the CWA section 303(d) List under section 4.6 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status. Five lines of evidence are available in the administrative record to assess pollutant. Fifteen of 47 samples exceed the water quality objective for Toxicity. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Fifteen of 47 samples exceed the water quality objective for Toxicity and this exceeds the allowable frequency listed in Table 4.1 of the Listing Policy. 4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 46397, Toxicity **Region 9**

Aliso Creek

LOE ID:	23504
Pollutant:	Toxicity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	15
Number of Exceedances:	2
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Selenastrum Algae Growth- None of the 15 samples exhibited NOECÂ's less than 100%. Ceriodaphnia dubia -Survival- Two of the 15 samples exhibited NOECÂ's less than 100%. Ceriodaphnia dubia -Reproduction- Two of the 15 samples exhibited NOECÂ's less than 100%. Fathead Minnow survival- None of the three samples exhibited NOECÂ's less than 100%. Fathead Minnow growth- None of the three samples exhibited NOECÂ's less than 100%. Hyalella azteca survival- None of the 15 samples exhibited LC50Â's less than 100% according to results in the Orange County Storm Water Annual Progress Report, 2007. Samples were collected from 2003-2005.
Data Reference:	Orange County Stormwater Program. 2004-2007. Unified Annual Progress Reports. Program Effectiveness Assessment (San Diego Region)
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	All waters shall be sustain free from toxic substances in concentrations that are toxic to, or that produce harmful physiological responses in human, plant, animal, or aquatic life (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Samples were found to exhibit toxicity when the No Observed Effect Concentration (NOEC) or median lethal concentration (LC50) for any given species was estimated to be less than 100% of the test sample concentration and signficantly different than the control.
Guideline Reference:	Waste Discharge Requirements for Discharges of Urban Runoff From the Municipal Separate Storm Sewer Systems Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego, the San Diego Unified Port District, and the San Diego County Regional Airport. Order No. R9-2007-0001
Spatial Representation:	There are three sampling locations along Aliso Creek. Sampling locations are Aliso/Woods Canyon Park, Country Club Road, and Pacific Park Dr.
Temporal Representation:	Samples were collected from 2003-2005.
Environmental Conditions:	
QAPP Information:	Quality control for the toxicity portion of this study was conducted in accordance with the County of Orange's NPDES monitoring program.
QAPP Information Reference(s):	Orange County Stormwater Program. 2004-2007. Unified Annual Progress Reports. Program Effectiveness Assessment (San Diego Region)

Line of Evidence (LOE) for Decision ID 46397, Toxicity **Region 9**

Aliso Creek

LOE ID:	72956
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate water toxicity. None of the samples exhibited significant toxicity. The toxicity test included survival of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL, Significant compared to negative control based on statistical test, less than stated alpha level, AND less than the evaluation threshold (both criteria are met).
Guideline Reference:	
Spatial Representation:	The sample was collected at station 901S01811.
Temporal Representation:	The sample was collected in May 2009.

Environmental Conditions: 036208

QAPP Information: All data was collected following the Standard Operating Procedures and Data Quality Objectives outlined in the SWAMP QAMP, (Puckett, 2002). QA data are included in submission.

QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 46397, Toxicity **Region 9**

Aliso Creek

LOE ID: 72955

Pollutant: Toxicity
LOE Subgroup: Toxicity
Matrix: Water
Fraction: None

Beneficial Use: Warm Freshwater Habitat

Number of Samples: 31
Number of Exceedances: 13

Data and Information Type: TOXICITY TESTING
Data Used to Assess Water Quality: Thirty-one samples were collected to test for toxicity. Thirteen of the 31 samples exhibited statistically and biologically significant toxicity. The toxicity tests that exhibited significant toxicity included Fathead Minnow biomass and survival, Mysid biomass and survival, Purple Urchin development, Hyallela biomass and survial and survival and reproduction of Ceriodaphnia dubia.
Data Reference: Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference: Water Quality Control Plan for the San Diego Basin

Evaluation Guideline: Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control. Additionally, the biological significance of the sample was evaluted by determining whether the sample response was lower than the evaluation threshold.
Guideline Reference:

Spatial Representation: The samples were collected at stations AC-CCR, ACJ01, and AC-PPD Aliso Creek.
Temporal Representation: The samples were collected approximately twice a year from 2006 to 2009.
Environmental Conditions:
QAPP Information: The data collected under the Quality Assurance Management Plan for The Orange County Stormwater Program. The SWAMP measurement quality objectives were followed for toxicity data. The performance of toxicity bioassays and evaluation of reference toxicants were performed using USEPA and Standard Methods.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 46397, Toxicity **Region 9**

Aliso Creek

LOE ID: 72940

Pollutant: Malathion
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total Dissolved

Beneficial Use:	Warm Freshwater Habitat	036209
Number of Samples:	41	
Number of Exceedances:	8	
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)	
Data Used to Assess Water Quality:	Eight of forty one samples exceed the maximum (Instantaneous) concentration for Malathion in freshwater of 100 ng/L.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The maximum (Instantaneous) concentration for Malathion in freshwater is 100 ng/L.	
Guideline Reference:	Quality Criteria for Water. USEPA Office of Water and Hazardous Materials. Washington, D.C	
Spatial Representation:	Forty one samples were collected at Aliso Creek at sites ACJ01, AC-PPD and AC-CCR.	
Temporal Representation:	Samples were collected from 2006 through 2009.	
Environmental Conditions:	According to the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010, samples were collected during the dry season and storm events.	
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 46397, Toxicity **Region 9**

Aliso Creek

LOE ID:	72948
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	10
Number of Exceedances:	8
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Eight of the ten samples exceed the criteria for selenium.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The CTR for selenium is 5.0 ug/L.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition

Spatial Representation:	Samples were collected from Aliso Creek at Camino Capistrano (AC-CCR), at Aliso / Wood Canyon Wilderness Park (ACJ01), and at Pacific Park (AC-PPD).
Temporal Representation:	Samples were collected intermittently from stations: AC-CCR from May 2007 through May 2009, ACJ01 from September 2006 through February 2009, and from AC-PPD from September 2006 through April 2009.
Environmental Conditions:	Approximately 50% of the samples were collected after a storm event.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 46397, Toxicity **Region 9**

Aliso Creek

LOE ID:	4442
Pollutant:	Toxicity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	Unspecified
Guideline Reference:	Placeholder reference pre-2006 303(d)
Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

DECISION ID **46398** **Region 9**

Aliso Creek

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not Delist from 303(d) list (being addressed with USEPA approved TMDL)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
TMDL Name:	Bacteria Impaired Waters I (creeks and beach shorelines)
TMDL Project Code:	169
Date TMDL Approved by USEPA:	06/22/2011
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for removal from the CWA section 303(d) List under section 4.2 and 4.3 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Six lines of evidence are available in the administrative record to assess this pollutant, one of which is a placeholder from 2006. Thirteen of the 14 samples for Enterococcus and 10 of 14 samples for Fecal Coliform exceed their corresponding objectives.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Thirteen of the 14 samples for Enterococcus and10 of 14 samples for Fecal Coliform exceed their corresponding objectives and these exceed the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 46398, Indicator Bacteria **Region 9**

Aliso Creek

LOE ID:	72969
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	13
Number of Exceedances:	12
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Twelve of the thirteen samples exceeded the enterococcus objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample enterococcus concentration shall not exceed more than 61/100ml. Ambient Water Quality Criteria USEPA. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from site ACJ01, Aliso Creek at Aliso / Wood Canyon Wilderness Park.
Temporal Representation:	The samples were collectedin April and December of 2007 and January 2008 and February 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Mass Emissions Monitoring Program.

QAPP Information Reference(s): 036212

Line of Evidence (LOE) for Decision ID 46398, Indicator Bacteria **Region 9**

Aliso Creek

LOE ID:	72970
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	The one geomean exceeded the enterococcus objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean enterococcus concentration shall not exceed more than 33/100ml. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from site ACJ01, Aliso Creek at Aliso / Wood Canyon Wilderness Park.
Temporal Representation:	The samples were collectedin April and December of 2007 and January 2008 and February 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Mass Emissions Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 46398, Indicator Bacteria **Region 9**

Aliso Creek

LOE ID:	4440
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Water Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Unspecified	036213
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)	
Evaluation Guideline:	Unspecified	
Guideline Reference:	Placeholder reference pre-2006 303(d)	
Spatial Representation:	Unspecified	
Temporal Representation:	Unspecified	
Environmental Conditions:	Unspecified	
QAPP Information:	Unspecified	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 46398, Indicator Bacteria **Region 9**

Aliso Creek

LOE ID:	72973
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	The one geomean exceeded the fecal coliform objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean fecal coliform concentration shall not exceed more than 200/100ml. Region 9 Basion Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from site ACJ01, Aliso Creek at Aliso / Wood Canyon Wilderness Park.
Temporal Representation:	The samples were collectedin April and December of 2007 and January 2008 and February 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Mass Emissions Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 46398, Indicator Bacteria **Region 9**

Aliso Creek

LOE ID:	72972
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	13	036214
Number of Exceedances:	9	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Nine of the thirteen samples exceeded the fecal coliform objective.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The single sample fecal coliform concentration shall not exceed more than 400/100ml. Region 9 Basion Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected from site ACJ01, Aliso Creek at Aliso / Wood Canyon Wilderness Park.	
Temporal Representation:	The samples were collectedin April and December of 2007 and January 2008 and February 2009.	
Environmental Conditions:		
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Mass Emissions Monitoring Program.	
QAPP Information Reference(s):		

DECISION ID	**47599**	**Region 9**
Aliso Creek		

Pollutant:	**Alkalinity as CaCO3**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of 1 sample did not exceed the evaluation guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 1 sample did not exceed the evaluation guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47599, Alkalinity as CaCO3 **Region 9**

Aliso Creek

LOE ID:	72925
Pollutant:	Alkalinity as CaCO3
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Aliso Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Alkalinity as CaCO3.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Alkalinity as CaCO3 criteria for the protection of freshwater aquatic life is 20000 ug/L (National Recommended Water Quality Criteria, 2009).
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for Aliso Creek was collected at 1 monitoring site [Aliso Creek ~0.7mi above Aliso Cr. Rd. - 901S01811]
Temporal Representation:	Data was collected on a single day 5/7/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **47600** **Region 9**

Aliso Creek

Pollutant:	**Aluminum**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of 1 sample exceeds the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section

303(d) List. 036216

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 1 sample exceeds the water quality objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47600, Aluminum **Region 9**
Aliso Creek

LOE ID:	72926
Pollutant:	Aluminum
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Aliso Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Aluminum.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The National Recommended Water Quality Critiera for the protection of aquatic life from aluminum is the chronic continuous concentration (expressed as a 4-day average) of 87 ug/L.
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for Aliso Creek was collected at 1 monitoring site [Aliso Creek ~0.7mi above Aliso Cr. Rd. - 901S01811]
Temporal Representation:	Data was collected on a single day 5/7/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **47601** **Region 9**
Aliso Creek

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Three lines of evidence are available in the administrative record to assess this pollutant. Zero of 63 samples exceed the criteria in water and 0 of 1 sample exceeds the criteria in sediment. No samples exhibited sediment toxicity because none were collected.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 63 samples exceed the criteria in water and 0 of 1 sample exceeds the criteria in sediment and this sample size is sufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 47601, Arsenic **Region 9**

Aliso Creek

LOE ID:	72931
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	41
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the 41 samples exceeded the water quality objective for arsenic.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36

	(section 131.36 revised at 57 FR 60848, December 22, 1992).	036218
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The CTR for arsenic is 150 ug/L.	
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Spatial Representation:	Samples were collected from Aliso Creek at Camino Capistrano (AC-CCR), at Aliso / Wood Canyon Wilderness Park (ACJ01), and at Pacific Park (AC-PPD).	
Temporal Representation:	Samples were collected intermittently from stations: AC-CCR from May 2007 through May 2009, ACJ01 from September 2006 through February 2009, and from AC-PPD from September 2006 through April 2009.	
Environmental Conditions:	Approximately 50% of the samples were collected after a storm event.	
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 47601, Arsenic **Region 9**

Aliso Creek

LOE ID:	72928
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Aliso Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for arsenic is 33 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Aliso Creek was collected at 1 monitoring site [Aliso Creek ~0.7mi above Aliso Cr. Rd. - 901S01811]
Temporal Representation:	Data was collected on a single day 5/7/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47601, Arsenic **Region 9**

Aliso Creek

LOE ID:	72929

Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Aliso Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The dissolved arsenic criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved arsenic is 0.150 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Aliso Creek was collected at 1 monitoring site [Aliso Creek ~0.7mi above Aliso Cr. Rd. - 901S01811]
Temporal Representation:	Data was collected on a single day 5/7/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47601, Arsenic **Region 9**

Aliso Creek

LOE ID:	72930
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	21
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the 21 samples exceed the criteria for arsenic.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The CTR for arsenic is 150 ug/L.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Aliso Creek at Camino Capistrano (AC-CCR), at Aliso / Wood Canyon Wilderness Park (ACJ01), and at Pacific Park (AC-PPD).
Temporal Representation:	Samples were collected intermittently from stations: AC-CCR from May 2007 through May 2009, ACJ01 from September 2006 through February 2009, and from AC-PPD from September 2006 through April 2009.
Environmental Conditions:	Approximately 50% of the samples were collected after a storm event.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID 47605 **Region 9**

Aliso Creek

Pollutant:	**Bifenthrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of 1 sample exceeds the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 1 sample exceeds the water quality objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47605, Bifenthrin **Region 9**

Aliso Creek

LOE ID:	72932
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	Total	036221
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Aliso Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Bifenthrin.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Bifenthrin does not exceed 0.0006 ug/L.	
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.	
Spatial Representation:	Data for this line of evidence for Aliso Creek was collected at 1 monitoring site [Aliso Creek ~0.7mi above Aliso Cr. Rd. - 901S01811]	
Temporal Representation:	Data was collected on a single day 5/7/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID	**47606**	**Region 9**
Aliso Creek		

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.6, two line(s) of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Three lines of evidence are available in the administrative record to assess this pollutant. Zero of 42 samples exceed the water quality objective in water, and 0 of 1 sample exceeds the water quality objective in sediment.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 42 samples exceed the water quality objective in water but 0 of 1 sample exceeds the water quality objective in sediment without an associated sediment toxicity line of evidence and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available

indicating that standards are not met. 036222

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 47606, Cadmium **Region 9**

Aliso Creek

LOE ID:	72933
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Aliso Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for cadmium is 4.98 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Aliso Creek was collected at 1 monitoring site [Aliso Creek ~0.7mi above Aliso Cr. Rd. - 901S01811]
Temporal Representation:	Data was collected on a single day 5/7/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47606, Cadmium **Region 9**

Aliso Creek

LOE ID:	72915
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	41
Number of Exceedances:	0

Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	The Total number of samples collected is 41. 6 at AC-PPD (all dry weather) 7 at AC-CCR (all dry weather) 29 at ACJ01 (7 dry, 22 stormwater runoff influenced). If actual hardness values are used for calculations, there are 0 exceedances. ACJ01 4/21/07 16:46 - 895 mg/L CaCO3 (use 400) - Cd = 2.8 ug/L, which is < 6.2 ug/L ACJ01 1/23/08 17:56 - 960 mg/L CaCO3 (use 400) - Cd = 2.5 ug/L, which is < 6.2 ug/L
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Aliso Creek at Camino Capistrano (AC-CCR), at Aliso / Wood Canyon Wilderness Park (ACJ01), and at Pacific Park (AC-PPD).
Temporal Representation:	Samples were collected intermittently from stations: AC-CCR from September 2006 through May 2009, ACJ01 from September 2006 through February 2009, and from AC-PPD from September 2006 through April 2009.
Environmental Conditions:	Approximately 50% of the samples were collected after a storm event.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 47606, Cadmium **Region 9**

Aliso Creek

LOE ID:	72934
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Aliso Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Cadmium to protect aquatic life in freshwater. The dissolved Cadmium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula

	for the metals criterion. 036224
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Aliso Creek was collected at 1 monitoring site [Aliso Creek ~0.7mi above Aliso Cr. Rd. - 901S01811]
Temporal Representation:	Data was collected on a single day 5/7/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 47610 Region 9

Aliso Creek

Pollutant:	**Chloride**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of 1 sample exceeds the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 1 sample exceeds the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47610, Chloride Region 9

Aliso Creek

LOE ID:	72916
Pollutant:	Chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Warm Freshwater Habitat	036225
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Aliso Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chloride.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Chloride objective for the protection of aquatic life according to Table 3-2 for Aliso Creek within the San Juan Hydrologic Unit is 400 mg/L.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Aliso Creek was collected at 1 monitoring site [Aliso Creek ~0.7mi above Aliso Cr. Rd. - 901S01811]	
Temporal Representation:	Data was collected on a single day 5/7/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID **47611** **Region 9**

Aliso Creek

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of 41 samples exceed the criteria for WARM freshwater aquatic life support and 0 of 38 samples exceed the criteria for municipal drinking water supply support.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 41 samples exceed the criteria for WARM freshwater aquatic life support and 0 of 38 samples exceed the criteria for municipal drinking water supply support and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality

standards are not being exceeded. 036226

Line of Evidence (LOE) for Decision ID 47611, Chlorpyrifos **Region 9**

Aliso Creek

LOE ID:	72918
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	41
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	None of forty one samples exceed the USEPA Health Advisory 2011 ed., criteria for chlorpyrifos.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	USEPA Health Advisory 2011 ed., criteria for chlorpyrifos in freshwater is 2.0 ug/L (represents a life-time risk).
Guideline Reference:	2012 Edition of the Drinking Water Standards and Health Advisories
Spatial Representation:	Samples were collected at Aliso Creek sites: ACJ01, AC-CCR and AC-PPD.
Temporal Representation:	Samples were collected from 2006 through 2009.
Environmental Conditions:	According to the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010, samples were collected during the dry season and storm events.
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 47611, Chlorpyrifos **Region 9**

Aliso Creek

LOE ID:	72917
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	38
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	None of thirty eight samples exceed the continuous concentration for Chlorpyrifos criteria of 14.0 ng/L.However for three samples the reporting limit was greater than the evaluation

	guideline, therefore these data are not of sufficient resolution to determine if water quality standards are being achieved.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Criteria Continuous Concentration (four day average) for chlorpyrifos in freshwater is 14.0 ng/L. Ref12
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game
Spatial Representation:	Thirty eight samples were collected at Aliso Creek sites ACJ01, AC-PPD and AC-CCR.
Temporal Representation:	Samples were collected from 2006 through 2009.
Environmental Conditions:	According to the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010, samples were collected during the dry season and storm events.
QAPP Information:	Data was submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

DECISION ID	**47612**	**Region 9**
Aliso Creek		

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Four lines of evidence are available in the administrative record to assess this pollutant. Zero of the 42 samples exceed the criteria for WARM freshwater aquatic life protection in water, 0 of 1 sample exceeds the criteria for WARM freshwater aquatic life protection in sediment, and 0 of 36 samples exceed the criteria for municipal drinking water in water. There were no samples collected for sediment toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the 42 samples exceed the criteria for WARM freshwater aquatic life protection in water, 0 of 1 sample exceeds the criteria for WARM freshwater aquatic life protection in sediment, and 0 of 36 samples exceed the criteria for municipal drinking water in water and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 47612, Chromium **Region 9**

Aliso Creek

LOE ID:	72920
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Aliso Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium. Since the chromium species was not identified, the data point(s) were assessed using both the Chromium III criteria which is hardness-dependent, and the criterion continuous concentration (4-day average) to protect aquatic life in freshwater for chromium VI which is 11 ug/L and is not hardness dependent.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Chromium to protect aquatic life in freshwater. The dissolved Chromium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Aliso Creek was collected at 1 monitoring site [Aliso Creek ~0.7mi above Aliso Cr. Rd. - 901S01811]
Temporal Representation:	Data was collected on a single day 5/7/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47612, Chromium **Region 9**

Aliso Creek

LOE ID:	72922
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	36
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Zero of the 36 samples exceed the primary MCL for Cr.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The CDPH Primary MCL for chromium is 50 ug/L.
Guideline Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Spatial Representation:	Samples were collected from Aliso Creek at Camino Capistrano (AC-CCR), at Aliso / Wood Canyon Wilderness Park (ACJ01), and at Pacific Park (AC-PPD).
Temporal Representation:	Samples were collected intermittently from stations: AC-CCR from May 2007 through May 2009, ACJ01 from September 2006 through February 2009, and from AC-PPD from September 2006 through April 2009.
Environmental Conditions:	Approximately 50% of the samples were collected after a storm event.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 47612, Chromium **Region 9**

Aliso Creek

LOE ID:	72919
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Aliso Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for chromium is 111 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31

Spatial Representation:	Data for this line of evidence for Aliso Creek was collected at 1 monitoring site [Aliso Creek ~0.7mi above Aliso Cr. Rd. - 901S01811]
Temporal Representation:	Data was collected on a single day 5/7/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47612, Chromium **Region 9**

Aliso Creek

LOE ID:	72921
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	41
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the 41 samples (6 @ AC-PPD, 6 @ AC-CCR, and 29 @ ACJ01) exceed the hardness adjusted criteria for chromium.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Aliso Creek at Camino Capistrano (AC-CCR), at Aliso / Wood Canyon Wilderness Park (ACJ01), and at Pacific Park (AC-PPD).
Temporal Representation:	Samples were collected intermittently from stations: AC-CCR from September 2006 through May 2009, ACJ01 from September 2006 through February 2009, and from AC-PPD from September 2006 through April 2009.
Environmental Conditions:	Approximately 50% of the samples were collected after a storm event.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID **47617** **Region 9**

Aliso Creek

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**

Last Listing Cycle's Final Listing Decision:	New Decision	036231
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 and 3.1 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Three lines of evidence are available in the administrative record to assess this pollutant. Zero of 37 samples exceed the criteria in water and 0 of 1 sample exceeds the criteria in sediment. No samples were collected for sediment toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 37 samples exceed the criteria in water and 0 of 1 sample exceeds the criteria in sediment and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 47617, Copper **Region 9**

Aliso Creek

LOE ID:	72963
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	36
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Zero of the 36 samples exceed the hardness adjusted criteria for dissolved copper.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness

	dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Aliso Creek at Camino Capistrano (AC-CCR), at Aliso / Wood Canyon Wilderness Park (ACJ01), and at Pacific Park (AC-PPD).
Temporal Representation:	Samples were collected intermittently from stations: AC-CCR from September 2006 through May 2009, ACJ01 from September 2006 through February 2009, and from AC-PPD from September 2006 through April 2009.
Environmental Conditions:	Approximately 50% of the samples were collected after a storm event.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 47617, Copper **Region 9**

Aliso Creek

LOE ID:	72923
Pollutant:	Copper
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Aliso Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for copper is 149 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Aliso Creek was collected at 1 monitoring site [Aliso Creek ~0.7mi above Aliso Cr. Rd. - 901S01811]
Temporal Representation:	Data was collected on a single day 5/7/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47617, Copper **Region 9**

Aliso Creek

LOE ID:	72924
Pollutant:	Copper

LOE Subgroup:	Pollutant-Water	036233
Matrix:	Water	
Fraction:	Dissolved	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Aliso Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Copper to protect aquatic life in freshwater. The dissolved Copper criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Aliso Creek was collected at 1 monitoring site [Aliso Creek ~0.7mi above Aliso Cr. Rd. - 901S01811]	
Temporal Representation:	Data was collected on a single day 5/7/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID	**47619**	**Region 9**
Aliso Creek		

Pollutant:	**Cyfluthrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 1 sample exceeds the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 1 sample exceeds the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available

indicating that standards are not met. 036234

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47619, Cyfluthrin **Region 9**

Aliso Creek

LOE ID:	72964
Pollutant:	Cyfluthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Aliso Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cyfluthrin, total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of lambda-cyhalothrin does not exceed 0.0005 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Mixtures of lambda-cyhalothrin and other pyrethroids should be considered in an additive manner. (Fojut et al. 2012)Â
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Aliso Creek was collected at 1 monitoring site [Aliso Creek ~0.7mi above Aliso Cr. Rd. - 901S01811]
Temporal Representation:	Data was collected on a single day 5/7/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **47622** **Region 9**

Aliso Creek

Pollutant:	**Cyhalothrin, Lambda**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of 1 sample exceeds the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 1 sample exceeds the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47622, Cyhalothrin, Lambda **Region 9**

Aliso Creek

LOE ID:	72965
Pollutant:	Cyhalothrin, Lambda
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Aliso Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cyhalothrin, lambda, total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Cyhalothrin, lambda, total does not exceed 0.0005 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Aliso Creek was collected at 1 monitoring site [Aliso Creek ~0.7mi above Aliso Cr. Rd. - 901S01811]
Temporal Representation:	Data was collected on a single day 5/7/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.

QAPP Information:	The SWAMP QAPP (2008) was followed.	036236
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID **47623** **Region 9**

Aliso Creek

Pollutant:	**Cypermethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of 1 sample exceeds the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 1 sample exceeds the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47623, Cypermethrin **Region 9**

Aliso Creek

LOE ID:	72966
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	One of one sample result was not used in the assessment because the laboratory data was non-detect and the method detection limit was above the guideline and therefore the results could not be quantified with the level of certainty required by the Listing Policy
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009

SWAMP Data:	SWAMP	036237
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of cypermethrin does not exceed 0.0002 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Fojut et al. 2012)	
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.	
Spatial Representation:	Data for this line of evidence for Aliso Creek was collected at 1 monitoring site [Aliso Creek ~0.7mi above Aliso Cr. Rd. - 901S01811]	
Temporal Representation:	Data was collected on a single day 5/7/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID 47625 Region 9

Aliso Creek

Pollutant:	**Deltamethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of 1 sample exceeds the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 1 sample exceeds the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47625, Deltamethrin Region 9

Aliso Creek

LOE ID:	72967

Pollutant:	Deltamethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Aliso Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Deltamethrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for Deltamethrin is the maximum acceptable toxicant concentration (MATC) of 0.02 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Aliso Creek was collected at 1 monitoring site [Aliso Creek ~0.7mi above Aliso Cr. Rd. - 901S01811]
Temporal Representation:	Data was collected on a single day 5/7/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID	33824	Region 9
Aliso Creek		

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. Zero of the 45 samples exceed the water quality objective for the protection of the WARM Freshwater Aquatic Life beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the 45 samples samples exceeded the water quality objective for the protection of the WARM Freshwater Aquatic Life beneficial use and this does not exceed the allowable frequency listed in Table

3.1 of the Listing Policy. 036239
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 33824, Diazinon **Region 9**

Aliso Creek

LOE ID:	72968
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	41
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	None of forty samples exceed the continuous concentration for Diazinon criteria of 0.1 ug/L.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Forty samples were collected at Aliso Creek at sites ACJ01, AC-PPD and AC-CCR.
Temporal Representation:	Samples were collected from 2006 through 2009.
Environmental Conditions:	According to the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010, samples were collected during the dry season and storm events.
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33824, Diazinon **Region 9**

Aliso Creek

LOE ID:	77979
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	25	036240
Number of Exceedances:	0	
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)	
Data Used to Assess Water Quality:	None of forty one samples exceed the CADPH Notification Level for diazinon criteria.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The California Department of Public Health (CDPH) Notification Level for Diazinon is 1.2 ug/L.	
Guideline Reference:	Drinking Water Notification and Response Levels: An Overview	
Spatial Representation:	Samples were collected at Aliso Creek sites: ACJ01, AC-CCR and AC-PPD.	
Temporal Representation:	Samples were collected from 2006 through 2009.	
Environmental Conditions:	According to the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010, samples were collected during the dry season and storm events.	
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33824, Diazinon **Region 9**

Aliso Creek

LOE ID:	2995
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	None of the 4 samples exceeded the CDFG Hazard Assessment criteria. (TSMP, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination or pesticides shall be present in concentrations that adversely affect beneficial uses.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	CDFG Hazard Assessment criteria for the protection of Aquatic life is as follows: 0.16 ug/L 1-hour average and 0.10 ug/L 4-day average (Siepman & Finlayson, 2000; Finlayson, 2004).
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	Samples were taken from one sample site at Aliso Creek: 33.51215 -117.75179
Temporal Representation:	Samples were collected from October 2002 through May 2003.
Environmental Conditions:	
QAPP Information:	SWAMP Quality Assurance Plan
QAPP Information Reference(s):	

DECISION ID	47624	Region 9
Aliso Creek		

Pollutant:	**Esfenvalerate/Fenvalerate**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 1 sample exceeds the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 1 sample exceeds the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47624, Esfenvalerate/Fenvalerate	Region 9
Aliso Creek	

LOE ID:	72971
Pollutant:	Esfenvalerate/Fenvalerate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Aliso Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Esfenvalerate/Fenvalerate, total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP

Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to the USEPA Office of Pesticide Programs Ecotoxicity database, the aquatic life EC50 for Esfenvalerate/Fenvalerate is 0.9 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Aliso Creek was collected at 1 monitoring site [Aliso Creek ~0.7mi above Aliso Cr. Rd. - 901S01811]
Temporal Representation:	Data was collected on a single day 5/7/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 47633 Region 9
Aliso Creek

Pollutant:	**Fenpropathrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of 1 sample exceeds the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 1 sample exceeds the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples are needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47633, Fenpropathrin Region 9
Aliso Creek

LOE ID:	72935
Pollutant:	Fenpropathrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	Total	036243
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Aliso Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Fenpropathrin.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The evaluation guideline for Fenpropathrin is the median lethal concentration (LC50; 2.2 ug/L).	
Guideline Reference:	OPP Pesticide Ecotoxicity Database.	
Spatial Representation:	Data for this line of evidence for Aliso Creek was collected at 1 monitoring site [Aliso Creek ~0.7mi above Aliso Cr. Rd. - 901S01811]	
Temporal Representation:	Data was collected on a single day 5/7/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID	**47635**	**Region 9**
Aliso Creek		

Pollutant:	**Iron**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of 1 sample exceeds the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 1 sample exceeds the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples are needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision	After review of the available data and information, RWQCB staff concludes that the water body-

Recommendation: pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47635, Iron **Region 9**

Aliso Creek

LOE ID:	72936
Pollutant:	Iron
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Aliso Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Iron.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Iron objective for the protection of aquatic life according to Table 3-2 for Aliso Creek within the San Juan Hydrologic Unit is 0.3 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Aliso Creek was collected at 1 monitoring site [Aliso Creek ~0.7mi above Aliso Cr. Rd. - 901S01811]
Temporal Representation:	Data was collected on a single day 5/7/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **47637** **Region 9**

Aliso Creek

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Five lines of evidence are available in the administrative record to assess this pollutant. Zero of 37

samples exceed the criteria in water and 0 of 1 sample exceeds the criteria in sediment. 45 samples for sediment toxicity were collected.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 37 samples exceed the criteria in water and 0 of 1 sample exceeds the criteria in sediment and and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 47637, Lead **Region 9**

Aliso Creek

LOE ID:	72939
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	36
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Zero of the 36 samples exceed the hardness adjusted criteria for lead.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Aliso Creek at Camino Capistrano (AC-CCR), at Aliso / Wood Canyon Wilderness Park (ACJ01), and at Pacific Park (AC-PPD).
Temporal Representation:	Samples were collected intermittently from stations: AC-CCR from May 2007 through May 2009, ACJ01 from September 2006 through February 2009, and from AC-PPD from September 2006 through April 2009.
Environmental Conditions:	Approximately 50% of the samples were collected after a storm event.

QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 47637, Lead **Region 9**

Aliso Creek

LOE ID:	72937
Pollutant:	Lead
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Aliso Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for lead is 128 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Aliso Creek was collected at 1 monitoring site [Aliso Creek ~0.7mi above Aliso Cr. Rd. - 901S01811]
Temporal Representation:	Data was collected on a single day 5/7/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47637, Lead **Region 9**

Aliso Creek

LOE ID:	72938
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Aliso Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.

Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	036247
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Lead to protect aquatic life in freshwater. The dissolved Lead criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Aliso Creek was collected at 1 monitoring site [Aliso Creek ~0.7mi above Aliso Cr. Rd. - 901S01811]	
Temporal Representation:	Data was collected on a single day 5/7/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID 47704 Region 9

Aliso Creek

Pollutant:	**Manganese**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. One of 1 sample exceeds the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of 1 sample exceeds the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47704, Manganese Region 9

Aliso Creek

LOE ID:	72942	036248

Pollutant:	Manganese
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Aliso Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Manganese.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Manganese objective for the protection of aquatic life according to Table 3-2 for Aliso Creek within the San Juan Hydrologic Unit is 0.05 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Aliso Creek was collected at 1 monitoring site [Aliso Creek ~0.7mi above Aliso Cr. Rd. - 901S01811]
Temporal Representation:	Data was collected on a single day 5/7/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID	**47705**	**Region 9**
Aliso Creek		

Pollutant:	**Mercury**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of 1samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 1 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16

samples is needed to determine if a beneficial use is fully supported using table 3.1. 036249
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47705, Mercury **Region 9**

Aliso Creek

LOE ID:	72943
Pollutant:	Mercury
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	The one sample did not exceed the criteria for mercury.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	National Recommended Water Quality Criteria Continuous Concentrations (4-day average concentrations) for freshwater aquatic organisms exposure to elemental mercury is 0.77 ug/L.
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Samples were collected from Aliso Creek at Aliso / Wood Canyon Wilderness Park (ACJ01).
Temporal Representation:	Sample was collected on 11/4/2008
Environmental Conditions:	
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID **47706** **Region 9**

Aliso Creek

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollution

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of

the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Six lines of evidence are available in the administrative record to assess this pollutant. Zero of 42 samples exceed the criteria in water for WARM freshwater aquatic life, 0 of 1 sample exceeds the criteria in water for COMM, and 0 of 1 sample exceeds the criteria in sediment. No samples were collected for sediment toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 42 samples exceed the criteria in water for WARM freshwater aquatic life, 0 of 1 sample exceeds the criteria in water for COMM, and 0 of 1 sample exceeds the criteria in sediment and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 47706, Nickel **Region 9**

Aliso Creek

LOE ID:	72958
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	41
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the 41 samples exceed the hardness adjusted criteria for nickel.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition

Spatial Representation:	Samples were collected from Aliso Creek at Camino Capistrano (AC-CCR), at Aliso / Wood Canyon Wilderness Park (ACJ01), and at Pacific Park (AC-PPD).
Temporal Representation:	Samples were collected intermittently from stations: AC-CCR from September 2006 through May 2009, ACJ01 from September 2006 through May 2009, and from AC-PPD from September 2006 through April 2009.
Environmental Conditions:	Approximately 50% of the samples were collected after a storm event.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 47706, Nickel **Region 9**

Aliso Creek

LOE ID:	72944
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Aliso Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for nickel is 48.6 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Aliso Creek was collected at 1 monitoring site [Aliso Creek ~0.7mi above Aliso Cr. Rd. - 901S01811]
Temporal Representation:	Data was collected on a single day 5/7/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47706, Nickel **Region 9**

Aliso Creek

LOE ID:	72945
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Aliso Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Nickel to protect aquatic life in freshwater. The dissolved Nickel criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Aliso Creek was collected at 1 monitoring site [Aliso Creek ~0.7mi above Aliso Cr. Rd. - 901S01811]
Temporal Representation:	Data was collected on a single day 5/7/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47706, Nickel **Region 9**

Aliso Creek

LOE ID:	72957
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Aliso Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The Nickel criteria for the protection of human health from consumption of organisms only is 4.6 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Aliso Creek was collected at 1 monitoring site [Aliso Creek ~0.7mi above Aliso Cr. Rd. - 901S01811]
Temporal Representation:	Data was collected on a single day 5/7/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.

QAPP Information:	The SWAMP QAPP (2008) was followed.	036253
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID 47709 Region 9

Aliso Creek

Pollutant:	**Nitrogen, ammonia (Total Ammonia)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of 1 sample exceeds the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 1 sample exceeds the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47709, Nitrogen, ammonia (Total Ammonia) Region 9

Aliso Creek

LOE ID:	72927
Pollutant:	Nitrogen, ammonia (Total Ammonia)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Aliso Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Ammonia as N, Total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009

SWAMP Data:	SWAMP	036254
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	Aquatic Life Ambient Water Quality Criteria for Ammonia â€“ Freshwater (USEPA 2013): the 30-day rolling average concentration (criterion continuous concentration or CCC) of total ammonia nitrogen(in mg TAN/L) in freshwater are not to be exceeded more than once every three years on average. The CCC values are based on pH and temperature. The CCC formula is found on page 46 and the table of CCC values is on page 49.	
Guideline Reference:	Aquatic Life Ambient Water Quality Criteria for Ammonia - Freshwater 2013	
Spatial Representation:	Data for this line of evidence for Aliso Creek was collected at 1 monitoring site [Aliso Creek ~0.7mi above Aliso Cr. Rd. - 901S01811]	
Temporal Representation:	Data was collected on a single day 5/7/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID 47779 Region 9

Aliso Creek

Pollutant:	**Oxygen, Dissolved**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of 36 samples exceed the basin plan objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 36 samples exceed the basin plan objective and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 47779, Oxygen, Dissolved Region 9

Aliso Creek

LOE ID:	72959

Pollutant:	Oxygen, Dissolved	036255
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	Dissolved	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Aliso Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Oxygen, Dissolved.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan, San Diego Basin, Warm Water Habitat Objective, Chapter III, General Objectives for all Inland Surface Waters, Enclosed Bays and Estuaries states the following: The dissolved oxygen concentration for warm water habitats shall not be reduced below 5.0 mg/l at any time.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Aliso Creek was collected at 1 monitoring site [Aliso Creek ~0.7mi above Aliso Cr. Rd. - 901S01811]	
Temporal Representation:	Data was collected on a single day 5/7/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 47779, Oxygen, Dissolved **Region 9**

Aliso Creek

LOE ID:	72960
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	35
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Zero of the 35 samples exceeded the 5.0 mg/L objective, and since only 2 of the 35 samples were below 7.0 mg/L, more than 90% of the values were below 7.0 mg/L.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The dissolved oxygen content of all surface waters designated as "Warm Freshwater Habitat" must be greater than 5.0 mg/L. The annual mean dissolved oxygen concentration shall not be less than 7 mg/l more than 10% of the time.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	

Guideline Reference:	036256
Spatial Representation:	Samples were collected from the AC-CCR, ACJ01, and AC-PPD stations.
Temporal Representation:	Samples were collected approximately 4 times every semi-annual period from September 2006 to April 2009.
Environmental Conditions:	
QAPP Information:	NPDES quality assurance.
QAPP Information Reference(s):	

DECISION ID 53337 Region 9

Aliso Creek

Pollutant:	**Permethrin, total**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the one samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53337, Permethrin, total Region 9

Aliso Creek

LOE ID:	72961
Pollutant:	Permethrin, total
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	036257
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Aliso Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Permethrin.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Permethrin does not exceed 0.002 ug/L.	
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.	
Spatial Representation:	Data for this line of evidence for Aliso Creek was collected at 1 monitoring site [Aliso Creek ~0.7mi above Aliso Cr. Rd. - 901S01811]	
Temporal Representation:	Data was collected on a single day 5/7/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID 47781 Region 9

Aliso Creek

Pollutant:	**Silver**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Four lines of evidence are available in the administrative record to assess this pollutant. Zero of 42 samples exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 42 samples exceed the evaluation guideline and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 47781, Silver Region 9

Aliso Creek

LOE ID:	72949
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Aliso Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Silver.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Silver to protect aquatic life in freshwater. The dissolved Silver criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Aliso Creek was collected at 1 monitoring site [Aliso Creek ~0.7mi above Aliso Cr. Rd. - 901S01811]
Temporal Representation:	Data was collected on a single day 5/7/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47781, Silver **Region 9**

Aliso Creek

LOE ID:	72950
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	41
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the 41 samples exceed the criteria for silver.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36

	(section 131.36 revised at 57 FR 60848, December 22, 1992).	036259
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion maximum concentrations for silver to protect aquatic life in freshwater (1-hour average). The dissolved silver criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.	
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Spatial Representation:	Samples were collected from Aliso Creek at Camino Capistrano (AC-CCR), at Aliso / Wood Canyon Wilderness Park (ACJ01), and at Pacific Park (AC-PPD).	
Temporal Representation:	Samples were collected intermittently from stations: AC-CCR from September 2006 through May 2009, ACJ01 from September 2006 through May 2009, and from AC-PPD from September 2006 through April 2009.	
Environmental Conditions:	Approximately 50% of the samples were collected after a storm event.	
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.	
QAPP Information Reference(s):		

DECISION ID	**47784**	**Region 9**
Aliso Creek		

Pollutant:	**Sulfates**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line(s) of evidence are necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. One of 1 sample exceeds the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of 1 sample exceeds the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47784, Sulfates	**Region 9**
Aliso Creek	

LOE ID:	72951	036260

Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Aliso Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Sulfate.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Sulfate objective for the protection of aquatic life according to Table 3-2 for Aliso Creek within the San Juan Hydrologic Unit is 500 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Aliso Creek was collected at 1 monitoring site [Aliso Creek ~0.7mi above Aliso Cr. Rd. - 901S01811]
Temporal Representation:	Data was collected on a single day 5/7/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID	**47786**	**Region 9**
Aliso Creek		

Pollutant:	**Total Dissolved Solids**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line(s) of evidence are necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. One of 1 samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of 1 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26

samples is needed to determine if a beneficial use is fully supported using table 3.2. 036261
4. Pursuant to 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47786, Total Dissolved Solids **Region 9**
Aliso Creek

LOE ID:	72954
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Aliso Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Dissolved Solids.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Dissolved Solids objective for the protection of aquatic life according to Table 3-2 for Aliso Creek within the San Juan Hydrologic Unit is 1000 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Aliso Creek was collected at 1 monitoring site [Aliso Creek ~0.7mi above Aliso Cr. Rd. - 901S01811]
Temporal Representation:	Data was collected on a single day 5/7/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **47789** **Region 9**
Aliso Creek

Pollutant:	**Turbidity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of

the Listing Policy. Under section 3.2 a single line(s) of evidence are necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of 1 sample exceeds the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 1 sample exceeds the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47789, Turbidity **Region 9**

Aliso Creek

LOE ID:	72974
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Aliso Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Turbidity(NTU).
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Turbidity(NTU) objective for the protection of aquatic life according to Table 3-2 for Aliso Creek within the San Juan Hydrologic Unit is 20 NTU.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Aliso Creek was collected at 1 monitoring site [Aliso Creek ~0.7mi above Aliso Cr. Rd. - 901S01811]
Temporal Representation:	Data was collected on a single day 5/7/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **47790** **Region 9**

Aliso Creek

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Five lines of evidence are available in the administrative record to assess this pollutant. Zero of 41 samples exceed the criteria in water and 0 of 1 sample exceeds the criteria in sediment. No samples exhibited sediment toxicity because none were collected.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient evidence against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 41 samples exceed the criteria in water and 0 of 1 sample exceeds the criteria in sediment. No samples exhibited sediment toxicity because none were collected and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 47790, Zinc **Region 9**

Aliso Creek

LOE ID:	72975
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Aliso Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP

Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for zinc is 459 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Aliso Creek was collected at 1 monitoring site [Aliso Creek ~0.7mi above Aliso Cr. Rd. - 901S01811]
Temporal Representation:	Data was collected on a single day 5/7/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47790, Zinc **Region 9**

Aliso Creek

LOE ID:	72976
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Aliso Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Zinc to protect aquatic life in freshwater. The dissolved Zinc criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Aliso Creek was collected at 1 monitoring site [Aliso Creek ~0.7mi above Aliso Cr. Rd. - 901S01811]
Temporal Representation:	Data was collected on a single day 5/7/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47790, Zinc **Region 9**

Aliso Creek

LOE ID:	72977

Pollutant:	Zinc	036265
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	Dissolved	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	40	
Number of Exceedances:	0	
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)	
Data Used to Assess Water Quality:	None of the 40 samples exceed the criteria for zinc.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.	
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Spatial Representation:	Samples were collected from Aliso Creek at Camino Capistrano (AC-CCR), at Aliso / Wood Canyon Wilderness Park (ACJ01), and at Pacific Park (AC-PPD).	
Temporal Representation:	Samples were collected intermittently from stations: AC-CCR from September 2006 through May 2009, ACJ01 from September 2006 through May 2009, and from AC-PPD from September 2006 through April 2009.	
Environmental Conditions:	Approximately 50% of the samples were collected after a storm event.	
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.	
QAPP Information Reference(s):		

DECISION ID	**47791**	**Region 9**
Aliso Creek		

Pollutant:	**pH**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of 36 samples exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 36 samples exceeded the objective and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 47791, pH **Region 9**

Aliso Creek

LOE ID:	72962
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Aliso Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for pH.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	In inland surface waters the pH shall not be depressed below 6.5 nor raised above 8.5.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Aliso Creek was collected at 1 monitoring site [Aliso Creek ~0.7mi above Aliso Cr. Rd. - 901S01811]
Temporal Representation:	Data was collected on a single day 5/7/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47791, pH **Region 9**

Aliso Creek

LOE ID:	72946
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	35

Number of Exceedances:	0	036267
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Numeric data generated from 35 minimums and maximums of pH data had no exceedences.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The pH of all inland surface waters shall not be depressed below 6.5 or raised above 8.5 as a result of waste discharges.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from the AC-CCR, ACJ01, and AC-PPD stations.	
Temporal Representation:	Samples were collected approximately twice a month from September 2006 to April 2009.	
Environmental Conditions:		
QAPP Information:	NPDES quality assurance.	
QAPP Information Reference(s):		

DECISION ID	**44339**	**Region 9**
Aliso Creek		

Pollutant:	**Benthic Community Effects**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Benthic Community Effects is being considered for placement on the CWA section 303(d) List under sections 3.9 and 3.1 of the Listing Policy. Under section 3.9, an additional line of evidence associating Benthic Community Effects with a water or sediment concentration of pollutant(s) is necessary to assess listing status. Based on the readily available data and information, the weight of evidence provides sufficient justification for placing Benthic Community Effects in this water segment on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Pursuant to section 3.9 of the Listing Policy, the water exhibits significant degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index. 4. Pursuant to section 3.9 of the Listing Policy, the water segment has associated pollutant(s) samples that exceed water quality objectives. 5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are being met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant(s) contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 44339, Benthic Community Effects 036268 Region 9

Aliso Creek

LOE ID:	7513
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	13
Number of Exceedances:	13
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	All thirteen flow-weighted event mean concentrations exceeded the water quality objective according to results in the Orange County Storm Water Annual Progress Report, 2007. Samples were collected during two to six storm events a year from 2002-2006.
Data Reference:	Orange County Stormwater Program. 2004-2007. Unified Annual Progress Reports. Program Effectiveness Assessment (San Diego Region)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses (RWQCB, 2007). The Water Quality Control Plan for the San Diego Basin (9) has a goal of 0.1 mg/L. for phosphorus in streams and other flowing waters
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at the mass loading station in Aliso/Woods Canyon Park at 33.5437Samples were collected at the mass loading station in Aliso/Woods Canyon Park at 33.5437Â°, 117.7325Â°.
Temporal Representation:	Samples were collected during two to six storm events a year from 2002-2006.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	Quality control for the toxicity portion of this study was conducted in accordance with the County of Orange's NPDES monitoring program.
QAPP Information Reference(s):	Orange County Stormwater Program. 2004-2007. Unified Annual Progress Reports. Program Effectiveness Assessment (San Diego Region)

Line of Evidence (LOE) for Decision ID 44339, Benthic Community Effects Region 9

Aliso Creek

LOE ID:	7514
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	13
Number of Exceedances:	12
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Twelve of thirteen flow-weighted event mean concentrations exceeded the water quality

	objective according to results in the Orange County Storm Water Annual Progress Report, 2007. Samples were collected during two to six storm events a year from 2002-2006.
Data Reference:	Orange County Stormwater Program. 2004-2007. Unified Annual Progress Reports. Program Effectiveness Assessment (San Diego Region)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses (RWQCB, 2007). The Water Quality Control Plan for the San Diego Basin (9) states: Â“A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used.Â” Since the goal for total phosphorus is 0.1 mg/L, then according to the ratio provided, the goal for total nitrogen is 1 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at the mass loading station in Aliso/Woods Canyon Park at 33.5437Â°, 117.7325Â°.
Temporal Representation:	Samples were collected during two to six storm events a year from 2002-2006.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the Orange County's NPDES Program.
QAPP Information Reference(s):	Orange County Stormwater Program. 2004-2007. Unified Annual Progress Reports. Program Effectiveness Assessment (San Diego Region)

Line of Evidence (LOE) for Decision ID 44339, Benthic Community Effects **Region 9**

Aliso Creek

LOE ID:	80740
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	22
Number of Exceedances:	15
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Twenty-two samples were collected from four stations in Aliso Creek. Fifteen of the samples were below the 0.79 threshold, and therefore exceeding the water quality objective for the aquatic life beneficial use. Five samples did not have scores calculated due to low organism counts.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009 Data for Various Waterbodies in Region 8 and Region 9, 2006-2009. Region 9 CSCI Scores & Water Body Information
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life.

	Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.
Guideline Reference:	The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.
Spatial Representation:	Samples were collected at stations, ACJ01, AC-CCR, AC-PPD and 901S01811
Temporal Representation:	The samples were collected from 2006 to 2009
Environmental Conditions:	
QAPP Information:	Data collected following SWAMP QA protocols for the County of Orange NPDES MS4 Copermittees Receiving Waters Monitoring and Reporting Program. Data also collected for the SWAMP RWB9 Stormwater Monitoring Council CY 2009 following SWAMP protocols and stored in the SWAMP database
QAPP Information Reference(s):	RWB9 Stormwater Monitoring Council CY 2009 Quality Assurance Project Plan for the Orange County Stormwater Program.

Line of Evidence (LOE) for Decision ID 44339, Benthic Community Effects **Region 9**

Aliso Creek

LOE ID:	77582
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	18
Number of Exceedances:	18
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Eighteen out of the eighteen IBI scores were below 40. Three stations were sampled six times each from 2006 to 2009. All of the IBI scores were below 20.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the State or Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired

conditions. 036271

Guideline Reference: Development of a Benthic Index of Biotic Integrity (B-IBI) for Wadeable Streams in Northern Coastal California and its Application to Regional 305(b) Assessment

Spatial Representation: Samples were collected at stations, ACJ01: Aliso Creek near Wood Canyon Wilderness Park, AC-CCR: Aliso Creek near Camino Capistrano, and AC-PPD: Aliso Creek near Pacific Park.

Temporal Representation: The samples were collected in the fall 2006, and the spring and fall of 2007 and 2008 and in the spring of 2009.

Environmental Conditions:

QAPP Information: The taxonomic analysis followed the guidelines of the Southern California Freshwater and Marine Invertebrate Taxonomic Associations (SAFIT, SCAMIT). All stream bioassessment sample collection and taxonomic analysis follow the Southern California Regional

QAPP Information Reference(s): Quality Assurance Project Plan for the Orange County Stormwater Program.

Line of Evidence (LOE) for Decision ID 44339, Benthic Community Effects **Region 9**

Aliso Creek

LOE ID: 72940

Pollutant: Malathion

LOE Subgroup: Pollutant-Water

Matrix: Water

Fraction: Total Dissolved

Beneficial Use: Warm Freshwater Habitat

Number of Samples: 41

Number of Exceedances: 8

Data and Information Type: Fixed station physical/chemical (conventional plus toxic pollutants)

Data Used to Assess Water Quality: Eight of forty one samples exceed the maximum (Instantaneous) concentration for Malathion in freshwater of 100 ng/L.

Data Reference: Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses.

Objective/Criterion Reference: Water Quality Control Plan for the San Diego Basin

Evaluation Guideline: The maximum (Instantaneous) concentration for Malathion in freshwater is 100 ng/L.

Guideline Reference: Quality Criteria for Water. USEPA Office of Water and Hazardous Materials. Washington, D.C

Spatial Representation: Forty one samples were collected at Aliso Creek at sites ACJ01, AC-PPD and AC-CCR.

Temporal Representation: Samples were collected from 2006 through 2009.

Environmental Conditions: According to the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010, samples were collected during the dry season and storm events.

QAPP Information: Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.

QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 44339, Benthic Community Effects **Region 9**

Aliso Creek

LOE ID: 72947

Pollutant: Selenium

LOE Subgroup:	Pollutant-Water	036272
Matrix:	Water	
Fraction:	Dissolved	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	1	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Aliso Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Selenium.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	The selenium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater is 0.005 mg/L (California Toxics Rule, 2000).	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Aliso Creek was collected at 1 monitoring site [Aliso Creek ~0.7mi above Aliso Cr. Rd. - 901S01811]	
Temporal Representation:	Data was collected on a single day 5/7/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 44339, Benthic Community Effects **Region 9**

Aliso Creek

LOE ID:	72948
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	10
Number of Exceedances:	8
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Eight of the ten samples exceed the criteria for selenium.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The CTR for selenium is 5.0 ug/L.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority

	toxic pollutants for the State of California. 7/1/2011 Edition	036273

Spatial Representation:	Samples were collected from Aliso Creek at Camino Capistrano (AC-CCR), at Aliso / Wood Canyon Wilderness Park (ACJ01), and at Pacific Park (AC-PPD).
Temporal Representation:	Samples were collected intermittently from stations: AC-CCR from May 2007 through May 2009, ACJ01 from September 2006 through February 2009, and from AC-PPD from September 2006 through April 2009.
Environmental Conditions:	Approximately 50% of the samples were collected after a storm event.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44339, Benthic Community Effects **Region 9**

Aliso Creek

LOE ID:	72754
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	The one sample collected had an IBI score below 40. The IBI score for this site was 4.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	Development of a Benthic Index of Biotic Integrity (B-IBI) for Wadeable Streams in Northern Coastal California and its Application to Regional 305(b) Assessment
Spatial Representation:	The sample was collected from Aliso Creek ~0.7mi above Aliso Cr. Rd.
Temporal Representation:	The sample was collected in May 2009.
Environmental Conditions:	
QAPP Information:	Samples were collected for the SWAMP RWB9 Stormwater Monitoring Council CY 2009 following SWAMP protocols and stored in the SWAMP database.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 44339, Benthic Community Effects **Region 9**

Aliso Creek

LOE ID:	72955
Pollutant:	Toxicity

LOE Subgroup:	Toxicity	036274
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	31	
Number of Exceedances:	13	
Data and Information Type:	TOXICITY TESTING	
Data Used to Assess Water Quality:	Thirty-one samples were collected to test for toxicity. Thirteen of the 31 samples exhibited statistically and biologically significant toxicity. The toxicity tests that exhibited significant toxicity included Fathead Minnow biomass and survival, Mysid biomass and survival, Purple Urchin development, Hyallela biomass and survial and survival and reproduction of Ceriodaphnia dubia.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control. Additionally, the biological significance of the sample was evaluted by determining whether the sample response was lower than the evaluation threshold.	
Guideline Reference:		
Spatial Representation:	The samples were collected at stations AC-CCR, ACJ01, and AC-PPD Aliso Creek.	
Temporal Representation:	The samples were collected approximately twice a year from 2006 to 2009.	
Environmental Conditions:		
QAPP Information:	The data collected under the Quality Assurance Management Plan for The Orange County Stormwater Program. The SWAMP measurement quality objectives were followed for toxicity data. The performance of toxicity bioassays and evaluation of reference toxicants were performed using USEPA and Standard Methods.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44339, Benthic Community Effects **Region 9**

Aliso Creek

LOE ID:	72956
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate water toxicity. None of the samples exhibited significant toxicity. The toxicity test included survival of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009

SWAMP Data:	SWAMP	036275
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL, Significant compared to negative control based on statistical test, less than stated alpha level, AND less than the evaluation threshold (both criteria are met).	
Guideline Reference:		
Spatial Representation:	The sample was collected at station 901S01811.	
Temporal Representation:	The sample was collected in May 2009.	
Environmental Conditions:		
QAPP Information:	All data was collected following the Standard Operating Procedures and Data Quality Objectives outlined in the SWAMP QAMP, (Puckett, 2002). QA data are included in submission.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44339, Benthic Community Effects **Region 9**

Aliso Creek

LOE ID:	26347
Pollutant:	Benthic Community Effects
LOE Subgroup:	Adverse Biological Responses
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	13
Number of Exceedances:	12
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Thirteen samples of IBI data were taken from May 1998 to May 2001 at two sampling sites. Of the total number of samples, twelve samples exceeded the IBI impairment threshold.
Data Reference:	Fish and Game IBI Data
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at two sites: 901ACPPDx and 901ACCCRx on Aliso Creek.

Temporal Representation:	Sampling occurred during one to three events annually over a four year period from May 1998 to May 2001.
Environmental Conditions:	
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Project Plan for the California Stream Bioassessment Procedure and the State of California, California Monitoring an Assessment Program: "CMAP", Quality Assurance Project Plan.
QAPP Information Reference(s):	State of California, California Monitoring and Assessment Program: "CMAP". Quality Assurance Project Plan for the California Stream Bioassessment Procedure The San Diego Stream Team Quality Assurance Project Plan

Line of Evidence (LOE) for Decision ID 44339, Benthic Community Effects **Region 9**

Aliso Creek

LOE ID:	9076
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	3
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Four water samples were collected at Aliso Creek station 901SJALC6 on October 2002, January, April, May 2003, three showed excessive selenium concentrations. Results are from California's Surface Water Ambient Monitoring Program Report, 2007.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	CTR Freshwater Chronic (CCC) 5 ug/L. (U.S. EPA, 2000).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Water samples were collected at Aliso Creek station (901SJALC6).
Temporal Representation:	Data was collected on October 2002, January 2003, April 2003, May 2003.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

DECISION ID **47640** **Region 9**

Aliso Creek

Pollutant:	**Malathion**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown

Expected TMDL Completion Date:	2029	036277
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Eight of the forty-one samples exceed the GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Eight of forty-one samples exceed the GUIDELINE and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 47640, Malathion **Region 9**

Aliso Creek

LOE ID:	72941
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	41
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	None of forty one samples exceed the USEPA drinking water health advisory for malathion.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for malathion is 500 Âµg/L.
Guideline Reference:	Water quality data for Temecula Creek, Murrieta Creek, and the Santa Margarita River, Temecula, CA 2011 Edition of the Drinking Water Standards and Health Advisories
Spatial Representation:	Samples were collected at Aliso Creek sites: ACJ01, AC-CCR and AC-PPD.
Temporal Representation:	Samples were collected from 2006 through 2009.
Environmental Conditions:	According to the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010, samples were collected during the dry season and storm

events. 036278

QAPP Information: Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.

QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 47640, Malathion **Region 9**

Aliso Creek

LOE ID:	72940
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	41
Number of Exceedances:	8
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Eight of forty one samples exceed the maximum (Instantaneous) concentration for Malathion in freshwater of 100 ng/L.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The maximum (Instantaneous) concentration for Malathion in freshwater is 100 ng/L.
Guideline Reference:	Quality Criteria for Water. USEPA Office of Water and Hazardous Materials. Washington, D.C
Spatial Representation:	Forty one samples were collected at Aliso Creek at sites ACJ01, AC-PPD and AC-CCR.
Temporal Representation:	Samples were collected from 2006 through 2009.
Environmental Conditions:	According to the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010, samples were collected during the dry season and storm events.
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

DECISION ID **34545** **Region 9**

Aliso Creek

Pollutant:	**Phosphorus**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. This pollutant is being considered for removal from the section 303(d) list under section 4.1 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status. Three lines of evidence are available in the administrative record to assess this pollutant. Thirteen of the 13 samples exceed the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the section 303(d) list. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Thirteen of the 13 samples exceed the Basin Plan criteria for phosporus and this exceeds the allowable frequency listed in Table 4.1 of the Listing Policy. 4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34545, Phosphorus **Region 9**

Aliso Creek

LOE ID:	7513
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	13
Number of Exceedances:	13
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	All thirteen flow-weighted event mean concentrations exceeded the water quality objective according to results in the Orange County Storm Water Annual Progress Report, 2007. Samples were collected during two to six storm events a year from 2002-2006.
Data Reference:	Orange County Stormwater Program. 2004-2007. Unified Annual Progress Reports, Program Effectiveness Assessment (San Diego Region)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses (RWQCB, 2007). The Water Quality Control Plan for the San Diego Basin (9) has a goal of 0.1 mg/L. for phosphorus in streams and other flowing waters
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at the mass loading station in Aliso/Woods Canyon Park at 33.5437Samples were collected at the mass loading station in Aliso/Woods Canyon Park at

	33.5437Â°, 117.7325Â°. 036280
Temporal Representation:	Samples were collected during two to six storm events a year from 2002-2006.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	Quality control for the toxicity portion of this study was conducted in accordance with the County of Orange's NPDES monitoring program.
QAPP Information Reference(s):	Orange County Stormwater Program. 2004-2007. Unified Annual Progress Reports, Program Effectiveness Assessment (San Diego Region)

DECISION ID 42917 Region 9

Aliso Creek

Pollutant:	**Nitrogen**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Twelve of the 13 samples exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Twelve of 13 samples exceed the objective, and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 42917, Nitrogen Region 9

Aliso Creek

LOE ID:	7514
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	13
Number of Exceedances:	12

Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only) 036281
Data Used to Assess Water Quality:	Twelve of thirteen flow-weighted event mean concentrations exceeded the water quality objective according to results in the Orange County Storm Water Annual Progress Report, 2007. Samples were collected during two to six storm events a year from 2002-2006.
Data Reference:	Orange County Stormwater Program. 2004-2007. Unified Annual Progress Reports, Program Effectiveness Assessment (San Diego Region)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses (RWQCB, 2007). The Water Quality Control Plan for the San Diego Basin (9) states: Â“A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used.Â” Since the goal for total phosphorus is 0.1 mg/L, then according to the ratio provided, the goal for total nitrogen is 1 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at the mass loading station in Aliso/Woods Canyon Park at 33.5437Â°, 117.7325Â°.
Temporal Representation:	Samples were collected during two to six storm events a year from 2002-2006.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the Orange County's NPDES Program.
QAPP Information Reference(s):	Orange County Stormwater Program. 2004-2007. Unified Annual Progress Reports, Program Effectiveness Assessment (San Diego Region)

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: English Canyon
Water Body ID: CAR9011300020050602203953
Water Body Type: River & Stream

DECISION ID 43273 **Region 9**
English Canyon

Pollutant: Selenium
Final Listing Decision: Do Not Delist from 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Sources: Source Unknown
Expected TMDL Completion Date: 2019
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal from the CWA section 303(d) List under section 4.1 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess pollutant. Five of 8 samples exceed the criteria. Two of 8 samples exhibit water toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Five of 8 samples exceed the criteria and this exceeds the allowable frequency listed in Table 4.1 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 43273, Selenium **Region 9**
English Canyon

LOE ID: 73665

Pollutant: Selenium
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Dissolved

Beneficial Use: Warm Freshwater Habitat

Number of Samples:	4	036283
Number of Exceedances:	2	
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)	
Data Used to Assess Water Quality:	Two of the four samples exceed the criteria for selenium.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The CTR for selenium is 5.0 ug/L.	
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Spatial Representation:	Samples were collected from English Canyon at Madera Drive (EC-MD).	
Temporal Representation:	Samples were collected from station EC-MD on 9/26/06, 5/30/07, 10/10/07, 5/13/08, 8/20/09, 09/30/08, and 4/28/09.	
Environmental Conditions:	All the samples are representative of dry weather conditions.	
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43273, Selenium **Region 9**

English Canyon

LOE ID:	73516
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	2
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Eight samples were collected to test for toxicity. two of the eight samples exhibited statistically and biologically significant toxicity. The toxicity tests that exhibited significant toxicity included Hyallela survival and Fathead Minnow survival.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control. Additionally, the biological significance of the sample was evaluted by determining whether the sample response was lower than the evaluation threshold.
Guideline Reference:	

Spatial Representation:	The samples were collected at station EC-MD English Creek.
Temporal Representation:	The samples were collected from June 2006 to November 2009.
Environmental Conditions:	
QAPP Information:	The data collected under the Quality Assurance Management Plan for The Orange County Stormwater Program. The SWAMP measurement quality objectives were followed for toxicity data. The performance of toxicity bioassays and evaluation of reference toxicants were performed using USEPA and Standard Methods.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43273, Selenium **Region 9**

English Canyon

LOE ID:	9090
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	3
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Four samples were collected at English Canyon Creek 2, station 901SJENG2 on October 2002; January 2003; April 2003; and May 2003 Three of the four samples showed excessive phosphorus concentrations (SWAMP, 2007).
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	CTR Freshwater Chronic (CCC) 5 ug/L. (U.S. EPA, 2000).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at English Canyon Creek station 2,(901SJENG2). (Latitude 33.6278, Longitude -117.6806).
Temporal Representation:	Samples were collected on October 2002; January 2003; April 2003; and May 2003.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

DECISION ID **33502** **Region 9**

English Canyon

Pollutant:	**Toxicity**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown

Expected TMDL Completion Date:	2019	036285
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for removal from the CWA section 303(d) List under section 4.1 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess pollutant. [NUMBER] of the [NUMBER] samples exceed the [OBJECTIVE/GUIDELINE/CRITERIA].

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. [NUMBER] of [NUMBER] samples exceeded the [OBJECTIVE/GUIDELINE/CRITERIA] and this exceeds the allowable frequency listed in Table 4.1 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation:

Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 33502, Toxicity **Region 9**

English Canyon

LOE ID:	2999
Pollutant:	Sediment Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	2
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Two out of four samples displayed statistically significant toxicity in the survival endpoint when compared to the negative control based on a statistical test with alpha of less than 5%. All samples were tested using the 10-day Hyallela azteca test. All data points had no associated QA qualifiers (SWAMP, 2004).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the Regional Board (Region 9 Basin Plan, pages 3-15 to 3-16; September 8, 1994).
Objective/Criterion Reference:	Placeholder reference 2006 303(d)

Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	All samples were collected from one station, English Creek 2.
Temporal Representation:	Samples were collected from October 2002 through May 2003. Toxicity in the survival endpoint was detected in samples collected on October 28, 2002 and January 13, 2003.
Environmental Conditions:	English Canyon Creek is located in Hydrologic Unit 901.13.
QAPP Information:	SWAMP QAPP.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33502, Toxicity **Region 9**

English Canyon

LOE ID:	21398
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	3
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Four samples were collected at English Canyon Creek station 901SJENG2 from October 2002 to May 2003. They showed significant toxicity levels (SL) in the following tests: Selenastrum algae growth test - two of the four samples. Ceriodaphnia dubia survival/reproductive test - three of the four samples.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.
Guideline Reference:	Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms. Fourth Edition. Office of Water, U.S. Environmental Protection Agency. Washington, D.C. EPA-821-R-02-013 Waste Discharge Requirements for Discharges of Urban Runoff From the Municipal Separate Storm Sewer Systems Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego, the San Diego Unified Port District, and the San Diego County Regional Airport. Order No. R9-2007-0001
Spatial Representation:	Water toxicity samples were collected at English Canyon Creek 2, station 901SJENG2; (Latitude 33.6278, Longitude -117.6806).
Temporal Representation:	Water samples were collected on October 2002, January 2003, April 2003 and May 2003.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 33502, Toxicity **Region 9**

English Canyon 036287

LOE ID:	73516
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	2
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Eight samples were collected to test for toxicity. two of the eight samples exhibited statistically and biologically significant toxicity. The toxicity tests that exhibited significant toxicity included Hyallela survival and Fathead Minnow survival.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control. Additionally, the biological significance of the sample was evaluted by determining whether the sample response was lower than the evaluation threshold.
Guideline Reference:	
Spatial Representation:	The samples were collected at station EC-MD English Creek.
Temporal Representation:	The samples were collected from June 2006 to November 2009.
Environmental Conditions:	
QAPP Information:	The data collected under the Quality Assurance Management Plan for The Orange County Stormwater Program. The SWAMP measurement quality objectives were followed for toxicity data. The performance of toxicity bioassays and evaluation of reference toxicants were performed using USEPA and Standard Methods.
QAPP Information Reference(s):	

DECISION ID **48432** **Region 9**

English Canyon

Pollutant:	**Ammonia (Unionized)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 6 samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section

303(d) List. 036288

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 6 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48432, Ammonia (Unionized) **Region 9**

English Canyon

LOE ID:	73662
Pollutant:	Ammonia (Unionized)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Zero of six samples did not exceeded the water quality objective for unionized ammonia. Data were reported as as total ammonia as nitrogen and were converted to unionized ammonia as nitrogen before being compared with the objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The San Diego Basin Plan objective for unionized ammonia is 0.025 mg/L as N.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Madera Drive.
Temporal Representation:	Samples were collected on 12/15/08.
Environmental Conditions:	
QAPP Information:	A signed QAPP was included with the stated goal of ensuring the consistent collection of accurate water quality information that will used to satisfy the objectives of the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID **48433** **Region 9**

English Canyon

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final	New Decision

Listing Decision:		036289
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 4 samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 4 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48433, Arsenic **Region 9**

English Canyon

LOE ID:	73622
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the four samples exceed the criteria for arsenic.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The CTR for arsenic is 150 ug/L.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition

Spatial Representation:	Samples were collected from English Canyon at Madera Drive (EC-MD).
Temporal Representation:	Samples were collected from station EC-MD on 9/26/06, 5/30/07, 10/10/07, 5/13/08, 8/20/09, 09/30/08, and 4/28/09.
Environmental Conditions:	All the samples are representative of dry weather conditions.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID 48435 Region 9

English Canyon

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of 7 samples exceed the WARM criteria and 0 of 6 samples exceed the MUN criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 7 samples exceed the WARM criteria and 0 of 6 samples exceed the MUN criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48435, Cadmium Region 9

English Canyon

LOE ID:	73632
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0

Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the six samples exceed the water quality objective for cadmium.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Total cadmium levels should not exceed the California Department of Public Health Primary MCL of 5 ug/L.
Guideline Reference:	
Spatial Representation:	Samples were collected from English Canyon at Madera Drive (EC-MD).
Temporal Representation:	Samples were collected from station EC-MD on 9/26/06, 5/30/07, 10/10/07, 5/13/08, 8/20/09, 09/30/08, and 4/28/09.
Environmental Conditions:	All the samples are representative of dry weather conditions.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 48435, Cadmium **Region 9**

English Canyon

LOE ID:	73631
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the seven samples exceed the hardness adjusted criteria for cadmium.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition

Spatial Representation:	Samples were collected from English Canyon at Madera Drive (EC-MD). 036292
Temporal Representation:	Samples were collected from station EC-MD on 9/26/06, 5/30/07, 10/10/07, 5/13/08, 8/20/09, 09/30/08, and 4/28/09.
Environmental Conditions:	All the samples are representative of dry weather conditions.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID **48436** **Region 9**

English Canyon

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of 7 samples exceed the WARM criteria and 0 of 6 samples exceed the MUN criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 6 samples exceed the WARM criteria and 0 of 6 samples exceed the MUN criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48436, Chlorpyrifos **Region 9**

English Canyon

LOE ID:	73634
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0

Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only) 036293
Data Used to Assess Water Quality:	None of six samples exceed the USEPA Health Advisory 2011 ed., criteria for chlorpyrifos.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	USEPA Health Advisory 2011 ed., criteria for chlorpyrifos in freshwater is 2.0 ug/L (represents a life-time risk).
Guideline Reference:	2012 Edition of the Drinking Water Standards and Health Advisories
Spatial Representation:	Samples were collected at English Canyon site EC-MD.
Temporal Representation:	Samples were collected from 2006 through 2009.
Environmental Conditions:	According to the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010, samples were collected during the dry season and storm events.
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 48436, Chlorpyrifos **Region 9**

English Canyon

LOE ID:	73633
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	None of six samples exceed the continuous concentration for Chlorpyrifos criteria of 14.0 ng/L.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Criteria Continuous Concentration (four day average) for chlorpyrifos in freshwater is 14.0 ng/L.Ref12
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game
Spatial Representation:	Six samples were collected at English Canyon site EC-MD.
Temporal Representation:	Samples were collected from 2006 to 2009.
Environmental Conditions:	According to the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010, samples were collected during the dry season and storm events.
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance

Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown

QAPP Information Reference(s):

DECISION ID	48440	Region 9
English Canyon		

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 7 samples exceed the WARM criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 7 samples exceed the WARM criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48440, Chromium	Region 9
English Canyon	

LOE ID:	73635
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the seven samples exceed the hardness adjusted criteria for chromium.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from English Canyon at Madera Drive (EC-MD).
Temporal Representation:	Samples were collected from station EC-MD on 9/26/06, 5/30/07, 10/10/07, 5/13/08, 8/20/09, 09/30/08, and 4/28/09.
Environmental Conditions:	All the samples are representative of dry weather conditions.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID 48441 Region 9

English Canyon

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of 7 samples exceed the WARM criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 7 samples exceed the WARM criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48441, Copper Region 9

English Canyon 036296

LOE ID:	73645
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the seven samples exceed the hardness adjusted criteria for copper.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from English Canyon at Madera Drive (EC-MD).
Temporal Representation:	Samples were collected from station EC-MD on 9/26/06, 5/30/07, 10/10/07, 5/13/08, 8/20/09, 09/30/08, and 4/28/09.
Environmental Conditions:	All the samples are representative of dry weather conditions.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID **33033** **Region 9**

English Canyon

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. Three lines of evidence are available in the administrative record to assess this pollutant. One of the 4 samples exceed the criteria for the protection of the agricultural supply beneficial use, 0 of 6 samples exceed the criteria for the protection of municipal drinking water supply beneficial use, and 0 of 6 samples exceed the criteria for the protection of warm freshwater aquatic life beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of the 4 samples exceed the criteria for the protection of the agricultural supply beneficial use, 0 of 6 samples exceed the criteria for the protection of municipal drinking water supply beneficial use, and 0 of 6 samples exceed the criteria for the protection of warm freshwater aquatic life beneficial use and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 33033, Diazinon **Region 9**

English Canyon

LOE ID:	77750
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	None of six samples exceed the CDPH Notification Level for Diazinon criteria.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Department of Public Health (CDPH) Notification Level for Diazinon is 1.2 ug/L.
Guideline Reference:	Drinking Water Notification and Response Levels: An Overview
Spatial Representation:	Samples were collected at English Canyon site EC-MD.
Temporal Representation:	Samples were collected from September 2006 through April 2009.
Environmental Conditions:	According to the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010, samples were collected during the dry season and storm events.
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33033, Diazinon 036298 Region 9

English Canyon

LOE ID:	2997
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Agricultural Supply
Number of Samples:	4
Number of Exceedances:	1
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Of the four samples, one exceeded the criteria. (SWAMP, 2004).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual pesticides or combination of pesticides shall be present in the water column, sediments, or biota at concentrations that adversely affect beneficial uses.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	CDFG Aquatic life Hazard Assessment Criteria 1-hour average 0.16 ug/L (Siepman & Finlayson, 2000; Finlayson, 2004).
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	One Station at English Creek: 33.62781 -117.68058
Temporal Representation:	Samples were collected from October 2002 through May 2003.
Environmental Conditions:	Aliso Creek Watershed 901.11.
QAPP Information:	SWAMP Quality Assurance Plan.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33033, Diazinon Region 9

English Canyon

LOE ID:	73646
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	None of six samples exceed the continuous concentration for Diazinon criteria of 0.1 ug/L.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous

concentration (Finlayson, 2004). 036299

Guideline Reference: Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game

Spatial Representation: Four samples were collected at English Canyon site EC-MD.
Temporal Representation: Samples were collected from 2006 to 2009.
Environmental Conditions: According to the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010, samples were collected during the dry season and storm events.
QAPP Information: Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):

DECISION ID 48442 Region 9
English Canyon

Pollutant: **Lead**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 7 samples exceeds the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 7 samples exceeds the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48442, Lead Region 9
English Canyon

LOE ID: 73647

Pollutant: Lead
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Dissolved

Beneficial Use:	Warm Freshwater Habitat	036300
Number of Samples:	7	
Number of Exceedances:	0	
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)	
Data Used to Assess Water Quality:	None of the seven samples exceed the hardness adjusted criteria for lead.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.	
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Spatial Representation:	Samples were collected from English Canyon at Madera Drive (EC-MD).	
Temporal Representation:	Samples were collected from station EC-MD on 9/26/06, 5/30/07, 10/10/07, 5/13/08, 8/20/09, 09/30/08, and 4/28/09.	
Environmental Conditions:	All the samples are representative of dry weather conditions.	
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.	
QAPP Information Reference(s):		

DECISION ID	48437	Region 9
English Canyon		

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of 7 samples exceed the WARM criteria and 0 of 6 samples exceed the MUN criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 6 samples exceed the WARM criteria and 0 of 6 samples exceed the MUN criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a

beneficial use is fully supported using table 3.1. 036301
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48437, Malathion **Region 9**

English Canyon

LOE ID:	73648
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	None of six samples exceed the maximum (Instantaneous) concentration for Malathion in freshwater of 100 ng/L.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The maximum (Instantaneous) concentration for Malathion in freshwater is 100 ng/L.
Guideline Reference:	Quality Criteria for Water. USEPA Office of Water and Hazardous Materials. Washington, D.C
Spatial Representation:	Samples were collected at English Canyon site EC-MD.
Temporal Representation:	Samples were collected from 2006 to 2009.
Environmental Conditions:	According to the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010, samples were collected during the dry season and storm events.
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 48437, Malathion **Region 9**

English Canyon

LOE ID:	77751
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	None of six samples exceed the CDPH notification level for Malathion criteria of 160.0 ug/L.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Department of Public Health (CDPH) notification level criteria for malathion in drinking water is 160.0 ug/L.
Guideline Reference:	Water quality data for Temecula Creek, Murrieta Creek, and the Santa Margarita River. Temecula, CA
Spatial Representation:	Samples were collected at English Canyon site EC-MD.
Temporal Representation:	Samples were collected from September 2006 through April 2009.
Environmental Conditions:	According to the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010, samples were collected during the dry season and storm events.
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

DECISION ID	**48443**	**Region 9**
English Canyon		

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of 7 samples exceeds the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 7 samples exceeds the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and

information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48443, Nickel **Region 9**

English Canyon

LOE ID:	73661
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the seven samples exceed the hardness adjusted criteria for nickel.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from English Canyon at Madera Drive (EC-MD).
Temporal Representation:	Samples were collected from station EC-MD on 9/26/06, 5/30/07, 10/10/07, 5/13/08, 8/20/09, 09/30/08, and 4/28/09.
Environmental Conditions:	All the samples are representative of dry weather conditions.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID **48446** **Region 9**

English Canyon

Pollutant:	**Oxygen, Dissolved**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of

the Listing Policy. Under section 3.2 a single line(s) of evidence are necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 7 samples exceeds the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 7 samples exceeds the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48446, Oxygen, Dissolved **Region 9**

English Canyon

LOE ID:	73663
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Zero of 7 samples exceeded the objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Dissolved oxygen levels shall not be less than 5.0 mg/l in inland surface waters with designated MAR or WARM beneficial uses. The annual mean dissolved oxygen concentration shall not be less than 7 mg/l more than 10% of the time.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the EC-MD station.
Temporal Representation:	Samples were collected approximately semi-annually from September 2006 to April 2009.
Environmental Conditions:	
QAPP Information:	NPDES quality assurance.
QAPP Information Reference(s):	

DECISION ID **48444** **Region 9**

English Canyon 036305

Pollutant:	**Silver**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 7 samples exceeds the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 7 samples exceeds the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48444, Silver — Region 9

English Canyon

LOE ID:	73515
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the seven samples exceed the hardness adjusted criteria for silver.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	California Toxics Rule (CTR) lists criterion maximum concentrations for silver to protect aquatic life in freshwater (1-hour average). The dissolved silver criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from English Canyon at Madera Drive (EC-MD).
Temporal Representation:	Samples were collected from station EC-MD on 9/26/06, 5/30/07, 10/10/07, 5/13/08, 8/20/09, 09/30/08, and 4/28/09.
Environmental Conditions:	All the samples are representative of dry weather conditions.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID 48445 Region 9
English Canyon

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of 7 samples exceeds the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 7 samples exceeds the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48445, Zinc Region 9
English Canyon

LOE ID:	73517
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water

Matrix:	Water	036307
Fraction:	Dissolved	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	7	
Number of Exceedances:	0	
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)	
Data Used to Assess Water Quality:	None of the seven samples exceed the hardness adjusted criteria for zinc.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.	
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Spatial Representation:	Samples were collected from English Canyon at Madera Drive (EC-MD).	
Temporal Representation:	Samples were collected from station EC-MD on 9/26/06, 5/30/07, 10/10/07, 5/13/08, 8/20/09, 09/30/08, and 4/28/09.	
Environmental Conditions:	All the samples are representative of dry weather conditions.	
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.	
QAPP Information Reference(s):		

DECISION ID	**48447**	**Region 9**
English Canyon		

Pollutant:	**pH**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line(s) of evidence are necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 7 samples exceeds the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.

3. Zero of 6 samples exceeds the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48447, pH **Region 9**
English Canyon

LOE ID:	73664
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Zero of the 6 samples exceeded the objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The pH of all inland surface waters shall not be depressed below 6.5 or raised above 8.5 as a result of waste discharges.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the EC-MD station.
Temporal Representation:	Samples were collected approximately twice semi-annually from September 2006 to April 2009.
Environmental Conditions:	
QAPP Information:	NPDES quality assurance.
QAPP Information Reference(s):	

DECISION ID **51688** **Region 9**
English Canyon

Pollutant:	**Benthic Community Effects**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: Benthic Community Effects is being considered for placement on the CWA section 303(d) List under sections 3.9 and 3.1 of the Listing Policy. Under section 3.9, an additional line of evidence associating Benthic Community Effects with a water or sediment concentration of pollutant(s) is necessary to assess listing status.

Based on the readily available data and information, the weight of evidence provides sufficient justification for placing Benthic Community Effects in this water segment on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. Bioassessment samples were collected at one station over a period of four years with all calculated scores exhibiting significant degradation.
3. Pursuant to section 3.9 of the Listing Policy, the water exhibits significant degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index.
4. Pursuant to section 3.9 of the Listing Policy, the water segment has associated pollutant(s) samples that exceed water quality objectives.
5. Pursuant to section 3.11 of the Listing Policy, no additional data and information is available indicating that standards are being met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant(s) contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 51688, Benthic Community Effects **Region 9**

English Canyon

LOE ID:	80741
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	5
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Seven samples were collected at one station. Five of the seven samples were below the 0.79 threshold, and therefore exceeding the water quality objective for the aquatic life beneficial use. Two samples did not have scores calculated due to low organism counts.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009. Region 9 CSCI Scores & Water Body Information
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in a stream into an overall measure of stream health. The CSCI score is calculated by

	comparing the expected condition with actual (observed) results (Rhen, A. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.
Guideline Reference:	Development of a Benthic Index of Biotic Integrity (B-IBI) for Wadeable Streams in Northern Coastal California and its Application to Regional 305(b) Assessment
Spatial Representation:	Samples were collected at station EC-MD, English Creek near Madera Drive.
Temporal Representation:	The samples were collected in the fall 2006, and the spring and fall of 2007 and 2008 and in the spring of 2009.
Environmental Conditions:	
QAPP Information:	Data collected following SWAMP QA protocols for the County of Orange NPDES MS4 Copermittees Receiving Waters Monitoring and Reporting Program
QAPP Information Reference(s):	Quality Assurance Project Plan for the Orange County Stormwater Program.

Line of Evidence (LOE) for Decision ID 51688, Benthic Community Effects **Region 9**

English Canyon

LOE ID:	9089
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	3
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Three of the four samples showed excessive phosphorus concentrations. The samples were collected at English Canyon Creek 2, station 901SJENG2 on October 2002; January 2003; April 2003; and May 2003. (SWAMP, 2007).
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	As described in San Diego Basin Plan; inland surface waters, bays and estuaries and coastal lagoon waters shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses (RWQCB, 2007). From the Basin Plan: For inland surface waters-streams and other flowing waters, with all beneficial uses, the water quality objective for total phosphorus is 0.1 mg/L (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at English Canyon Creek station 2(901SJENG2). (Latitude 33.6278, Longitude -117.6806).
Temporal Representation:	Samples were collected on October 2002; January 2003; April 2003; and May 2003.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 51688, Benthic Community Effects 036311 Region 9

English Canyon

LOE ID:	21398
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	3
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Four samples were collected at English Canyon Creek station 901SJENG2 from October 2002 to May 2003. They showed significant toxicity levels (SL) in the following tests: Selenastrum algae growth test - two of the four samples. Ceriodaphnia dubia survival/reproductive test - three of the four samples.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.
Guideline Reference:	Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms. Fourth Edition. Office of Water, U.S. Environmental Protection Agency. Washington, D.C. EPA-821-R-02-013 Waste Discharge Requirements for Discharges of Urban Runoff From the Municipal Separate Storm Sewer Systems Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego, the San Diego Unified Port District, and the San Diego County Regional Airport. Order No. R9-2007-0001
Spatial Representation:	Water toxicity samples were collected at English Canyon Creek 2, station 901SJENG2; (Latitude 33.6278, Longitude -117.6806).
Temporal Representation:	Water samples were collected on October 2002, January 2003, April 2003 and May 2003.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 51688, Benthic Community Effects Region 9

English Canyon

LOE ID:	73665
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	4	036312
Number of Exceedances:	2	
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)	
Data Used to Assess Water Quality:	Two of the four samples exceed the criteria for selenium.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The CTR for selenium is 5.0 ug/L.	
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Spatial Representation:	Samples were collected from English Canyon at Madera Drive (EC-MD).	
Temporal Representation:	Samples were collected from station EC-MD on 9/26/06, 5/30/07, 10/10/07, 5/13/08, 8/20/09, 09/30/08, and 4/28/09.	
Environmental Conditions:	All the samples are representative of dry weather conditions.	
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 51688, Benthic Community Effects **Region 9**

English Canyon

LOE ID:	2996
Pollutant:	Benzo[b]fluoranthene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	2
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Four samples, two samples exceeding (SWAMP, 2004).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	California Toxic Rule: (water and organisms) 0.0044 Âµg/L.
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	One Station at English Creek: 33.62781 -117.68058.
Temporal Representation:	Samples were collected from October 2002 through May 2003.
Environmental Conditions:	Aliso Creek Watershed 901.11.
QAPP Information:	SWAMP Quality Assurance Plan.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 51688, Benthic Community Effects **Region 9**

English Canyon

LOE ID:	2998
Pollutant:	Dieldrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	3
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Four samples, three samples exceeding (SWAMP, 2004).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxic Rule-Human Health-FW (water and organisms) .00014 µg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	One Station at English Creek: 33.62781 -117.68058
Temporal Representation:	Samples were collected from October 2002 through May 2003.
Environmental Conditions:	Aliso Creek Watershed 901.11.
QAPP Information:	SWAMP Quality Assurance Plan.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 51688, Benthic Community Effects **Region 9**

English Canyon

LOE ID:	2999
Pollutant:	Sediment Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	2
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Two out of four samples displayed statistically significant toxicity in the survival endpoint when compared to the negative control based on a statistical test with alpha of less than 5%. All samples were tested using the 10-day Hyallela azteca test. All data points had no associated QA qualifiers (SWAMP, 2004).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of

	species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the Regional Board (Region 9 Basin Plan, pages 3-15 to 3-16; September 8, 1994).
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	All samples were collected from one station, English Creek 2.
Temporal Representation:	Samples were collected from October 2002 through May 2003. Toxicity in the survival endpoint was detected in samples collected on October 28, 2002 and January 13, 2003.
Environmental Conditions:	English Canyon Creek is located in Hydrologic Unit 901.13.
QAPP Information:	SWAMP QAPP.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 51688, Benthic Community Effects **Region 9**

English Canyon

LOE ID:	9090
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	3
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Four samples were collected at English Canyon Creek 2, station 901SJENG2 on October 2002; January 2003; April 2003; and May 2003 Three of the four samples showed excessive phosphorus concentrations (SWAMP, 2007).
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	CTR Freshwater Chronic (CCC) 5 ug/L. (U.S. EPA, 2000).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at English Canyon Creek station 2,(901SJENG2). (Latitude 33.6278, Longitude -117.6806).
Temporal Representation:	Samples were collected on October 2002; January 2003; April 2003; and May 2003.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 51688, Benthic Community Effects **Region 9**

English Canyon

LOE ID:	72791

Pollutant:	Benthic-Macroinvertebrate Bioassessments	036315
LOE Subgroup:	Population/Community Degradation	
Matrix:	Water	
Fraction:	Not Recorded	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	6	
Number of Exceedances:	6	
Data and Information Type:	Benthic macroinvertebrate surveys	
Data Used to Assess Water Quality:	Six out of the six samples collected had an IBI score below 40. The scores were, fall 2006: 4.3, spring 2007: 7.2, fall 2007: 15.7, spring 2008: 15.7, fall 2008: 0, spring 2009: 8.6.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the State or Regional Board. Region 9 Basin Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.	
Guideline Reference:	Development of a Benthic Index of Biotic Integrity (B-IBI) for Wadeable Streams in Northern Coastal California and its Application to Regional 305(b) Assessment	
Spatial Representation:	Samples were collected at station EC-MD, English Creek near Madera Drive.	
Temporal Representation:	The samples were collected in the fall 2006, and the spring and fall of 2007 and 2008 and in the spring of 2009.	
Environmental Conditions:		
QAPP Information:	The taxonomic analysis followed the guidelines of the Southern California Freshwater and Marine Invertebrate Taxonomic Associations (SAFIT, SCAMIT). All stream bioassessment sample collection and taxonomic analysis follow the Southern California Regional	
QAPP Information Reference(s):	Quality Assurance Project Plan for the Orange County Stormwater Program.	

Line of Evidence (LOE) for Decision ID 51688, Benthic Community Effects **Region 9**

English Canyon

LOE ID:	73516
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	2
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Eight samples were collected to test for toxicity. two of the eight samples exhibited statistically and biologically significant toxicity. The toxicity tests that exhibited significant toxicity included Hyallela survival and Fathead Minnow survival.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control. Additionally, the biological significance of the sample was evaluted by determining whether the sample response was lower than the evaluation threshold.
Guideline Reference:	
Spatial Representation:	The samples were collected at station EC-MD English Creek.
Temporal Representation:	The samples were collected from June 2006 to November 2009.
Environmental Conditions:	
QAPP Information:	The data collected under the Quality Assurance Management Plan for The Orange County Stormwater Program. The SWAMP measurement quality objectives were followed for toxicity data. The performance of toxicity bioassays and evaluation of reference toxicants were performed using USEPA and Standard Methods.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 51688, Benthic Community Effects **Region 9**

English Canyon

LOE ID:	9088
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	2
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Four samples were collected at English Canyon Creek station 901SJENG2 on October 2002; January 2003; April 2003; and May 2003, two of the four showed excessive nitrogen concentrations(SWAMP, 2007).
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses (RWQCB, 2007). A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at English Canyon Creek station 2,(901SJENG2).(Latitude 33.6278, Longitude -117.6806).
Temporal Representation:	Samples were collected on October 2002; January 2003; April 2003; and May 2003.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

DECISION ID 42810 Region 9

English Canyon

Pollutant:	**Phosphorus**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2023
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Three of the 4 samples exceed the water quality objective. According to Table 3.1 of the Listing Policy the minimum sample requirement is five. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Three of the 4 samples exceeded the Basin Plan objective and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 42810, Phosphorus Region 9

English Canyon

LOE ID:	9089
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	4	036318
Number of Exceedances:	3	
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)	
Data Used to Assess Water Quality:	Three of the four samples showed excessive phosphorus concentrations. The samples were collected at English Canyon Creek 2, station 901SJENG2 on October 2002; January 2003; April 2003; and May 2003. (SWAMP, 2007).	
Data Reference:	Monitoring data for Region 9	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	As described in San Diego Basin Plan; inland surface waters, bays and estuaries and coastal lagoon waters shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses (RWQCB, 2007). From the Basin Plan: For inland surface waters-streams and other flowing waters, with all beneficial uses, the water quality objective for total phosphorus is 0.1 mg/L (RWQCB, 2007).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at English Canyon Creek station 2(901SJENG2). (Latitude 33.6278, Longitude -117.6806).	
Temporal Representation:	Samples were collected on October 2002; January 2003; April 2003; and May 2003.	
Environmental Conditions:		
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.	
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA	

DECISION ID	42811	Region 9
English Canyon		

Pollutant:	**Total Nitrogen as N**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Two of the four samples exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Two of four samples exceed the objective, and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.

	4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 42811, Total Nitrogen as N **Region 9**

English Canyon

LOE ID:	9088
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	2
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Four samples were collected at English Canyon Creek station 901SJENG2 on October 2002; January 2003; April 2003; and May 2003, two of the four showed excessive nitrogen concentrations(SWAMP, 2007).
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses (RWQCB, 2007). A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at English Canyon Creek station 2,(901SJENG2). (Latitude 33.6278, Longitude -117.6806).
Temporal Representation:	Samples were collected on October 2002; January 2003; April 2003; and May 2003.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

DECISION ID **33516** **Region 9**

English Canyon

Pollutant: **Benzo[b]fluoranthene**

Final Listing Decision:	**List on 303(d) list (TMDL required list)**	036320
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)	
Revision Status	Original	
Sources:	Source Unknown	
Expected TMDL Completion Date:	2019	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Two of 4 samples exceeded the CTR criteria for this pollutant and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33516, Benzo[b]fluoranthene **Region 9**

English Canyon

LOE ID:	2996
Pollutant:	Benzo[b]fluoranthene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	2
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Four samples, two samples exceeding (SWAMP, 2004).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	California Toxic Rule: (water and organisms) 0.0044 Âµg/L.
Guideline Reference:	Placeholder reference 2006 303(d)

Spatial Representation:	One Station at English Creek: 33.62781 -117.68058.	036321
Temporal Representation:	Samples were collected from October 2002 through May 2003.	
Environmental Conditions:	Aliso Creek Watershed 901.11.	
QAPP Information:	SWAMP Quality Assurance Plan.	
QAPP Information Reference(s):		

DECISION ID **33023** **Region 9**

English Canyon

Pollutant:	**Dieldrin**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. A sufficient number of samples exceed the California Toxic Rule-Human Health-FW (water and organisms) .00014 mg/L.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Three of 4 samples exceeded the CTR human health freshwater criterion and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33023, Dieldrin **Region 9**

English Canyon

LOE ID:	2998
Pollutant:	Dieldrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4

Number of Exceedances:	3	036322

Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Four samples, three samples exceeding (SWAMP, 2004).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxic Rule-Human Health-FW (water and organisms) .00014 µg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	One Station at English Creek: 33.62781 -117.68058
Temporal Representation:	Samples were collected from October 2002 through May 2003.
Environmental Conditions:	Aliso Creek Watershed 901.11.
QAPP Information:	SWAMP Quality Assurance Plan.
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Salt Creek (Orange County)
Water Body ID: CAR9011400020011025104104
Water Body Type: River & Stream

DECISION ID 48619 **Region 9**
Salt Creek (Orange County)

Pollutant: Ammonia
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the six samples exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of six samples exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48619, Ammonia **Region 9**
Salt Creek (Orange County)

LOE ID: 75559

Pollutant: Ammonia (Unionized)
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Warm Freshwater Habitat

Number of Samples: 6

Number of Exceedances:	0	036324
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Zero of six samples exceeded the water quality objective for unionized ammonia. Samples were reported as as total ammonia as nitrogen and were converted to unionized ammonia as nitrogen before being compared with the objective.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. The San Diego Basin Plan objective for unionized ammonia is 0.025 mg/L as N.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected upstream Monarch Beach.	
Temporal Representation:	Samples were collected from September 2006 to April 2009.	
Environmental Conditions:		
QAPP Information:	A signed QAPP was included with the stated goal of ensuring the consistent collection of accurate water quality information that will used to satisfy the objectives of the Orange County Stormwater Program.	
QAPP Information Reference(s):		

DECISION ID	**48629**	**Region 9**
Salt Creek (Orange County)		

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the three samples exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of three samples exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48629, Arsenic **Region 9**

Salt Creek (Orange County)

LOE ID:	75548
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the three samples exceeded the water quality objective for arsenic.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The CTR for arsenic is 150 ug/L.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Salt Creek, upstream Monarch Beach (SC-MB).
Temporal Representation:	The samples were collected from SC-MB on 9/27/06, 5/31/07, 10/11/07, 5/14/08, 10/1/08, and 4/28/09.
Environmental Conditions:	The samples are representative of dry weather conditions.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID **48635** **Region 9**

Salt Creek (Orange County)

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the six samples exceed the objective for protection of Aquatic Life and zero of five samples exceed the objective for protection of the drinking water beneficial use (MUN). Based on the readily available data and information, the weight of evidence indicates that there is

sufficient justification against placing this water segment-pollutant combination on the section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of six and zero of five samples exceeded the objectives and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48635, Cadmium **Region 9**

Salt Creek (Orange County)

LOE ID:	75549
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the six samples exceeded the hardness adjusted water quality objectives for cadmium.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Salt Creek, upstream Monarch Beach (SC-MB).
Temporal Representation:	The samples were collected from SC-MB on 9/27/06, 5/31/07, 10/11/07, 5/14/08, 10/1/08, and 4/28/09.
Environmental Conditions:	The samples are representative of dry weather conditions.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.

QAPP Information Reference(s): 036327

Line of Evidence (LOE) for Decision ID 48635, Cadmium **Region 9**

Salt Creek (Orange County)

LOE ID:	75550
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None out of the five samples exceeded the water quality objective for cadmium.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Total cadmium levels should not exceed the California Department of Public Health Primary MCL of 5 ug/L.
Guideline Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Spatial Representation:	Samples were collected from Salt Creek, upstream Monarch Beach (SC-MB).
Temporal Representation:	The samples were collected from SC-MB on 9/27/06, 5/31/07, 10/11/07, 5/14/08, 10/1/08, and 4/28/09.
Environmental Conditions:	The samples are representative of dry weather conditions.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID **48636** **Region 9**

Salt Creek (Orange County)

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the six samples exceed the objective for protection of Aquatic Life and zero of six samples exceed the objective for protection of the drinking water beneficial use (MUN). Based on the readily available data and information, the weight of evidence indicates that there is

sufficient justification against placing this water segment-pollutant combination on the section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of six samples exceeded the objectives and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48636, Chlorpyrifos **Region 9**

Salt Creek (Orange County)

LOE ID:	75551
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	None of six samples exceed the continuous concentration for Chlorpyrifos criteria of 14.0 ng/L.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Criteria Continuous Concentration (four day average) for chlorpyrifos in freshwater is 14.0 ng/L. Ref12
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game
Spatial Representation:	Samples were collected at Salt Creek site SC-MB.
Temporal Representation:	Samples were collected from 2006 through 2009.
Environmental Conditions:	According to the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010, samples were collected during the dry season and storm events.
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 48636, Chlorpyrifos **Region 9**

Salt Creek (Orange County) 036329

LOE ID:	77810
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	None of six samples exceed the USEPA Health Advisory for chlorpyrifos.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	USEPA Health Advisory 2011 ed., criteria for chlorpyrifos in freshwater is 2.0 ug/L (represents a life-time risk).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game
Spatial Representation:	Samples were collected at Salt Creek site SC-MB.
Temporal Representation:	Samples were collected from September 2006 through April 2009.
Environmental Conditions:	According to the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010, samples were collected during the dry season and storm events.
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

DECISION ID **48623** **Region 9**

Salt Creek (Orange County)

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the six samples exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that: 036330
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of six samples exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48623, Chromium **Region 9**

Salt Creek (Orange County)

LOE ID:	75552
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the six samples exceeded the hardness adjusted water quality objectives for chromium.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Salt Creek, upstream Monarch Beach (SC-MB).
Temporal Representation:	The samples were collected from SC-MB on 9/27/06, 5/31/07, 10/11/07, 5/14/08, 10/1/08, and 4/28/09.
Environmental Conditions:	The samples are representative of dry weather conditions.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID 48625 Region 9

Salt Creek (Orange County) 036331

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the six samples exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of six samples exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48625, Copper — Region 9

Salt Creek (Orange County)

LOE ID:	75553
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	10
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the six samples exceeded the hardness adjusted water quality objectives for copper.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).

Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	036332
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.	
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Spatial Representation:	Samples were collected from Salt Creek, upstream Monarch Beach (SC-MB) and at the mouth of Salt creek (SCM-1).	
Temporal Representation:	The samples were collected from SC-MB on 9/27/06, 5/31/07, 10/11/07, 5/14/08, 10/1/08, and 4/28/09, and from SCM-1 on 09/07/06, 12/27/06,10/11/07, and 01/24/08.	
Environmental Conditions:	The samples are representative of dry weather conditions.	
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.	
QAPP Information Reference(s):		

DECISION ID 48637 **Region 9**

Salt Creek (Orange County)

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the six samples exceed the objective for protection of Aquatic Life and zero of six samples exceed the objective for protection of the drinking water beneficial use (MUN).

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of six samples exceeded the objectives and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48637, Diazinon **Region 9**

Salt Creek (Orange County)

LOE ID:	75554	036333

Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	None of six samples exceed the continuous concentration for Diazinon criteria of 0.1 ug/L.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Samples were collected at Salt Creek at site SC-MB.
Temporal Representation:	Samples were collected from 2006 through 2009.
Environmental Conditions:	According to the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010, samples were collected during the dry season and storm events.
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 48637, Diazinon **Region 9**

Salt Creek (Orange County)

LOE ID:	77811
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	None of six samples exceed the California Department of Public Health (CDPH) Notification Level.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	The California Department of Public Health (CDPH) Notification Level for Diazinon is 1.2 ug/L.
Guideline Reference:	Drinking Water Notification and Response Levels: An Overview
Spatial Representation:	Samples were collected at Salt Creek at site SC-MB.
Temporal Representation:	Samples were collected from September 2006 through April 2009.
Environmental Conditions:	According to the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010, samples were collected during the dry season and storm events.
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

DECISION ID 48624 Region 9

Salt Creek (Orange County)

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the six samples exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of six samples exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48624, Lead Region 9

Salt Creek (Orange County)

LOE ID:	75555
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved

Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the six samples exceeded the hardness adjusted water quality objectives for lead.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Salt Creek, upstream Monarch Beach (SC-MB).
Temporal Representation:	The samples were collected from SC-MB on 9/27/06, 5/31/07, 10/11/07, 5/14/08, 10/1/08, and 4/28/09.
Environmental Conditions:	The samples are representative of dry weather conditions.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID	**48626**	**Region 9**
Salt Creek (Orange County)		

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the six samples exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of six samples exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of

16 samples is needed to determine if a beneficial use is fully supported using table 3.0136336
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48626, Nickel **Region 9**

Salt Creek (Orange County)

LOE ID:	75558
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	10
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the 10 samples exceeded the hardness adjusted water quality objectives for nickel.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Salt Creek, upstream Monarch Beach (SC-MB) and at the mouth of Salt Creek (SCM-1).
Temporal Representation:	The samples were collected from SC-MB on 9/27/06, 5/31/07, 10/11/07, 5/14/08, 10/1/08, and 4/28/09, and from SCM-1 on 09/07/06, 12/27/06,10/11/07, and 01/24/08.
Environmental Conditions:	The samples are representative of dry weather conditions.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID **48628** **Region 9**

Salt Creek (Orange County)

Pollutant:	**Selenium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**

Last Listing Cycle's Final Listing Decision:	New Decision	036337
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the zero samples exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of zero samples exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48628, Selenium **Region 9**

Salt Creek (Orange County)

LOE ID:	75562
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	The reporting limit for all six of the non-detect samples exceeded the water quality objective for selenium.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The CTR for selenium is 5.0 ug/L.

Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Salt Creek, upstream Monarch Beach (SC-MB).
Temporal Representation:	The samples were collected from SC-MB on 9/27/06, 5/31/07, 10/11/07, 5/14/08, 10/1/08, and 4/28/09.
Environmental Conditions:	The samples are representative of dry weather conditions.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID 48620 Region 9

Salt Creek (Orange County)

Pollutant:	**Silver**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the six samples exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of six samples exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48620, Silver Region 9

Salt Creek (Orange County)

LOE ID:	75563
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6

Number of Exceedances:	0	036339
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)	
Data Used to Assess Water Quality:	None of the six samples exceeded the hardness adjusted water quality objectives for silver.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion maximum concentrations for silver to protect aquatic life in freshwater (1-hour average). The dissolved silver criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.	
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Spatial Representation:	Samples were collected from Salt Creek, upstream Monarch Beach (SC-MB).	
Temporal Representation:	The samples were collected from SC-MB on 9/27/06, 5/31/07, 10/11/07, 5/14/08, 10/1/08, and 4/28/09.	
Environmental Conditions:	The samples are representative of dry weather conditions.	
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.	
QAPP Information Reference(s):		

DECISION ID	48622	Region 9
Salt Creek (Orange County)		

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the six samples exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of six samples exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48622, Zinc **Region 9**

Salt Creek (Orange County)

LOE ID:	75565
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the six samples exceeded the hardness adjusted water quality objectives for zinc.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Salt Creek, upstream Monarch Beach (SC-MB).
Temporal Representation:	The samples were collected from SC-MB on 9/27/06, 5/31/07, 10/11/07, 5/14/08, 10/1/08, and 4/28/09.
Environmental Conditions:	The samples are representative of dry weather conditions.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID **48630** **Region 9**

Salt Creek (Orange County)

Pollutant:	**pH**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line(s) of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the six samples exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of six samples exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48630, pH **Region 9**

Salt Creek (Orange County)

LOE ID:	75560
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Zero of 6 samples exceeded the objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The pH of all inland surface waters shall not be depressed below 6.5 or raised above 8.5 as a result of waste discharges.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the SC-MB station.
Temporal Representation:	Samples were collected approximately semi-annually from September 2006 to April 2009.
Environmental Conditions:	
QAPP Information:	NPDES quality assurance.
QAPP Information Reference(s):	

DECISION ID 48640 **Region 9**

Salt Creek (Orange County) 036342

Pollutant:	**Benthic Community Effects**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Hydromodification | Illicit Connections/Illegal Hook-ups/Dry Weather Flows | Source Unknown | Unknown Nonpoint Source | Unknown Point Source | Urban Runoff/Storm Sewers
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Benthic Community Effects is being considered for placement on the CWA section 303(d) List under sections 3.9 and 3.1 of the Listing Policy. Under section 3.9, an additional line of evidence associating Benthic Community Effects with a water or sediment concentration of pollutant(s) is necessary to assess listing status. Based on the readily available data and information, the weight of evidence provides sufficient justification for placing Benthic Community Effects in this water segment on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. One station was sampled over a four year period. 3. Pursuant to section 3.9 of the Listing Policy, the water exhibits significant degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index. 4. Pursuant to section 3.9 of the Listing Policy, the water segment has associated pollutant(s) samples that exceed water quality objectives. 5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are being met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant(s) contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 48640, Benthic Community Effects — Region 9

Salt Creek (Orange County)

LOE ID:	75564
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	3
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Eight samples were collected to test for toxicity. Three of the eight samples exhibited statistically and biologically significant toxicity. The toxicity tests that exhibited significant toxicity included Ceriodaphnia reproduction and survival and Hyallela biomass and survival.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control. Additionally, the biological significance of the sample is evaluated by determining whether the sample response is lower than the evaluation threshold.
Guideline Reference:	Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms. Fourth Edition. Office of Water, U.S. Environmental Protection Agency. Washington, D.C. EPA-821-R-02-013
Spatial Representation:	The sample was collected at stations SC-MB Salt Creek.
Temporal Representation:	The sample was collected from June 2006 to November 2009.
Environmental Conditions:	
QAPP Information:	The data collected under the Quality Assurance Management Plan for The Orange County Stormwater Program. The SWAMP measurement quality objectives were followed for toxicity data. The performance of toxicity bioassays and evaluation of reference toxicants were performed using USEPA and Standard Methods.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 48640, Benthic Community Effects **Region 9**

Salt Creek (Orange County)

LOE ID:	72795
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	6
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Six out of the six samples collected had an IBI score below 40. The scores were, fall 2006: 15.7, spring 2007: 5.7, fall 2007: 14.3, spring 2008: 1.4, fall 2008: 2.9, spring 2009: 0.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the State or Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	Development of a Benthic Index of Biotic Integrity (B-IBI) for Wadeable Streams in Northern Coastal California and its Application to Regional 305(b) Assessment
Spatial Representation:	Samples were collected at station SC-MB, Salt Creek near upstream Monarch Beach.

Temporal Representation:	The samples were collected in the fall 2006, and the spring and fall of 2007 and 2008 and in the spring of 2009.
Environmental Conditions:	
QAPP Information:	The taxonomic analysis followed the guidelines of the Southern California Freshwater and Marine Invertebrate Taxonomic Associations (SAFIT, SCAMIT). All stream bioassessment sample collection and taxonomic analysis follow the Southern California Regional
QAPP Information Reference(s):	Quality Assurance Project Plan for the Orange County Stormwater Program.

Line of Evidence (LOE) for Decision ID 48640, Benthic Community Effects **Region 9**

Salt Creek (Orange County)

LOE ID:	75556
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	10
Number of Exceedances:	4
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Four of ten samples exceed the maximum (Instantaneous) concentration for Malathion in freshwater of 100 ng/L.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The maximum (Instantaneous) concentration for Malathion in freshwater is 100 ng/L.
Guideline Reference:	Quality Criteria for Water. USEPA Office of Water and Hazardous Materials. Washington, D.C
Spatial Representation:	Samples were collected at Salt Creek, site SC-MB and at the mouth of Salt Creek (SCM-1)
Temporal Representation:	Samples were collected from 2006 through 2009
Environmental Conditions:	According to the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010, samples were collected during the dry season and storm events.
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 48640, Benthic Community Effects **Region 9**

Salt Creek (Orange County)

LOE ID:	80742
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	7

Number of Exceedances:	7	036345
Data and Information Type:	Benthic macroinvertebrate surveys	
Data Used to Assess Water Quality:	Seven out of seven samples were below the 0.79 threshold, and therefore exceeding the water quality objective for the aquatic life beneficial use.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009. Region 9 CSCI Scores & Water Body Information	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.	
Guideline Reference:	Development of a Benthic Index of Biotic Integrity (B-IBI) for Wadeable Streams in Northern Coastal California and its Application to Regional 305(b) Assessment	
Spatial Representation:	Samples were collected at station SC-MB, Salt Creek near upstream Monarch Beach.	
Temporal Representation:	The samples were collected in the fall 2006, and the spring and fall of 2007 and 2008 and in the spring of 2009.	
Environmental Conditions:		
QAPP Information:	Data collected following SWAMP QA protocols the County of Orange NPDES MS4 Copermittees Receiving Waters Monitoring and Reporting Program	
QAPP Information Reference(s):	Quality Assurance Project Plan for the Orange County Stormwater Program.	

DECISION ID	48639	Region 9
Salt Creek (Orange County)		

Pollutant:	**Malathion**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Surface Runoff
Expected TMDL Completion Date:	2027
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Four of the ten samples exceed the objective for protection of Aquatic Life. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Four of the ten samples exceed the objective for protection of Aquatic Life.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 48639, Malathion **Region 9**

Salt Creek (Orange County)

LOE ID:	75556
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	10
Number of Exceedances:	4
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Four of ten samples exceed the maximum (Instantaneous) concentration for Malathion in freshwater of 100 ng/L.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The maximum (Instantaneous) concentration for Malathion in freshwater is 100 ng/L.
Guideline Reference:	Quality Criteria for Water. USEPA Office of Water and Hazardous Materials. Washington, D.C
Spatial Representation:	Samples were collected at Salt Creek, site SC-MB and at the mouth of Salt Creek (SCM-1)
Temporal Representation:	Samples were collected from 2006 through 2009
Environmental Conditions:	According to the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010, samples were collected during the dry season and storm events.
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 48639, Malathion **Region 9**

Salt Creek (Orange County)

LOE ID:	75564
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None

Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	3
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Eight samples were collected to test for toxicity. Three of the eight samples exhibited statistically and biologically significant toxicity. The toxicity tests that exhibited significant toxicity included Ceriodaphnia reproduction and survival and Hyallela biomass and survival.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control. Additionally, the biological significance of the sample is evaluated by determining whether the sample response is lower than the evaluation threshold.
Guideline Reference:	Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms. Fourth Edition. Office of Water, U.S. Environmental Protection Agency. Washington, D.C. EPA-821-R-02-013
Spatial Representation:	The sample was collected at stations SC-MB Salt Creek.
Temporal Representation:	The sample was collected from June 2006 to November 2009.
Environmental Conditions:	
QAPP Information:	The data collected under the Quality Assurance Management Plan for The Orange County Stormwater Program. The SWAMP measurement quality objectives were followed for toxicity data. The performance of toxicity bioassays and evaluation of reference toxicants were performed using USEPA and Standard Methods.
QAPP Information Reference(s):	

DECISION ID	**48633**	**Region 9**
Salt Creek (Orange County)		

Pollutant:	**Toxicity**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2027
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 a single line of evidence is necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. Three of the 8 samples exceed the objective for water toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.036348
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Three of 8 samples exceed the objective and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 48633, Toxicity **Region 9**

Salt Creek (Orange County)

LOE ID:	75564
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	3
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Eight samples were collected to test for toxicity. Three of the eight samples exhibited statistically and biologically significant toxicity. The toxicity tests that exhibited significant toxicity included Ceriodaphnia reproduction and survival and Hyallela biomass and survival.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control. Additionally, the biological significance of the sample is evaluated by determining whether the sample response is lower than the evaluation threshold.
Guideline Reference:	Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms. Fourth Edition. Office of Water, U.S. Environmental Protection Agency. Washington, D.C. EPA-821-R-02-013
Spatial Representation:	The sample was collected at stations SC-MB Salt Creek.
Temporal Representation:	The sample was collected from June 2006 to November 2009.
Environmental Conditions:	
QAPP Information:	The data collected under the Quality Assurance Management Plan for The Orange County Stormwater Program. The SWAMP measurement quality objectives were followed for toxicity data. The performance of toxicity bioassays and evaluation of reference toxicants were performed using USEPA and Standard Methods.
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Oso Creek (at Mission Viejo Golf Course)
Water Body ID: CAR9012000020010831150708
Water Body Type: River & Stream

DECISION ID 33319 **Region 9**
Oso Creek (at Mission Viejo Golf Course)

Pollutant: Boron
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Original
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 13 samples exceed the Basin Plan water quality objective for Boron.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 13 samples exceed the Basin Plan water quality objective for Boron and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33319, Boron **Region 9**
Oso Creek (at Mission Viejo Golf Course)

LOE ID: 3001

Pollutant: Boron
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use:	Agricultural Supply	036350
Number of Samples:	13	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by the Santa Margarita Water District in 1998-2001. None of the 13 samples were in exceedance. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for Boron is 0.75 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Oso Creek at the Mission Viejo Golf Course.	
Temporal Representation:	Samples were collected on a quarterly basis from 01/15/1998 to 01/02/2001.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID 33124 Region 9

Oso Creek (at Mission Viejo Golf Course)

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 4 samples exceed the Basin Plan water quality objective for pesticides and the California Department of Fish and Game (Siepman & Finlayson, 2000; Finlayson, 2004) for diazinon.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 4 samples exceed the Basin Plan water quality objective for diazinon and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33124, Diazinon **Region 9**

Oso Creek (at Mission Viejo Golf Course)

LOE ID:	3005
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Four samples with none exceeding the criteria. (SWAMP, 2004).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination or pesticides shall be present in concentrations that adversely affect beneficial uses.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	CDFG Aquatic life toxicity one hour acute average 0.16 ug/L and 4 day chronic average 0.10 ug/L. (Siepman & Finlayson, 2000; Finlayson, 2004).
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	One station at Oso Creek: 33.53484 -117.67616.
Temporal Representation:	Four samples collected from October 2002 through May 2003.
Environmental Conditions:	San Juan Creek Watershed: 901.21.
QAPP Information:	SWAMP Quality Assurance Plan.
QAPP Information Reference(s):	

DECISION ID 33701 **Region 9**

Oso Creek (at Mission Viejo Golf Course)

Pollutant:	**Fluoride**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.Â

One line of evidence is available in the administrative record to assess this pollutant.Â One of 12 of the samples exceed the Basin Plan water quality objective for flouride. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this

water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of 12 of the samples exceed the Basin Plan water quality objective for flouride and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33701, Fluoride **Region 9**

Oso Creek (at Mission Viejo Golf Course)

LOE ID:	3004
Pollutant:	Fluoride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Agricultural Supply
Number of Samples:	12
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the Santa Margarita Water District from 1998 to 2001. One of 12 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for Fluoride is 1.0 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Oso Creek at the Mission Viejo Golf Course.
Temporal Representation:	Samples were collected on a quarterly basis from 01/15/1998 to 01/02/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 34925 **Region 9**

Oso Creek (at Mission Viejo Golf Course)

Pollutant:	**Chloride**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final	List on 303(d) list (TMDL required list)(2012)

Listing Decision:		036353
Revision Status	Original	
Sources:	Source Unknown	
Expected TMDL Completion Date:	2019	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Twelve of 13 samples exceed the Basin Plan water quality objective for chloride.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Twelve of 13 samples exceed the Basin Plan water quality objective for chloride and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34925, Chloride **Region 9**

Oso Creek (at Mission Viejo Golf Course)

LOE ID:	3002
Pollutant:	Chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Agricultural Supply
Number of Samples:	13
Number of Exceedances:	12
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the Santa Margarita Water District in 1998-2001. Twelve of 13 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for Chloride is 250 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	

Guideline Reference:	036354
Spatial Representation:	Samples were collected at Oso Creek at the Mission Valley Golf Course.
Temporal Representation:	Samples were collected on a quarterly basis from 01/15/1998 to 01/02/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 33700 **Region 9**

Oso Creek (at Mission Viejo Golf Course)

Pollutant:	**Sulfates**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Twelve of 13 samples exceed the Basin Plan water quality objective for sulfates.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Twelve of 13 samples exceed the Basin Plan water quality objective for sulfates and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33700, Sulfates **Region 9**

Oso Creek (at Mission Viejo Golf Course)

LOE ID:	3003
Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Agricultural Supply

Number of Samples:	13	036355
Number of Exceedances:	12	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Data were collected by the Santa Margarita Water District from 1998 to 2001. Twelve of 13 samples were in exceedance.	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for Sulfate 250 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Oso Creek at the Mission Viejo Golf Course.	
Temporal Representation:	Samples were collected on a quarterly basis from 01/15/1998 to 01/02/2001.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID 34850 Region 9

Oso Creek (at Mission Viejo Golf Course)

Pollutant:	**Total Dissolved Solids**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Thirteen of the 13 samples exceed the Basin Plan water quality objective for total dissolved solids.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Thirteen of the 13 samples exceed the Basin Plan water quality objective for total dissolved solids and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not

changed. 036356

Line of Evidence (LOE) for Decision ID 34850, Total Dissolved Solids **Region 9**

Oso Creek (at Mission Viejo Golf Course)

LOE ID:	3000
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Agricultural Supply
Number of Samples:	13
Number of Exceedances:	13
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the Santa Margarita Water District in 1998-2001. Thirteen of 13 water samples were in exceedance (San Diego RWQCB, 2002t).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters for the San Juan Hydrologic Unit, and all beneficial uses, the WQO for TDS is 500 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Oso Creek at the Mission Viejo Golf Course.
Temporal Representation:	Samples were collected on a quarterly basis from 01/15/1998 to 01/02/2001.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Oso Creek (lower)
Water Body ID: CAR9012000020010831154628
Water Body Type: River & Stream

DECISION ID 43534 **Region 9**
Oso Creek (lower)

Pollutant: Nitrogen
Final Listing Decision: List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Sources: Source Unknown
Expected TMDL Completion Date: 2023
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. Three of the four samples exceed the OBJECTIVE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Three of four samples exceed the OBJECTIVE and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 43534, Nitrogen **Region 9**
Oso Creek (lower)

LOE ID: 21400

Pollutant: Toxicity
LOE Subgroup: Toxicity
Matrix: Water
Fraction: None

Beneficial Use: Warm Freshwater Habitat

Number of Samples:	4	036358
Number of Exceedances:	4	
Data and Information Type:	Ambient toxicity testing (chronic)	
Data Used to Assess Water Quality:	Four samples were collected at Oso Creek station 901SJOSO3 from October 2002 to May 2003, they showed significant toxicity levels (SL) in the following tests: Selenastrum algae growth test: All four samples were toxic. Ceriodaphnia dubia survival/reproductive test : Two of the three samples were toxic.	
Data Reference:	Monitoring data for Region 9	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.	
Guideline Reference:	Monitoring data for Region 9	
Spatial Representation:	Water toxicity samples were collected at Oso Creek station 3, 901SJOSO3; (Latitude 33.5348, Longitude -117.6762).	
Temporal Representation:	Samples were collected on October 2002, January 2003, April 2003, and May 2003.	
Environmental Conditions:		
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.	
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA	

Line of Evidence (LOE) for Decision ID 43534, Nitrogen **Region 9**

Oso Creek (lower)

LOE ID:	9095
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	3
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Four water samples were collected at Oso Creek 3 Station 901SJOSO3 on October 2002, January 2003, April 2003, and May 2003, four of the four samples showed excessive nitrogen concentrations (SWAMP, 2007).
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses (RWQCB, 2007). A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional

	Board. Analogous threshold values have not been set for nitrogen compounds, however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Water samples were collected at Oso Creek 3 Station (901SJOSO3). (Latitude 33.5348, Longitude -117.6762).
Temporal Representation:	Samples were collected on October 2002, January 2003, April 2003, and May 2003.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

DECISION ID 43302 Region 9

Oso Creek (lower)

Pollutant:	**Phosphorus**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2023
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the section 303(d) list under sections 3.6 and 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence is available in the administrative record to assess this pollutant. Three of the four samples exceed the Basin Plan water quality objective for phosphorus. In addition, four of four samples exhibited toxicity. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Three of the four samples exceed the Basin Plan water quality objective for phosphorus and four of four samples exceed the toxicity objectives and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 43302, Phosphorus Region 9

Oso Creek (lower)

LOE ID:	9093	036360
Pollutant:	Phosphorus	
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	Not Recorded	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	4	
Number of Exceedances:	3	
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)	
Data Used to Assess Water Quality:	Four water samples were collected at Oso Creek Station 901SJOSO3 on October 2002, January 2003, April 2003, and May 2003, three of the four samples showed excessive phosphorus concentrations (SWAMP, 2007).	
Data Reference:	Monitoring data for Region 9	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. Water Quality Control Plan for the San Diego Basin Goal of 0.1 mg/L for total phosphorus in streams and other flowing waters (RWQCB, 2007).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Water samples were collected at Oso Creek 3 Station (901SJOSO3). (Latitude 33.5348, Longitude -117.6762).	
Temporal Representation:	Samples were collected on October 2002, January 2003, April 2003, and May 2003.	
Environmental Conditions:		
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.	
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA	

Line of Evidence (LOE) for Decision ID 43302, Phosphorus **Region 9**

Oso Creek (lower)

LOE ID:	21400
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Four samples were collected at Oso Creek station 901SJOSO3 from October 2002 to May 2003, they showed significant toxicity levels (SL) in the following tests: Selenastrum algae growth test: All four samples were toxic. Ceriodaphnia dubia survival/reproductive test : Two of the three samples were toxic.
Data Reference:	Monitoring data for Region 9

SWAMP Data:	Non-SWAMP	036361
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.	
Guideline Reference:	Monitoring data for Region 9	
Spatial Representation:	Water toxicity samples were collected at Oso Creek station 3, 901SJOSO3; (Latitude 33.5348, Longitude -117.6762).	
Temporal Representation:	Samples were collected on October 2002, January 2003, April 2003, and May 2003.	
Environmental Conditions:		
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.	
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA	

DECISION ID 44429 — Region 9

Oso Creek (lower)

Pollutant:	**Selenium**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the section 303(d) list under sections 3.6 and 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence is available in the administrative record to assess this pollutant. Three of the four samples exceed the Basin Plan water quality objective for selenium. In addition, four of four samples exhibited toxicity. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Three of the four samples exceed the Basin Plan water quality objective for selenium and four of four samples exceed the toxicity objectives and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 44429, Selenium — Region 9

Oso Creek (lower) 036362

LOE ID:	9094
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	3
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Four water samples were collected at Oso Creek Station 901SJOSO3 on October 2002, January 2003, April 2003, and May 2003, three of the four samples showed excessive phosphorus concentrations.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	CTR Freshwater Chronic (CCC) 5 ug/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Water samples were collected at Oso Creek 3 Station (901SJOSO3). (Latitude 33.5348, Longitude -117.6762).
Temporal Representation:	Samples were collected on October 2002, January 2003, April 2003, and May 2003.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 44429, Selenium **Region 9**

Oso Creek (lower)

LOE ID:	21400
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Four samples were collected at Oso Creek station 901SJOSO3 from October 2002 to May 2003, they showed significant toxicity levels (SL) in the following tests: Selenastrum algae growth test: All four samples were toxic. Ceriodaphnia dubia survival/reproductive test : Two of the three samples were toxic.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that

	produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.
Guideline Reference:	Monitoring data for Region 9
Spatial Representation:	Water toxicity samples were collected at Oso Creek station 3, 901SJOSO3; (Latitude 33.5348, Longitude -117.6762).
Temporal Representation:	Samples were collected on October 2002, January 2003, April 2003, and May 2003.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

DECISION ID 42685 Region 9

Oso Creek (lower)

Pollutant:	**Toxicity**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the section 303(d) list under section 3.6 of the Listing Policy. Under section 3.6 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Four of the four samples exceed the Basin Plan water quality objective for toxicity. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Four of the four samples exceed the Basin Plan water quality objective for toxicity and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 42685, Toxicity Region 9

Oso Creek (lower)

LOE ID:	21400

Pollutant:	Toxicity	036364
LOE Subgroup:	Toxicity	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	4	
Number of Exceedances:	4	
Data and Information Type:	Ambient toxicity testing (chronic)	
Data Used to Assess Water Quality:	Four samples were collected at Oso Creek station 901SJOSO3 from October 2002 to May 2003, they showed significant toxicity levels (SL) in the following tests: Selenastrum algae growth test: All four samples were toxic. Ceriodaphnia dubia survival/reproductive test : Two of the three samples were toxic.	
Data Reference:	Monitoring data for Region 9	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.	
Guideline Reference:	Monitoring data for Region 9	
Spatial Representation:	Water toxicity samples were collected at Oso Creek station 3, 901SJOSO3; (Latitude 33.5348, Longitude -117.6762).	
Temporal Representation:	Samples were collected on October 2002, January 2003, April 2003, and May 2003.	
Environmental Conditions:		
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.	
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Arroyo Trabuco Creek
Water Body ID: CAR9012000020011025103603
Water Body Type: River & Stream

DECISION ID 42259 **Region 9**
Arroyo Trabuco Creek

Pollutant: **Diazinon**
Final Listing Decision: **Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Reason for Delisting: Applicable WQS attained; threatened water no longer threatened
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for removal from the CWA section 303(d) List under section 4.1 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. Since the Ban of Diazinon in 2006, zero of 41 samples exceeded the water quality criteria for the protection of aquatic life.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Since the Ban of Diazinon in 2006, zero of 41 samples exceeded the water quality criteria for the protection of aquatic lifeand this does not exceed the allowable frequency listed in Table 4.1 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be removed from the section 303(d) list because applicable water quality standards for the pollutant are not being exceeded.

Line of Evidence (LOE) for Decision ID 42259, Diazinon **Region 9**
Arroyo Trabuco Creek

LOE ID: 77712

Pollutant: Diazinon
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total Dissolved

Beneficial Use: Municipal & Domestic Supply

Number of Samples:	22	036366
Number of Exceedances:	0	
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)	
Data Used to Assess Water Quality:	None of 22 samples exceed the CADPH Notification Level for Diazinon criteria.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The California Department of Public Health (CDPH) Notification Level for Diazinon is 1.2 ug/L.	
Guideline Reference:	Drinking Water Notification and Response Levels: An Overview	
Spatial Representation:	Samples were collected at Arroyo Trabuco Creek: REF-TCAS, TC-DO, TCOLO2, TC-AP and SMC00206.	
Temporal Representation:	Samples were collected from 2006 through 2009.	
Environmental Conditions:	According to the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010, samples were collected during the dry season and storm events.	
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 42259, Diazinon **Region 9**

Arroyo Trabuco Creek

LOE ID:	21274
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	6
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	All 6 samples taken exceeded the 0.17 Âµg/L limit for diazinon. Samples were collected six times from March 25, 1999 to February 23, 2000. Data was submitted into the Department of Pesticide RegulationÂ's Surface Water Database .
Data Reference:	Department of Pesticide Regulation (DPR), 2003. Surface Water Database, April 2003. Accessed July 8, 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments of biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organism. (RWQCB, 2007)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Diazinon is toxic to birds and aquatic life; especially invertebrates. The one-hour average concentration of diazinon should not exceed 0.17 Âµg/L more than once every three years on the average (acute criterion) and the four-day average concentration of diazinon should not exceed 0.17 Âµg/L more than once every three years on the average (chronic criterion).

	(U.S. EPA, 2006). 036367
Guideline Reference:	Fact Sheet: Final Recommended Aquatic Life Ambient Water Quality Criteria for Diazinon
Spatial Representation:	Samples were collected from the middle Trabuco Creek at Oso Parkway. Lat/Long: 33.5850/-117.6358.
Temporal Representation:	Samples were taken on various dates starting March 25, 1999 to February 23, 2000.
Environmental Conditions:	
QAPP Information:	Data submitted to the DPRÂ's Surface Water Database is subject to the document Â"Requirements for Inclusion of Monitoring Data in DPRÂ's Surface Water Database.Â"
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 42259, Diazinon **Region 9**

Arroyo Trabuco Creek

LOE ID:	73034
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	41
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	None of forty one samples exceed the continuous concentration for Diazinon criteria of 0.1 ug/L.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Samples were collected at Arroyo Trabuco Creek, sites: REF-TCAS, TC-DO, TCOLO2, TC-AP and SMC00206.
Temporal Representation:	Samples were collected from 2006 through 2009.
Environmental Conditions:	According to the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010, samples were collected during the dry season and storm events.
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown
QAPP Information Reference(s):	

DECISION ID **42387** **Region 9**

Arroyo Trabuco Creek

Pollutant:	**Toxicity**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)

Revision Status	Revised	036368
Sources:	Source Unknown	
Expected TMDL Completion Date:	2019	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for removal from the CWA section 303(d) List under section 4.6 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Four lines of evidence are available in the administrative record to assess pollutant. Twelve of the 41 samples exceed the water quality objective for Toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Twelve of the 41 samples exceed the water quality objective for Toxicity and this exceeds the allowable frequency listed in Table 4.1 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation:

Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.
After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 42387, Toxicity **Region 9**

Arroyo Trabuco Creek

LOE ID:	7732
Pollutant:	Toxicity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	From the four samples, there was no observed acute or chronic toxicity to Hyalella azteca, Selenastrum Algae Growth or Ceriodaphnia dubia. Toxicity data reviewed came from the Orange County Water Annual Progess Report from 2002 to 2006. Samples were collected from December 2002 through May 2005.
Data Reference:	Orange County Stormwater Program. 2004-2007. Unified Annual Progress Reports. Program Effectiveness Assessment (San Diego Region)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be sustain free from toxic substances in concentrations that are toxic to, or that produce harmful physiological responses in human, plant, animal, or aquatic life. Samples were found to exhibit toxicity when the No Observed Effect Concentration (NOEC) or median lethal concentration (LC50) for any given species was estimated to be less than 100% of the test sample concentration.

Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	036369
Evaluation Guideline:		
Guideline Reference:	Water Quality Control Plan for the San Diego Basin	
Spatial Representation:	Samples were collected at two locations in Trabuco Creek. Samples were collected at the end of Avery Parkway (TC-AP) and at Del Obispo Rd (TC-DO).	
Temporal Representation:	Samples were collected from December 2002 to May 2005.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control documents for their stormwater monitoring program.	
QAPP Information Reference(s):	Orange County Stormwater Program. 2004-2007. Unified Annual Progress Reports. Program Effectiveness Assessment (San Diego Region)	

Line of Evidence (LOE) for Decision ID 42387, Toxicity **Region 9**

Arroyo Trabuco Creek

LOE ID:	73023
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	27
Number of Exceedances:	6
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Twenty-seven samples were collected to test for toxicity. Six of the 27 samples exhibited statistically and biologically significant toxicity. The toxicity tests that exhibited significant toxicity included Mysid biomass and survival, Ceriodaphnia reproduction, and Selenastrum growth.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control. Additionally, the biological significance of the sample is evaluated by determining whether the sample response is lower than the evaluation threshold.
Guideline Reference:	
Spatial Representation:	The sample was collected at stations REF-TCAS, TC-AP, TC-DO, and TCOL02 Trabuco Creek.
Temporal Representation:	The sample was collected from June 2006 to April 2009.
Environmental Conditions:	
QAPP Information:	The data collected under the Quality Assurance Management Plan for The Orange County Stormwater Program. The SWAMP measurement quality objectives were followed for toxicity data. The performance of toxicity bioassays and evaluation of reference toxicants were performed using USEPA and Standard Methods.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 42387, Toxicity **Region 9**

Arroyo Trabuco Creek 036370

LOE ID:	26272
Pollutant:	Sediment Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	1
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	One of the four samples collected show significant toxicity levels (SL) to Hyalella azteca according to results from the Surface Ambient Monitoring Program results (SWAMP, 2007).
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.
Guideline Reference:	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA
Spatial Representation:	Water samples were collected at Trabucco Creek station Trabuco Creek 2, 901SJATC2 and Trabuco Creek 5, 901SJATC5.
Temporal Representation:	Water samples were collected on October 2002, January 2003, and May 2003.
Environmental Conditions:	
QAPP Information:	Quality control for this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	Orange County Stormwater Program. 2004-2007. Unified Annual Progress Reports, Program Effectiveness Assessment (San Diego Region)

Line of Evidence (LOE) for Decision ID 42387, Toxicity **Region 9**

Arroyo Trabuco Creek

LOE ID:	26224
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	5
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Five of the six samples collected show significant toxicity levels (SL). Ceriodaphnia dubia: Three of the six samples exhibited toxicity. Selenastrum capricornutum: Three of the six samples exhibited toxicity as determined by the Ceriodaphnia dubia survival/reproductive test (SWAMP, 2007).

Data Reference:	Monitoring data for Region 9	036371
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (RWQCB, 2007).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.	
Guideline Reference:	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA	
Spatial Representation:	Samples were collected at two locations in Trabuco Creek. Samples were collected at the end of Trabuco Creek 5 (901 SJATC5) and Trabuco Creek 2 (901 SJATC2).	
Temporal Representation:	Water samples were collected on October 2002, January 2003, April 2003, and May 2003.	
Environmental Conditions:		
QAPP Information:	Quality control for this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.	
QAPP Information Reference(s):	Orange County Stormwater Program. 2004-2007. Unified Annual Progress Reports, Program Effectiveness Assessment (San Diego Region)	

DECISION ID	47799	Region 9
Arroyo Trabuco Creek		

Pollutant:	**Ammonia (Unionized)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of 1 sample exceeds the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 1 sample exceeds the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47799, Ammonia (Unionized) 036372 Region 9

Arroyo Trabuco Creek

LOE ID:	73004
Pollutant:	Ammonia (Unionized)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	0 of 1 samples exceed the water objective for un-ionized ammonia (NH3) at 0.025 mg/l (as N). Un-ionized ammonia (as N) was calculated from Total Ammonia (as N) from monthly samples reported in the data. The calculated un-ionized ammonia (as N) values was then established and compared to the un-ionized Ammonia (as N) at 0.025 mg/L in the RB9 Basin Plan. The data are reported as underneath the quantitation limit. These quantitation values are less than or equal to the water quality standard, the value will be considered as meeting the water quality standard, objective, criterion, or evaluation guideline.
Data Reference:	Statewide Perennial Streams Assessment 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan, San Diego Region (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. The discharge of wastes shall not cause concentrations of un-ionized ammonia (NH3) to exceed 0.025 mg/l (as N) in inland surface waters, enclosed bays and estuaries and coastal lagoons.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at 901PS0057 (Arroyo Trabuco 57).
Temporal Representation:	Samples collected on 5/14/2008.
Environmental Conditions:	
QAPP Information:	SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 47800 Region 9

Arroyo Trabuco Creek

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of 37 samples exceed the criteria for WARM freshwater aquatic life and 0 of 45 samples exceed the objective for COLD freshwater aquatic life.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 37 samples exceed the criteria for WARM freshwater aquatic life and 0 of 45 samples exceed the objective for COLD freshwater aquatic life and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 47800, Arsenic **Region 9**

Arroyo Trabuco Creek

LOE ID:	73006
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	45
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the 45 samples exceeded the water quality objective for arsenic.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The CTR for arsenic is 150 ug/L.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Arroyo Trabuco Creek / Alder Spring (REF-TCAS).
Temporal Representation:	The samples were collected from REF-TCAS on 9/26/06, 6/1/07, 11/6/07, 5/20/08, and 4/30/09.
Environmental Conditions:	The samples are representative of dry weather conditions.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 47800, Arsenic **Region 9**

Arroyo Trabuco Creek

LOE ID:	73005
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	37
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the 37 samples exceeded the water quality objective for arsenic.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The CTR for arsenic is 150 ug/L.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Arroyo Trabuco Creek at TC-AP Avery Parkway (TC-AP), at Del Obispo (TC-DO), at Del Obispo (TCOL02), at Trabuco Creek / Alder Spring (REF-TCAS), and at SMC00206.
Temporal Representation:	Samples were collected from September 2006 through May of 2009.
Environmental Conditions:	Approximately half of the samples were collected after storm events.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID	47801	Region 9
Arroyo Trabuco Creek		

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Two of 54 samples exceed the objective for WARM freshwater aquatic life and 1 of 40 samples exceed the objective for municipal drinking water supply. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Two of 54 samples exceed the objective for WARM freshwater aquatic life and 1 of 40 samples exceed the objective for municipal drinking water supply and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 47801, Cadmium **Region 9**

Arroyo Trabuco Creek

LOE ID:	73026
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	40
Number of Exceedances:	1
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	One of the 40 samples exceeded the water quality objective for cadmium.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Total cadmium levels should not exceed the California Department of Public Health Primary MCL of 5 ug/L.
Guideline Reference:	
Spatial Representation:	Samples were collected from Arroyo Trabuco Creek at the following sites: Alder Spring (REF-TCAS), Avery Parkway (TC-AP), and Del Obispo (TC-DO and TCOL02).
Temporal Representation:	The samples were collected from 9/26/06 and 4/30/09.
Environmental Conditions:	The samples are representative of dry weather conditions.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 47801, Cadmium **Region 9**

Arroyo Trabuco Creek

LOE ID:	73027
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water

Matrix:	Water	036376
Fraction:	Dissolved	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	54	
Number of Exceedances:	2	
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)	
Data Used to Assess Water Quality:	Two of the 54 samples exceeded the hardness adjusted water quality objective for cadmium.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Spatial Representation:	Samples were collected from Arroyo Trabuco Creek at TC-AP Avery Parkway (TC-AP), at Del Obispo (TC-DO), at Del Obispo (TCOL02), at Trabuco Creek / Alder Spring (REF-TCAS), and at SMC00206.	
Temporal Representation:	Samples were collected from September 2006 through May of 2009.	
Environmental Conditions:	Approximately half of the samples were collected after storm events.	
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.	
QAPP Information Reference(s):		

DECISION ID	**47802**	**Region 9**
Arroyo Trabuco Creek		

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Four lines of evidence are available in the administrative record to assess this pollutant. Zero of 41 samples exceed the objective for municipal drinking water supply and 0 of 68 samples exceed the objective for WARM freshwater aquatic life.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.036377
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 41 samples exceed the objective for municipal drinking water supply and 0 of 68 samples exceed the objective for WARM freshwater aquatic life and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 47802, Chlorpyrifos **Region 9**

Arroyo Trabuco Creek

LOE ID:	73029
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	41
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	None of 41 samples exceed the USEPA Health Advisory 2011 ed., criteria for chlorpyrifos.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	USEPA Health Advisory 2011 ed., criteria for chlorpyrifos in freshwater is 2.0 ug/L (represents a life-time risk).
Guideline Reference:	2012 Edition of the Drinking Water Standards and Health Advisories
Spatial Representation:	Samples were collected at Arroyo Trabuco Creek, sites: REF-TCAS, TC-DO, TCOLO2, TC-AP and SMC00206.
Temporal Representation:	Samples were collected from 2006 through 2009.
Environmental Conditions:	According to the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010, samples were collected during the dry season and storm events.
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 47802, Chlorpyrifos **Region 9**

Arroyo Trabuco Creek

LOE ID:	73028
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	Total Dissolved	036378
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	35	
Number of Exceedances:	0	
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)	
Data Used to Assess Water Quality:	None of thirty-five samples exceed the continuous concentration for Chlorpyrifos criteria of 14.0 ng/L, however for six samples the reporting limit was greater than the evaluation guideline, therefore these data are not of sufficient resolution to determine if water quality standards are being achieved.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The Criteria Continuous Concentration (four day average) for chlorpyrifos in freshwater is 14.0 ng/L. Ref12	
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game	
Spatial Representation:	Samples were collected at Arroyo Trabuco, sites: REF-TCAS, TC-DO, TCOLO2, TC-AP and SMC00206.	
Temporal Representation:	Samples were collected from 2006 through 2009.	
Environmental Conditions:	According to the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010, samples were collected during the dry season and storm events.	
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 47802, Chlorpyrifos **Region 9**

Arroyo Trabuco Creek

LOE ID:	73030
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	33
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	None of 33 samples exceed the continuous concentration for Chlorpyrifos criteria of 14.0 ng/L, however for two samples the reporting limit was greater than the evaluation guideline, therefore these data are not of sufficient resolution to determine if water quality standards are being achieved.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column,

	sediments or biota at concentration(s) that adversely affect beneficial uses036379
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Criteria Continuous Concentration (four day average) for chlorpyrifos in freshwater is 14.0 ng/L. Ref12
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game
Spatial Representation:	Nineteen samples were collected at Segunda Deshecha Creek, sites: SD-AP and SDCM02
Temporal Representation:	Samples were collected from 2006 through 2009.
Environmental Conditions:	According to the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010, samples were collected during the dry season and storm events.
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

DECISION ID 47803 Region 9

Arroyo Trabuco Creek

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of 54 samples exceed the objective for COLD freshwater aquatic life and 0 of 46 samples exceed the objective for municipal drinking water supply. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 54 samples exceed the objective for COLD freshwater aquatic life and 0 of 46 samples exceed the objective for municipal drinking water supply and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 47803, Chromium Region 9

Arroyo Trabuco Creek

LOE ID:	73032

Pollutant:	Chromium	036380
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	Total	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	46	
Number of Exceedances:	0	
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)	
Data Used to Assess Water Quality:	None of the 46 samples exceeded the water quality objective for chromium.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The CDPH Primary MCL for chromium is 50 ug/L.	
Guideline Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR	
Spatial Representation:	Samples were collected from the following sites: REF-TCAS, TC-AP, TC-DO and TCOL02	
Temporal Representation:	The samples were collected between 2006 and 2009.	
Environmental Conditions:	The samples are representative of dry weather conditions.	
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 47803, Chromium **Region 9**

Arroyo Trabuco Creek

LOE ID:	73031
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	54
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the 54 samples exceeded the hardness adjusted water quality objective for chromium.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Arroyo Trabuco Creek at TC-AP Avery Parkway (TC-AP), at Del Obispo (TC-DO), at Del Obispo (TCOL02), at Trabuco Creek / Alder Spring (REF-TCAS), and at SMC00206.
Temporal Representation:	Samples were collected from September 2006 through May of 2009.
Environmental Conditions:	Approximately half of the samples were collected after storm events.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID 47804 Region 9

Arroyo Trabuco Creek

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Two of 41 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Two of 41 samples exceed the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 47804, Copper Region 9

Arroyo Trabuco Creek

LOE ID:	73033
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved

Beneficial Use:	Warm Freshwater Habitat	036382
Number of Samples:	41	
Number of Exceedances:	2	
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)	
Data Used to Assess Water Quality:	2 of 41 samples collected for dissolved copper exceeded the hardness adjusted water quality objective for copper.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.	
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Spatial Representation:	Samples were collected from Arroyo Trabuco Creek at TC-AP Avery Parkway (TC-AP), at Del Obispo (TC-DO), at Del Obispo (TCOL02), at Trabuco Creek / Alder Spring (REF-TCAS), and at SMC00206.	
Temporal Representation:	Samples were collected from September 2006 through May of 2009.	
Environmental Conditions:	Approximately half of the samples were collected after storm events.	
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.	
QAPP Information Reference(s):		

DECISION ID	47805	Region 9
Arroyo Trabuco Creek		

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollution

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1, one line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. One of six samples exceeded the water quality guidelines for lead for the protection of aquatic life.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of six samples exceeded the water quality guidelines for lead for the protection of aquatic life

and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to [SECTION 3.11/4.11] of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47805, Lead **Region 9**
Arroyo Trabuco Creek

LOE ID:	73039
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	1
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	One of six samples exceeded the hardness adjusted water quality objective for lead.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Arroyo Trabuco Creek at TC-AP Avery Parkway (TC-AP), at Del Obispo (TC-DO), at Del Obispo (TCOL02), at Trabuco Creek / Alder Spring (REF-TCAS), and at SMC00206.
Temporal Representation:	Samples were collected from September 2006 through May of 2009. Data collected within seven days were averaged.
Environmental Conditions:	Approximately half of the samples were collected after storm events.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID **63087** **Region 9**
Arroyo Trabuco Creek

Pollutant:	**Mercury**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 one line(s) of evidence are necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. Zero of one sample exceed the water quality objective for mercury for the protection of aquatic life.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceed the water quality objective for mercury for the protection of aquatic life and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to [SECTION 3.11/4.11] of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 63087, Mercury **Region 9**

Arroyo Trabuco Creek

LOE ID:	73009
Pollutant:	Mercury
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	zero of two samples exceeded the water quality objective for mercury.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	National Recommended Water Quality Criteria Continuous Concentrations (4-day average concentrations) for freshwater aquatic organisms exposure to elemental mercury is 0.77

ug/L. 036385

Guideline Reference: National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology

Spatial Representation: Samples were collected from Arroyo Trabuco Creek at Del Obispo (TCOL02) and at SMC00206.

Temporal Representation: Samples were collected from September 2006 through May of 2009.

Environmental Conditions:

QAPP Information: Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.

QAPP Information Reference(s):

DECISION ID 47808 Region 9

Arroyo Trabuco Creek

Pollutant: **Nickel**

Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**

Last Listing Cycle's Final Listing Decision: New Decision

Revision Status Revised

Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 54 samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 54 samples exceed the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 47808, Nickel Region 9

Arroyo Trabuco Creek

LOE ID: 73010

Pollutant: Nickel

LOE Subgroup: Pollutant-Water

Matrix: Water

Fraction: Dissolved

Beneficial Use: Warm Freshwater Habitat

Number of Samples: 54

Number of Exceedances: 0

Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the 54 samples exceeded the hardness adjusted water quality objective for nickel.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Arroyo Trabuco Creek at TC-AP Avery Parkway (TC-AP), at Del Obispo (TC-DO), at Del Obispo (TCOL02), at Trabuco Creek / Alder Spring (REF-TCAS), and at SMC00206.
Temporal Representation:	Samples were collected from September 2006 through May of 2009.
Environmental Conditions:	Approximately half of the samples were collected after storm events.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID	47809	Region 9
Arroyo Trabuco Creek		

Pollutant:	**Oxygen, Dissolved**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. Three lines of evidence are available in the administrative record to assess this pollutant. One of 34 samples exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of 34 samples exceed the objective and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision	After review of the available data and information, RWQCB staff concludes that the water body-

Recommendation: pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded. 01583

Line of Evidence (LOE) for Decision ID 47809, Oxygen, Dissolved **Region 9**

Arroyo Trabuco Creek

LOE ID:	73012
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Numeric data generated from 1 sample of Dissolved Oxygen concentrations had 1 exceedences.
Data Reference:	Statewide Perennial Streams Assessment 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: Dissolved oxygen levels shall not be less than 5.0 mg/l in inland surface waters with designated MAR or WARM beneficial uses or less than 6.0 mg/l in waters with designated COLD beneficial uses. The annual mean dissolved oxygen concentrations shall not be less than 7 mg/l more than 10% of the time.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	One sample was collected from the 901PS0057 station.
Temporal Representation:	One sample was collected in May 2008.
Environmental Conditions:	
QAPP Information:	NPDES quality assurance.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 47809, Oxygen, Dissolved **Region 9**

Arroyo Trabuco Creek

LOE ID:	73013
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	The sample collected did not exceed the objective.
Data Reference:	Statewide Ref Condition Management Plan 2008
SWAMP Data:	SWAMP

Water Quality Objective/Criterion:	Dissolved oxygen levels shall not be less than 5.0 mg/l in inland surface waters with designated MAR or WARM beneficial uses or less than 6.0 mg/l in waters with designated COLD beneficial uses. The annual mean dissolved oxygen concentration shall not be less than 7 mg/l more than 10% of the time
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the 901ATCAAS station.
Temporal Representation:	One sample was collected on 6/5/2008
Environmental Conditions:	
QAPP Information:	SWAMP QAPP
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 47809, Oxygen, Dissolved **Region 9**

Arroyo Trabuco Creek

LOE ID:	73011
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	32
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Zero of the 32 samples exceeded the objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Dissolved oxygen levels shall not be less than 5.0 mg/l in inland surface waters with designated MAR or WARM beneficial uses or less than 6.0 mg/l in waters with designated COLD beneficial uses. The annual mean dissolved oxygen concentration shall not be less than 7 mg/l more than 10% of the time
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the REF-TCAS, TC-AP, TC-DO, and TCOL02 stations
Temporal Representation:	Samples were collected approximately 4 times every semi-annual period from September 2006 to April 2009.
Environmental Conditions:	
QAPP Information:	NPDES quality assurance.
QAPP Information Reference(s):	

DECISION ID **47810** **Region 9**

Arroyo Trabuco Creek

Pollutant:	**Selenium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision

Revision Status	Revised	036389
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. One of 6 samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of 6 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47810, Selenium **Region 9**

Arroyo Trabuco Creek

LOE ID:	73018
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	1
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	One of the six samples exceeded the water quality objective for selenium. Six non-detect samples had reporting limits greater than the criterion and were not used in this assessment.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The CTR for selenium is 5.0 ug/L.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority

Spatial Representation:	Samples were collected from Arroyo Trabuco Creek at TC-AP Avery Parkway (TC-AP), at Del Obispo (TC-DO), at Del Obispo (TCOL02), at Trabuco Creek / Alder Spring (REF-TCAS), and at SMC00206.
Temporal Representation:	Samples were collected from September 2006 through May of 2009.
Environmental Conditions:	Approximately half of the samples were collected after storm events.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID 47811 Region 9

Arroyo Trabuco Creek

Pollutant:	**Silver**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of 54 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 54 samples exceed the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 47811, Silver Region 9

Arroyo Trabuco Creek

LOE ID:	73019
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	54
Number of Exceedances:	0

Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants) 036391
Data Used to Assess Water Quality:	None of the 54 samples exceeded the hardness adjusted water quality objective for silver.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion maximum concentrations for silver to protect aquatic life in freshwater (1-hour average). The dissolved silver criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Arroyo Trabuco Creek at TC-AP Avery Parkway (TC-AP), at Del Obispo (TC-DO), at Del Obispo (TCOL02), at Trabuco Creek / Alder Spring (REF-TCAS), and at SMC00206.
Temporal Representation:	Samples were collected from September 2006 through May of 2009.
Environmental Conditions:	Approximately half of the samples were collected after storm events.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID	**47812**	**Region 9**
Arroyo Trabuco Creek		

Pollutant:	**Temperature, water**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line(s) of evidence are necessary to assess listing status. One line of evidence are available in the administrative record to assess this pollutant. One of 17 samples exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of 17 samples exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2. 4. Pursuant to section 3.2 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision	After review of the available data and information, RWQCB staff concludes that the water body-

Recommendation: pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47812, Temperature, water **Region 9**

Arroyo Trabuco Creek

LOE ID:	73020
Pollutant:	Temperature, water
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	17
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	One of 17 samples exceeded the objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Board that such alteration in temperature does not adversely affect beneficial uses. At no time or place shall the temperature of any COLD water be increased more than 5Â°F above the natural receiving water temperature.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Inland Fishes of California (Moyle 1976) states that for rainbow trout the optimum range for growth and completion of most life stages is 13-21 degrees C (page 129).
Guideline Reference:	Inland Fishes of California
Spatial Representation:	Samples were collected from the TC-AP, TC-DO and TCOL02 stations.
Temporal Representation:	Samples were collected approximately thrice semi-annually from September 2006 to April 2009.
Environmental Conditions:	
QAPP Information:	NPDES quality assurance.
QAPP Information Reference(s):	

DECISION ID **47813** **Region 9**

Arroyo Trabuco Creek

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 54 samples exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 54 samples exceed the objective and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 47813, Zinc **Region 9**

Arroyo Trabuco Creek

LOE ID:	73024
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	54
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the 54 samples exceeded the hardness adjusted water quality objective for zinc.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Arroyo Trabuco Creek at TC-AP Avery Parkway (TC-AP), at Del Obispo (TC-DO), at Del Obispo (TCOL02), at Trabuco Creek / Alder Spring (REF-TCAS), and at SMC00206.
Temporal Representation:	Samples were collected from September 2006 through May of 2009.
Environmental Conditions:	Approximately half of the samples were collected after storm events.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID **47814** **Region 9**

Arroyo Trabuco Creek

Pollutant:	**pH**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Four lines of evidence are available in the administrative record to assess this pollutant. Zero of 35 samples exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 35 samples exceed the objective and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 47814, pH **Region 9**

Arroyo Trabuco Creek

LOE ID:	73014
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Numeric data generated from 1 sample of pH data had no exceedences.
Data Reference:	Data for bacteria in various waterbodies, Feb. 2005-May 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The pH of all inland surface waters shall not be depressed below 6.5 or raised above 8.5 as a result of waste discharges.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	

Guideline Reference:	036395
Spatial Representation:	Samples were collected from the Trabuco Creek station.
Temporal Representation:	One sample was collected on 5/5/2007.
Environmental Conditions:	
QAPP Information:	NPDES quality assurance.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 47814, pH **Region 9**

Arroyo Trabuco Creek

LOE ID:	73015
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	33
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Numeric data generated from 33 minimums and maximums of pH data had no exceedences.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The pH of all inland surface waters shall not be depressed below 6.5 or raised above 8.5 as a result of waste discharges.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the REF-TCAS, SMC00206, TC-AP, TC-DO, and TCOL02 stations.
Temporal Representation:	Samples were collected approximately twice a month from September 2006 to April 2009.
Environmental Conditions:	
QAPP Information:	NPDES quality assurance.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 47814, pH **Region 9**

Arroyo Trabuco Creek

LOE ID:	73016
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Numeric data generated from 1 sample collected had no exceedences.

Data Reference:	Statewide Perennial Streams Assessment 2008	036396
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	In inland surface waters[,] the pH shall not be depressed below 6.5 nor raised above 8.5.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from the 901PS0057 station.	
Temporal Representation:	One sample was collected in May 2008	
Environmental Conditions:		
QAPP Information:	SWAMP QAPP	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 47814, pH **Region 9**

Arroyo Trabuco Creek

LOE ID:	73017
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	0 of 0 samples exceed the water quality objective. The data are reported as non-detects and have been omitted from the sample count.
Data Reference:	Statewide Ref Condition Management Plan 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan, San Diego Region (SDRWQCB 2007): In inland surface waters the pH shall not be depressed below 6.5 nor raised above 8.5.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at 901ATCAAS (Arroyo Trabuco).
Temporal Representation:	Sample collected 6/5/2008.
Environmental Conditions:	
QAPP Information:	SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **45845** **Region 9**

Arroyo Trabuco Creek

Pollutant:	**Benthic Community Effects**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown

Expected TMDL Completion Date:	2025	036397
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

Benthic Community Effects is being considered for placement on the CWA section 303(d) List under sections 3.9 and 3.1 of the Listing Policy. Under section 3.9, an additional line of evidence associating Benthic Community Effects with a water or sediment concentration of pollutant(s) is necessary to assess listing status.

Based on the readily available data and information, the weight of evidence provides sufficient justification for placing Benthic Community Effects in this water segment on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Pursuant to section 3.9 of the Listing Policy, the water exhibits significant degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index.
4. Pursuant to section 3.9 of the Listing Policy, the water segment has associated pollutant(s) samples that exceed water quality objectives.
5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are being met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem. This listing does not apply to Upper Trabuco Creek within the National Forest as samples from those sites (n = 7) does not exhibit significant degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index.

Line of Evidence (LOE) for Decision ID 45845, Benthic Community Effects **Region 9**

Arroyo Trabuco Creek

LOE ID:	80749
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	15
Number of Exceedances:	13
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Fifteen samples were collected at five stations in lower Arroyo Trabuco downstream from the USFS boundary. Thirteen samples had CSCI scores below the 0.79 threshold, and are therefore exceeding the water quality objective for the aquatic life beneficial use.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009 Statewide Perennial Streams Assessment 2008 Data for Various Waterbodies in Region 8 and Region 9, 2006-2009. Region 9 CSCI Scores & Water Body Information
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of

	species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.
Guideline Reference:	The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.
Spatial Representation:	The samples were collected at stations TC-DO, 901PS0057, TC-AP, SMC00206
Temporal Representation:	The samples were collected from 2006 to 2009.
Environmental Conditions:	
QAPP Information:	Data collected following SWAMP QA protocols for the County of Orange NPDES MS4 Copermittees Receiving Waters Monitoring and Reporting Program, and for the SWAMP Statewide Perennial Streams Assessment 2008, and Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan.
QAPP Information Reference(s):	RWB9 Stormwater Monitoring Council CY 2009 Statewide Perennial Streams Assessment 2008 Quality Assurance Project Plan for the Orange County Stormwater Program.

Line of Evidence (LOE) for Decision ID 45845, Benthic Community Effects **Region 9**

Arroyo Trabuco Creek

LOE ID:	21274
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	6
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	All 6 samples taken exceeded the 0.17 Âµg/L limit for diazinon. Samples were collected six times from March 25, 1999 to February 23, 2000. Data was submitted into the Department of Pesticide RegulationÂ's Surface Water Database .
Data Reference:	Department of Pesticide Regulation (DPR), 2003. Surface Water Database, April 2003. Accessed July 8, 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments of biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organism. (RWQCB, 2007)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Diazinon is toxic to birds and aquatic life; especially invertebrates. The one-hour average concentration of diazinon should not exceed 0.17 Âµg/L more than once every three years on the average (acute criterion) and the four-day average concentration of diazinon should not exceed 0.17 Âµg/L more than once every three years on the average (chronic criterion).

	(U.S. EPA, 2006). 036399
Guideline Reference:	Fact Sheet: Final Recommended Aquatic Life Ambient Water Quality Criteria for Diazinon
Spatial Representation:	Samples were collected from the middle Trabuco Creek at Oso Parkway. Lat/Long: 33.5850/-117.6358.
Temporal Representation:	Samples were taken on various dates starting March 25, 1999 to February 23, 2000.
Environmental Conditions:	
QAPP Information:	Data submitted to the DPRÂ's Surface Water Database is subject to the document Â"Requirements for Inclusion of Monitoring Data in DPRÂ's Surface Water Database.Â"
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 45845, Benthic Community Effects **Region 9**

Arroyo Trabuco Creek

LOE ID:	73039
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	1
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	One of six samples exceeded the hardness adjusted water quality objective for lead.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Arroyo Trabuco Creek at TC-AP Avery Parkway (TC-AP), at Del Obispo (TC-DO), at Del Obispo (TCOL02), at Trabuco Creek / Alder Spring (REF-TCAS), and at SMC00206.
Temporal Representation:	Samples were collected from September 2006 through May of 2009. Data collected within seven days were averaged.
Environmental Conditions:	Approximately half of the samples were collected after storm events.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 45845, Benthic Community Effects **Region 9**

Arroyo Trabuco Creek

LOE ID:	80748

Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Seven samples were collected at two stations in upper Arroyo Trabuco. All scored samples were above the 0.79 threshold, and therefore not exceeding the water quality objective for the aquatic life beneficial use. One sample was not scored due to low organism counts.
Data Reference:	Statewide Ref Condition Management Plan 2008 Data for Various Waterbodies in Region 8 and Region 9, 2006-2009. Region 9 CSCI Scores & Water Body Information
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.
Guideline Reference:	The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.
Spatial Representation:	The samples were collected at stations 901ATCAAS and REF-TCAS.
Temporal Representation:	The samples were collected from 2006 to 2009.
Environmental Conditions:	
QAPP Information:	Data collected following SWAMP QA protocols for the County of Orange NPDES MS4 Copermittees Receiving Waters Monitoring and Reporting Program and for the SWAMP Statewide Reference Condition Management Plan 2008.
QAPP Information Reference(s):	Statewide Ref Condition Management Plan 2008 Quality Assurance Project Plan for the Orange County Stormwater Program.

Line of Evidence (LOE) for Decision ID 45845, Benthic Community Effects **Region 9**

Arroyo Trabuco Creek

LOE ID:	7733
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	9	036401
Number of Exceedances:	9	
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)	
Data Used to Assess Water Quality:	All nine flow-weighted event mean concentrations exceeded the water quality objective according to results in the the Orange County Stormwater Program annual progress reports. Samples were collected from December 2002 to March 2006.	
Data Reference:	Orange County Stormwater Program. 2004-2007. Unified Annual Progress Reports. Program Effectiveness Assessment (San Diego Region)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses (RWQCB, 2007). The Water Quality Control Plan for the San Diego Basin (9) goal for phosphorus in streams and other flowing waters is 0.1 mg/L.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:	Water Quality Control Plan for the San Diego Basin	
Spatial Representation:	Samples were collected at the mass loading station TCOL02 at Del Obispo Street at 33.4975Â°, 117.6657Â°.	
Temporal Representation:	Samples were collected from December 2002 to March 2006.	
Environmental Conditions:	Samples were collected during storm events.	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control documents for their stormwater monitoring program.	
QAPP Information Reference(s):	Orange County Stormwater Program. 2004-2007. Unified Annual Progress Reports. Program Effectiveness Assessment (San Diego Region)	

Line of Evidence (LOE) for Decision ID 45845, Benthic Community Effects **Region 9**

Arroyo Trabuco Creek

LOE ID:	73023
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	27
Number of Exceedances:	6
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Twenty-seven samples were collected to test for toxicity. Six of the 27 samples exhibited statistically and biologically significant toxicity. The toxicity tests that exhibited significant toxicity included Mysid biomass and survival, Ceriodaphnia reproduction, and Selenastrum growth.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there

	is a statistically significant decrease in organism response in the sample as compared to the control. Additionally, the biological significance of the sample is evaluated by determining whether the sample response is lower than the evaluation threshold.
Guideline Reference:	
Spatial Representation:	The sample was collected at stations REF-TCAS, TC-AP, TC-DO, and TCOL02 Trabuco Creek.
Temporal Representation:	The sample was collected from June 2006 to April 2009.
Environmental Conditions:	
QAPP Information:	The data collected under the Quality Assurance Management Plan for The Orange County Stormwater Program. The SWAMP measurement quality objectives were followed for toxicity data. The performance of toxicity bioassays and evaluation of reference toxicants were performed using USEPA and Standard Methods.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 45845, Benthic Community Effects **Region 9**

Arroyo Trabuco Creek

LOE ID:	73007
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	The sample collected had an IBI score below 40. The IBI score was 16.
Data Reference:	Statewide Perennial Streams Assessment 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the State or Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	The sample was collected at station, Arroyo Trabuco 57.
Temporal Representation:	The sample was collected in May 2008.
Environmental Conditions:	
QAPP Information:	Samples were collected for the Statewide Perennial Streams Assessment 2008, following SWAMP protocols and stored in the SWAMP database.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 45845, Benthic Community Effects **Region 9**

Arroyo Trabuco Creek

LOE ID:	26224
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	5
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Five of the six samples collected show significant toxicity levels (SL). Ceriodaphnia dubia: Three of the six samples exhibited toxicity. Selenastrum capricornutum: Three of the six samples exhibited toxicity as determined by the Ceriodaphnia dubia survival/reproductive test (SWAMP, 2007).
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.
Guideline Reference:	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA
Spatial Representation:	Samples were collected at two locations in Trabuco Creek. Samples were collected at the end of Trabuco Creek 5 (901 SJATC5) and Trabuco Creek 2 (901 SJATC2).
Temporal Representation:	Water samples were collected on October 2002, January 2003, April 2003, and May 2003.
Environmental Conditions:	
QAPP Information:	Quality control for this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	Orange County Stormwater Program. 2004-2007. Unified Annual Progress Reports, Program Effectiveness Assessment (San Diego Region)

Line of Evidence (LOE) for Decision ID 45845, Benthic Community Effects **Region 9**

Arroyo Trabuco Creek

LOE ID:	73008
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	41
Number of Exceedances:	6
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Six of fourty-one exceed the maximum (Instantaneous) concentration for Malathion in freshwater of 100 ng/L.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The maximum (Instantaneous) concentration for Malathion in freshwater is 100 ng/L.
Guideline Reference:	Quality Criteria for Water. USEPA Office of Water and Hazardous Materials. Washington, D.C
Spatial Representation:	Samples were collected at Arroyo Trabuco Creek, sites: REF-TCAS, TC-DO, TCOLO2, TC-AP and SMC00206.
Temporal Representation:	Samples were collected from 2006 through 2009.
Environmental Conditions:	According to the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010, samples were collected during the dry season and storm events.
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 45845, Benthic Community Effects **Region 9**

Arroyo Trabuco Creek

LOE ID:	73009
Pollutant:	Mercury
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	zero of two samples exceeded the water quality objective for mercury.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	National Recommended Water Quality Criteria Continuous Concentrations (4-day average concentrations) for freshwater aquatic organisms exposure to elemental mercury is 0.77 ug/L.
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Samples were collected from Arroyo Trabuco Creek at Del Obispo (TCOL02) and at SMC00206.
Temporal Representation:	Samples were collected from September 2006 through May of 2009.
Environmental Conditions:	
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 45845, Benthic Community Effects **Region 9**

Arroyo Trabuco Creek 036405

LOE ID:	73025
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	The sample collected had an IBI score above 40. The IBI score was 52.
Data Reference:	Statewide Ref Condition Management Plan 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the State or Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	The sample was collected at station, Arroyo Trabuco.
Temporal Representation:	The sample was collected in June 2008.
Environmental Conditions:	
QAPP Information:	Samples were collected for the Statewide Ref Condition Management Plan 2008, following SWAMP protocols and stored in the SWAMP database.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 45845, Benthic Community Effects **Region 9**

Arroyo Trabuco Creek

LOE ID:	26351
Pollutant:	Benthic Community Effects
LOE Subgroup:	Adverse Biological Responses
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	4
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Eight samples of IBI data were taken from September 1998 to June 2005 at two sampling sites. Of the total number of samples, four samples exceeded the IBI impairment threshold.
Data Reference:	Fish and Game IBI Data

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. (SDRWQCB, 1995)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at two sites: 901ATCAPx and 901ATCTCx on Arroyo Trabuco Creek.
Temporal Representation:	Sampling occurred during one to two events annually over a four year period from September 1998 to May 2001 and another event on June 2005.
Environmental Conditions:	
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Project Plan for the California Stream Bioassessment Procedure and the State of California, California Monitoring an Assessment Program: "CMAP", Quality Assurance Project Plan.
QAPP Information Reference(s):	State of California, California Monitoring and Assessment Program: "CMAP". Quality Assurance Project Plan for the California Stream Bioassessment Procedure The San Diego Stream Team Quality Assurance Project Plan

DECISION ID	47816	Region 9
Arroyo Trabuco Creek		

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2029
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Six lines of evidence are available in the administrative record to assess this pollutant. Data from 2007 and 2008 show that 11 of 11 and 8 of 11 single samples exceed the water quality objectives for single sample maximums of enterococcus and fecal coliform , respectively, for the protection of REC-1.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.

3. Data from 2007 and 2008 show that 11 of 11 and 8 of 11 single samples exceed the water quality objectives for single sample maximums of enterococcus and fecal coliform , respectively, for the protection of REC-1 and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 47816, Indicator Bacteria **Region 9**

Arroyo Trabuco Creek

LOE ID:	73038
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	The one geomean exceeded the fecal coliform objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean fecal coliform concentration shall not exceed more than 200/100ml.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin. Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from site TCOL02, Trabuco Creek at Del Obispo.
Temporal Representation:	The samples were collected from April 2007 to November 2008.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Mass Emissions Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 47816, Indicator Bacteria **Region 9**

Arroyo Trabuco Creek

LOE ID:	73037
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	11
Number of Exceedances:	8

Data and Information Type:	Not Specified	036408
Data Used to Assess Water Quality:	Eight of the eleven samples exceeded the fecal coliform objective.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The single sample fecal coliform concentration shall not exceed more than 400/100ml. Region 9 Basin Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected from site TCOL02, Trabuco Creek at Del Obispo.	
Temporal Representation:	The samples were collected from April 2007 to November 2008.	
Environmental Conditions:		
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Mass Emissions Monitoring Program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 47816, Indicator Bacteria **Region 9**

Arroyo Trabuco Creek

LOE ID:	73036
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	The one geomean exceeded the enterococcus objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geomeric mean enterococcus concentration shall not exceed more than 33/100ml. Water Quality Control Plan for the San Diego Basin.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from site TCOL02, Trabuco Creek at Del Obispo.
Temporal Representation:	The samples were collected from April 2007 to November 2008.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Mass Emissions Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 47816, Indicator Bacteria **Region 9**

Arroyo Trabuco Creek

LOE ID:	73035
Pollutant:	Enterococcus

LOE Subgroup:	Pollutant-Water	036409
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	11	
Number of Exceedances:	11	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Eleven of the eleven samples exceeded the enterococcus objective.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The single sample enterococcus concentration shall not exceed more than 61/100ml. Region 9 Basin Plan. Ambient Water Quality Control Criteria USEPA.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected from site TCOL02, Trabuco Creek at Del Obispo.	
Temporal Representation:	The samples were collected from April 2007 to November 2008.	
Environmental Conditions:		
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Mass Emissions Monitoring Program.	
QAPP Information Reference(s):		

DECISION ID	47806	Region 9
Arroyo Trabuco Creek		

Pollutant:	**Malathion**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2029
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Six of the forty-one samples exceed the GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Six of forty-one samples exceed the GUIDELINE and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 47806, Malathion **Region 9**

Arroyo Trabuco Creek

LOE ID:	73008
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	41
Number of Exceedances:	6
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Six of fourty-one exceed the maximum (Instantaneous) concentration for Malathion in freshwater of 100 ng/L.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The maximum (Instantaneous) concentration for Malathion in freshwater is 100 ng/L.
Guideline Reference:	Quality Criteria for Water. USEPA Office of Water and Hazardous Materials. Washington, D.C
Spatial Representation:	Samples were collected at Arroyo Trabuco Creek, sites: REF-TCAS, TC-DO, TCOLO2, TC-AP and SMC00206.
Temporal Representation:	Samples were collected from 2006 through 2009.
Environmental Conditions:	According to the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010, samples were collected during the dry season and storm events.
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 47806, Malathion **Region 9**

Arroyo Trabuco Creek

LOE ID:	77711
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	22
Number of Exceedances:	0

Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only) 036411
Data Used to Assess Water Quality:	None of 22 exceed the CDPH notification level for Malathion criteria of 160.0 ug/L.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Department of Public Health (CDPH) notification level criteria for malathion in freshwater is 160.0 ug/L.
Guideline Reference:	Water quality data for Temecula Creek, Murrieta Creek, and the Santa Margarita River. Temecula, CA
Spatial Representation:	Samples were collected at Arroyo Trabuco Creek, sites:REF-TCAS, TC-DO, TCOLO2, TC-AP and SMC00206.
Temporal Representation:	Samples were collected from September 2006 through April 2009.
Environmental Conditions:	According to the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010, samples were collected during the dry season and storm events.
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 47806, Malathion **Region 9**

Arroyo Trabuco Creek

LOE ID:	73023
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	27
Number of Exceedances:	6
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Twenty-seven samples were collected to test for toxicity. Six of the 27 samples exhibited statistically and biologically significant toxicity. The toxicity tests that exhibited significant toxicity included Mysid biomass and survival, Ceriodaphnia reproduction, and Selenastrum growth.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control. Additionally, the biological significance of the sample is evaluated by determining whether the sample response is lower than the evaluation threshold.
Guideline Reference:	
Spatial Representation:	The sample was collected at stations REF-TCAS, TC-AP, TC-DO, and TCOL02 Trabuco

Creek. 036412

Temporal Representation: The sample was collected from June 2006 to April 2009.

Environmental Conditions:

QAPP Information: The data collected under the Quality Assurance Management Plan for The Orange County Stormwater Program. The SWAMP measurement quality objectives were followed for toxicity data. The performance of toxicity bioassays and evaluation of reference toxicants were performed using USEPA and Standard Methods.

QAPP Information Reference(s):

DECISION ID 42285 Region 9

Arroyo Trabuco Creek

Pollutant:	**Nitrogen**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Eight of the nine samples exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Eight of nine samples exceed the objective and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 42285, Nitrogen Region 9

Arroyo Trabuco Creek

LOE ID:	7735
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	9
Number of Exceedances:	8

Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Eight of nine flow-weighted event mean concentrations exceeded the water quality objective according to results in the Orange County Stormwater Program annual progress reports. Samples were collected nine times from December 2002 to March 2006.
Data Reference:	Orange County Stormwater Program. 2004-2007. Unified Annual Progress Reports, Program Effectiveness Assessment (San Diego Region)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses (RWQCB, 2007). The Water Quality Control Plan for the San Diego Basin (9) states: Â“A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used.Â” Since the goal for total phosphorus is 0.1 mg/L, then according to the ratio provided, the goal for total nitrogen is 1 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at the mass loading station at Del Obispo Street at 33.4975Â°, 117.6657Â°. Station identification number is TCOL02.
Temporal Representation:	Samples were collected during two to four storm events a year from December 2002 to March 2006.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control documents for their stormwater monitoring program.
QAPP Information Reference(s):	Orange County Stormwater Program. 2004-2007. Unified Annual Progress Reports, Program Effectiveness Assessment (San Diego Region)

DECISION ID **34172** **Region 9**

Arroyo Trabuco Creek

Pollutant:	**Phosphorus**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Natural Sources | Source Unknown | Urban Runoff/Storm Sewers
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. Nine of the 9 samples exceed the phosphorus water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Nine of 9 samples exceed the Basin Plan objective for phosphorus and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34172, Phosphorus **Region 9**

Arroyo Trabuco Creek

LOE ID:	7733
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	9
Number of Exceedances:	9
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	All nine flow-weighted event mean concentrations exceeded the water quality objective according to results in the the Orange County Stormwater Program annual progress reports. Samples were collected from December 2002 to March 2006.
Data Reference:	Orange County Stormwater Program. 2004-2007. Unified Annual Progress Reports. Program Effectiveness Assessment (San Diego Region)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses (RWQCB, 2007). The Water Quality Control Plan for the San Diego Basin (9) goal for phosphorus in streams and other flowing waters is 0.1 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at the mass loading station TCOL02 at Del Obispo Street at 33.4975Â°, 117.6657Â°.
Temporal Representation:	Samples were collected from December 2002 to March 2006.
Environmental Conditions:	Samples were collected during storm events.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control documents for their stormwater monitoring program.
QAPP Information Reference(s):	Orange County Stormwater Program. 2004-2007. Unified Annual Progress Reports. Program Effectiveness Assessment (San Diego Region)

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: San Juan Creek
Water Body ID: CAR9012000020011025103828
Water Body Type: River & Stream

DECISION ID 33513 **Region 9**
San Juan Creek

Pollutant: DDE (Dichlorodiphenyldichloroethylene)
Final Listing Decision: Do Not Delist from 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Sources: Source Unknown
Expected TMDL Completion Date: 2019
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the section 303(d) list under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Two of 4 samples exceed the California Toxic Rule: Human Health-FW (water & organisms) criterion of 0.00059 Âµg/L. Zero of 2 samples exceed the guideline for sediment.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Two of 4 samples exceeded the California Toxic Rule: Human Health-FW (water & organisms) criterion of 0.00059 Âµg/L and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 33513, DDE (Dichlorodiphenyldichloroethylene) **Region 9**
San Juan Creek

LOE ID: 3009

Pollutant: DDE (Dichlorodiphenyldichloroethylene)
LOE Subgroup: Pollutant-Water

Matrix:	Water	036416
Fraction:	Not Recorded	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	4	
Number of Exceedances:	2	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Two of 4 samples exceeded the CTR (SWAMP, 2004).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	San Diego RWQCB Basin Plan: No individual pesticide or combination of pesticides shall be present in the water column, sediments, or biota at concentration(s) that adversely affect beneficial uses. California Toxic Rule: Human Health-FW (water & organisms) .00059 Âµg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:	California Toxic Rule: Human Health-FW (water & organisms) 0.00059 Âµg/L.	
Guideline Reference:	Placeholder reference 2006 303(d)	
Spatial Representation:	One station at San Juan Creek: 33.484429 -117.67577.	
Temporal Representation:	Four samples collected from October 2002 through May of 2003.	
Environmental Conditions:	San Juan Creek Watershed: 901.27.	
QAPP Information:	SWAMP Quality Assurance Plan.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33513, DDE (Dichlorodiphenyldichloroethylene) Region 9

San Juan Creek

LOE ID:	75921
Pollutant:	DDE (Dichlorodiphenyldichloroethylene)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for DDE.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for sum of DDE (o,p' + p,p') is 31.3 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31

Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 1 monitoring site [San Juan Creek 9 - 901SJSJC9]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 33513, DDE (Dichlorodiphenyldichloroethylene) Region 9

San Juan Creek

LOE ID:	75920
Pollutant:	DDE (Dichlorodiphenyldichloroethylene)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for DDE.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for sum of DDE (o,p' + p,p') is 31.3 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 1 monitoring site [San Juan Creek @ La Novia - 901SUP068]
Temporal Representation:	Data was collected on a single day 1/7/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID 41422 Region 9

San Juan Creek

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion	2019

Date:	036418
Impairment from Pollutant or Pollution:	Pollution
Regional Board Conclusion:	This pollutant is being considered for removal from the CWA section 303(d) List under section 4.3 of the Listing Policy. Under section 4.3 a single line of evidence is necessary to assess listing status. Six lines of evidence are available in the administrative record to assess this pollutant. Enterococcus 14 of 24 samples exceed the single sample objective for water contact recreation. 1 of 1 sample exceeds the geometric mean objective for water contact recreation. Escherichia coli 1 of 16 samples exceeded the single sample objective for water contact recreation. Fecal coliform Four of ten samples exceeds the single sample objective for water contact recreation. One of one sample exceeds the geometric mean objective for water contact recreation. The Indicator bacteria LOE is a placeholder to support a 303(d) listing decision made prior to 2006. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Samples and exceedences are as follows: Enterococcus 14 of 24 samples exceed the single sample objective for water contact recreation. 1 of 1 sample exceeds the geometric mean objective for water contact recreation. Escherichia coli 1 of 16 samples exceeded the single sample objective for water contact recreation. Fecal coliform Four of ten samples exceeds the single sample objective for water contact recreation. One of one sample exceeds the geometric mean objective for water contact recreation. The enterococcus samples exceed the allowable frequency listed in Table 4.2 of the Listing Policy. 4. Pursuant to section 3.1 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 41422, Indicator Bacteria **Region 9**

San Juan Creek

LOE ID:	4726
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Water Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.

Data Reference:	Placeholder reference pre-2006 303(d)	036419
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Unspecified	
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)	
Evaluation Guideline:	Unspecified	
Guideline Reference:	Placeholder reference pre-2006 303(d)	
Spatial Representation:	Unspecified	
Temporal Representation:	Unspecified	
Environmental Conditions:	Unspecified	
QAPP Information:	Unspecified	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 41422, Indicator Bacteria **Region 9**

San Juan Creek

LOE ID:	75852
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	14
Number of Exceedances:	4
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Four of the fourteen samples exceeded the objective for enterococcus.
Data Reference:	Data for Various Pollutants in San Mateo, San Juan and Cristianitos, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The enterococcus concentration shall not exceed 61/100 ml Water Quality Control Plan for the San Diego Basin.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from San Juan 1 and San Juan 2 located on San Juan Creek near the Ortega highway.
Temporal Representation:	Samples were collected from April 2009 to February 2010.
Environmental Conditions:	
QAPP Information:	This data was collected under the Quality Assurance Project Plan for Inland Empire Canyons Baseline Monitoring Project. qa13
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 41422, Indicator Bacteria **Region 9**

San Juan Creek

LOE ID:	75853
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation
Number of Samples:	10
Number of Exceedances:	10
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Ten of the 10 samples exceeded the entrococcus objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample enterococcus concentration shall not exceed more than 61/100ml. Region 9 Basin Plan. Ambient Water Quality Criteria USEPA.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from site SJNL01, San Juan Creek at La Novia.
Temporal Representation:	The samples were collected from April 2007 to February 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Mass Emissions Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 41422, Indicator Bacteria **Region 9**

San Juan Creek

LOE ID:	75854
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	The one geomean exceeded the entrococcus objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean enterococcus concentration shall not exceed more than 33/100ml. Water Quality Control Plan for the San Diego Basin.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from site SJNL01, San Juan Creek at La Novia.
Temporal Representation:	The samples were collected from April 2007 to February 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Mass Emissions Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 41422, Indicator Bacteria **Region 9**

San Juan Creek 036421

LOE ID:	75855
Pollutant:	Escherichia coli (E. coli)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	16
Number of Exceedances:	1
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	One of the sixteen samples exceeded the objective for E. coli.
Data Reference:	Data for Various Pollutants in San Mateo, San Juan and Cristianitos, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The E. coli concentration shall not exceed 235/100 ml Water Quality Control Plan for the San Diego Basin.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from San Juan 1 and San Juan 2 located on San Juan Creek near the Ortega highway.
Temporal Representation:	Samples were collected from April 2009 to February 2010.
Environmental Conditions:	
QAPP Information:	This data was collected under the Quality Assurance Project Plan for Inland Empire Canyons Baseline Monitoring Project. qa13
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 41422, Indicator Bacteria **Region 9**

San Juan Creek

LOE ID:	75861
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	10
Number of Exceedances:	4
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Four of the ten samples exceeded the fecal coliform objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample fecal coliform concentration shall not exceed more than 400/100ml. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	The samples were collected from site SJNL01, San Juan Creek at La Novia.
Temporal Representation:	The samples were collected from April 2007 to February 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Mass Emissions Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 41422, Indicator Bacteria **Region 9**

San Juan Creek

LOE ID:	75862
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	The one geomean exceeded the fecal coliform objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean fecal coliform concentration shall not exceed more than 200/100ml. Water Quality Control Plan for the San Diego Basin.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from site SJNL01, San Juan Creek at La Novia.
Temporal Representation:	The samples were collected from April 2007 to February 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Mass Emissions Monitoring Program.
QAPP Information Reference(s):	

DECISION ID **43131** **Region 9**

San Juan Creek

Pollutant:	**Selenium**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. Five of the 27 samples exceed the water quality criterion for selenium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Five of 27 samples exceed the selenium criterion and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 43131, Selenium **Region 9**

San Juan Creek

LOE ID:	9096
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	2
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Four water samples were collected at San Juan station 901SJSJC9 on October 2002, January 2003, April 2003, and May 2003. Two of the four samples showed excessive selenium concentrations according to results in California's Surface Water Ambient Monitoring Program.
Data Reference:	Orange County Stormwater Program. 2004-2007. Unified Annual Progress Reports, Program Effectiveness Assessment (San Diego Region)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	CTR Freshwater Chronic (CCC) 5 ug/L. (U.S. EPA, 2000).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Water samples were collected at San Juan Creek station (901SJSJC9).
Temporal Representation:	Samples for San Juan Creek were collected on October 2002, January 2003, April 2003, and May 2003.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43131, Selenium **Region 9**

San Juan Creek

LOE ID:	75969
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 1 of 2 samples exceed the criterion for Selenium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The selenium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater is 0.005 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]
Temporal Representation:	Data was collected on a single day 4/30/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 43131, Selenium **Region 9**

San Juan Creek

LOE ID:	75968
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 1 of 2 samples exceed the criterion for Selenium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The selenium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater is 0.005 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition

Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]
Temporal Representation:	Data was collected on a single day 4/30/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 43131, Selenium **Region 9**

San Juan Creek

LOE ID:	75970
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	17
Number of Exceedances:	2
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Two of the 17 samples exceeded the water quality objective for selenium. Two of the reporting limits for non-detect samples were greater than the water quality objective for selenium and were not used in the assessment.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The CTR for selenium is 5.0 ug/L.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from San Juan Creek at Cold Spring (REF-CS), at Ortega Highway (SJC-74), at Camino Capistrano (SJC-CC), and at La Novia (SJNL01)
Temporal Representation:	Samples were collected from REF-CS and SJC-CC starting in September of 2006 and continuing twice per year (fall and spring) during 2007, 2008, and 2009. Samples were collected from SJC-74 in September of 2006, in May of 2007 and 2008, and in April of 2009. Samples were collected from SJNL01 starting in April 2007 until February of 2009.
Environmental Conditions:	Approximately 54 percent of the samples were collected after storm events.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID 37571 **Region 9**

San Juan Creek

Pollutant:	**Toxicity**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for removal from the CWA section 303(d) List under section 4.1 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess pollutant. Twelve of the forty-four samples exceed the GUIDELINE. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Twelve of forty-four samples exceeded the GUIDELINE and this exceeds the allowable frequency listed in Table 4.1 of the Listing Policy. 4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 37571, Toxicity **Region 9**

San Juan Creek

LOE ID:	7758
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Selenastrum Algae Growth- None of the nine samples exhibited NOECÂ's less than 100%. Ceriodaphnia dubia -Survival- None of the nine samples exhibited NOECÂ's less than 100%. Ceriodaphnia dubia -Reproduction- None of the nine samples collected exhibited NOECÂ's less than 100%. Hyalella azteca survival- None of the nine samples exhibited LC50Â's less than 100% according to results in the

	Orange County Storm Water Program Annual Progress Report, 2002 - 2007. Samples were collected from 2003 - 2005.
Data Reference:	Orange County Stormwater Program. 2004-2007. Unified Annual Progress Reports. Program Effectiveness Assessment (San Diego Region)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Samples were found to exhibit toxicity when the No Observed Effect Concentration (NOEC) or median lethal concentration (LC50) for any given species was estimated to be less than 100% of the test sample concentration.
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at two locations in San Juan Creek. Samples were collected at the Highway 74 and between Camino Capistrano and Interstate 5.
Temporal Representation:	Samples were collected from 2003-2005.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	QA/QC conducted according to the County of Orange's Quality Assurance Plan .
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 37571, Toxicity **Region 9**

San Juan Creek

LOE ID:	75923
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	25
Number of Exceedances:	8
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Twenty-five samples were collected to test for toxicity. Eight of the 25 samples exhibited statistically and biologically significant toxicity. The toxicity tests that exhibited significant toxicity included Mysid biomass, Ceriodaphnia reproduction and Selenastrum growth.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control. Additionally, the biological significance of the sample was evaluted by determining whether the sample response was lower than the evaluation threshold.
Guideline Reference:	
Spatial Representation:	The sample was collected at stations REF-CS, SJC-74, SJC-CC, and SJNL01 San Juan Creek.
Temporal Representation:	The sample was collected from June 2006 to June 2010.

Environmental Conditions: 036428

QAPP Information: The data collected under the Quality Assurance Management Plan for The Orange County Stormwater Program. The SWAMP measurement quality objectives were followed for toxicity data. The performance of toxicity bioassays and evaluation of reference toxicants were performed using USEPA and Standard Methods.

QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 37571, Toxicity **Region 9**

San Juan Creek

LOE ID: 75925

Pollutant: Toxicity
LOE Subgroup: Toxicity
Matrix: Sediment
Fraction: None

Beneficial Use: Warm Freshwater Habitat

Number of Samples: 1
Number of Exceedances: 0

Data and Information Type: TOXICITY TESTING
Data Used to Assess Water Quality: One sample was collected to evaluate sediment toxicity. None of the samples exhibited significant toxicity. The toxicity test included survival of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference: Statewide Stream Pollution Trends Study 2008

SWAMP Data: SWAMP

Water Quality Objective/Criterion: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference: Water Quality Control Plan for the San Diego Basin

Evaluation Guideline: Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL, Significant compared to negative control based on statistical test, less than stated alpha level, AND less than the evaluation threshold (both criteria are met).
Guideline Reference:

Spatial Representation: The sample was collected at station 901SJSJC9.
Temporal Representation: The sample was collected in May 2008.
Environmental Conditions:
QAPP Information: Data quality is good. Data results were recorded in the SWAMP database and followed SWAMP protocols.

QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 37571, Toxicity **Region 9**

San Juan Creek

LOE ID: 75924

Pollutant: Toxicity
LOE Subgroup: Toxicity
Matrix: Water
Fraction: None

Beneficial Use:	Cold Freshwater Habitat	036429
Number of Samples:	2	
Number of Exceedances:	0	
Data and Information Type:	TOXICITY TESTING	
Data Used to Assess Water Quality:	Two samples were collected to evaluate water toxicity. None of the samples exhibited significant toxicity. The toxicity test included survival of Hyalella azteca and survival and reproduction of Ceriodaphnia dubia. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL, Significant compared to negative control based on statistical test, less than stated alpha level, AND less than the evaluation threshold (both criteria are met).	
Guideline Reference:		
Spatial Representation:	The samples were collected at stations 901S06030 and 901S00313.	
Temporal Representation:	The sample was collected in April 2009.	
Environmental Conditions:		
QAPP Information:	Data quality is good. Data results were recorded in the SWAMP database and followed SWAMP protocols.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 37571, Toxicity **Region 9**

San Juan Creek

LOE ID:	21401
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	4
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Eight samples were collected at San Juan Creek station 901SJSJC5 and 901SJSJC9 from October2002 to May 2003, they showed significant toxicity levels (SL) in the following test: Selenastrum algae growth test - Four of eight samples were toxic. Ceriodaphnia dubia survival and reproduction: None of the samples were toxic. Hyalella azteca: One of six samples were toxic. Two additional tests were not valid.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that

	produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold (EPA, 2002).
Guideline Reference:	Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms. Fourth Edition. Office of Water, U.S. Environmental Protection Agency. Washington, D.C. EPA-821-R-02-013
Spatial Representation:	Water Toxicity Samples were collected at San Juan Creek stations 901SJSJC5 and 901SJSJC9
Temporal Representation:	Water samples were collected on September 2002, November 2002, January 2003, April 2003, and May 2003.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 37571, Toxicity **Region 9**

San Juan Creek

LOE ID:	75926
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate sediment toxicity. The sample exhibited significant toxicity. The toxicity test included survival and growth of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted using the significant effect code: S equals significant, SG equals significantly greater and SL equals significantly lower. If a sample has any one of these codes, it will be considered an exceedance.
Guideline Reference:	
Spatial Representation:	The sample was collected at station 901SUP068.
Temporal Representation:	The sample was collected in January 2007.
Environmental Conditions:	
QAPP Information:	Data quality is good. Data results were recorded in the SWAMP database and followed SWAMP protocols.

QAPP Information Reference(s): 036431

DECISION ID	49037	Region 9
San Juan Creek		

Pollutant:	**Alkalinity as CaCO3**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the two samples exceed the criterion. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of two samples exceeded the criterion and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49037, Alkalinity as CaCO3	**Region 9**
San Juan Creek	

LOE ID:	75858
Pollutant:	Alkalinity as CaCO3
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Alkalinity as CaCO3.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP

Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Alkalinity as CaCO3 criteria for the protection of freshwater aquatic life is 20000 ug/L (National Recommended Water Quality Criteria, 2009).
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]
Temporal Representation:	Data was collected on a single day 4/30/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 49037, Alkalinity as CaCO3 **Region 9**

San Juan Creek

LOE ID:	75857
Pollutant:	Alkalinity as CaCO3
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Alkalinity as CaCO3.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Alkalinity as CaCO3 criteria for the protection of freshwater aquatic life is 20000 ug/L (National Recommended Water Quality Criteria, 2009).
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]
Temporal Representation:	Data was collected on a single day 4/30/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 48754 Region 9

San Juan Creek 036433

Pollutant:	**Aluminum**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 2 samples exceed the guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 2 samples exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48754, Aluminum — Region 9

San Juan Creek

LOE ID:	75864
Pollutant:	Aluminum
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Aluminum.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	The National Recommended Water Quality Critiera for the protection of aquatic life from aluminum is the chronic continuous concentration (expressed as a 4-day average) of 87 ug/L.
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]
Temporal Representation:	Data was collected on a single day 4/30/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 48754, Aluminum **Region 9**

San Juan Creek

LOE ID:	75865
Pollutant:	Aluminum
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Aluminum.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The National Recommended Water Quality Critiera for the protection of aquatic life from aluminum is the chronic continuous concentration (expressed as a 4-day average) of 87 ug/L.
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]
Temporal Representation:	Data was collected on a single day 4/30/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **51974** **Region 9**

San Juan Creek

Pollutant:	**Ammonia**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**

Last Listing Cycle's Final Listing Decision:	New Decision	036435
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. Zero of the eleven samples exceed the objective for Ammonia (unionized). Zero of two samples exceed the criterion for Nitrogen, ammonia (Total Ammonia)

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the samples exceeded the objective or criterion and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 51974, Ammonia **Region 9**

San Juan Creek

LOE ID:	75954
Pollutant:	Ammonia (Unionized)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	11
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Zero of 11 averaged samples exceeded the water quality objective for unionized ammonia. Samples were reported as as total ammonia as nitrogen and were converted to unionized ammonia as nitrogen before being compared with the objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. The San Diego Basin Plan objective for unionized ammonia is 0.025 mg/L as N.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at stations REF-CS and SJNL01.
Temporal Representation:	Samples were collected from September 2006 to April 2009.
Environmental Conditions:	
QAPP Information:	A signed QAPP was included with the stated goal of ensuring the consistent collection of accurate water quality information that will used to satisfy the objectives of the Orange County Stormwater Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 51974, Ammonia **Region 9**

San Juan Creek

LOE ID:	75866
Pollutant:	Nitrogen, ammonia (Total Ammonia)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Ammonia as N, Total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Aquatic Life Ambient Water Quality Criteria for Ammonia â€“ Freshwater (USEPA 2013): the 30-day rolling average concentration (criterion continuous concentration or CCC) of total ammonia nitrogen(in mg TAN/L) in freshwater are not to be exceeded more than once every three years on average. The CCC values are based on pH and temperature. The CCC formula is found on page 46 and the table of CCC values is on page 49.
Guideline Reference:	Aquatic Life Ambient Water Quality Criteria for Ammonia - Freshwater 2013
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]
Temporal Representation:	Data was collected on a single day 4/30/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51974, Ammonia **Region 9**

San Juan Creek

LOE ID:	75867
Pollutant:	Nitrogen, ammonia (Total Ammonia)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total

Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Ammonia as N, Total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Aquatic Life Ambient Water Quality Criteria for Ammonia â€“ Freshwater (USEPA 2013): the 30-day rolling average concentration (criterion continuous concentration or CCC) of total ammonia nitrogen(in mg TAN/L) in freshwater are not to be exceeded more than once every three years on average. The CCC values are based on pH and temperature. The CCC formula is found on page 46 and the table of CCC values is on page 49.
Guideline Reference:	Aquatic Life Ambient Water Quality Criteria for Ammonia - Freshwater 2013
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]
Temporal Representation:	Data was collected on a single day 4/30/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID	**48757**	**Region 9**
San Juan Creek		

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Seven lines of evidence are available in the administrative record to assess this pollutant. None of the samples exceed the guidelines for the individual beneficial uses.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the samples exceeded the guidelines for the individual beneficial uses.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 48757, Arsenic **Region 9**

San Juan Creek

LOE ID:	75875
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Arsenic.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The dissolved arsenic criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved arsenic is 0.150 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]
Temporal Representation:	Data was collected on a single day 4/30/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 48757, Arsenic **Region 9**

San Juan Creek

LOE ID:	75874
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for arsenic is 33 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 1 monitoring site [San Juan Creek 9 - 901SJSJC9]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the 2002 QAMP.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 48757, Arsenic **Region 9**

San Juan Creek

LOE ID:	75873
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Arsenic.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for arsenic is 33 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]
Temporal Representation:	Data was collected on a single day 4/30/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.

QAPP Information:	The SWAMP QAPP (2008) was followed.	036440
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 48757, Arsenic **Region 9**

San Juan Creek

LOE ID:	75878
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	31
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the 31 samples exceeded the water quality objective for arsenic.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The CTR for arsenic is 150 ug/L.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from San Juan Creek at Cold Spring (REF-CS), at Ortega Highway (SJC-74), at Camino Capistrano (SJC-CC), and at La Novia (SJNL01)
Temporal Representation:	Samples were collected from REF-CS and SJC-CC starting in September of 2006 and continuing twice per year (fall and spring) during 2007, 2008, and 2009. Samples were collected from SJC-74 in September of 2006, in May of 2007 and 2008, and in April of 2009. Samples were collected from SJNL01 starting in April 2007 until February of 2009.
Environmental Conditions:	Approximately 54 percent of the samples were collected after storm events.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 48757, Arsenic **Region 9**

San Juan Creek

LOE ID:	75868
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Arsenic.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for arsenic is 33 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]
Temporal Representation:	Data was collected on a single day 4/30/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 48757, Arsenic **Region 9**

San Juan Creek

LOE ID:	75877
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	22
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the 22 samples exceeded the water quality objective for arsenic.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The CTR for arsenic is 150 ug/L.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from San Juan Creek at Cold Spring (REF-CS), at Ortega Highway (SJC-74), at Camino Capistrano (SJC-CC), and at La Novia (SJNL01)
Temporal Representation:	Samples were collected from REF-CS and SJC-CC starting in September of 2006 and

	continuing twice per year (fall and spring) during 2007, 2008, and 2009. Samples were collected from SJC-74 in September of 2006, in May of 2007 and 2008, and in April of 2009. Samples were collected from SJNL01 starting in April 2007 until February of 2009.
Environmental Conditions:	Approximately 54 percent of the samples were collected after storm events.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 48757, Arsenic **Region 9**

San Juan Creek

LOE ID:	75876
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Arsenic.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The dissolved arsenic criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved arsenic is 0.150 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]
Temporal Representation:	Data was collected on a single day 4/30/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **40411** **Region 9**

San Juan Creek

Pollutant:	**Benthic-Macroinvertebrate Bioassessments**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

Only one line of evidence are available in the administrative record to assess this pollutant. Based on section 3.9 and the information submitted it cannot be determined if a pollutant is likely to cause or contribute to the toxic effect. California Stream Condition Index scores were not calculated for prior listing cycles.

Based on the readily available data and information, the weight of evidence indicates that there is not sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

Regional Board Decision Recommendation: Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

Line of Evidence (LOE) for Decision ID 40411, Benthic-Macroinvertebrate Bioassessments **Region 9**

San Juan Creek

LOE ID:	3008
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Not Specified
Fraction:	None
Beneficial Use:	Non-Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Data were collected for the San Diego Regional Water Quality Control Board 1999 Biological Assessment Annual Report. Physical habitat scores ranged from 106 to 125, relatively higher compared to other sampled waterbodies. BMI ranking scores were near average (1 below, one above, and one at) compared to other sampled waterbodies. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No objective.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at in San Juan Creek, 5 riffles upstream of Highway 74 (SJC-74). Lat/Long coordinates are N33E31' 9.0"/W117E37' 25.4".
Temporal Representation:	Samples were collected in September and November 1998 and May 1999.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **48759** **Region 9**

San Juan Creek

Pollutant:	**Bifenthrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or	Pollutant

Pollution: 036444

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Four lines of evidence are available in the administrative record to assess this pollutant. One of the two samples exceed the guideline for both water and sediment.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of two samples exceeded the guideline for both water and sediment and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48759, Bifenthrin **Region 9**

San Juan Creek

LOE ID:	75884
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 1 of 2 samples exceed the criterion for Bifenthrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Bifenthrin does not exceed 0.0006 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.

Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]
Temporal Representation:	Data was collected on a single day 4/30/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 48759, Bifenthrin **Region 9**

San Juan Creek

LOE ID:	75883
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 1 of 2 samples exceed the criterion for Bifenthrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Bifenthrin does not exceed 0.0006 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]
Temporal Representation:	Data was collected on a single day 4/30/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 48759, Bifenthrin **Region 9**

San Juan Creek

LOE ID:	75881
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Bifenthrin.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for bifenthrin is the median lethal concentration (LC50) of 0.43 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 0.43 ug/g is the geometric mean of LC50 values for bifenthrin from Amweg et al. (2005) and Amweg and Weston (2007).
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5 Whole-sediment toxicity identification evaluation tools for pyrethroid insecticides: I. piperonyl butoxide addition. Environ. Toxicol. Chem. 26:2389-2396.
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 1 monitoring site [San Juan Creek @ La Novia - 901SUP068]
Temporal Representation:	Data was collected on a single day 1/7/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 48759, Bifenthrin **Region 9**

San Juan Creek

LOE ID:	75882
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Bifenthrin.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for bifenthrin is the median lethal concentration (LC50) of 0.43 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 0.43 ug/g is the geometric mean of LC50 values for bifenthrin from Amweg et al. (2005) and Amweg and Weston (2007).

Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, 03647 Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5 Whole-sediment toxicity identification evaluation tools for pyrethroid insecticides: I. piperonyl butoxide addition. Environ. Toxicol. Chem. 26:2389-2396.
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 1 monitoring site [San Juan Creek 9 - 901SJSJC9]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID 48774 Region 9

San Juan Creek

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Seven lines of evidence are available in the administrative record to assess this pollutant. None of the samples exceed the guidelines for water or sediment. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero samples exceeded the guidelines and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 48774, Cadmium Region 9

San Juan Creek

LOE ID:	75890
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved

Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	34
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the 34 samples exceeded the hardness adjusted water quality objective for cadmium.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from San Juan Creek at Cold Spring (REF-CS), at Ortega Highway (SJC-74), at Camino Capistrano (SJC-CC), and at La Novia (SJNL01)
Temporal Representation:	Samples were collected from REF-CS and SJC-CC starting in September of 2006 and continuing twice per year (fall and spring) during 2007, 2008, and 2009. Samples were collected from SJC-74 in September of 2006, in May of 2007 and 2008, and in April of 2009. Samples were collected from SJNL01 starting in April 2007 until February of 2009.
Environmental Conditions:	Approximately 54 percent of the samples were collected after storm events.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 48774, Cadmium **Region 9**

San Juan Creek

LOE ID:	75886
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Cadmium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be

	maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for cadmium is 4.98 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]
Temporal Representation:	Data was collected on a single day 4/30/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 48774, Cadmium **Region 9**

San Juan Creek

LOE ID:	75887
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for cadmium is 4.98 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 1 monitoring site [San Juan Creek 9 - 901SJSJC9]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the 2002 QAMP.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 48774, Cadmium **Region 9**

San Juan Creek

LOE ID:	75888
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Cadmium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Cadmium to protect aquatic life in freshwater. The dissolved Cadmium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]
Temporal Representation:	Data was collected on a single day 4/30/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 48774, Cadmium **Region 9**

San Juan Creek

LOE ID:	75889
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Cadmium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved

	Cadmium to protect aquatic life in freshwater. The dissolved Cadmium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]
Temporal Representation:	Data was collected on a single day 4/30/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 48774, Cadmium **Region 9**

San Juan Creek

LOE ID:	75885
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Cadmium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for cadmium is 4.98 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]
Temporal Representation:	Data was collected on a single day 4/30/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 48774, Cadmium **Region 9**

San Juan Creek

LOE ID:	75891
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	32
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the 32 samples exceeded the water quality objective for cadmium.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Total cadmium levels should not exceed the California Department of Public Health Primary MCL of 5 ug/L.
Guideline Reference:	
Spatial Representation:	Samples were collected from San Juan Creek at Cold Spring (REF-CS), at Ortega Highway (SJC-74), at Camino Capistrano (SJC-CC), and at La Novia (SJNL01)
Temporal Representation:	Samples were collected from REF-CS and SJC-CC starting in September of 2006 and continuing twice per year (fall and spring) during 2007, 2008, and 2009. Samples were collected from SJC-74 in September of 2006, in May of 2007 and 2008, and in April of 2009. Samples were collected from SJNL01 starting in April 2007 until February of 2009.
Environmental Conditions:	Approximately 54 percent of the samples were collected after storm events.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID	**48775**	**Region 9**
San Juan Creek		

Pollutant:	**Chlordane**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Two lines of evidence are available in the administrative record to assess this pollutant. None of the samples exceed the guideline. Based on the readily available data and information, the weight of evidence indicates that there is

insufficient justification for placing this water segment-pollutant combination on the CWA Section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of two samples exceed the guideline and the sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48775, Chlordane **Region 9**

San Juan Creek

LOE ID:	72826
Pollutant:	Chlordane
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	0 of 1 samples collected exceeded the criteria for chlordane concentration (Sum of trans-Chlordane, cis-Chlordane, cis-Nonachlor, trans-Nonachlor, and Oxychlordane).
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Waters shall not contain substances in concentrations that result in the deposition of material that causes nuisance or adversely affects beneficial uses. (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Probable Effect Concentration for Chlordane in freshwater sediments is 17.6 ug/kg(MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data were collected at the following station 901SUP068 (San Juan Creek @ La Novia).
Temporal Representation:	The samples were collected on 1/7/2007.
Environmental Conditions:	
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 48775, Chlordane **Region 9**

San Juan Creek

LOE ID:	72832	036454

Pollutant:	Chlordane
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	0 of 1 samples collected exceeded the criteria for chlordane concentration (Sum of trans-Chlordane, cis-Chlordane, cis-Nonachlor, trans-Nonachlor, and Oxychlordane).
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Waters shall not contain substances in concentrations that result in the deposition of material that causes nuisance or adversely affects beneficial uses. (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Probable Effect Concentration for Chlordane in freshwater sediments is 17.6 ug/kg(MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data were collected at the following station 901SJSJC9 (San Juan Creek 9).
Temporal Representation:	The samples were collected on 5/21/2008.
Environmental Conditions:	
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID	**48791**	**Region 9**
San Juan Creek		

Pollutant:	**Chloride**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. None of the samples exceed the guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.

3. Zero of two samples exceeded the guidelines and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48791, Chloride **Region 9**

San Juan Creek

LOE ID:	75892
Pollutant:	Chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Chloride.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Chloride objective for the protection of aquatic life according to Table 3-2 for San Juan Creek within the San Juan Hydrologic Unit is 250 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]
Temporal Representation:	Data was collected on a single day 4/30/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 48791, Chloride **Region 9**

San Juan Creek

LOE ID:	75893
Pollutant:	Chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Cold Freshwater Habitat	036456
Number of Samples:	2	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Chloride.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Chloride objective for the protection of aquatic life according to Table 3-2 for San Juan Creek within the San Juan Hydrologic Unit is 250 mg/L.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]	
Temporal Representation:	Data was collected on a single day 4/30/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID	48862	Region 9
San Juan Creek		

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Four lines of evidence are available in the administrative record to assess this pollutant. None of the samples exceed the guidelines for the beneficial uses. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the samples exceeded the guidelines and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 48862, Chlorpyrifos **Region 9**

San Juan Creek

LOE ID:	75896
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	28
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of twenty eight samples exceed the continuous concentration (four day average) for chlorpyrifos in freshwater is 14.0 ng/L. However for five samples the reporting limit was greater than the evaluation guideline, therefore these data are not of sufficient resolution to determine if water quality standards are being achieved.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column,sediments or biota at concentration(s) that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Criteria Continuous Concentration (four day average) for chlorpyrifos in freshwater is 14.0 ng/L.
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game
Spatial Representation:	Samples were collected at San Juan Creek, sites SJNL01, REF-CS, SJC-74 and SJC-CC.
Temporal Representation:	Samples were collected from 2006 through 2009.
Environmental Conditions:	
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 48862, Chlorpyrifos **Region 9**

San Juan Creek

LOE ID:	75895
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	One of one sample result was not used in the assessment because the laboratory data was

	non-detect and the method detection limit was above the guideline and therefore the results could not be quantified with the level of certainty required by the Listing Policy
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	There is no chlorpyrifos evaluation guideline specific to "sediment, interstitial water" (pore water). The following evaluation guideline was used to evaluate an exceedance in water quality standards: the freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000, with minor corrections to significant figures as described in Beaulaurier et al., 2005).Â
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 1 monitoring site [San Juan Creek @ La Novia - 901SUP068]
Temporal Representation:	Data was collected on a single day 1/7/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 48862, Chlorpyrifos **Region 9**

San Juan Creek

LOE ID:	75894
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for chlorpyrifos is the median lethal concentration (LC50) of 1.77 ug/g and is normalized by the percentage of organic carbon in the sediment sample (Amweg and Weston, 2007).
Guideline Reference:	Whole-sediment toxicity identification evaluation tools for pyrethroid insecticides: I. piperonyl butoxide addition. Environ. Toxicol. Chem. 26:2389-2396.

Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 1 monitoring site [San Juan Creek 9 - 901SJSJC9]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 48862, Chlorpyrifos **Region 9**

San Juan Creek

LOE ID:	77820
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	20
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of twenty samples exceed the USEPA Health Advisory 2011 ed., criteria for chlorpyrifos.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column,sediments or biota at concentration(s) that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	USEPA Health Advisory 2011 ed., criteria for chlorpyrifos in freshwater is 2.0 ug/L (represents a life-time risk).
Guideline Reference:	2011 Edition of the Drinking Water Standards and Health Advisories
Spatial Representation:	Samples were collected at San Juan Creek, sites REF-CS, SJC-74, SJCC-CC and SJNL01.
Temporal Representation:	Samples were collected from 2006 through 2009.
Environmental Conditions:	
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

DECISION ID **48904** **Region 9**

San Juan Creek

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and

3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Six lines of evidence are available in the administrative record to assess this pollutant. Zero samples exceed the guideline/criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero samples exceeded the guideline/criteria for aquatic life and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 48904, Chromium **Region 9**

San Juan Creek

LOE ID:	75897
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Chromium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for chromium is 111 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]
Temporal Representation:	Data was collected on a single day 4/30/2009.

Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 48904, Chromium **Region 9**

San Juan Creek

LOE ID:	75898
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Chromium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for chromium is 111 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]
Temporal Representation:	Data was collected on a single day 4/30/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 48904, Chromium **Region 9**

San Juan Creek

LOE ID:	75899
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for chromium is 111 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 1 monitoring site [San Juan Creek 9 - 901SJSJC9]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the 2002 QAMP.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 48904, Chromium **Region 9**

San Juan Creek

LOE ID:	75900
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Chromium. Since the chromium species was not identified, the data point(s) were assessed using both the Chromium III criteria which is hardness-dependent, and the criterion continuous concentration (4-day average) to protect aquatic life in freshwater for chromium VI which is 11 ug/L and is not hardness dependent.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Chromium to protect aquatic life in freshwater. The dissolved Chromium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]
Temporal Representation:	Data was collected on a single day 4/30/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 48904, Chromium **Region 9**

San Juan Creek

LOE ID:	75902
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	34
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the 34 samples exceeded the hardness adjusted water quality objective for chromium.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from San Juan Creek at Cold Spring (REF-CS), at Ortega Highway (SJC-74), at Camino Capistrano (SJC-CC), and at La Novia (SJNL01)
Temporal Representation:	Samples were collected from REF-CS and SJC-CC starting in September of 2006 and continuing twice per year (fall and spring) during 2007, 2008, and 2009. Samples were collected from SJC-74 in September of 2006, in May of 2007 and 2008, and in April of 2009. Samples were collected from SJNL01 starting in April 2007 until February of 2009.
Environmental Conditions:	Approximately 54 percent of the samples were collected after storm events.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 48904, Chromium **Region 9**

San Juan Creek

LOE ID:	75901

Pollutant:	Chromium	036464
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	Dissolved	
Beneficial Use:	Cold Freshwater Habitat	
Number of Samples:	2	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Chromium. Since the chromium species was not identified, the data point(s) were assessed using both the Chromium III criteria which is hardness-dependent, and the criterion continuous concentration (4-day average) to protect aquatic life in freshwater for chromium VI which is 11 ug/L and is not hardness dependent.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved chromium to protect aquatic life in freshwater. The dissolved Chromium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]	
Temporal Representation:	Data was collected on a single day 4/30/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID	**48910**	**Region 9**
San Juan Creek		

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Six lines of evidence are available in the administrative record to assess this pollutant. Two of the 36 samples exceed the aquatic life criteria. None of the other samples exceeded the guideline/criteria. Based on the readily available data and information, the weight of evidence indicates that there is

sufficient justification against placing this water segment-pollutant combination on the section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Two of 36 samples exceeded the aquatic life criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 48910, Copper **Region 9**

San Juan Creek

LOE ID:	75905
Pollutant:	Copper
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for copper is 149 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 1 monitoring site [San Juan Creek 9 - 901SJSJC9]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the 2002 QAMP.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 48910, Copper **Region 9**

San Juan Creek

LOE ID:	75904

Pollutant:	Copper
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Copper.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for copper is 149 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]
Temporal Representation:	Data was collected on a single day 4/30/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 48910, Copper **Region 9**

San Juan Creek

LOE ID:	75903
Pollutant:	Copper
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Copper.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for copper is 149 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]
Temporal Representation:	Data was collected on a single day 4/30/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 48910, Copper **Region 9**

San Juan Creek

LOE ID:	75908
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	34
Number of Exceedances:	2
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Two of the 34 samples exceeded the hardness adjusted water quality objective for copper.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from San Juan Creek at Cold Spring (REF-CS), at Ortega Highway (SJC-74), at Camino Capistrano (SJC-CC), and at La Novia (SJNL01)
Temporal Representation:	Samples were collected from REF-CS and SJC-CC starting in September of 2006 and continuing twice per year (fall and spring) during 2007, 2008, and 2009. Samples were collected from SJC-74 in September of 2006, in May of 2007 and 2008, and in April of 2009. Samples were collected from SJNL01 starting in April 2007 until February of 2009.
Environmental Conditions:	Approximately 54 percent of the samples were collected after storm events.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 48910, Copper **Region 9**

San Juan Creek 036468

LOE ID:	75907
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Copper.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved copper to protect aquatic life in freshwater. The dissolved copper criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]
Temporal Representation:	Data was collected on a single day 4/30/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 48910, Copper **Region 9**

San Juan Creek

LOE ID:	75906
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Copper.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Copper

	to protect aquatic life in freshwater. The dissolved Copper criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]
Temporal Representation:	Data was collected on a single day 4/30/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **48912** **Region 9**

San Juan Creek

Pollutant:	**Cyfluthrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Four lines of evidence are available in the administrative record to assess this pollutant. None of the samples exceed the guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the two samples exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48912, Cyfluthrin **Region 9**

San Juan Creek

LOE ID:	75911

Pollutant:	Cyfluthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Cyfluthrin, total. Two sample results were not used in the assessment because the laboratory data reporting limit(s) was above the objective and therefore the results could not be quantified with the level of certainty required by the Listing Policy.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of lambda-cyhalothrin does not exceed 0.0005 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Mixtures of lambda-cyhalothrin and other pyrethroids should be considered in an additive manner. (Fojut et al. 2012)Â
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]
Temporal Representation:	Data was collected on a single day 4/30/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 48912, Cyfluthrin **Region 9**

San Juan Creek

LOE ID:	75910
Pollutant:	Cyfluthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Cyfluthrin, total. Two sample results were not used in the assessment because the laboratory data reporting limit(s) was above the objective and therefore the results could not be quantified with the level of certainty required by the Listing Policy.

Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	036471
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of lambda-cyhalothrin does not exceed 0.0005 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Mixtures of lambda-cyhalothrin and other pyrethroids should be considered in an additive manner. (Fojut et al. 2012)Â	
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.	
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]	
Temporal Representation:	Data was collected on a single day 4/30/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 48912, Cyfluthrin **Region 9**

San Juan Creek

LOE ID:	77821
Pollutant:	Cyfluthrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cyfluthrin, total.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for cyfluthrin is the median lethal concentration (LC50) of 1.1 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 1.1 ug/g is the geometric mean of LC50 values for cyfluthrin from Amweg et al. (2005).
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 1 monitoring site [San Juan Creek 9 - 901SJSJC9]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.

QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

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Line of Evidence (LOE) for Decision ID 48912, Cyfluthrin **Region 9**

San Juan Creek

LOE ID:	75909
Pollutant:	Cyfluthrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cyfluthrin, total.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for cyfluthrin is the median lethal concentration (LC50) of 1.1 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 1.1 ug/g is the geometric mean of LC50 values for cyfluthrin from Amweg et al. (2005).
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 1 monitoring site [San Juan Creek @ La Novia - 901SUP068]
Temporal Representation:	Data was collected on a single day 1/7/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **48917** **Region 9**

San Juan Creek

Pollutant:	**Cyhalothrin, Lambda**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Under section 3.6 at least two lines of evidence are necessary to assess listing status for

pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Four lines of evidence are available in the administrative record to assess this pollutant. None of the samples exceed the guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the two samples exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48917, Cyhalothrin, Lambda **Region 9**

San Juan Creek

LOE ID:	75912
Pollutant:	Cyhalothrin, Lambda
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cyhalothrin, lambda, total.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for lambda-cyhalothrin is the median lethal concentration (LC50) of 0.44 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 0.44 ug/g is the geometric mean of LC50 values for lambda-cyhalothrin from Amweg et al. (2005).
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 1 monitoring site [San Juan Creek @ La Novia - 901SUP068]

Temporal Representation:	Data was collected on a single day 1/7/2007. 036474
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 48917, Cyhalothrin, Lambda **Region 9**

San Juan Creek

LOE ID:	75913
Pollutant:	Cyhalothrin, Lambda
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Cyhalothrin, lambda, total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Cyhalothrin, lambda, total does not exceed 0.0005 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]
Temporal Representation:	Data was collected on a single day 4/30/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 48917, Cyhalothrin, Lambda **Region 9**

San Juan Creek

LOE ID:	75914
Pollutant:	Cyhalothrin, Lambda
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	2

Number of Exceedances:	0	036475
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Cyhalothrin, lambda, total.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Cyhalothrin, lambda, total does not exceed 0.0005 ug/L.	
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.	
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]	
Temporal Representation:	Data was collected on a single day 4/30/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 48917, Cyhalothrin, Lambda **Region 9**

San Juan Creek

LOE ID:	77822
Pollutant:	Cyhalothrin, Lambda
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cyhalothrin, lambda, total.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for lambda-cyhalothrin is the median lethal concentration (LC50) of 0.44 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 0.44 ug/g is the geometric mean of LC50 values for lambda-cyhalothrin from Amweg et al. (2005).
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5

Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 1 monitoring site [San Juan Creek 9 - 901SJSJC9]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID 48919 Region 9

San Juan Creek

Pollutant:	**Cypermethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Four lines of evidence are available in the administrative record to assess this pollutant. None of the samples exceed the guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the two samples exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48919, Cypermethrin Region 9

San Juan Creek

LOE ID:	75915
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat

Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cypermethrin, total.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for cypermethrin is the median lethal concentration (LC50) of 0.3 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 0.3 ug/g is the geometric mean of LC50 values for cypermethrin from Maund et al. (2002).
Guideline Reference:	Partitioning, bioavailability, and toxicity of the pyrethroid insecticide cypermethrin in sediments. Environmental Toxicology and Chemistry 21:9-15
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 1 monitoring site [San Juan Creek @ La Novia - 901SUP068]
Temporal Representation:	Data was collected on a single day 1/7/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 48919, Cypermethrin **Region 9**

San Juan Creek

LOE ID:	75916
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Two of two sample results were not used in the assessment because the laboratory data was non-detect and the method detection limit was above the guideline and therefore the results could not be quantified with the level of certainty required by the Listing Policy
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day

	average concentration of cypermethrin does not exceed 0.0002 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Fojut et al. 2012)
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]
Temporal Representation:	Data was collected on a single day 4/30/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 48919, Cypermethrin **Region 9**

San Juan Creek

LOE ID:	75917
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Two of two sample results were not used in the assessment because the laboratory data was non-detect and the method detection limit was above the guideline and therefore the results could not be quantified with the level of certainty required by the Listing Policy
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of cypermethrin does not exceed 0.0002 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Fojut et al. 2012)
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]
Temporal Representation:	Data was collected on a single day 4/30/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 48919, Cypermethrin **Region 9**

San Juan Creek

LOE ID:	77823
Pollutant:	Cypermethrin

LOE Subgroup:	Pollutant-Sediment	036479
Matrix:	Sediment	
Fraction:	Total	
Beneficial Use:	Cold Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cypermethrin, total.	
Data Reference:	Statewide Stream Pollution Trends Study 2008	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The evaluation guideline for cypermethrin is the median lethal concentration (LC50) of 0.3 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 0.3 ug/g is the geometric mean of LC50 values for cypermethrin from Maund et al. (2002).	
Guideline Reference:	Partitioning, bioavailability, and toxicity of the pyrethroid insecticide cypermethrin in sediments. Environmental Toxicology and Chemistry 21:9-15	
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 1 monitoring site [San Juan Creek 9 - 901SJSJC9]	
Temporal Representation:	Data was collected on a single day 5/21/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.	
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)	

DECISION ID	**48466**	**Region 9**
San Juan Creek		

Pollutant:	**DDD (Dichlorodiphenyldichloroethane)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 2 samples exceed the sediment guideline.

Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that: 036480
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the 2 samples exceed the sediment guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48466, DDD (Dichlorodiphenyldichloroethane) Region 9

San Juan Creek

LOE ID:	75919
Pollutant:	DDD (Dichlorodiphenyldichloroethane)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for DDD.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for sum of DDD (o,p' + p,p') is 28.0 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 1 monitoring site [San Juan Creek 9 - 901SJSJC9]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 48466, DDD (Dichlorodiphenyldichloroethane) Region 9

San Juan Creek

LOE ID:	75918

Pollutant:	DDD (Dichlorodiphenyldichloroethane)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for DDD.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for sum of DDD (o,p' + p,p') is 28.0 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 1 monitoring site [San Juan Creek @ La Novia - 901SUP068]
Temporal Representation:	Data was collected on a single day 1/7/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID	**49031**	**Region 9**
San Juan Creek		

Pollutant:	**DDT (Dichlorodiphenyltrichloroethane) | Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Four lines of evidence are available in the administrative record to assess this pollutant. Zero of the two samples exceed the guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that: 036482
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the two samples exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49031, Multiple Pollutants **Region 9**

San Juan Creek

LOE ID:	75982
Pollutant:	Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for DDT, Total.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for total DDTs (Sum DDT + Sum DDD + Sum DDE) is 572 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 1 monitoring site [San Juan Creek 9 - 901SJSJC9]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 49031, Multiple Pollutants **Region 9**

San Juan Creek

LOE ID:	75842

Pollutant:	DDT (Dichlorodiphenyltrichloroethane)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for DDT.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for sum of DDT (o,p' + p,p') is 62.9 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 1 monitoring site [San Juan Creek 9 - 901SJSJC9]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 49031, Multiple Pollutants **Region 9**

San Juan Creek

LOE ID:	75922
Pollutant:	DDT (Dichlorodiphenyltrichloroethane)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for DDT.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.

Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	036484
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for sum of DDT (o,p' + p,p') is 62.9 ug/Kg dry weight (MacDonald et al. 2000).	
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31	
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 1 monitoring site [San Juan Creek @ La Novia - 901SUP068]	
Temporal Representation:	Data was collected on a single day 1/7/2007.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.	
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)	

Line of Evidence (LOE) for Decision ID 49031, Multiple Pollutants **Region 9**

San Juan Creek

LOE ID:	75981
Pollutant:	Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for DDT, Total.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for total DDTs (Sum DDT + Sum DDD + Sum DDE) is 572 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 1 monitoring site [San Juan Creek @ La Novia - 901SUP068]
Temporal Representation:	Data was collected on a single day 1/7/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **48992** **Region 9**

San Juan Creek

Pollutant:	**Deltamethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Four lines of evidence are available in the administrative record to assess this pollutant. None of the samples exceed the sediment or water guidelines.

Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List.
This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the 2 samples exceed the sediment and water guidelines and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48992, Deltamethrin **Region 9**

San Juan Creek

LOE ID:	77815
Pollutant:	Deltamethrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Deltamethrin.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.

Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	036486
Evaluation Guideline:	The evaluation guideline for deltamethrin is the median lethal concentration (LC50) of 0.79 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 0.79 ug/g is the geometric mean of LC50 values for deltamethrin from Amweg et al. (2005).	
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5	
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 1 monitoring site [San Juan Creek 9 - 901SJSJC9]	
Temporal Representation:	Data was collected on a single day 5/21/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.	
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)	

Line of Evidence (LOE) for Decision ID 48992, Deltamethrin **Region 9**

San Juan Creek

LOE ID:	75843
Pollutant:	Deltamethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Deltamethrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for Deltamethrin is the maximum acceptable toxicant concentration (MATC) of 0.02 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]
Temporal Representation:	Data was collected on a single day 4/30/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 48992, Deltamethrin **Region 9**

San Juan Creek

LOE ID:	75844

Pollutant:	Deltamethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Deltamethrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for Deltamethrin is the maximum acceptable toxicant concentration (MATC) of 0.02 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]
Temporal Representation:	Data was collected on a single day 4/30/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 48992, Deltamethrin **Region 9**

San Juan Creek

LOE ID:	75845
Pollutant:	Deltamethrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Deltamethrin.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	The evaluation guideline for deltamethrin is the median lethal concentration (LC50) of 0.79 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 0.79 ug/g is the geometric mean of LC50 values for deltamethrin from Amweg et al. (2005).
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 1 monitoring site [San Juan Creek @ La Novia - 901SUP068]
Temporal Representation:	Data was collected on a single day 1/7/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **43102** **Region 9**

San Juan Creek

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Under 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. One of the fifty-nine water samples exceed the GUIDELINE and zero of the two sediment samples exceed the GUIDELINE. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of fifty-nine water samples exceeded the GUIDELINE and zero of two sediment samples exceed the GUIDELINE, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 43102, Diazinon **Region 9**

San Juan Creek

LOE ID:	77817

Pollutant:	Diazinon	036489
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	Total Dissolved	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	14	
Number of Exceedances:	0	
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)	
Data Used to Assess Water Quality:	None of 14 samples exceed the CADPH Notification Level for Diazinon criteria.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column,sediments or biota at concentration(s) that adversely affect beneficial uses.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The California Department of Public Health (CDPH) Notification Level for Diazinon is 1.2 ug/L.	
Guideline Reference:	Drinking Water Notification and Response Levels: An Overview	
Spatial Representation:	Samples were collected at San Juan Creek, sites REF-CS, SJC-74, SJCC-CC and SJNL01.	
Temporal Representation:	Samples were collected from September 2006 through April 2009.	
Environmental Conditions:		
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43102, Diazinon **Region 9**

San Juan Creek

LOE ID:	75847
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	33
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of thirty three samples exceed the continuous concentration for Diazinon criteria of 0.1 ug/L.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column,sediments or biota at concentration(s) that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game

Spatial Representation:	Samples were collected at San Juan Creek, sites REF-CS, SJC-74, SJCC-CC and SJNL01.
Temporal Representation:	Samples were collected from 2006 through 2009.
Environmental Conditions:	
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43102, Diazinon **Region 9**

San Juan Creek

LOE ID:	21244
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	There were no exceedances in the data, the four samples taken have a mean of 0.036 Âµg/L. according to results in the Surface Water Ambient Monitoring Program, 2007.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The one-hour average concentration of diazinon should not exceed 0.17 Âµg/L more than once every three years on the average (acute criterion) and the four-day average concentration of diazinon should not exceed 0.17 Âµg/L more than once every three years on the average (chronic criterion). (U.S. EPA, 2006)
Guideline Reference:	Fact Sheet: Final Recommended Aquatic Life Ambient Water Quality Criteria for Diazinon
Spatial Representation:	The four samples were collected in the lower San Juan Creek Station; Lat/Long: 33.4847/-117.6746.
Temporal Representation:	This site was monitored in 2003.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 43102, Diazinon **Region 9**

San Juan Creek

LOE ID:	77816
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total

Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Diazinon.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for diazinon is the median lethal concentration (LC50) of 11 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 11 ug/g is the geometric mean of LC50 values for diazinon from Ding et al. (2011).
Guideline Reference:	Toxicity of Sediment-Associated Pesticides to Chironomus dilutus and Hyalella azteca. Arch. Environ. Contam. Toxicol. 61:83Â–92.
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek at Camino del Norte - 904ESCOxx]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 43102, Diazinon **Region 9**

San Juan Creek

LOE ID:	75846
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Diazinon.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	There is no diazinon evaluation guideline specific to "sediment, interstitial water" (pore water). The following evaluation guideline was used to evaluate an exceedance in water

	quality standards: the freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).Â
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 1 monitoring site [San Juan Creek @ La Novia - 901SUP068]
Temporal Representation:	Data was collected on a single day 1/7/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 43102, Diazinon **Region 9**

San Juan Creek

LOE ID:	21242
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	17
Number of Exceedances:	1
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	One of the 17 samples exceeded 0.17 Âµg/L.
Data Reference:	California Stream Bioassesment Procedure: Protocol Brief for Biological and Physical/Habitat Assessment in Wadeable Streams
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The one-hour average concentration of diazinon should not exceed 0.17 Âµg/L more than once every three years on the average (acute criterion) and the four-day average concentration of diazinon should not exceed 0.17 Âµg/L more than once every three years on the average (chronic criterion). (U.S. EPA, 2006)
Guideline Reference:	Fact Sheet: Final Recommended Aquatic Life Ambient Water Quality Criteria for Diazinon
Spatial Representation:	Samples were collected from the lower San Juan Creek at Stonehill Drive. Latitude/Longitude: 33.4753/ -117.6790
Temporal Representation:	Samples were taken on various dates starting April 8, 1999 to January 17, 2001.
Environmental Conditions:	
QAPP Information:	None available. Data submitted to the DPRÂ's Surface Water Database is subject to the document Â"Requirements for Inclusion of Monitoring Data in DPRÂ's Surface Water Database.Â"
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43102, Diazinon **Region 9**

San Juan Creek

LOE ID:	21253

Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	There were no exceedances in the five samples collected according to results in the Unified Annual Progress Report Program Effectiveness Assessment, 2007. Samples were taken on five dates: October 10, 2003; May 13, 2004; October 14, 2004; May 18, 2005; December 14, 2005.
Data Reference:	Program Effectiveness Assessment Section of the Unified Annual Progress Report for the period of time 2001-2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The one-hour average concentration of diazinon should not exceed 0.17 Âµg/L more than once every three years on the average (acute criterion) and the four-day average concentration of diazinon should not exceed 0.17 Âµg/L more than once every three years on the average (chronic criterion). (U.S. EPA, 2006)
Guideline Reference:	Fact Sheet: Final Recommended Aquatic Life Ambient Water Quality Criteria for Diazinon
Spatial Representation:	Samples were collected from lower San Juan Creek at Camino Capistrano. Latitude/Longitude: 33.4978/ -117.6661.
Temporal Representation:	Samples were taken on five dates: October 10, 2003; May 13, 2004; October 14, 2004; May 18, 2005; December 14, 2005.
Environmental Conditions:	
QAPP Information:	Quality assurance plan followed guidelines outlined by the County of Orange.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

DECISION ID	48925	Region 9
San Juan Creek		

Pollutant:	**Dieldrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 2 samples exceed the sediment guideline. Based on the readily available data and information, the weight of evidence indicates that there is

insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the 2 samples exceed the sediment guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48925, Dieldrin **Region 9**

San Juan Creek

LOE ID:	75849
Pollutant:	Dieldrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Dieldrin.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for dieldrin is 61.8 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 1 monitoring site [San Juan Creek 9 - 901SJSJC9]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the 2002 QAMP.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 48925, Dieldrin **Region 9**

San Juan Creek 036495

LOE ID:	75848
Pollutant:	Dieldrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Dieldrin.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for dieldrin is 61.8 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 1 monitoring site [San Juan Creek @ La Novia - 901SUP068]
Temporal Representation:	Data was collected on a single day 1/7/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **48929** **Region 9**

San Juan Creek

Pollutant:	**Endrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 2 samples exceed the sediment guideline. Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d)

List. 036496

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the 2 samples exceed the sediment guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48929, Endrin **Region 9**

San Juan Creek

LOE ID:	75851
Pollutant:	Endrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Endrin.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for endrin is 207 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 1 monitoring site [San Juan Creek 9 - 901SJSJC9]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the 2002 QAMP.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 48929, Endrin **Region 9**

San Juan Creek

LOE ID:	75850
Pollutant:	Endrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Endrin.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for endrin is 207 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 1 monitoring site [San Juan Creek @ La Novia - 901SUP068]
Temporal Representation:	Data was collected on a single day 1/7/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID	**48933**	**Region 9**
San Juan Creek		

Pollutant:	**Esfenvalerate/Fenvalerate**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Four lines of evidence are available in the administrative record to assess this pollutant. None of the samples exceed the sediment or water guidelines. Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d)

List. 036498

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the 2 samples exceed the sediment and water guidelines and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48933, Esfenvalerate/Fenvalerate **Region 9**

San Juan Creek

LOE ID:	75859
Pollutant:	Esfenvalerate/Fenvalerate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Esfenvalerate/Fenvalerate, total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to the USEPA Office of Pesticide Programs Ecotoxicity database, the aquatic life EC50 for Esfenvalerate/Fenvalerate is 0.9 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]
Temporal Representation:	Data was collected on a single day 4/30/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 48933, Esfenvalerate/Fenvalerate **Region 9**

San Juan Creek

LOE ID:	75860	036499

Pollutant:	Esfenvalerate/Fenvalerate
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Esfenvalerate/Fenvalerate, total.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for esfenvalerate/fenvalerate is the median lethal concentration (LC50) of 1.5 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 1.5 ug/g is the geometric mean of LC50 values for esfenvalerate/fenvalerate from Amweg et al. (2005).
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 1 monitoring site [San Juan Creek @ La Novia - 901SUP068]
Temporal Representation:	Data was collected on a single day 1/7/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 48933, Esfenvalerate/Fenvalerate **Region 9**

San Juan Creek

LOE ID:	75856
Pollutant:	Esfenvalerate/Fenvalerate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Esfenvalerate/Fenvalerate, total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009

SWAMP Data:	SWAMP	036500
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	According to the USEPA Office of Pesticide Programs Ecotoxicity database, the aquatic life EC50 for Esfenvalerate/Fenvalerate is 0.9 ug/L.	
Guideline Reference:	OPP Pesticide Ecotoxicity Database.	
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]	
Temporal Representation:	Data was collected on a single day 4/30/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 48933, Esfenvalerate/Fenvalerate **Region 9**

San Juan Creek

LOE ID:	77818
Pollutant:	Esfenvalerate/Fenvalerate
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Esfenvalerate/Fenvalerate, total.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for esfenvalerate/fenvalerate is the median lethal concentration (LC50) of 1.5 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 1.5 ug/g is the geometric mean of LC50 values for esfenvalerate/fenvalerate from Amweg et al. (2005).
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 1 monitoring site [San Juan Creek 9 - 901SJSJC9]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID	48936	Region 9
San Juan Creek		

Pollutant:	**Fenpropathrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Four lines of evidence are available in the administrative record to assess this pollutant. None of the samples exceed the sediment or water guidelines. Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the 2 samples exceed the sediment and water guidelines and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48936, Fenpropathrin	**Region 9**
San Juan Creek	

LOE ID:	75870
Pollutant:	Fenpropathrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Fenpropathrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009

SWAMP Data:	SWAMP	036502
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The evaluation guideline for Fenpropathrin is the median lethal concentration (LC50; 2.2 ug/L).	
Guideline Reference:	OPP Pesticide Ecotoxicity Database.	
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]	
Temporal Representation:	Data was collected on a single day 4/30/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 48936, Fenpropathrin **Region 9**

San Juan Creek

LOE ID:	75869
Pollutant:	Fenpropathrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Fenpropathrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for Fenpropathrin is the median lethal concentration (LC50; 2.2 ug/L).
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]
Temporal Representation:	Data was collected on a single day 4/30/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 48936, Fenpropathrin **Region 9**

San Juan Creek

LOE ID:	75863	036503

Pollutant:	Fenpropathrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Fenpropathrin.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for fenpropathrin is the median lethal concentration (LC50) of 1 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 1 ug/g is the geometric mean of LC50 values for fenpropathrin from Ding et al. (2011).
Guideline Reference:	Toxicity of Sediment-Associated Pesticides to Chironomus dilutus and Hyalella azteca. Arch. Environ. Contam. Toxicol. 61:83Â–92.
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 1 monitoring site [San Juan Creek @ La Novia - 901SUP068]
Temporal Representation:	Data was collected on a single day 1/7/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 48936, Fenpropathrin **Region 9**

San Juan Creek

LOE ID:	77819
Pollutant:	Fenpropathrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Fenpropathrin.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP

Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for fenpropathrin is the median lethal concentration (LC50) of 1 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 1 ug/g is the geometric mean of LC50 values for fenpropathrin from Ding et al. (2011).
Guideline Reference:	Toxicity of Sediment-Associated Pesticides to Chironomus dilutus and Hyalella azteca. Arch. Environ. Contam. Toxicol. 61:83Â–92.
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 1 monitoring site [San Juan Creek 9 - 901SJSJC9]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID 48941 Region 9

San Juan Creek

Pollutant:	**Fipronil**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. None of the samples exceed the guidelines. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the samples were used in the assessment due to method detection limits that were above the guideline. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48941, Fipronil Region 9

San Juan Creek

LOE ID:	75871
Pollutant:	Fipronil
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	One of one sample result was not used in the assessment because the laboratory data was non-detect and the method detection limit was above the guideline and therefore the results could not be quantified with the level of certainty required by the Listing Policy.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for fipronil is the median lethal concentration (LC50) of 0.13 ug/g and is normalized by the percentage of organic carbon in the sediment sample (Maul et al. 2008).
Guideline Reference:	Effect of sediment-associated pyrethroids, fipronil, and metabolites on Chironomus tentans growth rate, body mass, condition index, immobilization, and survival. Environ. Toxicol. Chem. 27(12):2582-2590.
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 1 monitoring site [San Juan Creek @ La Novia - 901SUP068]
Temporal Representation:	Data was collected on a single day 1/7/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **48944** **Region 9**

San Juan Creek

Pollutant:	**Fipronil Sulfide**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. None of the samples exceed the guidelines.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the samples were used in the assessment due to method detection limits that were above the guideline.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48944, Fipronil Sulfide **Region 9**

San Juan Creek

LOE ID:	75872
Pollutant:	Fipronil Sulfide
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	One of one sample result was not used in the assessment because the laboratory data was non-detect and the method detection limit was above the guideline and therefore the results could not be quantified with the level of certainty required by the Listing Policy.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for fipronil sulfide is the median lethal concentration (LC50) of 0.16 ug/g and is normalized by the percentage of organic carbon in the sediment sample (Maul et al. 2008).
Guideline Reference:	Effect of sediment-associated pyrethroids, fipronil, and metabolites on Chironomus tentans growth rate, body mass, condition index, immobilization, and survival. Environ. Toxicol. Chem. 27(12):2582-2590.
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 1 monitoring site [San Juan Creek @ La Novia - 901SUP068]
Temporal Representation:	Data was collected on a single day 1/7/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **48945** **Region 9**

San Juan Creek

Pollutant:	**Fipronil Sulfone**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. None of the samples exceed the guidelines.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the samples were used in the assessment due to method detection limits that were above the guideline.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48945, Fipronil Sulfone **Region 9**

San Juan Creek

LOE ID:	75935
Pollutant:	Fipronil Sulfone
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	One of one sample result was not used in the assessment because the laboratory data was non-detect and the method detection limit was above the guideline and therefore the results could not be quantified with the level of certainty required by the Listing Policy.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP

Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for fipronil sulfone is the median lethal concentration (LC50) of 0.12 ug/g and is normalized by the percentage of organic carbon in the sediment sample (Maul et al. 2008).
Guideline Reference:	Effect of sediment-associated pyrethroids, fipronil, and metabolites on Chironomus tentans growth rate, body mass, condition index, immobilization, and survival. Environ. Toxicol. Chem. 27(12):2582-2590.
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 1 monitoring site [San Juan Creek @ La Novia - 901SUP068]
Temporal Representation:	Data was collected on a single day 1/7/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID 48947 Region 9

San Juan Creek

Pollutant:	**Iron**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. One of the two samples exceeded the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of two samples exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48947, Iron Region 9

San Juan Creek

LOE ID:	75937	036509

Pollutant:	Iron
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 1 of 2 samples exceed the criterion for Iron.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Iron objective for the protection of aquatic life according to Table 3-2 for San Juan Creek within the San Juan Hydrologic Unit is 0.3 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]
Temporal Representation:	Data was collected on a single day 4/30/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 48947, Iron **Region 9**

San Juan Creek

LOE ID:	75936
Pollutant:	Iron
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 1 of 2 samples exceed the criterion for Iron.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Iron objective for the protection of aquatic life according to Table 3-2 for San Juan Creek within the San Juan Hydrologic Unit is 0.3 mg/L.

Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	036510
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]	
Temporal Representation:	Data was collected on a single day 4/30/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID 48995 Region 9

San Juan Creek

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Six lines of evidence are available in the administrative record to assess this pollutant. One of the 36 samples exceeded the criterion. Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of 36 samples exceeded the criterion and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 48995, Lead Region 9

San Juan Creek

LOE ID:	75940
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Lead.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Lead to protect aquatic life in freshwater. The dissolved Lead criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]
Temporal Representation:	Data was collected on a single day 4/30/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 48995, Lead **Region 9**

San Juan Creek

LOE ID:	75941
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Lead.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved lead to protect aquatic life in freshwater. The dissolved lead criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San

	Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]
Temporal Representation:	Data was collected on a single day 4/30/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 48995, Lead **Region 9**

San Juan Creek

LOE ID:	75942
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	34
Number of Exceedances:	1
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	One of the 34 samples exceeded the hardness adjusted water quality objective for lead.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from San Juan Creek at Cold Spring (REF-CS), at Ortega Highway (SJC-74), at Camino Capistrano (SJC-CC), and at La Novia (SJNL01)
Temporal Representation:	Samples were collected from REF-CS and SJC-CC starting in September of 2006 and continuing twice per year (fall and spring) during 2007, 2008, and 2009. Samples were collected from SJC-74 in September of 2006, in May of 2007 and 2008, and in April of 2009. Samples were collected from SJNL01 starting in April 2007 until February of 2009.
Environmental Conditions:	Approximately 54 percent of the samples were collected after storm events.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 48995, Lead **Region 9**

San Juan Creek

LOE ID:	75939
Pollutant:	Lead
LOE Subgroup:	Pollutant-Sediment

Matrix:	Sediment	036513
Fraction:	Total	
Beneficial Use:	Cold Freshwater Habitat	
Number of Samples:	2	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Lead.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for lead is 128 mg/Kg dry weight (MacDonald et al. 2000).	
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31	
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]	
Temporal Representation:	Data was collected on a single day 4/30/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 48995, Lead **Region 9**

San Juan Creek

LOE ID:	75938
Pollutant:	Lead
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Lead.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for lead is 128 mg/Kg dry weight (MacDonald et al. 2000).

Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31 036514
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]
Temporal Representation:	Data was collected on a single day 4/30/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 48946 Region 9

San Juan Creek

Pollutant:	**Lindane/gamma Hexachlorocyclohexane (gamma-HCH)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. None of the samples exceed the guidelines. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the two samples exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48946, Lindane/gamma Hexachlorocyclohexane (gamma-HCH) Region 9

San Juan Creek

LOE ID:	75943
Pollutant:	Lindane/gamma Hexachlorocyclohexane (gamma-HCH)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total

Beneficial Use:	Cold Freshwater Habitat	036515
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for HCH, gamma.	
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for Lindane (gamma-HCH) is 4.99 ug/Kg dry weight (MacDonald et al. 2000).	
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31	
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 1 monitoring site [San Juan Creek @ La Novia - 901SUP068]	
Temporal Representation:	Data was collected on a single day 1/7/2007.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.	
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)	

Line of Evidence (LOE) for Decision ID 48946, Lindane/gamma Hexachlorocyclohexane (gamma-HCH) **Region 9**

San Juan Creek

LOE ID:	77824
Pollutant:	Lindane/gamma Hexachlorocyclohexane (gamma-HCH)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for HCH, gamma.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for Lindane (gamma-HCH) is 4.99 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater

ecosystems. Environmental Contamination and Toxicology. 39: 20-31 036516

Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek at Camino del Norte - 904ESCOxx]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the 2002 QAMP.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID 48964 Region 9

San Juan Creek

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section3.1 of the Listing Policy. Under section 3.1, one line(s) of evidence are necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. One of the 20 samples exceed the criteria for the protection of aquatic life. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of the 20 samples exceed the criteria for the protection of aquatic life and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to [SECTION 3.11/4.11] of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48964, Malathion Region 9

San Juan Creek

LOE ID:	77825
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	20	036517
Number of Exceedances:	0	
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)	
Data Used to Assess Water Quality:	Zero of 20 samples exceed the CDPH notification level for Malathion criteria of 160.0 ug/L.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column,sediments or biota at concentration(s) that adversely affect beneficial uses.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The California Department of Public Health (CDPH) notification level criteria for malathion in freshwater is 160.0 ug/L.	
Guideline Reference:	CDPH Archived Advisory Levels for Drinking Water. Archived Advisory Levels are currently considered Notification Levels.	
Spatial Representation:	Samples were collected at San Juan Creek, sites REF-CS, SJC-74, SJCC-CC and SJNL01.	
Temporal Representation:	Samples were collected from September 2006 through April 2009.	
Environmental Conditions:		
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 48964, Malathion **Region 9**

San Juan Creek

LOE ID:	75944
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	20
Number of Exceedances:	1
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	One of 20 samples exceed the maximum (Instantaneous) concentration for Malathion in freshwater of 100 ng/L.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column,sediments or biota at concentration(s) that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The maximum (Instantaneous) concentration for Malathion in freshwater is 100 ng/L.
Guideline Reference:	Quality Criteria for Water. USEPA Office of Water and Hazardous Materials. Washington, D.C
Spatial Representation:	Samples were collected at San Juan Creek, sites REF-CS, SJC-74, SJCC-CC and SJNL01.
Temporal Representation:	Samples were collected from 2006 through 2009.
Environmental Conditions:	
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.

QAPP Information Reference(s): 036518

DECISION ID	48966	Region 9
San Juan Creek		

Pollutant:	**Manganese**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. One of the two samples exceeded the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of two samples exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48966, Manganese	**Region 9**
San Juan Creek	

LOE ID:	75946
Pollutant:	Manganese
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 1 of 2 samples exceed the criterion for Manganese.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP

Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Manganese objective for the protection of aquatic life according to Table 3-2 for San Juan Creek within the San Juan Hydrologic Unit is 0.05 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]
Temporal Representation:	Data was collected on a single day 4/30/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 48966, Manganese **Region 9**

San Juan Creek

LOE ID:	75945
Pollutant:	Manganese
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 1 of 2 samples exceed the criterion for Manganese.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Manganese objective for the protection of aquatic life according to Table 3-2 for San Juan Creek within the San Juan Hydrologic Unit is 0.05 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]
Temporal Representation:	Data was collected on a single day 4/30/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **49000** **Region 9**

San Juan Creek

Pollutant: **Mercury**

Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	036520
Last Listing Cycle's Final Listing Decision:	New Decision	
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 one line(s) of evidence are necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. Zero of one sample exceed the criteria for mercury.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceed the criteria for mercury and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to [SECTION 3.11/4.11] of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49000, Mercury **Region 9**

San Juan Creek

LOE ID:	75947
Pollutant:	Mercury
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Mercury.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for mercury is 1.06 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater

	ecosystems. Environmental Contamination and Toxicology. 39: 20-31 036521
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 1 monitoring site [San Juan Creek 9 - 901SJSJC9]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the 2002 QAMP.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID 49003 Region 9

San Juan Creek

Pollutant:	**Methyl Parathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. The sample did not exceed the guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the one sample exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49003, Methyl Parathion Region 9

San Juan Creek

LOE ID:	77826
Pollutant:	Methyl Parathion
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat

Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Parathion, Methyl.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for methyl parathion is the median lethal concentration (LC50) of 6 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 6 ug/g is the geometric mean of LC50 values for methyl parathion from Ding et al. (2011).
Guideline Reference:	Toxicity of Sediment-Associated Pesticides to Chironomus dilutus and Hyalella azteca. Arch. Environ. Contam. Toxicol. 61:83Â–92.
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 1 monitoring site [San Juan Creek 9 - 901SJSJC9]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **49009** **Region 9**

San Juan Creek

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Five lines of evidence are available in the administrative record to assess this pollutant. Zero of the 36 samples exceeded the criterion.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the 36 samples exceed the guideline and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.

4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 49009, Nickel **Region 9**

San Juan Creek

LOE ID:	75950
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Nickel.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for nickel is 48.6 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]
Temporal Representation:	Data was collected on a single day 4/30/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 49009, Nickel **Region 9**

San Juan Creek

LOE ID:	75951
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2

Number of Exceedances:	0	036524
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Nickel.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Nickel to protect aquatic life in freshwater. The dissolved Nickel criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]	
Temporal Representation:	Data was collected on a single day 4/30/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 49009, Nickel **Region 9**

San Juan Creek

LOE ID:	75952
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Nickel.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Nickel to protect aquatic life in freshwater. The dissolved Nickel criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]

Temporal Representation:	Data was collected on a single day 4/30/2009.	036525
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 49009, Nickel **Region 9**

San Juan Creek

LOE ID:	75953
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	34
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the 34 samples exceeded the hardness adjusted water quality objective for nickel.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from San Juan Creek at Cold Spring (REF-CS), at Ortega Highway (SJC-74), at Camino Capistrano (SJC-CC), and at La Novia (SJNL01)
Temporal Representation:	Samples were collected from REF-CS and SJC-CC starting in September of 2006 and continuing twice per year (fall and spring) during 2007, 2008, and 2009. Samples were collected from SJC-74 in September of 2006, in May of 2007 and 2008, and in April of 2009. Samples were collected from SJNL01 starting in April 2007 until February of 2009.
Environmental Conditions:	Approximately 54 percent of the samples were collected after storm events.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49009, Nickel **Region 9**

San Juan Creek

LOE ID:	75949
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total

Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Nickel.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for nickel is 48.6 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]
Temporal Representation:	Data was collected on a single day 4/30/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **49034** **Region 9**

San Juan Creek

Pollutant:	**PCBs (Polychlorinated biphenyls)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. The sample did not exceed the guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the one sample exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available

indicating that standards are not met. 036527

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49034, PCBs (Polychlorinated biphenyls) **Region 9**

San Juan Creek

LOE ID:	72812
Pollutant:	PCBs (Polychlorinated biphenyls)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Zero of 1 sample collected for Total PCBs exceeded the evaluation guideline.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for total PCB is 676 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data were collected at the following station 901SJSJC9 (San Juan Creek 9).
Temporal Representation:	The samples were collected on 5/21/2008.
Environmental Conditions:	
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **49035** **Region 9**

San Juan Creek

Pollutant:	**Permethrin, total**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity

to justify adding that pollutant to the CWA section 303(d) List. 036528

Four lines of evidence are available in the administrative record to assess this pollutant. Zero of the two samples exceed the sediment or water guidelines.

Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List.
This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the 2 samples exceed the sediment and water guidelines and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49035, Permethrin, total **Region 9**

San Juan Creek

LOE ID:	75961
Pollutant:	Permethrin, total
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Permethrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Permethrin does not exceed 0.002 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]
Temporal Representation:	Data was collected on a single day 4/30/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.

QAPP Information Reference(s): Surface Water Ambient Monitoring Program Quality Assurance Program R036529

Line of Evidence (LOE) for Decision ID 49035, Permethrin, total **Region 9**

San Juan Creek

LOE ID:	75960
Pollutant:	Permethrin, total
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Soledad Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Permethrin, Total.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for permethrin is the median lethal concentration (LC50) of 8.9 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 8.9 ug/g is the geometric mean of LC50 values for permethrin from Amweg et al. (2005).
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5
Spatial Representation:	Data for this line of evidence for Soledad Canyon was collected at 1 monitoring site [Soledad Canyon Creek 4 - 906LPSOL4]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 49035, Permethrin, total **Region 9**

San Juan Creek

LOE ID:	75962
Pollutant:	Permethrin, total
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Permethrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Permethrin does not exceed 0.002 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]
Temporal Representation:	Data was collected on a single day 4/30/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 49035, Permethrin, total **Region 9**

San Juan Creek

LOE ID:	75959
Pollutant:	Permethrin, total
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Permethrin, Total.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for permethrin is the median lethal concentration (LC50) of 8.9 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 8.9 ug/g is the geometric mean of LC50 values for permethrin from Amweg et al. (2005).
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 1 monitoring site [San Juan Creek @ La Novia - 901SUP068]
Temporal Representation:	Data was collected on a single day 1/7/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.

QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.036531
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID 49036 Region 9

San Juan Creek

Pollutant:	**Silver**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Three lines of evidence are available in the administrative record to assess this pollutant. Zero of the 36 samples exceed the criterion. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 36 samples exceeded the criterion and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 49036, Silver Region 9

San Juan Creek

LOE ID:	75973
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	34
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the 34 samples exceeded the hardness adjusted water quality objective for silver.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion maximum concentrations for silver to protect aquatic life in freshwater (1-hour average). The dissolved silver criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from San Juan Creek at Cold Spring (REF-CS), at Ortega Highway (SJC-74), at Camino Capistrano (SJC-CC), and at La Novia (SJNL01)
Temporal Representation:	Samples were collected from REF-CS and SJC-CC starting in September of 2006 and continuing twice per year (fall and spring) during 2007, 2008, and 2009. Samples were collected from SJC-74 in September of 2006, in May of 2007 and 2008, and in April of 2009. Samples were collected from SJNL01 starting in April 2007 until February of 2009.
Environmental Conditions:	Approximately 54 percent of the samples were collected after storm events.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49036, Silver **Region 9**

San Juan Creek

LOE ID:	75972
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Silver.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Silver to protect aquatic life in freshwater. The dissolved Silver criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]
Temporal Representation:	Data was collected on a single day 4/30/2009.

Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 49036, Silver **Region 9**

San Juan Creek

LOE ID:	75971
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Silver.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Silver to protect aquatic life in freshwater. The dissolved Silver criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]
Temporal Representation:	Data was collected on a single day 4/30/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **48969** **Region 9**

San Juan Creek

Pollutant:	**Sulfates**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. One of the two samples exceeded the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of two samples exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48969, Sulfates **Region 9**

San Juan Creek

LOE ID:	75974
Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 1 of 2 samples exceed the criterion for Sulfate.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Sulfate objective for the protection of aquatic life according to Table 3-2 for San Juan Creek within the San Juan Hydrologic Unit is 250 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]
Temporal Representation:	Data was collected on a single day 4/30/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 48969, Sulfates **Region 9**

San Juan Creek

LOE ID:	75975	036535

Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 1 of 2 samples exceed the criterion for Sulfate.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Sulfate objective for the protection of aquatic life according to Table 3-2 for San Juan Creek within the San Juan Hydrologic Unit is 250 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]
Temporal Representation:	Data was collected on a single day 4/30/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID	**48978**	**Region 9**
San Juan Creek		

Pollutant:	**Temperature, water**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Two of the 16 samples exceeded the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Two of 16 samples exceeded the objective and this sample size is insufficient to determine, with the

power and confidence of the Listing Policy, the applicable beneficial use support rating 036536 minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 48978, Temperature, water **Region 9**

San Juan Creek

LOE ID:	75977
Pollutant:	Temperature, water
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	14
Number of Exceedances:	2
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Two of 14 samples exceeded the evaluation guideline.
Data Reference:	Data for Various Pollutants in San Mateo, San Juan and Cristianitos, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Board that such alteration in temperature does not adversely affect beneficial uses. At no time or place shall the temperature of any COLD water be increased more than 5Â°F above the natural receiving water temperature.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Inland Fishes of California (Moyle 1976) states that for rainbow trout the optimum range for growth and completion of most life stages is 13-21 degrees C (page 129).
Guideline Reference:	Inland Fishes of California
Spatial Representation:	Samples were collected from the SJ1 - San Juan 1and SJ2 - San Juan 2 stations.
Temporal Representation:	Samples were collected approximately once a month from April 2009 to February 2010.
Environmental Conditions:	
QAPP Information:	NPDES quality assurance.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 48978, Temperature, water **Region 9**

San Juan Creek

LOE ID:	75976
Pollutant:	Temperature, water
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	2

Number of Exceedances:	0	036537
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Water Temperature.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Board that such alteration in temperature does not adversely affect beneficial uses. At no time or place shall the temperature of any COLD water be increased more than 5Â°F above the natural receiving water temperature.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	Inland Fishes of California (Moyle 1976) states that for rainbow trout the optimum range for growth and completion of most life stages is 13-21 degrees C (page 129).	
Guideline Reference:	Inland Fishes of California	
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]	
Temporal Representation:	Data was collected on a single day 4/30/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID	**48982**	**Region 9**
San Juan Creek		

Pollutant:	**Total Dissolved Solids**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. One of the two samples exceeded the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of two samples exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2. 4. Pursuant to 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and

information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48982, Total Dissolved Solids **Region 9**

San Juan Creek

LOE ID:	75983
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 1 of 2 samples exceed the criterion for Dissolved Solids.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Dissolved Solids objective for the protection of aquatic life according to Table 3-2 for San Juan Creek within the San Juan Hydrologic Unit is 500 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]
Temporal Representation:	Data was collected on a single day 4/30/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 48982, Total Dissolved Solids **Region 9**

San Juan Creek

LOE ID:	75984
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 1 of 2 samples exceed the criterion for Dissolved Solids.

Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	036539
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Dissolved Solids objective for the protection of aquatic life according to Table 3-2 for San Juan Creek within the San Juan Hydrologic Unit is 500 mg/L.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]	
Temporal Representation:	Data was collected on a single day 4/30/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID 48986 Region 9

San Juan Creek

Pollutant:	**Turbidity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. The one sample did not exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. The one sample did not exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2. 4. Pursuant to 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48986, Turbidity Region 9

San Juan Creek

LOE ID:	75928	036540
Pollutant:	Turbidity	
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Cold Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Turbidity(NTU).	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Turbidity(NTU) objective for the protection of aquatic life according to Table 3-2 for San Juan Creek within the San Juan Hydrologic Unit is 20 NTU.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 1 monitoring site [San Juan Creek above La Novia Ave. - 901S06030]	
Temporal Representation:	Data was collected on a single day 4/30/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 48986, Turbidity **Region 9**

San Juan Creek

LOE ID:	75927
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Turbidity(NTU).
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Turbidity(NTU) objective for the protection of aquatic life according to Table 3-2 for San Juan Creek within the San Juan Hydrologic Unit is 20 NTU.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:
Guideline Reference:

Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 1 monitoring site [San Juan Creek above La Novia Ave. - 901S06030]
Temporal Representation:	Data was collected on a single day 4/30/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 48989 — Region 9
San Juan Creek

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Six lines of evidence are available in the administrative record to assess this pollutant. Zero of the 36 samples exceed the criterion. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 36 samples exceeded the criterion and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 48989, Zinc — Region 9
San Juan Creek

LOE ID:	75929
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING 036542
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for Zinc is 459 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 1 monitoring site [San Juan Creek 9 - 901SJSJC9]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the 2002 QAMP.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 48989, Zinc **Region 9**

San Juan Creek

LOE ID:	75934
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	34
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the 34 samples exceeded the hardness adjusted water quality objective for zinc.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition

Spatial Representation:	Samples were collected from San Juan Creek at Cold Spring (REF-CS), at Ortega Highway (SJC-74), at Camino Capistrano (SJC-CC), and at La Novia (SJNL01)
Temporal Representation:	Samples were collected from REF-CS and SJC-CC starting in September of 2006 and continuing twice per year (fall and spring) during 2007, 2008, and 2009. Samples were collected from SJC-74 in September of 2006, in May of 2007 and 2008, and in April of 2009. Samples were collected from SJNL01 starting in April 2007 until February of 2009.
Environmental Conditions:	Approximately 54 percent of the samples were collected after storm events.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 48989, Zinc **Region 9**

San Juan Creek

LOE ID:	75933
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Zinc.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Zinc to protect aquatic life in freshwater. The dissolved Zinc criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]
Temporal Representation:	Data was collected on a single day 4/30/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 48989, Zinc **Region 9**

San Juan Creek

LOE ID:	75932
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved

Beneficial Use:	Warm Freshwater Habitat	036544
Number of Samples:	2	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Zinc.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Zinc to protect aquatic life in freshwater. The dissolved Zinc criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]	
Temporal Representation:	Data was collected on a single day 4/30/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 48989, Zinc **Region 9**

San Juan Creek

LOE ID:	75931
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Zinc.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for zinc is 459 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31

Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]
Temporal Representation:	Data was collected on a single day 4/30/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 48989, Zinc **Region 9**

San Juan Creek

LOE ID:	75930
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Zinc.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for zinc is 459 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]
Temporal Representation:	Data was collected on a single day 4/30/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **33410** **Region 9**

San Juan Creek

Pollutant:	**pH**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the

Listing Policy. Under section 3.2 of the Policy, a minimum of one line of evidence is needed to assess listing status.

Six lines of evidence are available in the administrative record to assess this pollutant. One of 32 samples (fraction not reported) and zero of 15 (dissolved fraction) exceeded the water quality objective for warm fresh. One of eleven samples exceeds the water quality objective for agriculture. Guidelines were not exceeded for the cold freshwater or estuarine beneficial uses.

Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy..
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of 32 samples (fraction not reported) and this does not exceed the allowable frequency of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 33410, pH **Region 9**

San Juan Creek

LOE ID:	75967
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Estuarine Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Numeric data generated from 1 sample of pH data had no exceedences.
Data Reference:	Data for bacteria in various waterbodies, Feb. 2005-May 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In bays and estuaries the pH shall not be depressed below 7.0 nor raised above 9.0.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the San Juan Creek - estuary station.
Temporal Representation:	One sample was collected on 5/5/2007.
Environmental Conditions:	
QAPP Information:	NPDES quality assurance.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33410, pH **Region 9**

San Juan Creek

LOE ID:	75966	036547

Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	30
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	One of 30 samples exceeded the objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The pH of all inland surface waters shall not be depressed below 6.5 or raised above 8.5 as a result of waste discharges.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the REF-CS, SJC-74, SJC-CC, and SJNL01 stations.
Temporal Representation:	Samples were collected approximately once a month from September 2006 to April 2009.
Environmental Conditions:	
QAPP Information:	NPDES quality assurance.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33410, pH **Region 9**

San Juan Creek

LOE ID:	75965
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	15
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Numeric data generated from 15 averages of pH had no exceedences.
Data Reference:	Data for Various Pollutants in San Mateo, San Juan and Cristianitos, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The pH of all inland surface waters shall not be depressed below 6.5 or raised above 8.5 as a result of waste discharges.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the SJ1 - San Juan 1and SJ2 - San Juan 2 stations.
Temporal Representation:	Samples were collected approximately once a month from April 2009 to February 2010.
Environmental Conditions:	

QAPP Information:	NPDES quality assurance.	036548
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33410, pH **Region 9**

San Juan Creek

LOE ID:	75963
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for pH.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	In inland surface waters the pH shall not be depressed below 6.5 nor raised above 8.5.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]
Temporal Representation:	Data was collected on a single day 4/30/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 33410, pH **Region 9**

San Juan Creek

LOE ID:	3007
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Agricultural Supply
Number of Samples:	11
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the USDA Forest Service in 1998. One of 11 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for pH is 6.5 (minimum) and 8.5 (maximum).
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Juan Creek (San Juan/Hot Springs Drainage).
Temporal Representation:	Samples were collected 6 times on 06/26/1998 from 9:55am to 11:00am and 5 times on 10/30/1998 from 9:40am to 10:30am.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33410, pH **Region 9**

San Juan Creek

LOE ID:	75964
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for pH.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	In inland surface waters the pH shall not be depressed below 6.5 nor raised above 8.5.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]
Temporal Representation:	Data was collected on a single day 4/30/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **43761** **Region 9**

San Juan Creek

Pollutant:	**Benthic Community Effects**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Agriculture | Contaminated Sediments | Hydromodification | Illicit Connections/Illegal Hook-ups/Dry Weather Flows | Removal of Riparian Vegetation | Source Unknown | Unknown Nonpoint Source |

	Unknown Point Source | Urban Runoff/Storm Sewers	036550
Expected TMDL Completion Date:	2025	
Impairment from Pollutant or Pollution:	Pollutant	
Regional Board Conclusion:	Benthic Community Effects is being considered for placement on the CWA section 303(d) List under sections 3.9 and 3.1 of the Listing Policy. Under section 3.9, an additional line of evidence associating Benthic Community Effects with a water or sediment concentration of pollutant(s) is necessary to assess listing status. Based on the readily available data and information, the weight of evidence provides sufficient justification for placing Benthic Community Effects in this water segment on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Pursuant to section 3.9 of the Listing Policy, the water exhibits significant degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index. 4. Pursuant to section 3.9 of the Listing Policy, the water segment has associated pollutant(s) samples that exceed water quality objectives. 5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are being met.	
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant(s) contributes to or causes the problem.	

Line of Evidence (LOE) for Decision ID 43761, Benthic Community Effects **Region 9**

San Juan Creek

LOE ID:	75926
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate sediment toxicity. The sample exhibited significant toxicity. The toxicity test included survival and growth of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the

	control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted using the significant effect code: S equals significant, SG equals significantly greater and SL equals significantly lower. If a sample has any one of these codes, it will be considered an exceedance.
Guideline Reference:	
Spatial Representation:	The sample was collected at station 901SUP068.
Temporal Representation:	The sample was collected in January 2007.
Environmental Conditions:	
QAPP Information:	Data quality is good. Data results were recorded in the SWAMP database and followed SWAMP protocols.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43761, Benthic Community Effects **Region 9**

San Juan Creek

LOE ID:	75923
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	25
Number of Exceedances:	8
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Twenty-five samples were collected to test for toxicity. Eight of the 25 samples exhibited statistically and biologically significant toxicity. The toxicity tests that exhibited significant toxicity included Mysid biomass, Ceriodaphnia reproduction and Selenastrum growth.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control. Additionally, the biological significance of the sample was evaluted by determining whether the sample response was lower than the evaluation threshold.
Guideline Reference:	
Spatial Representation:	The sample was collected at stations REF-CS, SJC-74, SJC-CC, and SJNL01 San Juan Creek.
Temporal Representation:	The sample was collected from June 2006 to June 2010.
Environmental Conditions:	
QAPP Information:	The data collected under the Quality Assurance Management Plan for The Orange County Stormwater Program. The SWAMP measurement quality objectives were followed for toxicity data. The performance of toxicity bioassays and evaluation of reference toxicants were performed using USEPA and Standard Methods.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43761, Benthic Community Effects **Region 9**

San Juan Creek

LOE ID:	21401

Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	4
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Eight samples were collected at San Juan Creek station 901SJSJC5 and 901SJSJC9 from October2002 to May 2003, they showed significant toxicity levels (SL) in the following test: Selenastrum algae growth test - Four of eight samples were toxic. Ceriodaphnia dubia survival and reproduction: None of the samples were toxic. Hyalella azteca: One of six samples were toxic. Two additional tests were not valid.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold (EPA, 2002).
Guideline Reference:	Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms. Fourth Edition. Office of Water, U.S. Environmental Protection Agency. Washington, D.C. EPA-821-R-02-013
Spatial Representation:	Water Toxicity Samples were collected at San Juan Creek stations 901SJSJC5 and 901SJSJC9
Temporal Representation:	Water samples were collected on September 2002, November 2002, January 2003, April 2003, and May 2003.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43761, Benthic Community Effects **Region 9**

San Juan Creek

LOE ID:	9096
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	2
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Four water samples were collected at San Juan station 901SJSJC9 on October 2002, January 2003, April 2003, and May 2003. Two of the four samples showed excessive

	selenium concentrations according to results in California's Surface Water Ambient Monitoring Program.
Data Reference:	Orange County Stormwater Program. 2004-2007. Unified Annual Progress Reports. Program Effectiveness Assessment (San Diego Region)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	CTR Freshwater Chronic (CCC) 5 ug/L. (U.S. EPA, 2000).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Water samples were collected at San Juan Creek station (901SJSJC9).
Temporal Representation:	Samples for San Juan Creek were collected on October 2002, January 2003, April 2003, and May 2003.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43761, Benthic Community Effects **Region 9**

San Juan Creek

LOE ID:	26443
Pollutant:	Benthic Community Effects
LOE Subgroup:	Adverse Biological Responses
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	8
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Eight samples of IBI data were taken from September 1998 to 2007 at one sampling site. Of the total number of samples, all eight of the samples exceeded the IBI impairment threshold.
Data Reference:	Fish and Game IBI Data Southern California Postfire Study. Index of Biotic Integrity. 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. (SDRWQCB, 1995)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at one site: 901SJC74x on San Juan Creek.

Temporal Representation:	Sampling occurred during eight events over a ten year period from September 1998 to 2007.
Environmental Conditions:	
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Project Plan for the California Stream Bioassessment Procedure and the State of California, California Monitoring an Assessment Program: "CMAP", Quality Assurance Project Plan.
QAPP Information Reference(s):	State of California, California Monitoring and Assessment Program: "CMAP". Quality Assurance Project Plan for the California Stream Bioassessment Procedure The San Diego Stream Team Quality Assurance Project Plan

Line of Evidence (LOE) for Decision ID 43761, Benthic Community Effects **Region 9**

San Juan Creek

LOE ID:	3009
Pollutant:	DDE (Dichlorodiphenyldichloroethylene)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	2
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Two of 4 samples exceeded the CTR (SWAMP, 2004).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	San Diego RWQCB Basin Plan: No individual pesticide or combination of pesticides shall be present in the water column, sediments, or biota at concentration(s) that adversely affect beneficial uses. California Toxic Rule: Human Health-FW (water & organisms) .00059 Âµg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	California Toxic Rule: Human Health-FW (water & organisms) 0.00059 Âµg/L.
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	One station at San Juan Creek: 33.484429 -117.67577.
Temporal Representation:	Four samples collected from October 2002 through May of 2003.
Environmental Conditions:	San Juan Creek Watershed: 901.27.
QAPP Information:	SWAMP Quality Assurance Plan.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43761, Benthic Community Effects **Region 9**

San Juan Creek

LOE ID:	3008
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Not Specified
Fraction:	None
Beneficial Use:	Non-Contact Recreation
Number of Samples:	0

Number of Exceedances:	0	036555
Data and Information Type:	Benthic macroinvertebrate surveys	
Data Used to Assess Water Quality:	Data were collected for the San Diego Regional Water Quality Control Board 1999 Biological Assessment Annual Report. Physical habitat scores ranged from 106 to 125, relatively higher compared to other sampled waterbodies. BMI ranking scores were near average (1 below, one above, and one at) compared to other sampled waterbodies. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No objective.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at in San Juan Creek, 5 riffles upstream of Highway 74 (SJC-74). Lat/Long coordinates are N33E31' 9.0"/W117E37' 25.4".	
Temporal Representation:	Samples were collected in September and November 1998 and May 1999.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43761, Benthic Community Effects **Region 9**

San Juan Creek

LOE ID:	75948
Pollutant:	Mercury
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	6
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	All six samples exceeded the water quality objective for mercury.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	National Recommended Water Quality Criteria Continuous Concentrations (4-day average concentrations) for freshwater aquatic organisms exposure to elemental mercury is 0.77 ug/L.
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Samples were collected from San Juan Creek at Cold Spring (REF-CS), at Ortega Highway (SJC-74), at Camino Capistrano (SJC-CC), and at La Novia (SJNL01)
Temporal Representation:	Samples were collected from REF-CS and SJC-CC starting in September of 2006 and continuing twice per year (fall and spring) during 2007, 2008, and 2009. Samples were collected from SJC-74 in September of 2006, in May of 2007 and 2008, and in April of 2009. Samples were collected from SJNL01 starting in April 2007 until February of 2009.

Environmental Conditions:	Approximately 54 percent of the samples were collected after storm events 936556
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43761, Benthic Community Effects **Region 9**

San Juan Creek

LOE ID:	75944
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	20
Number of Exceedances:	1
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	One of 20 samples exceed the maximum (Instantaneous) concentration for Malathion in freshwater of 100 ng/L.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column,sediments or biota at concentration(s) that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The maximum (Instantaneous) concentration for Malathion in freshwater is 100 ng/L.
Guideline Reference:	Quality Criteria for Water. USEPA Office of Water and Hazardous Materials. Washington, D.C
Spatial Representation:	Samples were collected at San Juan Creek, sites REF-CS, SJC-74, SJCC-CC and SJNL01.
Temporal Representation:	Samples were collected from 2006 through 2009.
Environmental Conditions:	
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43761, Benthic Community Effects **Region 9**

San Juan Creek

LOE ID:	75884
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 1 of 2 samples exceed the criterion for Bifenthrin.

Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	036557
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Bifenthrin does not exceed 0.0006 ug/L.	
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.	
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]	
Temporal Representation:	Data was collected on a single day 4/30/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 43761, Benthic Community Effects **Region 9**

San Juan Creek

LOE ID:	75969
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 1 of 2 samples exceed the criterion for Selenium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The selenium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater is 0.005 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]
Temporal Representation:	Data was collected on a single day 4/30/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 43761, Benthic Community Effects **Region 9**

San Juan Creek

LOE ID:	75970
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	17
Number of Exceedances:	2
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Two of the 17 samples exceeded the water quality objective for selenium. Two of the reporting limits for non-detect samples were greater than the water quality objective for selenium and were not used in the assessment.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The CTR for selenium is 5.0 ug/L.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from San Juan Creek at Cold Spring (REF-CS), at Ortega Highway (SJC-74), at Camino Capistrano (SJC-CC), and at La Novia (SJNL01)
Temporal Representation:	Samples were collected from REF-CS and SJC-CC starting in September of 2006 and continuing twice per year (fall and spring) during 2007, 2008, and 2009. Samples were collected from SJC-74 in September of 2006, in May of 2007 and 2008, and in April of 2009. Samples were collected from SJNL01 starting in April 2007 until February of 2009.
Environmental Conditions:	Approximately 54 percent of the samples were collected after storm events.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43761, Benthic Community Effects **Region 9**

San Juan Creek

LOE ID:	75968
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 1 of 2 samples exceed the criterion for Selenium.

Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	036559
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	The selenium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater is 0.005 mg/L (California Toxics Rule, 2000).	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]	
Temporal Representation:	Data was collected on a single day 4/30/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 43761, Benthic Community Effects **Region 9**

San Juan Creek

LOE ID:	6814
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	12
Number of Exceedances:	10
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Ten of twelve flow-weighted event mean concentrations exceeded the water quality objective according to results in the Orange County Stormwater Program Annual Progress Reports from 2004-2007. Samples were collected during two to four storm events a year from 2002-2006.
Data Reference:	Orange County Stormwater Program. 2004-2007. Unified Annual Progress Reports, Program Effectiveness Assessment (San Diego Region)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses (RWQCB, 2007). The Water Quality Control Plan for the San Diego Basin (9) goal is 0.1 mg/L for phosphorus in streams and other flowing waters.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at the mass loading station at La Novia Avenue at 33.5020Â°, 117.6482Â°.
Temporal Representation:	Samples were collected during two to four storm events a year from 2002-2006.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43761, Benthic Community Effects **Region 9**

San Juan Creek

LOE ID:	80743
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	20
Number of Exceedances:	11
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Six stations on San Juan Creek were sampled twenty times. Eleven of the twenty samples were below the 0.79 threshold, and therefore exceeding the water quality objective for the aquatic life beneficial use. Six samples did not have scores calculated due to low organism counts.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009 RWB9 Status Sampling 2007 and 2008 Data for Various Waterbodies in Region 8 and Region 9, 2006-2009. Region 9 CSCI Scores & Water Body Information
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.
Guideline Reference:	The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.
Spatial Representation:	Samples were collected at the following stations: 901SJSJC9, SJC-CC, 901S06030, SJC-74, REF-CS, 901S00313
Temporal Representation:	Surveys done from 2006 to 2009.
Environmental Conditions:	
QAPP Information:	Data collected following SWAMP QA protocols for the County of Orange NPDES MS4 Copermittees Receiving Waters Monitoring and Reporting Program, the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan, and for the RWB9 Status Sampling 2007 and 2008 water quality monitoring project.
QAPP Information Reference(s):	RWB9 Stormwater Monitoring Council CY 2009 RWB9 Status Sampling 2007 and 2008 Quality Assurance Project Plan for the Orange County Stormwater Program.

Line of Evidence (LOE) for Decision ID 43761, Benthic Community Effects **Region 9**

San Juan Creek 036561

LOE ID:	75883
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 1 of 2 samples exceed the criterion for Bifenthrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Bifenthrin does not exceed 0.0006 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]
Temporal Representation:	Data was collected on a single day 4/30/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 43761, Benthic Community Effects **Region 9**

San Juan Creek

LOE ID:	75881
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Bifenthrin.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce

	detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for bifenthrin is the median lethal concentration (LC50) of 0.43 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 0.43 ug/g is the geometric mean of LC50 values for bifenthrin from Amweg et al. (2005) and Amweg and Weston (2007).
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5 Whole-sediment toxicity identification evaluation tools for pyrethroid insecticides: I. piperonyl butoxide addition. Environ. Toxicol. Chem. 26:2389-2396.
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 1 monitoring site [San Juan Creek @ La Novia - 901SUP068]
Temporal Representation:	Data was collected on a single day 1/7/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 43761, Benthic Community Effects **Region 9**

San Juan Creek

LOE ID:	75880
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	2
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Both of the IBI scores for this water body were below 40 which indicates that this water body may be considered to have impaired conditions.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at the following stations: 901S00313-San Juan Creek ~1mi above Lion Cyn. Cr. 901S06030-San Juan Creek above La Novia Ave.
Temporal Representation:	Surveys done April 30, 2009.
Environmental Conditions:	
QAPP Information:	Data collected following SWAMP QA protocols for the Southern California Stormwater Monitoring Coalition Project.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43761, Benthic Community Effects — Region 9

San Juan Creek

LOE ID:	75879
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	The IBI score for this water body was 13 which indicates that this water body may be considered to have impaired conditions.
Data Reference:	RWB9 Status Sampling 2007 and 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at the following station: 901SJSJC9-San Juan Creek 9.
Temporal Representation:	Surveys done May 5, 2008.
Environmental Conditions:	
QAPP Information:	Data collected following SWAMP QA protocols for the RWB9 Status Sampling 2007 and 2008 water quality monitoring project.
QAPP Information Reference(s):	

DECISION ID 49033 — Region 9

San Juan Creek

Pollutant:	**Oxygen, Dissolved**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2029
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Fourteen of the

forty samples exceed the OBJECTIVE. 036564

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Fourteen of forty samples exceed the OBJECTIVE and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 49033, Oxygen, Dissolved **Region 9**

San Juan Creek

LOE ID:	75957
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	15
Number of Exceedances:	8
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Eight of the 15 samples exceeded the Dissolved Oxygen objective.
Data Reference:	Data for Various Pollutants in San Mateo, San Juan and Cristianitos, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Dissolved oxygen levels shall not be less than 6.0 mg/l in inland surface waters with designated COLD beneficial uses. The annual mean dissolved oxygen concentration shall not be less than 7 mg/l more than 10% of the time.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the SJ1 - San Juan 1and SJ2 - San Juan 2 stations.
Temporal Representation:	Samples were collected approximately once a month from April 2009 to February 2010.
Environmental Conditions:	
QAPP Information:	NPDES quality assurance.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49033, Oxygen, Dissolved **Region 9**

San Juan Creek

LOE ID:	75958
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water

Matrix:	Water	036565
Fraction:	Dissolved	
Beneficial Use:	Cold Freshwater Habitat	
Number of Samples:	21	
Number of Exceedances:	4	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Four of 21 samples exceeded the objective.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Dissolved oxygen levels shall not be less than 6.0 mg/l in inland surface waters with designated COLD beneficial uses. The annual mean dissolved oxygen concentration shall not be less than 7 mg/l more than 10% of the time.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from the REF-CS, SJC-74, SJC-CC, and SJNL01 stations.	
Temporal Representation:	Samples were collected approximately thrice semi-annually from September 2006 to April 2009.	
Environmental Conditions:		
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 49033, Oxygen, Dissolved **Region 9**

San Juan Creek

LOE ID:	75956
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 1 of 2 samples exceed the criterion for Oxygen, Dissolved.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan, San Diego Basin, Cold Water Habitat Objective, Chapter III, General Objectives for all Inland Surface Waters, Enclosed Bays and Estuaries states the following: The dissolved oxygen concentration for cold water habitats shall not be reduced below 6.0 mg/l at any time.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]
Temporal Representation:	Data was collected on a single day 4/30/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 49033, Oxygen, Dissolved **Region 9**

San Juan Creek

LOE ID:	75955
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Oxygen, Dissolved.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan, San Diego Basin, Warm Water Habitat Objective, Chapter III, General Objectives for all Inland Surface Waters, Enclosed Bays and Estuaries states the following: The dissolved oxygen concentration for warm water habitats shall not be reduced below 5.0 mg/l at any time.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 2 monitoring sites [San Juan Creek ~1mi above Lion Cyn. Cr. - 901S00313, San Juan Creek above La Novia Ave. - 901S06030]
Temporal Representation:	Data was collected on a single day 4/30/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **43657** **Region 9**

San Juan Creek

Pollutant:	**Nitrogen**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2021
Impairment from Pollutant or	Pollutant

Pollution: 036567

Regional Board Conclusion: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Ten of the samples exceed the water quality objective for nitrogen.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Ten of 12 samples exceed the total nitrogen water quality objective and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43657, Nitrogen **Region 9**

San Juan Creek

LOE ID:	7759
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	12
Number of Exceedances:	10
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Ten of twelve flow-weighted event mean concentrations exceeded the water quality objective according to results in the Orange County Stormwater Program Annual Progress Report, 2004-2007. Samples were collected during two to four storm events a year from 2002-2006.
Data Reference:	Orange County Stormwater Program. 2004-2007. Unified Annual Progress Reports, Program Effectiveness Assessment (San Diego Region)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses (RWQCB, 2007). The Water Quality Control Plan for the San Diego Basin (9) states: Â“A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used.Â” Since the goal for total phosphorus is 0.1 mg/L, then according to the ratio provided, the goal for total nitrogen

is 1 mg/L. 036568

Objective/Criterion Reference: Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:

Guideline Reference: Water Quality Control Plan for the San Diego Basin

Spatial Representation: Samples were collected at the mass loading station at La Novia Avenue at 33.5020Â°, 117.6482Â°.

Temporal Representation: Samples were collected during two to four storm events a year from 2002-2006.

Environmental Conditions: Samples were collected during wet weather.

QAPP Information: QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.

QAPP Information Reference(s):

DECISION ID 32893 Region 9

San Juan Creek

Pollutant: **Phosphorus**

Final Listing Decision: **List on 303(d) list (TMDL required list)**

Last Listing Cycle's Final Listing Decision: List on 303(d) list (TMDL required list)(2012)

Revision Status Original

Sources: Source Unknown

Expected TMDL Completion Date: 2021

Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Ten of the samples exceed the water quality objective for phosphorus.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Ten of 23 samples exceeded the total phosphorus water quality objective and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32893, Phosphorus Region 9

San Juan Creek

LOE ID: 6814

Pollutant: Phosphorus

LOE Subgroup:	Pollutant-Water	036569
Matrix:	Water	
Fraction:	Total	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	12	
Number of Exceedances:	10	
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)	
Data Used to Assess Water Quality:	Ten of twelve flow-weighted event mean concentrations exceeded the water quality objective according to results in the Orange County Stormwater Program Annual Progress Reports from 2004-2007. Samples were collected during two to four storm events a year from 2002-2006.	
Data Reference:	Orange County Stormwater Program. 2004-2007. Unified Annual Progress Reports. Program Effectiveness Assessment (San Diego Region)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses (RWQCB, 2007). The Water Quality Control Plan for the San Diego Basin (9) goal is 0.1 mg/L for phosphorus in streams and other flowing waters.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:	Water Quality Control Plan for the San Diego Basin	
Spatial Representation:	Samples were collected at the mass loading station at La Novia Avenue at 33.5020Â°, 117.6482Â°.	
Temporal Representation:	Samples were collected during two to four storm events a year from 2002-2006.	
Environmental Conditions:	Samples were collected during wet weather.	
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 32893, Phosphorus **Region 9**

San Juan Creek

LOE ID:	3006
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Agricultural Supply
Number of Samples:	11
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the USDA Forest Service in 1998. Eleven samples were collected. All were at or below the standard of 0.1 mg/L. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters, streams, and other flowing waters and all beneficial uses, the WQO for total phosphorus is 0.1 mg/L. This appears to be the desired goal in order to prevent plant nuisance in streams and other flowing waters; not to

	be exceeded more than 10% of the time.	036570
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected in San Juan Creek (Hot Springs/San Juan Drainage).	
Temporal Representation:	Samples were collected 6 times on 06/26/1998 from 9:55am-11:00am and 5 times on 10/30/1998 from 9:40am to 10:30am.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Prima Deshecha Creek
Water Body ID: CAR9013000020010924090843
Water Body Type: River & Stream

DECISION ID 43494 **Region 9**
Prima Deshecha Creek

Pollutant: Nickel
Final Listing Decision: Delist from 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Reason for Delisting: Flaws in original listing
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for removal from the section 303(d) list under section 4.1 of the Listing Policy. Under section 4.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence is available in the administrative record to assess this pollutant. 3 of the 35 samples exceed the water quality objective for cadmium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List. This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3.
3. Three of 35 samples exceed the cadmium water quality objective and this exceeds the allowable frequency listed in Table 4.1 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 43494, Nickel **Region 9**
Prima Deshecha Creek

LOE ID: 7740

Pollutant: Nickel
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Dissolved

Beneficial Use: Warm Freshwater Habitat

Number of Samples: 8
Number of Exceedances: 3

Data and Information Type: Fixed station physical/chemical monitoring (conventional pollutants only)

Data Used to Assess Water Quality:	Three out of eight samples collected exceed the hardness adjusted Criterion Continuous Concentration for dissolved nickel according to results in the Orange County Stormwater Annual Progress Reports from 2002 through 2006. Samples were collected from December 2002 through March 2006.
Data Reference:	Orange County Stormwater Program. 2004-2007. Unified Annual Progress Reports, Program Effectiveness Assessment (San Diego Region)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the CTR, the dissolved nickel Criterion Continuous Concentration is 52 ppb and the Criterion Maximum Concentration is 470 ppb, but these criteria vary depending upon hardness of the sample (U.S. EPA, 2000).
Objective/Criterion Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the mass loading station in Prima Deschecha Creek at 33.44679Â°, 117.64448Â°.
Temporal Representation:	Samples were collected from December 2002 through March 2006.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43494, Nickel **Region 9**

Prima Deshecha Creek

LOE ID:	75495
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	27
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the 27 samples exceeded the hardness adjusted water quality criterion for nickel.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition

Spatial Representation:	Samples were collected from Prima Deshecha Channel at Calle Grande Vista from stations PD-CGV and PDCM01.
Temporal Representation:	The sample was collected from PD-CGV on 4/17/2007. Samples were collected from PDCM01 intermittently from November 2006 through February 2009.
Environmental Conditions:	The sample collected from PD-CGV is representative of dry weather conditions. The remaining 96% of the samples collected from PDCM01 were collected after storm events.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43494, Nickel **Region 9**

Prima Deshecha Creek

LOE ID:	75512
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	3
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Six samples were collected to test for toxicity. Three of the six samples exhibited statistically and biologically significant toxicity. The toxicity tests that exhibited significant toxicity included Purple Urchin fertilization and Mysid survival and biomass.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control. Additionally, the biological significance of the sample was evaluted by determining whether the sample response was lower than the evaluation threshold.
Guideline Reference:	
Spatial Representation:	The sample was collected at station PDCM01 Prima Deshecha Channel.
Temporal Representation:	The sample was collected from November 2006 to February 2009.
Environmental Conditions:	
QAPP Information:	The data collected under the Quality Assurance Management Plan for The Orange County Stormwater Program. The SWAMP measurement quality objectives were followed for toxicity data. The performance of toxicity bioassays and evaluation of reference toxicants were performed using USEPA and Standard Methods.
QAPP Information Reference(s):	

DECISION ID **36180** **Region 9**

Prima Deshecha Creek

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final	List on 303(d) list (TMDL required list)(2012)

Listing Decision:		036574
Revision Status	Revised	
Sources:	Source Unknown	
Expected TMDL Completion Date:	2021	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for removal from the section 303(d) list under section 4.1 of the Listing Policy. Under section 4.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence is available in the administrative record to assess this pollutant. 29 of the 35 samples exceed the water quality objective for cadmium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List. This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3.
3. 29 of 35 samples exceed the cadmium water quality objective and this exceeds the allowable frequency listed in Table 4.1 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 36180, Cadmium **Region 9**

Prima Deshecha Creek

LOE ID:	75482
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	9
Number of Exceedances:	4
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Four of the 9 samples exceeded the hardness adjusted water quality criterion for cadmium.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.

Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Prima Deshecha Channel at Calle Grande Vista from stations PD-CGV and PDCM01.
Temporal Representation:	The sample was collected from PD-CGV on 4/17/2007. Samples were collected from PDCM01 intermittently from November 2007 through February 2009.
Environmental Conditions:	The sample collected from PD-CGV is representative of dry weather conditions. The remaining 96% of the samples collected from PDCM01 were collected after storm events.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 36180, Cadmium **Region 9**

Prima Deshecha Creek

LOE ID:	7739
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	8
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Three out of eight samples collected exceed the hardness adjusted Criterion Maximum Concentration for dissolved cadmium. All eight of the samples collected exceed hardness adjusted Criterion Continuous Concentration for dissolved cadmium according to results in the Orange County Stormwater Progress Reports from 2002-2006.
Data Reference:	Orange County Stormwater Program. 2004-2007. Unified Annual Progress Reports, Program Effectiveness Assessment (San Diego Region)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the CTR, the dissolved cadmium Criterion Continuous Concentration is 2.2 ppb and the Criterion Maximum Concentration is 4.3 ppb, but these criteria may vary depending upon hardness of the sample (U.S. EPA, 2000).
Objective/Criterion Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the mass loading station in Prima Deschecha Creek at 33.44679Â°, 117.64448Â°.
Temporal Representation:	Samples were collected from December 2002 through March 2006.
Environmental Conditions:	Samples were collected during Wet Weather.
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 36180, Cadmium **Region 9**

Prima Deshecha Creek

LOE ID:	75512

Pollutant:	Toxicity	036576
LOE Subgroup:	Toxicity	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	6	
Number of Exceedances:	3	
Data and Information Type:	TOXICITY TESTING	
Data Used to Assess Water Quality:	Six samples were collected to test for toxicity. Three of the six samples exhibited statistically and biologically significant toxicity. The toxicity tests that exhibited significant toxicity included Purple Urchin fertilization and Mysid survival and biomass.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control. Additionally, the biological significance of the sample was evaluted by determining whether the sample response was lower than the evaluation threshold.	
Guideline Reference:		
Spatial Representation:	The sample was collected at station PDCM01 Prima Deshecha Channel.	
Temporal Representation:	The sample was collected from November 2006 to February 2009.	
Environmental Conditions:		
QAPP Information:	The data collected under the Quality Assurance Management Plan for The Orange County Stormwater Program. The SWAMP measurement quality objectives were followed for toxicity data. The performance of toxicity bioassays and evaluation of reference toxicants were performed using USEPA and Standard Methods.	
QAPP Information Reference(s):		

DECISION ID	**48500**	**Region 9**
Prima Deshecha Creek		

Pollutant:	**Ammonia**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. One of the seven samples exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.

2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.936577
3. One of seven samples exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48500, Ammonia **Region 9**

Prima Deshecha Creek

LOE ID:	75496
Pollutant:	Ammonia (Unionized)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	One of seven averaged samples exceeded the water quality objective for unionized ammonia. Samples were reported as as total ammonia as nitrogen and were converted to unionized ammonia as nitrogen before being compared with the objective. One averaged sample for 11/27/06 measured at 2.88 mg/L as total ammonia as nitrogen was not counted because it did not have corresponding pH and temperature data. The single exceedance was calculated at 1.18 mg/L as N for total ammonia at pH 8 and 14.66 degrees C which converts to 0.031 mg/L as N of unionized ammonia.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. The San Diego Basin Plan objective for unionized ammonia is 0.025 mg/L as N.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Calle Grande Vista.
Temporal Representation:	Samples were collected from April 2007 to February 2009.
Environmental Conditions:	
QAPP Information:	A signed QAPP was included with the stated goal of ensuring the consistent collection of accurate water quality information that will used to satisfy the objectives of the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID **48501** **Region 9**

Prima Deshecha Creek

Pollutant: **Arsenic**

Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	036578
Last Listing Cycle's Final Listing Decision:	New Decision	
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the 27 samples exceed the criterion.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 27 samples exceeded the criterion and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 48501, Arsenic **Region 9**

Prima Deshecha Creek

LOE ID:	75501
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	27
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the 27 samples exceeded the water quality criteria for arsenic.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The CTR for arsenic is 150 ug/L.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition

Spatial Representation:	Samples were collected from Prima Deshecha Channel at Calle Grande Vista from stations PD-CGV and PDCM01.
Temporal Representation:	The sample was collected from PD-CGV on 4/17/2007. Samples were collected from PDCM01 intermittently from November 2007 through February 2009.
Environmental Conditions:	The sample collected from PD-CGV is representative of dry weather conditions. The remaining 96% of the samples collected from PDCM01 were collected after storm events.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID 48504 — Region 9

Prima Deshecha Creek

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the 21 samples exceed the criterion. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 21 samples exceeded the criterion and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 48504, Chlorpyrifos — Region 9

Prima Deshecha Creek

LOE ID:	75484
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	21
Number of Exceedances:	0

Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only) 036580
Data Used to Assess Water Quality:	Twenty one samples did not exceed the continuous concentration (four day average) for chlorpyrifos in freshwater is 14.0 ng/L, However for four samples the reporting limit was greater than the evaluation guideline, therefore these data are not of sufficient resolution to determine if water quality standards are being achieved.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Criteria Continuous Concentration (four day average) for chlorpyrifos in freshwater is 14.0 ng/L.
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game
Spatial Representation:	Twenty five samples were collected at Prima Deshecha Creek, site PDCM01
Temporal Representation:	Samples were collected from 2006 through 2009.
Environmental Conditions:	According to the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010, samples were collected during the dry season and storm events.
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

DECISION ID	**48502**	**Region 9**
Prima Deshecha Creek		

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the 27 samples exceed the criterion. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 27 samples exceeded the criterion and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 48502, Chromium **Region 9**

Prima Deshecha Creek

LOE ID:	75485
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	27
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the 27 samples exceeded the hardness adjusted water quality criterion for chromium.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Prima Deshecha Channel at Calle Grande Vista from stations PD-CGV and PDCM01.
Temporal Representation:	The sample was collected from PD-CGV on 4/17/2007. Samples were collected from PDCM01 intermittently from November 2007 through February 2009.
Environmental Conditions:	The sample collected from PD-CGV is representative of dry weather conditions. The remaining 96% of the samples collected from PDCM01 were collected after storm events.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID **48503** **Region 9**

Prima Deshecha Creek

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the 27 samples exceed the criterion. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 27 samples exceeded the criterion and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 48503, Copper **Region 9**

Prima Deshecha Creek

LOE ID:	75486
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	27
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the 27 samples exceeded the hardness adjusted water quality criterion for copper.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Prima Deshecha Channel at Calle Grande Vista from stations PD-CGV and PDCM01.
Temporal Representation:	The sample was collected from PD-CGV on 4/17/2007. Samples were collected from

	PDCM01 intermittently from November 2007 through February 2009. 036583
Environmental Conditions:	The sample collected from PD-CGV is representative of dry weather conditions. The remaining 96% of the samples collected from PDCM01 were collected after storm events.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID 48505 Region 9

Prima Deshecha Creek

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the 25 samples exceed the criterion. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 25 samples exceeded the criterion and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 48505, Diazinon Region 9

Prima Deshecha Creek

LOE ID:	75487
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	25
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	None of twenty five samples exceed the continuous concentration for Diazinon criteria of 0.1 ug/L.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Twenty five samples were collected at Prima Deshecha Creek, site PDCM01
Temporal Representation:	Samples were collected from 2006 through 2009.
Environmental Conditions:	According to the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010, samples were collected during the dry season and storm events.
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

DECISION ID 48506 Region 9

Prima Deshecha Creek

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the 27 samples exceed the criterion. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 27 samples exceeded the criterion and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 48506, Lead Region 9

Prima Deshecha Creek

LOE ID: 75492

Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	27
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the 27 samples exceeded the hardness adjusted water quality criterion for lead.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Prima Deshecha Channel at Calle Grande Vista from stations PD-CGV and PDCM01.
Temporal Representation:	The sample was collected from PD-CGV on 4/17/2007. Samples were collected from PDCM01 intermittently from November 2007 through February 2009.
Environmental Conditions:	The sample collected from PD-CGV is representative of dry weather conditions. The remaining 96% of the samples collected from PDCM01 were collected after storm events.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID	**48508**	**Region 9**
Prima Deshecha Creek		

Pollutant:	**Mercury**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1, one line of evidence are necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the criteria for mercury. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section

303(d) List. 036586

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the one sample exceed the criteria for mercury and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to [SECTION 3.11/4.11] of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48508, Mercury **Region 9**

Prima Deshecha Creek

LOE ID:	75494
Pollutant:	Mercury
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Zero of one samples exceeded the water quality criteria for mercury.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	National Recommended Water Quality Criterion Continuous Concentrations (4-day average concentrations) for freshwater aquatic organisms exposure to elemental mercury is 0.77 ug/L.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Prima Deshecha Channel at PDCM01.
Temporal Representation:	Samples were collected from PDCM01 on November 4, 2008
Environmental Conditions:	The sample was collected in wet weather.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID **48512** **Region 9**

Prima Deshecha Creek

Pollutant: **Oxygen, Dissolved**

Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	036587
Last Listing Cycle's Final Listing Decision:	New Decision	
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line(s) of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the eight samples exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of eight samples exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48512, Oxygen, Dissolved **Region 9**

Prima Deshecha Creek

LOE ID:	75497
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Zero of 8 samples exceeded the objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The dissolved oxygen content of all surface waters designated as "Warm Freshwater Habitat" must be greater than 5.0 mg/L. The annual mean dissolved oxygen concentration shall not be less than 7 mg/l more than 10% of the time.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the PD-CGV and PDCM01 stations.
Temporal Representation:	Samples were collected approximately four times per semi-annual period from April 2007 to

February 2009. 036588

Environmental Conditions:

QAPP Information: Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.

QAPP Information Reference(s):

DECISION ID	48513	Region 9
Prima Deshecha Creek		

Pollutant:	**Selenium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the Zero samples exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of zero samples exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48513, Selenium	Region 9
Prima Deshecha Creek	

LOE ID:	75499
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	The reporting limits for all of the 27 non-detect samples exceeded the water quality criterion for selenium.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The CTR for selenium is 5.0 ug/L.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Prima Deshecha Channel at Calle Grande Vista from stations PD-CGV and PDCM01.
Temporal Representation:	The sample was collected from PD-CGV on 4/17/2007. Samples were collected from PDCM01 intermittently from November 2007 through February 2009.
Environmental Conditions:	The sample collected from PD-CGV is representative of dry weather conditions. The remaining 96% of the samples collected from PDCM01 were collected after storm events.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID **48509** **Region 9**

Prima Deshecha Creek

Pollutant:	**Silver**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the 27 samples exceed the criterion. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 27 samples exceeded the criterion and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 48509, Silver **Region 9**

Prima Deshecha Creek 036590

LOE ID:	75500
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	27
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the 27 samples exceeded the hardness adjusted water quality criterion for silver.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion maximum concentrations for silver to protect aquatic life in freshwater (1-hour average). The dissolved silver criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Prima Deshecha Channel at Calle Grande Vista from stations PD-CGV and PDCM01.
Temporal Representation:	The sample was collected from PD-CGV on 4/17/2007. Samples were collected from PDCM01 intermittently from November 2007 through February 2009.
Environmental Conditions:	The sample collected from PD-CGV is representative of dry weather conditions. The remaining 96% of the samples collected from PDCM01 were collected after storm events.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID **48510** **Region 9**

Prima Deshecha Creek

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the 27 samples exceed the criterion.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 27 samples exceeded the criterion and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 48510, Zinc **Region 9**

Prima Deshecha Creek

LOE ID:	75513
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	27
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the 27 samples exceeded the hardness adjusted water quality criterion for zinc.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Prima Deshecha Channel at Calle Grande Vista from stations PD-CGV and PDCM01.
Temporal Representation:	The sample was collected from PD-CGV on 4/17/2007. Samples were collected from PDCM01 intermittently from November 2007 through February 2009.
Environmental Conditions:	The sample collected from PD-CGV is representative of dry weather conditions. The remaining 96% of the samples collected from PDCM01 were collected after storm events.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.

QAPP Information Reference(s): 036592

DECISION ID	48511	Region 9
Prima Deshecha Creek		

Pollutant:	**pH**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line(s) of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. One of the 20 samples exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of 20 samples exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48511, pH	**Region 9**
Prima Deshecha Creek	

LOE ID:	75498
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	20
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Numeric data generated from 20 minimums and maximums of pH data had 1 exceedence.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The pH of all inland surface waters shall not be depressed below 6.5 or raised above 8.5 as a result of waste discharges.

Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	036593
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from the PD-CGV and PDCM01 stations.	
Temporal Representation:	Samples were collected approximately once a month from April 2007 to November 2009.	
Environmental Conditions:		
QAPP Information:	NPDES quality assurance.	
QAPP Information Reference(s):		

DECISION ID 48514 — Region 9

Prima Deshecha Creek

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2027
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.3 of the Listing Policy. Under section 3.3 a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. 14 of the 14 samples exceed the objective for enterococcus. 12 of 14 samples exceed the objective for fecal coliform.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. 14 of 14 and12 of 14samples exceed the objectives for indicator bacteria and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 48514, Indicator Bacteria — Region 9

Prima Deshecha Creek

LOE ID:	75491
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	The one geomean exceeded the fecal coliform objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean feal coliform concentration shall not exceed more than 200/100ml. Water Quality Control PLan for the San Diego Basin.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from site PDCM01, Prima Deshecha Channel at Calle Grande Vista.
Temporal Representation:	The samples were collected from April 2007 to February 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Mass Emissions Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 48514, Indicator Bacteria **Region 9**

Prima Deshecha Creek

LOE ID:	75490
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	14
Number of Exceedances:	12
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Twelve of the fourteen samples exceeded the fecal coliform objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample feal coliform concentration shall not exceed more than 400/100ml. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from site PDCM01, Prima Deshecha Channel at Calle Grande Vista.
Temporal Representation:	The samples were collected from April 2007 to February 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Mass Emissions Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 48514, Indicator Bacteria **Region 9**

Prima Deshecha Creek 036595

LOE ID:	75489
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	The one geomean exceeded the enterococcus objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean enterococcus concentration shall not exceed more than 33/100ml. Ambient Water Quality Criteria USEPA. Water Quality Control Plan for the San Diego Basin.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from site PDCM01, Prima Deshecha Channel at Calle Grande Vista.
Temporal Representation:	The samples were collected from April 2007 to February 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Mass Emissions Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 48514, Indicator Bacteria **Region 9**

Prima Deshecha Creek

LOE ID:	75488
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	14
Number of Exceedances:	14
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Fourteen of the fourteen samples exceeded the enterococcus objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample enterococcus concentration shall not exceed more than 61/100ml. Ambient Water Quality Criteria USEPA. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	The samples were collected from site PDCM01, Prima Deshecha Channel at Calle Grande Vista.
Temporal Representation:	The samples were collected from April 2007 to February 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Mass Emissions Monitoring Program.
QAPP Information Reference(s):	

DECISION ID 48507 **Region 9**

Prima Deshecha Creek

Pollutant:	**Malathion**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2027
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Six of the 25 samples exceed the evaluation guideline for malathion. Three of six samples exhibited toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Six of 25 samples exceeded the evaluation guideline for malathion, and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 48507, Malathion **Region 9**

Prima Deshecha Creek

LOE ID:	75493
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	25
Number of Exceedances:	6

Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Six of twenty five samples exceed the maximum (Instantaneous) concentration for Malathion in freshwater of 100 ng/L.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The maximum (Instantaneous) concentration for Malathion in freshwater is 100 ng/L.
Guideline Reference:	Quality Criteria for Water. USEPA Office of Water and Hazardous Materials. Washington, D.C
Spatial Representation:	Twenty five samples were collected at Prima Deshecha Creek, site PDCM01
Temporal Representation:	Samples were collected from 2006 through 2009.
Environmental Conditions:	According to the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010, samples were collected during the dry season and storm events.
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 48507, Malathion **Region 9**

Prima Deshecha Creek

LOE ID:	75512
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	3
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Six samples were collected to test for toxicity. Three of the six samples exhibited statistically and biologically significant toxicity. The toxicity tests that exhibited significant toxicity included Purple Urchin fertilization and Mysid survival and biomass.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control. Additionally, the biological significance of the sample was evaluted by determining whether the sample response was lower than the evaluation threshold.
Guideline Reference:	
Spatial Representation:	The sample was collected at station PDCM01 Prima Deshecha Channel.
Temporal Representation:	The sample was collected from November 2006 to February 2009.

Environmental Conditions:	036598
QAPP Information:	The data collected under the Quality Assurance Management Plan for The Orange County Stormwater Program. The SWAMP measurement quality objectives were followed for toxicity data. The performance of toxicity bioassays and evaluation of reference toxicants were performed using USEPA and Standard Methods.
QAPP Information Reference(s):	

DECISION ID **43927** **Region 9**

Prima Deshecha Creek

Pollutant:	**Nitrogen**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2023
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Eight of nine samples (collected in both dry and wet conditions) exceed the OBJECTIVE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Eight of nine samples (collected in both dry and wet conditions) exceed the OBJECTIVE and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 43927, Nitrogen **Region 9**

Prima Deshecha Creek

LOE ID:	7743
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	5
Number of Exceedances:	4
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)

Data Used to Assess Water Quality:	Four of five flow-weighted event mean concentrations exceeded the water quality objective according to results in the Orange County Stormwater Annual Progress Report from 2002 through 2006. Samples were collected from December 2002 through March 2006.
Data Reference:	Orange County Stormwater Program. 2004-2007. Unified Annual Progress Reports. Program Effectiveness Assessment (San Diego Region)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses (RWQCB, 2007). The Water Quality Control Plan for the San Diego Basin (9) states: Â“A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used.Â” Since the goal for total phosphorus is 0.1 mg/L, then according to the ratio provided, the goal for total nitrogen is 1 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at the mass loading station in Prima Deschecha Creek at 33.44679Â°, 117.64448Â°.
Temporal Representation:	Samples were collected from December 2002 through March 2006.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.
QAPP Information Reference(s):	

DECISION ID	33809	Region 9
Prima Deshecha Creek		

Pollutant:	**Phosphorus**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for removal from the section 303(d) list under section 4.1 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Fifty of samples exceeded the water quality objective for total phosphorus. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for removing this water segment-pollutant combination from the section 303(d) list. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.

3. Fifty of 59 samples exceeded the total phoshorus water quality objective and this does not exceed the allowable frequency listed in Table 4.1 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33809, Phosphorus **Region 9**

Prima Deshecha Creek

LOE ID:	7742
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	5
Number of Exceedances:	4
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Four of five flow-weighted event mean concentrations exceeded the water quality objective according to results in the Orange County Stormwater Annual Progress Reports from 2002 through 2006. Samples were collected from December 2002 through March 2006.
Data Reference:	Orange County Stormwater Program. 2004-2007. Unified Annual Progress Reports, Program Effectiveness Assessment (San Diego Region)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. The Water Quality Control Plan for the San Diego Basin (9) goal is 0.1 mg/L for phosphorus in streams and other flowing waters (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA
Spatial Representation:	Samples were collected at the mass loading station in Prima Deschecha Creek at 33.44679Â°, 117.64448Â°.
Temporal Representation:	Samples were collected from December 2002 through March 2006.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33809, Phosphorus **Region 9**

Prima Deshecha Creek

LOE ID:	3011
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water

Matrix:	Water	036601
Fraction:	Total	
Beneficial Use:	Agricultural Supply	
Number of Samples:	54	
Number of Exceedances:	46	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by Orange County in 1997-2000. Forty-six of 54 samples were in exceedance.	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters - streams and other flowing waters and all beneficial uses, the WQO for total phosphorus is 0.1 mg/L. This appears to be the desired goal in order to prevent plant nuisance in streams and other flowing waters; not to be exceeded more than 10% of the time.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:	Use unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board.	
Guideline Reference:	Placeholder reference 2006 303(d)	
Spatial Representation:	Samples were collected at Prima Deshecha Creek. Exact location was not reported.	
Temporal Representation:	Samples were collected 1-5 times per month from 07/02/1997 to 06/29/2000. At least 4 months per year were represented.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID **44624** **Region 9**

Prima Deshecha Creek

Pollutant:	**Turbidity**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for removal from the section 303(d) list under section 4.2 of the Listing Policy. Under section 4.2 a single line of evidence is necessary to assess delisting status.

One line of evidence is available in the administrative record to assess this pollutant. Forty of 54 samples exceed the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the section 303(d) list.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Forty of 54 samples were in exceedance of the turbidity water quality objective and this exceeds the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 44624, Turbidity **Region 9**

Prima Deshecha Creek

LOE ID:	3010
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Agricultural Supply
Number of Samples:	54
Number of Exceedances:	40
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by Orange County from 1997-2000. Forty of 54 samples were in exceedance. Turbidity concentrations ranged from 4.0 to 5400. There was no note of weather events to correspond with changing turbidity levels.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for turbidity is 20 NTU. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Prima Deshecha Channel.
Temporal Representation:	Samples were collected 1-5 times per month from 07/02/1997 to 06/29/2000. Data was reported for at least four months of each year.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Segunda Deshecha Creek
Water Body ID: CAR9013000020010924101553
Water Body Type: River & Stream

DECISION ID 44886 **Region 9**
Segunda Deshecha Creek

Pollutant: **Toxicity**
Final Listing Decision: **Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Sources: Source Unknown
Expected TMDL Completion Date: 2021
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for removal from the CWA section 303(d) List under section 4.1 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess pollutant. 15 of the 21 samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. 15 of the 21 samples exceed the criteria and this exceeds the allowable frequency listed in Table 4.1 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 44886, Toxicity **Region 9**
Segunda Deshecha Creek

LOE ID: 76738

Pollutant: Toxicity
LOE Subgroup: Toxicity
Matrix: Water
Fraction: None

Beneficial Use: Warm Freshwater Habitat

Number of Samples:	1	036604
Number of Exceedances:	0	
Data and Information Type:	TOXICITY TESTING	
Data Used to Assess Water Quality:	One sample was collected to evaluate water toxicity. The sample did not exhibit significant toxicity. The toxicity test included survival of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL, Significant compared to negative control based on statistical test, less than stated alpha level, AND less than the evaluation threshold (both criteria are met).	
Guideline Reference:		
Spatial Representation:	The sample was collected at station 901S00997.	
Temporal Representation:	The sample was collected in May 2009.	
Environmental Conditions:		
QAPP Information:	Data quality is good. Data results were recorded in the SWAMP database and followed SWAMP protocols.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44886, Toxicity **Region 9**

Segunda Deshecha Creek

LOE ID:	7768
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Selenastrum Algae Growth- None of the three samples exhibited NOECÂ's less than 100%. Ceriodaphnia dubia survival and reproduction, All four samples exhibited a NOECÂ's less than 100%. Hyalella azteca survival- None of the fours samples exhibited LC50Â's less than 100% according to results in the Orange County Storm Water Program Annual Progress Reports from 2002 through 2006. Samples were collected during two storm events a year from February 2004 through March 2006.
Data Reference:	Orange County Stormwater Program. 2004-2007. Unified Annual Progress Reports. Program Effectiveness Assessment (San Diego Region)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be sustain free from toxic substances in concentrations that are toxic to, or

that produce harmful physiological responses in human, plant, animal, or aquatic life.

Objective/Criterion Reference: Water Quality Control Plan for the San Diego Basin

Evaluation Guideline: Samples were found to exhibit toxicity when the No Observed Effect Concentration (NOEC) or median lethal concentration (LC50) for any given species was estimated to be less than 100% of the test sample concentration.

Guideline Reference: Water Quality Control Plan for the San Diego Basin

Spatial Representation: Samples were collected in Segunda Deshecha Creek upstream of Avenida Presidio.

Temporal Representation: Samples were collected during two storm events a year from February 2004 through March 2006.

Environmental Conditions: Samples were collected during wet weather.

QAPP Information: Quality control conducted according to the County of Oranges quality assurance plan.

QAPP Information Reference(s): County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44886, Toxicity **Region 9**

Segunda Deshecha Creek

LOE ID: 76737

Pollutant: Toxicity

LOE Subgroup: Toxicity

Matrix: Water

Fraction: None

Beneficial Use: Warm Freshwater Habitat

Number of Samples: 16

Number of Exceedances: 11

Data and Information Type: TOXICITY TESTING

Data Used to Assess Water Quality: Sixteen samples were collected to test for toxicity. Eleven of the 16 samples exhibited statistically and biologically significant toxicity. The toxicity tests that exhibited significant toxicity included Ceriodaphnia reproduction and survival, Hyallela biomass, Mysid survival and biomass and purple urchin development and fertilization.

Data Reference: Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life

Objective/Criterion Reference: Water Quality Control Plan for the San Diego Basin

Evaluation Guideline: Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control. Additionally, the biological significance of the sample is evaluated by determining whether the sample response is lower than the evaluation threshold.

Guideline Reference:

Spatial Representation: The sample was collected at stations SD-AP and SDCM02 Segunda Deshecha Channel.

Temporal Representation: The sample was collected from June 2006 to November 2009.

Environmental Conditions:

QAPP Information: The data collected under the Quality Assurance Management Plan for The Orange County Stormwater Program. The SWAMP measurement quality objectives were followed for toxicity data. The performance of toxicity bioassays and evaluation of reference toxicants were performed using USEPA and Standard Methods.

QAPP Information Reference(s): Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 34534 Region 9

Segunda Deshecha Creek 036606

Pollutant:	**Turbidity**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal from the CWA section 303(d) List under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of one samples exceed the objective. LOE 4733 is a placeholder to support a 303(d) listing decision made prior to 2006.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. The basis for this listing decision was made prior to 2006. The regional water board staff will update that information in a subsequent listing cycle.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 34534, Turbidity — Region 9

Segunda Deshecha Creek

LOE ID:	76739
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Segunda Deshecha Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Turbidity(NTU).
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The

	Turbidity(NTU) objective for the protection of aquatic life according to Table 3-2 for Segunda Deshecha Creek within the San Juan Hydrologic Unit is 20 NTU.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Segunda Deshecha Creek was collected at 1 monitoring site [Segunda Deshecha Canada above E Avenida Pico - 901S00997]
Temporal Representation:	Data was collected on a single day 5/14/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 34534, Turbidity **Region 9**

Segunda Deshecha Creek

LOE ID:	4733
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	Unspecified
Guideline Reference:	Placeholder reference pre-2006 303(d)
Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

DECISION ID **49503** **Region 9**

Segunda Deshecha Creek

Pollutant:	**Alkalinity as CaCO3**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of

the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. zero of one samples exceed the guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49503, Alkalinity as CaCO3 **Region 9**

Segunda Deshecha Creek

LOE ID:	76779
Pollutant:	Alkalinity as CaCO3
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Segunda Deshecha Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Alkalinity as CaCO3.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Alkalinity as CaCO3 criteria for the protection of freshwater aquatic life is 20000 ug/L (National Recommended Water Quality Criteria, 2009).
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for Segunda Deshecha Creek was collected at 1 monitoring site [Segunda Deshecha Canada above E Avenida Pico - 901S00997]
Temporal Representation:	Data was collected on a single day 5/14/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.

QAPP Information Reference(s): Surface Water Ambient Monitoring Program Quality Assurance Program R036609

DECISION ID	49426	Region 9
Segunda Deshecha Creek		

Pollutant:	**Aluminum**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence are available in the administrative record to assess this pollutant. The one sample did not exceed the guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. The one sample did not exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49426, Aluminum	**Region 9**
Segunda Deshecha Creek	

LOE ID:	76671
Pollutant:	Aluminum
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Segunda Deshecha Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Aluminum.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP

Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The National Recommended Water Quality Critiera for the protection of aquatic life from aluminum is the chronic continuous concentration (expressed as a 4-day average) of 87 ug/L.
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for Segunda Deshecha Creek was collected at 1 monitoring site [Segunda Deshecha Canada above E Avenida Pico - 901S00997]
Temporal Representation:	Data was collected on a single day 5/14/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 52002 Region 9

Segunda Deshecha Creek

Pollutant:	**Ammonia**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one sample exceed the criterion and zero of 13 samples exceeded the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the one sample exceed the criterion and zero of 13 samples exceeded the objective. The sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52002, Ammonia Region 9

Segunda Deshecha Creek

LOE ID:	76723

Pollutant:	Ammonia (Unionized)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	13
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Zero of 13 averaged samples exceeded the water quality objective for unionized ammonia. Samples were reported as as total ammonia as nitrogen and were converted to unionized ammonia as nitrogen before being compared with the objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. The San Diego Basin Plan objective for unionized ammonia is 0.025 mg/L as N.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Camino Real and Avenida Pico.
Temporal Representation:	Samples were collected from September 2006 to April 2009.
Environmental Conditions:	
QAPP Information:	A signed QAPP was included with the stated goal of ensuring the consistent collection of accurate water quality information that will used to satisfy the objectives of the Orange County Stormwater Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 52002, Ammonia **Region 9**

Segunda Deshecha Creek

LOE ID:	76672
Pollutant:	Nitrogen, ammonia (Total Ammonia)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Segunda Deshecha Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Ammonia as N, Total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	Aquatic Life Ambient Water Quality Criteria for Ammonia â€“ Freshwater (USEPA 2013): the 30-day rolling average concentration (criterion continuous concentration or CCC) of total ammonia nitrogen(in mg TAN/L) in freshwater are not to be exceeded more than once every three years on average. The CCC values are based on pH and temperature. The CCC formula is found on page 46 and the table of CCC values is on page 49.
Guideline Reference:	Aquatic Life Ambient Water Quality Criteria for Ammonia - Freshwater 2013
Spatial Representation:	Data for this line of evidence for Segunda Deshecha Creek was collected at 1 monitoring site [Segunda Deshecha Canada above E Avenida Pico - 901S00997]
Temporal Representation:	Data was collected on a single day 5/14/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 49427 — Region 9

Segunda Deshecha Creek

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Three lines of evidence are available in the administrative record to assess this pollutant. None of the samples exceeded the guideline or criterion. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 36 samples exceeded the guideline or criterion and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 49427, Arsenic — Region 9

Segunda Deshecha Creek

LOE ID:	76675
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	35
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the 35 samples exceeded the water quality objective for arsenic.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The CTR for arsenic is 150 ug/L.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Segunda Deshecha Channel at sites SDCM02 and SD-AP.
Temporal Representation:	Samples were collected from September 2006 through May of 2009.
Environmental Conditions:	Approximately 70% of the samples were collected after storm events.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49427, Arsenic **Region 9**

Segunda Deshecha Creek

LOE ID:	76674
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Segunda Deshecha Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The dissolved arsenic criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved arsenic is 0.150 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Segunda Deshecha Creek was collected at 1 monitoring

	site [Segunda Deshecha Canada above E Avenida Pico - 901S00997] 036614
Temporal Representation:	Data was collected on a single day 5/14/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 49427, Arsenic **Region 9**

Segunda Deshecha Creek

LOE ID:	76673
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Segunda Deshecha Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for arsenic is 33 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Segunda Deshecha Creek was collected at 1 monitoring site [Segunda Deshecha Canada above E Avenida Pico - 901S00997]
Temporal Representation:	Data was collected on a single day 5/14/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **49360** **Region 9**

Segunda Deshecha Creek

Pollutant:	**Bifenthrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. The one sample did not exceed the aquatic life guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. The one sample did not exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49360, Bifenthrin **Region 9**

Segunda Deshecha Creek

LOE ID:	76683
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Segunda Deshecha Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Bifenthrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Bifenthrin does not exceed 0.0006 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Segunda Deshecha Creek was collected at 1 monitoring site [Segunda Deshecha Canada above E Avenida Pico - 901S00997]
Temporal Representation:	Data was collected on a single day 5/14/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **49444** 036616 **Region 9**

Segunda Deshecha Creek

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 one of evidence are necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. One of one and one of 15 samples, respectively, exceed the respective water quality criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of one and one of 15 samples, respectively, exceed the water quality criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to [SECTION 3.11/4.11] of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49444, Cadmium **Region 9**

Segunda Deshecha Creek

LOE ID:	76685
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Segunda Deshecha Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved

	Cadmium to protect aquatic life in freshwater. The dissolved Cadmium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Segunda Deshecha Creek was collected at 1 monitoring site [Segunda Deshecha Canada above E Avenida Pico - 901S00997]
Temporal Representation:	Data was collected on a single day 5/14/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 49444, Cadmium **Region 9**

Segunda Deshecha Creek

LOE ID:	76686
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	14
Number of Exceedances:	1
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	One of the 14 samples exceeded the hardness adjusted water quality objective for cadmium. Samples collected within seven days were averaged. Pursuant to CTR recommendations, a hardness cap of 400 mg/L was used in conditions as appropriate. One sample at SD-AP exceeded the hardness adjusted CCC of 6.16 ug/L for dissolved Cd.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Segunda Deshecha Channel at sites SDCM02 (eight samples) and SD-AP (six samples).
Temporal Representation:	Samples were collected from September 2006 through May of 2009.
Environmental Conditions:	Approximately 70% of the samples were collected after storm events.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.

QAPP Information Reference(s): 036618

Line of Evidence (LOE) for Decision ID 49444, Cadmium **Region 9**

Segunda Deshecha Creek

LOE ID:	76684
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Segunda Deshecha Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Cadmium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for cadmium is 4.98 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Segunda Deshecha Creek was collected at 1 monitoring site [Segunda Deshecha Canada above E Avenida Pico - 901S00997]
Temporal Representation:	Data was collected on a single day 5/14/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **49507** **Region 9**

Segunda Deshecha Creek

Pollutant:	**Chloride**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. One of one samples exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of one samples exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49507, Chloride **Region 9**

Segunda Deshecha Creek

LOE ID:	76693
Pollutant:	Chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Segunda Deshecha Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Chloride.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Chloride objective for the protection of aquatic life according to Table 3-2 for Segunda Deshecha Creek within the San Juan Hydrologic Unit is 250 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Segunda Deshecha Creek was collected at 1 monitoring site [Segunda Deshecha Canada above E Avenida Pico - 901S00997]
Temporal Representation:	Data was collected on a single day 5/14/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **49447** **Region 9**

Segunda Deshecha Creek

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Three lines of evidence are available in the administrative record to assess this pollutant. None of the samples exceeded the guideline or criterion. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 36 samples exceeded the guideline or criterion and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 49447, Chromium **Region 9**

Segunda Deshecha Creek

LOE ID:	76694
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Segunda Deshecha Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for chromium is 111 mg/Kg dry weight (MacDonald et al.

	2000). 036621
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Segunda Deshecha Creek was collected at 1 monitoring site [Segunda Deshecha Canada above E Avenida Pico - 901S00997]
Temporal Representation:	Data was collected on a single day 5/14/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 49447, Chromium **Region 9**

Segunda Deshecha Creek

LOE ID:	76695
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Segunda Deshecha Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium. Since the chromium species was not identified, the data point(s) were assessed using both the Chromium III criteria which is hardness-dependent, and the criterion continuous concentration (4-day average) to protect aquatic life in freshwater for chromium VI which is 11 ug/L and is not hardness dependent.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Chromium to protect aquatic life in freshwater. The dissolved Chromium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Segunda Deshecha Creek was collected at 1 monitoring site [Segunda Deshecha Canada above E Avenida Pico - 901S00997]
Temporal Representation:	Data was collected on a single day 5/14/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 49447, Chromium **Region 9**

Segunda Deshecha Creek

LOE ID:	76696
Pollutant:	Chromium

LOE Subgroup:	Pollutant-Water	036622
Matrix:	Water	
Fraction:	Dissolved	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	35	
Number of Exceedances:	0	
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)	
Data Used to Assess Water Quality:	None of the 35 samples exceeded the hardness adjusted water quality objective for chromium.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.	
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Spatial Representation:	Samples were collected from Segunda Deshecha Channel at sites SDCM02 and SD-AP.	
Temporal Representation:	Samples were collected from September 2006 through May of 2009.	
Environmental Conditions:	Approximately 70% of the samples were collected after storm events.	
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.	
QAPP Information Reference(s):		

DECISION ID	**49449**	**Region 9**
Segunda Deshecha Creek		

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. For water samples, zero of 14 samples exceed the water quality criteria for the protection of aquatic life.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.

2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 936623
3. For water samples, zero of 14 samples exceed the water quality criteria for the protection of aquatic life and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 49449, Copper **Region 9**

Segunda Deshecha Creek

LOE ID:	76701
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Segunda Deshecha Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Copper to protect aquatic life in freshwater. The dissolved Copper criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Segunda Deshecha Creek was collected at 1 monitoring site [Segunda Deshecha Canada above E Avenida Pico - 901S00997]
Temporal Representation:	Data was collected on a single day 5/14/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 49449, Copper **Region 9**

Segunda Deshecha Creek

LOE ID:	76697
Pollutant:	Copper
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total

Beneficial Use:	Warm Freshwater Habitat	036624
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Segunda Deshecha Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for copper is 149 mg/Kg dry weight (MacDonald et al. 2000).	
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31	
Spatial Representation:	Data for this line of evidence for Segunda Deshecha Creek was collected at 1 monitoring site [Segunda Deshecha Canada above E Avenida Pico - 901S00997]	
Temporal Representation:	Data was collected on a single day 5/14/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 49449, Copper **Region 9**

Segunda Deshecha Creek

LOE ID:	76702
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	14
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Zero of 14 samples exceeded the hardness adjusted water quality objective for copper. Samples collected within 7 days were averaged. Pursuant to CTR recommendations, a hardness cap of 400 mg/L was used in conditions as appropriate.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness

	dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Segunda Deshecha Channel at sites SDCM02 (8 samples) and SD-AP (6 samples) .
Temporal Representation:	Samples were collected from September 2006 through May of 2009.
Environmental Conditions:	Approximately 70% of the samples were collected after storm events.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID 49364 Region 9

Segunda Deshecha Creek

Pollutant:	**Cyhalothrin, Lambda**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. The one sample did not exceed the aquatic life guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. The one sample did not exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49364, Cyhalothrin, Lambda Region 9

Segunda Deshecha Creek

LOE ID:	76704
Pollutant:	Cyhalothrin, Lambda
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total

Beneficial Use:	Warm Freshwater Habitat	036626
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Segunda Deshecha Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cyhalothrin, lambda, total.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Cyhalothrin, lambda, total does not exceed 0.0005 ug/L.	
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.	
Spatial Representation:	Data for this line of evidence for Segunda Deshecha Creek was collected at 1 monitoring site [Segunda Deshecha Canada above E Avenida Pico - 901S00997]	
Temporal Representation:	Data was collected on a single day 5/14/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID	**49366**	**Region 9**
Segunda Deshecha Creek		

Pollutant:	**Cypermethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. The one sample did not exceed the aquatic life guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. The one sample did not exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision	After review of the available data and information, RWQCB staff concludes that the water body-

Recommendation: pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49366, Cypermethrin **Region 9**

Segunda Deshecha Creek

LOE ID:	76705
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	One of one sample result was not used in the assessment because the laboratory data was non-detect and the method detection limit was above the guideline and therefore the results could not be quantified with the level of certainty required by the Listing Policy
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of cypermethrin does not exceed 0.0002 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Fojut et al. 2012)
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Segunda Deshecha Creek was collected at 1 monitoring site [Segunda Deshecha Canada above E Avenida Pico - 901S00997]
Temporal Representation:	Data was collected on a single day 5/14/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **49367** **Region 9**

Segunda Deshecha Creek

Pollutant:	**Deltamethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. The one sample did not exceed the aquatic life guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. The one sample did not exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49367, Deltamethrin **Region 9**

Segunda Deshecha Creek

LOE ID:	76706
Pollutant:	Deltamethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Segunda Deshecha Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Deltamethrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for Deltamethrin is the maximum acceptable toxicant concentration (MATC) of 0.02 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Segunda Deshecha Creek was collected at 1 monitoring site [Segunda Deshecha Canada above E Avenida Pico - 901S00997]
Temporal Representation:	Data was collected on a single day 5/14/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID	49563	036629 Region 9
Segunda Deshecha Creek		

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the 34 samples exceed the guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 34 samples exceeded the guideline and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 49563, Diazinon	**Region 9**
Segunda Deshecha Creek	

LOE ID:	72835
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	34
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	None of 34 samples exceed the continuous concentration for Diazinon criteria of 0.1 ug/L.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).

Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Twenty eight samples were collected at Segunda Deshecha Creek, Sites: SD-AP and SDCM02.
Temporal Representation:	Samples were collected from 2006 through 2009.
Environmental Conditions:	According to the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010, samples were collected during the dry season and storm events.
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	Quality Assurance Project Plan for the Orange County Stormwater Program.

DECISION ID 49368 Region 9

Segunda Deshecha Creek

Pollutant:	**Esfenvalerate/Fenvalerate**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. The one sample did not exceed the aquatic life guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. The one sample did not exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49368, Esfenvalerate/Fenvalerate Region 9

Segunda Deshecha Creek

LOE ID:	76709
Pollutant:	Esfenvalerate/Fenvalerate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total

Beneficial Use:	Warm Freshwater Habitat	036631
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Segunda Deshecha Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Esfenvalerate/Fenvalerate, total.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	According to the USEPA Office of Pesticide Programs Ecotoxicity database, the aquatic life EC50 for Esfenvalerate/Fenvalerate is 0.9 ug/L.	
Guideline Reference:	OPP Pesticide Ecotoxicity Database.	
Spatial Representation:	Data for this line of evidence for Segunda Deshecha Creek was collected at 1 monitoring site [Segunda Deshecha Canada above E Avenida Pico - 901S00997]	
Temporal Representation:	Data was collected on a single day 5/14/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID	**49369**	**Region 9**
Segunda Deshecha Creek		

Pollutant:	**Fenpropathrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. The one sample did not exceed the aquatic life guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. The one sample did not exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and

information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49369, Fenpropathrin **Region 9**

Segunda Deshecha Creek

LOE ID:	76712
Pollutant:	Fenpropathrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Segunda Deshecha Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Fenpropathrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for Fenpropathrin is the median lethal concentration (LC50; 2.2 ug/L).
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Segunda Deshecha Creek was collected at 1 monitoring site [Segunda Deshecha Canada above E Avenida Pico - 901S00997]
Temporal Representation:	Data was collected on a single day 5/14/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **49462** **Region 9**

Segunda Deshecha Creek

Pollutant:	**Iron**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceeds the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the criterion and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49462, Iron **Region 9**

Segunda Deshecha Creek

LOE ID:	76713
Pollutant:	Iron
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Segunda Deshecha Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Iron.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Iron objective for the protection of aquatic life according to Table 3-2 for Segunda Deshecha Creek within the San Juan Hydrologic Unit is 0.3 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Segunda Deshecha Creek was collected at 1 monitoring site [Segunda Deshecha Canada above E Avenida Pico - 901S00997]
Temporal Representation:	Data was collected on a single day 5/14/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **49451** **Region 9**

Segunda Deshecha Creek

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. None of the samples exceeded the guideline or criterion.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 36 samples exceeded the or criterion and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 49451, Lead **Region 9**

Segunda Deshecha Creek

LOE ID:	76716
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	35
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the 35 samples exceeded the hardness adjusted water quality objective for lead.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness

	dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Segunda Deshecha Channel at sites SDCM02 and SD-AP.
Temporal Representation:	Samples were collected from September 2006 through May of 2009.
Environmental Conditions:	Approximately 70% of the samples were collected after storm events.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49451, Lead **Region 9**

Segunda Deshecha Creek

LOE ID:	76715
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Segunda Deshecha Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Lead to protect aquatic life in freshwater. The dissolved Lead criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Segunda Deshecha Creek was collected at 1 monitoring site [Segunda Deshecha Canada above E Avenida Pico - 901S00997]
Temporal Representation:	Data was collected on a single day 5/14/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 49451, Lead **Region 9**

Segunda Deshecha Creek

LOE ID:	76714
Pollutant:	Lead
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment

Fraction:	Total	036636
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Segunda Deshecha Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for lead is 128 mg/Kg dry weight (MacDonald et al. 2000).	
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31	
Spatial Representation:	Data for this line of evidence for Segunda Deshecha Creek was collected at 1 monitoring site [Segunda Deshecha Canada above E Avenida Pico - 901S00997]	
Temporal Representation:	Data was collected on a single day 5/14/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID	49465	Region 9
Segunda Deshecha Creek		

Pollutant:	**Manganese**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceeds the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the criterion and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49465, Manganese **Region 9**

Segunda Deshecha Creek

LOE ID:	76718
Pollutant:	Manganese
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Segunda Deshecha Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Manganese.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Manganese objective for the protection of aquatic life according to Table 3-2 for Segunda Deshecha Creek within the San Juan Hydrologic Unit is 0.05 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Segunda Deshecha Creek was collected at 1 monitoring site [Segunda Deshecha Canada above E Avenida Pico - 901S00997]
Temporal Representation:	Data was collected on a single day 5/14/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **49468** **Region 9**

Segunda Deshecha Creek

Pollutant:	**Mercury**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Eighteen of the 19 samples exceed the criteria for mercury. In addition, 11 of 16 samples exhibit toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Eighteen of 19 samples exceed the criteria, and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 49468, Mercury **Region 9**

Segunda Deshecha Creek

LOE ID:	76719
Pollutant:	Mercury
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Zero of the one sample exceeded the water quality objective for mercury.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	National Recommended Water Quality Criteria Continuous Concentrations (4-day average concentrations) for freshwater aquatic organisms exposure to elemental mercury is 0.77 ug/L.
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Samples were collected from Station SDCM02.
Temporal Representation:	Samples were collected from on 11/04/2008
Environmental Conditions:	
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID **49454** **Region 9**

Segunda Deshecha Creek

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Of the water samples collected at the segment, zero of the 14 samples exceed the hardness adjusted CCC.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Of the water samples collected at the segment, zero of the 14 samples exceed the hardness adjusted CCC and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.

4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 49454, Nickel **Region 9**

Segunda Deshecha Creek

LOE ID:	76720
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Segunda Deshecha Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Nickel.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for

	sediment-dwelling organisms) for nickel is 48.6 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Segunda Deshecha Creek was collected at 1 monitoring site [Segunda Deshecha Canada above E Avenida Pico - 901S00997]
Temporal Representation:	Data was collected on a single day 5/14/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 49454, Nickel **Region 9**

Segunda Deshecha Creek

LOE ID:	76722
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	14
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Zero of the 14 samples exceeded the hardness adjusted water quality objective for nickel. Samples collected within seven days were averaged and compared with Hardness adjusted CCC.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Segunda Deshecha Channel at sites SDCM02 (8 samples) and SD-AP (six samples).
Temporal Representation:	Samples were collected from September 2006 through May of 2009.
Environmental Conditions:	Approximately 70% of the samples were collected after storm events.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49454, Nickel **Region 9**

Segunda Deshecha Creek

LOE ID:	76721

Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Segunda Deshecha Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Nickel to protect aquatic life in freshwater. The dissolved Nickel criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Segunda Deshecha Creek was collected at 1 monitoring site [Segunda Deshecha Canada above E Avenida Pico - 901S00997]
Temporal Representation:	Data was collected on a single day 5/14/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID	**49512**	**Region 9**
Segunda Deshecha Creek		

Pollutant:	**Oxygen, Dissolved**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. zero of 14 samples exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 14 samples exceeded the objective and this sample size is insufficient to determine, with the

power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49512, Oxygen, Dissolved **Region 9**

Segunda Deshecha Creek

LOE ID:	76724
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Segunda Deshecha Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Oxygen, Dissolved.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan, San Diego Basin, Warm Water Habitat Objective, Chapter III, General Objectives for all Inland Surface Waters, Enclosed Bays and Estuaries states the following: The dissolved oxygen concentration for warm water habitats shall not be reduced below 5.0 mg/l at any time.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Segunda Deshecha Creek was collected at 1 monitoring site [Segunda Deshecha Canada above E Avenida Pico - 901S00997]
Temporal Representation:	Data was collected on a single day 5/14/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 49512, Oxygen, Dissolved **Region 9**

Segunda Deshecha Creek

LOE ID:	76725
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	13
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Zero of 13 samples exceeded the objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Dissolved oxygen levels shall not be less than 5.0 mg/l in inland surface waters with designated MAR or WARM beneficial uses. The annual mean dissolved oxygen concentration shall not be less than 7 mg/l more than 10% of the time.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the SD-AP and SDCM02 stations.
Temporal Representation:	Samples were collected approximately thrice semi-annually from September 2006 to April 2009.
Environmental Conditions:	
QAPP Information:	NPDES quality assurance.
QAPP Information Reference(s):	

DECISION ID 49370 Region 9

Segunda Deshecha Creek

Pollutant:	**Permethrin, total**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. The one sample did not exceed the aquatic life guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. The one sample did not exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49370, Permethrin, total 036644 Region 9

Segunda Deshecha Creek

LOE ID:	76726
Pollutant:	Permethrin, total
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Segunda Deshecha Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Permethrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Permethrin does not exceed 0.002 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Segunda Deshecha Creek was collected at 1 monitoring site [Segunda Deshecha Canada above E Avenida Pico - 901S00997]
Temporal Representation:	Data was collected on a single day 5/14/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 49518 Region 9

Segunda Deshecha Creek

Pollutant:	**Sulfates**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. One of one samples exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of one samples exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49518, Sulfates **Region 9**

Segunda Deshecha Creek

LOE ID:	76733
Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Segunda Deshecha Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Sulfate.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Sulfate objective for the protection of aquatic life according to Table 3-2 for Segunda Deshecha Creek within the San Juan Hydrologic Unit is 250 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Segunda Deshecha Creek was collected at 1 monitoring site [Segunda Deshecha Canada above E Avenida Pico - 901S00997]
Temporal Representation:	Data was collected on a single day 5/14/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **49525** **Region 9**

Segunda Deshecha Creek

Pollutant:	**Total Dissolved Solids**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final	New Decision

Listing Decision:		036646
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. One of one samples exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of one samples exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49525, Total Dissolved Solids **Region 9**

Segunda Deshecha Creek

LOE ID:	76736
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Segunda Deshecha Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Dissolved Solids.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Dissolved Solids objective for the protection of aquatic life according to Table 3-2 for Segunda Deshecha Creek within the San Juan Hydrologic Unit is 500 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Data for this line of evidence for Segunda Deshecha Creek was collected at 1 monitoring site [Segunda Deshecha Canada above E Avenida Pico - 901S00997]
Temporal Representation:	Data was collected on a single day 5/14/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 49456 Region 9

Segunda Deshecha Creek

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Three lines of evidence are available in the administrative record to assess this pollutant. None of the samples exceeded the guideline or criterion. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 36 samples exceeded the criterion and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 49456, Zinc Region 9

Segunda Deshecha Creek

LOE ID:	76746
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Segunda Deshecha Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.

Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	036648
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Zinc to protect aquatic life in freshwater. The dissolved Zinc criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Segunda Deshecha Creek was collected at 1 monitoring site [Segunda Deshecha Canada above E Avenida Pico - 901S00997]	
Temporal Representation:	Data was collected on a single day 5/14/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 49456, Zinc **Region 9**

Segunda Deshecha Creek

LOE ID:	76745
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Segunda Deshecha Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for zinc is 459 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Segunda Deshecha Creek was collected at 1 monitoring site [Segunda Deshecha Canada above E Avenida Pico - 901S00997]
Temporal Representation:	Data was collected on a single day 5/14/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 49456, Zinc **Region 9**

Segunda Deshecha Creek 036649

LOE ID:	76747
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	35
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the 35 samples exceeded the hardness adjusted water quality objective for zinc.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Segunda Deshecha Channel at sites SDCM02 and SD-AP.
Temporal Representation:	Samples were collected from September 2006 through May of 2009.
Environmental Conditions:	Approximately 70% of the samples were collected after storm events.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID **49515** **Region 9**

Segunda Deshecha Creek

Pollutant:	**pH**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero samples exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section

303(d) List. 036650

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 27 samples exceeded the objective and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 49515, pH **Region 9**

Segunda Deshecha Creek

LOE ID:	76728
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	27
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Numeric data generated from 27 minimums and maximums of pH data had no exceedences.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The pH of all inland surface waters shall not be depressed below 6.5 or raised above 8.5 as a result of waste discharges.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the SD-AP and SDCM02 stations.
Temporal Representation:	Samples were collected approximately once a day for a wee week every semi-annual period from September 2006 to April 2009.
Environmental Conditions:	
QAPP Information:	NPDES quality assurance.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49515, pH **Region 9**

Segunda Deshecha Creek

LOE ID:	76727
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Warm Freshwater Habitat	036651
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Segunda Deshecha Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for pH.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	In inland surface waters the pH shall not be depressed below 6.5 nor raised above 8.5.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Segunda Deshecha Creek was collected at 1 monitoring site [Segunda Deshecha Canada above E Avenida Pico - 901S00997]	
Temporal Representation:	Data was collected on a single day 5/14/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID	51745	Region 9
Segunda Deshecha Creek		

Pollutant:	**Benthic Community Effects**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Benthic Community Effects is being considered for placement on the CWA section 303(d) List under sections 3.9 and 3.1 of the Listing Policy. Under section 3.9, an additional line of evidence associating Benthic Community Effects with a water or sediment concentration of pollutant(s) is necessary to assess listing status. Based on the readily available data and information, the weight of evidence provides sufficient justification for placing Benthic Community Effects in this water segment on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Pursuant to section 3.9 of the Listing Policy, the water exhibits significant degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index. 4. Pursuant to section 3.9 of the Listing Policy, the water segment has associated pollutant(s) samples that exceed water quality objectives. 5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are being met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality

standards are exceeded and a pollutant(s) contributes to or causes the problem. 036652

Line of Evidence (LOE) for Decision ID 51745, Benthic Community Effects **Region 9**

Segunda Deshecha Creek

LOE ID:	7768
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Selenastrum Algae Growth- None of the three samples exhibited NOECÂ's less than 100%. Ceriodaphnia dubia survival and reproduction, All four samples exhibited a NOECÂ's less than 100%. Hyalella azteca survival- None of the fours samples exhibited LC50Â's less than 100% according to results in the Orange County Storm Water Program Annual Progress Reports from 2002 through 2006. Samples were collected during two storm events a year from February 2004 through March 2006.
Data Reference:	Orange County Stormwater Program. 2004-2007. Unified Annual Progress Reports. Program Effectiveness Assessment (San Diego Region)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be sustain free from toxic substances in concentrations that are toxic to, or that produce harmful physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Samples were found to exhibit toxicity when the No Observed Effect Concentration (NOEC) or median lethal concentration (LC50) for any given species was estimated to be less than 100% of the test sample concentration.
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected in Segunda Deshecha Creek upstream of Avenida Presidio.
Temporal Representation:	Samples were collected during two storm events a year from February 2004 through March 2006.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	Quality control conducted according to the County of Oranges quality assurance plan.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual. February 2004

Line of Evidence (LOE) for Decision ID 51745, Benthic Community Effects **Region 9**

Segunda Deshecha Creek

LOE ID:	76693
Pollutant:	Chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	1	036653
Number of Exceedances:	1	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Segunda Deshecha Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Chloride.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Chloride objective for the protection of aquatic life according to Table 3-2 for Segunda Deshecha Creek within the San Juan Hydrologic Unit is 250 mg/L.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Segunda Deshecha Creek was collected at 1 monitoring site [Segunda Deshecha Canada above E Avenida Pico - 901S00997]	
Temporal Representation:	Data was collected on a single day 5/14/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 51745, Benthic Community Effects **Region 9**

Segunda Deshecha Creek

LOE ID:	80746
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	7
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Eight samples were taken at two stations in Segunda Descheca Creek. Seven samples had CSCI scores below the 0.79 threshold, and therefore exceed the water quality objective for the aquatic life beneficial use. One sample did not have a score calculated due to low organism counts.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009 Data for Various Waterbodies in Region 8 and Region 9, 2006-2009. Region 9 CSCI Scores & Water Body Information
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in

	a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.
Guideline Reference:	The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.
Spatial Representation:	Samples were collected at the following stations: 901S00997 and SD-AP
Temporal Representation:	Surveys done from 2006 to 2009.
Environmental Conditions:	
QAPP Information:	Data collected following SWAMP QA protocols for the Southern California Stormwater Monitoring Coalition Project and the the County of Orange NPDES MS4 Copermittees Receiving Waters Monitoring and Reporting Program.
QAPP Information Reference(s):	RWB9 Stormwater Monitoring Council CY 2009 Quality Assurance Project Plan for the Orange County Stormwater Program.

Line of Evidence (LOE) for Decision ID 51745, Benthic Community Effects **Region 9**

Segunda Deshecha Creek

LOE ID:	76737
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	16
Number of Exceedances:	11
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Sixteen samples were collected to test for toxicity. Eleven of the 16 samples exhibited statistically and biologically significant toxicity. The toxicity tests that exhibited significant toxicity included Ceriodaphnia reproduction and survival, Hyallela biomass, Mysid survival and biomass and purple urchin development and fertilization.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control. Additionally, the biological significance of the sample is evaluated by determining whether the sample response is lower than the evaluation threshold.
Guideline Reference:	
Spatial Representation:	The sample was collected at stations SD-AP and SDCM02 Segunda Deshecha Channel.
Temporal Representation:	The sample was collected from June 2006 to November 2009.
Environmental Conditions:	
QAPP Information:	The data collected under the Quality Assurance Management Plan for The Orange County Stormwater Program. The SWAMP measurement quality objectives were followed for toxicity data. The performance of toxicity bioassays and evaluation of reference toxicants were performed using USEPA and Standard Methods.

QAPP Information Reference(s): Surface Water Ambient Monitoring Program Quality Assurance Program Plan 036655

Line of Evidence (LOE) for Decision ID 51745, Benthic Community Effects **Region 9**

Segunda Deshecha Creek

LOE ID:	76736
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Segunda Deshecha Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Dissolved Solids.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Dissolved Solids objective for the protection of aquatic life according to Table 3-2 for Segunda Deshecha Creek within the San Juan Hydrologic Unit is 500 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Segunda Deshecha Creek was collected at 1 monitoring site [Segunda Deshecha Canada above E Avenida Pico - 901S00997]
Temporal Representation:	Data was collected on a single day 5/14/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51745, Benthic Community Effects **Region 9**

Segunda Deshecha Creek

LOE ID:	76733
Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Segunda Deshecha Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Sulfate.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009

SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Sulfate objective for the protection of aquatic life according to Table 3-2 for Segunda Deshecha Creek within the San Juan Hydrologic Unit is 250 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Segunda Deshecha Creek was collected at 1 monitoring site [Segunda Deshecha Canada above E Avenida Pico - 901S00997]
Temporal Representation:	Data was collected on a single day 5/14/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51745, Benthic Community Effects **Region 9**

Segunda Deshecha Creek

LOE ID:	76730
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	17
Number of Exceedances:	10
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Ten of the seventeen samples exceeded the water quality objective for selenium. Eighteen non-detect samples had reporting limits greater than the criteria and were not used in this assessment.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The CTR for selenium is 5.0 ug/L.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Segunda Deshecha Channel at sites SDCM02 and SD-AP.
Temporal Representation:	Samples were collected from September 2006 through May of 2009.
Environmental Conditions:	Approximately 70% of the samples were collected after storm events.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 51745, Benthic Community Effects **Region 9**

Segunda Deshecha Creek 036657

LOE ID:	76729
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Segunda Deshecha Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Selenium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The selenium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater is 0.005 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Segunda Deshecha Creek was collected at 1 monitoring site [Segunda Deshecha Canada above E Avenida Pico - 901S00997]
Temporal Representation:	Data was collected on a single day 5/14/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51745, Benthic Community Effects **Region 9**

Segunda Deshecha Creek

LOE ID:	76686
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	14
Number of Exceedances:	1
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	One of the 14 samples exceeded the hardness adjusted water quality objective for cadmium. Samples collected within seven days were averaged. Pursuant to CTR recommendations, a hardness cap of 400 mg/L was used in conditions as appropriate. One sample at SD-AP exceeded the hardness adjusted CCC of 6.16 ug/L for dissolved Cd.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or

	that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Segunda Deshecha Channel at sites SDCM02 (eight samples) and SD-AP (six samples).
Temporal Representation:	Samples were collected from September 2006 through May of 2009.
Environmental Conditions:	Approximately 70% of the samples were collected after storm events.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 51745, Benthic Community Effects **Region 9**

Segunda Deshecha Creek

LOE ID:	76684
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Segunda Deshecha Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Cadmium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for cadmium is 4.98 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Segunda Deshecha Creek was collected at 1 monitoring site [Segunda Deshecha Canada above E Avenida Pico - 901S00997]
Temporal Representation:	Data was collected on a single day 5/14/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51745, Benthic Community Effects **Region 9**

Segunda Deshecha Creek

LOE ID:	76682
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	The IBI score for this water body was below 40 which indicates that this water body may be considered to have impaired conditions.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at the following station: 901S00997-Segunda Deshecha Canada above E Avenida Pico
Temporal Representation:	Surveys done May 14, 2009.
Environmental Conditions:	
QAPP Information:	Data collected following SWAMP QA protocols for the Southern California Stormwater Monitoring Coalition Project.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 51745, Benthic Community Effects **Region 9**

Segunda Deshecha Creek

LOE ID:	76720
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Segunda Deshecha Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for

	Nickel.	036660
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for nickel is 48.6 mg/Kg dry weight (MacDonald et al. 2000).	
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31	
Spatial Representation:	Data for this line of evidence for Segunda Deshecha Creek was collected at 1 monitoring site [Segunda Deshecha Canada above E Avenida Pico - 901S00997]	
Temporal Representation:	Data was collected on a single day 5/14/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 51745, Benthic Community Effects **Region 9**

Segunda Deshecha Creek

LOE ID:	76719
Pollutant:	Mercury
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Zero of the one sample exceeded the water quality objective for mercury.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	National Recommended Water Quality Criteria Continuous Concentrations (4-day average concentrations) for freshwater aquatic organisms exposure to elemental mercury is 0.77 ug/L.
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Samples were collected from Station SDCM02.
Temporal Representation:	Samples were collected from on 11/04/2008
Environmental Conditions:	
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 51745, Benthic Community Effects **Region 9**

Segunda Deshecha Creek 036661

LOE ID:	76717
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	13
Number of Exceedances:	3
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Three of 13 samples exceed the maximum (Instantaneous) concentration for Malathion in freshwater of 100 ng/L. Data collected within seven days were averaged.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The maximum (Instantaneous) concentration for Malathion in freshwater is 100 ng/L.
Guideline Reference:	Quality Criteria for Water. USEPA Office of Water and Hazardous Materials. Washington, D.C
Spatial Representation:	Thirty-three samples were collected at Segunda Deshecha Creek, sites: SD-AP and SDCM02
Temporal Representation:	Samples were collected from 2006 through 2009.
Environmental Conditions:	According to the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010, samples were collected during the dry season and storm events.
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 51745, Benthic Community Effects **Region 9**

Segunda Deshecha Creek

LOE ID:	72796
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	6
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Six out of the six samples collected had an IBI score below 40. The scores were, fall 2006: 14.3, spring 2007: 14.3, fall 2007: 17.2, spring 2008: 17.2, fall 2008: 14.3, spring 2009: 14.3.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the State or Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	Development of a Benthic Index of Biotic Integrity (B-IBI) for Wadeable Streams in Northern Coastal California and its Application to Regional 305(b) Assessment
Spatial Representation:	Samples were collected at station SD-AP, Segunda Deshecha Channel near Avenida Pico.
Temporal Representation:	The samples were collected in the fall 2006, and the spring and fall of 2007 and 2008 and in the spring of 2009.
Environmental Conditions:	
QAPP Information:	The taxonomic analysis followed the guidelines of the Southern California Freshwater and Marine Invertebrate Taxonomic Associations (SAFIT, SCAMIT). All stream bioassessment sample collection and taxonomic analysis follow the Southern California Regional
QAPP Information Reference(s):	Quality Assurance Project Plan for the Orange County Stormwater Program.

Line of Evidence (LOE) for Decision ID 51745, Benthic Community Effects **Region 9**

Segunda Deshecha Creek

LOE ID:	76722
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	14
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Zero of the 14 samples exceeded the hardness adjusted water quality objective for nickel. Samples collected within seven days were averaged and compared with Hardness adjusted CCC.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition

Spatial Representation:	Samples were collected from Segunda Deshecha Channel at sites SDCM02 (8 samples) and SD-AP (six samples).
Temporal Representation:	Samples were collected from September 2006 through May of 2009.
Environmental Conditions:	Approximately 70% of the samples were collected after storm events.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 51745, Benthic Community Effects **Region 9**

Segunda Deshecha Creek

LOE ID:	7763
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	3
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Three of four flow-weighted event mean concentrations exceeded the water quality objective according to results in the Orange County Annual Progress Reports from 2002 through 2006. Samples were collected during two storm events a year from February 2004 through March 2006.
Data Reference:	Orange County Stormwater Program. 2004-2007. Unified Annual Progress Reports, Program Effectiveness Assessment (San Diego Region)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses (RWQCB, 2007). The Water Quality Control Plan for the San Diego Basin (9) states: Â“A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used.Â” Since the goal for total phosphorus is 0.1 mg/L, then according to the ratio provided, the goal for total nitrogen is 1 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at the mass loading station in Segunda Deschecha Creek at 33.43338Â°, 117.63154Â°.
Temporal Representation:	Samples were collected during two storm events a year from February 2004 through March 2006.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 51745, Benthic Community Effects **Region 9**

Segunda Deshecha Creek 036664

LOE ID:	7762
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	3
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Three of four flow-weighted event mean concentrations exceeded the water quality objective according to results in the Orange County Stormwater Annual Progress reports from 2002 through 2006. Samples were collected during two storm events a year from February 2004 through March 2006.
Data Reference:	Orange County Stormwater Program. 2004-2007. Unified Annual Progress Reports. Program Effectiveness Assessment (San Diego Region)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses (RWQCB, 2007). The Water Quality Control Plan for the San Diego Basin (9) has a goal of 0.1 mg/L for phosphorus in streams and other flowing waters.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at the mass loading station in Segunda Deschecha Creek at 33.43338Â°, 117.63154Â°.
Temporal Representation:	Samples were collected during two storm events a year from February 2004 through March 2006.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 51745, Benthic Community Effects **Region 9**

Segunda Deshecha Creek

LOE ID:	76702
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	14
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Zero of 14 samples exceeded the hardness adjusted water quality objective for copper. Samples collected within 7 days were averaged. Pursuant to CTR recommendations, a hardness cap of 400 mg/L was used in conditions as appropriate.

Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	036665
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.	
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Spatial Representation:	Samples were collected from Segunda Deshecha Channel at sites SDCM02 (8 samples) and SD-AP (6 samples) .	
Temporal Representation:	Samples were collected from September 2006 through May of 2009.	
Environmental Conditions:	Approximately 70% of the samples were collected after storm events.	
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.	
QAPP Information Reference(s):		

DECISION ID	51713	Region 9
Segunda Deshecha Creek		

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2027
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.3 of the Listing Policy. Under section 3.3 a single line of evidence is necessary to assess listing status.

Eight lines of evidence are available in the administrative record to assess this pollutant.
Enterococcus
74 of 163 samples exceed the single sample objective for water contact recreation.
103 of 136 samples exceed the geometric mean objective for water contact recreation.
Fecal coliform
25 of 163 samples exceed the single sample objective for water contact recreation.
19 of 136 samples exceed the geometric mean objective for water contact recreation.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Samples and exceedences are as follows:
Enterococcus

74 of 163 samples exceed the single sample objective for water contact recreation. 036666
103 of 136 samples exceed the geometric mean objective for water contact recreation.
Fecal coliform
25 of 163 samples exceed the single sample objective for water contact recreation.
19 of 136 samples exceed the geometric mean objective for water contact recreation.

The enterococcus geomean and single samples exceed the allowable frequency listed in Table 3.2 of the Listing Policy. The fecal and total coliform samples do not exceed the allowable frequency in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 51713, Indicator Bacteria **Region 9**

Segunda Deshecha Creek

LOE ID:	76711
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	16
Number of Exceedances:	13
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Thirteen of the sixteen samples exceeded the fecal coliform objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample fecal coliform concentration shall not exceed more than 400/100ml. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from site SDCM02, Segunda Deshecha Channel at El Camino Real.
Temporal Representation:	The samples were collected from November 2006 to February 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Mass Emissions Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 51713, Indicator Bacteria **Region 9**

Segunda Deshecha Creek

LOE ID:	72804
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	036667
Beneficial Use:	Water Contact Recreation	
Number of Samples:	134	
Number of Exceedances:	17	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Seventeen of the 134 geomeans exceeded the fecal coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The geometric mean for fecal coliform shall not exceed more than 200/100ml. Water Quality Control Plan for the San Diego Basin.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected from Segunda Deshecha Channel outlet (surfzone upcoast and surfzone downcoast).	
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.	
Environmental Conditions:		
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.	
QAPP Information Reference(s):	Quality Assurance Project Plan for the Orange County Stormwater Program.	

Line of Evidence (LOE) for Decision ID 51713, Indicator Bacteria **Region 9**

Segunda Deshecha Creek

LOE ID:	72805
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	134
Number of Exceedances:	101
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	One hundred one of the 134 geomeans exceeded the enterococcus objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean for enterococcus shall not exceed 35 MPN/100 mL. Water Quality Control Plan for the San Diego Basin.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Segunda Deshecha Channel outlet (surfzone upcoast and

	surfzone downcoast). 036668
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	Quality Assurance Project Plan for the Orange County Stormwater Program.

Line of Evidence (LOE) for Decision ID 51713, Indicator Bacteria **Region 9**

Segunda Deshecha Creek

LOE ID:	76710
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2
Number of Exceedances:	2
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Two of the two geometric means exceeded the fecal coliform objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: The fecal coliform concentration shall not exceed more than 200/100ml. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from site SDCM02, Segunda Deshecha Channel at El Camino Real.
Temporal Representation:	The samples were collected from November 2006 to February 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Mass Emissions Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 51713, Indicator Bacteria **Region 9**

Segunda Deshecha Creek

LOE ID:	76708
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	16
Number of Exceedances:	16
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Sixteen of the sixteen samples exceeded the enterococcus objective.

Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009. 036669
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample enterococcus concentration shall not exceed more than 61/100ml. Region 9 Basin Plan. Ambient Water Quality Criteria USEPA.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from site SDCM02, Segunda Deshecha Channel at El Camino Real.
Temporal Representation:	The samples were collected from November 2006 to February 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Mass Emissions Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 51713, Indicator Bacteria **Region 9**

Segunda Deshecha Creek

LOE ID:	76707
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2
Number of Exceedances:	2
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Two of the two geometric means exceeded the enterococcus objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: The enterococcus concentration shall not exceed more than 33/100ml. Water Quality Control Plan for the San Diego Basin.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Ambient Water Quality Criteria for Bacteria - 1986. EPA440/5-84-002
Spatial Representation:	The samples were collected from site SDCM02, Segunda Deshecha Channel at El Camino Real.
Temporal Representation:	The samples were collected from November 2006 to February 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Mass Emissions Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 51713, Indicator Bacteria **Region 9**

Segunda Deshecha Creek

LOE ID:	72819
Pollutant:	Enterococcus

LOE Subgroup:	Pollutant-Water	036670
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	147	
Number of Exceedances:	58	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Fifty-eight of the 147 samples exceeded the enterococcus objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The single sample enterococcus concentration shall not exceed more than 104/100ml. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected from Segunda Deshecha Channel outlet at Avenida Estacion (surfzone upcoast and surfzone downcoast).	
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.	
Environmental Conditions:		
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.	
QAPP Information Reference(s):	Quality Assurance Project Plan for the Orange County Stormwater Program.	

Line of Evidence (LOE) for Decision ID 51713, Indicator Bacteria **Region 9**

Segunda Deshecha Creek

LOE ID:	72818
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	147
Number of Exceedances:	12
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Twewlve of the 147 samples exceeded the fecal coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample fecal coliform concentration shall not exceed more than 400/100ml. Region 9 Basion Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	

Guideline Reference:	036671
Spatial Representation:	The samples were collected from Segunda Deshecha Channel outlet at Avenida Estacion (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	Quality Assurance Project Plan for the Orange County Stormwater Program.

DECISION ID 49566 Region 9

Segunda Deshecha Creek

Pollutant:	**Malathion**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2027
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Three lines of evidence are available in the administrative record to assess this pollutant. Three of the 7 samples exceed the criteria for malathion. In addition, 11 of 16 samples exhibited toxicity. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Three of 7 samples exceed the criteria, and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 49566, Malathion Region 9

Segunda Deshecha Creek

LOE ID:	76738
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	1	036672
Number of Exceedances:	0	
Data and Information Type:	TOXICITY TESTING	
Data Used to Assess Water Quality:	One sample was collected to evaluate water toxicity. The sample did not exhibit significant toxicity. The toxicity test included survival of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL, Significant compared to negative control based on statistical test, less than stated alpha level, AND less than the evaluation threshold (both criteria are met).	
Guideline Reference:		
Spatial Representation:	The sample was collected at station 901S00997.	
Temporal Representation:	The sample was collected in May 2009.	
Environmental Conditions:		
QAPP Information:	Data quality is good. Data results were recorded in the SWAMP database and followed SWAMP protocols.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 49566, Malathion **Region 9**

Segunda Deshecha Creek

LOE ID:	7768
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Selenastrum Algae Growth- None of the three samples exhibited NOECÂ's less than 100%. Ceriodaphnia dubia survival and reproduction, All four samples exhibited a NOECÂ's less than 100%. Hyalella azteca survival- None of the fours samples exhibited LC50Â's less than 100% according to results in the Orange County Storm Water Program Annual Progress Reports from 2002 through 2006. Samples were collected during two storm events a year from February 2004 through March 2006.
Data Reference:	Orange County Stormwater Program. 2004-2007. Unified Annual Progress Reports. Program Effectiveness Assessment (San Diego Region)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be sustain free from toxic substances in concentrations that are toxic to, or

	that produce harmful physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Samples were found to exhibit toxicity when the No Observed Effect Concentration (NOEC) or median lethal concentration (LC50) for any given species was estimated to be less than 100% of the test sample concentration.
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected in Segunda Deshecha Creek upstream of Avenida Presidio.
Temporal Representation:	Samples were collected during two storm events a year from February 2004 through March 2006.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	Quality control conducted according to the County of Oranges quality assurance plan.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 49566, Malathion **Region 9**

Segunda Deshecha Creek

LOE ID:	76737
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	16
Number of Exceedances:	11
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Sixteen samples were collected to test for toxicity. Eleven of the 16 samples exhibited statistically and biologically significant toxicity. The toxicity tests that exhibited significant toxicity included Ceriodaphnia reproduction and survival, Hyallela biomass, Mysid survival and biomass and purple urchin development and fertilization.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control. Additionally, the biological significance of the sample is evaluated by determining whether the sample response is lower than the evaluation threshold.
Guideline Reference:	
Spatial Representation:	The sample was collected at stations SD-AP and SDCM02 Segunda Deshecha Channel.
Temporal Representation:	The sample was collected from June 2006 to November 2009.
Environmental Conditions:	
QAPP Information:	The data collected under the Quality Assurance Management Plan for The Orange County Stormwater Program. The SWAMP measurement quality objectives were followed for toxicity data. The performance of toxicity bioassays and evaluation of reference toxicants were performed using USEPA and Standard Methods.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 49566, Malathion **Region 9**

Segunda Deshecha Creek

LOE ID:	76717
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	13
Number of Exceedances:	3
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Three of 13 samples exceed the maximum (Instantaneous) concentration for Malathion in freshwater of 100 ng/L. Data collected within seven days were averaged.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The maximum (Instantaneous) concentration for Malathion in freshwater is 100 ng/L.
Guideline Reference:	Quality Criteria for Water. USEPA Office of Water and Hazardous Materials. Washington, D.C
Spatial Representation:	Thirty-three samples were collected at Segunda Deshecha Creek, sites: SD-AP and SDCM02
Temporal Representation:	Samples were collected from 2006 through 2009.
Environmental Conditions:	According to the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010, samples were collected during the dry season and storm events.
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

DECISION ID	**43140**	**Region 9**
Segunda Deshecha Creek		

Pollutant:	**Nitrogen**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2027
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence are available in the administrative record to assess this pollutant. Nine over 12 samples (collected in both dry and storm conditions) exceed the water quality objective for biostimulatory substances. Based on the readily available data and information, the weight of evidence indicates that there is

sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Nine of 12 samples exceed the water quality objective for biostimulatory substances and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 43140, Nitrogen **Region 9**

Segunda Deshecha Creek

LOE ID:	7763
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	3
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Three of four flow-weighted event mean concentrations exceeded the water quality objective according to results in the Orange County Annual Progress Reports from 2002 through 2006. Samples were collected during two storm events a year from February 2004 through March 2006.
Data Reference:	Orange County Stormwater Program. 2004-2007. Unified Annual Progress Reports. Program Effectiveness Assessment (San Diego Region)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses (RWQCB, 2007). The Water Quality Control Plan for the San Diego Basin (9) states: Â“A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used.Â” Since the goal for total phosphorus is 0.1 mg/L, then according to the ratio provided, the goal for total nitrogen is 1 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at the mass loading station in Segunda Deschecha Creek at 33.43338Â°, 117.63154Â°.
Temporal Representation:	Samples were collected during two storm events a year from February 2004 through March

	2006.	036676
Environmental Conditions:	Samples were collected during wet weather.	
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.	
QAPP Information Reference(s):		

DECISION ID 49459 Region 9

Segunda Deshecha Creek

Pollutant:	**Selenium**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2027
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Four lines of evidence are available in the administrative record to assess this pollutant. Eleven of the 18 samples exceed the criteria for selenium. In addition, 11 of 17 samples exhibited toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Eleven of 18 samples exceed the criteria, and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 49459, Selenium Region 9

Segunda Deshecha Creek

LOE ID:	76730
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	17
Number of Exceedances:	10
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Ten of the seventeen samples exceeded the water quality objective for selenium. Eighteen

	non-detect samples had reporting limits greater than the criteria and were not used in this assessment.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The CTR for selenium is 5.0 ug/L.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Segunda Deshecha Channel at sites SDCM02 and SD-AP.
Temporal Representation:	Samples were collected from September 2006 through May of 2009.
Environmental Conditions:	Approximately 70% of the samples were collected after storm events.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49459, Selenium **Region 9**

Segunda Deshecha Creek

LOE ID:	76738
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate water toxicity. The sample did not exhibit significant toxicity. The toxicity test included survival of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL, Significant compared to negative control based on statistical test, less than stated alpha level, AND less than the evaluation threshold (both criteria are met).
Guideline Reference:	
Spatial Representation:	The sample was collected at station 901S00997.

Temporal Representation:	The sample was collected in May 2009.	036678
Environmental Conditions:		
QAPP Information:	Data quality is good. Data results were recorded in the SWAMP database and followed SWAMP protocols.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 49459, Selenium **Region 9**

Segunda Deshecha Creek

LOE ID:	7768
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Selenastrum Algae Growth- None of the three samples exhibited NOECÂ's less than 100%. Ceriodaphnia dubia survival and reproduction, All four samples exhibited a NOECÂ's less than 100%. Hyalella azteca survival- None of the fours samples exhibited LC50Â's less than 100% according to results in the Orange County Storm Water Program Annual Progress Reports from 2002 through 2006. Samples were collected during two storm events a year from February 2004 through March 2006.
Data Reference:	Orange County Stormwater Program. 2004-2007. Unified Annual Progress Reports, Program Effectiveness Assessment (San Diego Region)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be sustain free from toxic substances in concentrations that are toxic to, or that produce harmful physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Samples were found to exhibit toxicity when the No Observed Effect Concentration (NOEC) or median lethal concentration (LC50) for any given species was estimated to be less than 100% of the test sample concentration.
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected in Segunda Deshecha Creek upstream of Avenida Presidio.
Temporal Representation:	Samples were collected during two storm events a year from February 2004 through March 2006.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	Quality control conducted according to the County of Oranges quality assurance plan.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 49459, Selenium **Region 9**

Segunda Deshecha Creek

LOE ID:	76729
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved

Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Segunda Deshecha Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Selenium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The selenium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater is 0.005 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Segunda Deshecha Creek was collected at 1 monitoring site [Segunda Deshecha Canada above E Avenida Pico - 901S00997]
Temporal Representation:	Data was collected on a single day 5/14/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 49459, Selenium **Region 9**

Segunda Deshecha Creek

LOE ID:	76737
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	16
Number of Exceedances:	11
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Sixteen samples were collected to test for toxicity. Eleven of the 16 samples exhibited statistically and biologically significant toxicity. The toxicity tests that exhibited significant toxicity included Ceriodaphnia reproduction and survival, Hyallela biomass, Mysid survival and biomass and purple urchin development and fertilization.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control. Additionally, the biological significance of the sample is evaluated by determining whether the sample response is lower than the evaluation threshold.

Guideline Reference:	036680
Spatial Representation:	The sample was collected at stations SD-AP and SDCM02 Segunda Deshecha Channel.
Temporal Representation:	The sample was collected from June 2006 to November 2009.
Environmental Conditions:	
QAPP Information:	The data collected under the Quality Assurance Management Plan for The Orange County Stormwater Program. The SWAMP measurement quality objectives were followed for toxicity data. The performance of toxicity bioassays and evaluation of reference toxicants were performed using USEPA and Standard Methods.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 34533 Region 9

Segunda Deshecha Creek

Pollutant:	**Phosphorus**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: 303(d) listing decisions made prior to 2006 were not held in an assessment database. The Regional Boards will update this decision when new data and information become available and are assessed.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34533, Phosphorus Region 9

Segunda Deshecha Creek

LOE ID:	7762
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	3
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Three of four flow-weighted event mean concentrations exceeded the water quality objective according to results in the Orange County Stormwater Annual Progress reports from 2002 through 2006. Samples were collected during two storm events a year from February 2004 through March 2006.
Data Reference:	Orange County Stormwater Program. 2004-2007. Unified Annual Progress Reports. Program Effectiveness Assessment (San Diego Region)
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses (RWQCB, 2007). The Water Quality Control Plan for the San Diego Basin (9) has a goal of 0.1 mg/L for phosphorus in streams and other flowing waters.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at the mass loading station in Segunda Deschecha Creek at 33.43338Â°, 117.63154Â°.
Temporal Representation:	Samples were collected during two storm events a year from February 2004 through March 2006.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 34533, Phosphorus **Region 9**

Segunda Deshecha Creek

LOE ID:	4732
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	Unspecified
Guideline Reference:	Placeholder reference pre-2006 303(d)
Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

DECISION ID **49362** **Region 9**

Segunda Deshecha Creek

Pollutant:	**Cyfluthrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final	New Decision

Listing Decision:	036682
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. The one sample did not exceed the aquatic life guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. The one sample did not exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49362, Cyfluthrin **Region 9**

Segunda Deshecha Creek

LOE ID:	76703
Pollutant:	Cyfluthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Segunda Deshecha Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cyfluthrin, total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of lambda-cyhalothrin does not exceed 0.0005 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Mixtures of lambda-cyhalothrin and other pyrethroids should be considered in an additive manner. (Fojut et al. 2012)Â

Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Segunda Deshecha Creek was collected at 1 monitoring site [Segunda Deshecha Canada above E Avenida Pico - 901S00997]
Temporal Representation:	Data was collected on a single day 5/14/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 49460 Region 9

Segunda Deshecha Creek

Pollutant:	**Silver**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. None of the samples exceeded the criterion. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 36 samples exceeded the criterion and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 49460, Silver Region 9

Segunda Deshecha Creek

LOE ID:	76731
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Segunda Deshecha Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Silver.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Silver to protect aquatic life in freshwater. The dissolved Silver criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Segunda Deshecha Creek was collected at 1 monitoring site [Segunda Deshecha Canada above E Avenida Pico - 901S00997]
Temporal Representation:	Data was collected on a single day 5/14/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 49460, Silver **Region 9**

Segunda Deshecha Creek

LOE ID:	76732
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	35
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the 35 samples exceeded the hardness adjusted water quality objective for silver.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion maximum concentrations for silver to protect aquatic life in freshwater (1-hour average). The dissolved silver criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Segunda Deshecha Channel at sites SDCM02 and SD-AP.
Temporal Representation:	Samples were collected from September 2006 through May of 2009.

Environmental Conditions:	Approximately 70% of the samples were collected after storm events. 036685
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: San Mateo Creek (San Diego County)
Water Body ID: CAR9014000019980911121604
Water Body Type: River & Stream

DECISION ID 52901 **Region 9**
San Mateo Creek (San Diego County)

Pollutant: Alkalinity as CaCO3
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52901, Alkalinity as CaCO3 **Region 9**
San Mateo Creek (San Diego County)

LOE ID: 76141

Pollutant: Alkalinity as CaCO3
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Cold Freshwater Habitat

Number of Samples: 1

Number of Exceedances:	0	036687
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Mateo Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Alkalinity as CaCO3.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The Alkalinity as CaCO3 criteria for the protection of freshwater aquatic life is 20000 ug/L (National Recommended Water Quality Criteria, 2009).	
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology	
Spatial Representation:	Data for this line of evidence for San Mateo Creek (San Diego County) was collected at 1 monitoring site [San Mateo Canyon above Tenaja Cyn. Cr. - 901S00469.]	
Temporal Representation:	Data was collected on a single day 5/13/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID 52927 Region 9

San Mateo Creek (San Diego County)

Pollutant:	**Aluminum**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the one samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52927, Aluminum **Region 9**

San Mateo Creek (San Diego County)

LOE ID:	76159
Pollutant:	Aluminum
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Mateo Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Aluminum.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The National Recommended Water Quality Critiera for the protection of aquatic life from aluminum is the chronic continuous concentration (expressed as a 4-day average) of 87 ug/L.
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for San Mateo Creek (San Diego County) was collected at 1 monitoring site [San Mateo Canyon above Tenaja Cyn. Cr. - 901S00469.]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 52929 **Region 9**

San Mateo Creek (San Diego County)

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status; under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Three lines of evidence are available in the administrative record to assess this pollutant. Zero of one sample (sediment) exceeded the evaluation guideline and zero of 15 samples (water) exceeded the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample (sediment) and zero of 15 samples (water) exceeded the guideline/objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 52929, Arsenic **Region 9**

San Mateo Creek (San Diego County)

LOE ID:	76182
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	14
Number of Exceedances:	0
Data and Information Type:	Non-fixed station physical/chemical (conventional + toxicants)
Data Used to Assess Water Quality:	None of the fourteen samples tested for Arsenic exceeded the CTR criteria of 0.15 mg/L.
Data Reference:	Data for Various Pollutants in San Mateo, San Juan and Cristianitos, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule lists criterion continuous concentrations (expresesed as a 4-day average) for arsenic to protect aquatic life in freshwater. The CTR criteria for arsenic is 0.15 mg/L. ref2557
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from San Mateo Creek at three locations two are spatially dependent locations which include: SM1 - San Mateo Creek (just above the I-5 Freeway bridge where a spring re-establishes perennial flow) and San Mateo Outlet (an outlet under the old highway 101 bridge). The spatially independent location includes site, SM2 - San Mateo Confluence (at the head of the estuary where two spring fed branches of San Mateo Creek converge).
Temporal Representation:	Samples were collected in 2007 during the months of September, October and November; and in 2008 during the months of January, March and April.

Environmental Conditions:	036690
QAPP Information:	Samples were collected and analyzed in accordance with the Quality Assurance Project Plan For Inland Empire Canyons Baseline Monitoring Project prepared by Orange County Coastkeepers and Inland Empire WaterKeepers dated August 8, 2007.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 52929, Arsenic **Region 9**

San Mateo Creek (San Diego County)

LOE ID:	76181
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Mateo Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The dissolved arsenic criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved arsenic is 0.150 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Mateo Creek (San Diego County) was collected at 1 monitoring site [San Mateo Canyon above Tenaja Cyn. Cr. - 901S00469.]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 52929, Arsenic **Region 9**

San Mateo Creek (San Diego County)

LOE ID:	76179
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Mateo Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for arsenic is 33 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for San Mateo Creek was collected at 1 monitoring site [San Mateo Canyon above Tenaja Cyn. Cr. - 901S00469.]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 43123 Region 9

San Mateo Creek (San Diego County)

Pollutant:	**Benthic Community Effects**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Benthic Community Effects is being considered for placement on the CWA section 303(d) List under sections 3.9 and 3.1 of the Listing Policy. Under section 3.9, an additional line of evidence associating Benthic Community Effects with a water or sediment concentration of pollutant(s) is necessary to assess listing status. Based on the readily available data and information, the weight of evidence provides sufficient justification for not placing Benthic Community Effects in this water segment on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used does satisfy the data quantity requirements of section 6.1.5 of the Policy. 3. Pursuant to section 3.9 of the Listing Policy, the water does not exhibit significant degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index. 4. Pursuant to section 3.9 of the Listing Policy, the water segment does not have associated pollutant(s) samples that exceed water quality objectives. 5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not being met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 43123, Benthic Community Effects Region 9

San Mateo Creek (San Diego County) 036692

LOE ID:	76198
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	The IBI score for this water body was below 40 which indicates that this water body may be considered to have impaired conditions.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at the following station: 901S00469-San Mateo Canyon above Tenaja Cyn. Cr.
Temporal Representation:	Surveys done May 13, 2009.
Environmental Conditions:	
QAPP Information:	Data collected following SWAMP QA protocols for the Southern California Stormwater Monitoring Coalition Project.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43123, Benthic Community Effects **Region 9**

San Mateo Creek (San Diego County)

LOE ID:	76199
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	The one sample collected had an IBI scores above 40. NPDES bioassessment
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the State or Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	
Spatial Representation:	The sample was collected at station REF-SMC, San Mateo Creek.
Temporal Representation:	The sample was collected in May 2001.
Environmental Conditions:	
QAPP Information:	The data was collected under the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan, June 25, 2009.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 43123, Benthic Community Effects **Region 9**

San Mateo Creek (San Diego County)

LOE ID:	76183
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	2
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Two of the three IBI scores for this water body were below 40. A score below 40 indicates that this water body may be considered to have impaired conditions.
Data Reference:	RWB9 Status Sampling 2007 and 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at the following stations: 901SJSMT2-San Mateo Creek 2 901SJSMT3-San Mateo Creek 3
Temporal Representation:	Surveys done May 5, 2008 and May 8, 2008.
Environmental Conditions:	
QAPP Information:	Data collected following SWAMP QA protocols for the RWB9 Status Sampling 2007 and

	2008 water quality monitoring project.	036694
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43123, Benthic Community Effects **Region 9**

San Mateo Creek (San Diego County)

LOE ID:	26460
Pollutant:	Benthic Community Effects
LOE Subgroup:	Adverse Biological Responses
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Four samples of IBI data were taken from May 2001 to June 2005 at three sampling sites. Of the total number of samples, all four of the samples exceeded the IBI impairment threshold.
Data Reference:	Fish and Game IBI Data
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. (SDRWQCB, 1995)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at three sites: 901SMCDCx, 901SMCSMC, 901SMCSMR on San Mateo Creek.
Temporal Representation:	Sampling occurred during two events on May 2001 and one event on June 2005.
Environmental Conditions:	
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Project Plan for the California Stream Bioassessment Procedure and the State of California, California Monitoring an Assessment Program: "CMAP", Quality Assurance Project Plan.
QAPP Information Reference(s):	State of California, California Monitoring and Assessment Program: "CMAP". Quality Assurance Project Plan for the California Stream Bioassessment Procedure The San Diego Stream Team Quality Assurance Project Plan

Line of Evidence (LOE) for Decision ID 43123, Benthic Community Effects **Region 9**

San Mateo Creek (San Diego County)

LOE ID:	79465
Pollutant:	Benthic-Macroinvertebrate Bioassessments

LOE Subgroup:	Population/Community Degradation	036695
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Cold Freshwater Habitat	
Number of Samples:	4	
Number of Exceedances:	0	
Data and Information Type:	Benthic macroinvertebrate surveys	
Data Used to Assess Water Quality:	Four samples were taken in San Mateo Creek. The CSCI scores for all samples are above the 0.79 threshold, and are therefore not exceeding the water quality objective for the aquatic life beneficial use.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009 RWB9 Status Sampling 2007 and 2008 Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008. Region 9 CSCI Scores & Water Body Information	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.	
Guideline Reference:	The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.	
Spatial Representation:	Samples were collected at the following stations: 901REF-SMC, 901SJSMT2-San Mateo Creek 2, and 901SJSMT3-San Mateo Creek 3, 901S00469-San Mateo Canyon above Tenaja Cyn. Cr.	
Temporal Representation:	Surveys done in 2001, 2008, 2009	
Environmental Conditions:		
QAPP Information:	Data collected following SWAMP QA protocols for the RWB9 Status Sampling 2007 and 2008 water quality monitoring project, the County of San Diego MS4 Copermittees Receiving Waters Monitoring and Reporting Program, and theSouthern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan.	
QAPP Information Reference(s):	RWB9 Stormwater Monitoring Council CY 2009 RWB9 Status Sampling 2007 and 2008 Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008. The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.	

DECISION ID 52944 Region 9

San Mateo Creek (San Diego County)

Pollutant: Bifenthrin

Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	036696
Last Listing Cycle's Final Listing Decision:	New Decision	
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52944, Bifenthrin **Region 9**

San Mateo Creek (San Diego County)

LOE ID:	76201
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Mateo Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Bifenthrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Bifenthrin does not exceed 0.0006 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides.

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Spatial Representation:	Data for this line of evidence for San Mateo Creek (San Diego County) was collected at 1 monitoring site [San Mateo Canyon above Tenaja Cyn. Cr. - 901S00469.]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 52945 Region 9

San Mateo Creek (San Diego County)

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status; under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Three lines of evidence are available in the administrative record to assess this pollutant. Zero of one sample (sediment) exceeded the evaluation guideline and zero of 13 samples (water) exceeded the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample (sediment) and zero of 13 samples (water) exceeded the guideline/objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 52945, Cadmium Region 9

San Mateo Creek (San Diego County)

LOE ID:	76216
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Cold Freshwater Habitat

Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	Non-fixed station physical/chemical (conventional + toxicants)
Data Used to Assess Water Quality:	None of the twelve samples tested for Cadmium exceeded the hardness adjusted CTR criteria.
Data Reference:	Data for Various Pollutants in San Mateo, San Juan and Cristianitos, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. ref2557
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from San Mateo Creek at three locations two are spatially dependent locations which include: SM1 - San Mateo Creek (just above the I-5 Freeway bridge where a spring re-establishes perennial flow) and San Mateo Outlet (an outlet under the old highway 101 bridge). The spatially independent location includes site, SM2 - San Mateo Confluence (at the head of the estuary where two spring fed branches of San Mateo Creek converge).
Temporal Representation:	Samples were collected in 2007 during the months of September, October and November; and in 2008 during the months of January, March and April.
Environmental Conditions:	
QAPP Information:	Samples were collected and analyzed in accordance with the Quality Assurance Project Plan For Inland Empire Canyons Baseline Monitoring Project prepared by Orange County Coastkeepers and Inland Empire WaterKeepers dated August 8, 2007.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 52945, Cadmium **Region 9**

San Mateo Creek (San Diego County)

LOE ID:	76215
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Mateo Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Cadmium to protect aquatic life in freshwater. The dissolved Cadmium criterion in

	freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Mateo Creek (San Diego County) was collected at 1 monitoring site [San Mateo Canyon above Tenaja Cyn. Cr. - 901S00469.]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 52945, Cadmium **Region 9**

San Mateo Creek (San Diego County)

LOE ID:	76213
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Mateo Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for cadmium is 4.98 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for San Mateo Creek was collected at 1 monitoring site [San Mateo Canyon above Tenaja Cyn. Cr. - 901S00469.]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 52975 **Region 9**

San Mateo Creek (San Diego County)

Pollutant: Chloride

Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	036700
Last Listing Cycle's Final Listing Decision:	New Decision	
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52975, Chloride **Region 9**

San Mateo Creek (San Diego County)

LOE ID:	76229
Pollutant:	Chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Mateo Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chloride.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Chloride objective for the protection of aquatic life according to Table 3-2 for San Mateo Creek (San Diego County) within the San Juan Hydrologic Unit is 250 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	

Guideline Reference:	036701
Spatial Representation:	Data for this line of evidence for San Mateo Creek (San Diego County) was collected at 1 monitoring site [San Mateo Canyon above Tenaja Cyn. Cr. - 901S00469.]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 52977 Region 9

San Mateo Creek (San Diego County)

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status; under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Three lines of evidence are available in the administrative record to assess this pollutant. Zero of one sample (sediment) exceeded the evaluation guideline and zero of 15 samples (water) exceeded the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample (sediment) and zero of 15 samples (water) exceeded the guideline/objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52977, Chromium Region 9

San Mateo Creek (San Diego County)

LOE ID:	76233
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved

Beneficial Use:	Cold Freshwater Habitat	036702
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Mateo Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium. Since the chromium species was not identified, the data point(s) were assessed using both the Chromium III criteria which is hardness-dependent, and the criterion continuous concentration (4-day average) to protect aquatic life in freshwater for chromium VI which is 11 ug/L and is not hardness dependent.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved chromium to protect aquatic life in freshwater. The dissolved Chromium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for San Mateo Creek (San Diego County) was collected at 1 monitoring site [San Mateo Canyon above Tenaja Cyn. Cr. - 901S00469.]	
Temporal Representation:	Data was collected on a single day 5/13/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 52977, Chromium **Region 9**

San Mateo Creek (San Diego County)

LOE ID:	76231
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Mateo Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for

	sediment-dwelling organisms) for chromium is 111 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for San Mateo Creek was collected at 1 monitoring site [San Mateo Canyon above Tenaja Cyn. Cr. - 901S00469.]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 52977, Chromium **Region 9**

San Mateo Creek (San Diego County)

LOE ID:	76244
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	14
Number of Exceedances:	0
Data and Information Type:	Non-fixed station physical/chemical (conventional + toxicants)
Data Used to Assess Water Quality:	None of the fourteen samples tested for Chromium exceeded the hardness adjusted CTR criteria.
Data Reference:	Data for Various Pollutants in San Mateo, San Juan and Cristianitos, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. ref2557
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from San Mateo Creek at three locations two are spatially dependent locations which include: SM1 - San Mateo Creek (just above the I-5 Freeway bridge where a spring re-establishes perennial flow) and San Mateo Outlet (an outlet under the old highway 101 bridge). The spatially independent location includes site, SM2 - San Mateo Confluence (at the head of the estuary where two spring fed branches of San Mateo Creek converge).
Temporal Representation:	Samples were collected in 2007 during the months of September, October and November; and in 2008 during the months of January, March and April.
Environmental Conditions:	
QAPP Information:	Samples were collected and analyzed in accordance with the Quality Assurance Project Plan For Inland Empire Canyons Baseline Monitoring Project prepared by Orange County Coastkeepers and Inland Empire WaterKeepers dated August 8, 2007.
QAPP Information Reference(s):	

DECISION ID 52990 Region 9

San Mateo Creek (San Diego County) 036704

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status; under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Three lines of evidence are available in the administrative record to assess this pollutant. Zero of one sample (sediment) exceeded the evaluation guideline and zero of 14 samples (water) exceeded the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample (sediment) and zero of 14 samples (water) exceeded the guideline/objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52990, Copper — Region 9

San Mateo Creek (San Diego County)

LOE ID:	76248
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Mateo Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP

Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved copper to protect aquatic life in freshwater. The dissolved copper criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Mateo Creek (San Diego County) was collected at 1 monitoring site [San Mateo Canyon above Tenaja Cyn. Cr. - 901S00469.]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 52990, Copper **Region 9**

San Mateo Creek (San Diego County)

LOE ID:	76246
Pollutant:	Copper
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Mateo Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for copper is 149 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for San Mateo Creek was collected at 1 monitoring site [San Mateo Canyon above Tenaja Cyn. Cr. - 901S00469.]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 52990, Copper **Region 9**

San Mateo Creek (San Diego County)

LOE ID:	75995

Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	13
Number of Exceedances:	0
Data and Information Type:	Non-fixed station physical/chemical (conventional + toxicants)
Data Used to Assess Water Quality:	None of the thirteen samples tested for Copper exceeded the hardness adjusted CTR criteria.
Data Reference:	Data for Various Pollutants in San Mateo, San Juan and Cristianitos, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (CCC) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. ref2557
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from San Mateo Creek at three locations two are spatially dependent locations which include: SM1 - San Mateo Creek (just above the I-5 Freeway bridge where a spring re-establishes perennial flow) and San Mateo Outlet (an outlet under the old highway 101 bridge). The spatially independent location includes site, SM2 - San Mateo Confluence (at the head of the estuary where two spring fed branches of San Mateo Creek converge).
Temporal Representation:	Samples were collected in 2007 during the months of September, October and November; and in 2008 during the months of January, March and April.
Environmental Conditions:	
QAPP Information:	Samples were collected and analyzed in accordance with the Quality Assurance Project Plan For Inland Empire Canyons Baseline Monitoring Project prepared by Orange County Coastkeepers and Inland Empire WaterKeepers dated August 8, 2007.
QAPP Information Reference(s):	

DECISION ID 52991 Region 9

San Mateo Creek (San Diego County)

Pollutant:	**Cyfluthrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the one samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52991, Cyfluthrin **Region 9**

San Mateo Creek (San Diego County)

LOE ID:	75997
Pollutant:	Cyfluthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Mateo Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cyfluthrin, total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of lambda-cyhalothrin does not exceed 0.0005 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Mixtures of lambda-cyhalothrin and other pyrethroids should be considered in an additive manner. (Fojut et al. 2012)Â
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for San Mateo Creek was collected at 1 monitoring site [San Mateo Canyon above Tenaja Cyn. Cr. - 901S00469.]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 52992 Region 9

San Mateo Creek (San Diego County) 036708

Pollutant:	**Cyhalothrin, Lambda**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the one samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52992, Cyhalothrin, Lambda — Region 9

San Mateo Creek (San Diego County)

LOE ID:	75999
Pollutant:	Cyhalothrin, Lambda
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Mateo Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cyhalothrin, lambda, total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Cyhalothrin, lambda, total does not exceed 0.0005 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for San Mateo Creek (San Diego County) was collected at 1 monitoring site [San Mateo Canyon above Tenaja Cyn. Cr. - 901S00469.]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 52993 Region 9

San Mateo Creek (San Diego County)

Pollutant:	**Cypermethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the one samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52993, Cypermethrin Region 9

San Mateo Creek (San Diego County)

LOE ID:	76011
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat

Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	One of one sample result was not used in the assessment because the laboratory data was non-detect and the method detection limit was above the guideline and therefore the results could not be quantified with the level of certainty required by the Listing Policy
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of cypermethrin does not exceed 0.0002 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Fojut et al. 2012)
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for San Mateo Creek (San Diego County) was collected at 1 monitoring site [San Mateo Canyon above Tenaja Cyn. Cr. - 901S00469.]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 52994 Region 9

San Mateo Creek (San Diego County)

Pollutant:	**Deltamethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision

After review of the available data and information, RWQCB staff concludes that the water body-

Recommendation: pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52994, Deltamethrin **Region 9**

San Mateo Creek (San Diego County)

LOE ID:	76013
Pollutant:	Deltamethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Mateo Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Deltamethrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for Deltamethrin is the maximum acceptable toxicant concentration (MATC) of 0.02 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for San Mateo Creek (San Diego County) was collected at 1 monitoring site [San Mateo Canyon above Tenaja Cyn. Cr. - 901S00469.]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 52995 **Region 9**

San Mateo Creek (San Diego County)

Pollutant:	**Esfenvalerate/Fenvalerate**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52995, Esfenvalerate/Fenvalerate **Region 9**

San Mateo Creek (San Diego County)

LOE ID:	76029
Pollutant:	Esfenvalerate/Fenvalerate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Mateo Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Esfenvalerate/Fenvalerate, total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to the USEPA Office of Pesticide Programs Ecotoxicity database, the aquatic life EC50 for Esfenvalerate/Fenvalerate is 0.9 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for San Mateo Creek (San Diego County) was collected at 1 monitoring site [San Mateo Canyon above Tenaja Cyn. Cr. - 901S00469.]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 52996 **Region 9**

San Mateo Creek (San Diego County)

Pollutant:	**Fenpropathrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52996, Fenpropathrin **Region 9**

San Mateo Creek (San Diego County)

LOE ID:	76031
Pollutant:	Fenpropathrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Mateo Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Fenpropathrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	The evaluation guideline for Fenpropathrin is the median lethal concentration (LC50; 2.2 ug/L).
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for San Mateo Creek (San Diego County) was collected at 1 monitoring site [San Mateo Canyon above Tenaja Cyn. Cr. - 901S00469.]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 52997 Region 9

San Mateo Creek (San Diego County)

Pollutant:	**Iron**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the one samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52997, Iron Region 9

San Mateo Creek (San Diego County)

LOE ID:	76033
Pollutant:	Iron
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1

Number of Exceedances:	0	036715
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Mateo Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Iron.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Iron objective for the protection of aquatic life according to Table 3-2 for San Mateo Creek (San Diego County) within the San Juan Hydrologic Unit is 0.3 mg/L.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for San Mateo Creek (San Diego County) was collected at 1 monitoring site [San Mateo Canyon above Tenaja Cyn. Cr. - 901S00469.]	
Temporal Representation:	Data was collected on a single day 5/13/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID 52998 Region 9

San Mateo Creek (San Diego County)

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status; under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Three lines of evidence are available in the administrative record to assess this pollutant. Zero of one sample (sediment) exceeded the evaluation guideline and zero of 15 samples (water) exceeded the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample (sediment) and zero of 15 samples (water) exceeded the guideline/objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52998, Lead **Region 9**

San Mateo Creek (San Diego County)

LOE ID:	76049
Pollutant:	Lead
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Mateo Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for lead is 128 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for San Mateo Creek was collected at 1 monitoring site [San Mateo Canyon above Tenaja Cyn. Cr. - 901S00469.]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 52998, Lead **Region 9**

San Mateo Creek (San Diego County)

LOE ID:	76051
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Mateo Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved lead to protect aquatic life in freshwater. The dissolved lead criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Mateo Creek (San Diego County) was collected at 1 monitoring site [San Mateo Canyon above Tenaja Cyn. Cr. - 901S00469.]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 52998, Lead **Region 9**

San Mateo Creek (San Diego County)

LOE ID:	76052
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	14
Number of Exceedances:	0
Data and Information Type:	Non-fixed station physical/chemical (conventional + toxicants)
Data Used to Assess Water Quality:	None of fourteen samples tested for Lead exceeded the hardness adjusted CTR criteria.
Data Reference:	Data for Various Pollutants in San Mateo, San Juan and Cristianitos, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. ref2557
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from San Mateo Creek at three locations two are spatially dependent locations which include: SM1 - San Mateo Creek (just above the I-5 Freeway bridge where a spring re-establishes perennial flow) and San Mateo Outlet (an outlet under the old highway 101 bridge). The spatially independent location includes site, SM2 - San Mateo Confluence (at the head of the estuary where two spring fed branches of San Mateo

Creek converge). 036718

Temporal Representation: Samples were collected in 2007 during the months of September, October and November; and in 2008 during the months of January, March and April.

Environmental Conditions:

QAPP Information: Samples were collected and analyzed in accordance with the Quality Assurance Project Plan For Inland Empire Canyons Baseline Monitoring Project prepared by Orange County Coastkeepers and Inland Empire WaterKeepers dated August 8, 2007.

QAPP Information Reference(s):

DECISION ID 52999 Region 9

San Mateo Creek (San Diego County)

Pollutant: **Manganese**

Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**

Last Listing Cycle's Final Listing Decision: New Decision

Revision Status Revised

Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52999, Manganese Region 9

San Mateo Creek (San Diego County)

LOE ID: 76067

Pollutant: Manganese
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Dissolved

Beneficial Use: Cold Freshwater Habitat

Number of Samples: 1
Number of Exceedances: 0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	036719
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Mateo Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Manganese.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Manganese objective for the protection of aquatic life according to Table 3-2 for San Mateo Creek (San Diego County) within the San Juan Hydrologic Unit is 0.05 mg/L.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for San Mateo Creek (San Diego County) was collected at 1 monitoring site [San Mateo Canyon above Tenaja Cyn. Cr. - 901S00469.]	
Temporal Representation:	Data was collected on a single day 5/13/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID 53000 Region 9

San Mateo Creek (San Diego County)

Pollutant:	**Mercury**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the 14 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 14 samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53000, Mercury Region 9

San Mateo Creek (San Diego County) 036720

LOE ID:	76068
Pollutant:	Mercury
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	14
Number of Exceedances:	0
Data and Information Type:	Non-fixed station physical/chemical (conventional + toxicants)
Data Used to Assess Water Quality:	None of the fourteen samples tested for mercury exceeded the numeric criteria of 0.77 ug/L.
Data Reference:	Data for Various Pollutants in San Mateo, San Juan and Cristianitos, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	National Recommended Water Quality Criteria Continuous Concentrations are intended protect freshwater aquatic organisms from chronic exposures and are expressed as 4-day average concentrations. The numeric criteria for mercury is 0.77 ug/L.
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Samples were collected from San Mateo Creek at three locations two are spatially dependent locations which include: SM1 - San Mateo Creek (just above the I-5 Freeway bridge where a spring re-establishes perennial flow) and San Mateo Outlet (an outlet under the old highway 101 bridge). The spatially independent location includes site, SM2 - San Mateo Confluence (at the head of the estuary where two spring fed branches of San Mateo Creek converge).
Temporal Representation:	Samples were collected in 2007 during the months of September, October and November; and in 2008 during the months of January, March and April.
Environmental Conditions:	
QAPP Information:	Samples were collected and analyzed in accordance with the Quality Assurance Project Plan For Inland Empire Canyons Baseline Monitoring Project prepared by Orange County Coastkeepers and Inland Empire WaterKeepers dated August 8, 2007.
QAPP Information Reference(s):	

DECISION ID 53001 **Region 9**

San Mateo Creek (San Diego County)

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status; under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Three lines of evidence are available in the administrative record to assess this pollutant. Zero of one sample (sediment) exceeded the evaluation guideline and zero of 16 samples (water) exceeded the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample (sediment) and zero of 16 samples (water) exceeded the guideline/objective, and this sample size (water) is sufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating of fully supporting. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 53001, Nickel **Region 9**

San Mateo Creek (San Diego County)

LOE ID:	76070
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Mateo Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for nickel is 48.6 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for San Mateo Creek was collected at 1 monitoring site [San Mateo Canyon above Tenaja Cyn. Cr. - 901S00469.]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 53001, Nickel **Region 9**

San Mateo Creek (San Diego County)

LOE ID:	76084
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Mateo Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Nickel to protect aquatic life in freshwater. The dissolved Nickel criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Mateo Creek (San Diego County) was collected at 1 monitoring site [San Mateo Canyon above Tenaja Cyn. Cr. - 901S00469.]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 53001, Nickel **Region 9**

San Mateo Creek (San Diego County)

LOE ID:	76085
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	15
Number of Exceedances:	0
Data and Information Type:	Non-fixed station physical/chemical (conventional + toxicants)
Data Used to Assess Water Quality:	None of the fifteen samples tested for Nickel exceeded the hardness adjusted CTR criteria.
Data Reference:	Data for Various Pollutants in San Mateo, San Juan and Cristianitos, 2008-2009.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. ref2557
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from San Mateo Creek at three locations two are spatially dependent locations which include: SM1 - San Mateo Creek (just above the I-5 Freeway bridge where a spring re-establishes perennial flow) and San Mateo Outlet (an outlet under the old highway 101 bridge). The spatially independent location includes site, SM2 - San Mateo Confluence (at the head of the estuary where two spring fed branches of San Mateo Creek converge).
Temporal Representation:	Samples were collected in 2007 during the months of September, October and November; and in 2008 during the months of January, March and April.
Environmental Conditions:	
QAPP Information:	Samples were collected and analyzed in accordance with the Quality Assurance Project Plan For Inland Empire Canyons Baseline Monitoring Project prepared by Orange County Coastkeepers and Inland Empire WaterKeepers dated August 8, 2007.
QAPP Information Reference(s):	

DECISION ID 53002 Region 9

San Mateo Creek (San Diego County)

Pollutant:	**Nitrogen, ammonia (Total Ammonia)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the one samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53002, Nitrogen, ammonia (Total Ammonia) **Region 9**

San Mateo Creek (San Diego County)

LOE ID:	76161
Pollutant:	Nitrogen, ammonia (Total Ammonia)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Mateo Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Ammonia as N, Total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Aquatic Life Ambient Water Quality Criteria for Ammonia â€“ Freshwater (USEPA 2013): the 30-day rolling average concentration (criterion continuous concentration or CCC) of total ammonia nitrogen(in mg TAN/L) in freshwater are not to be exceeded more than once every three years on average. The CCC values are based on pH and temperature. The CCC formula is found on page 46 and the table of CCC values is on page 49.
Guideline Reference:	Aquatic Life Ambient Water Quality Criteria for Ammonia - Freshwater 2013
Spatial Representation:	Data for this line of evidence for San Mateo Creek was collected at 1 monitoring site [San Mateo Canyon above Tenaja Cyn. Cr. - 901S00469.]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 53003 **Region 9**

San Mateo Creek (San Diego County)

Pollutant:	**Oxygen, Dissolved**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. Three lines of evidence are available in the administrative record to assess this pollutant. 12 of the 19 samples exceed the Objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. 12 of 18 samples exceeded the Objective. While this does exceed the allowable frequency listed in Table 3.2 of the Listing Policy, additional lines of evidence required to assess dissolved oxygen in accordance with Section 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53003, Oxygen, Dissolved **Region 9**

San Mateo Creek (San Diego County)

LOE ID:	76087
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Mateo Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Oxygen, Dissolved.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan, San Diego Basin, Cold Water Habitat Objective, Chapter III, General Objectives for all Inland Surface Waters, Enclosed Bays and Estuaries states the following: The dissolved oxygen concentration for cold water habitats shall not be reduced below 6.0 mg/l at any time.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Mateo Creek (San Diego County) was collected at 1 monitoring site [San Mateo Canyon above Tenaja Cyn. Cr. - 901S00469.]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 53003, Oxygen, Dissolved **Region 9**

San Mateo Creek (San Diego County)

LOE ID:	76161	036726

Pollutant:	Nitrogen, ammonia (Total Ammonia)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Mateo Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Ammonia as N, Total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Aquatic Life Ambient Water Quality Criteria for Ammonia â€“ Freshwater (USEPA 2013): the 30-day rolling average concentration (criterion continuous concentration or CCC) of total ammonia nitrogen(in mg TAN/L) in freshwater are not to be exceeded more than once every three years on average. The CCC values are based on pH and temperature. The CCC formula is found on page 46 and the table of CCC values is on page 49.
Guideline Reference:	Aquatic Life Ambient Water Quality Criteria for Ammonia - Freshwater 2013
Spatial Representation:	Data for this line of evidence for San Mateo Creek was collected at 1 monitoring site [San Mateo Canyon above Tenaja Cyn. Cr. - 901S00469.]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 53003, Oxygen, Dissolved **Region 9**

San Mateo Creek (San Diego County)

LOE ID:	76103
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	18
Number of Exceedances:	12
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Numeric data from 18 samples of Dissolved Oxygen concentrations had 12 exceedences.
Data Reference:	Data for Various Pollutants in San Mateo, San Juan and Cristianitos, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan, San Diego Basin, Cold Water Habitat Objective, Chapter III, General Objectives for all Inland Surface Waters, Enclosed Bays and Estuaries states the

following: The dissolved oxygen concentration for cold water habitats shall not be reduced below 6.0 mg/l at any time.

Objective/Criterion Reference: Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected from the San Mateo and San Mateo Confluence stations.
Temporal Representation: Samples were collected from 2007 to 2008
Environmental Conditions:
QAPP Information: NPDES quality assurance.
QAPP Information Reference(s):

DECISION ID 53009 — Region 9

San Mateo Creek (San Diego County)

Pollutant: **Permethrin, total**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53009, Permethrin, total — Region 9

San Mateo Creek (San Diego County)

LOE ID: 76105

Pollutant: Permethrin, total
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Cold Freshwater Habitat

Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Mateo Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Permethrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Permethrin does not exceed 0.002 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for San Mateo Creek (San Diego County) was collected at 1 monitoring site [San Mateo Canyon above Tenaja Cyn. Cr. - 901S00469.]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 53010 Region 9

San Mateo Creek (San Diego County)

Pollutant:	**Selenium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the 13 samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 13 samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and

information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53010, Selenium **Region 9**

San Mateo Creek (San Diego County)

LOE ID:	76126
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	Non-fixed station physical/chemical (conventional + toxicants)
Data Used to Assess Water Quality:	Samples were collected from San Mateo Creek at three locations two are spatially dependent locations which include: SM1 - San Mateo Creek (just above the I-5 Freeway bridge where a spring re-establishes perennial flow) and San Mateo Outlet (an outlet under the old highway 101 bridge). The spatially independent location includes site, SM2 - San Mateo Confluence (at the head of the estuary where two spring fed branches of San Mateo Creek converge).
Data Reference:	Data for Various Pollutants in San Mateo, San Juan and Cristianitos, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. ref2557
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from San Mateo Creek at three locations two are spatially dependent locations which include: SM1 - San Mateo Creek (just above the I-5 Freeway bridge where a spring re-establishes perennial flow) and San Mateo Outlet (an outlet under the old highway 101 bridge). The spatially independent location includes site, SM2 - San Mateo Confluence (at the head of the estuary where two spring fed branches of San Mateo Creek converge).
Temporal Representation:	Samples were collected in 2007 during the months of September, October and November; and in 2008 during the months of January, March and April.
Environmental Conditions:	
QAPP Information:	Samples were collected and analyzed in accordance with the Quality Assurance Project Plan For Inland Empire Canyons Baseline Monitoring Project prepared by Orange County Coastkeepers and Inland Empire WaterKeepers dated August 8, 2007.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 53010, Selenium **Region 9**

San Mateo Creek (San Diego County)

LOE ID:	76125
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water

Matrix:	Water	036730
Fraction:	Dissolved	
Beneficial Use:	Cold Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Mateo Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Selenium.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	The selenium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater is 0.005 mg/L (California Toxics Rule, 2000).	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for San Mateo Creek (San Diego County) was collected at 1 monitoring site [San Mateo Canyon above Tenaja Cyn. Cr. - 901S00469.]	
Temporal Representation:	Data was collected on a single day 5/13/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID 53011 Region 9

San Mateo Creek (San Diego County)

Pollutant:	**Silver**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the 13 samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 13 samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53011, Silver **Region 9**

San Mateo Creek (San Diego County)

LOE ID:	76128
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Mateo Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Silver.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Silver to protect aquatic life in freshwater. The dissolved Silver criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Mateo Creek (San Diego County) was collected at 1 monitoring site [San Mateo Canyon above Tenaja Cyn. Cr. - 901S00469.]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 53011, Silver **Region 9**

San Mateo Creek (San Diego County)

LOE ID:	76129
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	12
Number of Exceedances:	0

Data and Information Type:	Non-fixed station physical/chemical (conventional + toxicants)	036732
Data Used to Assess Water Quality:	All samples were reported as non-detect.	
Data Reference:	Data for Various Pollutants in San Mateo, San Juan and Cristianitos, 2008-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion maximum concentrations for silver to protect aquatic life in freshwater (1-hour average). The silver criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used. ref2557	
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Spatial Representation:	Samples were collected from San Mateo Creek at three locations two are spatially dependent locations which include: SM1 - San Mateo Creek (just above the I-5 Freeway bridge where a spring re-establishes perennial flow) and San Mateo Outlet (an outlet under the old highway 101 bridge). The spatially independent location includes site, SM2 - San Mateo Confluence (at the head of the estuary where two spring fed branches of San Mateo Creek converge).	
Temporal Representation:	Samples were collected in 2007 during the months of September, October and November; and in 2008 during the months of January, March and April.	
Environmental Conditions:		
QAPP Information:	Samples were collected and analyzed in accordance with the Quality Assurance Project Plan For Inland Empire Canyons Baseline Monitoring Project prepared by Orange County Coastkeepers and Inland Empire WaterKeepers dated August 8, 2007.	
QAPP Information Reference(s):		

DECISION ID 53012 Region 9

San Mateo Creek (San Diego County)

Pollutant:	**Sulfates**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available

indicating that standards are not met. 036733

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53012, Sulfates **Region 9**

San Mateo Creek (San Diego County)

LOE ID:	76143
Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Mateo Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Sulfate.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Sulfate objective for the protection of aquatic life according to Table 3-2 for San Mateo Creek (San Diego County) within the San Juan Hydrologic Unit is 250 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Mateo Creek (San Diego County) was collected at 1 monitoring site [San Mateo Canyon above Tenaja Cyn. Cr. - 901S00469.]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 53013 **Region 9**

San Mateo Creek (San Diego County)

Pollutant:	**Temperature, water**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Eight of the 24 samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Eight of 24 samples exceeded the criteria and this does exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, additional data and information is available indicating that standards may be met. Two additional lines of evidence are available.

First, the location of the sampling and timing may not be representative of steelhead habitat utilization in San Mateo, and samples were taken as grabs. Critical information needed to assess temperatures for steelhead include growth periods (spring and fall) as well as summer daytime maximums in documented oversummering habitat.

Second, the criteria of 21 degrees as a limit is not necessarily applicable to southern California steelhead, which have been shown to have higher temperature tolerance. See Spina Environ Biol Fish (2007) 80:23Â–34.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53013, Temperature, water **Region 9**

San Mateo Creek (San Diego County)

LOE ID:	76144
Pollutant:	Temperature, water
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Mateo Creek (San Diego County) to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Water Temperature.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Board that such alteration in temperature does not adversely affect beneficial uses. At no time or place shall the temperature of any COLD water be increased more than 5Â°F above the natural receiving water temperature.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Inland Fishes of California (Moyle 1976) states that for rainbow trout the optimum range for growth and completion of most life stages is 13-21 degrees C (page 129).

Guideline Reference:	Inland Fishes of California	036735
Spatial Representation:	Data for this line of evidence for San Mateo Creek (San Diego County) was collected at 1 monitoring site [San Mateo Canyon above Tenaja Cyn. Cr. - 901S00469.]	
Temporal Representation:	Data was collected on a single day 5/13/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 53013, Temperature, water **Region 9**

San Mateo Creek (San Diego County)

LOE ID:	76145
Pollutant:	Temperature, water
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	23
Number of Exceedances:	7
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Seven of 23 samples exceeded the evaluation guideline.
Data Reference:	Data for Various Pollutants in San Mateo, San Juan and Cristianitos, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Board that such alteration in temperature does not adversely affect beneficial uses. At no time or place shall the temperature of any COLD water be increased more than 5Â°F above the natural receiving water temperature.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Inland Fishes of California (Moyle 1976) states that for rainbow trout the optimum range for growth and completion of most life stages is 13-21 degrees C (page 129).
Guideline Reference:	Inland Fishes of California
Spatial Representation:	Samples were collected from the San Mateo, San Mateo Outlet and San Mateo Confluence stations.
Temporal Representation:	Samples were collected approximately from 2007 to 2008
Environmental Conditions:	
QAPP Information:	NPDES quality assurance.
QAPP Information Reference(s):	

DECISION ID 53027 **Region 9**

San Mateo Creek (San Diego County)

Pollutant:	**Total Dissolved Solids**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of

the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53027, Total Dissolved Solids **Region 9**

San Mateo Creek (San Diego County)

LOE ID:	76163
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Mateo Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Dissolved Solids.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Dissolved Solids objective for the protection of aquatic life according to Table 3-2 for San Mateo Creek (San Diego County) within the San Juan Hydrologic Unit is 500 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Mateo Creek (San Diego County) was collected at 1 monitoring site [San Mateo Canyon above Tenaja Cyn. Cr. - 901S00469.]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 52932 **Region 9**

San Mateo Creek (San Diego County)

Pollutant:	**Toxicity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least one line of evidence is necessary to assess listing status for toxicity in sediment, and waters may be placed on the CWA section 303(d) List for toxicity alone.

One line of evidence is available in the administrative record to assess sediment toxicity. Zero of one samples exhibited sediment toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for not placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the one samples exhibited sediment toxicity and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52932, Toxicity **Region 9**

San Mateo Creek (San Diego County)

LOE ID:	76164
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate water toxicity. The sample did not exhibit significant toxicity. The toxicity test included survival and reproduction of Ceriodaphnia dubia. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009

SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL, Significant compared to negative control based on statistical test, less than stated alpha level, AND less than the evaluation threshold (both criteria are met).
Guideline Reference:	
Spatial Representation:	The sample was collected at station 901S00469.
Temporal Representation:	The sample was collected in May 2009.
Environmental Conditions:	
QAPP Information:	Data quality is good. Data results were recorded in the SWAMP database and followed SWAMP protocols.
QAPP Information Reference(s):	

DECISION ID 53029 Region 9

San Mateo Creek (San Diego County)

Pollutant:	**Turbidity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the one samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53029, Turbidity Region 9

San Mateo Creek (San Diego County)

LOE ID:	76166
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Mateo Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Turbidity(NTU).
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Turbidity(NTU) objective for the protection of aquatic life according to Table 3-2 for San Mateo Creek (San Diego County) within the San Juan Hydrologic Unit is 20 NTU.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Inland Fishes of California
Spatial Representation:	Data for this line of evidence for San Mateo Creek (San Diego County) was collected at 1 monitoring site [San Mateo Canyon above Tenaja Cyn. Cr. - 901S00469.]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 53030 Region 9

San Mateo Creek (San Diego County)

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status; under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Three lines of evidence are available in the administrative record to assess this pollutant. Zero of one sample (sediment) exceeded the evaluation guideline and zero of 15 samples (water) exceeded the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample (sediment) and zero of 15 samples (water) exceeded the guideline/objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53030, Zinc **Region 9**

San Mateo Creek (San Diego County)

LOE ID:	76184
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Mateo Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for zinc is 459 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for San Mateo Creek was collected at 1 monitoring site [San Mateo Canyon above Tenaja Cyn. Cr. - 901S00469.]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 53030, Zinc **Region 9**

San Mateo Creek (San Diego County)

LOE ID:	76187
Pollutant:	Zinc

LOE Subgroup:	Pollutant-Water	036741
Matrix:	Water	
Fraction:	Total Dissolved	
Beneficial Use:	Cold Freshwater Habitat	
Number of Samples:	14	
Number of Exceedances:	0	
Data and Information Type:	Non-fixed station physical/chemical (conventional + toxicants)	
Data Used to Assess Water Quality:	None of the fourteen samples tested for Zinc exceeded the hardness adjusted CTR criteria.	
Data Reference:	Data for Various Pollutants in San Mateo, San Juan and Cristianitos, 2008-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Spatial Representation:	Samples were collected from San Mateo Creek at three locations. Two sample locations are within 200 meters which include: SM1 - San Mateo Creek (just above the I-5 Freeway bridge where a spring re-establishes perennial flow) and San Mateo Outlet (an outlet under the old highway 101 bridge), the results from these stations were averaged. The other sample location is site, SM2 - San Mateo Confluence (at the head of the estuary where two spring fed branches of San Mateo Creek converge.	
Temporal Representation:	Samples were collected in 2007 during the months of September, October and November; and in 2008 during the months of January, March and April.	
Environmental Conditions:		
QAPP Information:	Samples were collected and analyzed in accordance with the Quality Assurance Project Plan For Inland Empire Canyons Baseline Monitoring Project prepared by Orange County Coastkeepers and Inland Empire WaterKeepers dated August 8, 2007.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 53030, Zinc **Region 9**

San Mateo Creek (San Diego County)

LOE ID:	76186
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Mateo Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009

SWAMP Data:	SWAMP	036742
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Zinc to protect aquatic life in freshwater. The dissolved Zinc criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for San Mateo Creek (San Diego County) was collected at 1 monitoring site [San Mateo Canyon above Tenaja Cyn. Cr. - 901S00469.]	
Temporal Representation:	Data was collected on a single day 5/13/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID 53031 Region 9

San Mateo Creek (San Diego County)

Pollutant:	**pH**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Three lines of evidence are available in the administrative record to assess this pollutant. Zero of the 24 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 24 samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 53031, pH Region 9

San Mateo Creek (San Diego County)

LOE ID:	76106
Pollutant:	pH
LOE Subgroup:	Pollutant-Water

Matrix:	Water	036743
Fraction:	None	
Beneficial Use:	Cold Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Mateo Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for pH.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	In inland surface waters the pH shall not be depressed below 6.5 nor raised above 8.5.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for San Mateo Creek was collected at 1 monitoring site [San Mateo Canyon above Tenaja Cyn. Cr. - 901S00469.]	
Temporal Representation:	Data was collected on a single day 5/13/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 53031, pH **Region 9**

San Mateo Creek (San Diego County)

LOE ID:	76109
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	The sample collected did not exceed the objective.
Data Reference:	Data for bacteria in various waterbodies, Feb. 2005-May 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In bays and estuaries the pH shall not be depressed below 7.0 nor raised above 9.0.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the San Mateo at mouth station.
Temporal Representation:	One sample was collected on 5/5/2007.
Environmental Conditions:	
QAPP Information:	NPDES quality assurance.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 53031, pH **Region 9**

San Mateo Creek (San Diego County) 036744

LOE ID:	76108
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	22
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Numeric data generated from 22 samples of pH had no exceedences.
Data Reference:	Data for Various Pollutants in San Mateo, San Juan and Cristianitos, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The pH of all inland surface waters shall not be depressed below 6.5 or raised above 8.5 as a result of waste discharges.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the San Mateo and San Mateo Confluence stations.
Temporal Representation:	Samples were collected approximately once a month from 2007 to 2008
Environmental Conditions:	
QAPP Information:	NPDES quality assurance.
QAPP Information Reference(s):	

DECISION ID 53495 **Region 9**

San Mateo Creek (San Diego County)

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. Data from 2007 to 2010 show that 12 of 26, 22 of 36, and 9 of 36 single samples exceed the water quality objectives for SSMs of E. coli., enterococcus, and total coliform, respectively, for the protection of REC-1.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.

2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 936745
3. Data from 2007 to 2010 show that 12 of 26, 22 of 36, and 9 of 36 single samples exceed the water quality objectives for SSMs of E. coli., enterococcus, and total coliform, respectively, for the protection of REC-1 and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 53495, Indicator Bacteria **Region 9**

San Mateo Creek (San Diego County)

LOE ID:	76146
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	36
Number of Exceedances:	9
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Nine of the 36 samples exceeded the objective for total coiform.
Data Reference:	Data for Various Pollutants in San Mateo, San Juan and Cristianitos, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Water Quality Control Plan for the San Diego Basin.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Total coliform shall not exceed 10,000/100ml.
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.
Spatial Representation:	Samples were collected from San Mateo 1 on San Mateo Creek and San Mateo 2, San Mateo confluence.
Temporal Representation:	Samples were collected from August 2007 to February 2010.
Environmental Conditions:	
QAPP Information:	This data was collected under the Quality Assurance Project Plan for Inland Empire Canyons Baseline Monitoring Project. qa13
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 53495, Indicator Bacteria **Region 9**

San Mateo Creek (San Diego County)

LOE ID:	76014
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	36
Number of Exceedances:	22
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Twenty-two of the 36 samples exceeded the objective for enterococcus.
Data Reference:	Data for Various Pollutants in San Mateo, San Juan and Cristianitos, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The enterococcus concentration shall not exceed 61/100 ml Water Quality Control Plan for the San Diego Basin.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from San Mateo 1 on San Mateo Creek and San Mateo 2, San Mateo confluence.
Temporal Representation:	Samples were collected from August 2007 to February 2010.
Environmental Conditions:	
QAPP Information:	This data was collected under the Quality Assurance Project Plan for Inland Empire Canyons Baseline Monitoring Project. qa13
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 53495, Indicator Bacteria **Region 9**

San Mateo Creek (San Diego County)

LOE ID:	76015
Pollutant:	Escherichia coli (E. coli)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	36
Number of Exceedances:	12
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Twelve of the 36 samples exceeded the objective for E. coli.
Data Reference:	Data for Various Pollutants in San Mateo, San Juan and Cristianitos, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The E. coli concentration shall not exceed 235/100 ml Water Quality Control Plan for the San Diego Basin.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from San Mateo 1 on San Mateo Creek and San Mateo 2, San Mateo confluence.
Temporal Representation:	Samples were collected from August 2007 to February 2010.
Environmental Conditions:	
QAPP Information:	This data was collected under the Quality Assurance Project Plan for Inland Empire Canyons Baseline Monitoring Project. qa13
QAPP Information Reference(s):	

DECISION ID **62966** 036747 **Region 9**

San Mateo Creek (San Diego County)

Pollutant:	**Invasive Species**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2027
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.10 of the Listing Policy. Under this section: A water segment shall be placed on the list if the water segment exhibits concentrations of pollutants or water body conditions for any listing factor that shows a trend of declining water quality standards attainment. In accordance with the Listing Policy, this section is focused on addressing the anti-degradation component of water quality standards and threatened waters as defined in 40 CFR 130.2(j) by identifying trends of declining water quality. Numeric, pollutant specific water quality objectives need not be exceeded for listing.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that:
1. The data used satisfies was collected for at least 3 years.
2. San Mateo Creek is currently designated as critical habitat for the endangered southern California Steelhead (O. mykiss) population segment and has a RARE benficial use. Designation is based on published surveys of over-summering pools from 1999 to 2003 by the California Department of Fish and Wildlife and subsequent genetic testing that found steelhead in San Mateo Creek (Hovey 2004, Clemento et al. 2009). The surveys identified water diversions and invasive species as potential issues of concern.
3. Two more recent publications on repeat field surveys over multiple years have failed to find a single steelhead during the critical over-summering period (Wilcox 2012, CADFW 2016), despite the continued presence of sufficient over-summering pools that provide suitable habitat for steelhead. However, thousands of competitive and predatory non-native species were found in the pools during the most recent surveys, directly impairing the RARE beneficial use of the critical habitat. The presence of non-natives causes direct impacts through predation and competition for food, as well as indirect impacts due to increases in oxygen demand and thermal stress. No information is available regarding the influence of water diversions on the lack of steelhead presence, though over-summering pools persisted as in prior years.
4. The decline in (lack of documented) steelhead presence in recent surveys and populations sizes of non-natives provides evidence of degradation and thus impairment of the RARE beneficial use.
5. This process is scientifically defensible and reproducible. State of California Department of Fish and Wildlife conducts surveys for steelhead presence and non-native species utilizing standard NOAA approved methods and equipment, and are/will be repeatable for San Mateo Creek.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 62966, Invasive Species **Region 9**

San Mateo Creek (San Diego County)

LOE ID:	95678
Pollutant:	Invasive Species
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None

Beneficial Use:	Preservation of Rare & Endangered Species
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	BIOLOGICAL MONITORING
Data Used to Assess Water Quality:	Published surveys of San Mateo Creek for steelhead and non-natives by the California Department of Fish and Wildlife.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009 RWB9 Status Sampling 2007 and 2008 Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008. Region 9 CSCI Scores & Water Body Information
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Surveys documenting presence/absence of steelhead and quantity of non-native species.
Guideline Reference:	California Department of Fish and Game. Current Status of Southern Steelhead/Rainbow Trout in San Mateo Creek, California. September 3, 2003 The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.
Spatial Representation:	Surveys were conducted on San Mateo Creek during the critical summer dry period in over-summering refuge pools.
Temporal Representation:	Surveys done from 1999-2015.
Environmental Conditions:	
QAPP Information:	Data collected by the State of California Department of Fish and Wildlife.
QAPP Information Reference(s):	RWB9 Stormwater Monitoring Council CY 2009 RWB9 Status Sampling 2007 and 2008 Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008. The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Cristianitos Creek
Water Body ID: CAR9014000020011025104327
Water Body Type: River & Stream

DECISION ID 48367 **Region 9**
Cristianitos Creek

Pollutant: Arsenic
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 13 samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 13 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48367, Arsenic **Region 9**
Cristianitos Creek

LOE ID: 73449

Pollutant: Arsenic
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total Dissolved

Beneficial Use: Warm Freshwater Habitat

Number of Samples: 13

Number of Exceedances:	0	036750
Data and Information Type:	Non-fixed station physical/chemical (conventional + toxicants)	
Data Used to Assess Water Quality:	None of the thirteen samples tested for Arsenic exceeded the CTR criteria of 0.15 mg/L.	
Data Reference:	Data for Various Pollutants in San Mateo, San Juan and Cristianitos, 2008-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	California Toxics Rule lists criterion continuous concentrations (expresesed as a 4-day average) for arsenic to protect aquatic life in freshwater. The CTR criteria for arsenic is 0.15 mg/L. ref2557	
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Spatial Representation:	Samples were collected from Cristianitos Creek at two spatially independent locations which include: CR1 - Upper Cristianitos Creek (above the urban runoff into Cristianitos creek added after rain events established water in the creek) and CR2 - Cristianitos Creek (near the end of Avenida Pico, the Talega housing development).	
Temporal Representation:	Samples were collected in 2007 during the months of September, October and November; and in 2008 during the months of January, March and April.	
Environmental Conditions:		
QAPP Information:	Samples were collected and analyzed in accordance with the Quality Assurance Project Plan For Inland Empire Canyons Baseline Monitoring Project prepared by Orange County Coastkeepers and Inland Empire WaterKeepers dated August 8, 2007.	
QAPP Information Reference(s):		

DECISION ID	**48368**	**Region 9**
Cristianitos Creek		

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of 13 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 13 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 48368, Chromium **Region 9**

Cristianitos Creek

LOE ID:	73451
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	13
Number of Exceedances:	0
Data and Information Type:	Non-fixed station physical/chemical (conventional + toxicants)
Data Used to Assess Water Quality:	None of the thirteen samples tested for Chromium exceeded the hardness adjusted CTR criteria.
Data Reference:	Data for Various Pollutants in San Mateo, San Juan and Cristianitos, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. ref2557
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Cristianitos Creek at two spatially independent locations which include: CR1 - Upper Cristianitos Creek (above the urban runoff into Cristianitos creek added after rain events established water in the creek) and CR2 - Cristianitos Creek (near the end of Avenida Pico, the Talega housing development).
Temporal Representation:	Samples were collected in 2007 during the months of September, October and November; and in 2008 during the months of January, March and April.
Environmental Conditions:	
QAPP Information:	Samples were collected and analyzed in accordance with the Quality Assurance Project Plan For Inland Empire Canyons Baseline Monitoring Project prepared by Orange County Coastkeepers and Inland Empire WaterKeepers dated August 8, 2007.
QAPP Information Reference(s):	

DECISION ID **48369** **Region 9**

Cristianitos Creek

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or	Pollutant

Pollution: 036752

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 13 samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 13 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48369, Copper **Region 9**

Cristianitos Creek

LOE ID:	73452
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	13
Number of Exceedances:	0
Data and Information Type:	Non-fixed station physical/chemical (conventional + toxicants)
Data Used to Assess Water Quality:	None of the thirteen samples tested for Copper exceeded the hardness adjusted CTR criteria.
Data Reference:	Data for Various Pollutants in San Mateo, San Juan and Cristianitos, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (CCC) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. ref2557
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Cristianitos Creek at two spatially independent locations which

	include: CR1 - Upper Cristianitos Creek (above the urban runoff into Cristianitos creek added after rain events established water in the creek) and CR2 - Cristianitos Creek (near the end of Avenida Pico, the Talega housing development).
Temporal Representation:	Samples were collected in 2007 during the months of September, October and November; and in 2008 during the months of January, March and April.
Environmental Conditions:	
QAPP Information:	Samples were collected and analyzed in accordance with the Quality Assurance Project Plan For Inland Empire Canyons Baseline Monitoring Project prepared by Orange County Coastkeepers and Inland Empire WaterKeepers dated August 8, 2007.
QAPP Information Reference(s):	

DECISION ID	48372	Region 9
Cristianitos Creek		

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of 12 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 12 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48372, Lead	Region 9
Cristianitos Creek	

LOE ID:	73455
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	12

Number of Exceedances:	0	036754
Data and Information Type:	Non-fixed station physical/chemical (conventional + toxicants)	
Data Used to Assess Water Quality:	None of twelve samples tested for Lead exceeded the hardness adjusted CTR criteria.	
Data Reference:	Data for Various Pollutants in San Mateo, San Juan and Cristianitos, 2008-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. ref2557	
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Spatial Representation:	Samples were collected from Cristianitos Creek at two spatially independent locations which include: CR1 - Upper Cristianitos Creek (above the urban runoff into Cristianitos creek added after rain events established water in the creek) and CR2 - Cristianitos Creek (near the end of Avenida Pico, the Talega housing development).	
Temporal Representation:	Samples were collected in 2007 during the months of September, October and November; and in 2008 during the months of January, March and April.	
Environmental Conditions:		
QAPP Information:	Samples were collected and analyzed in accordance with the Quality Assurance Project Plan For Inland Empire Canyons Baseline Monitoring Project prepared by Orange County Coastkeepers and Inland Empire WaterKeepers dated August 8, 2007.	
QAPP Information Reference(s):		

DECISION ID	**48370**	**Region 9**
Cristianitos Creek		

Pollutant:	**Mercury**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 13 samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 13 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48370, Mercury **Region 9**

Cristianitos Creek

LOE ID:	73456
Pollutant:	Mercury
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	13
Number of Exceedances:	0
Data and Information Type:	Non-fixed station physical/chemical (conventional + toxicants)
Data Used to Assess Water Quality:	None of the thirteen samples tested for mercury exceeded the numeric criteria of 0.77 ug/L,
Data Reference:	Data for Various Pollutants in San Mateo, San Juan and Cristianitos, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	National Recommended Water Quality Criteria Continuous Concentrations are intended protect freshwater aquatic organisms from chronic exposures and are expressed as 4-day average concentrations. Criterion derived from data for inorganic mercury (II), but is applied to total mercury. It will probably be underprotective if a substantial portion of mercury in the water column is methylmercury. Derivation of criterion did not consider exposure through the diet, which is probably important for aquatic life occupying upper trophic levels. The numeric criteria for mercury is 0.77 ug/L. ref13
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Samples were collected from Cristianitos Creek at two spatially independent locations which include: CR1 - Upper Cristianitos Creek (above the urban runoff into Cristianitos creek added after rain events established water in the creek) and CR2 - Cristianitos Creek (near the end of Avenida Pico, the Talega housing development).
Temporal Representation:	Samples were collected in 2007 during the months of September, October and November; and in 2008 during the months of January, March and April.
Environmental Conditions:	
QAPP Information:	Samples were collected and analyzed in accordance with the Quality Assurance Project Plan For Inland Empire Canyons Baseline Monitoring Project prepared by Orange County Coastkeepers and Inland Empire WaterKeepers dated August 8, 2007.
QAPP Information Reference(s):	

DECISION ID **48374** **Region 9**

Cristianitos Creek

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**

Last Listing Cycle's Final Listing Decision:	New Decision	036756
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. Zero of 13 samples exceed the Criteria Continuous Concentration for Nickel.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 13 samples exceed the Criteria Continuous Concentration for Nickel
and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 48374, Nickel **Region 9**

Cristianitos Creek

LOE ID:	73457
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	13
Number of Exceedances:	0
Data and Information Type:	Non-fixed station physical/chemical (conventional + toxicants)
Data Used to Assess Water Quality:	Zero of the 13 samples tested for Nickel exceeded the hardness adjusted CTR criteria (CCC=168.2 ug/L at a hardness of 400mg/L as CaCO3).
Data Reference:	Data for Various Pollutants in San Mateo, San Juan and Cristianitos, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition

Spatial Representation:	Samples were collected from Cristianitos Creek at two spatially independent locations which include: CR1 - Upper Cristianitos Creek (above the urban runoff into Cristianitos creek added after rain events established water in the creek) and CR2 - Cristianitos Creek (near the end of Avenida Pico, the Talega housing development).
Temporal Representation:	Samples were collected in 2007 during the months of September, October and November; and in 2008 during the months of January, March and April.
Environmental Conditions:	
QAPP Information:	Samples were collected and analyzed in accordance with the Quality Assurance Project Plan For Inland Empire Canyons Baseline Monitoring Project prepared by Orange County Coastkeepers and Inland Empire WaterKeepers dated August 8, 2007.
QAPP Information Reference(s):	

DECISION ID **48377** **Region 9**

Cristianitos Creek

Pollutant:	**Nitrate**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of 33 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 33 samples exceed the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 48377, Nitrate **Region 9**

Cristianitos Creek

LOE ID:	77728
Pollutant:	Nitrate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	33

Number of Exceedances:	0	036758
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)	
Data Used to Assess Water Quality:	Data were collected for two separate monitoring sub projects. None of 33 samples exceeded the MCL for nitrate. Samples were reported as nitrate as nitrogen and were converted to nitrate as nitrate before comparing data with the objective.	
Data Reference:	Data for Various Pollutants in San Mateo, San Juan and Cristianitos, 2008-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The Water Quality Control Plan, San Diego Basin, Objective for Municipal and Domestic Supply uses of inland surface waters states the following: waters shall not contain concentrations of inorganic chemicals in excess of the limits specified in California Code of Regulations, Title 22, Table 64431-A of section 64431 (Inorganic Chemicals). The maximum contaminant level listed in Table 64431-A for nitrate as NO3 is 45.0 mg/L.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at CR1 (Upper Cristianitos) and CR2 (Cristianitos).	
Temporal Representation:	Samples were collected at CR2 from August 2007 to June 2008 and again from April 2009 to February 2010. Samples were collected from CR1 from January 2008 to May 2008 and again during the months of April 2009 through June 2009 and then on January 2010 and February 2010.	
Environmental Conditions:	CR2 has perennial flows due to urban runoff from the Talega housing development. CR1 is approximately 200 yards upstream from CR1 and has intermittent flows. No data were collected at CR1 during the summer since the site is dry during this period.	
QAPP Information:	Quality assurance procedures were based on the Inland Empire Canyons Baseline Monitoring Project and adapted to two sub projects; one completed in 2008 for San Mateo Creek and Cristianitos Creek, and another completed in 2010 for San Juan Creek, Mateo Creek, and Cristianitos Creek. qa11	
QAPP Information Reference(s):		

DECISION ID	**48378**	**Region 9**
Cristianitos Creek		

Pollutant:	**Oxygen, Dissolved**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line(s) of evidence are necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. One of 15 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of 15 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.

4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48378, Oxygen, Dissolved **Region 9**

Cristianitos Creek

LOE ID:	73458
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	15
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Numeric data generated from 15 averages of Dissolved Oxygen concentrations had 1 exceedence.
Data Reference:	Data for Various Pollutants in San Mateo, San Juan and Cristianitos, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Dissolved oxygen levels shall not be less than 5.0 mg/l in inland surface waters with designated MAR or WARM beneficial uses. The annual mean dissolved oxygen concentration shall not be less than 7 mg/l more than 10% of the time.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the CR1 - Upper Cristianitos and CR2 - Cristianitos stations.
Temporal Representation:	Samples were collected approximately once a month from April 2009 to February 2010.
Environmental Conditions:	
QAPP Information:	NPDES quality assurance.
QAPP Information Reference(s):	

DECISION ID **48381** **Region 9**

Cristianitos Creek

Pollutant:	**Temperature, water**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line(s) of evidence are necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. One of 15

samples exceed the criteria. 036760

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of 15 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48381, Temperature, water **Region 9**

Cristianitos Creek

LOE ID:	73462
Pollutant:	Temperature, water
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	15
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	One of 15 samples exceeded the evaluation guideline.
Data Reference:	Data for Various Pollutants in San Mateo, San Juan and Cristianitos, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Board that such alteration in temperature does not adversely affect beneficial uses. At no time or place shall the temperature of any COLD water be increased more than 5Â°F above the natural receiving water temperature.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Inland Fishes of California (Moyle 1976) states that for rainbow trout the optimum range for growth and completion of most life stages is 13-21 degrees C (page 129).
Guideline Reference:	
Spatial Representation:	Samples were collected from the CR1 - Upper Cristianitos and CR2 - Cristianitos stations.
Temporal Representation:	Samples were collected approximately once a month from August 2007 to June 2008
Environmental Conditions:	
QAPP Information:	Samples were collected and analyzed in accordance with the Quality Assurance Project Plan For Inland Empire Canyons Baseline Monitoring Project prepared by Orange County Coastkeepers and Inland Empire WaterKeepers dated August 8, 2007.
QAPP Information Reference(s):	

DECISION ID	48371	036761 Region 9
Cristianitos Creek		

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of 13 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 13 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48371, Zinc	**Region 9**
Cristianitos Creek	

LOE ID:	73464
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	13
Number of Exceedances:	0
Data and Information Type:	Non-fixed station physical/chemical (conventional + toxicants)
Data Used to Assess Water Quality:	None of the thirteen samples tested for Zinc exceeded the hardness adjusted CTR criteria.
Data Reference:	Data for Various Pollutants in San Mateo, San Juan and Cristianitos, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Cristianitos Creek at two spatially independent locations which include: CR1 - Upper Cristianitos Creek (above the urban runoff into Cristianitos creek added after rain events established water in the creek) and CR2 - Cristianitos Creek (near the end of Avenida Pico, the Talega housing development).
Temporal Representation:	Samples were collected in 2007 during the months of September, October and November; and in 2008 during the months of January, March and April.
Environmental Conditions:	
QAPP Information:	Samples were collected and analyzed in accordance with the Quality Assurance Project Plan For Inland Empire Canyons Baseline Monitoring Project prepared by Orange County Coastkeepers and Inland Empire WaterKeepers dated August 8, 2007.
QAPP Information Reference(s):	

DECISION ID 48373 Region 9

Cristianitos Creek

Pollutant:	**pH**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line(s) of evidence are necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of 16 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 16 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48373, pH Region 9

Cristianitos Creek

LOE ID:	73459

Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	16
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Numeric data generated from 16 averages of pH had no exceedences.
Data Reference:	Data for Various Pollutants in San Mateo, San Juan and Cristianitos, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The pH of all inland surface waters shall not be depressed below 6.5 or raised above 8.5 as a result of waste discharges.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the CR1 - Upper Cristianitos and CR2 - Cristianitos stations.
Temporal Representation:	Samples were collected approximately once a month from April 2009 to February 2010.
Environmental Conditions:	
QAPP Information:	NPDES quality assurance.
QAPP Information Reference(s):	

DECISION ID **48375** **Region 9**

Cristianitos Creek

Pollutant:	**Cadmium**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2029
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Seven of the thirteen samples exceed the CRITERIA.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Seven of thirteen samples exceed the CRITERIA and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 48375, Cadmium **Region 9**

Cristianitos Creek

LOE ID:	73450
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	13
Number of Exceedances:	7
Data and Information Type:	Non-fixed station physical/chemical (conventional + toxicants)
Data Used to Assess Water Quality:	Seven of the thirteen samples tested for Cadmium exceeded the hardness adjusted CTR criteria.
Data Reference:	Data for Various Pollutants in San Mateo, San Juan and Cristianitos, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. ref2557
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Cristianitos Creek at two spatially independent locations which include: CR1 - Upper Cristianitos Creek (above the urban runoff into Cristianitos creek added after rain events established water in the creek) and CR2 - Cristianitos Creek (near the end of Avenida Pico, the Talega housing development).
Temporal Representation:	Samples were collected in 2007 during the months of September, October and November; and in 2008 during the months of January, March and April.
Environmental Conditions:	
QAPP Information:	Samples were collected and analyzed in accordance with the Quality Assurance Project Plan For Inland Empire Canyons Baseline Monitoring Project prepared by Orange County Coastkeepers and Inland Empire WaterKeepers dated August 8, 2007.
QAPP Information Reference(s):	

DECISION ID **48376** **Region 9**

Cristianitos Creek

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised

Sources:	Source Unknown	036765
Expected TMDL Completion Date:	2025	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.3 of the Listing Policy. Under section 3.3 a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. Data from 2007 to 2010 show that 19 of 32 and 10 of 33 single samples exceed the water quality objectives for enterococcus, E.Coli., and total coliform of single sample maximums of 61 and 235, respectively, for the protection of REC-1.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Data from 2007 to 2010 show that 19 of 32, and10 of 33 single samples exceed the water quality objectives for enterococcus, and E.coli. of single sample maximums of 61 and 235/100ml, respectively, for the protection of REC-1 and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 48376, Indicator Bacteria — Region 9

Cristianitos Creek

LOE ID:	73454
Pollutant:	Escherichia coli (E. coli)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	33
Number of Exceedances:	10
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Ten of the 33 samples exceeded the objective for E. coli.
Data Reference:	Data for Various Pollutants in San Mateo, San Juan and Cristianitos, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The E. coli concentration shall not exceed 235/100 ml Basin Plan Region 9.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from CR1, Cristianitos Creek above the urban runoff into Cristianitos creek and CR2, at Cristianitos creek near the end of Avenida Pico.

	CAR9014000020011025104327 036766
Temporal Representation:	Samples were collected from August 2007 to February 2010.
Environmental Conditions:	
QAPP Information:	This data was collected under the Quality Assurance Project Plan for Inland Empire Canyons Baseline Monitoring Project. qa13
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 48376, Indicator Bacteria **Region 9**

Cristianitos Creek

LOE ID:	73453
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	32
Number of Exceedances:	19
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Nineteen of the 32 samples exceeded the objective for enterococcus.
Data Reference:	Data for Various Pollutants in San Mateo, San Juan and Cristianitos, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The enterococcus concentration shall not exceed 61/100 ml Basin Plan Region 9.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from CR1, Cristianitos Creek above the urban runoff into Cristianitos creek and CR2, at Cristianitos creek near the end of Avenida Pico. CAR9014000020011025104327
Temporal Representation:	Samples were collected from August 2007 to February 2010.
Environmental Conditions:	
QAPP Information:	This data was collected under the Quality Assurance Project Plan for Inland Empire Canyons Baseline Monitoring Project. qa13
QAPP Information Reference(s):	

DECISION ID 48379 **Region 9**

Cristianitos Creek

Pollutant:	**Selenium**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2029
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Seven of the eleven samples exceed the CRITERIA.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Seven of eleven samples exceed the CRITERIA and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 48379, Selenium **Region 9**

Cristianitos Creek

LOE ID:	73460
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	11
Number of Exceedances:	7
Data and Information Type:	Non-fixed station physical/chemical (conventional + toxicants)
Data Used to Assess Water Quality:	Seven of the 11 samples tested for Selenium exceeded the CTR criteria of 0.005 mg/L.
Data Reference:	Data for Various Pollutants in San Mateo, San Juan and Cristianitos, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The CTR criteria for selenium is 0.005 mg/L or 5 ug/L.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Cristianitos Creek at two spatially independent locations which include: CR1 - Upper Cristianitos Creek (above the urban runoff into Cristianitos creek added after rain events established water in the creek) and CR2 - Cristianitos Creek (near the end of Avenida Pico, the Talega housing development).
Temporal Representation:	Samples were collected in 2007 during the months of September, October and November; and in 2008 during the months of January, March and April.
Environmental Conditions:	
QAPP Information:	Samples were collected and analyzed in accordance with the Quality Assurance Project Plan For Inland Empire Canyons Baseline Monitoring Project prepared by Orange County Coastkeepers and Inland Empire WaterKeepers dated August 8, 2007.
QAPP Information Reference(s):	

DECISION ID	48380	Region 9
Cristianitos Creek		

Pollutant:	**Silver**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of 11 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 11 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48380, Silver	**Region 9**
Cristianitos Creek	

LOE ID:	73461
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	11
Number of Exceedances:	0
Data and Information Type:	Non-fixed station physical/chemical (conventional + toxicants)
Data Used to Assess Water Quality:	All samples were reported as non-detect.
Data Reference:	Data for Various Pollutants in San Mateo, San Juan and Cristianitos, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36

	(section 131.36 revised at 57 FR 60848, December 22, 1992).	036769
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion maximum concentrations for silver to protect aquatic life in freshwater (1-hour average). The silver criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used. ref2557	
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Spatial Representation:	Samples were collected from Cristianitos Creek at two spatially independent locations which include: CR1 - Upper Cristianitos Creek (above the urban runoff into Cristianitos creek added after rain events established water in the creek) and CR2 - Cristianitos Creek (near the end of Avenida Pico, the Talega housing development).	
Temporal Representation:	Samples were collected in 2007 during the months of September, October and November; and in 2008 during the months of January, March and April.	
Environmental Conditions:		
QAPP Information:	Samples were collected and analyzed in accordance with the Quality Assurance Project Plan For Inland Empire Canyons Baseline Monitoring Project prepared by Orange County Coastkeepers and Inland Empire WaterKeepers dated August 8, 2007.	
QAPP Information Reference(s):		

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Santa Margarita River (Lower)
Water Body ID: CAR9021100019980911161346
Water Body Type: River & Stream

DECISION ID 43092 **Region 9**
Santa Margarita River (Lower)

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal from the CWA section 303(d) List under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Five of the Nine samples exceed the Water Quality Objective for REC-1 Beneficial Use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Five of Nine samples exceeded the Water Quality Objective for REC-1 Beneficial Use and this exceeds the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 43092, Indicator Bacteria **Region 9**
Santa Margarita River (Lower)

LOE ID:	76465
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Non-Contact Recreation

Number of Samples:	4	036771
Number of Exceedances:	0	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Coliform, Fecal.	
Data Reference:	Data for Various Pollutants from Bight, 2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	In waters designated for non contact recreation (REC 2), the fecal coliform concentration shall not exceed 4000 MPN/100 ml (Basin Plan).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 4 monitoring sites [Santa Margarita Estuary, Santa Margarita Estuary, Santa Margarita Estuary, Santa Margarita Estuary]	
Temporal Representation:	Data was collected on a single day 8/29/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.	

Line of Evidence (LOE) for Decision ID 43092, Indicator Bacteria **Region 9**

Santa Margarita River (Lower)

LOE ID:	76464
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Coliform, Fecal.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the fecal coliform concentration shall not exceed 400 MPN/100 ml.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 4 monitoring sites [Santa Margarita Estuary, Santa Margarita Estuary, Santa Margarita Estuary, Santa Margarita Estuary]
Temporal Representation:	Data was collected on a single day 8/29/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.

QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.	036772

Line of Evidence (LOE) for Decision ID 43092, Indicator Bacteria **Region 9**

Santa Margarita River (Lower)

LOE ID:	76463
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Enterococci.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Samples shall not exceed 61 organisms per 100 ml for enterococcus in waters designated for REC I beneficial use (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 4 monitoring sites [Santa Margarita Estuary, Santa Margarita Estuary, Santa Margarita Estuary, Santa Margarita Estuary]
Temporal Representation:	Data was collected on a single day 8/29/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 43092, Indicator Bacteria **Region 9**

Santa Margarita River (Lower)

LOE ID:	7504
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	5
Number of Exceedances:	5
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	All five samples collected exceed the water quality objective according to resuls in the San Diego County Municipal Copermittees Annual Progress Report, 2007. Samples were collected one to two times a year from 2001 - 2006, with the exception of the 2004-2005 monitoring year.
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No more than 10% of the samples during any 30-day period for waters designated for contact recreation shall exceed 400 colonies per 100 ml (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at the mass loading station located near the lower boundary of the watershed on Camp Pendleton under the Basilone Road Bridge.
Temporal Representation:	Samples were collected one to two times a year from 2001 - 2006, with the exception of the 2004-2005 monitoring year.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43092, Indicator Bacteria **Region 9**

Santa Margarita River (Lower)

LOE ID:	7503
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	5
Number of Exceedances:	5
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	All five samples collected exceed the water quality objective according to results in the San Diego County Municipal Copermittees Annual Progress Report, 2007. Samples were collected one to two times a year from 2001 - 2006, with the exception of the 2004-2005 monitoring year.
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, the bacteriological criteria for enterococcus sets a maximum limit at 61 colonies per 100mL (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the mass loading station located near the lower boundary of the watershed on Camp Pendleton under the Basilone Road Bridge.
Temporal Representation:	Samples were collected one to two times a year from 2001 - 2006, with the exception of the 2004-2005 monitoring year.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43092, Indicator Bacteria **Region 9**

Santa Margarita River (Lower)

LOE ID:	76542
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxicsubstances in concentrations which are toxic to,or which produce detrimental physiologicalresponses in human, plant, animal, or indigenousaquatic life (Basin Plan).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In waters designated for water contact recreation (REC I), the total coliform concentration shall not exceed 10000 MPN/100 ml (CDPH 2006).
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 4 monitoring sites [Santa Margarita Estuary, Santa Margarita Estuary, Santa Margarita Estuary, Santa Margarita Estuary]
Temporal Representation:	Data was collected on a single day 8/29/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID	**47505**	**Region 9**
Santa Margarita River (Lower)		

Pollutant:	**2-Methylnaphthalene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the four samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the four samples exceed the water quality objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47505, 2-Methylnaphthalene **Region 9**

Santa Margarita River (Lower)

LOE ID:	78321
Pollutant:	2-Methylnaphthalene
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for 2-Methylnaphthalene.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for 2-Methylnaphthalene is 201.28 ng/g dry weight (MacDonald et al., 1996).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 4 monitoring sites [902_6317, 902_6303, 902_6311, 902_6314]
Temporal Representation:	Data was collected on a single day 8/29/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID 47438 **Region 9**

Santa Margarita River (Lower)

Pollutant:	**Antimony**	036776
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	
Last Listing Cycle's Final Listing Decision:	New Decision	
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary, and under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of four samples (sediment) and zero of six samples (water) exceeded the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of four samples (sediment) and zero of six samples (water) exceeded the water quality objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 47438, Antimony **Region 9**

Santa Margarita River (Lower)

LOE ID:	78322
Pollutant:	Antimony
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Antimony.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.

Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	036777
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Antimony is 25 ug/g dry weight (Long and Morgan, 1990).	
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 4 monitoring sites [902_6317, 902_6303, 902_6311, 902_6314]	
Temporal Representation:	Data was collected on a single day 8/29/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.	

Line of Evidence (LOE) for Decision ID 47438, Antimony **Region 9**

Santa Margarita River (Lower)

LOE ID:	77838
Pollutant:	Antimony
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Antimony.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for antimony is .006 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 1 monitoring site [Santa Margarita River - 902SMR-MLS]
Temporal Representation:	Data was collected over the time period 11/29/2001-2/28/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was used.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID 47437 **Region 9**

Santa Margarita River (Lower)

Pollutant:	**Arsenic**	036778
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	
Last Listing Cycle's Final Listing Decision:	New Decision	
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary, and under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of sediment evidence and two lines of water evidence are available in the administrative record to assess this pollutant. Zero of five samples (sediment) and zero of six samples (water) exceeded the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of five samples (sediment) and zero of six samples (water) exceeded water quality objectives and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47437, Arsenic **Region 9**

Santa Margarita River (Lower)

LOE ID:	78323
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Arsenic.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be

	maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Arsenic is 70 ug/g dry weight (Long et al., 1995).
Guideline Reference:	Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuary sediments. Environmental Management. 19, (1): 81-97
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 4 monitoring sites [902_6317, 902_6303, 902_6311, 902_6314]
Temporal Representation:	Data was collected on a single day 8/29/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 47437, Arsenic **Region 9**

Santa Margarita River (Lower)

LOE ID:	77840
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Arsenic.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The dissolved arsenic criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved arsenic is 0.150 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 1 monitoring site [Santa Margarita River - 902SMR-MLS]
Temporal Representation:	Data was collected over the time period 11/29/2001-2/28/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was used.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 47437, Arsenic **Region 9**

Santa Margarita River (Lower) 036780

LOE ID:	76470
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Preservation of Rare & Endangered Species
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for arsenic is 33 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 1 monitoring site [Santa Margarita at Basilone Rd - 902SSMR07]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the 2002 QAMP.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 47437, Arsenic **Region 9**

Santa Margarita River (Lower)

LOE ID:	77841
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Arsenic.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for arsenic is 0.01 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 1 monitoring site [Santa Margarita River - 902SMR-MLS]
Temporal Representation:	Data was collected over the time period 11/29/2001-2/28/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was used.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID 47507 — Region 9

Santa Margarita River (Lower)

Pollutant:	**Benzo(a)anthracene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of the four samples exceed the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the four samples exceed the water quality objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47507, Benzo(a)anthracene — Region 9

Santa Margarita River (Lower) 036782

LOE ID:	78324
Pollutant:	Benzo(a)anthracene
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Benzo(a)anthracene.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for Benzo(a)anthracene is 692.53 ng/g dry weight (MacDonald et al., 1996).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 4 monitoring sites [902_6317, 902_6303, 902_6311, 902_6314]
Temporal Representation:	Data was collected on a single day 8/29/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID **47518** **Region 9**

Santa Margarita River (Lower)

Pollutant:	**Bifenthrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status. One lines of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeded the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that: 036783
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47518, Bifenthrin **Region 9**

Santa Margarita River (Lower)

LOE ID:	76472
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Preservation of Rare & Endangered Species
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Bifenthrin.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for bifenthrin is the median lethal concentration (LC50) of 0.43 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 0.43 ug/g is the geometric mean of LC50 values for bifenthrin from Amweg et al. (2005) and Amweg and Weston (2007).
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5 Whole-sediment toxicity identification evaluation tools for pyrethroid insecticides: I. piperonyl butoxide addition. Environ. Toxicol. Chem. 26:2389-2396.
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 1 monitoring site [Santa Margarita at Basilone Rd - 902SSMR07]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID	47361	036784 Region 9
Santa Margarita River (Lower)		

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary, and under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence for sediment and two lines of evidence for water are available in the administrative record to assess this pollutant. Zero of four samples (sediment) and zero of six samples (water) exceeded the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of four samples (sediment) and zero of six samples (water) exceeded the water quality objective and these sample sizes are insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47361, Cadmium	**Region 9**
Santa Margarita River (Lower)	

LOE ID:	76474
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Cadmium.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works

	Watershed Protection Program, 2001-2008. 036785
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Cadmium to protect aquatic life in freshwater. The dissolved Cadmium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 1 monitoring site [Santa Margarita River - 902SMR-MLS]
Temporal Representation:	Data was collected 11/29/2001-02/28/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 47361, Cadmium **Region 9**

Santa Margarita River (Lower)

LOE ID:	77844
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Preservation of Rare & Endangered Species
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Cadmium.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Cadmium to protect aquatic life in freshwater. The dissolved Cadmium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 1

	monitoring site [Santa Margarita River - 902SMR-MLS] 036786
Temporal Representation:	Data was collected over the time period 11/29/2001-2/28/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was used.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 47361, Cadmium **Region 9**

Santa Margarita River (Lower)

LOE ID:	77845
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Cadmium.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for cadmium is 0.005 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 1 monitoring site [Santa Margarita River - 902SMR-MLS]
Temporal Representation:	Data was collected over the time period 11/29/2001-2/28/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was used.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 47361, Cadmium **Region 9**

Santa Margarita River (Lower)

LOE ID:	78325
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total

Beneficial Use:	Estuarine Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Cadmium.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for Cadmium is 4.21 ng/g dry weight (MacDonald et al., 1996).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 4 monitoring sites [902_6317, 902_6303, 902_6311, 902_6314]
Temporal Representation:	Data was collected on a single day 8/29/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 47361, Cadmium **Region 9**

Santa Margarita River (Lower)

LOE ID:	76473
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Preservation of Rare & Endangered Species
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for cadmium is 4.98 mg/Kg dry weight (MacDonald et al. 2000).

Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 1 monitoring site [Santa Margarita at Basilone Rd - 902SSMR07]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the 2002 QAMP.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

036788

DECISION ID 47435 Region 9

Santa Margarita River (Lower)

Pollutant:	**Chlordane**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the five samples exceed the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the five samples exceed the water quality objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47435, Chlordane Region 9

Santa Margarita River (Lower)

LOE ID:	72833
Pollutant:	Chlordane
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total

Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	0 of 1 samples collected exceeded the criteria for chlordane concentration (Sum of trans-Chlordane, cis-Chlordane, cis-Nonachlor, trans-Nonachlor, and Oxychlordane).
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Waters shall not contain substances in concentrations that result in the deposition of material that causes nuisance or adversely affects beneficial uses. (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Probable Effect Concentration for Chlordane in freshwater sediments is 17.6 ug/kg(MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data were collected at the following station 902SSMR07 (Santa Margarita at Basilone Rd).
Temporal Representation:	The samples were collected on 5/21/2008.
Environmental Conditions:	
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47435, Chlordane **Region 9**

Santa Margarita River (Lower)

LOE ID:	78326
Pollutant:	Chlordane
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Chlordane, Total.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Total Chlordane is 6 ng/g dry weight (Long and Morgan, 1990).

Guideline Reference:	The potential for biological effects of sediment-sorbed contaminants tested in the National Status of Trends Program. NOAA Technical Memorandum NOS OMA 52. Seattle, WA: National Oceanic and Atmospheric Administration
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 4 monitoring sites [902_6317, 902_6303, 902_6311, 902_6314]
Temporal Representation:	Data was collected on a single day 8/29/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

036790

DECISION ID 47362 Region 9

Santa Margarita River (Lower)

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary, and under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Three lines of evidence are available in the administrative record to assess this pollutant. Zero of four samples (sediment) and zero of one sample (water) exceeded the water quality objective. Two lines of evidence (sediment) are available in the administrative record to assess this pollutant. Zero of the five sediment samples exceed the water quality objective, and one line of evidence (water) is available in the administrative record to assess this pollutant. Zero of the five sediment samples exceeded the water quality objectives, and zero of one sample exceeded the water quality objectives. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of four samples (sediment) and zero of one sample (water) exceeded the water quality objectives and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47362, Chromium Region 9

Santa Margarita River (Lower)

LOE ID: 76476

Pollutant:	Chromium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Preservation of Rare & Endangered Species
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for chromium is 111 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 1 monitoring site [Santa Margarita at Basilone Rd - 902SSMR07]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the 2002 QAMP.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 47362, Chromium **Region 9**

Santa Margarita River (Lower)

LOE ID:	78328
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Chromium.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be

	maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Chromium is 370 ug/g dry weight (Long et al., 1995).
Guideline Reference:	Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuary sediments. Environmental Management. 19, (1): 81-97
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 4 monitoring sites [902_6317, 902_6303, 902_6311, 902_6314]
Temporal Representation:	Data was collected on a single day 8/29/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 47362, Chromium **Region 9**

Santa Margarita River (Lower)

LOE ID:	76477
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved chromium to protect aquatic life in freshwater. The dissolved Chromium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 1 monitoring site [Santa Margarita River - 902SMR-MLS]
Temporal Representation:	Data was collected on a single day 11/29/2001.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID **47436** **Region 9**

Santa Margarita River (Lower)

Pollutant:	**Chrysene (C1-C4)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status.

One lines of evidence is available in the administrative record to assess this pollutant. zero of the four samples exceed the water quality objective

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of four samples exceeded the water quality objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47436, Chrysene (C1-C4) **Region 9**

Santa Margarita River (Lower)

LOE ID:	78332
Pollutant:	Chrysene (C1-C4)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Chrysene.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for Chrysene is 845.98 ng/g dry weight (MacDonald et al., 1996).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 4 monitoring sites [902_6317, 902_6303, 902_6311, 902_6314]
Temporal Representation:	Data was collected on a single day 8/29/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID 47442 Region 9

Santa Margarita River (Lower)

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary, and under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Four lines of evidence are available in the administrative record to assess this pollutant. Zero of five samples (sediment) and one of six samples (water) exceeded the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of five samples (sediment) and one of six samples (water) exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47442, Copper Region 9

Santa Margarita River (Lower)

LOE ID:	76478
Pollutant:	Copper
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Preservation of Rare & Endangered Species
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for copper is 149 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 1 monitoring site [Santa Margarita at Basilone Rd - 902SSMR07]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the 2002 QAMP.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 47442, Copper **Region 9**

Santa Margarita River (Lower)

LOE ID:	77853
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Copper.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.

SWAMP Data:	Non-SWAMP	036796
Water Quality Objective/Criterion:	The California Secondary MCL for copper is 1.0 mg/L (Title 22 California Code of Regulations).	
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 1 monitoring site [Santa Margarita River - 902SMR-MLS]	
Temporal Representation:	Data was collected over the time period 11/29/2001-2/28/2006.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was used.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.	

Line of Evidence (LOE) for Decision ID 47442, Copper **Region 9**

Santa Margarita River (Lower)

LOE ID:	77852
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 1 of 6 samples exceed the criterion for Copper.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Copper to protect aquatic life in freshwater. The dissolved Copper criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 1 monitoring site [Santa Margarita River - 902SMR-MLS]
Temporal Representation:	Data was collected over the time period 11/29/2001-2/28/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was used.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban

Line of Evidence (LOE) for Decision ID 47442, Copper **Region 9**

Santa Margarita River (Lower)

LOE ID:	78333
Pollutant:	Copper
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Copper.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Copper is 270 ug/g dry weight (Long et al., 1995).
Guideline Reference:	Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuary sediments. Environmental Management. 19, (1): 81-97
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 4 monitoring sites [902_6317, 902_6303, 902_6311, 902_6314]
Temporal Representation:	Data was collected on a single day 8/29/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID **47519** **Region 9**

Santa Margarita River (Lower)

Pollutant:	**Cyfluthrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of one

sample exceed the objective. 036798

Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47519, Cyfluthrin **Region 9**

Santa Margarita River (Lower)

LOE ID:	77855
Pollutant:	Cyfluthrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Preservation of Rare & Endangered Species
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cyfluthrin, total.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for cyfluthrin is the median lethal concentration (LC50) of 1.1 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 1.1 ug/g is the geometric mean of LC50 values for cyfluthrin from Amweg et al. (2005).
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 1 monitoring site [Santa Margarita at Basilone Rd - 902SSMR07]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP.

DECISION ID	47525	Region 9
Santa Margarita River (Lower)		

Pollutant:	**Cyhalothrin, Lambda**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47525, Cyhalothrin, Lambda	**Region 9**
Santa Margarita River (Lower)	

LOE ID:	77856
Pollutant:	Cyhalothrin, Lambda
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Preservation of Rare & Endangered Species
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cyhalothrin, lambda, total.
Data Reference:	Statewide Stream Pollution Trends Study 2008

SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for lambda-cyhalothrin is the median lethal concentration (LC50) of 0.44 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 0.44 ug/g is the geometric mean of LC50 values for lambda-cyhalothrin from Amweg et al. (2005).
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 1 monitoring site [Santa Margarita at Basilone Rd - 902SSMR07]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **47528** **Region 9**

Santa Margarita River (Lower)

Pollutant:	**Cypermethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47528, Cypermethrin **Region 9**

Santa Margarita River (Lower)

LOE ID:	77857
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Preservation of Rare & Endangered Species
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cypermethrin, total.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for cypermethrin is the median lethal concentration (LC50) of 0.3 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 0.3 ug/g is the geometric mean of LC50 values for cypermethrin from Maund et al. (2002).
Guideline Reference:	Partitioning, bioavailability, and toxicity of the pyrethroid insecticide cypermethrin in sediments. Environmental Toxicology and Chemistry 21:9-15
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 1 monitoring site [Santa Margarita at Basilone Rd - 902SSMR07]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **47531** **Region 9**

Santa Margarita River (Lower)

Pollutant:	**DDD (Dichlorodiphenyldichloroethane)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47531, DDD (Dichlorodiphenyldichloroethane) Region 9

Santa Margarita River (Lower)

LOE ID:	76480
Pollutant:	DDD (Dichlorodiphenyldichloroethane)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Preservation of Rare & Endangered Species
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for DDD.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for sum of DDD (o,p' + p,p') is 28.0 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 1 monitoring site [Santa Margarita at Basilone Rd - 902SSMR07]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP.

DECISION ID	47532	Region 9
Santa Margarita River (Lower)		

Pollutant:	**DDE (Dichlorodiphenyldichloroethylene)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47532, DDE (Dichlorodiphenyldichloroethylene)	**Region 9**
Santa Margarita River (Lower)	

LOE ID:	76481
Pollutant:	DDE (Dichlorodiphenyldichloroethylene)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Preservation of Rare & Endangered Species
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for DDE.
Data Reference:	Statewide Stream Pollution Trends Study 2008

SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for sum of DDE (o,p' + p,p') is 31.3 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 1 monitoring site [Santa Margarita at Basilone Rd - 902SSMR07]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID 47534 Region 9

Santa Margarita River (Lower)

Pollutant:	**DDT (Dichlorodiphenyltrichloroethane)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47534, DDT (Dichlorodiphenyltrichloroethane) Region 9

Santa Margarita River (Lower) 036805

LOE ID:	76482
Pollutant:	DDT (Dichlorodiphenyltrichloroethane)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Preservation of Rare & Endangered Species
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for DDT.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for sum of DDT (o,p' + p,p') is 62.9 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 1 monitoring site [Santa Margarita at Basilone Rd - 902SSMR07]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **47536** **Region 9**

Santa Margarita River (Lower)

Pollutant:	**Deltamethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is

insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47536, Deltamethrin **Region 9**

Santa Margarita River (Lower)

LOE ID:	77858
Pollutant:	Deltamethrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Preservation of Rare & Endangered Species
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Deltamethrin.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for deltamethrin is the median lethal concentration (LC50) of 0.79 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 0.79 ug/g is the geometric mean of LC50 values for deltamethrin from Amweg et al. (2005).
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 1 monitoring site [Santa Margarita at Basilone Rd - 902SSMR07]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **47564** **Region 9**

Santa Margarita River (Lower)

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary, and under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Three lines of evidence is available in the administrative record to assess this pollutant. Zero of one sample (sediment) and zero of three samples (water) exceeded the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample (sediment) and zero of three samples (water) exceeded the water quality objective and these sample sizes are insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47564, Diazinon **Region 9**

Santa Margarita River (Lower)

LOE ID:	77831
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Preservation of Rare & Endangered Species
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Diazinon.
Data Reference:	Statewide Stream Pollution Trends Study 2008

SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for diazinon is the median lethal concentration (LC50) of 11 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 11 ug/g is the geometric mean of LC50 values for diazinon from Ding et al. (2011).
Guideline Reference:	Toxicity of Sediment-Associated Pesticides to Chironomus dilutus and Hyalella azteca. Arch. Environ. Contam. Toxicol. 61:83Â–92.
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 1 monitoring site [Santa Margarita at Basilone Rd - 902SSMR07]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 47564, Diazinon **Region 9**

Santa Margarita River (Lower)

LOE ID:	77834
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Diazinon. Three of the six samples could not be used in this assessment because they lacked sufficiently sensitive methods.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Department of Public Health (CDPH) Notification Level for Diazinon is 1.2 ug/L.
Guideline Reference:	2011 Edition of the Drinking Water Standards and Health Advisories
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 1 monitoring site [Santa Margarita River - 902SMR-MLS]
Temporal Representation:	Data was collected over the time period 11/29/2001-2/28/2006.

Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was used.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 47564, Diazinon **Region 9**

Santa Margarita River (Lower)

LOE ID:	77832
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Diazinon. Three of the six samples could not be used in this assessment because they lacked sufficiently sensitive methods.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 1 monitoring site [Santa Margarita River - 902SMR-MLS]
Temporal Representation:	Data was collected over the time period 11/29/2001-2/28/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was used.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID 47537 **Region 9**

Santa Margarita River (Lower)

Pollutant: Dibenz[a,h]anthracene

Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	036810
Last Listing Cycle's Final Listing Decision:	New Decision	
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of four samples exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of four samples exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47537, Dibenz[a,h]anthracene **Region 9**

Santa Margarita River (Lower)

LOE ID:	78307
Pollutant:	Dibenz[a,h]anthracene
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Dibenzo(a, h)anthracene.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Dibenzo(a, h)anthracene is 260 ng/g dry weight (Long et al., 1995).
Guideline Reference:	Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuary sediments. Environmental Management. 19, (1): 81-97
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 4 monitoring sites [902_6317, 902_6303, 902_6311, 902_6314]
Temporal Representation:	Data was collected on a single day 8/29/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID 47538 Region 9

Santa Margarita River (Lower)

Pollutant:	**Dieldrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47538, Dieldrin Region 9

Santa Margarita River (Lower)

LOE ID:	76461
Pollutant:	Dieldrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total

Beneficial Use:	Preservation of Rare & Endangered Species
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Dieldrin.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for dieldrin is 61.8 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 1 monitoring site [Santa Margarita at Basilone Rd - 902SSMR07]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the 2002 QAMP.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **47543** **Region 9**

Santa Margarita River (Lower)

Pollutant:	**Endrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the two samples exceed the objective. Zero of two samples exhibited sediment toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the two samples exceed the objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum

of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.3
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47543, Endrin **Region 9**

Santa Margarita River (Lower)

LOE ID:	76462
Pollutant:	Endrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Preservation of Rare & Endangered Species
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Endrin.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for endrin is 207 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 1 monitoring site [Santa Margarita at Basilone Rd - 902SSMR07]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the 2002 QAMP.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 47543, Endrin **Region 9**

Santa Margarita River (Lower)

LOE ID:	78310
Pollutant:	Endrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total

Beneficial Use:	Estuarine Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: a total of 5 samples were collected and they were all non-detect, however 3 samples were not used in analysis because when the method detection limit was organic carbon normalized, the results were above the guideline and therefore could not be quanitified with the level of certainty required by the Listing Policy.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the sediment quality guideline (predictive of sediment toxicity for sediment-dwelling organisms) for Endrin is 0.76 ug/g oc (Fairey et al., 2001).
Guideline Reference:	Technical basis for deriving sediment criteria for nonionic organic contaminants for the protection of benthic organisms by using equilibrium partitioning. EPA822-R-93-011. Washington, D.C.: Office of Water, USEPA
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 4 monitoring sites [902_6317, 902_6303, 902_6311, 902_6314]
Temporal Representation:	Data was collected on a single day 8/29/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID	**47544**	**Region 9**
Santa Margarita River (Lower)		

Pollutant:	**Esfenvalerate/Fenvalerate**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.

3. Zero of one sample exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47544, Esfenvalerate/Fenvalerate **Region 9**

Santa Margarita River (Lower)

LOE ID:	77835
Pollutant:	Esfenvalerate/Fenvalerate
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Preservation of Rare & Endangered Species
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Esfenvalerate/Fenvalerate, total.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for esfenvalerate/fenvalerate is the median lethal concentration (LC50) of 1.5 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 1.5 ug/g is the geometric mean of LC50 values for esfenvalerate/fenvalerate from Amweg et al. (2005).
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 1 monitoring site [Santa Margarita at Basilone Rd - 902SSMR07]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **47545** **Region 9**

Santa Margarita River (Lower)

Pollutant: **Fenpropathrin**

Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	036816
Last Listing Cycle's Final Listing Decision:	New Decision	
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47545, Fenpropathrin **Region 9**

Santa Margarita River (Lower)

LOE ID:	77836
Pollutant:	Fenpropathrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Preservation of Rare & Endangered Species
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Fenpropathrin.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	The evaluation guideline for fenpropathrin is the median lethal concentration (LC50) of 1 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 1 ug/g is the geometric mean of LC50 values for fenpropathrin from Ding et al. (2011).
Guideline Reference:	Toxicity of Sediment-Associated Pesticides to Chironomus dilutus and Hyalella azteca. Arch. Environ. Contam. Toxicol. 61:83Â–92.
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 1 monitoring site [Santa Margarita at Basilone Rd - 902SSMR07]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID 47434 Region 9

Santa Margarita River (Lower)

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary, and under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of four samples (sediment) and zero of one sample (water) exceeded the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of four samples (sediment) and zero of one sample (water) exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47434, Lead Region 9

Santa Margarita River (Lower)

LOE ID:	78314

Pollutant:	Lead
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Lead.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for Lead is 112.18 ug/g dry weight (MacDonald et al., 1996).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 4 monitoring sites [902_6317, 902_6303, 902_6311, 902_6314]
Temporal Representation:	Data was collected on a single day 8/29/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 47434, Lead **Region 9**

Santa Margarita River (Lower)

LOE ID:	76466
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved lead to

	protect aquatic life in freshwater. The dissolved lead criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 1 monitoring site [Santa Margarita River - 902SMR-MLS]
Temporal Representation:	Data was collected on a single day 11/29/2001.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID	**47552**	**Region 9**
Santa Margarita River (Lower)		

Pollutant:	**Lindane/gamma Hexachlorocyclohexane (gamma-HCH)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the two samples exceed the objective. Zero of five samples exhibited sediment toxicity. Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the five samples exceed the objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47552, Lindane/gamma Hexachlorocyclohexane (gamma-HCH)	**Region 9**

Santa Margarita River (Lower) 036820

LOE ID:	77837
Pollutant:	Lindane/gamma Hexachlorocyclohexane (gamma-HCH)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Preservation of Rare & Endangered Species
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for HCH, gamma.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for Lindane (gamma-HCH) is 4.99 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 1 monitoring site [Santa Margarita at Basilone Rd - 902SSMR07]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the 2002 QAMP.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 47552, Lindane/gamma Hexachlorocyclohexane (gamma-HCH) **Region 9**

Santa Margarita River (Lower)

LOE ID:	78317
Pollutant:	Lindane/gamma Hexachlorocyclohexane (gamma-HCH)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for HCH, Gamma.
Data Reference:	Data for Various Pollutants from Bight, 2008.

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the sediment quality guideline (predictive of sediment toxicity for sediment-dwelling organisms) for HCH, gamma(Lindane; BHC, gamma) is 0.37 ug/g oc (Fairey et al., 2001).
Guideline Reference:	An evaluation of methods for calculating mean sediment quality guideline quotients as indicators of contamination and acute toxicity to amphipods by chemical mixtures. Environmental Toxicology and Chemistry. 20(10): 2276-2286
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 4 monitoring sites [902_6317, 902_6303, 902_6311, 902_6314]
Temporal Representation:	Data was collected on a single day 8/29/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID	33317	Region 9
Santa Margarita River (Lower)		

Pollutant:	**Mercury**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary, and under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Three lines of evidence are available in the administrative record to assess this pollutant. Zero of four samples (sediment) and Zero of four samples (tissue) exceeded the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of four samples (sediment) and zero of four samples (tissue) exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 33317, Mercury **Region 9**

Santa Margarita River (Lower)

LOE ID:	78318
Pollutant:	Mercury
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Mercury.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the sediment quality guideline (predictive of sediment toxicity for sediment-dwelling organisms) for Mercury is 2.1 ug/g (PTI Environmental Services, 1991).
Guideline Reference:	Pollutants of concern in Puget Sound. EPA 910/9-91-003. Seattle, WA: U.S. Environmental Protection Agency
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 4 monitoring sites [902_6317, 902_6303, 902_6311, 902_6314]
Temporal Representation:	Data was collected on a single day 8/29/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 33317, Mercury **Region 9**

Santa Margarita River (Lower)

LOE ID:	76467
Pollutant:	Mercury
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Preservation of Rare & Endangered Species
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Mercury.

Data Reference:	Statewide Stream Pollution Trends Study 2008	036823
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for mercury is 1.06 mg/Kg dry weight (MacDonald et al. 2000).	
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 1 monitoring site [Santa Margarita at Basilone Rd - 902SSMR07]	
Temporal Representation:	Data was collected on a single day 5/21/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	SWAMP data collected before September 2008 followed the 2002 QAMP.	
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)	

Line of Evidence (LOE) for Decision ID 33317, Mercury **Region 9**

Santa Margarita River (Lower)

LOE ID:	3012
Pollutant:	Mercury
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Total
Beneficial Use:	Agricultural Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	None of 4 samples for mercury in fish tissue taken exceeded the screening value. (TSMP, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	OEHHA screening value for mercury 0.3 mg/kg (ppm).
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Lower Santa Margarita River.
Temporal Representation:	Samples were taken between March 1979 and August 1999.
Environmental Conditions:	
QAPP Information:	CFCP 1998 Year 1 QA Summary Pesticides and PCBs. California Department of Fish and Game. CDFG Fish and Wildlife Water Pollution Control Laboratory Data Quality Assurance Report. 1999 Coastal Fish Contamination Program (CFCP Year 2). California Department of Fish and Game.
QAPP Information Reference(s):	

DECISION ID **47546** **Region 9**

Santa Margarita River (Lower)

Pollutant:	**Methyl Parathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47546, Methyl Parathion **Region 9**

Santa Margarita River (Lower)

LOE ID:	77912
Pollutant:	Methyl Parathion
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Preservation of Rare & Endangered Species
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Parathion, Methyl.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP

Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for methyl parathion is the median lethal concentration (LC50) of 6 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 6 ug/g is the geometric mean of LC50 values for methyl parathion from Ding et al. (2011).
Guideline Reference:	Toxicity of Sediment-Associated Pesticides to Chironomus dilutus and Hyalella azteca. Arch. Environ. Contam. Toxicol. 61:83Â–92.
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 1 monitoring site [Santa Margarita at Basilone Rd - 902SSMR07]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID	47565	Region 9
Santa Margarita River (Lower)		

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary, and under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Three lines of evidence is available in the administrative record to assess this pollutant. Zero of one sample (sediment) and zero of six samples (water) exceeded the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample (sediment) and zero of seven samples (water) exceeded the water quality objective and these sample sizes are insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47565, Nickel — Region 9

Santa Margarita River (Lower)

LOE ID:	77865
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Nickel.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Nickel to protect aquatic life in freshwater. The dissolved Nickel criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 1 monitoring site [Santa Margarita River - 902SMR-MLS]
Temporal Representation:	Data was collected over the time period 11/29/2001-2/28/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was used.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 47565, Nickel — Region 9

Santa Margarita River (Lower)

LOE ID:	76622
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Preservation of Rare & Endangered Species
Number of Samples:	1
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING 036827
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for nickel is 48.6 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 1 monitoring site [Santa Margarita at Basilone Rd - 902SSMR07]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the 2002 QAMP.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 47565, Nickel **Region 9**

Santa Margarita River (Lower)

LOE ID:	77862
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Nickel.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Nickel to protect aquatic life in freshwater. The dissolved Nickel criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 1

	monitoring site [Santa Margarita River - 902SMR-MLS] 036828
Temporal Representation:	Data was collected over the time period 11/29/2001-2/28/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was used.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 47565, Nickel **Region 9**

Santa Margarita River (Lower)

LOE ID:	77863
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Nickel.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nickel is 0.1 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 1 monitoring site [Santa Margarita River - 902SMR-MLS]
Temporal Representation:	Data was collected over the time period 11/29/2001-2/28/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was used.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID 47567 **Region 9**

Santa Margarita River (Lower)

Pollutant:	**Nitrate/Nitrite (Nitrite + Nitrate as N)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised

Impairment from Pollutant or Pollution:	Pollutant	036829
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the six samples exceed the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of six samples exceeded the water quality objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples iare needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.	
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.	

Line of Evidence (LOE) for Decision ID 47567, Nitrate/Nitrite (Nitrite + Nitrate as N) **Region 9**

Santa Margarita River (Lower)

LOE ID:	77867
Pollutant:	Nitrate/Nitrite (Nitrite + Nitrate as N)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Nitrate/Nitrite as N.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrate + nitrite (as N) is 10.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 1 monitoring site [Santa Margarita River - 902SMR-MLS]

Temporal Representation:	Data was collected over the time period 11/29/2001-2/28/2006. 036830
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was used.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID 47568 Region 9

Santa Margarita River (Lower)

Pollutant:	**Nitrogen, Nitrite**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the six samples exceed the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of six samples exceeded the water quality objective and this sample size is insufficient to determine with the power and confidence of the listing policy the applicable beneficial use support rating. A minimum of 16 samples are needed to determine if a beneficial use is fully supported using Table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47568, Nitrogen, Nitrite Region 9

Santa Margarita River (Lower)

LOE ID:	77868
Pollutant:	Nitrogen, Nitrite
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Nitrite as N.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrite (as N) is 1.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 1 monitoring site [Santa Margarita River - 902SMR-MLS]
Temporal Representation:	Data was collected over the time period 11/29/2001-2/28/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was used.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID	**47558**	**Region 9**
Santa Margarita River (Lower)		

Pollutant:	**PAHs (Polycyclic Aromatic Hydrocarbons)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the four samples exceed the evaluation guideline for total PAHs, Zero of four samples exceeded the evaluation guideline for low molecular weight PAhs, and zero of four samples exceeded the evaluation guideline for high molecular weight PAHs.

Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the 4 samples exceed the objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47558, PAHs (Polycyclic Aromatic Hydrocarbons) **Region 9**

Santa Margarita River (Lower)

LOE ID:	78342
Pollutant:	PAHs (Polycyclic Aromatic Hydrocarbons)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for PAH, Low molecular weight.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Low molecular weight PAHs is 1442 ng/g dry weight (Long et al., 1995).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 4 monitoring sites [902_6317, 902_6303, 902_6311, 902_6314]
Temporal Representation:	Data was collected on a single day 8/29/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 47558, PAHs (Polycyclic Aromatic Hydrocarbons) **Region 9**

Santa Margarita River (Lower)

LOE ID:	78341
Pollutant:	PAHs (Polycyclic Aromatic Hydrocarbons)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	4

Number of Exceedances:	0	036833
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for PAH, High molecular weight.	
Data Reference:	Data for Various Pollutants from Bight, 2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for High molecular weight PAHs is 9600 ng/g dry weight (Long et al., 1995).	
Guideline Reference:	Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuary sediments. Environmental Management. 19, (1): 81-97	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 4 monitoring sites [902_6317, 902_6303, 902_6311, 902_6314]	
Temporal Representation:	Data was collected on a single day 8/29/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.	

Line of Evidence (LOE) for Decision ID 47558, PAHs (Polycyclic Aromatic Hydrocarbons) Region 9

Santa Margarita River (Lower)

LOE ID:	78343
Pollutant:	PAHs (Polycyclic Aromatic Hydrocarbons)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for PAHs (Polycyclic Aromatic Hydrocarbons).
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the sediment quality guideline (predictive of sediment toxicity for sediment-dwelling organisms) for Total PAHs is 1800 ug/g (Fairey et al., 2001).
Guideline Reference:	An evaluation of methods for calculating mean sediment quality guideline quotients as indicators of contamination and acute toxicity to amphipods by chemical mixtures. Environmental Toxicology and Chemistry. 20(10): 2276-2286

Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at monitoring sites [902_6317, 902_6303, 902_6311, 902_6314]
Temporal Representation:	Data was collected on a single day 8/29/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID 47554 Region 9

Santa Margarita River (Lower)

Pollutant:	**PCBs (Polychlorinated biphenyls)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the two samples exceed the objective. Zero of five samples exhibited sediment toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the five samples exceed the objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47554, PCBs (Polychlorinated biphenyls) Region 9

Santa Margarita River (Lower)

LOE ID:	78344
Pollutant:	PCBs (Polychlorinated biphenyls)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	4
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	036835
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for PCB, Total.	
Data Reference:	Data for Various Pollutants from Bight, 2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In marine and estuarine sediments the sediment quality guideline (predictive of sediment toxicity for sediment-dwelling organisms) for Total PCBs is 400 ng/g (MacDonald et al., 2000b).	
Guideline Reference:	Development and evaluation of consensus-based sediment effect concentrations for polychlorinated biphenyls. Environmental Toxicology and Chemistry. 19(5): 1403-1413	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 4 monitoring sites [902_6317, 902_6303, 902_6311, 902_6314]	
Temporal Representation:	Data was collected on a single day 8/29/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.	

Line of Evidence (LOE) for Decision ID 47554, PCBs (Polychlorinated biphenyls) **Region 9**

Santa Margarita River (Lower)

LOE ID:	72813
Pollutant:	PCBs (Polychlorinated biphenyls)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Zero of 1 sample collected for Total PCBs exceeded the evaluation guideline.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for total PCB is 676 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data were collected at the following station 902SSMR07 (Santa Margarita at Basilone Rd).
Temporal Representation:	The samples were collected on 5/21/2008.
Environmental Conditions:	
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID	47547	Region 9
Santa Margarita River (Lower)		

Pollutant:	**Permethrin, total**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47547, Permethrin, total	**Region 9**
Santa Margarita River (Lower)	

LOE ID:	76524
Pollutant:	Permethrin, total
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Preservation of Rare & Endangered Species
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Permethrin, Total.
Data Reference:	Statewide Stream Pollution Trends Study 2008

SWAMP Data:	SWAMP	036837
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The evaluation guideline for permethrin is the median lethal concentration (LC50) of 8.9 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 8.9 ug/g is the geometric mean of LC50 values for permethrin from Amweg et al. (2005).	
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 1 monitoring site [Santa Margarita at Basilone Rd - 902SSMR07]	
Temporal Representation:	Data was collected on a single day 5/21/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.	
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)	

DECISION ID **47561** **Region 9**

Santa Margarita River (Lower)

Pollutant:	**Phenanthrene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of the four samples exceed the objective. Zero of four samples exhibited sediment toxicity. Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the four samples exceed the objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47561, Phenanthrene 036838 **Region 9**

Santa Margarita River (Lower)

LOE ID:	78345
Pollutant:	Phenanthrene
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Phenanthrene.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for Phenanthrene is 543.53 ng/g dry weight (MacDonald et al., 1996).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 4 monitoring sites [902_6317, 902_6303, 902_6311, 902_6314]
Temporal Representation:	Data was collected on a single day 8/29/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID **47562** **Region 9**

Santa Margarita River (Lower)

Pollutant:	**Pyrene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of the four samples exceed the objective. Zero of four samples exhibited sediment toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the four samples exceed the objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47562, Pyrene **Region 9**

Santa Margarita River (Lower)

LOE ID:	78346
Pollutant:	Pyrene
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Pyrene.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for Pyrene is 1397.4 ng/g dry weight (MacDonald et al., 1996).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 4 monitoring sites [902_6317, 902_6303, 902_6311, 902_6314]
Temporal Representation:	Data was collected on a single day 8/29/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID 47566 Region 9

Santa Margarita River (Lower) 036840

Pollutant:	**Selenium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One lines of evidence is available in the administrative record to assess this pollutant. Zero of the 6 samples exceed the water quality criteria for Selenium. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of six samples exceeded the water quality criteria for Selenium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47566, Selenium — Region 9

Santa Margarita River (Lower)

LOE ID:	77878
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Selenium.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The selenium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater is 0.005 mg/L (California Toxics Rule, 2000).

Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 1 monitoring site [Santa Margarita River - 902SMR-MLS]
Temporal Representation:	Data was collected over the time period 11/29/2001-2/28/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was used.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 47566, Selenium **Region 9**

Santa Margarita River (Lower)

LOE ID:	77876
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Selenium.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The Maximum Contaminant Level for selenium in the Basin Plan is 0.05 mg/L (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 1 monitoring site [Santa Margarita River - 902SMR-MLS]
Temporal Representation:	Data was collected over the time period 11/29/2001-2/28/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was used.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 47566, Selenium **Region 9**

Santa Margarita River (Lower)

LOE ID:	77875
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Selenium.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The selenium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater is 0.005 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 1 monitoring site [Santa Margarita River - 902SMR-MLS]
Temporal Representation:	Data was collected over the time period 11/29/2001-2/28/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was used.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID	**47563**	**Region 9**
Santa Margarita River (Lower)		

Pollutant:	**Silver**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of the four samples exceed the objective. Zero of four samples exhibited sediment toxicity. Based on the readily available data and information, the weight of evidence indicates that there is

insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the four samples exceed the objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47563, Silver **Region 9**
Santa Margarita River (Lower)

LOE ID:	78347
Pollutant:	Silver
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Silver.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for Silver is 1.77 ug/g dry weight (MacDonald et al., 1996).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 4 monitoring sites [902_6317, 902_6303, 902_6311, 902_6314]
Temporal Representation:	Data was collected on a single day 8/29/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID 47548 **Region 9**
Santa Margarita River (Lower)

Pollutant:	**Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47548, Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD) **Region 9**

Santa Margarita River (Lower)

LOE ID:	76543
Pollutant:	Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Preservation of Rare & Endangered Species
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for DDT, Total.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for total DDTs (Sum DDT + Sum DDD + Sum DDE) is 572 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 1 monitoring site [Santa Margarita at Basilone Rd - 902SSMR07]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID 47569 Region 9

Santa Margarita River (Lower)

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Â“This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary, and under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Four lines of evidence are available in the administrative record to assess this pollutant. Zero of four samples (sediment) and zero of One samples (water) exceeded the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of four samples (sediment) and zero of One samples (water) exceeded the water quality objective and these sample sizes are insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples are needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47569, Zinc Region 9

Santa Margarita River (Lower)

LOE ID: 77882

Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Zinc.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for zinc is 5.0 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 1 monitoring site [Santa Margarita River - 902SMR-MLS]
Temporal Representation:	Data was collected over the time period 11/29/2001-2/28/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was used.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 47569, Zinc **Region 9**

Santa Margarita River (Lower)

LOE ID:	77883
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Zinc.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Zinc to protect aquatic life in freshwater. The dissolved Zinc criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 1 monitoring site [Santa Margarita River - 902SMR-MLS]
Temporal Representation:	Data was collected over the time period 11/29/2001-2/28/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was used.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 47569, Zinc **Region 9**

Santa Margarita River (Lower)

LOE ID:	76556
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Preservation of Rare & Endangered Species
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for Zinc is 459 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 1 monitoring site [Santa Margarita at Basilone Rd - 902SSMR07]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the 2002 QAMP.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP.

Line of Evidence (LOE) for Decision ID 47569, Zinc **Region 9**

Santa Margarita River (Lower)

LOE ID:	76563
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Zinc to protect aquatic life in freshwater. The dissolved Zinc criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 1 monitoring site [Santa Margarita River - 902SMR-MLS]
Temporal Representation:	Data was collected on a single day 11/29/2001.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 47569, Zinc **Region 9**

Santa Margarita River (Lower)

LOE ID:	78348
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	4
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Zinc.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Zinc is 410 ug/g dry weight (Long et al., 1995).
Guideline Reference:	Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuary sediments. Environmental Management. 19, (1): 81-97
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 4 monitoring sites [902_6317, 902_6303, 902_6311, 902_6314]
Temporal Representation:	Data was collected on a single day 8/29/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID	49149	Region 9
Santa Margarita River (Lower)		

Pollutant:	**Benthic Community Effects**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

Benthic Community Effects is being considered for placement on the CWA section 303(d) List under sections 3.9 and 3.1 of the Listing Policy. Under section 3.9, an additional line of evidence associating Benthic Community Effects with a water or sediment concentration of pollutant(s) is necessary to assess listing status.

Based on the readily available data and information, the weight of evidence provides sufficient justification for placing Benthic Community Effects in this water segment on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Pursuant to section 3.9 of the Listing Policy, the water exhibits significant degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index.
4. Pursuant to section 3.9 of the Listing Policy, the water segment has associated pollutant(s) samples that exceed water quality objectives.
5. Pursuant to section 3.11 of the Listing Policy, additional data and information are available indicating that standards are being met.

Samples were collected at one site, with two samples exhibiting degradation in biological populations

and/or communities as compared to reference site(s) using the California Stream Condition Index during a 5 year period. More recent data from the Stormwater Monitoring Condition was not included in this listing cycle but confirms this listing. The station also exhibits persistent exceedances associated with water column toxicity and a chlorpyrifos.
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Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant(s) contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 49149, Benthic Community Effects **Region 9**

Santa Margarita River (Lower)

LOE ID:	7499
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	5
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Five of six samples exceed the water quality objective according to results in the San Diego County Municipal Copermittees Annual Progress Report, 2007. Samples were collected one to two times a year from 2001-2006, with the exception of the 2004-2005 monitoring year.
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin has a goal of 0.1 mg/L for total phosphorus in streams and other flowing waters. (RWQCB, 2007)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at the mass loading station located near the lower boundary of the watershed on Camp Pendleton under the Basilone Road Bridge.
Temporal Representation:	Samples were collected one to two times a year from 2001-2006, with the exception of the 2004-2005 monitoring year.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49149, Benthic Community Effects **Region 9**

Santa Margarita River (Lower)

LOE ID:	7498
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	5
Number of Exceedances:	3
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Three of five samples exceed the water quality objective of 1.0 mg/L for total nitrogen according to results in the Surface Water Ambient Monitoring Program Report, 2007. Samples were collected one to two times a year from 2001-2006, with the exception of the 2004-2005 monitoring year.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. (RWQCB, 2007) A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used. (RWQCB, 2007)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at the mass loading station located near the lower boundary of the watershed on Camp Pendleton under the Basilone Road Bridge.
Temporal Representation:	Samples were collected one to two times a year from 2001-2006, with the exception of the 2004-2005 monitoring year.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	QA/QC conducted according to Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 49149, Benthic Community Effects **Region 9**

Santa Margarita River (Lower)

LOE ID:	7497
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	5
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Five of six samples exceed the water quality objective according to results in the San Diego County Municipal Copermittees Annual Progress Report, 2007. Samples were collected one to two times a year from 2001-2006 with the exception of the 2004-2005 monitoring year.
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote

	aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. (RWQCB, 2007) A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used. (RWQCB, 2007)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at the mass loading station located near the lower boundary of the watershed on Camp Pendleton under the Basilone Road Bridge.
Temporal Representation:	Samples were collected one to two times a year from 2001-2006, with the exception of the 2004-2005 monitoring year.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49149, Benthic Community Effects **Region 9**

Santa Margarita River (Lower)

LOE ID:	76544
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	11
Number of Exceedances:	5
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Eleven samples were collected to test for toxicity. Five of the eleven samples exhibited statistically significant toxicity. The toxicity tests included survival of Hyalella azteca, growth of Selenastrum capriconutum and survival and reproduction of Ceriodaphnia dubia.
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected at station 902SMR-MLS - Santa Margarita River.
Temporal Representation:	The samples were collected from 2001 to 2008.
Environmental Conditions:	
QAPP Information:	The data was collected under the County of San Diego Co-Permittees Receiving Waters

	Urban Runoff Monitoring and Reporting Program (Order No. 2007-01). Data quality is good.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 49149, Benthic Community Effects **Region 9**

Santa Margarita River (Lower)

LOE ID:	7501
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	1
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Selenastrum capricornutum- Three samples were collected with one samples showing significant toxicity levels (SL) as determined by the Selenastrum capricornutum growth test. Ceriodaphnia dubia- Two samples were collected and one samples show significant toxicity levels (SL) as determined by the Ceriodaphnia dubia survival/reproductive test. A fourth sample was collected and tested however the sample temperature was received outside acceptable limits upon laboratory receipt and the results were not used in this assessment. Hyalella azteca- Two samples were collected and one sample shows significant toxicity levels (SL) as determined by the Hyalella azteca growth/survival test according to results in the Surface Water Ambient Monitoring Program Report, 2007. Samples were collected on the following dates: January 14, April 15, May 13, and September 9, 2003.
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.
Guideline Reference:	Monitoring data for Region 9
Spatial Representation:	Samples were collected at the monitoring station Santa Margarita 10 located on the main stem of the Lower Santa Margarita River.
Temporal Representation:	Samples were collected on the following dates: January 14, April 15, May 13, and September 9, 2003.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 49149, Benthic Community Effects **Region 9**

Santa Margarita River (Lower)

LOE ID:	77848
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	2
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 2 of 3 samples exceed the criterion for Chlorpyrifos. Four sample results were not used in the assessment because the laboratory data reporting limit(s) was above the objective and therefore the results could not be quantified with the level of certainty required by the Listing Policy.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.014 ug/L (Siepmann and Finlayson 2000).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 1 monitoring site [Santa Margarita River - 902SMR-MLS]
Temporal Representation:	Data was collected over the time period 11/29/2001-2/28/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was used.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 49149, Benthic Community Effects **Region 9**

Santa Margarita River (Lower)

LOE ID:	7500
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	5

Number of Exceedances:	5	036855
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)	
Data Used to Assess Water Quality:	All five samples exceed the water quality objective. according to results in the San Diego County Municipal Copermittees Annual Progress Report, 2007. Samples were collected on the following dates: January 14, April 15, twice on May 13, and September 9, 2003.	
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. Water Quality Control Plan for the San Diego Basin has a goal of 0.1 mg/L for total phosphorus in streams and other flowing waters. (RWQCB, 2007)	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:	Water Quality Control Plan for the San Diego Basin	
Spatial Representation:	The sampling site lies on the lower Santa Margarita River (Santa Margarita 10 (902SSMR10 lat/long: 33.23669/-117.39175)).	
Temporal Representation:	Samples were collected on the following dates: January 14, April 15, twice on May 13, and September 9, 2003.	
Environmental Conditions:	The first two sampling events occurred between storm events and high base flow respectively. The third and fourth occurred during declining and minimum base flow respectively.	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 49149, Benthic Community Effects **Region 9**

Santa Margarita River (Lower)

LOE ID:	79700
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	2
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Six samples were taken at one station in the Santa Margarita River below De Luz Creek. Two had CSCI scores below the 0.79 threshold, and therefore exceed the water quality objective for the aquatic life beneficial use.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009 Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008. Region 9 CSCI Scores & Water Body Information
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.

Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	036856
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.	
Guideline Reference:	The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.	
Spatial Representation:	The samples were collected at the following stations: 902SMR-CP	
Temporal Representation:	The samples were collected from 2003 to 2007.	
Environmental Conditions:		
QAPP Information:	The data was collected under the County of San Diego NPDES MS4 Copermittees Receiving Waters Monitoring and Reporting Program.	
QAPP Information Reference(s):	e-mail clarifying QAPP information RWB9 Stormwater Monitoring Council CY 2009 Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.	

Line of Evidence (LOE) for Decision ID 49149, Benthic Community Effects **Region 9**

Santa Margarita River (Lower)

LOE ID:	76471
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	7
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Seven of the eight samples collected had IBI scores below 40. NPDES bioassessment
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the State or Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	Development of a Benthic Index of Biotic Integrity (B-IBI) for Wadeable Streams in Northern Coastal California and its Application to Regional 305(b) Assessment

Spatial Representation:	The samples were collected at station SMR-CP Santa Margarita River.
Temporal Representation:	The samples were collected twice a year in May and October from 2003 to 2007.
Environmental Conditions:	
QAPP Information:	The data was collected under the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan, June 25, 2009.
QAPP Information Reference(s):	e-mail clarifying QAPP information

DECISION ID 47511 Region 9

Santa Margarita River (Lower)

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2029
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.6 an additional line of evidence is necessary to assess listing status. Three lines of evidence are available in the administrative record to assess this pollutant. Two of the three samples exceed the water quality objective and Zero of One samples exceeded the evaluation guideline for sediment. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Two of the three samples exceed the water quality objective and zero of the one samples exceeded the evaluation guideline for sediment and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 47511, Chlorpyrifos Region 9

Santa Margarita River (Lower)

LOE ID:	77848
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	3	036858
Number of Exceedances:	2	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 2 of 3 samples exceed the criterion for Chlorpyrifos. Four sample results were not used in the assessment because the laboratory data reporting limit(s) was above the objective and therefore the results could not be quantified with the level of certainty required by the Listing Policy.	
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.014 ug/L (Siepmann and Finlayson 2000).	
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 1 monitoring site [Santa Margarita River - 902SMR-MLS]	
Temporal Representation:	Data was collected over the time period 11/29/2001-2/28/2006.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was used.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.	

Line of Evidence (LOE) for Decision ID 47511, Chlorpyrifos **Region 9**

Santa Margarita River (Lower)

LOE ID:	77851
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for chlorpyrifos is 2.1 Âµg/L.
Guideline Reference:	2011 Edition of the Drinking Water Standards and Health Advisories
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 1 monitoring site [Santa Margarita River - 902SMR-MLS]
Temporal Representation:	Data was collected over the time period 11/29/2001-2/28/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was used.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 47511, Chlorpyrifos **Region 9**

Santa Margarita River (Lower)

LOE ID:	76475
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Preservation of Rare & Endangered Species
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for chlorpyrifos is the median lethal concentration (LC50) of 1.77 ug/g and is normalized by the percentage of organic carbon in the sediment sample (Amweg and Weston, 2007).
Guideline Reference:	Whole-sediment toxicity identification evaluation tools for pyrethroid insecticides: I. piperonyl butoxide addition. Environ. Toxicol. Chem. 26:2389-2396.
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 1 monitoring site [Santa Margarita at Basilone Rd - 902SSMR07]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient

DECISION ID	43126	Region 9
Santa Margarita River (Lower)		

Pollutant:	**Nitrogen**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Four lines of evidence are available in the administrative record to assess this pollutant. Eight of the 23 samples exceed the Basin Plan water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Eight of the 23 samples exceed the Basin Plan water quality objective and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 43126, Nitrogen	Region 9
Santa Margarita River (Lower)	

LOE ID:	77868
Pollutant:	Nitrogen, Nitrite
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Nitrite as N.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works

	Watershed Protection Program, 2001-2008.	036861

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrite (as N) is 1.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 1 monitoring site [Santa Margarita River - 902SMR-MLS]
Temporal Representation:	Data was collected over the time period 11/29/2001-2/28/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was used.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 43126, Nitrogen **Region 9**

Santa Margarita River (Lower)

LOE ID:	7498
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	5
Number of Exceedances:	3
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Three of five samples exceed the water quality objective of 1.0 mg/L for total nitrogen according to results in the Surface Water Ambient Monitoring Program Report, 2007. Samples were collected one to two times a year from 2001-2006, with the exception of the 2004-2005 monitoring year.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. (RWQCB, 2007) A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used. (RWQCB, 2007)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin

Spatial Representation:	Samples were collected at the mass loading station located near the lower boundary of the watershed on Camp Pendleton under the Basilone Road Bridge.
Temporal Representation:	Samples were collected one to two times a year from 2001-2006, with the exception of the 2004-2005 monitoring year.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	QA/QC conducted according to Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 43126, Nitrogen **Region 9**

Santa Margarita River (Lower)

LOE ID:	77867
Pollutant:	Nitrate/Nitrite (Nitrite + Nitrate as N)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego data for Santa Margarita River (Lower) to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Nitrate/Nitrite as N.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrate + nitrite (as N) is 10.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Lower) was collected at 1 monitoring site [Santa Margarita River - 902SMR-MLS]
Temporal Representation:	Data was collected over the time period 11/29/2001-2/28/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was used.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 43126, Nitrogen **Region 9**

Santa Margarita River (Lower)

LOE ID:	7497
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total

Beneficial Use:	Warm Freshwater Habitat	036863
Number of Samples:	6	
Number of Exceedances:	5	
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)	
Data Used to Assess Water Quality:	Five of six samples exceed the water quality objective according to results in the San Diego County Municipal Copermittees Annual Progress Report, 2007. Samples were collected one to two times a year from 2001-2006 with the exception of the 2004-2005 monitoring year.	
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. (RWQCB, 2007) A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used. (RWQCB, 2007)	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:	Water Quality Control Plan for the San Diego Basin	
Spatial Representation:	Samples were collected at the mass loading station located near the lower boundary of the watershed on Camp Pendleton under the Basilone Road Bridge.	
Temporal Representation:	Samples were collected one to two times a year from 2001-2006, with the exception of the 2004-2005 monitoring year.	
Environmental Conditions:	Samples were collected during wet weather.	
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.	
QAPP Information Reference(s):		

DECISION ID	43103	Region 9
Santa Margarita River (Lower)		

Pollutant:	**Toxicity**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Four lines of evidence are available in the administrative record to assess this pollutant. Six of 14 water samples exceed the water quality criteria for toxicity. Insufficient number of samples is available to evaluate the toxicity of sediment at this time. Based on the readily available data and information, the weight of evidence indicates that there is

sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Six of 14 water samples exceed the water quality criteria for toxicity and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 43103, Toxicity **Region 9**

Santa Margarita River (Lower)

LOE ID:	76546
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate sediment toxicity. The sample did not exhibit significant toxicity. The toxicity test included survival of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL, Significant compared to negative control based on statistical test, less than stated alpha level, AND less than the evaluation threshold (both criteria are met).
Guideline Reference:	
Spatial Representation:	The sample was collected at station 902SSMR07.
Temporal Representation:	The samples were collected in May 2008.
Environmental Conditions:	
QAPP Information:	All data was collected following the Standard Operating Procedures and Data Quality Objectives outlined in the SWAMP QAMP, (Puckett, 2002). QA data are included in submission.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43103, Toxicity **Region 9**

Santa Margarita River (Lower) 036865

LOE ID:	76544
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	11
Number of Exceedances:	5
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Eleven samples were collected to test for toxicity. Five of the eleven samples exhibited statistically significant toxicity. The toxicity tests included survival of Hyalella azteca, growth of Selenastrum capriconutum and survival and reproduction of Ceriodaphnia dubia.
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected at station 902SMR-MLS - Santa Margarita River.
Temporal Representation:	The samples were collected from 2001 to 2008.
Environmental Conditions:	
QAPP Information:	The data was collected under the County of San Diego Co-Permittees Receiving Waters Urban Runoff Monitoring and Reporting Program (Order No. 2007-01). Data quality is good.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 43103, Toxicity **Region 9**

Santa Margarita River (Lower)

LOE ID:	30287
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Hyalella azteca- Two samples were collected and neither shows significant toxicity levels (SL) as determined by the Hyalella azteca growth/survival test according to results in the Surface Water Ambient Monitoring Program Report, 2007. Samples were collected on the following dates: January 14, April 15, May 13, and September 9, 2003.
Data Reference:	Monitoring data for Region 9

SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.
Guideline Reference:	Monitoring data for Region 9
Spatial Representation:	Samples were collected at the monitoring station Santa Margarita 10 located on the main stem of the Lower Santa Margarita River.
Temporal Representation:	Samples were collected on the following dates: January 14, April 15, May 13, and September 9, 2003.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 43103, Toxicity **Region 9**

Santa Margarita River (Lower)

LOE ID:	7501
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	1
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Selenastrum capricornutum- Three samples were collected with one samples showing significant toxicity levels (SL) as determined by the Selenastrum capricornutum growth test. Ceriodaphnia dubia- Two samples were collected and one samples show significant toxicity levels (SL) as determined by the Ceriodaphnia dubia survival/reproductive test. A fourth sample was collected and tested however the sample temperature was received outside acceptable limits upon laboratory receipt and the results were not used in this assessment. Hyalella azteca- Two samples were collected and one sample shows significant toxicity levels (SL) as determined by the Hyalella azteca growth/survival test according to results in the Surface Water Ambient Monitoring Program Report, 2007. Samples were collected on the following dates: January 14, April 15, May 13, and September 9, 2003.
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (RWQCB, 2007).

Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	036867
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.	
Guideline Reference:	Monitoring data for Region 9	
Spatial Representation:	Samples were collected at the monitoring station Santa Margarita 10 located on the main stem of the Lower Santa Margarita River.	
Temporal Representation:	Samples were collected on the following dates: January 14, April 15, May 13, and September 9, 2003.	
Environmental Conditions:		
QAPP Information:	Quality control for the chemical analysis portion of this study conducted in accordance with the California's Surface Water Ambient Monitoring Program.	
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA	

DECISION ID **43402** **Region 9**

Santa Margarita River (Lower)

Pollutant:	**Sulfates**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Two of the five samples exceed the Basin Plan water quality objective for sulfates.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Two of the five samples exceed the Basin Plan water quality objective for sulfates and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43402, Sulfates **Region 9**

Santa Margarita River (Lower)

LOE ID:	21195	036868

Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	5
Number of Exceedances:	2
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Five water samples were collected at Santa Margarita River 10 Station 902SSMR10 on January 2003, April 2003, May 2003, and September 2003, Two of the five showed excessive sulfate concentrations according to results in California's Surface Water Ambient Monitoring Program Report, 2007.
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The recommended secondary drinking water standard for sulfate is 250 mg/l.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Water samples were collected at Santa Margarita River 10 Station 902SSMR10; (Latitude 33.2370, Longitude -117.3923).
Temporal Representation:	Samples were collected on January 2003, April 2003, May 2003, and September 2003.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

DECISION ID	**43390**	**Region 9**
Santa Margarita River (Lower)		

Pollutant:	**Phosphorus**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Ten of the eleven samples exceed the Basin Plan water quality objective for phosphorus.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d)

list in the Water Quality Limited Segments category. 036869

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Ten of the eleven samples exceed the Basin Plan water quality objective for phosphorus and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43390, Phosphorus **Region 9**

Santa Margarita River (Lower)

LOE ID:	7499
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	5
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Five of six samples exceed the water quality objective according to results in the San Diego County Municipal Copermittees Annual Progress Report, 2007. Samples were collected one to two times a year from 2001-2006, with the exception of the 2004-2005 monitoring year.
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin has a goal of 0.1 mg/L for total phosphorus in streams and other flowing waters. (RWQCB, 2007)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at the mass loading station located near the lower boundary of the watershed on Camp Pendleton under the Basilone Road Bridge.
Temporal Representation:	Samples were collected one to two times a year from 2001-2006, with the exception of the 2004-2005 monitoring year.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43390, Phosphorus **Region 9**

Santa Margarita River (Lower)

LOE ID:	7500
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water

Matrix:	Water	036870
Fraction:	Total	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	5	
Number of Exceedances:	5	
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)	
Data Used to Assess Water Quality:	All five samples exceed the water quality objective. according to results in the San Diego County Municipal Copermittees Annual Progress Report, 2007. Samples were collected on the following dates: January 14, April 15, twice on May 13, and September 9, 2003.	
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. Water Quality Control Plan for the San Diego Basin has a goal of 0.1 mg/L for total phosphorus in streams and other flowing waters. (RWQCB, 2007)	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:	Water Quality Control Plan for the San Diego Basin	
Spatial Representation:	The sampling site lies on the lower Santa Margarita River (Santa Margarita 10 (902SSMR10 lat/long: 33.23669/-117.39175)).	
Temporal Representation:	Samples were collected on the following dates: January 14, April 15, twice on May 13, and September 9, 2003.	
Environmental Conditions:	The first two sampling events occurred between storm events and high base flow respectively. The third and fourth occurred during declining and minimum base flow respectively.	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.	
QAPP Information Reference(s):		

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: De Luz Creek
Water Body ID: CAR9022100020010924135442
Water Body Type: River & Stream

DECISION ID 44303 **Region 9**
De Luz Creek

Pollutant: **Benthic Community Effects**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: Benthic Community Effects is being considered for placement on the CWA section 303(d) List under sections 3.9 and 3.1 of the Listing Policy. Under section 3.9, an additional line of evidence associating Benthic Community Effects with a water or sediment concentration of pollutant(s) is necessary to assess listing status.

Based on the readily available data and information, the weight of evidence provides sufficient justification for not placing Benthic Community Effects in this water segment on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used does satisfy the data quantity requirements of section 6.1.5 of the Policy.
3. Pursuant to section 3.9 of the Listing Policy, the water does not exhibit significant degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index.
4. Pursuant to section 3.9 of the Listing Policy, the water segment does have associated pollutant(s) samples that exceed water quality objectives.
5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not being met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 44303, Benthic Community Effects **Region 9**
De Luz Creek

LOE ID: 73499

Pollutant: Benthic-Macroinvertebrate Bioassessments
LOE Subgroup: Population/Community Degradation
Matrix: Water
Fraction: None

Beneficial Use: Cold Freshwater Habitat

Number of Samples: 6

Number of Exceedances:	0	036872

Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	None of the six samples collected had IBI scores below 40.
Data Reference:	Bioassessment Data for Various Pollutants from Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the State or Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	
Spatial Representation:	The samples were collected at station REF-DLC De Luz Creek. R9 says this is the same sites as REF-DLC3. WBs should be combined.
Temporal Representation:	The samples were collected in May and October 2001 to 2004.
Environmental Conditions:	
QAPP Information:	The data was collected under the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan, June 25, 2009.
QAPP Information Reference(s):	e-mail clarifying QAPP information Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.

Line of Evidence (LOE) for Decision ID 44303, Benthic Community Effects **Region 9**

De Luz Creek

LOE ID:	79476
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	The CSCI scores for all sites on De Luz Creek are above the 0.79 threshold, and therefore not exceeding the water quality objective for the aquatic life beneficial use.
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008. Bioassessment Data for Various Pollutants from Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009. Region 9 CSCI Scores & Water Body Information
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life.

	Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.
Guideline Reference:	The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.
Spatial Representation:	The samples were collected at station REF-DLC3 (902REF-DLC3), 902REF-DLC
Temporal Representation:	The samples were collected from 2001 to 2004
Environmental Conditions:	
QAPP Information:	The data was collected under the the County of San Diego NPDES MS4 Copermittees Receiving Waters Monitoring and Reporting Program.
QAPP Information Reference(s):	e-mail clarifying QAPP information Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.

Line of Evidence (LOE) for Decision ID 44303, Benthic Community Effects **Region 9**

De Luz Creek

LOE ID:	26381
Pollutant:	Benthic Community Effects
LOE Subgroup:	Adverse Biological Responses
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Four samples of IBI data were taken from November 2000 to October 2003 at one sampling site. None of the samples exceeded the IBI impairment threshold.
Data Reference:	Fish and Game IBI Data
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary

	between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9) 036874
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at one site: 902DLCDLM on De Luz Creek.
Temporal Representation:	Sampling occurred during four events from November 2000 to October 2003.
Environmental Conditions:	
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Project Plan for the California Stream Bioassessment Procedure and the State of California, California Monitoring an Assessment Program: "CMAP", Quality Assurance Project Plan.
QAPP Information Reference(s):	State of California, California Monitoring and Assessment Program: "CMAP". Quality Assurance Project Plan for the California Stream Bioassessment Procedure The San Diego Stream Team Quality Assurance Project Plan

Line of Evidence (LOE) for Decision ID 44303, Benthic Community Effects **Region 9**

De Luz Creek

LOE ID:	21183
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	3
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	All four samples collected at De Luz Creek show excessive nitrogen concentrations according to results in California's Surface Water Ambient Monitoring Program Report, 2007. Samples were collected in January 2003, April 2003, May 2003, and September 2003.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses (RWQCB, 2007). A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at De Luz Creek station 3,(902SMDLZ3).
Temporal Representation:	Samples were collected in January 2003, April 2003, May 2003, and September 2003.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

DECISION ID	47876	Region 9
De Luz Creek		

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the four samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the four samples exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47876, Cadmium	Region 9
De Luz Creek	

LOE ID:	73500
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for De Luz Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	The California Maximum Contaminant Level for cadmium is 0.005 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for De Luz Creek was collected at 1 monitoring site [De Luz Creek @ De Luz Road (Mile Marker 8 @ private driveway)]
Temporal Representation:	Data was collected from 5/13/2003 - 5/27/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47876, Cadmium **Region 9**

De Luz Creek

LOE ID:	73501
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for De Luz Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for De Luz Creek was collected at 1 monitoring site [De Luz Creek @ De Luz Road (Mile Marker 8 @ private driveway)]
Temporal Representation:	Data was collected from 5/13/2003 - 5/27/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 47877 **Region 9**

De Luz Creek 036877

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the three samples exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the three samples exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47877, Chlorpyrifos — Region 9

De Luz Creek

LOE ID:	73502
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for De Luz Creek to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).

Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	036878
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000).	
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).	
Spatial Representation:	Data for this line of evidence for De Luz Creek was collected at 1 monitoring site [De Luz Creek @ De Luz Road (Mile Marker 8 @ private driveway)]	
Temporal Representation:	Data was collected over the time period 5/10/2006-5/27/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 47877, Chlorpyrifos **Region 9**

De Luz Creek

LOE ID:	78015
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for De Luz Creek to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for chlorpyrifos is 2.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for De Luz Creek was collected at 1 monitoring site [De Luz Creek @ De Luz Road (Mile Marker 8 @ private driveway)]
Temporal Representation:	Data was collected over the time period 5/10/2006-5/27/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **33638** **Region 9**

De Luz Creek 036879

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Three lines of evidence are available in the administrative record to assess this pollutant. Zero of the 12 samples exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the 12 samples exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 33638, Copper — Region 9

De Luz Creek

LOE ID:	3026
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by LAW Crandall from 1997 to 2000. None of the 8 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for copper is 1.0 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	

Guideline Reference:	036880
Spatial Representation:	Samples were collected at De Luz Creek near Fallbrook.
Temporal Representation:	Samples were collected on a quarterly basis from 12/1997 to 06/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33638, Copper **Region 9**

De Luz Creek

LOE ID:	73465
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for De Luz Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for copper is 1.0 mg/L (Title 22 California Code of Regulations).
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for De Luz Creek was collected at 1 monitoring site [De Luz Creek @ De Luz Road (Mile Marker 8 @ private driveway)]
Temporal Representation:	Data was collected from 5/13/2003 - 5/27/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 33638, Copper **Region 9**

De Luz Creek

LOE ID:	73466
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	4

Number of Exceedances:	0	036881
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for De Luz Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Copper.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for De Luz Creek was collected at 1 monitoring site [De Luz Creek @ De Luz Road (Mile Marker 8 @ private driveway)]	
Temporal Representation:	Data was collected from 5/13/2003 - 5/27/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID	**47902**	**Region 9**
De Luz Creek		

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the three samples exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3.Zero of the three samples exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision	After review of the available data and information, RWQCB staff concludes that the water body-

Recommendation: pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47902, Diazinon **Region 9**

De Luz Creek

LOE ID:	78016
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for De Luz Creek to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for diazinon is 1.4 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for De Luz Creek was collected at 1 monitoring site [De Luz Creek @ De Luz Road (Mile Marker 8 @ private driveway)]
Temporal Representation:	Data was collected over the time period 5/10/2006-5/27/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47902, Diazinon **Region 9**

De Luz Creek

LOE ID:	73467
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	036883
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for De Luz Creek to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Diazinon.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).	
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game	
Spatial Representation:	Data for this line of evidence for De Luz Creek was collected at 1 monitoring site [De Luz Creek @ De Luz Road (Mile Marker 8 @ private driveway)]	
Temporal Representation:	Data was collected over the time period 5/10/2006-5/27/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID	49194	Region 9
De Luz Creek		

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollution

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.3 of the Listing Policy. Under section 3.3 a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. Four of the Five samples exceed the Single Sample Maximum Objective for Enterococcus, Three of the Five samples exceeded the Single Sample Maximum Objective for Fecal Coliform, and Two out of Five samples exceeded the Single Sample Maximum Objective for Total Coliform.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Four of the Five samples exceed the Single Sample Maximum Objective for Enterococcus, Three of the Five samples exceeded the Single Sample Maximum Objective for Fecal Coliform, and Two out of Five samples exceeded the Single Sample Maximum Objective for Total Coliform and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available

indicating that standards are not met. 036884

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49194, Indicator Bacteria **Region 9**

De Luz Creek

LOE ID:	73474
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	5
Number of Exceedances:	2
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for De Luz Creek to determine beneficial use support and results are as follows: 2 of 5 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxicsubstances in concentrations which are toxic to,or which produce detrimental physiologicalresponses in human, plant, animal, or indigenousaquatic life (Basin Plan).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In waters designated for water contact recreation (REC I), the total coliform concentration shall not exceed 10000 MPN/100 ml (CDPH 2006).
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.
Spatial Representation:	Data for this line of evidence for De Luz Creek was collected at 1 monitoring site [De Luz Creek @ De Luz Road (Mile Marker 8 @ private driveway)]
Temporal Representation:	Data was collected over the time period 5/13/2003-5/9/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 49194, Indicator Bacteria **Region 9**

De Luz Creek

LOE ID:	73468
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation	036885
Number of Samples:	5	
Number of Exceedances:	4	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for De Luz Creek to determine beneficial use support and results are as follows: 4 of 5 samples exceed the criterion for Enterococci.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Samples shall not exceed 61 organisms per 100 ml for enterococcus in waters designated for REC I beneficial use (Water Quality Control Plan for the San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for De Luz Creek was collected at 1 monitoring site [De Luz Creek @ De Luz Road (Mile Marker 8 @ private driveway)]	
Temporal Representation:	Data was collected over the time period 5/13/2003-5/9/2007.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 49194, Indicator Bacteria **Region 9**

De Luz Creek

LOE ID:	73469
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	5
Number of Exceedances:	3
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for De Luz Creek to determine beneficial use support and results are as follows: 3 of 5 samples exceed the criterion for Coliform, Fecal.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the fecal coliform concentration shall not exceed 400 MPN/100 ml.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for De Luz Creek was collected at 1 monitoring site [De Luz

	Creek @ De Luz Road (Mile Marker 8 @ private driveway)] 036886
Temporal Representation:	Data was collected over the time period 5/13/2003-5/9/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 47903 — Region 9

De Luz Creek

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the four samples exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the four samples exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47903, Lead — Region 9

De Luz Creek

LOE ID:	73470
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for De Luz Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for De Luz Creek was collected at 1 monitoring site [De Luz Creek @ De Luz Road (Mile Marker 8 @ private driveway)]
Temporal Representation:	Data was collected from 5/13/2003 - 5/27/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47903, Lead **Region 9**

De Luz Creek

LOE ID:	73471
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for De Luz Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for Lead is 0.015 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for De Luz Creek was collected at 1 monitoring site [De Luz Creek @ De Luz Road (Mile Marker 8 @ private driveway)]
Temporal Representation:	Data was collected from 5/13/2003 - 5/27/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.

QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev.012, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 47904 Region 9

De Luz Creek

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the three samples exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the three samples exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47904, Malathion Region 9

De Luz Creek

LOE ID:	73472
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for De Luz Creek to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Malathion.

Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for De Luz Creek was collected at 1 monitoring site [De Luz Creek @ De Luz Road (Mile Marker 8 @ private driveway)]
Temporal Representation:	Data was collected over the time period 5/10/2006-5/27/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47904, Malathion **Region 9**

De Luz Creek

LOE ID:	78017
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for De Luz Creek to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Malathion.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for malathion is 100 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for De Luz Creek was collected at 1 monitoring site [De Luz Creek @ De Luz Road (Mile Marker 8 @ private driveway)]
Temporal Representation:	Data was collected over the time period 5/10/2006-5/27/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix

DECISION ID **52988** **Region 9**

De Luz Creek

Pollutant:	**Nitrogen, Nitrite**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Water Quality Objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Water Quality Objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52988, Nitrogen, Nitrite **Region 9**

De Luz Creek

LOE ID:	73473
Pollutant:	Nitrogen, Nitrite
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for De Luz Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nitrite as N.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrite (as N) is 1.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for De Luz Creek was collected at 1 monitoring site [De Luz Creek @ De Luz Road (Mile Marker 8 @ private driveway)]
Temporal Representation:	Data was collected on a single day 5/13/2003.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 52989 Region 9

De Luz Creek

Pollutant:	**Nitrogen, ammonia (Total Ammonia)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Evaluation Guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52989, Nitrogen, ammonia (Total Ammonia) Region 9

De Luz Creek

LOE ID:	73498

Pollutant:	Nitrogen, ammonia (Total Ammonia)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for De Luz Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Ammonia As N, Total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Basin Plan: No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	EPA's Lifetime Health advisory level for total ammonia is 30.0 mg/L as stated on page 8 of the 2006 edition of the drinking water standards and health advisories. This Advisory Level is defined as "the concentration of a chemical in drinking water that is not expected to cause any adverse noncarcinogenic effects for up to ten days of exposure."
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for De Luz Creek was collected at 1 monitoring site [De Luz Creek @ De Luz Road (Mile Marker 8 @ private driveway)]
Temporal Representation:	Data was collected on a single day 5/13/2003.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID	**33640**	**Region 9**
De Luz Creek		

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the Nine samples exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that: 036893
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the Nine samples exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 33640, Zinc **Region 9**

De Luz Creek

LOE ID:	73476
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for De Luz Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for De Luz Creek was collected at 1 monitoring site [De Luz Creek @ De Luz Road (Mile Marker 8 @ private driveway)]
Temporal Representation:	Data was collected from 5/13/2003 - 5/27/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 33640, Zinc **Region 9**

De Luz Creek

LOE ID:	73475	036894

Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for De Luz Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for zinc is 5.0 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for De Luz Creek was collected at 1 monitoring site [De Luz Creek @ De Luz Road (Mile Marker 8 @ private driveway)]
Temporal Representation:	Data was collected from 5/13/2003 - 5/27/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 33640, Zinc **Region 9**

De Luz Creek

LOE ID:	3013
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by LAW Crandall from 1997 to 2000. None of the 9 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for zinc is 5.0 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at De Luz Creek near Fallbrook.
Temporal Representation: Samples were collected on a quarterly basis from 12/1997 to 06/2000.
Environmental Conditions:
QAPP Information: Data used in 2002 assessment.
QAPP Information Reference(s):

DECISION ID 33699 Region 9
De Luz Creek

Pollutant: **pH**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the ten samples exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the ten samples exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 33699, pH Region 9
De Luz Creek

LOE ID: 3018

Pollutant: pH
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 10
Number of Exceedances: 0

Data and Information Type: PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality:	Data were collected by LAW Crandall from 1997 to 2000. None of 10 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for pH is 6.5(minimum) to 8.5 (maximum).
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at De Luz Creek near Fallbrook.
Temporal Representation:	Samples were collected on a quarterly basis from 12/1997 to 06/2000. One sample was collected on most days. Two samples were collected on 03/07/200 and 06/01/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 33583 Region 9

De Luz Creek

Pollutant:	**Nitrogen**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Four of the Five samples exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Four of the Five samples exceed the objective and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	

Line of Evidence (LOE) for Decision ID 33583, Nitrogen Region 9

De Luz Creek

LOE ID:	21183

Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	3
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	All four samples collected at De Luz Creek show excessive nitrogen concentrations according to results in California's Surface Water Ambient Monitoring Program Report, 2007. Samples were collected in January 2003, April 2003, May 2003, and September 2003.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses (RWQCB, 2007). A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at De Luz Creek station 3,(902SMDLZ3).
Temporal Representation:	Samples were collected in January 2003, April 2003, May 2003, and September 2003.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 33583, Nitrogen **Region 9**

De Luz Creek

LOE ID:	3020
Pollutant:	Nitrogen
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by LAW Crandall in 1997-1999. Four samples were collected, but only 2 samples were collected on the same day as phosphorus samples, so that the N:P ratio

	could be used. One of the 2 ratios was in exceedance of a 10:1 ratio for N:P
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters, enclosed bays and estuaries, coastal lagoons, and ground waters, and all beneficial uses, analagous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at De Luz Creek near Fallbrook.
Temporal Representation:	Samples were collected once each in 12/1997, 05/1998, 11/1998, and 05/1999.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 33846 — Region 9

De Luz Creek

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: One line of evidence is available in the administrative record to assess this pollutant. None of the 9 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33846, Arsenic — Region 9

De Luz Creek

LOE ID:	3029
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	9	036899
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by LAW Crandall from 1997 to 2000. None of the 9 samples were in exceedance.	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for Arsenic is 0.05 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at De Luz Creek near Fallbrook.	
Temporal Representation:	Samples were collected on a quarterly basis from 12/1997 to 06/2000.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment. QA=?	
QAPP Information Reference(s):		

DECISION ID 34550 Region 9

De Luz Creek

Pollutant:	**Boron**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: One line of evidence is available in the administrative record to assess this pollutant. None of the 9 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34550, Boron Region 9

De Luz Creek

LOE ID:	3028
Pollutant:	Boron
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total

Beneficial Use:	Municipal & Domestic Supply	036900
Number of Samples:	9	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by LAW Crandall from 1997 to 2000. None of the 9 samples were in exceedance.	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for Boron is 0.75 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at De Luz Creek near Fallbrook.	
Temporal Representation:	Samples were collected on a quarterly basis from 12/1997 to 06/2000.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID	**44263**	**Region 9**
De Luz Creek		

Pollutant:	**Chloride**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. None of 11 samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of 11 samples exceeded the water quality objective and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 44263, Chloride **Region 9**

De Luz Creek

LOE ID:	3027
Pollutant:	Chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	11
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by LAW Crandall from 1997 to 2000. None of the 11 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for chloride is 250 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at De Luz Creek near Fallbrook.
Temporal Representation:	Samples were collected on a quarterly basis from 12/1997 to 06/01/2000. Samples were collected once per day on sampling days, but twice on 03/07/2000 and 06/01/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33586** **Region 9**

De Luz Creek

Pollutant:	**Cyanide**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

One line of evidence is available in the administrative record to assess this pollutant. None of the 5 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33586, Cyanide — Region 9

De Luz Creek

LOE ID:	3025
Pollutant:	Cyanide
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by LAW Crandall from 1997 to 2000. None of the 5 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for Cyanide is 0.2 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at De Luz Creek near Fallbrook.
Temporal Representation:	Samples were collected once each in 12/1997, 05/1998, 11/1998, 05/1999 and 03/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 33585 — Region 9

De Luz Creek

Pollutant:	**Fluoride**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

One line of evidence is available in the administrative record to assess this pollutant. One of the 9 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy.

Based on the readily available data and information, the weight of evidence indicates that there is

sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33585, Fluoride **Region 9**

De Luz Creek

LOE ID:	3024
Pollutant:	Fluoride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by LAW Crandall from 1997 to 2000. One of 9 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for Fluoride is 1.0 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at De Luz Creek near Fallrbook.
Temporal Representation:	Samples were collected on a quarterly basis from 12/1997 to 06/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **34609** **Region 9**

De Luz Creek

Pollutant:	**Mercury**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

One line of evidence is available in the administrative record to assess this pollutant. None of the 5 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing

Policy. 036904

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34609, Mercury **Region 9**

De Luz Creek

LOE ID:	3021
Pollutant:	Mercury
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by LAW Crandall from 1997 to 2000. None of the 5 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for Mercury is 0.002 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at De Luz Creek near Fallbrook.
Temporal Representation:	Samples were collected 1-2 times per year from 12/1997 to 03/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33704** **Region 9**

De Luz Creek

Pollutant:	**Oil and Grease**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: Region 8 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2, one line(s) of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. This conclusion is based on the fact that the data shows 1 out of 11 samples had "detectable levels" of oil and grease. There is no numeric water quality objective to compare the data to, to determine if water quality objectives are being met or exceeded.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. This conclusion is based on the fact that the data shows 1 out of 11 samples had "detectable levels" of oil and grease and this information is insufficient to determine with the confidence and power required by the Listing Policy. There is no numeric water quality objective to compare the data to, to determine if water quality objectives are being met or exceeded. A minimum of five samples is needed for application of table 3.2 when there is a numeric water quality objective.
4. Pursuant to [SECTION 3.11/4.11] of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33704, Oil and Grease **Region 9**

De Luz Creek

LOE ID:	3019
Pollutant:	Oil and Grease
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	11
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by LAW Crandall from 1997 to 2000. Ten of 11 samples were measured as non-detects, but one of the 11 samples measured 1.33 mg/L.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, waters shall not contain oils, greases, waxes, or other materials in concentrations which result in a visible film or coating on the surface of the water or on objects in the water, or which cause nuisance or which otherwise adversely affect beneficial uses.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data were collected at De Luz Creek near Fallbrook.
Temporal Representation:	Samples were collected on a quarterly basis from 12/1997 to 06/2000.
Environmental Conditions:	

QAPP Information:	Data used in 2002 assessment.	036906
QAPP Information Reference(s):		

DECISION ID 33772 Region 9

De Luz Creek

Pollutant:	**Phosphorus**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: One line of evidence is available in the administrative record to assess this pollutant. One of the 7 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33772, Phosphorus Region 9

De Luz Creek

LOE ID:	3017
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the LAW Crandall from 1997 to 1999. One of the 7 samples was in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters-streams and other flowing waters and all beneficial uses, the WQO for Total Phosphorus is 0.1 mg/L. This appears to be the desired goal in order to prevent plant nuisance in streams and other flowing waters; not to be exceeded more than 10% of the time.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at DeLuz Creek near Fallbrook.
Temporal Representation:	Samples were collected 1-4 times per year from 12/1997 to 05/1999.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 43770 Region 9

De Luz Creek

Pollutant:	**Surfactants (MBAS)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 8 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. One line of evidence is available in the administrative record to assess this pollutant. None of the 9 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43770, Surfactants (MBAS) Region 9

De Luz Creek

LOE ID:	3015
Pollutant:	Surfactants (MBAS)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by LAW Crandall from 1997 to 2000. None of the 9 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for MBAS is 0.5 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at De Luz Creek near Fallbrook.
Temporal Representation: Samples were collected on a quarterly basis from 12/1997 to 06/2000.
Environmental Conditions:
QAPP Information: Data used in 2002 assessment.
QAPP Information Reference(s):

DECISION ID 33637 Region 9
De Luz Creek

Pollutant: **Total Dissolved Solids**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Original
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

One line of evidence is available in the administrative record to assess this pollutant. Two of the 9 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33637, Total Dissolved Solids Region 9
De Luz Creek

LOE ID: 3014

Pollutant: Total Dissolved Solids
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total Dissolved

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 9
Number of Exceedances: 2

Data and Information Type: PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality: Data were collected by LAW Crandall from 1997 to 2000. Two of 9 samples were in exceedance.
Data Reference: Placeholder reference 2006 303(d)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: From the Basin Plan: For inland surface waters in the Deluz Creek HA, and all beneficial

	uses, the WQO for TDS is 750 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	These objectives apply to the lower portion of Murrieta Creek in the Wolf HSA (2.52) and the Santa Margarita River from its beginning at the confluence of Murrieta and Temecula Creeks, through the Gavilan HSA (2.22) and DeLuz HSA (2.21), to where it enters the Upper Ysidora HSA (2.13).
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	Samples were collected at De Luz Creek near Fallbrook.
Temporal Representation:	Samples were collected on a quarterly basis from 12/1997 to 06/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 46111 Region 9

De Luz Creek

Pollutant:	**Iron**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Five of 9 samples exceeded the Basin Plan criteria, and these exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 46111, Iron Region 9

De Luz Creek

LOE ID:	3023
Pollutant:	Iron
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	9	036910
Number of Exceedances:	5	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by LAW Crandall from 1997 to 2000. Five of 9 samples were in exceedance.	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for iron is 0.3 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at De Luz Creek near Fallbrook.	
Temporal Representation:	Samples were collected on a quarterly basis from 12/1997 to 06/2000.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID 34599 **Region 9**

De Luz Creek

Pollutant:	**Manganese**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Two of 9 samples exceeded the Basin Plan criteria, and these exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34599, Manganese **Region 9**

De Luz Creek

LOE ID:	3022
Pollutant:	Manganese
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	2
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by LAW Crandall from 1997 to 2000. Two of 9 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The water quality objective for manganese in De Luz Creek is 0.05 milligrams/liter (mg/l) according to Basin Plan, Table 3-2 entitled, Water Quality Objectives. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at De Luz Creek near Fallbrook.
Temporal Representation:	Samples were collected on a quarterly basis from 12/1997 to 06/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID	**33683**	**Region 9**
De Luz Creek		

Pollutant:	**Sulfates**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Six of the 13 samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that: 036912
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Six of the 13 samples exceed the secondary MCL drinking water standard and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33683, Sulfates **Region 9**

De Luz Creek

LOE ID:	21185
Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	All four samples collected show excessive sulfate concentrations according to results in California's Surface Water Ambient Monitoring Program Report, 2007.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The recommended secondary drinking water standard for sulfate is 250 mg/l (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at De Luz Creek station 3,(902SMDLZ3).
Temporal Representation:	Samples were collected in January 2003, April 2003, May 2003, and September 2003.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 33683, Sulfates **Region 9**

De Luz Creek

LOE ID:	3016
Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	9
Number of Exceedances:	2
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by LAW Crandall from 1997 to 2000. Two of 9 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial use, the WQO for Sulfate is 250 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at De Luz Creek near Fallbrook.
Temporal Representation:	Samples were collected on a quarterly basis from 12/1997 to 06/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Rainbow Creek
Water Body ID: CAR9022200019980803102333
Water Body Type: River & Stream

DECISION ID 33947 **Region 9**
Rainbow Creek

Pollutant: Iron
Final Listing Decision: Do Not Delist from 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Sources: Source Unknown
Expected TMDL Completion Date: 2019
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for removal from the CWA section 303(d) List under section 4.1 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Two lines of evidence is available in the administrative record to assess pollutant. Four of the fifteen samples exceed the OBJECTIVE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Four of fifteen samples exceeded the OBJECTIVE and this exceeds the allowable frequency listed in Table 4.1 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 33947, Iron **Region 9**
Rainbow Creek

LOE ID: 3060

Pollutant: Iron
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples:	11	036915
Number of Exceedances:	2	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by RWQCB9 from 1997 to 2000. Two of 11 samples were in exceedance.	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for iron is 0.3 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Rainbow Creek near Fallbrook.	
Temporal Representation:	Samples were collected on a quarterly basis from 12/1997 to 06/2000.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33947, Iron **Region 9**

Rainbow Creek

LOE ID:	80850
Pollutant:	Iron
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	2
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Rainbow Creek to determine beneficial use support and results are as follows: 2 of 4 samples exceed the criterion for Iron.
Data Reference:	Data for Metals, Nutrients, and Inoganics from the County of San Diego Rainbow Creek, 2004-2005.
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for iron is 0.3 mg/L (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Rainbow Creek was collected at 2 monitoring sites [Rainbow Creek at Old Highway 395 - 902RBC04, and Rainbow Creek at Stage Coach Lane - 902SMG06]
Temporal Representation:	Data was collected between 10/28/2004 and 04/19/2005.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and MACTEC Flow Monitoring Sampling SOP was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and MACTEC Flow

DECISION ID	33865	Region 9
Rainbow Creek		

Pollutant:	**Nitrogen**
Final Listing Decision:	**Do Not Delist from 303(d) list (being addressed with USEPA approved TMDL)**
Last Listing Cycle's Final Listing Decision:	Do Not Delist from 303(d) list (being addressed with USEPA approved TMDL)(2012)
Revision Status	Revised
Sources:	Agricultural Return Flows | Nonpoint Source | Nurseries | Onsite Wastewater Systems (Septic Tanks) | Other Urban Runoff | Point Source
TMDL Name:	Rainbow Creek
TMDL Project Code:	47
Date TMDL Approved by USEPA:	03/22/2006
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for removal on the section 303(d) list under sections 2.2 and 4.2 of the Listing Policy. Under 4.2 of the Policy, a minimum of one line of evidence is needed to assess listing status. Eight lines of evidence are available in the administrative record to assess this pollutant. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the section 303(d) list. There is sufficient justification to place it in the Being Addressed portion of the 303(d) list because a TMDL has been completed and approved by RWQCB and USEPA, and is expected to result in attainment of the standard.. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Sixty-six out of eighty-three exceeded the N:P Ratio in the Basin Plan, and these exceed the allowable frequency listed in Table 4.2 of the Listing Policy. 4. The Rainbow Creek Nutrient TMDL was approved by the RWQCB in 2004 and approved by USEPA on 3/22/2006. 5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 33865, Nitrogen	Region 9
Rainbow Creek	

LOE ID:	81110
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	6

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Rainbow Creek to determine beneficial use support and results are as follows: 6 of 8 samples exceed the criterion for Total Nitrogen as N.
Data Reference:	Data for Metals, Nutrients, and Inoganics from the County of San Diego Rainbow Creek, 2004-2005.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses (RWQCB, 2007). A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used (RWQCB, 2007).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Rainbow Creek was collected at 2 monitoring sites [Rainbow Creek at Old Highway 395 - 902RBC04, and Rainbow Creek at Stage Coach Lane - 902SMG06]
Temporal Representation:	Data was collected between 10/13/2004 and 06/08/2005.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and MACTEC Flow Monitoring Sampling SOP was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and MACTEC Flow Monitoring Sampling SOP.

Line of Evidence (LOE) for Decision ID 33865, Nitrogen **Region 9**

Rainbow Creek

LOE ID:	21192
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	3
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Three of the four samples collected at Rainbow Creek show excessive nitrogen concentrations according to results in California's Surface Water Ambient Monitoring Program Report, 2007. Samples were collected on January 2003, April 2003, May 2003, and September 2003.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial

uses (RWQCB, 2007). 036918

A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used (RWQCB, 2007).

Objective/Criterion Reference: Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Rainbow Creek station (902SMRNB4).
Temporal Representation: Samples were collected on January 2003, April 2003, May 2003, and September 2003.
Environmental Conditions:
QAPP Information: Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.

QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 33865, Nitrogen **Region 9**

Rainbow Creek

LOE ID: 3037

Pollutant: Nitrogen
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 25
Number of Exceedances: 18

Data and Information Type: PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality: Data were collected by RWQCB9 in 2000. Eighteen of 25 N:P ratios were in exceedance. However, all phosphorus samples were in exceedance of the 0.1 mg/L standard, and if phosphorus levels meet the standard, all 25 nitrogen samples would be in exceedance. Nitrogen levels varied in the creek from 2.1 mg/L (October) to 23 mg/L (June).

Data Reference: Placeholder reference 2006 303(d)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: From the Basin Plan: For inland surface waters, enclosed bays and estuaries, coastal lagoons, and ground waters, and all beneficial uses, analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used.

Objective/Criterion Reference: Placeholder reference 2006 303(d)

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Rainbow Creek Station 4, Willow Glen.
Temporal Representation: Samples were collected 2-4 times per month from 01/2000 to 10/2000
Environmental Conditions:
QAPP Information: Data used in 2002 assessment.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 33865, Nitrogen 036919 Region 9

Rainbow Creek

LOE ID:	3042
Pollutant:	Nitrogen
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by RWQCB from 1997-2000. Six samples were collected, but only 2 samples were collected on the same days that phosphorus samples were collected. Only these two samples were used, because there is currently only the N:P ratio to evaluate nitrogen levels. None of 2 ratios were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters, enclosed bays and estuaries, coastal lagoons, and ground waters, and all beneficial uses, analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Rainbow Creek near Fallbrook.
Temporal Representation:	Samples were collected 1-2 times per year from 12/1997 to 03/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33865, Nitrogen Region 9

Rainbow Creek

LOE ID:	3040
Pollutant:	Nitrogen
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	4
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 2002. For 4 of 9 samples, the N:P ratio exceeded 10:1. However, none of the phosphorus samples met standards, but if they had, all 9 of 9 nitrogen samples would have been considered to be in exceedance.
Data Reference:	Placeholder reference 2006 303(d)

SWAMP Data:	Non-SWAMP	036920
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters, enclosed bays and estuaries, coastal lagoons, and ground waters, and all beneficial uses, analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Rainbow Creek station 3, Oak Crest.	
Temporal Representation:	Samples were collected 2-4 times per month from 08/2000 to 10/2000.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33865, Nitrogen **Region 9**

Rainbow Creek

LOE ID:	3039
Pollutant:	Nitrogen
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 2000. One sample was collected and was in exceedance of the 10:1 N:P ratio.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters, enclosed bays and estuaries, coastal lagoons, and ground waters, and all beneficial uses, analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Rainbow Creek station 2, Hines Nurseries.
Temporal Representation:	One sample was collected on 09/19/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33865, Nitrogen **Region 9**

Rainbow Creek

LOE ID:	3038

Pollutant:	Nitrogen	036921
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	Total	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	25	
Number of Exceedances:	25	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 2000. Twenty-five of 25 samples, N:P ratios were in exceedance of the 10:1 ratio standard.	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters, enclosed bays and estuaries, coastal lagoons, and ground waters, and all beneficial uses, analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Rainbow Creek station 5, Riverhouse.	
Temporal Representation:	Samples were collected 2-4 times per month from 01/2000 to 10/2000.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33865, Nitrogen **Region 9**

Rainbow Creek

LOE ID:	3041
Pollutant:	Nitrogen
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	9
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 2000. Nine of 9 N:P ratios were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters, enclosed bays and estuaries, coastal lagoons, and ground waters, and all beneficial uses, analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	

Guideline Reference:	036922
Spatial Representation:	Samples were collected at Rainbow Creek station 6, Stage Coach.
Temporal Representation:	Samples were collected 2-4 times per month from 08/2000 to 10/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 43695 Region 9

Rainbow Creek

Pollutant:	**Phosphorus**
Final Listing Decision:	**Do Not Delist from 303(d) list (being addressed with USEPA approved TMDL)**
Last Listing Cycle's Final Listing Decision:	Do Not Delist from 303(d) list (being addressed with USEPA approved TMDL)(2012)
Revision Status	Revised
Sources:	Unknown Nonpoint Source | Unknown Point Source | Urban Runoff/Storm Sewers
TMDL Name:	Rainbow Creek
TMDL Project Code:	47
Date TMDL Approved by USEPA:	03/22/2006
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal on the CWA section 303(d) List under sections 2.2 and [SECTION] of the Listing Policy. Under 4.1 of the Policy, a minimum of one line of evidence is needed to assess listing status.

Eight lines of evidence are available in the administrative record to assess this pollutant.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List. There is sufficient justification to place it in the Being Addressed portion of the CWA 303(d) List because a TMDL has been completed and approved by RWQCB and USEPA, and is expected to result in attainment of the standard.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 4.1 of the Policy.
2. The data used satisfies the data quantity requirements of section 4.1 of the Policy.
3. Eighty-four of eighty-eight samples exceeded the OBJECTIVE and these exceed the allowable frequency listed in Table 4.1 of the Listing Policy.
4. The TOTAL MAXIMUM DAILY LOADS (TMDLS) FOR TOTAL NITROGEN AND TOTAL PHOSPHORUS IN THE RAINBOW CREEK WATERSHED was approved by USEPA on 02/09/2005.
5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 43695, Phosphorus Region 9

Rainbow Creek

LOE ID:	3055
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total

Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	7
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by RWQCB9 from 1997-1999. Seven of 7 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters - streams and other flowing waters and all beneficial uses, the WQO for total phosphorus is 0.1 mg/L. This appears to be desired goal in order to prevent plant nuisance in streams and other flowing waters; not to be exceeded more than 10% of the time.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Rainbow Creek near Fallbrook.
Temporal Representation:	Samples were collected on a quarterly basis from 12/1997 to 02/1999.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43695, Phosphorus **Region 9**

Rainbow Creek

LOE ID:	3034
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	9
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the RWQCB in 2000. Nine of 9 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters - streams and other flowing waters, and all beneficial uses, the WQO for total phosphorus is 0.1 mg/L. This appears to be desired goal in order to prevent plant nuisance in streams and other flowing waters; not to be exceeded more than 10% of the time.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Rainbow Creek Station 3, Oak Crest.
Temporal Representation:	Samples were collected 2-4 times per month from 08/2000 to 10/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.

QAPP Information Reference(s): 036924

Line of Evidence (LOE) for Decision ID 43695, Phosphorus **Region 9**

Rainbow Creek

LOE ID:	3033
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the RWQCB in 2000. One sample was collected. It was in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters - streams and other flowing waters, and all beneficial uses, the WQO for total phosphorus is 0.1 mg/L. This appears to be desired goal in order to prevent plant nuisance in streams and other flowing waters; not to be exceeded more than 10% of the time.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Rainbow Creek at Station 2, Hines Nurseries.
Temporal Representation:	One sample was collected on 09/19/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43695, Phosphorus **Region 9**

Rainbow Creek

LOE ID:	3032
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	25
Number of Exceedances:	25
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by RWQCB in 2000. Twenty-five of 25 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters - streams and other flowing waters, and all

	beneficial uses, the WQO for total phosphorus is 0.1 mg/L. This appears to be desired goal in order to prevent plant nuisance in streams and other flowing waters; not to be exceeded more than 10% of the time.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Rainbow Creek at station 5, Riverhouse.
Temporal Representation:	Samples were collected 2-3 times per month form 01/2000 to 10/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43695, Phosphorus **Region 9**

Rainbow Creek

LOE ID:	3031
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	25
Number of Exceedances:	25
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by RWQCB in 2000. Twenty-five of 25 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters - streams and other flowing waters, and all beneficial uses, the WQO for total phosphorus is 0.1 mg/L. This appears to be desired goal in order to prevent plant nuisance in streams and other flowing waters; not to be exceeded more than 10% of the time.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data were collected in Rainbow Creek at Station 4, Willow Glen, near the Willow Glen Rd. Steel Bridge.
Temporal Representation:	Samples were collected 2-3 times per month from 01/2000 to 10/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43695, Phosphorus **Region 9**

Rainbow Creek

LOE ID:	3035
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total

Beneficial Use:	Municipal & Domestic Supply	036926
Number of Samples:	9	
Number of Exceedances:	9	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by RWQCB in 2000. Nine of 9 samples were in exceedance.	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters - streams and other flowing waters, and all beneficial uses, the WQO for total phosphorus is 0.1 mg/L. This appears to be desired goal in order to prevent plant nuisance in streams and other flowing waters; not to be exceeded more than 10% of the time.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Rainbow Creek station 6, Stage Coach.	
Temporal Representation:	Samples were collected 2-4 times per month from 08/2000 to 10/2000.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43695, Phosphorus **Region 9**

Rainbow Creek

LOE ID:	21193
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	All four samples collected at Rainbow Creek show excessive phosphorus concentrations according to results in California's Surface Water Ambient Monitoring Program Report, 2007. Samples were collected on January 2003, April 2003, May 2003, and September 2003.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	As described in San Diego Basin Plan; inland surface waters, bays and estuaries and coastal lagoon waters shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses (RWQCB, 2007). From the Basin Plan: For inland surface waters-streams and other flowing waters, with all beneficial uses, the water quality objective for total phosphorus is 0.1 mg/L (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at Rainbow Creek station (902SMRNB4). 036927
Temporal Representation:	Samples were collected on January 2003, April 2003, May 2003, and September 2003.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43695, Phosphorus **Region 9**

Rainbow Creek

LOE ID:	81109
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	4
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Rainbow Creek to determine beneficial use support and results are as follows: 4 of 8 samples exceed the criterion for Phosphorus.
Data Reference:	Data for Metals, Nutrients, and Inoganics from the County of San Diego Rainbow Creek, 2004-2005.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The numeric target for phosphorus according to the Rainbow Creek TMDL is 0.1 mg/L. (San Diego Basin Plan)
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Rainbow Creek was collected at 2 monitoring sites [Rainbow Creek at Old Highway 395 - 902RBC04, and Rainbow Creek at Stage Coach Lane - 902SMG06]
Temporal Representation:	Data was collected between 10/13/2004 and 06/08/2005.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and MACTEC Flow Monitoring Sampling SOP was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and MACTEC Flow Monitoring Sampling SOP.

DECISION ID **53028** **Region 9**

Rainbow Creek

Pollutant:	**Antimony**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the eight samples exceed the CRITERIA. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of eight samples exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53028, Antimony **Region 9**

Rainbow Creek

LOE ID:	80846
Pollutant:	Antimony
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Rainbow Creek to determine beneficial use support and results are as follows: 0 of 8 samples exceed the criterion for Antimony.
Data Reference:	Data for Metals, Nutrients, and Inoganics from the County of San Diego Rainbow Creek, 2004-2005.
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for antimony is .006 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Rainbow Creek was collected at 2 monitoring sites [Rainbow Creek at Old Highway 395 - 902RBC04, and Rainbow Creek at Stage Coach Lane - 902SMG06]
Temporal Representation:	Data was collected between 10/13/2004 and 06/08/2005.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and MACTEC Flow

	Monitoring Sampling SOP was followed.	036929
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and MACTEC Flow Monitoring Sampling SOP.	

DECISION ID	44268	Region 9
Rainbow Creek		

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence is available in the administrative record to assess this pollutant. Zero of the eighteen samples exceed the CRITERIA. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of eighteen samples exceeded the CRITERIA and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 44268, Arsenic	**Region 9**
Rainbow Creek	

LOE ID:	80847
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Rainbow Creek to determine beneficial use support and results are as follows: 0 of 8 samples exceed the criterion for Arsenic.
Data Reference:	Data for Metals, Nutrients, and Inoganics from the County of San Diego Rainbow Creek, 2004-2005.

SWAMP Data:	SWAMP	036930
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for arsenic is 0.05 mg/L (Title 22 of the California Code of Regulations)..	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.	
Spatial Representation:	Data for this line of evidence for Rainbow Creek was collected at 2 monitoring sites [Rainbow Creek at Old Highway 395 - 902RBC04, and Rainbow Creek at Stage Coach Lane - 902SMG06]	
Temporal Representation:	Data was collected between 10/13/2004 and 06/08/2005.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and MACTEC Flow Monitoring Sampling SOP was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and MACTEC Flow Monitoring Sampling SOP.	

Line of Evidence (LOE) for Decision ID 44268, Arsenic **Region 9**

Rainbow Creek

LOE ID:	3066
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	10
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by RWQCB9 from 1997 to 2000. None of 10 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for arsenic is 0.05 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Rainbow Creek near Fallbrook.
Temporal Representation:	Samples were collected on a quarterly basis from 12/1997 to 06/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **53032** **Region 9**

Rainbow Creek

Pollutant:	**Barium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final	New Decision

Listing Decision:		036931
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the four samples exceed the CRITERIA.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of four samples exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53032, Barium **Region 9**

Rainbow Creek

LOE ID:	80848
Pollutant:	Barium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Rainbow Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Barium.
Data Reference:	Data for Metals, Nutrients, and Inoganics from the County of San Diego Rainbow Creek, 2004-2005.
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for barium is 1 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Rainbow Creek was collected at 2 monitoring sites [

	Rainbow Creek at Old Highway 395 - 902RBC04, and Rainbow Creek at Stage Coach Lane - 902SMG06]
Temporal Representation:	Data was collected between 10/28/2004 and 05/19/2005.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and MACTEC Flow Monitoring Sampling SOP was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and MACTEC Flow Monitoring Sampling SOP.

DECISION ID 43756 — Region 9

Rainbow Creek

Pollutant:	**Benthic Community Effects**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Benthic Community Effects is being considered for placement on the section 303(d) list under sections 3.9 and 3.2 of the Listing Policy. Under section 3.9, an additional line of evidence associating the Benthic Community Effects with a water or sediment concentration of pollutants is necessary to assess listing status. One line of evidence is available in the administrative record to assess this indicator. Ten of 13 samples exceeded the water quality objective for Benthic Community Effects, and Zero of the One samples exceeded the Water Quality Objective for Benthic-Macroinvertebrate Bioassessments. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing Benthic Community Effects in this water segment on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Ten of 13 samples exceeded the Index of Biological Integrity (IBI) value of "poor" water quality for this area, and Zero of the One samples exceeded the Water Quality Objective for Benthic-Macroinvertebrate Bioassessments and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy, however as required under section 3.9 of the Listing Policy, pollutant(s) could not be directly associated with the Benthic Community Effects. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 43756, Benthic Community Effects — Region 9

Rainbow Creek

LOE ID:	75503
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	The one sample collected had an IBI score above 40. NPDES bioassessment
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the State or Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	
Spatial Representation:	The samples were collected at stations 902RC-WGR and RC-I15, Rainbow Creek.
Temporal Representation:	The sample was collected in May 2008.
Environmental Conditions:	
QAPP Information:	The data was collected under the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan, June 25, 2009.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 43756, Benthic Community Effects **Region 9**

Rainbow Creek

LOE ID:	3050
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Not Specified
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Data were collected for the San Diego Regional Water Quality Control Board 1999 Biological Assessment Annual Report. Physical habitat quality scores at RC-WGR ranged from 134-144, relatively higher than other sampled waterbodies. BMI ranking scores for RC-WGR were both above and below average compared to other waterbodies. (SDRWQCB, 1999a).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	
Objective/Criterion Reference:	
Evaluation Guideline:	

Guideline Reference: 036934

Spatial Representation: Samples were collected at Rainbow Creek 3 riffles upstream of Willow Glen Rd (RC-WGR).
Temporal Representation: Samples were collected in May, September, and November 1998, and May 1999.
Environmental Conditions:
QAPP Information: Data used in 2002 assessment.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 43756, Benthic Community Effects **Region 9**

Rainbow Creek

LOE ID: 3051

Pollutant: Benthic-Macroinvertebrate Bioassessments
LOE Subgroup: Population/Community Degradation
Matrix: Not Specified
Fraction: None

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 0
Number of Exceedances: 0

Data and Information Type: Benthic macroinvertebrate surveys
Data Used to Assess Water Quality: Data were collected in 2001 by Stream Team. Taxa Richness was 13.5. The EPT index was 52. Tolerance value was 5. The feeding groups were 32% collectors, 40% filterers, 17% scrapers, 8.8% predators, and 0.5% shredders. (Stream Team, 2001).
Data Reference: Placeholder reference 2006 303(d)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion:
Objective/Criterion Reference:

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Rainbow Creek. Exact sampling location was not reported.
Temporal Representation: Samples were collected in Spring 2001.
Environmental Conditions:
QAPP Information: QA Info Missing
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 43756, Benthic Community Effects **Region 9**

Rainbow Creek

LOE ID: 26440

Pollutant: Benthic Community Effects
LOE Subgroup: Adverse Biological Responses
Matrix: Water
Fraction: None

Beneficial Use: Warm Freshwater Habitat

Number of Samples: 13
Number of Exceedances: 10

Data and Information Type: Benthic macroinvertebrate surveys
Data Used to Assess Water Quality: Thirteen samples of IBI data were taken from May 1998 to 2007 at one sampling site. Of the total number of samples, ten samples exceeded the IBI impairment threshold.

Data Reference:	Fish and Game IBI Data Southern California Postfire Study. Index of Biotic Integrity. 2007	036935
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. (SDRWQCB, 1995)	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)	
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13	
Spatial Representation:	Samples were collected at one site: 902RCWGRx on Rainbow Creek.	
Temporal Representation:	Sampling occurred during thirteen events over a ten year period from May 1998 to 2007.	
Environmental Conditions:		
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Project Plan for the California Stream Bioassessment Procedure and the State of California, California Monitoring an Assessment Program: "CMAP", Quality Assurance Project Plan.	
QAPP Information Reference(s):	State of California, California Monitoring and Assessment Program: "CMAP". Quality Assurance Project Plan for the California Stream Bioassessment Procedure The San Diego Stream Team Quality Assurance Project Plan	

DECISION ID	53033	Region 9
Rainbow Creek		

Pollutant:	**Beryllium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the four samples exceed the CRITERIA.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of four samples exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available

indicating that standards are not met. 036936

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53033, Beryllium **Region 9**

Rainbow Creek

LOE ID:	80849
Pollutant:	Beryllium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Rainbow Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Beryllium.
Data Reference:	Data for Metals, Nutrients, and Inoganics from the County of San Diego Rainbow Creek, 2004-2005.
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The CA Department of Health Services maximum contamination level(MCL) thought to be protective of drinking water for beryllium is 4 ug/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Rainbow Creek was collected at 2 monitoring sites [Rainbow Creek at Old Highway 395 - 902RBC04, and Rainbow Creek at Stage Coach Lane - 902SMG06]
Temporal Representation:	Data was collected between 10/28/2004 and 05/19/2005.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and MACTEC Flow Monitoring Sampling SOP was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and MACTEC Flow Monitoring Sampling SOP.

DECISION ID **50049** **Region 9**

Rainbow Creek

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the Eight samples exceed the Water Quality Criteria for Cadmium. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Eight samples exceeded the Water Quality Criteria for Cadmium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50049, Cadmium **Region 9**

Rainbow Creek

LOE ID:	75504
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Rainbow Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, and Inoganics from the County of San Diego Rainbow Creek, 2004-2005.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Data for this line of evidence for Rainbow Creek was collected at 2 monitoring sites [Rainbow Creek at Old Highway 395 - 902RBC04, and Rainbow Creek at Stage Coach Lane - 902SMG06]
Temporal Representation:	Data was collected between 10/13/2004 and 06/08/2005.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and MACTEC Flow Monitoring Sampling SOP was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and MACTEC Flow Monitoring Sampling SOP.

DECISION ID 50048 Region 9

Rainbow Creek

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the Eight samples exceed the Water Quality Criteria for Chromium. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Eight samples exceeded the Water Quality Criteria for Chromium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50048, Chromium Region 9

Rainbow Creek

LOE ID:	75505
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	8

Number of Exceedances:	0	036939

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Rainbow Creek to determine beneficial use support and results are as follows: 0 of 8 samples exceed the criterion for Chromium.
Data Reference:	Data for Metals, Nutrients, and Inoganics from the County of San Diego Rainbow Creek, 2004-2005.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Rainbow Creek was collected at 2 monitoring sites [Rainbow Creek at Old Highway 395 - 902RBC04, and Rainbow Creek at Stage Coach Lane - 902SMG06]
Temporal Representation:	Data was collected between 10/13/2004 and 06/08/2005.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and MACTEC Flow Monitoring Sampling SOP was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and MACTEC Flow Monitoring Sampling SOP.

DECISION ID	**43501**	**Region 9**
Rainbow Creek		

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollution

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the Eight samples exceed the Water Quality Criteria for Copper.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Eight samples exceeded the Water Quality Criteria for Copper and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.

4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 43501, Copper **Region 9**

Rainbow Creek

LOE ID:	75506
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Rainbow Creek to determine beneficial use support and results are as follows: 0 of 8 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, and Inoganics from the County of San Diego Rainbow Creek, 2004-2005.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Rainbow Creek was collected at 2 monitoring sites [Rainbow Creek at Old Highway 395 - 902RBC04, and Rainbow Creek at Stage Coach Lane - 902SMG06]
Temporal Representation:	Data was collected between 10/13/2004 and 06/08/2005.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and MACTEC Flow Monitoring Sampling SOP was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and MACTEC Flow Monitoring Sampling SOP.

Line of Evidence (LOE) for Decision ID 43501, Copper **Region 9**

Rainbow Creek

LOE ID:	3063
Pollutant:	Copper

LOE Subgroup:	Pollutant-Water	036941
Matrix:	Water	
Fraction:	Total	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	11	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by RWQCB9 from 1997 to 2000. None of the 11 samples were in exceedance. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial uses, the WQO for copper is 1.0 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Rainbow Creek near Fallbrook.	
Temporal Representation:	Samples were collected on a quarterly basis from 12/1997 to 06/2000.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID	50050	Region 9
Rainbow Creek		

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the Eight samples exceed the Water Quality Criteria for Lead. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Eight samples exceeded the Water Quality Criteria for Lead and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision	After review of the available data and information, RWQCB staff concludes that the water body-

Recommendation:	pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50050, Lead **Region 9**

Rainbow Creek

LOE ID:	75507
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Rainbow Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, and Inoganics from the County of San Diego Rainbow Creek, 2004-2005.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Rainbow Creek was collected at 2 monitoring sites [Rainbow Creek at Old Highway 395 - 902RBC04, and Rainbow Creek at Stage Coach Lane - 902SMG06]
Temporal Representation:	Data was collected between 10/13/2004 and 06/08/2005.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and MACTEC Flow Monitoring Sampling SOP was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and MACTEC Flow Monitoring Sampling SOP.

DECISION ID **33855** **Region 9**

Rainbow Creek

Pollutant:	**Manganese**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or	Pollutant

Pollution: 036943

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status.

Two lines of evidence is available in the administrative record to assess this pollutant. One of the eleven total manganese samples and zero of the four dissolved manganese samples exceed the CRITERIA.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of eleven total manganese and zero of four dissolved manganese samples exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 33855, Manganese **Region 9**

Rainbow Creek

LOE ID:	3059
Pollutant:	Manganese
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	11
Number of Exceedances:	1
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by RWQCB9 from 1997 to 2000. One of 11 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The water quality objective for manganese in Rainbow Creek is 0.05 milligrams/liter (mg/l) according to Basin Plan, Table 3-2 entitled, Water Quality Objectives. This concentration is not be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Rainbow Creek near Fallbrook.
Temporal Representation:	Samples were collected on a quarterly basis from 12/1997 to 06/2000.
Environmental Conditions:	

QAPP Information:	Data used in 2002 assessment.	036944
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33855, Manganese **Region 9**

Rainbow Creek

LOE ID:	81112
Pollutant:	Manganese
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Rainbow Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Manganese.
Data Reference:	Data for Metals, Nutrients, and Inoganics from the County of San Diego Rainbow Creek, 2004-2005.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for manganese is 0.05 mg/L (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Rainbow Creek was collected at 2 monitoring sites [Rainbow Creek at Old Highway 395 - 902RBC04, and Rainbow Creek at Stage Coach Lane - 902SMG06]
Temporal Representation:	Data was collected between 10/28/2004 and 03/19/2005.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and MACTEC Flow Monitoring Sampling SOP was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and MACTEC Flow Monitoring Sampling SOP.

DECISION ID **33597** **Region 9**

Rainbow Creek

Pollutant:	**Mercury**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a one line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the

seven total mercury samples zero of four dissolved mercury samples exceed the OBJECTIVE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of seven total mercury and zero of four dissolved mercury samples exceeded the OBJECTIVE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 33597, Mercury **Region 9**

Rainbow Creek

LOE ID:	3058
Pollutant:	Mercury
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by RWQCB9 from 1997 to 2000. None of the 7 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for mercury is 0.002 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Rainbow Creek near Fallbrook.
Temporal Representation:	Samples were collected 1-3 times per year from 12/1997 to 03/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33597, Mercury **Region 9**

Rainbow Creek

LOE ID:	81104

Pollutant:	Mercury
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DPW data for Rainbow Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the objective for Mercury.
Data Reference:	Data for Metals, Nutrients, and Inoganics from the County of San Diego Rainbow Creek, 2004-2005.
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	National Recommended Water Quality Criteria Continuous Concentrations (4-day average concentrations) for freshwater aquatic organisms exposure to elemental mercury is 0.77 ug/L.
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Rainbow Creek was collected at 2 monitoring sites [Rainbow Creek at Old Highway 395 - 902RBC04, and Rainbow Creek at Stage Coach Lane - 902SMG06]
Temporal Representation:	Data was collected 10/8/2004 - 4/15/2005.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and MACTEC Flow Monitoring Sampling SOP was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and MACTEC Flow Monitoring Sampling SOP.

DECISION ID	**50051**	**Region 9**
Rainbow Creek		

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Water Quality Criteria for Nickel.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.036947
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Water Quality Criteria for Nickel and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50051, Nickel **Region 9**

Rainbow Creek

LOE ID:	75508
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Rainbow Creek to determine beneficial use support and results are as follows: 0 of 8 samples exceed the criterion for Nickel.
Data Reference:	Data for Metals, Nutrients, and Inoganics from the County of San Diego Rainbow Creek, 2004-2005.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Rainbow Creek was collected at 2 monitoring sites [Rainbow Creek at Old Highway 395 - 902RBC04, and Rainbow Creek at Stage Coach Lane - 902SMG06]
Temporal Representation:	Data was collected between 10/13/2004 and 06/08/2005.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and MACTEC Flow Monitoring Sampling SOP was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and MACTEC Flow Monitoring Sampling SOP.

DECISION ID	53034	036948 Region 9
Rainbow Creek		

Pollutant:	**Nitrate**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the eight samples exceed the OBJECTIVE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of eight samples exceeded the OBJECTIVE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53034, Nitrate	**Region 9**
Rainbow Creek	

LOE ID:	81111
Pollutant:	Nitrate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Rainbow Creek to determine beneficial use support and results are as follows: 0 of 8 samples exceed the criterion for Nitrate as N.
Data Reference:	Data for Metals, Nutrients, and Inoganics from the County of San Diego Rainbow Creek, 2004-2005.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	The numeric objective for Nitrate according to the Rainbow Creek TMDL is 0.040 mg/L Nitrate as N. (San Diego Basin Plan)
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Rainbow Creek was collected at 2 monitoring sites [Rainbow Creek at Old Highway 395 - 902RBC04, and Rainbow Creek at Stage Coach Lane - 902SMG06]
Temporal Representation:	Data was collected between 10/13/2004 and 06/08/2005.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and MACTEC Flow Monitoring Sampling SOP was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and MACTEC Flow Monitoring Sampling SOP.

DECISION ID 53035 Region 9

Rainbow Creek

Pollutant:	**Selenium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the eight samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of eight samples exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53035, Selenium Region 9

Rainbow Creek

LOE ID:	81106
Pollutant:	Selenium

LOE Subgroup:	Pollutant-Water	036950
Matrix:	Water	
Fraction:	Dissolved	
Beneficial Use:	Cold Freshwater Habitat	
Number of Samples:	8	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Rainbow Creek to determine beneficial use support and results are as follows: 0 of 8 samples exceed the criterion for Selenium.	
Data Reference:	Data for Metals, Nutrients, and Inoganics from the County of San Diego Rainbow Creek, 2004-2005.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The selenium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater is 0.005 mg/L (California Toxics Rule, 2000).	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Rainbow Creek was collected at 2 monitoring sites [Rainbow Creek at Old Highway 395 - 902RBC04, and Rainbow Creek at Stage Coach Lane - 902SMG06]	
Temporal Representation:	Data was collected between 10/13/2004 and 06/08/2005.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and MACTEC Flow Monitoring Sampling SOP was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and MACTEC Flow Monitoring Sampling SOP.	

DECISION ID	**53036**	**Region 9**
Rainbow Creek		

Pollutant:	**Silver**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the six samples exceed the CRITERIA.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of six samples exceeded the CRITERIA and this sample size is insufficient to determine, with

the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53036, Silver Rainbow Creek **Region 9**

LOE ID:	81107
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Rainbow Creek to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Silver.
Data Reference:	Data for Metals, Nutrients, and Inoganics from the County of San Diego Rainbow Creek, 2004-2005.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion maximum concentrations for silver to protect aquatic life in freshwater (1-hour average). The silver criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Rainbow Creek was collected at 2 monitoring sites [Rainbow Creek at Old Highway 395 - 902RBC04, and Rainbow Creek at Stage Coach Lane - 902SMG06]
Temporal Representation:	Data was collected between 10/08/2004 and 07/05/2005.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and MACTEC Flow Monitoring Sampling SOP was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and MACTEC Flow Monitoring Sampling SOP.

DECISION ID 43596 **Region 9**
Rainbow Creek

Pollutant: **Turbidity**

Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	036952
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)	
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Two of the five samples exceed the OBJECTIVE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Two of five samples exceeded the OBJECTIVE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of twenty-six samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 43596, Turbidity **Region 9**

Rainbow Creek

LOE ID:	81113
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	2
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Rainbow Creek to determine beneficial use support and results are as follows: 2 of 4 samples exceed the criterion for Turbidity.
Data Reference:	Data for Metals, Nutrients, and Inoganics from the County of San Diego Rainbow Creek, 2004-2005.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for turbidity is 5 ntu.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	

Guideline Reference:	036953
Spatial Representation:	Data for this line of evidence for Rainbow Creek was collected at 2 monitoring sites [Rainbow Creek at Old Highway 395 - 902RBC04, and Rainbow Creek at Stage Coach Lane - 902SMG06]
Temporal Representation:	Data was collected between 03/19/2005 and 06/08/2005.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and MACTEC Flow Monitoring Sampling SOP was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and MACTEC Flow Monitoring Sampling SOP.

Line of Evidence (LOE) for Decision ID 43596, Turbidity **Region 9**

Rainbow Creek

LOE ID:	3049
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 1998. One sample was collected. It was not in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for turbidity is 5 ntu.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Rainbow Creek at Willow Glenn Rd.
Temporal Representation:	One sample was collected on 06/09/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **34101** **Region 9**

Rainbow Creek

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. None of the ten samples exceed the Basin Plan water quality objective for zinc.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the ten samples exceed the Basin Plan water quality objective for zinc, and this sample size is insufficient to determine with the power and confidence of the listing policy the applicable beneficial use support rating. At least 16 samples are required to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 34101, Zinc **Region 9**

Rainbow Creek

LOE ID:	3052
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	10
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected from 1997 to 2000. None of the 10 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for zinc is 5.0 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Rainbow Creek near Fallbrook.
Temporal Representation:	Samples were collected on a quarterly basis from 12/1997 to 06/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 34101, Zinc **Region 9**

Rainbow Creek

LOE ID:	75509	036955

Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Rainbow Creek to determine beneficial use support and results are as follows: 0 of 8 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, and Inoganics from the County of San Diego Rainbow Creek, 2004-2005.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Rainbow Creek was collected at 2 monitoring sites [Rainbow Creek at Stage Coach Lane - 902SMG06, and Rainbow Creek at Stage Coach Lane - 902SMG06]
Temporal Representation:	Data was collected between 10/13/2004 and 6/8/2005.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and MACTEC Flow Monitoring Sampling SOP was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and MACTEC Flow Monitoring Sampling SOP.

DECISION ID	**33789**	**Region 9**
Rainbow Creek		

Pollutant:	**Aluminum**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence is available in the administrative record to assess this pollutant. Three of the five

samples exceed the GUIDELINE. 036956

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Three of five samples exceed the GUIDELINE and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 33789, Aluminum **Region 9**

Rainbow Creek

LOE ID:	80845
Pollutant:	Aluminum
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	3
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Rainbow Creek to determine beneficial use support and results are as follows: 3 of 4 samples exceed the criterion for Aluminum.
Data Reference:	Data for Metals, Nutrients, and Inoganics from the County of San Diego Rainbow Creek, 2004-2005.
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The National Recommended Water Quality Critiera for the protection of aquatic life from aluminum is the chronic continuous concentration (expressed as a 4-day average) of 87 ug/L.
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Rainbow Creek was collected at 2 monitoring sites [Rainbow Creek at Old Highway 395 - 902RBC04, and Rainbow Creek at Stage Coach Lane - 902SMG06]
Temporal Representation:	Data was collected between 10/28/2004 and 05/19/2005.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and MACTEC Flow Monitoring Sampling SOP was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and MACTEC Flow Monitoring Sampling SOP.

Line of Evidence (LOE) for Decision ID 33789, Aluminum **Region 9**

Rainbow Creek

LOE ID:	3067
Pollutant:	Aluminum
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 1999. One sample was collected and was equal to the standard. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Aluminum is 0.2 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Rainbow Creek near Fallbrook.
Temporal Representation:	One sample was collected on 12/06/1999.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33723** **Region 9**

Rainbow Creek

Pollutant:	**Boron**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 11 samples exceed the Basin Plan water quality objective for Boron.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that: 036958
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 11 samples exceed the Basin Plan water quality objective for Boron, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33723, Boron **Region 9**

Rainbow Creek

LOE ID:	3065
Pollutant:	Boron
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	11
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by RWQCB9 from 1997 to 2000. None of the 11 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for Boron is 0.75 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Rainbow Creek near Fallbrook.
Temporal Representation:	Samples were collected on a quarterly basis from 12/1997 to 06/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **44364** **Region 9**

Rainbow Creek

Pollutant:	**Chloride**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or	Pollutant

Pollution: 036959

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. None of the 15 of the samples exceed the Basin Plan water quality objective for chloride.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 15 of the samples exceed the Basin Plan water quality objective for chloride, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 44364, Chloride **Region 9**

Rainbow Creek

LOE ID:	3064
Pollutant:	Chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	15
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by RWQCB9 from 1997 to 2000. None of the 15 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for chloride is 250 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Rainbow Creek near Fallbrook.
Temporal Representation:	Samples were collected on a quarterly basis from 12/1997 to 06/2000.

Environmental Conditions: 036960
QAPP Information: Data used in 2002 assessment.
QAPP Information Reference(s):

DECISION ID	34013	Region 9
Rainbow Creek		

Pollutant: **Cyanide**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Original
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. None of the six samples exceed the Basin Plan water quality objective for cyanide.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the six samples exceed the Basin Plan water quality objective for cyanide, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34013, Cyanide	Region 9
Rainbow Creek	

LOE ID: 3062

Pollutant: Cyanide
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 6
Number of Exceedances: 0

Data and Information Type: PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality: Data were collected by RWQCB9 from 1997 to 2000. None of the 6 samples were in

	exceedance. (SWRCB, 2003).	036961
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for cyanide is 0.2 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Rainbow Creek near Fallbrook.	
Temporal Representation:	Samples were collected 1-2 times per year from 12/1997 to 03/2000.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID	43676	Region 9
Rainbow Creek		

Pollutant:	**Fluoride**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence are available in the administrative record to assess this pollutant. None of 11 of the samples exceed the Basin Plan water quality objective for fluoride. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of 11 of the samples exceed the Basin Plan water quality objective for fluoride, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43676, Fluoride	Region 9
Rainbow Creek	

LOE ID:	3061	036962

Pollutant:	Fluoride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	11
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by RWQCB9 from 1997 to 2000. None of the 11 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for fluoride is 1.0 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Rainbow Creek near Fallbrook.
Temporal Representation:	Samples were collected on a quarterly basis from 12/1997 to 06/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID	**43611**	**Region 9**
Rainbow Creek		

Pollutant:	**Oil and Grease**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2, one line(s) of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. This conclusion is based on the fact that the data shows 2 out of 15 samples had "detectable levels" of oil and grease. There is no numeric water quality objective to compare the data to, to determine if water quality objectives are being met or exceeded.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.

2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy936963
3. This conclusion is based on the fact that the data shows 2 out of 15 samples had "detectable levels" of oil and grease and this information is insufficient to determine with the confidence and power required by the Listing Policy. There is no numeric water quality objective to compare the data to, to determine if water quality objectives are being met or exceeded. A minimum of five samples is needed for application of table 3.2 when there is a numeric water quality objective.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43611, Oil and Grease **Region 9**

Rainbow Creek

LOE ID:	3057
Pollutant:	Oil and Grease
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	15
Number of Exceedances:	2
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by RWQCB9 from 1997 to 2000. Fifteen samples were collected, 2 samples had detectable levels of oil and grease. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, waters shall not contain oils, greases, waxes, or other materials in concentrations which result in a visible film or coating on the surface of the water or on objects in the water, or which cause nuisance or which otherwise adversely affect beneficial uses.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Rainbow Creek near Fallbrook.
Temporal Representation:	Samples were collected on a quarterly basis from 12/1997 to 06/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **42353** **Region 9**

Rainbow Creek

Pollutant:	**Surfactants (MBAS)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or	Pollutant

Pollution: 036964

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One lines of evidence is available in the administrative record to assess this pollutant. None of the ten samples exceed the Basin Plan water quality objective for surfactants.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the ten samples exceed the Basin Plan water quality objective for surfactants, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 42353, Surfactants (MBAS) **Region 9**

Rainbow Creek

LOE ID:	3053
Pollutant:	Surfactants (MBAS)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	10
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected from 1997-2000 by RWQCB9. None of the 10 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for MBAS is 0.5 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Rainbow Creek near Fallbrook.
Temporal Representation:	Samples were collected on a quarterly basis from 12/1997 to 06/2000.

Environmental Conditions: 036965
QAPP Information: Data used in 2002 assessment.
QAPP Information Reference(s):

DECISION ID 33596 Region 9
Rainbow Creek

Pollutant: **pH**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Original
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. None of the 14 samples exceed the Basin Plan water quality objective for pH.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 14 samples exceed the Basin Plan water quality objective for pH and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33596, pH Region 9
Rainbow Creek

LOE ID: 3056

Pollutant: pH
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 14
Number of Exceedances: 0

Data and Information Type: PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality: Data were collected by RWQCB9 from 1997-2000. None of the 14 samples were in

	exceedance. (SWRCB, 2003).	036966
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for pH is 6.5(minimum) to 8.5(maximum).	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Rainbow Creek near Fallbrook.	
Temporal Representation:	Samples were collected on a quarterly basis from 12/1997 to 06/2000. Samples were collected once on most sampling days, but were collected twice on 12/06/1999, 03/07/2000, and 06/01/2000.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID	36317	Region 9
Rainbow Creek		

Pollutant:	**Sulfates**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for removal from the section 303(d) list under section 3.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status. One line of evidence are available in the administrative record to assess this pollutant. Six of 11 of samples exceed the Basin Plan water quality objective for sulfates. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the section 303(d) list. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Six of 11 of samples exceed the Basin Plan water quality objective for sulfates, and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 36317, Sulfates **Region 9**

Rainbow Creek 036967

LOE ID:	3054
Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	11
Number of Exceedances:	6
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by RWQCB9 from 1997 to 2000. Six of 11 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for sulfate is 250 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Rainbow Creek near Fallbrook.
Temporal Representation:	Samples were collected on a quarterly basis from 12/1997 to 06/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33806** **Region 9**

Rainbow Creek

Pollutant:	**Total Dissolved Solids**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for removal from the section 303(d) list under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Six lines of evidence are available in the administrative record to assess this pollutant. Sixty-nine of 71 of the samples exceed the Basin Plan water quality objective for total dissolved solids.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the section 303(d) list.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Sixty-nine of 71 of the samples exceed the Basin Plan water quality objective for total dissolved solids, and this exceeds the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33806, Total Dissolved Solids **Region 9**

Rainbow Creek

LOE ID:	3046
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	9
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 2000. Nine of 9 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters in HSA 902.22, and all beneficial uses, the WQO for TDS is 750 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	These objectives apply to the lower portion of Murrieta Creek in the Wolf HSA (2.52) and the Santa Margarita River from its beginning at the confluence of Murrieta and Temecula Creeks, through the Gavilan HSA (2.22) and DeLuz HSA (2.21), to where it enters the Upper Ysidora HSA (2.13).
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	Samples were collected in Rainbow Creek at station 3, Oak Crest.
Temporal Representation:	Samples were collected 2-4 times per month from 08/2000 to 10/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33806, Total Dissolved Solids **Region 9**

Rainbow Creek

LOE ID:	3047
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved

Beneficial Use:	Municipal & Domestic Supply	036969
Number of Samples:	9	
Number of Exceedances:	9	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 2000. Nine of 9 samples were in exceedance.	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters in HSA 902.22, and all beneficial uses, the WQO for TDS is 750 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:	These objectives apply to the lower portion of Murrieta Creek in the Wolf HSA (2.52) and the Santa Margarita River from its beginning at the confluence of Murrieta and Temecula Creeks, through the Gavilan HSA (2.22) and DeLuz HSA (2.21), to where it enters the Upper Ysidora HSA (2.13).	
Guideline Reference:	Placeholder reference 2006 303(d)	
Spatial Representation:	Samples were collected at Rainbow Creek station 6, Stage Coach.	
Temporal Representation:	Samples were collected 2-4 times per month from 08/2000 to 10/2000.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33806, Total Dissolved Solids **Region 9**

Rainbow Creek

LOE ID:	3045
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 2000. One sample was collected and was in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters in HSA 902.22, and all beneficial uses, the WQO for TDS is 750 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	These objectives apply to the lower portion of Murrieta Creek in the Wolf HSA (2.52) and the Santa Margarita River from its beginning at the confluence of Murrieta and Temecula Creeks, through the Gavilan HSA (2.22) and DeLuz HSA (2.21), to where it enters the Upper Ysidora HSA (2.13).
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	Samples were collected at Rainbow Creek at station 2, Hines Nurseries.
Temporal Representation:	One sample was collected on 09/19/2000.
Environmental Conditions:	

QAPP Information:	Data used in 2002 assessment.	036970
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33806, Total Dissolved Solids **Region 9**

Rainbow Creek

LOE ID:	3044
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	20
Number of Exceedances:	20
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 2000. Twenty of 20 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters in HSA 902.22, and all beneficial uses, the WQO for TDS is 750 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	These objectives apply to the lower portion of Murrieta Creek in the Wolf HSA (2.52) and the Santa Margarita River from its beginning at the confluence of Murrieta and Temecula Creeks, through the Gavilan HSA (2.22) and DeLuz HSA (2.21), to where it enters the Upper Ysidora HSA (2.13).
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	Samples were collected at Rainbow Creek at station 5, Riverhouse.
Temporal Representation:	Samples were collected 2-4 times per month from 03/2000 to 10/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33806, Total Dissolved Solids **Region 9**

Rainbow Creek

LOE ID:	3043
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	21
Number of Exceedances:	21
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 2000. Twenty of 20 samples were in exceedance. One sample was also collected by RWQCB9 on 06/09/1998. This sample was in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters in HSA 902.22, and all beneficial uses, the WQO for TDS is 500 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	These objectives apply to the lower portion of Murrieta Creek in the Wolf HSA (2.52) and the Santa Margarita River from its beginning at the confluence of Murrieta and Temecula Creeks, through the Gavilan HSA (2.22) and DeLuz HSA (2.21), to where it enters the Upper Ysidora HSA (2.13).
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	Samples were collected at Rainbow Creek station 4, Willow Glen.
Temporal Representation:	Samples were collected 2-4 times per year from 03/2000 to 10/2000, and on 06/09/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33806, Total Dissolved Solids **Region 9**

Rainbow Creek

LOE ID:	3048
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	11
Number of Exceedances:	9
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected from 1997 to 2000. Nine of 11 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters in HSA 902.22 and all beneficial uses, the WQO for TDS is 500 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	These objectives apply to the lower portion of Murrieta Creek in the Wolf HSA (2.52) and the Santa Margarita River from its beginning at the confluence of Murrieta and Temecula Creeks, through the Gavilan HSA (2.22) and DeLuz HSA (2.21), to where it enters the Upper Ysidora HSA (2.13).
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	Samples were collected at Rainbow Creek near Fallbrook.
Temporal Representation:	Samples were collected on a quarterly basis from 12/1997 to 06/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Sandia Creek
Water Body ID: CAR9022200019991117132333
Water Body Type: River & Stream

DECISION ID 44568 **Region 9**
Sandia Creek

Pollutant: Iron
Final Listing Decision: Do Not Delist from 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Sources: Source Unknown
Expected TMDL Completion Date: 2025
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal from the CWA section 303(d) List under section 4.1 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Four lines of evidence are available in the administrative record to assess pollutant. Six of the 16 samples exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Six of the 16 samples exceed the objective and this exceeds the allowable frequency listed in Table 4.1 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 44568, Iron **Region 9**
Sandia Creek

LOE ID: 76316

Pollutant: Iron
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Dissolved

Beneficial Use: Warm Freshwater Habitat

Number of Samples:	1	036973
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Iron.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Iron objective for the protection of aquatic life according to Table 3-2 for Sandia Creek within the Santa Margarita Hydrologic Unit is 0.3 mg/L.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]	
Temporal Representation:	Data was collected on a single day 5/11/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 44568, Iron **Region 9**

Sandia Creek

LOE ID:	76318
Pollutant:	Iron
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Iron.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Iron objective for the protection of aquatic life according to Table 3-2 for Sandia Creek within the Santa Margarita Hydrologic Unit is 0.3 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.

QAPP Information Reference(s): Surface Water Ambient Monitoring Program Quality Assurance Program Plan 036974

Line of Evidence (LOE) for Decision ID 44568, Iron **Region 9**

Sandia Creek

LOE ID:	76317
Pollutant:	Iron
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Iron.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for iron is 0.3 mg/L (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 44568, Iron **Region 9**

Sandia Creek

LOE ID:	76319
Pollutant:	Iron
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	2
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 2 of 4 samples exceed the criterion for Iron.
Data Reference:	Data for Metals, Nutrients, and Inorganics from the County of San Diego Sandia Creek and Santa Margarita River, 2004-2009.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	The California Secondary MCL for iron is 0.3 mg/L (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Creek @ Sandia Creek Drive (USGS gauging station) - 902SMG07]
Temporal Representation:	Data was collected over the time period 12/6/2007-11/28/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and COSD Santa Margarita Mass Loading Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and COSD Santa Margarita Mass Loading Report.

Line of Evidence (LOE) for Decision ID 44568, Iron **Region 9**

Sandia Creek

LOE ID:	76320
Pollutant:	Iron
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the eight samples tested for iron exceeded the numeric criteria of 1 mg/L to protect warm freshwater habitat.
Data Reference:	Data for Various Pollutants in the Santa Margarita River Watershed, 2007-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	National Recommended Water Quality Criteria Continuous Concentrations are intended protect freshwater aquatic organisms from chronic exposures and are expressed as 4-day average concentrations. The numeric criteria for iron is 1 mg/L.
Guideline Reference:	National recommended water quality criteria: 2002. EPA-822-R-02-047 Washington, D.C. USEPA
Spatial Representation:	Samples were collected from Sandia Creek near Fallbrook at 33.424444 / -117.24833, in the Santa Margarita River Watershed.
Temporal Representation:	Samples were collected in 2008 during the months of January, April, July and October and in 2009 during the months of February, April and July.
Environmental Conditions:	
QAPP Information:	Marine Corps Base Camp Pendleton - Sandia Creek
QAPP Information Reference(s):	Quality Assurance Project Plan for Biological and Surface Water Sampling to Lower Santa Margarita River Watershed Monitoring Program.

Line of Evidence (LOE) for Decision ID 44568, Iron **Region 9**

Sandia Creek

LOE ID:	3094	036976
Pollutant:	Iron	
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	Total	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	11	
Number of Exceedances:	4	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by LAW Crandall from 1997 to 2000. Four of 11 samples were in exceedance.	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for iron is 0.3 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Sandia Creek. Exact sampling location was not reported.	
Temporal Representation:	Samples were collected on a quarterly basis from 12/1997 to 06/2000.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID	33520	Region 9
Sandia Creek		

Pollutant:	**Sulfates**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown | Unknown Nonpoint Source | Unknown Point Source | Urban Runoff/Storm Sewers
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal from the section 303(d) list under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. Six of Twelve samples exceeded the Basin Plan water quality objective for sulfates.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the section 303(d) list.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Six of Twelve samples exceeded the Basin Plan water quality objective for sulfates and this exceeds the allowable frequency listed in Table 4.2 of the Listing Policy.

4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 33520, Sulfates **Region 9**

Sandia Creek

LOE ID:	76419
Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Sulfate.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Sulfate objective for the protection of aquatic life according to Table 3-2 for Sandia Creek within the Santa Margarita Hydrologic Unit is 250 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 33520, Sulfates **Region 9**

Sandia Creek

LOE ID:	3088
Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	11
Number of Exceedances:	5

Data and Information Type:	Not Specified	036978
Data Used to Assess Water Quality:	Data were collected by LAW Crandall from 1997 to 2001. Five of 11 samples were in exceedance.	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for sulfate is 250 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Sandia Creek. Exact sample location was not reported.	
Temporal Representation:	Samples were collected on a quarterly basis from 12/1997 to 06/2000.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33520, Sulfates **Region 9**

Sandia Creek

LOE ID:	76418
Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Sulfate.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for sulfate is 250 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **43160** **Region 9**

Sandia Creek

Pollutant:	**Total Dissolved Solids**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for removal from the section 303(d) list under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status. Four lines of evidence are available in the administrative record to assess this pollutant. Thirteen of the 13 samples exceed the Basin Plan water quality objective for total dissolved solids. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the section 303(d) list. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Thirteen of the 13 samples exceed the Basin Plan water quality objective for total dissolved solids and this exceeds the allowable frequency listed in Table 4.2 of the Listing Policy. 4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 43160, Total Dissolved Solids **Region 9**

Sandia Creek

LOE ID:	3069
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 1998. One sample was collected, it was in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters in HSA 902.22, and all beneficial uses, the WQO for TDS is 750 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)

Evaluation Guideline:	036980
Guideline Reference:	
Spatial Representation:	Sample was collected at Sandia Creek at Sandia Creek Rd., 0.5-1.0 mile above the confluence.
Temporal Representation:	One sample was collected on 06/09/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43160, Total Dissolved Solids **Region 9**

Sandia Creek

LOE ID:	76436
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Dissolved Solids.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Dissolved Solids objective for the protection of aquatic life according to Table 3-2 for Sandia Creek within the Santa Margarita Hydrologic Unit is 750 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 43160, Total Dissolved Solids **Region 9**

Sandia Creek

LOE ID:	76435
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1

Number of Exceedances:	1	036981

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Dissolved Solids.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for Dissolved Solids is 500 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 43160, Total Dissolved Solids **Region 9**

Sandia Creek

LOE ID:	3070
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	11
Number of Exceedances:	11
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by LAW Crandall from 1997 to 2000. Eleven of 11 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters in HSA 902.22, and all beneficial uses, the WQO for TDS is 750 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sandia Creek. Exact sample location was not reported.
Temporal Representation:	Samples were collected on a quarterly basis from 12/1997 to 06/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 48209 **Region 9**

Sandia Creek

036982

Pollutant:	**Aldicarb**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the four samples exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the four samples exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48209, Aldicarb — Region 9

Sandia Creek

LOE ID:	76326
Pollutant:	Aldicarb
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	None of the four samples exceeded the water quality objective for Aldicarb
Data Reference:	Data for Various Pollutants in the Santa Margarita River Watershed, 2007-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Pesticides shall not be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Department of Public Health archived advisory level for aldicarb is 7 ug/L.
Guideline Reference:	CDPH Archived Advisory Levels for Drinking Water. Archived Advisory Levels are currently

considered Notification Levels. 036983

Spatial Representation:	Four water samples were collected from single location at Sandia Creek near Fallbrook USGS Gage #11044350 (sampling point coincident with gage), Santa Margarita River Watershed.
Temporal Representation:	Samples were collected one time in 2008 (July), and three times in 2009 (February, April, and July).
Environmental Conditions:	
QAPP Information:	The Quality Assurance Project Plan (QAPP) has been submitted with the data but it does not have information about pesticides.
QAPP Information Reference(s):	

DECISION ID 48214 Region 9

Sandia Creek

Pollutant:	**Aldicarb sulfone**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the four samples exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the four samples exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48214, Aldicarb sulfone Region 9

Sandia Creek

LOE ID:	76327
Pollutant:	Aldicarb sulfone
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	4	036984
Number of Exceedances:	0	
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)	
Data Used to Assess Water Quality:	None of the four samples exceeded the water quality objective for Aldicarb sulfone.	
Data Reference:	Data for Various Pollutants in the Santa Margarita River Watershed, 2007-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Water designated for use as domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels specified in California Code of Regulations, Title 22, Table 64444-A of section 64444 (Organic Chemicals) which is incorporated by reference into this plan. This incorporation byreference is prospective including future changes to the incorporated provisions as the changes take effect. (See Table 3-5).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The primary MCL for aldicarb sulfone is 3 ug/L.	
Guideline Reference:	2011 Edition of the Drinking Water Standards and Health Advisories	
Spatial Representation:	Four water samples were collected from single location at Sandia Creek near Fallbrook USGS Gage #11044350 (sampling point coincident with gage),Santa Margarita River Watershed.	
Temporal Representation:	Samples were collected one time in 2008 (July), and three times in 2009 (February, April, and July).	
Environmental Conditions:		
QAPP Information:	The Quality Assurance Project Plan (QAPP) has been submitted with the data but it does not have information about pesticides.	
QAPP Information Reference(s):		

DECISION ID	**48216**	**Region 9**
Sandia Creek		

Pollutant:	**Aldicarb sulfoxide**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the four samples exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the four samples exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision	After review of the available data and information, RWQCB staff concludes that the water body-

Recommendation: pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48216, Aldicarb sulfoxide **Region 9**

Sandia Creek

LOE ID:	76328
Pollutant:	Aldicarb sulfoxide
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	No samples exceeded the water quality objective for Aldicarb sulfoxide.
Data Reference:	Data for Various Pollutants in the Santa Margarita River Watershed, 2007-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water designated for use as domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels specified in California Code of Regulations, Title 22, Table 64444-A of section 64444 (Organic Chemicals) which is incorporated by reference into this plan. This incorporation byreference is prospective including future changes to the incorporated provisions as the changes take effect. (See Table 3-5).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The drinking water standard maximum MCL is 3 ug/L.
Guideline Reference:	2011 Edition of the Drinking Water Standards and Health Advisories
Spatial Representation:	Four water samples were collected from single location.
Temporal Representation:	Samples were collected one time in 2008 (October), and three times in 2009 (February, April, and July).
Environmental Conditions:	
QAPP Information:	The Quality Assurance Project Plan (QAPP) has been submitted with the data but it does not have information about pesticides.
QAPP Information Reference(s):	

DECISION ID **48219** **Region 9**

Sandia Creek

Pollutant:	**Aldrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the zero

samples exceed the objective. 036986

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the zero samples exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48219, Aldrin **Region 9**

Sandia Creek

LOE ID:	76329
Pollutant:	Aldrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	The reporting limit for the six non-detect samples was 0.5 ng/L which is greater than the evaluation guideline, therefore these data are not of sufficient resolution to determine if water quality standards are being achieved.
Data Reference:	Data for Various Pollutants in the Santa Margarita River Watershed, 2007-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Toxic Rule for Aldrin in sources of drinking water is 0.13 ng/L.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Six water samples were collected from single location.
Temporal Representation:	Samples were collected one time in 2007 (November), two samples in 2008 (July & October), and three times in 2009 (February, April, and July).
Environmental Conditions:	
QAPP Information:	Data is complete includes QAPP only minor elements missing
QAPP Information Reference(s):	

DECISION ID 48222 **Region 9**

Sandia Creek 036987

Pollutant:	**Alkalinity as CaCO3**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeds the objectives.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeds the objectives and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48222, Alkalinity as CaCO3 — Region 9

Sandia Creek

LOE ID:	76336
Pollutant:	Alkalinity as CaCO3
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Alkalinity as CaCO3.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	The Alkalinity as CaCO3 criteria for the protection of freshwater aquatic life is 20000 ug/L (National Recommended Water Quality Criteria, 2009).
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 48222, Alkalinity as CaCO3 **Region 9**

Sandia Creek

LOE ID:	76330
Pollutant:	Alkalinity as CaCO3
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Alkalinity as CaCO3.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Alkalinity as CaCO3 criteria for the protection of freshwater aquatic life is 20000 ug/L (National Recommended Water Quality Criteria, 2009).
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **43108** **Region 9**

Sandia Creek

Pollutant:	**Aluminum**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)

Revision Status	Revised	036989
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the two samples exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the two samples exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 43108, Aluminum **Region 9**

Sandia Creek

LOE ID:	76337
Pollutant:	Aluminum
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Aluminum.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for aluminum is 0.2 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.

Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 43108, Aluminum **Region 9**

Sandia Creek

LOE ID:	3099
Pollutant:	Aluminum
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by LAW Crandall in 1999. One sample was collected, it's Aluminum level was equal to the WQO. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial uses, the WQO for aluminum is 0.2 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sandia Creek. Exact location was not reported.
Temporal Representation:	One sample was collected on 12/06/1999.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43108, Aluminum **Region 9**

Sandia Creek

LOE ID:	76339
Pollutant:	Aluminum
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Aluminum.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP

Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The National Recommended Water Quality Critiera for the protection of aquatic life from aluminum is the chronic continuous concentration (expressed as a 4-day average) of 87 ug/L.
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 43108, Aluminum **Region 9**

Sandia Creek

LOE ID:	76338
Pollutant:	Aluminum
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Aluminum.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The National Recommended Water Quality Critiera for the protection of aquatic life from aluminum is the chronic continuous concentration (expressed as a 4-day average) of 87 ug/L.
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 43108, Aluminum **Region 9**

Sandia Creek

LOE ID:	76340	036992

Pollutant:	Aluminum
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	4
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Four of the eight samples tested for aluminum exceeded the numeric criteria of 0.087 mg/L to protect warm freshwater habitat.
Data Reference:	Data for Various Pollutants in the Santa Margarita River Watershed, 2007-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	National Recommended Water Quality Criteria Continuous Concentrations are intended protect aquatic organisms from chronic exposures (expressed as 4-day average concentration) in freshwater. The numeric criteria for aluminum is 0.087 mg/L.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Sandia Creek near Fallbrook at 33.424444 / -117.24833, in the Santa Margarita River Watershed.
Temporal Representation:	Samples were collected in 2008 during the months of January, April, July and October and in 2009 during the months of February, April and July.
Environmental Conditions:	
QAPP Information:	Marine Corps Base Camp Pendleton - Sandia Creek
QAPP Information Reference(s):	

DECISION ID	**33028**	**Region 9**
Sandia Creek		

Pollutant:	**Antimony**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. A single sample was collected and it did not exceed the Basin Plan water quality objective for antimony.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.

3. A single sample was collected and it did not exceed the Basin Plan water quality objective for antimony and this sample size is insufficient to determine with the power and confidence of the Listing Policy if standards are not met. A minimum of two samples is needed for application of table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 33028, Antimony **Region 9**

Sandia Creek

LOE ID:	3071
Pollutant:	Antimony
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 1998. One sample was collected an was not in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for Antimony is 0.006 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sandia Creek at Sandia Creek Rd, 0.5-1.0 mile above the confluence.
Temporal Representation:	The sample was collected on 06/09/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33028, Antimony **Region 9**

Sandia Creek

LOE ID:	76351
Pollutant:	Antimony
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8

Number of Exceedances:	0	036994

Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the eight samples exceeded the water quality evaluation guideline.
Data Reference:	Data for Various Pollutants in the Santa Margarita River Watershed, 2007-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Criteria: Water designated for use as domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels specified in California Code of Regulations, Title 22, Table 64444-A of section 64444 (Organic Chemicals) which is incorporated by reference into this plan. This incorporation byreference is prospective including future changes to the incorporated provisions as the changes take effect. (See Table 3-5).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The CA Department of Health Services maximum contamination level (MCL) thought to be protective of drinking water for antimony is 6 ug/L.
Guideline Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Spatial Representation:	Samples were collected from Sandia Creek near Fallbrook at 33.424444 / -117.24833, in the Santa Margarita River Watershed.
Temporal Representation:	Samples were collected in 2008 during the months of January, April, July and October and in 2009 during the months of February, April and July.
Environmental Conditions:	
QAPP Information:	Marine Corps Base Camp Pendleton - Sandia Creek
QAPP Information Reference(s):	

DECISION ID	36728	Region 9
Sandia Creek		

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary, and under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Five lines of evidence are available in the administrative record to assess this pollutant. Zero of one samples (sediment) and one of 13 samples (water) exceeded the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples (sediment) and one of 13 samples (water) exceeded the water quality objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 36728, Arsenic **Region 9**

Sandia Creek

LOE ID:	76362
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The dissolved arsenic criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved arsenic is 0.150 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 36728, Arsenic **Region 9**

Sandia Creek

LOE ID:	76363
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)

Data Used to Assess Water Quality:	None of the eight samples tested for arseinc exceeded the numeric criteria of 0.15 mg/L to protect warm freshwater habitat.
Data Reference:	Data for Various Pollutants in the Santa Margarita River Watershed, 2007-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule lists criterion continuous concentrations (expresesed as a 4-day average) for dissolved arsenic to protect aquatic life in freshwater. The numeric criteria for arsenic is 0.15 mg/L.
Guideline Reference:	
Spatial Representation:	Samples were collected from Sandia Creek near Fallbrook at 33.424444 / -117.24833, in the Santa Margarita River Watershed.
Temporal Representation:	Samples were collected in 2008 during the months of January, April, July and October and in 2009 during the months of February, April and July.
Environmental Conditions:	
QAPP Information:	Marine Corps Base Camp Pendleton - Sandia Creek
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 36728, Arsenic **Region 9**

Sandia Creek

LOE ID:	76364
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	4
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Four of the eight samples exceeded the 0.004 ppb value, the rest were with MDLs greater than 0.004 ppb.
Data Reference:	Data for Various Pollutants in the Santa Margarita River Watershed, 2007-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Office of Environmental Hazard and Heath Assessment, Public Health Goal (PHG) for arsenic is 0.004 ug/L.
Guideline Reference:	Public Health Goal for Arsenic in Drinking Water
Spatial Representation:	Samples were collected from Sandia Creek near Fallbrook at 33.424444 / -117.24833, in the Santa Margarita River Watershed.
Temporal Representation:	Samples were collected in 2008 during the months of January, April, July and October and in 2009 during the months of February, April and July.
Environmental Conditions:	
QAPP Information:	Marine Corps Base Camp Pendleton - Sandia Creek
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 36728, Arsenic 036997 Region 9

Sandia Creek

LOE ID:	76359
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for arsenic is 33 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 36728, Arsenic Region 9

Sandia Creek

LOE ID:	76360
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP

Water Quality Objective/Criterion:	The dissolved arsenic criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved arsenic is 0.150 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 36728, Arsenic **Region 9**

Sandia Creek

LOE ID:	3072
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 1998. One sample was collected and was in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for arsenic is 0.05 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Sample was collected at Sandia Creek at Sandia Creek Rd., 0.5-1.0 mile above confluence.
Temporal Representation:	One sample was collected in 06/09/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 36728, Arsenic **Region 9**

Sandia Creek

LOE ID:	3073
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total

Beneficial Use:	Municipal & Domestic Supply	036999
Number of Samples:	10	
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Data were collected by LAW Crandall from 1997 to 2000. None of the 10 samples were in exceedance. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for arsenic is 0.05 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Sandia Creek. Exact sampling location was not reported.	
Temporal Representation:	Samples were collected on a quarterly basis from 12/1997 to 06/2000.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 36728, Arsenic **Region 9**

Sandia Creek

LOE ID:	76361
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for arsenic is 0.01 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 36728, Arsenic **Region 9**

Sandia Creek 037000

LOE ID:	76352
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for arsenic is 33 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 43771 **Region 9**

Sandia Creek

Pollutant:	**Benthic Community Effects**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollution
Regional Board Conclusion:	
Regional Board Decision Recommendation:	

Line of Evidence (LOE) for Decision ID 43771, Benthic Community Effects **Region 9**

Sandia Creek

LOE ID:	79466

Pollutant:	Benthic-Macroinvertebrate Bioassessments	037001
LOE Subgroup:	Population/Community Degradation	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Cold Freshwater Habitat	
Number of Samples:	16	
Number of Exceedances:	0	
Data and Information Type:	Benthic macroinvertebrate surveys	
Data Used to Assess Water Quality:	The CSCI scores for all sites on Sandia Creek are above the 0.79 threshold, and therefore not exceeding the water quality objective for the aquatic life beneficial use.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009 RWB9 Status Sampling 2007 and 2008 Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008. Region 9 CSCI Scores & Water Body Information	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.	
Guideline Reference:	The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.	
Spatial Representation:	The samples were collected at stations 902REF-SC, REF-SC2, 902SMSND3, 902S01097	
Temporal Representation:	The samples were collected from 2001 to 2009.	
Environmental Conditions:		
QAPP Information:	Data collected following SWAMP QA protocols for the RWB9 Status Sampling 2007 and 2008 water quality monitoring project, the County of San Diego MS4 Copermittees Receiving Waters Monitoring and Reporting Program, and the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan.	
QAPP Information Reference(s):	e-mail clarifying QAPP information RWB9 Stormwater Monitoring Council CY 2009 RWB9 Status Sampling 2007 and 2008 Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.	

Line of Evidence (LOE) for Decision ID 43771, Benthic Community Effects **Region 9**

Sandia Creek

LOE ID:	76405
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	Dissolved	037002
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	8	
Number of Exceedances:	2	
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)	
Data Used to Assess Water Quality:	Two of eight samples tested for total selenium exceeded the criteria of 5 ug/L.	
Data Reference:	Data for Various Pollutants in the Santa Margarita River Watershed, 2007-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (expressed as a 4-day average concentration) for selenium to protect aquatic life in freshwater. The criteria for selenium is 5 ug/L.	
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Spatial Representation:	Samples were collected from Sandia Creek near Fallbrook at 33.424444 / -117.24833, in the Santa Margarita River Watershed.	
Temporal Representation:	Samples were collected in 2008 during the months of January, April, July and October and in 2009 during the months of February, April and July.	
Environmental Conditions:		
QAPP Information:	Marine Corps Base Camp Pendleton - Sandia Creek	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43771, Benthic Community Effects **Region 9**

Sandia Creek

LOE ID:	76438
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate water toxicity. The sample exhibited significant toxicity. The toxicity test included survival and growth of Ceriodaphnia dubia. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL, Significant compared to negative control based on statistical test, less than stated alpha level, AND less than the evaluation threshold (both criteria are met).
Guideline Reference:	
Spatial Representation:	The sample was collected at station 902S01097.
Temporal Representation:	The sample was collected in May 2009.
Environmental Conditions:	
QAPP Information:	Data quality is good. Data results were recorded in the SWAMP database and followed SWAMP protocols.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43771, Benthic Community Effects **Region 9**

Sandia Creek

LOE ID:	76340
Pollutant:	Aluminum
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	4
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Four of the eight samples tested for aluminum exceeded the numeric criteria of 0.087 mg/L to protect warm freshwater habitat.
Data Reference:	Data for Various Pollutants in the Santa Margarita River Watershed, 2007-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	National Recommended Water Quality Criteria Continuous Concentrations are intended protect aquatic organisms from chronic exposures (expressed as 4-day average concentration) in freshwater. The numeric criteria for aluminum is 0.087 mg/L.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Sandia Creek near Fallbrook at 33.424444 / -117.24833, in the Santa Margarita River Watershed.
Temporal Representation:	Samples were collected in 2008 during the months of January, April, July and October and in 2009 during the months of February, April and July.
Environmental Conditions:	
QAPP Information:	Marine Corps Base Camp Pendleton - Sandia Creek
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43771, Benthic Community Effects **Region 9**

Sandia Creek

LOE ID:	76436
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water

Matrix:	Water	037004
Fraction:	Dissolved	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	1	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Dissolved Solids.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Dissolved Solids objective for the protection of aquatic life according to Table 3-2 for Sandia Creek within the Santa Margarita Hydrologic Unit is 750 mg/L.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]	
Temporal Representation:	Data was collected on a single day 5/11/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 43771, Benthic Community Effects **Region 9**

Sandia Creek

LOE ID:	76419
Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Sulfate.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Sulfate objective for the protection of aquatic life according to Table 3-2 for Sandia Creek within the Santa Margarita Hydrologic Unit is 250 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 43771, Benthic Community Effects **Region 9**

Sandia Creek

LOE ID:	76415
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	2
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Two of the eight samples tested for disolved silver exceeded the numeric criteria promulgated to protect warm freshwater habitat.
Data Reference:	Data for Various Pollutants in the Santa Margarita River Watershed, 2007-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion maximum concentrations for silver to protect aquatic life in freshwater (1-hour average). The disolved silver criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Sandia Creek near Fallbrook at 33.424444 / -117.24833, in the Santa Margarita River Watershed.
Temporal Representation:	Samples were collected in 2008 during the months of January, April, July and October and in 2009 during the months of February, April and July.
Environmental Conditions:	
QAPP Information:	Marine Corps Base Camp Pendleton - Sandia Creek
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43771, Benthic Community Effects **Region 9**

Sandia Creek

LOE ID:	76402
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Selenium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The selenium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater is 0.005 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 43771, Benthic Community Effects **Region 9**

Sandia Creek

LOE ID:	76373
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	14
Number of Exceedances:	1
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	One of the fourteen samplea collected had IBI scores below 40. NPDES bioassessment
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the State or Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	

Spatial Representation:	The samples were collected at stations 902REF-SC and REF-SC2, Sandia Creek.
Temporal Representation:	The samples were collected twice a year in May and October from 2001 to 2008.
Environmental Conditions:	
QAPP Information:	The data was collected under the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan, June 25, 2009.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 43771, Benthic Community Effects **Region 9**

Sandia Creek

LOE ID:	76372
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	The IBI score for this water body was above 40 which indicates that this water body is not considered to have impaired conditions.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at the following station: 902S01097-Sandia Canyon Creek ~1.9mi above De Anza Rd.
Temporal Representation:	Surveys done May 11, 2009.
Environmental Conditions:	
QAPP Information:	Data collected following SWAMP QA protocols for the Southern California Stormwater Monitoring Coalition Project.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43771, Benthic Community Effects **Region 9**

Sandia Creek

LOE ID:	3100
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Adverse Biological Responses
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Data were collected by the "Stream Team" in 2001. Taxa richness was 13.0, the EPT index was 88, and tolerance value was 3.8. The majority of macroinvertebrates were collectors and filterers. (Stream Team, 2001).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	
Objective/Criterion Reference:	
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sandia Creek. Exact location was not given.
Temporal Representation:	Samples were collected in Spring of 2001.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43771, Benthic Community Effects **Region 9**

Sandia Creek

LOE ID:	26461
Pollutant:	Benthic Community Effects
LOE Subgroup:	Adverse Biological Responses
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	14
Number of Exceedances:	3
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Fourteen samples of IBI data were taken from May 1998 to October 2003 at three sampling sites. Of the total number of samples, three of the samples exceeded the IBI impairment threshold.
Data Reference:	Fish and Game IBI Data 2007 SDRWQCB Bioassessment Data
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. (SDRWQCB, 1995)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)

Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at three sites: 902SCSCRx, 902SCDLRx, 902SMSND3 on Sandia Creek.
Temporal Representation:	Sampling occurred during one to three events annually from May 1998 to October 2003.
Environmental Conditions:	
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Project Plan for the California Stream Bioassessment Procedure and the State of California, California Monitoring an Assessment Program: "CMAP", Quality Assurance Project Plan.
QAPP Information Reference(s):	State of California, California Monitoring and Assessment Program: "CMAP". Quality Assurance Project Plan for the California Stream Bioassessment Procedure The San Diego Stream Team Quality Assurance Project Plan

Line of Evidence (LOE) for Decision ID 43771, Benthic Community Effects **Region 9**

Sandia Creek

LOE ID:	27025
Pollutant:	Benthic Community Effects
LOE Subgroup:	Adverse Biological Responses
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	1
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Seven samples of IBI data were taken from May 2004 to May 2007 at one sampling site. Of the total number of samples, one of the samples exceeded the IBI impairment threshold.
Data Reference:	Stream Bioassessment Data. Co-permitee Data. Collected 2002-2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at one site: REF-SC2 on Sandia Creek.
Temporal Representation:	Sampling occurred during May and October annually over a three year period from May 2004 to October 2006 and during May in 2007.
Environmental Conditions:	
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Manual for Freshwater Bioassessment.
QAPP Information Reference(s):	Quality Assurance Manual for Freshwater Bioassessment Revision 0

Line of Evidence (LOE) for Decision ID 43771, Benthic Community Effects 037010 Region 9

Sandia Creek

LOE ID:	76370
Pollutant:	Ammonia (Unionized)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	27
Number of Exceedances:	12
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	US Bureau of Reclamation data from the Marine Corps Military Base at Camp Pendleton. Twelve out of 27 samples exceeded the criteria from the Basin Plan.
Data Reference:	Data for Various Pollutants in the Santa Margarita River Watershed, 2007-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the San Diego Regional Water Quality Control Board Basin Plan the discharge of wastes shall not cause concentrations of un-ionized ammonia (NH3) to exceed 0.025 mg/l (as N) in inland surface waters, enclosed bays and estuaries and coastal lagoons.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Sandia Creek near Fallbrook at USGS gage #11044350 (33.424444,-117.248333)
Temporal Representation:	Samples were taken from Nov 2007 to May 2010.
Environmental Conditions:	
QAPP Information:	Quality Assurance Project Plan for Biological and Surface Water Sampling -- Hydrologic and Biological Support for Lower Santa Margarita Watershed Program. Prepared for the United States Bureau of Reclamation by Stetson Engineering Inc. Oct. 2007 tr50
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43771, Benthic Community Effects Region 9

Sandia Creek

LOE ID:	76371
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	The IBI score was above 40 which indicates that this water body is not considered to have impaired conditions.
Data Reference:	RWB9 Status Sampling 2007 and 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or

	that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at the following station: 902SMSND3-Sandia Creek 3
Temporal Representation:	Surveys done May 6, 2008.
Environmental Conditions:	
QAPP Information:	Data collected following SWAMP QA protocols for the RWB9 Status Sampling 2007 and 2008 water quality monitoring project.
QAPP Information Reference(s):	

DECISION ID 32823 Region 9

Sandia Creek

Pollutant:	**Beryllium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. A single sample was collected and it did not exceed the Basin Plan water quality objective for beryllium. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. A single sample was collected and it did not exceed the Basin Plan water quality objective for beryllium and this sample size is insufficient to determine with the power and confidence of the Listing Policy if standards are not met. A minimum of two samples is needed for application of table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 32823, Beryllium Region 9

Sandia Creek

LOE ID:	76374
Pollutant:	Beryllium

LOE Subgroup:	Pollutant-Water	037012
Matrix:	Water	
Fraction:	Not Recorded	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	8	
Number of Exceedances:	0	
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)	
Data Used to Assess Water Quality:	None of eight samples exceeded the Dept. of Health Services maximum contamination level (MCL).	
Data Reference:	Data for Various Pollutants in the Santa Margarita River Watershed, 2007-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Water designated for use as domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels specified in California Code of Regulations, Title 22, Table 64444-A of section 64444 (Organic Chemicals) which is incorporated by reference into this plan. This incorporation byreference is prospective including future changes to the incorporated provisions as the changes take effect. (See Table 3-5).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The CA Department of Health Services maximum contamination level (MCL) thought to be protective of drinking water for beryllium is 4 ug/L.	
Guideline Reference:	Maximum Contaminant Levels for organic and inorganic chemicals, CCR	
Spatial Representation:	Samples were collected from Sandia Creek near Fallbrook at 33.424444 / -117.24833, in the Santa Margarita River Watershed.	
Temporal Representation:	Samples were collected in 2008 during the months of January, April, July and October and in 2009 during the months of February, April and July.	
Environmental Conditions:		
QAPP Information:	Marine Corps Base Camp Pendleton - Sandia Creek	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 32823, Beryllium **Region 9**

Sandia Creek

LOE ID:	3074
Pollutant:	Beryllium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 1998. One sample was collected, it was not in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for beryllium is 0.004 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)

Evaluation Guideline:	037013
Guideline Reference:	
Spatial Representation:	Samples were collected at Sandia Creek at Sandia Creek Rd., 0.5-1.0 mile above confluence.
Temporal Representation:	One sample was collected on 06/09/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 48397 Region 9
Sandia Creek

Pollutant:	**Bifenthrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the eight samples exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the eight samples exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48397, Bifenthrin Region 9
Sandia Creek

LOE ID:	76375
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Bifenthrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Bifenthrin does not exceed 0.0006 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 48397, Bifenthrin **Region 9**

Sandia Creek

LOE ID:	76383
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	The samples did not exceed the evaluation guideline for permethrin.
Data Reference:	Data for Various Pollutants in the Santa Margarita River Watershed, 2007-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Maximum Concentration (1-hour average) is 0.03 ug/L. California Fish and Game Hazard Assessment of the Synthetic Pyrethroid Insecticides Bifenthrin, Cypermethrin, Esfenvalerate, and Permethrin to Aquatic Organisms in the Sacramento-San Joaquin River System. (PDF, 2 mb)
Guideline Reference:	Aquatic Life Criteria for Pyrethroid Insecticides (DFG Administrative Report 00-6, 2000)
Spatial Representation:	One water sample was collected from single location at Sandia Creek near Fallbrook USGS Gage #11044350 (sampling point coincident with gage), Santa Margarita River Watershed.
Temporal Representation:	The sample was collected one time in July of 2009.
Environmental Conditions:	
QAPP Information:	The Quality Assurance Project Plan (QAPP)has been submitted with the data but it does not have pesticide information.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 48397, Bifenthrin **Region 9**

Sandia Creek

LOE ID:	76382
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Bifenthrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Bifenthrin does not exceed 0.0006 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **44614** **Region 9**

Sandia Creek

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary, and under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Five lines of evidence are available in the administrative record to assess this pollutant. Zero of one sample (sediment) and zero of nine samples (water) exceeded the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is

sufficient justification against placing this water segment-pollutant combination on the 2010 section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample (sediment) and zero of nine samples (water) exceeded the water quality objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 44614, Cadmium **Region 9**

Sandia Creek

LOE ID:	76399
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the eight samples exceeded the objective.
Data Reference:	Data for Various Pollutants in the Santa Margarita River Watershed, 2007-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Total cadmium levels should not exceed the California Department of Public Health Primary MCL of 5 ug/L.
Guideline Reference:	
Spatial Representation:	Samples were collected from Sandia Creek near Fallbrook at 33.424444 / -117.24833, in the Santa Margarita River Watershed.
Temporal Representation:	Samples were collected in November 2007, 2008 during the months of January, April, July and October and in 2009 during the months of February, April and July.
Environmental Conditions:	
QAPP Information:	Marine Corps Base Camp Pendleton - Sandia Creek
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44614, Cadmium **Region 9**

Sandia Creek

LOE ID:	76384

Pollutant:	Cadmium	037017
LOE Subgroup:	Pollutant-Sediment	
Matrix:	Sediment	
Fraction:	Total	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for cadmium is 4.98 mg/Kg dry weight (MacDonald et al. 2000).	
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31	
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]	
Temporal Representation:	Data was collected on a single day 5/11/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 44614, Cadmium **Region 9**

Sandia Creek

LOE ID:	76396
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for cadmium is 0.005 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR

Evaluation Guideline:
Guideline Reference:

Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Creek @ Sandia Creek Drive (USGS gauging station) - 902SMG07]
Temporal Representation:	Data was collected 5/13/2003 - 5/27/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 44614, Cadmium **Region 9**

Sandia Creek

LOE ID:	76395
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for cadmium is 0.005 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR

Evaluation Guideline:
Guideline Reference:

Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 44614, Cadmium **Region 9**

Sandia Creek

LOE ID:	76387
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	1	037019
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Cadmium to protect aquatic life in freshwater. The dissolved Cadmium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]	
Temporal Representation:	Data was collected on a single day 5/11/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 44614, Cadmium **Region 9**

Sandia Creek

LOE ID:	3075
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 1998. One sample was collected, it was not in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for Cadmium is 0.005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sandia Creek at Sandia Creek Rd., 0.5-1.0 mile above confluence.
Temporal Representation:	One sample was collected on 06/09/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.

QAPP Information Reference(s): 037020

Line of Evidence (LOE) for Decision ID 44614, Cadmium **Region 9**

Sandia Creek

LOE ID:	76398
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the eight samples tested for cadmium exceeded the numeric criteria of 0.00246 mg/L to protect warm freshwater habitat.
Data Reference:	Data for Various Pollutants in the Santa Margarita River Watershed, 2007-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992). California Toxics Rule (CTR) lists criterion continuous concentrations for cadmium to protect aquatic life in freshwater. The cadmium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Sandia Creek near Fallbrook at 33.424444 / -117.24833, in the Santa Margarita River Watershed.
Temporal Representation:	Samples were collected in 2007, 2008 during the months of January, April, July and October and in 2009 during the months of February, April and July.
Environmental Conditions:	
QAPP Information:	Marine Corps Base Camp Pendleton - Sandia Creek
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44614, Cadmium **Region 9**

Sandia Creek

LOE ID:	76397
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Creek @ Sandia Creek Drive (USGS gauging station) - 902SMG07]
Temporal Representation:	Data was collected 5/13/2003 - 5/27/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 44614, Cadmium **Region 9**

Sandia Creek

LOE ID:	76386
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Cadmium to protect aquatic life in freshwater. The dissolved Cadmium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]

Temporal Representation:	Data was collected on a single day 5/11/2009.	037022
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 44614, Cadmium **Region 9**

Sandia Creek

LOE ID:	76385
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for cadmium is 4.98 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **48414** **Region 9**

Sandia Creek

Pollutant:	**Carbaryl**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the four

samples exceed the objective. 037023

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3.Zero of the four samples exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48414, Carbaryl **Region 9**

Sandia Creek

LOE ID:	76400
Pollutant:	Carbaryl
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	None of the samples exceeded the guidelines.
Data Reference:	Data for Various Pollutants in the Santa Margarita River Watershed, 2007-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Fish and Game for the Insecticide Carbaryl To Aquatic Life In The Sacramento-San Joaquin River Ssystem criteria value is 2.53 ug/L.
Guideline Reference:	Hazard Assessment of the Insecticide Carbaryl to Aquatic Organisms in the Sacramento-San Joaquin River System. State of California Department of Fish and Game
Spatial Representation:	Four water sample were collected from single location at Sandia Creek near Fallbrook USGS Gage #11044350 (sampling point coincident with gage), Santa Margarita River Watershed.
Temporal Representation:	The sample were collected one time in October 2008, February, April and July of 2009.
Environmental Conditions:	
QAPP Information:	The Quality Assurance Project Plan (QAPP)has been submitted with the data but it does not have pesticide information.
QAPP Information Reference(s):	

DECISION ID 48415 Region 9

Sandia Creek 037024

Pollutant:	**Carbofuran**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the four samples exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3.Zero of the four samples exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48415, Carbofuran — Region 9

Sandia Creek

LOE ID:	76408
Pollutant:	Carbofuran
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	None of the four samples exceeded the water quality objective for Carbofuran.
Data Reference:	Data for Various Pollutants in the Santa Margarita River Watershed, 2007-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water designated for use as domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels specified in Table 64449-A of section 64449 of Title 22 of the California Code of Regulations (Secondary Maximum Contaminant Levels, Consumer Acceptance Limits) which is incorporated by reference into this plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	The MCL for carbofuran is 18 ug/L.
Guideline Reference:	
Spatial Representation:	Four water sample were collected from single location at Sandia Creek near Fallbrook USGS Gage #11044350 (sampling point coincident with gage), Santa Margarita River Watershed.
Temporal Representation:	The sample were collected one time in October 2008, February, April and July of 2009.
Environmental Conditions:	
QAPP Information:	The Quality Assurance Project Plan (QAPP) has been submitted with the data but it does not have information about pesticides.
QAPP Information Reference(s):	

DECISION ID 43052 Region 9
Sandia Creek

Pollutant:	**Chloride**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 16 samples exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the 16 samples exceed the objective and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 43052, Chloride Region 9
Sandia Creek

LOE ID:	3097
Pollutant:	Chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	15

Number of Exceedances:	0	037026

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by LAW Crandall from 1997 to 2000. One of 15 samples was in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for chloride is 250 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sandia Creek. Exact location was not reported.
Temporal Representation:	Samples were collected on a quarterly basis from 12/1997 to 06/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43052, Chloride **Region 9**

Sandia Creek

LOE ID:	76411
Pollutant:	Chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chloride.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The recommended secondary maximum contamination level acceptable to consumers of drinking water is 250 mg/L.
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 43052, Chloride **Region 9**

Sandia Creek

LOE ID:	76410
Pollutant:	Chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chloride.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The recommended secondary maximum contamination level acceptable to consumers of drinking water is 250 mg/L.
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 43052, Chloride **Region 9**

Sandia Creek

LOE ID:	76409
Pollutant:	Chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chloride.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Chloride objective for the protection of aquatic life according to Table 3-2 for Sandia Creek within the Santa Margarita Hydrologic Unit is 250 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	037028
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 43052, Chloride **Region 9**

Sandia Creek

LOE ID:	76412
Pollutant:	Chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chloride.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Chloride objective for the protection of aquatic life according to Table 3-2 for Sandia Creek within the Santa Margarita Hydrologic Unit is 250 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **48417** **Region 9**

Sandia Creek

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of

the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One lines of evidence is available in the administrative record to assess this pollutant. Zero of the four samples exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the four samples exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48417, Chlorpyrifos **Region 9**

Sandia Creek

LOE ID:	78134
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for chlorpyrifos is 2.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Creek @ Sandia Creek Drive (USGS gauging station) - 902SMG07]
Temporal Representation:	Data was collected over the time period 5/10/2006-5/27/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.

QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48417, Chlorpyrifos **Region 9**

Sandia Creek

LOE ID:	76413
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Creek @ Sandia Creek Drive (USGS gauging station) - 902SMG07]
Temporal Representation:	Data was collected over the time period 5/10/2006-5/27/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **32824** **Region 9**

Sandia Creek

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and

3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary, and under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Four lines of evidence are available in the administrative record to assess this pollutant. Zero of one samples (sediment) and one of ten samples (water) exceeded the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples (sediment) and one of ten samples (water) exceeded the water quality objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 32824, Chromium **Region 9**

Sandia Creek

LOE ID:	76422
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium. Since the chromium species was not identified, the data point(s) were assessed using both the Chromium III criteria which is hardness-dependent, and the criterion continuous concentration (4-day average) to protect aquatic life in freshwater for chromium VI which is 11 ug/L and is not hardness dependent.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Chromium to protect aquatic life in freshwater. The dissolved Chromium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition

Evaluation Guideline:	037032
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 32824, Chromium **Region 9**

Sandia Creek

LOE ID:	76430
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium. Since the chromium species was not identified, the data point(s) were assessed using both the Chromium III criteria which is hardness-dependent, and the criterion continuous concentration (4-day average) to protect aquatic life in freshwater for chromium VI which is 11 ug/L and is not hardness dependent.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved chromium to protect aquatic life in freshwater. The dissolved Chromium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 32824, Chromium **Region 9**

Sandia Creek

LOE ID:	76432
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water

Matrix:	Water	037033
Fraction:	Not Recorded	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	8	
Number of Exceedances:	0	
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)	
Data Used to Assess Water Quality:	None of eight samples exceeded the Dept. of Health Services maximum contamination level (MCL).	
Data Reference:	Data for Various Pollutants in the Santa Margarita River Watershed, 2007-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The CA Department of Health Services maximum contamination level (MCL) thought to be protective of drinking water for chromium, total is 50 ug/L.	
Guideline Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR	
Spatial Representation:	Samples were collected from Sandia Creek near Fallbrook at 33.424444 / -117.24833, in the Santa Margarita River Watershed.	
Temporal Representation:	Samples were collected in November 2007, 2008 during the months of January, April, July and October and in 2009 during the months of February, April and July.	
Environmental Conditions:		
QAPP Information:	Marine Corps Base Camp Pendleton - Sandia Creek	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 32824, Chromium **Region 9**

Sandia Creek

LOE ID:	76423
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for total chromium is 0.05 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]

Temporal Representation:	Data was collected on a single day 5/11/2009.	037034
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 32824, Chromium **Region 9**

Sandia Creek

LOE ID:	3076
Pollutant:	Chromium (total)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 1998. One sample was collected, it was in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for total chromium is 0.05 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sandia Creek at Sandia Creek Rd., 0.5-1.0 mile above confluence.
Temporal Representation:	One sample was collected on 06/09/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 32824, Chromium **Region 9**

Sandia Creek

LOE ID:	76421
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009

SWAMP Data:	SWAMP	037035
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for chromium is 111 mg/Kg dry weight (MacDonald et al. 2000).	
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31	
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]	
Temporal Representation:	Data was collected on a single day 5/11/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 32824, Chromium **Region 9**

Sandia Creek

LOE ID:	76420
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for chromium is 111 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 32824, Chromium **Region 9**

Sandia Creek 037036

LOE ID:	76431
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the eight samples tested for total chromium exceeded the numeric criteria to protect warm freshwater habitat.
Data Reference:	Data for Various Pollutants in the Santa Margarita River Watershed, 2007-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The cadmium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Sandia Creek near Fallbrook at 33.424444 / -117.24833, in the Santa Margarita River Watershed.
Temporal Representation:	Samples were collected in 2008 during the months of January, April, July and October and in 2009 during the months of February, April and July.
Environmental Conditions:	
QAPP Information:	Marine Corps Base Camp Pendleton - Sandia Creek
QAPP Information Reference(s):	

DECISION ID **44615** **Region 9**

Sandia Creek

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary, and under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Six lines of evidence are available in the administrative record to assess this pollutant. Zero of one samples (sediment) and one of 15 samples (water) exceeded the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples (sediment) and one of 15 samples (water) exceeded the water quality objective and together, this sample size is sufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 44615, Copper **Region 9**

Sandia Creek

LOE ID:	76433
Pollutant:	Copper
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for copper is 149 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 44615, Copper **Region 9**

Sandia Creek

LOE ID:	76441	037038

Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Copper to protect aquatic life in freshwater. The dissolved Copper criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 44615, Copper **Region 9**

Sandia Creek

LOE ID:	76442
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for copper is 1.0 mg/L (Title 22 California Code of Regulations).
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.

Evaluation Guideline:	037039
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 44615, Copper **Region 9**

Sandia Creek

LOE ID:	76443
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved copper to protect aquatic life in freshwater. The dissolved copper criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 44615, Copper **Region 9**

Sandia Creek

LOE ID:	76444
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	6	037040
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Secondary MCL for copper is 1.0 mg/L (Title 22 California Code of Regulations).	
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Creek @ Sandia Creek Drive (USGS gauging station) - 902SMG07]	
Temporal Representation:	Data was collected 5/13/2003 - 5/27/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 44615, Copper **Region 9**

Sandia Creek

LOE ID:	76445
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Creek @ Sandia Creek Drive (USGS gauging station) - 902SMG07]
Temporal Representation:	Data was collected 5/13/2003 - 5/27/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 44615, Copper **Region 9**

Sandia Creek

LOE ID:	76446
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	1
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	One of the eight samples tested for copper exceeded the numeric criteria to protect warm freshwater habitat.
Data Reference:	Data for Various Pollutants in the Santa Margarita River Watershed, 2007-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Sandia Creek near Fallbrook at 33.424444 / -117.24833, in the Santa Margarita River Watershed.
Temporal Representation:	Samples were collected in 2007 during the month of November, 2008 during the months of January, April, July and October and in 2009 during the months of February, April and July.
Environmental Conditions:	
QAPP Information:	Marine Corps Base Camp Pendleton - Sandia Creek
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44615, Copper **Region 9**

Sandia Creek

LOE ID:	3077
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total

Beneficial Use:	Municipal & Domestic Supply	037042
Number of Samples:	1	
Number of Exceedances:	1	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 1998. One sample was collected and was in exceedance. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for copper is 1.0 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Sample was collected at Sandia Creek at Sandia Creek Rd., 0.5-1.0 mile above confluence.	
Temporal Representation:	One sample was collected on 06/09/1998.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44615, Copper **Region 9**

Sandia Creek

LOE ID:	3078
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	11
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by LAW Crandall from 1997 to 2000. None of the 11 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for copper is 1.0 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sandia Creek. Exact sample location was not reported.
Temporal Representation:	Samples were collected on a quarterly basis form 12/1997 to 06/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44615, Copper **Region 9**

Sandia Creek 037043

LOE ID:	76434
Pollutant:	Copper
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for copper is 149 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **48418** **Region 9**

Sandia Creek

Pollutant:	**Cyfluthrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. [NUMBER] lines of evidence are available in the administrative record to assess this pollutant. Zero of the one sample exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.

2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy
3. Zero of the one sample exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48418, Cyfluthrin **Region 9**

Sandia Creek

LOE ID:	76454
Pollutant:	Cyfluthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cyfluthrin, total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of lambda-cyhalothrin does not exceed 0.0005 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Mixtures of lambda-cyhalothrin and other pyrethroids should be considered in an additive manner. (Fojut et al. 2012)Â
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 48418, Cyfluthrin **Region 9**

Sandia Creek

LOE ID:	76453
Pollutant:	Cyfluthrin
LOE Subgroup:	Pollutant-Water

Matrix:	Water	037045
Fraction:	Total	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cyfluthrin, total.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of lambda-cyhalothrin does not exceed 0.0005 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Mixtures of lambda-cyhalothrin and other pyrethroids should be considered in an additive manner. (Fojut et al. 2012)Â	
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.	
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]	
Temporal Representation:	Data was collected on a single day 5/11/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID	**48420**	**Region 9**
Sandia Creek		

Pollutant:	**Cyhalothrin, Lambda**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the one sample exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the one sample exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.

	4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48420, Cyhalothrin, Lambda **Region 9**

Sandia Creek

LOE ID:	76455
Pollutant:	Cyhalothrin, Lambda
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cyhalothrin, lambda, total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Cyhalothrin, lambda, total does not exceed 0.0005 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 48420, Cyhalothrin, Lambda **Region 9**

Sandia Creek

LOE ID:	76456
Pollutant:	Cyhalothrin, Lambda
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat

Number of Samples:	1	037047
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cyhalothrin, lambda, total.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Cyhalothrin, lambda, total does not exceed 0.0005 ug/L.	
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.	
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]	
Temporal Representation:	Data was collected on a single day 5/11/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID	**48424**	**Region 9**
Sandia Creek		

Pollutant:	**Cypermethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one samples exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the one samples exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the

applicable beneficial use support rating. 037048

Line of Evidence (LOE) for Decision ID 48424, Cypermethrin **Region 9**

Sandia Creek

LOE ID:	76303
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	One of one sample result was not used in the assessment because the laboratory data was non-detect and the method detection limit was above the guideline and therefore the results could not be quantified with the level of certainty required by the Listing Policy
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of cypermethrin does not exceed 0.0002 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Fojut et al. 2012)
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 48424, Cypermethrin **Region 9**

Sandia Creek

LOE ID:	76457
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	One of one sample result was not used in the assessment because the laboratory data was

	non-detect and the method detection limit was above the guideline and therefore the results could not be quantified with the level of certainty required by the Listing Policy
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of cypermethrin does not exceed 0.0002 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Fojut et al. 2012)
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 48424, Cypermethrin **Region 9**

Sandia Creek

LOE ID:	76304
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	The samples did not exceed the water quality objective for Cypermethrin.
Data Reference:	Data for Various Pollutants in the Santa Margarita River Watershed, 2007-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	USEPA IRIS Reference Dose (RfD)as a drinking water level limit is 70 ug/L.
Guideline Reference:	IRIS Database Calculations (summary)
Spatial Representation:	One water sample was collected from single location at Sandia Creek near Fallbrook USGS Gage #11044350 (sampling point coincident with gage), Santa Margarita River Watershed.
Temporal Representation:	The sample was collected one time in July of 2009.
Environmental Conditions:	
QAPP Information:	The Quality Assurance Project Plan (QAPP)has been submitted with the data but it does not have pesticide information.
QAPP Information Reference(s):	

DECISION ID 48431 Region 9

Sandia Creek 037050

Pollutant:	**Deltamethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the one sample exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48431, Deltamethrin — Region 9

Sandia Creek

LOE ID:	76305
Pollutant:	Deltamethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Deltamethrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	The evaluation guideline for Deltamethrin is the maximum acceptable toxicant concentration (MATC) of 0.02 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 48431, Deltamethrin **Region 9**

Sandia Creek

LOE ID:	76306
Pollutant:	Deltamethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Deltamethrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for Deltamethrin is the maximum acceptable toxicant concentration (MATC) of 0.02 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **48434** **Region 9**

Sandia Creek

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the four samples exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3.Zero of the four samples exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48434, Diazinon **Region 9**

Sandia Creek

LOE ID:	76307
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).
Guideline Reference:	Water quality for diazinon, Memorandum to J. Karkoski, Central Valley RWQCB, Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Creek @ Sandia Creek Drive (USGS gauging station) - 902SMG07]
Temporal Representation:	Data was collected over the time period 5/10/2006-5/27/2009.

Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48434, Diazinon **Region 9**

Sandia Creek

LOE ID:	78132
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for diazinon is 1.4 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Creek @ Sandia Creek Drive (USGS gauging station) - 902SMG07]
Temporal Representation:	Data was collected over the time period 5/10/2006-5/27/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **48231** **Region 9**

Sandia Creek

Pollutant:	**Endrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the six samples exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the six samples exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48231, Endrin **Region 9**

Sandia Creek

LOE ID:	76308
Pollutant:	Endrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	None of the six samples exceeded the water quality objective for Endrin.
Data Reference:	Data for Various Pollutants in the Santa Margarita River Watershed, 2007-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water designated for use as domestic or municipal supply (MUN) shall not contain concentrations of pesticides in excess of the maximum contaminant levels specified in California Code of Regulations, Title 22, Table 64444-A of section 64444 (Organic Chemicals) which is incorporated by reference into this plan. This incorporation by reference is prospective including future changes to the ncorporated provisions as the changes take effect. (See Table 3-5).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	CTR human health for drinking water is 0.76 ug/l
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Six water samples were collected from USGS Gage #11044350 (sampling point coincident with gage), Santa Margarita River Watershed.
Temporal Representation:	Samples were collected one time in 2007 (November), two times in 2008 (July & October) and three times in 2009 (February, April, and July).
Environmental Conditions:	
QAPP Information:	The Quality Assurance Project Plan (QAPP) has been submitted with the data but it does not have information about pesticides.

QAPP Information Reference(s): 037055

DECISION ID	48438	Region 9
Sandia Creek		

Pollutant:	**Esfenvalerate/Fenvalerate**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the one sample exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48438, Esfenvalerate/Fenvalerate	**Region 9**
Sandia Creek	

LOE ID:	76311
Pollutant:	Esfenvalerate/Fenvalerate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Esfenvalerate/Fenvalerate, total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP

Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to the USEPA Office of Pesticide Programs Ecotoxicity database, the aquatic life EC50 for Esfenvalerate/Fenvalerate is 0.9 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 48438, Esfenvalerate/Fenvalerate **Region 9**

Sandia Creek

LOE ID:	76310
Pollutant:	Esfenvalerate/Fenvalerate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Esfenvalerate/Fenvalerate, total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to the USEPA Office of Pesticide Programs Ecotoxicity database, the aquatic life EC50 for Esfenvalerate/Fenvalerate is 0.9 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **48439** **Region 9**

Sandia Creek

Pollutant: **Fenpropathrin**

Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	037057
Last Listing Cycle's Final Listing Decision:	New Decision	
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the one sample exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 3.1 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48439, Fenpropathrin **Region 9**

Sandia Creek

LOE ID:	76314
Pollutant:	Fenpropathrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Fenpropathrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for Fenpropathrin is the median lethal concentration (LC50; 2.2 ug/L).
Guideline Reference:	OPP Pesticide Ecotoxicity Database.

Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 48439, Fenpropathrin **Region 9**

Sandia Creek

LOE ID:	76315
Pollutant:	Fenpropathrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Fenpropathrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for Fenpropathrin is the median lethal concentration (LC50; 2.2 ug/L).
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **51174** **Region 9**

Sandia Creek

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.3 of the Listing Policy. Under section 3.3 a single line of evidence is necessary to assess listing status.

Five lines of evidence are available in the administrative record to assess this pollutant. Four of the Five samples exceed the Water Quality Objective for Enterococcus, Two of the Twelve samples exceeded the Water Quality Objective for Fecal Coliform, and Two of the Ten samples exceeded the Evaluation Guideline for Total Coliform.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Four of the Five samples exceed the Water Quality Objective for Enterococcus, Two of the Twelve samples exceeded the Water Quality Objective for Fecal Coliform, and Two of the Ten samples exceeded the Evaluation Guideline for Total Coliform and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51174, Indicator Bacteria **Region 9**

Sandia Creek

LOE ID:	76309
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	5
Number of Exceedances:	4
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sandia Creek to determine beneficial use support and results are as follows: 4 of 5 samples exceed the criterion for Enterococci.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Samples shall not exceed 61 organisms per 100 ml for enterococcus in waters designated for REC I beneficial use (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Creek @ Sandia Creek Drive (USGS gauging station) - 902SMG07]
Temporal Representation:	Data was collected over the time period 5/13/2003-7/14/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix

	Analytical and Dry Weather Monitoring Program Rev. 8 was followed. 037060
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 51174, Indicator Bacteria **Region 9**

Sandia Creek

LOE ID:	76312
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	5
Number of Exceedances:	2
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sandia Creek to determine beneficial use support and results are as follows: 2 of 5 samples exceed the criterion for Coliform, Fecal.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the fecal coliform concentration shall not exceed 400 MPN/100 ml.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Creek @ Sandia Creek Drive (USGS gauging station) - 902SMG07]
Temporal Representation:	Data was collected over the time period 5/13/2003-7/14/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 51174, Indicator Bacteria **Region 9**

Sandia Creek

LOE ID:	76313
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the seven samples exceeded the fecal coliform objective.

Data Reference:	Data for Various Pollutants in the Santa Margarita River Watershed, 2007-2009 037061
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The fecal coliform concentration shall not exceed more than 10 percent of total samples during any 30-day period exceed 400/100 ml.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Sandia Creek near Fallbrook. CAR9022200019991117132333
Temporal Representation:	Samples were collected from January 2008 to July 2009.
Environmental Conditions:	
QAPP Information:	This data was collected under the Quality Assurance Project Plan for Biological and Surface Water Sampling.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 51174, Indicator Bacteria **Region 9**

Sandia Creek

LOE ID:	76428
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	5
Number of Exceedances:	1
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sandia Creek to determine beneficial use support and results are as follows: 1 of 5 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxicsubstances in concentrations which are toxic to,or which produce detrimental physiologicalresponses in human, plant, animal, or indigenousaquatic life (Basin Plan).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In waters designated for water contact recreation (REC I), the total coliform concentration shall not exceed 10000 MPN/100 ml (CDPH 2006).
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Creek @ Sandia Creek Drive (USGS gauging station) - 902SMG07]
Temporal Representation:	Data was collected over the time period 5/13/2003-7/14/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 51174, Indicator Bacteria 037062 Region 9

Sandia Creek

LOE ID:	76429
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	5
Number of Exceedances:	1
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	One of the five samples exceeded the total coliform objective.
Data Reference:	Data for Various Pollutants in the Santa Margarita River Watershed, 2007-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Total coliform shall not exceed 10,000/100ml.
Objective/Criterion Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Sandia Creek near Fallbrook.
Temporal Representation:	The samples were collected January 2008 to July 2009.
Environmental Conditions:	
QAPP Information:	This data was collected under the Quality Assurance Project Plan for Biological and Surface Water Sampling.
QAPP Information Reference(s):	

DECISION ID 48448 Region 9

Sandia Creek

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary, and under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Six lines of evidence are available in the administrative record to assess this pollutant. Zero of one sample (sediment) and zero of Eight samples (water) exceeded the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.037063
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample (sediment) and zero of Eight samples (water) exceeded the water quality objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48448, Lead **Region 9**

Sandia Creek

LOE ID:	76325
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Creek @ Sandia Creek Drive (USGS gauging station) - 902SMG07]
Temporal Representation:	Data was collected 5/13/2003 - 5/27/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48448, Lead **Region 9**

Sandia Creek

LOE ID:	76331	037064

Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for Lead is 0.015 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Creek @ Sandia Creek Drive (USGS gauging station) - 902SMG07]
Temporal Representation:	Data was collected 5/13/2003 - 5/27/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48448, Lead **Region 9**

Sandia Creek

LOE ID:	76324
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved lead to protect aquatic life in freshwater. The dissolved lead criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling.

	Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 48448, Lead **Region 9**

Sandia Creek

LOE ID:	76323
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Lead to protect aquatic life in freshwater. The dissolved Lead criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 48448, Lead **Region 9**

Sandia Creek

LOE ID:	76322
Pollutant:	Lead
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment

Fraction:	Total	037066
Beneficial Use:	Cold Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for lead is 128 mg/Kg dry weight (MacDonald et al. 2000).	
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31	
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]	
Temporal Representation:	Data was collected on a single day 5/11/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 48448, Lead **Region 9**

Sandia Creek

LOE ID:	76333
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of eight samples exceeded the OEHHA MCL/Action Level.
Data Reference:	Data for Various Pollutants in the Santa Margarita River Watershed, 2007-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Office of Environmental Hazard and Heath Assessment MCL is 15 ug/L for Lead.
Guideline Reference:	
Spatial Representation:	Samples were collected from Sandia Creek near Fallbrook at 33.424444 / -117.24833, in the Santa Margarita River Watershed.
Temporal Representation:	Samples were collected in November 2007, 2008 during the months of January, April, July

	and October and in 2009 during the months of February, April and July. 037067
Environmental Conditions:	
QAPP Information:	Marine Corps Base Camp Pendleton - Sandia Creek
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 48448, Lead **Region 9**

Sandia Creek

LOE ID:	76332
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the eight samples tested for lead exceeded the numeric criteria of 0.0032 mg/L to protect warm freshwater habitat.
Data Reference:	Data for Various Pollutants in the Santa Margarita River Watershed, 2007-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved lead to protect aquatic life in freshwater. The lead criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a hardness of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Sandia Creek near Fallbrook at 33.424444 / -117.24833, in the Santa Margarita River Watershed.
Temporal Representation:	Samples were collected in November 2007, 2008 during the months of January, April, July and October and in 2009 during the months of February, April and July.
Environmental Conditions:	
QAPP Information:	Marine Corps Base Camp Pendleton - Sandia Creek
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 48448, Lead **Region 9**

Sandia Creek

LOE ID:	76321
Pollutant:	Lead
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1

Number of Exceedances:	0	037068
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for lead is 128 mg/Kg dry weight (MacDonald et al. 2000).	
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31	
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]	
Temporal Representation:	Data was collected on a single day 5/11/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID	**48450**	**Region 9**
Sandia Creek		

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the four samples exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the four samples exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48450, Malathion **Region 9**

Sandia Creek

LOE ID:	76334
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Malathion.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Creek @ Sandia Creek Drive (USGS gauging station) - 902SMG07]
Temporal Representation:	Data was collected over the time period 5/10/2006-5/27/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48450, Malathion **Region 9**

Sandia Creek

LOE ID:	78133
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for

	Malathion. 037070
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for malathion is 100 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Creek @ Sandia Creek Drive (USGS gauging station) - 902SMG07]
Temporal Representation:	Data was collected over the time period 5/10/2006-5/27/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 33925 Region 9

Sandia Creek

Pollutant:	**Mercury**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Three lines of evidence are available in the administrative record to assess this pollutant. Zero of the 15 samples exceed the Basin Plan water quality objective for mercury. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the 15 samples exceed the Basin Plan water quality objective for mercury and this this sample size is insufficient to determine with the power and confidence of the listing policy the applicable beneficial use support rating. A minimum of 16 samples are required to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 33925, Mercury Region 9

Sandia Creek 037071

LOE ID:	3079
Pollutant:	Mercury
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 1998. One sample was collected and was not in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for mercury is 0.002 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Sample was collected at Sandia Creek at Sandia Creek Rd., 0.5-1.0 mile above confluence.
Temporal Representation:	One sample was collected on 06/09/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33925, Mercury **Region 9**

Sandia Creek

LOE ID:	76346
Pollutant:	Mercury
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Zero of eight samples exceeded Basin Plan Objective for Mercury.
Data Reference:	Data for Various Pollutants in the Santa Margarita River Watershed, 2007-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for mercury is 0.002 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition

Spatial Representation:	Samples were collected from Sandia Creek near Fallbrook at 33.424444 / -117.24833, in the Santa Margarita River Watershed.
Temporal Representation:	Samples were collected in 2008 during the months of January, April, July and October and in 2009 during the months of February, April and July.
Environmental Conditions:	
QAPP Information:	Marine Corps Base Camp Pendleton - Sandia Creek
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33925, Mercury **Region 9**

Sandia Creek

LOE ID:	76345
Pollutant:	Mercury
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the eight samples tested for mercury exceeded the numeric criteria of 0.77 ug/L, promulgated to protect warm freshwater habitat.
Data Reference:	Data for Various Pollutants in the Santa Margarita River Watershed, 2007-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	National Recommended Water Quality Criteria Continuous Concentrations are intended protect freshwater aquatic organisms from chronic exposures and are expressed as 4-day average concentrations. Criterion derived from data for inorganic mercury (II), but is applied to total mercury. It will probably be underprotective if a substantial portion of mercury in the water column is methylmercury. Derivation of criterion did not consider exposure through the diet, which is probably important for aquatic life occupying upper trophic levels. The numeric criteria for mercury is 0.77 ug/L.
Guideline Reference:	National recommended water quality criteria: 2002. EPA-822-R-02-047 Washington, D.C. USEPA
Spatial Representation:	Samples were collected from Sandia Creek near Fallbrook at 33.424444 / -117.24833, in the Santa Margarita River Watershed.
Temporal Representation:	Samples were collected in 2008 during the months of January, April, July and October and in 2009 during the months of February, April and July.
Environmental Conditions:	
QAPP Information:	Marine Corps Base Camp Pendleton - Sandia Creek
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33925, Mercury **Region 9**

Sandia Creek

LOE ID:	3080
Pollutant:	Mercury
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	Total	037073
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	6	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by LAW Crandall from 1997 to 2000. None of the 6 samples were in exceedance. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for mercury is 0.002 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Sandia Creek. Exact sampling location was not reported.	
Temporal Representation:	Samples were collected 1-2 times per year from 12/1997 to 03/2000.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID	**51115**	**Region 9**
Sandia Creek		

Pollutant:	**Methiocarb**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the Zero samples exceed the Water Quality Criteria for Methiocarb.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Zero samples exceeded the Water Quality Criteria for Methiocarb and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the

applicable beneficial use support rating. 037074

Line of Evidence (LOE) for Decision ID 51115, Methiocarb **Region 9**

Sandia Creek

LOE ID:	76347
Pollutant:	Methiocarb
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	The detection limit is higher than the criteria for Methiocarb so the data cannot be used for assessment purposes.
Data Reference:	Data for Various Pollutants in the Santa Margarita River Watershed, 2007-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The U.S.EPA Ecotox value for continuous concentration 4-day average is 1/10th of LC50is 0.075 ug/L.
Guideline Reference:	Ecotox database
Spatial Representation:	Four water sample were collected from single location at Sandia Creek near Fallbrook USGS Gage #11044350 (sampling point coincident with gage), Santa Margarita River Watershed.
Temporal Representation:	The sample were collected one time in October 2008, February, April and July of 2009.
Environmental Conditions:	
QAPP Information:	The Quality Assurance Project Plan (QAPP)has been submitted with the data but it does not have pesticide information.
QAPP Information Reference(s):	

DECISION ID **48451** **Region 9**

Sandia Creek

Pollutant:	**Methomyl**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is

sufficient justification against placing this water segment-pollutant combination on the 2006 section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the one samples exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48451, Methomyl **Region 9**

Sandia Creek

LOE ID:	76353
Pollutant:	Methomyl
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	None of the four samples exceeded the evaluation guideline for Methomyl.
Data Reference:	Data for Various Pollutants in the Santa Margarita River Watershed, 2007-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Fish and Game Hazard Assessment of the Insecticide Methomyl to Aquatic Organisms in the San Joaquin River System is 0.52 ug/L.
Guideline Reference:	Hazard Assessment of the Insecticide Methomyl to Aquatic Life in the Sacramento-San Joaquin River System
Spatial Representation:	Four water sample were collected from single location at Sandia Creek near Fallbrook USGS Gage #11044350 (sampling point coincident with gage),Santa Margarita River Watershed.
Temporal Representation:	The sample were collected one time in October 2008, February, April and July of 2009.
Environmental Conditions:	
QAPP Information:	The Quality Assurance Project Plan (QAPP)has been submitted with the data but it does not have pesticide information.
QAPP Information Reference(s):	

DECISION ID 37259 **Region 9**

Sandia Creek

Pollutant:	**Nickel**	037076
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)	
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the section 303(d) list under sections 3.1 and 3.6 of the Listing Policy. Under section 3.6 an additional line of evidence is necessary associating chemical concentrations with sediment toxicity to assess listing status.

Six lines of evidence are available in the administrative record to assess this pollutant. Zero of the Nine samples collected exceed the Water Quality Objective, and Zero of the One sample exceeded the Evaluation Guideline for Nickel.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the Nine samples collected exceed the Water Quality Objective, and Zero of the One sample exceeded the Evaluation Guideline for Nickel and this sample size is insufficient to determine with the power and confidence of the Listing Policy if standards are not met. A minimum of 16 samples is needed for application of table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 37259, Nickel **Region 9**

Sandia Creek

LOE ID:	3081
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 1998. One sample was collected, it was in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for Nickel is 0.1 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)

Evaluation Guideline:	037077
Guideline Reference:	
Spatial Representation:	Sample was collected at Sandia Creek at Sandia Creek Rd., 0.5-1.0 mile above confluence.
Temporal Representation:	One sample was collected on 06/09/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 37259, Nickel **Region 9**

Sandia Creek

LOE ID:	76356
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Nickel to protect aquatic life in freshwater. The dissolved Nickel criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 37259, Nickel **Region 9**

Sandia Creek

LOE ID:	76354
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1

Number of Exceedances:	0	037078

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for nickel is 48.6 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 37259, Nickel **Region 9**

Sandia Creek

LOE ID:	76358
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The Nickel criteria for the protection of human health from consumption of organisms only is 4.6 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 37259, Nickel **Region 9**

Sandia Creek

LOE ID:	76357
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nickel is 0.1 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 37259, Nickel **Region 9**

Sandia Creek

LOE ID:	76366
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the eight samples tested for dissolved nickel exceeded the numeric criteria promulgated to protect warm freshwater habitat.
Data Reference:	Data for Various Pollutants in the Santa Margarita River Watershed, 2007-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36

	(section 131.36 revised at 57 FR 60848, December 22, 1992).	037080
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (expressed as a 4-day average concentration) for dissolved nickel to protect aquatic life in freshwater. The nickel criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a hardness of 100 mg/L was used	
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Spatial Representation:	Samples were collected from Sandia Creek near Fallbrook at 33.424444 / -117.24833, in the Santa Margarita River Watershed.	
Temporal Representation:	Samples were collected in 2007 on November, 2008 during the months of January, April, July and October and in 2009 during the months of February, April and July.	
Environmental Conditions:		
QAPP Information:	Marine Corps Base Camp Pendleton - Sandia Creek	
QAPP Information Reference(s):		

DECISION ID	51117	Region 9
Sandia Creek		

Pollutant:	**Oxamyl (Vydate)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the Four samples exceed the Water Quality Criteria for Oxamyl (Vydate). Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Four samples exceeded the Water Quality Criteria for Oxamyl (Vydate) and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51117, Oxamyl (Vydate)	Region 9
Sandia Creek	

LOE ID:	76380	037081

Pollutant:	Oxamyl (Vydate)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	None of the four samples exceeded the water quality objective for Oxamyl.
Data Reference:	Data for Various Pollutants in the Santa Margarita River Watershed, 2007-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water designated for use as domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels specified in Table 64449-A of section 64449 of Title 22 of the California Code of Regulations (Secondary Maximum Contaminant Levels, Consumer Acceptance Limits) which is incorporated by reference into this plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The MCL for oxamyl is 50 ug/L.
Guideline Reference:	
Spatial Representation:	Four water sample were collected from single location at Sandia Creek near Fallbrook USGS Gage #11044350 (sampling point coincident with gage),Santa Margarita River Watershed.
Temporal Representation:	The sample were collected one time in October 2008, February, April and July of 2009.
Environmental Conditions:	
QAPP Information:	The Quality Assurance Project Plan (QAPP)has been submitted with the data but it does not have pesticide information.
QAPP Information Reference(s):	

DECISION ID	**51154**	**Region 9**
Sandia Creek		

Pollutant:	**Oxygen, Dissolved**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 25 samples exceed the Water Quality Objective for Oxygen, Dissolved. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.

3. Zero of 25 samples exceeded the Water Quality Objective for Oxygen, Dissolved and the sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51154, Oxygen, Dissolved **Region 9**

Sandia Creek

LOE ID:	72808
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	24
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Numeric data generated from 24 averages of Dissolved Oxygen concentrations had 0 exceedences.
Data Reference:	Data for Various Pollutants in the Santa Margarita River Watershed, 2007-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The dissolved oxygen content of all surface waters designated as "Warm Freshwater Habitat" must be greater than 5.0 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Sandia Creek near Fallbrook.
Temporal Representation:	Samples were collected twice a month from November 2007 to July 2009.
Environmental Conditions:	
QAPP Information:	No QAPP was submitted. Sampling was done by municipalities in San Diego pursuant to the San Diego Municipal Stormwater Permit. Sometimes there is information on their submittal form.
QAPP Information Reference(s):	Quality Assurance Project Plan for Biological and Surface Water Sampling to Lower Santa Margarita River Watershed Monitoring Program.

Line of Evidence (LOE) for Decision ID 51154, Oxygen, Dissolved **Region 9**

Sandia Creek

LOE ID:	80736
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved

Beneficial Use:	Cold Freshwater Habitat	037083
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Oxygen, Dissolved.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan, San Diego Basin, Warm Water Habitat Objective, Chapter III, General Objectives for all Inland Surface Waters, Enclosed Bays and Estuaries states the following: The dissolved oxygen concentration for cold water habitats shall not be reduced below 6.0 mg/l at any time.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]	
Temporal Representation:	Data was collected on a single day 5/11/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 51154, Oxygen, Dissolved **Region 9**

Sandia Creek

LOE ID:	76381
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Oxygen, Dissolved.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan, San Diego Basin, Warm Water Habitat Objective, Chapter III, General Objectives for all Inland Surface Waters, Enclosed Bays and Estuaries states the following: The dissolved oxygen concentration for warm water habitats shall not be reduced below 5.0 mg/l at any time.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia

	Canyon Creek ~1.9mi above De Anza Rd. - 902S01097] 037084
Temporal Representation:	Data was collected on a single day 5/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 51156 Region 9

Sandia Creek

Pollutant:	**Pendimethalin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Water Quality Criteria for Pendimethalin. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Water Quality Criteria for Pendimethalin and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51156, Pendimethalin Region 9

Sandia Creek

LOE ID:	76389
Pollutant:	Pendimethalin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	The sample did not exceeded the evaluation guideline for Pendimethalin.

Data Reference:	Data for Various Pollutants in the Santa Margarita River Watershed, 2007037085
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	USEPA IRIS Reference Dose (RfD)as a drinking water level limit is 280 ug/L.
Guideline Reference:	IRIS Summary for Pendimethalin
Spatial Representation:	One water sample was collected from single location at Sandia Creek near Fallbrook USGS Gage #11044350 (sampling point coincident with gage), Santa Margarita River Watershed.
Temporal Representation:	The sample was collected one time in July of 2009.
Environmental Conditions:	
QAPP Information:	The Quality Assurance Project Plan (QAPP)has been submitted with the data but it does not have pesticide information.
QAPP Information Reference(s):	

DECISION ID 51158 Region 9
Sandia Creek

Pollutant:	**Permethrin, total**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the One samples exceed the Water Quality Criteria for Permethrin, total. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Water Quality Criteria for Permethrin, total and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51158, Permethrin, total Region 9
Sandia Creek

LOE ID:	76390

Pollutant:	Permethrin, total
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Permethrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Permethrin does not exceed 0.002 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51158, Permethrin, total **Region 9**

Sandia Creek

LOE ID:	76392
Pollutant:	Permethrin, total
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	The reporting limit for the non-detect sample was 0.01 ug/L which is greater than the evaluation guideline, therefore these data are not of sufficient resolution to determine if water quality standards are being achieved.
Data Reference:	Data for Various Pollutants in the Santa Margarita River Watershed, 2007-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	National Recommended Water Quality Criteria is 0.03 ug/L. 037087
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	One water sample was collected from single location at Sandia Creek near Fallbrook USGS Gage #11044350 (sampling point coincident with gage), Santa Margarita River Watershed.
Temporal Representation:	The sample was collected one time in July of 2009.
Environmental Conditions:	
QAPP Information:	The Quality Assurance Project Plan (QAPP)has been submitted with the data but it does not have pesticide information.
QAPP Information Reference(s):	

DECISION ID 51168 Region 9

Sandia Creek

Pollutant:	**Simazine**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the Four samples exceed the Water Quality Criteria for Simazine. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Four samples exceeded the Water Quality Criteria for Simazine and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51168, Simazine Region 9

Sandia Creek

LOE ID:	76416
Pollutant:	Simazine
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the samples exceeded the water quality objective for simazine.
Data Reference:	Data for Various Pollutants in the Santa Margarita River Watershed, 2007-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water designated for use as domestic or municipal supply (MUN) shall not contain concentrations of pesticides in excess of the maximum contaminant levels specified in California Code of Regulations, Title 22, Table 64444-A of section 64444 (Organic Chemicals) which is incorporated by reference into this plan. This incorporation by reference is prospective including future changes to the incorporated provisions as the changes take effect. (See Table 3-5).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The MCL for Simazine is 4 ug/L.
Guideline Reference:	
Spatial Representation:	Four water samples were collected from single location.
Temporal Representation:	Samples were collected one time in 2008 (July), and three times in 2009 (February, April, and July).
Environmental Conditions:	
QAPP Information:	The Quality Assurance Project Plan (QAPP)has been submitted with the data but it does not have pesticide information.
QAPP Information Reference(s):	

DECISION ID	**51167**	**Region 9**
Sandia Creek		

Pollutant:	**Specific Conductivity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. One of the One samples exceed the Water Quality Objective for Specific Conductivity. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of One samples exceeded the Water Quality Objective for Specific Conductivity and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision	After review of the available data and information, RWQCB staff concludes that the water body-

Recommendation: pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51167, Specific Conductivity **Region 9**

Sandia Creek

LOE ID:	76417
Pollutant:	Specific Conductivity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Conductivity(Us).
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for specific conductance is 900 uS/cm (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **51169** **Region 9**

Sandia Creek

Pollutant:	**Temperature, water**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Two of the 26 samples exceed the Water Quality Objective for Temperature, water.

Based on the readily available data and information, the weight of evidence indicates that there is

sufficient justification against placing this water segment-pollutant combination on the 2010 section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Two of 26 samples exceeded the Water Quality Objective for Temperature, water and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 51169, Temperature, water **Region 9**

Sandia Creek

LOE ID:	76426
Pollutant:	Temperature, water
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	25
Number of Exceedances:	2
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Two of 25 samples exceed the evaluation guideline.
Data Reference:	Data for Various Pollutants in the Santa Margarita River Watershed, 2007-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Board that such alteration in temperature does not adversely affect beneficial uses. At no time or place shall the temperature of any COLD water be increased more than 5Â°F above the natural receiving water temperature.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Inland Fishes of California (Moyle 1976) states that for rainbow trout the optimum range for growth and completion of most life stages is 13-21 degrees C (page 129).
Guideline Reference:	Inland Fishes of California
Spatial Representation:	Data were collected in Sandia Creek near Fallbrook.
Temporal Representation:	Samples were collected intermittenly between November 2007 and July 2009.
Environmental Conditions:	
QAPP Information:	QUALITY ASSURANCE PROJECT PLAN FOR BIOLOGICAL AND SURFACE WATER SAMPLING: HYDROLOGICAL AND BIOLOGICAL SUPPORT TO LOWER SANTA MARGARITA RIVER WATERSHED MONITORING PROGRAM PREPARED FOR UNITED STATES BUREAU OF RECLAMATION SOUTHERN CALIFORNIA AREA OFFICE, TEMECULA (OCTOBER 11, 2007)
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 51169, Temperature, water **Region 9**

Sandia Creek

LOE ID:	76425	037091

Pollutant:	Temperature, water
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Water Temperature.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Board that such alteration in temperature does not adversely affect beneficial uses. At no time or place shall the temperature of any COLD water be increased more than 5Â°F above the natural receiving water temperature.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Inland Fishes of California (Moyle 1976) states that for rainbow trout the optimum range for growth and completion of most life stages is 13-21 degrees C (page 129).
Guideline Reference:	Inland Fishes of California
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID	**33864**	**Region 9**
Sandia Creek		

Pollutant:	**Thallium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. One out of Eight samples exceeded the Basin Plan water quality objective for thallium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.

2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 937092
3. One out of Eight samples exceeded the Basin Plan water quality objective for thallium and this sample size is insufficient to determine with the power and confidence of the Listing Policy if standards are not met. A minimum of two samples is needed for application of table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 33864, Thallium **Region 9**

Sandia Creek

LOE ID:	76427
Pollutant:	Thallium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	1
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	One of eight samples exceeded the maximum contamination level (MCL).
Data Reference:	Data for Various Pollutants in the Santa Margarita River Watershed, 2007-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The CTR value protective of human health for thallium is 1.7 ug/L.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Sandia Creek near Fallbrook at 33.424444 / -117.24833, in the Santa Margarita River Watershed.
Temporal Representation:	Samples were collected in 2008 during the months of January, April, July and October and in 2009 during the months of February, April and July.
Environmental Conditions:	
QAPP Information:	Marine Corps Base Camp Pendleton - Sandia Creek
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33864, Thallium **Region 9**

Sandia Creek

LOE ID:	3084
Pollutant:	Thallium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 1998. One sample was collected, it was not in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for thallium is 0.002 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Sample was collected at Sandia Creek at Sandia Creek Rd., 0.5-1.0 mile above confluence.
Temporal Representation:	One sample was collected on 06/09/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 51170 Region 9

Sandia Creek

Pollutant:	**Toxicity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. One of the One samples exhibited water toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of One samples exhibited water toxicity and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51170, Toxicity Region 9

Sandia Creek 037094

LOE ID:	76438
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate water toxicity. The sample exhibited significant toxicity. The toxicity test included survival and growth of Ceriodaphnia dubia. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL, Significant compared to negative control based on statistical test, less than stated alpha level, AND less than the evaluation threshold (both criteria are met).
Guideline Reference:	
Spatial Representation:	The sample was collected at station 902S01097.
Temporal Representation:	The sample was collected in May 2009.
Environmental Conditions:	
QAPP Information:	Data quality is good. Data results were recorded in the SWAMP database and followed SWAMP protocols.
QAPP Information Reference(s):	

DECISION ID **37239** **Region 9**

Sandia Creek

Pollutant:	**Turbidity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Neither of the two samples exceed the Basin Plan water quality objective for turbidity. Based on the readily available data and information, the weight of evidence indicates that there is

sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. 037095

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of two samples exceeded Basin Plan water quality objectives for turbidity, and this sample size is insufficient to determine with the power and confidence of the Listing Policy if standards are not met. A minimum of five samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 37239, Turbidity **Region 9**

Sandia Creek

LOE ID:	76439
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Turbidity(NTU).
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Turbidity(NTU) objective for the protection of aquatic life according to Table 3-2 for Sandia Creek within the Santa Margarita Hydrologic Unit is 20 NTU.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 37239, Turbidity **Region 9**

Sandia Creek

LOE ID:	3068

Pollutant:	Turbidity	037096
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	Total	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 1998. One sample was collected, it was not in exceedance. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for turbidity is 5 ntu.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Sample was collected at Sandia Creek at Sandia Creek Rd, 0.5 to 1.0 miles above confluence.	
Temporal Representation:	One sample was collected on 06/09/1998.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID	33744	Region 9
Sandia Creek		

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the section 303(d) list under sections 3.1 and 3.6 of the Listing Policy. Under section 3.6 an additional line of evidence is necessary associating chemical concentrations with sediment toxicity to assess listing status.

Eight lines of evidence are available in the administrative record to assess this pollutant. One of 19 samples exceed the Water Quality Criteria and Zero of the One samples exceeded the Evaluation Guideline for Zinc.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of 19 samples exceed the Water Quality Criteria for zinc and this this sample size is insufficient to determine with the power and confidence of the listing policy the applicable beneficial use support rating.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available

indicating that standards are not met. 037097

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 33744, Zinc **Region 9**

Sandia Creek

LOE ID:	76458
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Creek @ Sandia Creek Drive (USGS gauging station) - 902SMG07]
Temporal Representation:	Data was collected 5/13/2003 - 5/27/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 33744, Zinc **Region 9**

Sandia Creek

LOE ID:	76451
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Zinc to protect aquatic life in freshwater. The dissolved Zinc criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 33744, Zinc **Region 9**

Sandia Creek

LOE ID:	3086
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	11
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by LAW Crandall from 1997 to 2000. None of the 11 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Zinc is 5.0 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sandia Creek. Exact sample location was not reported.
Temporal Representation:	Samples were collected on a quarterly basis from 12/1997 to 06/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33744, Zinc **Region 9**

Sandia Creek

LOE ID:	76449
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	The California Secondary MCL for zinc is 5.0 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 33744, Zinc **Region 9**

Sandia Creek

LOE ID:	76448
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce

	detrimental physiological responses in, human, plant, animal, or aquatic life037100
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for zinc is 459 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 33744, Zinc **Region 9**

Sandia Creek

LOE ID:	76459
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of eight samples tested for total zinc exceeded the recommended criteria of 120 ug/L.
Data Reference:	Data for Various Pollutants in the Santa Margarita River Watershed, 2007-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (expressed as a 4-day average concentration) for zinc to protect aquatic life in freshwater. The zinc criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a hardness of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Sandia Creek near Fallbrook at 33.424444 / -117.24833, in the Santa Margarita River Watershed.
Temporal Representation:	Samples were collected in 2008 during the months of January, April, July and October and in 2009 during the months of February, April and July.
Environmental Conditions:	
QAPP Information:	Marine Corps Base Camp Pendleton - Sandia Creek
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33744, Zinc **Region 9**

Sandia Creek

LOE ID:	76450	037101

Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for zinc is 5.0 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Creek @ Sandia Creek Drive (USGS gauging station) - 902SMG07]
Temporal Representation:	Data was collected 5/13/2003 - 5/27/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 33744, Zinc **Region 9**

Sandia Creek

LOE ID:	3085
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 1998. One sample was collected and was in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Zinc is 5.0 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Sample was collected at Sandia Creek at Sandia Creek Rd., 0.5-1.0 mile above confluence.
Temporal Representation: One sample was collected on 06/09/1998.
Environmental Conditions:
QAPP Information: Data used in 2002 assessment.
QAPP Information Reference(s):

DECISION ID 43710 Region 9
Sandia Creek

Pollutant: **pH**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. Three of the 40 samples exceed the Basin Plan water quality objective for pH.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Three of the 40 samples exceed the Basin Plan water quality objective for pH and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 43710, pH Region 9
Sandia Creek

LOE ID: 3090

Pollutant: pH
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 14
Number of Exceedances: 0

Data and Information Type: PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality:	Data were collected by LAW Crandall from 1997 to 2000. None of the 14 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for pH is 6.5(minimum) and 8.5(maximum).
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sandia Creek. Exact location was not reported.
Temporal Representation:	Samples were collected on a quarterly basis from 12/1997 to 06/2000. Samples were collected once per sampling day, except for 03/07/2000 and 06/01/2000, on which 2 samples were collected per day.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43710, pH **Region 9**

Sandia Creek

LOE ID:	76393
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for pH.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	In inland surface waters the pH shall not be depressed below 6.5 nor raised above 8.5.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 43710, pH **Region 9**

Sandia Creek

LOE ID:	76401

Pollutant:	pH	037104
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	Total	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	25	
Number of Exceedances:	3	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Numeric data generated from 25 averages of pH had 3 exceedences.	
Data Reference:	Data for Various Pollutants in the Santa Margarita River Watershed, 2007-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The pH of all inland surface waters shall not be depressed below 6.5 or raised above 8.5 as a result of waste discharges.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Sandia Creek near Fallbrook.	
Temporal Representation:	Samples were collected twice a month from November 2007 to July 2009.	
Environmental Conditions:		
QAPP Information:	No QAPP was submitted. Sampling was done by municipalities in San Diego pursuant to the San Diego Municipal Stormwater Permit. Sometimes there is information on their submittal form.	
QAPP Information Reference(s):		

DECISION ID	**48227**	**Region 9**
Sandia Creek		

Pollutant:	**Ammonia (Unionized)**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Twelve of the 27 samples exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Twelve of the 27 samples exceed the objective and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available

indicating that standards are not met. 037105

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 48227, Ammonia (Unionized) **Region 9**

Sandia Creek

LOE ID:	76369
Pollutant:	Ammonia (Unionized)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Fish Spawning
Number of Samples:	27
Number of Exceedances:	12
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	US Bureau of Reclamation data from the Marine Corps Military Base at Camp Pendleton. Twelve out of 27 samples exceeded the criteria from the Basin Plan.
Data Reference:	Data for Various Pollutants in the Santa Margarita River Watershed, 2007-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the San Diego Regional Water Quality Control Board Basin Plan the discharge of wastes shall not cause concentrations of un-ionized ammonia (NH3) to exceed 0.025 mg/l (as N) in inland surface waters, enclosed bays and estuaries and coastal lagoons.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Sandia Creek near Fallbrook at USGS gage #11044350 (33.424444,-117.248333)
Temporal Representation:	Samples were taken from Nov 2007 to May 2010.
Environmental Conditions:	
QAPP Information:	Quality Assurance Project Plan for Biological and Surface Water Sampling -- Hydrologic and Biological Support for Lower Santa Margarita Watershed Program. Prepared for the United States Bureau of Reclamation by Stetson Engineering Inc. Oct. 2007 tr50
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 48227, Ammonia (Unionized) **Region 9**

Sandia Creek

LOE ID:	76370
Pollutant:	Ammonia (Unionized)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	27
Number of Exceedances:	12
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality:	US Bureau of Reclamation data from the Marine Corps Military Base at Camp Pendleton. Twelve out of 27 samples exceeded the criteria from the Basin Plan.
Data Reference:	Data for Various Pollutants in the Santa Margarita River Watershed, 2007-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the San Diego Regional Water Quality Control Board Basin Plan the discharge of wastes shall not cause concentrations of un-ionized ammonia (NH3) to exceed 0.025 mg/l (as N) in inland surface waters, enclosed bays and estuaries and coastal lagoons.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Sandia Creek near Fallbrook at USGS gage #11044350 (33.424444,-117.248333)
Temporal Representation:	Samples were taken from Nov 2007 to May 2010.
Environmental Conditions:	
QAPP Information:	Quality Assurance Project Plan for Biological and Surface Water Sampling -- Hydrologic and Biological Support for Lower Santa Margarita Watershed Program. Prepared for the United States Bureau of Reclamation by Stetson Engineering Inc. Oct. 2007 tr50
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 48227, Ammonia (Unionized) **Region 9**

Sandia Creek

LOE ID:	76376
Pollutant:	Ammonia (Unionized)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Agricultural Supply
Number of Samples:	27
Number of Exceedances:	12
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	US Bureau of Reclamation data from the Marine Corps Military Base at Camp Pendleton. Twelve out of 27 samples exceeded the criteria.
Data Reference:	Data for Various Pollutants in the Santa Margarita River Watershed, 2007-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the San Diego Regional Water Quality Control Board Basin Plan the discharge of wastes shall not cause concentrations of un-ionized ammonia (NH3) to exceed 0.025 mg/l (as N) in inland surface waters, enclosed bays and estuaries and coastal lagoons.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Sandia Creek near Fallbrook at USGS gage #11044350 (33.424444,-117.248333)
Temporal Representation:	Samples were taken from Nov 2007 to May 2010.
Environmental Conditions:	
QAPP Information:	Quality Assurance Project Plan for Biological and Surface Water Sampling -- Hydrologic and Biological Support for Lower Santa Margarita Watershed Program. Prepared for the United States Bureau of Reclamation by Stetson Engineering Inc. Oct. 2007 tr50
QAPP Information Reference(s):	

DECISION ID 37708 Region 9

Sandia Creek 037107

Pollutant:	**Manganese**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Four lines of evidence are available in the administrative record to assess this pollutant. Three of the 16 samples exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Three of the 16 samples exceed the objective and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 37708, Manganese — Region 9

Sandia Creek

LOE ID:	3093
Pollutant:	Manganese
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	11
Number of Exceedances:	2
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by LAW Crandall from 1997 to 2000. Two of 11 samples were in exceedance. The criteria was exceeded more than 10% of the time during 2 years.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The water quality objective for manganese in Sandia Creek is 0.05 milligrams/liter (mg/l) according to Basin Plan, Table 3-2 entitled, Water Quality Objectives. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Sandia Creek. Exact location was not reported.
Temporal Representation: Samples were collected on a quarterly basis from 12/1997 to 06/2000.
Environmental Conditions:
QAPP Information: Data used in 2002 assessment.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 37708, Manganese **Region 9**

Sandia Creek

LOE ID: 76335

Pollutant: Manganese
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Dissolved

Beneficial Use: Warm Freshwater Habitat

Number of Samples: 1
Number of Exceedances: 0

Data and Information Type: PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality: Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Manganese.
Data Reference: RWB9 Stormwater Monitoring Council CY 2009

SWAMP Data: SWAMP

Water Quality Objective/Criterion: Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Manganese objective for the protection of aquatic life according to Table 3-2 for Sandia Creek within the Santa Margarita Hydrologic Unit is 0.05 mg/L.
Objective/Criterion Reference: Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation: Data was collected on a single day 5/11/2009.
Environmental Conditions: Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information: The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s): Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 37708, Manganese **Region 9**

Sandia Creek

LOE ID: 76342

Pollutant: Manganese
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 1

Number of Exceedances:	0	037109

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Manganese.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for manganese is 0.05 mg/L (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 37708, Manganese **Region 9**

Sandia Creek

LOE ID:	76343
Pollutant:	Manganese
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Manganese.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Manganese objective for the protection of aquatic life according to Table 3-2 for Sandia Creek within the Santa Margarita Hydrologic Unit is 0.05 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 37708, Manganese **Region 9**

Sandia Creek 037110

LOE ID:	76344
Pollutant:	Manganese
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 1 of 4 samples exceed the criterion for Manganese.
Data Reference:	Data for Metals, Nutrients, and Inorganics from the County of San Diego Sandia Creek and Santa Margarita River, 2004-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for manganese is 0.05 mg/L (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Creek @ Sandia Creek Drive (USGS gauging station) - 902SMG07]
Temporal Representation:	Data was collected over the time period 5/14/2008-11/28/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and COSD Santa Margarita Mass Loading Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and COSD Santa Margarita Mass Loading Report.

DECISION ID **43855** **Region 9**

Sandia Creek

Pollutant:	**Nitrogen**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2029
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Five lines of evidence are available in the administrative record to assess this pollutant. Data from 1997 to 2000 show that two of four samples exceed the water quality objective for the prevention of biostimulatory substance of a N to P ratio of 10:1.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section

303(d) List. 037111

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Data from 1997 to 2000 show that two of four samples exceed the water quality objective for the prevention of biostimulatory substance of a N to P ratio of 10:1 and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 43855, Nitrogen **Region 9**

Sandia Creek

LOE ID:	76349
Pollutant:	Nitrogen, ammonia (Total Ammonia)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Ammonia As N, Total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Basin Plan: No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	EPA's Lifetime Health advisory level for total ammonia is 30.0 mg/L as stated on page 8 of the 2006 edition of the drinking water standards and health advisories. This Advisory Level is defined as "the concentration of a chemical in drinking water that is not expected to cause any adverse noncarcinogenic effects for up to ten days of exposure."
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 43855, Nitrogen **Region 9**

Sandia Creek

LOE ID:	76348

Pollutant:	Nitrogen, ammonia (Total Ammonia)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Ammonia as N, Total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Aquatic Life Ambient Water Quality Criteria for Ammonia â€“ Freshwater (USEPA 2013): the 30-day rolling average concentration (criterion continuous concentration or CCC) of total ammonia nitrogen(in mg TAN/L) in freshwater are not to be exceeded more than once every three years on average. The CCC values are based on pH and temperature. The CCC formula is found on page 46 and the table of CCC values is on page 49.
Guideline Reference:	Aquatic Life Ambient Water Quality Criteria for Ammonia - Freshwater 2013
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 43855, Nitrogen **Region 9**

Sandia Creek

LOE ID:	76341
Pollutant:	Nitrogen, ammonia (Total Ammonia)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Ammonia as N, Total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to,

	or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Aquatic Life Ambient Water Quality Criteria for Ammonia ? Freshwater (USEPA 2013): the 30-day rolling average concentration (criterion continuous concentration or CCC) of total ammonia nitrogen(in mg TAN/L) in freshwater are not to be exceeded more than once every three years on average. The CCC values are based on pH and temperature. The CCC formula is found on page 46 and the table of CCC values is on page 49.
Guideline Reference:	Aquatic Life Ambient Water Quality Criteria for Ammonia - Freshwater 2013
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 43855, Nitrogen **Region 9**

Sandia Creek

LOE ID:	76379
Pollutant:	Nitrogen, Nitrite
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nitrite as N.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrite (as N) is 1.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Creek @ Sandia Creek Drive (USGS gauging station) - 902SMG07]
Temporal Representation:	Data was collected on a single day 5/13/2003.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 43855, Nitrogen **Region 9**

Sandia Creek

LOE ID:	76377	037114

Pollutant:	Nitrogen, Nitrite
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nitrite as N.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrite (as N) is 1.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 43855, Nitrogen **Region 9**

Sandia Creek

LOE ID:	76378
Pollutant:	Nitrogen, Nitrite
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Nitrite as N.
Data Reference:	Data for Metals, Nutrients, and Inorganics from the County of San Diego Sandia Creek and Santa Margarita River, 2004-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrite (as N) is 1.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Creek @ Sandia Creek Drive (USGS gauging station) - 902SMG07]
Temporal Representation:	Data was collected over the time period 2/24/2008-11/28/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and COSD Santa Margarita Mass Loading Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and COSD Santa Margarita Mass Loading Report.

Line of Evidence (LOE) for Decision ID 43855, Nitrogen **Region 9**

Sandia Creek

LOE ID:	3092
Pollutant:	Nitrogen
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	2
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by LAW Crandall from 1997 to 2000. Although 6 samples were collected, only 4 samples were collected on the same day as phosphorus samples. From this data set, water quality was assessed using the N:P ratio from the 4 days on which both N and P samples were collected. Two of the 4 ratios were in exceedance of the 10:1 ratio.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters, enclosed bays and estuaries, coastal lagoons, and ground waters and all beneficial uses, analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sandia Creek. Exact sampling location was not reported.
Temporal Representation:	Samples were collected 1-2 times per year from 12/1997 to 03/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43855, Nitrogen **Region 9**

Sandia Creek

LOE ID:	76368
Pollutant:	Nitrate/Nitrite (Nitrite + Nitrate as N)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nitrate/Nitrite as N.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrate + nitrite (as N) is 10.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals, CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Creek @ Sandia Creek Drive (USGS gauging station) - 902SMG07]
Temporal Representation:	Data was collected on a single day 5/14/2003.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 43855, Nitrogen **Region 9**

Sandia Creek

LOE ID:	76367
Pollutant:	Nitrate/Nitrite (Nitrite + Nitrate as N)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nitrate/Nitrite as N.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrate + nitrite (as N) is 10.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals, CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.

Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 43855, Nitrogen **Region 9**

Sandia Creek

LOE ID:	76350
Pollutant:	Nitrogen, ammonia (Total Ammonia)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Ammonia As N, Total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Basin Plan: No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	EPA's Lifetime Health advisory level for total ammonia is 30.0 mg/L as stated on page 8 of the 2006 edition of the drinking water standards and health advisories. This Advisory Level is defined as "the concentration of a chemical in drinking water that is not expected to cause any adverse noncarcinogenic effects for up to ten days of exposure."
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Creek @ Sandia Creek Drive (USGS gauging station) - 902SMG07]
Temporal Representation:	Data was collected on a single day 5/13/2003.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **37554** **Region 9**

Sandia Creek

Pollutant:	**Selenium**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2027
Impairment from Pollutant or	Pollutant

Pollution: 037118

Regional Board Conclusion: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Four lines of evidence are available in the administrative record to assess this pollutant. Three of the Nine samples exceed the Water Quality Criteria for selenium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Three of the Nine samples exceeded the Water Quality Criteria for selenium and this does exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 37554, Selenium **Region 9**

Sandia Creek

LOE ID:	76405
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	2
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Two of eight samples tested for total selenium exceeded the criteria of 5 ug/L.
Data Reference:	Data for Various Pollutants in the Santa Margarita River Watershed, 2007-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (expressed as a 4-day average concentration) for selenium to protect aquatic life in freshwater. The criteria for selenium is 5 ug/L.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Sandia Creek near Fallbrook at 33.424444 / -117.24833, in the Santa Margarita River Watershed.
Temporal Representation:	Samples were collected in 2008 during the months of January, April, July and October and in 2009 during the months of February, April and July.
Environmental Conditions:	

QAPP Information:	Marine Corps Base Camp Pendleton - Sandia Creek	037119
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 37554, Selenium **Region 9**

Sandia Creek

LOE ID:	76403
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Selenium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The Maximum Contaminant Level for selenium in the Basin Plan is 0.05 mg/L.
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 37554, Selenium **Region 9**

Sandia Creek

LOE ID:	3082
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 1998. One sample was collected, and was not in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for selenium

	is 0.05 mg/L.	037120
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Sample was collected at Sandia Creek at Sandia Creek Rd., 0.5-1.0 mile above confluence.	
Temporal Representation:	One sample was collected on 06/09/1998.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 37554, Selenium **Region 9**

Sandia Creek

LOE ID:	76402
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Selenium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The selenium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater is 0.005 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **43122** **Region 9**

Sandia Creek

Pollutant:	**Silver**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2027

Impairment from Pollutant or Pollution:	Pollutant	037121
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Four lines of evidence are available in the administrative record to assess this pollutant. Two of the nine samples exceed the Water Quality Criteria for Silver. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Two of nine samples exceed the criteria for silver and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.	
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.	

Line of Evidence (LOE) for Decision ID 43122, Silver **Region 9**

Sandia Creek

LOE ID:	3083
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 1998. One sample was collected and was not in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for silver is 0.1 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Sample was collected at Sandia Creek at Sandia Creek Rd., 0.5-1.0 mile above confluence.
Temporal Representation:	One sample was collected on 06/09/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43122, Silver **Region 9**

Sandia Creek 037122

LOE ID:	76415
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	2
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Two of the eight samples tested for disolved silver exceeded the numeric criteria promulgated to protect warm freshwater habitat.
Data Reference:	Data for Various Pollutants in the Santa Margarita River Watershed, 2007-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion maximum concentrations for silver to protect aquatic life in freshwater (1-hour average). The disolved silver criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Sandia Creek near Fallbrook at 33.424444 / -117.24833, in the Santa Margarita River Watershed.
Temporal Representation:	Samples were collected in 2008 during the months of January, April, July and October and in 2009 during the months of February, April and July.
Environmental Conditions:	
QAPP Information:	Marine Corps Base Camp Pendleton - Sandia Creek
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43122, Silver **Region 9**

Sandia Creek

LOE ID:	76407
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Silver.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009

SWAMP Data:	SWAMP	037123
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Silver to protect aquatic life in freshwater. The dissolved Silver criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]	
Temporal Representation:	Data was collected on a single day 5/11/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 43122, Silver **Region 9**

Sandia Creek

LOE ID:	76406
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Sandia Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Silver.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for silver is 0.1 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Sandia Creek was collected at 1 monitoring site [Sandia Canyon Creek ~1.9mi above De Anza Rd. - 902S01097]
Temporal Representation:	Data was collected on a single day 5/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **37507** **Region 9**

Sandia Creek

Pollutant: **Boron**

Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	037124
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)	
Revision Status	Original	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 11 samples exceed the Basin Plan water quality objective for boron.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 11 samples exceed the Basin Plan water quality objective for boron and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 37507, Boron **Region 9**

Sandia Creek

LOE ID:	3098
Pollutant:	Boron
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	11
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by LAW Crandall from 1997 to 2000. None of the 11 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for Boron is 0.75 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at Sandia Creek. Exact location was not reported.
Temporal Representation:	Samples were collected on a quarterly basis from 12/1997 to 06/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 38011 Region 9
Sandia Creek

Pollutant:	**Cyanide**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. None of the 6 samples exceed the Basin Plan water quality objective for cyanide. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 6 samples exceed the Basin Plan water quality objective for cyanide and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 38011, Cyanide Region 9
Sandia Creek

LOE ID:	3096
Pollutant:	Cyanide
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by LAW Crandall from 1997-2000. None of the 6 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for cyanide is 0.2 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sandia Creek. Exact location was not reported.
Temporal Representation:	Samples were collected 1-2 times per year from 12/1997 to 03/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 33805 Region 9

Sandia Creek

Pollutant:	**Fluoride**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. None of the 11 samples exceed the Basin Plan water quality objective for flouride. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 11 samples exceed the Basin Plan water quality objective for flouride and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33805, Fluoride Region 9

Sandia Creek 037127

LOE ID:	3095
Pollutant:	Fluoride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	11
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by LAW Crandall from 1997 to 2000. None of the 11 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for Fluoride is 1.0 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sandia Creek. Exact location was not reported.
Temporal Representation:	Samples were collected on a quarterly basis from 12/1997 to 06/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33727** **Region 9**

Sandia Creek

Pollutant:	**Oil and Grease**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2, one line(s) of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. This conclusion is based on the fact that the data shows none out of 14 samples had "detectable levels" of oil and grease. There is no numeric water quality objective to compare the data to, to determine if water quality objectives are being met or exceeded.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

	This conclusion is based on the staff findings that: 037128 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. This conclusion is based on the fact that the data shows none out of 14 samples had "detectable levels" of oil and grease and this information is insufficient to determine with the confidence and power required by the Listing Policy. There is no numeric water quality objective to compare the data to, to determine if water quality objectives are being met or exceeded. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2 and a numeric water quality objective. 4. Pursuant to 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33727, Oil and Grease **Region 9**

Sandia Creek

LOE ID:	3091
Pollutant:	Oil and Grease
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	14
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by LAW Crandall from 1997 to 2000. None of the 14 samples were in exceedance. All samples were non-detect. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, Waters shall not contain oils, greases, waxes, or other materials in concentrations which result in a visible film or coating on the surface of the water or on objects in the water, or which cause nuisance or which otherwise adversely affect beneficial uses.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sandia Creek. Exact location was not reported.
Temporal Representation:	Samples were collected on a quarterly basis from 12/1997 to 06/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33726** **Region 9**

Sandia Creek

Pollutant:	**Phosphorus**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)

Revision Status	Original	037129
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. One of the 6 samples exceeds the Basin Plan water quality objective for phosphorus.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of the 6 samples exceeds the Basin Plan water quality objective for phosphorus and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33726, Phosphorus — Region 9

Sandia Creek

LOE ID:	3089
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by LAW Crandall from 1997 to 1999. One of 6 samples was in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters - streams and other flowing waters and all beneficial uses, the WQO for total phosphorus is 0.1 mg/L. This appears to be the desired goal in order to prevent plant nuisance in streams and other flowing waters; not to be exceeded more than 10% of the time.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at Sandia Creek. Exact sample location was not reported.
Temporal Representation:	Samples were collected on a quarterly basis from 12/1997 to 5/1999.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 44288 Region 9

Sandia Creek

Pollutant:	**Surfactants (MBAS)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. None of the 10 samples exceed the Basin Plan water quality objective for surfactants. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 10 samples exceed the Basin Plan water quality objective for surfactants and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 44288, Surfactants (MBAS) Region 9

Sandia Creek

LOE ID:	3087
Pollutant:	Surfactants (MBAS)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	10
Number of Exceedances:	0

Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by LAW Crandall from 1997 to 2000. None of the 10 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for MBAS is 0.5 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sandia Creek. Exact location was not reported.
Temporal Representation:	Samples were collected on a quarterly basis from 12/1997 to 06/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Santa Margarita River (Upper)
Water Body ID: CAR9022200020011001141050
Water Body Type: River & Stream

DECISION ID 37431 **Region 9**
Santa Margarita River (Upper)

Pollutant:	**Toxicity**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under sections 4.2 and 4.6 of the Listing Policy. Under section 4.1 a single line of evidence is necessary, and under section 4.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Four lines of evidence are available in the administrative record to assess this pollutant. Zero of two samples (sediment) and five of Eleven samples (water) exceeded the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of two samples (sediment) and five of Eleven samples (water) exceeded the water quality objective and this exceeds the frequency listed in table 4.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 37431, Toxicity **Region 9**
Santa Margarita River (Upper)

LOE ID:	30288
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None

Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Two samples were collected at Santa Margarita 1 station 902SSMR1 from January to September 2003, they showed significant toxicity levels (SL) in the following test: Hyalella azteca. No toxicity was observed.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.
Guideline Reference:	Monitoring data for Region 9
Spatial Representation:	One sampling site was used in this line of evidence. Santa Margarita 1 (902SSMR1 lat/long: 33.47404/-117.14148).
Temporal Representation:	Samples were collected on the following dates: January 15, April 16, May 14, and September 9, 2003.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 37431, Toxicity **Region 9**

Santa Margarita River (Upper)

LOE ID:	24978
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	3
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Selenastrum capricornutum- Six samples were collected and none showed significant toxicity levels (SL) as determined by the Selenastrum capricornutum growth test. Ceriodaphnia dubia- Six samples were collected and two samples show significant toxicity levels (SL) as determined by the Ceriodaphnia dubia survival/reproductive. Hyalella azteca- Six samples were collected and one sample show significant toxicity levels (SL) as determined by the Hyalella azteca growth/survival test. Samples were collected November 2001 through February 2006.

Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report 037134 San Diego Stormwater Copermittees Jurisdiction Urban Runoff Managment Program. Final Report. Baseline Long Term Effectiveness Assessment
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Samples were found to exhibit toxicity when the No Observed Effect Concentration (NOEC) or median lethal concentration (LC50) for any given species was estimated to be less than 100% of the test sample concentration (U.S. EPA, 2002).
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at the monitoring stations Santa Margarita 1 located on the main stem of the Santa Margarita River.
Temporal Representation:	Samples were collected on the following dates: January 14-15, April 15-16, and September 9, 2003.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 37431, Toxicity **Region 9**

Santa Margarita River (Upper)

LOE ID:	76503
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate water toxicity. The sample did not exhibit significant toxicity. The toxicity test included survival and growth of Ceriodaphnia dubia. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL, Significant compared to negative control based on statistical test, less than stated alpha level, AND less than the evaluation threshold (both criteria are met).
Guideline Reference:	

Spatial Representation:	The sample was collected at station 902S00565.	037135
Temporal Representation:	The sample was collected in May 2009.	
Environmental Conditions:		
QAPP Information:	Data quality is good. Data results were recorded in the SWAMP database and followed SWAMP protocols.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 37431, Toxicity **Region 9**

Santa Margarita River (Upper)

LOE ID:	21402
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	2
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Four samples were collected at Santa Margarita 1 station 902SSMR1 from January to September 2003, they showed significant toxicity levels (SL) in the following test: Selenastrum algae growth test - Two of the four samples. Ceriodaphnia dubia survival and reproduction. No toxicity was observed.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.
Guideline Reference:	Monitoring data for Region 9
Spatial Representation:	One sampling site was used in this line of evidence. Santa Margarita 1 (902SSMR1 lat/long: 33.47404/-117.14148).
Temporal Representation:	Samples were collected on the following dates: January 15, April 16, May 14, and September 9, 2003.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	

DECISION ID **47930** **Region 9**

Santa Margarita River (Upper)

Pollutant:	**Alkalinity as CaCO3**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or	Pollutant

Pollution: 037136

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the two samples exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the two samples exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47930, Alkalinity as CaCO3 **Region 9**

Santa Margarita River (Upper)

LOE ID:	76564
Pollutant:	Alkalinity as CaCO3
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Alkalinity as CaCO3.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Alkalinity as CaCO3 criteria for the protection of freshwater aquatic life is 20000 ug/L (National Recommended Water Quality Criteria, 2009).
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]

Temporal Representation:	Data was collected over the time period 4/27/2009-5/6/2009. 037137
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47930, Alkalinity as CaCO3 **Region 9**

Santa Margarita River (Upper)

LOE ID:	76565
Pollutant:	Alkalinity as CaCO3
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Alkalinity as CaCO3.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Alkalinity as CaCO3 criteria for the protection of freshwater aquatic life is 20000 ug/L (National Recommended Water Quality Criteria, 2009).
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]
Temporal Representation:	Data was collected over the time period 4/27/2009-5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **44289** **Region 9**

Santa Margarita River (Upper)

Pollutant:	**Alkalinity as CaCO3 | Ammonia | Manganese | Nickel | Orthophosphate | Total Kjeldahl Nitrogen (TKN) | Total Suspended Solids (TSS)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	These pollutants are being considered for placement on the section 303(d) list under sections 3.1 and 3.2 of the Listing Policy. Under sections 3.1 and 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the samples exceed the water quality objectives for these multiple pollutants.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the samples exceed the water quality objectives for these multiple pollutants and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 44289, Multiple Pollutants **Region 9**

Santa Margarita River (Upper)

LOE ID:	26402
Pollutant:	Alkalinity as CaCO3 | Ammonia | Manganese | Nickel | Orthophosphate | Total Kjeldahl Nitrogen (TKN) | Total Suspended Solids (TSS)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	37
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	37 samples were collected at Santa Margarita Creek station 902SMSMR1 during the months of January 2003, April 2003, May 2003, and September 2003, for conventioanl inorganics analyses. None of the 37 samples showed excessive concentrations.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Alkalinity as CaCO3 20 mg/l, ammonia as N 0.025 mg/l, nitrite as N 1.mg/l, nitrogen total Kjeldahl (If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used), ortho phosphate as P total 0.05 mg/l, sulfate 250 mg/l, total suspended solids narrative: Waters shall not contain suspended solids in concentrations of solids that cause nuisance or adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Water samples were collected at Santa Margarita Creek station 902SMSMR1; (Latitude 33.4741, Longitude -117.1414).
Temporal Representation:	Water samples were collected on January 2003, April 2003, May 2003, and September 2003.
Environmental Conditions:	
QAPP Information:	Quality control for chemical analysis portion of this study was conducted in accordance with the California Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	

DECISION ID **47571** **Region 9**

Santa Margarita River (Upper)

Pollutant:	**Aluminum**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceed the water quality objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47571, Aluminum **Region 9**

Santa Margarita River (Upper)

LOE ID:	76566
Pollutant:	Aluminum
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Aluminum.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP

Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for aluminum is 0.2 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47571, Aluminum **Region 9**

Santa Margarita River (Upper)

LOE ID:	76569
Pollutant:	Aluminum
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Aluminum.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The National Recommended Water Quality Critiera for the protection of aquatic life from aluminum is the chronic continuous concentration (expressed as a 4-day average) of 87 ug/L.
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47571, Aluminum **Region 9**

Santa Margarita River (Upper)

LOE ID:	76570

Pollutant:	Aluminum	037141
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	Dissolved	
Beneficial Use:	Cold Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Aluminum.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The National Recommended Water Quality Critiera for the protection of aquatic life from aluminum is the chronic continuous concentration (expressed as a 4-day average) of 87 ug/L.	
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]	
Temporal Representation:	Data was collected on a single day 5/6/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID	**47574**	**Region 9**
Santa Margarita River (Upper)		

Pollutant:	**Antimony**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceed the water quality objective and this sample size is insufficient to

determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47574, Antimony **Region 9**

Santa Margarita River (Upper)

LOE ID:	77890
Pollutant:	Antimony
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Antimony.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for antimony is .006 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River - 902SMR-MLS-2]
Temporal Representation:	Data was collected on a single day 12/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was used.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID **47613** **Region 9**

Santa Margarita River (Upper)

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final	New Decision

Listing Decision:		037143
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary, and under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Three lines of evidence are available in the administrative record to assess this pollutant. Zero of one sample (sediment) and zero of two samples (water) exceeded the water quality objectives.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample (sediment) and zero of two samples (water) exceeded the water quality objectives and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47613, Arsenic **Region 9**

Santa Margarita River (Upper)

LOE ID:	76578
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for arsenic is 0.01 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	

Guideline Reference:	037144
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47613, Arsenic **Region 9**

Santa Margarita River (Upper)

LOE ID:	76575
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for arsenic is 33 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]
Temporal Representation:	Data was collected on a single day 4/27/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47613, Arsenic **Region 9**

Santa Margarita River (Upper)

LOE ID:	76576
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat

Number of Samples:	1	037145
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for arsenic is 33 mg/Kg dry weight (MacDonald et al. 2000).	
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]	
Temporal Representation:	Data was collected on a single day 4/27/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 47613, Arsenic **Region 9**

Santa Margarita River (Upper)

LOE ID:	76577
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The dissolved arsenic criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved arsenic is 0.150 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]

Temporal Representation:	Data was collected on a single day 5/6/2009.	037146
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 47613, Arsenic **Region 9**

Santa Margarita River (Upper)

LOE ID:	77897
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for arsenic is 0.01 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River - 902SMR-MLS-2]
Temporal Representation:	Data was collected on a single day 12/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was used.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 47613, Arsenic **Region 9**

Santa Margarita River (Upper)

LOE ID:	77898
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The dissolved arsenic criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved arsenic is 0.150 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River - 902SMR-MLS-2]
Temporal Representation:	Data was collected on a single day 12/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was used.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 47613, Arsenic **Region 9**

Santa Margarita River (Upper)

LOE ID:	76579
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The dissolved arsenic criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved arsenic is 0.150 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 51181 Region 9

Santa Margarita River (Upper)

Pollutant:	**Benthic Community Effects**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

Benthic Community Effects is being considered for placement on the CWA section 303(d) List under sections 3.9 and 3.1 of the Listing Policy. Under section 3.9, an additional line of evidence associating Benthic Community Effects with a water or sediment concentration of pollutant(s) is necessary to assess listing status.

Based on the readily available data and information, the weight of evidence provides sufficient justification for not placing Benthic Community Effects in this water segment on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used does satisfy the data quantity requirements of section 6.1.5 of the Policy.
3. Pursuant to section 3.9 of the Listing Policy, the water does not exhibit significant degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index.
4. Pursuant to section 3.9 of the Listing Policy, the water segment does have associated pollutant(s) samples that exceed water quality objectives.
5. Pursuant to section 3.11 of the Listing Policy, additional data and information is available indicating that standards are being met.

Samples were collected at two sites, with two out of twelve samples exhibiting degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index during a 5 year period. More recent data from the Stormwater Monitoring Condition was not included in this listing cycle but confirms the more recent results that there is not significant degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 51181, Benthic Community Effects Region 9

Santa Margarita River (Upper)

LOE ID:	76501
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved

Beneficial Use:	Warm Freshwater Habitat	037149
Number of Samples:	1	
Number of Exceedances:	1	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Dissolved Solids.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Dissolved Solids objective for the protection of aquatic life according to Table 3-2 for Santa Margarita River (Upper) within the Santa Margarita Hydrologic Unit is 750 mg/L.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]	
Temporal Representation:	Data was collected on a single day 5/6/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 51181, Benthic Community Effects **Region 9**

Santa Margarita River (Upper)

LOE ID:	21402
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	2
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Four samples were collected at Santa Margarita 1 station 902SSMR1 from January to September 2003, they showed significant toxicity levels (SL) in the following test: Selenastrum algae growth test - Two of the four samples. Ceriodaphnia dubia survival and reproduction. No toxicity was observed.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.

Guideline Reference:	Monitoring data for Region 9	037150
Spatial Representation:	One sampling site was used in this line of evidence. Santa Margarita 1 (902SSMR1 lat/long: 33.47404/-117.14148).	
Temporal Representation:	Samples were collected on the following dates: January 15, April 16, May 14, and September 9, 2003.	
Environmental Conditions:		
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 51181, Benthic Community Effects **Region 9**

Santa Margarita River (Upper)

LOE ID:	21194
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	2
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Two of the four samples collected at Santa Margarita River on January 2003, April 2003, May 2003, and September 2003 show excessive nitrogen concentrations. (SWAMP, 2007).
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. Water Quality Control Plan for the San Diego Basin Goal of 0.1 mg/L for total phosphorus in streams and other flowing waters.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	One sampling site was used in this line of evidence. Santa Margarita 1 (902SSMR1 lat/long: 33.47404/-117.14148).
Temporal Representation:	Samples were collected on January 2003, April 2003, May 2003, and September 2003.
Environmental Conditions:	The first two sampling events occurred between storm events and high base flow respectively. The third and fourth occurred during declining and minimum base flow respectively.
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 51181, Benthic Community Effects **Region 9**

Santa Margarita River (Upper)

LOE ID:	72789
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation

Matrix:	Water	037151
Fraction:	None	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	1	
Data and Information Type:	Benthic macroinvertebrate surveys	
Data Used to Assess Water Quality:	The one sample collected had an IBI score below 40. The IBI score for this site was 13.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.	
Guideline Reference:	Development of a Benthic Index of Biotic Integrity (B-IBI) for Wadeable Streams in Northern Coastal California and its Application to Regional 305(b) Assessment	
Spatial Representation:	The sample was collected from Santa Margarita River (Upper).	
Temporal Representation:	The sample was collected in April 2009.	
Environmental Conditions:		
QAPP Information:	Samples were collected for the SWAMP RWB9 Stormwater Monitoring Council CY 2009 following SWAMP protocols and stored in the SWAMP database.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 51181, Benthic Community Effects **Region 9**

Santa Margarita River (Upper)

LOE ID:	24978
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	3
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Selenastrum capricornutum- Six samples were collected and none showed significant toxicity levels (SL) as determined by the Selenastrum capricornutum growth test. Ceriodaphnia dubia- Six samples were collected and two samples show significant toxicity levels (SL) as determined by the Ceriodaphnia dubia survival/reproductive. Hyalella azteca- Six samples were collected and one sample show significant toxicity levels (SL) as

	determined by the Hyalella azteca growth/survival test. Samples were collected November 2001 through February 2006.
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report San Diego Stormwater Copermittees Jurisdiction Urban Runoff Managment Program. Final Report. Baseline Long Term Effectiveness Assessment
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Samples were found to exhibit toxicity when the No Observed Effect Concentration (NOEC) or median lethal concentration (LC50) for any given species was estimated to be less than 100% of the test sample concentration (U.S. EPA, 2002).
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at the monitoring stations Santa Margarita 1 located on the main stem of the Santa Margarita River.
Temporal Representation:	Samples were collected on the following dates: January 14-15, April 15-16, and September 9, 2003.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 51181, Benthic Community Effects **Region 9**

Santa Margarita River (Upper)

LOE ID:	7407
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	All four samples collected exceeded the total phosphorus water quality objective. Samples were collected between January 2003 and September 2003 for the SWAMP program.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Water Quality Control Plan for the San Diego Basin Goal of 0.1 mg/L for total phosphorus in streams and other flowing waters.
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	One sampling site was used in this line of evidence. Santa Margarita 1 (902SMSMR1 lat/long: 33.47404/-117.14148).
Temporal Representation:	Samples were collected on January 2003, April 2003, May 2003, and September 2003.
Environmental Conditions:	The first two sampling events occurred between storm events and high base flow

	respectively. The third and fourth occurred during declining and minimum baseflow respectively.
QAPP Information:	Puckett, M. 2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program ("SWAMP"). California Department of Fish and Game, Monterey, CA.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 51181, Benthic Community Effects **Region 9**

Santa Margarita River (Upper)

LOE ID:	80832
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	12
Number of Exceedances:	2
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Twelve samples were taken at three stations in the Santa Margarita River above De Luz Creek. Two samples had CSCI scores below the 0.79 threshold, therefore exceeding the water quality objective for the aquatic life beneficial use.
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008. Region 9 CSCI Scores & Water Body Information
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.
Guideline Reference:	The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.
Spatial Representation:	The samples were collected at the following stations: 902SMR-TWAS-1, 902S00565, and 902SMR-WGR
Temporal Representation:	The samples were collected from 2003 to 2007.
Environmental Conditions:	
QAPP Information:	Data collected following SWAMP QA protocols for the RWB9 Status Sampling 2007 and 2008 water quality monitoring project and the County of San Diego NPDES MS4 Copermittees Receiving Waters Monitoring and Reporting Program
QAPP Information Reference(s):	e-mail clarifying QAPP information Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.

Line of Evidence (LOE) for Decision ID 51181, Benthic Community Effects — Region 9

Santa Margarita River (Upper)

LOE ID:	76583
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	11
Number of Exceedances:	10
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Ten of the eleven samples collected had IBI scores below 40. NPDES bioassessment
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the State or Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	
Spatial Representation:	The samples were collected at stations 902SMR-MLS-2, SMR-SC, and SMR-WGR Santa Margarita River.
Temporal Representation:	The samples were collected twice a year in May and October from 2002 to 2008.
Environmental Conditions:	
QAPP Information:	The data was collected under the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan, June 25, 2009.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 51181, Benthic Community Effects — Region 9

Santa Margarita River (Upper)

LOE ID:	76507
Pollutant:	Permethrin, total
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING 037155
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Permethrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Permethrin does not exceed 0.002 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51181, Benthic Community Effects **Region 9**

Santa Margarita River (Upper)

LOE ID:	77900
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Bifenthrin.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Bifenthrin does not exceed 0.0006 ug/L.
Guideline Reference:	Hazard Assessment of the Synthetic Pyrethroid Insecticides Bifenthrin, Cypermethrin, Esfenvalerate, and Permethrin to Aquatic Organisms in the Sacramento-San Joaquin River System. California Department of Fish and Game. Office of Spill Prevention and Response. Administrative Report 00-6

Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River - 902SMR-MLS-2]
Temporal Representation:	Data was collected on a single day 12/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was used.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 51181, Benthic Community Effects **Region 9**

Santa Margarita River (Upper)

LOE ID:	77885
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Cypermethrin, total.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of cypermethrin does not exceed 0.0002 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Fojut et al. 2012)
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River - 902SMR-MLS-2]
Temporal Representation:	Data was collected on a single day 12/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was used.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID 47614 Region 9

Santa Margarita River (Upper) 037157

Pollutant:	**Bifenthrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. One of the two samples exceed the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of the two samples exceed the water quality objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47614, Bifenthrin — Region 9

Santa Margarita River (Upper)

LOE ID:	77900
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Bifenthrin.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall

	not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Bifenthrin does not exceed 0.0006 ug/L.
Guideline Reference:	Hazard Assessment of the Synthetic Pyrethroid Insecticides Bifenthrin, Cypermethrin, Esfenvalerate, and Permethrin to Aquatic Organisms in the Sacramento-San Joaquin River System. California Department of Fish and Game. Office of Spill Prevention and Response. Administrative Report 00-6
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River - 902SMR-MLS-2]
Temporal Representation:	Data was collected on a single day 12/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was used.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 47614, Bifenthrin **Region 9**

Santa Margarita River (Upper)

LOE ID:	76585
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Bifenthrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Bifenthrin does not exceed 0.0006 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47614, Bifenthrin 037159 **Region 9**

Santa Margarita River (Upper)

LOE ID:	76584
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Bifenthrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Bifenthrin does not exceed 0.0006 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **47616** **Region 9**

Santa Margarita River (Upper)

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Six lines of evidence are available in the administrative record to assess this pollutant. Zero of the 15 samples exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that: 037160
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the 15 samples exceed the objective and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 47616, Cadmium **Region 9**

Santa Margarita River (Upper)

LOE ID:	76592
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for cadmium is 4.98 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]
Temporal Representation:	Data was collected on a single day 4/27/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47616, Cadmium **Region 9**

Santa Margarita River (Upper)

LOE ID:	76593
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Sediment

Matrix:	Sediment	037161
Fraction:	Total	
Beneficial Use:	Cold Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for cadmium is 4.98 mg/Kg dry weight (MacDonald et al. 2000).	
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]	
Temporal Representation:	Data was collected on a single day 4/27/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 47616, Cadmium **Region 9**

Santa Margarita River (Upper)

LOE ID:	77902
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for cadmium is 0.005 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR

Evaluation Guideline:	037162
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River - 902SMR-MLS-2]
Temporal Representation:	Data was collected on a single day 12/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was used.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 47616, Cadmium **Region 9**

Santa Margarita River (Upper)

LOE ID:	76600
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Cadmium to protect aquatic life in freshwater. The dissolved Cadmium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47616, Cadmium **Region 9**

Santa Margarita River (Upper)

LOE ID:	76599
Pollutant:	Cadmium

LOE Subgroup:	Pollutant-Water	037163
Matrix:	Water	
Fraction:	Dissolved	
Beneficial Use:	Cold Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.	
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Cadmium to protect aquatic life in freshwater. The dissolved Cadmium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River - 902SMR-MLS-2]	
Temporal Representation:	Data was collected on a single day 12/16/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.	

Line of Evidence (LOE) for Decision ID 47616, Cadmium **Region 9**

Santa Margarita River (Upper)

LOE ID:	76606
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	13
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 13 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.

SWAMP Data:	Non-SWAMP	037164
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for cadmium is 0.005 mg/L (Title 22 of the California Code of Regulations).	
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 2 monitoring sites [Santa Margarita River @ SDSU Ecological Reserve Entrance, Santa Margarita River @ Sandia Creek Drive (one-half mile east of De Luz Road)]	
Temporal Representation:	Data was collected over the time period 5/12/2003 - 5/27/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 47616, Cadmium **Region 9**

Santa Margarita River (Upper)

LOE ID:	76603
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	13
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 13 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 2 monitoring sites [Santa Margarita River @ Sandia Creek Drive (one-half mile east of De Luz Road), Santa Margarita River @ SDSU Ecological Reserve Entrance]
Temporal Representation:	Data was collected over the time period 5/12/2003 - 5/27/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47616, Cadmium **Region 9**

Santa Margarita River (Upper)

LOE ID:	76602
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Cadmium to protect aquatic life in freshwater. The dissolved Cadmium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47616, Cadmium **Region 9**

Santa Margarita River (Upper)

LOE ID:	76601
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.

Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	037166
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for cadmium is 0.005 mg/L (Title 22 of the California Code of Regulations).	
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]	
Temporal Representation:	Data was collected on a single day 5/6/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID 47618 Region 9

Santa Margarita River (Upper)

Pollutant:	**Chloride**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the one sample exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47618, Chloride Region 9

Santa Margarita River (Upper)

LOE ID:	76610
Pollutant:	Chloride

LOE Subgroup:	Pollutant-Water	037167
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Cold Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chloride.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Chloride objective for the protection of aquatic life according to Table 3-2 for Santa Margarita River (Upper) within the Santa Margarita Hydrologic Unit is 250 mg/L.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]	
Temporal Representation:	Data was collected on a single day 5/6/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 47618, Chloride **Region 9**

Santa Margarita River (Upper)

LOE ID:	76608
Pollutant:	Chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chloride.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The recommended secondary maximum contamination level acceptable to consumers of drinking water is 250 mg/L.
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47618, Chloride **Region 9**

Santa Margarita River (Upper)

LOE ID:	76607
Pollutant:	Chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chloride.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Chloride objective for the protection of aquatic life according to Table 3-2 for Santa Margarita River (Upper) within the Santa Margarita Hydrologic Unit is 250 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 47620 **Region 9**

Santa Margarita River (Upper)

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the nine samples exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the nine samples exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47620, Chlorpyrifos **Region 9**

Santa Margarita River (Upper)

LOE ID:	76616
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 2 monitoring sites [Santa Margarita River @ SDSU Ecological Reserve Entrance, Santa Margarita River @ Sandia Creek Drive (one-half mile east of De Luz Road)]
Temporal Representation:	Data was collected over the time period 5/10/2006-5/27/2009.

Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47620, Chlorpyrifos **Region 9**

Santa Margarita River (Upper)

LOE ID:	77913
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 8 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for chlorpyrifos is 2.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 2 monitoring sites [Santa Margarita River @ SDSU Ecological Reserve Entrance (902SMG09), Santa Margarita River @ Sandia Creek Drive (one-half mile east of De Luz Road, 902SMG10)]
Temporal Representation:	Data was collected over the time period 5/10/2006-5/27/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47620, Chlorpyrifos **Region 9**

Santa Margarita River (Upper)

LOE ID:	77909
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat

Number of Samples:	1	037171
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chlorpyrifos.	
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.014 ug/L (Siepmann and Finlayson 2000).	
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River - 902SMR-MLS-2]	
Temporal Representation:	Data was collected on a single day 12/16/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was used.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.	

Line of Evidence (LOE) for Decision ID 47620, Chlorpyrifos **Region 9**

Santa Margarita River (Upper)

LOE ID:	77910
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column,

	sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for chlorpyrifos is 2.1 Âµg/L.
Guideline Reference:	2011 Edition of the Drinking Water Standards and Health Advisories
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River - 902SMR-MLS-2]
Temporal Representation:	Data was collected on a single day 12/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was used.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID	47621	Region 9
Santa Margarita River (Upper)		

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary, and under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Four lines of evidence are available in the administrative record to assess this pollutant. Zero of one sample (sediment) and zero of 3 samples (water) exceeded the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample (sediment) and zero of 3 samples (water) exceeded the water quality objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47621, Chromium **Region 9**

Santa Margarita River (Upper) 037173

LOE ID:	76485
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium. Since the chromium species was not identified, the data point(s) were assessed using both the Chromium III criteria which is hardness-dependent, and the criterion continuous concentration (4-day average) to protect aquatic life in freshwater for chromium VI which is 11 ug/L and is not hardness dependent.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Chromium to protect aquatic life in freshwater. The dissolved Chromium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47621, Chromium **Region 9**

Santa Margarita River (Upper)

LOE ID:	76623
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium.

Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	037174
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for chromium is 111 mg/Kg dry weight (MacDonald et al. 2000).	
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]	
Temporal Representation:	Data was collected on a single day 4/27/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 47621, Chromium **Region 9**

Santa Margarita River (Upper)

LOE ID:	76486
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for total chromium is 0.05 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47621, Chromium **Region 9**

Santa Margarita River (Upper)

LOE ID:	76625
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium. Since the chromium species was not identified, the data point(s) were assessed using both the Chromium III criteria which is hardness-dependent, and the criterion continuous concentration (4-day average) to protect aquatic life in freshwater for chromium VI which is 11 ug/L and is not hardness dependent.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved chromium to protect aquatic life in freshwater. The dissolved Chromium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47621, Chromium **Region 9**

Santa Margarita River (Upper)

LOE ID:	76626
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works

	Watershed Protection Program, 2001-2008.	037176

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved chromium to protect aquatic life in freshwater. The dissolved Chromium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River - 902SMR-MLS-2]
Temporal Representation:	Data was collected on a single day 12/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 47621, Chromium **Region 9**

Santa Margarita River (Upper)

LOE ID:	76624
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for chromium is 111 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]

Temporal Representation:	Data was collected on a single day 4/27/2009.	037177
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID 47629 Region 9

Santa Margarita River (Upper)

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary, and under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Five lines of evidence are available in the administrative record to assess this pollutant. Zero of one sample (sediment) and zero of 16 samples (water) exceeded the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample (sediment) and zero of 16 samples (water) exceeded the water quality objective and this sample size is sufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 47629, Copper Region 9

Santa Margarita River (Upper)

LOE ID:	76547
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved copper to protect aquatic life in freshwater. The dissolved copper criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River - 902SMR-MLS-2]
Temporal Representation:	Data was collected on a single day 12/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 47629, Copper **Region 9**

Santa Margarita River (Upper)

LOE ID:	76490
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for copper is 1.0 mg/L (Title 22 California Code of Regulations).
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]
Temporal Representation:	Data was collected on a single day 5/6/2009.

Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47629, Copper **Region 9**

Santa Margarita River (Upper)

LOE ID:	76489
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Copper to protect aquatic life in freshwater. The dissolved Copper criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47629, Copper **Region 9**

Santa Margarita River (Upper)

LOE ID:	76488
Pollutant:	Copper
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine

	beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for copper is 149 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]
Temporal Representation:	Data was collected on a single day 4/27/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47629, Copper **Region 9**

Santa Margarita River (Upper)

LOE ID:	76487
Pollutant:	Copper
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for copper is 149 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]
Temporal Representation:	Data was collected on a single day 4/27/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47629, Copper **Region 9**

Santa Margarita River (Upper)

LOE ID:	77880
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for copper is 1.0 mg/L (Title 22 California Code of Regulations).
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River - 902SMR-MLS-2]
Temporal Representation:	Data was collected on a single day 12/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was used.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 47629, Copper **Region 9**

Santa Margarita River (Upper)

LOE ID:	76536
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	13
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 2 samples

	exceed the criterion for Copper. 037182
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for copper is 1.0 mg/L (Title 22 California Code of Regulations).
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 2 monitoring sites [Santa Margarita River @ Sandia Creek Drive (one-half mile east of De Luz Road), Santa Margarita River @ SDSU Ecological Reserve Entrance]
Temporal Representation:	Data was collected over the time period 5/12/2003 - 5/27/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47629, Copper **Region 9**

Santa Margarita River (Upper)

LOE ID:	76537
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	13
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 2 monitoring sites [Santa Margarita River @ Sandia Creek Drive (one-half mile east of De Luz Road), Santa Margarita River @ SDSU Ecological Reserve Entrance]
Temporal Representation:	Data was collected over the time period 5/12/2003 - 5/27/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.

QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev.012, 13 Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47629, Copper **Region 9**

Santa Margarita River (Upper)

LOE ID:	76535
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved copper to protect aquatic life in freshwater. The dissolved copper criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **47578** **Region 9**

Santa Margarita River (Upper)

Pollutant:	**Cyfluthrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of one

sample exceed the water quality objective. 037184

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceed the water quality objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47578, Cyfluthrin **Region 9**

Santa Margarita River (Upper)

LOE ID:	76549
Pollutant:	Cyfluthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cyfluthrin, total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of lambda-cyhalothrin does not exceed 0.0005 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Mixtures of lambda-cyhalothrin and other pyrethroids should be considered in an additive manner. (Fojut et al. 2012)Â
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.

QAPP Information Reference(s): Surface Water Ambient Monitoring Program Quality Assurance Program Plan 037185

Line of Evidence (LOE) for Decision ID 47578, Cyfluthrin **Region 9**

Santa Margarita River (Upper)

LOE ID:	76548
Pollutant:	Cyfluthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cyfluthrin, total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of lambda-cyhalothrin does not exceed 0.0005 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Mixtures of lambda-cyhalothrin and other pyrethroids should be considered in an additive manner. (Fojut et al. 2012)Â
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **47630** **Region 9**

Santa Margarita River (Upper)

Pollutant:	**Cyhalothrin, Lambda**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the one samples exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47630, Cyhalothrin, Lambda **Region 9**

Santa Margarita River (Upper)

LOE ID:	76550
Pollutant:	Cyhalothrin, Lambda
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cyhalothrin, lambda, total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Cyhalothrin, lambda, total does not exceed 0.0005 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47630, Cyhalothrin, Lambda **Region 9**

Santa Margarita River (Upper)

LOE ID:	76557
Pollutant:	Cyhalothrin, Lambda
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cyhalothrin, lambda, total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Cyhalothrin, lambda, total does not exceed 0.0005 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **47631** **Region 9**

Santa Margarita River (Upper)

Pollutant:	**Cypermethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollution

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. One of the two samples exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.

2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of the two samples exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47631, Cypermethrin **Region 9**

Santa Margarita River (Upper)

LOE ID:	76558
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	One of one sample result was not used in the assessment because the laboratory data was non-detect and the method detection limit was above the guideline and therefore the results could not be quantified with the level of certainty required by the Listing Policy
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of cypermethrin does not exceed 0.0002 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Fojut et al. 2012)
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47631, Cypermethrin **Region 9**

Santa Margarita River (Upper)

LOE ID:	76559
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Water

Matrix:	Water	037189
Fraction:	Total	
Beneficial Use:	Cold Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	One of one sample result was not used in the assessment because the laboratory data was non-detect and the method detection limit was above the guideline and therefore the results could not be quantified with the level of certainty required by the Listing Policy	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of cypermethrin does not exceed 0.0002 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Fojut et al. 2012)	
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]	
Temporal Representation:	Data was collected on a single day 5/6/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 47631, Cypermethrin **Region 9**

Santa Margarita River (Upper)

LOE ID:	77885
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Cypermethrin, total.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San

	Diego Basin).	037190
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of cypermethrin does not exceed 0.0002 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Fojut et al. 2012)	
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River - 902SMR-MLS-2]	
Temporal Representation:	Data was collected on a single day 12/16/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was used.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.	

DECISION ID 47644 Region 9

Santa Margarita River (Upper)

Pollutant:	**Deltamethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the two samples exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the two samples exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47644, Deltamethrin Region 9

Santa Margarita River (Upper)

LOE ID: 76567

Pollutant:	Deltamethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Deltamethrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for Deltamethrin is the maximum acceptable toxicant concentration (MATC) of 0.02 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47644, Deltamethrin **Region 9**

Santa Margarita River (Upper)

LOE ID:	76568
Pollutant:	Deltamethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Deltamethrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	The evaluation guideline for Deltamethrin is the maximum acceptable toxicant concentration (MATC) of 0.02 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47644, Deltamethrin **Region 9**

Santa Margarita River (Upper)

LOE ID:	77888
Pollutant:	Deltamethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Deltamethrin.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for Deltamethrin is the maximum acceptable toxicant concentration (MATC) of 0.02 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River - 902SMR-MLS-2]
Temporal Representation:	Data was collected on a single day 12/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was used.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID 47645 **Region 9**

Santa Margarita River (Upper)

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the nine samples exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the nine samples exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47645, Diazinon **Region 9**

Santa Margarita River (Upper)

LOE ID:	77893
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 8 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	The California Department of Public Health (CDPH) Notification Level for Diazinon is 1.2 ug/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 2 monitoring sites [Santa Margarita River @ SDSU Ecological Reserve Entrance, Santa Margarita River @ Sandia Creek Drive (one-half mile east of De Luz Road)]
Temporal Representation:	Data was collected over the time period 5/10/2006-5/27/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47645, Diazinon **Region 9**

Santa Margarita River (Upper)

LOE ID:	77891
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Diazinon.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River - 902SMR-MLS-2]
Temporal Representation:	Data was collected on a single day 12/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was used.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 47645, Diazinon — Region 9

037195

Santa Margarita River (Upper)

LOE ID:	77892
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Diazinon.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Department of Public Health (CDPH) Notification Level for Diazinon is 1.2 ug/L.
Guideline Reference:	2011 Edition of the Drinking Water Standards and Health Advisories
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River - 902SMR-MLS-2]
Temporal Representation:	Data was collected on a single day 12/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was used.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 47645, Diazinon — Region 9

Santa Margarita River (Upper)

LOE ID:	76573
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	037196
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 8 samples exceed the criterion for Diazinon.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).	
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 2 monitoring sites [Santa Margarita River @ SDSU Ecological Reserve Entrance, Santa Margarita River @ Sandia Creek Drive (one-half mile east of De Luz Road)]	
Temporal Representation:	Data was collected over the time period 5/10/2006-5/27/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID	**47646**	**Region 9**
Santa Margarita River (Upper)		

Pollutant:	**Esfenvalerate/Fenvalerate**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the two samples exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3.Zero of the two samples exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and

information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47646, Esfenvalerate/Fenvalerate **Region 9**

Santa Margarita River (Upper)

LOE ID:	76580
Pollutant:	Esfenvalerate/Fenvalerate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Esfenvalerate/Fenvalerate, total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to the USEPA Office of Pesticide Programs Ecotoxicity database, the aquatic life EC50 for Esfenvalerate/Fenvalerate is 0.9 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47646, Esfenvalerate/Fenvalerate **Region 9**

Santa Margarita River (Upper)

LOE ID:	77896
Pollutant:	Esfenvalerate/Fenvalerate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples

exceed the criterion for Esfenvalerate. 037198

Data Reference: Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).

Objective/Criterion Reference: Water Quality Control Plan for the San Diego Basin

Evaluation Guideline: According to the USEPA Office of Pesticide Programs Ecotoxicity database, the aquatic life EC50 for Esfenvalerate is 0.9 ug/L.

Guideline Reference: OPP Pesticide Ecotoxicity Database.

Spatial Representation: Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River - 902SMR-MLS-2]

Temporal Representation: Data was collected on a single day 12/16/2008.

Environmental Conditions: Staff is not aware of any special conditions that might affect interpretation of the data.

QAPP Information: The Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was used.

QAPP Information Reference(s): Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 47646, Esfenvalerate/Fenvalerate **Region 9**

Santa Margarita River (Upper)

LOE ID: 76581

Pollutant: Esfenvalerate/Fenvalerate

LOE Subgroup: Pollutant-Water

Matrix: Water

Fraction: Total

Beneficial Use: Cold Freshwater Habitat

Number of Samples: 1

Number of Exceedances: 0

Data and Information Type: PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality: Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Esfenvalerate/Fenvalerate, total.

Data Reference: RWB9 Stormwater Monitoring Council CY 2009

SWAMP Data: SWAMP

Water Quality Objective/Criterion: All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).

Objective/Criterion Reference: Water Quality Control Plan for the San Diego Basin

Evaluation Guideline: According to the USEPA Office of Pesticide Programs Ecotoxicity database, the aquatic life EC50 for Esfenvalerate/Fenvalerate is 0.9 ug/L.

Guideline Reference: OPP Pesticide Ecotoxicity Database.

Spatial Representation: Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]

Temporal Representation:	Data was collected on a single day 5/6/2009.	037199
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID 47661 Region 9

Santa Margarita River (Upper)

Pollutant:	**Fenpropathrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the one sample exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47661, Fenpropathrin Region 9

Santa Margarita River (Upper)

LOE ID:	76587
Pollutant:	Fenpropathrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Fenpropathrin.

Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	037200
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The evaluation guideline for Fenpropathrin is the median lethal concentration (LC50; 2.2 ug/L).	
Guideline Reference:	OPP Pesticide Ecotoxicity Database.	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]	
Temporal Representation:	Data was collected on a single day 5/6/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 47661, Fenpropathrin **Region 9**

Santa Margarita River (Upper)

LOE ID:	76586
Pollutant:	Fenpropathrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Fenpropathrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for Fenpropathrin is the median lethal concentration (LC50; 2.2 ug/L).
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 47659 Region 9

Santa Margarita River (Upper) 037201

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary, and under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Five lines of evidence are available in the administrative record to assess this pollutant. Zero of one sample (sediment) and zero of 15 samples (water) exceeded the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample (sediment) and zero of 15 samples (water) exceeded the water quality objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47659, Lead — Region 9

Santa Margarita River (Upper)

LOE ID:	76594
Pollutant:	Lead
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP

Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for lead is 128 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]
Temporal Representation:	Data was collected on a single day 4/27/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47659, Lead **Region 9**

Santa Margarita River (Upper)

LOE ID:	76595
Pollutant:	Lead
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for lead is 128 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]
Temporal Representation:	Data was collected on a single day 4/27/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47659, Lead **Region 9**

Santa Margarita River (Upper)

LOE ID:	76596

Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Lead to protect aquatic life in freshwater. The dissolved Lead criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47659, Lead **Region 9**

Santa Margarita River (Upper)

LOE ID:	76605
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved lead to protect aquatic life in freshwater. The dissolved lead criterion in freshwater is hardness

	dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River - 902SMR-MLS-2]
Temporal Representation:	Data was collected on a single day 12/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 47659, Lead **Region 9**

Santa Margarita River (Upper)

LOE ID:	76598
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	13
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 2 monitoring sites [Santa Margarita River @ Sandia Creek Drive (one-half mile east of De Luz Road), Santa Margarita River @ SDSU Ecological Reserve Entrance]
Temporal Representation:	Data was collected over the time period 5/12/2003 - 5/27/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47659, Lead — Region 9

Santa Margarita River (Upper)

LOE ID:	76604
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	13
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 13 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for Lead is 0.015 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals, CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 2 monitoring sites [Santa Margarita River @ SDSU Ecological Reserve Entrance, Santa Margarita River @ Sandia Creek Drive (one-half mile east of De Luz Road)]
Temporal Representation:	Data was collected over the time period 5/12/2003 - 5/27/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47659, Lead — Region 9

Santa Margarita River (Upper)

LOE ID:	76597
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.

Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	037206
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved lead to protect aquatic life in freshwater. The dissolved lead criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]	
Temporal Representation:	Data was collected on a single day 5/6/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID 47664 Region 9

Santa Margarita River (Upper)

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Four lines of evidence are available in the administrative record to assess this pollutant. Zero of the Eight samples exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the Eight samples exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47664, Malathion Region 9

Santa Margarita River (Upper)

LOE ID:	76611	037207

Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 8 samples exceed the criterion for Malathion.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 2 monitoring sites [Santa Margarita River @ SDSU Ecological Reserve Entrance, Santa Margarita River @ Sandia Creek Drive (one-half mile east of De Luz Road)]
Temporal Representation:	Data was collected over the time period 5/10/2006-5/27/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47664, Malathion **Region 9**

Santa Margarita River (Upper)

LOE ID:	77903
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Malathion.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.

SWAMP Data:	Non-SWAMP	037208
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The California Department of Public Health (CDPH) archived advisory level criteria for malathion in drinking water is 160.0 ug/L.	
Guideline Reference:	2011 Edition of the Drinking Water Standards and Health Advisories	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River - 902SMR-MLS-2]	
Temporal Representation:	Data was collected on a single day 12/16/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was used.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.	

Line of Evidence (LOE) for Decision ID 47664, Malathion **Region 9**

Santa Margarita River (Upper)

LOE ID:	77907
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Malathion.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River - 902SMR-MLS-2]

Temporal Representation:	Data was collected on a single day 12/16/2008.	037209
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was used.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.	

Line of Evidence (LOE) for Decision ID 47664, Malathion **Region 9**

Santa Margarita River (Upper)

LOE ID:	77904
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 8 samples exceed the criterion for Malathion.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Department of Public Health (CDPH) archived advisory level criteria for malathion in drinking water is 160.0 ug/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 2 monitoring sites [Santa Margarita River @ SDSU Ecological Reserve Entrance, Santa Margarita River @ Sandia Creek Drive (one-half mile east of De Luz Road)]
Temporal Representation:	Data was collected over the time period 5/10/2006-5/27/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **38589** **Region 9**

Santa Margarita River (Upper)

Pollutant:	**Metals**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised

Impairment from Pollutant or Pollution:	Pollutant	037210
Regional Board Conclusion:	This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. None of the samples exceed the water quality objectives for the multiple metal pollutants. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the samples exceed the water quality objectives for the multiple metal pollutants and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.	
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.	

Line of Evidence (LOE) for Decision ID 38589, Metals **Region 9**

Santa Margarita River (Upper)

LOE ID:	26399
Pollutant:	Metals
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	44
Number of Exceedances:	0
Data and Information Type:	Highest quality fixed-station P/C (conventional plus toxicants)
Data Used to Assess Water Quality:	Fouty-four samples were collected at Santa Margarita Creek station 902SMSMR1 during the months of January 2003, April 2003, May 2003, and September 2003, for metals analyses. None of the 44 samples show excessive concentrations.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The Maximum Contaminant Level (MCL) for aluminum is 1. mg /l (ppb). Water Quality Control for the San Diego Basin. 2007. The dissolved chronic criterion for the following metals applies: arsenic 150 Âµg/l (ppb), cadmium 2.2 Âµg/l (ppb), copper 9.0 Âµg/l (ppb), selenium 5.0 Âµg/l (ppb), zinc 120 Âµg/l (ppb), chromium 11 Âµg/l (ppb), manganese 0.05 mg/l, nickel 52 Âµg/l (ppb), lead 2.5 Âµg/l (ppb), and silver 3.4Âµg/l (ppb). California Toxics Rule. 2007.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Water samples were collected at Santa Margarita Creek station 902SMSMR1; (Latitude 33.4741, Longitude -117.1414).

Temporal Representation:	Water samples were collected on January 2003, April 2003, May 2003, and September 2003.
Environmental Conditions:	
QAPP Information:	Quality control for chemical analysis portion of this study was conducted in accordance with the California Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	

DECISION ID 47673 Region 9

Santa Margarita River (Upper)

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary, and under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Five lines of evidence are available in the administrative record to assess this pollutant. Zero of One sample (sediment) and zero of Two samples (water) exceeded the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample (sediment) and zero of Two samples (water) exceeded the water quality objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47673, Nickel Region 9

Santa Margarita River (Upper)

LOE ID:	77859
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1

Number of Exceedances:	0	037212
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.	
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nickel is 0.1 mg/L (Title 22 of the California Code of Regulations).	
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River - 902SMR-MLS-2]	
Temporal Representation:	Data was collected on a single day 12/16/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was used.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.	

Line of Evidence (LOE) for Decision ID 47673, Nickel **Region 9**

Santa Margarita River (Upper)

LOE ID:	76618
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for nickel is 48.6 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31

Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]
Temporal Representation:	Data was collected on a single day 4/27/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47673, Nickel **Region 9**

Santa Margarita River (Upper)

LOE ID:	76619
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nickel is 0.1 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47673, Nickel **Region 9**

Santa Margarita River (Upper)

LOE ID:	76620
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine

	beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Nickel to protect aquatic life in freshwater. The dissolved Nickel criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47673, Nickel **Region 9**

Santa Margarita River (Upper)

LOE ID:	76621
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Nickel to protect aquatic life in freshwater. The dissolved Nickel criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47673, Nickel — Region 9

Santa Margarita River (Upper)

LOE ID:	76491
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Nickel to protect aquatic life in freshwater. The dissolved Nickel criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River - 902SMR-MLS-2]
Temporal Representation:	Data was collected on a single day 12/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 47673, Nickel — Region 9

Santa Margarita River (Upper)

LOE ID:	76617
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	037216
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for nickel is 48.6 mg/Kg dry weight (MacDonald et al. 2000).	
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]	
Temporal Representation:	Data was collected on a single day 4/27/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID	**47677**	**Region 9**
Santa Margarita River (Upper)		

Pollutant:	**Nitrate/Nitrite (Nitrite + Nitrate as N)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Three lines of evidence are available in the administrative record to assess this pollutant. Zero of the Four samples exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the three samples exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to [SECTION 3.11/4.11] of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47677, Nitrate/Nitrite (Nitrite + Nitrate as N) 037217 Region 9

Santa Margarita River (Upper)

LOE ID:	76493
Pollutant:	Nitrate/Nitrite (Nitrite + Nitrate as N)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Nitrate/Nitrite as N.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrate + nitrite (as N) is 10.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River @ SDSU Ecological Reserve Entrance]
Temporal Representation:	Data was collected over the time period 5/13/2003-9/4/2003.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47677, Nitrate/Nitrite (Nitrite + Nitrate as N) Region 9

Santa Margarita River (Upper)

LOE ID:	77861
Pollutant:	Nitrate/Nitrite (Nitrite + Nitrate as N)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nitrate/Nitrite as N.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrate + nitrite (as N) is 10.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River - 902SMR-MLS-2]
Temporal Representation:	Data was collected on a single day 12/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was used.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 47677, Nitrate/Nitrite (Nitrite + Nitrate as N) Region 9

Santa Margarita River (Upper)

LOE ID:	76492
Pollutant:	Nitrate/Nitrite (Nitrite + Nitrate as N)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nitrate/Nitrite as N.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrate + nitrite (as N) is 10.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 47679 Region 9

Santa Margarita River (Upper)

Pollutant:	**Nitrogen, Nitrite**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Four lines of evidence are available in the administrative record to assess this pollutant. Zero of the Ten samples exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the Ten samples exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to [SECTION 3.11/4.11] of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47679, Nitrogen, Nitrite **Region 9**

Santa Margarita River (Upper)

LOE ID:	76496
Pollutant:	Nitrogen, Nitrite
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nitrite as N.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrite (as N) is 1.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	

Guideline Reference:	037220
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47679, Nitrogen, Nitrite **Region 9**

Santa Margarita River (Upper)

LOE ID:	76495
Pollutant:	Nitrogen, Nitrite
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Nitrite as N.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrite (as N) is 1.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 2 monitoring sites [Santa Margarita River @ SDSU Ecological Reserve Entrance, Santa Margarita River @ Sandia Creek Drive (one-half mile east of De Luz Road)]
Temporal Representation:	Data was collected over the time period 5/12/2003-9/5/2003.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47679, Nitrogen, Nitrite **Region 9**

Santa Margarita River (Upper)

LOE ID:	77866
Pollutant:	Nitrogen, Nitrite
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nitrite as N.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrite (as N) is 1.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals, CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River - 902SMR-MLS-2]
Temporal Representation:	Data was collected on a single day 12/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was used.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 47679, Nitrogen, Nitrite **Region 9**

Santa Margarita River (Upper)

LOE ID:	76497
Pollutant:	Nitrogen, Nitrite
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Nitrite as N.
Data Reference:	Data for Metals, Nutrients, and Inorganics from the County of San Diego Sandia Creek and Santa Margarita River, 2004-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrite (as N) is 1.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals, CCR
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 037221 monitoring site [Santa Margarita River upstream of Stone Creek - 902SMRGorge]
Temporal Representation:	Data was collected over the time period 12/6/2007-5/14/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and COSD Santa Margarita Mass Loading Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and COSD Santa Margarita Mass Loading Report.

DECISION ID 47682 Region 9

Santa Margarita River (Upper)

Pollutant:	**Nitrogen, ammonia (Total Ammonia)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the four samples exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the four samples exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to [SECTION 3.11/4.11] of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47682, Nitrogen, ammonia (Total Ammonia) Region 9

Santa Margarita River (Upper)

LOE ID:	76571
Pollutant:	Nitrogen, ammonia (Total Ammonia)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING 037223
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Ammonia As N, Total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Basin Plan: No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	EPA's Lifetime Health advisory level for total ammonia is 30.0 mg/L as stated on page 8 of the 2006 edition of the drinking water standards and health advisories. This Advisory Level is defined as "the concentration of a chemical in drinking water that is not expected to cause any adverse noncarcinogenic effects for up to ten days of exposure."
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47682, Nitrogen, ammonia (Total Ammonia) Region 9

Santa Margarita River (Upper)

LOE ID:	76572
Pollutant:	Nitrogen, ammonia (Total Ammonia)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Ammonia As N, Total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Basin Plan: No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	EPA's Lifetime Health advisory level for total ammonia is 30.0 mg/L as stated on page 8 of the 2006 edition of the drinking water standards and health advisories. This Advisory Level is defined as "the concentration of a chemical in drinking water that is not expected to cause any adverse noncarcinogenic effects for up to ten days of exposure."
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 2

	monitoring sites [Santa Margarita River @ SDSU Ecological Reserve Entrance, Santa Margarita River @ Sandia Creek Drive (one-half mile east of De Luz Road)]
Temporal Representation:	Data was collected over the time period 5/12/2003-9/4/2003.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 47931 — Region 9

Santa Margarita River (Upper)

Pollutant:	**Oxygen, Dissolved**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceeds the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the one sample exceeds the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47931, Oxygen, Dissolved — Region 9

Santa Margarita River (Upper)

LOE ID:	76498
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING 037225
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Oxygen, Dissolved.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan, San Diego Basin, Warm Water Habitat Objective, Chapter III, General Objectives for all Inland Surface Waters, Enclosed Bays and Estuaries states the following: The dissolved oxygen concentration for warm water habitats shall not be reduced below 5.0 mg/l at any time.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]
Temporal Representation:	Data was collected on a single day 4/27/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47931, Oxygen, Dissolved **Region 9**

Santa Margarita River (Upper)

LOE ID:	76499
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Oxygen, Dissolved.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan, San Diego Basin, Cold Water Habitat Objective, Chapter III, General Objectives for all Inland Surface Waters, Enclosed Bays and Estuaries states the following: The dissolved oxygen concentration for cold water habitats shall not be reduced below 8.0 mg/l at any time.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]
Temporal Representation:	Data was collected on a single day 4/27/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID	47687	Region 9
Santa Margarita River (Upper)		

Pollutant:	**Permethrin, total**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. One of one samples exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of one samples exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47687, Permethrin, total	**Region 9**
Santa Margarita River (Upper)	

LOE ID:	76507
Pollutant:	Permethrin, total
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Permethrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP

Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Permethrin does not exceed 0.002 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47687, Permethrin, total **Region 9**

Santa Margarita River (Upper)

LOE ID:	76506
Pollutant:	Permethrin, total
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Permethrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Permethrin does not exceed 0.002 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 47698 **Region 9**

Santa Margarita River (Upper)

Pollutant:	**Selenium**	037228
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	
Last Listing Cycle's Final Listing Decision:	New Decision	
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Four lines of evidence are available in the administrative record to assess this pollutant. Zero of the two samples exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the two samples exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47698, Selenium **Region 9**

Santa Margarita River (Upper)

LOE ID:	77872
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Selenium.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The selenium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater is 0.005 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition

Evaluation Guideline:	037229
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River - 902SMR-MLS-2]
Temporal Representation:	Data was collected on a single day 12/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was used.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 47698, Selenium **Region 9**

Santa Margarita River (Upper)

LOE ID:	77871
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Selenium.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The Maximum Contaminant Level for selenium in the Basin Plan is 0.05 mg/L (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River - 902SMR-MLS-2]
Temporal Representation:	Data was collected on a single day 12/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was used.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 47698, Selenium **Region 9**

Santa Margarita River (Upper)

LOE ID:	76510

Pollutant:	Selenium	037230
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	Dissolved	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Selenium.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	The selenium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater is 0.005 mg/L (California Toxics Rule, 2000).	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]	
Temporal Representation:	Data was collected on a single day 5/6/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 47698, Selenium **Region 9**

Santa Margarita River (Upper)

LOE ID:	76512
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Selenium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The selenium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater is 0.005 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	

Guideline Reference:	037231
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47698, Selenium **Region 9**

Santa Margarita River (Upper)

LOE ID:	76511
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Selenium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The Maximum Contaminant Level for selenium in the Basin Plan is 0.05 mg/L.
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 47702 **Region 9**

Santa Margarita River (Upper)

Pollutant:	**Silver**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the two

samples exceed the objective. 037232

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the two samples exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to [SECTION 3.11/4.11] of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47702, Silver **Region 9**

Santa Margarita River (Upper)

LOE ID:	76519
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Silver.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Silver to protect aquatic life in freshwater. The dissolved Silver criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47702, Silver **Region 9**

Santa Margarita River (Upper) 037233

LOE ID:	76517
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Silver.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for silver is 0.1 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47702, Silver **Region 9**

Santa Margarita River (Upper)

LOE ID:	76518
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Silver.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Silver to protect aquatic life in freshwater. The dissolved Silver criterion in freshwater is hardness

	dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 47933 Region 9

Santa Margarita River (Upper)

Pollutant:	**Specific Conductivity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One lines of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the one sample exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47933, Specific Conductivity Region 9

Santa Margarita River (Upper)

LOE ID:	76525
Pollutant:	Specific Conductivity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Conductivity(Us).
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for specific conductance is 900 uS/cm (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]
Temporal Representation:	Data was collected on a single day 4/27/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **47710** **Region 9**

Santa Margarita River (Upper)

Pollutant:	**Sulfates**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the one samples exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the one samples exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and

information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47710, Sulfates **Region 9**

Santa Margarita River (Upper)

LOE ID:	76528
Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Sulfate.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Sulfate objective for the protection of aquatic life according to Table 3-2 for Santa Margarita River (Upper) within the Santa Margarita Hydrologic Unit is 250 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47710, Sulfates **Region 9**

Santa Margarita River (Upper)

LOE ID:	76526
Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for

	Sulfate.	037237
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The California Secondary MCL for sulfate is 250 mg/L (Title 22 California Code of Regulations).	
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]	
Temporal Representation:	Data was collected on a single day 5/6/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 47710, Sulfates **Region 9**

Santa Margarita River (Upper)

LOE ID:	76527
Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Sulfate.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Sulfate objective for the protection of aquatic life according to Table 3-2 for Santa Margarita River (Upper) within the Santa Margarita Hydrologic Unit is 250 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 47934 **Region 9**

Santa Margarita River (Upper) 037238

Pollutant:	**Temperature, water**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One lines of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the one sample exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47934, Temperature, water — Region 9

Santa Margarita River (Upper)

LOE ID:	76529
Pollutant:	Temperature, water
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Water Temperature.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Board that such alteration in temperature does not adversely affect beneficial uses. At no time or place shall the temperature of any COLD water be increased more than 5Â°F above the natural receiving

	water temperature.	037239
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	Inland Fishes of California (Moyle 1976) states that for rainbow trout the optimum range for growth and completion of most life stages is 13-21 degrees C (page 129).	
Guideline Reference:	Inland Fishes of California	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]	
Temporal Representation:	Data was collected on a single day 4/27/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID 47927 Region 9

Santa Margarita River (Upper)

Pollutant:	**Total Dissolved Solids**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One lines of evidence is available in the administrative record to assess this pollutant. One of the one samples exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of the one samples exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47927, Total Dissolved Solids Region 9

Santa Margarita River (Upper)

LOE ID:	76501
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved

Beneficial Use:	Warm Freshwater Habitat	037240
Number of Samples:	1	
Number of Exceedances:	1	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Dissolved Solids.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Dissolved Solids objective for the protection of aquatic life according to Table 3-2 for Santa Margarita River (Upper) within the Santa Margarita Hydrologic Unit is 750 mg/L.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]	
Temporal Representation:	Data was collected on a single day 5/6/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 47927, Total Dissolved Solids **Region 9**

Santa Margarita River (Upper)

LOE ID:	76500
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Dissolved Solids.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for Dissolved Solids is 500 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]

Temporal Representation:	Data was collected on a single day 5/6/2009.	037241
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID 47935 Region 9

Santa Margarita River (Upper)

Pollutant:	**Turbidity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One lines of evidence is available in the administrative record to assess this pollutant. One of the one samples exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of the one samples exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47935, Turbidity Region 9

Santa Margarita River (Upper)

LOE ID:	76504
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Turbidity(NTU).

Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	037242
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Turbidity(NTU) objective for the protection of aquatic life according to Table 3-2 for Santa Margarita River (Upper) within the Santa Margarita Hydrologic Unit is 20 NTU.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]	
Temporal Representation:	Data was collected on a single day 4/27/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 47935, Turbidity **Region 9**

Santa Margarita River (Upper)

LOE ID:	76505
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Turbidity(NTU).
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Turbidity(NTU) objective for the protection of aquatic life according to Table 3-2 for Santa Margarita River (Upper) within the Santa Margarita Hydrologic Unit is 20 NTU.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]
Temporal Representation:	Data was collected on a single day 4/27/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 47711 Region 9

Santa Margarita River (Upper) 037243

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary, and under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Eight lines of evidence are available in the administrative record to assess this pollutant. Zero of one sample (sediment) and zero of 15 samples (water) exceeded the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample (sediment) and zero of 15 samples (water) exceeded the water quality objective and this sample size is isufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 47711, Zinc — Region 9

Santa Margarita River (Upper)

LOE ID:	76523
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Zinc to protect aquatic life in freshwater. The dissolved Zinc criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River - 902SMR-MLS-2]
Temporal Representation:	Data was collected on a single day 12/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 47711, Zinc **Region 9**

Santa Margarita River (Upper)

LOE ID:	76515
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	The California Secondary MCL for zinc is 5.0 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47711, Zinc **Region 9**

Santa Margarita River (Upper)

LOE ID:	76513	037245

Pollutant:	Zinc
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for zinc is 459 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]
Temporal Representation:	Data was collected on a single day 4/27/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47711, Zinc **Region 9**

Santa Margarita River (Upper)

LOE ID:	76516
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	13
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that

	adversely affect beneficial uses. (Water Quality Control Plan, San Diego Basin)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for zinc is 5.0 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 2 monitoring sites [Santa Margarita River @ Sandia Creek Drive (one-half mile east of De Luz Road), Santa Margarita River @ SDSU Ecological Reserve Entrance]
Temporal Representation:	Data was collected over the time period 5/12/2003 - 5/27/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47711, Zinc **Region 9**

Santa Margarita River (Upper)

LOE ID:	76522
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	13
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 2 monitoring sites [Santa Margarita River @ Sandia Creek Drive (one-half mile east of De Luz Road), Santa Margarita River @ SDSU Ecological Reserve Entrance]
Temporal Representation:	Data was collected over the time period 5/12/2003 - 5/27/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47711, Zinc **Region 9**

Santa Margarita River (Upper) 037247

LOE ID:	76520
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Zinc to protect aquatic life in freshwater. The dissolved Zinc criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47711, Zinc **Region 9**

Santa Margarita River (Upper)

LOE ID:	76514
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP

Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for zinc is 459 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]
Temporal Representation:	Data was collected on a single day 4/27/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47711, Zinc **Region 9**

Santa Margarita River (Upper)

LOE ID:	77869
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for zinc is 5.0 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River - 902SMR-MLS-2]
Temporal Representation:	Data was collected on a single day 12/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was used.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 47711, Zinc **Region 9**

Santa Margarita River (Upper) 037249

LOE ID:	76521
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Zinc to protect aquatic life in freshwater. The dissolved Zinc criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **47771** **Region 9**

Santa Margarita River (Upper)

Pollutant:	**pH**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one samples exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.037250
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the one samples exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47771, pH **Region 9**

Santa Margarita River (Upper)

LOE ID:	76509
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for pH.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	In inland surface waters the pH shall not be depressed below 6.5 nor raised above 8.5.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]
Temporal Representation:	Data was collected on a single day 4/27/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47771, pH **Region 9**

Santa Margarita River (Upper)

LOE ID:	76508
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	1	037251
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for pH.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	In inland surface waters the pH shall not be depressed below 6.5 nor raised above 8.5.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]	
Temporal Representation:	Data was collected on a single day 4/27/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID	**50567**	**Region 9**
Santa Margarita River (Upper)		

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. Seven of the 14 samples exceed the Water Quality Objective for Enterococcus, Three out of 14 samples exceeded the Water Quality Objective for Fecal Coliform, and One out of 14 samples exceeded the Water Quality Objective for Total Coliform.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Seven of the 14 samples exceed the Water Quality Objective for Enterococcus, Three out of 14 samples exceeded the Water Quality Objective for Fecal Coliform, and One out of 14 samples exceeded the Water Quality Objective for Total Coliform and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality

standards are exceeded and a pollutant contributes to or causes the problem. 037252

Line of Evidence (LOE) for Decision ID 50567, Indicator Bacteria **Region 9**

Santa Margarita River (Upper)

LOE ID:	76582
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	14
Number of Exceedances:	3
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 3 of 14 samples exceed the criterion for Coliform, Fecal.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the fecal coliform concentration shall not exceed 400 MPN/100 ml.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 2 monitoring sites [Santa Margarita River @ SDSU Ecological Reserve Entrance, Santa Margarita River @ Sandia Creek Drive (one-half mile east of De Luz Road)]
Temporal Representation:	Data was collected over the time period 5/12/2003-5/27/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 50567, Indicator Bacteria **Region 9**

Santa Margarita River (Upper)

LOE ID:	76574
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	14
Number of Exceedances:	7
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Santa Margarita River (Upper) to

	determine beneficial use support and results are as follows: 7 of 14 samples exceed the criterion for Enterococci.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Samples shall not exceed 61 organisms per 100 ml for enterococcus in waters designated for REC I beneficial use (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 2 monitoring sites [Santa Margarita River @ SDSU Ecological Reserve Entrance, Santa Margarita River @ Sandia Creek Drive (one-half mile east of De Luz Road)]
Temporal Representation:	Data was collected over the time period 5/12/2003-5/27/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 50567, Indicator Bacteria **Region 9**

Santa Margarita River (Upper)

LOE ID:	76530
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	14
Number of Exceedances:	1
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 1 of 14 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxicsubstances in concentrations which are toxic to,or which produce detrimental physiologicalresponses in human, plant, animal, or indigenousaquatic life (Basin Plan).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In waters designated for water contact recreation (REC I), the total coliform concentration shall not exceed 10000 MPN/100 ml (CDPH 2006).
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 2 monitoring sites [Santa Margarita River @ SDSU Ecological Reserve Entrance, Santa Margarita River @ Sandia Creek Drive (one-half mile east of De Luz Road)]
Temporal Representation:	Data was collected over the time period 5/12/2003-5/27/2009.

Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 47653 Region 9

Santa Margarita River (Upper)

Pollutant:	**Iron**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Two of the 5 samples exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Two of the 5 samples exceed the objective and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 47653, Iron Region 9

Santa Margarita River (Upper)

LOE ID:	76590
Pollutant:	Iron
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine

	beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Iron.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Iron objective for the protection of aquatic life according to Table 3-2 for Santa Margarita River (Upper) within the Santa Margarita Hydrologic Unit is 0.3 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47653, Iron **Region 9**

Santa Margarita River (Upper)

LOE ID:	76589
Pollutant:	Iron
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Iron.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for iron is 0.3 mg/L (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47653, Iron **Region 9**

Santa Margarita River (Upper)

LOE ID:	76588
Pollutant:	Iron
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Iron.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Iron objective for the protection of aquatic life according to Table 3-2 for Santa Margarita River (Upper) within the Santa Margarita Hydrologic Unit is 0.3 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47653, Iron **Region 9**

Santa Margarita River (Upper)

LOE ID:	76591
Pollutant:	Iron
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	2
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 2 of 4 samples exceed the criterion for Iron.
Data Reference:	Data for Metals, Nutrients, and Inorganics from the County of San Diego Sandia Creek and Santa Margarita River, 2004-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for iron is 0.3 mg/L (Water Quality Control Plan, San Diego

	Basin). 037257
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River upstream of Stone Creek - 902SMRGorge]
Temporal Representation:	Data was collected over the time period 12/6/2007-5/14/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and COSD Santa Margarita Mass Loading Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and COSD Santa Margarita Mass Loading Report.

DECISION ID 47668 Region 9

Santa Margarita River (Upper)

Pollutant:	**Manganese**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Three lines of evidence are available in the administrative record to assess this pollutant. Three of the six samples exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3.Three of the six samples exceed the objective and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 47668, Manganese Region 9

Santa Margarita River (Upper)

LOE ID:	76615
Pollutant:	Manganese
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	037258
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	4	
Number of Exceedances:	3	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 3 of 4 samples exceed the criterion for Manganese.	
Data Reference:	Data for Metals, Nutrients, and Inorganics from the County of San Diego Sandia Creek and Santa Margarita River, 2004-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Secondary MCL for manganese is 0.05 mg/L (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River upstream of Stone Creek - 902SMRGorge]	
Temporal Representation:	Data was collected over the time period 12/6/2007-5/14/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and COSD Santa Margarita Mass Loading Report was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and COSD Santa Margarita Mass Loading Report.	

Line of Evidence (LOE) for Decision ID 47668, Manganese **Region 9**

Santa Margarita River (Upper)

LOE ID:	76613
Pollutant:	Manganese
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Manganese.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for manganese is 0.05 mg/L (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47668, Manganese **Region 9**

Santa Margarita River (Upper)

LOE ID:	76612
Pollutant:	Manganese
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Manganese.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Manganese objective for the protection of aquatic life according to Table 3-2 for Santa Margarita River (Upper) within the Santa Margarita Hydrologic Unit is 0.05 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47668, Manganese **Region 9**

Santa Margarita River (Upper)

LOE ID:	76614
Pollutant:	Manganese
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	037260
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Margarita River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Manganese.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Manganese objective for the protection of aquatic life according to Table 3-2 for Santa Margarita River (Upper) within the Santa Margarita Hydrologic Unit is 0.05 mg/L.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Santa Margarita River (Upper) was collected at 1 monitoring site [Santa Margarita River ~0.3mi above Sandia Cr. Dr. - 902S00565]	
Temporal Representation:	Data was collected on a single day 5/6/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID	43136	Region 9
Santa Margarita River (Upper)		

Pollutant:	**Nitrogen**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2023
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One lines of evidence is available in the administrative record to assess this pollutant. Two of the four samples exceed the OBJECTIVE. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Two of four samples exceed the OBJECTIVE and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 43136, Nitrogen 037261 Region 9

Santa Margarita River (Upper)

LOE ID:	21194
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	2
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Two of the four samples collected at Santa Margarita River on January 2003, April 2003, May 2003, and September 2003 show excessive nitrogen concentrations. (SWAMP, 2007).
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. Water Quality Control Plan for the San Diego Basin Goal of 0.1 mg/L for total phosphorus in streams and other flowing waters.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	One sampling site was used in this line of evidence. Santa Margarita 1 (902SSMR1 lat/long: 33.47404/-117.14148).
Temporal Representation:	Samples were collected on January 2003, April 2003, May 2003, and September 2003.
Environmental Conditions:	The first two sampling events occurred between storm events and high base flow respectively. The third and fourth occurred during declining and minimum base flow respectively.
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

DECISION ID 34470 Region 9

Santa Margarita River (Upper)

Pollutant:	**Phosphorus**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

	303(d) listing decisions made prior to 2006 were not held in an assessment database. The Regional Boards will update this decision when new data and information become available and are assessed.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34470, Phosphorus **Region 9**

Santa Margarita River (Upper)

LOE ID:	7407
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	All four samples collected exceeded the total phosphorus water quality objective. Samples were collected between January 2003 and September 2003 for the SWAMP program.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Water Quality Control Plan for the San Diego Basin Goal of 0.1 mg/L for total phosphorus in streams and other flowing waters.
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	One sampling site was used in this line of evidence. Santa Margarita 1 (902SMSMR1 lat/long: 33.47404/-117.14148).
Temporal Representation:	Samples were collected on January 2003, April 2003, May 2003, and September 2003.
Environmental Conditions:	The first two sampling events occurred between storm events and high base flow respectively. The third and fourth occurred during declining and minimum base flow respectively.
QAPP Information:	Puckett, M. 2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program ("SWAMP"). California Department of Fish and Game, Monterey, CA.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 34470, Phosphorus **Region 9**

Santa Margarita River (Upper)

LOE ID:	4731
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	Unspecified
Guideline Reference:	Placeholder reference pre-2006 303(d)
Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 34470, Phosphorus **Region 9**

Santa Margarita River (Upper)

LOE ID:	24978
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	3
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Selenastrum capricornutum- Six samples were collected and none showed significant toxicity levels (SL) as determined by the Selenastrum capricornutum growth test. Ceriodaphnia dubia- Six samples were collected and two samples show significant toxicity levels (SL) as determined by the Ceriodaphnia dubia survival/reproductive. Hyalella azteca- Six samples were collected and one sample show significant toxicity levels (SL) as determined by the Hyalella azteca growth/survival test. Samples were collected November 2001 through February 2006.
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report San Diego Stormwater Copermittees Jurisdiction Urban Runoff Managment Program. Final Report. Baseline Long Term Effectiveness Assessment
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	Samples were found to exhibit toxicity when the No Observed Effect Concentration (NOEC) or median lethal concentration (LC50) for any given species was estimated to be less than 100% of the test sample concentration (U.S. EPA, 2002).
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at the monitoring stations Santa Margarita 1 located on the main stem of the Santa Margarita River.
Temporal Representation:	Samples were collected on the following dates: January 14-15, April 15-16, and September 9, 2003.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 34470, Phosphorus **Region 9**

Santa Margarita River (Upper)

LOE ID:	21402
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	2
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Four samples were collected at Santa Margarita 1 station 902SSMR1 from January to September 2003, they showed significant toxicity levels (SL) in the following test: Selenastrum algae growth test - Two of the four samples. Ceriodaphnia dubia survival and reproduction. No toxicity was observed.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.
Guideline Reference:	Monitoring data for Region 9
Spatial Representation:	One sampling site was used in this line of evidence. Santa Margarita 1 (902SSMR1 lat/long: 33.47404/-117.14148).
Temporal Representation:	Samples were collected on the following dates: January 15, April 16, May 14, and September 9, 2003.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 34470, Phosphorus **Region 9**

Santa Margarita River (Upper)

LOE ID:	76503	037265

Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate water toxicity. The sample did not exhibit significant toxicity. The toxicity test included survival and growth of Ceriodaphnia dubia. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL, Significant compared to negative control based on statistical test, less than stated alpha level, AND less than the evaluation threshold (both criteria are met).
Guideline Reference:	
Spatial Representation:	The sample was collected at station 902S00565.
Temporal Representation:	The sample was collected in May 2009.
Environmental Conditions:	
QAPP Information:	Data quality is good. Data results were recorded in the SWAMP database and followed SWAMP protocols.
QAPP Information Reference(s):	

DECISION ID	**43135**	**Region 9**
Santa Margarita River (Upper)		

Pollutant:	**PAHs (Polycyclic Aromatic Hydrocarbons)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. None of the 208 samples exceed the Basin Plan water quality objective for polycyclic aromatic hydrocarbons.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 208 samples exceed the Basin Plan water quality objective for polycyclic aromatic hydrocarbons and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.

4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43135, PAHs (Polycyclic Aromatic Hydrocarbons) Region 9

Santa Margarita River (Upper)

LOE ID:	26400
Pollutant:	PAHs (Polycyclic Aromatic Hydrocarbons)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	208
Number of Exceedances:	0
Data and Information Type:	Highest quality fixed-station P/C (conventional plus toxicants)
Data Used to Assess Water Quality:	208 samples were collected at Santa Margarita Creek station 902SMSMR1 during the months of January 2003, April 2003, May 2003, and September 2003, for PAHs analyses. None of the 208 samples showed excessive concentrations.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water designated for use as domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels (MCL 0.0002mg/l) specified in California Code of Regulations, Title 22, Table 64444-A of section 64444 (Organic Chemicals) which is incorporated by reference into this plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Water samples were collected at Santa Margarita Creek station 902SMSMR1; (Latitude 33.4741, Longitude -117.1414).
Temporal Representation:	Water samples were collected on January 2003, April 2003, May 2003, and September 2003.
Environmental Conditions:	
QAPP Information:	Quality control for chemical analysis portion of this study was conducted in accordance with the California Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	

DECISION ID **44273** 037267 **Region 9**

Santa Margarita River (Upper)

Pollutant:	**PCBs (Polychlorinated biphenyls)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 208 samples exceed the Basin Plan water quality objective for polychlorinated biphenyls.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 208 samples exceed the Basin Plan water quality objective for polychlorinated biphenyls and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 44273, PCBs (Polychlorinated biphenyls) **Region 9**

Santa Margarita River (Upper)

LOE ID:	26401
Pollutant:	PCBs (Polychlorinated biphenyls)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	208
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	208 samples were collected at Santa Margarita Creek station 902SMSMR1 during the months of January 2003, April 2003, May 2003, and September 2003, for PCBs analyses. None of the 208 samples showed excessive concentrations.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan; waters designated for use as domestic or municipal supply (MUN)

	shall not contain concentrations of chemical constituents in 037268 excess of the maximum contaminant levels (MCL 0.5 mg/l) specified in California Code of Regulations, Title 22, Table 64444-A of section 64444 (Organic Chemicals) which is incorporated by reference into this plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Water samples were collected at Santa Margarita Creek station 902SMSMR1; (Latitude 33.4741, Longitude -117.1414).
Temporal Representation:	Water samples were collected on January 2003, April 2003, May 2003, and September 2003.
Environmental Conditions:	
QAPP Information:	Quality control for chemical analysis portion of this study was conducted in accordance with the California Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Murrieta Creek
Water Body ID: CAR9023200020010924152136
Water Body Type: River & Stream

DECISION ID 33387 **Region 9**
Murrieta Creek

Pollutant: **Phosphorus**
Final Listing Decision: **Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not Delist from 303(d) list (TMDL required list)(2012)
Revision Status Revised
Sources: Source Unknown
Expected TMDL Completion Date: 2019
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for removal from the section 303(d) list under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess pollutant. One-hundred and five of 167 samples exceed the Basin Plan water quality objective for phosphorus.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the section 303(d) list.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One-hundred and five of 167 samples exceed the Basin Plan water quality objective for phosphorus and this exceeds the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 33387, Phosphorus **Region 9**
Murrieta Creek

LOE ID: 3103

Pollutant: Phosphorus
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples:	7	037270
Number of Exceedances:	5	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by LAW Crandall from 1997 to 1999. Five of 7 samples were in exceedance.	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters-streams and other flowing waters with all beneficial uses, the WQO for total phosphorus is 0.1 mg/L. This appears to be the desired goal in order to prevent plant nuisance in streams and other flowing waters; not to be exceeded more than 10% of the time.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:	Use unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board.	
Guideline Reference:	Placeholder reference 2006 303(d)	
Spatial Representation:	Samples were collected at Murrieta Creek. Exact location was not given.	
Temporal Representation:	Samples were collected from 12/09/1997 to 05/11/1999. One to 4 samples were collected per year. One sample was reported per sampling day.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33387, Phosphorus **Region 9**

Murrieta Creek

LOE ID:	3102
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	160
Number of Exceedances:	100
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the Rancho California Water District from 1999 to 2002. One hundred of 160 samples were in exceedance (Rancho California Water District, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters-streams and other flowing waters with all beneficial uses, the WQO for total phosphorus is 0.1 mg/L. This appears to be the desired goal in order to prevent plant nuisance in streams and other flowing waters; not to be exceeded more than 10% of the time.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	Use unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board.
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	Samples were collected at Murrieta Creek. Exact location was not reported.
Temporal Representation:	Samples were collected 4 times per month from 03/31/1999 to 04/17/2002.
Environmental Conditions:	

QAPP Information:	QA Info Missing	037271
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33387, Phosphorus **Region 9**

Murrieta Creek

LOE ID:	74448
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	5
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	5 of 7 samples exceed the water quality objective for Total Phosphorus for Murrieta Creek.
Data Reference:	Data for Various Pollutants in Riverside County, 2007-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Table 3-2 of the San Diego Basin Plan states that the water quality objective for Total Phosphorus for Murrieta Creek is 0.1 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at 778 (Murrieta Creek).
Temporal Representation:	Samples were collected from 12/7/2007 to 5/21/2009.
Environmental Conditions:	
QAPP Information:	No quality assurance information was provided.
QAPP Information Reference(s):	

DECISION ID **33429** **Region 9**

Murrieta Creek

Pollutant:	**Aluminum**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One lines of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceeds the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.

2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the one sample exceeds the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 33429, Aluminum **Region 9**
Murrieta Creek

LOE ID:	3153
Pollutant:	Aluminum
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by LAW Crandall on 12/06/1999. One sample was collected. It was equal to the WQO of 0.2 mg/L. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Aluminum is 0.2 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Sample was collected at Murrieta Creek. Exact location was not reported.
Temporal Representation:	One sample was collected on 12/06/1999.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33306** **Region 9**
Murrieta Creek

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the

Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. 03/2013

Two lines of evidence are available in the administrative record to assess this pollutant. One of the two samples exceed the Basin Plan water quality objective for chromium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of the two samples exceed the Basin Plan water quality objective for chromium and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 33306, Chromium **Region 9**

Murrieta Creek

LOE ID:	3123
Pollutant:	Chromium (total)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by RWQCB9 on 06/09/1998. One sample was collected, it was not in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for total chromium is 0.05 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Sample was collected at Murrieta Creek behind the cement factory.
Temporal Representation:	One sample was collected on 06/09/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33306, Chromium **Region 9**

Murrieta Creek

LOE ID:	3122

Pollutant:	Chromium (total)	037274
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	Total	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	1	
Number of Exceedances:	1	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by RWQCB9 on 06/09/1998. One sample was collected, it was in exceedance. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for total chromium is 0.05 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Sample was collected at Murrieta Creek at Calle Del Oso Rd.	
Temporal Representation:	One sample was collected on 06/09/1998.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID	**48180**	**Region 9**
Murrieta Creek		

Pollutant:	**Oxygen, Dissolved**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One lines of evidence is available in the administrative record to assess this pollutant. One of the ten samples exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of the ten samples exceed the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples are needed to determine if a beneficial use is fully supported using table 3.2. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision	After review of the available data and information, RWQCB staff concludes that the water body-

Recommendation: pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48180, Oxygen, Dissolved **Region 9**

Murrieta Creek

LOE ID:	74446
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	10
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	One of 10 samples exceeded the objective.
Data Reference:	Data for Various Pollutants in Riverside County, 2007-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Dissolved oxygen levels shall not be less than 5.0 mg/l in inland surface waters with designated MAR or WARM beneficial uses. The annual mean dissolved oxygen concentration shall not be less than 7 mg/l more than 10% of the time.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the Murietta Creek and Long Canyon sampling stations.
Temporal Representation:	Samples were collected 10 times between 2007 and 2009.
Environmental Conditions:	
QAPP Information:	NPDES quality assurance.
QAPP Information Reference(s):	

DECISION ID **34135** **Region 9**

Murrieta Creek

Pollutant:	**pH**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Three of the 29 samples exceed the Basin Plan water quality objective for pH.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Three of the 29 samples exceed the Basin Plan water quality objective and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 34135, pH **Region 9**

Murrieta Creek

LOE ID:	3144
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	14
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by LAW Crandall from 1997 to 2000. None of the 14 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for pH is 6.5 (minimum) to 8.5 (maximum).
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murrieta Creek. Exact location was not given.
Temporal Representation:	Samples were collected from 12/09/1997 to 06/01/2000. One to 4 samples were collected per year. One to 2 samples were reported per sampling day.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 34135, pH **Region 9**

Murrieta Creek

LOE ID:	74447
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	15
Number of Exceedances:	3
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Three of 15 samples exceeded the objective.
Data Reference:	Data for Various Pollutants in Riverside County, 2007-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The pH of all inland surface waters shall not be depressed below 6.5 or raised above 8.5 as a result of waste discharges.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the Long Canyon Channel and Murrieta Creek @ Clinton Keith Rd stations.
Temporal Representation:	Samples were collected seventeen times between 2007 and 2009.
Environmental Conditions:	
QAPP Information:	NPDES quality assurance.
QAPP Information Reference(s):	

DECISION ID **42284** **Region 9**

Murrieta Creek

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. Four lines of evidence are available in the administrative record to assess this pollutant. Seven of 15 samples exceed the water quality objective for fecal coliform of 400/100 ml for the protection of REC-1. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Seven of 15 samples exceed the water quality objective for fecal coliform of 400/100 ml for the protection of REC-1 and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 42284, Indicator Bacteria 037278 Region 9

Murrieta Creek

LOE ID:	74449
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	7
Number of Exceedances:	3
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Three of the seven samples exceeded the total coliform objective.
Data Reference:	Data for Various Pollutants in Riverside County, 2007-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life. Basin Plan for the San Diego Basin.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Total Coliform concentration shall not exceed more than 10000/100 ml. Guidance for Fresh Water Beaches (CDPH).
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.
Spatial Representation:	The samples were collected at Murrieta Creek and Long Canyon.
Temporal Representation:	Samples were collected between October, November and December 2008 and February and May 2009.
Environmental Conditions:	
QAPP Information:	No QAPP was submitted. Sampling was done by municipalities in Riverside County pursuant to the Riverside County Municipal Stormwater Permit.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 42284, Indicator Bacteria Region 9

Murrieta Creek

LOE ID:	74445
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	7
Number of Exceedances:	3
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Three of the seven samples exceeded the fecal coliform objective.
Data Reference:	Data for Various Pollutants in Riverside County, 2007-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The Fecal Coliform concentration shall not exceed more than 400/100 ml. Basin Plan for the

San Diego Basin. 037279

Objective/Criterion Reference: Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:
Guideline Reference:

Spatial Representation: The samples were collected at Murrieta Creek and Long Canyon.
Temporal Representation: Samples were collected between October, November and December 2008 and February and May 2009.

Environmental Conditions:
QAPP Information: No QAPP was submitted. Sampling was done by municipalities in Riverside County pursuant to the Riverside County Municipal Stormwater Permit.

QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 42284, Indicator Bacteria **Region 9**

Murrieta Creek

LOE ID: 7399

Pollutant: Fecal Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 8
Number of Exceedances: 4

Data and Information Type: PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality: Four out of eight samples collected exceed the water quality objective according to results in the Riverside County Flood Control and Water Conservation District annual progress report from 2005 and 2006. Samples were collected from October 2004 through May 2006.
Data Reference: Watershed Annual Progress Report 2004 to 2005 and 2005 to 2006

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: From the Basin Plan, no more than 10% of the samples during any 30-day period for waters designated for contact recreation shall exceed 400 per 100 ml (RWQCB, 2007).
Objective/Criterion Reference: Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Murrieta Creek at USGS weir, lat/long: 33Â°28Â’47.0Â” N/117Â °08Â’34.8Â” W.
Temporal Representation: Three to four samples are collected per monitoring year. Samples were collected from October 2004 through May 2006.

Environmental Conditions:
QAPP Information: Quality assurance conducted under Riverside County's quality assurance plan.
QAPP Information Reference(s): Watershed Annual Progress Report 2004 to 2005 and 2005 to 2006

Line of Evidence (LOE) for Decision ID 42284, Indicator Bacteria **Region 9**

Murrieta Creek

LOE ID: 74444

Pollutant: Escherichia coli (E. coli)
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use:	Water Contact Recreation
Number of Samples:	7
Number of Exceedances:	3
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Three of the seven samples exceeded the E.coli objective.
Data Reference:	Data for Various Pollutants in Riverside County, 2007-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The E. coli concentration shall not exceed more than 235/100 ml. Water Quality Control Plan for the San Diego Basin.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Murrieta Creek and Long Canyon.
Temporal Representation:	Samples were collected between October, November and December 2008 and February and May 2009.
Environmental Conditions:	
QAPP Information:	No QAPP was submitted. Sampling was done by municipalities in Riverside County pursuant to the Riverside County Municipal Stormwater Permit.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 42284, Indicator Bacteria **Region 9**

Murrieta Creek

LOE ID:	7401
Pollutant:	Escherichia coli (E. coli)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	8
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Four out of eight samples collected exceed the water quality objective according to results in the Riverside County Flood Control and Water Conservation District annual progress report from 2005 and 2006. Samples were collected from October 2004 through May 2006.
Data Reference:	Watershed Annual Progress Report 2004 to 2005 and 2005 to 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The maximum E. coli level for moderately or lightly used areas is 406 colonies per 100 ml (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murrieta Creek at USGS weir, lat/long: 33Â°28Â’26.4Â” N/117Â °07Â’46.1Â” W.
Temporal Representation:	Three to four samples are collected per monitoring year. Samples were collected from October 2004 through May 2006.
Environmental Conditions:	

QAPP Information:	Quality control conducted according to Riverside County's quality control document.
QAPP Information Reference(s):	Watershed Annual Progress Report 2004 to 2005 and 2005 to 2006

DECISION ID 44246 **Region 9**

Murrieta Creek

Pollutant:	**Toxicity**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for removal from the CWA section 303(d) List under section 4.6 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess pollutant. Six of the nine samples exhibited water toxicity. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Six of the nine samples exhibited water toxicity and this exceeds the allowable frequency listed in Table 4.1 of the Listing Policy. 4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 44246, Toxicity **Region 9**

Murrieta Creek

LOE ID:	6460
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	5
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Five out of seven samples collected exceed the water quality objective of 0.025 ug/L according to results in the Riverside County Flood Control and Water Conservation District annual progress report from 2005 and 2006. Samples were collected from July 2004 through May 2006.

Data Reference:	Watershed Annual Progress Report 2004 to 2005 and 2005 to 2006 037282
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The 1-hour average concentration of chlorpyrifos in freshwater is 0.025 ug/L according to Siepmann and Finlayson, 2000; Finlayson, 2004.
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game
Spatial Representation:	Samples were collected at Murrieta Creek at USGS weir, lat/long: 33Â°28Â'47.0Â" N/117Â °08Â'34.8Â" W.
Temporal Representation:	Four to five samples are collected per monitoring year. Samples were collected from July 2004 through May 2006.
Environmental Conditions:	
QAPP Information:	Quality assurance conducted under Riverside County's quality assurance plan.
QAPP Information Reference(s):	Watershed Annual Progress Report 2004 to 2005 and 2005 to 2006

Line of Evidence (LOE) for Decision ID 44246, Toxicity **Region 9**

Murrieta Creek

LOE ID:	7510
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	9
Number of Exceedances:	6
Data and Information Type:	Effluent toxicity testing (chronic)
Data Used to Assess Water Quality:	Hyalella azteca- Six out of nine samples were found to be toxic to Hyalella azteca. Selenastrum capricornutum- None of nine samples were found to be toxic to green algae, Selenastrum capricornutum, growth test according to results in the Riverside County Flood Control and Water Conservation District annual progress report from 2005 and 2006. Samples were collected from October 2004 through May 2006.
Data Reference:	Watershed Annual Progress Report 2004 to 2005 and 2005 to 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Samples were found to exhibit toxicity when the No Observed Effect Concentration (NOEC) or median lethal concentration (LC50) for any given species was estimated to be less than 100% of the test sample concentration.
Guideline Reference:	Waste Discharge Requirements for Discharges of Urban Runoff From the Municipal Separate Storm Sewer Systems Draining the Watersheds of the County of San Diego, the

	Incorporated Cities of San Diego, the San Diego Unified Port District, and the San Diego County Regional Airport. Order No. R9-2007-0001
Spatial Representation:	Samples were collected at Murrieta Creek at USGS weir, lat/long: 33Â°28Â'47.0Â" N/117Â °08Â'34.8Â" W.
Temporal Representation:	Three to four samples are collected per monitoring year. Samples were collected from October 2004 through March 2006.
Environmental Conditions:	
QAPP Information:	Quality assurance conducted under Riverside County's quality assurance plan.
QAPP Information Reference(s):	Watershed Annual Progress Report 2004 to 2005 and 2005 to 2006

Line of Evidence (LOE) for Decision ID 44246, Toxicity **Region 9**

Murrieta Creek

LOE ID:	6461
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	9
Number of Exceedances:	4
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Four out of nine samples collected exceed the water quality objective for the 1-hour average concentration of copper. according to results in the Riverside County Flood Control and Water Conservation District annual progress report from 2005 and 2006. Samples were collected from July 2004 through May 2006.
Data Reference:	Watershed Annual Progress Report 2004 to 2005 and 2005 to 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the CTR, the dissolved copper chronic criterion is 3.1 ppb and the acute criterion is 4.8 ppb, but these criteria may vary depending upon hardness of the sample.
Objective/Criterion Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murrieta Creek at USGS weir, lat/long: 33Â°28Â'47.0Â" N/117Â °08Â'34.8Â" W.
Temporal Representation:	Four to five samples were collected per monitoring year. Samples were collected from July 2004 through May 2006.
Environmental Conditions:	
QAPP Information:	Quality assurance conducted under Riverside County's quality assurance plan.
QAPP Information Reference(s):	Watershed Annual Progress Report 2004 to 2005 and 2005 to 2006

DECISION ID **32720** **Region 9**

Murrieta Creek

Pollutant:	**Antimony**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original

Impairment from Pollutant or Pollution:	Pollutant	037284

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. None of the two samples exceed the Basin Plan water quality objective for antimony.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the two samples exceed the Basin Plan water quality objective for antimony and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32720, Antimony **Region 9**

Murrieta Creek

LOE ID:	3114
Pollutant:	Antimony
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the RWQCB on 06/09/1998. One sample was collected, it was not in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for antimony is 0.006 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murrieta Creek behind the cement factory.
Temporal Representation:	One sample was collected on 06/09/1998.

Environmental Conditions: 037285
QAPP Information: Data used in 2002 assessment.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 32720, Antimony **Region 9**

Murrieta Creek

LOE ID: 3113

Pollutant: Antimony
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 1
Number of Exceedances: 0

Data and Information Type: PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality: Data were collected by the RWQCB on 06/09/1998. One sample was collected, it was not in exceedance. (SWRCB, 2003).
Data Reference: Placeholder reference 2006 303(d)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: From the Basin Plan: For all waters with a municipal beneficial use, the WQO for antimony is 0.006 mg/L.
Objective/Criterion Reference: Placeholder reference 2006 303(d)

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Murrieta Creek at Calle Del Oso Rd.
Temporal Representation: One sample was collected on 06/09/1998.
Environmental Conditions:
QAPP Information: Data used in 2002 assessment.
QAPP Information Reference(s):

DECISION ID **33488** **Region 9**

Murrieta Creek

Pollutant: **Arsenic**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Original
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. Two of the 51 samples exceed the Basin Plan water quality objective for arsenic.

Based on the readily available data and information, the weight of evidence indicates that there is

sufficient justification against placing this water segment-pollutant combination on the 2006 Section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Two of the 51 samples exceed the Basin Plan water quality objective for arsenic and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33488, Arsenic **Region 9**

Murrieta Creek

LOE ID:	3115
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the RWQCB on 06/09/1998. One sample was collected, and it was in exceedance of the water quality objective (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for Arsenic is 0.05 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murrieta Creek at Calle Del Oso Rd.
Temporal Representation:	One sample was collected on 06/09/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33488, Arsenic **Region 9**

Murrieta Creek

LOE ID:	3116
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total

Beneficial Use:	Municipal & Domestic Supply	037287
Number of Samples:	11	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by LAW Crandall from 1997 to 2000. None of the 11 samples were in exceedance (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for Arsenic is 0.05 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Murrieta Creek at Temecula. Exact location was not reported.	
Temporal Representation:	Samples were collected from 12/09/1997 to 06/01/2000. One to 4 samples were collected per year. One to 2 samples were reported per sampling day.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33488, Arsenic **Region 9**

Murrieta Creek

LOE ID:	3117
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	39
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	The Riverside County Flood Control and Water Conservation District collected water samples from 1994 to 2005 for their NPDES MS4 Permit. Of the 39 samples, only 1 was in exceedance of the WQO (RCFCWCD, 2005).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for Arsenic is 0.05 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected on Murrieta Creek, however, sites were not specified.
Temporal Representation:	The samples were collected from September 1994 to May 2005.
Environmental Conditions:	
QAPP Information:	Data was collected under an appropriate QAPP consistent with section 6.1.4 of the Listing Policy.
QAPP Information Reference(s):	

DECISION ID	44295	Region 9
Murrieta Creek		

Pollutant:	**Benthic Community Effects**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

Benthic Community Effects is being considered for placement on the section 303(d) list under sections 3.9 and 3.2 of the Listing Policy. Under section 3.9, an additional line of evidence associating the Benthic Community Effects with a water or sediment concentration of pollutants is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this indicator. 7 of 7 samples exceeded the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing Benthic Community Effects in this water segment on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. 7 of 7 samples exceeded the Index of Biological Integrity (IBI) value of "poor" water quality for this area and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy, however as required under section 3.9 of the Listing Policy, pollutant(s) could not be directly associated with the Benthic Community Effects.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 44295, Benthic Community Effects	Region 9
Murrieta Creek	

LOE ID:	26545
Pollutant:	Benthic Community Effects
LOE Subgroup:	Adverse Biological Responses
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	7
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Seven samples of IBI data were taken from May 1998 to November 2000 at two sampling sites. Of the total number of samples, all seven samples exceeded the IBI impairment threshold.
Data Reference:	Fish and Game IBI Data
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. (SDRWQCB, 1995)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at two sites: 902MCGSxx and 902MCWBxx on Murrieta Creek.
Temporal Representation:	Sampling occurred during one to four events annually for a period of three years from May 1998 to November 2000.
Environmental Conditions:	
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Project Plan for the California Stream Bioassessment Procedure and the State of California, California Monitoring an Assessment Program: "CMAP", Quality Assurance Project Plan.
QAPP Information Reference(s):	State of California, California Monitoring and Assessment Program: "CMAP". Quality Assurance Project Plan for the California Stream Bioassessment Procedure The San Diego Stream Team Quality Assurance Project Plan

DECISION ID	33019	Region 9
Murrieta Creek		

Pollutant:	**Beryllium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. None of the two samples exceed the Basin Plan water quality objective for beryllium. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the two samples exceed the Basin Plan water quality objective for beryllium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available

indicating that standards are not met. 037290

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33019, Beryllium **Region 9**

Murrieta Creek

LOE ID:	3118
Pollutant:	Beryllium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by RWQCB9 on 06/09/1998. One sample was collected. It was not in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For waters with a municipal beneficial use, the WQO for Beryllium is 0.004 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Sample was collected at Murrieta Creek at Calle Del Oso Rd.
Temporal Representation:	Sample was collected on 06/09/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33019, Beryllium **Region 9**

Murrieta Creek

LOE ID:	3119
Pollutant:	Beryllium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by RWQCB9 on 06/09/1998. One sample was collected. It was not in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For waters with a municipal beneficial use, the WQO for Beryllium is 0.004 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Sample was collected at Murrieta Creek behind the cement factory.
Temporal Representation:	Sample was collected on 06/09/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 42649 **Region 9**

Murrieta Creek

Pollutant:	**Boron**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. None of the 11 samples exceed the Basin Plan water quality objective for boron. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 11 samples exceed the Basin Plan water quality objective for boron and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 42649, Boron **Region 9**

Murrieta Creek

LOE ID:	3152

Pollutant:	Boron	037292
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	Total	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	11	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by LAW Crandall from 1997 to 2000. None of the 11 samples were in exceedance. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for Boron is 0.75 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Murrieta Creek at Temecula. Exact location was not reported.	
Temporal Representation:	Samples were collected from 12/09/1997 to 06/01/2000. One to 4 samples were collected per year. One to 2 samples were reported per sampling day.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID	**33067**	**Region 9**
Murrieta Creek		

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. One of the two samples exceed the Basin Plan water quality objective for cadmium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of the two samples exceed the Basin Plan water quality objective for cadmium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable

beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33067, Cadmium **Region 9**

Murrieta Creek

LOE ID:	3120
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by RWQCB9 on 06/09/1998. One sample was collected, it was in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for cadmium is 0.005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Sample was collected at Murrieta Creek at Calle Del Oso Rd.
Temporal Representation:	One sample was collected on 06/09/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33067, Cadmium **Region 9**

Murrieta Creek

LOE ID:	3121
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality:	Data were collected by RWQCB9 on 06/09/1998. One sample was collected, and was not in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for cadmium is 0.005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murrieta Creek behind the cement factory.
Temporal Representation:	One sample was collected on 06/09/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID	33428	Region 9
Murrieta Creek		

Pollutant:	**Chloride**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. None of the 15 samples exceed the Basin Plan water quality objective for chloride. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 15 samples exceed the Basin Plan water quality objective for chloride and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33428, Chloride	Region 9
Murrieta Creek	

LOE ID:	3151
Pollutant:	Chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	15
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by LAW Crandall from 1997 to 2000. None of the 15 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters in the Murrieta HA and all beneficial uses, the WQO for Chloride is 300 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murrieta Creek. Exact location was not reported.
Temporal Representation:	Samples were collected from 12/09/1997 to 06/01/2000. One to 4 samples were collected per year. One to 2 samples were reported per sampling day.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID	43413	Region 9
Murrieta Creek		

Pollutant:	**Cyanide**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the six samples exceed the Basin Plan water quality objective for cyanide.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.

2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.937296
3. None of the six samples exceed the Basin Plan water quality objective for cyanide and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43413, Cyanide **Region 9**

Murrieta Creek

LOE ID:	3150
Pollutant:	Cyanide
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by LAW Crandall on 6 days from 1997 to 2000. All 6 samples were non-detect. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For waters with a municipal beneficial use, the WQO for Cyanide is 0.2 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murrieta Creek. Exact location was not reported.
Temporal Representation:	Samples were collected in 1997-2000. One to 2 samples were collected per year.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **43061** **Region 9**

Murrieta Creek

Pollutant:	**Fluoride**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the

current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: 03/08/07

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 11 samples exceed the Basin Plan water quality objective for fluoride.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 11 samples exceed the Basin Plan water quality objective for fluoride and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43061, Fluoride **Region 9**

Murrieta Creek

LOE ID:	3149
Pollutant:	Fluoride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	11
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by LAW Crandall from 1997 to 2000. None of the 11 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for Fluoride is 1.0 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murrieta Creek. Exact location was not reported.
Temporal Representation:	Samples were collected from 12/09/1997 to 06/01/2000. One to 4 samples were collected per year. One to 2 samples were reported per sampling day.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.

QAPP Information Reference(s): 037298

DECISION ID	32726	Region 9
Murrieta Creek		

Pollutant:	**Mercury**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Three lines of evidence are available in the administrative record to assess this pollutant. One of the eight samples exceed the Basin Plan water quality objective for mercury. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of the eight samples exceed the Basin Plan water quality objective for mercury and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32726, Mercury	Region 9
Murrieta Creek	

LOE ID:	3128
Pollutant:	Mercury
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by RWQCB9 on 06/09/1998. One sample was collected, it was in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for Mercury is 0.002 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Sample was collected at Murrieta Creek at Calle Del Oso Rd.
Temporal Representation:	One sample was collected on 06/09/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 32726, Mercury **Region 9**

Murrieta Creek

LOE ID:	3129
Pollutant:	Mercury
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by RWQCB9 on 06/09/1998. One sample was collected, it was not in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for Mercury is 0.002 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Sample was collected at Murrieta Creek behind the cement factory.
Temporal Representation:	One sample was collected on 06/09/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 32726, Mercury **Region 9**

Murrieta Creek

LOE ID:	3130
Pollutant:	Mercury
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total

Beneficial Use:	Municipal & Domestic Supply	037300
Number of Samples:	6	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by LAW Crandall from 1997 to 2000. None of the 6 samples were in exceedance. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for Mercury is 0.002 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Murrieta Creek. Exact location was not given.	
Temporal Representation:	Samples were collected from 12/09/1997 to 06/01/2000. One to 4 samples were collected per year. One to 2 samples were reported per sampling day.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID	**32620**	**Region 9**
Murrieta Creek		

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Two of the two samples exceed the Basin Plan water quality objective for nickel. These samples were collected on the same day, so they are counted as one per section 6.1.5.3 of the Listing Policy.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of the two samples exceed the Basin Plan water quality objective for nickel and this sample size is insufficient to determine with the power and confidence of the Listing Policy if standards are not met. A minimum of two samples is needed for application of table 3.1
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision

This is a decision previously approved by the State Water Resources Control Board and the USEPA.

Recommendation: No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32620, Nickel — Region 9

Murrieta Creek

LOE ID:	3131
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by RWQCB9 on 06/09/1998. One sample was collected, it was in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for Nickel is 0.1 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Sample was collected at Murrieta Creek at Calle Del Oso Rd.
Temporal Representation:	One sample was collected on 06/09/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 32620, Nickel — Region 9

Murrieta Creek

LOE ID:	3132
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by RWQCB9 on 06/09/1998. One sample was collected, it was in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for Nickel is 0.1 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Sample was collected at Murrieta Creek behind the cement factory.
Temporal Representation:	One sample was collected on 06/09/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID	33332	Region 9
Murrieta Creek		

Pollutant:	**Oil and Grease**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2, one line(s) of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. This conclusion is based on the fact that the data shows 1 out of 15 samples had "detectable levels" of oil and grease. There is no numeric water quality objective to compare the data to, to determine if water quality objectives are being met or exceeded. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. This conclusion is based on the fact that the data shows 1 out of 15 samples had "detectable levels" of oil and grease and this information is insufficient to determine with the confidence and power required by the Listing Policy. There is no numeric water quality objective to compare the data to, to determine if water quality objectives are being met or exceeded. A minimum of five samples is needed for application of table 3.2 when there is a numeric water quality objective. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33332, Oil and Grease	Region 9
Murrieta Creek	

LOE ID:	3145

Pollutant:	Oil and Grease	037303
LOE Subgroup:	Pollutant-Nuisance	
Matrix:	Water	
Fraction:	Total	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	15	
Number of Exceedances:	1	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by LAW Crandall from 1997 to 2000. Fourteen of 15 samples were non-detect. A measured value of 1.2 mg/L was reported for 1 of 15 samples. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, for Oil and Grease, waters shall not contain oils, greases, waxes, or other materials in concentrations which result in a visible film or coating on the surface of the water or on objects in the water, or which cause nuisance or which otherwise adversely affect beneficial uses.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Murrieta Creek. Exact location was not given.	
Temporal Representation:	Samples were collected from 12/09/1997 to 06/01/2000. One to 4 samples were collected per year. One to 2 samples were reported per sampling day.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID	32621	Region 9
Murrieta Creek		

Pollutant:	**Selenium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. None of the two samples exceed the Basin Plan water quality objective for selenium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the two samples exceed the Basin Plan water quality objective for selenium and this sample

size is insufficient to determine with the power and confidence of the Listing Policy if standards are not met. A minimum of two samples is needed for application of table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32621, Selenium **Region 9**

Murrieta Creek

LOE ID:	3134
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by RWQCB9 on 06/09/1998. One sample was collected, it was not in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for Selenium is 0.05 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murrieta Creek behind the cement factory.
Temporal Representation:	One sample was collected on 06/09/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 32621, Selenium **Region 9**

Murrieta Creek

LOE ID:	3133
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality:	Data were collected by RWQCB9 on 06/09/1998. One sample was collected, it was not in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for Selenium is 0.05 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Sample was collected at Murrieta Creek at Calle Del Oso Rd.
Temporal Representation:	One sample was collected on 06/09/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID	33256	Region 9
Murrieta Creek		

Pollutant:	**Silver**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. None of the 2 samples exceed the Basin Plan water quality objective for silver. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 2 samples exceed the Basin Plan water quality objective for silver and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33256, Silver	Region 9
Murrieta Creek	

LOE ID:	3135
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by RWQCB9 on 06/09/1998. One sample was collected, it was not in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Silver is 0.1 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Sample was collected at Murrieta Creek at Calle Del Oso Rd.
Temporal Representation:	One sample was collected on 06/09/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33256, Silver **Region 9**

Murrieta Creek

LOE ID:	3136
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by RWQCB9 on 06/09/1998. One sample was collected, it was not in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Silver is 0.1 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Sample was collected at Murrieta Creek behind the cement factory.	037307
Temporal Representation:	One sample was collected on 06/09/1998.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID 33331 — Region 9

Murrieta Creek

Pollutant:	**Sulfates**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. None of the 11 samples exceed the Basin Plan water quality objective for sulfate.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 11 samples exceed the Basin Plan water quality objective for sulfate and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33331, Sulfates — Region 9

Murrieta Creek

LOE ID:	3143
Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	11
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	037308
Data Used to Assess Water Quality:	Data were collected by LAW Crandall from 1997 to 2000. None of the 11 samples were in exceedance. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters in the Murrieta HA and all beneficial uses, the WQO for sulfate is 300 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Murrieta Creek. Exact location was not given.	
Temporal Representation:	Samples were collected from 12/09/1997 to 06/01/2000. One to 4 samples were collected per year. One sample was reported per sampling day.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID 42752 Region 9

Murrieta Creek

Pollutant:	**Surfactants (MBAS)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Two of the 171 samples exceed the Basin Plan water quality objective for MBAS.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Two of the 171 samples exceed the Basin Plan water quality objective for MBAS and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 42752, Surfactants (MBAS) Region 9

Murrieta Creek 037309

LOE ID:	3110
Pollutant:	Surfactants (MBAS)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	11
Number of Exceedances:	1
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by LAW Crandall from 1997 to 2000. One of 11 samples was in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for MBAS is 0.5 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murrieta Creek. Exact location was not given.
Temporal Representation:	Samples were collected from 12/09/1997 to 06/01/2000. One to 4 samples were collected per year. One sample was reported per sampling day.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 42752, Surfactants (MBAS) **Region 9**

Murrieta Creek

LOE ID:	3109
Pollutant:	Surfactants (MBAS)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	160
Number of Exceedances:	1
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the Rancho California Water District from 1999 to 2002. One of 160 samples was in exceedance. (Rancho California Water District, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for MBAS is 0.5 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)

Evaluation Guideline:
Guideline Reference:

Spatial Representation:	Samples were collected at Murrieta Creek. Exact location was not reported.
Temporal Representation:	Samples were collected 4 times per month from 03/31/1999 to 04/17/2002.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

DECISION ID 43231 — Region 9

Murrieta Creek

Pollutant:	**Thallium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. One of the two samples exceed the Basin Plan water quality objective for Thallium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of the two samples exceed the Basin Plan water quality objective for Thallium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43231, Thallium — Region 9

Murrieta Creek

LOE ID:	3138
Pollutant:	Thallium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by RWQCB9 on 06/09/1998. One sample was collected, it was in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for Thallium is 0.002 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Sample was collected at Murrieta Creek behind the cement factory.
Temporal Representation:	One sample was collected on 06/09/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 asessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43231, Thallium **Region 9**

Murrieta Creek

LOE ID:	3137
Pollutant:	Thallium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by RWQCB9 on 06/09/1998. One sample was collected, it was not in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for Thallium is 0.002 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Sample was collected at Murrieta Creek at Calle Del Oso Rd.
Temporal Representation:	One sample was collected on 06/09/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 asssessment.
QAPP Information Reference(s):	

DECISION ID **33483** **Region 9**

Pollutant:	**Total Dissolved Solids**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Four lines of evidence are available in the administrative record to assess this pollutant. Twenty-five of 173 samples exceed the Basin Plan water quality objective for total dissolved solids.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Twenty-five of 173 samples exceed the Basin Plan water quality objective for total dissolved solids and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33483, Total Dissolved Solids **Region 9**

Murrieta Creek

LOE ID:	3107
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by RWQCB9 on 06/09/1998. One sample was collected, it was in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters in the Murrieta HA and all beneficial uses, the WQO for TDS is 750 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Sample was collected at Murrieta Creek behind the cement factory.
Temporal Representation: One sample was collected on 06/09/1998.
Environmental Conditions:
QAPP Information: Data used in 2002 assessment.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 33483, Total Dissolved Solids **Region 9**

Murrieta Creek

LOE ID: 3106

Pollutant: Total Dissolved Solids
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total Dissolved

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 1
Number of Exceedances: 0

Data and Information Type: PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality: Data were collected by RWQCB9 on 06/09/1998. The single sample was not in exceedance. (SWRCB, 2003).
Data Reference: Placeholder reference 2006 303(d)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: From the Basin Plan: For inland surface waters in the Murrieta HA and all beneficial uses, the WQO for TDS is 750 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference: Placeholder reference 2006 303(d)

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Sample was collected at Murrieta Creek at Calle Del Oso Rd.
Temporal Representation: One sample was collected on 06/09/1998.
Environmental Conditions:
QAPP Information: Data used in 2002 assessment.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 33483, Total Dissolved Solids **Region 9**

Murrieta Creek

LOE ID: 3108

Pollutant: Total Dissolved Solids
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total Dissolved

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 11
Number of Exceedances: 1

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	037314
Data Used to Assess Water Quality:	Data were collected by LAW Crandall from 1997 to 2000. One of 11 samples was in exceedance. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan : For inland surface waters in the Murrieta HA, and all beneficial uses, the WQO for total dissolved solids is 750 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Murrieta Creek. Exact location was not given.	
Temporal Representation:	Samples were collected from 12/09/1997 to 06/01/2000. One to 4 samples were collected per year. One sample was reported per sampling day.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33483, Total Dissolved Solids **Region 9**

Murrieta Creek

LOE ID:	3105
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	160
Number of Exceedances:	23
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the Rancho California Water District from 1999 to 2002. Twenty-three of 160 samples were in exceedance. (Rancho California Water District, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan : For inland surface waters in the Murrieta HA, and all beneficial uses, the WQO for total dissolved solids is 750 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murrieta Creek. Exact location was not reported.
Temporal Representation:	Samples were collected 4 times per month from 03/31/1999 to 04/17/2002.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

DECISION ID 33484 **Region 9**

Murrieta Creek

Pollutant:	**Turbidity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. None of the two samples exceed the Basin Plan water quality objective for turbidity.

Application of table 3.2 of the Listing Policy requires a minimum of five samples to assess a conventional pollutant.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the two samples exceed the Basin Plan water quality objective for turbidity and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33484, Turbidity **Region 9**

Murrieta Creek

LOE ID:	3112
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the RWQCB on 06/09/1998. One sample was collected, it was not in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for turbidity is 5.0 ntu.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The sample was collected at Murrieta Creek behind the cement factory.
Temporal Representation:	One sample was collected on 06/09/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33484, Turbidity **Region 9**

Murrieta Creek

LOE ID:	3111
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by RWQCB9 on 06/09/1998. The single sample was not in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for turbidity is 5.0 ntu.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Sample was collected at Murrieta Creek at Calle Del Oso Rd.
Temporal Representation:	One sample was collected on 06/09/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33330** **Region 9**

Murrieta Creek

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the

2010 listing cycle. 037317

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Four lines of evidence are available in the administrative record to assess this pollutant. Two of the 56 samples exceed the Basin Plan water quality objective for zinc.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Two of the 56 samples exceed the Basin Plan water quality objective for zinc and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33330, Zinc **Region 9**

Murrieta Creek

LOE ID:	3139
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the San Diego Regional Board on 06/09/1998. One sample was collected, it was in exceedance of the water quality objective (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for zinc is 5.0 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murrieta Creek at Calle Del Oso Rd.
Temporal Representation:	One sample was collected on 06/09/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33330, Zinc **Region 9**

Murrieta Creek 037318

LOE ID:	3142
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	43
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	The Riverside County Flood Control and Water Conservation District collected water samples from 1994 to 2005 for their NPDES MS4 Permit. Of the 43 samples, none were in exceedance of the water quality objective (RCFCWCD, 2005).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for zinc is 5.0 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected on Murrieta Creek, however sites were not specified.
Temporal Representation:	The samples were collected from September 1994 to May 2005.
Environmental Conditions:	
QAPP Information:	Data was collected under an appropriate QAPP consistent with section 6.1.4 of the Listing Policy.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33330, Zinc **Region 9**

Murrieta Creek

LOE ID:	3141
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	11
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by LAW Crandall from 1997 to 2000. None of the 11 samples were in exceedance of the water quality objective (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for zinc is 5.0 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)

Evaluation Guideline:	037319
Guideline Reference:	
Spatial Representation:	Samples were collected at Murrieta Creek. Exact location was not given.
Temporal Representation:	Samples were collected from 12/09/1997 to 06/01/2000. One to 4 samples were collected per year. One sample was reported per sampling day.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33330, Zinc **Region 9**

Murrieta Creek

LOE ID:	3140
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the San Diego Regional Board on 06/09/1998. One sample was collected, it was in exceedance (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for zinc is 5.0 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murrieta Creek behind the cement factory.
Temporal Representation:	One sample was collected on 06/09/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **42375** **Region 9**

Murrieta Creek

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the

current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Five of the seven samples exceed the San Diego Basin Plan water quality objective for Chlorpyrifos and the Siepmann and Finlayson water quality objective for the concentration of chlorpyrifos in freshwater.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Five of the seven samples exceed the San Diego Basin Plan water quality objective for Chlorpyrifos and the Siepmann and Finlayson water quality objective for the concentration of chlorpyrifos in freshwater and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 42375, Chlorpyrifos **Region 9**

Murrieta Creek

LOE ID:	6460
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	5
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Five out of seven samples collected exceed the water quality objective of 0.025 ug/L according to results in the Riverside County Flood Control and Water Conservation District annual progress report from 2005 and 2006. Samples were collected from July 2004 through May 2006.
Data Reference:	Watershed Annual Progress Report 2004 to 2005 and 2005 to 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The 1-hour average concentration of chlorpyrifos in freshwater is 0.025 ug/L according to Siepmann and Finlayson, 2000; Finlayson, 2004.
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game

Spatial Representation:	Samples were collected at Murrieta Creek at USGS weir, lat/long: 33Â°28Â'47.0Â" N/117Â °08Â'34.8Â" W.
Temporal Representation:	Four to five samples are collected per monitoring year. Samples were collected from July 2004 through May 2006.
Environmental Conditions:	
QAPP Information:	Quality assurance conducted under Riverside County's quality assurance plan.
QAPP Information Reference(s):	Watershed Annual Progress Report 2004 to 2005 and 2005 to 2006

Line of Evidence (LOE) for Decision ID 42375, Chlorpyrifos **Region 9**

Murrieta Creek

LOE ID:	7510
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	9
Number of Exceedances:	6
Data and Information Type:	Effluent toxicity testing (chronic)
Data Used to Assess Water Quality:	Hyalella azteca- Six out of nine samples were found to be toxic to Hyalella azteca. Selenastrum capricornutum- None of nine samples were found to be toxic to green algae, Selenastrum capricornutum, growth test according to results in the Riverside County Flood Control and Water Conservation District annual progress report from 2005 and 2006. Samples were collected from October 2004 through May 2006.
Data Reference:	Watershed Annual Progress Report 2004 to 2005 and 2005 to 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Samples were found to exhibit toxicity when the No Observed Effect Concentration (NOEC) or median lethal concentration (LC50) for any given species was estimated to be less than 100% of the test sample concentration.
Guideline Reference:	Waste Discharge Requirements for Discharges of Urban Runoff From the Municipal Separate Storm Sewer Systems Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego, the San Diego Unified Port District, and the San Diego County Regional Airport. Order No. R9-2007-0001
Spatial Representation:	Samples were collected at Murrieta Creek at USGS weir, lat/long: 33Â°28Â'47.0Â" N/117Â °08Â'34.8Â" W.
Temporal Representation:	Three to four samples are collected per monitoring year. Samples were collected from October 2004 through March 2006.
Environmental Conditions:	
QAPP Information:	Quality assurance conducted under Riverside County's quality assurance plan.
QAPP Information Reference(s):	Watershed Annual Progress Report 2004 to 2005 and 2005 to 2006

DECISION ID **33307** **Region 9**

Murrieta Creek

Pollutant:	**Copper**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Five lines of evidence are available in the administrative record to assess this pollutant. Four of the nine samples exceed the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Four of nine samples exceed the CTR, dissolved copper acute criterion and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33307, Copper **Region 9**

Murrieta Creek

LOE ID:	3124
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the San Diego Regional Board on 06/09/1998. One sample was collected and it exceeded the water quality objective (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the water quality objective for Copper is 1.0 mg/L.

Objective/Criterion Reference:	Placeholder reference 2006 303(d)	037323
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Sample was collected at Murrieta Creek at Calle Del Oso Rd.	
Temporal Representation:	One sample was collected on 06/09/1998.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33307, Copper **Region 9**

Murrieta Creek

LOE ID:	3125
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the San Diego Regional Board on 06/09/1998. One sample was collected, it was in exceedance (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Copper is 1.0 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Sample was collected at Murrieta Creek behind the cement factory.
Temporal Representation:	One sample was collected on 06/09/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33307, Copper **Region 9**

Murrieta Creek

LOE ID:	3127
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	43
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	037324
Data Used to Assess Water Quality:	The Riverside County Flood Control and Water Conservation District collected water samples from 1994 to 2005 for their NPDES MS4 Permit. Of the 43 samples, none was in exceedance of the WQO (RCFCWCD, 2005).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Copper is 1.0 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected on Murrieta Creek, however sites were not specified.	
Temporal Representation:	The samples were collected from September 1994 to May 2005.	
Environmental Conditions:		
QAPP Information:	Data was collected under an appropriate QAPP consistent with section 6.1.4 of the Listing Policy.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33307, Copper **Region 9**

Murrieta Creek

LOE ID:	3126
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	11
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by LAW Crandall from 1997 to 2000. None of the 11 samples were in exceedance (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Copper is 1.0 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murrieta Creek. Exact location was not reported.
Temporal Representation:	Samples were collected from 12/09/1997 to 06/01/2000. One to 4 samples were collected per year. One to 2 samples were reported per sampling day.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33307, Copper **Region 9**

Murrieta Creek

LOE ID:	6461	037325

Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	9
Number of Exceedances:	4
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Four out of nine samples collected exceed the water quality objective for the 1-hour average concentration of copper. according to results in the Riverside County Flood Control and Water Conservation District annual progress report from 2005 and 2006. Samples were collected from July 2004 through May 2006.
Data Reference:	Watershed Annual Progress Report 2004 to 2005 and 2005 to 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the CTR, the dissolved copper chronic criterion is 3.1 ppb and the acute criterion is 4.8 ppb, but these criteria may vary depending upon hardness of the sample.
Objective/Criterion Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murrieta Creek at USGS weir, lat/long: 33Â°28Â'47.0Â" N/117Â°08Â'34.8Â" W.
Temporal Representation:	Four to five samples were collected per monitoring year. Samples were collected from July 2004 through May 2006.
Environmental Conditions:	
QAPP Information:	Quality assurance conducted under Riverside County's quality assurance plan.
QAPP Information Reference(s):	Watershed Annual Progress Report 2004 to 2005 and 2005 to 2006

DECISION ID	33420	Region 9
Murrieta Creek		

Pollutant:	**Iron**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for removal from the section 303(d) list under section 3.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Five of 11 samples exceed the Basin Plan water quality objective for iron.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the section 303(d) list.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Five of 11 samples exceed the Basin Plan water quality objective for iron and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33420, Iron **Region 9**

Murrieta Creek

LOE ID:	3148
Pollutant:	Iron
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	11
Number of Exceedances:	5
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by LAW Crandall from 1997 to 2000. Five of 11 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for iron is 0.3 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Murrieta Creek. Exact location was not given.
Temporal Representation:	Samples were collected from 12/09/1997 to 06/01/2000. One to 4 samples were collected per year. One to 2 samples were reported per sampling day.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33419** **Region 9**

Murrieta Creek

Pollutant:	**Manganese**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)

Revision Status	Original	037327
Sources:	Source Unknown	
Expected TMDL Completion Date:	2019	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for removal from the section 303(d) list under section 3.1 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Seven of the 11 samples exceed the Basin Plan water quality objective for manganese.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the section 303(d) list.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Seven of the 11 samples exceed the Basin Plan water quality objective for manganese and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33419, Manganese **Region 9**

Murrieta Creek

LOE ID:	3147
Pollutant:	Manganese
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	11
Number of Exceedances:	7
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by LAW Crandall from 1997 to 2000. Seven of 11 samples were in exceedance (San Diego RWQCB)
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The water quality objective for manganese in Murrieta Creek is 0.05 milligrams/liter (mg/l) according to Basin Plan, Table 3-2 entitled, Water Quality Objectives. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at Murrieta Creek. Exact location was not reported.
Temporal Representation:	Samples were collected from 12/09/1997 to 06/01/2000. One to 4 samples were collected per year. One to 2 samples were reported per sampling day.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 43555 Region 9

Murrieta Creek

Pollutant:	**Nitrogen**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This following decision is carried over from the previous listing cycle (with update to table 3.1):

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Thirty nine of the 164 samples exceed the Basin Plan water quality objective for total nitrogen as N.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Thirty nine of the 164 samples exceed the Basin Plan water quality objective for total nitrogen as N, and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 43555, Nitrogen Region 9

Murrieta Creek

LOE ID:	3146
Pollutant:	Nitrogen
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4

Number of Exceedances:	0	037329

Data and Information Type: PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality: Data were collected by LAW Crandall from 1997 to 1999. Four N:P ratios were calculated, according to days on which both Nitrogen and Phosphorus samples were collected. None of the 4 ratios were in exceedance of the 10:1 N:P ratio.

Data Reference: Placeholder reference 2006 303(d)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: From the Basin Plan: For inland surface waters, enclosed bays and estuaries, coastal lagoons, and ground waters for all beneficial uses, analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used.

Objective/Criterion Reference: Placeholder reference 2006 303(d)

Evaluation Guideline:

Guideline Reference:

Spatial Representation: Samples were collected at Murrieta Creek. Exact location was not given.

Temporal Representation: Samples were collected from 12/09/1997 to 12/06/1999. One to 4 samples were collected per year. One sample was reported per sampling day.

Environmental Conditions:

QAPP Information: Data used in 2002 assessment.

QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 43555, Nitrogen **Region 9**

Murrieta Creek

LOE ID: 3104

Pollutant: Nitrogen

LOE Subgroup: Pollutant-Water

Matrix: Water

Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 160

Number of Exceedances: 39

Data and Information Type: PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality: Data were collected by the Rancho California Water District from 1999 to 2002. The N:P ratio was used to assess data. Thirty-nine of 160 samples exceeded the 10:1 ratio.

Data Reference: Placeholder reference 2006 303(d)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: From the Basin Plan: For inland surface waters, enclosed bays and estuaries, coastal lagoons, and ground waters and all beneficial uses, for Nitrogen, analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used.

Objective/Criterion Reference: Placeholder reference 2006 303(d)

Evaluation Guideline:

Guideline Reference:

Spatial Representation: Samples were collected at Murrieta Creek. Exact location was not reported.

Temporal Representation: Samples were collected 4 times per month from 03/31/1999 to 04/17/2002.

Environmental Conditions:

QAPP Information: QA Info Missing 037330
QAPP Information Reference(s):

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Temecula Creek
Water Body ID: CAR9025100020011025111323
Water Body Type: River & Stream

DECISION ID 34014 **Region 9**
Temecula Creek

Pollutant: Phosphorus
Final Listing Decision: Do Not Delist from 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Sources: Source Unknown
Expected TMDL Completion Date: 2019
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess pollutant. One-hundred forty-eight of 169 samples exceed the Basin Plan water quality objective for phosphorus.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the section 303(d) list.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One-hundred forty-eight of 169 samples exceeded the Basin Plan water quality objective for phosphorus and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 34014, Phosphorus **Region 9**
Temecula Creek

LOE ID: 77113

Pollutant: Phosphorus
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Warm Freshwater Habitat

Number of Samples:	9	037332
Number of Exceedances:	9	

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	9 of 9 samples exceed the water quality objective for Total Phosphorus for Temecula Creek.
Data Reference:	Data for Various Pollutants in Riverside County, 2007-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Table 3-2 of the San Diego Basin Plan states that the water quality objective for Total Phosphorus for Temecula Creek is 0.1 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at 777 (Temecula Creek).
Temporal Representation:	Samples were collected from 10/16/2007 to 5/21/2009.
Environmental Conditions:	
QAPP Information:	No quality assurance information was provided.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 34014, Phosphorus **Region 9**

Temecula Creek

LOE ID:	3158
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	160
Number of Exceedances:	139
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the Rancho California Water District in 1999-2002. There were 139 of 160 samples that were in exceedance (RCWD, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters - streams and other flowing waters and all beneficial uses, the WQO for total phosphorus is 0.1 mg/L. This appears to be desired goal in order to prevent plant nuisance in streams and other flowing waters; not to be exceeded more than 10% of the time.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	Use unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board.
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	Samples were collected at Temecula Creek.
Temporal Representation:	Samples were collected 4-5 times per month from 03/31/1999 to 04/17/2002.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

DECISION ID 47963 **Region 9**

Temecula Creek 037333

Pollutant:	**Oxygen, Dissolved**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single lines of evidence are necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. One of the seven samples exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of seven samples exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47963, Oxygen, Dissolved — Region 9

Temecula Creek

LOE ID:	77111
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	One of 7 samples exceeded the objective.
Data Reference:	Data for Various Pollutants in Riverside County, 2007-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Dissolved oxygen levels shall not be less than 5.0 mg/l in inland surface waters with designated MAR or WARM beneficial uses. The annual mean dissolved oxygen concentration shall not be less than 7 mg/l more than 10% of the time.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	

Guideline Reference:	037334
Spatial Representation:	Samples were collected from the Temecula Creek station.
Temporal Representation:	Samples were collected seven times between 2007 and 2009.
Environmental Conditions:	
QAPP Information:	NPDES quality assurance.
QAPP Information Reference(s):	

DECISION ID 47960 Region 9

Temecula Creek

Pollutant:	**pH**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the eight samples exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of eight samples exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47960, pH Region 9

Temecula Creek

LOE ID:	77112
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality:	Zero of 8 samples exceeded the objective.	037335
Data Reference:	Data for Various Pollutants in Riverside County, 2007-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The pH of all inland surface waters shall not be depressed below 6.5 or raised above 8.5 as a result of waste discharges.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from the Temecula Creek station.	
Temporal Representation:	Eight samples were between 2007 and 2009.	
Environmental Conditions:		
QAPP Information:	NPDES quality assurance.	
QAPP Information Reference(s):		

DECISION ID 42027 Region 9

Temecula Creek

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Four lines of evidence are available in the administrative record to assess this pollutant. With the latest data, 7 of 7 and 9 of 14 singles samples exceed the water quality objectives for E. Coli of 235/100ml and fecal coliform of 400/100ml for the protection of REC-1.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, 7 of 7 and 9 of 14 singles samples exceed the water quality objectives for E. Coli of 235/100ml and fecal coliform of 400/100ml for the protection of REC-1 and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 42027, Indicator Bacteria Region 9

Temecula Creek

LOE ID:	72784	037336

Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	7
Number of Exceedances:	4
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Four of the seven samples exceeded the total coliform objective.
Data Reference:	Data for Various Pollutants in Riverside County, 2007-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life. Basin Plan for the San Diego Basin.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The total coliform concentration shall not exceed more than 10000/100 ml. Guidance For Fresh Water Beaches (CDPH).
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.
Spatial Representation:	The samples were collected at Temecula Creek.
Temporal Representation:	Samples were collected between October 2007 and May 2009.
Environmental Conditions:	
QAPP Information:	No QAPP was submitted. Sampling was done by municipalities in Riverside County pursuant to the Riverside County Municipal Stormwater Permit.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 42027, Indicator Bacteria **Region 9**

Temecula Creek

LOE ID:	72783
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	7
Number of Exceedances:	5
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Five of the seven samples exceeded the fecal Coliform objectivec
Data Reference:	Data for Various Pollutants in Riverside County, 2007-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The Fecal Coliform concentration shall not exceed more than 400/100 ml. Water Quality Control Plan for the San Diego Basin.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	The samples were collected at Temecula Creek.
Temporal Representation:	Samples were collected between October 2007 and May 2009.
Environmental Conditions:	
QAPP Information:	No QAPP was submitted. Sampling was done by municipalities in Riverside County pursuant to the Riverside County Municipal Stormwater Permit.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 42027, Indicator Bacteria **Region 9**

Temecula Creek

LOE ID:	72782
Pollutant:	Escherichia coli (E. coli)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	7
Number of Exceedances:	7
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Seven of the seven samples exceeded the E. coli objective.
Data Reference:	Data for Various Pollutants in Riverside County, 2007-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The E.Coli concentration shall not exceed more than 235/100 ml. Water Quality Control Plan for the San Diego Basin.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Temecula Creek.
Temporal Representation:	Samples were collected between October 2007 and May 2009.
Environmental Conditions:	
QAPP Information:	No QAPP was submitted. Sampling was done by municipalities in Riverside County pursuant to the Riverside County Municipal Stormwater Permit.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 42027, Indicator Bacteria **Region 9**

Temecula Creek

LOE ID:	7403
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	7
Number of Exceedances:	4
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Four out of seven samples collected exceed the water quality objective according to results in the Riverside County Flood Control and Water Conservation District annual progress

	report from 2005 and 2006. Samples were collected from October 2004 through May 2006.
Data Reference:	Watershed Annual Progress Report 2004 to 2005 and 2005 to 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, no more than 10% of the samples during any 30-day period for waters designated for contact recreation shall exceed 400 per 100 ml (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Temecula Creek below Pala Road, lat/long: 33Â°28Â'26.4Â" N/117Â°07Â'46.1Â" W.
Temporal Representation:	Four samples are collected per monitoring year. Samples were collected from October 2004 through May 2006.
Environmental Conditions:	One sample represents the first storm event of each monitoring year that produces sufficient flow to collect a composite sample. In addition, three samples represent wet weather and two samples represent dry weather. However, one sampling event in both the 2004-2005 and 2005-2006 monitoring year did not analyze for all constituents.
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 42027, Indicator Bacteria **Region 9**

Temecula Creek

LOE ID:	7152
Pollutant:	Escherichia coli (E. coli)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	7
Number of Exceedances:	4
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Four out of seven samples collected exceed the water quality objective according to results in the Riverside County Flood Control and Water Conservation District annual progress report from 2005 and 2006. Samples were collected from October 2004 through May 2006.
Data Reference:	Watershed Annual Progress Report 2004 to 2005 and 2005 to 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The maximum E. coli level for moderately or lightly used areas is 406 colonies per 100 ml (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Temecula Creek below Pala Road, lat/long: 33Â°28Â'26.4Â" N/117Â°07Â'46.1Â" W.
Temporal Representation:	Four samples are collected per monitoring year. Samples were collected from October 2004 through May 2006.
Environmental Conditions:	One sample represents the first storm event of each monitoring year that produces sufficient flow to collect a composite sample. In addition, three samples represent wet weather and two samples represent dry weather. However, one sampling event in both the 2004-2005 and 2005-2006 monitoring year did not analyze for all constituents.

QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.
QAPP Information Reference(s):	

DECISION ID 43130 Region 9
Temecula Creek

Pollutant:	**Nitrogen**
Final Listing Decision:	**Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Original
Reason for Delisting:	Flaws in original listing
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for removal from the CWA section 303(d) List under section 4.1 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Nineteen of the 160 samples exceed the objective and, although this exceeds the allowable frequency listed in Table 4.1 of the Listing Policy, the quality of data is uncertain (QA information missing) and the data are old (1999-2002). Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for removing this water segment-pollutant combination from the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used does not satisfy the data quality requirements of section 6.1.4 of the Policy (QA information not available). 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Although 19 of 160 samples exceeded the objective and this exceeds the allowable frequency listed in Table 4.1 of the Listing Policy, the data are of uncertain quality and relatively old. 4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43130, Nitrogen Region 9
Temecula Creek

LOE ID:	3159
Pollutant:	Nitrogen
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	160
Number of Exceedances:	19
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by Ranch California Water District from 1999 to 2002. Nineteen of 160 samples were in exceedance (RCWD, 2002).

Data Reference:	Placeholder reference 2006 303(d)	037340
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters, enclosed bays and estuaries, coastal lagoons, and ground waters and all beneficial uses, analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Temecula Creek.	
Temporal Representation:	Samples were collected 4-5 times per month from 03/1999 to 04/2002	
Environmental Conditions:		
QAPP Information:	QA Info Missing	
QAPP Information Reference(s):		

DECISION ID 43915 Region 9

Temecula Creek

Pollutant:	**Benthic Community Effects**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Benthic Community Effects is being considered for placement on the section 303(d) list under sections 3.9 and 3.2 of the Listing Policy. Under section 3.9, an additional line of evidence associating the Benthic Community Effects with a water or sediment concentration of pollutants is necessary to assess listing status. One line of evidence is available in the administrative record to assess this indicator. 4 of 7 samples exceeded the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing Benthic Community Effects in this water segment on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. 4 of 7 samples exceeded the Index of Biological Integrity (IBI) value of "poor" water quality for this area and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43915, Benthic Community Effects Region 9

Temecula Creek

LOE ID:	3157

Pollutant:	Benthic-Macroinvertebrate Bioassessments	037341
LOE Subgroup:	Population/Community Degradation	
Matrix:	Not Specified	
Fraction:	None	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	0	
Number of Exceedances:	0	
Data and Information Type:	Benthic macroinvertebrate surveys	
Data Used to Assess Water Quality:	Data were collected for the San Diego Regional Water Quality Control Board 1999 Biological Assessment Annual Report. Physical habitat scores at TC-I-15 ranged from 109 to 136, higher scores compared to other sampled waterbodies. BMI scores at TC-I-15 were either slightly above or slightly below average, compared to other sampled waterbodies. (SDRWQCB, 1999A).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:		
Objective/Criterion Reference:		
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Temecula Creek, 5 riffles immediately downstream of I-15 (TC-I-15).	
Temporal Representation:	Samples were collected in May, September, November 1998 and May 1999.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43915, Benthic Community Effects **Region 9**

Temecula Creek

LOE ID:	26472
Pollutant:	Benthic Community Effects
LOE Subgroup:	Adverse Biological Responses
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	4
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Seven samples of IBI data were taken from May 1998 to November 2000 at one sampling site. Of the total number of samples, four samples exceeded the IBI impairment threshold.
Data Reference:	Fish and Game IBI Data
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. (SDRWQCB, 1995)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at one site: 902TCI15x on Temecula Creek.
Temporal Representation:	Sampling occurred during two to three events from May 1998 to November 2000.
Environmental Conditions:	
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Project Plan for the California Stream Bioassessment Procedure and the State of California, California Monitoring an Assessment Program: "CMAP", Quality Assurance Project Plan.
QAPP Information Reference(s):	State of California, California Monitoring and Assessment Program: "CMAP". Quality Assurance Project Plan for the California Stream Bioassessment Procedure The San Diego Stream Team Quality Assurance Project Plan

DECISION ID 33567 — Region 9

Temecula Creek

Pollutant:	**Boron**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. None of 160 of the samples exceed the Basin Plan water quality objective for Boron. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of 160 of the samples exceed the Basin Plan water quality objective for Boron and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33567, Boron — Region 9

Temecula Creek

LOE ID:	3161
Pollutant:	Boron
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	160
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by Rancho California Water District from 1999 to 2002. None of the 160 samples were in exceedance (RCWD, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for boron is 0.75 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Temecula Creek.
Temporal Representation:	Samples were collected 4-5 times per month from 03/31/1999 to 04/17/2002.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

DECISION ID	33566	Region 9
Temecula Creek		

Pollutant:	**Surfactants (MBAS)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of 160 of the samples exceed the Basin Plan water quality objective for surfactants.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.

3. None of 160 of the samples exceed the Basin Plan water quality objective for surfactants and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33566, Surfactants (MBAS) **Region 9**

Temecula Creek

LOE ID:	3160
Pollutant:	Surfactants (MBAS)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	160
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by Rancho California Water District from 1999 to 2002. None of the 160 samples were in exceedance (RCWD, 2002).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for MBAS is 0.5 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Temecula Creek.
Temporal Representation:	Samples were collected 4-5 times per month from 03/31/1999 to 04/17/2002.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

DECISION ID **37925** **Region 9**

Temecula Creek

Pollutant:	**Turbidity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

	One line of evidence is available in the administrative record to assess this pollutant. A single sample was collected and it did not exceed the Basin Plan criteria, but the number of samples is insufficient to determine with the confidence and power required by the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 37925, Turbidity **Region 9**

Temecula Creek

LOE ID:	3156
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by RWQCB 9 in 1998. One sample was collected and was not in exceedance (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for turbidity is 5.0 ntu.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected Temecula Creek east of the confluence, west of I-15.
Temporal Representation:	Samples were collected on 06/09/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **43283** **Region 9**

Temecula Creek

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Seven of nine of the samples exceed the Basin Plan water quality objective for Chlorpyrifos.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Seven of nine of the samples exceed the Basin Plan water quality objective for Chlorpyrifos and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43283, Chlorpyrifos **Region 9**

Temecula Creek

LOE ID:	6462
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	9
Number of Exceedances:	7
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Seven out of nine samples collected exceed the water quality objective according to results in the Riverside County Flood Control and Water Conservation District annual progress report from 2005 and 2006. Samples were collected from October 2004 through May 2006.
Data Reference:	Watershed Annual Progress Report 2004 to 2005 and 2005 to 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The 4-day average concentration of chlorpyrifos in freshwater is 0.014 ug/L. The 1-hour average concentration of chlorpyrifos in freshwater is 0.025 ug/L according to Siepmann and Finlayson, 2000; Finlayson, 2004.
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game

Spatial Representation:	Samples were collected at Temecula Creek below Pala Road, lat/long: 33Â°28Â'26.4Â" N/117Â°07Â'46.1Â" W.
Temporal Representation:	Four to six samples are collected per monitoring year. Samples were collected from October 2004 through May 2006.
Environmental Conditions:	One sample represents the first storm event of each monitoring year that produces sufficient flow to collect a composite sample. In addition, three samples represent wet weather and two samples represent dry weather. However, one sampling event in the 2004-2005 monitoring year did not analyze for all constituents.
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.
QAPP Information Reference(s):	

DECISION ID 42511 Region 9

Temecula Creek

Pollutant:	**Copper**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown | Urban Runoff/Storm Sewers
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Four of eight of the samples exceed the CTR water quality objective for copper.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Four of eight of the samples exceed the CTR water quality objective for copper and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 42511, Copper Region 9

Temecula Creek

LOE ID:	6515
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water

Matrix:	Water	037348
Fraction:	Dissolved	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	8	
Number of Exceedances:	4	
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)	
Data Used to Assess Water Quality:	Four of eight samples exceeded the warm freshwater habitat water quality objective for Copper from results in the Riverside County Flood Control and Water Conservation annual progress reports from 2005 and 2006. The eight samples were collected between October 2004 and May 2006.	
Data Reference:	Watershed Annual Progress Report 2004 to 2005 and 2005 to 2006	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the CTR, the dissolved copper chronic criterion is 3.1 ppb and the acute criterion is 4.8 ppb, but these criteria may vary depending upon hardness of the sample (U.S. EPA, 2000).	
Objective/Criterion Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Temecula Creek below Pala Road, lat/long: 33Â°28Â'26.4Â" N/117Â°07Â'46.1Â" W.	
Temporal Representation:	Four to six samples are collected per monitoring year. Samples were collected from October 2004 through May 2006.	
Environmental Conditions:	One sample represents the first storm event of each monitoring year that produces sufficient flow to collect a composite sample. In addition, three samples represent wet weather and two samples represent dry weather. However, one sampling event in both the 2004-2005 and 2005-2006 monitoring years did not analyze for all constituents.	
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.	
QAPP Information Reference(s):		

DECISION ID	33302	Region 9
Temecula Creek		

Pollutant:	**Total Dissolved Solids**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. One hundred fifty-seven of the 161 samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One hundred fifty-seven of the 161 samples exceed the Basin Plan objective, and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33302, Total Dissolved Solids **Region 9**

Temecula Creek

LOE ID:	3154
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 1998. One sample was collected and was in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for TDS is 500 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Temecula Creek east of the confluence, west of I-15.
Temporal Representation:	Samples were collected on 06/09/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment. QA=?
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33302, Total Dissolved Solids **Region 9**

Temecula Creek

LOE ID:	3155
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	Total Dissolved	037350
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	160	
Number of Exceedances:	156	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by Rancho California Water District from 1999 to 2002. There were 156 of 160 samples that were in exceedance (RCWD, 2002).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for TDS is 500 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Temecula Creek.	
Temporal Representation:	Samples were collected 4-5 times per month from 03/31/1999 to 04/17/2002.	
Environmental Conditions:		
QAPP Information:	QA Info Missing	
QAPP Information Reference(s):		

DECISION ID	42672	Region 9
Temecula Creek		

Pollutant:	**Toxicity**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Three of seven of the samples exceed the water quality objective for toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Three of seven of the samples exceed the Basin Plan water quality objective for toxicity and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision

After review of the available data and information, RWQCB staff concludes that the water body-

Recommendation: pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded. 01735

Line of Evidence (LOE) for Decision ID 42672, Toxicity **Region 9**

Temecula Creek

LOE ID:	7511
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	3
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Hyalella Azteca- Three out of seven samples were found to have acute toxicity by the Hyalella Azteca growth/survival test. Selenastrum capricornutum- None of seven samples were found to have toxicity by the green alage, Selenastrum capricornutum, growth test. Toxicity results were in the Riverside County Flood Control and Water Conservation District annual progress report from 2005 and 2006. Samples were collected from October 2004 through March 2006.
Data Reference:	Watershed Annual Progress Report 2004 to 2005 and 2005 to 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Samples were found to exhibit toxicity when the No Observed Effect Concentration (NOEC) or median lethal concentration (LC50) for any given species was estimated to be less than 100% of the test sample concentration.
Guideline Reference:	Waste Discharge Requirements for Discharges of Urban Runoff From the Municipal Separate Storm Sewer Systems Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego, the San Diego Unified Port District, and the San Diego County Regional Airport. Order No. R9-2007-0001
Spatial Representation:	Samples were collected at Temecula Creek below Pala Road, lat/long: 33Â°28Â’26.4Â” N/117Â°07Â’46.1Â” W.
Temporal Representation:	Three to four samples are collected per monitoring year. Samples were collected from October 2004 through March 2006.
Environmental Conditions:	Toxicity testing is conducted on all storm event samples (at least three annually).
QAPP Information:	Quality control conducted in compliance with the Riverside County's quality assurance plan.
QAPP Information Reference(s):	Watershed Annual Progress Report 2004 to 2005 and 2005 to 2006

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Long Canyon Creek (tributary to Murrieta Creek)
Water Body ID: CAR9028300020011025112509
Water Body Type: River & Stream

DECISION ID 43281 **Region 9**
Long Canyon Creek (tributary to Murrieta Creek)

Pollutant: Indicator Bacteria
Final Listing Decision: Delist from 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Reason for Delisting: Flaws in original listing
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.3 of the Listing Policy. Under section 3.3, one line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Four of four samples exceed the water quality objectives for E. coli., and fecal coliform, respectively, for the protection of REC-1 beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Four of four samples exceed the water quality objectives for E. coli., and fecal coliform, respectively, for the protection of REC-1 beneficial use and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to [SECTION 3.11/4.11] of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be removed from the section 303(d) list because applicable water quality standards for the pollutant are not being exceeded.

Line of Evidence (LOE) for Decision ID 43281, Indicator Bacteria **Region 9**
Long Canyon Creek (tributary to Murrieta Creek)

LOE ID: 7398

Pollutant: Fecal Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	All four samples collected exceed the water quality objective according to results in the Riverside County Flood Control and Water Conservation District annual progress report from 2005 and 2006. Samples were collected on 10/20/04, 12/28/04, 10/18/05 and 2/27/06.
Data Reference:	Watershed Annual Progress Report 2004 to 2005 and 2005 to 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, no more than 10% of the samples during any 30-day period for waters designated for contact recreation shall exceed 400 per 100 ml (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Long Canyon Creek. Lat/long: 33°30 38 N/117°09 40 W.
Temporal Representation:	Samples were collected on 10/20/04, 12/28/04, 10/18/05 and 2/27/06.
Environmental Conditions:	One sample represents the first storm event of each monitoring year that produces sufficient flow to collect a composite sample. In addition, another sample is collected during the monitoring year to represent a wet weather event.
QAPP Information:	Quality assurance conducted according to the Riverside County's Consolidated Monitoring Plan.
QAPP Information Reference(s):	Watershed Annual Progress Report 2004 to 2005 and 2005 to 2006

Line of Evidence (LOE) for Decision ID 43281, Indicator Bacteria **Region 9**

Long Canyon Creek (tributary to Murrieta Creek)

LOE ID:	7150
Pollutant:	Escherichia coli (E. coli)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Water Contact Recreation
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	All four samples collected exceed the water quality objective according to the results in the Riverside County Flood Control and Water Conservation District annual progress report from 2005 and 2006. Samples were collected on 10/20/04, 12/28/04, 10/18/05 and 2/27/06.
Data Reference:	Watershed Annual Progress Report 2004 to 2005 and 2005 to 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The maximum E. coli level for moderately or lightly used areas is 406 colonies per 100 ml (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Long Canyon Creek. Lat/long: 33°30 38 N/117°09 40 W.
Temporal Representation:	Samples were collected on 10/20/04, 12/28/04, 10/18/05 and 2/27/06.

Environmental Conditions:	One sample represents the first storm event of each monitoring year that produces sufficient flow to collect a composite sample. In addition, another sample is collected during the monitoring year to represent a wet weather event.
QAPP Information:	Quality assurance conducted according to the Riverside County's Consolidated Monitoring Plan.
QAPP Information Reference(s):	Watershed Annual Progress Report 2004 to 2005 and 2005 to 2006

DECISION ID 44458 Region 9

Long Canyon Creek (tributary to Murrieta Creek)

Pollutant:	**Nitrogen**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2023
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Four of the four samples exceed the water quality objective. According to table 3.1of the Listing Policy, the minimum sample requirement to assess conventional pollutants is 2. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Four of the four samples exceeded the Basin Plan objective and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 44458, Nitrogen Region 9

Long Canyon Creek (tributary to Murrieta Creek)

LOE ID:	6265
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4

Number of Exceedances:	4	037355
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)	
Data Used to Assess Water Quality:	All four samples collected exceed the evaluation guideline of 1 mg/L according to results in the Riverside County Flood Control and Water Conservation District annual progress report from 2005 and 2006. Samples were collected on 10/20/04, 12/28/04, 10/18/05, and 2/27/06.	
Data Reference:	Watershed Annual Progress Report 2004 to 2005 and 2005 to 2006	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses (RWQCB, 2007). A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used (RWQCB, 2007).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:	Water Quality Control Plan for the San Diego Basin	
Spatial Representation:	Samples were collected at station 780 Long Canyon Creek. Lat/long: 33°30 38 N/117°09 40 W.	
Temporal Representation:	Samples were collected on 10/20/04, 12/28/04, 10/18/05, and 2/27/06.	
Environmental Conditions:	One sample represents the first storm event of each monitoring year that produces sufficient flow to collect a composite sample. In addition, another sample is collected during the monitoring year to represent a wet weather event.	
QAPP Information:	Quality assurance conducted according to the Riverside County's Consolidated Monitoring Plan.	
QAPP Information Reference(s):	Watershed Annual Progress Report 2004 to 2005 and 2005 to 2006	

DECISION ID	**43253**	**Region 9**
Long Canyon Creek (tributary to Murrieta Creek)		

Pollutant:	**Phosphorus**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2023
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Four of the 4 samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.037356
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Four of the 4 samples exceeded the Basin Plan objective and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 43253, Phosphorus **Region 9**

Long Canyon Creek (tributary to Murrieta Creek)

LOE ID:	6266
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	All four samples collected exceed the evaluation guideline according to results in the Riverside County Flood Control and Water Conservation District annual progress reports. Samples were collected on 10/20/04, 12/28/04, 10/18/05, and 2/27/06.
Data Reference:	Watershed Annual Progress Report 2004 to 2005 and 2005 to 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses (RWQCB, 2007). The Water Quality Control Plan for San Diego Basin Plan which has a goal of 0.1 mg/L for total phosphorus in streams and other flowing waters (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at station 780 Long Canyon Creek. Lat/long: 33°30 38 N/117°09 40 W.
Temporal Representation:	Samples were collected on 10/20/04, 12/28/04, 10/18/05, and 2/27/06.
Environmental Conditions:	One sample represents the first storm event of each monitoring year that produces sufficient flow to collect a composite sample. In addition, another sample is collected during the monitoring year to represent a wet weather event.
QAPP Information:	Quality assurance conducted according to the Riverside County's Consolidated Monitoring Plan.
QAPP Information Reference(s):	Watershed Annual Progress Report 2004 to 2005 and 2005 to 2006

DECISION ID 33406 **Region 9**

Long Canyon Creek (tributary to Murrieta Creek)

Pollutant:	**Total Dissolved Solids**
Final Listing Decision:	**Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final	Delist from 303(d) list (TMDL required list)(2012)

Listing Decision:		037357
Revision Status	Original	
Reason for Delisting:	Flaws in original listing	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 one line(s) of evidence are necessary to assess listing status.

No lines of evidence are available in the administrative record to assess this pollutant.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33406, Total Dissolved Solids **Region 9**

Long Canyon Creek (tributary to Murrieta Creek)

LOE ID:	3164
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	25
Number of Exceedances:	6
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 1997 and 1998. Six of the 25 samples were in exceedance. All 6 samples were collected on 01/29/1998.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for TDS is 500 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Long Canyon Creek site LCC2.
Temporal Representation:	Samples were collected on 03/12/1997, 05/13/1997, 06/18/1997, and 01/29/1998. Five to nine of the samples were collected per day over a period of 3 minutes to 1.5 hours.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **43219** **Region 9**

Long Canyon Creek (tributary to Murrieta Creek) 037358

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Three of the 4 samples exceed the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Three of the 4 samples exceed the Basin Plan objective for pesticides and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43219, Chlorpyrifos — Region 9

Long Canyon Creek (tributary to Murrieta Creek)

LOE ID:	6456
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	3
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Three out of four samples exceeded 1-hour average concentration of Chlorpyrifos according to results in the Riverside County Flood Control and Water Conservation District's Watershed Annual Progress Report from 2005 and 2006. Samples were collected on 10/20/04, 12/28/04, 10/18/05, and 2/27/06.
Data Reference:	Watershed Annual Progress Report 2004 to 2005 and 2005 to 2006
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The 4-day average concentration of chlorpyrifos in freshwater is 0.014 ug/L. The 1-hour average concentration of chlorpyrifos in freshwater is 0.025 ug/L according to Siepmann and Finlayson, 2000; Finlayson, 2004.
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game
Spatial Representation:	Samples were collected at station 780 on Long Canyon Creek. Lat/long: 33°30 38 N/117°09 40 W.
Temporal Representation:	Samples were collected on the following dates: 10/20/04, 12/28/04, 10/18/05, and 2/27/06.
Environmental Conditions:	One sample represents the first storm event of each monitoring year that produces sufficient flow to collect a composite sample. In addition, another sample is collected during the monitoring year to represent a wet weather event.
QAPP Information:	Quality assurance conducted according to the Riverside County's Consolidated Monitoring Plan.
QAPP Information Reference(s):	Watershed Annual Progress Report 2004 to 2005 and 2005 to 2006

DECISION ID 43326 Region 9

Long Canyon Creek (tributary to Murrieta Creek)

Pollutant:	**Iron**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Four of the 4 samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Four of the 4 samples exceed the secondary drinking water MCL for iron and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not

changed. 037360

Line of Evidence (LOE) for Decision ID 43326, Iron **Region 9**

Long Canyon Creek (tributary to Murrieta Creek)

LOE ID:	6264
Pollutant:	Iron
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	All four samples collected exceed the water quality objective according to results in the Riverside County Flood Control and Water Conservation District annual progress report from 2005 and 2006. Samples were collected on 10/20/04, 12/28/04, 10/18/05, and 2/27/06.
Data Reference:	Watershed Annual Progress Report 2004 to 2005 and 2005 to 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, inland surface waters designated as domestic or municipal supply, shall not contain concentrations of iron in excess of the secondary maximum contaminant level 0.3 mg/L (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Long Canyon Creek. Lat/long: 33°30 38 N/117°09 40 W.
Temporal Representation:	Samples were collected on the following dates: 10/20/04, 12/28/04, 10/18/05, and 2/27/06.
Environmental Conditions:	
QAPP Information:	Quality assurance conducted according to the Riverside County's Consolidated Monitoring Plan.
QAPP Information Reference(s):	Watershed Annual Progress Report 2004 to 2005 and 2005 to 2006

DECISION ID 43363 **Region 9**

Long Canyon Creek (tributary to Murrieta Creek)

Pollutant:	**Manganese**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the

Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. 03/31

One line of evidence is available in the administrative record to assess this pollutant. Four of the 4 samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Four of the 4 samples exceed the secondary drinking water MCL for Mn and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43363, Manganese **Region 9**

Long Canyon Creek (tributary to Murrieta Creek)

LOE ID:	6458
Pollutant:	Manganese
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	All four samples collected exceed the water quality objective according to results in the Riverside County Flood Control and Water Conservation District annual progress report from 2005 and 2006. Samples were collected on 10/20/04, 12/28/04, 10/18/05, and 2/27/06.
Data Reference:	Watershed Annual Progress Report 2004 to 2005 and 2005 to 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, inland surface waters designated as domestic or municipal supply shall not contain concentrations of manganese in excess of the secondary maximum contaminant level 0.05 mg/L (RWQCB, 2007)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at station 780 on Long Canyon Creek. Lat/long: 33°30 38 N/117°09 40 W.
Temporal Representation:	Samples were collected on the following dates: 10/20/04, 12/28/04, 10/18/05, and 2/27/06.
Environmental Conditions:	One sample represents the first storm event of each monitoring year that produces sufficient flow to collect a composite sample. In addition, another sample is collected during the monitoring year to represent a wet weather event.
QAPP Information:	Quality assurance conducted according to the Riverside County's Consolidated Monitoring Plan.
QAPP Information Reference(s):	Watershed Annual Progress Report 2004 to 2005 and 2005 to 2006

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: San Luis Rey River, Lower (west of Interstate 15)
Water Body ID: CAR9031100020011005104327
Water Body Type: River & Stream

DECISION ID 43548 **Region 9**

San Luis Rey River, Lower (west of Interstate 15)

Pollutant: **Indicator Bacteria**
Final Listing Decision: **Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Sources: Source Unknown | Unknown Nonpoint Source | Unknown Point Source
Expected TMDL Completion Date: 2021
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for removal from the CWA section 303(d) List under section 4.3 of the Listing Policy. Under section 4.3 a single line of evidence is necessary to assess listing status.

Five lines of evidence are available in the administrative record to assess this pollutant.
Enterococcus
22 of 23 samples exceed the single sample objective for water contact recreation.
Fecal coliform
13 of 23 samples exceed the single sample objective for water contact recreation.
Total coliform
1 of 8 samples exceed the single sample objective for water contact recreation.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Samples and exceedences are as follows:
Enterococcus
22 of 23 samples exceed the single sample objective for water contact recreation.
Fecal coliform
13 of 23 samples exceed the single sample objective for water contact recreation.
Total coliform
1 of 8 samples exceed the single sample objective for water contact recreation.
The enterococcus and fecal coliform samples exceed the allowable frequency listed in Table 4.2 of the Listing Policy. The total coliform sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 43548, Indicator Bacteria — Region 9

San Luis Rey River, Lower (west of Interstate 15)

LOE ID:	76148
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	8
Number of Exceedances:	5
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Luis Rey River, Lower (west of Interstate 15) to determine beneficial use support and results are as follows: 5 of 8 samples exceed the criterion for Coliform, Fecal.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the fecal coliform concentration shall not exceed 400 MPN/100 ml.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Luis Rey River, Lower (west of Interstate 15) was collected at 1 monitoring site [San Luis Rey River at Highway 76 (Old Bonsall Bridge)]
Temporal Representation:	Data was collected over the time period 6/3/2003-5/28/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 43548, Indicator Bacteria — Region 9

San Luis Rey River, Lower (west of Interstate 15)

LOE ID:	7494
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	15
Number of Exceedances:	15
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	All fifteen samples collected exceed the water quality objective according to results in the San Diego County Municipal Copermittees Report, 2007. Samples were collected one to four times a year from 2001-2006.
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, the most stringent of the US EPA bacteriological criteria for enterococcus sets a maximum limit at 61 colonies per 100mL (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the mass loading station located near the lower boundary of the watershed in Oceanside, under the Benet Road Bridge, north of Highway 76.
Temporal Representation:	Samples were collected one to four times a year from 2001-2006.
Environmental Conditions:	Samples were collected during wet weather. base flow.
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43548, Indicator Bacteria **Region 9**

San Luis Rey River, Lower (west of Interstate 15)

LOE ID:	76132
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	8
Number of Exceedances:	7
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Luis Rey River, Lower (west of Interstate 15) to determine beneficial use support and results are as follows: 7 of 8 samples exceed the criterion for Enterococci.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Samples shall not exceed 61 organisms per 100 ml for enterococcus in waters designated for REC I beneficial use (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Luis Rey River, Lower (west of Interstate 15) was collected at 1 monitoring site [San Luis Rey River at Highway 76 (Old Bonsall Bridge)]
Temporal Representation:	Data was collected over the time period 6/3/2003-5/28/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 43548, Indicator Bacteria **Region 9**

San Luis Rey River, Lower (west of Interstate 15)

LOE ID:	76203
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	8
Number of Exceedances:	1
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Luis Rey River, Lower (west of Interstate 15) to determine beneficial use support and results are as follows: 1 of 8 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxicsubstances in concentrations which are toxic to,or which produce detrimental physiologicalresponses in human, plant, animal, or indigenousaquatic life (Basin Plan).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In waters designated for water contact recreation (REC I), the total coliform concentration shall not exceed 10000 MPN/100 ml (CDPH 2006).
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.
Spatial Representation:	Data for this line of evidence for San Luis Rey River, Lower (west of Interstate 15) was collected at 1 monitoring site [San Luis Rey River at Highway 76 (Old Bonsall Bridge)]
Temporal Representation:	Data was collected over the time period 6/3/2003-5/28/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 43548, Indicator Bacteria **Region 9**

San Luis Rey River, Lower (west of Interstate 15)

LOE ID:	7495
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	15
Number of Exceedances:	8
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Eight of fifteen samples collected exceed the water quality objective according to results in the San Diego County Municipal Copermittees Report, 2007. Samples were collected one to four times a year from 2001-2006.
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report

SWAMP Data:	Non-SWAMP	037367
Water Quality Objective/Criterion:	From the Basin Plan, no more than 10% of the samples during any 30-day period for waters designated for contact recreation shall exceed 400 colonies per 100 ml.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:	Water Quality Control Plan for the San Diego Basin	
Spatial Representation:	Samples were collected at the mass loading station located near the lower boundary of the watershed in Oceanside, under the Benet Road Bridge, north of Highway 76.	
Temporal Representation:	Samples were collected one to four times a year from 2001-2006.	
Environmental Conditions:	Samples were collected during wet weather.	
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.	
QAPP Information Reference(s):		

DECISION ID 43691 Region 9

San Luis Rey River, Lower (west of Interstate 15)

Pollutant:	**Toxicity**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for removal from section 303(d) list under sections 4.1 and 4.6 of the Listing Policy. Five lines of evidence are available in the administrative record to assess this pollutant. Thirteen of the fifty-one water samples exceed the water quality objective for toxicity. Two of the three sediment samples exceed the guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of keeping this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. 13 of 51 water samples exceed the toxicity water quality objective and this exceeds the allowable frequency listed in Table 4.1 of the Listing Policy. 4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 43691, Toxicity Region 9

San Luis Rey River, Lower (west of Interstate 15)

LOE ID: 7493

Pollutant:	Toxicity	037368
LOE Subgroup:	Toxicity	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	8	
Number of Exceedances:	3	
Data and Information Type:	Ambient toxicity testing (chronic)	
Data Used to Assess Water Quality:	Selenastrum capricornutum- Eight samples were collected and three samples show significant toxicity levels (SL) as determined by the Selenastrum capricornutum growth test. Ceriodaphnia dubia- Eight samples were collected and two samples show significant toxicity levels (SL) as determined by the Ceriodaphnia dubia survival/reproductive test. Hyalella azteca- Eight samples were collected and none show significant toxicity levels (SL) as determined by at least one of the Hyalella azteca survival/growth test according to results in the Surface Water Ambient Monitoring Program Report, 2007. Samples were collected at each site on the following four dates, May 18-19, September 13-14, 2004, March 1-2, April 18 and April 20, 2005.	
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms. Fourth Edition. Office of Water, U.S. Environmental Protection Agency. Washington, D.C. EPA-821-R-02-013	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (RWQCB, 2007).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	Waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.	
Guideline Reference:	Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms. Fourth Edition. Office of Water, U.S. Environmental Protection Agency. Washington, D.C. EPA-821-R-02-013	
Spatial Representation:	Samples were collected at monitoring station San Luis Rey River 2 and San Luis Rey River 8.	
Temporal Representation:	Samples were collected at each site on the following four dates, May 18-19, September 13-14, 2004, March 1-2, April 18 and April 20, 2005.	
Environmental Conditions:		
QAPP Information:	Quality control for the chemical anaylsis of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43691, Toxicity **Region 9**

San Luis Rey River, Lower (west of Interstate 15)

LOE ID:	76205
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment

Fraction:	None	037369
Beneficial Use:	Marine Habitat	
Number of Samples:	3	
Number of Exceedances:	2	
Data and Information Type:	TOXICITY TESTING	
Data Used to Assess Water Quality:	Three samples were collected to test for toxicity. Two of the three samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius. Each sample is a sediment composites from three different sites.	
Data Reference:	Data for Various Pollutants from Ambient Bay and Lagoon, 2003-2005.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.	
Guideline Reference:		
Spatial Representation:	The samples were collected at 903SLR_2003, 903SLR_2004, and 903SLR_2005. Each of these sample location names consists of a composite from three different sites.	
Temporal Representation:	The samples were collected in July 2003, 2004, and 2005.	
Environmental Conditions:		
QAPP Information:	The data was collected under the County of San Diego Ambient Bay and Lagoon Monitoring Project 2003-2005. Annual Report for the Receiving Waters and Urban Runoff Monitoring section covered under the San Diego County Municipal National Pollutant Discharge Elimination System (NPDES) Permit (RWQCB-Order NO. R9-2007-0001).	
QAPP Information Reference(s):	e-mail clarifying QAPP information	

Line of Evidence (LOE) for Decision ID 43691, Toxicity **Region 9**

San Luis Rey River, Lower (west of Interstate 15)

LOE ID:	76204
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	27
Number of Exceedances:	7
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Twenty-seven samples were collected to test for toxicity. Seven of the 27 samples exhibited statistically significant toxicity. The toxicity tests that exhibited significant toxicity included survival of Hyalella azteca, growth of Selenastrum capriconutum and reproduction of Ceriodaphnia dubia.
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life

Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	037370
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.	
Guideline Reference:		
Spatial Representation:	The samples were collected at stations 903SLR-MLS and 903SLR-TWAS-1, San Luis Rey River.	
Temporal Representation:	The samples were collected from 2001 to 2008.	
Environmental Conditions:		
QAPP Information:	The data was collected under the County of San Diego Co-Permittees Receiving Waters Urban Runoff Monitoring and Reporting Program (Order No. 2007-01). Data quality is good.	
QAPP Information Reference(s):	e-mail clarifying QAPP information	

Line of Evidence (LOE) for Decision ID 43691, Toxicity **Region 9**

San Luis Rey River, Lower (west of Interstate 15)

LOE ID:	76206
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to test for toxicity. The sample did not exhibit statistically and biologically significant toxicity. The toxicity tests included survival and reproduction of Ceriodaphnia dubia.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control. Additionally, the biological significance of the sample is evaluated by determining whether the sample response is less than the evaluation threshold
Guideline Reference:	
Spatial Representation:	The sample was collected from site 903_SMC00153, San Luis Rey River, lower.
Temporal Representation:	The sample was collected in June 2008.
Environmental Conditions:	
QAPP Information:	This data was collected for the Regional Monitoring Of Southern California's Coastal Watersheds - Stormwater Monitoring Coalition Bioassessment Working Group. CRG Marine Laboratories Quality Assurance Program Document was provided.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 43691, Toxicity **Region 9**

San Luis Rey River, Lower (west of Interstate 15) 037371

LOE ID:	23503
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	15
Number of Exceedances:	3
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Selenastrum capricornutum- One of fifteen samples collected were found to be toxic as determined by the Selenastrum capricornutum growth test, Ceriodaphnia dubia survival/reproductive test. Ceriodaphnia dubia- Two of fifteen samples collected were found to be toxic as determined by the Ceriodaphnia dubia survival/reproductive test. Hyalella azteca - None of the fifteen samples collected were found to be toxic as determined by the Hyalella azteca survival test according to results in the San Diego County Municipal Copermittees Report, 2007.
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Samples were found to exhibit toxicity when the No Observed Effect Concentration (NOEC) or median lethal concentration (LC50) for any given species was estimated to be less than 100% of the test sample concentration.
Guideline Reference:	Waste Discharge Requirements for Discharges of Urban Runoff From the Municipal Separate Storm Sewer Systems Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego, the San Diego Unified Port District, and the San Diego County Regional Airport. Order No. R9-2007-0001
Spatial Representation:	Samples were collected at mass loading station under the Benet Rd bridge north of highway 76 on the San Luis Rey River.
Temporal Representation:	Samples were collected at from 2001 through 2006
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with Weston's quality assurance plan.
QAPP Information Reference(s):	Weston Solutions, 2004. Quality Management Manual. March 2004 (Revised December 2009).

DECISION ID 49040 Region 9

San Luis Rey River, Lower (west of Interstate 15)

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or	Pollutant

Pollution: 037372

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 28 samples exceed the criterion.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 28 samples exceeded the criterion and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 49040, Arsenic **Region 9**

San Luis Rey River, Lower (west of Interstate 15)

LOE ID:	76287
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Luis Rey River to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The dissolved arsenic criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved arsenic is 0.150 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Luis Rey River was collected at 1 monitoring site [San Luis Rey River, lower - 903_SMC00153]
Temporal Representation:	Data was collected on a single day 6/8/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.

QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

Line of Evidence (LOE) for Decision ID 49040, Arsenic **Region 9**

San Luis Rey River, Lower (west of Interstate 15)

LOE ID:	76289
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	27
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Luis Rey River, Lower (west of Interstate 15) to determine beneficial use support and results are as follows: 0 of 27 samples exceed the criterion for Arsenic.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The dissolved arsenic criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved arsenic is 0.150 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Luis Rey River, Lower (west of Interstate 15) was collected at 2 monitoring sites [San Luis Rey River - 903SLR-MLS, San Luis Rey River - 903SLR-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/29/2001-12/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID 49051 **Region 9**

San Luis Rey River, Lower (west of Interstate 15)

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Three lines of evidence are available in the administrative record to assess this pollutant. Zero of the 34 samples exceed the beneficial use guidelines. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 34 samples exceeded the guideline and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 49051, Cadmium **Region 9**

San Luis Rey River, Lower (west of Interstate 15)

LOE ID:	76297
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for San Luis Rey River to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Luis Rey River was collected at 1 monitoring site [San Luis Rey River, lower - 903_SMC00153]
Temporal Representation:	Data was collected on a single day 6/8/2009.

Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

Line of Evidence (LOE) for Decision ID 49051, Cadmium **Region 9**

San Luis Rey River, Lower (west of Interstate 15)

LOE ID:	76071
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	26
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for San Luis Rey River, Lower (west of Interstate 15) to determine beneficial use support and results are as follows: 0 of 26 samples exceed the criterion for Cadmium.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Cadmium to protect aquatic life in freshwater. The dissolved Cadmium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Luis Rey River, Lower (west of Interstate 15) was collected at 2 monitoring sites [San Luis Rey River - 903SLR-MLS, San Luis Rey River - 903SLR-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/29/2001-12/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 49051, Cadmium **Region 9**

San Luis Rey River, Lower (west of Interstate 15)

LOE ID:	76300
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved

Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Luis Rey River, Lower (west of Interstate 15) to determine beneficial use support and results are as follows: 0 of 7 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Luis Rey River, Lower (west of Interstate 15) was collected at 1 monitoring site [San Luis Rey River at Highway 76 (Old Bonsall Bridge)]
Temporal Representation:	Data was collected 6/3/2003 - 5/28/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 50703 Region 9

San Luis Rey River, Lower (west of Interstate 15)

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. One of the 23 samples exceed the beneficial use guidelines.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of 23 samples exceeded the guideline and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available

indicating that standards are not met. 037377

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 50703, Chlorpyrifos **Region 9**

San Luis Rey River, Lower (west of Interstate 15)

LOE ID:	76073
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Luis Rey River, Lower (west of Interstate 15) to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).
Spatial Representation:	Data for this line of evidence for San Luis Rey River, Lower (west of Interstate 15) was collected at 1 monitoring site [San Luis Rey River at Highway 76 (Old Bonsall Bridge)]
Temporal Representation:	Data was collected over the time period 6/29/2006-5/28/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 50703, Chlorpyrifos **Region 9**

San Luis Rey River, Lower (west of Interstate 15)

LOE ID:	77827
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	19
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Luis Rey River, Lower (west of Interstate 15) to determine beneficial use support and results are as follows: 1 of 19 samples exceed the criterion for Chlorpyrifos. Eight sample results were not used in the assessment because the laboratory data reporting limit(s) was above the objective and therefore the results could not be quantified with the level of certainty required by the Listing Policy.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.014 ug/L (Siepmann and Finlayson 2000).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).
Spatial Representation:	Data for this line of evidence for San Luis Rey River, Lower (west of Interstate 15) was collected at 2 monitoring sites [San Luis Rey River - 903SLR-MLS, San Luis Rey River - 903SLR-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/29/2001-12/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID 50637 Region 9

San Luis Rey River, Lower (west of Interstate 15)

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 50637, Chromium 037379 Region 9

San Luis Rey River, Lower (west of Interstate 15)

LOE ID:	76089
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	25
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for San Luis Rey River, Lower (west of Interstate 15) to determine beneficial use support and results are as follows: 0 of 25 samples exceed the criterion for Chromium.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Chromium to protect aquatic life in freshwater. The dissolved Chromium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Luis Rey River, Lower (west of Interstate 15) was collected at 2 monitoring sites [San Luis Rey River - 903SLR-MLS, San Luis Rey River - 903SLR-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/29/2001-12/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 50637, Chromium Region 9

San Luis Rey River, Lower (west of Interstate 15)

LOE ID:	76088
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for San Luis Rey River to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Luis Rey River was collected at 1 monitoring site [San Luis Rey River, lower - 903_SMC00153]
Temporal Representation:	Data was collected on a single day 6/8/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

DECISION ID 50675 Region 9

San Luis Rey River, Lower (west of Interstate 15)

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 32 samples exceed the beneficial use guidelines. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 32 samples exceeded the guideline and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality

standards are not being exceeded. 037381

Line of Evidence (LOE) for Decision ID 50675, Copper **Region 9**

San Luis Rey River, Lower (west of Interstate 15)

LOE ID:	76092
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Luis Rey River, Lower (west of Interstate 15) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Luis Rey River, Lower (west of Interstate 15) was collected at 1 monitoring site [San Luis Rey River at Highway 76 (Old Bonsall Bridge)]
Temporal Representation:	Data was collected 6/3/2003 - 5/28/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 50675, Copper **Region 9**

San Luis Rey River, Lower (west of Interstate 15)

LOE ID:	76090
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING 037382
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for San Luis Rey River to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Luis Rey River was collected at 1 monitoring site [San Luis Rey River, lower - 903_SMC00153]
Temporal Representation:	Data was collected on a single day 6/8/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

Line of Evidence (LOE) for Decision ID 50675, Copper **Region 9**

San Luis Rey River, Lower (west of Interstate 15)

LOE ID:	76112
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	24
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for San Luis Rey River, Lower (west of Interstate 15) to determine beneficial use support and results are as follows: 0 of 24 samples exceed the criterion for Copper.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Copper to protect aquatic life in freshwater. The dissolved Copper criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Data for this line of evidence for San Luis Rey River, Lower (west of Interstate 15) was collected at 2 monitoring sites [San Luis Rey River - 903SLR-MLS, San Luis Rey River - 903SLR-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/29/2001-12/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID 50704 Region 9

San Luis Rey River, Lower (west of Interstate 15)

Pollutant:	**Cypermethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the zero samples exceed the beneficial use guidelines. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of zero samples exceeded the guideline. The samples were not used in the assessment due to reporting limits that were higher than the guideline. The sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50704, Cypermethrin Region 9

San Luis Rey River, Lower (west of Interstate 15)

LOE ID:	76113
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total

Beneficial Use:	Warm Freshwater Habitat	037384
Number of Samples:	0	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Luis Rey River, Lower (west of Interstate 15) to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Cypermethrin, total.	
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of cypermethrin does not exceed 0.0002 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Fojut et al. 2012)	
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.	
Spatial Representation:	Data for this line of evidence for San Luis Rey River, Lower (west of Interstate 15) was collected at 2 monitoring sites [San Luis Rey River - 903SLR-MLS, San Luis Rey River - 903SLR-TWAS-1]	
Temporal Representation:	Data was collected over the time period 11/30/2007-12/16/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.	

Line of Evidence (LOE) for Decision ID 50704, Cypermethrin **Region 9**

San Luis Rey River, Lower (west of Interstate 15)

LOE ID:	78120
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Luis Rey River to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Cypermethrin, total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of cypermethrin does not exceed 0.0002 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Fojut et al. 2012)
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for San Luis Rey River was collected at 1 monitoring site [San Luis Rey River, lower - 903_SMC00153]
Temporal Representation:	Data was collected on a single day 6/8/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

DECISION ID 50709 Region 9

San Luis Rey River, Lower (west of Interstate 15)

Pollutant:	**Deltamethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of zero samples exceeded the guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of zero samples exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50709, Deltamethrin Region 9

San Luis Rey River, Lower (west of Interstate 15)

LOE ID: 76114

Pollutant:	Deltamethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Luis Rey River, Lower (west of Interstate 15) to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Deltamethrin.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for Deltamethrin is the maximum acceptable toxicant concentration (MATC) of 0.02 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for San Luis Rey River, Lower (west of Interstate 15) was collected at 2 monitoring sites [San Luis Rey River - 903SLR-MLS, San Luis Rey River - 903SLR-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/30/2007-12/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID 50730 Region 9

San Luis Rey River, Lower (west of Interstate 15)

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. One of the 31 samples exceed the beneficial use guidelines. Based on the readily available data and information, the weight of evidence indicates that there is

sufficient justification against placing this water segment-pollutant combination on the 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of 31 samples exceeded the guideline and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 50730, Diazinon **Region 9**

San Luis Rey River, Lower (west of Interstate 15)

LOE ID:	76130
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	27
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Luis Rey River, Lower (west of Interstate 15) to determine beneficial use support and results are as follows: 1 of 27 samples exceed the criterion for Diazinon.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Data for this line of evidence for San Luis Rey River, Lower (west of Interstate 15) was collected at 2 monitoring sites [San Luis Rey River - 903SLR-MLS, San Luis Rey River - 903SLR-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/29/2001-12/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston

Line of Evidence (LOE) for Decision ID 50730, Diazinon **Region 9**

San Luis Rey River, Lower (west of Interstate 15)

LOE ID:	76131
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Luis Rey River, Lower (west of Interstate 15) to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Data for this line of evidence for San Luis Rey River, Lower (west of Interstate 15) was collected at 1 monitoring site [San Luis Rey River at Highway 76 (Old Bonsall Bridge)]
Temporal Representation:	Data was collected over the time period 6/29/2006-5/28/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 50739 **Region 9**

San Luis Rey River, Lower (west of Interstate 15)

Pollutant:	**Esfenvalerate/Fenvalerate**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of five

samples exceeded the guideline. 037389

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of five samples exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50739, Esfenvalerate/Fenvalerate **Region 9**

San Luis Rey River, Lower (west of Interstate 15)

LOE ID:	76133
Pollutant:	Esfenvalerate/Fenvalerate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Luis Rey River, Lower (west of Interstate 15) to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Esfenvalerate.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to the USEPA Office of Pesticide Programs Ecotoxicity database, the aquatic life EC50 for Esfenvalerate is 0.9 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for San Luis Rey River, Lower (west of Interstate 15) was collected at 2 monitoring sites [San Luis Rey River - 903SLR-MLS, San Luis Rey River - 903SLR-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/30/2007-12/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup

QAPP Information Reference(s):	Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed. Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID 50701 Region 9

San Luis Rey River, Lower (west of Interstate 15)

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 33 samples exceed the beneficial use guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 33 samples exceeded the guideline and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 50701, Lead Region 9

San Luis Rey River, Lower (west of Interstate 15)

LOE ID:	76152
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	25
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for San Luis Rey River, Lower (west of Interstate 15) to determine beneficial use support and results are as follows: 0 of 25 samples exceed the criterion for Lead.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works

	Watershed Protection Program, 2001-2008. 037391
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Lead to protect aquatic life in freshwater. The dissolved Lead criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Luis Rey River, Lower (west of Interstate 15) was collected at 2 monitoring sites [San Luis Rey River - 903SLR-MLS, San Luis Rey River - 903SLR-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/29/2001-12/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 50701, Lead **Region 9**

San Luis Rey River, Lower (west of Interstate 15)

LOE ID:	76150
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Luis Rey River, Lower (west of Interstate 15) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Luis Rey River, Lower (west of Interstate 15) was collected at 1 monitoring site [San Luis Rey River at Highway 76 (Old Bonsall Bridge)]

Temporal Representation:	Data was collected 6/3/2003 - 5/28/2009. 037392
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 50701, Lead **Region 9**

San Luis Rey River, Lower (west of Interstate 15)

LOE ID:	76149
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for San Luis Rey River to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Luis Rey River was collected at 1 monitoring site [San Luis Rey River, lower - 903_SMC00153]
Temporal Representation:	Data was collected on a single day 6/8/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

DECISION ID 50740 **Region 9**

San Luis Rey River, Lower (west of Interstate 15)

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or	Pollutant

Pollution: 037393

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Two of the twenty-eight samples exceed the GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Two of twenty-eight samples exceeded the GUIDELINE and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 50740, Malathion **Region 9**

San Luis Rey River, Lower (west of Interstate 15)

LOE ID:	76168
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	24
Number of Exceedances:	2
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Luis Rey River, Lower (west of Interstate 15) to determine beneficial use support and results are as follows: 2 of 24 samples exceed the criterion for Malathion.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for San Luis Rey River, Lower (west of Interstate 15) was

	collected at 2 monitoring sites [San Luis Rey River - 903SLR-MLS, San Luis Rey River - 903SLR-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/8/2002-12/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 50740, Malathion **Region 9**

San Luis Rey River, Lower (west of Interstate 15)

LOE ID:	76169
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Luis Rey River, Lower (west of Interstate 15) to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Malathion.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for San Luis Rey River, Lower (west of Interstate 15) was collected at 1 monitoring site [San Luis Rey River at Highway 76 (Old Bonsall Bridge)]
Temporal Representation:	Data was collected over the time period 6/29/2006-5/28/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 52069 **Region 9**

San Luis Rey River, Lower (west of Interstate 15)

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision

Revision Status	Revised	037395
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 25 samples exceed the beneficial use guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 25 samples exceeded the guideline and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 52069, Nickel **Region 9**

San Luis Rey River, Lower (west of Interstate 15)

LOE ID:	76171
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	24
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for San Luis Rey River, Lower (west of Interstate 15) to determine beneficial use support and results are as follows: 0 of 24 samples exceed the criterion for Nickel.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Nickel to protect aquatic life in freshwater. The dissolved Nickel criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Luis Rey River, Lower (west of Interstate 15) was

	collected at 2 monitoring sites [San Luis Rey River - 903SLR-MLS, San Luis Rey River - 903SLR-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/29/2001-12/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 52069, Nickel **Region 9**

San Luis Rey River, Lower (west of Interstate 15)

LOE ID:	76170
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for San Luis Rey River to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Luis Rey River was collected at 1 monitoring site [San Luis Rey River, lower - 903_SMC00153]
Temporal Representation:	Data was collected on a single day 6/8/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

DECISION ID 37417 **Region 9**

San Luis Rey River, Lower (west of Interstate 15)

Pollutant:	**Selenium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**

Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)	037397
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is not being placed on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. Two of the samples exceed the water quality objective for selenium.

Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used does not satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Two of 45 samples exceed the selenium water quality objective and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not exceeded at this time.

Line of Evidence (LOE) for Decision ID 37417, Selenium **Region 9**

San Luis Rey River, Lower (west of Interstate 15)

LOE ID:	21182
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	2
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Three water samples were collected at San Luis Rey River station 903SLSLR2 May 2004, September 2004, March 2005, and April 2005. Two of three samples showed excessive selenium concentrations but one sample was "estimated" according to results in California's Surface Water Ambient Monitoring Program Report, 2007.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (RWQCB, 2007). CTR Freshwater Chronic (CCC) 5 ug/L. (U.S. EPA, 2000).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Water samples were collected at San Luis Rey River station 903SLSLR2.
Temporal Representation:	Samples were collected on May 2004, September 2004, March 2005, and April 2005.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 37417, Selenium **Region 9**

San Luis Rey River, Lower (west of Interstate 15)

LOE ID:	30918
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	15
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Fifteen water samples were collected at San Luis Rey River station. None of the 15 samples showed excessive selenium concentrations.
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (RWQCB, 2007). CTR Freshwater Chronic (CCC) 5 ug/L. (U.S. EPA, 2000).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Water samples were collected at San Luis Rey River under Benet Rd Bridge north of Highway 76.
Temporal Representation:	Samples were collected on from November 2001 through February 2006.
Environmental Conditions:	
QAPP Information:	Quality control for this study was conducted in accordance with the Weston Solution's Quality Assurance Manual.
QAPP Information Reference(s):	Weston Solutions, 2004. Quality Management Manual. March 2004 (Revised December 2009).

Line of Evidence (LOE) for Decision ID 37417, Selenium **Region 9**

San Luis Rey River, Lower (west of Interstate 15)

LOE ID:	76191
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	27	037399
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Luis Rey River, Lower (west of Interstate 15) to determine beneficial use support and results are as follows: 0 of 27 samples exceed the criterion for Selenium.	
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The selenium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater is 0.005 mg/L (California Toxics Rule, 2000).	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for San Luis Rey River, Lower (west of Interstate 15) was collected at 2 monitoring sites [San Luis Rey River - 903SLR-MLS, San Luis Rey River - 903SLR-TWAS-1]	
Temporal Representation:	Data was collected over the time period 11/29/2001-12/16/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.	

DECISION ID 50741 Region 9

San Luis Rey River, Lower (west of Interstate 15)

Pollutant:	**Temperature, water**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the 42 samples exceed the beneficial use guidelines.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 42 samples exceeded the guideline and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50741, Temperature, water **Region 9**

San Luis Rey River, Lower (west of Interstate 15)

LOE ID:	76192
Pollutant:	Temperature, water
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	42
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	One of the 42 samples exceeded the evaluation guideline for temperature in this water body.
Data Reference:	Data for Trash, Nutrients, and Pathogens in Region 9, 2007-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Board that such alteration in temperature does not adversely affect beneficial uses. At no time or place shall the temperature of any COLD water be increased more than 5Â°F above the natural receiving water temperature.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Inland Fishes of California (Moyle 1976) states that for rainbow trout the optimum range for growth and completion of most life stages is 13-21 degrees C (page 129). Since there is no evaluation guideline for assessing temperature for the warm freshwater aquatic life beneficial use, this line of evidence will not be used for Listing Decisions in the 2012 Integrated Report and will be retired for said Listing cycle.
Guideline Reference:	Fish introductions in CA: History and impact on native fishes. Davis, CA: University of CA, Davis
Spatial Representation:	Samples were collected at the following stations: SLR-010-Pacific Coast Highway Bridge SLR-020-Shearer Crossing SLR-030-Douglas Ave Bridge SLR-040-Near Mission Ave where Hwy 76 crosses SLR SLR-050-Old Hwy 395 bridge W side of Interstate 15
Temporal Representation:	Samples were collected between January, 2009 and July, 2010.
Environmental Conditions:	
QAPP Information:	San Diego Regional Water Quality Assessment and Outreach Project Quality Assurance Project Plan Prepared by: Clay Clifton (San Diego Coastkeeper, Local Project Sponsor Manager), Bob Stafford (San Diego Stream Team), Dr. Rick Gersberg (San Diego State University), Bryan Bjorndal (Assure Controls, Inc.), and Morgan Justice-Black (I Love A Clean San Diego).
QAPP Information Reference(s):	

DECISION ID 52109 **Region 9**

San Luis Rey River, Lower (west of Interstate 15)

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**

Last Listing Cycle's Final Listing Decision:	New Decision	037401
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. Zero of the 33 samples exceed the beneficial use guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 33 samples exceeded the guideline and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 52109, Zinc **Region 9**

San Luis Rey River, Lower (west of Interstate 15)

LOE ID:	76218
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Luis Rey River, Lower (west of Interstate 15) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Data for this line of evidence for San Luis Rey River, Lower (west of Interstate 15) was collected at 1 monitoring site [San Luis Rey River at Highway 76 (Old Bonsall Bridge)]
Temporal Representation:	Data was collected 6/3/2003 - 5/28/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 52109, Zinc **Region 9**

San Luis Rey River, Lower (west of Interstate 15)

LOE ID:	76219
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for San Luis Rey River to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Luis Rey River was collected at 1 monitoring site [San Luis Rey River, lower - 903_SMC00153]
Temporal Representation:	Data was collected on a single day 6/8/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

Line of Evidence (LOE) for Decision ID 52109, Zinc **Region 9**

San Luis Rey River, Lower (west of Interstate 15)

LOE ID:	76220
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water

Matrix:	Water	037403
Fraction:	Dissolved	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	25	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for San Luis Rey River, Lower (west of Interstate 15) to determine beneficial use support and results are as follows: 0 of 25 samples exceed the criterion for Zinc.	
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Zinc to protect aquatic life in freshwater. The dissolved Zinc criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for San Luis Rey River, Lower (west of Interstate 15) was collected at 2 monitoring sites [San Luis Rey River - 903SLR-MLS, San Luis Rey River - 903SLR-TWAS-1]	
Temporal Representation:	Data was collected over the time period 11/29/2001-12/16/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.	

DECISION ID 44297 Region 9

San Luis Rey River, Lower (west of Interstate 15)

Pollutant:	**Benthic Community Effects**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: Benthic Community Effects is being considered for placement on the CWA section 303(d) List under sections 3.9 and 3.1 of the Listing Policy. Under section 3.9, an additional line of evidence associating Benthic Community Effects with a water or sediment concentration of pollutant(s) is necessary to assess listing status.

Based on the readily available data and information, the weight of evidence provides sufficient justification for placing Benthic Community Effects in this water segment on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Pursuant to section 3.9 of the Listing Policy, the water exhibits significant degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index.
4. Pursuant to section 3.9 of the Listing Policy, the water segment has associated pollutant(s) samples that exceed water quality objectives.
5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are being met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 44297, Benthic Community Effects **Region 9**

San Luis Rey River, Lower (west of Interstate 15)

LOE ID:	7348
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	15
Number of Exceedances:	15
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	All fifteen samples exceed the water quality objective according to results in the San Diego County Municipal Copermittees Report, 2007. Samples were collected one to four times a year from 2001-2006.
Data Reference:	Water Quality Control Plan for the San Diego Basin Urban Runoff Monitoring, Volume 1- Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. Water Quality Control Plan for the San Diego Basin Goal of 0.1 mg/L for total phosphorus in streams and other flowing waters. (RWQCB, 2007)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at the mass loading station located near the lower boundary of the watershed in Oceanside, under the Benet Road Bridge, north of Highway 76.
Temporal Representation:	Samples were collected one to four times a year from 2001-2006.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44297, Benthic Community Effects **Region 9**

San Luis Rey River, Lower (west of Interstate 15)

LOE ID:	7355	037405

Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	15
Number of Exceedances:	13
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Thirteen of fifteen samples exceed the water quality objective according to the results in San Diego County Municipal Copermittees Annual Progress Report, 2007. Samples were collected one to four times a year from 2001-2006.
Data Reference:	Water Quality Control Plan for the San Diego Basin Urban Runoff Monitoring, Volume 1- Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. (RWQCB, 2007) A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used. (RWQCB, 2007)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at the mass loading station located near the lower boundary of the watershed in Oceanside, under the Benet Road Bridge, north of Highway 76.
Temporal Representation:	Samples were collected one to four times a year from 2001-2006.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44297, Benthic Community Effects **Region 9**

San Luis Rey River, Lower (west of Interstate 15)

LOE ID:	76296
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Luis Rey River, Lower (west

	of Interstate 15) to determine beneficial use support and results are as follows: 4 of 4 samples exceed the criterion for Bifenthrin.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Bifenthrin does not exceed 0.0006 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for San Luis Rey River, Lower (west of Interstate 15) was collected at 2 monitoring sites [San Luis Rey River - 903SLR-MLS, San Luis Rey River - 903SLR-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/30/2007-12/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 44297, Benthic Community Effects **Region 9**

San Luis Rey River, Lower (west of Interstate 15)

LOE ID:	76204
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	27
Number of Exceedances:	7
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Twenty-seven samples were collected to test for toxicity. Seven of the 27 samples exhibited statistically significant toxicity. The toxicity tests that exhibited significant toxicity included survival of Hyalella azteca, growth of Selenastrum capriconutum and reproduction of Ceriodaphnia dubia.
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there

	is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected at stations 903SLR-MLS and 903SLR-TWAS-1, San Luis Rey River.
Temporal Representation:	The samples were collected from 2001 to 2008.
Environmental Conditions:	
QAPP Information:	The data was collected under the County of San Diego Co-Permittees Receiving Waters Urban Runoff Monitoring and Reporting Program (Order No. 2007-01). Data quality is good.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 44297, Benthic Community Effects **Region 9**

San Luis Rey River, Lower (west of Interstate 15)

LOE ID:	23503
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	15
Number of Exceedances:	3
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Selenastrum capricornutum- One of fifteen samples collected were found to be toxic as determined by the Selenastrum capricornutum growth test, Ceriodaphnia dubia survival/reproductive test. Ceriodaphnia dubia- Two of fifteen samples collected were found to be toxic as determined by the Ceriodaphnia dubia survival/reproductive test. Hyalella azteca - None of the fifteen samples collected were found to be toxic as determined by the Hyalella azteca survival test according to results in the San Diego County Municipal Copermittees Report, 2007.
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Samples were found to exhibit toxicity when the No Observed Effect Concentration (NOEC) or median lethal concentration (LC50) for any given species was estimated to be less than 100% of the test sample concentration.
Guideline Reference:	Waste Discharge Requirements for Discharges of Urban Runoff From the Municipal Separate Storm Sewer Systems Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego, the San Diego Unified Port District, and the San Diego County Regional Airport. Order No. R9-2007-0001
Spatial Representation:	Samples were collected at mass loading station under the Benet Rd bridge north of highway 76 on the San Luis Rey River.
Temporal Representation:	Samples were collected at from 2001 through 2006
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with Weston's quality assurance plan.

QAPP Information Reference(s): Weston Solutions, 2004. Quality Management Manual. March 2004 (Revised December 2009).

037408

Line of Evidence (LOE) for Decision ID 44297, Benthic Community Effects **Region 9**

San Luis Rey River, Lower (west of Interstate 15)

LOE ID:	21182
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	2
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Three water samples were collected at San Luis Rey River station 903SLSLR2 May 2004, September 2004, March 2005, and April 2005. Two of three samples showed excessive selenium concentrations but one sample was "estimated" according to results in California's Surface Water Ambient Monitoring Program Report, 2007.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (RWQCB, 2007). CTR Freshwater Chronic (CCC) 5 ug/L. (U.S. EPA, 2000).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Water samples were collected at San Luis Rey River station 903SLSLR2.
Temporal Representation:	Samples were collected on May 2004, September 2004, March 2005, and April 2005.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44297, Benthic Community Effects **Region 9**

San Luis Rey River, Lower (west of Interstate 15)

LOE ID:	7493
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	3
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Selenastrum capricornutum-

	Eight samples were collected and three samples show significant toxicity levels (SL) as determined by the Selenastrum capricornutum growth test. Ceriodaphnia dubia- Eight samples were collected and two samples show significant toxicity levels (SL) as determined by the Ceriodaphnia dubia survival/reproductive test. Hyalella azteca- Eight samples were collected and none show significant toxicity levels (SL) as determined by at least one of the Hyalella azteca survival/growth test according to results in the Surface Water Ambient Monitoring Program Report, 2007. Samples were collected at each site on the following four dates, May 18-19, September 13-14, 2004, March 1-2, April 18 and April 20, 2005.
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms. Fourth Edition. Office of Water, U.S. Environmental Protection Agency. Washington, D.C. EPA-821-R-02-013
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.
Guideline Reference:	Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms. Fourth Edition. Office of Water, U.S. Environmental Protection Agency. Washington, D.C. EPA-821-R-02-013
Spatial Representation:	Samples were collected at monitoring station San Luis Rey River 2 and San Luis Rey River 8.
Temporal Representation:	Samples were collected at each site on the following four dates, May 18-19, September 13-14, 2004, March 1-2, April 18 and April 20, 2005.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical anaylsis of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44297, Benthic Community Effects **Region 9**

San Luis Rey River, Lower (west of Interstate 15)

LOE ID:	7374
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	All four samples exceed the water quality objective according to results in the Surface Water Ambient Monitoring Program Report, 2007. Samples were collected at each site on the following four dates, May 18-19, 2004, September 13- 14, 2004, March 1- 2, 2005, April 18-20, 2005.

Data Reference:	Monitoring data for Region 9	037410
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. Water Quality Control Plan for the San Diego Basin Goal of 0.1 mg/L for total phosphorus in streams and other flowing waters. (RWQCB, 2007)	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:	Water Quality Control Plan for the San Diego Basin	
Spatial Representation:	Samples were collected at San Luis Rey River 8 (station id: 903SLSLR8 lat/long: 33.21494/-117.36837), located on the main stem of the San Luis Rey River.	
Temporal Representation:	Samples were collected at each site on the following four dates, May 18-19, 2004, September 13- 14, 2004, March 1- 2, 2005, April 18- 20, 2005.	
Environmental Conditions:	The first two sampling events occurred during declining and minimum base flow respectively. The third occurred between storm events and the fourth during high base flow.	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.	
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA	

Line of Evidence (LOE) for Decision ID 44297, Benthic Community Effects **Region 9**

San Luis Rey River, Lower (west of Interstate 15)

LOE ID:	76168
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	24
Number of Exceedances:	2
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Luis Rey River, Lower (west of Interstate 15) to determine beneficial use support and results are as follows: 2 of 24 samples exceed the criterion for Malathion.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for San Luis Rey River, Lower (west of Interstate 15) was

	collected at 2 monitoring sites [San Luis Rey River - 903SLR-MLS, San Luis Rey River - 903SLR-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/8/2002-12/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 44297, Benthic Community Effects **Region 9**

San Luis Rey River, Lower (west of Interstate 15)

LOE ID:	76290
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	The one sample collected had an IBI score below 40. The score was 7.2. SMC bioassessment
Data Reference:	Bioassessment Data for Various Pollutants from Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the State or Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	
Spatial Representation:	The samples were collected at 903_SMC00153, San Luis Rey River, lower.
Temporal Representation:	The samples were collected in June 2009.
Environmental Conditions:	
QAPP Information:	The data was collected under the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan, June 25, 2009.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 44297, Benthic Community Effects **Region 9**

San Luis Rey River, Lower (west of Interstate 15)

LOE ID:	79486

Pollutant:	Benthic-Macroinvertebrate Bioassessments	037412
LOE Subgroup:	Population/Community Degradation	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	28	
Number of Exceedances:	24	
Data and Information Type:	Benthic macroinvertebrate surveys	
Data Used to Assess Water Quality:	Of 28 total samples collected at 5 stations, 24 had scores below the 0.79 threshold, and therefore are exceeding the water quality objective for the aquatic life beneficial use. 1 sample was flagged and not included due to low organism counts.	
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008. Bioassessment Data for Various Pollutants from Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009. Region 9 CSCI Scores & Water Body Information	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.	
Guideline Reference:	The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.	
Spatial Representation:	The samples were collected at stations 903SLRR-MLS SMC00153 903SLRR-MR 903SLR-TWAS-1 SMC01717	
Temporal Representation:	The samples were from 2001 to 2009.	
Environmental Conditions:		
QAPP Information:	The data was collected under the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan and the County of San Diego NPDES MS4 Copermittees Receiving Waters Monitoring and Reporting Program	
QAPP Information Reference(s):	Quality Assurance Project Plan for SWAMP Bioassessment and Freshwater Bioassessment. Bioassessment Data for Various Pollutants from Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.	

Line of Evidence (LOE) for Decision ID 44297, Benthic Community Effects **Region 9**

San Luis Rey River, Lower (west of Interstate 15)

LOE ID:	81137
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water

Fraction:	None	037413
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	1	
Data and Information Type:	Benthic macroinvertebrate surveys	
Data Used to Assess Water Quality:	The one sample collected had an IBI score below 40. The score was 0. SMC bioassessment	
Data Reference:	Bioassessment Data for Various Pollutants from Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the State or Regional Board. Region 9 Basin Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.	
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13	
Spatial Representation:	The sample was collected at 903_SMC01717, San Luis Rey River, Couser Cyn Rd.	
Temporal Representation:	The sample was collected in May 2009.	
Environmental Conditions:		
QAPP Information:	The data was collected under the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan, June 25, 2009.	
QAPP Information Reference(s):	e-mail clarifying QAPP information	

Line of Evidence (LOE) for Decision ID 44297, Benthic Community Effects **Region 9**

San Luis Rey River, Lower (west of Interstate 15)

LOE ID:	72766
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	26
Number of Exceedances:	26
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Twenty-six of the 26 samples collected had IBI scores below 40. tr11c NPDES bioassessment
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or

	that produce detrimental physiological responses in, human, plant or animal or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the State or Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	Development of a Benthic Index of Biotic Integrity (B-IBI) for Wadeable Streams in Northern Coastal California and its Application to Regional 305(b) Assessment
Spatial Representation:	The samples were collected at stations SLRR-MR and SLR-TWAS-2, 903SLR-MLS, 903SLRR-BR, and 903SLR-TWAS-1 San Luis Rey River.
Temporal Representation:	The samples were collected twice a year in May and October from 2001 to 2008.
Environmental Conditions:	
QAPP Information:	The data was collected under the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan, June 25, 2009.
QAPP Information Reference(s):	Quality Assurance Project Plan for SWAMP Bioassessment and Freshwater Bioassessment.

Line of Evidence (LOE) for Decision ID 44297, Benthic Community Effects **Region 9**

San Luis Rey River, Lower (west of Interstate 15)

LOE ID:	27028
Pollutant:	Benthic Community Effects
LOE Subgroup:	Adverse Biological Responses
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	37
Number of Exceedances:	37
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Thirty-seven samples of IBI data were taken from May 1998 to May 2007 at two sampling sites. Of the total number of samples, all thirty-seven of the samples exceeded the IBI impairment threshold.
Data Reference:	Stream Bioassessment Data. Co-permitee Data. Collected 2002-2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams.

	Environmental Management. Volume 35, number 1 (2005): pp. 1-13 037415
Spatial Representation:	Samples were collected at four sites: SLRR-BR, SLRR-MR, SLRRFR, and SLR6xx on San Luis Rey River.
Temporal Representation:	Sampling occurred annually over an eight year period from May 1998 to October 2006 and during May 2007.
Environmental Conditions:	
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Manual for Freshwater Bioassessment.
QAPP Information Reference(s):	Quality Assurance Manual for Freshwater Bioassessment Revision 0

Line of Evidence (LOE) for Decision ID 44297, Benthic Community Effects **Region 9**

San Luis Rey River, Lower (west of Interstate 15)

LOE ID:	23502
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	5
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Five of eight samples exceed the water quality objective according to results in the Surface Water Ambient Monitoring Program Report, 2007. Samples were collected at each site on the following four dates, May 18-19, 2004, September 13-14, 2004, March 1-2, 2005, April 18- 20, 2005.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. (RWQCB, 2007) A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used. (RWQCB, 2007)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at monitoring station San Luis Rey River 8 (station id: 903SLSLR8 lat/long: 33.21494/-117.36837).
Temporal Representation:	Samples were collected at each site on the following four dates, May 18-19, 2004, September 13-14, 2004, March 1-2, 2005, April 18- 20, 2005.
Environmental Conditions:	The first two sampling events occurred during declining and minimum base flow respectively. The third sample occurred between storm events and the fourth during high base flow.
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

DECISION ID 49041 Region 9

San Luis Rey River, Lower (west of Interstate 15)

Pollutant:	**Bifenthrin**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2029
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. Four of the four samples exceed the GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Four of four samples exceed the GUIDELINE and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 49041, Bifenthrin Region 9

San Luis Rey River, Lower (west of Interstate 15)

LOE ID:	78131
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Luis Rey River to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Bifenthrin.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.

SWAMP Data:	Non-SWAMP	037417
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The UC Davis Criteria for Bifenthrin for the protection of aquatic organisms is a 4 day average of 0.0006 ug/L (Fojut et al. 2012).	
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.	
Spatial Representation:	Data for this line of evidence for San Luis Rey River was collected at 1 monitoring site [San Luis Rey River, lower - 903_SMC00153]	
Temporal Representation:	Data was collected on a single day 6/8/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.	

Line of Evidence (LOE) for Decision ID 49041, Bifenthrin **Region 9**

San Luis Rey River, Lower (west of Interstate 15)

LOE ID:	76296
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Luis Rey River, Lower (west of Interstate 15) to determine beneficial use support and results are as follows: 4 of 4 samples exceed the criterion for Bifenthrin.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Bifenthrin does not exceed 0.0006 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for San Luis Rey River, Lower (west of Interstate 15) was collected at 2 monitoring sites [San Luis Rey River - 903SLR-MLS, San Luis Rey River - 903SLR-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/30/2007-12/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup

QAPP Information Reference(s):	Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed. Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID 43141 Region 9

San Luis Rey River, Lower (west of Interstate 15)

Pollutant:	**Sulfates**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 one line of evidence is necessary to assess listing status. One line of evidence are available in the administrative record to assess this pollutant. All four of the samples exceed the water quality objective. According to Table 3.2 of the Listing Policy the minimum sample requirement is five. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. All four samples exceeded the sulfate water quality objective and this sample size is insufficient to determine with the power and confidence of the Listing Policy if standards are not met. A minimum of five samples is needed for application of table 3.2. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43141, Sulfates Region 9

San Luis Rey River, Lower (west of Interstate 15)

LOE ID:	23500
Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	4

Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Eight water samples were collected at San Luis Rey River station 903SLSLR8 on May 2004, September 2004, March 2005, and April 2005. All four samples showed excessive sulfate concentrations according to results in California's Surface Water Ambient Monitoring Program Report, 2007.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The recommended secondary drinking water standard for sulfate is 250 mg/l (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Water samples were collected at San Luis Rey River station 903SLSLR8.
Temporal Representation:	Samples were collected on May 2004, September 2004, March 2005, and April 2005.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	

DECISION ID 34482 Region 9

San Luis Rey River, Lower (west of Interstate 15)

Pollutant:	**Chloride**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. 303(d) listing decisions made prior to 2006 were not held in an assessment database. The Regional Boards will update this decision when new data and information become available and are assessed.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34482, Chloride Region 9

San Luis Rey River, Lower (west of Interstate 15)

LOE ID:	4728
Pollutant:	Chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	Unspecified
Guideline Reference:	Placeholder reference pre-2006 303(d)
Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

DECISION ID 43658 Region 9

San Luis Rey River, Lower (west of Interstate 15)

Pollutant:	**Nitrogen**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Eighteen of the 23 samples exceed the water quality objective for total nitrogen.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Eighteen of 23 samples exceed the total nitrogen water quality objective and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43658, Nitrogen Region 9

San Luis Rey River, Lower (west of Interstate 15) 037421

LOE ID:	7355
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	15
Number of Exceedances:	13
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Thirteen of fifteen samples exceed the water quality objective according to the results in San Diego County Municipal Copermittees Annual Progress Report, 2007. Samples were collected one to four times a year from 2001-2006.
Data Reference:	Water Quality Control Plan for the San Diego Basin Urban Runoff Monitoring, Volume 1- Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. (RWQCB, 2007) A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used. (RWQCB, 2007)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at the mass loading station located near the lower boundary of the watershed in Oceanside, under the Benet Road Bridge, north of Highway 76.
Temporal Representation:	Samples were collected one to four times a year from 2001-2006.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43658, Nitrogen **Region 9**

San Luis Rey River, Lower (west of Interstate 15)

LOE ID:	23502
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	5

Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only) 037422
Data Used to Assess Water Quality:	Five of eight samples exceed the water quality objective according to results in the Surface Water Ambient Monitoring Program Report, 2007. Samples were collected at each site on the following four dates, May 18-19, 2004, September 13-14, 2004, March 1-2, 2005, April 18- 20, 2005.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. (RWQCB, 2007) A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used. (RWQCB, 2007)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at monitoring station San Luis Rey River 8 (station id: 903SLSLR8 lat/long: 33.21494/-117.36837).
Temporal Representation:	Samples were collected at each site on the following four dates, May 18-19, 2004, September 13-14, 2004, March 1-2, 2005, April 18- 20, 2005.
Environmental Conditions:	The first two sampling events occurred during declining and minimum base flow respectively. The third sample occurred between storm events and the fourth during high base flow.
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

DECISION ID 37416 Region 9

San Luis Rey River, Lower (west of Interstate 15)

Pollutant:	**Phosphorus**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. All of the 19 samples exceed the water quality objective for phosphorus.

Based on the readily available data and information, the weight of evidence indicates that there is

sufficient justification in favor of placing this water segment-pollutant combination on the Section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. All 19 samples exceed the phosphorus water quality objective and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 37416, Phosphorus **Region 9**

San Luis Rey River, Lower (west of Interstate 15)

LOE ID:	7348
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	15
Number of Exceedances:	15
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	All fifteen samples exceed the water quality objective according to results in the San Diego County Municipal Copermittees Report, 2007. Samples were collected one to four times a year from 2001-2006.
Data Reference:	Water Quality Control Plan for the San Diego Basin Urban Runoff Monitoring, Volume 1- Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. Water Quality Control Plan for the San Diego Basin Goal of 0.1 mg/L for total phosphorus in streams and other flowing waters. (RWQCB, 2007)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at the mass loading station located near the lower boundary of the watershed in Oceanside, under the Benet Road Bridge, north of Highway 76.
Temporal Representation:	Samples were collected one to four times a year from 2001-2006.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 37416, Phosphorus **Region 9**

San Luis Rey River, Lower (west of Interstate 15)

LOE ID:	7374	037424

Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	All four samples exceed the water quality objective according to results in the Surface Water Ambient Monitoring Program Report, 2007. Samples were collected at each site on the following four dates, May 18-19, 2004, September 13- 14, 2004, March 1- 2, 2005, April 18-20, 2005.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. Water Quality Control Plan for the San Diego Basin Goal of 0.1 mg/L for total phosphorus in streams and other flowing waters. (RWQCB, 2007)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at San Luis Rey River 8 (station id: 903SLSLR8 lat/long: 33.21494/-117.36837), located on the main stem of the San Luis Rey River.
Temporal Representation:	Samples were collected at each site on the following four dates, May 18-19, 2004, September 13- 14, 2004, March 1- 2, 2005, April 18- 20, 2005.
Environmental Conditions:	The first two sampling events occurred during declining and minimum base flow respectively. The third occurred between storm events and the fourth during high base flow.
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

DECISION ID **34548** **Region 9**

San Luis Rey River, Lower (west of Interstate 15)

Pollutant:	**Total Dissolved Solids**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. 303(d) listing decisions made prior to 2006 were not held in an assessment database. The Regional Boards will update this decision when new data and information become available and are assessed.

Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34548, Total Dissolved Solids **Region 9**

San Luis Rey River, Lower (west of Interstate 15)

LOE ID:	4729
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Agricultural Supply
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	Unspecified
Guideline Reference:	Placeholder reference pre-2006 303(d)
Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Loma Alta Creek
Water Body ID: CAR9041000019991117145300
Water Body Type: River & Stream

DECISION ID 43254 **Region 9**
Loma Alta Creek

Pollutant: **Selenium**
Final Listing Decision: **Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Sources: Source Unknown
Expected TMDL Completion Date: 2019
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the section 303(d) list under section 4.1 of the Listing Policy. Under section 4.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Four of the Eight samples exceed the water quality criteria for Selenium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Four of the Eight samples exceed the CTR value for Se and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 43254, Selenium **Region 9**
Loma Alta Creek

LOE ID: 21384

Pollutant: Toxicity
LOE Subgroup: Toxicity
Matrix: Water
Fraction: None

Beneficial Use: Warm Freshwater Habitat

Number of Samples:	4	037427
Number of Exceedances:	4	
Data and Information Type:	Ambient toxicity testing (chronic)	
Data Used to Assess Water Quality:	Four samples were collected at Loma Alta Creek station 3, 904CBLAC3 from March 2002 to September 2002. The tests showed significant toxicity levels (SL) in the following tests: Selenastrum algae growth test - All four samples exhibited toxicity. Ceriodaphnia dubia survival/reproductive test - three of the four samples exhibited toxicity. Toxicity testing was part of California's Surface Water Ambient Monitoring Program Report, 2007.	
Data Reference:	Monitoring data for Region 9	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.	
Guideline Reference:	Monitoring data for Region 9	
Spatial Representation:	Water Toxicity Samples were collected at Loma Alta Creek station 3 (904CBLAC3). (Latitude 33.2000, Longitude -117.3306).	
Temporal Representation:	Samples were collected on March, April, June and September 2002.	
Environmental Conditions:		
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.	
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA	

Line of Evidence (LOE) for Decision ID 43254, Selenium **Region 9**

Loma Alta Creek

LOE ID:	74143
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Four samples were collected to test for toxicity. Four of the four samples exhibited statistically significant toxicity. The toxicity tests that exhibited significant toxicity included survival of Hyalella azteca, reproduction of Ceriodaphnia dubia, and growth of Selenastrum capriconutum.
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life

Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	037428
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.	
Guideline Reference:		
Spatial Representation:	The samples were collected at station 904LAC-TWAS-1 Loma Alta Creek.	
Temporal Representation:	The samples were collected from 2007 to 2008.	
Environmental Conditions:		
QAPP Information:	The data was collected under the County of San Diego Co-Permittees Receiving Waters Urban Runoff Monitoring and Reporting Program (Order No. 2007-01). Data quality is good.	
QAPP Information Reference(s):	e-mail clarifying QAPP information	

Line of Evidence (LOE) for Decision ID 43254, Selenium **Region 9**

Loma Alta Creek

LOE ID:	8875
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	3
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Four water samples were collected at Loma Alta Creek station 904CBLAC3 on March, April, June and September 2002. All samples showed excessive selenium concentrations according to results in California's Surface Water Ambient Monitoring Program Report, 2007.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	CTR Freshwater Chronic (CCC) 5 ug/L; (U.S. EPA, 2000).
Objective/Criterion Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Water samples were collected at Loma Alta Creek station 3 904CBLAC3; (Latitude 33.2000659, Longitude -117.330675).
Temporal Representation:	Samples were collected on March, April, June and September 2002.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 43254, Selenium **Region 9**

Loma Alta Creek

LOE ID:	77791

Pollutant:	Selenium	037429
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	Dissolved	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	4	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Loma Alta Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Selenium.	
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The selenium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater is 0.005 mg/L (California Toxics Rule, 2000).	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Loma Alta Creek was collected at 1 monitoring site [Loma Alta Creek - 904LAC-TWAS-1]	
Temporal Representation:	Data was collected over the time period 9/19/2007-5/14/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.	

DECISION ID	**43222**	**Region 9**
Loma Alta Creek		

Pollutant:	**Toxicity**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the section 303(d) list under section 3.6 of the Listing Policy. Under section 3.6 a single line of evidence is necessary to assess listing status. Seven lines of evidence are available in the administrative record to assess this pollutant. Eight out of Eight samples exhibited water toxicity, and Two out of Four samples exhibited sediment toxicity. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Eight out of Eight samples exhibited water toxicity, and Two out of Four samples exhibited sediment toxicity and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, this water body is also impaired for water concentrations of Bifenthrin and Selenium and has also exhibited signs of biological population and community degradation.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 43222, Toxicity **Region 9**

Loma Alta Creek

LOE ID:	74148
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	2
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Loma Alta Creek to determine beneficial use support and results are as follows: 2 of 2 samples exceed the criterion for Bifenthrin.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Bifenthrin does not exceed 0.0006 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Loma Alta Creek was collected at 1 monitoring site [Loma Alta Creek - 904LAC-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/30/2007-2/3/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 43222, Toxicity 037431 Region 9

Loma Alta Creek

LOE ID:	26415
Pollutant:	Benthic Community Effects
LOE Subgroup:	Adverse Biological Responses
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	11
Number of Exceedances:	11
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Eleven samples of IBI data were taken from May 1998 to November 2000 at two sampling sites. All 11 samples exceeded the IBI impairment threshold.
Data Reference:	Fish and Game IBI Data
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at two sites: 904LACECR and 904LACCBx on Loma Alta Creek.
Temporal Representation:	Sampling occurred during two to three events from May 1998 to November 2000.
Environmental Conditions:	
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Project Plan for the California Stream Bioassessment Procedure and the State of California, California Monitoring an Assessment Program: "CMAP", Quality Assurance Project Plan.
QAPP Information Reference(s):	State of California, California Monitoring and Assessment Program: "CMAP". Quality Assurance Project Plan for the California Stream Bioassessment Procedure The San Diego Stream Team Quality Assurance Project Plan

Line of Evidence (LOE) for Decision ID 43222, Toxicity Region 9

Loma Alta Creek

LOE ID:	79488
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	8
Number of Exceedances:	8
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Eight of the eight samples collected were below the 0.79 threshold, and are therefore exceeding the water quality objective for the aquatic life beneficial use.
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008. Region 9 CSCI Scores & Water Body Information
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.
Guideline Reference:	The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.
Spatial Representation:	The samples were collected at stations 904LAC-TWAS-1, LAC-CB, and LAC-ECR on Loma Alta Creek.
Temporal Representation:	The samples were collected in May and October 2001 to 2002 and in May 2008 and 2008.
Environmental Conditions:	
QAPP Information:	County of San Diego NPDES MS4 Copermittees Receiving Waters Monitoring and Reporting Program
QAPP Information Reference(s):	Quality Assurance Project Plan for SWAMP Bioassessment and Freshwater Bioassessment.

Line of Evidence (LOE) for Decision ID 43222, Toxicity **Region 9**

Loma Alta Creek

LOE ID:	26722
Pollutant:	Benthic Community Effects
LOE Subgroup:	Adverse Biological Responses
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	7
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Seven samples of IBI data were taken from May 2001 to October 2002 at two sampling sites. All seven of the samples exceeded the IBI impairment threshold.
Data Reference:	Stream Bioassessment Data. Co-permitee Data. Collected 2002-2007

SWAMP Data:	Non-SWAMP	037433
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)	
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13	
Spatial Representation:	Samples were collected at two sites: LAC-CB and LAC-ECR on Loma Alta Creek.	
Temporal Representation:	Sampling occurred during May and October in 2001 and 2002.	
Environmental Conditions:		
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Manual for Freshwater Bioassessment.	
QAPP Information Reference(s):	Quality Assurance Manual for Freshwater Bioassessment Revision 0	

Line of Evidence (LOE) for Decision ID 43222, Toxicity **Region 9**

Loma Alta Creek

LOE ID:	21384
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Four samples were collected at Loma Alta Creek station 3, 904CBLAC3 from March 2002 to September 2002. The tests showed significant toxicity levels (SL) in the following tests: Selenastrum algae growth test - All four samples exhibited toxicity. Ceriodaphnia dubia survival/reproductive test - three of the four samples exhibited toxicity. Toxicity testing was part of California's Surface Water Ambient Monitoring Program Report, 2007.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.

Guideline Reference:	Monitoring data for Region 9	037434
Spatial Representation:	Water Toxicity Samples were collected at Loma Alta Creek station 3 (904CBLAC3). (Latitude 33.2000, Longitude -117.3306).	
Temporal Representation:	Samples were collected on March, April, June and September 2002.	
Environmental Conditions:		
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.	
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA	

Line of Evidence (LOE) for Decision ID 43222, Toxicity **Region 9**

Loma Alta Creek

LOE ID:	8875
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	3
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Four water samples were collected at Loma Alta Creek station 904CBLAC3 on March, April, June and September 2002. All samples showed excessive selenium concentrations according to results in California's Surface Water Ambient Monitoring Program Report, 2007.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	CTR Freshwater Chronic (CCC) 5 ug/L; (U.S. EPA, 2000).
Objective/Criterion Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Water samples were collected at Loma Alta Creek station 3 904CBLAC3; (Latitude 33.2000659, Longitude -117.330675).
Temporal Representation:	Samples were collected on March, April, June and September 2002.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 43222, Toxicity **Region 9**

Loma Alta Creek

LOE ID:	74143
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None

Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Four samples were collected to test for toxicity. Four of the four samples exhibited statistically significant toxicity. The toxicity tests that exhibited significant toxicity included survival of Hyalella azteca, reproduction of Ceriodaphnia dubia, and growth of Selenastrum capriconutum.
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected at station 904LAC-TWAS-1 Loma Alta Creek.
Temporal Representation:	The samples were collected from 2007 to 2008.
Environmental Conditions:	
QAPP Information:	The data was collected under the County of San Diego Co-Permittees Receiving Waters Urban Runoff Monitoring and Reporting Program (Order No. 2007-01). Data quality is good.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 43222, Toxicity **Region 9**

Loma Alta Creek

LOE ID:	26774
Pollutant:	Sediment Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	2
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Four samples were collected at Loma Alta Creek station 3, 904CBLAC3 from March 2002 to September 2002. The tests showed significant toxicity levels (SL) in the following tests: Hyalella azteca - Two of the four samples exhibited toxicity. Toxicity testing was part of California's Surface Water Ambient Monitoring Program Report, 2007.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.

Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	037436
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.	
Guideline Reference:	Monitoring data for Region 9	
Spatial Representation:	Water Toxicity Samples were collected at Loma Alta Creek station 3 (904CBLAC3). (Latitude 33.2000, Longitude -117.3306).	
Temporal Representation:	Samples were collected on March, April, June and September 2002.	
Environmental Conditions:		
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.	
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA	

DECISION ID 49263 Region 9

Loma Alta Creek

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the Four samples exceed the Water Quality Criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Four samples exceeded the Water Quality Criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49263, Arsenic Region 9

Loma Alta Creek

LOE ID:	74145
Pollutant:	Arsenic

LOE Subgroup:	Pollutant-Water	037437
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	4	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Loma Alta Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Arsenic.	
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The dissolved arsenic criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved arsenic is 0.150 mg/L (California Toxics Rule, 2000).	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Loma Alta Creek was collected at 1 monitoring site [Loma Alta Creek - 904LAC-TWAS-1]	
Temporal Representation:	Data was collected over the time period 9/19/2007-5/14/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.	

DECISION ID	49266	Region 9
Loma Alta Creek		

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. [NUMBER] of the [NUMBER] samples exceed the [OBJECTIVE/GUIDELINE/CRITERIA]. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.

2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 937438
3. [NUMBER] of [NUMBER] samples exceeded the [OBJECTIVE/GUIDELINE/CRITERIA] and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of ____samples is needed to determine if a beneficial use is fully supported using table _____.
4. Pursuant to [SECTION 3.11/4.11] of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 49266, Cadmium **Region 9**

Loma Alta Creek

LOE ID:	74149
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Loma Alta Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Cadmium.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Cadmium to protect aquatic life in freshwater. The dissolved Cadmium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Loma Alta Creek was collected at 1 monitoring site [Loma Alta Creek - 904LAC-TWAS-1]
Temporal Representation:	Data was collected over the time period 9/19/2007-5/14/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID **49397** **Region 9**

Loma Alta Creek

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the Four samples exceed the Water Quality Criteria for Chlorpyrifos.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Four samples exceeded the Water Quality Criteria for Chlorpyrifos and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49397, Chlorpyrifos **Region 9**

Loma Alta Creek

LOE ID:	77789
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Loma Alta Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are

	harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.014 ug/L (Siepmann and Finlayson 2000).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).
Spatial Representation:	Data for this line of evidence for Loma Alta Creek was collected at 1 monitoring site [Loma Alta Creek - 904LAC-TWAS-1]
Temporal Representation:	Data was collected over the time period 9/19/2007-5/14/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID 49399 Region 9

Loma Alta Creek

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the Four samples exceed the Water Quality Criteria for Chromium. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Four samples exceeded the Water Quality Criteria for Chromium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49399, Chromium Region 9

Loma Alta Creek 037441

LOE ID:	74151
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Loma Alta Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Chromium.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Chromium to protect aquatic life in freshwater. The dissolved Chromium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Loma Alta Creek was collected at 1 monitoring site [Loma Alta Creek - 904LAC-TWAS-1]
Temporal Representation:	Data was collected over the time period 9/19/2007-5/14/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID **49400** **Region 9**

Loma Alta Creek

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the Four samples exceed the Water Quality Criteria for Copper.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Four samples exceeded the Water Quality Criteria for Copper and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49400, Copper **Region 9**

Loma Alta Creek

LOE ID:	74152
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Loma Alta Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Copper.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Copper to protect aquatic life in freshwater. The dissolved Copper criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Loma Alta Creek was collected at 1 monitoring site [Loma Alta Creek - 904LAC-TWAS-1]
Temporal Representation:	Data was collected over the time period 9/19/2007-5/14/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.

QAPP Information Reference(s): Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

037443

DECISION ID	49401	Region 9
Loma Alta Creek		

Pollutant:	**Cypermethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the Zero samples exceed the Water Quality Criteria for Cypermethrin.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Zero samples exceeded the and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49401, Cypermethrin	Region 9
Loma Alta Creek	

LOE ID:	74154
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	The reporting limit of the assessment used for these samples is greater than the objective for this pollutant, and therefore both of the samples had to be thrown out in accordance with section 6.1.5.5 of the Listing Policy. Water Board staff assessed County of San Diego data for Loma Alta Creek to determine beneficial use support and results are as follows: 0 of 0

samples exceed the criterion for Cypermethrin, total. 037444

Data Reference: Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).

Objective/Criterion Reference: Water Quality Control Plan for the San Diego Basin

Evaluation Guideline: UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of cypermethrin does not exceed 0.0002 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Fojut et al. 2012)

Guideline Reference: Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.

Spatial Representation: Data for this line of evidence for Loma Alta Creek was collected at 1 monitoring site [Loma Alta Creek - 904LAC-TWAS-1]

Temporal Representation: Data was collected over the time period 11/30/2007-2/3/2008.

Environmental Conditions: Staff is not aware of any special conditions that might affect interpretation of the data.

QAPP Information: The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.

QAPP Information Reference(s): Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID	**49402**	**Region 9**
Loma Alta Creek		

Pollutant: **Deltamethrin**

Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**

Last Listing Cycle's Final Listing Decision: New Decision

Revision Status Revised

Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the Two samples exceed the Water Quality Criteria for Deltamethrin.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Two samples exceeded the Water Quality Criteria for Deltamethrin and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49402, Deltamethrin **Region 9**

Loma Alta Creek

LOE ID:	74155
Pollutant:	Deltamethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Loma Alta Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Deltamethrin.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for Deltamethrin is the maximum acceptable toxicant concentration (MATC) of 0.02 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Loma Alta Creek was collected at 1 monitoring site [Loma Alta Creek - 904LAC-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/30/2007-2/3/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID **49405** **Region 9**

Loma Alta Creek

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised

Impairment from Pollutant or Pollution:	Pollutant	037446

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the Four samples exceed the Water Quality Criteria for Diazinon.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Four samples exceeded the Water Quality Criteria for Diazinon and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49405, Diazinon **Region 9**

Loma Alta Creek

LOE ID:	74157
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Loma Alta Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Diazinon.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).

Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Data for this line of evidence for Loma Alta Creek was collected at 1 monitoring site [Loma Alta Creek - 904LAC-TWAS-1]
Temporal Representation:	Data was collected over the time period 9/19/2007-5/14/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID	49406	Region 9
Loma Alta Creek		

Pollutant:	**Esfenvalerate/Fenvalerate**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the Two samples exceed the Evaluation Guideline for Esfenvalerate/Fenvalerate. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Two samples exceeded the Evaluation Guideline for Esfenvalerate/Fenvalerate and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49406, Esfenvalerate/Fenvalerate	Region 9
Loma Alta Creek	

LOE ID:	74158
Pollutant:	Esfenvalerate/Fenvalerate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Loma Alta Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Esfenvalerate.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to the USEPA Office of Pesticide Programs Ecotoxicity database, the aquatic life EC50 for Esfenvalerate is 0.9 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Loma Alta Creek was collected at 1 monitoring site [Loma Alta Creek - 904LAC-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/30/2007-2/3/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID	**49407**	**Region 9**
Loma Alta Creek		

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the Four samples exceed the Water Quality Criteria for Lead.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.

3. Zero of Four samples exceeded the Water Quality Criteria for Lead and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49407, Lead **Region 9**
Loma Alta Creek

LOE ID:	74159
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Loma Alta Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Lead.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Lead to protect aquatic life in freshwater. The dissolved Lead criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Loma Alta Creek was collected at 1 monitoring site [Loma Alta Creek - 904LAC-TWAS-1]
Temporal Representation:	Data was collected over the time period 9/19/2007-5/14/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID **49408** **Region 9**
Loma Alta Creek

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. One of the Four samples exceed the Water Quality Criteria for Malathion. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of Four samples exceeded the Water Quality Criteria for Malathion and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49408, Malathion **Region 9**

Loma Alta Creek

LOE ID:	74160
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Loma Alta Creek to determine beneficial use support and results are as follows: 1 of 4 samples exceed the criterion for Malathion.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are

	harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for Loma Alta Creek was collected at 1 monitoring site [Loma Alta Creek - 904LAC-TWAS-1]
Temporal Representation:	Data was collected over the time period 9/19/2007-5/14/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID	49409	Region 9
Loma Alta Creek		

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the Four samples exceed the Water Quality Criteria for Nickel. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Four samples exceeded the Water Quality Criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49409, Nickel	Region 9
Loma Alta Creek	

LOE ID:	74161	037452

Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Loma Alta Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Nickel.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Nickel to protect aquatic life in freshwater. The dissolved Nickel criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California, 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Loma Alta Creek was collected at 1 monitoring site [Loma Alta Creek - 904LAC-TWAS-1]
Temporal Representation:	Data was collected over the time period 9/19/2007-5/14/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID	**49410**	**Region 9**
Loma Alta Creek		

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the Four samples exceed the Water Quality Criteria for Zinc. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section

303(d) List. 037453

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Four samples exceeded the Water Quality Criteria for Zinc and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49410, Zinc **Region 9**

Loma Alta Creek

LOE ID:	74144
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Loma Alta Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Zinc.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Zinc to protect aquatic life in freshwater. The dissolved Zinc criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Loma Alta Creek was collected at 1 monitoring site [Loma Alta Creek - 904LAC-TWAS-1]
Temporal Representation:	Data was collected over the time period 9/19/2007-5/14/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID	44526	Region 9
Loma Alta Creek		

Pollutant:	**Benthic Community Effects**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Contaminated Sediments | Hydromodification | Illicit Connections/Illegal Hook-ups/Dry Weather Flows | Source Unknown | Unknown Point Source | Urban Runoff/Storm Sewers
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Benthic Community Effects is being considered for placement on the CWA section 303(d) List under sections 3.9 and 3.1 of the Listing Policy. Under section 3.9, an additional line of evidence associating Benthic Community Effects with a water or sediment concentration of pollutant(s) is necessary to assess listing status. Based on the readily available data and information, the weight of evidence provides sufficient justification for placing Benthic Community Effects in this water segment on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Pursuant to section 3.9 of the Listing Policy, the water exhibits significant degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index. 4. Pursuant to section 3.9 of the Listing Policy, the water segment has associated pollutant(s) samples that exceed water quality objectives. 5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are being met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant(s) contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 44526, Benthic Community Effects	**Region 9**
Loma Alta Creek	

LOE ID:	26722
Pollutant:	Benthic Community Effects
LOE Subgroup:	Adverse Biological Responses
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	7
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Seven samples of IBI data were taken from May 2001 to October 2002 at two sampling sites. All seven of the samples exceeded the IBI impairment threshold.
Data Reference:	Stream Bioassessment Data. Co-permitee Data. Collected 2002-2007

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at two sites: LAC-CB and LAC-ECR on Loma Alta Creek.
Temporal Representation:	Sampling occurred during May and October in 2001 and 2002.
Environmental Conditions:	
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Manual for Freshwater Bioassessment.
QAPP Information Reference(s):	Quality Assurance Manual for Freshwater Bioassessment Revision 0

Line of Evidence (LOE) for Decision ID 44526, Benthic Community Effects **Region 9**

Loma Alta Creek

LOE ID:	72763
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	8
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Eight of the eight samples collected had an IBI score below 40. tr11c NPDES bioassessment
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the State or Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired

	conditions. 037456
Guideline Reference:	Development of a Benthic Index of Biotic Integrity (B-IBI) for Wadeable Streams in Northern Coastal California and its Application to Regional 305(b) Assessment
Spatial Representation:	The samples were collected at stations 904LAC-TWAS-1, LAC-CB, and LAC-ECR on Loma Alta Creek.
Temporal Representation:	The samples were collected in May and October 2001 to 2002 and in May 2008 and 2008.
Environmental Conditions:	
QAPP Information:	The data was collected under the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan, June 25, 2009.
QAPP Information Reference(s):	Quality Assurance Project Plan for SWAMP Bioassessment and Freshwater Bioassessment.

Line of Evidence (LOE) for Decision ID 44526, Benthic Community Effects **Region 9**

Loma Alta Creek

LOE ID:	26415
Pollutant:	Benthic Community Effects
LOE Subgroup:	Adverse Biological Responses
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	11
Number of Exceedances:	11
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Eleven samples of IBI data were taken from May 1998 to November 2000 at two sampling sites. All 11 samples exceeded the IBI impairment threshold.
Data Reference:	Fish and Game IBI Data
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at two sites: 904LACECR and 904LACCBx on Loma Alta Creek.
Temporal Representation:	Sampling occurred during two to three events from May 1998 to November 2000.
Environmental Conditions:	
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Project Plan for the California Stream Bioassessment Procedure and the State of California, California Monitoring an Assessment Program: "CMAP", Quality Assurance Project Plan.
QAPP Information Reference(s):	State of California, California Monitoring and Assessment Program: "CMAP". Quality Assurance Project Plan for the California Stream Bioassessment Procedure The San Diego Stream Team Quality Assurance Project Plan

Line of Evidence (LOE) for Decision ID 44526, Benthic Community Effects **Region 9**

Loma Alta Creek

LOE ID:	8875
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	3
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Four water samples were collected at Loma Alta Creek station 904CBLAC3 on March, April, June and September 2002. All samples showed excessive selenium concentrations according to results in California's Surface Water Ambient Monitoring Program Report, 2007.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	CTR Freshwater Chronic (CCC) 5 ug/L; (U.S. EPA, 2000).
Objective/Criterion Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Water samples were collected at Loma Alta Creek station 3 904CBLAC3; (Latitude 33.2000659, Longitude -117.330675).
Temporal Representation:	Samples were collected on March, April, June and September 2002.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 44526, Benthic Community Effects **Region 9**

Loma Alta Creek

LOE ID:	26774
Pollutant:	Sediment Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	2
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Four samples were collected at Loma Alta Creek station 3, 904CBLAC3 from March 2002 to September 2002. The tests showed significant toxicity levels (SL) in the following tests: Hyalella azteca - Two of the four samples exhibited toxicity. Toxicity testing was part of

	California's Surface Water Ambient Monitoring Program Report, 2007. 037458
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.
Guideline Reference:	Monitoring data for Region 9
Spatial Representation:	Water Toxicity Samples were collected at Loma Alta Creek station 3 (904CBLAC3). (Latitude 33.2000, Longitude -117.3306).
Temporal Representation:	Samples were collected on March, April, June and September 2002.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 44526, Benthic Community Effects **Region 9**

Loma Alta Creek

LOE ID:	74148
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	2
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Loma Alta Creek to determine beneficial use support and results are as follows: 2 of 2 samples exceed the criterion for Bifenthrin.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Bifenthrin does not exceed 0.0006 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.

Spatial Representation:	Data for this line of evidence for Loma Alta Creek was collected at 1 monitoring site [Loma Alta Creek - 904LAC-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/30/2007-2/3/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 44526, Benthic Community Effects **Region 9**

Loma Alta Creek

LOE ID:	74143
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Four samples were collected to test for toxicity. Four of the four samples exhibited statistically significant toxicity. The toxicity tests that exhibited significant toxicity included survival of Hyalella azteca, reproduction of Ceriodaphnia dubia, and growth of Selenastrum capriconutum.
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected at station 904LAC-TWAS-1 Loma Alta Creek.
Temporal Representation:	The samples were collected from 2007 to 2008.
Environmental Conditions:	
QAPP Information:	The data was collected under the County of San Diego Co-Permittees Receiving Waters Urban Runoff Monitoring and Reporting Program (Order No. 2007-01). Data quality is good.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 44526, Benthic Community Effects **Region 9**

Loma Alta Creek

LOE ID:	79488
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation

Matrix:	Water	037460
Fraction:	None	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	8	
Number of Exceedances:	8	
Data and Information Type:	Benthic macroinvertebrate surveys	
Data Used to Assess Water Quality:	Eight of the eight samples collected were below the 0.79 threshold, and are therefore exceeding the water quality objective for the aquatic life beneficial use.	
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008. Region 9 CSCI Scores & Water Body Information	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.	
Guideline Reference:	The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.	
Spatial Representation:	The samples were collected at stations 904LAC-TWAS-1, LAC-CB, and LAC-ECR on Loma Alta Creek.	
Temporal Representation:	The samples were collected in May and October 2001 to 2002 and in May 2008 and 2008.	
Environmental Conditions:		
QAPP Information:	County of San Diego NPDES MS4 Copermittees Receiving Waters Monitoring and Reporting Program	
QAPP Information Reference(s):	Quality Assurance Project Plan for SWAMP Bioassessment and Freshwater Bioassessment.	

Line of Evidence (LOE) for Decision ID 44526, Benthic Community Effects **Region 9**

Loma Alta Creek

LOE ID:	3169
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Not Specified
Fraction:	None
Beneficial Use:	Non-Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys

Data Used to Assess Water Quality:	Data was collected for the San Diego Regional Water Quality Control Board 1999 Biological Assessment Report. Samples were collected at one location (near College Blvd) in Loma Alta Creek. Samples were collected from May 1998-May 1999. Bioassessment metrics were used to describe characteristics of the macroinvertebrate community. Physical habitat quality scores were given. The Loma Alta Creek site scored lower relative to other creeks in the region. BMI ranking scores were also given to each sample location for each sampling event. In all four sampling events, the BMI ranking for Loma Alta Creek was below average compared to the other creeks in the region. In 3 out of 4 events, it received a score of poor. (SDRWQCB, 1999a)
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	
Objective/Criterion Reference:	
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected along Loma Alta Creek at 5 riffles downstream of College Blvd.
Temporal Representation:	Samples were collected in May 1998, September 1998, November 1998, and May 1999.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44526, Benthic Community Effects **Region 9**

Loma Alta Creek

LOE ID:	21384
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Four samples were collected at Loma Alta Creek station 3, 904CBLAC3 from March 2002 to September 2002. The tests showed significant toxicity levels (SL) in the following tests: Selenastrum algae growth test - All four samples exhibited toxicity. Ceriodaphnia dubia survival/reproductive test - three of the four samples exhibited toxicity. Toxicity testing was part of California's Surface Water Ambient Monitoring Program Report, 2007.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.
Guideline Reference:	Monitoring data for Region 9

Spatial Representation:	Water Toxicity Samples were collected at Loma Alta Creek station 3 (904CBLAC3). (Latitude 33.2000, Longitude -117.3306).
Temporal Representation:	Samples were collected on March, April, June and September 2002.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

DECISION ID 49396 Region 9

Loma Alta Creek

Pollutant:	**Bifenthrin**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2027
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Two of the Two samples exceed the Water Quality Criteria for Bifenthrin.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Two of Two samples exceed the Water Quality Criteria for Bifenthrin and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 49396, Bifenthrin Region 9

Loma Alta Creek

LOE ID:	74148
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2

Number of Exceedances:	2	037463
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Loma Alta Creek to determine beneficial use support and results are as follows: 2 of 2 samples exceed the criterion for Bifenthrin.	
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Bifenthrin does not exceed 0.0006 ug/L.	
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.	
Spatial Representation:	Data for this line of evidence for Loma Alta Creek was collected at 1 monitoring site [Loma Alta Creek - 904LAC-TWAS-1]	
Temporal Representation:	Data was collected over the time period 11/30/2007-2/3/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.	

Line of Evidence (LOE) for Decision ID 49396, Bifenthrin **Region 9**

Loma Alta Creek

LOE ID:	21384
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Four samples were collected at Loma Alta Creek station 3, 904CBLAC3 from March 2002 to September 2002. The tests showed significant toxicity levels (SL) in the following tests: Selenastrum algae growth test - All four samples exhibited toxicity. Ceriodaphnia dubia survival/reproductive test - three of the four samples exhibited toxicity. Toxicity testing was part of California's Surface Water Ambient Monitoring Program Report, 2007.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of

	species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.
Guideline Reference:	Monitoring data for Region 9
Spatial Representation:	Water Toxicity Samples were collected at Loma Alta Creek station 3 (904CBLAC3). (Latitude 33.2000, Longitude -117.3306).
Temporal Representation:	Samples were collected on March, April, June and September 2002.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 49396, Bifenthrin **Region 9**

Loma Alta Creek

LOE ID:	74143
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Four samples were collected to test for toxicity. Four of the four samples exhibited statistically significant toxicity. The toxicity tests that exhibited significant toxicity included survival of Hyalella azteca, reproduction of Ceriodaphnia dubia, and growth of Selenastrum capriconutum.
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected at station 904LAC-TWAS-1 Loma Alta Creek.
Temporal Representation:	The samples were collected from 2007 to 2008.
Environmental Conditions:	
QAPP Information:	The data was collected under the County of San Diego Co-Permittees Receiving Waters Urban Runoff Monitoring and Reporting Program (Order No. 2007-01). Data quality is good.
QAPP Information Reference(s):	e-mail clarifying QAPP information

DECISION ID	32439	037465 Region 9
Loma Alta Creek		

Pollutant:	**Total Dissolved Solids**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One line of evidence is available. Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 2 samples were in exceedance of the water quality objective and the sample size is insufficient to determine if standards are being met or exceeded with the confidence and power of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32439, Total Dissolved Solids	**Region 9**
Loma Alta Creek	

LOE ID:	3167
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Non-Contact Recreation
Number of Samples:	2
Number of Exceedances:	2
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Two samples were collected by the Regional Board on 5/20/1998 at two locations on Loma Alta Creek. Both samples exceeded the water quality objective.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for total dissolved solids is 500 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.

Objective/Criterion Reference:	Placeholder reference 2006 303(d)	037466
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Two samples were taken along Loma Alta Creek; one at College Blvd. and one at El Camino Real.	
Temporal Representation:	One sample was taken at each of the two locations on one day, 5/20/1998.	
Environmental Conditions:		
QAPP Information:	Data was used in the 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID 32888 Region 9

Loma Alta Creek

Pollutant:	**Turbidity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of two samples exceed the water quality objective.

Application of table 3.2 of the Listing Policy requires a minimum of five samples.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 2 samples exceeded the Basin Plan criteria, and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32888, Turbidity Region 9

Loma Alta Creek

LOE ID:	3168
Pollutant:	Turbidity
LOE Subgroup:	Adverse Biological Responses
Matrix:	-N/A
Fraction:	Dissolved

Beneficial Use:	Non-Contact Recreation
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Samples were collected by RWQCB9 at two locations on Loma Alta Creek on 5/20/1998. No samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with all beneficial uses, the WQO for Turbidity is 20 NTU. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Two samples, one at each location, were collected along Loma Alta Creek at College Blvd. and El Camino Real.
Temporal Representation:	Samples were collected once on 5/20/1998
Environmental Conditions:	
QAPP Information:	Dataset was used in 2002's assessment.
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Buena Vista Creek
Water Body ID: CAR9042100020011025103123
Water Body Type: River & Stream

DECISION ID 42422 **Region 9**
Buena Vista Creek

Pollutant: Selenium
Final Listing Decision: Do Not Delist from 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Sources: Source Unknown
Expected TMDL Completion Date: 2019
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for removal from the CWA section 303(d) List under section 4.1 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess pollutant. Four of Eight samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Four of eight samples exceed the criteria and this exceeds the allowable frequency listed in Table 4.1 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 42422, Selenium **Region 9**
Buena Vista Creek

LOE ID: 77985

Pollutant: Selenium
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Warm Freshwater Habitat

Number of Samples:	4	037469
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Buena Vista Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Selenium.	
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The selenium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater is 0.005 mg/L (California Toxics Rule, 2000).	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California, 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Buena Vista Creek was collected at 1 monitoring site [Buena Vista Creek - 904BVC-TWAS-1]	
Temporal Representation:	Data was collected over the time period 9/19/2007-5/14/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.	

Line of Evidence (LOE) for Decision ID 42422, Selenium **Region 9**

Buena Vista Creek

LOE ID:	6549
Pollutant:	Selenium
LOE Subgroup:	Pollution
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	3
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	All four samples collected at Buena Vista Creek show excessive selenium concentrations according to results in California's Surface Water Ambient Monitoring Program Report, 2007.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	CTR Freshwater Chronic (CCC) 5 ug/L. (U.S. EPA, 2000.)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA

Spatial Representation:	Water samples were collected at Buena Vista Creek station 904CBBVR4; (Latitude 33.180577, Longitude -117.339035).
Temporal Representation:	Samples were collected in March, April, June and September 2002.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 42422, Selenium **Region 9**

Buena Vista Creek

LOE ID:	73077
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Preservation of Rare & Endangered Species
Number of Samples:	4
Number of Exceedances:	2
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Four samples were collected to test for toxicity. Two of the four samples exhibited statistically significant toxicity. The toxicity tests that exhibited significant toxicity included survival of Hyalella azteca.
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected at station 904BVC-TWAS-1 Buena Vista Creek.
Temporal Representation:	The samples were collected from 2007 to 2008.
Environmental Conditions:	
QAPP Information:	The data was collected under the County of San Diego Co-Permittees Receiving Waters Urban Runoff Monitoring and Reporting Program (Order No. 2007-01).
QAPP Information Reference(s):	e-mail clarifying QAPP information

DECISION ID **48044** **Region 9**

Buena Vista Creek

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 4 samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 4 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48044, Arsenic **Region 9**

Buena Vista Creek

LOE ID:	77983
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Buena Vista Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Arsenic.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The dissolved arsenic criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved arsenic is 0.150 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Buena Vista Creek was collected at 1 monitoring site [Buena Vista Creek - 904BVC-TWAS-1]
Temporal Representation:	Data was collected over the time period 9/19/2007-5/14/2008.

Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID 48045 Region 9

Buena Vista Creek

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of 4 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 4 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48045, Cadmium Region 9

Buena Vista Creek

LOE ID:	77984
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Buena Vista Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Cadmium.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The dissolved cadmium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved cadmium is 0.0022 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Buena Vista Creek was collected at 1 monitoring site [Buena Vista Creek - 904BVC-TWAS-1]
Temporal Representation:	Data was collected over the time period 9/19/2007-5/14/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID	**48080**	**Region 9**
Buena Vista Creek		

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of 4 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 4 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samplesis needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the

applicable beneficial use support rating. 037474

Line of Evidence (LOE) for Decision ID 48080, Chlorpyrifos **Region 9**

Buena Vista Creek

LOE ID:	77716
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Buena Vista Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.014 ug/L (Siepmann and Finlayson 2000).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).
Spatial Representation:	Data for this line of evidence for Buena Vista Creek was collected at 1 monitoring site [Buena Vista Creek - 904BVC-TWAS-1]
Temporal Representation:	Data was collected over the time period 9/19/2007-5/14/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID **48081** **Region 9**

Buena Vista Creek

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised

Impairment from Pollutant or Pollution:	Pollutant	037475

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 4 samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 4 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samplesis needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48081, Chromium **Region 9**

Buena Vista Creek

LOE ID:	73067
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Buena Vista Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Chromium.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Chromium to protect aquatic life in freshwater. The dissolved Chromium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Data for this line of evidence for Buena Vista Creek was collected at 1 monitoring site [Buena Vista Creek - 904BVC-TWAS-1]
Temporal Representation:	Data was collected over the time period 9/19/2007-5/14/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID 48082 Region 9

Buena Vista Creek

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of 4 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 4 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samplesis needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48082, Copper Region 9

Buena Vista Creek

LOE ID:	73068
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	4	037477
Number of Exceedances:	0	

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Buena Vista Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Copper.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Copper to protect aquatic life in freshwater. The dissolved Copper criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Buena Vista Creek was collected at 1 monitoring site [Buena Vista Creek - 904BVC-TWAS-1]
Temporal Representation:	Data was collected over the time period 9/19/2007-5/14/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID	**48106**	**Region 9**
Buena Vista Creek		

Pollutant:	**Cypermethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 0 samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 0 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samplesis needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available

indicating that standards are not met. 037478

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48106, Cypermethrin **Region 9**

Buena Vista Creek

LOE ID:	73069
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Buena Vista Creek to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Cypermethrin, total.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of cypermethrin does not exceed 0.0002 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Fojut et al. 2012)
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Buena Vista Creek was collected at 1 monitoring site [Buena Vista Creek - 904BVC-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/30/2007-2/3/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID **48107** **Region 9**

Buena Vista Creek

Pollutant: **Deltamethrin**

Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	037479
Last Listing Cycle's Final Listing Decision:	New Decision	
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 2 samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 2 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samplesis needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48107, Deltamethrin **Region 9**

Buena Vista Creek

LOE ID:	73070
Pollutant:	Deltamethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Buena Vista Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Deltamethrin.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	The evaluation guideline for Deltamethrin is the maximum acceptable toxicant concentration (MATC) of 0.02 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Buena Vista Creek was collected at 1 monitoring site [Buena Vista Creek - 904BVC-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/30/2007-2/3/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID 48084 — Region 9
Buena Vista Creek

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of 4 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 4 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samplesis needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48084, Diazinon — Region 9
Buena Vista Creek

LOE ID:	73071
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	037481
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	4	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Buena Vista Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Diazinon.	
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).	
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game	
Spatial Representation:	Data for this line of evidence for Buena Vista Creek was collected at 1 monitoring site [Buena Vista Creek - 904BVC-TWAS-1]	
Temporal Representation:	Data was collected over the time period 9/19/2007-5/14/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.	

DECISION ID	**48117**	**Region 9**
Buena Vista Creek		

Pollutant:	**Esfenvalerate/Fenvalerate**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 2 samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.037482
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 2 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48117, Esfenvalerate/Fenvalerate **Region 9**

Buena Vista Creek

LOE ID:	73072
Pollutant:	Esfenvalerate/Fenvalerate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Buena Vista Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Esfenvalerate.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to the USEPA Office of Pesticide Programs Ecotoxicity database, the aquatic life EC50 for Esfenvalerate is 0.9 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Buena Vista Creek was collected at 1 monitoring site [Buena Vista Creek - 904BVC-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/30/2007-2/3/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID **48101** **Region 9**

Buena Vista Creek 037483

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of 4 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 4 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samplesis needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48101, Lead — Region 9

Buena Vista Creek

LOE ID:	73073
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Buena Vista Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Lead.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Lead to protect aquatic life in freshwater. The dissolved Lead criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling.

Objective/Criterion Reference:	Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. 63748 Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Buena Vista Creek was collected at 1 monitoring site [Buena Vista Creek - 904BVC-TWAS-1]
Temporal Representation:	Data was collected over the time period 9/19/2007-5/14/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID **48102** **Region 9**

Buena Vista Creek

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of 4 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 4 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samplesis needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48102, Malathion **Region 9**

Buena Vista Creek

LOE ID:	73074
Pollutant:	Malathion

LOE Subgroup:	Pollutant-Water	037485
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	4	
Number of Exceedances:	1	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Buena Vista Creek to determine beneficial use support and results are as follows: 1 of 4 samples exceed the criterion for Malathion.	
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.	
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology	
Spatial Representation:	Data for this line of evidence for Buena Vista Creek was collected at 1 monitoring site [Buena Vista Creek - 904BVC-TWAS-1]	
Temporal Representation:	Data was collected over the time period 9/19/2007-5/14/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.	

DECISION ID	**48104**	**Region 9**
Buena Vista Creek		

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of 4 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 4 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samplesis needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48104, Nickel **Region 9**

Buena Vista Creek

LOE ID:	73075
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Buena Vista Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Nickel.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Nickel to protect aquatic life in freshwater. The dissolved Nickel criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Buena Vista Creek was collected at 1 monitoring site [Buena Vista Creek - 904BVC-TWAS-1]
Temporal Representation:	Data was collected over the time period 9/19/2007-5/14/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID	48105	037487 Region 9
Buena Vista Creek		

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of 4 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 4 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samplesis needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48105, Zinc	**Region 9**
Buena Vista Creek	

LOE ID:	73078
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Buena Vista Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Zinc.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Zinc to

	protect aquatic life in freshwater. The dissolved Zinc criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Buena Vista Creek was collected at 1 monitoring site [Buena Vista Creek - 904BVC-TWAS-1]
Temporal Representation:	Data was collected over the time period 9/19/2007-5/14/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID **43878** **Region 9**

Buena Vista Creek

Pollutant:	**Benthic Community Effects**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Benthic Community Effects is being considered for placement on the CWA section 303(d) List under sections 3.9 and 3.1 of the Listing Policy. Under section 3.9, an additional line of evidence associating Benthic Community Effects with a water or sediment concentration of pollutant(s) is necessary to assess listing status. Based on the readily available data and information, the weight of evidence provides sufficient justification for placing Benthic Community Effects in this water segment on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Pursuant to section 3.9 of the Listing Policy, the water exhibits significant degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index. 4. Pursuant to section 3.9 of the Listing Policy, the water segment has associated pollutant(s) samples that exceed water quality objectives. 5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are being met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant(s) contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 43878, Benthic Community Effects **Region 9**

Buena Vista Creek 037489

LOE ID:	26376
Pollutant:	Benthic Community Effects
LOE Subgroup:	Adverse Biological Responses
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	11
Number of Exceedances:	11
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Eleven samples of IBI data were taken from May 1998 to November 2000 at two sampling sites. Of the total number of samples, all eleven samples exceeded the IBI impairment threshold.
Data Reference:	Fish and Game IBI Data
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at two sites: 904BVRSVW and 904BVREDx on Buena Vista Creek.
Temporal Representation:	Sampling occurred during two to four events annually over a three year period from May 1998 to November 2000.
Environmental Conditions:	
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Project Plan for the California Stream Bioassessment Procedure and the State of California, California Monitoring an Assessment Program: "CMAP", Quality Assurance Project Plan.
QAPP Information Reference(s):	State of California, California Monitoring and Assessment Program: "CMAP". Quality Assurance Project Plan for the California Stream Bioassessment Procedure The San Diego Stream Team Quality Assurance Project Plan

Line of Evidence (LOE) for Decision ID 43878, Benthic Community Effects **Region 9**

Buena Vista Creek

LOE ID:	21371
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	4
Number of Exceedances:	3
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Selenastrum Capricornutum Three of the four samples collected show significant toxicity levels (SL) as determined by the following tests Selenastrum Capricornutum growth test. Ceriodaphnia dubia One of the four samples collected show significant toxicity levels (SL) as determined by the following tests Ceriodaphnia dubia survival/reproductive test according to results in California's Surface Water Ambient Monitoring Program, 2007. Samples were collected on March, April, June and September 2002.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms. Fourth Edition. Office of Water, U.S. Environmental Protection Agency. Washington, D.C. EPA-821-R-02-013
Spatial Representation:	Samples were collected at Buena Vista Creek station (904CBBVR4). (Latitude 33.1805, Longitude -117.3289).
Temporal Representation:	Samples were collected on March, April, June and September 2002.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 43878, Benthic Community Effects **Region 9**

Buena Vista Creek

LOE ID:	73077
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Preservation of Rare & Endangered Species
Number of Samples:	4
Number of Exceedances:	2
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Four samples were collected to test for toxicity. Two of the four samples exhibited statistically significant toxicity. The toxicity tests that exhibited significant toxicity included survival of Hyalella azteca.
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected at station 904BVC-TWAS-1 Buena Vista Creek.
Temporal Representation:	The samples were collected from 2007 to 2008.
Environmental Conditions:	
QAPP Information:	The data was collected under the County of San Diego Co-Permittees Receiving Waters Urban Runoff Monitoring and Reporting Program (Order No. 2007-01).
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 43878, Benthic Community Effects **Region 9**

Buena Vista Creek

LOE ID:	72798
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	11
Number of Exceedances:	11
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Eleven of the eleven samples collected had an IBI score below 40. tr11c NPDES bioassessment
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the State or Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	Development of a Benthic Index of Biotic Integrity (B-IBI) for Wadeable Streams in Northern Coastal California and its Application to Regional 305(b) Assessment
Spatial Representation:	The samples were collected at three stations on Buena Vista Creek. The stations are 904BVC-TWAS-1 or BVR-ED, BVR-CB, and BVR-SVW.
Temporal Representation:	The samples were collected in May and October from 2001 to 2008.
Environmental Conditions:	
QAPP Information:	The data was collected under the Southern California Regional Watershed Monitoring

QAPP Information Reference(s):	Program Bioassessment Quality Assurance Project Plan, June 25, 2009. 037492 Quality Assurance Project Plan for SWAMP Bioassessment and Freshwater Bioassessment.

Line of Evidence (LOE) for Decision ID 43878, Benthic Community Effects **Region 9**

Buena Vista Creek

LOE ID:	26278
Pollutant:	Sediment Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Hyalella azteca All four samples collected show significant toxicity levels (SL) as determined by the following tests Hyalella azteca survival and growth test according to results in California's Surface Water Ambient Monitoring Program, 2007. Samples were collected on March, April, June and September 2002.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.
Guideline Reference:	Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms. Fourth Edition. Office of Water, U.S. Environmental Protection Agency. Washington, D.C. EPA-821-R-02-013
Spatial Representation:	Samples were collected at Buena Vista Creek station (904CBBVR4). (Latitude 33.1805, Longitude -117.3289).
Temporal Representation:	Samples were collected on March, April, June and September 2002.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 43878, Benthic Community Effects **Region 9**

Buena Vista Creek

LOE ID:	26628
Pollutant:	Benthic Community Effects
LOE Subgroup:	Adverse Biological Responses
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	10
Number of Exceedances:	10
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Ten samples were taken from May 2001 to October 2006 at three sampling sites. All 10 samples exceeded the IBI impairment threshold.
Data Reference:	Stream Bioassessment Data. Co-permitee Data. Collected 2002-2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at three sites: BVR-CB, BVR-ED, and BVR-SVW on Buena Vista Creek.
Temporal Representation:	Sampling occurred during May and October in 2001 and 2002, then in October of 2003, 2004 and 2006.
Environmental Conditions:	
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Manual for Freshwater Bioassessment.
QAPP Information Reference(s):	Quality Assurance Manual for Freshwater Bioassessment Revision 0

Line of Evidence (LOE) for Decision ID 43878, Benthic Community Effects **Region 9**

Buena Vista Creek

LOE ID:	79494
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	10
Number of Exceedances:	6
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Of ten samples collected at three stations, six were below the 0.79 threshold, and therefore exceeding the water quality objective for the aquatic life beneficial use.
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008. Region 9 CSCI Scores & Water Body Information
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or

	that produce detrimental physiological responses in, human, plant or animal life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.
Guideline Reference:	The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.
Spatial Representation:	The samples were collected at three stations on Buena Vista Creek. 904BVR-SVW 904BVC-TWAS-1 904BVR-CB
Temporal Representation:	The samples were collected in May and October from 2001 to 2008.
Environmental Conditions:	
QAPP Information:	The data was collected under the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan, June 25, 2009.
QAPP Information Reference(s):	Quality Assurance Project Plan for SWAMP Bioassessment and Freshwater Bioassessment.

Line of Evidence (LOE) for Decision ID 43878, Benthic Community Effects **Region 9**

Buena Vista Creek

LOE ID:	3174
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Not Specified
Fraction:	None
Beneficial Use:	Agricultural Supply
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Data were collected in 1998 and 1999 at Buena Vista Creek for the San Diego Regional Water Quality Control Board 1999 Biological Assessment Annual Report. Physical habitat scores ranged from 59 to 80, relatively lower compared to other sampled waterbodies. BMI ranking scores were mostly below average, compared to other sampled waterbodies. (San Diego RWQCB, 1999a).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No objective.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Buena Vista Creek, 5 riffles upstream of South Vista Way (BVR-SVW). Lat/Long is N33E10' 48.7"/ W117E 19' 41.1"
Temporal Representation:	Samples were collected in May, September, and November 1998 and in May 1999.

Environmental Conditions: 037495
QAPP Information: Data used in 2002 assessment.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 43878, Benthic Community Effects **Region 9**

Buena Vista Creek

LOE ID: 3175

Pollutant: Benthic-Macroinvertebrate Bioassessments
LOE Subgroup: Population/Community Degradation
Matrix: Not Specified
Fraction: None

Beneficial Use: Agricultural Supply

Number of Samples: 0
Number of Exceedances: 0

Data and Information Type: Benthic macroinvertebrate surveys
Data Used to Assess Water Quality: Data were collected in 1998 and 1999 for the San Diego Regional Water Quality Control Board 1999 Biological Assessment Annual Report. Physical habitat assessment scores ranged from 44 to 68, relatively lower than for the other sampled watersheds. BMI ranking scores were mostly below average compared to other sampled watersheds. (San Diego RWQCB, 1999a).
Data Reference: Placeholder reference 2006 303(d)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: No objective.
Objective/Criterion Reference: Placeholder reference 2006 303(d)

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Buena Vista Creek, 5 riffles downstream of Santa Fe Avenue (BVR-ED). The Lat /Long is N33E11'57.9"/ W117E 14' 35.1"
Temporal Representation: Samples were collected in May, September, and November 1998 and May 1999.
Environmental Conditions:
QAPP Information: Data used in 2002 assessment.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 43878, Benthic Community Effects **Region 9**

Buena Vista Creek

LOE ID: 73065

Pollutant: Bifenthrin
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Warm Freshwater Habitat

Number of Samples: 2
Number of Exceedances: 2

Data and Information Type: PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality: Water Board staff assessed County of San Diego data for Buena Vista Creek to determine beneficial use support and results are as follows: 2 of 2 samples exceed the criterion for Bifenthrin.

Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Bifenthrin does not exceed 0.0006 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Buena Vista Creek was collected at 1 monitoring site [Buena Vista Creek - 904BVC-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/30/2007-2/3/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 43878, Benthic Community Effects **Region 9**

Buena Vista Creek

LOE ID:	3176
Pollutant:	Sediment Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	2
Data and Information Type:	Toxicity testing of sediments
Data Used to Assess Water Quality:	Two out of four samples displayed statistically significant toxicity in the survival endpoint when compared to the negative control based on a statistical test with alpha of less than 5%. All samples were tested using the 10-day Hyallela azteca test. Note that all four samples actually had significant toxicity relative to the control, but only the two samples without any QA qualifiers were considered as exceedances (SWAMP, 2004).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the Regional Board (Region 9 Basin Plan, pages 3-15 to 3-16; September 8, 1994).
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	

Guideline Reference:	037497
Spatial Representation:	All samples were collected from one station, Buena Vista Creek 4.
Temporal Representation:	Samples were collected from March 2002 through September 2002. Toxicity in the survival endpoint was detected in samples collected on March 12, 2002 and September 16, 2002.
Environmental Conditions:	San Diego County Coastal Stream: Buena Vista Creek, Hydrologic Unit Basin Number 904.21.
QAPP Information:	SWAMP QAPP.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43878, Benthic Community Effects **Region 9**

Buena Vista Creek

LOE ID:	6549
Pollutant:	Selenium
LOE Subgroup:	Pollution
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	3
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	All four samples collected at Buena Vista Creek show excessive selenium concentrations according to results in California's Surface Water Ambient Monitoring Program Report, 2007.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	CTR Freshwater Chronic (CCC) 5 ug/L. (U.S. EPA, 2000.)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA
Spatial Representation:	Water samples were collected at Buena Vista Creek station 904CBBVR4; (Latitude 33.180577, Longitude -117.339035).
Temporal Representation:	Samples were collected in March, April, June and September 2002.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

DECISION ID **48042** **Region 9**

Buena Vista Creek

Pollutant:	**Bifenthrin**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion	2027

Date:	037498
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Two of the two samples exceed the criteria. Two of four samples exhibited toxicity. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Two of two samples exceed the criteria, and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 48042, Bifenthrin **Region 9**

Buena Vista Creek

LOE ID:	73065
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	2
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Buena Vista Creek to determine beneficial use support and results are as follows: 2 of 2 samples exceed the criterion for Bifenthrin.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Bifenthrin does not exceed 0.0006 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.

Spatial Representation:	Data for this line of evidence for Buena Vista Creek was collected at 1 monitoring site [Buena Vista Creek - 904BVC-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/30/2007-2/3/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 48042, Bifenthrin **Region 9**

Buena Vista Creek

LOE ID:	73077
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Preservation of Rare & Endangered Species
Number of Samples:	4
Number of Exceedances:	2
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Four samples were collected to test for toxicity. Two of the four samples exhibited statistically significant toxicity. The toxicity tests that exhibited significant toxicity included survival of Hyalella azteca.
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected at station 904BVC-TWAS-1 Buena Vista Creek.
Temporal Representation:	The samples were collected from 2007 to 2008.
Environmental Conditions:	
QAPP Information:	The data was collected under the County of San Diego Co-Permittees Receiving Waters Urban Runoff Monitoring and Reporting Program (Order No. 2007-01).
QAPP Information Reference(s):	e-mail clarifying QAPP information

DECISION ID **33524** **Region 9**

Buena Vista Creek

Pollutant:	**Toxicity**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not Delist from 303(d) list (TMDL required list)(2012)

Revision Status	Original	037500
Sources:	Source Unknown	
Expected TMDL Completion Date:	2019	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the section 303(d) list under section 3.6 and 3.9 of the Listing Policy. Under section 3.6 and 3.9 a water segment can be placed on the 303(d) list if the water segment exhibits significant toxicity and the observed toxicity is associated with a pollutant or pollutants. The water body segment may also be listed for toxicity alone.

Three lines of evidence are available in the administrative record to assess this pollutant. Nine of the 12 samples exceed the Toxicity objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Nine of the 12 samples exceed sediment toxicity criteria and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 33524, Toxicity **Region 9**

Buena Vista Creek

LOE ID:	3176
Pollutant:	Sediment Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	2
Data and Information Type:	Toxicity testing of sediments
Data Used to Assess Water Quality:	Two out of four samples displayed statistically significant toxicity in the survival endpoint when compared to the negative control based on a statistical test with alpha of less than 5%. All samples were tested using the 10-day Hyallela azteca test. Note that all four samples actually had significant toxicity relative to the control, but only the two samples without any QA qualifiers were considered as exceedances (SWAMP, 2004).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the Regional Board (Region 9 Basin Plan, pages 3-15 to 3-16; September 8, 1994).

Objective/Criterion Reference:	Placeholder reference 2006 303(d)	037501
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	All samples were collected from one station, Buena Vista Creek 4.	
Temporal Representation:	Samples were collected from March 2002 through September 2002. Toxicity in the survival endpoint was detected in samples collected on March 12, 2002 and September 16, 2002.	
Environmental Conditions:	San Diego County Coastal Stream: Buena Vista Creek, Hydrologic Unit Basin Number 904.21.	
QAPP Information:	SWAMP QAPP.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33524, Toxicity **Region 9**

Buena Vista Creek

LOE ID:	26278
Pollutant:	Sediment Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Hyalella azteca All four samples collected show significant toxicity levels (SL) as determined by the following tests Hyalella azteca survival and growth test according to results in California's Surface Water Ambient Monitoring Program, 2007. Samples were collected on March, April, June and September 2002.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.
Guideline Reference:	Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms. Fourth Edition. Office of Water, U.S. Environmental Protection Agency. Washington, D.C. EPA-821-R-02-013
Spatial Representation:	Samples were collected at Buena Vista Creek station (904CBBVR4). (Latitude 33.1805, Longitude -117.3289).
Temporal Representation:	Samples were collected on March, April, June and September 2002.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 33524, Toxicity **Region 9**

Buena Vista Creek

LOE ID:	73077
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Preservation of Rare & Endangered Species
Number of Samples:	4
Number of Exceedances:	2
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Four samples were collected to test for toxicity. Two of the four samples exhibited statistically significant toxicity. The toxicity tests that exhibited significant toxicity included survival of Hyalella azteca.
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected at station 904BVC-TWAS-1 Buena Vista Creek.
Temporal Representation:	The samples were collected from 2007 to 2008.
Environmental Conditions:	
QAPP Information:	The data was collected under the County of San Diego Co-Permittees Receiving Waters Urban Runoff Monitoring and Reporting Program (Order No. 2007-01).
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 33524, Toxicity **Region 9**

Buena Vista Creek

LOE ID:	21371
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	3
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Selenastrum Capricornutum Three of the four samples collected show significant toxicity levels (SL) as determined by the following tests Selenastrum Capricornutum growth test. Ceriodaphnia dubia One of the four samples collected show significant toxicity levels (SL) as determined by the following tests Ceriodaphnia dubia survival/reproductive test according to results in California's Surface Water Ambient Monitoring Program, 2007. Samples were collected on

	March, April, June and September 2002.	037503
Data Reference:	Monitoring data for Region 9	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:	Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms. Fourth Edition. Office of Water, U.S. Environmental Protection Agency. Washington, D.C. EPA-821-R-02-013	
Spatial Representation:	Samples were collected at Buena Vista Creek station (904CBBVR4). (Latitude 33.1805, Longitude -117.3289).	
Temporal Representation:	Samples were collected on March, April, June and September 2002.	
Environmental Conditions:		
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.	
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA	

DECISION ID	**33981**	**Region 9**
Buena Vista Creek		

Pollutant:	**Chloride**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. The single sample exceeds the Basin Plan water quality objective for chloride. Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. The single sample exceeds the Basin Plan water quality objective for chloride. A minimum of two samples is needed to determine if the water quality objective is exceeded according to Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision	This is a decision previously approved by the State Water Resources Control Board and the USEPA.

Recommendation:	No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33981, Chloride **Region 9**

Buena Vista Creek

LOE ID:	3172
Pollutant:	Chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Agricultural Supply
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 1998. One sample was collected and it was in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for chloride is 250 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Buena Vista Creek. Exact location was not reported.
Temporal Representation:	Samples were collected on 06/29/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33593** **Region 9**

Buena Vista Creek

Pollutant:	**Sulfates**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. A single sample exceeds the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Only one sample exceeded the water quality objective for sulfate. More data is needed to determine if the water quality objective is exceeded.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33593, Sulfates **Region 9**

Buena Vista Creek

LOE ID:	3173
Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Tissue
Matrix:	Water
Fraction:	Total
Beneficial Use:	Agricultural Supply
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 1998. One sample was collected and it was in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for sulfate is 250 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Buena Vista Creek. Exact location was not reported.
Temporal Representation:	Samples were collected on 06/29/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33718** **Region 9**

Buena Vista Creek

Pollutant:	**Total Dissolved Solids**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)

Revision Status	Original	037506
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.2 and 3.9 of the Listing Policy. Under section 3.2 and 3.9 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. An insufficient number of samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is not sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used does not satisfy the data quantity requirements of section 6.1.5 of the Policy.
3. Two of 2 samples were in exceedance of the water quality objective for total dissolved solids and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33718, Total Dissolved Solids **Region 9**

Buena Vista Creek

LOE ID:	3170
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Agricultural Supply
Number of Samples:	2
Number of Exceedances:	2
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 1998. Two of 2 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for total dissolved solids is 500 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	One set of samples were collected at Buena Vista Creek at South Vista Way. The other set

	were collected at Buena Vista Creek; exact location was not reported.	037507
Temporal Representation:	Samples were collected once on 05/20/1998 and once on 06/29/1998.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID **34057** **Region 9**

Buena Vista Creek

Pollutant:	**Turbidity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the samples exceed the water quality objective.

Application of table 3.2 for a conventional pollutant requires a minimum of five samples.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 2 samples were in exceedance of the water quality objective for turbidity and this does not satisfy the sample size requirement in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34057, Turbidity **Region 9**

Buena Vista Creek

LOE ID:	3171
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Agricultural Supply
Number of Samples:	2
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	037508
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 1998. None of the 2 samples were in exceedance.	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for Turbidity is 20 ntu. This concentration is not to be exceeded more than 10% of the time during any one year period.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	One set of samples were collected at Buena Vista Creek at South Vista Way. The second set of samples were collected at Buena Vista Creek; exact location was not reported.	
Temporal Representation:	Samples were collected once on 05/20/1998 and once on 06/29/1998.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Agua Hedionda Creek
Water Body ID: CAR9043100020010924145051
Water Body Type: River & Stream

DECISION ID 33134 **Region 9**
Agua Hedionda Creek

Pollutant: Selenium
Final Listing Decision: Do Not Delist from 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Sources: Source Unknown
Expected TMDL Completion Date: 2019
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for removal from the CWA section 303(d) List under section 4.1 of the Listing Policy. Under section 4.1 a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. Four of the 29 samples exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Four of 29 samples exceed the objective and this exceeds the allowable frequency listed in Table 4.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 33134, Selenium **Region 9**
Agua Hedionda Creek

LOE ID: 77975

Pollutant: Selenium
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Warm Freshwater Habitat

Number of Samples:	25	037510
Number of Exceedances:	1	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 1 of 25 samples exceed the criterion for Selenium. Two samples of which RLs were not reported and the results were "ND" were not included in the assessment.	
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The selenium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater is 0.005 mg/L (California Toxics Rule, 2000).	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 2 monitoring sites [Agua Hedionda Creek - 904AHC-MLS, Agua Hedionda Creek - 904AHC-TWAS-1]	
Temporal Representation:	Data was collected over the time period 2/17/2002-11/4/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.	

Line of Evidence (LOE) for Decision ID 33134, Selenium **Region 9**

Agua Hedionda Creek

LOE ID:	77976
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	25
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 0 of 25 samples exceed the criterion for Selenium.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for selenium is 0.01 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 2 monitoring sites [Agua Hedionda Creek - 904AHC-MLS, Agua Hedionda Creek - 904AHC-TWAS-1]
Temporal Representation:	Data was collected over the time period 2/17/2002-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 33134, Selenium **Region 9**

Agua Hedionda Creek

LOE ID:	3183
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	3
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Four water samples, three samples exceeding The CTR criteria (SWAMP, 2004).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	CTR Freshwater Chronic (CCC) 5 µg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were taken at one station in Agua Hedionda Creek No. 33.14887 -117.29758.
Temporal Representation:	Samples were collected from March through September of 2002.
Environmental Conditions:	Agua Hedionda Creek, Part of the San Diego Coastal Streams: Hydrologic Unit Basin Number 4.31
QAPP Information:	SWAMP Quality Assurance Plan.
QAPP Information Reference(s):	

DECISION ID **42896** **Region 9**

Agua Hedionda Creek

Pollutant:	**Toxicity**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for removal from the CWA section 303(d) List under section 4.6 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Five lines of evidence are available in the administrative record to assess pollutant. Thirty-nine of the 46 samples exceed the water quality objective for Toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Thirty-nine of the 46 samples exceed the water quality objective for Toxicity and this exceeds the allowable frequency listed in Table 4.1 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 42896, Toxicity **Region 9**

Agua Hedionda Creek

LOE ID:	26225
Pollutant:	Sediment Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Toxicity testing of sediments
Data Used to Assess Water Quality:	Hyalella azteca- All four samples show significant toxicity levels (SL) as determined by the Hyalella azteca survival and growth test according to results in California's Surface Water Ambient Monitoring Program Annual Progress Report, 2007. Samples were collected one to three times a year from 2002-2006.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.
Guideline Reference:	Monitoring data for Region 9
Spatial Representation:	Samples were collected at monitoring station Agua Hedionda Creek 6 on the main stem of Agua Hedionda creek (station id: 904CBAQH6 lat/long: 33.14887/-117.29758).
Temporal Representation:	Samples were collected one to three times a year from 2002-2006.

Environmental Conditions:	Samples were collected during wet weather.	037513
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.	
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA	

Line of Evidence (LOE) for Decision ID 42896, Toxicity **Region 9**

Agua Hedionda Creek

LOE ID:	72894
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate sediment toxicity. The sample did not exhibit significant toxicity. The toxicity test included survival of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL, Significant compared to negative control based on statistical test, less than stated alpha level, AND less than the evaluation threshold (both criteria are met).
Guideline Reference:	
Spatial Representation:	The sample was collected at station 904CBAHC6.
Temporal Representation:	The samples were collected in May 2008.
Environmental Conditions:	
QAPP Information:	All data was collected following the Standard Operating Procedures and Data Quality Objectives outlined in the SWAMP QAMP, (Puckett, 2002). QA data are included in submission.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 42896, Toxicity **Region 9**

Agua Hedionda Creek

LOE ID:	7475
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None

Beneficial Use:	Warm Freshwater Habitat	037514
Number of Samples:	4	
Number of Exceedances:	4	
Data and Information Type:	Ambient toxicity testing (chronic)	
Data Used to Assess Water Quality:	Selenastrum capricornutum- All four samples show significant toxicity levels (SL) as determined by the Selenastrum capricornutum growth test. Ceriodaphnia dubia- All four samples show significant toxicity levels (SL) as determined by the Ceriodaphnia dubia survival and reproduction test according to results in California's Surface Water Ambient Monitoring Program Annual Progress Report, 2007. Samples were collected one to three times a year from 2002-2006.	
Data Reference:	Monitoring data for Region 9	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	Waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.	
Guideline Reference:	Monitoring data for Region 9 Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms. Fourth Edition. Office of Water, U.S. Environmental Protection Agency. Washington, D.C. EPA-821-R-02-013	
Spatial Representation:	Samples were collected at monitoring station Agua Hedionda Creek 6 on the main stem of Agua Hedionda creek (station id: 904CBAQH6 lat/long: 33.14887/-117.29758).	
Temporal Representation:	Samples were collected one to three times a year from 2002-2006.	
Environmental Conditions:	Samples were collected during wet weather.	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.	
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA	

Line of Evidence (LOE) for Decision ID 42896, Toxicity **Region 9**

Agua Hedionda Creek

LOE ID:	25001
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	15
Number of Exceedances:	8
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Selenastrum capricornutum- None of fifteen samples collected were found to be toxic as determined by the Selenastrum capricornutum growth test. Ceriodaphnia dubia-

	Three of fifteen samples collected were found to be toxic as determined by the Ceriodaphnia dubia survival/reproductive test. Hyalella Azteca- Seven of fifteen samples collected were found to be toxic as determined by the Hyalella azteca survival test according to the San Diego County Municipal Copermittees Urban Runoff Monitoring Report, 2007. Samples were collected one to three times a year from 2002-2006.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Samples were found to exhibit toxicity when the No Observed Effect Concentration (NOEC) or median lethal concentration (LC50) for any given species was estimated to be less than 100% of the test sample concentration (U.S. EPA, 2002).
Guideline Reference:	Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms. Fourth Edition. Office of Water, U.S. Environmental Protection Agency. Washington, D.C. EPA-821-R-02-013 Waste Discharge Requirements for Discharges of Urban Runoff From the Municipal Separate Storm Sewer Systems Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego, the San Diego Unified Port District, and the San Diego County Regional Airport. Order No. R9-2007-0001
Spatial Representation:	Samples were collected at the mass loading station located near the lower boundary of the watershed under the El Camino Real Bridge crossing immediately downstream of the confluence of Agua Hedionda Creek and Calavera Creek.
Temporal Representation:	Samples were collected one to three times a year from 2002-2006.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	Quality control for the toxicity portion of this study was conducted in accordance with the City of San Diego's NPDES program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 42896, Toxicity **Region 9**

Agua Hedionda Creek

LOE ID:	72893
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	27
Number of Exceedances:	17
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Twenty-seven samples were collected to test for toxicity. Seventeen of the 27 samples exhibited statistically significant toxicity. The toxicity tests that exhibited significant toxicity included survival of Hyalella azteca, growth of Selenastrum capriconutum and survival and reproduction of Ceriodaphnia dubia.
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or

	that produce detrimental physiological responses in human, plant, animal, or aquatic life 37516
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected at stations 904AHC-MLS and 904AHC-TWAS-1, Agua Hedionda Creek
Temporal Representation:	The samples were collected from 2001 to 2008.
Environmental Conditions:	
QAPP Information:	The data was collected under the County of San Diego Co-Permittees Receiving Waters Urban Runoff Monitoring and Reporting Program (Order No. 2007-01). Data quality is good.
QAPP Information Reference(s):	e-mail clarifying QAPP information

DECISION ID 47426 Region 9

Agua Hedionda Creek

Pollutant:	**Anthracene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence are available in the administrative record to assess this pollutant. Zero of 1 sample exceed the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3.Zero of 1 sample exceed the water quality objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that though this water body is impaired for sediment toxicity, these water body-pollutant combinations should not be placed on the section 303(d) list because applicable water quality standards for these pollutants are not being exceeded

Line of Evidence (LOE) for Decision ID 47426, Anthracene Region 9

Agua Hedionda Creek

LOE ID:	72849

Pollutant:	Anthracene	037517
LOE Subgroup:	Pollutant-Sediment	
Matrix:	Sediment	
Fraction:	Total	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Anthracene.	
Data Reference:	Statewide Stream Pollution Trends Study 2008	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for anthracene is 845 ug/Kg dry weight (MacDonald et al. 2000).	
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31	
Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 1 monitoring site [Agua Hedionda Creek 6 - 904CBAHC6]	
Temporal Representation:	Data was collected on a single day 5/21/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.	
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)	

DECISION ID	**47462**	**Region 9**
Agua Hedionda Creek		

Pollutant:	**Antimony**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 28 samples exceed the water quality objective for the protection of Municipal Drinking Water Supply.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 28 samples exceed the water quality objective for the protection of Municipal Drinking Water

Supply and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 47462, Antimony **Region 9**

Agua Hedionda Creek

LOE ID:	77968
Pollutant:	Antimony
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	28
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 0 of 28 samples exceed the criterion for Antimony.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for antimony is .006 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 2 monitoring sites [Agua Hedionda Creek - 904AHC-MLS, Agua Hedionda Creek - 904AHC-TWAS-1]
Temporal Representation:	Data was collected over the time period 2/17/2002-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID **47425** **Region 9**

Agua Hedionda Creek

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or	Pollutant

Pollution: 037519

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. Three of the 28 samples exceed the water quality objective for Municipal drinking supply, 0 of 28 for WARM Freshwater Aquatic life in water, and 0 of 1 for WARM Freshwater Aquatic life in sediment.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Three of the 28 samples exceed the water quality objective for Municipal drinking supply, 0 of 28 for WARM Freshwater Aquatic life in water, and 0 of 1 for WARM Freshwater Aquatic life in sediment and these do not exceed the allowable frequencies listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 47425, Arsenic **Region 9**

Agua Hedionda Creek

LOE ID:	77969
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	28
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 0 of 28 samples exceed the criterion for Arsenic.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The dissolved arsenic criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved arsenic is 0.150 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 2 monitoring sites [Agua Hedionda Creek - 904AHC-MLS, Agua Hedionda Creek - 904AHC-TWAS-1]

Temporal Representation:	Data was collected over the time period 2/17/2002-11/4/2008. 037520
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 47425, Arsenic **Region 9**

Agua Hedionda Creek

LOE ID:	77970
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	28
Number of Exceedances:	3
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 3 of 28 samples exceed the criterion for Arsenic.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for arsenic is 0.01 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 2 monitoring sites [Agua Hedionda Creek - 904AHC-MLS, Agua Hedionda Creek - 904AHC-TWAS-1]
Temporal Representation:	Data was collected over the time period 2/17/2002-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 47425, Arsenic **Region 9**

Agua Hedionda Creek

LOE ID:	72850
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total

Beneficial Use:	Warm Freshwater Habitat	037521
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.	
Data Reference:	Statewide Stream Pollution Trends Study 2008	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for arsenic is 33 mg/Kg dry weight (MacDonald et al. 2000).	
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31	
Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 1 monitoring site [Agua Hedionda Creek 6 - 904CBAHC6]	
Temporal Representation:	Data was collected on a single day 5/21/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	SWAMP data collected before September 2008 followed the 2002 QAMP.	
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)	

DECISION ID	**47427**	**Region 9**
Agua Hedionda Creek		

Pollutant:	**Benzo(a)anthracene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence are available in the administrative record to assess this pollutant. Zero of 1 sample exceed the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3.Zero of 1 sample exceed the water quality objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available

	indicating that standards are not met.	037522
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.	

Line of Evidence (LOE) for Decision ID 47427, Benzo(a)anthracene **Region 9**

Agua Hedionda Creek

LOE ID:	72841
Pollutant:	Benzo(a)anthracene
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Benzo(a)anthracene.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for Benzo(a)anthracene is 1050 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 1 monitoring site [Agua Hedionda Creek 6 - 904CBAHC6]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **47428** **Region 9**

Agua Hedionda Creek

Pollutant:	**Benzo(a)pyrene (3,4-Benzopyrene -7-d)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 1 samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the 1 samples exceed the water quality objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47428, Benzo(a)pyrene (3,4-Benzopyrene -7-d) **Region 9**

Agua Hedionda Creek

LOE ID:	72842
Pollutant:	Benzo(a)pyrene (3,4-Benzopyrene -7-d)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Benzo(a)pyrene.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effects level (predictive of sediment toxicity) for Benzo(a)Pyrene is 1450 ug/Kg dry weight (Macdonald et al. 2000)
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31

Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 1 monitoring site [Agua Hedionda Creek 6 - 904CBAHC6]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID 47431 Region 9

Agua Hedionda Creek

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Five lines of evidence are available in the administrative record to assess this pollutant. One of 55 samples exceed the objective for WARM freshwater aquatic life and 0 of 28 samples exceed the objective for municipal drinking water supply. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of 55 samples exceed the objective for WARM freshwater aquatic life and 0 of 28 samples exceed the objective for municipal drinking water supply and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 47431, Cadmium Region 9

Agua Hedionda Creek

LOE ID:	72846
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	26
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING 037525
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 0 of 26 samples exceed the criterion for Cadmium.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Cadmium to protect aquatic life in freshwater. The dissolved Cadmium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California, 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 2 monitoring sites [Agua Hedionda Creek - 904AHC-MLS, Agua Hedionda Creek - 904AHC-TWAS-1]
Temporal Representation:	Data was collected over the time period 2/17/2002-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 47431, Cadmium **Region 9**

Agua Hedionda Creek

LOE ID:	26225
Pollutant:	Sediment Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Toxicity testing of sediments
Data Used to Assess Water Quality:	Hyalella azteca- All four samples show significant toxicity levels (SL) as determined by the Hyalella azteca survival and growth test according to results in California's Surface Water Ambient Monitoring Program Annual Progress Report, 2007. Samples were collected one to three times a year from 2002-2006.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when

	statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.
Guideline Reference:	Monitoring data for Region 9
Spatial Representation:	Samples were collected at monitoring station Agua Hedionda Creek 6 on the main stem of Agua Hedionda creek (station id: 904CBAQH6 lat/long: 33.14887/-117.29758).
Temporal Representation:	Samples were collected one to three times a year from 2002-2006.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 47431, Cadmium **Region 9**

Agua Hedionda Creek

LOE ID:	77967
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	28
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 0 of 28 samples exceed the criterion for Cadmium.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for cadmium is 0.005 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 2 monitoring sites [Agua Hedionda Creek - 904AHC-MLS, Agua Hedionda Creek - 904AHC-TWAS-1]
Temporal Representation:	Data was collected over the time period 2/17/2002-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 47431, Cadmium **Region 9**

Agua Hedionda Creek

LOE ID:	77966
Pollutant:	Cadmium

LOE Subgroup:	Pollutant-Water	037527
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	28	
Number of Exceedances:	1	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 1 of 28 samples exceed the criterion for Cadmium.	
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The dissolved cadmium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved cadmium is 0.0022 mg/L (California Toxics Rule, 2000).	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 2 monitoring sites [Agua Hedionda Creek - 904AHC-MLS, Agua Hedionda Creek - 904AHC-TWAS-1]	
Temporal Representation:	Data was collected over the time period 2/17/2002-11/4/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.	

Line of Evidence (LOE) for Decision ID 47431, Cadmium **Region 9**

Agua Hedionda Creek

LOE ID:	72845
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce

	detrimental physiological responses in, human, plant, animal, or aquatic life 037528
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for cadmium is 4.98 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 1 monitoring site [Agua Hedionda Creek 6 - 904CBAHC6]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the 2002 QAMP.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID 47432 Region 9

Agua Hedionda Creek

Pollutant:	**Chlordane**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of 1 sample exceed the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 1 sample exceed the water quality objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47432, Chlordane Region 9

Agua Hedionda Creek

LOE ID:	72829

Pollutant:	Chlordane	037529
LOE Subgroup:	Pollutant-Sediment	
Matrix:	Sediment	
Fraction:	Total	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	0 of 1 samples collected exceeded the criteria for chlordane concentration (Sum of trans-Chlordane, cis-Chlordane, cis-Nonachlor, trans-Nonachlor, and Oxychlordane).	
Data Reference:	Statewide Stream Pollution Trends Study 2008	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Waters shall not contain substances in concentrations that result in the deposition of material that causes nuisance or adversely affects beneficial uses. (Water Quality Control Plan for the San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The Probable Effect Concentration for Chlordane in freshwater sediments is 17.6 ug/kg(MacDonald et al. 2000).	
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31	
Spatial Representation:	Data were collected at the following station 904CBAHC6 (Agua Hedionda Creek 6).	
Temporal Representation:	The samples were collected on 5/21/2008.	
Environmental Conditions:		
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID	**47439**	**Region 9**
Agua Hedionda Creek		

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of 26 samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 26 samples exceed the water quality objective and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.

4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 47439, Chromium **Region 9**

Agua Hedionda Creek

LOE ID:	72857
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for chromium is 111 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 1 monitoring site [Agua Hedionda Creek 6 - 904CBAHC6]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the 2002 QAMP.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 47439, Chromium **Region 9**

Agua Hedionda Creek

LOE ID:	72858
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	26	037531
Number of Exceedances:	0	

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 0 of 26 samples exceed the criterion for Chromium.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Chromium to protect aquatic life in freshwater. The dissolved Chromium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 2 monitoring sites [Agua Hedionda Creek - 904AHC-MLS, Agua Hedionda Creek - 904AHC-TWAS-1]
Temporal Representation:	Data was collected over the time period 2/17/2002-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID	**47440**	**Region 9**
Agua Hedionda Creek		

Pollutant:	**Chrysene (C1-C4)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 1 sample exceeds the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 1 sample exceeds the water quality objective and this sample size is insufficient to

determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47440, Chrysene (C1-C4) **Region 9**

Agua Hedionda Creek

LOE ID:	72859
Pollutant:	Chrysene (C1-C4)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chrysene.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effects level (predictive of sediment toxicity) for Chrysene is 1290 ug/Kg dry weight (Macdonald et al. 2000)
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 1 monitoring site [Agua Hedionda Creek 6 - 904CBAHC6]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **47441** **Region 9**

Agua Hedionda Creek

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision

Revision Status	Revised	037533
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of 28 samples exceed the water quality objective for the protection of the municipal drinking supply beneficial use and 1 of 26 samples exceed the water quality objective for the protection of the WARM freshwater aquatic life beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 28 samples exceed the water quality objective for the protection of the municipal drinking supply beneficial use and 1 of 26 samples exceed the water quality objective for the protection of the WARM freshwater aquatic life beneficial use and these do not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 47441, Copper **Region 9**

Agua Hedionda Creek

LOE ID:	72860
Pollutant:	Copper
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for copper is 149 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31

Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 1 monitoring site [Agua Hedionda Creek 6 - 904CBAHC6]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the 2002 QAMP.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 47441, Copper **Region 9**

Agua Hedionda Creek

LOE ID:	72861
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	26
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 1 of 26 samples exceed the criterion for Copper.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Copper to protect aquatic life in freshwater. The dissolved Copper criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 2 monitoring sites [Agua Hedionda Creek - 904AHC-MLS, Agua Hedionda Creek - 904AHC-TWAS-1]
Temporal Representation:	Data was collected over the time period 2/17/2002-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 47441, Copper **Region 9**

Agua Hedionda Creek

LOE ID:	77974
Pollutant:	Copper

LOE Subgroup:	Pollutant-Water	037535
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	28	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 0 of 28 samples exceed the criterion for Copper.	
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Secondary MCL for copper is 1.0 mg/L (Title 22 California Code of Regulations).	
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 2 monitoring sites [Agua Hedionda Creek - 904AHC-MLS, Agua Hedionda Creek - 904AHC-TWAS-1]	
Temporal Representation:	Data was collected over the time period 2/17/2002-11/4/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.	

DECISION ID	**47443**	**Region 9**
Agua Hedionda Creek		

Pollutant:	**Cyfluthrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 1 sample exceeds the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.

2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 1 sample exceeds the water quality objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47443, Cyfluthrin **Region 9**
Agua Hedionda Creek

LOE ID:	72862
Pollutant:	Cyfluthrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cyfluthrin, total.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for cyfluthrin is the median lethal concentration (LC50) of 1.1 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 1.1 ug/g is the geometric mean of LC50 values for cyfluthrin from Amweg et al. (2005).
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5
Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 1 monitoring site [Agua Hedionda Creek 6 - 904CBAHC6]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **47446** **Region 9**
Agua Hedionda Creek

Pollutant:	**Cyhalothrin, Lambda**	037537
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	
Last Listing Cycle's Final Listing Decision:	New Decision	
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 1 sample exceeds the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 1 sample exceeds the water quality objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47446, Cyhalothrin, Lambda **Region 9**

Agua Hedionda Creek

LOE ID:	72863
Pollutant:	Cyhalothrin, Lambda
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cyhalothrin, lambda, total.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.

Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	037538
Evaluation Guideline:	The evaluation guideline for lambda-cyhalothrin is the median lethal concentration (LC50) of 0.44 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 0.44 ug/g is the geometric mean of LC50 values for lambda-cyhalothrin from Amweg et al. (2005).	
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5	
Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 1 monitoring site [Agua Hedionda Creek 6 - 904CBAHC6]	
Temporal Representation:	Data was collected on a single day 5/21/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.	
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)	

DECISION ID **47449** **Region 9**

Agua Hedionda Creek

Pollutant:	**DDD (Dichlorodiphenyldichloroethane)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of 1 sample exceeds the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 1 sample exceeds the water quality objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47449, DDD (Dichlorodiphenyldichloroethane) **Region 9**

Agua Hedionda Creek

LOE ID:	72866	037539

Pollutant:	DDD (Dichlorodiphenyldichloroethane)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for DDD.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for sum of DDD (o,p' + p,p') is 28.0 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 1 monitoring site [Agua Hedionda Creek 6 - 904CBAHC6]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID 47451 Region 9

Agua Hedionda Creek

Pollutant:	**DDT (Dichlorodiphenyltrichloroethane)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47451, DDT (Dichlorodiphenyltrichloroethane) Region 9

Agua Hedionda Creek

LOE ID:	72892	037540

Pollutant:	Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for DDT, Total.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for total DDTs (Sum DDT + Sum DDD + Sum DDE) is 572 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 1 monitoring site [Agua Hedionda Creek 6 - 904CBAHC6]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 47451, DDT (Dichlorodiphenyltrichloroethane) Region 9

Agua Hedionda Creek

LOE ID:	72868
Pollutant:	DDT (Dichlorodiphenyltrichloroethane)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for DDT.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be

	maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for sum of DDT (o,p' + p,p') is 62.9 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 1 monitoring site [Agua Hedionda Creek 6 - 904CBAHC6]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **47452** **Region 9**

Agua Hedionda Creek

Pollutant:	**Deltamethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of 8 samples exceed the water quality objective in water, and 0 of 1 sample exceeds the evaluation guideline in sediment. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 8 samples exceed the water quality objective in water, and 0 of 1 sample exceeds the evaluation guideline in sediment and these sample sizes are insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples are needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 47452, Deltamethrin **Region 9**

Agua Hedionda Creek

LOE ID: 72870

Pollutant:	Deltamethrin	037542
LOE Subgroup:	Pollutant-Sediment	
Matrix:	Sediment	
Fraction:	Total	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Deltamethrin.	
Data Reference:	Statewide Stream Pollution Trends Study 2008	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The evaluation guideline for deltamethrin is the median lethal concentration (LC50) of 0.79 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 0.79 ug/g is the geometric mean of LC50 values for deltamethrin from Amweg et al. (2005).	
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5	
Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 1 monitoring site [Agua Hedionda Creek 6 - 904CBAHC6]	
Temporal Representation:	Data was collected on a single day 5/21/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.	
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)	

Line of Evidence (LOE) for Decision ID 47452, Deltamethrin **Region 9**

Agua Hedionda Creek

LOE ID:	72869
Pollutant:	Deltamethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 0 of 8 samples exceed the criterion for Deltamethrin.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for Deltamethrin is the maximum acceptable toxicant concentration (MATC) of 0.02 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 2 monitoring sites [Agua Hedionda Creek - 904AHC-MLS, Agua Hedionda Creek - 904AHC-TWAS-1]
Temporal Representation:	Data was collected over the time period 10/14/2006-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID 47453 Region 9

Agua Hedionda Creek

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Four lines of evidence are available in the administrative record to assess this pollutant. Considering the nation-wide ban of diazinon which went into effect on January 1, 2005, data from 2005 and on were evaluated in the assessment of LOE #72872, and 1 of 17 samples exceed the Criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Considering the nation-wide ban of diazinon which went into effect on January 1, 2005, data from 2005 and on were evaluated in the assessment of LOE #72872, and 1 of 17 samples exceed the Criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 47453, Diazinon Region 9

Agua Hedionda Creek

LOE ID:	77710
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	27
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 0 of 27 samples exceed the criterion for Diazinon.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Department of Public Health (CDPH) Notification Level for Diazinon is 1.2 ug/L.
Guideline Reference:	2011 Edition of the Drinking Water Standards and Health Advisories
Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 2 monitoring sites [Agua Hedionda Creek - 904AHC-MLS, Agua Hedionda Creek - 904AHC-TWAS-1]
Temporal Representation:	Data was collected over the time period 2/17/2002-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 47453, Diazinon **Region 9**

Agua Hedionda Creek

LOE ID:	72872
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	17
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 1 of 17 samples exceed the

criterion for Diazinon. 037545

Data Reference: Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).

Objective/Criterion Reference: Water Quality Control Plan for the San Diego Basin

Evaluation Guideline: The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).

Guideline Reference: Water quality for diazinon, Memorandum to J. Karkoski, Central Valley RWQCB, Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game

Spatial Representation: Data for this line of evidence for Agua Hedionda Creek was collected at 2 monitoring sites [Agua Hedionda Creek - 904AHC-MLS, Agua Hedionda Creek - 904AHC-TWAS-1]

Temporal Representation: Data was collected over the time period 2/11/2005-11/4/2008.

Environmental Conditions: Staff is not aware of any special conditions that might affect interpretation of the data.

QAPP Information: The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.

QAPP Information Reference(s): Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 47453, Diazinon **Region 9**

Agua Hedionda Creek

LOE ID: 72894

Pollutant: Toxicity

LOE Subgroup: Toxicity

Matrix: Sediment

Fraction: None

Beneficial Use: Warm Freshwater Habitat

Number of Samples: 1

Number of Exceedances: 0

Data and Information Type: TOXICITY TESTING

Data Used to Assess Water Quality: One sample was collected to evaluate sediment toxicity. The sample did not exhibit significant toxicity. The toxicity test included survival of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).

Data Reference: Statewide Stream Pollution Trends Study 2008

SWAMP Data: SWAMP

Water Quality Objective/Criterion: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.

Objective/Criterion Reference: Water Quality Control Plan for the San Diego Basin

Evaluation Guideline: Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL, Significant compared to negative control based

	on statistical test, less than stated alpha level, AND less than the evaluation threshold (both criteria are met).
Guideline Reference:	
Spatial Representation:	The sample was collected at station 904CBAHC6.
Temporal Representation:	The samples were collected in May 2008.
Environmental Conditions:	
QAPP Information:	All data was collected following the Standard Operating Procedures and Data Quality Objectives outlined in the SWAMP QAMP, (Puckett, 2002). QA data are included in submission.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 47453, Diazinon **Region 9**

Agua Hedionda Creek

LOE ID:	72871
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Diazinon.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for diazinon is the median lethal concentration (LC50) of 11 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 11 ug/g is the geometric mean of LC50 values for diazinon from Ding et al. (2011).
Guideline Reference:	Toxicity of Sediment-Associated Pesticides to Chironomus dilutus and Hyalella azteca. Arch. Environ. Contam. Toxicol. 61:83Â–92.
Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 1 monitoring site [Agua Hedionda Creek 6 - 904CBAHC6]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **47454** **Region 9**

Agua Hedionda Creek

Pollutant:	**Dieldrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final	New Decision

Listing Decision:		037547
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 1 sample exceeds the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 1 sample exceeds the water quality objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47454, Dieldrin **Region 9**

Agua Hedionda Creek

LOE ID:	72873
Pollutant:	Dieldrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Dieldrin.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for dieldrin is 61.8 ug/Kg dry weight (MacDonald et al. 2000).

Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31 037548
Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 1 monitoring site [Agua Hedionda Creek 6 - 904CBAHC6]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the 2002 QAMP.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID 47456 Region 9

Agua Hedionda Creek

Pollutant:	**Endrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of 1 sample exceeds the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 1 sample exceeds the water quality objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47456, Endrin Region 9

Agua Hedionda Creek

LOE ID:	72874
Pollutant:	Endrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total

Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Endrin.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for endrin is 207 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 1 monitoring site [Agua Hedionda Creek 6 - 904CBAHC6]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the 2002 QAMP.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **47457** **Region 9**

Agua Hedionda Creek

Pollutant:	**Esfenvalerate/Fenvalerate**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of 8 samples exceed the water quality objective in water and 0 of 1 sample exceed the water quality objective in sediment.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 8 samples exceed the water quality objective in water and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 47457, Esfenvalerate/Fenvalerate **Region 9**

Agua Hedionda Creek

LOE ID:	72875
Pollutant:	Esfenvalerate/Fenvalerate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 0 of 8 samples exceed the criterion for Esfenvalerate.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to the USEPA Office of Pesticide Programs Ecotoxicity database, the aquatic life EC50 for Esfenvalerate is 0.9 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 2 monitoring sites [Agua Hedionda Creek - 904AHC-MLS, Agua Hedionda Creek - 904AHC-TWAS-1]
Temporal Representation:	Data was collected over the time period 10/14/2006-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 47457, Esfenvalerate/Fenvalerate **Region 9**

Agua Hedionda Creek

LOE ID:	72876
Pollutant:	Esfenvalerate/Fenvalerate
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total

Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Esfenvalerate/Fenvalerate, total.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for esfenvalerate/fenvalerate is the median lethal concentration (LC50) of 1.5 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 1.5 ug/g is the geometric mean of LC50 values for esfenvalerate/fenvalerate from Amweg et al. (2005).
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5
Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 1 monitoring site [Agua Hedionda Creek 6 - 904CBAHC6]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID	**47458**	**Region 9**
Agua Hedionda Creek		

Pollutant:	**Fenpropathrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 1 sample exceeds the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.

3. Zero of 1 sample exceeds the water quality objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47458, Fenpropathrin **Region 9**

Agua Hedionda Creek

LOE ID:	72877
Pollutant:	Fenpropathrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Fenpropathrin.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for fenpropathrin is the median lethal concentration (LC50) of 1 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 1 ug/g is the geometric mean of LC50 values for fenpropathrin from Ding et al. (2011).
Guideline Reference:	Toxicity of Sediment-Associated Pesticides to Chironomus dilutus and Hyalella azteca. Arch. Environ. Contam. Toxicol. 61:83Â–92.
Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 1 monitoring site [Agua Hedionda Creek 6 - 904CBAHC6]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **47459** **Region 9**

Agua Hedionda Creek

Pollutant:	**Fluoranthene**	037553
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	
Last Listing Cycle's Final Listing Decision:	New Decision	
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 1 sample exceeds the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 1 sample exceeds the water quality objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47459, Fluoranthene **Region 9**

Agua Hedionda Creek

LOE ID:	72878
Pollutant:	Fluoranthene
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Fluoranthene.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	In freshwater sediments the probable effects level (predictive of sediment toxicity) for Fluoranthene is 2,230 ug/Kg dry weight (Macdonald et al. 2000)
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 1 monitoring site [Agua Hedionda Creek 6 - 904CBAHC6]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID 47460 Region 9

Agua Hedionda Creek

Pollutant:	**Fluorene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of 1 sample exceeds the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 1 sample exceeds the water quality objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47460, Fluorene Region 9

Agua Hedionda Creek

LOE ID:	72879
Pollutant:	Fluorene

LOE Subgroup:	Pollutant-Sediment	037555
Matrix:	Sediment	
Fraction:	Total	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Fluorene.	
Data Reference:	Statewide Stream Pollution Trends Study 2008	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for fluorene is 536 ug/Kg dry weight (MacDonald et al. 2000).	
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31	
Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 1 monitoring site [Agua Hedionda Creek 6 - 904CBAHC6]	
Temporal Representation:	Data was collected on a single day 5/21/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.	
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)	

DECISION ID	**47463**	**Region 9**
Agua Hedionda Creek		

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. Zero of 26 samples exceed the water quality objective for the protection of WARM freshwater aquatic life.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 26 samples exceed the water quality objective for the protection of WARM freshwater aquatic life and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.

	4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 47463, Lead **Region 9**

Agua Hedionda Creek

LOE ID:	72880
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	26
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 0 of 26 samples exceed the criterion for Lead.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Lead to protect aquatic life in freshwater. The dissolved Lead criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 2 monitoring sites [Agua Hedionda Creek - 904AHC-MLS, Agua Hedionda Creek - 904AHC-TWAS-1]
Temporal Representation:	Data was collected over the time period 2/17/2002-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID **47466** **Region 9**

Agua Hedionda Creek

Pollutant:	**Lindane/gamma Hexachlorocyclohexane (gamma-HCH)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision

Revision Status	Revised	037557
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 1 sample exceeds the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 1 sample exceeds the water quality objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47466, Lindane/gamma Hexachlorocyclohexane (gamma-HCH) **Region 9**

Agua Hedionda Creek

LOE ID:	72881
Pollutant:	Lindane/gamma Hexachlorocyclohexane (gamma-HCH)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for HCH, gamma.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity)

	for Lindane (gamma-HCH) is 4.99 ug/Kg dry weight (MacDonald et al. 2000) 037558
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 1 monitoring site [Agua Hedionda Creek 6 - 904CBAHC6]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the 2002 QAMP.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID 47469 Region 9

Agua Hedionda Creek

Pollutant:	**Mercury**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of 1 sample exceeds the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 1 sample exceeds the water quality objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47469, Mercury Region 9

Agua Hedionda Creek

LOE ID:	72851
Pollutant:	Mercury
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment

Fraction:	Total	037559
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Mercury.	
Data Reference:	Statewide Stream Pollution Trends Study 2008	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for mercury is 1.06 mg/Kg dry weight (MacDonald et al. 2000).	
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31	
Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 1 monitoring site [Agua Hedionda Creek 6 - 904CBAHC6]	
Temporal Representation:	Data was collected on a single day 5/21/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	SWAMP data collected before September 2008 followed the 2002 QAMP.	
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)	

DECISION ID	**47470**	**Region 9**
Agua Hedionda Creek		

Pollutant:	**Methyl Parathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 1 sample exceeds the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 1 sample exceeds the water quality objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support

rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47470, Methyl Parathion **Region 9**

Agua Hedionda Creek

LOE ID:	72852
Pollutant:	Methyl Parathion
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Parathion, Methyl.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for methyl parathion is the median lethal concentration (LC50) of 6 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 6 ug/g is the geometric mean of LC50 values for methyl parathion from Ding et al. (2011).
Guideline Reference:	Toxicity of Sediment-Associated Pesticides to Chironomus dilutus and Hyalella azteca. Arch. Environ. Contam. Toxicol. 61:83Â–92.
Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 1 monitoring site [Agua Hedionda Creek 6 - 904CBAHC6]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **47471** **Region 9**

Agua Hedionda Creek

Pollutant:	**Naphthalene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**

Last Listing Cycle's Final Listing Decision:	New Decision	037561
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 1 sample exceeds the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 1 sample exceeds the water quality objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47471, Naphthalene **Region 9**

Agua Hedionda Creek

LOE ID:	72853
Pollutant:	Naphthalene
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Naphthalene.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity)

	for naphthalene is 561 ug/Kg dry weight (MacDonald et al. 2000). 037562
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 1 monitoring site [Agua Hedionda Creek 6 - 904CBAHC6]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID 47472 Region 9

Agua Hedionda Creek

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Three lines of evidence are available in the administrative record to assess this pollutant. Zero of the 28 samples exceed the water quality objective for the protection of Municipal Drinking Water Supply, 0 of 26 samples exceed the water quality objective for the protection of WARM Freshwater Aquatic life in water, and 0 of 1 sample exceeds the water quality objective for the protection of WARM freshwater aquatic life in sediment. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the 28 samples exceed the water quality objective for the protection of Municipal Drinking Water Supply and 0 of 26 samples exceed the water quality objective for the protection of WARM Freshwater Aquatic life in water and these do not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 47472, Nickel Region 9

Agua Hedionda Creek

LOE ID:	72854
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment

Fraction:	Total	037563
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.	
Data Reference:	Statewide Stream Pollution Trends Study 2008	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for nickel is 48.6 mg/Kg dry weight (MacDonald et al. 2000).	
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31	
Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 1 monitoring site [Agua Hedionda Creek 6 - 904CBAHC6]	
Temporal Representation:	Data was collected on a single day 5/21/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	SWAMP data collected before September 2008 followed the 2002 QAMP.	
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)	

Line of Evidence (LOE) for Decision ID 47472, Nickel **Region 9**

Agua Hedionda Creek

LOE ID:	72855
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	26
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 0 of 26 samples exceed the criterion for Nickel.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Nickel to protect aquatic life in freshwater. The dissolved Nickel criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority

	toxic pollutants for the State of California. 7/1/2011 Edition	037564

Evaluation Guideline:
Guideline Reference:

Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 2 monitoring sites [Agua Hedionda Creek - 904AHC-MLS, Agua Hedionda Creek - 904AHC-TWAS-1]
Temporal Representation:	Data was collected over the time period 2/17/2002-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 47472, Nickel **Region 9**

Agua Hedionda Creek

LOE ID:	77971
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	28
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 0 of 28 samples exceed the criterion for Nickel.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nickel is 0.1 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR

Evaluation Guideline:
Guideline Reference:

Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 2 monitoring sites [Agua Hedionda Creek - 904AHC-MLS, Agua Hedionda Creek - 904AHC-TWAS-1]
Temporal Representation:	Data was collected over the time period 2/17/2002-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID 47473 **Region 9**

Agua Hedionda Creek

Pollutant:	**Nitrate/Nitrite (Nitrite + Nitrate as N)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 28 samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 28 samples exceed the water quality objective and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 47473, Nitrate/Nitrite (Nitrite + Nitrate as N) **Region 9**

Agua Hedionda Creek

LOE ID:	77972
Pollutant:	Nitrate/Nitrite (Nitrite + Nitrate as N)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	28
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 0 of 28 samples exceed the criterion for Nitrate/Nitrite as N.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrate + nitrite (as N) is 10.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 2 monitoring sites [Agua Hedionda Creek - 904AHC-MLS, Agua Hedionda Creek - 904AHC-TWAS-1]
Temporal Representation:	Data was collected over the time period 2/17/2002-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID 47475 — Region 9

Agua Hedionda Creek

Pollutant:	**Nitrogen, Nitrite**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of 26 samples exceed the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 26 samples exceed the water quality objective and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 47475, Nitrogen, Nitrite — Region 9

Agua Hedionda Creek

LOE ID:	77973
Pollutant:	Nitrogen, Nitrite
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	26
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 0 of 26 samples exceed the criterion for Nitrite as N.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrite (as N) is 1.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 2 monitoring sites [Agua Hedionda Creek - 904AHC-MLS, Agua Hedionda Creek - 904AHC-TWAS-1]
Temporal Representation:	Data was collected over the time period 2/17/2002-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID	**47476**	**Region 9**
Agua Hedionda Creek		

Pollutant:	**PAHs (Polycyclic Aromatic Hydrocarbons)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 1 sample exceeds the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 1 sample exceeds the water quality objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47476, PAHs (Polycyclic Aromatic Hydrocarbons) **Region 9**

Agua Hedionda Creek

LOE ID:	72856
Pollutant:	PAHs (Polycyclic Aromatic Hydrocarbons)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for PAHs (Polycyclic Aromatic Hydrocarbons).
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effects level (predictive of sediment toxicity) for PAH, Total is 22,800 ug/Kg dry weight (Macdonald et al. 2000)
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 1 monitoring site [Agua Hedionda Creek 6 - 904CBAHC6]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **47477** **Region 9**

Agua Hedionda Creek

Pollutant:	**PCBs (Polychlorinated biphenyls)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of

the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 1 sample exceeds the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 1 sample exceeds the water quality objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47477, PCBs (Polychlorinated biphenyls) **Region 9**

Agua Hedionda Creek

LOE ID:	72809
Pollutant:	PCBs (Polychlorinated biphenyls)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Zero of 1 sample collected for Total PCBs exceeded the evaluation guideline.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for total PCB is 676 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data were collected at the following station 904CBAHC6 (Agua Hedionda Creek 6).
Temporal Representation:	The samples were collected on 5/21/2008.
Environmental Conditions:	
QAPP Information:	The SWAMP QAPP (2008) was followed.

DECISION ID	47479	Region 9
Agua Hedionda Creek		

Pollutant:	**Phenanthrene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of 1 sample exceeds the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 1 sample exceeds the water quality objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47479, Phenanthrene	**Region 9**
Agua Hedionda Creek	

LOE ID:	72890
Pollutant:	Phenanthrene
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Phenanthrene.

Data Reference:	Statewide Stream Pollution Trends Study 2008	037571
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In freshwater sediments the probable effects level (predictive of sediment toxicity) for Phenanthrene is 1170 ug/Kg dry weight (Macdonald et al. 2000)	
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31	
Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 1 monitoring site [Agua Hedionda Creek 6 - 904CBAHC6]	
Temporal Representation:	Data was collected on a single day 5/21/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.	
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)	

DECISION ID	**47480**	**Region 9**
Agua Hedionda Creek		

Pollutant:	**Pyrene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of 1 sample exceeds the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 1 sample exceeds the water quality objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47480, Pyrene **Region 9**

Agua Hedionda Creek

LOE ID:	72891
Pollutant:	Pyrene
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Pyrene.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effects level (predictive of sediment toxicity) for Pyrene is 1520 ug/Kg dry weight (Macdonald et al. 2000)
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 1 monitoring site [Agua Hedionda Creek 6 - 904CBAHC6]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **47481** **Region 9**

Agua Hedionda Creek

Pollutant:	**Surfactants (MBAS)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of 28 samples exceed the secondary MCL for MBAS in water.

Based on the readily available data and information, the weight of evidence indicates that there is

sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 28 samples exceed the secondary MCL for MBAS in water
and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 47481, Surfactants (MBAS) **Region 9**

Agua Hedionda Creek

LOE ID:	77977
Pollutant:	Surfactants (MBAS)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	28
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 0 of 28 samples exceed the criterion for MBAS.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The Secondary California Maximum Contaminant Level for MBAS is 0.5 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 2 monitoring sites [Agua Hedionda Creek - 904AHC-MLS, Agua Hedionda Creek - 904AHC-TWAS-1]
Temporal Representation:	Data was collected over the time period 2/17/2002-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID **47482** **Region 9**

Agua Hedionda Creek

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. Zero of 28 samples exceed the water quality objective for the protection of the Municipal Drinking Water Supply beneficial use, 0 of 26 samples exceed the water quality objective for the protection of the WARM freshwater aquatic life beneficial use in water, and 0 of 1 sample exceeds the water quality objective for the protection of the WARM freshwater aquatic life beneficial use in sediment.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 28 samples exceed the water quality objective for the protection of the Municipal Drinking Water Supply beneficial use and 0 of 26 samples exceed the water quality objective for the protection of the WARM freshwater aquatic life beneficial use in water and these do not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 47482, Zinc **Region 9**

Agua Hedionda Creek

LOE ID:	77978
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	28
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 0 of 28 samples exceed the criterion for Zinc.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to,

	or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for zinc is 5.0 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 2 monitoring sites [Agua Hedionda Creek - 904AHC-MLS, Agua Hedionda Creek - 904AHC-TWAS-1]
Temporal Representation:	Data was collected over the time period 2/17/2002-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 47482, Zinc **Region 9**

Agua Hedionda Creek

LOE ID:	72895
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for Zinc is 459 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 1 monitoring site [Agua Hedionda Creek 6 - 904CBAHC6]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the 2002 QAMP.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 47482, Zinc **Region 9**

Agua Hedionda Creek

LOE ID:	72883
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	26
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 0 of 26 samples exceed the criterion for Zinc.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Zinc to protect aquatic life in freshwater. The dissolved Zinc criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 2 monitoring sites [Agua Hedionda Creek - 904AHC-MLS, Agua Hedionda Creek - 904AHC-TWAS-1]
Temporal Representation:	Data was collected over the time period 2/17/2002-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID **43871** **Region 9**

Agua Hedionda Creek

Pollutant:	**Benthic Community Effects**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Benthic Community Effects is being considered for placement on the CWA section 303(d) List under sections 3.9 and 3.1 of the Listing Policy. Under section 3.9, an additional line of evidence associating Benthic Community Effects with a water or sediment concentration of pollutant(s) is necessary to assess listing status.

Based on the readily available data and information, the weight of evidence provides sufficient justification for placing Benthic Community Effects in this water segment on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Pursuant to section 3.9 of the Listing Policy, the water exhibits significant degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index.
4. Pursuant to section 3.9 of the Listing Policy, the water segment has associated pollutant(s) samples that exceed water quality objectives.
5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are being met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem. Based on the readily available data and information, the weight of evidence provides sufficient justification for placing Benthic Community Effects in this water segment on the CWA section 303(d) List.

Line of Evidence (LOE) for Decision ID 43871, Benthic Community Effects **Region 9**

Agua Hedionda Creek

LOE ID:	77581
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	28
Number of Exceedances:	28
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Twenty-eight of the 28 samples collected had an IBI score below 40. tr11c NPDES bioassessment
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the State or Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	Development of a Benthic Index of Biotic Integrity (B-IBI) for Wadeable Streams in Northern Coastal California and its Application to Regional 305(b) Assessment

Spatial Representation:	The samples were collected twicea a year at two stations on Agua Hedionda Creek. The stations are 904AHC-ECR and AHC-MR.
Temporal Representation:	The samples were collected in May and October from 2001 to 2008.
Environmental Conditions:	
QAPP Information:	The data was collected under the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan, June 25, 2009.
QAPP Information Reference(s):	Quality Assurance Project Plan for SWAMP Bioassessment and Freshwater Bioassessment.

Line of Evidence (LOE) for Decision ID 43871, Benthic Community Effects **Region 9**

Agua Hedionda Creek

LOE ID:	26225
Pollutant:	Sediment Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Toxicity testing of sediments
Data Used to Assess Water Quality:	Hyalella azteca- All four samples show significant toxicity levels (SL) as determined by the Hyalella azteca survival and growth test according to results in California's Surface Water Ambient Monitoring Program Annual Progress Report, 2007. Samples were collected one to three times a year from 2002-2006.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.
Guideline Reference:	Monitoring data for Region 9
Spatial Representation:	Samples were collected at monitoring station Agua Hedionda Creek 6 on the main stem of Agua Hedionda creek (station id: 904CBAQH6 lat/long: 33.14887/-117.29758).
Temporal Representation:	Samples were collected one to three times a year from 2002-2006.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 43871, Benthic Community Effects **Region 9**

Agua Hedionda Creek

LOE ID:	26237
Pollutant:	Benthic Community Effects
LOE Subgroup:	Adverse Biological Responses
Matrix:	Water

Fraction:	None	037579
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	26	
Number of Exceedances:	26	
Data and Information Type:	Benthic macroinvertebrate surveys	
Data Used to Assess Water Quality:	Twenty six samples of IBI data were taken from May 2001 to May 2007 at two sampling sites. Of the total number of samples, all twenty six samples exceeded the IBI impairment threshold.	
Data Reference:	Stream Bioassessment Data. Co-permitee Data. Collected 2002-2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)	
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13	
Spatial Representation:	Samples were collected at two sites: AHCECR and AHC-MR on Agua Hedionda Creek.	
Temporal Representation:	Sampling occurred during May and October annually over a six year period from May 2001 to October 2006 and during May in 2007.	
Environmental Conditions:		
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Manual for Freshwater Bioassessment.	
QAPP Information Reference(s):	Quality Assurance Manual for Freshwater Bioassessment Revision 0	

Line of Evidence (LOE) for Decision ID 43871, Benthic Community Effects **Region 9**

Agua Hedionda Creek

LOE ID:	25001
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	15
Number of Exceedances:	8
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Selenastrum capricornutum- None of fifteen samples collected were found to be toxic as determined by the Selenastrum capricornutum growth test. Ceriodaphnia dubia- Three of fifteen samples collected were found to be toxic as determined by the

	Ceriodaphnia dubia survival/reproductive test.	037580
	Hyalella Azteca- Seven of fifteen samples collected were found to be toxic as determined by the Hyalella azteca survival test according to the San Diego County Municipal Copermittees Urban Runoff Monitoring Report, 2007. Samples were collected one to three times a year from 2002-2006.	
Data Reference:	Monitoring data for Region 9	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	Samples were found to exhibit toxicity when the No Observed Effect Concentration (NOEC) or median lethal concentration (LC50) for any given species was estimated to be less than 100% of the test sample concentration (U.S. EPA, 2002).	
Guideline Reference:	Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms. Fourth Edition. Office of Water, U.S. Environmental Protection Agency. Washington, D.C. EPA-821-R-02-013 Waste Discharge Requirements for Discharges of Urban Runoff From the Municipal Separate Storm Sewer Systems Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego, the San Diego Unified Port District, and the San Diego County Regional Airport. Order No. R9-2007-0001	
Spatial Representation:	Samples were collected at the mass loading station located near the lower boundary of the watershed under the El Camino Real Bridge crossing immediately downstream of the confluence of Agua Hedionda Creek and Calavera Creek.	
Temporal Representation:	Samples were collected one to three times a year from 2002-2006.	
Environmental Conditions:	Samples were collected during wet weather.	
QAPP Information:	Quality control for the toxicity portion of this study was conducted in accordance with the City of San Diego's NPDES program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43871, Benthic Community Effects **Region 9**

Agua Hedionda Creek

LOE ID:	72844
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	8
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 8 of 8 samples exceed the criterion for Bifenthrin.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are

	harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Bifenthrin does not exceed 0.0006 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 2 monitoring sites [Agua Hedionda Creek - 904AHC-MLS, Agua Hedionda Creek - 904AHC-TWAS-1]
Temporal Representation:	Data was collected over the time period 10/14/2006-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 43871, Benthic Community Effects **Region 9**

Agua Hedionda Creek

LOE ID:	72840
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	The IBI score for this water body was 16 which indicates that this water body may be considered to have impaired conditions.
Data Reference:	RWB9 Status Sampling 2007 and 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at the following station: 904CBAHC6 (Agua Hedionda Creek 6).
Temporal Representation:	Survey done May 6, 2008.
Environmental Conditions:	
QAPP Information:	Data collected following SWAMP QA protocols for the RWB9 Status Sampling 2007 and 2008 water quality monitoring project.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43871, Benthic Community Effects **Region 9**

Agua Hedionda Creek 037582

LOE ID:	72882
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	25
Number of Exceedances:	8
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 8 of 25 samples exceed the criterion for Malathion.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 2 monitoring sites [Agua Hedionda Creek - 904AHC-MLS, Agua Hedionda Creek - 904AHC-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/8/2002-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 43871, Benthic Community Effects **Region 9**

Agua Hedionda Creek

LOE ID:	72872
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	17
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 1 of 17 samples exceed the criterion for Diazinon.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 2 monitoring sites [Agua Hedionda Creek - 904AHC-MLS, Agua Hedionda Creek - 904AHC-TWAS-1]
Temporal Representation:	Data was collected over the time period 2/11/2005-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 43871, Benthic Community Effects **Region 9**

Agua Hedionda Creek

LOE ID:	72865
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	3
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 3 of 3 samples exceed the criterion for Cypermethrin, total.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of cypermethrin does not exceed 0.0002 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Fojut et al. 2012)
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 2 monitoring sites [Agua Hedionda Creek - 904AHC-MLS, Agua Hedionda Creek - 904AHC-TWAS-1]
Temporal Representation:	Data was collected over the time period 10/14/2006-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 43871, Benthic Community Effects **Region 9**

Agua Hedionda Creek

LOE ID:	72893
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	27
Number of Exceedances:	17
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Twenty-seven samples were collected to test for toxicity. Seventeen of the 27 samples exhibited statistically significant toxicity. The toxicity tests that exhibited significant toxicity included survival of Hyalella azteca, growth of Selenastrum capriconutum and survival and reproduction of Ceriodaphnia dubia.
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected at stations 904AHC-MLS and 904AHC-TWAS-1, Agua Hedionda Creek
Temporal Representation:	The samples were collected from 2001 to 2008.
Environmental Conditions:	
QAPP Information:	The data was collected under the County of San Diego Co-Permittees Receiving Waters Urban Runoff Monitoring and Reporting Program (Order No. 2007-01). Data quality is good.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 43871, Benthic Community Effects **Region 9**

Agua Hedionda Creek 037585

LOE ID:	26573
Pollutant:	Benthic Community Effects
LOE Subgroup:	Adverse Biological Responses
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	10
Number of Exceedances:	10
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Ten samples of IBI data were taken from May 1998 to May 2001 at two sampling sites. Of the total number of samples, all ten samples exceeded the IBI impairment threshold.
Data Reference:	Fish and Game IBI Data
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at two sites: 904AHCECR and 904AHCSAx on Agua Hedionda Creek.
Temporal Representation:	Sampling occurred during one to three events annually over a four year period from May 1998 to May 2001.
Environmental Conditions:	
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Project Plan for the California Stream Bioassessment Procedure and the State of California, California Monitoring an Assessment Program: "CMAP", Quality Assurance Project Plan.
QAPP Information Reference(s):	State of California, California Monitoring and Assessment Program: "CMAP". Quality Assurance Project Plan for the California Stream Bioassessment Procedure The San Diego Stream Team Quality Assurance Project Plan

Line of Evidence (LOE) for Decision ID 43871, Benthic Community Effects **Region 9**

Agua Hedionda Creek

LOE ID:	77708
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	21
Number of Exceedances:	7
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 7 of 21 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.014 ug/L (Siepmann and Finlayson 2000).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).
Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 2 monitoring sites [Agua Hedionda Creek - 904AHC-MLS, Agua Hedionda Creek - 904AHC-TWAS-1]
Temporal Representation:	Data was collected over the time period 2/17/2002-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 43871, Benthic Community Effects **Region 9**

Agua Hedionda Creek

LOE ID:	79512
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	29
Number of Exceedances:	29
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	29 total samples were collected at three stations. All 29 samples were below the 0.79 threshold, and therefore exceeding the water quality objective for the aquatic life beneficial use.
Data Reference:	RWB9 Status Sampling 2007 and 2008 Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008. Region 9 CSCI Scores & Water Body Information

SWAMP Data:	SWAMP	037587
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the State or Regional Board. Region 9 Basin Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.	
Guideline Reference:	The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.	
Spatial Representation:	The samples were collected at three stations on Agua Hedionda Creek. 904CBAHC6 904AHC-TWAS-1 904AHC-MR	
Temporal Representation:	The samples were collected from 2001 to 2008.	
Environmental Conditions:		
QAPP Information:	Data collected following SWAMP QA protocols for the RWB9 Status Sampling 2007 and 2008 water quality monitoring project and the County of San Diego NPDES MS4 Copermittees Receiving Waters Monitoring and Reporting Program.	
QAPP Information Reference(s):	RWB9 Status Sampling 2007 and 2008 Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008. Quality Assurance Project Plan for SWAMP Bioassessment and Freshwater Bioassessment.	

Line of Evidence (LOE) for Decision ID 43871, Benthic Community Effects **Region 9**

Agua Hedionda Creek

LOE ID:	3181
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Not Specified
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Data were collected by the Stream Team from 1999-2001. Over the 3 years, Taxa Richness remained at 6.5 to 6.0. EPT index changed, from 64.6 to 19.6 to 87.5 from 1999 to 2001. The Tolerance value remained fairly constant over the 3 year period, ranging from 4.2 to 5.5. The majority of feeding groups were collectors and filterers. Filterers increased from 2.7% to 59.3% from 1999 to 2000, and decreased to 9.6 in 2001 (Stream Team, 2001).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	

Objective/Criterion Reference: 037588

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Agua Hedionda Creek. Exact location was not reported.
Temporal Representation: Samples were collected in the Spring of 1999, 2000, and 2001.
Environmental Conditions:
QAPP Information: QA Info Missing
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 43871, Benthic Community Effects **Region 9**

Agua Hedionda Creek

LOE ID: 3180

Pollutant: Benthic-Macroinvertebrate Bioassessments
LOE Subgroup: Population/Community Degradation
Matrix: Not Specified
Fraction: None

Beneficial Use: Warm Freshwater Habitat

Number of Samples: 0
Number of Exceedances: 0

Data and Information Type: Benthic macroinvertebrate surveys
Data Used to Assess Water Quality: Data were collected for the San Diego Regional Water Quality Control Board 1999 Biological Assessment Annual Report. Physical habitat scores at AHC-ECR ranged from 57-86, relatively low compared to other sampled waterbodies. BMI scores at AHC-ECR were near or above average, compared to other sampled waterbodies.
Data Reference: Placeholder reference 2006 303(d)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion:
Objective/Criterion Reference:

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Agua Hedionda Creek 5 riffles downstream of El Camino Real (AHC-ECR).
Temporal Representation: Samples were collected in May, September and November 1998 and in May 1999.
Environmental Conditions:
QAPP Information: Data used in 2002 assessment.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 43871, Benthic Community Effects **Region 9**

Agua Hedionda Creek

LOE ID: 3179

Pollutant: Benthic-Macroinvertebrate Bioassessments
LOE Subgroup: Population/Community Degradation
Matrix: Not Specified
Fraction: None

Beneficial Use: Warm Freshwater Habitat

Number of Samples: 0

Number of Exceedances:	0	037589

Data and Information Type: Benthic macroinvertebrate surveys
Data Used to Assess Water Quality: Data were collected for the San Diego Regional Water Quality Control Board 1999 Biological Assessment Annual Report. Physical habitat quality scores at AHC-SA were 80 and 74, relatively low compared to other waterbodies' scores. BMI scores were below average compared to other waterbodies sampled.
Data Reference: Placeholder reference 2006 303(d)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion:
Objective/Criterion Reference:

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Agua Hedionda Creek, 5 riffles downstream of Sycamore Avenue (AHC-SA).
Temporal Representation: Samples were collected in 05/1998 and 09/1998.
Environmental Conditions:
QAPP Information: Data used in 2002 assessment.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 43871, Benthic Community Effects **Region 9**

Agua Hedionda Creek

LOE ID: 3184

Pollutant: Manganese
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 4
Number of Exceedances: 2

Data and Information Type: PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality: Two of 4 samples exceeded the water quality standard (SWAMP, 2004).
Data Reference: Placeholder reference 2006 303(d)

SWAMP Data: SWAMP

Water Quality Objective/Criterion: The water quality objective for manganese in Agua Hedionda Creek is 0.05 milligrams/liter (mg/l) according to Basin Plan, Table 3-2 entitled, Water Quality Objectives. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference: Placeholder reference 2006 303(d)

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples taken at one station in Agua Hedionda Creek No. 33.14887 -117.29758.
Temporal Representation: Samples were collected from March through September of 2002.
Environmental Conditions: Agua Hedionda Creek, Part of the San Diego Coastal Streams: Hydrologic Unit Basin Number 4.32
QAPP Information: SWAMP Quality Assurance Plan
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 43871, Benthic Community Effects **Region 9**

Agua Hedionda Creek 037590

LOE ID:	3183
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	3
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Four water samples, three samples exceeding The CTR criteria (SWAMP, 2004).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	CTR Freshwater Chronic (CCC) 5 µg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were taken at one station in Agua Hedionda Creek No. 33.14887 -117.29758.
Temporal Representation:	Samples were collected from March through September of 2002.
Environmental Conditions:	Agua Hedionda Creek, Part of the San Diego Coastal Streams: Hydrologic Unit Basin Number 4.31
QAPP Information:	SWAMP Quality Assurance Plan.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43871, Benthic Community Effects **Region 9**

Agua Hedionda Creek

LOE ID:	7360
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	3
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Three of four samples exceed the water quality objective according to results in the Surface Water Ambient Monitoring Program Annual Progress Report, 2007. Samples were collected on September, June, March and April 2002.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total phosphorus, P. These values are not to be exceeded more

	than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at monitoring station Agua Hedionda Creek 6 on the main stem of Agua Hedionda creek (station id: 904CBAQH6 lat/long: 33.14887/-117.29758).
Temporal Representation:	Samples were collected on September, June, March and April 2002.
Environmental Conditions:	The first two samples were taken during minimum and declining base flow respectively. The last two samples were taken during wet weather, between storm events and high base flow respectively.
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 43871, Benthic Community Effects **Region 9**

Agua Hedionda Creek

LOE ID:	6713
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	24
Number of Exceedances:	24
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	All twenty four samples collected exceed the water quality objective according to results in the San Diego County Municipal Copermittees Urban Runoff Monitoring Report, 2007. Samples were collected one to four times a year from 1998-2006.
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at the mass loading station located near the lower boundary of the

	watershed under the El Camino Real Bridge crossing immediately downstream of the confluence of Agua Hedionda Creek and Calavera Creek.
Temporal Representation:	Samples were collected one to four times a year from 1998-2006.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the City of San Diego's NPDES Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43871, Benthic Community Effects **Region 9**

Agua Hedionda Creek

LOE ID:	6704
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	24
Number of Exceedances:	24
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	All twenty four samples collected exceed the water quality objective according to results in the San Diego County Municipal Copermittees Urban Runoff Monitoring Report, 2007. Samples were collected one to four times a year from 1998-2006.
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses (RWQCB, 2007). Water Quality Control Plan for the San Diego Basin Goal of 0.1 mg/L for total phosphorus in streams and other flowing waters (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at the mass loading station located near the lower boundary of the watershed under the El Camino Real Bridge crossing immediately downstream of the confluence of Agua Hedionda Creek and Calavera Creek.
Temporal Representation:	Samples were collected one to four times a year from 1998-2006.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	Quality control for the toxicity portion of this study was conducted in accordance with the City of San Diego's NPDES monitoring program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 43871, Benthic Community Effects **Region 9**

Agua Hedionda Creek

LOE ID:	7475
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None

Beneficial Use:	Warm Freshwater Habitat	037593
Number of Samples:	4	
Number of Exceedances:	4	
Data and Information Type:	Ambient toxicity testing (chronic)	
Data Used to Assess Water Quality:	Selenastrum capricornutum- All four samples show significant toxicity levels (SL) as determined by the Selenastrum capricornutum growth test. Ceriodaphnia dubia- All four samples show significant toxicity levels (SL) as determined by the Ceriodaphnia dubia survival and reproduction test according to results in California's Surface Water Ambient Monitoring Program Annual Progress Report, 2007. Samples were collected one to three times a year from 2002-2006.	
Data Reference:	Monitoring data for Region 9	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	Waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.	
Guideline Reference:	Monitoring data for Region 9 Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms. Fourth Edition. Office of Water, U.S. Environmental Protection Agency. Washington, D.C. EPA-821-R-02-013	
Spatial Representation:	Samples were collected at monitoring station Agua Hedionda Creek 6 on the main stem of Agua Hedionda creek (station id: 904CBAQH6 lat/long: 33.14887/-117.29758).	
Temporal Representation:	Samples were collected one to three times a year from 2002-2006.	
Environmental Conditions:	Samples were collected during wet weather.	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.	
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA	

DECISION ID	**47429**	**Region 9**
Agua Hedionda Creek		

Pollutant:	**Bifenthrin**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2029
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Under 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding the pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Eight of the eight water samples exceed the GUIDELINE. Zero of one sediment sample exceed the GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Eight of eight water samples exceed the GUIDELINE and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 47429, Bifenthrin **Region 9**

Agua Hedionda Creek

LOE ID:	72843
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Bifenthrin.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for bifenthrin is the median lethal concentration (LC50) of 0.43 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 0.43 ug/g is the geometric mean of LC50 values for bifenthrin from Amweg et al. (2005) and Amweg and Weston (2007).
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5 Whole-sediment toxicity identification evaluation tools for pyrethroid insecticides: I. piperonyl butoxide addition. Environ. Toxicol. Chem. 26:2389-2396.
Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 1 monitoring site [Agua Hedionda Creek 6 - 904CBAHC6]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient

Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

037595

Line of Evidence (LOE) for Decision ID 47429, Bifenthrin **Region 9**

Agua Hedionda Creek

LOE ID:	72844
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	8
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 8 of 8 samples exceed the criterion for Bifenthrin.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Bifenthrin does not exceed 0.0006 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 2 monitoring sites [Agua Hedionda Creek - 904AHC-MLS, Agua Hedionda Creek - 904AHC-TWAS-1]
Temporal Representation:	Data was collected over the time period 10/14/2006-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 47429, Bifenthrin **Region 9**

Agua Hedionda Creek

LOE ID:	26225
Pollutant:	Sediment Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Toxicity testing of sediments
Data Used to Assess Water Quality:	Hyalella azteca- All four samples show significant toxicity levels (SL) as determined by the Hyalella azteca survival and growth test according to results in California's Surface Water Ambient Monitoring Program Annual Progress Report, 2007. Samples were collected one to three times a year from 2002-2006.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.
Guideline Reference:	Monitoring data for Region 9
Spatial Representation:	Samples were collected at monitoring station Agua Hedionda Creek 6 on the main stem of Agua Hedionda creek (station id: 904CBAQH6 lat/long: 33.14887/-117.29758).
Temporal Representation:	Samples were collected one to three times a year from 2002-2006.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

DECISION ID	47433	Region 9
Agua Hedionda Creek		

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2029
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Under 3.6 at least two lines of evidence are necessary to assess the listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Seven of the twenty-one water samples exceed the GUIDELINE. Zero of one sediment sample exceed the GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that: 037597
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Seven of twenty-one samples exceed the GUIDELINE and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 47433, Chlorpyrifos **Region 9**

Agua Hedionda Creek

LOE ID:	77708
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	21
Number of Exceedances:	7
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 7 of 21 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.014 ug/L (Siepmann and Finlayson 2000).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).
Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 2 monitoring sites [Agua Hedionda Creek - 904AHC-MLS, Agua Hedionda Creek - 904AHC-TWAS-1]
Temporal Representation:	Data was collected over the time period 2/17/2002-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 47433, Chlorpyrifos 037598 Region 9

Agua Hedionda Creek

LOE ID:	77709
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	28
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 0 of 28 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for chlorpyrifos is 2.1 Âµg/L.
Guideline Reference:	2011 Edition of the Drinking Water Standards and Health Advisories
Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 2 monitoring sites [Agua Hedionda Creek - 904AHC-MLS, Agua Hedionda Creek - 904AHC-TWAS-1]
Temporal Representation:	Data was collected over the time period 2/17/2002-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 47433, Chlorpyrifos Region 9

Agua Hedionda Creek

LOE ID:	72894
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING

Data Used to Assess Water Quality:	One sample was collected to evaluate sediment toxicity. The sample did not exhibit significant toxicity. The toxicity test included survival of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL, Significant compared to negative control based on statistical test, less than stated alpha level, AND less than the evaluation threshold (both criteria are met).
Guideline Reference:	
Spatial Representation:	The sample was collected at station 904CBAHC6.
Temporal Representation:	The samples were collected in May 2008.
Environmental Conditions:	
QAPP Information:	All data was collected following the Standard Operating Procedures and Data Quality Objectives outlined in the SWAMP QAMP, (Puckett, 2002). QA data are included in submission.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 47433, Chlorpyrifos **Region 9**

Agua Hedionda Creek

LOE ID:	72847
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for chlorpyrifos is the median lethal concentration (LC50) of 1.77 ug/g and is normalized by the percentage of organic carbon in the sediment sample (Amweg and Weston, 2007).
Guideline Reference:	Whole-sediment toxicity identification evaluation tools for pyrethroid insecticides: I. piperonyl butoxide addition. Environ. Toxicol. Chem. 26:2389-2396.

Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 1 monitoring site [Agua Hedionda Creek 6 - 904CBAHC6]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID 47447 — Region 9

Agua Hedionda Creek

Pollutant:	**Cypermethrin**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2029
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Under 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Three of the three water samples exceed the GUIDELINE and zero of one sediment sample exceed the GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Three of three water samples exceed the GUIDELINE and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 47447, Cypermethrin — Region 9

Agua Hedionda Creek

LOE ID:	72864
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total

Beneficial Use:	Warm Freshwater Habitat	037601
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cypermethrin, total.	
Data Reference:	Statewide Stream Pollution Trends Study 2008	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The evaluation guideline for cypermethrin is the median lethal concentration (LC50) of 0.3 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 0.3 ug/g is the geometric mean of LC50 values for cypermethrin from Maund et al. (2002).	
Guideline Reference:	Partitioning, bioavailability, and toxicity of the pyrethroid insecticide cypermethrin in sediments. Environmental Toxicology and Chemistry 21:9-15	
Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 1 monitoring site [Agua Hedionda Creek 6 - 904CBAHC6]	
Temporal Representation:	Data was collected on a single day 5/21/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.	
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)	

Line of Evidence (LOE) for Decision ID 47447, Cypermethrin **Region 9**

Agua Hedionda Creek

LOE ID:	26225
Pollutant:	Sediment Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Toxicity testing of sediments
Data Used to Assess Water Quality:	Hyalella azteca- All four samples show significant toxicity levels (SL) as determined by the Hyalella azteca survival and growth test according to results in California's Surface Water Ambient Monitoring Program Annual Progress Report, 2007. Samples were collected one to three times a year from 2002-2006.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	Waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.
Guideline Reference:	Monitoring data for Region 9
Spatial Representation:	Samples were collected at monitoring station Agua Hedionda Creek 6 on the main stem of Agua Hedionda creek (station id: 904CBAQH6 lat/long: 33.14887/-117.29758).
Temporal Representation:	Samples were collected one to three times a year from 2002-2006.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 47447, Cypermethrin **Region 9**

Agua Hedionda Creek

LOE ID:	72893
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	27
Number of Exceedances:	17
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Twenty-seven samples were collected to test for toxicity. Seventeen of the 27 samples exhibited statistically significant toxicity. The toxicity tests that exhibited significant toxicity included survival of Hyalella azteca, growth of Selenastrum capriconutum and survival and reproduction of Ceriodaphnia dubia.
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected at stations 904AHC-MLS and 904AHC-TWAS-1, Agua Hedionda Creek
Temporal Representation:	The samples were collected from 2001 to 2008.
Environmental Conditions:	
QAPP Information:	The data was collected under the County of San Diego Co-Permittees Receiving Waters Urban Runoff Monitoring and Reporting Program (Order No. 2007-01). Data quality is good.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 47447, Cypermethrin **Region 9**

Agua Hedionda Creek

LOE ID:	72865
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	3
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 3 of 3 samples exceed the criterion for Cypermethrin, total.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of cypermethrin does not exceed 0.0002 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Fojut et al. 2012)
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 2 monitoring sites [Agua Hedionda Creek - 904AHC-MLS, Agua Hedionda Creek - 904AHC-TWAS-1]
Temporal Representation:	Data was collected over the time period 10/14/2006-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID	**42264**	**Region 9**
Agua Hedionda Creek		

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the

current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Twenty-two of the 24 samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Twenty-two of 24 samples exceed the Water Contact Recreation criteria and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 42264, Indicator Bacteria **Region 9**

Agua Hedionda Creek

LOE ID:	7361
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	24
Number of Exceedances:	22
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Twenty two of twenty four samples collected exceed the water quality objective according to results in the San Diego County Municipal Copermittees Urban Runoff Monitoring Report, 2007. Samples were collected one to four times a year from 1998-2006.
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, no more than 10% of the samples during any 30-day period for waters designated for contact recreation shall exceed 400 colonies per 100 ml (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at the mass loading station located near the lower boundary of the watershed under the El Camino Real Bridge crossing immediately downstream of the confluence of Agua Hedionda Creek and Calavera Creek.
Temporal Representation:	Samples were collected one to four times a year from 1998 -2006.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	Quality control for the toxicity portion of this study was conducted in accordance with the City of San Diego's NPDES monitoring program.

QAPP Information Reference(s): 037605

Line of Evidence (LOE) for Decision ID 42264, Indicator Bacteria **Region 9**

Agua Hedionda Creek

LOE ID:	7309
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	18
Number of Exceedances:	18
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	All eighteen samples collected exceed the water quality objective according to results in the San Diego County Municipal Copermittees Urban Runoff Monitoring Report, 2007. Samples were collected one to four times a year from 1998-2006.
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, the bacteriological criteria for enterococcus sets a maximum limit at 61 colonies per 100mL (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at the mass loading station located near the lower boundary of the watershed under the El Camino Real Bridge crossing immediately downstream of the confluence of Agua Hedionda Creek and Calavera Creek.
Temporal Representation:	Samples were collected one to four times a year from 1998-2006.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	Quality control for the toxicity portion of this study was conducted in accordance with the City of San Diego's NPDES monitoring program.
QAPP Information Reference(s):	

DECISION ID **47467** **Region 9**

Agua Hedionda Creek

Pollutant:	**Malathion**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2029
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One lines of evidence is available in the administrative record to assess this pollutant. Eight of the twenty-five samples exceed the GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Eight of twenty-five samples exceed the GUIDELINE and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 47467, Malathion **Region 9**

Agua Hedionda Creek

LOE ID:	77707
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	28
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 0 of 28 samples exceed the criterion for Malathion.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The CDPH archived health advisory for malathion is 160 Âµg/L.
Guideline Reference:	2011 Edition of the Drinking Water Standards and Health Advisories
Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 2 monitoring sites [Agua Hedionda Creek - 904AHC-MLS, Agua Hedionda Creek - 904AHC-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/8/2002-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 47467, Malathion 037607 Region 9

Agua Hedionda Creek

LOE ID:	72882
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	25
Number of Exceedances:	8
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 8 of 25 samples exceed the criterion for Malathion.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 2 monitoring sites [Agua Hedionda Creek - 904AHC-MLS, Agua Hedionda Creek - 904AHC-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/8/2002-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID 44465 Region 9

Agua Hedionda Creek

Pollutant:	**Sulfates**
Final Listing Decision:	**Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Original
Reason for Delisting:	Flaws in original listing
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the

current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

Regional Board Conclusion:
This pollutant is being considered for removal from the section 303(d) list under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. All eight of samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the section 303(d) list.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. All eight samples exceeded the sulfate objective and this exceeds the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

State Board Review and Conclusion:
The original listing in 2006 applied Table 3.1 where the minimum sample requirement is 2. However, Region 9 considers sulfates a conventional pollutant and as such, Table 3.2 should have been applied with a minimum requirement of 5 samples.

In addition, upon review of the past record, there were only 4 samples that exceeded the water quality objective, not the 8 samples as originally reported.

State Board staff re-evaluated the original listing and recommends to Delist for sulfates. The revised recommendation is as follows:

This pollutant is being considered for removal from the section 303(d) list under section 4 of the Listing Policy. Under this section an existing listing may be removed if the listing was based on faulty data and it is demonstrated that the listing would not have occurred in the absence of such faulty data.

One line of evidence is available in the administrative record to assess this pollutant.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification to support removing this water segment-pollutant combination from the section 303(d) list. due to a flaw in the original listing.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Four of 4 samples exceeded the sulfate objective and this does not exceeds the allowable frequency listed in Table 3.2 of the Listing Policy. This pollutant should not have been listed in 2006.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 44465, Sulfates **Region 9**

Agua Hedionda Creek

LOE ID: 31397

Pollutant:	Sulfates	037609
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	Not Recorded	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	4	
Number of Exceedances:	4	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Four of 4 samples exceeded the basin plan objective (SWAMP, 2004).	
Data Reference:	Database as of 3-10-05 and SWAMP Information Management Plan. Sacramento, CA	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan WQO from Title 22 Table 64449-B Secondary Maximum Contaminant Levels of 250 mg/l.	
Objective/Criterion Reference:	Title 22, Division 4, Ch. 15, Article 4, Section 64449 Secondary Drinking Water Standards	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples taken from one sample site at Agua Hedionda Creek station No:33.14887 -117.29758	
Temporal Representation:	Samples were collected from March through September of 2002.	
Environmental Conditions:		
QAPP Information:	SWAMP Quality Assurance Plan	
QAPP Information Reference(s):		

DECISION ID 33728 Region 9

Agua Hedionda Creek

Pollutant:	**Total Dissolved Solids**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	One line of evidence is available in the administrative record to assess this pollutant. A single sample was collected and it did exceed the Basin Plan criteria, but the number of samples is insufficient to determine with the confidence and power required by the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33728, Total Dissolved Solids Region 9

Agua Hedionda Creek

LOE ID:	3177	037610

Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the RWQCB in 1998. One sample was collected. It was in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for TDS is 500 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Sample was collected at Agua Hedionda Creek at Sycamore Avenue.
Temporal Representation:	Sample was collected on 06/10/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID	47450	Region 9
Agua Hedionda Creek		

Pollutant:	**DDE (Dichlorodiphenyldichloroethylene)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 1 sample exceeds the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 1 sample exceeds the water quality objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support

rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47450, DDE (Dichlorodiphenyldichloroethylene) Region 9

Agua Hedionda Creek

LOE ID:	72867
Pollutant:	DDE (Dichlorodiphenyldichloroethylene)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for DDE.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for sum of DDE (o,p' + p,p') is 31.3 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 1 monitoring site [Agua Hedionda Creek 6 - 904CBAHC6]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID 47478 Region 9

Agua Hedionda Creek

Pollutant:	**Permethrin, total**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Original

Impairment from Pollutant or Pollution:	Pollutant	037612

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 1 sample exceeds the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 1 sample exceeds the water quality objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47478, Permethrin, total **Region 9**

Agua Hedionda Creek

LOE ID:	72889
Pollutant:	Permethrin, total
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Permethrin, Total.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for permethrin is the median lethal concentration (LC50) of 8.9 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 8.9 ug/g is the geometric mean of LC50 values for permethrin from Amweg et al.

	(2005). 037613
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5
Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 1 monitoring site [Agua Hedionda Creek 6 - 904CBAHC6]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID 33729 Region 9

Agua Hedionda Creek

Pollutant:	**Turbidity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: One line of evidence is available in the administrative record to assess this pollutant. A single sample was collected and it did not exceed the Basin Plan criteria, but the number of samples is insufficient to determine with the confidence and power required by the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33729, Turbidity Region 9

Agua Hedionda Creek

LOE ID:	3178
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the RWQCB in 1998. One sample was collected and was not in exceedance.
Data Reference:	Placeholder reference 2006 303(d)

SWAMP Data:	Non-SWAMP	037614
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for turbidity is 5 ntu.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Sample was collected at Agua Hedionda Creek at Sycamore Avenue.	
Temporal Representation:	Sample was collected on 06/10/1998.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID **32810** **Region 9**

Agua Hedionda Creek

Pollutant:	**Manganese**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. A sufficient number of samples exceed the Title 22 Secondary Drinking Water MCLs of 0.05 mg/L for manganese.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Two of 4 samples exceeded the MCL secondary drinking water standard and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32810, Manganese **Region 9**

Agua Hedionda Creek

LOE ID: 3184

Pollutant:	Manganese	037615
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	Total	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	4	
Number of Exceedances:	2	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Two of 4 samples exceeded the water quality standard (SWAMP, 2004).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	The water quality objective for manganese in Agua Hedionda Creek is 0.05 milligrams/liter (mg/l) according to Basin Plan, Table 3-2 entitled, Water Quality Objectives. This concentration is not to be exceeded more than 10% of the time during any one year period.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples taken at one station in Agua Hedionda Creek No. 33.14887 -117.29758.	
Temporal Representation:	Samples were collected from March through September of 2002.	
Environmental Conditions:	Agua Hedionda Creek, Part of the San Diego Coastal Streams: Hydrologic Unit Basin Number 4.32	
QAPP Information:	SWAMP Quality Assurance Plan	
QAPP Information Reference(s):		

DECISION ID	**33011**	**Region 9**
Agua Hedionda Creek		

Pollutant:	**Nitrogen**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Four lines of evidence are available in the administrative record to assess this pollutant. Twenty-seven of 28 samples exceed the Basin Plan water quality objective for Total Nitrogen as N. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Twenty-seven of 28 samples exceed the Basin Plan water quality objective for Total Nitrogen as N and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available

indicating that standards are not met. 037616

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33011, Nitrogen **Region 9**

Agua Hedionda Creek

LOE ID:	6713
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	24
Number of Exceedances:	24
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	All twenty four samples collected exceed the water quality objective according to results in the San Diego County Municipal Copermittees Urban Runoff Monitoring Report, 2007. Samples were collected one to four times a year from 1998-2006.
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at the mass loading station located near the lower boundary of the watershed under the El Camino Real Bridge crossing immediately downstream of the confluence of Agua Hedionda Creek and Calavera Creek.
Temporal Representation:	Samples were collected one to four times a year from 1998-2006.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the City of San Diego's NPDES Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33011, Nitrogen **Region 9**

Agua Hedionda Creek

LOE ID:	7360
Pollutant:	Total Nitrogen as N

LOE Subgroup:	Pollutant-Water	037617
Matrix:	Water	
Fraction:	Total	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	4	
Number of Exceedances:	3	
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)	
Data Used to Assess Water Quality:	Three of four samples exceed the water quality objective according to results in the Surface Water Ambient Monitoring Program Annual Progress Report, 2007. Samples were collected on September, June, March and April 2002.	
Data Reference:	Monitoring data for Region 9	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used (RWQCB, 2007).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:	Water Quality Control Plan for the San Diego Basin	
Spatial Representation:	Samples were collected at monitoring station Agua Hedionda Creek 6 on the main stem of Agua Hedionda creek (station id: 904CBAQH6 lat/long: 33.14887/-117.29758).	
Temporal Representation:	Samples were collected on September, June, March and April 2002.	
Environmental Conditions:	The first two samples were taken during minimum and declining base flow respectively. The last two samples were taken during wet weather, between storm events and high base flow respectively.	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.	
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA	

DECISION ID **42357** **Region 9**

Agua Hedionda Creek

Pollutant:	**Phosphorus**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Four lines of evidence are available in the administrative record to assess this pollutant. Twenty-four of the 28 samples exceed the water quality objective for phosphorus.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Twenty-four of 28 samples exceed the Basin Plan objectives for phosphorus and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 42357, Phosphorus **Region 9**

Agua Hedionda Creek

LOE ID:	7359
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	None of the four samples exceed the water quality objective according to results in the Surface Water Ambient Monitoring Program Annual Progress Report, 2007. Samples were collected on September 17, 2002; June 4, 2002; March 12, 2002; and April 23, 2002.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses (RWQCB, 2007). Water Quality Control Plan for the San Diego Basin Goal of 0.1 mg/L for total phosphorus in streams and other flowing waters (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	The samples were collected from the monitoring station Agua Hedionda Creek 6 (station id: 904CBAQH6 lat/long: 33.14887/-117.29758), located on the main stem of Agua Hedionda Creek
Temporal Representation:	Samples were collected on September 17, 2002; June 4, 2002; March 12, 2002; and April 23, 2002.
Environmental Conditions:	The first two samples were taken during minimum and declining base flow, respectively. The

	last two samples were taken during wet weather, between storm events and high base flow respectively.
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 42357, Phosphorus **Region 9**

Agua Hedionda Creek

LOE ID:	6704
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	24
Number of Exceedances:	24
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	All twenty four samples collected exceed the water quality objective according to results in the San Diego County Municipal Copermittees Urban Runoff Monitoring Report, 2007. Samples were collected one to four times a year from 1998-2006.
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses (RWQCB, 2007). Water Quality Control Plan for the San Diego Basin Goal of 0.1 mg/L for total phosphorus in streams and other flowing waters (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at the mass loading station located near the lower boundary of the watershed under the El Camino Real Bridge crossing immediately downstream of the confluence of Agua Hedionda Creek and Calavera Creek.
Temporal Representation:	Samples were collected one to four times a year from 1998-2006.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	Quality control for the toxicity portion of this study was conducted in accordance with the City of San Diego's NPDES monitoring program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Buena Creek
Water Body ID: CAR9043200020050630113820
Water Body Type: River & Stream

DECISION ID 33503 **Region 9**
Buena Creek

Pollutant: **Nitrate and Nitrite**
Final Listing Decision: **Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Sources: Source Unknown
Expected TMDL Completion Date: 2019
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for removal from the CWA section 303(d) List under section 4.1 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess pollutant. Five of 5 samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Five of 5 samples exceed the criteria and this exceeds the allowable frequency listed in Table 4.1 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 33503, Nitrate and Nitrite **Region 9**
Buena Creek

LOE ID: 73092

Pollutant: Nitrate/Nitrite (Nitrite + Nitrate as N)
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Municipal & Domestic Supply

Number of Samples:	1	037621
Number of Exceedances:	1	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Buena Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Nitrate/Nitrite as N.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrate + nitrite (as N) is 10.0 mg/L (Title 22 of the California Code of Regulations).	
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Buena Creek was collected at 1 monitoring site [Buena Creek @ Robelini Drive]	
Temporal Representation:	Data was collected on a single day 9/3/2003.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 33503, Nitrate and Nitrite **Region 9**

Buena Creek

LOE ID:	3185
Pollutant:	Nitrate and Nitrite
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Four of 4 samples exceeded the MCLs (SWAMP, 2004).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Waters designated for use as domestic or municipal supply shall not contain concentrations of nitrate and nitrite as nitrogen in excess of Maximum Contaminant Levels (MCL) set forth in Title 22 of the CCR, Table 64431-A of section 64431.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	One sample site at Buena Creek: 33.17225 - 117.20887.
Temporal Representation:	Samples were collected from March through September of 2002.
Environmental Conditions:	Buena Creek 904.32.
QAPP Information:	SWAMP Quality Assurance Plan
QAPP Information Reference(s):	

DECISION ID	48030	Region 9
Buena Creek		

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of 7 samples exceed the criteria for MUN and 0 of 7 samples exceed the criteria for WARM. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 7 samples exceed the criteria for MUN and 0 of 7 samples exceed the criteria for WARM and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48030, Cadmium	Region 9
Buena Creek	

LOE ID:	73081
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Buena Creek to determine beneficial use support and results are as follows: 0 of 7 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.

SWAMP Data:	Non-SWAMP	037623
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Buena Creek was collected at 1 monitoring site [Buena Creek @ Robelini Drive]	
Temporal Representation:	Data was collected from 6/30/2003 through 6/10/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 48030, Cadmium **Region 9**

Buena Creek

LOE ID:	73082
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Buena Creek to determine beneficial use support and results are as follows: 0 of 7 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for cadmium is 0.005 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Buena Creek was collected at 1 monitoring site [Buena Creek @ Robelini Drive]
Temporal Representation:	Data was collected from 6/30/2003 through 6/10/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID	48034	037624 Region 9
Buena Creek		

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of 5 samples exceed the criteria for MUN and 0 of 0 samples exceed the criteria for WARM. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 5 samples exceed the criteria for MUN and 0 of 0 samples exceed the criteria for WARM and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48034, Chlorpyrifos	**Region 9**
Buena Creek	

LOE ID:	77986
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Buena Creek to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for chlorpyrifos is 2.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Buena Creek was collected at 1 monitoring site [Buena Creek @ Robelini Drive]
Temporal Representation:	Data was collected over the time period 9/28/2005-6/10/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48034, Chlorpyrifos **Region 9**

Buena Creek

LOE ID:	73083
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Buena Creek to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).
Spatial Representation:	Data for this line of evidence for Buena Creek was collected at 1 monitoring site [Buena Creek @ Robelini Drive]
Temporal Representation:	Data was collected over the time period 9/28/2005-6/10/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID	48031	Region 9
Buena Creek		

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of 7 samples exceed the criteria for MUN and 0 of 7 samples exceed the criteria for WARM. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 7 samples exceed the criteria for MUN and 0 of 7 samples exceed the criteria for WARM and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48031, Copper	**Region 9**
Buena Creek	

LOE ID:	73085
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Buena Creek to determine beneficial use support and results are as follows: 0 of 7 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	The California Secondary MCL for copper is 1.0 mg/L (Title 22 California Code of Regulations).
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Buena Creek was collected at 1 monitoring site [Buena Creek @ Robelini Drive]
Temporal Representation:	Data was collected from 6/30/2003 through 6/10/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48031, Copper **Region 9**

Buena Creek

LOE ID:	73084
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Buena Creek to determine beneficial use support and results are as follows: 0 of 7 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Buena Creek was collected at 1 monitoring site [Buena Creek @ Robelini Drive]
Temporal Representation:	Data was collected from 6/30/2003 through 6/10/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 48035 Region 9

Buena Creek 037628

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of 5 samples exceed the criteria for MUN and 0 of 5 samples exceed the criteria for WARM.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 5 samples exceed the criteria for MUN and 0 of 5 samples exceed the criteria for WARM and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48035, Diazinon — Region 9

Buena Creek

LOE ID:	77987
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Buena Creek to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality

	Control Plan, San Diego Basin). 037629
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for diazinon is 1.4 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Buena Creek was collected at 1 monitoring site [Buena Creek @ Robelini Drive]
Temporal Representation:	Data was collected over the time period 9/28/2005-6/10/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48035, Diazinon **Region 9**

Buena Creek

LOE ID:	73086
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Buena Creek to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Data for this line of evidence for Buena Creek was collected at 1 monitoring site [Buena Creek @ Robelini Drive]
Temporal Representation:	Data was collected over the time period 9/28/2005-6/10/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **48032** **Region 9**

Buena Creek

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of 7 samples exceed the criteria for MUN and 0 of 7 samples exceed the criteria for WARM. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 7 samples exceed the criteria for MUN and 0 of 7 samples exceed the criteria for WARM and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48032, Lead **Region 9**

Buena Creek

LOE ID:	73089
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Buena Creek to determine beneficial use support and results are as follows: 0 of 7 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the

	hardness dependent formula for the metals criterion. 037631
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Buena Creek was collected at 1 monitoring site [Buena Creek @ Robelini Drive]
Temporal Representation:	Data was collected from 6/30/2003 through 6/10/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48032, Lead **Region 9**

Buena Creek

LOE ID:	73090
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Buena Creek to determine beneficial use support and results are as follows: 0 of 7 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for Lead is 0.015 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Buena Creek was collected at 1 monitoring site [Buena Creek @ Robelini Drive]
Temporal Representation:	Data was collected from 6/30/2003 through 6/10/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **48037** **Region 9**

Buena Creek

Pollutant: **Malathion**

Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	037632
Last Listing Cycle's Final Listing Decision:	New Decision	
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of 5 samples exceed the criteria for MUN and 0 of 5 samples exceed the criteria for WARM.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 5 samples exceed the criteria for MUN and 0 of 5 samples exceed the criteria for WARM and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48037, Malathion **Region 9**

Buena Creek

LOE ID:	73091
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Buena Creek to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Malathion.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Buena Creek was collected at 1 monitoring site [Buena Creek @ Robelini Drive]
Temporal Representation:	Data was collected over the time period 9/28/2005-6/10/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48037, Malathion **Region 9**

Buena Creek

LOE ID:	77988
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Buena Creek to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Malathion.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for malathion is 100 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Buena Creek was collected at 1 monitoring site [Buena Creek @ Robelini Drive]
Temporal Representation:	Data was collected over the time period 9/28/2005-6/10/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **48039** **Region 9**

Buena Creek

Pollutant:	**Nitrogen, Nitrite**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final	New Decision

Listing Decision:		037634
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of 2 samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 2 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48039, Nitrogen, Nitrite **Region 9**

Buena Creek

LOE ID:	73093
Pollutant:	Nitrogen, Nitrite
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Buena Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Nitrite as N.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrite (as N) is 1.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals, CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Buena Creek was collected at 1 monitoring site [Buena

	Creek @ Robelini Drive] 037635
Temporal Representation:	Data was collected over the time period 6/30/2003-9/3/2003.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 48040 Region 9

Buena Creek

Pollutant:	**Nitrogen, ammonia (Total Ammonia)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of 1 sample exceeds the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 1 sample exceeds the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48040, Nitrogen, ammonia (Total Ammonia) Region 9

Buena Creek

LOE ID:	73080
Pollutant:	Nitrogen, ammonia (Total Ammonia)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Buena Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Ammonia As N, Total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Basin Plan: No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	EPA's Lifetime Health advisory level for total ammonia is 30.0 mg/L as stated on page 8 of the 2006 edition of the drinking water standards and health advisories. This Advisory Level is defined as "the concentration of a chemical in drinking water that is not expected to cause any adverse noncarcinogenic effects for up to ten days of exposure."
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Buena Creek was collected at 1 monitoring site [Buena Creek @ Robelini Drive]
Temporal Representation:	Data was collected on a single day 6/30/2003.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID	48033	Region 9
Buena Creek		

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of 7 samples exceed the criteria for MUN and 0 of 7 samples exceed the criteria for WARM. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 7 samples exceed the criteria for MUN and 0 of 7 samples exceed the criteria for WARM and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and

information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48033, Zinc **Region 9**

Buena Creek

LOE ID:	73063
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Buena Creek to determine beneficial use support and results are as follows: 0 of 7 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for zinc is 5.0 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Buena Creek was collected at 1 monitoring site [Buena Creek @ Robelini Drive]
Temporal Representation:	Data was collected from 6/30/2003 through 6/10/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48033, Zinc **Region 9**

Buena Creek

LOE ID:	73064
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Buena Creek to determine

	beneficial use support and results are as follows: 0 of 7 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Buena Creek was collected at 1 monitoring site [Buena Creek @ Robelini Drive]
Temporal Representation:	Data was collected from 6/30/2003 through 6/10/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID	48036	Region 9
Buena Creek		

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2029
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. Three lines of evidence are available in the administrative record to assess this pollutant. Data from 2003 to 2009 show that 7 of 8 and 6 of 8 single samples exceed the water quality objectives for single sample maximums of enterococcus and fecal coliform for the protection of REC-1, and 3 of 8 samples exceeded the evaluation guideline for Total Coliform. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Data from 2003 to 2009 show that 7 of 8 and 6 of 8 single samples exceed the water quality objectives for single sample maximums of enterococcus and fecal coliform for the protection of REC-1 and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 48036, Indicator Bacteria **Region 9**

Buena Creek

LOE ID:	73094
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	8
Number of Exceedances:	3
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Buena Creek to determine beneficial use support and results are as follows: 3 of 8 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxicsubstances in concentrations which are toxic to,or which produce detrimental physiologicalresponses in human, plant, animal, or indigenousaquatic life (Basin Plan).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In waters designated for water contact recreation (REC I), the total coliform concentration shall not exceed 10000 MPN/100 ml (CDPH 2006).
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.
Spatial Representation:	Data for this line of evidence for Buena Creek was collected at 1 monitoring site [Buena Creek @ Robelini Drive]
Temporal Representation:	Data was collected over the time period 6/30/2003-6/10/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48036, Indicator Bacteria **Region 9**

Buena Creek

LOE ID:	73088
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	8

Number of Exceedances:	6	037640

Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Buena Creek to determine beneficial use support and results are as follows: 6 of 8 samples exceed the criterion for Coliform, Fecal.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the fecal coliform concentration shall not exceed 400 MPN/100 ml.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Buena Creek was collected at 1 monitoring site [Buena Creek @ Robelini Drive]
Temporal Representation:	Data was collected over the time period 6/30/2003-6/10/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48036, Indicator Bacteria **Region 9**

Buena Creek

LOE ID:	73087
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	8
Number of Exceedances:	7
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Buena Creek to determine beneficial use support and results are as follows: 7 of 8 samples exceed the criterion for Enterococci.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Samples shall not exceed 61 organisms per 100 ml for enterococcus in waters designated for REC I beneficial use (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Buena Creek was collected at 1 monitoring site [Buena Creek @ Robelini Drive]
Temporal Representation:	Data was collected over the time period 6/30/2003-6/10/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.

QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **44287** **Region 9**

Buena Creek

Pollutant:	**Nitrogen**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2023
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Four of four of the samples exceed the water quality objective for total nitrogen. According to table 3.1 of the Listing Policy, the minimum sample requirement to assess toxic pollutants is 2. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Four of four of the samples exceed the water quality objective for total nitrogen. and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 44287, Nitrogen **Region 9**

Buena Creek

LOE ID:	6542
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollution
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4

Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only) 037642
Data Used to Assess Water Quality:	All four samples collected at Buena Creek show excessive nitrogen concentrations according to results in California's Surface Water Ambient Monitoring Program Report, 2007. Water samples were collected in March, April, June and September 2002.
Data Reference:	Water Quality Control Plan for the San Diego Basin
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses (RWQCB, 2007). A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Water samples were collected at Buena Creek station 904CBBUR1; (Latitude 33.1725, Longitude -117.2082).
Temporal Representation:	Water samples were collected in March, April, June and September 2002.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	

DECISION ID	33504	Region 9
Buena Creek		

Pollutant:	**Phosphorus**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2023
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Four of four of samples exceeded the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Four of four samples exceeded the water quality standard for phosphorus and this exceeds the

allowable frequency listed in Table 3.1 of the Listing Policy. 037643
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 33504, Phosphorus **Region 9**

Buena Creek

LOE ID:	6540
Pollutant:	Phosphorus
LOE Subgroup:	Pollution
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Four of four samples collected at Buena Creek show excessive phosphorous concentrations according to results in California's Surface Water Ambient Monitoring Program, 2007. Samples were collected in March, April, June and September 2002.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters-streams and other flowing waters, with all beneficial uses, the water quality objective for total phosphorus is 0.1 mg/L (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Water samples were collected at Buena Creek station 904CBBUR1; (Latitude 33.1725, Longitude -117.2082).
Temporal Representation:	Samples were collected in March, April, June and September 2002.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	

DECISION ID **44130** **Region 9**

Buena Creek

Pollutant:	**Phosphate**
Final Listing Decision:	**Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Original
Reason for Delisting:	Flaws in original listing
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the

current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

Regional Board Conclusion:
This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. A large number of samples exceed the water quality phosphate goal of 0.1 mg/L in stream and flowing waters.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Four of 4 samples exceeded the phosphate water quality objective and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

State Board Review and Conclusion:
The original listing in 2006 applied Table 3.1 of the Listing Policy to determine if phosphorus should be listed. Table 3.1 is used for toxicants with a minimum sample requirement of 2 samples. However, Region 9 considers phosphorus a conventional pollutant and as such, Table 3.2 should have been applied with a minimum requirement of 5 samples.

There are only 4 samples in the line of evidence and this is insufficient to place the water body-pollutant combination on the section 303(d) list.

Furthermore, the line of evidence used to list this water body was based on phosphorus data and not phosphate data. The appropriate decision should have been for phosphorus.

State Board staff re-evaluated the original listing and recommends to Delist phosphate. Also, in order to correctly track these phosphorus data, these same data have been reassessed under the correct pollutant name "phosphorus" with a Do Not List decision. The revised recommendation for delisting phosphate is as follows:

This pollutant is being considered for removal from the section 303(d) list under section 4 of the Listing Policy. Under this section an existing listing may be removed if the listing was based on faulty data and it is demonstrated that the listing would not have occurred in the absence of such faulty data.

One line of evidence is available in the administrative record to assess this pollutant. Four of 4 samples exceed the water quality goal of 0.1 mg/L for phosphorus in streams and flowing waters.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of removing this water segment-pollutant combination from the section 303(d) list.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Four of 4 samples exceeded the basin plan water quality goal and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy. This pollutant should not have been listed in 2006.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 44130, Phosphate — Region 9

Buena Creek

LOE ID:	3188
Pollutant:	Phosphate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Four water samples, four samples exceeding the basin plan goal (SWAMP, 2004).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Waters shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growth causes nuisances or adversely affects beneficial uses. Water Quality Control Plan phosphate goal of 0.1 mg/L in stream and flowing waters.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	One Station at Buena Creek: 33.17225 -117.20887.
Temporal Representation:	Samples were collected from March through September of 2002.
Environmental Conditions:	Buena Creek 904.32.
QAPP Information:	SWAMP Quality Assurance Plan.
QAPP Information Reference(s):	

DECISION ID 33072 — Region 9

Buena Creek

Pollutant:	**DDT (Dichlorodiphenyltrichloroethane)**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. A large number of samples exceed the California Toxic Rule: Human Health carcinogenic risk for consumption of water & organisms of 0.00059 Âµg/L.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d)

list in the Water Quality Limited Segments category. 037646

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Four of 4 samples exceeded the CTR DDT criterion and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33072, DDT (Dichlorodiphenyltrichloroethane) **Region 9**

Buena Creek

LOE ID:	3186
Pollutant:	DDT (Dichlorodiphenyltrichloroethane)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Four of 4 samples exceeded the CTR criterion (SWAMP, 2004).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. California Toxic Rule: Human Health carcinogenic risk for consumption of water & organisms, 0.00059 µg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	One sample site in Buena Creek at 33.17225 - 117.20887.
Temporal Representation:	Samples were collected from March through September of 2002.
Environmental Conditions:	Buena Creek 904.32
QAPP Information:	SWAMP Quality Assurance Plan.
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Encinitas Creek
Water Body ID: CAR9045100019991117144759
Water Body Type: River & Stream

DECISION ID 48427 **Region 9**
Encinitas Creek

Pollutant: Ammonia (Unionized)
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of 1 sample exceeds the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 1 sample exceeds the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48427, Ammonia (Unionized) **Region 9**
Encinitas Creek

LOE ID: 73526

Pollutant: Ammonia (Unionized)
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Warm Freshwater Habitat

Number of Samples: 1

Number of Exceedances:	0	037648
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	0 of 1 samples exceed the water objective for un-ionized ammonia (NH3) at 0.025 mg/l (as N). Un-ionized ammonia (as N) was calculated from Total Ammonia (as N) from monthly samples reported in the data. The calculated un-ionized ammonia (as N) values was then established and compared to the un-ionized Ammonia (as N) at 0.025 mg/L in the RB9 Basin Plan.	
Data Reference:	Statewide Perennial Streams Assessment 2008	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan, San Diego Region (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. The discharge of wastes shall not cause concentrations of un-ionized ammonia (NH3) to exceed 0.025 mg/l (as N) in inland surface waters, enclosed bays and estuaries and coastal lagoons.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at 904PS0034 (Encinitas Creek).	
Temporal Representation:	Samples collected on 5/13/2008.	
Environmental Conditions:		
QAPP Information:	SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID	48430	Region 9
Encinitas Creek		

Pollutant:	**Oxygen, Dissolved**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line(s) of evidence are necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. One of 1 sample exceeds the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of 1 sample exceeds the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the

applicable beneficial use support rating. 037649

Line of Evidence (LOE) for Decision ID 48430, Oxygen, Dissolved **Region 9**

Encinitas Creek

LOE ID:	73527
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	The sample collected exceeded the objective.
Data Reference:	Statewide Perennial Streams Assessment 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Dissolved oxygen levels shall not be less than 5.0 mg/l in inland surface waters with designated MAR or WARM beneficial uses. The annual mean dissolved oxygen concentration shall not be less than 7 mg/l more than 10% of the time.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	One sample was collected from the 904PS0034 station.
Temporal Representation:	One sample was collected in May 2008.
Environmental Conditions:	
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	

DECISION ID **48428** **Region 9**

Encinitas Creek

Pollutant:	**Temperature, water**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line(s) of evidence are necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 0 samples exceeds the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.037650
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 0 samples exceeds the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to section 3.2 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48428, Temperature, water **Region 9**
Encinitas Creek

LOE ID:	72837
Pollutant:	Temperature, water
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Nine samples total were collected however there is no evaluation guideline for assessing temperature for the warm freshwater beneficial use.
Data Reference:	Data for Trash, Nutrients, and Pathogens in Region 9, 2007-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Board that such alteration in temperature does not adversely affect beneficial uses (Water Quality Control Plan San Diego Basin - Region 9).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at station BTQ-010 (Levante St. Bridge (south side)).
Temporal Representation:	Samples were collected between January, 2009 and July, 2010.
Environmental Conditions:	
QAPP Information:	"San Diego Regional Water Quality Assessment and Outreach Project Quality Assurance Project Plan Prepared by: Clay Clifton (San Diego Coastkeeper, Local Project Sponsor Manager), Bob Stafford (San Diego Stream Team), Dr. Rick Gersberg (San Diego State University), Bryan Bjorndal (Assure Controls, Inc.), and Morgan Justice-Black (I Love A Clean San Diego)."
QAPP Information Reference(s):	Quality Assurance Project Plan for San Diego Regional Water Quality Assessment and Outreach Project.

DECISION ID **48429** **Region 9**
Encinitas Creek

Pollutant: **pH**

Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	037651
Last Listing Cycle's Final Listing Decision:	New Decision	
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line(s) of evidence are necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 1 sample exceeds the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 1 sample exceeds the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48429, pH **Region 9**

Encinitas Creek

LOE ID:	73528
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Numeric data generated from 1 sample collected had no exceedences.
Data Reference:	Statewide Perennial Streams Assessment 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	In inland surface waters[,] the pH shall not be depressed below 6.5 nor raised above 8.5.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the 904PS0034 station.
Temporal Representation:	One sample was collected in May 2008
Environmental Conditions:	

QAPP Information:	SWAMP QAPP	037652
QAPP Information Reference(s):		

DECISION ID	44341	Region 9
Encinitas Creek		

Pollutant:	**Benthic Community Effects**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

Benthic Community Effects is being considered for placement on the CWA section 303(d) List under sections 3.9 and 3.1 of the Listing Policy. Under section 3.9, an additional line of evidence associating Benthic Community Effects with a water or sediment concentration of pollutant(s) is necessary to assess listing status.

Based on the readily available data and information, the weight of evidence provides sufficient justification for placing Benthic Community Effects in this water segment on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Pursuant to section 3.9 of the Listing Policy, the water exhibits significant degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index.
4. Pursuant to section 3.9 of the Listing Policy, the water segment has associated pollutant(s) samples that exceed water quality objectives.
5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are being met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant(s) contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 44341, Benthic Community Effects	**Region 9**
Encinitas Creek	

LOE ID:	3191
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Not Specified
Fraction:	None
Beneficial Use:	Agricultural Supply
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Data were collected for the San Diego Water Quality Control Board 1999 Biological Assessment Annual Report. Physical habitat scores for EC-GVR ranged from 104 to 116,

	moderate compared to other sampled waterbodies. BMI scores at EC-GVR were all below average. (SDRWQCB, 1999a).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	
Objective/Criterion Reference:	
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Encinitas Creek, 5 riffles downstream of Green Valley Road (EC-GVR).
Temporal Representation:	Samples were collected in May, September, November 1998 and May 1999.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44341, Benthic Community Effects **Region 9**

Encinitas Creek

LOE ID:	72762
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	3
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Three of the three samples collected had an IBI score below 40. tr11c NPDES bioassessment
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the State or Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	Development of a Benthic Index of Biotic Integrity (B-IBI) for Wadeable Streams in Northern Coastal California and its Application to Regional 305(b) Assessment
Spatial Representation:	The samples were collected at station ENC-GVR on Encinitas Creek.
Temporal Representation:	The samples were collected in May and October 2001 and May 2002.
Environmental Conditions:	
QAPP Information:	The data was collected under the Southern California Regional Watershed Monitoring

QAPP Information Reference(s):	Program Bioassessment Quality Assurance Project Plan, June 25, 2009. 037654 Quality Assurance Project Plan for SWAMP Bioassessment and Freshwater Bioassessment.

Line of Evidence (LOE) for Decision ID 44341, Benthic Community Effects **Region 9**

Encinitas Creek

LOE ID:	26383
Pollutant:	Benthic Community Effects
LOE Subgroup:	Adverse Biological Responses
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	7
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Seven samples of IBI data were taken from May 1998 to May 2000 at two sampling sites. All seven of the samples exceeded the IBI impairment threshold.
Data Reference:	Fish and Game IBI Data
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at two sites: 904ENCGVR and 904ENCRSF on Encinitas Creek.
Temporal Representation:	Sampling occurred during one to three events from May 1998 to May 2000.
Environmental Conditions:	
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Project Plan for the California Stream Bioassessment Procedure and the State of California, California Monitoring an Assessment Program: "CMAP", Quality Assurance Project Plan.
QAPP Information Reference(s):	State of California, California Monitoring and Assessment Program: "CMAP". Quality Assurance Project Plan for the California Stream Bioassessment Procedure The San Diego Stream Team Quality Assurance Project Plan

Line of Evidence (LOE) for Decision ID 44341, Benthic Community Effects **Region 9**

Encinitas Creek

LOE ID:	79516
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation

Matrix:	Water	037655
Fraction:	None	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	4	
Number of Exceedances:	4	
Data and Information Type:	Benthic macroinvertebrate surveys	
Data Used to Assess Water Quality:	Four samples were collected from two sites on Encinitas Creek. All four samples were below the 0.79 threshold, and therefore exceeding the water quality objective for the aquatic life beneficial use.	
Data Reference:	Statewide Perennial Streams Assessment 2008 Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008. Region 9 CSCI Scores & Water Body Information	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.	
Guideline Reference:	The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.	
Spatial Representation:	The samples were collected at station 904ENC-GVR and 904PS0034 on Encinitas Creek.	
Temporal Representation:	The samples were collected from 2001 to 2008.	
Environmental Conditions:		
QAPP Information:	Samples were collected for the Statewide Perennial Streams Assessment 2008 following SWAMP protocols and by the County of San Diego NPDES MS4 Copermittees Receiving Waters Monitoring and Reporting Program	
QAPP Information Reference(s):	Statewide Perennial Streams Assessment 2008 Surface Water Ambient Monitoring Program Quality Assurance Program Plan Quality Assurance Project Plan for SWAMP Bioassessment and Freshwater Bioassessment.	

Line of Evidence (LOE) for Decision ID 44341, Benthic Community Effects **Region 9**

Encinitas Creek

LOE ID:	26382
Pollutant:	Sediment Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	4	037656
Number of Exceedances:	2	
Data and Information Type:	Ambient toxicity testing (chronic)	
Data Used to Assess Water Quality:	Four samples were collected at Encinitas Creek station 904CBENC2 from March 2002 to September 2002. The samples showed significant toxicity levels (SL) in the following test: Hyalella azteca sediment toxicity. Two of four samples exhibited toxicity. The tests results can be found in California's Surface Water Ambient Monitoring Program Report, 2007. Samples were collected in March, April, June and September 2002.	
Data Reference:	Monitoring data for Region 9	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold (EPA, 2002).	
Guideline Reference:	Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms. Fourth Edition. Office of Water, U.S. Environmental Protection Agency. Washington, D.C. EPA-821-R-02-013	
Spatial Representation:	Water Toxicity Samples were collected at Encinitas Creek station 2 (904CBENC2); (Latitude 33.0682, Longitude -117.2625).	
Temporal Representation:	Samples were collected in March, April, June and September 2002.	
Environmental Conditions:		
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.	
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA	

Line of Evidence (LOE) for Decision ID 44341, Benthic Community Effects **Region 9**

Encinitas Creek

LOE ID:	21383
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	3
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Four samples were collected at Encinitas Creek station 904CBENC2 from March 2002 to September 2002. The samples showed significant toxicity levels (SL) in the following tests: Selenastrum algae growth test - one of the four samples was toxic. Ceriodaphnia dubia survival/reproductive test - three of the four samples showed toxicity. The tests results can be found in California's Surface Water Ambient Monitoring Program Report, 2007. Samples were collected in March, April, June and September 2002.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.

Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	037657
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold (EPA, 2002).	
Guideline Reference:	Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms. Fourth Edition. Office of Water, U.S. Environmental Protection Agency. Washington, D.C. EPA-821-R-02-013	
Spatial Representation:	Water Toxicity Samples were collected at Encinitas Creek station 2 (904CBENC2); (Latitude 33.0682, Longitude -117.2625).	
Temporal Representation:	Samples were collected in March, April, June and September 2002.	
Environmental Conditions:		
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.	
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA	

Line of Evidence (LOE) for Decision ID 44341, Benthic Community Effects **Region 9**

Encinitas Creek

LOE ID:	6526
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	2
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Two of four samples collected at Encinitas Creek show excessive nitrogen concentrations according to results in California's Surface Water Ambient Monitoring Program Report, 2007.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses (RWQCB, 2007). A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Water samples were collected at Encinitas Creek station 2, 904CBENC2; (Latitude 33.06824, Longitude -117.262515)
Temporal Representation:	Water samples were collected in March, April, June and September 2002.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance

	with the California's Surface Water Ambient Monitoring Program. 037658
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 44341, Benthic Community Effects **Region 9**

Encinitas Creek

LOE ID:	6523
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	All four samples collected at Encinitas Creek show excessive selenium concentrations according to results in California's Surface Water Ambient Monitoring Program Report, 2007. Samples were collected in March, April, June and September 2002.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	CTR Freshwater Chronic (CCC) 5 ug/L. (U.S. EPA, 2000).
Guideline Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA
Spatial Representation:	Water samples were collected at Encinitas Creek station 2, 904CBENC2; (Latitude 33.06824, Longitude -117.262515).
Temporal Representation:	Samples were collected in March, April, June and September 2002.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 44341, Benthic Community Effects **Region 9**

Encinitas Creek

LOE ID:	3193
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Four water samples, 4 samples exceeding (SWAMP, 2004).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Waters shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growth causes nuisances or adversely affects beneficial uses.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	Water Quality Control Plan for the San Diego Basin Goal of 0.1 mg/l in stream and flowing waters.
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	One station at Encinitas Creek: 33.06828 -117.26261
Temporal Representation:	Samples were collected from March through September of 2002.
Environmental Conditions:	San Marcos Creek Watershed 904.51.
QAPP Information:	SWAMP Quality Assurance Plan.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44341, Benthic Community Effects **Region 9**

Encinitas Creek

LOE ID:	72790
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	The one sample collected had an IBI score below 40. The IBI score was 0.
Data Reference:	Statewide Perennial Streams Assessment 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	Development of a Benthic Index of Biotic Integrity (B-IBI) for Wadeable Streams in Northern Coastal California and its Application to Regional 305(b) Assessment
Spatial Representation:	The samples were collected from Encinitas Creek.
Temporal Representation:	The sample was collected in May 2008.
Environmental Conditions:	
QAPP Information:	Samples were collected for the Statewide Perennial Streams Assessment 2008 following SWAMP protocols and stored in the SWAMP database.

QAPP Information Reference(s): Surface Water Ambient Monitoring Program Quality Assurance Program Project 037660

Line of Evidence (LOE) for Decision ID 44341, Benthic Community Effects **Region 9**

Encinitas Creek

LOE ID:	3192
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Not Specified
Fraction:	None
Beneficial Use:	Agricultural Supply
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Data were collected by the Stream Team in 1999. Taxa richness was 5. There were 0 EPT taxa. Tolerance value was 2.9. Feeding groups were 64.3% collectors and 7.1% predators. Other feeding groups were not reported. (Stream Team, 2001).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	
Objective/Criterion Reference:	
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Encinitas Creek. Exact sampling location was not reported.
Temporal Representation:	Samples were collected in the Fall of 1999.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44341, Benthic Community Effects **Region 9**

Encinitas Creek

LOE ID:	26716
Pollutant:	Benthic Community Effects
LOE Subgroup:	Adverse Biological Responses
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	3
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Three samples of IBI data were taken from May 2001 to May 2002 at one sampling site. All three samples exceeded the IBI impairment threshold.
Data Reference:	Stream Bioassessment Data. Co-permitee Data. Collected 2002-2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological

	responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at one site: ENC-GVR on Encinitas Creek.
Temporal Representation:	Sampling occurred during May and October in 2001 and on May 2002.
Environmental Conditions:	
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Manual for Freshwater Bioassessment.
QAPP Information Reference(s):	Quality Assurance Manual for Freshwater Bioassessment Revision 0

DECISION ID **33095** **Region 9**

Encinitas Creek

Pollutant:	**Phosphorus**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Four of the four samples exceed the Basin Plan Objective for Phosphorus. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Four of four samples exceed the Basin Plan Objective and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 33095, Phosphorus **Region 9**

Encinitas Creek 037662

LOE ID:	3193
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Four water samples, 4 samples exceeding (SWAMP, 2004).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Waters shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growth causes nuisances or adversely affects beneficial uses.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	Water Quality Control Plan for the San Diego Basin Goal of 0.1 mg/l in stream and flowing waters.
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	One station at Encinitas Creek: 33.06828 -117.26261
Temporal Representation:	Samples were collected from March through September of 2002.
Environmental Conditions:	San Marcos Creek Watershed 904.51.
QAPP Information:	SWAMP Quality Assurance Plan.
QAPP Information Reference(s):	

DECISION ID **43314** **Region 9**

Encinitas Creek

Pollutant:	**Selenium**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal from the CWA section 303(d) List under section 4.1 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess pollutant. Four of the four samples exceed the GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.

3. Four of four samples exceeded the GUIDELINE and this exceeds the allowable frequency listed in Table 4.1 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 43314, Selenium **Region 9**

Encinitas Creek

LOE ID:	6523
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	All four samples collected at Encinitas Creek show excessive selenium concentrations according to results in California's Surface Water Ambient Monitoring Program Report, 2007. Samples were collected in March, April, June and September 2002.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	CTR Freshwater Chronic (CCC) 5 ug/L. (U.S. EPA, 2000).
Guideline Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA
Spatial Representation:	Water samples were collected at Encinitas Creek station 2, 904CBENC2; (Latitude 33.06824, Longitude -117.262515).
Temporal Representation:	Samples were collected in March, April, June and September 2002.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

DECISION ID **33112** **Region 9**

Encinitas Creek

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original

Impairment from Pollutant or Pollution:	Pollutant	037664
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of 4 samples exceeded the CDFG Aquatic Life Hazard Assessment Criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.	
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.	

Line of Evidence (LOE) for Decision ID 33112, Diazinon **Region 9**

Encinitas Creek

LOE ID:	3194
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Of the four water samples, none of the samples were exceeding. (SWAMP, 2004).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual pesticides or combination of pesticides shall be present in the water column, sediments, or biota at concentrations that adversely affect beneficial uses.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	CDFG Aquatic Life Hazard Assessment Criteria 1-hour averave 0.16 ug/L (Siepman & Finlayson, 2000; Finlayson, 2004).
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	One station at Encinitas Creek: 33.06828 -117.26261.
Temporal Representation:	Samples were collected from March through September of 2002.
Environmental Conditions:	San Marcos Creek Watershed 904.51.
QAPP Information:	SWAMP Quality Assurance Plan.
QAPP Information Reference(s):	

DECISION ID	42670	Region 9
Encinitas Creek		

Pollutant:	**Nitrogen**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the section 303(d) list under sections 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Two of the 4 samples exceed the Basin Plan water quality objective for total nitrogen as N. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Two of the 4 samples exceed the Basin Plan water quality objective for total nitrogen as N and this sample size is insufficient to determine with the power and confidence of the Listing Policy if standards are not met. A minimum of five samples is needed for application of table 3.2. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 42670, Nitrogen	**Region 9**
Encinitas Creek	

LOE ID:	6526
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	2
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Two of four samples collected at Encinitas Creek show excessive nitrogen concentrations according to results in California's Surface Water Ambient Monitoring Program Report, 2007.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote

aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses (RWQCB, 2007). A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used (RWQCB, 2007).

Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Water samples were collected at Encinitas Creek station 2, 904CBENC2; (Latitude 33.06824, Longitude -117.262515)
Temporal Representation:	Water samples were collected in March, April, June and September 2002.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

DECISION ID **33792** **Region 9**

Encinitas Creek

Pollutant:	**Total Dissolved Solids**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. One line of evidence is available in the administrative record to assess this pollutant. A single sample was collected and it did exceed the Basin Plan criteria, but the number of samples is insufficient to determine with the confidence and power required by the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33792, Total Dissolved Solids **Region 9**

Encinitas Creek

LOE ID:	3189
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Unknown
Fraction:	Total

Beneficial Use:	Agricultural Supply	037667
Number of Samples:	1	
Number of Exceedances:	1	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 1998. One sample was collected, it was in exceedance. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for TDS is 500 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Encinitas Creek at Green Valley Road.	
Temporal Representation:	Samples were collected on 06/03/1998.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID	**33763**	**Region 9**
Encinitas Creek		

Pollutant:	**Turbidity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. One line of evidence is available in the administrative record to assess this pollutant. A single sample was collected and it did not exceed the Basin Plan criteria, but the number of samples is insufficient to determine with the confidence and power required by the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33763, Turbidity	**Region 9**
Encinitas Creek	

LOE ID:	3190
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water

Matrix:	Water	037668
Fraction:	Total	
Beneficial Use:	Agricultural Supply	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 1998. One sample was collected and was not in exceedance. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for turbidity is 20 ntu. This concentration is not to be exceeded more than 10% of the time during any one year period.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Encinitas Creek at Green Valley Rd.	
Temporal Representation:	Samples were collected on 06/03/1998.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID	**43313**	**Region 9**
Encinitas Creek		

Pollutant:	**Toxicity**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the section 303(d) list under section 3.6 of the Listing Policy. Under section 3.6 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Five of the eight samples exceed the water quality objective for toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Five of the eight samples exceed the Basin Plan objective for tocixity and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43313, Toxicity **Region 9**

Encinitas Creek

LOE ID:	26382
Pollutant:	Sediment Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	2
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Four samples were collected at Encinitas Creek station 904CBENC2 from March 2002 to September 2002. The samples showed significant toxicity levels (SL) in the following test: Hyalella azteca sediment toxicity. Two of four samples exhibited toxicity. The tests results can be found in California's Surface Water Ambient Monitoring Program Report, 2007. Samples were collected in March, April, June and September 2002.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold (EPA, 2002).
Guideline Reference:	Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms. Fourth Edition. Office of Water, U.S. Environmental Protection Agency. Washington, D.C. EPA-821-R-02-013
Spatial Representation:	Water Toxicity Samples were collected at Encinitas Creek station 2 (904CBENC2); (Latitude 33.0682, Longitude -117.2625).
Temporal Representation:	Samples were collected in March, April, June and September 2002.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 43313, Toxicity **Region 9**

Encinitas Creek

LOE ID:	21383
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None

Beneficial Use:	Warm Freshwater Habitat	037670
Number of Samples:	4	
Number of Exceedances:	3	
Data and Information Type:	Ambient toxicity testing (chronic)	
Data Used to Assess Water Quality:	Four samples were collected at Encinitas Creek station 904CBENC2 from March 2002 to September 2002. The samples showed significant toxicity levels (SL) in the following tests: Selenastrum algae growth test - one of the four samples was toxic. Ceriodaphnia dubia survival/reproductive test - three of the four samples showed toxicity. The tests results can be found in California's Surface Water Ambient Monitoring Program Report, 2007. Samples were collected in March, April, June and September 2002.	
Data Reference:	Monitoring data for Region 9	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold (EPA, 2002).	
Guideline Reference:	Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms. Fourth Edition. Office of Water, U.S. Environmental Protection Agency, Washington, D.C. EPA-821-R-02-013	
Spatial Representation:	Water Toxicity Samples were collected at Encinitas Creek station 2 (904CBENC2); (Latitude 33.0682, Longitude -117.2625).	
Temporal Representation:	Samples were collected in March, April, June and September 2002.	
Environmental Conditions:		
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.	
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Cottonwood Creek (San Marcos Creek watershed)
Water Body ID: CAR9045100020011009142248
Water Body Type: River & Stream

DECISION ID 33515 **Region 9**
Cottonwood Creek (San Marcos Creek watershed)

Pollutant: DDT (Dichlorodiphenyltrichloroethane)
Final Listing Decision: Do Not Delist from 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Sources: Source Unknown
Expected TMDL Completion Date: 2019
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for removal from the CWA section 303(d) List under section 4.1 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess pollutant. Two of 4 samples exceed the criteria in water and 0 of 1 sample exceeds the criteria in sediment.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Two of 4 samples exceed the criteria in water and 0 of 1 sample exceeds the criteria in sediment and this exceeds the allowable frequency listed in Table 4.1 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 33515, DDT (Dichlorodiphenyltrichloroethane) **Region 9**
Cottonwood Creek (San Marcos Creek watershed)

LOE ID: 3199

Pollutant: DDT (Dichlorodiphenyltrichloroethane)
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Warm Freshwater Habitat

Number of Samples:	4	037672
Number of Exceedances:	2	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Four water samples, two samples exceeding (SWAMP, 2004).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. California Toxic Rule: Freshwater Chronic .001 mg/L. Human Health-FW (water & organisms) .00059 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	One station at Cottonwood Creek: 33.18147 -117.32893.	
Temporal Representation:	Samples were collected from March through September of 2002.	
Environmental Conditions:	San Marcos Creek Watershed 904.51.	
QAPP Information:	SWAMP Quality Assurance Plan.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33515, DDT (Dichlorodiphenyltrichloroethane) Region 9

Cottonwood Creek (San Marcos Creek watershed)

LOE ID:	73320
Pollutant:	DDT (Dichlorodiphenyltrichloroethane)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (San Marcos Creek watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for DDT.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for sum of DDT (o,p' + p,p') is 62.9 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (San Marcos Creek watershed) was collected at 1 monitoring site [Cottonwood Creek 2 - 904CBCWC2]
Temporal Representation:	Data was collected on a single day 1/7/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.

QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.037673
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID 33142 Region 9

Cottonwood Creek (San Marcos Creek watershed)

Pollutant:	**Toxicity**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for removal from the CWA section 303(d) List under section 4.1 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status. Three lines of evidence are available in the administrative record to assess pollutant. Four of five samples exceed the sediment toxicity criteria and four of four samples exceed the water toxicity criteria. The water segment does have associated pollutant(s) samples that exceed water quality objectives. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Four of five samples exceed the sediment toxicity criteria and four of four samples exceed the water toxicity criteria and this exceeds the allowable frequency listed in Table 4.1 of the Listing Policy. 4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 33142, Toxicity Region 9

Cottonwood Creek (San Marcos Creek watershed)

LOE ID:	73349
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate sediment toxicity. The sample exhibited significant

	toxicity. The toxicity test included survival and growth of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted using the significant effect code: S equals significant, SG equals significantly greater and SL equals significantly lower. If a sample has any one of these codes, it will be considered an exceedance.
Guideline Reference:	Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates, Second Edition. U.S. Environmental Protection Agency Office of Research and Development, Duluth, MI , U.S. Environmental Protection Agency Office of Water, Washington, DC EPA-600/R-99/064
Spatial Representation:	The sample was collected at station 904CBCWC2.
Temporal Representation:	The sample was collected in January 2007.
Environmental Conditions:	
QAPP Information:	All data was collected following the Standard Operating Procedures and Data Quality Objectives outlined in the SWAMP QAMP, (Puckett, 2002). QA data are included in submission.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33142, Toxicity **Region 9**

Cottonwood Creek (San Marcos Creek watershed)

LOE ID:	72824
Pollutant:	Chlordane
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	1 of 1 samples collected exceeded the criteria for chlordane concentration (Sum of trans-Chlordane, cis-Chlordane, cis-Nonachlor, trans-Nonachlor, and Oxychlordane).
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Waters shall not contain substances in concentrations that result in the deposition of material that causes nuisance or adversely affects beneficial uses. (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Probable Effect Concentration for Chlordane in freshwater sediments is 17.6 ug/kg(MacDonald et al. 2000).

Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data were collected at the following station 904CBCWC2 (Cottonwood Creek 2).
Temporal Representation:	The samples were collected on 1/7/2007.
Environmental Conditions:	
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 33142, Toxicity **Region 9**

Cottonwood Creek (San Marcos Creek watershed)

LOE ID:	73317
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (San Marcos Creek watershed) to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Cypermethrin, total.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for cypermethrin is the median lethal concentration (LC50) of 0.3 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 0.3 ug/g is the geometric mean of LC50 values for cypermethrin from Maund et al. (2002).
Guideline Reference:	Partitioning, bioavailability, and toxicity of the pyrethroid insecticide cypermethrin in sediments. Environmental Toxicology and Chemistry 21:9-15
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (San Marcos Creek watershed) was collected at 1 monitoring site [Cottonwood Creek 2 - 904CBCWC2]
Temporal Representation:	Data was collected on a single day 1/7/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 33142, Toxicity **Region 9**

Cottonwood Creek (San Marcos Creek watershed)

LOE ID:	73308
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment

Fraction:	Total	037676
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	1	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (San Marcos Creek watershed) to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Bifenthrin.	
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The evaluation guideline for bifenthrin is the median lethal concentration (LC50) of 0.43 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 0.43 ug/g is the geometric mean of LC50 values for bifenthrin from Amweg et al. (2005) and Amweg and Weston (2007).	
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5 Whole-sediment toxicity identification evaluation tools for pyrethroid insecticides: I. piperonyl butoxide addition. Environ. Toxicol. Chem. 26:2389-2396.	
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (San Marcos Creek watershed) was collected at 1 monitoring site [Cottonwood Creek 2 - 904CBCWC2]	
Temporal Representation:	Data was collected on a single day 1/7/2007.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.	
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)	

Line of Evidence (LOE) for Decision ID 33142, Toxicity **Region 9**

Cottonwood Creek (San Marcos Creek watershed)

LOE ID:	3197
Pollutant:	Sediment Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	3
Data and Information Type:	Toxicity testing of sediments
Data Used to Assess Water Quality:	Three out of four samples displayed statistically significant toxicity in the survival endpoint when compared to the negative control based on a statistical test with alpha of less than 5%. All samples were tested using the 10-day Hyallela azteca test. Note that all four samples actually had significant toxicity relative to the control, but only the three samples without any QA qualifiers were considered as exceedances (SWAMP, 2004).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	SWAMP

Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the Regional Board (Region 9 Basin Plan, pages 3-15 to 3-16; September 8, 1994).
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	All samples were collected from one station, Cottonwood Creek 2.
Temporal Representation:	Samples were collected from March 2002 through September 2002. Toxicity in the survival endpoint was detected in samples collected on March 13, 2002, June 4, 2002 and September 17, 2002.
Environmental Conditions:	Cottonwood Creek = 904.51
QAPP Information:	SWAMP QAPP.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33142, Toxicity **Region 9**

Cottonwood Creek (San Marcos Creek watershed)

LOE ID:	3199
Pollutant:	DDT (Dichlorodiphenyltrichloroethane)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	2
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Four water samples, two samples exceeding (SWAMP, 2004).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. California Toxic Rule: Freshwater Chronic .001 mg/L. Human Health-FW (water & organisms) .00059 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	One station at Cottonwood Creek: 33.18147 -117.32893.
Temporal Representation:	Samples were collected from March through September of 2002.
Environmental Conditions:	San Marcos Creek Watershed 904.51.
QAPP Information:	SWAMP Quality Assurance Plan.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33142, Toxicity **Region 9**

Cottonwood Creek (San Marcos Creek watershed)

LOE ID:	21379

Pollutant:	Toxicity
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Four samples were collected at Cottonwood Creek station 2, 904CBCWC2. Samples were collected March, April, June and September 2002. Samples showed significant toxicity levels (SL) in the following tests: Selenastrum algae growth test - three of the four samples exhibited toxicity. Ceriodaphnia dubia survival/reproductive test - three of the four samples exhibited toxicity. The test results are from California's Surface Water Ambient Monitoring Program Report, 2007.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.
Guideline Reference:	Waste Discharge Requirements for Discharges of Urban Runoff From the Municipal Separate Storm Sewer Systems Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego, the San Diego Unified Port District, and the San Diego County Regional Airport. Order No. R9-2007-0001
Spatial Representation:	Samples were collected at Cottonwood Creek station 2,(904CBCWC2). (Latitude 30.0486, Longitude -117.2954).
Temporal Representation:	Samples were collected in March, April, June and September 2002.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 33142, Toxicity **Region 9**

Cottonwood Creek (San Marcos Creek watershed)

LOE ID:	8517
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Four water samples were collected at Cottonwood Creek station 2, 904CBCWC2 on March,

	April, June, and September 2002. All samples showed excessive sulfate concentrations according to results in California's Surface Water Ambient Monitoring Program Report, 2007.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	CTR Freshwater Chronic (CCC) 5 ug/L; (U.S. EPA, 2000).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA
Spatial Representation:	Water samples were collected at Cottonwood Creek station 2, 904CBCWC2; (Latitude 33.0486, Longitude -117.2954).
Temporal Representation:	Water samples were collected in March, April June, and September 2002.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

DECISION ID	**48291**	**Region 9**
Cottonwood Creek (San Marcos Creek watershed)		

Pollutant:	**Bifenthrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. One of 1 sample exceeds the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of 1 sample exceeds the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48291, Bifenthrin **Region 9**

Cottonwood Creek (San Marcos Creek watershed)

LOE ID:	73308
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (San Marcos Creek watershed) to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Bifenthrin.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for bifenthrin is the median lethal concentration (LC50) of 0.43 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 0.43 ug/g is the geometric mean of LC50 values for bifenthrin from Amweg et al. (2005) and Amweg and Weston (2007).
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5 Whole-sediment toxicity identification evaluation tools for pyrethroid insecticides: I. piperonyl butoxide addition. Environ. Toxicol. Chem. 26:2389-2396.
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (San Marcos Creek watershed) was collected at 1 monitoring site [Cottonwood Creek 2 - 904CBCWC2]
Temporal Representation:	Data was collected on a single day 1/7/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID 48292 **Region 9**

Cottonwood Creek (San Marcos Creek watershed)

Pollutant:	**Chlordane**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing

status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. One of 1 sample exceeds the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of 1 sample exceeds the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48292, Chlordane **Region 9**

Cottonwood Creek (San Marcos Creek watershed)

LOE ID:	72824
Pollutant:	Chlordane
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	1 of 1 samples collected exceeded the criteria for chlordane concentration (Sum of trans-Chlordane, cis-Chlordane, cis-Nonachlor, trans-Nonachlor, and Oxychlordane).
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Waters shall not contain substances in concentrations that result in the deposition of material that causes nuisance or adversely affects beneficial uses. (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Probable Effect Concentration for Chlordane in freshwater sediments is 17.6 ug/kg(MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data were collected at the following station 904CBCWC2 (Cottonwood Creek 2).
Temporal Representation:	The samples were collected on 1/7/2007.
Environmental Conditions:	

QAPP Information:	The SWAMP QAPP (2008) was followed.	037682
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID 48335 Region 9

Cottonwood Creek (San Marcos Creek watershed)

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 0 samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 0 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48335, Chlorpyrifos Region 9

Cottonwood Creek (San Marcos Creek watershed)

LOE ID:	73309
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	One of one sample result was not used in the assessment because the laboratory data was non-detect and the method detection limit was above the guideline and therefore the results could not be quantified with the level of certainty required by the Listing Policy

Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring	037683
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	There is no chlorpyrifos evaluation guideline specific to "sediment, interstitial water" (pore water). The following evaluation guideline was used to evaluate an exceedance in water quality standards: the freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000, with minor corrections to significant figures as described in Beaulaurier et al., 2005).Â	
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).	
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (San Marcos Creek watershed) was collected at 1 monitoring site [Cottonwood Creek 2 - 904CBCWC2]	
Temporal Representation:	Data was collected on a single day 1/7/2007.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.	
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)	

DECISION ID 48294 Region 9

Cottonwood Creek (San Marcos Creek watershed)

Pollutant:	**Cyfluthrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 1 sample exceeds the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 1 sample exceeds the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision

After review of the available data and information, RWQCB staff concludes that the water body-

Recommendation:	pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48294, Cyfluthrin **Region 9**

Cottonwood Creek (San Marcos Creek watershed)

LOE ID:	73310
Pollutant:	Cyfluthrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (San Marcos Creek watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cyfluthrin, total.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for cyfluthrin is the median lethal concentration (LC50) of 1.1 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 1.1 ug/g is the geometric mean of LC50 values for cyfluthrin from Amweg et al. (2005).
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (San Marcos Creek watershed) was collected at 1 monitoring site [Cottonwood Creek 2 - 904CBCWC2]
Temporal Representation:	Data was collected on a single day 1/7/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **48295** **Region 9**

Cottonwood Creek (San Marcos Creek watershed)

Pollutant:	**Cyhalothrin, Lambda**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of

the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 1 sample exceeds the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 1 sample exceeds the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48295, Cyhalothrin, Lambda **Region 9**

Cottonwood Creek (San Marcos Creek watershed)

LOE ID:	73316
Pollutant:	Cyhalothrin, Lambda
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (San Marcos Creek watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cyhalothrin, lambda, total.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for lambda-cyhalothrin is the median lethal concentration (LC50) of 0.44 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 0.44 ug/g is the geometric mean of LC50 values for lambda-cyhalothrin from Amweg et al. (2005).
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (San Marcos Creek watershed) was

	collected at 1 monitoring site [Cottonwood Creek 2 - 904CBCWC2] 037686
Temporal Representation:	Data was collected on a single day 1/7/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID 48293 Region 9

Cottonwood Creek (San Marcos Creek watershed)

Pollutant:	**Cypermethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. One of 1 sample exceeds the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of 1 sample exceeds the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48293, Cypermethrin Region 9

Cottonwood Creek (San Marcos Creek watershed)

LOE ID:	73317
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (San Marcos Creek watershed) to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Cypermethrin, total.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for cypermethrin is the median lethal concentration (LC50) of 0.3 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 0.3 ug/g is the geometric mean of LC50 values for cypermethrin from Maund et al. (2002).
Guideline Reference:	Partitioning, bioavailability, and toxicity of the pyrethroid insecticide cypermethrin in sediments. Environmental Toxicology and Chemistry 21:9-15
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (San Marcos Creek watershed) was collected at 1 monitoring site [Cottonwood Creek 2 - 904CBCWC2]
Temporal Representation:	Data was collected on a single day 1/7/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID	**48296**	**Region 9**
Cottonwood Creek (San Marcos Creek watershed)		

Pollutant:	**DDD (Dichlorodiphenyldichloroethane)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 1 sample exceeds the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 1 sample exceeds the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48296, DDD (Dichlorodiphenyldichloroethane) Region 9

Cottonwood Creek (San Marcos Creek watershed)

LOE ID:	73318
Pollutant:	DDD (Dichlorodiphenyldichloroethane)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (San Marcos Creek watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for DDD.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for sum of DDD (o,p' + p,p') is 28.0 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (San Marcos Creek watershed) was collected at 1 monitoring site [Cottonwood Creek 2 - 904CBCWC2]
Temporal Representation:	Data was collected on a single day 1/7/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID 48297 Region 9

Cottonwood Creek (San Marcos Creek watershed)

Pollutant:	**DDE (Dichlorodiphenyldichloroethylene)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of 1 sample exceeds the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 1 sample exceeds the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48297, DDE (Dichlorodiphenyldichloroethylene) **Region 9**

Cottonwood Creek (San Marcos Creek watershed)

LOE ID:	73319
Pollutant:	DDE (Dichlorodiphenyldichloroethylene)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (San Marcos Creek watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for DDE.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for sum of DDE (o,p' + p,p') is 31.3 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (San Marcos Creek watershed) was collected at 1 monitoring site [Cottonwood Creek 2 - 904CBCWC2]

Temporal Representation:	Data was collected on a single day 1/7/2007.	037690
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.	
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)	

DECISION ID 48298 Region 9

Cottonwood Creek (San Marcos Creek watershed)

Pollutant:	**Deltamethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 1 sample exceeds the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 1 sample exceeds the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48298, Deltamethrin Region 9

Cottonwood Creek (San Marcos Creek watershed)

LOE ID:	73327
Pollutant:	Deltamethrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	037691
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (San Marcos Creek watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Deltamethrin.	
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The evaluation guideline for deltamethrin is the median lethal concentration (LC50) of 0.79 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 0.79 ug/g is the geometric mean of LC50 values for deltamethrin from Amweg et al. (2005).	
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5	
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (San Marcos Creek watershed) was collected at 1 monitoring site [Cottonwood Creek 2 - 904CBCWC2]	
Temporal Representation:	Data was collected on a single day 1/7/2007.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.	
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)	

DECISION ID **48299** **Region 9**

Cottonwood Creek (San Marcos Creek watershed)

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 1 sample exceeds the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 1 sample exceeds the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48299, Diazinon **Region 9**

Cottonwood Creek (San Marcos Creek watershed)

LOE ID:	73328
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (San Marcos Creek watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Diazinon.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	There is no diazinon evaluation guideline specific to "sediment, interstitial water" (pore water). The following evaluation guideline was used to evaluate an exceedance in water quality standards: the freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).Â
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (San Marcos Creek watershed) was collected at 1 monitoring site [Cottonwood Creek 2 - 904CBCWC2]
Temporal Representation:	Data was collected on a single day 1/7/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **48300** **Region 9**

Cottonwood Creek (San Marcos Creek watershed)

Pollutant:	**Dieldrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 1 sample exceeds the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 1 sample exceeds the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48300, Dieldrin **Region 9**

Cottonwood Creek (San Marcos Creek watershed)

LOE ID:	73329
Pollutant:	Dieldrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (San Marcos Creek watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Dieldrin.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for dieldrin is 61.8 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (San Marcos Creek watershed) was

	collected at 1 monitoring site [Cottonwood Creek 2 - 904CBCWC2] 037694
Temporal Representation:	Data was collected on a single day 1/7/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID 48301 Region 9

Cottonwood Creek (San Marcos Creek watershed)

Pollutant:	**Endrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of 1 sample exceeds the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 1 sample exceeds the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48301, Endrin Region 9

Cottonwood Creek (San Marcos Creek watershed)

LOE ID:	73330
Pollutant:	Endrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (San Marcos Creek watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Endrin.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for endrin is 207 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (San Marcos Creek watershed) was collected at 1 monitoring site [Cottonwood Creek 2 - 904CBCWC2]
Temporal Representation:	Data was collected on a single day 1/7/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **48302** **Region 9**

Cottonwood Creek (San Marcos Creek watershed)

Pollutant:	**Esfenvalerate/Fenvalerate**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 1 sample exceeds the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 1 sample exceeds the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision

After review of the available data and information, RWQCB staff concludes that the water body-

Recommendation:	pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48302, Esfenvalerate/Fenvalerate **Region 9**

Cottonwood Creek (San Marcos Creek watershed)

LOE ID:	73331
Pollutant:	Esfenvalerate/Fenvalerate
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (San Marcos Creek watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Esfenvalerate/Fenvalerate, total.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for esfenvalerate/fenvalerate is the median lethal concentration (LC50) of 1.5 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 1.5 ug/g is the geometric mean of LC50 values for esfenvalerate/fenvalerate from Amweg et al. (2005).
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (San Marcos Creek watershed) was collected at 1 monitoring site [Cottonwood Creek 2 - 904CBCWC2]
Temporal Representation:	Data was collected on a single day 1/7/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **48303** **Region 9**

Cottonwood Creek (San Marcos Creek watershed)

Pollutant:	**Fenpropathrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of 1 sample exceeds the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 1 sample exceeds the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48303, Fenpropathrin **Region 9**

Cottonwood Creek (San Marcos Creek watershed)

LOE ID:	73336
Pollutant:	Fenpropathrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (San Marcos Creek watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Fenpropathrin.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for fenpropathrin is the median lethal concentration (LC50) of 1 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 1 ug/g is the geometric mean of LC50 values for fenpropathrin from Ding et al. (2011).
Guideline Reference:	Toxicity of Sediment-Associated Pesticides to Chironomus dilutus and Hyalella azteca. Arch. Environ. Contam. Toxicol. 61:83Â–92.

Spatial Representation:	Data for this line of evidence for Cottonwood Creek (San Marcos Creek watershed) was collected at 1 monitoring site [Cottonwood Creek 2 - 904CBCWC2]
Temporal Representation:	Data was collected on a single day 1/7/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID 48332 Region 9

Cottonwood Creek (San Marcos Creek watershed)

Pollutant:	**Fipronil**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 0 samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 0 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48332, Fipronil Region 9

Cottonwood Creek (San Marcos Creek watershed)

LOE ID:	73337
Pollutant:	Fipronil
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0

Number of Exceedances:	0	037699

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	One of one sample result was not used in the assessment because the laboratory data was non-detect and the method detection limit was above the guideline and therefore the results could not be quantified with the level of certainty required by the Listing Policy.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for fipronil is the median lethal concentration (LC50) of 0.13 ug/g and is normalized by the percentage of organic carbon in the sediment sample (Maul et al. 2008).
Guideline Reference:	Effect of sediment-associated pyrethroids, fipronil, and metabolites on Chironomus tentans growth rate, body mass, condition index, immobilization, and survival. Environ. Toxicol. Chem. 27(12):2582-2590.
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (San Marcos Creek watershed) was collected at 1 monitoring site [Cottonwood Creek 2 - 904CBCWC2]
Temporal Representation:	Data was collected on a single day 1/7/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID	**48337**	**Region 9**
Cottonwood Creek (San Marcos Creek watershed)		

Pollutant:	**Fipronil Sulfide**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 0 samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 0 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available

indicating that standards are not met. 037700

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48337, Fipronil Sulfide **Region 9**

Cottonwood Creek (San Marcos Creek watershed)

LOE ID:	73338
Pollutant:	Fipronil Sulfide
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	One of one sample result was not used in the assessment because the laboratory data was non-detect and the method detection limit was above the guideline and therefore the results could not be quantified with the level of certainty required by the Listing Policy.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for fipronil sulfide is the median lethal concentration (LC50) of 0.16 ug/g and is normalized by the percentage of organic carbon in the sediment sample (Maul et al. 2008).
Guideline Reference:	Effect of sediment-associated pyrethroids, fipronil, and metabolites on Chironomus tentans growth rate, body mass, condition index, immobilization, and survival. Environ. Toxicol. Chem. 27(12):2582-2590.
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (San Marcos Creek watershed) was collected at 1 monitoring site [Cottonwood Creek 2 - 904CBCWC2]
Temporal Representation:	Data was collected on a single day 1/7/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID 48338 **Region 9**

Cottonwood Creek (San Marcos Creek watershed)

Pollutant:	**Fipronil Sulfone**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised

Impairment from Pollutant or Pollution:	Pollutant	037701
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of 0 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 0 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.	
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.	

Line of Evidence (LOE) for Decision ID 48338, Fipronil Sulfone **Region 9**

Cottonwood Creek (San Marcos Creek watershed)

LOE ID:	73339
Pollutant:	Fipronil Sulfone
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	One of one sample result was not used in the assessment because the laboratory data was non-detect and the method detection limit was above the guideline and therefore the results could not be quantified with the level of certainty required by the Listing Policy.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for fipronil sulfone is the median lethal concentration (LC50) of 0.12 ug/g and is normalized by the percentage of organic carbon in the sediment sample (Maul et al. 2008).
Guideline Reference:	Effect of sediment-associated pyrethroids, fipronil, and metabolites on Chironomus tentans

growth rate, body mass, condition index, immobilization, and survival. Environ. Toxicol. Chem. 27(12):2582-2590.

037702

Spatial Representation:	Data for this line of evidence for Cottonwood Creek (San Marcos Creek watershed) was collected at 1 monitoring site [Cottonwood Creek 2 - 904CBCWC2]
Temporal Representation:	Data was collected on a single day 1/7/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID 48304 Region 9

Cottonwood Creek (San Marcos Creek watershed)

Pollutant:	**Lindane/gamma Hexachlorocyclohexane (gamma-HCH)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of 1 sample exceeds the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 1 sample exceeds the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48304, Lindane/gamma Hexachlorocyclohexane (gamma-HCH) Region 9

Cottonwood Creek (San Marcos Creek watershed)

LOE ID:	73340
Pollutant:	Lindane/gamma Hexachlorocyclohexane (gamma-HCH)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total

Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (San Marcos Creek watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for HCH, gamma.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for Lindane (gamma-HCH) is 4.99 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (San Marcos Creek watershed) was collected at 1 monitoring site [Cottonwood Creek 2 - 904CBCWC2]
Temporal Representation:	Data was collected on a single day 1/7/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **48341** **Region 9**

Cottonwood Creek (San Marcos Creek watershed)

Pollutant:	**Permethrin, total**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 1 sample exceeds the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 1 sample exceeds the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16

samples is needed to determine if a beneficial use is fully supported using table 3.1. 037704
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48341, Permethrin, total **Region 9**

Cottonwood Creek (San Marcos Creek watershed)

LOE ID:	73347
Pollutant:	Permethrin, total
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (San Marcos Creek watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Permethrin, Total.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for permethrin is the median lethal concentration (LC50) of 8.9 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 8.9 ug/g is the geometric mean of LC50 values for permethrin from Amweg et al. (2005).
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (San Marcos Creek watershed) was collected at 1 monitoring site [Cottonwood Creek 2 - 904CBCWC2]
Temporal Representation:	Data was collected on a single day 1/7/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID 48342 **Region 9**

Cottonwood Creek (San Marcos Creek watershed)

Pollutant:	**Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final	New Decision

Listing Decision:		037705
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 1 sample exceeds the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 1 sample exceeds the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48342, Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD) **Region 9**

Cottonwood Creek (San Marcos Creek watershed)

LOE ID:	73348
Pollutant:	Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (San Marcos Creek watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for DDT, Total.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity)

	for total DDTs (Sum DDT + Sum DDD + Sum DDE) is 572 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (San Marcos Creek watershed) was collected at 1 monitoring site [Cottonwood Creek 2 - 904CBCWC2]
Temporal Representation:	Data was collected on a single day 1/7/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID 43602 Region 9

Cottonwood Creek (San Marcos Creek watershed)

Pollutant:	**Benthic Community Effects**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Hydromodification | Illicit Connections/Illegal Hook-ups/Dry Weather Flows | Other | Source Unknown | Unknown Point Source | Urban Runoff/Storm Sewers
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Benthic Community Effects is being considered for placement on the CWA section 303(d) List under sections 3.9 and 3.1 of the Listing Policy. Under section 3.9, an additional line of evidence associating Benthic Community Effects with a water or sediment concentration of pollutant(s) is necessary to assess listing status. Based on the readily available data and information, the weight of evidence provides sufficient justification for placing Benthic Community Effects in this water segment on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Pursuant to section 3.9 of the Listing Policy, the water exhibits significant degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index. 4. Pursuant to section 3.9 of the Listing Policy, the water segment has associated pollutant(s) samples that exceed water quality objectives. 5. Pursuant to section 3.11 of the Listing Policy, the station sampled exhibited degradation during all sampling events, and historic data from prior listings also showed degradation utilizing the southern California IBI.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant(s) contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 43602, Benthic Community Effects Region 9

Cottonwood Creek (San Marcos Creek watershed)

LOE ID:	3199

Pollutant:	DDT (Dichlorodiphenyltrichloroethane)	037707
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	Total	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	4	
Number of Exceedances:	2	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Four water samples, two samples exceeding (SWAMP, 2004).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. California Toxic Rule: Freshwater Chronic .001 mg/L. Human Health-FW (water & organisms) .00059 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	One station at Cottonwood Creek: 33.18147 -117.32893.	
Temporal Representation:	Samples were collected from March through September of 2002.	
Environmental Conditions:	San Marcos Creek Watershed 904.51.	
QAPP Information:	SWAMP Quality Assurance Plan.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43602, Benthic Community Effects **Region 9**

Cottonwood Creek (San Marcos Creek watershed)

LOE ID:	3197
Pollutant:	Sediment Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	3
Data and Information Type:	Toxicity testing of sediments
Data Used to Assess Water Quality:	Three out of four samples displayed statistically significant toxicity in the survival endpoint when compared to the negative control based on a statistical test with alpha of less than 5%. All samples were tested using the 10-day Hyallela azteca test. Note that all four samples actually had significant toxicity relative to the control, but only the three samples without any QA qualifiers were considered as exceedances (SWAMP, 2004).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the Regional Board (Region 9 Basin Plan,

	pages 3-15 to 3-16; September 8, 1994).	037708
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	All samples were collected from one station, Cottonwood Creek 2.	
Temporal Representation:	Samples were collected from March 2002 through September 2002. Toxicity in the survival endpoint was detected in samples collected on March 13, 2002, June 4, 2002 and September 17, 2002.	
Environmental Conditions:	Cottonwood Creek = 904.51	
QAPP Information:	SWAMP QAPP.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43602, Benthic Community Effects **Region 9**

Cottonwood Creek (San Marcos Creek watershed)

LOE ID:	3195
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	-N/A
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	The Cottonwood Creek and Encinitas Creek Bioassessment Study Report was written in December 2003. The report states that, "The stream bioassessment survey at Cottonwood Creek indicated that reaches of the stream upstream and downstream of the water purification facility are very similar in the benthic macroinvertebrate community composition. Chrinonmid midges, the black fly Simulium, and ostracod crustaceans dominated both sites. The Index of Biotic Integrity was substantially higher downstream of the water purification facility, due to lower percentage of non-insect taxa and a lower percentage of tolerant taxa." (City of Encinitas, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No objective was found.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The UV system is along Cottonwood Creek before it enters Moonlight Beach. Samples for the Bioassessment were collected upstream and downstream of the treatment facility.
Temporal Representation:	The report for the study is dated December 2003.
Environmental Conditions:	
QAPP Information:	Some QA information is included in the report titled Cottonwood Creek and Encinitas Creek Bioassessment Study. Prepared by MEC Analytical Systems, Inc. for the City of Encinitas, December 2003.The report includes information regarding sample site selection and description, sample collection procedures, laboratory processing and analysis, and data analysis.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43602, Benthic Community Effects **Region 9**

Cottonwood Creek (San Marcos Creek watershed)

LOE ID:	79519
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	3
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Three of the three samples collected were below the 0.79 threshold, and therefore exceeding the water quality objective for the aquatic life beneficial use.
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008. Region 9 CSCI Scores & Water Body Information
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.
Guideline Reference:	The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.
Spatial Representation:	The samples were collected at one station on Cottonwood Creek. The station is 904CC-E.
Temporal Representation:	The samples were collected in May and October 2001 and May 2002.
Environmental Conditions:	
QAPP Information:	The data was collected under the County of San Diego NPDES MS4 Copermittees Receiving Waters Monitoring and Reporting Progr
QAPP Information Reference(s):	Quality Assurance Project Plan for SWAMP Bioassessment and Freshwater Bioassessment.

Line of Evidence (LOE) for Decision ID 43602, Benthic Community Effects **Region 9**

Cottonwood Creek (San Marcos Creek watershed)

LOE ID:	73308
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	1	037710
Number of Exceedances:	1	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (San Marcos Creek watershed) to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Bifenthrin.	
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The evaluation guideline for bifenthrin is the median lethal concentration (LC50) of 0.43 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 0.43 ug/g is the geometric mean of LC50 values for bifenthrin from Amweg et al. (2005) and Amweg and Weston (2007).	
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5 Whole-sediment toxicity identification evaluation tools for pyrethroid insecticides: I. piperonyl butoxide addition. Environ. Toxicol. Chem. 26:2389-2396.	
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (San Marcos Creek watershed) was collected at 1 monitoring site [Cottonwood Creek 2 - 904CBCWC2]	
Temporal Representation:	Data was collected on a single day 1/7/2007.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.	
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)	

Line of Evidence (LOE) for Decision ID 43602, Benthic Community Effects **Region 9**

Cottonwood Creek (San Marcos Creek watershed)

LOE ID:	72760
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	3
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Three of the three samples collected had an IBI score below 40. tr11c NPDES bioassessment
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the State or Regional Board. Region 9 Basin

	Plan. 037711
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	Development of a Benthic Index of Biotic Integrity (B-IBI) for Wadeable Streams in Northern Coastal California and its Application to Regional 305(b) Assessment
Spatial Representation:	The samples were collected at one station on Cottonwood Creek. The station is CC-E..
Temporal Representation:	The samples were collected in May and October 2001 and May 2002.
Environmental Conditions:	
QAPP Information:	The data was collected under the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan, June 25, 2009.
QAPP Information Reference(s):	Quality Assurance Project Plan for SWAMP Bioassessment and Freshwater Bioassessment.

Line of Evidence (LOE) for Decision ID 43602, Benthic Community Effects **Region 9**

Cottonwood Creek (San Marcos Creek watershed)

LOE ID:	73317
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (San Marcos Creek watershed) to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Cypermethrin, total.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for cypermethrin is the median lethal concentration (LC50) of 0.3 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 0.3 ug/g is the geometric mean of LC50 values for cypermethrin from Maund et al. (2002).
Guideline Reference:	Partitioning, bioavailability, and toxicity of the pyrethroid insecticide cypermethrin in sediments. Environmental Toxicology and Chemistry 21:9-15
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (San Marcos Creek watershed) was collected at 1 monitoring site [Cottonwood Creek 2 - 904CBCWC2]
Temporal Representation:	Data was collected on a single day 1/7/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 43602, Benthic Community Effects **Region 9**

Cottonwood Creek (San Marcos Creek watershed)

LOE ID:	72824
Pollutant:	Chlordane
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	1 of 1 samples collected exceeded the criteria for chlordane concentration (Sum of trans-Chlordane, cis-Chlordane, cis-Nonachlor, trans-Nonachlor, and Oxychlordane).
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Waters shall not contain substances in concentrations that result in the deposition of material that causes nuisance or adversely affects beneficial uses. (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Probable Effect Concentration for Chlordane in freshwater sediments is 17.6 ug/kg(MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data were collected at the following station 904CBCWC2 (Cottonwood Creek 2).
Temporal Representation:	The samples were collected on 1/7/2007.
Environmental Conditions:	
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 43602, Benthic Community Effects **Region 9**

Cottonwood Creek (San Marcos Creek watershed)

LOE ID:	73349
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate sediment toxicity. The sample exhibited significant toxicity. The toxicity test included survival and growth of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if

provided). 037713

Data Reference: Statewide Project Urban Pyrethroid Status Monitoring

SWAMP Data: SWAMP

Water Quality Objective/Criterion: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.

Objective/Criterion Reference: Water Quality Control Plan for the San Diego Basin

Evaluation Guideline: Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted using the significant effect code: S equals significant, SG equals significantly greater and SL equals significantly lower. If a sample has any one of these codes, it will be considered an exceedance.

Guideline Reference: Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates, Second Edition. U.S. Environmental Protection Agency Office of Research and Development, Duluth, MI , U.S. Environmental Protection Agency Office of Water, Washington, DC EPA-600/R-99/064

Spatial Representation: The sample was collected at station 904CBCWC2.

Temporal Representation: The sample was collected in January 2007.

Environmental Conditions:

QAPP Information: All data was collected following the Standard Operating Procedures and Data Quality Objectives outlined in the SWAMP QAMP, (Puckett, 2002). QA data are included in submission.

QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 43602, Benthic Community Effects **Region 9**

Cottonwood Creek (San Marcos Creek watershed)

LOE ID: 21379

Pollutant: Toxicity

LOE Subgroup: Population/Community Degradation

Matrix: Water

Fraction: None

Beneficial Use: Warm Freshwater Habitat

Number of Samples: 4

Number of Exceedances: 4

Data and Information Type: Ambient toxicity testing (chronic)

Data Used to Assess Water Quality: Four samples were collected at Cottonwood Creek station 2, 904CBCWC2. Samples were collected March, April, June and September 2002.

Samples showed significant toxicity levels (SL) in the following tests: Selenastrum algae growth test - three of the four samples exhibited toxicity. Ceriodaphnia dubia survival/reproductive test - three of the four samples exhibited toxicity. The test results are from California's Surface Water Ambient Monitoring Program Report, 2007.

Data Reference: Monitoring data for Region 9

SWAMP Data: SWAMP

Water Quality Objective/Criterion: From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.

Objective/Criterion Reference: Water Quality Control Plan for the San Diego Basin

Evaluation Guideline: According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control

values less than the evaluation threshold. 037714

Guideline Reference: Waste Discharge Requirements for Discharges of Urban Runoff From the Municipal Separate Storm Sewer Systems Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego, the San Diego Unified Port District, and the San Diego County Regional Airport. Order No. R9-2007-0001

Spatial Representation: Samples were collected at Cottonwood Creek station 2,(904CBCWC2). (Latitude 30.0486, Longitude -117.2954).

Temporal Representation: Samples were collected in March, April, June and September 2002.

Environmental Conditions:

QAPP Information: Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.

QAPP Information Reference(s): 2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 43602, Benthic Community Effects **Region 9**

Cottonwood Creek (San Marcos Creek watershed)

LOE ID: 8517

Pollutant: Selenium

LOE Subgroup: Pollutant-Water

Matrix: Water

Fraction: Dissolved

Beneficial Use: Warm Freshwater Habitat

Number of Samples: 4

Number of Exceedances: 4

Data and Information Type: Fixed station physical/chemical (conventional plus toxic pollutants)

Data Used to Assess Water Quality: Four water samples were collected at Cottonwood Creek station 2, 904CBCWC2 on March, April, June, and September 2002. All samples showed excessive sulfate concentrations according to results in California's Surface Water Ambient Monitoring Program Report, 2007.

Data Reference: Monitoring data for Region 9

SWAMP Data: SWAMP

Water Quality Objective/Criterion: CTR Freshwater Chronic (CCC) 5 ug/L; (U.S. EPA, 2000).

Objective/Criterion Reference: Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:

Guideline Reference: Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA

Spatial Representation: Water samples were collected at Cottonwood Creek station 2, 904CBCWC2; (Latitude 33.0486, Longitude -117.2954).

Temporal Representation: Water samples were collected in March, April June, and September 2002.

Environmental Conditions:

QAPP Information: Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.

QAPP Information Reference(s): 2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 43602, Benthic Community Effects **Region 9**

Cottonwood Creek (San Marcos Creek watershed)

LOE ID: 6551

Pollutant:	Total Nitrogen as N	037715
LOE Subgroup:	Pollution	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	4	
Number of Exceedances:	4	
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)	
Data Used to Assess Water Quality:	All 4 samples collected show excessive nitrogen concentrations according to results in California's Surface Water Ambient Monitoring Program Report, 2007. Water samples were collected in March, April June, and September 2002.	
Data Reference:	Water Quality Control Plan for the San Diego Basin	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses (RWQCB, 2007). A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used (RWQCB, 2007).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:	Water Quality Control Plan for the San Diego Basin	
Spatial Representation:	Samples were collected at Cottonwood Creek station 904CBCWC2; (Latitude 33.0486, Longitude -117.2954).	
Temporal Representation:	Water samples were collected in March, April June, and September 2002.	
Environmental Conditions:		
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.	
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA	

Line of Evidence (LOE) for Decision ID 43602, Benthic Community Effects **Region 9**

Cottonwood Creek (San Marcos Creek watershed)

LOE ID:	3198
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Four of 4 samples exceeding basin plan goal (SWAMP, 2004).
Data Reference:	Placeholder reference 2006 303(d)

SWAMP Data:	SWAMP	037716
Water Quality Objective/Criterion:	Waters shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growth causes nuisances or adversely affects beneficial uses.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:	Water Quality Control Plan for the San Diego Basin Goal of 0.1 mg/l in stream and flowing waters.	
Guideline Reference:	Placeholder reference 2006 303(d)	
Spatial Representation:	One station in Cottonwood Creek: 33.18147 -117.32893	
Temporal Representation:	Samples were collected from March through September of 2002.	
Environmental Conditions:		
QAPP Information:	SWAMP Quality Assurance Plan	
QAPP Information Reference(s):		

DECISION ID 43224 Region 9

Cottonwood Creek (San Marcos Creek watershed)

Pollutant:	**Nitrogen**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2023
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Four of the 4 samples exceed the water quality objective. According to table 3.1 of the Listing Policy, the minimum sample requirement to assess conventional pollutants is 2. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Four of the 4 samples exceeded the Basin Plan objective and this does exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 43224, Nitrogen Region 9

Cottonwood Creek (San Marcos Creek watershed)

LOE ID:	6551

Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollution
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	All 4 samples collected show excessive nitrogen concentrations according to results in California's Surface Water Ambient Monitoring Program Report, 2007. Water samples were collected in March, April June, and September 2002.
Data Reference:	Water Quality Control Plan for the San Diego Basin
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses (RWQCB, 2007). A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at Cottonwood Creek station 904CBCWC2; (Latitude 33.0486, Longitude -117.2954).
Temporal Representation:	Water samples were collected in March, April June, and September 2002.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

DECISION ID 44292 Region 9

Cottonwood Creek (San Marcos Creek watershed)

Pollutant:	**Phosphorus**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Regional Board Conclusion: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. A large number of samples exceed the Basin Plan water quality goal of 0.1 mg/L in stream and flowing waters for Phosphorus.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Four of 4 samples exceeded the basin plan water quality goal and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 44292, Phosphorus **Region 9**

Cottonwood Creek (San Marcos Creek watershed)

LOE ID:	3198
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Four of 4 samples exceeding basin plan goal (SWAMP, 2004).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Waters shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growth causes nuisances or adversely affects beneficial uses.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	Water Quality Control Plan for the San Diego Basin Goal of 0.1 mg/l in stream and flowing waters.
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	One station in Cottonwood Creek: 33.18147 -117.32893
Temporal Representation:	Samples were collected from March through September of 2002.
Environmental Conditions:	
QAPP Information:	SWAMP Quality Assurance Plan
QAPP Information Reference(s):	

DECISION ID **33129** **Region 9**

Cottonwood Creek (San Marcos Creek watershed)

Pollutant:	**Turbidity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**

Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)	037719
Revision Status	Original	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 24 samples exceeded the Basin Plan objective of more than 10% of the time during any one year period is 20 NTU. water quality objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33129, Turbidity **Region 9**

Cottonwood Creek (San Marcos Creek watershed)

LOE ID:	3196
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	24
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of Encinitas from 05/2002 to 09/2002. None of the 24 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the turbidity concentration not to be exceeded more than 10% of the time during any one year period is 20 NTU.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	

Guideline Reference:	037720
Spatial Representation:	Samples were collected along Cottonwood Creek at Third and B Streets. Samples were collected at 2 other locations from the creek to the mixing zone. The next location is post-treatment, but still part of the creek (and entered in the database as such) and the 3rd location is in the mixing zone and entered into the database as the Pacific Shoreline, San Marcos HA.
Temporal Representation:	Samples were collected from 05/28/2002 to 09/11/2002.
Environmental Conditions:	
QAPP Information:	The Moonlight Beach Urban Runoff Treatment Facility Quality Assurance Project Plan, City of Encinitas. Refer Correspondence to Katherine Weldon.Considered an acceptable QAPP by the SWRCB.
QAPP Information Reference(s):	

DECISION ID 46059 **Region 9**

Cottonwood Creek (San Marcos Creek watershed)

Pollutant:	**Selenium**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Four of the 4 samples exceed the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Four of 4 samples exceed the CTR criterion and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 46059, Selenium **Region 9**

Cottonwood Creek (San Marcos Creek watershed)

LOE ID:	8517
Pollutant:	Selenium

LOE Subgroup:	Pollutant-Water	037721
Matrix:	Water	
Fraction:	Dissolved	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	4	
Number of Exceedances:	4	
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)	
Data Used to Assess Water Quality:	Four water samples were collected at Cottonwood Creek station 2, 904CBCWC2 on March, April, June, and September 2002. All samples showed excessive sulfate concentrations according to results in California's Surface Water Ambient Monitoring Program Report, 2007.	
Data Reference:	Monitoring data for Region 9	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	CTR Freshwater Chronic (CCC) 5 ug/L; (U.S. EPA, 2000).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA	
Spatial Representation:	Water samples were collected at Cottonwood Creek station 2, 904CBCWC2; (Latitude 33.0486, Longitude -117.2954).	
Temporal Representation:	Water samples were collected in March, April June, and September 2002.	
Environmental Conditions:		
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.	
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: San Marcos Creek
Water Body ID: CAR9045100020011025132925
Water Body Type: River & Stream

DECISION ID 33035 **Region 9**
San Marcos Creek

Pollutant: DDE (Dichlorodiphenyldichloroethylene)
Final Listing Decision: Do Not Delist from 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Sources: Source Unknown
Expected TMDL Completion Date: 2019
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for removal from the section 303(d) list under sections 3.1 and 3.6 of the Listing Policy. Under section 3.6 an additional line of evidence is necessary associating chemical concentrations with sediment toxicity to assess listing status.

Two line of evidence is available in the administrative record to assess pollutant. Three of four of samples exceed the Basin Plan water quality objective, and Zero of One samples exceeded the Evaluation Guideline for DDE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the section 303(d) list.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Three of four of samples exceed the Basin Plan water quality objective, and Zero of One samples exceeded the Evaluation Guideline for DDE, and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 33035, DDE (Dichlorodiphenyldichloroethylene) **Region 9**
San Marcos Creek

LOE ID: 76136

Pollutant: DDE (Dichlorodiphenyldichloroethylene)
LOE Subgroup: Pollutant-Sediment
Matrix: Sediment
Fraction: Total

Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Marcos Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for DDE.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for sum of DDE (o,p' + p,p') is 31.3 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for San Marcos Creek was collected at 1 monitoring site [San Marcos Creek 6 - 904CBSAM6]
Temporal Representation:	Data was collected on a single day 1/7/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 33035, DDE (Dichlorodiphenyldichloroethylene) Region 9

San Marcos Creek

LOE ID:	3211
Pollutant:	DDE (Dichlorodiphenyldichloroethylene)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	3
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Four samples; three samples exceeding (SWAMP, 2004).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxic Rule: Human Health-FW (water & organisms) .00059 mg/L. San Diego RWQCB Basin Plan: No individual pesticide or combination of pesticides shall be present in the water column, sediments, or biota at concentration(s) that adversely affect beneficial uses.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	One Station at San Marcos Creek: 33.13027 -117.192.
Temporal Representation:	Samples were collected from March through September of 2002.
Environmental Conditions:	San Marcos Creek Watershed 904.51.
QAPP Information:	SWAMP Quality Assurance Plan.
QAPP Information Reference(s):	

DECISION ID 34726 Region 9

San Marcos Creek

Pollutant:	**Toxicity**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal from the section 303(d) list under section 4.6 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess pollutant. Five of Nine samples exceed the Evaluation Guideline for sediment toxicity, and Six out of Nine samples exhibited water toxicity, and these samples correspond with Five out of Six samples that exceeded the Water Quality Criteria for Selenium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the section 303(d) list.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Five of Nine samples exceed the Evaluation Guideline for sediment toxicity, and Six out of Nine samples exhibited water toxicity, and these samples correspond with Five out of Six samples that exceeded the Water Quality Criteria for Selenium, and this exceeds the allowable frequency listed in Table 4.1 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 34726, Toxicity Region 9

San Marcos Creek

LOE ID:	8878
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	6	037725
Number of Exceedances:	5	
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)	
Data Used to Assess Water Quality:	Eight water samples were collected at San Marcos Creek stations 904CBSAM6 on March, April, June and September 2002. Seven of eight samples showed excessive selenium concentrations according to results in California's Surface Water Ambient Monitoring Program Report, 2007.	
Data Reference:	Monitoring data for Region 9	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	CTR Freshwater Chronic (CCC) 5 ug/L; (U.S. EPA, 2000).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Water samples were collected at San Marcos Creek stations (904CBSAM6), and station (904CBSAM3) (Latitude 33.129985, Longitude -117.19242).	
Temporal Representation:	Samples were collected on March, April, June and September 2002.	
Environmental Conditions:		
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.	
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA	

Line of Evidence (LOE) for Decision ID 34726, Toxicity **Region 9**

San Marcos Creek

LOE ID:	3209
Pollutant:	Sediment Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	2
Data and Information Type:	Chemical monitoring of sediments
Data Used to Assess Water Quality:	Two out of four samples displayed statistically significant toxicity in the survival endpoint when compared to the negative control based on a statistical test with alpha of less than 5%. One of the four samples (collected April 23, 2002) also displayed statistically significant toxicity in the survival endpoint compared to the negative control, but this data point is not included in the total 'toxic' samples as it had a data qualifier. All samples were tested using the 10-day Hyallela azteca test (SWAMP, 2004).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the Regional Board (Region 9 Basin Plan, pages 3-15 to 3-16; September 8, 1994).

Objective/Criterion Reference:	Placeholder reference 2006 303(d)	037726
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	All samples were collected from one station, San Marcos Creek 6.	
Temporal Representation:	Samples were collected from March 2002 through September 2002. Toxicity in the survival endpoint was detected in samples collected on March 13, 2002 and September 17, 2002.	
Environmental Conditions:		
QAPP Information:	SWAMP QAPP.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 34726, Toxicity **Region 9**

San Marcos Creek

LOE ID:	76243
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate sediment toxicity. The sample exhibited significant toxicity. The toxicity test included survival and growth of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted using the significant effect code: S equals significant, SG equals significantly greater and SL equals significantly lower. If a sample has any one of these codes, it will be considered an exceedance.
Guideline Reference:	Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates, Second Edition. U.S. Environmental Protection Agency Office of Research and Development, Duluth, MI , U.S. Environmental Protection Agency Office of Water, Washington, DC EPA-600/R-99/064
Spatial Representation:	The sample was collected at station 904CBSAM6.
Temporal Representation:	The sample was collected in January 2007.
Environmental Conditions:	
QAPP Information:	All data was collected following the Standard Operating Procedures and Data Quality Objectives outlined in the SWAMP QAMP, (Puckett, 2002). QA data are included in submission.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 34726, Toxicity **Region 9**

San Marcos Creek 037727

LOE ID:	3208
Pollutant:	Sediment Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	2
Data and Information Type:	Chemical monitoring of sediments
Data Used to Assess Water Quality:	Two out of four samples displayed statistically significant toxicity in the survival endpoint when compared to the negative control based on a statistical test with alpha of less than 5%. One of the four samples (collected April 23, 2002) also displayed statistically significant toxicity in the survival endpoint compared to the negative control, but this data point is not included in the total 'toxic' samples as it had a data qualifier. All samples were tested using the 10-day Hyallela azteca test (SWAMP, 2004).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the Regional Board (Region 9 Basin Plan, pages 3-15 to 3-16; September 8, 1994).
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	All samples were collected from one station, San Marcos Creek 3.
Temporal Representation:	Samples were collected from March 2002 through September 2002. Toxicity in the survival endpoint was detected in samples collected on March 12, 2002 and September 18, 2002.
Environmental Conditions:	
QAPP Information:	SWAMP QAPP.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 34726, Toxicity **Region 9**

San Marcos Creek

LOE ID:	76242
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to test for toxicity. None of the samples exhibited statistically and biologically significant toxicity. The toxicity tests included survival and reproduction of Ceriodaphnia dubia.

037728

Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control. Additionally, the biological significance of the sample is evaluated by determining whether the sample response is lower than the evaluation threshold.
Guideline Reference:	
Spatial Representation:	The samples were collected from site 904_SMC00729, San Marcos Creek.
Temporal Representation:	The samples were collected in June 2009.
Environmental Conditions:	
QAPP Information:	This data was collected for the Regional Monitoring Of Southern California's Coastal Watersheds - Stormwater Monitoring Coalition Bioassessment Working Group. CRG Marine Laboratories Quality Assurance Program Document was provided.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 34726, Toxicity **Region 9**

San Marcos Creek

LOE ID:	21385
Pollutant:	Toxicity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	6
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Total of eight samples were collected, four at San Marcos Creek station 904CBSAM3and four at San Marcos Creek station 904CBSAM6. They showed significant toxicity levels (SL) in the following tests: Selenastrum algae growth test - six of the eight samples. Ceriodaphnia dubia survival/reproductive test -four of the eight samples. Samples were collected in 2002. Tests results can be found in California's Surface Water Ambient Monitoring Program Report, 2007.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.
Guideline Reference:	Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms. Fourth Edition. Office of Water, U.S. Environmental Protection Agency. Washington, D.C. EPA-821-R-02-013

Spatial Representation:	Samples were collected from stations San Marcos Creek 3 (904CBSAM3) and San Marcos Creek 6 (904CBSAM6).
Temporal Representation:	Samples were collected on March, April, June and September 2002.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	

DECISION ID 50055 Region 9

San Marcos Creek

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Water Quality Criteria for Arsenic. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Water Quality Criteria for Arsenic and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50055, Arsenic Region 9

San Marcos Creek

LOE ID:	76058
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Marcos Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The dissolved arsenic criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved arsenic is 0.150 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Marcos Creek was collected at 1 monitoring site [San Marcos Creek - 904_SMC00729]
Temporal Representation:	Data was collected on a single day 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

DECISION ID	**50099**	**Region 9**
San Marcos Creek		

Pollutant:	**Bifenthrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.6 an additional line of evidence associating chemical sediment concentrations with sediment toxicity is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. Zero of the One samples exceed the Water Quality Criteria for Bifenthrin, one out of one samples exceeded the sediment chemistry guideline for Bifenthrin, and one out of one samples exhibited sediment toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the One samples exceed the Water Quality Criteria for Bifenthrin, one out of one samples exceeded the sediment chemistry guideline for Bifenthrin, and one out of one samples exhibited sediment toxicity. and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50099, Bifenthrin **Region 9**

San Marcos Creek

LOE ID:	76074
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Marcos Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Bifenthrin.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for bifenthrin is the median lethal concentration (LC50) of 0.43 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 0.43 ug/g is the geometric mean of LC50 values for bifenthrin from Amweg et al. (2005) and Amweg and Weston (2007).
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5 Whole-sediment toxicity identification evaluation tools for pyrethroid insecticides: I. piperonyl butoxide addition. Environ. Toxicol. Chem. 26:2389-2396.
Spatial Representation:	Data for this line of evidence for San Marcos Creek was collected at 1 monitoring site [San Marcos Creek 6 - 904CBSAM6]
Temporal Representation:	Data was collected on a single day 1/7/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 50099, Bifenthrin **Region 9**

San Marcos Creek

LOE ID:	78119
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Warm Freshwater Habitat	037732
Number of Samples:	0	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Marcos Creek to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Bifenthrin.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The UC Davis Criteria for Bifenthrin for the protection of aquatic organisms is a 4 day average of 0.0006 ug/L (Fojut et al. 2012).	
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.	
Spatial Representation:	Data for this line of evidence for San Marcos Creek was collected at 1 monitoring site [San Marcos Creek - 904_SMC00729]	
Temporal Representation:	Data was collected on a single day 6/3/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.	

Line of Evidence (LOE) for Decision ID 50099, Bifenthrin **Region 9**

San Marcos Creek

LOE ID:	76243
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate sediment toxicity. The sample exhibited significant toxicity. The toxicity test included survival and growth of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted using the significant effect code: S equals significant, SG equals significantly greater and SL equals significantly lower. If a sample has any one of these codes, it will be considered an exceedance.
Guideline Reference:	Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates, Second Edition. U.S. Environmental Protection Agency Office of Research and Development, Duluth, MI , U.S. Environmental Protection Agency Office of Water, Washington, DC EPA-600/R-99/064
Spatial Representation:	The sample was collected at station 904CBSAM6.
Temporal Representation:	The sample was collected in January 2007.
Environmental Conditions:	
QAPP Information:	All data was collected following the Standard Operating Procedures and Data Quality Objectives outlined in the SWAMP QAMP, (Puckett, 2002). QA data are included in submission.
QAPP Information Reference(s):	

DECISION ID **50106** **Region 9**

San Marcos Creek

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the Seven samples exceed the Water Quality Criteria for Cadmium. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of seven samples exceeded the Water Quality Criteria for Cadmium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50106, Cadmium **Region 9**

San Marcos Creek

LOE ID:	76075

Pollutant:	Cadmium	037734
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	6	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Marcos Creek to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Cadmium.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for San Marcos Creek was collected at 1 monitoring site [San Marcos Creek @ Discovery Street]	
Temporal Representation:	Data was collected 7/20/2004 - 1/11/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 50106, Cadmium **Region 9**

San Marcos Creek

LOE ID:	76076
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for San Marcos Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Marcos Creek was collected at 1 monitoring site [San Marcos Creek - 904_SMC00729]
Temporal Representation:	Data was collected on a single day 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

DECISION ID 50111 Region 9

San Marcos Creek

Pollutant:	**Chlordane**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 an additional line of evidence is necessary associating sediment concentrations with sediment toxicity to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Chlordane. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Evaluation Guideline Chlordane for and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50111, Chlordane Region 9

San Marcos Creek

LOE ID:	72827
Pollutant:	Chlordane
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	0 of 1 samples collected exceeded the criteria for chlordane concentration (Sum of trans-Chlordane, cis-Chlordane, cis-Nonachlor, trans-Nonachlor, and Oxychlordane).
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Waters shall not contain substances in concentrations that result in the deposition of material that causes nuisance or adversely affects beneficial uses. (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Probable Effect Concentration for Chlordane in freshwater sediments is 17.6 ug/kg(MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data were collected at the following station 904CBSAM6 (San Marcos Creek 6).
Temporal Representation:	The samples were collected on 1/7/2007.
Environmental Conditions:	
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID	50116	Region 9
San Marcos Creek		

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.6 an additional line of evidence associating chemical sediment concentrations with sediment toxicity is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. Zero of the Zero samples exceed the Water Quality Criteria for Chlorpyrifos, Zero out of Zero samples exceeded the sediment chemistry guideline for Chlorpyrifos.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that: 037737
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the Zero samples exceed the Water Quality Criteria for Chlorpyrifos, Zero out of Zero samples exceeded the sediment chemistry guideline for Chlorpyrifos, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50116, Chlorpyrifos **Region 9**

San Marcos Creek

LOE ID:	76095
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	One of one sample result was not used in the assessment because the laboratory data was non-detect and the method detection limit was above the guideline and therefore the results could not be quantified with the level of certainty required by the Listing Policy
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	There is no chlorpyrifos evaluation guideline specific to "sediment, interstitial water" (pore water). The following evaluation guideline was used to evaluate an exceedance in water quality standards: the freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000, with minor corrections to significant figures as described in Beaulaurier et al., 2005).Â
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).
Spatial Representation:	Data for this line of evidence for San Marcos Creek was collected at 1 monitoring site [San Marcos Creek 6 - 904CBSAM6]
Temporal Representation:	Data was collected on a single day 1/7/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP.

Line of Evidence (LOE) for Decision ID 50116, Chlorpyrifos **Region 9**

San Marcos Creek

LOE ID:	76094
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Marcos Creek to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).
Spatial Representation:	Data for this line of evidence for San Marcos Creek was collected at 1 monitoring site [San Marcos Creek @ Discovery Street]
Temporal Representation:	Data was collected over the time period 9/23/2005-6/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **50125** **Region 9**

San Marcos Creek

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Water Quality Criteria for Chromium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Water Quality Criteria for Chromium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50125, Chromium **Region 9**

San Marcos Creek

LOE ID:	76096
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for San Marcos Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Marcos Creek was collected at 1 monitoring site [San Marcos Creek - 904_SMC00729]
Temporal Representation:	Data was collected on a single day 6/3/2009.

Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

DECISION ID 50133 Region 9

San Marcos Creek

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. One of the Thirteen samples exceed the Water Quality Criteria for Copper. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of Three samples exceeded the Water Quality Criteria for Copper and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50133, Copper Region 9

San Marcos Creek

LOE ID:	76115
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Marcos Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the

criterion for Copper. 037741

Data Reference: Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.

Objective/Criterion Reference: Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition

Evaluation Guideline:

Guideline Reference:

Spatial Representation: Data for this line of evidence for San Marcos Creek was collected at 1 monitoring site [San Marcos Creek @ Discovery Street]

Temporal Representation: Data was collected 7/20/2004 - 1/11/2009.

Environmental Conditions: Staff is not aware of any special conditions that might affect interpretation of the data.

QAPP Information: The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.

QAPP Information Reference(s): Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 50133, Copper **Region 9**

San Marcos Creek

LOE ID: 76117

Pollutant: Copper

LOE Subgroup: Pollutant-Water

Matrix: Water

Fraction: Dissolved

Beneficial Use: Warm Freshwater Habitat

Number of Samples: 4

Number of Exceedances: 0

Data and Information Type: Non-fixed station physical/chemical (conventional + toxicants)

Data Used to Assess Water Quality: None of the four samples exceeded the criteria. One of the samples was reported as "ND" without a reporting limit, therefore this data was not used in the assessment.

Data Reference: Data for Various Pollutants in Region 9, 2002-2009.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).

Objective/Criterion Reference: Water Quality Control Plan for the San Diego Basin

Evaluation Guideline: California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.

Guideline Reference: Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition

Spatial Representation: A sample was collected from station LSM Creek (North end of lake), also called CAR4.

Temporal Representation: Samples were collected annually in the summer months during the years: 2004 through

	2008.	037742
Environmental Conditions:		
QAPP Information:	The samples were collected and analyzed by the County of San Diego as part of their storm water program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 50133, Copper **Region 9**

San Marcos Creek

LOE ID:	76116
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	1
Data and Information Type:	Non-fixed station physical/chemical (conventional + toxicants)
Data Used to Assess Water Quality:	One of the two samples exceeded the hardness adjusted criteria.
Data Reference:	Data for Various Pollutants in Region 9, 2002-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from San Marcos Creek at Site 3, a location downstream from Lake San Marcos (just outside the dam) and Site 7 which was obtained from San Marcos Creek in a location upstream of the lake.
Temporal Representation:	Samples were collected on 5/18/2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed by the San Diego Regional Water Quality Control Board.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 50133, Copper **Region 9**

San Marcos Creek

LOE ID:	76097
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	1	037743
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for San Marcos Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for San Marcos Creek was collected at 1 monitoring site [San Marcos Creek - 904_SMC00729]	
Temporal Representation:	Data was collected on a single day 6/3/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.	

DECISION ID	**50146**	**Region 9**
San Marcos Creek		

Pollutant:	**Cyfluthrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one samples exceed the Evaluation Guideline for Cyfulthrin.

Based on the readily available data and information, the weight of evidence indicates that there is INSUFFICIENT justification FOR placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the One samples exceed the Evaluation Guideline and this sample size is INSUFFICIENT to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using

table 3.1. 037744
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50146, Cyfluthrin **Region 9**

San Marcos Creek

LOE ID:	76118
Pollutant:	Cyfluthrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Marcos Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cyfluthrin, total.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for cyfluthrin is the median lethal concentration (LC50) of 1.1 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 1.1 ug/g is the geometric mean of LC50 values for cyfluthrin from Amweg et al. (2005).
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5
Spatial Representation:	Data for this line of evidence for San Marcos Creek was collected at 1 monitoring site [San Marcos Creek 6 - 904CBSAM6]
Temporal Representation:	Data was collected on a single day 1/7/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **50158** **Region 9**

San Marcos Creek

Pollutant:	**Cyhalothrin, Lambda**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised

Impairment from Pollutant or Pollution:	Pollutant	037745
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 an additional line of evidence is necessary associating sediment concentrations with sediment toxicity to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline . Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Evaluation Guideline for and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.	
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.	

Line of Evidence (LOE) for Decision ID 50158, Cyhalothrin, Lambda **Region 9**

San Marcos Creek

LOE ID:	76119
Pollutant:	Cyhalothrin, Lambda
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Marcos Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cyhalothrin, lambda, total.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for lambda-cyhalothrin is the median lethal concentration (LC50) of 0.44 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 0.44 ug/g is the geometric mean of LC50 values for lambda-cyhalothrin from Amweg et al. (2005).

Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, 03/2006 Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5
Spatial Representation:	Data for this line of evidence for San Marcos Creek was collected at 1 monitoring site [San Marcos Creek 6 - 904CBSAM6]
Temporal Representation:	Data was collected on a single day 1/7/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID 50744 Region 9

San Marcos Creek

Pollutant:	**Cypermethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.6 an additional line of evidence is necessary associating chemical concentrations with sediment toxicity to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the Zero samples exceed the Water Quality Criteria, and Zero of the One samples exceeded the Evaluation Guideline for Cypermethrin. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the Zero samples exceed the Water Quality Criteria, and Zero of the One samples exceeded the Evaluation Guideline for Cypermethrin and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50744, Cypermethrin Region 9

San Marcos Creek

LOE ID:	76134
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment

Fraction:	Total	037747
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Marcos Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cypermethrin, total.	
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The evaluation guideline for cypermethrin is the median lethal concentration (LC50) of 0.3 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 0.3 ug/g is the geometric mean of LC50 values for cypermethrin from Maund et al. (2002).	
Guideline Reference:	Partitioning, bioavailability, and toxicity of the pyrethroid insecticide cypermethrin in sediments. Environmental Toxicology and Chemistry 21:9-15	
Spatial Representation:	Data for this line of evidence for San Marcos Creek was collected at 1 monitoring site [San Marcos Creek 6 - 904CBSAM6]	
Temporal Representation:	Data was collected on a single day 1/7/2007.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.	
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)	

Line of Evidence (LOE) for Decision ID 50744, Cypermethrin **Region 9**

San Marcos Creek

LOE ID:	78122
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Marcos Creek to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Cypermethrin, total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic

	life (Water Quality Control Plan for the San Diego Basin).	037748
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of cypermethrin does not exceed 0.0002 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Fojut et al. 2012)	
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.	
Spatial Representation:	Data for this line of evidence for San Marcos Creek was collected at 1 monitoring site [San Marcos Creek - 904_SMC00729]	
Temporal Representation:	Data was collected on a single day 6/3/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.	

DECISION ID **50156** **Region 9**

San Marcos Creek

Pollutant:	**DDD (Dichlorodiphenyldichloroethane)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 an additional line of evidence is necessary associating sediment concentrations with sediment toxicity to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Evaluation Guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50156, DDD (Dichlorodiphenyldichloroethane) **Region 9**

San Marcos Creek

LOE ID:	76135

Pollutant:	DDD (Dichlorodiphenyldichloroethane)	037749
LOE Subgroup:	Pollutant-Sediment	
Matrix:	Sediment	
Fraction:	Total	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Marcos Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for DDD.	
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for sum of DDD (o,p' + p,p') is 28.0 ug/Kg dry weight (MacDonald et al. 2000).	
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31	
Spatial Representation:	Data for this line of evidence for San Marcos Creek was collected at 1 monitoring site [San Marcos Creek 6 - 904CBSAM6]	
Temporal Representation:	Data was collected on a single day 1/7/2007.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.	
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)	

DECISION ID	**50157**	**Region 9**
San Marcos Creek		

Pollutant:	**DDT (Dichlorodiphenyltrichloroethane)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 an addition line of evidence is necessary associating sediment concentrations with sediment toxicity to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for DDT (Dichlorodiphenyltrichloroethane).

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.

3. Zero of One samples exceeded the Evaluation Guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50157, DDT (Dichlorodiphenyltrichloroethane) **Region 9**

San Marcos Creek

LOE ID:	76153
Pollutant:	DDT (Dichlorodiphenyltrichloroethane)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Marcos Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for DDT.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for sum of DDT (o,p' + p,p') is 62.9 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for San Marcos Creek was collected at 1 monitoring site [San Marcos Creek 6 - 904CBSAM6]
Temporal Representation:	Data was collected on a single day 1/7/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **50160** **Region 9**

San Marcos Creek

Pollutant:	**Deltamethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final	New Decision

Listing Decision:		037751
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 an additional line of evidence is necessary associating sediment concentrations with sediment toxicity to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Deltamethrin.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Evaluation Guideline for Deltamethrin and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50160, Deltamethrin **Region 9**

San Marcos Creek

LOE ID:	76154
Pollutant:	Deltamethrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Marcos Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Deltamethrin.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for deltamethrin is the median lethal concentration (LC50) of 0.79 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 0.79 ug/g is the geometric mean of LC50 values for deltamethrin from Amweg et al.

	(2005). 037752
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5
Spatial Representation:	Data for this line of evidence for San Marcos Creek was collected at 1 monitoring site [San Marcos Creek 6 - 904CBSAM6]
Temporal Representation:	Data was collected on a single day 1/7/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **50161** **Region 9**

San Marcos Creek

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.6 an additional line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the Five samples exceed the Water Quality Criteria for Diazinon and zero of the one samples exceeded the evaluation guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Five samples exceeded the Water Quality Criteria and zero of the one samples exceeded the evaluation guideline for Dazinon and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50161, Diazinon **Region 9**

San Marcos Creek

LOE ID:	76155
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	037753
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	5	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Marcos Creek to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Diazinon.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).	
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game	
Spatial Representation:	Data for this line of evidence for San Marcos Creek was collected at 1 monitoring site [San Marcos Creek @ Discovery Street]	
Temporal Representation:	Data was collected over the time period 9/23/2005-6/11/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 50161, Diazinon **Region 9**

San Marcos Creek

LOE ID:	76156
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Marcos Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Diazinon.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	There is no diazinon evaluation guideline specific to "sediment, interstitial water" (pore water). The following evaluation guideline was used to evaluate an exceedance in water quality standards: the freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).Â
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Data for this line of evidence for San Marcos Creek was collected at 1 monitoring site [San Marcos Creek 6 - 904CBSAM6]
Temporal Representation:	Data was collected on a single day 1/7/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **50162** **Region 9**

San Marcos Creek

Pollutant:	**Dieldrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.6 an additional line of evidence associating chemical sediment concentrations with sediment toxicity is necessary to assess listing status. Three lines of evidence are available in the administrative record to assess this pollutant. Zero of the One samples exceed the sediment chemistry guideline for Dieldrin. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the One samples exceed the sediment chemistry guideline for Dieldrin and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50162, Dieldrin **Region 9**

San Marcos Creek

LOE ID:	76157
Pollutant:	Dieldrin

LOE Subgroup:	Pollutant-Sediment	037755
Matrix:	Sediment	
Fraction:	Total	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Marcos Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Dieldrin.	
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for dieldrin is 61.8 ug/Kg dry weight (MacDonald et al. 2000).	
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31	
Spatial Representation:	Data for this line of evidence for San Marcos Creek was collected at 1 monitoring site [San Marcos Creek 6 - 904CBSAM6]	
Temporal Representation:	Data was collected on a single day 1/7/2007.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.	
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)	

DECISION ID	**50163**	**Region 9**
San Marcos Creek		

Pollutant:	**Endrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.6 an additional line of evidence associating chemical sediment concentrations with sediment toxicity is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. Zero of the One samples exceed the sediment chemistry guideline for Endrin.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the one samples exceeded the valuation guideline and this sample size is insufficient to

determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50163, Endrin **Region 9**

San Marcos Creek

LOE ID:	76172
Pollutant:	Endrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Marcos Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Endrin.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for endrin is 207 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for San Marcos Creek was collected at 1 monitoring site [San Marcos Creek 6 - 904CBSAM6]
Temporal Representation:	Data was collected on a single day 1/7/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **50165** **Region 9**

San Marcos Creek

Pollutant:	**Esfenvalerate/Fenvalerate**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision

Revision Status	Revised	037757
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.6 an additional line of evidence associating chemical sediment concentrations with sediment toxicity is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceeded the Evaluation Guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the one samples exceeded the Evaluation Guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50165, Esfenvalerate/Fenvalerate **Region 9**

San Marcos Creek

LOE ID:	76176
Pollutant:	Esfenvalerate/Fenvalerate
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Marcos Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Esfenvalerate/Fenvalerate, total.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for esfenvalerate/fenvalerate is the median lethal concentration (LC50) of 1.5 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 1.5 ug/g is the geometric mean of LC50 values for

	esfenvalerate/fenvalerate from Amweg et al. (2005). 037758
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5
Spatial Representation:	Data for this line of evidence for San Marcos Creek was collected at 1 monitoring site [San Marcos Creek 6 - 904CBSAM6]
Temporal Representation:	Data was collected on a single day 1/7/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID 50166 Region 9

San Marcos Creek

Pollutant:	**Fenpropathrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.6 an additional line of evidence associating chemical sediment concentrations with sediment toxicity is necessary to assess listing status. Three lines of evidence are available in the administrative record to assess this pollutant. Zero of one samples exceeded the Evaluation Guideline for Fenpropathrin. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one samples exceeded the Evaluation Guideline for Fenpropathrin and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50166, Fenpropathrin Region 9

San Marcos Creek

LOE ID:	76193
Pollutant:	Fenpropathrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total

Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Marcos Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Fenpropathrin.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for fenpropathrin is the median lethal concentration (LC50) of 1 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 1 ug/g is the geometric mean of LC50 values for fenpropathrin from Ding et al. (2011).
Guideline Reference:	Toxicity of Sediment-Associated Pesticides to Chironomus dilutus and Hyalella azteca. Arch. Environ. Contam. Toxicol. 61:83Â–92.
Spatial Representation:	Data for this line of evidence for San Marcos Creek was collected at 1 monitoring site [San Marcos Creek 6 - 904CBSAM6]
Temporal Representation:	Data was collected on a single day 1/7/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID	**50168**	**Region 9**
San Marcos Creek		

Pollutant:	**Fipronil**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.6 an additional line of evidence associating chemical sediment concentrations with sediment toxicity is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceeded the Evaluation Guideline for Fipronil

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the one samples exceeded the evaluation guideline for fipronil and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial

use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50168, Fipronil **Region 9**

San Marcos Creek

LOE ID:	76194
Pollutant:	Fipronil
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	One of one sample result was not used in the assessment because the laboratory data was non-detect and the method detection limit was above the guideline and therefore the results could not be quantified with the level of certainty required by the Listing Policy.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for fipronil is the median lethal concentration (LC50) of 0.13 ug/g and is normalized by the percentage of organic carbon in the sediment sample (Maul et al. 2008).
Guideline Reference:	Effect of sediment-associated pyrethroids, fipronil, and metabolites on Chironomus tentans growth rate, body mass, condition index, immobilization, and survival. Environ. Toxicol. Chem. 27(12):2582-2590.
Spatial Representation:	Data for this line of evidence for San Marcos Creek was collected at 1 monitoring site [San Marcos Creek 6 - 904CBSAM6]
Temporal Representation:	Data was collected on a single day 1/7/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **50169** **Region 9**

San Marcos Creek

Pollutant:	**Fipronil Sulfide**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**

Last Listing Cycle's Final Listing Decision:	New Decision	037761
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 an additional line of evidence is necessary associating chemical concentrations with sediment toxicity to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the Zero samples exceed the Evaluation Guideline for Fipronil Sulfide.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Zero samples exceeded the Evaluation Guideline for Firponil Sulfide and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50169, Fipronil Sulfide **Region 9**

San Marcos Creek

LOE ID:	76195
Pollutant:	Fipronil Sulfide
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	One of one sample result was not used in the assessment because the laboratory data was non-detect and the method detection limit was above the guideline and therefore the results could not be quantified with the level of certainty required by the Listing Policy.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for fipronil sulfide is the median lethal concentration (LC50) of 0.16

	ug/g and is normalized by the percentage of organic carbon in the sediment sample (Maul et al. 2008).
Guideline Reference:	Effect of sediment-associated pyrethroids, fipronil, and metabolites on Chironomus tentans growth rate, body mass, condition index, immobilization, and survival. Environ. Toxicol. Chem. 27(12):2582-2590.
Spatial Representation:	Data for this line of evidence for San Marcos Creek was collected at 1 monitoring site [San Marcos Creek 6 - 904CBSAM6]
Temporal Representation:	Data was collected on a single day 1/7/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **50170** **Region 9**

San Marcos Creek

Pollutant:	**Fipronil Sulfone**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.6 an additional line of evidence associating chemical sediment concentrations with sediment toxicity is necessary to assess listing status. Three lines of evidence are available in the administrative record to assess this pollutant. Zero of the Zero samples exceeded the Evaluation Guideline for Fipronil Sulfone. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the Zero samples exceeded the Ealuation Guideline for Fipronil Sulfone and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50170, Fipronil Sulfone **Region 9**

San Marcos Creek

LOE ID:	76196
Pollutant:	Fipronil Sulfone
LOE Subgroup:	Pollutant-Sediment

Matrix:	Sediment	037763
Fraction:	Total	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	0	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	One of one sample result was not used in the assessment because the laboratory data was non-detect and the method detection limit was above the guideline and therefore the results could not be quantified with the level of certainty required by the Listing Policy.	
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The evaluation guideline for fipronil sulfone is the median lethal concentration (LC50) of 0.12 ug/g and is normalized by the percentage of organic carbon in the sediment sample (Maul et al. 2008).	
Guideline Reference:	Effect of sediment-associated pyrethroids, fipronil, and metabolites on Chironomus tentans growth rate, body mass, condition index, immobilization, and survival. Environ. Toxicol. Chem. 27(12):2582-2590.	
Spatial Representation:	Data for this line of evidence for San Marcos Creek was collected at 1 monitoring site [San Marcos Creek 6 - 904CBSAM6]	
Temporal Representation:	Data was collected on a single day 1/7/2007.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.	
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)	

DECISION ID	**50172**	**Region 9**
San Marcos Creek		

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Four lines of evidence are available in the administrative record to assess this pollutant. One of the Twelve samples exceeded the Water Quality Criteria for Lead. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.

3.One of the Twelve samples exceeded the Water Quality Criteria for Lead and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50172, Lead **Region 9**

San Marcos Creek

LOE ID:	76210
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	Non-fixed station physical/chemical (conventional + toxicants)
Data Used to Assess Water Quality:	None of the four samples exceeded the criteria. One of the samples was reported as "ND" without a reporting limit, therefore this data was not used in the assessment.
Data Reference:	Data for Various Pollutants in Region 9, 2002-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	A sample was collected from station LSM Creek at North end of lake (CAR4).
Temporal Representation:	Samples were collected annually in the summer months during the years: 2004 through 2008.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed by the County of San Diego as part of their storm water program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 50172, Lead **Region 9**

San Marcos Creek

LOE ID:	76197

Pollutant:	Lead	037765
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	Dissolved	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for San Marcos Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California, 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for San Marcos Creek was collected at 1 monitoring site [San Marcos Creek - 904_SMC00729]	
Temporal Representation:	Data was collected on a single day 6/3/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.	

Line of Evidence (LOE) for Decision ID 50172, Lead **Region 9**

San Marcos Creek

LOE ID:	76208
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Marcos Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Marcos Creek was collected at 1 monitoring site [San Marcos Creek @ Discovery Street]
Temporal Representation:	Data was collected 7/20/2004 - 1/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 50172, Lead **Region 9**

San Marcos Creek

LOE ID:	76209
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Non-fixed station physical/chemical (conventional + toxicants)
Data Used to Assess Water Quality:	The one sample exceeded the hardness adjusted criteria. An additional sample result was reported as "ND", no reporting limit was provided with the data, so it could not be used in this assessment.
Data Reference:	Data for Various Pollutants in Region 9, 2002-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from San Marcos Creek at Site 3, a location downstream from Lake San Marcos (just outside the dam) and Site 7 which was obtained from San Marcos Creek in a location upstream of the lake.
Temporal Representation:	Samples were collected on 5/18/2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed by the San Diego Regional Water Quality Control

Board. 037767

QAPP Information Reference(s):

DECISION ID	50177	Region 9
San Marcos Creek		

Pollutant:	**Lindane/gamma Hexachlorocyclohexane (gamma-HCH)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.6 an additional line of evidence associating chemical sediment concentrations with sediment toxicity is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceeded the Evaluation Guideline for Lindane/gamma Hexachlorocyclohexane (gamma-HCH).

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the one samples exceeded the Evaluation Guideline for Lindane/gamma Hexachlorocyclohexane (gamma-HCH) and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50177, Lindane/gamma Hexachlorocyclohexane (gamma-HCH)	**Region 9**
San Marcos Creek	

LOE ID:	76211
Pollutant:	Lindane/gamma Hexachlorocyclohexane (gamma-HCH)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Marcos Creek to determine beneficial use

	support and results are as follows: 0 of 1 samples exceed the criterion for 01716 gamma.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for Lindane (gamma-HCH) is 4.99 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for San Marcos Creek was collected at 1 monitoring site [San Marcos Creek 6 - 904CBSAM6]
Temporal Representation:	Data was collected on a single day 1/7/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID	**50178**	**Region 9**
San Marcos Creek		

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Water Quality Criteria for Malathion. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Water Quality Criteria for Malathion and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50178, Malathion 037769 **Region 9**

San Marcos Creek

LOE ID:	76212
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Marcos Creek to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Malathion.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for San Marcos Creek was collected at 1 monitoring site [San Marcos Creek @ Discovery Street]
Temporal Representation:	Data was collected over the time period 9/23/2005-6/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **50745** **Region 9**

San Marcos Creek

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the Three samples exceed the Water Quality Criteria for Nickel. Based on the readily available data and information, the weight of evidence indicates that there is

sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Three samples exceeded the Water Quality Criteria for Nickel and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50745, Nickel **Region 9**

San Marcos Creek

LOE ID:	76223
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for San Marcos Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Marcos Creek was collected at 1 monitoring site [San Marcos Creek - 904_SMC00729]
Temporal Representation:	Data was collected on a single day 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

Line of Evidence (LOE) for Decision ID 50745, Nickel **Region 9**

San Marcos Creek

LOE ID:	76224
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	Non-fixed station physical/chemical (conventional + toxicants)
Data Used to Assess Water Quality:	None of the two samples exceeded the hardness adjusted criteria.
Data Reference:	Data for Various Pollutants in Region 9, 2002-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from San Marcos Creek at Site 3, a location downstream from Lake San Marcos (just outside the dam) and Site 7 which was obtained from San Marcos Creek in a location upstream of the lake.
Temporal Representation:	Samples were collected on 5/18/2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed by the San Diego Regional Water Quality Control Board.
QAPP Information Reference(s):	

DECISION ID **50746** **Region 9**

San Marcos Creek

Pollutant:	**Oxygen, Dissolved**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Three of the Five samples exceed the water Quality Objective for Oxygen, Dissolved.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Three of Five samples exceeded the Water Quality Objective for Oxygen, Dissolved and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50746, Oxygen, Dissolved **Region 9**

San Marcos Creek

LOE ID:	76225
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	5
Number of Exceedances:	3
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Numeric data generated from 5 minimums of Dissolved Oxygen concentrations had 3 exceedences.
Data Reference:	Data for Various Pollutants in Region 9, 2002-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Dissolved oxygen levels shall not be less than 5.0 mg/l in inland surface waters with designated MAR or WARM beneficial uses. The annual mean dissolved oxygen concentration shall not be less than 7 mg/l more than 10% of the time.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from stations 3, 7, and LSM-40.
Temporal Representation:	Samples were collected thrice in 2007 and twice in 2009.
Environmental Conditions:	
QAPP Information:	NPDES quality assurance.
QAPP Information Reference(s):	

DECISION ID **50747** **Region 9**

San Marcos Creek

Pollutant: **Permethrin, total**

Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	037773
Last Listing Cycle's Final Listing Decision:	New Decision	
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 an additional line of evidence is necessary associating chemical concentrations with sediment toxicity to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Permethrin, Total.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Evaluation Guideline for Permethrin, Total and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50747, Permethrin, total **Region 9**

San Marcos Creek

LOE ID:	76226
Pollutant:	Permethrin, total
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Marcos Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Permethrin, Total.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for permethrin is the median lethal concentration (LC50) of 8.9

	ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 8.9 ug/g is the geometric mean of LC50 values for permethrin from Amweg et al. (2005).
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5
Spatial Representation:	Data for this line of evidence for San Marcos Creek was collected at 1 monitoring site [San Marcos Creek 6 - 904CBSAM6]
Temporal Representation:	Data was collected on a single day 1/7/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID 50749 — Region 9

San Marcos Creek

Pollutant:	**Temperature, water**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Four of the Nine samples exceed the Water Quality Objective for Temperature, water. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Four of Nine samples exceeded the Water Quality Objective for Temperature, water and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50749, Temperature, water — Region 9

San Marcos Creek

LOE ID:	76228
Pollutant:	Temperature, water
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	037775
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	9	
Number of Exceedances:	4	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Four of the 9 samples exceeded the evaluation guideline for temperature in this water body.	
Data Reference:	Data for Trash, Nutrients, and Pathogens in Region 9, 2007-2010.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Board that such alteration in temperature does not adversely affect beneficial uses. At no time or place shall the temperature of any COLD water be increased more than 5Â°F above the natural receiving water temperature.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	Inland Fishes of California (Moyle 1976) states that for rainbow trout the optimum range for growth and completion of most life stages is 13-21 degrees C (page 129). Since there is no evaluation guideline for assessing temperature for the warm freshwater aquatic life beneficial use, this line of evidence will not be used for Listing Decisions in the 2012 Integrated Report and will be retired for said Listing cycle.	
Guideline Reference:	Fish introductions in CA: History and impact on native fishes. Davis, CA: University of CA, Davis	
Spatial Representation:	Samples were collected at station BTQ-02-Box Canyon Dam (downstream at bank).	
Temporal Representation:	Samples were collected between January, 2009 and July, 2010.	
Environmental Conditions:		
QAPP Information:	San Diego Regional Water Quality Assessment and Outreach Project Quality Assurance Project Plan Prepared by: Clay Clifton (San Diego Coastkeeper, Local Project Sponsor Manager), Bob Stafford (San Diego Stream Team), Dr. Rick Gersberg (San Diego State University), Bryan Bjorndal (Assure Controls, Inc.), and Morgan Justice-Black (I Love A Clean San Diego).	
QAPP Information Reference(s):		

DECISION ID	50748	Region 9
San Marcos Creek		

Pollutant:	**Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 an additional line of evidence is necessary associating chemical concentrations with sediment toxicity to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD). Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that: 037776
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the One samples exceed the Evaluation Guideline for Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD) and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50748, Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD) **Region 9**

San Marcos Creek

LOE ID:	76241
Pollutant:	Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Marcos Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for DDT, Total.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for total DDTs (Sum DDT + Sum DDD + Sum DDE) is 572 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for San Marcos Creek was collected at 1 monitoring site [San Marcos Creek 6 - 904CBSAM6]
Temporal Representation:	Data was collected on a single day 1/7/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **50750** **Region 9**

San Marcos Creek 037777

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Four lines of evidence is available in the administrative record to assess this pollutant. One of the 13 samples exceed the Water Quality Criteria for Zinc.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of 13 samples exceeded the Water Quality Criteria for Zinc and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50750, Zinc — Region 9

San Marcos Creek

LOE ID:	76255
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	Non-fixed station physical/chemical (conventional + toxicants)
Data Used to Assess Water Quality:	None of the two samples exceeded the hardness adjusted criteria.
Data Reference:	Data for Various Pollutants in Region 9, 2002-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from San Marcos Creek at Site 3, a location downstream from Lake San Marcos (just outside the dam) and Site 7 which was obtained from San Marcos Creek in a location upstream of the lake.
Temporal Representation:	Samples were collected on 5/18/2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed by the San Diego Regional Water Quality Control Board.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 50750, Zinc **Region 9**

San Marcos Creek

LOE ID:	76254
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Marcos Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Marcos Creek was collected at 1 monitoring site [San Marcos Creek @ Discovery Street]
Temporal Representation:	Data was collected 7/20/2004 - 1/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 50750, Zinc **Region 9**

San Marcos Creek 037779

LOE ID:	76256
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	1
Data and Information Type:	Non-fixed station physical/chemical (conventional + toxicants)
Data Used to Assess Water Quality:	One of the four samples exceeded the criteria. One of the samples was reported as "ND" without a reporting limit, therefore this data was not used in the assessment.
Data Reference:	Data for Various Pollutants in Region 9, 2002-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	A sample was collected from station LSM Creek (North end of lake), also called CAR4.
Temporal Representation:	Samples were collected annually in the summer months during the years: 2004 through 2008.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed by the County of San Diego as part of their storm water program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 50750, Zinc **Region 9**

San Marcos Creek

LOE ID:	76253
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for San Marcos Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater

	Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Marcos Creek was collected at 1 monitoring site [San Marcos Creek - 904_SMC00729]
Temporal Representation:	Data was collected on a single day 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

DECISION ID	**50751**	**Region 9**
San Marcos Creek		

Pollutant:	**pH**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the Four samples exceed the Water Quality Objective for pH. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Four samples exceeded the Water Quality Objective for pH and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50751, pH 037781 **Region 9**

San Marcos Creek

LOE ID:	76227
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Zero of the 4 samples exceeded the objective. The sample collected from site LSM-40 6/23/2007 is a clerical error as the pH reading is 25.53.
Data Reference:	Data for Various Pollutants in Region 9, 2002-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The pH of all inland surface waters shall not be depressed below 6.5 or raised above 8.5 as a result of waste discharges.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the 3, 7, and LSM - 40 stations.
Temporal Representation:	Samples were collected thrice in 2007 and once in 2009.
Environmental Conditions:	
QAPP Information:	NPDES quality assurance.
QAPP Information Reference(s):	

DECISION ID **43723** **Region 9**

San Marcos Creek

Pollutant:	**Benthic Community Effects**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: Benthic Community Effects is being considered for placement on the CWA section 303(d) List under sections 3.9 and 3.1 of the Listing Policy. Under section 3.9, an additional line of evidence associating Benthic Community Effects with a water or sediment concentration of pollutant(s) is necessary to assess listing status.

Based on the readily available data and information, the weight of evidence provides sufficient justification for placing Benthic Community Effects in this water segment on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.

2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 937782
3. Pursuant to section 3.9 of the Listing Policy, the water exhibits significant degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index.
4. Pursuant to section 3.9 of the Listing Policy, the water segment has associated pollutant(s) samples that exceed water quality objectives.
5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are being met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 43723, Benthic Community Effects **Region 9**

San Marcos Creek

LOE ID:	8878
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	5
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Eight water samples were collected at San Marcos Creek stations 904CBSAM6 on March, April, June and September 2002. Seven of eight samples showed excessive selenium concentrations according to results in California's Surface Water Ambient Monitoring Program Report, 2007.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	CTR Freshwater Chronic (CCC) 5 ug/L; (U.S. EPA, 2000).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Water samples were collected at San Marcos Creek stations (904CBSAM6), and station (904CBSAM3) (Latitude 33.129985, Longitude -117.19242).
Temporal Representation:	Samples were collected on March, April, June and September 2002.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 43723, Benthic Community Effects **Region 9**

San Marcos Creek

LOE ID:	72767

Pollutant:	Benthic-Macroinvertebrate Bioassessments	037783
LOE Subgroup:	Population/Community Degradation	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	14	
Number of Exceedances:	14	
Data and Information Type:	Benthic macroinvertebrate surveys	
Data Used to Assess Water Quality:	Fourteen of the 14 samples collected had IBI scores below 40. tr11c NPDES bioassessment	
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the State or Regional Board. Region 9 Basin Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.	
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13	
Spatial Representation:	The samples were collected at stations SMC-LCCC, SMC-M, SMC-RSFR, SMC-SP, and SM-TWAS-1b San Marcos Creek.	
Temporal Representation:	The samples were collected twice a year in May and October from 2001 to 2002.	
Environmental Conditions:		
QAPP Information:	The data was collected under the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan, June 25, 2009.	
QAPP Information Reference(s):	Quality Assurance Project Plan for SWAMP Bioassessment and Freshwater Bioassessment.	

Line of Evidence (LOE) for Decision ID 43723, Benthic Community Effects **Region 9**

San Marcos Creek

LOE ID:	76074
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Marcos Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Bifenthrin.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring

SWAMP Data:	SWAMP	037784
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The evaluation guideline for bifenthrin is the median lethal concentration (LC50) of 0.43 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 0.43 ug/g is the geometric mean of LC50 values for bifenthrin from Amweg et al. (2005) and Amweg and Weston (2007).	
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5 Whole-sediment toxicity identification evaluation tools for pyrethroid insecticides: I. piperonyl butoxide addition. Environ. Toxicol. Chem. 26:2389-2396.	
Spatial Representation:	Data for this line of evidence for San Marcos Creek was collected at 1 monitoring site [San Marcos Creek 6 - 904CBSAM6]	
Temporal Representation:	Data was collected on a single day 1/7/2007.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.	
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)	

Line of Evidence (LOE) for Decision ID 43723, Benthic Community Effects **Region 9**

San Marcos Creek

LOE ID:	76243
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate sediment toxicity. The sample exhibited significant toxicity. The toxicity test included survival and growth of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted using the significant effect code: S equals significant, SG equals significantly greater and SL equals significantly lower. If a sample has any one of these codes, it will be considered an exceedance.
Guideline Reference:	Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates, Second Edition. U.S. Environmental

	Protection Agency Office of Research and Development, Duluth, MI , U.S. Environmental Protection Agency Office of Water, Washington, DC EPA-600/R-99/064
Spatial Representation:	The sample was collected at station 904CBSAM6.
Temporal Representation:	The sample was collected in January 2007.
Environmental Conditions:	
QAPP Information:	All data was collected following the Standard Operating Procedures and Data Quality Objectives outlined in the SWAMP QAMP, (Puckett, 2002). QA data are included in submission.
QAPP Information Reference(s):	

037785

Line of Evidence (LOE) for Decision ID 43723, Benthic Community Effects **Region 9**

San Marcos Creek

LOE ID:	79694
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	6
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Seven samples where taken at three locations on San Marcos Creek above San Marcos reservoir. Six samples were below the 0.79 threshold, and therefore exceeding the water quality objective for the aquatic life beneficial use.
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008. Bioassessment Data for Various Pollutants from Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009. Region 9 CSCI Scores & Water Body Information
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.
Guideline Reference:	The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.
Spatial Representation:	The samples was collected at: 904SMC-M, SMC00729, 904SMC-SP
Temporal Representation:	The samples were collected in 2001, 2002, and 2009.
Environmental Conditions:	
QAPP Information:	The data was collected under the the County of San Diego NPDES MS4 Copermittees

QAPP Information Reference(s):	Receiving Waters Monitoring and Reporting Program and the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan. e-mail clarifying QAPP information Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008. Bioassessment Data for Various Pollutants from Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.

Line of Evidence (LOE) for Decision ID 43723, Benthic Community Effects **Region 9**

San Marcos Creek

LOE ID:	79693
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Eight samples were taken at two stations on San Marcos Creek below San Marcos reservoir. The CSCI scores for are above the 0.79 threshold, and therefore the site is not exceeding the water quality objective for the aquatic life beneficial use.
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008. Region 9 CSCI Scores & Water Body Information
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	The samples were collected at stations 904SMC-LCCC and 904SMC-RSFR
Temporal Representation:	The samples were collected twice a year in May and October from 2001 to 2004.
Environmental Conditions:	
QAPP Information:	The data was collected under the County of San Diego NPDES MS4 Copermittees Receiving Waters Monitoring and Reporting Program.
QAPP Information Reference(s):	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008. Quality Assurance Project Plan for SWAMP Bioassessment and Freshwater Bioassessment.

Line of Evidence (LOE) for Decision ID 43723, Benthic Community Effects — Region 9

San Marcos Creek

LOE ID:	76116
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	1
Data and Information Type:	Non-fixed station physical/chemical (conventional + toxicants)
Data Used to Assess Water Quality:	One of the two samples exceeded the hardness adjusted criteria.
Data Reference:	Data for Various Pollutants in Region 9, 2002-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from San Marcos Creek at Site 3, a location downstream from Lake San Marcos (just outside the dam) and Site 7 which was obtained from San Marcos Creek in a location upstream of the lake.
Temporal Representation:	Samples were collected on 5/18/2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed by the San Diego Regional Water Quality Control Board.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43723, Benthic Community Effects — Region 9

San Marcos Creek

LOE ID:	21385
Pollutant:	Toxicity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	6
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Total of eight samples were collected, four at San Marcos Creek station 904CBSAM3and

	four at San Marcos Creek station 904CBSAM6. They showed significant toxicity levels (SL) in the following tests: Selenastrum algae growth test - six of the eight samples. Ceriodaphnia dubia survival/reproductive test -four of the eight samples. Samples were collected in 2002. Tests results can be found in California's Surface Water Ambient Monitoring Program Report, 2007.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.
Guideline Reference:	Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms. Fourth Edition. Office of Water, U.S. Environmental Protection Agency. Washington, D.C. EPA-821-R-02-013
Spatial Representation:	Samples were collected from stations San Marcos Creek 3 (904CBSAM3) and San Marcos Creek 6 (904CBSAM6).
Temporal Representation:	Samples were collected on March, April, June and September 2002.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43723, Benthic Community Effects **Region 9**

San Marcos Creek

LOE ID:	27029
Pollutant:	Benthic Community Effects
LOE Subgroup:	Adverse Biological Responses
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	14
Number of Exceedances:	14
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Fourteen samples of IBI data were taken from May 2001 to October 2004 at four sampling sites. Of the total number of samples, all fourteen of the samples exceeded the IBI impairment threshold.
Data Reference:	Stream Bioassessment Data. Co-permitee Data. Collected 2002-2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring

	range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at four sites: SMC-LCCC, SMC-M, SMC-RSFR, and SMC-SP on San Marcos Creek.
Temporal Representation:	Sampling occurred during May and October annually over a two year period from May 2001 to October 2002 and during October 2004.
Environmental Conditions:	
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Manual for Freshwater Bioassessment.
QAPP Information Reference(s):	Quality Assurance Manual for Freshwater Bioassessment Revision 0

Line of Evidence (LOE) for Decision ID 43723, Benthic Community Effects **Region 9**

San Marcos Creek

LOE ID:	26446
Pollutant:	Benthic Community Effects
LOE Subgroup:	Adverse Biological Responses
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	24
Number of Exceedances:	24
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Twenty four samples of IBI data were taken from May 1998 to November 2000 at four sampling sites. Of the total number of samples, all twenty four samples exceeded the IBI impairment threshold.
Data Reference:	Fish and Game IBI Data
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. (SDRWQCB, 1995)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at four sites: 904SMCLCC, 904SMCMxx, 904SMCRSF, and 904SMCSPx on San Marcos Creek.
Temporal Representation:	Sampling occurred during one to seven events annually from May 1998 to November 2000.
Environmental Conditions:	
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Project Plan for the California Stream Bioassessment Procedure and the

	State of California, California Monitoring an Assessment Program: "CMAP". Quality Assurance Project Plan.
QAPP Information Reference(s):	State of California, California Monitoring and Assessment Program: "CMAP". Quality Assurance Project Plan for the California Stream Bioassessment Procedure The San Diego Stream Team Quality Assurance Project Plan

Line of Evidence (LOE) for Decision ID 43723, Benthic Community Effects **Region 9**

San Marcos Creek

LOE ID:	3209
Pollutant:	Sediment Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	2
Data and Information Type:	Chemical monitoring of sediments
Data Used to Assess Water Quality:	Two out of four samples displayed statistically significant toxicity in the survival endpoint when compared to the negative control based on a statistical test with alpha of less than 5%. One of the four samples (collected April 23, 2002) also displayed statistically significant toxicity in the survival endpoint compared to the negative control, but this data point is not included in the total 'toxic' samples as it had a data qualifier. All samples were tested using the 10-day Hyallela azteca test (SWAMP, 2004).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the Regional Board (Region 9 Basin Plan, pages 3-15 to 3-16; September 8, 1994).
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	All samples were collected from one station, San Marcos Creek 6.
Temporal Representation:	Samples were collected from March 2002 through September 2002. Toxicity in the survival endpoint was detected in samples collected on March 13, 2002 and September 17, 2002.
Environmental Conditions:	
QAPP Information:	SWAMP QAPP.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43723, Benthic Community Effects **Region 9**

San Marcos Creek

LOE ID:	3207
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Not Specified
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Data were collected for the San Diego Regional Water Quality Control Board 1999 Biological Assessment Annual Report. Physical habitat scores for SMC-LCCC ranged from 104 to 132, higher scores compared to other sampled waterbodies. BMI scores were near average for the sampling months (3 at or slightly above, 1 slightly below). (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	
Objective/Criterion Reference:	
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Marcos Creek, 5 riffles downstream of Rancho Santa Fe Rd (SMC-LCCC).
Temporal Representation:	Samples were collected in May, September, November 1998 and May 1999.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43723, Benthic Community Effects **Region 9**

San Marcos Creek

LOE ID:	3206
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Not Specified
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Data were collected for the San Diego Regional Water Quality Control Board 1999 Biological Assessment Annual Report. Physical habitat scores ranged from 108 to 128, higher scores compared to other sampled waterbodies. BMI scores were either at, slightly above, or slightly below average. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	
Objective/Criterion Reference:	
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Marcos Creek, 5 riffles 50m upstream of McMahr Rd intersection (SMC-RSFR).
Temporal Representation:	Samples were collected in May, September, November 1998, and May 1999.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43723, Benthic Community Effects **Region 9**

San Marcos Creek

LOE ID:	3205
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Not Specified
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Data were collected for the San Diego Regional Water Quality Control Board 1999 Biological Assessment Annual Report. Physical habitat scores for SMC-SP ranged from 90 to 120, moderate scores, compared to other sampled waterbodies. BMI scores were below average. In May and September 1998, the scores were just slightly below average, but decreased further below average in November 1998 and May 1999. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	
Objective/Criterion Reference:	
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Marcos Creek, 5 riffles downstream of Santar Place (SMC-SP).
Temporal Representation:	Samples were collected in May, September, November 1998 and in May 1999.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43723, Benthic Community Effects **Region 9**

San Marcos Creek

LOE ID:	3204
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Not Specified
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Samples were collected for the San Diego Regional Water Quality Control Board 1999 Biological Assessment Annual Report. Physical habitat scores at SMC-M ranged from 107 to 126, moderate compared to other sampled waterbodies. BMI scores were above and below average. Of the 4 scores, 3 were below average, and 1 was above. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)

SWAMP Data:	Non-SWAMP	037793
Water Quality Objective/Criterion:		
Objective/Criterion Reference:		
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at San Marcos Creek, 5 riffles 50m upstream of McMahr Rd. intersection (SMC-M).	
Temporal Representation:	Samples were collected in May, September, November 1998, and May 1999.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43723, Benthic Community Effects **Region 9**

San Marcos Creek

LOE ID:	3208
Pollutant:	Sediment Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	2
Data and Information Type:	Chemical monitoring of sediments
Data Used to Assess Water Quality:	Two out of four samples displayed statistically significant toxicity in the survival endpoint when compared to the negative control based on a statistical test with alpha of less than 5%. One of the four samples (collected April 23, 2002) also displayed statistically significant toxicity in the survival endpoint compared to the negative control, but this data point is not included in the total 'toxic' samples as it had a data qualifier. All samples were tested using the 10-day Hyallela azteca test (SWAMP, 2004).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the Regional Board (Region 9 Basin Plan, pages 3-15 to 3-16; September 8, 1994).
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	All samples were collected from one station, San Marcos Creek 3.
Temporal Representation:	Samples were collected from March 2002 through September 2002. Toxicity in the survival endpoint was detected in samples collected on March 12, 2002 and September 18, 2002.
Environmental Conditions:	
QAPP Information:	SWAMP QAPP.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43723, Benthic Community Effects **Region 9**

San Marcos Creek

LOE ID:	3211
Pollutant:	DDE (Dichlorodiphenyldichloroethylene)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	3
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Four samples; three samples exceeding (SWAMP, 2004).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxic Rule: Human Health-FW (water & organisms) .00059 mg/L. San Diego RWQCB Basin Plan: No individual pesticide or combination of pesticides shall be present in the water column, sediments, or biota at concentration(s) that adversely affect beneficial uses.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	One Station at San Marcos Creek: 33.13027 -117.192.
Temporal Representation:	Samples were collected from March through September of 2002.
Environmental Conditions:	San Marcos Creek Watershed 904.51.
QAPP Information:	SWAMP Quality Assurance Plan.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43723, Benthic Community Effects **Region 9**

San Marcos Creek

LOE ID:	3210
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	8
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Eight water samples, eight samples exceeding (SWAMP, 2004).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Waters shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growth causes nuisances or adversely affects beneficial uses. Water Quality Control Plan for the San Diego Basin Goal of 0.1 mg/L in stream and flowing waters.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)

Evaluation Guideline:	037795
Guideline Reference:	
Spatial Representation:	Two stations at San Marcos Creek: 33.13027 - 117.192 and at 33.08791 - 117.26933.
Temporal Representation:	Eight samples collected from March through September of 2002.
Environmental Conditions:	San Marcos Creek Watershed 904.5.
QAPP Information:	SWAMP Quality Assurance Plan.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43723, Benthic Community Effects **Region 9**

San Marcos Creek

LOE ID:	76060
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	The one sample collected had an IBI score below 40. The score was 4.3. SMC bioassessment
Data Reference:	Bioassessment Data for Various Pollutants from Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the State or Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	
Spatial Representation:	The sample was collected at 904_SMC00729, San Marcos Creek .
Temporal Representation:	The sample was collected in June 2009.
Environmental Conditions:	
QAPP Information:	The data was collected under the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan, June 25, 2009.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 43723, Benthic Community Effects **Region 9**

San Marcos Creek

LOE ID:	76209
Pollutant:	Lead

LOE Subgroup:	Pollutant-Water	037796
Matrix:	Water	
Fraction:	Dissolved	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	1	
Data and Information Type:	Non-fixed station physical/chemical (conventional + toxicants)	
Data Used to Assess Water Quality:	The one sample exceeded the hardness adjusted criteria. An additional sample result was reported as "ND", no reporting limit was provided with the data, so it could not be used in this assessment.	
Data Reference:	Data for Various Pollutants in Region 9, 2002-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.	
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Spatial Representation:	Samples were collected from San Marcos Creek at Site 3, a location downstream from Lake San Marcos (just outside the dam) and Site 7 which was obtained from San Marcos Creek in a location upstream of the lake.	
Temporal Representation:	Samples were collected on 5/18/2009.	
Environmental Conditions:		
QAPP Information:	The samples were collected and analyzed by the San Diego Regional Water Quality Control Board.	
QAPP Information Reference(s):		

DECISION ID	**53496**	**Region 9**
San Marcos Creek		

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollution

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Four lines of evidence are available in the administrative record to assess this pollutant. Ten of 14 and 6 of 16 single samples exceed the water quality objectives for enterococcus (fresh water) and fecal coliform for the protection of REC-1.

Based on the readily available data and information, the weight of evidence indicates that there is

sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Ten of 14 and 6 of 16 single samples exceed the water quality objectives for enterococcus (fresh water) and fecal coliform for the protection of REC-1 and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 53496, Indicator Bacteria **Region 9**

San Marcos Creek

LOE ID:	76177
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	6
Number of Exceedances:	3
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Marcos Creek to determine beneficial use support and results are as follows: 3 of 6 samples exceed the criterion for Coliform, Fecal.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the fecal coliform concentration shall not exceed 400 MPN/100 ml.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Marcos Creek was collected at 1 monitoring site [San Marcos Creek @ Discovery Street]
Temporal Representation:	Data was collected over the time period 7/20/2004-6/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 53496, Indicator Bacteria **Region 9**

San Marcos Creek

LOE ID:	76178

Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	10
Number of Exceedances:	3
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Three of the ten samples exceeded the fecal coliform objective.
Data Reference:	Data for Various Pollutants in Region 9, 2002-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The fecal coliform concentration shall not exceed 400/100ml. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Stations 3 and 7, CAR04, and LSM-40. All samples were upstream of Lake San Marcos except for Station 3 which is downstream of the dam at the lake.
Temporal Representation:	Samples were collected from July 2004 to May 2009.
Environmental Conditions:	
QAPP Information:	Data was a combination of Regional Board Lab data, County of San Diego Watershed Protection Program Lab data, and citizen group Lake San Marcos Task Force data. No QAPP documents were included.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 53496, Indicator Bacteria **Region 9**

San Marcos Creek

LOE ID:	76175
Pollutant:	Escherichia coli (E. coli)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2
Number of Exceedances:	2
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Both samples exceeded the E. Coli objective.
Data Reference:	Data for Various Pollutants in Region 9, 2002-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The E. Coli concentration shall not exceed more than 235/100 ml.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Stations 3 and 7. Station 3 is downstream of the dam at the lake. Station 7 is upstream of the lake.

Temporal Representation:	Samples were collected on May 18, 2009.	037799
Environmental Conditions:		
QAPP Information:	No QAPP documents were included with the Regional Board Lab data.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 53496, Indicator Bacteria **Region 9**

San Marcos Creek

LOE ID:	76173
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	6
Number of Exceedances:	5
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Marcos Creek to determine beneficial use support and results are as follows: 5 of 6 samples exceed the criterion for Enterococci.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Samples shall not exceed 61 organisms per 100 ml for enterococcus in waters designated for REC I beneficial use (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Marcos Creek was collected at 1 monitoring site [San Marcos Creek @ Discovery Street]
Temporal Representation:	Data was collected over the time period 7/20/2004-6/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 53496, Indicator Bacteria **Region 9**

San Marcos Creek

LOE ID:	76174
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	8
Number of Exceedances:	5
Data and Information Type:	Not Specified

Data Used to Assess Water Quality:	Five of the eight samples exceeded the enterococcus objective.	037800
Data Reference:	Data for Various Pollutants in Region 9, 2002-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The enterococcus concentration shall not exceed 61/100ml. Region 9 Basin Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Stations 3 and 7, CAR04, and LSM-40. All samples were upstream of Lake San Marcos except for Station 3 which is downstream of the dam at the lake.	
Temporal Representation:	Samples were collected from July 2004 to May 2009.	
Environmental Conditions:		
QAPP Information:	Data was a combination of Regional Board Lab data, County of San Diego Watershed Protection Program Lab data, and citizen group Lake San Marcos Task Force data. No QAPP documents were included.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 53496, Indicator Bacteria **Region 9**

San Marcos Creek

LOE ID:	76239
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	6
Number of Exceedances:	1
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Marcos Creek to determine beneficial use support and results are as follows: 1 of 6 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxicsubstances in concentrations which are toxic to,or which produce detrimental physiologicalresponses in human, plant, animal, or indigenousaquatic life (Basin Plan).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In waters designated for water contact recreation (REC I), the total coliform concentration shall not exceed 10000 MPN/100 ml (CDPH 2006).
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.
Spatial Representation:	Data for this line of evidence for San Marcos Creek was collected at 1 monitoring site [San Marcos Creek @ Discovery Street]
Temporal Representation:	Data was collected over the time period 7/20/2004-6/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix

Line of Evidence (LOE) for Decision ID 53496, Indicator Bacteria **Region 9**

San Marcos Creek

LOE ID:	76240
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	9
Number of Exceedances:	1
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	One of the nine samples exceeded the total coliform objective.
Data Reference:	Data for Various Pollutants in Region 9, 2002-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The total coliform concentration shall not exceed 10000/100ml. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Stations 3 and 7, CAR04, and LSM-40. All samples were upstream of Lake San Marcos except for Station 3 which is downstream of the dam at the lake.
Temporal Representation:	Samples were collected from July 2004 to May 2009.
Environmental Conditions:	
QAPP Information:	Data was a combination of Regional Board Lab data, County of San Diego Watershed Protection Program Lab data, and citizen group Lake San Marcos Task Force data. No QAPP documents were included.
QAPP Information Reference(s):	

DECISION ID **37435** **Region 9**

San Marcos Creek

Pollutant:	**Total Dissolved Solids**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2, one line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Two of two of the samples exceed the Basin Plan water quality objective for total dissolved solids.

Based on the readily available data and information, the weight of evidence indicates that there is

sufficient justification against placing this water segment-pollutant combination on the Section 303(d) list in the Water Quality Limited Segments category. 037602

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Two of two of the samples exceed the Basin Plan water quality objective for total dissolved solids, and this sample size is insufficient to determine with the power and confidence of the Listing Policy if standards are not met. A minimum of 26 samples is needed for application of table 3.2.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 37435, Total Dissolved Solids **Region 9**

San Marcos Creek

LOE ID:	3200
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Agricultural Supply
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 1998. One sample was collected, it was in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for TDS is 500 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Sample was collected at San Marcos Creek at Mcmahr.
Temporal Representation:	Sample was collected on 06/03/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 37435, Total Dissolved Solids **Region 9**

San Marcos Creek

LOE ID:	3201
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	Total Dissolved	037803
Beneficial Use:	Agricultural Supply	
Number of Samples:	1	
Number of Exceedances:	1	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 1998. One sample was collected, it was in exceedance. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for TDS is 500 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Sample was collected at San Marcos Creek at Rancho Santa Fe Rd.	
Temporal Representation:	Sample was collected on 06/03/1998.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID	33523	Region 9
San Marcos Creek		

Pollutant:	**Turbidity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2, one line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Neither of the two samples exceed the Basin Plan water quality objective for turbidity.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Neither of the two samples exceed the Basin Plan water quality objective for turbidity, and this sample size is insufficient to determine with the power and confidence of the Listing Policy if standards are not met. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33523, Turbidity **Region 9**

San Marcos Creek

LOE ID:	3202
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Agricultural Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 1998. One sample was collected and was not in exceedance (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for turbidity is 20 ntu. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Sample was collected at San Marcos Creek at Rancho Santa Fe Rd.
Temporal Representation:	Sample was collected on 06/03/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33523, Turbidity **Region 9**

San Marcos Creek

LOE ID:	3203
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Agricultural Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 1998. 1 sample was collected and was not in exceedance (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for turbidity is 20 ntu. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Marcos Creek at McMahr.
Temporal Representation:	Samples were collected on 06/03/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 33514 Region 9

San Marcos Creek

Pollutant:	**Phosphorus**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown | Unknown Nonpoint Source | Unknown Point Source | Urban Runoff/Storm Sewers
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for addition to the section 303(d) list under section 3.1 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Eight of eight of samples exceed the Basin Plan water quality objective for phosphorus. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of adding this water segment-pollutant combination to the section 303(d) list. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Eight of eight of samples exceed the Basin Plan water quality objective for phosphorus, and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33514, Phosphorus Region 9

San Marcos Creek

LOE ID:	3210
Pollutant:	Phosphorus

LOE Subgroup:	Pollutant-Water	037806
Matrix:	Water	
Fraction:	Total	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	8	
Number of Exceedances:	8	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Eight water samples, eight samples exceeding (SWAMP, 2004).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Waters shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growth causes nuisances or adversely affects beneficial uses. Water Quality Control Plan for the San Diego Basin Goal of 0.1 mg/L in stream and flowing waters.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Two stations at San Marcos Creek: 33.13027 - 117.192 and at 33.08791 - 117.26933.	
Temporal Representation:	Eight samples collected from March through September of 2002.	
Environmental Conditions:	San Marcos Creek Watershed 904.5.	
QAPP Information:	SWAMP Quality Assurance Plan.	
QAPP Information Reference(s):		

DECISION ID	**43708**	**Region 9**
San Marcos Creek		

Pollutant:	**Selenium**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. Seven of eight of the samples exceed the California Toxics Rule water quality objective for selenium, and these samples correspond with six out of eight samples that exhibited water toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Seven of eight of the samples exceed the California Toxics Rule water quality objective for selenium, and these samples correspond with six out of eight samples that exhibited water toxicity, and this

exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. 037807
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43708, Selenium **Region 9**

San Marcos Creek

LOE ID:	8878
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	5
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Eight water samples were collected at San Marcos Creek stations 904CBSAM6 on March, April, June and September 2002. Seven of eight samples showed excessive selenium concentrations according to results in California's Surface Water Ambient Monitoring Program Report, 2007.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	CTR Freshwater Chronic (CCC) 5 ug/L; (U.S. EPA, 2000).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Water samples were collected at San Marcos Creek stations (904CBSAM6), and station (904CBSAM3) (Latitude 33.129985, Longitude -117.19242).
Temporal Representation:	Samples were collected on March, April, June and September 2002.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 43708, Selenium **Region 9**

San Marcos Creek

LOE ID:	21385
Pollutant:	Toxicity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Warm Freshwater Habitat	037808
Number of Samples:	8	
Number of Exceedances:	6	
Data and Information Type:	Ambient toxicity testing (chronic)	
Data Used to Assess Water Quality:	Total of eight samples were collected, four at San Marcos Creek station 904CBSAM3and four at San Marcos Creek station 904CBSAM6. They showed significant toxicity levels (SL) in the following tests: Selenastrum algae growth test - six of the eight samples. Ceriodaphnia dubia survival/reproductive test -four of the eight samples. Samples were collected in 2002. Tests results can be found in California's Surface Water Ambient Monitoring Program Report, 2007.	
Data Reference:	Monitoring data for Region 9	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.	
Guideline Reference:	Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms. Fourth Edition. Office of Water, U.S. Environmental Protection Agency. Washington, D.C. EPA-821-R-02-013	
Spatial Representation:	Samples were collected from stations San Marcos Creek 3 (904CBSAM3) and San Marcos Creek 6 (904CBSAM6).	
Temporal Representation:	Samples were collected on March, April, June and September 2002.	
Environmental Conditions:		
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.	
QAPP Information Reference(s):		

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Reidy Canyon Creek
Water Body ID: CAR9046200020010927085916
Water Body Type: River & Stream

DECISION ID 48531 **Region 9**
Reidy Canyon Creek

Pollutant: Ammonia
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the three samples exceed the objective for protection of the drinking water beneficial use (MUN).

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of three samples exceeded the objectives this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48531, Ammonia **Region 9**
Reidy Canyon Creek

LOE ID: 75514

Pollutant: Nitrogen, ammonia (Total Ammonia)
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 3
Number of Exceedances: 0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Reidy Canyon Creek to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Ammonia As N, Total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Basin Plan: No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	EPA's Lifetime Health advisory level for total ammonia is 30.0 mg/L as stated on page 8 of the 2006 edition of the drinking water standards and health advisories. This Advisory Level is defined as "the concentration of a chemical in drinking water that is not expected to cause any adverse noncarcinogenic effects for up to ten days of exposure."
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Reidy Canyon Creek was collected at 2 monitoring sites [Reidy Canyon Creek @ Bachelor Lane, Reidy Canyon Creek @ Paseo Del Norte]
Temporal Representation:	Data was collected over the time period 5/22/2003-6/2/2003.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID	**48515**	**Region 9**
Reidy Canyon Creek		

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the eight samples exceed the objective for protection of Aquatic Life and zero of eight samples exceed the objective for protection of the drinking water beneficial use (MUN). Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of eight samples exceeded the objectives and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision	After review of the available data and information, RWQCB staff concludes that the water body-

Recommendation: pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48515, Cadmium **Region 9**

Reidy Canyon Creek

LOE ID:	75515
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Reidy Canyon Creek to determine beneficial use support and results are as follows: 0 of 8 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Reidy Canyon Creek was collected at 2 monitoring sites [Reidy Canyon Creek @ Bachelor Lane, Reidy Canyon Creek @ Paseo Del Norte]
Temporal Representation:	Data was collected over the time period 5/22/2004-6/10/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48515, Cadmium **Region 9**

Reidy Canyon Creek

LOE ID:	75516
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8

Number of Exceedances:	0	037812

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Reidy Canyon Creek to determine beneficial use support and results are as follows: 0 of 8 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for cadmium is 0.005 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Reidy Canyon Creek was collected at 2 monitoring sites [Reidy Canyon Creek @ Bachelor Lane, Reidy Canyon Creek @ Paseo Del Norte]
Temporal Representation:	Data was collected over the time period 5/22/2004-6/10/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID	**48523**	**Region 9**
Reidy Canyon Creek		

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the zero samples exceed the objective for protection of Aquatic Life and zero of four samples exceed the guideline for protection of the drinking water beneficial use (MUN).

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of zero samples exceeded the objectives and zero of four samples exceed the guideline, this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and

information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48523, Chlorpyrifos **Region 9**

Reidy Canyon Creek

LOE ID:	75517
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Reidy Canyon Creek to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).
Spatial Representation:	Data for this line of evidence for Reidy Canyon Creek was collected at 1 monitoring site [Reidy Canyon Creek @ Paseo Del Norte]
Temporal Representation:	Data was collected over the time period 6/27/2006-6/10/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48523, Chlorpyrifos **Region 9**

Reidy Canyon Creek

LOE ID:	78083
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	4	037814
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Reidy Canyon Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Chlorpyrifos.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The USEPA drinking water health advisory for chlorpyrifos is 2.1 Âµg/L.	
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013	
Spatial Representation:	Data for this line of evidence for Reidy Canyon Creek was collected at 1 monitoring site [Reidy Canyon Creek @ Paseo Del Norte]	
Temporal Representation:	Data was collected over the time period 6/27/2006-6/10/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID	**48516**	**Region 9**
Reidy Canyon Creek		

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the eight samples exceed the objective for protection of Aquatic Life and zero of eight samples exceed the objective for protection of the drinking water beneficial use (MUN). Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of eight samples exceeded the objectives and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision	After review of the available data and information, RWQCB staff concludes that the water body-

Recommendation: pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48516, Copper **Region 9**

Reidy Canyon Creek

LOE ID:	75519
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Reidy Canyon Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Reidy Canyon Creek was collected at 2 monitoring sites [Reidy Canyon Creek @ Bachelor Lane, Reidy Canyon Creek @ Paseo Del Norte]
Temporal Representation:	Data was collected over the time period 5/22/2004-6/10/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48516, Copper **Region 9**

Reidy Canyon Creek

LOE ID:	75518
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8

Number of Exceedances:	0	037816
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Reidy Canyon Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Copper.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Secondary MCL for copper is 1.0 mg/L (Title 22 California Code of Regulations).	
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Reidy Canyon Creek was collected at 2 monitoring sites [Reidy Canyon Creek @ Bachelor Lane, Reidy Canyon Creek @ Paseo Del Norte]	
Temporal Representation:	Data was collected over the time period 5/22/2004-6/10/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID	**48522**	**Region 9**
Reidy Canyon Creek		

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the four samples exceed the objective for protection of Aquatic Life and zero of four samples exceed the guideline for protection of the drinking water beneficial use (MUN). Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of four samples exceeded the objectives and guideline, this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and

information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48522, Diazinon **Region 9**

Reidy Canyon Creek

LOE ID:	78084
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Reidy Canyon Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for diazinon is 1.4 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Reidy Canyon Creek was collected at 1 monitoring site [Reidy Canyon Creek @ Paseo Del Norte]
Temporal Representation:	Data was collected over the time period 6/27/2006-6/10/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48522, Diazinon **Region 9**

Reidy Canyon Creek

LOE ID:	75520
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Reidy Canyon Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).
Guideline Reference:	Water quality for diazinon, Memorandum to J. Karkoski, Central Valley RWQCB, Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Data for this line of evidence for Reidy Canyon Creek was collected at 1 monitoring site [Reidy Canyon Creek @ Paseo Del Norte]
Temporal Representation:	Data was collected over the time period 6/27/2006-6/10/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID	48517	Region 9
Reidy Canyon Creek		

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the eight samples exceed the objective for protection of Aquatic Life and zero of eight samples exceed the objective for protection of the drinking water beneficial use (MUN). Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of eight samples exceeded the objectives and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48517, Lead **Region 9**

Reidy Canyon Creek

LOE ID:	75526
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Reidy Canyon Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Reidy Canyon Creek was collected at 2 monitoring sites [Reidy Canyon Creek @ Bachelor Lane, Reidy Canyon Creek @ Paseo Del Norte]
Temporal Representation:	Data was collected over the time period 5/22/2004-6/10/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48517, Lead **Region 9**

Reidy Canyon Creek

LOE ID:	75525
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Reidy Canyon Creek to determine beneficial use support and results are as follows: 0 of 8 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for Lead is 0.015 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Reidy Canyon Creek was collected at 2 monitoring sites [Reidy Canyon Creek @ Bachelor Lane, Reidy Canyon Creek @ Paseo Del Norte]
Temporal Representation:	Data was collected over the time period 5/22/2004-6/10/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID	48520	Region 9
Reidy Canyon Creek		

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the four samples exceed the objective for protection of Aquatic Life and zero of four samples exceed the guideline for protection of the drinking water beneficial use (MUN). Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of four samples exceeded the objectives and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48520, Malathion 037821 Region 9

Reidy Canyon Creek

LOE ID:	75527
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Reidy Canyon Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Malathion.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Reidy Canyon Creek was collected at 1 monitoring site [Reidy Canyon Creek @ Paseo Del Norte]
Temporal Representation:	Data was collected over the time period 6/27/2006-6/10/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48520, Malathion Region 9

Reidy Canyon Creek

LOE ID:	78085
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Reidy Canyon Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Malathion.

Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides in the County of San Diego, 2003-2009. 037822
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for malathion is 100 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Reidy Canyon Creek was collected at 1 monitoring site [Reidy Canyon Creek @ Paseo Del Norte]
Temporal Representation:	Data was collected over the time period 6/27/2006-6/10/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 48528 Region 9

Reidy Canyon Creek

Pollutant:	**Nitrate/Nitrite (Nitrite + Nitrate as N)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the fone samples exceed the objective for protection of the drinking water beneficial use (MUN). Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one samples exceeded the objectives this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48528, Nitrate/Nitrite (Nitrite + Nitrate as N) Region 9

Reidy Canyon Creek

LOE ID:	75528	037823

Pollutant:	Nitrate/Nitrite (Nitrite + Nitrate as N)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Reidy Canyon Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nitrate/Nitrite as N.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrate + nitrite (as N) is 10.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Reidy Canyon Creek was collected at 1 monitoring site [Reidy Canyon Creek @ Bachelor Lane]
Temporal Representation:	Data was collected on a single day 5/23/2003.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID	**43957**	**Region 9**
Reidy Canyon Creek		

Pollutant:	**Nitrogen, Nitrite**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2, one line(s) of evidence is necessary to assess listing status.

Two lines of evidence is available in the administrative record to assess this pollutant. Zeror of the five samples exceeded the Basin Plan water quality objective for nitrite.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.

3. Neither of the two the samples exceeded the Basin Plan water quality objective for nitrate and this sample size is insufficient to determine with the power and confidence of the Listing Policy if standards are not met. A minimum of five samples is needed for application of table 3.2.
4. Pursuant to [SECTION 3.11/4.11] of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 43957, Nitrogen, Nitrite **Region 9**

Reidy Canyon Creek

LOE ID:	3213
Pollutant:	Nitrogen, Nitrite
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected in Reidy Creek at the Mountain Meadow Mushroom Farm on 3/12/01. Two samples were collected; one upstream and one downstream. Both samples were ND. The detection limit is below the WQO. (SDRWQCB, 2001).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, the numeric objective for Nitrate as N is 1.0 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Two samples were collected, one upstream and one downstream, near Mountain Meadow Mushroom Farm on 3/12/2001.
Temporal Representation:	Samples were collected once on 3/12/2001.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43957, Nitrogen, Nitrite **Region 9**

Reidy Canyon Creek

LOE ID:	75529
Pollutant:	Nitrogen, Nitrite
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3

Number of Exceedances:	0	037825
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Reidy Canyon Creek to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Nitrite as N.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrite (as N) is 1.0 mg/L (Title 22 of the California Code of Regulations).	
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Reidy Canyon Creek was collected at 2 monitoring sites [Reidy Canyon Creek @ Bachelor Lane, Reidy Canyon Creek @ Paseo Del Norte]	
Temporal Representation:	Data was collected over the time period 5/22/2003-5/23/2003.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID	**48518**	**Region 9**
Reidy Canyon Creek		

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the eight samples exceed the objective for protection of Aquatic Life and zero of eight samples exceed the objective for protection of the drinking water beneficial use (MUN). Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of eight samples exceeded the objectives and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48518, Zinc **Region 9**

Reidy Canyon Creek

LOE ID:	75531
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Reidy Canyon Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for zinc is 5.0 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Reidy Canyon Creek was collected at 2 monitoring sites [Reidy Canyon Creek @ Bachelor Lane, Reidy Canyon Creek @ Paseo Del Norte]
Temporal Representation:	Data was collected over the time period 5/22/2004-6/10/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48518, Zinc **Region 9**

Reidy Canyon Creek

LOE ID:	75532
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Reidy Canyon Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Zinc.

Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009. 037827
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Reidy Canyon Creek was collected at 2 monitoring sites [Reidy Canyon Creek @ Bachelor Lane, Reidy Canyon Creek @ Paseo Del Norte]
Temporal Representation:	Data was collected over the time period 5/22/2004-6/10/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID	**48532**	**Region 9**
Reidy Canyon Creek		

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2027
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.3 of the Listing Policy. Under section 3.3 a single line of evidence is necessary to assess listing status. Three lines of evidence are available in the administrative record to assess this pollutant. Seven of the nine samples exceed the objective for enterococcus. Four of nine samples exceed the objective for fecal coliform and two of nine samples exceed the objective for total coliform. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Seven of nine samples exceed the objectives for enterococcus and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 48532, Indicator Bacteria **Region 9**

Reidy Canyon Creek

LOE ID:	75524
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	9
Number of Exceedances:	4
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Reidy Canyon Creek to determine beneficial use support and results are as follows: 4 of 9 samples exceed the criterion for Coliform, Fecal.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the fecal coliform concentration shall not exceed 400 MPN/100 ml.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Reidy Canyon Creek was collected at 2 monitoring sites [Reidy Canyon Creek @ Bachelor Lane, Reidy Canyon Creek @ Paseo Del Norte]
Temporal Representation:	Data was collected over the time period 5/22/2003-7/22/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48532, Indicator Bacteria **Region 9**

Reidy Canyon Creek

LOE ID:	75530
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	9
Number of Exceedances:	2
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Reidy Canyon Creek to determine beneficial use support and results are as follows: 2 of 9 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the

	County of San Diego, 2003-2009.	037829

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxicsubstances in concentrations which are toxic to,or which produce detrimental physiologicalresponses in human, plant, animal, or indigenousaquatic life (Basin Plan).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In waters designated for water contact recreation (REC I), the total coliform concentration shall not exceed 10000 MPN/100 ml (CDPH 2006).
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.
Spatial Representation:	Data for this line of evidence for Reidy Canyon Creek was collected at 2 monitoring sites [Reidy Canyon Creek @ Bachelor Lane, Reidy Canyon Creek @ Paseo Del Norte]
Temporal Representation:	Data was collected over the time period 5/22/2003-7/22/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48532, Indicator Bacteria **Region 9**

Reidy Canyon Creek

LOE ID:	75523
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	9
Number of Exceedances:	7
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Reidy Canyon Creek to determine beneficial use support and results are as follows: 7 of 9 samples exceed the criterion for Enterococci.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Samples shall not exceed 61 organisms per 100 ml for enterococcus in waters designated for REC I beneficial use (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Reidy Canyon Creek was collected at 2 monitoring sites [Reidy Canyon Creek @ Bachelor Lane, Reidy Canyon Creek @ Paseo Del Norte]
Temporal Representation:	Data was collected over the time period 5/22/2003-7/22/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID	32634	Region 9
Reidy Canyon Creek		

Pollutant:	**Phosphorus**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Two of two of samples exceeded the Basin Plan water quality objective for phosphorus.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of adding this water segment-pollutant combination from the section 303(d) list.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Two of two of samples exceeded the Basin Plan water quality objective for phosphorus, and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 32634, Phosphorus	**Region 9**
Reidy Canyon Creek	

LOE ID:	3214
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	2
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected on 3/12/2001 at Reidy Creek near Mountain Meadow Mushroom Farm at two locations; one upstream and one downstream. Samples in exceedance: 2 of 2 (SDRWQCB, 2001).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	From the Basin Plan, the WQO for Total Phosphorus for inland surface waters-streams and other flowing waters is 0.1 mg/L. This appears to be desired goal in order to prevent plant nuisance in streams and other flowing waters; not to be exceeded more than 10% of the time.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Reidy Creek near Mountain Meadow Mushroom Farm at one upstream location and one downstream location.
Temporal Representation:	One sample was taken at each location on one day, 3/12/2001.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

DECISION ID 32605 Region 9

Reidy Canyon Creek

Pollutant:	**Nitrogen**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1, one line(s) of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. One of two of the samples exceed the Basin Plan water quality objective for total nitrogen.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of two of the samples exceed the Basin Plan water quality objective for total nitrogen and this sample size is insufficient to determine with the power and confidence of the Listing Policy. A minimum of 16 samples is needed to determine if beneficial uses are fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 32605, Nitrogen Region 9

Reidy Canyon Creek

LOE ID:	3212
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water

Matrix:	Water	037832
Fraction:	Total	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	2	
Number of Exceedances:	1	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data was collected at Reidy Creek near Mountain Meadow Mushroom Farm on 3/12/2001. Two samples were collected; one upstream and one downstream. In 1 of 2 samples, the N:P ratio exceeds 10:1. The exceedance occurs in the upstream sample. Both phosphorus samples are in exceedance. (SDRWQCB, 2001).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan, Narrative Objective for Biostimulatory Substances: Inland surface waters, bays and estuaries, and coastal lagoon waters shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. Concentrations of nitrogen and phosphorus, by themselves or in combination with other nutrients, shall be maintained at levels below those which stimulate algae and emergent plant growth. Narrative Objective for Nitrogen: Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data was collected in Reidy Creek near the Mountain Meadow Mushroom Farm at one upstream and one downstream location.	
Temporal Representation:	Data was collected on 3/12/2001.	
Environmental Conditions:		
QAPP Information:	QA Info Missing	
QAPP Information Reference(s):		

DECISION ID	32624	Region 9
Reidy Canyon Creek		

Pollutant:	**Turbidity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2, one line(s) of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Two of two of the samples exceed the Basin Plan water quality objective for turbidity. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list

in the Water Quality Limited Segments category. 037833

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Two of two of the samples exceed the Basin Plan water quality objective for turbidity, and this sample size is insufficient to determine with the power and confidence of the Listing Policy if standards are not met. A minimum of five samples is needed for application of table 3.2.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32624, Turbidity **Region 9**

Reidy Canyon Creek

LOE ID:	3215
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	2
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was obtained from samples collected on 3/12/2001 in Reidy Creek near the Mountain Meadow Mushroom Farm. One upstream sample and one downstream sample were collected. For the MUN beneficial use, 2 of 2 samples are in exceedance (SDRWQCB, 2001).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, the Turbidity WQO for inland surface water with Municipal (MUN) Beneficial Uses is 5 units. The Turbidity WQO for inland surface waters with all other beneficial uses is 20 NTU. Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Two samples, one upstream and one downstream, were collected at Reidy Creek near the Mountain Meadow Mushroom Farm.
Temporal Representation:	Samples were collected once on 3/12/2001.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Escondido Creek
Water Body ID: CAR9046200020011005134542
Water Body Type: River & Stream

DECISION ID 42668 **Region 9**
Escondido Creek

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not Delist from 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Sources: Source Unknown
Expected TMDL Completion Date: 2019
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for removal from the section 303(d) list under section 4.2 of the Listing Policy. Under section 4.2 a single line of evidence is necessary to assess listing status.

Five lines of evidence are available in the administrative record to assess this pollutant. Thirty-two of the 33 samples exceed the Single Sample Maximum Objective for Enterococcus, 26 out of 33 samples exceeded the Single Sample Maximum Objective for Fecal Coliform, and Five out of 18 sampels exceeded the Single Sample Maximum Guideline for Total Coliform.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Thirty-two of the 33 samples exceed the Single Sample Maximum Objective for Enterococcus, 26 out of 33 samples exceeded the Single Sample Maximum Objective for Fecal Coliform, and Five out of 18 samples exceeded the Single Sample Maximum Guideline for Total Coliform and this exceeds the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 42668, Indicator Bacteria **Region 9**
Escondido Creek

LOE ID: 73593

Pollutant: Fecal Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water

Fraction:	None	037835
Beneficial Use:	Water Contact Recreation	
Number of Samples:	18	
Number of Exceedances:	11	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Escondido Creek to determine beneficial use support and results are as follows: 11 of 18 samples exceed the criterion for Coliform, Fecal.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the fecal coliform concentration shall not exceed 400 MPN/100 ml.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 2 monitoring sites [Escondido Creek @ El Camino Del Norte, Escondido Creek @ East County Club Drive]	
Temporal Representation:	Data was collected over the time period 6/10/2003-6/18/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 42668, Indicator Bacteria **Region 9**

Escondido Creek

LOE ID:	7364
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	15
Number of Exceedances:	15
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	All fifteen samples collected exceed the water quality objective according to results in the San Diego County Municipal Copermittees Annual Monitoring Report, 2007. Samples were collected one to three times a year from 2001 - 2006.
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, the limit for enterococcus sets a maximum at 61 colonies per 100mL (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at the mass loading station located near the lower boundary of the watershed under the Camino Del Norte Bridge east of Rancho Santa Fe Road along a natural channel in Encinitas.
Temporal Representation:	Samples were collected one to three times a year from 2001 - 2006.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the City of San Diego's quality assurance program.
QAPP Information Reference(s):	Water Quality Laboratory. Quality Assurance Manual

Line of Evidence (LOE) for Decision ID 42668, Indicator Bacteria **Region 9**

Escondido Creek

LOE ID:	7365
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	15
Number of Exceedances:	15
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	All fifteen samples collected exceed the water quality objective according to results in the San Diego County Municipal Copermittees Annual Monitoring Report, 2007. Samples were collected one to three times a year from 2001 - 2006.
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, no more than 10% of the samples during any 30-day period for waters designated for contact recreation shall exceed 400 colonies per 100 ml (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at the mass loading station located near the lower boundary of the watershed under the Camino Del Norte Bridge east of Rancho Santa Fe Road along a natural channel in Encinitas.
Temporal Representation:	Samples were collected one to three times a year from 2001 - 2006.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the City of San Diego's quality assurance program.
QAPP Information Reference(s):	Water Quality Laboratory. Quality Assurance Manual

Line of Evidence (LOE) for Decision ID 42668, Indicator Bacteria **Region 9**

Escondido Creek

LOE ID:	73589
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	18

Number of Exceedances:	17	037837

Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Escondido Creek to determine beneficial use support and results are as follows: 17 of 18 samples exceed the criterion for Enterococci.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Samples shall not exceed 61 organisms per 100 ml for enterococcus in waters designated for REC I beneficial use (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 2 monitoring sites [Escondido Creek @ El Camino Del Norte, Escondido Creek @ East County Club Drive]
Temporal Representation:	Data was collected over the time period 6/10/2003-6/18/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 42668, Indicator Bacteria **Region 9**

Escondido Creek

LOE ID:	73552
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	18
Number of Exceedances:	5
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Escondido Creek to determine beneficial use support and results are as follows: 5 of 18 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxicsubstances in concentrations which are toxic to,or which produce detrimental physiologicalresponses in human, plant, animal, or indigenousaquatic life (Basin Plan).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In waters designated for water contact recreation (REC I), the total coliform concentration shall not exceed 10000 MPN/100 ml (CDPH 2006).
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 2 monitoring sites [

	Escondido Creek @ El Camino Del Norte, Escondido Creek @ East Country Club Drive] 037338
Temporal Representation:	Data was collected over the time period 6/10/2003-6/18/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 44424 Region 9

Escondido Creek

Pollutant:	**Selenium**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Seven lines of evidence are available in the administrative record to assess this pollutant. Eight out of the thirty-six samples exceeded water quality objective for Selenium. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Eight of 36 samples exceeded the CTR freshwater criterion and this exceeds the allowable frequency listed in Table 3.1 on the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 44424, Selenium Region 9

Escondido Creek

LOE ID:	73522
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	037839
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Selenium.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	The selenium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater is 0.005 mg/L (California Toxics Rule, 2000).	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]	
Temporal Representation:	Data was collected on a single day 5/4/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 44424, Selenium **Region 9**

Escondido Creek

LOE ID:	73660
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Selenium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The Maximum Contaminant Level for selenium in the Basin Plan is 0.05 mg/L.
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]
Temporal Representation:	Data was collected on a single day 5/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 44424, Selenium **Region 9**

Escondido Creek

LOE ID:	81141

Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	7
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed data available from CEDEN for Escondido Creek from the SWAMP Program (RWB9 Rotational Monitoring 2002).
Data Reference:	Selenium data from SWAMP RWB9 Monitoring for placeholder LOE # 3231 downloaded from CEDEN 6/2/2016
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The selenium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater is 0.005 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA Surface Water Ambient Monitoring Program Quality Assurance Program Plan
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 2 monitoring sites [904CBESC5 and 904CBESC8].
Temporal Representation:	Data was collected over the time period 3/13/2002 - 9/18/2002.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	At this time, the SWAMP Quality Assurance Management Plan v.1 12/22/02 was being developed and addresses SWAMP samples collected prior to its publication date.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44424, Selenium **Region 9**

Escondido Creek

LOE ID:	81147
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed data available from CEDEN for Escondido Creek from the SWAMP Program (RWB9 Rotational Monitoring 2002).
Data Reference:	Selenium data from SWAMP RWB9 Monitoring for placeholder LOE # 3231 downloaded from CEDEN 6/2/2016
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The Maximum Contaminant Level for selenium in the Basin Plan is 0.05 mg/L.
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR

Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 2 monitoring sites [904CBESC5 and 904CBESC8].
Temporal Representation:	Data was collected over the time period 3/13/2002 - 9/18/2002.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	At this time, the SWAMP Quality Assurance Management Plan v.1 12/22/02 was being developed and addresses SWAMP samples collected prior to its publication date.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 44424, Selenium **Region 9**

Escondido Creek

LOE ID:	3231
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	12
Number of Exceedances:	8
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Twelve water samples, eight samples exceeding (SWAMP, 2004).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	CTR Freshwater Chronic (CCC) 5 mg/l.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Two stations at Escondido Creek ESC5, HBA 904.62 (33.08559 -117.15037) and ESC8, HBA 904.61 (33.03393 -117.23565).
Temporal Representation:	Twelve samples collected from March through September of 2002.
Environmental Conditions:	Escondido Creek Watershed; Escondido Creek 904.61 and 904.62
QAPP Information:	SWAMP Quality Assurance Plan.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44424, Selenium **Region 9**

Escondido Creek

LOE ID:	77730
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	27

Number of Exceedances:	0	037842
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 27 samples exceed the criterion for Selenium.	
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for selenium is 0.05 mg/L (Title 22 of the California Code of Regulations).	
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 2 monitoring sites [Escondido Creek - 904ESC-MLS, Escondido Creek - 904ESC-TWAS-1]	
Temporal Representation:	Data was collected over the time period 11/29/2001-11/4/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.	

Line of Evidence (LOE) for Decision ID 44424, Selenium **Region 9**

Escondido Creek

LOE ID:	77731
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	27
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 27 samples exceed the criterion for Selenium.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The selenium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater is 0.005 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 2 monitoring sites [

	Escondido Creek - 904ESC-MLS, Escondido Creek - 904ESC-TWAS-1] 037843
Temporal Representation:	Data was collected over the time period 11/29/2001-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 44424, Selenium **Region 9**

Escondido Creek

LOE ID:	3230
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 1998. One sample was collected, it was not in exceedance (SWAMP, 2004).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for selenium is 0.05 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Escondido Creek at the intersection of Elfin Forest and Harmony Grove.
Temporal Representation:	Samples were collected on 06/03/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44424, Selenium **Region 9**

Escondido Creek

LOE ID:	6246
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	18
Number of Exceedances:	0

Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only) 037844
Data Used to Assess Water Quality:	None of the 18 samples exceeded the water quality objective. Samples were collected by the City of Escondido for monitoring of Escondido Creek. Samples were collected quarterly in 2003 through 2005.
Data Reference:	City of Escondido. 2007. Baseline quarterly monitoring report for Calendar Years 1998-2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, the selenium water quality objective is 0.05 mg/L (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at 5 monitoring stations within Escondido Creek. Sample stations locations were Station 910, 912, 916, 917, and 923. Stations 912 and 916 were grouped as one station due to close proximity.
Temporal Representation:	Samples were collected quarterly in 2003 through 2005
Environmental Conditions:	Samples were collected during dry weather.
QAPP Information:	Samples were collected and analyzed in compliance with the City of Escondido's Quality Assurance Program 2009.
QAPP Information Reference(s):	City of Escondido, 2009. Quality Assurance Program, City of Escondido Water Quality Lab. Janurary 2009

DECISION ID	**34087**	**Region 9**
Escondido Creek		

Pollutant:	**Sulfates**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the section 303(d) list under section 4.2 of the Listing Policy. Under section 4.2 a single line of evidence is necessary to assess listing status. Four lines of evidence are available in the administrative record to assess this pollutant. Nine of ten samples exceed the water quality objective for sulfate. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Nine of ten samples exceed the drinking water secondary MCL for sulfate and this exceeds the allowable frequency listed in Table 4.2 of the Listing Policy. 4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 34087, Sulfates 037845 Region 9

Escondido Creek

LOE ID:	3243
Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	5
Number of Exceedances:	4
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by DWR from 1998 to 2000. Four of 5 samples were in exceedance (S.D. Department of Water Resources, 2000).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for sulfate is 250 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Escondido Creek near Harmony Grove.
Temporal Representation:	Samples were collected once each in May and November each year from 05/1998 to 05/2000.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 34087, Sulfates Region 9

Escondido Creek

LOE ID:	73541
Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Sulfate.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses.

Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	037846
Evaluation Guideline:	The California Secondary MCL for sulfate is 250 mg/L (Title 22 California Code of Regulations).	
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.	
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]	
Temporal Representation:	Data was collected on a single day 5/4/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 34087, Sulfates **Region 9**

Escondido Creek

LOE ID:	3244
Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Four water samples, four samples exceeding (SWAMP, 2004).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The recommended secondary drinking water standard for sulfate is 250 mg/l with an upper limit of 500 (Basin Plan).
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	One station at Escondido Creek: 33.03393 -117.23565.
Temporal Representation:	Four samples were collected from March through September of 2002.
Environmental Conditions:	Escondido Creek Watershed; Escondido Creek 904.61.
QAPP Information:	SWAMP Quality Assurance Plan.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 34087, Sulfates **Region 9**

Escondido Creek

LOE ID:	73543
Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Sulfate.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Sulfate objective for the protection of aquatic life according to Table 3-2 for Escondido Creek within the Carlsbad Hydrologic Unit is 250 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]
Temporal Representation:	Data was collected on a single day 5/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 34087, Sulfates **Region 9**

Escondido Creek

LOE ID:	73542
Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Sulfate.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Sulfate objective for the protection of aquatic life according to Table 3-2 for Escondido Creek within the Carlsbad Hydrologic Unit is 250 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]
Temporal Representation:	Data was collected on a single day 5/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **42803** **Region 9**

Escondido Creek

Pollutant:	**Toxicity**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the section 303(d) list under section 3.6 of the Listing Policy. Under section 3.6 a single line of evidence is necessary to assess listing status.

Six lines of evidence are available in the administrative record to assess this pollutant. Ten of the 51 samples exceed the water quality objective for toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Ten of 51 samples exceed the toxicity water quality objective and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 42803, Toxicity **Region 9**

Escondido Creek

LOE ID:	73567
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate water toxicity. The sample did not exhibit significant toxicity. The toxicity test included survival and growth of Ceriodaphnia dubia. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009

SWAMP Data:	SWAMP	037849
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL, Significant compared to negative control based on statistical test, less than stated alpha level, AND less than the evaluation threshold (both criteria are met).	
Guideline Reference:		
Spatial Representation:	The sample was collected at station 904S00537.	
Temporal Representation:	The sample was collected in May 2009.	
Environmental Conditions:		
QAPP Information:	Data quality is good. Data results were recorded in the SWAMP database and followed SWAMP protocols.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 42803, Toxicity **Region 9**

Escondido Creek

LOE ID:	7486
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	15
Number of Exceedances:	2
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Selenastrum: None of the 15 samples were found to exhibit toxicity. Hyalella azteca: None of the 15 samples were found to exhibit toxicity. Ceriodaphnia dubia- Two of fifteen samples were found to be toxic as determined by the Ceriodaphnia dubia survival/reproductive test according to results in the San Diego County Municipal Copermittees Annual Progress Report, 2007. The samples were collected from November 2001 through March 2006.
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic lifE.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Samples were found to exhibit toxicity when the No Observed Effect Concentration (NOEC) or median lethal concentration (LC50) for any given species was estimated to be less than 100% of the test sample concentration (San Diego Water Board, 2007).
Guideline Reference:	Waste Discharge Requirements for Discharges of Urban Runoff From the Municipal Separate Storm Sewer Systems Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego, the San Diego Unified Port District, and the San Diego County Regional Airport. Order No. R9-2007-0001

Spatial Representation:	Samples were collected at the mass loading station in Escondido Creek east of Rancho Santa Fe rd and under the Camino del Norte bridge.
Temporal Representation:	The samples were collected from November 2001 through March 2006.
Environmental Conditions:	
QAPP Information:	Quality control for project was conducted under Weston's quality control plan.
QAPP Information Reference(s):	Weston Solutions, 2004. Quality Management Manual. March 2004 (Revised December 2009).

Line of Evidence (LOE) for Decision ID 42803, Toxicity **Region 9**

Escondido Creek

LOE ID:	73568
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate sediment toxicity. The sample exhibited significant toxicity. The toxicity test included survival and growth of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL, Significant compared to negative control based on statistical test, less than stated alpha level, AND less than the evaluation threshold (both criteria are met).
Guideline Reference:	
Spatial Representation:	The sample was collected at station 904ESCOxx.
Temporal Representation:	The sample was collected in May 2008.
Environmental Conditions:	
QAPP Information:	Data quality is good. Data results were recorded in the SWAMP database and followed SWAMP protocols.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 42803, Toxicity **Region 9**

Escondido Creek

LOE ID:	25804
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None

Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	1
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	A total of eight samples were analyzed for toxicity. Four samples each were collected at Escondido Creek 5 and Escondido Creek 8. Selenastrum capricornutum- None of the eight samples exhibited toxicity by the Selenastrum capricornutum growth test. Ceriodaphnia dubia- One out of the eight samples collected exhibited toxicity to the Ceriodaphnia dubia survival/reproductive test. Samples were collected as part of California's Surface Water Ambient Monitoring Program. The samples were collected in March, April, June and May of 2002.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. Samples were found to exhibit toxicity when the No Observed Effect Concentration (NOEC) or median lethal concentration (LC50) for any given species was estimated to be less than 100% of the test sample concentration (San Diego Water Board, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Samples were found to exhibit toxicity when the No Observed Effect Concentration (NOEC) or median lethal concentration (LC50) for any given species was estimated to be less than 100% of the test sample concentration.
Guideline Reference:	Waste Discharge Requirements for Discharges of Urban Runoff From the Municipal Separate Storm Sewer Systems Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego, the San Diego Unified Port District, and the San Diego County Regional Airport. Order No. R9-2007-0001
Spatial Representation:	Samples were collected at the monitoring station Escondido Creek 5 (904CBESC5 latitude; 33.0865, longitude -117.14507) and 904CBESC8, latitude: 33.03492, longitude -117.23632 located on the main stem of Escondido Creek.
Temporal Representation:	The samples were collected in March, April, June, and September 2002.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 42803, Toxicity **Region 9**

Escondido Creek

LOE ID:	26480
Pollutant:	Sediment Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8

Number of Exceedances:	3	037852
Data and Information Type:	Ambient toxicity testing (chronic)	
Data Used to Assess Water Quality:	A total of eight samples were analyzed for toxicity. Four samples each were collected at Escondido Creek 5 and Escondido Creek 8. Hyalella azteca- Three of the eight samples exhibited sediment toxicity. Samples were collected in March, April, June and May of 2002 as part of California's Surface Water Ambient Monitoring Program.	
Data Reference:	Monitoring data for Region 9	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. Samples were found to exhibit toxicity when the No Observed Effect Concentration (NOEC) or median lethal concentration (LC50) for any given species was estimated to be less than 100% of the test sample concentration (San Diego Water Board, 2007).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	Samples were found to exhibit toxicity when the No Observed Effect Concentration (NOEC) or median lethal concentration (LC50) for any given species was estimated to be less than 100% of the test sample concentration.	
Guideline Reference:	Waste Discharge Requirements for Discharges of Urban Runoff From the Municipal Separate Storm Sewer Systems Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego, the San Diego Unified Port District, and the San Diego County Regional Airport. Order No. R9-2007-0001	
Spatial Representation:	Samples were collected at the monitoring station Escondido Creek 5 (904CBESC5 latitude; 33.0865, longitude -117.14507) and 904CBESC8, latitude: 33.03492, longitude -117.23632 located on the main stem of Escondido Creek.	
Temporal Representation:	The samples were collected in March, April, June, and September 2002.	
Environmental Conditions:		
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.	
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA	

Line of Evidence (LOE) for Decision ID 42803, Toxicity **Region 9**

Escondido Creek

LOE ID:	73566
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	27
Number of Exceedances:	7
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Twenty-seven samples were collected to test for toxicity. Seven of the 27 samples exhibited statistically significant toxicity. The toxicity tests that exhibited significant toxicity included survival of Hyalella azteca, growth of Selenastrum capriconutum and survival and reproduction of Ceriodaphnia dubia.

Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected at stations 904EC-MLS and 904EC-TWAS-1 Escondido Creek.
Temporal Representation:	The samples were collected from 2001 to 2008.
Environmental Conditions:	
QAPP Information:	The data was collected under the County of San Diego Co-Permittees Receiving Waters Urban Runoff Monitoring and Reporting Program (Order No. 2007-01). Data quality is good.
QAPP Information Reference(s):	e-mail clarifying QAPP information

037853

DECISION ID 47719 Region 9

Escondido Creek

Pollutant:	**Alkalinity as CaCO3**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a Single line of evidence is necessary to assess listing status. Zero lines of evidence are available in the administrative record to assess this pollutant. One of the One samples exceed the Water Quality Criteria for Alkalinity, Carbonate as CaCO3. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Water Quality Criteria for Alkalinity, Carbonate as CaCO3 and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47719, Alkalinity as CaCO3 Region 9

Escondido Creek 037854

LOE ID:	73607
Pollutant:	Alkalinity as CaCO3
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Alkalinity as CaCO3.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Alkalinity as CaCO3 criteria for the protection of freshwater aquatic life is 20000 ug/L (National Recommended Water Quality Criteria, 2009).
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]
Temporal Representation:	Data was collected on a single day 5/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47719, Alkalinity as CaCO3 **Region 9**

Escondido Creek

LOE ID:	73606
Pollutant:	Alkalinity as CaCO3
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Alkalinity as CaCO3.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP

Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Alkalinity as CaCO3 criteria for the protection of freshwater aquatic life is 20000 ug/L (National Recommended Water Quality Criteria, 2009).
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]
Temporal Representation:	Data was collected on a single day 5/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 47721 Region 9

Escondido Creek

Pollutant:	**Aluminum**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a Single line of evidence is necessary to assess listing status. Three lines of evidence are available in the administrative record to assess this pollutant. One of the One samples exceed the Water Quality Criteria for Aluminum. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of One samples exceeded the Water Quality Criteria for Aluminum and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47721, Aluminum Region 9

Escondido Creek

LOE ID:	73614
Pollutant:	Aluminum

LOE Subgroup:	Pollutant-Water	037856
Matrix:	Water	
Fraction:	Dissolved	
Beneficial Use:	Cold Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	1	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Aluminum.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The National Recommended Water Quality Critiera for the protection of aquatic life from aluminum is the chronic continuous concentration (expressed as a 4-day average) of 87 ug/L.	
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology	
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]	
Temporal Representation:	Data was collected on a single day 5/4/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 47721, Aluminum **Region 9**

Escondido Creek

LOE ID:	73613
Pollutant:	Aluminum
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Aluminum.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The National Recommended Water Quality Critiera for the protection of aquatic life from

	aluminum is the chronic continuous concentration (expressed as a 4-day average) of 87 ug/L.
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]
Temporal Representation:	Data was collected on a single day 5/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47721, Aluminum **Region 9**

Escondido Creek

LOE ID:	73612
Pollutant:	Aluminum
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Aluminum.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for aluminum is 0.2 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]
Temporal Representation:	Data was collected on a single day 5/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **43690** **Region 9**

Escondido Creek

Pollutant:	**Antimony**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 28 samples exceed the OBJECTIVE. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 28 samples exceeded the OBJECTIVE for Antimony and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 43690, Antimony **Region 9**

Escondido Creek

LOE ID:	3222
Pollutant:	Antimony
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 1998. One sample was collected and it was not in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municpal beneficial use, the WQO for antimony is 0.006 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Escondido Creek at the intersection of Elfin Forest and Harmony Grove.
Temporal Representation:	Samples were collected on 06/03/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43690, Antimony **Region 9**

Escondido Creek

LOE ID:	78021
Pollutant:	Antimony
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	27
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 27 samples exceed the criterion for Antimony.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for antimony is .006 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 2 monitoring sites [Escondido Creek - 904ESC-MLS, Escondido Creek - 904ESC-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/29/2001-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID **33881** **Region 9**

Escondido Creek

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. 6 lines of evidence are available in the administrative record to assess this pollutant. One of the 29 samples exceed the Basin Plan Objective for Arsenic. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that: 037860
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of 29 samples exceeded the Basin Plan Objective and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 33881, Arsenic **Region 9**

Escondido Creek

LOE ID:	73638
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for arsenic is 0.01 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]
Temporal Representation:	Data was collected on a single day 5/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 33881, Arsenic **Region 9**

Escondido Creek

LOE ID:	73637
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	1	037861
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	The dissolved arsenic criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved arsenic is 0.150 mg/L (California Toxics Rule, 2000).	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]	
Temporal Representation:	Data was collected on a single day 5/4/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 33881, Arsenic **Region 9**

Escondido Creek

LOE ID:	73636
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for arsenic is 33 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek at Camino del Norte - 904ESCOxx]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.

QAPP Information:	SWAMP data collected before September 2008 followed the 2002 QAMP.037862
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 33881, Arsenic **Region 9**

Escondido Creek

LOE ID:	78023
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	27
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 27 samples exceed the criterion for Arsenic.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The dissolved arsenic criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved arsenic is 0.150 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 2 monitoring sites [Escondido Creek - 904ESC-MLS, Escondido Creek - 904ESC-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/29/2001-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 33881, Arsenic **Region 9**

Escondido Creek

LOE ID:	78022
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	27	037863
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 27 samples exceed the criterion for Arsenic.	
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for arsenic is 0.01 mg/L (Title 22 of the California Code of Regulations).	
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 2 monitoring sites [Escondido Creek - 904ESC-MLS, Escondido Creek - 904ESC-TWAS-1]	
Temporal Representation:	Data was collected over the time period 11/29/2001-11/4/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.	

Line of Evidence (LOE) for Decision ID 33881, Arsenic **Region 9**

Escondido Creek

LOE ID:	73639
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The dissolved arsenic criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved arsenic is 0.150 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [

	Escondido Creek above El Camino Del Norte - 904S00537]	037864
Temporal Representation:	Data was collected on a single day 5/4/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 33881, Arsenic **Region 9**

Escondido Creek

LOE ID:	73625
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for arsenic is 33 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]
Temporal Representation:	Data was collected on a single day 5/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 33881, Arsenic **Region 9**

Escondido Creek

LOE ID:	73626
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for arsenic is 33 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]
Temporal Representation:	Data was collected on a single day 5/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 33881, Arsenic **Region 9**

Escondido Creek

LOE ID:	3223
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 1998. One sample was collected and was in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for Arsenic is 0.05 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Escondido Creek at the intersection of Elfin Forest and Harmony Grove.
Temporal Representation:	One sample was collected on 06/03/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33942** **Region 9**

Escondido Creek 037866

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary and under section 3.6 at least two lines of evidence are necessary to assess listing status. Eleven lines of evidence are available in the administrative record to assess this pollutant. Zero of the 38 samples exceed the California Toxics Rule Objective for Cadmium. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 38 samples exceeded the California Toxics Rule Objective for Cadmium and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 33942, Cadmium — Region 9

Escondido Creek

LOE ID:	73529
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	25
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 25 samples exceed the criterion for Cadmium.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Cadmium to protect aquatic life in freshwater. The dissolved Cadmium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula

	for the metals criterion. 037867
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 2 monitoring sites [Escondido Creek - 904ESC-MLS, Escondido Creek - 904ESC-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/29/2001-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 33942, Cadmium **Region 9**

Escondido Creek

LOE ID:	73538
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 12 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for cadmium is 0.005 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 2 monitoring sites [Escondido Creek @ East County Club Drive, Escondido Creek @ El Camino Del Norte]
Temporal Representation:	Data was collected over the time period 6/10/2003-7/18/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 33942, Cadmium **Region 9**

Escondido Creek

LOE ID:	73521	037868

Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for cadmium is 4.98 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek at Camino del Norte - 904ESCOxx]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the 2002 QAMP.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 33942, Cadmium **Region 9**

Escondido Creek

LOE ID:	73520
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce

	detrimental physiological responses in, human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for cadmium is 4.98 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]
Temporal Representation:	Data was collected on a single day 5/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 33942, Cadmium **Region 9**

Escondido Creek

LOE ID:	3225
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 1998. One sample was collected, it was not in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for Cadmium is 0.005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Escondido Creek at the intersection of Elfin Forest and Harmony Grove.
Temporal Representation:	One sample was collected on 06/03/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33942, Cadmium **Region 9**

Escondido Creek

LOE ID:	73536
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total

Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for cadmium is 0.005 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]
Temporal Representation:	Data was collected on a single day 5/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 33942, Cadmium **Region 9**

Escondido Creek

LOE ID:	78019
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	27
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Escondido Creek to determine beneficial use support and results are as follows: 1 of 27 samples exceed the criterion for Cadmium.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for cadmium is 0.005 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 2 monitoring sites [Escondido Creek - 904ESC-MLS, Escondido Creek - 904ESC-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/29/2001-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.

QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 33942, Cadmium **Region 9**

Escondido Creek

LOE ID:	73535
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Cadmium to protect aquatic life in freshwater. The dissolved Cadmium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]
Temporal Representation:	Data was collected on a single day 5/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 33942, Cadmium **Region 9**

Escondido Creek

LOE ID:	73539
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	12
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 14 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California, 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 2 monitoring sites [Escondido Creek @ East County Club Drive, Escondido Creek @ El Camino Del Norte]
Temporal Representation:	Data was collected over the time period 6/10/2003-7/18/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID	**47726**	**Region 9**
Escondido Creek		

Pollutant:	**Chlordane**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Chlordane. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Evaluation Guideline for Chlordane and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision	After review of the available data and information, RWQCB staff concludes that the water body-

Recommendation: pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47726, Chlordane **Region 9**

Escondido Creek

LOE ID:	72830
Pollutant:	Chlordane
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	0 of 1 samples collected exceeded the criteria for chlordane concentration (Sum of trans-Chlordane, cis-Chlordane, cis-Nonachlor, trans-Nonachlor, and Oxychlordane).
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Waters shall not contain substances in concentrations that result in the deposition of material that causes nuisance or adversely affects beneficial uses. (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Probable Effect Concentration for Chlordane in freshwater sediments is 17.6 ug/kg(MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data were collected at the following station 904ESCOxx (Escondido Creek at Camino del Norte).
Temporal Representation:	The samples were collected on 5/21/2008.
Environmental Conditions:	
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47726, Chlordane **Region 9**

Escondido Creek

LOE ID:	73567
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0

Data and Information Type:	TOXICITY TESTING 037874
Data Used to Assess Water Quality:	One sample was collected to evaluate water toxicity. The sample did not exhibit significant toxicity. The toxicity test included survival and growth of Ceriodaphnia dubia. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL, Significant compared to negative control based on statistical test, less than stated alpha level, AND less than the evaluation threshold (both criteria are met).
Guideline Reference:	
Spatial Representation:	The sample was collected at station 904S00537.
Temporal Representation:	The sample was collected in May 2009.
Environmental Conditions:	
QAPP Information:	Data quality is good. Data results were recorded in the SWAMP database and followed SWAMP protocols.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 47726, Chlordane **Region 9**

Escondido Creek

LOE ID:	7486
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	15
Number of Exceedances:	2
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Selenastrum: None of the 15 samples were found to exhibit toxicity. Hyalella azteca: None of the 15 samples were found to exhibit toxicity. Ceriodaphnia dubia- Two of fifteen samples were found to be toxic as determined by the Ceriodaphnia dubia survival/reproductive test according to results in the San Diego County Municipal Copermittees Annual Progress Report, 2007. The samples were collected from November 2001 through March 2006.
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic lifE.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	Samples were found to exhibit toxicity when the No Observed Effect Concentration (NOEC) or median lethal concentration (LC50) for any given species was estimated to be less than 100% of the test sample concentration (San Diego Water Board, 2007).
Guideline Reference:	Waste Discharge Requirements for Discharges of Urban Runoff From the Municipal Separate Storm Sewer Systems Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego, the San Diego Unified Port District, and the San Diego County Regional Airport. Order No. R9-2007-0001
Spatial Representation:	Samples were collected at the mass loading station in Escondido Creek east of Rancho Santa Fe rd and under the Camino del Norte bridge.
Temporal Representation:	The samples were collected from November 2001 through March 2006.
Environmental Conditions:	
QAPP Information:	Quality control for project was conducted under Weston's quality control plan.
QAPP Information Reference(s):	Weston Solutions, 2004. Quality Management Manual. March 2004 (Revised December 2009).

Line of Evidence (LOE) for Decision ID 47726, Chlordane **Region 9**

Escondido Creek

LOE ID:	73566
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	27
Number of Exceedances:	7
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Twenty-seven samples were collected to test for toxicity. Seven of the 27 samples exhibited statistically significant toxicity. The toxicity tests that exhibited significant toxicity included survival of Hyalella azteca, growth of Selenastrum capriconutum and survival and reproduction of Ceriodaphnia dubia.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected at stations 904EC-MLS and 904EC-TWAS-1 Escondido Creek.
Temporal Representation:	The samples were collected from 2001 to 2008.
Environmental Conditions:	
QAPP Information:	The data was collected under the County of San Diego Co-Permittees Receiving Waters Urban Runoff Monitoring and Reporting Program (Order No. 2007-01). Data quality is good.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 47726, Chlordane **Region 9**

Escondido Creek

LOE ID:	25804	037876
Pollutant:	Toxicity	
LOE Subgroup:	Toxicity	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	8	
Number of Exceedances:	1	
Data and Information Type:	Ambient toxicity testing (chronic)	
Data Used to Assess Water Quality:	A total of eight samples were analyzed for toxicity. Four samples each were collected at Escondido Creek 5 and Escondido Creek 8. Selenastrum capricornutum- None of the eight samples exhibited toxicity by the Selenastrum capricornutum growth test. Ceriodaphnia dubia- One out of the eight samples collected exhibited toxicity to the Ceriodaphnia dubia survival/reproductive test. Samples were collected as part of California's Surface Water Ambient Monitoring Program. The samples were collected in March, April, June and May of 2002.	
Data Reference:	Monitoring data for Region 9	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. Samples were found to exhibit toxicity when the No Observed Effect Concentration (NOEC) or median lethal concentration (LC50) for any given species was estimated to be less than 100% of the test sample concentration (San Diego Water Board, 2007).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	Samples were found to exhibit toxicity when the No Observed Effect Concentration (NOEC) or median lethal concentration (LC50) for any given species was estimated to be less than 100% of the test sample concentration.	
Guideline Reference:	Waste Discharge Requirements for Discharges of Urban Runoff From the Municipal Separate Storm Sewer Systems Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego, the San Diego Unified Port District, and the San Diego County Regional Airport. Order No. R9-2007-0001	
Spatial Representation:	Samples were collected at the monitoring station Escondido Creek 5 (904CBESC5 latitude; 33.0865, longitude -117.14507) and 904CBESC8, latitude: 33.03492, longitude -117.23632 located on the main stem of Escondido Creek.	
Temporal Representation:	The samples were collected in March, April, June, and September 2002.	
Environmental Conditions:		
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.	
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA	

DECISION ID	**47727**	**Region 9**
Escondido Creek		

Pollutant:	**Chloride**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final	New Decision

Listing Decision:		037877
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a Single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. One of the One samples exceed the Basin Plan Objective for Chloride.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of One samples exceeded the Basin Plan Objective for Chloride and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47727, Chloride **Region 9**

Escondido Creek

LOE ID:	73530
Pollutant:	Chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Chloride.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Chloride objective for the protection of aquatic life according to Table 3-2 for Escondido Creek within the Carlsbad Hydrologic Unit is 250 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]
Temporal Representation:	Data was collected on a single day 5/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47727, Chloride **Region 9**

Escondido Creek

LOE ID:	73532
Pollutant:	Chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Chloride.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The recommended secondary maximum contamination level acceptable to consumers of drinking water is 250 mg/L.
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]
Temporal Representation:	Data was collected on a single day 5/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47727, Chloride **Region 9**

Escondido Creek

LOE ID:	73533
Pollutant:	Chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Chloride.

Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	037879
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Chloride objective for the protection of aquatic life according to Table 3-2 for Escondido Creek within the Carlsbad Hydrologic Unit is 250 mg/L.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]	
Temporal Representation:	Data was collected on a single day 5/4/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID 47729 Region 9

Escondido Creek

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Four lines of evidence are available in the administrative record to assess this pollutant. Zero of the 20 samples exceed the Water Quality Criteria for Chlorpyrifos. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 20 samples exceeded the Basin Plan Objective for Chlorpyrifos and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 47729, Chlorpyrifos Region 9

Escondido Creek

LOE ID:	77734
Pollutant:	Chlorpyrifos

LOE Subgroup:	Pollutant-Water	037880
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	27	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 27 samples exceed the criterion for Chlorpyrifos.	
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The USEPA drinking water health advisory for chlorpyrifos is 2.0 Âµg/L.	
Guideline Reference:	2011 Edition of the Drinking Water Standards and Health Advisories 2012 Edition of the Drinking Water Standards and Health Advisories	
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 2 monitoring sites [Escondido Creek - 904ESC-MLS, Escondido Creek - 904ESC-TWAS-1]	
Temporal Representation:	Data was collected over the time period 11/29/2001-11/4/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.	

Line of Evidence (LOE) for Decision ID 47729, Chlorpyrifos **Region 9**

Escondido Creek

LOE ID:	77733
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 8 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.

SWAMP Data:	Non-SWAMP	037881
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The USEPA drinking water health advisory for chlorpyrifos is 2.1 Âµg/L.	
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013	
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 2 monitoring sites [Escondido Creek @ El Camino Del Norte, Escondido Creek @ East County Club Drive]	
Temporal Representation:	Data was collected over the time period 6/20/2006-6/18/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 47729, Chlorpyrifos **Region 9**

Escondido Creek

LOE ID:	77732
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	20
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Escondido Creek to determine beneficial use support and results are as follows: 1 of 20 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 2 monitoring sites [Escondido Creek - 904ESC-MLS, Escondido Creek - 904ESC-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/29/2001-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup

QAPP Information Reference(s):	Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed. Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 47729, Chlorpyrifos **Region 9**

Escondido Creek

LOE ID:	73534
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for chlorpyrifos is the median lethal concentration (LC50) of 1.77 ug/g and is normalized by the percentage of organic carbon in the sediment sample (Amweg and Weston, 2007).
Guideline Reference:	Whole-sediment toxicity identification evaluation tools for pyrethroid insecticides: I. piperonyl butoxide addition. Environ. Toxicol. Chem. 26:2389-2396.
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek at Camino del Norte - 904ESCOxx]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 47729, Chlorpyrifos **Region 9**

Escondido Creek

LOE ID:	73545
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	0

Number of Exceedances:	0	037883
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Chlorpyrifos.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000).	
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).	
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 2 monitoring sites [Escondido Creek @ El Camino Del Norte, Escondido Creek @ East County Club Drive]	
Temporal Representation:	Data was collected over the time period 6/20/2006-6/18/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID	**42884**	**Region 9**
Escondido Creek		

Pollutant:	**Chromium (total)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Five lines of evidence are available in the administrative record to assess this pollutant. Zero of the 26 samples exceed the Objective for Chromium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 26 exceeded the Basin Plan Objective for Chromium and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 42884, Chromium (total) **Region 9**

Escondido Creek

LOE ID:	73558
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium. Since the chromium species was not identified, the data point(s) were assessed using both the Chromium III criteria which is hardness-dependent, and the criterion continuous concentration (4-day average) to protect aquatic life in freshwater for chromium VI which is 11 ug/L and is not hardness dependent.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Chromium to protect aquatic life in freshwater. The dissolved Chromium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]
Temporal Representation:	Data was collected on a single day 5/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 42884, Chromium (total) **Region 9**

Escondido Creek

LOE ID:	73557
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat

Number of Samples:	1	037885
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium.	
Data Reference:	Statewide Stream Pollution Trends Study 2008	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for chromium is 111 mg/Kg dry weight (MacDonald et al. 2000).	
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31	
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek at Camino del Norte - 904ESCOxx]	
Temporal Representation:	Data was collected on a single day 5/21/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	SWAMP data collected before September 2008 followed the 2002 QAMP.	
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)	

Line of Evidence (LOE) for Decision ID 42884, Chromium (total) **Region 9**

Escondido Creek

LOE ID:	73556
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for chromium is 111 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31

Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]
Temporal Representation:	Data was collected on a single day 5/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 42884, Chromium (total) **Region 9**

Escondido Creek

LOE ID:	73570
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	25
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 25 samples exceed the criterion for Chromium.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved chromium to protect aquatic life in freshwater. The dissolved Chromium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 2 monitoring sites [Escondido Creek - 904ESC-MLS, Escondido Creek - 904ESC-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/29/2001-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 42884, Chromium (total) **Region 9**

Escondido Creek

LOE ID:	73560
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	Dissolved	037887
Beneficial Use:	Cold Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium. Since the chromium species was not identified, the data point(s) were assessed using both the Chromium III criteria which is hardness-dependent, and the criterion continuous concentration (4-day average) to protect aquatic life in freshwater for chromium VI which is 11 ug/L and is not hardness dependent.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved chromium to protect aquatic life in freshwater. The dissolved Chromium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]	
Temporal Representation:	Data was collected on a single day 5/4/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 42884, Chromium (total) **Region 9**

Escondido Creek

LOE ID:	3226
Pollutant:	Chromium (total)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 1998. One sample was collected and was in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for Chromium is 0.05 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)

Evaluation Guideline:	037888
Guideline Reference:	
Spatial Representation:	Samples were collected at Escondido Creek at the intersection of Elfin Forest and Harmony Grove.
Temporal Representation:	One sample was collected in 06/03/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 42884, Chromium (total) **Region 9**

Escondido Creek

LOE ID:	73546
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for chromium is 111 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]
Temporal Representation:	Data was collected on a single day 5/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 42884, Chromium (total) **Region 9**

Escondido Creek

LOE ID:	73559
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for total chromium is 0.05 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]
Temporal Representation:	Data was collected on a single day 5/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID	33960	Region 9
Escondido Creek		

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 and Section 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary and under Section 3.6 two lines of evidence are necessary to assess listing status.

Eleven lines of evidence are available in the administrative record to assess this pollutant. Two of the 40 samples exceed the Water Quality Objective for Copper.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Two of 40 samples exceeded the Water Quality Objective for Copper and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Zero of two samples exceeded the Sediment Evaluation Guideline for copper and this sample size is insufficient to determine with the power and confidence of the Listing Policy the applicable beneficial use support rating. A minimum of 16 sediment chemistry samples and 16 sediment toxicity samples to determine if a beneficial use is fully supported using table 3.1.
5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality

standards are not being exceeded. 037890

Line of Evidence (LOE) for Decision ID 33960, Copper **Region 9**

Escondido Creek

LOE ID:	3227
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 1998. One sample was collected, it was in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for copper is 1.0 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Escondido Creek at the intersection of Elfin Forest and Harmony Grove.
Temporal Representation:	Samples were collected on 06/03/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33960, Copper **Region 9**

Escondido Creek

LOE ID:	73572
Pollutant:	Copper
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP

Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for copper is 149 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]
Temporal Representation:	Data was collected on a single day 5/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 33960, Copper **Region 9**

Escondido Creek

LOE ID:	73573
Pollutant:	Copper
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for copper is 149 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek at Camino del Norte - 904ESCOxx]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the 2002 QAMP.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 33960, Copper **Region 9**

Escondido Creek

LOE ID:	73574	037892

Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for copper is 1.0 mg/L (Title 22 California Code of Regulations).
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]
Temporal Representation:	Data was collected on a single day 5/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 33960, Copper **Region 9**

Escondido Creek

LOE ID:	73575
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved copper to protect aquatic life in freshwater. The dissolved copper criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition

Evaluation Guideline:	037893
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]
Temporal Representation:	Data was collected on a single day 5/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 33960, Copper **Region 9**

Escondido Creek

LOE ID:	73571
Pollutant:	Copper
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for copper is 149 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]
Temporal Representation:	Data was collected on a single day 5/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 33960, Copper **Region 9**

Escondido Creek

LOE ID:	73547
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat

Number of Samples:	25	037894
Number of Exceedances:	2	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Escondido Creek to determine beneficial use support and results are as follows: 2 of 25 samples exceed the criterion for Copper.	
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved copper to protect aquatic life in freshwater. The dissolved copper criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 2 monitoring sites [Escondido Creek - 904ESC-MLS, Escondido Creek - 904ESC-TWAS-1]	
Temporal Representation:	Data was collected over the time period 11/29/2001-11/4/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.	

Line of Evidence (LOE) for Decision ID 33960, Copper **Region 9**

Escondido Creek

LOE ID:	73548
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Copper to protect aquatic life in freshwater. The dissolved Copper criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition

Evaluation Guideline:	037895
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]
Temporal Representation:	Data was collected on a single day 5/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 33960, Copper Escondido Creek **Region 9**

LOE ID:	73549
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	14
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 14 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for copper is 1.0 mg/L (Title 22 California Code of Regulations).
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 2 monitoring sites [Escondido Creek @ East County Club Drive, Escondido Creek @ El Camino Del Norte]
Temporal Representation:	Data was collected over the time period 6/10/2003-7/18/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 33960, Copper Escondido Creek **Region 9**

LOE ID:	73550
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat

Number of Samples:	14
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 14 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 2 monitoring sites [Escondido Creek @ East County Club Drive, Escondido Creek @ El Camino Del Norte]
Temporal Representation:	Data was collected over the time period 6/10/2003-7/18/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 33960, Copper **Region 9**

Escondido Creek

LOE ID:	77735
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	27
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 27 samples exceed the criterion for Copper.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for copper is 1.0 mg/L (Title 22 California Code of Regulations).
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 2 monitoring sites [Escondido Creek - 904ESC-MLS, Escondido Creek - 904ESC-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/29/2001-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID 47730 Region 9

Escondido Creek

Pollutant:	**Cyfluthrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary and under section 3.6 at least two lines of evidence are necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the One samples exceed the Water Quality Criteria for Cyfulthrin. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Water Quality Criteria for Cyfulthrin and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47730, Cyfluthrin Region 9

Escondido Creek

LOE ID:	73562
Pollutant:	Cyfluthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total

Beneficial Use:	Cold Freshwater Habitat	037898
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cyfluthrin, total.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of lambda-cyhalothrin does not exceed 0.0005 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Mixtures of lambda-cyhalothrin and other pyrethroids should be considered in an additive manner. (Fojut et al. 2012)Â	
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.	
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]	
Temporal Representation:	Data was collected on a single day 5/4/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 47730, Cyfluthrin **Region 9**

Escondido Creek

LOE ID:	77736
Pollutant:	Cyfluthrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cyfluthrin, total.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for cyfluthrin is the median lethal concentration (LC50) of 1.1 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 1.1 ug/g is the geometric mean of LC50 values for cyfluthrin from Amweg et al. (2005).
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA.

	Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No037899
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek at Camino del Norte - 904ESCOxx]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID 47731 — Region 9

Escondido Creek

Pollutant:	**Cyhalothrin, Lambda**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.6 an additional line of evidence are necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the One samples exceed the Water Quality Criteria for Cyhalothrin, Lambda. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Water Quality Criteria for Cyhalothrin, Lambda and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47731, Cyhalothrin, Lambda — Region 9

Escondido Creek

LOE ID:	73563
Pollutant:	Cyhalothrin, Lambda
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat

Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cyhalothrin, lambda, total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Cyhalothrin, lambda, total does not exceed 0.0005 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]
Temporal Representation:	Data was collected on a single day 5/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47731, Cyhalothrin, Lambda **Region 9**

Escondido Creek

LOE ID:	77737
Pollutant:	Cyhalothrin, Lambda
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cyhalothrin, lambda, total.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for lambda-cyhalothrin is the median lethal concentration (LC50) of 0.44 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 0.44 ug/g is the geometric mean of LC50 values for lambda-cyhalothrin from Amweg et al. (2005).
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA.

	Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No 037901
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek at Camino del Norte - 904ESCOxx]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID 47732 — Region 9

Escondido Creek

Pollutant:	**Cypermethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.6 an additional line of evidence are necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the One samples exceed the Water Quality Criteria for Cypermethrin. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Water Quality Criteria for Cypermethrin and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47732, Cypermethrin — Region 9

Escondido Creek

LOE ID:	77738
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat

Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cypermethrin, total.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for cypermethrin is the median lethal concentration (LC50) of 0.3 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 0.3 ug/g is the geometric mean of LC50 values for cypermethrin from Maund et al. (2002).
Guideline Reference:	Partitioning, bioavailability, and toxicity of the pyrethroid insecticide cypermethrin in sediments. Environmental Toxicology and Chemistry 21:9-15
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek at Camino del Norte - 904ESCOxx]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 47732, Cypermethrin **Region 9**

Escondido Creek

LOE ID:	73577
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	One of one sample result was not used in the assessment because the laboratory data was non-detect and the method detection limit was above the guideline and therefore the results could not be quantified with the level of certainty required by the Listing Policy
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day

	average concentration of cypermethrin does not exceed 0.0002 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Fojut et al. 2012)
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]
Temporal Representation:	Data was collected on a single day 5/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47732, Cypermethrin **Region 9**

Escondido Creek

LOE ID:	73578
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Escondido Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Cypermethrin, total.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of cypermethrin does not exceed 0.0002 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Fojut et al. 2012)
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 2 monitoring sites [Escondido Creek - 904ESC-MLS, Escondido Creek - 904ESC-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/30/2007-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID 47733 Region 9

Escondido Creek 037904

Pollutant:	**Deltamethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.6 an additional line of evidence are necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the One samples exceed the Water Quality Criteria for Deltamethrin. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Water Quality Criteria for Deltamethrin and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47733, Deltamethrin — Region 9

Escondido Creek

LOE ID:	73582
Pollutant:	Deltamethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Deltamethrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).

Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	037905
Evaluation Guideline:	The evaluation guideline for Deltamethrin is the maximum acceptable toxicant concentration (MATC) of 0.02 ug/L.	
Guideline Reference:	OPP Pesticide Ecotoxicity Database.	
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]	
Temporal Representation:	Data was collected on a single day 5/4/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 47733, Deltamethrin **Region 9**

Escondido Creek

LOE ID:	77739
Pollutant:	Deltamethrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Deltamethrin.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for deltamethrin is the median lethal concentration (LC50) of 0.79 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 0.79 ug/g is the geometric mean of LC50 values for deltamethrin from Amweg et al. (2005).
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek at Camino del Norte - 904ESCOxx]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 47733, Deltamethrin **Region 9**

Escondido Creek

LOE ID:	73583

Pollutant:	Deltamethrin	037906
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	Total	
Beneficial Use:	Cold Freshwater Habitat	
Number of Samples:	5	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Deltamethrin.	
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The evaluation guideline for Deltamethrin is the maximum acceptable toxicant concentration (MATC) of 0.02 ug/L.	
Guideline Reference:	OPP Pesticide Ecotoxicity Database.	
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 2 monitoring sites [Escondido Creek - 904ESC-MLS, Escondido Creek - 904ESC-TWAS-1]	
Temporal Representation:	Data was collected over the time period 11/30/2007-11/4/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.	

DECISION ID	**47734**	**Region 9**
Escondido Creek		

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Three lines of evidence are available in the administrative record to assess this pollutant. Considering the nation-wide ban of diazinon which went into effect on January 1, 2005, data from 2005 and on were evaluated in the assessment of LOE #73584, and 0 of 17 samples exceed the Criteria Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section

303(d) List in the Water Quality Limited Segments category. 037907

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Considering the nation-wide ban of diazinon which went into effect on January 1, 2005, data from 2005 and on were evaluated in the assessment of LOE #73584, and 0 of 17 samples exceed the Criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 47734, Diazinon **Region 9**

Escondido Creek

LOE ID:	77740
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Diazinon.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for diazinon is the median lethal concentration (LC50) of 11 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 11 ug/g is the geometric mean of LC50 values for diazinon from Ding et al. (2011).
Guideline Reference:	Toxicity of Sediment-Associated Pesticides to Chironomus dilutus and Hyalella azteca. Arch. Environ. Contam. Toxicol. 61:83Â–92.
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek at Camino del Norte - 904ESCOxx]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 47734, Diazinon **Region 9**

Escondido Creek

LOE ID:	77741	037908

Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 8 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for diazinon is 1.4 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 2 monitoring sites [Escondido Creek @ El Camino Del Norte (904CAR03), Escondido Creek @ East County Club Drive (904CAR02)]
Temporal Representation:	Data was collected over the time period 6/20/2006-6/18/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47734, Diazinon **Region 9**

Escondido Creek

LOE ID:	73585
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 7 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 2 monitoring sites [Escondido Creek @ El Camino Del Norte, Escondido Creek @ East County Club Drive]
Temporal Representation:	Data was collected over the time period 6/20/2006-6/18/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47734, Diazinon **Region 9**

Escondido Creek

LOE ID:	73584
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 17 samples exceed the criterion for Diazinon.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 2 monitoring sites [Escondido Creek - 904ESC-MLS, Escondido Creek - 904ESC-TWAS-1]
Temporal Representation:	Data was collected over the time period 02/11/2005-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and

QAPP Information Reference(s):	Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed. Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 47734, Diazinon **Region 9**

Escondido Creek

LOE ID:	73586
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	27
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 27 samples exceed the criterion for Diazinon.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water lifetime health advisory for diazinon is 1 Âµg/L.
Guideline Reference:	2011 Edition of the Drinking Water Standards and Health Advisories
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 2 monitoring sites [Escondido Creek - 904ESC-MLS, Escondido Creek - 904ESC-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/29/2001-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID **47735** **Region 9**

Escondido Creek

Pollutant:	**Dieldrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 an additional line of evidence are necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the One samples exceed the Water Quality Criteria for Dieldrin.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Water Quality Criteria for Dieldrin and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47735, Dieldrin **Region 9**

Escondido Creek

LOE ID:	73587
Pollutant:	Dieldrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Dieldrin.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for dieldrin is 61.8 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek at Camino del Norte - 904ESCOxx]

Temporal Representation:	Data was collected on a single day 5/21/2008.	037912
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	SWAMP data collected before September 2008 followed the 2002 QAMP.	
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)	

DECISION ID **47736** **Region 9**

Escondido Creek

Pollutant:	**Endrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 an additional line of evidence are necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the One samples exceed the Water Quality Criteria for Endrin.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Water Quality Criteria for Endrin and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47736, Endrin **Region 9**

Escondido Creek

LOE ID:	73588
Pollutant:	Endrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	037913
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Endrin.	
Data Reference:	Statewide Stream Pollution Trends Study 2008	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for endrin is 207 ug/Kg dry weight (MacDonald et al. 2000).	
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31	
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek at Camino del Norte - 904ESCOxx]	
Temporal Representation:	Data was collected on a single day 5/21/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	SWAMP data collected before September 2008 followed the 2002 QAMP.	
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)	

DECISION ID	**47737**	**Region 9**
Escondido Creek		

Pollutant:	**Esfenvalerate/Fenvalerate**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.6 an additional line of evidence are necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the One samples exceed the Water Quality Criteria for Esfenvalerate/Fenvalerate. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Water Quality Criteria for Esfenvalerate/Fenvalerate and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the

applicable beneficial use support rating. 037914

Line of Evidence (LOE) for Decision ID 47737, Esfenvalerate/Fenvalerate **Region 9**

Escondido Creek

LOE ID:	77742
Pollutant:	Esfenvalerate/Fenvalerate
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Esfenvalerate/Fenvalerate, total.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for esfenvalerate/fenvalerate is the median lethal concentration (LC50) of 1.5 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 1.5 ug/g is the geometric mean of LC50 values for esfenvalerate/fenvalerate from Amweg et al. (2005).
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek at Camino del Norte - 904ESCOxx]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 47737, Esfenvalerate/Fenvalerate **Region 9**

Escondido Creek

LOE ID:	73592
Pollutant:	Esfenvalerate/Fenvalerate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Esfenvalerate/Fenvalerate, total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to the USEPA Office of Pesticide Programs Ecotoxicity database, the aquatic life EC50 for Esfenvalerate/Fenvalerate is 0.9 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]
Temporal Representation:	Data was collected on a single day 5/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47737, Esfenvalerate/Fenvalerate **Region 9**

Escondido Creek

LOE ID:	73590
Pollutant:	Esfenvalerate/Fenvalerate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Esfenvalerate.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to the USEPA Office of Pesticide Programs Ecotoxicity database, the aquatic life EC50 for Esfenvalerate is 0.9 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 2 monitoring sites [Escondido Creek - 904ESC-MLS, Escondido Creek - 904ESC-TWAS-1]

Temporal Representation:	Data was collected over the time period 11/30/2007-11/4/2008. 037916
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID 47738 Region 9

Escondido Creek

Pollutant:	**Fenpropathrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.6 an additional line of evidence are necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the One samples exceed the Water Quality Criteria for Fenpropathrin. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Water Quality Criteria for Fenpropathrin and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47738, Fenpropathrin Region 9

Escondido Creek

LOE ID:	73595
Pollutant:	Fenpropathrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1

Number of Exceedances:	0	037917

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Fenpropathrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for Fenpropathrin is the median lethal concentration (LC50; 2.2 ug/L).
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]
Temporal Representation:	Data was collected on a single day 5/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47738, Fenpropathrin **Region 9**

Escondido Creek

LOE ID:	77743
Pollutant:	Fenpropathrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Fenpropathrin.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for fenpropathrin is the median lethal concentration (LC50) of 1 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 1 ug/g is the geometric mean of LC50 values for fenpropathrin from Ding et al. (2011).
Guideline Reference:	Toxicity of Sediment-Associated Pesticides to Chironomus dilutus and Hyalella azteca. Arch. Environ. Contam. Toxicol. 61:83Â–92.
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek at Camino del Norte - 904ESCOxx]
Temporal Representation:	Data was collected on a single day 5/21/2008.

Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID 47739 Region 9

Escondido Creek

Pollutant:	**Iron**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. One of the One samples exceed the Basin Plan Objective for Iron. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of One samples exceeded the Basin Plan Objective for Iron and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47739, Iron Region 9

Escondido Creek

LOE ID:	73597
Pollutant:	Iron
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use

	support and results are as follows: 1 of 1 samples exceed the criterion for Iron.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for iron is 0.3 mg/L (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]
Temporal Representation:	Data was collected on a single day 5/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47739, Iron **Region 9**

Escondido Creek

LOE ID:	73598
Pollutant:	Iron
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Iron.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Iron objective for the protection of aquatic life according to Table 3-2 for Escondido Creek within the Carlsbad Hydrologic Unit is 0.3 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]
Temporal Representation:	Data was collected on a single day 5/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 47740 **Region 9**

Escondido Creek

Pollutant:	**Lead**	037920
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	
Last Listing Cycle's Final Listing Decision:	New Decision	
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.6 an additional line of evidence are necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 40 samples exceed the California Toxics Rule Objective for Lead.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Water Quality Criteria for Lead and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47740, Lead **Region 9**

Escondido Creek

LOE ID:	73603
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	14
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 14 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for Lead is 0.015 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals, CCR

Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 2 monitoring sites [Escondido Creek @ East County Club Drive, Escondido Creek @ El Camino Del Norte]
Temporal Representation:	Data was collected over the time period 6/10/2003-7/18/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47740, Lead **Region 9**

Escondido Creek

LOE ID:	73605
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	25
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 25 samples exceed the criterion for Lead.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved lead to protect aquatic life in freshwater. The dissolved lead criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 2 monitoring sites [Escondido Creek - 904ESC-MLS, Escondido Creek - 904ESC-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/29/2001-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 47740, Lead **Region 9**

Escondido Creek

LOE ID:	73604	037922

Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	14
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 14 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California, 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 2 monitoring sites [Escondido Creek @ East County Club Drive, Escondido Creek @ El Camino Del Norte]
Temporal Representation:	Data was collected over the time period 6/10/2003-7/18/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47740, Lead **Region 9**

Escondido Creek

LOE ID:	73600
Pollutant:	Lead
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP

Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for lead is 128 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]
Temporal Representation:	Data was collected on a single day 5/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47740, Lead **Region 9**

Escondido Creek

LOE ID:	73602
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved lead to protect aquatic life in freshwater. The dissolved lead criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]
Temporal Representation:	Data was collected on a single day 5/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **47741** **Region 9**

Escondido Creek

Pollutant: **Lindane/gamma Hexachlorocyclohexane (gamma-HCH)**

Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	037924
Last Listing Cycle's Final Listing Decision:	New Decision	
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Lindane.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Evaluation Guideline for Lindane and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47741, Lindane/gamma Hexachlorocyclohexane (gamma-HCH) **Region 9**

Escondido Creek

LOE ID:	77744
Pollutant:	Lindane/gamma Hexachlorocyclohexane (gamma-HCH)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for HCH, gamma.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity)

	for Lindane (gamma-HCH) is 4.99 ug/Kg dry weight (MacDonald et al. 2000) 037925
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek at Camino del Norte - 904ESCOxx]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the 2002 QAMP.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID 47743 Region 9

Escondido Creek

Pollutant:	**Methyl Parathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the One samples exceed the Water Quality Criteria for Methyl Parathion. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Water Quality Criteria for Methyl Parathion and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47743, Methyl Parathion Region 9

Escondido Creek

LOE ID:	77746
Pollutant:	Methyl Parathion
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total

Beneficial Use:	Cold Freshwater Habitat	037926
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Parathion, Methyl.	
Data Reference:	Statewide Stream Pollution Trends Study 2008	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The evaluation guideline for methyl parathion is the median lethal concentration (LC50) of 6 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 6 ug/g is the geometric mean of LC50 values for methyl parathion from Ding et al. (2011).	
Guideline Reference:	Toxicity of Sediment-Associated Pesticides to Chironomus dilutus and Hyalella azteca. Arch. Environ. Contam. Toxicol. 61:83Â–92.	
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek at Camino del Norte - 904ESCOxx]	
Temporal Representation:	Data was collected on a single day 5/21/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.	
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)	

DECISION ID	33968	Region 9
Escondido Creek		

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary and under section 3.6 at least two lines of evidence are necessary to assess listing status.

Six lines of evidence are available in the administrative record to assess this pollutant. One of the 29 samples exceed the Basin Plan Objective and zero of one samples exceeded the Evaluation guideline for Nickel.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of 29 samples exceeded the Basin Plan Objective and zero of one samples exceeded the Evaluation guideline for Nickel and this does not exceed the allowable frequency listed in Table 3.1 of

the Listing Policy. 037927
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 33968, Nickel **Region 9**

Escondido Creek

LOE ID:	3229
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 1998. One sample was collected, it was in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO nickel is 0.1 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Escondido Creek at the intersection of Elfin Forest and Harmony Grove.
Temporal Representation:	Samples were collected on 06/03/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33968, Nickel **Region 9**

Escondido Creek

LOE ID:	73621
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Nickel to protect aquatic life in freshwater. The dissolved Nickel criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]
Temporal Representation:	Data was collected on a single day 5/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 33968, Nickel **Region 9**

Escondido Creek

LOE ID:	73620
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for nickel is 48.6 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]
Temporal Representation:	Data was collected on a single day 5/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 33968, Nickel 037929 Region 9

Escondido Creek

LOE ID:	73619
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for nickel is 48.6 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]
Temporal Representation:	Data was collected on a single day 5/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 33968, Nickel Region 9

Escondido Creek

LOE ID:	73629
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	25
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 25 samples exceed the criterion for Nickel.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.

SWAMP Data:	Non-SWAMP	037930
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Nickel to protect aquatic life in freshwater. The dissolved Nickel criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 2 monitoring sites [Escondido Creek - 904ESC-MLS, Escondido Creek - 904ESC-TWAS-1]	
Temporal Representation:	Data was collected over the time period 11/29/2001-11/4/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.	

Line of Evidence (LOE) for Decision ID 33968, Nickel **Region 9**

Escondido Creek

LOE ID:	73627
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nickel is 0.1 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]
Temporal Representation:	Data was collected on a single day 5/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 33968, Nickel **Region 9**

Escondido Creek

LOE ID:	73628
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Nickel to protect aquatic life in freshwater. The dissolved Nickel criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]
Temporal Representation:	Data was collected on a single day 5/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 33968, Nickel **Region 9**

Escondido Creek

LOE ID:	77747
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	27
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 27 samples exceed the criterion for Nickel.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nickel is 0.1 mg/L (Title 22 of the California

	Code of Regulations). 037932
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 2 monitoring sites [Escondido Creek - 904ESC-MLS, Escondido Creek - 904ESC-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/29/2001-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID 48464 Region 9

Escondido Creek

Pollutant:	**Nitrate/Nitrite (Nitrite + Nitrate as N)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Three lines of evidence are available in the administrative record to assess this pollutant. Zero of the 31 samples exceed the Basin Plan Objective for Nitrate/Nitrite (Nitrite + Nitrate as N). Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 31 samples exceeded the Basin Plan Objective for Nitrate/Nitrite (Nitrite + Nitrate as N) and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 48464, Nitrate/Nitrite (Nitrite + Nitrate as N) Region 9

Escondido Creek

LOE ID:	77748
Pollutant:	Nitrate/Nitrite (Nitrite + Nitrate as N)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	27
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 27 samples exceed the criterion for Nitrate/Nitrite as N.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrate + nitrite (as N) is 10.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 2 monitoring sites [Escondido Creek - 904ESC-MLS, Escondido Creek - 904ESC-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/29/2001-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 48464, Nitrate/Nitrite (Nitrite + Nitrate as N) Region 9

Escondido Creek

LOE ID:	73630
Pollutant:	Nitrate/Nitrite (Nitrite + Nitrate as N)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nitrate/Nitrite as N.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrate + nitrite (as N) is 10.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]
Temporal Representation:	Data was collected on a single day 5/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 48464, Nitrate/Nitrite (Nitrite + Nitrate as N) Region 9

Escondido Creek

LOE ID:	73640
Pollutant:	Nitrate/Nitrite (Nitrite + Nitrate as N)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Nitrate/Nitrite as N.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrate + nitrite (as N) is 10.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek @ East County Club Drive]
Temporal Representation:	Data was collected over the time period 7/8/2003-9/3/2003.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 48475 Region 9

Escondido Creek

Pollutant:	**Nitrogen, Nitrite**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of

the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. 107935

Three lines of evidence are available in the administrative record to assess this pollutant. Zero of the 30 samples exceed the Basin Plan Objective for Nitrogen, Nitrite.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 30 samples exceeded the Basin Plan Objective for Nitrogen, Nitrite and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 48475, Nitrogen, Nitrite **Region 9**

Escondido Creek

LOE ID:	77749
Pollutant:	Nitrogen, Nitrite
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	25
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 25 samples exceed the criterion for Nitrite as N.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrite (as N) is 1.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 2 monitoring sites [Escondido Creek - 904ESC-MLS, Escondido Creek - 904ESC-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/29/2001-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston

Solutions Inc. Desk Reference for Quality Control Of Work Products. 037936

Line of Evidence (LOE) for Decision ID 48475, Nitrogen, Nitrite **Region 9**

Escondido Creek

LOE ID:	73641
Pollutant:	Nitrogen, Nitrite
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nitrite as N.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrite (as N) is 1.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]
Temporal Representation:	Data was collected on a single day 5/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 48475, Nitrogen, Nitrite **Region 9**

Escondido Creek

LOE ID:	73642
Pollutant:	Nitrogen, Nitrite
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Nitrite as N.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrite (as N) is 1.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 2 monitoring sites [Escondido Creek @ El Camino Del Norte, Escondido Creek @ East County Club Drive]
Temporal Representation:	Data was collected over the time period 6/10/2003-9/3/2003.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 48476 Region 9

Escondido Creek

Pollutant:	**Nitrogen, ammonia (Total Ammonia)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Three lines of evidence are available in the administrative record to assess this pollutant. Zero of the Four samples exceed the Basin Plan Objective for Nitrogen, ammonia (Total Ammonia). Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Four samples exceeded the Basin Plan Objective for Nitrogen, ammonia (Total Ammonia) and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48476, Nitrogen, ammonia (Total Ammonia) Region 9

Escondido Creek

LOE ID:	73616
Pollutant:	Nitrogen, ammonia (Total Ammonia)

LOE Subgroup:	Pollutant-Water	037938
Matrix:	Water	
Fraction:	Total	
Beneficial Use:	Cold Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Ammonia as N, Total.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	Aquatic Life Ambient Water Quality Criteria for Ammonia â€“ Freshwater (USEPA 2013): the 30-day rolling average concentration (criterion continuous concentration or CCC) of total ammonia nitrogen(in mg TAN/L) in freshwater are not to be exceeded more than once every three years on average. The CCC values are based on pH and temperature. The CCC formula is found on page 46 and the table of CCC values is on page 49.	
Guideline Reference:	Aquatic Life Ambient Water Quality Criteria for Ammonia - Freshwater 2013	
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]	
Temporal Representation:	Data was collected on a single day 5/4/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 48476, Nitrogen, ammonia (Total Ammonia) Region 9

Escondido Creek

LOE ID:	73624
Pollutant:	Nitrogen, ammonia (Total Ammonia)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Ammonia As N, Total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Basin Plan: No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses (Water Quality Control Plan, San Diego

	Basin). 037939
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	EPA's Lifetime Health advisory level for total ammonia is 30.0 mg/L as stated on page 8 of the 2006 edition of the drinking water standards and health advisories. This Advisory Level is defined as "the concentration of a chemical in drinking water that is not expected to cause any adverse noncarcinogenic effects for up to ten days of exposure."
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 2 monitoring sites [Escondido Creek @ El Camino Del Norte, Escondido Creek @ East County Club Drive]
Temporal Representation:	Data was collected over the time period 6/10/2003-7/9/2003.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48476, Nitrogen, ammonia (Total Ammonia) Region 9

Escondido Creek

LOE ID:	73623
Pollutant:	Nitrogen, ammonia (Total Ammonia)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Ammonia As N, Total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Basin Plan: No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	EPA's Lifetime Health advisory level for total ammonia is 30.0 mg/L as stated on page 8 of the 2006 edition of the drinking water standards and health advisories. This Advisory Level is defined as "the concentration of a chemical in drinking water that is not expected to cause any adverse noncarcinogenic effects for up to ten days of exposure."
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]
Temporal Representation:	Data was collected on a single day 5/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 47744 Region 9

Escondido Creek 037940

Pollutant:	**PCBs (Polychlorinated biphenyls)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for PCBs. One of One samples exhibited sediment toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is INSUFFICIENT] justification FOR placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the One samples exceed the Evaluation Guideline for PCBs and this sample size is INSUFFICIENT to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 47744, PCBs (Polychlorinated biphenyls) Region 9

Escondido Creek

LOE ID:	73568
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate sediment toxicity. The sample exhibited significant toxicity. The toxicity test included survival and growth of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP

Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL, Significant compared to negative control based on statistical test, less than stated alpha level, AND less than the evaluation threshold (both criteria are met).
Guideline Reference:	
Spatial Representation:	The sample was collected at station 904ESCOxx.
Temporal Representation:	The sample was collected in May 2008.
Environmental Conditions:	
QAPP Information:	Data quality is good. Data results were recorded in the SWAMP database and followed SWAMP protocols.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 47744, PCBs (Polychlorinated biphenyls) Region 9

Escondido Creek

LOE ID:	72810
Pollutant:	PCBs (Polychlorinated biphenyls)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Zero of 1 sample collected for Total PCBs exceeded the evaluation guideline.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for total PCB is 676 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data were collected at the following station 904ESCOxx (Escondido Creek at Camino del Norte).
Temporal Representation:	The samples were collected on 5/21/2008.
Environmental Conditions:	
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 47745 Region 9

Escondido Creek

Pollutant:	**Permethrin, total**	037942
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	
Last Listing Cycle's Final Listing Decision:	New Decision	
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.6 an additional line of evidence for sediment toxicity is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the One samples exceed the Water Quality Criteria for Permethrin.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Water Quality Criteria for Permethrin and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47745, Permethrin, total **Region 9**

Escondido Creek

LOE ID:	73654
Pollutant:	Permethrin, total
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Soledad Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Permethrin, Total.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	The evaluation guideline for permethrin is the median lethal concentration (LC50) of 8.9 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 8.9 ug/g is the geometric mean of LC50 values for permethrin from Amweg et al. (2005).
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5
Spatial Representation:	Data for this line of evidence for Soledad Canyon was collected at 1 monitoring site [Soledad Canyon Creek 4 - 906LPSOL4]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 47745, Permethrin, total **Region 9**

Escondido Creek

LOE ID:	73656
Pollutant:	Permethrin, total
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Permethrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Permethrin does not exceed 0.002 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]
Temporal Representation:	Data was collected on a single day 5/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **33634** **Region 9**

Escondido Creek

Pollutant:	**Silver**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**

Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)	037944
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion: Three line of evidence is available in the administrative record to assess this pollutant. Zero of two samples exceed the Basin Plan criteria, and the number of samples is insufficient to determine with the confidence and power required by the Listing Policy.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 33634, Silver Escondido Creek **Region 9**

LOE ID:	73523
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Silver.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for silver is 0.1 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]
Temporal Representation:	Data was collected on a single day 5/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 33634, Silver Escondido Creek **Region 9**

LOE ID:	73525

Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Silver.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Silver to protect aquatic life in freshwater. The dissolved Silver criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]
Temporal Representation:	Data was collected on a single day 5/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 33634, Silver **Region 9**

Escondido Creek

LOE ID:	73524
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Silver.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Silver to protect aquatic life in freshwater. The dissolved Silver criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority

toxic pollutants for the State of California. 7/1/2011 Edition 037946

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]
Temporal Representation: Data was collected on a single day 5/4/2009.
Environmental Conditions: Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information: The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s): Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 33634, Silver Escondido Creek **Region 9**

LOE ID: 3232

Pollutant: Silver
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 1
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Data were collected by RWQCB9 in 1998. One sample was collected and was not in exceedance. (SWRCB, 2003).
Data Reference: Placeholder reference 2006 303(d)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for silver is 0.1 mg/L.
Objective/Criterion Reference: Placeholder reference 2006 303(d)

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Escondido Creek at the intersection of Elfin Forest and Harmony Grove.
Temporal Representation: Samples were collected on 06/03/1998.
Environmental Conditions:
QAPP Information: Data used in 2002 assessment.
QAPP Information Reference(s):

DECISION ID 47746 Escondido Creek **Region 9**

Pollutant: **Specific Conductivity**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of

the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. One of the One samples exceed the Basin Plan Objective for Specific Conductivity.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of One samples exceeded the Basin Plan Objective for Specific Conductivity and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47746, Specific Conductivity **Region 9**

Escondido Creek

LOE ID:	73540
Pollutant:	Specific Conductivity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Conductivity(Us).
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for specific conductance is 900 uS/cm (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]
Temporal Representation:	Data was collected on a single day 5/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID	47747	Region 9
Escondido Creek		

Pollutant:	**Surfactants (MBAS)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One lineof evidence is available in the administrative record to assess this pollutant. Zero of 27 samples exceed the secondary MCL for MBAS in water.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 27 samples exceed the secondary MCL for MBAS in water and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 47747, Surfactants (MBAS)	**Region 9**
Escondido Creek	

LOE ID:	78020
Pollutant:	Surfactants (MBAS)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	27
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 27 samples exceed the criterion for MBAS.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The Secondary California Maximum Contaminant Level for MBAS is 0.5 mg/L (Title 22 of the California Code of Regulations).

Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 s037949 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 2 monitoring sites [Escondido Creek - 904ESC-MLS, Escondido Creek - 904ESC-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/29/2001-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID	47748	Region 9
Escondido Creek		

Pollutant:	**Temperature, water**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Seven of the 28 samples exceed the Evaluation Guideline for Temperature, water. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Seven of 28 samples exceed the Evaluation Guideline for Temperature, water and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, additional data and information is available indicating that standards may be met. Two additional lines of evidence are available. First, the location of the sampling and timing may not be representative of steelhead habitat utilization in the waterbody, and samples were taken as grabs. Critical information needed to assess temperatures for steelhead include growth periods (spring and fall) as well as summer daytime maximums in documented oversummering habitat. Second, the criteria of 21 degrees as a limit is not necessarily applicable to southern California steelhead, which have been shown to have higher temperature tolerance. See Spina Environ Biol Fish (2007) 80:23Â–34.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47748, Temperature, water	Region 9

Escondido Creek 037950

LOE ID:	73544
Pollutant:	Temperature, water
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Water Temperature.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Board that such alteration in temperature does not adversely affect beneficial uses. At no time or place shall the temperature of any COLD water be increased more than 5Â°F above the natural receiving water temperature.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Inland Fishes of California (Moyle 1976) states that for rainbow trout the optimum range for growth and completion of most life stages is 13-21 degrees C (page 129).
Guideline Reference:	Inland Fishes of California
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]
Temporal Representation:	Data was collected on a single day 5/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47748, Temperature, water **Region 9**

Escondido Creek

LOE ID:	73551
Pollutant:	Temperature, water
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	27
Number of Exceedances:	7
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Seven of the 27 samples exceeded the evaluation guideline for temperature in this water body.
Data Reference:	Data for Trash, Nutrients, and Pathogens in Region 9, 2007-2010.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Board that such alteration in temperature does not adversely affect beneficial uses. At no time or place shall the temperature of any COLD water be increased more than 5Â°F above the natural receiving water temperature.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Evaluation Guideline: Inland Fishes of California (Moyle 1976) states that for rainbow trout the optimum range for growth and completion of most life stages is 13-21 degrees C (page 129).
Guideline Reference:	Fish introductions in CA: History and impact on native fishes. Davis, CA: University of CA, Davis
Spatial Representation:	Samples were collected at the following stations: EDC-010-Santa Fe Rd. Overpass EDC-020-El Camino del Norte Bridge EDC-030-Elfin Forest Rd/ Harmony Grove Rd EDC-040-Elfin Forest Reserve EDC-050-Country Club Dr/ Harmony Grove Rd
Temporal Representation:	Samples were collected between January, 2009 and July, 2010.
Environmental Conditions:	
QAPP Information:	San Diego Regional Water Quality Assessment and Outreach Project Quality Assurance Project Plan Prepared by: Clay Clifton (San Diego Coastkeeper, Local Project Sponsor Manager), Bob Stafford (San Diego Stream Team), Dr. Rick Gersberg (San Diego State University), Bryan Bjorndal (Assure Controls, Inc.), and Morgan Justice-Black (I Love A Clean San Diego).
QAPP Information Reference(s):	Quality Assurance Project Plan for San Diego Regional Water Quality Assessment and Outreach Project.

DECISION ID	33880	Region 9
Escondido Creek		

Pollutant:	**Turbidity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. Four lines of evidence are available in the administrative record to assess this pollutant. One of the five samples exceed the Basin Plan Objective for turbidity. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of five samples exceeded the basin plan objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 33880, Turbidity **Region 9**

Escondido Creek

LOE ID:	3219
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected in 1998 by RWQCB9. One sample was collected, it was not in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for turbidity is 5 ntu.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Escondido Creek below the Harmony Grove Bridge.
Temporal Representation:	One sample was collected on 06/03/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33880, Turbidity **Region 9**

Escondido Creek

LOE ID:	3221
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	1
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by DWR in 1998 and 2000. One of 3 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for turbidity is 5 ntu.

Objective/Criterion Reference:	Placeholder reference 2006 303(d)	037953
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Escondido Creek near Harmony Grove.	
Temporal Representation:	Samples were collected once each in May and November, 1998 and in November 2000.	
Environmental Conditions:		
QAPP Information:	QA Info Missing	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33880, Turbidity **Region 9**

Escondido Creek

LOE ID:	73698
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Turbidity(NTU).
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Turbidity(NTU) objective for the protection of aquatic life according to Table 3-2 for Escondido Creek within the Carlsbad Hydrologic Unit is 20 NTU.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]
Temporal Representation:	Data was collected on a single day 5/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 33880, Turbidity **Region 9**

Escondido Creek

LOE ID:	3220
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	1	037954
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 1998. One sample was collected and was not in exceedance. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for turbidity is 5 ntu.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Escondido Creek at the intersection of Elfin Forest and and Harmony Grove.	
Temporal Representation:	Samples were collected on 06/03/1998.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID	**32838**	**Region 9**
Escondido Creek		

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary and under section 3.6 at least two lines of evidence are necessary to assess listing status. Nine lines of evidence are available in the administrative record to assess this pollutant. One of the 43 samples exceed the Basin Plan Objective and zero out of two samples exceeded the Evaluation Guideline for Zinc. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of 43 samples exceeded the Basin Plan Objective and zero of two samples exceeded the Evaluation Guideline for zinc, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 32838, Zinc 037955 **Region 9**

Escondido Creek

LOE ID:	73708
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	25
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 25 samples exceed the criterion for Zinc.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Zinc to protect aquatic life in freshwater. The dissolved Zinc criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 2 monitoring sites [Escondido Creek - 904ESC-MLS, Escondido Creek - 904ESC-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/29/2001-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 32838, Zinc **Region 9**

Escondido Creek

LOE ID:	73707
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	14
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 14 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 2 monitoring sites [Escondido Creek @ East County Club Drive, Escondido Creek @ El Camino Del Norte]
Temporal Representation:	Data was collected over the time period 6/10/2003-7/18/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 32838, Zinc **Region 9**

Escondido Creek

LOE ID:	73706
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Zinc to protect aquatic life in freshwater. The dissolved Zinc criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]
Temporal Representation:	Data was collected on a single day 5/4/2009.

Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 32838, Zinc **Region 9**

Escondido Creek

LOE ID:	73705
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Zinc to protect aquatic life in freshwater. The dissolved Zinc criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]
Temporal Representation:	Data was collected on a single day 5/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 32838, Zinc **Region 9**

Escondido Creek

LOE ID:	73703
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	14
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 14 samples exceed the

	criterion for Zinc. 037958
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for zinc is 5.0 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 2 monitoring sites [Escondido Creek @ East County Club Drive, Escondido Creek @ El Camino Del Norte]
Temporal Representation:	Data was collected over the time period 6/10/2003-7/18/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 32838, Zinc **Region 9**

Escondido Creek

LOE ID:	73702
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	The California Secondary MCL for zinc is 5.0 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]
Temporal Representation:	Data was collected on a single day 5/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 32838, Zinc **Region 9**

Escondido Creek

LOE ID:	73701	037959

Pollutant:	Zinc
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for zinc is 459 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]
Temporal Representation:	Data was collected on a single day 5/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 32838, Zinc **Region 9**

Escondido Creek

LOE ID:	73700
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for zinc is 459 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]
Temporal Representation:	Data was collected on a single day 5/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 32838, Zinc **Region 9**

Escondido Creek

LOE ID:	73699
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for Zinc is 459 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek at Camino del Norte - 904ESCOxx]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the 2002 QAMP.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 32838, Zinc **Region 9**

Escondido Creek

LOE ID:	3234
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water

Matrix:	Water	037961
Fraction:	Total	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	1	
Number of Exceedances:	1	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 1998. One sample was collected and was in exceedance. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin plan: For inland surface waters with a municipal beneficial use, the WQO for zinc is 5.0 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Escondido Creek at the intersection of Elfin Forest and Harmony Grove.	
Temporal Representation:	Samples were collected on 06/03/1998.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 32838, Zinc **Region 9**

Escondido Creek

LOE ID:	77755
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	27
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 27 samples exceed the criterion for Zinc.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for zinc is 5.0 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 2 monitoring sites [

	Escondido Creek - 904ESC-MLS, Escondido Creek - 904ESC-TWAS-1] 037962
Temporal Representation:	Data was collected over the time period 11/29/2001-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID **34042** **Region 9**

Escondido Creek

Pollutant:	**pH**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line) of evidence are necessary to assess listing status. Four lines of evidence are available in the administrative record to assess this pollutant. Three of the ten samples exceed the Basin Plan Objective for pH. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Three of ten samples exceeded the Basin Plan Objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 34042, pH **Region 9**

Escondido Creek

LOE ID:	73657
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for pH.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	In inland surface waters the pH shall not be depressed below 6.5 nor raised above 8.5.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]
Temporal Representation:	Data was collected on a single day 5/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 34042, pH **Region 9**

Escondido Creek

LOE ID:	73658
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for pH.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	In inland surface waters the pH shall not be depressed below 6.5 nor raised above 8.5.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]
Temporal Representation:	Data was collected on a single day 5/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 34042, pH **Region 9**

Escondido Creek

LOE ID:	3240

Pollutant:	pH	037964
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	Total	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	5	
Number of Exceedances:	3	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Data were collected by DWR from 1998 to 2000. Three of 5 field samples were in exceedance. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for pH is 6.5(minimum) to 8.5 (maximum).	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected in the field at Escondido Creek near Harmony Grove.	
Temporal Representation:	Samples were collected once each in May and November each year from 05/1998 to 05/2000.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 34042, pH **Region 9**

Escondido Creek

LOE ID:	3241
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by DWR from 1998 to 2000. None of 4 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for pH is 6.5(minimum) to 8.5 (maximum).
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples from Escondido Creek near Harmony Grove were analyzed in the lab.
Temporal Representation:	Samples were collected once each in May and November each year from 11/1998 to

	05/2000.	037965
Environmental Conditions:		
QAPP Information:	QA Info Missing	
QAPP Information Reference(s):		

DECISION ID	46213	Region 9
Escondido Creek		

Pollutant:	**Benthic Community Effects**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

Benthic Community Effects is being considered for placement on the CWA section 303(d) List under sections 3.9 and 3.1 of the Listing Policy. Under section 3.9, an additional line of evidence associating Benthic Community Effects with a water or sediment concentration of pollutant(s) is necessary to assess listing status.

Based on the readily available data and information, the weight of evidence provides sufficient justification for placing Benthic Community Effects in this water segment on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Pursuant to section 3.9 of the Listing Policy, the water exhibits significant degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index.
4. Pursuant to section 3.9 of the Listing Policy, the water segment has associated pollutant(s) samples that exceed water quality objectives.
5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are being met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant(s) contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 46213, Benthic Community Effects	**Region 9**
Escondido Creek	

LOE ID:	73650
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	37
Number of Exceedances:	37
Data and Information Type:	Benthic macroinvertebrate surveys

Data Used to Assess Water Quality:	Thirty-eight of the thirty-eight samples collected had an IBI score below 40. NPDES bioassessment
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the State or Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	
Spatial Representation:	The samples were collected at six different stations on Escondido Creek. Station ESC-CC is the same as station ESC-TWAS-1.
Temporal Representation:	The samples were collected in May and October 2001 to 2008.
Environmental Conditions:	
QAPP Information:	The data was collected under the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan, June 25, 2009.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 46213, Benthic Community Effects **Region 9**

Escondido Creek

LOE ID:	73649
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	The IBI score for this water body was 10 which indicates that this water body may be considered to have impaired conditions.
Data Reference:	RWB9 Status Sampling 2007 and 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams.

	Environmental Management. Volume 35, number 1 (2005): pp. 1-13 037967
Spatial Representation:	Samples were collected at the following station: 904CBESC8 (Escondido Creek 8).
Temporal Representation:	Survey done May 9, 2008.
Environmental Conditions:	
QAPP Information:	Data collected following SWAMP QA protocols for the RWB9 Status Sampling 2007 and 2008 water quality monitoring project.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 46213, Benthic Community Effects **Region 9**

Escondido Creek

LOE ID:	73609
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	24
Number of Exceedances:	3
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Escondido Creek to determine beneficial use support and results are as follows: 3 of 24 samples exceed the criterion for Malathion.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 2 monitoring sites [Escondido Creek - 904ESC-MLS, Escondido Creek - 904ESC-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/8/2002-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 46213, Benthic Community Effects **Region 9**

Escondido Creek

LOE ID:	72755

Pollutant:	Benthic-Macroinvertebrate Bioassessments	037968
LOE Subgroup:	Population/Community Degradation	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	1	
Data and Information Type:	Benthic macroinvertebrate surveys	
Data Used to Assess Water Quality:	The one sample collected had an IBI score below 40. The IBI score for this site was 14.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.	
Guideline Reference:	Development of a Benthic Index of Biotic Integrity (B-IBI) for Wadeable Streams in Northern Coastal California and its Application to Regional 305(b) Assessment	
Spatial Representation:	The sample was collected from Escondido Creek above El Camino Del Norte.	
Temporal Representation:	The sample was collected in May 2009.	
Environmental Conditions:		
QAPP Information:	Samples were collected for the SWAMP RWB9 Stormwater Monitoring Council CY 2009 following SWAMP protocols and stored in the SWAMP database.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 46213, Benthic Community Effects **Region 9**

Escondido Creek

LOE ID:	73584
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 17 samples exceed the criterion for Diazinon.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 2 monitoring sites [Escondido Creek - 904ESC-MLS, Escondido Creek - 904ESC-TWAS-1]
Temporal Representation:	Data was collected over the time period 02/11/2005-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 46213, Benthic Community Effects **Region 9**

Escondido Creek

LOE ID:	73518
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Escondido Creek to determine beneficial use support and results are as follows: 4 of 4 samples exceed the criterion for Bifenthrin.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Bifenthrin does not exceed 0.0006 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 2 monitoring sites [Escondido Creek - 904ESC-MLS, Escondido Creek - 904ESC-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/30/2007-11/4/2008.

Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 46213, Benthic Community Effects **Region 9**

Escondido Creek

LOE ID:	79543
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	39
Number of Exceedances:	18
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	A total of 39 samples were taken at 8 stations in Escondido Creek. Eighteen of the thirty-nine CSCI scores for this site are below the 0.79 threshold, and therefore the site is exceeding the water quality objective for the aquatic life beneficial use.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009 RWB9 Status Sampling 2007 and 2008 Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008. Bioassessment Data for Various Pollutants from Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009. Region 9 CSCI Scores & Water Body Information
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.
Guideline Reference:	The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.
Spatial Representation:	Samples were collected at the following stations: 904CBESC8 904ESC-RSFR 904ESC-MLS 904S00537 904ESC-VC 904ESC-EF 904ESC-TWAS-1 904ESC-HRB
Temporal Representation:	Samples were taken from 2001 to 2009.
Environmental Conditions:	
QAPP Information:	Data collected following SWAMP QA protocols for the RWB9 Status Sampling 2007 and

	2008 water quality monitoring project, the County of San Diego NPDES MS4 Copermittees Receiving Waters Monitoring and Reporting Program, and the SWAMP RWB9 Stormwater Monitoring Council CY 2009.
QAPP Information Reference(s):	RWB9 Stormwater Monitoring Council CY 2009 RWB9 Status Sampling 2007 and 2008 Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.

Line of Evidence (LOE) for Decision ID 46213, Benthic Community Effects **Region 9**

Escondido Creek

LOE ID:	3235
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Not Specified
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Data were collected in 1998 and 1999 for the San Diego Regional Water Quality Control Board 1999 Biological Assessment Annual Report. Physical habitat scores for locatoin EC-HRBranged from 75-98, a relatively low score compared to other sampled waterbodies. BMI scores at this location ranged from average to below average, compared to other sampled waterbodies. (SDRWQCB, 1999-A).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	
Objective/Criterion Reference:	
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected in Escondido Creek 5 riffles downstream of Harmony Grove Bridge (EC-HRB).
Temporal Representation:	Samples were collected in May, September and November 1998 and in May 1999.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 46213, Benthic Community Effects **Region 9**

Escondido Creek

LOE ID:	3237
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Not Specified
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	0
Number of Exceedances:	0

Data and Information Type:	Benthic macroinvertebrate surveys 037972
Data Used to Assess Water Quality:	Data were collected for the San Diego Regional Water Quality Control Board 1999 Biological Assessment Annual Report. The physical habitat score for EC-RSFR) was 86 in 05/1998, lower conpared to other waterbodies. The BMI score was slightly below average at this location, compared to other waterbodies. (SDRWQCB, 1999-A).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	
Objective/Criterion Reference:	
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Escondido Creek at 5 riffles upstream of Rancho Santa Fe Road (EC-RSFR).
Temporal Representation:	Samples were collected in 05/1998.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 46213, Benthic Community Effects **Region 9**

Escondido Creek

LOE ID:	3238
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Not Specified
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Two sets of samples were collected by the Stream Team at Escondido Creek in 2001. For both sets, Taxa Richness was 4.7. For set 1, EPT index was 87.3, and was 88.2 for the second set. Tolerance valuse for sets 1 and 2 were 4.3 and 4.4, respectively. 98.4-100% of feeding groups were either collectors of filterers. (SDRWQCB, 1999-A).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	
Objective/Criterion Reference:	
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Escondido Creek. Two sets of samples were reported. It is unclear whether both sets were taken at the same location.
Temporal Representation:	Samples were collected in Spring of 2001.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 46213, Benthic Community Effects **Region 9**

Escondido Creek

LOE ID:	3236
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Not Specified
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Data were collected in 1998 and 1999 for the San Diego Regional Water Quality Control Board 1999 Biological Assessment Annual Report. Physical habitat quality scores for location EC-EF ranged from 112-150, moderate-higher scores compared to other sampled waterbodies. BMI scores showed locatin EC-EF to be near average compared to other waterbodies sampled. (SDRWQCB, 1999-A).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	
Objective/Criterion Reference:	
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Escondido Creek, 5 riffles downstream of Elfin Forest Resort (EC-EF).
Temporal Representation:	Samples were collected in May, September, and November 1998 and May 1999.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 46213, Benthic Community Effects **Region 9**

Escondido Creek

LOE ID:	3247
Pollutant:	DDT (Dichlorodiphenyltrichloroethane)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	5
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Eight total samples taken at two stations, a total of five samples from two sampling stations exceeded the CTR criteria (SWAMP, 2004).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	San Diego RWQCB Basin Plan: No individual pesticide or combination of pesticides shall be present in the water column, sediments, or biota at concentration(s) that adversely affect beneficial uses. California Toxic Rule: Human Health-FW (water & organisms) .00059 mg/L.

Objective/Criterion Reference:	Placeholder reference 2006 303(d)	037974
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Two Escondido Creek stations located at 33.03393 -117.23565 and at 33.08559 -117.15037.	
Temporal Representation:	Eight samples collected from March through September of 2002.	
Environmental Conditions:	Escondido Creek Watershed; Escondido Creek 904.61.	
QAPP Information:	SWAMP Quality Assurance Plan.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 46213, Benthic Community Effects **Region 9**

Escondido Creek

LOE ID:	3245
Pollutant:	Phosphate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	6
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Eight water samples, six samples exceeding (SWAMP, 2004).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin; 0.1 mg/l in stream and flowing waters.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Two stations at Escondido Creek ESC5, HBA 904.62 (33.08559 -117.15037) and at ESC8, HBA 904.61 (33.03393 -117.23565).
Temporal Representation:	Eight samples collected from March through September of 2002.
Environmental Conditions:	Escondido Creek Watershed; Escondido Creek 904.61 and 904.62.
QAPP Information:	SWAMP Quality Assurance Plan.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 46213, Benthic Community Effects **Region 9**

Escondido Creek

LOE ID:	6258
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	326
Number of Exceedances:	117

Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only) 037975
Data Used to Assess Water Quality:	One hundred seventeen samples out of 326 exceed the water quality objective. Samples were collected by the City of Escondido for monitoring of Escondido Creek. Samples were collected quarterly in 1998 through 2005.
Data Reference:	City of Escondido. 2007. Baseline quarterly monitoring report for Calendar Years 1998-2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. From the Basin Plan, Â“A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional BoardÂ” (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at 15 monitoring stations within Escondido Creek. Sample stations locations were Station 907, 908, 909, 910, 911, 912, 913, 916, 917, 920, 922, 923, 924, and 925. Stations 912 and 916 were grouped as one station due to close proximity.
Temporal Representation:	Samples were collected quarterly in 1999 through 2006.
Environmental Conditions:	Samples were collected during dry and wet weather.
QAPP Information:	Quality assurance conducted according to the City of Escondido's quality assurance manual.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 46213, Benthic Community Effects **Region 9**

Escondido Creek

LOE ID:	7486
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	15
Number of Exceedances:	2
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Selenastrum: None of the 15 samples were found to exhibit toxicity. Hyalella azteca: None of the 15 samples were found to exhibit toxicity. Ceriodaphnia dubia- Two of fifteen samples were found to be toxic as determined by the Ceriodaphnia dubia survival/reproductive test according to results in the San Diego County Municipal Copermittees Annual Progress Report, 2007. The samples were collected from November 2001 through March 2006.
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic lifE.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	Samples were found to exhibit toxicity when the No Observed Effect Concentration (NOEC) or median lethal concentration (LC50) for any given species was estimated to be less than 100% of the test sample concentration (San Diego Water Board, 2007).
Guideline Reference:	Waste Discharge Requirements for Discharges of Urban Runoff From the Municipal Separate Storm Sewer Systems Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego, the San Diego Unified Port District, and the San Diego County Regional Airport. Order No. R9-2007-0001
Spatial Representation:	Samples were collected at the mass loading station in Escondido Creek east of Rancho Santa Fe rd and under the Camino del Norte bridge.
Temporal Representation:	The samples were collected from November 2001 through March 2006.
Environmental Conditions:	
QAPP Information:	Quality control for project was conducted under Weston's quality control plan.
QAPP Information Reference(s):	Weston Solutions, 2004. Quality Management Manual. March 2004 (Revised December 2009).

Line of Evidence (LOE) for Decision ID 46213, Benthic Community Effects **Region 9**

Escondido Creek

LOE ID:	7368
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	8
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	All eight samples exceed the water quality objective according to results in the Surface Water Ambient Monitoring Program Report, 2007. Samples were collected on March 13 and 14, April 24, June 4 and September 17 and 18, 2002.
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at monitoring station, Escondido Creek 5 (station id:904CBESC5, latitude 33.08651, longitude -117.14507) and Escondido Creek 8 (904CBESC8, latitude 33.03492, longitude -117.23632) located on the main stem of Escondido Creek.
Temporal Representation:	Samples were collected on March 13 and 14, April 24, June 4 and September 17 and 18, 2002.
Environmental Conditions:	The first two samples were taken during minimum and declining base flow respectively. The

	last two samples were taken during wet weather, between storm events and high base flow respectively.
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 46213, Benthic Community Effects **Region 9**

Escondido Creek

LOE ID:	7366
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	15
Number of Exceedances:	15
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	All fifteen samples collected exceed the water quality objective according to results in the San Diego County Municipal Copermittees Annual Progress Report, 2007. Samples were collected one to three times a year from 2001 - 2006.
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (RWQCB, 2007). A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at the mass loading station located near the lower boundary of the watershed under the Camino Del Norte Bridge east of Rancho Santa Fe Road along a natural channel in Encinitas.
Temporal Representation:	Samples were collected one to three times a year from 2001 - 2006.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	Quality control of sample collection conducted under Weston Solution's Quality Management Manual 2004.
QAPP Information Reference(s):	Weston Solutions, 2004. Quality Management Manual. March 2004 (Revised December 2009).

Line of Evidence (LOE) for Decision ID 46213, Benthic Community Effects **Region 9**

Escondido Creek

LOE ID:	8887

Pollutant:	Phosphorus	037978
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	8	
Number of Exceedances:	6	
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)	
Data Used to Assess Water Quality:	Water samples were collected at Escondido Creek station 5 904CBESC5 and Escondido Creek station 8 904CBESC8 in March, April, June and September 2002, all three showed excessive phosphorus concentrations according to results in California's Surface Water Ambient Monitoring Program Report, 2007. Samples were collected on March, April, June and September 2002.	
Data Reference:	Monitoring data for Region 9	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters-streams and other flowing waters, with all beneficial uses, the water quality objective for total phosphorus is 0.1 mg/L (RWQCB, 2007).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Escondido Creek station 904CBESC5; (Latitude 33.0863, Longitude -117.1450) and Escondido Creek station 8 904CBESC8; (Latitude 33.03492, Longitude -117.2363)	
Temporal Representation:	Samples were collected on March, April, June and September 2002.	
Environmental Conditions:		
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.	
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA	

Line of Evidence (LOE) for Decision ID 46213, Benthic Community Effects **Region 9**

Escondido Creek

LOE ID:	26718
Pollutant:	Benthic Community Effects
LOE Subgroup:	Adverse Biological Responses
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	35
Number of Exceedances:	35
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Thirty five samples of IBI data were taken from May 2001 to May 2007 at five sampling sites. All 35 of the samples exceeded the IBI impairment threshold.
Data Reference:	Stream Bioassessment Data. Co-permitee Data. Collected 2002-2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be

	determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at five sites: ESC-CC, ESC-EF, ESC-HRB, ESC-RSFR, and ESC-VC on Escondido Creek.
Temporal Representation:	Sampling occurred during May and October for a period of seven years from May 2001 to May 2007.
Environmental Conditions:	
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Manual for Freshwater Bioassessment.
QAPP Information Reference(s):	Quality Assurance Manual for Freshwater Bioassessment Revision 0

Line of Evidence (LOE) for Decision ID 46213, Benthic Community Effects **Region 9**

Escondido Creek

LOE ID:	26480
Pollutant:	Sediment Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	3
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	A total of eight samples were analyzed for toxicity. Four samples each were collected at Escondido Creek 5 and Escondido Creek 8. Hyalella azteca- Three of the eight samples exhibited sediment toxicity. Samples were collected in March, April, June and May of 2002 as part of California's Surface Water Ambient Monitoring Program.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. Samples were found to exhibit toxicity when the No Observed Effect Concentration (NOEC) or median lethal concentration (LC50) for any given species was estimated to be less than 100% of the test sample concentration (San Diego Water Board, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Samples were found to exhibit toxicity when the No Observed Effect Concentration (NOEC) or median lethal concentration (LC50) for any given species was estimated to be less than

	100% of the test sample concentration. 037980
Guideline Reference:	Waste Discharge Requirements for Discharges of Urban Runoff From the Municipal Separate Storm Sewer Systems Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego, the San Diego Unified Port District, and the San Diego County Regional Airport. Order No. R9-2007-0001
Spatial Representation:	Samples were collected at the monitoring station Escondido Creek 5 (904CBESC5 latitude; 33.0865, longitude -117.14507) and 904CBESC8, latitude: 33.03492, longitude -117.23632 located on the main stem of Escondido Creek.
Temporal Representation:	The samples were collected in March, April, June, and September 2002.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 46213, Benthic Community Effects **Region 9**

Escondido Creek

LOE ID:	26384
Pollutant:	Benthic Community Effects
LOE Subgroup:	Adverse Biological Responses
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	17
Number of Exceedances:	17
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Seventeen samples of IBI data were taken from May 1998 to 2007 at four sampling sites. All 17 samples exceeded the IBI impairment threshold.
Data Reference:	Fish and Game IBI Data Southern California Postfire Study. Index of Biotic Integrity. 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at four sites: 904ECEFxx, 904ECHRBx, 904ECRSFR, and 904ECHGxx on Escondido Creek.
Temporal Representation:	Sampling occurred during one to three events from May 1998 to 2007.
Environmental Conditions:	
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Project Plan for the California Stream Bioassessment Procedure and the

	State of California, California Monitoring an Assessment Program: "CMAP", Quality Assurance Project Plan.
QAPP Information Reference(s):	State of California, California Monitoring and Assessment Program: "CMAP". Quality Assurance Project Plan for the California Stream Bioassessment Procedure The San Diego Stream Team Quality Assurance Project Plan

Line of Evidence (LOE) for Decision ID 46213, Benthic Community Effects **Region 9**

Escondido Creek

LOE ID:	73566
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	27
Number of Exceedances:	7
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Twenty-seven samples were collected to test for toxicity. Seven of the 27 samples exhibited statistically significant toxicity. The toxicity tests that exhibited significant toxicity included survival of Hyalella azteca, growth of Selenastrum capriconutum and survival and reproduction of Ceriodaphnia dubia.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected at stations 904EC-MLS and 904EC-TWAS-1 Escondido Creek.
Temporal Representation:	The samples were collected from 2001 to 2008.
Environmental Conditions:	
QAPP Information:	The data was collected under the County of San Diego Co-Permittees Receiving Waters Urban Runoff Monitoring and Reporting Program (Order No. 2007-01). Data quality is good.
QAPP Information Reference(s):	e-mail clarifying QAPP information

DECISION ID **47722** **Region 9**

Escondido Creek

Pollutant:	**Bifenthrin**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2027
Impairment from Pollutant or	Pollutant

Pollution: 037982

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary and under section 3.6 at least two lines of evidence are necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. Four of the Five samples exceed the Water Quality Criteria for Bifenthrin.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Four of Five samples exceed the Water Quality Criteria for Bifenthrin and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 47722, Bifenthrin **Region 9**

Escondido Creek

LOE ID:	73518
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Escondido Creek to determine beneficial use support and results are as follows: 4 of 4 samples exceed the criterion for Bifenthrin.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Bifenthrin does not exceed 0.0006 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.

Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 2 monitoring sites [Escondido Creek - 904ESC-MLS, Escondido Creek - 904ESC-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/30/2007-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 47722, Bifenthrin **Region 9**

Escondido Creek

LOE ID:	73653
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Bifenthrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Bifenthrin does not exceed 0.0006 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]
Temporal Representation:	Data was collected on a single day 5/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47722, Bifenthrin **Region 9**

Escondido Creek

LOE ID:	73566
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	27	037984
Number of Exceedances:	7	
Data and Information Type:	TOXICITY TESTING	
Data Used to Assess Water Quality:	Twenty-seven samples were collected to test for toxicity. Seven of the 27 samples exhibited statistically significant toxicity. The toxicity tests that exhibited significant toxicity included survival of Hyalella azteca, growth of Selenastrum capriconutum and survival and reproduction of Ceriodaphnia dubia.	
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.	
Guideline Reference:		
Spatial Representation:	The samples were collected at stations 904EC-MLS and 904EC-TWAS-1 Escondido Creek.	
Temporal Representation:	The samples were collected from 2001 to 2008.	
Environmental Conditions:		
QAPP Information:	The data was collected under the County of San Diego Co-Permittees Receiving Waters Urban Runoff Monitoring and Reporting Program (Order No. 2007-01). Data quality is good.	
QAPP Information Reference(s):	e-mail clarifying QAPP information	

Line of Evidence (LOE) for Decision ID 47722, Bifenthrin **Region 9**

Escondido Creek

LOE ID:	73651
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Bifenthrin.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for bifenthrin is the median lethal concentration (LC50) of 0.43 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 0.43 ug/g is the geometric mean of LC50 values for bifenthrin from Amweg et al. (2005) and Amweg and Weston (2007).
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA.

	Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No Whole-sediment toxicity identification evaluation tools for pyrethroid insecticides: I. piperonyl butoxide addition. Environ. Toxicol. Chem. 26:2389-2396.
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek at Camino del Norte - 904ESCOxx]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID 47742 — Region 9

Escondido Creek

Pollutant:	**Malathion**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2027
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Four lines of evidence are available in the administrative record to assess this pollutant. Three of the 31 samples exceed the Water Quality Criteria for Malathion. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Three of 31 samples exceed the Water Quality Criteria for Malathion and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 47742, Malathion — Region 9

Escondido Creek

LOE ID:	73610
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Warm Freshwater Habitat	037986
Number of Samples:	7	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 7 samples exceed the criterion for Malathion.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.	
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013	
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 2 monitoring sites [Escondido Creek @ El Camino Del Norte, Escondido Creek @ East County Club Drive]	
Temporal Representation:	Data was collected over the time period 6/20/2006-6/18/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 47742, Malathion **Region 9**

Escondido Creek

LOE ID:	73608
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	24
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 24 samples exceed the criterion for Malathion.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	The USEPA drinking water lifetime health advisory for malathion is 500 Âµg/L.
Guideline Reference:	2011 Edition of the Drinking Water Standards and Health Advisories
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 2 monitoring sites [Escondido Creek - 904ESC-MLS, Escondido Creek - 904ESC-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/8/2002-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 47742, Malathion **Region 9**

Escondido Creek

LOE ID:	73609
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	24
Number of Exceedances:	3
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Escondido Creek to determine beneficial use support and results are as follows: 3 of 24 samples exceed the criterion for Malathion.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 2 monitoring sites [Escondido Creek - 904ESC-MLS, Escondido Creek - 904ESC-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/8/2002-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 47742, Malathion 037988 **Region 9**

Escondido Creek

LOE ID:	77745
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 8 samples exceed the criterion for Malathion.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Department of Public Health (CDPH) archived advisory level criteria for malathion in drinking water is 160.0 ug/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 2 monitoring sites [Escondido Creek @ El Camino Del Norte, Escondido Creek @ East County Club Drive]
Temporal Representation:	Data was collected over the time period 6/20/2006-6/18/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **33920** **Region 9**

Escondido Creek

Pollutant:	**DDT (Dichlorodiphenyltrichloroethane)**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the section 303(d) list under sections 3.1 and 3.6 of the Listing Policy. Under section 3.6 an additonal line of evidence is necessary to assess listing status.

Five lines of evidence are available in the administrative record to assess this pollutant. Five out of the

8 samples exceed the California Toxic Rule: Human Health-FW (water & organisms) criterion of 0.00059 mg/L.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Five of 8 samples exceeded the CTR criterion and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 33920, DDT (Dichlorodiphenyltrichloroethane) Region 9

Escondido Creek

LOE ID:	6231
Pollutant:	DDT (Dichlorodiphenyltrichloroethane)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Data reviewed was from the City of Escondido's Live Stream Discharge monitoring of Escondido Creek. Quarterly sample occurred between 2004 and 2005. Six samples were collected and analyzed for pesticides however the detection limits were less than 5.0 ug/liter. Well above the CTR criteria.
Data Reference:	City of Escondido. 2007. Baseline quarterly monitoring report for Calendar Years 1998-2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the CTR, the DDT criterion for protection of human health is 0.00059 ug/L (USEPA, 2000).
Objective/Criterion Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at 3 monitoring stations within Escondido Creek. Sample stations locations were Station 912, 916, and 917. Stations 912 and 916 were grouped as one station due to close proximity.
Temporal Representation:	Samples were collected quarterly in 2004 and 2005
Environmental Conditions:	Samples were collected during dry weather.
QAPP Information:	Quality control for the toxicity portion of this study was conducted in accordance with the City of Escondido's NPDES monitoring program.

QAPP Information Reference(s): 037990

Line of Evidence (LOE) for Decision ID 33920, DDT (Dichlorodiphenyltrichloroethane) Region 9

Escondido Creek

LOE ID:	73579
Pollutant:	DDD (Dichlorodiphenyldichloroethane)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for DDD.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for sum of DDD (o,p' + p,p') is 28.0 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek at Camino del Norte - 904ESCOxx]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 33920, DDT (Dichlorodiphenyltrichloroethane) Region 9

Escondido Creek

LOE ID:	73580
Pollutant:	DDT (Dichlorodiphenyltrichloroethane)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for DDT.

Data Reference:	Statewide Stream Pollution Trends Study 2008	037991
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for sum of DDT (o,p' + p,p') is 62.9 ug/Kg dry weight (MacDonald et al. 2000).	
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31	
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek at Camino del Norte - 904ESCOxx]	
Temporal Representation:	Data was collected on a single day 5/21/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.	
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)	

Line of Evidence (LOE) for Decision ID 33920, DDT (Dichlorodiphenyltrichloroethane) Region 9

Escondido Creek

LOE ID:	73553
Pollutant:	Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for DDT, Total.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for total DDTs (Sum DDT + Sum DDD + Sum DDE) is 572 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek at Camino del Norte - 904ESCOxx]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient

Line of Evidence (LOE) for Decision ID 33920, DDT (Dichlorodiphenyltrichloroethane) **Region 9**

Escondido Creek

LOE ID:	3247
Pollutant:	DDT (Dichlorodiphenyltrichloroethane)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	5
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Eight total samples taken at two stations, a total of five samples from two sampling stations exceeded the CTR criteria (SWAMP, 2004).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	San Diego RWQCB Basin Plan: No individual pesticide or combination of pesticides shall be present in the water column, sediments, or biota at concentration(s) that adversely affect beneficial uses. California Toxic Rule: Human Health-FW (water & organisms) .00059 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Two Escondido Creek stations located at 33.03393 -117.23565 and at 33.08559 -117.15037.
Temporal Representation:	Eight samples collected from March through September of 2002.
Environmental Conditions:	Escondido Creek Watershed; Escondido Creek 904.61.
QAPP Information:	SWAMP Quality Assurance Plan.
QAPP Information Reference(s):	

DECISION ID **33919** **Region 9**

Escondido Creek

Pollutant:	**Manganese**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for removal from the section 303(d) list under section 4.1 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status. Five lines of evidence are available in the administrative record to assess pollutant. Twelve of 28 samples exceed the water quality objective for manganese.

037993

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the section 303(d) list.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Twelve of 28 samples exceeded the secondary MCL for manganese and this exceeds the allowable frequency listed in Table Table 4.1 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 33919, Manganese **Region 9**

Escondido Creek

LOE ID:	73617
Pollutant:	Manganese
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Manganese.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for manganese is 0.05 mg/L (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]
Temporal Representation:	Data was collected on a single day 5/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 33919, Manganese **Region 9**

Escondido Creek

LOE ID:	6240
Pollutant:	Manganese
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	Total	037994
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	8	
Number of Exceedances:	2	
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)	
Data Used to Assess Water Quality:	Two out of eight samples exceeded the water quality objective. Samples were collected by the City of Escondido for monitoring of Escondido Creek. Samples were collected quarterly in 2003 through 2005.	
Data Reference:	City of Escondido. 2007. Baseline quarterly monitoring report for Calendar Years 1998-2006	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan, the manganese water quality objective for Escondido Creek is 0.05 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period (RWQCB, 2007).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at 6 monitoring stations within Escondido Creek. Sample stations locations were Station 910, 912, 916, 917, 920, and 923. Stations 912 and 916 were grouped as one station due to close proximity.	
Temporal Representation:	Samples were collected quarterly in 2003 through 2005.	
Environmental Conditions:	Samples were collected during dry weather.	
QAPP Information:	Samples were collected and analyzed in compliance with the City of Escondido's Quality Assurance Program 2009.	
QAPP Information Reference(s):	City of Escondido, 2009. Quality Assurance Program, City of Escondido Water Quality Lab. Janurary 2009	

Line of Evidence (LOE) for Decision ID 33919, Manganese **Region 9**

Escondido Creek

LOE ID:	3246
Pollutant:	Manganese
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	12
Number of Exceedances:	6
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Twelve water samples, six samples exceeding (SWAMP, 2004).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The water quality objective for manganese in Escondido Creek is 0.05 milligrams/liter (mg/L) according to Basin Plan, Table 3-2 entitled, Water Quality Objectives. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Two stations at Escondido Creek ESC5, HBA 904.62 (33.08559 -117.15037) and ESC8, HBA 904.61(33.03393 -117.23565).
Temporal Representation:	Twelve samples collected from March through September of 2002.
Environmental Conditions:	Escondido Creek Watershed; Escondido Creek 904.61 and 904.62
QAPP Information:	SWAMP Quality Assurance Plan.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33919, Manganese **Region 9**

Escondido Creek

LOE ID:	8884
Pollutant:	Manganese
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	3
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Seven water samples were collected at Escondido Creek 5 Station 904CBESC5 and Escondido Creek 8 Station 904CBESC8 on March, April, June and September 2002. Three of the seven samples exceed the secondard drinking water standard for manganese according to results in California's Surface Water Ambient Monitoring Program Report, 2007. Samples were collected in March, April, June and September 2002.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The secondary drinking water standard for manganese is 0.05 mg/l (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Water samples were collected at Escondido Creek 5 Station 904CBESC8; (Latitude 33.0861, Longitude -117.1449) and Escondido Creek 8 Station 904CBESC8; (Latitude 33.0348, Longitude -117.2363).
Temporal Representation:	Samples were collected in March, April, June and September 2002.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 33919, Manganese **Region 9**

Escondido Creek

LOE ID:	73611
Pollutant:	Manganese
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1

Number of Exceedances:	1	037996
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Manganese.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Manganese objective for the protection of aquatic life according to Table 3-2 for Escondido Creek within the Carlsbad Hydrologic Unit is 0.05 mg/L.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]	
Temporal Representation:	Data was collected on a single day 5/4/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID	**33133**	**Region 9**
Escondido Creek		

Pollutant:	**Phosphate**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for removal from the section 303(d) list under section 4.1 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. One hundred and twenty-nine of the 342 samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the section 303(d) list.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One hundred and twenty-nine of the 342 samples exceeded the basin plan water quality goal and this exceeds the allowable frequency according to Table 4.1
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision

This is a decision previously approved by the State Water Resources Control Board and the USEPA.

Recommendation: No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33133, Phosphate **Region 9**

Escondido Creek

LOE ID:	8887
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	6
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Water samples were collected at Escondido Creek station 5 904CBESC5 and Escondido Creek station 8 904CBESC8 in March, April, June and September 2002, all three showed excessive phosphorus concentrations according to results in California's Surface Water Ambient Monitoring Program Report, 2007. Samples were collected on March, April, June and September 2002.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters-streams and other flowing waters, with all beneficial uses, the water quality objective for total phosphorus is 0.1 mg/L (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Escondido Creek station 904CBESC5; (Latitude 33.0863, Longitude -117.1450) and Escondido Creek station 8 904CBESC8; (Latitude 33.03492, Longitude -117.2363)
Temporal Representation:	Samples were collected on March, April, June and September 2002.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 33133, Phosphate **Region 9**

Escondido Creek

LOE ID:	3245
Pollutant:	Phosphate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	6

Data and Information Type:	Not Specified	037998
Data Used to Assess Water Quality:	Eight water samples, six samples exceeding (SWAMP, 2004).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin; 0.1 mg/l in stream and flowing waters.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Two stations at Escondido Creek ESC5, HBA 904.62 (33.08559 -117.15037) and at ESC8, HBA 904.61 (33.03393 -117.23565).	
Temporal Representation:	Eight samples collected from March through September of 2002.	
Environmental Conditions:	Escondido Creek Watershed; Escondido Creek 904.61 and 904.62.	
QAPP Information:	SWAMP Quality Assurance Plan.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33133, Phosphate **Region 9**

Escondido Creek

LOE ID:	6258
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	326
Number of Exceedances:	117
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	One hundred seventeen samples out of 326 exceed the water quality objective. Samples were collected by the City of Escondido for monitoring of Escondido Creek. Samples were collected quarterly in 1998 through 2005.
Data Reference:	City of Escondido. 2007. Baseline quarterly monitoring report for Calendar Years 1998-2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. From the Basin Plan, Â“A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional BoardÂ” (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at 15 monitoring stations within Escondido Creek. Sample stations locations were Station 907, 908, 909, 910, 911, 912, 913, 916, 917, 920, 922, 923, 924, and 925. Stations 912 and 916 were grouped as one station due to close proximity.
Temporal Representation:	Samples were collected quarterly in 1999 through 2006.
Environmental Conditions:	Samples were collected during dry and wet weather.
QAPP Information:	Quality assurance conducted according to the City of Escondido's quality assurance manual.

QAPP Information Reference(s): 037999

DECISION ID	33685	Region 9
Escondido Creek		

Pollutant:	**Total Dissolved Solids**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification in favor of removing this water segment-pollutant combination from the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. The 348 of 354 samples exceeded the Basin Plan criteria, and these exceed the allowable frequency listed in Table 4.2 of the Listing Policy. 4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 33685, Total Dissolved Solids	**Region 9**
Escondido Creek	

LOE ID:	73554
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Dissolved Solids.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	The California Secondary MCL for Dissolved Solids is 500 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]
Temporal Representation:	Data was collected on a single day 5/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 33685, Total Dissolved Solids **Region 9**

Escondido Creek

LOE ID:	73555
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Dissolved Solids.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Dissolved Solids objective for the protection of aquatic life according to Table 3-2 for Escondido Creek within the Carlsbad Hydrologic Unit is 500 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]
Temporal Representation:	Data was collected on a single day 5/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 33685, Total Dissolved Solids **Region 9**

Escondido Creek

LOE ID:	73565
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat

Number of Samples:	1	038001
Number of Exceedances:	1	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Dissolved Solids.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Dissolved Solids objective for the protection of aquatic life according to Table 3-2 for Escondido Creek within the Carlsbad Hydrologic Unit is 500 mg/L.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]	
Temporal Representation:	Data was collected on a single day 5/4/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 33685, Total Dissolved Solids **Region 9**

Escondido Creek

LOE ID:	6250
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	354
Number of Exceedances:	348
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Three hundred fifty four sample out of 348 exceed the water quality objective. Samples were collected by the City of Escondido for monitoring of Escondido Creek. Samples were collected 1998 through 2005.
Data Reference:	City of Escondido. 2007. Baseline quarterly monitoring report for Calendar Years 1998-2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, the total dissolved solids water quality objective for Escondido Creek is 500 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at 14 monitoring stations within Escondido Creek. Sample stations locations were Station 907, 908, 909, 910, 911, 912, 913, 916, 917, 920, 922, 923, 924, and 925. Stations 912 and 916 were grouped as one station due to close proximity.
Temporal Representation:	Samples were collected quarterly in 1998 through 2005.
Environmental Conditions:	Samples were collected during dry and wet weather.

QAPP Information:	Quality control for the water chemisty was conducted in accordance with the City of Escondido's NPDES monitoring program.
QAPP Information Reference(s):	City of Escondido, 2009. Quality Assurance Program, City of Escondido Water Quality Lab. Janurary 2009

Line of Evidence (LOE) for Decision ID 33685, Total Dissolved Solids **Region 9**

Escondido Creek

LOE ID:	3218
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	5
Number of Exceedances:	3
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by DWR from 1998 to 2000. Three of 5 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for TDS is 500 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Escondido Creek near Harmony Grove.
Temporal Representation:	Samples were collected once each in May and November each year from 05/1998 to 11/2000.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33685, Total Dissolved Solids **Region 9**

Escondido Creek

LOE ID:	3217
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 1998. One sample was collected, it was in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for TDS is 500 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Escondido creek at the intersection of Elfin Forest and Harmony Grove.
Temporal Representation:	Samples were collected on 06/03/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33685, Total Dissolved Solids **Region 9**

Escondido Creek

LOE ID:	3216
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 1998. One sample was collected, it was in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for TDS is 500 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Escondido Creek below Harmony Grove Bridge.
Temporal Representation:	Samples were collected on 06/03/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33879** **Region 9**

Escondido Creek

Pollutant:	**Beryllium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or	Pollutant

Pollution: 038004

Regional Board Conclusion: Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

One line of evidence is available in the administrative record to assess this pollutant. A single sample was collected and it did not exceed the Basin Plan criteria, but the number of samples is insufficient to determine with the confidence and power required by the Listing Policy.
Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33879, Beryllium **Region 9**

Escondido Creek

LOE ID:	3224
Pollutant:	Beryllium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 1998. 1 sample was collected, it was not in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for Beryllium is 0.004 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Escondido Creek at the intersection of Elfin Forest and Harmony Grove.
Temporal Representation:	One sample was collected on 06/03/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **44234** **Region 9**

Escondido Creek

Pollutant:	**Boron**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)

Revision Status	Original	038005
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

One line of evidence is available in the administrative record to assess this pollutant. None of the 4 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 44234, Boron **Region 9**

Escondido Creek

LOE ID:	3242
Pollutant:	Boron
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by DWR from 1998-2000. None of the 4 samples were in exceedance. (S.D. Dept. of Water Resources).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin plan: For inland surface waters and all beneficial uses, the WQO for Boron is 0.75 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Escondido Creek near Harmony Grove.
Temporal Representation:	Samples were collected once each in May and November each year from 11/1998 to 05/2000.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

DECISION ID **34091** **Region 9**

Escondido Creek

Pollutant:	**Mercury**	038006
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)	
Revision Status	Original	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

One line of evidence is available in the administrative record to assess this pollutant. A single sample was collected and it did not exceed the Basin Plan criteria, but the number of samples is insufficient to determine with the confidence and power required by the Listing Policy.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34091, Mercury **Region 9**

Escondido Creek

LOE ID:	3228
Pollutant:	Mercury
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 1998. One sample was collected, it was not in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for mercury is 0.002 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Escondido Creek at the intersection of Elfin Forest and Harmony Grove.
Temporal Representation:	Samples were collected on 06/03/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **35906** **Region 9**

Escondido Creek 038007

Pollutant:	**Oxygen, Dissolved**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. One of the one sample exceed the Basin Plan Objective for Oxygen, Dissolved.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of one sample exceeded the Basin Plan Objective for Oxygen, Dissolved and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 35906, Oxygen, Dissolved — Region 9

Escondido Creek

LOE ID:	3239
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by DWR from 1998 to 2000. None of the 5 samples were in exceedance. (S.D. Department of Water Resources).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: Dissolved oxygen levels shall not be less than 5.0 mg/l in inland surface waters with designated MAR or WARM beneficial uses or less than 6.0 mg/l in waters with designated COLD beneficial uses. The annual mean dissolved oxygen concentrations shall not be less than 7 mg/l more than 10% of the time.

Objective/Criterion Reference:	Placeholder reference 2006 303(d)	038008
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Escondido Creek near Harmony Grove.	
Temporal Representation:	Samples were collected once each in May and November during each year from 05/1998 to 05/2000.	
Environmental Conditions:		
QAPP Information:	QA Info Missing	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 35906, Oxygen, Dissolved **Region 9**

Escondido Creek

LOE ID:	73643
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Oxygen, Dissolved.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan, San Diego Basin, Warm Water Habitat Objective, Chapter III, General Objectives for all Inland Surface Waters, Enclosed Bays and Estuaries states the following: The dissolved oxygen concentration for warm water habitats shall not be reduced below 5.0 mg/l at any time.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]
Temporal Representation:	Data was collected on a single day 5/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 35906, Oxygen, Dissolved **Region 9**

Escondido Creek

LOE ID:	73644
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved

Beneficial Use:	Cold Freshwater Habitat	038009
Number of Samples:	1	
Number of Exceedances:	1	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Escondido Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Oxygen, Dissolved.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan, San Diego Basin, Cold Water Habitat Objective, Chapter III, General Objectives for all Inland Surface Waters, Enclosed Bays and Estuaries states the following: The dissolved oxygen concentration for cold water habitats shall not be reduced below 8.0 mg/l at any time.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Escondido Creek was collected at 1 monitoring site [Escondido Creek above El Camino Del Norte - 904S00537]	
Temporal Representation:	Data was collected on a single day 5/4/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID 33620 Region 9

Escondido Creek

Pollutant:	**Thallium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. One line of evidence is available in the administrative record to assess this pollutant. A single sample was collected and it did not exceed the Basin Plan criteria, but the number of samples is insufficient to determine with the confidence and power required by the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33620, Thallium Region 9

Escondido Creek

LOE ID:	3233

Pollutant:	Thallium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 1998. One sample was collected, it was not in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for thallium is 0.002 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Escondido Creek at the intersection of Elfin Forest and Harmony Grove.
Temporal Representation:	Samples were collected on 06/03/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID	43310	Region 9
Escondido Creek		

Pollutant:	**Nitrogen**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. Twenty-four of the 24 samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.

2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 938011
3. Twenty-four of the 24 samples exceed the Basin Plan objective and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 43310, Nitrogen **Region 9**

Escondido Creek

LOE ID:	7366
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	15
Number of Exceedances:	15
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	All fifteen samples collected exceed the water quality objective according to results in the San Diego County Municipal Copermittees Annual Progress Report, 2007. Samples were collected one to three times a year from 2001 - 2006.
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (RWQCB, 2007). A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at the mass loading station located near the lower boundary of the watershed under the Camino Del Norte Bridge east of Rancho Santa Fe Road along a natural channel in Encinitas.
Temporal Representation:	Samples were collected one to three times a year from 2001 - 2006.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	Quality control of sample collection conducted under Weston Solution's Quality Management Manual 2004.
QAPP Information Reference(s):	Weston Solutions, 2004. Quality Management Manual. March 2004 (Revised December 2009).

Line of Evidence (LOE) for Decision ID 43310, Nitrogen **Region 9**

Escondido Creek

LOE ID:	7369
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	One sample was collected and it exceeds the water quality objective. The report was submitted to the San Diego Regional Water Quality Control Board Report in June 2006 as part of the Surface Ambient Monitoring Program. The sample was collected on June 13, 2006.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at the monitoring station Escondido Creek 5 (station id: 904CBESC5 lat/long: 33.008651/-117.14506), located on the main stem of Escondido Creek.
Temporal Representation:	The sample was collected on June 13, 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 43310, Nitrogen **Region 9**

Escondido Creek

LOE ID:	7368
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	8

Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	All eight samples exceed the water quality objective according to results in the Surface Water Ambient Monitoring Program Report, 2007. Samples were collected on March 13 and 14, April 24, June 4 and September 17 and 18, 2002.
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at monitoring station, Escondido Creek 5 (station id:904CBESC5, latitude 33.08651, longitude -117.14507) and Escondido Creek 8 (904CBESC8, latitude 33.03492, longitude -117.23632) located on the main stem of Escondido Creek.
Temporal Representation:	Samples were collected on March 13 and 14, April 24, June 4 and September 17 and 18, 2002.
Environmental Conditions:	The first two samples were taken during minimum and declining base flow respectively. The last two samples were taken during wet weather, between storm events and high base flow respectively.
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Kit Carson Creek
Water Body ID: CAR9052100020010926132824
Water Body Type: River & Stream

DECISION ID 43934 **Region 9**
Kit Carson Creek

Pollutant: **Benthic Community Effects**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: Benthic Community Effects is being considered for placement on the CWA section 303(d) List under sections 3.9 and 3.1 of the Listing Policy. Under section 3.9, an additional line of evidence associating Benthic Community Effects with a water or sediment concentration of pollutant(s) is necessary to assess listing status.

Based on the readily available data and information, the weight of evidence does not provide sufficient justification for placing Benthic Community Effects in this water segment on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Pursuant to section 3.9 of the Listing Policy, it is unknown if the water exhibits significant degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index. Carry-over bioassessment data did not have California Stream Condition Index scores calculated.
4. Pursuant to section 3.9 of the Listing Policy, the water segment has associated pollutant(s) samples that exceed water quality objectives.
5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are being met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 43934, Benthic Community Effects **Region 9**
Kit Carson Creek

LOE ID: 3255

Pollutant: Benthic-Macroinvertebrate Bioassessments
LOE Subgroup: Population/Community Degradation
Matrix: Not Specified
Fraction: None

Beneficial Use: Municipal & Domestic Supply

Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Data were collected by the Stream Team in 2000 and 2001. Taxa Richness increased from Fall to Spring from 3.7 to 7.0. EPT index increased from 1.1 to 11.2. Tolerance value decreased from 6.7 to 5.8. For both seasons, the dominant feeding group was collectors. (Stream Team, 2001).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No objective.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Kit Carson Creek. Exact location was not reported.
Temporal Representation:	Samples were collected in Fall 2000 and Spring 2001.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43934, Benthic Community Effects **Region 9**

Kit Carson Creek

LOE ID:	26403
Pollutant:	Benthic Community Effects
LOE Subgroup:	Adverse Biological Responses
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	2
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Two samples of IBI data were taken on November 2000 and May 2003 at one sampling site. Of the total number of samples, all two of the samples exceeded the IBI impairment threshold.
Data Reference:	Fish and Game IBI Data
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. (SDRWQCB, 1995)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)

Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal Californ038016eams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at one site: 905KCCSDx on Kit Carson Creek.
Temporal Representation:	Sampling occurred during one event on November 2000 and May 2003.
Environmental Conditions:	
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Project Plan for the California Stream Bioassessment Procedure and the State of California, California Monitoring an Assessment Program: "CMAP", Quality Assurance Project Plan.
QAPP Information Reference(s):	State of California, California Monitoring and Assessment Program: "CMAP". Quality Assurance Project Plan for the California Stream Bioassessment Procedure The San Diego Stream Team Quality Assurance Project Plan

Line of Evidence (LOE) for Decision ID 43934, Benthic Community Effects **Region 9**

Kit Carson Creek

LOE ID:	3252
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	11
Number of Exceedances:	10
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1999-2000. Ten of the 11 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for TDS is 500 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Kit Carson Creek at Sunset Drive.
Temporal Representation:	Samples were collected in April-June 1999 and February-April 2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43934, Benthic Community Effects **Region 9**

Kit Carson Creek

LOE ID:	3249
Pollutant:	Pentachlorophenol (PCP)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	2
Number of Exceedances:	2
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 2000. Two of 2 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for pentachlorophenol is 0.001 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Kit Carson Creek at Sunset Dr.
Temporal Representation:	Samples were collected once each on 02/22/2000 and 03/06/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID	33039	Region 9
Kit Carson Creek		

Pollutant:	**Total Dissolved Solids**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Ten of 11samples exceed the water quality objective

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Ten of 11 samples exceeded the 500 mg/L TDS for inland surface waters Basin Plan water quality objective and this exceeds the allowable frequency listed in Table 4.1 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not

changed. 038018

Line of Evidence (LOE) for Decision ID 33039, Total Dissolved Solids **Region 9**

Kit Carson Creek

LOE ID:	3252
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	11
Number of Exceedances:	10
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 1999-2000. Ten of the 11 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for TDS is 500 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Kit Carson Creek at Sunset Drive.
Temporal Representation:	Samples were collected in April-June 1999 and February-April 2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33090** **Region 9**

Kit Carson Creek

Pollutant:	**Picloram**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is

sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used does not satisfy the data quantity requirements of section 6.1.5 of the Policy. QAQC information was not available
3. None of the two samples exceeded the 0.5 mg/L MCL for Picloram water quality objective and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
3. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33090, Picloram **Region 9**

Kit Carson Creek

LOE ID:	3250
Pollutant:	Picloram
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 2000. None of the 2 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Picloram is 0.5 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Kit Carson Creek at Sunset Drive.
Temporal Representation:	Samples were collected once each on 02/22/2000 and 04/18/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **32646** **Region 9**

Kit Carson Creek

Pollutant:	**Simazine**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original

Impairment from Pollutant or Pollution:	Pollutant	038020

Regional Board Conclusion:

Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. A single sample was taken and it did not exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
4. The data satisfies the data quality requirements of section 6.1.4 of the Policy.
5. The data satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Only one sample exceeded the 0.004 mg/L MCL simazine criteria for inland surface water and domestic use. More data is needed to determine if the water quality objective is exceeded.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32646, Simazine **Region 9**

Kit Carson Creek

LOE ID:	3251
Pollutant:	Simazine
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 2000. One sample was collected and was not in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Simazine is 0.004 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Kit Carson Creek at Sunset Drive.
Temporal Representation:	One sample was collected on 03/21/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.

QAPP Information Reference(s): 038021

DECISION ID	33276	Region 9
Kit Carson Creek		

Pollutant:	**Total Suspended Solids (TSS)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. There is not numerical guideline available to determine if water quality objective has been exceeded. Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Only two samples were collected but an adquate guideline is not available to determine the allowable exceedance frequency listed in Table 3.1 of the Listing Policy. 3.Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33276, Total Suspended Solids (TSS)	**Region 9**
Kit Carson Creek	

LOE ID:	3253
Pollutant:	Total Suspended Solids (TSS)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 1999. Two samples were collected. Their TSS concentrations ranged from 2.5-3.3 mg/L. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, waters shall not contain suspended and settleable solids in concentrations of solids that cause nuisance or adversely affect beneficial uses.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Kit Carson Creek at Sunset Drive.
Temporal Representation:	Samples were collected once each on 04/26/1999 and 05/24/1999.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 33400 Region 9

Kit Carson Creek

Pollutant:	**Turbidity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. None of the samples exceed the water quality objective. Application of table 3.2 for a conventional pollutant requires a minimum of five samples Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 3 samples exceeded the 5 NTU for inland turbidity water quality objective and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy. However, a less than 5 samples were collected, which is below the required number of sample size. 3.Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33400, Turbidity Region 9

Kit Carson Creek

LOE ID:	3254

Pollutant:	Turbidity	038023
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	Total	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	3	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 1999. None of the 3 samples were in exceedance. (SWRCB. 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Turbidity is 5 ntu.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Kit Carson Creek at Sunset Drive.	
Temporal Representation:	Samples were collected once each in 04/1999, 05/1999, and 06/1999.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID	**33352**	**Region 9**
Kit Carson Creek		

Pollutant:	**Pentachlorophenol (PCP)**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. An adequate number of samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Two of 2 samples exceeded the 0.001 mg/L MCL for pentachlorophenol in inland surface waters,

water quality objective and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.

4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33352, Pentachlorophenol (PCP) **Region 9**

Kit Carson Creek

LOE ID:	3249
Pollutant:	Pentachlorophenol (PCP)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	2
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 2000. Two of 2 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for pentachlorophenol is 0.001 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Kit Carson Creek at Sunset Dr.
Temporal Representation:	Samples were collected once each on 02/22/2000 and 03/06/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Del Dios Creek
Water Body ID: CAR9052100020011026104034
Water Body Type: River & Stream

DECISION ID 33263 **Region 9**
Del Dios Creek

Pollutant: Chloride
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Original
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of three samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of three samples exceeded thewater quality objective and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33263, Chloride **Region 9**
Del Dios Creek

LOE ID: 3256

Pollutant: Chloride
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Agricultural Supply

Number of Samples:	3	038026
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Samples were collected by the City of San Diego Water Dept.from 04/1999 to 06/1999. None of the 3 samples were in exceedance.	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for Chloride is 250 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected in Del Dios Creek at the "Rd crossing res at entra."	
Temporal Representation:	One sample per day was collected on 04/26/1999, 05/24/1999, and 06/21/1999.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID 33455 **Region 9**

Del Dios Creek

Pollutant:	**Mercury**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. One line of evidence is available in the administrative record to assess this pollutant. The single sample taken did not exceed the Basin Plan criteria, but the number of samples is insufficient to determine with the confidence and power required by the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33455, Mercury **Region 9**

Del Dios Creek

LOE ID:	3257
Pollutant:	Mercury
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total

Beneficial Use:	Agricultural Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. on 04/26/1999. The one sample collected was not in exceedance of the water quality objective.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for mercury is 0.002 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The sample was collected at Del Dios Creek at the "Rd crossing res at entra."
Temporal Representation:	One sample was collected on 04/26/1999.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 32528 — Region 9

Del Dios Creek

Pollutant:	**Nitrate as Nitrate (NO3)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	One line of evidence is available in the administrative record to assess this pollutant. None of the 2 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32528, Nitrate as Nitrate (NO3) — Region 9

Del Dios Creek

LOE ID:	3259
Pollutant:	Nitrate as Nitrate (NO3)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total

Beneficial Use:	Agricultural Supply	038028
Number of Samples:	2	
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 05/1999 and 06/1999. None of the 2 samples were in exceedance.	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for Nitrate as NO3 is 45 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected in Del Dios Creek at the "Rd crossing res at entra."	
Temporal Representation:	One sample per day was collected on 05/24/1999 and 06/21/1999.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID	**32731**	**Region 9**
Del Dios Creek		

Pollutant:	**Sulfates**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Three of the three samples exceed the secondary MSL drinking water standard. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Three of the three samples exceed the secondary MSL drinking water standard and this sample size is insufficient to determine with the power and confidence of the Listing Policy if standards are not met. A minimum of 5 samples is needed for application of table 3.2. 4. Pursuant to [SECTION 3.11/4.11] of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32731, Sulfates **Region 9**

Del Dios Creek

LOE ID:	3258
Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Agricultural Supply
Number of Samples:	3
Number of Exceedances:	3
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 04/1999 to 06/1999. Three of 3 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for sulfate is 250 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Del Dios Creek at the "Rd crossing res at entra."
Temporal Representation:	One sample per day was collected on 04/26/1999, 05/24/1999, and 06/21/1999.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **32545** **Region 9**

Del Dios Creek

Pollutant:	**Total Dissolved Solids**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

One line of evidence is available in the administrative record to assess this pollutant. Three of the 3 samples exceed the Basin Plan criteria, but the number of samples is insufficient to determine with the confidence and power required by the Listing Policy. According to Table 3.2 of the Listing Policy, a minimum sample size of 5 is necessary to determine if water quality standards are met.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32545, Total Dissolved Solids **Region 9**

Del Dios Creek

LOE ID:	3260
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Agricultural Supply
Number of Samples:	3
Number of Exceedances:	3
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 04/1999 to 06/1999. Three of 3 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for TDS is 500. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Del Dios Creek at the "Rd crossing res at entra."
Temporal Representation:	One sample per day was collected on 04/26/1999, 05/24/1999, 06/21/1999.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33499** **Region 9**

Del Dios Creek

Pollutant:	**Turbidity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 3

samples exceed the Basin Plan water quality objective for turbidity. 038031

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 3 samples exceed the Basin Plan water quality objective for turbidity and this sample size is insufficient to determine with the power and confidence of the Listing Policy if standards are not met. A minimum of five samples is needed for application of table 3.2.
4. Pursuant to [SECTION 3.11/4.11] of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33499, Turbidity **Region 9**

Del Dios Creek

LOE ID:	3261
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Agricultural Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 04/1999 to 06/19999. None of the 3 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Turbidity is 5 units.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Del Dios Creek at the "Rd crossing res at entra."
Temporal Representation:	One sample per day was collected on 04/26/1999, 05/24/1999, and 06/21/1999.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Green Valley Creek
Water Body ID: CAR9052200020010926130745
Water Body Type: River & Stream

DECISION ID 33251 **Region 9**
Green Valley Creek

Pollutant: Antimony
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the seven samples exceed the Basin Plan Objective for Antimony.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of seven samples exceeded the Basin Plan Objective for Antimony and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 33251, Antimony **Region 9**
Green Valley Creek

LOE ID: 3266

Pollutant: Antimony
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples:	3	038033
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 03/2000 and 04/2000. None of the 3 samples were in exceedance. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Antimony is 0.006 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Green Valley Creek west of West Bernardo Drive.	
Temporal Representation:	Samples were collected 03/13/2000, 03/21/200, and 04/18/2000. One sample was collected each day.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33251, Antimony **Region 9**

Green Valley Creek

LOE ID:	77762
Pollutant:	Antimony
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Green Valley Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Antimony.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for antimony is .006 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Green Valley Creek was collected at 1 monitoring site [Green Valley Creek - 905SDC-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/30/2007-6/3/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.

QAPP Information Reference(s): Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

038034

DECISION ID	32614	Region 9
Green Valley Creek		

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. Zero of the eight samples exceed the Basin Plan Objective for Arsenic.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of eight samples exceeded the Basin Plan Objective for Arsenic and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 32614, Arsenic	Region 9
Green Valley Creek	

LOE ID:	3267
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 04/1999, 03/2000, and 04/2000. None of the 4 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Arsenic is 0.05 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Green Valley Creek west of West Bernardo Drive.
Temporal Representation:	Samples were collected on 04/26/1999, 03//13/2000, 03/21/2000, and 04/18/2000. One sample was collected on each day.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 32614, Arsenic **Region 9**

Green Valley Creek

LOE ID:	77763
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Green Valley Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Arsenic.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The dissolved arsenic criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved arsenic is 0.150 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Green Valley Creek was collected at 1 monitoring site [Green Valley Creek - 905SDC-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/30/2007-6/3/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 32614, Arsenic **Region 9**

Green Valley Creek 038036

LOE ID:	77764
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Green Valley Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Arsenic.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for arsenic is 0.01 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Green Valley Creek was collected at 1 monitoring site [Green Valley Creek - 905SDC-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/30/2007-6/3/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID **33391** **Region 9**

Green Valley Creek

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Three lines of evidence are available in the administrative record to assess this pollutant. Zero of the eight samples exceed the California Toxics Rule Objective for Cadmium. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of eight samples exceeded the California Toxics Rule Objective for Cadmium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 33391, Cadmium **Region 9**

Green Valley Creek

LOE ID:	77766
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Green Valley Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Cadmium.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for cadmium is 0.005 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Green Valley Creek was collected at 1 monitoring site [Green Valley Creek - 905SDC-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/30/2007-6/3/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 33391, Cadmium **Region 9**

Green Valley Creek

LOE ID:	77765
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Green Valley Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Cadmium.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The dissolved cadmium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved cadmium is 0.0022 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California, 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Green Valley Creek was collected at 1 monitoring site [Green Valley Creek - 905SDC-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/30/2007-6/3/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 33391, Cadmium **Region 9**

Green Valley Creek

LOE ID:	3270
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 04/1999, 03/2000, and 04/2000. None of the 4 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)

SWAMP Data:	Non-SWAMP	038039
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Cadmium is 0.005 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Green Valley Creek west of West Bernardo Drive.	
Temporal Representation:	One sample was collected each day on 04/26/1999, 03/13/2000, 03/21/2000, and 04/18/2000.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33391, Cadmium **Region 9**

Green Valley Creek

LOE ID:	73767
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Green Valley Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Cadmium.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Cadmium to protect aquatic life in freshwater. The dissolved Cadmium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Green Valley Creek was collected at 1 monitoring site [Green Valley Creek - 905SDC-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/30/2007-6/3/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID	33339	Region 9
Green Valley Creek		

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the four samples exceed the California Toxics Rule Objective for Chromium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of four samples exceeded the California Toxics Rule Objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 33339, Chromium	**Region 9**
Green Valley Creek	

LOE ID:	73768
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Green Valley Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Chromium.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved chromium to protect aquatic life in freshwater. The dissolved Chromium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Green Valley Creek was collected at 1 monitoring site [Green Valley Creek - 905SDC-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/30/2007-6/3/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 33339, Chromium **Region 9**

Green Valley Creek

LOE ID:	3272
Pollutant:	Chromium (total)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 04/1999 to 04/2000. None of the 4 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Chromium is 0.05 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Green Valley Creek west of West Bernardo Drive.
Temporal Representation:	One sample was collected each day on 04/26/1999, 03/13/2000, 03/21/2000, and 04/18/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **46269** **Region 9**

Green Valley Creek 038042

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Three lines of evidence are available in the administrative record to assess this pollutant. Zero of the eight samples exceed the Basin Plan Objective for Copper. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of eight samples exceeded the Basin Plan Objective for copper and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 46269, Copper — Region 9

Green Valley Creek

LOE ID:	77767
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Green Valley Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Copper.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for copper is 1.0 mg/L (Title 22 California Code of Regulations).

Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Green Valley Creek was collected at 1 monitoring site [Green Valley Creek - 905SDC-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/30/2007-6/3/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 46269, Copper **Region 9**

Green Valley Creek

LOE ID:	73769
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Green Valley Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Copper.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved copper to protect aquatic life in freshwater. The dissolved copper criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Green Valley Creek was collected at 1 monitoring site [Green Valley Creek - 905SDC-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/30/2007-6/3/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 46269, Copper **Region 9**

Green Valley Creek 038044

LOE ID:	3273
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 04/1999 to 04/2000. None of the 4 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Copper is 1.0 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Green Valley Creek west of West Bernardo Drive.
Temporal Representation:	One sample per day was collected on 04/26/1999, 03/13/2000, 03/21/2000, and 04/18/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **47585** **Region 9**

Green Valley Creek

Pollutant:	**Cypermethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the Zero samples exceed the Water Quality Criteria for Cypermethrin .

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Zero samples exceeded the Water Quality Criteria for Cypermethrin and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial

use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47585, Cypermethrin **Region 9**

Green Valley Creek

LOE ID:	73781
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Green Valley Creek to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Cypermethrin, total.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of cypermethrin does not exceed 0.0002 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Fojut et al. 2012)
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Green Valley Creek was collected at 1 monitoring site [Green Valley Creek - 905SDC-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/30/2007-2/3/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID **47586** **Region 9**

Green Valley Creek 038046

Pollutant:	**Deltamethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the two samples exceed the Evaluation Guideline for Deltamethrin.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of two samples exceeded the Evaluation Guideline for Delthamethrin and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47586, Deltamethrin — Region 9

Green Valley Creek

LOE ID:	73782
Pollutant:	Deltamethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Green Valley Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Deltamethrin.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall

	not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for Deltamethrin is the maximum acceptable toxicant concentration (MATC) of 0.02 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Green Valley Creek was collected at 1 monitoring site [Green Valley Creek - 905SDC-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/30/2007-2/3/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID	**47587**	**Region 9**
Green Valley Creek		

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the four samples exceed the Water Quality Criteria for Diazinon. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of four samples exceeded the Water Quality Criteria for Diazinon and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47587, Diazinon	**Region 9**
Green Valley Creek	

LOE ID:	73783	038048

Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Green Valley Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Diazinon.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Data for this line of evidence for Green Valley Creek was collected at 1 monitoring site [Green Valley Creek - 905SDC-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/30/2007-6/3/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 47587, Diazinon **Region 9**

Green Valley Creek

LOE ID:	73784
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Green Valley Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for

	Diazinon. 038049
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water lifetime health advisory for diazinon is 1 Âµg/L.
Guideline Reference:	2011 Edition of the Drinking Water Standards and Health Advisories
Spatial Representation:	Data for this line of evidence for Green Valley Creek was collected at 1 monitoring site [Green Valley Creek - 905SDC-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/30/2007-6/3/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID	**47648**	**Region 9**
Green Valley Creek		

Pollutant:	**Esfenvalerate/Fenvalerate**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the two samples exceed the Evaluation Guideline for Esfenvalerate/Fenvalerate. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of two samples exceeded the Evaluation Guideline for Esfenvalerate/Fenvalerate and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the

applicable beneficial use support rating. 038050

Line of Evidence (LOE) for Decision ID 47648, Esfenvalerate/Fenvalerate **Region 9**

Green Valley Creek

LOE ID:	73785
Pollutant:	Esfenvalerate/Fenvalerate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Green Valley Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Esfenvalerate.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to the USEPA Office of Pesticide Programs Ecotoxicity database, the aquatic life EC50 for Esfenvalerate is 0.9 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Green Valley Creek was collected at 1 monitoring site [Green Valley Creek - 905SDC-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/30/2007-2/3/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID **47649** **Region 9**

Green Valley Creek

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the four samples exceed the California Toxics Rule Objective for Lead. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of four samples exceeded the California Toxics Rule Objective for Lead and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47649, Lead **Region 9**

Green Valley Creek

LOE ID:	73786
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Green Valley Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Lead.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved lead to protect aquatic life in freshwater. The dissolved lead criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Green Valley Creek was collected at 1 monitoring site [Green Valley Creek - 905SDC-TWAS-1]

Temporal Representation:	Data was collected over the time period 11/30/2007-6/3/2008. 038052
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID 47650 Region 9

Green Valley Creek

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. One of the four samples exceed the Water Quality Criteria for Malathion. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of four samples exceeded the Water Quality Criteria for Malathion and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47650, Malathion Region 9

Green Valley Creek

LOE ID:	73787
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Green Valley Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Malathion.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water lifetime health advisory for malathion is 500 Âµg/L.
Guideline Reference:	2011 Edition of the Drinking Water Standards and Health Advisories
Spatial Representation:	Data for this line of evidence for Green Valley Creek was collected at 1 monitoring site [Green Valley Creek - 905SDC-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/30/2007-6/3/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 47650, Malathion **Region 9**

Green Valley Creek

LOE ID:	73788
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Green Valley Creek to determine beneficial use support and results are as follows: 1 of 4 samples exceed the criterion for Malathion.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for Green Valley Creek was collected at 1 monitoring site [Green Valley Creek - 905SDC-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/30/2007-6/3/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID **33069** **Region 9**

Green Valley Creek

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Three lines of evidence are available in the administrative record to assess this pollutant. Zero of the eight samples exceed the Basin Plan Objective for Nickel. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of eight samples exceeded the Basin Plan Objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 33069, Nickel **Region 9**

Green Valley Creek

LOE ID:	3276
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water

Matrix:	Water	038055
Fraction:	Total	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	4	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 04/1999 to 04/2000. None of the 4 samples were in exceedance. (SWRCB, 2002).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Nickel is 0.1 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Green Valley Creek west of West Bernardo Drive.	
Temporal Representation:	One sample was collected per day on 04/26/1999, 03/13/2000, 03/21/2000, and 04/18/2000.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33069, Nickel **Region 9**

Green Valley Creek

LOE ID:	73789
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Green Valley Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Nickel.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Nickel to protect aquatic life in freshwater. The dissolved Nickel criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Data for this line of evidence for Green Valley Creek was collected at 1 monitoring site [Green Valley Creek - 905SDC-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/30/2007-6/3/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 33069, Nickel **Region 9**

Green Valley Creek

LOE ID:	77768
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Green Valley Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Nickel.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nickel is 0.1 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Green Valley Creek was collected at 1 monitoring site [Green Valley Creek - 905SDC-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/30/2007-6/3/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID **48586** **Region 9**

Green Valley Creek

Pollutant:	**Nitrate/Nitrite (Nitrite + Nitrate as N)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final	New Decision

Listing Decision:		038057
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the Four samples exceed the Basin Plan Objective for Nitrate/Nitrite (Nitrite + Nitrate as N).

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Four samples exceeded the Basin Plan Objective for Nitrate/Nitrite (Nitrite + Nitrate as N) and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48586, Nitrate/Nitrite (Nitrite + Nitrate as N) **Region 9**

Green Valley Creek

LOE ID:	77769
Pollutant:	Nitrate/Nitrite (Nitrite + Nitrate as N)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Green Valley Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Nitrate/Nitrite as N.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrate + nitrite (as N) is 10.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Data for this line of evidence for Green Valley Creek was collected at 1 monitoring site [Green Valley Creek - 905SDC-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/30/2007-6/3/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID 48587 Region 9

Green Valley Creek

Pollutant:	**Nitrogen, Nitrite**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a Single line of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the Four samples exceed the Basin Plan Objective for Nitrogen, Nitrite. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Four samples exceeded the Basin Plan Objective for Nitrogen, Nitrite and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48587, Nitrogen, Nitrite Region 9

Green Valley Creek

LOE ID:	77770
Pollutant:	Nitrogen, Nitrite
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	4	038059
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Green Valley Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Nitrite as N.	
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrite (as N) is 1.0 mg/L (Title 22 of the California Code of Regulations).	
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Green Valley Creek was collected at 1 monitoring site [Green Valley Creek - 905SDC-TWAS-1]	
Temporal Representation:	Data was collected over the time period 11/30/2007-6/3/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.	

DECISION ID	**33402**	**Region 9**
Green Valley Creek		

Pollutant:	**Selenium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. Zero of the eight samples exceed the Basin Plan Objective for selenium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of eight samples exceeded the Basin Plan Objective for Selenium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 33402, Selenium **Region 9**

Green Valley Creek

LOE ID:	77772
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Green Valley Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Selenium.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for selenium is 0.05 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals, CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Green Valley Creek was collected at 1 monitoring site [Green Valley Creek - 905SDC-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/30/2007-6/3/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 33402, Selenium **Region 9**

Green Valley Creek

LOE ID:	3277
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4

Number of Exceedances:	0	038061
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 04/1999 to 04/2000. None of 4 samples were in exceedance. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Selenium is 0.05 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Green Valley Creek west of West Bernardo Drive.	
Temporal Representation:	One sample per day was collected on 04/26/1999, 03/13/2000, 03/21/2000, and 04/18/2000.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33402, Selenium **Region 9**

Green Valley Creek

LOE ID:	77771
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Green Valley Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Selenium.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The selenium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater is 0.005 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Green Valley Creek was collected at 1 monitoring site [Green Valley Creek - 905SDC-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/30/2007-6/3/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.

QAPP Information Reference(s): Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

038062

DECISION ID	47651	Region 9
Green Valley Creek		

Pollutant:	**Surfactants (MBAS)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Four of the Four samples exceed the Evaluation Guideline for Surfactants (MBAS).

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Four of four samples exceeded the Evaluation Guideline for Surfactants (MBAS) and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47651, Surfactants (MBAS)	Region 9
Green Valley Creek	

LOE ID:	78034
Pollutant:	Surfactants (MBAS)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Green Valley Creek to determine beneficial use support and results are as follows: 4 of 4 samples exceed the criterion for MBAS.

Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The Secondary California Maximum Contaminant Level for MBAS is 0.5 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Green Valley Creek was collected at 1 monitoring site [Green Valley Creek - 905SDC-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/30/2007-6/3/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID	44219	Region 9
Green Valley Creek		

Pollutant:	**Benthic Community Effects**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Hydromodification | Illicit Connections/Illegal Hook-ups/Dry Weather Flows | Source Unknown | Unknown Point Source | Urban Runoff/Storm Sewers
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Benthic Community Effects is being considered for placement on the CWA section 303(d) List under sections 3.9 and 3.1 of the Listing Policy. Under section 3.9, an additional line of evidence associating Benthic Community Effects with a water or sediment concentration of pollutant(s) is necessary to assess listing status. Based on the readily available data and information, the weight of evidence provides sufficient justification for placing Benthic Community Effects in this water segment on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. Samples were collected at one station over a six year period. 3. Pursuant to section 3.9 of the Listing Policy, the water exhibits significant degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index. 4. Pursuant to section 3.9 of the Listing Policy, the water segment has associated pollutant(s) samples that exceed water quality objectives. 5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are being met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality

standards are exceeded and a pollutant(s) contributes to or causes the problem. 038064

Line of Evidence (LOE) for Decision ID 44219, Benthic Community Effects **Region 9**

Green Valley Creek

LOE ID:	73790
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	3
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Four samples were collected to test for toxicity. Three of the four samples exhibited statistically significant toxicity. The toxicity tests that exhibited significant toxicity included survival of Hyalella azteca and reproduction of Ceriodaphnia dubia.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected at station 905SDC-TWAS-1 Green Valley Creek.
Temporal Representation:	The samples were collected from 2007 to 2008.
Environmental Conditions:	
QAPP Information:	The data was collected under the County of San Diego Co-Permittees Receiving Waters Urban Runoff Monitoring and Reporting Program (Order No. 2007-01). Data quality is good.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 44219, Benthic Community Effects **Region 9**

Green Valley Creek

LOE ID:	79556
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	11
Number of Exceedances:	9
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Nine of the eleven samples collected had an CSCI score below the 0.79 threshold, and is

	therefore exceeding the water quality objective for the aquatic life beneficial use. 78065
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008. Region 9 CSCI Scores & Water Body Information
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.
Guideline Reference:	The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.
Spatial Representation:	The samples were collected at station 905SDC-TWAS-1 (GVC-WB) on Green Valley Creek.
Temporal Representation:	The samples were collected from 2002 to 2008.
Environmental Conditions:	
QAPP Information:	The data was collected under the County of San Diego NPDES MS4 Copermittees Receiving Waters Monitoring and Reporting Program
QAPP Information Reference(s):	e-mail clarifying QAPP information Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.

Line of Evidence (LOE) for Decision ID 44219, Benthic Community Effects **Region 9**

Green Valley Creek

LOE ID:	78032
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	2
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Green Valley Creek to determine beneficial use support and results are as follows: 2 of 4 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column,

	sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).
Spatial Representation:	Data for this line of evidence for Green Valley Creek was collected at 1 monitoring site [Green Valley Creek - 905SDC-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/30/2007-6/3/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 44219, Benthic Community Effects **Region 9**

Green Valley Creek

LOE ID:	26391
Pollutant:	Benthic Community Effects
LOE Subgroup:	Adverse Biological Responses
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	2
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Two samples of IBI data were taken on November 2000 and June of 2003 at one sampling site. Both of the samples exceeded the IBI impairment threshold.
Data Reference:	Fish and Game IBI Data
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13

Spatial Representation:	Samples were collected at one site: 905GVCWBx on Green Valley Creek.
Temporal Representation:	Sampling occurred during two events on November 2000 and June of 2003.
Environmental Conditions:	
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Project Plan for the California Stream Bioassessment Procedure and the State of California, California Monitoring an Assessment Program: "CMAP", Quality Assurance Project Plan.
QAPP Information Reference(s):	State of California, California Monitoring and Assessment Program: "CMAP". Quality Assurance Project Plan for the California Stream Bioassessment Procedure The San Diego Stream Team Quality Assurance Project Plan

Line of Evidence (LOE) for Decision ID 44219, Benthic Community Effects **Region 9**

Green Valley Creek

LOE ID:	9033
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Four water samples were collected at Green Valley Creek station 2, 905SDGVC2, on January 2003, April 2003, May 2003, and September 2003. All showed excessive nitrogen concentrations according to results in California's Surface Water Ambient Monitoring Program Report, 2007.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses (RWQCB, 2007). A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Water samples were collected at Green Valley Creek Station 2, 905SDGVC2; (Latitude 33.04342, Longitude -117.07557).
Temporal Representation:	Samples were collected on January 2003, April 2003, and May 2003.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 44219, Benthic Community Effects 038068 Region 9

Green Valley Creek

LOE ID:	26719
Pollutant:	Benthic Community Effects
LOE Subgroup:	Adverse Biological Responses
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	10
Number of Exceedances:	10
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Ten samples of IBI data were taken on October 2002 to May 2007 at one sampling site. All ten of the samples exceeded the IBI impairment threshold.
Data Reference:	Stream Bioassessment Data. Co-permitee Data. Collected 2002-2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at one site: GVC-WB on Green Valley Creek.
Temporal Representation:	Sampling occurred during October 2002 and May and October from May 2003 to October 2006 and during May 2007.
Environmental Conditions:	
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Manual for Freshwater Bioassessment.
QAPP Information Reference(s):	Quality Assurance Manual for Freshwater Bioassessment Revision 0

Line of Evidence (LOE) for Decision ID 44219, Benthic Community Effects Region 9

Green Valley Creek

LOE ID:	73766
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	2

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Green Valley Creek to determine beneficial use support and results are as follows: 2 of 2 samples exceed the criterion for Bifenthrin.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Bifenthrin does not exceed 0.0006 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Green Valley Creek was collected at 1 monitoring site [Green Valley Creek - 905SDC-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/30/2007-2/3/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 44219, Benthic Community Effects **Region 9**

Green Valley Creek

LOE ID:	73765
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	11
Number of Exceedances:	11
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Eleven of the eleven samples collected had an IBI score below 40. NPDES bioassessment
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the State or Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions. IBI scale based on 1-70.
Guideline Reference:	
Spatial Representation:	The samples were collected at station GVC-WB on Green Valley Creek.
Temporal Representation:	The samples were collected in May and October 2002 to 2008.
Environmental Conditions:	
QAPP Information:	The data was collected under the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan, June 25, 2009.
QAPP Information Reference(s):	e-mail clarifying QAPP information

DECISION ID 47583 Region 9

Green Valley Creek

Pollutant:	**Bifenthrin**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary and under section 3.6 at least two lines of evidence are necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Two of the Two samples exceed the Water Quality Criteria for Bifenthrin, and Three of the Four samples exceeded the Objective for Water Toxicity. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Two of Two samples exceed the Water Quality Criteria for Bifenthrin and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 47583, Bifenthrin Region 9

Green Valley Creek

LOE ID:	73766
Pollutant:	Bifenthrin

LOE Subgroup:	Pollutant-Water	038071
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	2	
Number of Exceedances:	2	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Green Valley Creek to determine beneficial use support and results are as follows: 2 of 2 samples exceed the criterion for Bifenthrin.	
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Bifenthrin does not exceed 0.0006 ug/L.	
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.	
Spatial Representation:	Data for this line of evidence for Green Valley Creek was collected at 1 monitoring site [Green Valley Creek - 905SDC-TWAS-1]	
Temporal Representation:	Data was collected over the time period 11/30/2007-2/3/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.	

Line of Evidence (LOE) for Decision ID 47583, Bifenthrin **Region 9**

Green Valley Creek

LOE ID:	73790
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	3
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Four samples were collected to test for toxicity. Three of the four samples exhibited statistically significant toxicity. The toxicity tests that exhibited significant toxicity included survival of Hyalella azteca and reproduction of Ceriodaphnia dubia.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected at station 905SDC-TWAS-1 Green Valley Creek.
Temporal Representation:	The samples were collected from 2007 to 2008.
Environmental Conditions:	
QAPP Information:	The data was collected under the County of San Diego Co-Permittees Receiving Waters Urban Runoff Monitoring and Reporting Program (Order No. 2007-01). Data quality is good.
QAPP Information Reference(s):	e-mail clarifying QAPP information

DECISION ID 47584 Region 9

Green Valley Creek

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary and under section 3.6 at least two lines of evidence are necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Two of the 4 samples exceed the Water Quality Criteria for Chlorpyrifos, and Three of the Four samples exceeded the Objective for Water Toxicity. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Two of 4 samples exceed the Water Quality Criteria for Chlorpyrifos and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 47584, Chlorpyrifos Region 9

Green Valley Creek 038073

LOE ID:	73790
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	3
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Four samples were collected to test for toxicity. Three of the four samples exhibited statistically significant toxicity. The toxicity tests that exhibited significant toxicity included survival of Hyalella azteca and reproduction of Ceriodaphnia dubia.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected at station 905SDC-TWAS-1 Green Valley Creek.
Temporal Representation:	The samples were collected from 2007 to 2008.
Environmental Conditions:	
QAPP Information:	The data was collected under the County of San Diego Co-Permittees Receiving Waters Urban Runoff Monitoring and Reporting Program (Order No. 2007-01). Data quality is good.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 47584, Chlorpyrifos **Region 9**

Green Valley Creek

LOE ID:	78033
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Green Valley Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.

SWAMP Data:	Non-SWAMP	038074
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The USEPA drinking water health advisory for chlorpyrifos is 2 Âµg/L.	
Guideline Reference:	2011 Edition of the Drinking Water Standards and Health Advisories 2012 Edition of the Drinking Water Standards and Health Advisories	
Spatial Representation:	Data for this line of evidence for Green Valley Creek was collected at 1 monitoring site [Green Valley Creek - 905SDC-TWAS-1]	
Temporal Representation:	Data was collected over the time period 11/30/2007-6/3/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.	

Line of Evidence (LOE) for Decision ID 47584, Chlorpyrifos **Region 9**

Green Valley Creek

LOE ID:	78032
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	2
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Green Valley Creek to determine beneficial use support and results are as follows: 2 of 4 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).

Spatial Representation:	Data for this line of evidence for Green Valley Creek was collected at 1 monitoring site [Green Valley Creek - 905SDC-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/30/2007-6/3/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID 42727 Region 9

Green Valley Creek

Pollutant:	**Total Nitrogen as N**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence are available in the administrative record to assess this pollutant. Four of the 4 samples exceed the water quality objective. According to table 3.1 of the Listing Policy, the minimum sample requirement to assess conventional pollutants is 2. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Four of the 4 samples exceeded the Basin Plan objective and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 42727, Total Nitrogen as N Region 9

Green Valley Creek

LOE ID:	9033
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Four water samples were collected at Green Valley Creek station 2, 905SDGVC2, on January 2003, April 2003, May 2003, and September 2003. All showed excessive nitrogen concentrations according to results in California's Surface Water Ambient Monitoring Program Report, 2007.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses (RWQCB, 2007). A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Water samples were collected at Green Valley Creek Station 2, 905SDGVC2; (Latitude 33.04342, Longitude -117.07557).
Temporal Representation:	Samples were collected on January 2003, April 2003, and May 2003.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

DECISION ID	33345	Region 9
Green Valley Creek		

Pollutant:	**Sulfates**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. This pollutant is being considered for removal from the section 303(d) list under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. Twenty-five of 40 samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the section 303(d) list.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Twenty-five of 40 samples exceeded the water quality objective and this exceeds the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33345, Sulfates **Region 9**

Green Valley Creek

LOE ID:	9032
Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	3
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Four water samples were collected at Green Valley Creek station 2, 905SDGVC2 on January 2003, April 2003, May 2003, and September 2003. Three out of four samples showed excessive sulfate concentrations according to results in California's Surface Water Ambient Monitoring Program Report, 2007.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The recommended secondary drinking water standard for sulfate is 250 mg/l (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Water samples were collected at Green Valley Creek station 2; 905SDGVC2; (Latitude 33.0433, Longitude -117.0755).
Temporal Representation:	Samples were collected on January 2003, April 2003, May 2003, and September 2003.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 33345, Sulfates **Region 9**

Green Valley Creek 038078

LOE ID:	3262
Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	23
Number of Exceedances:	14
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 04/1999 to 07/2001. Fourteen of 23 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Sulfate is 250 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected in Green Valley Creek west of West Bernardo Drive.
Temporal Representation:	Samples were collected from 04/1999 to 07/2001. Three to 10 samples were collected per year, with multiple samples being collected on different days during the sampling months.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33345, Sulfates **Region 9**

Green Valley Creek

LOE ID:	3279
Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	13
Number of Exceedances:	8
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 04/1999 to 04/2000. Eight of 13 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for sulfate is 250 mg/L. This is the concentration not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Green Valley Creek west of West Bernardo Drive.
Temporal Representation: Samples were collected from 04/26/1999 to 04/18/2000. Three samples were collected in 1999 (1 each in April, May, June) and 10 samples were collected in 2000, with multiple samples being collected each month in February, March, and April.

Environmental Conditions:
QAPP Information: Data used in 2002 assessment.
QAPP Information Reference(s):

DECISION ID 32796 Region 9
Green Valley Creek

Pollutant: **Aluminum**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Original
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. One of the three samples exceed the Basin Plan Objective for aluminum.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of three samples exceeded the Basin Plan Objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 32796, Aluminum Region 9
Green Valley Creek

LOE ID: 3265

Pollutant: Aluminum
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 3

Number of Exceedances:	1	038080
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 03/2000 and 04/2000. One of 3 samples were in exceedance. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Aluminum is 0.2 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Green Valley Creek west of West Bernardo Drive.	
Temporal Representation:	Samples were collected 03/13/2000, 03/21/200, and 04/18/2000. One sample was collected each day.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID 32615 **Region 9**

Green Valley Creek

Pollutant:	**Barium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. One line of evidence is available in the administrative record to assess this pollutant. None of the 3 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32615, Barium **Region 9**

Green Valley Creek

LOE ID:	3268
Pollutant:	Barium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total

Beneficial Use:	Municipal & Domestic Supply	038081
Number of Samples:	3	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 03/2000 and 04/2000. None of the 3 samples were in exceedance. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Barium is 1.0 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Green Valley Creek west of West Bernardo Drive.	
Temporal Representation:	Samples were collected on 03/13/2000, 03/21/2000, and 04/18/2000. One sample was collected each day.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID 32616 Region 9

Green Valley Creek

Pollutant:	**Beryllium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. One line of evidence is available in the administrative record to assess this pollutant. None of the 3 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32616, Beryllium Region 9

Green Valley Creek

LOE ID:	3269
Pollutant:	Beryllium
LOE Subgroup:	Pollutant-Water

Matrix:	Water	038082
Fraction:	Total	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	3	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 03/2000 and 04/2000. None of the 3 samples were in exceedance. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Beryllium is 0.004 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Green Valley Creek west of West Bernardo Drive.	
Temporal Representation:	Samples were collected on 03/13/2000, 03/21/2000, and 04/18/2000. One sample was collected each day.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID **33031** **Region 9**

Green Valley Creek

Pollutant:	**Mercury**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. One line of evidence is available in the administrative record to assess this pollutant. None of the 2 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33031, Mercury **Region 9**

Green Valley Creek

LOE ID:	3275

Pollutant:	Mercury
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 04/1999 and 02/2000. None of the 2 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Mercury is 0.002 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Green Valley Creek west of West Bernardo Drive.
Temporal Representation:	Samples were collected on 04/26/1999 and 02/14/2000. One sample was collected each day.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 32795 Region 9

Green Valley Creek

Pollutant:	**Picloram**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. One line of evidence is available in the administrative record to assess this pollutant. None of the 2 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32795, Picloram Region 9

Green Valley Creek 038084

LOE ID:	3264
Pollutant:	Picloram
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. on 02/15/2000 and 02/22/2000. None of the 2 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Picloram is 0.5 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Green Valley Creek west of West Bernardo Drive.
Temporal Representation:	Samples were collected on 02/15/2000 and 02/22/2000. One sample was collected on each day.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33403** **Region 9**

Green Valley Creek

Pollutant:	**Silver**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. One line of evidence is available in the administrative record to assess this pollutant. None of the 4 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33403, Silver Green Valley Creek **Region 9**

LOE ID:	3278
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 04/1999 to 04/2000. None of the 4 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for SIlver is 0.1 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Green Valley Creek west of West Bernardo Drive.
Temporal Representation:	One sample per day was collected on 04/26/1999, 03/13/2000, 03/21/2000, and 04/18/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 33404 **Region 9**
Green Valley Creek

Pollutant:	**Thallium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. One line of evidence is available in the administrative record to assess this pollutant. None of the 3 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision	This is a decision previously approved by the State Water Resources Control Board and the USEPA.

Recommendation:	No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33404, Thallium **Region 9**

Green Valley Creek

LOE ID:	3280
Pollutant:	Thallium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 03/2000 and 04/2000. None of the 3 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for thallium is 0.002 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Green Valley Creek west of West Bernardo Drive.
Temporal Representation:	One sample per day was collected on 03/13/2000, 03/21/2000, and 04/18/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **46270** **Region 9**

Green Valley Creek

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status. Three lines of evidence are available in the administrative record to assess this pollutant. Zero of the eight samples exceed the Basin Plan Objective for Zinc. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that: 038087
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of eight samples exceeded the Basin Plan Objective for Zinc and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 46270, Zinc **Region 9**

Green Valley Creek

LOE ID:	73791
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Green Valley Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Zinc.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Zinc to protect aquatic life in freshwater. The dissolved Zinc criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Green Valley Creek was collected at 1 monitoring site [Green Valley Creek - 905SDC-TWAS-1]
Temporal Representation:	Data was collected over the time period 11/30/2007-6/3/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 46270, Zinc **Region 9**

Green Valley Creek 038088

LOE ID:	3281
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 04/1999 to 04/2000. None of the 4 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Zinc is 5.0 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Green Valley Creek west of West Bernardo Drive.
Temporal Representation:	One sample per day was collected on 04/26/1999, 03/13/2000, 03/21/2000, and 04/18/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 46270, Zinc **Region 9**

Green Valley Creek

LOE ID:	77773
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Green Valley Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Zinc.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan, San Diego Basin).

Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	038089
Evaluation Guideline:	The California Secondary MCL for zinc is 5.0 mg/L (Title 22 California Code of Regulations).	
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.	
Spatial Representation:	Data for this line of evidence for Green Valley Creek was collected at 1 monitoring site [Green Valley Creek - 905SDC-TWAS-1]	
Temporal Representation:	Data was collected over the time period 11/30/2007-6/3/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.	

DECISION ID 33338 — Region 9

Green Valley Creek

Pollutant:	**Chloride**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Six of 13 samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Six of 13 samples exceeded the Basin Plan criteria, and these exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33338, Chloride — Region 9

Green Valley Creek

LOE ID: 3271

Pollutant:	Chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	13
Number of Exceedances:	6
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 04/1999 to 04/2000. Six of 13 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Chloride is 250 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Green Valley Creek west of West Bernardo Drive.
Temporal Representation:	Samples were collected from 04/1999 to 04/2000. Three samples were collected in 1999 and 10 samples were collected in 2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID	**33340**	**Region 9**
Green Valley Creek		

Pollutant:	**Manganese**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Four of 4 samples exceeded the Basin Plan criteria and both years had exceedances more than 10% or the time. These exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available

indicating that standards are not met. 038091

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33340, Manganese **Region 9**

Green Valley Creek

LOE ID:	3274
Pollutant:	Manganese
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. on four days from 4/26/1999 to 4/18/2000. Four of 4 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The water quality objective for manganese in Green Valley Creek is 0.05 milligrams/liter (mg/l) according to Basin Plan, Table 3-2 entitled, Water Quality Objectives. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Green Valley Creek west of West Bernardo Drive.
Temporal Representation:	One sample per day was collected on 04/26/1999, 03/13/2000, 03/21/2000, and 04/18/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **46271** **Region 9**

Green Valley Creek

Pollutant:	**Pentachlorophenol (PCP)**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Two of 2 samples exceeded the Basin Plan criteria, and these exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 46271, Pentachlorophenol (PCP) **Region 9**

Green Valley Creek

LOE ID:	3263
Pollutant:	Pentachlorophenol (PCP)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	2
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. on 02/15/2000 and 02/22/2000. Two of 2 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Pentachlorophenol is 0.001 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Green Valley Creek west of West Bernardo Drive.
Temporal Representation:	Samples were collected on 02/15/2000 and 02/22/2000. One sample was collected on each day.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Felicita Creek
Water Body ID: CAR9052300020010925131049
Water Body Type: River & Stream

DECISION ID 33312 **Region 9**
Felicita Creek

Pollutant: Cadmium
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. Zero of the nine samples exceed the California Toxics Rule objective for cadmium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of nine samples exceeded the California Toxics Rule for cadmium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 33312, Cadmium **Region 9**
Felicita Creek

LOE ID: 73713

Pollutant: Cadmium
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Warm Freshwater Habitat

Number of Samples:	6	038094
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Felicita Creek to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Cadmium.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Felicita Creek was collected at 1 monitoring site [Felicita Creek @ Quiet Hills Farm Road]	
Temporal Representation:	Data was collected 8/12/2004 - 6/11/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 33312, Cadmium **Region 9**

Felicita Creek

LOE ID:	73714
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Felicita Creek to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for cadmium is 0.005 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Data for this line of evidence for Felicita Creek was collected at 1 monitoring site [Felicita Creek @ Quiet Hills Farm Road]
Temporal Representation:	Data was collected 8/12/2004 - 6/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 33312, Cadmium **Region 9**

Felicita Creek

LOE ID:	3290
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 02/2000 to 04/2000. None of the 3 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Cadmium is 0.005 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Felicita Creek site FEL3 at the road crossing above the water line.
Temporal Representation:	One sample per day was collected on 02/22/2000, 03/13/2000, and 04/18/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment. QA=?
QAPP Information Reference(s):	

DECISION ID **47393** **Region 9**

Felicita Creek

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the six

samples exceed the Basin Plan Objective for Chlorpyrifos. 038096

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of six samples exceeded the Basin Plan Objective Chlorpyrifos and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47393, Chlorpyrifos **Region 9**

Felicita Creek

LOE ID:	73715
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Felicita Creek to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).
Spatial Representation:	Data for this line of evidence for Felicita Creek was collected at 1 monitoring site [Felicita Creek @ Quiet Hills Farm Road]
Temporal Representation:	Data was collected over the time period 8/12/2004-6/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.

QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47393, Chlorpyrifos **Region 9**

Felicita Creek

LOE ID:	78027
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Felicita Creek to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for chlorpyrifos is 2.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Felicita Creek was collected at 1 monitoring site [Felicita Creek @ Quiet Hills Farm Road]
Temporal Representation:	Data was collected over the time period 8/12/2004-6/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **43082** **Region 9**

Felicita Creek

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. Zero of the nine samples exceed the Basin Plan Objective for copper.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of nine samples exceeded the Basin Plan Objective for copper and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 43082, Copper **Region 9**

Felicita Creek

LOE ID:	73721
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Felicita Creek to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for copper is 1.0 mg/L (Title 22 California Code of Regulations).
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Felicita Creek was collected at 1 monitoring site [Felicita Creek @ Quiet Hills Farm Road]
Temporal Representation:	Data was collected 8/12/2004 - 6/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 43082, Copper **Region 9**

Felicita Creek

LOE ID:	3292
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 02/2000 to 04/2000. None of the 3 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Copper is 1.0 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Felicita Creek site FEL3 at the road crossing above the water line.
Temporal Representation:	One sample per day was collected on 02/22/2000, 03/13/2000, 04/18/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment. QA=?
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43082, Copper **Region 9**

Felicita Creek

LOE ID:	73720
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Felicita Creek to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Felicita Creek was collected at 1 monitoring site [Felicita Creek @ Quiet Hills Farm Road]
Temporal Representation:	Data was collected 8/12/2004 - 6/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 47394 Region 9

Felicita Creek

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the six samples exceed the Evaluation Guideline for Diazinon. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of six samples exceeded the Evaluation Guideline for Diazinon and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47394, Diazinon Region 9

Felicita Creek

LOE ID:	73722

Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Felicita Creek to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Data for this line of evidence for Felicita Creek was collected at 1 monitoring site [Felicita Creek @ Quiet Hills Farm Road]
Temporal Representation:	Data was collected over the time period 8/12/2004-6/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47394, Diazinon **Region 9**

Felicita Creek

LOE ID:	78029
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Felicita Creek to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for diazinon is 1.4 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Felicita Creek was collected at 1 monitoring site [Felicita Creek @ Quiet Hills Farm Road]
Temporal Representation:	Data was collected over the time period 8/12/2004-6/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 47396 Region 9

Felicita Creek

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the six samples exceed the Evaluation Guideline for Malathion. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of six samples exceeded the Evaluation Guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47396, Malathion Region 9

Felicita Creek

LOE ID:	73731

Pollutant:	Malathion	038103
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	6	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Felicita Creek to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Malathion.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.	
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013	
Spatial Representation:	Data for this line of evidence for Felicita Creek was collected at 1 monitoring site [Felicita Creek @ Quiet Hills Farm Road]	
Temporal Representation:	Data was collected over the time period 8/12/2004-6/11/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 47396, Malathion **Region 9**

Felicita Creek

LOE ID:	78030
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Felicita Creek to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Malathion.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column,

	sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for malathion is 100 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Felicita Creek was collected at 1 monitoring site [Felicita Creek @ Quiet Hills Farm Road]
Temporal Representation:	Data was collected over the time period 8/12/2004-6/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 32552 Region 9

Felicita Creek

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status. Three lines of evidence are available in the administrative record to assess this pollutant. Zero of the nine samples exceed the Basin Plan Objective for zinc. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of nine samples exceeded the Basin Plan Objective for zinc and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 32552, Zinc Region 9

Felicita Creek

LOE ID:	73733
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water

Matrix:	Water	038105
Fraction:	None	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	6	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Felicita Creek to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Zinc.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The California Secondary MCL for zinc is 5.0 mg/L (Title 22 California Code of Regulations).	
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.	
Spatial Representation:	Data for this line of evidence for Felicita Creek was collected at 1 monitoring site [Felicita Creek @ Quiet Hills Farm Road]	
Temporal Representation:	Data was collected 8/12/2004 - 6/11/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 32552, Zinc **Region 9**

Felicita Creek

LOE ID:	73738
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Felicita Creek to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority

toxic pollutants for the State of California. 7/1/2011 Edition 038106

Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Felicita Creek was collected at 1 monitoring site [Felicita Creek @ Quiet Hills Farm Road]
Temporal Representation:	Data was collected 8/12/2004 - 6/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 32552, Zinc **Region 9**

Felicita Creek

LOE ID:	3298
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 02/2000 to 04/2000. None of the 3 samples were in exceedance.(SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Zinc is 5.0 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Felicita Creek site FEL3 at the road crossing above the water line.
Temporal Representation:	One sample per day was collected on 02/22/2000, 03/13/2000, and 04/18/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 63386 **Region 9**

Felicita Creek

Pollutant:	**1,4-Dioxane**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Hazardous Waste
Expected TMDL Completion	2027

Date:	038107
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One lines of evidence is available in the administrative record to assess this pollutant. Nine of nine samples exceed the Objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Nine of 9 samples exceed the Objective and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 63386, 1,4-Dioxane **Region 9**

Felicita Creek

LOE ID:	95688
Pollutant:	1,4-Dioxane
LOE Subgroup:	Subgroup Missing
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	9
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Samples were collected from three sites: FC-4, FC-10 and FC-7.
Data Reference:	Data for Felicita Creek
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. (Basin Plan, 2004)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Cal/EPA Cancer Potency Factor as a drinking water level of 1.3 ug/L
Guideline Reference:	
Spatial Representation:	Samples were collected from one station at the east fork (FC-4, 33.08374, -117.08470), and two stations at the main stem of the north Felicita Creek (FC-10, 33.08169, -117.08510; and FC-7, 33.079699, -117.084811, GPS approximates)
Temporal Representation:	Grab samples were collected between March 3, 2008 and March 10, 2010
Environmental Conditions:	
QAPP Information:	Sampling Activity was conducted in accordance with a 1993 QAPP which was updated in

QAPP Information Reference(s):	2011 (Appendix B of a Monitoring and Contingency Plan dated 2011)	038108
	QA Document for data associated with Felicita Creek (north)	

DECISION ID	47398	Region 9
Felicita Creek		

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.3 of the Listing Policy. Under section 3.3 a single line of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Six of the Six samples exceed the Single Sample Maximum Objective for Enterococcus, Three of the Six samples exceeded the Single Sample Maximum Objective for Fecal Coliform, and Two out of Six samples exceeded the Single Sample Maximum Guideline for Total Coliform. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Six of the Six samples exceed the Single Sample Maximum Objective for Enterococcus, Three of the Six samples exceeded the Single Sample Maximum Objective for Fecal Coliform, and Two out of Six samples exceeded the Single Sample Maximum Guideline for Total Coliform and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 47398, Indicator Bacteria	**Region 9**
Felicita Creek	

LOE ID:	73724
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	6
Number of Exceedances:	3
Data and Information Type:	PATHOGEN MONITORING

Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Felicita Creek to determine beneficial use support and results are as follows: 3 of 6 samples exceed the criterion for Coliform, Fecal.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the fecal coliform concentration shall not exceed 400 MPN/100 ml.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Felicita Creek was collected at 1 monitoring site [Felicita Creek @ Quiet Hills Farm Road]
Temporal Representation:	Data was collected over the time period 8/12/2004-6/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47398, Indicator Bacteria **Region 9**

Felicita Creek

LOE ID:	73723
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	6
Number of Exceedances:	6
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Felicita Creek to determine beneficial use support and results are as follows: 6 of 6 samples exceed the criterion for Enterococci.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Samples shall not exceed 61 organisms per 100 ml for enterococcus in waters designated for REC I beneficial use (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Felicita Creek was collected at 1 monitoring site [Felicita Creek @ Quiet Hills Farm Road]
Temporal Representation:	Data was collected over the time period 8/12/2004-6/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix

Line of Evidence (LOE) for Decision ID 47398, Indicator Bacteria **Region 9**

Felicita Creek

LOE ID:	73732
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	6
Number of Exceedances:	2
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Felicita Creek to determine beneficial use support and results are as follows: 2 of 6 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxicsubstances in concentrations which are toxic to,or which produce detrimental physiologicalresponses in human, plant, animal, or indigenousaquatic life (Basin Plan).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In waters designated for water contact recreation (REC I), the total coliform concentration shall not exceed 10000 MPN/100 ml (CDPH 2006).
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.
Spatial Representation:	Data for this line of evidence for Felicita Creek was collected at 1 monitoring site [Felicita Creek @ Quiet Hills Farm Road]
Temporal Representation:	Data was collected over the time period 8/12/2004-6/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **63384** **Region 9**

Felicita Creek

Pollutant:	**Tetrachloroethylene/PCE**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Industrial Point Sources
Expected TMDL Completion Date:	2027
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of

the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. 15 of 15 samples exceed the Objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. 15 of 15 samples exceed the Objective and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 63384, Tetrachloroethylene/PCE **Region 9**

Felicita Creek

LOE ID:	95655
Pollutant:	Tetrachloroethylene/PCE
LOE Subgroup:	Subgroup Missing
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	15
Number of Exceedances:	15
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Samples were collected from three sites: FC-4, FC-10 and FC-7. In the sampling period, nine samples were not included in the assessment because the RL is greater than the criterion of 0.8 ug/L
Data Reference:	Data for Felicita Creek
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	CTR Criterion for Human Health Protection, Sources of Drinking Water (water and fish consumption) value of 0.8 ug/L to assess the data.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from one station at the east fork (FC-4, 33.08374, -117.08470), and two stations at the main stem of the north Felicita Creek (FC-10, 33.08169, -117.08510; and FC-7, 33.079699, -117.084811, GPS approximates)
Temporal Representation:	Grab samples were collected between March 3, 2008 and June 4, 2010
Environmental Conditions:	
QAPP Information:	Sampling Activity was conducted in accordance with a 1993 QAPP which was updated in 2011 (Appendix B of a Monitoring and Contingency Plan dated 2011)
QAPP Information Reference(s):	QA Document for data associated with Felicita Creek (north)

DECISION ID	63385	Region 9
Felicita Creek		

Pollutant:	**Trichloroethylene/TCE**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Industrial Point Sources
Expected TMDL Completion Date:	2027
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. 14 of 24 samples exceed the Objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. 14 of 24 samples exceed the Objective and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 63385, Trichloroethylene/TCE	**Region 9**
Felicita Creek	

LOE ID:	95654
Pollutant:	Trichloroethylene/TCE
LOE Subgroup:	Subgroup Missing
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	24
Number of Exceedances:	14
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Samples were collected from three sites: FC-4, FC-10 and FC-7.
Data Reference:	Data for Felicita Creek
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	CTR Criterion for Human Health Protection, Sources of Drinking Water (water and fish consumption) value of 2.7 ug/L to assess the data.

Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from one station at the east fork (FC-4, 33.08374, -117.08470), and two stations at the main stem of the north Felicita Creek (FC-10, 33.08169, -117.08510; and FC-7, GPS to be added)
Temporal Representation:	Grab samples were collected between March 3, 2008 and June 4, 2010
Environmental Conditions:	
QAPP Information:	Sampling Activity was conducted in accordance with a 1993 QAPP which was updated in 2011 (Appendix B of a Monitoring and Contingency Plan dated 2011)
QAPP Information Reference(s):	QA Document for data associated with Felicita Creek (north)

DECISION ID 33343 — Region 9

Felicita Creek

Pollutant:	**Total Dissolved Solids**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the section 303(d) list. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Twenty-three of 24 samples exceeded the Basin Plan's water quality objective. The minimum number of samples required is 26 according to Table 4.2 of the Listing Policy. 4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33343, Total Dissolved Solids — Region 9

Felicita Creek

LOE ID:	3300
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	21
Number of Exceedances:	20
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 04/1999 to 04/2000. Twenty of 21 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with all beneficial uses, the WQO for TDS is 500 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Felicita Creek site FEL3 at the road crossing above the water line.
Temporal Representation:	Samples were collected from 04/26/1999 to 04/18/2000. One sample per month was collected in 1999 from April to June, and 2-3 samples per month were collected in 2000 from February to April.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33343, Total Dissolved Solids **Region 9**

Felicita Creek

LOE ID:	3301
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	3
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 04/1999 to 06/1999. Three of 3 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with all beneficial uses, the WQO for TDS is 500 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Felicita Creek site FEL2, off Quiet Hills Farm Road.
Temporal Representation:	Samples were collected once per month in April, May and June of 1999.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment. QA=?

QAPP Information Reference(s): 038115

DECISION ID	33174	Region 9
Felicita Creek		

Pollutant:	**2,4,5-TP (Silvex)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. One line of evidence is available in the administrative record to assess this pollutant. None of the 7 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33174, 2,4,5-TP (Silvex)	**Region 9**
Felicita Creek	

LOE ID:	3315
Pollutant:	2,4,5-TP (Silvex)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 02/2000 to 04/2000. None of the 7 samples were in exceedance. (SDRWQCB, 2002-I)
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 2,4,5-TP (Silvex) is 0.05 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Felicita Creek site FEL3 at the road crossing above the water line.

Temporal Representation:	Samples were collected from 02/2000 to 04/2000. Two samples were collected in February, 2 in March, and 3 in April.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

DECISION ID 33173 Region 9

Felicita Creek

Pollutant:	**2,4-D (2,4-Dichlorophenoxy acetic acid)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. One line of evidence is available in the administrative record to assess this pollutant. None of the 7 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33173, 2,4-D (2,4-Dichlorophenoxy acetic acid) Region 9

Felicita Creek

LOE ID:	3314
Pollutant:	2,4-D (2,4-Dichlorophenoxy acetic acid)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 02/2000 to 04/2000. None of the 7 samples were in exceedance. (SDRWQCB, 2002-I).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for 2,4-D is 0.07 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	

Guideline Reference:	038117
Spatial Representation:	Samples were collected at Felicita Creek site FEL3 at the road crossing above the water line.
Temporal Representation:	Samples were collected from 02/2000 to 04/2000. Two samples were collected in February, 2 in March, and 3 in April.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

DECISION ID 33297 Region 9
Felicita Creek

Pollutant:	**Alachlor**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. One line of evidence is available in the administrative record to assess this pollutant. None of the 5 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33297, Alachlor Region 9
Felicita Creek

LOE ID:	3305
Pollutant:	Alachlor
LOE Subgroup:	Pollutant-Tissue
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 02/2000 to 04/2000. None of the 5 samples were in exceedance. (SDRWQCB, 2002-I).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for

	Alachlor is 0.002 mg/L.	038118
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Felicita Creek site FEL3 at the road crossing above the water line.	
Temporal Representation:	Samples were collected from 02/2000 to 04/2000. Two samples were collected in February, 2 in March, and 1 in April.	
Environmental Conditions:		
QAPP Information:	QA Info Missing	
QAPP Information Reference(s):		

DECISION ID 33248 Region 9

Felicita Creek

Pollutant:	**Antimony**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. One line of evidence is available in the administrative record to assess this pollutant. None of the 3 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33248, Antimony Region 9

Felicita Creek

LOE ID:	3286
Pollutant:	Antimony
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 02/2000 to 04/2000. None of the 3 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Antimony is 0.006 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Felicita Creek site FEL3 at the road crossing above the water line.
Temporal Representation:	One sample per day was collected on 02/22/2000, 03/13/2000, and 04/18/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 33249 Region 9

Felicita Creek

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. One line of evidence is available in the administrative record to assess this pollutant. None of the 3 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33249, Arsenic Region 9

Felicita Creek

LOE ID:	3287
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 02/2000 to 04/2000. None of the 3 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for arsenic is 0.05 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Felicita Creek site FEL3 at the road crossing above the water line.
Temporal Representation:	One sample per day was collected on 02/22/2000, 03/13/2000, and 04/18/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 46214 Region 9

Felicita Creek

Pollutant:	**Atrazine**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. One line of evidence is available in the administrative record to assess this pollutant. None of the 6 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 46214, Atrazine Region 9

Felicita Creek

LOE ID:	3306
Pollutant:	Atrazine
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6

Number of Exceedances:	0	038121
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 02/2000 to 04/2000. None of 6 samples were in exceedance. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Atrazine is 0.003 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Felicita Creek site FEL3 at the road crossing above the water line.	
Temporal Representation:	Samples were collected from 02/2000 to 04/2000. Two samples were collected in February, 3 in March, and 1 in April.	
Environmental Conditions:		
QAPP Information:	QA Info Missing	
QAPP Information Reference(s):		

DECISION ID 33480 — Region 9

Felicita Creek

Pollutant:	**Barium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. One line of evidence is available in the administrative record to assess this pollutant. None of the 3 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33480, Barium — Region 9

Felicita Creek

LOE ID:	3288
Pollutant:	Barium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total

Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 02/2000 to 04/2000. None of the 3 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for barium is 1.0 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Felicita Creek site FEL3 at the road crossing above the water line.
Temporal Representation:	One sample per day was collected on 02/222000, 03/13/2000, and 04/18/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 33298 Region 9

Felicita Creek

Pollutant:	**Benzo(a)pyrene (3,4-Benzopyrene -7-d)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. One line of evidence is available in the administrative record to assess this pollutant. None of the 6 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33298, Benzo(a)pyrene (3,4-Benzopyrene -7-d) Region 9

Felicita Creek

LOE ID:	3307
Pollutant:	Benzo(a)pyrene (3,4-Benzopyrene -7-d)

LOE Subgroup:	Pollutant-Water	038123
Matrix:	Water	
Fraction:	Total	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	6	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 02/2000 to 04/2000. None of the 6 samples were in exceedance. (SDRWQCB, 2002-I).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Benzo(a)pyrene is 0.0002 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Felicita Creek site FEL3 at the road crossing above the water line.	
Temporal Representation:	Samples were collected from 02/2000 to 04/2000. Two samples were collected in February, 3 in March, and 1 in April.	
Environmental Conditions:		
QAPP Information:	QA Info Missing	
QAPP Information Reference(s):		

DECISION ID 33277 **Region 9**

Felicita Creek

Pollutant:	**Beryllium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. One line of evidence is available in the administrative record to assess this pollutant. None of the 3 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33277, Beryllium **Region 9**

Felicita Creek

LOE ID:	3289
Pollutant:	Beryllium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 02/2000 to 04/2000. None of the 3 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Beryllium is 0.004 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Felicita Creek site FEL3 at the road crossing above the water line.
Temporal Representation:	One sample per day was collected on 02/22/2000, 03/13/2000, and 04/18/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID	33214	Region 9
Felicita Creek		

Pollutant:	**Chlordane**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. One line of evidence is available in the administrative record to assess this pollutant. None of the 2 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33214, Chlordane 038125 **Region 9**

Felicita Creek

LOE ID:	3308
Pollutant:	Chlordane
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. on 03/13/2000 and 04/03/2000. None of 2 samples were in exceedance. (SDRWQCB, 2002-I).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Chlordane is 0.0001 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Felicita Creek site FEL3 at the road crossing above the water line.
Temporal Representation:	One sample was collected per day on 03/13/2000 and 04/03/2000.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

DECISION ID **33313** **Region 9**

Felicita Creek

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: One line of evidence is available in the administrative record to assess this pollutant. None of the 3 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	

Line of Evidence (LOE) for Decision ID 33313, Chromium **Region 9**

Felicita Creek

LOE ID:	3291
Pollutant:	Chromium (total)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 02/2000 to 04/2000. None of the 3 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Chromium is 0.05 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Felicita Creek site FEL3 at the road crossing above the water line.
Temporal Representation:	One sample per day was collected on 02/22/2000, 03/13/2000, and 04/18/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33262** **Region 9**

Felicita Creek

Pollutant:	**Dinoseb**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

One line of evidence is available in the administrative record to assess this pollutant. None of the 7 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33262, Dinoseb **Region 9**

Felicita Creek

LOE ID:	3316
Pollutant:	Dinoseb
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 02/2000 to 04/2000. None of the 7 samples were in exceedance. (SDRWQCB, 2002-I).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Dinoseb is 0.007 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Felicita Creek site FEL3 at the road crossing above the water line.
Temporal Representation:	Samples were collected from 02/2000 to 04/2000. Two samples were collected in February, 2 in March, and 3 in April.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

DECISION ID **33478** **Region 9**

Felicita Creek

Pollutant:	**Endrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. One line of evidence is available in the administrative record to assess this pollutant. None of the 6 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy.

	Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33478, Endrin **Region 9**

Felicita Creek

LOE ID:	3309
Pollutant:	Endrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 02/2000 to 04/2000. None of the 6 samples were in exceedance. (SDRWQCB, 2002-I).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Endrin is 0.002 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Felicita Creek site FEL3 at the road crossing above the water line.
Temporal Representation:	Samples were collected from 02/2000 to 04/2000. Two samples were collected in February, 3 in March, and 1 in April.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

DECISION ID **33479** **Region 9**

Felicita Creek

Pollutant:	**Heptachlor**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

One line of evidence is available in the administrative record to assess this pollutant. None of the 6 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33479, Heptachlor **Region 9**

Felicita Creek

LOE ID:	3310
Pollutant:	Heptachlor
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 02/2000 to 04/2000. None of the 6 samples were in exceedance. (SDRWQCB, 2002-I).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Heptachlor is 0.00001 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Felicita Creek site FEL3 at the road crossing above the water line.
Temporal Representation:	Samples were collected from 02/2000 to 04/2000. Two samples were collected in February, 3 in March, and 1 in April.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

DECISION ID **33109** **Region 9**

Felicita Creek

Pollutant:	**Heptachlor epoxide**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

One line of evidence is available in the administrative record to assess this pollutant. None of the 6 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33109, Heptachlor epoxide **Region 9**

Felicita Creek

LOE ID:	3311
Pollutant:	Heptachlor epoxide
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 02/2000 to 04/2000. None of the 6 samples were in exceedance. (SDRWQCB, 2002-I).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Heptachlor epoxide is 0.00001 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Felicita Creek site FEL3 at the road crossing above the water line.
Temporal Representation:	Samples were collected from 02/2000 to 04/2000. Two samples were collected in February, 3 in March, and 1 in April.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

DECISION ID **33414** **Region 9**

Felicita Creek

Pollutant:	**Hexachlorobenzene/ HCB**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final	Do Not List on 303(d) list (TMDL required list)(2012)

Listing Decision:		038131
Revision Status	Original	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

One line of evidence is available in the administrative record to assess this pollutant. None of the 6 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33414, Hexachlorobenzene/ HCB **Region 9**

Felicita Creek

LOE ID:	3303
Pollutant:	Hexachlorobenzene/ HCB
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 02/2000 to 04/2000. None of the 6 samples were in exceedance. (SDRWQCB, 2002-I).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Hexachlorobenzene is 0.001 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Felicita Creek site FEL3 at the road crossing above the water line.
Temporal Representation:	Samples were collected from 02/2000 to 04/2000. Two samples were collected in February, 3 in March, and 1 in April.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

DECISION ID **33296** **Region 9**

Felicita Creek

Pollutant:	**Hexachlorocyclopentadiene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. One line of evidence is available in the administrative record to assess this pollutant. None of the 6 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33296, Hexachlorocyclopentadiene **Region 9**

Felicita Creek

LOE ID:	3304
Pollutant:	Hexachlorocyclopentadiene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 02/2000 to 04/2000. None of the 6 samples were in exceedance. (SDRWQCB, 2002-I).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Hexachlorocyclopentadiene is 0.05 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Felicita Creek site FEL3 at the road crossing above the water line.
Temporal Representation:	Samples were collected from 02/2000 to 04/2000. Two samples were collected in February, 3 in March and 1 in April.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

DECISION ID **47395** **Region 9**

Felicita Creek

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the six samples exceed the California Toxics Rule Objective for Lead. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of six samples exceeded the Basin Plan Objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47395, Lead **Region 9**

Felicita Creek

LOE ID:	73730
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Felicita Creek to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	The California Maximum Contaminant Level for Lead is 0.015 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Felicita Creek was collected at 1 monitoring site [Felicita Creek @ Quiet Hills Farm Road]
Temporal Representation:	Data was collected 8/12/2004 - 6/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47395, Lead **Region 9**

Felicita Creek

LOE ID:	73729
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Felicita Creek to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Felicita Creek was collected at 1 monitoring site [Felicita Creek @ Quiet Hills Farm Road]
Temporal Representation:	Data was collected 8/12/2004 - 6/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 33314 **Region 9**

Felicita Creek 038135

Pollutant:	**Manganese**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. One line of evidence is available in the administrative record to assess this pollutant. One of the 3 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33314, Manganese — Region 9

Felicita Creek

LOE ID:	3293
Pollutant:	Manganese
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 02/2000 to 04/2000. One of 3 samples was in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The water quality objective for manganese in Felicita Creek is 0.05 milligrams/liter (mg/l) according to Basin Plan, Table 3-2 entitled, Water Quality Objectives. This concentration is not be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Felicita Creek site FEL3 at the road crossing above the water line.
Temporal Representation:	One sample per day was collected on 02/22/2000, 03/13/2000, and 04/18/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID	33110	Region 9
Felicita Creek		

Pollutant:	**Methoxychlor**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. One line of evidence is available in the administrative record to assess this pollutant. None of the 6 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33110, Methoxychlor	**Region 9**
Felicita Creek	

LOE ID:	3312
Pollutant:	Methoxychlor
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 02/2000 to 04/2000. None of the 6 samples were in exceedance. (SDRWQCB, 2002-I).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for methoxychlor is 0.04 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Felicita Creek site FEL3 at the road crossing above the water line.
Temporal Representation:	Samples were collected from 02/2000 to 04/2000. Two samples were collected in February,

	3 in March, and 1 in April.	038137
Environmental Conditions:		
QAPP Information:	QA Info Missing	
QAPP Information Reference(s):		

DECISION ID	33252	Region 9
Felicita Creek		

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. One line of evidence is available in the administrative record to assess this pollutant. None of the 3 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33252, Nickel	Region 9
Felicita Creek	

LOE ID:	3294
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 02/2000 to 04/2000. None of the 3 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Nickel is 0.1 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at Felicita Creek site FEL3 at the road crossing above the water line.
Temporal Representation:	One sample per day was collected on 02/22/2000, 03/13/2000, and 04/18/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 33329 Region 9

Felicita Creek

Pollutant:	**Nitrite as Nitrite NO2**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: One line of evidence is available in the administrative record to assess this pollutant. None of the 7 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	

Line of Evidence (LOE) for Decision ID 33329, Nitrite as Nitrite NO2 Region 9

Felicita Creek

LOE ID:	3299
Pollutant:	Nitrite as Nitrite NO2
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 04/1999 to 04/2000. None of the 7 samples were in exceedance. (SDRWQCB, 2002-I).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Nitrite (as N) is 1.0 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)

Evaluation Guideline:	038139
Guideline Reference:	
Spatial Representation:	Samples were collected at Felicita Creek site FEL3 at the road crossing above the water line.
Temporal Representation:	Samples were collected from 04/26/1999 to 04/18/2000. One sample per moneth was collected in 1999 from April to June, and 2-3 samples per month were collected in 2000 from February to April.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

DECISION ID 33473 Region 9

Felicita Creek

Pollutant:	**Pentachlorophenol (PCP)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. One line of evidence is available in the administrative record to assess this pollutant. None of the 3 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33473, Pentachlorophenol (PCP) Region 9

Felicita Creek

LOE ID:	3283
Pollutant:	Pentachlorophenol (PCP)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 02/2000 and 03/2000. None of the 3 samples were in exceedance. (SDRWQCB, 2002-I).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Pentachlorophenol is 0.001 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected in Felicita Creek station FEL3 at the road crossing above the water line.
Temporal Representation:	One sample was collected per day on 02/29/2000, 02/22/2000, and 03/21/2000.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

DECISION ID 42885 Region 9

Felicita Creek

Pollutant:	**Picloram**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. One line of evidence is available in the administrative record to assess this pollutant. None of the 7 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 42885, Picloram Region 9

Felicita Creek

LOE ID:	3284
Pollutant:	Picloram
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 02/2000 to 04/2000. None of the 7 samples were in exceedance. (SDRWQCB, 2002-I).

Data Reference:	Placeholder reference 2006 303(d)	038141
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Picloram is 0.5 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Felicita Creek site FEL3 at the road crossing above the water line.	
Temporal Representation:	Samples were collected from 02/2000 to 04/2000. Two to 3 samples were collected each month.	
Environmental Conditions:		
QAPP Information:	QA Info Missing	
QAPP Information Reference(s):		

DECISION ID 33253 Region 9

Felicita Creek

Pollutant:	**Selenium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. One line of evidence is available in the administrative record to assess this pollutant. None of the 3 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33253, Selenium Region 9

Felicita Creek

LOE ID:	3295
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 02/2000 to 04/2000. None of the 3 samples were in exceedance (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Selenium is 0.05 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Felicita Creek site FEL3 at the road crossing above the water line.
Temporal Representation:	One sample per day was collected on 02/22/2000, 03/13/2000, and 04/18/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 33254 Region 9

Felicita Creek

Pollutant:	**Silver**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. One line of evidence is available in the administrative record to assess this pollutant. None of the 3 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33254, Silver Region 9

Felicita Creek

LOE ID:	3296
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 02/2000 to 04/2000. None of the 3 samples were in exceedance.(SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Silver is 0.1 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Felicita Creek site FEL3 at the road crossing above the water line.
Temporal Representation:	Samples were collected once per day on 02/22/2000, 03/13/2000, and 04/18/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 46215 Region 9

Felicita Creek

Pollutant:	**Simazine**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. One line of evidence is available in the administrative record to assess this pollutant. None of the 5 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 46215, Simazine Region 9

Felicita Creek

LOE ID:	3313
Pollutant:	Simazine
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	Total	038144
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	5	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 02/2000 to 04/2000. None of the 5 samples were in exceedance. (SDRWQCB, 2002-I).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municpal beneficial use, the WQO for Simazine is 0.004 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Felicita Creek site FEL3 at the road crossing above the water line.	
Temporal Representation:	Samples were collected from 02/2000 to 04/2000. Two samples were collected in February, 1 in March, and 1 in April.	
Environmental Conditions:		
QAPP Information:	QA Info Missing	
QAPP Information Reference(s):		

DECISION ID	**33255**	**Region 9**
Felicita Creek		

Pollutant:	**Thallium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. One line of evidence is available in the administrative record to assess this pollutant. None of the 3 samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33255, Thallium	**Region 9**
Felicita Creek	

LOE ID:	3297

Pollutant:	Thallium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 02/2000 to 04/2000. None of the 3 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Thallium is 0.002 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Felicita Creek site FEL3 at the road crossing above the water line.
Temporal Representation:	One sample per day was collected on 02/22/2000, 03/13/2000, and 04/18/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 33413 Region 9

Felicita Creek

Pollutant:	**Turbidity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. One line of evidence is available in the administrative record to assess this pollutant. None of the 3 samples exceed the Basin Plan criteria, but the number of samples is insufficient to determine with the confidence and power required by the Listing Policy. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33413, Turbidity Region 9

Felicita Creek 038146

LOE ID:	3302
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 1999 from April to June. None of the 3 samples were in exceedance. (SDRWQCB, 2002-I).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Turbidity is 5 units.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Felicita Creek site FEL3 at the road crossing above the water line.
Temporal Representation:	Samples were collected once per day on 04/26/1999, 05/24/1999, and 06/21/1999.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

DECISION ID **33247** **Region 9**

Felicita Creek

Pollutant:	**Aluminum**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Two of 6 samples exceeded the Basin Plan criteria, and these exceed the allowable frequency listed

in Table 3.1 of the Listing Policy. 038147
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle.

Line of Evidence (LOE) for Decision ID 33247, Aluminum **Region 9**

Felicita Creek

LOE ID:	3285
Pollutant:	Aluminum
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	2
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. from 02/2000 to 04/2000. Two of 6 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Aluminum is 0.2 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Felicita Creek site FEL3 at the road crossing above the water line.
Temporal Representation:	Samples were collected from 02/22/2000 to 04/18/2000. One sample was collected in 02/2000, 2 samples were collected in 03/2000, and 3 samples were collected in 04/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment. QA=?
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Cloverdale Creek
Water Body ID: CAR9053200020010926112758
Water Body Type: River & Stream

DECISION ID 44129 **Region 9**
Cloverdale Creek

Pollutant: Nitrogen
Final Listing Decision: List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Sources: Source Unknown
Expected TMDL Completion Date: 2023
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Three of the three samples exceed the Basin Plan water quality objective for nitrogen.

According to table 3.1 of the Listing Policy, the minimum sample requirement to assess conventional pollutants is 2.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Three of the three samples exceed the Basin Plan water quality objective for nitrogen and this excceds the allowable frequency under Table 3.1.
4. Pursuant to [SECTION 3.11/4.11] of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 44129, Nitrogen **Region 9**
Cloverdale Creek

LOE ID: 9026

Pollutant: Total Nitrogen as N
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Not Recorded

Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	3
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Three water samples were collected at Cloverdale Creek station 905SDCDC4 on January 2003, April 2003, and May 2003. All three samples showed excessive nitrogen concentrations (SWAMP, 2007).
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses (RWQCB, 2007). A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Water samples were collected at Cloverdale Creek station 4, 905SDCDC4; (Latitude 33.0905, Longitude -117.0197).
Temporal Representation:	Samples were collected on January 2003, April 2003, and May 2003.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

DECISION ID	**34002**	**Region 9**
Cloverdale Creek		

Pollutant:	**Total Dissolved Solids**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: 303(d) listing decisions made prior to 2006 were not held in an assessment database. The Regional Boards will update this decision when new data and information become available and are assessed.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not

changed. 038150

Line of Evidence (LOE) for Decision ID 34002, Total Dissolved Solids **Region 9**

Cloverdale Creek

LOE ID:	4449
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Agricultural Supply
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	Unspecified
Guideline Reference:	Placeholder reference pre-2006 303(d)
Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

DECISION ID **42286** **Region 9**

Cloverdale Creek

Pollutant:	**Sulfates**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Three of the 3 samples exceed the secondary MCL of drinking water standard.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Three of the 3 samples exceed the secondary MCL of drinking water standard and this sample size is insufficient to determine with the power and confidence of the Listing Policy if standards are not met. A minimum of five samples is needed for application of table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 42286, Sulfates **Region 9**

Cloverdale Creek

LOE ID:	9024
Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	3
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Three water samples were collected at Cloverdale Creek station 4, 905SDCDC4. Sample dates were January 2003, April 2003, and May 2003. All three samples showed excessive sulfate concentrations according to results in California's Surface Water Ambient Monitoring Program Report, 2007.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The recommended secondary drinking water standard for sulfate is 250 mg/l (RWQCB, 2007)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Water samples were collected at Cloverdale Creek station 4, 905SDCDC4; (Latitude 33.0905, Longitude -117.0197).
Temporal Representation:	Samples were collected in January 2003, April 2003, and May 2003.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

DECISION ID **34001** **Region 9**

Cloverdale Creek

Pollutant:	**Phosphorus**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final	List on 303(d) list (TMDL required list)(2012)

Listing Decision:		038152
Revision Status	Original	
Sources:	Source Unknown	
Expected TMDL Completion Date:	2019	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

303(d) listing decisions made prior to 2006 were not held in an assessment database. The Regional Boards will update this decision when new data and information become available and are assessed.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34001, Phosphorus **Region 9**

Cloverdale Creek

LOE ID:	4448
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	Unspecified
Guideline Reference:	Placeholder reference pre-2006 303(d)
Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Santa Maria Creek
Water Body ID: CAR9054100020020306090409
Water Body Type: River & Stream

DECISION ID 51983 **Region 9**
Santa Maria Creek

Pollutant: Ammonia
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of two samples exceeded the guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of two samples exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51983, Ammonia **Region 9**
Santa Maria Creek

LOE ID: 76531

Pollutant: Nitrogen, ammonia (Total Ammonia)
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 2

Number of Exceedances:	0	038154
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Santa Maria Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Ammonia As N, Total.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Basin Plan: No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	EPA's Lifetime Health advisory level for total ammonia is 30.0 mg/L as stated on page 8 of the 2006 edition of the drinking water standards and health advisories. This Advisory Level is defined as "the concentration of a chemical in drinking water that is not expected to cause any adverse noncarcinogenic effects for up to ten days of exposure."	
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013	
Spatial Representation:	Data for this line of evidence for Santa Maria Creek was collected at 1 monitoring site [Santa Maria Creek @ Rangeland Road]	
Temporal Representation:	Data was collected over the time period 6/25/2003-7/5/2003.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID	49118	Region 9
Santa Maria Creek		

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the four samples exceed the Primary Maximum Contaminant Level and CTR criterion.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of four samples exceeded the Primary Maximum Contaminant Level and CTR criterion and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.11.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49118, Cadmium **Region 9**

Santa Maria Creek

LOE ID:	76533
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Santa Maria Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for cadmium is 0.005 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals, CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Maria Creek was collected at 1 monitoring site [Santa Maria Creek @ Rangeland Road]
Temporal Representation:	Data was collected 6/25/2003 - 6/1/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 49118, Cadmium **Region 9**

Santa Maria Creek

LOE ID:	76532
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Santa Maria Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California, 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Maria Creek was collected at 1 monitoring site [Santa Maria Creek @ Rangeland Road]
Temporal Representation:	Data was collected 6/25/2003 - 6/1/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID	49273	Region 9
Santa Maria Creek		

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the three samples exceed the aquatic life beneficial use guideline. The samples were not used in the assessment of Municipal & Domestic Supply due to reporting limits that were higher than the guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of three samples exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.11. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision	After review of the available data and information, RWQCB staff concludes that the water body-

Recommendation: pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49273, Chlorpyrifos **Region 9**

Santa Maria Creek

LOE ID:	78135
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Santa Maria Creek to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for chlorpyrifos is 2.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Santa Maria Creek was collected at 1 monitoring site [Santa Maria Creek @ Rangeland Road]
Temporal Representation:	Data was collected over the time period 7/26/2007-6/1/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 49273, Chlorpyrifos **Region 9**

Santa Maria Creek

LOE ID:	76534
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	038158
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Santa Maria Creek to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Chlorpyrifos.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000).	
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).	
Spatial Representation:	Data for this line of evidence for Santa Maria Creek was collected at 1 monitoring site [Santa Maria Creek @ Rangeland Road]	
Temporal Representation:	Data was collected over the time period 7/26/2007-6/1/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID	**49127**	**Region 9**
Santa Maria Creek		

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the four samples exceed the Primary Maximum Contaminant Level and CTR criterion. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of four samples exceeded the Primary Maximum Contaminant Level and CTR criterion and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.11. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49127, Copper **Region 9**

Santa Maria Creek

LOE ID:	76538
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Santa Maria Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Maria Creek was collected at 1 monitoring site [Santa Maria Creek @ Rangeland Road]
Temporal Representation:	Data was collected 6/25/2003 - 6/1/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 49127, Copper **Region 9**

Santa Maria Creek

LOE ID:	76539
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	4	038160
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Santa Maria Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Secondary MCL for copper is 1.0 mg/L (Title 22 California Code of Regulations).	
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Santa Maria Creek was collected at 1 monitoring site [Santa Maria Creek @ Rangeland Road]	
Temporal Representation:	Data was collected 6/25/2003 - 6/1/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID	**49280**	**Region 9**
Santa Maria Creek		

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the three samples exceed the beneficial use guidelines. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of three samples exceeded the guidelines and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the

applicable beneficial use support rating. 038161

Line of Evidence (LOE) for Decision ID 49280, Diazinon **Region 9**

Santa Maria Creek

LOE ID:	76540
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Santa Maria Creek to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Data for this line of evidence for Santa Maria Creek was collected at 1 monitoring site [Santa Maria Creek @ Rangeland Road]
Temporal Representation:	Data was collected over the time period 7/26/2007-6/1/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 49280, Diazinon **Region 9**

Santa Maria Creek

LOE ID:	78136
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	038162
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Santa Maria Creek to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Diazinon.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The USEPA drinking water health advisory for diazinon is 1.4 Âµg/L.	
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013	
Spatial Representation:	Data for this line of evidence for Santa Maria Creek was collected at 1 monitoring site [Santa Maria Creek @ Rangeland Road]	
Temporal Representation:	Data was collected over the time period 7/26/2007-6/1/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID	**51709**	**Region 9**
Santa Maria Creek		

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.3 of the Listing Policy. Under section 3.3 a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant.
Enterococcus
3 of 3 samples exceed the single sample objective for water contact recreation.
Fecal coliform
2 of 3 samples exceed the single sample objective for water contact recreation.
Total coliform
0 of 3 samples exceed the single sample objective for water contact recreation.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Samples and exceedences are as follows:
Enterococcus
3 of 3 samples exceed the single sample objective for water contact recreation.
Fecal coliform
2 of 3 samples exceed the single sample objective for water contact recreation.
Total coliform

0 of 3 samples exceed the single sample objective for water contact recreation. 038163
The samples do not exceed the allowable frequency listed in Table 3.2 of the Listing Policy. The sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 51709, Indicator Bacteria **Region 9**

Santa Maria Creek

LOE ID:	76541
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	3
Number of Exceedances:	3
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Santa Maria Creek to determine beneficial use support and results are as follows: 3 of 3 samples exceed the criterion for Enterococci.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Samples shall not exceed 61 organisms per 100 ml for enterococcus in waters designated for REC I beneficial use (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Maria Creek was collected at 1 monitoring site [Santa Maria Creek @ Rangeland Road]
Temporal Representation:	Data was collected over the time period 6/25/2003-7/24/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 51709, Indicator Bacteria **Region 9**

Santa Maria Creek

LOE ID:	76551
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	038164
Beneficial Use:	Water Contact Recreation	
Number of Samples:	3	
Number of Exceedances:	2	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Santa Maria Creek to determine beneficial use support and results are as follows: 2 of 3 samples exceed the criterion for Coliform, Fecal.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the fecal coliform concentration shall not exceed 400 MPN/100 ml.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Santa Maria Creek was collected at 1 monitoring site [Santa Maria Creek @ Rangeland Road]	
Temporal Representation:	Data was collected over the time period 6/25/2003-7/24/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 51709, Indicator Bacteria **Region 9**

Santa Maria Creek

LOE ID:	76560
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Santa Maria Creek to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxicsubstances in concentrations which are toxic to,or which produce detrimental physiologicalresponses in human, plant, animal, or indigenousaquatic life (Basin Plan).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In waters designated for water contact recreation (REC I), the total coliform concentration

	shall not exceed 10000 MPN/100 ml (CDPH 2006). 038165
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.
Spatial Representation:	Data for this line of evidence for Santa Maria Creek was collected at 1 monitoring site [Santa Maria Creek @ Rangeland Road]
Temporal Representation:	Data was collected over the time period 6/25/2003-7/24/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 49130 Region 9

Santa Maria Creek

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the four samples exceed the beneficial use objective/criterion. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of four samples exceeded the objective/criterion and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.11. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49130, Lead Region 9

Santa Maria Creek

LOE ID:	76553
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Municipal & Domestic Supply	038166
Number of Samples:	4	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Santa Maria Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Lead.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for Lead is 0.015 mg/L (Title 22 of the California Code of Regulations).	
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Santa Maria Creek was collected at 1 monitoring site [Santa Maria Creek @ Rangeland Road]	
Temporal Representation:	Data was collected 6/25/2003 - 6/1/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 49130, Lead **Region 9**

Santa Maria Creek

LOE ID:	76552
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Santa Maria Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	

Guideline Reference:	038167
Spatial Representation:	Data for this line of evidence for Santa Maria Creek was collected at 1 monitoring site [Santa Maria Creek @ Rangeland Road]
Temporal Representation:	Data was collected 6/25/2003 - 6/1/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 49282 — Region 9

Santa Maria Creek

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the three samples exceed the beneficial use guidelines. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of three samples exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49282, Malathion — Region 9

Santa Maria Creek

LOE ID:	78137
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3

Number of Exceedances:	0	038168
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Santa Maria Creek to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Malathion.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The USEPA drinking water health advisory for malathion is 100 Âµg/L.	
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013	
Spatial Representation:	Data for this line of evidence for Santa Maria Creek was collected at 1 monitoring site [Santa Maria Creek @ Rangeland Road]	
Temporal Representation:	Data was collected over the time period 7/26/2007-6/1/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 49282, Malathion **Region 9**

Santa Maria Creek

LOE ID:	76554
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Santa Maria Creek to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Malathion.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Santa Maria Creek was collected at 1 monitoring site [

	Santa Maria Creek @ Rangeland Road]	038169
Temporal Representation:	Data was collected over the time period 7/26/2007-6/1/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID 51984 Region 9

Santa Maria Creek

Pollutant:	**Nitrogen, Nitrite**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeded the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 51984, Nitrogen, Nitrite Region 9

Santa Maria Creek

LOE ID:	76555
Pollutant:	Nitrogen, Nitrite
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Santa Maria Creek to determine

	beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nitrite as N.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrite (as N) is 1.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Maria Creek was collected at 1 monitoring site [Santa Maria Creek @ Rangeland Road]
Temporal Representation:	Data was collected on a single day 6/25/2003.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **49269** **Region 9**

Santa Maria Creek

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the four samples exceed the beneficial use objective/criterion. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of four samples exceeded the objective/criterion and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.11. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49269, Zinc **Region 9**

Santa Maria Creek 038171

LOE ID:	76561
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Santa Maria Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for zinc is 5.0 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Santa Maria Creek was collected at 1 monitoring site [Santa Maria Creek @ Rangeland Road]
Temporal Representation:	Data was collected 6/25/2003 - 6/1/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 49269, Zinc **Region 9**

Santa Maria Creek

LOE ID:	76562
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Santa Maria Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Maria Creek was collected at 1 monitoring site [Santa Maria Creek @ Rangeland Road]
Temporal Representation:	Data was collected 6/25/2003 - 6/1/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Hatfield Creek
Water Body ID: CAR9054400020020306091138
Water Body Type: River & Stream

DECISION ID 47761 **Region 9**
Hatfield Creek

Pollutant: Cadmium
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the One samples exceed the California Toxics Rule Objective for cadmium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples exceeded the California Toxics Rule Objective for cadmium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47761, Cadmium **Region 9**
Hatfield Creek

LOE ID: 73822

Pollutant: Cadmium
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Municipal & Domestic Supply

Number of Samples:	1	038174
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Hatfield Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for cadmium is 0.005 mg/L (Title 22 of the California Code of Regulations).	
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Hatfield Creek was collected at 1 monitoring site [Hatfield Creek @ Magnolia Avenue]	
Temporal Representation:	Data was collected on a single day 7/26/2007.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 47761, Cadmium **Region 9**

Hatfield Creek

LOE ID:	73821
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Hatfield Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Data for this line of evidence for Hatfield Creek was collected at 1 monitoring site [Hatfield Creek @ Magnolia Avenue]
Temporal Representation:	Data was collected on a single day 7/26/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 47762 Region 9

Hatfield Creek

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the One samples exceed the Criteria for Chlorpyrifos. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one samples exceeded the Criteria for Chlorpyrifos and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47762, Chlorpyrifos Region 9

Hatfield Creek

LOE ID:	73823
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Hatfield Creek to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).
Spatial Representation:	Data for this line of evidence for Hatfield Creek was collected at 1 monitoring site [Hatfield Creek @ Magnolia Avenue]
Temporal Representation:	Data was collected on a single day 7/26/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47762, Chlorpyrifos **Region 9**

Hatfield Creek

LOE ID:	78038
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Hatfield Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for chlorpyrifos is 2.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013

Spatial Representation:	Data for this line of evidence for Hatfield Creek was collected at 1 monitoring site [Hatfield Creek @ Magnolia Avenue]
Temporal Representation:	Data was collected on a single day 7/26/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 47763 Region 9
Hatfield Creek

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the One samples exceed the California Toxics Rule Objective for copper. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the California Toxics Rule Objective for Copper and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47763, Copper Region 9
Hatfield Creek

LOE ID:	73824
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1

Number of Exceedances:	0	038178

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Hatfield Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Hatfield Creek was collected at 1 monitoring site [Hatfield Creek @ Magnolia Avenue]
Temporal Representation:	Data was collected on a single day 7/26/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47763, Copper **Region 9**

Hatfield Creek

LOE ID:	73825
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Hatfield Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for copper is 1.0 mg/L (Title 22 California Code of Regulations).
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Hatfield Creek was collected at 1 monitoring site [Hatfield

	Creek @ Magnolia Avenue] 038179
Temporal Representation:	Data was collected on a single day 7/26/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 47764 Region 9

Hatfield Creek

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the water quality criteria for Diazanon. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one samples exceeded the water quality criteria for Diazanon and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47764, Diazinon Region 9

Hatfield Creek

LOE ID:	78035
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING 038180
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Hatfield Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for diazinon is 1.4 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Hatfield Creek was collected at 1 monitoring site [Hatfield Creek @ Magnolia Avenue]
Temporal Representation:	Data was collected on a single day 7/26/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47764, Diazinon **Region 9**

Hatfield Creek

LOE ID:	73797
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Hatfield Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Data for this line of evidence for Hatfield Creek was collected at 1 monitoring site [Hatfield Creek @ Magnolia Avenue]

Temporal Representation:	Data was collected on a single day 7/26/2007.	038181
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID **47765** **Region 9**

Hatfield Creek

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.3 of the Listing Policy. Under section 3.3 a single line(s) of evidence are necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Single Sample Maximum Objective for Enterococcus, Zero out of One samples exceeded the Single Sample Maximum Objective for Fecal Coliform, and Zero out of One samples exceeded the Single Sample Maximum Guideline for Total Coliform.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the One samples exceed the Single Sample Maximum Objective for Enterococcus, Zero out of One samples exceeded the Single Sample Maximum Objective for Fecal Coliform, and Zero out of One samples exceeded the Single Sample Maximum Guideline for Total Coliform and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47765, Indicator Bacteria **Region 9**

Hatfield Creek

LOE ID:	73803
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	1	038182
Number of Exceedances:	0	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Hatfield Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Coliform, Total.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxicsubstances in concentrations which are toxic to,or which produce detrimental physiologicalresponses in human, plant, animal, or indigenousaquatic life (Basin Plan).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In waters designated for water contact recreation (REC I), the total coliform concentration shall not exceed 10000 MPN/100 ml (CDPH 2006).	
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.	
Spatial Representation:	Data for this line of evidence for Hatfield Creek was collected at 1 monitoring site [Hatfield Creek @ Magnolia Avenue]	
Temporal Representation:	Data was collected on a single day 7/26/2007.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 47765, Indicator Bacteria **Region 9**

Hatfield Creek

LOE ID:	73799
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Hatfield Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Coliform, Fecal.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the fecal coliform concentration shall not exceed 400 MPN/100 ml.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Data for this line of evidence for Hatfield Creek was collected at 1 monitoring site [Hatfield Creek @ Magnolia Avenue]
Temporal Representation:	Data was collected on a single day 7/26/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47765, Indicator Bacteria **Region 9**

Hatfield Creek

LOE ID:	73798
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Hatfield Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Enterococci.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Samples shall not exceed 61 organisms per 100 ml for enterococcus in waters designated for REC I beneficial use (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Hatfield Creek was collected at 1 monitoring site [Hatfield Creek @ Magnolia Avenue]
Temporal Representation:	Data was collected on a single day 7/26/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **47767** **Region 9**

Hatfield Creek

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. One of the One samples exceed the California Toxics Rule Objective for Lead. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of One samples exceeded the California Toxics Rule Objective for Lead and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47767, Lead **Region 9**

Hatfield Creek

LOE ID:	73801
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Hatfield Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for Lead is 0.015 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Hatfield Creek was collected at 1 monitoring site [Hatfield Creek @ Magnolia Avenue]
Temporal Representation:	Data was collected on a single day 7/26/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix

	Analytical and Dry Weather Monitoring Program Rev. 8 was followed. 038185
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47767, Lead **Region 9**
Hatfield Creek

LOE ID:	73800
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Hatfield Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Hatfield Creek was collected at 1 monitoring site [Hatfield Creek @ Magnolia Avenue]
Temporal Representation:	Data was collected on a single day 7/26/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **47768** **Region 9**
Hatfield Creek

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a Single line of evidence are necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the One samples exceed the Water Quality Criteria for Malathion.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Water Quality Criteria for Malathion and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47768, Malathion **Region 9**

Hatfield Creek

LOE ID:	73802
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Hatfield Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Malathion.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Hatfield Creek was collected at 1 monitoring site [Hatfield Creek @ Magnolia Avenue]
Temporal Representation:	Data was collected on a single day 7/26/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.

QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47768, Malathion **Region 9**

Hatfield Creek

LOE ID:	78036
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Hatfield Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Malathion.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for malathion is 100 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Hatfield Creek was collected at 1 monitoring site [Hatfield Creek @ Magnolia Avenue]
Temporal Representation:	Data was collected on a single day 7/26/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **47770** **Region 9**

Hatfield Creek

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the One samples exceed the California Toxics Rule Objective for Zinc.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Basin Plan Objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47770, Zinc **Region 9**

Hatfield Creek

LOE ID:	73804
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Hatfield Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for zinc is 5.0 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Hatfield Creek was collected at 1 monitoring site [Hatfield Creek @ Magnolia Avenue]
Temporal Representation:	Data was collected on a single day 7/26/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47770, Zinc **Region 9**

Hatfield Creek 038189

LOE ID:	73805
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Hatfield Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Hatfield Creek was collected at 1 monitoring site [Hatfield Creek @ Magnolia Avenue]
Temporal Representation:	Data was collected on a single day 7/26/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Los Penasquitos Creek
Water Body ID: CAR9061000020011025112826
Water Body Type: River & Stream

DECISION ID 43248 **Region 9**
Los Penasquitos Creek

Pollutant: Selenium
Final Listing Decision: Delist from 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Reason for Delisting: Applicable WQS attained; reason for recovery unspecified
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for removal from the CWA section 303(d) List under section 4.1 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Three of the 46 samples exceeded the Water Quality Criteria for the protection of warm freshwater habitat of 0.005 mg/l of dissolved selenium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Three of 46 samples exceeded the Water Quality Criteria for the protection of warm freshwater habitat of 0.005 mg/l of dissolved selenium, and this does not exceed the allowable frequency listed in Table 4.1 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be removed from the section 303(d) list because applicable water quality standards for the pollutant are not being exceeded.

Line of Evidence (LOE) for Decision ID 43248, Selenium **Region 9**
Los Penasquitos Creek

LOE ID: 77795

Pollutant: Selenium
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Dissolved

Beneficial Use: Warm Freshwater Habitat

Number of Samples:	27	038191
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Los Penasquitos Creek to determine beneficial use support and results are as follows: 0 of 27 samples exceed the criterion for Selenium.	
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The selenium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater is 0.005 mg/L (California Toxics Rule, 2000).	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Los Penasquitos Creek was collected at 2 monitoring sites [Los PeÃ±asquitos Creek - 906LPC-MLS, Los PeÃ±asquitos Creek - 906LPC-TWAS-2]	
Temporal Representation:	Data was collected over the time period 11/29/2001-11/11/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.	

Line of Evidence (LOE) for Decision ID 43248, Selenium **Region 9**

Los Penasquitos Creek

LOE ID:	26869
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	15
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	None of the fifteen samples collected exceed the water quality objective according to results in the San Diego County Municipal Copermittees Urban Runoff Monitoring Report, January 2007. Samples were collected in November 2001 to February 2006.
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	CTR Freshwater Chronic (CCC) 5 ug/L.
Objective/Criterion Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA
Evaluation Guideline:	
Guideline Reference:	Water Quality Standards 2000. Establishment of numeric criteria for priority toxic pollutants for the State of California: Rules and regulations. Federal Register Vol. 65, No. 97.

	Washington, D.C.: Environmental Protection Agency	038192

Spatial Representation:	Samples were collected at the mass loading station located near the lower boundary of the watershed at the north end of Sorrento Valley Court, under the Sorrento Valley Court Bridge.
Temporal Representation:	Samples were collected from November 2001 to February 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with Weston Solutions Quality Assurance Plan, 2004.
QAPP Information Reference(s):	Weston Solutions, 2004. Quality Management Manual. March 2004 (Revised December 2009).

Line of Evidence (LOE) for Decision ID 43248, Selenium **Region 9**

Los Penasquitos Creek

LOE ID:	7050
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	3
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Samples were collected for the Surface Water Ambient Monitoring Program. Samples were collected in March, April, June, and September 2002. Four samples were collected in this period and three exceeded the evaluation guideline for selenium.
Data Reference:	Surface Water Ambient Monitoring Program Data for selenium in Los Penasquitos Creek, March 2002 to September 2002
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	CTR Freshwater Chronic (CCC) 5 ug/L. (U.S. EPA, 2000).
Objective/Criterion Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA
Evaluation Guideline:	
Guideline Reference:	Water Quality Standards 2000. Establishment of numeric criteria for priority toxic pollutants for the State of California: Rules and regulations. Federal Register Vol. 65, No. 97. Washington, D.C.: Environmental Protection Agency
Spatial Representation:	Water samples were collected at Los Penasquitos station 906LPLPC6; (Latitude 32.9036775, Longitude -117.2262075).
Temporal Representation:	Samples were collected on March, April, June, and September 2002.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

DECISION ID **42736** **Region 9**

Los Penasquitos Creek

Pollutant:	**Toxicity**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**

Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)	038193
Revision Status	Revised	
Sources:	Source Unknown	
Expected TMDL Completion Date:	2023	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for removal from the CWA section 303(d) List under section 4.6 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

5 lines of evidence are available in the administrative record to assess pollutant. Ten of the 47 samples exceed the guideline for water toxicity. One of one sample exceeds the guideline for sediment toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Ten of the 47 samples exceed the guideline for water toxicity and this exceeds the allowable frequency listed in Table 4.1 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 42736, Toxicity **Region 9**

Los Penasquitos Creek

LOE ID:	74174
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to test for toxicity. None of the samples exhibited statistically and biologically significant toxicity. The toxicity tests included survival and reproduction of Ceriodaphnia dubia.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the

	control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control. Additionally, the biological significance of the sample is evaluted by determining whether the sample response is lower than the evaluation threshold.
Guideline Reference:	
Spatial Representation:	The samples were collected from site 906_SMC00198, Los Penasquitos Creek.
Temporal Representation:	The samples were collected in June 2009.
Environmental Conditions:	
QAPP Information:	This data was collected for the Regional Monitoring Of Southern California's Coastal Watersheds - Stormwater Monitoring Coalition Bioassessment Working Group. CRG Marine Laboratories Quality Assurance Program Document was provided.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 42736, Toxicity **Region 9**

Los Penasquitos Creek

LOE ID:	74173
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	27
Number of Exceedances:	7
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Twenty-seven samples were collected to test for toxicity. Seven of the 27 samples exhibited statistically significant toxicity. The toxicity tests that exhibited significant toxicity included survival of Hyalella azteca, growth of Selenastrum capriconutum and survival and reproduction of Ceriodaphnia dubia.
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms. Fourth Edition. Office of Water, U.S. Environmental Protection Agency. Washington, D.C. EPA-821-R-02-013
Spatial Representation:	The samples were collected at stations 906LPC-MLS and 906LPC-TWAS-2 Los Penasquitos Creek.
Temporal Representation:	The samples were collected from 2001 to 2008.
Environmental Conditions:	
QAPP Information:	The data was collected under the County of San Diego Co-Permittees Receiving Waters Urban Runoff Monitoring and Reporting Program (Order No. 2007-01). Data quality is good.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 42736, Toxicity **Region 9**

Los Penasquitos Creek

LOE ID:	72752
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate sediment toxicity. The sample exhibited significant toxicity. The toxicity test included survival and growth of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL. SL is defined as the result being significant compared to the negative control based on a statistical test, less than stated the alpha level, AND less than the evaluation threshold.
Guideline Reference:	Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates, Second Edition. U.S. Environmental Protection Agency Office of Research and Development, Duluth, MI , U.S. Environmental Protection Agency Office of Water, Washington, DC EPA-600/R-99/064
Spatial Representation:	The sample was collected at station 906SUP076.
Temporal Representation:	The sample was collected in January 2007.
Environmental Conditions:	
QAPP Information:	All data was collected following the Standard Operating Procedures and Data Quality Objectives outlined in the SWAMP QAMP, (Puckett, 2002). QA data are included in submission.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 42736, Toxicity **Region 9**

Los Penasquitos Creek

LOE ID:	21387
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	3
Data and Information Type:	Ambient toxicity testing (chronic)

Data Used to Assess Water Quality:	Four samples were collected at Los Penasquitos Creek station 906LPLPC6 from March 2002 to September 2002, they showed significant toxicity levels (SL) in the following tests: Selenastrum algae growth test - three of the four samples showed significant levels of toxicity. Ceriodaphnia dubia survival/reproductive test - one of the four samples.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.
Guideline Reference:	Monitoring data for Region 9
Spatial Representation:	Samples were collected at Los Penasquitos Creek station 906LPLPC6; (Latitude 32.9036775, Longitude -117.2262075).
Temporal Representation:	Samples were collected on March, April, June, and September 2002.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 42736, Toxicity **Region 9**

Los Penasquitos Creek

LOE ID:	26872
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	15
Number of Exceedances:	0
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Selenastrum: None of the 15 samples were found to exhibit toxicity. Hyalella azteca: None of the 15 samples were found to exhibit toxicity. Ceriodaphnia dubia- None of the fifteen samples were found to be toxic as determined by the Ceriodaphnia dubia survival/reproductive test according to results in the San Diego County Municipal Copermittees Annual Progress Report, 2007. The samples were collected from November 2001 through February 2006.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Samples were found to exhibit toxicity when the No Observed Effect Concentration (NOEC) or median lethal concentration (LC50) for any given species was estimated to be less than

	100% of the test sample concentration (San Diego Water Board, 2007). 038197
Guideline Reference:	Waste Discharge Requirements for Discharges of Urban Runoff From the Municipal Separate Storm Sewer Systems Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego, the San Diego Unified Port District, and the San Diego County Regional Airport. Order No. R9-2007-0001
Spatial Representation:	Samples were collected at the mass loading station located near the lower boundary of the watershed at the north end of Sorrento Valley Court, under the Sorrento Valley Court Bridge
Temporal Representation:	The samples were collected from November 2001 through February 2006.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	Quality control was conducted in accordance with the Weston Solution's quality assurance program.
QAPP Information Reference(s):	Weston Solutions, 2004. Quality Management Manual. March 2004 (Revised December 2009).

DECISION ID 47474 — Region 9

Los Penasquitos Creek

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. 2 lines of evidence are available in the administrative record to assess this pollutant. Zero of the 28 samples exceed the CRITERIA for protection of the Aquatic Life beneficial uses. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 28 samples exceeded the CRITERIA and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 47474, Arsenic — Region 9

Los Penasquitos Creek

LOE ID:	77792
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	27
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Los Penasquitos Creek to determine beneficial use support and results are as follows: 0 of 27 samples exceed the criterion for Arsenic.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The dissolved arsenic criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved arsenic is 0.150 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Los Penasquitos Creek was collected at 2 monitoring sites [Los PeÃ±asquitos Creek - 906LPC-MLS, Los PeÃ±asquitos Creek - 906LPC-TWAS-2]
Temporal Representation:	Data was collected over the time period 11/29/2001-11/11/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 47474, Arsenic **Region 9**

Los Penasquitos Creek

LOE ID:	74177
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Los Penasquitos Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The dissolved arsenic criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved arsenic is 0.150 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition

Evaluation Guideline:
Guideline Reference:

Spatial Representation:	Data for this line of evidence for Los Penasquitos Creek was collected at 1 monitoring site [Los Penasquitos Creek - 906_SMC00198]
Temporal Representation:	Data was collected on a single day 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

DECISION ID 47498 Region 9

Los Penasquitos Creek

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 26 samples exceed the criterion. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 26 samples exceeded the criterion and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 47498, Cadmium Region 9

Los Penasquitos Creek

LOE ID:	74189
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Los Penasquitos Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Los Penasquitos Creek was collected at 1 monitoring site [Los Penasquitos Creek - 906_SMC00198]
Temporal Representation:	Data was collected on a single day 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

Line of Evidence (LOE) for Decision ID 47498, Cadmium **Region 9**

Los Penasquitos Creek

LOE ID:	74190
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	25
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Los Penasquitos Creek to determine beneficial use support and results are as follows: 0 of 25 samples exceed the criterion for Cadmium.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Cadmium to protect aquatic life in freshwater. The dissolved Cadmium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition

Evaluation Guideline:	038201
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Los Penasquitos Creek was collected at 2 monitoring sites [Los PeÃ±asquitos Creek - 906LPC-TWAS-2, Los PeÃ±asquitos Creek - 906LPC-MLS]
Temporal Representation:	Data was collected over the time period 11/29/2001-11/11/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID 47502 Region 9

Los Penasquitos Creek

Pollutant:	**Chlordane**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollution
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the sediment chemistry guideline. One of one sample exhibited sediment toxicity. Based on the readily available data and information, the weight of evidence indicates that there is INSUFFICIENT justification AGAINST placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the one samples exceed the GUIDELINE and this sample size is INSUFFICIENT to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47502, Chlordane Region 9

Los Penasquitos Creek

LOE ID:	72752
Pollutant:	Toxicity
LOE Subgroup:	Toxicity

Matrix:	Sediment	038202
Fraction:	None	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	1	
Data and Information Type:	TOXICITY TESTING	
Data Used to Assess Water Quality:	One sample was collected to evaluate sediment toxicity. The sample exhibited significant toxicity. The toxicity test included survival and growth of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).	
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL. SL is defined as the result being significant compared to the negative control based on a statistical test, less than stated the alpha level, AND less than the evaluation threshold.	
Guideline Reference:	Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates, Second Edition. U.S. Environmental Protection Agency Office of Research and Development, Duluth, MI , U.S. Environmental Protection Agency Office of Water, Washington, DC EPA-600/R-99/064	
Spatial Representation:	The sample was collected at station 906SUP076.	
Temporal Representation:	The sample was collected in January 2007.	
Environmental Conditions:		
QAPP Information:	All data was collected following the Standard Operating Procedures and Data Quality Objectives outlined in the SWAMP QAMP, (Puckett, 2002). QA data are included in submission.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 47502, Chlordane **Region 9**

Los Penasquitos Creek

LOE ID:	72825
Pollutant:	Chlordane
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	0 of 1 samples collected exceeded the criteria for chlordane concentration (Sum of trans-Chlordane, cis-Chlordane, cis-Nonachlor, trans-Nonachlor, and Oxychlordane).
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP

Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Waters shall not contain substances in concentrations that result in the deposition of material that causes nuisance or adversely affects beneficial uses. (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Probable Effect Concentration for Chlordane in freshwater sediments is 17.6 ug/kg(MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data were collected at the following station 906SUP076 (Penasquitos Creek @ Springbrook).
Temporal Representation:	The samples were collected on 1/8/2007.
Environmental Conditions:	
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 47503 Region 9

Los Penasquitos Creek

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollution
Regional Board Conclusion:	
Regional Board Decision Recommendation:	

Line of Evidence (LOE) for Decision ID 47503, Chromium Region 9

Los Penasquitos Creek

LOE ID:	74193
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	25
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Los Penasquitos Creek to determine beneficial use support and results are as follows: 0 of 25 samples exceed the criterion for Chromium.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved chromium to protect aquatic life in freshwater. The dissolved Chromium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Los Penasquitos Creek was collected at 2 monitoring sites [Los PeÃ±asquitos Creek - 906LPC-TWAS-2, Los PeÃ±asquitos Creek - 906LPC-MLS]
Temporal Representation:	Data was collected over the time period 11/29/2001-11/11/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 47503, Chromium **Region 9**

Los Penasquitos Creek

LOE ID:	74192
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Los Penasquitos Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Los Penasquitos Creek was collected at 1 monitoring site [Los Penasquitos Creek - 906_SMC00198]
Temporal Representation:	Data was collected on a single day 6/3/2009.

Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

DECISION ID 47499 **Region 9**

Los Penasquitos Creek

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 26 samples exceed the criterion. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 26 samples exceeded the criterion and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 47499, Copper **Region 9**

Los Penasquitos Creek

LOE ID:	74194
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Los Penasquitos Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Los Penasquitos Creek was collected at 1 monitoring site [Los Penasquitos Creek - 906_SMC00198]
Temporal Representation:	Data was collected on a single day 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

Line of Evidence (LOE) for Decision ID 47499, Copper **Region 9**

Los Penasquitos Creek

LOE ID:	74195
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	25
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Los Penasquitos Creek to determine beneficial use support and results are as follows: 0 of 25 samples exceed the criterion for Copper.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved copper to protect aquatic life in freshwater. The dissolved copper criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Los Penasquitos Creek was collected at 2 monitoring sites [Los PeÃ±asquitos Creek - 906LPC-TWAS-2, Los PeÃ±asquitos Creek - 906LPC-MLS]
Temporal Representation:	Data was collected over the time period 11/29/2001-11/11/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup

QAPP Information Reference(s):	Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed. Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID	47539	Region 9
Los Penasquitos Creek		

Pollutant:	**Cyfluthrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the sediment chemistry guideline. One of one sample exhibited sediment toxicity. Based on the readily available data and information, the weight of evidence indicates that there is INSUFFICIENT justification AGAINST placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the one samples exceed the GUIDELINE and this sample size is INSUFFICIENT to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47539, Cyfluthrin	**Region 9**
Los Penasquitos Creek	

LOE ID:	72752
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1

Data and Information Type:	TOXICITY TESTING 038208
Data Used to Assess Water Quality:	One sample was collected to evaluate sediment toxicity. The sample exhibited significant toxicity. The toxicity test included survival and growth of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL. SL is defined as the result being significant compared to the negative control based on a statistical test, less than stated the alpha level, AND less than the evaluation threshold.
Guideline Reference:	Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates, Second Edition. U.S. Environmental Protection Agency Office of Research and Development, Duluth, MI , U.S. Environmental Protection Agency Office of Water, Washington, DC EPA-600/R-99/064
Spatial Representation:	The sample was collected at station 906SUP076.
Temporal Representation:	The sample was collected in January 2007.
Environmental Conditions:	
QAPP Information:	All data was collected following the Standard Operating Procedures and Data Quality Objectives outlined in the SWAMP QAMP, (Puckett, 2002). QA data are included in submission.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47539, Cyfluthrin **Region 9**

Los Penasquitos Creek

LOE ID:	74196
Pollutant:	Cyfluthrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Los Penasquitos Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cyfluthrin, total.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for cyfluthrin is the median lethal concentration (LC50) of 1.1 ug/g

	and is normalized by the percentage of organic carbon in the sediment sample. The LC50 1.1 ug/g is the geometric mean of LC50 values for cyfluthrin from Amweg et al. (2005).
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5
Spatial Representation:	Data for this line of evidence for Los Penasquitos Creek was collected at 1 monitoring site [Penasquitos Creek @ Springbrook - 906SUP076]
Temporal Representation:	Data was collected on a single day 1/8/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID 47540 — Region 9

Los Penasquitos Creek

Pollutant:	**Cyhalothrin, Lambda**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the sediment chemistry guideline. One of one sample exhibited sediment toxicity. Based on the readily available data and information, the weight of evidence indicates that there is INSUFFICIENT justification AGAINST placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the one samples exceed the GUIDELINE and this sample size is INSUFFICIENT to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47540, Cyhalothrin, Lambda — Region 9

Los Penasquitos Creek

LOE ID:	74197
Pollutant:	Cyhalothrin, Lambda
LOE Subgroup:	Pollutant-Sediment

Matrix:	Sediment	038210
Fraction:	Total	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Los Penasquitos Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cyhalothrin, lambda, total.	
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The evaluation guideline for lambda-cyhalothrin is the median lethal concentration (LC50) of 0.44 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 0.44 ug/g is the geometric mean of LC50 values for lambda-cyhalothrin from Amweg et al. (2005).	
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5	
Spatial Representation:	Data for this line of evidence for Los Penasquitos Creek was collected at 1 monitoring site [Penasquitos Creek @ Springbrook - 906SUP076]	
Temporal Representation:	Data was collected on a single day 1/8/2007.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.	
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)	

Line of Evidence (LOE) for Decision ID 47540, Cyhalothrin, Lambda **Region 9**

Los Penasquitos Creek

LOE ID:	72752
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate sediment toxicity. The sample exhibited significant toxicity. The toxicity test included survival and growth of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP

Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL. SL is defined as the result being significant compared to the negative control based on a statistical test, less than stated the alpha level, AND less than the evaluation threshold.
Guideline Reference:	Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates, Second Edition. U.S. Environmental Protection Agency Office of Research and Development, Duluth, MI , U.S. Environmental Protection Agency Office of Water, Washington, DC EPA-600/R-99/064
Spatial Representation:	The sample was collected at station 906SUP076.
Temporal Representation:	The sample was collected in January 2007.
Environmental Conditions:	
QAPP Information:	All data was collected following the Standard Operating Procedures and Data Quality Objectives outlined in the SWAMP QAMP, (Puckett, 2002). QA data are included in submission.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID	47541	Region 9
Los Penasquitos Creek		

Pollutant:	**Cypermethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Three lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the sediment chemistry guideline. One of one sample exhibited sediment toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is

	INSUFFICIENT justification AGAINST placing this water segment-pollutant combination on the CWA section 303(d) List. 03/2012 This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the one samples exceed the GUIDELINE and this sample size is INSUFFICIENT to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47541, Cypermethrin **Region 9**

Los Penasquitos Creek

LOE ID:	74198
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Los Penasquitos Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cypermethrin, total.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for cypermethrin is the median lethal concentration (LC50) of 0.3 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 0.3 ug/g is the geometric mean of LC50 values for cypermethrin from Maund et al. (2002).
Guideline Reference:	Partitioning, bioavailability, and toxicity of the pyrethroid insecticide cypermethrin in sediments. Environmental Toxicology and Chemistry 21:9-15
Spatial Representation:	Data for this line of evidence for Los Penasquitos Creek was collected at 1 monitoring site [Penasquitos Creek @ Springbrook - 906SUP076]
Temporal Representation:	Data was collected on a single day 1/8/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 47541, Cypermethrin **Region 9**

Los Penasquitos Creek

LOE ID:	72752
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate sediment toxicity. The sample exhibited significant toxicity. The toxicity test included survival and growth of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL. SL is defined as the result being significant compared to the negative control based on a statistical test, less than stated the alpha level, AND less than the evaluation threshold.
Guideline Reference:	Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates, Second Edition. U.S. Environmental Protection Agency Office of Research and Development, Duluth, MI , U.S. Environmental Protection Agency Office of Water, Washington, DC EPA-600/R-99/064
Spatial Representation:	The sample was collected at station 906SUP076.
Temporal Representation:	The sample was collected in January 2007.
Environmental Conditions:	
QAPP Information:	All data was collected following the Standard Operating Procedures and Data Quality Objectives outlined in the SWAMP QAMP, (Puckett, 2002). QA data are included in submission.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47541, Cypermethrin **Region 9**

Los Penasquitos Creek

LOE ID:	74199
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	0	038214
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Los Penasquitos Creek to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Cypermethrin, total.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of cypermethrin does not exceed 0.0002 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Fojut et al. 2012)	
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.	
Spatial Representation:	Data for this line of evidence for Los Penasquitos Creek was collected at 1 monitoring site [Los Penasquitos Creek - 906_SMC00198]	
Temporal Representation:	Data was collected on a single day 6/3/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.	

Line of Evidence (LOE) for Decision ID 47541, Cypermethrin **Region 9**

Los Penasquitos Creek

LOE ID:	74200
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Los Penasquitos Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Cypermethrin, total.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of cypermethrin does not exceed 0.0002 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Fojut et al. 2012)
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Los Penasquitos Creek was collected at 2 monitoring sites [Los PeÃ±asquitos Creek - 906LPC-MLS, Los PeÃ±asquitos Creek - 906LPC-TWAS-2]
Temporal Representation:	Data was collected over the time period 9/27/2007-11/11/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID	**47542**	**Region 9**
Los Penasquitos Creek		

Pollutant:	**DDD (Dichlorodiphenyldichloroethane)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the sediment chemistry guideline. One of one sample exhibited sediment toxicity. Based on the readily available data and information, the weight of evidence indicates that there is INSUFFICIENT justification AGAINST placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the one samples exceed the GUIDELINE and this sample size is INSUFFICIENT to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47542, DDD (Dichlorodiphenyldichloroethane)	**Region 9**
Los Penasquitos Creek	

LOE ID:	74207

Pollutant:	DDD (Dichlorodiphenyldichloroethane)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Los Penasquitos Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for DDD.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for sum of DDD (o,p' + p,p') is 28.0 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Los Penasquitos Creek was collected at 1 monitoring site [Penasquitos Creek @ Springbrook - 906SUP076]
Temporal Representation:	Data was collected on a single day 1/8/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 47542, DDD (Dichlorodiphenyldichloroethane) Region 9

Los Penasquitos Creek

LOE ID:	72752
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate sediment toxicity. The sample exhibited significant toxicity. The toxicity test included survival and growth of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP

Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL. SL is defined as the result being significant compared to the negative control based on a statistical test, less than stated the alpha level, AND less than the evaluation threshold.
Guideline Reference:	Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates, Second Edition. U.S. Environmental Protection Agency Office of Research and Development, Duluth, MI , U.S. Environmental Protection Agency Office of Water, Washington, DC EPA-600/R-99/064
Spatial Representation:	The sample was collected at station 906SUP076.
Temporal Representation:	The sample was collected in January 2007.
Environmental Conditions:	
QAPP Information:	All data was collected following the Standard Operating Procedures and Data Quality Objectives outlined in the SWAMP QAMP, (Puckett, 2002). QA data are included in submission.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID	47549	Region 9
Los Penasquitos Creek		

Pollutant:	**DDE (Dichlorodiphenyldichloroethylene)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the sediment chemistry guideline. One of one sample exhibited sediment toxicity. Based on the readily available data and information, the weight of evidence indicates that there is INSUFFICIENT justification AGAINST placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the one samples exceed the GUIDELINE and this sample size is INSUFFICIENT to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47549, DDE (Dichlorodiphenyldichloroethylene) **Region 9**

Los Penasquitos Creek

LOE ID:	74208
Pollutant:	DDE (Dichlorodiphenyldichloroethylene)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Los Penasquitos Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for DDE.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for sum of DDE (o,p' + p,p') is 31.3 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Los Penasquitos Creek was collected at 1 monitoring site [Penasquitos Creek @ Springbrook - 906SUP076]
Temporal Representation:	Data was collected on a single day 1/8/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 47549, DDE (Dichlorodiphenyldichloroethylene) **Region 9**

Los Penasquitos Creek

LOE ID:	72752
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate sediment toxicity. The sample exhibited significant

	toxicity. The toxicity test included survival and growth of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL. SL is defined as the result being significant compared to the negative control based on a statistical test, less than stated the alpha level, AND less than the evaluation threshold.
Guideline Reference:	Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates, Second Edition. U.S. Environmental Protection Agency Office of Research and Development, Duluth, MI , U.S. Environmental Protection Agency Office of Water, Washington, DC EPA-600/R-99/064
Spatial Representation:	The sample was collected at station 906SUP076.
Temporal Representation:	The sample was collected in January 2007.
Environmental Conditions:	
QAPP Information:	All data was collected following the Standard Operating Procedures and Data Quality Objectives outlined in the SWAMP QAMP, (Puckett, 2002). QA data are included in submission.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID	47550	Region 9
Los Penasquitos Creek		

Pollutant:	**DDT (Dichlorodiphenyltrichloroethane)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the sediment chemistry guideline. One of one sample exhibited sediment toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is INSUFFICIENT justification AGAINST placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the one samples exceed the GUIDELINE and this sample size is INSUFFICIENT to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.

4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47550, DDT (Dichlorodiphenyltrichloroethane) Region 9

Los Penasquitos Creek

LOE ID:	74209
Pollutant:	DDT (Dichlorodiphenyltrichloroethane)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Los Penasquitos Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for DDT.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for sum of DDT (o,p' + p,p') is 62.9 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Los Penasquitos Creek was collected at 1 monitoring site [Penasquitos Creek @ Springbrook - 906SUP076]
Temporal Representation:	Data was collected on a single day 1/8/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 47550, DDT (Dichlorodiphenyltrichloroethane) Region 9

Los Penasquitos Creek

LOE ID:	72752
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None

Beneficial Use:	Warm Freshwater Habitat	038221
Number of Samples:	1	
Number of Exceedances:	1	
Data and Information Type:	TOXICITY TESTING	
Data Used to Assess Water Quality:	One sample was collected to evaluate sediment toxicity. The sample exhibited significant toxicity. The toxicity test included survival and growth of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).	
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL. SL is defined as the result being significant compared to the negative control based on a statistical test, less than stated the alpha level, AND less than the evaluation threshold.	
Guideline Reference:	Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates, Second Edition. U.S. Environmental Protection Agency Office of Research and Development, Duluth, MI , U.S. Environmental Protection Agency Office of Water, Washington, DC EPA-600/R-99/064	
Spatial Representation:	The sample was collected at station 906SUP076.	
Temporal Representation:	The sample was collected in January 2007.	
Environmental Conditions:		
QAPP Information:	All data was collected following the Standard Operating Procedures and Data Quality Objectives outlined in the SWAMP QAMP, (Puckett, 2002). QA data are included in submission.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID	47553	Region 9
Los Penasquitos Creek		

Pollutant:	**Deltamethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Three lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.

3. Zero of one samples exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the sediment chemistry guideline. One of one sample exhibited sediment toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is INSUFFICIENT justification AGAINST placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the one samples exceed the GUIDELINE and this sample size is INSUFFICIENT to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47553, Deltamethrin **Region 9**

Los Penasquitos Creek

LOE ID:	72752
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate sediment toxicity. The sample exhibited significant toxicity. The toxicity test included survival and growth of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.

Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	038223
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL. SL is defined as the result being significant compared to the negative control based on a statistical test, less than stated the alpha level, AND less than the evaluation threshold.	
Guideline Reference:	Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates, Second Edition. U.S. Environmental Protection Agency Office of Research and Development, Duluth, MI , U.S. Environmental Protection Agency Office of Water, Washington, DC EPA-600/R-99/064	
Spatial Representation:	The sample was collected at station 906SUP076.	
Temporal Representation:	The sample was collected in January 2007.	
Environmental Conditions:		
QAPP Information:	All data was collected following the Standard Operating Procedures and Data Quality Objectives outlined in the SWAMP QAMP, (Puckett, 2002). QA data are included in submission.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 47553, Deltamethrin **Region 9**

Los Penasquitos Creek

LOE ID:	74210
Pollutant:	Deltamethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Los Penasquitos Creek to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Deltamethrin.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for Deltamethrin is the maximum acceptable toxicant concentration (MATC) of 0.02 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Los Penasquitos Creek was collected at 2 monitoring sites [Los PeÃ±asquitos Creek - 906LPC-MLS, Los PeÃ±asquitos Creek - 906LPC-TWAS-2]
Temporal Representation:	Data was collected over the time period 9/27/2007-11/11/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.

QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

038224

Line of Evidence (LOE) for Decision ID 47553, Deltamethrin **Region 9**

Los Penasquitos Creek

LOE ID:	74211
Pollutant:	Deltamethrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Los Penasquitos Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Deltamethrin.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for deltamethrin is the median lethal concentration (LC50) of 0.79 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 0.79 ug/g is the geometric mean of LC50 values for deltamethrin from Amweg et al. (2005).
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5
Spatial Representation:	Data for this line of evidence for Los Penasquitos Creek was collected at 1 monitoring site [Penasquitos Creek @ Springbrook - 906SUP076]
Temporal Representation:	Data was collected on a single day 1/8/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **47555** **Region 9**

Los Penasquitos Creek

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of

the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Considering the nation-wide ban of diazinon which went into effect on January 1, 2005, data from 2005 and on were evaluated in the assessment of LOE #74219, and 0 of 17 samples exceed the Criteria

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Considering the nation-wide ban of diazinon which went into effect on January 1, 2005, data from 2005 and on were evaluated in the assessment of LOE #74219, and 0 of 17 samples exceed the Criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 47555, Diazinon **Region 9**

Los Penasquitos Creek

LOE ID:	74219
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Los Penasquitos Creek to determine beneficial use support and results are as follows: 0 of 17 samples exceed the criterion for Diazinon.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Data for this line of evidence for Los Penasquitos Creek was collected at 2 monitoring sites [Los PeÃ±asquitos Creek - 906LPC-MLS, Los PeÃ±asquitos Creek - 906LPC-TWAS-2]

Temporal Representation:	Data was collected over the time period 02/11/2005-11/11/2008. 038226
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 47555, Diazinon **Region 9**

Los Penasquitos Creek

LOE ID:	74220
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Los Penasquitos Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Diazinon.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	There is no diazinon evaluation guideline specific to "sediment, interstitial water" (pore water). The following evaluation guideline was used to evaluate an exceedance in water quality standards: the freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).Â
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Data for this line of evidence for Los Penasquitos Creek was collected at 1 monitoring site [Penasquitos Creek @ Springbrook - 906SUP076]
Temporal Representation:	Data was collected on a single day 1/8/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **47556** **Region 9**

Los Penasquitos Creek

Pollutant:	**Dieldrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision

Revision Status	Revised	038227
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the sediment chemistry guideline. One of one sample exhibited sediment toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is INSUFFICIENT justification AGAINST placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the one samples exceed the GUIDELINE and this sample size is INSUFFICIENT to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47556, Dieldrin **Region 9**

Los Penasquitos Creek

LOE ID:	72752
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate sediment toxicity. The sample exhibited significant toxicity. The toxicity test included survival and growth of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL. SL is defined as the result being significant compared to the negative control based on a statistical test, less than stated the alpha level, AND less than the evaluation threshold.
Guideline Reference:	Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates, Second Edition. U.S. Environmental Protection Agency Office of Research and Development, Duluth, MI , U.S. Environmental Protection Agency Office of Water, Washington, DC EPA-600/R-99/064
Spatial Representation:	The sample was collected at station 906SUP076.
Temporal Representation:	The sample was collected in January 2007.
Environmental Conditions:	
QAPP Information:	All data was collected following the Standard Operating Procedures and Data Quality Objectives outlined in the SWAMP QAMP, (Puckett, 2002). QA data are included in submission.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47556, Dieldrin **Region 9**

Los Penasquitos Creek

LOE ID:	74221
Pollutant:	Dieldrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Los Penasquitos Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Dieldrin.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for dieldrin is 61.8 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Los Penasquitos Creek was collected at 1 monitoring site [Penasquitos Creek @ Springbrook - 906SUP076]
Temporal Representation:	Data was collected on a single day 1/8/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID 47557 Region 9

Los Penasquitos Creek 038229

Pollutant:	**Endrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the sediment chemistry guideline. One of one sample exhibited sediment toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is INSUFFICIENT justification AGAINST placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the one samples exceed the GUIDELINE and this sample size is INSUFFICIENT to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47557, Endrin — Region 9

Los Penasquitos Creek

LOE ID:	74222
Pollutant:	Endrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Los Penasquitos Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Endrin.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be

	maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for endrin is 207 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Los Penasquitos Creek was collected at 1 monitoring site [Penasquitos Creek @ Springbrook - 906SUP076]
Temporal Representation:	Data was collected on a single day 1/8/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 47557, Endrin **Region 9**

Los Penasquitos Creek

LOE ID:	72752
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate sediment toxicity. The sample exhibited significant toxicity. The toxicity test included survival and growth of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL. SL is defined as the result being significant compared to the negative control based on a statistical test, less than stated the alpha level, AND less than the evaluation threshold.
Guideline Reference:	Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates, Second Edition. U.S. Environmental Protection Agency Office of Research and Development, Duluth, MI , U.S. Environmental Protection Agency Office of Water, Washington, DC EPA-600/R-99/064
Spatial Representation:	The sample was collected at station 906SUP076.
Temporal Representation:	The sample was collected in January 2007.
Environmental Conditions:	
QAPP Information:	All data was collected following the Standard Operating Procedures and Data Quality

	Objectives outlined in the SWAMP QAMP, (Puckett, 2002). QA data are included in submission.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 47589 Region 9

Los Penasquitos Creek

Pollutant:	**Esfenvalerate/Fenvalerate**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the sediment chemistry guideline. One of one sample exhibited sediment toxicity. Based on the readily available data and information, the weight of evidence indicates that there is INSUFFICIENT justification AGAINST placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the one samples exceed the GUIDELINE and this sample size is INSUFFICIENT to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47589, Esfenvalerate/Fenvalerate Region 9

Los Penasquitos Creek

LOE ID:	72752
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate sediment toxicity. The sample exhibited significant

	toxicity. The toxicity test included survival and growth of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL. SL is defined as the result being significant compared to the negative control based on a statistical test, less than stated the alpha level, AND less than the evaluation threshold.
Guideline Reference:	Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates, Second Edition. U.S. Environmental Protection Agency Office of Research and Development, Duluth, MI , U.S. Environmental Protection Agency Office of Water, Washington, DC EPA-600/R-99/064
Spatial Representation:	The sample was collected at station 906SUP076.
Temporal Representation:	The sample was collected in January 2007.
Environmental Conditions:	
QAPP Information:	All data was collected following the Standard Operating Procedures and Data Quality Objectives outlined in the SWAMP QAMP, (Puckett, 2002). QA data are included in submission.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47589, Esfenvalerate/Fenvalerate **Region 9**

Los Penasquitos Creek

LOE ID:	74224
Pollutant:	Esfenvalerate/Fenvalerate
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Los Penasquitos Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Esfenvalerate/Fenvalerate, total.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for esfenvalerate/fenvalerate is the median lethal concentration (LC50) of 1.5 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 1.5 ug/g is the geometric mean of LC50 values for

	esfenvalerate/fenvalerate from Amweg et al. (2005). 038233
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5
Spatial Representation:	Data for this line of evidence for Los Penasquitos Creek was collected at 1 monitoring site [Penasquitos Creek @ Springbrook - 906SUP076]
Temporal Representation:	Data was collected on a single day 1/8/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 47589, Esfenvalerate/Fenvalerate **Region 9**

Los Penasquitos Creek

LOE ID:	74223
Pollutant:	Esfenvalerate/Fenvalerate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Los Penasquitos Creek to determine beneficial use support and results are as follows: 0 of 7 samples exceed the criterion for Esfenvalerate.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to the USEPA Office of Pesticide Programs Ecotoxicity database, the aquatic life EC50 for Esfenvalerate is 0.9 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Los Penasquitos Creek was collected at 2 monitoring sites [Los PeÃ±asquitos Creek - 906LPC-MLS, Los PeÃ±asquitos Creek - 906LPC-TWAS-2]
Temporal Representation:	Data was collected over the time period 9/27/2007-11/11/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID 47602 Region 9

Los Penasquitos Creek 038234

Pollutant:	**Fenpropathrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the sediment chemistry guideline. One of one sample exhibited sediment toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is INSUFFICIENT justification AGAINST placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the one samples exceed the GUIDELINE and this sample size is INSUFFICIENT to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47602, Fenpropathrin — Region 9

Los Penasquitos Creek

LOE ID:	72752
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate sediment toxicity. The sample exhibited significant toxicity. The toxicity test included survival and growth of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP

Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL. SL is defined as the result being significant compared to the negative control based on a statistical test, less than stated the alpha level, AND less than the evaluation threshold.
Guideline Reference:	Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates, Second Edition. U.S. Environmental Protection Agency Office of Research and Development, Duluth, MI , U.S. Environmental Protection Agency Office of Water, Washington, DC EPA-600/R-99/064
Spatial Representation:	The sample was collected at station 906SUP076.
Temporal Representation:	The sample was collected in January 2007.
Environmental Conditions:	
QAPP Information:	All data was collected following the Standard Operating Procedures and Data Quality Objectives outlined in the SWAMP QAMP, (Puckett, 2002). QA data are included in submission.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47602, Fenpropathrin **Region 9**

Los Penasquitos Creek

LOE ID:	74225
Pollutant:	Fenpropathrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Los Penasquitos Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Fenpropathrin.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for fenpropathrin is the median lethal concentration (LC50) of 1 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 1 ug/g is the geometric mean of LC50 values for fenpropathrin from Ding et al. (2011).
Guideline Reference:	Toxicity of Sediment-Associated Pesticides to Chironomus dilutus and Hyalella azteca. Arch. Environ. Contam. Toxicol. 61:83Â–92.
Spatial Representation:	Data for this line of evidence for Los Penasquitos Creek was collected at 1 monitoring site [Penasquitos Creek @ Springbrook - 906SUP076]
Temporal Representation:	Data was collected on a single day 1/8/2007.

Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID 47603 Region 9

Los Penasquitos Creek

Pollutant:	**Fipronil**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the sediment chemistry guideline. One of one sample exhibited sediment toxicity. Based on the readily available data and information, the weight of evidence indicates that there is INSUFFICIENT justification AGAINST placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the one samples exceed the GUIDELINE and this sample size is INSUFFICIENT to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47603, Fipronil Region 9

Los Penasquitos Creek

LOE ID:	74226
Pollutant:	Fipronil
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING 038237
Data Used to Assess Water Quality:	One of one sample result was not used in the assessment because the laboratory data was non-detect and the method detection limit was above the guideline and therefore the results could not be quantified with the level of certainty required by the Listing Policy.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for fipronil is the median lethal concentration (LC50) of 0.13 ug/g and is normalized by the percentage of organic carbon in the sediment sample (Maul et al. 2008).
Guideline Reference:	Effect of sediment-associated pyrethroids, fipronil, and metabolites on Chironomus tentans growth rate, body mass, condition index, immobilization, and survival. Environ. Toxicol. Chem. 27(12):2582-2590.
Spatial Representation:	Data for this line of evidence for Los Penasquitos Creek was collected at 1 monitoring site [Penasquitos Creek @ Springbrook - 906SUP076]
Temporal Representation:	Data was collected on a single day 1/8/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 47603, Fipronil **Region 9**

Los Penasquitos Creek

LOE ID:	72752
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate sediment toxicity. The sample exhibited significant toxicity. The toxicity test included survival and growth of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL. SL is defined as the result being significant

	compared to the negative control based on a statistical test, less than stated the alpha level, AND less than the evaluation threshold.
Guideline Reference:	Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates, Second Edition. U.S. Environmental Protection Agency Office of Research and Development, Duluth, MI , U.S. Environmental Protection Agency Office of Water, Washington, DC EPA-600/R-99/064
Spatial Representation:	The sample was collected at station 906SUP076.
Temporal Representation:	The sample was collected in January 2007.
Environmental Conditions:	
QAPP Information:	All data was collected following the Standard Operating Procedures and Data Quality Objectives outlined in the SWAMP QAMP, (Puckett, 2002). QA data are included in submission.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 47604 Region 9

Los Penasquitos Creek

Pollutant:	**Fipronil Sulfide**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the sediment chemistry guideline. One of one sample exhibited sediment toxicity. Based on the readily available data and information, the weight of evidence indicates that there is INSUFFICIENT justification AGAINST placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the one samples exceed the GUIDELINE and this sample size is INSUFFICIENT to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47604, Fipronil Sulfide Region 9

Los Penasquitos Creek

LOE ID:	74227
Pollutant:	Fipronil Sulfide

LOE Subgroup:	Pollutant-Sediment	038239
Matrix:	Sediment	
Fraction:	Total	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	0	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	One of one sample result was not used in the assessment because the laboratory data was non-detect and the method detection limit was above the guideline and therefore the results could not be quantified with the level of certainty required by the Listing Policy.	
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The evaluation guideline for fipronil sulfide is the median lethal concentration (LC50) of 0.16 ug/g and is normalized by the percentage of organic carbon in the sediment sample (Maul et al. 2008).	
Guideline Reference:	Effect of sediment-associated pyrethroids, fipronil, and metabolites on Chironomus tentans growth rate, body mass, condition index, immobilization, and survival. Environ. Toxicol. Chem. 27(12):2582-2590.	
Spatial Representation:	Data for this line of evidence for Los Penasquitos Creek was collected at 1 monitoring site [Penasquitos Creek @ Springbrook - 906SUP076]	
Temporal Representation:	Data was collected on a single day 1/8/2007.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.	
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)	

Line of Evidence (LOE) for Decision ID 47604, Fipronil Sulfide **Region 9**

Los Penasquitos Creek

LOE ID:	72752
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate sediment toxicity. The sample exhibited significant toxicity. The toxicity test included survival and growth of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP

Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL. SL is defined as the result being significant compared to the negative control based on a statistical test, less than stated the alpha level, AND less than the evaluation threshold.
Guideline Reference:	Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates, Second Edition. U.S. Environmental Protection Agency Office of Research and Development, Duluth, MI , U.S. Environmental Protection Agency Office of Water, Washington, DC EPA-600/R-99/064
Spatial Representation:	The sample was collected at station 906SUP076.
Temporal Representation:	The sample was collected in January 2007.
Environmental Conditions:	
QAPP Information:	All data was collected following the Standard Operating Procedures and Data Quality Objectives outlined in the SWAMP QAMP, (Puckett, 2002). QA data are included in submission.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID	47607	Region 9
Los Penasquitos Creek		

Pollutant:	**Fipronil Sulfone**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the sediment chemistry guideline. One of one sample exhibited sediment toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is INSUFFICIENT justification AGAINST placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the one samples exceed the GUIDELINE and this sample size is INSUFFICIENT to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47607, Fipronil Sulfone **Region 9**

Los Penasquitos Creek

LOE ID:	72752
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate sediment toxicity. The sample exhibited significant toxicity. The toxicity test included survival and growth of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL. SL is defined as the result being significant compared to the negative control based on a statistical test, less than stated the alpha level, AND less than the evaluation threshold.
Guideline Reference:	Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates, Second Edition. U.S. Environmental Protection Agency Office of Research and Development, Duluth, MI , U.S. Environmental Protection Agency Office of Water, Washington, DC EPA-600/R-99/064
Spatial Representation:	The sample was collected at station 906SUP076.
Temporal Representation:	The sample was collected in January 2007.
Environmental Conditions:	
QAPP Information:	All data was collected following the Standard Operating Procedures and Data Quality Objectives outlined in the SWAMP QAMP, (Puckett, 2002). QA data are included in submission.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47607, Fipronil Sulfone **Region 9**

Los Penasquitos Creek

LOE ID:	74228
Pollutant:	Fipronil Sulfone
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	One of one sample result was not used in the assessment because the laboratory data was non-detect and the method detection limit was above the guideline and therefore the results could not be quantified with the level of certainty required by the Listing Policy.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for fipronil sulfone is the median lethal concentration (LC50) of 0.12 ug/g and is normalized by the percentage of organic carbon in the sediment sample (Maul et al. 2008).
Guideline Reference:	Effect of sediment-associated pyrethroids, fipronil, and metabolites on Chironomus tentans growth rate, body mass, condition index, immobilization, and survival. Environ. Toxicol. Chem. 27(12):2582-2590.
Spatial Representation:	Data for this line of evidence for Los Penasquitos Creek was collected at 1 monitoring site [Penasquitos Creek @ Springbrook - 906SUP076]
Temporal Representation:	Data was collected on a single day 1/8/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **47500** **Region 9**

Los Penasquitos Creek

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 26 samples exceed the criterion.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 26 samples exceeded the criterion and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 47500, Lead **Region 9**

Los Penasquitos Creek

LOE ID:	74229
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Los Penasquitos Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Los Penasquitos Creek was collected at 1 monitoring site [Los Penasquitos Creek - 906_SMC00198]
Temporal Representation:	Data was collected on a single day 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

Line of Evidence (LOE) for Decision ID 47500, Lead **Region 9**

Los Penasquitos Creek

LOE ID:	74230
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	25
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Los Penasquitos Creek to determine beneficial use support and results are as follows: 0 of 25 samples exceed the criterion for Lead.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved lead to protect aquatic life in freshwater. The dissolved lead criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Los Penasquitos Creek was collected at 2 monitoring sites [Los PeÃ±asquitos Creek - 906LPC-TWAS-2, Los PeÃ±asquitos Creek - 906LPC-MLS]
Temporal Representation:	Data was collected over the time period 11/29/2001-11/11/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID	47608	Region 9
Los Penasquitos Creek		

Pollutant:	**Lindane/gamma Hexachlorocyclohexane (gamma-HCH)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the sediment chemistry guideline. One of one sample exhibited sediment toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is INSUFFICIENT justification AGAINST placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the one samples exceed the GUIDELINE and this sample size is INSUFFICIENT to

determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47608, Lindane/gamma Hexachlorocyclohexane (gamma-HCH) **Region 9**

Los Penasquitos Creek

LOE ID:	74231
Pollutant:	Lindane/gamma Hexachlorocyclohexane (gamma-HCH)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Los Penasquitos Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for HCH, gamma.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for Lindane (gamma-HCH) is 4.99 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Los Penasquitos Creek was collected at 1 monitoring site [Penasquitos Creek @ Springbrook - 906SUP076]
Temporal Representation:	Data was collected on a single day 1/8/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 47608, Lindane/gamma Hexachlorocyclohexane (gamma-HCH) **Region 9**

Los Penasquitos Creek

LOE ID:	72752

Pollutant:	Toxicity	038246
LOE Subgroup:	Toxicity	
Matrix:	Sediment	
Fraction:	None	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	1	
Data and Information Type:	TOXICITY TESTING	
Data Used to Assess Water Quality:	One sample was collected to evaluate sediment toxicity. The sample exhibited significant toxicity. The toxicity test included survival and growth of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).	
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL. SL is defined as the result being significant compared to the negative control based on a statistical test, less than stated the alpha level, AND less than the evaluation threshold.	
Guideline Reference:	Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates, Second Edition. U.S. Environmental Protection Agency Office of Research and Development, Duluth, MI , U.S. Environmental Protection Agency Office of Water, Washington, DC EPA-600/R-99/064	
Spatial Representation:	The sample was collected at station 906SUP076.	
Temporal Representation:	The sample was collected in January 2007.	
Environmental Conditions:		
QAPP Information:	All data was collected following the Standard Operating Procedures and Data Quality Objectives outlined in the SWAMP QAMP, (Puckett, 2002). QA data are included in submission.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID **47609** **Region 9**

Los Penasquitos Creek

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the 24 samples exceed the GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is

sufficient justification against placing this water segment-pollutant combination on the section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 24 samples exceeded the GUIDELINE and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 47609, Malathion **Region 9**

Los Penasquitos Creek

LOE ID:	74232
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	24
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Los Penasquitos Creek to determine beneficial use support and results are as follows: 1 of 24 samples exceed the criterion for Malathion.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for Los Penasquitos Creek was collected at 2 monitoring sites [Los PeÃ±asquitos Creek - 906LPC-MLS, Los PeÃ±asquitos Creek - 906LPC-TWAS-2]
Temporal Representation:	Data was collected over the time period 11/8/2002-11/11/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID	47504	Region 9
Los Penasquitos Creek		

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 26 samples exceed the criterion.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 26 samples exceeded the criterion and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 47504, Nickel	**Region 9**
Los Penasquitos Creek	

LOE ID:	74234
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	25
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Los Penasquitos Creek to determine beneficial use support and results are as follows: 0 of 25 samples exceed the criterion for Nickel.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Nickel to

	protect aquatic life in freshwater. The dissolved Nickel criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Los Penasquitos Creek was collected at 2 monitoring sites [Los PeÃ±asquitos Creek - 906LPC-TWAS-2, Los PeÃ±asquitos Creek - 906LPC-MLS]
Temporal Representation:	Data was collected over the time period 11/29/2001-11/11/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 47504, Nickel **Region 9**

Los Penasquitos Creek

LOE ID:	74233
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Los Penasquitos Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Los Penasquitos Creek was collected at 1 monitoring site [Los Penasquitos Creek - 906_SMC00198]
Temporal Representation:	Data was collected on a single day 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.

QAPP Information Reference(s): Quality Assurance Project Plan from the CRG Marine Laboratories and SMBRP workplan. 038250

DECISION ID	47551	Region 9
Los Penasquitos Creek		

Pollutant:	**Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the sediment chemistry guideline. One of one sample exhibited sediment toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is INSUFFICIENT justification AGAINST placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the one samples exceed the GUIDELINE and this sample size is INSUFFICIENT to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47551, Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD)	**Region 9**
Los Penasquitos Creek	

LOE ID:	72752
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate sediment toxicity. The sample exhibited significant toxicity. The toxicity test included survival and growth of Hyalella azteca. One sample can

	have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL. SL is defined as the result being significant compared to the negative control based on a statistical test, less than stated the alpha level, AND less than the evaluation threshold.
Guideline Reference:	Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates, Second Edition. U.S. Environmental Protection Agency Office of Research and Development, Duluth, MI , U.S. Environmental Protection Agency Office of Water, Washington, DC EPA-600/R-99/064
Spatial Representation:	The sample was collected at station 906SUP076.
Temporal Representation:	The sample was collected in January 2007.
Environmental Conditions:	
QAPP Information:	All data was collected following the Standard Operating Procedures and Data Quality Objectives outlined in the SWAMP QAMP, (Puckett, 2002). QA data are included in submission.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47551, Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD) **Region 9**

Los Penasquitos Creek

LOE ID:	74237
Pollutant:	Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Los Penasquitos Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for DDT, Total.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for total DDTs (Sum DDT + Sum DDD + Sum DDE) is 572 ug/Kg dry weight (MacDonald et al. 2000).

Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Los Penasquitos Creek was collected at 1 monitoring site [Penasquitos Creek @ Springbrook - 906SUP076]
Temporal Representation:	Data was collected on a single day 1/8/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

038252

DECISION ID 47501 Region 9

Los Penasquitos Creek

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 26 samples exceed the criterion. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 26 samples exceeded the criterion and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 47501, Zinc Region 9

Los Penasquitos Creek

LOE ID:	74176
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	25
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Los Penasquitos Creek to determine beneficial use support and results are as follows: 0 of 25 samples exceed the criterion for Zinc.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Zinc to protect aquatic life in freshwater. The dissolved Zinc criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Los Penasquitos Creek was collected at 2 monitoring sites [Los PeÃ±asquitos Creek - 906LPC-TWAS-2, Los PeÃ±asquitos Creek - 906LPC-MLS]
Temporal Representation:	Data was collected over the time period 11/29/2001-11/11/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 47501, Zinc **Region 9**

Los Penasquitos Creek

LOE ID:	74175
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Los Penasquitos Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority

Evaluation Guideline:
Guideline Reference:

Spatial Representation:	Data for this line of evidence for Los Penasquitos Creek was collected at 1 monitoring site [Los Penasquitos Creek - 906_SMC00198]
Temporal Representation:	Data was collected on a single day 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

DECISION ID 43909 Region 9

Los Penasquitos Creek

Pollutant:	**Benthic Community Effects**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Contaminated Sediments | Hydromodification | Illicit Connections/Illegal Hook-ups/Dry Weather Flows | Source Unknown | Unknown Nonpoint Source | Unknown Point Source | Urban Runoff/Storm Sewers
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Benthic Community Effects is being considered for placement on the CWA section 303(d) List under sections 3.9 and 3.1 of the Listing Policy. Under section 3.9, an additional line of evidence associating Benthic Community Effects with a water or sediment concentration of pollutant(s) is necessary to assess listing status. Based on the readily available data and information, the weight of evidence provides sufficient justification for placing Benthic Community Effects in this water segment on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Pursuant to section 3.9 of the Listing Policy, the water exhibits significant degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index. 4. Pursuant to section 3.9 of the Listing Policy, the water segment has associated pollutant(s) samples that exceed water quality objectives. 5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are being met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant(s) contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 43909, Benthic Community Effects Region 9

Los Penasquitos Creek

LOE ID:	72752
Pollutant:	Toxicity
LOE Subgroup:	Toxicity

Matrix:	Sediment	038255
Fraction:	None	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	1	
Data and Information Type:	TOXICITY TESTING	
Data Used to Assess Water Quality:	One sample was collected to evaluate sediment toxicity. The sample exhibited significant toxicity. The toxicity test included survival and growth of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).	
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL. SL is defined as the result being significant compared to the negative control based on a statistical test, less than stated the alpha level, AND less than the evaluation threshold.	
Guideline Reference:	Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates, Second Edition. U.S. Environmental Protection Agency Office of Research and Development, Duluth, MI , U.S. Environmental Protection Agency Office of Water, Washington, DC EPA-600/R-99/064	
Spatial Representation:	The sample was collected at station 906SUP076.	
Temporal Representation:	The sample was collected in January 2007.	
Environmental Conditions:		
QAPP Information:	All data was collected following the Standard Operating Procedures and Data Quality Objectives outlined in the SWAMP QAMP, (Puckett, 2002). QA data are included in submission.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 43909, Benthic Community Effects **Region 9**

Los Penasquitos Creek

LOE ID:	74219
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Los Penasquitos Creek to determine beneficial use support and results are as follows: 0 of 17 samples exceed the criterion for Diazinon.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Data for this line of evidence for Los Penasquitos Creek was collected at 2 monitoring sites [Los PeÃ±asquitos Creek - 906LPC-MLS, Los PeÃ±asquitos Creek - 906LPC-TWAS-2]
Temporal Representation:	Data was collected over the time period 02/11/2005-11/11/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 43909, Benthic Community Effects **Region 9**

Los Penasquitos Creek

LOE ID:	21387
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	3
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Four samples were collected at Los Penasquitos Creek station 906LPLPC6 from March 2002 to September 2002, they showed significant toxicity levels (SL) in the following tests: Selenastrum algae growth test - three of the four samples showed significant levels of toxicity. Ceriodaphnia dubia survival/reproductive test - one of the four samples.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.
Guideline Reference:	Monitoring data for Region 9
Spatial Representation:	Samples were collected at Los Penasquitos Creek station 906LPLPC6; (Latitude 32.9036775, Longitude -117.2262075).

Temporal Representation:	Samples were collected on March, April, June, and September 2002. 038257
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 43909, Benthic Community Effects **Region 9**

Los Penasquitos Creek

LOE ID:	74211
Pollutant:	Deltamethrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Los Penasquitos Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Deltamethrin.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for deltamethrin is the median lethal concentration (LC50) of 0.79 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 0.79 ug/g is the geometric mean of LC50 values for deltamethrin from Amweg et al. (2005).
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5
Spatial Representation:	Data for this line of evidence for Los Penasquitos Creek was collected at 1 monitoring site [Penasquitos Creek @ Springbrook - 906SUP076]
Temporal Representation:	Data was collected on a single day 1/8/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 43909, Benthic Community Effects **Region 9**

Los Penasquitos Creek

LOE ID:	7336
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Warm Freshwater Habitat	038258
Number of Samples:	15	
Number of Exceedances:	15	
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)	
Data Used to Assess Water Quality:	All fifteen samples collected exceed the water quality objective of 1 mg/L outlined in results in the San Diego County Municipal Copermittees Urban Runoff Monitoring Report, January 2007. Samples were collected one to four times a year from 2001-2006	
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used (RWQCB, 2007).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:	Water Quality Control Plan for the San Diego Basin	
Spatial Representation:	Samples were collected at the mass loading station located near the lower boundary of the watershed at the north end of Sorrento Valley Court, under the Sorrento Valley Court Bridge.	
Temporal Representation:	Samples were collected one to four times a year from 2001-2006.	
Environmental Conditions:	Samples were collected during wet weather.	
QAPP Information:	Quality assurance conducted according to Weston Solution's quality assurance plan, 2004.	
QAPP Information Reference(s):	Weston Solutions, 2004. Quality Management Manual. March 2004 (Revised December 2009).	

Line of Evidence (LOE) for Decision ID 43909, Benthic Community Effects **Region 9**

Los Penasquitos Creek

LOE ID:	74200
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Los Penasquitos Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Cypermethrin, total.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of cypermethrin does not exceed 0.0002 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Fojut et al. 2012)
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Los Penasquitos Creek was collected at 2 monitoring sites [Los PeÃ±asquitos Creek - 906LPC-MLS, Los PeÃ±asquitos Creek - 906LPC-TWAS-2]
Temporal Representation:	Data was collected over the time period 9/27/2007-11/11/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 43909, Benthic Community Effects **Region 9**

Los Penasquitos Creek

LOE ID:	79572
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	22
Number of Exceedances:	9
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Of twenty-two samples taken at six stations along Los Penasquitos Creek, nine samples were below the 0.79 threshold, and therefore exceeding the water quality objective for the aquatic life beneficial use.
Data Reference:	RWB9 Status Sampling 2007 and 2008 Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008. Bioassessment Data for Various Pollutants from Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009. Region 9 CSCI Scores & Water Body Information
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in a stream into an overall measure of stream health. The CSCI score is calculated by

	comparing the expected condition with actual (observed) results (Rhen, A. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.
Guideline Reference:	The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.
Spatial Representation:	Samples were taken at the following stations: 906LPLPC6 906PC-MLS SMC00198 906LPC-BMR 906PC-TWAS-2 906LPC-CCR
Temporal Representation:	Surveys done from 2001 to 2009.
Environmental Conditions:	
QAPP Information:	Data collected following SWAMP QA protocols for the RWB9 Status Sampling 2007 and 2008 water quality monitoring project, the County of San Diego NPDES MS4 Copermittees Receiving Waters Monitoring and Reporting Program, and the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan.
QAPP Information Reference(s):	RWB9 Status Sampling 2007 and 2008 Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008. Bioassessment Data for Various Pollutants from Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.

Line of Evidence (LOE) for Decision ID 43909, Benthic Community Effects **Region 9**

Los Penasquitos Creek

LOE ID:	7050
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	3
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Samples were collected for the Surface Water Ambient Monitoring Program. Samples were collected in March, April, June, and September 2002. Four samples were collected in this period and three exceeded the evaluation guideline for selenium.
Data Reference:	Surface Water Ambient Monitoring Program Data for selenium in Los Penasquitos Creek, March 2002 to September 2002
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	CTR Freshwater Chronic (CCC) 5 ug/L. (U.S. EPA, 2000).
Objective/Criterion Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA
Evaluation Guideline:	
Guideline Reference:	Water Quality Standards 2000. Establishment of numeric criteria for priority toxic pollutants for the State of California: Rules and regulations. Federal Register Vol. 65, No. 97. Washington, D.C.: Environmental Protection Agency
Spatial Representation:	Water samples were collected at Los Penasquitos station 906LPLPC6; (Latitude 32.9036775, Longitude -117.2262075).
Temporal Representation:	Samples were collected on March, April, June, and September 2002.
Environmental Conditions:	

QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 43909, Benthic Community Effects **Region 9**

Los Penasquitos Creek

LOE ID:	74187
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Los Penasquitos Creek to determine beneficial use support and results are as follows: 4 of 4 samples exceed the criterion for Bifenthrin.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Bifenthrin does not exceed 0.0006 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Los Penasquitos Creek was collected at 2 monitoring sites [Los PeÃ±asquitos Creek - 906LPC-MLS, Los PeÃ±asquitos Creek - 906LPC-TWAS-2]
Temporal Representation:	Data was collected over the time period 9/27/2007-11/11/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 43909, Benthic Community Effects **Region 9**

Los Penasquitos Creek

LOE ID:	3321
Pollutant:	Phosphate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total

Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	2
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Four water samples, two samples exceeding (SWAMP, 2004).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Waters shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growth causes nuisance or adversely affects beneficial uses. Water Quality Control Plan for the San Diego Basin Goal of 0.1 mg/l in stream and flowing waters
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	One station at Los Penasquitos Creek: 32.90588 -117.22703.
Temporal Representation:	Four samples collected from March through September of 2002.
Environmental Conditions:	Los Penasquitos Creek, 906.10.
QAPP Information:	SWAMP Quality Assurance Plan.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43909, Benthic Community Effects **Region 9**

Los Penasquitos Creek

LOE ID:	74185
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Los Penasquitos Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Bifenthrin.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for bifenthrin is the median lethal concentration (LC50) of 0.43 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 0.43 ug/g is the geometric mean of LC50 values for bifenthrin from Amweg et al. (2005) and Amweg and Weston (2007).
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5 Whole-sediment toxicity identification evaluation tools for pyrethroid insecticides: I. piperonyl

butoxide addition. Environ. Toxicol. Chem. 26:2389-2396. 038263

Spatial Representation:	Data for this line of evidence for Los Penasquitos Creek was collected at 1 monitoring site [Penasquitos Creek @ Springbrook - 906SUP076]
Temporal Representation:	Data was collected on a single day 1/8/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 43909, Benthic Community Effects **Region 9**

Los Penasquitos Creek

LOE ID:	3319
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Not Specified
Fraction:	None
Beneficial Use:	Agricultural Supply
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Data was collected in the Fall 2000 and Spring 2001 in Los Penasquitos Creek by the Stream Team. Bioassessment Metrics were used. The reported values are based on a average of 3 composite samples per site. From Fall 2000 to Spring 2001 there was a decrease in taxa richness, EPT index, average tolerance value, percent tolerant organisms, and percent predators. There was an increase in percent dominant taxa, and percent collectors, filterers and scrapers. (Stream Team, 2001).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	
Objective/Criterion Reference:	
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data set does not give a specific location in Los Penasquitos Creek.
Temporal Representation:	Samples were collected in Fall of 2000 and in Spring of 2001.
Environmental Conditions:	Changes in the Bioassessment Metrics levels may be due to seasonal effects and not necessarily water quality.
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43909, Benthic Community Effects **Region 9**

Los Penasquitos Creek

LOE ID:	3320
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Not Specified
Fraction:	None
Beneficial Use:	Agricultural Supply

Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	The data was collected for the San Diego Regional Water Quality Control Board: 1999 Biological Assessment Annual Report. Bioassessment metrics were used to describe the characteristics of the macroinvertebrate community. Physical habitat scores for the two locations were in the middle range compared to other creeks in the region. BMI ranking scores for the two locations were at or above average 3 out of 4 times for both sampling sites, compared to other creeks in the region. (SDRWQCB, 1999a).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	
Objective/Criterion Reference:	
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected in Los Penasquitos Creek at 5 riffles upstream of Cobblestone Creek Rd. and 5 riffles upstream of Black Mountain Rd.
Temporal Representation:	The sampling occurred in May 1998, September 1998, November 1998, and May 1999.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43909, Benthic Community Effects **Region 9**

Los Penasquitos Creek

LOE ID:	74181
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	20
Number of Exceedances:	20
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Twenty of the twenty samples collected had an IBI score below 40. NPDES bioassessment.
Data Reference:	Bioassessment Data for Various Pollutants from Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the State or Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired

	conditions. 038265
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	The samples were collected at stations906LPC-MLS, 906LPC-TWAS-2, LPC-BMR, and LPC-CCR on Los PeÃ±asquitos Creek.
Temporal Representation:	The samples were collected in May and October 2001 to 2007.
Environmental Conditions:	
QAPP Information:	The data was collected under the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan, June 25, 2009.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 43909, Benthic Community Effects **Region 9**

Los Penasquitos Creek

LOE ID:	74180
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	The one sample collected had an IBI score below 40. The score was 8.6. SMC bioassessment.
Data Reference:	Bioassessment Data for Various Pollutants from Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the State or Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	The sample was collected at 906_SMC00198, Los Penasquitos Creek.
Temporal Representation:	The sample was collected in May 2009.
Environmental Conditions:	
QAPP Information:	The data was collected under the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan, June 25, 2009.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 43909, Benthic Community Effects **Region 9**

Los Penasquitos Creek

LOE ID:	74179	038266

Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	The IBI score for this water body is 9 which indicates that this water body may be considered to have impaired conditions.
Data Reference:	RWB9 Status Sampling 2007 and 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at the following station: 906LPLPC6 (Los Penasquitos Creek 6).
Temporal Representation:	Surveys done May 7, 2008.
Environmental Conditions:	
QAPP Information:	Data collected following SWAMP QA protocols for the RWB9 Status Sampling 2007 and 2008 water quality monitoring project.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43909, Benthic Community Effects **Region 9**

Los Penasquitos Creek

LOE ID:	77794
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	21
Number of Exceedances:	2
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Los Penasquitos Creek to determine beneficial use support and results are as follows: 2 of 21 samples exceed the criterion for Chlorpyrifos. Three sample results were not used in the assessment because the laboratory data reporting limit(s) was above the objective and therefore the results could not be quantified with the level of certainty required by the Listing Policy.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.

SWAMP Data:	Non-SWAMP	038267
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.014 ug/L (Siepmann and Finlayson 2000).	
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).	
Spatial Representation:	Data for this line of evidence for Los Penasquitos Creek was collected at 2 monitoring sites [Los PeÃ±asquitos Creek - 906LPC-MLS, Los PeÃ±asquitos Creek - 906LPC-TWAS-2]	
Temporal Representation:	Data was collected over the time period 11/29/2001-11/11/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.	

Line of Evidence (LOE) for Decision ID 43909, Benthic Community Effects **Region 9**

Los Penasquitos Creek

LOE ID:	26436
Pollutant:	Benthic Community Effects
LOE Subgroup:	Adverse Biological Responses
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	16
Number of Exceedances:	16
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Sixteen samples of IBI data were taken from May 2001 to May 2007 at two sampling sites. Of the total number of samples, all sixteen the samples exceeded the IBI impairment threshold.
Data Reference:	Stream Bioassessment Data. Co-permitee Data. Collected 2002-2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. (SDRWQCB, 1995)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two

	standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at two sites: LPC-BMR and LPC-CCR on Los Penasquitos Creek.
Temporal Representation:	Sampling occurred during May and October from 2001 to May 2006 and one event on May 2007.
Environmental Conditions:	
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Manual for Freshwater Bioassessment.
QAPP Information Reference(s):	Quality Assurance Manual for Freshwater Bioassessment Revision 0

Line of Evidence (LOE) for Decision ID 43909, Benthic Community Effects **Region 9**

Los Penasquitos Creek

LOE ID:	26834
Pollutant:	Benthic Community Effects
LOE Subgroup:	Adverse Biological Responses
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	16
Number of Exceedances:	16
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Sixteen samples of IBI data were taken from May 1998 to June 2006 at four sampling sites. All 16 samples exceeded the IBI impairment threshold.
Data Reference:	Fish and Game IBI Data
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at four sites: LPC-BMR, LPC-CCR, 906LPLPC4, and 906LPLPC5 on Los Penasquitos Creek.
Temporal Representation:	Sampling occurred on one to three events from May 1998 to May 2001 annually for a period of four years and on June 2006.
Environmental Conditions:	
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Project Plan for the California Stream Bioassessment Procedure and the State of California, California Monitoring an Assessment Program: "CMAP", Quality Assurance Project Plan.
QAPP Information Reference(s):	State of California, California Monitoring and Assessment Program: "CMAP". Quality Assurance Project Plan for the California Stream Bioassessment Procedure

Line of Evidence (LOE) for Decision ID 43909, Benthic Community Effects **Region 9**

Los Penasquitos Creek

LOE ID:	74173
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	27
Number of Exceedances:	7
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Twenty-seven samples were collected to test for toxicity. Seven of the 27 samples exhibited statistically significant toxicity. The toxicity tests that exhibited significant toxicity included survival of Hyalella azteca, growth of Selenastrum capriconutum and survival and reproduction of Ceriodaphnia dubia.
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms. Fourth Edition. Office of Water, U.S. Environmental Protection Agency. Washington, D.C. EPA-821-R-02-013
Spatial Representation:	The samples were collected at stations 906LPC-MLS and 906LPC-TWAS-2 Los Penasquitos Creek.
Temporal Representation:	The samples were collected from 2001 to 2008.
Environmental Conditions:	
QAPP Information:	The data was collected under the County of San Diego Co-Permittees Receiving Waters Urban Runoff Monitoring and Reporting Program (Order No. 2007-01). Data quality is good.
QAPP Information Reference(s):	e-mail clarifying QAPP information

DECISION ID **47497** **Region 9**

Los Penasquitos Creek

Pollutant:	**Bifenthrin**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2027
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Four lines of evidence are available in the administrative record to assess this pollutant. For water samples, four of the four samples exceed the evaluation guideline of 0.0006 ug/l for bifenthrin for the protection of warm aquatic life, and seven out of 28 samples failed in toxicity tests. [For sediment samples, one of one sample exceeded the evaluation guideline for bifenthrin, and one of one sample failed in toxicity tests.]

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. For water samples, four of the four samples exceed the evaluation guideline of 0.0006 ug/l for bifenthrin for the protection of warm aquatic life, and seven out of 28 samples failed in toxicity tests, and these exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 47497, Bifenthrin **Region 9**

Los Penasquitos Creek

LOE ID:	72752
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate sediment toxicity. The sample exhibited significant toxicity. The toxicity test included survival and growth of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL. SL is defined as the result being significant compared to the negative control based on a statistical test, less than stated the alpha level,

	AND less than the evaluation threshold. 038271
Guideline Reference:	Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates, Second Edition. U.S. Environmental Protection Agency Office of Research and Development, Duluth, MI , U.S. Environmental Protection Agency Office of Water, Washington, DC EPA-600/R-99/064
Spatial Representation:	The sample was collected at station 906SUP076.
Temporal Representation:	The sample was collected in January 2007.
Environmental Conditions:	
QAPP Information:	All data was collected following the Standard Operating Procedures and Data Quality Objectives outlined in the SWAMP QAMP, (Puckett, 2002). QA data are included in submission.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47497, Bifenthrin **Region 9**

Los Penasquitos Creek

LOE ID:	74174
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to test for toxicity. None of the samples exhibited statistically and biologically significant toxicity. The toxicity tests included survival and reproduction of Ceriodaphnia dubia.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control. Additionally, the biological significance of the sample is evaluted by determining whether the sample response is lower than the evaluation threshold.
Guideline Reference:	
Spatial Representation:	The samples were collected from site 906_SMC00198, Los Penasquitos Creek.
Temporal Representation:	The samples were collected in June 2009.
Environmental Conditions:	
QAPP Information:	This data was collected for the Regional Monitoring Of Southern California's Coastal Watersheds - Stormwater Monitoring Coalition Bioassessment Working Group. CRG Marine Laboratories Quality Assurance Program Document was provided.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 47497, Bifenthrin **Region 9**

Los Penasquitos Creek

LOE ID:	74173	038272
Pollutant:	Toxicity	
LOE Subgroup:	Toxicity	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	27	
Number of Exceedances:	7	
Data and Information Type:	TOXICITY TESTING	
Data Used to Assess Water Quality:	Twenty-seven samples were collected to test for toxicity. Seven of the 27 samples exhibited statistically significant toxicity. The toxicity tests that exhibited significant toxicity included survival of Hyalella azteca, growth of Selenastrum capriconutum and survival and reproduction of Ceriodaphnia dubia.	
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.	
Guideline Reference:	Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms. Fourth Edition. Office of Water, U.S. Environmental Protection Agency. Washington, D.C. EPA-821-R-02-013	
Spatial Representation:	The samples were collected at stations 906LPC-MLS and 906LPC-TWAS-2 Los Penasquitos Creek.	
Temporal Representation:	The samples were collected from 2001 to 2008.	
Environmental Conditions:		
QAPP Information:	The data was collected under the County of San Diego Co-Permittees Receiving Waters Urban Runoff Monitoring and Reporting Program (Order No. 2007-01). Data quality is good.	
QAPP Information Reference(s):	e-mail clarifying QAPP information	

Line of Evidence (LOE) for Decision ID 47497, Bifenthrin **Region 9**

Los Penasquitos Creek

LOE ID:	74187
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Los Penasquitos Creek to determine beneficial use support and results are as follows: 4 of 4 samples exceed the criterion for Bifenthrin.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works

	Watershed Protection Program, 2001-2008. 038273
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Bifenthrin does not exceed 0.0006 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Los Penasquitos Creek was collected at 2 monitoring sites [Los PeÃ±asquitos Creek - 906LPC-MLS, Los PeÃ±asquitos Creek - 906LPC-TWAS-2]
Temporal Representation:	Data was collected over the time period 9/27/2007-11/11/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 47497, Bifenthrin **Region 9**

Los Penasquitos Creek

LOE ID:	74185
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Los Penasquitos Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Bifenthrin.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for bifenthrin is the median lethal concentration (LC50) of 0.43 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 0.43 ug/g is the geometric mean of LC50 values for bifenthrin from Amweg et al. (2005) and Amweg and Weston (2007).
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5 Whole-sediment toxicity identification evaluation tools for pyrethroid insecticides: I. piperonyl

butoxide addition. Environ. Toxicol. Chem. 26:2389-2396. 038274

Spatial Representation:	Data for this line of evidence for Los Penasquitos Creek was collected at 1 monitoring site [Penasquitos Creek @ Springbrook - 906SUP076]
Temporal Representation:	Data was collected on a single day 1/8/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 47497, Bifenthrin **Region 9**

Los Penasquitos Creek

LOE ID:	78056
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Los Penasquitos Creek to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Bifenthrin.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The UC Davis Criteria for Bifenthrin for the protection of aquatic organisms is a 4 day average of 0.0006 ug/L (Fojut et al. 2012).
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Los Penasquitos Creek was collected at 1 monitoring site [Los Penasquitos Creek - 906_SMC00198]
Temporal Representation:	Data was collected on a single day 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

DECISION ID **47517** **Region 9**

Los Penasquitos Creek

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision

Revision Status	Revised	038275
Sources:	Source Unknown	
Expected TMDL Completion Date:	2027	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Four lines of evidence are available in the administrative record to assess this pollutant. For water samples, two of the 21 samples exceed the evaluation guideline for chlorpyrifos, and seven of the 28 samples failed in toxicity tests. [For sediment samples, zero out of zero samples exceed the evaluation guideline for chlorpyrifos, and one out of one sample failed in toxicity tests.]

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Two of 21samples exceed the guideline for chlorpyrifos and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 47517, Chlorpyrifos — Region 9

Los Penasquitos Creek

LOE ID:	77794
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	21
Number of Exceedances:	2
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Los Penasquitos Creek to determine beneficial use support and results are as follows: 2 of 21 samples exceed the criterion for Chlorpyrifos. Three sample results were not used in the assessment because the laboratory data reporting limit(s) was above the objective and therefore the results could not be quantified with the level of certainty required by the Listing Policy.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San

	Diego Basin).	038276
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.014 ug/L (Siepmann and Finlayson 2000).	
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).	
Spatial Representation:	Data for this line of evidence for Los Penasquitos Creek was collected at 2 monitoring sites [Los PeÃ±asquitos Creek - 906LPC-MLS, Los PeÃ±asquitos Creek - 906LPC-TWAS-2]	
Temporal Representation:	Data was collected over the time period 11/29/2001-11/11/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.	

Line of Evidence (LOE) for Decision ID 47517, Chlorpyrifos **Region 9**

Los Penasquitos Creek

LOE ID:	74191
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	One of one sample result was not used in the assessment because the laboratory data was non-detect and the method detection limit was above the guideline and therefore the results could not be quantified with the level of certainty required by the Listing Policy
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	There is no chlorpyrifos evaluation guideline specific to "sediment, interstitial water" (pore water). The following evaluation guideline was used to evaluate an exceedance in water quality standards: the freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000, with minor corrections to significant figures as described in Beaulaurier et al., 2005).Â
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).
Spatial Representation:	Data for this line of evidence for Los Penasquitos Creek was collected at 1 monitoring site [Penasquitos Creek @ Springbrook - 906SUP076]
Temporal Representation:	Data was collected on a single day 1/8/2007.

Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 47517, Chlorpyrifos **Region 9**

Los Penasquitos Creek

LOE ID:	72752
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate sediment toxicity. The sample exhibited significant toxicity. The toxicity test included survival and growth of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL. SL is defined as the result being significant compared to the negative control based on a statistical test, less than stated the alpha level, AND less than the evaluation threshold.
Guideline Reference:	Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates, Second Edition. U.S. Environmental Protection Agency Office of Research and Development, Duluth, MI , U.S. Environmental Protection Agency Office of Water, Washington, DC EPA-600/R-99/064
Spatial Representation:	The sample was collected at station 906SUP076.
Temporal Representation:	The sample was collected in January 2007.
Environmental Conditions:	
QAPP Information:	All data was collected following the Standard Operating Procedures and Data Quality Objectives outlined in the SWAMP QAMP, (Puckett, 2002). QA data are included in submission.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **33885** **Region 9**

Los Penasquitos Creek

Pollutant:	**Phosphate**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final	Delist from 303(d) list (TMDL required list)(2012)

Listing Decision:		038278
Revision Status	Revised	
Sources:	Source Unknown	
Expected TMDL Completion Date:	2019	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being re-considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Two of the 4 samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of adding this water segment-pollutant combination from the section 303(d) list.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Two of the 4 samples exceed the water quality objective and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33885, Phosphate **Region 9**

Los Penasquitos Creek

LOE ID:	3321
Pollutant:	Phosphate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	2
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Four water samples, two samples exceeding (SWAMP, 2004).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Waters shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growth causes nuisance or adversely affects beneficial uses. Water Quality Control Plan for the San Diego Basin Goal of 0.1 mg/l in stream and flowing waters
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	One station at Los Penasquitos Creek: 32.90588 -117.22703.

Temporal Representation:	Four samples collected from March through September of 2002.	038279
Environmental Conditions:	Los Penasquitos Creek, 906.10.	
QAPP Information:	SWAMP Quality Assurance Plan.	
QAPP Information Reference(s):		

DECISION ID 47615 **Region 9**

Los Penasquitos Creek

Pollutant:	**Permethrin, total**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the sediment chemistry guideline. One of one sample exhibited sediment toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is INSUFFICIENT justification AGAINST placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the one samples exceed the GUIDELINE and this sample size is INSUFFICIENT to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47615, Permethrin, total **Region 9**

Los Penasquitos Creek

LOE ID:	72752
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING

Data Used to Assess Water Quality:	One sample was collected to evaluate sediment toxicity. The sample exhibited significant toxicity. The toxicity test included survival and growth of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL. SL is defined as the result being significant compared to the negative control based on a statistical test, less than stated the alpha level, AND less than the evaluation threshold.
Guideline Reference:	Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates, Second Edition. U.S. Environmental Protection Agency Office of Research and Development, Duluth, MI , U.S. Environmental Protection Agency Office of Water, Washington, DC EPA-600/R-99/064
Spatial Representation:	The sample was collected at station 906SUP076.
Temporal Representation:	The sample was collected in January 2007.
Environmental Conditions:	
QAPP Information:	All data was collected following the Standard Operating Procedures and Data Quality Objectives outlined in the SWAMP QAMP, (Puckett, 2002). QA data are included in submission.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47615, Permethrin, total **Region 9**

Los Penasquitos Creek

LOE ID:	74235
Pollutant:	Permethrin, total
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Los Penasquitos Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Permethrin, Total.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for permethrin is the median lethal concentration (LC50) of 8.9 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The

	LC50 8.9 ug/g is the geometric mean of LC50 values for permethrin from Amweg et al. (2005).
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5
Spatial Representation:	Data for this line of evidence for Los Penasquitos Creek was collected at 1 monitoring site [Penasquitos Creek @ Springbrook - 906SUP076]
Temporal Representation:	Data was collected on a single day 1/8/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID 32613 — Region 9

Los Penasquitos Creek

Pollutant:	**Turbidity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 one line of evidence are necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of two samples exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of two samples exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32613, Turbidity — Region 9

Los Penasquitos Creek

LOE ID:	3318
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Agricultural Supply

Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Samples were collected by the RWQCB on 6/3/1998 at two sites in Los Penasquitos Creek. One sample was collected at each site. No samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For all inland surface waters with all beneficial uses, the WQO for Turbidity is 20 NTU. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Los Penasquitos Creek at Cobblestone Creek Rd. and upstream of Black Mountain Rd.
Temporal Representation:	Samples were collected on 6/3/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID	43282	Region 9
Los Penasquitos Creek		

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the section 303(d) list under section 3.3 of the Listing Policy. Under section 3.3 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. 15 of the 15 samples exceed the objective for enterococcus and 11 of 15 samples exceed the objective for fecal coliform. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Fifteen of the 15 samples and 11of 15 samples exceed the Basin Paln objectives this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not

changed. 038283

Line of Evidence (LOE) for Decision ID 43282, Indicator Bacteria **Region 9**

Los Penasquitos Creek

LOE ID:	7335
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	15
Number of Exceedances:	15
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	All fifteen samples collected exceed the water quality objective according to results in the San Diego County Municipal Copermittees Urban Runoff Monitoring Report, January 2007. Samples were collected one to four times a year from 2001-2006
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The criteria for enterococcus sets a maximum limit at 61 colonies per 100mL (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the mass loading station located near the lower boundary of the watershed at the north end of Sorrento Valley Court, under the Sorrento Valley Court Bridge.
Temporal Representation:	Samples were collected one to four times a year from 2001-2006
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	Quality assurance conducted under Weston Solutions Quality Assurance Plan, March 2004.
QAPP Information Reference(s):	Weston Solutions, 2004. Quality Management Manual. March 2004 (Revised December 2009).

Line of Evidence (LOE) for Decision ID 43282, Indicator Bacteria **Region 9**

Los Penasquitos Creek

LOE ID:	7370
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	15
Number of Exceedances:	11
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Eleven of fifteen samples collected exceed the water quality objective according to results in the San Diego County Municipal Copermittees Urban Runoff Monitoring Report, January 2007. Samples were collected one to four times a year from 2001-2006

Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report	038284
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No more than 10% of the samples during any 30-day period for waters designated for contact recreation shall exceed 400 per 100 ml (RWQCB, 2007).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at the mass loading station located near the lower boundary of the watershed at the north end of Sorrento Valley Court, under the Sorrento Valley Court Bridge.	
Temporal Representation:	Samples were collected one to four times a year from 2001-2006	
Environmental Conditions:	Samples were collected during wet weather.	
QAPP Information:	Quality assurance conducted according to Weston Solution's quality assurance plan, 2004.	
QAPP Information Reference(s):	Weston Solutions, 2004. Quality Management Manual. March 2004 (Revised December 2009).	

DECISION ID 42783 Region 9

Los Penasquitos Creek

Pollutant:	**Nitrogen**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Sixteen of the 19 samples exceed the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Sixteen of the 19 samples exceed the Basin Plan objective and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 42783, Nitrogen Region 9

Los Penasquitos Creek

LOE ID:	7336	038285

Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	15
Number of Exceedances:	15
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	All fifteen samples collected exceed the water quality objective of 1 mg/L outlined in results in the San Diego County Municipal Copermittees Urban Runoff Monitoring Report, January 2007. Samples were collected one to four times a year from 2001-2006
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at the mass loading station located near the lower boundary of the watershed at the north end of Sorrento Valley Court, under the Sorrento Valley Court Bridge.
Temporal Representation:	Samples were collected one to four times a year from 2001-2006.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	Quality assurance conducted according to Weston Solution's quality assurance plan, 2004.
QAPP Information Reference(s):	Weston Solutions, 2004. Quality Management Manual. March 2004 (Revised December 2009).

Line of Evidence (LOE) for Decision ID 42783, Nitrogen **Region 9**

Los Penasquitos Creek

LOE ID:	21387
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	3
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Four samples were collected at Los Penasquitos Creek station 906LPLPC6 from March

	2002 to September 2002, they showed significant toxicity levels (SL) in the following tests: Selenastrum algae growth test - three of the four samples showed significant levels of toxicity. Ceriodaphnia dubia survival/reproductive test - one of the four samples.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.
Guideline Reference:	Monitoring data for Region 9
Spatial Representation:	Samples were collected at Los Penasquitos Creek station 906LPLPC6; (Latitude 32.9036775, Longitude -117.2262075).
Temporal Representation:	Samples were collected on March, April, June, and September 2002.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 42783, Nitrogen **Region 9**

Los Penasquitos Creek

LOE ID:	8813
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	1
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	One of four samples collected exceed the water quality objective according to results in the Surface Water Ambient Monitoring Program Urban Runoff Monitoring Report, January 2007. Samples were collected on; March 13, April 24, June 5, and September 18, 2002.
Data Reference:	Monitoring data for Region 9 2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used (RWQCB, 2007).

Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	038287
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at the monitoring station Los PeÃ±asquitos Creek 6 (station id : 906LPLPC6 lat/long: 32.90588/-117.22703), located on the main stem of Los PeÃ±asquitos Creek.	
Temporal Representation:	Samples were collected on; March 13, April 24, June 5, and September 18, 2002.	
Environmental Conditions:	The first two samples were taken during minimum and declining base flow respectively. The last two samples were taken during wet weather, between storm events and high base flow respectively.	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.	
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA	

Line of Evidence (LOE) for Decision ID 42783, Nitrogen **Region 9**

Los Penasquitos Creek

LOE ID:	26872
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	15
Number of Exceedances:	0
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Selenastrum: None of the 15 samples were found to exhibit toxicity. Hyalella azteca: None of the 15 samples were found to exhibit toxicity. Ceriodaphnia dubia- None of the fifteen samples were found to be toxic as determined by the Ceriodaphnia dubia survival/reproductive test according to results in the San Diego County Municipal Copermittees Annual Progress Report, 2007. The samples were collected from November 2001 through February 2006.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Samples were found to exhibit toxicity when the No Observed Effect Concentration (NOEC) or median lethal concentration (LC50) for any given species was estimated to be less than 100% of the test sample concentration (San Diego Water Board, 2007).
Guideline Reference:	Waste Discharge Requirements for Discharges of Urban Runoff From the Municipal Separate Storm Sewer Systems Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego, the San Diego Unified Port District, and the San Diego County Regional Airport, Order No. R9-2007-0001
Spatial Representation:	Samples were collected at the mass loading station located near the lower boundary of the watershed at the north end of Sorrento Valley Court, under the Sorrento Valley Court Bridge
Temporal Representation:	The samples were collected from November 2001 through February 2006.
Environmental Conditions:	Samples were collected during wet weather.

QAPP Information:	Quality control was conducted in accordance with the Weston Solution's quality assurance program.
QAPP Information Reference(s):	Weston Solutions, 2004. Quality Management Manual. March 2004 (Revised December 2009).

DECISION ID 32612 Region 9

Los Penasquitos Creek

Pollutant:	**Total Dissolved Solids**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Eight of the 8 samples exceeded the Basin Plan criteria, and these exceed the allowable frequency of table 3.2 in the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32612, Total Dissolved Solids Region 9

Los Penasquitos Creek

LOE ID:	3317
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Agricultural Supply
Number of Samples:	8
Number of Exceedances:	8
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data is from samples collected by the RWQCB and San Diego County from 6/3/1998 to 2/11/03 in Los Penasquitos Creek. Samples were collected at two sites; upstream of Black Mountain Rd and at Cobblestone Creek Rd. Eight of the 8 samples are in exceedance (SDRWQCB, 1998b; County of San Diego, 2003).
Data Reference:	Placeholder reference 2006 303(d)

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, Table 3-2: For inland surface waters with all Beneficial Uses, the WQO for Total Dissolved Solids is 500mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at two locations in Los Penasquitos Creek: upstream of Black Mountain Rd. and at Cobblestone Creek Rd.
Temporal Representation:	Samples were collected from 6/3/1998-2/11/03.
Environmental Conditions:	
QAPP Information:	Data used in 2002 Assessment.
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Soledad Canyon
Water Body ID: CAR9061000020011026104908
Water Body Type: River & Stream

DECISION ID 34023 **Region 9**
Soledad Canyon

Pollutant: **Sediment Toxicity**
Final Listing Decision: **Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Sources: Source Unknown
Expected TMDL Completion Date: 2019
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for removal from the section 303(d) list under section 3.6 of the Listing Policy. Under section 3.6 a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. Five of 9 samples exceed the water quality objective for sediment toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Five of 9 samples exceeded the water quality objective and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 34023, Sediment Toxicity **Region 9**
Soledad Canyon

LOE ID: 3322

Pollutant: Sediment Toxicity
LOE Subgroup: Toxicity
Matrix: Sediment
Fraction: Total

Beneficial Use: Warm Freshwater Habitat

Number of Samples:	4	038291
Number of Exceedances:	2	
Data and Information Type:	Chemical monitoring of sediments	
Data Used to Assess Water Quality:	Two out of four samples displayed statistically significant toxicity in the survival endpoint when compared to the negative control based on a statistical test with alpha of less than 5%. One of the four samples (collected April 24, 2002) also displayed statistically significant toxicity in the survival endpoint compared to the negative control, but this data point is not included in the total toxic samples as it had a data qualifier. All samples were tested using the 10-day Hyallela azteca test (SWAMP, 2004).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the Regional Board (Region 9 Basin Plan, pages 3-15 to 3-16; September 8, 1994).	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	All samples were collected from one station, Soledad Canyon Creek 2.	
Temporal Representation:	Samples were collected from March 2002 through September 2002. Toxicity in the survival endpoint was detected in samples collected on March 13, 2002 and September 18, 2002.	
Environmental Conditions:		
QAPP Information:	SWAMP QAPP.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 34023, Sediment Toxicity **Region 9**

Soledad Canyon

LOE ID:	77160
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate sediment toxicity. The sample did not exhibit significant toxicity. The toxicity test included survival of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL, Significant compared to negative control based on statistical test, less than stated alpha level, AND less than the evaluation threshold (both criteria are met).
Guideline Reference:	
Spatial Representation:	The sample was collected at station 906LPSOL4.
Temporal Representation:	The samples were collected in May 2008.
Environmental Conditions:	
QAPP Information:	All data was collected following the Standard Operating Procedures and Data Quality Objectives outlined in the SWAMP QAMP, (Puckett, 2002). QA data are included in submission.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 34023, Sediment Toxicity **Region 9**

Soledad Canyon

LOE ID:	21390
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	3
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Four samples were collected at Soledad Canyon Creek station 906LPSOL2 from March 2002 to September 2002, they showed significant toxicity levels (SL) in the following tests: Selenastrum algae growth test - three of the four samples. Ceriodaphnia dubia survival/reproductive test - one of the four samples. Results were from California's Surface Water Ambient Monitoring Program Report, 2007.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.
Guideline Reference:	Monitoring data for Region 9
Spatial Representation:	Samples were collected at Soledad Canyon Creek station 906LPSOL2; (Latitude 32.89116, Longitude -117.21268).
Temporal Representation:	Samples were collected on March, April, June, and September 2002.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	

DECISION ID **50801** **Region 9**

Soledad Canyon

Pollutant:	**Anthracene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeds the sediment guidelines.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeds the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50801, Anthracene **Region 9**

Soledad Canyon

LOE ID:	77118
Pollutant:	Anthracene
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Soledad Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Anthracene.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for anthracene is 845 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Soledad Canyon was collected at 1 monitoring site [Soledad Canyon Creek 4 - 906LPSOL4]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID 52123 Region 9

Soledad Canyon

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeds the sediment guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeds the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 52123, Arsenic Region 9

Soledad Canyon

LOE ID:	77123
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment

Fraction:	Total	038295
Beneficial Use:	Cold Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Soledad Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.	
Data Reference:	Statewide Stream Pollution Trends Study 2008	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for arsenic is 33 mg/Kg dry weight (MacDonald et al. 2000).	
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31	
Spatial Representation:	Data for this line of evidence for Soledad Canyon was collected at 1 monitoring site [Soledad Canyon Creek 4 - 906LPSOL4]	
Temporal Representation:	Data was collected on a single day 5/21/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	SWAMP data collected before September 2008 followed the 2002 QAMP.	
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)	

DECISION ID	50802	Region 9
Soledad Canyon		

Pollutant:	**Benzo(a)anthracene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeds the sediment guidelines.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeds the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of

16 samples is needed to determine if a beneficial use is fully supported using table 3.0138296
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50802, Benzo(a)anthracene **Region 9**

Soledad Canyon

LOE ID:	77125
Pollutant:	Benzo(a)anthracene
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Soledad Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Benzo(a)anthracene.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for Benzo(a)anthracene is 1050 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Soledad Canyon was collected at 1 monitoring site [Soledad Canyon Creek 4 - 906LPSOL4]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **50803** **Region 9**

Soledad Canyon

Pollutant:	**Benzo(a)pyrene (3,4-Benzopyrene -7-d)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised

Impairment from Pollutant or Pollution:	Pollutant	038297

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeds the sediment guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeds the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50803, Benzo(a)pyrene (3,4-Benzopyrene -7-d) **Region 9**

Soledad Canyon

LOE ID:	77126
Pollutant:	Benzo(a)pyrene (3,4-Benzopyrene -7-d)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Soledad Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Benzo(a)pyrene.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effects level (predictive of sediment toxicity) for Benzo(a)Pyrene is 1450 ug/Kg dry weight (Macdonald et al. 2000)
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31

Spatial Representation:	Data for this line of evidence for Soledad Canyon was collected at 1 monitoring site [03298 Soledad Canyon Creek 4 - 906LPSOL4]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID 50804 Region 9

Soledad Canyon

Pollutant:	**Bifenthrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeds the sediment guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeds the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50804, Bifenthrin Region 9

Soledad Canyon

LOE ID:	77127
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1

Number of Exceedances:	0	038299
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Soledad Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Bifenthrin.	
Data Reference:	Statewide Stream Pollution Trends Study 2008	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The evaluation guideline for bifenthrin is the median lethal concentration (LC50) of 0.43 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 0.43 ug/g is the geometric mean of LC50 values for bifenthrin from Amweg et al. (2005) and Amweg and Weston (2007).	
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5 Whole-sediment toxicity identification evaluation tools for pyrethroid insecticides: I. piperonyl butoxide addition. Environ. Toxicol. Chem. 26:2389-2396.	
Spatial Representation:	Data for this line of evidence for Soledad Canyon was collected at 1 monitoring site [Soledad Canyon Creek 4 - 906LPSOL4]	
Temporal Representation:	Data was collected on a single day 5/21/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.	
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)	

DECISION ID	**52124**	**Region 9**
Soledad Canyon		

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeds the sediment guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeds the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.

	4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52124, Cadmium **Region 9**

Soledad Canyon

LOE ID:	77130
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Soledad Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for cadmium is 4.98 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Soledad Canyon was collected at 1 monitoring site [Soledad Canyon Creek 4 - 906LPSOL4]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the 2002 QAMP.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **50805** **Region 9**

Soledad Canyon

Pollutant:	**Chlordane**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeds the sediment guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeds the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50805, Chlordane **Region 9**

Soledad Canyon

LOE ID:	72821
Pollutant:	Chlordane
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	0 of 1 samples collected exceeded the criteria for chlordane concentration (Sum of trans-Chlordane, cis-Chlordane, cis-Nonachlor, trans-Nonachlor, and Oxychlordane).
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Waters shall not contain substances in concentrations that result in the deposition of material that causes nuisance or adversely affects beneficial uses. (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Probable Effect Concentration for Chlordane in freshwater sediments is 17.6 ug/kg(MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31

Spatial Representation:	Data were collected at the following station 906LPSOL4 Soledad Canyon Creek (38802 4).
Temporal Representation:	The samples were collected on 5/21/2008.
Environmental Conditions:	
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 50806 Region 9
Soledad Canyon

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeds the sediment guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeds the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50806, Chlorpyrifos Region 9
Soledad Canyon

LOE ID:	77131
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Soledad Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for chlorpyrifos is the median lethal concentration (LC50) of 1.77 ug/g and is normalized by the percentage of organic carbon in the sediment sample (Amweg and Weston, 2007).
Guideline Reference:	Whole-sediment toxicity identification evaluation tools for pyrethroid insecticides: I. piperonyl butoxide addition. Environ. Toxicol. Chem. 26:2389-2396.
Spatial Representation:	Data for this line of evidence for Soledad Canyon was collected at 1 monitoring site [Soledad Canyon Creek 4 - 906LPSOL4]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID	52125	Region 9
Soledad Canyon		

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeds the sediment guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeds the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the

applicable beneficial use support rating. 038304

Line of Evidence (LOE) for Decision ID 52125, Chromium **Region 9**

Soledad Canyon

LOE ID:	77132
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Soledad Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for chromium is 111 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Soledad Canyon was collected at 1 monitoring site [Soledad Canyon Creek 4 - 906LPSOL4]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the 2002 QAMP.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **50807** **Region 9**

Soledad Canyon

Pollutant:	**Chrysene (C1-C4)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeds the sediment guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeds the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50807, Chrysene (C1-C4) **Region 9**

Soledad Canyon

LOE ID:	77133
Pollutant:	Chrysene (C1-C4)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Soledad Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chrysene.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effects level (predictive of sediment toxicity) for Chrysene is 1290 ug/Kg dry weight (Macdonald et al. 2000)
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Soledad Canyon was collected at 1 monitoring site [Soledad Canyon Creek 4 - 906LPSOL4]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID	52126	Region 9
Soledad Canyon		

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeds the sediment guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeds the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52126, Copper	**Region 9**
Soledad Canyon	

LOE ID:	77134
Pollutant:	Copper
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Soledad Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP

Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for copper is 149 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Soledad Canyon was collected at 1 monitoring site [Soledad Canyon Creek 4 - 906LPSOL4]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the 2002 QAMP.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID 51110 — Region 9

Soledad Canyon

Pollutant:	**Cyfluthrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeds the sediment guidelines. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeds the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51110, Cyfluthrin — Region 9

Soledad Canyon

LOE ID:	77946
Pollutant:	Cyfluthrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Soledad Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cyfluthrin, total.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for cyfluthrin is the median lethal concentration (LC50) of 1.1 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 1.1 ug/g is the geometric mean of LC50 values for cyfluthrin from Amweg et al. (2005).
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5
Spatial Representation:	Data for this line of evidence for Soledad Canyon was collected at 1 monitoring site [Soledad Canyon Creek 4 - 906LPSOL4]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID	**51111**	**Region 9**
Soledad Canyon		

Pollutant:	**Cyhalothrin, Lambda**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeds the sediment guidelines.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section

303(d) List. 038309

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeds the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51111, Cyhalothrin, Lambda **Region 9**

Soledad Canyon

LOE ID:	77948
Pollutant:	Cyhalothrin, Lambda
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Soledad Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cyhalothrin, lambda, total.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for lambda-cyhalothrin is the median lethal concentration (LC50) of 0.44 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 0.44 ug/g is the geometric mean of LC50 values for lambda-cyhalothrin from Amweg et al. (2005).
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5
Spatial Representation:	Data for this line of evidence for Soledad Canyon was collected at 1 monitoring site [Soledad Canyon Creek 4 - 906LPSOL4]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID	51109	038310 Region 9
Soledad Canyon		

Pollutant:	**Cypermethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeds the sediment guidelines. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeds the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51109, Cypermethrin	**Region 9**
Soledad Canyon	

LOE ID:	77949
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Soledad Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cypermethrin, total.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP

Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for cypermethrin is the median lethal concentration (LC50) of 0.3 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 0.3 ug/g is the geometric mean of LC50 values for cypermethrin from Maund et al. (2002).
Guideline Reference:	Partitioning, bioavailability, and toxicity of the pyrethroid insecticide cypermethrin in sediments. Environmental Toxicology and Chemistry 21:9-15
Spatial Representation:	Data for this line of evidence for Soledad Canyon was collected at 1 monitoring site [Soledad Canyon Creek 4 - 906LPSOL4]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **50808** **Region 9**

Soledad Canyon

Pollutant:	**DDD (Dichlorodiphenyldichloroethane)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeds the sediment guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeds the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50808, DDD (Dichlorodiphenyldichloroethane) **Region 9**

Soledad Canyon 038312

LOE ID:	77138
Pollutant:	DDD (Dichlorodiphenyldichloroethane)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Soledad Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for DDD.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for sum of DDD (o,p' + p,p') is 28.0 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Soledad Canyon was collected at 1 monitoring site [Soledad Canyon Creek 4 - 906LPSOL4]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **50809** **Region 9**

Soledad Canyon

Pollutant:	**DDE (Dichlorodiphenyldichloroethylene)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeds the sediment guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section

303(d) List. 038313

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeds the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50809, DDE (Dichlorodiphenyldichloroethylene) **Region 9**
Soledad Canyon

LOE ID:	77139
Pollutant:	DDE (Dichlorodiphenyldichloroethylene)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Soledad Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for DDE.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for sum of DDE (o,p' + p,p') is 31.3 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Soledad Canyon was collected at 1 monitoring site [Soledad Canyon Creek 4 - 906LPSOL4]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **50810** **Region 9**
Soledad Canyon

Pollutant:	**DDT (Dichlorodiphenyltrichloroethane)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeds the sediment guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeds the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50810, DDT (Dichlorodiphenyltrichloroethane) Region 9

Soledad Canyon

LOE ID:	77140
Pollutant:	DDT (Dichlorodiphenyltrichloroethane)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Soledad Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for DDT.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for sum of DDT (o,p' + p,p') is 62.9 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Soledad Canyon was collected at 1 monitoring site [Soledad Canyon Creek 4 - 906LPSOL4]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **51112** **Region 9**

Soledad Canyon

Pollutant:	**Deltamethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeds the sediment guidelines. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeds the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51112, Deltamethrin **Region 9**

Soledad Canyon

LOE ID:	77954
Pollutant:	Deltamethrin
LOE Subgroup:	Pollutant-Sediment

Matrix:	Sediment	038316
Fraction:	Total	
Beneficial Use:	Cold Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Soledad Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Deltamethrin.	
Data Reference:	Statewide Stream Pollution Trends Study 2008	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The evaluation guideline for deltamethrin is the median lethal concentration (LC50) of 0.79 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 0.79 ug/g is the geometric mean of LC50 values for deltamethrin from Amweg et al. (2005).	
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5	
Spatial Representation:	Data for this line of evidence for Soledad Canyon was collected at 1 monitoring site [Soledad Canyon Creek 4 - 906LPSOL4]	
Temporal Representation:	Data was collected on a single day 5/21/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.	
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)	

DECISION ID	**50811**	**Region 9**
Soledad Canyon		

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeds the sediment guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.

2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.938317
3. Zero of one sample exceeds the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50811, Diazinon **Region 9**
Soledad Canyon

LOE ID:	77955
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Soledad Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Diazinon.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for diazinon is the median lethal concentration (LC50) of 11 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 11 ug/g is the geometric mean of LC50 values for diazinon from Ding et al. (2011).
Guideline Reference:	Toxicity of Sediment-Associated Pesticides to Chironomus dilutus and Hyalella azteca. Arch. Environ. Contam. Toxicol. 61:83Â–92.
Spatial Representation:	Data for this line of evidence for Soledad Canyon was collected at 1 monitoring site [Soledad Canyon Creek 4 - 906LPSOL4]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **50812** **Region 9**
Soledad Canyon

Pollutant: **Dieldrin**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**

Last Listing Cycle's Final Listing Decision:	New Decision	038318
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeds the sediment guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeds the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50812, Dieldrin **Region 9**

Soledad Canyon

LOE ID:	77143
Pollutant:	Dieldrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Dieldrin.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for dieldrin is 61.8 ug/Kg dry weight (MacDonald et al. 2000).

Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 1 monitoring site [San Juan Creek 9 - 901SJSJC9]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the 2002 QAMP.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

038319

DECISION ID 50813 Region 9

Soledad Canyon

Pollutant:	**Endrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeds the sediment guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeds the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50813, Endrin Region 9

Soledad Canyon

LOE ID:	77144
Pollutant:	Endrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total

Beneficial Use:	Cold Freshwater Habitat	038320
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Soledad Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Endrin.	
Data Reference:	Statewide Stream Pollution Trends Study 2008	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for endrin is 207 ug/Kg dry weight (MacDonald et al. 2000).	
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31	
Spatial Representation:	Data for this line of evidence for Soledad Canyon was collected at 1 monitoring site [Soledad Canyon Creek 4 - 906LPSOL4]	
Temporal Representation:	Data was collected on a single day 5/21/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	SWAMP data collected before September 2008 followed the 2002 QAMP.	
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)	

DECISION ID	**51113**	**Region 9**
Soledad Canyon		

Pollutant:	**Esfenvalerate/Fenvalerate**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeds the sediment guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeds the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available

indicating that standards are not met. 038321

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51113, Esfenvalerate/Fenvalerate **Region 9**

Soledad Canyon

LOE ID:	77956
Pollutant:	Esfenvalerate/Fenvalerate
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Soledad Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Esfenvalerate/Fenvalerate, total.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for esfenvalerate/fenvalerate is the median lethal concentration (LC50) of 1.5 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 1.5 ug/g is the geometric mean of LC50 values for esfenvalerate/fenvalerate from Amweg et al. (2005).
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5
Spatial Representation:	Data for this line of evidence for Soledad Canyon was collected at 1 monitoring site [Soledad Canyon Creek 4 - 906LPSOL4]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **51114** **Region 9**

Soledad Canyon

Pollutant:	**Fenpropathrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised

Impairment from Pollutant or Pollution:	Pollutant	038322
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeds the sediment guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeds the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.	
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.	

Line of Evidence (LOE) for Decision ID 51114, Fenpropathrin **Region 9**

Soledad Canyon

LOE ID:	77957
Pollutant:	Fenpropathrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Soledad Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Fenpropathrin.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for fenpropathrin is the median lethal concentration (LC50) of 1 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 1 ug/g is the geometric mean of LC50 values for fenpropathrin from Ding et al. (2011).
Guideline Reference:	Toxicity of Sediment-Associated Pesticides to Chironomus dilutus and Hyalella azteca.

	Arch. Environ. Contam. Toxicol. 61:83Â–92.	038323

Spatial Representation:	Data for this line of evidence for Soledad Canyon was collected at 1 monitoring site [Soledad Canyon Creek 4 - 906LPSOL4]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID 51097 Region 9

Soledad Canyon

Pollutant:	**Fluoranthene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeds the sediment guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeds the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51097, Fluoranthene Region 9

Soledad Canyon

LOE ID:	77147
Pollutant:	Fluoranthene
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat

Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Agua Hedionda Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Fluoranthene.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effects level (predictive of sediment toxicity) for Fluoranthene is 2,230 ug/Kg dry weight (Macdonald et al. 2000)
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Agua Hedionda Creek was collected at 1 monitoring site [Agua Hedionda Creek 6 - 904CBAHC6]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **51098** **Region 9**

Soledad Canyon

Pollutant:	**Fluorene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeds the sediment guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeds the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51098, Fluorene **Region 9**

Soledad Canyon

LOE ID:	77148
Pollutant:	Fluorene
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Soledad Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Fluorene.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for fluorene is 536 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Soledad Canyon was collected at 1 monitoring site [Soledad Canyon Creek 4 - 906LPSOL4]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **51101** **Region 9**

Soledad Canyon

Pollutant:	**Lindane/gamma Hexachlorocyclohexane (gamma-HCH)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of

the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeds the sediment guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeds the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51101, Lindane/gamma Hexachlorocyclohexane (gamma-HCH) **Region 9**

Soledad Canyon

LOE ID:	77958
Pollutant:	Lindane/gamma Hexachlorocyclohexane (gamma-HCH)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Soledad Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for HCH, gamma.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for Lindane (gamma-HCH) is 4.99 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Soledad Canyon was collected at 1 monitoring site [Soledad Canyon Creek 4 - 906LPSOL4]
Temporal Representation:	Data was collected on a single day 5/21/2008.

Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the 2002 QAMP.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **51102** **Region 9**

Soledad Canyon

Pollutant:	**Methyl Parathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeds the sediment guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeds the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51102, Methyl Parathion **Region 9**

Soledad Canyon

LOE ID:	77959
Pollutant:	Methyl Parathion
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Soledad Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Parathion, Methyl.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for methyl parathion is the median lethal concentration (LC50) of 6 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 6 ug/g is the geometric mean of LC50 values for methyl parathion from Ding et al. (2011).
Guideline Reference:	Toxicity of Sediment-Associated Pesticides to Chironomus dilutus and Hyalella azteca. Arch. Environ. Contam. Toxicol. 61:83Â–92.
Spatial Representation:	Data for this line of evidence for Soledad Canyon was collected at 1 monitoring site [Soledad Canyon Creek 4 - 906LPSOL4]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID	51103	Region 9
Soledad Canyon		

Pollutant:	**Naphthalene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeds the sediment guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeds the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and

information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51103, Naphthalene	Region 9
Soledad Canyon	

LOE ID:	77149
Pollutant:	Naphthalene
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Soledad Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Naphthalene.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for naphthalene is 561 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Soledad Canyon was collected at 1 monitoring site [Soledad Canyon Creek 4 - 906LPSOL4]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID 52127	Region 9
Soledad Canyon	

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeds the sediment guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeds the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52127, Nickel **Region 9**

Soledad Canyon

LOE ID:	77150
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Soledad Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for nickel is 48.6 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Soledad Canyon was collected at 1 monitoring site [Soledad Canyon Creek 4 - 906LPSOL4]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the 2002 QAMP.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID	51104	Region 9
Soledad Canyon		

Pollutant:	**PAHs (Polycyclic Aromatic Hydrocarbons)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeds the sediment guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeds the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51104, PAHs (Polycyclic Aromatic Hydrocarbons)	**Region 9**
Soledad Canyon	

LOE ID:	77151
Pollutant:	PAHs (Polycyclic Aromatic Hydrocarbons)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Soledad Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for PAHs (Polycyclic Aromatic Hydrocarbons).
Data Reference:	Statewide Stream Pollution Trends Study 2008

SWAMP Data:	SWAMP	038332
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In freshwater sediments the probable effects level (predictive of sediment toxicity) for PAH, Total is 22,800 ug/Kg dry weight (Macdonald et al. 2000)	
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31	
Spatial Representation:	Data for this line of evidence for Soledad Canyon was collected at 1 monitoring site [Soledad Canyon Creek 4 - 906LPSOL4]	
Temporal Representation:	Data was collected on a single day 5/21/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.	
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)	

DECISION ID **51105** **Region 9**

Soledad Canyon

Pollutant:	**PCBs (Polychlorinated biphenyls)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeds the sediment guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeds the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51105, PCBs (Polychlorinated biphenyls) **Region 9**

Soledad Canyon 038333

LOE ID:	72814
Pollutant:	PCBs (Polychlorinated biphenyls)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Zero of 1 sample collected for Total PCBs exceeded the evaluation guideline.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for total PCB is 676 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data were collected at the following station 906LPSOL4 (Soledad Canyon Creek 4).
Temporal Representation:	The samples were collected on 5/21/2008.
Environmental Conditions:	
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **51116** **Region 9**

Soledad Canyon

Pollutant:	**Permethrin, total**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeds the sediment guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.

2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeds the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51116, Permethrin, total **Region 9**
Soledad Canyon

LOE ID:	77152
Pollutant:	Permethrin, total
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Soledad Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Permethrin, Total.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for permethrin is the median lethal concentration (LC50) of 8.9 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 8.9 ug/g is the geometric mean of LC50 values for permethrin from Amweg et al. (2005).
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5
Spatial Representation:	Data for this line of evidence for Soledad Canyon was collected at 1 monitoring site [Soledad Canyon Creek 4 - 906LPSOL4]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **51106** **Region 9**
Soledad Canyon

Pollutant: **Phenanthrene**

Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	038335
Last Listing Cycle's Final Listing Decision:	New Decision	
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeds the sediment guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeds the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51106, Phenanthrene **Region 9**

Soledad Canyon

LOE ID:	77153
Pollutant:	Phenanthrene
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Soledad Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Phenanthrene.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effects level (predictive of sediment toxicity) for

	Phenanthrene is 1170 ug/Kg dry weight (Macdonald et al. 2000) 038336
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Soledad Canyon was collected at 1 monitoring site [Soledad Canyon Creek 4 - 906LPSOL4]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID 51107 Region 9

Soledad Canyon

Pollutant:	**Pyrene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeds the sediment guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeds the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51107, Pyrene Region 9

Soledad Canyon

LOE ID:	77154
Pollutant:	Pyrene
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total

Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Soledad Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Pyrene.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effects level (predictive of sediment toxicity) for Pyrene is 1520 ug/Kg dry weight (Macdonald et al. 2000)
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Soledad Canyon was collected at 1 monitoring site [Soledad Canyon Creek 4 - 906LPSOL4]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID	51108	Region 9
Soledad Canyon		

Pollutant:	**Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeds the sediment guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeds the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.

4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51108, Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD) **Region 9**

Soledad Canyon

LOE ID:	77159
Pollutant:	Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Juan Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for DDT, Total.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for sum of DDT (o,p' + p,p') is 62.9 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for San Juan Creek was collected at 1 monitoring site [San Juan Creek 9 - 901SJSJC9]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **52128** **Region 9**

Soledad Canyon

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or	Pollutant

Pollution: 038339

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeds the sediment guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeds the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52128, Zinc **Region 9**

Soledad Canyon

LOE ID:	77161
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Soledad Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for Zinc is 459 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Soledad Canyon was collected at 1 monitoring site [

	Soledad Canyon Creek 4 - 906LPSOL4] 038340
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the 2002 QAMP.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **44274** **Region 9**

Soledad Canyon

Pollutant:	**Selenium**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown | Unknown Nonpoint Source | Urban Runoff/Storm Sewers
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Two of the three samples exceed the water quality objective for selenium. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Three of the four samples exceed the water quality objective for selenium and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 44274, Selenium **Region 9**

Soledad Canyon

LOE ID:	7578
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	3	038341
Number of Exceedances:	2	
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)	
Data Used to Assess Water Quality:	Three water samples were collected at Soledad Canyon Creek station 906LPSOL2 in March, April, June, and September 2002. Two samples showed excessive selenium concentration according to results in the Surface Water Ambient Monitoring Program Report, 2007.	
Data Reference:	Monitoring data for Region 9	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	CTR Freshwater Chronic (CCC) 5 ug/L (U.S. EPA, 2000).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA	
Spatial Representation:	Water samples were collected at Soledad Canyon Creek station 906LPSOL2; (Latitude 32.8911675, Longitude -117.2126625).	
Temporal Representation:	Samples were collected on March, April, June, and September 2002.	
Environmental Conditions:		
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.	
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Rattlesnake Creek
Water Body ID: CAR9062000020011025132339
Water Body Type: River & Stream

DECISION ID 44296 **Region 9**
Rattlesnake Creek

Pollutant: **Benthic Community Effects**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: Benthic Community Effects is being considered for placement on the section 303(d) list under sections 3.9 of the Listing Policy. Under section 3.9, an additional line of evidence associating the Benthic Community Effects with a water or sediment concentration of pollutants is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this indicator. 5 of 5 samples exceeded the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing Benthic Community Effects in this water segment on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. 5 of 5 samples exceeded the Index of Biological Integrity (IBI) value of "poor" water quality for this area and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy, however as required under section 3.9 of the Listing Policy, pollutant(s) could not be directly associated with the Benthic Community Effects.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 44296, Benthic Community Effects **Region 9**
Rattlesnake Creek

LOE ID: 3325

Pollutant: Benthic-Macroinvertebrate Bioassessments
LOE Subgroup: Population/Community Degradation
Matrix: Not Specified
Fraction: None

Beneficial Use: Agricultural Supply

Number of Samples:	0	038343
Number of Exceedances:	0	
Data and Information Type:	Benthic macroinvertebrate surveys	
Data Used to Assess Water Quality:	Data were collected for the San Diego Regional Water Quality Control Board 1999 Biological Assessment Annual Report. Physical habitat scores at RC-HP ranged from 62-79, slightly lower, compared to other sampled waterbodies. BMI scores at RC-HP were all near (slightly above or below) average for all sampling months. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:		
Objective/Criterion Reference:		
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Rattlesnake Creek, 5 riffles adjacent of Hillary Park (RC-HP).	
Temporal Representation:	Samples were collected in May, September, and November 1998, and May 1999.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44296, Benthic Community Effects **Region 9**

Rattlesnake Creek

LOE ID:	26441
Pollutant:	Benthic Community Effects
LOE Subgroup:	Adverse Biological Responses
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	5
Number of Exceedances:	5
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Five samples of IBI data were taken from May 1998 to June 2000 at one sampling site. Of the total number of samples, all five samples exceeded the IBI impairment threshold.
Data Reference:	Fish and Game IBI Data
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. (SDRWQCB, 1995)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13

Spatial Representation:	Samples were collected at one site: 906RCHPxx on Rattlesnake Creek.
Temporal Representation:	Sampling occurred during one to three events over a three year period from May 1998 to June 2000.
Environmental Conditions:	
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Project Plan for the California Stream Bioassessment Procedure and the State of California, California Monitoring an Assessment Program: "CMAP", Quality Assurance Project Plan.
QAPP Information Reference(s):	State of California, California Monitoring and Assessment Program: "CMAP". Quality Assurance Project Plan for the California Stream Bioassessment Procedure The San Diego Stream Team Quality Assurance Project Plan

DECISION ID 43597 Region 9

Rattlesnake Creek

Pollutant:	**Total Dissolved Solids**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2, one line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. The one sample collected exceeded the Basin Plan water quality objective for total dissolved solids. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. The one sample collected exceeded the Basin Plan water quality objective for total dissolved solids and this sample size is insufficient to determine with the power and confidence of the Listing Policy if standards are not met. A minimum of five samples is needed for application of Table 3.2. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43597, Total Dissolved Solids Region 9

Rattlesnake Creek

LOE ID:	3323
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved

Beneficial Use:	Agricultural Supply
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 1998. One sample was collected and was in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for TDS is 500 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	One sample was collected at Rattlesnake Creek at Hilleary Park, off Community Road.
Temporal Representation:	One sample was collected on 06/03/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID	33790	Region 9
Rattlesnake Creek		

Pollutant:	**Turbidity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2, one line of evidence is necessary to assess listing status. One lines of evidence is available in the administrative record to assess this pollutant. The one sample collected did not exceed the Basin Plan water quality objective for turbidity. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. The one sample collected did not exceed the Basin Plan water quality objective for turbidity, and this sample size is insufficient to determine with the power and confidence of the Listing Policy if standards are not met. A minimum of five samples is needed for application of Table 3.2. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision	This is a decision previously approved by the State Water Resources Control Board and the USEPA.

Recommendation:	No new data were assessed by the Regional Board for the current cycle. The decision has not changed.	33246

Line of Evidence (LOE) for Decision ID 33790, Turbidity **Region 9**

Rattlesnake Creek

LOE ID:	3324
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Agricultural Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by RWQCB9 in 1998. One sample was collected and was not in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for turbidity is 20 ntu. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Sample was collected at Rattlesnake Creek at Hilleary Park, off Community Road.
Temporal Representation:	One sample was collected on 06/03/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Rose Creek
Water Body ID: CAR9064000020011025132732
Water Body Type: River & Stream

DECISION ID 43399 **Region 9**
Rose Creek

Pollutant: **Toxicity**
Final Listing Decision: **Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Sources: Source Unknown
Expected TMDL Completion Date: 2021
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for removal from the CWA section 303(d) List under section 4.6 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess pollutant. Four of the five samples exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Four of five samples exceeded the objective and this exceeds the allowable frequency listed in Table 4.1 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 43399, Toxicity **Region 9**
Rose Creek

LOE ID: 21389

Pollutant: Toxicity
LOE Subgroup: Toxicity
Matrix: Water
Fraction: None

Beneficial Use: Warm Freshwater Habitat

Number of Samples:	4	038348
Number of Exceedances:	4	
Data and Information Type:	Ambient toxicity testing (chronic)	
Data Used to Assess Water Quality:	Four samples were collected at Rose Canyon Creek station 906LPRSC4 from March 2002 to September 2002 and they showed significant toxicity levels (SL) in the following tests: Selenastrum algae growth test - three of the four samples. Ceriodaphnia dubia survival/reproductive test - two of the four samples were toxic. Results were from California's Surface Water Ambient Monitoring Program Report, 2007.	
Data Reference:	Monitoring data for Region 9	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.	
Guideline Reference:	Monitoring data for Region 9	
Spatial Representation:	Water Toxicity Samples were collected at Rose Canyon Creek station 906LPRSC4; (Latitude 33.1299, Longitude -117.1924).	
Temporal Representation:	Samples were collected on March, April, June, and September 2002.	
Environmental Conditions:		
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43399, Toxicity **Region 9**

Rose Creek

LOE ID:	75546
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to test for toxicity. None of the samples exhibited statistically and biologically significant toxicity. The toxicity tests included survival and reproduction of Ceriodaphnia dubia.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there

	is a statistically significant decrease in organism response in the sample as compared to the control. Additionally, the biological significance of the sample is evaluted by determining whether the sample response is lower than the evaluation threshold.
Guideline Reference:	
Spatial Representation:	The samples were collected from site 906_SMC01606, Rose Canyon.
Temporal Representation:	The samples were collected in May 2009.
Environmental Conditions:	
QAPP Information:	This data was collected for the Regional Monitoring Of Southern California's Coastal Watersheds - Stormwater Monitoring Coalition Bioassessment Working Group. CRG Marine Laboratories Quality Assurance Program Document was provided.
QAPP Information Reference(s):	e-mail clarifying QAPP information

DECISION ID 48570 Region 9

Rose Creek

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one samples exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48570, Arsenic Region 9

Rose Creek

LOE ID:	75533
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Rose Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The dissolved arsenic criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved arsenic is 0.150 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Rose Creek was collected at 1 monitoring site [Rose Canyon - 906_SMC01606]
Temporal Representation:	Data was collected on a single day 5/26/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

DECISION ID	**48594**	**Region 9**
Rose Creek		

Pollutant:	**Bifenthrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. One of the one samples exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of one samples exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision	After review of the available data and information, RWQCB staff concludes that the water body-

Recommendation: pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48594, Bifenthrin **Region 9**

Rose Creek

LOE ID:	78086
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Rose Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Bifenthrin.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The UC Davis Criteria for Bifenthrin for the protection of aquatic organisms is a 4 day average of 0.0006 ug/L (Fojut et al. 2012).
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Rose Creek was collected at 1 monitoring site [Rose Canyon - 906_SMC01606]
Temporal Representation:	Data was collected on a single day 5/26/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

DECISION ID **48573** **Region 9**

Rose Creek

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48573, Cadmium **Region 9**

Rose Creek

LOE ID:	75538
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Rose Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The dissolved cadmium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved cadmium is 0.0022 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Rose Creek was collected at 1 monitoring site [Rose Canyon - 906_SMC01606]
Temporal Representation:	Data was collected on a single day 5/26/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

DECISION ID	48580	Region 9
Rose Creek		

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48580, Chromium	Region 9
Rose Creek	

LOE ID:	75540
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Rose Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Rose Creek was collected at 1 monitoring site [Rose Canyon - 906_SMC01606]
Temporal Representation:	Data was collected on a single day 5/26/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

DECISION ID	**48581**	**Region 9**
Rose Creek		

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one samples exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48581, Copper	**Region 9**
Rose Creek	

LOE ID:	75541	038355

Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Rose Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Rose Creek was collected at 1 monitoring site [Rose Canyon - 906_SMC01606]
Temporal Representation:	Data was collected on a single day 5/26/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

DECISION ID	**48597**	**Region 9**
Rose Creek		

Pollutant:	**Cypermethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. One of the one samples exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of one samples exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48597, Cypermethrin **Region 9**

Rose Creek

LOE ID:	78087
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Rose Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Cypermethrin, total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of cypermethrin does not exceed 0.0002 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Fojut et al. 2012)
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Rose Creek was collected at 1 monitoring site [Rose Canyon - 906_SMC01606]
Temporal Representation:	Data was collected on a single day 5/26/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

DECISION ID 48582 **Region 9**

Rose Creek

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48582, Lead **Region 9**

Rose Creek

LOE ID:	75543
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Rose Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each

	sample and varies based on the ambient hardness during sampling. Section 131.38(b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Rose Creek was collected at 1 monitoring site [Rose Canyon - 906_SMC01606]
Temporal Representation:	Data was collected on a single day 5/26/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

DECISION ID 48595 Region 9

Rose Creek

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one samples exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48595, Nickel Region 9

Rose Creek

LOE ID:	75544
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	038359
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Rose Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Rose Creek was collected at 1 monitoring site [Rose Canyon - 906_SMC01606]	
Temporal Representation:	Data was collected on a single day 5/26/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.	

DECISION ID	**48596**	**Region 9**
Rose Creek		

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one samples exceeded the objective and this sample size is insufficient to determine, with

the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48596, Zinc **Region 9**

Rose Creek

LOE ID:	75547
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Rose Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Rose Creek was collected at 1 monitoring site [Rose Canyon - 906_SMC01606]
Temporal Representation:	Data was collected on a single day 5/26/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

DECISION ID **43634** **Region 9**

Rose Creek

Pollutant:	**Benthic Community Effects**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**

Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)	038361
Revision Status	Revised	
Sources:	Hydromodification | Illicit Connections/Illegal Hook-ups/Dry Weather Flows | Source Unknown | Unknown Nonpoint Source | Unknown Point Source | Urban Runoff/Storm Sewers	
Expected TMDL Completion Date:	2025	
Impairment from Pollutant or Pollution:	Pollutant	
Regional Board Conclusion:	Benthic Community Effects is being considered for placement on the CWA section 303(d) List under sections 3.9 and 3.1 of the Listing Policy. Under section 3.9, an additional line of evidence associating Benthic Community Effects with a water or sediment concentration of pollutant(s) is necessary to assess listing status. Based on the readily available data and information, the weight of evidence provides sufficient justification for placing Benthic Community Effects in this water segment on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Pursuant to section 3.9 of the Listing Policy, the water segment exhibits significant degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index. 4. Pursuant to section 3.9 of the Listing Policy, the water segment has associated pollutant(s) samples that exceed water quality objectives. 5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are being met.	
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant(s) contributes to or causes the problem.	

Line of Evidence (LOE) for Decision ID 43634, Benthic Community Effects **Region 9**

Rose Creek

LOE ID:	26724
Pollutant:	Benthic Community Effects
LOE Subgroup:	Adverse Biological Responses
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	10
Number of Exceedances:	10
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Ten samples of IBI data were taken from October 2002 to May 2007 at one sampling site. Of the total number of samples, all ten samples exceeded the IBI impairment threshold.
Data Reference:	Stream Bioassessment Data. Co-permitee Data. Collected 2002-2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as

specified by the Regional Board. (SDRWQCB, 1995) 038362

Objective/Criterion Reference: Water Quality Control Plan for the San Diego Basin

Evaluation Guideline: The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)

Guideline Reference: A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13

Spatial Representation: Samples were collected at one site: MB-RC on Rose Creek.

Temporal Representation: Sampling occurred on October 2002 and during May and October from 2003 to 2006 and one event on May 2007.

Environmental Conditions:

QAPP Information: Quality Control for collection and identification was conducted in accordance with the Quality Assurance Manual for Freshwater Bioassessment.

QAPP Information Reference(s): Quality Assurance Manual for Freshwater Bioassessment Revision 0

Line of Evidence (LOE) for Decision ID 43634, Benthic Community Effects **Region 9**

Rose Creek

LOE ID: 78086

Pollutant: Bifenthrin

LOE Subgroup: Pollutant-Water

Matrix: Water

Fraction: None

Beneficial Use: Warm Freshwater Habitat

Number of Samples: 1

Number of Exceedances: 1

Data and Information Type: PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality: Water Board staff assessed County of San Diego data for Rose Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Bifenthrin.

Data Reference: Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).

Objective/Criterion Reference: Water Quality Control Plan for the San Diego Basin

Evaluation Guideline: The UC Davis Criteria for Bifenthrin for the protection of aquatic organisms is a 4 day average of 0.0006 ug/L (Fojut et al. 2012).

Guideline Reference: Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.

Spatial Representation: Data for this line of evidence for Rose Creek was collected at 1 monitoring site [Rose Canyon - 906_SMC01606]

Temporal Representation: Data was collected on a single day 5/26/2009.

Environmental Conditions: Staff is not aware of any special conditions that might affect interpretation of the data.

QAPP Information: The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.

QAPP Information Reference(s): Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

LOE ID:	79613
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	12
Number of Exceedances:	9
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	A total of twelve samples were taken at three stations on Rose Creek. Nine samples were below the 0.79 threshold, and therefore exceeding the water quality objective for the aquatic life beneficial use. Two samples were not scored due to low organism counts.
Data Reference:	RWB9 Status Sampling 2007 and 2008 Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008. Region 9 CSCI Scores & Water Body Information
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.
Guideline Reference:	The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.
Spatial Representation:	Samples were collected at the following stations: 906LPRSC4, SMC01606, 906MB-RC
Temporal Representation:	Surveys done from 2002 to 2009.
Environmental Conditions:	
QAPP Information:	Data collected following SWAMP QA protocols for the RWB9 Status Sampling 2007 and 2008 water quality monitoring project, the County of San Diego NPDES MS4 Copermittees Receiving Waters Monitoring and Reporting Program, and the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan.
QAPP Information Reference(s):	RWB9 Status Sampling 2007 and 2008 Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008. Bioassessment Data for Various Pollutants from Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.

Line of Evidence (LOE) for Decision ID 43634, Benthic Community Effects **Region 9**
Rose Creek

LOE ID:	21389
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Four samples were collected at Rose Canyon Creek station 906LPRSC4 from March 2002 to September 2002 and they showed significant toxicity levels (SL) in the following tests: Selenastrum algae growth test - three of the four samples. Ceriodaphnia dubia survival/reproductive test - two of the four samples were toxic. Results were from California's Surface Water Ambient Monitoring Program Report, 2007.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.
Guideline Reference:	Monitoring data for Region 9
Spatial Representation:	Water Toxicity Samples were collected at Rose Canyon Creek station 906LPRSC4; (Latitude 33.1299, Longitude -117.1924).
Temporal Representation:	Samples were collected on March, April, June, and September 2002.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43634, Benthic Community Effects **Region 9**

Rose Creek

LOE ID:	75536
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	11
Number of Exceedances:	11
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Eleven of the eleven samples collected had an IBI score below 40. NPDES bioassessment
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the State or Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	The samples were collected at stations MB-RC and MB-TWAS-1 on Rose Creek.
Temporal Representation:	The samples were collected in May and October 2002 to 2007 and in May 2010.
Environmental Conditions:	
QAPP Information:	The data was collected under the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan, June 25, 2009.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 43634, Benthic Community Effects **Region 9**

Rose Creek

LOE ID:	7935
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	3
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Four water samples were collected at Rose Canyon Creek station. Three samples showed excessive selenium concentrations according to resluts in the Surface Water Ambient Monitoring Program Report from 2007. Samples were collected on March, April, June, and September 2002.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	CTR Freshwater Chronic (CCC) 5 ug/L; (U.S. EPA, 2000).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA
Spatial Representation:	Water samples were collected at Rose Canyon Creek station 906LPRSC4; (Latitude 32.8371625, Longitude -117.23298).
Temporal Representation:	Samples were collected on March, April, June, and September 2002.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.

QAPP Information Reference(s): 2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 43634, Benthic Community Effects **Region 9**

Rose Creek

LOE ID:	75535
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	The IBI score for this water body was 1 which indicates that this water body may be considered to have impaired conditions.
Data Reference:	RWB9 Status Sampling 2007 and 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at the following station: 906LPRSC4-Rose Canyon Creek 4.
Temporal Representation:	Surveys done May 7, 2008.
Environmental Conditions:	
QAPP Information:	Data collected following SWAMP QA protocols for the RWB9 Status Sampling 2007 and 2008 water quality monitoring project.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43634, Benthic Community Effects **Region 9**

Rose Creek

LOE ID:	78087
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Rose Creek to determine

	beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Cypermethrin, total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of cypermethrin does not exceed 0.0002 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Fojut et al. 2012)
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Rose Creek was collected at 1 monitoring site [Rose Canyon - 906_SMC01606]
Temporal Representation:	Data was collected on a single day 5/26/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

DECISION ID	33036	Region 9
Rose Creek		

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. One of four of the samples exceed the Ca. Dept, of Fish & Game guideline water quality objective for diazinon. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of four of the samples exceed the Ca. DFG guideline water quality objective for Diazinon and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision	This is a decision previously approved by the State Water Resources Control Board and the USEPA.

Recommendation:	No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33036, Diazinon **Region 9**

Rose Creek

LOE ID:	3326
Pollutant:	Diazinon
LOE Subgroup:	Adverse Biological Responses
Matrix:	-N/A
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	1
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	One of 4 samples exceeding the CDFG guideline. (SWAMP, 2004).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination or pesticides shall be present in concentrations that adversely affect beneficial uses.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	CDFG Aquatic life toxicity one hour average 0.16 ug/L. (Siepman & Finlayson, 2000; Finlayson, 2004).
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	One sample station at Rose Canyon Creek: 32.83703 -117.23178.
Temporal Representation:	Samples were collected from March through October 2002.
Environmental Conditions:	Rose Canyon Creek Watershed: 906.40.
QAPP Information:	SWAMP Quality Assurance Plan.
QAPP Information Reference(s):	

DECISION ID **36872** **Region 9**

Rose Creek

Pollutant:	**Selenium**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Natural Sources | Source Unknown
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Three of four of

the samples exceed the California Toxics Rule water quality objective for selenium. 038369

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Three of four of the samples exceed the California Toxics Rule water quality objective for selenium, and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 36872, Selenium **Region 9**

Rose Creek

LOE ID:	21389
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Four samples were collected at Rose Canyon Creek station 906LPRSC4 from March 2002 to September 2002 and they showed significant toxicity levels (SL) in the following tests: Selenastrum algae growth test - three of the four samples. Ceriodaphnia dubia survival/reproductive test - two of the four samples were toxic. Results were from California's Surface Water Ambient Monitoring Program Report, 2007.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.
Guideline Reference:	Monitoring data for Region 9
Spatial Representation:	Water Toxicity Samples were collected at Rose Canyon Creek station 906LPRSC4; (Latitude 33.1299, Longitude -117.1924).
Temporal Representation:	Samples were collected on March, April, June, and September 2002.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	

LOE ID:	7935
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	3
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Four water samples were collected at Rose Canyon Creek station. Three samples showed excessive selenium concentrations according to resluts in the Surface Water Ambient Monitoring Program Report from 2007. Samples were collected on March, April, June, and September 2002.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	CTR Freshwater Chronic (CCC) 5 ug/L; (U.S. EPA, 2000).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA
Spatial Representation:	Water samples were collected at Rose Canyon Creek station 906LPRSC4; (Latitude 32.8371625, Longitude -117.23298).
Temporal Representation:	Samples were collected on March, April, June, and September 2002.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Tecolote Creek
Water Body ID: CAR9065000019990208103941
Water Body Type: River & Stream

DECISION ID 37924 **Region 9**
Tecolote Creek

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal from the CWA section 303(d) List under section 4.1 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess pollutant. Two of the 19 samples exceed the Criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Two of 19 samples exceeded the Criteria. This does not meet the minimum sample size for delisting under Section 4.1 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 37924, Cadmium **Region 9**
Tecolote Creek

LOE ID:	4734
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	Unspecified
Guideline Reference:	Placeholder reference pre-2006 303(d)
Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 37924, Cadmium **Region 9**

Tecolote Creek

LOE ID:	78173
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	19
Number of Exceedances:	2
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Tecolote Creek to determine beneficial use support and results are as follows: 2 of 19 samples exceed the criterion for Cadmium.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The dissolved cadmium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved cadmium is 0.0022 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Tecolote Creek was collected at 1 monitoring site [Tecolote Creek - 906TC-MLS]
Temporal Representation:	Data was collected over the time period 11/29/2001-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and

QAPP Information Reference(s):	Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed. Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID	33826	Region 9
Tecolote Creek		

Pollutant:	**Copper**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for removal from the CWA section 303(d) List under section 4.1 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess pollutant. One of the 17 samples exceed the Criteria. Based on the readily available data and information, the weight of evidence indicates that there is not sufficient justification for removing this water segment-pollutant combination from the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of 17 samples exceeded the Criteria and this does not meet the the minimum sample size listed in Section 4.1 of the Listing Policy. 4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 33826, Copper	**Region 9**
Tecolote Creek	

LOE ID:	4735
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to

	2006.	038374
Data Reference:	Placeholder reference pre-2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Unspecified	
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)	
Evaluation Guideline:	Unspecified	
Guideline Reference:	Placeholder reference pre-2006 303(d)	
Spatial Representation:	Unspecified	
Temporal Representation:	Unspecified	
Environmental Conditions:	Unspecified	
QAPP Information:	Unspecified	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33826, Copper Tecolote Creek **Region 9**

LOE ID:	77037
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	17
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Tecolote Creek to determine beneficial use support and results are as follows: 1 of 17 samples exceed the criterion for Copper.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Copper to protect aquatic life in freshwater. The dissolved Copper criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Tecolote Creek was collected at 1 monitoring site [Tecolote Creek - 906TC-MLS]
Temporal Representation:	Data was collected over the time period 11/29/2001-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID	33829	Region 9
Tecolote Creek		

Pollutant:	**Lead**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal from the CWA section 303(d) List under section 4.1 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess pollutant. Zero of the 17 samples exceed the Criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 17 samples exceeded the Criteria. This does not meet the minimum sample size for delisting under Section 4.1 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 33829, Lead	**Region 9**
Tecolote Creek	

LOE ID:	77075
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Tecolote Creek to determine beneficial use support and results are as follows: 0 of 17 samples exceed the criterion for Lead.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.

SWAMP Data:	Non-SWAMP	038376
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Lead to protect aquatic life in freshwater. The dissolved Lead criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Tecolote Creek was collected at 1 monitoring site [Tecolote Creek - 906TC-MLS]	
Temporal Representation:	Data was collected over the time period 11/29/2001-11/4/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.	

Line of Evidence (LOE) for Decision ID 33829, Lead **Region 9**

Tecolote Creek

LOE ID:	4737
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	Unspecified
Guideline Reference:	Placeholder reference pre-2006 303(d)
Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

DECISION ID 42796 **Region 9**

Tecolote Creek

Pollutant:	**Selenium**	038377
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**	
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)	
Revision Status	Revised	
Sources:	Natural Sources | Source Unknown	
Expected TMDL Completion Date:	2021	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for removal from the CWA section 303(d) List under section 4.1 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess pollutant. Zero of the 19 samples exceed the Criteria for the line of evidence since the prior listing.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 19 samples exceeded the Criteria since the prior listing. This does not meet the minimum sample size for delisting under Section 4.1 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 42796, Selenium **Region 9**

Tecolote Creek

LOE ID:	7579
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	3
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Three water samples were collected at Tecolote Creek station 906LPTEC3 on March, April, June, and September 2002. All three samples showed excessive selenium concentrations according to results in California's Surface Water Ambient Monitoring Program Report, 2007. Samples were collected in March, April, June, and September 2002.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (RWQCB, 2007). CTR Freshwater Chronic (CCC) 5 ug/L; (U.S. EPA, 2000).

Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin 038378 Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA
Evaluation Guideline:	
Guideline Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA
Spatial Representation:	Water samples were collected at Tecolote Creek station 906LPTEC3; (Latitude 33.7768533, Longitude -117.18618).
Temporal Representation:	Samples were collected in March, April, and June 2002.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 42796, Selenium **Region 9**

Tecolote Creek

LOE ID:	78181
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	19
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Tecolote Creek to determine beneficial use support and results are as follows: 0 of 19 samples exceed the criterion for Selenium.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The selenium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater is 0.005 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Tecolote Creek was collected at 1 monitoring site [Tecolote Creek - 906TC-MLS]
Temporal Representation:	Data was collected over the time period 11/29/2001-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID	36097	Region 9
Tecolote Creek		

Pollutant:	**Toxicity**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal from the CWA section 303(d) List under section 4.6 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess pollutant. In this cycle, six of the 19 samples exceed the evaluation guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Six of 19 samples exceeded the evaluation guideline, and this exceeds the allowable frequency listed in Table 4.1 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 36097, Toxicity	**Region 9**
Tecolote Creek	

LOE ID:	77091
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	19
Number of Exceedances:	6
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Nineteen samples were collected to test for toxicity. Six of the 19 samples exhibited statistically significant toxicity. The toxicity tests that exhibited significant toxicity included survival of Hyalella azteca, growth of Selenastrum capriconutum and survival and reproduction of Ceriodaphnia dubia.
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.

SWAMP Data:	Non-SWAMP	038380
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.	
Guideline Reference:		
Spatial Representation:	The samples were collected at station 906TC-MLS Tecolote Creek.	
Temporal Representation:	The samples were collected from 2001 to 2008.	
Environmental Conditions:		
QAPP Information:	The data was collected under the County of San Diego Co-Permittees Receiving Waters Urban Runoff Monitoring and Reporting Program (Order No. 2007-01). Data quality is good.	
QAPP Information Reference(s):	e-mail clarifying QAPP information	

Line of Evidence (LOE) for Decision ID 36097, Toxicity **Region 9**

Tecolote Creek

LOE ID:	4738
Pollutant:	Toxicity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	Unspecified
Guideline Reference:	Placeholder reference pre-2006 303(d)
Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

DECISION ID **33849** **Region 9**

Tecolote Creek

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)

Revision Status	Revised	038381
Sources:	Source Unknown	
Expected TMDL Completion Date:	2019	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for removal from the CWA section 303(d) List under section 4.1 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess pollutant. Zero of the 17 samples exceed the Criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 17 samples exceeded the Criteria. This does not meet the minimum sample size for delisting under Section 4.1 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 33849, Zinc **Region 9**

Tecolote Creek

LOE ID:	77092
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Tecolote Creek to determine beneficial use support and results are as follows: 0 of 17 samples exceed the criterion for Zinc.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Zinc to protect aquatic life in freshwater. The dissolved Zinc criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition

Evaluation Guideline:	038382
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Tecolote Creek was collected at 1 monitoring site [Tecolote Creek - 906TC-MLS]
Temporal Representation:	Data was collected over the time period 11/29/2001-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 33849, Zinc **Region 9**

Tecolote Creek

LOE ID:	4739
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	Unspecified
Guideline Reference:	Placeholder reference pre-2006 303(d)
Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

DECISION ID 36746 **Region 9**

Tecolote Creek

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not Delist from 303(d) list (being addressed with USEPA approved TMDL)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
TMDL Name:	Bacteria Impaired Waters I (creeks and beach shorelines)
TMDL Project Code:	169
Date TMDL Approved by	06/22/2011

USEPA: 038383

Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for removal from the CWA section 303(d) List under section 4.3 of the Listing Policy. Under section 4.3 a single line of evidence is necessary to assess listing status.

Five lines of evidence are available in the administrative record to assess this pollutant.
Enterococcus
56 of 77 samples exceed the single sample objective for water contact recreation.
Fecal coliform
39 of 77 samples exceed the single sample objective for water contact recreation.
Total coliform
4 of 4 samples exceed the single sample objective for water contact recreation.
The Indicator bacteria LOE is a placeholder to support a 303(d) listing decision made prior to 2006.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Samples and exceedences are as follows:
Enterococcus
56 of 77 samples exceed the single sample objective for water contact recreation.
Fecal coliform
39 of 77 samples exceed the single sample objective for water contact recreation.
Total coliform
4 of 4 samples exceed the single sample objective for water contact recreation.
The Indicator bacteria LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
The enterococcus and fecal coliform samples exceed the allowable frequency listed in Table 4.2 of the Listing Policy. The total coliform sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 36746, Indicator Bacteria **Region 9**

Tecolote Creek

LOE ID:	77074
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	77
Number of Exceedances:	39
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Thirty-nine of the seventy-seven samples exceeded the fecal Coliform objective.
Data Reference:	Data for Various Pollutants in the City of San Diego Tecolote Creek, 2007-2010.

SWAMP Data:	Non-SWAMP	038384
Water Quality Objective/Criterion:	The Fecal Coliform concentration shall not exceed more than 400/100 ml. Water Quality Control Plan for the San Diego Basin.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected from 22 stations on Tecolote Creek.	
Temporal Representation:	Samples were collected between September 2007 and March 2010.	
Environmental Conditions:		
QAPP Information:	No QAPP was submitted. The data was collected for the Tecolted Creek Bacterial Sourcee Tracking Investigation and used for background for the City of San Diego Bacteria TMDL.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 36746, Indicator Bacteria **Region 9**

Tecolote Creek

LOE ID:	4736
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Water Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	Unspecified
Guideline Reference:	Placeholder reference pre-2006 303(d)
Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 36746, Indicator Bacteria **Region 9**

Tecolote Creek

LOE ID:	72772
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Four of the four samples exceeded the total coliform objective.
Data Reference:	Data for Various Pollutants in the City of San Diego Tecolote Creek, 2007-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The total coliform concentration shall not exceed more than 10,000/100 ml. Water Quality Control Plan for the San Diego Basin.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from 3 stations on Tecolote Creek.
Temporal Representation:	Samples were collected between September 2007 and March 2010.
Environmental Conditions:	
QAPP Information:	No QAPP was submitted. The data was collected for the Tecolted Creek Bacterial Sourcee Tracking Investigation and used for background for the City of San Diego Bacteria TMDL.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 36746, Indicator Bacteria **Region 9**

Tecolote Creek

LOE ID:	77058
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	77
Number of Exceedances:	56
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Fifty-six of the seventy-seven samples exceeded the enterococcus objective.
Data Reference:	Data for Various Pollutants in the City of San Diego Tecolote Creek, 2007-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The enterococcus concentration shall not exceed more than 61/100 ml. Water Quality Control Plan for the San Diego Basin.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from 22 stations on Tecolote Creek.
Temporal Representation:	Samples were collected between September 2007 and March 2010.
Environmental Conditions:	
QAPP Information:	No QAPP was submitted. The data was collected for the Tecolted Creek Bacterial Sourcee Tracking Investigation and used for background for the City of San Diego Bacteria TMDL.
QAPP Information Reference(s):	

DECISION ID **53184** **Region 9**

Tecolote Creek 038386

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the 19 samples exceed the beneficial use guidelines. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 19 samples exceeded the guideline and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 53184, Arsenic — Region 9

Tecolote Creek

LOE ID:	78170
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	19
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Tecolote Creek to determine beneficial use support and results are as follows: 0 of 19 samples exceed the criterion for Arsenic.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The dissolved arsenic criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved arsenic is 0.150 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition

Evaluation Guideline:
Guideline Reference:

Spatial Representation:	Data for this line of evidence for Tecolote Creek was collected at 1 monitoring site [Tecolote Creek - 906TC-MLS]
Temporal Representation:	Data was collected over the time period 11/29/2001-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID 33284 Region 9
Tecolote Creek

Pollutant:	**Benthic-Macroinvertebrate Bioassessments**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the following: The single line of evidence in the record to assess this pollutant consists of bioassessment data. California Stream Index scores were not calculated for prior listing cycles.
Regional Board Decision Recommendation:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. The Regional Board will update this decision when new data and information become available and are assessed.

Line of Evidence (LOE) for Decision ID 33284, Benthic-Macroinvertebrate Bioassessments Region 9
Tecolote Creek

LOE ID:	3327
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Not Specified
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Bioassessments were done by the San Diego Regional Water Quality Control Board in 1998 and 1999. Physical habitat scores and BMI ranking scores were given to each sampling site. Relative to other waterbodies in the study, the Tecolote Creek had medium to high physical

	habitat quality. Relative to the other sampled waterbodies, the BMI ranking for the Tecolote Creek site for 11/1998 was around average, but was well below average for 05/1999. (SDRWQCB, 1999A).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	
Objective/Criterion Reference:	
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected in Tecolote Creek, 5 riffles upstream of Gardena Av. and Cross St.
Temporal Representation:	Sampling occurred in 11/1998 and 05/1999.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 51641 Region 9

Tecolote Creek

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. One of 12 samples exceeded the guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of 12 samples exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51641, Chlorpyrifos Region 9

Tecolote Creek

LOE ID:	77940

Pollutant:	Chlorpyrifos	038389
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	12	
Number of Exceedances:	1	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Tecolote Creek to determine beneficial use support and results are as follows: 1 of 12 samples exceed the criterion for Chlorpyrifos. Seven sample results were not used in the assessment because the laboratory data reporting limit(s) was above the objective and therefore the results could not be quantified with the level of certainty required by the Listing Policy.	
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000).	
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).	
Spatial Representation:	Data for this line of evidence for Tecolote Creek was collected at 1 monitoring site [Tecolote Creek - 906TC-MLS]	
Temporal Representation:	Data was collected over the time period 11/29/2001-11/4/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.	

DECISION ID	**53292**	**Region 9**
Tecolote Creek		

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the 17

samples exceed the beneficial use guideline. 038390

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 17 samples exceeded the guideline and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 53292, Chromium **Region 9**

Tecolote Creek

LOE ID:	77036
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Tecolote Creek to determine beneficial use support and results are as follows: 0 of 17 samples exceed the criterion for Chromium.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Chromium to protect aquatic life in freshwater. The dissolved Chromium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Tecolote Creek was collected at 1 monitoring site [Tecolote Creek - 906TC-MLS]
Temporal Representation:	Data was collected over the time period 11/29/2001-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban

DECISION ID	51656	Region 9
Tecolote Creek		

Pollutant:	**Deltamethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of four samples exceeded the guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of four samples exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51656, Deltamethrin	**Region 9**
Tecolote Creek	

LOE ID:	77055
Pollutant:	Deltamethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Tecolote Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Deltamethrin.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for Deltamethrin is the maximum acceptable toxicant concentration (MATC) of 0.02 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Tecolote Creek was collected at 1 monitoring site [Tecolote Creek - 906TC-MLS]
Temporal Representation:	Data was collected over the time period 12/10/2006-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID	51659	Region 9
Tecolote Creek		

Pollutant:	**Esfenvalerate/Fenvalerate**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of four samples exceeded the guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of four samples exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51659, Esfenvalerate/Fenvalerate 038393 Region 9

Tecolote Creek

LOE ID:	77073
Pollutant:	Esfenvalerate/Fenvalerate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Tecolote Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Esfenvalerate.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to the USEPA Office of Pesticide Programs Ecotoxicity database, the aquatic life EC50 for Esfenvalerate is 0.9 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Tecolote Creek was collected at 1 monitoring site [Tecolote Creek - 906TC-MLS]
Temporal Representation:	Data was collected over the time period 12/10/2006-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID 53293 Region 9

Tecolote Creek

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the 17 samples exceed the beneficial use guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 17 samples exceeded the guideline and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 53293, Nickel **Region 9**

Tecolote Creek

LOE ID:	77077
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Tecolote Creek to determine beneficial use support and results are as follows: 0 of 17 samples exceed the criterion for Nickel.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Nickel to protect aquatic life in freshwater. The dissolved Nickel criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Tecolote Creek was collected at 1 monitoring site [Tecolote Creek - 906TC-MLS]
Temporal Representation:	Data was collected over the time period 11/29/2001-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban

DECISION ID	44332	Region 9
Tecolote Creek		

Pollutant:	**Benthic Community Effects**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Hydromodification | Illicit Connections/Illegal Hook-ups/Dry Weather Flows | Source Unknown | Unknown Point Source | Urban Runoff/Storm Sewers
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Benthic Community Effects is being considered for placement on the CWA section 303(d) List under sections 3.9 and 3.1 of the Listing Policy. Under section 3.9, an additional line of evidence associating Benthic Community Effects with a water or sediment concentration of pollutant(s) is necessary to assess listing status. Based on the readily available data and information, the weight of evidence provides sufficient justification for placing Benthic Community Effects in this water segment on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Pursuant to section 3.9 of the Listing Policy, the water exhibits significant degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index. 4. Pursuant to section 3.9 of the Listing Policy, the water segment has associated pollutant(s) samples that exceed water quality objectives. 5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are being met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant(s) contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 44332, Benthic Community Effects	**Region 9**
Tecolote Creek	

LOE ID:	7192
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	37
Number of Exceedances:	33
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Thirty three of thirty seven samples collected exceed the water quality objective according to

	results in the San Diego County Municipal Copermittees Annual Progress Report, 2007. Samples were collected two to four times a year from 1994-2006
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. (RWQCB, 2007) A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used. (RWQCB, 2007)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at the mass loading station located near the lower boundary of the watershed on the east side of Morena Boulevard.
Temporal Representation:	Samples were collected two to four times a year from 1994-2006
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44332, Benthic Community Effects **Region 9**

Tecolote Creek

LOE ID:	3332
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Non-Contact Recreation
Number of Samples:	9
Number of Exceedances:	7
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego from 11/1997 to 03/2000. Seven of 9 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for turbidity is 20 ntu.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Tecolote Creek site SD5. The location of this site is unknown.
Temporal Representation:	Samples were collected from 11/1997 to 03/2000. Two to 3 samples were collected per year.

Environmental Conditions: 038397
QAPP Information: Data used in 2002 assessment.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 44332, Benthic Community Effects **Region 9**

Tecolote Creek

LOE ID: 3330

Pollutant: Phosphorus
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Non-Contact Recreation

Number of Samples: 9
Number of Exceedances: 9

Data and Information Type: PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality: Data were collected by the City of San Diego from 11/1997 to 03/2000. Nine of 9 samples were in exceedance.
Data Reference: Placeholder reference 2006 303(d)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: From the Basin Plan: For inland surface waters-streams and other flowing waters with all beneficial uses, the WQO for total phosphorus is 0.1 mg/L. This appears to be the desired goal in order to prevent plant nuisance in streams and other flowing waters; not to be exceeded more than 10% of the time.
Objective/Criterion Reference: Placeholder reference 2006 303(d)

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected in Tecolote Creek at site SD5. The exact location of this site is unknown.
Temporal Representation: Samples were collected from 11/1997 to 03/2000. 2-3 samples were collected per year.
Environmental Conditions:
QAPP Information: Data used in 2002 assessment.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 44332, Benthic Community Effects **Region 9**

Tecolote Creek

LOE ID: 79627

Pollutant: Benthic-Macroinvertebrate Bioassessments
LOE Subgroup: Population/Community Degradation
Matrix: Water
Fraction: None

Beneficial Use: Warm Freshwater Habitat

Number of Samples: 13
Number of Exceedances: 11

Data and Information Type: Benthic macroinvertebrate surveys
Data Used to Assess Water Quality: Thirteen samples were taken from one station in Tecolote Creek. Eleven of the samples were below the 0.79 threshold, and therefore exceeding the water quality objective for the aquatic life beneficial use. Two samples did not have scores calculated due to low organism

counts. 038398

Data Reference: Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.

Objective/Criterion Reference: Water Quality Control Plan for the San Diego Basin

Evaluation Guideline: The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.

Guideline Reference: The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.
Region 9 CSCI Scores & Water Body Information

Spatial Representation: The samples were collected at station TC-TCNP on Tecolote Creek.
Temporal Representation: The samples were collected from 2001 to 2007
Environmental Conditions:
QAPP Information: Data collected following the County of San Diego NPDES MS4 Copermittees Receiving Waters Monitoring and Reporting Program.
QAPP Information Reference(s): e-mail clarifying QAPP information
Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.

Line of Evidence (LOE) for Decision ID 44332, Benthic Community Effects **Region 9**

Tecolote Creek

LOE ID: 77009

Pollutant: Benthic-Macroinvertebrate Bioassessments
LOE Subgroup: Population/Community Degradation
Matrix: Water
Fraction: None

Beneficial Use: Warm Freshwater Habitat

Number of Samples: 15
Number of Exceedances: 15

Data and Information Type: Benthic macroinvertebrate surveys
Data Used to Assess Water Quality: Fifteen of the fifteen samples collected had an IBI score below 40. NPDES bioassessment
Data Reference: Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration

	or other appropriate methods as specified by the State or Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	
Spatial Representation:	The samples were collected at stations 906TC-MLS and TC-TCNP on Tecolote Creek.
Temporal Representation:	The samples were collected in May and October 2001 to 2007 and in May 2010.
Environmental Conditions:	
QAPP Information:	The data was collected under the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan, June 25, 2009.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 44332, Benthic Community Effects **Region 9**

Tecolote Creek

LOE ID:	78173
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	19
Number of Exceedances:	2
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Tecolote Creek to determine beneficial use support and results are as follows: 2 of 19 samples exceed the criterion for Cadmium.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The dissolved cadmium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved cadmium is 0.0022 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Tecolote Creek was collected at 1 monitoring site [Tecolote Creek - 906TC-MLS]
Temporal Representation:	Data was collected over the time period 11/29/2001-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 44332, Benthic Community Effects 038400 Region 9

Tecolote Creek

LOE ID:	77076
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	16
Number of Exceedances:	5
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Tecolote Creek to determine beneficial use support and results are as follows: 5 of 16 samples exceed the criterion for Malathion.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for Tecolote Creek was collected at 1 monitoring site [Tecolote Creek - 906TC-MLS]
Temporal Representation:	Data was collected over the time period 11/8/2002-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 44332, Benthic Community Effects Region 9

Tecolote Creek

LOE ID:	77091
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	19
Number of Exceedances:	6

Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Nineteen samples were collected to test for toxicity. Six of the 19 samples exhibited statistically significant toxicity. The toxicity tests that exhibited significant toxicity included survival of Hyalella azteca, growth of Selenastrum capriconutum and survival and reproduction of Ceriodaphnia dubia.
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected at station 906TC-MLS Tecolote Creek.
Temporal Representation:	The samples were collected from 2001 to 2008.
Environmental Conditions:	
QAPP Information:	The data was collected under the County of San Diego Co-Permittees Receiving Waters Urban Runoff Monitoring and Reporting Program (Order No. 2007-01). Data quality is good.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 44332, Benthic Community Effects **Region 9**

Tecolote Creek

LOE ID:	77054
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	2
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Tecolote Creek to determine beneficial use support and results are as follows: 2 of 2 samples exceed the criterion for Cypermethrin, total.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of cypermethrin does not exceed 0.0002 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Fojut et al. 2012)

Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Tecolote Creek was collected at 1 monitoring site [Tecolote Creek - 906TC-MLS]
Temporal Representation:	Data was collected over the time period 12/10/2006-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 44332, Benthic Community Effects **Region 9**

Tecolote Creek

LOE ID:	77057
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	19
Number of Exceedances:	5
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Tecolote Creek to determine beneficial use support and results are as follows: 5 of 19 samples exceed the criterion for Diazinon.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Data for this line of evidence for Tecolote Creek was collected at 1 monitoring site [Tecolote Creek - 906TC-MLS]
Temporal Representation:	Data was collected over the time period 11/29/2001-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 44332, Benthic Community Effects **Region 9**

Tecolote Creek 038403

LOE ID:	77021
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Tecolote Creek to determine beneficial use support and results are as follows: 4 of 4 samples exceed the criterion for Bifenthrin.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Bifenthrin does not exceed 0.0006 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Tecolote Creek was collected at 1 monitoring site [Tecolote Creek - 906TC-MLS]
Temporal Representation:	Data was collected over the time period 12/10/2006-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 44332, Benthic Community Effects **Region 9**

Tecolote Creek

LOE ID:	27031
Pollutant:	Benthic Community Effects
LOE Subgroup:	Adverse Biological Responses
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	13
Number of Exceedances:	13
Data and Information Type:	Benthic macroinvertebrate surveys

Data Used to Assess Water Quality:	Thirteen samples of IBI data were taken from May 2001 to May 2007 at one sampling site. Of the total number of samples, all thirteen of the samples exceeded the IBI impairment threshold.
Data Reference:	Stream Bioassessment Data. Co-permitee Data. Collected 2002-2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at one site: TC-TCNP on Tecolote River.
Temporal Representation:	Sampling occurred during May and October annually over a six year period from May 2001 to October 2006 and during May 2007.
Environmental Conditions:	
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Manual for Freshwater Bioassessment.
QAPP Information Reference(s):	Quality Assurance Manual for Freshwater Bioassessment Revision 0

Line of Evidence (LOE) for Decision ID 44332, Benthic Community Effects **Region 9**

Tecolote Creek

LOE ID:	26470
Pollutant:	Benthic Community Effects
LOE Subgroup:	Adverse Biological Responses
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Four samples of IBI data were taken from November 1998 to May 2000 at one sampling site. Of the total number of samples, all four samples exceeded the IBI impairment threshold.
Data Reference:	Fish and Game IBI Data
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. (SDRWQCB, 1995)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at one site: 906TCTCNP on Tecolote River.
Temporal Representation:	Sampling occurred during one to two events annually from November 1998 to May 2000.
Environmental Conditions:	
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Project Plan for the California Stream Bioassessment Procedure and the State of California, California Monitoring an Assessment Program: "CMAP", Quality Assurance Project Plan.
QAPP Information Reference(s):	State of California, California Monitoring and Assessment Program: "CMAP". Quality Assurance Project Plan for the California Stream Bioassessment Procedure The San Diego Stream Team Quality Assurance Project Plan

Line of Evidence (LOE) for Decision ID 44332, Benthic Community Effects **Region 9**

Tecolote Creek

LOE ID:	7579
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	3
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Three water samples were collected at Tecolote Creek station 906LPTEC3 on March, April, June, and September 2002. All three samples showed excessive selenium concentrations according to results in California's Surface Water Ambient Monitoring Program Report, 2007. Samples were collected in March, April, June, and September 2002.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (RWQCB, 2007). CTR Freshwater Chronic (CCC) 5 ug/L; (U.S. EPA, 2000).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA
Evaluation Guideline:	
Guideline Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA
Spatial Representation:	Water samples were collected at Tecolote Creek station 906LPTEC3; (Latitude 33.7768533, Longitude -117.18618).
Temporal Representation:	Samples were collected in March, April, and June 2002.
Environmental Conditions:	

QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 44332, Benthic Community Effects **Region 9**

Tecolote Creek

LOE ID:	3327
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Not Specified
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Bioassessments were done by the San Diego Regional Water Quality Control Board in 1998 and 1999. Physical habitat scores and BMI ranking scores were given to each sampling site. Relative to other waterbodies in the study, the Tecolote Creek had medium to high physical habitat quality. Relative to the other sampled waterbodies, the BMI ranking for the Tecolote Creek site for 11/1998 was around average, but was well below average for 05/1999. (SDRWQCB, 1999A).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	
Objective/Criterion Reference:	
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected in Tecolote Creek, 5 riffles upstream of Gardena Av. and Cross St.
Temporal Representation:	Sampling occurred in 11/1998 and 05/1999.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **53376** **Region 9**

Tecolote Creek

Pollutant:	**Bifenthrin**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Four of the Four

samples exceed the Criteria. 038407

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Four of the Four samples exceed the Criteria and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 53376, Bifenthrin **Region 9**

Tecolote Creek

LOE ID:	77021
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Tecolote Creek to determine beneficial use support and results are as follows: 4 of 4 samples exceed the criterion for Bifenthrin.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Bifenthrin does not exceed 0.0006 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Tecolote Creek was collected at 1 monitoring site [Tecolote Creek - 906TC-MLS]
Temporal Representation:	Data was collected over the time period 12/10/2006-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.

QAPP Information Reference(s): Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

038408

DECISION ID	53377	Region 9
Tecolote Creek		

Pollutant:	**Cypermethrin**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Two of the two samples exceed the Criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Two of the two samples exceed the Criteria and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 53377, Cypermethrin	**Region 9**
Tecolote Creek	

LOE ID:	77054
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	2
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Tecolote Creek to determine beneficial use support and results are as follows: 2 of 2 samples exceed the criterion for Cypermethrin, total.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works

	Watershed Protection Program, 2001-2008.	038409
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of cypermethrin does not exceed 0.0002 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Fojut et al. 2012)	
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.	
Spatial Representation:	Data for this line of evidence for Tecolote Creek was collected at 1 monitoring site [Tecolote Creek - 906TC-MLS]	
Temporal Representation:	Data was collected over the time period 12/10/2006-11/4/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.	

DECISION ID	**53378**	**Region 9**
Tecolote Creek		

Pollutant:	**Diazinon**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Five of the 19 samples exceed the Criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Five of the 19 samples exceed the Criteria and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality

standards are exceeded and a pollutant contributes to or causes the problem. 038410

Line of Evidence (LOE) for Decision ID 53378, Diazinon **Region 9**

Tecolote Creek

LOE ID:	77057
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	19
Number of Exceedances:	5
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Tecolote Creek to determine beneficial use support and results are as follows: 5 of 19 samples exceed the criterion for Diazinon.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Data for this line of evidence for Tecolote Creek was collected at 1 monitoring site [Tecolote Creek - 906TC-MLS]
Temporal Representation:	Data was collected over the time period 11/29/2001-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID **43069** **Region 9**

Tecolote Creek

Pollutant:	**Oil and Grease**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2, one line(s) of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. This conclusion is based on the fact that the data shows 7 out of 9 samples had "detectable levels" of oil and grease. There is no numeric water quality objective to compare the data with, to determine if water quality objectives are being met or exceeded.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used does not satisfy the data quality requirements of section 6.1.4 of the Policy. The lack of an exact sampling location and actual data results make this LOEs insufficient information to determine beneficial use support and attainment of the Narrative Water Quality objective.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. This conclusion is based on the fact that the data shows 7 out of 9 samples had "detectable levels" of oil and grease and this information is insufficient to determine with the confidence and power required by the Listing Policy. There is no numeric water quality objective to compare the data with, to determine if water quality objectives are being met or exceeded. A minimum of five samples is needed for application of table 3.2 when there is a numeric water quality objective.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43069, Oil and Grease **Region 9**

Tecolote Creek

LOE ID:	3329
Pollutant:	Oil and Grease
LOE Subgroup:	Pollutant-Nuisance
Matrix:	Water
Fraction:	Total
Beneficial Use:	Non-Contact Recreation
Number of Samples:	9
Number of Exceedances:	7
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego from 11/1997 to 03/2000. Seven of 9 samples showed a measurable amount (0.5 mg/L or higher) of oil and grease (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for oil and grease says, "Waters shall not contain oils, greases, waxes, or other materials in concentrations which result in a visible film or coating on the surface of the water or on objects in the water, or which cause nuisance or which otherwise adversely affect beneficial uses."
Objective/Criterion Reference:	Placeholder reference 2006 303(d)

Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Tecolote Creek site SD5. The exact location of this site was not reported.
Temporal Representation:	Samples were collected from 11/1997 to 03/2000. Two to 3 samples were collected per year.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 33175 Region 9

Tecolote Creek

Pollutant:	**Total Dissolved Solids**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Four of the Nine samples exceed the Basin Plan objective for Total Dissolved Solids.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Four of Nine samples exceeded the Basin Plan Objective for Total Dissolved Solids and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33175, Total Dissolved Solids Region 9

Tecolote Creek

LOE ID:	3331
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved

Beneficial Use:	Non-Contact Recreation
Number of Samples:	9
Number of Exceedances:	4
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected by the City of San Diego from 11/1997 to 03/2000. Four of 9 samples were in exceedance (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for TDS is 500 mg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Tecolote Creek site SD5. The exact location of this site was not recorded.
Temporal Representation:	Samples were collected from 11/1997 to 03/2000. Two to 3 samples were collected per year.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **38349** **Region 9**

Tecolote Creek

Pollutant:	**pH**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. One of the 15 samples exceed the Basin Plan objective for pH.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of 15 samples exceeded the Basin Plan Objective for pH and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 38349, pH **Region 9**

Tecolote Creek

LOE ID:	3328
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Non-Contact Recreation
Number of Samples:	15
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego from 11/1997 to 03/2000. One of 15 samples, collected in the field and laboratory, was in exceedance. It was a field pH sample, reading 6.49 (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for pH is 6.5 (minimum) to 8.5 (maximum).
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Tecolote Creek site SD5. Location of this site was not reported.
Temporal Representation:	Samples were collected from 11/1997 to 03/05/2000. Samples were collected 2-3 times per year.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **38167** **Region 9**

Tecolote Creek

Pollutant:	**Nitrogen**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

	Two lines of evidence are available in the administrative record to assess this pollutant. Thirty three of the 40 samples exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Thirty three of 40 samples exceed the objective, and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 38167, Nitrogen **Region 9**

Tecolote Creek

LOE ID:	7192
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	37
Number of Exceedances:	33
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Thirty three of thirty seven samples collected exceed the water quality objective according to results in the San Diego County Municipal Copermittees Annual Progress Report, 2007. Samples were collected two to four times a year from 1994-2006
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. (RWQCB, 2007) A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used. (RWQCB, 2007)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at the mass loading station located near the lower boundary of the watershed on the east side of Morena Boulevard.
Temporal Representation:	Samples were collected two to four times a year from 1994-2006

Environmental Conditions:	Samples were collected during wet weather.	038416
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 38167, Nitrogen **Region 9**

Tecolote Creek

LOE ID:	7379
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	None of the three samples collected exceed the water quality objective according to results in the Surface Water Ambient Monitoring Program Report, 2007. Samples were collected on June 5, March 14, and April 24, 2002.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. (RWQCB, 2007) A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used. (RWQCB, 2007)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected from the monitoring station Tecolote Creek 3 (station id: 906LPTEC3 lat/long: 32.77633/-117.18608), located on the main stem of Tecolote Creek.
Temporal Representation:	Samples were collected on June 5, March 14, and April 24, 2002.
Environmental Conditions:	The first sample was taken during declining base flow respectively. The last two were taken during wet weather, between storm events and wet weather, high base flow respectively.
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

DECISION ID **43252** **Region 9**

Tecolote Creek

Pollutant:	**Phosphorus**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final	List on 303(d) list (TMDL required list)(2012)

Listing Decision:		038417
Revision Status	Original	
Sources:	Source Unknown	
Expected TMDL Completion Date:	2019	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for removal from the section 303(d) list under section 3.1 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Nine of samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of adding this water segment-pollutant combination from the section 303(d) list.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. All nine samples exceeded the phosphorus and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43252, Phosphorus **Region 9**

Tecolote Creek

LOE ID:	3330
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Non-Contact Recreation
Number of Samples:	9
Number of Exceedances:	9
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego from 11/1997 to 03/2000. Nine of 9 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters-streams and other flowing waters with all beneficial uses, the WQO for total phosphorus is 0.1 mg/L. This appears to be the desired goal in order to prevent plant nuisance in streams and other flowing waters; not to be exceeded more than 10% of the time.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)

Evaluation Guideline:	038418
Guideline Reference:	
Spatial Representation:	Samples were collected in Tecolote Creek at site SD5. The exact location of this site is unknown.
Temporal Representation:	Samples were collected from 11/1997 to 03/2000. 2-3 samples were collected per year.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 44909 **Region 9**

Tecolote Creek

Pollutant:	**Turbidity**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Seven of nine of samples exceed the Basin Plan water quality objective for turbidity.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of adding this water segment-pollutant combination to the section 303(d) list.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Seven of nine of samples exceed the Basin Plan water quality objective for turbidity and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 44909, Turbidity **Region 9**

Tecolote Creek

LOE ID:	3332
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total

Beneficial Use:	Non-Contact Recreation	038419
Number of Samples:	9	
Number of Exceedances:	7	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by the City of San Diego from 11/1997 to 03/2000. Seven of 9 samples were in exceedance.	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for turbidity is 20 ntu.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Tecolote Creek site SD5. The location of this site is unknown.	
Temporal Representation:	Samples were collected from 11/1997 to 03/2000. Two to 3 samples were collected per year.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: San Diego River (Lower)
Water Body ID: CAR9071100020011025101606
Water Body Type: River & Stream

DECISION ID 34487 **Region 9**
San Diego River (Lower)

Pollutant: Oxygen, Dissolved
Final Listing Decision: Do Not Delist from 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Sources: Source Unknown
Expected TMDL Completion Date: 2019
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for removal from the CWA section 303(d) List under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Forty-seven of the one hundred and eight samples exceed the OBJECTIVE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Forty-seven of one hundred and eight samples exceeded the OBJECTIVE and this exceeds the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 34487, Oxygen, Dissolved **Region 9**
San Diego River (Lower)

LOE ID: 72807

Pollutant: Oxygen, Dissolved
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Dissolved

Beneficial Use: Warm Freshwater Habitat

Number of Samples:	108	038421
Number of Exceedances:	47	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Numeric data generated from 108 averages of Dissolved Oxygen concentrations had 47 exceedences.	
Data Reference:	Data for Various Pollutants in the Middle San Diego River Basin, 2005-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The dissolved oxygen content of all surface waters designated as "Warm Freshwater Habitat" must be greater than 5.0 mg/L.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from the Old Mission Dam RSW-006 monitoring location and at Mission Ponds 9 miles downstream of discharge.	
Temporal Representation:	Samples were collected once a month from January 2005 to May 2009.	
Environmental Conditions:		
QAPP Information:	No QAPP was submitted. Sampling was done by municipalities in San Diego pursuant to the San Diego Municipal Stormwater Permit. Sometimes there is information on their submittal form.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 34487, Oxygen, Dissolved **Region 9**

San Diego River (Lower)

LOE ID:	4720
Pollutant:	Low Dissolved Oxygen
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	Unspecified
Guideline Reference:	Placeholder reference pre-2006 303(d)
Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

DECISION ID 44931 **Region 9**

San Diego River (Lower) 038422

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not Delist from 303(d) list (being addressed with USEPA approved TMDL)**
Last Listing Cycle's Final Listing Decision:	Do Not Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
TMDL Name:	Bacteria Impaired Waters I (creeks and beach shorelines)
TMDL Project Code:	169
Date TMDL Approved by USEPA:	06/22/2011
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal on the CWA section 303(d) List under sections 2.2 and 4.2 of the Listing Policy. Under section 4.2 of the Policy, a minimum of one line of evidence is needed to assess listing status.

Five lines of evidence are available in the administrative record to assess this pollutant.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List. There is sufficient justification to place it in the Being Addressed portion of the CWA 303(d) List because a TMDL has been completed and approved by RWQCB and USEPA, and is expected to result in attainment of the standard.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Fifteen of 20 samples exceeded the water quality objective for enterococcus of a single sample maximum of 61/100 ml for the protection of REC-1, and these exceed the allowable frequency listed in Table 4.2 of the Listing Policy.
4. The Bacterial TMDL for 20 beaches/creeks was approved by USEPA on 06/22/2011.
5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 44931, Indicator Bacteria — Region 9

San Diego River (Lower)

LOE ID:	75568
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	162
Number of Exceedances:	10
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Ten of the 162 samples exceeded the Total Coliform objective.
Data Reference:	Data for Various Pollutants in the Middle San Diego River Basin, 2005-2009.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life. Basin Plan for the San Diego Basin.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Total Coliform concentration shall not exceed more than 10000/100 ml. USEPA Ambient Water Quality Criteria for Bacteria - 1986.
Guideline Reference:	Ambient Water Quality Criteria for Bacteria - 1986. EPA440/5-84-002
Spatial Representation:	The samples were collected at San Diego River (Lower) at Sycamore Creek leaving Golf Course, Old Mission Dam and Mission Ponds. WBID: CAR9071100020011025101606
Temporal Representation:	Samples were collected between January 2006 and December 2009.
Environmental Conditions:	
QAPP Information:	No QAPP was submitted. Sampling was done by municipalities in San Diego pursuant to the San Diego Municipal Stormwater Permit. Sometimes there is information on their submittal form.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44931, Indicator Bacteria **Region 9**

San Diego River (Lower)

LOE ID:	75567
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Diego River (Lower) to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxicsubstances in concentrations which are toxic to,or which produce detrimental physiologicalresponses in human, plant, animal, or indigenousaquatic life (Basin Plan).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In waters designated for water contact recreation (REC I), the total coliform concentration shall not exceed 10000 MPN/100 ml (CDPH 2006).
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.
Spatial Representation:	Data for this line of evidence for San Diego River (Lower) was collected at 5 monitoring sites [San Diego River, San Diego River, San Diego River, San Diego River, San Diego River]
Temporal Representation:	Data was collected on a single day 7/11/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 44931, Indicator Bacteria **Region 9**

San Diego River (Lower)

LOE ID:	75615
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	162
Number of Exceedances:	14
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Fourteen of the 162 samples exceeded the Fecal Coliform objective.
Data Reference:	Data for Various Pollutants in the Middle San Diego River Basin, 2005-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life. Basin Plan for the San Diego Basin.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Fecal Coliform concentration shall not exceed more than 400/100 ml. USEPA Ambient Water Quality Criteria for Bacteria - 1986.
Guideline Reference:	Ambient Water Quality Criteria for Bacteria - 1986. EPA440/5-84-002
Spatial Representation:	The samples were collected at San Diego River (Lower) at Sycamore Creek leaving Golf Course, Old Mission Dam and Mission Ponds. WBID: CAR9071100020011025101606
Temporal Representation:	Samples were collected between January 2006 and December 2009.
Environmental Conditions:	
QAPP Information:	No QAPP was submitted. Sampling was done by municipalities in San Diego pursuant to the San Diego Municipal Stormwater Permit. Sometimes there is information on their submittal form.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44931, Indicator Bacteria **Region 9**

San Diego River (Lower)

LOE ID:	75611
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Diego River (Lower) to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Coliform, Fecal.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the fecal coliform concentration shall not exceed 400 MPN/100 ml.

Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	038425

Evaluation Guideline:
Guideline Reference:

Spatial Representation:	Data for this line of evidence for San Diego River (Lower) was collected at 5 monitoring sites [San Diego River, San Diego River, San Diego River, San Diego River, San Diego River]
Temporal Representation:	Data was collected on a single day 7/11/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 44931, Indicator Bacteria **Region 9**

San Diego River (Lower)

LOE ID:	75610
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Non-Contact Recreation
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Diego River (Lower) to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Coliform, Fecal.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters designated for non contact recreation (REC 2), the fecal coliform concentration shall not exceed 4000 MPN/100 ml (Basin Plan).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:
Guideline Reference:

Spatial Representation:	Data for this line of evidence for San Diego River (Lower) was collected at 5 monitoring sites [San Diego River, San Diego River, San Diego River, San Diego River, San Diego River]
Temporal Representation:	Data was collected on a single day 7/11/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 44931, Indicator Bacteria **Region 9**

San Diego River (Lower)

LOE ID:	75608
Pollutant:	Escherichia coli (E. coli)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	162	038426
Number of Exceedances:	21	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Twenty-one of the 162 samples exceeded the E.Coli objective.	
Data Reference:	Data for Various Pollutants in the Middle San Diego River Basin, 2005-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life. Basin Plan for the San Diego Basin.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The E.Coli concentration shall not exceed more than 235/100 ml. USEPA Ambient Water Quality Criteria for Bacteria - 1986.	
Guideline Reference:	Ambient Water Quality Criteria for Bacteria - 1986. EPA440/5-84-002	
Spatial Representation:	The samples were collected at San Diego River (Lower) at Sycamore Creek leaving Golf Course, Old Mission Dam and Mission Ponds. WBID: CAR9071100020011025101606	
Temporal Representation:	Samples were collected between January 2005 and December 2009.	
Environmental Conditions:		
QAPP Information:	No QAPP was submitted. Sampling was done by municipalities in San Diego pursuant to the San Diego Municipal Stormwater Permit. Sometimes there is information on their submittal form.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44931, Indicator Bacteria **Region 9**

San Diego River (Lower)

LOE ID:	75607
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Diego River (Lower) to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Enterococci.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Samples shall not exceed 61 organisms per 100 ml for enterococcus in waters designated for REC I beneficial use (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego River (Lower) was collected at 5 monitoring sites [San Diego River, San Diego River, San Diego River, San Diego River, San Diego River]
Temporal Representation:	Data was collected on a single day 7/11/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.

QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.	038427

Line of Evidence (LOE) for Decision ID 44931, Indicator Bacteria **Region 9**

San Diego River (Lower)

LOE ID:	7488
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	15
Number of Exceedances:	13
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Thirteen of fifteen samples collected exceed the water quality objective according to results in the San Diego County Municipal Copermittees Urban Runoff Monitoring Report, 2007. Samples were collected one to three times a year from 2001-2006.
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, no more than 10% of the samples during any 30-day period for waters designated for contact recreation shall exceed 400 colonies per 100 ml (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the mass loading station located near the lower boundary of the watershed along a natural channel adjacent to the Fashion Valley Mall in San Diego.
Temporal Representation:	Samples were collected one to three times a year from 2001-2006.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44931, Indicator Bacteria **Region 9**

San Diego River (Lower)

LOE ID:	7487
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	15
Number of Exceedances:	15
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	All fifteen samples collected exceed the water quality objective according to results in the San Diego County Municipal Copermittees Urban Runoff Monitoring Report, 2007. Samples were collected one to three times a year from 2001-2006.
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report

SWAMP Data:	Non-SWAMP	038428
Water Quality Objective/Criterion:	From the Basin Plan, the criteria for enterococcus sets a maximum limit at 61 colonies per 100mL (RWQCB, 2007).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at the mass loading station located near the lower boundary of the watershed along a natural channel adjacent to the Fashion Valley Mall in San Diego.	
Temporal Representation:	Samples were collected one to three times a year from 2001-2006.	
Environmental Conditions:	Samples were collected during wet weather.	
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44931, Indicator Bacteria **Region 9**

San Diego River (Lower)

LOE ID:	4719
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Water Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	Unspecified
Guideline Reference:	Placeholder reference pre-2006 303(d)
Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

DECISION ID **49144** **Region 9**

San Diego River (Lower)

Pollutant:	**2-Methylnaphthalene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or	Pollutant

Pollution: 038429

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. Zero of the five samples exceed the GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of five samples exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49144, 2-Methylnaphthalene **Region 9**

San Diego River (Lower)

LOE ID:	78262
Pollutant:	2-Methylnaphthalene
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for San Diego River (Lower) to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for 2-Methylnaphthalene.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for 2-Methylnaphthalene is 201.28 ng/g dry weight (MacDonald et al., 1996).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for San Diego River (Lower) was collected at 5 monitoring sites

	[907_6181, 907_6189, 907_6192, 907_6197, 907_6200]	038430
Temporal Representation:	Data was collected on a single day 7/11/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.	

DECISION ID 49145 Region 9

San Diego River (Lower)

Pollutant:	**Antimony**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary, and at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. One of the nineteen water samples exceed the CRITERIA (and zero five sediment samples exceeded the guideline).

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of nineteen water samples exceeded the CRITERIA (and zero of the five sediment samples exceeded the guideline) and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 49145, Antimony Region 9

San Diego River (Lower)

LOE ID:	78089
Pollutant:	Antimony
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	19
Number of Exceedances:	1

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING 038431
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Diego River (Lower) to determine beneficial use support and results are as follows: 1 of 19 samples exceed the criterion for Antimony.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for antimony is .006 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego River (Lower) was collected at 1 monitoring site [San Diego River - 907SDR-MLS]
Temporal Representation:	Data was collected over the time period 11/29/2001-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 49145, Antimony **Region 9**

San Diego River (Lower)

LOE ID:	78263
Pollutant:	Antimony
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for San Diego River (Lower) to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Antimony.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Antimony is 25 ug/g dry weight (Long and Morgan, 1990).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for San Diego River (Lower) was collected at 5 monitoring sites [907_6181, 907_6189, 907_6192, 907_6197, 907_6200]

Temporal Representation:	Data was collected on a single day 7/11/2008.	038432
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.	

DECISION ID 49146 Region 9

San Diego River (Lower)

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Under 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) list.

One lines of evidence are available in the administrative record to assess this pollutant. One of the nineteen water samples exceed the CRITERIA (for MUN). Zero of the five sediment samples exceeded the guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of nineteen water samples exceeded the CRITERIA and zero of the five sediment samples exceeded the guideline, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 49146, Arsenic Region 9

San Diego River (Lower)

LOE ID:	78091
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	19
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Diego River (Lower) to determine beneficial use support and results are as follows: 1 of 19 samples exceed the criterion for Arsenic.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for arsenic is 0.01 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego River (Lower) was collected at 1 monitoring site [San Diego River - 907SDR-MLS]
Temporal Representation:	Data was collected over the time period 11/29/2001-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 49146, Arsenic **Region 9**

San Diego River (Lower)

LOE ID:	78092
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	19
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Diego River (Lower) to determine beneficial use support and results are as follows: 0 of 19 samples exceed the criterion for Arsenic.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The dissolved arsenic criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved arsenic is 0.150 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego River (Lower) was collected at 1 monitoring site [San Diego River - 907SDR-MLS]
Temporal Representation:	Data was collected over the time period 11/29/2001-11/4/2008.

Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 49146, Arsenic **Region 9**

San Diego River (Lower)

LOE ID:	78265
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for San Diego River (Lower) to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Arsenic.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Arsenic is 70 ug/g dry weight (Long et al., 1995).
Guideline Reference:	Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuary sediments. Environmental Management. 19, (1): 81-97
Spatial Representation:	Data for this line of evidence for San Diego River (Lower) was collected at 5 monitoring sites [907_6181, 907_6189, 907_6192, 907_6197, 907_6200]
Temporal Representation:	Data was collected on a single day 7/11/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID **49148** **Region 9**

San Diego River (Lower)

Pollutant:	**Benzo(a)anthracene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing

status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the five samples exceed the GUIDELINE. Two of five samples exhibited sediment toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is INSUFFICIENT justification for placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the five samples exceed the GUIDELINE and this sample size is INSUFFICIENT to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49148, Benzo(a)anthracene **Region 9**

San Diego River (Lower)

LOE ID:	78266
Pollutant:	Benzo(a)anthracene
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for San Diego River (Lower) to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Benzo(a)anthracene.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for Benzo(a)anthracene is 692.53 ng/g dry weight (MacDonald et al., 1996).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for San Diego River (Lower) was collected at 5 monitoring sites [907_6181, 907_6189, 907_6192, 907_6197, 907_6200]

Temporal Representation:	Data was collected on a single day 7/11/2008.	038436
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.	

Line of Evidence (LOE) for Decision ID 49148, Benzo(a)anthracene **Region 9**

San Diego River (Lower)

LOE ID:	75571
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	2
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Five samples were collected to test for toxicity. Two of the samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius and percent normal of Mytilus galloprovincialis.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected from sites 907_6181, 907_6189, 907_6192, 907_6197, 907_6200 San Diego River.
Temporal Representation:	The samples were collected in July 2008.
Environmental Conditions:	
QAPP Information:	This data was collected under the Southern California Bight 2008 Regional Marine Monitoring Survey Quality Assurance Plan.
QAPP Information Reference(s):	e-mail clarifying QAPP information

DECISION ID **49150** **Region 9**

San Diego River (Lower)

Pollutant:	**Bifenthrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the zero samples exceed the GUIDELINE. One water sample was collected, but the detection limit is greater than the guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of zero samples exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to [SECTION 3.11/4.11] of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49150, Bifenthrin **Region 9**

San Diego River (Lower)

LOE ID:	75581
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Diego River (Lower) to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Bifenthrin.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Bifenthrin does not exceed 0.0006 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for San Diego River (Lower) was collected at 1 monitoring site [San Diego River - 907SDR-MLS]

Temporal Representation:	Data was collected on a single day 11/4/2008.	038438
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.	

DECISION ID **49152** **Region 9**

San Diego River (Lower)

Pollutant:	**Chlordane**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. One of the five samples exceed the CRITERIA. Two of five samples exhibited sediment toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is INSUFFICIENT justification FOR placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of the five samples exceed the CRITERIA and this sample size is INSUFFICIENT to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49152, Chlordane **Region 9**

San Diego River (Lower)

LOE ID:	78268
Pollutant:	Chlordane
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5

Number of Exceedances:	1	038439

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for San Diego River (Lower) to determine beneficial use support and results are as follows: 1 of 5 samples exceed the criterion for Chlordane, Total.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Total Chlordane is 6 ng/g dry weight (Long and Morgan, 1990).
Guideline Reference:	The potential for biological effects of sediment-sorbed contaminants tested in the National Status of Trends Program. NOAA Technical Memorandum NOS OMA 52. Seattle, WA: National Oceanic and Atmospheric Administration
Spatial Representation:	Data for this line of evidence for San Diego River (Lower) was collected at 5 monitoring sites [907_6181, 907_6189, 907_6192, 907_6197, 907_6200]
Temporal Representation:	Data was collected on a single day 7/11/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 49152, Chlordane **Region 9**

San Diego River (Lower)

LOE ID:	75571
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	2
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Five samples were collected to test for toxicity. Two of the samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius and percent normal of Mytilus galloprovincialis.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	

Spatial Representation:	The samples were collected from sites 907_6181, 907_6189, 907_6192, 907_6197, 907_6200 San Diego River.
Temporal Representation:	The samples were collected in July 2008.
Environmental Conditions:	
QAPP Information:	This data was collected under the Southern California Bight 2008 Regional Marine Monitoring Survey Quality Assurance Plan.
QAPP Information Reference(s):	e-mail clarifying QAPP information

DECISION ID 49153 Region 9

San Diego River (Lower)

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. One of the twelve samples exceed the CRITERIA for WARM, and zero of the nineteen samples exceeded the guideline for MUN. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of twelve samples exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to [SECTION 3.11/4.11] of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49153, Chlorpyrifos Region 9

San Diego River (Lower)

LOE ID:	77813
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	12

Number of Exceedances:	1	038441

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Diego River (Lower) to determine beneficial use support and results are as follows: 1 of 12 samples exceed the criterion for Chlorpyrifos. Two sample results were not used in the assessment because the laboratory data reporting limit(s) was above the objective and therefore the results could not be quantified with the level of certainty required by the Listing Policy.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.014 ug/L (Siepmann and Finlayson 2000).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).
Spatial Representation:	Data for this line of evidence for San Diego River (Lower) was collected at 1 monitoring site [San Diego River - 907SDR-MLS]
Temporal Representation:	Data was collected over the time period 11/29/2001-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 49153, Chlorpyrifos **Region 9**

San Diego River (Lower)

LOE ID:	78095
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	19
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Diego River (Lower) to determine beneficial use support and results are as follows: 0 of 19 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for chlorpyrifos is 2.1 Âµg/L.
Guideline Reference:	2011 Edition of the Drinking Water Standards and Health Advisories
Spatial Representation:	Data for this line of evidence for San Diego River (Lower) was collected at 1 monitoring site [San Diego River - 907SDR-MLS]
Temporal Representation:	Data was collected over the time period 11/29/2001-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID 49154 — Region 9

San Diego River (Lower)

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Under 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) list. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the seventeen water samples exceed the CRITERIA, and zero of the five sediment samples exceeded the CRITERIA. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of seventeen water samples and zero of five sediment samples exceeded the CRITERIA and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49154, Chromium — Region 9

San Diego River (Lower) 038443

LOE ID:	75594
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for San Diego River (Lower) to determine beneficial use support and results are as follows: 0 of 17 samples exceed the criterion for Chromium.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved chromium to protect aquatic life in freshwater. The dissolved Chromium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego River (Lower) was collected at 1 monitoring site [San Diego River - 907SDR-MLS]
Temporal Representation:	Data was collected over the time period 11/29/2001-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 49154, Chromium **Region 9**

San Diego River (Lower)

LOE ID:	78269
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for San Diego River (Lower) to determine beneficial

	use support and results are as follows: 0 of 5 samples exceed the criterion for Chromium.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Chromium is 370 ug/g dry weight (Long et al., 1995).
Guideline Reference:	Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuary sediments. Environmental Management. 19, (1): 81-97
Spatial Representation:	Data for this line of evidence for San Diego River (Lower) was collected at 5 monitoring sites [907_6181, 907_6189, 907_6192, 907_6197, 907_6200]
Temporal Representation:	Data was collected on a single day 7/11/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID 49155 Region 9

San Diego River (Lower)

Pollutant:	**Chrysene (C1-C4)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the five samples exceed the CRITERIA. Two of five samples exhibited sediment toxicity. Based on the readily available data and information, the weight of evidence indicates that there is INSUFFICIENT justification FOR placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the five samples exceed the CRITERIA and this sample size is INSUFFICIENT to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49155, Chrysene (C1-C4) Region 9

San Diego River (Lower) 038445

LOE ID:	78270
Pollutant:	Chrysene (C1-C4)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for San Diego River (Lower) to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Chrysene.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for Chrysene is 845.98 ng/g dry weight (MacDonald et al., 1996).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for San Diego River (Lower) was collected at 5 monitoring sites [907_6181, 907_6189, 907_6192, 907_6197, 907_6200]
Temporal Representation:	Data was collected on a single day 7/11/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 49155, Chrysene (C1-C4) **Region 9**

San Diego River (Lower)

LOE ID:	75571
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	2
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Five samples were collected to test for toxicity. Two of the samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius and percent normal of Mytilus galloprovincialis.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected from sites 907_6181, 907_6189, 907_6192, 907_6197, 907_6200 San Diego River.
Temporal Representation:	The samples were collected in July 2008.
Environmental Conditions:	
QAPP Information:	This data was collected under the Southern California Bight 2008 Regional Marine Monitoring Survey Quality Assurance Plan.
QAPP Information Reference(s):	e-mail clarifying QAPP information

DECISION ID 49156 Region 9

San Diego River (Lower)

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Under 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) list. One line of evidence are available in the administrative record to assess this pollutant. Zero of the seventeen water samples and zero of the five sediment samples exceed the CRITERIA. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of seventeen samples exceeded the CRITERIA and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 49156, Copper Region 9

San Diego River (Lower)

LOE ID:	78096

Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	19
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Diego River (Lower) to determine beneficial use support and results are as follows: 0 of 19 samples exceed the criterion for Copper.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for copper is 1.0 mg/L (Title 22 California Code of Regulations).
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego River (Lower) was collected at 1 monitoring site [San Diego River - 907SDR-MLS]
Temporal Representation:	Data was collected over the time period 11/29/2001-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 49156, Copper **Region 9**

San Diego River (Lower)

LOE ID:	75596
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for San Diego River (Lower) to determine beneficial use support and results are as follows: 0 of 17 samples exceed the criterion for Copper.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved copper to protect aquatic life in freshwater. The dissolved copper criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego River (Lower) was collected at 1 monitoring site [San Diego River - 907SDR-MLS]
Temporal Representation:	Data was collected over the time period 11/29/2001-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 49156, Copper **Region 9**

San Diego River (Lower)

LOE ID:	78271
Pollutant:	Copper
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for San Diego River (Lower) to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Copper.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Copper is 270 ug/g dry weight (Long et al., 1995).
Guideline Reference:	Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuary sediments. Environmental Management. 19, (1): 81-97
Spatial Representation:	Data for this line of evidence for San Diego River (Lower) was collected at 5 monitoring sites [907_6181, 907_6189, 907_6192, 907_6197, 907_6200]
Temporal Representation:	Data was collected on a single day 7/11/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 49156, Copper **Region 9**

San Diego River (Lower) 038449

LOE ID:	75571
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	2
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Five samples were collected to test for toxicity. Two of the samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius and percent normal of Mytilus galloprovincialis.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected from sites 907_6181, 907_6189, 907_6192, 907_6197, 907_6200 San Diego River.
Temporal Representation:	The samples were collected in July 2008.
Environmental Conditions:	
QAPP Information:	This data was collected under the Southern California Bight 2008 Regional Marine Monitoring Survey Quality Assurance Plan.
QAPP Information Reference(s):	e-mail clarifying QAPP information

DECISION ID **49157** **Region 9**

San Diego River (Lower)

Pollutant:	**Cypermethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the zero samples exceed the GUIDELINE. One water sample was collected, but the detection limit was greater than the guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section

303(d) List. 038450

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of zero samples exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49157, Cypermethrin **Region 9**

San Diego River (Lower)

LOE ID:	75597
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Diego River (Lower) to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Cypermethrin, total.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of cypermethrin does not exceed 0.0002 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Fojut et al. 2012)
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for San Diego River (Lower) was collected at 1 monitoring site [San Diego River - 907SDR-MLS]
Temporal Representation:	Data was collected on a single day 11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.

QAPP Information Reference(s): Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

038451

DECISION ID	49158	Region 9
San Diego River (Lower)		

Pollutant:	**Deltamethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the one sample exceed the GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49158, Deltamethrin	Region 9
San Diego River (Lower)	

LOE ID:	75598
Pollutant:	Deltamethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Diego River (Lower) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Deltamethrin.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works

	Watershed Protection Program, 2001-2008.	038452
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The evaluation guideline for Deltamethrin is the maximum acceptable toxicant concentration (MATC) of 0.02 ug/L.	
Guideline Reference:	OPP Pesticide Ecotoxicity Database.	
Spatial Representation:	Data for this line of evidence for San Diego River (Lower) was collected at 1 monitoring site [San Diego River - 907SDR-MLS]	
Temporal Representation:	Data was collected on a single day 11/4/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.	

DECISION ID	**49392**	**Region 9**
San Diego River (Lower)		

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Considering the nation-wide ban of diazinon which went into effect on January 1, 2005, data from 2005 and on were evaluated in the assessment of LOE #75599, and 0 of 9 samples exceed the Criteria Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Considering the nation-wide ban of diazinon which went into effect on January 1, 2005, data from 2005 and on were evaluated in the assessment of LOE #75599, and 0 of 9 samples exceed the Criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 49392, Diazinon **Region 9**

San Diego River (Lower)

LOE ID:	75603
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	19
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Diego River (Lower) to determine beneficial use support and results are as follows: 0 of 19 samples exceed the criterion for Diazinon.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water lifetime health advisory for diazinon is 1 Âµg/L.
Guideline Reference:	2011 Edition of the Drinking Water Standards and Health Advisories
Spatial Representation:	Data for this line of evidence for San Diego River (Lower) was collected at 1 monitoring site [San Diego River - 907SDR-MLS]
Temporal Representation:	Data was collected over the time period 11/29/2001-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 49392, Diazinon **Region 9**

San Diego River (Lower)

LOE ID:	75599
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	9
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	038454
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Diego River (Lower) to determine beneficial use support and results are as follows: 0 of 9 samples exceed the criterion for Diazinon.	
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).	
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game	
Spatial Representation:	Data for this line of evidence for San Diego River (Lower) was collected at 1 monitoring site [San Diego River - 907SDR-MLS]	
Temporal Representation:	Data was collected over the time period 02/11/2005 -11/4/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.	

DECISION ID **49455** **Region 9**

San Diego River (Lower)

Pollutant:	**Dibenz[a,h]anthracene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the five samples exceed the CRITERIA. Two of five samples exhibited sediment toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is INSUFFICIENT justification FOR placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the five samples exceed the CRITERIA and this sample size is INSUFFICIENT to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.

4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49455, Dibenz[a,h]anthracene **Region 9**

San Diego River (Lower)

LOE ID:	78272
Pollutant:	Dibenz[a,h]anthracene
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for San Diego River (Lower) to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Dibenzo(a, h)anthracene.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Dibenzo(a, h)anthracene is 260 ng/g dry weight (Long et al., 1995).
Guideline Reference:	Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuary sediments. Environmental Management. 19, (1): 81-97
Spatial Representation:	Data for this line of evidence for San Diego River (Lower) was collected at 5 monitoring sites [907_6181, 907_6189, 907_6192, 907_6197, 907_6200]
Temporal Representation:	Data was collected on a single day 7/11/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 49455, Dibenz[a,h]anthracene **Region 9**

San Diego River (Lower)

LOE ID:	75571
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat

Number of Samples:	5
Number of Exceedances:	2
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Five samples were collected to test for toxicity. Two of the samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius and percent normal of Mytilus galloprovincialis.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected from sites 907_6181, 907_6189, 907_6192, 907_6197, 907_6200 San Diego River.
Temporal Representation:	The samples were collected in July 2008.
Environmental Conditions:	
QAPP Information:	This data was collected under the Southern California Bight 2008 Regional Marine Monitoring Survey Quality Assurance Plan.
QAPP Information Reference(s):	e-mail clarifying QAPP information

DECISION ID **49458** **Region 9**

San Diego River (Lower)

Pollutant:	**Endrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the four samples exceed the GUIDELINE. Two of five samples exhibited sediment toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is INSUFFICIENT justification FOR placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the five samples exceed the GUIDELINE and this sample size is INSUFFICIENT to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.

4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49458, Endrin **Region 9**

San Diego River (Lower)

LOE ID:	78273
Pollutant:	Endrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for San Diego River (Lower) to determine beneficial use support and results are as follows: a total of 5 samples were collected and they were all non-detect, however 1 sample was not used in analysis because when the method detection limit was organic carbon normalized, the result was above the guideline and therefore could not be quanitified with the level of certainty required by the Listing Policy.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the sediment quality guideline (predictive of sediment toxicity for sediment-dwelling organisms) for Endrin is 0.76 ug/g oc (Fairey et al., 2001).
Guideline Reference:	Technical basis for deriving sediment criteria for nonionic organic contaminants for the protection of benthic organisms by using equilibrium partitioning. EPA822-R-93-011. Washington, D.C.: Office of Water, USEPA
Spatial Representation:	Data for this line of evidence for San Diego River (Lower) was collected at 5 monitoring sites [907_6181, 907_6189, 907_6192, 907_6197, 907_6200]
Temporal Representation:	Data was collected on a single day 7/11/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 49458, Endrin **Region 9**

San Diego River (Lower)

LOE ID:	75571
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None

Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	2
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Five samples were collected to test for toxicity. Two of the samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius and percent normal of Mytilus galloprovincialis.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected from sites 907_6181, 907_6189, 907_6192, 907_6197, 907_6200 San Diego River.
Temporal Representation:	The samples were collected in July 2008.
Environmental Conditions:	
QAPP Information:	This data was collected under the Southern California Bight 2008 Regional Marine Monitoring Survey Quality Assurance Plan.
QAPP Information Reference(s):	e-mail clarifying QAPP information

DECISION ID **49466** **Region 9**

San Diego River (Lower)

Pollutant:	**Esfenvalerate/Fenvalerate**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available

indicating that standards are not met. 038459

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49466, Esfenvalerate/Fenvalerate **Region 9**

San Diego River (Lower)

LOE ID:	75609
Pollutant:	Esfenvalerate/Fenvalerate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Diego River (Lower) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Esfenvalerate.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to the USEPA Office of Pesticide Programs Ecotoxicity database, the aquatic life EC50 for Esfenvalerate is 0.9 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for San Diego River (Lower) was collected at 1 monitoring site [San Diego River - 907SDR-MLS]
Temporal Representation:	Data was collected on a single day 11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID **49469** **Region 9**

San Diego River (Lower)

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final	New Decision

Listing Decision:		038460
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Under 3.6 at least two lines of evidence are necessary to asses listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) list.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the seventeen water samples exceed the CRITERIA. Zero of the 5 sediment samples exceed the evaluation guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of seventeen water samples exceeded the CRITERIA, zero of the five sediment samples exceed the guideline, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 49469, Lead **Region 9**

San Diego River (Lower)

LOE ID:	75571
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	2
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Five samples were collected to test for toxicity. Two of the samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius and percent normal of Mytilus galloprovincialis.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the

	control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected from sites 907_6181, 907_6189, 907_6192, 907_6197, 907_6200 San Diego River.
Temporal Representation:	The samples were collected in July 2008.
Environmental Conditions:	
QAPP Information:	This data was collected under the Southern California Bight 2008 Regional Marine Monitoring Survey Quality Assurance Plan.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 49469, Lead **Region 9**

San Diego River (Lower)

LOE ID:	75616
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for San Diego River (Lower) to determine beneficial use support and results are as follows: 0 of 17 samples exceed the criterion for Lead.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved lead to protect aquatic life in freshwater. The dissolved lead criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego River (Lower) was collected at 1 monitoring site [San Diego River - 907SDR-MLS]
Temporal Representation:	Data was collected over the time period 11/29/2001-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 49469, Lead **Region 9**

San Diego River (Lower)

LOE ID:	78274	038462

Pollutant:	Lead
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for San Diego River (Lower) to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Lead.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for Lead is 112.18 ug/g dry weight (MacDonald et al., 1996).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for San Diego River (Lower) was collected at 5 monitoring sites [907_6181, 907_6189, 907_6192, 907_6197, 907_6200]
Temporal Representation:	Data was collected on a single day 7/11/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID	**49470**	**Region 9**
San Diego River (Lower)		

Pollutant:	**Lindane/gamma Hexachlorocyclohexane (gamma-HCH)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the five samples exceed the GUIDELINE. Two of five samples exhibited sediment toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is INSUFFICIENT justification FOR placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.038463
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the five samples exceed the GUIDELINE and this sample size is INSUFFICIENT to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49470, Lindane/gamma Hexachlorocyclohexane (gamma-HCH) **Region 9**

San Diego River (Lower)

LOE ID:	75571
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	2
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Five samples were collected to test for toxicity. Two of the samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius and percent normal of Mytilus galloprovincialis.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected from sites 907_6181, 907_6189, 907_6192, 907_6197, 907_6200 San Diego River.
Temporal Representation:	The samples were collected in July 2008.
Environmental Conditions:	
QAPP Information:	This data was collected under the Southern California Bight 2008 Regional Marine Monitoring Survey Quality Assurance Plan.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 49470, Lindane/gamma Hexachlorocyclohexane (gamma-HCH) **Region 9**

San Diego River (Lower)

LOE ID:	78275
Pollutant:	Lindane/gamma Hexachlorocyclohexane (gamma-HCH)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for San Diego River (Lower) to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for HCH, Gamma.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the sediment quality guideline (predictive of sediment toxicity for sediment-dwelling organisms) for HCH, gamma(Lindane; BHC, gamma) is 0.37 ug/g oc (Fairey et al., 2001).
Guideline Reference:	An evaluation of methods for calculating mean sediment quality guideline quotients as indicators of contamination and acute toxicity to amphipods by chemical mixtures. Environmental Toxicology and Chemistry. 20(10): 2276-2286
Spatial Representation:	Data for this line of evidence for San Diego River (Lower) was collected at 5 monitoring sites [907_6181, 907_6189, 907_6192, 907_6197, 907_6200]
Temporal Representation:	Data was collected on a single day 7/11/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID	**49472**	**Region 9**
San Diego River (Lower)		

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence are available in the administrative record to assess this pollutant. Zero of the sixteen samples exceed the GUIDELINE. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that: 038465
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of sixteen samples exceeded the GUIDELINE and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 49472, Malathion **Region 9**

San Diego River (Lower)

LOE ID:	75621
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	16
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Diego River (Lower) to determine beneficial use support and results are as follows: 0 of 16 samples exceed the criterion for Malathion.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for San Diego River (Lower) was collected at 1 monitoring site [San Diego River - 907SDR-MLS]
Temporal Representation:	Data was collected over the time period 11/8/2002-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 49472, Malathion **Region 9**

San Diego River (Lower) 038466

LOE ID:	75620
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	16
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Diego River (Lower) to determine beneficial use support and results are as follows: 0 of 16 samples exceed the criterion for Malathion.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water lifetime health advisory for malathion is 500 Âµg/L.
Guideline Reference:	2011 Edition of the Drinking Water Standards and Health Advisories
Spatial Representation:	Data for this line of evidence for San Diego River (Lower) was collected at 1 monitoring site [San Diego River - 907SDR-MLS]
Temporal Representation:	Data was collected over the time period 11/8/2002-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID **49473** **Region 9**

San Diego River (Lower)

Pollutant:	**Mercury**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the five

samples exceed the GUIDELINE. Two of five samples exhibited sediment toxicity. 038467

Based on the readily available data and information, the weight of evidence indicates that there is INSUFFICIENT justification FOR placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the five samples exceed the GUIDELINE and this sample size is INSUFFICIENT to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49473, Mercury **Region 9**

San Diego River (Lower)

LOE ID:	75571
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	2
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Five samples were collected to test for toxicity. Two of the samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius and percent normal of Mytilus galloprovincialis.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected from sites 907_6181, 907_6189, 907_6192, 907_6197, 907_6200 San Diego River.
Temporal Representation:	The samples were collected in July 2008.
Environmental Conditions:	
QAPP Information:	This data was collected under the Southern California Bight 2008 Regional Marine Monitoring Survey Quality Assurance Plan.

QAPP Information Reference(s):	e-mail clarifying QAPP information	038468

Line of Evidence (LOE) for Decision ID 49473, Mercury **Region 9**

San Diego River (Lower)

LOE ID:	78276
Pollutant:	Mercury
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for San Diego River (Lower) to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Mercury.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the sediment quality guideline (predictive of sediment toxicity for sediment-dwelling organisms) for Mercury is 2.1 ug/g (PTI Environmental Services, 1991).
Guideline Reference:	Pollutants of concern in Puget Sound. EPA 910/9-91-003. Seattle, WA: U.S. Environmental Protection Agency
Spatial Representation:	Data for this line of evidence for San Diego River (Lower) was collected at 5 monitoring sites [907_6181, 907_6189, 907_6192, 907_6197, 907_6200]
Temporal Representation:	Data was collected on a single day 7/11/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID **49474** **Region 9**

San Diego River (Lower)

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the nineteen samples exceed the CRITERIA.

Based on the readily available data and information, the weight of evidence indicates that there is

sufficient justification against placing this water segment-pollutant combination on the section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of nineteen samples exceeded the CRITERIA and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 49474, Nickel **Region 9**

San Diego River (Lower)

LOE ID:	75626
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for San Diego River (Lower) to determine beneficial use support and results are as follows: 0 of 17 samples exceed the criterion for Nickel.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Nickel to protect aquatic life in freshwater. The dissolved Nickel criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego River (Lower) was collected at 1 monitoring site [San Diego River - 907SDR-MLS]
Temporal Representation:	Data was collected over the time period 11/29/2001-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 49474, Nickel **Region 9**

San Diego River (Lower) 038470

LOE ID:	78097
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	19
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Diego River (Lower) to determine beneficial use support and results are as follows: 0 of 19 samples exceed the criterion for Nickel.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nickel is 0.1 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego River (Lower) was collected at 1 monitoring site [San Diego River - 907SDR-MLS]
Temporal Representation:	Data was collected over the time period 11/29/2001-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID **49475** **Region 9**

San Diego River (Lower)

Pollutant:	**Nitrate/Nitrite (Nitrite + Nitrate as N)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence are available in the administrative record to assess this pollutant. Zero of the nineteen samples exceed the CRITERIA. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of nineteen samples exceeded the CRITERIA and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 49475, Nitrate/Nitrite (Nitrite + Nitrate as N) **Region 9**
San Diego River (Lower)

LOE ID:	78098
Pollutant:	Nitrate/Nitrite (Nitrite + Nitrate as N)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	19
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Diego River (Lower) to determine beneficial use support and results are as follows: 0 of 19 samples exceed the criterion for Nitrate/Nitrite as N.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrate + nitrite (as N) is 10.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego River (Lower) was collected at 1 monitoring site [San Diego River - 907SDR-MLS]
Temporal Representation:	Data was collected over the time period 11/29/2001-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID **49476** **Region 9**
San Diego River (Lower)

Pollutant: **Nitrogen, Nitrite**

Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	038472
Last Listing Cycle's Final Listing Decision:	New Decision	
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. Zero of the nineteen samples exceed the CRITERIA.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of nineteen samples exceeded the CRITERIA and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 49476, Nitrogen, Nitrite **Region 9**

San Diego River (Lower)

LOE ID:	78099
Pollutant:	Nitrogen, Nitrite
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	19
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Diego River (Lower) to determine beneficial use support and results are as follows: 0 of 19 samples exceed the criterion for Nitrite as N.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrite (as N) is 1.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals, CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego River (Lower) was collected at 1 monitoring site

	[San Diego River - 907SDR-MLS]	038473
Temporal Representation:	Data was collected over the time period 11/29/2001-11/4/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.	

DECISION ID 49477 Region 9

San Diego River (Lower)

Pollutant:	**PAHs (Polycyclic Aromatic Hydrocarbons)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Four lines of evidence are available in the administrative record to assess this pollutant. Zero of the five samples exceed the GUIDELINES. Two of five samples exhibited sediment toxicity. Based on the readily available data and information, the weight of evidence indicates that there is INSUFFICIENT justification FOR placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the five samples exceed the GUIDELINE and this sample size is INSUFFICIENT to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49477, PAHs (Polycyclic Aromatic Hydrocarbons) Region 9

San Diego River (Lower)

LOE ID:	78277
Pollutant:	PAHs (Polycyclic Aromatic Hydrocarbons)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat

Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for San Diego River (Lower) to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for PAH, High molecular weight.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for High molecular weight PAHs is 9600 ng/g dry weight (Long et al., 1995).
Guideline Reference:	Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuary sediments. Environmental Management. 19, (1): 81-97
Spatial Representation:	Data for this line of evidence for San Diego River (Lower) was collected at 5 monitoring sites [907_6181, 907_6189, 907_6192, 907_6197, 907_6200]
Temporal Representation:	Data was collected on a single day 7/11/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 49477, PAHs (Polycyclic Aromatic Hydrocarbons) Region 9

San Diego River (Lower)

LOE ID:	78278
Pollutant:	PAHs (Polycyclic Aromatic Hydrocarbons)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for San Diego River (Lower) to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for PAH, Low molecular weight.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Low molecular weight PAHs is 1442 ng/g dry weight (Long et al., 1995).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters.

Ecotoxicology 5: 253-278 038475

Spatial Representation:	Data for this line of evidence for San Diego River (Lower) was collected at 5 monitoring sites [907_6181, 907_6189, 907_6192, 907_6197, 907_6200]
Temporal Representation:	Data was collected on a single day 7/11/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 49477, PAHs (Polycyclic Aromatic Hydrocarbons) Region 9

San Diego River (Lower)

LOE ID:	75571
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	2
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Five samples were collected to test for toxicity. Two of the samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius and percent normal of Mytilus galloprovincialis.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected from sites 907_6181, 907_6189, 907_6192, 907_6197, 907_6200 San Diego River.
Temporal Representation:	The samples were collected in July 2008.
Environmental Conditions:	
QAPP Information:	This data was collected under the Southern California Bight 2008 Regional Marine Monitoring Survey Quality Assurance Plan.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 49477, PAHs (Polycyclic Aromatic Hydrocarbons) Region 9

San Diego River (Lower)

LOE ID:	78279
Pollutant:	PAHs (Polycyclic Aromatic Hydrocarbons)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total

Beneficial Use:	Estuarine Habitat	038476
Number of Samples:	5	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for San Diego River (Lower) to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for PAHs (Polycyclic Aromatic Hydrocarbons).	
Data Reference:	Data for Various Pollutants from Bight, 2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In marine and estuarine sediments the sediment quality guideline (predictive of sediment toxicity for sediment-dwelling organisms) for Total PAHs is 1800 ug/g (Fairey et al., 2001).	
Guideline Reference:	An evaluation of methods for calculating mean sediment quality guideline quotients as indicators of contamination and acute toxicity to amphipods by chemical mixtures. Environmental Toxicology and Chemistry. 20(10): 2276-2286	
Spatial Representation:	Data for this line of evidence for San Diego River (Lower) was collected at 5 monitoring sites [907_6181, 907_6189, 907_6192, 907_6197, 907_6200]	
Temporal Representation:	Data was collected on a single day 7/11/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.	

DECISION ID	49478	Region 9
San Diego River (Lower)		

Pollutant:	**PCBs (Polychlorinated biphenyls)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the five samples exceed the GUIDELINE. Two of five samples exhibited sediment toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is INSUFFICIENT justification FOR placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the five samples exceed the GUIDELINE and this sample size is INSUFFICIENT to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.

4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49478, PCBs (Polychlorinated biphenyls) **Region 9**

San Diego River (Lower)

LOE ID:	78280
Pollutant:	PCBs (Polychlorinated biphenyls)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for San Diego River (Lower) to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for PCB, Total.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the sediment quality guideline (predictive of sediment toxicity for sediment-dwelling organisms) for Total PCBs is 400 ng/g (MacDonald et al., 2000b).
Guideline Reference:	Development and evaluation of consensus-based sediment effect concentrations for polychlorinated biphenyls. Environmental Toxicology and Chemistry. 19(5): 1403-1413
Spatial Representation:	Data for this line of evidence for San Diego River (Lower) was collected at 5 monitoring sites [907_6181, 907_6189, 907_6192, 907_6197, 907_6200]
Temporal Representation:	Data was collected on a single day 7/11/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 49478, PCBs (Polychlorinated biphenyls) **Region 9**

San Diego River (Lower)

LOE ID:	75571
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat

Number of Samples:	5	038478
Number of Exceedances:	2	
Data and Information Type:	TOXICITY TESTING	
Data Used to Assess Water Quality:	Five samples were collected to test for toxicity. Two of the samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius and percent normal of Mytilus galloprovincialis.	
Data Reference:	Data for Various Pollutants from Bight, 2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.	
Guideline Reference:		
Spatial Representation:	The samples were collected from sites 907_6181, 907_6189, 907_6192, 907_6197, 907_6200 San Diego River.	
Temporal Representation:	The samples were collected in July 2008.	
Environmental Conditions:		
QAPP Information:	This data was collected under the Southern California Bight 2008 Regional Marine Monitoring Survey Quality Assurance Plan.	
QAPP Information Reference(s):	e-mail clarifying QAPP information	

DECISION ID	**51359**	**Region 9**
San Diego River (Lower)		

Pollutant:	**Phenanthrene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the five samples exceed the GUIDELINE. Two of five samples exhibited sediment toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is INSUFFICIENT justification FOR placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the five samples exceed the GUIDELINE and this sample size is INSUFFICIENT to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available

indicating that standards are not met. 038479

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51359, Phenanthrene **Region 9**

San Diego River (Lower)

LOE ID:	78281
Pollutant:	Phenanthrene
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for San Diego River (Lower) to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Phenanthrene.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for Phenanthrene is 543.53 ng/g dry weight (MacDonald et al., 1996).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for San Diego River (Lower) was collected at 5 monitoring sites [907_6181, 907_6189, 907_6192, 907_6197, 907_6200]
Temporal Representation:	Data was collected on a single day 7/11/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 51359, Phenanthrene **Region 9**

San Diego River (Lower)

LOE ID:	75571
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat

Number of Samples:	5	038480
Number of Exceedances:	2	
Data and Information Type:	TOXICITY TESTING	
Data Used to Assess Water Quality:	Five samples were collected to test for toxicity. Two of the samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius and percent normal of Mytilus galloprovincialis.	
Data Reference:	Data for Various Pollutants from Bight, 2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.	
Guideline Reference:		
Spatial Representation:	The samples were collected from sites 907_6181, 907_6189, 907_6192, 907_6197, 907_6200 San Diego River.	
Temporal Representation:	The samples were collected in July 2008.	
Environmental Conditions:		
QAPP Information:	This data was collected under the Southern California Bight 2008 Regional Marine Monitoring Survey Quality Assurance Plan.	
QAPP Information Reference(s):	e-mail clarifying QAPP information	

DECISION ID	**51363**	**Region 9**
San Diego River (Lower)		

Pollutant:	**Pyrene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the five samples exceed the GUIDELINE. Two of five samples exhibited sediment toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is INSUFFICIENT justification FOR placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the five samples exceed the GUIDELINE and this sample size is INSUFFICIENT to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available

indicating that standards are not met. 038481

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51363, Pyrene **Region 9**

San Diego River (Lower)

LOE ID:	78282
Pollutant:	Pyrene
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for San Diego River (Lower) to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Pyrene.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for Pyrene is 1397.4 ng/g dry weight (MacDonald et al., 1996).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for San Diego River (Lower) was collected at 5 monitoring sites [907_6181, 907_6189, 907_6192, 907_6197, 907_6200]
Temporal Representation:	Data was collected on a single day 7/11/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 51363, Pyrene **Region 9**

San Diego River (Lower)

LOE ID:	75571
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	5

Number of Exceedances:	2	038482
Data and Information Type:	TOXICITY TESTING	
Data Used to Assess Water Quality:	Five samples were collected to test for toxicity. Two of the samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius and percent normal of Mytilus galloprovincialis.	
Data Reference:	Data for Various Pollutants from Bight, 2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.	
Guideline Reference:		
Spatial Representation:	The samples were collected from sites 907_6181, 907_6189, 907_6192, 907_6197, 907_6200 San Diego River.	
Temporal Representation:	The samples were collected in July 2008.	
Environmental Conditions:		
QAPP Information:	This data was collected under the Southern California Bight 2008 Regional Marine Monitoring Survey Quality Assurance Plan.	
QAPP Information Reference(s):	e-mail clarifying QAPP information	

DECISION ID	51364	Region 9
San Diego River (Lower)		

Pollutant:	**Selenium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence are available in the administrative record to assess this pollutant. Zero of the nineteen samples exceed the CRITERIA. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of nineteen samples exceeded the CRITERIA and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 51364, Selenium **Region 9**

San Diego River (Lower)

LOE ID:	78101
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	19
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Diego River (Lower) to determine beneficial use support and results are as follows: 0 of 19 samples exceed the criterion for Selenium.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The selenium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater is 0.005 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego River (Lower) was collected at 1 monitoring site [San Diego River - 907SDR-MLS]
Temporal Representation:	Data was collected over the time period 11/29/2001-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 51364, Selenium **Region 9**

San Diego River (Lower)

LOE ID:	78100
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	19
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Diego River (Lower) to determine beneficial use support and results are as follows: 0 of 19 samples exceed the criterion for Selenium.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for selenium is 0.01 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego River (Lower) was collected at 1 monitoring site [San Diego River - 907SDR-MLS]
Temporal Representation:	Data was collected over the time period 11/29/2001-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID	51366	Region 9
San Diego River (Lower)		

Pollutant:	**Silver**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the five samples exceed the GUIDELINE. Two of five samples exhibited sediment toxicity. Based on the readily available data and information, the weight of evidence indicates that there is INSUFFICIENT justification FOR placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the five samples exceed the GUIDELINE and this sample size is INSUFFICIENT to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and

information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51366, Silver San Diego River (Lower) **Region 9**

LOE ID:	75571
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	2
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Five samples were collected to test for toxicity. Two of the samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius and percent normal of Mytilus galloprovincialis.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected from sites 907_6181, 907_6189, 907_6192, 907_6197, 907_6200 San Diego River.
Temporal Representation:	The samples were collected in July 2008.
Environmental Conditions:	
QAPP Information:	This data was collected under the Southern California Bight 2008 Regional Marine Monitoring Survey Quality Assurance Plan.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 51366, Silver San Diego River (Lower) **Region 9**

LOE ID:	78261
Pollutant:	Silver
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	038486
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for San Diego River (Lower) to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Silver.	
Data Reference:	Data for Various Pollutants from Bight, 2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for Silver is 1.77 ug/g dry weight (MacDonald et al., 1996).	
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278	
Spatial Representation:	Data for this line of evidence for San Diego River (Lower) was collected at 5 monitoring sites [907_6181, 907_6189, 907_6192, 907_6197, 907_6200]	
Temporal Representation:	Data was collected on a single day 7/11/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.	

DECISION ID	**51367**	**Region 9**
San Diego River (Lower)		

Pollutant:	**Surfactants (MBAS)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One line of evidence are available in the administrative record to assess this pollutant. One of 19 samples exceed the secondary MCL for MBAS in water. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of 19 samples exceed the secondary MCL for MBAS in water and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 51367, Surfactants (MBAS)	**Region 9**
San Diego River (Lower)	

LOE ID:	78088
Pollutant:	Surfactants (MBAS)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	19
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Diego River (Lower) to determine beneficial use support and results are as follows: 1 of 19 samples exceed the criterion for MBAS.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The Secondary California Maximum Contaminant Level for MBAS is 0.5 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego River (Lower) was collected at 1 monitoring site [San Diego River - 907SDR-MLS]
Temporal Representation:	Data was collected over the time period 11/29/2001-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID	**51374**	**Region 9**
San Diego River (Lower)		

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Under 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) list.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the seventeen water samples and zero of the five sediment samples exceed the CRITERIA.

Based on the readily available data and information, the weight of evidence indicates that there is

sufficient justification against placing this water segment-pollutant combination on the 303(d) section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of seventeen water samples and zero of the five sediment samples exceeded the CRITERIA and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 51374, Zinc **Region 9**

San Diego River (Lower)

LOE ID:	75571
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	2
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Five samples were collected to test for toxicity. Two of the samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius and percent normal of Mytilus galloprovincialis.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected from sites 907_6181, 907_6189, 907_6192, 907_6197, 907_6200 San Diego River.
Temporal Representation:	The samples were collected in July 2008.
Environmental Conditions:	
QAPP Information:	This data was collected under the Southern California Bight 2008 Regional Marine Monitoring Survey Quality Assurance Plan.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 51374, Zinc **Region 9**

San Diego River (Lower)

LOE ID:	78264	038489

Pollutant:	Zinc
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for San Diego River (Lower) to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Zinc.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Zinc is 410 ug/g dry weight (Long et al., 1995).
Guideline Reference:	Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuary sediments. Environmental Management. 19, (1): 81-97
Spatial Representation:	Data for this line of evidence for San Diego River (Lower) was collected at 5 monitoring sites [907_6181, 907_6189, 907_6192, 907_6197, 907_6200]
Temporal Representation:	Data was collected on a single day 7/11/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 51374, Zinc **Region 9**

San Diego River (Lower)

LOE ID:	78090
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	19
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Diego River (Lower) to determine beneficial use support and results are as follows: 0 of 19 samples exceed the criterion for Zinc.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic

	life (Water Quality Control Plan, San Diego Basin). 038490
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for zinc is 5.0 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for San Diego River (Lower) was collected at 1 monitoring site [San Diego River - 907SDR-MLS]
Temporal Representation:	Data was collected over the time period 11/29/2001-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 51374, Zinc **Region 9**

San Diego River (Lower)

LOE ID:	75574
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for San Diego River (Lower) to determine beneficial use support and results are as follows: 0 of 17 samples exceed the criterion for Zinc.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Zinc to protect aquatic life in freshwater. The dissolved Zinc criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego River (Lower) was collected at 1 monitoring site [San Diego River - 907SDR-MLS]
Temporal Representation:	Data was collected over the time period 11/29/2001-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID	49479	Region 9
San Diego River (Lower)		

Pollutant:	**pH**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the one hundred seven samples exceed the OBJECTIVE. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one hundred seven samples exceeded the OBJECTIVE and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 49479, pH	Region 9
San Diego River (Lower)	

LOE ID:	75643
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	107
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Zero of 107 samples exceeded the objective.
Data Reference:	Data for Various Pollutants in the Middle San Diego River Basin, 2005-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The pH of all inland surface waters shall not be depressed below 6.5 or raised above 8.5 as a result of waste discharges.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	

Guideline Reference:	038492
Spatial Representation:	Samples were collected from the Old Mission Dam RSW-006 monitoring location and at Mission Ponds 9 miles downstream of discharge.
Temporal Representation:	Samples were collected once a month from January 2005 to May 2009.
Environmental Conditions:	
QAPP Information:	No QAPP was submitted. Sampling was done by municipalities in San Diego pursuant to the San Diego Municipal Stormwater Permit. Sometimes there is information on their submittal form.
QAPP Information Reference(s):	

DECISION ID 51732 — Region 9

San Diego River (Lower)

Pollutant:	**Benthic Community Effects**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Hydromodification | Illicit Connections/Illegal Hook-ups/Dry Weather Flows | Source Unknown | Unknown Nonpoint Source | Unknown Point Source | Urban Runoff/Storm Sewers
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Benthic Community Effects is being considered for placement on the CWA section 303(d) List under sections 3.9 and 3.1 of the Listing Policy. Under section 3.9, an additional line of evidence associating Benthic Community Effects with a water or sediment concentration of pollutant(s) is necessary to assess listing status. Based on the readily available data and information, the weight of evidence provides sufficient justification for placing Benthic Community Effects in this water segment on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Pursuant to section 3.9 of the Listing Policy, the water exhibits significant degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index. 4. Pursuant to section 3.9 of the Listing Policy, the water segment has associated pollutant(s) samples that exceed water quality objectives. 5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are being met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant(s) contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 51732, Benthic Community Effects — Region 9

San Diego River (Lower)

LOE ID:	25293
Pollutant:	Toxicity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	15
Number of Exceedances:	2
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Two of fifteen samples were found to be toxic as determined by at least one of the following tests: Selenastrum Capicornutum growth test, Ceriodaphnia dubia survival/reproductive test, and Hyalella Azteca growth/survival test according to results in the San Diego County Municipal Copermittees Urban Runoff Monitoring Report, 2007.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Samples were found to exhibit toxicity when the No Observed Effect Concentration (NOEC) or median lethal concentration (LC50) for any given species was estimated to be less than 100% of the test sample concentration
Guideline Reference:	Waste Discharge Requirements for Discharges of Urban Runoff From the Municipal Separate Storm Sewer Systems Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego, the San Diego Unified Port District, and the San Diego County Regional Airport, Order No. R9-2007-0001
Spatial Representation:	Samples were collected at the mass loading station located near the lower boundary of the watershed along a natural channel adjacent to the Fashion Valley Mall in San Diego. Samples were collected one to four times a year from 2001-2006.
Temporal Representation:	Samples were collected one to four times a year from 2001-2006.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	QA/QC conducted according to SWAMP guidelines.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 51732, Benthic Community Effects **Region 9**

San Diego River (Lower)

LOE ID:	78093
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	19
Number of Exceedances:	2
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Diego River (Lower) to determine beneficial use support and results are as follows: 2 of 19 samples exceed the criterion for Cadmium.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The dissolved cadmium criterion continuous concentration (expressed as a 4-day average)

	to protect aquatic life in freshwater for dissolved cadmium is 0.0022 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego River (Lower) was collected at 1 monitoring site [San Diego River - 907SDR-MLS]
Temporal Representation:	Data was collected over the time period 11/29/2001-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 51732, Benthic Community Effects **Region 9**

San Diego River (Lower)

LOE ID:	79666
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	23
Number of Exceedances:	15
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Twenty-three samples were taken at three stations in the lower San Diego River. Fifteen samples were below the 0.79 threshold, therefore exceeding the water quality objective for the aquatic life beneficial use. Two samples did not have calculated scores due to low organism counts.
Data Reference:	RWB9 Status Sampling 2007 and 2008 Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008. Region 9 CSCI Scores & Water Body Information
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to

	have exceeded the water quality objective for the aquatic life beneficial use 038495
Guideline Reference:	The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.
Spatial Representation:	The samples were collected at stations 907SDR-MT 907SSDR11 907SDR-1
Temporal Representation:	The samples were collected twice a year in May and October from 2002 to 2008.
Environmental Conditions:	
QAPP Information:	Data collected following SWAMP QA protocols for the RWB9 Status Sampling 2007 and 2008 water quality monitoring project and the County of San Diego NPDES MS4 Copermittees Receiving Waters Monitoring and Reporting Program.
QAPP Information Reference(s):	RWB9 Status Sampling 2007 and 2008 Quality Assurance Project Plan for SWAMP Bioassessment and Freshwater Bioassessment.

Line of Evidence (LOE) for Decision ID 51732, Benthic Community Effects **Region 9**

San Diego River (Lower)

LOE ID:	72765
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	25
Number of Exceedances:	25
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Twenty-five of the 25 samples collected had IBI scores below 40. tr11c NPDES bioassessment
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the State or Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	Development of a Benthic Index of Biotic Integrity (B-IBI) for Wadeable Streams in Northern Coastal California and its Application to Regional 305(b) Assessment
Spatial Representation:	The samples were collected at stations SDR-1, SDR-MLS, SDR-MT, SDR-TWAS-1, and SDR-TWAS-2 San Diego River.
Temporal Representation:	The samples were collected twice a year in May and October from 2002 to 2010.
Environmental Conditions:	
QAPP Information:	The data was collected under the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan, June 25, 2009.
QAPP Information Reference(s):	Quality Assurance Project Plan for SWAMP Bioassessment and Freshwater Bioassessment.

Line of Evidence (LOE) for Decision ID 51732, Benthic Community Effects 038496 Region 9

San Diego River (Lower)

LOE ID:	75599
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Diego River (Lower) to determine beneficial use support and results are as follows: 0 of 9 samples exceed the criterion for Diazinon.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Data for this line of evidence for San Diego River (Lower) was collected at 1 monitoring site [San Diego River - 907SDR-MLS]
Temporal Representation:	Data was collected over the time period 02/11/2005 -11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 51732, Benthic Community Effects Region 9

San Diego River (Lower)

LOE ID:	75580
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1

Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	The one sample collected had an IBI score below 40. NPDES bioassessment
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the State or Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	
Spatial Representation:	The sample was collected at station SDR-TWAS-3, San Diego River.
Temporal Representation:	The sample was collected in May 2010.
Environmental Conditions:	
QAPP Information:	The data was collected under the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan, June 25, 2009.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 51732, Benthic Community Effects **Region 9**

San Diego River (Lower)

LOE ID:	75573
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	The sample collected had an IBI score below 40. The score was 14.3. SMC bioassessment
Data Reference:	Bioassessment Data for Various Pollutants from Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the State or Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are

	converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	
Spatial Representation:	The samples was collected at 907_SMC04054, San Diego River.
Temporal Representation:	The samples were collected in May 2009.
Environmental Conditions:	
QAPP Information:	The data was collected under the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan, June 25, 2009.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 51732, Benthic Community Effects **Region 9**

San Diego River (Lower)

LOE ID:	75572
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	The IBI score for this water body was 6 which indicates that this water body may be considered to have impaired conditions.
Data Reference:	RWB9 Status Sampling 2007 and 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at the following station: 907SSDR11 (San Diego River 11).
Temporal Representation:	Surveys done May 5, 2008.
Environmental Conditions:	
QAPP Information:	Data collected following SWAMP QA protocols for the RWB9 Status Sampling 2007 and 2008 water quality monitoring project.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 51732, Benthic Community Effects **Region 9**

San Diego River (Lower)

LOE ID:	75570
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water

Fraction:	None	038499
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	19	
Number of Exceedances:	3	
Data and Information Type:	TOXICITY TESTING	
Data Used to Assess Water Quality:	Nineteen samples were collected to test for toxicity. Three of the 19 samples exhibited statistically significant toxicity. The toxicity tests that exhibited significant toxicity included survival of Hyalella azteca, growth of Selenastrum capriconutum and reproduction of Ceriodaphnia dubia.	
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.	
Guideline Reference:		
Spatial Representation:	The samples were collected at station 907SDR-MLS San Diego River.	
Temporal Representation:	The samples were collected from 2001 to 2008.	
Environmental Conditions:		
QAPP Information:	The data was collected under the County of San Diego Co-Permittees Receiving Waters Urban Runoff Monitoring and Reporting Program (Order No. 2007-01). Data quality is good.	
QAPP Information Reference(s):	e-mail clarifying QAPP information	

Line of Evidence (LOE) for Decision ID 51732, Benthic Community Effects **Region 9**

San Diego River (Lower)

LOE ID:	7491
Pollutant:	Toxicity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	3
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Four samples were collected and three samples show significant toxicity levels (SL) as determined by at least one of the following tests: Selenastrum Capicornutum growth test, and Ceriodaphnia dubia survival/reproductive test according to the Surface Water Ambient Monitoring Program, 2007. Samples were collected one to four times a year from 2001-2006.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (RWQCB, 2007).

Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	038500
Evaluation Guideline:	Waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.	
Guideline Reference:	Monitoring data for Region 9	
Spatial Representation:	Samples were collected at San Diego River 15.	
Temporal Representation:	Samples were collected one to four times a year from 2001-2006.	
Environmental Conditions:	Samples were collected during wet weather.	
QAPP Information:	QA/QC conducted according Surface Ambient Monitoring Program procedures.	
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA	

Line of Evidence (LOE) for Decision ID 51732, Benthic Community Effects **Region 9**

San Diego River (Lower)

LOE ID:	7490
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	1
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	One of the four samples exceeds water quality objectives according to resullts in the Surface Water Ambient Monitoring Program Annual Progress Report, 2007. Samples were collected on four dates. May 18 and September 13, 2004 and February 28 and April 19, 2005.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. (RWQCB, 2007) A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used. (RWQCB, 2007)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at the monitoring station San Diego River 15 (station id: 907SSDR15 lat/long: 32.76194/-117.1927), located on the main stem of the San Diego River.
Temporal Representation:	Samples were collected on four dates. May 18 and September 13, 2004, February 28 and April 19, 2005.
Environmental Conditions:	The first two sampling events occurred during declining and minimum base flow respectively. The third sample occurred between storm events and the fourth during high

	base flow. 038501
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 51732, Benthic Community Effects **Region 9**

San Diego River (Lower)

LOE ID:	7489
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	15
Number of Exceedances:	14
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Fourteen of fifteen samples collected exceeded the water quality objective according to results in the San Diego County Municipal Copermittees Urban Runoff Monitoring Report, 2007. Samples were collected one to three times a year from 2001-2006.
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. (RWQCB, 2007) A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used. (RWQCB, 2007)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at the mass loading station located near the lower boundary of the watershed along a natural channel adjacent to the Fashion Valley Mall in San Diego.
Temporal Representation:	Samples were collected one to three times a year from 2001-2006.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.
QAPP Information Reference(s):	

DECISION ID **49151** **Region 9**

San Diego River (Lower)

Pollutant:	**Cadmium**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision

Revision Status	Revised	038502
Sources:	Source Unknown	
Expected TMDL Completion Date:	2029	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Under 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Three lines of evidence are available in the administrative record to assess this pollutant. Two of the nineteen water samples exceed the CRITERIA, and zero of the five sediment samples exceed the GUIDELINE..

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Two of nineteen water samples exceed the CRITERIA and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 49151, Cadmium **Region 9**

San Diego River (Lower)

LOE ID:	75571
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	2
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Five samples were collected to test for toxicity. Two of the samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius and percent normal of Mytilus galloprovincialis.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected from sites 907_6181, 907_6189, 907_6192, 907_6197, 907_6200 San Diego River.
Temporal Representation:	The samples were collected in July 2008.
Environmental Conditions:	
QAPP Information:	This data was collected under the Southern California Bight 2008 Regional Marine Monitoring Survey Quality Assurance Plan.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 49151, Cadmium **Region 9**

San Diego River (Lower)

LOE ID:	78094
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	19
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Diego River (Lower) to determine beneficial use support and results are as follows: 1 of 19 samples exceed the criterion for Cadmium.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for cadmium is 0.005 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego River (Lower) was collected at 1 monitoring site [San Diego River - 907SDR-MLS]
Temporal Representation:	Data was collected over the time period 11/29/2001-11/4/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 49151, Cadmium **Region 9**

San Diego River (Lower)

LOE ID:	78093

Pollutant:	Cadmium	038504
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	19	
Number of Exceedances:	2	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Diego River (Lower) to determine beneficial use support and results are as follows: 2 of 19 samples exceed the criterion for Cadmium.	
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The dissolved cadmium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved cadmium is 0.0022 mg/L (California Toxics Rule, 2000).	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for San Diego River (Lower) was collected at 1 monitoring site [San Diego River - 907SDR-MLS]	
Temporal Representation:	Data was collected over the time period 11/29/2001-11/4/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.	

Line of Evidence (LOE) for Decision ID 49151, Cadmium **Region 9**

San Diego River (Lower)

LOE ID:	78267
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for San Diego River (Lower) to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Cadmium.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be

	maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for Cadmium is 4.21 ng/g dry weight (MacDonald et al., 1996).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for San Diego River (Lower) was collected at 5 monitoring sites [907_6181, 907_6189, 907_6192, 907_6197, 907_6200]
Temporal Representation:	Data was collected on a single day 7/11/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID 43059 Region 9

San Diego River (Lower)

Pollutant:	**Nitrogen**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2029
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Fifteen of the nineteen samples exceed the OBJECTIVE. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Fifteen of nineteen samples exceed the OBJECTIVE and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 43059, Nitrogen Region 9

San Diego River (Lower)

LOE ID:	7490
Pollutant:	Total Nitrogen as N

LOE Subgroup:	Pollutant-Water	038506
Matrix:	Water	
Fraction:	Total	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	4	
Number of Exceedances:	1	
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)	
Data Used to Assess Water Quality:	One of the four samples exceeds water quality objectives according to resullts in the Surface Water Ambient Monitoring Program Annual Progress Report, 2007. Samples were collected on four dates. May 18 and September 13, 2004 and February 28 and April 19, 2005.	
Data Reference:	Monitoring data for Region 9	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. (RWQCB, 2007) A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used. (RWQCB, 2007)	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:	Water Quality Control Plan for the San Diego Basin	
Spatial Representation:	Samples were collected at the monitoring station San Diego River 15 (station id: 907SSDR15 lat/long: 32.76194/-117.1927), located on the main stem of the San Diego River.	
Temporal Representation:	Samples were collected on four dates. May 18 and September 13, 2004, February 28 and April 19, 2005.	
Environmental Conditions:	The first two sampling events occurred during declining and minimum base flow respectively. The third sample occurred between storm events and the fourth during high base flow.	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.	
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA	

Line of Evidence (LOE) for Decision ID 43059, Nitrogen **Region 9**

San Diego River (Lower)

LOE ID:	7489
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	15
Number of Exceedances:	14

Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only) 038507
Data Used to Assess Water Quality:	Fourteen of fifteen samples collected exceeded the water quality objective according to results in the San Diego County Municipal Copermittees Urban Runoff Monitoring Report, 2007. Samples were collected one to three times a year from 2001-2006.
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. (RWQCB, 2007) A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used. (RWQCB, 2007)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at the mass loading station located near the lower boundary of the watershed along a natural channel adjacent to the Fashion Valley Mall in San Diego.
Temporal Representation:	Samples were collected one to three times a year from 2001-2006.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.
QAPP Information Reference(s):	

DECISION ID 51375 Region 9

San Diego River (Lower)

Pollutant:	**Toxicity**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Three lines of evidence are available in the administrative record to assess this pollutant. Six of 23 water samples and two of the five sediment samples exceed the GUIDELINES. In the portion of San Diego River Estuary, two of five sediment samples also showed toxicity to aquatic life. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Six of 23 water samples and two of the five sediment samples exceed the GUIDELINES. In the

portion of San Diego River Estuary, two of five sediment samples also showed toxicity to aquatic life and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 51375, Toxicity **Region 9**

San Diego River (Lower)

LOE ID:	75571
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	2
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Five samples were collected to test for toxicity. Two of the samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius and percent normal of Mytilus galloprovincialis.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected from sites 907_6181, 907_6189, 907_6192, 907_6197, 907_6200 San Diego River.
Temporal Representation:	The samples were collected in July 2008.
Environmental Conditions:	
QAPP Information:	This data was collected under the Southern California Bight 2008 Regional Marine Monitoring Survey Quality Assurance Plan.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 51375, Toxicity **Region 9**

San Diego River (Lower)

LOE ID:	75570
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None

Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	19
Number of Exceedances:	3
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Nineteen samples were collected to test for toxicity. Three of the 19 samples exhibited statistically significant toxicity. The toxicity tests that exhibited significant toxicity included survival of Hyalella azteca, growth of Selenastrum capriconutum and reproduction of Ceriodaphnia dubia.
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected at station 907SDR-MLS San Diego River.
Temporal Representation:	The samples were collected from 2001 to 2008.
Environmental Conditions:	
QAPP Information:	The data was collected under the County of San Diego Co-Permittees Receiving Waters Urban Runoff Monitoring and Reporting Program (Order No. 2007-01). Data quality is good.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 51375, Toxicity **Region 9**

San Diego River (Lower)

LOE ID:	95659
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Two samples were collected to test for toxicity. one of the two samples exhibited statistically significant toxicity. The toxicity tests that exhibited significant toxicity included survival and growth of Hyalella Azteca..
Data Reference:	Monitoring data for Region 9
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the

	control using EPA-recommended hypothesis testing. The paired t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	Waste Discharge Requirements for Discharges of Urban Runoff From the Municipal Separate Storm Sewer Systems Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego, the San Diego Unified Port District, and the San Diego County Regional Airport. Order No. R9-2007-0001
Spatial Representation:	The samples were collected at station 907SSDR15 on San Diego River.
Temporal Representation:	The samples were collected from on May 18 and September 13 of 2004.
Environmental Conditions:	
QAPP Information:	The data was collected under the County of San Diego Co-Permittees Receiving Waters Urban Runoff Monitoring and Reporting Program (Order No. 2007-01). Data quality is good.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 51375, Toxicity **Region 9**

San Diego River (Lower)

LOE ID:	7491
Pollutant:	Toxicity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	3
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Four samples were collected and three samples show significant toxicity levels (SL) as determined by at least one of the following tests: Selenastrum Capicornutum growth test, and Ceriodaphnia dubia survival/reproductive test according to the Surface Water Ambient Monitoring Program, 2007. Samples were collected one to four times a year from 2001-2006.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.
Guideline Reference:	Monitoring data for Region 9
Spatial Representation:	Samples were collected at San Diego River 15.
Temporal Representation:	Samples were collected one to four times a year from 2001-2006.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	QA/QC conducted according Surface Ambient Monitoring Program procedures.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

DECISION ID **44492** **Region 9**

San Diego River (Lower)

Pollutant:	**Manganese**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

Regional Board Conclusion:
This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 one line(s) of evidence is necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. All three of the samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. All three samples exceeded the manganese water quality objective and this sample size is insufficient to determine with the power and confidence of the Listing Policy if standards are not met. A minimum of five samples is needed for application of table 3.2.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

State Board Review and Conclusion:
The Regional Board staff mistakenly assessed manganese as a conventional pollutant and applied table 3.2 of the listing Policy. Manganese is a toxicant and should be assessed using Table 3.1. State Water Board staff has corrected this error and revised the recommendation to List for manganese as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Three of the three samples exceed the water quality objective for manganese.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Three of three samples exceeded the water quality objective for manganese and this exceeds the allowable frequency under Section 3.1 of the Listing Policy.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met..

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 44492, Manganese **Region 9**

San Diego River (Lower)

LOE ID:	30914
Pollutant:	Manganese
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	3
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Five water samples were collected at San Diego River station 907SSDR15 on March, April, June and September 2002, all showed excessive manganese concentrations (SWAMP, 2007).
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Inland surface waters shall not contain manganese in excess of the numerical values described in table 3-2. The secondary drinking water standard for manganese is 0.05 mg/l (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Water samples were collected at San Diego River station 907SSDR15; (Latitude 32.7621, Longitude -117.1925).
Temporal Representation:	Data was collected during the months of May and Sept. 2004, and April and Feb. 2005.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

DECISION ID **34467** **Region 9**

San Diego River (Lower)

Pollutant:	**Phosphorus**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

303(d) listing decisions made prior to 2006 were not held in an assessment database. This is a placeholder decision for a 303(d) listing made in a previous assessment cycle. The Regional Boards

will update this decision when new data and information become available and are assessed.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34467, Phosphorus **Region 9**

San Diego River (Lower)

LOE ID:	4721
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	Unspecified
Guideline Reference:	Placeholder reference pre-2006 303(d)
Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

DECISION ID **43058** **Region 9**

San Diego River (Lower)

Pollutant:	**Total Dissolved Solids**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

303(d) listing decisions made prior to 2006 were not held in an assessment database. This is a placeholder decision for a 303(d) listing made in a previous assessment cycle. The Regional Boards

will update this decision when new data and information become available and are assessed.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43058, Total Dissolved Solids **Region 9**

San Diego River (Lower)

LOE ID:	4722
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Agricultural Supply
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	Unspecified
Guideline Reference:	Placeholder reference pre-2006 303(d)
Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Alvarado Creek
Water Body ID: CAR9071100020011025125514
Water Body Type: River & Stream

DECISION ID 42850 **Region 9**
Alvarado Creek

Pollutant: Nitrogen
Final Listing Decision: List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Sources: Source Unknown
Expected TMDL Completion Date: 2023
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One lines of evidence is available in the administrative record to assess this pollutant. Two of the four samples exceed the OBJECTIVE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Two of four samples exceed the OBJECTIVE and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 42850, Nitrogen **Region 9**
Alvarado Creek

LOE ID: 8899

Pollutant: Nitrogen
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Not Recorded

Beneficial Use: Warm Freshwater Habitat

Number of Samples:	4	038516
Number of Exceedances:	2	

Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Four water samples were collected at Alvarado Creek station 907SDALV3 on May 2004, September 2004, February and April 2005. Two of four samples showed excessive nitrogen concentrations according to results in California's Surface Water Ambient Monitoring Program, 2007. Samples were collected in May 2004, September 2004, February 2005, and April 2005.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses (RWQCB, 2007). A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Water samples were collected at Alvarado Creek station 907SDALV3.
Temporal Representation:	Samples were collected in May 2004, September 2004, February 2005, and April 2005.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

DECISION ID	**44402**	**Region 9**
Alvarado Creek		

Pollutant:	**Benthic Community Effects**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed. Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. Benthic Community Effects is being considered for placement on the section 303(d) list under sections 3.9 and 3.2 of the Listing Policy. Under section 3.9, an additional line of evidence associating the Benthic Community Effects with a water or sediment concentration of pollutants is necessary to assess listing status. One line of evidence is available in the administrative record to assess this indicator. 2 of 2 samples exceeded the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing Benthic Community Effects in this water segment on the section

303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. 2 of 2 samples exceeded the Index of Biological Integrity (IBI) value of "poor" water quality for this area and this sample size is insufficient to determine with the power and confidence of the Listing Policy if standards are not met. A minimum of 5 samples is needed for application of Table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

The decision has not changed. Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because it cannot be determined if applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 44402, Benthic Community Effects **Region 9**

Alvarado Creek

LOE ID:	26349
Pollutant:	Benthic Community Effects
LOE Subgroup:	Adverse Biological Responses
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	2
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Two samples of IBI data were taken in June 2004 and June 2006 at two sampling sites. Both samples exceeded the IBI impairment threshold.
Data Reference:	Fish and Game IBI Data 2007 SDRWQCB Bioassessment Data
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at two sites: 907ALV204 and 907SDALV3 on Alvarado Creek.
Temporal Representation:	Sampling occurred during one event on June 2004 and another event on June 2006.
Environmental Conditions:	
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the

QAPP Information Reference(s):	Quality Assurance Project Plan for the California Stream Bioassessment Procedure and the State of California, California Monitoring an Assessment Program: "CMAP", Quality Assurance Project Plan. State of California, California Monitoring and Assessment Program: "CMAP". Quality Assurance Project Plan for the California Stream Bioassessment Procedure The San Diego Stream Team Quality Assurance Project Plan

DECISION ID	43846	Region 9
Alvarado Creek		

Pollutant:	**Selenium**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Four of the four samples exceed the CTR water quality objective for selenium. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Four of the four samples exceed the CTR water quality objective for selenium and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43846, Selenium	Region 9
Alvarado Creek	

LOE ID:	8925
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4

Number of Exceedances:	4	038519
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)	
Data Used to Assess Water Quality:	Four water samples were collected at Alvarado Creek station 907SDALV3 on May 2004, September 2004, April 2005, and February 2005. All four samples showed excessive selenium concentrations according to results in California's Surface Water Ambient Monitoring Program, 2007.	
Data Reference:	Monitoring data for Region 9	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	CTR Freshwater Chronic (CCC) 5 ug/L; (U.S. EPA, 2000).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Water samples were collected at Alvarado Creek station 907SDALV3.	
Temporal Representation:	Samples were collected on May 2004, September 2004, April 2005, and February 2005.	
Environmental Conditions:		
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.	
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Sycamore Canyon
Water Body ID: CAR9071200020011005135819
Water Body Type: River & Stream

DECISION ID 48189 **Region 9**
Sycamore Canyon

Pollutant: pH
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line(s) of evidence are necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. Two of the eight samples exceed the OBJECTIVE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Two of eight samples exceeded the OBJECTIVE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of twenty-six samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 48189, pH **Region 9**
Sycamore Canyon

LOE ID: 76974

Pollutant: pH
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Dissolved

Beneficial Use: Warm Freshwater Habitat

Number of Samples: 8

Number of Exceedances:	2	038521
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Two of the 8 samples exceeded the objective.	
Data Reference:	Data for Various Pollutants in the Middle San Diego River Basin, 2005-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The pH of all inland surface waters shall not be depressed below 6.5 or raised above 8.5 as a result of waste discharges.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from the RSW-001 and RSW-001a stations.	
Temporal Representation:	Samples were collected once a month from January 2005 to December 2009.	
Environmental Conditions:		
QAPP Information:	No QAPP was submitted. Sampling was done by municipalities in San Diego pursuant to the San Diego Municipal Stormwater Permit. Sometimes there is information on their submittal form.	
QAPP Information Reference(s):		

DECISION ID 48183 Region 9

Sycamore Canyon

Pollutant:	**Oxygen, Dissolved**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Twenty of the sixty samples exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Twenty of sixty samples exceed the objective and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 48183, Oxygen, Dissolved Region 9

Sycamore Canyon 038522

LOE ID:	72817
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	60
Number of Exceedances:	20
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Numeric data generated from 60 averages of Dissolved Oxygen concentrations had 20 exceedences.
Data Reference:	Data for Various Pollutants in the Middle San Diego River Basin, 2005-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The dissolved oxygen content of all surface waters designated as "Warm Freshwater Habitat" must be greater than 5.0 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the RSW-001 and RSW-001a stations.
Temporal Representation:	Samples were collected once a month from January 2005 to December 2009.
Environmental Conditions:	
QAPP Information:	No QAPP was submitted. Sampling was done by municipalities in San Diego pursuant to the San Diego Municipal Stormwater Permit. Sometimes there is information on their submittal form.
QAPP Information Reference(s):	

DECISION ID **33627** **Region 9**

Sycamore Canyon

Pollutant:	**Chloride**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of two samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.038523
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Two samples exceeded the Basin Plan water quality objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33627, Chloride **Region 9**

Sycamore Canyon

LOE ID:	3335
Pollutant:	Chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Agricultural Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 2000. None of the 2 samples were in exceedance (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters in the 907.10 HA and all beneficial uses, the WQO for Chloride is 400 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Sycamore Canyon Creek site SYC2.
Temporal Representation:	Samples were collected on 03/06/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Forester Creek
Water Body ID: CAR9071300020010924120240
Water Body Type: River & Stream

DECISION ID 46216 **Region 9**
Forester Creek

Pollutant: **Oxygen, Dissolved**
Final Listing Decision: **Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Delist from 303(d) list (TMDL required list)(2012)
Revision Status Revised
Reason for Delisting: Flaws in original listing
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Eight of the seventy samples exceed the OBJECTIVE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Eight of seventy samples exceeded the OBJECTIVE and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 46216, Oxygen, Dissolved **Region 9**
Forester Creek

LOE ID: 3342

Pollutant: Oxygen, Dissolved
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Dissolved

Beneficial Use: Industrial Service Supply

Number of Samples: 10
Number of Exceedances: 3

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected at Forester Creek by the City of El Cajon in 09/1997 and monthly from 04/2000-12/2000. Three of 10 averages were below 7.0 mg/L, which is more than 10% of the time (SWRCB, 2003)
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: Dissolved oxygen levels shall not be less than 5.0 mg/l in inland surface waters with designated MAR or WARM beneficial uses or less than 6.0 mg/l in waters with designated COLD beneficial uses. The annual mean dissolved oxygen concentrations shall not be less than 7 mg/l more than 10% of the time.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Forester Creek. The exact sample location is unknown.
Temporal Representation:	Samples were collected in 09/1997 and monthly from 04/2000-12/2000. Averages were reported. It is unknown how many samples were collected per month.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 46216, Oxygen, Dissolved **Region 9**

Forester Creek

LOE ID:	72806
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	60
Number of Exceedances:	5
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Numeric data generated from 60 averages of Dissolved Oxygen concentrations had 5 exceedences.
Data Reference:	Data for Various Pollutants in the Middle San Diego River Basin, 2005-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The dissolved oxygen content of all surface waters designated as "Warm Freshwater Habitat" must be greater than 5.0 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the RSW-004 station.
Temporal Representation:	Samples were collected once a month from January 2005 to December 2009.
Environmental Conditions:	
QAPP Information:	No QAPP was submitted. Sampling was done by municipalities in San Diego pursuant to the San Diego Municipal Stormwater Permit. Sometimes there is information on their submittal form.
QAPP Information Reference(s):	

DECISION ID **32669** **Region 9**

Forester Creek

Pollutant:	**pH**
Final Listing Decision:	**Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Reason for Delisting:	Applicable WQS attained; due to change in WQS
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal from the CWA section 303(d) List under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Two of the fifty-nine samples exceeded the OBJECTIVE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Two of fifty-nine samples exceeded the OBJECTIVE and this does not exceed the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be removed from the section 303(d) list because applicable water quality standards for the pollutant are not being exceeded.

Line of Evidence (LOE) for Decision ID 32669, pH **Region 9**

Forester Creek

LOE ID:	3340
Pollutant:	pH (high)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Industrial Service Supply
Number of Samples:	12
Number of Exceedances:	12
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of El Cajon from 09/1994 to 01/2001. Twelve of 12 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for pH is 6.5 (minimum) to 8.5 (maximum).
Objective/Criterion Reference:	Placeholder reference 2006 303(d)

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Forester Creek Channel at North City Limit.
Temporal Representation: Age of oldest data assessed is almost 10 years at time of assessment. Samples were collected from 09/27/1994 to 01/03/2001. Two samples per month were collected in 09/1994, 05/1996, 11/1997, 01/1999, and 01/2001. One sample per month was also collected in 06/1999 and 07/2000.
Environmental Conditions:
QAPP Information: Data used in 2002 assessment.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 32669, pH **Region 9**

Forester Creek

LOE ID: 3338

Pollutant: pH (high)
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Industrial Service Supply

Number of Samples: 14
Number of Exceedances: 14

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Data were collected by the City of El Cajon from 09/19994 to 01/2001. Fourteen of 14 samples were in exceedance.
Data Reference: Placeholder reference 2006 303(d)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for pH is 6.5 (minimum) to 8.5 (maximum).
Objective/Criterion Reference: Placeholder reference 2006 303(d)

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected in Forester Creek, North of I-8 between Magnolia and Johnson.
Temporal Representation: Oldest data used is almost 10 years old at time of assessment. Samples were collected from 09/27/1994 to 01/03/2001. Two samples each were collected in 09/1994, 05/1996, 11/1997, 01/1999, 06/1999, and 01/2001. One sample each was collected in 12/1999, and 07/2000.
Environmental Conditions:
QAPP Information: Data used in 2002 assessment.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 32669, pH **Region 9**

Forester Creek

LOE ID: 3336

Pollutant: pH (high)
LOE Subgroup: Ancillary Evidence Spills
Matrix: Not Specified
Fraction: None

Beneficial Use:	Industrial Service Supply	038528
Number of Samples:	0	
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	A letter from the City of El Cajon, by Richard C. Odiorne, City Engineer, was written to Julian Medina at Chem-tronics, Inc, in El Cajon, CA. The letter is dated July 6, 2000 and documents a 1000 gallons sodium hydroxide spill from Chem-tronic, Inc, that occurred on July 5, 2000.The letter from Richard Odiorne (City of El Cajon) asks that Chem-tronics, inc. ensure that they have Best Management Practices in place for spill preventions and cleanup.	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: The pH value shall not be changed at any time more than 0.2 pH units from that which occurs naturally. Changes in normal ambient pH levels shall not exceed 0.2 units in waters with designated marine (MAR), or estuarine (EST), or saline (SAL) beneficial uses. Changes in normal ambient pH levels shall not exceed 0.5 units in fresh waters with designated cold freshwater habitat (COLD) or warm freshwater habitat (WARM) beneficial uses. In bays and estuaries the pH shall not be depressed below 7.0 nor raised above 9.0. In inland surface waters the pH shall not be depressed below 6.5 nor raised above 8.5.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:	The corresponding numeric objective for pH from the Basin Plan for inland surface waters with all beneficial uses is 6.5 (minimum) to 8.5 (maximum).	
Guideline Reference:	Placeholder reference 2006 303(d)	
Spatial Representation:	A sodium hydroxide spill occurred in the Forester Creek Channel from Chem-tronics, Inc. 1150 West Bradley Av., El Cajon, CA 92020.	
Temporal Representation:	The spill occurred on July 5, 2000.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment. QA=?	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 32669, pH **Region 9**

Forester Creek

LOE ID:	3337
Pollutant:	pH (high)
LOE Subgroup:	Ancillary Evidence Spills
Matrix:	Not Specified
Fraction:	None
Beneficial Use:	Industrial Service Supply
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	A County of San Diego Department of Environmental Health referral form indicates that 10-20 gallons of an acid/water/copper mixture (pH of 2-3) spilled into Forester Creek on 05/01/2001. The spill was reported to the County of San Diego DEH by Randy Olms (employee at Chem-tronics). The complaint was referred to the City of El Cajon. It is reported that an emergency response team was on scene to conduct the clean up.County of San Diego DEH referral says that an emergency response team was on the scene to conduct a cleanup of the spill.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	The pH value shall not be changed at any time more than 0.2 pH units from that which occurs naturally. Changes in normal ambient pH levels shall not exceed 0.2 units in waters with designated marine (MAR), or estuarine (EST), or saline (SAL) beneficial uses. Changes in normal ambient pH levels shall not exceed 0.5 units in fresh waters with designated cold freshwater habitat (COLD) or warm freshwater habitat (WARM) beneficial uses. In bays and estuaries the pH shall not be depressed below 7.0 nor raised above 9.0. In inland surface waters the pH shall not be depressed below 6.5 nor raised above 8.5.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	The corresponding numeric objective for pH from the Basin Plan for inland surface waters with all beneficial uses is 6.5 (minimum) to 8.5 (maximum).
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	The spill occurred from 1150 W. Bradley Av., El Cajon, CA 92020 (Chem-tronics, Inc.).
Temporal Representation:	The spill occurred on 05/01/2001.
Environmental Conditions:	It was noted in the referral form that the acid spilled into a dry bed.
QAPP Information:	Data used in 2002 assessment. QA=?
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 32669, pH **Region 9**

Forester Creek

LOE ID:	3339
Pollutant:	pH (high)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Industrial Service Supply
Number of Samples:	12
Number of Exceedances:	12
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of El Cajon from 09/1994 to 01/2001. Twelve of 12 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for pH is 6.5 (minimum) to 8.5 (maximum).
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Forester Creek North of Vernon Way between Johnson and Marshall.
Temporal Representation:	Oldest data used is just under 10 years old at time of assessment. Samples were collected from 09/27/1994 to 01/03/2001. Two samples were collected per month in 09/1994, 05/1996, 11/1997, 01/1999, and 01/2001. One sample was collected per month in 06/1999 and 07/2000.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 32669, pH **Region 9**

Forester Creek

LOE ID:	73744
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	59
Number of Exceedances:	2
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Two of 59 samples exceeded the objective.
Data Reference:	Data for Various Pollutants in the Middle San Diego River Basin, 2005-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The pH of all inland surface waters shall not be depressed below 6.5 or raised above 8.5 as a result of waste discharges.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the RSW-004 monitoring station.
Temporal Representation:	Samples were collected once a month from January 2005 to December 2009.
Environmental Conditions:	
QAPP Information:	No QAPP was submitted. Sampling was done by municipalities in San Diego pursuant to the San Diego Municipal Stormwater Permit. Sometimes there is information on their submittal form.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 32669, pH **Region 9**

Forester Creek

LOE ID:	3341
Pollutant:	pH (high)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Industrial Service Supply
Number of Samples:	10
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of El Cajon in 09/1997 and 04/2000-12/2000. Only monthly averages were reported. None of the 10 averages were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for pH is 6.5 (minimum) to 8.5 (maximum).
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at Forester Creek. Location of sampling is unknown.
Temporal Representation:	Samples were collected in 09/1997 and 04/2000-12/2000. Monthly averages are reported. It is unknown how many samples were collected per month.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

DECISION ID 34007 Region 9

Forester Creek

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not Delist from 303(d) list (being addressed with USEPA approved TMDL)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
TMDL Name:	Bacteria Impaired Waters I (creeks and beach shorelines)
TMDL Project Code:	169
Date TMDL Approved by USEPA:	06/22/2011
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal on the CWA section 303(d) List under sections 2.2 and 4.2 of the Listing Policy. Under section 4.2 of the Policy, a minimum of one line of evidence is needed to assess listing status.

Four lines of evidence are available in the administrative record to assess this pollutant.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List. There is sufficient justification to place it in the Being Addressed portion of the CWA 303(d) List because a TMDL has been completed and approved by RWQCB and USEPA, and is expected to result in attainment of the standard.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, 66 of 120, 53 of 118, and 23 of 119 single samples exceed the water quality objectives for E. Coli., fecal coliform, and total coliform of 61/100ml, 400/100ml, and 10000/100 ml, respectively, for the protection of REC-1, and these exceed the allowable frequency listed in Table 4.2 of the Listing Policy.
4. The Bacteria TMDL for 20 beaches/creeks was approved by USEPA on 06/22/2011.
5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 34007, Indicator Bacteria Region 9

Forester Creek

LOE ID:	73745
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	038532
Beneficial Use:	Water Contact Recreation	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Forester Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Coliform, Total.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxicsubstances in concentrations which are toxic to,or which produce detrimental physiologicalresponses in human, plant, animal, or indigenousaquatic life (Basin Plan).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In waters designated for water contact recreation (REC I), the total coliform concentration shall not exceed 10000 MPN/100 ml (CDPH 2006).	
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.	
Spatial Representation:	Data for this line of evidence for Forester Creek was collected at 1 monitoring site [Forrester Creek @ Greenfield Drive]	
Temporal Representation:	Data was collected on a single day 5/18/2006.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 34007, Indicator Bacteria **Region 9**

Forester Creek

LOE ID:	73746
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	118
Number of Exceedances:	23
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Twenty-three of the 118 samples exceeded the Total Coliform objective.
Data Reference:	Data for Various Pollutants in the Middle San Diego River Basin, 2005-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life. Basin Plan for the San Diego Basin.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Total Coliform concentration shall not exceed more than 10000/100 ml. USEPA

	Ambient Water Quality Criteria for Bacteria - 1986.	038533
Guideline Reference:	Ambient Water Quality Criteria for Bacteria - 1986. EPA440/5-84-002	
Spatial Representation:	The samples were collected at the Forrester Creek station and the Mast Boulevard station. WBID: CAR9071300020010924120240	
Temporal Representation:	Samples were collected between January 2005 and December 2009.	
Environmental Conditions:		
QAPP Information:	No QAPP was submitted. Sampling was done by municipalities in San Diego pursuant to the San Diego Municipal Stormwater Permit. Sometimes there is information on their submittal form.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 34007, Indicator Bacteria **Region 9**

Forester Creek

LOE ID:	73719
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Forester Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Enterococci.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	San Diego Water Board Basin Plan (2010) states that enterococcus concentration shall not exceed a single sample maximum of 61/100 ml in fresh water.
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Forester Creek was collected at 1 monitoring site [Forrester Creek @ Greenfield Drive]
Temporal Representation:	Data was collected on a single day 5/18/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 34007, Indicator Bacteria **Region 9**

Forester Creek

LOE ID:	4452
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded

Beneficial Use:	Water Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	Unspecified
Guideline Reference:	Placeholder reference pre-2006 303(d)
Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 34007, Indicator Bacteria **Region 9**

Forester Creek

LOE ID:	73726
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Forester Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Coliform, Fecal.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the fecal coliform concentration shall not exceed 400 MPN/100 ml.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Forester Creek was collected at 1 monitoring site [Forrester Creek @ Greenfield Drive]
Temporal Representation:	Data was collected on a single day 5/18/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.

QAPP Information Reference(s): Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, 03/05 Matrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 34007, Indicator Bacteria **Region 9**

Forester Creek

LOE ID:	73727
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	117
Number of Exceedances:	53
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Fifty-three of the 117 samples exceeded the Fecal Coliform objective.
Data Reference:	Data for Various Pollutants in the Middle San Diego River Basin, 2005-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life. Basin Plan for the San Diego Basin.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Fecal Coliform concentration shall not exceed more than 400/100 ml. USEPA Ambient Water Quality Criteria for Bacteria - 1986.
Guideline Reference:	Ambient Water Quality Criteria for Bacteria - 1986. EPA440/5-84-002
Spatial Representation:	The samples were collected at the Forrester Creek station and the Mast Boulevard station. WBID: CAR9071300020010924120240
Temporal Representation:	Samples were collected between January 2005 and December 2009.
Environmental Conditions:	
QAPP Information:	No QAPP was submitted. Sampling was done by municipalities in San Diego pursuant to the San Diego Municipal Stormwater Permit. Sometimes there is information on their submittal form.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 34007, Indicator Bacteria **Region 9**

Forester Creek

LOE ID:	73725
Pollutant:	Escherichia coli (E. coli)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	120
Number of Exceedances:	66
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	sixty-six of the 120 samples exceeded the E.Coli objective.
Data Reference:	Data for Various Pollutants in the Middle San Diego River Basin, 2005-2009.

SWAMP Data:	Non-SWAMP	038536
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life. Basin Plan for the San Diego Basin.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The E.Coli concentration shall not exceed more than 235/100 ml. USEPA Ambient Water Quality Criteria for Bacteria - 1986.	
Guideline Reference:	Ambient Water Quality Criteria for Bacteria - 1986. EPA440/5-84-002	
Spatial Representation:	The samples were collected at the Forrester Creek station. WBID: CAR9071300020010924120240	
Temporal Representation:	Samples were collected between January 2005 and December 2009.	
Environmental Conditions:		
QAPP Information:	No QAPP was submitted. Sampling was done by municipalities in San Diego pursuant to the San Diego Municipal Stormwater Permit. Sometimes there is information on their submittal form.	
QAPP Information Reference(s):		

DECISION ID	**48358**	**Region 9**
Forester Creek		

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status. Under 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the two water and zero of the one sediment sample(s) exceed the CRITERIA. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of two water and zero of one sediment sample(s) exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48358, Arsenic **Region 9**

Forester Creek 038537

LOE ID:	73676
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Forester Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for arsenic is 33 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Forester Creek was collected at 1 monitoring site [Forrester Creek 2 - 907SDFRC2]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the 2002 QAMP.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 48358, Arsenic **Region 9**

Forester Creek

LOE ID:	73677
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Forester Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Arsenic.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.

SWAMP Data:	Non-SWAMP	038538
Water Quality Objective/Criterion:	The dissolved arsenic criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved arsenic is 0.150 mg/L (California Toxics Rule, 2000).	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Forester Creek was collected at 2 monitoring sites [Forrester Creek - 907_SMC02006, "San Diego River" - 907_SMC04054]	
Temporal Representation:	Data was collected over the time period 5/26/2009-6/3/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.	

Line of Evidence (LOE) for Decision ID 48358, Arsenic **Region 9**

Forester Creek

LOE ID:	73678
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Forester Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Arsenic.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for arsenic is 0.01 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Forester Creek was collected at 2 monitoring sites [Forrester Creek - 907_SMC02006, "San Diego River" - 907_SMC04054]
Temporal Representation:	Data was collected over the time period 5/26/2009-6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

Line of Evidence (LOE) for Decision ID 48358, Arsenic **Region 9**

Forester Creek

LOE ID:	73749	038539

Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate sediment toxicity. None of the samples exhibited significant toxicity. The toxicity test included survival of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL, Significant compared to negative control based on statistical test, less than stated alpha level, AND less than the evaluation threshold (both criteria are met).
Guideline Reference:	
Spatial Representation:	The samples were collected at station 907SDFRC2.
Temporal Representation:	The samples were collected in May 2008.
Environmental Conditions:	
QAPP Information:	All data was collected following the Standard Operating Procedures and Data Quality Objectives outlined in the SWAMP QAMP, (Puckett, 2002). QA data are included in submission.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 48358, Arsenic **Region 9**

Forester Creek

LOE ID:	73748
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Two samples were collected to test for toxicity. None of the samples exhibited statistically significant toxicity. The toxicity tests included survival and reproduction of Ceriodaphnia dubia.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater

	Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009. 038540
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected from site 907_SMC02006, Forrester Creek and 907_SMC04054, San Diego River.
Temporal Representation:	The samples were collected in June 2009.
Environmental Conditions:	
QAPP Information:	This data was collected for the Regional Monitoring Of Southern California's Coastal Watersheds - Stormwater Monitoring Coalition Bioassessment Working Group. CRG Marine Laboratories Quality Assurance Program Document was provided.
QAPP Information Reference(s):	e-mail clarifying QAPP information

DECISION ID	48383	Region 9
Forester Creek		

Pollutant:	**Bifenthrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status. Under 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Two lines of evidence are available in the administrative record to assess this pollutant. One of the one water sample and zero of the one sediment sample exceed the CRITERIA. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of one water sample and zero of one sediment sample exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the

applicable beneficial use support rating. 038541

Line of Evidence (LOE) for Decision ID 48383, Bifenthrin **Region 9**

Forester Creek

LOE ID:	73748
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Two samples were collected to test for toxicity. None of the samples exhibited statistically significant toxicity. The toxicity tests included survival and reproduction of Ceriodaphnia dubia.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected from site 907_SMC02006, Forrester Creek and 907_SMC04054, San Diego River.
Temporal Representation:	The samples were collected in June 2009.
Environmental Conditions:	
QAPP Information:	This data was collected for the Regional Monitoring Of Southern California's Coastal Watersheds - Stormwater Monitoring Coalition Bioassessment Working Group. CRG Marine Laboratories Quality Assurance Program Document was provided.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 48383, Bifenthrin **Region 9**

Forester Creek

LOE ID:	73682
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Forester Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Bifenthrin.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for bifenthrin is the median lethal concentration (LC50) of 0.43 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 0.43 ug/g is the geometric mean of LC50 values for bifenthrin from Amweg et al. (2005) and Amweg and Weston (2007).
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5 Whole-sediment toxicity identification evaluation tools for pyrethroid insecticides: I. piperonyl butoxide addition. Environ. Toxicol. Chem. 26:2389-2396.
Spatial Representation:	Data for this line of evidence for Forester Creek was collected at 1 monitoring site [Forrester Creek 2 - 907SDFRC2]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 48383, Bifenthrin **Region 9**

Forester Creek

LOE ID:	78024
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Forester Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Bifenthrin.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The UC Davis Criteria for Bifenthrin for the protection of aquatic organisms is a 4 day average of 0.0006 ug/L (Fojut et al. 2012).

Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Forester Creek was collected at 2 monitoring sites [Forrester Creek - 907_SMC02006, "San Diego River" - 907_SMC04054]
Temporal Representation:	Data was collected over the time period 5/26/2009-6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

Line of Evidence (LOE) for Decision ID 48383, Bifenthrin **Region 9**

Forester Creek

LOE ID:	73749
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate sediment toxicity. None of the samples exhibited significant toxicity. The toxicity test included survival of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL, Significant compared to negative control based on statistical test, less than stated alpha level, AND less than the evaluation threshold (both criteria are met).
Guideline Reference:	
Spatial Representation:	The samples were collected at station 907SDFRC2.
Temporal Representation:	The samples were collected in May 2008.
Environmental Conditions:	
QAPP Information:	All data was collected following the Standard Operating Procedures and Data Quality Objectives outlined in the SWAMP QAMP, (Puckett, 2002). QA data are included in submission.
QAPP Information Reference(s):	

DECISION ID **48384** **Region 9**

Forester Creek

Pollutant: **Cadmium**

Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	038544
Last Listing Cycle's Final Listing Decision:	New Decision	
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status. Under 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the three water samples and zero of the one sediment sample exceed the CRITERIA and GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of three water samples and zero of one sediment sample exceeded the CRITERIA/GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48384, Cadmium **Region 9**

Forester Creek

LOE ID:	73748
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Two samples were collected to test for toxicity. None of the samples exhibited statistically significant toxicity. The toxicity tests included survival and reproduction of Ceriodaphnia dubia.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.

	Region 9 Basin Plan.	038545
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.	
Guideline Reference:		
Spatial Representation:	The samples were collected from site 907_SMC02006, Forrester Creek and 907_SMC04054, San Diego River.	
Temporal Representation:	The samples were collected in June 2009.	
Environmental Conditions:		
QAPP Information:	This data was collected for the Regional Monitoring Of Southern California's Coastal Watersheds - Stormwater Monitoring Coalition Bioassessment Working Group. CRG Marine Laboratories Quality Assurance Program Document was provided.	
QAPP Information Reference(s):	e-mail clarifying QAPP information	

Line of Evidence (LOE) for Decision ID 48384, Cadmium **Region 9**

Forester Creek

LOE ID:	73749
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate sediment toxicity. None of the samples exhibited significant toxicity. The toxicity test included survival of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL, Significant compared to negative control based on statistical test, less than stated alpha level, AND less than the evaluation threshold (both criteria are met).
Guideline Reference:	
Spatial Representation:	The samples were collected at station 907SDFRC2.
Temporal Representation:	The samples were collected in May 2008.
Environmental Conditions:	
QAPP Information:	All data was collected following the Standard Operating Procedures and Data Quality Objectives outlined in the SWAMP QAMP, (Puckett, 2002). QA data are included in submission.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 48384, Cadmium **Region 9**

Forester Creek

LOE ID:	73684
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Forester Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for cadmium is 4.98 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Forester Creek was collected at 1 monitoring site [Forrester Creek 2 - 907SDFRC2]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the 2002 QAMP.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 48384, Cadmium **Region 9**

Forester Creek

LOE ID:	73685
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Forester Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.

Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for cadmium is 0.005 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Forester Creek was collected at 1 monitoring site [Forrester Creek @ Greenfield Drive]
Temporal Representation:	Data was collected on a single day 5/18/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48384, Cadmium **Region 9**

Forester Creek

LOE ID:	73686
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Forester Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Forester Creek was collected at 1 monitoring site [Forrester Creek @ Greenfield Drive]
Temporal Representation:	Data was collected on a single day 5/18/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix

Line of Evidence (LOE) for Decision ID 48384, Cadmium **Region 9**

Forester Creek

LOE ID:	73687
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Forester Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The dissolved cadmium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved cadmium is 0.0022 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Forester Creek was collected at 2 monitoring sites [Forrester Creek - 907_SMC02006, "San Diego River" - 907_SMC04054]
Temporal Representation:	Data was collected over the time period 5/26/2009-6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

Line of Evidence (LOE) for Decision ID 48384, Cadmium **Region 9**

Forester Creek

LOE ID:	73688
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Forester Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for

	Cadmium. 038549
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for cadmium is 0.005 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Forester Creek was collected at 2 monitoring sites [Forrester Creek - 907_SMC02006, "San Diego River" - 907_SMC04054]
Temporal Representation:	Data was collected over the time period 5/26/2009-6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

DECISION ID 48385 Region 9

Forester Creek

Pollutant:	**Chlordane (sediment)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the GUIDELINE. zero of one samples exhibited sediment toxicity. Based on the readily available data and information, the weight of evidence indicates that there is INSUFFICIENT justification FOR placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the one samples exceed the GUIDELINE and this sample size is INSUFFICIENT to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48385, Chlordane (sediment) Region 9

Forester Creek 038550

LOE ID:	72831
Pollutant:	Chlordane
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	0 of 1 samples collected exceeded the criteria for chlordane concentration (Sum of trans-Chlordane, cis-Chlordane, cis-Nonachlor, trans-Nonachlor, and Oxychlordane).
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Waters shall not contain substances in concentrations that result in the deposition of material that causes nuisance or adversely affects beneficial uses. (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Probable Effect Concentration for Chlordane in freshwater sediments is 17.6 ug/kg(MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data were collected at the following station 907SDFRC2 (Forrester Creek 2).
Temporal Representation:	The samples were collected on 5/21/2008.
Environmental Conditions:	
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 48385, Chlordane (sediment) **Region 9**

Forester Creek

LOE ID:	73749
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate sediment toxicity. None of the samples exhibited significant toxicity. The toxicity test included survival of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	Statewide Stream Pollution Trends Study 2008

SWAMP Data:	SWAMP	038551
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL, Significant compared to negative control based on statistical test, less than stated alpha level, AND less than the evaluation threshold (both criteria are met).	
Guideline Reference:		
Spatial Representation:	The samples were collected at station 907SDFRC2.	
Temporal Representation:	The samples were collected in May 2008.	
Environmental Conditions:		
QAPP Information:	All data was collected following the Standard Operating Procedures and Data Quality Objectives outlined in the SWAMP QAMP, (Puckett, 2002). QA data are included in submission.	
QAPP Information Reference(s):		

DECISION ID	48386	Region 9
Forester Creek		

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One line of evidence are available in the administrative record to assess this pollutant. Zero of the two samples exceed the CRITERION (water) and GUIDELINE (sediment). Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of two samples exceeded the GUIDELINE (sediment) CRITERIA (water) and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48386, Chlorpyrifos **Region 9**

Forester Creek 038552

LOE ID:	73749
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate sediment toxicity. None of the samples exhibited significant toxicity. The toxicity test included survival of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL, Significant compared to negative control based on statistical test, less than stated alpha level, AND less than the evaluation threshold (both criteria are met).
Guideline Reference:	
Spatial Representation:	The samples were collected at station 907SDFRC2.
Temporal Representation:	The samples were collected in May 2008.
Environmental Conditions:	
QAPP Information:	All data was collected following the Standard Operating Procedures and Data Quality Objectives outlined in the SWAMP QAMP, (Puckett, 2002). QA data are included in submission.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 48386, Chlorpyrifos **Region 9**

Forester Creek

LOE ID:	78025
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Forester Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for

	Chlorpyrifos. 038553
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for chlorpyrifos is 2.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Forester Creek was collected at 1 monitoring site [Forrester Creek @ Greenfield Drive]
Temporal Representation:	Data was collected on a single day 5/18/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48386, Chlorpyrifos **Region 9**

Forester Creek

LOE ID:	73690
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Forester Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for chlorpyrifos is the median lethal concentration (LC50) of 1.77 ug/g and is normalized by the percentage of organic carbon in the sediment sample (Amweg and Weston, 2007).
Guideline Reference:	Whole-sediment toxicity identification evaluation tools for pyrethroid insecticides: I. piperonyl butoxide addition. Environ. Toxicol. Chem. 26:2389-2396.
Spatial Representation:	Data for this line of evidence for Forester Creek was collected at 1 monitoring site [Forrester Creek 2 - 907SDFRC2]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient

Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

038554

Line of Evidence (LOE) for Decision ID 48386, Chlorpyrifos **Region 9**

Forester Creek

LOE ID:	73691
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Forester Creek to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).
Spatial Representation:	Data for this line of evidence for Forester Creek was collected at 1 monitoring site [Forrester Creek @ Greenfield Drive]
Temporal Representation:	Data was collected on a single day 5/18/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **48387** **Region 9**

Forester Creek

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 and

3.6 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status. Under 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the two water samples exceed the CRITERIA and zero of the one sediment sample exceed the GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of two water and zero of one sediment sample(s) exceeded the CRITERIA/GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48387, Chromium **Region 9**

Forester Creek

LOE ID:	73749
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate sediment toxicity. None of the samples exhibited significant toxicity. The toxicity test included survival of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL, Significant compared to negative control based on statistical test, less than stated alpha level, AND less than the evaluation threshold (both

criteria are met). 038556

Guideline Reference:

Spatial Representation: The samples were collected at station 907SDFRC2.
Temporal Representation: The samples were collected in May 2008.
Environmental Conditions:
QAPP Information: All data was collected following the Standard Operating Procedures and Data Quality Objectives outlined in the SWAMP QAMP, (Puckett, 2002). QA data are included in submission.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 48387, Chromium **Region 9**
Forester Creek

LOE ID: 73748

Pollutant: Toxicity
LOE Subgroup: Toxicity
Matrix: Water
Fraction: None

Beneficial Use: Warm Freshwater Habitat

Number of Samples: 2
Number of Exceedances: 0

Data and Information Type: TOXICITY TESTING
Data Used to Assess Water Quality: Two samples were collected to test for toxicity. None of the samples exhibited statistically significant toxicity. The toxicity tests included survival and reproduction of Ceriodaphnia dubia.
Data Reference: Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference: Water Quality Control Plan for the San Diego Basin

Evaluation Guideline: Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:

Spatial Representation: The samples were collected from site 907_SMC02006, Forrester Creek and 907_SMC04054, San Diego River.
Temporal Representation: The samples were collected in June 2009.
Environmental Conditions:
QAPP Information: This data was collected for the Regional Monitoring Of Southern California's Coastal Watersheds - Stormwater Monitoring Coalition Bioassessment Working Group. CRG Marine Laboratories Quality Assurance Program Document was provided.
QAPP Information Reference(s): e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 48387, Chromium **Region 9**
Forester Creek

LOE ID: 73693

Pollutant: Chromium

LOE Subgroup:	Pollutant-Water	038557
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	2	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Forester Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Chromium.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Forester Creek was collected at 2 monitoring sites [Forrester Creek - 907_SMC02006, "San Diego River" - 907_SMC04054]	
Temporal Representation:	Data was collected over the time period 5/26/2009-6/3/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.	

Line of Evidence (LOE) for Decision ID 48387, Chromium **Region 9**

Forester Creek

LOE ID:	73692
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Forester Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce

	detrimental physiological responses in, human, plant, animal, or aquatic life 038558
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for chromium is 111 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Forester Creek was collected at 1 monitoring site [Forrester Creek 2 - 907SDFRC2]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the 2002 QAMP.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID	48388	Region 9
Forester Creek		

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status. Under 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the three water samples exceed the CRITERIA and zero of the one sediment sample exceed the GUIDELINE. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of three water samples and zero of one sediment sample exceeded the CRITERIA/GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48388, Copper	**Region 9**
Forester Creek	

LOE ID:	73748
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Two samples were collected to test for toxicity. None of the samples exhibited statistically significant toxicity. The toxicity tests included survival and reproduction of Ceriodaphnia dubia.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected from site 907_SMC02006, Forrester Creek and 907_SMC04054, San Diego River.
Temporal Representation:	The samples were collected in June 2009.
Environmental Conditions:	
QAPP Information:	This data was collected for the Regional Monitoring Of Southern California's Coastal Watersheds - Stormwater Monitoring Coalition Bioassessment Working Group. CRG Marine Laboratories Quality Assurance Program Document was provided.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 48388, Copper Forester Creek **Region 9**

LOE ID:	73694
Pollutant:	Copper
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Forester Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	Statewide Stream Pollution Trends Study 2008

SWAMP Data:	SWAMP	038560
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for copper is 149 mg/Kg dry weight (MacDonald et al. 2000).	
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31	
Spatial Representation:	Data for this line of evidence for Forester Creek was collected at 1 monitoring site [Forrester Creek 2 - 907SDFRC2]	
Temporal Representation:	Data was collected on a single day 5/21/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	SWAMP data collected before September 2008 followed the 2002 QAMP.	
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)	

Line of Evidence (LOE) for Decision ID 48388, Copper **Region 9**

Forester Creek

LOE ID:	73704
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Forester Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Forester Creek was collected at 2 monitoring sites [Forrester Creek - 907_SMC02006, "San Diego River" - 907_SMC04054]
Temporal Representation:	Data was collected over the time period 5/26/2009-6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan

	was followed. 038561
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

Line of Evidence (LOE) for Decision ID 48388, Copper Forester Creek **Region 9**

LOE ID:	73697
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Forester Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for copper is 1.0 mg/L (Title 22 California Code of Regulations).
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Forester Creek was collected at 2 monitoring sites [Forrester Creek - 907_SMC02006, "San Diego River" - 907_SMC04054]
Temporal Representation:	Data was collected over the time period 5/26/2009-6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

Line of Evidence (LOE) for Decision ID 48388, Copper Forester Creek **Region 9**

LOE ID:	73696
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Forester Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.

Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for copper is 1.0 mg/L (Title 22 California Code of Regulations).
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Forester Creek was collected at 1 monitoring site [Forrester Creek @ Greenfield Drive]
Temporal Representation:	Data was collected on a single day 5/18/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48388, Copper **Region 9**

Forester Creek

LOE ID:	73695
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Forester Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Forester Creek was collected at 1 monitoring site [Forrester Creek @ Greenfield Drive]
Temporal Representation:	Data was collected on a single day 5/18/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix

Line of Evidence (LOE) for Decision ID 48388, Copper Forester Creek **Region 9**

LOE ID:	73749
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate sediment toxicity. None of the samples exhibited significant toxicity. The toxicity test included survival of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL, Significant compared to negative control based on statistical test, less than stated alpha level, AND less than the evaluation threshold (both criteria are met).
Guideline Reference:	
Spatial Representation:	The samples were collected at station 907SDFRC2.
Temporal Representation:	The samples were collected in May 2008.
Environmental Conditions:	
QAPP Information:	All data was collected following the Standard Operating Procedures and Data Quality Objectives outlined in the SWAMP QAMP, (Puckett, 2002). QA data are included in submission.
QAPP Information Reference(s):	

DECISION ID 48390 Forester Creek **Region 9**

Pollutant:	**Cyfluthrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing

status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the GUIDELINE. Zero of one samples exhibited sediment toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is INSUFFICIENT justification FOR placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the one samples exceed the GUIDELINE and this sample size is INSUFFICIENT to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48390, Cyfluthrin **Region 9**

Forester Creek

LOE ID:	73749
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate sediment toxicity. None of the samples exhibited significant toxicity. The toxicity test included survival of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL, Significant compared to negative control based on statistical test, less than stated alpha level, AND less than the evaluation threshold (both criteria are met).
Guideline Reference:	

Spatial Representation:	The samples were collected at station 907SDFRC2.
Temporal Representation:	The samples were collected in May 2008.
Environmental Conditions:	
QAPP Information:	All data was collected following the Standard Operating Procedures and Data Quality Objectives outlined in the SWAMP QAMP, (Puckett, 2002). QA data are included in submission.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 48390, Cyfluthrin **Region 9**

Forester Creek

LOE ID:	77752
Pollutant:	Cyfluthrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Forester Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cyfluthrin, total.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for cyfluthrin is the median lethal concentration (LC50) of 1.1 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 1.1 ug/g is the geometric mean of LC50 values for cyfluthrin from Amweg et al. (2005).
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5
Spatial Representation:	Data for this line of evidence for Forester Creek was collected at 1 monitoring site [Forrester Creek 2 - 907SDFRC2]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **48391** **Region 9**

Forester Creek

Pollutant:	**Cyhalothrin, Lambda**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or	Pollutant

Pollution: 038566

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one sample exceed the GUIDELINE. Zero of one sample exhibited sediment toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is INSUFFICIENT justification FOR placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the one sample exceed the GUIDELINE and this sample size is INSUFFICIENT to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48391, Cyhalothrin, Lambda **Region 9**

Forester Creek

LOE ID:	73749
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate sediment toxicity. None of the samples exhibited significant toxicity. The toxicity test included survival of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are

	counted with the significant effect code SL, Significant compared to negative control based on statistical test, less than stated alpha level, AND less than the evaluation threshold (both criteria are met).
Guideline Reference:	
Spatial Representation:	The samples were collected at station 907SDFRC2.
Temporal Representation:	The samples were collected in May 2008.
Environmental Conditions:	
QAPP Information:	All data was collected following the Standard Operating Procedures and Data Quality Objectives outlined in the SWAMP QAMP, (Puckett, 2002). QA data are included in submission.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 48391, Cyhalothrin, Lambda **Region 9**

Forester Creek

LOE ID:	77753
Pollutant:	Cyhalothrin, Lambda
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Forester Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cyhalothrin, lambda, total.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for lambda-cyhalothrin is the median lethal concentration (LC50) of 0.44 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 0.44 ug/g is the geometric mean of LC50 values for lambda-cyhalothrin from Amweg et al. (2005).
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5
Spatial Representation:	Data for this line of evidence for Forester Creek was collected at 1 monitoring site [Forrester Creek 2 - 907SDFRC2]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **48392** **Region 9**

Forester Creek

Pollutant:	**Cypermethrin**	038568
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	
Last Listing Cycle's Final Listing Decision:	New Decision	
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status. Under 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. One of the one water samples exceed the GUIDELINE and zero of the one sediment sample exceed the GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of one water and zero of one sediment sample(s) exceeded the GUIDELINES and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48392, Cypermethrin **Region 9**

Forester Creek

LOE ID:	73748
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Two samples were collected to test for toxicity. None of the samples exhibited statistically significant toxicity. The toxicity tests included survival and reproduction of Ceriodaphnia dubia.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or

	that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected from site 907_SMC02006, Forrester Creek and 907_SMC04054, San Diego River.
Temporal Representation:	The samples were collected in June 2009.
Environmental Conditions:	
QAPP Information:	This data was collected for the Regional Monitoring Of Southern California's Coastal Watersheds - Stormwater Monitoring Coalition Bioassessment Working Group. CRG Marine Laboratories Quality Assurance Program Document was provided.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 48392, Cypermethrin **Region 9**

Forester Creek

LOE ID:	73749
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate sediment toxicity. None of the samples exhibited significant toxicity. The toxicity test included survival of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL, Significant compared to negative control based on statistical test, less than stated alpha level, AND less than the evaluation threshold (both criteria are met).
Guideline Reference:	
Spatial Representation:	The samples were collected at station 907SDFRC2.
Temporal Representation:	The samples were collected in May 2008.
Environmental Conditions:	
QAPP Information:	All data was collected following the Standard Operating Procedures and Data Quality Objectives outlined in the SWAMP QAMP, (Puckett, 2002). QA data are included in submission.

QAPP Information Reference(s): 038570

Line of Evidence (LOE) for Decision ID 48392, Cypermethrin **Region 9**

Forester Creek

LOE ID:	78026
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Forester Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Cypermethrin, total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of cypermethrin does not exceed 0.0002 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Fojut et al. 2012)
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Forester Creek was collected at 2 monitoring sites [Forrester Creek - 907_SMC02006, "San Diego River" - 907_SMC04054]
Temporal Representation:	Data was collected over the time period 5/26/2009-6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

Line of Evidence (LOE) for Decision ID 48392, Cypermethrin **Region 9**

Forester Creek

LOE ID:	77754
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Forester Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cypermethrin, total.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for cypermethrin is the median lethal concentration (LC50) of 0.3 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 0.3 ug/g is the geometric mean of LC50 values for cypermethrin from Maund et al. (2002).
Guideline Reference:	Partitioning, bioavailability, and toxicity of the pyrethroid insecticide cypermethrin in sediments. Environmental Toxicology and Chemistry 21:9-15
Spatial Representation:	Data for this line of evidence for Forester Creek was collected at 1 monitoring site [Forrester Creek 2 - 907SDFRC2]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID	**48393**	**Region 9**
Forester Creek		

Pollutant:	**DDD (Dichlorodiphenyldichloroethane)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the GUIDELINE. Zero of one samples exhibited sediment toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is INSUFFICIENT justification FOR placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the one sample exceed the GUIDELINE and this sample size is INSUFFICIENT to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48393, DDD (Dichlorodiphenyldichloroethane) **Region 9**

Forester Creek

LOE ID:	73710
Pollutant:	DDD (Dichlorodiphenyldichloroethane)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Forester Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for DDD.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for sum of DDD (o,p' + p,p') is 28.0 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Forester Creek was collected at 1 monitoring site [Forrester Creek 2 - 907SDFRC2]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 48393, DDD (Dichlorodiphenyldichloroethane) **Region 9**

Forester Creek

LOE ID:	73749
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0

Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate sediment toxicity. None of the samples exhibited significant toxicity. The toxicity test included survival of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL, Significant compared to negative control based on statistical test, less than stated alpha level, AND less than the evaluation threshold (both criteria are met).
Guideline Reference:	
Spatial Representation:	The samples were collected at station 907SDFRC2.
Temporal Representation:	The samples were collected in May 2008.
Environmental Conditions:	
QAPP Information:	All data was collected following the Standard Operating Procedures and Data Quality Objectives outlined in the SWAMP QAMP, (Puckett, 2002). QA data are included in submission.
QAPP Information Reference(s):	

DECISION ID **48394** **Region 9**

Forester Creek

Pollutant:	**DDE (Dichlorodiphenyldichloroethylene)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the GUIDELINE. Zero of one samples exhibited sediment toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is INSUFFICIENT justification FOR placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the one sample exceed the GUIDELINE and this sample size is or INSUFFICIENT to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.

4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48394, DDE (Dichlorodiphenyldichloroethylene) **Region 9**

Forester Creek

LOE ID:	73711
Pollutant:	DDE (Dichlorodiphenyldichloroethylene)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Forester Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for DDE.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for sum of DDE (o,p' + p,p') is 31.3 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Forester Creek was collected at 1 monitoring site [Forrester Creek 2 - 907SDFRC2]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 48394, DDE (Dichlorodiphenyldichloroethylene) **Region 9**

Forester Creek

LOE ID:	73749
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate sediment toxicity. None of the samples exhibited significant toxicity. The toxicity test included survival of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL, Significant compared to negative control based on statistical test, less than stated alpha level, AND less than the evaluation threshold (both criteria are met).
Guideline Reference:	
Spatial Representation:	The samples were collected at station 907SDFRC2.
Temporal Representation:	The samples were collected in May 2008.
Environmental Conditions:	
QAPP Information:	All data was collected following the Standard Operating Procedures and Data Quality Objectives outlined in the SWAMP QAMP, (Puckett, 2002). QA data are included in submission.
QAPP Information Reference(s):	

DECISION ID	48395	Region 9
Forester Creek		

Pollutant:	**DDT (Dichlorodiphenyltrichloroethane)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the GUIDELINE. Zero of one samples exhibited sediment toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is INSUFFICIENT justification FOR placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the one samples exceed the GUIDELINE and this sample size is INSUFFICIENT to

determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48395, DDT (Dichlorodiphenyltrichloroethane) Region 9

Forester Creek

LOE ID:	73749
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate sediment toxicity. None of the samples exhibited significant toxicity. The toxicity test included survival of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL, Significant compared to negative control based on statistical test, less than stated alpha level, AND less than the evaluation threshold (both criteria are met).
Guideline Reference:	
Spatial Representation:	The samples were collected at station 907SDFRC2.
Temporal Representation:	The samples were collected in May 2008.
Environmental Conditions:	
QAPP Information:	All data was collected following the Standard Operating Procedures and Data Quality Objectives outlined in the SWAMP QAMP, (Puckett, 2002). QA data are included in submission.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 48395, DDT (Dichlorodiphenyltrichloroethane) Region 9

Forester Creek

LOE ID:	73712

Pollutant:	DDT (Dichlorodiphenyltrichloroethane)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Forester Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for DDT.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for sum of DDT (o,p' + p,p') is 62.9 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Forester Creek was collected at 1 monitoring site [Forrester Creek 2 - 907SDFRC2]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID	**48396**	**Region 9**
Forester Creek		

Pollutant:	**Deltamethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the [OBJECTIVE, GUIDELINE, CRITERIA]. Zero of one samples exhibited sediment toxicity. Based on the readily available data and information, the weight of evidence indicates that there is INSUFFICIENT justification FOR placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that: 038578
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the one samples exceed the GUIDELINE and this sample size is INSUFFICIENT to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48396, Deltamethrin **Region 9**

Forester Creek

LOE ID:	77756
Pollutant:	Deltamethrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Forester Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Deltamethrin.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for deltamethrin is the median lethal concentration (LC50) of 0.79 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 0.79 ug/g is the geometric mean of LC50 values for deltamethrin from Amweg et al. (2005).
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5
Spatial Representation:	Data for this line of evidence for Forester Creek was collected at 1 monitoring site [Forrester Creek 2 - 907SDFRC2]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 48396, Deltamethrin **Region 9**

Forester Creek

LOE ID:	73749
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate sediment toxicity. None of the samples exhibited significant toxicity. The toxicity test included survival of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL, Significant compared to negative control based on statistical test, less than stated alpha level, AND less than the evaluation threshold (both criteria are met).
Guideline Reference:	
Spatial Representation:	The samples were collected at station 907SDFRC2.
Temporal Representation:	The samples were collected in May 2008.
Environmental Conditions:	
QAPP Information:	All data was collected following the Standard Operating Procedures and Data Quality Objectives outlined in the SWAMP QAMP, (Puckett, 2002). QA data are included in submission.
QAPP Information Reference(s):	

DECISION ID **48398** **Region 9**

Forester Creek

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status. Under 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one

water sample and zero of the one sediment sample exceed the CRITERIA/GUIDELINE 58580

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one water and zero of one sediment sample exceeded the CRITERIA/GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48398, Diazinon **Region 9**

Forester Creek

LOE ID:	73716
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Forester Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Data for this line of evidence for Forester Creek was collected at 1 monitoring site [Forrester Creek @ Greenfield Drive]
Temporal Representation:	Data was collected on a single day 5/18/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.

QAPP Information Reference(s): Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, 03/08/01 Matrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48398, Diazinon **Region 9**

Forester Creek

LOE ID:	73749
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate sediment toxicity. None of the samples exhibited significant toxicity. The toxicity test included survival of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL, Significant compared to negative control based on statistical test, less than stated alpha level, AND less than the evaluation threshold (both criteria are met).
Guideline Reference:	
Spatial Representation:	The samples were collected at station 907SDFRC2.
Temporal Representation:	The samples were collected in May 2008.
Environmental Conditions:	
QAPP Information:	All data was collected following the Standard Operating Procedures and Data Quality Objectives outlined in the SWAMP QAMP, (Puckett, 2002). QA data are included in submission.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 48398, Diazinon **Region 9**

Forester Creek

LOE ID:	73748
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2

Number of Exceedances:	0	038582
Data and Information Type:	TOXICITY TESTING	
Data Used to Assess Water Quality:	Two samples were collected to test for toxicity. None of the samples exhibited statistically significant toxicity. The toxicity tests included survival and reproduction of Ceriodaphnia dubia.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.	
Guideline Reference:		
Spatial Representation:	The samples were collected from site 907_SMC02006, Forrester Creek and 907_SMC04054, San Diego River.	
Temporal Representation:	The samples were collected in June 2009.	
Environmental Conditions:		
QAPP Information:	This data was collected for the Regional Monitoring Of Southern California's Coastal Watersheds - Stormwater Monitoring Coalition Bioassessment Working Group. CRG Marine Laboratories Quality Assurance Program Document was provided.	
QAPP Information Reference(s):	e-mail clarifying QAPP information	

Line of Evidence (LOE) for Decision ID 48398, Diazinon **Region 9**

Forester Creek

LOE ID:	78028
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Forester Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for diazinon is 1.4 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013

Spatial Representation:	Data for this line of evidence for Forester Creek was collected at 1 monitoring site [Forrester Creek @ Greenfield Drive]
Temporal Representation:	Data was collected on a single day 5/18/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48398, Diazinon **Region 9**

Forester Creek

LOE ID:	77757
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Forester Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Diazinon.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for diazinon is the median lethal concentration (LC50) of 11 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 11 ug/g is the geometric mean of LC50 values for diazinon from Ding et al. (2011).
Guideline Reference:	Toxicity of Sediment-Associated Pesticides to Chironomus dilutus and Hyalella azteca. Arch. Environ. Contam. Toxicol. 61:83Â–92.
Spatial Representation:	Data for this line of evidence for Forester Creek was collected at 1 monitoring site [Forrester Creek 2 - 907SDFRC2]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **48399** **Region 9**

Forester Creek

Pollutant:	**Dieldrin (sediment)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised

Impairment from Pollutant or Pollution:	Pollutant	038584

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the GUIDELINE. Zero of one samples exhibited sediment toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is INSUFFICIENT justification FOR placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the one samples exceed the GUIDELINE and this sample size is INSUFFICIENT to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48399, Dieldrin (sediment) **Region 9**

Forester Creek

LOE ID:	73749
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate sediment toxicity. None of the samples exhibited significant toxicity. The toxicity test included survival of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the

control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL, Significant compared to negative control based on statistical test, less than stated alpha level, AND less than the evaluation threshold (both criteria are met).

Guideline Reference:

Spatial Representation: The samples were collected at station 907SDFRC2.
Temporal Representation: The samples were collected in May 2008.
Environmental Conditions:
QAPP Information: All data was collected following the Standard Operating Procedures and Data Quality Objectives outlined in the SWAMP QAMP, (Puckett, 2002). QA data are included in submission.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 48399, Dieldrin (sediment) **Region 9**

Forester Creek

LOE ID: 73717

Pollutant: Dieldrin
LOE Subgroup: Pollutant-Sediment
Matrix: Sediment
Fraction: Total

Beneficial Use: Warm Freshwater Habitat

Number of Samples: 1
Number of Exceedances: 0

Data and Information Type: PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality: Water Board staff assessed SWAMP data for Forester Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Dieldrin.
Data Reference: Statewide Stream Pollution Trends Study 2008

SWAMP Data: SWAMP

Water Quality Objective/Criterion: Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference: Water Quality Control Plan for the San Diego Basin

Evaluation Guideline: In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for dieldrin is 61.8 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference: Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31

Spatial Representation: Data for this line of evidence for Forester Creek was collected at 1 monitoring site [Forrester Creek 2 - 907SDFRC2]
Temporal Representation: Data was collected on a single day 5/21/2008.
Environmental Conditions: Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information: SWAMP data collected before September 2008 followed the 2002 QAMP.
QAPP Information Reference(s): Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **48403** **Region 9**

Forester Creek

Pollutant: **Endrin**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**

Last Listing Cycle's Final Listing Decision:	New Decision	038586
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the GUIDELINE. Zero of one samples exhibited sediment toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is INSUFFICIENT justification FOR placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the one samples exceed the GUIDELINE and this sample size is INSUFFICIENT to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48403, Endrin **Region 9**

Forester Creek

LOE ID:	73718
Pollutant:	Endrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Forester Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Endrin.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity)

	for endrin is 207 ug/Kg dry weight (MacDonald et al. 2000). 038587
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Forester Creek was collected at 1 monitoring site [Forrester Creek 2 - 907SDFRC2]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the 2002 QAMP.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 48403, Endrin **Region 9**

Forester Creek

LOE ID:	73749
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate sediment toxicity. None of the samples exhibited significant toxicity. The toxicity test included survival of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL, Significant compared to negative control based on statistical test, less than stated alpha level, AND less than the evaluation threshold (both criteria are met).
Guideline Reference:	
Spatial Representation:	The samples were collected at station 907SDFRC2.
Temporal Representation:	The samples were collected in May 2008.
Environmental Conditions:	
QAPP Information:	All data was collected following the Standard Operating Procedures and Data Quality Objectives outlined in the SWAMP QAMP, (Puckett, 2002). QA data are included in submission.
QAPP Information Reference(s):	

DECISION ID 48760 **Region 9**

Forester Creek

Pollutant:	**Esfenvalerate/Fenvalerate**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the GUIDELINE. Zero of one samples exhibited sediment toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is INSUFFICIENT justification FOR placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the one samples exceed the GUIDELINE and this sample size is INSUFFICIENT to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48760, Esfenvalerate/Fenvalerate **Region 9**

Forester Creek

LOE ID:	73749
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate sediment toxicity. None of the samples exhibited significant toxicity. The toxicity test included survival of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP

Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL, Significant compared to negative control based on statistical test, less than stated alpha level, AND less than the evaluation threshold (both criteria are met).
Guideline Reference:	
Spatial Representation:	The samples were collected at station 907SDFRC2.
Temporal Representation:	The samples were collected in May 2008.
Environmental Conditions:	
QAPP Information:	All data was collected following the Standard Operating Procedures and Data Quality Objectives outlined in the SWAMP QAMP, (Puckett, 2002). QA data are included in submission.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 48760, Esfenvalerate/Fenvalerate **Region 9**

Forester Creek

LOE ID:	77758
Pollutant:	Esfenvalerate/Fenvalerate
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Forester Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Esfenvalerate/Fenvalerate, total.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for esfenvalerate/fenvalerate is the median lethal concentration (LC50) of 1.5 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 1.5 ug/g is the geometric mean of LC50 values for esfenvalerate/fenvalerate from Amweg et al. (2005).
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5
Spatial Representation:	Data for this line of evidence for Forester Creek was collected at 1 monitoring site [Forrester Creek 2 - 907SDFRC2]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP.

DECISION ID	48761	Region 9
Forester Creek		

Pollutant:	**Fenpropathrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the GUIDELINE. Zero of one samples exhibited sediment toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is INSUFFICIENT justification FOR placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the one samples exceed the GUIDELINE and this sample size is INSUFFICIENT to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48761, Fenpropathrin	**Region 9**
Forester Creek	

LOE ID:	73749
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate sediment toxicity. None of the samples exhibited significant toxicity. The toxicity test included survival of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as

	being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL, Significant compared to negative control based on statistical test, less than stated alpha level, AND less than the evaluation threshold (both criteria are met).
Guideline Reference:	
Spatial Representation:	The samples were collected at station 907SDFRC2.
Temporal Representation:	The samples were collected in May 2008.
Environmental Conditions:	
QAPP Information:	All data was collected following the Standard Operating Procedures and Data Quality Objectives outlined in the SWAMP QAMP, (Puckett, 2002). QA data are included in submission.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 48761, Fenpropathrin **Region 9**

Forester Creek

LOE ID:	77759
Pollutant:	Fenpropathrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Forester Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Fenpropathrin.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for fenpropathrin is the median lethal concentration (LC50) of 1 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 1 ug/g is the geometric mean of LC50 values for fenpropathrin from Ding et al. (2011).
Guideline Reference:	Toxicity of Sediment-Associated Pesticides to Chironomus dilutus and Hyalella azteca. Arch. Environ. Contam. Toxicol. 61:83Â–92.
Spatial Representation:	Data for this line of evidence for Forester Creek was collected at 1 monitoring site [Forrester Creek 2 - 907SDFRC2]

Temporal Representation:	Data was collected on a single day 5/21/2008.	038592
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.	
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)	

DECISION ID 48324 Region 9

Forester Creek

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. Zero of the three samples exceed the CRITERIA.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of three samples exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48324, Lead Region 9

Forester Creek

LOE ID:	73748
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Two samples were collected to test for toxicity. None of the samples exhibited statistically

	significant toxicity. The toxicity tests included survival and reproduction of Ceriodaphnia dubia.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected from site 907_SMC02006, Forrester Creek and 907_SMC04054, San Diego River.
Temporal Representation:	The samples were collected in June 2009.
Environmental Conditions:	
QAPP Information:	This data was collected for the Regional Monitoring Of Southern California's Coastal Watersheds - Stormwater Monitoring Coalition Bioassessment Working Group. CRG Marine Laboratories Quality Assurance Program Document was provided.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 48324, Lead **Region 9**

Forester Creek

LOE ID:	73734
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Forester Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for Lead is 0.015 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Forester Creek was collected at 1 monitoring site [Forrester Creek @ Greenfield Drive]
Temporal Representation:	Data was collected on a single day 5/18/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.

QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev.012, 5 Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48324, Lead **Region 9**

Forester Creek

LOE ID:	73735
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Forester Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Forester Creek was collected at 2 monitoring sites [Forrester Creek - 907_SMC02006, "San Diego River" - 907_SMC04054]
Temporal Representation:	Data was collected over the time period 5/26/2009-6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

Line of Evidence (LOE) for Decision ID 48324, Lead **Region 9**

Forester Creek

LOE ID:	73728
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	1	038595
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Forester Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Forester Creek was collected at 1 monitoring site [Forrester Creek @ Greenfield Drive]	
Temporal Representation:	Data was collected on a single day 5/18/2006.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID	**48762**	**Region 9**
Forester Creek		

Pollutant:	**Lindane/gamma Hexachlorocyclohexane (gamma-HCH)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the GUIDELINE. Zero of one samples exhibited sediment toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is INSUFFICIENT justification FOR placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the one samples exceed the GUIDELINE and this sample size is INSUFFICIENT to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.

4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48762, Lindane/gamma Hexachlorocyclohexane (gamma-HCH) **Region 9**

Forester Creek

LOE ID:	73749
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate sediment toxicity. None of the samples exhibited significant toxicity. The toxicity test included survival of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL, Significant compared to negative control based on statistical test, less than stated alpha level, AND less than the evaluation threshold (both criteria are met).
Guideline Reference:	
Spatial Representation:	The samples were collected at station 907SDFRC2.
Temporal Representation:	The samples were collected in May 2008.
Environmental Conditions:	
QAPP Information:	All data was collected following the Standard Operating Procedures and Data Quality Objectives outlined in the SWAMP QAMP, (Puckett, 2002). QA data are included in submission.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 48762, Lindane/gamma Hexachlorocyclohexane (gamma-HCH) **Region 9**

Forester Creek

LOE ID:	77760

Pollutant:	Lindane/gamma Hexachlorocyclohexane (gamma-HCH)	038597
LOE Subgroup:	Pollutant-Sediment	
Matrix:	Sediment	
Fraction:	Total	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Forester Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for HCH, gamma.	
Data Reference:	Statewide Stream Pollution Trends Study 2008	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for Lindane (gamma-HCH) is 4.99 ug/Kg dry weight (MacDonald et al. 2000).	
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31	
Spatial Representation:	Data for this line of evidence for Forester Creek was collected at 1 monitoring site [Forrester Creek 2 - 907SDFRC2]	
Temporal Representation:	Data was collected on a single day 5/21/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	SWAMP data collected before September 2008 followed the 2002 QAMP.	
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)	

DECISION ID	**48321**	**Region 9**
Forester Creek		

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the CRITERIA.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples exceeded the CRITERIA and this sample size is insufficient to determine, with

the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48321, Malathion **Region 9**

Forester Creek

LOE ID:	73736
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Forester Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Malathion.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Forester Creek was collected at 1 monitoring site [Forrester Creek @ Greenfield Drive]
Temporal Representation:	Data was collected on a single day 5/18/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48321, Malathion **Region 9**

Forester Creek

LOE ID:	78031
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	038599
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Forester Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Malathion.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The USEPA drinking water health advisory for malathion is 100 Âµg/L.	
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013	
Spatial Representation:	Data for this line of evidence for Forester Creek was collected at 1 monitoring site [Forrester Creek @ Greenfield Drive]	
Temporal Representation:	Data was collected on a single day 5/18/2006.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID	48763	Region 9
Forester Creek		

Pollutant:	**Mercury**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the GUIDELINE. Zero of one samples exhibited sediment toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is INSUFFICIENT justification FOR placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the one samples exceed the GUIDELINE and this sample size is INSUFFICIENT to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support

rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48763, Mercury **Region 9**

Forester Creek

LOE ID:	73749
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate sediment toxicity. None of the samples exhibited significant toxicity. The toxicity test included survival of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL, Significant compared to negative control based on statistical test, less than stated alpha level, AND less than the evaluation threshold (both criteria are met).
Guideline Reference:	
Spatial Representation:	The samples were collected at station 907SDFRC2.
Temporal Representation:	The samples were collected in May 2008.
Environmental Conditions:	
QAPP Information:	All data was collected following the Standard Operating Procedures and Data Quality Objectives outlined in the SWAMP QAMP, (Puckett, 2002). QA data are included in submission.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 48763, Mercury **Region 9**

Forester Creek

LOE ID:	73737

Pollutant:	Mercury	038601
LOE Subgroup:	Pollutant-Sediment	
Matrix:	Sediment	
Fraction:	Total	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Forester Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Mercury.	
Data Reference:	Statewide Stream Pollution Trends Study 2008	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for mercury is 1.06 mg/Kg dry weight (MacDonald et al. 2000).	
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31	
Spatial Representation:	Data for this line of evidence for Forester Creek was collected at 1 monitoring site [Forrester Creek 2 - 907SDFRC2]	
Temporal Representation:	Data was collected on a single day 5/21/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	SWAMP data collected before September 2008 followed the 2002 QAMP.	
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)	

DECISION ID	**48772**	**Region 9**
Forester Creek		

Pollutant:	**Methyl Parathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the GUIDELINE. Zero of one samples exhibited sediment toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is INSUFFICIENT justification FOR placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.

2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 938602
3. Zero of the one samples exceed the GUIDELINE and this sample size is INSUFFICIENT to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48772, Methyl Parathion **Region 9**

Forester Creek

LOE ID:	73749
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate sediment toxicity. None of the samples exhibited significant toxicity. The toxicity test included survival of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL, Significant compared to negative control based on statistical test, less than stated alpha level, AND less than the evaluation threshold (both criteria are met).
Guideline Reference:	
Spatial Representation:	The samples were collected at station 907SDFRC2.
Temporal Representation:	The samples were collected in May 2008.
Environmental Conditions:	
QAPP Information:	All data was collected following the Standard Operating Procedures and Data Quality Objectives outlined in the SWAMP QAMP, (Puckett, 2002). QA data are included in submission.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 48772, Methyl Parathion **Region 9**

Forester Creek

LOE ID:	77761
Pollutant:	Methyl Parathion
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Forester Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Parathion, Methyl.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for methyl parathion is the median lethal concentration (LC50) of 6 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 6 ug/g is the geometric mean of LC50 values for methyl parathion from Ding et al. (2011).
Guideline Reference:	Toxicity of Sediment-Associated Pesticides to Chironomus dilutus and Hyalella azteca. Arch. Environ. Contam. Toxicol. 61:83Â–92.
Spatial Representation:	Data for this line of evidence for Forester Creek was collected at 1 monitoring site [Forrester Creek 2 - 907SDFRC2]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **48773** **Region 9**

Forester Creek

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status. Under 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the two water samples and zero of one sediment sample exceed the CRITERIA/GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of two water and zero of one sediment samples exceeded the CRITERIA/GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48773, Nickel **Region 9**

Forester Creek

LOE ID:	73749
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate sediment toxicity. None of the samples exhibited significant toxicity. The toxicity test included survival of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL, Significant compared to negative control based on statistical test, less than stated alpha level, AND less than the evaluation threshold (both criteria are met).
Guideline Reference:	
Spatial Representation:	The samples were collected at station 907SDFRC2.
Temporal Representation:	The samples were collected in May 2008.
Environmental Conditions:	
QAPP Information:	All data was collected following the Standard Operating Procedures and Data Quality Objectives outlined in the SWAMP QAMP, (Puckett, 2002). QA data are included in

submission. 038605

QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 48773, Nickel **Region 9**

Forester Creek

LOE ID:	73748
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Two samples were collected to test for toxicity. None of the samples exhibited statistically significant toxicity. The toxicity tests included survival and reproduction of Ceriodaphnia dubia.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected from site 907_SMC02006, Forrester Creek and 907_SMC04054, San Diego River.
Temporal Representation:	The samples were collected in June 2009.
Environmental Conditions:	
QAPP Information:	This data was collected for the Regional Monitoring Of Southern California's Coastal Watersheds - Stormwater Monitoring Coalition Bioassessment Working Group. CRG Marine Laboratories Quality Assurance Program Document was provided.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 48773, Nickel **Region 9**

Forester Creek

LOE ID:	73740
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Forester Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Nickel.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Forester Creek was collected at 2 monitoring sites [Forrester Creek - 907_SMC02006, "San Diego River" - 907_SMC04054]
Temporal Representation:	Data was collected over the time period 5/26/2009-6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

Line of Evidence (LOE) for Decision ID 48773, Nickel **Region 9**

Forester Creek

LOE ID:	73739
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Forester Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for nickel is 48.6 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31

Spatial Representation:	Data for this line of evidence for Forester Creek was collected at 1 monitoring site [Forrester Creek 2 - 907SDFRC2]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the 2002 QAMP.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID 49101 Region 9

Forester Creek

Pollutant:	**Nitrate/Nitrite (Nitrite + Nitrate as N)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the two samples exceed the CRITERIA. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of two samples exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49101, Nitrate/Nitrite (Nitrite + Nitrate as N) Region 9

Forester Creek

LOE ID:	73741
Pollutant:	Nitrate/Nitrite (Nitrite + Nitrate as N)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING 038608
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Forester Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Nitrate/Nitrite as N.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrate + nitrite (as N) is 10.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Forester Creek was collected at 2 monitoring sites [Forrester Creek - 907_SMC02006, "San Diego River" - 907_SMC04054]
Temporal Representation:	Data was collected over the time period 5/26/2009-6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

DECISION ID 49104 Region 9

Forester Creek

Pollutant:	**Nitrogen, Nitrite**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One line of evidence are available in the administrative record to assess this pollutant. Zero of the two samples exceed the CRITERIA. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of two samples exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49104, Nitrogen, Nitrite Region 9

Forester Creek 038609

LOE ID:	73742
Pollutant:	Nitrogen, Nitrite
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Forester Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Nitrite as N.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrite (as N) is 1.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Forester Creek was collected at 2 monitoring sites [Forrester Creek - 907_SMC02006, "San Diego River" - 907_SMC04054]
Temporal Representation:	Data was collected over the time period 5/26/2009-6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

DECISION ID **52037** **Region 9**

Forester Creek

Pollutant:	**PCBs (Polychlorinated biphenyls)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. Zero of the one sample exceed the GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.

2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 938610
3. Zero of one sample exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52037, PCBs (Polychlorinated biphenyls) **Region 9**

Forester Creek

LOE ID:	72811
Pollutant:	PCBs (Polychlorinated biphenyls)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Zero of 1 sample collected for Total PCBs exceeded the evaluation guideline.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for total PCB is 676 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data were collected at the following station 907SDFRC2 (Forrester Creek 2).
Temporal Representation:	The samples were collected on 5/21/2008.
Environmental Conditions:	
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **52038** **Region 9**

Forester Creek

Pollutant:	**Permethrin, total**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the GUIDELINE. Zero of one samples exhibited sediment toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is INSUFFICIENT justification FOR placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the one samples exceed the GUIDELINE and this sample size is INSUFFICIENT to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52038, Permethrin, total **Region 9**

Forester Creek

LOE ID:	73749
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate sediment toxicity. None of the samples exhibited significant toxicity. The toxicity test included survival of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL, Significant compared to negative control based

	on statistical test, less than stated alpha level, AND less than the evaluation threshold (both criteria are met).
Guideline Reference:	
Spatial Representation:	The samples were collected at station 907SDFRC2.
Temporal Representation:	The samples were collected in May 2008.
Environmental Conditions:	
QAPP Information:	All data was collected following the Standard Operating Procedures and Data Quality Objectives outlined in the SWAMP QAMP, (Puckett, 2002). QA data are included in submission.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 52038, Permethrin, total **Region 9**

Forester Creek

LOE ID:	73743
Pollutant:	Permethrin, total
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Forester Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Permethrin, Total.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for permethrin is the median lethal concentration (LC50) of 8.9 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 8.9 ug/g is the geometric mean of LC50 values for permethrin from Amweg et al. (2005).
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5
Spatial Representation:	Data for this line of evidence for Forester Creek was collected at 1 monitoring site [Forrester Creek 2 - 907SDFRC2]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **49106** **Region 9**

Forester Creek

Pollutant:	**Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**

Last Listing Cycle's Final Listing Decision:	New Decision	038613
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the GUIDELINE. Zero of one samples exhibited sediment toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is INSUFFICIENT justification FOR placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the one samples exceed the GUIDELINE and this sample size is INSUFFICIENT to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49106, Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD) **Region 9**

Forester Creek

LOE ID:	73747
Pollutant:	Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Forester Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for DDT, Total.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for total DDTs (Sum DDT + Sum DDD + Sum DDE) is 572 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Forester Creek was collected at 1 monitoring site [Forrester Creek 2 - 907SDFRC2]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 49106, Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD) **Region 9**

Forester Creek

LOE ID:	73749
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate sediment toxicity. None of the samples exhibited significant toxicity. The toxicity test included survival of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL, Significant compared to negative control based on statistical test, less than stated alpha level, AND less than the evaluation threshold (both criteria are met).
Guideline Reference:	
Spatial Representation:	The samples were collected at station 907SDFRC2.
Temporal Representation:	The samples were collected in May 2008.
Environmental Conditions:	
QAPP Information:	All data was collected following the Standard Operating Procedures and Data Quality Objectives outlined in the SWAMP QAMP, (Puckett, 2002). QA data are included in submission.
QAPP Information Reference(s):	

DECISION ID	49108	038615 Region 9
Forester Creek		

Pollutant:	**Toxicity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. Zero of the two water samples and zero of the one sediment sample exceed the GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of two water and one sediment samples exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49108, Toxicity	**Region 9**
Forester Creek	

LOE ID:	73748
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Two samples were collected to test for toxicity. None of the samples exhibited statistically significant toxicity. The toxicity tests included survival and reproduction of Ceriodaphnia dubia.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected from site 907_SMC02006, Forrester Creek and 907_SMC04054, San Diego River.
Temporal Representation:	The samples were collected in June 2009.
Environmental Conditions:	
QAPP Information:	This data was collected for the Regional Monitoring Of Southern California's Coastal Watersheds - Stormwater Monitoring Coalition Bioassessment Working Group. CRG Marine Laboratories Quality Assurance Program Document was provided.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 49108, Toxicity **Region 9**

Forester Creek

LOE ID:	73749
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate sediment toxicity. None of the samples exhibited significant toxicity. The toxicity test included survival of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL, Significant compared to negative control based on statistical test, less than stated alpha level, AND less than the evaluation threshold (both criteria are met).
Guideline Reference:	
Spatial Representation:	The samples were collected at station 907SDFRC2.
Temporal Representation:	The samples were collected in May 2008.
Environmental Conditions:	
QAPP Information:	All data was collected following the Standard Operating Procedures and Data Quality Objectives outlined in the SWAMP QAMP, (Puckett, 2002). QA data are included in

submission. 038617

QAPP Information Reference(s):

DECISION ID	49107	Region 9
Forester Creek		

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status. Under 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the three water samples and zero of the one sediment sample exceed the CRITERIA.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of three water and one sediment samples exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49107, Zinc	**Region 9**
Forester Creek	

LOE ID:	73752
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Forester Creek to

	determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Forester Creek was collected at 1 monitoring site [Forrester Creek @ Greenfield Drive]
Temporal Representation:	Data was collected on a single day 5/18/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 49107, Zinc **Region 9**

Forester Creek

LOE ID:	73751
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Forester Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for zinc is 5.0 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Forester Creek was collected at 1 monitoring site [Forrester Creek @ Greenfield Drive]
Temporal Representation:	Data was collected on a single day 5/18/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix

	Analytical and Dry Weather Monitoring Program Rev. 8 was followed. 038619
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 49107, Zinc **Region 9**

Forester Creek

LOE ID:	73750
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Forester Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for Zinc is 459 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Forester Creek was collected at 1 monitoring site [Forrester Creek 2 - 907SDFRC2]
Temporal Representation:	Data was collected on a single day 5/21/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the 2002 QAMP.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 49107, Zinc **Region 9**

Forester Creek

LOE ID:	73749
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING

Data Used to Assess Water Quality:	One sample was collected to evaluate sediment toxicity. None of the samples exhibited significant toxicity. The toxicity test included survival of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL, Significant compared to negative control based on statistical test, less than stated alpha level, AND less than the evaluation threshold (both criteria are met).
Guideline Reference:	
Spatial Representation:	The samples were collected at station 907SDFRC2.
Temporal Representation:	The samples were collected in May 2008.
Environmental Conditions:	
QAPP Information:	All data was collected following the Standard Operating Procedures and Data Quality Objectives outlined in the SWAMP QAMP, (Puckett, 2002). QA data are included in submission.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49107, Zinc **Region 9**

Forester Creek

LOE ID:	73748
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Two samples were collected to test for toxicity. None of the samples exhibited statistically significant toxicity. The toxicity tests included survival and reproduction of Ceriodaphnia dubia.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.

Guideline Reference:	038621
Spatial Representation:	The samples were collected from site 907_SMC02006, Forrester Creek and 907_SMC04054, San Diego River.
Temporal Representation:	The samples were collected in June 2009.
Environmental Conditions:	
QAPP Information:	This data was collected for the Regional Monitoring Of Southern California's Coastal Watersheds - Stormwater Monitoring Coalition Bioassessment Working Group. CRG Marine Laboratories Quality Assurance Program Document was provided.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 49107, Zinc **Region 9**

Forester Creek

LOE ID:	73753
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Forester Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Forester Creek was collected at 2 monitoring sites [Forrester Creek - 907_SMC02006, "San Diego River" - 907_SMC04054]
Temporal Representation:	Data was collected over the time period 5/26/2009-6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

DECISION ID **51692** **Region 9**

Forester Creek

Pollutant:	**Benthic Community Effects**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**

Last Listing Cycle's Final Listing Decision:	New Decision	038622
Revision Status	Revised	
Sources:	Source Unknown	
Expected TMDL Completion Date:	2025	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

Benthic Community Effects is being considered for placement on the CWA section 303(d) List under sections 3.9 and 3.1 of the Listing Policy. Under section 3.9, an additional line of evidence associating Benthic Community Effects with a water or sediment concentration of pollutant(s) is necessary to assess listing status.

Based on the readily available data and information, the weight of evidence provides sufficient justification for placing Benthic Community Effects in this water segment on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Pursuant to section 3.9 of the Listing Policy, the water exhibits significant degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index.
4. Pursuant to section 3.9 of the Listing Policy, the water segment has associated pollutant(s) samples that exceed water quality objectives.
5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are being met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant(s) contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 51692, Benthic Community Effects **Region 9**

Forester Creek

LOE ID:	9014
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Non-fixed station physical/chemical monitoring (conventional pollutant only)
Data Used to Assess Water Quality:	Four water samples were collected at Forrester Creek station 2 (907SDFRC2) in May 2004, September 2004, April 2005, and February 2005, all showed excessive selenium concentrations according to results in California's Surface Water Ambient Monitoring Program Report, 2007.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	CTR Freshwater Chronic (CCC) 5 ug/L (U.S. EPA, 2000.
Objective/Criterion Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA

Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Forrester Creek station 2(907SDFRC2).
Temporal Representation:	Samples were collected in May 2004, September 2004, April 2005, and February 2005.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 51692, Benthic Community Effects **Region 9**

Forester Creek

LOE ID:	73681
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	The IBI score for this water body was 16 which indicates that this water body may be considered to have impaired conditions.
Data Reference:	RWB9 Status Sampling 2007 and 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at the following station: 907SDFRC2 (Forrester Creek 2).
Temporal Representation:	Survey done May 5, 2008.
Environmental Conditions:	
QAPP Information:	Data collected following SWAMP QA protocols for the RWB9 Status Sampling 2007 and 2008 water quality monitoring project.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 51692, Benthic Community Effects **Region 9**

Forester Creek

LOE ID:	78026
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	038624
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	1	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Forester Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Cypermethrin, total.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of cypermethrin does not exceed 0.0002 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Fojut et al. 2012)	
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.	
Spatial Representation:	Data for this line of evidence for Forester Creek was collected at 2 monitoring sites [Forrester Creek - 907_SMC02006, "San Diego River" - 907_SMC04054]	
Temporal Representation:	Data was collected over the time period 5/26/2009-6/3/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.	

Line of Evidence (LOE) for Decision ID 51692, Benthic Community Effects **Region 9**

Forester Creek

LOE ID:	78024
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Forester Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Bifenthrin.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).

Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	038625
Evaluation Guideline:	The UC Davis Criteria for Bifenthrin for the protection of aquatic organisms is a 4 day average of 0.0006 ug/L (Fojut et al. 2012).	
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.	
Spatial Representation:	Data for this line of evidence for Forester Creek was collected at 2 monitoring sites [Forrester Creek - 907_SMC02006, "San Diego River" - 907_SMC04054]	
Temporal Representation:	Data was collected over the time period 5/26/2009-6/3/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.	

Line of Evidence (LOE) for Decision ID 51692, Benthic Community Effects **Region 9**

Forester Creek

LOE ID:	79669
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	3
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Three samples were taken at three stations in Forester Creek. All three samples were below the 0.79 threshold and therefore exceeding the water quality objective for the aquatic life beneficial use.
Data Reference:	RWB9 Status Sampling 2007 and 2008 Bioassessment Data for Various Pollutants from Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009. Region 9 CSCI Scores & Water Body Information
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.
Guideline Reference:	The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.
Spatial Representation:	The samples were collected at: SMC04054 907SDFRC2 SMC02006

Temporal Representation:	The samples were collected in 2008 and 2009.	038626
Environmental Conditions:		
QAPP Information:	Data collected following SWAMP QA protocols for the RWB9 Status Sampling 2007 and 2008 water quality monitoring project and the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan.	
QAPP Information Reference(s):	e-mail clarifying QAPP information RWB9 Status Sampling 2007 and 2008 Bioassessment Data for Various Pollutants from Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.	

Line of Evidence (LOE) for Decision ID 51692, Benthic Community Effects **Region 9**

Forester Creek

LOE ID:	73680
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	The sample collected had IBI score below 40. The scores was 4.3. tr11e SMC bioassessment
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the State or Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	
Spatial Representation:	The sample was collected at 907_SMC02006, Forrester Creek.
Temporal Representation:	The samples were collected in May 2009.
Environmental Conditions:	
QAPP Information:	The data was collected under the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan, June 25, 2009.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 51692, Benthic Community Effects **Region 9**

Forester Creek

LOE ID:	3344
Pollutant:	Phosphorus

LOE Subgroup:	Pollutant-Water	038627
Matrix:	Water	
Fraction:	Total	
Beneficial Use:	Industrial Service Supply	
Number of Samples:	10	
Number of Exceedances:	3	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Data were collected by the City of El Cajon in 09/1997 and monthly from 04/2000-12/2000. Only monthly averages were reported. Three of 10 averages were at or in exceedance of the standard.	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters-streams and other flowing waters, with all beneficial uses, the WQO for total phosphorus is 0.1 mg/L. This appears to be desired goal in order to prevent plant nuisance in streams and other flowing waters; not to be exceeded more than 10% of the time.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Forester Creek. The exact sampling location was not reported.	
Temporal Representation:	Samples were collected in 09/1997 and monthly from 04/2000-12/2000. Only monthly averages were reported. It is unknown how many samples the monthly average represents.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 51692, Benthic Community Effects **Region 9**

Forester Creek

LOE ID:	3343
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Industrial Service Supply
Number of Samples:	10
Number of Exceedances:	10
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of El Cajon in 09/1997 and monthly from 04/2000-12/2000. Only monthly averages were reported. Ten of 10 averages were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with all beneficial uses, the WQO for TDS is 500. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at Forester Creek. The exact sampling location was not reported.
Temporal Representation:	Samples were collected in 09/1997 and monthly from 04/2000-12/2000. Only monthly averages were reported. It is unknown how often samples were collected during each month.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 51692, Benthic Community Effects **Region 9**

Forester Creek

LOE ID:	9012
Pollutant:	Nitrogen
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Four water samples were collected at Forrester Creek 2 station 907SDFRC2 in May 2004, September 2004; February 2005; and April 2005. All showed excessive nitrogen concentrations according to results in California's Surface Water Ambient Monitoring Program Report, 2007.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses (RWQCB, 2007). A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Forrester Creek station 2(907SDFRC2).
Temporal Representation:	Samples were collected in May 2004, September 2004, February 2005, and April 2005.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

DECISION ID **42728** **Region 9**

Forester Creek

Pollutant:	**Nitrogen**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2029
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Four of the four samples exceed the OBJECTIVE. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Four of four samples exceed the OBJECTIVE and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 42728, Nitrogen **Region 9**

Forester Creek

LOE ID:	9012
Pollutant:	Nitrogen
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Four water samples were collected at Forrester Creek 2 station 907SDFRC2 in May 2004, September 2004; February 2005; and April 2005. All showed excessive nitrogen concentrations according to results in California's Surface Water Ambient Monitoring Program Report, 2007.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses (RWQCB, 2007).

	A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Forrester Creek station 2(907SDFRC2).
Temporal Representation:	Samples were collected in May 2004, September 2004, February 2005, and April 2005.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

DECISION ID 32406 Region 9

Forester Creek

Pollutant:	**Total Dissolved Solids**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. One line of evidence is available in the administrative record to assess this pollutant. Ten of the 10 samples exceed the Basin Plan criteria. Even though the number of samples is insufficient to determine with the confidence and power of the Listing Policy, a minimum of 61 samples would be needed before 10 exceedances would result in a delisting of this pollutant for this waterbody. Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification in favor of removing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32406, Total Dissolved Solids Region 9

Forester Creek

LOE ID:	3343
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	Total Dissolved	038631
Beneficial Use:	Industrial Service Supply	
Number of Samples:	10	
Number of Exceedances:	10	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Data were collected by the City of El Cajon in 09/1997 and monthly from 04/2000-12/2000. Only monthly averages were reported. Ten of 10 averages were in exceedance.	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with all beneficial uses, the WQO for TDS is 500. This concentration is not to be exceeded more than 10% of the time during any one year period.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Forester Creek. The exact sampling location was not reported.	
Temporal Representation:	Samples were collected in 09/1997 and monthly from 04/2000-12/2000. Only monthly averages were reported. It is unknown how often samples were collected during each month.	
Environmental Conditions:		
QAPP Information:	QA Info Missing	
QAPP Information Reference(s):		

DECISION ID	**42809**	**Region 9**
Forester Creek		

Pollutant:	**Sulfates**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Three of 4 samples exceed the secondary drinking water MCL.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Three of 4 samples exceed the secondary drinking water MCL and this sample size is insufficient to determine with the power and confidence of the Listing Policy if standards are not met. A minimum of five samples is needed for application of table 3.2.
4. Pursuant to [SECTION 3.11/4.11] of the Listing Policy, no additional data and information are

available indicating that standards are not met. 038632

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 42809, Sulfates **Region 9**

Forester Creek

LOE ID:	9013
Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	3
Data and Information Type:	Non-fixed station physical/chemical monitoring (conventional pollutant only)
Data Used to Assess Water Quality:	Four water samples were collected at Forrester Creek station 2 in March 2002, April 2002, June 2002, and September 2002. Three showed excessive sulfate concentrations according to results in California's Surface Water Ambient Monitoring Program Report, 2007.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The recommended secondary drinking water standards for sulfate is 250 mg/l (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Forrester Creek station 2(907SDFRC2).
Temporal Representation:	Samples were collected in March 2002, April 2002, June 2002, and September 2002.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

DECISION ID **33283** **Region 9**

Forester Creek

Pollutant:	**Turbidity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

One line of evidence is available in the administrative record to assess this pollutant. None of the 9

samples exceed the Basin Plan criteria, and this does not exceed the allowable frequency of the Listing Policy. 033833

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33283, Turbidity **Region 9**

Forester Creek

LOE ID:	3345
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Industrial Service Supply
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of El Cajon from 04/2000 to 12/2000. None of the 9 averages were in exceedance of the above standards. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for turbidity is 5 units. For inland surface waters with other beneficial uses, the WQO for turbidity is 20 ntu.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Forester Creek. The exact sampling location was not reported.
Temporal Representation:	Samples were collected from 04/2000 to 12/2000. Only monthly averages were reported. It is unknown how many samples per month the monthly average represents.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

DECISION ID **44281** **Region 9**

Forester Creek

Pollutant:	**Phosphorus**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019

Impairment from Pollutant or Pollution:	Pollutant	038634
Regional Board Conclusion:	Regional Board Conclusion: Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Three of 10 samples exceeded the Basin Plan criteria, and these exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.	
Regional Board Decision Recommendation:		

Line of Evidence (LOE) for Decision ID 44281, Phosphorus **Region 9**

Forester Creek

LOE ID:	3344
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Industrial Service Supply
Number of Samples:	10
Number of Exceedances:	3
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of El Cajon in 09/1997 and monthly from 04/2000-12/2000. Only monthly averages were reported. Three of 10 averages were at or in exceedance of the standard.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters-streams and other flowing waters, with all beneficial uses, the WQO for total phosphorus is 0.1 mg/L. This appears to be desired goal in order to prevent plant nuisance in streams and other flowing waters; not to be exceeded more than 10% of the time.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Forester Creek. The exact sampling location was not reported.
Temporal Representation:	Samples were collected in 09/1997 and monthly from 04/2000-12/2000. Only monthly averages were reported. It is unknown how many samples the monthly average represents.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **42648** **Region 9**

Forester Creek 038635

Pollutant:	**Selenium**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Four of the 4 samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Four of 4 samples exceed the CTR value for Se and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 42648, Selenium — Region 9

Forester Creek

LOE ID:	9014
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Non-fixed station physical/chemical monitoring (conventional pollutant only)
Data Used to Assess Water Quality:	Four water samples were collected at Forrester Creek station 2 (907SDFRC2) in May 2004, September 2004, April 2005, and February 2005, all showed excessive selenium concentrations according to results in California's Surface Water Ambient Monitoring Program Report, 2007.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP

Water Quality Objective/Criterion:	CTR Freshwater Chronic (CCC) 5 ug/L (U.S. EPA, 2000.
Objective/Criterion Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Forrester Creek station 2(907SDFRC2).
Temporal Representation:	Samples were collected in May 2004, September 2004, April 2005, and February 2005.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: San Diego River (Upper)
Water Body ID: CAR9073100020011025102439
Water Body Type: River & Stream

DECISION ID 51463 **Region 9**
San Diego River (Upper)

Pollutant: Alkalinity as CaCO3
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line(s) of evidence are necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. Zero of the one sample exceed the GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of twenty-six samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51463, Alkalinity as CaCO3 **Region 9**
San Diego River (Upper)

LOE ID: 75575

Pollutant: Alkalinity as CaCO3
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Warm Freshwater Habitat

Number of Samples: 1

Number of Exceedances:	0	038638
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Alkalinity as CaCO3.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The Alkalinity as CaCO3 criteria for the protection of freshwater aquatic life is 20000 ug/L (National Recommended Water Quality Criteria, 2009).	
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology	
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]	
Temporal Representation:	Data was collected on a single day 5/12/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 51463, Alkalinity as CaCO3 **Region 9**

San Diego River (Upper)

LOE ID:	75576
Pollutant:	Alkalinity as CaCO3
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Alkalinity as CaCO3.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Alkalinity as CaCO3 criteria for the protection of freshwater aquatic life is 20000 ug/L (National Recommended Water Quality Criteria, 2009).
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]

Temporal Representation:	Data was collected on a single day 5/12/2009.	038639
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID 51465 Region 9

San Diego River (Upper)

Pollutant:	**Aluminum**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One line of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the GUIDELINES. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one samples exceeded the GUIDELINES and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51465, Aluminum Region 9

San Diego River (Upper)

LOE ID:	75577
Pollutant:	Aluminum
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for

	Aluminum.	038640
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan for the San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The California Secondary MCL for aluminum is 0.2 mg/L (Title 22 California Code of Regulations).	
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.	
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]	
Temporal Representation:	Data was collected on a single day 5/12/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 51465, Aluminum **Region 9**

San Diego River (Upper)

LOE ID:	75578
Pollutant:	Aluminum
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Aluminum.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The National Recommended Water Quality Critiera for the protection of aquatic life from aluminum is the chronic continuous concentration (expressed as a 4-day average) of 87 ug/L.
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51465, Aluminum **Region 9**

San Diego River (Upper) 038641

LOE ID:	75579
Pollutant:	Aluminum
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Aluminum.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The National Recommended Water Quality Critiera for the protection of aquatic life from aluminum is the chronic continuous concentration (expressed as a 4-day average) of 87 ug/L.
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **51468** **Region 9**

San Diego River (Upper)

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status. Under 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one water sample and zero of the one sediment sample exceed the CRITERIA and GUIDELINE. Based on the readily available data and information, the weight of evidence indicates that there is

sufficient justification against placing this water segment-pollutant combination on the section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one water and zero of one sediment sample exceeded the CRITERIA and GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51468, Arsenic **Region 9**

San Diego River (Upper)

LOE ID:	75586
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for arsenic is 33 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51468, Arsenic **Region 9**

San Diego River (Upper)

LOE ID:	75588
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for arsenic is 33 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51468, Arsenic **Region 9**

San Diego River (Upper)

LOE ID:	75591
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The dissolved arsenic criterion continuous concentration (expressed as a 4-day average) to

	protect aquatic life in freshwater for dissolved arsenic is 0.150 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51468, Arsenic **Region 9**

San Diego River (Upper)

LOE ID:	75590
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for arsenic is 0.01 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51468, Arsenic **Region 9**

San Diego River (Upper)

LOE ID:	75589
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved

Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The dissolved arsenic criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved arsenic is 0.150 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID	**51733**	**Region 9**
San Diego River (Upper)		

Pollutant:	**Benthic Community Effects**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Benthic Community Effects is being considered for placement on the CWA section 303(d) List under sections 3.9 and 3.1 of the Listing Policy. Under section 3.9, an additional line of evidence associating Benthic Community Effects with a water or sediment concentration of pollutant(s) is necessary to assess listing status. Based on the readily available data and information, the weight of evidence provides sufficient justification for not placing Benthic Community Effects in this water segment on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Pursuant to section 3.9 of the Listing Policy, the water does not exhibit significant degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index. 4. Pursuant to section 3.9 of the Listing Policy, the water segment does not have associated pollutant(s) samples that exceed water quality objectives. 5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not being met.

Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. Furthermore, what data is available does not indicate that the benthic community exhibits degradation when compared to reference.

Line of Evidence (LOE) for Decision ID 51733, Benthic Community Effects **Region 9**

San Diego River (Upper)

LOE ID:	72788
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	The CSCI score for this site is above the 0.79 threshold, and is therefore not exceeding the water quality objective for the aquatic life beneficial use.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009 Region 9 CSCI Scores & Water Body Information
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the State or Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.
Guideline Reference:	Development of a Benthic Index of Biotic Integrity (B-IBI) for Wadeable Streams in Northern Coastal California and its Application to Regional 305(b) Assessment
Spatial Representation:	
Temporal Representation:	The station is: 907S00577
Environmental Conditions:	
QAPP Information:	Samples were collected for the SWAMP RWB9 Stormwater Monitoring Council CY 2009 following SWAMP protocols and stored in the SWAMP database.
QAPP Information Reference(s):	RWB9 Stormwater Monitoring Council CY 2009 Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **51494** **Region 9**

San Diego River (Upper) 038647

Pollutant:	**Bifenthrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status. One line of evidence are available in the administrative record to assess this pollutant. Zero of the one sample exceed the GUIDELINE. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51494, Bifenthrin — Region 9

San Diego River (Upper)

LOE ID:	75593
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Bifenthrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Bifenthrin does not exceed 0.0006 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51494, Bifenthrin **Region 9**

San Diego River (Upper)

LOE ID:	75592
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Bifenthrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Bifenthrin does not exceed 0.0006 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **51495** **Region 9**

San Diego River (Upper)

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or	Pollutant

Pollution: 038649

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status. Under 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Three lines of evidence are available in the administrative record to assess this pollutant. Zero of the one sediment and zero of the five water samples exceed the GUIDELINE and CRITERIA.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sediment and zero of five water samples exceeded the GUIDELINE and CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51495, Cadmium **Region 9**

San Diego River (Upper)

LOE ID:	75719
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Cadmium to protect aquatic life in freshwater. The dissolved Cadmium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition

Evaluation Guideline:	038650
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51495, Cadmium **Region 9**

San Diego River (Upper)

LOE ID:	75733
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River @ Channel Road]
Temporal Representation:	Data was collected on a single day 6/9/2003 - 8/5/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 51495, Cadmium **Region 9**

San Diego River (Upper)

LOE ID:	75720
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	Total	038651
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for cadmium is 0.005 mg/L (Title 22 of the California Code of Regulations).	
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]	
Temporal Representation:	Data was collected on a single day 5/12/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 51495, Cadmium **Region 9**

San Diego River (Upper)

LOE ID:	75717
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for cadmium is 4.98 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31

Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51495, Cadmium **Region 9**

San Diego River (Upper)

LOE ID:	75718
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for cadmium is 4.98 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51495, Cadmium **Region 9**

San Diego River (Upper)

LOE ID:	75722
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	4	038653
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Cadmium.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for cadmium is 0.005 mg/L (Title 22 of the California Code of Regulations).	
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River @ Channel Road]	
Temporal Representation:	Data was collected on a single day 6/9/2003 - 8/5/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 51495, Cadmium **Region 9**

San Diego River (Upper)

LOE ID:	75721
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Cadmium to protect aquatic life in freshwater. The dissolved Cadmium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 51496 Region 9

San Diego River (Upper)

Pollutant:	**Chloride**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. Zero of the one sample exceed the OBJECTIVE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the OBJECTIVE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51496, Chloride Region 9

San Diego River (Upper)

LOE ID:	75735
Pollutant:	Chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine

	beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chloride.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The recommended secondary maximum contamination level acceptable to consumers of drinking water is 250 mg/L.
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51496, Chloride **Region 9**

San Diego River (Upper)

LOE ID:	75737
Pollutant:	Chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chloride.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Chloride objective for the protection of aquatic life according to Table 3-2 for San Diego River (Upper) within the San Diego Hydrologic Unit is 50 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51496, Chloride **Region 9**

San Diego River (Upper)

LOE ID:	75734
Pollutant:	Chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chloride.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Chloride objective for the protection of aquatic life according to Table 3-2 for San Diego River (Upper) within the San Diego Hydrologic Unit is 50 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID	**51515**	**Region 9**
San Diego River (Upper)		

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status. One line of evidence are available in the administrative record to assess this pollutant. Zero of the two samples exceed the GUIDELINE. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.

3. Zero of two samples exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51515, Chlorpyrifos **Region 9**

San Diego River (Upper)

LOE ID:	75738
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River @ Channel Road]
Temporal Representation:	Data was collected over the time period 7/6/2006-8/5/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 51515, Chlorpyrifos **Region 9**

San Diego River (Upper)

LOE ID:	78106

Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for chlorpyrifos is 2.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River @ Channel Road]
Temporal Representation:	Data was collected over the time period 7/6/2006-8/5/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID	**51502**	**Region 9**
San Diego River (Upper)		

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status. Under 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one water an zero of the one sediment samples exceed the CRITERIA and GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that: 038659
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one water sample and zero of one sediment sample exceeded the CRITERIA and GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51502, Chromium **Region 9**

San Diego River (Upper)

LOE ID:	75749
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for chromium is 111 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51502, Chromium **Region 9**

San Diego River (Upper)

LOE ID:	75748

Pollutant:	Chromium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for chromium is 111 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51502, Chromium **Region 9**

San Diego River (Upper)

LOE ID:	75750
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium. Since the chromium species was not identified, the data point(s) were assessed using both the Chromium III criteria which is hardness-dependent, and the criterion continuous concentration (4-day average) to protect aquatic life in freshwater for chromium VI which is 11 ug/L and is not hardness dependent.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP

Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Chromium to protect aquatic life in freshwater. The dissolved Chromium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51502, Chromium **Region 9**

San Diego River (Upper)

LOE ID:	75761
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium. Since the chromium species was not identified, the data point(s) were assessed using both the Chromium III criteria which is hardness-dependent, and the criterion continuous concentration (4-day average) to protect aquatic life in freshwater for chromium VI which is 11 ug/L and is not hardness dependent.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved chromium to protect aquatic life in freshwater. The dissolved Chromium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51502, Chromium **Region 9**

San Diego River (Upper)

LOE ID:	75751
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for total chromium is 0.05 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **51511** **Region 9**

San Diego River (Upper)

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status. Under 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence are available in the administrative record to assess this pollutant. Zero of the five water and zero of the one sediment samples exceed the CRITERIA and GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section

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This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of five water and zero of one sediment samples exceeded the CRITERIA and GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51511, Copper **Region 9**
San Diego River (Upper)

LOE ID:	75762
Pollutant:	Copper
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for copper is 149 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51511, Copper **Region 9**
San Diego River (Upper)

LOE ID:	75763	038664

Pollutant:	Copper
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for copper is 149 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51511, Copper **Region 9**

San Diego River (Upper)

LOE ID:	75764
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Copper to protect aquatic life in freshwater. The dissolved Copper criterion in freshwater is hardness

	dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51511, Copper **Region 9**

San Diego River (Upper)

LOE ID:	75765
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for copper is 1.0 mg/L (Title 22 California Code of Regulations).
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51511, Copper **Region 9**

San Diego River (Upper)

LOE ID:	75766
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved

Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved copper to protect aquatic life in freshwater. The dissolved copper criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51511, Copper **Region 9**

San Diego River (Upper)

LOE ID:	75773
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for copper is 1.0 mg/L (Title 22 California Code of Regulations).
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River @ Channel Road]
Temporal Representation:	Data was collected on a single day 6/9/2003 - 8/5/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 51511, Copper **Region 9**

San Diego River (Upper)

LOE ID:	75774
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River @ Channel Road]
Temporal Representation:	Data was collected on a single day 6/9/2003 - 8/5/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **51517** **Region 9**

San Diego River (Upper)

Pollutant:	**Cyfluthrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised

Impairment from Pollutant or Pollution:	Pollutant	038668

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. Zero of the one sample exceed the GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to [SECTION 3.11/4.11] of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51517, Cyfluthrin **Region 9**

San Diego River (Upper)

LOE ID:	75775
Pollutant:	Cyfluthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cyfluthrin, total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of lambda-cyhalothrin does not exceed 0.0005 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Mixtures of lambda-cyhalothrin and other pyrethroids should be considered in an additive manner. (Fojut et al. 2012)Â
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.

Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51517, Cyfluthrin **Region 9**

San Diego River (Upper)

LOE ID:	75776
Pollutant:	Cyfluthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cyfluthrin, total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of lambda-cyhalothrin does not exceed 0.0005 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Mixtures of lambda-cyhalothrin and other pyrethroids should be considered in an additive manner. (Fojut et al. 2012)Â
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **51518** **Region 9**

San Diego River (Upper)

Pollutant:	**Cyhalothrin, Lambda**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to [SECTION 3.11/4.11] of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51518, Cyhalothrin, Lambda **Region 9**

San Diego River (Upper)

LOE ID:	75777
Pollutant:	Cyhalothrin, Lambda
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cyhalothrin, lambda, total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Cyhalothrin, lambda, total does not exceed 0.0005 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.

Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51518, Cyhalothrin, Lambda **Region 9**

San Diego River (Upper)

LOE ID:	75786
Pollutant:	Cyhalothrin, Lambda
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cyhalothrin, lambda, total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Cyhalothrin, lambda, total does not exceed 0.0005 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **51519** **Region 9**

San Diego River (Upper)

Pollutant:	**Cypermethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status. One line of evidence are available in the administrative record to assess this pollutant. Zero of the one sample exceed the GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51519, Cypermethrin **Region 9**

San Diego River (Upper)

LOE ID:	75787
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	One of one sample result was not used in the assessment because the laboratory data was non-detect and the method detection limit was above the guideline and therefore the results could not be quantified with the level of certainty required by the Listing Policy
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of cypermethrin does not exceed 0.0002 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Fojut et al. 2012)
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51519, Cypermethrin **Region 9**

San Diego River (Upper) 038673

LOE ID:	75788
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	One of one sample result was not used in the assessment because the laboratory data was non-detect and the method detection limit was above the guideline and therefore the results could not be quantified with the level of certainty required by the Listing Policy
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of cypermethrin does not exceed 0.0002 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Fojut et al. 2012)
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **51520** **Region 9**

San Diego River (Upper)

Pollutant:	**Deltamethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status. One line of evidence are available in the administrative record to assess this pollutant. Zero of the one sample exceed the GUIDELINE. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that: 038674
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51520, Deltamethrin **Region 9**

San Diego River (Upper)

LOE ID:	75789
Pollutant:	Deltamethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Deltamethrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for Deltamethrin is the maximum acceptable toxicant concentration (MATC) of 0.02 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51520, Deltamethrin **Region 9**

San Diego River (Upper)

LOE ID:	75790
Pollutant:	Deltamethrin
LOE Subgroup:	Pollutant-Water

Matrix:	Water	038675
Fraction:	Total	
Beneficial Use:	Cold Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Deltamethrin.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The evaluation guideline for Deltamethrin is the maximum acceptable toxicant concentration (MATC) of 0.02 ug/L.	
Guideline Reference:	OPP Pesticide Ecotoxicity Database.	
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]	
Temporal Representation:	Data was collected on a single day 5/12/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID	**51521**	**Region 9**
San Diego River (Upper)		

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. Zero of the two samples exceed the GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of two samples exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51521, Diazinon **Region 9**

San Diego River (Upper)

LOE ID:	75801
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River @ Channel Road]
Temporal Representation:	Data was collected over the time period 7/6/2006-8/5/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 51521, Diazinon **Region 9**

San Diego River (Upper)

LOE ID:	78113
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for diazinon is 1.4 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River @ Channel Road]
Temporal Representation:	Data was collected over the time period 7/6/2006-8/5/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID	**51522**	**Region 9**
San Diego River (Upper)		

Pollutant:	**Esfenvalerate/Fenvalerate**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status. One line of evidence are available in the administrative record to assess this pollutant. Zero of the one sample exceed the GUIDELINE. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision	After review of the available data and information, RWQCB staff concludes that the water body-

Recommendation: pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51522, Esfenvalerate/Fenvalerate **Region 9**

San Diego River (Upper)

LOE ID:	75811
Pollutant:	Esfenvalerate/Fenvalerate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Esfenvalerate/Fenvalerate, total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to the USEPA Office of Pesticide Programs Ecotoxicity database, the aquatic life EC50 for Esfenvalerate/Fenvalerate is 0.9 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51522, Esfenvalerate/Fenvalerate **Region 9**

San Diego River (Upper)

LOE ID:	75812
Pollutant:	Esfenvalerate/Fenvalerate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine

	beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Esfenvalerate/Fenvalerate, total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to the USEPA Office of Pesticide Programs Ecotoxicity database, the aquatic life EC50 for Esfenvalerate/Fenvalerate is 0.9 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 51523 Region 9

San Diego River (Upper)

Pollutant:	**Fenpropathrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status. One line of evidence are available in the administrative record to assess this pollutant. Zero of the one sample exceed the GUIDELINE. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51523, Fenpropathrin Region 9

San Diego River (Upper)

LOE ID:	75821
Pollutant:	Fenpropathrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Fenpropathrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for Fenpropathrin is the median lethal concentration (LC50; 2.2 ug/L).
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51523, Fenpropathrin **Region 9**

San Diego River (Upper)

LOE ID:	75822
Pollutant:	Fenpropathrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Fenpropathrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic

	life (Water Quality Control Plan for the San Diego Basin).	038681
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The evaluation guideline for Fenpropathrin is the median lethal concentration (LC50; 2.2 ug/L).	
Guideline Reference:	OPP Pesticide Ecotoxicity Database.	
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]	
Temporal Representation:	Data was collected on a single day 5/12/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID	51524	Region 9
San Diego River (Upper)		

Pollutant:	**Iron**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status. One line of evidence are available in the administrative record to assess this pollutant. Zero of the one sample exceed the OBJECTIVE. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeded the OBJECTIVE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51524, Iron	Region 9
San Diego River (Upper)	

LOE ID:	75823
Pollutant:	Iron
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved

Beneficial Use:	Warm Freshwater Habitat	038682
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Iron.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Iron objective for the protection of aquatic life according to Table 3-2 for San Diego River (Upper) within the San Diego Hydrologic Unit is 0.3 mg/L.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]	
Temporal Representation:	Data was collected on a single day 5/12/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 51524, Iron **Region 9**

San Diego River (Upper)

LOE ID:	75825
Pollutant:	Iron
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Iron.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Iron objective for the protection of aquatic life according to Table 3-2 for San Diego River (Upper) within the San Diego Hydrologic Unit is 0.3 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site

	[San Diego River below Sentenac Cr. - 907S00577]	038683
Temporal Representation:	Data was collected on a single day 5/12/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 51524, Iron **Region 9**

San Diego River (Upper)

LOE ID:	75824
Pollutant:	Iron
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Iron.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for iron is 0.3 mg/L (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **51526** **Region 9**

San Diego River (Upper)

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status. Under 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Three lines of evidence are available in the administrative record to assess this pollutant. Zero of the five water and zero of the one sediment samples exceed the CRITERIA and GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of five water and zero of one sediment samples exceeded the CRITERIA and GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51526, Lead **Region 9**

San Diego River (Upper)

LOE ID:	75826
Pollutant:	Lead
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for lead is 128 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51526, Lead **Region 9**

San Diego River (Upper)

LOE ID:	75832
Pollutant:	Lead
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for lead is 128 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51526, Lead **Region 9**

San Diego River (Upper)

LOE ID:	75836
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the

	County of San Diego, 2003-2009.	038686

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for Lead is 0.015 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River @ Channel Road]
Temporal Representation:	Data was collected on a single day 6/9/2003 - 8/5/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 51526, Lead **Region 9**

San Diego River (Upper)

LOE ID:	75834
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved lead to protect aquatic life in freshwater. The dissolved lead criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51526, Lead **Region 9**

San Diego River (Upper) 038687

LOE ID:	75835
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River @ Channel Road]
Temporal Representation:	Data was collected on a single day 6/9/2003 - 8/5/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 51526, Lead **Region 9**

San Diego River (Upper)

LOE ID:	75833
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009

SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Lead to protect aquatic life in freshwater. The dissolved Lead criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 51530 Region 9

San Diego River (Upper)

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status. One line of evidence are available in the administrative record to assess this pollutant. Zero of the two samples exceed the GUIDELINE. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of two samples exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51530, Malathion Region 9

San Diego River (Upper)

LOE ID:	75663

Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Malathion.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River @ Channel Road]
Temporal Representation:	Data was collected over the time period 7/6/2006-8/5/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 51530, Malathion **Region 9**

San Diego River (Upper)

LOE ID:	78115
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Malathion.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for malathion is 100 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River @ Channel Road]
Temporal Representation:	Data was collected over the time period 7/6/2006-8/5/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 51533 Region 9

San Diego River (Upper)

Pollutant:	**Manganese**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status. One line of evidence are available in the administrative record to assess this pollutant. Zero of the one sample exceed the OBJECTIVE. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeded the OBJECTIVE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51533, Manganese Region 9

San Diego River (Upper)

LOE ID:	75665
Pollutant:	Manganese
LOE Subgroup:	Pollutant-Water

Matrix:	Water	038691
Fraction:	Total	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Manganese.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	The California Secondary MCL for manganese is 0.05 mg/L (Water Quality Control Plan for the San Diego Basin).	
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]	
Temporal Representation:	Data was collected on a single day 5/12/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 51533, Manganese **Region 9**

San Diego River (Upper)

LOE ID:	75666
Pollutant:	Manganese
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Manganese.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Manganese objective for the protection of aquatic life according to Table 3-2 for San Diego River (Upper) within the San Diego Hydrologic Unit is 0.05 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51533, Manganese **Region 9**

San Diego River (Upper)

LOE ID:	75664
Pollutant:	Manganese
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Manganese.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Manganese objective for the protection of aquatic life according to Table 3-2 for San Diego River (Upper) within the San Diego Hydrologic Unit is 0.05 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **51536** **Region 9**

San Diego River (Upper)

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status. Under 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in

sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one water sample and zero of the one sediment sample exceed the CRITERIA and GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one water and zero of one sediment sample exceeded the CRITERIA and GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51536, Nickel **Region 9**

San Diego River (Upper)

LOE ID:	75668
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for nickel is 48.6 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.

Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51536, Nickel **Region 9**

San Diego River (Upper)

LOE ID:	75674
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Nickel to protect aquatic life in freshwater. The dissolved Nickel criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51536, Nickel **Region 9**

San Diego River (Upper)

LOE ID:	75673
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine

	beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nickel is 0.1 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51536, Nickel **Region 9**

San Diego River (Upper)

LOE ID:	75672
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Nickel to protect aquatic life in freshwater. The dissolved Nickel criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51536, Nickel **Region 9**

San Diego River (Upper) 038696

LOE ID:	75667
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for nickel is 48.6 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **51550** **Region 9**

San Diego River (Upper)

Pollutant:	**Nitrate/Nitrite (Nitrite + Nitrate as N)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. Zero of the one sample exceed the CRITERIA.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.038697
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51550, Nitrate/Nitrite (Nitrite + Nitrate as N) **Region 9**
San Diego River (Upper)

LOE ID:	75675
Pollutant:	Nitrate/Nitrite (Nitrite + Nitrate as N)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nitrate/Nitrite as N.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrate + nitrite (as N) is 10.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **51558** **Region 9**
San Diego River (Upper)

Pollutant:	**Nitrogen, Nitrite**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or	Pollutant

Pollution: 038698

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the three samples exceed the CRITERIA.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of three samples exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51558, Nitrogen, Nitrite **Region 9**

San Diego River (Upper)

LOE ID:	75677
Pollutant:	Nitrogen, Nitrite
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Nitrite as N.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrite (as N) is 1.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River @ Channel Road]
Temporal Representation:	Data was collected over the time period 6/9/2003-6/11/2003.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.

QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev.012, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 51558, Nitrogen, Nitrite **Region 9**

San Diego River (Upper)

LOE ID:	75676
Pollutant:	Nitrogen, Nitrite
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nitrite as N.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrite (as N) is 1.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **51554** **Region 9**

San Diego River (Upper)

Pollutant:	**Nitrogen, ammonia (Total Ammonia)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. Zero of the two samples exceed the GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is

sufficient justification against placing this water segment-pollutant combination on the section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of two samples exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51554, Nitrogen, ammonia (Total Ammonia) **Region 9**

San Diego River (Upper)

LOE ID:	75585
Pollutant:	Nitrogen, ammonia (Total Ammonia)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Ammonia As N, Total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Basin Plan: No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	EPA's Lifetime Health advisory level for total ammonia is 30.0 mg/L as stated on page 8 of the 2006 edition of the drinking water standards and health advisories. This Advisory Level is defined as "the concentration of a chemical in drinking water that is not expected to cause any adverse noncarcinogenic effects for up to ten days of exposure."
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River @ Channel Road]
Temporal Representation:	Data was collected on a single day 6/9/2003.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 51554, Nitrogen, ammonia (Total Ammonia) 038701 Region 9

San Diego River (Upper)

LOE ID:	75584
Pollutant:	Nitrogen, ammonia (Total Ammonia)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Ammonia As N, Total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Basin Plan: No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	EPA's Lifetime Health advisory level for total ammonia is 30.0 mg/L as stated on page 8 of the 2006 edition of the drinking water standards and health advisories. This Advisory Level is defined as "the concentration of a chemical in drinking water that is not expected to cause any adverse noncarcinogenic effects for up to ten days of exposure."
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51554, Nitrogen, ammonia (Total Ammonia) Region 9

San Diego River (Upper)

LOE ID:	75583
Pollutant:	Nitrogen, ammonia (Total Ammonia)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Ammonia as N, Total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009

SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Aquatic Life Ambient Water Quality Criteria for Ammonia â€“ Freshwater (USEPA 2013): the 30-day rolling average concentration (criterion continuous concentration or CCC) of total ammonia nitrogen(in mg TAN/L) in freshwater are not to be exceeded more than once every three years on average. The CCC values are based on pH and temperature. The CCC formula is found on page 46 and the table of CCC values is on page 49.
Guideline Reference:	Aquatic Life Ambient Water Quality Criteria for Ammonia - Freshwater 2013
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51554, Nitrogen, ammonia (Total Ammonia) Region 9

San Diego River (Upper)

LOE ID:	75582
Pollutant:	Nitrogen, ammonia (Total Ammonia)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Ammonia as N, Total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Aquatic Life Ambient Water Quality Criteria for Ammonia â€“ Freshwater (USEPA 2013): the 30-day rolling average concentration (criterion continuous concentration or CCC) of total ammonia nitrogen(in mg TAN/L) in freshwater are not to be exceeded more than once every three years on average. The CCC values are based on pH and temperature. The CCC formula is found on page 46 and the table of CCC values is on page 49.
Guideline Reference:	Aquatic Life Ambient Water Quality Criteria for Ammonia - Freshwater 2013
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.

QAPP Information Reference(s): Surface Water Ambient Monitoring Program Quality Assurance Program R038703

DECISION ID	51561	Region 9
San Diego River (Upper)		

Pollutant:	**Permethrin, total**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status. One line of evidence are available in the administrative record to assess this pollutant. Zero of the one sample exceed the GUIDELINE. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one samples exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51561, Permethrin, total	**Region 9**
San Diego River (Upper)	

LOE ID:	75684
Pollutant:	Permethrin, total
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Permethrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP

Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Permethrin does not exceed 0.002 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51561, Permethrin, total **Region 9**

San Diego River (Upper)

LOE ID:	75683
Pollutant:	Permethrin, total
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Permethrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Permethrin does not exceed 0.002 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 51601 **Region 9**

San Diego River (Upper)

Pollutant:	**Selenium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. Zero of the one sample exceeds the CRITERIA.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceededs the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51601, Selenium **Region 9**

San Diego River (Upper)

LOE ID:	75690
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Selenium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The selenium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater is 0.005 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition

Evaluation Guideline:	038706
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51601, Selenium **Region 9**

San Diego River (Upper)

LOE ID:	75689
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Selenium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The Maximum Contaminant Level for selenium in the Basin Plan is 0.01 mg/L.
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51601, Selenium **Region 9**

San Diego River (Upper)

LOE ID:	75688
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	038707
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Selenium.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	The selenium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater is 0.005 mg/L (California Toxics Rule, 2000).	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]	
Temporal Representation:	Data was collected on a single day 5/12/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID **51622** **Region 9**

San Diego River (Upper)

Pollutant:	**Silver**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence are available in the administrative record to assess this pollutant. Zero of the one sample exceed the CRITERIA. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51622, Silver **Region 9**

San Diego River (Upper) 038708

LOE ID:	75693
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Silver.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Silver to protect aquatic life in freshwater. The dissolved Silver criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51622, Silver **Region 9**

San Diego River (Upper)

LOE ID:	75691
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Silver.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP

Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for silver is 0.1 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51622, Silver **Region 9**

San Diego River (Upper)

LOE ID:	75692
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Silver.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Silver to protect aquatic life in freshwater. The dissolved Silver criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **51630** **Region 9**

San Diego River (Upper)

Pollutant:	**Specific Conductivity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**

Last Listing Cycle's Final Listing Decision:	New Decision	038710
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero] of the one sample exceed the GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of twenty-six samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51630, Specific Conductivity **Region 9**

San Diego River (Upper)

LOE ID:	75694
Pollutant:	Specific Conductivity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Conductivity(Us).
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for specific conductance is 900 uS/cm (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.

Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 52009 Region 9

San Diego River (Upper)

Pollutant:	**Temperature, water**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One lines of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the GUIDELINE. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of twenty-six samples is needed to determine if a beneficial use is fully supported using table 3.2. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52009, Temperature, water Region 9

San Diego River (Upper)

LOE ID:	75698
Pollutant:	Temperature, water
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine

	beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Water Temperature.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Board that such alteration in temperature does not adversely affect beneficial uses. At no time or place shall the temperature of any COLD water be increased more than 5Â°F above the natural receiving water temperature.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Inland Fishes of California (Moyle 1976) states that for rainbow trout the optimum range for growth and completion of most life stages is 13-21 degrees C (page 129).
Guideline Reference:	Inland Fishes of California
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 36791 Region 9

San Diego River (Upper)

Pollutant:	**Total Dissolved Solids**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. One of the one sample exceed the OBJECTIVE. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of one sample exceeded the OBJECTIVE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of twenty-six samples is needed to determine if a beneficial use is fully supported using table 3.2. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 36791, Total Dissolved Solids Region 9

San Diego River (Upper) 038713

LOE ID:	75709
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Dissolved Solids.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Dissolved Solids objective for the protection of aquatic life according to Table 3-2 for San Diego River (Upper) within the San Diego Hydrologic Unit is 300 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 36791, Total Dissolved Solids **Region 9**

San Diego River (Upper)

LOE ID:	75708
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Dissolved Solids.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists

	objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Dissolved Solids objective for the protection of aquatic life according to Table 3-2 for San Diego River (Upper) within the San Diego Hydrologic Unit is 300 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 36791, Total Dissolved Solids **Region 9**

San Diego River (Upper)

LOE ID:	3346
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Testimonial Evidence
Matrix:	Not Specified
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	From the letter written by the San Diego Baykeeper on 06/14/2004: There is also evidence that the San Diego River has problems with total dissolved solids. See Huntley, David and Serratore, Shannon, Groundwater Management Planning Study El Monte/Santee Basin. Draft Report Prepared by the San Diego County Groundwater Authority, San Diego CA (1999). This is particularly a problem because of the Santee-El Monte Groundwater Basin which runs directly under the river bed. Therefore, there is substantial surface to groundwater interaction, and opportunity for the total dissolved solids to enter into the water supply. (San Diego Baykeeper, 2004).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The objective is numeric.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	From the Basin Plan: for inland surface waters and all beneficial uses, the WQO for TDS is 500 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	The are is described as the Upper San Diego River. Exact location was not given.
Temporal Representation:	The letter was written on 06/14/2004. No other dates were provided. There is note of another study that dates back to 1999.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 36791, Total Dissolved Solids **Region 9**

San Diego River (Upper)

LOE ID:	75707	038715

Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Dissolved Solids.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for Dissolved Solids is 500 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID	**51634**	**Region 9**
San Diego River (Upper)		

Pollutant:	**Toxicity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. One of the one sample exceeds the GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of one samples exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum

of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51634, Toxicity **Region 9**

San Diego River (Upper)

LOE ID:	75710
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate water toxicity. The sample exhibited significant toxicity. The toxicity test included survival and reproduction of Ceriodaphnia dubia. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL, Significant compared to negative control based on statistical test, less than stated alpha level, AND less than the evaluation threshold (both criteria are met).
Guideline Reference:	
Spatial Representation:	The sample was collected at station907S00577.
Temporal Representation:	The sample was collected in May 2009.
Environmental Conditions:	
QAPP Information:	Data quality is good. Data results were recorded in the SWAMP database and followed SWAMP protocols.
QAPP Information Reference(s):	

DECISION ID **51635** **Region 9**

San Diego River (Upper)

Pollutant:	**Turbidity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final	New Decision

Listing Decision:		038717
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line(s) of evidence are necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceeded the OBJECTIVE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the OBJECTIVE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of twenty-six samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51635, Turbidity **Region 9**

San Diego River (Upper)

LOE ID:	75711
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Turbidity(NTU).
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Turbidity(NTU) objective for the protection of aquatic life according to Table 3-2 for San Diego River (Upper) within the San Diego Hydrologic Unit is 20 NTU.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51635, Turbidity **Region 9**

San Diego River (Upper)

LOE ID:	75712
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Turbidity(NTU).
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Turbidity(NTU) objective for the protection of aquatic life according to Table 3-2 for San Diego River (Upper) within the San Diego Hydrologic Unit is 20 NTU.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **51640** **Region 9**

San Diego River (Upper)

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status. Under 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in

sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Three lines of evidence are available in the administrative record to assess this pollutant. Zero of the five water samples and zero of the one sediment sample exceed the CRITERIA and GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of five water and zero of one sediment samples exceeded the CRITERIA and GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51640, Zinc **Region 9**

San Diego River (Upper)

LOE ID:	75727
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Zinc to protect aquatic life in freshwater. The dissolved Zinc criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.

Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51640, Zinc **Region 9**

San Diego River (Upper)

LOE ID:	75728
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Zinc to protect aquatic life in freshwater. The dissolved Zinc criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51640, Zinc **Region 9**

San Diego River (Upper)

LOE ID:	75723
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine

	beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for zinc is 459 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51640, Zinc **Region 9**

San Diego River (Upper)

LOE ID:	75726
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for zinc is 5.0 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River @ Channel Road]
Temporal Representation:	Data was collected on a single day 6/9/2003 - 8/5/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 51640, Zinc **Region 9**

San Diego River (Upper)

LOE ID:	75725
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	The California Secondary MCL for zinc is 5.0 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51640, Zinc **Region 9**

San Diego River (Upper)

LOE ID:	75724
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP

Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for zinc is 459 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51640, Zinc **Region 9**

San Diego River (Upper)

LOE ID:	75739
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River @ Channel Road]
Temporal Representation:	Data was collected on a single day 6/9/2003 - 8/5/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 51592 Region 9

San Diego River (Upper) 038724

Pollutant:	**pH**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One line of evidence are available in the administrative record to assess this pollutant. Zero of the sixty-one samples exceed the OBJECTIVE. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of sixty-one samples exceeded the OBJECTIVE and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 51592, pH — Region 9

San Diego River (Upper)

LOE ID:	75685
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for pH.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	In inland surface waters the pH shall not be depressed below 6.5 nor raised above 8.5.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site

	[San Diego River below Sentenac Cr. - 907S00577]	038725
Temporal Representation:	Data was collected on a single day 5/12/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 51592, pH **Region 9**

San Diego River (Upper)

LOE ID:	75687
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	60
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Zero of 60 samples exceeded the objective.
Data Reference:	Data for Various Pollutants in the Middle San Diego River Basin, 2005-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The pH of all inland surface waters shall not be depressed below 6.5 or raised above 8.5 as a result of waste discharges.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the RSW-003 station.
Temporal Representation:	Samples were collected once a month from January 2005 to December 2009.
Environmental Conditions:	
QAPP Information:	No QAPP was submitted. Sampling was done by municipalities in San Diego pursuant to the San Diego Municipal Stormwater Permit. Sometimes there is information on their submittal form.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 51592, pH **Region 9**

San Diego River (Upper)

LOE ID:	75686
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for pH.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009

SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	In inland surface waters the pH shall not be depressed below 6.5 nor raised above 8.5.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 53420 Region 9

San Diego River (Upper)

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. Five lines of evidence are available in the administrative record to assess this pollutant. Data from June 2003 to August 2008 show that 25 of 58 single samples exceed the water quality objective for enterococcus of a single sample maximum of 61/100 ml in fresh water. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Data from June 2003 to August 2008 show that 25 of 58 single samples exceed the water quality objective for enterococcus of a single sample maximum of 61/100 ml in fresh water and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 53420, Indicator Bacteria Region 9

San Diego River (Upper)

LOE ID:	75816

Pollutant:	Fecal Coliform	038727
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	60	
Number of Exceedances:	5	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Five (5) of the sixty (60) samples exceeded the Fecal Coliform objective.	
Data Reference:	Data for Various Pollutants in the Middle San Diego River Basin, 2005-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life. Basin Plan for the San Diego Basin.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The Fecal Coliform concentration shall not exceed more than 400/100 ml. USEPA Ambient Water Quality Criteria for Bacteria - 1986.	
Guideline Reference:	Ambient Water Quality Criteria for Bacteria - 1986. EPA440/5-84-002	
Spatial Representation:	The samples were collected at the Carlton Hills Bridge station. WBID: CAR9073100020011025102439	
Temporal Representation:	Samples were collected between January 2005 and December 2009.	
Environmental Conditions:		
QAPP Information:	No QAPP was submitted. Sampling was done by municipalities in San Diego pursuant to the San Diego Municipal Stormwater Permit. Sometimes there is information on their submittal form.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 53420, Indicator Bacteria **Region 9**

San Diego River (Upper)

LOE ID:	75802
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	54
Number of Exceedances:	24
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Diego River (Upper) to determine beneficial use support and results are as follows: 24 of 54 samples exceed the criterion for Enterococci.
Data Reference:	Data for Pathogens from San Diego River, 2006-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Samples shall not exceed 61 organisms per 100 ml for enterococcus in waters designated for REC I beneficial use (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	

Guideline Reference:	038728
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River @ Riverford Road]
Temporal Representation:	Data was collected over the time period 2/28/2006-2/6/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan for the County of San Diego's Dry Weather Monitoring Program and MS4 Program and Truesdail Laboratories Quality Assurance and Quality Control Manual for Environmental Sample Analysis was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan for the County of San Diego's Dry Weather Monitoring Program and MS4 Program and Truesdail Laboratories Quality Assurance and Quality Control Manual for Environmental Sample Analysis.

Line of Evidence (LOE) for Decision ID 53420, Indicator Bacteria **Region 9**

San Diego River (Upper)

LOE ID:	75803
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	4
Number of Exceedances:	1
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Diego River (Upper) to determine beneficial use support and results are as follows: 1 of 4 samples exceed the criterion for Enterococci.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Samples shall not exceed 61 organisms per 100 ml for enterococcus in waters designated for REC I beneficial use (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River @ Channel Road]
Temporal Representation:	Data was collected over the time period 6/9/2003-8/5/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 53420, Indicator Bacteria **Region 9**

San Diego River (Upper)

LOE ID:	75699
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	038729
Beneficial Use:	Water Contact Recreation	
Number of Samples:	54	
Number of Exceedances:	14	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Diego River (Upper) to determine beneficial use support and results are as follows: 14 of 54 samples exceed the criterion for Coliform, Total.	
Data Reference:	Data for Pathogens from San Diego River, 2006-2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxicsubstances in concentrations which are toxic to,or which produce detrimental physiologicalresponses in human, plant, animal, or indigenousaquatic life (Basin Plan).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In waters designated for water contact recreation (REC I), the total coliform concentration shall not exceed 10000 MPN/100 ml (CDPH 2006).	
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.	
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River @ Riverford Road]	
Temporal Representation:	Data was collected over the time period 2/28/2006-2/6/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan for the County of San Diego's Dry Weather Monitoring Program and MS4 Program and Truesdail Laboratories Quality Assurance and Quality Control Manual for Environmental Sample Analysis was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan for the County of San Diego's Dry Weather Monitoring Program and MS4 Program and Truesdail Laboratories Quality Assurance and Quality Control Manual for Environmental Sample Analysis.	

Line of Evidence (LOE) for Decision ID 53420, Indicator Bacteria **Region 9**

San Diego River (Upper)

LOE ID:	75700
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxicsubstances in concentrations which are toxic to,or which produce detrimental physiologicalresponses in human, plant, animal, or

	indigenousaquatic life (Basin Plan).	038730
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In waters designated for water contact recreation (REC I), the total coliform concentration shall not exceed 10000 MPN/100 ml (CDPH 2006).	
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.	
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River @ Channel Road]	
Temporal Representation:	Data was collected over the time period 6/9/2003-8/5/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 53420, Indicator Bacteria **Region 9**

San Diego River (Upper)

LOE ID:	75701
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	60
Number of Exceedances:	6
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Six (6) of the sixty (60) samples exceeded the Total Coliform objective.
Data Reference:	Data for Various Pollutants in the Middle San Diego River Basin, 2005-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life. Basin Plan for the San Diego Basin.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Total Coliform concentration shall not exceed more than 10000/100 ml. USEPA Ambient Water Quality Criteria for Bacteria - 1986.
Guideline Reference:	Ambient Water Quality Criteria for Bacteria - 1986. EPA440/5-84-002
Spatial Representation:	The samples were collected at the Carlton Hills Bridge station. WBID: CAR9073100020011025102439
Temporal Representation:	Samples were collected between January 2005 and December 2009.
Environmental Conditions:	
QAPP Information:	No QAPP was submitted. Sampling was done by municipalities in San Diego pursuant to the San Diego Municipal Stormwater Permit. Sometimes there is information on their submittal form.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 53420, Indicator Bacteria **Region 9**

San Diego River (Upper)

LOE ID:	75804

Pollutant:	Escherichia coli (E. coli)	038731
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	53	
Number of Exceedances:	16	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Diego River (Upper) to determine beneficial use support and results are as follows: 16 of 53 samples exceed the criterion for Escherichia coli.	
Data Reference:	Data for Pathogens from San Diego River, 2006-2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Samples shall not exceed 235 per 100 ml for E. coli in waters designated for REC I beneficial use (Water Quality Control Plan for the San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River @ Riverford Road]	
Temporal Representation:	Data was collected over the time period 2/28/2006-2/6/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan for the County of San Diego's Dry Weather Monitoring Program and MS4 Program and Truesdail Laboratories Quality Assurance and Quality Control Manual for Environmental Sample Analysis was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan for the County of San Diego's Dry Weather Monitoring Program and MS4 Program and Truesdail Laboratories Quality Assurance and Quality Control Manual for Environmental Sample Analysis.	

Line of Evidence (LOE) for Decision ID 53420, Indicator Bacteria **Region 9**

San Diego River (Upper)

LOE ID:	75805
Pollutant:	Escherichia coli (E. coli)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	60
Number of Exceedances:	4
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Four (4) of the sixty (60) samples exceeded the E.Coli objective.
Data Reference:	Data for Various Pollutants in the Middle San Diego River Basin, 2005-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life. Basin Plan for the San Diego Basin.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	The E.Coli concentration shall not exceed more than 235/100 ml. USEPA Ambient Water Quality Criteria for Bacteria - 1986.
Guideline Reference:	Ambient Water Quality Criteria for Bacteria - 1986. EPA440/5-84-002
Spatial Representation:	The samples were collected at the Carlton Hills Bridge station. WBID: CAR9073100020011025102439
Temporal Representation:	Samples were collected between January 2005 and December 2009.
Environmental Conditions:	
QAPP Information:	No QAPP was submitted. Sampling was done by municipalities in San Diego pursuant to the San Diego Municipal Stormwater Permit. Sometimes there is information on their submittal form.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 53420, Indicator Bacteria **Region 9**

San Diego River (Upper)

LOE ID:	75813
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Non-Contact Recreation
Number of Samples:	50
Number of Exceedances:	3
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Diego River (Upper) to determine beneficial use support and results are as follows: 3 of 50 samples exceed the criterion for Coliform, Fecal.
Data Reference:	Data for Pathogens from San Diego River, 2006-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters designated for non contact recreation (REC 2), the fecal coliform concentration shall not exceed 4000 MPN/100 ml (Basin Plan).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River @ Riverford Road]
Temporal Representation:	Data was collected over the time period 3/2/2006-2/6/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan for the County of San Diego's Dry Weather Monitoring Program and MS4 Program and Truesdail Laboratories Quality Assurance and Quality Control Manual for Environmental Sample Analysis was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan for the County of San Diego's Dry Weather Monitoring Program and MS4 Program and Truesdail Laboratories Quality Assurance and Quality Control Manual for Environmental Sample Analysis.

Line of Evidence (LOE) for Decision ID 53420, Indicator Bacteria **Region 9**

San Diego River (Upper)

LOE ID:	75814
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water

Matrix:	Water	038733
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	50	
Number of Exceedances:	14	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Diego River (Upper) to determine beneficial use support and results are as follows: 14 of 50 samples exceed the criterion for Coliform, Fecal.	
Data Reference:	Data for Pathogens from San Diego River, 2006-2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the fecal coliform concentration shall not exceed 400 MPN/100 ml.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River @ Riverford Road]	
Temporal Representation:	Data was collected over the time period 3/2/2006-2/6/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan for the County of San Diego's Dry Weather Monitoring Program and MS4 Program and Truesdail Laboratories Quality Assurance and Quality Control Manual for Environmental Sample Analysis was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan for the County of San Diego's Dry Weather Monitoring Program and MS4 Program and Truesdail Laboratories Quality Assurance and Quality Control Manual for Environmental Sample Analysis.	

Line of Evidence (LOE) for Decision ID 53420, Indicator Bacteria **Region 9**

San Diego River (Upper)

LOE ID:	75815
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	4
Number of Exceedances:	1
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Diego River (Upper) to determine beneficial use support and results are as follows: 1 of 4 samples exceed the criterion for Coliform, Fecal.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the fecal coliform concentration shall not exceed 400 MPN/100 ml.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	038734
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River @ Channel Road]
Temporal Representation:	Data was collected over the time period 6/9/2003-8/5/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 51560 — Region 9

San Diego River (Upper)

Pollutant:	**Oxygen, Dissolved**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Forty of the sixty-one samples exceed the OBJECTIVE for Warm Freshwater Habitat (even more would exceed for Cold Water Habitat). Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Forty of sixty-one samples exceed the OBJECTIVE and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 51560, Oxygen, Dissolved — Region 9

San Diego River (Upper)

LOE ID:	72816
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved

Beneficial Use:	Warm Freshwater Habitat	038735
Number of Samples:	60	
Number of Exceedances:	40	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Numeric data generated from 60 averages of Dissolved Oxygen concentrations had 40 exceedences.	
Data Reference:	Data for Various Pollutants in the Middle San Diego River Basin, 2005-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The dissolved oxygen content of all surface waters designated as "Warm Freshwater Habitat" must be greater than 5.0 mg/L.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from the RSW-003 station.	
Temporal Representation:	Samples were collected once a month from January 2005 to December 2009.	
Environmental Conditions:		
QAPP Information:	No QAPP was submitted. Sampling was done by municipalities in San Diego pursuant to the San Diego Municipal Stormwater Permit. Sometimes there is information on their submittal form.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 51560, Oxygen, Dissolved **Region 9**

San Diego River (Upper)

LOE ID:	75682
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Oxygen, Dissolved.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan, San Diego Basin, Cold Water Habitat Objective, Chapter III, General Objectives for all Inland Surface Waters, Enclosed Bays and Estuaries states the following: The dissolved oxygen concentration for cold water habitats shall not be reduced below 8.0 mg/l at any time.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.

Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51560, Oxygen, Dissolved **Region 9**

San Diego River (Upper)

LOE ID:	75678
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Oxygen, Dissolved.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan, San Diego Basin, Warm Water Habitat Objective, Chapter III, General Objectives for all Inland Surface Waters, Enclosed Bays and Estuaries states the following: The dissolved oxygen concentration for warm water habitats shall not be reduced below 5.0 mg/l at any time.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **52018** **Region 9**

San Diego River (Upper)

Pollutant:	**Sulfates**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. Four of the six samples exceed the OBJECTIVE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Four of six samples exceed the OBJECTIVE and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 52018, Sulfates **Region 9**

San Diego River (Upper)

LOE ID:	75695
Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Sulfate.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for sulfate is 250 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 52018, Sulfates **Region 9**

San Diego River (Upper)

LOE ID:	9017	038738
Pollutant:	Sulfates	
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	Not Recorded	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	5	
Number of Exceedances:	4	
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)	
Data Used to Assess Water Quality:	Five water samples were collected at San Diego River station 907SSDR15 on May 2004, September 2004, February 2005, and April 2005, four out of five showed excessive sulfate concentrations (SWAMP, 2007).	
Data Reference:	Monitoring data for Region 9	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	The recommended secondary drinking water standard for sulfate is 250 mg/l (RWQCB, 2007).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Water samples were collected at San Diego River station 907SSDR15; (Latitude 32.7621, Longitude -117.1925).	
Temporal Representation:	Samples were collected on May 2004, September 2004, February 2005, and April 2005.	
Environmental Conditions:		
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.	
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA	

Line of Evidence (LOE) for Decision ID 52018, Sulfates **Region 9**

San Diego River (Upper)

LOE ID:	75697
Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Sulfate.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Sulfate objective for the protection of aquatic life according to Table 3-2 for San Diego River (Upper)

	within the San Diego Hydrologic Unit is 65 mg/L.	038739
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]	
Temporal Representation:	Data was collected on a single day 5/12/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 52018, Sulfates **Region 9**

San Diego River (Upper)

LOE ID:	75696
Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for San Diego River (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Sulfate.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Sulfate objective for the protection of aquatic life according to Table 3-2 for San Diego River (Upper) within the San Diego Hydrologic Unit is 65 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Diego River (Upper) was collected at 1 monitoring site [San Diego River below Sentenac Cr. - 907S00577]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **33623** **Region 9**

San Diego River (Upper)

Pollutant:	**Excess Algal Growth**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original

Impairment from Pollutant or Pollution:	Pollutant	038740
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. 303(d) listing decisions made prior to 2006 were not held in an assessment database. This is a placeholder decision for a 303(d) listing made in a previous assessment cycle. The Regional Boards will update this decision when new data and information become available and are assessed. One line of evidence (visual observation) is available in the administrative record. The excess algae growth information is not backed by nutrient data. Excess algae growth information should not be placed on the section 303(d) list because is not a pollutant or toxicity (section 2 of the Listing Policy).	
Regional Board Decision Recommendation:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. The Regional Board will update this decision when new data and information become available and are assessed. After review of the available data and information, Regional Board staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because the information is not based on a condition and not a pollutant.	

Line of Evidence (LOE) for Decision ID 33623, Excess Algal Growth **Region 9**

San Diego River (Upper)

LOE ID:	3349
Pollutant:	Excess Algal Growth
LOE Subgroup:	Testimonial Evidence
Matrix:	Not Specified
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	From the letter written on 06/14/2004 by the San Diego Baykeeper: In the Santee portion of the San Diego River there have been visual observations that reveal foam and algal blooms, foul river odors, and trash dumping. (San Diego Baykeeper, 2004).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters, enclosed bays and estuaries, coastal lagoons, and ground waters and all beneficial uses, inland surface waters, bays and estuaries, and coastal lagoon waters shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. Concentrations of nitrogen and phosphorus, by themselves or in combination with other nutrients, shall be maintained at levels below those which stimulate algae and emergent plant growth.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The area is described as Upper San Diego River.
Temporal Representation:	A letter regarding pollution was written on 06/14/2004. No other dates were provided.
Environmental Conditions:	
QAPP Information:	QA Info Missing

QAPP Information Reference(s): 038741

DECISION ID	43100	Region 9
San Diego River (Upper)		

Pollutant:	**Foam/Flocs/Scum/Oil Slicks**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for listing under sections 2.1, 3.6, and 3.10 of the Listing Policy. Under section 3.6, a single line of evidence is necessary to assess listing status while under section 3.10, a minimum of two lines of evidence are needed to assess listing status. One line of evidence is required are available in the administrative record to assess foams, flocculants, and oil slicks. Two lines of evidence are required for scum. Scum data is not backed by any nutrient data and therefore cannot be used as the basis for a listing on its own (section 2 of the Listing Policy). Based on the information presented, the water body-pollutant should not be placed on the section 303(d) list because it cannot be determined if the pollutant contribute or cause a toxicological effect (section 2 of the Listing Policy). This data was reviewed during the development of the 2002 303(d) List and was not considered to be the basis for a listing at that time. It is still not enough information to list this waterbody for this pollutant.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43100, Foam/Flocs/Scum/Oil Slicks	**Region 9**
San Diego River (Upper)	

LOE ID:	3348
Pollutant:	Foam/Flocs/Scum/Oil Slicks
LOE Subgroup:	Testimonial Evidence
Matrix:	Not Specified
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	From the letter written by the San Diego Baykeeper on 06/14/2004: . In the Santee portion of the San Diego River there have been visual observations that reveal foam and algal blooms, foul river odors, and trash dumping. (San Diego Baykeeper, 2004).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, waters shall not contain floating material, including solids, liquids foams, and scum in concentrations which cause nuisance or adversely affect beneficial uses.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The area is described as Upper San Diego River near Santee.
Temporal Representation:	The letter regarding pollution was written on 06/14/200. No other dates were provided.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

DECISION ID 33624 Region 9

San Diego River (Upper)

Pollutant:	**Sediment**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: One line of evidence (visual observation) is available in the administrative record. Information is not backed with numerical data. One time visual observation information should not be placed on the section 303(d) list because it cannot be determined if the pollutant contribute or cause a toxicological effect (section 2 of the Listing Policy). (More likely, the sediment is destroying habitat.) This data was reviewed during the development of the 2002 303(d) List and was not considered to be the basis for a listing at that time. It is still not enough information to list this waterbody for this pollutant.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33624, Sediment Region 9

San Diego River (Upper)

LOE ID:	3347
Pollutant:	Sediment
LOE Subgroup:	Testimonial Evidence
Matrix:	Not Specified
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Chemical monitoring of sediments
Data Used to Assess Water Quality:	From the letter from the San Diego Baykeeper on 06/14/2004: The State Board has data that was submitted in 2002 by Suzanne M. Michel, Ph.D., Water Resources Geography,

	which states that contaminants were dumped into the river by Lakeside Landfill, and sediment from Pier 3 was dumped into the river by the Naval Station. (San Diego Baykeeper, 2004).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for sediment states that the suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The area is described as Upper San Diego River. No other location information was reported.
Temporal Representation:	The letter regarding possible impairment was written on 06/14/2004. No other dates were reported.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

DECISION ID 32811 Region 9

San Diego River (Upper)

Pollutant:	**Taste and odor**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: One line of evidence is available in the administrative record. Information is not backed with numerical data. Based on the information presented, the water body-pollutant should not be placed on the section 303(d) list because it cannot be determined if the pollutant contribute or cause a toxicological effect (section 2 of the Listing Policy). This data was reviewed during the development of the 2002 303(d) List and was not considered to be the basis for a listing at that time. It is still not enough information to list this waterbody for this pollutant.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32811, Taste and odor Region 9

San Diego River (Upper)

LOE ID:	3350
Pollutant:	Taste and odor
LOE Subgroup:	Testimonial Evidence
Matrix:	Not Specified
Fraction:	None

Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	From the letter from the San Diego Baykeeper on 06/14/2004: . In the Santee portion of the San Diego River there have been visual observations that reveal foam and algal blooms, foul river odors, and trash dumping. (San Diego Baykeeper, 2004).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, Waters shall not contain taste or odor producing substances at concentrations which cause a nuisance or adversely affect beneficial uses.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Odor is 3 units.
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	The are is described as the Upper San Diego River.
Temporal Representation:	The letter regarding pollution was written on 06/14/2004. No other dates were provided.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

DECISION ID 43381 Region 9

San Diego River (Upper)

Pollutant:	**Trash**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: One line of evidence is available in the administrative record. Information is not backed with numerical data. Based on the information presented, the water body-pollutant should not be placed on the section 303(d) list because it cannot be determined if the pollutant contribute or cause a toxicological effect (section 2 of the Listing Policy). This data was reviewed during the development of the 2002 303(d) List and was not considered to be the basis for a listing at that time. It is still not enough information to list this waterbody for this pollutant.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43381, Trash Region 9

San Diego River (Upper)

LOE ID:	3351

Pollutant:	Trash
LOE Subgroup:	Testimonial Evidence
Matrix:	Not Specified
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	From the letter written by the San Diego Baykeeper on 06/14/2004: In the Santee portion of the San Diego River there have been visual observations that reveal foam and algal blooms, foul river odors, and trash dumping. (San Diego Baykeeper, 2004).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No objective was found.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The are is described as the Upper San Diego River.
Temporal Representation:	The letter regarding trash dumping was written on 06/14/2004. No other dates were provided.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: King Creek
Water Body ID: CAR9073100020020306092623
Water Body Type: River & Stream

DECISION ID 51830 **Region 9**
King Creek

Pollutant: Alkalinity as CaCO3
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one samples exceed the GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of twenty-six samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51830, Alkalinity as CaCO3 **Region 9**
King Creek

LOE ID: 74018

Pollutant: Alkalinity as CaCO3
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Cold Freshwater Habitat

Number of Samples: 1

Number of Exceedances:	0	038747

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Alkalinity as CaCO3.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Alkalinity as CaCO3 criteria for the protection of freshwater aquatic life is 20000 ug/L (National Recommended Water Quality Criteria, 2009).
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51830, Alkalinity as CaCO3 **Region 9**

King Creek

LOE ID:	74017
Pollutant:	Alkalinity as CaCO3
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Alkalinity as CaCO3.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Alkalinity as CaCO3 criteria for the protection of freshwater aquatic life is 20000 ug/L (National Recommended Water Quality Criteria, 2009).
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]

Temporal Representation:	Data was collected on a single day 5/13/2009.	038748
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID 51831 Region 9

King Creek

Pollutant:	**Aluminum**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceeds the GUIDELINE. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51831, Aluminum Region 9

King Creek

LOE ID:	74019
Pollutant:	Aluminum
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Aluminum.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009

SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for aluminum is 0.2 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51831, Aluminum **Region 9**

King Creek

LOE ID:	74021
Pollutant:	Aluminum
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Aluminum.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The National Recommended Water Quality Critiera for the protection of aquatic life from aluminum is the chronic continuous concentration (expressed as a 4-day average) of 87 ug/L.
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51831, Aluminum **Region 9**

King Creek

LOE ID:	74020	038750

Pollutant:	Aluminum
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Aluminum.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The National Recommended Water Quality Critiera for the protection of aquatic life from aluminum is the chronic continuous concentration (expressed as a 4-day average) of 87 ug/L.
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID	**51832**	**Region 9**
King Creek		

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status. Under 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one water sample and zero of the one sediment sample exceed the CRITERIA and GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that: 038751
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one water sample and zero of one sediment sample exceeded the CRITERIA and GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51832, Arsenic **Region 9**
King Creek

LOE ID:	74029
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The dissolved arsenic criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved arsenic is 0.150 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51832, Arsenic **Region 9**
King Creek

LOE ID:	74027
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water

Matrix:	Water	038752
Fraction:	Dissolved	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	The dissolved arsenic criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved arsenic is 0.150 mg/L (California Toxics Rule, 2000).	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]	
Temporal Representation:	Data was collected on a single day 5/13/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 51832, Arsenic **Region 9**

King Creek

LOE ID:	74028
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for arsenic is 0.01 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]

Temporal Representation:	Data was collected on a single day 5/13/2009.	038753
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 51832, Arsenic **Region 9**

King Creek

LOE ID:	74026
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for arsenic is 33 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51832, Arsenic **Region 9**

King Creek

LOE ID:	74025
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use

	support and results are as follows: 0 of 1 samples exceed the criterion for arsenic.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for arsenic is 33 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 53336 Region 9

King Creek

Pollutant:	**Benthic Community Effects**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Benthic Community Effects is being considered for placement on the CWA section 303(d) List under sections 3.9 and 3.1 of the Listing Policy. Under section 3.9, an additional line of evidence associating Benthic Community Effects with a water or sediment concentration of pollutant(s) is necessary to assess listing status. Based on the readily available data and information, the weight of evidence provides sufficient justification for not placing Benthic Community Effects in this water segment on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Pursuant to section 3.9 of the Listing Policy, the water does not exhibit significant degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index. 4. Pursuant to section 3.9 of the Listing Policy, the water segment does not have associated pollutant(s) samples that exceed water quality objectives. 5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not being met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. Furthermore, what data is available does not indicate that the benthic community exhibits degradation when compared to reference.

Line of Evidence (LOE) for Decision ID 53336, Benthic Community Effects Region 9

King Creek 038755

LOE ID:	81136
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	The CSCI score for this site is above the 0.79 threshold, and is therefore not exceeding the water quality objective for the aquatic life beneficial use.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009 Region 9 CSCI Scores & Water Body Information
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.
Guideline Reference:	Development of a Benthic Index of Biotic Integrity (B-IBI) for Wadeable Streams in Northern Coastal California and its Application to Regional 305(b) Assessment
Spatial Representation:	The samples were collected from King Creek ~0.8mi above WF. 907S01434
Temporal Representation:	The sample was collected in May 2009.
Environmental Conditions:	
QAPP Information:	Samples were collected for the SWAMP RWB9 Stormwater Monitoring Council CY 2009 following SWAMP protocols and stored in the SWAMP database.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 53336, Benthic Community Effects **Region 9**

King Creek

LOE ID:	72756
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1

Number of Exceedances:	0	038756
Data and Information Type:	Benthic macroinvertebrate surveys	
Data Used to Assess Water Quality:	The one sample collected had an IBI score above 40. The IBI score for this site was 53.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.	
Guideline Reference:	Development of a Benthic Index of Biotic Integrity (B-IBI) for Wadeable Streams in Northern Coastal California and its Application to Regional 305(b) Assessment	
Spatial Representation:	The samples were collected from King Creek ~0.8mi above WF. 907S01434	
Temporal Representation:	The sample was collected in May 2009.	
Environmental Conditions:		
QAPP Information:	Samples were collected for the SWAMP RWB9 Stormwater Monitoring Council CY 2009 following SWAMP protocols and stored in the SWAMP database.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID	**51837**	**Region 9**
King Creek		

Pollutant:	**Bifenthrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the GUIDELINE. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision	After review of the available data and information, RWQCB staff concludes that the water body-

Recommendation: pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51837, Bifenthrin **Region 9**

King Creek

LOE ID:	74030
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Bifenthrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Bifenthrin does not exceed 0.0006 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51837, Bifenthrin **Region 9**

King Creek

LOE ID:	74031
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Bifenthrin.

Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	038758
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Bifenthrin does not exceed 0.0006 ug/L.	
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.	
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]	
Temporal Representation:	Data was collected on a single day 5/13/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID 51840 Region 9

King Creek

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status. Under 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one sediment sample and zero of the one water sample exceed the GUIDELINE and CRITERIA.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sediment and zero of one water sample exceeded the GUIDELINE and CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51840, Cadmium Region 9

King Creek 038759

LOE ID:	74033
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for cadmium is 4.98 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51840, Cadmium **Region 9**

King Creek

LOE ID:	74032
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be

	maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for cadmium is 4.98 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51840, Cadmium **Region 9**

King Creek

LOE ID:	74034
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Cadmium to protect aquatic life in freshwater. The dissolved Cadmium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51840, Cadmium **Region 9**

King Creek

LOE ID:	74036

Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Cadmium to protect aquatic life in freshwater. The dissolved Cadmium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51840, Cadmium **Region 9**

King Creek

LOE ID:	74035
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for cadmium is 0.005 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR

Evaluation Guideline:		038762
Guideline Reference:		

Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 51848 — Region 9
King Creek

Pollutant:	**Chloride**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the CRITERIA. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51848, Chloride — Region 9
King Creek

LOE ID:	74037
Pollutant:	Chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chloride.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Chloride objective for the protection of aquatic life according to Table 3-2 for King Creek within the San Diego Hydrologic Unit is 50 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51848, Chloride **Region 9**

King Creek

LOE ID:	74038
Pollutant:	Chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chloride.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The recommended secondary maximum contamination level acceptable to consumers of drinking water is 250 mg/L.
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51848, Chloride **Region 9**

King Creek 038764

LOE ID:	74041
Pollutant:	Chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chloride.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Chloride objective for the protection of aquatic life according to Table 3-2 for King Creek within the San Diego Hydrologic Unit is 50 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **51850** **Region 9**

King Creek

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status. Under 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one sediment sample and zero of the one water sample exceed the GUIDELINE and CRITERIA.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that: 038765
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one water sample and zero of one sediment sample exceeded the GUIDELINE and CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51850, Chromium **Region 9**
King Creek

LOE ID:	74045
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for total chromium is 0.05 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51850, Chromium **Region 9**
King Creek

LOE ID:	74046
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved

Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium. Since the chromium species was not identified, the data point(s) were assessed using both the Chromium III criteria which is hardness-dependent, and the criterion continuous concentration (4-day average) to protect aquatic life in freshwater for chromium VI which is 11 ug/L and is not hardness dependent.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved chromium to protect aquatic life in freshwater. The dissolved Chromium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51850, Chromium **Region 9**

King Creek

LOE ID:	74042
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for chromium is 111 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51850, Chromium **Region 9**

King Creek

LOE ID:	74043
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for chromium is 111 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51850, Chromium **Region 9**

King Creek

LOE ID:	74044
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	Dissolved	038768
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium. Since the chromium species was not identified, the data point(s) were assessed using both the Chromium III criteria which is hardness-dependent, and the criterion continuous concentration (4-day average) to protect aquatic life in freshwater for chromium VI which is 11 ug/L and is not hardness dependent.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Chromium to protect aquatic life in freshwater. The dissolved Chromium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]	
Temporal Representation:	Data was collected on a single day 5/13/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID	**51862**	**Region 9**
King Creek		

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status. Under 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one sediment sample and zero of the one water sample exceed the GUIDELINE and CRITERIA.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.038769
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sediment sample and zero of one water sample exceeded the GUIDELINE and CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51862, Copper **Region 9**
King Creek

LOE ID:	74049
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Copper to protect aquatic life in freshwater. The dissolved Copper criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51862, Copper **Region 9**
King Creek

LOE ID:	74048
Pollutant:	Copper
LOE Subgroup:	Pollutant-Sediment

Matrix:	Sediment	038770
Fraction:	Total	
Beneficial Use:	Cold Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for copper is 149 mg/Kg dry weight (MacDonald et al. 2000).	
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31	
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]	
Temporal Representation:	Data was collected on a single day 5/13/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 51862, Copper **Region 9**

King Creek

LOE ID:	74047
Pollutant:	Copper
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for copper is 149 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater

ecosystems. Environmental Contamination and Toxicology. 39: 20-31 038771

Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51862, Copper King Creek **Region 9**

LOE ID:	74051
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved copper to protect aquatic life in freshwater. The dissolved copper criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51862, Copper King Creek **Region 9**

LOE ID:	74050
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1

Number of Exceedances:	0	038772

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for copper is 1.0 mg/L (Title 22 California Code of Regulations).
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID	51864	Region 9
King Creek		

Pollutant:	**Cyfluthrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the GUIDELINE. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51864, Cyfluthrin **Region 9**

King Creek 038773

LOE ID:	74053
Pollutant:	Cyfluthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cyfluthrin, total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of lambda-cyhalothrin does not exceed 0.0005 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Mixtures of lambda-cyhalothrin and other pyrethroids should be considered in an additive manner. (Fojut et al. 2012)Â
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51864, Cyfluthrin **Region 9**

King Creek

LOE ID:	74052
Pollutant:	Cyfluthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cyfluthrin, total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP

Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of lambda-cyhalothrin does not exceed 0.0005 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Mixtures of lambda-cyhalothrin and other pyrethroids should be considered in an additive manner. (Fojut et al. 2012)Â
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 51868 Region 9

King Creek

Pollutant:	**Cyhalothrin, Lambda**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the one samples exceed the GUIDELINE. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51868, Cyhalothrin, Lambda Region 9

King Creek

LOE ID: 74054

Pollutant:	Cyhalothrin, Lambda	038775
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	Total	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cyhalothrin, lambda, total.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Cyhalothrin, lambda, total does not exceed 0.0005 ug/L.	
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.	
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]	
Temporal Representation:	Data was collected on a single day 5/13/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 51868, Cyhalothrin, Lambda **Region 9**

King Creek

LOE ID:	74055
Pollutant:	Cyhalothrin, Lambda
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cyhalothrin, lambda, total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Cyhalothrin, lambda, total does not exceed 0.0005 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 51871 Region 9

King Creek

Pollutant:	**Cypermethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the GUIDELINE. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51871, Cypermethrin Region 9

King Creek

LOE ID:	74057
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat

Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	One of one sample result was not used in the assessment because the laboratory data was non-detect and the method detection limit was above the guideline and therefore the results could not be quantified with the level of certainty required by the Listing Policy
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of cypermethrin does not exceed 0.0002 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Fojut et al. 2012)
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51871, Cypermethrin **Region 9**

King Creek

LOE ID:	74056
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	One of one sample result was not used in the assessment because the laboratory data was non-detect and the method detection limit was above the guideline and therefore the results could not be quantified with the level of certainty required by the Listing Policy
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of cypermethrin does not exceed 0.0002 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Fojut et al. 2012)
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides.

Reviews of Environmental Contamination and Toxicology 216:51-103. 038778

Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 51875 Region 9

King Creek

Pollutant:	**Deltamethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the GUIDELINE. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51875, Deltamethrin Region 9

King Creek

LOE ID:	74059
Pollutant:	Deltamethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	038779
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Deltamethrin.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The evaluation guideline for Deltamethrin is the maximum acceptable toxicant concentration (MATC) of 0.02 ug/L.	
Guideline Reference:	OPP Pesticide Ecotoxicity Database.	
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]	
Temporal Representation:	Data was collected on a single day 5/13/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 51875, Deltamethrin **Region 9**

King Creek

LOE ID:	74058
Pollutant:	Deltamethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Deltamethrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for Deltamethrin is the maximum acceptable toxicant concentration (MATC) of 0.02 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID	51876	038780 Region 9
King Creek		

Pollutant:	**Esfenvalerate/Fenvalerate**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51876, Esfenvalerate/Fenvalerate **Region 9**

King Creek

LOE ID:	74061
Pollutant:	Esfenvalerate/Fenvalerate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Esfenvalerate/Fenvalerate, total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic

	life (Water Quality Control Plan for the San Diego Basin).	038781
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	According to the USEPA Office of Pesticide Programs Ecotoxicity database, the aquatic life EC50 for Esfenvalerate/Fenvalerate is 0.9 ug/L.	
Guideline Reference:	OPP Pesticide Ecotoxicity Database.	
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]	
Temporal Representation:	Data was collected on a single day 5/13/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 51876, Esfenvalerate/Fenvalerate **Region 9**

King Creek

LOE ID:	74060
Pollutant:	Esfenvalerate/Fenvalerate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Esfenvalerate/Fenvalerate, total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to the USEPA Office of Pesticide Programs Ecotoxicity database, the aquatic life EC50 for Esfenvalerate/Fenvalerate is 0.9 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **51877** **Region 9**

King Creek

Pollutant:	**Fenpropathrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision

Revision Status	Revised	038782
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51877, Fenpropathrin **Region 9**

King Creek

LOE ID:	74062
Pollutant:	Fenpropathrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Fenpropathrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for Fenpropathrin is the median lethal concentration (LC50; 2.2 ug/L).
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]

Temporal Representation:	Data was collected on a single day 5/13/2009.	038783
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 51877, Fenpropathrin **Region 9**

King Creek

LOE ID:	74063
Pollutant:	Fenpropathrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Fenpropathrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for Fenpropathrin is the median lethal concentration (LC50; 2.2 ug/L).
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **51878** **Region 9**

King Creek

Pollutant:	**Iron**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the OBJECTIVE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the OBJECTIVE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51878, Iron **Region 9**

King Creek

LOE ID:	74066
Pollutant:	Iron
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Iron.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Iron objective for the protection of aquatic life according to Table 3-2 for King Creek within the San Diego Hydrologic Unit is 0.3 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51878, Iron **Region 9**

King Creek

LOE ID:	74064

Pollutant:	Iron
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Iron.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Iron objective for the protection of aquatic life according to Table 3-2 for King Creek within the San Diego Hydrologic Unit is 0.3 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51878, Iron **Region 9**

King Creek

LOE ID:	74065
Pollutant:	Iron
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Iron.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for iron is 0.3 mg/L (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 51879 Region 9

King Creek

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status. Under 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one sediment sample and zero of the one water sample exceed the GUIDELINE and CRITERIA.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sediment sample and zero of the one water sample exceeded the GUIDELINE and CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51879, Lead Region 9

King Creek

LOE ID:	74069
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	1	038787
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Lead to protect aquatic life in freshwater. The dissolved Lead criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]	
Temporal Representation:	Data was collected on a single day 5/13/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 51879, Lead **Region 9**

King Creek

LOE ID:	74068
Pollutant:	Lead
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for lead is 128 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.

Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51879, Lead **Region 9**

King Creek

LOE ID:	74067
Pollutant:	Lead
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for lead is 128 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51879, Lead **Region 9**

King Creek

LOE ID:	73978
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.

Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	038789
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved lead to protect aquatic life in freshwater. The dissolved lead criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]	
Temporal Representation:	Data was collected on a single day 5/13/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID 51881 Region 9

King Creek

Pollutant:	**Manganese**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the OBJECTIVE. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeded the OBJECTIVE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51881, Manganese Region 9

King Creek

LOE ID:	73981	038790

Pollutant:	Manganese
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Manganese.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Manganese objective for the protection of aquatic life according to Table 3-2 for King Creek within the San Diego Hydrologic Unit is 0.05 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51881, Manganese **Region 9**

King Creek

LOE ID:	73980
Pollutant:	Manganese
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Manganese.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for manganese is 0.05 mg/L (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	

Guideline Reference:	038791
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51881, Manganese **Region 9**

King Creek

LOE ID:	73979
Pollutant:	Manganese
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Manganese.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Manganese objective for the protection of aquatic life according to Table 3-2 for King Creek within the San Diego Hydrologic Unit is 0.05 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **51885** **Region 9**

King Creek

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing

status. Under 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one sediment sample and zero of the one water sample exceed the GUIDELINE and CRITERIA.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sediment and zero of one water sample exceeded the GUIDELINE and CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51885, Nickel **Region 9**

King Creek

LOE ID:	73985
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nickel is 0.1 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51885, Nickel **Region 9**

King Creek

LOE ID:	73983
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for nickel is 48.6 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51885, Nickel **Region 9**

King Creek

LOE ID:	73984
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP

Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Nickel to protect aquatic life in freshwater. The dissolved Nickel criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51885, Nickel **Region 9**

King Creek

LOE ID:	73982
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for nickel is 48.6 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51885, Nickel **Region 9**

King Creek

LOE ID:	73986

Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Nickel to protect aquatic life in freshwater. The dissolved Nickel criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID	**51905**	**Region 9**
King Creek		

Pollutant:	**Nitrate/Nitrite (Nitrite + Nitrate as N)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the CRITERIA. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum

of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51905, Nitrate/Nitrite (Nitrite + Nitrate as N) Region 9
King Creek

LOE ID:	73987
Pollutant:	Nitrate/Nitrite (Nitrite + Nitrate as N)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nitrate/Nitrite as N.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrate + nitrite (as N) is 10.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 51920 Region 9
King Creek

Pollutant:	**Nitrogen, Nitrite**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the CRITERIA.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51920, Nitrogen, Nitrite **Region 9**

King Creek

LOE ID:	73988
Pollutant:	Nitrogen, Nitrite
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nitrite as N.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrite (as N) is 1.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **51919** **Region 9**

King Creek

Pollutant:	**Nitrogen, ammonia (Total Ammonia)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. Zero of the one sample exceed the GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51919, Nitrogen, ammonia (Total Ammonia) **Region 9**

King Creek

LOE ID:	74024
Pollutant:	Nitrogen, ammonia (Total Ammonia)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Ammonia As N, Total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Basin Plan: No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	EPA's Lifetime Health advisory level for total ammonia is 30.0 mg/L as stated on page 8 of the 2006 edition of the drinking water standards and health advisories. This Advisory Level is defined as "the concentration of a chemical in drinking water that is not expected to cause any adverse noncarcinogenic effects for up to ten days of exposure."
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51919, Nitrogen, ammonia (Total Ammonia) Region 9

King Creek

LOE ID:	74023
Pollutant:	Nitrogen, ammonia (Total Ammonia)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Ammonia as N, Total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Aquatic Life Ambient Water Quality Criteria for Ammonia â€“ Freshwater (USEPA 2013): the 30-day rolling average concentration (criterion continuous concentration or CCC) of total ammonia nitrogen(in mg TAN/L) in freshwater are not to be exceeded more than once every three years on average. The CCC values are based on pH and temperature. The CCC formula is found on page 46 and the table of CCC values is on page 49.
Guideline Reference:	Aquatic Life Ambient Water Quality Criteria for Ammonia - Freshwater 2013
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51919, Nitrogen, ammonia (Total Ammonia) Region 9

King Creek

LOE ID:	74022
Pollutant:	Nitrogen, ammonia (Total Ammonia)

LOE Subgroup:	Pollutant-Water	038800
Matrix:	Water	
Fraction:	Total	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Ammonia as N, Total.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	Aquatic Life Ambient Water Quality Criteria for Ammonia â€“ Freshwater (USEPA 2013): the 30-day rolling average concentration (criterion continuous concentration or CCC) of total ammonia nitrogen(in mg TAN/L) in freshwater are not to be exceeded more than once every three years on average. The CCC values are based on pH and temperature. The CCC formula is found on page 46 and the table of CCC values is on page 49.	
Guideline Reference:	Aquatic Life Ambient Water Quality Criteria for Ammonia - Freshwater 2013	
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]	
Temporal Representation:	Data was collected on a single day 5/13/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID	**51921**	**Region 9**
King Creek		

Pollutant:	**Oxygen, Dissolved**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. One of the one sample exceed the OBJECTIVE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of one sample exceeded the OBJECTIVE and this sample size is insufficient to determine, with

the power and confidence of the Listing Policy, the applicable beneficial use support rating. 3. A minimum of twenty-six samples is needed to determine if a beneficial use is fully supported using table 3.2. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51921, Oxygen, Dissolved **Region 9**

King Creek

LOE ID:	73990
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Oxygen, Dissolved.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan, San Diego Basin, Cold Water Habitat Objective, Chapter III, General Objectives for all Inland Surface Waters, Enclosed Bays and Estuaries states the following: The dissolved oxygen concentration for cold water habitats shall not be reduced below 8.0 mg/l at any time.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51921, Oxygen, Dissolved **Region 9**

King Creek

LOE ID:	73989
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Oxygen, Dissolved.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan, San Diego Basin, Warm Water Habitat Objective, Chapter III, General Objectives for all Inland Surface Waters, Enclosed Bays and Estuaries states the following: The dissolved oxygen concentration for warm water habitats shall not be reduced below 5.0 mg/l at any time.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID	51922	Region 9
King Creek		

Pollutant:	**Permethrin, total**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the

applicable beneficial use support rating. 038803

Line of Evidence (LOE) for Decision ID 51922, Permethrin, total **Region 9**

King Creek

LOE ID:	73991
Pollutant:	Permethrin, total
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Permethrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Permethrin does not exceed 0.002 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51922, Permethrin, total **Region 9**

King Creek

LOE ID:	73992
Pollutant:	Permethrin, total
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Permethrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009

SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Permethrin does not exceed 0.002 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 51924 Region 9

King Creek

Pollutant:	**Selenium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the CRITERIA. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51924, Selenium Region 9

King Creek

LOE ID:	73995

Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Selenium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The selenium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater is 0.005 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51924, Selenium **Region 9**

King Creek

LOE ID:	73996
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Selenium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The Maximum Contaminant Level for selenium in the Basin Plan is 0.01 mg/L.
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek

	~0.8mi above WF - 907S01434]	038806
Temporal Representation:	Data was collected on a single day 5/13/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 51924, Selenium **Region 9**

King Creek

LOE ID:	73997
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Selenium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The selenium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater is 0.005 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **51925** **Region 9**

King Creek

Pollutant:	**Silver**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the CRITERIA.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51925, Silver King Creek **Region 9**

LOE ID:	73999
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Silver.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Silver to protect aquatic life in freshwater. The dissolved Silver criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51925, Silver King Creek **Region 9**

LOE ID:	73998	038808

Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Silver.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for silver is 0.1 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51925, Silver **Region 9**

King Creek

LOE ID:	74000
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Silver.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Silver to protect aquatic life in freshwater. The dissolved Silver criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition

Evaluation Guideline:
Guideline Reference:

Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 51926 Region 9
King Creek

Pollutant:	**Specific Conductivity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the GUIDELINE. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of twenty-six samples is needed to determine if a beneficial use is fully supported using table 3.2. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51926, Specific Conductivity Region 9
King Creek

LOE ID:	74001
Pollutant:	Specific Conductivity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1

Number of Exceedances:	0	038810
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Conductivity(Us).	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan for the San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The California Secondary MCL for specific conductance is 900 uS/cm (Title 22 California Code of Regulations).	
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.	
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]	
Temporal Representation:	Data was collected on a single day 5/13/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID 51927 Region 9

King Creek

Pollutant:	**Sulfates**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the OBJECTIVE. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeded the OBJECTIVE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51927, Sulfates Region 9

King Creek 038811

LOE ID:	74004
Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Sulfate.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Sulfate objective for the protection of aquatic life according to Table 3-2 for King Creek within the San Diego Hydrologic Unit is 65 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51927, Sulfates **Region 9**

King Creek

LOE ID:	74002
Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Sulfate.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	The California Secondary MCL for sulfate is 250 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51927, Sulfates **Region 9**

King Creek

LOE ID:	74003
Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Sulfate.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Sulfate objective for the protection of aquatic life according to Table 3-2 for King Creek within the San Diego Hydrologic Unit is 65 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **51928** **Region 9**

King Creek

Pollutant:	**Temperature, water**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of twenty-six samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51928, Temperature, water **Region 9**

King Creek

LOE ID:	74005
Pollutant:	Temperature, water
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Water Temperature.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Board that such alteration in temperature does not adversely affect beneficial uses. At no time or place shall the temperature of any COLD water be increased more than 5Â°F above the natural receiving water temperature.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Inland Fishes of California (Moyle 1976) states that for rainbow trout the optimum range for growth and completion of most life stages is 13-21 degrees C (page 129).
Guideline Reference:	Inland Fishes of California
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]

Temporal Representation:	Data was collected on a single day 5/13/2009.	038814
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID 51929 **Region 9**
King Creek

Pollutant:	**Total Dissolved Solids**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. One of the one sample exceed the OBJECTIVE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of one sample exceeded the OBJECTIVE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of twenty-six samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51929, Total Dissolved Solids **Region 9**
King Creek

LOE ID:	74006
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Dissolved Solids.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009

SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for Dissolved Solids is 500 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51929, Total Dissolved Solids **Region 9**

King Creek

LOE ID:	74008
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Dissolved Solids.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Dissolved Solids objective for the protection of aquatic life according to Table 3-2 for King Creek within the San Diego Hydrologic Unit is 300 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51929, Total Dissolved Solids **Region 9**

King Creek

LOE ID:	74007

Pollutant:	Total Dissolved Solids	038816
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	Dissolved	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	1	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Dissolved Solids.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Dissolved Solids objective for the protection of aquatic life according to Table 3-2 for King Creek within the San Diego Hydrologic Unit is 300 mg/L.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]	
Temporal Representation:	Data was collected on a single day 5/13/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID	**51930**	**Region 9**
King Creek		

Pollutant:	**Toxicity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available

indicating that standards are not met. 038817

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51930, Toxicity **Region 9**

King Creek

LOE ID:	74009
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate water toxicity. The sample did not exhibit significant toxicity. The toxicity test included survival and reproduction of Ceriodaphnia dubia. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing.For SWAMP data exceedances are counted with the significant effect code SL, Significant compared to negative control based on statistical test, less than stated alpha level, AND less than the evaluation threshold (both criteria are met).
Guideline Reference:	
Spatial Representation:	The sample was collected at station 907S01434.
Temporal Representation:	The sample was collected in May 2009.
Environmental Conditions:	
QAPP Information:	Data quality is good. Data results were recorded in the SWAMP database and followed SWAMP protocols.
QAPP Information Reference(s):	

DECISION ID **51951** **Region 9**

King Creek

Pollutant:	**Turbidity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised

Impairment from Pollutant or Pollution:	Pollutant	038818

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the OBJECTIVE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the OBJECTIVE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of twenty-six samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51951, Turbidity **Region 9**

King Creek

LOE ID:	74010
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Turbidity(NTU).
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Turbidity(NTU) objective for the protection of aquatic life according to Table 3-2 for King Creek within the San Diego Hydrologic Unit is 20 NTU.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.

Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51951, Turbidity **Region 9**

King Creek

LOE ID:	74011
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Turbidity(NTU).
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Turbidity(NTU) objective for the protection of aquatic life according to Table 3-2 for King Creek within the San Diego Hydrologic Unit is 20 NTU.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **51954** **Region 9**

King Creek

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status. Under 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one

sediment sample and zero of the one water sample exceed the GUIDELINE and CRITERIA.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of sediment sample and zero of one water sample exceeded the GUIDELINE and CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51954, Zinc **Region 9**

King Creek

LOE ID:	74012
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for zinc is 459 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51954, Zinc **Region 9**

King Creek 038821

LOE ID:	74013
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for zinc is 459 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51954, Zinc **Region 9**

King Creek

LOE ID:	74014
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan for the San Diego Basin).

Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR 038822
Evaluation Guideline:	The California Secondary MCL for zinc is 5.0 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51954, Zinc **Region 9**

King Creek

LOE ID:	74015
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Zinc to protect aquatic life in freshwater. The dissolved Zinc criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51954, Zinc **Region 9**

King Creek

LOE ID:	74016
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved

Beneficial Use:	Cold Freshwater Habitat	038823
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Zinc to protect aquatic life in freshwater. The dissolved Zinc criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]	
Temporal Representation:	Data was collected on a single day 5/13/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID	51923	Region 9
King Creek		

Pollutant:	**pH**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the OBJECTIVE. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeded the OBJECTIVE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of twenty-six samples is needed to determine if a beneficial use is fully supported using table 3.2. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and

information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51923, pH **Region 9**

King Creek

LOE ID:	73993
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for pH.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	In inland surface waters the pH shall not be depressed below 6.5 nor raised above 8.5.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51923, pH **Region 9**

King Creek

LOE ID:	73994
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for King Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for pH.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP

Water Quality Objective/Criterion:	In inland surface waters the pH shall not be depressed below 6.5 nor raised above 8.5.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for King Creek was collected at 1 monitoring site [King Creek ~0.8mi above WF - 907S01434]
Temporal Representation:	Data was collected on a single day 5/13/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Alpine Creek
Water Body ID: CAR9073300019990208084333
Water Body Type: River & Stream

DECISION ID 48211 **Region 9**
Alpine Creek

Pollutant: Cadmium
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. Zero of the ten samples exceed the criterion.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of ten samples exceeded the [OBJECTIVE/GUIDELINE/CRITERIA] and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48211, Cadmium **Region 9**
Alpine Creek

LOE ID: 72989

Pollutant: Cadmium
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Municipal & Domestic Supply

Number of Samples:	10	038827
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Alpine Creek to determine beneficial use support and results are as follows: 0 of 10 samples exceed the criterion for Cadmium.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for cadmium is 0.005 mg/L (Title 22 of the California Code of Regulations).	
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Alpine Creek was collected at 2 monitoring sites [Alpine Creek @ Tavern Road, Alpine Creek @ Midway Drive]	
Temporal Representation:	Data was collected from 5/20/2003 through 6/17/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 48211, Cadmium **Region 9**

Alpine Creek

LOE ID:	72990
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	10
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Alpine Creek to determine beneficial use support and results are as follows: 0 of 10 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Data for this line of evidence for Alpine Creek was collected at 2 monitoring sites [Alpine Creek @ Tavern Road, Alpine Creek @ Midway Drive]
Temporal Representation:	Data was collected from 5/20/2003 through 6/17/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 48273 Region 9

Alpine Creek

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One line of evidence are available in the administrative record to assess this pollutant. Zero of the six samples exceed the drinking water GUIDELINE. It is unknown whether any of the six samples exceeded the cold freshwater habitat guideline, as the detection limit of the analyses used is higher than the guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of six samples exceeded the GUIDELINE for drinking water (unknown whether any samples exceeded the cold freshwater guideline) and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48273, Chlorpyrifos Region 9

Alpine Creek

LOE ID:	72991
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat

Number of Samples:	0	038829
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Alpine Creek to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Chlorpyrifos.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000).	
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game	
Spatial Representation:	Data for this line of evidence for Alpine Creek was collected at 2 monitoring sites [Alpine Creek @ Midway Drive, Alpine Creek @ Tavern Road]	
Temporal Representation:	Data was collected over the time period 5/3/2006-6/17/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 48273, Chlorpyrifos **Region 9**

Alpine Creek

LOE ID:	77980
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Alpine Creek to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for chlorpyrifos is 2.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013

Spatial Representation:	Data for this line of evidence for Alpine Creek was collected at 2 monitoring sites [Alpine Creek @ Midway Drive, Alpine Creek @ Tavern Road]
Temporal Representation:	Data was collected over the time period 5/3/2006-6/17/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 48213 Region 9
Alpine Creek

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One line of evidence are available in the administrative record to assess this pollutant. Zero of the ten samples exceed the criterion. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of ten samples exceeded the [OBJECTIVE/GUIDELINE/CRITERIA] and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48213, Copper Region 9
Alpine Creek

LOE ID:	72993
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	10

Number of Exceedances:	0	038831
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Alpine Creek to determine beneficial use support and results are as follows: 0 of 10 samples exceed the criterion for Copper.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Alpine Creek was collected at 2 monitoring sites [Alpine Creek @ Tavern Road, Alpine Creek @ Midway Drive]	
Temporal Representation:	Data was collected from 5/20/2003 through 6/17/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 48213, Copper **Region 9**

Alpine Creek

LOE ID:	72992
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	10
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Alpine Creek to determine beneficial use support and results are as follows: 0 of 10 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for copper is 1.0 mg/L (Title 22 California Code of Regulations).
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Alpine Creek was collected at 2 monitoring sites [Alpine

	Creek @ Tavern Road, Alpine Creek @ Midway Drive]	038832
Temporal Representation:	Data was collected from 5/20/2003 through 6/17/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID 48217 Region 9

Alpine Creek

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. Zero of the six samples exceed the criterion.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of six samples exceeded the criterion and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48217, Diazinon Region 9

Alpine Creek

LOE ID:	72994
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Alpine Creek to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).
Guideline Reference:	Water quality for diazinon, Memorandum to J. Karkoski, Central Valley RWQCB, Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Data for this line of evidence for Alpine Creek was collected at 2 monitoring sites [Alpine Creek @ Midway Drive, Alpine Creek @ Tavern Road]
Temporal Representation:	Data was collected over the time period 5/3/2006-6/17/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48217, Diazinon **Region 9**

Alpine Creek

LOE ID:	77981
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Alpine Creek to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for diazinon is 1.4 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Alpine Creek was collected at 2 monitoring sites [Alpine Creek @ Midway Drive, Alpine Creek @ Tavern Road]
Temporal Representation:	Data was collected over the time period 5/3/2006-6/17/2009.

Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 48218 Region 9
Alpine Creek

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One line of evidence are available in the administrative record to assess this pollutant. Zero of the ten samples exceed the criterion. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of ten samples exceeded the criterion and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48218, Lead Region 9
Alpine Creek

LOE ID:	72998
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	10
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Alpine Creek to determine beneficial use support and results are as follows: 0 of 10 samples exceed the criterion for

	Lead. 038835
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Alpine Creek was collected at 2 monitoring sites [Alpine Creek @ Tavern Road, Alpine Creek @ Midway Drive]
Temporal Representation:	Data was collected from 5/20/2003 through 6/17/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48218, Lead **Region 9**

Alpine Creek

LOE ID:	72997
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	10
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Alpine Creek to determine beneficial use support and results are as follows: 0 of 10 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for Lead is 0.015 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Alpine Creek was collected at 2 monitoring sites [Alpine Creek @ Tavern Road, Alpine Creek @ Midway Drive]
Temporal Representation:	Data was collected from 5/20/2003 through 6/17/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.

QAPP Information Reference(s): Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, 03/08/06 matrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID	48269	Region 9
Alpine Creek		

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. Zero of the six samples exceed the criterion.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of six samples exceeded the criterion and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48269, Malathion	**Region 9**
Alpine Creek	

LOE ID:	77982
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Alpine Creek to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Malathion.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for malathion is 100 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Alpine Creek was collected at 2 monitoring sites [Alpine Creek @ Midway Drive, Alpine Creek @ Tavern Road]
Temporal Representation:	Data was collected over the time period 5/3/2006-6/17/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48269, Malathion **Region 9**

Alpine Creek

LOE ID:	72999
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Alpine Creek to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Malathion.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Alpine Creek was collected at 2 monitoring sites [Alpine Creek @ Midway Drive, Alpine Creek @ Tavern Road]
Temporal Representation:	Data was collected over the time period 5/3/2006-6/17/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **48271** **Region 9**
Alpine Creek

Pollutant:	**Nitrogen, Nitrite**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. Zero of the two samples exceed the CRITERIA.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of two samples exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48271, Nitrogen, Nitrite **Region 9**
Alpine Creek

LOE ID:	73000
Pollutant:	Nitrogen, Nitrite
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Alpine Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Nitrite as N.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrite (as N) is 1.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Alpine Creek was collected at 2 monitoring sites [Alpine Creek @ Tavern Road, Alpine Creek @ Midway Drive]
Temporal Representation:	Data was collected on a single day 5/20/2003.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 48270 Region 9
Alpine Creek

Pollutant:	**Nitrogen, ammonia (Total Ammonia)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One line of evidence are available in the administrative record to assess this pollutant. Zero of the two samples exceed the GUIDELINE. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of two samples exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48270, Nitrogen, ammonia (Total Ammonia) Region 9
Alpine Creek

LOE ID:	72988
Pollutant:	Nitrogen, ammonia (Total Ammonia)
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	038840
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	2	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Alpine Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Ammonia As N, Total.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Basin Plan: No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	EPA's Lifetime Health advisory level for total ammonia is 30.0 mg/L as stated on page 8 of the 2006 edition of the drinking water standards and health advisories. This Advisory Level is defined as "the concentration of a chemical in drinking water that is not expected to cause any adverse noncarcinogenic effects for up to ten days of exposure."	
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013	
Spatial Representation:	Data for this line of evidence for Alpine Creek was collected at 2 monitoring sites [Alpine Creek @ Tavern Road, Alpine Creek @ Midway Drive]	
Temporal Representation:	Data was collected on a single day 5/20/2003.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID	**48272**	**Region 9**
Alpine Creek		

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the ten samples exceed the CRITERIA.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of ten samples exceeded the CRITERIA and this sample size is insufficient to determine, with

the power and confidence of the Listing Policy, the applicable beneficial use support rating. 03/04/11 A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48272, Zinc **Region 9**

Alpine Creek

LOE ID:	73003
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	10
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Alpine Creek to determine beneficial use support and results are as follows: 0 of 10 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Alpine Creek was collected at 2 monitoring sites [Alpine Creek @ Tavern Road, Alpine Creek @ Midway Drive]
Temporal Representation:	Data was collected from 5/20/2003 through 6/17/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48272, Zinc **Region 9**

Alpine Creek

LOE ID:	73002
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water

Matrix:	Water	038842
Fraction:	None	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	10	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Alpine Creek to determine beneficial use support and results are as follows: 0 of 10 samples exceed the criterion for Zinc.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The California Secondary MCL for zinc is 5.0 mg/L (Title 22 California Code of Regulations).	
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.	
Spatial Representation:	Data for this line of evidence for Alpine Creek was collected at 2 monitoring sites [Alpine Creek @ Tavern Road, Alpine Creek @ Midway Drive]	
Temporal Representation:	Data was collected from 5/20/2003 through 6/17/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID	**53440**	**Region 9**
Alpine Creek		

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2029
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. Data from 2003 to 2009 show that 9 of 11, and 5 of 11 single samples exceed the water quality objectives for enterococcus and fecal coliform of a single sample maximum of 61/100 ml and 400/100 ml, respectively, for the protection of REC-1.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.038843
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Data from 2003 to 2009 show that 9 of 11, and 5 of 11 single samples exceed the water quality objectives for enterococcus and fecal coliform of a single sample maximum of 61/100 ml and 400/100 ml, respectively, for the protection of REC-1 and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 53440, Indicator Bacteria **Region 9**

Alpine Creek

LOE ID:	73001
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	11
Number of Exceedances:	2
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Alpine Creek to determine beneficial use support and results are as follows: 2 of 11 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxicsubstances in concentrations which are toxic to,or which produce detrimental physiologicalresponses in human, plant, animal, or indigenousaquatic life (Basin Plan).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In waters designated for water contact recreation (REC I), the total coliform concentration shall not exceed 10000 MPN/100 ml (CDPH 2006).
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Alpine Creek was collected at 2 monitoring sites [Alpine Creek @ Tavern Road, Alpine Creek @ Midway Drive]
Temporal Representation:	Data was collected over the time period 5/20/2003-6/17/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 53440, Indicator Bacteria **Region 9**

Alpine Creek

LOE ID:	72996

Pollutant:	Fecal Coliform	038844
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	11	
Number of Exceedances:	5	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Alpine Creek to determine beneficial use support and results are as follows: 5 of 11 samples exceed the criterion for Coliform, Fecal.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the fecal coliform concentration shall not exceed 400 MPN/100 ml.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Alpine Creek was collected at 2 monitoring sites [Alpine Creek @ Tavern Road, Alpine Creek @ Midway Drive]	
Temporal Representation:	Data was collected over the time period 5/20/2003-6/17/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 53440, Indicator Bacteria **Region 9**

Alpine Creek

LOE ID:	72995
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	11
Number of Exceedances:	9
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Alpine Creek to determine beneficial use support and results are as follows: 9 of 11 samples exceed the criterion for Enterococci.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Samples shall not exceed 61 organisms per 100 ml for enterococcus in waters designated for REC I beneficial use (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:
Guideline Reference:

Spatial Representation:	Data for this line of evidence for Alpine Creek was collected at 2 monitoring sites [Alpine Creek @ Tavern Road, Alpine Creek @ Midway Drive]
Temporal Representation:	Data was collected over the time period 5/20/2003-6/17/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Chocolate Creek
Water Body ID: CAR9073300020020306144308
Water Body Type: River & Stream

DECISION ID 44302 **Region 9**
Chocolate Creek

Pollutant: **Benthic Community Effects**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: Benthic Community Effects is being considered for placement on the CWA section 303(d) List under sections 3.9 and 3.1 of the Listing Policy. Under section 3.9, an additional line of evidence associating Benthic Community Effects with a water or sediment concentration of pollutant(s) is necessary to assess listing status.

Based on the readily available data and information, the weight of evidence provides sufficient justification for not placing Benthic Community Effects in this water segment on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Pursuant to section 3.9 of the Listing Policy, the water does exhibit significant degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index.
4. Pursuant to section 3.9 of the Listing Policy, the water segment does have associated pollutant(s) samples that exceed water quality objectives.
5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not being met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 44302, Benthic Community Effects **Region 9**
Chocolate Creek

LOE ID: 79670

Pollutant: Benthic-Macroinvertebrate Bioassessments
LOE Subgroup: Population/Community Degradation
Matrix: Water
Fraction: None

Beneficial Use: Cold Freshwater Habitat

Number of Samples:	1	038847
Number of Exceedances:	1	
Data and Information Type:	Benthic macroinvertebrate surveys	
Data Used to Assess Water Quality:	The CSCI score for this site below the 0.79 threshold, and is therefore exceeding the water quality objective for the aquatic life beneficial use.	
Data Reference:	RWB9 Status Sampling 2007 and 2008 Region 9 CSCI Scores & Water Body Information	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.	
Guideline Reference:	The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.	
Spatial Representation:	Samples were collected at the following station: 907SDCHC3 (Chocolate Creek 3).	
Temporal Representation:	Survey done May 8, 2008.	
Environmental Conditions:		
QAPP Information:	Data collected following SWAMP QA protocols for the RWB9 Status Sampling 2007 and 2008 water quality monitoring project.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44302, Benthic Community Effects **Region 9**

Chocolate Creek

LOE ID:	73283
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	The IBI score for this water body was 20 which indicates that this water body may be considered to have impaired conditions.
Data Reference:	RWB9 Status Sampling 2007 and 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.

Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	038848
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.	
Guideline Reference:		
Spatial Representation:	Samples were collected at the following station: 907SDCHC3 (Chocolate Creek 3).	
Temporal Representation:	Survey done May 8, 2008.	
Environmental Conditions:		
QAPP Information:	Data collected following SWAMP QA protocols for the RWB9 Status Sampling 2007 and 2008 water quality monitoring project.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44302, Benthic Community Effects **Region 9**

Chocolate Creek

LOE ID:	8929
Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	2
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Three water samples were collected at Chocolate Creek station 907SDCHC3 in May 2004, February 2005, and April 2005. Two of three showed excessive sulfate concentrations according to results in California's Surface Water Ambient Monitoring Program Report, 2007.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The recommended secondary drinking water standard for sulfate is 250 mg/l (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Water samples were collected at Chocolate Creek station (907SDCHC3).
Temporal Representation:	Samples were collected on May 2004, February 2005, and April 2005.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 44302, Benthic Community Effects **Region 9**

Chocolate Creek

LOE ID:	8928
Pollutant:	Phosphorus

LOE Subgroup:	Pollutant-Water	038849
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	3	
Number of Exceedances:	2	
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)	
Data Used to Assess Water Quality:	Three water samples were collected at Chocolate Creek station 907SDCHC3 in May 2004, February 2005, and April 2005. Two of three showed excessive phosphorus concentrations according to results in California's Surface Water Ambient Monitoring Program Report, 2007.	
Data Reference:	Monitoring data for Region 9	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters-streams and other flowing waters, with all beneficial uses, the water quality objective for total phosphorus is 0.1 mg/L (RWQCB, 2007).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Water samples were collected at Chocolate Creek station (907SDCHC3).	
Temporal Representation:	Samples were collected in May 2004, February 2005, and April 2005.	
Environmental Conditions:		
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44302, Benthic Community Effects **Region 9**

Chocolate Creek

LOE ID:	8926
Pollutant:	Nitrogen
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	3
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Three water samples were collected at Chocolate Creek station 907SDCHC3 in May 2004, February 2005, and April 2005, all showed excessive nitrogen concentrations according to results in California's Surface Water Ambient Monitoring Program Report, 2007.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses (RWQCB, 2007). A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional

	Board. Analogous threshold values have not been set for nitrogen compounds, however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Water samples were collected at Chocolate Creek station (907SDCHC3).
Temporal Representation:	Samples were collected on May 2004, February 2005, and April 2005.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 44302, Benthic Community Effects **Region 9**

Chocolate Creek

LOE ID:	26378
Pollutant:	Benthic Community Effects
LOE Subgroup:	Adverse Biological Responses
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	One sample of IBI data was taken from May 2004 at one sampling site. Of that one sample, one sample exceeded the IBI impairment threshold.
Data Reference:	Fish and Game IBI Data
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. (SDRWQCB, 1995)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at one site: 907CHC2xx on Chocolate Creek.
Temporal Representation:	Sampling occurred during one event on May 22, 2004.
Environmental Conditions:	
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Project Plan for the California Stream Bioassessment Procedure and the State of California, California Monitoring an Assessment Program: "CMAP", Quality

	Assurance Project Plan. 038851
QAPP Information Reference(s):	State of California, California Monitoring and Assessment Program: "CMAP". Quality Assurance Project Plan for the California Stream Bioassessment Procedure The San Diego Stream Team Quality Assurance Project Plan

DECISION ID 53449 Region 9

Chocolate Creek

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the six samples exceed the CRITERIA. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of six samples exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53449, Cadmium Region 9

Chocolate Creek

LOE ID:	73284
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Chocolate Creek to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Cadmium.

Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Chocolate Creek was collected at 1 monitoring site [Chocolate Canyon Creek @ Arnold Way]
Temporal Representation:	Data was collected from 5/20/2003 through 6/17/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 53449, Cadmium **Region 9**

Chocolate Creek

LOE ID:	73285
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Chocolate Creek to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for cadmium is 0.005 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Chocolate Creek was collected at 1 monitoring site [Chocolate Canyon Creek @ Arnold Way]
Temporal Representation:	Data was collected from 5/20/2003 through 6/17/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix

DECISION ID	53438	Region 9
Chocolate Creek		

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the four samples exceed the GUIDELINE. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of four samples exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53438, Chlorpyrifos	**Region 9**
Chocolate Creek	

LOE ID:	78003
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Chocolate Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.

SWAMP Data:	Non-SWAMP	038854
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The USEPA drinking water health advisory for chlorpyrifos is 2.1 Âµg/L.	
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013	
Spatial Representation:	Data for this line of evidence for Chocolate Creek was collected at 1 monitoring site [Chocolate Canyon Creek @ Arnold Way]	
Temporal Representation:	Data was collected over the time period 5/3/2006-6/17/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 53438, Chlorpyrifos **Region 9**

Chocolate Creek

LOE ID:	73286
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Chocolate Creek to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).
Spatial Representation:	Data for this line of evidence for Chocolate Creek was collected at 1 monitoring site [Chocolate Canyon Creek @ Arnold Way]
Temporal Representation:	Data was collected over the time period 5/3/2006-6/17/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix

DECISION ID	53450	Region 9
Chocolate Creek		

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the six samples exceed the CRITERIA. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of six samples exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53450, Copper	**Region 9**
Chocolate Creek	

LOE ID:	73287
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Chocolate Creek to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.

SWAMP Data:	Non-SWAMP	038856
Water Quality Objective/Criterion:	The California Secondary MCL for copper is 1.0 mg/L (Title 22 California Code of Regulations).	
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Chocolate Creek was collected at 1 monitoring site [Chocolate Canyon Creek @ Arnold Way]	
Temporal Representation:	Data was collected from 5/20/2003 through 6/17/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 53450, Copper **Region 9**

Chocolate Creek

LOE ID:	73288
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Chocolate Creek to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Chocolate Creek was collected at 1 monitoring site [Chocolate Canyon Creek @ Arnold Way]
Temporal Representation:	Data was collected from 5/20/2003 through 6/17/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID	53442	038857 Region 9
Chocolate Creek		

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the four samples exceed the GUIDELINE. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of four samples exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53442, Diazinon	**Region 9**
Chocolate Creek	

LOE ID:	73289
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Chocolate Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column,

	sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Data for this line of evidence for Chocolate Creek was collected at 1 monitoring site [Chocolate Canyon Creek @ Arnold Way]
Temporal Representation:	Data was collected over the time period 5/3/2006-6/17/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 53442, Diazinon **Region 9**

Chocolate Creek

LOE ID:	78004
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Chocolate Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for diazinon is 1.4 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Chocolate Creek was collected at 1 monitoring site [Chocolate Canyon Creek @ Arnold Way]
Temporal Representation:	Data was collected over the time period 5/3/2006-6/17/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **53451** **Region 9**

Chocolate Creek 038859

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the six samples exceed the CRITERIA.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of six samples exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53451, Lead — Region 9

Chocolate Creek

LOE ID:	73293
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Chocolate Creek to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the

	hardness dependent formula for the metals criterion. 038860
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Chocolate Creek was collected at 1 monitoring site [Chocolate Canyon Creek @ Arnold Way]
Temporal Representation:	Data was collected from 5/20/2003 through 6/17/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 53451, Lead **Region 9**

Chocolate Creek

LOE ID:	73292
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Chocolate Creek to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for Lead is 0.015 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Chocolate Creek was collected at 1 monitoring site [Chocolate Canyon Creek @ Arnold Way]
Temporal Representation:	Data was collected from 5/20/2003 through 6/17/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **53443** **Region 9**

Chocolate Creek

Pollutant: **Malathion**

Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	038861
Last Listing Cycle's Final Listing Decision:	New Decision	
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. Zero of the four samples exceed the GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of four samples exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53443, Malathion **Region 9**

Chocolate Creek

LOE ID:	73294
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Chocolate Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Malathion.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous

	maximum for malathion is 0.1 Âµg/L. 038862
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Chocolate Creek was collected at 1 monitoring site [Chocolate Canyon Creek @ Arnold Way]
Temporal Representation:	Data was collected over the time period 5/3/2006-6/17/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 53443, Malathion **Region 9**

Chocolate Creek

LOE ID:	78005
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Chocolate Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Malathion.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for malathion is 100 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Chocolate Creek was collected at 1 monitoring site [Chocolate Canyon Creek @ Arnold Way]
Temporal Representation:	Data was collected over the time period 5/3/2006-6/17/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **53453** **Region 9**

Chocolate Creek

Pollutant:	**Nitrogen, Nitrite**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision

Revision Status	Revised	038863
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the six samples exceed the CRITERIA.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of six samples exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53453, Nitrogen, Nitrite **Region 9**

Chocolate Creek

LOE ID:	73295
Pollutant:	Nitrogen, Nitrite
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Chocolate Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Nitrite as N.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrite (as N) is 1.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Chocolate Creek was collected at 1 monitoring site [Chocolate Canyon Creek @ Arnold Way]

Temporal Representation:	Data was collected on a single day 5/20/2003.	038864
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID 53448 Region 9
Chocolate Creek

Pollutant:	**Nitrogen, ammonia (Total Ammonia)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53448, Nitrogen, ammonia (Total Ammonia) Region 9
Chocolate Creek

LOE ID:	73282
Pollutant:	Nitrogen, ammonia (Total Ammonia)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Chocolate Creek to determine

	beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Ammonia As N, Total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Basin Plan: No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	EPA's Lifetime Health advisory level for total ammonia is 30.0 mg/L as stated on page 8 of the 2006 edition of the drinking water standards and health advisories. This Advisory Level is defined as "the concentration of a chemical in drinking water that is not expected to cause any adverse noncarcinogenic effects for up to ten days of exposure."
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Chocolate Creek was collected at 1 monitoring site [Chocolate Canyon Creek @ Arnold Way]
Temporal Representation:	Data was collected on a single day 5/20/2003.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID	**53452**	**Region 9**
Chocolate Creek		

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the six samples exceed the CRITERIA. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of six samples exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53452, Zinc **Region 9**

Chocolate Creek

LOE ID:	73297
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Chocolate Creek to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for zinc is 5.0 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Chocolate Creek was collected at 1 monitoring site [Chocolate Canyon Creek @ Arnold Way]
Temporal Representation:	Data was collected from 5/20/2003 through 6/17/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 53452, Zinc **Region 9**

Chocolate Creek

LOE ID:	73298
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Chocolate Creek to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Zinc.

Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009. 038867
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Chocolate Creek was collected at 1 monitoring site [Chocolate Canyon Creek @ Arnold Way]
Temporal Representation:	Data was collected from 5/20/2003 through 6/17/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID	**53447**	**Region 9**
Chocolate Creek		

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2029
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. Three lines of evidence are available in the administrative record to assess this pollutant. Seven of seven samples, and 6 of 8 samples exceed the water quality objectives for enterococcus and fecal coliform of a SSM of 61/100ml and 400/100ml, respectively, for the protection of REC-1. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Seven of seven samples, and 6 of 8 samples exceed the water quality objectives for enterococcus and fecal coliform of a SSM of 61/100ml and 400/100ml, respectively, for the protection of REC-1 and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 53447, Indicator Bacteria — Region 9

Chocolate Creek

LOE ID:	73296
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	8
Number of Exceedances:	4
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Chocolate Creek to determine beneficial use support and results are as follows: 4 of 8 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxicsubstances in concentrations which are toxic to,or which produce detrimental physiologicalresponses in human, plant, animal, or indigenousaquatic life (Basin Plan).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In waters designated for water contact recreation (REC I), the total coliform concentration shall not exceed 10000 MPN/100 ml (CDPH 2006).
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.
Spatial Representation:	Data for this line of evidence for Chocolate Creek was collected at 1 monitoring site [Chocolate Canyon Creek @ Arnold Way]
Temporal Representation:	Data was collected over the time period 5/20/2003-6/17/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 53447, Indicator Bacteria — Region 9

Chocolate Creek

LOE ID:	73291
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	8
Number of Exceedances:	6
Data and Information Type:	PATHOGEN MONITORING

Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Chocolate Creek to determine beneficial use support and results are as follows: 6 of 8 samples exceed the criterion for Coliform, Fecal.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the fecal coliform concentration shall not exceed 400 MPN/100 ml.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Chocolate Creek was collected at 1 monitoring site [Chocolate Canyon Creek @ Arnold Way]
Temporal Representation:	Data was collected over the time period 5/20/2003-6/17/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 53447, Indicator Bacteria **Region 9**

Chocolate Creek

LOE ID:	73290
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	7
Number of Exceedances:	7
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Chocolate Creek to determine beneficial use support and results are as follows: 7 of 7 samples exceed the criterion for Enterococci.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Samples shall not exceed 61 organisms per 100 ml for enterococcus in waters designated for REC I beneficial use (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Chocolate Creek was collected at 1 monitoring site [Chocolate Canyon Creek @ Arnold Way]
Temporal Representation:	Data was collected over the time period 5/20/2003-6/17/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix

DECISION ID	42678	Region 9
Chocolate Creek		

Pollutant:	**Nitrogen**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Three of the three samples exceed the OBJECTIVE. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Three of three samples exceed the OBJECTIVE and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 42678, Nitrogen	**Region 9**
Chocolate Creek	

LOE ID:	8926
Pollutant:	Nitrogen
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	3
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Three water samples were collected at Chocolate Creek station 907SDCHC3 in May 2004, February 2005, and April 2005, all showed excessive nitrogen concentrations according to results in California's Surface Water Ambient Monitoring Program Report, 2007.
Data Reference:	Monitoring data for Region 9

SWAMP Data:	SWAMP	038871
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses (RWQCB, 2007). A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used (RWQCB, 2007).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Water samples were collected at Chocolate Creek station (907SDCHC3).	
Temporal Representation:	Samples were collected on May 2004, February 2005, and April 2005.	
Environmental Conditions:		
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.	
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA	

DECISION ID	43144	Region 9
Chocolate Creek		

Pollutant:	**Phosphorus**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2023
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Two of the 3 samples exceed the Basin Plan water quality objective for phosphorus. According to Table 3.1 of the Listing Policy the minimum sample requirement is two. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Two of the 3 samples exceed the Basin Plan water quality objective for phosphorus and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision	This is a decision previously approved by the State Water Resources Control Board and the USEPA.

Recommendation: No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43144, Phosphorus **Region 9**

Chocolate Creek

LOE ID:	8928
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	2
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Three water samples were collected at Chocolate Creek station 907SDCHC3 in May 2004, February 2005, and April 2005. Two of three showed excessive phosphorus concentrations according to results in California's Surface Water Ambient Monitoring Program Report, 2007.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters-streams and other flowing waters, with all beneficial uses, the water quality objective for total phosphorus is 0.1 mg/L (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Water samples were collected at Chocolate Creek station (907SDCHC3).
Temporal Representation:	Samples were collected in May 2004, February 2005, and April 2005.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	

DECISION ID **44028** **Region 9**

Chocolate Creek

Pollutant:	**Sulfates**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Two of 3 samples

exceed the secondary MSL drinking water standard. 038873

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Two of 3 samples exceed the secondary MSL drinking water standard and this sample size is insufficient to determine with the power and confidence of the Listing Policy if standards are not met. A minimum of five samples is needed for application of table 3.2.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 44028, Sulfates **Region 9**

Chocolate Creek

LOE ID:	8929
Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	2
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Three water samples were collected at Chocolate Creek station 907SDCHC3 in May 2004, February 2005, and April 2005. Two of three showed excessive sulfate concentrations according to results in California's Surface Water Ambient Monitoring Program Report, 2007.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The recommended secondary drinking water standard for sulfate is 250 mg/l (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Water samples were collected at Chocolate Creek station (907SDCHC3).
Temporal Representation:	Samples were collected on May 2004, February 2005, and April 2005.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Boulder Creek (San Diego County)
Water Body ID: CAR9074100020020306091433
Water Body Type: River & Stream

DECISION ID 43879 **Region 9**
Boulder Creek (San Diego County)

Pollutant: **Benthic Community Effects**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: Benthic Community Effects is being considered for placement on the CWA section 303(d) List under sections 3.9 and 3.1 of the Listing Policy. Under section 3.9, an additional line of evidence associating Benthic Community Effects with a water or sediment concentration of pollutant(s) is necessary to assess listing status.

Based on the readily available data and information, the weight of evidence provides sufficient justification for not placing Benthic Community Effects in this water segment on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Pursuant to section 3.9 of the Listing Policy, the water does not exhibit significant degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index.
4. Pursuant to section 3.9 of the Listing Policy, the water segment does not have associated pollutant(s) samples that exceed water quality objectives.
5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not being met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 43879, Benthic Community Effects **Region 9**
Boulder Creek (San Diego County)

LOE ID: 26374

Pollutant: Benthic Community Effects
LOE Subgroup: Adverse Biological Responses
Matrix: Water
Fraction: None

Beneficial Use: Warm Freshwater Habitat

Number of Samples: 5

Number of Exceedances:	3	038875
Data and Information Type:	Benthic macroinvertebrate surveys	
Data Used to Assess Water Quality:	Five samples were taken from May 2001 to 2007 at one sampling site. Of the total number of samples, three samples exceeded the IBI impairment threshold.	
Data Reference:	Fish and Game IBI Data Southern California Postfire Study. Index of Biotic Integrity. 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)	
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13	
Spatial Representation:	Samples were collected at one site: 907BCBCRx on Boulder Creek.	
Temporal Representation:	Sampling occurred during one event every other year over a seven year period from May 2001 to 2007.	
Environmental Conditions:		
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Project Plan for the California Stream Bioassessment Procedure and the State of California, California Monitoring an Assessment Program: "CMAP", Quality Assurance Project Plan.	
QAPP Information Reference(s):	State of California, California Monitoring and Assessment Program: "CMAP". Quality Assurance Project Plan for the California Stream Bioassessment Procedure The San Diego Stream Team Quality Assurance Project Plan	

Line of Evidence (LOE) for Decision ID 43879, Benthic Community Effects **Region 9**

Boulder Creek (San Diego County)

LOE ID:	73062
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	1
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	One of the six samples collected had an IBI score below 40. NPDES bioassessment
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or

	that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the State or Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	
Spatial Representation:	The samples were collected at station 907REF-BC Boulder Creek.
Temporal Representation:	The samples were collected in Ocotber 2005, May and Ocotber 2006 and May 2007, 2008, and 2010..
Environmental Conditions:	
QAPP Information:	The data was collected under the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan, June 25, 2009.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 43879, Benthic Community Effects **Region 9**

Boulder Creek (San Diego County)

LOE ID:	27024
Pollutant:	Benthic Community Effects
LOE Subgroup:	Adverse Biological Responses
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	1
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Four samples of IBI data were taken from October 2005 to May 2007 at one sampling site. Of the total number of samples, one sample exceeded the IBI impairment threshold.
Data Reference:	Stream Bioassessment Data. Co-permitee Data. Collected 2002-2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. (SDRWQCB, 1995)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at one site: REF-BCR on Boulder Creek.

Temporal Representation:	Sampling occurred on four events from October 2005 to May 2007. 038877
Environmental Conditions:	
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Manual for Freshwater Bioassessment.
QAPP Information Reference(s):	Quality Assurance Manual for Freshwater Bioassessment Revision 0

Line of Evidence (LOE) for Decision ID 43879, Benthic Community Effects **Region 9**

Boulder Creek (San Diego County)

LOE ID:	79674
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Four samples were taken at one station in Boulder Creek. The CSCI scores for this site are above the 0.79 threshold, and therefore the site is not exceeding the water quality objective for the aquatic life beneficial use.
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008. Region 9 CSCI Scores & Water Body Information
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.
Guideline Reference:	The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.
Spatial Representation:	The samples were collected at station 907REF-BC Boulder Creek. Note this is co-located with SWAMP station 907SDBOC2
Temporal Representation:	The samples were collected in from 2005 to 2008
Environmental Conditions:	
QAPP Information:	The data was collected under the the County of San Diego NPDES MS4 Copermittees Receiving Waters Monitoring and Reporting Program
QAPP Information Reference(s):	e-mail clarifying QAPP information Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.

DECISION ID **42339** 038878 **Region 9**

Boulder Creek (San Diego County)

Pollutant:	**Toxicity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one water sample and one of the three sediment samples exceed the GUIDELINES. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one water and one of three sediment samples exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 42339, Toxicity **Region 9**

Boulder Creek (San Diego County)

LOE ID:	21391
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	1
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Three samples were collected at Boulder Creek station 907SDBOC2 from May 2004 to April 2005, they showed significant toxicity levels (SL) in the following tests: Selenastrum algae growth test - one of the three samples exhibit toxicity. Ceriodaphnia dubia survival/reproductive test - one of the three samples exhibit toxicity. Results were from California's Surface Water Ambient Monitoring Program, 2007. Water samples were collected on May 2004, February 2005, and April 2005.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP

Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.
Guideline Reference:	Monitoring data for Region 9
Spatial Representation:	Water Toxicity Samples were collected at Boulder Creek station 907SDBOC2; (Latitude 32.96346, Longitude -116.66411).
Temporal Representation:	Water samples for Boulder Creek were collected on May 2004, February 2005, April 2005.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 42339, Toxicity **Region 9**

Boulder Creek (San Diego County)

LOE ID:	26275
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	One sample was collected at Boulder Creek station 907SDBOC2 from May 2004. Significant toxicity levels (SL) were not found in the following test: Hyalella azteca. Results were from California's Surface Water Ambient Monitoring Program, 2007. The sediment sample was collected in May 2004.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.
Guideline Reference:	Monitoring data for Region 9
Spatial Representation:	Water Toxicity Samples were collected at Boulder Creek station 907SDBOC2; (Latitude 32.96346, Longitude -116.66411).
Temporal Representation:	Sediment sample for Boulder Creek was collected on May 2004.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Chollas Creek
Water Body ID: CAR9082200019990208140725
Water Body Type: River & Stream

DECISION ID 33808 **Region 9**
Chollas Creek

Pollutant: Cadmium
Final Listing Decision: Delist from 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Delist from 303(d) list (TMDL required list)(2012)
Revision Status Revised
Reason for Delisting: Applicable WQS attained; reason for recovery unspecified
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal from the CWA section 303(d) List under section 4.1 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. One of the 63 samples exceeded the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of 63 samples exceeded the criteria, and this does not exceed the allowable frequency listed in Table 4.1 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be removed from the section 303(d) list because applicable water quality standards for the pollutant are not being exceeded.

Line of Evidence (LOE) for Decision ID 33808, Cadmium **Region 9**
Chollas Creek

LOE ID: 77998

Pollutant: Cadmium
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Dissolved

Beneficial Use: Warm Freshwater Habitat

Number of Samples: 23
Number of Exceedances: 3

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Chollas Creek to determine beneficial use support and results are as follows: 3 of 23 samples exceed the criterion for Cadmium.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The dissolved cadmium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved cadmium is 0.0022 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Chollas Creek was collected at 1 monitoring site [Chollas Creek - 908CC-SD8(1)]
Temporal Representation:	Data was collected over the time period 11/29/2001-10/5/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 33808, Cadmium **Region 9**

Chollas Creek

LOE ID:	3355
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	42
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	One of 42 samples exceeded the CTR - CCC criteria for dissolved cadmium (San Diego RWQCB, 2001b).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	CTR Dissolved Cadmium Criterion for continuous concentration (CCC) in water for the protection of aquatic life is expressed as a function of the total hardness of the water body. The aquatic life criteria will vary depending of total hardness reported at the sampling site. The CCC for dissolved cadmium is the highest concentration to which aquatic life can be exposed for an extended period of time (four days) without deleterious effects. This criterion is linked and applicable for the protection of aquatic life Beneficial Uses.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Six stations were sampled throughout the Chollas Creek watershed.
Temporal Representation:	Five samples were collected in June 1991 and March 1992. Forty-two samples were collected as part of the MS4 storm water permit between February 1994 and February 2003.
Environmental Conditions:	Chollas Creek is an urban creek that runs through portions of San Diego, La Mesa, and Lemon Grove before emptying into San Diego Bay.
QAPP Information:	NPDES permit.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33808, Cadmium **Region 9**

Chollas Creek

LOE ID:	3354
Pollutant:	Cadmium
LOE Subgroup:	Narrative Description Data
Matrix:	Not Specified
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	A TMDL and implementation plan has been approved for this water segment-pollutant combination. The Chollas Creek Metals TMDL was approved by RWQCB in 2004 and subsequently approved by USEPA.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	
Objective/Criterion Reference:	
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	
Temporal Representation:	
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33808, Cadmium **Region 9**

Chollas Creek

LOE ID:	73302
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	21
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Chollas Creek to

	determine beneficial use support and results are as follows: 0 of 21 samples exceed the criterion for Cadmium.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Cadmium to protect aquatic life in freshwater. The dissolved Cadmium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Chollas Creek was collected at 1 monitoring site [Chollas Creek - 908CC-SD8(1)]
Temporal Representation:	Data was collected over the time period 11/29/2001-10/5/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID	34268	Region 9
Chollas Creek		

Pollutant:	**Copper**
Final Listing Decision:	**Do Not Delist from 303(d) list (being addressed with USEPA approved TMDL)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
TMDL Name:	Chollas Creek Metals
TMDL Project Code:	165
Date TMDL Approved by USEPA:	12/18/2008
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for removal on the CWA section 303(d) List under sections 2.2 and 4.1 of the Listing Policy. Under 4.1 of the Policy, a minimum of one line of evidence is needed to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List. There is sufficient justification to place it in the Being Addressed portion of the CWA 303(d) List because a TMDL has been completed and approved by RWQCB and USEPA, and is expected to result in attainment of the standard. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.14 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.15 of the Policy. 3. Seventeen of 21 samples exceeded the criteria, and these exceed the allowable frequency listed in

Table 4.1 of the Listing Policy. 038885
4. The "TMDLs for Copper, Lead, and Zinc in Chollas Creek" was approved by USEPA on 12/18/2008.
5. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 34268, Copper Chollas Creek **Region 9**

LOE ID:	3356
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Agricultural Supply
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	
Objective/Criterion Reference:	
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	
Temporal Representation:	
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 34268, Copper Chollas Creek **Region 9**

LOE ID:	73252
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	21
Number of Exceedances:	17
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Chollas Creek to

	determine beneficial use support and results are as follows: 17 of 21 samples exceed the criterion for Copper.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Copper to protect aquatic life in freshwater. The dissolved Copper criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Chollas Creek was collected at 1 monitoring site [Chollas Creek - 908CC-SD8(1)]
Temporal Representation:	Data was collected over the time period 11/29/2001-10/5/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID	**44282**	**Region 9**
Chollas Creek		

Pollutant:	**Lead**
Final Listing Decision:	**Do Not Delist from 303(d) list (being addressed with USEPA approved TMDL)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
TMDL Name:	Chollas Creek Metals
TMDL Project Code:	165
Date TMDL Approved by USEPA:	12/18/2008
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal on the CWA section 303(d) List under sections 2.2 and 4.1 of the Listing Policy. Under 4.1 of the Policy, a minimum of one line of evidence is needed to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List. There is sufficient justification to place it in the Being Addressed portion of the CWA 303(d) List because a TMDL has been completed and approved by RWQCB and USEPA, and is expected to result in attainment of the standard.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.14 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.15 of the Policy.
3. Four of 21 samples exceeded the criteria, and these exceed the allowable frequency listed in Table 4.1 of the Listing Policy.

4. The "TMDLs for Copper, Lead, and Zinc in Chollas Creek" was approved by USEPA on 12/18/2008.
5. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 44282, Lead **Region 9**

Chollas Creek

LOE ID:	73274
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	21
Number of Exceedances:	4
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Chollas Creek to determine beneficial use support and results are as follows: 4 of 21 samples exceed the criterion for Lead.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Lead to protect aquatic life in freshwater. The dissolved Lead criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Chollas Creek was collected at 1 monitoring site [Chollas Creek - 908CC-SD8(1)]
Temporal Representation:	Data was collected over the time period 11/29/2001-10/5/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 44282, Lead **Region 9**

Chollas Creek

LOE ID:	3357
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water

Matrix:	Water	038888
Fraction:	Not Recorded	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:		
Number of Exceedances:		
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:		
Objective/Criterion Reference:		
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:		
Temporal Representation:		
Environmental Conditions:		
QAPP Information:	QA Info Missing	
QAPP Information Reference(s):		

DECISION ID	**34327**	**Region 9**
Chollas Creek		

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not Delist from 303(d) list (being addressed with USEPA approved TMDL)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
TMDL Name:	Chollas Creek Metals
TMDL Project Code:	165
Date TMDL Approved by USEPA:	12/18/2008
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal on the CWA section 303(d) List under sections 2.2 and 4.1 of the Listing Policy. Under 4.1 of the Policy, a minimum of one line of evidence is needed to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List. There is sufficient justification to place it in the Being Addressed portion of the CWA 303(d) List because a TMDL has been completed and approved by RWQCB and USEPA, and is expected to result in attainment of the standard.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.14 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.15 of the Policy.
3. Six of 21 samples exceeded the criteria, and these exceed the allowable frequency listed in Table 4.1 of the Listing Policy.
4. The "TMDLs for Copper, Lead, and Zinc in Chollas Creek" was approved by USEPA on 12/18/2008.

	5. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 34327, Zinc **Region 9**

Chollas Creek

LOE ID:	3358
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	
Number of Exceedances:	
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	
Objective/Criterion Reference:	
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	
Temporal Representation:	
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 34327, Zinc **Region 9**

Chollas Creek

LOE ID:	73281
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	21
Number of Exceedances:	6
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Chollas Creek to determine beneficial use support and results are as follows: 6 of 21 samples exceed the criterion for Zinc.

Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Zinc to protect aquatic life in freshwater. The dissolved Zinc criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Chollas Creek was collected at 1 monitoring site [Chollas Creek - 908CC-SD8(1)]
Temporal Representation:	Data was collected over the time period 11/29/2001-10/5/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID	53133	Region 9
Chollas Creek		

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the 23 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 23 samples exceeded the criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 53133, Arsenic	Region 9

Chollas Creek 038891

LOE ID:	78007
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	23
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Chollas Creek to determine beneficial use support and results are as follows: 0 of 23 samples exceed the criterion for Arsenic.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The dissolved arsenic criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved arsenic is 0.150 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Chollas Creek was collected at 1 monitoring site [Chollas Creek - 908CC-SD8(1)]
Temporal Representation:	Data was collected over the time period 11/29/2001-10/5/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID **43572** **Region 9**

Chollas Creek

Pollutant:	**Benthic Community Effects**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Benthic Community Effects is being considered for placement on the section 303(d) list under sections 3.9 and 3.1 of the Listing Policy. Under section 3.9, an additional line of evidence associating the Benthic Community Effects with a water or sediment concentration of pollutants is necessary to assess listing status. Three lines of evidence are available in the administrative record to assess this indicator. Ten of Ten samples exceeded the water quality objective for benthic community effects, and Eleven out of Eleven

samples exceeded the water quality objective for Benthic-Macroinvertebrate Bio-assessments.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing Benthic Community Effects in this water segment on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. 10 of 10 samples exceeded the Index of Biological Integrity (IBI) value of "poor" water quality for this area, and Eleven out of Eleven samples exceeded the water quality objective for Benthic-Macroinvertebrate Bio-assessments and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy, however as required under section 3.9 of the Listing Policy, pollutant(s) could not be directly associated with the Benthic Community Effects.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 43572, Benthic Community Effects **Region 9**

Chollas Creek

LOE ID:	26715
Pollutant:	Benthic Community Effects
LOE Subgroup:	Adverse Biological Responses
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	9
Number of Exceedances:	9
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Nine samples of IBI data were taken from May 2003 to May 2007 at one sampling site. Of the total number of samples, all nine samples exceeded the IBI impairment threshold.
Data Reference:	Stream Bioassessment Data. Co-permitee Data. Collected 2002-2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. (SDRWQCB, 1995)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at one site: CC-FB on Chollas Creek.

Temporal Representation:	Sampling occurred during during May and October annually from May 2003 to May 2006 and one event on May 2007.
Environmental Conditions:	
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Manual for Freshwater Bioassessment.
QAPP Information Reference(s):	Quality Assurance Manual for Freshwater Bioassessment Revision 0

Line of Evidence (LOE) for Decision ID 43572, Benthic Community Effects **Region 9**

Chollas Creek

LOE ID:	72761
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	11
Number of Exceedances:	11
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Eleven of the eleven samples collected had an IBI score below 40. tr11c NPDES bioassessment
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the State or Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	Development of a Benthic Index of Biotic Integrity (B-IBI) for Wadeable Streams in Northern Coastal California and its Application to Regional 305(b) Assessment
Spatial Representation:	The samples were collected at stations 908CC-FB and CC-NF54 on Chollas Creek.
Temporal Representation:	The samples were collected in May and October 2003 to 2006 and May 2007 to 2010.
Environmental Conditions:	
QAPP Information:	The data was collected under the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan, June 25, 2009.
QAPP Information Reference(s):	Quality Assurance Project Plan for SWAMP Bioassessment and Freshwater Bioassessment.

Line of Evidence (LOE) for Decision ID 43572, Benthic Community Effects **Region 9**

Chollas Creek

LOE ID:	26521
Pollutant:	Benthic Community Effects
LOE Subgroup:	Adverse Biological Responses

Matrix:	Water	038894
Fraction:	None	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	1	
Data and Information Type:	Benthic macroinvertebrate surveys	
Data Used to Assess Water Quality:	One sample of IBI data was taken on November 2005 at one sampling site. Of one sample, that one sample exceeded the IBI impairment threshold.	
Data Reference:	Fish and Game IBI Data	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)	
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13	
Spatial Representation:	Samples were collected at one site: 908CLCANB on Chollas Creek.	
Temporal Representation:	Sampling occurred during one event on November 2005.	
Environmental Conditions:		
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Project Plan for the California Stream Bioassessment Procedure and the State of California, California Monitoring an Assessment Program: "CMAP", Quality Assurance Project Plan.	
QAPP Information Reference(s):	State of California, California Monitoring and Assessment Program: "CMAP". Quality Assurance Project Plan for the California Stream Bioassessment Procedure The San Diego Stream Team Quality Assurance Project Plan	

DECISION ID	50632	Region 9
Chollas Creek		

Pollutant:	**Chlordane**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 an additional line of evidence are necessary associating chemical concentrations with sediment toxicity to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Water Quality Criteria for Chlordane.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Water Quality Criteria for Chlordane and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50632, Chlordane **Region 9**

Chollas Creek

LOE ID:	72823
Pollutant:	Chlordane
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	0 of 1 samples collected exceeded the criteria for chlordane concentration (Sum of trans-Chlordane, cis-Chlordane, cis-Nonachlor, trans-Nonachlor, and Oxychlordane).
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Waters shall not contain substances in concentrations that result in the deposition of material that causes nuisance or adversely affects beneficial uses. (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Probable Effect Concentration for Chlordane in freshwater sediments is 17.6 ug/kg(MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data were collected at the following station 908SUP096 (Chollas Creek @ Ocean View).
Temporal Representation:	The samples were collected on 1/8/2007.
Environmental Conditions:	
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **53134** **Region 9**

Chollas Creek 038896

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the 21 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 21 samples exceeded the criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 53134, Chromium — Region 9

Chollas Creek

LOE ID:	73251
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	21
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Chollas Creek to determine beneficial use support and results are as follows: 0 of 21 samples exceed the criterion for Chromium.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Chromium to protect aquatic life in freshwater. The dissolved Chromium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.

Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Chollas Creek was collected at 1 monitoring site [Chollas Creek - 908CC-SD8(1)]
Temporal Representation:	Data was collected over the time period 11/29/2001-10/5/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID	**50634**	**Region 9**
Chollas Creek		

Pollutant:	**Cyfluthrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 an additional line of evidence associating chemical concentrations with sediment toxicity is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Cyfulthrin. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Evaluation Guideline for Cyfulthrin and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50634, Cyfluthrin	**Region 9**
Chollas Creek	

LOE ID:	73253

Pollutant:	Cyfluthrin	038898
LOE Subgroup:	Pollutant-Sediment	
Matrix:	Sediment	
Fraction:	Total	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Chollas Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cyfluthrin, total.	
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The evaluation guideline for cyfluthrin is the median lethal concentration (LC50) of 1.1 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 1.1 ug/g is the geometric mean of LC50 values for cyfluthrin from Amweg et al. (2005).	
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5	
Spatial Representation:	Data for this line of evidence for Chollas Creek was collected at 1 monitoring site [Chollas Creek @ Ocean View - 908SUP096]	
Temporal Representation:	Data was collected on a single day 1/8/2007.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.	
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)	

DECISION ID	**50639**	**Region 9**
Chollas Creek		

Pollutant:	**Cyhalothrin, Lambda**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 an additional line of evidence associating chemical concentrations with sediment toxicity is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Cyhalothrin, Lambda.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.

2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.938899
3. Zero of One samples exceeded the Evaluation Guideline for Cyhalothrin, Lambda and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50639, Cyhalothrin, Lambda **Region 9**
Chollas Creek

LOE ID:	73254
Pollutant:	Cyhalothrin, Lambda
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Chollas Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cyhalothrin, lambda, total.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for lambda-cyhalothrin is the median lethal concentration (LC50) of 0.44 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 0.44 ug/g is the geometric mean of LC50 values for lambda-cyhalothrin from Amweg et al. (2005).
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5
Spatial Representation:	Data for this line of evidence for Chollas Creek was collected at 1 monitoring site [Chollas Creek @ Ocean View - 908SUP096]
Temporal Representation:	Data was collected on a single day 1/8/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **50642** **Region 9**
Chollas Creek

Pollutant:	**DDD (Dichlorodiphenyldichloroethane)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 an additional line of evidence associating chemical concentrations with sediment toxicity is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for DDD (Dichlorodiphenyldichloroethane).

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Evaluation Guideline for DDD (Dichlorodiphenyldichloroethane) and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50642, DDD (Dichlorodiphenyldichloroethane) **Region 9**

Chollas Creek

LOE ID:	73258
Pollutant:	DDD (Dichlorodiphenyldichloroethane)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Chollas Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for DDD.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for sum of DDD (o,p' + p,p') is 28.0 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Chollas Creek was collected at 1 monitoring site [Chollas Creek @ Ocean View - 908SUP096]
Temporal Representation:	Data was collected on a single day 1/8/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID 50643 — Region 9
Chollas Creek

Pollutant:	**DDE (Dichlorodiphenyldichloroethylene)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 an additional line of evidence associating chemical concentrations with sediment toxicity is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for DDE (Dichlorodiphenyldichloroethylene). Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Evaluation Guideline for DDE (Dichlorodiphenyldichloroethylene) and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50643, DDE (Dichlorodiphenyldichloroethylene) — Region 9
Chollas Creek

LOE ID:	73259
Pollutant:	DDE (Dichlorodiphenyldichloroethylene)
LOE Subgroup:	Pollutant-Sediment

Matrix:	Sediment	038902
Fraction:	Total	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Chollas Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for DDE.	
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for sum of DDE (o,p' + p,p') is 31.3 ug/Kg dry weight (MacDonald et al. 2000).	
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31	
Spatial Representation:	Data for this line of evidence for Chollas Creek was collected at 1 monitoring site [Chollas Creek @ Ocean View - 908SUP096]	
Temporal Representation:	Data was collected on a single day 1/8/2007.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.	
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)	

DECISION ID	**50644**	**Region 9**
Chollas Creek		

Pollutant:	**DDT (Dichlorodiphenyltrichloroethane)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 an additional line of evidence associating chemical concentrations with sediment toxicity is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for DDT (Dichlorodiphenyltrichloroethane).

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Evaluation Guideline for DDT (Dichlorodiphenyltrichloroethane) and this sample size is insufficient to determine, with the power and confidence of the Listing Policy,

the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50644, DDT (Dichlorodiphenyltrichloroethane) **Region 9**

Chollas Creek

LOE ID:	73260
Pollutant:	DDT (Dichlorodiphenyltrichloroethane)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Chollas Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for DDT.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for sum of DDT (o,p' + p,p') is 62.9 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Chollas Creek was collected at 1 monitoring site [Chollas Creek @ Ocean View - 908SUP096]
Temporal Representation:	Data was collected on a single day 1/8/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **50645** **Region 9**

Chollas Creek

Pollutant:	**Deltamethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised

Impairment from Pollutant or Pollution:	Pollutant	038904
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.6 an additional line of evidence associating chemical concentrations with sediment toxicity is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero out of Five samples exceeded the Water Quality Criteria, and Zero of the One samples exceed the Evaluation Guideline for Deltamethrin.. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero out of Five samples exceeded the Water Quality Criteria, and Zero of the One samples exceed the Evaluation Guideline for Deltamethrin and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.	
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.	

Line of Evidence (LOE) for Decision ID 50645, Deltamethrin **Region 9**

Chollas Creek

LOE ID:	73261
Pollutant:	Deltamethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Chollas Creek to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Deltamethrin.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	The evaluation guideline for Deltamethrin is the maximum acceptable toxicant concentration (MATC) of 0.02 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Chollas Creek was collected at 1 monitoring site [Chollas Creek - 908CC-SD8(1)]
Temporal Representation:	Data was collected over the time period 10/14/2006-2/3/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 50645, Deltamethrin **Region 9**

Chollas Creek

LOE ID:	73262
Pollutant:	Deltamethrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Chollas Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Deltamethrin.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for deltamethrin is the median lethal concentration (LC50) of 0.79 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 0.79 ug/g is the geometric mean of LC50 values for deltamethrin from Amweg et al. (2005).
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5
Spatial Representation:	Data for this line of evidence for Chollas Creek was collected at 1 monitoring site [Chollas Creek @ Ocean View - 908SUP096]
Temporal Representation:	Data was collected on a single day 1/8/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **50648** **Region 9**

Chollas Creek

Pollutant:	**Dieldrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 an additional line of evidence associating chemical concentrations with sediment toxicity is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Dieldrin.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Evaluation Guideline for Dieldrin and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50648, Dieldrin **Region 9**

Chollas Creek

LOE ID:	73266
Pollutant:	Dieldrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Chollas Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Dieldrin.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for dieldrin is 61.8 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Chollas Creek was collected at 1 monitoring site [Chollas Creek @ Ocean View - 908SUP096]
Temporal Representation:	Data was collected on a single day 1/8/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID 50655 Region 9

Chollas Creek

Pollutant:	**Endrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 an additional line of evidence associating chemical concentrations with sediment toxicity is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Endrin. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Evaluation Guideline for Endrin and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50655, Endrin Region 9

Chollas Creek

LOE ID:	73267
Pollutant:	Endrin
LOE Subgroup:	Pollutant-Sediment

Matrix:	Sediment	038908
Fraction:	Total	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Chollas Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Endrin.	
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for endrin is 207 ug/Kg dry weight (MacDonald et al. 2000).	
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31	
Spatial Representation:	Data for this line of evidence for Chollas Creek was collected at 1 monitoring site [Chollas Creek @ Ocean View - 908SUP096]	
Temporal Representation:	Data was collected on a single day 1/8/2007.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.	
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)	

DECISION ID	**50656**	**Region 9**
Chollas Creek		

Pollutant:	**Esfenvalerate/Fenvalerate**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.6 an additional line of evidence associating chemical concentrations with sediment toxicity is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero for the Six samples exceeded the water quality criteria, and Zero of the One samples exceed the Evaluation Guideline for Esfenvalerate/Fenvalerate.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3.Zero for the Six samples exceeded the water quality criteria, and Zero of the One samples exceed

the Evaluation Guideline for Esfenvalerate/Fenvalerate and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50656, Esfenvalerate/Fenvalerate **Region 9**

Chollas Creek

LOE ID:	73268
Pollutant:	Esfenvalerate/Fenvalerate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Chollas Creek to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Esfenvalerate.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to the USEPA Office of Pesticide Programs Ecotoxicity database, the aquatic life EC50 for Esfenvalerate is 0.9 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Chollas Creek was collected at 1 monitoring site [Chollas Creek - 908CC-SD8(1)]
Temporal Representation:	Data was collected over the time period 10/14/2006-10/5/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 50656, Esfenvalerate/Fenvalerate **Region 9**

Chollas Creek

LOE ID:	73269	038910

Pollutant:	Esfenvalerate/Fenvalerate
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Chollas Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Esfenvalerate/Fenvalerate, total.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for esfenvalerate/fenvalerate is the median lethal concentration (LC50) of 1.5 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 1.5 ug/g is the geometric mean of LC50 values for esfenvalerate/fenvalerate from Amweg et al. (2005).
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5
Spatial Representation:	Data for this line of evidence for Chollas Creek was collected at 1 monitoring site [Chollas Creek @ Ocean View - 908SUP096]
Temporal Representation:	Data was collected on a single day 1/8/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID	**50660**	**Region 9**
Chollas Creek		

Pollutant:	**Fenpropathrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 an additional line of evidence associating chemical concentrations with sediment toxicity is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Fenpropathrin. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section

303(d) List. 038911

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Evaluation Guideline for Fenpropathrin and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50660, Fenpropathrin **Region 9**

Chollas Creek

LOE ID:	73270
Pollutant:	Fenpropathrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Chollas Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Fenpropathrin.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for fenpropathrin is the median lethal concentration (LC50) of 1 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 1 ug/g is the geometric mean of LC50 values for fenpropathrin from Ding et al. (2011).
Guideline Reference:	Toxicity of Sediment-Associated Pesticides to Chironomus dilutus and Hyalella azteca. Arch. Environ. Contam. Toxicol. 61:83Â–92.
Spatial Representation:	Data for this line of evidence for Chollas Creek was collected at 1 monitoring site [Chollas Creek @ Ocean View - 908SUP096]
Temporal Representation:	Data was collected on a single day 1/8/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID	50670	038912 Region 9
Chollas Creek		

Pollutant:	**Fipronil**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 an additional line of evidence associating chemical concentrations with sediment toxicity is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the Zero samples exceed the Evaluation Guideline for Fipronil.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Zero samples exceeded the Evaluation Guideline for Fipronil and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50670, Fipronil	**Region 9**
Chollas Creek	

LOE ID:	73271
Pollutant:	Fipronil
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	One of one sample result was not used in the assessment because the laboratory data was non-detect and the method detection limit was above the guideline and therefore the results could not be quantified with the level of certainty required by the Listing Policy.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP

Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for fipronil is the median lethal concentration (LC50) of 0.13 ug/g and is normalized by the percentage of organic carbon in the sediment sample (Maul et al. 2008).
Guideline Reference:	Effect of sediment-associated pyrethroids, fipronil, and metabolites on Chironomus tentans growth rate, body mass, condition index, immobilization, and survival. Environ. Toxicol. Chem. 27(12):2582-2590.
Spatial Representation:	Data for this line of evidence for Chollas Creek was collected at 1 monitoring site [Chollas Creek @ Ocean View - 908SUP096]
Temporal Representation:	Data was collected on a single day 1/8/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **50672** **Region 9**

Chollas Creek

Pollutant:	**Fipronil Sulfide**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 an additional line of evidence associating chemical concentrations with sediment toxicity is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the Zero samples exceed the Evaluation Guideline for Fipronil Sulfide. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Evaluation Guideline for Fipronil Sulfide and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50672, Fipronil Sulfide **Region 9**

Chollas Creek 038914

LOE ID:	73272
Pollutant:	Fipronil Sulfide
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	One of one sample result was not used in the assessment because the laboratory data was non-detect and the method detection limit was above the guideline and therefore the results could not be quantified with the level of certainty required by the Listing Policy.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for fipronil sulfide is the median lethal concentration (LC50) of 0.16 ug/g and is normalized by the percentage of organic carbon in the sediment sample (Maul et al. 2008).
Guideline Reference:	Effect of sediment-associated pyrethroids, fipronil, and metabolites on Chironomus tentans growth rate, body mass, condition index, immobilization, and survival. Environ. Toxicol. Chem. 27(12):2582-2590.
Spatial Representation:	Data for this line of evidence for Chollas Creek was collected at 1 monitoring site [Chollas Creek @ Ocean View - 908SUP096]
Temporal Representation:	Data was collected on a single day 1/8/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **50673** **Region 9**

Chollas Creek

Pollutant:	**Fipronil Sulfone**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 an additional line of evidence associating chemical concentrations with sediment toxicity is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the Zero samples exceed the Evaluation Guideline for Fipronil Sulfone.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Zero samples exceeded the Evaluation Guideline for Fipronil Sulfone and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50673, Fipronil Sulfone **Region 9**

Chollas Creek

LOE ID:	73273
Pollutant:	Fipronil Sulfone
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	One of one sample result was not used in the assessment because the laboratory data was non-detect and the method detection limit was above the guideline and therefore the results could not be quantified with the level of certainty required by the Listing Policy.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for fipronil sulfone is the median lethal concentration (LC50) of 0.12 ug/g and is normalized by the percentage of organic carbon in the sediment sample (Maul et al. 2008).
Guideline Reference:	Effect of sediment-associated pyrethroids, fipronil, and metabolites on Chironomus tentans growth rate, body mass, condition index, immobilization, and survival. Environ. Toxicol. Chem. 27(12):2582-2590.
Spatial Representation:	Data for this line of evidence for Chollas Creek was collected at 1 monitoring site [Chollas Creek @ Ocean View - 908SUP096]
Temporal Representation:	Data was collected on a single day 1/8/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP.

DECISION ID	50674	Region 9
Chollas Creek		

Pollutant:	**Lindane/gamma Hexachlorocyclohexane (gamma-HCH)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 an additional line of evidence associating chemical concentrations with sediment toxicity is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Lindane/gamma Hexachlorocyclohexane (gamma-HCH). Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Evaluation Guideline for Lindane/gamma Hexachlorocyclohexane (gamma-HCH) and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50674, Lindane/gamma Hexachlorocyclohexane (gamma-HCH)	**Region 9**
Chollas Creek	

LOE ID:	73275
Pollutant:	Lindane/gamma Hexachlorocyclohexane (gamma-HCH)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Chollas Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for HCH, gamma.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring

SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for Lindane (gamma-HCH) is 4.99 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Chollas Creek was collected at 1 monitoring site [Chollas Creek @ Ocean View - 908SUP096]
Temporal Representation:	Data was collected on a single day 1/8/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID 53025 — Region 9

Chollas Creek

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the 21 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 21 samples exceeded the criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 53025, Nickel — Region 9

Chollas Creek

LOE ID:	73277

Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	21
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Chollas Creek to determine beneficial use support and results are as follows: 0 of 21 samples exceed the criterion for Nickel.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Nickel to protect aquatic life in freshwater. The dissolved Nickel criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Chollas Creek was collected at 1 monitoring site [Chollas Creek - 908CC-SD8(1)]
Temporal Representation:	Data was collected over the time period 11/29/2001-10/5/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 53025, Nickel **Region 9**

Chollas Creek

LOE ID:	78000
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	23
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Chollas Creek to determine beneficial use support and results are as follows: 0 of 23 samples exceed the criterion for Nickel.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The Nickel criteria for the protection of human health from consumption of organisms only is 4.6 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Chollas Creek was collected at 1 monitoring site [Chollas Creek - 908CC-SD8(1)]
Temporal Representation:	Data was collected over the time period 11/29/2001-10/5/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID	50685	Region 9
Chollas Creek		

Pollutant:	**Permethrin, total**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 an additional line of evidence associating chemical concentrations with sediment toxicity is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Permethrin, total. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Evaluation Guideline for Permethrin, total and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50685, Permethrin, total	Region 9

Chollas Creek 038920

LOE ID:	73278
Pollutant:	Permethrin, total
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Chollas Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Permethrin, Total.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for permethrin is the median lethal concentration (LC50) of 8.9 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 8.9 ug/g is the geometric mean of LC50 values for permethrin from Amweg et al. (2005).
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5
Spatial Representation:	Data for this line of evidence for Chollas Creek was collected at 1 monitoring site [Chollas Creek @ Ocean View - 908SUP096]
Temporal Representation:	Data was collected on a single day 1/8/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **53037** **Region 9**

Chollas Creek

Pollutant:	**Selenium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. One of the 23 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section

303(d) List in the Water Quality Limited Segments category. 038921

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of 23 samples exceeded the criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 53037, Selenium **Region 9**

Chollas Creek

LOE ID:	78001
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	23
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Chollas Creek to determine beneficial use support and results are as follows: 1 of 23 samples exceed the criterion for Selenium.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The selenium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater is 0.005 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Chollas Creek was collected at 1 monitoring site [Chollas Creek - 908CC-SD8(1)]
Temporal Representation:	Data was collected over the time period 11/29/2001-10/5/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID **53135** **Region 9**

Chollas Creek

Pollutant:	**Temperature, water**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line(s) of evidence are necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 0 samples exceeds the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 0 samples exceeds the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to section 3.2 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53135, Temperature, water **Region 9**

Chollas Creek

LOE ID:	72838
Pollutant:	Temperature, water
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Thirty five samples total were collected however there is no evaluation guideline for assessing temperature for the warm freshwater beneficial use.
Data Reference:	Data for Trash, Nutrients, and Pathogens in Region 9, 2007-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Board that such alteration in temperature does not adversely affect beneficial uses (Water Quality Control Plan San Diego Basin - Region 9).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	038923
Guideline Reference:	
Spatial Representation:	Samples were collected at the following stations: PBL-010-Harbor Dr. Bridge PBL-015-National Ave and 33rd at Park One Towing PBL-020-Federal Blvd. PBL-040-Alpha St. and 38th St. Restoration area
Temporal Representation:	Samples were collected between January, 2009 and July, 2010.
Environmental Conditions:	
QAPP Information:	"San Diego Regional Water Quality Assessment and Outreach Project Quality Assurance Project Plan Prepared by: Clay Clifton (San Diego Coastkeeper, Local Project Sponsor Manager), Bob Stafford (San Diego Stream Team), Dr. Rick Gersberg (San Diego State University), Bryan Bjorndal (Assure Controls, Inc.), and Morgan Justice-Black (I Love A Clean San Diego)."
QAPP Information Reference(s):	Quality Assurance Project Plan for San Diego Regional Water Quality Assessment and Outreach Project.

DECISION ID **50661** **Region 9**

Chollas Creek

Pollutant:	**Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 an additional line of evidence associating chemical concentrations with sediment toxicity is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD). Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Evaluation Guideline for Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD) and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50661, Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD) **Region 9**

Chollas Creek

LOE ID:	73279
Pollutant:	Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Chollas Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for DDT, Total.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for total DDTs (Sum DDT + Sum DDD + Sum DDE) is 572 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Chollas Creek was collected at 1 monitoring site [Chollas Creek @ Ocean View - 908SUP096]
Temporal Representation:	Data was collected on a single day 1/8/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID	49066	Region 9
Chollas Creek		

Pollutant:	**Bifenthrin**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2027
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Six of the six samples exceed the objective for bifenthrin. Seventeen of 23 samples exhibited water toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is

sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Six of six samples exceed the objective and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 49066, Bifenthrin **Region 9**

Chollas Creek

LOE ID:	73299
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Chollas Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Bifenthrin.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for bifenthrin is the median lethal concentration (LC50) of 0.43 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 0.43 ug/g is the geometric mean of LC50 values for bifenthrin from Amweg et al. (2005) and Amweg and Weston (2007).
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5 Whole-sediment toxicity identification evaluation tools for pyrethroid insecticides: I. piperonyl butoxide addition. Environ. Toxicol. Chem. 26:2389-2396.
Spatial Representation:	Data for this line of evidence for Chollas Creek was collected at 1 monitoring site [Chollas Creek @ Ocean View - 908SUP096]
Temporal Representation:	Data was collected on a single day 1/8/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 49066, Bifenthrin **Region 9**

Chollas Creek 038926

LOE ID:	73301
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	6
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Chollas Creek to determine beneficial use support and results are as follows: 6 of 6 samples exceed the criterion for Bifenthrin.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Bifenthrin does not exceed 0.0006 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Chollas Creek was collected at 1 monitoring site [Chollas Creek - 908CC-SD8(1)]
Temporal Representation:	Data was collected over the time period 10/14/2006-10/5/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 49066, Bifenthrin **Region 9**

Chollas Creek

LOE ID:	73280
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	23
Number of Exceedances:	17
Data and Information Type:	TOXICITY TESTING

Data Used to Assess Water Quality:	Twenty-three samples were collected to test for toxicity. Seventeen of the 23 samples exhibited statistically significant toxicity. The toxicity tests included survival of Hyalella azteca, growth of Selenastrum capriconutum and survival and reproduction of Ceriodaphnia dubia.
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected at station 908CC-SD8(1) - Chollas Creek.
Temporal Representation:	The samples were collected from 2001 to 2008.
Environmental Conditions:	
QAPP Information:	The data was collected under the County of San Diego Co-Permittees Receiving Waters Urban Runoff Monitoring and Reporting Program (Order No. 2007-01). Data quality is good.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 49066, Bifenthrin **Region 9**

Chollas Creek

LOE ID:	72753
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate sediment toxicity. The sample exhibited significant toxicity. The toxicity test included survival and growth of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL. SL is defined as the result being significant compared to the negative control based on a statistical test, less than stated the alpha level, AND less than the evaluation threshold.
Guideline Reference:	Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated

	Contaminants with Freshwater Invertebrates, Second Edition. U.S. Environmental Protection Agency Office of Research and Development, Duluth, MI , U.S. Environmental Protection Agency Office of Water, Washington, DC EPA-600/R-99/064
Spatial Representation:	The sample was collected at station 908SUP096.
Temporal Representation:	The sample was collected in January 2007.
Environmental Conditions:	
QAPP Information:	All data was collected following the Standard Operating Procedures and Data Quality Objectives outlined in the SWAMP QAMP, (Puckett, 2002). QA data are included in submission.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **50633** **Region 9**

Chollas Creek

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status; under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Two lines of evidence are available in the administrative record to assess this pollutant. Five of the 20 samples (water) and 0 of the 0 samples (sediment) exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Five of 29 samples (water) exceed the criteria, and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 50633, Chlorpyrifos **Region 9**

Chollas Creek

LOE ID:	73250
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment

Fraction:	Total	038929
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	0	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	One of one sample result was not used in the assessment because the laboratory data was detected, but not quantified and the reporting limit was above the guideline and therefore the results could not be quantified with the level of certainty required by the Listing Policy	
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	There is no chlorpyrifos evaluation guideline specific to "sediment, interstitial water" (pore water). The following evaluation guideline was used to evaluate an exceedance in water quality standards: the freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000, with minor corrections to significant figures as described in Beaulaurier et al., 2005).Â	
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).	
Spatial Representation:	Data for this line of evidence for Chollas Creek was collected at 1 monitoring site [Chollas Creek @ Ocean View - 908SUP096]	
Temporal Representation:	Data was collected on a single day 1/8/2007.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.	
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)	

Line of Evidence (LOE) for Decision ID 50633, Chlorpyrifos **Region 9**

Chollas Creek

LOE ID:	77726
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	20
Number of Exceedances:	5
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Chollas Creek to determine beneficial use support and results are as follows: 5 of 20 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.014 ug/L (Siepmann and Finlayson 2000).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).
Spatial Representation:	Data for this line of evidence for Chollas Creek was collected at 1 monitoring site [Chollas Creek - 908CC-SD8(1)]
Temporal Representation:	Data was collected over the time period 11/29/2001-6/3/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID	50641	Region 9
Chollas Creek		

Pollutant:	**Cypermethrin**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.6 an additional line of evidence associating chemical concentrations with sediment toxicity is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Five out of five samples (water) and zero out of one sample (sediment) exceeded the criteria for cypermethrin. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Five out of five samples (water) exceeded the criteria, and this exceeds the allowable frequency listed in table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality

standards are exceeded and a pollutant contributes to or causes the problem. 038931

Line of Evidence (LOE) for Decision ID 50641, Cypermethrin **Region 9**

Chollas Creek

LOE ID:	73257
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	5
Number of Exceedances:	5
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Chollas Creek to determine beneficial use support and results are as follows: 5 of 5 samples exceed the criterion for Cypermethrin, total.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of cypermethrin does not exceed 0.0002 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Fojut et al. 2012)
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Chollas Creek was collected at 1 monitoring site [Chollas Creek - 908CC-SD8(1)]
Temporal Representation:	Data was collected over the time period 10/14/2006-10/5/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 50641, Cypermethrin **Region 9**

Chollas Creek

LOE ID:	73255
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total

Beneficial Use:	Warm Freshwater Habitat	038932
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Chollas Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cypermethrin, total.	
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The evaluation guideline for cypermethrin is the median lethal concentration (LC50) of 0.3 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 0.3 ug/g is the geometric mean of LC50 values for cypermethrin from Maund et al. (2002).	
Guideline Reference:	Partitioning, bioavailability, and toxicity of the pyrethroid insecticide cypermethrin in sediments. Environmental Toxicology and Chemistry 21:9-15	
Spatial Representation:	Data for this line of evidence for Chollas Creek was collected at 1 monitoring site [Chollas Creek @ Ocean View - 908SUP096]	
Temporal Representation:	Data was collected on a single day 1/8/2007.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.	
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)	

DECISION ID	**50683**	**Region 9**
Chollas Creek		

Pollutant:	**Malathion**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Ten of the 20 samples exceed the Water Quality Criteria for Malathion.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.

3. Ten of 20 samples exceed the Water Quality Criteria, and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 50683, Malathion **Region 9**

Chollas Creek

LOE ID:	73276
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	20
Number of Exceedances:	10
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Chollas Creek to determine beneficial use support and results are as follows: 10 of 20 samples exceed the criterion for Malathion.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for Chollas Creek was collected at 1 monitoring site [Chollas Creek - 908CC-SD8(1)]
Temporal Representation:	Data was collected over the time period 11/8/2002-6/3/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID **32356** **Region 9**

Chollas Creek

Pollutant:	**Diazinon**	038934
Final Listing Decision:	**Do Not Delist from 303(d) list (being addressed with USEPA approved TMDL)**	
Last Listing Cycle's Final Listing Decision:	Do Not Delist from 303(d) list (being addressed with USEPA approved TMDL)(2012)	
Revision Status	Original	
Sources:	Source Unknown	
TMDL Name:	Chollas Creek Diazinon	
TMDL Project Code:	56	
Date TMDL Approved by USEPA:	11/03/2003	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for removal on the CWA section 303(d) List under sections 2.2 and 4.1 of the Listing Policy. Under 4.1 of the Policy, a minimum of one line of evidence is needed to assess listing status.

Six lines of evidence are available in the administrative record to assess this pollutant. Six of 23 samples (water) and zero of one sample (sediment) exceeded the criteria for diazinon. Also, 34 of 44 samples exhibited toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List. There is sufficient justification to place it in the Being Addressed portion of the CWA 303(d) List because a TMDL has been completed and approved by RWQCB and USEPA, and is expected to result in attainment of the standard.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.14 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.15 of the Policy.
3. Six of 23 samples (water) exceeded the criteria, and this exceeds the allowable frequency listed in Table 4.1 of the Listing Policy.
4. The "TMDL of Diazinon, Chollas Creek Watershed, San Diego County" was approved by USEPA on 11/03/2003.
5. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 32356, Diazinon **Region 9**

Chollas Creek

LOE ID:	73264
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	23
Number of Exceedances:	6
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Chollas Creek to determine beneficial use support and results are as follows: 6 of 23 samples exceed the criterion for Diazinon.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works

	Watershed Protection Program, 2001-2008.	038935

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Data for this line of evidence for Chollas Creek was collected at 1 monitoring site [Chollas Creek - 908CC-SD8(1)]
Temporal Representation:	Data was collected over the time period 11/29/2001-10/5/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 32356, Diazinon **Region 9**

Chollas Creek

LOE ID:	73265
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Chollas Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Diazinon.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	There is no diazinon evaluation guideline specific to "sediment, interstitial water" (pore water). The following evaluation guideline was used to evaluate an exceedance in water quality standards: the freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).Â
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Data for this line of evidence for Chollas Creek was collected at 1 monitoring site [Chollas

	Creek @ Ocean View - 908SUP096] 038936
Temporal Representation:	Data was collected on a single day 1/8/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 32356, Diazinon **Region 9**

Chollas Creek

LOE ID:	7484
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Selenastrum capricornutum- One sample was collected and it shows significant toxicity as determined by the Selenastrum capricornutum growth test. Ceriodaphnia dubia- One sample was collected and it shows significant toxicity as determined by the Ceriodaphnia dubia survival/reproductive test according to results in a report submitted by Nautilus Environmental, 2006. The samples were collected on June 1-2, 2006.
Data Reference:	Results of Toxicity Testing for Aliso, Poggi, and Chollas Creeks
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Samples were found to exhibit toxicity when the No Observed Effect Concentration (NOEC) or median lethal concentration (LC50) for any given species was estimated to be less than 100% of the test sample concentration.
Guideline Reference:	Waste Discharge Requirements for Discharges of Urban Runoff From the Municipal Separate Storm Sewer Systems Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego, the San Diego Unified Port District, and the San Diego County Regional Airport. Order No. R9-2007-0001
Spatial Representation:	Samples were collected at the monitoring station Chollas Creek 4 located on the main stem of Chollas Creek (lat/long: 32.69629/-117.12237).
Temporal Representation:	The samples were collected on June 2, 2006.
Environmental Conditions:	
QAPP Information:	Toxicity test results met quality assurance requirements of the toxicity laboratory.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 32356, Diazinon **Region 9**

Chollas Creek

LOE ID:	26373

Pollutant:	Sediment Toxicity	038937
LOE Subgroup:	Toxicity	
Matrix:	Sediment	
Fraction:	Total	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	1	
Data and Information Type:	Ambient toxicity testing (chronic)	
Data Used to Assess Water Quality:	Hyallela azteca- One sample was collected and it shows significant toxicity as determined by both of the freshwater amphipod, Hyalella azteca, survival/growth test according to results in a report submitted by Nautilus Environmental, 2006. The samples were collected on June 1-2, 2006.	
Data Reference:	Results of Toxicity Testing for Aliso, Poggi, and Chollas Creeks	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (RWQCB, 2007).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	Samples were found to exhibit toxicity when the No Observed Effect Concentration (NOEC) or median lethal concentration (LC50) for any given species was estimated to be less than 100% of the test sample concentration.	
Guideline Reference:	Waste Discharge Requirements for Discharges of Urban Runoff From the Municipal Separate Storm Sewer Systems Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego, the San Diego Unified Port District, and the San Diego County Regional Airport. Order No. R9-2007-0001	
Spatial Representation:	Samples were collected at the monitoring station Chollas Creek 4 located on the main stem of Chollas Creek (lat/long: 32.69629/-117.12237).	
Temporal Representation:	The samples were collected on June 2, 2006.	
Environmental Conditions:		
QAPP Information:	Toxicity test results met quality assurance requirements of the toxicity laboratory.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 32356, Diazinon **Region 9**

Chollas Creek

LOE ID:	3353
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	

Objective/Criterion Reference:	Placeholder reference 2006 303(d)	038938
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:		
Temporal Representation:		
Environmental Conditions:		
QAPP Information:	QA Info Missing	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 32356, Diazinon **Region 9**

Chollas Creek

LOE ID:	72753
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate sediment toxicity. The sample exhibited significant toxicity. The toxicity test included survival and growth of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL. SL is defined as the result being significant compared to the negative control based on a statistical test, less than stated the alpha level, AND less than the evaluation threshold.
Guideline Reference:	Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates, Second Edition. U.S. Environmental Protection Agency Office of Research and Development, Duluth, MI , U.S. Environmental Protection Agency Office of Water, Washington, DC EPA-600/R-99/064
Spatial Representation:	The sample was collected at station 908SUP096.
Temporal Representation:	The sample was collected in January 2007.
Environmental Conditions:	
QAPP Information:	All data was collected following the Standard Operating Procedures and Data Quality Objectives outlined in the SWAMP QAMP, (Puckett, 2002). QA data are included in submission.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 32356, Diazinon **Region 9**

Chollas Creek

LOE ID:	25002
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	18
Number of Exceedances:	14
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Selenastrum capricornutum- None of the 18 samples were found to be toxic as determined by at the Selenastrum capricornutum growth test. Ceriodaphnia dubia- Nine of 18 samples were found to be toxic as determined by the Ceriodaphnia dubia survival/reproductive test. Hyalella azteca- Twelve of eighteen samples were found to be toxic as determined by the Hyalella azteca survival test according to results in the San Diego County Municipal Copermittees Urban Runoff Monitoring Report, 2007. Samples were collected 2002 and 2006.
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report Results of Toxicity Testing for Aliso, Poggi, and Chollas Creeks
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Samples were found to exhibit toxicity when the No Observed Effect Concentration (NOEC) or median lethal concentration (LC50) for any given species was estimated to be less than 100% of the test sample concentration.
Guideline Reference:	Waste Discharge Requirements for Discharges of Urban Runoff From the Municipal Separate Storm Sewer Systems Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego, the San Diego Unified Port District, and the San Diego County Regional Airport. Order No. R9-2007-0001
Spatial Representation:	Samples were collected at the mass loading station for Chollas Creek. The station (SD 8) is located near 33 rd and Durant Street.
Temporal Representation:	The samples were collected on from 2002 through 2006.
Environmental Conditions:	
QAPP Information:	Quality assurance conducted according to the Weston Solution Quality assurance plan.
QAPP Information Reference(s):	Weston Solutions, 2004. Quality Management Manual. March 2004 (Revised December 2009).

Line of Evidence (LOE) for Decision ID 32356, Diazinon **Region 9**

Chollas Creek

LOE ID:	73280
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None

Beneficial Use:	Warm Freshwater Habitat	038940
Number of Samples:	23	
Number of Exceedances:	17	
Data and Information Type:	TOXICITY TESTING	
Data Used to Assess Water Quality:	Twenty-three samples were collected to test for toxicity. Seventeen of the 23 samples exhibited statistically significant toxicity. The toxicity tests included survival of Hyalella azteca, growth of Selenastrum capriconutum and survival and reproduction of Ceriodaphnia dubia.	
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.	
Guideline Reference:		
Spatial Representation:	The samples were collected at station 908CC-SD8(1) - Chollas Creek.	
Temporal Representation:	The samples were collected from 2001 to 2008.	
Environmental Conditions:		
QAPP Information:	The data was collected under the County of San Diego Co-Permittees Receiving Waters Urban Runoff Monitoring and Reporting Program (Order No. 2007-01). Data quality is good.	
QAPP Information Reference(s):	e-mail clarifying QAPP information	

DECISION ID	43346	Region 9
Chollas Creek		

Pollutant:	**Nitrogen**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Four lines of evidence are available in the administrative record to assess this pollutant. Thirty-eight of the 40 samples exceed the Basin Plan water quality objective for total nitrogen as N.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Thirty-eight of the 40 samples exceed the Basin Plan water quality objective for total nitrogen as N and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.

	4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43346, Nitrogen **Region 9**

Chollas Creek

LOE ID:	7363
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	The one sample collected exceeds the water quality objective according to results in the Surface Water Ambient Monitoring Program Report, 2006. The sample was collected on June 2, 2006.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at the monitoring station Chollas Creek 4 located on the main stem of Chollas Creek (lat/long: 32.69629/-117.12237).
Temporal Representation:	The sample was collected on June 2, 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 43346, Nitrogen **Region 9**

Chollas Creek

LOE ID:	6728

Pollutant:	Total Nitrogen as N	038942
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	Total	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	39	
Number of Exceedances:	37	
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)	
Data Used to Assess Water Quality:	Thirty-seven of 39 samples exceeded the warm freshwater habitat water quality objective for Total Nitrogen outlined in the Urban Runoff Monitoring, Final Report, 2005-2006. Samples were collected two to four times a year from 1994 -2006.	
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used (RWQCB, 2007).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:	Water Quality Control Plan for the San Diego Basin	
Spatial Representation:	Samples were collected at the mass loading station located within the Chollas sub-watershed in the north fork of the Chollas Creek near the intersection of 33rd and Durant Streets.	
Temporal Representation:	Samples were collected two to four times a year from 1994 - 2006.	
Environmental Conditions:	Samples were collected during wet weather.	
QAPP Information:	Quality assurance conducted according to the City of San Diego's Water Quality Department quality assurance manual.	
QAPP Information Reference(s):	Water Quality Laboratory. Quality Assurance Manual	

DECISION ID **44572** **Region 9**

Chollas Creek

Pollutant:	**Phosphorus**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the

Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. 03843

One line of evidence are available in the administrative record to assess this pollutant. Thirty-nine of the 40 samples exceed the Basin Plan water quality objective for phosphorus.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Thirty-nine of the 40 samples exceed the Basin Plan water quality objective for phosphorus and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 44572, Phosphorus **Region 9**

Chollas Creek

LOE ID:	6706
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	40
Number of Exceedances:	39
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Thirty-nine of 40 samples exceeded the warm freshwater habitat water quality objective for Phosphorus outlined in the Urban Runoff Monitoring, Final Report, 2005-2006. Samples were collected two to four times a year from 1994-2006.
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. Water Quality Control Plan for the San Diego Basin Goal of 0.1 mg/L for total phosphorus in streams and other flowing waters (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at the mass loading station located within the Chollas sub-watershed in the north fork of the Chollas Creek near the intersection of 33rd and Durant Streets.
Temporal Representation:	Samples were collected two to four times a year from 1994 -2006.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	Quality Assurance conducted according to the City of San Diego's Water Quality Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	Water Quality Laboratory. Quality Assurance Manual

DECISION ID	43167	Region 9
Chollas Creek		

Pollutant:	**Trash**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.11 of the Listing Policy. Under section 3.11 listing may be proposed based on the situation-specific weight of evidence. Eight lines of evidence are available in the administrative record to assess this pollutant, these lines of evidence consist of interpretation of data from field survey/photo evidence. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Eight lines of evidence indicate that there is sufficient justification available in favor of placing this water segment-pollutant combination to the Section 303(d) list per Section 3.11 of the Listing Policy.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43167, Trash	**Region 9**
Chollas Creek	

LOE ID:	6108
Pollutant:	Trash
LOE Subgroup:	Pollutant-Nuisance
Matrix:	-N/A
Fraction:	None
Beneficial Use:	Non-Contact Recreation
Number of Samples:	
Number of Exceedances:	
Data and Information Type:	Occurrence of conditions judged to cause impairment
Data Used to Assess Water Quality:	Trash distracts the eye at first glance and is one of the first things noticeable about the water body. Five of the six photos provided from Mike Chee of National Steel and Shipbuilding Company (NASSCO) exhibit excessive trash conditions within the NASCCO leasehold, which is adjacent to the mouth of Chollas Creek. This trash is reported to have

	originated from Chollas Creek after a storm event. Photos were taken January 10, 2005. (Chee, T.M., 2005).
Data Reference:	Email correspondence from T. Michael Chee of NASSCO to John Robertus of the San Diego Regional Water Quality Control Board, regarding trash conditions at mouth of Chollas Creek.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Floating Material Â– Waters shall not contain floating material, including solids, liquids, foams, and scum in concentrations which cause nuisance or adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Photos were taken of trash flushed down Chollas Creek into NASSCO's leasehold . The NASSCO leasehold is adjacent to the mouth of Chollas Creek in San Diego Bay.
Temporal Representation:	Photos were taken January 10, 2005.
Environmental Conditions:	
QAPP Information:	None
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43167, Trash **Region 9**

Chollas Creek

LOE ID:	6111
Pollutant:	Trash
LOE Subgroup:	Pollutant-Nuisance
Matrix:	-N/A
Fraction:	None
Beneficial Use:	Non-Contact Recreation
Number of Samples:	
Number of Exceedances:	
Data and Information Type:	Occurrence of conditions judged to cause impairment
Data Used to Assess Water Quality:	Trash distracts the eye at first glance and is one of the first things noticeable about the water body. Three of three photos taken prior to the I Love a Clean San Diego Creek to Bay Cleanup at the mouth of Chollas Creek exhibit excessive trash conditions within the creek channel. Other photos exhibit large amounts of trash removed from the mouth of Chollas Creek (I Love a Clean San Diego, 2007a).
Data Reference:	I Love a Clean San Diego. 2007a. Photos of trash in Chollas Creek, April 28, 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Floating Material Â– Waters shall not contain floating material, including solids, liquids, foams, and scum in concentrations which cause nuisance or adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Photos were taken of trash located at the mouth of Chollas Creek near Harbor Drive.
Temporal Representation:	Photos were taken April 28, 2007.
Environmental Conditions:	
QAPP Information:	None
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43167, Trash 038946 Region 9

Chollas Creek

LOE ID:	6121
Pollutant:	Trash
LOE Subgroup:	Pollutant-Nuisance
Matrix:	-N/A
Fraction:	None
Beneficial Use:	Non-Contact Recreation
Number of Samples:	
Number of Exceedances:	
Data and Information Type:	Occurrence of conditions judged to cause impairment
Data Used to Assess Water Quality:	Trash conditions, where trash distracts the eye at first glance and is one of the first things noticeable about the water body. The presence of trash impacts the non contact recreational uses of Chollas Creek and San Diego Bay. Between 2002 and 2007, 9.2 tons (18,475 lbs) of trash were removed from Chollas Creek. In September 2002, 1253 pounds of trash were removed from the mouth of Chollas Creek. In September 2003, 643.5 pounds of trash were removed from Chollas Creek. In April 2004, 1525 pounds of trash were removed from the mouth of Chollas Creek. In September 2004, 278.5 pounds of trash were removed from the mouth of Chollas Creek. In April 2005, 1560 pounds of trash were removed from the mouth of Chollas Creek. In September 2005, 940 pounds of trash were removed from the mouth of Chollas Creek. In April 2006, 1600 pounds of trash were removed from the mouth of Chollas Creek. In September 2006, 2700 pounds of trash were removed from the mouth of Chollas Creek. In April 2007, 7975 pounds of trash were removed from the mouth of Chollas Creek, including 575 pounds of hazardous and electronic wastes (I Love a Clean San Diego, 2007b)
Data Reference:	I Love a Clean San Diego. 2007a. Photos of trash in Chollas Creek, April 28, 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Floating Material Â– Waters shall not contain floating material, including solids, liquids, foams, and scum in concentrations which cause nuisance or adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Trash was collected in Chollas Creek near Harbor Drive at the mouth of Chollas Creek.
Temporal Representation:	Cleanup efforts in Chollas Creek took place annually or biannually from 2002 Â– 2007.
Environmental Conditions:	Data is from spring and fall, representing conditions at the start and end of the rainy season.
QAPP Information:	None
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43167, Trash Region 9

Chollas Creek

LOE ID:	26358
Pollutant:	Trash
LOE Subgroup:	Pollutant-Nuisance
Matrix:	-N/A
Fraction:	None
Beneficial Use:	Non-Contact Recreation

Number of Samples:	038947
Number of Exceedances:	
Data and Information Type:	Occurrence of conditions judged to cause impairment
Data Used to Assess Water Quality:	Trash distracts the eye at first glance and is one of the first things noticeable about the water body. While conducting annual dry weather monitoring at 35 - 38 sites in the Chollas and Paleta Creek watersheds from 2003-2006, the City of San Diego's Creek Refuse Assessment Program estimated the amount of trash in both creeks. In 2003, the amount of trash was estimated to be 500 cu ft. In 2004, the amount estimated was 500 cu ft. In 2005, the amount estimated was 1250 cu ft. and in 2006, 200 cu ft. Trash was observed at nearly every monitoring location (City of San Diego, 2007).
Data Reference:	City of SD Trash 2007. Data on trash in Chollas Creek, 2003-2007. Semi-Annual Reports: Addressing Floating Material in Chollas and Paleta Creeks
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Floating Material Â– Waters shall not contain floating material, including solids, liquids, foams, and scum in concentrations which cause nuisance or adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The survey area covered 35 - 38 locations in Chollas and Paleta Creek.
Temporal Representation:	Dry weather monitoring took place between 2003 and 2006.
Environmental Conditions:	
QAPP Information:	None
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43167, Trash **Region 9**

Chollas Creek

LOE ID:	6104
Pollutant:	Trash
LOE Subgroup:	Pollutant-Nuisance
Matrix:	-N/A
Fraction:	None
Beneficial Use:	Non-Contact Recreation
Number of Samples:	
Number of Exceedances:	
Data and Information Type:	Occurrence of conditions judged to cause impairment
Data Used to Assess Water Quality:	Trash distracts the eye at first glance and is one of the first things noticeable about the water body. Inspections of trash conditions in Chollas Creek were conducted August 31, 2001, February 15, 2002, November 8, 2002, May 14, 2004, and September 14, 2006. Photos were collected during the inspections. The photos were reviewed to assess trash conditions in Chollas Creek. All seven photos from August 31, 2001 exhibit poor trash conditions within the creek. One of three photos from February 15, 2002 exhibit poor trash conditions within the creek. All fifteen photos from November 8, 2002 exhibit poor trash conditions within the creek. All four photos from May 14, 2004 exhibit poor trash conditions within the creek. Sixteen of twenty photos from September 14, 2006 exhibit abundant trash within the creek (San Diego Regional Water Quality Control Board, 2006).
Data Reference:	Water Quality Control Plan for the San Diego Basin San Diego Regional Water Quality Control Board. 2001-2006. Facility Inspection Photos of

	Chollas Creek Trash	038948

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Floating Material Â– Waters shall not contain floating material, including solids, liquids, foams, and scum in concentrations which cause nuisance or adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Photos were taken at eight Chollas Creek locations over the course of the inspections.
Temporal Representation:	Photos were taken in August 31, 2001, February 15, 2002, November 8, 2002, May 14, 2004, and September 14, 2006.
Environmental Conditions:	
QAPP Information:	None
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43167, Trash **Region 9**

Chollas Creek

LOE ID:	6110
Pollutant:	Trash
LOE Subgroup:	Pollutant-Nuisance
Matrix:	-N/A
Fraction:	None
Beneficial Use:	Non-Contact Recreation
Number of Samples:	
Number of Exceedances:	
Data and Information Type:	Occurrence of conditions judged to cause impairment
Data Used to Assess Water Quality:	Trash distracts the eye at first glance and is one of the first things noticeable about the water body. All three photos from the United States Navy exhibit abundant trash within the creek after a storme event. (United States Navy, 2001).
Data Reference:	United States Navy. 2001. Photos of trash in Chollas Creek, January 11, 2001
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Floating Material Â– Waters shall not contain floating material, including solids, liquids, foams, and scum in concentrations which cause nuisance or adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Photos were taken of trash caught by the boom located at the mouth of Chollas Creek in San Diego Bay after a rain event.
Temporal Representation:	Photos were taken January 11, 2001.
Environmental Conditions:	Photos were taken following a rain event.
QAPP Information:	None
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43167, Trash **Region 9**

Chollas Creek

LOE ID:	6125

Pollutant:	Trash
LOE Subgroup:	Pollutant-Nuisance
Matrix:	-N/A
Fraction:	None
Beneficial Use:	Non-Contact Recreation
Number of Samples:	
Number of Exceedances:	
Data and Information Type:	Occurrence of conditions judged to cause impairment
Data Used to Assess Water Quality:	Trash distracts the eye at first glance and is one of the first things noticeable about the water body. The San Diego County Municipal Storm Water Copermittees identified trash as a constituent of concern in the Pueblo San Diego Hydrologic Unit (which includes the Chollas Hydrologic Subarea) (San Diego County Municipal Storm Water Copermittees, 2007).
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Floating Material Â– Waters shall not contain floating material, including solids, liquids, foams, and scum in concentrations which cause nuisance or adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Pueblo San Diego Hydrologic Unit. The Chollas Creek watershed is a hydrologic subarea within this larger watershed.
Temporal Representation:	Conclusions made in reports dated 2007.
Environmental Conditions:	
QAPP Information:	None
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43167, Trash **Region 9**

Chollas Creek

LOE ID:	6123
Pollutant:	Trash
LOE Subgroup:	Pollutant-Nuisance
Matrix:	-N/A
Fraction:	None
Beneficial Use:	Non-Contact Recreation
Number of Samples:	
Number of Exceedances:	
Data and Information Type:	Occurrence of conditions judged to cause impairment
Data Used to Assess Water Quality:	Trash distracts the eye at first glance and is one of the first things noticeable about the water body. Between 2002 and 2005, approximately 12.3 tons of trash was collected in Chollas Creek and at the Mouth of Chollas Creek near San Diego Bay. An April 9, 2005 cleanup effort of Chollas Creek west of 38th Street and north of Alpha Street yielded over one ton of trash. A September 17, 2005 cleanup effort of Chollas Creek near the corner of 47th Street and Castana Street yielded approximately 500 pounds of trash and debris.

	A September 21, 2002 cleanup effort of Chollas Creek at Winona Avenue yielded approximately 490 pounds of trash.
	A September 21, 2002 cleanup effort of Chollas Creek at 33rd Street and McLarens Lane yielded approximately 445 pounds of trash.
	In its February 14, 2003 report, the City of San Diego states that the United States Navy removed 10.6 tons of trash from the mouth of Chollas Creek at the location of its trash boom.
Data Reference:	City of SD Trash 2007. Data on trash in Chollas Creek, 2003-2007. Semi-Annual Reports: Addressing Floating Material in Chollas and Paleta Creeks
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Floating Material Â– Waters shall not contain floating material, including solids, liquids, foams, and scum in concentrations which cause nuisance or adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Trash was collected at five locations that covers approximately 12 miles along Chollas Creek channel.
Temporal Representation:	The trash collection efforts took place between 2002 and 2005.
Environmental Conditions:	Data is from spring and fall, representing conditions at the start and end of the rainy season.
QAPP Information:	None
QAPP Information Reference(s):	

DECISION ID 34499 Region 9

Chollas Creek

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (being addressed by USEPA approved TMDL)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
TMDL Name:	Bacteria Impaired Waters I (creeks and beach shorelines)
TMDL Project Code:	169
Date TMDL Approved by USEPA:	06/22/2011
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	303(d) listing decisions made prior to 2006 were not held in an assessment database. The Regional Boards will update this decision when new data and information become available and are assessed.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34499, Indicator Bacteria Region 9

Chollas Creek

LOE ID:	4447
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water

Matrix:	Water	038951
Fraction:	Not Recorded	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	0	
Number of Exceedances:	0	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.	
Data Reference:	Placeholder reference pre-2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Unspecified	
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)	
Evaluation Guideline:	Unspecified	
Guideline Reference:	Placeholder reference pre-2006 303(d)	
Spatial Representation:	Unspecified	
Temporal Representation:	Unspecified	
Environmental Conditions:	Unspecified	
QAPP Information:	Unspecified	
QAPP Information Reference(s):		

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Paradise Creek, HSA 908.320
Water Body ID: CAR9091200019991117092131
Water Body Type: River & Stream

DECISION ID 43648 **Region 9**
Paradise Creek, HSA 908.320

Pollutant: **Phosphorus**
Final Listing Decision: **List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Sources: Source Unknown
Expected TMDL Completion Date: 2023
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 one line of evidence is necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. Four of the samples exceed the water quality objective for phosphorus.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. All four samples exceeded the phosphorus water quality objective and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 43648, Phosphorus **Region 9**
Paradise Creek, HSA 908.320

LOE ID: 8496

Pollutant: Phosphorus
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Dissolved

Beneficial Use: Warm Freshwater Habitat

Number of Samples:	4	038953
Number of Exceedances:	4	
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)	
Data Used to Assess Water Quality:	Four water samples were collected at Paradise Creek station 908PPAR04 on May 2005, September 2005, January 2006 and April 2006. All four samples showed excessive phosphorus concentrations according to results in California's Surface Water Ambient Monitoring Program Report, 2007.	
Data Reference:	Monitoring data for Region 9	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters-streams and other flowing waters, with all beneficial uses, the water quality objective for total phosphorus is 0.1 mg/L (RWQCB, 2007).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Water samples were collected at Paradise Creek station 908PPAR04; (Latitude 32.67115, Longitude -117.10303).	
Temporal Representation:	Samples were collected on May 2005, September 2005, January 2006, April 2006.	
Environmental Conditions:		
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.	
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA	

DECISION ID **44863** **Region 9**

Paradise Creek, HSA 908.320

Pollutant:	**Selenium**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 one line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Four of the samples exceed the water quality objective for Selenium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. All four samples exceeded the selenium water quality objective and this sample size is insufficient to determine with the power and confidence of the Listing Policy if standards are not met. A minimum of five samples is needed for application of table 3.2.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

State Board Review and Conclusion:
The Regional Board staff incorrectly assessed selenium as a conventional pollutant and applied table 3.2 of the listing Policy. Selenium is a toxicant and should be assessed using Table 3.1 . State Water Board staff has corrected this error and revised the recommendation to List for selenium. The revised recommendation is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Four of the four samples exceed the water quality objective for selenium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Four of four samples exceeded the water quality objective for selenium and this exceeds the allowable frequency under Section 3.1 of the Listing Policy.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 44863, Selenium **Region 9**

Paradise Creek, HSA 908.320

LOE ID:	8495
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Four water samples were collected at Paradise Creek station 908PPAR04 on May 2005, September 2005, January 2006 and April 2006. All four samples showed excessive selenium concentrations according to results in California's Surface Water Ambient Monitoring Program Report, 2007.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	CTR Freshwater Chronic (CCC) 5 ug/L; (U.S. EPA, 2000).
Objective/Criterion Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin

Spatial Representation:	Water samples were collected at Paradise Creek station 908PPAR04; (Latitude 33.65532.67115, Longitude -117.10303).
Temporal Representation:	Samples were collected on May 2005, September 2005, January 2006, April 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Otay River
Water Body ID: CAR9102000019991117160226
Water Body Type: River & Stream

DECISION ID 48478 **Region 9**
Otay River

Pollutant: Benthic Community Effects
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: Benthic Community Effects is being considered for placement on the CWA section 303(d) List under sections 3.9 of the Listing Policy. Under section 3.9, an additional line of evidence associating the Benthic Community Effects with a water or sediment concentration of pollutants is necessary to assess listing status. One lines of evidence is/are available in the administrative record to assess this indicator. Three of 24 samples exceeded the objective for the associated pollutant.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing Benthic Community Effects in this water segment on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. [NUMBER] of [NUMBER] samples exceeded the Index of Biological Integrity (IBI) value of poor water quality for this area and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy, however as required under section 3.9 of the Listing Policy, pollutant(s) could not be directly associated with the Benthic Community Effects.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48478, Benthic Community Effects **Region 9**
Otay River

LOE ID: 72764

Pollutant: Benthic-Macroinvertebrate Bioassessments
LOE Subgroup: Population/Community Degradation
Matrix: Water
Fraction: None

Beneficial Use: Warm Freshwater Habitat

Number of Samples:	1	038957
Number of Exceedances:	1	
Data and Information Type:	Benthic macroinvertebrate surveys	
Data Used to Assess Water Quality:	The one sample collected had an IBI score below 40. tr11c NPDES bioassessment	
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the State or Regional Board. Region 9 Basin Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.	
Guideline Reference:	Development of a Benthic Index of Biotic Integrity (B-IBI) for Wadeable Streams in Northern Coastal California and its Application to Regional 305(b) Assessment	
Spatial Representation:	The sample was collected at stations 910OR-TWAS-1 on the Otay River.	
Temporal Representation:	The sample was collected in May 2010.	
Environmental Conditions:		
QAPP Information:	The data was collected under the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan, June 25, 2009.	
QAPP Information Reference(s):	Quality Assurance Project Plan for SWAMP Bioassessment and Freshwater Bioassessment.	

Line of Evidence (LOE) for Decision ID 48478, Benthic Community Effects **Region 9**

Otay River

LOE ID:	74476
Pollutant:	Temperature, water
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	24
Number of Exceedances:	3
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Three of the 24 samples exceeded the evaluation guideline for temperature in this water body.
Data Reference:	Data for Trash, Nutrients, and Pathogens in Region 9, 2007-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Board that such alteration in temperature does not adversely affect beneficial uses. At no time or place shall the temperature of any COLD water be increased more than 5Â°F above the natural receiving water temperature.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	Inland Fishes of California (Moyle 1976) states that for rainbow trout the optimum range for growth and completion of most life stages is 13-21 degrees C (page 129). Since there is no evaluation guideline for assessing temperature for the warm freshwater aquatic life beneficial use, this line of evidence will not be used for Listing Decisions in the 2012 Integrated Report and will be retired for said Listing cycle.
Guideline Reference:	Fish introductions in CA: History and impact on native fishes. Davis, CA: University of CA, Davis
Spatial Representation:	Samples were collected at the following stations: OTY-020-Otay Valley Regional Park- Date St. OTY-025-Otay R. at quarry OTY-030-Otay Valley Regional Park- South
Temporal Representation:	Samples were collected between January, 2009 and July, 2010.
Environmental Conditions:	
QAPP Information:	San Diego Regional Water Quality Assessment and Outreach Project Quality Assurance Project Plan Prepared by: Clay Clifton (San Diego Coastkeeper, Local Project Sponsor Manager), Bob Stafford (San Diego Stream Team), Dr. Rick Gersberg (San Diego State University), Bryan Bjorndal (Assure Controls, Inc.), and Morgan Justice-Black (I Love A Clean San Diego).
QAPP Information Reference(s):	

DECISION ID 48477 Region 9

Otay River

Pollutant:	**Temperature, water**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line(s) of evidence are necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Three of the 24 samples exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. 3 of 24 samples exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48477, Temperature, water Region 9

Otay River

LOE ID:	74476

Pollutant:	Temperature, water	038959
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	24	
Number of Exceedances:	3	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Three of the 24 samples exceeded the evaluation guideline for temperature in this water body.	
Data Reference:	Data for Trash, Nutrients, and Pathogens in Region 9, 2007-2010.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Board that such alteration in temperature does not adversely affect beneficial uses. At no time or place shall the temperature of any COLD water be increased more than 5Â°F above the natural receiving water temperature.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	Inland Fishes of California (Moyle 1976) states that for rainbow trout the optimum range for growth and completion of most life stages is 13-21 degrees C (page 129). Since there is no evaluation guideline for assessing temperature for the warm freshwater aquatic life beneficial use, this line of evidence will not be used for Listing Decisions in the 2012 Integrated Report and will be retired for said Listing cycle.	
Guideline Reference:	Fish introductions in CA: History and impact on native fishes. Davis, CA: University of CA, Davis	
Spatial Representation:	Samples were collected at the following stations: OTY-020-Otay Valley Regional Park- Date St. OTY-025-Otay R. at quarry OTY-030-Otay Valley Regional Park- South	
Temporal Representation:	Samples were collected between January, 2009 and July, 2010.	
Environmental Conditions:		
QAPP Information:	San Diego Regional Water Quality Assessment and Outreach Project Quality Assurance Project Plan Prepared by: Clay Clifton (San Diego Coastkeeper, Local Project Sponsor Manager), Bob Stafford (San Diego Stream Team), Dr. Rick Gersberg (San Diego State University), Bryan Bjorndal (Assure Controls, Inc.), and Morgan Justice-Black (I Love A Clean San Diego).	
QAPP Information Reference(s):		

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Poggi Canyon Creek
Water Body ID: CAR9102000020050630122106
Water Body Type: River & Stream

DECISION ID 43074 **Region 9**
Poggi Canyon Creek

Pollutant: **Nitrogen**
Final Listing Decision: **List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Sources: Source Unknown
Expected TMDL Completion Date: 2023
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 one line of evidence is necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. Three of the samples exceed the water quality objective for total nitrogen.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. All three samples exceeded the nitrogen water quality objective and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 43074, Nitrogen **Region 9**
Poggi Canyon Creek

LOE ID: 21386

Pollutant: Toxicity
LOE Subgroup: Toxicity
Matrix: Water
Fraction: None

Beneficial Use: Warm Freshwater Habitat

Number of Samples:	3	038961
Number of Exceedances:	3	
Data and Information Type:	Ambient toxicity testing (chronic)	
Data Used to Assess Water Quality:	Three samples were collected at Poggi Creek station 910OTPOG3 from January to May 2003, they showed significant toxicity levels (SL) in the following tests: Selenastrum algae growth test - three of the three samples exhibited toxicity. Ceriodaphnia dubia survival/reproductive test - one of the three samples exhibited toxicity.	
Data Reference:	Monitoring data for Region 9	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.	
Guideline Reference:	Monitoring data for Region 9	
Spatial Representation:	Water toxicity samples were collected at Poggi Creek station 910OTPOG3; (Latitude 32.60885, Longitude -117.02087).	
Temporal Representation:	Water samples were collected on January, April, and May 2003.	
Environmental Conditions:		
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43074, Nitrogen **Region 9**

Poggi Canyon Creek

LOE ID:	7432
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Aquatic Life Use:	Limited Warmwater
Number of Samples:	3
Number of Exceedances:	3
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Three water samples were collected at Poggi Creek station 910OTPOG3 during January, April, and May 2003. All three samples showed excessive nitrogen concentrations according to results in California's Surface Water Ambient Monitoring Program Report, 2007.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used (RWQCB, 2007).

Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	038962
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Water samples were collected at Poggi Creek station 910OTPOG3; (Latitude 32.60885, Longitude -117.02087).	
Temporal Representation:	Samples were collected on January, April, and May 2003.	
Environmental Conditions:		
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.	
QAPP Information Reference(s):	Water Quality Control Plan for the San Diego Basin	

DECISION ID	33299	Region 9
Poggi Canyon Creek		

Pollutant:	**DDT (Dichlorodiphenyltrichloroethane)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. A sufficient number of samples exceed the California Toxic Rule: DDT human health carcinogenic risk for consumption of water & organisms of 0.00059 Âµg/L.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Two of the 3 samples exceeded the water quality objective and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

State Board Review and Conclusion:

Based on comments received from City of Chula Vista comment letter #10, on the April 19, 2010 State Water Board staff report for the 2010 Integrated Report, State Water Board staff recommended to remove this water body from the 303(d) list for DDT based on an error with the number of exceedances in the original decision. The original decision was based on 2 out of 3 samples exceeding the water quality objective but this was an error because only one out of 3 samples exceeded the water quality objective. The San Diego Regional Board staff had originally agreed to correct this error but the correction was inadvertently left out of the San Diego Regional Board's Integrated Report when it was submitted to the State Board for its review.

On August 4, 2010 the State Water Board approved the staff listing recommendation to remove this water body from the 303(d) list for DDT.
The final language for the recommendation is:

This pollutant is being considered for removal from the section 303(d) list under section 4.1 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. One of three samples exceeded the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for removing this water segment-pollutant combination from the section 303(d) list.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of 3 samples exceeded the water quality objective and this does not exceed the allowable frequency listed in Table 4.1 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 33299, DDT (Dichlorodiphenyltrichloroethane) Region 9

Poggi Canyon Creek

LOE ID:	3359
Pollutant:	DDT (Dichlorodiphenyltrichloroethane)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Water Contact Recreation
Number of Samples:	3
Number of Exceedances:	2
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Two of 3 sample exceeding CTR criterion (SWAMP, 2004).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses. California Toxic Rule: DDT human health carcinogenic risk for consumption of water & organisms 0.00059 Âµg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	One sampling station at Pogi Creek: 32.6 -117.02114.
Temporal Representation:	Samples were collected from March through September of 2002.
Environmental Conditions:	Otay River Watershed: 910.20.
QAPP Information:	SWAMP Quality Assurance Plan.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33299, DDT (Dichlorodiphenyltrichloroethane) Region 9

Poggi Canyon Creek

LOE ID:	31433	038964

Pollutant:	DDT (Dichlorodiphenyltrichloroethane)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Water Contact Recreation
Number of Samples:	3
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	One of 3 sample exceeding CTR criterion (SWAMP, 2004). This is a 2010 correction of the 2006 LOE # 3359 changing the number of exceedances from 2 to 1.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses. California Toxic Rule: DDT human health carcinogenic risk for consumption of water & organisms 0.00059 Âµg/L.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	One sampling station at Pogi Creek: 32.6 -117.02114.
Temporal Representation:	Samples were collected from March through September of 2002.
Environmental Conditions:	Otay River Watershed: 910.20.
QAPP Information:	SWAMP Quality Assurance Plan.
QAPP Information Reference(s):	

DECISION ID	**43673**	**Region 9**
Poggi Canyon Creek		

Pollutant:	**Selenium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. One of one sample exceeds the water quality objective for selenium. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of one sample exceeds the water quality objective for selenium. and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial

use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43673, Selenium **Region 9**

Poggi Canyon Creek

LOE ID:	7427
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Aquatic Life Use:	Limited Warmwater
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Three water samples were collected at Poggi Creek station (910OTPOG3) on January, April, and May 2003. All three samples showed excessive selenium concentrations according to results in California's Surface Water Ambient Monitoring Program Report, 2007.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	CTR Freshwater Chronic (CCC) 5 ug/L. (U.S. EPA, 2000).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA
Spatial Representation:	Water samples were collected at Poggi Creek station (910OTPOG3); (Latitude 32.60885, Longitude -117.02087).
Temporal Representation:	Samples were collected on January, April, and May 2003.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

DECISION ID **43633** **Region 9**

Poggi Canyon Creek

Pollutant:	**Toxicity**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original

Sources:	Source Unknown	038966
Expected TMDL Completion Date:	2021	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the section 303(d) list under section 3.6 of the Listing Policy. Under section 3.6 a single line of evidence is necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. Three of the samples exceed the water quality objective for toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. All three samples exceed the toxicity water quality objective and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43633, Toxicity **Region 9**

Poggi Canyon Creek

LOE ID:	21386
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	3
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Three samples were collected at Poggi Creek station 910OTPOG3 from January to May 2003, they showed significant toxicity levels (SL) in the following tests: Selenastrum algae growth test - three of the three samples exhibited toxicity. Ceriodaphnia dubia survival/reproductive test - one of the three samples exhibited toxicity.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.
Guideline Reference:	Monitoring data for Region 9

Spatial Representation:	Water toxicity samples were collected at Poggi Creek station 910OTPOG3; (Latitude 32.60885, Longitude -117.02087).
Temporal Representation:	Water samples were collected on January, April, and May 2003.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Dulzura Creek
Water Body ID: CAR9103600020020306084017
Water Body Type: River & Stream

DECISION ID 49039 **Region 9**
Dulzura Creek

Pollutant: **Benthic Community Effects**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: Benthic Community Effects is being considered for placement on the CWA section 303(d) List under sections 3.9 and 3.1 of the Listing Policy. Under section 3.9, an additional line of evidence associating Benthic Community Effects with a water or sediment concentration of pollutant(s) is necessary to assess listing status.

Based on the readily available data and information, the weight of evidence provides sufficient justification for not placing Benthic Community Effects in this water segment on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Pursuant to section 3.9 of the Listing Policy, the water does not exhibit significant degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index.
4. Pursuant to section 3.9 of the Listing Policy, the water segment does not have associated pollutant(s) samples that exceed water quality objectives.
5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not being met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. Furthermore, what data is available does not indicate that the benthic community does exhibits degradation when compared to reference.

Line of Evidence (LOE) for Decision ID 49039, Benthic Community Effects **Region 9**
Dulzura Creek

LOE ID: 73514

Pollutant: Benthic-Macroinvertebrate Bioassessments
LOE Subgroup: Population/Community Degradation
Matrix: Water
Fraction: None

Beneficial Use: Warm Freshwater Habitat

Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	The IBI score for this water body was 37 which indicates that this water body may be considered to have impaired conditions.
Data Reference:	RWB9 Status Sampling 2007 and 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at the following station: 910DZRA03 (Dulzura Creek 3).
Temporal Representation:	Survey done May 6, 2008.
Environmental Conditions:	
QAPP Information:	Data collected following SWAMP QA protocols for the RWB9 Status Sampling 2007 and 2008 water quality monitoring project.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49039, Benthic Community Effects **Region 9**

Dulzura Creek

LOE ID:	79685
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	One sample was taken at one station on Delzura Creek. The CSCI score for this site is above the 0.79 threshold, and is therefore not exceeding the water quality objective for the aquatic life beneficial use.
Data Reference:	RWB9 Status Sampling 2007 and 2008 Region 9 CSCI Scores & Water Body Information
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic

	resource managers translate complex data about benthic macroinvertebrates found living in a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.
Guideline Reference:	The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.
Spatial Representation:	Samples were collected at the following station: 910DZRA03 (Dulzura Creek 3).
Temporal Representation:	Survey done May 6, 2008.
Environmental Conditions:	
QAPP Information:	Data collected following SWAMP QA protocols for the RWB9 Status Sampling 2007 and 2008 water quality monitoring project.
QAPP Information Reference(s):	RWB9 Status Sampling 2007 and 2008

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Tijuana River
Water Body ID: CAR9111100019990208133940
Water Body Type: River & Stream

DECISION ID 44653 **Region 9**
Tijuana River

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not Delist from 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Sources: Source Unknown
Expected TMDL Completion Date: 2010
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for removal from the CWA section 303(d) List under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Five lines of evidence are available in the administrative record to assess this pollutant. With the latest data, 112 of 137 and 137 of 137 geomean samples exceed the water quality objectives for E. Coli. and total coliform of geomeans of 126/100ml and 1000/100ml, respectively, for the protection of REC-1.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, 112 of 137 and 137 of 137 geomean samples exceed the water quality objectives for E. Coli. and total coliform of geomeans of 126/100ml and 1000/100ml, respectively, for the protection of REC-1 and this exceeds the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 44653, Indicator Bacteria **Region 9**
Tijuana River

LOE ID: 76807

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use:	Water Contact Recreation
Number of Samples:	137
Number of Exceedances:	137
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	One hundred and thirty-seven of the 137 samples exceeded the total coliform geomean objective.
Data Reference:	Data for bacteria and temperature in Alamo River, New River (Imperial County), and Tijuana River, Jan 2006-Mar. 2010
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Geometric Mean: The total coliform concentration shall not exceed more than 1000/100 ml. California Department of Public Health
Guideline Reference:	
Spatial Representation:	The samples were collected at Hollister Bridge and Dairy Mart Bridge.
Temporal Representation:	The samples were collected between January 2007 to February 2009. CAR9111100019990208133940
Environmental Conditions:	
QAPP Information:	Laboratory QA document is provided. The samples were analyzed under the City of San Diego EMTS Division Laboratory Quality Assurance Report.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44653, Indicator Bacteria **Region 9**

Tijuana River

LOE ID:	76808
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	155
Number of Exceedances:	151
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	One hundered and fifty-one (151) of the one hundered and fifty-five (155) samples exceeded the Total Coliform objective.
Data Reference:	Data for bacteria and temperature in Alamo River, New River (Imperial County), and Tijuana River, Jan 2006-Mar. 2010
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The Total Coliform concentration shall not exceed more than 10000/100 ml. Basin Plan for the San Diego Region.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Hollister Bridge and Dairy Mart Bridge.
Temporal Representation:	The samples were collected between January 2007 to February 2009.

CAR9111100019990208133940 038973

Environmental Conditions:
QAPP Information: Laboratory QA document is provided. The samples were analyzed under the City of San Diego EMTS Division Laboratory Quality Assurance Report.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 44653, Indicator Bacteria **Region 9**
Tijuana River

LOE ID: 76792

Pollutant: Escherichia coli (E. coli)
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 155
Number of Exceedances: 106

Data and Information Type: Not Specified
Data Used to Assess Water Quality: One hundred and six of the one hundred fifty-five (155) samples exceeded the E. Coli objective.
Data Reference: Data for bacteria and temperature in Alamo River, New River (Imperial County), and Tijuana River, Jan 2006-Mar. 2010

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The E. Coli concentration shall not exceed more than 235/100 ml. Basin Plan for the San Diego Region.
Objective/Criterion Reference: Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:
Guideline Reference:

Spatial Representation: The samples were collected at Dairy Mart Bridge and Hollister Bridge.
Temporal Representation: The samples were collected between January 2007 to February 2009.
CAR9111100019990208133940
Environmental Conditions:
QAPP Information: Laboratory QA document is provided. The samples were analyzed under the City of San Diego EMTS Division Laboratory Quality Assurance Report.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 44653, Indicator Bacteria **Region 9**
Tijuana River

LOE ID: 4741

Pollutant: Indicator Bacteria
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Not Recorded

Beneficial Use: Water Contact Recreation

Number of Samples: 0
Number of Exceedances: 0

Data and Information Type: PATHOGEN MONITORING
Data Used to Assess Water Quality: Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to

	2006.	038974
Data Reference:	Placeholder reference pre-2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Unspecified	
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)	
Evaluation Guideline:	Unspecified	
Guideline Reference:	Placeholder reference pre-2006 303(d)	
Spatial Representation:	Unspecified	
Temporal Representation:	Unspecified	
Environmental Conditions:	Unspecified	
QAPP Information:	Unspecified	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44653, Indicator Bacteria **Region 9**

Tijuana River

LOE ID:	76793
Pollutant:	Escherichia coli (E. coli)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	137
Number of Exceedances:	112
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	One hundred twelve of the 137 samples exceeded the E. Coli geomean objective.
Data Reference:	Data for bacteria and temperature in Alamo River, New River (Imperial County), and Tijuana River, Jan 2006-Mar. 2010
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geometric Mean: The E. Coli concentration shall not exceed more than 126/100 ml. Basin Plan for the San Diego Region.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Dairy Mart Bridge and Hollister Bridge.
Temporal Representation:	The samples were collected between January 2007 to February 2009. CAR9111100019990208133940
Environmental Conditions:	
QAPP Information:	Laboratory QA document is provided. The samples were analyzed under the City of San Diego EMTS Division Laboratory Quality Assurance Report.
QAPP Information Reference(s):	

DECISION ID **43338** **Region 9**

Tijuana River

Pollutant:	**Selenium**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final	List on 303(d) list (TMDL required list)(2012)

Listing Decision:		038975
Revision Status	Revised	
Sources:	Source Unknown	
Expected TMDL Completion Date:	2025	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for removal from the CWA section 303(d) List under section 4.1 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess pollutant. Three of the 21 samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Three of 21 samples exceeded the objective and this exceeds the allowable frequency listed in Table 4.1 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 43338, Selenium **Region 9**

Tijuana River

LOE ID:	21201
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	2
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Two water samples were collected at Tijuana River station 911TTJR05 on May 2004, September 2004, February 2005, and April 2005.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	CTR Freshwater Chronic (CCC) 5 ug/L. (U.S. EPA, 2000). All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Standards 2000. Establishment of numeric criteria for priority toxic pollutants for the State of California: Rules and regulations. Federal Register Vol. 65, No. 97. Washington, D.C.: Environmental Protection Agency Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Water samples were collected at Tijuana River station (911TTJR05).
Temporal Representation: Samples were collected on May 2004, September 2004, February 2005, and April 2005.
Environmental Conditions:
QAPP Information: Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s): 2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 43338, Selenium **Region 9**

Tijuana River

LOE ID: 78140

Pollutant: Selenium
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Cold Freshwater Habitat

Number of Samples: 19
Number of Exceedances: 1

Data and Information Type: PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality: Water Board staff assessed County of San Diego data for Tijuana River to determine beneficial use support and results are as follows: 1 of 19 samples exceed the criterion for Selenium.
Data Reference: Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The selenium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater is 0.005 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference: Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Data for this line of evidence for Tijuana River was collected at 1 monitoring site [Tijuana River - 911TJR-MLS]
Temporal Representation: Data was collected over the time period 1/29/2002-12/16/2008.
Environmental Conditions: Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information: The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s): Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID 43056 **Region 9**

Tijuana River

Pollutant: Toxicity
Final Listing Decision: Do Not Delist from 303(d) list (TMDL required list)

Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)	038977
Revision Status	Revised	
Sources:	Source Unknown	
Expected TMDL Completion Date:	2025	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for removal from the CWA section 303(d) List under section 4.1 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Four lines of evidence are available in the administrative record to assess pollutant. Thirty four of the 34 samples (water) exceed the objective, and three of the three samples (sediment) exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Thirty four of 34 samples exceeded the objective and this exceeds the allowable frequency listed in Table 4.1 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 43056, Toxicity **Region 9**

Tijuana River

LOE ID:	7507
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	15
Number of Exceedances:	15
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Toxicity was observed in the following tests: Hyalella azteca growth and survival test- Five of 15 samples collected were found to be toxic. (Ceriodaphnia dubia test -15 of 15 samples were found to be toxic.) Ceriodaphnia dubia; All 15 samples were toxic according to results in the San Diego County Municipal Copermittees Annual Progress Report, 2007. Samples from the river were collected from January 2002 through February 2006.
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Samples were found to exhibit toxicity when the No Observed Effect Concentration (NOEC) or median lethal concentration (LC50) for any given species was estimated to be less than 100% of the test sample concentration.
Guideline Reference:	Waste Discharge Requirements for Discharges of Urban Runoff From the Municipal Separate Storm Sewer Systems Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego, the San Diego Unified Port District, and the San Diego County Regional Airport. Order No. R9-2007-0001
Spatial Representation:	Samples were collected from the from the mass loading station on the Tijuana River and Hollister Street Bridge.
Temporal Representation:	Samples from the river were collected from January 2002 through February 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance Weston Solutions
QAPP Information Reference(s):	Weston Solutions, 2004. Quality Management Manual. March 2004 (Revised December 2009).

Line of Evidence (LOE) for Decision ID 43056, Toxicity **Region 9**

Tijuana River

LOE ID:	25808
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Aquatic Life Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	2
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	toxicity was observed in the Hyalella azteca survival and growth test- Two samples were collected and both show significant toxicity levels according to results in the Surface Water Ambient Monitoring Program Report, 2007. The Tijuana River was sampled on May 31, 2005 and April 10, 2006.
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.
Guideline Reference:	Monitoring data for Region 9
Spatial Representation:	Samples were collected from the monitoring station Tijuana River 5 (station id: 911TTJR05 lat/long: 32.55132/-117.08439), located on the main stem of the Tijuana River.
Temporal Representation:	The Tijuana River 5 monitoring station was sampled on May 31, 2005 and April 10, 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance

	with the California's Surface Water Ambient Monitoring Program. 038979
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 43056, Toxicity **Region 9**

Tijuana River

LOE ID:	76810
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Preservation of Areas of Special Biological Significance
Number of Samples:	19
Number of Exceedances:	19
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Nineteen samples were collected to test for toxicity. Nineteen of the 19 samples exhibited statistically significant toxicity. The toxicity tests that exhibited significant toxicity included survival of Hyalella azteca and survival and reproduction of Ceriodaphnia dubia.
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected at station 911TJR-MLS Tijuana River.
Temporal Representation:	The samples were collected from 2002 to 2008.
Environmental Conditions:	
QAPP Information:	The data was collected under the County of San Diego Co-Permittees Receiving Waters Urban Runoff Monitoring and Reporting Program (Order No. 2007-01). Data quality is good.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 43056, Toxicity **Region 9**

Tijuana River

LOE ID:	72751
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING

Data Used to Assess Water Quality:	One sample was collected to evaluate sediment toxicity. The sample exhibited significant toxicity. The toxicity test included survival of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL. SL is defined as the result being significant compared to the negative control based on a statistical test, less than stated the alpha level, AND less than the evaluation threshold.
Guideline Reference:	Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates, Second Edition. U.S. Environmental Protection Agency Office of Research and Development, Duluth, MI , U.S. Environmental Protection Agency Office of Water, Washington, DC EPA-600/R-99/064
Spatial Representation:	The sample was collected at station 911TJHRxx.
Temporal Representation:	The sample was collected in May 2008.
Environmental Conditions:	
QAPP Information:	All data was collected following the Standard Operating Procedures and Data Quality Objectives outlined in the SWAMP QAMP, (Puckett, 2002). QA data are included in submission.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID	47156	Region 9
Tijuana River		

Pollutant:	**Antimony**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. None of the 19 samples exceed the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 19 samples exceeded the water quality objective, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision	After review of the available data and information, RWQCB staff concludes that the water body-

Recommendation:	pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 47156, Antimony **Region 9**

Tijuana River

LOE ID:	78141
Pollutant:	Antimony
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	19
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Tijuana River to determine beneficial use support and results are as follows: 0 of 19 samples exceed the criterion for Antimony.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The Antimony criteria for the protection of human health from consumption of organisms only is 4.3 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Tijuana River was collected at 1 monitoring site [Tijuana River - 911TJR-MLS]
Temporal Representation:	Data was collected over the time period 1/29/2002-12/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID **47150** **Region 9**

Tijuana River

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing

status; under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 19 samples (water) and zero of one sample (sediment) exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 19 samples exceeded the criterion, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 47150, Arsenic **Region 9**

Tijuana River

LOE ID:	76834
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Preservation of Rare & Endangered Species
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Tijuana River to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for arsenic is 33 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Tijuana River was collected at 1 monitoring site [Tijuana River at Hollister Rd - 911TJHRxx]
Temporal Representation:	Data was collected on a single day 5/22/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the 2002 QAMP.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient

Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

038983

Line of Evidence (LOE) for Decision ID 47150, Arsenic **Region 9**

Tijuana River

LOE ID:	78143
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	19
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Tijuana River to determine beneficial use support and results are as follows: 0 of 19 samples exceed the criterion for Arsenic.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The dissolved arsenic criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved arsenic is 0.150 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Tijuana River was collected at 1 monitoring site [Tijuana River - 911TJR-MLS]
Temporal Representation:	Data was collected over the time period 1/29/2002-12/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID **47151** **Region 9**

Tijuana River

Pollutant:	**Bifenthrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing

status; under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of one sample (sediment) and one of one sample (water) exceeded the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of one sample (water) and zero of one sample (sediment) exceeded the criteria, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47151, Bifenthrin **Region 9**

Tijuana River

LOE ID:	76835
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Preservation of Rare & Endangered Species
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Tijuana River to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Bifenthrin.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for bifenthrin is the median lethal concentration (LC50) of 0.43 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 0.43 ug/g is the geometric mean of LC50 values for bifenthrin from Amweg et al. (2005) and Amweg and Weston (2007).
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5 Whole-sediment toxicity identification evaluation tools for pyrethroid insecticides: I. piperonyl butoxide addition. Environ. Toxicol. Chem. 26:2389-2396.

Spatial Representation:	Data for this line of evidence for Tijuana River was collected at 1 monitoring site [Tijuana River at Hollister Rd - 911TJHRxx]
Temporal Representation:	Data was collected on a single day 5/22/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 47151, Bifenthrin **Region 9**

Tijuana River

LOE ID:	76839
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Tijuana River to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Bifenthrin.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Bifenthrin does not exceed 0.0006 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Tijuana River was collected at 1 monitoring site [Tijuana River - 911TJR-MLS]
Temporal Representation:	Data was collected on a single day 12/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID 47313 **Region 9**

Tijuana River

Pollutant:	**Chlordane**	038986
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	
Last Listing Cycle's Final Listing Decision:	New Decision	
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 two lines of evidence are necessary to assess listing status.

Only one line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceeds the guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the guideline, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47313, Chlordane **Region 9**

Tijuana River

LOE ID:	72822
Pollutant:	Chlordane
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	0 of 1 samples collected exceeded the criteria for chlordane concentration (Sum of trans-Chlordane, cis-Chlordane, cis-Nonachlor, trans-Nonachlor, and Oxychlordane).
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Waters shall not contain substances in concentrations that result in the deposition of material that causes nuisance or adversely affects beneficial uses. (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	The Probable Effect Concentration for Chlordane in freshwater sediments is 17.6 ug/kg(MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data were collected at the following station 911TJHRxx (Tijuana River at Hollister Rd).
Temporal Representation:	The samples were collected on 5/22/2008.
Environmental Conditions:	
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 48052 Region 9

Tijuana River

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of 17 samples (water) and zero of one sample (sediment) exceeded the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 17 samples (water) exceeded the water quality objective, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. [Zero of one sample (sediment) exceeded the water quality objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating; a minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.] 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 48052, Chromium Region 9

Tijuana River

LOE ID:	76849
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Cold Freshwater Habitat	038988
Number of Samples:	17	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Tijuana River to determine beneficial use support and results are as follows: 0 of 17 samples exceed the criterion for Chromium.	
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved chromium to protect aquatic life in freshwater. The dissolved Chromium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Tijuana River was collected at 1 monitoring site [Tijuana River - 911TJR-MLS]	
Temporal Representation:	Data was collected over the time period 1/29/2002-12/16/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.	

Line of Evidence (LOE) for Decision ID 48052, Chromium **Region 9**

Tijuana River

LOE ID:	76848
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Preservation of Rare & Endangered Species
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Tijuana River to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for chromium is 111 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Tijuana River was collected at 1 monitoring site [Tijuana River at Hollister Rd - 911TJHRxx]
Temporal Representation:	Data was collected on a single day 5/22/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the 2002 QAMP.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID 53166 Region 9

Tijuana River

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status; under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 17 samples (water) and zero of one sample (sediment) exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 17 samples (water) exceeded the criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 53166, Copper Region 9

Tijuana River

LOE ID:	76852
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	038990
Beneficial Use:	Cold Freshwater Habitat	
Number of Samples:	17	
Number of Exceedances:	1	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Tijuana River to determine beneficial use support and results are as follows: 1 of 17 samples exceed the criterion for Copper.	
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved copper to protect aquatic life in freshwater. The dissolved copper criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Tijuana River was collected at 1 monitoring site [Tijuana River - 911TJR-MLS]	
Temporal Representation:	Data was collected over the time period 1/29/2002-12/16/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.	

Line of Evidence (LOE) for Decision ID 53166, Copper **Region 9**

Tijuana River

LOE ID:	76851
Pollutant:	Copper
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Preservation of Rare & Endangered Species
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Tijuana River to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.

Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	038991
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for copper is 149 mg/Kg dry weight (MacDonald et al. 2000).	
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31	
Spatial Representation:	Data for this line of evidence for Tijuana River was collected at 1 monitoring site [Tijuana River at Hollister Rd - 911TJHRxx]	
Temporal Representation:	Data was collected on a single day 5/22/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	SWAMP data collected before September 2008 followed the 2002 QAMP.	
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)	

DECISION ID 53168 Region 9

Tijuana River

Pollutant:	**Cyfluthrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeded the criteria, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53168, Cyfluthrin Region 9

Tijuana River

LOE ID:	77922
Pollutant:	Cyfluthrin

LOE Subgroup:	Pollutant-Sediment	038992
Matrix:	Sediment	
Fraction:	Total	
Beneficial Use:	Preservation of Rare & Endangered Species	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Tijuana River to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cyfluthrin, total.	
Data Reference:	Statewide Stream Pollution Trends Study 2008	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The evaluation guideline for cyfluthrin is the median lethal concentration (LC50) of 1.1 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 1.1 ug/g is the geometric mean of LC50 values for cyfluthrin from Amweg et al. (2005).	
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5	
Spatial Representation:	Data for this line of evidence for Tijuana River was collected at 1 monitoring site [Tijuana River at Hollister Rd - 911TJHRxx]	
Temporal Representation:	Data was collected on a single day 5/22/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.	
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)	

DECISION ID	**53169**	**Region 9**
Tijuana River		

Pollutant:	**Cyhalothrin, Lambda**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeds the criterion.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.

2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the criterion, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53169, Cyhalothrin, Lambda **Region 9**
Tijuana River

LOE ID:	77923
Pollutant:	Cyhalothrin, Lambda
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Preservation of Rare & Endangered Species
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Tijuana River to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cyhalothrin, lambda, total.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for lambda-cyhalothrin is the median lethal concentration (LC50) of 0.44 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 0.44 ug/g is the geometric mean of LC50 values for lambda-cyhalothrin from Amweg et al. (2005).
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5
Spatial Representation:	Data for this line of evidence for Tijuana River was collected at 1 monitoring site [Tijuana River at Hollister Rd - 911TJHRxx]
Temporal Representation:	Data was collected on a single day 5/22/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **53171** **Region 9**
Tijuana River

Pollutant:	**DDD (Dichlorodiphenyldichloroethane)**	038994
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	
Last Listing Cycle's Final Listing Decision:	New Decision	
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeds the criterion.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the criterion, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53171, DDD (Dichlorodiphenyldichloroethane) **Region 9**

Tijuana River

LOE ID:	76782
Pollutant:	DDD (Dichlorodiphenyldichloroethane)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Preservation of Rare & Endangered Species
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Tijuana River to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for DDD.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for sum of DDD (o,p' + p,p') is 28.0 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Tijuana River was collected at 1 monitoring site [Tijuana River at Hollister Rd - 911TJHRxx]
Temporal Representation:	Data was collected on a single day 5/22/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID 53175 — Region 9

Tijuana River

Pollutant:	**DDE (Dichlorodiphenyldichloroethylene)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeds the criterion.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the criterion, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53175, DDE (Dichlorodiphenyldichloroethylene) — Region 9

Tijuana River

LOE ID:	76783
Pollutant:	DDE (Dichlorodiphenyldichloroethylene)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment

Fraction:	Total	038996
Beneficial Use:	Preservation of Rare & Endangered Species	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Tijuana River to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for DDE.	
Data Reference:	Statewide Stream Pollution Trends Study 2008	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for sum of DDE (o,p' + p,p') is 31.3 ug/Kg dry weight (MacDonald et al. 2000).	
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31	
Spatial Representation:	Data for this line of evidence for Tijuana River was collected at 1 monitoring site [Tijuana River at Hollister Rd - 911TJHRxx]	
Temporal Representation:	Data was collected on a single day 5/22/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.	
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)	

DECISION ID	**53176**	**Region 9**
Tijuana River		

Pollutant:	**DDT (Dichlorodiphenyltrichloroethane)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeds the criterion.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the criterion, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of

16 samples is needed to determine if a beneficial use is fully supported using table 3.1 138997
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53176, DDT (Dichlorodiphenyltrichloroethane) Region 9
Tijuana River

LOE ID:	76784
Pollutant:	DDT (Dichlorodiphenyltrichloroethane)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Preservation of Rare & Endangered Species
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Tijuana River to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for DDT.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for sum of DDT (o,p' + p,p') is 62.9 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Tijuana River was collected at 1 monitoring site [Tijuana River at Hollister Rd - 911TJHRxx]
Temporal Representation:	Data was collected on a single day 5/22/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID 53179 Region 9
Tijuana River

Pollutant:	**Deltamethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or	Pollutant

Pollution: 038998

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status; under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of one sample (water) and zero of one sample (sediment) exceeded the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample (water) and zero of one sample (sediment) exceeded the criteria, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53179, Deltamethrin **Region 9**

Tijuana River

LOE ID:	76787
Pollutant:	Deltamethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Tijuana River to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Deltamethrin.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	The evaluation guideline for Deltamethrin is the maximum acceptable toxicant concentration (MATC) of 0.02 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Tijuana River was collected at 1 monitoring site [Tijuana River - 911TJR-MLS]
Temporal Representation:	Data was collected on a single day 12/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 53179, Deltamethrin **Region 9**

Tijuana River

LOE ID:	77914
Pollutant:	Deltamethrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Preservation of Rare & Endangered Species
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Tijuana River to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Deltamethrin.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for deltamethrin is the median lethal concentration (LC50) of 0.79 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 0.79 ug/g is the geometric mean of LC50 values for deltamethrin from Amweg et al. (2005).
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5
Spatial Representation:	Data for this line of evidence for Tijuana River was collected at 1 monitoring site [Tijuana River at Hollister Rd - 911TJHRxx]
Temporal Representation:	Data was collected on a single day 5/22/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **53201** **Region 9**

Tijuana River

Pollutant:	**Dieldrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeds the criterion.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the criterion, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53201, Dieldrin **Region 9**

Tijuana River

LOE ID:	76790
Pollutant:	Dieldrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Preservation of Rare & Endangered Species
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Tijuana River to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Dieldrin.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for dieldrin is 61.8 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Tijuana River was collected at 1 monitoring site [Tijuana River at Hollister Rd - 911TJHRxx]
Temporal Representation:	Data was collected on a single day 5/22/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the 2002 QAMP.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID 53206 Region 9

Tijuana River

Pollutant:	**Endrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeds the criterion. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeded the criterion, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53206, Endrin Region 9

Tijuana River

LOE ID:	76791
Pollutant:	Endrin
LOE Subgroup:	Pollutant-Sediment

Matrix:	Sediment	039002
Fraction:	Total	
Beneficial Use:	Preservation of Rare & Endangered Species	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Tijuana River to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Endrin.	
Data Reference:	Statewide Stream Pollution Trends Study 2008	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for endrin is 207 ug/Kg dry weight (MacDonald et al. 2000).	
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31	
Spatial Representation:	Data for this line of evidence for Tijuana River was collected at 1 monitoring site [Tijuana River at Hollister Rd - 911TJHRxx]	
Temporal Representation:	Data was collected on a single day 5/22/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	SWAMP data collected before September 2008 followed the 2002 QAMP.	
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)	

DECISION ID	**53213**	**Region 9**
Tijuana River		

Pollutant:	**Esfenvalerate/Fenvalerate**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status; under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of one sample (water) and zero of one sample (sediment) exceeded the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.

3. Zero of one sample (water) and zero of one sample (sediment) exceeded the criterion, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53213, Esfenvalerate/Fenvalerate **Region 9**

Tijuana River

LOE ID:	76794
Pollutant:	Esfenvalerate/Fenvalerate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Tijuana River to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Esfenvalerate.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to the USEPA Office of Pesticide Programs Ecotoxicity database, the aquatic life EC50 for Esfenvalerate is 0.9 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Tijuana River was collected at 1 monitoring site [Tijuana River - 911TJR-MLS]
Temporal Representation:	Data was collected on a single day 12/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 53213, Esfenvalerate/Fenvalerate **Region 9**

Tijuana River

LOE ID:	77916
Pollutant:	Esfenvalerate/Fenvalerate
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Preservation of Rare & Endangered Species
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Tijuana River to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Esfenvalerate/Fenvalerate, total.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for esfenvalerate/fenvalerate is the median lethal concentration (LC50) of 1.5 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 1.5 ug/g is the geometric mean of LC50 values for esfenvalerate/fenvalerate from Amweg et al. (2005).
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5
Spatial Representation:	Data for this line of evidence for Tijuana River was collected at 1 monitoring site [Tijuana River at Hollister Rd - 911TJHRxx]
Temporal Representation:	Data was collected on a single day 5/22/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **53222** **Region 9**

Tijuana River

Pollutant:	**Fenpropathrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeds the criterion.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the criterion, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53222, Fenpropathrin **Region 9**

Tijuana River

LOE ID:	77917
Pollutant:	Fenpropathrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Preservation of Rare & Endangered Species
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Tijuana River to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Fenpropathrin.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for fenpropathrin is the median lethal concentration (LC50) of 1 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 1 ug/g is the geometric mean of LC50 values for fenpropathrin from Ding et al. (2011).
Guideline Reference:	Toxicity of Sediment-Associated Pesticides to Chironomus dilutus and Hyalella azteca. Arch. Environ. Contam. Toxicol. 61:83Â–92.
Spatial Representation:	Data for this line of evidence for Tijuana River was collected at 1 monitoring site [Tijuana River at Hollister Rd - 911TJHRxx]
Temporal Representation:	Data was collected on a single day 5/22/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID	32713	Region 9
Tijuana River		

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. In the first line of evidence (associated with LOE #3367), insufficient information is available for making listing decisions). In the second line of evidence (associated with LOE#76796), zero of the 17 samples exceed the California Toxics Rule criteria for Lead for the protection of aquatic lives. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 17 samples exceeded the California Toxics Rule and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 32713, Lead	Region 9
Tijuana River	

LOE ID:	76796
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Tijuana River to determine beneficial use support and results are as follows: 0 of 17 samples exceed the criterion for Lead.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved lead to protect aquatic life in freshwater. The dissolved lead criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Tijuana River was collected at 1 monitoring site [Tijuana River - 911TJR-MLS]
Temporal Representation:	Data was collected over the time period 1/29/2002-12/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 32713, Lead **Region 9**

Tijuana River

LOE ID:	3367
Pollutant:	Lead
LOE Subgroup:	Testimonial Evidence
Matrix:	Not Specified
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	From the letter from the San Diego Baykeeper written 06/14/2004: We recommend continued listing of this area for impairment by bacteria, low dissolved oxygen, eutrophication, pesticides, solids, synthetic organics, lead, nickel, thallium, and trash.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Objectives are numeric, taken from CTR and Freshwater Sediment (Policy).
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	From the CTR: Freshwater acute standard for lead is 64.58 ppb. Freshwater chronic standard is 2.52 ppb. The probable effects concentration for freshwater sediment is 128 ppm.
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	The area with possible impairment is reported as the Tijuana River. Exact location was not reported.
Temporal Representation:	The letter suggesting impairment was written on 06/14/2004. Specific sample or study dates were not reported.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

DECISION ID 53228 **Region 9**

Tijuana River 039008

Pollutant:	**Lindane/gamma Hexachlorocyclohexane (gamma-HCH)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeds the criterion.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the criterion, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53228, Lindane/gamma Hexachlorocyclohexane (gamma-HCH) — Region 9

Tijuana River

LOE ID:	77918
Pollutant:	Lindane/gamma Hexachlorocyclohexane (gamma-HCH)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Preservation of Rare & Endangered Species
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Tijuana River to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for HCH, gamma.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce

	detrimental physiological responses in, human, plant, animal, or aquatic life 039009
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for Lindane (gamma-HCH) is 4.99 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Tijuana River was collected at 1 monitoring site [Tijuana River at Hollister Rd - 911TJHRxx]
Temporal Representation:	Data was collected on a single day 5/22/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the 2002 QAMP.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID 53231 Region 9

Tijuana River

Pollutant:	**Mercury**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeds the criterion. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeded the criterion, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53231, Mercury Region 9

Tijuana River

LOE ID:	76798

Pollutant:	Mercury	039010
LOE Subgroup:	Pollutant-Sediment	
Matrix:	Sediment	
Fraction:	Total	
Beneficial Use:	Preservation of Rare & Endangered Species	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Tijuana River to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Mercury.	
Data Reference:	Statewide Stream Pollution Trends Study 2008	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for mercury is 1.06 mg/Kg dry weight (MacDonald et al. 2000).	
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31	
Spatial Representation:	Data for this line of evidence for Tijuana River was collected at 1 monitoring site [Tijuana River at Hollister Rd - 911TJHRxx]	
Temporal Representation:	Data was collected on a single day 5/22/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	SWAMP data collected before September 2008 followed the 2002 QAMP.	
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)	

DECISION ID	**53246**	**Region 9**
Tijuana River		

Pollutant:	**Methyl Parathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeds the criterion.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.

2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 939011
3. Zero of one sample exceeded the criterion, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53246, Methyl Parathion **Region 9**
Tijuana River

LOE ID:	77919
Pollutant:	Methyl Parathion
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Preservation of Rare & Endangered Species
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Tijuana River to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Parathion, Methyl.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for methyl parathion is the median lethal concentration (LC50) of 6 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 6 ug/g is the geometric mean of LC50 values for methyl parathion from Ding et al. (2011).
Guideline Reference:	Toxicity of Sediment-Associated Pesticides to Chironomus dilutus and Hyalella azteca. Arch. Environ. Contam. Toxicol. 61:83Â–92.
Spatial Representation:	Data for this line of evidence for Tijuana River was collected at 1 monitoring site [Tijuana River at Hollister Rd - 911TJHRxx]
Temporal Representation:	Data was collected on a single day 5/22/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **43374** **Region 9**
Tijuana River

Pollutant: **Nickel**

Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	039012
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)	
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Three lines of evidence are available in the administrative record to assess this pollutant. Zero of 17 samples (water) and zero of one of sample (sediment) exceeded the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 17 samples (water) exceeded the water quality objective, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. [Zero of one sample (sediment) exceeded the water quality objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating; a minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.]
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 43374, Nickel **Region 9**

Tijuana River

LOE ID:	76800
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Preservation of Rare & Endangered Species
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Tijuana River to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for nickel is 48.6 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Tijuana River was collected at 1 monitoring site [Tijuana River at Hollister Rd - 911TJHRxx]
Temporal Representation:	Data was collected on a single day 5/22/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the 2002 QAMP.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 43374, Nickel **Region 9**

Tijuana River

LOE ID:	3368
Pollutant:	Nickel
LOE Subgroup:	Testimonial Evidence
Matrix:	Not Specified
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	From the letter from the San Diego Baykeeper written on 06/14/2004: We recommend continued listing of this area for impairment by bacteria, low dissolved oxygen, eutrophication, pesticides, solids, synthetic organics, lead, nickel, thallium, and trash.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The objectives are numeric.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	From the CTR: The freshwater acute criteria for nickel (when the water hardness is 100) is 468.24 ppb and the freshwater chronic criteria (hardness= 100) is 52.06 ppb. Human Health Criteria for water and organisms is 610 ppb. Freshwater sediment criteria is 48.6 ppm.
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	The waterbody with a possible impairment is the Tijuana River. Exact location was not reported.
Temporal Representation:	The letter documenting a possible impairment was written on 06/14/2004. Temporal representation for samples or studies was not reported.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43374, Nickel **Region 9**

Tijuana River

LOE ID:	76801
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water

Matrix:	Water	039014
Fraction:	None	
Beneficial Use:	Cold Freshwater Habitat	
Number of Samples:	17	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Tijuana River to determine beneficial use support and results are as follows: 0 of 17 samples exceed the criterion for Nickel.	
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Nickel to protect aquatic life in freshwater. The dissolved Nickel criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Tijuana River was collected at 1 monitoring site [Tijuana River - 911TJR-MLS]	
Temporal Representation:	Data was collected over the time period 1/29/2002-12/16/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.	

Line of Evidence (LOE) for Decision ID 43374, Nickel **Region 9**

Tijuana River

LOE ID:	78138
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	19
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Tijuana River to determine beneficial use support and results are as follows: 0 of 19 samples exceed the criterion for Nickel.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	The Nickel criteria for the protection of human health from consumption of organisms only is 4.6 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Tijuana River was collected at 1 monitoring site [Tijuana River - 911TJR-MLS]
Temporal Representation:	Data was collected over the time period 1/29/2002-12/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID 53250 — Region 9

Tijuana River

Pollutant:	**PCBs (Polychlorinated biphenyls)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeds the criterion. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeded the criterion, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53250, PCBs (Polychlorinated biphenyls) — Region 9

Tijuana River

LOE ID:	72815	039016

Pollutant:	PCBs (Polychlorinated biphenyls)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Zero of 1 sample collected for Total PCBs exceeded the evaluation guideline.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for total PCB is 676 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data were collected at the following station 911TJHRxx (Tijuana River at Hollister Rd).
Temporal Representation:	The samples were collected on 5/22/2008.
Environmental Conditions:	
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID	**53260**	**Region 9**
Tijuana River		

Pollutant:	**Permethrin, total**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeds the criterion.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the criterion, and this sample size is insufficient to determine, with the

power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53260, Permethrin, total **Region 9**

Tijuana River

LOE ID:	76802
Pollutant:	Permethrin, total
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Preservation of Rare & Endangered Species
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Tijuana River to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Permethrin, Total.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for permethrin is the median lethal concentration (LC50) of 8.9 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 8.9 ug/g is the geometric mean of LC50 values for permethrin from Amweg et al. (2005).
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5
Spatial Representation:	Data for this line of evidence for Tijuana River was collected at 1 monitoring site [Tijuana River at Hollister Rd - 911TJHRxx]
Temporal Representation:	Data was collected on a single day 5/22/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **53269** **Region 9**

Tijuana River

Pollutant:	**Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final	New Decision

Listing Decision:		039018
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeds the criterion.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the criterion, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53269, Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD) **Region 9**

Tijuana River

LOE ID:	76809
Pollutant:	Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Preservation of Rare & Endangered Species
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Tijuana River to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for DDT, Total.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for total DDTs (Sum DDT + Sum DDD + Sum DDE) is 572 ug/Kg dry weight (MacDonald et

	al. 2000). 039019
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Tijuana River was collected at 1 monitoring site [Tijuana River at Hollister Rd - 911TJHRxx]
Temporal Representation:	Data was collected on a single day 5/22/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID 53273 Region 9

Tijuana River

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status; under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 17 samples (water) and zero of one sample (sediment) exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 17 samples (water) exceeded the criteria, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 53273, Zinc Region 9

Tijuana River

LOE ID:	76813
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total

Beneficial Use:	Preservation of Rare & Endangered Species	039020
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Tijuana River to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.	
Data Reference:	Statewide Stream Pollution Trends Study 2008	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for Zinc is 459 mg/Kg dry weight (MacDonald et al. 2000).	
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31	
Spatial Representation:	Data for this line of evidence for Tijuana River was collected at 1 monitoring site [Tijuana River at Hollister Rd - 911TJHRxx]	
Temporal Representation:	Data was collected on a single day 5/22/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	SWAMP data collected before September 2008 followed the 2002 QAMP.	
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)	

Line of Evidence (LOE) for Decision ID 53273, Zinc **Region 9**

Tijuana River

LOE ID:	76814
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Tijuana River to determine beneficial use support and results are as follows: 0 of 17 samples exceed the criterion for Zinc.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Zinc to protect aquatic life in freshwater. The dissolved Zinc criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition

Evaluation Guideline:	039021
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Tijuana River was collected at 1 monitoring site [Tijuana River - 911TJR-MLS]
Temporal Representation:	Data was collected over the time period 1/29/2002-12/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID 42754 — Region 9

Tijuana River

Pollutant:	**Ammonia as Nitrogen**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2027
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence are available in the administrative record to assess this pollutant. Ten of the 12 samples exceed the water quality objective for unionized ammonia for the protection of WARM beneficial use. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Ten of the 12 samples exceed the water quality objective for unionized ammonia for the protection of WARM beneficial use and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 42754, Ammonia as Nitrogen — Region 9

Tijuana River

LOE ID:	7193
Pollutant:	Ammonia as Nitrogen
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	039022
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	12	
Number of Exceedances:	10	
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)	
Data Used to Assess Water Quality:	Ten of twelve samples collected exceed the water quality objective according to results in the San Diego County Municipal Copermittees Annual Progress Report, 2007. Samples were collected two to four times a year from 2002-2006.	
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan the WQO for un-ionized ammonia (NH3) for inland surface waters is 0.025mg/L (as N) (RWQCB, 2007).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at the mass loading station located near the lower boundary of the watershed under the Hollister Street Bridge in San Diego, downstream from the International Boundary and Water CommissionÂ's diversion structure and treatment plant.	
Temporal Representation:	Samples were collected two to four times a year from 2002-2006.	
Environmental Conditions:	Samples were collected during wet weather.	
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 42754, Ammonia as Nitrogen **Region 9**

Tijuana River

LOE ID:	7380
Pollutant:	Ammonia as Nitrogen
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	2
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Two of two samples exceed the water quality objective according to results in the Surface Water Ambient Monitoring Program Report, 2007. Tijuana River 5 monitoring station was sampled on April 10, 2006 and May 31, 2005.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	From the Basin Plan the WQO for un-ionized ammonia (NH3) for inland surface waters is 0.025mg/L (as N) (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the monitoring station Tijuana River 5 on the main stem of the

	Tijuana River. (Station ID: 911TTJR05; lat/long: 32.55132/-117.08439) 039023
Temporal Representation:	Tijuana River 5 monitoring station was sampled on April 10, 2006 and May 31, 2005.
Environmental Conditions:	The sampling event in April occurred during high base flow. The May sampling event occurred during declining base flow.
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

DECISION ID 43772 Region 9

Tijuana River

Pollutant:	**Benthic Community Effects**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Benthic Community Effects is being considered for placement on the CWA section 303(d) List under sections 3.9 and 3.1 of the Listing Policy. Under section 3.9, an additional line of evidence associating Benthic Community Effects with a water or sediment concentration of pollutant(s) is necessary to assess listing status. Based on the readily available data and information, the weight of evidence provides sufficient justification for placing Benthic Community Effects in this water segment on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Pursuant to section 3.9 of the Listing Policy, the water exhibits significant degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index. It is important to note the CSCI does not have GIS data for the O/E component for portions of the watershed in Mexico. However, the pMMI results exhibited significant degradation in biological populations and/or communities as compared to reference site(s). 4. Pursuant to section 3.9 of the Listing Policy, the water segment has associated pollutant(s) samples that exceed water quality objectives. 5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are being met. The continued cross-border flows of sewage and untreated industrial discharges and stormwater, combined with the pMMI portion of the CSCI, provides sufficient weight of evidence that standards are not being met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant(s) contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 43772, Benthic Community Effects Region 9

Tijuana River

LOE ID:	7193
Pollutant:	Ammonia as Nitrogen
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	039024
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	12	
Number of Exceedances:	10	
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)	
Data Used to Assess Water Quality:	Ten of twelve samples collected exceed the water quality objective according to results in the San Diego County Municipal Copermittees Annual Progress Report, 2007. Samples were collected two to four times a year from 2002-2006.	
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan the WQO for un-ionized ammonia (NH3) for inland surface waters is 0.025mg/L (as N) (RWQCB, 2007).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at the mass loading station located near the lower boundary of the watershed under the Hollister Street Bridge in San Diego, downstream from the International Boundary and Water CommissionÂ's diversion structure and treatment plant.	
Temporal Representation:	Samples were collected two to four times a year from 2002-2006.	
Environmental Conditions:	Samples were collected during wet weather.	
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43772, Benthic Community Effects **Region 9**

Tijuana River

LOE ID:	76781
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Tijuana River to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Cypermethrin, total.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of cypermethrin does not exceed 0.0002 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Fojut et al. 2012)
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Tijuana River was collected at 1 monitoring site [Tijuana River - 911TJR-MLS]
Temporal Representation:	Data was collected on a single day 12/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 43772, Benthic Community Effects **Region 9**

Tijuana River

LOE ID:	7384
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	2
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Two of two samples exceed the water quality objective according to reuslts in the Surface Water Ambient Monitoring Program Report, 2007. The Tijuana River 5 monitoring station was sampled on May 31, 2005 and April 10, 2006.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. (RWQCB, 2007) A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used. (RWQCB, 2007)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected from the monitoring station Tijuana River 5 (station id: 911TTJR05 lat/long: 32.55132/-117.08439), located on the main stem of the Tijuana River.
Temporal Representation:	The Tijuana River 5 monitoring station was sampled on May 31, 2005 and April 10, 2006.
Environmental Conditions:	The sampling event in April occurred during high base flow. The May sampling event occurred during declining base flow.
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance

	with the California's Surface Water Ambient Monitoring Program. 039026
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 43772, Benthic Community Effects **Region 9**

Tijuana River

LOE ID:	7380
Pollutant:	Ammonia as Nitrogen
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	2
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Two of two samples exceed the water quality objective according to results in the Surface Water Ambient Monitoring Program Report, 2007. Tijuana River 5 monitoring station was sampled on April 10, 2006 and May 31, 2005.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	From the Basin Plan the WQO for un-ionized ammonia (NH3) for inland surface waters is 0.025mg/L (as N) (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the monitoring station Tijuana River 5 on the main stem of the Tijuana River. (Station ID: 911TTJR05; lat/long: 32.55132/-117.08439)
Temporal Representation:	Tijuana River 5 monitoring station was sampled on April 10, 2006 and May 31, 2005.
Environmental Conditions:	The sampling event in April occurred during high base flow. The May sampling event occurred during declining base flow.
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 43772, Benthic Community Effects **Region 9**

Tijuana River

LOE ID:	7381
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	15
Number of Exceedances:	15
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	All fifteen samples collected exceed the water quality objective according to results in the

	San Diego County Municipal Copermittees Annual Progress Report, 2007. Samples were collected two to four times a year from 2001-2006.
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. (RWQCB, 2007) Water Quality Control Plan for the San Diego Basin Goal of 0.1 mg/L for total phosphorus in streams and other flowing waters. (RWQCB, 2007)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at the mass loading station located near the lower boundary of the watershed under the Hollister Street Bridge in San Diego, downstream from the International Boundary and Water CommissionÂ's diversion structure and treatment plant.
Temporal Representation:	Samples were collected two to four times a year from 2001-2006.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	QA/QC conducted according to Weston Solutions QA Plan.
QAPP Information Reference(s):	Weston Solutions, 2004. Quality Management Manual. March 2004 (Revised December 2009).

Line of Evidence (LOE) for Decision ID 43772, Benthic Community Effects **Region 9**

Tijuana River

LOE ID:	7383
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	15
Number of Exceedances:	15
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	All fifteen samples collected exceed the water quality objective according to results in the San Diego County Municipal Copermittees Annual Progress Report, 2007. Samples were collected two to four times a year from 2001-2006.
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. (RWQCB, 2007) A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used. (RWQCB, 2007)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	

Guideline Reference:	Water Quality Control Plan for the San Diego Basin	039028
Spatial Representation:	Samples were collected at the mass loading station located near the lower boundary of the watershed under the Hollister Street Bridge in San Diego, downstream from the International Boundary and Water CommissionÂ's diversion structure and treatment plant.	
Temporal Representation:	Samples were collected two to four times a year from 2001-2006.	
Environmental Conditions:	Samples were collected during wet weather.	
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43772, Benthic Community Effects **Region 9**

Tijuana River

LOE ID:	7382
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	2
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Two of two samples exceed the water quality objective according to results in the Surface Water Ambient Monitoring Program Report, 2007. The Tijuana River 5 monitoring station was sampled on May 31, 2005 and April 10, 2006.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. (RWQCB, 2007) Water Quality Control Plan for the San Diego Basin Goal of 0.1 mg/L for total phosphorus in streams and other flowing waters. (RWQCB, 2007)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected from the monitoring station Tijuana River 5 (station id: 911TTJR05 lat/long: 32.55132/-117.08439), located on the main stem of the Tijuana River.
Temporal Representation:	The Tijuana River 5 monitoring station was sampled on May 31, 2005 and April 10, 2006.
Environmental Conditions:	The sampling event in April occurred during high base flow. The May sampling event occurred during declining base flow.
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 43772, Benthic Community Effects **Region 9**

Tijuana River

LOE ID:	7507
Pollutant:	Toxicity
LOE Subgroup:	Toxicity

Matrix:	Water	039029
Fraction:	None	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	15	
Number of Exceedances:	15	
Data and Information Type:	Ambient toxicity testing (chronic)	
Data Used to Assess Water Quality:	Toxicity was observed in the following tests: Hyalella azteca growth and survival test- Five of 15 samples collected were found to be toxic. (Ceriodaphnia dubia test -15 of 15 samples were found to be toxic.) Ceriodaphnia dubia; All 15 samples were toxic according to results in the San Diego County Municipal Copermittees Annual Progress Report, 2007. Samples from the river were collected from January 2002 through February 2006.	
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	Samples were found to exhibit toxicity when the No Observed Effect Concentration (NOEC) or median lethal concentration (LC50) for any given species was estimated to be less than 100% of the test sample concentration.	
Guideline Reference:	Waste Discharge Requirements for Discharges of Urban Runoff From the Municipal Separate Storm Sewer Systems Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego, the San Diego Unified Port District, and the San Diego County Regional Airport, Order No. R9-2007-0001	
Spatial Representation:	Samples were collected from the from the mass loading station on the Tijuana River and Hollister Street Bridge.	
Temporal Representation:	Samples from the river were collected from January 2002 through February 2006.	
Environmental Conditions:		
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance Weston Solutions	
QAPP Information Reference(s):	Weston Solutions, 2004. Quality Management Manual. March 2004 (Revised December 2009).	

Line of Evidence (LOE) for Decision ID 43772, Benthic Community Effects **Region 9**

Tijuana River

LOE ID:	21201
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	2
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Two water samples were collected at Tijuana River station 911TTJR05 on May 2004, September 2004, February 2005, and April 2005.
Data Reference:	Monitoring data for Region 9

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	CTR Freshwater Chronic (CCC) 5 ug/L. (U.S. EPA, 2000). All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Standards 2000. Establishment of numeric criteria for priority toxic pollutants for the State of California: Rules and regulations. Federal Register Vol. 65, No. 97. Washington, D.C.: Environmental Protection Agency Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Water samples were collected at Tijuana River station (911TTJR05).
Temporal Representation:	Samples were collected on May 2004, September 2004, February 2005, and April 2005.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 43772, Benthic Community Effects **Region 9**

Tijuana River

LOE ID:	25808
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Aquatic Life Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	2
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	toxicity was observed in the Hyalella azteca survival and growth test- Two samples were collected and both show significant toxicity levels according to results in the Surface Water Ambient Monitoring Program Report, 2007. The Tijuana River was sampled on May 31, 2005 and April 10, 2006.
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.
Guideline Reference:	Monitoring data for Region 9
Spatial Representation:	Samples were collected from the monitoring station Tijuana River 5 (station id: 911TTJR05 lat/long: 32.55132/-117.08439), located on the main stem of the Tijuana River.

Temporal Representation:	The Tijuana River 5 monitoring station was sampled on May 31, 2005 and April 10, 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 43772, Benthic Community Effects **Region 9**

Tijuana River

LOE ID:	27032
Pollutant:	Benthic Community Effects
LOE Subgroup:	Adverse Biological Responses
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Four samples of IBI data were taken from May 2003 to May 2007 at one sampling site. Of the total number of samples, all four of the samples exceeded the IBI impairment threshold.
Data Reference:	Stream Bioassessment Data. Co-permitee Data. Collected 2002-2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at one site: TJ-DM&BF on Tijuana River.
Temporal Representation:	Sampling occurred during May from 2003 to 2007.
Environmental Conditions:	
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Manual for Freshwater Bioassessment.
QAPP Information Reference(s):	Quality Assurance Manual for Freshwater Bioassessment Revision 0

Line of Evidence (LOE) for Decision ID 43772, Benthic Community Effects **Region 9**

Tijuana River

LOE ID:	72771
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water

Fraction:	None	039032
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	6	
Number of Exceedances:	6	
Data and Information Type:	Benthic macroinvertebrate surveys	
Data Used to Assess Water Quality:	Six of the six samples collected had an IBI score below 40. tr11c NPDES bioassessment	
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the State or Regional Board. Region 9 Basin Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.	
Guideline Reference:	Development of a Benthic Index of Biotic Integrity (B-IBI) for Wadeable Streams in Northern Coastal California and its Application to Regional 305(b) Assessment	
Spatial Representation:	The samples were collected at stations 911TJR-MLS, TJ-BF, TJ-DM, and TJR-TWAS-2 Tijuana River.	
Temporal Representation:	The samples were collected in May 2003 to 2010.	
Environmental Conditions:		
QAPP Information:	The data was collected under the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan, June 25, 2009.	
QAPP Information Reference(s):	Quality Assurance Project Plan for SWAMP Bioassessment and Freshwater Bioassessment.	

Line of Evidence (LOE) for Decision ID 43772, Benthic Community Effects **Region 9**

Tijuana River

LOE ID:	72751
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate sediment toxicity. The sample exhibited significant toxicity. The toxicity test included survival of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP

Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL. SL is defined as the result being significant compared to the negative control based on a statistical test, less than stated the alpha level, AND less than the evaluation threshold.
Guideline Reference:	Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates, Second Edition. U.S. Environmental Protection Agency Office of Research and Development, Duluth, MI , U.S. Environmental Protection Agency Office of Water, Washington, DC EPA-600/R-99/064
Spatial Representation:	The sample was collected at station 911TJHRxx.
Temporal Representation:	The sample was collected in May 2008.
Environmental Conditions:	
QAPP Information:	All data was collected following the Standard Operating Procedures and Data Quality Objectives outlined in the SWAMP QAMP, (Puckett, 2002). QA data are included in submission.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 43772, Benthic Community Effects **Region 9**

Tijuana River

LOE ID:	76839
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Tijuana River to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Bifenthrin.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Bifenthrin does not exceed 0.0006 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Tijuana River was collected at 1 monitoring site [Tijuana River - 911TJR-MLS]

Temporal Representation:	Data was collected on a single day 12/16/2008.	039034
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.	

Line of Evidence (LOE) for Decision ID 43772, Benthic Community Effects **Region 9**

Tijuana River

LOE ID:	76797
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	16
Number of Exceedances:	11
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Tijuana River to determine beneficial use support and results are as follows: 11 of 16 samples exceed the criterion for Malathion.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for Tijuana River was collected at 1 monitoring site [Tijuana River - 911TJR-MLS]
Temporal Representation:	Data was collected over the time period 11/8/2002-12/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 43772, Benthic Community Effects **Region 9**

Tijuana River

LOE ID:	76789

Pollutant:	Diazinon	039035
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	19	
Number of Exceedances:	18	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Tijuana River to determine beneficial use support and results are as follows: 18 of 19 samples exceed the criterion for Diazinon.	
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).	
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game	
Spatial Representation:	Data for this line of evidence for Tijuana River was collected at 1 monitoring site [Tijuana River - 911TJR-MLS]	
Temporal Representation:	Data was collected over the time period 1/29/2002-12/16/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.	

Line of Evidence (LOE) for Decision ID 43772, Benthic Community Effects **Region 9**

Tijuana River

LOE ID:	78145
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	19
Number of Exceedances:	3
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Tijuana River to determine beneficial use support and results are as follows: 3 of 19 samples exceed the criterion for Cadmium.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works

	Watershed Protection Program, 2001-2008.	039036

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The dissolved cadmium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved cadmium is 0.0022 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Tijuana River was collected at 1 monitoring site [Tijuana River - 911TJR-MLS]
Temporal Representation:	Data was collected over the time period 1/29/2002-12/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 43772, Benthic Community Effects **Region 9**

Tijuana River

LOE ID:	77920
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	15
Number of Exceedances:	5
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Tijuana River to determine beneficial use support and results are as follows: 5 of 15 samples exceed the criterion for Chlorpyrifos. Four sample results were not used in the assessment because the laboratory data reporting limit(s) was above the objective and therefore the results could not be quantified with the level of certainty required by the Listing Policy.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier

et al., 2005). 039037

Spatial Representation:	Data for this line of evidence for Tijuana River was collected at 1 monitoring site [Tijuana River - 911TJR-MLS]
Temporal Representation:	Data was collected over the time period 1/29/2002-12/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 43772, Benthic Community Effects **Region 9**

Tijuana River

LOE ID:	76810
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Preservation of Areas of Special Biological Significance
Number of Samples:	19
Number of Exceedances:	19
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Nineteen samples were collected to test for toxicity. Nineteen of the 19 samples exhibited statistically significant toxicity. The toxicity tests that exhibited significant toxicity included survival of Hyalella azteca and survival and reproduction of Ceriodaphnia dubia.
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected at station 911TJR-MLS Tijuana River.
Temporal Representation:	The samples were collected from 2002 to 2008.
Environmental Conditions:	
QAPP Information:	The data was collected under the County of San Diego Co-Permittees Receiving Waters Urban Runoff Monitoring and Reporting Program (Order No. 2007-01). Data quality is good.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 43772, Benthic Community Effects **Region 9**

Tijuana River

LOE ID:	79690
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation

Matrix:	Water	039038
Fraction:	None	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	4	
Number of Exceedances:	2	
Data and Information Type:	Benthic macroinvertebrate surveys	
Data Used to Assess Water Quality:	Four samples were taken at one station on the Tijuana River between the international border and estuary. Two samples were below the 0.79 threshold, and therefore exceeding the water quality objective for the aquatic life beneficial use. Two samples were not scored due to low organism counts. It is important to note that the O/E portion of the CSCI for these sites includes portions of the watershed that are in Mexico. The pMMI portion of the CSCI was examined for all site scores, with all results falling below 0.50, which is outside the reference distribution.	
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008. Region 9 CSCI Scores & Water Body Information	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.	
Guideline Reference:	Development of a Benthic Index of Biotic Integrity (B-IBI) for Wadeable Streams in Northern Coastal California and its Application to Regional 305(b) Assessment	
Spatial Representation:	The samples were collected at stations 911TJR-TWAS-2 (proximal to 911TJR-MLS, TJ-BF, TJ-DM)	
Temporal Representation:	The samples were collected in from 2003 to 2009	
Environmental Conditions:		
QAPP Information:	Data collected following the County of San Diego NPDES MS4 Copermittees Receiving Waters Monitoring and Reporting Program	
QAPP Information Reference(s):	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008. Quality Assurance Project Plan for SWAMP Bioassessment and Freshwater Bioassessment.	

DECISION ID	**47312**	**Region 9**
Tijuana River		

Pollutant:	**Cadmium**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised

Sources:	Source Unknown	039039
Expected TMDL Completion Date:	2025	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status; under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Three of 19 samples (water) and zero of one sample (sediment) exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Three of 19 samples exceed the criteria, and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 47312, Cadmium — Region 9

Tijuana River

LOE ID:	78145
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	19
Number of Exceedances:	3
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Tijuana River to determine beneficial use support and results are as follows: 3 of 19 samples exceed the criterion for Cadmium.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The dissolved cadmium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved cadmium is 0.0022 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition

Evaluation Guideline:	039040
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Tijuana River was collected at 1 monitoring site [Tijuana River - 911TJR-MLS]
Temporal Representation:	Data was collected over the time period 1/29/2002-12/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 47312, Cadmium **Region 9**

Tijuana River

LOE ID:	76840
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Preservation of Rare & Endangered Species
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Tijuana River to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for cadmium is 4.98 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Tijuana River was collected at 1 monitoring site [Tijuana River at Hollister Rd - 911TJHRxx]
Temporal Representation:	Data was collected on a single day 5/22/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the 2002 QAMP.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **47314** **Region 9**

Tijuana River

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**

Last Listing Cycle's Final Listing Decision:	New Decision	039041
Revision Status	Revised	
Sources:	Source Unknown	
Expected TMDL Completion Date:	2025	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status; under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Five of 15 samples (water) and zero of one sample (sediment) exceeded the guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Five of 15 samples exceed the guideline, and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 47314, Chlorpyrifos **Region 9**

Tijuana River

LOE ID:	77920
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	15
Number of Exceedances:	5
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Tijuana River to determine beneficial use support and results are as follows: 5 of 15 samples exceed the criterion for Chlorpyrifos. Four sample results were not used in the assessment because the laboratory data reporting limit(s) was above the objective and therefore the results could not be quantified with the level of certainty required by the Listing Policy.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column,

	sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).
Spatial Representation:	Data for this line of evidence for Tijuana River was collected at 1 monitoring site [Tijuana River - 911TJR-MLS]
Temporal Representation:	Data was collected over the time period 1/29/2002-12/16/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 47314, Chlorpyrifos **Region 9**

Tijuana River

LOE ID:	76847
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Preservation of Rare & Endangered Species
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Tijuana River to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for chlorpyrifos is the median lethal concentration (LC50) of 1.77 ug/g and is normalized by the percentage of organic carbon in the sediment sample (Amweg and Weston, 2007).
Guideline Reference:	Whole-sediment toxicity identification evaluation tools for pyrethroid insecticides: I. piperonyl butoxide addition. Environ. Toxicol. Chem. 26:2389-2396.
Spatial Representation:	Data for this line of evidence for Tijuana River was collected at 1 monitoring site [Tijuana River at Hollister Rd - 911TJHRxx]
Temporal Representation:	Data was collected on a single day 5/22/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.

QAPP Information Reference(s): Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID	47157	Region 9
Tijuana River		

Pollutant:	**Diazinon**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Eighteen of the 19 samples exceed the freshwater chronic value for diazinon.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Eighteen of 19 samples exceed the freshwater chronic value for diazinon and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 47157, Diazinon	**Region 9**
Tijuana River	

LOE ID:	77915
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Preservation of Rare & Endangered Species
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Tijuana River to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Diazinon.
Data Reference:	Statewide Stream Pollution Trends Study 2008

SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for diazinon is the median lethal concentration (LC50) of 11 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 11 ug/g is the geometric mean of LC50 values for diazinon from Ding et al. (2011).
Guideline Reference:	Toxicity of Sediment-Associated Pesticides to Chironomus dilutus and Hyalella azteca. Arch. Environ. Contam. Toxicol. 61:83Â–92.
Spatial Representation:	Data for this line of evidence for Tijuana River was collected at 1 monitoring site [Tijuana River at Hollister Rd - 911TJHRxx]
Temporal Representation:	Data was collected on a single day 5/22/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 47157, Diazinon **Region 9**

Tijuana River

LOE ID:	76789
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	19
Number of Exceedances:	18
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Tijuana River to determine beneficial use support and results are as follows: 18 of 19 samples exceed the criterion for Diazinon.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Data for this line of evidence for Tijuana River was collected at 1 monitoring site [Tijuana River - 911TJR-MLS]
Temporal Representation:	Data was collected over the time period 1/29/2002-12/16/2008.

Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID 53233 **Region 9**

Tijuana River

Pollutant:	**Malathion**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Eleven of the 16 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Eleven of 16 samples exceed the criteria, and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 53233, Malathion **Region 9**

Tijuana River

LOE ID:	76797
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	16
Number of Exceedances:	11

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	039046
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Tijuana River to determine beneficial use support and results are as follows: 11 of 16 samples exceed the criterion for Malathion.	
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.	
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology	
Spatial Representation:	Data for this line of evidence for Tijuana River was collected at 1 monitoring site [Tijuana River - 911TJR-MLS]	
Temporal Representation:	Data was collected over the time period 11/8/2002-12/16/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.	

DECISION ID	**53170**	**Region 9**
Tijuana River		

Pollutant:	**Cypermethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status; under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of one sample (sediment) and one of one sample (water) exceeded the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample (sediment) and one of one sample (water) exceeded the criteria, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable

beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53170, Cypermethrin **Region 9**

Tijuana River

LOE ID:	77924
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Preservation of Rare & Endangered Species
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Tijuana River to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cypermethrin, total.
Data Reference:	Statewide Stream Pollution Trends Study 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for cypermethrin is the median lethal concentration (LC50) of 0.3 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 0.3 ug/g is the geometric mean of LC50 values for cypermethrin from Maund et al. (2002).
Guideline Reference:	Partitioning, bioavailability, and toxicity of the pyrethroid insecticide cypermethrin in sediments. Environmental Toxicology and Chemistry 21:9-15
Spatial Representation:	Data for this line of evidence for Tijuana River was collected at 1 monitoring site [Tijuana River at Hollister Rd - 911TJHRxx]
Temporal Representation:	Data was collected on a single day 5/22/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 53170, Cypermethrin **Region 9**

Tijuana River

LOE ID:	76781
Pollutant:	Cypermethrin

LOE Subgroup:	Pollutant-Water	039048
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Cold Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	1	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Tijuana River to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Cypermethrin, total.	
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of cypermethrin does not exceed 0.0002 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Fojut et al. 2012)	
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.	
Spatial Representation:	Data for this line of evidence for Tijuana River was collected at 1 monitoring site [Tijuana River - 911TJR-MLS]	
Temporal Representation:	Data was collected on a single day 12/16/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.	

DECISION ID	32711	Region 9
Tijuana River		

Pollutant:	**Thallium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Thallium is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1, one line(s) of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of zero of the samples exceed the California Toxics Rule water quality objective for Thallium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of zero samples exceeded the California Toxics Rule for thallium and this sample size is insufficient to determine with the power and confidence of the Listing Policy if standards are not met. A minimum of two samples is needed for application of table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met; EXCEPT that
the Information that is provided is based on visual observations and not supported by numerical data. Visual observation information alone is insufficient to place a water body segment pollutant combination on the section 303(d) list because it cannot be quantitatively determined if applicable water quality standards are met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32711, Thallium **Region 9**

Tijuana River

LOE ID:	3369
Pollutant:	Thallium
LOE Subgroup:	Testimonial Evidence
Matrix:	Not Specified
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	From the letter written by the San Diego Baykeeper on 06/14/2004: We recommend continued listing of this area for impairment by bacteria, low dissolved oxygen, eutrophication, pesticides, solids, synthetic organics, lead, nickel, thallium, and trash.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The objective is numeric.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	From the CTR, the human health freshwater criteria for water and organisms is 1.7 ppb.
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	The letter suggesting impairment describes the waterbody as the Tijuana River. Exact location of samples or studies was not reported.
Temporal Representation:	Time of possible impairment was not reported. The letter suggesting impairment was written on 06/14/2004.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

DECISION ID **40562** **Region 9**

Tijuana River 039050

Pollutant:	**Eutrophic**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. 303(d) listing decisions made prior to 2006 were not held in an assessment database. This is a placeholder decision for a 303(d) listing made in a previous assessment cycle. The Regional Boards will update this decision when new data and information become available and are assessed.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 40562, Eutrophic — Region 9

Tijuana River

LOE ID:	4740
Pollutant:	Eutrophic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	Unspecified
Guideline Reference:	Placeholder reference pre-2006 303(d)
Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

DECISION ID 44569 — Region 9

Tijuana River 039051

Pollutant:	**Low Dissolved Oxygen**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. 303(d) listing decisions made prior to 2006 were not held in an assessment database. This is a placeholder decision for a 303(d) listing made in a previous assessment cycle. The Regional Boards will update this decision when new data and information become available and are assessed.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 44569, Low Dissolved Oxygen — Region 9

Tijuana River

LOE ID:	4742
Pollutant:	Low Dissolved Oxygen
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	Unspecified
Guideline Reference:	Placeholder reference pre-2006 303(d)
Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

DECISION ID 43166 — Region 9

Tijuana River 039052

Pollutant:	**Pesticides**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	303(d) listing decisions made prior to 2006 were not held in an assessment database. This is a placeholder decision for a CWA section 303(d) Listing made in a previous assessment cycle. The Regional Boards will update this decision when new data and information become available and are assessed.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43166, Pesticides — Region 9

Tijuana River

LOE ID:	4743
Pollutant:	Pesticides
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	Unspecified
Guideline Reference:	Placeholder reference pre-2006 303(d)
Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

DECISION ID 43333 — Region 9

Tijuana River

Pollutant:	**Phosphorus**	039053
Final Listing Decision:	**List on 303(d) list (TMDL required list)**	
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)	
Revision Status	Original	
Sources:	Source Unknown	
Expected TMDL Completion Date:	2021	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Seventeen of 17 of the samples exceed the Basin Plan water quality objective for Phosphorus.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Seventeen of 17 of the samples exceed the Basin Plan water quality objective for Phosphorus and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43333, Phosphorus **Region 9**

Tijuana River

LOE ID:	7382
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	2
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Two of two samples exceed the water quality objective according to results in the Surface Water Ambient Monitoring Program Report, 2007. The Tijuana River 5 monitoring station was sampled on May 31, 2005 and April 10, 2006.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial

	uses. (RWQCB, 2007) 039054 Water Quality Control Plan for the San Diego Basin Goal of 0.1 mg/L for total phosphorus in streams and other flowing waters. (RWQCB, 2007)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected from the monitoring station Tijuana River 5 (station id: 911TTJR05 lat/long: 32.55132/-117.08439), located on the main stem of the Tijuana River.
Temporal Representation:	The Tijuana River 5 monitoring station was sampled on May 31, 2005 and April 10, 2006.
Environmental Conditions:	The sampling event in April occurred during high base flow. The May sampling event occurred during declining base flow.
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 43333, Phosphorus **Region 9**

Tijuana River

LOE ID:	7381
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	15
Number of Exceedances:	15
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	All fifteen samples collected exceed the water quality objective according to results in the San Diego County Municipal Copermittees Annual Progress Report, 2007. Samples were collected two to four times a year from 2001-2006.
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. (RWQCB, 2007) Water Quality Control Plan for the San Diego Basin Goal of 0.1 mg/L for total phosphorus in streams and other flowing waters. (RWQCB, 2007)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at the mass loading station located near the lower boundary of the watershed under the Hollister Street Bridge in San Diego, downstream from the International Boundary and Water CommissionÂ's diversion structure and treatment plant.
Temporal Representation:	Samples were collected two to four times a year from 2001-2006.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	QA/QC conducted according to Weston Solutions QA Plan.
QAPP Information Reference(s):	Weston Solutions, 2004. Quality Management Manual. March 2004 (Revised December 2009).

DECISION ID 43580 Region 9

Tijuana River 039055

Pollutant:	**Sedimentation/Siltation**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.7.2 of the Listing Policy. Under section 3.7.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Photos were collected by the Tijuana River National Estuarine Research Reserve. The photos were reviewed to assess sedimenation problem in the Tijuana River valley and estuary Photos from February 13, 2008 Powerpoint presentation exhibit the sedimentation problem within the watershed. Aerial and ground level photographs show the changes that have occurred due to large storm events and over time. The occurrence of conditions judged to cause impairment and therefore exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. The occurrence of conditions judged to cause impairment and therefore this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43580, Sedimentation/Siltation — Region 9

Tijuana River

LOE ID:	27012
Pollutant:	Sedimentation/Siltation
LOE Subgroup:	Pollutant-Nuisance
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	
Number of Exceedances:	
Data and Information Type:	Occurrence of conditions judged to cause impairment
Data Used to Assess Water Quality:	Photos were collected by the Tijuana River National Estuarine Research Reserve. The photos were reviewed to assess sedimentation problem in the Tijuana River valley and estuary

	Photos from February 13, 2008 Powerpoint presentation exhibit the sedimentation problem within the watershed. Aerial and ground level photographs show the changes that have occurred due to large storm events and over time.
Data Reference:	Photographs of the sedimentation problem in the Tijuana River valley and estuary
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Waters shall not contain suspended and settleable solids in concentrations of solids that cause nuisance or adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Information and photographs were collected at various locations in the Tijuana River watershed.
Temporal Representation:	Information and photographs were collected at various locations in the Tijuana River watershed all predating February 2008. One set of photos were before and after photographs dated May 10, 2003 and January 30, 2005.
Environmental Conditions:	
QAPP Information:	None
QAPP Information Reference(s):	

DECISION ID 34466 Region 9

Tijuana River

Pollutant:	**Solids**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. 303(d) listing decisions made prior to 2006 were not held in an assessment database. This is a placeholder decision for a 303(d) listing made in a previous assessment cycle. The Regional Boards will update this decision when new data and information become available and are assessed.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34466, Solids Region 9

Tijuana River

LOE ID:	4744
Pollutant:	Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded

Beneficial Use:	Warm Freshwater Habitat	039057

Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	Unspecified
Guideline Reference:	Placeholder reference pre-2006 303(d)
Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

DECISION ID	42793	Region 9
Tijuana River		

Pollutant:	**Surfactants (MBAS)**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Six of 15 of the samples exceed the Basin Plan water quality objective for surfactants (MBAS).

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Six of 15 of the samples exceed the Basin Plan water quality objective for surfactants (MBAS) and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not

changed. 039058

Line of Evidence (LOE) for Decision ID 42793, Surfactants (MBAS) **Region 9**

Tijuana River

LOE ID:	7512
Pollutant:	Surfactants (MBAS)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	15
Number of Exceedances:	6
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Six of fifteen samples collected exceed the water quality objective. Since only four samples were collected at most in a one year period, any exceedance results in an annual exceedance frequency greater than 10%. All five years in which this water body was monitored found exceedances more than 10% of the time according to results in the San Diego County Municipal Copermittees Annual Progress Report, 2007. Samples were collected three times a year from 2001-2006.
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan the WQO for methylene blue Â– activated substances (MBAS) for inland surface waters is 0.5mg/L. This concentration is not to be exceeded more than 10% of the time (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the mass loading station located near the lower boundary of the watershed under the Hollister Street Bridge in San Diego, downstream from the International Boundary and Water CommissionÂ's diversion structure and treatment plant.
Temporal Representation:	Samples were collected three times a year from 2001-2006.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.
QAPP Information Reference(s):	

DECISION ID **43320** **Region 9**

Tijuana River

Pollutant:	**Synthetic Organics**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:	303(d) listing decisions made prior to 2006 were not held in an assessment database. This is a placeholder decision for a CWA section 303(d) Listing made in a previous assessment cycle. The Regional Boards will update this decision when new data and information become available and are assessed.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43320, Synthetic Organics **Region 9**

Tijuana River

LOE ID:	4745
Pollutant:	Synthetic Organics
LOE Subgroup:	Pollutant-Water
Matrix:	Not Specified
Fraction:	Not Recorded
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	Unspecified
Guideline Reference:	Placeholder reference pre-2006 303(d)
Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

DECISION ID **43581** **Region 9**

Tijuana River

Pollutant:	**Total Nitrogen as N**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Natural Sources | Source Unknown | Unknown Nonpoint Source | Urban Runoff/Storm Sewers
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Seventeen of the 17 samples exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Seventeen of 17 samples exceed the objective and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43581, Total Nitrogen as N **Region 9**

Tijuana River

LOE ID:	7384
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	2
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Two of two samples exceed the water quality objective according to reuslts in the Surface Water Ambient Monitoring Program Report, 2007. The Tijuana River 5 monitoring station was sampled on May 31, 2005 and April 10, 2006.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. (RWQCB, 2007) A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used. (RWQCB, 2007)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected from the monitoring station Tijuana River 5 (station id: 911TTJR05 lat/long: 32.55132/-117.08439), located on the main stem of the Tijuana River.
Temporal Representation:	The Tijuana River 5 monitoring station was sampled on May 31, 2005 and April 10, 2006.

Environmental Conditions:	The sampling event in April occurred during high base flow. The May sampling event occurred during declining base flow.
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 43581, Total Nitrogen as N **Region 9**

Tijuana River

LOE ID:	7383
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	15
Number of Exceedances:	15
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	All fifteen samples collected exceed the water quality objective according to results in the San Diego County Municipal Copermittees Annual Progress Report, 2007. Samples were collected two to four times a year from 2001-2006.
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. (RWQCB, 2007) A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used. (RWQCB, 2007)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at the mass loading station located near the lower boundary of the watershed under the Hollister Street Bridge in San Diego, downstream from the International Boundary and Water CommissionÂ's diversion structure and treatment plant.
Temporal Representation:	Samples were collected two to four times a year from 2001-2006.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.
QAPP Information Reference(s):	

DECISION ID **44587** **Region 9**

Tijuana River

Pollutant:	**Trace Elements**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**

Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)	039062
Revision Status	Original	
Sources:	Source Unknown	
Expected TMDL Completion Date:	2019	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion: Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

303(d) listing decisions made prior to 2006 were not held in an assessment database. This is a placeholder decision for a 303(d) listing made in a previous assessment cycle. The Regional Boards will update this decision when new data and information become available and are assessed.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 44587, Trace Elements **Region 9**

Tijuana River

LOE ID:	4667
Pollutant:	Trace Elements
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	Unspecified
Guideline Reference:	Placeholder reference pre-2006 303(d)
Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

DECISION ID **34451** **Region 9**

Tijuana River

Pollutant:	**Trash**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**

Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)	039063
Revision Status	Original	
Sources:	Source Unknown	
Expected TMDL Completion Date:	2019	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion: Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

303(d) listing decisions made prior to 2006 were not held in an assessment database. This is a placeholder decision for a 303(d) listing made in a previous assessment cycle. The Regional Boards will update this decision when new data and information become available and are assessed.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34451, Trash **Region 9**

Tijuana River

LOE ID:	4668
Pollutant:	Trash
LOE Subgroup:	Visual
Matrix:	Not Specified
Fraction:	Not Recorded
Beneficial Use:	Non-Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	Unspecified
Guideline Reference:	Placeholder reference pre-2006 303(d)
Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pine Valley Creek (Upper)
Water Body ID: CAR9114100020010924113027
Water Body Type: River & Stream

DECISION ID 33692 **Region 9**
Pine Valley Creek (Upper)

Pollutant: **Turbidity**
Final Listing Decision: **Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Reason for Delisting: Flaws in original listing
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: The original 2006 listing decision was based on data from the late 1990s. This data was evaluated in prior cycles without listing. In 2006 the data was incorrectly re-evaluated utilizing the objective of 5 NTU for groundwater. The appropriate NTU should have been 20 NTU for inland surface waters.

More recently sampling for the 2014 cycle had zero exceedances of the objective for one sampling event. For the more recent data:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be removed from the section 303(d) list because applicable water quality standards for the pollutant are not being exceeded.

Line of Evidence (LOE) for Decision ID 33692, Turbidity **Region 9**
Pine Valley Creek (Upper)

LOE ID: 3379

Pollutant: Turbidity
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 10
Number of Exceedances: 2

Data and Information Type: PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality: Samples were collected at site NPC3C by the City of San Diego Water Dept. from 1/14/1998 to 8/18/1998. Of 10 samples, 2 exceeded the WQO for municipal beneficial uses.

Data Reference:	Placeholder reference 2006 303(d)	039065
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for turbidity is 5 units. For inland surface waters and all other beneficial uses, the WQO for turbidity is 20 ntu.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at site NPC3C. The exact location of this site is unknown. Samples were collected at 4 other sites in the creek. The proximity of these sites to each other is unknown.	
Temporal Representation:	Samples were collected monthly between 1/14/1998 to 8/18/1998.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33692, Turbidity **Region 9**

Pine Valley Creek (Upper)

LOE ID:	75358
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Turbidity(NTU).
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Turbidity(NTU) objective for the protection of aquatic life according to Table 3-2 for Pine Valley Creek (Upper) within the Tijuana Hydrologic Unit is 20 NTU.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Upper) was collected at 1 monitoring site [Pine Valley Creek below Noble Cyn. Cr. - 911S01818]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 33692, Turbidity **Region 9**

Pine Valley Creek (Upper)

LOE ID:	3381
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	11
Number of Exceedances:	3
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Samples were collected at site PVC1A by the City of San Diego Water Dept. from 1/14/1998 to 9/15/1998. Of 11 samples, 3 exceeded the WQO for municipal beneficial uses.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for turbidity is 5 units. For inland surface waters and all other beneficial uses, the WQO for turbidity is 20 ntu.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at site PVC1A. The exact location of this site is unknown. Samples were collected at 4 other sites in the creek. The proximity of these sites to each other is unknown.
Temporal Representation:	Samples were collected monthly between 1/14/1998 and 9/15/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33692, Turbidity **Region 9**

Pine Valley Creek (Upper)

LOE ID:	3377
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	10
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Samples were collected at site NPC3A by the City of San Diego Water Dept. from 1/14/1998 to 8/18/1998. Of 10 samples, 1 exceeded the WQO for municipal beneficial uses.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for turbidity is 5 units. For inland surface waters and all other beneficial uses, the WQO for turbidity is 20 ntu.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at site NPC3A. The exact location of this site is unknown. Samples were collected at 4 other sites in the creek. The proximity of these sites to each other is unknown.
Temporal Representation: Samples were collected monthly between 1/14/1998 and 8/18/1998.
Environmental Conditions:
QAPP Information: Data used in 2002 assessment.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 33692, Turbidity **Region 9**

Pine Valley Creek (Upper)

LOE ID: 3378

Pollutant: Turbidity
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 10
Number of Exceedances: 1

Data and Information Type: PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality: Samples were collected at site NPC3B by the City of San Diego Water Dept. from 1/14/1998 to 8/18/1998. Of 10 samples, 1 exceeded the WQO for municipal beneficial uses.
Data Reference: Placeholder reference 2006 303(d)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for turbidity is 5 units. For inland surface waters and all other beneficial uses, the WQO for turbidity is 20 ntu.
Objective/Criterion Reference: Placeholder reference 2006 303(d)

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at site NPC3B. The exact location of this site is unknown. Samples were collected at 4 other sites in the creek. The proximity of these sites to each other is unknown.
Temporal Representation: Samples were collected monthly between 1/14/1998 and 8/18/1998.
Environmental Conditions:
QAPP Information: Data used in 2002 assessment.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 33692, Turbidity **Region 9**

Pine Valley Creek (Upper)

LOE ID: 3412

Pollutant: Turbidity
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	One sample was collected at site PVC1B by the City of San Diego Water Dept. on May 20, 1997. The single sample was not in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for turbidity is 5 units. For inland surface waters with all other beneficial uses, the WQO is 20 units.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The sample was collected at site PVC1B in Pine Valley Creek. Other samples were collected at PVC1A.
Temporal Representation:	One sample was collected on May 20, 1997.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33692, Turbidity **Region 9**

Pine Valley Creek (Upper)

LOE ID:	3411
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Samples were collected at site PVC1A by the City of San Diego Water Dept. on May 19, 1997 and October 9, 1997. Two samples were collected (one on each day) and none were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for turbidity is 5 units. For inland surface waters with all other beneficial uses, the WQO is 20 units.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at sample site PVC1A. Another sample was collected at site PVC1B.
Temporal Representation:	Samples were collected once on each day on May 19, 1997 and October 9, 1997.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.

QAPP Information Reference(s): 039069

Line of Evidence (LOE) for Decision ID 33692, Turbidity **Region 9**

Pine Valley Creek (Upper)

LOE ID:	3380
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	4
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Samples were collected at site NPC3D by the City of San Diego Water Dept. from 1/14/1998 to 7/14/1998. Of 9 samples, 4 exceeded the WQO for municipal beneficial uses.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for turbidity is 5 units. For inland surface waters and all other beneficial uses, the WQO for turbidity is 20 ntu.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at site NPC3D. The exact location of this site is unknown. Samples were collected at 4 other sites in the creek. The proximity of these sites to each other is unknown.
Temporal Representation:	Samples were collected monthly between 1/14/1998 and 7/14/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **53306** **Region 9**

Pine Valley Creek (Upper)

Pollutant:	**Alkalinity as CaCO3**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the one samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53306, Alkalinity as CaCO3 **Region 9**

Pine Valley Creek (Upper)

LOE ID:	75367
Pollutant:	Alkalinity as CaCO3
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Alkalinity as CaCO3.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Alkalinity as CaCO3 criteria for the protection of freshwater aquatic life is 20000 ug/L (National Recommended Water Quality Criteria, 2009).
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Upper) was collected at 1 monitoring site [Pine Valley Creek below Noble Cyn. Cr. - 911S01818]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **53307** **Region 9**

Pine Valley Creek (Upper)

Pollutant:	**Aluminum**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**

Last Listing Cycle's Final Listing Decision:	New Decision	039071
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53307, Aluminum **Region 9**

Pine Valley Creek (Upper)

LOE ID:	75370
Pollutant:	Aluminum
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Upper) to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Aluminum.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The National Recommended Water Quality Critiera for the protection of aquatic life from aluminum is the chronic continuous concentration (expressed as a 4-day average) of 87 ug/L.

Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Upper) was collected at 1 monitoring site [Pine Valley Creek below Noble Cyn. Cr. - 911S01818]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 53307, Aluminum **Region 9**

Pine Valley Creek (Upper)

LOE ID:	75368
Pollutant:	Aluminum
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Aluminum.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for aluminum is 0.2 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Upper) was collected at 1 monitoring site [Pine Valley Creek below Noble Cyn. Cr. - 911S01818]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **53308** **Region 9**

Pine Valley Creek (Upper)

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and

3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status; under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of one sample (sediment) exceeded the evaluation guideline and zero of one samples (water) exceeded the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample (sediment) and zero of 1 samples (water) exceeded the guideline/objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53308, Arsenic **Region 9**

Pine Valley Creek (Upper)

LOE ID:	75390
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The dissolved arsenic criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved arsenic is 0.150 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Upper) was collected at 1 monitoring

	site [Pine Valley Creek below Noble Cyn. Cr. - 911S01818]	039074
Temporal Representation:	Data was collected on a single day 5/6/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 53308, Arsenic **Region 9**

Pine Valley Creek (Upper)

LOE ID:	75381
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for arsenic is 33 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Upper) was collected at 1 monitoring site [Pine Valley Creek below Noble Cyn. Cr. - 911S01818]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 53308, Arsenic **Region 9**

Pine Valley Creek (Upper)

LOE ID:	75383
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	039075
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for arsenic is 0.01 mg/L (Title 22 of the California Code of Regulations).	
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Upper) was collected at 1 monitoring site [Pine Valley Creek below Noble Cyn. Cr. - 911S01818]	
Temporal Representation:	Data was collected on a single day 5/6/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID 43722 Region 9

Pine Valley Creek (Upper)

Pollutant:	**Benthic Community Effects**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Benthic Community Effects is being considered for placement on the CWA section 303(d) List under sections 3.9 and 3.1 of the Listing Policy. Under section 3.9, an additional line of evidence associating Benthic Community Effects with a water or sediment concentration of pollutant(s) is necessary to assess listing status. Based on the readily available data and information, the weight of evidence provides sufficient justification for not placing Benthic Community Effects in this water segment on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used does satisfy the data quantity requirements of section 6.1.5 of the Policy. 3. Pursuant to section 3.9 of the Listing Policy, the water does not exhibit significant degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index. See decision for lower Pine Valley for CSCI scores. 4. Pursuant to section 3.9 of the Listing Policy, the water segment does not have associated pollutant(s) samples that exceed water quality objectives. 5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not being met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 43722, Benthic Community Effects Region 9

Pine Valley Creek (Upper)

LOE ID:	72759
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	The sample collected had an IBI score above 40.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the State or Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	Development of a Benthic Index of Biotic Integrity (B-IBI) for Wadeable Streams in Northern Coastal California and its Application to Regional 305(b) Assessment
Spatial Representation:	The sample was collected at Pine Valley Creek below Noble Cyn. Cr..
Temporal Representation:	The sample was collected in May 2009.
Environmental Conditions:	
QAPP Information:	Samples were collected for the SWAMP RWB9 Stormwater Monitoring Council CY 2009.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 43722, Benthic Community Effects **Region 9**

Pine Valley Creek (Upper)

LOE ID:	26438
Pollutant:	Benthic Community Effects
LOE Subgroup:	Adverse Biological Responses
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	1
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Four samples of IBI data were taken from May 2001 to 2007 at one sampling site. Of the total number of samples, one sample exceeded the IBI impairment threshold.
Data Reference:	Fish and Game IBI Data 2007 SDRWQCB Bioassessment Data Southern California Postfire Study. Index of Biotic Integrity. 2007

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. (SDRWQCB, 1995)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at one site: 911NPCNCx on Pine Valley Creek (Upper).
Temporal Representation:	Sampling occurred during four events from May 2001 to 2007.
Environmental Conditions:	
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Project Plan for the California Stream Bioassessment Procedure and the State of California, California Monitoring an Assessment Program: "CMAP", Quality Assurance Project Plan.
QAPP Information Reference(s):	State of California, California Monitoring and Assessment Program: "CMAP". Quality Assurance Project Plan for the California Stream Bioassessment Procedure

Line of Evidence (LOE) for Decision ID 43722, Benthic Community Effects **Region 9**

Pine Valley Creek (Upper)

LOE ID:	75391
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	The IBI scores for this water body were both above 40 which indicates that this water body is not considered to have impaired conditions.
Data Reference:	RWB9 Status Sampling 2007 and 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams.

Environmental Management. Volume 35, number 1 (2005): pp. 1-13 039078

Spatial Representation:	Samples were collected at the following station: 911TJNPC2-North Pine Creek (NPCNC).
Temporal Representation:	Surveys done June 5, 2007.
Environmental Conditions:	
QAPP Information:	Data collected following SWAMP QA protocols for the RWB9 Status Sampling 2007 and 2008 water quality monitoring project.
QAPP Information Reference(s):	

DECISION ID 53309 Region 9

Pine Valley Creek (Upper)

Pollutant:	**Bifenthrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53309, Bifenthrin Region 9

Pine Valley Creek (Upper)

LOE ID:	75393
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	039079
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Bifenthrin.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Bifenthrin does not exceed 0.0006 ug/L.	
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Upper) was collected at 1 monitoring site [Pine Valley Creek below Noble Cyn. Cr. - 911S01818]	
Temporal Representation:	Data was collected on a single day 5/6/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID	**53310**	**Region 9**
Pine Valley Creek (Upper)		

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status; under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of one sample (sediment) exceeded the evaluation guideline and zero of 1 samples (water) exceeded the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample (sediment) and zero of 1 samples (water) exceeded the guideline/objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and

information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53310, Cadmium **Region 9**

Pine Valley Creek (Upper)

LOE ID:	75395
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for cadmium is 4.98 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Upper) was collected at 1 monitoring site [Pine Valley Creek below Noble Cyn. Cr. - 911S01818]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 53310, Cadmium **Region 9**

Pine Valley Creek (Upper)

LOE ID:	75408
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Upper) to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Cadmium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Cadmium to protect aquatic life in freshwater. The dissolved Cadmium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Upper) was collected at 1 monitoring site [Pine Valley Creek below Noble Cyn. Cr. - 911S01818]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 53310, Cadmium **Region 9**

Pine Valley Creek (Upper)

LOE ID:	75407
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for cadmium is 0.005 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Upper) was collected at 1 monitoring site [Pine Valley Creek below Noble Cyn. Cr. - 911S01818]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **53311** **Region 9**

Pine Valley Creek (Upper)

Pollutant:	**Chloride**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53311, Chloride **Region 9**

Pine Valley Creek (Upper)

LOE ID:	75412
Pollutant:	Chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chloride.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists

	objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Chloride objective for the protection of aquatic life according to Table 3-2 for Pine Valley Creek (Upper) within the Tijuana Hydrologic Unit is 250 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Upper) was collected at 1 monitoring site [Pine Valley Creek below Noble Cyn. Cr. - 911S01818]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 53311, Chloride **Region 9**

Pine Valley Creek (Upper)

LOE ID:	75410
Pollutant:	Chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chloride.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The recommended secondary maximum contamination level acceptable to consumers of drinking water is 250 mg/L.
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Upper) was collected at 1 monitoring site [Pine Valley Creek below Noble Cyn. Cr. - 911S01818]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **53312** **Region 9**

Pine Valley Creek (Upper)

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised

Impairment from Pollutant or Pollution:	Pollutant	039084

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status; under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of one sample (sediment) exceeded the evaluation guideline and zero of 1 samples (water) exceeded the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample (sediment) and zero of 1 samples (water) exceeded the guideline/objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53312, Chromium **Region 9**

Pine Valley Creek (Upper)

LOE ID:	75421
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for

	sediment-dwelling organisms) for chromium is 111 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Upper) was collected at 1 monitoring site [Pine Valley Creek below Noble Cyn. Cr. - 911S01818]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 53312, Chromium **Region 9**

Pine Valley Creek (Upper)

LOE ID:	75424
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium. Since the chromium species was not identified, the data point(s) were assessed using both the Chromium III criteria which is hardness-dependent, and the criterion continuous concentration (4-day average) to protect aquatic life in freshwater for chromium VI which is 11 ug/L and is not hardness dependent.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved chromium to protect aquatic life in freshwater. The dissolved Chromium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Upper) was collected at 1 monitoring site [Pine Valley Creek below Noble Cyn. Cr. - 911S01818]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 53312, Chromium **Region 9**

Pine Valley Creek (Upper)

LOE ID:	75423

Pollutant:	Chromium	039086
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	Total	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for total chromium is 0.05 mg/L (Title 22 of the California Code of Regulations).	
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Upper) was collected at 1 monitoring site [Pine Valley Creek below Noble Cyn. Cr. - 911S01818]	
Temporal Representation:	Data was collected on a single day 5/6/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID	**53313**	**Region 9**
Pine Valley Creek (Upper)		

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status; under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of one sample (sediment) exceeded the evaluation guideline and zero of 1 samples (water) exceeded the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample (sediment) and zero of 1 samples (water) exceeded the guideline/objective, and

this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53313, Copper **Region 9**
Pine Valley Creek (Upper)

LOE ID:	75436
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for copper is 1.0 mg/L (Title 22 California Code of Regulations).
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Upper) was collected at 1 monitoring site [Pine Valley Creek below Noble Cyn. Cr. - 911S01818]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 53313, Copper **Region 9**
Pine Valley Creek (Upper)

LOE ID:	75437
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat

Number of Samples:	1	039088
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved copper to protect aquatic life in freshwater. The dissolved copper criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Upper) was collected at 1 monitoring site [Pine Valley Creek below Noble Cyn. Cr. - 911S01818]	
Temporal Representation:	Data was collected on a single day 5/6/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 53313, Copper **Region 9**

Pine Valley Creek (Upper)

LOE ID:	75434
Pollutant:	Copper
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for copper is 149 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Upper) was collected at 1 monitoring

	site [Pine Valley Creek below Noble Cyn. Cr. - 911S01818] 039089
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 53314 Region 9

Pine Valley Creek (Upper)

Pollutant:	**Cyfluthrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the one samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53314, Cyfluthrin Region 9

Pine Valley Creek (Upper)

LOE ID:	75449
Pollutant:	Cyfluthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for

	Cyfluthrin, total.	039090
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of lambda-cyhalothrin does not exceed 0.0005 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Mixtures of lambda-cyhalothrin and other pyrethroids should be considered in an additive manner. (Fojut et al. 2012)Â	
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Upper) was collected at 1 monitoring site [Pine Valley Creek below Noble Cyn. Cr. - 911S01818]	
Temporal Representation:	Data was collected on a single day 5/6/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID	**53315**	**Region 9**
Pine Valley Creek (Upper)		

Pollutant:	**Cyhalothrin, Lambda**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the one samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53315, Cyhalothrin, Lambda **Region 9**

Pine Valley Creek (Upper) 039091

LOE ID:	75451
Pollutant:	Cyhalothrin, Lambda
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cyhalothrin, lambda, total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Cyhalothrin, lambda, total does not exceed 0.0005 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Upper) was collected at 1 monitoring site [Pine Valley Creek below Noble Cyn. Cr. - 911S01818]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **53316** **Region 9**

Pine Valley Creek (Upper)

Pollutant:	**Cypermethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.039092
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53316, Cypermethrin **Region 9**

Pine Valley Creek (Upper)

LOE ID:	75453
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	One of one sample result was not used in the assessment because the laboratory data was non-detect and the method detection limit was above the guideline and therefore the results could not be quantified with the level of certainty required by the Listing Policy
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of cypermethrin does not exceed 0.0002 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Fojut et al. 2012)
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Upper) was collected at 1 monitoring site [Pine Valley Creek below Noble Cyn. Cr. - 911S01818]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **53317** **Region 9**

Pine Valley Creek (Upper)

Pollutant:	**Deltamethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**

Last Listing Cycle's Final Listing Decision:	New Decision	039093
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53317, Deltamethrin **Region 9**

Pine Valley Creek (Upper)

LOE ID:	75465
Pollutant:	Deltamethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Deltamethrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for Deltamethrin is the maximum acceptable toxicant concentration (MATC) of 0.02 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.

Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Upper) was collected at 1 monitoring site [Pine Valley Creek below Noble Cyn. Cr. - 911S01818]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 53318 Region 9

Pine Valley Creek (Upper)

Pollutant:	**Esfenvalerate/Fenvalerate**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53318, Esfenvalerate/Fenvalerate Region 9

Pine Valley Creek (Upper)

LOE ID:	75468
Pollutant:	Esfenvalerate/Fenvalerate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Esfenvalerate/Fenvalerate, total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to the USEPA Office of Pesticide Programs Ecotoxicity database, the aquatic life EC50 for Esfenvalerate/Fenvalerate is 0.9 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Upper) was collected at 1 monitoring site [Pine Valley Creek below Noble Cyn. Cr. - 911S01818]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 53319 Region 9

Pine Valley Creek (Upper)

Pollutant:	**Fenpropathrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the one samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53319, Fenpropathrin Region 9

Pine Valley Creek (Upper) 039096

LOE ID:	75470
Pollutant:	Fenpropathrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Fenpropathrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for Fenpropathrin is the median lethal concentration (LC50; 2.2 ug/L).
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Upper) was collected at 1 monitoring site [Pine Valley Creek below Noble Cyn. Cr. - 911S01818]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **53320** **Region 9**

Pine Valley Creek (Upper)

Pollutant:	**Iron**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.

2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53320, Iron **Region 9**
Pine Valley Creek (Upper)

LOE ID:	75264
Pollutant:	Iron
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Iron.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for iron is 0.3 mg/L (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Upper) was collected at 1 monitoring site [Pine Valley Creek below Noble Cyn. Cr. - 911S01818]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 53320, Iron **Region 9**
Pine Valley Creek (Upper)

LOE ID:	75265
Pollutant:	Iron
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat

Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Iron.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Iron objective for the protection of aquatic life according to Table 3-2 for Pine Valley Creek (Upper) within the Tijuana Hydrologic Unit is 0.3 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Upper) was collected at 1 monitoring site [Pine Valley Creek below Noble Cyn. Cr. - 911S01818]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID	**53321**	**Region 9**
Pine Valley Creek (Upper)		

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status; under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of one sample (sediment) exceeded the evaluation guideline and zero of 1 samples (water) exceeded the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample (sediment) and zero of 1 samples (water) exceeded the guideline/objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available

indicating that standards are not met. 039099

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53321, Lead **Region 9**

Pine Valley Creek (Upper)

LOE ID:	75267
Pollutant:	Lead
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for lead is 128 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Upper) was collected at 1 monitoring site [Pine Valley Creek below Noble Cyn. Cr. - 911S01818]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 53321, Lead **Region 9**

Pine Valley Creek (Upper)

LOE ID:	75278
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1

Number of Exceedances:	0	039100
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved lead to protect aquatic life in freshwater. The dissolved lead criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Upper) was collected at 1 monitoring site [Pine Valley Creek below Noble Cyn. Cr. - 911S01818]	
Temporal Representation:	Data was collected on a single day 5/6/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID	**53322**	**Region 9**
Pine Valley Creek (Upper)		

Pollutant:	**Manganese**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the one samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53322, Manganese **Region 9**

Pine Valley Creek (Upper)

LOE ID:	75281
Pollutant:	Manganese
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Manganese.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Manganese objective for the protection of aquatic life according to Table 3-2 for Pine Valley Creek (Upper) within the Tijuana Hydrologic Unit is 0.05 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Upper) was collected at 1 monitoring site [Pine Valley Creek below Noble Cyn. Cr. - 911S01818]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 53322, Manganese **Region 9**

Pine Valley Creek (Upper)

LOE ID:	75280
Pollutant:	Manganese
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Manganese.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009

SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for manganese is 0.05 mg/L (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Upper) was collected at 1 monitoring site [Pine Valley Creek below Noble Cyn. Cr. - 911S01818]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 53323 Region 9

Pine Valley Creek (Upper)

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status; under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of one sample (sediment) exceeded the evaluation guideline and zero of 1 samples (water) exceeded the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample (sediment) and zero of 1 samples (water) exceeded the guideline/objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53323, Nickel Region 9

Pine Valley Creek (Upper)

LOE ID:	75296
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Nickel to protect aquatic life in freshwater. The dissolved Nickel criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Upper) was collected at 1 monitoring site [Pine Valley Creek below Noble Cyn. Cr. - 911S01818]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 53323, Nickel **Region 9**

Pine Valley Creek (Upper)

LOE ID:	75283
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be

	maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for nickel is 48.6 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Upper) was collected at 1 monitoring site [Pine Valley Creek below Noble Cyn. Cr. - 911S01818]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 53323, Nickel **Region 9**

Pine Valley Creek (Upper)

LOE ID:	75295
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nickel is 0.1 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Upper) was collected at 1 monitoring site [Pine Valley Creek below Noble Cyn. Cr. - 911S01818]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **53324** **Region 9**

Pine Valley Creek (Upper)

Pollutant:	**Nitrate/Nitrite (Nitrite + Nitrate as N)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision

Revision Status	Revised	039105
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53324, Nitrate/Nitrite (Nitrite + Nitrate as N) **Region 9**

Pine Valley Creek (Upper)

LOE ID:	75297
Pollutant:	Nitrate/Nitrite (Nitrite + Nitrate as N)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nitrate/Nitrite as N.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrate + nitrite (as N) is 10.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Upper) was collected at 1 monitoring site [Pine Valley Creek below Noble Cyn. Cr. - 911S01818]
Temporal Representation:	Data was collected on a single day 5/6/2009.

Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 33181 Region 9

Pine Valley Creek (Upper)

Pollutant:	**Nitrite as Nitrite NO2**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. Zero of the 4 samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 4 samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 33181, Nitrite as Nitrite NO2 Region 9

Pine Valley Creek (Upper)

LOE ID:	3410
Pollutant:	Nitrite as Nitrite NO2
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected at site PCV1B by the City of San Diego Water Dept. on May 20, 1997. One sample was collected and it was not in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)

SWAMP Data:	Non-SWAMP	039107
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Nitrite (as N) is 1.0 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	One sample was collected at site PVC1B in Pine Valley Creek. Other samples were collected from site PVC1A.	
Temporal Representation:	The sample was collected on May 20, 1997.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33181, Nitrite as Nitrite NO2 **Region 9**

Pine Valley Creek (Upper)

LOE ID:	75298
Pollutant:	Nitrogen, Nitrite
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nitrite as N.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrite (as N) is 1.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Upper) was collected at 1 monitoring site [Pine Valley Creek below Noble Cyn. Cr. - 911S01818]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 33181, Nitrite as Nitrite NO2 **Region 9**

Pine Valley Creek (Upper)

LOE ID:	3409
Pollutant:	Nitrite as Nitrite NO2
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	Total	039108
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	2	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Nitrite samples were collected at site PVC1A by the City of San Diego Water Dept. on May 19, 1997 and October 9, 1997. One sample was collected on each date, giving a total of 2 samples. There were no exceedances of 2 samples. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Nitrite (as N) is 1.0 mg/L.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at sample site PVC1A in Pine Valley Creek. Samples were also collected at PVC1B.	
Temporal Representation:	One sample was collected on May 19, 1997 and one was collected on October 9, 1997.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID	**53325**	**Region 9**
Pine Valley Creek (Upper)		

Pollutant:	**Nitrogen, Nitrite**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the one samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and

information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53325, Nitrogen, Nitrite	Region 9
Pine Valley Creek (Upper)	

LOE ID:	75298
Pollutant:	Nitrogen, Nitrite
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nitrite as N.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrite (as N) is 1.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Upper) was collected at 1 monitoring site [Pine Valley Creek below Noble Cyn. Cr. - 911S01818]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID	53327	Region 9
Pine Valley Creek (Upper)		

Pollutant:	**Nitrogen, ammonia (Total Ammonia)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the one samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section

303(d) List in the Water Quality Limited Segments category. 039110

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53327, Nitrogen, ammonia (Total Ammonia) Region 9

Pine Valley Creek (Upper)

LOE ID:	75378
Pollutant:	Nitrogen, ammonia (Total Ammonia)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Ammonia as N, Total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Aquatic Life Ambient Water Quality Criteria for Ammonia â€“ Freshwater (USEPA 2013): the 30-day rolling average concentration (criterion continuous concentration or CCC) of total ammonia nitrogen(in mg TAN/L) in freshwater are not to be exceeded more than once every three years on average. The CCC values are based on pH and temperature. The CCC formula is found on page 46 and the table of CCC values is on page 49.
Guideline Reference:	Aquatic Life Ambient Water Quality Criteria for Ammonia - Freshwater 2013
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Upper) was collected at 1 monitoring site [Pine Valley Creek below Noble Cyn. Cr. - 911S01818]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 53327, Nitrogen, ammonia (Total Ammonia) Region 9

Pine Valley Creek (Upper)

LOE ID:	75379
Pollutant:	Nitrogen, ammonia (Total Ammonia)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Ammonia As N, Total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Basin Plan: No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	EPA's Lifetime Health advisory level for total ammonia is 30.0 mg/L as stated on page 8 of the 2006 edition of the drinking water standards and health advisories. This Advisory Level is defined as "the concentration of a chemical in drinking water that is not expected to cause any adverse noncarcinogenic effects for up to ten days of exposure."
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Upper) was collected at 1 monitoring site [Pine Valley Creek below Noble Cyn. Cr. - 911S01818]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID	**33115**	**Region 9**
Pine Valley Creek (Upper)		

Pollutant:	**Oxygen, Dissolved**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. 10 lines of evidence are available in the administrative record to assess this pollutant. Zero of the 26 samples exceed the Objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.039112
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the 26 samples exceed the Objective and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 33115, Oxygen, Dissolved **Region 9**

Pine Valley Creek (Upper)

LOE ID:	3390
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected at sample site SPC2 by the City of San Diego Water Dept. on March 13, 1997 and March 31, 1997. On each date, multiple samples were taken within 5 minutes. For data assessment, an average was calculated for these samples on each day. The average of 2 samples was taken for March 13, and an average of 4 samples was calculated for March 31. None of the samples or averages were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: Dissolved oxygen levels shall not be less than 5.0 mg/l in inland surface waters with designated MAR or WARM beneficial uses or less than 6.0 mg/l in waters with designated COLD beneficial uses. The annual mean dissolved oxygen concentrations shall not be less than 7 mg/l more than 10% of the time.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at site SPC2 in Pine Valley Creek. Samples were also collected from 8 other sites along Pine Valley Creek.
Temporal Representation:	Samples were collected around 10am on March 13, 1997 and March 31, 1997.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33115, Oxygen, Dissolved **Region 9**

Pine Valley Creek (Upper)

LOE ID:	3388
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	Dissolved	039113
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	0	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data was collected at sample site PVC2 by the City of San Diego Water Dept. on March 19, 1997. Multiple samples were taken within 1 hour. For data assessment, an average was calculated for these samples. The average of 6 samples was taken for March 19. None of the samples or averages were in exceedance. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: Dissolved oxygen levels shall not be less than 5.0 mg/l in inland surface waters with designated MAR or WARM beneficial uses or less than 6.0 mg/l in waters with designated COLD beneficial uses. The annual mean dissolved oxygen concentrations shall not be less than 7 mg/l more than 10% of the time.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at site PVC2 in Pine Valley Creek. Samples were also collected from 8 other sites along Pine Valley Creek.	
Temporal Representation:	Samples were collected on March 19, 1997.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33115, Oxygen, Dissolved **Region 9**

Pine Valley Creek (Upper)

LOE ID:	3383
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected at sample site NPC3B by the City of San Diego Water Dept. on March 13 and March 31, 1997. Multiple samples were collected within 5 minutes. For data assessment, an average was calculated for these samples. None of the samples or averages were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: Dissolved oxygen levels shall not be less than 5.0 mg/l in inland surface waters with designated MAR or WARM beneficial uses or less than 6.0 mg/l in waters with designated COLD beneficial uses. The annual mean dissolved oxygen concentrations shall not be less than 7 mg/l more than 10% of the time.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)

Evaluation Guideline:	039114
Guideline Reference:	
Spatial Representation:	Samples were collected at site NPC3B in Pine Valley Creek. Samples were also collected from 8 other sites along Pine Valley Creek.
Temporal Representation:	Samples were collected on March 13 and March 31, 1997.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33115, Oxygen, Dissolved **Region 9**

Pine Valley Creek (Upper)

LOE ID:	3384
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected at sample site NPC3C by the City of San Diego Water Dept. on January 1, 1997 and March 31, 1997. On each date, multiple samples were taken within 20 minutes. For data assessment, an average was calculated for these samples on each day. The average of 5 samples was taken for Jan. 1, and an average of 4 samples was calculated for March 31. None of the samples or averages were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: Dissolved oxygen levels shall not be less than 5.0 mg/l in inland surface waters with designated MAR or WARM beneficial uses or less than 6.0 mg/l in waters with designated COLD beneficial uses. The annual mean dissolved oxygen concentrations shall not be less than 7 mg/l more than 10% of the time.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at site NPC3C in Pine Valley Creek. Samples were also collected from 8 other sites along Pine Valley Creek.
Temporal Representation:	Samples were collected around 11am on January 1, 1997 and March 31, 1997.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33115, Oxygen, Dissolved **Region 9**

Pine Valley Creek (Upper)

LOE ID:	3385
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved

Beneficial Use:	Municipal & Domestic Supply	039115
Number of Samples:	7	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data was collected at sample site NPC3D by the City of San Diego Water Dept. on March 13, 1997 and March 31, 1997. On each date, multiple samples were taken within 2 minutes. For data assessment, an average was calculated for these samples on each day. The average of 3 samples was taken for March 13, and an average of 4 samples was calculated for March 31. None of the samples or averages were in exceedance. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: Dissolved oxygen levels shall not be less than 5.0 mg/l in inland surface waters with designated MAR or WARM beneficial uses or less than 6.0 mg/l in waters with designated COLD beneficial uses. The annual mean dissolved oxygen concentrations shall not be less than 7 mg/l more than 10% of the time.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at site NPC3D in Pine Valley Creek. Samples were also collected from 8 other sites along Pine Valley Creek.	
Temporal Representation:	Samples were collected around 10am on March 13, 1997 and March 31, 1997.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33115, Oxygen, Dissolved **Region 9**

Pine Valley Creek (Upper)

LOE ID:	3389
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected at sample site NPC2 by the City of San Diego Water Dept. on March 13, 1997 and March 31, 1997. On each date, multiple samples were taken within 5 minutes. For data assessment, an average was calculated for these samples on each day. The average of 6 samples was taken for March 13, and an average of 3 samples was calculated for March 31. None of the samples or averages were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: Dissolved oxygen levels shall not be less than 5.0 mg/l in inland surface waters with designated MAR or WARM beneficial uses or less than 6.0 mg/l in waters with designated COLD beneficial uses. The annual mean dissolved oxygen concentrations shall not be less than 7 mg/l more than 10% of the time.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)

Evaluation Guideline:	039116
Guideline Reference:	
Spatial Representation:	Samples were collected at site NPC2 in Pine Valley Creek. Samples were also collected from 8 other sites along Pine Valley Creek.
Temporal Representation:	Samples were collected around noon and 1pm on March 13, 1997 and March 31, 1997.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33115, Oxygen, Dissolved **Region 9**

Pine Valley Creek (Upper)

LOE ID:	3386
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected at sample site PVC1A by the City of San Diego Water Dept. on 4 days between March 1997 and October 1997. On each date, multiple samples were taken within an hour. For data assessment, an average was calculated for these samples on each day. The number of samples for each day ranged from 4 to 7. None of the samples or averages were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: Dissolved oxygen levels shall not be less than 5.0 mg/l in inland surface waters with designated MAR or WARM beneficial uses or less than 6.0 mg/l in waters with designated COLD beneficial uses. The annual mean dissolved oxygen concentrations shall not be less than 7 mg/l more than 10% of the time.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at site PVC1A in Pine Valley Creek. Samples were also collected from 8 other sites along Pine Valley Creek.
Temporal Representation:	Samples were collected from March 13, 1997 to October 9, 1997.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33115, Oxygen, Dissolved **Region 9**

Pine Valley Creek (Upper)

LOE ID:	3387
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved

Beneficial Use:	Municipal & Domestic Supply	039117
Number of Samples:	0	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data was collected at sample site PVC1B by the City of San Diego Water Dept. on February 19, 1997 and May 20, 1997. On each date, multiple samples were taken in approximately 1 hour. For data assessment, an average was calculated for these samples on each day. The average of 8 samples was taken for February 19, and an average of 4 samples was calculated for May 20. None of the samples or averages were in exceedance. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: Dissolved oxygen levels shall not be less than 5.0 mg/l in inland surface waters with designated MAR or WARM beneficial uses or less than 6.0 mg/l in waters with designated COLD beneficial uses. The annual mean dissolved oxygen concentrations shall not be less than 7 mg/l more than 10% of the time.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at site PVC1B in Pine Valley Creek. Samples were also collected from 8 other sites along Pine Valley Creek.	
Temporal Representation:	Samples were collected in the morning on February 19, 1997 and May 20, 1997.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33115, Oxygen, Dissolved **Region 9**

Pine Valley Creek (Upper)

LOE ID:	75300
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Oxygen, Dissolved.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan, San Diego Basin, Cold Water Habitat Objective, Chapter III, General Objectives for all Inland Surface Waters, Enclosed Bays and Estuaries states the following: The dissolved oxygen concentration for cold water habitats shall not be reduced below 8.0 mg/l at any time.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	

Guideline Reference:	039118
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Upper) was collected at 1 monitoring site [Pine Valley Creek below Noble Cyn. Cr. - 911S01818]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 33115, Oxygen, Dissolved **Region 9**

Pine Valley Creek (Upper)

LOE ID:	3382
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected at sample site NPC3A by the City of San Diego Water Dept. on March 13, 1997 and March 31, 1997. On each date, multiple samples were taken within 5 minutes. For data assessment, an average was calculated for these samples on each day. The average of 5 samples was taken for March 13, and an average of 4 samples was calculated for March 31. None of the samples or averages were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: Dissolved oxygen levels shall not be less than 5.0 mg/l in inland surface waters with designated MAR or WARM beneficial uses or less than 6.0 mg/l in waters with designated COLD beneficial uses. The annual mean dissolved oxygen concentrations shall not be less than 7 mg/l more than 10% of the time.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at site NPC3A in Pine Valley Creek. Samples were also collected from 8 other sites along Pine Valley Creek.
Temporal Representation:	Samples were collected on March 13, 1997 and March 31, 1997.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **53328** **Region 9**

Pine Valley Creek (Upper)

Pollutant:	**Permethrin, total**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53328, Permethrin, total **Region 9**

Pine Valley Creek (Upper)

LOE ID:	75313
Pollutant:	Permethrin, total
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Permethrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Permethrin does not exceed 0.002 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Upper) was collected at 1 monitoring site [Pine Valley Creek below Noble Cyn. Cr. - 911S01818]
Temporal Representation:	Data was collected on a single day 5/6/2009.

Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 32840 Region 9

Pine Valley Creek (Upper)

Pollutant:	**Phosphorus**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being re-considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status. Five lines of evidence are available in the administrative record to assess this pollutant. Six of 51 of samples exceeded the Basin Plan water quality objective for phosphorus. Based on the readily available data and information, the weight of evidence indicates that there is not sufficient justification in favor of placing this water segment-pollutant combination from the section 303(d) list. This conclusion is based on the staff findings that: 1. The data used does not satisfy the data quality requirements of section 6.1.4 of the Policy. The data was collected in the later 1990s and information required under 6.1.4 of the Policy is not available. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Six of 51 of samples exceeded the water quality objective for phosphorus. and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, additional data and information is available indicating that standards are met: Historic site visits by the San Diego Water Board stormwater staff were conducted to educate property owners regarding dumping of horse manure into the creek.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 32840, Phosphorus Region 9

Pine Valley Creek (Upper)

LOE ID:	3372
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	10
Number of Exceedances:	2
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Phosphorus data was collected at 5 sample sites by the City of San Diego Water Dept. from 1/14/1998 to 8/18/1998. At site NPC3B, 2 of 10 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters-streams and other flowing waters and for all beneficial uses, the WQO for total phosphorus is 0.1 mg/L. This appears to be the desired goal in order to prevent plant nuisance in streams and other flowing waters; not to be exceeded more than 10% of the time.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	Use unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board.
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	Phosphorus samples for this LOE were collected at site NPC3B. The exact location of this site is unknown. Samples were collected at 4 other sample sites in Pine Valley Creek. The proximity of the sites to each other is unknown.
Temporal Representation:	Samples were collected monthly from 1/14/1998 to 8/18/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 32840, Phosphorus **Region 9**

Pine Valley Creek (Upper)

LOE ID:	3373
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	10
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Phosphorus data was collected at 5 sample sites by the City of San Diego Water Dept. from 1/14/1998 to 8/18/1998. At site NPC3C, 0 of 10 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters-streams and other flowing waters and for all beneficial uses, the WQO for total phosphorus is 0.1 mg/L. This appears to be the desired goal in order to prevent plant nuisance in streams and other flowing waters; not to be exceeded more than 10% of the time.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	Use unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board.
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	Phosphorus samples for this LOE were collected at site NPC3C. The exact location of this site is unknown. Samples were collected at 4 other sample sites in Pine Valley Creek. The proximity of the sites to each other is unknown.
Temporal Representation:	Samples were collected on a monthly basis from 1/14/1998 to 8/18/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 32840, Phosphorus **Region 9**

Pine Valley Creek (Upper) 039122

LOE ID:	3374
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	10
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Phosphorus data was collected at 5 sample sites by the City of San Diego Water Dept. from 1/14/1998 to 8/18/1998. At site NPC3D, 1 of 10 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters-streams and other flowing waters and for all beneficial uses, the WQO for total phosphorus is 0.1 mg/L. This appears to be the desired goal in order to prevent plant nuisance in streams and other flowing waters; not to be exceeded more than 10% of the time.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	Use unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board.
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	Phosphorus samples for this LOE were collected at site NPC3D. The exact location of this site is unknown. Samples were collected at 4 other sample sites in Pine Valley Creek. The proximity of the sites to each other is unknown.
Temporal Representation:	Samples were collected on a monthly basis from 1/14/1998 to 8/18/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 32840, Phosphorus **Region 9**

Pine Valley Creek (Upper)

LOE ID:	3375
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	11
Number of Exceedances:	2
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Phosphorus data was collected at 5 sample sites by the City of San Diego Water Dept. from 1/14/1998 to 9/15/1998. At site PVC1A, 2 of 11 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters-streams and other flowing waters and for all

	beneficial uses, the WQO for total phosphorus is 0.1 mg/L. This appears to be the desired goal in order to prevent plant nuisance in streams and other flowing waters; not to be exceeded more than 10% of the time.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	Use unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board.
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	Phosphorus samples for this LOE were collected at site PVC1A. The exact location of this site is unknown. Samples were collected at 4 other sample sites in Pine Valley Creek. The proximity of the sites to each other is unknown.
Temporal Representation:	Samples were collected on a monthly basis from 1/14/1998 to 9/15/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 32840, Phosphorus **Region 9**

Pine Valley Creek (Upper)

LOE ID:	3371
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	10
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Phosphorus data was collected at 5 sample sites by the City of San Diego Water Dept. from 1/14/1998 to 8/18/1998. At site NPC3A, 1 of 10 samples was in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters-streams and other flowing waters and for all beneficial uses, the WQO for total phosphorus is 0.1 mg/L. This appears to be the desired goal in order to prevent plant nuisance in streams and other flowing waters; not to be exceeded more than 10% of the time.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	Use unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Certain exceptions to these objectives are described in Chapter 4 of the Basin Plan in the sections titled "Discharges to Coastal Lagoons from Pilot Water Reclamation Projects" and "Discharges to Inland Surface Waters".
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	Samples for this LOE were collected at site NPC3A in Pine Valley Creek. The exact location of this site is unknown. Samples were collected at 4 more sample sites in Pine Valley Creek.
Temporal Representation:	Samples were collected monthly from January 14, 1998 to August 18, 1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 53329 **Region 9**

Pine Valley Creek (Upper) 039124

Pollutant:	**Selenium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53329, Selenium — Region 9

Pine Valley Creek (Upper)

LOE ID:	75317
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Selenium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The Maximum Contaminant Level for selenium in the Basin Plan is 0.01 mg/L.
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	

Guideline Reference:	039125
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Upper) was collected at 1 monitoring site [Pine Valley Creek below Noble Cyn. Cr. - 911S01818]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 53329, Selenium **Region 9**

Pine Valley Creek (Upper)

LOE ID:	75318
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Selenium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The selenium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater is 0.005 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Upper) was collected at 1 monitoring site [Pine Valley Creek below Noble Cyn. Cr. - 911S01818]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **53330** **Region 9**

Pine Valley Creek (Upper)

Pollutant:	**Silver**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53330, Silver Pine Valley Creek (Upper) **Region 9**

LOE ID:	75331
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Silver.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Silver to protect aquatic life in freshwater. The dissolved Silver criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Upper) was collected at 1 monitoring site [Pine Valley Creek below Noble Cyn. Cr. - 911S01818]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 53330, Silver Pine Valley Creek (Upper) 039127 **Region 9**

LOE ID:	75329
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Silver.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for silver is 0.1 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Upper) was collected at 1 monitoring site [Pine Valley Creek below Noble Cyn. Cr. - 911S01818]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 53331 Region 9
Pine Valley Creek (Upper)

Pollutant:	**Specific Conductivity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.039128
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53331, Specific Conductivity **Region 9**

Pine Valley Creek (Upper)

LOE ID:	75332
Pollutant:	Specific Conductivity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Conductivity(Us).
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for specific conductance is 900 uS/cm (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Upper) was collected at 1 monitoring site [Pine Valley Creek below Noble Cyn. Cr. - 911S01818]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **53332** **Region 9**

Pine Valley Creek (Upper)

Pollutant:	**Sulfates**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised

Impairment from Pollutant or Pollution:	Pollutant	039129
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the one samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.	
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.	

Line of Evidence (LOE) for Decision ID 53332, Sulfates **Region 9**

Pine Valley Creek (Upper)

LOE ID:	75333
Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Sulfate.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for sulfate is 250 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Upper) was collected at 1 monitoring site [Pine Valley Creek below Noble Cyn. Cr. - 911S01818]
Temporal Representation:	Data was collected on a single day 5/6/2009.

Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 53332, Sulfates **Region 9**

Pine Valley Creek (Upper)

LOE ID:	75345
Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Sulfate.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Sulfate objective for the protection of aquatic life according to Table 3-2 for Pine Valley Creek (Upper) within the Tijuana Hydrologic Unit is 250 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Upper) was collected at 1 monitoring site [Pine Valley Creek below Noble Cyn. Cr. - 911S01818]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **53333** **Region 9**

Pine Valley Creek (Upper)

Pollutant:	**Temperature, water**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. One of the One samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of one samples exceeded the criteria. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating per Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, additional data and information is available indicating that standards may be met. Two additional lines of evidence are available.

First, the location of the sampling and timing may not be representative of steelhead habitat utilization in San Mateo, and samples were taken as grabs. Critical information needed to assess temperatures for steelhead include growth periods (spring and fall) as well as summer daytime maximums in documented oversummering habitat.

Second, the criteria of 21 degrees as a limit is not necessarily applicable to southern California steelhead, which have been shown to have higher temperature tolerance. See Spina Environ Biol Fish (2007) 80:23Â–34.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53333, Temperature, water **Region 9**

Pine Valley Creek (Upper)

LOE ID:	75346
Pollutant:	Temperature, water
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Upper) to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Water Temperature.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Board that such alteration in temperature does not adversely affect beneficial uses. At no time or place shall the temperature of any COLD water be increased more than 5Â°F above the natural receiving water temperature.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Inland Fishes of California (Moyle 1976) states that for rainbow trout the optimum range for growth and completion of most life stages is 13-21 degrees C (page 129).
Guideline Reference:	Inland Fishes of California

Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Upper) was collected at 911S02 monitoring site [Pine Valley Creek below Noble Cyn. Cr. - 911S01818]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 33167 Region 9

Pine Valley Creek (Upper)

Pollutant:	**Total Dissolved Solids**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 52 samples exceed the obejctive. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the 52 samples exceed the obejctiveand this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 33167, Total Dissolved Solids Region 9

Pine Valley Creek (Upper)

LOE ID:	3402
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected at sample site NPC3C by the City of San Diego Water Dept. on January 1, 1997 and March 31, 1997. On each date, multiple samples were taken within 20 minutes. For data assessment, an average was calculated for these samples on each day. The average of 5 samples was taken for Jan. 1, and an average of 4 samples was calculated for

	March 31. None of the samples or averages were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for TDS is 500. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at site NPC3C in Pine Valley Creek. Samples were also collected from 8 other sites along Pine Valley Creek.
Temporal Representation:	Samples were collected around 11am on January 1, 1997 and March 31, 1997.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33167, Total Dissolved Solids **Region 9**

Pine Valley Creek (Upper)

LOE ID:	3401
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected at sample site NPC3B by the City of San Diego Water Dept. on March 13 and March 31, 1997. Multiple samples were collected within 5 minutes. For data assessment, an average was calculated for these samples. None of the samples or averages were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for TDS is 500. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at site NPC3B in Pine Valley Creek. Samples were also collected from 8 other sites along Pine Valley Creek.
Temporal Representation:	Samples were collected between 10am and noon on March 13 and March 31, 1997.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33167, Total Dissolved Solids **Region 9**

Pine Valley Creek (Upper)

LOE ID:	3403
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected at sample site NPC3D by the City of San Diego Water Dept. on March 13, 1997 and March 31, 1997. On each date, multiple samples were taken within 2 minutes. For data assessment, an average was calculated for these samples on each day. The average of 3 samples was taken for March 13, and an average of 4 samples was calculated for March 31. None of the samples or averages were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for TDS is 500. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	
Temporal Representation:	Samples were collected at site NPC3D in Pine Valley Creek. Samples were also collected from 8 other sites along Pine Valley Creek.
Environmental Conditions:	Samples were collected around 10am on March 13, 1997 and March 31, 1997.
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33167, Total Dissolved Solids **Region 9**

Pine Valley Creek (Upper)

LOE ID:	75347
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Dissolved Solids.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that

	adversely affect beneficial uses. 039135
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for Dissolved Solids is 500 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Upper) was collected at 1 monitoring site [Pine Valley Creek below Noble Cyn. Cr. - 911S01818]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 33167, Total Dissolved Solids **Region 9**

Pine Valley Creek (Upper)

LOE ID:	3404
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected at sample site PVC1A by the City of San Diego Water Dept. on 4 days between March 1997 and October 1997. On each date, multiple samples were taken within an hour. For data assessment, an average was calculated for these samples on each day. The number of samples for each day ranged from 4 to 7. None of the samples or averages were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for TDS is 500. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at site PVC1A in Pine Valley Creek. Samples were also collected from 8 other sites along Pine Valley Creek.
Temporal Representation:	Samples were collected around between 8:45am and 2:12pm from March 13, 1997 to October 9, 1997.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33167, Total Dissolved Solids **Region 9**

Pine Valley Creek (Upper)

LOE ID:	3400
Pollutant:	Total Dissolved Solids

LOE Subgroup:	Pollutant-Water	039136
Matrix:	Water	
Fraction:	Total Dissolved	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	0	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data was collected at sample site NPC3A by the City of San Diego Water Dept. on March 13, 1997 and March 31, 1997. On each date, multiple samples were taken within 5 minutes. For data assessment, an average was calculated for these samples on each day. The average of 5 samples was taken for March 13, and an average of 4 samples was calculated for March 31. None of the samples or averages were in exceedance. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for TDS is 500. This concentration is not to be exceeded more than 10% of the time during any one year period.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at site NPC3A in Pine Valley Creek. Samples were also collected from 8 other sites along Pine Valley Creek.	
Temporal Representation:	Samples were collected around 11am and noon on March 13, 1997 and March 31, 1997.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33167, Total Dissolved Solids **Region 9**

Pine Valley Creek (Upper)

LOE ID:	75349
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Dissolved Solids.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Dissolved Solids objective for the protection of aquatic life according to Table 3-2 for Pine Valley Creek (Upper) within the Tijuana Hydrologic Unit is 500 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Upper) was collected at 1 monitoring site [Pine Valley Creek below Noble Cyn. Cr. - 911S01818]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 33167, Total Dissolved Solids **Region 9**

Pine Valley Creek (Upper)

LOE ID:	3405
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected at sample site PVC1B by the City of San Diego Water Dept. on February 19, 1997 and May 20, 1997. On each date, multiple samples were taken in approximately 1 hour. For data assessment, an average was calculated for these samples on each day. The average of 8 samples was taken for February 19, and an average of 4 samples was calculated for May 20. None of the samples or averages were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for TDS is 500. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at site PVC1B in Pine Valley Creek. Samples were also collected from 8 other sites along Pine Valley Creek.
Temporal Representation:	Samples were collected in the morning on February 19, 1997 and May 20, 1997.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33167, Total Dissolved Solids **Region 9**

Pine Valley Creek (Upper)

LOE ID:	3408
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved

Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected at sample site SPC2 by the City of San Diego Water Dept. on March 13, 1997 and March 31, 1997. On each date, multiple samples were taken within 5 minutes. For data assessment, an average was calculated for these samples on each day. The average of 2 samples was taken for March 13, and an average of 4 samples was calculated for March 31. None of the samples or averages were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for TDS is 500. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at site SPC2 in Pine Valley Creek. Samples were also collected from 8 other sites along Pine Valley Creek.
Temporal Representation:	Samples were collected around 10am on March 13, 1997 and March 31, 1997.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33167, Total Dissolved Solids **Region 9**

Pine Valley Creek (Upper)

LOE ID:	3407
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected at sample site NPC2 by the City of San Diego Water Dept. on March 13, 1997 and March 31, 1997. On each date, multiple samples were taken within 5 minutes. For data assessment, an average was calculated for these samples on each day. The average of 6 samples was taken for March 13, and an average of 3 samples was calculated for March 31. None of the samples or averages were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for TDS is 500. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	

Guideline Reference:	039139
Spatial Representation:	Samples were collected at site NPC2 in Pine Valley Creek. Samples were also collected from 8 other sites along Pine Valley Creek.
Temporal Representation:	Samples were collected around noon and 1pm on March 13, 1997 and March 31, 1997.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33167, Total Dissolved Solids **Region 9**

Pine Valley Creek (Upper)

LOE ID:	3406
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected at sample site PVC2 by the City of San Diego Water Dept. on March 19, 1997. Multiple samples were taken within 1 hour. For data assessment, an average was calculated for these samples. The average of 6 samples was taken for March 19. None of the samples or averages were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for TDS is 500. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at site PVC2 in Pine Valley Creek. Samples were also collected from 8 other sites along Pine Valley Creek.
Temporal Representation:	Samples were collected around 10am on March 19, 1997.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33167, Total Dissolved Solids **Region 9**

Pine Valley Creek (Upper)

LOE ID:	3376
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	51

Number of Exceedances:	0	039140
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	TDS data was collected at 5 sites in Pine Valley Creek by the City of San Diego Water Dept. from 1/14/1998 to 9/15/1998. There were no exceedances at any of the sites. A total of 51 samples were collected; 10 at all sites, except PVC1A, where 11 samples were collected. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for total dissolved solids is 500. This concentration is not to be exceeded more than 10% of the time during any one year period.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at 5 sites in Pine Valley Creek. These samples are labeled NPC3A-D, and PVC1A. The locations of these sites and distances from each other are unknown.	
Temporal Representation:	Samples were collected on a monthly basis from 1/14/1998 to 9/15/1998.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID	**53334**	**Region 9**
Pine Valley Creek (Upper)		

Pollutant:	**Toxicity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the one samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53334, Toxicity **Region 9**

Pine Valley Creek (Upper)

LOE ID:	75350
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate water toxicity. The sample did not exhibit significant toxicity. The toxicity test included survival and reproduction of Ceriodaphnia dubia. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL, Significant compared to negative control based on statistical test, less than stated alpha level, AND less than the evaluation threshold (both criteria are met).
Guideline Reference:	
Spatial Representation:	The sample was collected at station 911S01818.
Temporal Representation:	The sample was collected in May 2009.
Environmental Conditions:	
QAPP Information:	Data quality is good. Data results were recorded in the SWAMP database and followed SWAMP protocols.
QAPP Information Reference(s):	

DECISION ID **53335** **Region 9**

Pine Valley Creek (Upper)

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status; under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity

to justify adding that pollutant to the CWA section 303(d) List. 039142

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of one sample (sediment) exceeded the evaluation guideline and zero of 1 samples (water) exceeded the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample (sediment) and zero of 1 samples (water) exceeded the guideline/objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53335, Zinc **Region 9**

Pine Valley Creek (Upper)

LOE ID:	75372
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Zinc to protect aquatic life in freshwater. The dissolved Zinc criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Upper) was collected at 1 monitoring site [Pine Valley Creek below Noble Cyn. Cr. - 911S01818]
Temporal Representation:	Data was collected on a single day 5/6/2009.

Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 53335, Zinc **Region 9**

Pine Valley Creek (Upper)

LOE ID:	75360
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for zinc is 459 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Upper) was collected at 1 monitoring site [Pine Valley Creek below Noble Cyn. Cr. - 911S01818]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 53335, Zinc **Region 9**

Pine Valley Creek (Upper)

LOE ID:	75361
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Upper) to determine

	beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	The California Secondary MCL for zinc is 5.0 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Upper) was collected at 1 monitoring site [Pine Valley Creek below Noble Cyn. Cr. - 911S01818]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 33116 Region 9

Pine Valley Creek (Upper)

Pollutant:	**pH**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 20 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 20 samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 33116, pH Region 9

Pine Valley Creek (Upper)

LOE ID:	3391
Pollutant:	pH

LOE Subgroup:	Pollutant-Water	039145
Matrix:	Water	
Fraction:	Total	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	2	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data was collected at sample site NPC3A by the City of San Diego Water Dept. on March 13, 1997 and March 31, 1997. On each date, multiple samples were taken within 5 minutes. For data assessment, an average was calculated for these samples on each day. The average of 5 samples was taken for March 13, and an average of 4 samples was calculated for March 31. None of the samples or averages were in exceedance. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for pH is 6.5 (minimum) to 8.5 (maximum).	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at site NPC3A in Pine Valley Creek. Samples were also collected from 8 other sites along Pine Valley Creek.	
Temporal Representation:	Samples were collected around 11am and noon on March 13, 1997 and March 31, 1997.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33116, pH **Region 9**

Pine Valley Creek (Upper)

LOE ID:	3395
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected at sample site PVC1A by the City of San Diego Water Dept. on 4 days between March 1997 and October 1997. On each date, multiple samples were taken within an hour. For data assessment, an average was calculated for these samples on each day. The number of samples for each day ranged from 4 to 7. None of the samples or averages were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for pH is 6.5 (minimum) to 8.5 (maximum).
Objective/Criterion Reference:	Placeholder reference 2006 303(d)

Evaluation Guideline:	039146
Guideline Reference:	
Spatial Representation:	Samples were collected at site PVC1A in Pine Valley Creek. Samples were also collected from 8 other sites along Pine Valley Creek.
Temporal Representation:	Samples were collected around between 8:45am and 2:12pm from March 13, 1997 to October 9, 1997.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33116, pH **Region 9**

Pine Valley Creek (Upper)

LOE ID:	3396
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected at sample site PVC1B by the City of San Diego Water Dept. on February 19, 1997 and May 20, 1997. On each date, multiple samples were taken in approximately 1 hour. For data assessment, an average was calculated for these samples on each day. The average of 8 samples was taken for February 19, and an average of 4 samples was calculated for May 20. None of the samples or averages were in exceedance. (SWRCB, 2004).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for pH is 6.5 (minimum) to 8.5 (maximum).
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at site PVC1B in Pine Valley Creek. Samples were also collected from 8 other sites along Pine Valley Creek.
Temporal Representation:	Samples were collected in the morning on February 19, 1997 and May 20, 1997.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33116, pH **Region 9**

Pine Valley Creek (Upper)

LOE ID:	3394
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total

Beneficial Use:	Municipal & Domestic Supply	039147
Number of Samples:	2	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data was collected at sample site NPC3D by the City of San Diego Water Dept. on March 13, 1997 and March 31, 1997. On each date, multiple samples were taken within 2 minutes. For data assessment, an average was calculated for these samples on each day. The average of 3 samples was taken for March 13, and an average of 4 samples was calculated for March 31. None of the samples or averages were in exceedance. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for pH is 6.5 (minimum) to 8.5 (maximum).	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at site NPC3D in Pine Valley Creek. Samples were also collected from 8 other sites along Pine Valley Creek.	
Temporal Representation:	Samples were collected around 10am on March 13, 1997 and March 31, 1997.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33116, pH **Region 9**

Pine Valley Creek (Upper)

LOE ID:	3393
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected at sample site NPC3C by the City of San Diego Water Dept. on January 1, 1997 and March 31, 1997. On each date, multiple samples were taken within 20 minutes. For data assessment, an average was calculated for these samples on each day. The average of 5 samples was taken for Jan. 1, and an average of 4 samples was calculated for March 31. None of the samples or averages were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for pH is 6.5 (minimum) to 8.5 (maximum).
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at site NPC3C in Pine Valley Creek. Samples were also collected

	from 8 other sites along Pine Valley Creek. 039148
Temporal Representation:	Samples were collected around 11am on January 1, 1997 and March 31, 1997.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33116, pH **Region 9**

Pine Valley Creek (Upper)

LOE ID:	75315
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for pH.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	In inland surface waters the pH shall not be depressed below 6.5 nor raised above 8.5.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Upper) was collected at 1 monitoring site [Pine Valley Creek below Noble Cyn. Cr. - 911S01818]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 33116, pH **Region 9**

Pine Valley Creek (Upper)

LOE ID:	3399
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected at sample site SPC2 by the City of San Diego Water Dept. on March 13, 1997 and March 31, 1997. On each date, multiple samples were taken within 5 minutes. For data assessment, an average was calculated for these samples on each day. The average of 2 samples was taken for March 13, and an average of 4 samples was calculated for

	March 31. None of the samples or averages were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for pH is 6.5 (minimum) to 8.5 (maximum).
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at site SPC2 in Pine Valley Creek. Samples were also collected from 8 other sites along Pine Valley Creek.
Temporal Representation:	Samples were collected around 10am on March 13, 1997 and March 31, 1997.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33116, pH **Region 9**

Pine Valley Creek (Upper)

LOE ID:	3398
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected at sample site NPC2 by the City of San Diego Water Dept. on March 13, 1997 and March 31, 1997. On each date, multiple samples were taken within 5 minutes. For data assessment, an average was calculated for these samples on each day. The average of 6 samples was taken for March 13, and an average of 3 samples was calculated for March 31. None of the samples or averages were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for pH is 6.5 (minimum) to 8.5 (maximum).
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at site NPC2 in Pine Valley Creek. Samples were also collected from 8 other sites along Pine Valley Creek.
Temporal Representation:	Samples were collected around noon and 1pm on March 13, 1997 and March 31, 1997.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33116, pH **Region 9**

Pine Valley Creek (Upper)

LOE ID:	3392	039150

Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected at sample site NPC3B by the City of San Diego Water Dept. on March 13 and March 31, 1997. Multiple samples were collected within 5 minutes. For data assessment, an average was calculated for these samples. None of the samples or averages were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for pH is 6.5 (minimum) to 8.5 (maximum).
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at site NPC3B in Pine Valley Creek. Samples were also collected from 8 other sites along Pine Valley Creek.
Temporal Representation:	Samples were collected between 10am and noon on March 13 and March 31, 1997.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33116, pH **Region 9**

Pine Valley Creek (Upper)

LOE ID:	3397
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data was collected at sample site PVC2 by the City of San Diego Water Dept. on March 19, 1997. Multiple samples were taken within 1 hour. For data assessment, an average was calculated for these samples. The average of 6 samples was taken for March 19. None of the samples or averages were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for pH is 6.5 (minimum) to 8.5 (maximum).
Objective/Criterion Reference:	Placeholder reference 2006 303(d)

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at site PVC2 in Pine Valley Creek. Samples were also collected from 8 other sites along Pine Valley Creek.
Temporal Representation: Samples were collected around 10am on March 19, 1997.
Environmental Conditions:
QAPP Information: Data used in 2002 assessment.
QAPP Information Reference(s):

DECISION ID 34185 Region 9
Pine Valley Creek (Upper)

Pollutant: **Indicator Bacteria**
Final Listing Decision: **Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Delist from 303(d) list (TMDL required list)(2012)
Revision Status Original
Reason for Delisting: Applicable WQS attained; reason for recovery unspecified
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for removal from the section 303(d) list under section 4.3 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Fourteen of samples exceeded the water quality objective for enterococcus.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for removing this water segment-pollutant combination from the section 303(d) list.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Fourteen of 87 samples exceeded the enterococcus water quality objective and this does not exceed the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34185, Indicator Bacteria Region 9
Pine Valley Creek (Upper)

LOE ID: 29790

Pollutant: Enterococcus
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Non-Contact Recreation

Number of Samples:	87
Number of Exceedances:	14
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Samples were collected by the City of San Diego from January 1998 through February 2008. Fourteen of 87 samples exceeded the freshwater water quality objective.
Data Reference:	Pine Valley Creek Monitoring Data, 1998 - 2008
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Freshwater enterococci maximum for infrequently used areas is 151 colonies per 100 ml.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at one station on Cottonwood Pine Valley Creek 0.25 miles upstream. Station ID is PVC1a
Temporal Representation:	Samples were collected January 1998 through February 2008.
Environmental Conditions:	
QAPP Information:	Samples were collected in accordance with the City of San Diego Water Quality Laboratory's quality assurance plan.
QAPP Information Reference(s):	Water Quality Laboratory. Quality Assurance Manual

Line of Evidence (LOE) for Decision ID 34185, Indicator Bacteria **Region 9**

Pine Valley Creek (Upper)

LOE ID:	4692
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Water Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	Unspecified
Guideline Reference:	Placeholder reference pre-2006 303(d)
Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Noble Canyon Creek
Water Body ID: CAR9114100020011025125948
Water Body Type: River & Stream

DECISION ID 43712 **Region 9**
Noble Canyon Creek

Pollutant: **Benthic Community Effects**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Original
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: Benthic Community Effects is being considered for placement on the section 303(d) list under sections 3.9 and 3.2 of the Listing Policy. Under section 3.9, an additional line of evidence associating the Benthic Community Effects with a water or sediment concentration of pollutants is necessary to assess listing status.

Two lines of evidence is available in the administrative record to assess this indicator. 4 of 5 samples exceeded the evaluation guidleine.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing Benthic Community Effects in this water segment on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. 4 of 5 samples exceeded the Index of Biological Integrity (IBI) value of "poor" water quality for this area and this sample size is insufficient to determine with the power and confidence of the Listing Policy if standards are not met. A minimum of 5 samples is needed for application of Table 3.2. ANd no indicator pollutants are available.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because it cannot be determined if applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 43712, Benthic Community Effects **Region 9**
Noble Canyon Creek

LOE ID: 74450

Pollutant: Benthic-Macroinvertebrate Bioassessments
LOE Subgroup: Population/Community Degradation
Matrix: Water
Fraction: None

Beneficial Use: Warm Freshwater Habitat

Number of Samples:	1	039154
Number of Exceedances:	1	
Data and Information Type:	Benthic macroinvertebrate surveys	
Data Used to Assess Water Quality:	The IBI score for this water body is 39 which indicates that this water body may be considered to have impaired conditions.	
Data Reference:	RWB9 Status Sampling 2007 and 2008	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.	
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13	
Spatial Representation:	Samples were collected at the following station: 911NCPCRx-Nobel Creek (NCPCR).	
Temporal Representation:	Surveys done June 5, 2007.	
Environmental Conditions:		
QAPP Information:	Data collected following SWAMP QA protocols for the RWB9 Status Sampling 2007 and 2008 water quality monitoring project.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43712, Benthic Community Effects **Region 9**

Noble Canyon Creek

LOE ID:	26546
Pollutant:	Benthic Community Effects
LOE Subgroup:	Adverse Biological Responses
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	3
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Four samples of IBI data were taken from May 2001 to 2007 at one sampling site. Of the total number of samples, three of the samples exceeded the IBI impairment threshold.
Data Reference:	Fish and Game IBI Data Southern California Postfire Study. Index of Biotic Integrity. 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI

score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)

Guideline Reference: A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13

Spatial Representation: Samples were collected at one site: 911NCPCRx on Noble Canyon Creek.
Temporal Representation: Sampling occurred during four events from May 2001 to 2007.
Environmental Conditions:
QAPP Information: Quality Control for collection and identification was conducted in accordance with the Quality Assurance Project Plan for the California Stream Bioassessment Procedure and the State of California, California Monitoring an Assessment Program: "CMAP", Quality Assurance Project Plan.
QAPP Information Reference(s): State of California, California Monitoring and Assessment Program: "CMAP". Quality Assurance Project Plan for the California Stream Bioassessment Procedure The San Diego Stream Team Quality Assurance Project Plan

DECISION ID 42799 Region 9
Noble Canyon Creek

Pollutant: **Oxygen, Dissolved**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Original
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 8 samples exceed the Basin Plan water quality objective for dissolved oxygen.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. Four samples were not used due to temporal representation, section 6.1.5.3.
3. None of the 8 samples exceed the Basin Plan water quality objective for dissolved oxygen and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 42799, Oxygen, Dissolved Region 9
Noble Canyon Creek

LOE ID: 3413

Pollutant:	Oxygen, Dissolved	039156
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	Dissolved	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	12	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 03/1997. Five samples were collected within 3 minutes on 3/13, 4 samples were collected within 3 minutes on 3/18 and 3 samples were collected within 1 minute on 3/31. Neither the average of the measured DO concentrations, nor each individual concentration was in exceedance. (SWRCB, 2003)	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: Dissolved oxygen levels shall not be less than 5.0 mg/l in inland surface waters with designated MAR or WARM beneficial uses or less than 6.0 mg/l in waters with designated COLD beneficial uses. The annual mean dissolved oxygen concentrations shall not be less than 7 mg/l more than 10% of the time.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Noble Canyon Creek station NOB2.	
Temporal Representation:	Samples were collected on 03/13/1997, 3/18/1997, and 3/31/1997.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID	33635	Region 9
Noble Canyon Creek		

Pollutant:	**Total Dissolved Solids**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 12 samples exceed the Basin Plan water quality objective for total dissolved solids.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.

3. None of the 12 samples exceed the Basin Plan water quality objective for total dissolved solids and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33635, Total Dissolved Solids **Region 9**

Noble Canyon Creek

LOE ID:	3415
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. For all 12 samples, neither the average of the samples, nor each individual sample was in exceedance.(SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for TDS is 500 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Noble Canyon Creek site NOB2.
Temporal Representation:	Samples were collected on 03/13/1997, 03/18/1997, and 3/31/1997.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **42682** **Region 9**

Noble Canyon Creek

Pollutant:	**pH**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the

current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 12 samples exceed the Basin Plan water quality objective for pH.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 12 samples exceed the Basin Plan water quality objective for pH and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 42682, pH **Region 9**

Noble Canyon Creek

LOE ID:	3414
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. For all 12 samples, neither the average of the samples, nor each of the actual samples was in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for pH is 6.5 (minimum) to 8.5 (maximum).
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Noble Canyon Creek at station NOB2.
Temporal Representation:	Samples were collected on 03/13/1997, on 3/18/1997, and 03/31/1997.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Kitchen Creek
Water Body ID: CAR9116000020011025105327
Water Body Type: River & Stream

DECISION ID 43839 **Region 9**
Kitchen Creek

Pollutant: **Benthic Community Effects**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: Benthic Community Effects is being considered for placement on the CWA section 303(d) List under sections 3.9 and 3.1 of the Listing Policy. Under section 3.9, an additional line of evidence associating Benthic Community Effects with a water or sediment concentration of pollutant(s) is necessary to assess listing status.

Based on the readily available data and information, the weight of evidence provides sufficient justification for not placing Benthic Community Effects in this water segment on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Pursuant to section 3.9 of the Listing Policy, the water does not exhibit significant degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index.
4. Pursuant to section 3.9 of the Listing Policy, the water segment does not have associated pollutant(s) samples that exceed water quality objectives.
5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not being met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. Furthermore, what data is available does not indicate that the benthic community exhibits degradation when compared to reference.

Line of Evidence (LOE) for Decision ID 43839, Benthic Community Effects **Region 9**
Kitchen Creek

LOE ID: 26407

Pollutant: Benthic Community Effects
LOE Subgroup: Adverse Biological Responses
Matrix: Water
Fraction: None

Beneficial Use: Warm Freshwater Habitat

Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Two samples of IBI data were taken on May 2001 at one sampling site. None of the samples exceeded the IBI impairment threshold.
Data Reference:	Fish and Game IBI Data
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at one site: 911KCKCRx on Kitchen Creek.
Temporal Representation:	Sampling occurred during two events on May 2001.
Environmental Conditions:	
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Project Plan for the California Stream Bioassessment Procedure and the State of California, California Monitoring an Assessment Program: "CMAP", Quality Assurance Project Plan.
QAPP Information Reference(s):	State of California, California Monitoring and Assessment Program: "CMAP". Quality Assurance Project Plan for the California Stream Bioassessment Procedure The San Diego Stream Team Quality Assurance Project Plan

Line of Evidence (LOE) for Decision ID 43839, Benthic Community Effects **Region 9**

Kitchen Creek

LOE ID:	79686
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Aquatic Life Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	One samples was taken at one station on Kitchen Creek. The CSCI score was above the 0.79 threshold, and therefore not exceeding the water quality objective for the aquatic life beneficial use.
Data Reference:	RWB9 Status Sampling 2007 and 2008 Region 9 CSCI Scores & Water Body Information

SWAMP Data:	SWAMP	039162
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.	
Guideline Reference:	The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.	
Spatial Representation:	Samples were collected at the following stations: 911TJKCT5	
Temporal Representation:	Surveys done in 2008	
Environmental Conditions:		
QAPP Information:	Data collected following SWAMP QA protocols for the RWB9 Status Sampling 2007 and 2008 water quality monitoring project.	
QAPP Information Reference(s):	RWB9 Status Sampling 2007 and 2008	

Line of Evidence (LOE) for Decision ID 43839, Benthic Community Effects **Region 9**

Kitchen Creek

LOE ID:	74040
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	The IBI score for this water body was over 40 which indicates that this water body is not considered to have impaired conditions.
Data Reference:	RWB9 Status Sampling 2007 and 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13

Spatial Representation:	Samples were collected at the following station: 911TJKTC5 (Kitchen Creek 5).
Temporal Representation:	Surveys done May 7, 2008.
Environmental Conditions:	
QAPP Information:	Data collected following SWAMP QA protocols for the RWB9 Status Sampling 2007 and 2008 water quality monitoring project.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43839, Benthic Community Effects **Region 9**

Kitchen Creek

LOE ID:	3423
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Subgroup Missing
Matrix:	-N/A
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Data were collected by the Stream Team in 1998. Taxa richness was 17 during both seasons. EPT taxa were 7 in Spring and 9 in Fall. EPT index was 57.8 in Spring and 65.9 in Fall. The tolerance value was 3.3 and 3.9. There appeared to be a good balance of all 5 types of feeding groups during both sampling periods. (Stream Team, 2001).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	
Objective/Criterion Reference:	
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Kitchen Creel site KTC2.
Temporal Representation:	Samples were collected in Spring and Fall of 1998.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43839, Benthic Community Effects **Region 9**

Kitchen Creek

LOE ID:	3422
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Subgroup Missing
Matrix:	-N/A
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	134
Number of Exceedances:	
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Data were collected by the City of San Diego. The data summary is as follows: Total

	Specimens: 134, EPT Index: 8, Total Ephemeroptera: 35, Total Plecoptera: 4, Total Tricoptera: 82, Total Diptera:13. (SDRWQCB, 2002m).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	
Objective/Criterion Reference:	
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Kitchen Creek. Exact location was not reported.
Temporal Representation:	Temporal representation was not reported. However, other data in the dataset is from 1997.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

DECISION ID 32527 Region 9

Kitchen Creek

Pollutant:	**Oxygen, Dissolved**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. None of the samples exceed the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 28 samples from two combined lines of evidence exceeded the dissolved oxygen Basin Plan water quality objective and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy. 3. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 32527, Oxygen, Dissolved Region 9

Kitchen Creek

LOE ID:	3416
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water

Matrix:	Water	039165
Fraction:	Dissolved	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	8	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 1997. None of the 8 samples were in exceedance of any of the above standards. (SWRCB, 2003).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a WARM beneficial use, the WQO for Dissolved Oxygen is a minimum of 5.0 mg/L. For COLD beneficial uses, the WQO is 6.0 mg/L and for all other beneficial uses, the WQO is 7.0 mg/L. For inland surface waters and all beneficial uses, the WQO of 7.0 mg/L is the annual mean concentration not to be less than this more than 10% of the time.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Kitchen Creek site KTC2.	
Temporal Representation:	Samples were collected on 03/12/1997 and 06/18/1997. In 03/1997, 3 samples were collected over a period of 6 minutes in the morning and in 06/1997, 5 samples were collected over a period of 3 minutes in the morning.	
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 32527, Oxygen, Dissolved **Region 9**

Kitchen Creek

LOE ID:	3417
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	21
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 1997 and 1998. None of the 21 samples were in exceedance. (SWRCB, 2003)
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a WARM beneficial use, the WQO for Dissolved Oxygen is a minimum of 5.0 mg/L. For COLD beneficial uses, the WQO is 6.0 mg/L and for all other beneficial uses, the WQO is 7.0 mg/L. For inland surface waters and all beneficial uses, the WQO of 7.0 mg/L is the annual mean concentration not to be less than this more than 10% of the time.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)

Evaluation Guideline:	039166
Guideline Reference:	
Spatial Representation:	Samples were collected at Kitchen Creek site KTC5.
Temporal Representation:	Samples were collected on 01/01/1997, 04/01/1997, 05/19/1997, 06/18/1997, and 01/29/1998. For all sampling days, 3-5 samples were collected over the course of 30 minutes or less in the morning, or early afternoon.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 43323 — Region 9
Kitchen Creek

Pollutant:	**pH**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for listing on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant.
Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of 29 samples from two combined lines of evidence exceeded the 6 - 8.5 pH Basin Plan water quality objective and this does not exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
3. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 43323, pH — Region 9
Kitchen Creek

LOE ID:	3419
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	21
Number of Exceedances:	5

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego in 1997 and 1998. Five of the 21 samples were in exceedance. Since all 5 exceedances occurred on one day, 05/19/1997, it is averaged as one exceedence.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for pH is 6.5 (minimum) to 8.5 (maximum).
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Kitchen Creek at site KTC5.
Temporal Representation:	Samples were collected on 01/01/1997, 04/01/1997, 05/19/1997, 06/18/1997, and 01/29/1998.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43323, pH **Region 9**

Kitchen Creek

LOE ID:	3418
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 1997. None of the 8 samples were in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for pH is 6.5 (minimum) to 8.5 (maximum).
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Kitchen Creek site KTC2.
Temporal Representation:	Samples were collected 3-5 times over a period of 6 minutes or less on 03/12/1997 and 06/18/1997.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 35501 **Region 9**

Pollutant:	**Total Dissolved Solids**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. One of the 24 samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of the 29 samples exceeded the 500 mg/L TDS Basin Plan water quality objective and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
3. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 35501, Total Dissolved Solids **Region 9**

Kitchen Creek

LOE ID:	3421
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	21
Number of Exceedances:	4
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 1997 and 1998. Four of the 21 samples were in exceedance. All 4 samples were collected on 01/29/1998. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all benficial uses, the WQO for TDS is 500 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)

Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Kitchen Creek site KTC5.
Temporal Representation:	Samples were collected on 01/01/1997, 04/01/1997, 05/19/1997, 06/18/1997, and 01/29/1998. Samples were collected 3-5 times over a 30 mintues period in the morning or early afternoon.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 35501, Total Dissolved Solids **Region 9**

Kitchen Creek

LOE ID:	3420
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept in 1997. None of the 8 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for TDS is 500 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Kitchen Creek site KTC2
Temporal Representation:	Samples were collected on 03/12/1997 and 06/18/1997. Three to five samples were collected on each day over a 6 minute period in the morning.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID **33469** **Region 9**

Kitchen Creek

Pollutant:	**Turbidity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. No samples exceeded the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 4. It cannot be determine if the data quality requirements of section 6.1.4 of the Policy are satisfied due to the absence of the information. 5. The data used does not satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. The one sample did not exceed the 5 NTU water quality objective and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy. 4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33469, Turbidity **Region 9**

Kitchen Creek

LOE ID:	3424
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 1997. None of 1 sample was in exceedance.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a municipal beneficial use, the WQO for Turbidity is 5 ntu. For other beneficial uses, the WQO for turbidity is 20 ntu.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Kitchen Creek at site KTC5.
Temporal Representation:	One sample was collected on 05/19/1997.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Cottonwood Creek (Tijuana River watershed)
Water Body ID: CAR9116000020020306143545
Water Body Type: River & Stream

DECISION ID 42288 **Region 9**
Cottonwood Creek (Tijuana River watershed)

Pollutant: Selenium
Final Listing Decision: Do Not Delist from 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Sources: Source Unknown
Expected TMDL Completion Date: 2019
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for removal from the CWA section 303(d) List under section 4.1 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess pollutant. Three of three samples exceeded the aquatic life objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Three of three samples exceeded the objective, and this exceeds the allowable frequency listed in Table 4.1 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 42288, Selenium **Region 9**
Cottonwood Creek (Tijuana River watershed)

LOE ID: 73411

Pollutant: Selenium
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Dissolved

Beneficial Use: Warm Freshwater Habitat

Number of Samples:	1	039172
Number of Exceedances:	1	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Selenium.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	The selenium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater is 0.005 mg/L (California Toxics Rule, 2000).	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek ~0.7mi below Hauser Cr. - 911S04086]	
Temporal Representation:	Data was collected on a single day 5/6/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 42288, Selenium **Region 9**

Cottonwood Creek (Tijuana River watershed)

LOE ID:	21199
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	2
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Two water samples were collected at Cottonwood Creek 10, station 911TCWD10 on June 2005, and April 2006.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	CTR Freshwater Chronic (CCC) 5 ug/L. (U.S. EPA, 2000).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Water samples were collected at Cottonwood Creek station 2, 911TCWD10.
Temporal Representation:	Samples were collected on June 2005, and April 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.

QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

039173

Line of Evidence (LOE) for Decision ID 42288, Selenium **Region 9**

Cottonwood Creek (Tijuana River watershed)

LOE ID:	73412
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Selenium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The Maximum Contaminant Level for selenium in the Basin Plan is 0.05 mg/L.
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals, CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek ~0.7mi below Hauser Cr. - 911S04086]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 47221 **Region 9**

Cottonwood Creek (Tijuana River watershed)

Pollutant:	**Alkalinity as CaCO3**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 one line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceeds the National Recommended Water Quality Criteria, 2009. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that: 039174
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the criteria, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47221, Alkalinity as CaCO3 **Region 9**

Cottonwood Creek (Tijuana River watershed)

LOE ID:	73351
Pollutant:	Alkalinity as CaCO3
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Alkalinity as CaCO3.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Alkalinity as CaCO3 criteria for the protection of freshwater aquatic life is 20000 ug/L (National Recommended Water Quality Criteria, 2009).
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek ~0.7mi below Hauser Cr. - 911S04086]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 47223 **Region 9**

Cottonwood Creek (Tijuana River watershed)

Pollutant:	**Aluminum**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**

Last Listing Cycle's Final Listing Decision:	New Decision	039175
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 one line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of one sample exceeded the criteria for aquatic life beneficial uses, and zero of one sample exceeded the objective for the MUN beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the criteria/objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47223, Aluminum **Region 9**

Cottonwood Creek (Tijuana River watershed)

LOE ID:	73354
Pollutant:	Aluminum
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Aluminum.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The National Recommended Water Quality Critiera for the protection of aquatic life from aluminum is the chronic continuous concentration (expressed as a 4-day average) of 87

ug/L. 039176

Guideline Reference: National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology

Spatial Representation: Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek ~0.7mi below Hauser Cr. - 911S04086]

Temporal Representation: Data was collected on a single day 5/6/2009.

Environmental Conditions: Staff is not aware of any special conditions that might affect interpretation of the data.

QAPP Information: The SWAMP QAPP (2008) was followed.

QAPP Information Reference(s): Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47223, Aluminum **Region 9**

Cottonwood Creek (Tijuana River watershed)

LOE ID: 73353

Pollutant: Aluminum

LOE Subgroup: Pollutant-Water

Matrix: Water

Fraction: Dissolved

Beneficial Use: Warm Freshwater Habitat

Number of Samples: 1

Number of Exceedances: 0

Data and Information Type: PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality: Water Board staff assessed SWAMP data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Aluminum.

Data Reference: RWB9 Stormwater Monitoring Council CY 2009

SWAMP Data: SWAMP

Water Quality Objective/Criterion: All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).

Objective/Criterion Reference: Water Quality Control Plan for the San Diego Basin

Evaluation Guideline: The National Recommended Water Quality Critiera for the protection of aquatic life from aluminum is the chronic continuous concentration (expressed as a 4-day average) of 87 ug/L.

Guideline Reference: National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology

Spatial Representation: Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek ~0.7mi below Hauser Cr. - 911S04086]

Temporal Representation: Data was collected on a single day 5/6/2009.

Environmental Conditions: Staff is not aware of any special conditions that might affect interpretation of the data.

QAPP Information: The SWAMP QAPP (2008) was followed.

QAPP Information Reference(s): Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47223, Aluminum **Region 9**

Cottonwood Creek (Tijuana River watershed)

LOE ID: 73352

Pollutant: Aluminum

LOE Subgroup: Pollutant-Water

Matrix: Water

Fraction: Total

Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Aluminum.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for aluminum is 0.2 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek ~0.7mi below Hauser Cr. - 911S04086]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 47224 Region 9

Cottonwood Creek (Tijuana River watershed)

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status; under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of one sample (sediment) exceeded the evaluation guideline and zero of two samples (water) exceeded the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample (sediment) and zero of two samples (water) exceeded the guideline/objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.

4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47224, Arsenic **Region 9**

Cottonwood Creek (Tijuana River watershed)

LOE ID:	73360
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for arsenic is 33 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek ~0.7mi below Hauser Cr. - 911S04086]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47224, Arsenic **Region 9**

Cottonwood Creek (Tijuana River watershed)

LOE ID:	73362
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat

Number of Samples:	2	039179
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Arsenic.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	The dissolved arsenic criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved arsenic is 0.150 mg/L (California Toxics Rule, 2000).	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek ~0.7mi below Hauser Cr. - 911S04086]	
Temporal Representation:	Data was collected on a single day 5/6/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID	43573	Region 9
Cottonwood Creek (Tijuana River watershed)		

Pollutant:	**Benthic Community Effects**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Benthic Community Effects is being considered for placement on the CWA section 303(d) List under sections 3.9 and 3.1 of the Listing Policy. Under section 3.9, an additional line of evidence associating Benthic Community Effects with a water or sediment concentration of pollutant(s) is necessary to assess listing status. Based on the readily available data and information, the weight of evidence provides sufficient justification for not placing Benthic Community Effects in this water segment on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Pursuant to section 3.9 of the Listing Policy, the water does not exhibit significant degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index. 4. Pursuant to section 3.9 of the Listing Policy, the water segment does have associated pollutant(s) samples that exceed water quality objectives. 5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not being met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the

applicable beneficial use support rating. Furthermore, what data is available does not indicate that the benthic community exhibits degradation when compared to reference.

Line of Evidence (LOE) for Decision ID 43573, Benthic Community Effects **Region 9**

Cottonwood Creek (Tijuana River watershed)

LOE ID:	26380
Pollutant:	Benthic Community Effects
LOE Subgroup:	Adverse Biological Responses
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	12
Number of Exceedances:	3
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Twelve samples of IBI data were taken from December 1999 to 2007 at two sampling sites. Of the total number of samples, two samples exceeded the IBI impairment threshold.
Data Reference:	Fish and Game IBI Data Southern California Postfire Study. Index of Biotic Integrity. 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as (SDRWQCB, 1995)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at two sites: 911CCH80x and 911MCCBML on Cottonwood Creek.
Temporal Representation:	Sampling occurred during nine events from December 1999 to 2007.
Environmental Conditions:	
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Project Plan for the California Stream Bioassessment Procedure and the State of California, California Monitoring an Assessment Program: "CMAP", Quality Assurance Project Plan.
QAPP Information Reference(s):	State of California, California Monitoring and Assessment Program: "CMAP". Quality Assurance Project Plan for the California Stream Bioassessment Procedure The San Diego Stream Team Quality Assurance Project Plan

Line of Evidence (LOE) for Decision ID 43573, Benthic Community Effects **Region 9**

Cottonwood Creek (Tijuana River watershed)

LOE ID:	26700
Pollutant:	Benthic Community Effects

LOE Subgroup:	Adverse Biological Responses	039181
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	3	
Number of Exceedances:	3	
Data and Information Type:	Benthic macroinvertebrate surveys	
Data Used to Assess Water Quality:	Three samples of IBI data were taken from May 2001 to May 2002 at one sampling site. All three samples exceeded the IBI impairment threshold.	
Data Reference:	Stream Bioassessment Data. Co-permitee Data. Collected 2002-2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)	
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13	
Spatial Representation:	Samples were collected at one site: CC-E on Cottonwood Creek.	
Temporal Representation:	Sampling occurred during three events from May 2001 to May 2002.	
Environmental Conditions:		
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Manual for Freshwater Bioassessment.	
QAPP Information Reference(s):	Quality Assurance Manual for Freshwater Bioassessment Revision 0	

Line of Evidence (LOE) for Decision ID 43573, Benthic Community Effects **Region 9**

Cottonwood Creek (Tijuana River watershed)

LOE ID:	79689
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	One sample was collected at one station on Cottonwood Creek (911HU). The CSCI score for this site is above the 0.79 threshold, and is therefore not exceeding the water quality objective for the aquatic life beneficial use.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009 Region 9 CSCI Scores & Water Body Information

SWAMP Data:	SWAMP	039182
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.	
Guideline Reference:	The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.	
Spatial Representation:	The sample station: 911S04086	
Temporal Representation:	The sample was collected 2009.	
Environmental Conditions:		
QAPP Information:	Samples were collected for the SWAMP RWB9 Stormwater Monitoring Council CY 2009 following SWAMP protocols and stored in the SWAMP database.	
QAPP Information Reference(s):	e-mail clarifying QAPP information RWB9 Stormwater Monitoring Council CY 2009	

Line of Evidence (LOE) for Decision ID 43573, Benthic Community Effects **Region 9**

Cottonwood Creek (Tijuana River watershed)

LOE ID:	73363
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	The one sample collected had an IBI score above 40. NPDES bioassessment
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the State or Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are

	converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions. The dataset uses the old 0-70 IBI scoring.
Guideline Reference:	
Spatial Representation:	The sample was collected at station REF-CWC, Cottonwood Creek.
Temporal Representation:	The sample was collected in May 2010.
Environmental Conditions:	
QAPP Information:	The data was collected under the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan, June 25, 2009.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 43573, Benthic Community Effects **Region 9**

Cottonwood Creek (Tijuana River watershed)

LOE ID:	21199
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	2
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Two water samples were collected at Cottonwood Creek 10, station 911TCWD10 on June 2005, and April 2006.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	CTR Freshwater Chronic (CCC) 5 ug/L. (U.S. EPA, 2000).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Water samples were collected at Cottonwood Creek station 2, 911TCWD10.
Temporal Representation:	Samples were collected on June 2005, and April 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

DECISION ID 47225 **Region 9**

Cottonwood Creek (Tijuana River watershed)

Pollutant:	**Bifenthrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or	Pollutant

Pollution: 039184

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one samples exceeded the guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47225, Bifenthrin **Region 9**

Cottonwood Creek (Tijuana River watershed)

LOE ID:	73365
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Bifenthrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Bifenthrin does not exceed 0.0006 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek ~0.7mi below Hauser Cr. - 911S04086]
Temporal Representation:	Data was collected on a single day 5/6/2009.

Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 47229 Region 9

Cottonwood Creek (Tijuana River watershed)

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status; under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Five lines of evidence are available in the administrative record to assess this pollutant. Zero of one sample (sediment) and zero of seven samples (water) exceeded the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample (sediment) and zero of seven samples (water) exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47229, Cadmium Region 9

Cottonwood Creek (Tijuana River watershed)

LOE ID:	73367
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for cadmium is 4.98 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek ~0.7mi below Hauser Cr. - 911S04086]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47229, Cadmium **Region 9**

Cottonwood Creek (Tijuana River watershed)

LOE ID:	73372
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek @ Old Highway 80 (Bridge Crossing)]
Temporal Representation:	Data was collected 5/28/2003 - 6/2/2009.

Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47229, Cadmium **Region 9**

Cottonwood Creek (Tijuana River watershed)

LOE ID:	73371
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for cadmium is 0.005 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals, CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek @ Old Highway 80 (Bridge Crossing)]
Temporal Representation:	Data was collected 5/28/2003 - 6/2/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47229, Cadmium **Region 9**

Cottonwood Creek (Tijuana River watershed)

LOE ID:	73370
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	039188
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Cadmium to protect aquatic life in freshwater. The dissolved Cadmium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek ~0.7mi below Hauser Cr. - 911S04086]	
Temporal Representation:	Data was collected on a single day 5/6/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 47229, Cadmium **Region 9**

Cottonwood Creek (Tijuana River watershed)

LOE ID:	73369
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for cadmium is 0.005 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek ~0.7mi below Hauser Cr. - 911S04086]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 47226 **Region 9**

Cottonwood Creek (Tijuana River watershed)

Pollutant:	**Chloride**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one sample exceeded the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the water quality objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47226, Chloride **Region 9**

Cottonwood Creek (Tijuana River watershed)

LOE ID:	73375
Pollutant:	Chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chloride.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP

Water Quality Objective/Criterion:	The recommended secondary maximum contamination level acceptable to consumers of drinking water is 250 mg/L.
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek ~0.7mi below Hauser Cr. - 911S04086]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47226, Chloride **Region 9**

Cottonwood Creek (Tijuana River watershed)

LOE ID:	73376
Pollutant:	Chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chloride.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Chloride objective for the protection of aquatic life according to Table 3-2 for Cottonwood Creek (Tijuana River watershed) within the Tijuana Hydrologic Unit is 250 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek ~0.7mi below Hauser Cr. - 911S04086]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 47230 **Region 9**

Cottonwood Creek (Tijuana River watershed)

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final	New Decision

Listing Decision:		039191
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the four samples exceeded the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of four samples exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to [SECTION 3.11/4.11] of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47230, Chlorpyrifos **Region 9**

Cottonwood Creek (Tijuana River watershed)

LOE ID:	73377
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho

	Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response, Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek @ Old Highway 80 (Bridge Crossing)]
Temporal Representation:	Data was collected over the time period 5/2/2006-6/2/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47230, Chlorpyrifos **Region 9**

Cottonwood Creek (Tijuana River watershed)

LOE ID:	78011
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for chlorpyrifos is 2.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek @ Old Highway 80 (Bridge Crossing)]
Temporal Representation:	Data was collected over the time period 5/2/2006-6/2/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 47255 **Region 9**

Cottonwood Creek (Tijuana River watershed)

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final	New Decision

Listing Decision:		039193
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status; under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Three lines of evidence are available in the administrative record to assess this pollutant. Zero of one sample (sediment) and zero of one sample (water) exceeded the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample (sediment) and zero of one sample (water) exceeded the criteria, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47255, Chromium **Region 9**

Cottonwood Creek (Tijuana River watershed)

LOE ID:	73381
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for total chromium is 0.05 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	

Guideline Reference:	039194
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek ~0.7mi below Hauser Cr. - 911S04086]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47255, Chromium **Region 9**

Cottonwood Creek (Tijuana River watershed)

LOE ID:	73379
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for chromium is 111 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek ~0.7mi below Hauser Cr. - 911S04086]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47255, Chromium **Region 9**

Cottonwood Creek (Tijuana River watershed)

LOE ID:	73382
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat

Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium. Since the chromium species was not identified, the data point(s) were assessed using both the Chromium III criteria which is hardness-dependent, and the criterion continuous concentration (4-day average) to protect aquatic life in freshwater for chromium VI which is 11 ug/L and is not hardness dependent.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved chromium to protect aquatic life in freshwater. The dissolved Chromium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek ~0.7mi below Hauser Cr. - 911S04086]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 47256 Region 9

Cottonwood Creek (Tijuana River watershed)

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary, and under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Five lines of evidence are available in the administrative record to assess this pollutant. Zero of one sample (sediment) and zero of seven samples (water) exceeded the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3.Zero of one sample (sediment) and zero of seven samples (water) exceeded the criteria, and this

sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47256, Copper **Region 9**
Cottonwood Creek (Tijuana River watershed)

LOE ID:	73387
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved copper to protect aquatic life in freshwater. The dissolved copper criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek ~0.7mi below Hauser Cr. - 911S04086]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47256, Copper **Region 9**
Cottonwood Creek (Tijuana River watershed)

LOE ID:	73386
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total

Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for copper is 1.0 mg/L (Title 22 California Code of Regulations).
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek ~0.7mi below Hauser Cr. - 911S04086]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47256, Copper **Region 9**

Cottonwood Creek (Tijuana River watershed)

LOE ID:	73384
Pollutant:	Copper
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for copper is 149 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected

	at 1 monitoring site [Cottonwood Creek ~0.7mi below Hauser Cr. - 911S0438 43863]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47256, Copper **Region 9**

Cottonwood Creek (Tijuana River watershed)

LOE ID:	73388
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for copper is 1.0 mg/L (Title 22 California Code of Regulations).
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek @ Old Highway 80 (Bridge Crossing)]
Temporal Representation:	Data was collected 5/28/2003 - 6/2/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47256, Copper **Region 9**

Cottonwood Creek (Tijuana River watershed)

LOE ID:	73389
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING 039199
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek @ Old Highway 80 (Bridge Crossing)]
Temporal Representation:	Data was collected 5/28/2003 - 6/2/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 47257 Region 9

Cottonwood Creek (Tijuana River watershed)

Pollutant:	**Cyfluthrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceeded the guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeded the guideline, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the

applicable beneficial use support rating. 039200

Line of Evidence (LOE) for Decision ID 47257, Cyfluthrin **Region 9**

Cottonwood Creek (Tijuana River watershed)

LOE ID:	73391
Pollutant:	Cyfluthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cyfluthrin, total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of lambda-cyhalothrin does not exceed 0.0005 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Mixtures of lambda-cyhalothrin and other pyrethroids should be considered in an additive manner. (Fojut et al. 2012)Â
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek ~0.7mi below Hauser Cr. - 911S04086]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 47258 **Region 9**

Cottonwood Creek (Tijuana River watershed)

Pollutant:	**Cyhalothrin, Lambda**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the one

sample exceeded the criteria. 039201

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the criteria, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47258, Cyhalothrin, Lambda **Region 9**

Cottonwood Creek (Tijuana River watershed)

LOE ID:	73393
Pollutant:	Cyhalothrin, Lambda
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cyhalothrin, lambda, total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Cyhalothrin, lambda, total does not exceed 0.0005 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek ~0.7mi below Hauser Cr. - 911S04086]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **47259** 039202 **Region 9**

Cottonwood Creek (Tijuana River watershed)

Pollutant:	**Cypermethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeded the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeded the criteria, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47259, Cypermethrin **Region 9**

Cottonwood Creek (Tijuana River watershed)

LOE ID:	73304
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	One of one sample result was not used in the assessment because the laboratory data was non-detect and the method detection limit was above the guideline and therefore the results could not be quantified with the level of certainty required by the Listing Policy
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic

	life (Water Quality Control Plan for the San Diego Basin).	039203
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of cypermethrin does not exceed 0.0002 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Fojut et al. 2012)	
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.	
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek ~0.7mi below Hauser Cr. - 911S04086]	
Temporal Representation:	Data was collected on a single day 5/6/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID 47260 Region 9

Cottonwood Creek (Tijuana River watershed)

Pollutant:	**Deltamethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeded the guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeded the guideline, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47260, Deltamethrin Region 9

Cottonwood Creek (Tijuana River watershed)

LOE ID:	73306
Pollutant:	Deltamethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	Total	039204
Beneficial Use:	Cold Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Deltamethrin.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The evaluation guideline for Deltamethrin is the maximum acceptable toxicant concentration (MATC) of 0.02 ug/L.	
Guideline Reference:	OPP Pesticide Ecotoxicity Database.	
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek ~0.7mi below Hauser Cr. - 911S04086]	
Temporal Representation:	Data was collected on a single day 5/6/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID 47261 Region 9

Cottonwood Creek (Tijuana River watershed)

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the four samples exceed the guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of four samples exceeded the guideline, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47261, Diazinon **Region 9**

Cottonwood Creek (Tijuana River watershed)

LOE ID:	78009
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for diazinon is 1.4 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek @ Old Highway 80 (Bridge Crossing)]
Temporal Representation:	Data was collected over the time period 5/2/2006-6/2/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47261, Diazinon **Region 9**

Cottonwood Creek (Tijuana River watershed)

LOE ID:	73307
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek @ Old Highway 80 (Bridge Crossing)]
Temporal Representation:	Data was collected over the time period 5/2/2006-6/2/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 47262 Region 9

Cottonwood Creek (Tijuana River watershed)

Pollutant:	**Esfenvalerate/Fenvalerate**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceeded the guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the guideline, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 47262, Esfenvalerate/Fenvalerate **Region 9**

Cottonwood Creek (Tijuana River watershed)

LOE ID:	73313
Pollutant:	Esfenvalerate/Fenvalerate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Esfenvalerate/Fenvalerate, total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to the USEPA Office of Pesticide Programs Ecotoxicity database, the aquatic life EC50 for Esfenvalerate/Fenvalerate is 0.9 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek ~0.7mi below Hauser Cr. - 911S04086]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 47263 **Region 9**

Cottonwood Creek (Tijuana River watershed)

Pollutant:	**Fenpropathrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceeded the guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section

303(d) List. 039208

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the guideline, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47263, Fenpropathrin **Region 9**

Cottonwood Creek (Tijuana River watershed)

LOE ID:	73315
Pollutant:	Fenpropathrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Fenpropathrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for Fenpropathrin is the median lethal concentration (LC50; 2.2 ug/L).
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek ~0.7mi below Hauser Cr. - 911S04086]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 47265 **Region 9**

Cottonwood Creek (Tijuana River watershed)

Pollutant: **Iron**

Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	039209
Last Listing Cycle's Final Listing Decision:	New Decision	
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one sample exceeded the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47265, Iron **Region 9**

Cottonwood Creek (Tijuana River watershed)

LOE ID:	73323
Pollutant:	Iron
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Iron.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for iron is 0.3 mg/L (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek ~0.7mi below Hauser Cr. - 911S04086]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47265, Iron **Region 9**

Cottonwood Creek (Tijuana River watershed)

LOE ID:	73324
Pollutant:	Iron
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Iron.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Iron objective for the protection of aquatic life according to Table 3-2 for Cottonwood Creek (Tijuana River watershed) within the Tijuana Hydrologic Unit is 0.3 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek ~0.7mi below Hauser Cr. - 911S04086]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 47290 **Region 9**

Cottonwood Creek (Tijuana River watershed)

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status; under section 3.6 at least two lines of evidence are necessary to assess listing status for

pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Four lines of evidence are available in the administrative record to assess this pollutant. Zero of one sample (sediment) and zero of seven samples (water) exceeded the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample (sediment) and zero of seven samples (water) exceeded the water quality objective/guideline, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47290, Lead **Region 9**

Cottonwood Creek (Tijuana River watershed)

LOE ID:	73333
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved lead to protect aquatic life in freshwater. The dissolved lead criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek ~0.7mi below Hauser Cr. - 911S04086]
Temporal Representation:	Data was collected on a single day 5/6/2009.

Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47290, Lead **Region 9**

Cottonwood Creek (Tijuana River watershed)

LOE ID:	73326
Pollutant:	Lead
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for lead is 128 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek ~0.7mi below Hauser Cr. - 911S04086]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47290, Lead **Region 9**

Cottonwood Creek (Tijuana River watershed)

LOE ID:	73334
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Cottonwood Creek (Tijuana

	River watershed) to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek @ Old Highway 80 (Bridge Crossing)]
Temporal Representation:	Data was collected 5/28/2003 - 6/2/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47290, Lead **Region 9**

Cottonwood Creek (Tijuana River watershed)

LOE ID:	73335
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for Lead is 0.015 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek @ Old Highway 80 (Bridge Crossing)]
Temporal Representation:	Data was collected 5/28/2003 - 6/2/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix

QAPP Information Reference(s):	Analytical and Dry Weather Monitoring Program Rev. 8 was followed. 039214 Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 47291 Region 9

Cottonwood Creek (Tijuana River watershed)

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the four samples exceed the criteria/guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the four samples exceed the criteria/guideline, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47291, Malathion Region 9

Cottonwood Creek (Tijuana River watershed)

LOE ID:	73341
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Malathion.

Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek @ Old Highway 80 (Bridge Crossing)]
Temporal Representation:	Data was collected over the time period 5/2/2006-6/2/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47291, Malathion **Region 9**

Cottonwood Creek (Tijuana River watershed)

LOE ID:	78010
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Malathion.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for malathion is 100 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek @ Old Highway 80 (Bridge Crossing)]
Temporal Representation:	Data was collected over the time period 5/2/2006-6/2/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix

DECISION ID 47292 Region 9

Cottonwood Creek (Tijuana River watershed)

Pollutant:	**Manganese**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one sample exceed the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeded the water quality objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47292, Manganese Region 9

Cottonwood Creek (Tijuana River watershed)

LOE ID:	73342
Pollutant:	Manganese
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Manganese.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009

SWAMP Data:	SWAMP	039217
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Manganese objective for the protection of aquatic life according to Table 3-2 for Cottonwood Creek (Tijuana River watershed) within the Tijuana Hydrologic Unit is 0.05 mg/L.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek ~0.7mi below Hauser Cr. - 911S04086]	
Temporal Representation:	Data was collected on a single day 5/6/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 47292, Manganese **Region 9**

Cottonwood Creek (Tijuana River watershed)

LOE ID:	73343
Pollutant:	Manganese
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Manganese.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for manganese is 0.05 mg/L (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek ~0.7mi below Hauser Cr. - 911S04086]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 49006 **Region 9**

Cottonwood Creek (Tijuana River watershed)

Pollutant:	**Nitrate/Nitrite (Nitrite + Nitrate as N)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**

Last Listing Cycle's Final Listing Decision:	New Decision	039218
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of 2 samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 2 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49006, Nitrate/Nitrite (Nitrite + Nitrate as N) **Region 9**

Cottonwood Creek (Tijuana River watershed)

LOE ID:	73398
Pollutant:	Nitrate/Nitrite (Nitrite + Nitrate as N)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nitrate/Nitrite as N.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrate + nitrite (as N) is 10.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek @ Old Highway 80 (Bridge Crossing)]
Temporal Representation:	Data was collected on a single day 7/1/2004.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 49006, Nitrate/Nitrite (Nitrite + Nitrate as N) Region 9

Cottonwood Creek (Tijuana River watershed)

LOE ID:	73397
Pollutant:	Nitrate/Nitrite (Nitrite + Nitrate as N)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nitrate/Nitrite as N.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrate + nitrite (as N) is 10.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek ~0.7mi below Hauser Cr. - 911S04086]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 49008 Region 9

Cottonwood Creek (Tijuana River watershed)

Pollutant:	**Nitrogen, Nitrite**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of 3 samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 3 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49008, Nitrogen, Nitrite **Region 9**

Cottonwood Creek (Tijuana River watershed)

LOE ID:	73399
Pollutant:	Nitrogen, Nitrite
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nitrite as N.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrite (as N) is 1.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek ~0.7mi below Hauser Cr. - 911S04086]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 49008, Nitrogen, Nitrite **Region 9**

Cottonwood Creek (Tijuana River watershed)

LOE ID:	73400
Pollutant:	Nitrogen, Nitrite
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Nitrite as N.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrite (as N) is 1.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek @ Old Highway 80 (Bridge Crossing)]
Temporal Representation:	Data was collected over the time period 5/28/2003-7/1/2004.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 47294 Region 9

Cottonwood Creek (Tijuana River watershed)

Pollutant:	**Nitrogen, ammonia (Total Ammonia)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. Zero of the four samples exceed the guideline/criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.

2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.939222
3. Zero of four samples exceed the guideline/criteria, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47294, Nitrogen, ammonia (Total Ammonia) Region 9
Cottonwood Creek (Tijuana River watershed)

LOE ID:	73356
Pollutant:	Nitrogen, ammonia (Total Ammonia)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Ammonia as N, Total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Aquatic Life Ambient Water Quality Criteria for Ammonia â€“ Freshwater (USEPA 2013): the 30-day rolling average concentration (criterion continuous concentration or CCC) of total ammonia nitrogen(in mg TAN/L) in freshwater are not to be exceeded more than once every three years on average. The CCC values are based on pH and temperature. The CCC formula is found on page 46 and the table of CCC values is on page 49.
Guideline Reference:	Aquatic Life Ambient Water Quality Criteria for Ammonia - Freshwater 2013
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek ~0.7mi below Hauser Cr. - 911S04086]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47294, Nitrogen, ammonia (Total Ammonia) Region 9
Cottonwood Creek (Tijuana River watershed)

LOE ID:	73357
Pollutant:	Nitrogen, ammonia (Total Ammonia)

LOE Subgroup:	Pollutant-Water	039223
Matrix:	Water	
Fraction:	Total	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Ammonia As N, Total.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Basin Plan: No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses (Water Quality Control Plan for the San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	EPA's Lifetime Health advisory level for total ammonia is 30.0 mg/L as stated on page 8 of the 2006 edition of the drinking water standards and health advisories. This Advisory Level is defined as "the concentration of a chemical in drinking water that is not expected to cause any adverse noncarcinogenic effects for up to ten days of exposure."	
Guideline Reference:	2006 edition of the drinking water standards and health advisories, EPA 822-R-03-013	
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek ~0.7mi below Hauser Cr. - 911S04086]	
Temporal Representation:	Data was collected on a single day 5/6/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 47294, Nitrogen, ammonia (Total Ammonia) Region 9

Cottonwood Creek (Tijuana River watershed)

LOE ID:	73358
Pollutant:	Nitrogen, ammonia (Total Ammonia)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Ammonia As N, Total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Basin Plan: No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).

Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	039224
Evaluation Guideline:	EPA's Lifetime Health advisory level for total ammonia is 30.0 mg/L as stated on page 8 of the 2006 edition of the drinking water standards and health advisories. This Advisory Level is defined as "the concentration of a chemical in drinking water that is not expected to cause any adverse noncarcinogenic effects for up to ten days of exposure."	
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013	
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek @ Old Highway 80 (Bridge Crossing)]	
Temporal Representation:	Data was collected over the time period 5/28/2003-7/9/2004.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID 47295 Region 9

Cottonwood Creek (Tijuana River watershed)

Pollutant:	**Oxygen, Dissolved**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. One of one sample exceeds the objective for the COLD beneficial use, and zero of one sample exceeds the objective for the WARM beneficial use. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of one sample exceeds the objective for COLD and zero of one sample exceeds the objective for WARM, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47295, Oxygen, Dissolved Region 9

Cottonwood Creek (Tijuana River watershed)

LOE ID: 73402

Pollutant:	Oxygen, Dissolved	039225
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	Dissolved	
Beneficial Use:	Cold Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	1	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Oxygen, Dissolved.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan, San Diego Basin, Cold Water Habitat Objective, Chapter III, General Objectives for all Inland Surface Waters, Enclosed Bays and Estuaries states the following: The dissolved oxygen concentration for cold water habitats shall not be reduced below 8.0 mg/l at any time.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek ~0.7mi below Hauser Cr. - 911S04086]	
Temporal Representation:	Data was collected on a single day 5/6/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 47295, Oxygen, Dissolved **Region 9**

Cottonwood Creek (Tijuana River watershed)

LOE ID:	73401
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Oxygen, Dissolved.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan, San Diego Basin, Warm Water Habitat Objective, Chapter III, General Objectives for all Inland Surface Waters, Enclosed Bays and Estuaries states the following: The dissolved oxygen concentration for warm water habitats shall not be reduced below 5.0 mg/l at any time.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:
Guideline Reference:

Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek ~0.7mi below Hauser Cr. - 911S04086]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 47296 Region 9

Cottonwood Creek (Tijuana River watershed)

Pollutant:	**Permethrin, total**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeds the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeds the criteria, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47296, Permethrin, total Region 9

Cottonwood Creek (Tijuana River watershed)

LOE ID:	73404
Pollutant:	Permethrin, total
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1

Number of Exceedances:	0	039227
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Permethrin.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Permethrin does not exceed 0.002 ug/L.	
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.	
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek ~0.7mi below Hauser Cr. - 911S04086]	
Temporal Representation:	Data was collected on a single day 5/6/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID 47298 Region 9

Cottonwood Creek (Tijuana River watershed)

Pollutant:	**Silver**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one sample exceeds the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeded the objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47298, Silver Cottonwood Creek (Tijuana River watershed) **Region 9**

LOE ID:	73414
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Silver.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for silver is 0.1 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek ~0.7mi below Hauser Cr. - 911S04086]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47298, Silver Cottonwood Creek (Tijuana River watershed) **Region 9**

LOE ID:	73416
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Silver.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009

SWAMP Data:	SWAMP	039229
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Silver to protect aquatic life in freshwater. The dissolved Silver criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek ~0.7mi below Hauser Cr. - 911S04086]	
Temporal Representation:	Data was collected on a single day 5/6/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID 47299 Region 9

Cottonwood Creek (Tijuana River watershed)

Pollutant:	**Specific Conductivity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence are necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. One of the one samples exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of one samples exceeded the objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47299, Specific Conductivity Region 9

Cottonwood Creek (Tijuana River watershed)

LOE ID: 73421

Pollutant:	Specific Conductivity	039230
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	1	
Number of Exceedances:	1	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Conductivity(Us).	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan for the San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The California Secondary MCL for specific conductance is 900 uS/cm (Title 22 California Code of Regulations).	
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.	
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek ~0.7mi below Hauser Cr. - 911S04086]	
Temporal Representation:	Data was collected on a single day 5/6/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID 47300 Region 9

Cottonwood Creek (Tijuana River watershed)

Pollutant:	**Sulfates**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one sample exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available

indicating that standards are not met. 039231

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47300, Sulfates **Region 9**

Cottonwood Creek (Tijuana River watershed)

LOE ID:	73422
Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Sulfate.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for sulfate is 250 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek ~0.7mi below Hauser Cr. - 911S04086]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47300, Sulfates **Region 9**

Cottonwood Creek (Tijuana River watershed)

LOE ID:	73424
Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	039232
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Sulfate.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Sulfate objective for the protection of aquatic life according to Table 3-2 for Cottonwood Creek (Tijuana River watershed) within the Tijuana Hydrologic Unit is 250 mg/L.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek ~0.7mi below Hauser Cr. - 911S04086]	
Temporal Representation:	Data was collected on a single day 5/6/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID 47301 Region 9

Cottonwood Creek (Tijuana River watershed)

Pollutant:	**Temperature, water**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceeds the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47301, Temperature, water Region 9

Cottonwood Creek (Tijuana River watershed) 039233

LOE ID:	73425
Pollutant:	Temperature, water
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Water Temperature.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Board that such alteration in temperature does not adversely affect beneficial uses. At no time or place shall the temperature of any COLD water be increased more than 5Â°F above the natural receiving water temperature.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Inland Fishes of California (Moyle 1976) states that for rainbow trout the optimum range for growth and completion of most life stages is 13-21 degrees C (page 129).
Guideline Reference:	Inland Fishes of California
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek ~0.7mi below Hauser Cr. - 911S04086]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **47302** **Region 9**

Cottonwood Creek (Tijuana River watershed)

Pollutant:	**Total Dissolved Solids**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. One of the one sample exceeds the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that: 039234
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of one sample exceeded the objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47302, Total Dissolved Solids **Region 9**
Cottonwood Creek (Tijuana River watershed)

LOE ID:	73432
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Dissolved Solids.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for Dissolved Solids is 500 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek ~0.7mi below Hauser Cr. - 911S04086]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47302, Total Dissolved Solids **Region 9**
Cottonwood Creek (Tijuana River watershed)

LOE ID:	73434
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	Dissolved	039235
Beneficial Use:	Cold Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	1	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Dissolved Solids.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Dissolved Solids objective for the protection of aquatic life according to Table 3-2 for Cottonwood Creek (Tijuana River watershed) within the Tijuana Hydrologic Unit is 500 mg/L.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek ~0.7mi below Hauser Cr. - 911S04086]	
Temporal Representation:	Data was collected on a single day 5/6/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID 47304 Region 9

Cottonwood Creek (Tijuana River watershed)

Pollutant:	**Toxicity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceeds the guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the guideline, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47304, Toxicity **Region 9**

Cottonwood Creek (Tijuana River watershed)

LOE ID:	73435
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate water toxicity. The sample did not exhibit significant toxicity. The toxicity test included survival and reproduction of Ceriodaphnia dubia. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL, Significant compared to negative control based on statistical test, less than stated alpha level, AND less than the evaluation threshold (both criteria are met).
Guideline Reference:	
Spatial Representation:	The sample was collected at station 911S04086.
Temporal Representation:	The sample was collected in May 2009.
Environmental Conditions:	
QAPP Information:	Data quality is good. Data results were recorded in the SWAMP database and followed SWAMP protocols.
QAPP Information Reference(s):	

DECISION ID 47309 **Region 9**

Cottonwood Creek (Tijuana River watershed)

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status; under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Five lines of evidence are available in the administrative record to assess this pollutant. Zero of one sample (sediment) and zero of seven samples (water) exceeded the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample (sediment) and zero of seven samples (water) exceeded the water quality objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47309, Zinc **Region 9**

Cottonwood Creek (Tijuana River watershed)

LOE ID:	73445
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for zinc is 5.0 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected

	at 1 monitoring site [Cottonwood Creek @ Old Highway 80 (Bridge Crossing)]
Temporal Representation:	Data was collected 5/28/2003 - 6/2/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47309, Zinc **Region 9**

Cottonwood Creek (Tijuana River watershed)

LOE ID:	73444
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	The California Secondary MCL for zinc is 5.0 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek ~0.7mi below Hauser Cr. - 911S04086]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47309, Zinc **Region 9**

Cottonwood Creek (Tijuana River watershed)

LOE ID:	73443
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for zinc is 459 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek ~0.7mi below Hauser Cr. - 911S04086]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47309, Zinc **Region 9**

Cottonwood Creek (Tijuana River watershed)

LOE ID:	73448
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek @ Old Highway 80 (Bridge Crossing)]
Temporal Representation:	Data was collected 5/28/2003 - 6/2/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.

QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev.012, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47309, Zinc **Region 9**

Cottonwood Creek (Tijuana River watershed)

LOE ID:	73447
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Zinc to protect aquatic life in freshwater. The dissolved Zinc criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek ~0.7mi below Hauser Cr. - 911S04086]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 47297 **Region 9**

Cottonwood Creek (Tijuana River watershed)

Pollutant:	**pH**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of one

sample exceeds the objective. 039241

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeds the objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47297, pH **Region 9**

Cottonwood Creek (Tijuana River watershed)

LOE ID:	73406
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for pH.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	In inland surface waters the pH shall not be depressed below 6.5 nor raised above 8.5.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek ~0.7mi below Hauser Cr. - 911S04086]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 49002 **Region 9**

Cottonwood Creek (Tijuana River watershed)

Pollutant:	**Indicator Bacteria**	039242
Final Listing Decision:	**List on 303(d) list (TMDL required list)**	
Last Listing Cycle's Final Listing Decision:	New Decision	
Revision Status	Revised	
Sources:	Source Unknown	
Expected TMDL Completion Date:	2029	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. Five of eight single samples exceed the water quality objective for enterococcus of 61/100ml for the protection of REC-1.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Five of eight single samples exceed the water quality objective for enterococcus of 61/100ml for the protection of REC-1 and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 49002, Indicator Bacteria **Region 9**

Cottonwood Creek (Tijuana River watershed)

LOE ID:	73311
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	8
Number of Exceedances:	5
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 5 of 8 samples exceed the criterion for Enterococci.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Samples shall not exceed 61 organisms per 100 ml for enterococcus in waters designated for REC I beneficial use (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek @ Old Highway 80 (Bridge Crossing)]
Temporal Representation:	Data was collected over the time period 5/28/2003-6/2/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 49002, Indicator Bacteria **Region 9**

Cottonwood Creek (Tijuana River watershed)

LOE ID:	73426
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	8
Number of Exceedances:	1
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 1 of 8 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxicsubstances in concentrations which are toxic to,or which produce detrimental physiologicalresponses in human, plant, animal, or indigenousaquatic life (Basin Plan).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In waters designated for water contact recreation (REC I), the total coliform concentration shall not exceed 10000 MPN/100 ml (CDPH 2006).
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek @ Old Highway 80 (Bridge Crossing)]
Temporal Representation:	Data was collected over the time period 5/28/2003-6/2/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 49002, Indicator Bacteria **Region 9**

Cottonwood Creek (Tijuana River watershed)

LOE ID:	73314

Pollutant:	Fecal Coliform	039244
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	8	
Number of Exceedances:	3	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 3 of 8 samples exceed the criterion for Coliform, Fecal.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the fecal coliform concentration shall not exceed 400 MPN/100 ml.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek @ Old Highway 80 (Bridge Crossing)]	
Temporal Representation:	Data was collected over the time period 5/28/2003-6/2/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID **47293** **Region 9**

Cottonwood Creek (Tijuana River watershed)

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status; under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Three lines of evidence are available in the administrative record to assess this pollutant. Zero of one sample (sediment) and zero of one sample (water) exceeded the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.

2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 939245
3. Zero of one sample (sediment) and zero of one sample (water) exceeded the water quality objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47293, Nickel **Region 9**
Cottonwood Creek (Tijuana River watershed)

LOE ID:	73395
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nickel is 0.1 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek ~0.7mi below Hauser Cr. - 911S04086]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47293, Nickel **Region 9**
Cottonwood Creek (Tijuana River watershed)

LOE ID:	73396
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved

Beneficial Use:	Cold Freshwater Habitat	039246
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Nickel to protect aquatic life in freshwater. The dissolved Nickel criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek ~0.7mi below Hauser Cr. - 911S04086]	
Temporal Representation:	Data was collected on a single day 5/6/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 47293, Nickel **Region 9**

Cottonwood Creek (Tijuana River watershed)

LOE ID:	73346
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for nickel is 48.6 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31

Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek ~0.7mi below Hauser Cr. - 911S04086]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 47307 Region 9

Cottonwood Creek (Tijuana River watershed)

Pollutant:	**Turbidity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceeds the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47307, Turbidity Region 9

Cottonwood Creek (Tijuana River watershed)

LOE ID:	73441
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cottonwood Creek (Tijuana River watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Turbidity(NTU).
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Turbidity(NTU) objective for the protection of aquatic life according to Table 3-2 for Cottonwood Creek (Tijuana River watershed) within the Tijuana Hydrologic Unit is 20 NTU.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Cottonwood Creek (Tijuana River watershed) was collected at 1 monitoring site [Cottonwood Creek ~0.7mi below Hauser Cr. - 911S04086]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Troy Canyon (to 0.3 mile upstream from confluence w Long Canyon)
Water Body ID: CAR9116000020041108124851
Water Body Type: River & Stream

DECISION ID 44682 **Region 9**

Troy Canyon (to 0.3 mile upstream from confluence w Long Canyon)

Pollutant: **Benthic Community Effects**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: Benthic Community Effects is being considered for placement on the CWA section 303(d) List under sections 3.9 and 3.1 of the Listing Policy. Under section 3.9, an additional line of evidence associating Benthic Community Effects with a water or sediment concentration of pollutant(s) is necessary to assess listing status.

Based on the readily available data and information, the weight of evidence provides sufficient justification for not placing Benthic Community Effects in this water segment on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Pursuant to section 3.9 of the Listing Policy, the water does not exhibit significant degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index.
4. Pursuant to section 3.9 of the Listing Policy, the water segment does not have associated pollutant(s) samples that exceed water quality objectives.
5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not being met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. Furthermore, what data is available does not indicate that the benthic community exhibits degradation when compared to reference.

Line of Evidence (LOE) for Decision ID 44682, Benthic Community Effects **Region 9**

Troy Canyon (to 0.3 mile upstream from confluence w Long Canyon)

LOE ID: 76827

Pollutant: Benthic-Macroinvertebrate Bioassessments
LOE Subgroup: Population/Community Degradation
Matrix: Water
Fraction: None

Beneficial Use: Cold Freshwater Habitat

Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	The IBI scores for this water body were both above 40 which indicates that this water body is not considered to have impaired conditions.
Data Reference:	RWB9 Status Sampling 2007 and 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at the following station: 911TCCTCx-Troy Canyon Creek (TCC2).
Temporal Representation:	Surveys done June 6, 2007.
Environmental Conditions:	
QAPP Information:	Data collected following SWAMP QA protocols for the RWB9 Status Sampling 2007 and 2008 water quality monitoring project.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44682, Benthic Community Effects **Region 9**

Troy Canyon (to 0.3 mile upstream from confluence w Long Canyon)

LOE ID:	26475
Pollutant:	Benthic Community Effects
LOE Subgroup:	Adverse Biological Responses
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	2
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Six samples of IBI data were taken from May 2000 to 2007 at two sampling sites. Of the total number of samples, two samples exceeded the IBI impairment threshold.
Data Reference:	Fish and Game IBI Data Southern California Postfire Study. Index of Biotic Integrity. 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. (SDRWQCB, 1995)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the

	biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at two sites: 911TCCTCx and 911TJTCC2 on Troy Canyon Creek.
Temporal Representation:	Sampling occurred during six events from May 2000 to 2007.
Environmental Conditions:	
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Project Plan for the California Stream Bioassessment Procedure and the State of California, California Monitoring an Assessment Program: "CMAP", Quality Assurance Project Plan.
QAPP Information Reference(s):	State of California, California Monitoring and Assessment Program: "CMAP". Quality Assurance Project Plan for the California Stream Bioassessment Procedure The San Diego Stream Team Quality Assurance Project Plan

Line of Evidence (LOE) for Decision ID 44682, Benthic Community Effects **Region 9**

Troy Canyon (to 0.3 mile upstream from confluence w Long Canyon)

LOE ID:	79697
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	One samples was taken at one station on Troy Canyon Creek. The CSCI score was above the 0.79 threshold, and therefore not exceeding the water quality objective for the aquatic life beneficial use.
Data Reference:	RWB9 Status Sampling 2007 and 2008 Region 9 CSCI Scores & Water Body Information
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.
Guideline Reference:	The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.

Spatial Representation:	Samples were collected at the following stations: 911TCCTCx
Temporal Representation:	Surveys done in 2008
Environmental Conditions:	
QAPP Information:	Data collected following SWAMP QA protocols for the RWB9 Status Sampling 2007 and 2008 water quality monitoring project.
QAPP Information Reference(s):	RWB9 Status Sampling 2007 and 2008

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Long Canyon (Cottonwood wshed) (from 0.2 mile upstream to 0.4 miles downstream of Troy Canyon)
Water Body ID: CAR9116000020041108131738
Water Body Type: River & Stream

DECISION ID 43336 **Region 9**
Long Canyon (Cottonwood wshed) (from 0.2 mile upstream to 0.4 miles downstream of Troy Canyon)

Pollutant: Benthic Community Effects
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Impairment from Pollutant or Pollution: Pollution

Regional Board Conclusion:

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 43336, Benthic Community Effects **Region 9**
Long Canyon (Cottonwood wshed) (from 0.2 mile upstream to 0.4 miles downstream of Troy Canyon)

LOE ID: 79696

Pollutant: Benthic-Macroinvertebrate Bioassessments
LOE Subgroup: Population/Community Degradation
Matrix: Water
Fraction: None

Beneficial Use: Cold Freshwater Habitat

Number of Samples: 2
Number of Exceedances: 0

Data and Information Type: Benthic macroinvertebrate surveys
Data Used to Assess Water Quality: Two samples were taken at one station on Long Canyon. The CSCI scores were above the 0.79 threshold, and therefore not exceeding the water quality objective for the aquatic life beneficial use.
Data Reference: RWB9 Status Sampling 2007 and 2008
Region 9 CSCI Scores & Water Body Information

SWAMP Data: SWAMP

Water Quality Objective/Criterion: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference: Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.
Guideline Reference:	The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.
Spatial Representation:	Samples were collected at the following stations: 911TJLCC2
Temporal Representation:	Surveys done in 2007 and 2008
Environmental Conditions:	
QAPP Information:	Data collected following SWAMP QA protocols for the RWB9 Status Sampling 2007 and 2008 water quality monitoring project.
QAPP Information Reference(s):	RWB9 Status Sampling 2007 and 2008

Line of Evidence (LOE) for Decision ID 43336, Benthic Community Effects **Region 9**

Long Canyon (Cottonwood wshed) (from 0.2 mile upstream to 0.4 miles downstream of Troy Canyon)

LOE ID:	26723
Pollutant:	Benthic Community Effects
LOE Subgroup:	Adverse Biological Responses
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	One sample of IBI data was taken on October 2002 at one sampling site. The sample exceeded the IBI impairment threshold.
Data Reference:	Stream Bioassessment Data. Co-permitee Data. Collected 2002-2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at one site: SR-AD on Long Canyon Creek.
Temporal Representation:	Sampling occurred during one event on October 2002.
Environmental Conditions:	

QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Manual for Freshwater Bioassessment.
QAPP Information Reference(s):	Quality Assurance Manual for Freshwater Bioassessment Revision 0

Line of Evidence (LOE) for Decision ID 43336, Benthic Community Effects **Region 9**

Long Canyon (Cottonwood wshed) (from 0.2 mile upstream to 0.4 miles downstream of Troy Canyon)

LOE ID:	26424
Pollutant:	Benthic Community Effects
LOE Subgroup:	Adverse Biological Responses
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Two samples of IBI data were taken in May 2001 and July 2006 at two sampling sites. None of the samples exceeded the IBI impairment threshold.
Data Reference:	Fish and Game IBI Data 2007 SDRWQCB Bioassessment Data
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at two sites: 911TJLCC2 and 911LCCCFC on Long Canyon Creek.
Temporal Representation:	Sampling occurred during one event on May 2001 and one event on July 2006.
Environmental Conditions:	
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Project Plan for the California Stream Bioassessment Procedure and the State of California, California Monitoring an Assessment Program: "CMAP", Quality Assurance Project Plan.
QAPP Information Reference(s):	State of California, California Monitoring and Assessment Program: "CMAP". Quality Assurance Project Plan for the California Stream Bioassessment Procedure The San Diego Stream Team Quality Assurance Project Plan

Line of Evidence (LOE) for Decision ID 43336, Benthic Community Effects **Region 9**

Long Canyon (Cottonwood wshed) (from 0.2 mile upstream to 0.4 miles downstream of Troy Canyon)

LOE ID:	74162
Pollutant:	Benthic-Macroinvertebrate Bioassessments

LOE Subgroup:	Population/Community Degradation	039256
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Cold Freshwater Habitat	
Number of Samples:	4	
Number of Exceedances:	0	
Data and Information Type:	Benthic macroinvertebrate surveys	
Data Used to Assess Water Quality:	The IBI scores for this water body are all above 40 which indicates that this water body is not considered to have impaired conditions.	
Data Reference:	RWB9 Status Sampling 2007 and 2008	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.	
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13	
Spatial Representation:	Samples were collected at the following station: 911TJLCC2 (Long Canyon Creek 2).	
Temporal Representation:	Surveys done June 6, 2007 and May 7, 2008.	
Environmental Conditions:		
QAPP Information:	Data collected following SWAMP QA protocols for the RWB9 Status Sampling 2007 and 2008 water quality monitoring project.	
QAPP Information Reference(s):		

DECISION ID 44018 Region 9

Long Canyon (Cottonwood wshed) (from 0.2 mile upstream to 0.4 miles downstream of Troy Canyon)

Pollutant:	**Oxygen, Dissolved**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 25 samples exceed the Basin Plan water quality objective for dissolved oxygen.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.

2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.939257
3. None of the 25 samples exceed the Basin Plan water quality objective for dissolved oxygen and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 44018, Oxygen, Dissolved **Region 9**

Long Canyon (Cottonwood wshed) (from 0.2 mile upstream to 0.4 miles downstream of Troy Canyon)

LOE ID:	30164
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	25
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 1997 and 1998. None of the 25 samples were in exceedance. (SWRCB, 2003)
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters with a WARM beneficial use, the WQO for Dissolved Oxygen is 5.0 mg/L. For a COLD beneficial use, the WQO is 6.0 mg/L. For all other beneficial uses, the WQO for DO is 7.0 mg/L. The annual mean concentration is not to be less than this more than 10% of the time.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Long Canyon Creek at site LCC2.
Temporal Representation:	Samples were collected once each on 03/12/1997, 05/13/1997, 06/18/1997, and 01/29/1998.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

DECISION ID 43886 **Region 9**

Long Canyon (Cottonwood wshed) (from 0.2 mile upstream to 0.4 miles downstream of Troy Canyon)

Pollutant:	**pH**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:	This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the Four samples exceed the Basin Plan water quality objective for pH. Although the LOE states that 25 samples were collected in total, these samples were taken over the course of four separate days, and thus can only be counted as four discrete samples as per the temporal independence requirements of the listing policy (section 6.1.5.6). Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the Four samples exceed the Basin Plan water quality objective for pH and this sample count is insufficient to determine with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is supported using table 3.2. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 43886, pH **Region 9**

Long Canyon (Cottonwood wshed) (from 0.2 mile upstream to 0.4 miles downstream of Troy Canyon)

LOE ID:	30166
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	25
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 1997 and 1998. None of the 25 samples were in exceedance. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for pH is 6.5 (minimum) to 8.5 (maximum).
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Long Canyon Creek site LCC2.
Temporal Representation:	Samples were collected on 03/12/1997, 05/13/1997, 06/18/1997, and 01/29/1998. Five to nine of the samples were collected per sampling day over the course of 3 minutes to 1.5 hours.

Environmental Conditions:		039259
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

DECISION ID 43162 Region 9

Long Canyon (Cottonwood wshed) (from 0.2 mile upstream to 0.4 miles downstream of Troy Canyon)

Pollutant:	**Total Dissolved Solids**
Final Listing Decision:	**Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Original
Reason for Delisting:	Flaws in original listing
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the section 303(d) list under section 4.2 of the Listing Policy. Under section 4.2 a one line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. One of the samples exceed the water quality objective for total dissolved solids. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3.One of four samples exceeded the total dissolved solids objective and this sample size is insufficient to determine with the power and confidence of the Listing Policy if standards are not met. A minimum of 26 samples is needed for application of table 4.2. 4. Pursuant to 4.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43162, Total Dissolved Solids Region 9

Long Canyon (Cottonwood wshed) (from 0.2 mile upstream to 0.4 miles downstream of Troy Canyon)

LOE ID:	30106
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Warm Freshwater Habitat
Aquatic Life Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	1
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	One of the four samples collected exceeded the water quality objective. Samples were collected in March, May and June 1997 and once in January 1998 by the City of San Diego Water Department.

Data Reference:	Monitoring Data for Long Canyon Creek (San Diego County). August 2, 2039260
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	For inland surface waters and all beneficial uses, the water quality objective for total dissolved solids is 500 mg/l.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	One station was sampled on Long Canyon Creek. Station ID is LCC2.
Temporal Representation:	Samples were collected in March, May and June 1997 and once in January 1998.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with the City of San Diego's quality assurance plan.
QAPP Information Reference(s):	Water Quality Laboratory. Quality Assurance Manual

Line of Evidence (LOE) for Decision ID 43162, Total Dissolved Solids **Region 9**

Long Canyon (Cottonwood wshed) (from 0.2 mile upstream to 0.4 miles downstream of Troy Canyon)

LOE ID:	30165
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	25
Number of Exceedances:	6
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 1997 and 1998. Six of the 25 samples were in exceedance. All 6 samples were collected on 01/29/1998.
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters and all beneficial uses, the WQO for TDS is 500 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Long Canyon Creek site LCC2.
Temporal Representation:	Samples were collected on 03/12/1997, 05/13/1997, 06/18/1997, and 01/29/1998. Five to nine of the samples were collected per day over a period of 3 minutes to 1.5 hours.
Environmental Conditions:	
QAPP Information:	Data used in 2002 assessment.
QAPP Information Reference(s):	

DECISION ID 34024 **Region 9**

Long Canyon (Cottonwood wshed) (from 0.2 mile upstream to 0.4 miles downstream of Troy Canyon)

Pollutant:	**Habitat Assessment (Streams)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final	Do Not List on 303(d) list (TMDL required list)(2012)

Listing Decision:		039261
Revision Status	Original	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this water body habitat. This sample site received a rating of excellent because it was 123.89%comparable to the reference, and had an overall score of 113. (SWRCB, 2003).

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. This sample site received a rating of excellent because it was 123.89%comparable to the reference, and had an overall score of 113. (SWRCB, 2003).
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34024, Habitat Assessment (Streams) **Region 9**

Long Canyon (Cottonwood wshed) (from 0.2 mile upstream to 0.4 miles downstream of Troy Canyon)

LOE ID:	30163
Pollutant:	Habitat Assessment (Streams)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Data were collected by the City of San Diego Water Dept. in 1998. Sample site LCC2 received a rating of excellent because it was 123.89% comparable to the reference, and had an overall score of 113. (SWRCB, 2003).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No Objective.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Long Canyon Creek site LCC2.

Temporal Representation:	Samples were collected on 01/29/1998.	039262
Environmental Conditions:		
QAPP Information:	Data used in 2002 assessment.	
QAPP Information Reference(s):		

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: La Posta Creek
Water Body ID: CAR9117000020011025112350
Water Body Type: River & Stream

DECISION ID 44151 **Region 9**
La Posta Creek

Pollutant: **Ammonia as Nitrogen | Nickel | Phosphorus | Total Nitrogen as N**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Original
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 and 3.2 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the four samples exceed the water quality objectives.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the four samples exceeded the water quality objectives and this does not exceed the allowable frequency listed in Table 3.1 and is not enough samples for use of Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 44151, Multiple Pollutants **Region 9**
La Posta Creek

LOE ID: 26412

Pollutant: Ammonia as Nitrogen | Nickel | Phosphorus | Total Nitrogen as N
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Not Recorded

Beneficial Use: Municipal & Domestic Supply

Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	None of the four samples collected at La Posta Creek station 4 911TLAP04 exceeded the water quality objective. Samples were collected from June 2005, September 2005, January 2006, and April 2006, for conventional inorganics analyses.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Ammonia as N 0.025 mg/l, total nitrogen and phosphorus (If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used), and sulfate 250 mg/l.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Water samples were collected at La Posta Creek station 4(911TLAP04); (Latitude 32.6999, Longitude -116.4795).
Temporal Representation:	Water samples were collected on June 2005, September 2005, January 2006, and April 2006.
Environmental Conditions:	
QAPP Information:	Quality control for chemical analysis portion of this study was conducted in accordance with the California Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

DECISION ID	43897	Region 9
La Posta Creek		

Pollutant:	**Benthic Community Effects**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Benthic Community Effects is being considered for placement on the section 303(d) list under sections 3.9 and 3.2 of the Listing Policy. Under section 3.9, an additional line of evidence associating the Benthic Community Effects with a water or sediment concentration of pollutants is necessary to assess listing status. One line of evidence is available in the administrative record to assess this indicator. 3 of 6 samples exceeded the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing Benthic Community Effects in this water segment on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. 3 of 6 samples exceeded the Index of Biological Integrity (IBI) value of "poor" water quality for this area and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.2.

4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 43897, Benthic Community Effects **Region 9**

La Posta Creek

LOE ID:	26409
Pollutant:	Benthic Community Effects
LOE Subgroup:	Adverse Biological Responses
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	3
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Six samples of IBI data were taken from November 2000 to 2007 at one sampling site. Three of the six samples exceeded the IBI impairment threshold.
Data Reference:	Fish and Game IBI Data Southern California Postfire Study. Index of Biotic Integrity. 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at one site: 911LPCCTT on La Posta Creek.
Temporal Representation:	Sampling occurred during six events from November 2000 to 2007.
Environmental Conditions:	
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Project Plan for the California Stream Bioassessment Procedure and the State of California, California Monitoring an Assessment Program: "CMAP", Quality Assurance Project Plan.
QAPP Information Reference(s):	State of California, California Monitoring and Assessment Program: "CMAP". Quality Assurance Project Plan for the California Stream Bioassessment Procedure The San Diego Stream Team Quality Assurance Project Plan

DECISION ID **33098** **Region 9**

La Posta Creek 039266

Pollutant:	**Metals**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One lines of evidence is available in the administrative record to assess this pollutant. None of the 4 samples exceed the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of 4 samples exceeded the CTR or MCL values for selected metals and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33098, Metals — Region 9

La Posta Creek

LOE ID:	26410
Pollutant:	Metals
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Four samples were collected at La Posta Creek station 4 (911TLAP04) during the months of June 2005, September 2005, January 2006, and April 2006, for the following constituents: aluminum, arsenic, cadmium, copper, selenium, silver, zinc. None of the four samples showed excessive concentrations.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The Maximum Contaminant Level (MCL) for aluminum is 1.0 mg /l. The dissolved chronic criterion for the following metals applies: arsenic 150 Âµg/l ,cadmium 2.2 Âµg/l, copper 9.0

	Âµg/l , selenium 5.0 Âµg/l, zinc 120 Âµg/l, chromium 11 Âµg/l, manganese 0.025 mg/l, nickel 52 Âµg/l, lead 2.5 Âµg/l, and silver 3.4 Âµg/l. California Toxics Rule. 2007.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Water samples were collected at La Posta Creek station 4 (911TLAP04); (Latitude 32.6999, Longitude -116.4795).
Temporal Representation:	Water samples were collected on June 2005, September 2005, January 2006, and April 2006.
Environmental Conditions:	
QAPP Information:	Quality control for chemical analysis portion of this study was conducted in accordance with the California Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

DECISION ID	33145	Region 9
La Posta Creek		

Pollutant:	**PAHs (Polycyclic Aromatic Hydrocarbons)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. None of the 4 samples exceed the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of 4 samples exceeded the CTR value for PAHs and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 33145, PAHs (Polycyclic Aromatic Hydrocarbons)	Region 9

La Posta Creek 039268

LOE ID:	26411
Pollutant:	PAHs (Polycyclic Aromatic Hydrocarbons)
LOE Subgroup:	Health Advisories
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Four samples were collected at La Posta Creek station 4 (911TLAP04) during the months of June 2005, September 2005, January 2006, and April 2006. None of the four samples showed excessive concentrations.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water designated for use as domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels specified in California Code of Regulations, Title 22, Table 64444-A of section 64444 (Organic Chemicals) which is incorporated by reference into this plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Evaluation guidelines used came California Toxics Rule for Human Health Risk. Acenaphthene;1200 ug/l, Anthracene;9,600 ug/l, Benz(a)anthracene; 4.4 ug/l, Benzo(b)fluoranthene; 4.4 ug/l, Benzo(k)fluoranthene; 4.4 ug/l, Chrysene; 4.4 ug/l, Fluoranthene; 300 ug/l, and Fluorene; 1300 ug/l.
Guideline Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA
Spatial Representation:	Water samples were collected at La Posta Creek station 4 (911TLAP04); (Latitude 32.6999, Longitude -116.4795).
Temporal Representation:	Water samples were collected on June 2005, September 2005, January 2006, and April 2006.
Environmental Conditions:	
QAPP Information:	Quality control for chemical analysis portion of this study was conducted in accordance with the California Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

DECISION ID **43362** **Region 9**

La Posta Creek

Pollutant:	**PCBs (Polychlorinated biphenyls)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 4 samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of 4 samples exceeded the CTR value for PCBs and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43362, PCBs (Polychlorinated biphenyls) **Region 9**

La Posta Creek

LOE ID:	26543
Pollutant:	PCBs (Polychlorinated biphenyls)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Two samples were collected at La Posta Creek station 4 911TLAP04 during the months of June 2005, September 2005, January 2006, and April 2006, for PCBs analyses. None of the four samples showed excessive concentrations.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan; waters designated for use as domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels (MCL 0.5 ug/l) specified in California Code of Regulations, Title 22, Table 64444-A of section 64444 (Organic Chemicals) which is incorporated by reference into this plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Water samples were collected at La Posta Creek station 4 911TLAP04; (Latitude 32.6999, Longitude -116.4795).
Temporal Representation:	Water samples were collected on June 2005, September 2005, January 2006, and April

2006. 039270

Environmental Conditions:

QAPP Information: Quality control for chemical analysis portion of this study was conducted in accordance with the California Surface Water Ambient Monitoring Program.

QAPP Information Reference(s): 2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at San Elijo Lagoon
Water Body ID: CAX9046100019991116164230
Water Body Type: Coastal & Bay Shoreline

DECISION ID 43876 Region 9
Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at San Elijo Lagoon

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2008
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal from the CWA section 303(d) List under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Fifteen lines of evidence are available in the administrative record to assess this pollutant. With the latest data, 129 of 472 samples exceed the SSM water quality objective for total coliform for the protection of SHELL.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, 129 of 472 samples exceed the SSM water quality objective for total coliform for the protection of SHELL and this exceeds the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 43876, Indicator Bacteria Region 9
Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at San Elijo Lagoon

LOE ID:	27422
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation	039272
Number of Samples:	302	
Number of Exceedances:	16	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. The number of samples collected for total coliform analysis was 302 with 16 samples exceeding the single sample maximum total coliform standard.	
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005). Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from the San Elijo HSA, from Cardiff State Beach, at Station SE-060, Lat/ Long : 33.01563/ -117.28127.	
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43876, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at San Elijo Lagoon

LOE ID:	27406
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	302
Number of Exceedances:	117
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. The number of samples collected for total coliform analysis was 302 with 117 samples exceeding the single sample maximum total coliform standard for shellfish harvesting.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan, the median total coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005.

	Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the San Elijo HSA, from Cardiff State Beach, at Station SE-060, Lat/ Long : 33.01563/ -117.28127.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43876, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at San Elijo Lagoon

LOE ID:	74686
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	156
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 156 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the San Elijo Lagoon site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43876, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at San Elijo Lagoon

LOE ID:	74685
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting

Number of Samples:	170	039274
Number of Exceedances:	12	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed bw data for Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at San Elijo Lagoon to determine beneficial use support and results are as follows: 12 of 170 samples exceed the criterion for Coliform, Total.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at San Elijo Lagoon was collected at 1 monitoring site [Cardiff/ San Elijo Lagoon]	
Temporal Representation:	Data was collected over the time period 1/2/2008-8/26/2010.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43876, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at San Elijo Lagoon

LOE ID:	74684
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	156
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 156 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the San Elijo Lagoon site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43876, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at San Elijo Lagoon 039275

LOE ID:	74683
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	156
Number of Exceedances:	6
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Six of the 156 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the San Elijo Lagoon site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43876, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at San Elijo Lagoon

LOE ID:	77664
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	155
Number of Exceedances:	23
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Twenty-three of the 155 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:	039276
Guideline Reference:	
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at San Elijo Lagoon.
Temporal Representation:	The samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43876, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at San Elijo Lagoon

LOE ID:	31207
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	18
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from May 2004 through October 2007. A total of 117 dry month (April through October) single samples were collected with 18 dry month geomeans calculated. None of the 18 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the San Elijo HSA, from Cardiff State Beach, at Station SE-060 Lat/ Long : 33.01563/ -117.28127.
Temporal Representation:	Samples were collected weekly from May 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43876, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at San Elijo Lagoon

LOE ID:	30742
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	039277
Beneficial Use:	Water Contact Recreation	
Number of Samples:	188	
Number of Exceedances:	5	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 197 single samples were collected of which 188 are dry weather (AB411) samples with five samples exceeding the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from the San Elijo HSA, from Cardiff State Beach, at Station SE-060 Lat/ Long : 33.01563/ -117.28127.	
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43876, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at San Elijo Lagoon

LOE ID:	31208
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	26
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from May 2004 through October 2007. A total of 197 dry month (April through October) single samples were collected with 26 dry month geomeans calculated. Four of the 26 geomeans exceeded the geomean water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005). Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the San Elijo HSA, from Cardiff State Beach, at Station SE-060, Lat/ Long : 33.01563/ -117.28127.
Temporal Representation:	Samples were collected weekly from May 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43876, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at San Elijo Lagoon

LOE ID:	31206
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	26
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from May 2004 through October 2007. A total of 195 dry month (April through October) single samples were collected with 26 dry month geomeans calculated. None of the 26 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the San Elijo HSA, from Cardiff State Beach/San Elijo Lagoon, at Station SE-060 Lat/ Long : 33.01563/ -117.28127.
Temporal Representation:	Samples were collected weekly from May 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43876, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at San Elijo Lagoon 039279

LOE ID:	27496
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	187
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 187 single samples were collected with three samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the San Elijo HSA, from Seaside Beach, at Station SE-030, Lat/ Long : 33.00264/ -117.28735.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43876, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at San Elijo Lagoon

LOE ID:	27469
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	27
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 197 single samples were collected with 27 geomeans calculated. None of the geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the San Elijo HSA, from Cardiff State Beach, at Station SE-060 Lat/ Long : 33.01563/ -117.28127.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43876, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at San Elijo Lagoon

LOE ID:	27417
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	11
Number of Exceedances:	8
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. The number of samples collected for total coliform analysis was 302. Of the 302 samples, 11 were correlated with a storm event. Eight of the 11 storm samples exceeded the single sample maximum total coliform standard for shellfish harvesting. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan, the median total coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the San Elijo HSA, from Cardiff State Beach, at Station SE-060, Lat/ Long : 33.01563/ -117.28127.

Temporal Representation:	Samples were collected weekly from January 2004 through December 2007
Environmental Conditions:	Comparisons were also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43876, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at San Elijo Lagoon

LOE ID:	27480
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	300
Number of Exceedances:	21
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 300 single samples were collected with 21 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the San Elijo HSA, from Cardiff State Beach, at Station SE-060 Lat/ Long : 33.01563/ -117.28127.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43876, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at San Elijo Lagoon

LOE ID:	27491
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	34
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from Samples were collected from January 2004 through December 2007. The number of samples collected for total coliform analysis was 302 with 34 monthly geomeans calculated. None of the geomeans exceeded the geomean water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005). Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the San Elijo HSA, from Cardiff State Beach, at Station SE-060, Lat/ Long : 33.01563/ -117.28127.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43876, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at San Elijo Lagoon

LOE ID:	27482
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	16
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 187 single samples were collected with 16 samples correlated with a storm event. Two of the storm samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005). Comparisons to water quality objectives were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the San Elijo HSA, from Seaside Beach, at Station SE-030, Lat/ Long : 33.00264/ -117.28735.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43876, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at San Elijo Lagoon

LOE ID:	27444
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	11
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. The number of samples collected for total coliform analysis was 302 with 11 samples correlated with a storm event. Two of the storm samples exceed the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005). Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the San Elijo HSA, from Cardiff State Beach, at Station SE-060, Lat/ Long : 33.01563/ -117.28127.

Temporal Representation:	Samples were collected weekly from January 2004 through December 2007 079284
Environmental Conditions:	Comparisons were also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43876, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at San Elijo Lagoon

LOE ID:	27465
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	9
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 197 single samples were collected with nine samples correlated with a storm event. Three of the storm samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005). Comparisons to water quality objectives were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the San Elijo HSA, from Cardiff State Beach, at Station SE-060 Lat/ Long : 33.01563/ -117.28127.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43876, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at San Elijo Lagoon

LOE ID:	27452	039285

Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	197
Number of Exceedances:	8
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 197 single samples were collected with eight samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the San Elijo HSA, from Cardiff State Beach, at Station SE-060 Lat/ Long : 33.01563/ -117.28127.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43876, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at San Elijo Lagoon

LOE ID:	30643
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	171
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 187 single samples were collected of which 171 are dry weather (AB411) samples with one sample exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data:	Non-SWAMP	039286
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from the San Elijo HSA, from Seaside Beach, at Station SE-030, Lat/ Long : 33.00264/ -117.28735.	
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43876, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at San Elijo Lagoon

LOE ID:	30849
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	291
Number of Exceedances:	14
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. The number of samples collected for total coliform analysis was 302 of which 291 are dry weather (AB411) samples with 14 of those samples exceeding the single sample maximum total coliform standard.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005). Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the San Elijo HSA, from Cardiff State Beach, at Station SE-060, Lat/ Long : 33.01563/ -117.28127.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.

QAPP Information Reference(s): County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

039287

Line of Evidence (LOE) for Decision ID 43876, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at San Elijo Lagoon

LOE ID:	4681
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Water Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	Unspecified
Guideline Reference:	Placeholder reference pre-2006 303(d)
Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43876, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at San Elijo Lagoon

LOE ID:	27481
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	35
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data were collected by the County of San Diego from January 2004 through December 2007. A total of 300 single samples were collected with 35 monthly geomeans calculated. Only one of the geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the San Elijo HSA, from Cardiff State Beach/San Elijo Lagoon, at Station SE-060 Lat/ Long : 33.01563/ -117.28127.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Miramar Reservoir HA, at Los Penasquitos River mouth
Water Body ID: CAX9061000020021127155300
Water Body Type: Coastal & Bay Shoreline

DECISION ID 44844 **Region 9**
Pacific Ocean Shoreline, Miramar Reservoir HA, at Los Penasquitos River mouth

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not Delist from 303(d) list (being addressed with USEPA approved TMDL)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
TMDL Name:	Bacteria Impaired Waters I (creeks and beach shorelines)
TMDL Project Code:	169
Date TMDL Approved by USEPA:	06/22/2011
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal from the CWA section 303(d) List under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Fifteen lines of evidence are available in the administrative record to assess this pollutant. Including the latest data, 125 of the 676 samples exceed the water quality objective for total coliform of a SSM of 230/100ml for the protection of SHELL.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Including the latest data, 125 of the 676 samples exceed the water quality objective for total coliform of a SSM of 230/100ml for the protection of SHELL and this exceeds the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

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Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 44844, Indicator Bacteria **Region 9**
Pacific Ocean Shoreline, Miramar Reservoir HA, at Los Penasquitos River mouth

LOE ID:	26428
Pollutant:	Total Coliform

LOE Subgroup:	Pollutant-Water	039290
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	93	
Number of Exceedances:	2	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from Januray 1999 through December 2007. A total of 497 single samples were collected with 93 geomeans calculated. Two of the 93 geomeans exceeded the geomean water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Los Penasquitos River mouth outlet at Torrey Pines State Beach, Del Mar, California. Station identification number is FM-100.	
Temporal Representation:	Samples were collected from Januray 1999 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44844, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Miramar Reservoir HA, at Los Penasquitos River mouth

LOE ID:	74782
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	165
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 165 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline: 039291
Guideline Reference:

Spatial Representation: Samples were collected at the surfzone outfall site.
Temporal Representation: Samples were collected from January 2008 to August 2010.
Environmental Conditions:
QAPP Information: The samples were collected for the beach watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 44844, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Miramar Reservoir HA, at Los Penasquitos River mouth

LOE ID: 26430

Pollutant: Fecal Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 398
Number of Exceedances: 17

Data and Information Type: PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality: Beach monitoring data was collected by the County of San Diego from Januray 1999 through December 2007. A total of 398 single samples were collected with 17 exceeding the single sample water quality objective.
Data Reference: Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml;

Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference: Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Los Penasquitos River mouth outlet at Torrey Pines State Beach, Del Mar, California. Station identification number is FM-100.
Temporal Representation: Samples were collected from Januray 1999 through December 2007.
Environmental Conditions:
QAPP Information: Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s): County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44844, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Miramar Reservoir HA, at Los Penasquitos River mouth

LOE ID: 26434

Pollutant: Enterococcus
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use:	Water Contact Recreation
Number of Samples:	90
Number of Exceedances:	6
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from Januray 1999 through December 2007. A total of 487 single samples were collected with 90 monthly geomeans calculated. Six of the 90 geomeans exceed the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Los Penasquitos River mouth outlet at Torrey Pines State Beach, Del Mar, California. Station identification number is FM-100.
Temporal Representation:	Samples were collected from Januray 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44844, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Miramar Reservoir HA, at Los Penasquitos River mouth

LOE ID:	26435
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	22
Number of Exceedances:	11
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from Januray 1999 through December 2007. A total of 487 single samples were collected with 22 samples correlated with a storm event. Eleven of the 22 single samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml;

039293

	Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Comparisons to water quality objectives were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Los Penasquitos River mouth outlet at Torrey Pines State Beach, Del Mar, California. Station identification number is FM-100.
Temporal Representation:	Samples were collected from Januray 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44844, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Miramar Reservoir HA, at Los Penasquitos River mouth

LOE ID:	26431
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	78
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from Januray 1999 through December 2007. A total of 398 single samples were collected with 78 geomeans calculated. None of the geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml;
	Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Los Penasquitos River mouth outlet at Torrey Pines State Beach, Del Mar, California. Station identification number is FM-100.
Temporal Representation:	Samples were collected from Januray 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance

Line of Evidence (LOE) for Decision ID 44844, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Miramar Reservoir HA, at Los Penasquitos River mouth

LOE ID:	26432
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	19
Number of Exceedances:	7
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from Januray 1999 through December 2007. A total of 398 single samples were collected with 19 samples correlated with a storm event. Seven of the 19 samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005). Comparisons to water quality objectives were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Los Penasquitos River mouth outlet at Torrey Pines State Beach, Del Mar, California. Station identification number is FM-100.
Temporal Representation:	Samples were collected from Januray 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44844, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Miramar Reservoir HA, at Los Penasquitos River mouth

LOE ID:	26418
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation	039295
Number of Samples:	22	
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 2002 through June 2005. A total of 72 single samples were collected with 22 monthly geomeans calculated. None of the geomeans exceeded the geomean water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Anderson Canyon at Torrey Pines State Beach, Del Mar, California. Station identification number is EH-353. Lat 32.94210 Long -117.26230.	
Temporal Representation:	Samples were collected from April 2002 through June 2005. The majority of the samples came from April through October of 2002 and 2003.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44844, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Miramar Reservoir HA, at Los Penasquitos River mouth

LOE ID:	26426
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	21
Number of Exceedances:	16
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from Januray 1999 through December 2007. A total of 497 single samples were collected with 21 samples correlated with a storm event. Sixteen of the 21 samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan, the median total coliform density shall not exceed 70 per 100 ml, and

	not more than 10 percent of the samples shall exceed 230 per 100 ml (SWRCB, 2005). Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Los Penasquitos River mouth outlet at Torrey Pines State Beach, Del Mar, California. Station identification number is FM-100.
Temporal Representation:	Samples were collected from Januray 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44844, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Miramar Reservoir HA, at Los Penasquitos River mouth

LOE ID:	26427
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	497
Number of Exceedances:	11
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from Januray 1999 through December 2007. A total of 497 single samples were collected with 11 samples exceeded the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Los Penasquitos River mouth outlet at Torrey Pines State Beach, Del Mar, California. Station identification number is FM-100.
Temporal Representation:	Samples were collected from Januray 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44844, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Miramar Reservoir HA, at Los Penasquitos River mouth

LOE ID:	26425
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	497
Number of Exceedances:	120
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from Januray 1999 through December 2007. A total of 497 single samples were collected with 120 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Los Penasquitos River mouth outlet at Torrey Pines State Beach, Del Mar, California. Station identification number is FM-100.
Temporal Representation:	Samples were collected from Januray 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44844, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Miramar Reservoir HA, at Los Penasquitos River mouth

LOE ID:	26429
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	21
Number of Exceedances:	6
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from Januray 1999 through December 2007. A total of 497 single samples were collected with 21 samples

	correlated with a storm event. Six of the 21 samples exceeded the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005). Comparisons to water quality objectives were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Los Penasquitos River mouth outlet at Torrey Pines State Beach, Del Mar, California. Station identification number is FM-100.
Temporal Representation:	Samples were collected from Januray 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44844, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Miramar Reservoir HA, at Los Penasquitos River mouth

LOE ID:	28190
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	35
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were 35 beach advisory days for two locations in Del Mar. Bacteriological samples are collected on a weekly basis from April through October. When a bacteriological sample exceeds water quality standards, signs are posted indicating that waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 to December 2007. Data used was the number of days the beach was postedb with an Advisory when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	County of Orange. March 2007. Annual Ocean and Bay Water Quality Report, 2006 Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Spatial Representation:	Bacteriological monitoring samples were collected at Anderson Canyon on Torrey Pines State Beach and at the mouth of Los Penasquitos Lagoon.
Temporal Representation:	The beach advisory covers the time frame of January 2001 -December 2007. For Anderson Canyon, the sampling occurred in 2002 through 2005.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44844, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Miramar Reservoir HA, at Los Penasquitos River mouth

LOE ID:	3631
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Not Specified
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	180
Number of Exceedances:	1
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	A total of 180 analyses were performed from 1999 through 2003. Of these, there was only one exceedance of the bacterial standards for all three indicators: The Enterococcus standard of 104 MPN/100mL was exceeded in 10/2002 (City of San Diego, 2004).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The objective is numeric.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	From AB411: Enterococcus: 35"per 100 ml for 30-day average", single sample: 104 per 100 ml. Fecal coliform: 30-day average- 200 colonies/100 mL. Single sample- 400 colonies/100mL. Total coliform: 30-day average: 1,000 colonies/100 mL, single sample: If FC/TC ratio is < 0.1, 10,000 colonies/100 mL, if FC/TC ratio is > 0.1, 1,000 colonies/100mL.
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	Two stations were monitored at Anderson Canyon during this time: one at the sampling site and one 75 feet to the left of the site.
Temporal Representation:	Data were available for this assessment from 01/2002 through 10/2004. The majority of samples were taken during the dry season, but samples were also taken during the wet

	season. 039300
Environmental Conditions:	The report notes that "there was one sewage spill that impacted Anderson Canyon. It did not appear to have an impact on bacterial indicator levels." Southern California has three distinct weather/hydrological conditions: summer dry weather, winter dry weather, and storm events. The data set used in this analysis includes summer and winter season data. Whether or not storm event samples are included in the data set are not known. For future water quality assessments, the RWQCB may classify bacteria samples as summer dry, winter dry, or storm event samples to ensure adequate representation of all three weather/hydrological conditions.
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44844, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Miramar Reservoir HA, at Los Penasquitos River mouth

LOE ID:	30713
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	379
Number of Exceedances:	10
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from Januray 1999 through December 2007. A total of 398 single samples were collected of which 379 are dry weather (AB411) samples with 10 exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Los Penasquitos River mouth outlet at Torrey Pines State Beach, Del Mar, California. Station identification number is FM-100.
Temporal Representation:	Samples were collected from Januray 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44844, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Miramar Reservoir HA, at Los Penasquitos River mouth

LOE ID:	31307

Pollutant:	Fecal Coliform	039301
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	50	
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 271 dry month (April through October) single samples were collected with 50 dry month geomeans calculated. None of the 50 geomeans exceeded the geomean water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Los Penasquitos River mouth outlet at Torrey Pines State Beach, Del Mar, California. Station identification number is FM-100.	
Temporal Representation:	Samples were collected from April 1999 through October 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44844, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Miramar Reservoir HA, at Los Penasquitos River mouth

LOE ID:	31308
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	60
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 351 dry month (April through October) single samples were collected with 60 dry month geomeans calculated. None of the 60 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data:	Non-SWAMP	039302
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Los Penasquitos River mouth outlet at Torrey Pines State Beach, Del Mar, California. Station identification number is FM-100.	
Temporal Representation:	Samples were collected from April 1999 through October 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44844, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Miramar Reservoir HA, at Los Penasquitos River mouth

LOE ID:	30602
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	465
Number of Exceedances:	16
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from Januray 1999 through December 2007. A total of 487 single samples were collected of which 465 are dry weather (AB411) samples with 16 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Los Penasquitos River mouth outlet at Torrey Pines State Beach, Del Mar, California. Station identification number is FM-100.
Temporal Representation:	Samples were collected from Januray 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.

QAPP Information Reference(s): County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

039303

Line of Evidence (LOE) for Decision ID 44844, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Miramar Reservoir HA, at Los Penasquitos River mouth

LOE ID:	30818
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	476
Number of Exceedances:	5
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from Januray 1999 through December 2007. A total of 497 single samples were collected of which 476 are dry weather (AB411) samples with five samples exceeded the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Los Penasquitos River mouth outlet at Torrey Pines State Beach, Del Mar, California. Station identification number is FM-100.
Temporal Representation:	Samples were collected from Januray 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44844, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Miramar Reservoir HA, at Los Penasquitos River mouth

LOE ID:	74783
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	179
Number of Exceedances:	5

Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Beach Watch data for Pacific Ocean Shoreline, Miramar Reservoir HA, Los Penasquitos River mouth to determine beneficial use support and results are as follows: 5 of 179 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Miramar Reservoir HA, Los Penasquitos River mouth was collected at 1 monitoring site [Torrey Pine at Los PeÂ ±asquitos Lagoon mouth]
Temporal Representation:	Data was collected over the time period 1/9/2008-8/30/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44844, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Miramar Reservoir HA, at Los Penasquitos River mouth

LOE ID:	74784
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	165
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 165 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Torrey Pines site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44844, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Miramar Reservoir HA, at Los Penasquitos River mouth

LOE ID:	31306
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	60
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 352 dry month (April through October) single samples were collected with 60 dry month geomeans calculated. Two of the 60 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Los Penasquitos River mouth outlet at Torrey Pines State Beach, Del Mar, California. Station identification number is FM-100.
Temporal Representation:	Samples were collected from April 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44844, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Miramar Reservoir HA, at Los Penasquitos River mouth

LOE ID:	77644
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	164
Number of Exceedances:	5
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Five of the 164 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.

SWAMP Data:	Non-SWAMP	039306
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, Miramar Reservoir HA, Los Penasquitos River mouth.	
Temporal Representation:	The samples were collected from September 2008 to August 2010.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the beach watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44844, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Miramar Reservoir HA, at Los Penasquitos River mouth

LOE ID:	74781
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	165
Number of Exceedances:	9
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Nine of the 165 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Torrey Pines site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44844, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Miramar Reservoir HA, at Los Penasquitos River mouth

LOE ID:	26433
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	039307
Beneficial Use:	Water Contact Recreation	
Number of Samples:	487	
Number of Exceedances:	27	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from Januray 1999 through December 2007. A total of 487 single samples were collected with 27 samples exceeding the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Los Penasquitos River mouth outlet at Torrey Pines State Beach, Del Mar, California. Station identification number is FM-100.	
Temporal Representation:	Samples were collected from Januray 1999 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Torrey Pines State Beach, Anderson Canyon
Water Body ID: CAX9063000020020805132658
Water Body Type: Coastal & Bay Shoreline

DECISION ID 41392 **Region 9**
Pacific Ocean Shoreline, Torrey Pines State Beach, Anderson Canyon

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Eight lines of evidence are available in the administrative record to assess this pollutant. Based on data collected from 2002 to 2005, one of 71 samples exceed the water quality objective for enterococcus of a SSM of 104/100ml for the protection of REC-1 and zero of 72 samples exceed the WQO for total coliform of a SSM of 230/100ml for the protection of SHELL.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Based on data collected from 2002 to 2005, one of 71 samples exceed the water quality objective for enterococcus of a SSM of 104/100ml for the protection of REC-1 and zero of 72 samples exceed the WQO for total coliform of a SSM of 230/100ml for the protection of SHELL and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 41392, Indicator Bacteria **Region 9**
Pacific Ocean Shoreline, Torrey Pines State Beach, Anderson Canyon

LOE ID: 28278

Pollutant: Enterococcus
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples:	71
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 2002 through June 2005. A total of 71 single samples with one sample exceeding the water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Anderson Canyon at Torrey Pines State Beach, Del Mar, California. Station identification number is EH-353. Lat 32.94210 Long -117.26230.
Temporal Representation:	Samples were collected from April 2002 through June 2005. The majority of the samples came from April through October of 2002 and 2003.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 41392, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Torrey Pines State Beach, Anderson Canyon

LOE ID:	28279
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	22
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 2002 through June 2005. A total of 71 single samples with 22 monthly geomeans calculated. None of the geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental

Protection Agency 039310

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Anderson Canyon at Torrey Pines State Beach, Del Mar, California. Station identification number is EH-353. Lat 32.94210 Long -117.26230.

Temporal Representation: Samples were collected from April 2002 through June 2005. The majority of the samples came from April through October of 2002 and 2003.

Environmental Conditions:

QAPP Information: Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.

QAPP Information Reference(s): County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 41392, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Torrey Pines State Beach, Anderson Canyon

LOE ID: 28273

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Shellfish Harvesting

Number of Samples: 72
Number of Exceedances: 0

Data and Information Type: PWS pathogen monitoring (ambient water)

Data Used to Assess Water Quality: Beach monitoring data was collected by the County of San Diego from April 2002 through June 2005. A total of 72 single samples were collected with no samples exceeding the single sample water quality objective.

Data Reference: Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).

Objective/Criterion Reference: Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Anderson Canyon at Torrey Pines State Beach, Del Mar, California. Station identification number is EH-353. Lat 32.94210 Long -117.26230

Temporal Representation: Samples were collected from April 2002 through June 2005. The majority of the samples came from April through October of 2002 and 2003.

Environmental Conditions:

QAPP Information: Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.

QAPP Information Reference(s): County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 41392, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Torrey Pines State Beach, Anderson Canyon

LOE ID:	28274	039311

Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	72
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 2002 through June 2005. A total of 72 single samples were collected with no samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Anderson Canyon at Torrey Pines State Beach, Del Mar, California. Station identification number is EH-353. Lat 32.94210 Long -117.26230.
Temporal Representation:	Samples were collected from April 2002 through June 2005. The majority of the samples came from April through October of 2002 and 2003.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 41392, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Torrey Pines State Beach, Anderson Canyon

LOE ID:	28275
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	22
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 2002 through June 2005. A total of 72 single samples were collected with 22 monthly geomeans calculated. None of the geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Anderson Canyon at Torrey Pines State Beach, Del Mar, California. Station identification number is EH-353. Lat 32.94210 Long -117.26230.
Temporal Representation:	Samples were collected from April 2002 through June 2005. The majority of the samples came from April through October of 2002 and 2003.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 41392, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Torrey Pines State Beach, Anderson Canyon

LOE ID:	28276
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	72
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 2002 through June 2005. A total of 72 single samples were collected with none exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Anderson Canyon at Torrey Pines State Beach, Del Mar, California. Station identification number is EH-353. Lat 32.94210 Long -117.26230.
Temporal Representation:	Samples were collected from April 2002 through June 2005. The majority of the samples came from April through October of 2002 and 2003.
Environmental Conditions:	

QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 41392, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Torrey Pines State Beach, Anderson Canyon

LOE ID:	28277
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	22
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 2002 through June 2005. A total of 72 single samples were collected with 22 monthly geomeans calculated. None of the geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Anderson Canyon at Torrey Pines State Beach, Del Mar, California. Station identification number is EH-353. Lat 32.94210 Long -117.26230.
Temporal Representation:	Samples were collected from April 2002 through June 2005. The majority of the samples came from April through October of 2002 and 2003.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 41392, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Torrey Pines State Beach, Anderson Canyon

LOE ID:	28280
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	2555	039314
Number of Exceedances:	35	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were 35 beach advisory days for two locations in Del Mar. Bacteriological samples are collected on a weekly basis from April through October. When a bacteriological sample exceeds water quality standards, signs are posted indicating that waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 to December 2007. Data used was the number of days the beach was postedb with an Advisory when the ocean or bay failed to meet the bacteriological standards.	
Data Reference:	County of Orange. March 2007. Annual Ocean and Bay Water Quality Report, 2006 Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.	
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960	
Evaluation Guideline:		
Guideline Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Spatial Representation:	Bacteriological monitoring samples were collected at Anderson Canyon on Torrey Pines State Beach and at the mouth of Los Penasquitos Lagoon.	
Temporal Representation:	The beach advisory covers the time frame of January 2001 -December 2007. For Anderson Canyon, the sampling occurred in 2002 through 2005.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: San Diego Bay Shoreline; Kellogg Street Beach
Water Body ID: CAX9081000020020805134910
Water Body Type: Coastal & Bay Shoreline

DECISION ID 44519 **Region 9**

San Diego Bay Shoreline; Kellogg Street Beach

Pollutant: **Indicator Bacteria**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Impairment from Pollutant or Pollution: Pollution

Regional Board Conclusion: This pollutant is being considered for placement on the section 303(d) list under section 4.3 of the Listing Policy. Under section 4.3 a single line of evidence is necessary to assess listing status.

Sixteen lines of evidence are available in the administrative record to assess this pollutant. Seventeen of the 243 samples exceed the contact recreation single sample maximum water quality objective for enterococcus. One out of 38 samples exceeded the contact recreation geomean objective for enterococcus. Six out of 210 samples exceeded the contact recreation single sample maximum for Fecal Coliform. Zero out of 31 samples exceeded the contact recreation geomean objective for Fecal Coliform. Three of the 71 samples exceeded the shellfish harvesting single sample objective for Total Coliform. Five of the 84 samples exceeded the shellfish harvesting rolling 30 day geomean for Total Coliform. Zero of the 16 samples exceeded the Water Contact Recreation single sample geomean objective for Total Coliform. Zero of the 67 samples exceeded the Water Contact Recreation single sample water quality objective for Total Coliform.

The water body segment is identified as an AB411 beach and data collected during the time frame of April 1st to October 31st (dry weather) is assessed using a four percent exceedance percentage (sections 3.3 and 4.3 of Listing Policy). There are two additional lines of evidence for dry weather single sample and geometric mean calculations. One of the 66 samples exceeded the Contact Recreation Single Sample Maximum Objective and Zero out of 61 samples exceeded the Dry Weather Contact Recreation Geomean Objective for enterococcus. One out of 38 samples exceeded the contact recreation dry weather single sample objective and Zero out of 62 samples exceeded the contact recreation geomean objective for Fecal Coliform. Zero out of 61 samples exceeded the contact recreation dry weather geomean objective for Total Coliform. The single sample and geometric mean results do not exceed the allowable limit in Section 3.3 of the listing Policy (at the applicable four percent exceedance percentage Â– AB411).

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.
This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Seventeen of the 243 samples exceed the contact recreation single sample maximum water quality objective for enterococcus. One out of 38 samples exceeded the contact recreation geomean objective for enterococcus. Six out of 210 samples exceeded the contact recreation single sample maximum for Fecal Coliform. Zero out of 31 samples exceeded the contact recreation geomean objective for Fecal Coliform. Three of the 71 samples exceeded the shellfish harvesting single sample objective for Total Coliform. Five of the 84 samples exceeded the shellfish harvesting rolling 30 day geomean for Total Coliform. Zero of the 16 samples exceeded the Water Contact Recreation single sample geomean

objective for Total Coliform. Zero of the 67 samples exceeded the Water Contact Recreation single sample water quality objective for Total Coliform and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. One of the 66 samples exceeded the Contact Recreation Single Sample Maximum Objective and Zero out of 61 samples exceeded the Dry Weather Contact Recreation Geomean Objective for enterococcus. One out of 38 samples exceeded the contact recreation dry weather single sample objective and Zero out of 62 samples exceeded the contact recreation geomean objective for Fecal Coliform. Zero out of 61 samples exceeded the contact recreation dry weather geomean objective for Total Coliform. The single sample and geometric mean results do not exceed the allowable limit in Section 3.3 of the listing Policy (at the applicable four percent exceedance percentage Â– AB411).
5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 44519, Indicator Bacteria **Region 9**

San Diego Bay Shoreline; Kellogg Street Beach

LOE ID:	30677
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	66
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 67 single samples were collected of which 66 are dry weather (AB411) samples with one sample exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Lawrence Street, San Diego, California. Station identification number is EH-211.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44519, Indicator Bacteria **Region 9**

San Diego Bay Shoreline; Kellogg Street Beach

LOE ID:	29847
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	8
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were eight beach advisory days for this section of shoreline. Bacteriological samples are collected on a weekly basis at ocean and bay locations in San Diego County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that an advisory for waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 - December 2007. Data used was the number of days the beach was advisories were issued when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Spatial Representation:	Beach advisories were from Kellogg St Beach located in San Diego Bay.
Temporal Representation:	The beach advisories covers the time frame of January January 2001 to December 2007.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of San Diego's Quality Assessment/Quality Control document
QAPP Information Reference(s):	County of San Diego. 2006. Department Public Health Laboratory. Quality Assurance Manual. December 2006

Line of Evidence (LOE) for Decision ID 44519, Indicator Bacteria **Region 9**

San Diego Bay Shoreline; Kellogg Street Beach

LOE ID:	75569

Pollutant:	Total Coliform	039318
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	61	
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Zero of the 61 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at the Lawrence Street site.	
Temporal Representation:	Samples were collected from April 2008 to August 2010.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44519, Indicator Bacteria **Region 9**

San Diego Bay Shoreline; Kellogg Street Beach

LOE ID:	75657
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	71
Number of Exceedances:	3
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed bw data for San Diego Bay Shoreline; Kellogg Street Beach to determine beneficial use support and results are as follows: 3 of 71 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The Water Quality Control Plan (Basin Plan 2011)states the following: At all areas where shellfish may be harvested for human consumption, ten percent of the samples collected during any 30-day period shall not exceed 230 MPN/100mL.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Data for this line of evidence for San Diego Bay Shoreline; Kellogg Street Beach was collected at 2 monitoring sites [Lawrence (Kellogg) St., Lawrence St]
Temporal Representation:	Data was collected over the time period 4/2/2008-8/23/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44519, Indicator Bacteria **Region 9**

San Diego Bay Shoreline; Kellogg Street Beach

LOE ID:	75656
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	62
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 62 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Lawrence Street site.
Temporal Representation:	Samples were collected from April 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44519, Indicator Bacteria **Region 9**

San Diego Bay Shoreline; Kellogg Street Beach

LOE ID:	75655
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	61
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 61 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four

	percent exceedance frequency should be used.	039320
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at the Lawrence Street site.	
Temporal Representation:	Samples were collected from April 2008 to August 2010.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44519, Indicator Bacteria **Region 9**

San Diego Bay Shoreline; Kellogg Street Beach

LOE ID:	77701
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	62
Number of Exceedances:	5
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Five of the 62 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The Water Quality Control Plan for the San Diego BasinÂ states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at San Diego Bay Shoreline; Kellogg Street Beach, Lawrence St station.
Temporal Representation:	The samples were collected from July 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44519, Indicator Bacteria **Region 9**

San Diego Bay Shoreline; Kellogg Street Beach

LOE ID:	27711

Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 39 single samples were collected with one sample correlated with a storm event. This sample did not exceed the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005). Comparisons are also made only for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Lawrence Street, San Diego, California. Station identification number is EH-211.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44519, Indicator Bacteria **Region 9**

San Diego Bay Shoreline; Kellogg Street Beach

LOE ID:	27710
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	39
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)

Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 39 single samples were collected with one sample exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Lawrence Street, San Diego, California. Station identification number is EH-211.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44519, Indicator Bacteria **Region 9**

San Diego Bay Shoreline; Kellogg Street Beach

LOE ID:	27709
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 67 single samples were collected with one sample correlated with a storm event. This sample did not exceed the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005). Comparisons were also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.

Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Lawrence Street, San Diego, California. Station identification number is EH-211.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44519, Indicator Bacteria **Region 9**

San Diego Bay Shoreline; Kellogg Street Beach

LOE ID:	27708
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	67
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 67 single samples were collected with no sample exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Lawrence Street, San Diego, California. Station identification number is EH-211.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44519, Indicator Bacteria 039324 Region 9

San Diego Bay Shoreline; Kellogg Street Beach

LOE ID:	27707
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 67 single samples were collected with one sample correlated with a storm event. This sample exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005). Comparisons are also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Lawrence Street, San Diego, California. Station identification number is EH-211.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44519, Indicator Bacteria Region 9

San Diego Bay Shoreline; Kellogg Street Beach

LOE ID:	27706
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	67

Number of Exceedances:	6	039325
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 67 single samples were collected with 6 samples exceeded the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005). Comparisons were also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Lawrence Street, San Diego, California. Station identification number is EH-211.	
Temporal Representation:	Samples were collected from January 2004 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44519, Indicator Bacteria **Region 9**

San Diego Bay Shoreline; Kellogg Street Beach

LOE ID:	27716
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	16
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 67 single samples were collected with 16 monthly geomeans calculated. None of the 16 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental

Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Lawrence Street, San Diego, California. Station identification number is EH-211.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44519, Indicator Bacteria **Region 9**

San Diego Bay Shoreline; Kellogg Street Beach

LOE ID:	27715
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 39 single samples were collected and 9 geomeans calculated. None of the 9 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Lawrence Street, San Diego, California. Station identification number is EH-211.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44519, Indicator Bacteria **Region 9**

San Diego Bay Shoreline; Kellogg Street Beach

LOE ID:	27714	039327

Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	16
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 67 single samples were collected with 16 monthly geomeans calculated. None of the 16 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Lawrence Street, San Diego, California. Station identification number is EH-211.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44519, Indicator Bacteria **Region 9**

San Diego Bay Shoreline; Kellogg Street Beach

LOE ID:	27713
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 67 single samples were collected with one sample correlated with a storm event. This sample did not exceed the single sample water quality objective.

Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005). Comparisons are also made for days with matching bacteria and storm event data. A storm event is defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Lawrence Street, San Diego, California. Station identification number is EH-211.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44519, Indicator Bacteria **Region 9**

San Diego Bay Shoreline; Kellogg Street Beach

LOE ID:	27712
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	67
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 67 single samples were collected with one sample exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:	039329
Guideline Reference:	
Spatial Representation:	Samples were collected at Lawrence Street, San Diego, California. Station identification number is EH-211.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44519, Indicator Bacteria **Region 9**

San Diego Bay Shoreline; Kellogg Street Beach

LOE ID:	31117
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	16
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 67 single samples were collected with 16 monthly geomeans calculated. None of the 16 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Lawrence Street, San Diego, California. Station identification number is EH-211.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44519, Indicator Bacteria **Region 9**

San Diego Bay Shoreline; Kellogg Street Beach

LOE ID:	30884

Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	67
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 67 single samples were collected with no sample exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Lawrence Street, San Diego, California. Station identification number is EH-211.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44519, Indicator Bacteria **Region 9**

San Diego Bay Shoreline; Kellogg Street Beach

LOE ID:	30778
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	38
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 39 single samples were collected of which 38 are dry weather (AB411) samples with one sample exceeding the single sample water quality objective.

Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Lawrence Street, San Diego, California. Station identification number is EH-211.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44519, Indicator Bacteria **Region 9**

San Diego Bay Shoreline; Kellogg Street Beach

LOE ID:	3650
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	584
Number of Exceedances:	26
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego from 1999 to 2003. For enterococcus,16 of 176 single samples were in exceedance and 1 of 22 calculated geomeans was in exceedance. For fecal coliform, 5 of 171 samples were in exceedance and 0 of 22 calculated geomeans were in exceedance. For total coliform, 0 of 22 geomeans were in exceedance. Where the FC/TC ratio was less than 0.1, there were 0 exceedances. Where the ratio was greater than 0.1, 4 of 171 samples were in exceedance. (City of San Diego, 2004).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	AB411 standards: for fecal coliform: 30-day avg is 200 colonies/100 mL, single sample standard is 400 colonies/100 mL. For total coliform: 30-day avg. is 1,000 colonies/100mL, single sample standard is 10,000 colonies/100 mL. If fecal/total ratio is greater than 0.1, the single sample maximum for total coliform is 1,000 colonies/100 mL.. The AB411 standard for enterococcus for the 30-day avg is 35 colonies/100mL, single sample maximum is 104 colonies/100 mL.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at the San Diego Bay Shoreline, Kellogg St. Samples were collected at 3 locations relative to each other: "Left," "middle," and "right."
Temporal Representation:	Samples were collected from 04/27/1999 to 10/23/2003.
Environmental Conditions:	Southern California has three distinct weather/hydrological conditions: summer dry weather, winter dry weather, and storm events. The data set used in this analysis includes summer and winter season data. Whether or not storm event samples are included in the data set are not known. For future water quality assessments, the RWQCB may classify bacteria samples as summer dry, winter dry, or storm event samples to ensure adequate representation of all three weather/hydrological conditions.
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: San Diego Bay Shoreline, Shelter Island Shoreline Park
Water Body ID: CAX9081000020020805135647
Water Body Type: Coastal & Bay Shoreline

DECISION ID 34011 **Region 9**
San Diego Bay Shoreline, Shelter Island Shoreline Park

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not Delist from 303(d) list (being addressed with USEPA approved TMDL)**
Last Listing Cycle's Final Listing Decision:	Do Not Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
TMDL Name:	Bacteria TMDL for San Diego Bay and Dana Point Harbor Shorelines
TMDL Project Code:	659
Date TMDL Approved by USEPA:	10/26/2009
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal on the CWA section 303(d) List under sections 2.2 and 4.3 of the Listing Policy. Under 4.3 of the Policy, a minimum of one line of evidence is needed to assess listing status.

Fifteen lines of evidence are available in the administrative record to assess this pollutant.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List. There is sufficient justification to place it in the Being Addressed portion of the CWA 303(d) List because a TMDL has been completed and approved by RWQCB and USEPA, and is expected to result in attainment of the standard.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. With the latest data, 27 of 124 geomean samples collected during the AB411 period exceeded the water quality objective (WQO) for enterococcus of 35/100 ml, and 85 of 416 samples exceed the WQO for total coliform of a single sample maximum of 230/100 ml, and these exceed the allowable frequency listed in Sections 4.3 and 4.2 of the Listing Policy.
4. The bacteria TMDL for Shelter Island and Baby Beach was approved by USEPA on 10/26/2009
5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 34011, Indicator Bacteria **Region 9**
San Diego Bay Shoreline, Shelter Island Shoreline Park

LOE ID:	27288
Pollutant:	Total Coliform

LOE Subgroup:	Pollutant-Water	039334
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	69	
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 337 single samples were collected with 69 monthly geomeans calculated. None of the 69 geomeans exceeded the geomean water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Shelter Island, San Diego, California. Station identification number is EH-200.	
Temporal Representation:	Samples were collected from January 1999 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 34011, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, Shelter Island Shoreline Park

LOE ID:	27290
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	68
Number of Exceedances:	25
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 337 single samples were collected with 68 monthly geomeans calculated. 25 of the 68 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data:	Non-SWAMP	039335
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Shelter Island, San Diego, California. Station identification number is EH-200.	
Temporal Representation:	Samples were collected from January 1999 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 34011, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, Shelter Island Shoreline Park

LOE ID:	27286
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	337
Number of Exceedances:	81
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 337 single samples were collected with 81 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Shelter Island, San Diego, California. Station identification number is EH-200.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the

QAPP Information Reference(s):	County of San Diego, Department Public Health Laboratory Quality Assurance Manual. County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 34011, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, Shelter Island Shoreline Park

LOE ID:	27285
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	6
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 300 single samples were collected with 6 samples correlated with a storm event. Three of the 6 samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005). Comparisons are also made only for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Shelter Island, San Diego, California. Station identification number is EH-200.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 34011, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, Shelter Island Shoreline Park

LOE ID:	27284
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water

Matrix:	Water	039337
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	300	
Number of Exceedances:	41	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 300 single samples were collected with 41 samples exceeding the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Shelter Island, San Diego, California. Station identification number is EH-200.	
Temporal Representation:	Samples were collected from January 1999 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 34011, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, Shelter Island Shoreline Park

LOE ID:	27283
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 337 single samples were collected with 7 samples correlated with a storm event. None of the 7 samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data:	Non-SWAMP	039338
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005). Comparisons were also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Shelter Island, San Diego, California. Station identification number is EH-200.	
Temporal Representation:	Samples were collected from January 1999 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 34011, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, Shelter Island Shoreline Park

LOE ID:	27282
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	337
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 337 single samples were collected with no sample exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at Shelter Island, San Diego, California. Station identification number is EH-200.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 34011, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, Shelter Island Shoreline Park

LOE ID:	77699
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	70
Number of Exceedances:	11
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Eleven of the 70 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The Water Quality Control Plan for the San Diego BasinÂ states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at San Diego Bay Shoreline, at Spanish Landing.
Temporal Representation:	The samples were collected from April 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 34011, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, Shelter Island Shoreline Park

LOE ID:	28295
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	658

Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were 658 beach advisory days for this section of shoreline. Bacteriological samples are collected on a weekly basis at ocean and bay locations in San Diego County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that an advisory for waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 - December 2007. Data used was the number of days the beach was advisories were issued when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Spatial Representation:	Beach advisories were from Shelter Island Shoreline Park located in San Diego Bay.
Temporal Representation:	The beach advisory covers the time frame of January January 2001 to December 2007.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of San Diego's Quality Assessment/Quality Control document
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 34011, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, Shelter Island Shoreline Park

LOE ID:	75647
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	70
Number of Exceedances:	9
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Nine of the 70 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.

SWAMP Data:	Non-SWAMP	039341
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at the Shelter Island Shoreline Park site.	
Temporal Representation:	Samples were collected from April 2008 to August 2010.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 34011, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, Shelter Island Shoreline Park

LOE ID:	75648
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	70
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 70 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Shelter Island Shoreline Park site.
Temporal Representation:	Samples were collected from April 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 34011, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, Shelter Island Shoreline Park

LOE ID:	75649
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Shellfish Harvesting	039342
Number of Samples:	79	
Number of Exceedances:	6	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed bw data for San Diego Bay Shoreline, Shelter Island Shoreline Park to determine beneficial use support and results are as follows: 6 of 79 samples exceed the criterion for Coliform, Total.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The Water Quality Control Plan (Basin Plan 2011)states the following: At all areas where shellfish may be harvested for human consumption, ten percent of the samples collected during any 30-day period shall not exceed 230 MPN/100mL.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for San Diego Bay Shoreline, Shelter Island Shoreline Park was collected at 1 monitoring site [Shelter Is shoreline park]	
Temporal Representation:	Data was collected over the time period 4/16/2008-8/23/2010.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 34011, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, Shelter Island Shoreline Park

LOE ID:	75650
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	70
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 70 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Shelter Island Shoreline Park site.
Temporal Representation:	Samples were collected from April 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.

QAPP Information Reference(s): 039343

Line of Evidence (LOE) for Decision ID 34011, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, Shelter Island Shoreline Park

LOE ID:	3652
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	1178
Number of Exceedances:	199
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	A total of 1,178 analyses were performed from 1999 through 2003. Of these, there were 199 exceedances of the bacterial standards for all three indicators. Exceedances occurred during both wet and dry seasons (City of San Diego, 2004).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Objectives are numeric.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	From AB411: Enterococcus: 35"per 100 ml for 30-day average", single sample: 104 per 100 ml. Fecal coliform: 30-day average- 200 colonies/100 mL. Single sample- 400 colonies/100mL. Total coliform: 30-day average: 1,000 colonies/100 mL, single sample: If FC/TC ratio is < 0.1, 10,000 colonies/100 mL, if FC/TC ratio is > 0.1, 1,000 colonies/100mL.
Guideline Reference:	Placeholder reference 2006 303(d)
Spatial Representation:	Shelter Island Shoreline Park. This site is located in San Diego Bay on the east side of Shelter Island. "Ten stations were monitored at the Shelter Island Shoreline Park site during this time: one at the sampling site, eight as far as 2,800 feet to the left, and one 300 feet to the right of the site."
Temporal Representation:	Data were available for the Shelter Island Shoreline Park assessment from 01/1999 through 10/2003. Samples were collected during both the wet and dry seasons.
Environmental Conditions:	Southern California has three distinct weather/hydrological conditions: summer dry weather, winter dry weather, and storm events. The data set used in this analysis includes summer and winter season data. Whether or not storm event samples are included in the data set are not known. For future water quality assessments, the RWQCB may classify bacteria samples as summer dry, winter dry, or storm event samples to ensure adequate representation of all three weather/hydrological conditions. There were no sewage spills that impacted the site from 1999 through 2003.
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 34011, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, Shelter Island Shoreline Park

LOE ID:	3651
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation	039344
Number of Samples:	461	
Number of Exceedances:	145	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Data were collected by the City of San Diego from 1999 to 2003. AB411 standards: For enterococcus, 32 of 47 geomeans were in exceedance and 113 of 414 samples were in exceedance of the single sample standard (City of San Diego, 2004).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan: For inland surface waters, enclosed bays and estuaries, coastal lagoons, and ground waters with a REC2 beneficial use, the WQO for Fecal Coliform is and average of 2,000 colonies/100mL for any 30-day period. No more than 10% of total samples during any 30-day period should exceed 4,000 colonies per 100 mL. AB411 standards: for fecal coliform: 30-day avg is 200 colonies/100 mL, single sample standard is 400 colonies/100 mL. For total coliform: 30-day avg. is 1,000 colonies/100mL, single sample standard is 10,000 colonies/100 mL. If fecal/total ratio is greater than 0.1, the single sample maximum for total coliform is 1,000 colonies/100 mL. The AB411 standard for enterococcus for the 30-day avg is 35 colonies/100mL, single sample maximum is 104 colonies/100 mL.	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected in the San Diego Bay at Shelter Island. Samples were collected at three locations in relation to each other: "Left," "Right," and "Middle."	
Temporal Representation:	Samples were collected from 05/25/1999 to 10/23/2003.	
Environmental Conditions:	Southern California has three distinct weather/hydrological conditions: summer dry weather, winter dry weather, and storm events. The data set used in this analysis includes summer and winter season data. Whether or not storm event samples are included in the data set are not known. For future water quality assessments, the RWQCB may classify bacteria samples as summer dry, winter dry, or storm event samples to ensure adequate representation of all three weather/hydrological conditions.	
QAPP Information:	QA Info Missing	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 34011, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, Shelter Island Shoreline Park

LOE ID:	31313
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	54
Number of Exceedances:	18
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 269 dry month (April through October) single samples were collected with 54 dry month geomeans calculated. Eighteen of the 54 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program,

	2007. AB 411 monitoring data 1999 to 2007 039345
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Shelter Island, San Diego, California. Station identification number is EH-200.
Temporal Representation:	Samples were collected from April 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 34011, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, Shelter Island Shoreline Park

LOE ID:	30878
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	330
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 337 single samples were collected of which 330 are dry weather (AB411) samples with none of those samples exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at Shelter Island, San Diego, California. Station identification number is EH-200.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 34011, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, Shelter Island Shoreline Park

LOE ID:	31314
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	45
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 232 dry month (April through October) single samples were collected with 45 dry month geomeans calculated. One of the 45 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Shelter Island, San Diego, California. Station identification number is EH-200.
Temporal Representation:	Samples were collected from April 1999 to October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 34011, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, Shelter Island Shoreline Park

LOE ID:	31315
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water

Matrix:	Water	039347
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	54	
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 269 dry month (April through October) single samples were collected with 54 dry month geomeans calculated. None of the 54 geomeans exceeded the geomean water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Shelter Island, San Diego, California. Station identification number is EH-200.	
Temporal Representation:	Samples were collected from April 1999 through October 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 34011, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, Shelter Island Shoreline Park

LOE ID:	30772
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	294
Number of Exceedances:	38
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 300 single samples were collected of which 294 are dry weather (AB411) samples with 38 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Shelter Island, San Diego, California. Station identification number is EH-200.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 34011, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, Shelter Island Shoreline Park

LOE ID:	30671
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	330
Number of Exceedances:	79
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 337 single samples were collected of which 330 are dry weather (AB411) samples with 79 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Shelter Island, San Diego, California. Station identification number is EH-200.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the

QAPP Information Reference(s):	County of San Diego, Department Public Health Laboratory Quality Assurance Manual. County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 34011, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, Shelter Island Shoreline Park

LOE ID:	27279
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	337
Number of Exceedances:	79
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April1999 through December 2007. A total of 337 single samples were collected with 79 samples exceeded the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005). Comparisons were also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Shelter Island, San Diego, California. Station identification number is EH-200.
Temporal Representation:	Samples were collected from April1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 34011, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, Shelter Island Shoreline Park

LOE ID:	27281
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	7

Number of Exceedances:	3	039350

Data and Information Type: PWS pathogen monitoring (ambient water)

Data Used to Assess Water Quality: Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 337 single samples were collected with 7 samples correlated with a storm event. Three of the 7 samples exceeded the single sample water quality objective.

Data Reference: National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).

Comparisons are also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.

Objective/Criterion Reference: Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:

Guideline Reference:

Spatial Representation: Samples were collected at Shelter Island, San Diego, California. Station identification number is EH-200.

Temporal Representation: Samples were collected from January 1999 through December 2007.

Environmental Conditions:

QAPP Information: Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.

QAPP Information Reference(s): County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 34011, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, Shelter Island Shoreline Park

LOE ID: 27289

Pollutant: Fecal Coliform

LOE Subgroup: Pollutant-Water

Matrix: Water

Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 60

Number of Exceedances: 4

Data and Information Type: PWS pathogen monitoring (ambient water)

Data Used to Assess Water Quality: Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 300 single samples were collected and 60 geomeans calculated. Four of the 60 geomeans exceeded the geomean water quality objective.

Data Reference: Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: Geomean; Fecal coliform density shall not exceed 200 per 100 ml;

Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB,

	2005). 039351
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Shelter Island, San Diego, California. Station identification number is EH-200.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 34011, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, Shelter Island Shoreline Park

LOE ID:	27287
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	7
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 337 single samples were collected with 7 samples correlated with a storm event. Two of the 7 samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005). Comparisons are also made for days with matching bacteria and storm event data. A storm event is defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Shelter Island, San Diego, California. Station identification number is EH-200.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	

QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: San Diego Bay Shoreline, G Street Pier
Water Body ID: CAX9082100020021202130542
Water Body Type: Coastal & Bay Shoreline

DECISION ID 33221 **Region 9**
San Diego Bay Shoreline, G Street Pier

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.3 of the Listing Policy. Under section 3.3 a single line of evidence is necessary to assess listing status.

Seven lines of evidence are available in the administrative record to assess this pollutant. Data collected in 2006 and 2007 show that 13 of 40 single samples exceed the water quality objective for total coliform of a SSM of 230/100ml.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Data collected in 2006 and 2007 show that 13 of 40 single samples exceed the water quality objective for total coliform of a SSM of 230/100ml and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 33221, Indicator Bacteria **Region 9**
San Diego Bay Shoreline, G Street Pier

LOE ID:	30920
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Shellfish Harvesting	039354
Number of Samples:	40	
Number of Exceedances:	13	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Monitoring data was collected from April 2006 through January 2007. Thirteen of 40 samples exceeded the single sample water quality objective.	
Data Reference:	Submittal of Data for G St. Shorelines, Lindbergh Hydrologic Area (908.21)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005). Comparisons were also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from four stations along G St. Pier in San Diego Bay	
Temporal Representation:	Samples were collected from April 2006 through January 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the Port of San Diego's Quality Assurance Manual.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 33221, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, G Street Pier

LOE ID:	4702
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Water Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	Unspecified
Guideline Reference:	Placeholder reference pre-2006 303(d)
Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified

QAPP Information Reference(s): 039355

Line of Evidence (LOE) for Decision ID 33221, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, G Street Pier

LOE ID:	30924
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	40
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Monitoring data was collected from April 2006 through January 2007. None of the 40 samples exceeding the single sample water quality objective.
Data Reference:	Submittal of Data for G St. Shorelines, Lindbergh Hydrologic Area (908.21)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from four stations along G St. Pier in San Diego Bay
Temporal Representation:	Samples were collected from April 2006 through January 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the Port of San Diego's Quality Assurance Manual.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33221, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, G Street Pier

LOE ID:	30930
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	10
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Monitoring data was collected from April 2006 through January 2007. Two of the 10 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program,

	2007. AB 411 monitoring data 1999 to 2007 039356 Submittal of Data for G St. Shorelines, Lindbergh Hydrologic Area (908.21)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from four stations along G St. Pier in San Diego Bay
Temporal Representation:	Samples were collected from April 2006 through January 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 33221, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, G Street Pier

LOE ID:	30926
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	10
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Monitoring data was collectedfrom April 2006 through January 2007. None of the 10 geomeans exceeded the geomean water quality objective.
Data Reference:	Submittal of Data for G St. Shorelines, Lindbergh Hydrologic Area (908.21)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from four stations along G St. Pier in San Diego Bay
Temporal Representation:	Samples were collected from April 2006 through January 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the Port

of San Diego's Quality Assurance Manual. 039357

QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 33221, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, G Street Pier

LOE ID:	30928
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	40
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Monitoring data was collected from April 2006 through January 2007. Two of 40 samples exceeding the single sample water quality objective.
Data Reference:	Submittal of Data for G St. Shorelines, Lindbergh Hydrologic Area (908.21)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from four stations along G St. Pier in San Diego Bay
Temporal Representation:	Samples were collected from April 2006 through January 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the Port of San Diego's Quality Assurance Manual.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33221, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, G Street Pier

LOE ID:	30932
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	40
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Monitoring data was collected from April 2006 through January 2007. None of the 40 samples exceeded the single sample water quality objective.

Data Reference:	Submittal of Data for G St. Shorelines, Lindbergh Hydrologic Area (908.21) 039358
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from four stations along G St. Pier in San Diego Bay
Temporal Representation:	Samples were collected from April 2006 through January 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the Port of San Diego's Quality Assurance Manual.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 33221, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, G Street Pier

LOE ID:	30934
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	10
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Monitoring data was collected from April 2006 through January 2007. None of the 10 geomeans exceeded the geomean water quality objective.
Data Reference:	Submittal of Data for G St. Shorelines, Lindbergh Hydrologic Area (908.21)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from four stations along G St. Pier in San Diego Bay
Temporal Representation:	Samples were collected from April 2006 through January 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the Port of San Diego's Quality Assurance Manual.
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: San Diego Bay Shoreline, Chula Vista Marina
Water Body ID: CAX9091200020021206085938
Water Body Type: Coastal & Bay Shoreline

DECISION ID 34706 **Region 9**
San Diego Bay Shoreline, Chula Vista Marina

Pollutant: Indicator Bacteria
Final Listing Decision: Delist from 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Delist from 303(d) list (TMDL required list)(2012)
Revision Status Original
Reason for Delisting: Flaws in original listing
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for removal from the section 303(d) list under section 4 of the Listing Policy. The Policy calls for the delisting of waters if the decision is found to be based faulty data and it is demonstrated that the listing would not have occurred in the absence of such faulty data. One line of evidence is available in the administrative record to assess this pollutant.

The bacteria indicators listing was based on a precautionary posting by the County Health Department and the posting was not backed by any data (section 3.3 of the Listing Policy).

Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for maintaining the listing for this water segment-pollutant combination.

This conclusion is based on the staff findings that no bacteria data are available to assess the status of this water body for this pollutant. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation: Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

Line of Evidence (LOE) for Decision ID 34706, Indicator Bacteria **Region 9**
San Diego Bay Shoreline, Chula Vista Marina

LOE ID: 3654

Pollutant: Indicator Bacteria
LOE Subgroup: Testimonial Evidence
Matrix: Not Specified
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 0
Number of Exceedances: 0

Data and Information Type:	PATHOGEN MONITORING	039360
Data Used to Assess Water Quality:	The Chula Vista Marina was placed on the 303(d) list for bacteria indicators in 1998. However, the area that was listed is actually south of the Chula Vista marina, rather than within the marina itself. The area south of the marina was listed in 1998 due to postings by the County Department of Public Health. According to RWQCB staff, the Health Department posted the area as a precaution because of a nearby storm drain outlet, not because they had data showing elevated bacteria levels. To the knowledge of RWQCB staff, data were never collected from the water body. The RWQCB staff support delisting this site based on the lack of evidence to support the listing.	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:		
Objective/Criterion Reference:		
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:		
Temporal Representation:		
Environmental Conditions:	Southern California has three distinct weather/hydrological conditions: summer dry weather, winter dry weather, and storm events. The data set used in this analysis includes summer and winter season data. Whether or not storm event samples are included in the data set are not known. For future water quality assessments, the RWQCB may classify bacteria samples as summer dry, winter dry, or storm event samples to ensure adequate representation of all three weather/hydrological conditions.	
QAPP Information:	QA Info Missing	
QAPP Information Reference(s):		

DECISION ID	33346	Region 9
San Diego Bay Shoreline, Chula Vista Marina		

Pollutant:	**Copper**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. A large number of samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Two of 3 samples exceeded the 3.1 ppb CTR chronic saltwater criteria and this exceeds the

allowable frequency listed in Table 3.1 of the Listing Policy. 039361
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 33346, Copper **Region 9**

San Diego Bay Shoreline, Chula Vista Marina

LOE ID:	3653
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Estuarine Habitat
Number of Samples:	3
Number of Exceedances:	2
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Data were collected by the RWQCB in 03/2004. Two of 3 samples were in exceedance for both the acute and chronic criteria. The sample collected at the north end of marina next to bridge and third pier was in exceedance of chronic criteria, but not acute (SDRWQCB, 2004c).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the CTR: the dissolved copper chronic criterion is 3.1 ppb, and the acute criterion is 4.8 ppb.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the San Diego Bay at the Chula Vista Marina, at the north end of marina next to bridge and third pier, in front of public loading dock, and at the south end of marina.
Temporal Representation:	Data were collected on 03/20/2004.
Environmental Conditions:	
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: San Diego Bay Shoreline, Tidelands Park
Water Body ID: CAX910100002002080514065 3
Water Body Type: Coastal & Bay Shoreline

DECISION ID 44200 **Region 9**
San Diego Bay Shoreline, Tidelands Park

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not Delist from 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Sources: Source Unknown
Expected TMDL Completion Date: 2021
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the section 303(d) list under section 4.3 of the Listing Policy. Under section 4.3 a single line of evidence is necessary to assess listing status.

Fifteen lines of evidence are available in the administrative record to assess this pollutant. Fifty-two of 428 samples exceed the contact recreation single sample maximum water quality objective for enterococcus. Twelve out of 62 samples exceeded the contact recreation geomean objective for enterococcus. 14 out of 396 samples exceeded the contact recreation single sample maximum for Fecal Coliform. Zero out of 72 samples exceeded the contact recreation geomean objective for Fecal Coliform. Three out of 72 samples exceeded the shellfish harvesting objective for Total Coliform. Sixty-Five out of 352 samples exceeded the shellfish harvesting single sample maximum objective for Total Coliform. Two out of 262 samples exceeded the contact recreation single sample maximum objective for Total Coliform. Zero out of 80 samples exceeded the contact recreation monthly objective for Total Coliform. 2 out of 271 samples exceeded the contact recreation single sample objective for Total Coliform.

The water body segment is identified as an AB411 beach and data collected during the time frame of April 1st to October 31st (dry weather) is assessed using a four percent exceedance percentage (sections 3.3 and 4.3 of Listing Policy). There are two additional lines of evidence for dry weather single sample and geometric mean calculations. Twenty-eight of 262 dry weather single samples and 12 of 54 geometric mean calculations exceeded the criteria for the single sample and geometric mean criteria for enterococcus, respectively. Seven out of 218 samples exceeded the contact recreation dry weather single sample objective and zero out of 118 samples exceeded the contact recreation geomean objective for Fecal Coliform. Zero out of 126 samples exceeded the contact recreation dry weather geomean objective for Total Coliform. The single sample and geometric mean results exceed the allowable limit in Section 4.3 of the listing Policy (at the applicable four percent exceedance percentage Â– AB411).

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Fifty-two of 428 samples exceed the contact recreation single sample maximum water quality objective for enterococcus. Twelve out of 62 samples exceeded the contact recreation geomean

objective for enterococcus. 14 out of 396 samples exceeded the contact recreation single sample maximum for Fecal Coliform. Zero out of 72 samples exceeded the contact recreation geomean objective for Fecal Coliform. Three out of 72 samples exceeded the shellfish harvesting objective for Total Coliform. Sixty-Five out of 352 samples exceeded the shellfish harvesting single sample maximum objective for Total Coliform. Two out of 262 samples exceeded the contact recreation single sample maximum objective for Total Coliform. Zero out of 80 samples exceeded the contact recreation monthly objective for Total Coliform. 2 out of 271 samples exceeded the contact recreation single sample objective for Total Coliform and this exceeds the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Twenty-eight of 262 dry weather single samples and 12 of 54 geometric mean calculations exceeded the criteria for the single sample and geometric mean criteria for enterococcus, respectively. Seven out of 218 samples exceeded the contact recreation dry weather single sample objective and zero out of 118 samples exceeded the contact recreation geomean objective for Fecal Coliform. Zero out of 126 samples exceeded the contact recreation dry weather geomean objective for Total Coliform. The single sample and geometric mean results exceed the allowable limit in Section 4.3 of the listing Policy (at the applicable four percent exceedance percentage Â– AB411).
5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 44200, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, Tidelands Park

LOE ID:	75651
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	72
Number of Exceedances:	3
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Three of the 72 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Tidelands Park site.
Temporal Representation:	Samples were collected from April 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44200, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, Tidelands Park 039364

LOE ID:	75652
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	72
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 72 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Tidelands Park site.
Temporal Representation:	Samples were collected from April 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44200, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, Tidelands Park

LOE ID:	75653
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	81
Number of Exceedances:	5
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed bw data for San Diego Bay Shoreline, Tidelands Park to determine beneficial use support and results are as follows: 5 of 81 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The Water Quality Control Plan (Basin Plan 2011)states the following: At all areas where shellfish may be harvested for human consumption, ten percent of the samples collected during any 30-day period shall not exceed 230 MPN/100mL.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Data for this line of evidence for San Diego Bay Shoreline, Tidelands Park was collected at 1 monitoring site [Tidelands Park]
Temporal Representation: Data was collected over the time period 4/2/2008-8/23/2010.
Environmental Conditions: Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 44200, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, Tidelands Park

LOE ID: 75654

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 72
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Zero of the 72 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at the Tidelands Park site.
Temporal Representation: Samples were collected from April 2008 to August 2010.
Environmental Conditions:
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 44200, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, Tidelands Park

LOE ID: 27346

Pollutant: Enterococcus
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 62
Number of Exceedances: 12

Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 271 single samples were collected with 62 monthly geomeans calculated. Twelve of the 62 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Tidelands Park (bayside), San Diego, California. Station identification number is EH-070.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44200, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, Tidelands Park

LOE ID:	28297
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	135
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were 135 beach advisory days for this section of shoreline. Bacteriological samples are collected on a weekly basis at ocean and bay locations in San Diego County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that an advisory for waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 - December 2007. Data used was the number of days the beach was advisories were issued when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report

SWAMP Data:	Non-SWAMP	039367
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.	
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960	
Evaluation Guideline:		
Guideline Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Spatial Representation:	Beach advisories were from Tidelands Park located in San Diego Bay.	
Temporal Representation:	The beach closures covers the time frame of January January 2001 to December 2007.	
Environmental Conditions:		
QAPP Information:	Samples were collected in compliance with County of San Diego's Quality Assessment/Quality Control document	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44200, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, Tidelands Park

LOE ID:	3655
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	569
Number of Exceedances:	28
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Data were collected by the City of San Diego from 1999-2003. For enterococcus, 3 of 17 calculated geomeans were in exceedance and 20 of 166 samples were in exceedance of the single sample standard. For fecal coliform, 0 of 17 geomeans were in exceedance and 5 of 171 single samples were in exceedance. For total coliform, 0 of 17 geomeans were in exceedance. Where the FC/TC ratio was below 0.1, 0 samples were in exceedance of 10.000 colonies/100mL. Where the ratio was greater than 0.1, 4 of 171 samples were in exceedance of 1,000 colonies/100 mL geomean standard (City of San Diego, 2004).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	AB411 standards: for fecal coliform: 30-day avg. is 200 colonies/100 mL, single sample standard is 400 colonies/100 mL. For total coliform: 30-day avg. is 1,000 colonies/100 mL, single sample standard is 10,000 colonies/100 mL. If fecal/total ratio is greater than 0.1, the single sample maximum for total coliform is 1,000 colonies/100 mL. The AB411 standard for enterococcus for the 30-day avg. is 35 colonies/100mL, single sample maximum is 104 colonies/100 mL.
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at San Diego Bay at Tidelands Park (bayside). Samples were collected at 3 locations in relation to one another. One location was labeled EH-070-50-L (left), the next labeled EH-070-0-M (middle), and the last was labeled EH-070-75-R (right).
Temporal Representation:	Samples were collected from 3/1999 to 5/2003.
Environmental Conditions:	Southern California has three distinct weather/hydrological conditions: summer dry weather, winter dry weather, and storm events. The data set used in this analysis includes summer and winter season data. Whether or not storm event samples are included in the data set are not known. For future water quality assessments, the RWQCB may classify bacteria samples as summer dry, winter dry, or storm event samples to ensure adequate representation of all three weather/hydrological conditions.
QAPP Information:	QA Info Missing
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44200, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, Tidelands Park

LOE ID:	30879
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	262
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 271 single samples were collected of which 262 are dry weather (AB411) samples with two of those samples exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Tidelands Park (bayside), San Diego, California. Station identification number is EH-070.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44200, Indicator Bacteria 039369 Region 9

San Diego Bay Shoreline, Tidelands Park

LOE ID:	31332
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	46
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from May 1999 through October 2007. A total of 203 dry month (April through October) single samples were collected with 46 dry month geomeans calculated. None of the 46 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Tidelands Park (bayside), San Diego, California. Station identification number is EH-070.
Temporal Representation:	Samples were collected from May 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44200, Indicator Bacteria Region 9

San Diego Bay Shoreline, Tidelands Park

LOE ID:	31333
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	54
Number of Exceedances:	0

Data and Information Type:	PWS pathogen monitoring (ambient water) 039370
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from May 1999 through October 2007. A total of 249 dry month (April through October) single samples were collected with 54 dry month geomeans calculated. None of the 54 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Tidelands Park (bayside), San Diego, California. Station identification number is EH-070.
Temporal Representation:	Samples were collected from May 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44200, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, Tidelands Park

LOE ID:	30773
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	218
Number of Exceedances:	7
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 225 single samples were collected of which 218 are dry weather (AB411) samples with seven samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental

Protection Agency 039371

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Tidelands Park (bayside), San Diego, California. Station identification number is EH-070.
Temporal Representation: Samples were collected from January 1999 through December 2007.
Environmental Conditions:
QAPP Information: Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s): County of Orange. Quality Assurance/Quality Control Manual, February 2004
County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44200, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, Tidelands Park

LOE ID: 30672

Pollutant: Enterococcus
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 262
Number of Exceedances: 28

Data and Information Type: PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality: Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 271 single samples were collected of which 262 are dry weather (AB411) samples with 28 samples exceeding the single sample water quality objective.
Data Reference: Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: Geomean: Enterococcus density shall not exceed 35 per 100 ml.

Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference: Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Tidelands Park (bayside), San Diego, California. Station identification number is EH-070.
Temporal Representation: Samples were collected from January 1999 through December 2007.
Environmental Conditions:
QAPP Information: Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s): County of Orange. Quality Assurance/Quality Control Manual, February 2004
County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44200, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, Tidelands Park 039372

LOE ID:	31331
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	54
Number of Exceedances:	12
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from May 1999 through October 2007. A total of 250 dry month (April through October) single samples were collected with 54 dry month geomeans calculated. Twelve of the 54 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Tidelands Park (bayside), San Diego, California. Station identification number is EH-070.
Temporal Representation:	Samples were collected from May 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44200, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, Tidelands Park

LOE ID:	27336
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	271
Number of Exceedances:	60
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999

	through December 2007. A total of 271 single samples were collected with 9 samples exceeded the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005). Comparisons were also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Tidelands Park (bayside), San Diego, California. Station identification number is EH-070.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44200, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, Tidelands Park

LOE ID:	27337
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	9
Number of Exceedances:	5
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 271 single samples were collected with 9 samples correlated with a storm event. Five of the 9 samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005). Comparisons are also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental

Protection Agency 039374

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Tidelands Park (bayside), San Diego, California. Station identification number is EH-070.

Temporal Representation: Samples were collected from January 1999 through December 2007.

Environmental Conditions:

QAPP Information: Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.

QAPP Information Reference(s): County of Orange. Quality Assurance/Quality Control Manual, February 2004
County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44200, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, Tidelands Park

LOE ID: 27338

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 271
Number of Exceedances: 2

Data and Information Type: PWS pathogen monitoring (ambient water)

Data Used to Assess Water Quality: Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 271 single samples were collected with 2 samples exceeding the single sample water quality objective.

Data Reference: National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: Geomean: Total coliform density shall not exceed 1,000 per 100ml;

Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).

Objective/Criterion Reference: Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Tidelands Park (bayside), San Diego, California. Station identification number is EH-070.

Temporal Representation: Samples were collected from January 1999 through December 2007.

Environmental Conditions:

QAPP Information: Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.

QAPP Information Reference(s): County of Orange. Quality Assurance/Quality Control Manual, February 2004
County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44200, Indicator Bacteria 039375 Region 9

San Diego Bay Shoreline, Tidelands Park

LOE ID:	27339
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 271 single samples were collected with 9 samples correlated with a storm event. None of the 9 samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005). Comparisons were also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Tidelands Park (bayside), San Diego, California. Station identification number is EH-070.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44200, Indicator Bacteria Region 9

San Diego Bay Shoreline, Tidelands Park

LOE ID:	27340
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation	039376
Number of Samples:	225	
Number of Exceedances:	8	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 225 single samples were collected with 8 samples exceeding the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Tidelands Park (bayside), San Diego, California. Station identification number is EH-070.	
Temporal Representation:	Samples were collected from January 1999 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44200, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, Tidelands Park

LOE ID:	27341
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	7
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 225 single samples were collected with 7 samples correlated with a storm event. One of the 7 samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; 039377 Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005). Comparisons are also made only for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Tidelands Park (bayside), San Diego, California. Station identification number is EH-070.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44200, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, Tidelands Park

LOE ID:	27342
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	271
Number of Exceedances:	32
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 271 single samples were collected with 32 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Tidelands Park (bayside), San Diego, California. Station identification number is EH-070.
Temporal Representation:	Samples were collected from January 1999 through December 2007.

Environmental Conditions:	039378
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44200, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, Tidelands Park

LOE ID:	27343
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	9
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 271 single samples were collected with 9 samples correlated with a storm event. Four of the 9 samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005). Comparisons are also made for days with matching bacteria and storm event data. A storm event is defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Tidelands Park (bayside), San Diego, California. Station identification number is EH-070.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44200, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, Tidelands Park

LOE ID:	27344	039379

Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	63
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 271 single samples were collected with 63 monthly geomeans calculated. None of the 63 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Tidelands Park (bayside), San Diego, California. Station identification number is EH-070.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44200, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, Tidelands Park

LOE ID:	27345
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	55
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 225 single samples were collected and 55 geomeans calculated. None of the 55 geomeans exceeded the geomean water quality objective.

Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Tidelands Park (bayside), San Diego, California. Station identification number is EH-070.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44200, Indicator Bacteria **Region 9**

San Diego Bay Shoreline, Tidelands Park

LOE ID:	77700
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	72
Number of Exceedances:	3
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Three of the 72 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The Water Quality Control Plan for the San Diego BasinÂ states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at San Diego Bay Shoreline, Tidelands Park.
Temporal Representation:	The samples were collected from April 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.

QAPP Information Reference(s): 039381

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Paleta Creek
Water Body ID: CAR9083100020080825092823
Water Body Type: River & Stream

DECISION ID 41404 **Region 9**
Paleta Creek

Pollutant: **Arsenic**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Original
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the samples exceed the water quality objective for arsenic.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of three samples exceeded the arsenic water quality objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 41404, Arsenic **Region 9**
Paleta Creek

LOE ID: 7160

Pollutant: Arsenic
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use:	Warm Freshwater Habitat	039383
Number of Samples:	3	
Number of Exceedances:	0	
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)	
Data Used to Assess Water Quality:	None of the 3 samples exceed the water quality objective as outlined in Monitoring and Modeling of Chollas, Switzer, and Paleta Creek, May 2007.	
Data Reference:	Monitoring and Modeling of Chollas, Switzer, and Paleta Creek, Southern California Coastal Water Research Project	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the CTR the Arsenic water quality objective for maximum freshwater concentration is 340 ug/L and continuous freshwater concentration is 150 ug/L (U.S. EPA, 2000).	
Objective/Criterion Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at 1 monitoring station on Paleta Creek.	
Temporal Representation:	Samples were collected during 3 storm events in 2006.	
Environmental Conditions:		
QAPP Information:	QA/QC conducted according to 40 CFR 136.	
QAPP Information Reference(s):		

DECISION ID	42881	Region 9
Paleta Creek		

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the samples exceed the water quality objective for cadmium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the three samples exceeded the cadmium water quality objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 42881, Cadmium **Region 9**

Paleta Creek

LOE ID:	7162
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	None of the three samples exceed the water quality objective from results in Monitoring and Modeling of Chollas, Switzer, and Paleta Creek, May 2007.
Data Reference:	Monitoring and Modeling of Chollas, Switzer, and Paleta Creek, Southern California Coastal Water Research Project
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the CTR, the Cadmium water quality objective for maximum freshwater concentration is 4.3 ug/L and continuous freshwater concentration is 2.2 ug/L (U.S. EPA, 2000).
Objective/Criterion Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at 1 monitoring station on Paleta Creek.
Temporal Representation:	Samples were collected during 3 storm events in 2006.
Environmental Conditions:	
QAPP Information:	QA/QC conducted according to 40 CFR 136.
QAPP Information Reference(s):	

DECISION ID **43587** **Region 9**

Paleta Creek

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. One of the three samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of three samples exceeded the chromium water quality objective and his sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 43587, Chromium **Region 9**

Paleta Creek

LOE ID:	7164
Pollutant:	Chromium (total)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	1
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	One of three samples exceeded the chronic water quality objective as outlined in Monitoring and Modeling of Chollas, Switzer, and Paleta Creek, May 2007.
Data Reference:	Monitoring and Modeling of Chollas, Switzer, and Paleta Creek, Southern California Coastal Water Research Project
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the CTR, the Chromium water quality objective for maximum freshwater concentration is 16 ug/L and continuous freshwater concentration is 11 ug/L (U.S. EPA, 2000).
Objective/Criterion Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at 1 monitoring station on Paleta Creek.
Temporal Representation:	Samples were collected during 3 storm events in 2007.
Environmental Conditions:	
QAPP Information:	QA/QC conducted according to 40 CFR 136.
QAPP Information Reference(s):	

DECISION ID **43616** **Region 9**

Paleta Creek

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the samples exceed the water quality objective for Nickel.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of three samples exceeded the Nickel water quality objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43616, Nickel **Region 9**

Paleta Creek

LOE ID:	7172
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	None of the three samples exceed the chronic water quality objectives as outlined in Monitoring and Modeling of Chollas, Switzer, and Paleta Creek, May 2007.
Data Reference:	Monitoring and Modeling of Chollas, Switzer, and Paleta Creek, Southern California Coastal Water Research Project
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the CTR, the Nickel water quality objective for maximum freshwater concentration is 460 ug/L and continuous freshwater concentration is 52 ug/L (U.S. EPA, 2000).

Objective/Criterion Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at 1 monitoring station on Paleta Creek.
Temporal Representation:	Samples were collected during 3 storm events in 2006.
Environmental Conditions:	
QAPP Information:	QA/QC conducted according to 40 CFR 136.
QAPP Information Reference(s):	

DECISION ID 43656 Region 9

Paleta Creek

Pollutant:	**Selenium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. None of the samples exceed the water quality objective for selenium. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of three samples exceeded the selenium water quality objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 43656, Selenium Region 9

Paleta Creek

LOE ID:	7167
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total

Beneficial Use:	Warm Freshwater Habitat	039388
Number of Samples:	3	
Number of Exceedances:	0	
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)	
Data Used to Assess Water Quality:	None of the three samples exceeded the chronic water quality objective as outlined in Monitoring and Modeling of Chollas, Switzer, and Paleta Creek, May 2007.	
Data Reference:	Monitoring and Modeling of Chollas, Switzer, and Paleta Creek, Southern California Coastal Water Research Project	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the CTR, the Selenium water quality objective for continuous freshwater concentration is 5.0 ug/L (U.S. EPA, 2000).	
Objective/Criterion Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at 1 monitoring station on Paleta Creek.	
Temporal Representation:	Samples were collected during 3 storm events in 2006.	
Environmental Conditions:		
QAPP Information:	QA/QC conducted according to 40 CFR 136.	
QAPP Information Reference(s):		

DECISION ID	42983	Region 9
Paleta Creek		

Pollutant:	**Silver**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. None of the samples exceed the water quality objective for silver. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of three samples exceeded the silver water quality objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not

changed. 039389

Line of Evidence (LOE) for Decision ID 42983, Silver Paleta Creek **Region 9**

LOE ID:	7170
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	None of the single sample exceed the acute water quality as outlined in Monitoring and Modeling of Chollas, Switzer, and Paleta Creek, May 2007.
Data Reference:	Monitoring and Modeling of Chollas, Switzer, and Paleta Creek, Southern California Coastal Water Research Project
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the CTR, the Silver water quality objective for maximum freshwater concentration is 3.4 ug/L (U.S. EPA, 2000).
Objective/Criterion Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at 1 monitoring station on Paleta Creek.
Temporal Representation:	Samples were collected during 3 storm events in 2007.
Environmental Conditions:	
QAPP Information:	QA/QC conducted according to 40 CFR 136.
QAPP Information Reference(s):	

DECISION ID 43571 Paleta Creek **Region 9**

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. One of the 3 samples exceed the California Toxics Rule criteria for Zinc.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of 3 samples exceeded the California Toxics Rule objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43571, Zinc **Region 9**

Paleta Creek

LOE ID:	7171
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	1
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	One of three samples exceed the chronic water quality objective as outlined in Monitoring and Modeling of Chollas, Switzer, and Paleta Creek, May 2007.
Data Reference:	Monitoring and Modeling of Chollas, Switzer, and Paleta Creek, Southern California Coastal Water Research Project
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the CTR, the zinc water quality objective for maximum freshwater concentration is 120 ug/L and continuous freshwater concentration is 120 ug/L
Objective/Criterion Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at 1 monitoring station on Paleta Creek.
Temporal Representation:	Samples were collected during 3 storm events in 2007.
Environmental Conditions:	
QAPP Information:	QA/QC conducted according to 40 CFR 136.
QAPP Information Reference(s):	

DECISION ID **43588** **Region 9**

Paleta Creek

Pollutant:	**Copper**	039391
Final Listing Decision:	**List on 303(d) list (TMDL required list)**	
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)	
Revision Status	Original	
Sources:	Source Unknown	
Expected TMDL Completion Date:	2021	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. All three of the samples exceed the water quality objective for copper.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. All three samples exceed the copper water quality objective and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43588, Copper **Region 9**

Paleta Creek

LOE ID:	7166
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	3
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	All three samples exceeded the chronic water quality objective as outlined in Monitoring and Modeling of Chollas, Switzer, and Paleta Creek, May 2007.
Data Reference:	Monitoring and Modeling of Chollas, Switzer, and Paleta Creek, Southern California Coastal Water Research Project
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the CTR, the Copper water quality objective for maximum freshwater concentration is 14 ug/L and continuous freshwater concentration is 9 ug/L (U.S. EPA, 2000).

Objective/Criterion Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at 1 monitoring station on Paleta Creek.
Temporal Representation:	Samples were collected during 3 storm events in 2006.
Environmental Conditions:	
QAPP Information:	QA/QC conducted according to 40 CFR 136.
QAPP Information Reference(s):	

039392

DECISION ID 41664 Region 9

Paleta Creek

Pollutant:	**Lead**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. All three of the samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. All three of the samples exceed the lead water quality objective and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 41664, Lead Region 9

Paleta Creek

LOE ID:	7168
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water

Matrix:	Water	039393
Fraction:	Total	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	3	
Number of Exceedances:	3	
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)	
Data Used to Assess Water Quality:	All three samples exceed the chronic water quality objective as outlined in Monitoring and Modeling of Chollas, Switzer, and Paleta Creek, May 2007.	
Data Reference:	Monitoring and Modeling of Chollas, Switzer, and Paleta Creek, Southern California Coastal Water Research Project	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the CTR, the Lead water quality objective for maximum freshwater concentration is 82 ug/L and continuous freshwater concentration is 3 ug/L (U.S. EPA, 2000).	
Objective/Criterion Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at 1 monitoring station on Paleta Creek.	
Temporal Representation:	Samples were collected during 3 storm events in 2006.	
Environmental Conditions:		
QAPP Information:	QA/QC conducted according to 40 CFR 136.	
QAPP Information Reference(s):		

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: San Dieguito River
Water Body ID: CAR9051100020080825090830
Water Body Type: River & Stream

DECISION ID 43139 **Region 9**
San Dieguito River

Pollutant: Toxicity
Final Listing Decision: Do Not Delist from 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Sources: Source Unknown
Expected TMDL Completion Date: 2021
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the section 303(d) list under section 3.6 of the Listing Policy. Under section 3.6 a single line of evidence is necessary to assess listing status.

Four lines of evidence are available in the administrative record to assess this pollutant. Twenty-seven of the 43 samples exceed the water quality objective for toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. wenty-seven of the 43 samples exceed the water quality objective for toxicity, and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 43139, Toxicity **Region 9**
San Dieguito River

LOE ID: 24991

Pollutant: Toxicity
LOE Subgroup: Toxicity
Matrix: Water
Fraction: None

Beneficial Use: Warm Freshwater Habitat

Number of Samples: 4

Number of Exceedances:	4	039395
Data and Information Type:	Ambient toxicity testing (chronic)	
Data Used to Assess Water Quality:	Selenastrum capricornutum- (used for the 303(d) Listing) three samples were collected and three samples show significant toxicity levels (SL) and Compliant with QAPP as determined by the Selenastrum capricornutum growth test. Other Toxicity Tests: Ceriodaphnia dubia- Four samples were collected and two samples show significant toxicity levels (SL) as determined by the Ceriodaphnia dubia survival/reproductive test. Hyalella azteca- Two samples were collected and neithered show significant toxicity levels (SL) as determined by the Hyalella azteca growth and survival test according to results in the Surface Water Ambient Monitoring Program Annual Progress Report, 2007. Samples were collected in January, April, May and September 2003.	
Data Reference:	Monitoring data for Region 9	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (RWQCB, 2007).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.	
Guideline Reference:	Monitoring data for Region 9	
Spatial Representation:	Samples were collected at the monitoring station San Dieguito 9 (station id: 905SDSDQ9 lat/long: 32.97877/-117.23506), located on the main stem of the San Dieguito River.	
Temporal Representation:	Samples were collected in January, April, May and September 2003.	
Environmental Conditions:		
QAPP Information:	QA/QC conducted in accordance with the Surface Ambient Monitoring Program.	
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA	

Line of Evidence (LOE) for Decision ID 43139, Toxicity **Region 9**

San Dieguito River

LOE ID:	75829
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	23
Number of Exceedances:	14
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Twenty-three samples were collected to test for toxicity. Fourteen of the 23 samples exhibited statistically significant toxicity. The toxicity tests that exhibited significant toxicity included survival of Hyalella azteca, growth of Selenastrum capriconutum and survival and reproduction of Ceriodaphnia dubia.
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected at stations 905SDC-MLS San Dieguito Creek.
Temporal Representation:	The samples were collected from 2001 to 2008.
Environmental Conditions:	
QAPP Information:	The data was collected under the County of San Diego Co-Permittees Receiving Waters Urban Runoff Monitoring and Reporting Program (Order No. 2007-01). Data quality is good.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 43139, Toxicity **Region 9**

San Dieguito River

LOE ID:	7492
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	15
Number of Exceedances:	9
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Ceriodaphnia dubia- Six of fifteen samples collected were found to be toxic as determined by the Ceriodaphnia dubia survival/reproductive test. Hyalella azteca- None of the fifteen samples collected were found to be toxic as determined by the Hyalella azteca survival test. Selenastrum capricornutum- Five of fifteen samples collected were found to be toxic as determined by the Selenastrum capricornutum growth test.
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms. Fourth Edition. Office of Water, U.S. Environmental Protection Agency. Washington, D.C. EPA-821-R-02-013
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Samples were found to exhibit toxicity when the No Observed Effect Concentration (NOEC) or median lethal concentration (LC50) for any given species was estimated to be less than 100% of the test sample concentration.

Guideline Reference:	Waste Discharge Requirements for Discharges of Urban Runoff From the Municipal Separate Storm Sewer Systems Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego, the San Diego Unified Port District, and the San Diego County Regional Airport. Order No. R9-2007-0001
Spatial Representation:	Samples were collected at the mass loading station located near the lower boundary of the watershed behind the Morgan Run Golf Course maintenance shop along a natural channel off Via De La Valle.
Temporal Representation:	Samples were collected one to four times a year from 2001-2006.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	QA/QC conducted according to Weston Solutions quality assurance plan.
QAPP Information Reference(s):	Weston Solutions, 2004. Quality Management Manual. March 2004 (Revised December 2009).

Line of Evidence (LOE) for Decision ID 43139, Toxicity **Region 9**

San Dieguito River

LOE ID:	75830
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to test for toxicity. None of the samples exhibited statistically and biologically significant toxicity. The toxicity tests included survival and reproduction of Ceriodaphnia dubia.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control. Additionally, the biological significance of the sample is evaluted by determining whether the sample response is lower than the evaluation threshold
Guideline Reference:	
Spatial Representation:	The samples were collected from site 905_SMC00473, San Dieguito Creek
Temporal Representation:	The samples were collected in June 2009.
Environmental Conditions:	
QAPP Information:	This data was collected for the Regional Monitoring Of Southern California's Coastal Watersheds - Stormwater Monitoring Coalition Bioassessment Working Group. CRG Marine Laboratories Quality Assurance Program Document was provided.
QAPP Information Reference(s):	e-mail clarifying QAPP information

DECISION ID 41468 **Region 9**

San Dieguito River

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not Delist from 303(d) list (being addressed with USEPA approved TMDL)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Agriculture | Highway/Road/Bridge Runoff | Municipal Point Sources | Urban Runoff/Storm Sewers
TMDL Name:	Bacteria Impaired Waters I (creeks and beach shorelines)
TMDL Project Code:	169
Date TMDL Approved by USEPA:	06/22/2011
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal from the section 303(d) list under section 4.3 of the Listing Policy. Under section 4.3 a single line of evidence is necessary to assess listing status.

Five lines of evidence is available in the administrative record to assess this pollutant. Nineteen of 21 of the samples exceed the Basin Plan water quality objective for Enterococcus. Twelve of 22 samples exceed the Basin Plan water quality objective for Fecal Coliform. One of 7 samples exceed the Basin Plan water quality objective for Total Coliform.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3.Nineteen of 21 of the samples exceed the Basin Plan water quality objective for Enterococcus. Twelve of 22 samples exceed the Basin Plan water quality objective for Fecal Coliform. One of 7 samples exceed the Basin Plan water quality objective for Total Coliform., and this exceeds the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 41468, Indicator Bacteria **Region 9**

San Dieguito River

LOE ID:	7371
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	15
Number of Exceedances:	8
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Eight of fifteen samples collected exceed the water quality objective according to results in the San Diego County Municipal Copermittees Urban Runoff Monitoring Report, 2007. Samples were collected one to three times a year from 2001-2006.
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report

SWAMP Data:	Non-SWAMP	039399
Water Quality Objective/Criterion:	From the Basin Plan, no more than 10% of the samples during any 30-day period for waters designated for contact recreation shall exceed 400 per 100 ml (RWQCB, 2007).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at the mass loading station located near the lower boundary of the watershed behind the Morgan Run Golf Course maintenance shop along a natural channel off Via De La Valle.	
Temporal Representation:	Samples were collected one to three times a year from 2001-2006.	
Environmental Conditions:	Samples were collected during wet weather.	
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 41468, Indicator Bacteria **Region 9**

San Dieguito River

LOE ID:	75795
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	6
Number of Exceedances:	4
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Dieguito River to determine beneficial use support and results are as follows: 4 of 6 samples exceed the criterion for Enterococci.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Samples shall not exceed 61 organisms per 100 ml for enterococcus in waters designated for REC I beneficial use (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Dieguito River was collected at 1 monitoring site [San Dieguito River @ El Apajo (end)]
Temporal Representation:	Data was collected over the time period 6/10/2003-6/18/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 41468, Indicator Bacteria **Region 9**

San Dieguito River

LOE ID:	75807	039400

Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	7
Number of Exceedances:	4
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Dieguito River to determine beneficial use support and results are as follows: 4 of 7 samples exceed the criterion for Coliform, Fecal.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the fecal coliform concentration shall not exceed 400 MPN/100 ml.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Dieguito River was collected at 1 monitoring site [San Dieguito River @ El Apajo (end)]
Temporal Representation:	Data was collected over the time period 6/10/2003-6/18/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 41468, Indicator Bacteria **Region 9**

San Dieguito River

LOE ID:	7311
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	15
Number of Exceedances:	15
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	All fifteen samples collected exceed the water quality objective according to the San Diego County Municipal Copermittees Urban Runoff Monitoring Report, January 2007. Samples were collected one to three times a year from 2001 to 2006.
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, the criteria for enterococcus sets a maximum limit at 61 colonies per 100mL (RWQCB, 2007).

Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	039401
Evaluation Guideline:		
Guideline Reference:	Water Quality Control Plan for the San Diego Basin	
Spatial Representation:	Samples were collected at the mass loading station located near the lower boundary of the watershed behind the Morgan Run Golf Course maintenance shop along a natural channel off Via De La Valle.	
Temporal Representation:	Samples were collected one to three times a year from 2001-2006.	
Environmental Conditions:	Samples were collected during wet weather.	
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 41468, Indicator Bacteria **Region 9**

San Dieguito River

LOE ID:	75828
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	7
Number of Exceedances:	1
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Dieguito River to determine beneficial use support and results are as follows: 1 of 7 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxicsubstances in concentrations which are toxic to,or which produce detrimental physiologicalresponses in human, plant, animal, or indigenousaquatic life (Basin Plan).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In waters designated for water contact recreation (REC I), the total coliform concentration shall not exceed 10000 MPN/100 ml (CDPH 2006).
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.
Spatial Representation:	Data for this line of evidence for San Dieguito River was collected at 1 monitoring site [San Dieguito River @ El Apajo (end)]
Temporal Representation:	Data was collected over the time period 6/10/2003-6/18/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **49032** **Region 9**

San Dieguito River

Pollutant:	**Arsenic**	039402
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	
Last Listing Cycle's Final Listing Decision:	New Decision	
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 28 samples exceed the Objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the 28 samples exceeded the Objective and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 49032, Arsenic **Region 9**

San Dieguito River

LOE ID:	75740
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Dieguito River to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The dissolved arsenic criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved arsenic is 0.150 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	

Guideline Reference:	039403
Spatial Representation:	Data for this line of evidence for San Dieguito River was collected at 1 monitoring site [San Dieguito Creek - 905_SMC00473]
Temporal Representation:	Data was collected on a single day 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

Line of Evidence (LOE) for Decision ID 49032, Arsenic **Region 9**

San Dieguito River

LOE ID:	78105
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	27
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Dieguito River to determine beneficial use support and results are as follows: 0 of 27 samples exceed the criterion for Arsenic.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The dissolved arsenic criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved arsenic is 0.150 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Dieguito River was collected at 2 monitoring sites [San Dieguito Creek - 905SDC-MLS, San Pasqual Creek - 905SDC-TWAS-2]
Temporal Representation:	Data was collected over the time period 11/29/2001-11/12/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID **49769** **Region 9**

San Dieguito River

Pollutant:	**Benthic-Macroinvertebrate Bioassessments**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final	New Decision

Listing Decision:		039404
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

Benthic Community Effects is being considered for placement on the CWA section 303(d) List under sections 3.9 of the Listing Policy. Under section 3.9, an additional line of evidence associating the Benthic Community Effects with a water or sediment concentration of pollutants is necessary to assess listing status. Three lines of evidence are available in the administrative record to assess this indicator. Twelve out of 13 samples exceeded the objective for freshwater habitat beneficial use..

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing Benthic Community Effects in this water segment on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Twelve of 13 samples exceeded the Index of Biological Integrity (IBI) value of poor water quality for this area and this sample size is insufficient to determine with the power and confidence of the Listing Policy if standards are not met. A minimum of 2 samples is needed to determine impairment using Table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 49769, Benthic-Macroinvertebrate Bioassessments **Region 9**

San Dieguito River

LOE ID:	79544
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	12
Number of Exceedances:	8
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	12 samples were taken at 3 stations along the San Dieguito River. Eight of twelve CSCI scores for this site are below the 0.79 threshold, and therefore are is exceeding the water quality objective for the aquatic life beneficial use.
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008. Bioassessment Data for Various Pollutants from Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009. Region 9 CSCI Scores & Water Body Information
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.
Guideline Reference:	The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.
Spatial Representation:	The samples were collected at stations 905SSD-DDH SMC00473 905SDC-MLS
Temporal Representation:	The samples were collected from 2002 to 2009.
Environmental Conditions:	
QAPP Information:	The data was collected under the County of San Diego NPDES MS4 Copermittees Receiving Waters Monitoring and Reporting Program and the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan.
QAPP Information Reference(s):	e-mail clarifying QAPP information Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008. Bioassessment Data for Various Pollutants from Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.

Line of Evidence (LOE) for Decision ID 49769, Benthic-Macroinvertebrate Bioassessments **Region 9**

San Dieguito River

LOE ID:	75742
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	12
Number of Exceedances:	11
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Eleven of the twelve samples collected had IBI scores below 40. NPDES bioassessment
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the State or Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	

Spatial Representation:	The samples were collected at stations 905SDC-MLS, San Dieguito Creek; 905SDC-TWAS-2, San Pasqual Creek and SD-DDH, San Dieguito River. R9 suggest separating San Pasqual station from SD-DDH.
Temporal Representation:	The samples were collected from October 2002 to May 2008.
Environmental Conditions:	
QAPP Information:	The data was collected under the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan, June 25, 2009.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 49769, Benthic-Macroinvertebrate Bioassessments **Region 9**

San Dieguito River

LOE ID:	75741
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	The one sample collected had an IBI score below 40. The score was 5.7. SMC bioassessment
Data Reference:	Bioassessment Data for Various Pollutants from Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the State or Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	Development of a Benthic Index of Biotic Integrity (B-IBI) for Wadeable Streams in Northern Coastal California and its Application to Regional 305(b) Assessment
Spatial Representation:	The sample was collected at 905_SMC00473, San Dieguito Creek .
Temporal Representation:	The sample was collected in June 2009.
Environmental Conditions:	
QAPP Information:	The data was collected under the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan, June 25, 2009.
QAPP Information Reference(s):	e-mail clarifying QAPP information

DECISION ID **49340** **Region 9**

San Dieguito River

Pollutant: **Bifenthrin**

Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	039407
Last Listing Cycle's Final Listing Decision:	New Decision	
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollution	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. One of the One samples exceed the Evaluation Guideline for Bifenthrin.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of One samples exceeded the Evaluation Guideline for Bifenthrin and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49340, Bifenthrin **Region 9**

San Dieguito River

LOE ID:	78107
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Dieguito River to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Bifenthrin.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).

Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	039408
Evaluation Guideline:	The UC Davis Criteria for Bifenthrin for the protection of aquatic organisms is a 4 day average of 0.0006 ug/L (Fojut et al. 2012).	
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.	
Spatial Representation:	Data for this line of evidence for San Dieguito River was collected at 1 monitoring site [San Dieguito Creek - 905_SMC00473]	
Temporal Representation:	Data was collected on a single day 6/3/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.	

Line of Evidence (LOE) for Decision ID 49340, Bifenthrin **Region 9**

San Dieguito River

LOE ID:	75752
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Dieguito River to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Bifenthrin.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Bifenthrin does not exceed 0.0006 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for San Dieguito River was collected at 2 monitoring sites [San Dieguito Creek - 905SDC-MLS, San Pasqual Creek - 905SDC-TWAS-2]
Temporal Representation:	Data was collected over the time period 11/30/2007-11/12/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID **49373** **Region 9**

San Dieguito River

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Four lines of evidence are available in the administrative record to assess this pollutant. Zero of the 32 samples exceed the Objective

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the 32 samples exceed the Objective and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 49373, Cadmium **Region 9**

San Dieguito River

LOE ID:	75754
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for San Dieguito River to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to

	protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Dieguito River was collected at 1 monitoring site [San Dieguito Creek - 905_SMC00473]
Temporal Representation:	Data was collected on a single day 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

Line of Evidence (LOE) for Decision ID 49373, Cadmium **Region 9**

San Dieguito River

LOE ID:	75753
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Dieguito River to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Dieguito River was collected at 1 monitoring site [San Dieguito River @ El Apajo (end)]
Temporal Representation:	Data was collected 6/10/2003 - 6/18/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 49373, Cadmium **Region 9**

San Dieguito River 039411

LOE ID:	75767
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	25
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for San Dieguito River to determine beneficial use support and results are as follows: 0 of 25 samples exceed the criterion for Cadmium.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Cadmium to protect aquatic life in freshwater. The dissolved Cadmium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Dieguito River was collected at 2 monitoring sites [San Dieguito Creek - 905SDC-MLS, San Pasqual Creek - 905SDC-TWAS-2]
Temporal Representation:	Data was collected over the time period 11/29/2001-11/12/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID **49378** **Region 9**

San Dieguito River

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 20 samples exceed the Water Quality Criteria for Chlorpyrifos.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 20 samples exceeded the Water Quality Criteria for Chlorpyrifos and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 49378, Chlorpyrifos **Region 9**

San Dieguito River

LOE ID:	75768
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Dieguito River to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).
Spatial Representation:	Data for this line of evidence for San Dieguito River was collected at 1 monitoring site [San Dieguito River @ El Apajo (end)]
Temporal Representation:	Data was collected over the time period 9/23/2005-6/18/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 49378, Chlorpyrifos **Region 9**

San Dieguito River

LOE ID:	77814
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	20
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Dieguito River to determine beneficial use support and results are as follows: 0 of 20 samples exceed the criterion for Chlorpyrifos. Eight sample results were not used in the assessment because the laboratory data reporting limit(s) was above the objective and therefore the results could not be quantified with the level of certainty required by the Listing Policy.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).
Spatial Representation:	Data for this line of evidence for San Dieguito River was collected at 2 monitoring sites [San Dieguito Creek - 905SDC-MLS, San Pasqual Creek - 905SDC-TWAS-2]
Temporal Representation:	Data was collected over the time period 11/29/2001-11/12/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID **49384** **Region 9**

San Dieguito River

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised

Impairment from Pollutant or Pollution:	Pollutant	039414
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 26 samples exceed the Water Quality Criteria for Chromium. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 26 samples exceeded the Water Quality Criteria for Chromium and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.	
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.	

Line of Evidence (LOE) for Decision ID 49384, Chromium **Region 9**

San Dieguito River

LOE ID:	75769
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for San Dieguito River to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Data for this line of evidence for San Dieguito River was collected at 1 monitoring site [San Dieguito Creek - 905_SMC00473]
Temporal Representation:	Data was collected on a single day 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

Line of Evidence (LOE) for Decision ID 49384, Chromium **Region 9**

San Dieguito River

LOE ID:	75778
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	25
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for San Dieguito River to determine beneficial use support and results are as follows: 0 of 25 samples exceed the criterion for Chromium.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Chromium to protect aquatic life in freshwater. The dissolved Chromium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Dieguito River was collected at 2 monitoring sites [San Dieguito Creek - 905SDC-MLS, San Pasqual Creek - 905SDC-TWAS-2]
Temporal Representation:	Data was collected over the time period 11/29/2001-11/12/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID **49393** **Region 9**

San Dieguito River

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final	New Decision

Listing Decision:		039416
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. Zero of the 32 samples exceed the Water Quality Criteria for Copper.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 32 samples exceeded the Water Quality Criteria for Copper and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 49393, Copper **Region 9**

San Dieguito River

LOE ID:	75780
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for San Dieguito River to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	

Guideline Reference:	039417
Spatial Representation:	Data for this line of evidence for San Dieguito River was collected at 1 monitoring site [San Dieguito Creek - 905_SMC00473]
Temporal Representation:	Data was collected on a single day 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

Line of Evidence (LOE) for Decision ID 49393, Copper **Region 9**

San Dieguito River

LOE ID:	75779
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Dieguito River to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Dieguito River was collected at 1 monitoring site [San Dieguito River @ El Apajo (end)]
Temporal Representation:	Data was collected 6/10/2003 - 6/18/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 49393, Copper **Region 9**

San Dieguito River

LOE ID:	75781
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	Dissolved	039418
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	25	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for San Dieguito River to determine beneficial use support and results are as follows: 0 of 25 samples exceed the criterion for Copper.	
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Copper to protect aquatic life in freshwater. The dissolved Copper criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for San Dieguito River was collected at 2 monitoring sites [San Dieguito Creek - 905SDC-MLS, San Pasqual Creek - 905SDC-TWAS-2]	
Temporal Representation:	Data was collected over the time period 11/29/2001-11/12/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.	

DECISION ID	**49733**	**Region 9**
San Dieguito River		

Pollutant:	**Cypermethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 31 samples exceed the Criterion for the Warm Freshwater Habitat beneficial use. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.

3. Zero of the 31 samples exceed the Criterion for the Warm Freshwater Habitat beneficial use and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
5. Pursuant to section 6.1.5.5 of the Listing Policy, 3 of the samples were thrown out due to the fact that the assessment was less sensitive than the objective.

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 49733, Cypermethrin **Region 9**

San Dieguito River

LOE ID:	78111
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Dieguito River to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Cypermethrin, total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of cypermethrin does not exceed 0.0002 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Fojut et al. 2012)
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for San Dieguito River was collected at 1 monitoring site [San Dieguito Creek - 905_SMC00473]
Temporal Representation:	Data was collected on a single day 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

Line of Evidence (LOE) for Decision ID 49733, Cypermethrin **Region 9**

San Dieguito River

LOE ID:	75791
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Water

Matrix:	Water	039420
Fraction:	None	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	0	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Dieguito River to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Cypermethrin, total.	
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of cypermethrin does not exceed 0.0002 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Fojut et al. 2012)	
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.	
Spatial Representation:	Data for this line of evidence for San Dieguito River was collected at 2 monitoring sites [San Dieguito Creek - 905SDC-MLS, San Pasqual Creek - 905SDC-TWAS-2]	
Temporal Representation:	Data was collected over the time period 11/30/2007-11/12/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.	

DECISION ID	**49741**	**Region 9**
San Dieguito River		

Pollutant:	**Deltamethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the five samples exceed the objective for Warm Freshwater Habitat beneficial use for Deltamethrin. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the five samples exceed the objective for Warm Freshwater Habitat beneficial use for Deltamethrin and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 49741, Deltamethrin **Region 9**

San Dieguito River

LOE ID:	75792
Pollutant:	Deltamethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Dieguito River to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Deltamethrin.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for Deltamethrin is the maximum acceptable toxicant concentration (MATC) of 0.02 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for San Dieguito River was collected at 2 monitoring sites [San Dieguito Creek - 905SDC-MLS, San Pasqual Creek - 905SDC-TWAS-2]
Temporal Representation:	Data was collected over the time period 11/30/2007-11/12/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID **49732** **Region 9**

San Dieguito River

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 31 samples exceed the Criterion for the Warm Freshwater Habitat beneficial use..

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the 31 samples exceed the Criterion for the Warm Freshwater Habitat beneficial use and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 49732, Diazinon **Region 9**

San Dieguito River

LOE ID:	75793
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	27
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Dieguito River to determine beneficial use support and results are as follows: 0 of 27 samples exceed the criterion for Diazinon.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Data for this line of evidence for San Dieguito River was collected at 2 monitoring sites [San Dieguito Creek - 905SDC-MLS, San Pasqual Creek - 905SDC-TWAS-2]
Temporal Representation:	Data was collected over the time period 11/29/2001-11/12/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 49732, Diazinon **Region 9**

San Dieguito River

LOE ID:	75794
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Dieguito River to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Data for this line of evidence for San Dieguito River was collected at 1 monitoring site [San Dieguito River @ El Apajo (end)]
Temporal Representation:	Data was collected over the time period 9/23/2005-6/18/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **49729** **Region 9**

San Dieguito River 039424

Pollutant:	**Esfenvalerate/Fenvalerate**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the five samples exceed the Objective for Warm Freshwater Habitat beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the five samples exceed the Objective for Warm Freshwater Habitat beneficial use and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 49729, Esfenvalerate/Fenvalerate — Region 9

San Dieguito River

LOE ID:	75806
Pollutant:	Esfenvalerate/Fenvalerate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Dieguito River to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Esfenvalerate.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	According to the USEPA Office of Pesticide Programs Ecotoxicity database, the aquatic life EC50 for Esfenvalerate is 0.9 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for San Dieguito River was collected at 2 monitoring sites [San Dieguito Creek - 905SDC-MLS, San Pasqual Creek - 905SDC-TWAS-2]
Temporal Representation:	Data was collected over the time period 11/30/2007-11/12/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID 49386 — Region 9

San Dieguito River

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Three lines of evidence are available in the administrative record to assess this pollutant. Zero of the 32 samples exceed the Water Quality Criteria for Lead. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 32 samples exceeded the Water Quality Criteria for Lead and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 49386, Lead — Region 9

San Dieguito River

LOE ID:	75808
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved

Beneficial Use:	Warm Freshwater Habitat	039426
Number of Samples:	6	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Dieguito River to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for San Dieguito River was collected at 1 monitoring site [San Dieguito River @ El Apajo (end)]	
Temporal Representation:	Data was collected 6/10/2003 - 6/18/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 49386, Lead **Region 9**

San Dieguito River

LOE ID:	75809
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for San Dieguito River to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR

	contains the hardness dependent formula for the metals criterion. 039427
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Dieguito River was collected at 1 monitoring site [San Dieguito Creek - 905_SMC00473]
Temporal Representation:	Data was collected on a single day 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

Line of Evidence (LOE) for Decision ID 49386, Lead **Region 9**

San Dieguito River

LOE ID:	75810
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	25
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for San Dieguito River to determine beneficial use support and results are as follows: 0 of 25 samples exceed the criterion for Lead.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Lead to protect aquatic life in freshwater. The dissolved Lead criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Dieguito River was collected at 2 monitoring sites [San Dieguito Creek - 905SDC-MLS, San Pasqual Creek - 905SDC-TWAS-2]
Temporal Representation:	Data was collected over the time period 11/29/2001-11/12/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID 49726 Region 9

San Dieguito River 039428

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 28 samples exceed the criterion for Warm Freshwater Habitat beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the 28 samples exceed the criterion for Warm Freshwater Habitat beneficial use and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 49726, Malathion — Region 9

San Dieguito River

LOE ID:	75818
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Dieguito River to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Malathion.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous

	maximum for malathion is 0.1 Âµg/L. 039429
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for San Dieguito River was collected at 1 monitoring site [San Dieguito River @ El Apajo (end)]
Temporal Representation:	Data was collected over the time period 9/23/2005-6/18/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 49726, Malathion **Region 9**

San Dieguito River

LOE ID:	75817
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	24
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Dieguito River to determine beneficial use support and results are as follows: 0 of 24 samples exceed the criterion for Malathion.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for San Dieguito River was collected at 2 monitoring sites [San Dieguito Creek - 905SDC-MLS, San Pasqual Creek - 905SDC-TWAS-2]
Temporal Representation:	Data was collected over the time period 2/11/2003-11/12/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID 49731 **Region 9**

San Dieguito River 039430

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 26 samples exceed the criterion for the Warm Freshwater Habitat beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the 26 samples exceed the criterion for the Warm Freshwater Habitat beneficial use and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 49731, Nickel — Region 9

San Dieguito River

LOE ID:	75820
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	25
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for San Dieguito River to determine beneficial use support and results are as follows: 0 of 25 samples exceed the criterion for Nickel.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Nickel to protect aquatic life in freshwater. The dissolved Nickel criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition

Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Dieguito River was collected at 2 monitoring sites [San Dieguito Creek - 905SDC-MLS, San Pasqual Creek - 905SDC-TWAS-2]
Temporal Representation:	Data was collected over the time period 11/29/2001-11/12/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 49731, Nickel **Region 9**

San Dieguito River

LOE ID:	75819
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for San Dieguito River to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Dieguito River was collected at 1 monitoring site [San Dieguito Creek - 905_SMC00473]
Temporal Representation:	Data was collected on a single day 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

DECISION ID 49721 Region 9

San Dieguito River 039432

Pollutant:	**Selenium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. One of the 27 samples exceed the criteria for Warm Freshwater Habitat beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of the 27 samples exceed the criteria for Warm Freshwater Habitat beneficial use and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 49721, Selenium — Region 9

San Dieguito River

LOE ID:	78114
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	27
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Dieguito River to determine beneficial use support and results are as follows: 1 of 27 samples exceed the criterion for Selenium.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The selenium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater is 0.005 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	

Guideline Reference:	039433
Spatial Representation:	Data for this line of evidence for San Dieguito River was collected at 2 monitoring sites [San Dieguito Creek - 905SDC-MLS, San Pasqual Creek - 905SDC-TWAS-2]
Temporal Representation:	Data was collected over the time period 11/29/2001-11/12/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID 49723 — Region 9

San Dieguito River

Pollutant:	**Temperature, water**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Nine of the 32 samples exceed the Objective for Cold Freshwater Habitat beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Nine of 32 samples exceeded the Objective for Cold Freshwater Habitat beneficial use and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 49723, Temperature, water — Region 9

San Dieguito River

LOE ID:	75827
Pollutant:	Temperature, water
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	32
Number of Exceedances:	9

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Nine of the 32 samples exceeded the evaluation guideline for temperature in this water body.
Data Reference:	Data for Trash, Nutrients, and Pathogens in Region 9, 2007-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Board that such alteration in temperature does not adversely affect beneficial uses. At no time or place shall the temperature of any COLD water be increased more than 5Â°F above the natural receiving water temperature.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Inland Fishes of California (Moyle 1976) states that for rainbow trout the optimum range for growth and completion of most life stages is 13-21 degrees C (page 129).
Guideline Reference:	Inland Fishes of California
Spatial Representation:	Samples were collected at the following stations: SGT-010-Del Mar- El Camino Real SGT-020-Solana Beach- Via De Santa Fe SGT-025-Lusardi Creek/ Artesian Rd SGT-028-Del Dios Hwy @ fruit stand
Temporal Representation:	Samples were collected between January, 2009 and July, 2010.
Environmental Conditions:	
QAPP Information:	San Diego Regional Water Quality Assessment and Outreach Project Quality Assurance Project Plan Prepared by: Clay Clifton (San Diego Coastkeeper, Local Project Sponsor Manager), Bob Stafford (San Diego Stream Team), Dr. Rick Gersberg (San Diego State University), Bryan Bjorndal (Assure Controls, Inc.), and Morgan Justice-Black (I Love A Clean San Diego).
QAPP Information Reference(s):	Quality Assurance Project Plan for San Diego Regional Water Quality Assessment and Outreach Project.

DECISION ID **49685** **Region 9**

San Dieguito River

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. Zero of the 31 samples exceed the criteria for Warm Freshwater Habitat beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the 31 samples exceed the criteria for Warm Freshwater Habitat beneficial use and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: 039435

Line of Evidence (LOE) for Decision ID 49685, Zinc **Region 9**

San Dieguito River

LOE ID:	75837
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for San Dieguito River to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Dieguito River was collected at 1 monitoring site [San Dieguito Creek - 905_SMC00473]
Temporal Representation:	Data was collected on a single day 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

Line of Evidence (LOE) for Decision ID 49685, Zinc **Region 9**

San Dieguito River

LOE ID:	75831
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	5

Number of Exceedances:	0	039436

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Dieguito River to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Dieguito River was collected at 1 monitoring site [San Dieguito River @ El Apajo (end)]
Temporal Representation:	Data was collected 6/10/2003 - 6/18/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 49685, Zinc **Region 9**

San Dieguito River

LOE ID:	75838
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	25
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for San Dieguito River to determine beneficial use support and results are as follows: 0 of 25 samples exceed the criterion for Zinc.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Zinc to protect aquatic life in freshwater. The dissolved Zinc criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	

Guideline Reference:	039437
Spatial Representation:	Data for this line of evidence for San Dieguito River was collected at 2 monitoring sites [San Dieguito Creek - 905SDC-MLS, San Pasqual Creek - 905SDC-TWAS-2]
Temporal Representation:	Data was collected over the time period 11/29/2001-11/12/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID 36832 — Region 9

San Dieguito River

Pollutant:	**Benthic Community Effects**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Agriculture | Hydromodification | Illicit Connections/Illegal Hook-ups/Dry Weather Flows | Source Unknown | Unknown Nonpoint Source | Unknown Point Source | Urban Runoff/Storm Sewers
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Benthic Community Effects is being considered for placement on the CWA section 303(d) List under sections 3.9 and 3.1 of the Listing Policy. Under section 3.9, an additional line of evidence associating Benthic Community Effects with a water or sediment concentration of pollutant(s) is necessary to assess listing status. Based on the readily available data and information, the weight of evidence provides sufficient justification for placing Benthic Community Effects in this water segment on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Pursuant to section 3.9 of the Listing Policy, the water exhibits significant degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index. 4. Pursuant to section 3.9 of the Listing Policy, the water segment has associated pollutant(s) samples that exceed water quality objectives. 5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are being met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 36832, Benthic Community Effects — Region 9

San Dieguito River

LOE ID:	7312
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water

Matrix:	Water	039438
Fraction:	Total	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	15	
Number of Exceedances:	12	
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)	
Data Used to Assess Water Quality:	Twelve of fifteen samples collected exceed the water quality objective according to results in the San Diego County Municipal Copermittees Urban Runoff Monitoring Report, 2007. Samples were collected one to four times a year from 2001-2006.	
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. The Water Quality Control Plan goal for the San Diego Basin Goal is 0.1 mg/L for total phosphorus in streams and other flowing waters. (RWQCB, 2007)	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:	Water Quality Control Plan for the San Diego Basin	
Spatial Representation:	Samples were collected at the mass loading station located near the lower boundary of the watershed behind the Morgan Run Golf Course maintenance shop along a natural channel off Via De La Valle.	
Temporal Representation:	Samples were collected one to four times a year from 2001-2006.	
Environmental Conditions:	Samples were collected during wet weather.	
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 36832, Benthic Community Effects **Region 9**

San Dieguito River

LOE ID:	7492
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	15
Number of Exceedances:	9
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Ceriodaphnia dubia- Six of fifteen samples collected were found to be toxic as determined by the Ceriodaphnia dubia survival/reproductive test. Hyalella azteca- None of the fifteen samples collected were found to be toxic as determined by the Hyalella azteca survival test. Selenastrum capricornutum- Five of fifteen samples collected were found to be toxic as determined by the Selenastrum capricornutum growth test.
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report

	Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms. Fourth Edition. Office of Water, U.S. Environmental Protection Agency. Washington, D.C. EPA-821-R-02-013
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Samples were found to exhibit toxicity when the No Observed Effect Concentration (NOEC) or median lethal concentration (LC50) for any given species was estimated to be less than 100% of the test sample concentration.
Guideline Reference:	Waste Discharge Requirements for Discharges of Urban Runoff From the Municipal Separate Storm Sewer Systems Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego, the San Diego Unified Port District, and the San Diego County Regional Airport. Order No. R9-2007-0001
Spatial Representation:	Samples were collected at the mass loading station located near the lower boundary of the watershed behind the Morgan Run Golf Course maintenance shop along a natural channel off Via De La Valle.
Temporal Representation:	Samples were collected one to four times a year from 2001-2006.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	QA/QC conducted according to Weston Solutions quality assurance plan.
QAPP Information Reference(s):	Weston Solutions, 2004. Quality Management Manual. March 2004 (Revised December 2009).

Line of Evidence (LOE) for Decision ID 36832, Benthic Community Effects **Region 9**

San Dieguito River

LOE ID:	24991
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Selenastrum capricornutum- (used for the 303(d) Listing) three samples were collected and three samples show significant toxicity levels (SL) and Compliant with QAPP as determined by the Selenastrum capricornutum growth test. Other Toxicity Tests: Ceriodaphnia dubia- Four samples were collected and two samples show significant toxicity levels (SL) as determined by the Ceriodaphnia dubia survival/reproductive test. Hyalella azteca- Two samples were collected and neithered show significant toxicity levels (SL) as determined by the Hyalella azteca growth and survival test according to results in the Surface Water Ambient Monitoring Program Annual Progress Report, 2007. Samples were collected in January, April, May and September 2003.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP

Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to 039440, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.
Guideline Reference:	Monitoring data for Region 9
Spatial Representation:	Samples were collected at the monitoring station San Dieguito 9 (station id: 905SDSDQ9 lat/long: 32.97877/-117.23506), located on the main stem of the San Dieguito River.
Temporal Representation:	Samples were collected in January, April, May and September 2003.
Environmental Conditions:	
QAPP Information:	QA/QC conducted in accordance with the Surface Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 36832, Benthic Community Effects **Region 9**

San Dieguito River

LOE ID:	7372
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	All four samples collected exceed the water quality objective according to results in the Surface Water Ambient Monitoring Program Report, 2007. Samples were collected on January 16, April 17, May 15 and September 9, 2003.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. (RWQCB, 2007) Water Quality Control Plan for the San Diego Basin Goal of 0.1 mg/L for total phosphorus in streams and other flowing waters. (RWQCB, 2007)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at the monitoring station San Dieguito 9 (station id: 905SDSDQ9 lat/long: 32.97877/-117.23506), located on the main stem of the San Dieguito River.
Temporal Representation:	Samples were collected on January 16, April 17, May 15 and September 9, 2003.
Environmental Conditions:	The above sampling events occurred during wet weather between storm events, wet weather high base flow, dry weather declining base flow, and dry weather minimum base flow, respectively.
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 36832, Benthic Community Effects — Region 9

San Dieguito River

LOE ID:	7324
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	15
Number of Exceedances:	13
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Thirteen of fifteen samples collected exceed the water quality objective according to results in the San Diego County Municipal Copermittees Urban Runoff Monitoring Report, 2007. Samples were collected one to four times a year from 2001 through 2006.
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used. (RWQCB, 2007)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at the mass loading station located near the lower boundary of the watershed behind the Morgan Run Golf Course maintenance shop along a natural channel off Via De La Valle.
Temporal Representation:	Samples were collected one to four times a year from 2001-2006.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 36832, Benthic Community Effects — Region 9

San Dieguito River

LOE ID:	7373
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	4	039442
Number of Exceedances:	3	
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)	
Data Used to Assess Water Quality:	Three of four samples collected exceed the water quality objective according to results in the Surface Water Ambient Monitoring Program, 2007. Samples were collected on January 16, April 17, May 15 and September 9, 2003.	
Data Reference:	Monitoring data for Region 9	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used. (RWQCB, 2007)	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:	Water Quality Control Plan for the San Diego Basin	
Spatial Representation:	Samples were collected at the monitoring station San Dieguito 9 (station id: 905SDSDQ9 lat/long: 32.97877/-117.23506), located on the main stem of the San Dieguito River.	
Temporal Representation:	Samples were collected on January 16, April 17, May 15 and September 9, 2003.	
Environmental Conditions:	The above sampling events occurred during wet weather between storm events, wet weather high base flow, dry weather declining base flow, and dry weather minimum base flow, respectively.	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.	
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA	

Line of Evidence (LOE) for Decision ID 36832, Benthic Community Effects **Region 9**

San Dieguito River

LOE ID:	7313
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	15
Number of Exceedances:	15
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	All fifteen samples collected exceed the water quality objective. Since a maximum of four samples were collected at most in a one year period, any exceedance results in an annual exceedance frequency greater than 10% according to the San Diego County Municipal Copermittees Urban Runoff Monitoring Report, 2007. Samples were collected one to three times a year from 2001 to 2006.
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	From the Basin Plan, concentrations of total dissolved solids cannot exceed 500 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the mass loading station located near the lower boundary of the watershed behind the Morgan Run Golf Course maintenance shop along a natural channel off Via De La Valle.
Temporal Representation:	Samples were collected one to three times a year from 2001-2006.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 36832, Benthic Community Effects **Region 9**

San Dieguito River

LOE ID:	27026
Pollutant:	Benthic Community Effects
LOE Subgroup:	Adverse Biological Responses
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	10
Number of Exceedances:	10
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Ten samples of IBI data were taken from October 2002 to May 2007 at one sampling site. Of the total number of samples, all ten of the samples exceeded the IBI impairment threshold.
Data Reference:	Stream Bioassessment Data. Co-permitee Data. Collected 2002-2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at one site: SD-DDH on San Dieguito Creek.
Temporal Representation:	Sampling occurred during May and October annually over a four year period from May 2003 to October 2006 and during October 2002 and May 2007.
Environmental Conditions:	

QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Manual for Freshwater Bioassessment.
QAPP Information Reference(s):	Quality Assurance Manual for Freshwater Bioassessment Revision 0

Line of Evidence (LOE) for Decision ID 36832, Benthic Community Effects **Region 9**

San Dieguito River

LOE ID:	75742
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	12
Number of Exceedances:	11
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Eleven of the twelve samples collected had IBI scores below 40. NPDES bioassessment
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the State or Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	
Spatial Representation:	The samples were collected at stations 905SDC-MLS, San Dieguito Creek; 905SDC-TWAS-2, San Pasqual Creek and SD-DDH, San Dieguito River. R9 suggest separating San Pasqual station from SD-DDH.
Temporal Representation:	The samples were collected from October 2002 to May 2008.
Environmental Conditions:	
QAPP Information:	The data was collected under the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan, June 25, 2009.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 36832, Benthic Community Effects **Region 9**

San Dieguito River

LOE ID:	75752
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Dieguito River to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Bifenthrin.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Bifenthrin does not exceed 0.0006 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for San Dieguito River was collected at 2 monitoring sites [San Dieguito Creek - 905SDC-MLS, San Pasqual Creek - 905SDC-TWAS-2]
Temporal Representation:	Data was collected over the time period 11/30/2007-11/12/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 36832, Benthic Community Effects **Region 9**

San Dieguito River

LOE ID:	75829
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	23
Number of Exceedances:	14
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Twenty-three samples were collected to test for toxicity. Fourteen of the 23 samples exhibited statistically significant toxicity. The toxicity tests that exhibited significant toxicity included survival of Hyalella azteca, growth of Selenastrum capriconutum and survival and reproduction of Ceriodaphnia dubia.
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or

	that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected at stations 905SDC-MLS San Dieguito Creek.
Temporal Representation:	The samples were collected from 2001 to 2008.
Environmental Conditions:	
QAPP Information:	The data was collected under the County of San Diego Co-Permittees Receiving Waters Urban Runoff Monitoring and Reporting Program (Order No. 2007-01). Data quality is good.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 36832, Benthic Community Effects **Region 9**

San Dieguito River

LOE ID:	79544
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	12
Number of Exceedances:	8
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	12 samples were taken at 3 stations along the San Dieguito River. Eight of twelve CSCI scores for this site are below the 0.79 threshold, and therefore are is exceeding the water quality objective for the aquatic life beneficial use.
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008. Bioassessment Data for Various Pollutants from Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009. Region 9 CSCI Scores & Water Body Information
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.
Guideline Reference:	The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.

Spatial Representation:	The samples were collected at stations 905SSD-DDH SMC00473 905SDC-MLS
Temporal Representation:	The samples were collected from 2002 to 2009.
Environmental Conditions:	
QAPP Information:	The data was collected under the County of San Diego NPDES MS4 Copermittees Receiving Waters Monitoring and Reporting Program and the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan.
QAPP Information Reference(s):	e-mail clarifying QAPP information Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008. Bioassessment Data for Various Pollutants from Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.

Line of Evidence (LOE) for Decision ID 36832, Benthic Community Effects **Region 9**

San Dieguito River

LOE ID:	75741
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	The one sample collected had an IBI score below 40. The score was 5.7. SMC bioassessment
Data Reference:	Bioassessment Data for Various Pollutants from Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the State or Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	Development of a Benthic Index of Biotic Integrity (B-IBI) for Wadeable Streams in Northern Coastal California and its Application to Regional 305(b) Assessment
Spatial Representation:	The sample was collected at 905_SMC00473, San Dieguito Creek .
Temporal Representation:	The sample was collected in June 2009.
Environmental Conditions:	
QAPP Information:	The data was collected under the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan, June 25, 2009.
QAPP Information Reference(s):	e-mail clarifying QAPP information

DECISION ID **43093** **Region 9**

San Dieguito River 039448

Pollutant:	**Nitrogen**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

No new data was assessed this cycle. The decision has not changed and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Sixteen of 19 of the samples exceed the Basin Plan water quality objective for total nitrogen.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Sixteen of 19 of the samples exceed the Basin Plan water quality objective for total nitrogen, and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 43093, Nitrogen — Region 9

San Dieguito River

LOE ID:	7373
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	3
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Three of four samples collected exceed the water quality objective according to results in the Surface Water Ambient Monitoring Program, 2007. Samples were collected on January 16, April 17, May 15 and September 9, 2003.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial

uses. 039449
A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used. (RWQCB, 2007)

Objective/Criterion Reference: Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:

Guideline Reference: Water Quality Control Plan for the San Diego Basin

Spatial Representation: Samples were collected at the monitoring station San Dieguito 9 (station id: 905SDSDQ9 lat/long: 32.97877/-117.23506), located on the main stem of the San Dieguito River.

Temporal Representation: Samples were collected on January 16, April 17, May 15 and September 9, 2003.

Environmental Conditions: The above sampling events occurred during wet weather between storm events, wet weather high base flow, dry weather declining base flow, and dry weather minimum base flow, respectively.

QAPP Information: Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.

QAPP Information Reference(s): 2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 43093, Nitrogen **Region 9**

San Dieguito River

LOE ID: 7324

Pollutant: Total Nitrogen as N

LOE Subgroup: Pollutant-Water

Matrix: Water

Fraction: Total

Beneficial Use: Warm Freshwater Habitat

Number of Samples: 15

Number of Exceedances: 13

Data and Information Type: Fixed station physical/chemical monitoring (conventional pollutants only)

Data Used to Assess Water Quality: Thirteen of fifteen samples collected exceed the water quality objective according to results in the San Diego County Municipal Copermittees Urban Runoff Monitoring Report, 2007. Samples were collected one to four times a year from 2001 through 2006.

Data Reference: Urban Runoff Monitoring, Volume 1- Final Report

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses.
A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used. (RWQCB, 2007)

Objective/Criterion Reference: Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:

Guideline Reference:	Water Quality Control Plan for the San Diego Basin	039450
Spatial Representation:	Samples were collected at the mass loading station located near the lower boundary of the watershed behind the Morgan Run Golf Course maintenance shop along a natural channel off Via De La Valle.	
Temporal Representation:	Samples were collected one to four times a year from 2001-2006.	
Environmental Conditions:	Samples were collected during wet weather.	
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.	
QAPP Information Reference(s):		

DECISION ID 43138 Region 9

San Dieguito River

Pollutant:	**Phosphorus**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Sixteen of 19 of the samples exceed the Basin Plan water quality objective for phosphorus.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Sixteen of 19 of the samples exceed the Basin Plan water quality objective for phosphorus, and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43138, Phosphorus Region 9

San Dieguito River

LOE ID:	7372
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total

Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	All four samples collected exceed the water quality objective according to results in the Surface Water Ambient Monitoring Program Report, 2007. Samples were collected on January 16, April 17, May 15 and September 9, 2003.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. (RWQCB, 2007) Water Quality Control Plan for the San Diego Basin Goal of 0.1 mg/L for total phosphorus in streams and other flowing waters. (RWQCB, 2007)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at the monitoring station San Dieguito 9 (station id: 905SDSDQ9 lat/long: 32.97877/-117.23506), located on the main stem of the San Dieguito River.
Temporal Representation:	Samples were collected on January 16, April 17, May 15 and September 9, 2003.
Environmental Conditions:	The above sampling events occurred during wet weather between storm events, wet weather high base flow, dry weather declining base flow, and dry weather minimum base flow, respectively.
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 43138, Phosphorus **Region 9**

San Dieguito River

LOE ID:	7312
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	15
Number of Exceedances:	12
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Twelve of fifteen samples collected exceed the water quality objective according to results in the San Diego County Municipal Copermittees Urban Runoff Monitoring Report, 2007. Samples were collected one to four times a year from 2001-2006.
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. The Water Quality Control Plan goal for the San Diego Basin Goal is 0.1 mg/L for total phosphorus in streams and other flowing waters. (RWQCB, 2007)

Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	039452
Evaluation Guideline:		
Guideline Reference:	Water Quality Control Plan for the San Diego Basin	
Spatial Representation:	Samples were collected at the mass loading station located near the lower boundary of the watershed behind the Morgan Run Golf Course maintenance shop along a natural channel off Via De La Valle.	
Temporal Representation:	Samples were collected one to four times a year from 2001-2006.	
Environmental Conditions:	Samples were collected during wet weather.	
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.	
QAPP Information Reference(s):		

DECISION ID 43664 Region 9

San Dieguito River

Pollutant:	**Total Dissolved Solids**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Fifteen of 15 of the samples exceed the Basin Plan water quality objective for total dissolved solids.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Fifteen of 15 of the samples exceed the Basin Plan water quality objective for total dissolved solids, and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43664, Total Dissolved Solids Region 9

San Dieguito River

LOE ID:	7313
Pollutant:	Total Dissolved Solids

LOE Subgroup:	Pollutant-Water	039453
Matrix:	Water	
Fraction:	Total	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	15	
Number of Exceedances:	15	
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)	
Data Used to Assess Water Quality:	All fifteen samples collected exceed the water quality objective. Since a maximum of four samples were collected at most in a one year period, any exceedance results in an annual exceedance frequency greater than 10% according to the San Diego County Municipal Copermittees Urban Runoff Monitoring Report, 2007. Samples were collected one to three times a year from 2001 to 2006.	
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan, concentrations of total dissolved solids cannot exceed 500 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period (RWQCB, 2007).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at the mass loading station located near the lower boundary of the watershed behind the Morgan Run Golf Course maintenance shop along a natural channel off Via De La Valle.	
Temporal Representation:	Samples were collected one to three times a year from 2001-2006.	
Environmental Conditions:	Samples were collected during wet weather.	
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.	
QAPP Information Reference(s):		

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Santa Gertrudis Creek
Water Body ID: CAR9024200020080825001546
Water Body Type: River & Stream

DECISION ID 44673 **Region 9**
Santa Gertrudis Creek

Pollutant: **Indicator Bacteria**
Final Listing Decision: **Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Sources: Source Unknown
Expected TMDL Completion Date: 2021
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the section 303(d) list under section 4.3 of the Listing Policy. Under section 4.3 a single line of evidence is necessary to assess listing status.

Five line of evidence is available in the administrative record to assess this pollutant. Seven of the Seven samples exceed the Basin Plan water quality objective for escherichia coli, Seven out of Seven samples exceeded the Water Quality Objective for Fecal Coliform, and Two of the Two samples exceeded the Evaluation Guideline for Total Coliform.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Seven of the Seven samples exceed the Basin Plan water quality objective for escherichia coli, Seven out of Seven samples exceeded the Water Quality Objective for Fecal Coliform, and Two of the Two samples exceeded the Evaluation Guideline for Total Coliform and this exceeds the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 44673, Indicator Bacteria **Region 9**
Santa Gertrudis Creek

LOE ID: 7151

Pollutant: Escherichia coli (E. coli)
LOE Subgroup: Pollutant-Water
Matrix: Water

Fraction:	None	039455
Beneficial Use:	Water Contact Recreation	
Number of Samples:	5	
Number of Exceedances:	5	
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)	
Data Used to Assess Water Quality:	All five samples collected exceed the water quality objective according to results in the Riverside County Flood Control and Water Conservation District annual progress report from 2005 and 2006. Samples were collected from October 2004 through February 2006.	
Data Reference:	San Diego, CA., Riverside, CA.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The maximum E. coli level for moderately or lightly used areas is 406 colonies per 100 ml (RWQCB, 2007).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Santa Gertrudis Creek near Temecula. Lat/long: 33Â°31Â'28Â" N/117Â°09Â'50Â" W.	
Temporal Representation:	Two to three samples were collected per monitoring year. Samples were collected from October 2004 through February 2006.	
Environmental Conditions:	One sample represents the first storm event of each monitoring year that produces sufficient flow to collect a composite sample. In addition, another sample is collected during the monitoring year to represent a wet weather event. Two dry sampling events are also required each monitoring year; however, only one dry event was monitored in the 2004-2005 monitoring year and no dry events in the 2005-2006 monitoring year due to low flow.	
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44673, Indicator Bacteria **Region 9**

Santa Gertrudis Creek

LOE ID:	72781
Pollutant:	Escherichia coli (E. coli)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2
Number of Exceedances:	2
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Two of the two samples exceeded the E. coli objective.
Data Reference:	Data for Various Pollutants in Riverside County, 2007-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The maximum E. coli level for moderately or lightly used areas is 406 colonies per 100 ml (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	The samples were collected at Santa Gertrudis Creek.
Temporal Representation:	Samples were collected between November 2008 and December 2008.
Environmental Conditions:	
QAPP Information:	No QAPP was submitted. Sampling was done by municipalities in Riverside County pursuant to the Riverside County Municipal Stormwater Permit.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44673, Indicator Bacteria **Region 9**

Santa Gertrudis Creek

LOE ID:	72780
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2
Number of Exceedances:	2
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Two of the two samples exceeded the total coliform objective.
Data Reference:	Data for Various Pollutants in Riverside County, 2007-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life. Basin Plan for the San Diego Basin.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Total Coliform concentration shall not exceed more than 10000/100 ml. Guidance for Fresh Water Beaches (CDPH).
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.
Spatial Representation:	The samples were collected at Santa Gertrudis Creek.
Temporal Representation:	Samples were collected between November 2008 and December 2008.
Environmental Conditions:	
QAPP Information:	No QAPP was submitted. Sampling was done by municipalities in Riverside County pursuant to the Riverside County Municipal Stormwater Permit.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44673, Indicator Bacteria **Region 9**

Santa Gertrudis Creek

LOE ID:	72779
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2
Number of Exceedances:	2

Data and Information Type:	Not Specified	039457
Data Used to Assess Water Quality:	Two of the two samples exceeded the fecal coliform objective.	
Data Reference:	Data for Various Pollutants in Riverside County, 2007-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The Fecal Coliform concentration shall not exceed more than 400/100 ml. Water Quality Control Plan for the San Diego Basin.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected at Santa Gertrudis Creek.	
Temporal Representation:	Samples were collected between November 2008 and December 2008.	
Environmental Conditions:		
QAPP Information:	No QAPP was submitted. Sampling was done by municipalities in Riverside County pursuant to the Riverside County Municipal Stormwater Permit.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44673, Indicator Bacteria **Region 9**

Santa Gertrudis Creek

LOE ID:	7402
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	5
Number of Exceedances:	5
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	All five samples collected exceed the water quality objective according to results in the Riverside County Flood Control and Water Conservation District annual progress report from 2005 and 2006. Samples were collected from October 2004 through February 2006.
Data Reference:	Watershed Annual Progress Report 2004 to 2005 and 2005 to 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, no more than 10% of the samples during any 30-day period for waters designated for contact recreation shall exceed 400 per 100 ml (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Santa Gertrudis Creek near Temecula. Lat/long: 33Â°31Â’28Â” N/117Â°09Â’50Â” W.
Temporal Representation:	Two to three samples were collected per monitoring year. Samples were collected from October 2004 through February 2006.
Environmental Conditions:	One sample represents the first storm event of each monitoring year that produces sufficient flow to collect a composite sample. In addition, another sample is collected during the monitoring year to represent a wet weather event. Two dry sampling events are also required each monitoring year; however, only one dry event was monitored in the 2004-2005 monitoring year and no dry events in the 2005-2006 monitoring year due to low flow.
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.
QAPP Information Reference(s):	

DECISION ID	43057	Region 9
Santa Gertrudis Creek		

Pollutant:	**Nitrogen**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2023
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Four of the five samples exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Four of the five samples exceed the objective and this exceeds the allowable frequency using table 3.1. 4. Pursuant to section of the Listing Policy, no additional data and information are available indicating that standards are met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 43057, Nitrogen	**Region 9**
Santa Gertrudis Creek	

LOE ID:	7034
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	5
Number of Exceedances:	4
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Four of five samples exceeded the warm freshwater habitat water quality objective for Total Nitrogen in the Riverside County Flood Control and Water Conservation District annual monitoring report from 2005 and 2006. The five samples were collected between October 2004 and February 2006.
Data Reference:	Watershed Annual Progress Report 2004 to 2005 and 2005 to 2006

SWAMP Data:	Non-SWAMP	039459
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses (RWQCB, 2007). desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used (RWQCB, 2007).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:	Water Quality Control Plan for the San Diego Basin	
Spatial Representation:	Samples were collected at Santa Gertrudis Creek near Temecula. Lat/long: 33Â°31Â'28Â" N/117Â°09Â'50Â" W.	
Temporal Representation:	Two to three samples were collected per monitoring year. Samples were collected from October 2004 through February 2006.	
Environmental Conditions:	One sample represents the first storm event of each monitoring year that produces sufficient flow to collect a composite sample. In addition, another sample is collected during the monitoring year to represent a wet weather event. Two dry sampling events are also required each monitoring year; however, only one dry event was monitored in the 2004-2005 monitoring year and no dry events in the 2005-2006 monitoring year due to low flow.	
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.	
QAPP Information Reference(s):		

DECISION ID	37136	Region 9
Santa Gertrudis Creek		

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Seven of the nine samples exceed the Basin Plan water quality objective for chlorpyrifos.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.

3. Seven of the nine samples exceed the Basin Plan water quality objective for chlorpyrifos and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 37136, Chlorpyrifos **Region 9**

Santa Gertrudis Creek

LOE ID:	7029
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	9
Number of Exceedances:	7
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Seven out of nine samples collected exceed the water quality objective according to results in the Riverside County Flood Control and Water Conservation District annual progress report from 2005 and 2006. Samples were collected from October 2004 through May 2006.
Data Reference:	Watershed Annual Progress Report 2004 to 2005 and 2005 to 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The 4-day average concentration of chlorpyrifos in freshwater is 0.014 ug/L. The 1-hour average concentration of chlorpyrifos in freshwater is 0.025 ug/L according to Siepmann and Finlayson, 2000; Finlayson, 2004.
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Samples were collected at Temecula Creek below Pala Road, lat/long: 33Â°28Â'26.4Â" N/117Â°07Â'46.1Â" W.
Temporal Representation:	Four to six samples are collected per monitoring year. Samples were collected from October 2004 through May 2006.
Environmental Conditions:	One sample represents the first storm event of each monitoring year that produces sufficient flow to collect a composite sample. In addition, three samples represent wet weather and two samples represent dry weather. However, one sampling event in the 2004-2005 monitoring year did not analyze for all constituents.
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.
QAPP Information Reference(s):	

DECISION ID **43071** **Region 9**

Santa Gertrudis Creek 039461

Pollutant:	**Copper**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Two of the four samples exceed the Basin Plan water quality objective for copper.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Two of the four samples exceed the Basin Plan water quality objective for copper and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43071, Copper — Region 9

Santa Gertrudis Creek

LOE ID:	7030
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	2
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Two out of four samples collected exceed the water quality objective for the 1-hour average concentration of copper. Two of four samples collected exceeds the water quality objective for the 4-day average concentration of copper according to results in the Riverside County Flood Control and Water Conservation District annual progress report from 2005 and 2006. Samples were collected from October 2004 through May 2006.
Data Reference:	Watershed Annual Progress Report 2004 to 2005 and 2005 to 2006

SWAMP Data:	Non-SWAMP	039462
Water Quality Objective/Criterion:	From the CTR, the dissolved copper chronic criterion is 3.1 ppb and the acute criterion is 4.8 ppb, but these criteria may vary depending upon hardness of the sample (U.S. EPA, 2000).	
Objective/Criterion Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Santa Gertrudis Creek near Temecula. Lat/long: 33Â°31Â'28Â" N/117Â°09Â'50Â" W.	
Temporal Representation:	Two to three samples were collected per monitoring year. Samples were collected from October 2004 through February 2006.	
Environmental Conditions:	One sample represents the first storm event of each monitoring year that produces sufficient flow to collect a composite sample. In addition, another sample is collected during the monitoring year to represent a wet weather event. Two dry sampling events are also required each monitoring year; however, only one dry event was monitored in the 2004-2005 monitoring year and no dry events in the 2005-2006 monitoring year due to low flow.	
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.	
QAPP Information Reference(s):		

DECISION ID	**43679**	**Region 9**
Santa Gertrudis Creek		

Pollutant:	**Iron**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Five of the five samples exceed the Basin Plan water quality objective for iron. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Five of the five samples exceed the Basin Plan water quality objective for iron and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision	This is a decision previously approved by the State Water Resources Control Board and the USEPA.

Recommendation:	No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43679, Iron **Region 9**

Santa Gertrudis Creek

LOE ID:	7031
Pollutant:	Iron
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	5
Number of Exceedances:	5
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	All five of the samples exceeded the domestic or municipal supply water quality objective according to the results in Riverside County Flood Control and Water Conservation District annual monitoring program from 2005 and 2006. The five samples were collected between October 2004 and February 2006.
Data Reference:	Watershed Annual Progress Report 2004 to 2005 and 2005 to 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, inland surface waters designated as domestic or municipal supply, shall not contain concentrations of iron in excess of the secondary maximum contaminant level 0.3 mg/L (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Santa Gertrudis Creek near Temecula. Lat/long: 33Â°31Â'28Â" N/117Â°09Â'50Â" W.
Temporal Representation:	Two to three samples were collected per monitoring year. Samples were collected from October 2004 through February 2006.
Environmental Conditions:	One sample represents the first storm event of each monitoring year that produces sufficient flow to collect a composite sample. In addition, another sample is collected during the monitoring year to represent a wet weather event. Two dry sampling events are also required each monitoring year; however, only one dry event was monitored in the 2004-2005 monitoring year and no dry events in the 2005-2006 monitoring year due to low flow.
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.
QAPP Information Reference(s):	

DECISION ID **44195** **Region 9**

Santa Gertrudis Creek

Pollutant:	**Manganese**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2021

Impairment from Pollutant or Pollution:	Pollutant	039464

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

Regional Board Conclusion:
This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Four of the five samples exceed the Basin Plan water quality objective for Manganese.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Four of the five samples exceed the Basin Plan water quality objective for Manganese and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

State Board Review and Conclusion:
The Regional Board staff mistakenly assessed manganese as a conventional pollutant and applied table 3.2 of the listing Policy. Manganese is a toxicant and should be assessed using Table 3.1 . State Water Board staff has corrected this error and revised the recommendation to List for manganese as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Four of the five samples exceed the water quality objective for selenium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Four of five samples exceeded the water quality objective for selenium and this exceeds the allowable frequency under Section 3.1 of the Listing Policy.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met..

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 44195, Manganese **Region 9**

Santa Gertrudis Creek

LOE ID:	7033
Pollutant:	Manganese
LOE Subgroup:	Pollutant-Water

Matrix:	Water	039465
Fraction:	None	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	5	
Number of Exceedances:	4	
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)	
Data Used to Assess Water Quality:	Four of the five samples exceeded the water quality objective for Manganese in the Riverside County Flood Control and Water Conservation District annual monitoring reports from 2005 and 2006. The five samples were collected between October 2004 and February 2006.	
Data Reference:	Watershed Annual Progress Report 2004 to 2005 and 2005 to 2006	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan, inland surface waters designated as domestic or municipal supply shall not contain concentrations of manganese in excess of the secondary maximum contaminant level 0.05 mg/L (RWQCB, 2007).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Santa Gertrudis Creek near Temecula. Lat/long: 33Â°31Â'28Â" N/117Â°09Â'50Â" W.	
Temporal Representation:	Two to three samples were collected per monitoring year. Samples were collected from October 2004 through February 2006.	
Environmental Conditions:	One sample represents the first storm event of each monitoring year that produces sufficient flow to collect a composite sample. In addition, another sample is collected during the monitoring year to represent a wet weather event. Two dry sampling events are also required each monitoring year; however, only one dry event was monitored in the 2004-2005 monitoring year and no dry events in the 2005-2006 monitoring year due to low flow.	
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.	
QAPP Information Reference(s):		

DECISION ID	43680	Region 9
Santa Gertrudis Creek		

Pollutant:	**Phosphorus**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Five of the five samples exceed the Basin Plan water quality objective for phosphorus.

	Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Five of the five samples exceed the Basin Plan water quality objective for phosphorus and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43680, Phosphorus **Region 9**

Santa Gertrudis Creek

LOE ID:	7036
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	5
Number of Exceedances:	5
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	All five samples exceeded the warm freshwater habitat water quality objective for Phosphorus according to results in the Riverside County Flood Control and Water Conservation annual monitoring report from 2005 and 2006. The five samples were collected between October 2004 and February 2006.
Data Reference:	Watershed Annual Progress Report 2004 to 2005 and 2005 to 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses (RWQCB, 2007). Water Quality Control Plan for the San Diego Basin Plan has a goal of 0.1 mg/L for total phosphorus in streams and other flowing waters (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at Santa Gertrudis Creek near Temecula. Lat/long: 33Â°31Â’28Â” N/117Â°09Â’50Â” W.
Temporal Representation:	Two to three samples were collected per monitoring year. Samples were collected from October 2004 through February 2006.
Environmental Conditions:	One sample represents the first storm event of each monitoring year that produces sufficient flow to collect a composite sample. In addition, another sample is collected during the monitoring year to represent a wet weather event. Two dry sampling events are also required each monitoring year; however, only one dry event was monitored in the 2004-2005 monitoring year and no dry events in the 2005-2006 monitoring year due to low flow.
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.

QAPP Information Reference(s): 039467

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Switzer Creek
Water Body ID: CAR9082200020080825092534
Water Body Type: River & Stream

DECISION ID 50201 **Region 9**
Switzer Creek

Pollutant: Bifenthrin
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. The one sample exceeded the guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. The one sample exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50201, Bifenthrin **Region 9**
Switzer Creek

LOE ID: 76911

Pollutant: Bifenthrin
LOE Subgroup: Pollutant-Sediment
Matrix: Sediment
Fraction: Total

Beneficial Use: Warm Freshwater Habitat

Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Switzer Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Bifenthrin.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for bifenthrin is the median lethal concentration (LC50) of 0.43 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 0.43 ug/g is the geometric mean of LC50 values for bifenthrin from Amweg et al. (2005) and Amweg and Weston (2007).
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5 Whole-sediment toxicity identification evaluation tools for pyrethroid insecticides: I. piperonyl butoxide addition. Environ. Toxicol. Chem. 26:2389-2396.
Spatial Representation:	Data for this line of evidence for Switzer Creek was collected at 1 monitoring site [Switzer Creek @ Harbor - 908SUP095]
Temporal Representation:	Data was collected on a single day 1/8/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID	**50460**	**Region 9**
Switzer Creek		

Pollutant:	**Chlordane**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. One of one sample exceeds the sediment guidelines.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of one sample exceeds the guideline and this sample size is insufficient to determine, with the

power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50460, Chlordane **Region 9**
Switzer Creek

LOE ID:	72828
Pollutant:	Chlordane
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	1 of 1 samples collected exceeded the criteria for chlordane concentration (Sum of trans-Chlordane, cis-Chlordane, cis-Nonachlor, trans-Nonachlor, and Oxychlordane).
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Waters shall not contain substances in concentrations that result in the deposition of material that causes nuisance or adversely affects beneficial uses. (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Probable Effect Concentration for Chlordane in freshwater sediments is 17.6 ug/kg(MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data were collected at the following station 908SUP095 (Switzer Creek @ Harbor).
Temporal Representation:	The samples were collected on 1/8/2007.
Environmental Conditions:	
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **50476** **Region 9**
Switzer Creek

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or	Pollutant

Pollution: 039471

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of zero samples exceeded the guideline. The sample was not used in the assessment due to reporting limits that were higher than the guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of zero samples exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50476, Chlorpyrifos **Region 9**

Switzer Creek

LOE ID:	76912
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	One of one sample result was not used in the assessment because the laboratory data was non-detect and the method detection limit was above the guideline and therefore the results could not be quantified with the level of certainty required by the Listing Policy
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	There is no chlorpyrifos evaluation guideline specific to "sediment, interstitial water" (pore water). The following evaluation guideline was used to evaluate an exceedance in water quality standards: the freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000, with minor corrections to

	significant figures as described in Beaulaurier et al., 2005).Â 039472
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).
Spatial Representation:	Data for this line of evidence for Switzer Creek was collected at 1 monitoring site [Switzer Creek @ Harbor - 908SUP095]
Temporal Representation:	Data was collected on a single day 1/8/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID 50205 Region 9
Switzer Creek

Pollutant:	**Cyfluthrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeds the sediment guidelines. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeds the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50205, Cyfluthrin Region 9
Switzer Creek

LOE ID:	76913
Pollutant:	Cyfluthrin
LOE Subgroup:	Pollutant-Sediment

Matrix:	Sediment	039473
Fraction:	Total	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Switzer Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cyfluthrin, total.	
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The evaluation guideline for cyfluthrin is the median lethal concentration (LC50) of 1.1 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 1.1 ug/g is the geometric mean of LC50 values for cyfluthrin from Amweg et al. (2005).	
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5	
Spatial Representation:	Data for this line of evidence for Switzer Creek was collected at 1 monitoring site [Switzer Creek @ Harbor - 908SUP095]	
Temporal Representation:	Data was collected on a single day 1/8/2007.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.	
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)	

DECISION ID	**50435**	**Region 9**
Switzer Creek		

Pollutant:	**Cyhalothrin, Lambda**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeds the sediment guidelines.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.

3. Zero of one sample exceeds the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50435, Cyhalothrin, Lambda **Region 9**
Switzer Creek

LOE ID:	76914
Pollutant:	Cyhalothrin, Lambda
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Switzer Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cyhalothrin, lambda, total.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for lambda-cyhalothrin is the median lethal concentration (LC50) of 0.44 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 0.44 ug/g is the geometric mean of LC50 values for lambda-cyhalothrin from Amweg et al. (2005).
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5
Spatial Representation:	Data for this line of evidence for Switzer Creek was collected at 1 monitoring site [Switzer Creek @ Harbor - 908SUP095]
Temporal Representation:	Data was collected on a single day 1/8/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **50437** **Region 9**
Switzer Creek

Pollutant: **Cypermethrin**

Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	039475
Last Listing Cycle's Final Listing Decision:	New Decision	
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeds the sediment guidelines.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeds the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50437, Cypermethrin **Region 9**

Switzer Creek

LOE ID:	76915
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Switzer Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cypermethrin, total.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	The evaluation guideline for cypermethrin is the median lethal concentration (LC50) of 0.3 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 0.3 ug/g is the geometric mean of LC50 values for cypermethrin from Maund et al. (2002).
Guideline Reference:	Partitioning, bioavailability, and toxicity of the pyrethroid insecticide cypermethrin in sediments. Environmental Toxicology and Chemistry 21:9-15
Spatial Representation:	Data for this line of evidence for Switzer Creek was collected at 1 monitoring site [Switzer Creek @ Harbor - 908SUP095]
Temporal Representation:	Data was collected on a single day 1/8/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID 50467 Region 9

Switzer Creek

Pollutant:	**DDE (Dichlorodiphenyldichloroethylene)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeds the sediment guidelines. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeds the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50467, DDE (Dichlorodiphenyldichloroethylene) Region 9

Switzer Creek

LOE ID:	76927
Pollutant:	DDE (Dichlorodiphenyldichloroethylene)

LOE Subgroup:	Pollutant-Sediment	039477
Matrix:	Sediment	
Fraction:	Total	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Switzer Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for DDE.	
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for sum of DDE (o,p' + p,p') is 31.3 ug/Kg dry weight (MacDonald et al. 2000).	
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31	
Spatial Representation:	Data for this line of evidence for Switzer Creek was collected at 1 monitoring site [Switzer Creek @ Harbor - 908SUP095]	
Temporal Representation:	Data was collected on a single day 1/8/2007.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.	
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)	

DECISION ID	**50469**	**Region 9**
Switzer Creek		

Pollutant:	**DDT (Dichlorodiphenyltrichloroethane)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of one sample exceeds the sediment guidelines.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.

3. Zero of one sample exceeds the guidelines and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50469, DDT (Dichlorodiphenyltrichloroethane) Region 9

Switzer Creek

LOE ID:	76961
Pollutant:	Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Switzer Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for DDT, Total.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for total DDTs (Sum DDT + Sum DDD + Sum DDE) is 572 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Switzer Creek was collected at 1 monitoring site [Switzer Creek @ Harbor - 908SUP095]
Temporal Representation:	Data was collected on a single day 1/8/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

Line of Evidence (LOE) for Decision ID 50469, DDT (Dichlorodiphenyltrichloroethane) Region 9

Switzer Creek

LOE ID:	76928
Pollutant:	DDT (Dichlorodiphenyltrichloroethane)
LOE Subgroup:	Pollutant-Sediment

Matrix:	Sediment	039479
Fraction:	Total	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Switzer Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for DDT.	
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for sum of DDT (o,p' + p,p') is 62.9 ug/Kg dry weight (MacDonald et al. 2000).	
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31	
Spatial Representation:	Data for this line of evidence for Switzer Creek was collected at 1 monitoring site [Switzer Creek @ Harbor - 908SUP095]	
Temporal Representation:	Data was collected on a single day 1/8/2007.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.	
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)	

DECISION ID	**50438**	**Region 9**
Switzer Creek		

Pollutant:	**Deltamethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeds the sediment guidelines.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeds the guideline and this sample size is insufficient to determine, with the

power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50438, Deltamethrin **Region 9**
Switzer Creek

LOE ID:	76929
Pollutant:	Deltamethrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Switzer Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Deltamethrin.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for deltamethrin is the median lethal concentration (LC50) of 0.79 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 0.79 ug/g is the geometric mean of LC50 values for deltamethrin from Amweg et al. (2005).
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5
Spatial Representation:	Data for this line of evidence for Switzer Creek was collected at 1 monitoring site [Switzer Creek @ Harbor - 908SUP095]
Temporal Representation:	Data was collected on a single day 1/8/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **50477** **Region 9**
Switzer Creek

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final	New Decision

Listing Decision:		039481
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeds the sediment guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeds the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50477, Diazinon **Region 9**

Switzer Creek

LOE ID:	76930
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Switzer Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Diazinon.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	There is no diazinon evaluation guideline specific to "sediment, interstitial water" (pore water). The following evaluation guideline was used to evaluate an exceedance in water quality standards: the freshwater chronic value for diazinon is 0.1 ug/L, expressed as a

	continuous concentration (Finlayson, 2004).Â 039482
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Data for this line of evidence for Switzer Creek was collected at 1 monitoring site [Switzer Creek @ Harbor - 908SUP095]
Temporal Representation:	Data was collected on a single day 1/8/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID 50472 Region 9

Switzer Creek

Pollutant:	**Dieldrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeds the sediment guidelines. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeds the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50472, Dieldrin Region 9

Switzer Creek

LOE ID:	76943
Pollutant:	Dieldrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total

Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Switzer Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Dieldrin.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for dieldrin is 61.8 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Switzer Creek was collected at 1 monitoring site [Switzer Creek @ Harbor - 908SUP095]
Temporal Representation:	Data was collected on a single day 1/8/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID 50474 Region 9

Switzer Creek

Pollutant:	**Endrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 50474, Endrin Region 9

Switzer Creek

LOE ID:	76944
Pollutant:	Endrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Switzer Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Endrin.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for endrin is 207 ug/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Switzer Creek was collected at 1 monitoring site [Switzer Creek @ Harbor - 908SUP095]
Temporal Representation:	Data was collected on a single day 1/8/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID	**50447**	**Region 9**
Switzer Creek		

Pollutant:	**Esfenvalerate/Fenvalerate**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeds the sediment guidelines.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeds the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50447, Esfenvalerate/Fenvalerate **Region 9**

Switzer Creek

LOE ID:	76945
Pollutant:	Esfenvalerate/Fenvalerate
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Switzer Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Esfenvalerate/Fenvalerate, total.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for esfenvalerate/fenvalerate is the median lethal concentration (LC50) of 1.5 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 1.5 ug/g is the geometric mean of LC50 values for esfenvalerate/fenvalerate from Amweg et al. (2005).
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5
Spatial Representation:	Data for this line of evidence for Switzer Creek was collected at 1 monitoring site [Switzer Creek @ Harbor - 908SUP095]
Temporal Representation:	Data was collected on a single day 1/8/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **50450** **Region 9**

Switzer Creek

Pollutant:	**Fenpropathrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or	Pollutant

Pollution: 039486

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeds the sediment guidelines.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeds the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50450, Fenpropathrin **Region 9**

Switzer Creek

LOE ID:	76946
Pollutant:	Fenpropathrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Switzer Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Fenpropathrin.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for fenpropathrin is the median lethal concentration (LC50) of 1 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 1 ug/g is the geometric mean of LC50 values for fenpropathrin from Ding et al. (2011).
Guideline Reference:	Toxicity of Sediment-Associated Pesticides to Chironomus dilutus and Hyalella azteca. Arch. Environ. Contam. Toxicol. 61:83Â–92.

Spatial Representation:	Data for this line of evidence for Switzer Creek was collected at 1 monitoring site [Switzer Creek @ Harbor - 908SUP095]
Temporal Representation:	Data was collected on a single day 1/8/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID 50487 — Region 9

Switzer Creek

Pollutant:	**Fipronil**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of zero samples exceeded the guideline. The sample was not used in the assessment due to reporting limits that were higher than the guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of zero samples exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50487, Fipronil — Region 9

Switzer Creek

LOE ID:	76947
Pollutant:	Fipronil
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	One of one sample result was not used in the assessment because the laboratory data was non-detect and the method detection limit was above the guideline and therefore the results could not be quantified with the level of certainty required by the Listing Policy.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for fipronil is the median lethal concentration (LC50) of 0.13 ug/g and is normalized by the percentage of organic carbon in the sediment sample (Maul et al. 2008).
Guideline Reference:	Effect of sediment-associated pyrethroids, fipronil, and metabolites on Chironomus tentans growth rate, body mass, condition index, immobilization, and survival. Environ. Toxicol. Chem. 27(12):2582-2590.
Spatial Representation:	Data for this line of evidence for Switzer Creek was collected at 1 monitoring site [Switzer Creek @ Harbor - 908SUP095]
Temporal Representation:	Data was collected on a single day 1/8/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID	50488	Region 9
Switzer Creek		

Pollutant:	**Fipronil Sulfide**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of zero samples exceeded the guideline. The sample was not used in the assessment due to reporting limits that were higher than the guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of zero samples exceeded the guideline and this sample size is insufficient to determine, with

the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50488, Fipronil Sulfide **Region 9**
Switzer Creek

LOE ID:	76957
Pollutant:	Fipronil Sulfide
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	One of one sample result was not used in the assessment because the laboratory data was non-detect and the method detection limit was above the guideline and therefore the results could not be quantified with the level of certainty required by the Listing Policy.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for fipronil sulfide is the median lethal concentration (LC50) of 0.16 ug/g and is normalized by the percentage of organic carbon in the sediment sample (Maul et al. 2008).
Guideline Reference:	Effect of sediment-associated pyrethroids, fipronil, and metabolites on Chironomus tentans growth rate, body mass, condition index, immobilization, and survival. Environ. Toxicol. Chem. 27(12):2582-2590.
Spatial Representation:	Data for this line of evidence for Switzer Creek was collected at 1 monitoring site [Switzer Creek @ Harbor - 908SUP095]
Temporal Representation:	Data was collected on a single day 1/8/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **50489** **Region 9**
Switzer Creek

Pollutant:	**Fipronil Sulfone**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**

Last Listing Cycle's Final Listing Decision:	New Decision	039490
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of zero samples exceeded the guideline. The sample was not used in the assessment due to reporting limits that were higher than the guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of zero samples exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50489, Fipronil Sulfone **Region 9**

Switzer Creek

LOE ID:	76958
Pollutant:	Fipronil Sulfone
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	One of one sample result was not used in the assessment because the laboratory data was non-detect and the method detection limit was above the guideline and therefore the results could not be quantified with the level of certainty required by the Listing Policy.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	The evaluation guideline for fipronil sulfone is the median lethal concentration (LC50) of 0.12 ug/g and is normalized by the percentage of organic carbon in the sediment sample (Maul et al. 2008).
Guideline Reference:	Effect of sediment-associated pyrethroids, fipronil, and metabolites on Chironomus tentans growth rate, body mass, condition index, immobilization, and survival. Environ. Toxicol. Chem. 27(12):2582-2590.
Spatial Representation:	Data for this line of evidence for Switzer Creek was collected at 1 monitoring site [Switzer Creek @ Harbor - 908SUP095]
Temporal Representation:	Data was collected on a single day 1/8/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID	50475	Region 9
Switzer Creek		

Pollutant:	**Lindane/gamma Hexachlorocyclohexane (gamma-HCH)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeds the sediment guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeds the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50475, Lindane/gamma Hexachlorocyclohexane (gamma-HCH)	**Region 9**
Switzer Creek	

LOE ID:	76959

Pollutant:	Lindane/gamma Hexachlorocyclohexane (gamma-HCH)	039492
LOE Subgroup:	Pollutant-Sediment	
Matrix:	Sediment	
Fraction:	Total	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Switzer Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for HCH, gamma.	
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for Lindane (gamma-HCH) is 4.99 ug/Kg dry weight (MacDonald et al. 2000).	
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31	
Spatial Representation:	Data for this line of evidence for Switzer Creek was collected at 1 monitoring site [Switzer Creek @ Harbor - 908SUP095]	
Temporal Representation:	Data was collected on a single day 1/8/2007.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.	
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)	

DECISION ID	**50454**	**Region 9**
Switzer Creek		

Pollutant:	**Permethrin, total**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeds the sediment guidelines.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.

2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 939493
3. Zero of one sample exceeds the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50454, Permethrin, total **Region 9**
Switzer Creek

LOE ID:	76960
Pollutant:	Permethrin, total
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Switzer Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Permethrin, Total.
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for permethrin is the median lethal concentration (LC50) of 8.9 ug/g and is normalized by the percentage of organic carbon in the sediment sample. The LC50 8.9 ug/g is the geometric mean of LC50 values for permethrin from Amweg et al. (2005).
Guideline Reference:	Use and Toxicity of Pyrethroid Pesticides in the Central Valley, California, USA. Environmental Toxicology and Chemistry, 24:966-972, with erratum 24:No. 5
Spatial Representation:	Data for this line of evidence for Switzer Creek was collected at 1 monitoring site [Switzer Creek @ Harbor - 908SUP095]
Temporal Representation:	Data was collected on a single day 1/8/2007.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)

DECISION ID **53493** **Region 9**
Switzer Creek

Pollutant: **Toxicity**

Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	039494
Last Listing Cycle's Final Listing Decision:	New Decision	
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One lines of evidence are available in the administrative record to assess this pollutant. One of one sediment sample exhibited sediment toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is INSUFFICIENT justification FOR placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of the one sediment sample exceed the GUIDELINE for toxicity and this sample size is INSUFFICIENT to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53493, Toxicity **Region 9**

Switzer Creek

LOE ID:	76973
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate sediment toxicity. The sample exhibited significant toxicity. The toxicity test included survival and growth of Hyalella azteca. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life.

	Region 9 Basin Plan.	039495
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted using the significant effect code: S equals significant, SG equals significantly greater and SL equals significantly lower. If a sample has any one of these codes, it will be considered an exceedance.	
Guideline Reference:	Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates, Second Edition. U.S. Environmental Protection Agency Office of Research and Development, Duluth, MI , U.S. Environmental Protection Agency Office of Water, Washington, DC EPA-600/R-99/064	
Spatial Representation:	The sample was collected at station 908SUP095 .	
Temporal Representation:	The sample was collected in January 2007.	
Environmental Conditions:		
QAPP Information:	All data was collected following the Standard Operating Procedures and Data Quality Objectives outlined in the SWAMP QAMP, (Puckett, 2002). QA data are included in submission.	
QAPP Information Reference(s):		

DECISION ID	42789	Region 9
Switzer Creek		

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. None of the 3 samples exceed the California Toxics Rule water quality objective for Arsenic. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 3 samples exceed the California Toxics Rule water quality objective for Arsenic and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 42789, Arsenic **Region 9**

Switzer Creek 039496

LOE ID:	7048
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	None of the three samples exceed the water quality objective.
Data Reference:	Monitoring and Modeling of Chollas, Switzer, and Paleta Creek, Southern California Coastal Water Research Project
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the CTR, the Arsenic water quality objective for maximum freshwater concentration is 340 ug/L and continuous freshwater concentration is 150 ug/L (U.S. EPA, 2000).
Objective/Criterion Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at 1 monitoring station in Switzer Creek.
Temporal Representation:	Samples were collected during 3 storm events in 2006.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	QA/QC conducted according to 40 CFR 136.
QAPP Information Reference(s):	

DECISION ID **43228** **Region 9**

Switzer Creek

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. One of three samples exceed the California Toxics Rule water quality objective for Cadmium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.039497
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of three samples exceed the California Toxics Rule water quality objective for Cadmium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43228, Cadmium **Region 9**

Switzer Creek

LOE ID:	7158
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	1
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	One of the three samples taken during storm events in 2007 for the Monitoring and Modeling of Chollas, Switzer, and Paleta Creek, Southern exceed the water quality objective for Cadmium.
Data Reference:	Monitoring and Modeling of Chollas, Switzer, and Paleta Creek, Southern California Coastal Water Research Project
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the CTR, Cadmium water quality objective for maximum freshwater concentration is 4.3 ug/L and continuous freshwater concentration is 2.2 ug/L (U.S. EPA, 2000).
Objective/Criterion Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at 1 monitoring station in Switzer Creek.
Temporal Representation:	Samples were collected during 3 storm events in 2006.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	QA/QC conducted according to 40 CFR 136.
QAPP Information Reference(s):	

DECISION ID **38166** **Region 9**

Switzer Creek

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)

Revision Status	Original	039498
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the three samples exceed the California Toxics Rule water quality objective for Chromium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the three samples exceed the California Toxics Rule water quality objective for Chromium. The sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 38166, Chromium **Region 9**

Switzer Creek

LOE ID:	7053
Pollutant:	Chromium (total)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	None of the three samples taken during storm events in 2007 for the Monitoring and Modeling of Chollas, Switzer, and Paleta Creek, exceded the water quality objective for Chromium.
Data Reference:	Monitoring and Modeling of Chollas, Switzer, and Paleta Creek, Southern California Coastal Water Research Project
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the CTR, the Chromium water quality objective for maximum freshwater concentration is 16 ug/L and continuous freshwater concentration is 11 ug/L (U.S. EPA, 2000).
Objective/Criterion Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at 1 monitoring station in Switzer Creek.
Temporal Representation:	Samples were collected during 3 storm events in 2006.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	QA/QC conducted according to 40 CFR 136.
QAPP Information Reference(s):	

DECISION ID 50464 Region 9
Switzer Creek

Pollutant:	**DDD (Dichlorodiphenyldichloroethane)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeds the sediment guidelines.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeds the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50464, DDD (Dichlorodiphenyldichloroethane) Region 9
Switzer Creek

LOE ID:	76926
Pollutant:	DDD (Dichlorodiphenyldichloroethane)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	039500
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Switzer Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for DDD.	
Data Reference:	Statewide Project Urban Pyrethroid Status Monitoring	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity) for sum of DDD (o,p' + p,p') is 28.0 ug/Kg dry weight (MacDonald et al. 2000).	
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31	
Spatial Representation:	Data for this line of evidence for Switzer Creek was collected at 1 monitoring site [Switzer Creek @ Harbor - 908SUP095]	
Temporal Representation:	Data was collected on a single day 1/8/2007.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	SWAMP data collected before September 2008 followed the QAMP 2002.	
QAPP Information Reference(s):	Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)	

DECISION ID	**43063**	**Region 9**
Switzer Creek		

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. None of the samples exceed the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the three samples exceeded the nickel and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not

changed. 039501

Line of Evidence (LOE) for Decision ID 43063, Nickel **Region 9**

Switzer Creek

LOE ID:	7155
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	None of the three samples exceed the chronic water quality objectives as outlined in Monitoring and Modeling of Chollas, Switzer, and Paleta Creek, 2007.
Data Reference:	Monitoring and Modeling of Chollas, Switzer, and Paleta Creek, Southern California Coastal Water Research Project
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the CTR, the Nickel water quality objective for maximum freshwater concentration is 460 ug/L and continuous freshwater concentration is 52 ug/L (U.S. EPA, 2000).
Objective/Criterion Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at 1 monitoring station in Switzer Creek.
Temporal Representation:	Samples were collected during 3 storm events in 2006.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	QA/QC conducted according to 40 CFR 136.
QAPP Information Reference(s):	

DECISION ID **43031** **Region 9**

Switzer Creek

Pollutant:	**Copper**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. All three of the samples exceed the California Toxics Rule water quality objective for copper.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. All three of the samples exceed the California Toxics Rule water quality objective for copper, and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43031, Copper **Region 9**
Switzer Creek

LOE ID:	7052
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	3
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	All three samples exceeded the chronic water quality objective for copper.
Data Reference:	Monitoring and Modeling of Chollas, Switzer, and Paleta Creek, Southern California Coastal Water Research Project
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the CTR, the Copper water quality objective for maximum freshwater concentration is 14 ug/L and continuous freshwater concentration is 9 ug/L (U.S. EPA, 2000).
Objective/Criterion Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at 1 monitoring station in Switzer Creek.
Temporal Representation:	Samples were collected during 3 storm events in 2006.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	QA/QC conducted according to 40 CFR 136.
QAPP Information Reference(s):	

DECISION ID 43239 **Region 9**
Switzer Creek

Pollutant:	**Lead**	039503
Final Listing Decision:	**List on 303(d) list (TMDL required list)**	
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)	
Revision Status	Original	
Sources:	Source Unknown	
Expected TMDL Completion Date:	2021	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. All three of the samples exceed the California Toxics Rule water quality objective for lead.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. All three of the samples exceed the California Toxics Rule water quality objective for lead, and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43239, Lead **Region 9**

Switzer Creek

LOE ID:	7154
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	3
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	All three samples exceed the chronic water quality objective for lead.
Data Reference:	Monitoring and Modeling of Chollas, Switzer, and Paleta Creek, Southern California Coastal Water Research Project
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the CTR, the Lead water quality objective for maximum freshwater concentration is 82 ug/L and continuous freshwater concentration is 3 ug/L (U.S. EPA, 2000).
Objective/Criterion Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for

the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA

Evaluation Guideline:
Guideline Reference:

Spatial Representation:	Samples were collected at 1 monitoring station in Switzer Creek.
Temporal Representation:	Samples were collected during 3 storm events in 2006.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	QA/QC conducted according to 40 CFR 136.
QAPP Information Reference(s):	

DECISION ID 43294 Region 9
Switzer Creek

Pollutant:	**Zinc**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Two of the 3 samples exceed the California Toxics Rule criteria for Zinc.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Two of 3 samples exceed the California Toxics Rule criteria for Zinc and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43294, Zinc Region 9
Switzer Creek

LOE ID:	7156
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	Total	039505
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	3	
Number of Exceedances:	2	
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)	
Data Used to Assess Water Quality:	Two of three samples exceed the acute and chronic water quality objectives as outlined in Monitoring and Modeling of Chollas, Switzer, and Paleta Creek, 2007.	
Data Reference:	Monitoring and Modeling of Chollas, Switzer, and Paleta Creek, Southern California Coastal Water Research Project	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the CTR, the Lead water quality objective in for maximum and continuous freshwater concentration is 120 ug/L. (U.S. EPA, 2000).	
Objective/Criterion Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at 1 monitoring station in Switzer Creek.	
Temporal Representation:	Samples were collected during 3 storm events in 2006.	
Environmental Conditions:	Samples were collected during wet weather.	
QAPP Information:	QA/QC conducted according to 40 CFR 136.	
QAPP Information Reference(s):		

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Warm Springs Creek (Riverside County)
Water Body ID: CAR9023300020080825005933
Water Body Type: River & Stream

DECISION ID 42792 **Region 9**
Warm Springs Creek (Riverside County)

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal from the CWA section 303(d) List under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Four lines of evidence are available in the administrative record to assess this pollutant. With the latest data, at least six of seven single samples exceed the water quality objectives for E. Coli., and fecal coliform for the protection of REC-1 beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, at least six of seven single samples exceed the water quality objectives for E. Coli., and fecal coliform for the protection of REC-1 beneficial use and this exceeds the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 42792, Indicator Bacteria **Region 9**
Warm Springs Creek (Riverside County)

LOE ID:	72776
Pollutant:	Escherichia coli (E. coli)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation	039507
Number of Samples:	2	
Number of Exceedances:	2	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Two of the two samples exceeded the E. coli objective.	
Data Reference:	Data for Various Pollutants in Riverside County, 2007-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The E.Coli concentration shall not exceed more than 235/100 ml. Warter Quality Control Plan for the San Diego Basin.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected at Warm Springs Creek.	
Temporal Representation:	Samples were collected between November 2008 and December 2008.	
Environmental Conditions:		
QAPP Information:	No QAPP was submitted. Sampling was done by municipalities in Riverside County pursuant to the Riverside County Municipal Stormwater Permit.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 42792, Indicator Bacteria **Region 9**

Warm Springs Creek (Riverside County)

LOE ID:	72777
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2
Number of Exceedances:	2
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Two of the two samples exceeded the fecal coliform objective.
Data Reference:	Data for Various Pollutants in Riverside County, 2007-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The Fecal Coliform concentration shall not exceed more than 400/100 ml. Water Quality Control Plan for the San Diego Basin.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Warm Springs Creek.
Temporal Representation:	Samples were collected between November 2008 and December 2008.
Environmental Conditions:	
QAPP Information:	No QAPP was submitted. Sampling was done by municipalities in Riverside County pursuant to the Riverside County Municipal Stormwater Permit.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 42792, Indicator Bacteria **Region 9**

Warm Springs Creek (Riverside County) 039508

LOE ID:	7182
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	5
Number of Exceedances:	4
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Four out of five samples collected exceed the water quality objective according to results in the Riverside County Flood Control and Water Conservation District annual progress report from 2005 and 2006. Samples were collected from October 2004 through February 2006.
Data Reference:	Watershed Annual Progress Report 2004 to 2005 and 2005 to 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, no more than 10% of the samples during any 30-day period for waters designated for contact recreation shall exceed 400 per 100 ml (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Warm Springs Creek near Murrieta. Lat/long: 33Â°31Â'56Â" N/117Â°10Â'34Â" W.
Temporal Representation:	Two to three samples were collected per monitoring year. Samples were collected from October 2004 through February 2006.
Environmental Conditions:	One sample represents the first storm event of each monitoring year that produces sufficient flow to collect a composite sample. In addition, another sample is collected during the monitoring year to represent a wet weather event. Two dry sampling events are also required each monitoring year; however, only one dry event was monitored in the 2004-2005 monitoring year and no dry events in the 2005-2006 monitoring year due to low flow.
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 42792, Indicator Bacteria **Region 9**

Warm Springs Creek (Riverside County)

LOE ID:	7404
Pollutant:	Escherichia coli (E. coli)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	5
Number of Exceedances:	4
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Four out of five samples collected exceed the water quality objective according to results in the Riverside County Flood Control and Water Conservation District annual progress report from 2005 and 2006. Samples were collected from October 2004 through May 2006.
Data Reference:	Watershed Annual Progress Report 2004 to 2005 and 2005 to 2006

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The maximum E. coli level for moderately or lightly used areas is 406 colonies per 100 ml.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Warm Springs Creek near Murrieta. Lat/long: 33Â°31Â'56Â" N/117Â°10Â'34Â" W.
Temporal Representation:	Two to three samples were collected per monitoring year. Samples were collected from October 2004 through February 2006.
Environmental Conditions:	One sample represents the first storm event of each monitoring year that produces sufficient flow to collect a composite sample. In addition, another sample is collected during the monitoring year to represent a wet weather event. Two dry sampling events are also required each monitoring year; however, only one dry event was monitored in the 2004-2005 monitoring year and no dry events in the 2005-2006 monitoring year due to low flow.
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 42792, Indicator Bacteria **Region 9**

Warm Springs Creek (Riverside County)

LOE ID:	72778
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2
Number of Exceedances:	2
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Two of the two samples exceeded the total coliform objective.
Data Reference:	Data for Various Pollutants in Riverside County, 2007-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life. Basin Plan for the San Diego Basin.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Total Coliform concentration shall not exceed more than 10000/100 ml. Guidance for Fresh Water Beaches (CDPH).
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.
Spatial Representation:	The samples were collected at Warm Springs Creek.
Temporal Representation:	Samples were collected between November 2008 and December 2008.
Environmental Conditions:	
QAPP Information:	No QAPP was submitted. Sampling was done by municipalities in Riverside County pursuant to the Riverside County Municipal Stormwater Permit.
QAPP Information Reference(s):	

DECISION ID 44683 Region 9

Warm Springs Creek (Riverside County) 039510

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Three of four of the samples exceed the Basin Plan water quality objective for chlorpyrifos.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Three of four of the samples exceed the Basin Plan water quality objective for chlorpyrifos and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 44683, Chlorpyrifos — Region 9

Warm Springs Creek (Riverside County)

LOE ID:	7037
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	3
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Three of four samples exceeded the warm freshwater habitat water quality objective for Chlorpyrifos in the Riverside County Flood Control and Water Conservation District annual progress reports from 2005 and 2006. Four samples were collected between October 2004 and February 2006.
Data Reference:	Watershed Annual Progress Report 2004 to 2005 and 2005 to 2006
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The 4-day average concentration of chlorpyrifos in freshwater is 0.014 ug/L. The 1-hour average concentration of chlorpyrifos in freshwater is 0.025 ug/L according to Siepmann and Finlayson, 2000; Finlayson, 2004.
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Samples were collected at Warm Springs Creek near Murrieta. Lat/long: 33Â°31Â'56Â" N/117Â°10Â'34Â" W.
Temporal Representation:	Two to three samples were collected per monitoring year. Samples were collected from October 2004 through February 2006.
Environmental Conditions:	One sample represents the first storm event of each monitoring year that produces sufficient flow to collect a composite sample. In addition, another sample is collected during the monitoring year to represent a wet weather event. Two dry sampling events are also required each monitoring year; however, only one dry event was monitored in the 2004-2005 monitoring year and no dry events in the 2005-2006 monitoring year due to low flow.
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.
QAPP Information Reference(s):	

DECISION ID 42738 Region 9

Warm Springs Creek (Riverside County)

Pollutant:	**Iron**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Five of the five samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Five of the 5 samples exceed the Basin Plan objective and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.

4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 42738, Iron **Region 9**

Warm Springs Creek (Riverside County)

LOE ID:	7038
Pollutant:	Iron
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	5
Number of Exceedances:	5
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	All five samples, from results in the Riverside County Flood Control and Water Conservation District annual progress reports from 2005 and 2006, exceeded the water quality objective for Iron. Five samples were collected between October 2004 and February 2006.
Data Reference:	Watershed Annual Progress Report 2004 to 2005 and 2005 to 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, inland surface waters designated as domestic or municipal supply, shall not contain concentrations of iron in excess of the secondary maximum contaminant level 0.3 mg/L (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Warm Springs Creek near Murrieta. Lat/long: 33Â°31Â'56Â" N/117Â°10Â'34Â" W.
Temporal Representation:	Two to three samples were collected per monitoring year. Samples were collected from October 2004 through February 2006.
Environmental Conditions:	One sample represents the first storm event of each monitoring year that produces sufficient flow to collect a composite sample. In addition, another sample is collected during the monitoring year to represent a wet weather event. Two dry sampling events are also required each monitoring year; however, only one dry event was monitored in the 2004-2005 monitoring year and no dry events in the 2005-2006 monitoring year due to low flow.
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.
QAPP Information Reference(s):	

DECISION ID 44590 **Region 9**

Warm Springs Creek (Riverside County)

Pollutant:	**Manganese**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original

Sources:	Source Unknown	039513
Expected TMDL Completion Date:	2021	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. Two of three of the samples exceed the Basin Plan water quality objective for manganese.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Two of three of the samples exceed the Basin Plan water quality objective for manganese and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 44590, Manganese **Region 9**

Warm Springs Creek (Riverside County)

LOE ID:	7040
Pollutant:	Manganese
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	2
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Two of three samples exceeded the warm freshwater habitat water quality objective for Manganese in the Riverside County Flood Control and Water Conservation District annual progress reports from 2005 and 2006. Three samples were collected between October 2004 and March 2005.
Data Reference:	Watershed Annual Progress Report 2004 to 2005 and 2005 to 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, inland surface waters designated as domestic or municipal supply shall not contain concentrations of manganese in excess of the secondary maximum contaminant level 0.05 mg/L (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	

Guideline Reference:	039514
Spatial Representation:	Samples were collected at Warm Springs Creek near Murrieta. Lat/long: 33Â°31Â'56Â" N/117Â°10Â'34Â" W.
Temporal Representation:	Two to three samples were collected per monitoring year. Samples were collected from October 2004 through March 2005.
Environmental Conditions:	One sample represents the first storm event of each monitoring year that produces sufficient flow to collect a composite sample. In addition, another sample is collected during the monitoring year to represent a wet weather event. Two dry sampling events are also required each monitoring year; however, only one dry event was monitored in the 2004-2005 monitoring year and no dry events in the 2005-2006 monitoring year due to low flow.
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.
QAPP Information Reference(s):	

DECISION ID 43143 Region 9

Warm Springs Creek (Riverside County)

Pollutant:	**Nitrogen**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Five of the five samples exceed the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Five of five samples exceed the objective, and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43143, Nitrogen Region 9

Warm Springs Creek (Riverside County)

LOE ID:	7041
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	Total	039515
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	5	
Number of Exceedances:	5	
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)	
Data Used to Assess Water Quality:	All five samples exceeded the warm freshwater habitat water quality objective for Total Nitrogen in the Riverside County Flood Control and Water Conservation District annual progress reports from 2005 and 2006. Five samples were collected between October 2004 and February 2006.	
Data Reference:	Watershed Annual Progress Report 2004 to 2005 and 2005 to 2006	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses (RWQCB, 2007).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used (RWQCB, 2007)	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin	
Spatial Representation:	Samples were collected at Warm Springs Creek near Murrieta. Lat/long: 33Â°31Â'56Â" N/117Â°10Â'34Â" W.	
Temporal Representation:	Two to three samples were collected per monitoring year. Samples were collected from October 2004 through February 2006.	
Environmental Conditions:	One sample represents the first storm event of each monitoring year that produces sufficient flow to collect a composite sample. In addition, another sample is collected during the monitoring year to represent a wet weather event. Two dry sampling events are also required each monitoring year; however, only one dry event was monitored in the 2004-2005 monitoring year and no dry events in the 2005-2006 monitoring year due to low flow.	
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.	
QAPP Information Reference(s):		

DECISION ID	**32587**	**Region 9**
Warm Springs Creek (Riverside County)		

Pollutant:	**Phosphorus**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Five of the five samples exceed the Basin Plan water quality objective for phosphorus.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Five of the five samples exceed the Basin Plan water quality objective for phosphorus and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32587, Phosphorus **Region 9**

Warm Springs Creek (Riverside County)

LOE ID:	7042
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	5
Number of Exceedances:	5
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	All five samples exceeded the warm freshwater habitat water quality objective for Phosphorus in the Riverside County Flood Control and Water Conservation District annual progress reports from 2005 and 2006. Five samples were collected between October 2004 and February 2006.
Data Reference:	Watershed Annual Progress Report 2004 to 2005 and 2005 to 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Water Quality Control Plan for the San Diego Basin Goal of 0.1 mg/L for total phosphorus in streams and other flowing waters (RWQCB, 2007).
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at Warm Springs Creek near Murrieta. Lat/long: 33Â°31Â’56Â” N/117Â°10Â’34Â” W.
Temporal Representation:	Two to three samples were collected per monitoring year. Samples were collected from October 2004 through February 2006.
Environmental Conditions:	One sample represents the first storm event of each monitoring year that produces sufficient flow to collect a composite sample. In addition, another sample is collected during the

monitoring year to represent a wet weather event. Two dry sampling events are also required each monitoring year; however, only one dry event was monitored in the 2004-2005 monitoring year and no dry events in the 2005-2006 monitoring year due to low flow.

QAPP Information: QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.

QAPP Information Reference(s):

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Poway Creek
Water Body ID: CAR9062000020080904172636
Water Body Type: River & Stream

DECISION ID 43500 **Region 9**
Poway Creek

Pollutant: Nitrogen
Final Listing Decision: List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Sources: Source Unknown
Expected TMDL Completion Date: 2023
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Four of the four samples exceed the water quality objective for total nitrogen.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. All four samples exceeded the total nitrogen water quality objective and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 43500, Nitrogen **Region 9**
Poway Creek

LOE ID: 21388

Pollutant: Toxicity
LOE Subgroup: Toxicity
Matrix: Water
Fraction: None

Beneficial Use: Warm Freshwater Habitat

Number of Samples:	4	039519
Number of Exceedances:	4	
Data and Information Type:	Ambient toxicity testing (chronic)	
Data Used to Assess Water Quality:	Four samples were collected at Poway Creek Station 906LPPOW2 from March 2002 to September 2002 and they showed significant toxicity levels (SL) in the following tests: Selenastrum algae growth test - four of the four samples. Ceriodaphnia dubia survival/reproductive test - one of the four samples. Hyalella Azteca growth/survival test - three of the four samples. Results were from California's Surface Water Ambient Monitoring Program Report, 2007.	
Data Reference:	Monitoring data for Region 9	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold (EPA, 2002).	
Guideline Reference:	Monitoring data for Region 9	
Spatial Representation:	Water samples were collected at Poway Creek Station 906LPPOW2; (Latitude 32.95173, Longitude -117.04766).	
Temporal Representation:	Samples were collected on March, April, June, and September 2002.	
Environmental Conditions:		
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43500, Nitrogen **Region 9**

Poway Creek

LOE ID:	7576
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Aquatic Life Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Four water samples were collected at Poway Creek station 906LPPOW2 in March, April, June, and September 2002. All four samples showed excessive nitrogen concentrations according to results in California's Surface Water Ambient Monitoring Program, 2007.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses (RWQCB, 2007). A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are

	approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at Poway Creek station (906LPPOW2); (Latitude 32.952, Longitude -117.046).
Temporal Representation:	Samples were collected on March, April, June, and September 2002.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

DECISION ID 43499 Region 9

Poway Creek

Pollutant:	**Selenium**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Three of the samples exceed the water quality objective for selenium. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. All three samples exceed the selenium water quality objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43499, Selenium Region 9

Poway Creek

LOE ID:	7577	039521

Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Aquatic Life Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	3
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Three water samples were collected at Poway Creek station 906LPPOW2 in March, April, and June 2002. All three samples showed excessive selenium concentrations according to results from California's Surface Water Ambient Monitoring Program Report, 2007.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	CTR Freshwater Chronic (CCC) 5 ug/L. (U.S. EPA, 2000).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA
Spatial Representation:	Water samples were collected at Poway Creek station 906LPPOW2; (Latitude 32.95182, Longitude -117.046955).
Temporal Representation:	Samples were collected on March, April, and June 2002.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 43499, Selenium **Region 9**

Poway Creek

LOE ID:	21388
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Four samples were collected at Poway Creek Station 906LPPOW2 from March 2002 to September 2002 and they showed significant toxicity levels (SL) in the following tests: Selenastrum algae growth test - four of the four samples. Ceriodaphnia dubia survival/reproductive test - one of the four samples. Hyalella Azteca growth/survival test - three of the four samples. Results were from California's Surface Water Ambient Monitoring Program Report, 2007.
Data Reference:	Monitoring data for Region 9

SWAMP Data:	SWAMP	039522
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold (EPA, 2002).	
Guideline Reference:	Monitoring data for Region 9	
Spatial Representation:	Water samples were collected at Poway Creek Station 906LPPOW2; (Latitude 32.95173, Longitude -117.04766).	
Temporal Representation:	Samples were collected on March, April, June, and September 2002.	
Environmental Conditions:		
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.	
QAPP Information Reference(s):		

DECISION ID 44462 **Region 9**

Poway Creek

Pollutant:	**Toxicity**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the section 303(d) list under section 3.6 of the Listing Policy. Under section 3.6 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Four of the samples exceed the water quality objective for toxicity. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. All four samples exceed the toxicity water quality objective and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 44462, Toxicity **Region 9**

Poway Creek

LOE ID:	21388	039523

Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Four samples were collected at Poway Creek Station 906LPPOW2 from March 2002 to September 2002 and they showed significant toxicity levels (SL) in the following tests: Selenastrum algae growth test - four of the four samples. Ceriodaphnia dubia survival/reproductive test - one of the four samples. Hyalella Azteca growth/survival test - three of the four samples. Results were from California's Surface Water Ambient Monitoring Program Report, 2007.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold (EPA, 2002).
Guideline Reference:	Monitoring data for Region 9
Spatial Representation:	Water samples were collected at Poway Creek Station 906LPPOW2; (Latitude 32.95173, Longitude -117.04766).
Temporal Representation:	Samples were collected on March, April, June, and September 2002.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Redhawk Channel
Water Body ID: CAR9025100020080904171327
Water Body Type: River & Stream

DECISION ID 43592 **Region 9**
Redhawk Channel

Pollutant: **Indicator Bacteria**
Final Listing Decision: **Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Sources: Source Unknown
Expected TMDL Completion Date: 2025
Impairment from Pollutant or Pollution: Pollution

Regional Board Conclusion: This pollutant is being considered for removal from the CWA section 303(d) List under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. With the latest data, 7 of 9 single samples exceed the water quality objective for E. Coli. of 235/100ml and for fecal coliform of 400/100ml for the protection of REC-1.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, 7 of 9 single samples exceed the water quality objective for E. Coli. of 235/100ml and for fecal coliform of 400/100ml for the protection of REC-1 and this exceeds the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 43592, Indicator Bacteria **Region 9**
Redhawk Channel

LOE ID: 72786

Pollutant: Fecal Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use:	Water Contact Recreation	039525
Number of Samples:	2	
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Zero of the two samples exceeded the fecal coliform objective.	
Data Reference:	Data for Various Pollutants in Riverside County, 2007-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The Fecal Coliform concentration shall not exceed more than 400/100 ml. Water Quality Control Plan for the San Diego Basin.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected at Redhawk Channel.	
Temporal Representation:	Samples were collected between November 2008 and June 2009.	
Environmental Conditions:		
QAPP Information:	No QAPP was submitted. Sampling was done by municipalities in Riverside County pursuant to the Riverside County Municipal Stormwater Permit.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43592, Indicator Bacteria **Region 9**

Redhawk Channel

LOE ID:	72785
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the two samples exceeded the total coliform objective.
Data Reference:	Data for Various Pollutants in Riverside County, 2007-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life. Basin Plan for the San Diego Basin.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Total Coliform concentration shall not exceed more than 10000/100 ml. Guidance for Fresh Water Beaches (CDPH).
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.
Spatial Representation:	The samples were collected at Redhawk Channel.
Temporal Representation:	Samples were collected between November 2008 and June 2009.
Environmental Conditions:	
QAPP Information:	No QAPP was submitted. Sampling was done by municipalities in Riverside County pursuant to the Riverside County Municipal Stormwater Permit.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43592, Indicator Bacteria — Region 9

Redhawk Channel

LOE ID:	72787
Pollutant:	Escherichia coli (E. coli)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the two samples exceeded the E. coli objective.
Data Reference:	Data for Various Pollutants in Riverside County, 2007-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The E.Coli concentration shall not exceed more than 235/100 ml. Water Quality Control Plan for the San Diego Basin.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Redhawk Channel.
Temporal Representation:	Samples were collected between November 2008 and June 2009.
Environmental Conditions:	
QAPP Information:	No QAPP was submitted. Sampling was done by municipalities in Riverside County pursuant to the Riverside County Municipal Stormwater Permit.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43592, Indicator Bacteria — Region 9

Redhawk Channel

LOE ID:	7466
Pollutant:	Escherichia coli (E. coli)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	7
Number of Exceedances:	7
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	All seven samples collected exceed the water quality objective according to results in the Riverside County Flood Control and Water Conservation District annual progress report from 2005 and 2006. Samples were collected from October 2004 through February 2006.
Data Reference:	Watershed Annual Progress Report 2004 to 2005 and 2005 to 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The maximum E. coli level for moderately or lightly used areas is 406 colonies per 100 ml (RWQCB, 2007).

Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	039527
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Redhawk Channel downstream of Overland Dr. Lat/long: 33Â °28Â'34.6Â" N/117Â°05Â'40.8Â" W.	
Temporal Representation:	Three to four samples were collected per monitoring year. Samples were collected from October 2004 through February 2006.	
Environmental Conditions:	One sample represents the first storm event of each monitoring year that produces sufficient flow to collect a composite sample. In addition, another sample is collected during the monitoring year to represent a wet weather event. Two dry sampling events are also required each monitoring year; however, two dry events were monitored in the 2004-2005 monitoring year and one dry event in the 2005-2006 monitoring year due to low flow.	
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43592, Indicator Bacteria **Region 9**

Redhawk Channel

LOE ID:	7465
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	7
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	All seven samples collected exceed the water quality objective according to the Riverside County Flood Control and Water Conservation District annual progress report from 2005 and 2006. Samples were collected from October 2004 through February 2006. .
Data Reference:	Watershed Annual Progress Report 2004 to 2005 and 2005 to 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, no more than 10% of the samples during any 30-day period for waters designated for contact recreation shall exceed 400 per 100 ml (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Redhawk Channel downstream of Overland Dr. Lat/long: 33Â °28Â'34.6Â" N/117Â°05Â'40.8Â" W.
Temporal Representation:	Three to four samples were collected per monitoring year. Samples were collected from October 2004 through February 2006.
Environmental Conditions:	One sample represents the first storm event of each monitoring year that produces sufficient flow to collect a composite sample. In addition, another sample is collected during the monitoring year to represent a wet weather event. Two dry sampling events are also required each monitoring year; however, two dry events were monitored in the 2004-2005 monitoring year and one dry event in the 2005-2006 monitoring year due to low flow.
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.
QAPP Information Reference(s):	

DECISION ID	53338	039528 Region 9
Redhawk Channel		

Pollutant:	**Oxygen, Dissolved**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line(s) of evidence are necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the four samples exceed the Objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the four samples exceed the Objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2. 4. Pursuant to [SECTION 3.11/4.11] of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53338, Oxygen, Dissolved	**Region 9**
Redhawk Channel	

LOE ID:	75521
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Zero of 4 samples exceeded the objective.
Data Reference:	Data for Various Pollutants in Riverside County, 2007-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Dissolved oxygen levels shall not be less than 5.0 mg/l in inland surface waters with designated MAR or WARM beneficial uses. The annual mean dissolved oxygen concentration shall not be less than 7 mg/l more than 10% of the time.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:
Guideline Reference:

Spatial Representation:	Samples were collected from the Redhawk Channel Station.
Temporal Representation:	Samples were collected four times between 2007 and 2009.
Environmental Conditions:	
QAPP Information:	NPDES quality assurance.
QAPP Information Reference(s):	

DECISION ID 50052 Region 9
Redhawk Channel

Pollutant:	**pH**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Four of the Four samples exceed the Water Quality Objective for pH.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Four of Four samples exceeded the Water Quality Objective for pH for and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50052, pH Region 9
Redhawk Channel

LOE ID:	75522
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4

Number of Exceedances:	4	039530

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Four of 4 samples exceeded the objective.
Data Reference:	Data for Various Pollutants in Riverside County, 2007-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The pH of all inland surface waters shall not be depressed below 6.5 or raised above 8.5 as a result of waste discharges.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the Red Hawk Channel station.
Temporal Representation:	Samples were collected approximately once a year from 2007 to 2009.
Environmental Conditions:	
QAPP Information:	NPDES quality assurance.
QAPP Information Reference(s):	

DECISION ID	43085	Region 9
Redhawk Channel		

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Seven of eight of the samples exceed the Basin Plan water quality objective for chlorpyrifos.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Seven of eight of the samples exceed the Basin Plan water quality objective for chlorpyrifos, and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43085, Chlorpyrifos 039531 Region 9

Redhawk Channel

LOE ID:	7467
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	7
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Four out of four wet weather samples collected exceed the water quality objective of 0.025 ug/L. Three out of four dry weather samples exceed 0.014 ug/L according to results in the Riverside County Flood Control and Water Conservation District annual progress report from 2005 and 2006. Samples were collected from July 2004 through February 2006.
Data Reference:	Water Quality Control Plan for the San Diego Basin
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The 4-day average concentration of chlorpyrifos in freshwater is 0.014 ug/L. The 1-hour average concentration of chlorpyrifos in freshwater is 0.025 ug/L according to Siepmann and Finlayson, 2000; Finlayson, 2004.
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game
Spatial Representation:	Samples were collected at Redhawk Channel downstream of Overland Dr. Lat/long: 33Â °28Â'34.6Â" N/117Â°05Â'40.8Â" W.
Temporal Representation:	Three to five samples were collected per monitoring year. Samples were collected from July 2004 through February 2006.
Environmental Conditions:	One sample represents the first storm event of each monitoring year that produces sufficient flow to collect a composite sample. In addition, another sample is collected during the monitoring year to represent a wet weather event. Two dry sampling events are also required each monitoring year; however, three dry events were monitored in the 2004-2005 monitoring year and only one dry event in the 2005-2006 monitoring year due to low flow.
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.
QAPP Information Reference(s):	

DECISION ID 43600 Region 9

Redhawk Channel

Pollutant:	**Copper**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion	2021

Date:	039532
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Two of eight of the samples exceed the California Toxic Rule water quality objective for copper. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Two of eight of the samples exceed the California Toxic Rule water quality objective for copper, and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43600, Copper **Region 9**

Redhawk Channel

LOE ID:	7468
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	2
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Two out of four wet weather samples collected exceed the water quality objective for the 1-hour average concentration of copper. None of four dry weather samples collected exceeds the water quality objective for the 4-day average concentration of copper according to results in the Riverside County Flood Control and Water Conservation District annual progress report from 2005 and 2006. Samples were collected from July 2004 through February 2006.
Data Reference:	Watershed Annual Progress Report 2004 to 2005 and 2005 to 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the CTR, the dissolved copper chronic criterion is 3.1 ppb and the acute criterion is 4.8 ppb, but these criteria may vary depending upon hardness of the sample (U.S. EPA, 2000).
Objective/Criterion Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA

Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Redhawk Channel downstream of Overland Dr. Lat/long: 33Â °28Â'34.6Â" N/117Â°05Â'40.8Â" W.
Temporal Representation:	Three to five samples were collected per monitoring year. Samples were collected from July 2004 through February 2006.
Environmental Conditions:	One sample represents the first storm event of each monitoring year that produces sufficient flow to collect a composite sample. In addition, another sample is collected during the monitoring year to represent a wet weather event. Two dry sampling events are also required each monitoring year; however, three dry events were monitored in the 2004-2005 monitoring year and only one dry event in the 2005-2006 monitoring year due to low flow.
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.
QAPP Information Reference(s):	

DECISION ID **43668** **Region 9**

Redhawk Channel

Pollutant:	**Diazinon**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One lines of evidence is available in the administrative record to assess this pollutant. Two of eight of the samples exceed the Basin Plan water quality objective for Dianzinon.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Two of eight of the samples exceed the Basin Plan water quality objective for Dianzinon, and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43668, Diazinon **Region 9**

Redhawk Channel

LOE ID:	7469	039534

Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	2
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Two out of eight samples collected exceed the water quality objective; these two exceedances occurred within a one year period according to results in the Riverside County Flood Control and Water Conservation District annual progress report from 2005 and 2006. Samples were collected from July 2004 through February 2006.
Data Reference:	Watershed Annual Progress Report 2004 to 2005 and 2005 to 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments of biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organism (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The one-hour average concentration of diazinon should not exceed 0.17 Âµg/L more than once every three years on the average (acute criterion) and the four-day average concentration of diazinon should not exceed 0.17 Âµg/L more than once every three years on the average (chronic criterion). (U.S. EPA, 2006)
Guideline Reference:	Fact Sheet: Final Recommended Aquatic Life Ambient Water Quality Criteria for Diazinon
Spatial Representation:	Samples were collected at Redhawk Channel downstream of Overland Dr. Lat/long: 33Â °28Â'34.6Â" N/117Â°05Â'40.8Â" W.
Temporal Representation:	Three to five samples were collected per monitoring year. Samples were collected from July 2004 through February 2006.
Environmental Conditions:	One sample represents the first storm event of each monitoring year that produces sufficient flow to collect a composite sample. In addition, another sample is collected during the monitoring year to represent a wet weather event. Two dry sampling events are also required each monitoring year; however, three dry events were monitored in the 2004-2005 monitoring year and only one dry event in the 2005-2006 monitoring year due to low flow.
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.
QAPP Information Reference(s):	

DECISION ID	**43204**	**Region 9**
Redhawk Channel		

Pollutant:	**Iron**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Natural Sources | Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the

current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Five of six of the samples exceed the Basin Plan water quality objective for iron.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Five of six of the samples exceed the Basin Plan water quality objective for iron, and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43204, Iron **Region 9**

Redhawk Channel

LOE ID:	7470
Pollutant:	Iron
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	5
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Five out of six samples collected exceed the water quality objective according to results in the Riverside County Flood Control and Water Conservation District annual progress report from 2005 and 2006, Samples were collected from October 2004 through February 2006.
Data Reference:	Watershed Annual Progress Report 2004 to 2005 and 2005 to 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, inland surface waters designated as domestic or municipal supply, shall not contain concentrations of iron in excess of the secondary maximum contaminant level 0.3 mg/L (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Redhawk Channel downstream of Overland Dr. Lat/long: 33Â °28Â'34.6Â" N/117Â°05Â'40.8Â" W.
Temporal Representation:	Two to four samples were collected per monitoring year. Samples were collected from October 2004 through February 2006.
Environmental Conditions:	One sample represents the first storm event of each monitoring year that produces sufficient flow to collect a composite sample. In addition, another sample is collected during the

	monitoring year to represent a wet weather event. Two dry sampling events also required each monitoring year; however, three dry events were monitored in the 2004-2005 monitoring year and only one dry event in the 2005-2006 monitoring year due to low flow.
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.
QAPP Information Reference(s):	

DECISION ID	43669	Region 9
Redhawk Channel		

Pollutant:	**Manganese**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Six of six of the samples exceed the Basin Plan water quality objective for manganese. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Six of six of the samples exceed the Basin Plan water quality objective for manganese, and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43669, Manganese	Region 9
Redhawk Channel	

LOE ID:	7471
Pollutant:	Manganese
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6

Number of Exceedances:	6	039537
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)	
Data Used to Assess Water Quality:	All six samples collected exceed the water quality objective according to results in the Riverside County Flood Control and Water Conservation District annual progress report from 2005 and 2006. Samples were collected from October 2004 through February 2006.	
Data Reference:	Watershed Annual Progress Report 2004 to 2005 and 2005 to 2006	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan, inland surface waters designated as domestic or municipal supply shall not contain concentrations of manganese in excess of the secondary maximum contaminant level 0.05 mg/L (RWQCB, 2007).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Redhawk Channel downstream of Overland Dr. Lat/long: 33Â °28Â'34.6Â" N/117Â°05Â'40.8Â" W.	
Temporal Representation:	Two to four samples were collected per monitoring year. Samples were collected from October 2004 through February 2006.	
Environmental Conditions:	One sample represents the first storm event of each monitoring year that produces sufficient flow to collect a composite sample. In addition, another sample is collected during the monitoring year to represent a wet weather event. Two dry sampling events are also required each monitoring year; however, three dry events were monitored in the 2004-2005 monitoring year and only one dry event in the 2005-2006 monitoring year due to low flow.	
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.	
QAPP Information Reference(s):		

DECISION ID	**43644**	**Region 9**
Redhawk Channel		

Pollutant:	**Nitrogen**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. (with update to table 3.1)

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Six of seven of the samples exceed the Basin Plan water quality objective for nitrogen.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.

3. Six of seven of the samples exceed the Basin Plan water quality objective for nitrogen, and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 43644, Nitrogen **Region 9**

Redhawk Channel

LOE ID:	7473
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	6
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Six out of seven samples collected exceed the evaluation guideline of 1 mg/L according to the Riverside County Flood Control and Water Conservation District annual progress report from 2005 and 2006. Samples were collected from July 2004 through February 2006.
Data Reference:	Watershed Annual Progress Report 2004 to 2005 and 2005 to 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses (RWQCB, 2007). A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at Redhawk Channel downstream of Overland Dr. Lat/long: 33Â °28Â'34.6Â" N/117Â°05Â'40.8Â" W.
Temporal Representation:	Three to five samples were collected per monitoring year. Samples collected in July 2004 through February 2006.
Environmental Conditions:	One sample represents the first storm event of each monitoring year that produces sufficient flow to collect a composite sample. In addition, another sample is collected during the monitoring year to represent a wet weather event. Two dry sampling events are also required each monitoring year; however, three dry events were monitored in the 2004-2005 monitoring year and only one dry event in the 2005-2006 monitoring year due to low flow.
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES

permit. 039539

QAPP Information Reference(s):

DECISION ID	43113	Region 9
Redhawk Channel		

Pollutant:	**Phosphorus**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Seven of seven of the samples exceed the Basin Plan water quality objective for phosphorus.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Seven of seven of the samples exceed the Basin Plan water quality objective for phosphorus, and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43113, Phosphorus	Region 9
Redhawk Channel	

LOE ID:	7474
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	7
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	All seven samples collected exceed the evaluation guideline according to the Riverside

	County Flood Control and Water Conservation District annual progress reports from 2005 and 2006. Samples were collected from July 2004 through February 2006.
Data Reference:	Watershed Annual Progress Report 2004 to 2005 and 2005 to 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses (RWQCB, 2007). Water Quality Control Plan for the San Diego Basin has a goal of 0.1 mg/L for total phosphorus in streams and other flowing waters (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at Redhawk Channel downstream of Overland Dr. Lat/long: 33Â °28Â'34.6Â" N/117Â°05Â'40.8Â" W.
Temporal Representation:	Three to five samples were collected per monitoring year. Samples collected in July 2004 through February 2006.
Environmental Conditions:	One sample represents the first storm event of each monitoring year that produces sufficient flow to collect a composite sample. In addition, another sample is collected during the monitoring year to represent a wet weather event. Two dry sampling events are also required each monitoring year; however, three dry events were monitored in the 2004-2005 monitoring year and only one dry event in the 2005-2006 monitoring year due to low flow.
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.
QAPP Information Reference(s):	

DECISION ID	43114	Region 9
Redhawk Channel		

Pollutant:	**Total Dissolved Solids**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Six of nine of the samples exceed the Basin Plan water quality objective for total dissolved solids.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Six of nine of the samples exceed the Basin Plan water quality objective for total dissolved solids and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.

4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43114, Total Dissolved Solids **Region 9**

Redhawk Channel

LOE ID:	7472
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	6
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Six out of nine samples collected exceed the water quality objective according to results in the Riverside County Flood Control and Water Conservation District annual progress report from 2005 and 2006. Samples were collected from October 2004 through February 2006.
Data Reference:	Watershed Annual Progress Report 2004 to 2005 and 2005 to 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, inland surface waters designated as domestic or municipal supply, shall not contain concentrations of iron in excess of the secondary maximum contaminant level 0.3 mg/L (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Redhawk Channel downstream of Overland Dr. Lat/long: 33Â °28Â’34.6Â” N/117Â°05Â’40.8Â” W.
Temporal Representation:	Two to four samples were collected per monitoring year. Samples were collected from October 2004 through February 2006.
Environmental Conditions:	One sample represents the first storm event of each monitoring year that produces sufficient flow to collect a composite sample. In addition, another sample is collected during the monitoring year to represent a wet weather event. Two dry sampling events are also required each monitoring year; however, three dry events were monitored in the 2004-2005 monitoring year and only one dry event in the 2005-2006 monitoring year due to low flow.
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit.
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Telegraph Canyon Creek
Water Body ID: CAR9091100020081010151336
Water Body Type: River & Stream

DECISION ID 44159 **Region 9**
Telegraph Canyon Creek

Pollutant: **Benthic Community Effects**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

Benthic Community Effects is being considered for placement on the section 303(d) list under sections 3.9 and 3.2 of the Listing Policy. Under section 3.9, an additional line of evidence associating the Benthic Community Effects with a water or sediment concentration of pollutants is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this indicator. 1 of 1 samples exceeded the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing Benthic Community Effects in this water segment on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. 1 of 1 samples exceeded the Index of Biological Integrity (IBI) value of "poor" water quality for this area and this sample size is insufficient to determine with the power and confidence of the Listing Policy if standards are not met as California Stream Condition Index scores were not calculated for prior listing cycles.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because it cannot be determined if applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 44159, Benthic Community Effects **Region 9**
Telegraph Canyon Creek

LOE ID: 26471

Pollutant: Benthic Community Effects

LOE Subgroup:	Adverse Biological Responses	039543
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	1	
Data and Information Type:	Benthic macroinvertebrate surveys	
Data Used to Assess Water Quality:	One samples of IBI data were taken on November 2005 at one sampling site. Of the total number of samples, the one sample exceeded the IBI impairment threshold.	
Data Reference:	Fish and Game IBI Data	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. (SDRWQCB, 1995)	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)	
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13	
Spatial Representation:	Samples were collected at one site: 909TCCAHP on Telegraph Canyon Creek.	
Temporal Representation:	Sampling occurred during one event on November 2005.	
Environmental Conditions:		
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Project Plan for the California Stream Bioassessment Procedure and the State of California, California Monitoring an Assessment Program: "CMAP", Quality Assurance Project Plan.	
QAPP Information Reference(s):	State of California, California Monitoring and Assessment Program: "CMAP". Quality Assurance Project Plan for the California Stream Bioassessment Procedure The San Diego Stream Team Quality Assurance Project Plan	

DECISION ID	**32905**	**Region 9**
Telegraph Canyon Creek		

Pollutant:	**Nitrogen**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2027
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. Four of four samples exceed the water quality objective for biostimulatory substances.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Four of four samples exceed the water quality objectives for biostimulatory substances and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 32905, Nitrogen **Region 9**

Telegraph Canyon Creek

LOE ID:	26151
Pollutant:	Nitrogen
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Four of four samples collected at Telegraph Canyon Creek station (908PTEL02) from May 2005 to April 2006 show excessive nitrogen concentrations according to results of California's SWAMP (2007).
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used (RWQCB, 2007).
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Water samples were collected at Telegraph Canyon Creek station (908PTEL02); (Latitude -117.06288, Longitude 32.62860).
Temporal Representation:	Samples was collected in May 2005; September 2005; January 2006; and April 2006.
Environmental Conditions:	
QAPP Information:	Quality Assurance Management Plan for the State of California's Surface Water Ambient

	Monitoring Program.	039545
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA	

DECISION ID	32596	Region 9
Telegraph Canyon Creek		

Pollutant:	**Selenium**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Four of four of the samples exceed the California Toxics Rule water quality objective for selenium. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Four of four of the samples exceed the California Toxics Rule water quality objective for selenium and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 32596, Selenium	Region 9
Telegraph Canyon Creek	

LOE ID:	26152
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)

Data Used to Assess Water Quality:	Four of four samples collected at Telegraph Canyon Creek station (908PTEL02) from May 2005 to April 2006 show excessive selenium concentrations according to results of California's SWAMP (2007).
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	CTR Freshwater Chronic (CCC) 5 ug/L. (U.S. EPA, 2000).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA
Evaluation Guideline:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (RWQCB, 2007).
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Water samples were collected at Telegraph Canyon Creek station (908PTEL02); (Latitude -117.06288, Longitude 32.62860).
Temporal Representation:	Samples was collected in May 2005; September 2005; January 2006; and April 2006.
Environmental Conditions:	
QAPP Information:	Puckett, M. 2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Jamul Creek
Water Body ID: CAR9103300020081031153832
Water Body Type: River & Stream

DECISION ID 47968 **Region 9**
Jamul Creek

Pollutant: Aluminum
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Aluminum.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Evaluation Guideline for Aluminum and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47968, Aluminum **Region 9**
Jamul Creek

LOE ID: 73953

Pollutant: Aluminum
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Municipal & Domestic Supply

Number of Samples:	1	039548
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Jamul Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Aluminum.	
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan,San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The California Secondary MCL for aluminum is 0.2 mg/L (Title 22 California Code of Regulations).	
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.	
Spatial Representation:	Data for this line of evidence for Jamul Creek was collected at 1 monitoring site [Dulzura Creek @ Otay Lakes Rd.]	
Temporal Representation:	Data was collected on a single day 3/31/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.	

DECISION ID	**47971**	**Region 9**
Jamul Creek		

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the Two samples exceed the California Toxics Rule Objective for Arsenic. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Two samples exceeded the California Toxics Rule Objective for Arsenic and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and

information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47971, Arsenic **Region 9**

Jamul Creek

LOE ID:	73955
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Jamul Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Arsenic.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The dissolved arsenic criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved arsenic is 0.150 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Jamul Creek was collected at 1 monitoring site [Dulzura Creek @ Otay Lakes Rd.]
Temporal Representation:	Data was collected over the time period 2/6/2009-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 47971, Arsenic **Region 9**

Jamul Creek

LOE ID:	73956
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Jamul Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Arsenic.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for arsenic is 0.01 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Jamul Creek was collected at 1 monitoring site [Dulzura Creek @ Otay Lakes Rd.]
Temporal Representation:	Data was collected over the time period 2/6/2009-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID	48003	Region 9
Jamul Creek		

Pollutant:	**Azinphos-methyl (Guthion)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the Zero samples exceed the Water Quality Criteria for Azinphos-methyl (Guthion). Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Zero samples exceeded the Water Quality Criteria for Azinphos-methyl (Guthion) and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48003, Azinphos-methyl (Guthion)	Region 9

Jamul Creek 039551

LOE ID:	78052
Pollutant:	Azinphos-methyl (Guthion)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Jamul Creek to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Azinphos methyl.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The National Recommended Water Quality Criteria for Azinphos Methyl (Guthion) for the protection of freshwater aquatic life is a maximum of 0.01 ug/l.
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for Jamul Creek was collected at 1 monitoring site [Dulzura Creek @ Otay Lakes Rd.]
Temporal Representation:	Data was collected on a single day 3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID **48008** **Region 9**

Jamul Creek

Pollutant:	**Barium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Barium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Evaluation Guideline for Barium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48008, Barium **Region 9**
Jamul Creek

LOE ID:	73957
Pollutant:	Barium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Jamul Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Barium.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for barium is 1 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Jamul Creek was collected at 1 monitoring site [Dulzura Creek @ Otay Lakes Rd.]
Temporal Representation:	Data was collected on a single day 3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID **48010** **Region 9**
Jamul Creek

Pollutant: **Beryllium**

Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	039553
Last Listing Cycle's Final Listing Decision:	New Decision	
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Beryllium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Evaluation Guideline Beryllium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48010, Beryllium **Region 9**

Jamul Creek

LOE ID:	73958
Pollutant:	Beryllium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Jamul Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Beryllium.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for beryllium is 0.004 mg/L 9 (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Data for this line of evidence for Jamul Creek was collected at 1 monitoring site [Dulzura Creek @ Otay Lakes Rd.]
Temporal Representation:	Data was collected on a single day 3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID 48015 Region 9

Jamul Creek

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Four lines of evidence are available in the administrative record to assess this pollutant. Zero of the Seven samples exceed the California Toxics Rule Objective for Cadmium. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Seven samples exceeded the California Toxics Rule Objective for Cadmium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48015, Cadmium Region 9

Jamul Creek

LOE ID:	73963
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2

Number of Exceedances:	0	039555

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Jamul Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Cadmium.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for cadmium is 0.005 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Jamul Creek was collected at 1 monitoring site [Dulzura Creek @ Otay Lakes Rd.]
Temporal Representation:	Data was collected over the time period 2/6/2009-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 48015, Cadmium **Region 9**

Jamul Creek

LOE ID:	73961
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Jamul Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Cadmium.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Jamul Creek was collected at 1 monitoring site [Dulzura

	Creek @ Otay Lakes Rd. - 910OTY03] 039556
Temporal Representation:	Data was collected over the time period 2/6/2009-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 48015, Cadmium **Region 9**

Jamul Creek

LOE ID:	73960
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Jamul Creek to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Jamul Creek was collected at 1 monitoring site [Dulzura Creek @ Otay Lakes Rd.]
Temporal Representation:	Data was collected once yearly from 2003 to 2006 and in 2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48015, Cadmium **Region 9**

Jamul Creek

LOE ID:	73959
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Municipal & Domestic Supply	039557
Number of Samples:	5	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Jamul Creek to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Cadmium.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for cadmium is 0.005 mg/L (Title 22 of the California Code of Regulations).	
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Jamul Creek was collected at 1 monitoring site [Dulzura Creek @ Otay Lakes Rd.]	
Temporal Representation:	Data was collected once yearly from 2003 to 2006 and in 2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID	**48017**	**Region 9**
Jamul Creek		

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Four lines of evidence are available in the administrative record to assess this pollutant. Zero of the Two samples exceed the Water Quality Criteria for Chlorpyrifos.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Two samples exceeded the Water Quality Criteria for Chlorpyrifos and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48017, Chlorpyrifos **Region 9**

Jamul Creek

LOE ID:	78053
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Jamul Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).
Spatial Representation:	Data for this line of evidence for Jamul Creek was collected at 1 monitoring site [Dulzura Creek @ Otay Lakes Rd.]
Temporal Representation:	Data was collected over the time period 2/6/2009-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 48017, Chlorpyrifos **Region 9**

Jamul Creek

LOE ID:	78044
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Jamul Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for chlorpyrifos is 2.1 Âµg/L.
Guideline Reference:	2011 Edition of the Drinking Water Standards and Health Advisories
Spatial Representation:	Data for this line of evidence for Jamul Creek was collected at 1 monitoring site [Dulzura Creek @ Otay Lakes Rd.]
Temporal Representation:	Data was collected over the time period 2/6/2009-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 48017, Chlorpyrifos **Region 9**

Jamul Creek

LOE ID:	73921
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Jamul Creek to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department

	of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).
Spatial Representation:	Data for this line of evidence for Jamul Creek was collected at 1 monitoring site [Dulzura Creek @ Otay Lakes Rd.]
Temporal Representation:	Data was collected over the time period 5/9/2006-6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48017, Chlorpyrifos **Region 9**

Jamul Creek

LOE ID:	78045
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Jamul Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for chlorpyrifos is 2.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Jamul Creek was collected at 1 monitoring site [Dulzura Creek @ Otay Lakes Rd.]
Temporal Representation:	Data was collected over the time period 5/9/2006-6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **48018** **Region 9**

Jamul Creek

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision

Revision Status	Revised	039561
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the Two samples exceed the California Toxics Rule Objective for Chromium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Two samples exceeded the California Toxics Rule Objective for Chromium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48018, Chromium **Region 9**

Jamul Creek

LOE ID:	73922
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Jamul Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Chromium.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition

Evaluation Guideline:	039562
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Jamul Creek was collected at 1 monitoring site [Dulzura Creek @ Otay Lakes Rd. - 910OTY03]
Temporal Representation:	Data was collected over the time period 2/6/2009-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID 48019 — Region 9

Jamul Creek

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Four lines of evidence are available in the administrative record to assess this pollutant. Zero of the Seven samples exceed the California Toxics Rule Objective for Copper. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Seven samples exceeded the California Toxics Rule Objective for Copper and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48019, Copper — Region 9

Jamul Creek

LOE ID:	73924
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Jamul Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for copper is 1.0 mg/L (Title 22 California Code of Regulations).
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Jamul Creek was collected at 1 monitoring site [Dulzura Creek @ Otay Lakes Rd.]
Temporal Representation:	Data was collected once yearly from 2003 to 2006 and in 2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48019, Copper **Region 9**

Jamul Creek

LOE ID:	73923
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Jamul Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Data for this line of evidence for Jamul Creek was collected at 1 monitoring site [Dulzura Creek @ Otay Lakes Rd.]
Temporal Representation:	Data was collected once yearly from 2003 to 2006 and in 2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48019, Copper **Region 9**

Jamul Creek

LOE ID:	73925
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Jamul Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Copper.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Jamul Creek was collected at 1 monitoring site [Dulzura Creek @ Otay Lakes Rd. - 910OTY03]
Temporal Representation:	Data was collected over the time period 2/6/2009-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 48019, Copper **Region 9**

Jamul Creek

LOE ID:	73926
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water

Matrix:	Water	039565
Fraction:	None	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	2	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Jamul Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Copper.	
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Secondary MCL for copper is 1.0 mg/L (Title 22 California Code of Regulations).	
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Jamul Creek was collected at 1 monitoring site [Dulzura Creek @ Otay Lakes Rd.]	
Temporal Representation:	Data was collected over the time period 2/6/2009-3/31/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.	

DECISION ID	48020	Region 9
Jamul Creek		

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a Single line of evidence is necessary to assess listing status.

Four lines of evidence are available in the administrative record to assess this pollutant. Zero of the Four samples exceed the Water Quality Criteria for Diazinon.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Four samples exceeded the Water Quality Criteria for Diazinon and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 16.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available

indicating that standards are not met. 039566

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48020, Diazinon **Region 9**

Jamul Creek

LOE ID:	73927
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Jamul Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Data for this line of evidence for Jamul Creek was collected at 1 monitoring site [Dulzura Creek @ Otay Lakes Rd.]
Temporal Representation:	Data was collected over the time period 5/9/2006-6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48020, Diazinon **Region 9**

Jamul Creek

LOE ID:	78047
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Municipal & Domestic Supply	039567
Number of Samples:	2	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Jamul Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Diazinon.	
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The USEPA drinking water health advisory for diazinon is 1.4 Âµg/L.	
Guideline Reference:	2011 Edition of the Drinking Water Standards and Health Advisories	
Spatial Representation:	Data for this line of evidence for Jamul Creek was collected at 1 monitoring site [Dulzura Creek @ Otay Lakes Rd.]	
Temporal Representation:	Data was collected over the time period 2/6/2009-3/31/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.	

Line of Evidence (LOE) for Decision ID 48020, Diazinon **Region 9**

Jamul Creek

LOE ID:	78048
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Jamul Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for diazinon is 1.4 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013

Spatial Representation:	Data for this line of evidence for Jamul Creek was collected at 1 monitoring site [Dulzura Creek @ Otay Lakes Rd.]
Temporal Representation:	Data was collected over the time period 5/9/2006-6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48020, Diazinon **Region 9**

Jamul Creek

LOE ID:	78046
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Jamul Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Diazinon.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Data for this line of evidence for Jamul Creek was collected at 1 monitoring site [Dulzura Creek @ Otay Lakes Rd.]
Temporal Representation:	Data was collected over the time period 2/6/2009-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID **48021** **Region 9**

Jamul Creek

Pollutant:	**Dimethoate**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or	Pollutant

Pollution: 039569

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Dimethoate.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Evaluation Guideline for Dimethoate and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48021, Dimethoate **Region 9**

Jamul Creek

LOE ID:	77774
Pollutant:	Dimethoate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Jamul Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Dimethoate.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Department of Health Services archived advisory level for dimethoate is 1 Âµg/L.
Guideline Reference:	CDPH Archived Advisory Levels for Drinking Water. Archived Advisory Levels are currently considered Notification Levels.
Spatial Representation:	Data for this line of evidence for Jamul Creek was collected at 1 monitoring site [Dulzura

	Creek @ Otay Lakes Rd.]	039570
Temporal Representation:	Data was collected on a single day 3/31/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.	

Line of Evidence (LOE) for Decision ID 48021, Dimethoate **Region 9**

Jamul Creek

LOE ID:	77775
Pollutant:	Dimethoate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Jamul Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Dimethoate.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for Dimethoate is the median lethal concentration (LC50; 43 ug/L).
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Jamul Creek was collected at 1 monitoring site [Dulzura Creek @ Otay Lakes Rd.]
Temporal Representation:	Data was collected on a single day 3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID **48022** **Region 9**

Jamul Creek

Pollutant:	**Disulfoton**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of

the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the One samples exceed the Water Quality Criteria for Disulfoton.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Water Quality Criteria for Disulfoton and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48022, Disulfoton **Region 9**

Jamul Creek

LOE ID:	77777
Pollutant:	Disulfoton
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Jamul Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Disulfoton.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for disulfoton is 0.05 Âµg/L (US EPA 1973 guidance).
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for Jamul Creek was collected at 1 monitoring site [Dulzura Creek @ Otay Lakes Rd.]
Temporal Representation:	Data was collected on a single day 3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.

QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 48022, Disulfoton **Region 9**

Jamul Creek

LOE ID:	77776
Pollutant:	Disulfoton
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Jamul Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Disulfoton.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory level for disulfoton is 0.7 Âµg/L for life-time health protection.
Guideline Reference:	2011 Edition of the Drinking Water Standards and Health Advisories
Spatial Representation:	Data for this line of evidence for Jamul Creek was collected at 1 monitoring site [Dulzura Creek @ Otay Lakes Rd.]
Temporal Representation:	Data was collected on a single day 3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID **48024** **Region 9**

Jamul Creek

Pollutant:	**Ethoprop**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Ethoprop.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Evaluation Guideline for Ethoprop and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48024, Ethoprop **Region 9**

Jamul Creek

LOE ID:	77778
Pollutant:	Ethoprop
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Jamul Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Ethoprop.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for Ethoprop is the maximum acceptable toxicant concentration (MATC) of 1.4 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Jamul Creek was collected at 1 monitoring site [Dulzura Creek @ Otay Lakes Rd.]
Temporal Representation:	Data was collected on a single day 3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern

DECISION ID	48023	Region 9
Jamul Creek		

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.3 of the Listing Policy. Under section 3.3 a single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Three of the Seven samples exceed the Single Sample Maximum Objective for Enterococcus, Zero of Seven samples exceeded the Single Sample Maximum Objective for Fecal Colifrom, and Zero out of Seven samples exceeded the Single Sample Maximum Guideline for Total Coliform.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Three of the Seven samples exceed the Single Sample Maximum Objective for Enterococcus, Zero of Seven samples exceeded the Single Sample Maximum Objective for Fecal Colifrom, and Zero out of Seven samples exceeded the Single Sample Maximum Guideline for Total Coliform, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48023, Indicator Bacteria	Region 9
Jamul Creek	

LOE ID:	73947
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Jamul Creek to determine

	beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxicsubstances in concentrations which are toxic to,or which produce detrimental physiologicalresponses in human, plant, animal, or indigenousaquatic life (Basin Plan).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In waters designated for water contact recreation (REC I), the total coliform concentration shall not exceed 10000 MPN/100 ml (CDPH 2006).
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.
Spatial Representation:	Data for this line of evidence for Jamul Creek was collected at 1 monitoring site [Dulzura Creek @ Otay Lakes Rd.]
Temporal Representation:	Data was collected over the time period 2/6/2009-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 48023, Indicator Bacteria **Region 9**

Jamul Creek

LOE ID:	73948
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Jamul Creek to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxicsubstances in concentrations which are toxic to,or which produce detrimental physiologicalresponses in human, plant, animal, or indigenousaquatic life (Basin Plan).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In waters designated for water contact recreation (REC I), the total coliform concentration shall not exceed 10000 MPN/100 ml (CDPH 2006).
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.
Spatial Representation:	Data for this line of evidence for Jamul Creek was collected at 1 monitoring site [Dulzura Creek @ Otay Lakes Rd.]
Temporal Representation:	Data was collected over the time period 7/2/2003-6/3/2009.

Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48023, Indicator Bacteria **Region 9**

Jamul Creek

LOE ID:	73932
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Jamul Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Coliform, Fecal.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the fecal coliform concentration shall not exceed 400 MPN/100 ml.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Jamul Creek was collected at 1 monitoring site [Dulzura Creek @ Otay Lakes Rd.]
Temporal Representation:	Data was collected over the time period 2/6/2009-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 48023, Indicator Bacteria **Region 9**

Jamul Creek

LOE ID:	73928
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	5
Number of Exceedances:	2
Data and Information Type:	PATHOGEN MONITORING

Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Jamul Creek to determine beneficial use support and results are as follows: 2 of 5 samples exceed the criterion for Enterococci.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Samples shall not exceed 61 organisms per 100 ml for enterococcus in waters designated for REC I beneficial use (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Jamul Creek was collected at 1 monitoring site [Dulzura Creek @ Otay Lakes Rd.]
Temporal Representation:	Data was collected over the time period 7/2/2003-6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48023, Indicator Bacteria **Region 9**

Jamul Creek

LOE ID:	73929
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2
Number of Exceedances:	1
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Jamul Creek to determine beneficial use support and results are as follows: 1 of 2 samples exceed the criterion for Enterococci.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Samples shall not exceed 61 organisms per 100 ml for enterococcus in waters designated for REC I beneficial use (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Jamul Creek was collected at 1 monitoring site [Dulzura Creek @ Otay Lakes Rd.]
Temporal Representation:	Data was collected over the time period 2/6/2009-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 48023, Indicator Bacteria — Region 9

Jamul Creek

LOE ID:	73930
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Jamul Creek to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Coliform, Fecal.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the fecal coliform concentration shall not exceed 400 MPN/100 ml.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Jamul Creek was collected at 1 monitoring site [Dulzura Creek @ Otay Lakes Rd.]
Temporal Representation:	Data was collected over the time period 7/2/2003-6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48023, Indicator Bacteria — Region 9

Jamul Creek

LOE ID:	73931
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Non-Contact Recreation
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Jamul Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Coliform, Fecal.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters designated for non contact recreation (REC 2), the fecal coliform concentration shall not exceed 4000 MPN/100 ml (Basin Plan).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Jamul Creek was collected at 1 monitoring site [Dulzura Creek @ Otay Lakes Rd.]
Temporal Representation:	Data was collected over the time period 2/6/2009-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID 48026 Region 9

Jamul Creek

Pollutant:	**Iron**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a _____ line(s) of evidence are necessary to assess listing status.

[NUMBER] lines of evidence are available in the administrative record to assess this pollutant. [NUMBER] of the [NUMBER] samples exceed the [OBJECTIVE/GUIDELINE/CRITERIA].

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. [NUMBER] of [NUMBER] samples exceeded the [OBJECTIVE/GUIDELINE/CRITERIA] and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of ____samples is needed to determine if a beneficial use is fully supported using table _____.
4. Pursuant to [SECTION 3.11/4.11] of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 48026, Iron Region 9

Jamul Creek

LOE ID: 73933

Pollutant:	Iron	039580
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	2	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Jamul Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Iron.	
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Secondary MCL for iron is 0.3 mg/L (Water Quality Control Plan,San Diego Basin).	
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Jamul Creek was collected at 1 monitoring site [Dulzura Creek @ Otay Lakes Rd.]	
Temporal Representation:	Data was collected over the time period 2/6/2009-3/31/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.	

DECISION ID	48027	Region 9
Jamul Creek		

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Three lines of evidence are available in the administrative record to assess this pollutant. Zero of the Seven samples exceed the California Toxics Rule Objective for Lead. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Seven samples exceeded the California Toxics Rule Objective for Lead and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully

supported using table 3.1. 039581
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48027, Lead **Region 9**
Jamul Creek

LOE ID:	73935
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Jamul Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Jamul Creek was collected at 1 monitoring site [Dulzura Creek @ Otay Lakes Rd.]
Temporal Representation:	Data was collected once yearly from 2003 to 2006 and in 2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48027, Lead **Region 9**
Jamul Creek

LOE ID:	73936
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	039582
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	2	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Jamul Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Lead.	
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Jamul Creek was collected at 1 monitoring site [Dulzura Creek @ Otay Lakes Rd. - 910OTY03]	
Temporal Representation:	Data was collected over the time period 2/6/2009-3/31/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.	

Line of Evidence (LOE) for Decision ID 48027, Lead **Region 9**

Jamul Creek

LOE ID:	73934
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Jamul Creek to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for Lead is 0.015 mg/L (Title 22 of the California Code of Regulations).

Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR 039583
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Jamul Creek was collected at 1 monitoring site [Dulzura Creek @ Otay Lakes Rd.]
Temporal Representation:	Data was collected once yearly from 2003 to 2006 and in 2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 48028 Region 9

Jamul Creek

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a Single line of evidence is necessary to assess listing status. Four lines of evidence are available in the administrative record to assess this pollutant. Zero of the Four samples exceed the Water Quality Criteria for Malathion. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Four samples exceeded the Water Quality Criteria for Malathion and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48028, Malathion Region 9

Jamul Creek

LOE ID:	78050
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Jamul Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Malathion.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for malathion is 100 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories, EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Jamul Creek was collected at 1 monitoring site [Dulzura Creek @ Otay Lakes Rd.]
Temporal Representation:	Data was collected over the time period 5/9/2006-6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48028, Malathion **Region 9**

Jamul Creek

LOE ID:	78049
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Jamul Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Malathion.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for malathion is 100 Âµg/L.
Guideline Reference:	2011 Edition of the Drinking Water Standards and Health Advisories

Spatial Representation:	Data for this line of evidence for Jamul Creek was collected at 1 monitoring site [Dulzura Creek @ Otay Lakes Rd.]
Temporal Representation:	Data was collected over the time period 2/6/2009-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 48028, Malathion **Region 9**

Jamul Creek

LOE ID:	73937
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Jamul Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Malathion.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Jamul Creek was collected at 1 monitoring site [Dulzura Creek @ Otay Lakes Rd.]
Temporal Representation:	Data was collected over the time period 5/9/2006-6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48028, Malathion **Region 9**

Jamul Creek

LOE ID:	78051
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Jamul Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Malathion.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for Jamul Creek was collected at 1 monitoring site [Dulzura Creek @ Otay Lakes Rd.]
Temporal Representation:	Data was collected over the time period 2/6/2009-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID	48029	Region 9
Jamul Creek		

Pollutant:	**Manganese**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a Single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. One of the Two samples exceed the California Toxics Rule Objective for Manganese.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of Two samples exceeded the California Toxics Rule Objective for Manganese and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.

4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48029, Manganese **Region 9**

Jamul Creek

LOE ID:	73938
Pollutant:	Manganese
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Jamul Creek to determine beneficial use support and results are as follows: 1 of 2 samples exceed the criterion for Manganese.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for manganese is 0.05 mg/L (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Jamul Creek was collected at 1 monitoring site [Dulzura Creek @ Otay Lakes Rd.]
Temporal Representation:	Data was collected over the time period 2/6/2009-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID **48070** **Region 9**

Jamul Creek

Pollutant:	**Methidathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of

the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Methidathion.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Evaluation Guideline for Methidathion and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48070, Methidathion **Region 9**

Jamul Creek

LOE ID:	77780
Pollutant:	Methidathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Jamul Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Methidathion.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for Methidathion is the maximum acceptable toxicant concentration (MATC) of 0.86 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Jamul Creek was collected at 1 monitoring site [Dulzura Creek @ Otay Lakes Rd.]
Temporal Representation:	Data was collected on a single day 3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern

	Watersheds Report was followed. 039589
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 48070, Methidathion **Region 9**

Jamul Creek

LOE ID:	77779
Pollutant:	Methidathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Jamul Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Methidathion.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Based on USEPA IRIS reference dose (RfD) as a drinking water level, the drinking water health advisory level for methidathion is 7 Âµg/L.
Guideline Reference:	IRIS Database Calculations (summary)
Spatial Representation:	Data for this line of evidence for Jamul Creek was collected at 1 monitoring site [Dulzura Creek @ Otay Lakes Rd.]
Temporal Representation:	Data was collected on a single day 3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID **48075** **Region 9**

Jamul Creek

Pollutant:	**Methyl Parathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a Single line of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the

One samples exceed the Water Quality Criteria for Methyl Parathion. 039590

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Water Quality Criteria for Methyl Parathion and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48075, Methyl Parathion **Region 9**

Jamul Creek

LOE ID:	77781
Pollutant:	Methyl Parathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Jamul Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Parathion, Methyl.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. There shall be no increase in hazardous chemical concentrations found in bottom sediments or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Department of Fish and Game instantaneous criteria for Methyl Parathion is 0.08 ug/L.
Guideline Reference:	Hazard Assessment of the Insecticide Methyl Parathion to Aquatic Organisms in the Sacramento River System. California Department of Fish and Game. Environmental Services Division. Administrative Report 92-1
Spatial Representation:	Data for this line of evidence for Jamul Creek was collected at 1 monitoring site [Dulzura Creek @ Otay Lakes Rd.]
Temporal Representation:	Data was collected on a single day 3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern

	Watersheds Report was followed.	039591
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.	

DECISION ID	48085	Region 9
Jamul Creek		

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the One samples exceed the California Toxics Rule Objective for Nickel. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the California Toxics Rule Objective for Nickel and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48085, Nickel	Region 9
Jamul Creek	

LOE ID:	73940
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Jamul Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Nickel.

Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nickel is 0.1 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Jamul Creek was collected at 1 monitoring site [Dulzura Creek @ Otay Lakes Rd.]
Temporal Representation:	Data was collected over the time period 2/6/2009-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 48085, Nickel **Region 9**

Jamul Creek

LOE ID:	73939
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Jamul Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Nickel.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Jamul Creek was collected at 1 monitoring site [Dulzura Creek @ Otay Lakes Rd. - 910OTY03]
Temporal Representation:	Data was collected over the time period 2/6/2009-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern

DECISION ID	48089	Region 9
Jamul Creek		

Pollutant:	**Nitrate/Nitrite (Nitrite + Nitrate as N)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the One samples exceed the Basin Plan Objective for Nitrate/Nitrite (Nitrite + Nitrate as N).

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Basin Plan Objective for Nitrate/Nitrite (Nitrite + Nitrate as N) and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48089, Nitrate/Nitrite (Nitrite + Nitrate as N)	Region 9
Jamul Creek	

LOE ID:	73941
Pollutant:	Nitrate/Nitrite (Nitrite + Nitrate as N)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Jamul Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nitrate/Nitrite as N.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrate + nitrite (as N) is 10.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Jamul Creek was collected at 1 monitoring site [Dulzura Creek @ Otay Lakes Rd.]
Temporal Representation:	Data was collected on a single day 5/23/2005.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 48125 Region 9

Jamul Creek

Pollutant:	**Nitrogen, Nitrite**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the Four samples exceed the Basin Plan Objective for Nitrogen, Nitrite. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Four samples exceeded the Basin Plan Objective for Nitrogen, Nitrite and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48125, Nitrogen, Nitrite Region 9

Jamul Creek

LOE ID:	73942

Pollutant:	Nitrogen, Nitrite
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Jamul Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Nitrite as N.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrite (as N) is 1.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals, CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Jamul Creek was collected at 1 monitoring site [Dulzura Creek @ Otay Lakes Rd.]
Temporal Representation:	Data was collected over the time period 2/6/2009-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 48125, Nitrogen, Nitrite **Region 9**

Jamul Creek

LOE ID:	73943
Pollutant:	Nitrogen, Nitrite
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Jamul Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Nitrite as N.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrite (as N) is 1.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals, CCR

Evaluation Guideline:
Guideline Reference:

Spatial Representation:	Data for this line of evidence for Jamul Creek was collected at 1 monitoring site [Dulzura Creek @ Otay Lakes Rd.]
Temporal Representation:	Data was collected over the time period 7/2/2003-5/23/2005.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 48127 — Region 9

Jamul Creek

Pollutant:	**Nitrogen, ammonia (Total Ammonia)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Basin Plan Objective for Nitrogen, ammonia (Total Ammonia).

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Basin Plan Objective for Nitrogen, ammonia (Total Ammonia) and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48127, Nitrogen, ammonia (Total Ammonia) — Region 9

Jamul Creek

LOE ID:	73954
Pollutant:	Nitrogen, ammonia (Total Ammonia)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Municipal & Domestic Supply	039597
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Jamul Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Ammonia As N, Total.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Basin Plan: No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	EPA's Lifetime Health advisory level for total ammonia is 30.0 mg/L as stated on page 8 of the 2006 edition of the drinking water standards and health advisories. This Advisory Level is defined as "the concentration of a chemical in drinking water that is not expected to cause any adverse noncarcinogenic effects for up to ten days of exposure."	
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013	
Spatial Representation:	Data for this line of evidence for Jamul Creek was collected at 1 monitoring site [Dulzura Creek @ Otay Lakes Rd.]	
Temporal Representation:	Data was collected on a single day 7/2/2003.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID	**48092**	**Region 9**
Jamul Creek		

Pollutant:	**Parathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the Zero samples exceed the Water Quality Criteria for Parathion.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Zero samples exceeded the Water Quality Criteria for Parathion and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully

supported using table 3.1. 039598
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48092, Parathion **Region 9**
Jamul Creek

LOE ID:	77782
Pollutant:	Parathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Jamul Creek to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Parathion, Ethyl.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. There shall be no increase in hazardous chemical concentrations found in bottom sediments or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The criterion continuous concentraion for Parathion, Ethyl is 0.013 ug/l from the National Recommended Water Quality Criteria.
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for Jamul Creek was collected at 1 monitoring site [Dulzura Creek @ Otay Lakes Rd.]
Temporal Representation:	Data was collected on a single day 3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID **48096** **Region 9**
Jamul Creek

Pollutant:	**Phorate**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision

Revision Status	Revised	039599
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Phorate.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Water Quality Criteria for Phorate and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48096, Phorate **Region 9**

Jamul Creek

LOE ID:	77783
Pollutant:	Phorate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Jamul Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Phorate.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for Phorate is the median lethal concentration (LC50; 2 ug/L).
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Jamul Creek was collected at 1 monitoring site [Dulzura

	Creek @ Otay Lakes Rd.]	039600
Temporal Representation:	Data was collected on a single day 3/31/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.	

Line of Evidence (LOE) for Decision ID 48096, Phorate **Region 9**

Jamul Creek

LOE ID:	77784
Pollutant:	Phorate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Jamul Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Phorate.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The national health advisory level for phorate is 0.7 Âµg/L.
Guideline Reference:	Volume I Drinking Water and Health
Spatial Representation:	Data for this line of evidence for Jamul Creek was collected at 1 monitoring site [Dulzura Creek @ Otay Lakes Rd.]
Temporal Representation:	Data was collected on a single day 3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID **48097** **Region 9**

Jamul Creek

Pollutant:	**Phosmet**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of

the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Phosmet.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Evaluation Guideline for Phosmet and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48097, Phosmet **Region 9**

Jamul Creek

LOE ID:	77785
Pollutant:	Phosmet
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Jamul Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Phosmet.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to the USEPA Office of Pesticide Programs Ecotoxicity database, the aquatic life EC50 for Phosmet is 5.6 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Jamul Creek was collected at 1 monitoring site [Dulzura Creek @ Otay Lakes Rd.]
Temporal Representation:	Data was collected on a single day 3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern

	Watersheds Report was followed. 039602
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 48097, Phosmet **Region 9**

Jamul Creek

LOE ID:	77786
Pollutant:	Phosmet
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Jamul Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Phosmet.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Based on USEPA IRIS reference dose (RfD) as a drinking water level, the drinking water health advisory level for phosmet is 140 Âµg/L.
Guideline Reference:	IRIS Database Calculations (summary)
Spatial Representation:	Data for this line of evidence for Jamul Creek was collected at 1 monitoring site [Dulzura Creek @ Otay Lakes Rd.]
Temporal Representation:	Data was collected on a single day 3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID **48100** **Region 9**

Jamul Creek

Pollutant:	**Selenium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the

Two samples exceed the California Toxics Rule Objective for Selenium. 039603

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Two samples exceeded the California Toxics Rule Objective for Selenium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48100, Selenium **Region 9**

Jamul Creek

LOE ID:	73944
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Jamul Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Selenium.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The selenium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater is 0.005 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Jamul Creek was collected at 1 monitoring site [Dulzura Creek @ Otay Lakes Rd.]
Temporal Representation:	Data was collected over the time period 2/6/2009-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 48100, Selenium 039604 **Region 9**

Jamul Creek

LOE ID:	73945
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Jamul Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Selenium.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The Maximum Contaminant Level for selenium in the Basin Plan is 0.01 mg/L (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Jamul Creek was collected at 1 monitoring site [Dulzura Creek @ Otay Lakes Rd.]
Temporal Representation:	Data was collected over the time period 2/6/2009-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID **48123** **Region 9**

Jamul Creek

Pollutant:	**Silver**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Silver. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that: 039605
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Evaluation Guideline for Silver and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48123, Silver **Region 9**
Jamul Creek

LOE ID:	73946
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Jamul Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Silver.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for silver is 0.1 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Jamul Creek was collected at 1 monitoring site [Dulzura Creek @ Otay Lakes Rd.]
Temporal Representation:	Data was collected on a single day 3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID **48108** **Region 9**
Jamul Creek

Pollutant: **Zinc**

Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	039606
Last Listing Cycle's Final Listing Decision:	New Decision	
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Four lines of evidence are available in the administrative record to assess this pollutant. Zero of the Seven samples exceed the California Toxics Rule Objective for Zinc.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Seven samples exceeded the California Toxics Rule Objective for Zinc and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48108, Zinc **Region 9**

Jamul Creek

LOE ID:	73949
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Jamul Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for zinc is 5.0 mg/L (Title 22 California Code of Regulations).

Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Jamul Creek was collected at 1 monitoring site [Dulzura Creek @ Otay Lakes Rd.]
Temporal Representation:	Data was collected once yearly from 2003 to 2006 and in 2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48108, Zinc **Region 9**

Jamul Creek

LOE ID:	73950
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Jamul Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Zinc.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for zinc is 5.0 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Jamul Creek was collected at 1 monitoring site [Dulzura Creek @ Otay Lakes Rd.]
Temporal Representation:	Data was collected over the time period 2/6/2009-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 48108, Zinc **Region 9**

Jamul Creek

LOE ID:	73951
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Jamul Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Zinc.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Jamul Creek was collected at 1 monitoring site [Dulzura Creek @ Otay Lakes Rd. - 910OTY03]
Temporal Representation:	Data was collected over the time period 2/6/2009-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 48108, Zinc **Region 9**

Jamul Creek

LOE ID:	73952
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Jamul Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority

toxic pollutants for the State of California. 7/1/2011 Edition 039609

Evaluation Guideline:
Guideline Reference:

Spatial Representation:	Data for this line of evidence for Jamul Creek was collected at 1 monitoring site [Dulzura Creek @ Otay Lakes Rd.]
Temporal Representation:	Data was collected once yearly from 2003 to 2006 and in 2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 43265 Region 9
Jamul Creek

Pollutant:	**Alkalinity as CaCO3 | Ammonia as Nitrogen | Manganese | Nickel | Orthophosphate | Total Kjeldahl Nitrogen (TKN) | Total Suspended Solids (TSS)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. None of the 28 samples exceed the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of 28 samples exceeded the Basin Plan objectives for inorganic chemicals and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43265, Multiple Pollutants Region 9
Jamul Creek

LOE ID:	26390
Pollutant:	Alkalinity as CaCO3 | Ammonia as Nitrogen | Manganese | Nickel | Orthophosphate | Total Kjeldahl Nitrogen (TKN) | Total Suspended Solids (TSS)
LOE Subgroup:	Pollutant-Water

Matrix:	Water	039610
Fraction:	Not Recorded	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	28	
Number of Exceedances:	0	
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)	
Data Used to Assess Water Quality:	Twenty-eight samples were collected at Jamul Creek station (910OTJAM4) during the months of January 2003, April 2003, and May 2003, for conventional inorganics analyses (SWAMP, 2007), none of the 28 samples exceeded evaluation concentrations.	
Data Reference:	Monitoring data for Region 9	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Ammonia as N 0.025 mg/l, nitrite as N 1.mg/l, nitrogen total Kjeldahl (If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used), ortho phosphate as P total 0.05 mg/l, sulfate 250 mg/l.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:	Water Quality Control Plan for the San Diego Basin	
Spatial Representation:	Samples were collected at Jamul Creek station (910OTJAM4); (Latitude 32.6369, Longitude -116.8842).	
Temporal Representation:	Samples were collected during the months of January 2003, April 2003, and May 2003.	
Environmental Conditions:		
QAPP Information:	Quality control for chemical analysis portion of this study was conducted in accordance with the California Surface Water Ambient Monitoring Program.	
QAPP Information Reference(s):		

DECISION ID	**43574**	**Region 9**
Jamul Creek		

Pollutant:	**Benthic Community Effects**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

Benthic Community Effects is being considered for placement on the section 303(d) list under sections 3.9 and 3.2 of the Listing Policy. Under section 3.9, an additional line of evidence associating the Benthic Community Effects with a water or sediment concentration of pollutants is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this indicator. 2 of 3 samples exceeded the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing Benthic Community Effects in this water segment on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. 2 of 3 samples exceeded the Index of Biological Integrity (IBI) value of "poor" water quality for this

area and this sample size is insufficient to determine with the power and confidence of the Listing Policy if standards are not met. A minimum of 5 samples is needed for application of Table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43574, Benthic Community Effects **Region 9**

Jamul Creek

LOE ID:	26396
Pollutant:	Benthic Community Effects
LOE Subgroup:	Adverse Biological Responses
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	2
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Three samples of IBI data were taken from November 2000 to May 2001 at two sampling sites. Of the total number of samples, two exceeded the IBI impairment threshold.
Data Reference:	Fish and Game IBI Data
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at two sites: 910JCOLRx and 910JCGSxx on Jamul Creek.
Temporal Representation:	Sampling occurred during between November 2000 to May 2001.
Environmental Conditions:	
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Project Plan for the California Stream Bioassessment Procedure and the State of California, California Monitoring an Assessment Program: "CMAP", Quality Assurance Project Plan.
QAPP Information Reference(s):	State of California, California Monitoring and Assessment Program: "CMAP". Quality Assurance Project Plan for the California Stream Bioassessment Procedure The San Diego Stream Team Quality Assurance Project Plan

DECISION ID **44226** **Region 9**

Jamul Creek 039612

Pollutant:	**Metals**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. None of the 3 samples exceed the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 3 samples exceeded the CTR values for a number of metals and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 44226, Metals — Region 9

Jamul Creek

LOE ID:	26388
Pollutant:	Metals
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Three samples were collected at Jamul Creek station 4(910OTJAM4) during the months of January, April and May 2003 for the following constituents: aluminum dissolved, arsenic dissolved, cadmium dissolved, copper dissolved, selenium dissolved, silver dissolved, zinc dissolved (SWAMP, 2007), none of the 3 samples exceeded the metals evaluation concentrations.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or

that produce detrimental physiological responses in human, plant, animal, or aquatic life 03/01/13
Water Quality Control for the San Diego Basin, 2007.

The Maximum Contaminant Level (MCL) for aluminum is 1.0 mg/l. From the California Toxic Rules, the dissolved chronic criterion for arsenic is 150 Âµg/l (ppb), cadmium 2.2 Âµg/l (ppb), copper is 9.0 Âµg/l (ppb), selenium 5.0 Âµg/l (ppb), zinc is 120 Âµg/l (ppb), chromium is 11 Âµg/l (ppb), lead 2.5 Âµg/l (ppb), and dissolved acute criterion for silver 3.4 Âµg/l (ppb).

Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at Jamul Creek station 4(910OTJAM4); (Latitude 32.6369, Longitude -116.8842).
Temporal Representation:	Samples at Jamul Creek were collected during the months of January, April, and May 2003.
Environmental Conditions:	Samples were collected during wet-between storm events, wet-high base flow, and declining base flow conditions.
QAPP Information:	Quality control for chemical analysis portion of this study was conducted in accordance with the California Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

DECISION ID	42757	Region 9
Jamul Creek		

Pollutant:	**PAHs (Polycyclic Aromatic Hydrocarbons)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the 3 samples exceed the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 3 samples exceeded the CTR values for PAHs and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 42757, PAHs (Polycyclic Aromatic Hydrocarbons) Region 9
Jamul Creek

LOE ID:	26389
Pollutant:	PAHs (Polycyclic Aromatic Hydrocarbons)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Three samples were collected at Jamul Creek station 4(910OTJAM4) during the months of January 2003, April 2003, and May 2003, for PAHs analyses. Analyses included: Acenaphthene, Anthracene, Benz(a)anthracene, Benzo(b)fluoranthene, Benzo(g,h,i)perylene, Benzo(k)fluoranthene, Chrysene, Fluoranthene, and Fluorene. None of the 3 samples exceeded evaluation concentration.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water designated for use as domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels specified in California Code of Regulations, Title 22, Table 64444-A of section 64444 (Organic Chemicals) which is incorporated by reference into this plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Evaluation guidelines used came California Toxics Rule for Human Health Risk. Acenaphthene;1200 ug/l, Anthracene;9,600 ug/l, Benz(a)anthracene; 4.4 ug/l, Benzo(b)fluoranthene; 4.4 ug/l, Benzo(k)fluoranthene; 4.4 ug/l, Chrysene; 4.4 ug/l, Fluoranthene; 300 ug/l, and Fluorene; 1300 ug/l.
Guideline Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA
Spatial Representation:	Samples were collected at Jamul Creek station 4(910OTJAM4); (Latitude 32.6369, Longitude -116.8842).
Temporal Representation:	Samples were collected during the months of January 2003, April 2003, and May 2003.
Environmental Conditions:	
QAPP Information:	Quality control for chemical analysis portion of this study was conducted in accordance with the California Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

DECISION ID 43270 Region 9
Jamul Creek

Pollutant:	**Toxicity**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion	2019

Date:	039615
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the section 303(d) list under section 3.6 of the Listing Policy. Under section 3.6 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Two of the three samples exhibited water toxicity. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. 2 of 3 samples exhibited water toxicity and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43270, Toxicity **Region 9**

Jamul Creek

LOE ID:	26150
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	2
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Two out of the 3 samples collected show significant toxicity levels (SL) to the green alga, Selenastrum Capricornutum, growth test. One of three samples collected show significant toxicity levels in the ten days survival test on Hyalella azteca, Survival and Growth test. Ceriodaphnia dubia, one test was conducted but did not show significant toxicity. The test results are from California's Surface Water Ambient Monitoring Program Report (2007).
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.
Guideline Reference:	Waste Discharge Requirements for Discharges of Urban Runoff From the Municipal

	Separate Storm Sewer Systems Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego, the San Diego Unified Port District, and the San Diego County Regional Airport. Order No. R9-2007-0001
Spatial Representation:	Samples were collected at Jamul Creek station 4, 910OTJAM4;(Latitude 32.63693, Longitude -116.88422).
Temporal Representation:	Samples were collected in January, April, and May 2003.
Environmental Conditions:	
QAPP Information:	Quality control of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 43270, Toxicity **Region 9**

Jamul Creek

LOE ID:	26511
Pollutant:	Sediment Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Two sediment samples were collected and none showed significant toxicity levels (SL) in the Hyalella azteca, Survival and Growth test. The test results are from California's Surface Water Ambient Monitoring Program Report (2007).
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.
Guideline Reference:	Waste Discharge Requirements for Discharges of Urban Runoff From the Municipal Separate Storm Sewer Systems Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego, the San Diego Unified Port District, and the San Diego County Regional Airport. Order No. R9-2007-0001
Spatial Representation:	Samples were collected at Jamul Creek station 4, 910OTJAM4;(Latitude 32.63693, Longitude -116.88422).
Temporal Representation:	Samples were collected in January, April, and May 2003.
Environmental Conditions:	
QAPP Information:	Quality control of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Keys Creek
Water Body ID: CAR9031200020081210153438
Water Body Type: River & Stream

DECISION ID 48139 **Region 9**
Keys Creek

Pollutant: Arsenic
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the One samples exceed the California Toxics Rule Objective for Arsenic.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the California Toxics Rule Objective for Arsenic and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48139, Arsenic **Region 9**
Keys Creek

LOE ID: 73964

Pollutant: Arsenic
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Warm Freshwater Habitat

Number of Samples:	1	039618
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Keys Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The dissolved arsenic criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved arsenic is 0.150 mg/L (California Toxics Rule, 2000).	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Keys Creek was collected at 1 monitoring site [Keys Creek (orange grove) - 903_SMC01909]	
Temporal Representation:	Data was collected on a single day 6/8/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.	

DECISION ID	**44312**	**Region 9**
Keys Creek		

Pollutant:	**Benthic Community Effects**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollution
Regional Board Conclusion:	Benthic Community Effects is being considered for placement on the CWA section 303(d) List under sections 3.9 and 3.1 of the Listing Policy. Under section 3.9, an additional line of evidence associating Benthic Community Effects with a water or sediment concentration of pollutant(s) is necessary to assess listing status. Based on the readily available data and information, the weight of evidence provides sufficient justification for not placing Benthic Community Effects in this water segment on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used does satisfy the data quantity requirements of section 6.1.5 of the Policy. 3. Pursuant to section 3.9 of the Listing Policy, the water does not exhibit significant degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index. 4. Pursuant to section 3.9 of the Listing Policy, the water segment does have associated pollutant(s) samples that exceed water quality objectives. 5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not being met.
Regional Board Decision	After review of the available data and information, RWQCB staff concludes that the water body-

Recommendation: pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 44312, Benthic Community Effects **Region 9**

Keys Creek

LOE ID:	73965
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	The IBI score for this water body was below 40 which indicates that this water body may be considered to have impaired conditions.
Data Reference:	RWB9 Status Sampling 2007 and 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at the following station: 903SLKYS3 (Keys Creek 3).
Temporal Representation:	Surveys done May 7, 2008.
Environmental Conditions:	
QAPP Information:	Data collected following SWAMP QA protocols for the RWB9 Status Sampling 2007 and 2008 water quality monitoring project.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44312, Benthic Community Effects **Region 9**

Keys Creek

LOE ID:	79484
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	5
Number of Exceedances:	1
Data and Information Type:	Benthic macroinvertebrate surveys

Data Used to Assess Water Quality:	A total of five samples were taken between three stations in Keys Creek. One of the five samples was below the 0.79 threshold, and was therefore exceeding the water quality objective for the aquatic life beneficial use.
Data Reference:	RWB9 Status Sampling 2007 and 2008 Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008. Bioassessment Data for Various Pollutants from Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009. Region 9 CSCI Scores & Water Body Information
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.
Guideline Reference:	The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.
Spatial Representation:	The samples were collected at 903_SMC01909, 903REF-KC, and 903SLKYS3
Temporal Representation:	The samples were collected from 2001 to 2009
Environmental Conditions:	
QAPP Information:	Data collected following SWAMP QA protocols for the RWB9 Status Sampling 2007 and 2008 water quality monitoring project, the County of San Diego NPDES MS4 Copermittees Receiving Waters Monitoring and Reporting Program, and theSouthern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan
QAPP Information Reference(s):	RWB9 Status Sampling 2007 and 2008 Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008. Quality Assurance Project Plan for Southern California Regional Watershed Monitoring Program Bioassessment, Version 1.0, and Freshwater Bioassessment from Weston Solutions.

Line of Evidence (LOE) for Decision ID 44312, Benthic Community Effects **Region 9**

Keys Creek

LOE ID:	72801
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Benthic macroinvertebrate surveys

Data Used to Assess Water Quality:	The one sample collected had an IBI score below 40. The score was 37.2 using the SMC bioassessment
Data Reference:	Bioassessment Data for Various Pollutants from Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the State or Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	Development of a Benthic Index of Biotic Integrity (B-IBI) for Wadeable Streams in Northern Coastal California and its Application to Regional 305(b) Assessment
Spatial Representation:	The sample was collected at 903_SMC01909, Keys Creek (orange grove) .
Temporal Representation:	The sample was collected in June 2009.
Environmental Conditions:	
QAPP Information:	The data was collected under the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan, June 25, 2009.
QAPP Information Reference(s):	Quality Assurance Project Plan for Southern California Regional Watershed Monitoring Program Bioassessment, Version 1.0, and Freshwater Bioassessment from Weston Solutions.

Line of Evidence (LOE) for Decision ID 44312, Benthic Community Effects **Region 9**

Keys Creek

LOE ID:	26210
Pollutant:	Nitrogen
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Four of the four samples collected at Keys Creek station 3(903SLKYS3) from May 2004 to April 2005 showed excessive nitrogen concentration (SWAMP, 2007).
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses (RWQCB, 2007). A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional

	Board. Analogous threshold values have not been set for nitrogen compounds, however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Water samples were collected from Keys Creek station 3(903SLKYS3); (Latitude 33.2894, Longitude -117.0715).
Temporal Representation:	Samples were collected in May 2004, September 2004, March 2005 and April 2005.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 44312, Benthic Community Effects **Region 9**

Keys Creek

LOE ID:	26209
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	2
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Two of the three samples collected at Keys Creek station 3(903SLKYS3) from May 2004 to April 2005 showed excessive selenium concentration (SWAMP, 2007).
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	CTR Freshwater Chronic (CCC) 5 ug/L.
Objective/Criterion Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Water samples were collected from Keys Creek station 3(903SLKYS3); (Latitude 33.2894, Longitude -117.0715).
Temporal Representation:	Samples were collected in May 2004, September 2004, March 2005 and April 2005.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 44312, Benthic Community Effects **Region 9**

Keys Creek

LOE ID:	81139

Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	2
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Two of the three samples collected had IBI scores below 40. NPDES bioassessment
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the State or Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	The samples were collected at station REF-KC, Keys Creek.
Temporal Representation:	The samples were collected in October 2001 and May and October 2002.
Environmental Conditions:	
QAPP Information:	The data was collected under the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan, June 25, 2009.
QAPP Information Reference(s):	e-mail clarifying QAPP information

DECISION ID	48141	Region 9
Keys Creek		

Pollutant:	**Bifenthrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the Zero samples exceed the Water Quality Criteria for Bifenthrin. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Zero samples exceeded the Water Quality Criteria for Bifenthrin and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48141, Bifenthrin **Region 9**

Keys Creek

LOE ID:	78054
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Keys Creek to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Bifenthrin.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The UC Davis Criteria for Bifenthrin for the protection of aquatic organisms is a 4 day average of 0.0006 ug/L (Fojut et al. 2012).
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Keys Creek was collected at 1 monitoring site [Keys Creek (orange grove) - 903_SMC01909]
Temporal Representation:	Data was collected on a single day 6/8/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

DECISION ID 48142 **Region 9**

Keys Creek

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the Twelve samples exceed the California Toxics Rule Objective for Cadmium. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Twelve samples exceeded the California Toxics Rule Objective for Cadmium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48142, Cadmium **Region 9**

Keys Creek

LOE ID:	73967
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Keys Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The dissolved cadmium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved cadmium is 0.0022 mg/L (California Toxics Rule, 2000).

Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Keys Creek was collected at 1 monitoring site [Keys Creek (orange grove) - 903_SMC01909]
Temporal Representation:	Data was collected on a single day 6/8/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

Line of Evidence (LOE) for Decision ID 48142, Cadmium **Region 9**

Keys Creek

LOE ID:	73966
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	11
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Keys Creek to determine beneficial use support and results are as follows: 0 of 11 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Keys Creek was collected at 2 monitoring site [Keys Creek @ Lilac Road] and [Keys Creek @ Dulin Road]
Temporal Representation:	Data was collected May 2003 - June 2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **48611** **Region 9**

Keys Creek

Pollutant:	**Chlorpyrifos**	039627
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	
Last Listing Cycle's Final Listing Decision:	New Decision	
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the Zero samples exceed the Water Quality Criteria for Chlorpyrifos.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Zero samples exceeded the Water Quality Criteria for Chlorpyrifos and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48611, Chlorpyrifos **Region 9**

Keys Creek

LOE ID:	73968
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Keys Creek to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).
Spatial Representation:	Data for this line of evidence for Keys Creek was collected at 2 monitoring sites [Keys Creek @ Lilac Road, Keys Creek at Dulin Road]
Temporal Representation:	Data was collected over the time period 8/10/2004-6/8/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 48607 Region 9

Keys Creek

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the Eleven samples exceed the California Toxics Rule Objective for Copper. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Eleven samples exceeded the California Toxics Rule Objective for Copper and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48607, Copper Region 9

Keys Creek

LOE ID:	73969
Pollutant:	Copper

LOE Subgroup:	Pollutant-Water	039629
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	11	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Keys Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Keys Creek was collected at 2 monitoring site [Keys Creek @ Lilac Road] and [Keys Creek @ Dulin Road]	
Temporal Representation:	Data was collected May 2003 - June 2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID	**48617**	**Region 9**
Keys Creek		

Pollutant:	**Cypermethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the Zero samples exceed the Water Quality Criteria for Cypermethrin. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.

3. Zero of Zero samples exceeded the Water Quality Criteria for Cypermethrin and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48617, Cypermethrin **Region 9**

Keys Creek

LOE ID:	78055
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Keys Creek to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Cypermethrin, total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of cypermethrin does not exceed 0.0002 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Fojut et al. 2012)
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Keys Creek was collected at 1 monitoring site [Keys Creek (orange grove) - 903_SMC01909]
Temporal Representation:	Data was collected on a single day 6/8/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

DECISION ID **48627** **Region 9**

Keys Creek

Pollutant: **Diazinon**

Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	039631
Last Listing Cycle's Final Listing Decision:	New Decision	
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the Seven samples exceed the Water Quality Criteria for Diazinon.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Seven samples exceeded the Water Quality Criteria for Diazinon and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48627, Diazinon **Region 9**

Keys Creek

LOE ID:	73970
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Keys Creek to determine beneficial use support and results are as follows: 0 of 7 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Data for this line of evidence for Keys Creek was collected at 2 monitoring sites [Keys Creek @ Lilac Road, Keys Creek at Dulin Road]
Temporal Representation:	Data was collected over the time period 8/10/2004-6/8/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 48638 Region 9

Keys Creek

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a Single line of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the Eleven samples exceed the California Toxics Rule Objective for Lead. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Eleven samples exceeded the California Toxics Rule Objective for Lead and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48638, Lead Region 9

Keys Creek

LOE ID:	73973
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	11
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Keys Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Keys Creek was collected at 2 monitoring site [Keys Creek @ Lilac Road] and [Keys Creek @ Dulin Road]
Temporal Representation:	Data was collected May 2003 - June 2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID	**48641**	**Region 9**
Keys Creek		

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a 3.1 line of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the Seven samples exceed the Water Quality Criteria for Malathion. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Seven samples exceeded the Water Quality Criteria for Malathion and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully

supported using table 3.1. 039634
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48641, Malathion **Region 9**

Keys Creek

LOE ID:	73974
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Keys Creek to determine beneficial use support and results are as follows: 0 of 7 samples exceed the criterion for Malathion.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Keys Creek was collected at 2 monitoring sites [Keys Creek @ Lilac Road, Keys Creek at Dulin Road]
Temporal Representation:	Data was collected over the time period 8/10/2004-6/8/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **48644** **Region 9**

Keys Creek

Pollutant:	**Toxicity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised

Impairment from Pollutant or Pollution:	Pollutant	039635

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Zero of One samples exhibited water toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is INSUFFICIENT justification FOR placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the One samples exceed the Basin Plan Objective for Toxicity and this sample size is INSUFFICIENT to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48644, Toxicity **Region 9**

Keys Creek

LOE ID:	73976
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to test for toxicity. None of the samples exhibited statistically significant toxicity. The toxicity tests included survival and reproduction of Ceriodaphnia dubia.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the

control. 039636

Guideline Reference:

Spatial Representation: The samples were collected from site 903_SMC01909, Keys Creek (orange grove).
Temporal Representation: The samples were collected in June 2008.
Environmental Conditions:
QAPP Information: This data was collected for the Regional Monitoring Of Southern California's Coastal Watersheds - Stormwater Monitoring Coalition Bioassessment Working Group. CRG Marine Laboratories Quality Assurance Program Document was provided.
QAPP Information Reference(s): e-mail clarifying QAPP information

DECISION ID 48643 Region 9
Keys Creek

Pollutant: **Zinc**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the Eleven samples exceed the California Toxics Rule Objective for Zinc.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Eleven samples exceeded the Evaluation Guideline for Zinc and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48643, Zinc Region 9
Keys Creek

LOE ID: 73977

Pollutant: Zinc
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Warm Freshwater Habitat

Number of Samples:	11	039637
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Keys Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Keys Creek was collected at 2 monitoring site [Keys Creek @ Lilac Road] and [Keys Creek @ Dulin Road]	
Temporal Representation:	Data was collected May 2003 - June 2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID	**48632**	**Region 9**
Keys Creek		

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.3 of the Listing Policy. Under section 3.3 a single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Eleven of the Eleven samples exceed the Single Sample Maximum Objective for Enterococcus, Six of the Eleven samples exceeded the Single Sample Maximum Objective for Fecal Coliform, and Three out of Eleven samples exceeded the Single Sample Maximum Guideline for Total Coliform.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Eleven of the Eleven samples exceed the Single Sample Maximum Objective for Enterococcus, Six

of the Eleven samples exceeded the Single Sample Maximum Objective for Fecal Coliform, and Three out of Eleven samples exceeded the Single Sample Maximum Guideline for Total Coliform, and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 48632, Indicator Bacteria **Region 9**

Keys Creek

LOE ID:	73971
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	11
Number of Exceedances:	11
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Keys Creek to determine beneficial use support and results are as follows: 11 of 11 samples exceed the criterion for Enterococci.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Samples shall not exceed 61 organisms per 100 ml for enterococcus in waters designated for REC I beneficial use (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Keys Creek was collected at 2 monitoring sites [Keys Creek at Dulin Road, Keys Creek @ Lilac Road]
Temporal Representation:	Data was collected over the time period 5/15/2003-6/8/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48632, Indicator Bacteria **Region 9**

Keys Creek

LOE ID:	73972
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation	039639
Number of Samples:	11	
Number of Exceedances:	6	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Keys Creek to determine beneficial use support and results are as follows: 6 of 11 samples exceed the criterion for Coliform, Fecal.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the fecal coliform concentration shall not exceed 400 MPN/100 ml.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Keys Creek was collected at 2 monitoring sites [Keys Creek at Dulin Road, Keys Creek @ Lilac Road]	
Temporal Representation:	Data was collected over the time period 5/15/2003-6/8/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 48632, Indicator Bacteria **Region 9**

Keys Creek

LOE ID:	73975
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	11
Number of Exceedances:	3
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Keys Creek to determine beneficial use support and results are as follows: 3 of 11 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxicsubstances in concentrations which are toxic to,or which produce detrimental physiologicalresponses in human, plant, animal, or indigenousaquatic life (Basin Plan).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In waters designated for water contact recreation (REC I), the total coliform concentration shall not exceed 10000 MPN/100 ml (CDPH 2006).
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November

	1997. California Department of Public Health.	039640

Spatial Representation:	Data for this line of evidence for Keys Creek was collected at 2 monitoring sites [Keys Creek at Dulin Road, Keys Creek @ Lilac Road]
Temporal Representation:	Data was collected over the time period 5/15/2003-6/8/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 43330 Region 9

Keys Creek

Pollutant:	**Nitrogen**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This decision is being changed based on incorrect application of the listing policy. Nitrogen is a toxicant and should be assessed using table 3.1.

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. Four of the 4 samples exceed the water quality objective for nitrogen.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Four of the 4 samples exceeded the Basin Plan objective for nitrogen.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 43330, Nitrogen Region 9

Keys Creek

LOE ID:	26210
Pollutant:	Nitrogen
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded

Beneficial Use:	Warm Freshwater Habitat	039641
Number of Samples:	4	
Number of Exceedances:	4	
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)	
Data Used to Assess Water Quality:	Four of the four samples collected at Keys Creek station 3(903SLKYS3) from May 2004 to April 2005 showed excessive nitrogen concentration (SWAMP, 2007).	
Data Reference:	Monitoring data for Region 9	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses (RWQCB, 2007). A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used (RWQCB, 2007).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:	Water Quality Control Plan for the San Diego Basin	
Spatial Representation:	Water samples were collected from Keys Creek station 3(903SLKYS3); (Latitude 33.2894, Longitude -117.0715).	
Temporal Representation:	Samples were collected in May 2004, September 2004, March 2005 and April 2005.	
Environmental Conditions:		
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.	
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA	

DECISION ID	43933	Region 9
Keys Creek		

Pollutant:	**Phosphorus**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence are available in the administrative record to assess this pollutant. One of the 4 samples exceed the water quality objective for phosphorus. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that: 039642
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of the 4 samples exceeded the Basin Plan objective for phosphorus and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43933, Phosphorus **Region 9**
Keys Creek

LOE ID:	26208
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	1
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	One of 4 samples collected at Keys Creek station 3(903SLKYS3) from May 2004 to April 2005 showed excessive phosphorus concentration (SWAMP, 2007).
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	As described in San Diego Basin Plan; inland surface waters, bays and estuaries and coastal lagoon waters shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses (RWQCB, 2007). For inland surface waters-streams and other flowing waters, with all beneficial uses, the water quality objective for total phosphorus is 0.1 mg/L (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Water samples were collected from Keys Creek station 3(903SLKYS3); (Latitude 33.2894, Longitude -117.0715).
Temporal Representation:	Samples were collected in May 2004, September 2004, March 2005, and April 2005.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

DECISION ID **43217** **Region 9**
Keys Creek

Pollutant:	**Selenium**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Two of the three samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Two of three samples exceed the CTR value for Se and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43217, Selenium **Region 9**

Keys Creek

LOE ID:	26209
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	2
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Two of the three samples collected at Keys Creek station 3(903SLKYS3) from May 2004 to April 2005 showed excessive selenium concentration (SWAMP, 2007).
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	CTR Freshwater Chronic (CCC) 5 ug/L.
Objective/Criterion Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for

	the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Water samples were collected from Keys Creek station 3(903SLKYS3); (Latitude 33.2894, Longitude -117.0715).
Temporal Representation:	Samples were collected in May 2004, September 2004, March 2005 and April 2005.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Los Coches Creek
Water Body ID: CAR9071400020081210155144
Water Body Type: River & Stream

DECISION ID 47444 **Region 9**
Los Coches Creek

Pollutant: Cadmium
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 one line of evidence are necessary to assess listing status.

One lines of evidence is available in the administrative record to assess this pollutant. 0 of the13 samples exceed the criterion.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of thirteen samples exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47444, Cadmium **Region 9**
Los Coches Creek

LOE ID: 74202

Pollutant: Cadmium
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Warm Freshwater Habitat

Number of Samples: 13

Number of Exceedances:	0	039646

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Los Coches Creek to determine beneficial use support and results are as follows: 0 of 13 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Los Coches Creek was collected at 2 monitoring sites [Los Coches Creek @ I-8 Business Route, Los Coches Creek @ Los Coches Road and Ha Hana Road]
Temporal Representation:	Data was collected from May 2003 to June 2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID	**47445**	**Region 9**
Los Coches Creek		

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 one line of evidence are necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the Zero samples exceed the guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Zero samples exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47445, Chlorpyrifos **Region 9**

Los Coches Creek

LOE ID:	74203
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Los Coches Creek to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).
Spatial Representation:	Data for this line of evidence for Los Coches Creek was collected at 2 monitoring sites [Los Coches Creek @ Los Coches Road and Ha Hana Road, Los Coches Creek @ I-8 Business Route]
Temporal Representation:	Data was collected over the time period 8/5/2004-6/24/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **47455** **Region 9**

Los Coches Creek

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised

Impairment from Pollutant or Pollution:	Pollutant	039648
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 one line of evidence are necessary to assess listing status. One lines of evidence is available in the administrative record to assess this pollutant. 0 of the13 samples exceed the criterion. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of thirteen samples exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.	
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.	

Line of Evidence (LOE) for Decision ID 47455, Copper **Region 9**

Los Coches Creek

LOE ID:	74204
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	13
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Los Coches Creek to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Los Coches Creek was collected at 2 monitoring sites [Los Coches Creek @ I-8 Business Route, Los Coches Creek @ Los Coches Road and Ha Hana Road]

Temporal Representation:	Data was collected from May 2003 to June 2009. 039649
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 47464 Region 9

Los Coches Creek

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 one line of evidence are necessary to assess listing status. One lines of evidence is available in the administrative record to assess this pollutant. 0 of the13 samples exceed the criterion. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of thirteen samples exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47464, Lead Region 9

Los Coches Creek

LOE ID:	74215
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	13
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Los Coches Creek to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the

	County of San Diego, 2003-2009.	039650

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Los Coches Creek was collected at 2 monitoring sites [Los Coches Creek @ I-8 Business Route, Los Coches Creek @ Los Coches Road and Ha Hana Road]
Temporal Representation:	Data was collected from May 2003 to June 2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 47468 **Region 9**

Los Coches Creek

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 one line of evidence are necessary to assess listing status. One lines of evidence is available in the administrative record to assess this pollutant. 0 of the 9 samples exceed the criterion. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of nine samples exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy,
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47468, Malathion **Region 9**

Los Coches Creek

LOE ID:	74216
Pollutant:	Malathion

LOE Subgroup:	Pollutant-Water	039651
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	9	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Los Coches Creek to determine beneficial use support and results are as follows: 0 of 9 samples exceed the criterion for Malathion.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.	
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013	
Spatial Representation:	Data for this line of evidence for Los Coches Creek was collected at 2 monitoring sites [Los Coches Creek @ I-8 Business Route, Los Coches Creek @ Los Coches Road and Ha Hana Road]	
Temporal Representation:	Data was collected over the time period 9/23/2005-6/24/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID	**47465**	**Region 9**
Los Coches Creek		

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 one line of evidence are necessary to assess listing status. One lines of evidence is available in the administrative record to assess this pollutant. 0 of the13 samples exceed the criterion. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of thirteen samples exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.

4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47465, Zinc **Region 9**

Los Coches Creek

LOE ID:	74218
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	13
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Los Coches Creek to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Los Coches Creek was collected at 2 monitoring sites [Los Coches Creek @ I-8 Business Route, Los Coches Creek @ Los Coches Road and Ha Hana Road]
Temporal Representation:	Data was collected from May 2003 to June 2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **47461** **Region 9**

Los Coches Creek

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision

Revision Status	Revised	039653
Sources:	Source Unknown	
Expected TMDL Completion Date:	2027	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. For Enterococcus, 12 of the 13 samples exceed the Water Quality Criteria of 61 /100 ml for water contact recreation in fresh water.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. For enterococcus, 12 of 13 samples exceed the Water Quality Criteria of 61 /100 ml for water contact recreation in fresh water and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 47461, Indicator Bacteria **Region 9**

Los Coches Creek

LOE ID:	74206
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	13
Number of Exceedances:	8
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Los Coches Creek to determine beneficial use support and results are as follows: 8 of 13 samples exceed the criterion for Coliform, Fecal.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the fecal coliform concentration shall not exceed 400 MPN/100 ml.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Data for this line of evidence for Los Coches Creek was collected at 2 monitoring sites [Los Coches Creek @ I-8 Business Route, Los Coches Creek @ Los Coches Road and Ha Hana Road]
Temporal Representation:	Data was collected over the time period 5/21/2003-6/24/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47461, Indicator Bacteria **Region 9**

Los Coches Creek

LOE ID:	74205
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	13
Number of Exceedances:	12
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Los Coches Creek to determine beneficial use support and results are as follows: 12 of 13 samples exceed the criterion for Enterococci.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Samples shall not exceed 61 organisms per 100 ml for enterococcus in waters designated for REC I beneficial use (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Los Coches Creek was collected at 2 monitoring sites [Los Coches Creek @ I-8 Business Route, Los Coches Creek @ Los Coches Road and Ha Hana Road]
Temporal Representation:	Data was collected over the time period 5/21/2003-6/24/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47461, Indicator Bacteria **Region 9**

Los Coches Creek

LOE ID:	74217
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation
Number of Samples:	13
Number of Exceedances:	3
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Los Coches Creek to determine beneficial use support and results are as follows: 3 of 13 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxicsubstances in concentrations which are toxic to,or which produce detrimental physiologicalresponses in human, plant, animal, or indigenousaquatic life (Basin Plan).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In waters designated for water contact recreation (REC I), the total coliform concentration shall not exceed 10000 MPN/100 ml (CDPH 2006).
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.
Spatial Representation:	Data for this line of evidence for Los Coches Creek was collected at 2 monitoring sites [Los Coches Creek @ I-8 Business Route, Los Coches Creek @ Los Coches Road and Ha Hana Road]
Temporal Representation:	Data was collected over the time period 5/21/2003-6/24/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID	**43119**	**Region 9**
Los Coches Creek		

Pollutant:	**Nitrogen**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2027
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Four of the 4 samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.

2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Four of the 4 samples exceeded the Basin Plan objective and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 43119, Nitrogen **Region 9**

Los Coches Creek

LOE ID:	26189
Pollutant:	Nitrogen
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Four of four samples collected at Los Coches Creek station (907SDLCO2) from May 2004 to April 2005 showed excessive nitrogen concentrations (SWAMP, 2007).
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses (RWQCB, 2007). A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Water samples were collected at Los Coches Creek station 2 (907SDLCO2).
Temporal Representation:	Samples were collected in May 2004, September 2004, February 2005, and April 2005.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

DECISION ID **44602** **Region 9**

Los Coches Creek

Pollutant:	**Phosphorus**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2023
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Two of the 4 samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Two of the 4 samples exceeded the Basin Plan objective and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 44602, Phosphorus **Region 9**

Los Coches Creek

LOE ID:	26190
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	2
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Two of four samples collected at Los Coches Creek station 2(907SDLCO2) from May 2004 to April 2005 showed excessive phosphorus concentrations (SWAMP, 2007).
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	As described in San Diego Basin Plan; inland surface waters, bays and estuaries and coastal lagoon waters shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses (RWQCB, 2007). From the Basin Plan: For inland surface waters-streams and other flowing waters, with all

	beneficial uses, the water quality objective for total phosphorus is 0.1 mg/L (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Water samples were collected at Los Coches Creek station 2 (907SDLCO2).
Temporal Representation:	Samples were collected in May 2004, September 2004; February 2005; and April 2005.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

DECISION ID 42782 Region 9

Los Coches Creek

Pollutant:	**Selenium**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Three of the 4 samples exceed the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Three of the 4 samples exceed the CTR value for Se and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 42782, Selenium Region 9

Los Coches Creek

LOE ID:	26191
Pollutant:	Selenium

LOE Subgroup:	Pollutant-Water	039659
Matrix:	Water	
Fraction:	Dissolved	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	4	
Number of Exceedances:	3	
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)	
Data Used to Assess Water Quality:	Three of four samples collected at Los Coches Creek station 2 (907SDLCO2) from May 2004 to April 2005 showed excessive phosphorus concentrations (SWAMP, 2007).	
Data Reference:	Monitoring data for Region 9	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	CTR Freshwater Chronic (CCC) 5 ug/L. (U.S. EPA, 2000).	
Objective/Criterion Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Water samples were collected at Los Coches Creek station 2(907SDLCO2).	
Temporal Representation:	Samples were collected in May 2004, September 2004; February 2005; and April 2005.	
Environmental Conditions:		
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.	
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Moosa Canyon Creek
Water Body ID: CAR9031300020081210154123
Water Body Type: River & Stream

DECISION ID 48038 **Region 9**
Moosa Canyon Creek

Pollutant: Arsenic
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the CRITERION for protection of the aquatic life beneficial use. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 1 samples exceeded the CRITERIA for aquatic life which is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48038, Arsenic **Region 9**
Moosa Canyon Creek

LOE ID: 74387

Pollutant: Arsenic
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Warm Freshwater Habitat

Number of Samples: 1
Number of Exceedances: 0

Data and Information Type: PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality: Water Board staff assessed County of San Diego data for Moosa Canyon Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the

	criterion for Arsenic. 039661
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The dissolved arsenic criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved arsenic is 0.150 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Moosa Canyon Creek was collected at 1 monitoring site [Moosa Creek - 903_SMC00457]
Temporal Representation:	Data was collected on a single day 6/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

DECISION ID 48116 Region 9

Moosa Canyon Creek

Pollutant:	**Benthic Community Effects**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Benthic Community Effects is being considered for placement on the CWA section 303(d) List under sections 3.9 and 3.1 of the Listing Policy. Under section 3.9, an additional line of evidence associating Benthic Community Effects with a water or sediment concentration of pollutant(s) is necessary to assess listing status. Based on the readily available data and information, the weight of evidence provides sufficient justification for not placing Benthic Community Effects in this water segment on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used does satisfy the data quantity requirements of section 6.1.5 of the Policy. 3. Pursuant to section 3.9 of the Listing Policy, the water does not exhibit significant degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index. Of two stations sampled, one had evidence of degradation while one did not (n =2). 4. Pursuant to section 3.9 of the Listing Policy, the water segment does have associated pollutant(s) samples that exceed water quality objectives. 5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not being met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48116, Benthic Community Effects Region 9

Moosa Canyon Creek 039662

LOE ID:	74388
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	The IBI score for this water body is 13 which indicates that this water body may be considered to have impaired conditions.
Data Reference:	RWB9 Status Sampling 2007 and 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at the following station: 903SLMSA2 (Moosa Creek 2).
Temporal Representation:	Surveys done May 9, 2008.
Environmental Conditions:	
QAPP Information:	Data collected following SWAMP QA protocols for the RWB9 Status Sampling 2007 and 2008 water quality monitoring project.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 48116, Benthic Community Effects **Region 9**

Moosa Canyon Creek

LOE ID:	26212
Pollutant:	Nitrogen
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	All four samples collected at Moosa Creek station 2, (903SLMSA2) show excessive nitrogen concentrations. (SWAMP, 2007).
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP

Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses (RWQCB, 2007). A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Water Samples were collected at Moosa Creek station 2, 903SLMSA2; (Latitude 33.2862, Longitude -117.2092).
Temporal Representation:	Samples were collected in May 2004, September 2004, March 2005, and April 2005.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 48116, Benthic Community Effects **Region 9**

Moosa Canyon Creek

LOE ID:	26213
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	1
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	One of the three samples collected at Moosa Creek station 2(903SLMSA2) showed significant toxicity levels (SL) to the Green alga, Selenastrum Capricornutum, growth test method. None of the samples showed significant toxicity to Ceriodaphnia dubia.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.
Guideline Reference:	Monitoring data for Region 9
Spatial Representation:	Water Samples were collected at Moosa Creek station 2 (903SLMSA2); (Latitude 33.2862, Longitude -117.2092).

Temporal Representation:	Samples were collected in May 2004, September 2004, March 2005, and April 2005.
Environmental Conditions:	
QAPP Information:	Quality control of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 48116, Benthic Community Effects **Region 9**

Moosa Canyon Creek

LOE ID:	79485
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	1
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	A total of two samples were taken at two stations in Moosa Canyon Creek. One sample was below the 0.79 threshold, and is therefore exceeding the water quality objective for the aquatic life beneficial use.
Data Reference:	RWB9 Status Sampling 2007 and 2008 Bioassessment Data for Various Pollutants from Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009. Region 9 CSCI Scores & Water Body Information
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.
Guideline Reference:	The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.
Spatial Representation:	The samples were collected at 903_SMC00457 and 903SLMSA2
Temporal Representation:	The sample were collected in June 2009 and May 2008.
Environmental Conditions:	
QAPP Information:	Data collected following SWAMP QA protocols for the RWB9 Status Sampling 2007 and 2008 water quality monitoring project and the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan.
QAPP Information Reference(s):	e-mail clarifying QAPP information RWB9 Status Sampling 2007 and 2008 Bioassessment Data for Various Pollutants from Stormwater Monitoring Coalition Regional

Line of Evidence (LOE) for Decision ID 48116, Benthic Community Effects **Region 9**

Moosa Canyon Creek

LOE ID:	26211
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	All four samples collected at Moosa Creek station 2, (903SLMSA2) show excessive phosphorus concentrations. (SWAMP, 2007).
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Inland surface waters, bays and estuaries and coastal lagoon waters shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. For inland surface waters-streams and other flowing waters, with all beneficial uses, the water quality objective for total phosphorus is 0.1 mg/L. This appears to be the desired goal in order to prevent plant nuisance in streams and other flowing waters; not to be exceeded more than 10% of the time (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Water Samples were collected at Moosa Creek station 2,903SLMSA2; (Latitude 33.2862, Longitude -117.2092).
Temporal Representation:	Samples were collected in May 2004, September 2004, March 2005, and April 2005.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 48116, Benthic Community Effects **Region 9**

Moosa Canyon Creek

LOE ID:	74389
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1

Data and Information Type:	Benthic macroinvertebrate surveys	039666
Data Used to Assess Water Quality:	The one sample collected had an IBI score below 40. The score was 32.9. SMC bioassessment	
Data Reference:	Bioassessment Data for Various Pollutants from Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the State or Regional Board. Region 9 Basin Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.	
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Appendix 7-B Environmental Management Vol. 35, No. 4, pp. 493-504.	
Spatial Representation:	The sample was collected at 903_SMC00457, Moosa Canyon Creek.	
Temporal Representation:	The sample was collected in June 2009.	
Environmental Conditions:		
QAPP Information:	The data was collected under the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan, June 25, 2009.	
QAPP Information Reference(s):	e-mail clarifying QAPP information	

DECISION ID	48041	Region 9
Moosa Canyon Creek		

Pollutant:	**Bifenthrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the zero samples exceed the CRITERION for protection of the Aquatic Life beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 0 samples exceeded the CRITERIA for aquatic life which is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48041, Bifenthrin **Region 9**

Moosa Canyon Creek

LOE ID:	78066
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Moosa Canyon Creek to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Bifenthrin.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The UC Davis Criteria for Bifenthrin for the protection of aquatic organisms is a 4 day average of 0.0006 ug/L (Fojut et al. 2012).
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Moosa Canyon Creek was collected at 1 monitoring site [Moosa Creek - 903_SMC00457]
Temporal Representation:	Data was collected on a single day 6/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

DECISION ID **48043** **Region 9**

Moosa Canyon Creek

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of

the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 13 samples exceed the CRITERION for protection of the aquatic life beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 13 samples exceeded the criterion which is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48043, Cadmium **Region 9**

Moosa Canyon Creek

LOE ID:	74390
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Moosa Canyon Creek to determine beneficial use support and results are as follows: 0 of 11 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Moosa Canyon Creek was collected at 2 monitoring sites [Moosa Canyon Creek @ End of Betsworth Road, Moosa Canyon Creek at Old River Road]
Temporal Representation:	Data was collected June 2003 to June 2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.

QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev.012, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48043, Cadmium **Region 9**

Moosa Canyon Creek

LOE ID:	74391
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Moosa Canyon Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Moosa Canyon Creek was collected at 1 monitoring site [Moosa Creek - 903_SMC00457]
Temporal Representation:	Data was collected on a single day 6/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

DECISION ID **48111** **Region 9**

Moosa Canyon Creek

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the zero samples exceed the CRITERION for protection of the Aquatic Life beneficial use. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 0 samples exceeded the CRITERIA for aquatic life which is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48111, Chlorpyrifos **Region 9**

Moosa Canyon Creek

LOE ID:	74393
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Moosa Canyon Creek to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).
Spatial Representation:	Data for this line of evidence for Moosa Canyon Creek was collected at 3 monitoring sites [

	Moosa Canyon Creek @ Sunday Drive, Moosa Canyon Creek @ End of Betsworth Road, Moosa Canyon Creek at Old River Road]
Temporal Representation:	Data was collected over the time period 6/29/2006-6/8/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID	48051	Region 9
Moosa Canyon Creek		

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the CRITERION for protection of the aquatic life beneficial use. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 1 samples exceeded the CRITERIA for aquatic life which is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48051, Chromium	Region 9
Moosa Canyon Creek	

LOE ID:	74394
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Moosa Canyon Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater

	Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009. 039672
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Moosa Canyon Creek was collected at 1 monitoring site [Moosa Creek - 903_SMC00457]
Temporal Representation:	Data was collected on a single day 6/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

DECISION ID	48046	Region 9
Moosa Canyon Creek		

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 13 samples exceed the CRITERION for protection of the aquatic life beneficial use. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 13 samples exceeded the criterion which is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48046, Copper	Region 9

Moosa Canyon Creek 039673

LOE ID:	74395
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Moosa Canyon Creek to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Moosa Canyon Creek was collected at 2 monitoring sites [Moosa Canyon Creek @ End of Betsworth Road, Moosa Canyon Creek at Old River Road]
Temporal Representation:	Data was collected June 2003 to June 2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48046, Copper **Region 9**

Moosa Canyon Creek

LOE ID:	74396
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Moosa Canyon Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater

	Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009. 039674
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Moosa Canyon Creek was collected at 1 monitoring site [Moosa Creek - 903_SMC00457]
Temporal Representation:	Data was collected on a single day 6/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

DECISION ID	**48112**	**Region 9**
Moosa Canyon Creek		

Pollutant:	**Cypermethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the zero samples exceed the CRITERION for protection of the Aquatic Life beneficial use. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 0 samples exceeded the CRITERIA for aquatic life which is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48112, Cypermethrin **Region 9**

Moosa Canyon Creek 039675

LOE ID:	78067
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Moosa Canyon Creek to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Cypermethrin, total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of cypermethrin does not exceed 0.0002 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Fojut et al. 2012)
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Moosa Canyon Creek was collected at 1 monitoring site [Moosa Creek - 903_SMC00457]
Temporal Representation:	Data was collected on a single day 6/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

DECISION ID **48114** **Region 9**

Moosa Canyon Creek

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the ten samples exceed the CRITERION for protection of the Aquatic Life beneficial use. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section

303(d) List. 039676

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 10 samples exceeded the CRITERIA for the aquatic life beneficial use which is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48114, Diazinon **Region 9**

Moosa Canyon Creek

LOE ID:	74397
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	10
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Moosa Canyon Creek to determine beneficial use support and results are as follows: 0 of 10 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Data for this line of evidence for Moosa Canyon Creek was collected at 3 monitoring sites [Moosa Canyon Creek @ Sunday Drive, Moosa Canyon Creek @ End of Betsworth Road, Moosa Canyon Creek at Old River Road]
Temporal Representation:	Data was collected over the time period 6/29/2006-6/8/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **48047** **Region 9**

Moosa Canyon Creek

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 13 samples exceed the CRITERION for protection of the aquatic life beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 13 samples exceeded the criterion which is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48047, Lead **Region 9**

Moosa Canyon Creek

LOE ID:	74401
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Moosa Canyon Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Moosa Canyon Creek was collected at 1 monitoring site [Moosa Creek - 903_SMC00457]
Temporal Representation:	Data was collected on a single day 6/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

Line of Evidence (LOE) for Decision ID 48047, Lead **Region 9**

Moosa Canyon Creek

LOE ID:	74400
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Moosa Canyon Creek to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Moosa Canyon Creek was collected at 2 monitoring sites [Moosa Canyon Creek @ End of Betsworth Road, Moosa Canyon Creek at Old River Road]
Temporal Representation:	Data was collected June 2003 to June 2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID	48115	Region 9
Moosa Canyon Creek		

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the ten samples exceed the CRITERION for protection of the Aquatic Life beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 10 samples exceeded the CRITERIA for the aquatic life beneficial use which is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48115, Malathion	Region 9
Moosa Canyon Creek	

LOE ID:	74402
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	10
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Moosa Canyon Creek to determine beneficial use support and results are as follows: 0 of 10 samples exceed the criterion for Malathion.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.

SWAMP Data:	Non-SWAMP	039680
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.	
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013	
Spatial Representation:	Data for this line of evidence for Moosa Canyon Creek was collected at 3 monitoring sites [Moosa Canyon Creek @ Sunday Drive, Moosa Canyon Creek @ End of Betsworth Road, Moosa Canyon Creek at Old River Road]	
Temporal Representation:	Data was collected over the time period 6/29/2006-6/8/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID 48048 — Region 9

Moosa Canyon Creek

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 13 samples exceed the CRITERION for protection of the aquatic life beneficial use. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 13 samples exceeded the criterion which is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48048, Nickel — Region 9

Moosa Canyon Creek

LOE ID:	79049	039681
Pollutant:	Nickel	
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	12	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Moosa Canyon Creek to determine beneficial use support and results are as follows: 0 of 11 samples exceed the criterion for Nickel.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California, 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Moosa Canyon Creek was collected at 2 monitoring sites [Moosa Canyon Creek @ End of Betsworth Road, Moosa Canyon Creek at Old River Road]	
Temporal Representation:	Data was collected June 2003 to June 2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 48048, Nickel **Region 9**

Moosa Canyon Creek

LOE ID:	74403
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Moosa Canyon Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.

SWAMP Data:	Non-SWAMP	039682
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Moosa Canyon Creek was collected at 1 monitoring site [Moosa Creek - 903_SMC00457]	
Temporal Representation:	Data was collected on a single day 6/4/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.	

DECISION ID	42906	Region 9
Moosa Canyon Creek		

Pollutant:	**Toxicity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. One of four of the samples exceed the water quality objective for toxicity. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of four of the samples exceed the water quality objective for toxicity and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 42906, Toxicity **Region 9**

Moosa Canyon Creek 039683

LOE ID:	74405
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to test for toxicity. None of the samples exhibited statistically and biologically significant toxicity. The toxicity tests included survival and reproduction of Ceriodaphnia dubia.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control. Additionally, the biological significance of the sample is evaluted by determining whether the sample response is lower than the evaluation threshold
Guideline Reference:	
Spatial Representation:	The samples were collected from site 903_SMC00457, Moosa Creek.
Temporal Representation:	The samples were collected in June 2009.
Environmental Conditions:	
QAPP Information:	This data was collected for the Regional Monitoring Of Southern California's Coastal Watersheds - Stormwater Monitoring Coalition Bioassessment Working Group. CRG Marine Laboratories Quality Assurance Program Document was provided.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 42906, Toxicity **Region 9**

Moosa Canyon Creek

LOE ID:	26213
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	1
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	One of the three samples collected at Moosa Creek station 2(903SLMSA2) showed significant toxicity levels (SL) to the Green alga, Selenastrum Capricornutum, growth test method. None of the samples showed significant toxicity to Ceriodaphnia dubia.

Data Reference:	Monitoring data for Region 9	039684
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (RWQCB, 2007).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.	
Guideline Reference:	Monitoring data for Region 9	
Spatial Representation:	Water Samples were collected at Moosa Creek station 2 (903SLMSA2); (Latitude 33.2862, Longitude -117.2092).	
Temporal Representation:	Samples were collected in May 2004, September 2004, March 2005, and April 2005.	
Environmental Conditions:		
QAPP Information:	Quality control of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.	
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA	

DECISION ID	48049	Region 9
Moosa Canyon Creek		

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 13 samples exceed the CRITERION for protection of the aquatic life beneficial use. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 13 samples exceeded the criterion which is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48049, Zinc **Region 9**

Moosa Canyon Creek 039685

LOE ID:	74407
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Moosa Canyon Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Moosa Canyon Creek was collected at 1 monitoring site [Moosa Creek - 903_SMC00457]
Temporal Representation:	Data was collected on a single day 6/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

Line of Evidence (LOE) for Decision ID 48049, Zinc **Region 9**

Moosa Canyon Creek

LOE ID:	74406
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Moosa Canyon Creek to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Zinc.

Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009. 039686
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Moosa Canyon Creek was collected at 2 monitoring sites [Moosa Canyon Creek @ End of Betsworth Road, Moosa Canyon Creek at Old River Road]
Temporal Representation:	Data was collected June 2003 to June 2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID	48050	Region 9
Moosa Canyon Creek		

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2027
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.3 of the Listing Policy. Under section 3.3 a single line of evidence is necessary to assess listing status. Three lines of evidence are available in the administrative record to assess this pollutant. 15 of the 17 samples exceed the objective for enterococcus. Six of 17 samples exceed the objective for fecal coliform and three of 17 samples exceed the objective for total coliform. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. 15 of 17 samples and 6 of 17 samples exceed the objectives and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 48050, Indicator Bacteria **Region 9**

Moosa Canyon Creek

LOE ID:	74404
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	17
Number of Exceedances:	3
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Moosa Canyon Creek to determine beneficial use support and results are as follows: 3 of 17 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxicsubstances in concentrations which are toxic to,or which produce detrimental physiologicalresponses in human, plant, animal, or indigenousaquatic life (Basin Plan).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In waters designated for water contact recreation (REC I), the total coliform concentration shall not exceed 10000 MPN/100 ml (CDPH 2006).
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.
Spatial Representation:	Data for this line of evidence for Moosa Canyon Creek was collected at 3 monitoring sites [Moosa Canyon Creek at Old River Road, Moosa Canyon Creek @ Sunday Drive, Moosa Canyon Creek @ End of Betsworth Road]
Temporal Representation:	Data was collected over the time period 6/3/2003-6/8/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48050, Indicator Bacteria **Region 9**

Moosa Canyon Creek

LOE ID:	74398
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	17
Number of Exceedances:	15
Data and Information Type:	PATHOGEN MONITORING

Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Moosa Canyon Creek to determine beneficial use support and results are as follows: 15 of 17 samples exceed the criterion for Enterococci.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Samples shall not exceed 61 organisms per 100 ml for enterococcus in waters designated for REC I beneficial use (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Moosa Canyon Creek was collected at 3 monitoring sites [Moosa Canyon Creek at Old River Road, Moosa Canyon Creek @ Sunday Drive, Moosa Canyon Creek @ End of Betsworth Road]
Temporal Representation:	Data was collected over the time period 6/3/2003-6/8/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48050, Indicator Bacteria **Region 9**

Moosa Canyon Creek

LOE ID:	74399
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	17
Number of Exceedances:	6
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Moosa Canyon Creek to determine beneficial use support and results are as follows: 6 of 17 samples exceed the criterion for Coliform, Fecal.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the fecal coliform concentration shall not exceed 400 MPN/100 ml.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Moosa Canyon Creek was collected at 3 monitoring sites [Moosa Canyon Creek at Old River Road, Moosa Canyon Creek @ Sunday Drive, Moosa Canyon Creek @ End of Betsworth Road]
Temporal Representation:	Data was collected over the time period 6/3/2003-6/8/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix

QAPP Information Reference(s):	Analytical and Dry Weather Monitoring Program Rev. 8 was followed. 039689 Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 42371 Region 9

Moosa Canyon Creek

Pollutant:	**Nitrogen**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2023
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Four of the four samples exceed the OBJECTIVE. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Four of four samples exceed the OBJECTIVE and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 42371, Nitrogen Region 9

Moosa Canyon Creek

LOE ID:	26212
Pollutant:	Nitrogen
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	All four samples collected at Moosa Creek station 2, (903SLMSA2) show excessive nitrogen concentrations. (SWAMP, 2007).
Data Reference:	Monitoring data for Region 9

SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses (RWQCB, 2007). A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Water Samples were collected at Moosa Creek station 2, 903SLMSA2; (Latitude 33.2862, Longitude -117.2092).
Temporal Representation:	Samples were collected in May 2004, September 2004, March 2005, and April 2005.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

DECISION ID	44652	Region 9
Moosa Canyon Creek		

Pollutant:	**Phosphorus**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2023
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Four of the four samples exceed the Basin Plan water quality objective for phosphorus as P. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Four of the four samples exceed the Basin Plan water quality objective for phosphorus as P and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 44652, Phosphorus **Region 9**

Moosa Canyon Creek

LOE ID:	26211
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	All four samples collected at Moosa Creek station 2, (903SLMSA2) show excessive phosphorus concentrations. (SWAMP, 2007).
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Inland surface waters, bays and estuaries and coastal lagoon waters shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. For inland surface waters-streams and other flowing waters, with all beneficial uses, the water quality objective for total phosphorus is 0.1 mg/L. This appears to be the desired goal in order to prevent plant nuisance in streams and other flowing waters; not to be exceeded more than 10% of the time (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Water Samples were collected at Moosa Creek station 2,903SLMSA2; (Latitude 33.2862, Longitude -117.2092).
Temporal Representation:	Samples were collected in May 2004, September 2004, March 2005, and April 2005.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Moro Canyon Creek
Water Body ID: CAR9011100020081210154547
Water Body Type: River & Stream

DECISION ID 48261 **Region 9**
Moro Canyon Creek

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.3 of the Listing Policy. Under section 3.3 a single line of evidence is necessary to assess listing status.

Seven lines of evidence are available in the administrative record to assess this pollutant. Two of the 151 samples exceed the single sample objective for enterococcus and five of the 137 samples exceed the geomean objective for enterococcus. Zero of 151 samples exceed the single sample objectives for fecal and total coliform. Zero of 131 samples exceed the geomean objectives for fecal and total coliform.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. 2 of 151 samples exceed the singles sample objective and 5 of 137 samples exceed the geomean objective and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 48261, Indicator Bacteria **Region 9**
Moro Canyon Creek

LOE ID: 74422

Pollutant: Fecal Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples:	132	039693
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	None of the 132 geomeans exceeded the fecal coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The geometric mean for fecal coliform shall not exceed more than 200/100ml. Water Quality Control Plan for the San Diego Basin.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected from Morro Creek (surfzone upcoast and surfzone downcoast).	
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.	
Environmental Conditions:		
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 48261, Indicator Bacteria **Region 9**

Moro Canyon Creek

LOE ID:	74418
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	5
Number of Exceedances:	5
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Five of the five geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the El Morro Creek site.
Temporal Representation:	Samples were collected approximately once a week from September 2008 to June 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 48261, Indicator Bacteria **Region 9**

Moro Canyon Creek 039694

LOE ID:	74420
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	132
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	None of the 132 geomeans exceeded the enterococcus objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean for enterococcus shall not exceed 35 MPN/100 mL. Water Quality Control Plan for the San Diego Basin. Californis Ocean Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Morro Creek (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 48261, Indicator Bacteria **Region 9**

Moro Canyon Creek

LOE ID:	74419
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	151
Number of Exceedances:	2
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Two of the 151 samples exceeded the enterococcus objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample enterococcus concentration shall not exceed more than 104/100ml.

Objective/Criterion Reference:	Water Quality Control Plan for Ocean Waters of California. Region 9 Basion Plan. 03/2005 Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health. California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Morro Creek (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to April 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 48261, Indicator Bacteria **Region 9**

Moro Canyon Creek

LOE ID:	74426
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	151
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 151 samples exceeded the total coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample total coliform concentration shall not exceed more than 10000/100ml.
Objective/Criterion Reference:	Water Quality Control Plan for Ocean Waters of California. Region 9 Basion Plan. Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Morro Creek (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to April 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 48261, Indicator Bacteria **Region 9**

Moro Canyon Creek

LOE ID:	74427
Pollutant:	Total Coliform

LOE Subgroup:	Pollutant-Water	039696
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	132	
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	None of the 132 samples exceeded the total coliform objective. For these stations, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The geometric mean for total coliform shall not exceed more than 1000/100ml. Water Quality Control Plan for the San Diego Basin.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected from Coastal Morro Creek(surfzone upcoast and surfzone downcoast).	
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.	
Environmental Conditions:		
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 48261, Indicator Bacteria **Region 9**

Moro Canyon Creek

LOE ID:	74421
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	151
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 151 samples exceeded the fecal coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample fecal coliform concentration shall not exceed more than 400/100ml. Water Quality Control Plan for Ocean Waters of California. Region 9 Basion Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	

Guideline Reference:	039697
Spatial Representation:	The samples were collected from Morro Creek (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to April 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

DECISION ID 48262 Region 9

Moro Canyon Creek

Pollutant:	**Oxygen, Dissolved**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line(s) of evidence are necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the One samples exceed the OBJECTIVE. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one samples exceeded the [OBJECTIVE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2. 4. Pursuant to [SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48262, Oxygen, Dissolved Region 9

Moro Canyon Creek

LOE ID:	74423
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Numeric data generated from 1 sample of Dissolved Oxygen concentrations had no exceedences.
Data Reference:	Data for bacteria in various waterbodies, Feb. 2005-May 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Dissolved oxygen levels shall not be less than 5.0 mg/l in inland surface waters with designated MAR or WARM beneficial uses. The annual mean dissolved oxygen concentration shall not be less than 7 mg/l more than 10% of the time.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the El Morrow Creek - fresh water station.
Temporal Representation:	One sample was collected in May 2007.
Environmental Conditions:	
QAPP Information:	NPDES quality assurance.
QAPP Information Reference(s):	

DECISION ID 48263 Region 9

Moro Canyon Creek

Pollutant:	**pH**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line(s) of evidence are necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the One samples exceed the OBJECTIVE. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one samples exceeded the [OBJECTIVE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2. 4. Pursuant to [SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48263, pH Region 9

Moro Canyon Creek

LOE ID:	74424
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Numeric data generated from 1 sample of pH data had no exceedences.
Data Reference:	Data for bacteria in various waterbodies, Feb. 2005-May 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The pH of all inland surface waters shall not be depressed below 6.5 or raised above 8.5 as a result of waste discharges.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the El Morrow Creek station.
Temporal Representation:	One sample was collected on 5/5/2007.
Environmental Conditions:	
QAPP Information:	NPDES quality assurance.
QAPP Information Reference(s):	

DECISION ID	43125	Region 9
Moro Canyon Creek		

Pollutant:	**Nitrogen**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2023
Impairment from Pollutant or Pollution:	Pollution

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. Two of the four samples exceed the OBJECTIVE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Two of four samples exceed the OBJECTIVE and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.

	4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 43125, Nitrogen **Region 9**

Moro Canyon Creek

LOE ID:	26193
Pollutant:	Nitrogen
LOE Subgroup:	Subgroup Missing
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	2
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Two of the four samples collected at Moro Canyon Creek 2 Station (901SJMCC2) (Latitude 33.5624, Longitude -117.8182) from October 2002 to May 2003 showed excessive nitrogen concentrations (SWAMP, 2007).
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Water samples were collected at Moro Canyon Creek 2 Station (901SJMCC2). (Latitude 33.5624, Longitude -117.8182).
Temporal Representation:	Samples were collected in October 2002; January 2003, April 2003, and May 2003.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 43125, Nitrogen **Region 9**

Moro Canyon Creek

LOE ID:	26197

Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Four samples were collected at Moro Canyon Creek 2 Station (901SJMCC2) (Latitude 33.5624, Longitude -117.8182) from October 2002 to May 2003 for the Surface Water Ambient Monitoring Program. Selenastrum Capicornutum alga growth test: - All four samples were considered toxic; Ceriodaphnia dubia survival and reproduction test: One of the two samples was toxic; Hyalella azteca; None of the two samples was toxic.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.
Guideline Reference:	Monitoring data for Region 9
Spatial Representation:	Water samples were collected at Moro Canyon Creek 2 Station (901SJMCC2). (Latitude 33.5624, Longitude -117.8182).
Temporal Representation:	Samples were collected in October 2002; January 2003, April 2003, and May 2003.
Environmental Conditions:	
QAPP Information:	Quality control of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

DECISION ID	42334	Region 9
Moro Canyon Creek		

Pollutant:	**Phosphorus**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2023
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Four of the four samples exceed the Basin Plan water quality objective for phosphorus. Based on the readily available data and information, the weight of evidence indicates that there is

sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Four of the four samples exceed the Basin Plan water quality objective for phosphorus and this exceeds the allowable frequency listed table 3.1 of the Listing Policy.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 42334, Phosphorus **Region 9**

Moro Canyon Creek

LOE ID:	26197
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Four samples were collected at Moro Canyon Creek 2 Station (901SJMCC2) (Latitude 33.5624, Longitude -117.8182) from October 2002 to May 2003 for the Surface Water Ambient Monitoring Program. Selenastrum Capicornutum alga growth test: - All four samples were considered toxic; Ceriodaphnia dubia survival and reproduction test: One of the two samples was toxic; Hyalella azteca; None of the two samples was toxic.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.
Guideline Reference:	Monitoring data for Region 9
Spatial Representation:	Water samples were collected at Moro Canyon Creek 2 Station (901SJMCC2). (Latitude 33.5624, Longitude -117.8182).
Temporal Representation:	Samples were collected in October 2002; January 2003, April 2003, and May 2003.
Environmental Conditions:	
QAPP Information:	Quality control of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 42334, Phosphorus **Region 9**

Moro Canyon Creek

LOE ID:	26194
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	All four samples collected at Moro Canyon Creek 2 Station (901SJMCC2) (Latitude 33.5624, Longitude -117.8182) from October 2002 to May 2003 showed excessive phosphorus concentrations (SWAMP, 2007).
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. Water Quality Control Plan for the San Diego Basin Goal of 0.1 mg/L for total phosphorus in streams and other flowing waters (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Water samples were collected at Moro Canyon Creek 2 Station (901SJMCC2). (Latitude 33.5624, Longitude -117.8182).
Temporal Representation:	Samples were collected in October 2002; January 2003, April 2003, and May 2003.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

DECISION ID	42852	Region 9
Moro Canyon Creek		

Pollutant:	**Selenium**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: Regional Board Conclusion: This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Four of the four samples exceed the water quality objective for Selenium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Four of four samples exceeded the water quality objective for Selenium and this sample size is insufficient to determine with the power and confidence of the Listing Policy if standards are not met. A minimum of five samples is needed for application of table 3.2.
4. Pursuant to Section 3.11of the Listing Policy, no additional data and information are available indicating that standards are not met.

State Board Review and Conclusion:
The Regional Board staff incorrectly assessed selenium as a conventional pollutant and applied table 3.2 of the listing Policy. Selenium is a toxicant and should be assessed using Table 3.1 . State Water Board staff has corrected this error and revised the recommendation to List for selenium. The revised recommendation is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Four of the four samples exceed the water quality objective for selenium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Four of four samples exceeded the water quality objective for selenium and this exceeds the allowable frequency under Section 3.1 of the Listing Policy.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 42852, Selenium **Region 9**

Moro Canyon Creek

LOE ID:	26195
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4

Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants) 039705
Data Used to Assess Water Quality:	All four samples collected at Moro Canyon Creek 2 Station (901SJMCC2) (Latitude 33.5624, Longitude -117.8182) showed excessive selenium concentrations according to results from the Surface Water Ambient Monitoring program. Samples were collected from October 2002 through May 2003.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	CTR Freshwater Chronic (CCC) 5 ug/l. (U.S. EPA, 2000).
Objective/Criterion Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Water samples were collected at Moro Canyon Creek 2 Station (901SJMCC2). (Latitude 33.5624, Longitude -117.8182).
Temporal Representation:	Samples were collected in October 2002; January 2003, April 2003, and May 2003.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 42852, Selenium **Region 9**

Moro Canyon Creek

LOE ID:	26197
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Four samples were collected at Moro Canyon Creek 2 Station (901SJMCC2) (Latitude 33.5624, Longitude -117.8182) from October 2002 to May 2003 for the Surface Water Ambient Monitoring Program. Selenastrum Capicornutum alga growth test: - All four samples were considered toxic; Ceriodaphnia dubia survival and reproduction test: One of the two samples was toxic; Hyalella azteca; None of the two samples was toxic.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.
Guideline Reference:	Monitoring data for Region 9
Spatial Representation:	Water samples were collected at Moro Canyon Creek 2 Station (901SJMCC2). (Latitude

	33.5624, Longitude -117.8182). 039706
Temporal Representation:	Samples were collected in October 2002; January 2003, April 2003, and May 2003.
Environmental Conditions:	
QAPP Information:	Quality control of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

DECISION ID **43527** **Region 9**

Moro Canyon Creek

Pollutant:	**Toxicity**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the section 303(d) list under section 3.6 of the Listing Policy. Under section 3.6 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Four of the four samples exceed the Basin Plan water quality objective for toxicity. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Four of four samples exceed the Basin Plan water quality objective for toxicity and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43527, Toxicity **Region 9**

Moro Canyon Creek

LOE ID:	26197
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4

Data and Information Type:	Ambient toxicity testing (chronic) 039707
Data Used to Assess Water Quality:	Four samples were collected at Moro Canyon Creek 2 Station (901SJMCC2) (Latitude 33.5624, Longitude -117.8182) from October 2002 to May 2003 for the Surface Water Ambient Monitoring Program. Selenastrum Capicornutum alga growth test: - All four samples were considered toxic; Ceriodaphnia dubia survival and reproduction test: One of the two samples was toxic; Hyalella azteca; None of the two samples was toxic.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.
Guideline Reference:	Monitoring data for Region 9
Spatial Representation:	Water samples were collected at Moro Canyon Creek 2 Station (901SJMCC2). (Latitude 33.5624, Longitude -117.8182).
Temporal Representation:	Samples were collected in October 2002; January 2003, April 2003, and May 2003.
Environmental Conditions:	
QAPP Information:	Quality control of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Tecate Creek
Water Body ID: CAR9112300020081210154839
Water Body Type: River & Stream

DECISION ID 43237 **Region 9**
Tecate Creek

Pollutant: Nitrogen
Final Listing Decision: List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Sources: Source Unknown
Expected TMDL Completion Date: 2027
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Four of four samples exceed the water quality objectives for biostimulatory substances.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3.Four of four samples exceed the water quality objectives for biostimulatory substances and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 43237, Nitrogen **Region 9**
Tecate Creek

LOE ID: 26215

Pollutant: Nitrogen
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Warm Freshwater Habitat

Number of Samples:	4	039709
Number of Exceedances:	4	

Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Four of four samples collected at Tecate Creek station (911TTET02) showed excessive nitrogen concentrations. (SWAMP, 2007).
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	As described in San Diego Basin Plan; inland surface waters, bays and estuaries and coastal lagoon waters shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used (RWQCB, 2007).
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at Tecate Creek station (911TTET02).
Temporal Representation:	Samples were collected on June 2005; September 2005; January 2006; and April 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

DECISION ID	**42788**	**Region 9**
Tecate Creek		

Pollutant:	**Phosphorus**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2023
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1, one line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Four of four of the samples exceed the Basin Plan water quality objective for Phosphorus.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that: 039710
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Four of the four samples exceeded the Basin Plan objective and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 42788, Phosphorus **Region 9**

Tecate Creek

LOE ID:	26214
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Four of four samples collected at Tecate Creek station (911TTET02) showed excessive phosphorus concentrations (SWAMP, 2007).
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	As described in San Diego Basin Plan; inland surface waters, bays and estuaries and coastal lagoon waters shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	From the Basin Plan: For inland surface waters-streams and other flowing waters, with all beneficial uses, the water quality objective for total phosphorus is 0.1 mg/L (RWQCB, 2007).
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at Tecate Creek station (911TTET02).
Temporal Representation:	Samples were collected on June 2005; September 2005; January 2006; and April 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

DECISION ID **43218** **Region 9**

Tecate Creek

Pollutant:	**Selenium**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original

Sources:	Source Unknown	039711
Expected TMDL Completion Date:	2021	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

One line of evidence is available in the administrative record to assess this pollutant. Four of f
This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. our of the samples exceed the Califronia Toxics Rule water quality objective for Selenium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Four of four of the samples exceed the Califronia Toxics Rule water quality objective for Selenium and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43218, Selenium **Region 9**

Tecate Creek

LOE ID:	26216
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Four of four samples collected at Tecate Creek station (911TTET02) showed excessive selenium concentrations (SWAMP, 2007).
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	CTR Freshwater Chronic (CCC) 5 ug/L. (U.S. EPA, 2000).
Objective/Criterion Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA
Evaluation Guideline:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (RWQCB, 2007).

Guideline Reference:	Water Quality Control Plan for the San Diego Basin	039712
Spatial Representation:	Samples were collected at Tecate Creek station (911TTET02).	
Temporal Representation:	Samples were collected on June 2005; September 2005; January 2006; and April 2006.	
Environmental Conditions:		
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.	
QAPP Information Reference(s):		

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Black Canyon
Water Body ID: CAR9055200020081223083535
Water Body Type: River & Stream

DECISION ID 43002 **Region 9**
Black Canyon

Pollutant: **Benthic Community Effects**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Original
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43002, Benthic Community Effects **Region 9**
Black Canyon

LOE ID: 26832

Pollutant: Benthic Community Effects
LOE Subgroup: Adverse Biological Responses
Matrix: Water
Fraction: None

Beneficial Use: Warm Freshwater Habitat

Number of Samples: 3
Number of Exceedances: 2

Data and Information Type: Benthic macroinvertebrate surveys
Data Used to Assess Water Quality: Three samples of IBI data were taken from May 2001 to June 2005 at one sampling site. Of the total number of samples, two samples exceeded the IBI impairment threshold.
Data Reference: Fish and Game IBI Data

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.
Objective/Criterion Reference: Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at one site: 905BMCCGx on Black Canyon Creek.
Temporal Representation:	Sampling occurred during one event on May 2001, May 2004, and June 2005.
Environmental Conditions:	
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Project Plan for the California Stream Bioassessment Procedure and the State of California, California Monitoring an Assessment Program: "CMAP", Quality Assurance Project Plan.
QAPP Information Reference(s):	State of California, California Monitoring and Assessment Program: "CMAP". Quality Assurance Project Plan for the California Stream Bioassessment Procedure The San Diego Stream Team Quality Assurance Project Plan

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Campo Creek
Water Body ID: CAR9118200020081222142645
Water Body Type: River & Stream

DECISION ID 48195 **Region 9**
Campo Creek

Pollutant: Arsenic
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of 2 samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 2 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48195, Arsenic **Region 9**
Campo Creek

LOE ID: 73095

Pollutant: Arsenic
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Warm Freshwater Habitat

Number of Samples: 2

Number of Exceedances:	0	039716
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Campo Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Arsenic.	
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The dissolved arsenic criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved arsenic is 0.150 mg/L (California Toxics Rule, 2000).	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Campo Creek was collected at 1 monitoring site [Campo Creek @ Highway 94]	
Temporal Representation:	Data was collected over the time period 2/6/2009-3/31/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.	

DECISION ID	**48226**	**Region 9**
Campo Creek		

Pollutant:	**Azinphos-methyl (Guthion)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of 0 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 0 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the

applicable beneficial use support rating. 039717

Line of Evidence (LOE) for Decision ID 48226, Azinphos-methyl (Guthion) **Region 9**

Campo Creek

LOE ID:	77989
Pollutant:	Azinphos-methyl (Guthion)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Campo Creek to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Azinphos methyl.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The National Recommended Water Quality Criteria for Azinphos Methyl (Guthion) for the protection of freshwater aquatic life is a maximum of 0.01 ug/l.
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for Campo Creek was collected at 1 monitoring site [Campo Creek @ Highway 94]
Temporal Representation:	Data was collected on a single day 3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID **42270** **Region 9**

Campo Creek

Pollutant:	**Benthic Community Effects**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollution
Regional Board Conclusion:	Benthic Community Effects is being considered for placement on the CWA section 303(d) List under sections 3.9 and 3.1 of the Listing Policy. Under section 3.9, an additional line of evidence associating Benthic Community Effects with a water or sediment concentration of pollutant(s) is necessary to assess listing status.

Based on the readily available data and information, the weight of evidence provides sufficient justification for not placing Benthic Community Effects in this water segment on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used does satisfy the data quantity requirements of section 6.1.5 of the Policy.
3. Pursuant to section 3.9 of the Listing Policy, the water does exhibit significant degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index at the upstream station. The downstream station does not exhibit significant degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index.
4. Pursuant to section 3.9 of the Listing Policy, the water segment does not have associated pollutant(s) samples that exceed water quality objectives.
5. Pursuant to section 3.11 of the Listing Policy, additional data and information are available indicating that standards are not being met: The upstream station is located adjacent to grazing activities, including in the stream. As there is no associated pollutant this water should remain in Category 4c.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 42270, Benthic Community Effects **Region 9**

Campo Creek

LOE ID:	26243
Pollutant:	Benthic Community Effects
LOE Subgroup:	Adverse Biological Responses
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	7
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Eight samples of IBI data were taken from May 2003 to May 2007 at two sampling sites. Seven of the eight samples exceeded the IBI impairment threshold.
Data Reference:	Stream Bioassessment Data. Co-permitee Data. Collected 2002-2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13

Spatial Representation:	Samples were collected at two sites: CC-H94 and CC-C on Campo Creek039719
Temporal Representation:	Sampling occurred in May 2003, May and October from 2004 to 2006, and in May 2007.
Environmental Conditions:	
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Manual for Freshwater Bioassessment.
QAPP Information Reference(s):	Quality Assurance Manual for Freshwater Bioassessment Revision 0

Line of Evidence (LOE) for Decision ID 42270, Benthic Community Effects **Region 9**

Campo Creek

LOE ID:	79692
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Two samples were collected at two stations in lower Campo Creek. The CSCI scores are above the 0.79 threshold, and therefore the site is not exceeding the water quality objective for the aquatic life beneficial use.
Data Reference:	RWB9 Status Sampling 2007 and 2008 Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008. Region 9 CSCI Scores & Water Body Information
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.
Guideline Reference:	The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.
Spatial Representation:	Samples were collected at the following station: 911TCAM01 (Campo Creek 1) and 911CC-H94.
Temporal Representation:	Surveys done in 2003 and 2008.
Environmental Conditions:	
QAPP Information:	Data collected following SWAMP QA protocols for the RWB9 Status Sampling 2007 and 2008 water quality monitoring project and the County of San Diego NPDES MS4 Copermittees Receiving Waters Monitoring and Reporting Program.
QAPP Information Reference(s):	RWB9 Status Sampling 2007 and 2008 Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.

Line of Evidence (LOE) for Decision ID 42270, Benthic Community Effects **Region 9**

Campo Creek 039720

LOE ID:	79691
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	3
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Seven samples were taken from one station in Campo Creek. Three samples were below the 0.79 threshold, and therefore exceeding the water quality objective for the aquatic life beneficial use.
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008. Region 9 CSCI Scores & Water Body Information
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.
Guideline Reference:	The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.
Spatial Representation:	The samples were collected at 911CC-C.
Temporal Representation:	The samples were collected from 2003 to 2008.
Environmental Conditions:	
QAPP Information:	The data was collected under the County of San Diego NPDES MS4 Copermittees Receiving Waters Monitoring and Reporting Program.
QAPP Information Reference(s):	e-mail clarifying QAPP information Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.

Line of Evidence (LOE) for Decision ID 42270, Benthic Community Effects **Region 9**

Campo Creek

LOE ID:	73097
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None

Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	9
Number of Exceedances:	8
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Eight of the nine samples collected had an IBI score below 40. NPDES bioassessment
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the State or Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	
Spatial Representation:	The samples were collected at two stations on Campo Creek. The stations are CC-C or TJR-TWAS-1 and CC-H94.
Temporal Representation:	The samples were collected in May and October from 2003 to 2008.
Environmental Conditions:	
QAPP Information:	The data was collected under the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan, June 25, 2009.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 42270, Benthic Community Effects **Region 9**

Campo Creek

LOE ID:	73096
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	The IBI score for this water body was 32 which indicates that this water body may be considered to have impaired conditions.
Data Reference:	RWB9 Status Sampling 2007 and 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at the following station: 911TCAM01 (Campo Creek 1).
Temporal Representation:	Survey done May 7, 2008.
Environmental Conditions:	
QAPP Information:	Data collected following SWAMP QA protocols for the RWB9 Status Sampling 2007 and 2008 water quality monitoring project.
QAPP Information Reference(s):	

DECISION ID 48197 Region 9

Campo Creek

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. Three lines of evidence are available in the administrative record to assess this pollutant. Zero of 9 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 9 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48197, Cadmium Region 9

Campo Creek

LOE ID:	73099
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Campo Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Cadmium.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Campo Creek was collected at 1 monitoring site [Campo Creek @ Highway 94 - 911TIJ04]
Temporal Representation:	Data was collected over the time period 2/6/2009-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 48197, Cadmium **Region 9**

Campo Creek

LOE ID:	73100
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Campo Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Cadmium.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The dissolved cadmium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved cadmium is 0.0022 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority

	toxic pollutants for the State of California. 7/1/2011 Edition	039724

Evaluation Guideline:
Guideline Reference:

Spatial Representation:	Data for this line of evidence for Campo Creek was collected at 1 monitoring site [Campo Creek @ Highway 94]
Temporal Representation:	Data was collected over the time period 2/6/2009-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 48197, Cadmium **Region 9**

Campo Creek

LOE ID:	73098
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Campo Creek to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition

Evaluation Guideline:
Guideline Reference:

Spatial Representation:	Data for this line of evidence for Campo Creek was collected at 1 monitoring site [Campo Creek @ Highway 94]
Temporal Representation:	Data was collected from 5/31/2005 through 6/2/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 48207 **Region 9**

Campo Creek

Pollutant:	**Chlorpyrifos**	039725
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	
Last Listing Cycle's Final Listing Decision:	New Decision	
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of 2 samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 2 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48207, Chlorpyrifos **Region 9**

Campo Creek

LOE ID:	77990
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Campo Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L

	(Siepmann and Finlayson 2000). 039726
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).
Spatial Representation:	Data for this line of evidence for Campo Creek was collected at 1 monitoring site [Campo Creek @ Highway 94]
Temporal Representation:	Data was collected over the time period 2/6/2009-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 48207, Chlorpyrifos **Region 9**

Campo Creek

LOE ID:	73101
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Campo Creek to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).
Spatial Representation:	Data for this line of evidence for Campo Creek was collected at 1 monitoring site [Campo Creek @ Highway 94]
Temporal Representation:	Data was collected over the time period 5/31/2005-6/2/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 48233 Region 9

Campo Creek 039727

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of 2 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 2 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48233, Chromium — Region 9

Campo Creek

LOE ID:	73102
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Campo Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Chromium.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each

	sample and varies based on the ambient hardness during sampling. Section 131.38(c)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Campo Creek was collected at 1 monitoring site [Campo Creek @ Highway 94 - 911TIJ04]
Temporal Representation:	Data was collected over the time period 2/6/2009-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID 48206 Region 9
Campo Creek

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of 7 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 7 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48206, Copper Region 9
Campo Creek

LOE ID:	73103
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water

Matrix:	Water	039729
Fraction:	None	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	5	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Campo Creek to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Copper.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Campo Creek was collected at 1 monitoring site [Campo Creek @ Highway 94]	
Temporal Representation:	Data was collected from 5/31/2005 through 6/2/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 48206, Copper **Region 9**

Campo Creek

LOE ID:	73104
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Campo Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Copper.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to

	protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Campo Creek was collected at 1 monitoring site [Campo Creek @ Highway 94 - 911TIJ04]
Temporal Representation:	Data was collected over the time period 2/6/2009-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID 48232 Region 9

Campo Creek

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of 7 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 7 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48232, Diazinon Region 9

Campo Creek

LOE ID:	77991
Pollutant:	Diazinon

LOE Subgroup:	Pollutant-Water	039731
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	2	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Campo Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Diazinon.	
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).	
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game	
Spatial Representation:	Data for this line of evidence for Campo Creek was collected at 1 monitoring site [Campo Creek @ Highway 94]	
Temporal Representation:	Data was collected over the time period 2/6/2009-3/31/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.	

Line of Evidence (LOE) for Decision ID 48232, Diazinon **Region 9**

Campo Creek

LOE ID:	73105
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Campo Creek to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality

	Control Plan, San Diego Basin). 039732
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Data for this line of evidence for Campo Creek was collected at 1 monitoring site [Campo Creek @ Highway 94]
Temporal Representation:	Data was collected over the time period 5/31/2005-6/2/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 48234 — Region 9

Campo Creek

Pollutant:	**Dimethoate**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of 1 sample exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 1 sample exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48234, Dimethoate — Region 9

Campo Creek

LOE ID:	77717
Pollutant:	Dimethoate
LOE Subgroup:	Pollutant-Water

Matrix:	Water	039733
Fraction:	None	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Campo Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Dimethoate.	
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The evaluation guideline for Dimethoate is the median lethal concentration (LC50; 43 ug/L).	
Guideline Reference:	OPP Pesticide Ecotoxicity Database.	
Spatial Representation:	Data for this line of evidence for Campo Creek was collected at 1 monitoring site [Campo Creek @ Highway 94]	
Temporal Representation:	Data was collected on a single day 3/31/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.	

DECISION ID	**48235**	**Region 9**
Campo Creek		

Pollutant:	**Disulfoton**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of 1 sample exceeds the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 1 sample exceeds the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available

indicating that standards are not met. 039734

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48235, Disulfoton **Region 9**

Campo Creek

LOE ID:	77718
Pollutant:	Disulfoton
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Campo Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Disulfoton.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for disulfoton is 0.05 Âµg/L (US EPA 1973).
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for Campo Creek was collected at 1 monitoring site [Campo Creek @ Highway 94]
Temporal Representation:	Data was collected on a single day 3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID **48237** **Region 9**

Campo Creek

Pollutant:	**Ethoprop**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of 1 sample exceeds the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 1 sample exceeds the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48237, Ethoprop **Region 9**

Campo Creek

LOE ID:	77719
Pollutant:	Ethoprop
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Campo Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Ethoprop.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for Ethoprop is the maximum acceptable toxicant concentration (MATC) of 1.4 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Campo Creek was collected at 1 monitoring site [Campo Creek @ Highway 94]
Temporal Representation:	Data was collected on a single day 3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.

QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID	48202	Region 9
Campo Creek		

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of 7 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 7 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48202, Lead	Region 9
Campo Creek	

LOE ID:	73112
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Campo Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Lead.

Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Campo Creek was collected at 1 monitoring site [Campo Creek @ Highway 94 - 911TIJ04]
Temporal Representation:	Data was collected over the time period 2/6/2009-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 48202, Lead **Region 9**

Campo Creek

LOE ID:	73111
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Campo Creek to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Campo Creek was collected at 1 monitoring site [Campo Creek @ Highway 94]
Temporal Representation:	Data was collected from 5/31/2005 through 6/2/2009.

Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 48203 Region 9
Campo Creek

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of 7 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 7 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48203, Malathion Region 9
Campo Creek

LOE ID:	77992
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Campo Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for

	Malathion. 039739
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for Campo Creek was collected at 1 monitoring site [Campo Creek @ Highway 94]
Temporal Representation:	Data was collected over the time period 2/6/2009-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 48203, Malathion **Region 9**

Campo Creek

LOE ID:	73113
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Campo Creek to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Malathion.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Campo Creek was collected at 1 monitoring site [Campo Creek @ Highway 94]
Temporal Representation:	Data was collected over the time period 5/31/2005-6/2/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix

	Analytical and Dry Weather Monitoring Program Rev. 8 was followed. 039740
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 48236 Region 9

Campo Creek

Pollutant:	**Methidathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of 1 sample exceeds the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 1 sample exceeds the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48236, Methidathion Region 9

Campo Creek

LOE ID:	77720
Pollutant:	Methidathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Campo Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Methidathion.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for Methidathion is the maximum acceptable toxicant concentration (MATC) of 0.86 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Campo Creek was collected at 1 monitoring site [Campo Creek @ Highway 94]
Temporal Representation:	Data was collected on a single day 3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID 48238 Region 9

Campo Creek

Pollutant:	**Methyl Parathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of 1 sample exceeds the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 1 sample exceeds the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48238, Methyl Parathion Region 9

Campo Creek

LOE ID:	77721	039742

Pollutant:	Methyl Parathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Campo Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Parathion, Methyl.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. There shall be no increase in hazardous chemical concentrations found in bottom sediments or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Department of Fish and Game instantaneous criteria for Methyl Parathion is 0.08 ug/L.
Guideline Reference:	Hazard Assessment of the Insecticide Methyl Parathion to Aquatic Organisms in the Sacramento River System. California Department of Fish and Game. Environmental Services Division. Administrative Report 92-1
Spatial Representation:	Data for this line of evidence for Campo Creek was collected at 1 monitoring site [Campo Creek @ Highway 94]
Temporal Representation:	Data was collected on a single day 3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID	**48241**	**Region 9**
Campo Creek		

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of 2 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 2 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48241, Nickel **Region 9**

Campo Creek

LOE ID:	73114
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Campo Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Nickel.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Campo Creek was collected at 1 monitoring site [Campo Creek @ Highway 94 - 911TIJ04]
Temporal Representation:	Data was collected over the time period 2/6/2009-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID 48943 **Region 9**

Campo Creek 039744

Pollutant:	**Parathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 0 samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 0 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48943, Parathion — Region 9

Campo Creek

LOE ID:	77722
Pollutant:	Parathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Campo Creek to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Parathion, Ethyl.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. There shall be no increase in hazardous chemical concentrations found in bottom sediments or aquatic life (Water Quality Control Plan,San Diego Basin).

Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	039745
Evaluation Guideline:	The criterion continuous concentraion for Parathion, Ethyl is 0.013 ug/l from the National Recommended Water Quality Criteria.	
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology	
Spatial Representation:	Data for this line of evidence for Campo Creek was collected at 1 monitoring site [Campo Creek @ Highway 94]	
Temporal Representation:	Data was collected on a single day 3/31/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.	

DECISION ID 48239 Region 9

Campo Creek

Pollutant:	**Phorate**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of 1 sample exceeds the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 1 sample exceeds the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48239, Phorate Region 9

Campo Creek

LOE ID:	77723
Pollutant:	Phorate
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	039746
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Campo Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Phorate.	
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The evaluation guideline for Phorate is the median lethal concentration (LC50; 2 ug/L).	
Guideline Reference:	OPP Pesticide Ecotoxicity Database.	
Spatial Representation:	Data for this line of evidence for Campo Creek was collected at 1 monitoring site [Campo Creek @ Highway 94]	
Temporal Representation:	Data was collected on a single day 3/31/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.	

DECISION ID	**48240**	**Region 9**
Campo Creek		

Pollutant:	**Phosmet**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of 1 sample exceeds the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 1 sample exceeds the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48240, Phosmet **Region 9**

Campo Creek

LOE ID:	77724
Pollutant:	Phosmet
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Campo Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Phosmet.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to the USEPA Office of Pesticide Programs Ecotoxicity database, the aquatic life EC50 for Phosmet is 5.6 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Campo Creek was collected at 1 monitoring site [Campo Creek @ Highway 94]
Temporal Representation:	Data was collected on a single day 3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID **48242** **Region 9**

Campo Creek

Pollutant:	**Selenium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of

the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of 2 samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 2 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48242, Selenium **Region 9**

Campo Creek

LOE ID:	73115
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Campo Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Selenium.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The selenium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater is 0.005 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Campo Creek was collected at 1 monitoring site [Campo Creek @ Highway 94]
Temporal Representation:	Data was collected over the time period 2/6/2009-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern

DECISION ID	48204	Region 9
Campo Creek		

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of 7 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 7 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48204, Zinc	**Region 9**
Campo Creek	

LOE ID:	73119
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Campo Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Zinc.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Campo Creek was collected at 1 monitoring site [Campo Creek @ Highway 94 - 911TIJ04]
Temporal Representation:	Data was collected over the time period 2/6/2009-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 48204, Zinc **Region 9**

Campo Creek

LOE ID:	73118
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Campo Creek to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Campo Creek was collected at 1 monitoring site [Campo Creek @ Highway 94]
Temporal Representation:	Data was collected from 5/31/2005 through 6/2/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.

QAPP Information Reference(s): Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, 03/751 Matrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **48243** **Region 9**

Campo Creek

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2029
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Four lines of evidence are available in the administrative record to assess this pollutant. With the latest data, six of seven single samples exceed the water quality objective for enterococcus of 61/100 ml for the protection of REC-1.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, six of seven single samples exceed the water quality objective for enterococcus of 61/100 ml for the protection of REC-1 and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 48243, Indicator Bacteria **Region 9**

Campo Creek

LOE ID:	73106
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2
Number of Exceedances:	2
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Campo Creek to determine beneficial use support and results are as follows: 2 of 2 samples exceed the criterion for

	Enterococci. 039752
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Samples shall not exceed 61 organisms per 100 ml for enterococcus in waters designated for REC I beneficial use (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Campo Creek was collected at 1 monitoring site [Campo Creek @ Highway 94]
Temporal Representation:	Data was collected on 2/6/2009 and 3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 48243, Indicator Bacteria **Region 9**

Campo Creek

LOE ID:	73116
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2
Number of Exceedances:	1
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Campo Creek to determine beneficial use support and results are as follows: 1 of 2 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxicsubstances in concentrations which are toxic to,or which produce detrimental physiologicalresponses in human, plant, animal, or indigenousaquatic life (Basin Plan).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In waters designated for water contact recreation (REC I), the total coliform concentration shall not exceed 10000 MPN/100 ml (CDPH 2006).
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.
Spatial Representation:	Data for this line of evidence for Campo Creek was collected at 1 monitoring site [Campo Creek @ Highway 94]
Temporal Representation:	Data was collected on 2/6/2009 and 3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 48243, Indicator Bacteria — Region 9

Campo Creek

LOE ID:	73117
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Campo Creek to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxicsubstances in concentrations which are toxic to,or which produce detrimental physiologicalresponses in human, plant, animal, or indigenousaquatic life (Basin Plan).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In waters designated for water contact recreation (REC I), the total coliform concentration shall not exceed 10000 MPN/100 ml (CDPH 2006).
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.
Spatial Representation:	Data for this line of evidence for Campo Creek was collected at 1 monitoring site [Campo Creek @ Highway 94]
Temporal Representation:	Data was collected over the time period 5/31/2005-6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48243, Indicator Bacteria — Region 9

Campo Creek

LOE ID:	73110
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	5
Number of Exceedances:	1
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Campo Creek to determine

	beneficial use support and results are as follows: 1 of 5 samples exceed the criterion for Coliform, Fecal.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the fecal coliform concentration shall not exceed 400 MPN/100 ml.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Campo Creek was collected at 1 monitoring site [Campo Creek @ Highway 94]
Temporal Representation:	Data was collected over the time period 5/31/2005-6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48243, Indicator Bacteria **Region 9**

Campo Creek

LOE ID:	73109
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2
Number of Exceedances:	1
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Campo Creek to determine beneficial use support and results are as follows: 1 of 2 samples exceed the criterion for Coliform, Fecal.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the fecal coliform concentration shall not exceed 400 MPN/100 ml.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Campo Creek was collected at 1 monitoring site [Campo Creek @ Highway 94]
Temporal Representation:	Data was collected on 2/6/2009 and 3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 48243, Indicator Bacteria 039755 Region 9

Campo Creek

LOE ID:	73108
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Non-Contact Recreation
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Campo Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Coliform, Fecal.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters designated for non contact recreation (REC 2), the fecal coliform concentration shall not exceed 4000 MPN/100 ml (Basin Plan).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Campo Creek was collected at 1 monitoring site [Campo Creek @ Highway 94]
Temporal Representation:	Data was collected on a single day 2/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 48243, Indicator Bacteria Region 9

Campo Creek

LOE ID:	73107
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	5
Number of Exceedances:	4
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Campo Creek to determine beneficial use support and results are as follows: 4 of 5 samples exceed the criterion for Enterococci.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.

SWAMP Data:	Non-SWAMP	039756
Water Quality Objective/Criterion:	Samples shall not exceed 61 organisms per 100 ml for enterococcus in waters designated for REC I beneficial use (Water Quality Control Plan for the San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Campo Creek was collected at 1 monitoring site [Campo Creek @ Highway 94]	
Temporal Representation:	Data was collected over the time period 5/31/2005-6/3/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Chicarita Creek
Water Body ID: CAR9062000020081223083844
Water Body Type: River & Stream

DECISION ID 42283 **Region 9**
Chicarita Creek

Pollutant: **Benthic Community Effects**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: Benthic Community Effects is being considered for placement on the section 303(d) list under sections 3.9 and 3.2 of the Listing Policy. Under section 3.9, an additional line of evidence associating the Benthic Community Effects with a water or sediment concentration of pollutants is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this indicator. 6 of 6 samples exceeded the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing Benthic Community Effects in this water segment on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. 6 of 6 samples exceeded the Index of Biological Integrity (IBI) value of "poor" water quality for this area and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy, however as required under section 3.9 of the Listing Policy, pollutant(s) could not be directly associated with the Benthic Community Effects.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 42283, Benthic Community Effects **Region 9**
Chicarita Creek

LOE ID: 26377

Pollutant: Benthic Community Effects
LOE Subgroup: Adverse Biological Responses
Matrix: Water
Fraction: None

Beneficial Use: Warm Freshwater Habitat

Number of Samples:	6	039758
Number of Exceedances:	6	
Data and Information Type:	Benthic macroinvertebrate surveys	
Data Used to Assess Water Quality:	Six samples of IBI data were taken from May 2000 to 2007 at two sampling sites. Of the total number of samples, all six samples exceeded the IBI impairment threshold.	
Data Reference:	Fish and Game IBI Data 2007 SDRWQCB Bioassessment Data Southern California Postfire Study. Index of Biotic Integrity. 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. (SDRWQCB, 1995)	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)	
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13	
Spatial Representation:	Samples were collected at two sites: 906CCECRx and 906LPCRC2 on Chicarita Creek.	
Temporal Representation:	Sampling occurred during one event annually over a four year period from May 2004 to 2007 and two events in May and November of the year 2000.	
Environmental Conditions:		
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Project Plan for the California Stream Bioassessment Procedure and the State of California, California Monitoring an Assessment Program: "CMAP", Quality Assurance Project Plan.	
QAPP Information Reference(s):	State of California, California Monitoring and Assessment Program: "CMAP". Quality Assurance Project Plan for the California Stream Bioassessment Procedure The San Diego Stream Team Quality Assurance Project Plan	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Conejos Creek
Water Body ID: CAR9073100020081223084048
Water Body Type: River & Stream

DECISION ID 44163 **Region 9**
Conejos Creek

Pollutant: **Benthic Community Effects**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Original
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion:

Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

Benthic Community Effects is being considered for placement on the section 303(d) list under sections 3.9 and 3.2 of the Listing Policy. Under section 3.9, an additional line of evidence associating the Benthic Community Effects with a water or sediment concentration of pollutants is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this indicator. 4 of 4 samples exceeded the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing Benthic Community Effects in this water segment on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. 4 of 4 samples exceeded the Index of Biological Integrity (IBI) value of "poor" water quality for this area and this sample size is insufficient to determine with the power and confidence of the Listing Policy if standards are not met. A minimum of 5 samples is needed for application of Table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because it cannot be determined if applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 44163, Benthic Community Effects **Region 9**
Conejos Creek

LOE ID: 26379

Pollutant: Benthic Community Effects
LOE Subgroup: Adverse Biological Responses

Matrix:	Water	039760
Fraction:	None	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	4	
Number of Exceedances:	4	
Data and Information Type:	Benthic macroinvertebrate surveys	
Data Used to Assess Water Quality:	Four samples of IBI data were collected betweenMay 2001 to 2007 at one sampling site. All four samples exceeded the IBI impairment threshold.	
Data Reference:	Fish and Game IBI Data Southern California Postfire Study. Index of Biotic Integrity. 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)	
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13	
Spatial Representation:	Samples were collected at one site: 907CONECR on Conejos Creek.	
Temporal Representation:	Sampling occurred during four events from May 2001 to 2007.	
Environmental Conditions:		
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Project Plan for the California Stream Bioassessment Procedure and the State of California, California Monitoring an Assessment Program: "CMAP", Quality Assurance Project Plan.	
QAPP Information Reference(s):	State of California, California Monitoring and Assessment Program: "CMAP". Quality Assurance Project Plan for the California Stream Bioassessment Procedure The San Diego Stream Team Quality Assurance Project Plan	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: French Creek (San Diego County)
Water Body ID: CAR9032200020081223080715
Water Body Type: River & Stream

DECISION ID 43317 **Region 9**
French Creek (San Diego County)

Pollutant: **Benthic Community Effects**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Original
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

Benthic Community Effects is being considered for placement on the section 303(d) list under sections 3.9 and 3.2 of the Listing Policy. Under section 3.9, an additional line of evidence associating the Benthic Community Effects with a water or sediment concentration of pollutants is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this indicator. 1 of 4 samples exceeded the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing Benthic Community Effects in this water segment on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. 1 of 4 samples exceeded the Index of Biological Integrity (IBI) value of "poor" water quality for this area and this sample size is insufficient to determine with the power and confidence of the Listing Policy if standards are not met. A minimum of 5 samples is needed for application of Table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 43317, Benthic Community Effects **Region 9**
French Creek (San Diego County)

LOE ID: 26385

Pollutant: Benthic Community Effects
LOE Subgroup: Adverse Biological Responses
Matrix: Water
Fraction: None

Beneficial Use: Warm Freshwater Habitat

Aquatic Life Use:	Preservation of Rare & Endangered Species	039762
Number of Samples:	4	
Number of Exceedances:	1	
Data and Information Type:	Benthic macroinvertebrate surveys	
Data Used to Assess Water Quality:	Four samples of IBI data were taken from May 2001 to 2007 at two sampling sites. One of the four samples exceeded the IBI impairment threshold.	
Data Reference:	Fish and Game IBI Data Southern California Postfire Study. Index of Biotic Integrity. 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)	
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13	
Spatial Representation:	Samples were collected at two sites: 903FCPSPx and 903SLFPCx on French Creek.	
Temporal Representation:	Sampling occurred during four events from May 2001 to 2007.	
Environmental Conditions:		
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Project Plan for the California Stream Bioassessment Procedure and the State of California, California Monitoring an Assessment Program: "CMAP", Quality Assurance Project Plan.	
QAPP Information Reference(s):	State of California, California Monitoring and Assessment Program: "CMAP". Quality Assurance Project Plan for the California Stream Bioassessment Procedure The San Diego Stream Team Quality Assurance Project Plan	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Fry Creek
Water Body ID: CAR9033100020081223081859
Water Body Type: River & Stream

DECISION ID 44229 **Region 9**
Fry Creek

Pollutant: **Benthic Community Effects**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Impairment from Pollutant or Pollution: Pollution

Regional Board Conclusion: Benthic Community Effects is being considered for placement on the CWA section 303(d) List under sections 3.9 and 3.1 of the Listing Policy. Under section 3.9, an additional line of evidence associating Benthic Community Effects with a water or sediment concentration of pollutant(s) is necessary to assess listing status.

Based on the readily available data and information, the weight of evidence provides sufficient justification for not placing Benthic Community Effects in this water segment on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Pursuant to section 3.9 of the Listing Policy, the water does not exhibit significant degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index.
4. Pursuant to section 3.9 of the Listing Policy, the water segment does not have associated pollutant(s) samples that exceed water quality objectives.
5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not being met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. Furthermore, what data is available does not indicate that the benthic community does not exhibit degradation when compared to reference.

Line of Evidence (LOE) for Decision ID 44229, Benthic Community Effects **Region 9**
Fry Creek

LOE ID: 73754

Pollutant: Benthic-Macroinvertebrate Bioassessments
LOE Subgroup: Population/Community Degradation
Matrix: Water
Fraction: None

Beneficial Use: Cold Freshwater Habitat

Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	The IBI score for this water body was 53 which indicates that this water body is not considered to have impaired conditions.
Data Reference:	RWB9 Status Sampling 2007 and 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	
Spatial Representation:	Samples were collected at the following station: 903SLFRCx (Fry Creek (FRC)).
Temporal Representation:	Survey done May 7, 2008.
Environmental Conditions:	
QAPP Information:	Data collected following SWAMP QA protocols for the RWB9 Status Sampling 2007 and 2008 water quality monitoring project.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44229, Benthic Community Effects **Region 9**

Fry Creek

LOE ID:	79482
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	The CSCI score for this site is above the 0.79 threshold, and is therefore not exceeding the water quality objective for the aquatic life beneficial use.
Data Reference:	RWB9 Status Sampling 2007 and 2008 Region 9 CSCI Scores & Water Body Information
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in a stream into an overall measure of stream health. The CSCI score is calculated by

	comparing the expected condition with actual (observed) results (Rhen, A. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.
Guideline Reference:	The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.
Spatial Representation:	Samples were collected at the following station: 903SLFRCx (Fry Creek (FRC)).
Temporal Representation:	Survey done May 7, 2008.
Environmental Conditions:	
QAPP Information:	Data collected following SWAMP QA protocols for the RWB9 Status Sampling 2007 and 2008 water quality monitoring project.
QAPP Information Reference(s):	RWB9 Status Sampling 2007 and 2008

Line of Evidence (LOE) for Decision ID 44229, Benthic Community Effects **Region 9**

Fry Creek

LOE ID:	26387
Pollutant:	Benthic Community Effects
LOE Subgroup:	Adverse Biological Responses
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Two samples of IBI data were taken on May 2001 and June of 2005 at one sampling site. None of the samples exceeded the IBI impairment threshold.
Data Reference:	Fish and Game IBI Data
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at one site: 903FCFCCx on Fry Creek.
Temporal Representation:	Sampling occurred during two events on May 2001 and June of 2005.
Environmental Conditions:	
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Project Plan for the California Stream Bioassessment Procedure and the State of California, California Monitoring an Assessment Program: "CMAP", Quality

Assurance Project Plan. 039766

QAPP Information Reference(s): State of California, California Monitoring and Assessment Program: "CMAP". Quality Assurance Project Plan for the California Stream Bioassessment Procedure The San Diego Stream Team Quality Assurance Project Plan

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Gopher Creek
Water Body ID: CAR9031200020081223084435
Water Body Type: River & Stream

DECISION ID 47402 **Region 9**
Gopher Creek

Pollutant: Chlorpyrifos
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the zero samples exceed the Evaluation Guideline for Chlorpyrifos. Five samples were collected and all were non detects, but none could be used in this assessment as per the management guidance document on quantitation limits (imperfect scenario #1).

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of zero samples exceeded the Evaluation Guideline for Chlorpyrifos and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47402, Chlorpyrifos **Region 9**
Gopher Creek

LOE ID: 73776

Pollutant: Chlorpyrifos
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use:	Warm Freshwater Habitat	039768
Number of Samples:	0	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Gopher Creek to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Chlorpyrifos.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000).	
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).	
Spatial Representation:	Data for this line of evidence for Gopher Creek was collected at 1 monitoring site [Little Gopher Canyon Creek at Old River Road]	
Temporal Representation:	Data was collected over the time period 5/15/2006-5/28/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID	**47404**	**Region 9**
Gopher Creek		

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the eight samples exceed the California Toxics Rule Objective for copper.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of eight samples exceeded the California Toxics Rule Objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial

use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47404, Copper Gopher Creek **Region 9**

LOE ID:	73777
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Gopher Creek to determine beneficial use support and results are as follows: 0 of 8 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Gopher Creek was collected at 1 monitoring site [Little Gopher Canyon Creek at Old River Road]
Temporal Representation:	Data was collected 6/3/2003 - 5/28/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 47405 **Region 9**
Gopher Creek

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final	New Decision

Listing Decision:		039770
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the five samples exceed the Evaluation Guideline for Diazinon.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of five samples exceeded the Evaluation Guideline for Diazinon and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47405, Diazinon **Region 9**

Gopher Creek

LOE ID:	73778
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Gopher Creek to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).

Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Data for this line of evidence for Gopher Creek was collected at 1 monitoring site [Little Gopher Canyon Creek at Old River Road]
Temporal Representation:	Data was collected over the time period 5/15/2006-5/28/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 47409 — Region 9

Gopher Creek

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the five samples exceed the Water Quality Criteria for Malathion. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of five samples exceeded the Water Quality Criteria for Malathion and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47409, Malathion — Region 9

Gopher Creek

LOE ID:	73771
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Gopher Creek to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Malathion.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Gopher Creek was collected at 1 monitoring site [Little Gopher Canyon Creek at Old River Road]
Temporal Representation:	Data was collected over the time period 5/15/2006-5/28/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID	47411	Region 9
Gopher Creek		

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the eight samples exceed the California Toxics Rule Objective for Zinc. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of eight samples exceeded the California Toxics Rule Objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47411, Zinc **Region 9**

Gopher Creek

LOE ID:	73773
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Gopher Creek to determine beneficial use support and results are as follows: 0 of 8 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Gopher Creek was collected at 1 monitoring site [Little Gopher Canyon Creek at Old River Road]
Temporal Representation:	Data was collected 6/3/2003 - 5/28/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **47406** **Region 9**

Gopher Creek

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion	2025

Date:	039774
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.3 of the Listing Policy. Under section 3.3 a single line of evidence is necessary to assess listing status. Three lines of evidence are available in the administrative record to assess this pollutant. Ten of the Ten samples exceed the Single Sample Maximum Objective for Enterococcus, Seven out of Ten samples exceeded the Single Sample Maximum Objective for Fecal Coliform, and Four out of Ten samples exceeded the Single Sample Maximum Guideline for Total Coliform. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Ten of the Ten samples exceed the Single Sample Maximum Objective for Enterococcus, Seven out of Ten samples exceeded the Single Sample Maximum Objective for Fecal Coliform, and Four out of Ten samples exceeded the Single Sample Maximum Guideline for Total Coliform, and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 47406, Indicator Bacteria **Region 9**

Gopher Creek

LOE ID:	73779
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	10
Number of Exceedances:	10
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Gopher Creek to determine beneficial use support and results are as follows: 9 of 9 samples exceed the criterion for Enterococci.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Samples shall not exceed 61 organisms per 100 ml for enterococcus in waters designated for REC I beneficial use (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Data for this line of evidence for Gopher Creek was collected at 1 monitoring site [Little Gopher Canyon Creek at Old River Road]
Temporal Representation:	Data was collected over the time period 6/3/2003-5/28/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47406, Indicator Bacteria **Region 9**

Gopher Creek

LOE ID:	73772
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	10
Number of Exceedances:	4
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Gopher Creek to determine beneficial use support and results are as follows: 4 of 10 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxicsubstances in concentrations which are toxic to,or which produce detrimental physiologicalresponses in human, plant, animal, or indigenousaquatic life (Basin Plan).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In waters designated for water contact recreation (REC I), the total coliform concentration shall not exceed 10000 MPN/100 ml (CDPH 2006).
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.
Spatial Representation:	Data for this line of evidence for Gopher Creek was collected at 1 monitoring site [Little Gopher Canyon Creek at Old River Road]
Temporal Representation:	Data was collected over the time period 6/3/2003-5/28/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47406, Indicator Bacteria **Region 9**

Gopher Creek

LOE ID:	73780
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation
Number of Samples:	10
Number of Exceedances:	7
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Gopher Creek to determine beneficial use support and results are as follows: 7 of 10 samples exceed the criterion for Coliform, Fecal.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the fecal coliform concentration shall not exceed 400 MPN/100 ml.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Gopher Creek was collected at 1 monitoring site [Little Gopher Canyon Creek at Old River Road]
Temporal Representation:	Data was collected over the time period 6/3/2003-5/28/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID	**42652**	**Region 9**
Gopher Creek		

Pollutant:	**Benthic Community Effects**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

Benthic Community Effects is being considered for placement on the section 303(d) list under sections 3.9 and 3.2 of the Listing Policy. Under section 3.9, an additional line of evidence associating the Benthic Community Effects with a water or sediment concentration of pollutants is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this indicator. 2 of 2 samples exceeded the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing Benthic Community Effects in this water segment on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. 2 of 2 samples exceeded the Index of Biological Integrity (IBI) value of "poor" water quality for this area and this sample size is insufficient to determine with the power and confidence of the Listing

Policy if standards are not met. A minimum of 5 samples is needed for application of Table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 42652, Benthic Community Effects **Region 9**

Gopher Creek

LOE ID:	26833
Pollutant:	Benthic Community Effects
LOE Subgroup:	Adverse Biological Responses
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	2
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Two samples of IBI data were taken from June 2003 to June 2006 at one sampling site. Of the total number of samples, two samples exceeded the IBI impairment threshold.
Data Reference:	Fish and Game IBI Data 2007 SDRWQCB Bioassessment Data
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at one site: 903SLLGC2 on Gopher Creek.
Temporal Representation:	Sampling occurred during one event on June 2003 and one event on June 2006.
Environmental Conditions:	
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Project Plan for the California Stream Bioassessment Procedure and the State of California, California Monitoring an Assessment Program: "CMAP", Quality Assurance Project Plan.
QAPP Information Reference(s):	State of California, California Monitoring and Assessment Program: "CMAP". Quality Assurance Project Plan for the California Stream Bioassessment Procedure The San Diego Stream Team Quality Assurance Project Plan

DECISION ID **47401** **Region 9**

Gopher Creek 039778

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the eight samples exceed the California Toxics Rule Objective for Cadmium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of eight samples exceeded the Basin Plan Objective for Cadmium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47401, Cadmium — Region 9

Gopher Creek

LOE ID:	73775
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Gopher Creek to determine beneficial use support and results are as follows: 0 of 8 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies

	based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Gopher Creek was collected at 1 monitoring site [Little Gopher Canyon Creek at Old River Road]
Temporal Representation:	Data was collected 6/3/2003 - 5/28/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 47408 Region 9
Gopher Creek

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence are available in the administrative record to assess this pollutant. Zero of the eight samples exceed the California Toxics Rule for Lead. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of eight samples exceeded the California Toxics Rule Objective for lead and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47408, Lead Region 9
Gopher Creek

LOE ID:	73770
Pollutant:	Lead

LOE Subgroup:	Pollutant-Water	039780
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	8	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Gopher Creek to determine beneficial use support and results are as follows: 0 of 8 samples exceed the criterion for Lead.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Gopher Creek was collected at 1 monitoring site [Little Gopher Canyon Creek at Old River Road]	
Temporal Representation:	Data was collected 6/3/2003 - 5/28/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Iron Springs Creek
Water Body ID: CAR9033100020081223082602
Water Body Type: River & Stream

DECISION ID 44230 **Region 9**
Iron Springs Creek

Pollutant: **Benthic Community Effects**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: Benthic Community Effects is being considered for placement on the CWA section 303(d) List under sections 3.9 and 3.1 of the Listing Policy. Under section 3.9, an additional line of evidence associating Benthic Community Effects with a water or sediment concentration of pollutant(s) is necessary to assess listing status.

Based on the readily available data and information, the weight of evidence provides sufficient justification for not placing Benthic Community Effects in this water segment on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Pursuant to section 3.9 of the Listing Policy, the water does not exhibit significant degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index.
4. Pursuant to section 3.9 of the Listing Policy, the water segment does not have associated pollutant(s) samples that exceed water quality objectives.
5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not being met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 44230, Benthic Community Effects **Region 9**
Iron Springs Creek

LOE ID: 26392

Pollutant: Benthic Community Effects
LOE Subgroup: Adverse Biological Responses
Matrix: Water
Fraction: None

Beneficial Use: Warm Freshwater Habitat

Number of Samples:	1	039782
Number of Exceedances:	0	
Data and Information Type:	Benthic macroinvertebrate surveys	
Data Used to Assess Water Quality:	One sample of IBI data was taken on June of 2004 at one sampling site. The sample did not exceed the IBI impairment threshold.	
Data Reference:	Fish and Game IBI Data	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)	
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13	
Spatial Representation:	Samples were collected at one site: 903IRS2xx on Iron Springs Creek.	
Temporal Representation:	Sampling occurred during one event on June of 2004.	
Environmental Conditions:		
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Project Plan for the California Stream Bioassessment Procedure and the State of California, California Monitoring an Assessment Program: "CMAP", Quality Assurance Project Plan.	
QAPP Information Reference(s):	State of California, California Monitoring and Assessment Program: "CMAP". Quality Assurance Project Plan for the California Stream Bioassessment Procedure The San Diego Stream Team Quality Assurance Project Plan	

Line of Evidence (LOE) for Decision ID 44230, Benthic Community Effects **Region 9**

Iron Springs Creek

LOE ID:	79480
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	The CSCI score for this site is above the 0.79 threshold, and is therefore not exceeding the water quality objective for the aquatic life beneficial use.
Data Reference:	RWB9 Status Sampling 2007 and 2008 Region 9 CSCI Scores & Water Body Information
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or

	that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.
Guideline Reference:	The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.
Spatial Representation:	Samples were collected at the following station: 903SLIRS2 (Irons Springs 2).
Temporal Representation:	Surveys done June 6, 2007.
Environmental Conditions:	
QAPP Information:	Data collected following SWAMP QA protocols for the RWB9 Status Sampling 2007 and 2008 water quality monitoring project.
QAPP Information Reference(s):	RWB9 Status Sampling 2007 and 2008

Line of Evidence (LOE) for Decision ID 44230, Benthic Community Effects **Region 9**

Iron Springs Creek

LOE ID:	73904
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	1
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	One of the 2 IBI scores for this water body were below 40. A score under 40 indicates that this water body may be considered to have impaired conditions. There were 3 replicates using the same collection method, those three IBI scores were averaged and resulted in an IBI score of 35.
Data Reference:	RWB9 Status Sampling 2007 and 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13

Spatial Representation:	Samples were collected at the following station: 903SLIRS2 (Irons Springs 29)
Temporal Representation:	Surveys done June 6, 2007.
Environmental Conditions:	
QAPP Information:	Data collected following SWAMP QA protocols for the RWB9 Status Sampling 2007 and 2008 water quality monitoring project.
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Lawson Creek
Water Body ID: CAR9092100020081222142247
Water Body Type: River & Stream

DECISION ID 42812 **Region 9**
Lawson Creek

Pollutant: **Benthic Community Effects**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: Benthic Community Effects is being considered for placement on the CWA section 303(d) List under sections 3.9 and 3.1 of the Listing Policy. Under section 3.9, an additional line of evidence associating Benthic Community Effects with a water or sediment concentration of pollutant(s) is necessary to assess listing status.

Based on the readily available data and information, the weight of evidence provides sufficient justification for not placing Benthic Community Effects in this water segment on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Pursuant to section 3.9 of the Listing Policy, the water does not exhibit significant degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index.
4. Pursuant to section 3.9 of the Listing Policy, the water segment does not have associated pollutant(s) samples that exceed water quality objectives.
5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not being met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. Furthermore, what data is available does not indicate that the benthic community exhibits degradation when compared to reference.

Line of Evidence (LOE) for Decision ID 42812, Benthic Community Effects **Region 9**
Lawson Creek

LOE ID: 26414

Pollutant: Benthic Community Effects
LOE Subgroup: Adverse Biological Responses
Matrix: Water
Fraction: None

Beneficial Use: Warm Freshwater Habitat

Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	One sample of IBI data was taken on November 2005 at one sampling site. Of the total number of samples, one of the samples exceeded the IBI impairment threshold.
Data Reference:	Fish and Game IBI Data
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at one site: 909LSCLVR on Lawson Creek.
Temporal Representation:	Sampling occurred in November 2005.
Environmental Conditions:	
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Project Plan for the California Stream Bioassessment Procedure and the State of California, California Monitoring an Assessment Program: "CMAP", Quality Assurance Project Plan.
QAPP Information Reference(s):	State of California, California Monitoring and Assessment Program: "CMAP". Quality Assurance Project Plan for the California Stream Bioassessment Procedure The San Diego Stream Team Quality Assurance Project Plan

Line of Evidence (LOE) for Decision ID 42812, Benthic Community Effects **Region 9**

Lawson Creek

LOE ID:	74131
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	The IBI score for this water body is 16 which indicates that this water body may be considered to have impaired conditions.
Data Reference:	RWB9 Status Sampling 2007 and 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or

	that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at the following station: 909SLAW02 (Lawson Valley Creek 2).
Temporal Representation:	Surveys done May 6, 2008.
Environmental Conditions:	
QAPP Information:	Data collected following SWAMP QA protocols for the RWB9 Status Sampling 2007 and 2008 water quality monitoring project.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 42812, Benthic Community Effects **Region 9**

Lawson Creek

LOE ID:	79684
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	One sample was taken at one station on Lawson Valley Creek. The CSCI score for this site is above the 0.79 threshold, and is therefore not exceeding the water quality objective for the aquatic life beneficial use.
Data Reference:	RWB9 Status Sampling 2007 and 2008 Region 9 CSCI Scores & Water Body Information
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.
Guideline Reference:	The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.

Spatial Representation:	Samples were collected at the following station: 909SLAW02 (Lawson Valley Creek 2).
Temporal Representation:	Surveys done May 6, 2008.
Environmental Conditions:	
QAPP Information:	Data collected following SWAMP QA protocols for the RWB9 Status Sampling 2007 and 2008 water quality monitoring project.
QAPP Information Reference(s):	RWB9 Status Sampling 2007 and 2008

DECISION ID 42770 Region 9

Lawson Creek

Pollutant:	**Metals**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. None of the 2 samples exceed the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 2 samples exceeded the CTR values for selected metals and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 42770, Metals Region 9

Lawson Creek

LOE ID:	26404
Pollutant:	Metals
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)

Data Used to Assess Water Quality:	Two samples were collected at Lawson Valley Creek station 2, 909SLAW02 during the months of June 2005, and April 2006, for the following constituents: aluminum, arsenic, cadmium, copper, silver, and zinc. None of the 2 samples showed excessive concentrations.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The Maximum Contaminant Level (MCL) for aluminum is 1.0 mg /l. Water Quality Control for the San Diego Basin. 2007. The dissolved chronic criterion for the following metals applies: arsenic 150 Âµg/l (ppb), cadmium 2.2 Âµg/l (ppb), copper 9.0 Âµg/l (ppb), zinc 120 Âµg/l (ppb), chromium 11 Âµg/l (ppb), manganese 0.05 mg/l, nickel 52 Âµg/l (ppb), lead 2.5 Âµg/l (ppb), and silver 3.4Âµg/l (ppb). California Toxics Rule. 2007.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Water samples were collected at Lawson Valley Creek station 2, 909SLAW02; (Latitude 37.7540, Longitude -116.7788).
Temporal Representation:	Water samples were collected on June 2005 and April 2006.
Environmental Conditions:	
QAPP Information:	Quality control for chemical analysis portion of this study was conducted in accordance with the California Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

DECISION ID	44593	Region 9
Lawson Creek		

Pollutant:	**Ammonia as Nitrogen | Phosphorus | Sulfates | Total Nitrogen as N**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 and 3.2 of the Listing Policy. Under sections 3.1 and 3.2 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess these pollutants. None of the 2 samples exceed the water quality objectives. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the 2 samples exceeded the Basin Plan objectives for ammonia, total nitrogen, and phosphorus and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 3. None of the 2 samples exceeded the Basin Plan objective for sulfates and this does not exceed the

allowable frequency listed in Table 3.2 of the Listing Policy. 039790
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 44593, Multiple Pollutants **Region 9**

Lawson Creek

LOE ID:	26406
Pollutant:	Ammonia as Nitrogen | Phosphorus | Sulfates | Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Two samples were collected at Lawson Valley Creek station 909SLAW02 during the months of June 2005 and April 2006, for conventional inorganics analyses. None of the samples showed excessive concentrations.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Ammonia as N 0.025 mg/l, nitrogen total a ratio of N:P = 10:1, on a weight to weight basis shall be used, Phosphorus, total 0.05 mg/l, and sulfate 250 mg/l.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Water samples were collected at Lawson Valley Creek station 909SLAW02; (Latitude 37.7540, Longitude -116.7788).
Temporal Representation:	Water samples were collected on June 2005, and April 2006.
Environmental Conditions:	
QAPP Information:	Quality control for chemical analysis portion of this study was conducted in accordance with the California Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

DECISION ID **42804** **Region 9**

Lawson Creek

Pollutant:	**PCBs (Polychlorinated biphenyls)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the

2010 listing cycle. 039791

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the 2 samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 2 samples exceeded the CTR value for PCBs and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 42804, PCBs (Polychlorinated biphenyls) **Region 9**

Lawson Creek

LOE ID:	26408
Pollutant:	PCBs (Polychlorinated biphenyls)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Two samples were collected at Lawson Valley Creek station 909SLAW02 during the months of June 2005, and April 2006, for PCBs analyses. None of the 2 samples showed excessive concentrations.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan; waters designated for use as domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels (MCL 0.5 ug/l) specified in California Code of Regulations, Title 22, Table 64444-A of section 64444 (Organic Chemicals) which is incorporated by reference into this plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Water samples were collected at Lawson Valley Creek station 2, 909SLAW02; (Latitude 37.7540, Longitude -116.7788).
Temporal Representation:	Water samples were collected on June 2005 and April 2006.
Environmental Conditions:	

QAPP Information:	Quality control for chemical analysis portion of this study was conducted in accordance with the California Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pauma Creek
Water Body ID: CAR9032200020081223083119
Water Body Type: River & Stream

DECISION ID 43858 **Region 9**
Pauma Creek

Pollutant: **Benthic Community Effects**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Original
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: Benthic Community Effects is being considered for placement on the section 303(d) list under sections 3.9 and 3.2 of the Listing Policy. Under section 3.9, an additional line of evidence associating the Benthic Community Effects with a water or sediment concentration of pollutants is necessary to assess listing status. One line of evidence is available in the administrative record to assess this indicator. 1 of 1 samples exceeded the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing Benthic Community Effects in this water segment on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. 1 of 1 samples exceeded the Index of Biological Integrity (IBI) value of "poor" water quality for this area and this sample size is insufficient to determine with the power and confidence of the Listing Policy if standards are not met. A minimum of 5 samples is needed for application of Table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43858, Benthic Community Effects **Region 9**
Pauma Creek

LOE ID: 26437

Pollutant: Benthic Community Effects
LOE Subgroup: Adverse Biological Responses
Matrix: Water
Fraction: None

Beneficial Use: Preservation of Areas of Special Biological Significance

Number of Samples: 1
Number of Exceedances: 1

Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	One sample of IBI data was taken on November 2000 at one sampling site. Of the total number of samples, the one sample exceeded the IBI impairment threshold.
Data Reference:	Fish and Game IBI Data
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. (SDRWQCB, 1995)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at one site: 903PCPMPx on Pauma Creek.
Temporal Representation:	Sampling occurred during one event on November 2000.
Environmental Conditions:	
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Project Plan for the California Stream Bioassessment Procedure and the State of California, California Monitoring an Assessment Program: "CMAP", Quality Assurance Project Plan.
QAPP Information Reference(s):	State of California, California Monitoring and Assessment Program: "CMAP". Quality Assurance Project Plan for the California Stream Bioassessment Procedure The San Diego Stream Team Quality Assurance Project Plan

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Doane Creek
Water Body ID: CAR9032200020081222141738
Water Body Type: River & Stream

DECISION ID 44371 **Region 9**
Doane Creek

Pollutant: **Benthic Community Effects**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: Benthic Community Effects is being considered for placement on the CWA section 303(d) List under sections 3.9 and 3.1 of the Listing Policy. Under section 3.9, an additional line of evidence associating Benthic Community Effects with a water or sediment concentration of pollutant(s) is necessary to assess listing status.

Based on the readily available data and information, the weight of evidence provides sufficient justification for not placing Benthic Community Effects in this water segment on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used does satisfy the data quantity requirements of section 6.1.5 of the Policy.
3. Pursuant to section 3.9 of the Listing Policy, the water does not exhibit significant degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index.
4. Pursuant to section 3.9 of the Listing Policy, the water segment does not have associated pollutant(s) samples that exceed water quality objectives.
5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not being met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 44371, Benthic Community Effects **Region 9**
Doane Creek

LOE ID: 26830

Pollutant: Benthic Community Effects
LOE Subgroup: Adverse Biological Responses
Matrix: Water
Fraction: None

Beneficial Use: Warm Freshwater Habitat

Number of Samples: 7

Number of Exceedances:	0	039796
Data and Information Type:	Benthic macroinvertebrate surveys	
Data Used to Assess Water Quality:	Seven samples of IBI data were taken from May 2004 to May 2007 at one sampling site. Of the total number of samples, none of the samples exceeded the IBI impairment threshold.	
Data Reference:	Stream Bioassessment Data. Co-permitee Data. Collected 2002-2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)	
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13	
Spatial Representation:	Samples were collected at one site: REF-DC on Doane Creek.	
Temporal Representation:	Sampling occurred during May and October annually over a three year period from May 2004 to October 2006 and during May in 2007.	
Environmental Conditions:		
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Manual for Freshwater Bioassessment.	
QAPP Information Reference(s):	Quality Assurance Manual for Freshwater Bioassessment Revision 0	

Line of Evidence (LOE) for Decision ID 44371, Benthic Community Effects **Region 9**

Doane Creek

LOE ID:	79478
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	The CSCI scores for this site are above the 0.79 threshold, and is therefore not exceeding the water quality objective for the aquatic life beneficial use.
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008. Region 9 CSCI Scores & Water Body Information
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration,

	or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.
Guideline Reference:	The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.
Spatial Representation:	The samples were collected at station 903REF-DC Doane Creek.
Temporal Representation:	The samples were collected in May and October 2004 to 2008.
Environmental Conditions:	
QAPP Information:	The data was collected under the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan, June 25, 2009.
QAPP Information Reference(s):	e-mail clarifying QAPP information Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.

Line of Evidence (LOE) for Decision ID 44371, Benthic Community Effects **Region 9**

Doane Creek

LOE ID:	77729
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Zero of the eight samples collected had IBI scores above 40. NPDES bioassessment
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the State or Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions. The dataset uses the old 0-70 IBI scoring.
Guideline Reference:	

Spatial Representation:	The samples were collected at station 903REF-DC Doane Creek.	039798
Temporal Representation:	The samples were collected in May and October 2004 to 2008.	
Environmental Conditions:		
QAPP Information:	The data was collected under the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan, June 25, 2009.	
QAPP Information Reference(s):	e-mail clarifying QAPP information	

DECISION ID **49038** **Region 9**

Doane Creek

Pollutant:	**Temperature, water**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line(s) of evidence are necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 9 samples exceeded the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 9 samples exceeded the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49038, Temperature, water **Region 9**

Doane Creek

LOE ID:	73503
Pollutant:	Temperature, water
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	None of the 9 samples exceeded the evaluation guideline for temperature in this water

	body.	039799
Data Reference:	Data for Trash, Nutrients, and Pathogens in Region 9, 2007-2010.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Board that such alteration in temperature does not adversely affect beneficial uses. At no time or place shall the temperature of any COLD water be increased more than 5Â°F above the natural receiving water temperature.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	Evaluation Guideline: Inland Fishes of California (Moyle 1976) states that for rainbow trout the optimum range for growth and completion of most life stages is 13-21 degrees C (page 129).	
Guideline Reference:	Fish introductions in CA: History and impact on native fishes. Davis, CA: University of CA, Davis	
Spatial Representation:	Samples were collected at station SLR-080 (Pauma Creek).	
Temporal Representation:	Samples were collected between January, 2009 and July, 2010.	
Environmental Conditions:		
QAPP Information:	San Diego Regional Water Quality Assessment and Outreach Project Quality Assurance Project Plan Prepared by: Clay Clifton (San Diego Coastkeeper, Local Project Sponsor Manager), Bob Stafford (San Diego Stream Team), Dr. Rick Gersberg (San Diego State University), Bryan Bjorndal (Assure Controls, Inc.), and Morgan Justice-Black (I Love A Clean San Diego).	
QAPP Information Reference(s):		

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Roblar Creek
Water Body ID: CAR9022100020081223075955
Water Body Type: River & Stream

DECISION ID 43847 **Region 9**
Roblar Creek

Pollutant: **Benthic Community Effects**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Original
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: Benthic Community Effects is being considered for placement on the section 303(d) list under sections 3.9 of the Listing Policy. Under section 3.9, an additional line of evidence associating the Benthic Community Effects with a water or sediment concentration of pollutants is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this indicator. 0 of 4 samples exceeded the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing Benthic Community Effects in this water segment on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. 0 of 4 samples exceeded the Index of Biological Integrity (IBI) value of "poor" water quality for this area and this sample size is insufficient to determine with the power and confidence of the Listing Policy if standards are not met. A minimum of 5 samples is needed for application of Table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43847, Benthic Community Effects **Region 9**
Roblar Creek

LOE ID: 26442

Pollutant: Benthic Community Effects
LOE Subgroup: Adverse Biological Responses
Matrix: Water
Fraction: None

Beneficial Use: Warm Freshwater Habitat

Number of Samples: 4

Number of Exceedances:	0	039801
Data and Information Type:	Benthic macroinvertebrate surveys	
Data Used to Assess Water Quality:	Four samples of IBI data were taken from May 2001 to 2007 at one sampling site. Of the total number of samples, none of the samples exceeded the IBI impairment threshold.	
Data Reference:	Fish and Game IBI Data Southern California Postfire Study. Index of Biotic Integrity. 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. (SDRWQCB, 1995)	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)	
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13	
Spatial Representation:	Samples were collected at one site: 902ROBDLZ on Roblar Creek.	
Temporal Representation:	Sampling occurred during four events over a seven year period from from May 2001 to 2007.	
Environmental Conditions:		
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Project Plan for the California Stream Bioassessment Procedure and the State of California, California Monitoring an Assessment Program: "CMAP", Quality Assurance Project Plan.	
QAPP Information Reference(s):	State of California, California Monitoring and Assessment Program: "CMAP". Quality Assurance Project Plan for the California Stream Bioassessment Procedure The San Diego Stream Team Quality Assurance Project Plan	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Bell Canyon Creek
Water Body ID: CAR9012000020090115151948
Water Body Type: River & Stream

DECISION ID 47972 **Region 9**
Bell Canyon Creek

Pollutant: Ammonia (Unionized)
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 3 samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 3 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47972, Ammonia (Unionized) **Region 9**
Bell Canyon Creek

LOE ID: 73054

Pollutant: Ammonia (Unionized)
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Warm Freshwater Habitat

Number of Samples: 3

Number of Exceedances:	0	039803
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	None of three samples exceeded the water quality objective for unionized ammonia. None of the samples showed detectable levels of total ammonia.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The San Diego Basin Plan objective for unionized ammonia is 0.025 mg/L as N.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at station REF-BC.	
Temporal Representation:	Samples were collected on 6/6/07, 5/20/08, and 4/28/09.	
Environmental Conditions:		
QAPP Information:	A signed QAPP was included with the stated goal of ensuring the consistent collection of accurate water quality information that will used to satisfy the objectives of the Orange County Stormwater Program.	
QAPP Information Reference(s):		

DECISION ID 47973 Region 9

Bell Canyon Creek

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of 2 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 2 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47973, Arsenic Region 9

Bell Canyon Creek 039804

LOE ID:	73042
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the two samples exceeded the water quality criterion for arsenic.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The CTR for arsenic is 150 ug/L.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Bell Canyon Creek (REF-BC).
Temporal Representation:	The samples were collected from REF-BC on 5/20/08, and 4/28/09.
Environmental Conditions:	The samples are representative of dry weather conditions.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID **42338** **Region 9**

Bell Canyon Creek

Pollutant:	**Benthic Community Effects**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Based on the readily available data and information, the weight of evidence provides sufficient justification for not placing Benthic Community Effects in this water segment on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Pursuant to section 3.9 of the Listing Policy, the water does not exhibit significant degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index. 4. Pursuant to section 3.9 of the Listing Policy, the water segment does have associated pollutant(s)

samples that exceed water quality objectives. 039805
5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not being met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded. What data is available does not indicate that the benthic community exhibits significant degradation when compared to reference. Furthermore, additional data has been collected on multiple sections of Bell Creek which support the future splitting of the waterbody based upon point source discharges.

Line of Evidence (LOE) for Decision ID 42338, Benthic Community Effects **Region 9**

Bell Canyon Creek

LOE ID:	77713
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	1
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	One out of the three IBI scores were below 40. One station was sampled three times from 2007 to 2009. The scores were, spring 2007: 65.8, spring 2008: 42.9, and spring 2009: 37.2.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the State or Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment based on a 1-100 point scale that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at reference station, REF-BC: Bell Creek.
Temporal Representation:	The samples were collected in the spring of 2007, 2008, and 2009.
Environmental Conditions:	
QAPP Information:	The taxonomic analysis followed the guidelines of the Southern California Freshwater and Marine Invertebrate Taxonomic Associations (SAFIT, SCAMIT). All stream bioassessment sample collection and taxonomic analysis follow the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan. The California Stream Bioassessment Procedure was followed.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 42338, Benthic Community Effects **Region 9**

Bell Canyon Creek 039806

LOE ID:	73060
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	2
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Four samples were collected to test for toxicity.Two of the four samples exhibited statistically and biologically significant toxicity. The toxicity tests that exhibited significant toxicity included Ceriodaphnia reproduction, Selenastrum growth, and Hyallela survival.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control. Additionally, the biological significance of the sample was evaluted by determining whether the sample response was lower than the evaluation threshold.
Guideline Reference:	
Spatial Representation:	The sample was collected at station REF-BC Bell Creek.
Temporal Representation:	The sample was collected from June 2006 to June 2010.
Environmental Conditions:	
QAPP Information:	The data collected under the Quality Assurance Management Plan for The Orange County Stormwater Program. The SWAMP measurement quality objectives were followed for toxicity data. The performance of toxicity bioassays and evaluation of reference toxicants were performed using USEPA and Standard Methods.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 42338, Benthic Community Effects **Region 9**

Bell Canyon Creek

LOE ID:	80747
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	1
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Four samples were collected at one station in Bell Creek. One sample had a CSCI score below the 0.79 threshold, and is therefore exceeding the water quality objective for the aquatic life beneficial use.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.
Guideline Reference:	The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.
Spatial Representation:	Samples were collected at REF-BC
Temporal Representation:	The samples were collected in 2007, 2008, and 2009.
Environmental Conditions:	
QAPP Information:	Data collected following SWAMP QA protocols for the County of Orange NPDES MS4 Copermittees Receiving Waters Monitoring and Reporting Program
QAPP Information Reference(s):	Quality Assurance Project Plan for the Orange County Stormwater Program.

Line of Evidence (LOE) for Decision ID 42338, Benthic Community Effects **Region 9**

Bell Canyon Creek

LOE ID:	26520
Pollutant:	Benthic Community Effects
LOE Subgroup:	Adverse Biological Responses
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	2
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Two samples of IBI data were taken on May 2001 at two sampling sites. Of the total number of samples, all two samples exceeded the IBI impairment threshold.
Data Reference:	Fish and Game IBI Data
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. (SDRWQCB, 1995)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the

	biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at two sites: 901BCCBCT and 901BCCSRT on Bell Canyon Creek.
Temporal Representation:	Sampling occurred during one event on May 2001.
Environmental Conditions:	
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Project Plan for the California Stream Bioassessment Procedure and the State of California, California Monitoring an Assessment Program: "CMAP", Quality Assurance Project Plan.
QAPP Information Reference(s):	State of California, California Monitoring and Assessment Program: "CMAP". Quality Assurance Project Plan for the California Stream Bioassessment Procedure The San Diego Stream Team Quality Assurance Project Plan

DECISION ID 47974 — Region 9

Bell Canyon Creek

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of 3 samples exceed the criteria for MUN and 0 of 3 samples exceed the criteria for WARM. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 3 samples exceed the criteria for MUN and 0 of 3 samples exceed the criteria for WARM and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47974, Cadmium — Region 9

Bell Canyon Creek

LOE ID: 73043

Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the three samples exceeded the hardness adjusted water quality criteria for cadmium.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Bell Canyon Creek (REF-BC).
Temporal Representation:	The samples were collected from REF-BC on 6/6/07, 5/20/08, and 4/28/09.
Environmental Conditions:	The samples are representative of dry weather conditions.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 47974, Cadmium **Region 9**

Bell Canyon Creek

LOE ID:	73044
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the three samples exceeded the water quality objective for cadmium.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or

	that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Total cadmium levels should not exceed the California Department of Public Health Primary MCL of 5 ug/L.
Guideline Reference:	
Spatial Representation:	Samples were collected from Bell Canyon Creek (REF-BC).
Temporal Representation:	The samples were collected from REF-BC on 6/6/07, 5/20/08, and 4/28/09.
Environmental Conditions:	The samples are representative of dry weather conditions.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID 47975 Region 9

Bell Canyon Creek

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of 3 samples exceed the criteria for MUN and 0 of 3 samples exceed the criteria for WARM. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 3 samples exceed the criteria for MUN and 0 of 3 samples exceed the criteria for WARM and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47975, Chlorpyrifos Region 9

Bell Canyon Creek

LOE ID:	73046
Pollutant:	Chlorpyrifos

LOE Subgroup:	Pollutant-Water	039811
Matrix:	Water	
Fraction:	Total Dissolved	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	3	
Number of Exceedances:	0	
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)	
Data Used to Assess Water Quality:	None of three samples exceed the USEPA Health Advisory 2011 ed., criteria for chlorpyrifos.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column,sediments or biota at concentration(s) that adversely affect beneficial uses.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	USEPA Health Advisory 2011 ed., criteria for chlorpyrifos in freshwater is 2.0 ug/L (represents a life-time risk).	
Guideline Reference:	2011 Edition of the Drinking Water Standards and Health Advisories 2012 Edition of the Drinking Water Standards and Health Advisories	
Spatial Representation:	Samples were collected at Bell Canyon Creek, site REF-BC	
Temporal Representation:	Samples were collected from 2007 through 2009.	
Environmental Conditions:		
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 47975, Chlorpyrifos **Region 9**

Bell Canyon Creek

LOE ID:	73045
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of three samples exceed the continuous concentration (four day average) for chlorpyrifos in freshwater is 14.0 ng/L.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column,sediments or biota at concentration(s) that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Criteria Continuous Concentration (four day average) for chlorpyrifos in freshwater is 14.0 ng/L.
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho

	Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response, California Department of Fish and Game
Spatial Representation:	Samples were collected at Bell Canyon Creek, site REF-BC
Temporal Representation:	Samples were collected from 2007 through 2009.
Environmental Conditions:	
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

DECISION ID 47976 Region 9

Bell Canyon Creek

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of 3 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 3 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47976, Chromium Region 9

Bell Canyon Creek

LOE ID:	73047
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3

Number of Exceedances:	0	039813
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)	
Data Used to Assess Water Quality:	None of the three samples exceeded the hardness adjusted water quality criteria for chromium.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.	
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Spatial Representation:	Samples were collected from Bell Canyon Creek (REF-BC).	
Temporal Representation:	The samples were collected from REF-BC on 6/6/07, 5/20/08, and 4/28/09.	
Environmental Conditions:	The samples are representative of dry weather conditions.	
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.	
QAPP Information Reference(s):		

DECISION ID	**47978**	**Region 9**
Bell Canyon Creek		

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 3 samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 3 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47978, Copper **Region 9**

Bell Canyon Creek

LOE ID:	73048
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the three samples exceeded the hardness adjusted water quality criteria for copper.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Bell Canyon Creek (REF-BC).
Temporal Representation:	The samples were collected from REF-BC on 6/6/07, 5/20/08, and 4/28/09.
Environmental Conditions:	The samples are representative of dry weather conditions.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID **47979** **Region 9**

Bell Canyon Creek

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of 3 samples exceed the criteria for MUN and 0 of 3 samples exceed the criteria for WARM. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 3 samples exceed the criteria for MUN and 0 of 3 samples exceed the criteria for WARM and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47979, Diazinon **Region 9**

Bell Canyon Creek

LOE ID:	73049
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of three samples exceed the continuous concentration for Diazinon criteria of 0.1 ug/L.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column,sediments or biota at concentration(s) that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Samples were collected at Bell Canyon Creek, site REF-BC
Temporal Representation:	Samples were collected from 2007 through 2009.
Environmental Conditions:	
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.

QAPP Information Reference(s): 039816

Line of Evidence (LOE) for Decision ID 47979, Diazinon **Region 9**

Bell Canyon Creek

LOE ID:	77714
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of three samples exceed the CADPH Notification Level for Diazinon criteria.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column,sediments or biota at concentration(s) that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Department of Public Health (CDPH) Notification Level for Diazinon is 1.2 ug/L.
Guideline Reference:	Drinking Water Notification and Response Levels: An Overview
Spatial Representation:	Samples were collected at Bell Canyon Creek, site REF-BC
Temporal Representation:	Samples were collected from June 2007 through April 2009.
Environmental Conditions:	
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

DECISION ID 47981 **Region 9**

Bell Canyon Creek

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 3 samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that: 039817
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 3 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47981, Lead **Region 9**

Bell Canyon Creek

LOE ID:	73050
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the three samples exceeded the hardness adjusted water quality criteria for lead.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Bell Canyon Creek (REF-BC).
Temporal Representation:	The samples were collected from REF-BC on 6/6/07, 5/20/08, and 4/28/09.
Environmental Conditions:	The samples are representative of dry weather conditions.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID 47984 **Region 9**

Bell Canyon Creek

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of 3 samples exceed the criteria for MUN and 0 of 3 samples exceed the criteria for WARM.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3.
Three lines of evidence are available in the administrative record to assess this pollutant. Zero of 3 samples exceed the criteria for MUN and 0 of 3 samples exceed the criteria for WARM and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47984, Malathion **Region 9**

Bell Canyon Creek

LOE ID:	73051
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of three samples exceed the maximum (Instantaneous) concentration for Malathion in freshwater of 100 ng/L.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column,sediments or biota at concentration(s) that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	The maximum (Instantaneous) concentration for Malathion in freshwater is 100 ng/L.
Guideline Reference:	Quality Criteria for Water. USEPA Office of Water and Hazardous Materials. Washington, D.C
Spatial Representation:	Samples were collected at Bell Canyon Creek, site REF-BC
Temporal Representation:	Samples were collected from 2007 through 2009.
Environmental Conditions:	
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 47984, Malathion **Region 9**

Bell Canyon Creek

LOE ID:	77715
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of three samples exceed the CDPH notification level for Malathion criteria of 160.0 ug/L.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column,sediments or biota at concentration(s) that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Department of Public Health (CDPH) archived advisory level criteria for malathion in drinking water is 160.0 ug/L.
Guideline Reference:	CDPH Archived Advisory Levels for Drinking Water. Archived Advisory Levels are currently considered Notification Levels.
Spatial Representation:	Samples were collected at Bell Canyon Creek, site REF-BC
Temporal Representation:	Samples were collected from 2007 through 2009.
Environmental Conditions:	
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

DECISION ID **47987** **Region 9**

Bell Canyon Creek

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised

Impairment from Pollutant or Pollution:	Pollutant	039820
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of 3 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 3 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.	
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.	

Line of Evidence (LOE) for Decision ID 47987, Nickel **Region 9**

Bell Canyon Creek

LOE ID:	73053
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the three samples exceeded the hardness adjusted water quality criteria for nickel.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority

Spatial Representation:	Samples were collected from Bell Canyon Creek (REF-BC).
Temporal Representation:	The samples were collected from REF-BC on 6/6/07, 5/20/08, and 4/28/09.
Environmental Conditions:	The samples are representative of dry weather conditions.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID 47988 Region 9

Bell Canyon Creek

Pollutant:	**Oxygen, Dissolved**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line(s) of evidence are necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of 3 samples exceed the basin plan objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 3 samples exceed the basin plan objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47988, Oxygen, Dissolved Region 9

Bell Canyon Creek

LOE ID:	73055
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	039822
Data Used to Assess Water Quality:	Zero of 3 samples exceeded the objective.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Dissolved oxygen levels shall not be less than 5.0 mg/l in inland surface waters with designated MAR or WARM beneficial uses. The annual mean dissolved oxygen concentration shall not be less than 7 mg/l more than 10% of the time.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from the REF-BC station.	
Temporal Representation:	Samples were collected annually from 2007 to 2009	
Environmental Conditions:		
QAPP Information:	NPDES quality assurance.	
QAPP Information Reference(s):		

DECISION ID 47991 **Region 9**

Bell Canyon Creek

Pollutant:	**Selenium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of 0 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 0 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47991, Selenium **Region 9**

Bell Canyon Creek

LOE ID:	73057

Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	The reporting limits for all three non-detect samples exceeded the water quality criterion for selenium.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The CTR for selenium is 5.0 ug/L.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Bell Canyon Creek (REF-BC).
Temporal Representation:	The samples were collected from REF-BC on 6/6/07, 5/20/08, and 4/28/09.
Environmental Conditions:	The samples are representative of dry weather conditions.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID	**47993**	**Region 9**
Bell Canyon Creek		

Pollutant:	**Silver**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of 3 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.

3. Zero of 3 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47993, Silver Bell Canyon Creek **Region 9**

LOE ID:	73058
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the three samples exceeded the hardness adjusted water quality criteria for silver.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion maximum concentrations for silver to protect aquatic life in freshwater (1-hour average). The dissolved silver criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Bell Canyon Creek (REF-BC).
Temporal Representation:	The samples were collected from REF-BC on 6/6/07, 5/20/08, and 4/28/09.
Environmental Conditions:	The samples are representative of dry weather conditions.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID 47996 **Region 9**
Bell Canyon Creek

Pollutant:	**Temperature, water**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**

Last Listing Cycle's Final Listing Decision:	New Decision	039825
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line(s) of evidence are necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of 3 samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 3 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to section 3.2 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47996, Temperature, water **Region 9**

Bell Canyon Creek

LOE ID:	73059
Pollutant:	Temperature, water
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Zero of 3 samples exceeded the objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Board that such alteration in temperature does not adversely affect beneficial uses. At no time or place shall the temperature of any COLD water be increased more than 5Â°F above the natural receiving water temperature.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Inland Fishes of California (Moyle 1976) states that for rainbow trout the optimum range for growth and completion of most life stages is 13-21 degrees C (page 129).
Guideline Reference:	Inland Fishes of California

Spatial Representation:	Samples were collected from the REF-BC station.
Temporal Representation:	Samples were collected annually from 2007 to 2009.
Environmental Conditions:	
QAPP Information:	NPDES quality assurance.
QAPP Information Reference(s):	

DECISION ID 47997 Region 9

Bell Canyon Creek

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 3 samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 3 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47997, Zinc Region 9

Bell Canyon Creek

LOE ID:	73061
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the three samples exceeded the hardness adjusted water quality criteria for zinc.

Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009. 039827
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Bell Canyon Creek (REF-BC).
Temporal Representation:	The samples were collected from REF-BC on 6/6/07, 5/20/08, and 4/28/09.
Environmental Conditions:	The samples are representative of dry weather conditions.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID	48000	Region 9
Bell Canyon Creek		

Pollutant:	**pH**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line(s) of evidence are necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of 3 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 3 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48000, pH — Region 9

Bell Canyon Creek

LOE ID:	73056
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Numeric data generated from 3 minimums and maximums of pH data had no exceedences.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The pH of all inland surface waters shall not be depressed below 6.5 or raised above 8.5 as a result of waste discharges.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the REF-BC station.
Temporal Representation:	Samples were collected once a year from 2007 to 2009.
Environmental Conditions:	
QAPP Information:	NPDES quality assurance.
QAPP Information Reference(s):	

DECISION ID 53411 — Region 9

Bell Canyon Creek

Pollutant:	**Toxicity**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2027
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least one line of evidence is necessary to assess listing status for toxicity in water, and waters may be placed on the CWA section 303(d) List for toxicity alone.

One line of evidence is available in the administrative record to assess toxicity. Two of the four samples exhibited toxicity. The water segment does have associated pollutant(s) samples that exceed water quality objectives.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Two of the four samples exhibited toxicity, and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 53411, Toxicity **Region 9**

Bell Canyon Creek

LOE ID:	73060
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	2
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Four samples were collected to test for toxicity.Two of the four samples exhibited statistically and biologically significant toxicity. The toxicity tests that exhibited significant toxicity included Ceriodaphnia reproduction, Selenastrum growth, and Hyallela survival.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control. Additionally, the biological significance of the sample was evaluted by determining whether the sample response was lower than the evaluation threshold.
Guideline Reference:	
Spatial Representation:	The sample was collected at station REF-BC Bell Creek.
Temporal Representation:	The sample was collected from June 2006 to June 2010.
Environmental Conditions:	
QAPP Information:	The data collected under the Quality Assurance Management Plan for The Orange County Stormwater Program. The SWAMP measurement quality objectives were followed for toxicity data. The performance of toxicity bioassays and evaluation of reference toxicants were performed using USEPA and Standard Methods.
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Carroll Canyon
Water Body ID: CAR9061000020090127004841
Water Body Type: River & Stream

DECISION ID 48244 **Region 9**
Carroll Canyon

Pollutant: Arsenic
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

Four lines of evidence are available in the administrative record to assess this pollutant. Zero of 1 sample exceeds the COLD criteria, 0 of 1 sample exceeds the MUN criteria, and 0 of 5 samples exceed the WARM criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 1 sample exceeds the COLD criteria, 0 of 1 sample exceeds the MUN criteria, and 0 of 5 samples exceed the WARM criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48244, Arsenic **Region 9**
Carroll Canyon

LOE ID: 77993

Pollutant: Arsenic
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Warm Freshwater Habitat

Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Carroll Canyon to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Arsenic.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The dissolved arsenic criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved arsenic is 0.150 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Carroll Canyon was collected at 1 monitoring site [Carroll Canyon Creek - 906LPC-TWAS-1]
Temporal Representation:	Data was collected over the time period 9/27/2007-6/3/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 48244, Arsenic **Region 9**

Carroll Canyon

LOE ID:	73122
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Carroll Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The dissolved arsenic criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved arsenic is 0.150 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition

Evaluation Guideline:
Guideline Reference:

Spatial Representation:	Data for this line of evidence for Carroll Canyon was collected at 1 monitoring site [Soledad Canyon - 906_SMC00710]
Temporal Representation:	Data was collected on a single day 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

Line of Evidence (LOE) for Decision ID 48244, Arsenic **Region 9**

Carroll Canyon

LOE ID:	73121
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Carroll Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for arsenic is 0.01 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR

Evaluation Guideline:
Guideline Reference:

Spatial Representation:	Data for this line of evidence for Carroll Canyon was collected at 1 monitoring site [Soledad Canyon - 906_SMC00710]
Temporal Representation:	Data was collected on a single day 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

Line of Evidence (LOE) for Decision ID 48244, Arsenic **Region 9**

Carroll Canyon

LOE ID:	73120
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Warm Freshwater Habitat	039833
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Carroll Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The dissolved arsenic criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved arsenic is 0.150 mg/L (California Toxics Rule, 2000).	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Carroll Canyon was collected at 1 monitoring site [Soledad Canyon - 906_SMC00710]	
Temporal Representation:	Data was collected on a single day 6/3/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.	

DECISION ID	**48245**	**Region 9**
Carroll Canyon		

Pollutant:	**Bifenthrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. Three lines of evidence are available in the administrative record to assess this pollutant. One of 1 sample exceeds the criteria for both WARM and COLD. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of 1 sample exceeds the criteria for both WARM and COLD and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48245, Bifenthrin **Region 9**

Carroll Canyon

LOE ID:	77994
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Carroll Canyon to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Bifenthrin.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The UC Davis Criteria for Bifenthrin for the protection of aquatic organisms is a 4 day average of 0.0006 ug/L (Fojut et al. 2012).
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Carroll Canyon was collected at 1 monitoring site [Soledad Canyon - 906_SMC00710]
Temporal Representation:	Data was collected on a single day 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

Line of Evidence (LOE) for Decision ID 48245, Bifenthrin **Region 9**

Carroll Canyon

LOE ID:	73125
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	1	039835
Number of Exceedances:	1	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Carroll Canyon to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Bifenthrin.	
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Bifenthrin does not exceed 0.0006 ug/L.	
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.	
Spatial Representation:	Data for this line of evidence for Carroll Canyon was collected at 1 monitoring site [Carroll Canyon Creek - 906LPC-TWAS-1]	
Temporal Representation:	Data was collected over the time period 9/27/2007-2/3/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.	

Line of Evidence (LOE) for Decision ID 48245, Bifenthrin **Region 9**

Carroll Canyon

LOE ID:	73124
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Carroll Canyon to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Bifenthrin.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).

Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	039836
Evaluation Guideline:	The UC Davis Criteria for Bifenthrin for the protection of aquatic organisms is a 4 day average of 0.0006 ug/L (Fojut et al. 2012).	
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.	
Spatial Representation:	Data for this line of evidence for Carroll Canyon was collected at 1 monitoring site [Soledad Canyon - 906_SMC00710]	
Temporal Representation:	Data was collected on a single day 6/3/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.	

DECISION ID 48246 Region 9

Carroll Canyon

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. Three lines of evidence are available in the administrative record to assess this pollutant. Zero of 5 samples exceed the WARM criteria and 0 of 1 sample exceeds the MUN criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 5 samples exceed the WARM criteria and 0 of 1 sample exceeds the MUN criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48246, Cadmium Region 9

Carroll Canyon

LOE ID:	73128
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	039837
Beneficial Use:	Cold Freshwater Habitat	
Number of Samples:	4	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Carroll Canyon to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Cadmium.	
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Cadmium to protect aquatic life in freshwater. The dissolved Cadmium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Carroll Canyon was collected at 1 monitoring site [Carroll Canyon Creek - 906LPC-TWAS-1]	
Temporal Representation:	Data was collected over the time period 9/27/2007-6/3/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.	

Line of Evidence (LOE) for Decision ID 48246, Cadmium **Region 9**

Carroll Canyon

LOE ID:	73126
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Carroll Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	The California Maximum Contaminant Level for cadmium is 0.005 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Carroll Canyon was collected at 1 monitoring site [Soledad Canyon - 906_SMC00710]
Temporal Representation:	Data was collected on a single day 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

Line of Evidence (LOE) for Decision ID 48246, Cadmium **Region 9**

Carroll Canyon

LOE ID:	73127
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Carroll Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Carroll Canyon was collected at 1 monitoring site [Soledad Canyon - 906_SMC00710]
Temporal Representation:	Data was collected on a single day 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

DECISION ID 48247 Region 9

Carroll Canyon 039839

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 4 samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 4 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48247, Chlorpyrifos — Region 9

Carroll Canyon

LOE ID:	77725
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Carroll Canyon to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are

	harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.014 ug/L (Siepmann and Finlayson 2000).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).
Spatial Representation:	Data for this line of evidence for Carroll Canyon was collected at 1 monitoring site [Carroll Canyon Creek - 906LPC-TWAS-1]
Temporal Representation:	Data was collected over the time period 9/27/2007-6/3/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID 48248 Region 9

Carroll Canyon

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of 5 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 5 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48248, Chromium Region 9

Carroll Canyon

LOE ID:	73131
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Carroll Canyon to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Chromium.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved chromium to protect aquatic life in freshwater. The dissolved Chromium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Carroll Canyon was collected at 1 monitoring site [Carroll Canyon Creek - 906LPC-TWAS-1]
Temporal Representation:	Data was collected over the time period 9/27/2007-6/3/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 48248, Chromium **Region 9**

Carroll Canyon

LOE ID:	73130
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Carroll Canyon to determine beneficial use support and results are as follows: 0 of 1 samples

	exceed the criterion for Chromium. 039842
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Carroll Canyon was collected at 1 monitoring site [Soledad Canyon - 906_SMC00710]
Temporal Representation:	Data was collected on a single day 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

DECISION ID	**48249**	**Region 9**
Carroll Canyon		

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of 1 sample exceeds the criteria for COLD and 0 of 1 sample exceeds the criteria for MUN. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 1 sample exceeds the criteria for COLD and 0 of 1 sample exceeds the criteria for MUN and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48249, Copper — Region 9

Carroll Canyon

LOE ID:	73133
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Carroll Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Carroll Canyon was collected at 1 monitoring site [Soledad Canyon - 906_SMC00710]
Temporal Representation:	Data was collected on a single day 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

Line of Evidence (LOE) for Decision ID 48249, Copper — Region 9

Carroll Canyon

LOE ID:	73132
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	039844
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Carroll Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Secondary MCL for copper is 1.0 mg/L (Title 22 California Code of Regulations).	
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Carroll Canyon was collected at 1 monitoring site [Soledad Canyon - 906_SMC00710]	
Temporal Representation:	Data was collected on a single day 6/3/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.	

DECISION ID	48250	Region 9
Carroll Canyon		

Pollutant:	**Cypermethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of 0 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 0 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48250, Cypermethrin **Region 9**

Carroll Canyon 039845

LOE ID:	73134
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Carroll Canyon to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Cypermethrin, total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of cypermethrin does not exceed 0.0002 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Fojut et al. 2012)
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Carroll Canyon was collected at 1 monitoring site [Soledad Canyon - 906_SMC00710]
Temporal Representation:	Data was collected on a single day 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

Line of Evidence (LOE) for Decision ID 48250, Cypermethrin **Region 9**

Carroll Canyon

LOE ID:	73135
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Carroll Canyon to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Cypermethrin, total.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works

	Watershed Protection Program, 2001-2008.	039846
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of cypermethrin does not exceed 0.0002 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Fojut et al. 2012)	
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.	
Spatial Representation:	Data for this line of evidence for Carroll Canyon was collected at 1 monitoring site [Carroll Canyon Creek - 906LPC-TWAS-1]	
Temporal Representation:	Data was collected over the time period 9/27/2007-2/3/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.	

DECISION ID	**48251**	**Region 9**
Carroll Canyon		

Pollutant:	**Deltamethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of 3 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 3 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the

applicable beneficial use support rating. 039847

Line of Evidence (LOE) for Decision ID 48251, Deltamethrin **Region 9**

Carroll Canyon

LOE ID:	73136
Pollutant:	Deltamethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Carroll Canyon to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Deltamethrin.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for Deltamethrin is the maximum acceptable toxicant concentration (MATC) of 0.02 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Carroll Canyon was collected at 1 monitoring site [Carroll Canyon Creek - 906LPC-TWAS-1]
Temporal Representation:	Data was collected over the time period 9/27/2007-2/3/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID **48252** **Region 9**

Carroll Canyon

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of 4 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 4 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48252, Diazinon **Region 9**

Carroll Canyon

LOE ID:	73137
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Carroll Canyon to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Diazinon.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Data for this line of evidence for Carroll Canyon was collected at 1 monitoring site [Carroll

	Canyon Creek - 906LPC-TWAS-1]	039849
Temporal Representation:	Data was collected over the time period 9/27/2007-6/3/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.	

DECISION ID	**48253**	**Region 9**
Carroll Canyon		

Pollutant:	**Esfenvalerate/Fenvalerate**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 3 samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 3 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samplesis needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48253, Esfenvalerate/Fenvalerate	**Region 9**
Carroll Canyon	

LOE ID:	73138
Pollutant:	Esfenvalerate/Fenvalerate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Carroll Canyon to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Esfenvalerate.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to the USEPA Office of Pesticide Programs Ecotoxicity database, the aquatic life EC50 for Esfenvalerate is 0.9 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Carroll Canyon was collected at 1 monitoring site [Carroll Canyon Creek - 906LPC-TWAS-1]
Temporal Representation:	Data was collected over the time period 9/27/2007-2/3/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID	**48254**	**Region 9**
Carroll Canyon		

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of 5 samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 5 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48254, Lead **Region 9**

Carroll Canyon

LOE ID:	73140
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Carroll Canyon to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Lead.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved lead to protect aquatic life in freshwater. The dissolved lead criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Carroll Canyon was collected at 1 monitoring site [Carroll Canyon Creek - 906LPC-TWAS-1]
Temporal Representation:	Data was collected over the time period 9/27/2007-6/3/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 48254, Lead **Region 9**

Carroll Canyon

LOE ID:	73139
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Carroll Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Carroll Canyon was collected at 1 monitoring site [Soledad Canyon - 906_SMC00710]
Temporal Representation:	Data was collected on a single day 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

DECISION ID	**48255**	**Region 9**
Carroll Canyon		

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of 4 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 4 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16

samples is needed to determine if a beneficial use is fully supported using table 3.1. 039853
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48255, Malathion **Region 9**

Carroll Canyon

LOE ID:	73141
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Carroll Canyon to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Malathion.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for Carroll Canyon was collected at 1 monitoring site [Carroll Canyon Creek - 906LPC-TWAS-1]
Temporal Representation:	Data was collected over the time period 9/27/2007-6/3/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID **48256** **Region 9**

Carroll Canyon

Pollutant:	**Nickel**	039854
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	
Last Listing Cycle's Final Listing Decision:	New Decision	
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of 5 samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 5 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48256, Nickel **Region 9**

Carroll Canyon

LOE ID:	73142
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Carroll Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR

	contains the hardness dependent formula for the metals criterion. 039855
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Carroll Canyon was collected at 1 monitoring site [Soledad Canyon - 906_SMC00710]
Temporal Representation:	Data was collected on a single day 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

Line of Evidence (LOE) for Decision ID 48256, Nickel **Region 9**

Carroll Canyon

LOE ID:	73143
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Carroll Canyon to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Nickel.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Nickel to protect aquatic life in freshwater. The dissolved Nickel criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Carroll Canyon was collected at 1 monitoring site [Carroll Canyon Creek - 906LPC-TWAS-1]
Temporal Representation:	Data was collected over the time period 9/27/2007-6/3/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID 48259 Region 9

Carroll Canyon 039856

Pollutant:	**Nitrate/Nitrite (Nitrite + Nitrate as N)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 1 sample exceeds the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 1 sample exceeds the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48259, Nitrate/Nitrite (Nitrite + Nitrate as N) Region 9

Carroll Canyon

LOE ID:	73144
Pollutant:	Nitrate/Nitrite (Nitrite + Nitrate as N)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Carroll Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nitrate/Nitrite as N.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrate + nitrite (as N) is 10.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR

Evaluation Guideline:
Guideline Reference:

Spatial Representation:	Data for this line of evidence for Carroll Canyon was collected at 1 monitoring site [Soledad Canyon - 906_SMC00710]
Temporal Representation:	Data was collected on a single day 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

DECISION ID 48260 Region 9
Carroll Canyon

Pollutant:	**Nitrogen, Nitrite**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a signle line(s) of evidence are necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of 1 sample exceeds the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 1 sample exceeds the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48260, Nitrogen, Nitrite Region 9
Carroll Canyon

LOE ID:	73145
Pollutant:	Nitrogen, Nitrite
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	1	039858
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Carroll Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nitrite as N.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrite (as N) is 1.0 mg/L (Title 22 of the California Code of Regulations).	
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Carroll Canyon was collected at 1 monitoring site [Soledad Canyon - 906_SMC00710]	
Temporal Representation:	Data was collected on a single day 6/3/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.	

DECISION ID	**48257**	**Region 9**
Carroll Canyon		

Pollutant:	**Selenium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of 4 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 4 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48257, Selenium **Region 9**

Carroll Canyon

LOE ID:	77997
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Carroll Canyon to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Selenium.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The selenium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater is 0.005 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Carroll Canyon was collected at 1 monitoring site [Carroll Canyon Creek - 906LPC-TWAS-1]
Temporal Representation:	Data was collected over the time period 9/27/2007-6/3/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID **48258** **Region 9**

Carroll Canyon

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of 5

samples exceed the criteria. 039860

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 5 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48258, Zinc **Region 9**

Carroll Canyon

LOE ID:	73149
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Carroll Canyon to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Zinc.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Zinc to protect aquatic life in freshwater. The dissolved Zinc criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Carroll Canyon was collected at 1 monitoring site [Carroll Canyon Creek - 906LPC-TWAS-1]
Temporal Representation:	Data was collected over the time period 9/27/2007-6/3/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.

QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

039861

Line of Evidence (LOE) for Decision ID 48258, Zinc **Region 9**

Carroll Canyon

LOE ID:	73148
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Carroll Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Carroll Canyon was collected at 1 monitoring site [Soledad Canyon - 906_SMC00710]
Temporal Representation:	Data was collected on a single day 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

DECISION ID **44190** **Region 9**

Carroll Canyon

Pollutant:	**Benthic Community Effects**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Hydromodification | Illicit Connections/Illegal Hook-ups/Dry Weather Flows | Source Unknown | Unknown Nonpoint Source | Unknown Point Source | Urban Runoff/Storm Sewers
Expected TMDL Completion Date:	2025

Impairment from Pollutant or Pollution:	Pollutant	039862
Regional Board Conclusion:	Benthic Community Effects is being considered for placement on the CWA section 303(d) List under sections 3.9 and 3.1 of the Listing Policy. Under section 3.9, an additional line of evidence associating Benthic Community Effects with a water or sediment concentration of pollutant(s) is necessary to assess listing status. Based on the readily available data and information, the weight of evidence provides sufficient justification for placing Benthic Community Effects in this water segment on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Pursuant to section 3.9 of the Listing Policy, the water exhibits significant degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index. 4. Pursuant to section 3.9 of the Listing Policy, the water segment has associated pollutant(s) samples that exceed water quality objectives. 5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are being met.	
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant(s) contributes to or causes the problem.	

Line of Evidence (LOE) for Decision ID 44190, Benthic Community Effects **Region 9**

Carroll Canyon

LOE ID:	81138
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	12
Number of Exceedances:	12
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Twelve of the twelve samples collected had an IBI score below 40. NPDES bioassessment
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the State or Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired

	conditions. 039863
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	The samples were collected at one station on Carroll Canyon Creek. The station had thee different names, CCC-805, PC-TWAS-1, and LPC-TWAS-1.
Temporal Representation:	The samples were collected in May and October from 2001 to 2008.
Environmental Conditions:	
QAPP Information:	The data was collected under the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan, June 25, 2009.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 44190, Benthic Community Effects **Region 9**

Carroll Canyon

LOE ID:	79577
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	13
Number of Exceedances:	9
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Thirteen samples were collected at two stations. Nine samples were below the 0.79 threshold, and therefore exceeding the water quality objective for the aquatic life beneficial use.
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008. Bioassessment Data for Various Pollutants from Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009. Region 9 CSCI Scores & Water Body Information
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.
Guideline Reference:	The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.
Spatial Representation:	The sample were collected at 906_SMC00710 and 906LPC-TWAS-1. Note LPC-TWAS-1/PC-TWAS-1/CCC-805 located at the same sample point.

Temporal Representation:	The samples were collected from 2001 to 2009	039864
Environmental Conditions:		
QAPP Information:	The data was collected under the County of San Diego NPDES MS4 Copermittees Receiving Waters Monitoring and Reporting Program, and the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan.	
QAPP Information Reference(s):	e-mail clarifying QAPP information Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008. Bioassessment Data for Various Pollutants from Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.	

Line of Evidence (LOE) for Decision ID 44190, Benthic Community Effects **Region 9**

Carroll Canyon

LOE ID:	26559
Pollutant:	Benthic Community Effects
LOE Subgroup:	Adverse Biological Responses
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Four samples of IBI data were taken from May 1999 to November 2000 at one sampling site. Of the total number of samples, all four samples exceeded the IBI impairment threshold.
Data Reference:	Fish and Game IBI Data
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. (SDRWQCB, 1995)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at one site: 906CCC805 on Carroll Canyon Creek.
Temporal Representation:	Sampling occurred during two events annually over a two year period from May 1998 to May 2001.
Environmental Conditions:	
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Project Plan for the California Stream Bioassessment Procedure and the State of California, California Monitoring an Assessment Program: "CMAP", Quality Assurance Project Plan.
QAPP Information Reference(s):	State of California, California Monitoring and Assessment Program: "CMAP". Quality Assurance Project Plan for the California Stream Bioassessment Procedure The San Diego Stream Team Quality Assurance Project Plan

Line of Evidence (LOE) for Decision ID 44190, Benthic Community Effects — Region 9

Carroll Canyon

LOE ID:	73125
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Carroll Canyon to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Bifenthrin.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Bifenthrin does not exceed 0.0006 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Carroll Canyon was collected at 1 monitoring site [Carroll Canyon Creek - 906LPC-TWAS-1]
Temporal Representation:	Data was collected over the time period 9/27/2007-2/3/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 44190, Benthic Community Effects — Region 9

Carroll Canyon

LOE ID:	73123
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1

Number of Exceedances:	1	039866
Data and Information Type:	Benthic macroinvertebrate surveys	
Data Used to Assess Water Quality:	The one sample collected had an IBI score below 40. The score was 7.2. SMC bioassessment	
Data Reference:	Bioassessment Data for Various Pollutants from Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the State or Regional Board. Region 9 Basin Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.	
Guideline Reference:		
Spatial Representation:	The sample was collected at 906_SMC00710, Soledad Canyon.	
Temporal Representation:	The sample was collected in May 2009.	
Environmental Conditions:		
QAPP Information:	The data was collected under the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan, June 25, 2009.	
QAPP Information Reference(s):	e-mail clarifying QAPP information	

Line of Evidence (LOE) for Decision ID 44190, Benthic Community Effects **Region 9**

Carroll Canyon

LOE ID:	73146
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	2
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Four samples were collected to test for toxicity. Two of the four samples exhibited statistically significant toxicity. The toxicity tests that exhibited significant toxicity included growth of Selenastrum capriconutum and reproduction of Ceriodaphnia dubia.
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there

	is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected at station 906LPC-TWAS-1 Carroll Canyon Creek.
Temporal Representation:	The samples were collected from 2007 to 2008.
Environmental Conditions:	
QAPP Information:	The data was collected under the County of San Diego Co-Permittees Receiving Waters Urban Runoff Monitoring and Reporting Program (Order No. 2007-01). Data quality is good.
QAPP Information Reference(s):	e-mail clarifying QAPP information

DECISION ID 48949 Region 9

Carroll Canyon

Pollutant:	**Toxicity**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2027
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least one line of evidence is necessary to assess listing status for toxicity in water, and waters may be placed on the CWA section 303(d) List for toxicity alone. Two lines of evidence are available in the administrative record to assess toxicity. Two of the five samples exhibited toxicity. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Two of the five samples exhibited toxicity, and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 48949, Toxicity Region 9

Carroll Canyon

LOE ID:	73147
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat

Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to test for toxicity. None of the samples exhibited statistically and biologically significant toxicity. The toxicity tests included survival and reproduction of Ceriodaphnia dubia.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control. Additionally, the biological significance of the sample is evaluted by determining whether the sample response is lower than the evaluation threshold.
Guideline Reference:	
Spatial Representation:	The samples were collected from site 906_SMC00710, Soledad Canyon.
Temporal Representation:	The samples were collected in June 2009.
Environmental Conditions:	
QAPP Information:	This data was collected for the Regional Monitoring Of Southern California's Coastal Watersheds - Stormwater Monitoring Coalition Bioassessment Working Group. CRG Marine Laboratories Quality Assurance Program Document was provided.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 48949, Toxicity **Region 9**

Carroll Canyon

LOE ID:	73146
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	2
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Four samples were collected to test for toxicity. Two of the four samples exhibited statistically significant toxicity. The toxicity tests that exhibited significant toxicity included growth of Selenastrum capriconutum and reproduction of Ceriodaphnia dubia.
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the

	control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected at station 906LPC-TWAS-1 Carroll Canyon Creek.
Temporal Representation:	The samples were collected from 2007 to 2008.
Environmental Conditions:	
QAPP Information:	The data was collected under the County of San Diego Co-Permittees Receiving Waters Urban Runoff Monitoring and Reporting Program (Order No. 2007-01). Data quality is good.
QAPP Information Reference(s):	e-mail clarifying QAPP information

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Weaver Creek
Water Body ID: CAR9031200020090116003428
Water Body Type: River & Stream

DECISION ID 43995 **Region 9**
Weaver Creek

Pollutant: **Benthic Community Effects**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

Benthic Community Effects is being considered for placement on the section 303(d) list under sections 3.9 and 3.2 of the Listing Policy. Under section 3.9, an additional line of evidence associating the Benthic Community Effects with a water or sediment concentration of pollutants is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this indicator. The single sample exceeded the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing Benthic Community Effects in this water segment on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. The single sample exceeded the Index of Biological Integrity (IBI) value of poor water quality for this area and this sample size is insufficient to determine with the power and confidence of the Listing Policy if standards are not met as California Stream Condition Index Scores were not calculated for prior listing cycles.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because it cannot be determined if applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 43995, Benthic Community Effects **Region 9**
Weaver Creek

LOE ID: 26550

Pollutant: Benthic Community Effects

LOE Subgroup:	Adverse Biological Responses	039871
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	1	
Data and Information Type:	Benthic macroinvertebrate surveys	
Data Used to Assess Water Quality:	One sample of IBI data was taken from June 2002 at one sampling site. Out of the total number of samles, one of the samples exceed the IBI impairment threshold.	
Data Reference:	Fish and Game IBI Data 2007 SDRWQCB Bioassessment Data	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. (SDRWQCB, 1995)	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)	
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13	
Spatial Representation:	The sample was collected at one site: 903SLWVR1 on Weaver Creek.	
Temporal Representation:	Sampling occurred during one event on June 23, 2002.	
Environmental Conditions:		
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Project Plan for the California Stream Bioassessment Procedure and the State of California, California Monitoring an Assessment Program: "CMAP", Quality Assurance Project Plan.	
QAPP Information Reference(s):	State of California, California Monitoring and Assessment Program: "CMAP". Quality Assurance Project Plan for the California Stream Bioassessment Procedure The San Diego Stream Team Quality Assurance Project Plan	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Gird Creek
Water Body ID: CAR9031200020090202031512
Water Body Type: River & Stream

DECISION ID 42651 **Region 9**
Gird Creek

Pollutant: **Benthic Community Effects**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: Benthic Community Effects is being considered for placement on the CWA section 303(d) List under sections 3.9 and 3.1 of the Listing Policy. Under section 3.9, an additional line of evidence associating Benthic Community Effects with a water or sediment concentration of pollutant(s) is necessary to assess listing status.

Based on the readily available data and information, the weight of evidence provides sufficient justification for not placing Benthic Community Effects in this water segment on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Pursuant to section 3.9 of the Listing Policy, the water does not exhibit significant degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index.
4. Pursuant to section 3.9 of the Listing Policy, the water segment does not have associated pollutant(s) samples that exceed water quality objectives.
5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not being met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 42651, Benthic Community Effects **Region 9**
Gird Creek

LOE ID: 79483

Pollutant: Benthic-Macroinvertebrate Bioassessments
LOE Subgroup: Population/Community Degradation
Matrix: Water
Fraction: None

Beneficial Use: Warm Freshwater Habitat

Number of Samples:	1	039873
Number of Exceedances:	0	
Data and Information Type:	Benthic macroinvertebrate surveys	
Data Used to Assess Water Quality:	The CSCI score for this site is above the 0.79 threshold, and is therefore not exceeding the water quality objective for the aquatic life beneficial use.	
Data Reference:	RWB9 Status Sampling 2007 and 2008 Region 9 CSCI Scores & Water Body Information	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.	
Guideline Reference:	The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.	
Spatial Representation:	Samples were collected at the following station: 903SLGRD2	
Temporal Representation:	Survey done May 2008.	
Environmental Conditions:		
QAPP Information:	Data collected following SWAMP QA protocols for the RWB9 Status Sampling 2007 and 2008 water quality monitoring project.	
QAPP Information Reference(s):	RWB9 Status Sampling 2007 and 2008	

Line of Evidence (LOE) for Decision ID 42651, Benthic Community Effects **Region 9**

Gird Creek

LOE ID:	26831
Pollutant:	Benthic Community Effects
LOE Subgroup:	Adverse Biological Responses
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	3
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Three samples of IBI data were taken from June 2003 to June 2006 at two sampling sites. Of the total number of samples, all three samples exceeded the IBI impairment threshold.
Data Reference:	Fish and Game IBI Data 2007 SDRWQCB Bioassessment Data
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic

	substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at two sites: 903GIR2xx and 903SLGRD2 on Gird Creek.
Temporal Representation:	Sampling occurred during one event on June 2003, July 2004, and June 2006.
Environmental Conditions:	
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Project Plan for the California Stream Bioassessment Procedure and the State of California, California Monitoring an Assessment Program: "CMAP", Quality Assurance Project Plan.
QAPP Information Reference(s):	State of California, California Monitoring and Assessment Program: "CMAP". Quality Assurance Project Plan for the California Stream Bioassessment Procedure The San Diego Stream Team Quality Assurance Project Plan

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: San Vicente Creek (San Diego County)
Water Body ID: CAR9072200020081210155551
Water Body Type: River & Stream

DECISION ID 43872 **Region 9**
San Vicente Creek (San Diego County)

Pollutant: **Benthic Community Effects**
Final Listing Decision: **Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Reason for Delisting: Flaws in original listing
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

Regional Board Conclusion:
Benthic Community Effects is being considered for placement on the section 303(d) list under sections 3.9 and 3.2 of the Listing Policy. Under section 3.9, an additional line of evidence associating the Benthic Community Effects with a water or sediment concentration of pollutants is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this indicator. 5 of 6 samples exceeded the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing Benthic Community Effects in this water segment on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. 5 of 6 samples exceeded the Index of Biological Integrity (IBI) value of "poor" water quality for this area and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy, however as required under section 3.9 of the Listing Policy, pollutant(s) could not be directly associated with the Benthic Community Effects.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

State Board Review and Conclusion:
State Water Board staff used section 3.11 situation-specific weight of evidence approach to evaluate Benthic Community Effects for placement on the section 303(d) list. State Water Board staff determined that it is necessary to include these listings because additional data analyses and multiple line of evidence show that benthic macroinvertebrate populations are impacted by a wide range of stressors.

Multiple lines of evidence are available in the administrative record to assess this pollutant. The water quality chemistry and bioassessment data provide a substantial basis that benthic macroinvertebrate populations are impacted by a wide range of anthropogenic stressors.

Based on the available data and information, the weight of evidence indicates there is sufficient justification for placing this water segment-pollutant combination on the section 303(d) list.

Regional Board Decision Recommendation:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because it cannot be determined if applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 43872, Benthic Community Effects **Region 9**

San Vicente Creek (San Diego County)

LOE ID:	26854
Pollutant:	Benthic Community Effects
LOE Subgroup:	Adverse Biological Responses
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	5
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Six samples of IBI data were taken on November 2000 to 2007 at two sampling sites. Out of the total number of samples, five samples exceeded the IBI impairment threshold.
Data Reference:	Fish and Game IBI Data 2007 SDRWQCB Bioassessment Data Southern California Postfire Study. Index of Biotic Integrity. 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at two sites: 907SVWCRx and 907SDSVC3 on San Vicente Creek.
Temporal Representation:	Sampling occurred during six events from November 2000 to 2007.
Environmental Conditions:	
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Project Plan for the California Stream Bioassessment Procedure and the State of California, California Monitoring an Assessment Program: "CMAP", Quality Assurance Project Plan.
QAPP Information Reference(s):	State of California, California Monitoring and Assessment Program: "CMAP". Quality Assurance Project Plan for the California Stream Bioassessment Procedure The San Diego Stream Team Quality Assurance Project Plan

DECISION ID **43873** 039877 **Region 9**

San Vicente Creek (San Diego County)

Pollutant:	**Ammonia as Nitrogen**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for removal from the CWA section 303(d) List under section 4.1 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status. One line of evidence are available in the administrative record to assess pollutant. Two of the five samples exceed the OBJECTIVE. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Two of five samples exceeded the OBJECTIVE and this exceeds the allowable frequency listed in Table 4.1 of the Listing Policy. 4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 43873, Ammonia as Nitrogen **Region 9**

San Vicente Creek (San Diego County)

LOE ID:	31428
Pollutant:	Ammonia as Nitrogen
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	5
Number of Exceedances:	2
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Two of the 5 samples collected at San Vicente Creek exceed the water quality objective for un-ionized ammonia as N.
Data Reference:	Surface Water Ambient Monitoring Program Report on the San Diego Hydrologic Unit; Final Technical Report 2007
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	From the Basin Plan the WQO for un-ionized ammonia (NH3) for inland surface waters is

	0.025mg/L (as N).	039878
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:	Water Quality Control Plan for the San Diego Basin	
Spatial Representation:	Water samples were collected at San Vicente Creek station 907SDSVC4; (Latitude 32.9934, Longitude -116.8498).	
Temporal Representation:	Data was collected during 2002.	
Environmental Conditions:		
QAPP Information:	Data collected and measured as per the SWAMP Quality Assurance Management Plan (QAMP).	
QAPP Information Reference(s):		

DECISION ID 44832 **Region 9**

San Vicente Creek (San Diego County)

Pollutant:	**Toxicity**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

This pollutant is being considered for placement on the section 303(d) list under section 3.6 of the Listing Policy. Under section 3.6 a single line of evidence is necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. Four of the samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Four of 5 samples exhibits significant toxicity and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 44832, Toxicity **Region 9**

San Vicente Creek (San Diego County)

LOE ID:	31431
Pollutant:	Toxicity

LOE Subgroup:	Toxicity	039879
Matrix:	-N/A	
Fraction:	None	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	5	
Number of Exceedances:	4	
Data and Information Type:	Ambient toxicity testing (chronic)	
Data Used to Assess Water Quality:	Chronic water toxicity was evaluated with 7-day exposures on the water flea, Ceriodaphnia dubia, and 96-hour exposures to the alga Selenastrum capricornutum. Four out of 5 samples exhibit significant toxicity.	
Data Reference:	Surface Water Ambient Monitoring Program Report on the San Diego Hydrologic Unit; Final Technical Report 2007	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	All waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	Samples meeting the following criteria were considered toxic: 1) treatment responses significantly different from controls, as determined by a statistical t-test; and 2) endpoints less than 80% of controls.	
Guideline Reference:	Surface Water Ambient Monitoring Program Report on the San Diego Hydrologic Unit; Final Technical Report 2007	
Spatial Representation:	Water samples were collected at San Vicente Creek station 907SDSVC4; (Latitude 32.9934, Longitude -116.8498).	
Temporal Representation:	Data was collected between 2004 and 2006.	
Environmental Conditions:		
QAPP Information:	Data collected and measured as per the SWAMP Quality Assurance Management Plan (QAMP).	
QAPP Information Reference(s):		

DECISION ID 49109 Region 9

San Vicente Creek (San Diego County)

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. Zero of the eight samples exceed the CRITERIA.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of eight samples exceeded the CRITERIA and this sample size is insufficient to determine, with

the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49109, Cadmium **Region 9**

San Vicente Creek (San Diego County)

LOE ID:	76269
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Vicente Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 8 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for cadmium is 0.005 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals, CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Vicente Creek (San Diego County) was collected at 2 monitoring sites [San Vicente Creek @ San Vicente Road, San Vicente Creek @ Wildcat Canyon Road]
Temporal Representation:	Data was collected 6/23/2003 - 1/1/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 49109, Cadmium **Region 9**

San Vicente Creek (San Diego County)

LOE ID:	76268
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Vicente Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 8 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Vicente Creek (San Diego County) was collected at 2 monitoring sites [San Vicente Creek @ San Vicente Road, San Vicente Creek @ Wildcat Canyon Road]
Temporal Representation:	Data was collected 6/23/2003 - 1/1/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 49110 Region 9

San Vicente Creek (San Diego County)

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. Zero of the zero (seven were collected, but detection limit is greater than evaluation guideline) samples exceed the GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of zero samples exceeded the GUIDELINE and this sample size is insufficient to determine,

with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49110, Chlorpyrifos **Region 9**

San Vicente Creek (San Diego County)

LOE ID:	78127
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Vicente Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 7 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for chlorpyrifos is 2.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for San Vicente Creek (San Diego County) was collected at 2 monitoring sites [San Vicente Creek @ Wildcat Canyon Road, San Vicente Creek @ San Vicente Road]
Temporal Representation:	Data was collected over the time period 8/17/2004-6/1/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 49110, Chlorpyrifos **Region 9**

San Vicente Creek (San Diego County)

LOE ID:	76275
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water

Matrix:	Water	039883
Fraction:	None	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	0	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Vicente Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Chlorpyrifos.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000).	
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).	
Spatial Representation:	Data for this line of evidence for San Vicente Creek (San Diego County) was collected at 2 monitoring sites [San Vicente Creek @ Wildcat Canyon Road, San Vicente Creek @ San Vicente Road]	
Temporal Representation:	Data was collected over the time period 8/17/2004-6/1/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID 49111 Region 9

San Vicente Creek (San Diego County)

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. Zero of the eight samples exceed the CRITERIA.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.039884
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of eight samples exceeded the [OBJECTIVE/GUIDELINE/CRITERIA] and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49111, Copper **Region 9**
San Vicente Creek (San Diego County)

LOE ID:	76277
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Vicente Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for copper is 1.0 mg/L (Title 22 California Code of Regulations).
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Vicente Creek (San Diego County) was collected at 2 monitoring sites [San Vicente Creek @ San Vicente Road, San Vicente Creek @ Wildcat Canyon Road]
Temporal Representation:	Data was collected 6/23/2003 - 1/1/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 49111, Copper **Region 9**
San Vicente Creek (San Diego County)

LOE ID:	76276

Pollutant:	Copper	039885
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	8	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Vicente Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for San Vicente Creek (San Diego County) was collected at 2 monitoring sites [San Vicente Creek @ San Vicente Road, San Vicente Creek @ Wildcat Canyon Road]	
Temporal Representation:	Data was collected 6/23/2003 - 1/1/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID 49112 Region 9

San Vicente Creek (San Diego County)

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One line of evidence are available in the administrative record to assess this pollutant. Zero of the seven samples exceed the GUIDELINE. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.039886
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of seven samples exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49112, Diazinon **Region 9**

San Vicente Creek (San Diego County)

LOE ID:	76278
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Vicente Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 7 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Data for this line of evidence for San Vicente Creek (San Diego County) was collected at 2 monitoring sites [San Vicente Creek @ Wildcat Canyon Road, San Vicente Creek @ San Vicente Road]
Temporal Representation:	Data was collected over the time period 8/17/2004-6/1/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 49112, Diazinon **Region 9**

San Vicente Creek (San Diego County)

LOE ID:	78125
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Vicente Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 7 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for diazinon is 1.4 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for San Vicente Creek (San Diego County) was collected at 2 monitoring sites [San Vicente Creek @ Wildcat Canyon Road, San Vicente Creek @ San Vicente Road]
Temporal Representation:	Data was collected over the time period 8/17/2004-6/1/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 49113 Region 9

San Vicente Creek (San Diego County)

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One line of evidence are available in the administrative record to assess this pollutant. Zero of the eight samples exceed the CRITERIA. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that: 039888
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of eight samples exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49113, Lead **Region 9**

San Vicente Creek (San Diego County)

LOE ID:	76261
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Vicente Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 8 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for Lead is 0.015 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Vicente Creek (San Diego County) was collected at 2 monitoring sites [San Vicente Creek @ San Vicente Road, San Vicente Creek @ Wildcat Canyon Road]
Temporal Representation:	Data was collected 6/23/2003 - 1/1/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 49113, Lead **Region 9**

San Vicente Creek (San Diego County)

LOE ID:	76260

Pollutant:	Lead	039889
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	8	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Vicente Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for San Vicente Creek (San Diego County) was collected at 2 monitoring sites [San Vicente Creek @ San Vicente Road, San Vicente Creek @ Wildcat Canyon Road]	
Temporal Representation:	Data was collected 6/23/2003 - 1/1/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID 49114 Region 9

San Vicente Creek (San Diego County)

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the seven samples exceed the GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.039890
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of seven samples exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49114, Malathion **Region 9**

San Vicente Creek (San Diego County)

LOE ID:	78126
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Vicente Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 7 samples exceed the criterion for Malathion.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for malathion is 100 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for San Vicente Creek (San Diego County) was collected at 2 monitoring sites [San Vicente Creek @ Wildcat Canyon Road, San Vicente Creek @ San Vicente Road]
Temporal Representation:	Data was collected over the time period 8/17/2004-6/1/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 49114, Malathion **Region 9**

San Vicente Creek (San Diego County)

LOE ID:	76262

Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Vicente Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 7 samples exceed the criterion for Malathion.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for San Vicente Creek (San Diego County) was collected at 2 monitoring sites [San Vicente Creek @ Wildcat Canyon Road, San Vicente Creek @ San Vicente Road]
Temporal Representation:	Data was collected over the time period 8/17/2004-6/1/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 49119 Region 9

San Vicente Creek (San Diego County)

Pollutant:	**Nitrate/Nitrite (Nitrite + Nitrate as N)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. One of the one sample exceed the CRITERIA.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.039892
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of one sample exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49119, Nitrate/Nitrite (Nitrite + Nitrate as N) **Region 9**

San Vicente Creek (San Diego County)

LOE ID:	76263
Pollutant:	Nitrate/Nitrite (Nitrite + Nitrate as N)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Vicente Creek (San Diego County) to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Nitrate/Nitrite as N.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrate + nitrite (as N) is 10.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Vicente Creek (San Diego County) was collected at 1 monitoring site [San Vicente Creek @ Wildcat Canyon Road]
Temporal Representation:	Data was collected on a single day 9/10/2003.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 49121 **Region 9**

San Vicente Creek (San Diego County)

Pollutant:	**Nitrogen, Nitrite**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final	New Decision

Listing Decision:		039893
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. Zero of the two samples exceed the CRITERIA.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of two samples exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49121, Nitrogen, Nitrite **Region 9**

San Vicente Creek (San Diego County)

LOE ID:	76264
Pollutant:	Nitrogen, Nitrite
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Vicente Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Nitrite as N.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrite (as N) is 1.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals, CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Vicente Creek (San Diego County) was collected at 1

	monitoring site [San Vicente Creek @ Wildcat Canyon Road] 039894
Temporal Representation:	Data was collected over the time period 6/23/2003-9/10/2003.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 49120 Region 9

San Vicente Creek (San Diego County)

Pollutant:	**Nitrogen, ammonia (Total Ammonia)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the two samples exceed the GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of two samples exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49120, Nitrogen, ammonia (Total Ammonia) Region 9

San Vicente Creek (San Diego County)

LOE ID:	76267
Pollutant:	Nitrogen, ammonia (Total Ammonia)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Vicente Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Ammonia As N, Total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Basin Plan: No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	EPA's Lifetime Health advisory level for total ammonia is 30.0 mg/L as stated on page 8 of the 2006 edition of the drinking water standards and health advisories. This Advisory Level is defined as "the concentration of a chemical in drinking water that is not expected to cause any adverse noncarcinogenic effects for up to ten days of exposure."
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for San Vicente Creek (San Diego County) was collected at 1 monitoring site [San Vicente Creek @ Wildcat Canyon Road]
Temporal Representation:	Data was collected over the time period 6/23/2003-6/6/2005.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 49122 Region 9

San Vicente Creek (San Diego County)

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One line of evidence are available in the administrative record to assess this pollutant. Zero of the eight samples exceed the CRITERIA. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of eight samples exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 3.1 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the

applicable beneficial use support rating. 039896

Line of Evidence (LOE) for Decision ID 49122, Zinc **Region 9**

San Vicente Creek (San Diego County)

LOE ID:	76266
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Vicente Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for zinc is 5.0 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for San Vicente Creek (San Diego County) was collected at 2 monitoring sites [San Vicente Creek @ San Vicente Road, San Vicente Creek @ Wildcat Canyon Road]
Temporal Representation:	Data was collected 6/23/2003 - 1/1/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 49122, Zinc **Region 9**

San Vicente Creek (San Diego County)

LOE ID:	76270
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Vicente Creek (San

	Diego County) to determine beneficial use support and results are as follows: 7 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Vicente Creek (San Diego County) was collected at 2 monitoring sites [San Vicente Creek @ San Vicente Road, San Vicente Creek @ Wildcat Canyon Road]
Temporal Representation:	Data was collected 6/23/2003 - 1/1/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 53445 Region 9

San Vicente Creek (San Diego County)

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. Three lines of evidence are available in the administrative record to assess this pollutant. Seven of seven samples exceed the water quality objective for enterococcus of a SSM of 61/100 ml for the protection of REC-1 beneficial use. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Seven of seven samples exceed the water quality objective for enterococcus of a SSM of 61/100 ml for the protection of REC-1 beneficial use and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 53445, Indicator Bacteria **Region 9**

San Vicente Creek (San Diego County)

LOE ID:	76258
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	7
Number of Exceedances:	7
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Vicente Creek (San Diego County) to determine beneficial use support and results are as follows: 7 of 7 samples exceed the criterion for Enterococci.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Samples shall not exceed 61 organisms per 100 ml for enterococcus in waters designated for REC I beneficial use (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Vicente Creek (San Diego County) was collected at 2 monitoring sites [San Vicente Creek @ Wildcat Canyon Road, San Vicente Creek @ San Vicente Road]
Temporal Representation:	Data was collected over the time period 6/23/2003-7/24/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 53445, Indicator Bacteria **Region 9**

San Vicente Creek (San Diego County)

LOE ID:	76259
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	7
Number of Exceedances:	4

Data and Information Type:	PATHOGEN MONITORING 039899
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Vicente Creek (San Diego County) to determine beneficial use support and results are as follows: 4 of 7 samples exceed the criterion for Coliform, Fecal.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the fecal coliform concentration shall not exceed 400 MPN/100 ml.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Vicente Creek (San Diego County) was collected at 2 monitoring sites [San Vicente Creek @ Wildcat Canyon Road, San Vicente Creek @ San Vicente Road]
Temporal Representation:	Data was collected over the time period 6/23/2003-7/24/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 53445, Indicator Bacteria **Region 9**

San Vicente Creek (San Diego County)

LOE ID:	76265
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	7
Number of Exceedances:	2
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Vicente Creek (San Diego County) to determine beneficial use support and results are as follows: 2 of 7 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxicsubstances in concentrations which are toxic to,or which produce detrimental physiologicalresponses in human, plant, animal, or indigenousaquatic life (Basin Plan).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In waters designated for water contact recreation (REC I), the total coliform concentration shall not exceed 10000 MPN/100 ml (CDPH 2006).
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.
Spatial Representation:	Data for this line of evidence for San Vicente Creek (San Diego County) was collected at 2 monitoring sites [San Vicente Creek @ Wildcat Canyon Road, San Vicente Creek @ San

	Vicente Road]	039900
Temporal Representation:	Data was collected over the time period 6/23/2003-7/24/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID 43874 Region 9

San Vicente Creek (San Diego County)

Pollutant:	**Phosphorus**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2023
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. Two of the samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Two of 5 samples exceeded the water quality objective for total phosphorus and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 43874, Phosphorus Region 9

San Vicente Creek (San Diego County)

LOE ID:	31427
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	5
Number of Exceedances:	2
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality:	Two of the 5 samples collected at San Vicente Creek exceed the water quality objective for total phosphorus.
Data Reference:	Surface Water Ambient Monitoring Program Report on the San Diego Hydrologic Unit; Final Technical Report 2007
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Inland surface waters, bays and estuaries and coastal lagoon waters shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. For inland surface waters-streams and other flowing waters, with all beneficial uses, the water quality objective for total phosphorus is 0.1 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Water samples were collected at San Vicente Creek station 907SDSVC4; (Latitude 32.9934, Longitude -116.8498).
Temporal Representation:	Data was collected during 2002.
Environmental Conditions:	
QAPP Information:	Data collected and measured as per the SWAMP Quality Assurance Management Plan (QAMP).
QAPP Information Reference(s):	

DECISION ID 44573 Region 9

San Vicente Creek (San Diego County)

Pollutant:	**Sulfates**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One line of evidence are available in the administrative record to assess this pollutant. Four of the samples exceed the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Four of 4 samples exceeded the water quality objective for sulfates and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not

changed. 039902

Line of Evidence (LOE) for Decision ID 44573, Sulfates **Region 9**

San Vicente Creek (San Diego County)

LOE ID:	31429
Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Four of the 4 samples collected at San Vicente Creek exceed the water quality objective for sulfates.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	For inland surface waters in the San Vicente HA and all beneficial uses, the WQO for sulfate is 65 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Water samples were collected at San Vicente Creek station 907SDSVC4; (Latitude 32.9934, Longitude -116.8498).
Temporal Representation:	Data was collected in 2004 and 2005.
Environmental Conditions:	
QAPP Information:	Data collected and measured as per the SWAMP Quality Assurance Management Plan (QAMP).
QAPP Information Reference(s):	

DECISION ID 44544 **Region 9**

San Vicente Creek (San Diego County)

Pollutant:	**pH**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Three of the samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Three of 4 samples exceeded the water quality objective for pH and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 44544, pH **Region 9**

San Vicente Creek (San Diego County)

LOE ID:	31430
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	3
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Three of the 4 samples collected at San Vicente Creek exceed the water quality objective for pH.
Data Reference:	Surface Water Ambient Monitoring Program Report on the San Diego Hydrologic Unit; Final Technical Report 2007
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	For inland surface waters and all beneficial uses, the WQO for pH is 6.5 (minimum) to 8.5 (maximum).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Water samples were collected at San Vicente Creek station 907SDSVC4; (Latitude 32.9934, Longitude -116.8498).
Temporal Representation:	Data was collected during 2002.
Environmental Conditions:	
QAPP Information:	Data collected and measured as per the SWAMP Quality Assurance Management Plan (QAMP).
QAPP Information Reference(s):	

DECISION ID 44543 **Region 9**

San Vicente Creek (San Diego County)

Pollutant:	**Total Nitrogen as N**	039904
Final Listing Decision:	**List on 303(d) list (TMDL required list)**	
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)	
Revision Status	Original	
Sources:	Source Unknown	
Expected TMDL Completion Date:	2021	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. (with update to table 3.1)

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Five of the five samples exceed the water quality criterion.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Five of five samples exceed the water quality criterion for total nitrogen and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 44543, Total Nitrogen as N **Region 9**

San Vicente Creek (San Diego County)

LOE ID:	31426
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	5
Number of Exceedances:	5
Data and Information Type:	Non-fixed station physical/chemical (conv + toxicants during key seasons and flows)
Data Used to Assess Water Quality:	Five of the 5 samples collected at San Vicente Creek show excessive nitrogen concentrations.
Data Reference:	Surface Water Ambient Monitoring Program Report on the San Diego Hydrologic Unit; Final Technical Report 2007
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial

	uses	039905
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin	
Spatial Representation:	Water samples were collected at San Vicente Creek station 907SDSVC4; (Latitude 32.9934, Longitude -116.8498).	
Temporal Representation:	Data was collected during 2002.	
Environmental Conditions:		
QAPP Information:	Data collected and measured as per the SWAMP Quality Assurance Management Plan (QAMP).	
QAPP Information Reference(s):		

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Boden Canyon
Water Body ID: CAR9055100020090204012532
Water Body Type: River & Stream

DECISION ID 43419 **Region 9**
Boden Canyon

Pollutant: **Benthic Community Effects**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Original
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: Benthic Community Effects is being considered for placement on the section 303(d) list under sections 3.9 and 3.2 of the Listing Policy. Under section 3.9, an additional line of evidence associating the Benthic Community Effects with a water or sediment concentration of pollutants is necessary to assess listing status. One line of evidence is available in the administrative record to assess this indicator. 1 of 2 samples exceeded the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing Benthic Community Effects in this water segment on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. 1 of 2 samples exceeded the Index of Biological Integrity (IBI) value of "poor" water quality for this area and this sample size is insufficient to determine with the power and confidence of the Listing Policy if standards are not met. A minimum of 5 samples is needed for application of Table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43419, Benthic Community Effects **Region 9**
Boden Canyon

LOE ID: 26849

Pollutant: Benthic Community Effects
LOE Subgroup: Adverse Biological Responses
Matrix: Water
Fraction: None

Beneficial Use: Warm Freshwater Habitat

Number of Samples: 2
Number of Exceedances: 1

Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Two samples of IBI data were taken on May 2001 at two sampling sites. Of the total number of samples, one sample exceeded the IBI impairment threshold.
Data Reference:	Fish and Game IBI Data
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at two sites: 905BCN1xx and 905BCN2xx on Boden Creek.
Temporal Representation:	Sampling occurred during one event on May 2001.
Environmental Conditions:	
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Project Plan for the California Stream Bioassessment Procedure and the State of California, California Monitoring an Assessment Program: "CMAP", Quality Assurance Project Plan.
QAPP Information Reference(s):	State of California, California Monitoring and Assessment Program: "CMAP". Quality Assurance Project Plan for the California Stream Bioassessment Procedure The San Diego Stream Team Quality Assurance Project Plan

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Cedar Creek (San Diego County)
Water Body ID: CAR9074100020090204013146
Water Body Type: River & Stream

DECISION ID 51651 **Region 9**
Cedar Creek (San Diego County)

Pollutant: Alkalinity as CaCO3
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of twenty-six samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51651, Alkalinity as CaCO3 **Region 9**
Cedar Creek (San Diego County)

LOE ID: 73177

Pollutant: Alkalinity as CaCO3
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Cold Freshwater Habitat

Number of Samples: 1

Number of Exceedances:	0	039909
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Alkalinity as CaCO3.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The Alkalinity as CaCO3 criteria for the protection of freshwater aquatic life is 20000 ug/L (National Recommended Water Quality Criteria, 2009).	
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology	
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]	
Temporal Representation:	Data was collected on a single day 5/12/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 51651, Alkalinity as CaCO3 **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73176
Pollutant:	Alkalinity as CaCO3
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Alkalinity as CaCO3.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Alkalinity as CaCO3 criteria for the protection of freshwater aquatic life is 20000 ug/L (National Recommended Water Quality Criteria, 2009).
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]

Temporal Representation:	Data was collected on a single day 5/12/2009.	039910
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID 51652 **Region 9**

Cedar Creek (San Diego County)

Pollutant:	**Aluminum**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51652, Aluminum **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73160
Pollutant:	Aluminum
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Aluminum.

Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	039911
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The National Recommended Water Quality Critiera for the protection of aquatic life from aluminum is the chronic continuous concentration (expressed as a 4-day average) of 87 ug/L.	
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology	
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]	
Temporal Representation:	Data was collected on a single day 5/12/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 51652, Aluminum **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73161
Pollutant:	Aluminum
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Aluminum.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The National Recommended Water Quality Critiera for the protection of aquatic life from aluminum is the chronic continuous concentration (expressed as a 4-day average) of 87 ug/L.
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51652, Aluminum **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73178
Pollutant:	Aluminum
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Aluminum.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for aluminum is 0.2 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 51653 **Region 9**

Cedar Creek (San Diego County)

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status. Under 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one water and zero of the one sediment samples exceed the CRITERIA and GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is

sufficient justification against placing this water segment-pollutant combination on the 2010 section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one water and zero of one sediment samples exceeded the CRITERIA and GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51653, Arsenic **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73169
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The dissolved arsenic criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved arsenic is 0.150 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51653, Arsenic **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73165	039914

Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for arsenic is 33 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51653, Arsenic **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73166
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce

	detrimental physiological responses in, human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for arsenic is 33 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51653, Arsenic **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73167
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The dissolved arsenic criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved arsenic is 0.150 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51653, Arsenic **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73168
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water

Matrix:	Water	039916
Fraction:	Total	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for arsenic is 0.01 mg/L (Title 22 of the California Code of Regulations).	
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]	
Temporal Representation:	Data was collected on a single day 5/12/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID 42271 Region 9

Cedar Creek (San Diego County)

Pollutant:	**Benthic Community Effects**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

Benthic Community Effects is being considered for placement on the CWA section 303(d) List under sections 3.9 and 3.1 of the Listing Policy. Under section 3.9, an additional line of evidence associating Benthic Community Effects with a water or sediment concentration of pollutant(s) is necessary to assess listing status.

Based on the readily available data and information, the weight of evidence provides sufficient justification for not placing Benthic Community Effects in this water segment on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used does not satisfy the data quantity requirements of section 6.1.5 of the Policy.
3. Pursuant to section 3.9 of the Listing Policy, the water does not exhibit significant degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index.
4. Pursuant to section 3.9 of the Listing Policy, the water segment does not have associated pollutant(s) samples that exceed water quality objectives.
5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not being met.

Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 42271, Benthic Community Effects **Region 9**

Cedar Creek (San Diego County)

LOE ID:	26850
Pollutant:	Benthic Community Effects
LOE Subgroup:	Adverse Biological Responses
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	One sample of IBI data was taken on May 2001 at one sampling site. Zero out of one sample exceeded the IBI impairment threshold.
Data Reference:	Fish and Game IBI Data
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	The sample was collected at one site: 907CCCCRx on Cedar Creek.
Temporal Representation:	Sampling occurred during one event on May 2001.
Environmental Conditions:	
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Project Plan for the California Stream Bioassessment Procedure and the State of California, California Monitoring an Assessment Program: "CMAP", Quality Assurance Project Plan.
QAPP Information Reference(s):	State of California, California Monitoring and Assessment Program: "CMAP". Quality Assurance Project Plan for the California Stream Bioassessment Procedure The San Diego Stream Team Quality Assurance Project Plan

Line of Evidence (LOE) for Decision ID 42271, Benthic Community Effects **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73171
Pollutant:	Benthic-Macroinvertebrate Bioassessments

LOE Subgroup:	Population/Community Degradation	039918
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Cold Freshwater Habitat	
Number of Samples:	2	
Number of Exceedances:	1	
Data and Information Type:	Benthic macroinvertebrate surveys	
Data Used to Assess Water Quality:	One of the two samples collected had an IBI score below 40. NPDES bioassessment	
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the State or Regional Board. Region 9 Basin Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions. The dataset uses the old 0-70 IBI scoring.	
Guideline Reference:		
Spatial Representation:	The samples were collected at stations REF-CC and REF-CC2, Cedar Creek.	
Temporal Representation:	The samples were collected in May 2003 and 2010.	
Environmental Conditions:		
QAPP Information:	The data was collected under the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan, June 25, 2009.	
QAPP Information Reference(s):	e-mail clarifying QAPP information	

Line of Evidence (LOE) for Decision ID 42271, Benthic Community Effects **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73170
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	One of the 1 IBIs score for this water body was below the level which indicates that this water body may be considered to have impaired conditions.
Data Reference:	RWB9 Status Sampling 2007 and 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.

Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	039919
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.	
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13	
Spatial Representation:	Samples were collected at the following station: (907CCCR02) Cedar Creek 2.	
Temporal Representation:	Survey done May 8, 2008.	
Environmental Conditions:		
QAPP Information:	Data collected following SWAMP QA protocols for the RWB9 Status Sampling 2007 and 2008 water quality monitoring project.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 42271, Benthic Community Effects **Region 9**

Cedar Creek (San Diego County)

LOE ID:	72757
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	The one sample collected had an IBI score above 40. The IBI score for this site was 69.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	Development of a Benthic Index of Biotic Integrity (B-IBI) for Wadeable Streams in Northern Coastal California and its Application to Regional 305(b) Assessment
Spatial Representation:	The samples were collected from Cedar Creek ~1.5mi above San Diego R.
Temporal Representation:	The sample was collected in May 2009.
Environmental Conditions:	
QAPP Information:	Samples were collected for the SWAMP RWB9 Stormwater Monitoring Council CY 2009 following SWAMP protocols and stored in the SWAMP database.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 42271, Benthic Community Effects **Region 9**

Cedar Creek (San Diego County) 039920

LOE ID:	79672
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Three samples were collected from three stations in Cedar Creek. All scores are above the 0.79 threshold, and therefore the site is not exceeding the water quality objective for the aquatic life beneficial use.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009 RWB9 Status Sampling 2007 and 2008 Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008. Region 9 CSCI Scores & Water Body Information
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.
Guideline Reference:	The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.
Spatial Representation:	Samples were collected at the following stations: 907S01418 907CCCRO2 907REF-CC
Temporal Representation:	Surveys done in 2003, 2008, 2009
Environmental Conditions:	
QAPP Information:	Data collected following SWAMP QA protocols for the RWB9 Status Sampling 2007 and 2008 water quality monitoring project, the County of San Diego NPDES MS4 Copermittees Receiving Waters Monitoring and Reporting Program, and the SWAMP RWB9 Stormwater Monitoring Council CY 2009.
QAPP Information Reference(s):	RWB9 Stormwater Monitoring Council CY 2009 RWB9 Status Sampling 2007 and 2008 Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.

DECISION ID 51655 **Region 9**

Cedar Creek (San Diego County)

Pollutant:	**Bifenthrin**	039921
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	
Last Listing Cycle's Final Listing Decision:	New Decision	
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51655, Bifenthrin **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73172
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Bifenthrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Bifenthrin does not exceed 0.0006 ug/L.

Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51655, Bifenthrin **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73173
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Bifenthrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Bifenthrin does not exceed 0.0006 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 51661 **Region 9**

Cedar Creek (San Diego County)

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence are available in the administrative record to assess this pollutant. Zero of the one water and zero of the one sediment sample exceed the CRITERIA and GUIDELINE. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one water and zero of one sediment sample exceeded the CRITERIA and GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51661, Cadmium **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73174
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for cadmium is 4.98 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]

Temporal Representation:	Data was collected on a single day 5/12/2009.	039924
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 51661, Cadmium **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73175
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for cadmium is 4.98 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51661, Cadmium **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73181
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING 039925
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Cadmium to protect aquatic life in freshwater. The dissolved Cadmium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51661, Cadmium **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73180
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for cadmium is 0.005 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51661, Cadmium **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73179
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Cadmium to protect aquatic life in freshwater. The dissolved Cadmium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 51662 **Region 9**

Cedar Creek (San Diego County)

Pollutant:	**Chloride**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence are available in the administrative record to assess this pollutant. Zero of the one sample exceed the OBJECTIVE. Based on the readily available data and information, the weight of evidence indicates that there is

sufficient justification against placing this water segment-pollutant combination on the 2002 section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the OBJECTIVE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51662, Chloride **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73185
Pollutant:	Chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chloride.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Chloride objective for the protection of aquatic life according to Table 3-2 for Cedar Creek (San Diego County) within the San Diego Hydrologic Unit is 50 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51662, Chloride **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73184

Pollutant:	Chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chloride.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The recommended secondary maximum contamination level acceptable to consumers of drinking water is 250 mg/L.
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51662, Chloride **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73182
Pollutant:	Chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chloride.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Chloride objective for the protection of aquatic life according to Table 3-2 for Cedar Creek (San Diego County) within the San Diego Hydrologic Unit is 50 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	039929
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 51664 Region 9

Cedar Creek (San Diego County)

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status. Under 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one water sample and zero of the one sediment sample exceed the CRITERIA and GUIDELINE. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one water and zero of one sediment sample exceeded the CRITERIA and GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51664, Chromium Region 9

Cedar Creek (San Diego County)

LOE ID:	73189
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total

Beneficial Use:	Municipal & Domestic Supply	039930
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for total chromium is 0.05 mg/L (Title 22 of the California Code of Regulations).	
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]	
Temporal Representation:	Data was collected on a single day 5/12/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 51664, Chromium **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73188
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium. Since the chromium species was not identified, the data point(s) were assessed using both the Chromium III criteria which is hardness-dependent, and the criterion continuous concentration (4-day average) to protect aquatic life in freshwater for chromium VI which is 11 ug/L and is not hardness dependent.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Chromium to protect aquatic life in freshwater. The dissolved Chromium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	

Guideline Reference:	039931
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51664, Chromium **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73190
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium. Since the chromium species was not identified, the data point(s) were assessed using both the Chromium III criteria which is hardness-dependent, and the criterion continuous concentration (4-day average) to protect aquatic life in freshwater for chromium VI which is 11 ug/L and is not hardness dependent.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved chromium to protect aquatic life in freshwater. The dissolved Chromium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51664, Chromium **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73186
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment

Fraction:	Total	039932
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for chromium is 111 mg/Kg dry weight (MacDonald et al. 2000).	
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31	
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]	
Temporal Representation:	Data was collected on a single day 5/12/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 51664, Chromium **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73187
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for

	sediment-dwelling organisms) for chromium is 111 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 51668 Region 9

Cedar Creek (San Diego County)

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status. Under 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one sediment sample and zero of the one water sample exceed the GUIDELINE and CRITERIA.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sediment sample and zero of one water sample exceeded the GUIDELINE and CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51668, Copper Region 9

Cedar Creek (San Diego County)

LOE ID:	73195
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	Dissolved	039934
Beneficial Use:	Cold Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved copper to protect aquatic life in freshwater. The dissolved copper criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]	
Temporal Representation:	Data was collected on a single day 5/12/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 51668, Copper **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73193
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Copper to protect aquatic life in freshwater. The dissolved Copper criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition

Evaluation Guideline:		039935
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]	
Temporal Representation:	Data was collected on a single day 5/12/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 51668, Copper Cedar Creek (San Diego County) **Region 9**

LOE ID:	73194
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for copper is 1.0 mg/L (Title 22 California Code of Regulations).
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51668, Copper Cedar Creek (San Diego County) **Region 9**

LOE ID:	73191
Pollutant:	Copper
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for copper is 149 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51668, Copper **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73192
Pollutant:	Copper
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for copper is 149 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.

Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 51669 **Region 9**

Cedar Creek (San Diego County)

Pollutant:	**Cyfluthrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. Zero of the one sample exceed the GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51669, Cyfluthrin **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73197
Pollutant:	Cyfluthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cyfluthrin, total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009

SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of lambda-cyhalothrin does not exceed 0.0005 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Mixtures of lambda-cyhalothrin and other pyrethroids should be considered in an additive manner. (Fojut et al. 2012)Â
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51669, Cyfluthrin **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73196
Pollutant:	Cyfluthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cyfluthrin, total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of lambda-cyhalothrin does not exceed 0.0005 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Mixtures of lambda-cyhalothrin and other pyrethroids should be considered in an additive manner. (Fojut et al. 2012)Â
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.

QAPP Information Reference(s): Surface Water Ambient Monitoring Program Quality Assurance Program Plan 039939

DECISION ID	51670	Region 9
Cedar Creek (San Diego County)		

Pollutant:	**Cyhalothrin, Lambda**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the GUIDELINE. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51670, Cyhalothrin, Lambda	**Region 9**
Cedar Creek (San Diego County)	

LOE ID:	73198
Pollutant:	Cyhalothrin, Lambda
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cyhalothrin, lambda, total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP

Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Cyhalothrin, lambda, total does not exceed 0.0005 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51670, Cyhalothrin, Lambda **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73199
Pollutant:	Cyhalothrin, Lambda
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cyhalothrin, lambda, total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Cyhalothrin, lambda, total does not exceed 0.0005 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 51673 **Region 9**

Cedar Creek (San Diego County)

Pollutant:	**Cypermethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. Zero of the one sample exceed the GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51673, Cypermethrin **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73201
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	One of one sample result was not used in the assessment because the laboratory data was non-detect and the method detection limit was above the guideline and therefore the results could not be quantified with the level of certainty required by the Listing Policy
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of cypermethrin does not exceed 0.0002 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Fojut et al. 2012)
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51673, Cypermethrin **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73200
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	One of one sample result was not used in the assessment because the laboratory data was non-detect and the method detection limit was above the guideline and therefore the results could not be quantified with the level of certainty required by the Listing Policy
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of cypermethrin does not exceed 0.0002 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Fojut et al. 2012)
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 51675 **Region 9**

Cedar Creek (San Diego County)

Pollutant:	**Deltamethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final	New Decision

Listing Decision:		039943
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51675, Deltamethrin **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73203
Pollutant:	Deltamethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Deltamethrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for Deltamethrin is the maximum acceptable toxicant concentration (MATC) of 0.02 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.

Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51675, Deltamethrin **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73202
Pollutant:	Deltamethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Deltamethrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for Deltamethrin is the maximum acceptable toxicant concentration (MATC) of 0.02 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 51677 **Region 9**

Cedar Creek (San Diego County)

Pollutant:	**Esfenvalerate/Fenvalerate**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51677, Esfenvalerate/Fenvalerate **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73204
Pollutant:	Esfenvalerate/Fenvalerate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Esfenvalerate/Fenvalerate, total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to the USEPA Office of Pesticide Programs Ecotoxicity database, the aquatic life EC50 for Esfenvalerate/Fenvalerate is 0.9 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51677, Esfenvalerate/Fenvalerate **Region 9**

Cedar Creek (San Diego County) 039946

LOE ID:	73205
Pollutant:	Esfenvalerate/Fenvalerate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Esfenvalerate/Fenvalerate, total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to the USEPA Office of Pesticide Programs Ecotoxicity database, the aquatic life EC50 for Esfenvalerate/Fenvalerate is 0.9 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 51679 **Region 9**

Cedar Creek (San Diego County)

Pollutant:	**Fenpropathrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.

2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51679, Fenpropathrin **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73207
Pollutant:	Fenpropathrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Fenpropathrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for Fenpropathrin is the median lethal concentration (LC50; 2.2 ug/L).
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51679, Fenpropathrin **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73206
Pollutant:	Fenpropathrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total

Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Fenpropathrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for Fenpropathrin is the median lethal concentration (LC50; 2.2 ug/L).
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 51680 Region 9

Cedar Creek (San Diego County)

Pollutant:	**Iron**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision

After review of the available data and information, RWQCB staff concludes that the water body-

Recommendation: pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51680, Iron **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73208
Pollutant:	Iron
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Iron.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Iron objective for the protection of aquatic life according to Table 3-2 for Cedar Creek (San Diego County) within the San Diego Hydrologic Unit is 0.3 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51680, Iron **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73210
Pollutant:	Iron
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to

	determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Iron.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Iron objective for the protection of aquatic life according to Table 3-2 for Cedar Creek (San Diego County) within the San Diego Hydrologic Unit is 0.3 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51680, Iron **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73209
Pollutant:	Iron
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Iron.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for iron is 0.3 mg/L (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 51725 Region 9

Cedar Creek (San Diego County) 039951

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status. Under 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one water sample and zero of the one sediment sample exceed the CRITERIA and GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one water sediment and zero of one sediment sample exceeded the CRITERIA and GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51725, Lead — Region 9

Cedar Creek (San Diego County)

LOE ID:	73211
Pollutant:	Lead
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP

Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for lead is 128 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51725, Lead **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73214
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved lead to protect aquatic life in freshwater. The dissolved lead criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51725, Lead **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73213

Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Lead to protect aquatic life in freshwater. The dissolved Lead criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51725, Lead **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73212
Pollutant:	Lead
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.

Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	039954
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for lead is 128 mg/Kg dry weight (MacDonald et al. 2000).	
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31	
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]	
Temporal Representation:	Data was collected on a single day 5/12/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID 51726 Region 9

Cedar Creek (San Diego County)

Pollutant:	**Manganese**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the CRITERIA.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51726, Manganese Region 9

Cedar Creek (San Diego County)

LOE ID:	73216
Pollutant:	Manganese
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved

Beneficial Use:	Cold Freshwater Habitat	039955
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Manganese.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Manganese objective for the protection of aquatic life according to Table 3-2 for Cedar Creek (San Diego County) within the San Diego Hydrologic Unit is 0.05 mg/L.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]	
Temporal Representation:	Data was collected on a single day 5/12/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 51726, Manganese **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73215
Pollutant:	Manganese
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Manganese.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for manganese is 0.05 mg/L (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.

Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51726, Manganese **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73217
Pollutant:	Manganese
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Manganese.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Manganese objective for the protection of aquatic life according to Table 3-2 for Cedar Creek (San Diego County) within the San Diego Hydrologic Unit is 0.05 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 51728 **Region 9**

Cedar Creek (San Diego County)

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status. Under 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one sediment sample and zero of the one water sample exceed the GUIDELINE and CRITERIA.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sediment sample and zero of one water sample exceeded the GUIDELINE and CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51728, Nickel **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73219
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for nickel is 48.6 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51728, Nickel **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73222
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Nickel to protect aquatic life in freshwater. The dissolved Nickel criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51728, Nickel **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73221
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009

SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nickel is 0.1 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51728, Nickel **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73220
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Nickel to protect aquatic life in freshwater. The dissolved Nickel criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51728, Nickel **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73218

Pollutant:	Nickel
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for nickel is 48.6 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 51736 Region 9

Cedar Creek (San Diego County)

Pollutant:	**Nitrate/Nitrite (Nitrite + Nitrate as N)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the CRITERIA.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the CRITERIA and this sample size is insufficient to determine, with

the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51736, Nitrate/Nitrite (Nitrite + Nitrate as N) **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73223
Pollutant:	Nitrate/Nitrite (Nitrite + Nitrate as N)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nitrate/Nitrite as N.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrate + nitrite (as N) is 10.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 51738 **Region 9**

Cedar Creek (San Diego County)

Pollutant:	**Nitrogen, Nitrite**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of

the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the CRITERIA.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51738, Nitrogen, Nitrite **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73224
Pollutant:	Nitrogen, Nitrite
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nitrite as N.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrite (as N) is 1.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **51737** 039963 **Region 9**

Cedar Creek (San Diego County)

Pollutant:	**Nitrogen, ammonia (Total Ammonia)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the GUIDELINE/CRITERIA.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples exceeded the GUIDELINE/CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51737, Nitrogen, ammonia (Total Ammonia) **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73164
Pollutant:	Nitrogen, ammonia (Total Ammonia)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Ammonia As N, Total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Basin Plan: No individual chemical or combination of chemicals shall be present in

	concentrations that adversely affect beneficial uses (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	EPA's Lifetime Health advisory level for total ammonia is 30.0 mg/L as stated on page 8 of the 2006 edition of the drinking water standards and health advisories. This Advisory Level is defined as "the concentration of a chemical in drinking water that is not expected to cause any adverse noncarcinogenic effects for up to ten days of exposure."
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51737, Nitrogen, ammonia (Total Ammonia) Region 9

Cedar Creek (San Diego County)

LOE ID:	73163
Pollutant:	Nitrogen, ammonia (Total Ammonia)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Ammonia as N, Total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Aquatic Life Ambient Water Quality Criteria for Ammonia â€“ Freshwater (USEPA 2013): the 30-day rolling average concentration (criterion continuous concentration or CCC) of total ammonia nitrogen(in mg TAN/L) in freshwater are not to be exceeded more than once every three years on average. The CCC values are based on pH and temperature. The CCC formula is found on page 46 and the table of CCC values is on page 49.
Guideline Reference:	Aquatic Life Ambient Water Quality Criteria for Ammonia - Freshwater 2013
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51737, Nitrogen, ammonia (Total Ammonia) Region 9

Cedar Creek (San Diego County)

LOE ID:	73162
Pollutant:	Nitrogen, ammonia (Total Ammonia)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Ammonia as N, Total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Aquatic Life Ambient Water Quality Criteria for Ammonia â€“ Freshwater (USEPA 2013): the 30-day rolling average concentration (criterion continuous concentration or CCC) of total ammonia nitrogen(in mg TAN/L) in freshwater are not to be exceeded more than once every three years on average. The CCC values are based on pH and temperature. The CCC formula is found on page 46 and the table of CCC values is on page 49.
Guideline Reference:	Aquatic Life Ambient Water Quality Criteria for Ammonia - Freshwater 2013
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 51739 Region 9

Cedar Creek (San Diego County)

Pollutant:	**Oxygen, Dissolved**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. One of the one sample exceed the OBJECTIVE. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that: 039966
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of one samples exceeded the OBJECTIVE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of twenty-six samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51739, Oxygen, Dissolved **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73226
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Oxygen, Dissolved.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan, San Diego Basin, Cold Water Habitat Objective, Chapter III, General Objectives for all Inland Surface Waters, Enclosed Bays and Estuaries states the following: The dissolved oxygen concentration for cold water habitats shall not be reduced below 8.0 mg/l at any time.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51739, Oxygen, Dissolved **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73225
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water

Matrix:	Water	039967
Fraction:	Dissolved	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Oxygen, Dissolved.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan, San Diego Basin, Warm Water Habitat Objective, Chapter III, General Objectives for all Inland Surface Waters, Enclosed Bays and Estuaries states the following: The dissolved oxygen concentration for warm water habitats shall not be reduced below 5.0 mg/l at any time.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]	
Temporal Representation:	Data was collected on a single day 5/12/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID 51740 Region 9

Cedar Creek (San Diego County)

Pollutant:	**Permethrin, total**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51740, Permethrin, total **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73228
Pollutant:	Permethrin, total
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Permethrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Permethrin does not exceed 0.002 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51740, Permethrin, total **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73227
Pollutant:	Permethrin, total
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Permethrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Permethrin does not exceed 0.002 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 51743 Region 9

Cedar Creek (San Diego County)

Pollutant:	**Selenium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the CRITERIA. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51743, Selenium **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73233
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Selenium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The selenium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater is 0.005 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51743, Selenium **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73231
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Selenium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP

Water Quality Objective/Criterion:	The selenium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater is 0.005 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51743, Selenium **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73232
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Selenium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The Maximum Contaminant Level for selenium in the Basin Plan is 0.01 mg/L.
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 51744 **Region 9**

Cedar Creek (San Diego County)

Pollutant:	**Silver**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised

Impairment from Pollutant or Pollution:	Pollutant	039972
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the CRITERIA. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.	
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.	

Line of Evidence (LOE) for Decision ID 51744, Silver Cedar Creek (San Diego County) **Region 9**

LOE ID:	73234
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Silver.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for silver is 0.1 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.

Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51744, Silver Cedar Creek (San Diego County) **Region 9**

LOE ID:	73236
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Silver.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Silver to protect aquatic life in freshwater. The dissolved Silver criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51744, Silver Cedar Creek (San Diego County) **Region 9**

LOE ID:	73235
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to

	determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Silver.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Silver to protect aquatic life in freshwater. The dissolved Silver criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 51746 Region 9

Cedar Creek (San Diego County)

Pollutant:	**Specific Conductivity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One lines of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the GUIDELINE. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of twenty-six samples is needed to determine if a beneficial use is fully supported using table 3.2. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51746, Specific Conductivity Region 9

Cedar Creek (San Diego County) 039975

LOE ID:	73237
Pollutant:	Specific Conductivity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Conductivity(Us).
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for specific conductance is 900 uS/cm (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 51748 **Region 9**

Cedar Creek (San Diego County)

Pollutant:	**Sulfates**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. One of the one samples exceed the OBJECTIVE. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.

3. One of one samples exceeded the OBJECTIVE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51748, Sulfates **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73238
Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Sulfate.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for sulfate is 250 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51748, Sulfates **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73239
Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Sulfate.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Sulfate objective for the protection of aquatic life according to Table 3-2 for Cedar Creek (San Diego County) within the San Diego Hydrologic Unit is 65 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51748, Sulfates **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73240
Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Sulfate.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Sulfate objective for the protection of aquatic life according to Table 3-2 for Cedar Creek (San Diego County) within the San Diego Hydrologic Unit is 65 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]

Temporal Representation:	Data was collected on a single day 5/12/2009.	039978
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID 51750 **Region 9**

Cedar Creek (San Diego County)

Pollutant:	**Temperature, water**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. One of the one sample exceed the GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of one sample exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of twenty-six samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51750, Temperature, water **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73241
Pollutant:	Temperature, water
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Water Temperature.

Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	039979
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Board that such alteration in temperature does not adversely affect beneficial uses. At no time or place shall the temperature of any COLD water be increased more than 5Â°F above the natural receiving water temperature.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	Inland Fishes of California (Moyle 1976) states that for rainbow trout the optimum range for growth and completion of most life stages is 13-21 degrees C (page 129).	
Guideline Reference:	Inland Fishes of California	
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]	
Temporal Representation:	Data was collected on a single day 5/12/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID 51752 Region 9

Cedar Creek (San Diego County)

Pollutant:	**Total Dissolved Solids**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. One of the one sample exceed the OBJECTIVE. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of one sample exceeded the OBJECTIVE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of twenty-six samples is needed to determine if a beneficial use is fully supported using table 3.2. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51752, Total Dissolved Solids Region 9

Cedar Creek (San Diego County)

LOE ID:	73243	039980

Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Dissolved Solids.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Dissolved Solids objective for the protection of aquatic life according to Table 3-2 for Cedar Creek (San Diego County) within the San Diego Hydrologic Unit is 300 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51752, Total Dissolved Solids **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73242
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Dissolved Solids.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	The California Secondary MCL for Dissolved Solids is 500 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51752, Total Dissolved Solids **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73244
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Dissolved Solids.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Dissolved Solids objective for the protection of aquatic life according to Table 3-2 for Cedar Creek (San Diego County) within the San Diego Hydrologic Unit is 300 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 51755 **Region 9**

Cedar Creek (San Diego County)

Pollutant:	**Toxicity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or	Pollutant

Pollution: 039982

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. One of the one sample exceed the GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of one sample exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51755, Toxicity **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73245
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate water toxicity. The sample exhibited significant toxicity. The toxicity test included survival and reproduction of Ceriodaphnia dubia. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL, Significant compared to negative control based on statistical test, less than stated alpha level, AND less than the evaluation threshold (both criteria are met).

Guideline Reference:	039983
Spatial Representation:	The sample was collected at station 907S01418.
Temporal Representation:	The sample was collected in May 2009.
Environmental Conditions:	
QAPP Information:	All data was collected following the Standard Operating Procedures and Data Quality Objectives outlined in the SWAMP QAMP, (Puckett, 2002). QA data are included in submission.
QAPP Information Reference(s):	

DECISION ID 51761 Region 9

Cedar Creek (San Diego County)

Pollutant:	**Turbidity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the OBJECTIVE. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one samples exceeded the OBJECTIVE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of twenty-six samples is needed to determine if a beneficial use is fully supported using table 3.2. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51761, Turbidity Region 9

Cedar Creek (San Diego County)

LOE ID:	73246
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Turbidity(NTU).
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Turbidity(NTU) objective for the protection of aquatic life according to Table 3-2 for Cedar Creek (San Diego County) within the San Diego Hydrologic Unit is 20 NTU.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51761, Turbidity **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73247
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Turbidity(NTU).
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Turbidity(NTU) objective for the protection of aquatic life according to Table 3-2 for Cedar Creek (San Diego County) within the San Diego Hydrologic Unit is 20 NTU.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.

DECISION ID 51829 Region 9

Cedar Creek (San Diego County)

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status. Under 3.6 at least two lines of evidence are necessary to assess listing status for pollutants in sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one water sample and zero of the one sediment sample exceed the CRITERIA and GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one water sample and zero of one sediment sample exceeded the CRITERIA and GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51829, Zinc Region 9

Cedar Creek (San Diego County)

LOE ID:	73159
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the

criterion for Zinc. 039986

Data Reference: RWB9 Stormwater Monitoring Council CY 2009

SWAMP Data: SWAMP

Water Quality Objective/Criterion: California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Zinc to protect aquatic life in freshwater. The dissolved Zinc criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.

Objective/Criterion Reference: Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]

Temporal Representation: Data was collected on a single day 5/12/2009.

Environmental Conditions: Staff is not aware of any special conditions that might affect interpretation of the data.

QAPP Information: The SWAMP QAPP (2008) was followed.

QAPP Information Reference(s): Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51829, Zinc **Region 9**

Cedar Creek (San Diego County)

LOE ID: 73157

Pollutant: Zinc
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 1
Number of Exceedances: 0

Data and Information Type: PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality: Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.

Data Reference: RWB9 Stormwater Monitoring Council CY 2009

SWAMP Data: SWAMP

Water Quality Objective/Criterion: No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan for the San Diego Basin).

Objective/Criterion Reference: Maximum Contaminant Levels for organic and inorganic chemicals. CCR

Evaluation Guideline: The California Secondary MCL for zinc is 5.0 mg/L (Title 22 California Code of Regulations).

Guideline Reference: Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.

Spatial Representation: Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]

Temporal Representation: Data was collected on a single day 5/12/2009.

Environmental Conditions: Staff is not aware of any special conditions that might affect interpretation of the data.

QAPP Information: The SWAMP QAPP (2008) was followed.

QAPP Information Reference(s): Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51829, Zinc **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73249
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for zinc is 459 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51829, Zinc **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73248
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be

	maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for zinc is 459 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51829, Zinc **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73158
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Zinc to protect aquatic life in freshwater. The dissolved Zinc criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 51742 **Region 9**

Cedar Creek (San Diego County)

Pollutant: pH

Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	039989
Last Listing Cycle's Final Listing Decision:	New Decision	
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the OBJECTIVE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the OBJECTIVE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of twenty-six samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51742, pH — Region 9

Cedar Creek (San Diego County)

LOE ID:	73230
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for pH.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	In inland surface waters the pH shall not be depressed below 6.5 nor raised above 8.5.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1

	monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418] 039990
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51742, pH **Region 9**

Cedar Creek (San Diego County)

LOE ID:	73229
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Cedar Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for pH.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	In inland surface waters the pH shall not be depressed below 6.5 nor raised above 8.5.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Cedar Creek (San Diego County) was collected at 1 monitoring site [Cedar Creek ~1.5mi above San Diego R. - 907S01418]
Temporal Representation:	Data was collected on a single day 5/12/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Cold Stream (San Diego County)
Water Body ID: CAR9093500020090204020154
Water Body Type: River & Stream

DECISION ID 42287 **Region 9**
Cold Stream (San Diego County)

Pollutant: Benthic Community Effects
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Original
Impairment from Pollutant or Pollution: Pollution

Regional Board Conclusion:

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 42287, Benthic Community Effects **Region 9**
Cold Stream (San Diego County)

LOE ID: 26851

Pollutant: Benthic Community Effects
LOE Subgroup: Adverse Biological Responses
Matrix: Water
Fraction: None

Beneficial Use: Warm Freshwater Habitat

Number of Samples: 6
Number of Exceedances: 3

Data and Information Type: Benthic macroinvertebrate surveys
Data Used to Assess Water Quality: Six samples of IBI data were taken on May 2001 to 2007 at one sampling site. Out of the total number of samples, three samples exceeded the IBI impairment threshold.
Data Reference: Fish and Game IBI Data
Southern California Postfire Study. Index of Biotic Integrity. 2007

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.
Objective/Criterion Reference: Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	The sample was collected at one site: 909CCCSPx on Cold Stream.
Temporal Representation:	Sampling occurred during six events from May 2001 to 2007.
Environmental Conditions:	
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Project Plan for the California Stream Bioassessment Procedure and the State of California, California Monitoring an Assessment Program: "CMAP", Quality Assurance Project Plan.
QAPP Information Reference(s):	State of California, California Monitoring and Assessment Program: "CMAP". Quality Assurance Project Plan for the California Stream Bioassessment Procedure The San Diego Stream Team Quality Assurance Project Plan

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Devils Canyon Creek
Water Body ID: CAR9014000020090204010850
Water Body Type: River & Stream

DECISION ID 42683 **Region 9**
Devils Canyon Creek

Pollutant: **Benthic Community Effects**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Original
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

Benthic Community Effects is being considered for placement on the section 303(d) list under sections 3.9 and 3.2 of the Listing Policy. Under section 3.9, an additional line of evidence associating the Benthic Community Effects with a water or sediment concentration of pollutants is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this indicator. 1 of 2 samples exceeded the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing Benthic Community Effects in this water segment on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. 1 of 2 samples exceeded the Index of Biological Integrity (IBI) value of "poor" water quality for this area and this sample size is insufficient to determine with the power and confidence of the Listing Policy if standards are not met. A minimum of 5 samples is needed for application of Table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because it cannot be determined if applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 42683, Benthic Community Effects **Region 9**
Devils Canyon Creek

LOE ID: 26852

Pollutant: Benthic Community Effects
LOE Subgroup: Adverse Biological Responses

Matrix:	Water	039994
Fraction:	None	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	2	
Number of Exceedances:	1	
Data and Information Type:	Benthic macroinvertebrate surveys	
Data Used to Assess Water Quality:	Two samples of IBI data were taken on May 2001 and June 2005 at one sampling site. Out of the total number of samples, one sample exceeded the IBI impairment threshold.	
Data Reference:	Fish and Game IBI Data	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)	
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13	
Spatial Representation:	The sample was collected at one site: 901DCCDCx on Devil Canyon Stream.	
Temporal Representation:	Sampling occurred during one event on May 2001 and one event on June 2005.	
Environmental Conditions:		
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Project Plan for the California Stream Bioassessment Procedure and the State of California, California Monitoring an Assessment Program: "CMAP", Quality Assurance Project Plan.	
QAPP Information Reference(s):	State of California, California Monitoring and Assessment Program: "CMAP". Quality Assurance Project Plan for the California Stream Bioassessment Procedure The San Diego Stream Team Quality Assurance Project Plan	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Wilson Creek (San Diego County)
Water Body ID: CAR9113000020090204021246
Water Body Type: River & Stream

DECISION ID 44677 **Region 9**
Wilson Creek (San Diego County)

Pollutant: **Benthic Community Effects**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: Benthic Community Effects is being considered for placement on the CWA section 303(d) List under sections 3.9 and 3.1 of the Listing Policy. Under section 3.9, an additional line of evidence associating Benthic Community Effects with a water or sediment concentration of pollutant(s) is necessary to assess listing status.

Based on the readily available data and information, the weight of evidence provides sufficient justification for not placing Benthic Community Effects in this water segment on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used does satisfy the data quantity requirements of section 6.1.5 of the Policy.
3. Pursuant to section 3.9 of the Listing Policy, the water does not exhibit significant degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index.
4. Pursuant to section 3.9 of the Listing Policy, the water segment does not have associated pollutant(s) samples that exceed water quality objectives.
5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not being met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 44677, Benthic Community Effects **Region 9**
Wilson Creek (San Diego County)

LOE ID: 79688

Pollutant: Benthic-Macroinvertebrate Bioassessments
LOE Subgroup: Population/Community Degradation
Matrix: Water
Fraction: None

Beneficial Use: Warm Freshwater Habitat
Aquatic Life Use: Cold Freshwater Habitat

Number of Samples:	2	039996
Number of Exceedances:	0	
Data and Information Type:	Benthic macroinvertebrate surveys	
Data Used to Assess Water Quality:	Two samples were taken at two stations in Wilson Creek. The CSCI scores for this site are above the 0.79 threshold, and therefore the site is not exceeding the water quality objective for the aquatic life beneficial use.	
Data Reference:	RWB9 Status Sampling 2007 and 2008 Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008. Region 9 CSCI Scores & Water Body Information	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.	
Guideline Reference:	The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.	
Spatial Representation:	Samples were collected at the following stations: 911TJWIL3, 911REF-WC	
Temporal Representation:	Surveys done in 2005 and 2008	
Environmental Conditions:		
QAPP Information:	Data collected following SWAMP QA protocols for the RWB9 Status Sampling 2007 and 2008 water quality monitoring project and the County of San Diego NPDES MS4 Copermittees Receiving Waters Monitoring and Reporting Program.	
QAPP Information Reference(s):	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.	

Line of Evidence (LOE) for Decision ID 44677, Benthic Community Effects **Region 9**

Wilson Creek (San Diego County)

LOE ID:	26861
Pollutant:	Benthic Community Effects
LOE Subgroup:	Adverse Biological Responses
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	One sample of IBI data was taken on May 2001 at one sampling site. Out of the total number of samples, no samples exceeded the IBI impairment threshold.
Data Reference:	Fish and Game IBI Data

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at one site: 911WLCABL on Wilson Creek.
Temporal Representation:	Sampling occurred during one event on May 2001.
Environmental Conditions:	
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Project Plan for the California Stream Bioassessment Procedure and the State of California, California Monitoring an Assessment Program: "CMAP", Quality Assurance Project Plan.
QAPP Information Reference(s):	State of California, California Monitoring and Assessment Program: "CMAP". Quality Assurance Project Plan for the California Stream Bioassessment Procedure The San Diego Stream Team Quality Assurance Project Plan

Line of Evidence (LOE) for Decision ID 44677, Benthic Community Effects **Region 9**

Wilson Creek (San Diego County)

LOE ID:	77192
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	The IBI score for this water body was 34 which indicates that this water body may be considered to have impaired conditions.
Data Reference:	RWB9 Status Sampling 2007 and 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.

Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal Californ039998eams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at the following station: 911TJWIL3-Wilson Creek 3.
Temporal Representation:	Surveys done May 6, 2008.
Environmental Conditions:	
QAPP Information:	Data collected following SWAMP QA protocols for the RWB9 Status Sampling 2007 and 2008 water quality monitoring project.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44677, Benthic Community Effects **Region 9**

Wilson Creek (San Diego County)

LOE ID:	77193
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	The one sample collected had an IBI score above 40. NPDES bioassessment
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the State or Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	
Spatial Representation:	The sample was collected at station REF-WC, Wilson Creek.
Temporal Representation:	The sample was collected in May 2005.
Environmental Conditions:	
QAPP Information:	The data was collected under the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan, June 25, 2009.
QAPP Information Reference(s):	e-mail clarifying QAPP information

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Wood Canyon (Orange County)
Water Body ID: CAR9011300020090204011348
Water Body Type: River & Stream

DECISION ID 52055 **Region 9**
Wood Canyon (Orange County)

Pollutant: Ammonia
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of eight samples exceeded the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of eight samples exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52055, Ammonia **Region 9**
Wood Canyon (Orange County)

LOE ID: 77206

Pollutant: Ammonia (Unionized)
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Warm Freshwater Habitat

Number of Samples: 8

Number of Exceedances:	0	040000
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Zero of eight averaged samples exceeded the water quality objective for unionized ammonia. Samples were reported as as total ammonia as nitrogen and were converted to unionized ammonia as nitrogen before being compared with the objective.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. The San Diego Basin Plan objective for unionized ammonia is 0.025 mg/L as N.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at station WC-WCT.	
Temporal Representation:	Samples were collected from August 2006 to April 2009.	
Environmental Conditions:		
QAPP Information:	A signed QAPP was included with the stated goal of ensuring the consistent collection of accurate water quality information that will used to satisfy the objectives of the Orange County Stormwater Program.	
QAPP Information Reference(s):		

DECISION ID 50550 Region 9

Wood Canyon (Orange County)

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of ten samples exceeded the criterion. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of ten samples exceeded the criterion and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50550, Arsenic **Region 9**

Wood Canyon (Orange County)

LOE ID:	77194
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	10
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the ten samples exceeded the water quality objective for arsenic.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The CTR for arsenic is 150 ug/L.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Wood Canyon Creek (WC-WCT).
Temporal Representation:	Samples were collected from WC-WCT in 2006 - weekly from August through September, and twice per year in Spring and Summer during 2007 and 2008, and on 4/28/2009.
Environmental Conditions:	All of the samples are representative of dry weather conditions.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID 50551 **Region 9**

Wood Canyon (Orange County)

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of ten samples did not exceed the criterion or objective. Based on the readily available data and information, the weight of evidence indicates that there is

sufficient justification against placing this water segment-pollutant combination on the 2002 section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of ten samples did not exceed the criterion or objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50551, Cadmium **Region 9**

Wood Canyon (Orange County)

LOE ID:	77195
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	10
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the ten samples exceeded the hardness adjusted water quality objective for cadmium.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Wood Canyon Creek (WC-WCT).
Temporal Representation:	Samples were collected from WC-WCT in 2006 - weekly from August through September, and twice per year in Spring and Summer during 2007 and 2008, and on 4/28/2009.
Environmental Conditions:	All of the samples are representative of dry weather conditions.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.

QAPP Information Reference(s): 040003

Line of Evidence (LOE) for Decision ID 50551, Cadmium **Region 9**

Wood Canyon (Orange County)

LOE ID:	77196
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	10
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the ten samples exceeded the water quality objective for cadmium.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Total cadmium levels should not exceed the California Department of Public Health Primary MCL of 5 ug/L.
Guideline Reference:	
Spatial Representation:	Samples were collected from Wood Canyon Creek (WC-WCT).
Temporal Representation:	Samples were collected from WC-WCT in 2006 - weekly from August through September, and twice per year in Spring and Summer during 2007 and 2008, and on 4/28/2009.
Environmental Conditions:	All of the samples are representative of dry weather conditions.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID 50582 **Region 9**

Wood Canyon (Orange County)

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of ten samples exceeded the criterion or guideline. Based on the readily available data and information, the weight of evidence indicates that there is

sufficient justification against placing this water segment-pollutant combination on the 2004 section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of ten samples exceeded the criterion or guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50582, Chlorpyrifos **Region 9**

Wood Canyon (Orange County)

LOE ID:	77197
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	10
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	None of ten samples exceed the continuous concentration for Chlorpyrifos criteria of 14.0 ng/L.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Criteria Continuous Concentration (four day average) for chlorpyrifos in freshwater is 14.0 ng/L. Ref12
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game
Spatial Representation:	Ten samples were collected at Wood Canyon (Orange County) site WC-WCT.
Temporal Representation:	Samples were collected from August and September of 2006, May and October of 2007 and 2008 and April 2009.
Environmental Conditions:	According to the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010, samples were collected during the dry season and storm events.
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 50582, Chlorpyrifos 040005 **Region 9**

Wood Canyon (Orange County)

LOE ID:	77198
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	10
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	None of ten samples exceed the USEPA Health Advisory 2011 ed., criteria for chlorpyrifos.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	USEPA Health Advisory 2011 ed., criteria for chlorpyrifos in freshwater is 2.0 ug/L (represents a life-time risk).
Guideline Reference:	2012 Edition of the Drinking Water Standards and Health Advisories
Spatial Representation:	Samples were collected at Wood Canyon (Orange County), site WC-WCT.
Temporal Representation:	Samples were collected from August and September of 2006, May and October of 2007 and 2008 and April 2009.
Environmental Conditions:	According to the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010, samples were collected during the dry season and storm events.
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown
QAPP Information Reference(s):	

DECISION ID 50575 **Region 9**

Wood Canyon (Orange County)

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of ten samples exceeded the criterion.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

040006

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of ten samples exceeded the criterion and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50575, Chromium **Region 9**

Wood Canyon (Orange County)

LOE ID:	77199
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	10
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the ten samples exceeded the hardness adjusted water quality objective for chromium.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Wood Canyon Creek (WC-WCT).
Temporal Representation:	Samples were collected from WC-WCT in 2006 - weekly from August through September, and twice per year in Spring and Summer during 2007 and 2008, and on 4/28/2009.
Environmental Conditions:	All of the samples are representative of dry weather conditions.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID 50576 Region 9

Wood Canyon (Orange County) 040007

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of ten samples exceeded the criterion. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of ten samples exceeded the criterion and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50576, Copper — Region 9

Wood Canyon (Orange County)

LOE ID:	77200
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	10
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the ten samples exceeded the hardness adjusted water quality objective for copper.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).

Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	040008
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.	
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Spatial Representation:	Samples were collected from Wood Canyon Creek (WC-WCT).	
Temporal Representation:	Samples were collected from WC-WCT in 2006 - weekly from August through September, and twice per year in Spring and Summer during 2007 and 2008, and on 4/28/2009.	
Environmental Conditions:	All of the samples are representative of dry weather conditions.	
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.	
QAPP Information Reference(s):		

DECISION ID 50552 **Region 9**

Wood Canyon (Orange County)

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of ten samples exceeded the criterion. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of ten samples exceeded the criterion. The sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50552, Lead **Region 9**

Wood Canyon (Orange County)

LOE ID:	77203
Pollutant:	Lead

LOE Subgroup:	Pollutant-Water	040009
Matrix:	Water	
Fraction:	Dissolved	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	10	
Number of Exceedances:	0	
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)	
Data Used to Assess Water Quality:	None of the ten samples exceeded the hardness adjusted water quality objective for lead.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.	
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Spatial Representation:	Samples were collected from Wood Canyon Creek (WC-WCT).	
Temporal Representation:	Samples were collected from WC-WCT in 2006 - weekly from August through September, and twice per year in Spring and Summer during 2007 and 2008, and on 4/28/2009.	
Environmental Conditions:	All of the samples are representative of dry weather conditions.	
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.	
QAPP Information Reference(s):		

DECISION ID **50584** **Region 9**

Wood Canyon (Orange County)

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of ten samples exceeded the guideline for warm freshwater and zero of nine exceeded the guideline for municipal and domestic use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.040010
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of ten samples exceeded the guideline for warm freshwater and zero of nine exceeded the guideline for municipal and domestic use. The sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50584, Malathion **Region 9**

Wood Canyon (Orange County)

LOE ID:	77960
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	None of nine samples exceed the CDPH notification level for Malathion criteria of 160.0 ug/L.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Department of Public Health (CDPH) archived advisory level criteria for malathion in drinking water is 160.0 ug/L.
Guideline Reference:	Water quality data for Temecula Creek, Murrieta Creek, and the Santa Margarita River, Temecula, CA
Spatial Representation:	Samples were collected at Wood Canyon (Orange County), site WC-WCT.
Temporal Representation:	Samples were collected from August and September of 2006, May and October of 2007 and 2008 and April 2009.
Environmental Conditions:	According to the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010, samples were collected during the dry season and storm events.
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 50584, Malathion **Region 9**

Wood Canyon (Orange County)

LOE ID:	77204

Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	10
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	None of ten samples exceed the maximum (Instantaneous) concentration for Malathion in freshwater of 100 ng/L.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The maximum (Instantaneous) concentration for Malathion in freshwater is 100 ng/L.
Guideline Reference:	Quality Criteria for Water. USEPA Office of Water and Hazardous Materials. Washington, D.C
Spatial Representation:	Ten samples were collected at Wood Canyon (Orange County) site WC-WCT.
Temporal Representation:	Samples were collected from August and September of 2006, May and October of 2007 and 2008 and April 2009.
Environmental Conditions:	According to the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010, samples were collected during the dry season and storm events.
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

DECISION ID 50578 Region 9

Wood Canyon (Orange County)

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of ten samples exceeded the criterion.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.

3. Zero of ten samples exceeded the criterion and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50578, Nickel **Region 9**
Wood Canyon (Orange County)

LOE ID:	77205
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	10
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the ten samples exceeded the hardness adjusted water quality objective for nickel.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Wood Canyon Creek (WC-WCT).
Temporal Representation:	Samples were collected from WC-WCT in 2006 - weekly from August through September, and twice per year in Spring and Summer during 2007 and 2008, and on 4/28/2009.
Environmental Conditions:	All of the samples are representative of dry weather conditions.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID **50586** **Region 9**
Wood Canyon (Orange County)

Pollutant: **Oxygen, Dissolved**

Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	040013
Last Listing Cycle's Final Listing Decision:	New Decision	
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of eight samples exceeded the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of eight samples exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50586, Oxygen, Dissolved **Region 9**

Wood Canyon (Orange County)

LOE ID:	77207
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Zero of 8 samples exceeded the objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Dissolved oxygen levels shall not be less than 5.0 mg/l in inland surface waters with designated MAR or WARM beneficial uses. The annual mean dissolved oxygen concentration shall not be less than 7 mg/l more than 10% of the time.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the WC-WCT station.

Temporal Representation:	Samples were collected approximately twice semi-annually from August 2006 to April 2009.
Environmental Conditions:	
QAPP Information:	NPDES quality assurance.
QAPP Information Reference(s):	

DECISION ID 50580 Region 9

Wood Canyon (Orange County)

Pollutant:	**Silver**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of ten samples exceeded the criterion.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of ten samples exceeded the criterion and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50580, Silver Region 9

Wood Canyon (Orange County)

LOE ID:	77210
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	10
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the ten samples exceeded the hardness adjusted water quality objective for silver.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.

SWAMP Data:	Non-SWAMP	040015
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion maximum concentrations for silver to protect aquatic life in freshwater (1-hour average). The dissolved silver criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.	
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Spatial Representation:	Samples were collected from Wood Canyon Creek (WC-WCT).	
Temporal Representation:	Samples were collected from WC-WCT in 2006 - weekly from August through September, and twice per year in Spring and Summer during 2007 and 2008, and on 4/28/2009.	
Environmental Conditions:	All of the samples are representative of dry weather conditions.	
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.	
QAPP Information Reference(s):		

DECISION ID	50581	Region 9
Wood Canyon (Orange County)		

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of ten samples exceeded the criterion. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of ten samples exceeded the criterion and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50581, Zinc 040016 **Region 9**

Wood Canyon (Orange County)

LOE ID:	77212
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	10
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the ten samples exceeded the hardness adjusted water quality objective for zinc.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Wood Canyon Creek (WC-WCT).
Temporal Representation:	Samples were collected from WC-WCT in 2006 - weekly from August through September, and twice per year in Spring and Summer during 2007 and 2008, and on 4/28/2009.
Environmental Conditions:	All of the samples are representative of dry weather conditions.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID 50599 **Region 9**

Wood Canyon (Orange County)

Pollutant:	**pH**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of ten samples exceeded the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of ten samples exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50599, pH **Region 9**

Wood Canyon (Orange County)

LOE ID:	77208
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	10
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Numeric data generated from 10 minimums and maximums of pH data had no exceedences.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The pH of all inland surface waters shall not be depressed below 6.5 or raised above 8.5 as a result of waste discharges.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the WC-WCT station.
Temporal Representation:	Samples were collected approximately semi-annually from August 2006 to April 2009.
Environmental Conditions:	
QAPP Information:	NPDES quality assurance.
QAPP Information Reference(s):	

DECISION ID 43928 **Region 9**

Wood Canyon (Orange County)

Pollutant:	**Benthic Community Effects**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final	Do Not List on 303(d) list (TMDL required list)(2012)

Listing Decision:		040018
Revision Status	Revised	
Sources:	Source Unknown	
Expected TMDL Completion Date:	2025	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

Benthic Community Effects is being considered for placement on the CWA section 303(d) List under sections 3.9 and 3.1 of the Listing Policy. Under section 3.9, an additional line of evidence associating Benthic Community Effects with a water or sediment concentration of pollutant(s) is necessary to assess listing status.

Based on the readily available data and information, the weight of evidence provides sufficient justification for placing Benthic Community Effects in this water segment on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Pursuant to section 3.9 of the Listing Policy, the water exhibits significant degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index. While sampling was limited to one station, the station was sampled over a period of four years with all samples exhibiting degradation.
4. Pursuant to section 3.9 of the Listing Policy, the water segment has associated pollutant(s) samples that exceed water quality objectives.
5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are being met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant(s) contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 43928, Benthic Community Effects **Region 9**

Wood Canyon (Orange County)

LOE ID:	26862
Pollutant:	Benthic Community Effects
LOE Subgroup:	Adverse Biological Responses
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	2
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Two samples of IBI data were taken on May 2001 at two sampling sites. Out of the total number of samples, two samples exceeded the IBI impairment threshold.
Data Reference:	Fish and Game IBI Data
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.

Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	040019
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)	
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13	
Spatial Representation:	Samples were collected at two sites: 901WC2MMx and 901WCEOTx on Wood Canyon Creek.	
Temporal Representation:	Sampling occurred during one event on May 2001.	
Environmental Conditions:		
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Project Plan for the California Stream Bioassessment Procedure and the State of California, California Monitoring an Assessment Program: "CMAP", Quality Assurance Project Plan.	
QAPP Information Reference(s):	State of California, California Monitoring and Assessment Program: "CMAP". Quality Assurance Project Plan for the California Stream Bioassessment Procedure The San Diego Stream Team Quality Assurance Project Plan	

Line of Evidence (LOE) for Decision ID 43928, Benthic Community Effects **Region 9**

Wood Canyon (Orange County)

LOE ID:	72797
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	6
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Six out of the six IBI scores were below 40. One station was sampled six times from 2006 to 2009. All of the IBI scores were below 20.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the State or Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	Development of a Benthic Index of Biotic Integrity (B-IBI) for Wadeable Streams in Northern Coastal California and its Application to Regional 305(b) Assessment
Spatial Representation:	

Temporal Representation:	040020
Environmental Conditions:	
QAPP Information:	County of Orange NPDES MS4 Copermittees Receiving Waters Monitoring and Reporting Program
QAPP Information Reference(s):	Quality Assurance Project Plan for the Orange County Stormwater Program.

Line of Evidence (LOE) for Decision ID 43928, Benthic Community Effects **Region 9**

Wood Canyon (Orange County)

LOE ID:	77211
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	10
Number of Exceedances:	6
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Ten samples were collected to test for toxicity. Six of the twelve samples exhibited statistically and biologically significant toxicity. The toxicity tests that exhibited significant toxicity included Ceriodaphnia survival and reproduction, Hyallela survival and Fathead Minnow survival.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control. Additionally, the biological significance of the sample is evaluated by determining whether the sample response is lower than the evaluation threshold.
Guideline Reference:	
Spatial Representation:	The sample was collected at station WC-WCT Wood Canyon Creek.
Temporal Representation:	The sample was collected from June 2006 to November 2009.
Environmental Conditions:	
QAPP Information:	The data collected under the Quality Assurance Management Plan for The Orange County Stormwater Program. The SWAMP measurement quality objectives were followed for toxicity data. The performance of toxicity bioassays and evaluation of reference toxicants were performed using USEPA and Standard Methods.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43928, Benthic Community Effects **Region 9**

Wood Canyon (Orange County)

LOE ID:	77209
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	7
Number of Exceedances:	7
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	All seven samples exceeded the water quality objective for selenium.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The CTR for selenium is 5.0 ug/L.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Wood Canyon Creek (WC-WCT).
Temporal Representation:	Samples were collected from WC-WCT in 2006 - weekly from August through September, and twice per year in Spring and Summer during 2007 and 2008, and on 4/28/2009.
Environmental Conditions:	All of the samples are representative of dry weather conditions.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43928, Benthic Community Effects **Region 9**

Wood Canyon (Orange County)

LOE ID:	80739
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	7
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	All seven samples were below the 0.79 threshold, and therefore exceeding the water quality objective for the aquatic life beneficial use.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009. Region 9 CSCI Scores & Water Body Information
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in

	a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.
Guideline Reference:	The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.
Spatial Representation:	
Temporal Representation:	
Environmental Conditions:	
QAPP Information:	County of Orange NPDES MS4 Copermittees Receiving Waters Monitoring and Reporting Program
QAPP Information Reference(s):	Quality Assurance Project Plan for the Orange County Stormwater Program.

Line of Evidence (LOE) for Decision ID 43928, Benthic Community Effects **Region 9**

Wood Canyon (Orange County)

LOE ID:	77201
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	10
Number of Exceedances:	2
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Two of ten samples exceed the continuous concentration for Diazinon criteria of 0.1 ug/L at .382 ug/L.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Samples were collected at Wood Canyon (Orange County) site WC-WCT.
Temporal Representation:	Samples were collected from August and September of 2006, May and October of 2007 and 2008 and April 2009.
Environmental Conditions:	According to the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010, samples were collected during the dry season and storm events.
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

DECISION ID 50583 Region 9

Wood Canyon (Orange County) 040023

Pollutant:	**Diazinon**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2027
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Two of the 10 samples exceed the continuous concentration for Diazinon criteria of 0.1 ug/L for the protection of aquatic life in fresh water. Six of ten samples exhibit significant toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Two of the 10 samples exceed the continuous concentration for Diazinon criteria of 0.1 ug/L for the protection of aquatic life in fresh water. Six of ten samples exhibit significant toxicity and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 50583, Diazinon — Region 9

Wood Canyon (Orange County)

LOE ID:	77211
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	10
Number of Exceedances:	6
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Ten samples were collected to test for toxicity. Six of the twelve samples exhibited statistically and biologically significant toxicity. The toxicity tests that exhibited significant toxicity included Ceriodaphnia survival and reproduction, Hyallela survival and Fathead Minnow survival.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control. Additionally, the biological significance of the sample is evaluated by determining whether the sample response is lower than the evaluation threshold.
Guideline Reference:	
Spatial Representation:	The sample was collected at station WC-WCT Wood Canyon Creek.
Temporal Representation:	The sample was collected from June 2006 to November 2009.
Environmental Conditions:	
QAPP Information:	The data collected under the Quality Assurance Management Plan for The Orange County Stormwater Program. The SWAMP measurement quality objectives were followed for toxicity data. The performance of toxicity bioassays and evaluation of reference toxicants were performed using USEPA and Standard Methods.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 50583, Diazinon **Region 9**

Wood Canyon (Orange County)

LOE ID:	77201
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	10
Number of Exceedances:	2
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Two of ten samples exceed the continuous concentration for Diazinon criteria of 0.1 ug/L at .382 ug/L.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Samples were collected at Wood Canyon (Orange County) site WC-WCT.
Temporal Representation:	Samples were collected from August and September of 2006, May and October of 2007 and 2008 and April 2009.
Environmental Conditions:	According to the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010, samples were collected during the dry season and storm events.
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

DECISION ID **50579** **Region 9**

Wood Canyon (Orange County)

Pollutant:	**Selenium**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2027
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Seven of the seven samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Seven of seven samples exceed the objective, and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 50579, Selenium **Region 9**

Wood Canyon (Orange County)

LOE ID:	77209
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	7
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	All seven samples exceeded the water quality objective for selenium.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.

	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The CTR for selenium is 5.0 ug/L.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Wood Canyon Creek (WC-WCT).
Temporal Representation:	Samples were collected from WC-WCT in 2006 - weekly from August through September, and twice per year in Spring and Summer during 2007 and 2008, and on 4/28/2009.
Environmental Conditions:	All of the samples are representative of dry weather conditions.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Lower Ysidora HSA, at Camp Pendleton
Water Body ID: CAC902110002009021114145 2
Water Body Type: Coastal & Bay Shoreline

DECISION ID 44483 **Region 9**
Pacific Ocean Shoreline, Lower Ysidora HSA, at Camp Pendleton

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Fourteen lines of evidence are available in the administrative record to assess this pollutant. Including the latest data, three of 90 samples exceed the water quality objective for total coliform of a SSM of 230/100ml for the protection of SHELL.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Including the latest data, three of 90 samples exceed the water quality objective for total coliform of a SSM of 230/100ml for the protection of SHELL and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 44483, Indicator Bacteria **Region 9**
Pacific Ocean Shoreline, Lower Ysidora HSA, at Camp Pendleton

LOE ID:	28057
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555

Number of Exceedances:	0	040028

Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were no beach advisory days for this section of shoreline. Bacteriological samples are collected on a weekly basis at ocean and bay locations in San Diego County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that an advisory for waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 - December 2007. Data used was the number of days the beach was advisories were issued when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Spatial Representation:	Bacteriological monitoring samples were collected at Camp del Mar, Camp Pendleton, CA.
Temporal Representation:	The beach advisory covers the time frame of January January 2001 to December 2007.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of San Diego's Quality Assessment/Quality Control document
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44483, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower Ysidora HSA, at Camp Pendleton

LOE ID:	27066
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	86
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 86 single samples were collected with 2 samples exceeded the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program,

	2007. AB 411 monitoring data 1999 to 2007	040029

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Camp del Mar, Camp Pendleton, California. Station identification number is EH-500.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44483, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower Ysidora HSA, at Camp Pendleton

LOE ID:	27067
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 86 single samples were collected with two samples correlated with a storm event. None of the two samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Camp del Mar, Camp Pendleton, California. Station identification number is EH-500.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.

	Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44483, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower Ysidora HSA, at Camp Pendleton

LOE ID:	27068
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	86
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 86 single samples were collected with no sample exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Camp del Mar, Camp Pendleton, California. Station identification number is EH-500.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44483, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower Ysidora HSA, at Camp Pendleton

LOE ID:	27069

Pollutant:	Total Coliform	040031
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	2	
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 86 single samples were collected with 2 samples correlated with a storm event. None of the 2 samples exceeded the single sample water quality objective.	
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Camp del Mar, Camp Pendleton, California. Station identification number is EH-500.	
Temporal Representation:	Samples were collected from June 2004 through October 2007.	
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44483, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower Ysidora HSA, at Camp Pendleton

LOE ID:	27070
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	50
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)

Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 50 single samples were collected with no sample exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Camp del Mar, Camp Pendleton, California. Station identification number is EH-500.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44483, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower Ysidora HSA, at Camp Pendleton

LOE ID:	31345
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	16
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 2002 through October 2007. A total of 51 dry month (April through October) single samples were collected with 16 dry month geomeans calculated. Zero of the 16 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Camp del Mar, Camp Pendleton, California. Station identification

	number is EH-500. 040033
Temporal Representation:	Samples were collected from July 2002 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44483, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower Ysidora HSA, at Camp Pendleton

LOE ID:	27072
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	86
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 to October 2007 with no sample exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Camp del Mar, Camp Pendleton, California. Station identification number is EH-500.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44483, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower Ysidora HSA, at Camp Pendleton

LOE ID:	27073
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation	040034
Number of Samples:	2	
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 86 single samples were collected with 2 samples correlated with a storm event. None of the 2 samples exceeded the single sample water quality objective.	
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005). Comparisons are also made for days with matching bacteria and storm event data. A storm event is defined as 0.2 inches of rainfall within a 72 hour period.	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Camp del Mar, Camp Pendleton, California. Station identification number is EH-500.	
Temporal Representation:	Samples were collected from June 2004 through October 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44483, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower Ysidora HSA, at Camp Pendleton

LOE ID:	27074
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	25
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through Ocotober 2007. A total of 86 single samples were collected with 25 monthly geomeans calculated. None of the 25 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Camp del Mar, Camp Pendleton, California. Station identification number is EH-500.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44483, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower Ysidora HSA, at Camp Pendleton

LOE ID:	27075
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	15
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 50 single samples were collected and 15 geomeans calculated. None of the 15 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Camp del Mar, Camp Pendleton, California. Station identification number is EH-500.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44483, Indicator Bacteria 040036 **Region 9**

Pacific Ocean Shoreline, Lower Ysidora HSA, at Camp Pendleton

LOE ID:	27076
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	25
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 86 single samples were collected with 25 monthly geomeans calculated. None of the 25 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Camp del Mar, Camp Pendleton, California. Station identification number is EH-500.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44483, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower Ysidora HSA, at Camp Pendleton

LOE ID:	30712
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	49
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through

	October 2007. A total of 50 single samples were collected of which 49 are dry weather (AB411) samples with no sample exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Camp del Mar, Camp Pendleton, California. Station identification number is EH-500.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44483, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower Ysidora HSA, at Camp Pendleton

LOE ID:	30817
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	84
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 86 single samples were collected of which 84 are dry weather (AB411) samples with no sample exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	

Guideline Reference:	040038
Spatial Representation:	Samples were collected at Camp del Mar, Camp Pendleton, California. Station identification number is EH-500.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44483, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower Ysidora HSA, at Camp Pendleton

LOE ID:	74779
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	4
Number of Exceedances:	1
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Beach Watch data for Pacific Ocean Shoreline, Lower Ysidora HSA, at Camp Pendleton to determine beneficial use support and results are as follows: 1 of 4 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Lower Ysidora HSA, at Camp Pendleton was collected at 1 monitoring site [Camp del Mar]
Temporal Representation:	Data was collected over the time period 4/18/2008-2/25/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44483, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower Ysidora HSA, at Camp Pendleton

LOE ID:	30579
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	84	040039
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 to October 2007 with a total of 86 samples of which 84 are dry weather (AB411) samples with zero samples exceeding the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Camp del Mar, Camp Pendleton, California. Station identification number is EH-500.	
Temporal Representation:	Samples were collected from June 2004 through October 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44483, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower Ysidora HSA, at Camp Pendleton

LOE ID:	31346
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	26
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 2002 through October 2007. A total of 87 dry month (April through October) single samples were collected with 26 dry month geomeans calculated. Zero of the 26 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005.

	Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Camp del Mar, Camp Pendleton, California. Station identification number is EH-500.
Temporal Representation:	Samples were collected from July 2002 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44483, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower Ysidora HSA, at Camp Pendleton

LOE ID:	27071
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 50 single samples were collected with one sample correlated with a storm event. The sample did not exceed the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Camp del Mar, Camp Pendleton, California. Station identification number is EH-500.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44483, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower Ysidora HSA, at Camp Pendleton

040041

LOE ID:	31309
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	26
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 87 single samples were collected with 26 monthly geomeans calculated. None of the 26 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Camp del Mar, Camp Pendleton, California. Station identification number is EH-500.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Batiquitos HSA, at Swamis Beach
Water Body ID: CAC904510002009021114241 1
Water Body Type: Coastal & Bay Shoreline

DECISION ID 43019 **Region 9**
Pacific Ocean Shoreline, Batiquitos HSA, at Swamis Beach

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Fifteen lines of evidence are available in the administrative record to assess this pollutant. With the latest data, three of the 76 samples collected during the AB411 period exceed the Water Quality Objective for enterococcus of a geomean of 35 /100 ml in a 30-day period for the protection of REC-1.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, three of the 76 samples collected during the AB411 period exceed the Water Quality Objective for enterococcus of a geomean of 35 /100 ml in a 30-day period for the protection of REC-1 and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 43019, Indicator Bacteria **Region 9**
Pacific Ocean Shoreline, Batiquitos HSA, at Swamis Beach

LOE ID: 27176

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 92

Number of Exceedances:	1	040043

Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. The number of samples collected for total coliform analysis was 92. Of the 92 samples, only one exceeded the single sample maximum total coliform standard.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005). Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Swami's Beach in the City of Encinitas, Batiquitos HSA. Station ID number is EH - 410. Lat/Long: 33.03443/ -117.29239.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43019, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at Swamis Beach

LOE ID:	27365
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. The number of samples collected for total coliform analysis was 92 with two samples correlated with a storm event. None of the samples exceeded the single sample maximum total coliform standard for shellfish harvesting.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan, the median total coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:	040044
Guideline Reference:	
Spatial Representation:	Samples were collected from Swami's Beach, in the City of Encinitas, Batiquitos HSA. Station ID number is EH - 410. Lat/Long: 33.03443/ -117.29239.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43019, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at Swamis Beach

LOE ID:	28032
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	8
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were eight beach advisory days for this section of shoreline. Bacteriological samples are collected on a weekly basis at ocean and bay locations in San Diego County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that an advisory for waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 - December 2007. Data used was the number of days the beach was advisories were issued when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	

Guideline Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Spatial Representation:	Bacteriological monitoring samples were collected at Swami's Beach, Cardiff by the Sea, CA.
Temporal Representation:	The beach advisory covers the time frame of January January 2001 to December 2007.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of San Diego's Quality Assessment/Quality Control document
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43019, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at Swamis Beach

LOE ID:	30558
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	91
Number of Exceedances:	5
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 92 single samples were collected of which 91 are dry weather (AB411) samples with five samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Swami's Beach, in the City of Encinitas, Batiquitos HSA. The station ID number is EH -410. Lat/Long: 33.03443/ -117.29239.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43019, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at Swamis Beach

LOE ID:	74585
Pollutant:	Fecal Coliform

LOE Subgroup:	Pollutant-Water	040046
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	50	
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Zero of the 50 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at the Swami's Beach site.	
Temporal Representation:	Samples were collected approximately once a week from April 2008 to August 2010.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the beach watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43019, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at Swamis Beach

LOE ID:	74584
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	50
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 50 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Swami Beach site.
Temporal Representation:	Samples were collected roughly once per week from April 2008 to August 2010.

Environmental Conditions:		040047
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43019, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at Swamis Beach

LOE ID:	27177
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	25
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. The number of samples collected for total coliform analysis was 92 with 25 monthly geomeans calculated. None of the geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005). Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Swami's Beach, in the City of Encinitas, Batiquitos HSA. Station ID number is EH - 410. Lat/Long: 33.03443/ -117.29239.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43019, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at Swamis Beach

LOE ID:	27196
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	16
Number of Exceedances:	0

Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 52 single samples were collected with 16 geomeans calculated. None of the geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Swami's Beach, in the City of Encinitas, Batiquitos HSA. Station ID number is EH - 410. Lat/Long: 33.03443/ -117.29239.
Temporal Representation:	Samples were collected from June 2004 through October 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43019, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at Swamis Beach

LOE ID:	27209
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 92 single samples were collected with one sample correlated with a storm event. The one sample did not exceed the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at Swami's Beach in the City of Encinitas, Batiquitos HSA. The station ID number is EH - 410. Lat/Long: 33.03443/ -117.29239.
Temporal Representation:	Samples were collectedfrom June 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43019, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at Swamis Beach

LOE ID:	27181
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from October 2004 through October 2007. A total of 52 single samples were collected with no samples correlated with a storm event.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Swami's Beach, in the City of Encinitas, Batiquitos HSA. The station ID number is EH - 410. Lat/Long: 33.03443/ -117.29239.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43019, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at Swamis Beach

LOE ID:	31252
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water

Matrix:	Water	040050
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	17	
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 2002 through October 2007. A total of 53 single samples were collected with 17 geomeans calculated. None of the 17 geomeans exceeded the geomean water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Swami's Beach, in the City of Encinitas, Batiquitos HSA. Station ID number is EH - 410. Lat/Long: 33.03443/ -117.29239.	
Temporal Representation:	Samples were collected from July 2002 through October 2006.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43019, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at Swamis Beach

LOE ID:	74586
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	59
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed BW data for Pacific Ocean Shoreline, Batiquitos HSA, at Swamis Beach to determine beneficial use support and results are as follows: 0 of 59 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Data for this line of evidence for Pacific Ocean Shoreline, Batiquitos HSA, at Swamis Beach was collected at 1 monitoring site [Swami's]
Temporal Representation: Data was collected over the time period 4/17/2008-8/24/2010.
Environmental Conditions: Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 43019, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at Swamis Beach

LOE ID: 27364

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Shellfish Harvesting

Number of Samples: 92
Number of Exceedances: 6

Data and Information Type: PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality: Shoreline beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. The number of samples collected for total coliform analysis was 92 with six of the samples exceeding the single sample maximum total coliform standard for shellfish harvesting.
Data Reference: Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: From the Ocean Plan, the median total coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml.
Objective/Criterion Reference: Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected fromSwami's Beach, in the City of Encinitas, Batiquitos HSA. Station ID number is EH - 410. Lat/Long: 33.03443/ -117.29239.
Temporal Representation: Samples were collected from June 2004 through October 2007.
Environmental Conditions:
QAPP Information: Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s): County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43019, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at Swamis Beach

LOE ID: 74587

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water

Matrix:	Water	040052
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	50	
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Zero of the 50 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at the Swami's Beach site.	
Temporal Representation:	Samples were collected roughly once per week from April 2008 to August 2010.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43019, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at Swamis Beach

LOE ID:	27178
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. The number of samples collected for total coliform analysis was 92 with only one sample correlated with a storm event. The one sample did not exceed the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005). Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:	040053
Guideline Reference:	
Spatial Representation:	Samples were collected at Swami's Beach, in the City of Encinitas, Batiquitos HSA. The station ID number is EH - 410. Lat/Long: 33.03443/ -117.29239.
Temporal Representation:	Samples were collected weekly from June 2004 through October 2007.
Environmental Conditions:	Comparisons were also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43019, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at Swamis Beach

LOE ID:	27208
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	25
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data were collected by the County of San Diego from June 2004 through October 2007. A total of 92 single samples were collected with 25 monthly geomeans calculated. Three of the 25 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Swami's Beach, in the City of Encinitas, Batiquitos HSA. Station ID number is EH - 410. Lat/Long: 33.03443/ -117.29239.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43019, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at Swamis Beach

LOE ID:	30794
Pollutant:	Total Coliform

LOE Subgroup:	Pollutant-Water	040054
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	91	
Number of Exceedances:	1	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. The number of samples collected for total coliform analysis was 92 of which 91 are dry weather (AB411) samples and only one exceeded the single sample maximum total coliform standard.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005). Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Swami's Beach in the City of Encinitas, Batiquitos HSA. Station ID number is EH - 410. Lat/Long: 33.03443/ -117.29239.	
Temporal Representation:	Samples were collected from June 2004 through October 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43019, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at Swamis Beach

LOE ID:	77591
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	50
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	None of the fifty samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria

	objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, Batiquitos HSA, at Swamis Beach.
Temporal Representation:	The samples were collected from April 2008 through August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43019, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at Swamis Beach

LOE ID:	31253
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	26
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 2002 through October 2007. A total of 93 dry month (April through October) single samples were collected with 26 dry month geomeans calculated. None of the 26 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005). Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Swami's Beach, in the City of Encinitas, Batiquitos HSA. Station ID number is EH - 410. Lat/Long: 33.03443/ -117.29239.
Temporal Representation:	Samples were collected from July 2002 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43019, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at Swamis Beach

LOE ID:	31251

Pollutant:	Enterococcus	040056
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	26	
Number of Exceedances:	3	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data were collected by the County of San Diego from July 2002 through October 2007. A total of 93 single samples were collected with 26 monthly geomeans calculated. Three of the 26 geomeans exceeded the geomean water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Swami's Beach, in the City of Encinitas, Batiquitos HSA. Station ID number is EH - 410. Lat/Long: 33.03443/ -117.29239.	
Temporal Representation:	Samples were collected from July 2002 through October 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43019, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at Swamis Beach

LOE ID:	27195
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	52
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 52 single samples were collected. None of samples exceeded the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml;

Objective/Criterion Reference:	Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005). Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Swami's Beach, in the City of Encinitas, Batiquitos HSA. Station ID number is EH - 410. Lat/Long: 33.03443/ -117.29239.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43019, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at Swamis Beach

LOE ID:	27197
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	92
Number of Exceedances:	5
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 92 single samples were collected with five samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Swami's Beach, in the City of Encinitas, Batiquitos HSA. The station ID number is EH -410. Lat/Long: 33.03443/ -117.29239.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, San Elijo HSA, at San Elijo State Beach (Pipes area)
Water Body ID: CAC904610002009021114320 4
Water Body Type: Coastal & Bay Shoreline

DECISION ID 43701 Region 9
Pacific Ocean Shoreline, San Elijo HSA, at San Elijo State Beach (Pipes area)

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Fourteen lines of evidence are available in the administrative record to assess this pollutant. With the latest data, zero of 158 geomean samples exceed the water quality objective for enterococcus for the protection of REC-1.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, zero of 158 geomean samples exceed the water quality objective for enterococcus for the protection of REC-1 and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 43701, Indicator Bacteria Region 9
Pacific Ocean Shoreline, San Elijo HSA, at San Elijo State Beach (Pipes area)

LOE ID: 27210

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 127

Number of Exceedances:	0	040059

Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from July 2005 through December 2007. The number of samples collected for total coliform analysis was 127. None of the 127 samples exceeded the single sample maximum total coliform standard.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005). Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the San Elijo State Beach Station, station id EH-400, in the San Elijo HSA. Lat/Long: 33.02597/ -117.28759.
Temporal Representation:	Samples were collected weekly from July 2005 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43701, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at San Elijo State Beach (Pipes area)

LOE ID:	27215
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	10
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from January 2007 through December 2007. The number of samples collected for total coliform analysis was 127. Of the 127 samples, 10 were correlated with a storm event. None of the samples exceeded the single sample maximum total coliform standard for shellfish harvesting.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan, the median total coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005.

	Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency 040060
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the San Elijo State Beach Station (Pipes area), station id EH-400, in the San Elijo HSA. Lat/Long: 33.02597/ -117.28759.
Temporal Representation:	Samples were collected weekly from January 2007 through December 2007.
Environmental Conditions:	Comparisons were also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43701, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at San Elijo State Beach (Pipes area)

LOE ID:	74738
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	134
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 134 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the San Elijo State Beach (Pipes area) site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43701, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at San Elijo State Beach (Pipes area)

LOE ID:	74737
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting

Number of Samples:	137
Number of Exceedances:	2
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed bw data for Pacific Ocean Shoreline, San Elijo HSA, at San Elijo State Beach (Pipes area) to determine beneficial use support and results are as follows: 2 of 137 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, San Elijo HSA, at San Elijo State Beach (Pipes area) was collected at 2 monitoring sites [San Elijo State Beach (EH-400), Pipes]
Temporal Representation:	Data was collected over the time period 1/2/2008-8/23/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43701, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at San Elijo State Beach (Pipes area)

LOE ID:	74736
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	134
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 134 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the San Elijo State Beach (Pipes Area) site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43701, Indicator Bacteria 040062 **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at San Elijo State Beach (Pipes area)

LOE ID:	74715
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	134
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 134 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the San Elijo State Beach (Pipes area) site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43701, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at San Elijo State Beach (Pipes area)

LOE ID:	77667
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	134
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Zero of the 134 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.

Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 040063009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, San Elijo HSA, at San Elijo State Beach (Pipes area).
Temporal Representation:	The samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43701, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at San Elijo State Beach (Pipes area)

LOE ID:	30646
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	117
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 2005 through December 2007. A total of 127 single samples were collected of which 117 are dry weather (AB411) samples . None of the samples exceeded the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the San Elijo State Beach Station (Pipes area), station id EH-400, in the San Elijo HSA. Lat/Long: 33.02597/ -117.28759.
Temporal Representation:	Samples were collected weekly from July 2005 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43701, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at San Elijo State Beach (Pipes area)

LOE ID:	30852
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water

Matrix:	Water	040064
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	117	
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from July 2005 through December 2007. The number of samples collected for total coliform analysis was 127 of which 117 are dry weather (AB411) samples and none of those samples exceeded the single sample maximum total coliform standard.	
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005). Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from the San Elijo State Beach Station, station id EH-400, in the San Elijo HSA. Lat/Long: 33.02597/ -117.28759.	
Temporal Representation:	Samples were collected weekly from July 2005 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43701, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at San Elijo State Beach (Pipes area)

LOE ID:	31202
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	18
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 2005 through October 2007. A total of 76 dry month (April through October) single samples were collected with 18 dry month geomeans calculated. None of the 18 geomeans exceeded the geomean water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005). Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the San Elijo State Beach Station (Pipes area), station id EH-400, in the San Elijo HSA. Lat/Long: 33.02597/ -117.28759.
Temporal Representation:	Samples were collected weekly from July 2005 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43701, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at San Elijo State Beach (Pipes area)

LOE ID:	31201
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	18
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 2005 through October 2007. A total of 76 dry month (April through October) single samples were collected with 18 dry month geomeans calculated. None of the 18 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the San Elijo State Beach Station (Pipes area), station id EH-400, in the San Elijo HSA. Lat/Long: 33.02597/ -117.28759.
Temporal Representation:	Samples were collected weekly from July 2005 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance

Line of Evidence (LOE) for Decision ID 43701, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at San Elijo State Beach (Pipes area)

LOE ID:	31200
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	18
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 2005 through October 2007. A total of 76 dry month (April through October) single samples were collected with 18 dry month geomeans calculated. None of the 18 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the San Elijo State Beach Station (Pipes area), station id EH-400, in the San Elijo HSA. Lat/Long: 33.02597/ -117.28759.
Temporal Representation:	Samples were collected weekly from July 2005 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43701, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at San Elijo State Beach (Pipes area)

LOE ID:	30745
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	117
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)

Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 2005 through December 2007. A total of 127 single samples were collected of which 117 are dry weather (AB411) samples . One of sample exceeded the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the San Elijo State Beach Station (Pipes area), station id EH-400, in the San Elijo HSA. Lat/Long: 33.02597/ -117.28759.
Temporal Representation:	Samples were collected weekly from July 2005 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43701, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at San Elijo State Beach (Pipes area)

LOE ID:	27218
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	127
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 2005 through December 2007. A total of 127 single samples were collected. None of samples exceeded the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the San Elijo State Beach Station (Pipes area), station id EH-400, in the San Elijo HSA. Lat/Long: 33.02597/ -117.28759.
Temporal Representation:	Samples were collected weekly from July 2005 through December 2007.

Environmental Conditions:	040068
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43701, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at San Elijo State Beach (Pipes area)

LOE ID:	27216
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	10
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from July 2005 through December 2007. The number of samples collected for total coliform analysis was 127 with 10 samples correlated with a storm event. None of the 10 samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005). Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the San Elijo State Beach Station (Pipes area), station id EH-400, in the San Elijo HSA. Lat/Long: 33.02597/ -117.28759.
Temporal Representation:	Samples were collected weekly from July 2005 through December 2007.
Environmental Conditions:	Comparisons were also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43701, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at San Elijo State Beach (Pipes area)

LOE ID:	27217
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation
Number of Samples:	24
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from July 2005 through December 2007. The number of samples collected for total coliform analysis was 127 with 24 geomeans calculated. None of the geomeans exceeded the geomean water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005). Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the San Elijo State Beach Station (Pipes area), station id EH-400, in the San Elijo HSA. Lat/Long: 33.02597/ -117.28759.
Temporal Representation:	Samples were collected weekly from July 2005 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43701, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at San Elijo State Beach (Pipes area)

LOE ID:	27214
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	127
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from July 2005 through December 2007. The number of samples collected for total coliform analysis was 127. Of the 157 samples, two exceeded the single sample maximum total coliform standard for shellfish harvesting.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan, the median total coliform density shall not exceed 70 per 100 ml, and

	not more than 10 percent of the samples shall exceed 230 per 100 ml. 040070
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the San Elijo State Beach Station (Pipes area), station id EH-400, in the San Elijo HSA. Lat/Long: 33.02597/ -117.28759.
Temporal Representation:	Samples were collected weekly from July 2005 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43701, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at San Elijo State Beach (Pipes area)

LOE ID:	27220
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	24
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 2005 through December 2007. A total of 127 single samples were collected with 24 geomeans calculated. None of the geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the San Elijo State Beach Station (Pipes area), station id EH-400, in the San Elijo HSA. Lat/Long: 33.02597/ -117.28759.
Temporal Representation:	Samples were collected weekly from July 2005 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43701, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at San Elijo State Beach (Pipes area)

LOE ID:	27219
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	10
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 2005 through December 2007. A total of 127 single samples were collected with 10 samples correlated with a storm event. None of the storm samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005). Comparisons to water quality objectives were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the San Elijo State Beach Station (Pipes area), station id EH-400, in the San Elijo HSA. Lat/Long: 33.02597/ -117.28759.
Temporal Representation:	Samples were collected weekly from July 2005 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43701, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at San Elijo State Beach (Pipes area)

LOE ID:	27221
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	127
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)

Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 2005 through December 2007. A total of 127 single samples were collected. None of the samples exceeded the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the San Elijo State Beach Station (Pipes area), station id EH-400, in the San Elijo HSA. Lat/Long: 33.02597/ -117.28759.
Temporal Representation:	Samples were collected weekly from July 2005 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43701, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at San Elijo State Beach (Pipes area)

LOE ID:	28241
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	110
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were 110 beach advisory days for this section of shoreline. Bacteriological samples are collected on a weekly basis at ocean and bay locations in San Diego County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that an advisory for waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 - December 2007. Data used was the number of days the beach was advisories were issued when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the

	Department, after taking into consideration the causes therefor, may at his discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Spatial Representation:	Beach advisories were from the San Elijo State Beach Station (Pipes area), station id EH-400, in the San Elijo HSA. Lat/Long: 33.02597/ -117.28759.
Temporal Representation:	The beach advisory covers the time frame of January January 2001 to December 2007.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of San Diego's Quality Assessment/Quality Control document
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43701, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at San Elijo State Beach (Pipes area)

LOE ID:	27222
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	10
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 2005 through December 2007. A total of 127 single samples were collected with 10 samples correlated with a storm event. None of the storm samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005). Comparisons to water quality objectives were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the San Elijo State Beach Station (Pipes area), station id EH-400, in the San Elijo HSA. Lat/Long: 33.02597/ -117.28759.
Temporal Representation:	Samples were collected weekly from July 2005 through December 2007.

Environmental Conditions:	040074
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43701, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at San Elijo State Beach (Pipes area)

LOE ID:	27224
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	24
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data were collected by the County of San Diego from July 2005 through December 2007. A total of 127 single samples were collected with 24 monthly geomeans calculated. None of the geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the San Elijo State Beach Station (Pipes area), station id EH-400, in the San Elijo HSA. Lat/Long: 33.02597/ -117.28759.
Temporal Representation:	Samples were collected weekly from July 2005 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, San Elijo HSA, at San Elijo State Beach (Main Entrance)
Water Body ID: CAC904610002009021115105 7
Water Body Type: Coastal & Bay Shoreline

DECISION ID 44346 Region 9
Pacific Ocean Shoreline, San Elijo HSA, at San Elijo State Beach (Main Entrance)

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Fourteen lines of evidence are available in the administrative record to assess this pollutant. With the latest data, zero of 168 geomean samples exceed the water quality objective for enterococcus for the protection of REC-1.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, zero of 168 geomean samples exceed the water quality objective for enterococcus for the protection of REC-1 and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 44346, Indicator Bacteria Region 9
Pacific Ocean Shoreline, San Elijo HSA, at San Elijo State Beach (Main Entrance)

LOE ID: 77666

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Shellfish Harvesting

Number of Samples: 133

Number of Exceedances:	0	040076

Data and Information Type: PATHOGEN MONITORING
Data Used to Assess Water Quality: Zero of the 133 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: The samples were collected at Pacific Ocean Shoreline, San Elijo HSA, at San Elijo State Beach (Main Entrance).
Temporal Representation: The samples were collected from January 2008 to August 2010.
Environmental Conditions:
QAPP Information: The samples were collected for the beach watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 44346, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at San Elijo State Beach (Main Entrance)

LOE ID: 74711

Pollutant: Enterococcus
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 133
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Zero of the 133 geomeans exceeded the objective.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at the San Elijo State Beach (Main Entrance) site.
Temporal Representation: Samples were collected from January 2008 to August 2010.
Environmental Conditions:
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 44346, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at San Elijo State Beach (Main Entrance) 040077

LOE ID:	74712
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	133
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 133 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the San Elijo State Beach (Main Entrance) site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44346, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at San Elijo State Beach (Main Entrance)

LOE ID:	74713
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	136
Number of Exceedances:	1
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed bw data for Pacific Ocean Shoreline, San Elijo HSA, at San Elijo State Beach (Main Entrance) to determine beneficial use support and results are as follows: 1 of 136 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	

Guideline Reference:	040078
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, San Elijo HSA, at San Elijo State Beach (Main Entrance) was collected at 2 monitoring sites [stairs near main entrance, San Elijo State Park SE-070]
Temporal Representation:	Data was collected over the time period 1/2/2008-8/23/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44346, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at San Elijo State Beach (Main Entrance)

LOE ID:	74714
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	133
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 133 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the San Elijo State Beach (Main Entrance) site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44346, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at San Elijo State Beach (Main Entrance)

LOE ID:	31319
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	26
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from May 2004 through

	October 2007. A total of 108 dry month (April through October) single samples were collected with 26 dry month geomeans calculated. None of the 26 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from San Elijo State Beach (Main Entrance), station id SE-070, in the San Elijo HSA. Lat/Long: 33.02053/ -117.28487.
Temporal Representation:	Samples were collected weekly from May 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44346, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at San Elijo State Beach (Main Entrance)

LOE ID:	31320
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	26
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from May 2004 through October 2007. A total of 108 dry month (April through October) single samples were collected with 26 dry month geomeans calculated. None of the 26 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from San Elijo State Beach (Main Entrance), station id SE-070, in the San Elijo HSA. Lat/Long: 33.02053/ -117.28487.

Temporal Representation:	Samples were collected weekly from May 2004 through October 2007. 040080
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44346, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at San Elijo State Beach (Main Entrance)

LOE ID:	31321
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	26
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from May 2004 through October 2007. A total of 108 dry month (April through October) single samples were collected with 26 dry month geomeans calculated. None of the 26 geomeans exceeded the geomean water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005). Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from San Elijo State Beach (Main Entrance), station id SE-070, in the San Elijo HSA. Lat/Long: 33.02053/ -117.28487.
Temporal Representation:	Samples were collected weekly from May 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44346, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at San Elijo State Beach (Main Entrance)

LOE ID:	30744
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation
Number of Samples:	170
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 188 single samples were collected of which 170 are dry weather (AB411) samples with three of the samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from San Elijo State Beach (Main Entrance), station id SE-070, in the San Elijo HSA. Lat/Long: 33.02053/ -117.28487.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44346, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at San Elijo State Beach (Main Entrance)

LOE ID:	30851
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	170
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. The number of samples collected for total coliform analysis was 188 of which 170 are dry weather (AB411) samples and none of those samples exceeded the single sample maximum total coliform standard.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).

Objective/Criterion Reference:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100 ml; Geomean: Total coliform density shall not exceed 1,000 per 100 ml; Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from San Elijo State Beach (Main Entrance), station id SE-070, in the San Elijo HSA. Lat/Long: 33.02053/ -117.28487.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44346, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at San Elijo State Beach (Main Entrance)

LOE ID:	30645
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	170
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 188 single samples were collected of which 170 are dry weather (AB411) samples with one of the samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from San Elijo State Beach (Main Entrance), station id SE-070, in the San Elijo HSA. Lat/Long: 33.02053/ -117.28487.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44346, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at San Elijo State Beach (Main Entrance) 040083

LOE ID:	27263
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	188
Number of Exceedances:	9
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. The number of samples collected for total coliform analysis was 188. Of the 188 samples, nine exceeded the single sample maximum total coliform standard for shellfish harvesting.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan, the median total coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from San Elijo State Beach (Main Entrance), station id SE-070, in the San Elijo HSA. Lat/Long: 33.02053/ -117.28487.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44346, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at San Elijo State Beach (Main Entrance)

LOE ID:	27264
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	188
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. The number of samples collected for total coliform analysis was 188. None of the 188 samples exceeded the single sample maximum total coliform standard.

Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005). Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from San Elijo State Beach (Main Entrance), station id SE-070, in the San Elijo HSA. Lat/Long: 33.02053/ -117.28487.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44346, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at San Elijo State Beach (Main Entrance)

LOE ID:	27358
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	188
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 188 single samples were collected with four of the samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from San Elijo State Beach (Main Entrance), station id SE-070, in the San Elijo HSA. Lat/Long: 33.02053/ -117.28487.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	

QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44346, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at San Elijo State Beach (Main Entrance)

LOE ID:	27360
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	35
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data were collected by the County of San Diego from January 2004 through December 2007. A total of 188 single samples were collected with 35 monthly geomeans calculated. None of the geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from San Elijo State Beach (Main Entrance), station id SE-070, in the San Elijo HSA. Lat/Long: 33.02053/ -117.28487.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44346, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at San Elijo State Beach (Main Entrance)

LOE ID:	27359
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	18

Number of Exceedances:	3	040086

Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 188 single samples were collected with 18 samples correlated with a storm event. Three of the storm samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005). Comparisons to water quality objectives were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from San Elijo State Beach (Main Entrance), station id SE-070, in the San Elijo HSA. Lat/Long: 33.02053/ -117.28487.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44346, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at San Elijo State Beach (Main Entrance)

LOE ID:	27291
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	35
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 188 single samples were collected with 35 geomeans calculated. None of the geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005.

	Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency 040087
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from San Elijo State Beach (Main Entrance), station id SE-070, in the San Elijo HSA. Lat/Long: 33.02053/ -117.28487.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44346, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at San Elijo State Beach (Main Entrance)

LOE ID:	27265
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	18
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. The number of samples collected for total coliform analysis was 188. Eighteen of the 188 samples correlated with a storm event. None of the 18 samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005). Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from San Elijo State Beach (Main Entrance), station id SE-070, in the San Elijo HSA. Lat/Long: 33.02053/ -117.28487.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	Comparisons were also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44346, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at San Elijo State Beach (Main Entrance) 040088

LOE ID:	27267
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	188
Number of Exceedances:	6
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 188 single samples were collected with six of the samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from San Elijo State Beach (Main Entrance), station id SE-070, in the San Elijo HSA. Lat/Long: 33.02053/ -117.28487.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44346, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at San Elijo State Beach (Main Entrance)

LOE ID:	28240
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were no beach advisory days for this section of shoreline. Bacteriological samples are collected on a weekly basis at ocean and bay locations in San Diego County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that an advisory for waters have exceeded public health standards.

	Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 - December 2007. Data used was the number of days the beach was advisories were issued when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Spatial Representation:	Beach advisories were posted at San Elijo State Beach main entrance in Cardiff-by-the-Sea, CA.
Temporal Representation:	The beach advisory covers the time frame of January January 2001 to December 2007.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of San Diego's Quality Assessment/Quality Control document
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44346, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at San Elijo State Beach (Main Entrance)

LOE ID:	27249
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	18
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. The number of samples collected for total coliform analysis was 188. Of the 188 samples, 18 were correlated with a storm event. Of the 18 storm samples only eight exceeded the single sample maximum total coliform standard for shellfish harvesting.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	From the Ocean Plan, the median total coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from San Elijo State Beach (Main Entrance), station id SE-070, in the San Elijo HSA. Lat/Long: 33.02053/ -117.28487.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	Comparisons were also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44346, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at San Elijo State Beach (Main Entrance)

LOE ID:	27280
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	18
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 188 single samples were collected with 8 samples correlated with a storm event. Three of the storm samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005). Comparisons to water quality objectives were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from San Elijo State Beach (Main Entrance), station id SE-070, in the San Elijo HSA. Lat/Long: 33.02053/ -117.28487.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.

Environmental Conditions:	040091
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44346, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at San Elijo State Beach (Main Entrance)

LOE ID:	27266
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	34
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. The number of samples collected for total coliform analysis was 188 with 34 geomeans calculated. None of the geomeans exceeded the geomean water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005). Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from San Elijo State Beach (Main Entrance), station id SE-070, in the San Elijo HSA. Lat/Long: 33.02053/ -117.28487.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Rancho Santa Fe HSA, at Powerhouse Park
Water Body ID: CAC905110002009021623011 4
Water Body Type: Coastal & Bay Shoreline

DECISION ID 44264 Region 9
Pacific Ocean Shoreline, Rancho Santa Fe HSA, at Powerhouse Park

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Fifteen lines of evidence are available in the administrative record to assess this pollutant. With the latest data, one of 98 samples exceed the water quality objective for enterococcus of a geomean of 35/100ml in a 30-day period for the protection of REC-1.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, one of 98 samples exceed the water quality objective for enterococcus of a geomean of 35/100ml in a 30-day period for the protection of REC-1 and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 44264, Indicator Bacteria Region 9
Pacific Ocean Shoreline, Rancho Santa Fe HSA, at Powerhouse Park

LOE ID: 27103

Pollutant: Fecal Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 107

Number of Exceedances:	2	040093
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 107 single samples were collected with two samples exceeding the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at 15th St. Del Mar City Beach, Del Mar, California. Station identification number is EH-360.	
Temporal Representation:	Samples were collected from January 2004 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44264, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Rancho Santa Fe HSA, at Powerhouse Park

LOE ID:	27104
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 107 single samples were collected with three samples correlated with a storm event. No sample exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).

Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at 15th St. Del Mar City Beach, Del Mar, California. Station identification number is EH-360.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44264, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Rancho Santa Fe HSA, at Powerhouse Park

LOE ID:	27105
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	169
Number of Exceedances:	5
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 169 single samples were collected with 5 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at 15th St. Del Mar City Beach, Del Mar, California. Station identification number is EH-360.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	

QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44264, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Rancho Santa Fe HSA, at Powerhouse Park

LOE ID:	27106
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	5
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 169 single samples were collected with five samples correlated with a storm event. One of the five samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at 15th St. Del Mar City Beach, Del Mar, California. Station identification number is EH-360.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44264, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Rancho Santa Fe HSA, at Powerhouse Park

LOE ID:	27107
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	040096
Beneficial Use:	Water Contact Recreation	
Number of Samples:	40	
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 169 single samples were collected with 40 monthly geomeans calculated. None of the 40 geomeans exceeded the geomean water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at 15th St. Del Mar City Beach, Del Mar, California. Station identification number is EH-360.	
Temporal Representation:	Samples were collected from January 2004 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44264, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Rancho Santa Fe HSA, at Powerhouse Park

LOE ID:	27108
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	26
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 107 single samples were collected and 26 geomeans calculated. None of the 26 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml;

	Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at 15th St. Del Mar City Beach, Del Mar, California. Station identification number is EH-360.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44264, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Rancho Santa Fe HSA, at Powerhouse Park

LOE ID:	27109
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	40
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 169 single samples were collected with 40 monthly geomeans calculated. One of the 40 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml.
	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at 15th St. Del Mar City Beach, Del Mar, California. Station identification number is EH-360.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance

Line of Evidence (LOE) for Decision ID 44264, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Rancho Santa Fe HSA, at Powerhouse Park

LOE ID:	28208
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were two beach advisory days for this location. Bacteriological samples are collected on a weekly basis from April through October. When a bacteriological sample exceeds water quality standards, signs are posted indicating that waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 to December 2007. Data used was the number of days the beach was posted with an Advisory when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	County of Orange. March 2007. Annual Ocean and Bay Water Quality Report, 2006 Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Spatial Representation:	Bacteriological monitoring samples were collected at the shoreline near Powerhouse Park in Del Mar, CA.
Temporal Representation:	The beach advisory covers the time frame of January 2001 -December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44264, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Rancho Santa Fe HSA, at Powerhouse Park

LOE ID:	30722	040099

Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	104
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 107 single samples were collected of which 104 are dry weather (AB411) samples with two samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at 15th St. Del Mar City Beach, Del Mar, California. Station identification number is EH-360.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44264, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Rancho Santa Fe HSA, at Powerhouse Park

LOE ID:	30827
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	164
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 169 single samples were collected of which 164 are dry weather (AB411) samples with one sample exceeding the single sample water quality objective.

Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at 15th St. Del Mar City Beach, Del Mar, California. Station identification number is EH-360.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44264, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Rancho Santa Fe HSA, at Powerhouse Park

LOE ID:	31239
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	25
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 107 dry month (April through October) single samples were collected with 25 dry month geomeans calculated. One of the 25 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at 15th St. Del Mar City Beach, Del Mar, California. Station identification number is EH-360.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44264, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Rancho Santa Fe HSA, at Powerhouse Park

LOE ID:	31240
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	16
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 65 dry month (April through October) single samples were collected with 16 dry month geomeans calculated. None of the 16 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at 15th St. Del Mar City Beach, Del Mar, California. Station identification number is EH-360.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44264, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Rancho Santa Fe HSA, at Powerhouse Park

LOE ID:	31241
Pollutant:	Total Coliform

LOE Subgroup:	Pollutant-Water	040102
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	25	
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 25 dry month (April through October) single samples were collected with 25 dry month geomeans calculated. None of the 25 geomeans exceeded the geomean water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at 15th St. Del Mar City Beach, Del Mar, California. Station identification number is EH-360.	
Temporal Representation:	Samples were collected from June 2004 through October 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44264, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Rancho Santa Fe HSA, at Powerhouse Park

LOE ID:	75023
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	58
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 58 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.

Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009 040123

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at the Powerhouse Park, Del Mar site.
Temporal Representation: Samples were collected from January 2008 to August 2010.
Environmental Conditions:
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 44264, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Rancho Santa Fe HSA, at Powerhouse Park

LOE ID: 75046

Pollutant: Fecal Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 58
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Zero of the 58 geomeans exceeded the objective.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at the Powerhouse Park, Del Mar site.
Temporal Representation: Samples were collected from January 2008 to August 2010.
Environmental Conditions:
QAPP Information: The samples were collected for the beach watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 44264, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Rancho Santa Fe HSA, at Powerhouse Park

LOE ID: 75047

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Shellfish Harvesting

Number of Samples: 78
Number of Exceedances: 1

Data and Information Type: PATHOGEN MONITORING

Data Used to Assess Water Quality:	Water Board staff assessed Beach Watch data for Pacific Ocean Shoreline, Rancho Santa Fe HSA, at Powerhouse Park to determine beneficial use support and results are as follows: 1 of 78 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Rancho Santa Fe HSA, at Powerhouse Park was collected at 1 monitoring site [15th St. near outlet]
Temporal Representation:	Data was collected over the time period 1/15/2008-8/31/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44264, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Rancho Santa Fe HSA, at Powerhouse Park

LOE ID:	75048
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	58
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 58 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Powerhouse Park, Del Mar site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44264, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Rancho Santa Fe HSA, at Powerhouse Park

LOE ID:	27102

Pollutant:	Total Coliform	040105
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	5	
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 169 single samples were collected with five samples correlated with a storm event. None of the five samples exceeded the single sample water quality objective.	
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at 15th St. Del Mar City Beach, Del Mar, California. Station identification number is EH-360.	
Temporal Representation:	Samples were collected from January 2004 through December 2007.	
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44264, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Rancho Santa Fe HSA, at Powerhouse Park

LOE ID:	27100
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	169

Number of Exceedances:	1	040106

Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 169 single samples were collected with one sample exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at 15th St. Del Mar City Beach, Del Mar, California. Station identification number is EH-360.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44264, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Rancho Santa Fe HSA, at Powerhouse Park

LOE ID:	27099
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	5
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 169 single samples were collected with five samples correlated with a storm event. Two of the five samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).

	Comparisons are also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at 15th St. Del Mar City Beach, Del Mar, California. Station identification number is EH-360.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44264, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Rancho Santa Fe HSA, at Powerhouse Park

LOE ID:	77652
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	57
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Zero of the 57 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, Rancho Santa Fe HSA, at Powerhouse Park.
Temporal Representation:	The samples were collected from January 2008 to August 2010.
Environmental Conditions:	

QAPP Information:	The samples were collected for the beach watch program.	040108
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44264, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Rancho Santa Fe HSA, at Powerhouse Park

LOE ID:	30612
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	164
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 169 single samples were collected of which 164 are dry weather (AB411) samples with four samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at 15th St. Del Mar City Beach, Del Mar, California. Station identification number is EH-360.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44264, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Rancho Santa Fe HSA, at Powerhouse Park

LOE ID:	27098
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting

Number of Samples:	169	040109
Number of Exceedances:	11	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 169 single samples were collected with 11 samples exceeded the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at 15th St. Del Mar, Del Mar City Beach, California. Station identification number is EH-360.	
Temporal Representation:	Samples were collected from January 2004 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

DECISION ID 49917 Region 9

Pacific Ocean Shoreline, Rancho Santa Fe HSA, at Powerhouse Park

Pollutant:	**Trash**
Final Listing Decision:	**List on 303(d) list (being addressed by action other than TMDL)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected Attainment Date:	2029
Implementation Action Other than TMDL:	Collected effort of public, agencies, organizations, and permittees. Methods include street sweeping, education programs on littering, installation of trash-catching devices on storm drains.
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.7 of the Listing Policy. Under this section when all other listing factors do not result in the listing of a water segment but information indicates non-attainment of standards, a water segment shall be evaluated to determine whether the weight of evidence demonstrates that water quality standard is not attained. If the weight of evidence indicates non-attainment, the water segment shall be placed on the CWA section 303(d) List.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for placing this water segment-pollutant combination from the CWA section 303(d) List. This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The following information indicates that the water quality standard is not being attained: Coastkeeper cleanups occurred on 5/10/08, 5/9/09, and 5/8/10 for this water body. The total weight of trash (lbs) collected on these dates was 484.5. Using the metric, Coastkeeper classified this water body as low for trash impairment. However, any trash found is an exceedance and needs to be addressed by an action other than a TMDL.

3. This process is scientifically defensible and reproducible. 040110

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49917, Trash **Region 9**

Pacific Ocean Shoreline, Rancho Santa Fe HSA, at Powerhouse Park

LOE ID:	75049
Pollutant:	Trash
LOE Subgroup:	Pollutant-Nuisance
Matrix:	Not Recorded
Fraction:	None
Beneficial Use:	Non-Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Occurrence of conditions judged to cause impairment
Data Used to Assess Water Quality:	The San Diego Coastkeeper conducts trash cleanups and uses a metric (pounds of trash collected per volunteer) to compare levels of trash across beaches and categorizes beaches as either low, medium, high or severe, based on this metric. Coastkeeper cleanups occurred on 5/10/08, 5/9/09, and 5/8/10 for this water body. The total weight of trash (lbs) collected on these dates was 484.5. However, using the metric, Coastkeeper classified this water body as low for trash impairment.
Data Reference:	Data for Trash, Nutrients, and Pathogens in Region 9, 2007-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Floating Material Waters shall not contain floating material, including solids, liquids, foams, and scum in concentrations which cause nuisance or adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	15th Street/Powerhouse - Del Mar
Temporal Representation:	Three cleanups occurred on 5/10/08, 5/9/09, and 5/8/10.
Environmental Conditions:	
QAPP Information:	San Diego Coastkeeper QAPP was provided.
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Batiquitos HSA, at South Carlsbad State Beach (Batiquitos Lagoon Outlet)
Water Body ID: CAC904510002009021709315 3
Water Body Type: Coastal & Bay Shoreline

DECISION ID 43230 **Region 9**
Pacific Ocean Shoreline, Batiquitos HSA, at South Carlsbad State Beach (Batiquitos Lagoon Outlet)

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Fifteen lines of evidence are available in the administrative record to assess this pollutant. With the latest data, one of the 84 samples collected during the AB411 period exceed the Water Quality Objective for enterococcus of a geomean of 35/100ml in a 30-day period for the protection of REC-1.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, one of the 84 samples collected during the AB411 period exceed the Water Quality Objective for enterococcus of a geomean of 35/100ml in a 30-day period for the protection of REC-1and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 43230, Indicator Bacteria **Region 9**
Pacific Ocean Shoreline, Batiquitos HSA, at South Carlsbad State Beach (Batiquitos Lagoon Outlet)

LOE ID: 31250

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples:	26	040112
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 2002 through October 2007. A total of 111 single samples were collected with 26 monthly geomeans calculated. None of the 26 geomeans exceeded the geomean water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml. Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml.	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at South Carlsbad State Beach (Batiquitos Lagoon Outlet), San Diego, California. Department of Environmental Health identification number is EH-440.	
Temporal Representation:	Samples were collected from July 2002 through October 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43230, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at South Carlsbad State Beach (Batiquitos Lagoon Outlet)

LOE ID:	31249
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	18
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 2002 through October 2007. A total of 69 dry month (April through October) single samples were collected with 18 dry month geomeans calculated. One of the 18 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; (SWRCB, 2005)
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at South Carlsbad State Beach (Batiquitos Lagoon Outlet), San Diego, California. Department of Environmental Health identification number is EH-440.
Temporal Representation: Samples were collected from July 2002 through October 2007.
Environmental Conditions:
QAPP Information: Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s): County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43230, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at South Carlsbad State Beach (Batiquitos Lagoon Outlet)

LOE ID: 74563

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Shellfish Harvesting

Number of Samples: 72
Number of Exceedances: 2

Data and Information Type: PATHOGEN MONITORING
Data Used to Assess Water Quality: Water Board staff assessed BW data for Pacific Ocean Shoreline, Batiquitos HSA, at South Carlsbad State Beach (Batiquitos Lagoon Outlet) to determine beneficial use support and results are as follows: 2 of 72 samples exceed the criterion for Coliform, Total.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Data for this line of evidence for Pacific Ocean Shoreline, Batiquitos HSA, at South Carlsbad State Beach (Batiquitos Lagoon Outlet) was collected at 1 monitoring site [Batiquitos Lagoon outlet]
Temporal Representation: Data was collected over the time period April 2008 through August 2010.
Environmental Conditions: Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 43230, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at South Carlsbad State Beach (Batiquitos Lagoon Outlet)

LOE ID: 74564

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water

Fraction:	None	040114
Beneficial Use:	Water Contact Recreation	
Number of Samples:	57	
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Zero of the 57 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at the Batiquitos Lagoon outlet site.	
Temporal Representation:	Samples were collected from April 2008 to August 2010.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43230, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at South Carlsbad State Beach (Batiquitos Lagoon Outlet)

LOE ID:	27180
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	13
Number of Exceedances:	7
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 2002 through October 2007. A total of 147 single samples were collected with 13 samples correlated with a storm event. Seven of the 13 samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at South Carlsbad State Beach (Batiquitos Lagoon Outlet), San Diego, California. Department of Environmental Health identification number is EH-440.
Temporal Representation:	Samples were collected from October 2004 through May 2006.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43230, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at South Carlsbad State Beach (Batiquitos Lagoon Outlet)

LOE ID:	27097
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	147
Number of Exceedances:	10
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 2002 through October 2007. A total of 145 single samples were collected with 10 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at South Carlsbad State Beach (Batiquitos Lagoon Outlet), San Diego, California. Department of Environmental Health identification number is EH-440.
Temporal Representation:	Samples were collected from July 2002 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43230, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at South Carlsbad State Beach (Batiquitos Lagoon Outlet)

LOE ID:	28030
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there was one beach advisory days for this section of shoreline. Bacteriological samples are collected on a weekly basis at ocean and bay locations in San Diego County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that an advisory for waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 - December 2007. Data used was the number of days the beach was advisories were issued when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Spatial Representation:	Bacteriological monitoring samples were collected at Batiquitos Lagoon Outlet at South Carlsbad State Beach, Carlsbad, CA.
Temporal Representation:	The beach advisory covers the time frame of January January 2001 to December 2007.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of San Diego's Quality Assessment/Quality Control document
QAPP Information Reference(s):	County of San Diego. 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43230, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at South Carlsbad State Beach (Batiquitos Lagoon Outlet)

LOE ID:	74561
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	040117
Beneficial Use:	Water Contact Recreation	
Number of Samples:	58	
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Zero of the 58 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at the Batiquitos Lagoon outlet site.	
Temporal Representation:	Samples were collected from April 2008 to August 2010.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43230, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at South Carlsbad State Beach (Batiquitos Lagoon Outlet)

LOE ID:	27154
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	147
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 2002 through October 2007. A total of 147 single samples were collected with two samples exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml. Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:	040118
Guideline Reference:	
Spatial Representation:	Samples were collected at South Carlsbad State Beach (Batiquitos Lagoon Outlet), San Diego, California. Department of Environmental Health identification number is EH-440.
Temporal Representation:	Samples were collected from July 2002 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43230, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at South Carlsbad State Beach (Batiquitos Lagoon Outlet)

LOE ID:	27175
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	30
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 2002 through October 2007. A total of 105 single samples were collected and 30 geomeans calculated. None of the 30 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; (SWRCB, 2005)
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at South Carlsbad State Beach (Batiquitos Lagoon Outlet), San Diego, California. Department of Environmental Health identification number is EH-440.
Temporal Representation:	Samples were collected from July 2002 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43230, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at South Carlsbad State Beach (Batiquitos Lagoon Outlet)

LOE ID:	27174

Pollutant:	Total Coliform	040119
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	38	
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 2002 through October 2007. A total of 147 single samples were collected with 38 monthly geomeans calculated. None of the 38 geomeans exceeded the geomean water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml. Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml.	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at South Carlsbad State Beach (Batiquitos Lagoon Outlet), San Diego, California. Department of Environmental Health identification number is EH-440.	
Temporal Representation:	Samples were collected from July 2002 through October 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43230, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at South Carlsbad State Beach (Batiquitos Lagoon Outlet)

LOE ID:	27173
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	13
Number of Exceedances:	5
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 2002 through October 2007. A total of 148 single samples were collected with 13 samples correlated with a storm event. Five of the 13 samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data:	Non-SWAMP	040120
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at South Carlsbad State Beach (Batiquitos Lagoon Outlet), San Diego, California. Department of Environmental Health identification number is EH-440.	
Temporal Representation:	Samples were collected from July 2002 through October 2007.	
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43230, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at South Carlsbad State Beach (Batiquitos Lagoon Outlet)

LOE ID:	27171
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	148
Number of Exceedances:	7
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 2002 through October 2007. A total of 148 single samples were collected with seven samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	

Guideline Reference:	040121
Spatial Representation:	Samples were collected at South Carlsbad State Beach (Batiquitos Lagoon Outlet), San Diego, California. Department of Environmental Health identification number is EH-440.
Temporal Representation:	Samples were collected from July 2002 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43230, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at South Carlsbad State Beach (Batiquitos Lagoon Outlet)

LOE ID:	27179
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	39
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 2002 through October 2007. A total of 148 single samples were collected with 39 monthly geomeans calculated. Three of the 39 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at South Carlsbad State Beach (Batiquitos Lagoon Outlet), San Diego, California. Department of Environmental Health identification number is EH-440.
Temporal Representation:	Samples were collected from July 2002 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43230, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at South Carlsbad State Beach (Batiquitos Lagoon Outlet)

LOE ID:	27169
Pollutant:	Fecal Coliform

LOE Subgroup:	Pollutant-Water	040122
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	11	
Number of Exceedances:	2	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 2002 through October 2007. A total of 105 single samples were collected with 11 samples correlating with a storm event. Two of the 11 samples exceeded the single sample water quality objective.	
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; (SWRCB, 2005)	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at South Carlsbad State Beach (Batiquitos Lagoon Outlet), San Diego, California. Department of Environmental Health identification number is EH-440.	
Temporal Representation:	Samples were collected from July 2002 through October 2007.	
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43230, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at South Carlsbad State Beach (Batiquitos Lagoon Outlet)

LOE ID:	27163
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	105
Number of Exceedances:	3

Data and Information Type:	PWS pathogen monitoring (ambient water) 040123
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 2002 through October 2007. A total of 105 single samples were collected with three samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; (SWRCB, 2005)
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at South Carlsbad State Beach (Batiquitos Lagoon Outlet), San Diego, California. Department of Environmental Health identification number is EH-440.
Temporal Representation:	Samples were collected from July 2002 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43230, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at South Carlsbad State Beach (Batiquitos Lagoon Outlet)

LOE ID:	27161
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	13
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 2002 through October 2007. A total of 147 single samples were collected with 13 samples correlated with a storm event. Two of the 13 samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml. Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at South Carlsbad State Beach (Batiquitos Lagoon Outlet), San Diego, California. Department of Environmental Health identification number is EH-440.
Temporal Representation:	Samples were collected from July 2002 through October 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43230, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at South Carlsbad State Beach (Batiquitos Lagoon Outlet)

LOE ID:	77587
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	57
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	None of the fifty-six samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, Batiquitos HSA, at South Carlsbad State Beach (Batiquitos Lagoon Outlet).
Temporal Representation:	The samples were collected from April 2008 through August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43230, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at South Carlsbad State Beach (Batiquitos Lagoon Outlet)

LOE ID:	74562
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	58
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 58 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Batiquitos Lagoon outlet site.
Temporal Representation:	Samples were collected approximately once a week from April 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43230, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at South Carlsbad State Beach (Batiquitos Lagoon Outlet)

LOE ID:	31248
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	26
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 2002 through October 2007. A total of 111 dry month (April through October) single samples were collected with 26 dry month geomeans calculated. One of the 26 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB,

	2005). 040126
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at South Carlsbad State Beach (Batiquitos Lagoon Outlet), San Diego, California. Department of Environmental Health identification number is EH-440.
Temporal Representation:	Samples were collected from July 2002 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43230, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at South Carlsbad State Beach (Batiquitos Lagoon Outlet)

LOE ID:	30557
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	135
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 2002 through October 2007. A total of 148 single samples were collected of which 135 are dry weather (AB411) samples with two samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at South Carlsbad State Beach (Batiquitos Lagoon Outlet), San Diego, California. Department of Environmental Health identification number is EH-440.
Temporal Representation:	Samples were collected from July 2002 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43230, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at South Carlsbad State Beach (Batiquitos Lagoon Outlet) 040127

LOE ID:	30793
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	134
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 2002 through October 2007. A total of 147 single samples were collected of which 134 are dry weather (AB411) samples with zero samples exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml. Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at South Carlsbad State Beach (Batiquitos Lagoon Outlet), San Diego, California. Department of Environmental Health identification number is EH-440.
Temporal Representation:	Samples were collected from July 2002 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43230, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at South Carlsbad State Beach (Batiquitos Lagoon Outlet)

LOE ID:	30679
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	94
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 2002 through

	October 2007. A total of 105 single samples were collected of which 94 are dry weather (AB411) samples with one sample exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; (SWRCB, 2005)
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at South Carlsbad State Beach (Batiquitos Lagoon Outlet), San Diego, California. Department of Environmental Health identification number is EH-440.
Temporal Representation:	Samples were collected from July 2002 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Los Monos HSA, at South Carlsbad State Beach (near Cerezo Drive)
Water Body ID: CAC904310002009021709385 7
Water Body Type: Coastal & Bay Shoreline

DECISION ID 42724 **Region 9**

Pacific Ocean Shoreline, Los Monos HSA, at South Carlsbad State Beach (near Cerezo Drive)

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Fifteen lines of evidence are available in the administrative record to assess this pollutant. Including the latest data, one of the 173 samples exceed the water quality objective for enterococcus of a geomean of 35/100ml in a 30-day period for the protection of REC-1.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Including the latest data, one of the 173 samples exceed the water quality objective for enterococcus of a geomean of 35/100ml in a 30-day period for the protection of REC-1 and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 42724, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Los Monos HSA, at South Carlsbad State Beach (near Cerezo Drive)

LOE ID: 77630

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Shellfish Harvesting

Number of Samples: 129

Number of Exceedances:	0	040130

Data and Information Type: PATHOGEN MONITORING
Data Used to Assess Water Quality: Zero of the 129 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: The samples were collected at Pacific Ocean Shoreline, Los Monos HSA, at South Carlsbad State Beach (near Cerezo Drive).
Temporal Representation: The samples were collected from April 2008 through August 2010.
Environmental Conditions:
QAPP Information: The samples were collected for the beach watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 42724, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Los Monos HSA, at South Carlsbad State Beach (near Cerezo Drive)

LOE ID: 74746

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 129
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Zero of the 129 geomeans exceeded the objective.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at the Cerezo Drive site.
Temporal Representation: Samples were collected from January 2008 to August 2010.
Environmental Conditions:
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 42724, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Los Monos HSA, at South Carlsbad State Beach (near Cerezo Drive) 040131

LOE ID:	74745
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	135
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Beach Watch data for Pacific Ocean Shoreline, Los Monos HSA, at South Carlsbad State Beach (near Cerezo Drive) to determine beneficial use support and results are as follows: 0 of 135 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Los Monos HSA, at South Carlsbad State Beach (near Cerezo Drive) was collected at 1 monitoring site [Cerezo Drive]
Temporal Representation:	Data was collected over the time period 1/22/2008-8/23/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 42724, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Los Monos HSA, at South Carlsbad State Beach (near Cerezo Drive)

LOE ID:	74744
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	129
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 129 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:		040132
Guideline Reference:		
Spatial Representation:	Samples were collected at the Cerezo Drive site.	
Temporal Representation:	Samples were collected from January 2008 to August 2010.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the beach watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 42724, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Los Monos HSA, at South Carlsbad State Beach (near Cerezo Drive)

LOE ID:	31310
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	25
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 103 dry month (April through October) single samples were collected with 25 dry month geomeans calculated. None of the 25 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at South Carlsbad State Beach (near Cerezo Drive), Carlsbad, California. Department of Environmental Health identification number is EN-050.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42724, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Los Monos HSA, at South Carlsbad State Beach (near Cerezo Drive)

LOE ID:	74743
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation	040133
Number of Samples:	129	
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Zero of the 129 geomeans exceeded the objective.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at the Cerezo Drive site.	
Temporal Representation:	Samples were collected from January 2008 to August 2010.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 42724, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Los Monos HSA, at South Carlsbad State Beach (near Cerezo Drive)

LOE ID:	31311
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	25
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 104 dry month (April through October) single samples were collected with 25 dry month geomeans calculated. None of the 25 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at South Carlsbad State Beach (near Cerezo Drive), Carlsbad, California. Department of Environmental Health identification number is EN-050.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the

QAPP Information Reference(s):	County of San Diego, Department Public Health Laboratory Quality Assurance Manual. County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42724, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Los Monos HSA, at South Carlsbad State Beach (near Cerezo Drive)

LOE ID:	31312
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	25
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 104 dry month (April through October) single samples were collected with 25 dry month geomeans calculated. None of the 25 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at South Carlsbad State Beach (near Cerezo Drive), Carlsbad, California. Department of Environmental Health identification number is EN-050.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42724, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Los Monos HSA, at South Carlsbad State Beach (near Cerezo Drive)

LOE ID:	30696
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	168
Number of Exceedances:	0

Data and Information Type:	PWS pathogen monitoring (ambient water) 040135
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 185 single samples were collected of which 168 are dry weather (AB411) samples with no sample exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at South Carlsbad State Beach (near Cerezo Drive), Carlsbad, California. Department of Environmental Health identification number is EN-050.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42724, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Los Monos HSA, at South Carlsbad State Beach (near Cerezo Drive)

LOE ID:	30811
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	168
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 185 single samples were collected of which 168 are dry weather (AB411) samples with no sample exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at South Carlsbad State Beach (near Cerezo Drive), Carlsbad, California. Department of Environmental Health identification number is EN-050.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42724, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Los Monos HSA, at South Carlsbad State Beach (near Cerezo Drive)

LOE ID:	28056
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were no beach advisory days for this section of shoreline. Bacteriological samples are collected on a weekly basis at ocean and bay locations in San Diego County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that an advisory for waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 - December 2007. Data used was the number of days the beach was advisories were issued when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Spatial Representation:	Bacteriological monitoring samples were collected at Cerezo Drive on Oceanside City Beach, Oceanside, CA.
Temporal Representation:	The beach advisory covers the time frame of January January 2001 to December 2007.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of San Diego's Quality Assessment/Quality Control document

QAPP Information Reference(s): County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006 040137

Line of Evidence (LOE) for Decision ID 42724, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Los Monos HSA, at South Carlsbad State Beach (near Cerezo Drive)

LOE ID:	27204
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	44
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 185 single samples were collected and 44 geomeans calculated. None of the 44 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at South Carlsbad State Beach (near Cerezo Drive), Carlsbad, California. Department of Environmental Health identification number is EN-050.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42724, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Los Monos HSA, at South Carlsbad State Beach (near Cerezo Drive)

LOE ID:	27201
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	44
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004

	through December 2007. A total of 185 single samples were collected with 44 monthly geomeans calculated. None of the 44 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at South Carlsbad State Beach (near Cerezo Drive), Carlsbad, California. Department of Environmental Health identification number is EN-050.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42724, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Los Monos HSA, at South Carlsbad State Beach (near Cerezo Drive)

LOE ID:	27202
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	185
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 185 single samples were collected with no sample exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at South Carlsbad State Beach (near Cerezo Drive), Carlsbad, California. Department of Environmental Health identification number is EN-050.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	

QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42724, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Los Monos HSA, at South Carlsbad State Beach (near Cerezo Drive)

LOE ID:	27207
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	44
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 184 single samples were collected with 44 monthly geomeans calculated. One of the 44 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at South Carlsbad State Beach (near Cerezo Drive), Carlsbad, California. Department of Environmental Health identification number is EH-041.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42724, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Los Monos HSA, at South Carlsbad State Beach (near Cerezo Drive)

LOE ID:	30574
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	167
Number of Exceedances:	0

Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 184 single samples were collected of which 167 are dry weather (AB411) samples with zero samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at South Carlsbad State Beach (near Cerezo Drive), Carlsbad, California. Department of Environmental Health identification number is EN-050.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42724, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Los Monos HSA, at South Carlsbad State Beach (near Cerezo Drive)

LOE ID:	27205
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	184
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 184 single samples were collected with two samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at South Carlsbad State Beach (near Cerezo Drive), Carlsbad, California. Department of Environmental Health identification number is EN-050.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42724, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Los Monos HSA, at South Carlsbad State Beach (near Cerezo Drive)

LOE ID:	27206
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	17
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 184 single samples were collected with 17 samples correlated with a storm event. Two of the 17 samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at South Carlsbad State Beach (near Cerezo Drive), Carlsbad, California. Department of Environmental Health identification number is EN-050.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42724, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Los Monos HSA, at South Carlsbad State Beach (near Cerezo Drive) 040142

LOE ID:	27199
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	185
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 185 single samples were collected with two samples exceeded the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at South Carlsbad State Beach (near Cerezo Drive), Carlsbad, California. Station identification number is EN-050.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42724, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Los Monos HSA, at South Carlsbad State Beach (near Cerezo Drive)

LOE ID:	27200
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	17
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 185 single samples were collected with 17 samples correlated with a storm event. Two of the 17 samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional

	Temperature and Precipitation Listings by Station 040143 Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005). Comparisons are also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at South Carlsbad State Beach (near Cereza Drive), Carlsbad, California. Department of Environmental Health identification number is EN-050.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42724, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Los Monos HSA, at South Carlsbad State Beach (near Cerezo Drive)

LOE ID:	27193
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	185
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 185 single samples were collected with no sample exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental

Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at South Carlsbad State Beach (near Cerezo Drive), Carlsbad, California. Department of Environmental Health identification number is EN-050.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42724, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Los Monos HSA, at South Carlsbad State Beach (near Cerezo Drive)

LOE ID:	27198
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 185 single samples were collected with 17 samples correlated with a storm event. None of the 17 samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at South Carlsbad State Beach (near Cerezo Drive), Carlsbad, California. Station identification number is EN-050.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the

QAPP Information Reference(s):	County of San Diego, Department Public Health Laboratory Quality Assurance Manual. County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42724, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Los Monos HSA, at South Carlsbad State Beach (near Cerezo Drive)

LOE ID:	27203
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 185 single samples were collected with 17 samples correlating with a storm event. None of the 17 samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at South Carlsbad State Beach (near Cerezo Drive), Carlsbad, California. Department of Environmental Health identification number is EN-050.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, San Mateo Canyon HA, at San Mateo Creek outlet
Water Body ID: CAC9014000020090218165222
Water Body Type: Coastal & Bay Shoreline

DECISION ID 44426 **Region 9**

Pacific Ocean Shoreline, San Mateo Canyon HA, at San Mateo Creek outlet

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal from the CWA section 303(d) List under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Sixteen lines of evidence are available in the administrative record to assess this pollutant. With the latest data, 27 of 141 samples exceed the water quality objective of single sample maximum for total coliform for the protection of SHELL beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. [With the latest data, 27 of 141 samples exceed the water quality objective of single sample maximum for total coliform for the protection of SHELL beneficial use and this exceeds the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 44426, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Mateo Canyon HA, at San Mateo Creek outlet

LOE ID:	27187
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation	040147
Number of Samples:	4	
Number of Exceedances:	1	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 67 single samples were collected with four sample correlated with a storm event. One sample exceeded the single sample water quality objective.	
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005). Comparisons are also made only for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at San Mateo Creek Outlet, San Diego, California. Station identification number is EH-520.	
Temporal Representation:	Samples were collected from January 2004 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44426, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Mateo Canyon HA, at San Mateo Creek outlet

LOE ID:	31186
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	26
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 2002 through Otober 2007. A total of 94 dry month (April through October) single samples were collected with 26 dry month geomeans calculated. None of the 26 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Mateo Creek Outlet, San Diego, California. Station identification number is EH-520.
Temporal Representation:	Samples were collected from July 2002 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44426, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Mateo Canyon HA, at San Mateo Creek outlet

LOE ID:	27185
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 117 single samples were collected with five sample correlated with a storm event. None exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005). Comparisons were also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at San Mateo Creek Outlet, San Diego, California. Station identification number is EH-520.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44426, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Mateo Canyon HA, at San Mateo Creek outlet

LOE ID:	30750
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	63
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 67 single samples were collected of which 63 are dry weather (AB411) samples with one sample exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Mateo Creek Outlet, San Diego, California. Station identification number is EH-520.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44426, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Mateo Canyon HA, at San Mateo Creek outlet

LOE ID:	27184
Pollutant:	Total Coliform

LOE Subgroup:	Pollutant-Water	040150
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	117	
Number of Exceedances:	1	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 117 single samples were collected with one sample exceeding the single sample water quality objective.	
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at San Mateo Creek Outlet, San Diego, California. Station identification number is EH-520.	
Temporal Representation:	Samples were collected from January 2004 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44426, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Mateo Canyon HA, at San Mateo Creek outlet

LOE ID:	27182
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	117
Number of Exceedances:	27
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 117 single samples were collected with 27 samples exceeded the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data:	Non-SWAMP	040151
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005). Comparisons were also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at San Mateo Creek Outlet, San Diego, California. Station identification number is EH-520.	
Temporal Representation:	Samples were collected from January 2004 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44426, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Mateo Canyon HA, at San Mateo Creek outlet

LOE ID:	75087
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	16
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 16 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the San Mateo Creek outlet site.
Temporal Representation:	Samples were collected from April 2008 to December 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44426, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Mateo Canyon HA, at San Mateo Creek outlet

LOE ID:	77673

Pollutant:	Total Coliform	040152
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Shellfish Harvesting	
Number of Samples:	16	
Number of Exceedances:	0	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Zero of the 16 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, San Mateo Canyon HA, at San Mateo Creek outlet.	
Temporal Representation:	The samples were collected from April 2008 to December 2009.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the beach watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44426, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Mateo Canyon HA, at San Mateo Creek outlet

LOE ID:	31185
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 2002 through Otober 2007. A total of 57 dry month (April through October) single samples were collected with 17 dry month geomeans calculated. None of the 17 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB,

	2005). 040153
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Mateo Creek Outlet, San Diego, California. Station identification number is EH-520.
Temporal Representation:	Samples were collected from July 2002 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44426, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Mateo Canyon HA, at San Mateo Creek outlet

LOE ID:	31184
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	26
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 2002 through Otober 2007. A total of 94 dry month (April through October) single samples were collected with 26 dry month geomeans calculated. One of the 26 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Mateo Creek Outlet, San Diego, California. Station identification number is EH-520.
Temporal Representation:	Samples were collected from July 2002 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44426, Indicator Bacteria 040154 Region 9

Pacific Ocean Shoreline, San Mateo Canyon HA, at San Mateo Creek outlet

LOE ID:	27189
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	5
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 117 single samples were collected with five samples correlated with a storm event. Three samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005). Comparisons are also made for days with matching bacteria and storm event data. A storm event is defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Mateo Creek Outlet, San Diego, California. Station identification number is EH-520.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44426, Indicator Bacteria Region 9

Pacific Ocean Shoreline, San Mateo Canyon HA, at San Mateo Creek outlet

LOE ID:	27183
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting

Number of Samples:	5
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 117 single samples were collected with five sample correlated with a storm event. Four of the five sample exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005). Comparisons are also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Mateo Creek Outlet, San Diego, California. Station identification number is EH-520.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44426, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Mateo Canyon HA, at San Mateo Creek outlet

LOE ID:	27192
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	31
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 117 single samples were collected with 31 monthly geomeans calculated. Three of the 31 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. 040156 Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Mateo Creek Outlet, San Diego, California. Station identification number is EH-520.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44426, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Mateo Canyon HA, at San Mateo Creek outlet

LOE ID:	27191
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	21
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 67 single samples were collected and 21 geomeans calculated. None of the 21 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Mateo Creek Outlet, San Diego, California. Station identification number is EH-520.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance

Line of Evidence (LOE) for Decision ID 44426, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Mateo Canyon HA, at San Mateo Creek outlet

LOE ID:	27190
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	31
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 117 single samples were collected with 31 monthly geomeans calculated. Two of the 31 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Mateo Creek Outlet, San Diego, California. Station identification number is EH-520.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44426, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Mateo Canyon HA, at San Mateo Creek outlet

LOE ID:	30651
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	112
Number of Exceedances:	7

Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 117 single samples were collected of which 112 are dry weather (AB411) samples with seven samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Mateo Creek Outlet, San Diego, California. Station identification number is EH-520.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44426, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Mateo Canyon HA, at San Mateo Creek outlet

LOE ID:	75090
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	16
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 16 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the San Mateo Creek outlet site.
Temporal Representation:	Samples were collected from April 2008 to December 2009.
Environmental Conditions:	

QAPP Information:	The samples were collected for the Beach Watch program.	040159
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44426, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Mateo Canyon HA, at San Mateo Creek outlet

LOE ID:	30857
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	112
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 117 single samples were collected of which 112 are dry weather (AB411) samples with one sample exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Mateo Creek Outlet, San Diego, California. Station identification number is EH-520.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44426, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Mateo Canyon HA, at San Mateo Creek outlet

LOE ID:	75089
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting

Number of Samples:	24
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed bw data for Pacific Ocean Shoreline, San Mateo Canyon HA, at San Mateo Creek outlet to determine beneficial use support and results are as follows: 0 of 24 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, San Mateo Canyon HA, at San Mateo Creek outlet was collected at 1 monitoring site [Trestles San Mateo Crk]
Temporal Representation:	Data was collected over the time period 4/3/2008-12/23/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44426, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Mateo Canyon HA, at San Mateo Creek outlet

LOE ID:	75088
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	16
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 16 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the San Mateo Creek outlet site.
Temporal Representation:	Samples were collected from April 2008 to December 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44426, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Mateo Canyon HA, at San Mateo Creek outlet 040161

LOE ID:	28294
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	109
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were 109 beach advisory days for this section of shoreline. Bacteriological samples are collected on a weekly basis at ocean and bay locations in San Diego County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that an advisory for waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 - December 2007. Data used was the number of days the beach was advisories were issued when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Spatial Representation:	Beach advisories were from the San Mateo Creek Outlet station id EH-520. Lat/Long: 33.38595/ -117.59519.
Temporal Representation:	The beach advisory covers the time frame of January January 2001 to December 2007.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of San Diego's Quality Assessment/Quality Control document
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44426, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Mateo Canyon HA, at San Mateo Creek outlet

LOE ID:	27188
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water

Matrix:	Water	040162
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	117	
Number of Exceedances:	10	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 117 single samples were collected with 10 samples exceeding the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at San Mateo Creek Outlet, San Diego, California. Station identification number is EH-520.	
Temporal Representation:	Samples were collected from January 2004 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44426, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Mateo Canyon HA, at San Mateo Creek outlet

LOE ID:	27186
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	67
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 67 single samples were collected with two sample exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml;

	Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Mateo Creek Outlet, San Diego, California. Station identification number is EH-520.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, El Salto HSA, Oceanside at St Malo Beach
Water Body ID: CAC904210002009022411510 5
Water Body Type: Coastal & Bay Shoreline

DECISION ID 36340 Region 9
Pacific Ocean Shoreline, El Salto HSA, Oceanside at St Malo Beach

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Fifteen lines of evidence are available in the administrative record to assess this pollutant. Including the latest data, 12 of the 174 samples exceed the water quality objective for enterococcus of a geomean of 35/100 ml in a 30-day period for the protection of REC-1.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Including the latest data, 12 of the 174 samples exceed the water quality objective for enterococcus of a geomean of 35/100 ml in a 30-day period for the protection of REC-1 and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 36340, Indicator Bacteria Region 9
Pacific Ocean Shoreline, El Salto HSA, Oceanside at St Malo Beach

LOE ID: 27236

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Shellfish Harvesting

Number of Samples: 185

Number of Exceedances:	13	040165
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 185 single samples were collected with 13 samples exceeded the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at St. Malo Beach, Oceanside, California. Station identification number is OC-010.	
Temporal Representation:	Samples were collected from January 2004 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 36340, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, El Salto HSA, Oceanside at St Malo Beach

LOE ID:	27242
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	185
Number of Exceedances:	6
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 185 single samples were collected with six samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	

Guideline Reference:	040166
Spatial Representation:	Samples were collected at St. Malo Beach, Oceanside, California. Station identification number is OC-010.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 36340, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, El Salto HSA, Oceanside at St Malo Beach

LOE ID:	27241
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	17
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 185 single samples were collected with 17 samples correlated with a storm event. Two of the 17 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at St. Malo Beach, Oceanside, California. Station identification number is OC-010.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.

QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 36340, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, El Salto HSA, Oceanside at St Malo Beach

LOE ID:	27240
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	185
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 185 single samples were collected with two samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at St. Malo Beach, Oceanside, California. Station identification number is OC-010.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 36340, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, El Salto HSA, Oceanside at St Malo Beach

LOE ID:	27239
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	17	040168
Number of Exceedances:	1	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 185 single samples were collected with 17 samples correlated with a storm event. One of the 17 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.	
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at St. Malo Beach, Oceanside, California. Station identification number is OC-010.	
Temporal Representation:	Samples were collected from January 2004 through December 2007.	
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 36340, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, El Salto HSA, Oceanside at St Malo Beach

LOE ID:	27238
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	185
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 185 single samples were collected with one sample

exceeding the single sample water quality objective. 040169

Data Reference: National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: Geomean: Total coliform density shall not exceed 1,000 per 100ml;

Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).

Objective/Criterion Reference: Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at St. Malo Beach, Oceanside, California. Station identification number is OC-010.

Temporal Representation: Samples were collected from January 2004 through December 2007.

Environmental Conditions:

QAPP Information: Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.

QAPP Information Reference(s): County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 36340, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, El Salto HSA, Oceanside at St Malo Beach

LOE ID: 27237

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Shellfish Harvesting

Number of Samples: 17
Number of Exceedances: 10

Data and Information Type: PWS pathogen monitoring (ambient water)

Data Used to Assess Water Quality: Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 185 single samples were collected with 17 samples correlated with a storm event. Ten of the17 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.

Data Reference: National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).

Objective/Criterion Reference: Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at St. Malo Beach, Oceanside, California. Station identification number is OC-010.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 36340, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, El Salto HSA, Oceanside at St Malo Beach

LOE ID:	30570
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	168
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 185 single samples were collected of which 168 are dry weather (AB411) samples with zero samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at St. Malo Beach, Oceanside, California. Station identification number is OC-010.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.

QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 36340, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, El Salto HSA, Oceanside at St Malo Beach

LOE ID:	28053
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were four beach advisory days for this section of shoreline. Bacteriological samples are collected on a weekly basis at ocean and bay locations in San Diego County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that an advisory for waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 - December 2007. Data used was the number of days the beach was advisories were issued when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Spatial Representation:	Bacteriological monitoring samples were collected at Saint Malo Beach, Oceanside, CA.
Temporal Representation:	The beach advisory covers the time frame of January January 2001 to December 2007.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of San Diego's Quality Assessment/Quality Control document
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 36340, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, El Salto HSA, Oceanside at St Malo Beach

LOE ID:	27245	040172
Pollutant:	Fecal Coliform	
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	44	
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 185 single samples were collected and 44 geomeans calculated. None of the 44 geomeans exceeded the geomean water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at St. Malo Beach, Oceanside, California. Station identification number is OC-010.	
Temporal Representation:	Samples were collected from January 2004 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 36340, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, El Salto HSA, Oceanside at St Malo Beach

LOE ID:	27244
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	44
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 185 single samples were collected with 44 monthly geomeans calculated. None of the 44 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program,

	2007. AB 411 monitoring data 1999 to 2007	040173

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at St. Malo Beach, Oceanside, California. Station identification number is OC-010.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 36340, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, El Salto HSA, Oceanside at St Malo Beach

LOE ID:	27243
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	17
Number of Exceedances:	6
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 185 single samples were collected with 17 samples correlated with a storm event. Six of the 17 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	

Guideline Reference:	040174
Spatial Representation:	Samples were collected at St. Malo Beach, Oceanside, California. Station identification number is OC-010.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 36340, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, El Salto HSA, Oceanside at St Malo Beach

LOE ID:	31289
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	26
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 2002 through October 2007. A total of 103 dry month (April through October) single samples were collected with 26 dry month geomeans calculated. One of the 26 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at St. Malo Beach, Oceanside, California. Station identification number is OC-010.
Temporal Representation:	Samples were collected from July 2002 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 36340, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, El Salto HSA, Oceanside at St Malo Beach

LOE ID:	30806
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	168
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 185 single samples were collected of which 168 are dry weather (AB411) samples with zero samples exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at St. Malo Beach, Oceanside, California. Station identification number is OC-010.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 36340, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, El Salto HSA, Oceanside at St Malo Beach

LOE ID:	30692
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	168

Number of Exceedances:	0	040176
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 185 single samples were collected of which 168 are dry weather (AB411) samples with no samples exceeding the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at St. Malo Beach, Oceanside, California. Station identification number is OC-010.	
Temporal Representation:	Samples were collected from January 2004 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 36340, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, El Salto HSA, Oceanside at St Malo Beach

LOE ID:	31288
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	26
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 2002 through October 2007. A total of 103 dry month (April through October) single samples were collected with 26 dry month geomeans calculated. None of the 26 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005.

	Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at St. Malo Beach, Oceanside, California. Station identification number is OC-010.
Temporal Representation:	Samples were collected from July 2002 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 36340, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, El Salto HSA, Oceanside at St Malo Beach

LOE ID:	31287
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	26
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 2002 through October 2007. A total of 103 dry month (April through October) single samples were collected with 26 dry month geomeans calculated. Two of the 26 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at St. Malo Beach, Oceanside, California. Station identification number is OC-010.
Temporal Representation:	Samples were collected from July 2002 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 36340, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, El Salto HSA, Oceanside at St Malo Beach 040178

LOE ID:	74855
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	130
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 130 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the St. Malo Beach site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 36340, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, El Salto HSA, Oceanside at St Malo Beach

LOE ID:	74854
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	44
Number of Exceedances:	5
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Beach Watch data for Pacific Ocean Shoreline, El Salto HSA, Oceanside at St Malo Beach to determine beneficial use support and results are as follows: 5 of 44 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	

Guideline Reference:	040179
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, El Salto HSA, Oceanside at St Malo Beach was collected at 1 monitoring site [St. Malo Beach]
Temporal Representation:	Data was collected over the time period 1/23/2008-8/16/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 36340, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, El Salto HSA, Oceanside at St Malo Beach

LOE ID:	74853
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	130
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 130 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the St Malo Beach site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 36340, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, El Salto HSA, Oceanside at St Malo Beach

LOE ID:	74852
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	130
Number of Exceedances:	9
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Nine of the 130 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the St Malo Beach site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 36340, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, El Salto HSA, Oceanside at St Malo Beach

LOE ID:	27246
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	44
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 185 single samples were collected with 44 monthly geomeans calculated. Three of the 44 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at St. Malo Beach, Oceanside, California. Station identification number is OC-010.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 36340, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, El Salto HSA, Oceanside at St Malo Beach

040181

LOE ID:	77622
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	130
Number of Exceedances:	11
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Eleven of the 130 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, El Salto HSA, Oceanside at St Malo Beach.
Temporal Representation:	The samples were collected from January 2008 through August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Loma Alta HSA, Oceanside at Forester Street
Water Body ID: CAC904100002009022410512 8
Water Body Type: Coastal & Bay Shoreline

DECISION ID 44564 **Region 9**
Pacific Ocean Shoreline, Loma Alta HSA, Oceanside at Forester Street

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Fourteen lines of evidence are available in the administrative record to assess this pollutant. Including the latest data, 13 of the 173 samples exceed the water quality objective for enterococcus of a geomean of 35/100 ml in a 30-day period for the protection of REC-1.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Including the latest data, 13 of the 173 samples exceed the water quality objective for enterococcus of a geomean of 35/100 ml in a 30-day period for the protection of REC-1 and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 44564, Indicator Bacteria **Region 9**
Pacific Ocean Shoreline, Loma Alta HSA, Oceanside at Forester Street

LOE ID: 27292

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Shellfish Harvesting

Number of Samples: 184

Number of Exceedances:	9	040183

Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 184 single samples were collected with nine samples exceeded the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Forester Street, Oceanside, California. Station identification number is OC-040.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44564, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Loma Alta HSA, Oceanside at Forester Street

LOE ID:	30572
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	168
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 168 single samples associated with dry weather were collected with zero samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	

Guideline Reference:	040184
Spatial Representation:	Samples were collected at Forester Street, Oceanside, California. Station identification number is OC-040.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44564, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Loma Alta HSA, Oceanside at Forester Street

LOE ID:	27295
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	16
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 184 single samples were collected with 16 samples correlated with a storm event. Three of the 16 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Forester Street, Oceanside, California. Station identification number is OC-040.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.

QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44564, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Loma Alta HSA, Oceanside at Forester Street

LOE ID:	27296
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	184
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 184 single samples were collected with four samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Forester Street, Oceanside, California. Station identification number is OC-040.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44564, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Loma Alta HSA, Oceanside at Forester Street

LOE ID:	27297
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	16	040186
Number of Exceedances:	5	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 184 single samples were collected with 16 samples correlated with a storm event. Five of the 16 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.	
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Forester Street, Oceanside, California. Station identification number is OC-040.	
Temporal Representation:	Samples were collected from January 2004 through December 2007.	
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44564, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Loma Alta HSA, Oceanside at Forester Street

LOE ID:	27298
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	184
Number of Exceedances:	5
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 184 single samples were collected with five samples

exceeding the single sample water quality objective. 040187

Data Reference: Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: Geomean: Enterococcus density shall not exceed 35 per 100 ml.

Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).

Objective/Criterion Reference: Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Forester Street, Oceanside, California. Station identification number is OC-040.

Temporal Representation: Samples were collected from January 2004 through December 2007.

Environmental Conditions:

QAPP Information: Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.

QAPP Information Reference(s): County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44564, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Loma Alta HSA, Oceanside at Forester Street

LOE ID: 28055

Pollutant: Indicator Bacteria
LOE Subgroup: Health Advisories
Matrix: -N/A
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 2555
Number of Exceedances: 2

Data and Information Type: PWS pathogen monitoring (ambient water)

Data Used to Assess Water Quality: For the period from January 2001 to December 2007, there were two beach advisory days for this section of shoreline. Bacteriological samples are collected on a weekly basis at ocean and bay locations in San Diego County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that an advisory for waters have exceeded public health standards.

Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 - December 2007. Data used was the number of days the beach was advisories were issued when the ocean or bay failed to meet the bacteriological standards.

Data Reference: Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: California Code of Regulations. Title 17, Section 7960.

(a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the

	Department, after taking into consideration the causes therefor, may at his discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Bacteriological monitoring samples were collected at Forster and Wisconsin Street on Oceanside City Beach, Oceanside, CA.
Temporal Representation:	The beach advisory covers the time frame of January January 2001 to December 2007.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of San Diego's Quality Assessment/Quality Control document
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44564, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Loma Alta HSA, Oceanside at Forester Street

LOE ID:	27294
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	184
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 184 single samples were collected with four samples exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Forester Street, Oceanside, California. Station identification number is OC-040.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance

Line of Evidence (LOE) for Decision ID 44564, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Loma Alta HSA, Oceanside at Forester Street

LOE ID:	27293
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	16
Number of Exceedances:	6
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 184 single samples were collected with 16 samples correlated with a storm event. Six of the16 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Forester Street, Oceanside, California. Station identification number is OC-040.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44564, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Loma Alta HSA, Oceanside at Forester Street

LOE ID:	27302

Pollutant:	Enterococcus	040190
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	44	
Number of Exceedances:	3	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 184 single samples were collected with 44 monthly geomeans calculated. Three of the 44 geomeans exceeded the geomean water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Forester Street, Oceanside, California. Station identification number is OC-040.	
Temporal Representation:	Samples were collected from January 2004 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44564, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Loma Alta HSA, Oceanside at Forester Street

LOE ID:	27301
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	44
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 184 single samples were collected and 44 geomeans calculated. None of the 44 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data:	Non-SWAMP	040191
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Forester Street, Oceanside, California. Station identification number is OC-040.	
Temporal Representation:	Samples were collected from January 2004 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44564, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Loma Alta HSA, Oceanside at Forester Street

LOE ID:	27300
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	44
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 184 single samples were collected with 44 monthly geomeans calculated. None of the 44 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Forester Street, Oceanside, California. Station identification number is OC-040.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	

QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44564, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Loma Alta HSA, Oceanside at Forester Street

LOE ID:	31295
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	25
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 103 dry month (April through October) single samples were collected with 25 dry month geomeans calculated. None of the 25 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Forester Street, Oceanside, California. Station identification number is OC-040.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44564, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Loma Alta HSA, Oceanside at Forester Street

LOE ID:	31293
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	25
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 103 dry month (April through October) single samples were collected with 25 dry month geomeans calculated. One of the 25 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Forester Street, Oceanside, California. Station identification number is OC-040.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44564, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Loma Alta HSA, Oceanside at Forester Street

LOE ID:	30809
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	168
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 184 single samples were collected of which 168 are dry weather (AB411) samples with one samples exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml;

	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Forester Street, Oceanside, California. Station identification number is OC-040.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44564, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Loma Alta HSA, Oceanside at Forester Street

LOE ID:	74693
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	129
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 129 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Forester Street site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44564, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Loma Alta HSA, Oceanside at Forester Street

LOE ID:	74692
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Shellfish Harvesting
Number of Samples:	132
Number of Exceedances:	6
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Beach Watch data for Pacific Ocean Shoreline, Loma Alta HSA, Oceanside at Forester Streets to determine beneficial use support and results are as follows:6 of 132 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Loma Alta HSA, Oceanside at Forester Streets was collected at 1 monitoring site [Forester Street]
Temporal Representation:	Data was collected over the time period 1/9/2008-8/23/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44564, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Loma Alta HSA, Oceanside at Forester Street

LOE ID:	27299
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	16
Number of Exceedances:	5
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 184 single samples were collected with 16 samples correlated with a storm event. Five of the 16 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).

Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Forester Street, Oceanside, California. Station identification number is OC-040.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44564, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Loma Alta HSA, Oceanside at Forester Street

LOE ID:	74690
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	129
Number of Exceedances:	10
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Ten of the 129 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Forester Street site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44564, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Loma Alta HSA, Oceanside at Forester Street

LOE ID:	31294

Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	25
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 103 dry month (April through October) single samples were collected with 25 dry month geomeans calculated. None of the 25 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Forester Street, Oceanside, California. Station identification number is OC-040.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44564, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Loma Alta HSA, Oceanside at Forester Street

LOE ID:	77627
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	129
Number of Exceedances:	2
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Two of the 129 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, Loma Alta HSA, Oceanside at Forester Street.
Temporal Representation:	The samples were collected from January 2008 through August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44564, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Loma Alta HSA, Oceanside at Forester Street

LOE ID:	74691
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	129
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 129 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Forester Street site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty
Water Body ID: CAC910100002009110413320 8
Water Body Type: Coastal & Bay Shoreline

DECISION ID 49884 **Region 9**

Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty

Pollutant: Arsenic
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. One of the One samples exceed the Evaluation Guideline for Arsenic.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of One samples exceeded the Evaluation Guideline for Arsenic and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49884, Arsenic **Region 9**

Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty

LOE ID: 74840

Pollutant: Arsenic
LOE Subgroup: Pollutant-Tissue
Matrix: Tissue
Fraction: Fish fillet

Beneficial Use: Shellfish Harvesting

Number of Samples:	1	040200
Number of Exceedances:	1	
Data and Information Type:	Shellfish surveys	
Data Used to Assess Water Quality:	The one sample did exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal. Ten percent of the total arsenic result was used to estimate of the amount of inorganic arsenic in the sample; this number was screened against the guideline.	
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for arsenic in shellfish tissue is 0.0052 ppm. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; OEHHA, 2004)	
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Air Toxics Hotspots Program Risk Assessment Guidelines. Part II Technical Support Document for Describing Available Cancer Potency Values.	
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from Imperial Beach North Jetty, site IBNJ.	
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 12/10/2007	
Environmental Conditions:		
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/	
QAPP Information Reference(s):		

DECISION ID 49885 Region 9

Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One

samples exceed the Evaluation Guideline for Cadmium. 040201

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Evaluation Guideline for Cadmium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49885, Cadmium **Region 9**

Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty

LOE ID:	74841
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Fish fillet
Beneficial Use:	Shellfish Harvesting
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The sample did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for cadmium in shellfish tissue is 3.3 ppm. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; USEPA, 2000)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Guidance for Assessing Chemical Contaminant Data for Use In Fish Advisories Volume 1:

	Fish Sampling and Analysis	040202

Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from Imperial Beach North Jetty, site IBNJ.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 12/10/2007
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID 49886 Region 9

Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty

Pollutant:	**Chlordane**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Chlordane. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Evaluation Guideline for Chlordane and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49886, Chlordane Region 9

Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty

LOE ID:	74842
Pollutant:	Chlordane
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue

Fraction:	Fish fillet	040203
Beneficial Use:	Shellfish Harvesting	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	Shellfish surveys	
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal. Chlordane result was calculated by summing the results for chlordane isomers: cis- and trans-nonachlor, alpha- and gamma-chlordane, and oxychlordane.	
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for total chlordane in shellfish tissue is 6.0 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008)	
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene	
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from Imperial Beach North Jetty, site IBNJ.	
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 12/10/2007	
Environmental Conditions:		
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/	
QAPP Information Reference(s):		

DECISION ID 49888 Region 9

Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Chlorpyrifos. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Evaluation Guideline for Chlorpyrifos and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49888, Chlorpyrifos **Region 9**

Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty

LOE ID:	74867
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Fish fillet
Beneficial Use:	Shellfish Harvesting
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for chlorpyrifos in shellfish tissue is 1,000 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; USEPA, 2000)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California

Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment
Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene
Guidance for Assessing Chemical Contaminant Data for Use In Fish Advisories Volume 1: Fish Sampling and Analysis

Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from Imperial Beach North Jetty, site IBNJ.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 12/10/2007
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID 49889 Region 9

Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty

Pollutant:	**Dieldrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Dieldrin. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Evaluation Guideline for Dieldrin and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49889, Dieldrin Region 9

Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty

LOE ID:	74868
Pollutant:	Dieldrin
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Fish fillet
Beneficial Use:	Shellfish Harvesting
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The results did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for dieldrin in shellfish tissue is 0.49 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from Imperial Beach North Jetty, site IBNJ.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 12/10/2007
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID 49891 Region 9

Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty

Pollutant:	**Endosulfan**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision

Revision Status	Revised	040207
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Endosulfan.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Evaluation Guideline for Endosulfan and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49891, Endosulfan **Region 9**

Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty

LOE ID:	74869
Pollutant:	Endosulfan
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Fish fillet
Beneficial Use:	Shellfish Harvesting
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal. Total Endosulfan result was calculated by summing Endosulfan I and Endosulfan II.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for endosulfan (I and II) in shellfish tissue is 20,000 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; USEPA, 2000)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Guidance for Assessing Chemical Contaminant Data for Use In Fish Advisories Volume 1: Fish Sampling and Analysis
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from Imperial Beach North Jetty, site IBNJ.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 12/10/2007
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID 49892 Region 9

Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty

Pollutant:	**Endrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Endrin. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Evaluation Guideline for Endrin and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49892, Endrin **Region 9**

Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty

LOE ID:	74891
Pollutant:	Endrin
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Fish fillet
Beneficial Use:	Shellfish Harvesting
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for endrin in shellfish tissue is 1,000 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; USEPA, 2000)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Guidance for Assessing Chemical Contaminant Data for Use In Fish Advisories Volume 1: Fish Sampling and Analysis
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from Imperial Beach North Jetty, site IBNJ.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 12/10/2007
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID **49898** **Region 9**

Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty 040210

Pollutant:	**Heptachlor epoxide**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Heptachlor epoxide. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Evaluation Guideline for Heptachlor epoxide and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49898, Heptachlor epoxide — Region 9

Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty

LOE ID:	74892
Pollutant:	Heptachlor epoxide
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Fish fillet
Beneficial Use:	Shellfish Harvesting
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s)

	that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for heptachlor epoxide in shellfish tissue is 1.4 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; OEHHA, 1999)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Public Health Goal for Heptachlor and Heptachlor Epoxide in Drinking Water
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from Imperial Beach North Jetty, site IBNJ.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 12/10/2007
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID 49899 Region 9

Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty

Pollutant:	**Hexachlorobenzene/ HCB**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Hexachlorobenzene/ HCB. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Evaluation Guideline for and Hexachlorobenzene/ HCB this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49899, Hexachlorobenzene/ HCB **Region 9**

Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty

LOE ID:	74893
Pollutant:	Hexachlorobenzene/ HCB
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Fish fillet
Beneficial Use:	Shellfish Harvesting
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for hexachlorobenzene in shellfish tissue is 4.3 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; OEHHA, 2005)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Air Toxics Hotspots Program Risk Assessment Guidelines. Part II Technical Support Document for Describing Available Cancer Potency Values.
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from Imperial Beach North Jetty, site IBNJ.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 12/10/2007
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at:

QAPP Information Reference(s):

DECISION ID 49900 Region 9

Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty

Pollutant:	**Lindane/gamma Hexachlorocyclohexane (gamma-HCH)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Lindane/gamma Hexachlorocyclohexane (gamma-HCH).

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Evaluation Guideline for Lindane/gamma Hexachlorocyclohexane (gamma-HCH) and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49900, Lindane/gamma Hexachlorocyclohexane (gamma-HCH) Region 9

Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty

LOE ID:	74915
Pollutant:	Lindane/gamma Hexachlorocyclohexane (gamma-HCH)
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Fish fillet
Beneficial Use:	Shellfish Harvesting
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.

Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. 040214 Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for lindane in shellfish tissue is 7.1 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; OEHHA, 2005)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Air Toxics Hotspots Program Risk Assessment Guidelines. Part II Technical Support Document for Describing Available Cancer Potency Values.
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from Imperial Beach North Jetty, site IBNJ.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 12/10/2007
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID 49901 Region 9

Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty

Pollutant:	**Mercury**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Water Quality Criteria for Mercury.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.040215
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Water Quality Criteria for Mercury and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49901, Mercury **Region 9**

Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty

LOE ID:	74916
Pollutant:	Mercury
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Fish fillet
Beneficial Use:	Shellfish Harvesting
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The sample did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The USEPA 304(a) recommended water quality criterion for concentrations of methylmercury in shellfish tissue (wet weight) is 0.2 ppm. (Brodberg, R.K., and G.A. Pollock, 1999; USEPA, 2001)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Water Quality Criterion for the Protection of Human Health: Methylmercury. Final. United States Environmental Protection Agency Office of Science and Technology Office of Water. EPA-823-R-01-001. January 2001
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from Imperial Beach North Jetty, site IBNJ.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 12/10/2007
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and

mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program
Additional background information can be found at:
http://ccma.nos.noaa.gov/stressors/pollution/nsandt/

QAPP Information Reference(s):

DECISION ID 49902 Region 9

Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty

Pollutant:	**Mirex**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Mirex. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Evaluation Guideline for Mirex and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49902, Mirex Region 9

Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty

LOE ID:	74917
Pollutant:	Mirex
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Fish fillet
Beneficial Use:	Shellfish Harvesting
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The detected not quantifiable result was not included in the assessment since the reporting limit was above the evaluation guideline. MDL were provided by NOAA Federal and RL

	were calculated by multiplying 3.18 by the MDL. 040217
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for mirex in shellfish tissue is 0.43 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; OEHHA, 1992)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Expedited Cancer Potency Values and Proposed Regulatory Levels for Certain Proposition 65 Carcinogens.
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from Imperial Beach North Jetty, site IBNJ.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 12/10/2007
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID 49903 Region 9

Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty

Pollutant:	**PAHs (Polycyclic Aromatic Hydrocarbons)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for .

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.040218
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Evaluation Guideline for and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 49903, PAHs (Polycyclic Aromatic Hydrocarbons) Region 9

Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty

LOE ID:	74938
Pollutant:	PAHs (Polycyclic Aromatic Hydrocarbons)
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Fish fillet
Beneficial Use:	Shellfish Harvesting
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The sample did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal. The total PAHs were calculated as the potency equivalency concentration or the sum of the toxic equivalency factors multiplied by the concentrations of: Acenaphthene, Acenaphthylene, Anthracene, Benz[a]anthracene, Benzo[a]pyrene, Benzo[b]fluoranthene, Benzo[g,h,i]perylene, Benzo[k]fluoranthene, Dibenzo[a,h]anthracene, Chrysene, Fluoranthene, Fluorene, Indeno[1,2,3-c,d]pyrene, Phenanthrene, and Pyrene.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for polycyclic aromatic hydrocarbons in shellfish tissue is 1.1 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; USEPA, 2000)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Guidance for Assessing Chemical Contaminant Data for Use In Fish Advisories Volume 1: Fish Sampling and Analysis
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite

	sample was collected from Imperial Beach North Jetty, site IBNJ. 040219
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 12/10/2007
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID 49905 Region 9

Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty

Pollutant:	**PCBs (Polychlorinated biphenyls)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. One of the One samples exceed the Evaluation Guideline for PCBs (Polychlorinated biphenyls). Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of One samples exceeded the Evaluation Guideline for PCBs (Polychlorinated biphenyls) and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49905, PCBs (Polychlorinated biphenyls) Region 9

Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty

LOE ID:	74939
Pollutant:	PCBs (Polychlorinated biphenyls)
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Fish fillet
Beneficial Use:	Shellfish Harvesting

Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The sample did exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal. Total PCB was assessed for as follows: PCB aroclors and congeners were summed separately and the sum that yielded the highest value was used for the assessment.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for polychlorinated biphenyls in shellfish tissue is 3.9 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from Imperial Beach North Jetty, site IBNJ.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 12/10/2007
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID 49906 Region 9

Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty

Pollutant:	**Selenium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Selenium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Evaluation Guideline for Selenium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49906, Selenium **Region 9**

Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty

LOE ID:	74940
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Fish fillet
Beneficial Use:	Shellfish Harvesting
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The sample did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for selenium in shellfish tissue is 11 ppm. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day. A background dietary consuption rate of 0.114 mg/day is applied for this micronutrient. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite

	sample was collected from Imperial Beach North Jetty, site IBNJ. 040222
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 12/10/2007
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID 49907 Region 9

Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty

Pollutant:	**Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD). Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Evaluation Guideline for Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD) and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49907, Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD) Region 9

Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty

LOE ID:	74960
Pollutant:	Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD)
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Fish fillet

Beneficial Use:	Shellfish Harvesting
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The sample did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal. The total DDTs were calculated as the sum of 4,4- and 2,4- isomers of DDT, DDE, and DDD.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for total DDT in shellfish tissue is 23 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from Imperial Beach North Jetty, site IBNJ.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 12/10/2007
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID 42675 Region 9

Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

No new data of indicator bacteria were available for this water body, and so decision has been carried over from 2012.

Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

This pollutant is being considered for placement on the section 303(d) list under section 3.3 of the Listing Policy. Under section 3.3 a single line of evidence is necessary to assess listing status.

Ten lines of evidence are available in the administrative record to assess this pollutant. Fifty-one of the samples exceed the water quality objective for Shellfish Harvesting.

The coastal beach at this water segment is identified as an AB411 beach. To comply with the requirements of AB411 the dry weather data collected during the time frame of April 1st to October 31st is assessed using a four percent exceedance percentage, as described in section 3.3 (and 4.3) of the Listing Policy. An assessment for dry weather single sample and the geometric mean calculation was conducted and three additional lines of evidence are available in the administrative record. Six of 173 and zero of 97 single samples exceeded the criteria for recreational use at station IB060 and EH041, respectively, and zero of 25 geometric mean calculations from station IB060 exceeded the criteria for recreational use and this does not exceed the allowable limit based on the application of a four percent exceedance percentage (AB411) to section 3.3 of the Listing Policy.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Fifity-one of 295 samples exceed the Shellfish Harvesting water quality objective and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Six of 173 dry weather single samples exceeded the total coliform criteria for recreational use and this does not exceed the allowable limit (at a four percent exceedance percentage - AB411) in section 3.3 of the Listing Policy.
5. Zero of 97 dry weather single samples exceeded the total coliform criteria for recreational use and this does not exceed the allowable limit (at a four percent exceedance percentage - AB411) in section 3.3 of the Listing Policy.
6. Zero of 25 dry weather geometric mean calculations exceeded the total coliform criteria for recreational use and this does not exceed the allowable limit (at a four percent exceedance percentage - AB411) in section 3.3 of the Listing Policy.
7. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

No new data of indicator bacteria were available for this water body, decision was carried over from 2012.

Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 42675, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty

LOE ID:	27815
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water

Matrix:	Water	040225
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	16	
Number of Exceedances:	1	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 56 single samples were collected and 16 geomeans calculated. One of the 16 geomeans exceeded the geomean water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml;	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Camp Surf Jetty, Imperial Beach, California. Department of Environmental Health identification number is EH-041.	
Temporal Representation:	Samples were collected from June 2004 through October 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 42675, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty

LOE ID:	27804
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	99
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 99 single samples were collected with no sample exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).

Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Camp Surf Jetty, Imperial Beach, California. Department of Environmental Health identification number is EH-041.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42675, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty

LOE ID:	30607
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	98
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 100 single samples were collected of which 98 are dry weather (AB411) samples with one sample exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Camp Surf Jetty, San Diego, California. Department of Environmental Health identification number is EH-041.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42675, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty

LOE ID:	31297	040227

Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	25
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 110 dry month (April through October) single samples were collected with 25 dry month geomeans calculated. One of the 25 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Carnation Ave, Imperial Beach, California. Department of Environmental Health identification number is IBI-060.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42675, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty

LOE ID:	31299
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	25
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 110 dry month (April through October) single samples were collected with 25 dry month geomeans calculated. None of the 25 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data:	Non-SWAMP	040228
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml;	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Carnation Ave, Imperial Beach, California. Department of Environmental Health identification number is IB-060.	
Temporal Representation:	Samples were collected from June 2004 through October 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 42675, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty

LOE ID:	27796
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	21
Number of Exceedances:	14
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from JFebruary 2004 through December 2007. A total of 196 single samples were collected with 21 samples correlating with a storm event. Fourteen of the 21 samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Carnation Ave, Imperial Beach, California. Department of Environmental Health identification number is IB-060.
Temporal Representation:	Samples were collected from February 2004 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach

	monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42675, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty

LOE ID:	27797
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	44
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 196 single samples were collected with 44 monthly geomeans calculated. Two of the 44 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Carnation Ave, Imperial Beach, California. Department of Environmental Health identification number is IB-060.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42675, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty

LOE ID:	27798
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation	040230
Number of Samples:	196	
Number of Exceedances:	19	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 196 single samples were collected with 19 samples exceeding the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Carnation Ave, Imperial Beach, California. Department of Environmental Health identification number is IB-060.	
Temporal Representation:	Samples were collected from January 2004 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 42675, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty

LOE ID:	27801
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	197
Number of Exceedances:	22
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 197 single samples were collected with 22 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:	040231
Guideline Reference:	
Spatial Representation:	Samples were collected at Carnation Ave, Imperial Beach, California. Department of Environmental Health identification number is IB-060.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42675, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty

LOE ID:	27803
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	44
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 197 single samples were collected with 44 monthly geomeans calculated. Four of the 44 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Carnation Ave, Imperial Beach, California. Department of Environmental Health identification number is IBI-060.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42675, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty

LOE ID:	27799
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water

Matrix:	Water	040232
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	22	
Number of Exceedances:	10	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from February 2004 through December 2007. A total of 196 single samples were collected with 22 samples correlating with a storm event. Ten of the 22 samples exceeded the single sample water quality objective.	
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Carnation Ave, Imperial Beach, California. Department of Environmental Health identification number is IBI-060.	
Temporal Representation:	Samples were collected from February 2004 through December 2007.	
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 42675, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty

LOE ID:	27806
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	99
Number of Exceedances:	15
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through

	October 2007. A total of 99 single samples were collected with 15 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Camp Surf Jetty, Imperial Beach, California. Department of Environmental Health identification number is EH-041.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42675, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty

LOE ID:	28015
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 56 single samples were collected with one sample correlated with a storm event. The one sample did not exceed the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Camp Surf Jetty, Imperial Beach, California. Department of Environmental Health identification number is EH-041.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event

was defined as 0.2 inches of rainfall within a 72 hour period. 040234

Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.

QAPP Information: Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.

QAPP Information Reference(s): County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42675, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty

LOE ID: 28198

Pollutant: Indicator Bacteria
LOE Subgroup: Health Advisories
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 2555
Number of Exceedances: 11

Data and Information Type: PWS pathogen monitoring (ambient water)

Data Used to Assess Water Quality: For the period from January 2001 to December 2007, there were 11 beach advisory days for these locations. Bacteriological samples are collected on a weekly basis from April through October. When a bacteriological sample exceeds water quality standards, signs are posted indicating that waters have exceeded public health standards.

Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 to December 2007. Data used was the number of days the beach was posted with an Advisory when the ocean or bay failed to meet the bacteriological standards.

Data Reference: County of Orange. March 2007. Annual Ocean and Bay Water Quality Report, 2006 Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: California Code of Regulations. Title 17, Section 7960.

(a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.

Objective/Criterion Reference: California Code of Regulations, Title 17, Section 7960

Evaluation Guideline:

Guideline Reference: Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Spatial Representation: Bacteriological monitoring samples were collected at Carnation Avenue and Camp Surf Jetty in Imperial Beach.

Temporal Representation: The beach advisory covers the time frame of January 2001 -December 2007.

Environmental Conditions:	040235
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42675, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty

LOE ID:	27807
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 99 single samples were collected with two samples correlating with a storm event. Neither sample exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005). Comparisons were also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Camp Surf Jetty, Imperial Beach, California. Department of Environmental Health identification number is EH-041.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42675, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty 040236

LOE ID:	27808
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	2
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 99 single samples were collected with one sample correlating with a storm event. One of the two samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Camp Surf Jetty, Imperial Beach, California. Department of Environmental Health identification number is EH-041.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42675, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty

LOE ID:	27811
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	56	040237
Number of Exceedances:	1	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 56 single samples were collected with one sample exceeding the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Camp Surf Jetty, Imperial Beach, California. Department of Environmental Health identification number is EH-041.	
Temporal Representation:	Samples were collected from June 2004 through October 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 42675, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty

LOE ID:	27793
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	196
Number of Exceedances:	14
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 196 single samples were collected with 14 samples exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:	040238
Guideline Reference:	
Spatial Representation:	Samples were collected at Carnation Ave, Imperial Beach, California. Department of Environmental Health identification number is IB-060.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42675, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty

LOE ID:	27800
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	44
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 196 single samples were collected and 44 geomeans calculated. None of the 44 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Carnation Ave, Imperial Beach, California. Department of Environmental Health identification number is IB-060.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42675, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty

LOE ID:	27795
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	040239
Beneficial Use:	Water Contact Recreation	
Number of Samples:	21	
Number of Exceedances:	8	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from February 2004 through December 2007. A total of 196 single samples were collected with 21 samples correlating with a storm event. Eight of the 21 samples exceeded the single sample water quality objective.	
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Carnation Ave, San Diego, California. Department of Environmental Health identification number is IB-060.	
Temporal Representation:	Samples were collected from February 2004 through December 2007.	
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 42675, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty

LOE ID:	27802
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	22
Number of Exceedances:	11
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from February 2004 through December 2007. A total of 196 single samples were collected with 22 samples

	correlating with a storm event. Eleven of the 22 samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Carnation Ave, Imperial Beach, California. Department of Environmental Health identification number is IB-060.
Temporal Representation:	Samples were collected from February 2004 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42675, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty

LOE ID:	27809
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	25
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 99 single samples were collected with 25 monthly geomeans calculated. None of the 25 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Camp Surf Jetty, Imperial Beach, California. Department of Environmental Health identification number is EH-041.
Temporal Representation: Samples were collected from June 2004 through October 2007.
Environmental Conditions:
QAPP Information: Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s): County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42675, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty

LOE ID: 28018

Pollutant: Fecal Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 25
Number of Exceedances: 0

Data and Information Type: PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality: Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 56 single samples were collected with and 25 geomeans calculated. None of the geomeans exceeded the water quality objective.
Data Reference: Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: Geomean: Enterococcus density shall not exceed 35 per 100 ml.
Objective/Criterion Reference: Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Camp Surf Jetty, Imperial Beach, California. Department of Environmental Health identification number is EH-041.
Temporal Representation: Samples were collected from June 2004 through October 2007.
Environmental Conditions:
QAPP Information: Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s): County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42675, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty

LOE ID: 27794

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water

Matrix:	Water	040242
Fraction:	None	
Beneficial Use:	Shellfish Harvesting	
Number of Samples:	196	
Number of Exceedances:	36	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 196 single samples were collected with 36 samples exceeding the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Carnation Ave, Imperial Beach, California. Department of Environmental Health identification number is IB-060.	
Temporal Representation:	Samples were collected from January 2004 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 42675, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty

LOE ID:	27823
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	100
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 100 single samples were collected with one sample exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005.

	Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Camp Surf Jetty, San Diego, California. Department of Environmental Health identification number is EH-041.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42675, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty

LOE ID:	27825
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 100 single samples were collected with two samples correlating with a storm event. None of the two samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected atCamp Surf Jetty, Imperial Beach, California. Department of Environmental Health identification number is EH-041.
Temporal Representation:	Samples were collected from May 2006 through April 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.

QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42675, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty

LOE ID:	30716
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	55
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 56 single samples were collected of which 55 are dry weather (AB411) samples with one sample exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Camp Surf Jetty, Imperial Beach, California. Department of Environmental Health identification number is EH-041.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42675, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty

LOE ID:	30717
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	174
Number of Exceedances:	9

Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 196 single samples were collected of which 174 are dry weather (AB411) samples with nine samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Carnation Ave, Imperial Beach, California. Department of Environmental Health identification number is IB-060.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42675, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty

LOE ID:	30606
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	175
Number of Exceedances:	11
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 197 single samples were collected of which 175 are dry weather (AB411) samples with 11 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at Carnation Ave, Imperial Beach, California. Department of Environmental Health identification number is IB-060.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42675, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty

LOE ID:	30821
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	173
Number of Exceedances:	6
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 196 single samples were collected of which 173 are dry weather (AB411) samples with six of those samples exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Carnation Ave, Imperial Beach, California. Department of Environmental Health identification number is IB-060.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42675, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty

LOE ID:	30822
Pollutant:	Total Coliform

LOE Subgroup:	Pollutant-Water	040247
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	97	
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 99 single samples were collected of which 97 are dry weather (AB411) samples with none of those samples exceeding the single sample water quality objective.	
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Camp Surf Jetty, Imperial Beach, California. Department of Environmental Health identification number is EH-041.	
Temporal Representation:	Samples were collected from June 2004 through October 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 42675, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty

LOE ID:	31296
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	25
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 100 dry month (April through October) single samples were collected with 25 dry month geomeans calculated. None of the 25 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data:	Non-SWAMP	040248
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml.	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Camp Surf Jetty, Imperial Beach, California. Department of Environmental Health identification number is EH-041.	
Temporal Representation:	Samples were collected from June 2004 through October 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 42675, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty

LOE ID:	31298
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	25
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 109 dry month (April through October) single samples were collected with 25 dry month geomeans calculated. None of the 25 geomeans exceeded the geomean water quality objective. .
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Carnation Ave, Imperial Beach, California. Department of Environmental Health identification number is IB-060.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Point Loma HA, at Lighthouse
Water Body ID: CAC908100002009110410245 6
Water Body Type: Coastal & Bay Shoreline

DECISION ID 44225 Region 9
Pacific Ocean Shoreline, Point Loma HA, at Lighthouse

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Fourteen lines of evidence are available in the administrative record to assess this pollutant. With the latest data, 1 of 233 samples exceed the water quality objective for enterococcus of a geomean of 35/100ml in a 30-day period for the protection of REC-1.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, 1 of 233 samples exceed the water quality objective for enterococcus of a geomean of 35/100ml in a 30-day period for the protection of REC-1 and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 44225, Indicator Bacteria Region 9
Pacific Ocean Shoreline, Point Loma HA, at Lighthouse

LOE ID: 77649

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Shellfish Harvesting

Number of Samples: 138

Number of Exceedances:	2	040250
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Two of the 138 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, Point Loma HA, at Lighthouse.	
Temporal Representation:	The samples were collected from January 2008 to August 2010.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the beach watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44225, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Lighthouse

LOE ID:	27660
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	21
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 1999 through December 2007. A total of 351 single samples were collected with 21 samples correlated with a storm event. One of the 21 samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005). Comparisons are also made for days with matching bacteria and storm event data. A storm event is defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Lighthouse, San Diego, California. Station identification number is PL-040.
Temporal Representation:	Samples were collected from July 1999 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44225, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Lighthouse

LOE ID:	74992
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	149
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Beach Watch data for Pacific Ocean Shoreline, Point Loma HA, at Lighthouse to determine beneficial use support and results are as follows: 0 of 149 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Point Loma HA, at Lighthouse was collected at 1 monitoring site [Lighthouse]
Temporal Representation:	Data was collected over the time period 1/5/2008-8/24/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44225, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Lighthouse

LOE ID:	74991	040252

Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	138
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 138 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Lighthouse site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44225, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Lighthouse

LOE ID:	74990
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	137
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 137 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Lighthouse site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	

QAPP Information:	The samples were collected for the Beach Watch program.	040253
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44225, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Lighthouse

LOE ID:	27658
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	351
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 1999 through December 2007. A total of 351 single samples were collected with four samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Lighthouse, San Diego, California. Station identification number is PL-040.
Temporal Representation:	Samples were collected from July 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44225, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Lighthouse

LOE ID:	27657
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	21
Number of Exceedances:	0

Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 1999 through December 2007. A total of 351 single samples were collected with 21 samples correlated with a storm event. None of the 21 samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Lighthouse, San Diego, California. Station identification number is PL-040.
Temporal Representation:	Samples were collected from July 1999 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44225, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Lighthouse

LOE ID:	31272
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	57
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 1999 through October 2007. A total of 222 dry month (April through October) single samples were collected with 57 dry month geomeans calculated. None of the 57 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Lighthouse, San Diego, California. Station identification number is PL-040.
Temporal Representation:	Samples were collected from July 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44225, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Lighthouse

LOE ID:	27656
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	351
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 1999 through December 2007. A total of 351 single samples were collected with one sample exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Lighthouse, San Diego, California. Station identification number is PL-040.
Temporal Representation:	Samples were collected from July 1999 through December 2007.
Environmental Conditions:	

QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44225, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Lighthouse

LOE ID:	27655
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	21
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 1999 through December 2007. A total of 351 single samples were collected with 21 samples correlated with a storm event. None of the 21 samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Lighthouse, San Diego, California. Station identification number is PL-040.
Temporal Representation:	Samples were collected from July 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44225, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Lighthouse

LOE ID:	27654
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation
Number of Samples:	351
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 1999 through December 2007. A total of 351 single samples were collected with no sample exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Lighthouse, San Diego, California. Station identification number is PL-040.
Temporal Representation:	Samples were collected from July 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44225, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Lighthouse

LOE ID:	31275
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	57
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 1999 through October 2007. A total of 222 dry month (April through October) single samples were collected with 57 dry month geomeans calculated. None of the 57 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; 040258 Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Lighthouse, San Diego, California. Station identification number is PL-040.
Temporal Representation:	Samples were collected from July 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44225, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Lighthouse

LOE ID:	31274
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	57
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 1999 through October 2007. A total of 222 dry month (April through October) single samples were collected with 57 dry month geomeans calculated. None of the 57 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Lighthouse, San Diego, California. Station identification number is PL-040.
Temporal Representation:	Samples were collected from July 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.

QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44225, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Lighthouse

LOE ID:	27653
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	21
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 1999 through December 2007. A total of 351 single samples were collected with 21 samples correlated with a storm event. Three of the 21 samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Lighthouse, San Diego, California. Station identification number is PL-040.
Temporal Representation:	Samples were collected from July 1999 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44225, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Lighthouse

LOE ID:	30610
Pollutant:	Enterococcus

LOE Subgroup:	Pollutant-Water	040260
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	330	
Number of Exceedances:	3	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 1999 through December 2007. A total of 351 single samples were collected of which 330 are dry weather (AB411) samples with three samples exceeding the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Lighthouse, San Diego, California. Station identification number is PL-040.	
Temporal Representation:	Samples were collected from July 1999 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44225, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Lighthouse

LOE ID:	27652
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	351
Number of Exceedances:	9
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 1999 through December 2007. A total of 351 single samples were collected with 9 samples exceeded the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Lighthouse, San Diego, California. Station identification number is PL-040.
Temporal Representation:	Samples were collected from July 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44225, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Lighthouse

LOE ID:	30825
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	330
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 1999 through December 2007. A total of 351 single samples were collected of which 330 are dry weather (AB411) samples with none of those samples exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Lighthouse, San Diego, California. Station identification number is PL-040.
Temporal Representation:	Samples were collected from July 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.

QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44225, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Lighthouse

LOE ID:	30720
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	330
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 1999 through December 2007. A total of 351 single samples were collected of which 330 are dry weather (AB411) samples with one sample exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Lighthouse, San Diego, California. Station identification number is PL-040.
Temporal Representation:	Samples were collected from July 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44225, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Lighthouse

LOE ID:	27663
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	96
Number of Exceedances:	1

Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 1999 through December 2007. A total of 351 single samples were collected with 96 monthly geomeans calculated. One of the 96 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Lighthouse, San Diego, California. Station identification number is PL-040.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44225, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Lighthouse

LOE ID:	27662
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	96
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 1999 through December 2007. A total of 351 single samples were collected and 96 geomeans calculated. None of the 96 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:	040264
Guideline Reference:	
Spatial Representation:	Samples were collected at Lighthouse, San Diego, California. Station identification number is PL-040.
Temporal Representation:	Samples were collected from July 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44225, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Lighthouse

LOE ID:	27661
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	96
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 1999 through December 2007. A total of 351 single samples were collected with 96 monthly geomeans calculated. None of the 96 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Lighthouse, San Diego, California. Station identification number is PL-040.
Temporal Representation:	Samples were collected from July 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44225, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Lighthouse

LOE ID:	74993

Pollutant:	Total Coliform	040265
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	138	
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Zero of the 138 geomeans exceeded the objective.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at the Lighthouse site.	
Temporal Representation:	Samples were collected from January 2008 to August 2010.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Point Loma HA, at Point Loma Treatment Plant
Water Body ID: CAC908100002009110410330 5
Water Body Type: Coastal & Bay Shoreline

DECISION ID 43016 **Region 9**
Pacific Ocean Shoreline, Point Loma HA, at Point Loma Treatment Plant

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Fourteen lines of evidence are available in the administrative record to assess this pollutant. With the latest data, 2 of 228 samples exceed the water quality objective for enterococcus of a geomean of 35/100 ml in a 30-day period for the protection of REC-1.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, 2 of 228 samples exceed the water quality objective for enterococcus of a geomean of 35/100 ml in a 30-day period for the protection of REC-1 and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 43016, Indicator Bacteria **Region 9**
Pacific Ocean Shoreline, Point Loma HA, at Point Loma Treatment Plant

LOE ID: 74994

Pollutant: Enterococcus
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 132

Number of Exceedances:	0	040267

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Zero of the 132 geomeans exceeded the objective.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at the Point Loma Treatment Plant site.
Temporal Representation: Samples were collected from January 2008 to August 2010.
Environmental Conditions:
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 43016, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Point Loma Treatment Plant

LOE ID: 75017

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 132
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Zero of the 132 geomeans exceeded the objective.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at the Point Loma Treatment Plant site.
Temporal Representation: Samples were collected from January 2008 to August 2010.
Environmental Conditions:
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 43016, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Point Loma Treatment Plant

LOE ID: 75016

Pollutant: Total Coliform

LOE Subgroup:	Pollutant-Water	040268
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Shellfish Harvesting	
Number of Samples:	143	
Number of Exceedances:	6	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed Beach Watch data for Pacific Ocean Shoreline, Point Loma HA, at Point Loma Treatment Plant to determine beneficial use support and results are as follows: 6 of 143 samples exceed the criterion for Coliform, Total.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Point Loma HA, at Point Loma Treatment Plant was collected at 1 monitoring site [Point Loma Treatment Plant]	
Temporal Representation:	Data was collected over the time period 1/5/2008-8/24/2010.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43016, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Point Loma Treatment Plant

LOE ID:	31271
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	57
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 1999 through October 2007. A total of 223 dry month (April through October) single samples were collected with 57 dry month geomeans calculated. None of the 57 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:	040269
Guideline Reference:	
Spatial Representation:	Samples were collected at Point Loma Treatment Plant, San Diego, California. Station identification number is PL-050.
Temporal Representation:	Samples were collected from July 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43016, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Point Loma Treatment Plant

LOE ID:	31270
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	57
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 1999 through October 2007. A total of 223 dry month (April through October) single samples were collected with 57 dry month geomeans calculated. None of the 57 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Point Loma Treatment Plant, San Diego, California. Station identification number is PL-050.
Temporal Representation:	Samples were collected from July 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43016, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Point Loma Treatment Plant

LOE ID:	31269

Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	57
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 1999 through October 2007. A total of 223 dry month (April through October) single samples were collected with 57 dry month geomeans calculated. One of the 57 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Point Loma Treatment Plant, San Diego, California. Station identification number is PL-050.
Temporal Representation:	Samples were collected from July 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43016, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Point Loma Treatment Plant

LOE ID:	30721
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	334
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 1999 through December 2007. A total of 357 single samples were collected of which 334 are dry weather (AB411) samples with zero samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Lighthouse, San Diego, California. Station identification number is PL-040.
Temporal Representation:	Samples were collected from July 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43016, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Point Loma Treatment Plant

LOE ID:	30826
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	334
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 1999 through December 2007. A total of 357 single samples were collected of which 334 are dry weather (AB411) samples with one sample exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Point Loma Treatment Plant, San Diego, California. Station identification number is PL-050.

Temporal Representation:	Samples were collected from July 1999 through December 2007. 040272
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43016, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Point Loma Treatment Plant

LOE ID:	27680
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	96
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 1999 through December 2007. A total of 357 single samples were collected with 96 monthly geomeans calculated. Two of the 96 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Point Loma Treatment Plant, San Diego, California. Station identification number is PL-050.
Temporal Representation:	Samples were collected from July 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43016, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Point Loma Treatment Plant

LOE ID:	30611
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation	040273
Number of Samples:	334	
Number of Exceedances:	4	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 1999 through December 2007. A total of 357 single samples were collected of which 334 are dry weather (AB411) samples with four samples exceeding the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Point Loma Treatment Plant, San Diego, California. Station identification number is PL-050.	
Temporal Representation:	Samples were collected from July 1999 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43016, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Point Loma Treatment Plant

LOE ID:	27679
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	96
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 1999 through December 2007. A total of 357 single samples were collected and 96 geomeans calculated. None of the 96 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB,

	2005). 040274
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Point Loma Treatment Plant, San Diego, California. Station identification number is PL-050.
Temporal Representation:	Samples were collected from July 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43016, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Point Loma Treatment Plant

LOE ID:	27678
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	96
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 1999 through December 2007. A total of 357 single samples were collected with 96 monthly geomeans calculated. None of the 96 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Point Loma Treatment Plant, San Diego, California. Station identification number is PL-050.
Temporal Representation:	Samples were collected from July 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43016, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Point Loma Treatment Plant

LOE ID:	27676	040275

Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	23
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 1999 through December 2007. A total of 357 single samples were collected with 23 samples correlated with a storm event. One of the 23 samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Point Loma Treatment Plant, San Diego, California. Station identification number is PL-050.
Temporal Representation:	Samples were collected from July 1999 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43016, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Point Loma Treatment Plant

LOE ID:	27675
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	357
Number of Exceedances:	5
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 1999 through December 2007. A total of 357 single samples were collected with five samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Point Loma Treatment Plant, San Diego, California. Station identification number is PL-050.
Temporal Representation:	Samples were collected from July 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43016, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Point Loma Treatment Plant

LOE ID:	27674
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	23
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 1999 through December 2007. A total of 357 single samples were collected with 23 samples correlated with a storm event. One of the 23 samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml;

	Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Point Loma Treatment Plant, San Diego, California. Station identification number is PL-050.
Temporal Representation:	Samples were collected from July 1999 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43016, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Point Loma Treatment Plant

LOE ID:	27673
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	357
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 1999 through December 2007. A total of 357 single samples were collected with one sample exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at Lighthouse, San Diego, California. Station identification number is PL-040.
Temporal Representation:	Samples were collected from July 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43016, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Point Loma Treatment Plant

LOE ID:	27672
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	23
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 1999 through December 2007. A total of 357 single samples were collected with 23 samples correlating with a storm event. None of the 23 samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Point Loma Treatment Plant, San Diego, California. Station identification number is PL-050.
Temporal Representation:	Samples were collected from July 1999 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43016, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Point Loma Treatment Plant 040279

LOE ID:	27671
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	357
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 1999 through December 2007. A total of 357 single samples were collected with one sample exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Point Loma Treatment Plant, San Diego, California. Station identification number is PL-050.
Temporal Representation:	Samples were collected from July 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43016, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Point Loma Treatment Plant

LOE ID:	27670
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	23
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 1999 through

	December 2007. A total of 357 single samples were collected with 23 samples correlated with a storm event. Three of the 23 samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Point Loma Treatment Plant, San Diego, California. Station identification number is PL-050.
Temporal Representation:	Samples were collected from July 1999 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43016, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Point Loma Treatment Plant

LOE ID:	27669
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	357
Number of Exceedances:	13
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 1999 through December 2007. A total of 357 single samples were collected with 13 samples exceeded the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005.

Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency 040281

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Point Loma Treatment Plant, San Diego, California. Station identification number is PL-050.
Temporal Representation: Samples were collected from July 1999 through December 2007.
Environmental Conditions:
QAPP Information: Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s): County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43016, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Point Loma Treatment Plant

LOE ID: 74995

Pollutant: Fecal Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 132
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Zero of the 132 geomeans exceeded the objective.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at the Point Loma Treatment Plant site.
Temporal Representation: Samples were collected from January 2008 to August 2010.
Environmental Conditions:
QAPP Information: The samples were collected for the beach watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 43016, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Point Loma Treatment Plant

LOE ID: 77650

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Shellfish Harvesting

Number of Samples:	132	040282
Number of Exceedances:	16	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Sixteen of the 132 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, Point Loma HA, at Point Loma Treatment Plant.	
Temporal Representation:	The samples were collected from January 2008 to August 2010.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the beach watch program.	
QAPP Information Reference(s):		

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Point Loma HA, at Ladera Street
Water Body ID: CAC908100002009110411043 9
Water Body Type: Coastal & Bay Shoreline

DECISION ID 42335 **Region 9**
Pacific Ocean Shoreline, Point Loma HA, at Ladera Street

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Fifteen lines of evidence are available in the administrative record to assess this pollutant. With the latest data, 2 of 238 samples exceed the water quality objective for enterococcus of a geomean of 35/100ml in a 30-day period for the protection of REC-1.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, 2 of 238 samples exceed the water quality objective for enterococcus of a geomean of 35/100ml in a 30-day period for the protection of REC-1 and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 42335, Indicator Bacteria **Region 9**
Pacific Ocean Shoreline, Point Loma HA, at Ladera Street

LOE ID: 77648

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Shellfish Harvesting

Number of Samples: 146

Number of Exceedances:	6	040284
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Six of the 146 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, Point Loma HA, at Ladera Street.	
Temporal Representation:	The samples were collected from January 2008 to August 2010.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the beach watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 42335, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Ladera Street

LOE ID:	27684
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	340
Number of Exceedances:	20
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 1999 through December 2007. A total of 340 single samples were collected with 20 samples exceeded the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Ladera Street, San Diego, California. Station identification number is PL-070.
Temporal Representation:	Samples were collected from July 1999 through December 2007.
Environmental Conditions:	

QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42335, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Ladera Street

LOE ID:	27685
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	23
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 1999 through December 2007. A total of 340 single samples were collected with 23 samples correlated with a storm event. One of the 23 samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005). Comparisons are also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Ladera Street, San Diego, California. Station identification number is PL-070.
Temporal Representation:	Samples were collected from July 1999 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42335, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Ladera Street 040286

LOE ID:	28205
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	5
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were five beach advisory days for this location. Bacteriological samples are collected on a weekly basis from April through October. When a bacteriological sample exceeds water quality standards, signs are posted indicating that waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 to December 2007. Data used was the number of days the beach was posted with an Advisory when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	County of Orange. March 2007. Annual Ocean and Bay Water Quality Report, 2006 Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Spatial Representation:	Bacteriological monitoring samples were collected at the shoreline near Ladera Street in San Diego, CA.
Temporal Representation:	The beach advisory covers the time frame of January 2001 -December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42335, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Ladera Street

LOE ID:	27691
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water

Matrix:	Water	040287
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	23	
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 1999 through December 2007. A total of 342 single samples were collected with 23 samples correlated with a storm event. None of the 23 samples exceeded the single sample water quality objective.	
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Ladera Street, San Diego, California. Station identification number is PL-070.	
Temporal Representation:	Samples were collected from July 1999 through December 2007.	
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 42335, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Ladera Street

LOE ID:	27692
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	92
Number of Exceedances:	1

Data and Information Type:	PWS pathogen monitoring (ambient water) 040288
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 1999 through December 2007. A total of 340 single samples were collected with 92 monthly geomeans calculated. One of the 92 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Ladera Street, San Diego, California. Station identification number is PL-070.
Temporal Representation:	Samples were collected from July 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42335, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Ladera Street

LOE ID:	27693
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	92
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 1999 through December 2007. A total of 341 single samples were collected and 92 geomeans calculated. None of the 92 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	

Guideline Reference:	040289
Spatial Representation:	Samples were collected at Ladera Street, San Diego, California. Station identification number is PL-070.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42335, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Ladera Street

LOE ID:	27686
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	340
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 1999 through December 2007. A total of 340 single samples were collected with no sample exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Ladera Street, San Diego, California. Station identification number is PL-070.
Temporal Representation:	Samples were collected from July 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42335, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Ladera Street

LOE ID:	27694

Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	92
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 1999 through December 2007. A total of 342 single samples were collected with 92 monthly geomeans calculated. Two of the 92 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Ladera Street, San Diego, California. Station identification number is PL-070.
Temporal Representation:	Samples were collected from July 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42335, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Ladera Street

LOE ID:	27687
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	23
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 1999 through December 2007. A total of 340 single samples were collected with 23 samples correlated with a storm event. None of the 23 samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station

	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005). Comparisons were also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Ladera Street, San Diego, California. Station identification number is PL-070.
Temporal Representation:	Samples were collected from July 1999 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42335, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Ladera Street

LOE ID:	27688
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	341
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 1999 through December 2007. A total of 341 single samples were collected with two samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB,

2005). 040292

Objective/Criterion Reference: Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Ladera Street, San Diego, California. Station identification number is PL-070.

Temporal Representation: Samples were collected from July 1999 through December 2007.

Environmental Conditions:

QAPP Information: Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.

QAPP Information Reference(s): County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42335, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Ladera Street

LOE ID: 27689

Pollutant: Fecal Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 22
Number of Exceedances: 0

Data and Information Type: PWS pathogen monitoring (ambient water)

Data Used to Assess Water Quality: Beach monitoring data was collected by the County of San Diego from July 1999 through December 2007. A total of 341 single samples were collected with 22 samples correlated with a storm event. None of the 22 samples exceeded the single sample water quality objective.

Data Reference: National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: Geomean; Fecal coliform density shall not exceed 200 per 100 ml;

Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).

Objective/Criterion Reference: Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Ladera Street, San Diego, California. Station identification number is PL-070.

Temporal Representation: Samples were collected from July 1999 through December 2007.

Environmental Conditions: Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.

Analyzing only storm water bacteria data is important because the majority of beach

	monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42335, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Ladera Street

LOE ID:	27690
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	342
Number of Exceedances:	6
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 1999 through December 2007. A total of 342 single samples were collected with six samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Ladera Street, San Diego, California. Station identification number is PL-070.
Temporal Representation:	Samples were collected from July 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42335, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Ladera Street

LOE ID:	30719
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	040294
Beneficial Use:	Water Contact Recreation	
Number of Samples:	319	
Number of Exceedances:	2	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 1999 through December 2007. A total of 341 single samples were collected of which 319 are dry weather (AB411) samples with two samples exceeding the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Ladera Street, San Diego, California. Station identification number is PL-070.	
Temporal Representation:	Samples were collected from July 1999 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 42335, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Ladera Street

LOE ID:	30824
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	317
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 1999 through December 2007. A total of 340 single samples were collected of which 317 are dry weather (AB411) samples with none of those samples exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Ladera Street, San Diego, California. Station identification number is PL-070.
Temporal Representation:	Samples were collected from July 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42335, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Ladera Street

LOE ID:	30609
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	319
Number of Exceedances:	6
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 1999 through December 2007. A total of 342 single samples were collected of which 319 are dry weather (AB411) samples with six samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Ladera Street, San Diego, California. Station identification number is PL-070.
Temporal Representation:	Samples were collected from July 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.

QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42335, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Ladera Street

LOE ID:	31278
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	53
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 1999 through October 2007. A total of 207 dry month (April through October) single samples were collected with 53 dry month geomeans calculated. One of the 53 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Ladera Street, San Diego, California. Station identification number is PL-070.
Temporal Representation:	Samples were collected from July 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42335, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Ladera Street

LOE ID:	31279
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	53

Number of Exceedances:	0	040297
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 1999 through October 2007. A total of 207 dry month (April through October) single samples were collected with 53 dry month geomeans calculated. None of the 53 geomeans exceeded the geomean water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Ladera Street, San Diego, California. Station identification number is PL-070.	
Temporal Representation:	Samples were collected from July 1999 through October 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 42335, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Ladera Street

LOE ID:	31282
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	53
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 1999 through October 2007. A total of 205 dry month (April through October) single samples were collected with 53 dry month geomeans calculated. None of the 53 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005.

	Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency 040298
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Ladera Street, San Diego, California. Station identification number is PL-070.
Temporal Representation:	Samples were collected from July 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42335, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Ladera Street

LOE ID:	74966
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	146
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 146 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Ladera Street site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 42335, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Ladera Street

LOE ID:	74987
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	146	040299
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Zero of the 146 geomeans exceeded the objective.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at the Ladera Street site.	
Temporal Representation:	Samples were collected from January 2008 to August 2010.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the beach watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 42335, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Ladera Street

LOE ID:	74988
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	154
Number of Exceedances:	2
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Beach Watch data for Pacific Ocean Shoreline, Point Loma HA, at Ladera Street to determine beneficial use support and results are as follows: 2 of 154 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Point Loma HA, at Ladera Street was collected at 1 monitoring site [Ladera Street]
Temporal Representation:	Data was collected over the time period 1/5/2008-8/24/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 42335, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Ladera Street 040300

LOE ID:	74989
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	146
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 146 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Ladera Street site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Point Loma HA, at Bermuda Ave
Water Body ID: CAC908100002009110410434 3
Water Body Type: Coastal & Bay Shoreline

DECISION ID 32922 Region 9
Pacific Ocean Shoreline, Point Loma HA, at Bermuda Ave

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal from the CWA section 303(d) List under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Fifteen lines of evidence are available in the administrative record to assess this pollutant. With the latest data, 56 of the 129 samples exceed the water quality objective for total coliform of a geomean of 70/100ml in a 30-day period for the protection of SHELL.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, 56 of the 129 samples exceed the water quality objective for total coliform of a geomean of 70/100ml in a 30-day period for the protection of SHELL and this exceeds the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 32922, Indicator Bacteria Region 9
Pacific Ocean Shoreline, Point Loma HA, at Bermuda Ave

LOE ID:	27695
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Shellfish Harvesting	040302
Number of Samples:	385	
Number of Exceedances:	70	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 1999 through December 2007. A total of 385 single samples were collected with 70 samples exceeded the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Bermuda Ave., San Diego, California. Station identification number is PL-080.	
Temporal Representation:	Samples were collected from July 1999 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 32922, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Bermuda Ave

LOE ID:	31286
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	57
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 1999 through October 2007. A total of 234 dry month (April through October) single samples were collected with 57 dry month geomeans calculated. None of the 57 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005.

	Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency 040303
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Bermuda Ave., San Diego, California. Station identification number is PL-080.
Temporal Representation:	Samples were collected from July 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 32922, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Bermuda Ave

LOE ID:	27697
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	385
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 385 single samples were collected with one sample exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Bermuda Ave., San Diego, California. Station identification number is PL-080.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 32922, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Bermuda Ave 040304

LOE ID:	27698
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	25
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 385 single samples were collected with 25 samples correlated with a storm event. None of the 25 samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Bermuda Ave., San Diego, California. Station identification number is PL-080.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 32922, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Bermuda Ave

LOE ID:	27699
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	382
Number of Exceedances:	15
Data and Information Type:	PWS pathogen monitoring (ambient water)

Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 382 single samples were collected with 15 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Bermuda Ave., San Diego, California. Station identification number is PL-080.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 32922, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Bermuda Ave

LOE ID:	27700
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	25
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 382 single samples were collected with 25 samples correlated with a storm event. Two of the 25 samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005). Comparisons are also made only for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.

Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Bermuda Ave., San Diego, California. Station identification number is PL-080.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 32922, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Bermuda Ave

LOE ID:	27701
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	386
Number of Exceedances:	19
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 386 single samples were collected with 19 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Bermuda Ave., San Diego, California. Station identification number is PL-080.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 32922, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Bermuda Ave 040307

LOE ID:	27702
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	25
Number of Exceedances:	6
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 386 single samples were collected with 25 samples correlated with a storm event. Six of the 25 samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Bermuda Ave., San Diego, California. Station identification number is PL-080.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 32922, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Bermuda Ave

LOE ID:	27703
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation
Number of Samples:	97
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 385 single samples were collected with 97 monthly geomeans calculated. One of the 97 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Bermuda Ave., San Diego, California. Station identification number is PL-080.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 32922, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Bermuda Ave

LOE ID:	27704
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	97
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 382 single samples were collected and 97 geomeans calculated. None of the 97 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml;

	Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Bermuda Ave., San Diego, California. Station identification number is PL-080.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 32922, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Bermuda Ave

LOE ID:	27705
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	97
Number of Exceedances:	5
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 386 single samples were collected with 97 monthly geomeans calculated. Five of the 97 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml.
	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Bermuda Ave., San Diego, California. Station identification number is PL-080.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 32922, Indicator Bacteria — Region 9

Pacific Ocean Shoreline, Point Loma HA, at Bermuda Ave

LOE ID:	30823
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	360
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 385 single samples were collected of which 360 are dry weather (AB411) samples with one of those samples exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Bermuda Ave., San Diego, California. Station identification number is PL-080.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 32922, Indicator Bacteria — Region 9

Pacific Ocean Shoreline, Point Loma HA, at Bermuda Ave

LOE ID:	28201
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555

Number of Exceedances:	37	040311
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were 37 beach advisory days for these locations. Bacteriological samples are collected on a weekly basis from April through October. When a bacteriological sample exceeds water quality standards, signs are posted indicating that waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 to December 2007. Data used was the number of days the beach was posted with an Advisory when the ocean or bay failed to meet the bacteriological standards.	
Data Reference:	County of Orange. March 2007. Annual Ocean and Bay Water Quality Report, 2006 Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.	
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960	
Evaluation Guideline:		
Guideline Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Spatial Representation:	Bacteriological monitoring samples were collected at Ocean Beach near Bermuda Avenue.	
Temporal Representation:	The beach advisory covers the time frame of January 2001 -December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 32922, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Bermuda Ave

LOE ID:	31284
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	57
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 1999 through October 2007. A total of 235 dry month (April through October) single samples were collected with 57 dry month geomeans calculated. Two of the 57 geomeans exceeded the geomean water quality objective.

Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007 040312
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Bermuda Ave., San Diego, California. Station identification number is PL-080.
Temporal Representation:	Samples were collected from July 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 32922, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Bermuda Ave

LOE ID:	30718
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	347
Number of Exceedances:	13
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 382 single samples were collected of which 347 are dry weather (AB411) samples with 13 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Bermuda Ave., San Diego, California. Station identification

	number is PL-080. 040313
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 32922, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Bermuda Ave

LOE ID:	30608
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	361
Number of Exceedances:	14
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 386 single samples were collected of which 361 are dry weather (AB411) samples with 14 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Bermuda Ave., San Diego, California. Station identification number is PL-080.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 32922, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Bermuda Ave

LOE ID:	77647
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	040314
Beneficial Use:	Shellfish Harvesting	
Number of Samples:	129	
Number of Exceedances:	56	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Fifty-six of the 129 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, Point Loma HA, at Bermuda Ave.	
Temporal Representation:	The samples were collected from January 2008 to August 2010.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the beach watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 32922, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Bermuda Ave

LOE ID:	74962
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	133
Number of Exceedances:	26
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Twenty-six of the 133 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Bermuda Ave site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.

QAPP Information Reference(s): 040315

Line of Evidence (LOE) for Decision ID 32922, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Bermuda Ave

LOE ID:	74963
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	133
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 133 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Bermuda Ave site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 32922, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Bermuda Ave

LOE ID:	74964
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	137
Number of Exceedances:	25
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Beach Watch data for Pacific Ocean Shoreline, Point Loma HA, at Bermuda Ave to determine beneficial use support and results are as follows: 25 of 137 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100

mL. 040316

Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Data for this line of evidence for Pacific Ocean Shoreline, Point Loma HA, at Bermuda Ave was collected at 1 monitoring site [Bermuda Ave]
Temporal Representation: Data was collected over the time period 1/5/2008-8/24/2010.
Environmental Conditions: Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 32922, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Bermuda Ave

LOE ID: 74965

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 129
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Zero of the 129 geomeans exceeded the objective.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at the Bermuda Ave site.
Temporal Representation: Samples were collected from January 2008 to August 2010.
Environmental Conditions:
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 32922, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Bermuda Ave

LOE ID: 31285

Pollutant: Fecal Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 57
Number of Exceedances: 0

Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 1999 through October 2007. A total of 234 dry month (April through October) single samples were collected with 57 dry month geomeans calculated. None of the 57 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Bermuda Ave., San Diego, California. Station identification number is PL-080.
Temporal Representation:	Samples were collected from July 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 32922, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Point Loma HA, at Bermuda Ave

LOE ID:	27696
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	25
Number of Exceedances:	10
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 385 single samples were collected with 25 samples correlated with a storm event. Ten of the 23 samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005). Comparisons are also made for days with matching bacteria and storm event data. A storm

	event was defined as 0.2 inches of rainfall within a 72 hour period. 040318
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Bermuda Ave., San Diego, California. Station identification number is PL-080.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Mission San Diego HSA, at Ocean Beach pier at Narrangaset
Water Body ID: CAC908100002009110411285 4
Water Body Type: Coastal & Bay Shoreline

DECISION ID 42291 Region 9
Pacific Ocean Shoreline, Mission San Diego HSA, at Ocean Beach pier at Narrangaset

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Fourteen lines of evidence are available in the administrative record to assess this pollutant. With the latest data, seven of the 232 samples exceed the water quality objective for enterococcus of a geomean of 35/100ml in a 30-day period for the protection of REC-1.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3.With the latest data, seven of the 232 samples exceed the water quality objective for enterococcus of a geomean of 35/100ml in a 30-day period for the protection of REC-1 and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 42291, Indicator Bacteria Region 9
Pacific Ocean Shoreline, Mission San Diego HSA, at Ocean Beach pier at Narrangaset

LOE ID: 31301

Pollutant: Fecal Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 57

Number of Exceedances:	0	040320
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 1999 through October 2007. A total of 226 dry month (April through October) single samples were collected with 57 dry month geomeans calculated. None of the 57 geomeans exceeded the geomean water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from the Mission San Diego HSA, Ocean Beach, at Ocean Beach Pier, at Narrangaset Avenue, Station id PL-090. Lat/ Long: 32.746700/ -117.254000	
Temporal Representation:	Samples were collected weekly from July 1999 through October 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 42291, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Mission San Diego HSA, at Ocean Beach pier at Narrangaset

LOE ID:	77646
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	144
Number of Exceedances:	6
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Six of the 144 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, Mission San Diego HSA, at Ocean Beach pier at Narrangaset.
Temporal Representation:	The samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 42291, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Mission San Diego HSA, at Ocean Beach pier at Narrangaset

LOE ID:	74814
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	144
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 144 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Ocean Beach pier at Narrangaset site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 42291, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Mission San Diego HSA, at Ocean Beach pier at Narrangaset

LOE ID:	74813
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	179
Number of Exceedances:	7
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Beach Watch data for Pacific Ocean Shoreline, Mission San Diego HSA, at Ocean Beach pier at Narrangaset to determine beneficial use support and results are as follows: 7 of 179 samples exceed the criterion for Coliform, Total.

Data Reference:	Data for Region 9 Beach Watch.	040322
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Mission San Diego HSA, at Ocean Beach pier at Narrangaset was collected at 1 monitoring site [O.B. pier @ Narrangaset]	
Temporal Representation:	Data was collected over the time period 1/5/2008-8/24/2010.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 42291, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Mission San Diego HSA, at Ocean Beach pier at Narrangaset

LOE ID:	31300
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	57
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 1999 through October 2007. A total of 227 dry month (April through October) single samples were collected with 57 dry month geomeans calculated. None of the 57 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the Mission San Diego HSA, Ocean Beach, at Ocean Beach Pier, at Narrangaset Avenue, Station id PL-090. Lat/ Long: 32.746700/ -117.254000
Temporal Representation:	Samples were collected weekly from July 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance

Line of Evidence (LOE) for Decision ID 42291, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Mission San Diego HSA, at Ocean Beach pier at Narrangaset

LOE ID:	30820
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	363
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from July 1999 through December 2007. The number of samples collected for total coliform analysis was 388 of which 363 are dry weather (AB411) samples and none of those samples exceeded the single sample maximum total coliform objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005). Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the Mission San Diego HSA, Ocean Beach, at Ocean Beach Pier, at Narrangaset Avenue, Station id PL-090. Lat/ Long: 32.746700/ -117.254000
Temporal Representation:	Samples were collected weekly from July 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42291, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Mission San Diego HSA, at Ocean Beach pier at Narrangaset

LOE ID:	74811
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	145

Number of Exceedances:	0	040324

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Zero of the 145 geomeans exceeded the objective.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at the Ocean Beach pier at Narrangaset site.
Temporal Representation: Samples were collected from January 2008 to August 2010.
Environmental Conditions:
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 42291, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Mission San Diego HSA, at Ocean Beach pier at Narrangaset

LOE ID: 27616

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Shellfish Harvesting

Number of Samples: 25
Number of Exceedances: 6

Data and Information Type: PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality: Shoreline beach monitoring data was collected by the County of San Diego from July 1999 through December 2007. The number of samples collected for total coliform analysis was 388. Twenty-five of the samples were correlated with a storm event. Six of the storm samples exceeded the single sample maximum total coliform standard for shellfish harvesting.
Data Reference: National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: From the Ocean Plan, the median total coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml.
Objective/Criterion Reference: Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected from the Mission San Diego HSA, Ocean Beach, at Ocean Beach Pier, at Narrangaset Avenue, Station id PL-090.
Lat/ Long: 32.746700/ -117.254000
Temporal Representation: Samples were collected weekly from July 1999 through December 2007.

Environmental Conditions:	Comparisons were also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42291, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Mission San Diego HSA, at Ocean Beach pier at Narrangaset

LOE ID:	27664
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	388
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 1999 through December 2007. A total of 388 single samples were collected. None of the samples exceeded the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the Mission San Diego HSA, Ocean Beach, at Ocean Beach Pier, at Narrangaset Avenue, Station id PL-090. Lat/ Long: 32.746700/ -117.254000
Temporal Representation:	Samples were collected weekly from July 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42291, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Mission San Diego HSA, at Ocean Beach pier at Narrangaset

LOE ID:	27681
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	25
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 1999 through December 2007. A total of 388 single samples were collected with 25 samples correlated with a storm event. Two of the storm samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005). Comparisons to water quality objectives were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the Mission San Diego HSA, Ocean Beach, at Ocean Beach Pier, at Narrangaset Avenue, Station id PL-090. Lat/ Long: 32.746700/ -117.254000
Temporal Representation:	Samples were collected weekly from July 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42291, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Mission San Diego HSA, at Ocean Beach pier at Narrangaset

LOE ID:	27659
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	25
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from July 1999 through December 2007. The number of samples collected for total coliform analysis was 388 with 25 samples correlated with a storm event. None of the storm samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005). Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the Mission San Diego HSA, Ocean Beach, at Ocean Beach Pier, at Narrangaset Avenue, Station id PL-090. Lat/ Long: 32.746700/ -117.254000
Temporal Representation:	Samples were collected weekly from July 1999 through December 2007.
Environmental Conditions:	Comparisons were also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42291, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Mission San Diego HSA, at Ocean Beach pier at Narrangaset

LOE ID:	27629
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	86
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from Samples were collected from July 1999 through December 2007. The number of samples collected for total coliform analysis was 388 with 86 monthly geomeans calculated. Only one of the geomeans exceeded the geomean water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005). Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the Mission San Diego HSA, Ocean Beach, at Ocean Beach Pier, at Narrangaset Avenue, Station id PL-090. Lat/ Long: 32.746700/ -117.254000

Temporal Representation:	Samples were collected weekly from July 1999 through December 2007. 040328
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42291, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Mission San Diego HSA, at Ocean Beach pier at Narrangaset

LOE ID:	27626
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	388
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from July 1999 through December 2007. The number of samples collected for total coliform analysis was 388. None of the samples exceeded the single sample maximum total coliform standard.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005). Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the Mission San Diego HSA, Ocean Beach, at Ocean Beach Pier, at Narrangaset Avenue, Station id PL-090. Lat/ Long: 32.746700/ -117.254000
Temporal Representation:	Samples were collected weekly from July 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42291, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Mission San Diego HSA, at Ocean Beach pier at Narrangaset

LOE ID:	30604
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation
Number of Samples:	363
Number of Exceedances:	5
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 1999 through December 2007. A total of 388 single samples were collected of which 363 are dry weather (AB411) samples with five samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the San Elijo HSA, from Seaside Beach, at Station SE-030, Lat/ Long : 33.00264/ -117.28735.
Temporal Representation:	Samples were collected weekly from July 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42291, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Mission San Diego HSA, at Ocean Beach pier at Narrangaset

LOE ID:	27677
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	388
Number of Exceedances:	7
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 1999 through December 2007. A total of 388 single samples were collected with seven samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected from the San Elijo HSA, from Seaside Beach, at Station SE-030, Lat/ Long : 33.00264/ -117.28735.
Temporal Representation: Samples were collected weekly from July 1999 through December 2007.
Environmental Conditions:
QAPP Information: Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s): County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42291, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Mission San Diego HSA, at Ocean Beach pier at Narrangaset

LOE ID: 27596

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Shellfish Harvesting

Number of Samples: 388
Number of Exceedances: 18

Data and Information Type: PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality: Shoreline beach monitoring data was collected by the County of San Diego from July 1999 through December 2007. The number of samples collected for total coliform analysis was 388 with 18 samples exceeding the single sample maximum total coliform standard for shellfish harvesting.
Data Reference: Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: From the Ocean Plan, the median total coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml.
Objective/Criterion Reference: Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected from the Mission San Diego HSA, Ocean Beach, at Ocean Beach Pier, at Narrangaset Avenue, Station id PL-090.
Lat/ Long: 32.746700/ -117.254000
Temporal Representation: Samples were collected weekly from July 1999 through December 2007.
Environmental Conditions:
QAPP Information: Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s): County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42291, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Mission San Diego HSA, at Ocean Beach pier at Narrangaset

LOE ID: 27668

Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	87
Number of Exceedances:	7
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data were collected by the County of San Diego from July 1999 through December 2007. A total of 388 single samples were collected with 87 monthly geomeans calculated. Seven of the geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the Mission San Diego HSA, Ocean Beach, at Ocean Beach Pier, at Narrangaset Avenue, Station id PL-090. Lat/ Long: 32.746700/ -117.254000
Temporal Representation:	Samples were collected weekly from July 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42291, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Mission San Diego HSA, at Ocean Beach pier at Narrangaset

LOE ID:	27666
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	87
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 1999 through December 2007. A total of 388 single samples were collected with 87 geomeans calculated. None of the geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the Mission San Diego HSA, Ocean Beach, at Ocean Beach Pier, at Narrangaset Avenue, Station id PL-090. Lat/ Long: 32.746700/ -117.254000
Temporal Representation:	Samples were collected weekly from July 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42291, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Mission San Diego HSA, at Ocean Beach pier at Narrangaset

LOE ID:	27665
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	25
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 1999 through December 2007. A total of 388 single samples were collected with 25 samples correlated with a storm event. None of the storm samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005). Comparisons to water quality objectives were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the Mission San Diego HSA, Ocean Beach, at Ocean Beach Pier, at Narrangaset Avenue, Station id PL-090. Lat/ Long: 32.746700/ -117.254000

Temporal Representation:	Samples were collected weekly from July 1999 through December 2007. 040333
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42291, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Mission San Diego HSA, at Ocean Beach pier at Narrangaset

LOE ID:	30715
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	353
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 1999 through December 2007. A total of 388 single samples were collected of which 353 are dry weather (AB411) samples None of the dry weather samples exceeded the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the Mission San Diego HSA, Ocean Beach, at Ocean Beach Pier, at Narrangaset Avenue, Station id PL-090. Lat/ Long: 32.746700/ -117.254000
Temporal Representation:	Samples were collected weekly from July 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42291, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Mission San Diego HSA, at Ocean Beach pier at Narrangaset

LOE ID:	31302
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation	040334
Number of Samples:	57	
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 1999 through October 2007. A total of 227 dry month (April through October) single samples were collected with 57 dry month geomeans calculated. None of the 57 geomeans exceeded the geomean water quality objective.	
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005). Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from the Mission San Diego HSA, Ocean Beach, at Ocean Beach Pier, at Narrangaset Avenue, Station id PL-090. Lat/ Long: 32.746700/ -117.254000	
Temporal Representation:	Samples were collected weekly from July 1999 through October 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 42291, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Mission San Diego HSA, at Ocean Beach pier at Narrangaset

LOE ID:	74812
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	145
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 145 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	

Guideline Reference:	040335
Spatial Representation:	Samples were collected at the Ocean Beach pier at Narrangaset site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

DECISION ID 49883 Region 9

Pacific Ocean Shoreline, Mission San Diego HSA, at Ocean Beach pier at Narrangaset

Pollutant:	**Trash**
Final Listing Decision:	**List on 303(d) list (being addressed by action other than TMDL)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected Attainment Date:	2029
Implementation Action Other than TMDL:	Collected effort of public, agencies, organizations, and permittees. Methods include street sweeping, education programs on littering, installation of trash-catching devices on storm drains.
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.7 of the Listing Policy. Under this section when all other listing factors do not result in the listing of a water segment but information indicates non-attainment of standards, a water segment shall be evaluated to determine whether the weight of evidence demonstrates that water quality standard is not attained. If the weight of evidence indicates non-attainment, the water segment shall be placed on the CWA section 303(d) List. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for placing this water segment-pollutant combination from the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The following information indicates that the water quality standard is not being attained: Coastkeeper cleanups occurred on 1/24/09 and 1/23/10 for this water body. The total weight of trash (lbs) collected on these dates was 801.75. Using the metric, Coastkeeper classified this water body as high for trash impairment. However, any trash found is an exceedance and needs to be addressed by an action other than a TMDL. 3. This process is scientifically defensible and reproducible.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 49883, Trash Region 9

Pacific Ocean Shoreline, Mission San Diego HSA, at Ocean Beach pier at Narrangaset

LOE ID:	74815
Pollutant:	Trash
LOE Subgroup:	Pollutant-Nuisance
Matrix:	Not Recorded
Fraction:	None
Beneficial Use:	Non-Contact Recreation
Number of Samples:	0
Number of Exceedances:	0

Data and Information Type:	Occurrence of conditions judged to cause impairment
Data Used to Assess Water Quality:	The San Diego Coastkeeper conducts trash cleanups and uses a metric (pounds of trash collected per volunteer) to compare levels of trash across beaches and categorizes beaches as either low, medium, high or severe, based on this metric. Coastkeeper cleanups occurred on 1/24/09 and 1/23/10 for this water body. The total weight of trash (lbs) collected on these dates was 801.75. However, using the metric, Coastkeeper classified this water body as high for trash impairment.
Data Reference:	Data for Trash, Nutrients, and Pathogens in Region 9, 2007-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Floating Material Waters shall not contain floating material, including solids, liquids, foams, and scum in concentrations which cause nuisance or adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Ocean Beach Pier.
Temporal Representation:	Two cleanups occurred on 1/24/09 and 1/23/10.
Environmental Conditions:	
QAPP Information:	San Diego Coastkeeper QAPP was provided.
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Mission San Diego HSA, at Newport Ave
Water Body ID: CAC907110002009110411350 3
Water Body Type: Coastal & Bay Shoreline

DECISION ID 42310 Region 9
Pacific Ocean Shoreline, Mission San Diego HSA, at Newport Ave

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Fifteen lines of evidence are available in the administrative record to assess this pollutant. With the latest data, 30 of the 380 samples exceed the Water Quality Objective for total coliform of a SSM of 230 cfu/100 ml for the protection of SHELL beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Fifteen lines of evidence are available in the administrative record to assess this pollutant. With the latest data, 30 of the 380 samples exceed the Water Quality Objective for total coliform of a SSM of 230 cfu/100 ml for the protection of SHELL beneficial use and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 42310, Indicator Bacteria Region 9
Pacific Ocean Shoreline, Mission San Diego HSA, at Newport Ave

LOE ID: 28193

Pollutant: Indicator Bacteria
LOE Subgroup: Health Advisories
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples:	2555	040338
Number of Exceedances:	5	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were 5 beach advisory days for this location. Bacteriological samples are collected on a weekly basis from April through October. When a bacteriological sample exceeds water quality standards, signs are posted indicating that waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 to December 2007. Data used was the number of days the beach was posted with an Advisory when the ocean or bay failed to meet the bacteriological standards.	
Data Reference:	County of Orange. March 2007. Annual Ocean and Bay Water Quality Report, 2006 Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.	
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960	
Evaluation Guideline:		
Guideline Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Spatial Representation:	Bacteriological monitoring samples were collected at Ocean Beach Park near Newport Avenue.	
Temporal Representation:	The beach advisory covers the time frame of January 2001 -December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego. 2006. Department Public Health Laboratory. Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 42310, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Mission San Diego HSA, at Newport Ave

LOE ID:	27722
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	228
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 228 single samples were collected with two of the

samples exceeding the single sample water quality objective. 040339

Data Reference: Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).

Objective/Criterion Reference: Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:

Guideline Reference:

Spatial Representation: Samples were collected at Ocean Beach on the north side of the pier at Newport Avenue, Station id PL-100.
Lat/ Long: 32.749160/ -117.253000.

Temporal Representation: Samples were collected weekly from January 2004 through December 2007.

Environmental Conditions:

QAPP Information: Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.

QAPP Information Reference(s): County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42310, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Mission San Diego HSA, at Newport Ave

LOE ID: 77645

Pollutant: Total Coliform

LOE Subgroup: Pollutant-Water

Matrix: Water

Fraction: None

Beneficial Use: Shellfish Harvesting

Number of Samples: 145

Number of Exceedances: 14

Data and Information Type: PATHOGEN MONITORING

Data Used to Assess Water Quality: Fourteen of the 145 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.

Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.

Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:

Guideline Reference:

Spatial Representation: The samples were collected at Pacific Ocean Shoreline, Mission San Diego HSA, at Newport Ave.

Temporal Representation: The samples were collected from January 2008 to August 2010.

Environmental Conditions:

QAPP Information: The samples were collected for the beach watch program.

QAPP Information Reference(s): 040340

Line of Evidence (LOE) for Decision ID 42310, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Mission San Diego HSA, at Newport Ave

LOE ID:	74810
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	145
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 145 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Newport Ave, north side of pier site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 42310, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Mission San Diego HSA, at Newport Ave

LOE ID:	74809
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	153
Number of Exceedances:	9
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Beach Watch data for Pacific Ocean Shoreline, Mission San Diego HSA, at Newport Ave to determine beneficial use support and results are as follows: 9 of 153 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100

mL. 040341

Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Data for this line of evidence for Pacific Ocean Shoreline, Mission San Diego HSA, at Newport Ave was collected at 1 monitoring site [Newport Ave, north side of pier]
Temporal Representation: Data was collected over the time period 1/11/2008-8/6/2010.
Environmental Conditions: Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 42310, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Mission San Diego HSA, at Newport Ave

LOE ID: 74808

Pollutant: Fecal Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 145
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Zero of the 145 geomeans exceeded the objective.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at the Newport Ave, north side pier site.
Temporal Representation: Samples were collected from January 2008 to August 2010.
Environmental Conditions:
QAPP Information: The samples were collected for the beach watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 42310, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Mission San Diego HSA, at Newport Ave

LOE ID: 31303

Pollutant: Enterococcus
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 29
Number of Exceedances: 0

Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from August 2003 through October 2007. A total of 137 dry month (April through October) single samples were collected with 29 dry month geomeans calculated. None of the 29 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Ocean Beach on the north side of the pier at Newport Avenue, Station id PL-100. Lat/ Long: 32.749160/ -117.253000.
Temporal Representation:	Samples were collected weekly from August 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42310, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Mission San Diego HSA, at Newport Ave

LOE ID:	74785
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	145
Number of Exceedances:	4
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Four of the 145 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Newport Ave, north side of pier site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.

QAPP Information Reference(s): 040343

Line of Evidence (LOE) for Decision ID 42310, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Mission San Diego HSA, at Newport Ave

LOE ID:	30603
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	207
Number of Exceedances:	5
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 228 single samples were collected of which 207 are dry weather (AB411) samples with five samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Ocean Beach on the north side of the pier at Newport Avenue, Station id PL-100. Lat/ Long: 32.749160/ -117.253000
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42310, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Mission San Diego HSA, at Newport Ave

LOE ID:	31305
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	29
Number of Exceedances:	0

Data and Information Type:	PWS pathogen monitoring (ambient water) 040344
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from August 2003 through October 2007. A total of 137 dry month (April through October) single samples were collected with 29 dry month geomeans calculated. None of the 29 geomeans exceeded the geomean water quality objective. .
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005). Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Ocean Beach on the north side of the pier at Newport Avenue, Station id PL-100. Lat/ Long: 32.749160/ -117.253000.
Temporal Representation:	Samples were collected weekly from August 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42310, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Mission San Diego HSA, at Newport Ave

LOE ID:	31304
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	29
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from August 2003 through October 2007. A total of 137 dry month (April through October) single samples were collected with 29 dry month geomeans calculated. None of the 29 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:	040345
Guideline Reference:	
Spatial Representation:	Samples were collected at Ocean Beach on the north side of the pier at Newport Avenue, Station id PL-100. Lat/ Long: 32.749160/ -117.253000.
Temporal Representation:	Samples were collected weekly from August 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42310, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Mission San Diego HSA, at Newport Ave

LOE ID:	30819
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	206
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. The number of samples collected for total coliform analysis was 227 of which 206 are dry weather (AB411) samples and none of the samples exceeded the single sample maximum total coliform objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005). Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Ocean Beach on the north side of the pier at Newport Avenue, Station id PL-100. Lat/ Long: 32.749160/ -117.253000.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42310, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Mission San Diego HSA, at Newport Ave

LOE ID:	30714

Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	207
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 228 single samples were collected of which 207 are dry weather (AB411) samples with one sample exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Ocean Beach on the north side of the pier at Newport Avenue, Station id PL-100. Lat/ Long: 32.749160/ -117.253000.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42310, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Mission San Diego HSA, at Newport Ave

LOE ID:	27724
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	45
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 228 single samples were collected with 45 geomeans calculated. None of the geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data:	Non-SWAMP	040347
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Ocean Beach on the north side of the pier at Newport Avenue, Station id PL-100. Lat/ Long: 32.749160/ -117.253000.	
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 42310, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Mission San Diego HSA, at Newport Ave

LOE ID:	27723
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	21
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 228 single samples were collected with 21 samples correlated with a storm event. Only one of the storm samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Ocean Beach on the north side of the pier at Newport Avenue, Station id PL-100. Lat/ Long: 32.749160/ -117.253000.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	

QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42310, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Mission San Diego HSA, at Newport Ave

LOE ID:	27717
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	227
Number of Exceedances:	21
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. The number of samples collected for total coliform analysis was 227 with 21 samples exceeding the single sample maximum total coliform standard for shellfish harvesting.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan, the median total coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Ocean Beach on the north side of the pier at Newport Avenue, Station id PL-100. Lat/ Long: 32.749160/ -117.253000.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42310, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Mission San Diego HSA, at Newport Ave

LOE ID:	27725
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	45	040349
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data were collected by the County of San Diego from January 2004 through December 2007. A total of 228 single samples were collected with 45 monthly geomeans calculated. None of the geomeans exceeded the geomean water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Ocean Beach on the north side of the pier at Newport Avenue, Station id PL-100. Lat/ Long: 32.749160/ -117.253000.	
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 42310, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Mission San Diego HSA, at Newport Ave

LOE ID:	27721
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	21
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. The number of samples collected for total coliform analysis was 227 with 21 samples correlated with a storm event. Only one of the storm samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005). Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005.

	Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency 040350
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Ocean Beach on the north side of the pier at Newport Avenue, Station id PL-100. Lat/ Long: 32.749160/ -117.253000.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42310, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Mission San Diego HSA, at Newport Ave

LOE ID:	27718
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	21
Number of Exceedances:	10
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. The number of samples collected for total coliform analysis was 227 with 21 of the samples correlated with a storm event. Ten of the storm samples exceeded the single sample maximum total coliform standard for shellfish harvesting.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan, the median total coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Ocean Beach on the north side of the pier at Newport Avenue, Station id PL-100. Lat/ Long: 32.749160/ -117.253000.

Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42310, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Mission San Diego HSA, at Newport Ave

LOE ID:	27719
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	227
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. The number of samples collected for total coliform analysis was 227. Only one of the samples exceeded the single sample maximum total coliform standard.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005). Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Ocean Beach on the north side of the pier at Newport Avenue, Station id PL-100. Lat/ Long: 32.749160/ -117.253000.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42310, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Mission San Diego HSA, at Newport Ave

LOE ID:	27720	040352

Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	44
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from Samples were collected from January 2004 through December 2007. The number of samples collected for total coliform analysis was 227 with 44 monthly geomeans calculated. None of the geomeans exceeded the geomean water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005). Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Ocean Beach on the north side of the pier at Newport Avenue, Station id PL-100. Lat/ Long: 32.749160/ -117.253000.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42310, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Mission San Diego HSA, at Newport Ave

LOE ID:	27728
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	21
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 228 single samples were collected with 21 samples correlated with a storm event. Two of the storm samples exceeded the single sample water

	quality objective. 040353
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005). Comparisons to water quality objectives were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the Mission San Diego HSA, at Ocean Beach on the north side of the pier at Newport Avenue, Station id PL-100. Lat/ Long: 32.749160/ -117.253000.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42310, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Mission San Diego HSA, at Newport Ave

LOE ID:	27727
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	228
Number of Exceedances:	7
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 228 single samples were collected with seven samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml;

Objective/Criterion Reference:	Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005). Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Ocean Beach on the north side of the pier at Newport Avenue, Station id PL-100. Lat/ Long: 32.749160/ -117.253000
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Coronado HA, at Silver Strand (north end, Oceanside)
Water Body ID: CAC910100002009110411482 0
Water Body Type: Coastal & Bay Shoreline

DECISION ID 43950 Region 9
Pacific Ocean Shoreline, Coronado HA, at Silver Strand (north end, Oceanside)

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Fifteen lines of evidence are available in the administrative record to assess this pollutant. Including the latest data, ten of the 184 samples exceed the water quality objective for enterococcus of a geomean of 35/100 ml in a 30-day period for the protection of REC-1 beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Including the latest data, ten of the 184 samples exceed the water quality objective for enterococcus of a geomean of 35/100 ml in a 30-day period for the protection of REC-1 beneficial use and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 43950, Indicator Bacteria Region 9
Pacific Ocean Shoreline, Coronado HA, at Silver Strand (north end, Oceanside)

LOE ID: 74620

Pollutant: Enterococcus
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 140

Number of Exceedances:	6	040356

Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Six of the 140 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Silver Strand (north end, Oceanside) site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43950, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Silver Strand (north end, Oceanside)

LOE ID:	27651
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	44
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 210 single samples were collected with 44 monthly geomeans calculated. Four of the 44 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program. 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Silver Strand (ocean side), Coronado, California. Station identification number is IB-070.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the

QAPP Information Reference(s):	County of San Diego, Department Public Health Laboratory Quality Assurance Manual. County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43950, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Silver Strand (north end, Oceanside)

LOE ID:	74622
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	143
Number of Exceedances:	11
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed BW data for Pacific Ocean Shoreline, Coronado HA, at Silver Strand (north end, Oceanside) to determine beneficial use support and results are as follows: 11 of 143 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Coronado HA, at Silver Strand (north end, Oceanside) was collected at 1 monitoring site [Silver Strand N end (ocean)]
Temporal Representation:	Data was collected over the time period 1/2/2008-8/24/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43950, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Silver Strand (north end, Oceanside)

LOE ID:	77597
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	140
Number of Exceedances:	10
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Ten of the 140 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.

Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:

Guideline Reference:

Spatial Representation: The samples were collected at Pacific Ocean Shoreline, Coronado HA, at Silver Strand (north end, Oceanside).

Temporal Representation: The samples were collected from January 2008 through August 2010.

Environmental Conditions:

QAPP Information: The samples were collected for the beach watch program.

QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 43950, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Silver Strand (north end, Oceanside)

LOE ID: 74626

Pollutant: Total Coliform

LOE Subgroup: Pollutant-Water

Matrix: Water

Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 140

Number of Exceedances: 0

Data and Information Type: Not Specified

Data Used to Assess Water Quality: Zero of the 140 geomeans exceeded the objective.

Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.

Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:

Guideline Reference:

Spatial Representation: Samples were collected at the Silver Strand (north end, Oceanside) site.

Temporal Representation: Samples were collected from January 2008 to August 2010.

Environmental Conditions:

QAPP Information: The samples were collected for the Beach Watch program.

QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 43950, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Silver Strand (north end, Oceanside)

LOE ID: 31273

Pollutant: Enterococcus

LOE Subgroup: Pollutant-Water

Matrix:	Water	040359
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	26	
Number of Exceedances:	3	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 2002 through October 2007. A total of 117 dry month (April through October) single samples were collected with 26 dry month geomeans calculated. Three of the 26 geomeans exceeded the geomean water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Silver Strand (ocean side), Coronado, California. Station identification number is IB-070.	
Temporal Representation:	Samples were collected from July 2002 through October 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43950, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Silver Strand (north end, Oceanside)

LOE ID:	31276
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	26
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 2002 through October 2007. A total of 115 dry month (April through October) single samples were collected with 26 dry month geomeans calculated. None of the 26 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Silver Strand (ocean side), Coronado, California. Station identification number is IB-070.
Temporal Representation:	Samples were collected from July 2002 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43950, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Silver Strand (north end, Oceanside)

LOE ID:	31277
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	26
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 2004 through October 2007. A total of 116 dry month (April through October) single samples were collected with 26 dry month geomeans calculated. None of the 26 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Silver Strand (ocean side), Coronado, California. Station identification number is IB-070.
Temporal Representation:	Samples were collected from April 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the

QAPP Information Reference(s):	County of San Diego, Department Public Health Laboratory Quality Assurance Manual. County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43950, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Silver Strand (north end, Oceanside)

LOE ID:	30686
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	176
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 206 single samples were collected of which 176 are dry weather (AB411) samples with three samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Silver Strand (ocean side), Coronado, California. Station identification number is IB-070.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43950, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Silver Strand (north end, Oceanside)

LOE ID:	30800
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	176	040362
Number of Exceedances:	2	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 209 single samples were collected of which 176 are dry weather (AB411) samples with two samples exceeding the single sample water quality objective.	
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Silver Strand (ocean side), Coronado, California. Station identification number is IB-070.	
Temporal Representation:	Samples were collected from January 2004 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43950, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Silver Strand (north end, Oceanside)

LOE ID:	28052
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	9
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were nine beach advisory days for this section of shoreline. Bacteriological samples are collected on a weekly basis at ocean and bay locations in San Diego County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that an advisory for waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 - December 2007. Data used was the number of days the beach was advisories were issued when the ocean or bay failed to meet the bacteriological standards.

Data Reference:	Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Spatial Representation:	Bacteriological monitoring samples were collected at the north end of Silverstrand State Beach, Coronado, CA.
Temporal Representation:	The beach advisory covers the time frame of January January 2001 to December 2007.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of San Diego's Quality Assessment/Quality Control document
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43950, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Silver Strand (north end, Oceanside)

LOE ID:	30565
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	177
Number of Exceedances:	5
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 210 single samples were collected of which 177 are dry weather samples with 5 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	

Guideline Reference:	040364
Spatial Representation:	Samples were collected at Silver Strand (ocean side), Coronado, California. Station identification number is IB-070.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43950, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Silver Strand (north end, Oceanside)

LOE ID:	27641
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	209
Number of Exceedances:	26
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 209 single samples were collected with 26 samples exceeded the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Silver Strand (ocean side), Coronado, California. Station identification number is IB-070.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43950, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Silver Strand (north end, Oceanside)

LOE ID:	27642
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	040365
Beneficial Use:	Shellfish Harvesting	
Number of Samples:	33	
Number of Exceedances:	19	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 209 single samples were collected with 33 samples correlated with a storm event. Nineteen of the 33 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.	
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Silver Strand (ocean side), Coronado, California. Station identification number is IB-070.	
Temporal Representation:	Samples were collected from January 2004 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43950, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Silver Strand (north end, Oceanside)

LOE ID:	27643
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	209
Number of Exceedances:	7
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 209 single samples were collected with seven samples exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Silver Strand (ocean side), Coronado, California. Station identification number is IB-070.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43950, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Silver Strand (north end, Oceanside)

LOE ID:	27644
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	33
Number of Exceedances:	5
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 209 single samples were collected with 33 samples correlated with a storm event. Five of the 33 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at Silver Strand (ocean side), Coronado, California. Station identification number is IB-070.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43950, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Silver Strand (north end, Oceanside)

LOE ID:	27645
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	206
Number of Exceedances:	13
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 206 single samples were collected with 13 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Silver Strand (ocean side), Coronado, California. Station identification number is IB-070.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43950, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Silver Strand (north end, Oceanside)

LOE ID:	27646
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water

Matrix:	Water	040368
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	30	
Number of Exceedances:	10	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 206 single samples were collected with 30 samples correlated with a storm event. Ten of the 30 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.	
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Silver Strand (ocean side), Coronado, California. Station identification number is IB-070.	
Temporal Representation:	Samples were collected from January 2004 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43950, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Silver Strand (north end, Oceanside)

LOE ID:	27647
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	210
Number of Exceedances:	20
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 210 single samples were collected with 20 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program,

	2007. AB 411 monitoring data 1999 to 2007	040369

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Silver Strand (ocean side), Coronado, California. Station identification number is IB-070.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43950, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Silver Strand (north end, Oceanside)

LOE ID:	27648
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	33
Number of Exceedances:	15
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 206 single samples were collected with 33 samples correlated with a storm event. Fifteen of the 33 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	

Guideline Reference:	040370
Spatial Representation:	Samples were collected at Silver Strand (ocean side), Coronado, California. Station identification number is IB-070.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43950, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Silver Strand (north end, Oceanside)

LOE ID:	27649
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	44
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 209 single samples were collected with 44 monthly geomeans calculated. None of the 44 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Silver Strand (ocean side), Coronado, California. Station identification number is IB-070.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43950, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Silver Strand (north end, Oceanside)

LOE ID:	27650

Pollutant:	Fecal Coliform	040371
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	44	
Number of Exceedances:	1	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 206 single samples were collected and 44 geomeans calculated. One of the 44 geomeans exceeded the geomean water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Silver Strand (ocean side), Coronado, California. Station identification number is IB-070.	
Temporal Representation:	Samples were collected from January 2004 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43950, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Silver Strand (north end, Oceanside)

LOE ID:	74621
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	140
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 140 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.

Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Silver Strand (north end, Oceanside) site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Coronado HA, at Avenida del Sol
Water Body ID: CAC910100002009110322471 0
Water Body Type: Coastal & Bay Shoreline

DECISION ID 44718 Region 9
Pacific Ocean Shoreline, Coronado HA, at Avenida del Sol

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Fifteen lines of evidence are available in the administrative record to assess this pollutant. Including the latest data, three of the 361 samples exceed the water quality objective for enterococcus of a geomean of 35/100ml in a 30-day period for the protection of REC-1.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Including the latest data, three of the 361 samples exceed the water quality objective for enterococcus of a geomean of 35/100ml in a 30-day period for the protection of REC-1 and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 44718, Indicator Bacteria Region 9
Pacific Ocean Shoreline, Coronado HA, at Avenida del Sol

LOE ID: 27633

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 39

Number of Exceedances:	5	040374

Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 496 single samples were collected with 39 samples correlated with a storm event. Five of the 39 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Avenida del Sol, Coronado, California. Station identification number is IB-080.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44718, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Avenida del Sol

LOE ID:	27634
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	385
Number of Exceedances:	15
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 385 single samples were collected with 15 samples exceeding the single sample water quality objective.

Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Avenida del Sol, Coronado, California. Station identification number is IB-080.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44718, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Avenida del Sol

LOE ID:	27635
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	34
Number of Exceedances:	11
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 385 single samples were collected with 34 samples correlated with a storm event. Eleven of the 34 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:	040376
Guideline Reference:	
Spatial Representation:	Samples were collected at Avenida del Sol, Coronado, California. Station identification number is IB-080.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44718, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Avenida del Sol

LOE ID:	27636
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	499
Number of Exceedances:	19
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 499 single samples were collected with 19 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Avenida del Sol, Coronado, California. Station identification number is IB-080.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44718, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Avenida del Sol

LOE ID:	27637
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	37
Number of Exceedances:	14
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 499 single samples were collected with 37 samples correlated with a storm event. Fourteen of the 37 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Avenida del Sol, Coronado, California. Station identification number is IB-080.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44718, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Avenida del Sol

LOE ID:	77593

Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	312
Number of Exceedances:	2
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Two of the 312 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, Coronado HA, at Avenida del Sol.
Temporal Representation:	The samples were collected from January 2008 through August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44718, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Avenida del Sol

LOE ID:	74597
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	316
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 316 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at the Avenida del Sol site.	040379
Temporal Representation:	Samples were collected from April 2008 to August 2010.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44718, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Avenida del Sol

LOE ID:	74598
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	302
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 302 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Avenida del Sol site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44718, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Avenida del Sol

LOE ID:	74599
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	318
Number of Exceedances:	6
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed BW data for Pacific Ocean Shoreline, Coronado HA, at Avenida del Sol to determine beneficial use support and results are as follows: 6 of 318 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.

SWAMP Data:	Non-SWAMP	040380
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Coronado HA, at Avenida del Sol was collected at 1 monitoring site [Avd. del Sol]	
Temporal Representation:	Data was collected over the time period 1/2/2008-8/26/2010.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44718, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Avenida del Sol

LOE ID:	74600
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	315
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 315 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Avenida del Sol site.
Temporal Representation:	Samples were collected from April 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44718, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Avenida del Sol

LOE ID:	31257
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation	040381
Number of Samples:	27	
Number of Exceedances:	1	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 2002 through October 2007. A total of 288 dry month (April through October) single samples were collected with 27 dry month geomeans calculated. One of the 27 geomeans exceeded the geomean water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Avenida del Sol, San Diego, California. Station identification number is IB-080.	
Temporal Representation:	Samples were collected from July 2002 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44718, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Avenida del Sol

LOE ID:	30561
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	462
Number of Exceedances:	5
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 499 single samples were collected of which 462 are dry weather samples with 5 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB,

	2005). 040382
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Avenida del Sol, Coronado, California. Station identification number is IB-080.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44718, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Avenida del Sol

LOE ID:	30682
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	351
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 385 single samples were collected of which 351 are dry weather (AB411) samples with four samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Avenida del Sol, Coronado, California. Station identification number is IB-080.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44718, Indicator Bacteria 040383 Region 9

Pacific Ocean Shoreline, Coronado HA, at Avenida del Sol

LOE ID:	30796
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	457
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 496 single samples were collected of which 457 are dry weather (AB411) samples with two samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Avenida del Sol, Coronado, California. Station identification number is IB-080.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44718, Indicator Bacteria Region 9

Pacific Ocean Shoreline, Coronado HA, at Avenida del Sol

LOE ID:	31258
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	27
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)

Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 2002 through October 2007. A total of 212 dry month (April through October) single samples were collected with 27 dry month geomeans calculated. None of the 27 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Avenida del Sol, San Diego, California. Station identification number is IB-080.
Temporal Representation:	Samples were collected from July 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44718, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Avenida del Sol

LOE ID:	31259
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	27
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 2002 through October 2007. A total of 285 dry month (April through October) single samples were collected with 27 dry month geomeans calculated. None of the 27 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:	040385
Guideline Reference:	
Spatial Representation:	Samples were collected at Avenida del Sol, Coronado, California. Station identification number is IB-080.
Temporal Representation:	Samples were collected from July 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44718, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Avenida del Sol

LOE ID:	28050
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	14
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were 14 beach advisory days for this section of shoreline. Bacteriological samples are collected on a weekly basis at ocean and bay locations in San Diego County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that an advisory for waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 - December 2007. Data used was the number of days the beach was advisories were issued when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Spatial Representation:	Bacteriological monitoring samples were collected at Avenida del Sol, Coronado Municipal Beach, Coronado, CA.
Temporal Representation:	The beach advisory covers the time frame of January January 2001 to December 2007.

Environmental Conditions:	040386
QAPP Information:	Samples were collected in compliance with County of San Diego's Quality Assessment/Quality Control document
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44718, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Avenida del Sol

LOE ID:	27638
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	45
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 496 single samples were collected with 45 monthly geomeans calculated. None of the 45 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Avenida del Sol, Coronado, California. Station identification number is IB-080.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44718, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Avenida del Sol

LOE ID:	27639
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation	040387
Number of Samples:	45	
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 385 single samples were collected and 45 geomeans calculated. None of the 45 geomeans exceeded the geomean water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Avenida del Sol, San Diego, California. Station identification number is IB-080.	
Temporal Representation:	Samples were collected from January 2004 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44718, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Avenida del Sol

LOE ID:	27640
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	45
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 499 single samples were collected with 45 monthly geomeans calculated. Three of the 45 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB,

	2005). 040388
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Avenida del Sol, San Diego, California. Station identification number is IB-080.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44718, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Avenida del Sol

LOE ID:	27630
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	496
Number of Exceedances:	32
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 496 single samples were collected with 32 samples exceeded the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Avenida del Sol, Coronado, California. Station identification number is IB-080.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44718, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Avenida del Sol

LOE ID:	27631
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	39
Number of Exceedances:	16
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 496 single samples were collected with 39 samples correlated with a storm event. Sixteen of the 39 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Avenida del Sol, Coronado, California. Station identification number is IB-080.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44718, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Avenida del Sol

LOE ID:	27632
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation	040390
Number of Samples:	496	
Number of Exceedances:	7	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 496 single samples were collected with 7 samples exceeding the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Avenida del Sol, Coronado, California. Station identification number is IB-080.	
Temporal Representation:	Samples were collected from January 2004 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Coronado HA, at Loma Ave/ Central Beach
Water Body ID: CAC910100002009110322564 0
Water Body Type: Coastal & Bay Shoreline

DECISION ID 43266 **Region 9**
Pacific Ocean Shoreline, Coronado HA, at Loma Ave/ Central Beach

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Fourteen lines of evidence are available in the administrative record to assess this pollutant. Including the latest data, 13 of the 336 samples exceed the water quality objective for enterococcus of a geomean of 35/100 ml in a 30-day period.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Including the latest data, 13 of the 336 samples exceed the water quality objective for enterococcus of a geomean of 35/100 ml in a 30-day period for the protection of REC-1 and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 43266, Indicator Bacteria **Region 9**
Pacific Ocean Shoreline, Coronado HA, at Loma Ave/ Central Beach

LOE ID: 74607

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Shellfish Harvesting

Number of Samples: 192

Number of Exceedances:	1	040392

Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed BW data for Pacific Ocean Shoreline, Coronado HA, at Loma Ave/ Central Beach to determine beneficial use support and results are as follows: 1 of 192 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Coronado HA, at Loma Ave/ Central Beach was collected at 1 monitoring site [Loma Ave (frmrly Isabella]
Temporal Representation:	Data was collected over the time period 1/3/2008-8/26/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43266, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Loma Ave/ Central Beach

LOE ID:	27627
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	31
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 211 single samples were collected and 31 geomeans calculated. None of the 31 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Loma Ave (formerly Isabella ave), Coronado, California. Station identification number is EH-050.

Temporal Representation:	Samples were collected from January 2004 through December 2007. 040393
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43266, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Loma Ave/ Central Beach

LOE ID:	27625
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	45
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 336 single samples were collected with 45 monthly geomeans calculated. None of the 45 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Loma Ave (frmrly Isabella ave), Coronado, California. Station identification number is EH-050.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43266, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Loma Ave/ Central Beach

LOE ID:	27624
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation
Number of Samples:	22
Number of Exceedances:	9
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 336 single samples were collected with 22 samples correlated with a storm event. Nine of the 22 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Loma Ave (formerly Isabella ave), Coronado, California. Station identification number is EH-050.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43266, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Loma Ave/ Central Beach

LOE ID:	27623
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	336
Number of Exceedances:	13
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 336 single samples were collected with 13 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data:	Non-SWAMP	040395
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Loma Ave (formerly Isabella ave), Coronado, California. Station identification number is EH-050.	
Temporal Representation:	Samples were collected from January 2004 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43266, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Loma Ave/ Central Beach

LOE ID:	30562
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	314
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 336 single samples were collected of which 314 are dry weather (AB411) samples with 4 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Loma Ave (formerly Isabella ave), Coronado, California. Station identification number is EH-050.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	

QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43266, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Loma Ave/ Central Beach

LOE ID:	28051
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	6
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were six beach advisory days for this section of shoreline. Bacteriological samples are collected on a weekly basis at ocean and bay locations in San Diego County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that an advisory for waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 - December 2007. Data used was the number of days the beach was advisories were issued when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Spatial Representation:	Bacteriological monitoring samples were collected at Loma Avenue, Coronado Municipal Beach, Coronado, CA.
Temporal Representation:	The beach advisory covers the time frame of January January 2001 to December 2007.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of San Diego's Quality Assessment/Quality Control document
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43266, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Loma Ave/ Central Beach 040397

LOE ID:	27622
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	19
Number of Exceedances:	5
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 211 single samples were collected with 19 samples correlated with a storm event. Five of the 19 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Loma Ave (formerly Isabella ave), Coronado, California. Station identification number is EH-050.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43266, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Loma Ave/ Central Beach

LOE ID:	27621
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	211
Number of Exceedances:	6

Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 211 single samples were collected with six samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Loma Ave (formerly Isabella ave), Coronado, California. Station identification number is EH-050.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43266, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Loma Ave/ Central Beach

LOE ID:	27620
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	22
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 336 single samples were collected with 22 samples correlated with a storm event. Three of the 22 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml

	(SWRCB, 2005). 040399
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Loma Ave (formerly Isabella ave), Coronado, California. Station identification number is EH-050.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43266, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Loma Ave/ Central Beach

LOE ID:	27619
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	336
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 336 single samples were collected with 3 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Loma Ave (formerly Isabella ave), Coronado, California. Station identification number is EH-050.
Temporal Representation:	Samples were collected from January 2004 through December 2007.

Environmental Conditions:	040400
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43266, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Loma Ave/ Central Beach

LOE ID:	27618
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	22
Number of Exceedances:	12
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 336 single samples were collected with 22 samples correlated with a storm event. Twelve of the 22 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Loma Ave (formerly Isabella), Coronado, California. Station identification number is EH-050.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43266, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Loma Ave/ Central Beach 040401

LOE ID:	27617
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	336
Number of Exceedances:	18
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 336 single samples were collected with 18 samples exceeded the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Loma Ave (formerly Isabella ave), Coronado, California. Station identification number is EH-050.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43266, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Loma Ave/ Central Beach

LOE ID:	31262
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	26
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 2004 through October 2007. A total of 194 dry month (April through October) single samples were collected with 26 dry month geomeans calculated. None of the 26 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program,

	2007. AB 411 monitoring data 1999 to 2007	040402

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Loma Ave (frmrly Isabella ave), Coronado, California. Station identification number is EH-050.
Temporal Representation:	Samples were collected from April 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43266, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Loma Ave/ Central Beach

LOE ID:	31261
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 2004 through October 2007. A total of 110 dry month (April through October) single samples were collected with 17 dry month geomeans calculated. None of the 17 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Loma Ave (formerly Isabella ave), Coronado, California. Station identification number is EH-050.

Temporal Representation:	Samples were collected from April 2004 through October 2007.	040403
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43266, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Loma Ave/ Central Beach

LOE ID:	31260
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	26
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 2004 through October 2007. A total of 194 dry month (April through October) single samples were collected with 26 dry month geomeans calculated. None of the 26 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Loma Ave (formerly Isabella ave), San Diego, California. Station identification number is EH-050.
Temporal Representation:	Samples were collected from April 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43266, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Loma Ave/ Central Beach

LOE ID:	30797
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation
Number of Samples:	314
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 336 single samples were collected of which 314 are dry weather (AB411) samples with zero samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Loma Ave (formerly Isabella ave), Coronado, California. Station identification number is EH-050.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43266, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Loma Ave/ Central Beach

LOE ID:	30683
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	192
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 211 single samples were collected of which 192 are dry weather (AB411) samples with one sample exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml;

	Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Loma Ave (formerly Isabella ave), Coronado, California. Station identification number is EH-050.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43266, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Loma Ave/ Central Beach

LOE ID:	74606
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	156
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 156 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Loma Ave/Central Beach site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43266, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Loma Ave/ Central Beach

LOE ID:	74605
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation
Number of Samples:	178
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 178 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Loma Ave/Central Beach site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43266, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Loma Ave/ Central Beach

LOE ID:	77594
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	178
Number of Exceedances:	1
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	One of the 178 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, Coronado HA, at Loma Ave/ Central Beach.
Temporal Representation:	The samples were collected from January 2008 through August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.

QAPP Information Reference(s): 040407

Line of Evidence (LOE) for Decision ID 43266, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Loma Ave/ Central Beach

LOE ID:	74608
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	178
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 178 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Loma Ave/Central Beach site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43266, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Loma Ave/ Central Beach

LOE ID:	27628
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	45
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 336 single samples were collected with 45 monthly geomeans calculated. Two of the 45 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml.	040408
	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Loma Ave (formerly Isabella ave), San Diego, California. Station identification number is EH-050.	
Temporal Representation:	Samples were collected from January 2004 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, San Clemente HA, at Capistrano Shores at North Ole Hanson Beach
Water Body ID: CAC9013000020090418230836
Water Body Type: Coastal & Bay Shoreline

DECISION ID 43373 **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Capistrano Shores at North Ole Hanson Beach

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Reason for Delisting:	Applicable WQS attained; reason for recovery unspecified
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal from the CWA section 303(d) List under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Ten lines of evidence are available in the administrative record to assess this pollutant. With the latest data, 42 of the 859 samples exceeded the water quality objective for enterococcus of a geomean of 35/100 ml in a 30-day period for the protection of REC-1.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, 42 of the 859 samples exceeded the water quality objective for enterococcus of a geomean of 35/100 ml in a 30-day period for the protection of REC-1 and this does not exceed the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be removed from the section 303(d) list because applicable water quality standards for the pollutant are not being exceeded.

Line of Evidence (LOE) for Decision ID 43373, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Capistrano Shores at North Ole Hanson Beach

LOE ID:	75050
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	146	040410
Number of Exceedances:	12	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Twelve of the 146 samples exceeded the enterococcus objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The single sample enterococcus concentration shall not exceed more than 104/100ml. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected from Coastal Stormdrain at N El Camino Real / N of Avenida Estacion (surfzone upcoast and surfzone downcoast).	
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.	
Environmental Conditions:		
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43373, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Capistrano Shores at North Ole Hanson Beach

LOE ID:	75051
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	133
Number of Exceedances:	15
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Fifteen of the 133 geomeans exceeded the enterococcus objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean for enterococcus shall not exceed 35 MPN/100 mL. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Coastal Stormdrain at N El Camino Real / N of Avenida Estacion (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.

Environmental Conditions:	040411
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43373, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Capistrano Shores at North Ole Hanson Beach

LOE ID:	75052
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	146
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	None of the 146 samples exceeded the fecal coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample fecal coliform concentration shall not exceed more than 400/100ml. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Coastal Stormdrain at N El Camino Real / N of Avenida Estacion (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43373, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Capistrano Shores at North Ole Hanson Beach

LOE ID:	74674
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	133
Number of Exceedances:	0
Data and Information Type:	Not Specified

Data Used to Assess Water Quality:	None of the 133 geomeans exceeded the fecal coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean for fecal coliform shall not exceed more than 200/100ml. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Coastal Stormdrain at N El Camino Real / N of Avenida Estacion (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43373, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Capistrano Shores at North Ole Hanson Beach

LOE ID:	74675
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	146
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	None of the 146 samples exceeded the total coliform objective. For these stations, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample total coliform concentration shall not exceed more than 10000/100ml. Water Quality Control Plan for the San Diego Basin. Water Quality Control Plan for Ocean Waters.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Coastal Stormdrain at N El Camino Real / N of Avenida Estacion (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.

QAPP Information Reference(s): 040413

Line of Evidence (LOE) for Decision ID 43373, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Capistrano Shores at North Ole Hanson Beach

LOE ID:	74676
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	133
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	None of the 133 samples exceeded the total coliform objective. For these stations, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean for total coliform shall not exceed more than 1000/100ml. Water Quality Control Plan for the San Diego Basin. Water Quality Control Plan for Ocean Waters.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Coastal Stormdrain at N El Camino Real / N of Avenida Estacion (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43373, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Capistrano Shores at North Ole Hanson Beach

LOE ID:	30968
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	20
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange within the time period from January 2004 through December 2006. A total of 20 monthly geomeans were calculated for data collected within the time frame of

	April 1st to October 31st (AB411 data) during the aforementioned time period. Of the 20 geomeans one exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. over a 30 day period
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling located at Pacific Ocean Shoreline, San Clemente HA. Capistrano Shores at North Ole Hanson Beach (SCCS17), (Latitude 33.43312N Longitude 117.63442 W).
Temporal Representation:	Samples were collected at least once a week from January 2004 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) during the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43373, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Capistrano Shores at North Ole Hanson Beach

LOE ID:	30969
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	20
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange within the time period from January 2004 through December 2006. A total of 20 monthly geomeans were calculated for data collected within the time frame of April 1st to October 31st (AB411 data) during the aforementioned time period. Of the 20 geomeans zero exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml over a 30 day period
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling located at Pacific Ocean Shoreline, San Clemente HA. Capistrano

	Shores at North Ole Hanson Beach (SCCS17), (Latitude 33.43312N Longitude 117.63442 W).
Temporal Representation:	Samples were collected at least once a week from January 2004 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) during the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43373, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Capistrano Shores at North Ole Hanson Beach

LOE ID:	30967
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	20
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange within the time period from January 2004 through December 2006. A total of 20 monthly geomeans were calculated for data collected within the time frame of April 1st to October 31st (AB411 data) during the aforementioned time period. Of the 20 geomeans zero exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml. over a 30 day period
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling located at Pacific Ocean Shoreline, San Clemente HA. Capistrano Shores at North Ole Hanson Beach (SCCS17), (Latitude 33.43312N Longitude 117.63442 W).
Temporal Representation:	Samples were collected at least once a week from January 2004 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) during the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43373, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Capistrano Shores at North Ole Hanson Beach

LOE ID:	30613
Pollutant:	Enterococcus

LOE Subgroup:	Pollutant-Water	040416
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	537	
Number of Exceedances:	9	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2004 through December 2006. A total of 548 single samples were collected of which 537 are dry weather (AB411) samples with nine samples exceeding the single sample water quality objective.	
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	There is one sampling located at Pacific Ocean Shoreline, San Clemente HA. Capistrano Shores at North Ole Hanson Beach (SCCS17), (Latitude 33.43312N Longitude 117.63442 W).	
Temporal Representation:	Samples were collected at least once a week from January 2004 through December 2006.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 43373, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Capistrano Shores at North Ole Hanson Beach

LOE ID:	30828
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	537
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2004 through December 2006. A total of 548 single samples were collected of which 537 are dry weather (AB411) samples with one sample exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml. 040417 Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling located at Pacific Ocean Shoreline, San Clemente HA. Capistrano Shores at North Ole Hanson Beach (SCCS17), (Latitude 33.43312N Longitude 117.63442 W).
Temporal Representation:	Samples were collected at least once a week from January 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43373, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Capistrano Shores at North Ole Hanson Beach

LOE ID:	30313
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Water Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006. For the 2008 assessment , the 2006 listed coastline 'Pacific Ocean Shoreline, San Clemente HA' was split into smaller segments and each represents an area near the sampling location of the data being assessed. This segment 'Pacific Ocean Shoreline, San Clemente HA, at Capistrano Shores at North Ole Hanson Beach' is one of the sampling locations. This LOE is a copy of the 2006 listing placeholder LOE for Pacific Ocean Shoreline, San Clemente HA and is considered by the Regional Board to be applicable to this more specific segment formed from the split.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	
Temporal Representation:	
Environmental Conditions:	
QAPP Information:	Unspecified
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43373, Indicator Bacteria 040418 **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Capistrano Shores at North Ole Hanson Beach

LOE ID:	30723
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	536
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2004 through December 2006. A total of 547 single samples were collected of which 536 are dry weather (AB411) samples with three samples exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; (SWRCB, 2005)
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling located at Pacific Ocean Shoreline, San Clemente HA. Capistrano Shores at North Ole Hanson Beach (SCCS17), (Latitude 33.43312N Longitude 117.63442 W).
Temporal Representation:	Samples were collected at least once a week from January 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43373, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Capistrano Shores at North Ole Hanson Beach

LOE ID:	28518
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	11
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2004 through

	December 2006. A total of 548 single samples were collected and 11 samples were correlated with storm events. From those 11 samples, 3 exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005). Comparison to water quality objectives were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling located at Pacific Ocean Shoreline, San Clemente HA. Capistrano Shores at North Ole Hanson Beach (SCCS17), (Latitude 33.43312N Longitude 117.63442 W).
Temporal Representation:	Samples were collected at least once a week from January 2004 through December 2006. Rainfall data was available for the same period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43373, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Capistrano Shores at North Ole Hanson Beach

LOE ID:	28526
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	32
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2004 through December 2006. A total of 548 single samples were collected and 32 monthly geomeans calculated. From the 32 geomeans, four samples exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB,

	2005). 040420
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling located at Pacific Ocean Shoreline, San Clemente HA. Capistrano Shores at North Ole Hanson Beach (SCCS17), (Latitude 33.43312N Longitude 117.63442 W).
Temporal Representation:	Samples were collected at least once a week from January 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43373, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Capistrano Shores at North Ole Hanson Beach

LOE ID:	28527
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	11
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2004 through December 2006. A total of 548 single samples were collected with 11 samples correlated with a storm event. From the 11 samples, two exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005). Comparison to water quality objectives were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling located at Pacific Ocean Shoreline, San Clemente HA. Capistrano Shores at North Ole Hanson Beach (SCCS17), (Latitude 33.43312N Longitude 117.63442 W).

Temporal Representation:	Samples were collected at least once a week from January 2004 through December 2006. Rainfall data was available for the same period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43373, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Capistrano Shores at North Ole Hanson Beach

LOE ID:	28525
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	548
Number of Exceedances:	11
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2004 through December 2006. A total of 548 single samples were collected with 11 samples exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program, Bacteria Shoreline Data, 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling located at Pacific Ocean Shoreline, San Clemente HA. Capistrano Shores at North Ole Hanson Beach (SCCS17), (Latitude 33.43312N Longitude 117.63442 W).
Temporal Representation:	Samples were collected at least once a week from January 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43373, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Capistrano Shores at North Ole Hanson Beach

LOE ID:	28519
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation	040422
Number of Samples:	548	
Number of Exceedances:	1	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2004 through December 2006. A total of 548 single samples were collected with one sample exceeding the single sample water quality objective.	
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml. Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	There is one sampling located at Pacific Ocean Shoreline, San Clemente HA. Capistrano Shores at North Ole Hanson Beach (SCCS17), (Latitude 33.43312N Longitude 117.63442 W).	
Temporal Representation:	Samples were collected at least once a week from January 2004 through December 2006.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 43373, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Capistrano Shores at North Ole Hanson Beach

LOE ID:	28520
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	32
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2004 through December 2006. A total of 548 single samples were collected and 32 monthly geomeans calculated. None of the geomeans exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml. Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).

Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling located at Pacific Ocean Shoreline, San Clemente HA. Capistrano Shores at North Ole Hanson Beach (SCCS17), (Latitude 33.43312N Longitude 117.63442 W).
Temporal Representation:	Samples were collected at least once a week from January 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43373, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Capistrano Shores at North Ole Hanson Beach

LOE ID:	28521
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	11
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2004 through December 2006. A total of 548 single samples were collected and 11 samples were correlated with a storm event. None of the 11 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml. Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005). Comparison to water quality objectives were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling located at Pacific Ocean Shoreline, San Clemente HA. Capistrano Shores at North Ole Hanson Beach (SCCS17), (Latitude 33.43312N Longitude 117.63442 W).

Temporal Representation:	Samples were collected at least once a week from January 2004 through December 2006. Rainfall data was available for the same period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43373, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Capistrano Shores at North Ole Hanson Beach

LOE ID:	28522
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	547
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2004 through December 2006. A total of 547 single samples were collected with three samples exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program, Bacteria Shoreline Data, 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; (SWRCB, 2005)
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling located at Pacific Ocean Shoreline, San Clemente HA. Capistrano Shores at North Ole Hanson Beach (SCCS17), (Latitude 33.43312N Longitude 117.63442 W).
Temporal Representation:	Samples were collected at least once a week from January 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43373, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Capistrano Shores at North Ole Hanson Beach

LOE ID:	28523
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation	040425
Number of Samples:	32	
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2004 through December 2006. A total of 547 single samples were collected and 32 geomeans calculated. None of the 32 geomeans exceeded the geomean water quality objective.	
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; (SWRCB, 2005)	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	There is one sampling located at Pacific Ocean Shoreline, San Clemente HA. Capistrano Shores at North Ole Hanson Beach (SCCS17), (Latitude 33.43312N Longitude 117.63442 W).	
Temporal Representation:	Samples were collected at least once a week from January 2004 through December 2006.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 43373, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Capistrano Shores at North Ole Hanson Beach

LOE ID:	28524
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	11
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2004 through December 2006. A total of 547 single samples were collected with 11 samples correlated with a storm event. None of the 11 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml

	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100ml; (SWRCB, 2005). Comparison to water quality objectives were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling located at Pacific Ocean Shoreline, San Clemente HA. Capistrano Shores at North Ole Hanson Beach (SCCS17), (Latitude 33.43312N Longitude 117.63442 W).
Temporal Representation:	Samples were collected at least once a week from January 2004 through December 2006. Rainfall data was available for the same time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43373, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Capistrano Shores at North Ole Hanson Beach

LOE ID:	28517
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	548
Number of Exceedances:	12
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2004 through December 2006. A total of 548 single samples were collected with 12 exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling located at Pacific Ocean Shoreline, San Clemente HA. Capistrano Shores at North Ole Hanson Beach (SCCS17), (Latitude 33.43312N Longitude 117.63442 W).
Temporal Representation:	Samples were collected at least once a week from January 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.

QAPP Information Reference(s): County of Orange. Quality Assurance/Quality Control Manual, February 2004 040427

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, San Clemente HA, at Poche Beach
Water Body ID: CAC9013000020090418220913
Water Body Type: Coastal & Bay Shoreline

DECISION ID 44202 **Region 9**
Pacific Ocean Shoreline, San Clemente HA, at Poche Beach

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not Delist from 303(d) list (being addressed with USEPA approved TMDL)**
Last Listing Cycle's Final Listing Decision:	Do Not Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
TMDL Name:	Bacteria Impaired Waters I (creeks and beach shorelines)
TMDL Project Code:	169
Date TMDL Approved by USEPA:	06/22/2011
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal on the CWA section 303(d) List under sections 2.2 and 3.2 of the Listing Policy. Under section 3.2 of the Policy, a minimum of one line of evidence is needed to assess listing status.

Thirteen lines of evidence are available in the administrative record to assess this pollutant.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List. There is sufficient justification to place it in the Being Addressed portion of the CWA 303(d) List because a TMDL has been completed and approved by RWQCB and USEPA, and is expected to result in attainment of the standard.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, 221 of 296 geomean samples and 60 of 296 geomeans samples exceed the water quality objectives for enterococcus and fecal coliform, respectively, and 232 of 598 single samples exceed the WQO for total coliform for the protection of SHELL, and these exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. The Bacteria TMDL for 20 beaches/creeks was approved by USEPA on 06/22/2011.
5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 44202, Indicator Bacteria **Region 9**
Pacific Ocean Shoreline, San Clemente HA, at Poche Beach

LOE ID: 30615

Pollutant:	Enterococcus	040429
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	454	
Number of Exceedances:	128	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 490 single samples were collected of which 454 are dry weather (AB411) samples with 128 exceeding the single sample water quality objective.	
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program, Bacteria Shoreline Data, 2002 through 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Poche Beach, station id S-15, in the San Clemente HA. (Latitude 33.44125, Longitude -117.64636).	
Temporal Representation:	Samples were collected at least once a week from January 2002 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 44202, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Poche Beach

LOE ID:	30829
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	456
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 490 single samples were collected of which 456 are dry weather (AB411) samples with four exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program, Bacteria Shoreline Data, 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;

Objective/Criterion Reference:	Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005). Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Poche Beach, station id S-15, in the San Clemente HA. (Latitude 33.44125, Longitude -117.64636).
Temporal Representation:	Samples were collected at least once a week from January 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44202, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Poche Beach

LOE ID:	28792
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	-N/A
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	1392
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2000 to December 2006, there were and 1392 beach postings days for this section of shoreline. Bacteriological samples are collected on a weekly basis at approximately 150 ocean and bay location in Orange County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of Orange in their Annual Ocean and Bay Water Quality Report, March 2007. The reporting period was from January 2000 -December 2006. Data used was the number of days the beach was posting when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	County of Orange. March 2007. Annual Ocean and Bay Water Quality Report, 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Spatial Representation:	Bacteriological monitoring samples were collected at Poche Beach in the San Clemente . The posting covers 0.2 miles of beach shoreline.
Temporal Representation:	The beach posting covers the time frame of January 2000 -December 2006.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of Orange's Quality Assessment/Quality Control document (County of Orange, 2004).
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44202, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Poche Beach

LOE ID:	28489
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	490
Number of Exceedances:	35
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 455 single samples were collected with 35 samples exceeding the single sample water quality objective
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Poche Beach, station id S-15, in the San Clemente HA. (Latitude 33.44125, Longitude -117.64636).
Temporal Representation:	Samples were collected at least once a week from January 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44202, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Poche Beach

LOE ID:	28490
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	72
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 490 single samples were collected and 72 monthly geomeans calculated. None of the geomeans exceeded the geomean water quality objective
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Poche Beach, station id S-15, in the San Clemente HA. (Latitude 33.44125, Longitude -117.64636).
Temporal Representation:	Samples were collected at least once a week from January 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44202, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Poche Beach

LOE ID:	28491
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	34
Number of Exceedances:	7
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 490 single samples were collected. From March 2002 through August 2007, there were 34 samples correlated with a storm event and seven of those samples exceeded the single sample maximum objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml;

040433

	Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Poche Beach, station id S-15, in the San Clemente HA. (Latitude 33.44125, Longitude -117.64636).
Temporal Representation:	Samples were collected at least once a week from January 2002 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44202, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Poche Beach

LOE ID:	28484
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	490
Number of Exceedances:	189
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 490 single samples were collected with 189 exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Poche Beach, station id S-15, in the San Clemente HA. (Latitude 33.44125, Longitude -117.64636).
Temporal Representation:	Samples were collected at least once a week from January 2002 through December 2007.
Environmental Conditions:	

QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44202, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Poche Beach

LOE ID:	28485
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	34
Number of Exceedances:	21
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 490 single samples were collected. From March 2002 through August 2007, there were 34 samples correlated with storm events. From those 34 samples 21 exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Poche Beach, station id S-15, in the San Clemente HA. (Latitude 33.44125, Longitude -117.64636).
Temporal Representation:	Samples were collected at least once a week from January 2002 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44202, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Poche Beach

LOE ID:	28492
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	490
Number of Exceedances:	143
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 490 single samples were collected with 143 exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Poche Beach, station id S-15, in the San Clemente HA. (Latitude 33.44125, Longitude -117.64636).
Temporal Representation:	Samples were collected at least once a week from January 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44202, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Poche Beach

LOE ID:	28493
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	72
Number of Exceedances:	15
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 490 single samples were collected and 72 monthly geomeans calculated. Fifteen of the 72 geomeans exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007

SWAMP Data:	Non-SWAMP	040436
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Poche Beach, station id S-15, in the San Clemente HA. (Latitude 33.44125, Longitude -117.64636).	
Temporal Representation:	Samples were collected at least once a week from January 2002 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 44202, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Poche Beach

LOE ID:	28494
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	36
Number of Exceedances:	15
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 490 single samples were collected. From March 2002 through August 2007, there were 34 samples correlated with a storm event. From the 34 samples, 13 exceeded the single sample maximum objective . This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Poche Beach, station id S-15, in the San Clemente HA. (Latitude 33.44125, Longitude -117.64636).

Temporal Representation:	Samples were collected at least once a week from January 2002 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44202, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Poche Beach

LOE ID:	28486
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	490
Number of Exceedances:	6
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 490 single samples were collected with six exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Poche Beach, station id S-15, in the San Clemente HA. (Latitude 33.44125, Longitude -117.64636).
Temporal Representation:	Samples were collected at least once a week from January 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44202, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Poche Beach

LOE ID:	28487

Pollutant:	Total Coliform	040438
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	72	
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 490 single samples were collected and 72 monthly geomeans calculated. None of the geomeans exceeded exceeded the geomean water quality objective.	
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Poche Beach, station id S-15, in the San Clemente HA. (Latitude 33.44125, Longitude -117.64636).	
Temporal Representation:	Samples were collected at least once a week from January 2002 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 44202, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Poche Beach

LOE ID:	28488
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	34
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 490 single samples were collected. From March 2002 through August 2007, there were 34 samples correlated with a storm event. Two of the 34 samples exceeded the single sample maximum objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional

	Temperature and Precipitation Listings by Station 040439 The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Poche Beach, station id S-15, in the San Clemente HA. (Latitude 33.44125, Longitude -117.64636).
Temporal Representation:	Samples were collected at least once a week from January 2002 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44202, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Poche Beach

LOE ID:	30724
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	456
Number of Exceedances:	28
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 490 single samples were collected of which 456 are dry weather (AB411) samples with 28 samples exceeding the single sample water quality objective
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Poche Beach, station id S-15, in the San Clemente HA. (Latitude 33.44125, Longitude -117.64636).
Temporal Representation:	Samples were collected at least once a week from January 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44202, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Poche Beach

LOE ID:	31020
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	42
Number of Exceedances:	24
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange within the time period from January 2002 through December 2007. A total of 42 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 42 geomeans 24 exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml over a 30 day period (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Poche Beach, station id S-15, in the San Clemente HA. (Latitude 33.44125, Longitude -117.64636).
Temporal Representation:	Samples were collected at least once a week within the time period from January 2002 through December 2007. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44202, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Poche Beach

LOE ID:	31018	040441
Pollutant:	Total Coliform	
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	42	
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange within the time period from January 2002 through December 2007. A total of 42 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 42 geomeans zero exceeded the geomean water quality objective.	
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml over a 30 day period (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Poche Beach, station id S-15, in the San Clemente HA. (Latitude 33.44125, Longitude -117.64636).	
Temporal Representation:	Samples were collected at least once a week within the time period from January 2002 through December 2007. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 44202, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Poche Beach

LOE ID:	30314
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Water Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.

	For the 2008 assessment , the 2006 listed coastline 'Pacific Ocean Shoreline, San Clemente HA' was split into smaller segments and each represents an area near the sampling location of the data being assessed. This segment 'Pacific Ocean Shoreline, San Clemente HA, at Poche Beach' is one of the sampling locations. This LOE is a copy of the 2006 listing placeholder LOE for Pacific Ocean Shoreline, San Clemente HA and is considered by the Regional Board to be applicable to this more specific segment formed from the split.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	
Temporal Representation:	
Environmental Conditions:	
QAPP Information:	Unspecified
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44202, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Poche Beach

LOE ID:	31019
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	42
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange within the time period from January 2002 through December 2007. A total of 42 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 42 geomeans zero exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml over a 30 day period (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Poche Beach, station id S-15, in the San Clemente HA. (Latitude 33.44125, Longitude -117.64636).
Temporal Representation:	Samples were collected at least once a week within the time period from January 2002 through December 2007.

Environmental Conditions:	The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44202, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Poche Beach

LOE ID:	77653
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	90
Number of Exceedances:	68
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Sixty-eight of the 90 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, San Clemente HA, at Poche Beach.
Temporal Representation:	The samples were collected from January 2008 to January 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44202, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Poche Beach

LOE ID:	74677
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	90
Number of Exceedances:	80

Data and Information Type:	Not Specified	040444
Data Used to Assess Water Quality:	Eighty of the 90 geomeans exceeded the objective.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at the Poche Beach site.	
Temporal Representation:	Samples were collected from January 2008 to January 2010.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44202, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Poche Beach

LOE ID:	74678
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	147
Number of Exceedances:	100
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	One hundred of the 147 samples exceeded the enterococcus objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample enterococcus concentration shall not exceed more than 104/100ml. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Prima Deshecha Channel outlet at Beach Road (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44202, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Poche Beach

LOE ID:	74679
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	134
Number of Exceedances:	126
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	One hundred twenty-six of the 134 geomeans exceeded the enterococcus objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean for enterococcus shall not exceed 35 MPN/100 mL. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Coastal Prima Deshecha Channel outlet (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44202, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Poche Beach

LOE ID:	74680
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	147
Number of Exceedances:	30
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Thirty of the 147 samples exceeded the fecal coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample fecal coliform concentration shall not exceed more than 400/100ml.

	Water Quality Control Plan for the San Diego Basin. California Ocean Plan. 040446
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Prima Deshecha Channel outlet at Beach Road (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44202, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Poche Beach

LOE ID:	74701
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	134
Number of Exceedances:	55
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Fifty-five of the 134 geomeans exceeded the fecal coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean for fecal coliform shall not exceed more than 200/100ml. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Prima Deshecha Channel outlet (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44202, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Poche Beach

LOE ID:	74702

Pollutant:	Fecal Coliform	040447
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	90	
Number of Exceedances:	5	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Five of the 90 geomeans exceeded the objective.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at the Poche Beach site.	
Temporal Representation:	Samples were collected from January 2008 to January 2010.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the beach watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44202, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Poche Beach

LOE ID:	74703
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	108
Number of Exceedances:	43
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Beach Watch data for Pacific Ocean Shoreline, San Clemente HA, at Poche Beach to determine beneficial use support and results are as follows: 43 of 108 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, San Clemente HA, at Poche Beach was collected at 1 monitoring site [Poche Beach]

Temporal Representation:	Data was collected over the time period 1/3/2008-1/11/2010. 040448
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44202, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Poche Beach

LOE ID:	74704
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	147
Number of Exceedances:	4
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Four of the 147 samples exceeded the total coliform objective. For these stations, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample total coliform concentration shall not exceed more than 10000/100ml. Water Quality Control Plan for the San Diego Basin. Water Quality Control Plan for Ocean Waters.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Prima Deshecha Channel outlet at Beach Road (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44202, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Poche Beach

LOE ID:	74705
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	134
Number of Exceedances:	47

Data and Information Type:	Not Specified	040449
Data Used to Assess Water Quality:	Forty-seven of the 134 samples exceeded the total coliform objective. For these stations, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The geometric mean for total coliform shall not exceed more than 1000/100ml. Water Quality Control Plan for the San Diego Basin. Water Quality Control Plan for Ocean Waters.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected from Prima Deshecha Channel outlet (surfzone upcoast and surfzone downcoast).	
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.	
Environmental Conditions:		
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44202, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Poche Beach

LOE ID:	74706
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	90
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 90 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Poche Beach site.
Temporal Representation:	Samples were collected from January 2008 to January 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, San Clemente HA, at Riviera Beach
Water Body ID: CAC9013000020090419002355
Water Body Type: Coastal & Bay Shoreline

DECISION ID 44201 Region 9
Pacific Ocean Shoreline, San Clemente HA, at Riviera Beach

Pollutant: Indicator Bacteria
Final Listing Decision: Delist from 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Delist from 303(d) list (TMDL required list)(2012)
Revision Status Revised
Reason for Delisting: Applicable WQS attained; reason for recovery unspecified
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for removal from the CWA section 303(d) List under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Eleven lines of evidence are available in the administrative record to assess this pollutant. With the latest data, eight of the 140 samples exceed the water quality objective for enterococcus of a geomean of 35/100 ml in a 30-day period for the protection of REC-1.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, eight of the 140 samples exceed the water quality objective for enterococcus of a geomean of 35/100 ml in a 30-day period for the protection of REC-1and this does not exceed the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be removed from the section 303(d) list because applicable water quality standards for the pollutant are not being exceeded.

Line of Evidence (LOE) for Decision ID 44201, Indicator Bacteria Region 9
Pacific Ocean Shoreline, San Clemente HA, at Riviera Beach

LOE ID: 28385

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Shellfish Harvesting

Number of Samples:	11	040451
Number of Exceedances:	1	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2004 through December 2006. A total of 548 single samples were collected with 11 samples correlated with a storm event. One of the 11 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.	
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, Riviera Beach (station id RIVERA) off of Plaza de la Playa (Latitude 33.40854N, Longitude 117.60942 W).	
Temporal Representation:	Samples were collected at least once a week from January 2004 through December 2006. Rainfall data was available for the same time period.	
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 44201, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Riviera Beach

LOE ID:	30975
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	20
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange within the time period from January 2004 through December 2006. A total of 20 monthly geomeans were calculated for data collected within the time frame of April 1st to October 31st (AB411 data) during the aforementioned time period. Of the 20 geomeans zero exceeded the geomean water quality objective.

Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml over a 30 day period (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, Riviera Beach (station id RIVERA) off of Plaza de la Playa (Latitude 33.40854N, Longitude 117.60942 W).
Temporal Representation:	Samples were collected at least once a week from January 2004 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) during the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44201, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Riviera Beach

LOE ID:	28384
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	548
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2004 through December 2006. A total of 548 single samples were collected with four exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, Riviera Beach (station id RIVERA) off of Plaza de la Playa (Latitude 33.40854N, Longitude 117.60942 W).
Temporal Representation:	Samples were collected at least once a week from January 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance

	with the County of Orange Quality Assessment/Quality Control document.040453
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44201, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Riviera Beach

LOE ID:	28386
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	548
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2004 through December 2006. A total of 548 single samples were collected with no samples exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, Riviera Beach (station id RIVERA) off of Plaza de la Playa (Latitude 33.40854N, Longitude 117.60942 W).
Temporal Representation:	Samples were collected at least once a week from January 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44201, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Riviera Beach

LOE ID:	28387
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	32
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)

Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2004 through December 2006. A total of 548 single samples were collected and 32 monthly geomeans calculated. None of the geomeans exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, Riviera Beach (station id RIVERA) off of Plaza de la Playa (Latitude 33.40854N, Longitude 117.60942 W).
Temporal Representation:	Samples were collected at least once a week from January 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44201, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Riviera Beach

LOE ID:	28388
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	11
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2004 through December 2006. A total of 548 single samples were with 11 samples correlated with a storm event. From the 11 samples, none exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, Riviera Beach (station id RIVERA) off of Plaza de la Playa (Latitude 33.40854N, Longitude 117.60942 W).
Temporal Representation:	Samples were collected at least once a week from January 2004 through December 2006. Rainfall data was available for the same period of time.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44201, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Riviera Beach

LOE ID:	28390
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	32
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2004 through December 2006. A total of 547 single samples were collected and 32 monthly geomean calculated. None of the 32 monthly geomean exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, Riviera Beach (station id RIVERA) off of Plaza de la Playa (Latitude 33.40854N, Longitude 117.60942 W).
Temporal Representation:	Samples were collected at least once a week from January 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44201, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Riviera Beach

LOE ID:	28391
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	11
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2004 through December 2006. A total of 547 single samples were collected with 11 samples correlated with a storm event. None of the 11 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, Riviera Beach (station id RIVERA) off of Plaza de la Playa (Latitude 33.40854N, Longitude 117.60942 W).
Temporal Representation:	Samples were collected at least once a week from January 2004 through December 2006.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44201, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Riviera Beach

LOE ID:	28392
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation
Number of Samples:	548
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2004 through December 2006. A total of 548 single samples were collected with two samples exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, Riviera Beach (station id RIVERA) off of Plaza de la Playa (Latitude 33.40854N, Longitude 117.60942 W).
Temporal Representation:	Samples were collected at least once a week from January 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44201, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Riviera Beach

LOE ID:	28393
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	32
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2004 through December 2006. A total of 548 single samples were collected and 32 monthly geomeans calculated. From the 32 geomeans, only one exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005.

	Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency 040458
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, Riviera Beach (station id RIVERA) off of Plaza de la Playa (Latitude 33.40854N, Longitude 117.60942 W).
Temporal Representation:	Samples were collected at least once a week from January 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44201, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Riviera Beach

LOE ID:	30974
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	20
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange within the time period from January 2004 through December 2006. A total of 20 monthly geomeans were calculated for data collected within the time frame of April 1st to October 31st (AB411 data) during the aforementioned time period. Of the 20 geomeans zero exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml over a 30 day period (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, Riviera Beach (station id RIVERA) off of Plaza de la Playa (Latitude 33.40854N, Longitude 117.60942 W).
Temporal Representation:	Samples were collected at least once a week from January 2004 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) during the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44201, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Riviera Beach 040459

LOE ID:	30622
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	537
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2004 through December 2006. A total of 548 single samples were collected of which 537 are dry weather (AB411) samples with two samples exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program, Bacteria Shoreline Data, 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, Riviera Beach (station id RIVERA) off of Plaza de la Playa (Latitude 33.40854N, Longitude 117.60942 W).
Temporal Representation:	Samples were collected at least once a week from January 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44201, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Riviera Beach

LOE ID:	30831
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	537
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2004 through December 2006. A total of 548 single samples were collected of which 537 are dry weather (AB411) samples with none of those samples exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater

	Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2004 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, Riviera Beach (station id RIVERA) off of Plaza de la Playa (Latitude 33.40854N, Longitude 117.60942 W).
Temporal Representation:	Samples were collected at least once a week from January 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44201, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Riviera Beach

LOE ID:	30315
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Water Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006. For the 2008 assessment , the 2006 listed coastline 'Pacific Ocean Shoreline, San Clemente HA' was split into smaller segments and each represents an area near the sampling location of the data being assessed. This segment 'Pacific Ocean Shoreline, San Clemente HA, at Riviera Beach' is one of the sampling locations. This LOE is a copy of the 2006 listing placeholder LOE for Pacific Ocean Shoreline, San Clemente HA and is considered by the Regional Board to be applicable to this more specific segment formed from the split.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	
Temporal Representation:	
Environmental Conditions:	
QAPP Information:	Unspecified

QAPP Information Reference(s): 040461

Line of Evidence (LOE) for Decision ID 44201, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Riviera Beach

LOE ID:	30726
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	536
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2004 through December 2006. A total of 547 single samples were collected of which 536 are dry weather (AB411) samples with no samples exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, Riviera Beach (station id RIVERA) off of Plaza de la Playa (Latitude 33.40854N, Longitude 117.60942 W).
Temporal Representation:	Samples were collected at least once a week from January 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44201, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Riviera Beach

LOE ID:	28394
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	11
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2004 through

	December 2006. A total of 548 single samples were collected with 11 samples correlated with a storm event. From the 11 samples, none exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, Riviera Beach (station id RIVERA) off of Plaza de la Playa (Latitude 33.40854N, Longitude 117.60942 W).
Temporal Representation:	Samples were collected at least once a week from January 2004 through December 2006. Rainfall data was available for the same time period.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44201, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Riviera Beach

LOE ID:	74730
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	108
Number of Exceedances:	7
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Seven of the 108 geomeans exceeded the enterococcus objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean for enterococcus shall not exceed 35 MPN/100 mL. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.

Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin 040463 California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Coastal Stormdrain at Plaza A La Playa (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from January 2007 to June 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44201, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Riviera Beach

LOE ID:	74731
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	120
Number of Exceedances:	2
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Two of the 120 samples exceeded the fecal coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample fecal coliform concentration shall not exceed more than 400/100ml. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Coastal Stormdrain at Plaza A La Playa (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from January 2007 to June 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44201, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Riviera Beach

LOE ID:	74732
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water

Matrix:	Water	040464
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	108	
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	None of the 108 geomeans exceeded the fecal coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The geometric mean for fecal coliform shall not exceed more than 200/100ml. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected from Coastal Stormdrain at Plaza A La Playa (surfzone upcoast and surfzone downcoast).	
Temporal Representation:	The samples were collected once a week from January 2007 to June 2009.	
Environmental Conditions:		
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44201, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Riviera Beach

LOE ID:	74733
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	120
Number of Exceedances:	1
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	One of the 120 samples exceeded the total coliform objective. For these stations, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample total coliform concentration shall not exceed more than 10000/100ml. Water Quality Control Plan for the San Diego Basin. Water Quality Control Plan for Ocean Waters.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:	040465
Guideline Reference:	
Spatial Representation:	The samples were collected from Coastal Stormdrain at Plaza A La Playa (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from January 2007 to June 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44201, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Riviera Beach

LOE ID:	74734
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	108
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	None of the 108 samples exceeded the total coliform objective. For these stations, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean for total coliform shall not exceed more than 1000/100ml. Water Quality Control Plan for the San Diego Basin. Water Quality Control Plan for Ocean Waters.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Coastal Stormdrain at Plaza A La Playa (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from January 2007 to June 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44201, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Riviera Beach

LOE ID:	74707
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation
Number of Samples:	120
Number of Exceedances:	6
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Six of the 120 samples exceeded the enterococcus objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample enterococcus concentration shall not exceed more than 104/100ml. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Coastal Stormdrain at Plaza A La Playa (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from January 2007 to June 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44201, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Riviera Beach

LOE ID:	30976
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	20
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange within the time period from January 2004 through December 2006. A total of 20 monthly geomeans were calculated for data collected within the time frame of April 1st to October 31st (AB411 data) during the aforementioned time period. Of the 20 geomeans one exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml over a 30 day period(SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:	040467
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, Riviera Beach (station id RIVERA) off of Plaza de la Playa (Latitude 33.40854N, Longitude 117.60942 W).
Temporal Representation:	Samples were collected at least once a week from January 2004 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) during the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44201, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at Riviera Beach

LOE ID:	28389
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	547
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2004 through December 2006. A total of 547 single samples were collected with no samples exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, Riviera Beach (station id RIVERA) off of Plaza de la Playa (Latitude 33.40854N, Longitude 117.60942 W).
Temporal Representation:	Samples were collected at least once a week from January 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Pier
Water Body ID: CAC9013000020090419001811
Water Body Type: Coastal & Bay Shoreline

DECISION ID 42681 **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Pier

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (being addressed by USEPA approved TMDL)**
Last Listing Cycle's Final Listing Decision:	Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
TMDL Name:	Bacteria Impaired Waters I (creeks and beach shorelines)
TMDL Project Code:	169
Date TMDL Approved by USEPA:	06/22/2011
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal on the CWA section 303(d) List under sections 2.2 and 3.2 of the Listing Policy. Under section 3.2 of the Policy, a minimum of one line of evidence is needed to assess listing status.

Eleven lines of evidence are available in the administrative record to assess this pollutant.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List. There is sufficient justification to place it in the Being Addressed portion of the CWA 303(d) List because a TMDL has been completed and approved by RWQCB and USEPA, and is expected to result in attainment of the standard.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, 80 of 166 geomean samples exceed the water quality objective for enterococcus and these exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. The Bacteria TMDL for 20 beaches/creeks was approved by USEPA on 06/22/2011.
5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 42681, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Pier

LOE ID:	74816
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water

Matrix:	Water	040469
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	134	
Number of Exceedances:	74	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Seventy-four of the 134 geomeans exceeded the enterococcus objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The geometric mean for enterococcus shall not exceed 35 MPN/100 mL. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected from Coastal Stormdrain Beneath San Clemente Pier (surfzone upcoast and surfzone downcoast).	
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.	
Environmental Conditions:		
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 42681, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Pier

LOE ID:	74791
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	147
Number of Exceedances:	28
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Twenty-eight of the 147 samples exceeded the enterococcus objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample enterococcus concentration shall not exceed more than 104/100ml. Water Quality Control Plan for the San Diego Basin. CAlifornia Ocean Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	

Guideline Reference:	040470
Spatial Representation:	The samples were collected from the coastal stormdrain beneath San Clemente Pier (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 42681, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Pier

LOE ID:	74818
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	134
Number of Exceedances:	3
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Three of the 134 geomeans exceeded the fecal coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean for fecal coliform shall not exceed more than 200/100ml. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Coastal Stormdrain Beneath San Clemente Pier (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 42681, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Pier

LOE ID:	74819
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation	040471
Number of Samples:	147	
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Zero of the 147 samples exceeded the total coliform objective. For these stations, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The single sample total coliform concentration shall not exceed more than 10000/100ml. Water Quality Control Plan for the San Diego Basin. Water Quality Control Plan for Ocean Waters.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected from a coastal stormdrain beneath San Clemente Pier (surfzone upcoast and surfzone downcoast).	
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.	
Environmental Conditions:		
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 42681, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Pier

LOE ID:	74820
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	134
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	None of the 134 samples exceeded the total coliform objective. For these stations, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean for total coliform shall not exceed more than 1000/100ml. Water Quality Control Plan for the San Diego Basin. Water Quality Control Plan for Ocean Waters.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	The samples were collected from Coastal Stormdrain Beneath San Clemente Pier (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 42681, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Pier

LOE ID:	74817
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	147
Number of Exceedances:	13
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Thirteen of the 147 samples exceeded the fecal coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample fecal coliform concentration shall not exceed more than 400/100ml. Region 9 Basion Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from the coastal stormdrain beneath San Clemente Pier (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 42681, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Pier

LOE ID:	30984
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	20	040473
Number of Exceedances:	1	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange within the time period from May 2004 through December 2006. A total of 20 monthly geomeans were calculated for data collected within the time frame of April 1st to October 31st (AB411 data) during the aforementioned time period. Of the 20 geomeans one exceeded the geomean water quality objective.	
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml over a 30 day period (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from San Clemente HA, San Clemente City Beach at Pier (station id PIER). This is found underneath the Municipal Pier in San Clemente (Latitude: 33.41957, Longitude: -117.62000).	
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) during the aforementioned time period.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 42681, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Pier

LOE ID:	30985
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	20
Number of Exceedances:	6
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 20 monthly geomeans were calculated for data collected within the time frame of April 1st to October 31st (AB411 data) during the aforementioned time period. Of the 20 geomeans six exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml over a 30 day period (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005.

	Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from San Clemente HA, San Clemente City Beach at Pier (station id PIER). This is found underneath the Municipal Pier in San Clemente (Latitude: 33.41957, Longitude: -117.62000).
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006. Rainfall data was available for the same time period. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) during the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 42681, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Pier

LOE ID:	30983
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	20
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange within the time period from May 2004 through December 2006. A total of 20 monthly geomeans were calculated for data collected within the time frame of April 1st to October 31st (AB411 data) during the aforementioned time period. Of the 20 geomeans zero exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml over a 30 day period (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from San Clemente HA, San Clemente City Beach at Pier (station id PIER). This is found underneath the Municipal Pier in San Clemente (Latitude: 33.41957, Longitude: -117.62000).
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) during the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.

QAPP Information Reference(s): County of Orange. Quality Assurance/Quality Control Manual, February 2004 040475

Line of Evidence (LOE) for Decision ID 42681, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Pier

LOE ID:	30319
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Water Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006. For the 2008 assessment , the 2006 listed coastline 'Pacific Ocean Shoreline, San Clemente HA' was split into smaller segments and each represents an area near the sampling location of the data being assessed. This segment 'Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Pier' is one of the sampling locations. This LOE is a copy of the 2006 listing placeholder LOE for Pacific Ocean Shoreline, San Clemente HA and is considered by the Regional Board to be applicable to this more specific segment formed from the split.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	
Temporal Representation:	
Environmental Conditions:	
QAPP Information:	Unspecified
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 42681, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Pier

LOE ID:	30729
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	535
Number of Exceedances:	14
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2004 through

	December 2006. A total of 547 single samples were collected of which 535 are dry weather (AB411) samples with 14 samples exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from San Clemente HA, San Clemente City Beach at Pier (station id PIER). This is found underneath the Municipal Pier in San Clemente (Latitude: 33.41957, Longitude: -117.62000).
Temporal Representation:	Samples were collected at least once a week from January 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 42681, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Pier

LOE ID:	30834
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	536
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 548 single samples were collected of which 536 are dry weather (AB411) samples with none of those samples exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from San Clemente HA, San Clemente City Beach at Pier (station

	id PIER). This is found underneath the Municipal Pier in San Clemente (Latitude: 33.41957, Longitude: -117.62000).
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 42681, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Pier

LOE ID:	30628
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	536
Number of Exceedances:	14
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 548 single samples were collected of which 536 are dry weather (AB411) samples with 14 samples exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from San Clemente HA, San Clemente City Beach at Pier (station id PIER). This is found underneath the Municipal Pier in San Clemente (Latitude: 33.41957, Longitude: -117.62000).
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006. Rainfall data was available for the same time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 42681, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Pier

LOE ID:	28452
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 548 single samples were collected with 12 samples correlated with a storm event. None of the 12 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program, Bacteria Shoreline Data, 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from San Clemente HA, San Clemente City Beach at Pier (station id PIER). This is found underneath the Municipal Pier in San Clemente (Latitude: 33.41957, Longitude: -117.62000).
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 42681, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Pier

LOE ID:	28451
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	32
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through

	December 2006. A total of 548 single samples were collected and 32 monthly geomeans calculated. None of the geomeans exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from San Clemente HA, San Clemente City Beach at Pier (station id PIER). This is found underneath the Municipal Pier in San Clemente (Latitude: 33.41957, Longitude: -117.62000).
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 42681, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Pier

LOE ID:	28458
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	12
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 548 single samples were collected with 12 samples correlated with a storm event. From the 12 samples, two exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	

Guideline Reference:	040480
Spatial Representation:	Samples were collected from San Clemente HA, San Clemente City Beach at Pier (station id PIER). This is found underneath the Municipal Pier in San Clemente (Latitude: 33.41957, Longitude: -117.62000).
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006. Rainfall data was available for the same time period.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 42681, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Pier

LOE ID:	28450
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	548
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 548 single samples were collected with no samples exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from San Clemente HA, San Clemente City Beach at Pier (station id PIER). This is found underneath the Municipal Pier in San Clemente (Latitude: 33.41957, Longitude: -117.62000).
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 42681, Indicator Bacteria 040481 Region 9

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Pier

LOE ID:	28449
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	12
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 548 single samples were collected with 12 samples correlated with a storm event. From the 12 samples, four exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from San Clemente HA, San Clemente City Beach at Pier (station id PIER). This is found underneath the Municipal Pier in San Clemente (Latitude: 33.41957, Longitude: -117.62000).
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 42681, Indicator Bacteria Region 9

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Pier

LOE ID:	28448
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	040482
Beneficial Use:	Shellfish Harvesting	
Number of Samples:	548	
Number of Exceedances:	42	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 548 single samples were collected with 42 exceeding the single sample water quality objective.	
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from San Clemente HA, San Clemente City Beach at Pier (station id PIER). This is found underneath the Municipal Pier in San Clemente (Latitude: 33.41957, Longitude: -117.62000).	
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 42681, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Pier

LOE ID:	28457
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	32
Number of Exceedances:	6
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 548 single samples were collected with 32 monthly geomeans calculated. From the 32 geomeans, six exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005.

	Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

040483

Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from San Clemente HA, San Clemente City Beach at Pier (station id PIER). This is found underneath the Municipal Pier in San Clemente (Latitude: 33.41957, Longitude: -117.62000).
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006. Rainfall data was available for the same time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 42681, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Pier

LOE ID:	28456
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	548
Number of Exceedances:	16
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 548 single samples were collected with 16 samples exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from San Clemente HA, San Clemente City Beach at Pier (station id PIER). This is found underneath the Municipal Pier in San Clemente (Latitude: 33.41957, Longitude: -117.62000).
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006. Rainfall data was available for the same time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 42681, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Pier 040484

LOE ID:	28455
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 547 single samples were collected with 12 samples correlated with a storm event. None of the 12 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from San Clemente HA, San Clemente City Beach at Pier (station id PIER). This is found underneath the Municipal Pier in San Clemente (Latitude: 33.41957, Longitude: -117.62000).
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006. Rainfall data was available for the same time period.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 42681, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Pier

LOE ID:	28454
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	040485
Beneficial Use:	Water Contact Recreation	
Number of Samples:	32	
Number of Exceedances:	1	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 547 single samples were collected and 32 monthly geomeans calculated. From the 32 geomeans, one exceeded the geomean water quality objective.	
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from San Clemente HA, San Clemente City Beach at Pier (station id PIER). This is found underneath the Municipal Pier in San Clemente (Latitude: 33.41957, Longitude: -117.62000).	
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 42681, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Pier

LOE ID:	28453
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	547
Number of Exceedances:	14
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2004 through December 2006. A total of 547 single samples were collected with 14 samples exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).

Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from San Clemente HA, San Clemente City Beach at Pier (station id PIER). This is found underneath the Municipal Pier in San Clemente (Latitude: 33.41957, Longitude: -117.62000).
Temporal Representation:	Samples were collected at least once a week from January 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name:	Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Projection of Las Palmeras
Water Body ID:	**CAC9013000020090419004107**
Water Body Type:	**Coastal & Bay Shoreline**

DECISION ID **32378** **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Projection of Las Palmeras

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Fourteen lines of evidence are available in the administrative record to assess this pollutant. With the latest data, one of 159 geomean samples exceed the water quality objective for enterococcus of 35/100ml in a 30-day period for the protection of REC-1.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, one of 159 geomean samples exceed the water quality objective for enterococcus of 35/100ml in a 30-day period for the protection of REC-1 and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 32378, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Projection of Las Palmeras

LOE ID:	28349
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	423	040488
Number of Exceedances:	2	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 423 single samples were collected with two samples exceeding the single sample water quality objective.	
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; (SWRCB, 2005)	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	There is one sampling location at the projection of Las Palmeras, S-23, in the San Clemente HA. Lat/Long: 33.3958/-117.60024.	
Temporal Representation:	Samples were collected at least once a week from January 2002 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 32378, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Projection of Las Palmeras

LOE ID:	30835
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	387
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 423 single samples were collected of which 387 are dry weather (AB411) samples with none of those samples exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml. Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental

Protection Agency 040489

Evaluation Guideline:
Guideline Reference:

Spatial Representation: There is one sampling location at the projection of Las Palmeras, S-23, in the San Clemente HA. Lat/Long: 33.3958/-117.60024.
Temporal Representation: Samples were collected at least once a week from January 2002 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:
QAPP Information: Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s): County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 32378, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Projection of Las Palmeras

LOE ID: 28352

Pollutant: Enterococcus
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 423
Number of Exceedances: 15

Data and Information Type: PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality: Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 423 single samples were collected with 15 samples exceeding the single sample water quality objective.
Data Reference: The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: Geomean: Enterococcus density shall not exceed 35 per 100 ml.

Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference: Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:
Guideline Reference:

Spatial Representation: There is one sampling location at the projection of Las Palmeras, S-23, in the San Clemente HA. Lat/Long: 33.3958/-117.60024.
Temporal Representation: Samples were collected at least once a week from January 2002 through December 2007.
Environmental Conditions:
QAPP Information: Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s): County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 32378, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Projection of Las Palmeras

LOE ID: 28353

Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	72
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 423 single samples were collected with 72 monthly geomeans calculated. None of the 72 geomeans exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location at the projection of Las Palmeras, S-23, in the San Clemente HA. Lat/Long: 33.3958/-117.60024.
Temporal Representation:	Samples were collected at least once a week from January 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 32378, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Projection of Las Palmeras

LOE ID:	28435
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	-N/A
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	367
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2000 to December 2006, there were and 367 beach postings days for this section of shoreline. Bacteriological samples are collected on a weekly basis at approximately 150 ocean and bay location in Orange County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of

	Orange in their Annual Ocean and Bay Water Quality Report, March 2007. The reporting period was from January 2000 -December 2006. Data used was the number of days the beach was posting when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	County of Orange. March 2007. Annual Ocean and Bay Water Quality Report, 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Spatial Representation:	Bacteriological monitoring samples were collected at North Beach, 450 feet North of Pier, Trafalgar Street, Avenida Calafia, Avenida de Las Palmeras. The posting covers 3.2 miles of beach shoreline.
Temporal Representation:	The beach posting covers the time frame of January 2000 -December 2006.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of Orange's Quality Assessment/Quality Control document (County of Orange, 2004).
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 32378, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Projection of Las Palmeras

LOE ID:	28346
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	423
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 423 single samples were collected with no samples exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml. Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location at the projection of Las Palmeras, S-23, in the San Clemente HA. Lat/Long: 33.3958/-117.60024.
Temporal Representation:	Samples were collected at least once a week from January 2002 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 32378, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Projection of Las Palmeras

LOE ID:	28351
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	36
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 423 single samples were collected. From March 2002 through December 2007, there were 36 samples correlated with a storm event. From the 36 samples, 3 exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location at the projection of Las Palmeras, S-23, in the San Clemente HA. Lat/Long: 33.3958/-117.60024.
Temporal Representation:	Samples were collected at least once a week from January 2002 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff

	because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 32378, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Projection of Las Palmeras

LOE ID:	28347
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	72
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 423 single samples were collected and 72 monthly geomeans calculated. None of the monthly geomeans exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml. Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location at the projection of Las Palmeras, S-23, in the San Clemente HA. Lat/Long: 33.3958/-117.60024.
Temporal Representation:	Samples were collected at least once a week from January 2002 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 32378, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Projection of Las Palmeras

LOE ID:	28348
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	36
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 423 single samples were collected. From March 2002 through December 2007, there were 36 samples correalted with a storm event. None of the 36 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml. Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location at the projection of Las Palmeras, S-23, in the San Clemente HA. Lat/Long: 33.3958/-117.60024.
Temporal Representation:	Samples were collected at least once a week from January 2002 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 32378, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Projection of Las Palmeras

LOE ID:	28350
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	72
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 423 single samples were collected and 72 monthly geomeans

	calculated. None of the monthly geomeans exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; (SWRCB, 2005)
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location at the projection of Las Palmeras, S-23, in the San Clemente HA. Lat/Long: 33.3958/-117.60024.
Temporal Representation:	Samples were collected at least once a week from January 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 32378, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Projection of Las Palmeras

LOE ID:	28344
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	423
Number of Exceedances:	12
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 423 single samples were collected with 12 exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location at the projection of Las Palmeras, S-23, in the San Clemente HA. Lat/Long: 33.3958/-117.60024.
Temporal Representation:	Samples were collected at least once a week from January 2002 through December 2007.
Environmental Conditions:	

QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 32378, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Projection of Las Palmeras

LOE ID:	28345
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	36
Number of Exceedances:	11
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 423 single samples were collected. From March 2002 through December 2007, there were 36 samples correlated with storm events. From the 36 samples, 11 exceeded the single sample maximum water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location at the projection of Las Palmeras, S-23, in the San Clemente HA. Lat/Long: 33.3958/-117.60024.
Temporal Representation:	Samples were collected at least once a week from January 2002 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 32378, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Projection of Las Palmeras

LOE ID:	77654

Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	87
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Zero of the 87 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Projection of Las Palmeras.
Temporal Representation:	The samples were collected from January 2008 to January 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 32378, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Projection of Las Palmeras

LOE ID:	74844
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	87
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 87 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at the Las Palmeras site.
Temporal Representation:	Samples were collected from January 2008 to January 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 32378, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Projection of Las Palmeras

LOE ID:	74843
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	105
Number of Exceedances:	3
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Beach Watch data for Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Projection of Las Palmeras to determine beneficial use support and results are as follows: 3 of 105 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Projection of Las Palmeras was collected at 1 monitoring site [Las Palmeras]
Temporal Representation:	Data was collected over the time period 1/3/2008-1/11/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 32378, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Projection of Las Palmeras

LOE ID:	31030
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	42
Number of Exceedances:	0

Data and Information Type:	PWS pathogen monitoring (ambient water) 040499
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange within the time period from January 2002 through December 2007. A total of 42 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 42geomeans zero exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml. over a 30 day period (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location at the projection of Las Palmeras, S-23, in the San Clemente HA. Lat/Long: 33.3958/-117.60024.
Temporal Representation:	Samples were collected at least once a week within the time period from January 2002 through December 2007;. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 32378, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Projection of Las Palmeras

LOE ID:	31031
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	42
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange within the time period from January 2002 through December 2007. A total of 42 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 42 geomeans zero exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml over a 30 day period (SWRCB, 2005)
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location at the projection of Las Palmeras, S-23, in the San Clemente HA. Lat/Long: 33.3958/-117.60024.
Temporal Representation:	Samples were collected at least once a week within the time period from January 2002 through December 2007. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 32378, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Projection of Las Palmeras

LOE ID:	31032
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	42
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange within the time period from January 2002 through December 2007. A total of 42 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 42 geomeans zero exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. over a 30 day period (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location at the projection of Las Palmeras, S-23, in the San Clemente HA. Lat/Long: 33.3958/-117.60024.
Temporal Representation:	Samples were collected at least once a week within the time period from January 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 32378, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Projection of Las Palmeras

LOE ID:	74821
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	87
Number of Exceedances:	1
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	One of the 87 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Las Palmeras site.
Temporal Representation:	Samples were collected from January 2008 to January 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 32378, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Projection of Las Palmeras

LOE ID:	74822
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	87
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 87 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Las Palmeras site.
Temporal Representation:	Samples were collected from January 2008 to January 2010.

Environmental Conditions:		040502
QAPP Information:	The samples were collected for the beach watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 32378, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Projection of Las Palmeras

LOE ID:	30629
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	387
Number of Exceedances:	5
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 423 single samples; 387 are dry weather (AB411) samples, five of which exceeded the criteria for recreational use.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location at the projection of Las Palmeras, S-23, in the San Clemente HA. Lat/Long: 33.3958/-117.60024.
Temporal Representation:	Samples were collected at least once a week from January 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual. February 2004

Line of Evidence (LOE) for Decision ID 32378, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Projection of Las Palmeras

LOE ID:	28354
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	36
Number of Exceedances:	10

Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 423 single samples were collected. From March 2002 through December 2007, there were 36 samples correlated with storm events. From the 36 samples, 10 exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location at the projection of Las Palmeras, S-23, in the San Clemente HA. Lat/Long: 33.3958/-117.60024.
Temporal Representation:	Samples were collected at least once a week from January 2002 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name:	Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at South Trafalgar St Beach
Water Body ID:	**CAC9013000020090419231954**
Water Body Type:	**Coastal & Bay Shoreline**

DECISION ID 44022 Region 9

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at South Trafalgar St Beach

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Reason for Delisting:	Applicable WQS attained; reason for recovery unspecified
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal from the CWA section 303(d) List under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Ten lines of evidence are available in the administrative record to assess this pollutant. With the latest data, five of the 207 geomean samples exceed the water quality objective for enterococcus of 35/100 ml in a 30-day period for the protection of REC-1.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, five of the 207 geomean samples exceed the water quality objective for enterococcus of 35/100 ml in a 30-day period for the protection of REC-1 and this does not exceed the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be removed from the section 303(d) list because applicable water quality standards for the pollutant are not being exceeded.

Line of Evidence (LOE) for Decision ID 44022, Indicator Bacteria Region 9

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at South Trafalgar St Beach

LOE ID:	28396
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting

Number of Samples:	548
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 548 single samples were collected with one exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, San Clemente City Beach at S. Trafalgar St., station id LADERA. This location is found approximately 500 yards south of Trafalgar Canyon pipe.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44022, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at South Trafalgar St Beach

LOE ID:	28397
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 548 single samples were collected with 12 samples correlated with a storm event. None of the samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005.

	Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency 040506
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, San Clemente City Beach at S. Trafalgar St., station id LADERA. This location is found approximately 500 yards south of Trafalgar Canyon pipe.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006. Rainfall data was available for the same time period.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44022, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at South Trafalgar St Beach

LOE ID:	28398
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	548
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 548 single samples were collected with no samples exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, San Clemente City Beach at S. Trafalgar St., station id LADERA. This location is found approximately 500 yards south of Trafalgar Canyon pipe.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	

QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44022, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at South Trafalgar St Beach

LOE ID:	28399
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	32
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 548 single samples were collected with 32 geomeans calculated. None of the geomeans exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, San Clemente City Beach at S. Trafalgar St., station id LADERA. This location is found approximately 500 yards south of Trafalgar Canyon pipe.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44022, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at South Trafalgar St Beach

LOE ID:	28400
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	12
Number of Exceedances:	0

Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 548 single samples were collected with 12 samples correlated with a storm event. None of the samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, San Clemente City Beach at S. Trafalgar St., station id LADERA. This location is found approximately 500 yards south of Trafalgar Canyon pipe.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006. Rainfall data was available for the same time period.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44022, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at South Trafalgar St Beach

LOE ID:	28401
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	547
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 547 single samples were collected with no samples exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, San Clemente City Beach at S. Trafalgar St., station id LADERA. This location is found approximately 500 yards south of Trafalgar Canyon pipe.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44022, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at South Trafalgar St Beach

LOE ID:	28402
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	32
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 547 single samples were collected with 32 monthly geomeans calculated. None of the 32 geomeans exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, San Clemente City Beach at S. Trafalgar St., station id LADERA. This location is found approximately 500 yards south of Trafalgar Canyon pipe.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance

	with the County of Orange Quality Assessment/Quality Control document.040510
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44022, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at South Trafalgar St Beach

LOE ID:	28403
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 547 single samples were collected with 12 samples correlated with a storm event. None of the 12 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program, Bacteria Shoreline Data, 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, San Clemente City Beach at S. Trafalgar St., station id LADERA. This location is found approximately 500 yards south of Trafalgar Canyon pipe.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006. Rainfall data was available for the same time frame.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44022, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at South Trafalgar St Beach

LOE ID:	28405	040511
Pollutant:	Enterococcus	
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	548	
Number of Exceedances:	1	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 548 single samples were collected with only one sample exceeding the single sample water quality objective.	
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, San Clemente City Beach at S. Trafalgar St., station id LADERA. This location is found approximately 500 yards south of Trafalgar Canyon pipe.	
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 44022, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at South Trafalgar St Beach

LOE ID:	28406
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	32
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 548 single samples were collected with 32 monthly geomeans calculated. None of the geomeans exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007

SWAMP Data:	Non-SWAMP	040512
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, San Clemente City Beach at S. Trafalgar St., station id LADERA. This location is found approximately 500 yards south of Trafalgar Canyon pipe.	
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 44022, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at South Trafalgar St Beach

LOE ID:	28407
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	12
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 548 single samples were collected with 12 samples correlated with a storm event. From the 12 samples, only one exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, San Clemente City Beach at S. Trafalgar St., station id LADERA. This location is found approximately 500

	yards south of Trafalgar Canyon pipe. 040513
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006. Rainfall data was available for the same time frame.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44022, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at South Trafalgar St Beach

LOE ID:	30630
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	536
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 548 single samples were collected of which 536 are dry weather (AB411) samples with zero samples exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, San Clemente City Beach at S. Trafalgar St., station id LADERA. This location is found approximately 500 yards south of Trafalgar Canyon pipe.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44022, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at South Trafalgar St Beach

LOE ID:	30836	040514

Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	536
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 548 single samples were collected of which 536 are dry weather (AB411) samples with none of those samples exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, San Clemente City Beach at S. Trafalgar St., station id LADERA. This location is found approximately 500 yards south of Trafalgar Canyon pipe.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44022, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at South Trafalgar St Beach

LOE ID:	30320
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Water Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006. For the 2008 assessment , the 2006 listed coastline 'Pacific Ocean Shoreline, San Clemente HA' was split into smaller segments that each represent an area near the

	sampling location of the data being assessed. This segment 'Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at South Trafalgar St Beach' is one of the sampling locations. This LOE is a copy of the 2006 listing placeholder LOE for Pacific Ocean Shoreline, San Clemente HA and is considered by the Regional Board to be applicable to this more specific segment formed from the split.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	
Temporal Representation:	
Environmental Conditions:	
QAPP Information:	Unspecified
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44022, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at South Trafalgar St Beach

LOE ID:	74845
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	147
Number of Exceedances:	2
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Two of the 147 samples exceeded the enterococcus objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample total coliform concentration shall not exceed more than 104/100ml. Water Quality Control Plan for Ocean Waters of California. Region 9 Basion Plan.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from site LADERA, Coastal Stormdrain at W Avenida Valencia / Boca Del Canon (surfzone upcoast and downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to June 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44022, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at South Trafalgar St Beach 040516

LOE ID:	74846
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	134
Number of Exceedances:	4
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Four of the 134 geomeans exceeded the enterococcus objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean for enterococcus shall not exceed 35 MPN/100 mL. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Coastal Stormdrain at W Avenida Valencia / Boca Del Canon(surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44022, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at South Trafalgar St Beach

LOE ID:	74847
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	41
Number of Exceedances:	1
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	One of the 41 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.

Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at the Trafalgar Street Beach site.
Temporal Representation: Samples were collected from January 2008 to October 2009.
Environmental Conditions:
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 44022, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at South Trafalgar St Beach

LOE ID: 74848

Pollutant: Fecal Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 147
Number of Exceedances: 1

Data and Information Type: Not Specified
Data Used to Assess Water Quality: One of the 147 samples exceeded the fecal coliform objective.
Data Reference: Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The single sample fecal coliform concentration shall not exceed more than 400/100ml. Water Quality Control Plan for Ocean Waters of California. Region 9 Basion Plan.
Objective/Criterion Reference: Water Quality Control Plan for the San Diego Basin
California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: The samples were collected from site LADERA, Coastal Stormdrain at W Avenida Valencia / Boca Del Canon (surfzone upcoast and downcoast).
Temporal Representation: The samples were collected once a week from July 2006 to June 2009.
Environmental Conditions:
QAPP Information: The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 44022, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at South Trafalgar St Beach

LOE ID: 74849

Pollutant: Fecal Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples:	134	040518
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	None of the 134 geomeans exceeded the fecal coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The geometric mean for fecal coliform shall not exceed more than 200/100ml. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected from Coastal Stormdrain at W Avenida Valencia / Boca Del Canon (surfzone upcoast and surfzone downcoast).	
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.	
Environmental Conditions:		
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44022, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at South Trafalgar St Beach

LOE ID:	74870
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	41
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 41 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 400 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Trafalgar Street Beach site.
Temporal Representation:	Samples were collected from January 2008 to October 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44022, Indicator Bacteria 040519 **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at South Trafalgar St Beach

LOE ID:	74871
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	147
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 147 samples exceeded the total coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample total coliform concentration shall not exceed more than 10000/100ml. Water Quality Control Plan for Ocean Waters of California. Region 9 Basion Plan.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from site LADERA, Coastal Stormdrain at W Avenida Valencia / Boca Del Canon (surfzone upcoast and downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to June 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44022, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at South Trafalgar St Beach

LOE ID:	74872
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	134
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	None of the 134 samples exceeded the total coliform objective. For these stations, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	The geometric mean for total coliform shall not exceed more than 1000/100ml. Water Quality Control Plan for the San Diego Basin. Water Quality Control Plan for Ocean Waters.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Coastal Stormdrain at W Avenida Valencia / Boca Del Canon (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44022, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at South Trafalgar St Beach

LOE ID:	74873
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	41
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 41 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Trafalgar Street Beach site.
Temporal Representation:	Samples were collected from January 2008 to October 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44022, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at South Trafalgar St Beach

LOE ID:	30986
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation
Number of Samples:	20
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange within the time period from May 2004 through December 2006. A total of 20 monthly geomeans were calculated for data collected within the time frame of April 1st to October 31st (AB411 data) during the aforementioned time period. Of the 20 geomeans zero exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml over a 30 day period(SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, San Clemente City Beach at S. Trafalgar St., station id LADERA. This location is found approximately 500 yards south of Trafalgar Canyon pipe.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) during the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44022, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at South Trafalgar St Beach

LOE ID:	30987
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	20
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange within the time period from May 2004 through December 2006. A total of 20 monthly geomeans were calculated for data collected within the time frame of April 1st to October 31st (AB411 data) during the aforementioned time period. Of the 20 geomeans zero exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml over a 30 day period (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, San Clemente City Beach at S. Trafalgar St., station id LADERA. This location is found approximately 500 yards south of Trafalgar Canyon pipe.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) during the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44022, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at South Trafalgar St Beach

LOE ID:	30988
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	20
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 20 monthly geomeans were calculated for data collected within the time frame of April 1st to October 31st (AB411 data) during the aforementioned time period. Of the 20 geomeans zero exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml within the time period over a 30 day period(SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, San Clemente City Beach at S. Trafalgar St., station id LADERA. This location is found approximately 500 yards south of Trafalgar Canyon pipe.
Temporal Representation:	Samples were collected at least once a week within the time period from May 2004 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) during the aforementioned time period.

Environmental Conditions:	040523
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44022, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at South Trafalgar St Beach

LOE ID:	30730
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	535
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 547 single samples were collected of which 535 are dry weather (AB411) samples with no samples exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, San Clemente City Beach at S. Trafalgar St., station id LADERA. This location is found approximately 500 yards south of Trafalgar Canyon pipe.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name:	Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Trafalgar Canyon outlet
Water Body ID:	**CAC9013000020090419000627**
Water Body Type:	**Coastal & Bay Shoreline**

DECISION ID **43497** **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Trafalgar Canyon outlet

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Reason for Delisting:	Applicable WQS attained; reason for recovery unspecified
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal from the CWA section 303(d) List under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Ten lines of evidence are available in the administrative record to assess this pollutant. With the latest data, eight of the 166 geomean samples exceeded the water quality objective for enterococcus of 35/100ml in a 30-day period for the protection of REC-1.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, eight of the 166 geomean samples exceeded the water quality objective for enterococcus of 35/100ml in a 30-day period for the protection of REC-1 and this does not exceed the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be removed from the section 303(d) list because applicable water quality standards for the pollutant are not being exceeded.

Line of Evidence (LOE) for Decision ID 43497, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Trafalgar Canyon outlet

LOE ID:	28411
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	32
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2004 through December 2006. A total of 548 single samples were collected and 32 monthly geomeans calculated. None of the 32 monthly geomeans exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, San Clemente City Beach at Trafalgar Canyon outlet (station id TRFCYN). (Latitude: 33.41796 Longitude: 117.61787). .
Temporal Representation:	Samples were collected at least once a week from January 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43497, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Trafalgar Canyon outlet

LOE ID:	30991
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	20
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange within the time period from January 2004 through December 2006. A total of 20 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 20 geomeans zero exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml over a 30 day period (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005.

	Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency 040526
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, San Clemente City Beach at Trafalgar Canyon outlet (station id TRFCYN). (Latitude: 33.41796 Longitude: 117.61787). .
Temporal Representation:	Samples were collected at least once a week within the time period from January 2004 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43497, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Trafalgar Canyon outlet

LOE ID:	28416
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	548
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2004 through December 2006. A total of 548 single samples were collected with one sample exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, San Clemente City Beach at Trafalgar Canyon outlet (station id TRFCYN). (Latitude: 33.41796 Longitude: 117.61787). .
Temporal Representation:	Samples were collected at least once a week from January 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43497, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Trafalgar Canyon outlet 040527

LOE ID:	28412
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2004 through December 2006. A total of 548 single samples were collected with 12 samples correlated with a storm event. None of the 12 storm samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, San Clemente City Beach at Trafalgar Canyon outlet (station id TRFCYN). (Latitude: 33.41796 Longitude: 117.61787). .
Temporal Representation:	Samples were collected at least once a week from January 2004 through December 2006. Rainfall data was available for the same time frame.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43497, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Trafalgar Canyon outlet

LOE ID:	28418
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation	040528
Number of Samples:	12	
Number of Exceedances:	1	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2004 through December 2006. A total of 548 single samples were collected with 12 sample correlated with a storm event. From the 12 samples, only one exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.	
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program, Bacteria Shoreline Data, 2002 through 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, San Clemente City Beach at Trafalgar Canyon outlet (station id TRFCYN). (Latitude: 33.41796 Longitude: 117.61787). .	
Temporal Representation:	Samples were collected at least once a week from January 2004 through December 2006. Rainfall data was available for the same time period.	
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 43497, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Trafalgar Canyon outlet

LOE ID:	28408
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	548
Number of Exceedances:	5
Data and Information Type:	PWS pathogen monitoring (ambient water)

Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2004 through December 2006. A total of 548 single samples were collected with five exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, San Clemente City Beach at Trafalgar Canyon outlet (station id TRFCYN). (Latitude: 33.41796 Longitude: 117.61787). .
Temporal Representation:	Samples were collected at least once a week from January 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43497, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Trafalgar Canyon outlet

LOE ID:	28409
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	12
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2004 through December 2006. A total of 548 single samples were collected with 12 samples correlated with a storm event. From the 12 samples only one exceeded single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, San Clemente

	City Beach at Trafalgar Canyon outlet (station id TRFCYN). (Latitude: 33.41796 Longitude: 117.61787). .
Temporal Representation:	Samples were collected at least once a week from January 2004 through December 2006. Rainfall data was available for the same time frame.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43497, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Trafalgar Canyon outlet

LOE ID:	28410
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	548
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2004 through December 2006. A total of 548 single samples were collected with no samples exceeding single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, San Clemente City Beach at Trafalgar Canyon outlet (station id TRFCYN). (Latitude: 33.41796 Longitude: 117.61787). .
Temporal Representation:	Samples were collected at least once a week from January 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43497, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Trafalgar Canyon outlet

LOE ID:	28413
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	547
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2004 through December 2006. A total of 547 single samples were collected with no samples exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, San Clemente City Beach at Trafalgar Canyon outlet (station id TRFCYN). (Latitude: 33.41796 Longitude: 117.61787). .
Temporal Representation:	Samples were collected at least once a week from January 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43497, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Trafalgar Canyon outlet

LOE ID:	28414
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	32
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2004 through December 2006. A total of 547 single samples were collected and 32 geomeans calculated. From the 32 geomeans, none exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, San Clemente City Beach at Trafalgar Canyon outlet (station id TRFCYN). (Latitude: 33.41796 Longitude: 117.61787). .
Temporal Representation:	Samples were collected at least once a week from January 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43497, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Trafalgar Canyon outlet

LOE ID:	28417
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	32
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2004 through December 2006. A total of 548 single samples were collected and 32 monthly geomeans calculated. None of the geomeans exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, San Clemente City Beach at Trafalgar Canyon outlet (station id TRFCYN). (Latitude: 33.41796 Longitude: 117.61787). .
Temporal Representation:	Samples were collected at least once a week from January 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance

	with the County of Orange Quality Assessment/Quality Control document.040533
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43497, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Trafalgar Canyon outlet

LOE ID:	30731
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	535
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2004 through December 2006. A total of 547 single samples were collected of which 535 are dry weather (AB411) samples with no samples exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, San Clemente City Beach at Trafalgar Canyon outlet (station id TRFCYN). (Latitude: 33.41796 Longitude: 117.61787). .
Temporal Representation:	Samples were collected at least once a week from January 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43497, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Trafalgar Canyon outlet

LOE ID:	30631
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	548
Number of Exceedances:	1

Data and Information Type:	PWS pathogen monitoring (ambient water) 040534
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2004 through December 2006. A total of 548 single samples were collected with one sample exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, San Clemente City Beach at Trafalgar Canyon outlet (station id TRFCYN). (Latitude: 33.41796 Longitude: 117.61787). .
Temporal Representation:	Samples were collected at least once a week from January 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43497, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Trafalgar Canyon outlet

LOE ID:	30837
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	548
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2004 through December 2006. A total of 548 single samples were collected of which 536 are dry weather (AB411) samples with none of the samples exceeding single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Trafalgar Canyon outlet (station id TRFCYN). (Latitude: 33.41796 Longitude: 117.61787). .
Temporal Representation:	Samples were collected at least once a week from January 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43497, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Trafalgar Canyon outlet

LOE ID:	30321
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Water Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006. For the 2008 assessment , the 2006 listed coastline 'Pacific Ocean Shoreline, San Clemente HA' was split into smaller segments and each represents an area near the sampling location of the data being assessed. This segment 'Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Trafalgar Canyon outlet' is one of the sampling locations. This LOE is a copy of the 2006 listing placeholder LOE for Pacific Ocean Shoreline, San Clemente HA and is considered by the Regional Board to be applicable to this more specific segment formed from the split.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	
Temporal Representation:	
Environmental Conditions:	
QAPP Information:	Unspecified
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43497, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Trafalgar Canyon outlet

LOE ID:	74894
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation	040536
Number of Samples:	134	
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	None of the 134 geomeans exceeded the fecal coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The geometric mean for fecal coliform shall not exceed more than 200/100ml. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected from Trafalgar Canyon (surfzone upcoast and surfzone downcoast).	
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.	
Environmental Conditions:		
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43497, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Trafalgar Canyon outlet

LOE ID:	74895
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	147
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	None of the 147 samples exceeded the total coliform objective. For these stations, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample total coliform concentration shall not exceed more than 10000/100ml. Water Quality Control Plan for the San Diego Basin. Water Quality Control Plan for Ocean Waters.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	The samples were collected from Trafalgar Canyon Between Esplanade and Salvador Lane (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43497, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Trafalgar Canyon outlet

LOE ID:	74896
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	134
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	None of the 134 samples exceeded the total coliform objective. For these stations, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean for total coliform shall not exceed more than 1000/100ml. Water Quality Control Plan for the San Diego Basin. Water Quality Control Plan for Ocean Waters.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Trafalgar Canyon (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43497, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Trafalgar Canyon outlet

LOE ID:	74874
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	147	040538
Number of Exceedances:	5	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Five of the 147 samples exceeded the enterococcus objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The single sample enterococcus concentration shall not exceed more than 104/100ml. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected from Trafalgar Canyon Between Esplanade and Cazador Lane (surfzone upcoast and surfzone downcoast).	
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.	
Environmental Conditions:		
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43497, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Trafalgar Canyon outlet

LOE ID:	74875
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	134
Number of Exceedances:	8
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Eight of the 134 geomeans exceeded the enterococcus objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean for enterococcus shall not exceed 35 MPN/100 mL. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Trafalgar Canyon (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	

QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43497, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Trafalgar Canyon outlet

LOE ID:	74876
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	147
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	None of the 147 samples exceeded the fecal coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample fecal coliform concentration shall not exceed more than 400/100ml. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Trafalgar Canyon Between Esplanade and Cazador Lane (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43497, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Trafalgar Canyon outlet

LOE ID:	30989
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	20
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange within the time period from

	January 2004 through December 2006. 040540 A total of 20 monthly geomeans were calculated for data collected within the time frame of April 1st to October 31st (AB411 data) during the aforementioned time period. Of the 20 geomeans zero exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml over a 30 day period (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, San Clemente City Beach at Trafalgar Canyon outlet (station id TRFCYN). (Latitude: 33.41796 Longitude: 117.61787). .
Temporal Representation:	Samples were collected at least once a week within the time period from January 2004 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) during the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43497, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Trafalgar Canyon outlet

LOE ID:	30990
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	20
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange within the time period from January 2004 through December 2006. A total of 20 monthly geomeans were calculated for data collected within the time frame of April 1st to October 31st (AB411 data) during the aforementioned time period. Of the 20 geomeans zero exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml over a 30 day period (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:	040541
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, San Clemente City Beach at Trafalgar Canyon outlet (station id TRFCYN). (Latitude: 33.41796 Longitude: 117.61787). .
Temporal Representation:	Samples were collected at least once a week within the time period from January 2004 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) during the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43497, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Trafalgar Canyon outlet

LOE ID:	28415
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2004 through December 2006. A total of 547 single samples were collected with 12 samples correlated with a storm event. From the 12 samples, none exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, San Clemente City Beach at Trafalgar Canyon outlet (station id TRFCYN). (Latitude: 33.41796 Longitude: 117.61787). .
Temporal Representation:	Samples were collected at least once a week from January 2004 through December 2006. Rainfall data was available for the same time period.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff

	because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, 450 ft North of Pier
Water Body ID: CAC9013000020090418233959
Water Body Type: Coastal & Bay Shoreline

DECISION ID 44099 **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, 450 ft North of Pier

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Fifteen lines of evidence are available in the administrative record to assess this pollutant. With the latest data, 13 of 162 geomean samples exceed the water quality objective for enterococcus of 35/100ml in a 30-day period for the protection of REC-1.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, 13 of 162 geomean samples exceed the water quality objective for enterococcus of 35/100ml in a 30-day period for the protection of REC-1 and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 44099, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, 450 ft North of Pier

LOE ID: 28432

Pollutant: Indicator Bacteria
LOE Subgroup: Health Advisories
Matrix: -N/A
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 2555

Number of Exceedances:	367	040544
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	For the period from January 2000 to December 2006, there were and 367 beach postings days for this section of shoreline. Bacteriological samples are collected on a weekly basis at approximately 150 ocean and bay location in Orange County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of Orange in their Annual Ocean and Bay Water Quality Report, March 2007. The reporting period was from January 2000 -December 2006. Data used was the number of days the beach was posting when the ocean or bay failed to meet the bacteriological standards.	
Data Reference:	County of Orange. March 2007. Annual Ocean and Bay Water Quality Report, 2006	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.	
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960	
Evaluation Guideline:		
Guideline Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Spatial Representation:	Bacteriological monitoring samples were collected at North Beach, 450 feet North of Pier, Trafalgar Street, Avenida Calafia, Avenida de Las Palmeras. The posting covers 3.2 miles of beach shoreline.	
Temporal Representation:	The beach posting covers the time frame of January 2000 -December 2006.	
Environmental Conditions:		
QAPP Information:	Samples were collected in compliance with County of Orange's Quality Assessment/Quality Control document (County of Orange, 2004).	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44099, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, 450 ft North of Pier

LOE ID:	28328
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	72
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 431 single samples were collected with 72 monthly geomeans calculated. None of the geomeans exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location for this line of evidence located 450 feet north of the pier, S-19, in the San Clemente HA. Lat/Long: 33.42074/-117.62134.
Temporal Representation:	Samples were collected at least once a week from January 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44099, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, 450 ft North of Pier

LOE ID:	28329
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	36
Number of Exceedances:	13
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 431 single samples were collected. From March 2002 through December 2007, 36 samples were correlated with a storm event. From those 36 samples, 13 exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location for this line of evidence located 450 feet north of the pier, S-

	19, in the San Clemente HA. Lat/Long: 33.42074/-117.62134. 040546
Temporal Representation:	Samples were collected at least once a week from January 2002 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44099, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, 450 ft North of Pier

LOE ID:	77655
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	89
Number of Exceedances:	8
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Eight of the 89 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, 450Â' North of Pier.
Temporal Representation:	The samples were collected from January 2008 to January 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44099, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, 450 ft North of Pier

LOE ID:	74897
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water

Matrix:	Water	040547
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	90	
Number of Exceedances:	13	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Thirteen of the 90 geomeans exceeded the objective.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Dana Point Harbor, San Clemente City Beach, 450 Feet North of Pier site.	
Temporal Representation:	Samples were collected from January 2008 to January 2010.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44099, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, 450 ft North of Pier

LOE ID:	74898
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	89
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 89 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Clemente City Beach, 450 feet North of Pier site.
Temporal Representation:	Samples were collected from January 2008 to January 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44099, Indicator Bacteria 040548 **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, 450 ft North of Pier

LOE ID:	74899
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	107
Number of Exceedances:	8
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Beach Watch data for Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, 450â€™ North of Pier to determine beneficial use support and results are as follows: 8 of 107 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, 450â€™ North of Pier was collected at 1 monitoring site [450' North of Pier]
Temporal Representation:	Data was collected over the time period 1/3/2008-1/11/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44099, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, 450 ft North of Pier

LOE ID:	74900
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	89
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 89 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not

	exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Clemente City Beach, 450 feet North of Pier site.
Temporal Representation:	Samples were collected from January 2008 to January 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44099, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, 450 ft North of Pier

LOE ID:	31026
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	42
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange within the time period from January 2002 through December 2007. A total of 42 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 42 geomeans one exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. over a 30 day period (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location for this line of evidence located 450 feet north of the pier, S-19, in the San Clemente HA. Lat/Long: 33.42074/-117.62134.
Temporal Representation:	Samples were collected at least once a week within the time period from January 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44099, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, 450 ft North of Pier

LOE ID:	30632

Pollutant:	Enterococcus	040550
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	395	
Number of Exceedances:	15	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 431 single samples were collected of which 395 are dry weather (AB411) samples with 15 exceeding the single sample water quality objective.	
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program, Bacteria Shoreline Data, 2002 through 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	There is one sampling location for this line of evidence located 450 feet north of the pier, S-19, in the San Clemente HA. Lat/Long: 33.42074/-117.62134.	
Temporal Representation:	Samples were collected at least once a week from January 2002 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 44099, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, 450 ft North of Pier

LOE ID:	31024
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	42
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange within the time period from January 2002 through December 2007. A total of 42 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 42 geomeans zero exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program, Bacteria Shoreline Data, 2002 through 2007

SWAMP Data:	Non-SWAMP	040551
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml. over a 30 day period (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	There is one sampling location for this line of evidence located 450 feet north of the pier, S-19, in the San Clemente HA. Lat/Long: 33.42074/-117.62134.	
Temporal Representation:	Samples were collected at least once a week within the time period from January 2002 through December 2007. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 44099, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, 450 ft North of Pier

LOE ID:	31025
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	42
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange within the time period from January 2002 through December 2007. A total of 42 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 42 geomeans zero exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml over a 30 day period (SWRCB, 2005)
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location for this line of evidence located 450 feet north of the pier, S-19, in the San Clemente HA. Lat/Long: 33.42074/-117.62134.
Temporal Representation:	Samples were collected at least once a week within the time period from January 2002 through December 2007. The data assessed is AB411 data which is data collected during the time frame of April 1st

	to October 31st (summer months) within the aforementioned time period. 040552
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44099, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, 450 ft North of Pier

LOE ID:	30838
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	395
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 431 single samples were collected of which 395 are dry weather (AB411) samples with none of those samples exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program, Bacteria Shoreline Data, 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml. Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location for this line of evidence located 450 feet north of the pier, S-19, in the San Clemente HA. Lat/Long: 33.42074/-117.62134.
Temporal Representation:	Samples were collected at least once a week from January 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44099, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, 450 ft North of Pier

LOE ID:	28326
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	36
Number of Exceedances:	5
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 431 single samples were collected. From March 2002 through December 2007, there were 36 samples correlated with a storm event. Of those 36 samples, five exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program, Bacteria Shoreline Data, 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; (SWRCB, 2005). Comparison to water quality objectives were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location for this line of evidence located 450 feet north of the pier, S-19, in the San Clemente HA. Lat/Long: 33.42074/-117.62134.
Temporal Representation:	Samples were collected at least once a week from January 2002 through December 2007; however, rainfall data is only available from March 2002 through December 2007
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44099, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, 450 ft North of Pier

LOE ID:	28327
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	431
Number of Exceedances:	28
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 431 single samples were collected with 28 exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater

	Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location for this line of evidence located 450 feet north of the pier, S-19, in the San Clemente HA. Lat/Long: 33.42074/-117.62134.
Temporal Representation:	Samples were collected at least once a week from January 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44099, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, 450 ft North of Pier

LOE ID:	28322
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	431
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 431 single samples were collected with none exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml. Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location for this line of evidence located 450 feet north of the pier, S-19, in the San Clemente HA. Lat/Long: 33.42074/-117.62134.
Temporal Representation:	Samples were collected at least once a week from January 2002 through December 2007.
Environmental Conditions:	

QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44099, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, 450 ft North of Pier

LOE ID:	28323
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	36
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 431 single samples were collected. From March 2002 to August 2007, 34 samples were correlated with a storm event. None of the 34 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml. Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location for this line of evidence located 450 feet north of the pier, S-19, in the San Clemente HA. Lat/Long: 33.42074/-117.62134.
Temporal Representation:	Samples were collected at least once a week from January 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44099, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, 450 ft North of Pier 040556

LOE ID:	28324
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	431
Number of Exceedances:	7
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 431 single samples were collected with seven samples exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program, Bacteria Shoreline Data, 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; (SWRCB, 2005)
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location for this line of evidence located 450 feet north of the pier, S-19, in the San Clemente HA. Lat/Long: 33.42074/-117.62134.
Temporal Representation:	Samples were collected at least once a week from January 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44099, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, 450 ft North of Pier

LOE ID:	28325
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	72
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 431 single samples were collected with 72 monthly geomeans calculated. None of the geomeans exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater

	Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; (SWRCB, 2005)
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location for this line of evidence located 450 feet north of the pier, S-19, in the San Clemente HA. Lat/Long: 33.42074/-117.62134.
Temporal Representation:	Samples were collected at least once a week from January 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44099, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, 450 ft North of Pier

LOE ID:	30732
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	395
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 431 single samples were collected of which 395 are dry weather (AB411) samples with two samples exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; (SWRCB, 2005)
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location for this line of evidence located 450 feet north of the pier, S-19, in the San Clemente HA. Lat/Long: 33.42074/-117.62134.
Temporal Representation:	Samples were collected at least once a week from January 2002 through December 2007.
Environmental Conditions:	

QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44099, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, 450 ft North of Pier

LOE ID:	28319
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	431
Number of Exceedances:	45
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 431 single samples were collected with 45 exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location for this line of evidence located 450 feet north of the pier, S-19, in the San Clemente HA. Lat/Long: 33.42074/-117.62134.
Temporal Representation:	Samples were collected at least once a week from January 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44099, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, 450 ft North of Pier

LOE ID:	28320
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	36
Number of Exceedances:	19
Data and Information Type:	PWS pathogen monitoring (ambient water)

Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 430 single samples were collected. From March 2002 through December 2007, 36 samples were correlated with a storm event. Of those 36 samples, 19 exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location for this line of evidence located 450 feet north of the pier, S-19, in the San Clemente HA. Lat/Long: 33.42074/-117.62134.
Temporal Representation:	Samples were collected at least once a week from January 2002 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44099, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, 450 ft North of Pier

LOE ID:	28321
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	72
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 431 single samples were collected with 72 monthly geomeans calculated. None of the geomeans exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml. Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location for this line of evidence located 450 feet north of the pier, S-19, in the San Clemente HA. Lat/Long: 33.42074/-117.62134.
Temporal Representation:	Samples were collected at least once a week from January 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, North Beach
Water Body ID: CAC9013000020090418232344
Water Body Type: Coastal & Bay Shoreline

DECISION ID 43328 **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, North Beach

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (being addressed by USEPA approved TMDL)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
TMDL Name:	Bacteria Impaired Waters I (creeks and beach shorelines)
TMDL Project Code:	169
Date TMDL Approved by USEPA:	06/22/2011
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal on the CWA section 303(d) List under sections 2.2 and 4.2 of the Listing Policy. Under Section 4.2 of the Policy, a minimum of one line of evidence is needed to assess listing status.

Thirteen lines of evidence are available in the administrative record to assess this pollutant.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List. There is sufficient justification to place it in the Being Addressed portion of the CWA 303(d) List because a TMDL has been completed and approved by RWQCB and USEPA, and is expected to result in attainment of the standard.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. 76 of 448 samples exceeded the SSM criterion for Total Coliform for the protection of SHELL and these exceed the allowable frequency listed in Table 4.2 of the Listing Policy.
4. The 20 Beach and Creek TMDL was approved by USEPA on 06/22/2011.
5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 43328, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, North Beach

LOE ID:	28436
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories

Matrix:	-N/A	040562
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	2555	
Number of Exceedances:	367	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	For the period from January 2000 to December 2006, there were and 367 beach postings days for this section of shoreline. Bacteriological samples are collected on a weekly basis at approximately 150 ocean and bay location in Orange County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of Orange in their Annual Ocean and Bay Water Quality Report, March 2007. The reporting period was from January 2000 -December 2006. Data used was the number of days the beach was posting when the ocean or bay failed to meet the bacteriological standards.	
Data Reference:	County of Orange. March 2007. Annual Ocean and Bay Water Quality Report, 2006	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.	
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960	
Evaluation Guideline:		
Guideline Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Spatial Representation:	Bacteriological monitoring samples were collected at North Beach, 450 feet North of Pier, Trafalgar Street, Avenida Calafia, Avenida de Las Palmeras. The posting covers 3.2 miles of beach shoreline.	
Temporal Representation:	The beach posting covers the time frame of January 2000 -December 2006.	
Environmental Conditions:		
QAPP Information:	Samples were collected in compliance with County of Orange's Quality Assessment/Quality Control document (County of Orange, 2004).	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43328, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, North Beach

LOE ID:	28360
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	36
Number of Exceedances:	20

Data and Information Type:	PWS pathogen monitoring (ambient water) 040563
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 448 single samples were collected. From March 2002 through December 2007, there were 36 samples correlated with storm events. From those 36 samples, 20 exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location at North Beach, S-17, in the San Clemente HA. Lat/Long: 33.43065/-117.63183.
Temporal Representation:	Samples were collected at least once a week from January 2002 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43328, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, North Beach

LOE ID:	28374
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	76
Number of Exceedances:	6
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 448 single samples were collected with 76 monthly geomeans calculated. From the 76 geomeans, six exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007

SWAMP Data:	Non-SWAMP	040564
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	There is one sampling location at North Beach, S-17, in the San Clemente HA. Lat/Long: 33.43065/-117.63183.	
Temporal Representation:	Samples were collected at least once a week from January 2002 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 43328, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, North Beach

LOE ID:	28372
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	448
Number of Exceedances:	56
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 448 single samples were collected with 56 exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location at North Beach, S-17, in the San Clemente HA. Lat/Long: 33.43065/-117.63183.
Temporal Representation:	Samples were collected at least once a week from January 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.

QAPP Information Reference(s): County of Orange. Quality Assurance/Quality Control Manual, February 2004 040565

Line of Evidence (LOE) for Decision ID 43328, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, North Beach

LOE ID:	30633
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	413
Number of Exceedances:	38
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 448 single samples were collected of which 413 are dry weather (AB411) samples with 38 exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location at North Beach, S-17, in the San Clemente HA. Lat/Long: 33.43065/-117.63183.
Temporal Representation:	Samples were collected at least once a week from January 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43328, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, North Beach

LOE ID:	30839
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	412
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)

Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 448 single samples were collected of which 412 are dry weather (AB411) samples with none of those samples exceeding the single sample maximum water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml. Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location at North Beach, S-17, in the San Clemente HA. Lat/Long: 33.43065/-117.63183.
Temporal Representation:	Samples were collected at least once a week from January 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43328, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, North Beach

LOE ID:	31023
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	42
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange within the time period from January 2002 through December 2007. A total of 42 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 42 geomeans two exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. over a 30 day period (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	There is one sampling location at North Beach, S-17, in the San Clemente HA. Lat/Long: 33.43065/-117.63183.
Temporal Representation:	Samples were collected at least once a week within the time period from January 2002 through December 2007. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43328, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, North Beach

LOE ID:	31022
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	42
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange within the time period from January 2002 through December 2007. A total of 42 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 42 geomeans zero exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; (SWRCB, 2005)
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location at North Beach, S-17, in the San Clemente HA. Lat/Long: 33.43065/-117.63183.
Temporal Representation:	Samples were collected at least once a week within the time period from January 2002 through December 2007. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43328, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, North Beach 040568

LOE ID:	28369
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	72
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 447 single samples were collected and 72 monthly geomeans calculated. From the 72 geomeans, none exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program, Bacteria Shoreline Data, 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; (SWRCB, 2005)
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location at North Beach, S-17, in the San Clemente HA. Lat/Long: 33.43065/-117.63183.
Temporal Representation:	Samples were collected at least once a week from January 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43328, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, North Beach

LOE ID:	28366
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	36
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 448 single samples were collected. From March 2002 through December 2007, there were 36 samples correlated with storm

	events. None of the 36 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml. Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location at North Beach, S-17, in the San Clemente HA. Lat/Long: 33.43065/-117.63183.
Temporal Representation:	Samples were collected at least once a week from January 2002 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43328, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, North Beach

LOE ID:	28371
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	36
Number of Exceedances:	9
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 447 single samples were collected. From March 2002 through December 2007, there were 36 samples correlated with a storm event. From the 36 samples, nine exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station

	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location at North Beach, S-17, in the San Clemente HA. Lat/Long: 33.43065/-117.63183.
Temporal Representation:	Samples were collected at least once a week from January 2002 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43328, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, North Beach

LOE ID:	28368
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	447
Number of Exceedances:	10
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 447 single samples were collected with 10 exceeding the single sample maximum.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; (SWRCB, 2005)
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental

Protection Agency 040571

Evaluation Guideline:
Guideline Reference:

Spatial Representation: There is one sampling location at North Beach, S-17, in the San Clemente HA. Lat/Long: 33.43065/-117.63183.
Temporal Representation: Samples were collected at least once a week from January 2002 through December 2007.
Environmental Conditions:
QAPP Information: Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s): County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43328, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, North Beach

LOE ID: 28363

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 72
Number of Exceedances: 0

Data and Information Type: PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality: Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 448 single samples were collected and 72 monthly geomeans calculated. None of the geomeans exceeded the geomean water quality objective.
Data Reference: The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: Geomean: Total coliform density shall not exceed 1,000 per 100ml.

Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference: Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:
Guideline Reference:

Spatial Representation: There is one sampling location at North Beach, S-17, in the San Clemente HA. Lat/Long: 33.43065/-117.63183.
Temporal Representation: Samples were collected at least once a week from January 2002 through December 2007.
Environmental Conditions:
QAPP Information: Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s): County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43328, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, North Beach

LOE ID: 28362

Pollutant:	Total Coliform	040572
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	448	
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 448 single samples were collected with none exceeding the single sample maximum water quality objective.	
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program, Bacteria Shoreline Data, 2002 through 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml. Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	There is one sampling location at North Beach, S-17, in the San Clemente HA. Lat/Long: 33.43065/-117.63183.	
Temporal Representation:	Samples were collected at least once a week from January 2002 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 43328, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, North Beach

LOE ID:	31021
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	42
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange within the time period from January 2002 through December 2007. A total of 42 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 42 geomeans zero exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program, Bacteria Shoreline Data, 2002 through 2007

SWAMP Data:	Non-SWAMP	040573
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml. over a 30 day period (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	There is one sampling location at North Beach, S-17, in the San Clemente HA. Lat/Long: 33.43065/-117.63183.	
Temporal Representation:	Samples were collected at least once a week within the time period from January 2002 through December 2007. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 43328, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, North Beach

LOE ID:	30734
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	411
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 447 single samples were collected of which 411 are dry weather (AB411) samples with one exceeding the single sample maximum.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; (SWRCB, 2005)
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location at North Beach, S-17, in the San Clemente HA. Lat/Long: 33.43065/-117.63183.
Temporal Representation:	Samples were collected at least once a week from January 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance

	with the County of Orange Quality Assessment/Quality Control document.040574
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43328, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, North Beach

LOE ID:	28375
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	35
Number of Exceedances:	18
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 448 single samples were collected. From March 2002 through December 2007, there were 35 samples correlated with a storm event. From the 35 samples, 18 exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location at North Beach, S-17, in the San Clemente HA. Lat/Long: 33.43065/-117.63183.
Temporal Representation:	Samples were collected at least once a week from January 2002 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43328, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, North Beach 040575

LOE ID:	28358
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	448
Number of Exceedances:	76
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 448 single samples were collected with 76 exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program, Bacteria Shoreline Data, 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location at North Beach, S-17, in the San Clemente HA. Lat/Long: 33.43065/-117.63183.
Temporal Representation:	Samples were collected at least once a week from January 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, Trafalgar Street Beach
Water Body ID: CAC9013000020090418235132
Water Body Type: Coastal & Bay Shoreline

DECISION ID 44651 **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, Trafalgar Street Beach

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Fourteen lines of evidence are available in the administrative record to assess this pollutant. With the latest data, 26 of the 338 samples exceed the water quality objective for total coliform of a SSM of 230/100ml in a 30-day period for the protection of SHELL.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, 26 of the 338 samples exceed the water quality objective for total coliform of a SSM of 230/100ml in a 30-day period for the protection of SHELL and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 44651, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, Trafalgar Street Beach

LOE ID: 28437

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Shellfish Harvesting

Number of Samples: 278

Number of Exceedances:	24	040577

Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2002 through December 2007. A total of 278 single samples were collected with 24 exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Trafalgar Street, station id OSC01, in the San Clemente HA. (Latitude 33.41825, Longitude:-117.61921).
Temporal Representation:	Samples were collected at least once a week from May 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44651, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, Trafalgar Street Beach

LOE ID:	30840
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	243
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2002 through December 2007. A total of 278 single samples were collected of which 243 are dry weather (AB411) samples with none of those samples exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected from Trafalgar Street, station id OSC01, in the San Clemente HA. (Latitude 33.41825, Longitude:-117.61921).
Temporal Representation:	Samples were collected at least once a week from May 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44651, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, Trafalgar Street Beach

LOE ID:	31033
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	39
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange within the time period from May 2002 through December 2007. A total of 39 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 39 geomeans zero exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml over a 30 day period (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Trafalgar Street, station id OSC01, in the San Clemente HA. (Latitude 33.41825, Longitude:-117.61921).
Temporal Representation:	Samples were collected at least once a week within the time period from July May 2002 through December 2007. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44651, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, Trafalgar Street Beach

LOE ID:	30735
Pollutant:	Fecal Coliform

LOE Subgroup:	Pollutant-Water	040579
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	243	
Number of Exceedances:	3	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2002 through December 2007. A total of 278 single samples were collected of which 243 are dry weather (AB411) samples with three exceeding the single sample water quality objective.	
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Trafalgar Street, station id OSC01, in the San Clemente HA. (Latitude 33.41825, Longitude:-117.61921).	
Temporal Representation:	Samples were collected at least once a week from May 2002 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 44651, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, Trafalgar Street Beach

LOE ID:	31035
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	39
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange within the time period from May 2002 through December 2007. A total of 39 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 39 geomeans zero exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml over a 30 day period (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Trafalgar Street, station id OSC01, in the San Clemente HA. (Latitude 33.41825, Longitude:-117.61921).
Temporal Representation:	Samples were collected at least once a week within the time period from May 2002 through December 2007. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44651, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, Trafalgar Street Beach

LOE ID:	31034
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	39
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange within the time period from May 2002 through December 2007. A total of 39 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 39 geomeans zero exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml over a 30 day period (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Trafalgar Street, station id OSC01, in the San Clemente HA. (Latitude 33.41825, Longitude:-117.61921).
Temporal Representation:	Samples were collected at least once a week within the time period from May 2002 through December 2007. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period.
Environmental Conditions:	

QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44651, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, Trafalgar Street Beach

LOE ID:	30634
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	243
Number of Exceedances:	9
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2002 through December 2007. A total of 278 single samples were collected of which 243 are dry weather (AB411) samples with nine samples exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Trafalgar Street, station id OSC01, in the San Clemente HA. (Latitude 33.41825, Longitude:-117.61921).
Temporal Representation:	Samples were collected at least once a week from May 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44651, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, Trafalgar Street Beach

LOE ID:	74918
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	60
Number of Exceedances:	2

Data and Information Type:	PATHOGEN MONITORING 040582
Data Used to Assess Water Quality:	Water Board staff assessed Beach Watch data for Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, Trafalgar Street Beach to determine beneficial use support and results are as follows: 2 of 60 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, Trafalgar Street Beach was collected at 1 monitoring site [Trafalgar Street Beach]
Temporal Representation:	Data was collected over the time period 1/3/2008-10/29/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44651, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, Trafalgar Street Beach

LOE ID:	77656
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	41
Number of Exceedances:	4
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Four of the 41 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, Trafalgar Street Beach.
Temporal Representation:	The samples were collected from January 2008 to October 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44651, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, Trafalgar Street Beach

LOE ID:	28440
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	66
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2002 through December 2007. A total of 278 single samples were collected with 66 monthly geomeans calculated. None of the 66 geomeans exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Trafalgar Street, station id OSC01, in the San Clemente HA. (Latitude 33.41825, Longitude:-117.61921).
Temporal Representation:	Samples were collected at least once a week from July May 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44651, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, Trafalgar Street Beach

LOE ID:	28439
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	278
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2002 through December 2007. A total of 278 single samples were collected with one sample exceeding

	the single sample water quality objective. 040584
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Trafalgar Street, station id OSC01, in the San Clemente HA. (Latitude 33.41825, Longitude:-117.61921).
Temporal Representation:	Samples were collected at least once a week from May 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44651, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, Trafalgar Street Beach

LOE ID:	28447
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	35
Number of Exceedances:	8
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2002 through December 2007. A total of 278 single samples were collected with 35 samples correlated with a storm event. From the 35 samples, eight exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected from Trafalgar Street, station id OSC01, in the San Clemente HA. (Latitude 33.41825, Longitude:-117.61921).
Temporal Representation:	Samples were collected at least once a week from May 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44651, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, Trafalgar Street Beach

LOE ID:	28446
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	66
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2002 through December 2007. A total of 278 single samples were collected with 66 monthly geomeans calculated. From the 66 geomeans only one exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Trafalgar Street, station id OSC01, in the San Clemente HA. (Latitude 33.41825, Longitude:-117.61921).
Temporal Representation:	Samples were collected at least once a week from May 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44651, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, Trafalgar Street Beach

LOE ID:	28445

Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	278
Number of Exceedances:	17
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2002 through December 2007. A total of 278 single samples were collected with 17 samples exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Trafalgar Street, station id OSC01, in the San Clemente HA. (Latitude 33.41825, Longitude:-117.61921).
Temporal Representation:	Samples were collected at least once a week from May 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44651, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, Trafalgar Street Beach

LOE ID:	28438
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	35
Number of Exceedances:	10
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2002 through December 2007. A total of 278 single samples were collected with 35 samples correlated with a storm event. From the 35 samples, 10 exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater

	Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Trafalgar Street, station id OSC01, in the San Clemente HA. (Latitude 33.41825, Longitude:-117.61921).
Temporal Representation:	Samples were collected at least once a week from May 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44651, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, Trafalgar Street Beach

LOE ID:	28442
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	278
Number of Exceedances:	5
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2002 through December 2007. A total of 278 single samples were collected with five exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected from Trafalgar Street, station id OSC01, in the San Clemente HA. (Latitude 33.41825, Longitude:-117.61921).
Temporal Representation:	Samples were collected at least once a week from May 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44651, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, Trafalgar Street Beach

LOE ID:	28441
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	35
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2002 through December 2007. A total of 278 single samples were collected with 35 samples correlated with a storm event. From the 35 samples, only one exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program, Bacteria Shoreline Data, 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Trafalgar Street, station id OSC01, in the San Clemente HA. (Latitude 33.41825, Longitude:-117.61921).
Temporal Representation:	Samples were collected at least once a week from May 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44651, Indicator Bacteria 040589 Region 9

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, Trafalgar Street Beach

LOE ID:	28444
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	35
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2002 through December 2007. A total of 278 single samples were collected with 35 samples correlated with a storm event. From the 35 samples, two exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Trafalgar Street, station id OSC01, in the San Clemente HA. (Latitude 33.41825, Longitude:-117.61921).
Temporal Representation:	Samples were collected at least once a week from May 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44651, Indicator Bacteria Region 9

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, Trafalgar Street Beach

LOE ID:	28443
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	040590
Beneficial Use:	Water Contact Recreation	
Number of Samples:	66	
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2002 through December 2007. A total of 278 single samples were collected with 66 monthly geomeans calculated. None of the geomeans exceeded the geomean water quality objective.	
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Trafalgar Street, station id OSC01, in the San Clemente HA. (Latitude 33.41825, Longitude:-117.61921).	
Temporal Representation:	Samples were collected at least once a week from May 2002 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name:	Pacific Ocean Shoreline, San Clemente HA, at San Clemente State Beach, Projection of Avenida Calafia
Water Body ID:	**CAC9013000020090419003030**
Water Body Type:	**Coastal & Bay Shoreline**

DECISION ID **32368** **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente State Beach, Projection of Avenida Calafia

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Fifteen lines of evidence are available in the administrative record to assess this pollutant. With the latest data, eight of 160 geomean samples exceed the water quality objective for enterococcus for the protection of REC-1 beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, eight of 160 geomean samples exceed the water quality objective for enterococcus for the protection of REC-1 beneficial use and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 32368, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente State Beach, Projection of Avenida Calafia

LOE ID:	30841
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	390	040592
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 426 single samples were collected of which 390 are dry weather (AB411) samples with none of those samples exceeding the single sample water quality objective.	
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml. Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	There is one sampling location located at the projection of Avenida Calafia, S-21, in the San Clemente HA. Lat/Long: 33.40515/-117.60689.	
Temporal Representation:	Samples were collected at least once a week from January 2002 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 32368, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente State Beach, Projection of Avenida Calafia

LOE ID:	28332
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	36
Number of Exceedances:	13
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 426 single samples were collected. From March 2002 through December 2007, there were 36 correlated with a storm event. Of those 36 samples, 13 exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location located at the projection of Avenida Calafia, S-21, in the San Clemente HA. Lat/Long: 33.40515/-117.60689.
Temporal Representation:	Samples were collected at least once a week from January 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 32368, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente State Beach, Projection of Avenida Calafia

LOE ID:	77657
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	88
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Zero of the 88 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, San Clemente HA, at San Clemente State Beach, Projection of Avenida Calafia.
Temporal Representation:	The samples were collected from January 2008 to January 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 32368, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente State Beach, Projection of Avenida Calafia

LOE ID:	31029
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	42
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange within the time period from January 2002 through December 2007. A total of 42 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 42 geomeans zero exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. over a 30 day period (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location located at the projection of Avenida Calafia, S-21, in the San Clemente HA. Lat/Long: 33.40515/-117.60689.
Temporal Representation:	Samples were collected at least once a week within the time period from January 2002 through December 2007. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 32368, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente State Beach, Projection of Avenida Calafia

LOE ID:	74922
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	88
Number of Exceedances:	0

Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 88 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Avenida Calafia site.
Temporal Representation:	Samples were collected from January 2008 to January 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 32368, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente State Beach, Projection of Avenida Calafia

LOE ID:	28334
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	426
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 426 single samples were collected with none of the samples exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml. Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location located at the projection of Avenida Calafia, S-21, in the San Clemente HA. Lat/Long: 33.40515/-117.60689.
Temporal Representation:	Samples were collected at least once a week from January 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 32368, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente State Beach, Projection of Avenida Calafia

LOE ID:	28434
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	-N/A
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	367
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2000 to December 2006, there were and 367 beach postings days for this section of shoreline. Bacteriological samples are collected on a weekly basis at approximately 150 ocean and bay location in Orange County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of Orange in their Annual Ocean and Bay Water Quality Report, March 2007. The reporting period was from January 2000 -December 2006. Data used was the number of days the beach was posting when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	County of Orange. March 2007. Annual Ocean and Bay Water Quality Report, 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Spatial Representation:	Bacteriological monitoring samples were collected at North Beach, 450 feet North of Pier, Trafalgar Street, Avenida Calafia, Avenida de Las Palmeras. The posting covers 3.2 miles of beach shoreline.
Temporal Representation:	The beach posting covers the time frame of January 2000 -December 2006.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of Orange's Quality Assessment/Quality Control document (County of Orange, 2004).
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 32368, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente State Beach, Projection of Avenida Calafia

LOE ID:	28336
Pollutant:	Total Coliform

LOE Subgroup:	Pollutant-Water	040597
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	36	
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 426 single samples were collected. From March 2002 through December 2007, there were 36 samples correlated with storm events. None of the samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.	
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program, Bacteria Shoreline Data, 2002 through 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml. Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005). Comparison to water quality objectives were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	There is one sampling location located at the projection of Avenida Calafia, S-21, in the San Clemente HA. Lat/Long: 33.40515/-117.60689.	
Temporal Representation:	Samples were collected at least once a week from January 2002 through December 2007; however, rainfall data is only available from March 2002 through August 2007.	
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 32368, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente State Beach, Projection of Avenida Calafia

LOE ID:	74921
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	040598
Beneficial Use:	Shellfish Harvesting	
Number of Samples:	106	
Number of Exceedances:	5	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed Beach Watch data for Pacific Ocean Shoreline, San Clemente HA, at San Clemente State Beach, Projection of Avenida Calafia to determine beneficial use support and results are as follows: 5 of 106 samples exceed the criterion for Coliform, Total.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, San Clemente HA, at San Clemente State Beach, Projection of Avenida Calafia was collected at 1 monitoring site [AVENIDA CALAFIA]	
Temporal Representation:	Data was collected over the time period 1/3/2008-1/11/2010.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 32368, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente State Beach, Projection of Avenida Calafia

LOE ID:	28331
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	426
Number of Exceedances:	19
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 426 single samples were collected with 19 exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	

Guideline Reference:	040599
Spatial Representation:	There is one sampling location located at the projection of Avenida Calafia, S-21, in the San Clemente HA. Lat/Long: 33.40515/-117.60689.
Temporal Representation:	Samples were collected at least once a week from January 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 32368, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente State Beach, Projection of Avenida Calafia

LOE ID:	28335
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	72
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 426 single samples were collected and 72 monthly geomeans calculated. None of the monthly geomeans exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml. Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location located at the projection of Avenida Calafia, S-21, in the San Clemente HA. Lat/Long: 33.40515/-117.60689.
Temporal Representation:	Samples were collected at least once a week from January 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 32368, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente State Beach, Projection of Avenida Calafia

LOE ID:	30635
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	040600
Beneficial Use:	Water Contact Recreation	
Number of Samples:	390	
Number of Exceedances:	5	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 426 single samples were collected of which 390 are dry weather (AB411) samples with five samples exceeding the single sample water quality objective.	
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	There is one sampling location located at the projection of Avenida Calafia, S-21, in the San Clemente HA. Lat/Long: 33.40515/-117.60689.	
Temporal Representation:	Samples were collected at least once a week from January 2002 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 32368, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente State Beach, Projection of Avenida Calafia

LOE ID:	28337
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	426
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 426 single samples were collected with two samples exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; (SWRCB,

	2005) 040601
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location located at the projection of Avenida Calafia, S-21, in the San Clemente HA. Lat/Long: 33.40515/-117.60689.
Temporal Representation:	Samples were collected at least once a week from January 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 32368, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente State Beach, Projection of Avenida Calafia

LOE ID:	28341
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	72
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 426 single samples were collected with 72 monthly geomeans calculated. Only one of the geomeans exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location located at the projection of Avenida Calafia, S-21, in the San Clemente HA. Lat/Long: 33.40515/-117.60689.
Temporal Representation:	Samples were collected at least once a week from January 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 32368, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente State Beach, Projection of Avenida Calafia

LOE ID:	28340
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	426
Number of Exceedances:	18
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 426 single samples were collected with 18 samples exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location located at the projection of Avenida Calafia, S-21, in the San Clemente HA. Lat/Long: 33.40515/-117.60689.
Temporal Representation:	Samples were collected at least once a week from January 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 32368, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente State Beach, Projection of Avenida Calafia

LOE ID:	31028
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	42
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange within the time period from January 2002 through December 2007. A total of 42 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 42 geomeans zero exceeded the geomean water quality objective.

Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml over a 30 day period (SWRCB, 2005)
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location located at the projection of Avenida Calafia, S-21, in the San Clemente HA. Lat/Long: 33.40515/-117.60689.
Temporal Representation:	Samples were collected at least once a week within the time period from January 2002 through December 2007. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 32368, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente State Beach, Projection of Avenida Calafia

LOE ID:	31027
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	42
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange within the time period from January 2002 through December 2007. A total of 42 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 42 geomeans zero exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml. over a 30 day period (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location located at the projection of Avenida Calafia, S-21, in the San Clemente HA. Lat/Long: 33.40515/-117.60689.

Temporal Representation:	Samples were collected at least once a week within the time period from January 2002 through December 2007. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 32368, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente State Beach, Projection of Avenida Calafia

LOE ID:	74920
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	88
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 88 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Avenida Calafia site.
Temporal Representation:	Samples were collected from January 2008 to January 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 32368, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente State Beach, Projection of Avenida Calafia

LOE ID:	74919
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	88
Number of Exceedances:	7
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Seven of the 88 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Avendida Calafia site.
Temporal Representation:	Samples were collected from January 2008 to January 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 32368, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente State Beach, Projection of Avenida Calafia

LOE ID:	28338
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	72
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 426 single samples were collected with 72 monthly geomeans calculated. None of the geomeans exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; (SWRCB, 2005)
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location located at the projection of Avenida Calafia, S-21, in the San Clemente HA. Lat/Long: 33.40515/-117.60689.
Temporal Representation:	Samples were collected at least once a week from January 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 32368, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente State Beach, Projection of Avenida Calafia

LOE ID:	28339
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	36
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 426 single samples were collected. From March 2002 through December 2007, there were 36 samples correlated with storm events. From the 36 samples, two exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location located at the projection of Avenida Calafia, S-21, in the San Clemente HA. Lat/Long: 33.40515/-117.60689.
Temporal Representation:	Samples were collected at least once a week from January 2002 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 32368, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente State Beach, Projection of Avenida Calafia

LOE ID:	28342
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water

Matrix:	Water	040607
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	36	
Number of Exceedances:	13	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 426 single samples were collected. From March 2002 through December 2007, there were 36 samples correlated with storm events. From these 36 samples, 13 exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.	
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program, Bacteria Shoreline Data, 2002 through 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	There is one sampling location located at the projection of Avenida Calafia, S-21, in the San Clemente HA. Lat/Long: 33.40515/-117.60689.	
Temporal Representation:	Samples were collected at least once a week from January 2002 through December 2007; however, rainfall data is only available from March 2002 through December 2007.	
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 32368, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente State Beach, Projection of Avenida Calafia

LOE ID:	30736
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	390	040608
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2002 through December 2007. A total of 426 single samples were collected of which 390 are dry weather (AB411) samples with zero samples exceeding the single sample water quality objective.	
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; (SWRCB, 2005)	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	There is one sampling location located at the projection of Avenida Calafia, S-21, in the San Clemente HA. Lat/Long: 33.40515/-117.60689.	
Temporal Representation:	Samples were collected at least once a week from January 2002 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, San Clemente HA, at South Poche Beach at Capistrano Shores
Water Body ID: CAC9013000020090418224042
Water Body Type: Coastal & Bay Shoreline

DECISION ID 44379 **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Poche Beach at Capistrano Shores

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Ten lines of evidence are available in the administrative record to assess this pollutant. With the latest data, 19 of 166 geomean samples exceed the water quality objective for enterococcus for the protection of REC-1 beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, 19 of 166 geomean samples exceed the water quality objective for enterococcus for the protection of REC-1 beneficial use and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 44379, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Poche Beach at Capistrano Shores

LOE ID: 28423

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 9

Number of Exceedances:	0	040610
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 548 single samples were collected with nine samples correlated with a storm event. None of the nine samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.	
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, South Poche Beach at Capistrano Shores (station id SCCS52). (Latitude: 33.43545 Longitude: -117.63784).	
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006. Rainfall data was available for the same time period.	
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 44379, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Poche Beach at Capistrano Shores

LOE ID:	30844
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	539
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2004 through December 2006. A total of 548 single samples were collected of which 539 are dry weather (AB411) samples with none of those samples exceeding the single sample water quality objective.

Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, South Poche Beach at Capistrano Shores (station id SCCS52). (Latitude: 33.43545 Longitude: -117.63784).
Temporal Representation:	Samples were collected at least once a week from January 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44379, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Poche Beach at Capistrano Shores

LOE ID:	28420
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	9
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 548 single samples were collected with nine sample correlated with a storm event. From the nine samples, three exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan, the median total coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, South Poche Beach at Capistrano Shores (station id SCCS52). (Latitude: 33.43545 Longitude: -117.63784).
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006. Rainfall data was available for the same time period.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44379, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Poche Beach at Capistrano Shores

LOE ID:	28427
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	548
Number of Exceedances:	6
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 548 single samples were collected six samples exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, South Poche Beach at Capistrano Shores (station id SCCS52). (Latitude: 33.43545 Longitude: -117.63784).
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44379, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Poche Beach at Capistrano Shores 040613

LOE ID:	28424
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	547
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 547 single samples were collected and no samples exceeded the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, South Poche Beach at Capistrano Shores (station id SCCS52). (Latitude: 33.43545 Longitude: -117.63784).
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44379, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Poche Beach at Capistrano Shores

LOE ID:	28425
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	32
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 547 single samples were collected and 32 monthly geomeans calculated. None of the geomeans exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater

	Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, South Poche Beach at Capistrano Shores (station id SCCS52). (Latitude: 33.43545 Longitude: -117.63784).
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44379, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Poche Beach at Capistrano Shores

LOE ID:	28421
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	548
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2004 through December 2006. A total of 548 single samples were collected with no samples exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, South Poche Beach at Capistrano Shores (station id SCCS52). (Latitude: 33.43545 Longitude: -117.63784).
Temporal Representation:	Samples were collected at least once a week from January 2004 through December 2006.
Environmental Conditions:	

QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44379, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Poche Beach at Capistrano Shores

LOE ID:	28426
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 547 single samples were collected with nine samples correlated with a storm event. None of the nine samples the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, South Poche Beach at Capistrano Shores (station id SCCS52). (Latitude: 33.43545 Longitude: -117.63784).
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44379, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Poche Beach at Capistrano Shores

LOE ID:	28428	040616

Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	32
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 548 single samples were collected and 32 monthly geomeans calculated. From the 32 geomeans only one sample exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, South Poche Beach at Capistrano Shores (station id SCCS52). (Latitude: 33.43545 Longitude: -117.63784).
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44379, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Poche Beach at Capistrano Shores

LOE ID:	28429
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	9
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 548 single samples were collected with nine samples correlated with a storm event. From the nine sample, two exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.

Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station 040617 The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, South Poche Beach at Capistrano Shores (station id SCCS52). (Latitude: 33.43545 Longitude: -117.63784).
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44379, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Poche Beach at Capistrano Shores

LOE ID:	28422
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	32
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 548 single samples were collected with 32 monthly geomeans collected. None of the monthly geomeans exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected from Pacific Ocean Shoreline, San Clemente HA, South Poche Beach at Capistrano Shores (station id SCCS52). (Latitude: 33.43545 Longitude: -117.63784).
Temporal Representation: Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:
QAPP Information: Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s): County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44379, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Poche Beach at Capistrano Shores

LOE ID: 74997

Pollutant: Fecal Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 147
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: None of the 147 samples exceeded the fecal coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.
Data Reference: Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The single sample fecal coliform concentration shall not exceed more than 400/100ml. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.
Objective/Criterion Reference: Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:
Guideline Reference:

Spatial Representation: The samples were collected from Coastal Stormdrain at N El Camino Real (surfzone upcoast and surfzone downcoast).
Temporal Representation: The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:
QAPP Information: The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 44379, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Poche Beach at Capistrano Shores

LOE ID: 74998

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water

Fraction:	None	040619
Beneficial Use:	Water Contact Recreation	
Number of Samples:	147	
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	None of the 147 samples exceeded the total coliform objective. For these stations, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The single sample total coliform concentration shall not exceed more than 10000/100ml. Water Quality Control Plan for the San Diego Basin. Water Quality Control Plan for Ocean Waters.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected from Coastal Stormdrain at N El Camino Real(surfzone upcoast and surfzone downcoast).	
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.	
Environmental Conditions:		
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44379, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Poche Beach at Capistrano Shores

LOE ID:	74971
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	134
Number of Exceedances:	18
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Eighteen of the 134 geomeans exceeded the enterococcus objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean for enterococcus shall not exceed 35 MPN/100 mL. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	

Guideline Reference:	040620
Spatial Representation:	The samples were collected from Coastal Stormdrain at N El Camino Real (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44379, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Poche Beach at Capistrano Shores

LOE ID:	74972
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	146
Number of Exceedances:	12
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Twelve of the 146 samples exceeded the enterococcus objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample enterococcus concentration shall not exceed more than 104/100ml. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Coastal Stormdrain at N El Camino Real(surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44379, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Poche Beach at Capistrano Shores

LOE ID:	74999
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation	040621
Number of Samples:	134	
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	None of the 134 samples exceeded the total coliform objective. For these stations, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The geometric mean for total coliform shall not exceed more than 1000/100ml. Water Quality Control Plan for the San Diego Basin. Water Quality Control Plan for Ocean Waters.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected from Coastal Stormdrain at N El Camino Real (surfzone upcoast and surfzone downcoast).	
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.	
Environmental Conditions:		
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44379, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Poche Beach at Capistrano Shores

LOE ID:	74996
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	134
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 134 geomeans exceeded the fecal coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean for fecal coliform shall not exceed more than 200/100ml. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Coastal Stormdrain at N El Camino Real (surfzone

upcoast and surfzone downcoast). 040622

Temporal Representation: The samples were collected once a week from July 2006 to 2009.

Environmental Conditions:

QAPP Information: The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.

QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 44379, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Poche Beach at Capistrano Shores

LOE ID: 31001

Pollutant: Enterococcus

LOE Subgroup: Pollutant-Water

Matrix: Water

Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 20

Number of Exceedances: 0

Data and Information Type: PWS pathogen monitoring (ambient water)

Data Used to Assess Water Quality: Beach monitoring data was collected by the County of Orange within the time period from May 2004 through December 2006. A total of 20 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 20 geomeans zero exceeded the geomean water quality objective.

Data Reference: The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: Geomean: Enterococcus density shall not exceed 35 per 100 ml over a 30 day period (SWRCB, 2005).

Objective/Criterion Reference: Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:

Guideline Reference:

Spatial Representation: Samples were collected from Pacific Ocean Shoreline, San Clemente HA, South Poche Beach at Capistrano Shores (station id SCCS52). (Latitude: 33.43545 Longitude: -117.63784).

Temporal Representation: Samples were collected at least once a week within the time period from May 2004 through December 2006.
The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period. AB411 excludes the consideration of wet weather data.

Environmental Conditions:

QAPP Information: Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.

QAPP Information Reference(s): County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44379, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Poche Beach at Capistrano Shores

LOE ID: 30739

Pollutant:	Fecal Coliform	040623
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	538	
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 547 single samples were collected of which 538 are dry weather (AB411) samples with no samples exceeding the single sample water quality objective.	
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program, Bacteria Shoreline Data, 2002 through 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, South Poche Beach at Capistrano Shores (station id SCCS52). (Latitude: 33.43545 Longitude: -117.63784).	
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange, Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 44379, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Poche Beach at Capistrano Shores

LOE ID:	30999
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	20
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange within the time period from May 2004 through December 2006. A total of 20 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 20 geomeans zero exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program, Bacteria Shoreline Data, 2002 through 2007

SWAMP Data:	Non-SWAMP	040624
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml over a 30 day period (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, South Poche Beach at Capistrano Shores (station id SCCS52). (Latitude: 33.43545 Longitude: -117.63784).	
Temporal Representation:	Samples were collected at least once a week within the time period from May 2004 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 44379, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Poche Beach at Capistrano Shores

LOE ID:	31000
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	20
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange within the time period from May 2004 through December 2006. A total of 20 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 20 geomeans zero exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml over a 30 day period (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, South Poche Beach at Capistrano Shores (station id SCCS52). (Latitude: 33.43545 Longitude: -117.63784).
Temporal Representation:	Samples were collected at least once a week within the time period from May 2004 through

December 2006. 040625
The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period. AB411 excludes the consideration of wet weather data.

Environmental Conditions:

QAPP Information: Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.

QAPP Information Reference(s): County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44379, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Poche Beach at Capistrano Shores

LOE ID: 30638

Pollutant: Enterococcus
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 539
Number of Exceedances: 4

Data and Information Type: PWS pathogen monitoring (ambient water)

Data Used to Assess Water Quality: Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 548 single samples were collected of which 539 are dry weather (AB411) samples wityh four samples exceeding the single sample water quality objective.

Data Reference: The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml;

Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).

Objective/Criterion Reference: Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected from Pacific Ocean Shoreline, San Clemente HA, South Poche Beach at Capistrano Shores (station id SCCS52). (Latitude: 33.43545 Longitude: -117.63784).

Temporal Representation: Samples were collected at least once a week from May 2004 through December 2006.

Environmental Conditions:

QAPP Information: Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.

QAPP Information Reference(s): County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44379, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Poche Beach at Capistrano Shores

LOE ID: 28419

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use:	Shellfish Harvesting
Number of Samples:	548
Number of Exceedances:	9
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 548 single samples were collected with nine exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, South Poche Beach at Capistrano Shores (station id SCCS52). (Latitude: 33.43545 Longitude: -117.63784).
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Mission Bay Shoreline, at Bahia Point
Water Body ID: CAC907510002009042220391 0
Water Body Type: Coastal & Bay Shoreline

DECISION ID 43165 Region 9
Mission Bay Shoreline, at Bahia Point

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal from the CWA section 303(d) List under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Eleven lines of evidence are available in the administrative record to assess this pollutant. With the latest data, 21 of 121 geomean samples collected in AB411 period exceed the water quality objective (WQO) of 35/100ml in a 30-day period, and 63 of 456 samples collected in AB411 period exceed the SSM WQO for enterococcus of 104/100ml.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, 21 of 121 geomean samples collected in AB411 period exceed the water quality objective (WQO) of 35/100ml in a 30-day period, and 63 of 456 samples collected in AB411 period exceed the SSM WQO for enterococcus of 104/100ml and this exceeds the allowable frequency of AB411 period listed in Section 4.3 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 43165, Indicator Bacteria Region 9
Mission Bay Shoreline, at Bahia Point

LOE ID:	28669
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	040628
Beneficial Use:	Water Contact Recreation	
Number of Samples:	79	
Number of Exceedances:	16	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 399 single samples were collected with 79 monthly geomeans calculated. Sixteen of the 79 geomeans exceeded the geomean water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Bahia Point, San Diego, California. Station identification number is MB-160.	
Temporal Representation:	Samples were collected from January 1999 through October 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43165, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Bahia Point

LOE ID:	28670
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	15
Number of Exceedances:	7
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 399 single samples were collected with 15 samples correlated with a storm event. Seven of the 15 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program,

	2007. AB 411 monitoring data 1999 to 2007	040629

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Bahia Point, San Diego, California. Station identification number is MB-160.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43165, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Bahia Point

LOE ID:	81125
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	63
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed bw data for Mission Bay Shoreline, at Bahia Point to determine beneficial use support and results are as follows: 0 of 63 samples (AB 411 period) exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1000 per 100ml in any 30-day period (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Mission Bay Shoreline, at Bahia Point was collected at 1

	monitoring site [Bahia Point]	040630
Temporal Representation:	Data was collected over the AB 411 time period 4/2/2008-8/24/2010.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43165, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Bahia Point

LOE ID:	81126
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	63
Number of Exceedances:	10
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed bw data for Mission Bay Shoreline, at Bahia Point to determine beneficial use support and results are as follows: 10 of 63 samples (AB411 period) exceed the criterion for Enterococcus.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100ml in any 30-day period (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Mission Bay Shoreline, at Bahia Point was collected at 1 monitoring site [Bahia Point]
Temporal Representation:	Data was collected over the AB411 time period 4/2/2008-8/24/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43165, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Bahia Point

LOE ID:	81127
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	72
Number of Exceedances:	6
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed bw data for Mission Bay Shoreline, at Bahia Point to determine beneficial use support and results are as follows: 6 of 72 samples (AB 411 period) exceed

the criterion for Enterococcus. 040631

Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: Single Sample Maximum: Enterococcus density shall not exceed 104 per 100ml (SWRCB, 2005).

Objective/Criterion Reference: Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:

Guideline Reference:

Spatial Representation: Data for this line of evidence for Mission Bay Shoreline, at Bahia Point was collected at 1 monitoring site [Bahia Point]

Temporal Representation: Data was collected over the time period 4/2/2008-8/24/2010.

Environmental Conditions: Staff is not aware of any special conditions that might affect interpretation of the data.

QAPP Information: The samples were collected for the Beach Watch program.

QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 43165, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Bahia Point

LOE ID: 81128

Pollutant: Fecal Coliform

LOE Subgroup: Pollutant-Water

Matrix: Water

Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 63

Number of Exceedances: 0

Data and Information Type: PATHOGEN MONITORING

Data Used to Assess Water Quality: Water Board staff assessed bw data for Mission Bay Shoreline, at Bahia Point to determine beneficial use support and results are as follows: 0 of 63 samples (AB 411 period) exceed the criterion for Coliform, Fecal.

Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: Geomean: fecal coliform density shall not exceed 200 per 100ml in any 30-day period (SWRCB, 2005).

Objective/Criterion Reference: Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:

Guideline Reference:

Spatial Representation: Data for this line of evidence for Mission Bay Shoreline, at Bahia Point was collected at 1 monitoring site [Bahia Point]

Temporal Representation: Data was collected over the AB 411 time period 4/2/2008-8/24/2010.

Environmental Conditions: Staff is not aware of any special conditions that might affect interpretation of the data.

QAPP Information: The samples were collected for the Beach Watch program.

QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 43165, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Bahia Point

LOE ID: 81129

Pollutant:	Fecal Coliform	040632
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	72	
Number of Exceedances:	0	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed bw data for Mission Bay Shoreline, at Bahia Point to determine beneficial use support and results are as follows: 0 of 72 samples (AB 411 period) exceed the criterion for Coliform, Fecal.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Single Sample Maximum: fecal coliform density shall not exceed 400 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Mission Bay Shoreline, at Bahia Point was collected at 1 monitoring site [Bahia Point]	
Temporal Representation:	Data was collected over the AB 411 time period 4/2/2008-8/24/2010.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43165, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Bahia Point

LOE ID:	74328
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	72
Number of Exceedances:	2
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed bw data for Mission Bay Shoreline, at Bahia Point to determine beneficial use support and results are as follows: 2 of 72 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The Water Quality Control Plan (Basin Plan 2011)states the following: At all areas where shellfish may be harvested for human consumption, ten percent of the samples collected during any 30-day period shall not exceed 230 MPN/100mL.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Data for this line of evidence for Mission Bay Shoreline, at Bahia Point was collected at 1 monitoring site [Bahia Point]
Temporal Representation:	Data was collected over the time period 4/2/2008-8/24/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43165, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Bahia Point

LOE ID:	30780
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	382
Number of Exceedances:	5
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 397 single samples were collected of which 382 are dry weather (AB411) samples with five samples exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Bahia Point, San Diego, California. Station identification number is MB-160.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43165, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Bahia Point

LOE ID:	30543
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	040634
Beneficial Use:	Water Contact Recreation	
Number of Samples:	384	
Number of Exceedances:	57	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 399 single samples were collected of which 384 are dry weather (AB411) samples and with 57 samples exceeded the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Bahia Point, San Diego, California. Station identification number is MB-160.	
Temporal Representation:	Samples were collected from January 1999 through October 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43165, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Bahia Point

LOE ID:	28734
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	79
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected from January 1999 through October 2007. A total of 397 single samples were collected with 79 monthly geomeans calculated. One of the 79 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml;

	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Bahia Point, San Diego, California. Station identification number is MB-160.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43165, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Bahia Point

LOE ID:	28682
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	358
Number of Exceedances:	43
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 358 single samples were collected with 43 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml;
	Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Bahia Point, San Diego, California. Station identification number is MB-160.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43165, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Bahia Point

LOE ID:	28746
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	397
Number of Exceedances:	8
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 397 single samples were collected with eight samples exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Bahia Point, San Diego, California. Station identification number is MB-160.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43165, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Bahia Point

LOE ID:	31334
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	58
Number of Exceedances:	11
Data and Information Type:	PWS pathogen monitoring (ambient water)

Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 309 dry month (April through October) single samples were collected with 58 dry month geomeans calculated. Eleven of the 58 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Bahia Point, San Diego, California. Station identification number is MB-160.
Temporal Representation:	Samples were collected from April 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43165, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Bahia Point

LOE ID:	31335
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	49
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 268 dry month (April through October) single samples were collected with 49 dry month geomeans calculated. Four of the 49 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:	040638
Guideline Reference:	
Spatial Representation:	Samples were collected from Bahia Point, San Diego, California. Station identification number is MB-160.
Temporal Representation:	Samples were collected from April 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43165, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Bahia Point

LOE ID:	30338
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2933
Number of Exceedances:	959
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Below is a copy of the 2006 LOE for the data supporting the listing of Mission Bay Shoreline: Available data indicate sufficient exceedances of bacterial indicator objectives. There were 576 out of 3662 samples exceeding the single sample maximum for enterococci, 959 out of 2933 exceedances of the geomean enterococci, and 333 out samples exceeding the single sample maximum for fecal coliform (USEPA, 2007).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Title 17 C.C.R. Section 7958 states: Based on a single sample, the density of bacteria in water from each sampling station at a public beach or public water contact sports area shall not exceed: (A) 1,000 total coliform bacteria per 100 milliliters, if the ratio of fecal/total coliform bacteria exceeds 0.1; or (B) 10,000 total coliform bacteria per 100 milliliters; or (C) 400 fecal coliform bacteria per 100 milliliters; or (D) 104 enterococcus bacteria per 100 milliliters. Based on the mean of the logarithms of the results of at least five weekly samples during any 30-day sampling period, the density of bacteria in water from any sampling station at a public beach or public water contact sports area, shall not exceed: (A) 1,000 total coliform bacteria per 100 milliliters; or (B) 200 fecal coliform bacteria per 100 milliliters; or (C) 35 enterococcus bacteria per 100 milliliters (DHS, 1999).
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	In 2006, data from sampling sites along the Mission Bay shoreline were aggregated for the assessment. For 2008, the 2006 Mission Bay Shoreline segment has been split into smaller segments and each represents an area near the sampling location of the data being

	assessed. 'Mission Bay Shoreline, at Bahia Point ' is one of the sampling locations for Mission Bay Shoreline and is considered to be part of the original listing
Temporal Representation:	From 03/21/2000-10/30/2005.
Environmental Conditions:	
QAPP Information:	Data record: 2000-2005, San Diego County Health Dept.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43165, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Bahia Point

LOE ID:	31336
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	58
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 307 dry month (April through October) single samples were collected with 58 dry month geomeans calculated. None of the 58 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Bahia Point, San Diego, California. Station identification number is MB-160.
Temporal Representation:	Samples were collected from April 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43165, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Bahia Point

LOE ID:	28740
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation
Number of Samples:	15
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 397 single samples were collected with 15 samples correlated with a storm event. Three of the 15 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Bahia Point, San Diego, California. Station identification number is MB-160.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43165, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Bahia Point

LOE ID:	30528
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	344
Number of Exceedances:	37

Data and Information Type:	PWS pathogen monitoring (ambient water) 040641
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 344 dry weather single samples were collected with 37 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Bahia Point, San Diego, California. Station identification number is MB-160.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43165, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Bahia Point

LOE ID:	30107
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	-N/A
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	128
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were 128 beach advisory days for this location. When a bacteriological sample exceeds water quality standards, signs are posted indicating that waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 to December 2007. Data used was the number of days the beach was posted with an Advisory when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	County of Orange. March 2007. Annual Ocean and Bay Water Quality Report, 2006 Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960.

	(a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Spatial Representation:	Bacteriological monitoring samples were collected at Bahia Point in Mission Bay.
Temporal Representation:	The beach posting covers the time frame of January 2001 -December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43165, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Bahia Point

LOE ID:	28686
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	70
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 358 single samples were collected and 70 geomeans calculated. Four of the 70 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Bahia Point, San Diego, California. Station identification number is MB-160.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.

QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43165, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Bahia Point

LOE ID:	28687
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	14
Number of Exceedances:	6
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 358 single samples were collected with 14 samples correlated with a storm event. Six of the 14 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005). Comparisons are also made only for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Bahia Point, San Diego, California. Station identification number is MB-160.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange, Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43165, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Bahia Point

LOE ID:	28644

Pollutant:	Total Coliform	040644
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Shellfish Harvesting	
Number of Samples:	397	
Number of Exceedances:	75	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 397 single samples were collected with 75 samples exceeded the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Bahia Point, San Diego, California. Station identification number is MB-160.	
Temporal Representation:	Samples were collected from January 1999 through October 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43165, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Bahia Point

LOE ID:	28646
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	15
Number of Exceedances:	9
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 397 single samples were collected with 15 samples correlated with a storm event. Nine of the 15 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program,

	2007. AB 411 monitoring data 1999 to 2007	040645

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Bahia Point, San Diego, California. Station identification number is MB-160.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43165, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Bahia Point

LOE ID:	28668
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	399
Number of Exceedances:	64
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 399 single samples were collected with 64 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	

Guideline Reference:	040646
Spatial Representation:	Samples were collected from Bahia Point, San Diego, California. Station identification number is MB-160.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Mission Bay Shoreline, at Balboa Court
Water Body ID: CAC907510002009042220034 9
Water Body Type: Coastal & Bay Shoreline

DECISION ID 44224 **Region 9**
Mission Bay Shoreline, at Balboa Court

Pollutant: Indicator Bacteria
Final Listing Decision: Delist from 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Delist from 303(d) list (TMDL required list)(2012)
Revision Status Revised
Reason for Delisting: Applicable WQS attained; reason for recovery unspecified
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for removal from the CWA section 303(d) List under section 4.3 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Fourteen lines of evidence are available in the administrative record to assess this pollutant. Both REC-1 and SHELL beneficial uses are evaluated in this decision. With the latest data, zero of the 66 samples exceeded the Water Quality Objective (WQO) for REC-1 of a geomean of 1000 /100 ml for Total Coliform, one of the 66 samples exceeded the geomean of 35/100 ml for Enterococci, zero out of the 58 samples exceeded the geomean of 200/100 ml for Fecal Coliform , and 11 out of 217 exceeded the WQO for SHELL of 230/100 ml for Total Coliform.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, zero of the 66 samples exceeded the Water Quality Objective (WQO) for REC-1 of a geomean of 1000 /100 ml for Total Coliform, one of the 66 samples exceeded the geomean of 35/100 ml for Enterococci, zero out of the 58 samples exceeded the geomean of 200/100 ml for Fecal Coliform , and 11 out of 217 exceeded the WQO for SHELL of 230/100 ml for Total Coliform. These do not exceed the allowable frequencies referred to in Section 4.3 and 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be removed from the section 303(d) list because applicable water quality standards for the pollutant are not being exceeded.

Line of Evidence (LOE) for Decision ID 44224, Indicator Bacteria **Region 9**
Mission Bay Shoreline, at Balboa Court

LOE ID: 28606

Pollutant: Fecal Coliform
LOE Subgroup: Pollutant-Water

Matrix:	Water	040648
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	150	
Number of Exceedances:	3	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2001 through December 2007. A total of 150 single samples were collected with 3 samples exceeding the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Balboa Court, San Diego, California. Station identification number is MB-225.	
Temporal Representation:	Samples were collected from June 2001 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44224, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Balboa Court

LOE ID:	28610
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	45
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2001 through December 2007. A total of 192 single samples were collected with 45 monthly geomeans calculated. None of the 45 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml;

	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Balboa Court, San Diego, California. Station identification number is MB-225.
Temporal Representation:	Samples were collected from June 2001 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44224, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Balboa Court

LOE ID:	28611
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	36
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2001 through December 2007. A total of 150 single samples were collected and 36 geomeans calculated. None of the 36 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml;
	Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Balboa Court, San Diego, California. Station identification number is MB-225.
Temporal Representation:	Samples were collected from June 2001 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44224, Indicator Bacteria — Region 9

Mission Bay Shoreline, at Balboa Court

LOE ID:	28612
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	45
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2001 through December 2007. A total of 191 single samples were collected with 45 monthly geomeans calculated. None of the 45 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Balboa Court, San Diego, California. Station identification number is MB-225.
Temporal Representation:	Samples were collected from June 2001 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44224, Indicator Bacteria — Region 9

Mission Bay Shoreline, at Balboa Court

LOE ID:	28607
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)

Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2001 through December 2007. A total of 150 single samples were collected with no samples correlated with a storm event. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Balboa Court, San Diego, California. Station identification number is MB-225.
Temporal Representation:	Samples were collected from June 2001 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44224, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Balboa Court

LOE ID:	28608
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	191
Number of Exceedances:	9
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data June 2001 through December 2007. A total of 191 single samples were collected with nine samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml.

	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Balboa Court, San Diego, California. Station identification number is MB-225.
Temporal Representation:	Samples were collected from June 2001 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44224, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Balboa Court

LOE ID:	28609
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2001 through December 2007. A total of 191 single samples were collected with one sample correlated with a storm event. The one sample did not exceed the water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml.
	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Balboa Court, San Diego, California. Station identification number is MB-225.
Temporal Representation:	Samples were collected from June 2001 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event

was defined as 0.2 inches of rainfall within a 72 hour period. 040653

Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March

QAPP Information: Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.

QAPP Information Reference(s): County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44224, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Balboa Court

LOE ID: 77603

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Shellfish Harvesting

Number of Samples: 21
Number of Exceedances: 0

Data and Information Type: PATHOGEN MONITORING
Data Used to Assess Water Quality: Zero of the twenty one samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The Water Quality Control Plan for the San Diego Basin states that at all areas where shellfish may be harvested for human consumption, the median total coliform concentration throughout the water column for any 30-day period shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference: Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:
Guideline Reference:

Spatial Representation: The samples were collected at Mission Bay Shoreline, at Balboa Court.
Temporal Representation: The samples were collected from April 2008 to September 2008.
Environmental Conditions:
QAPP Information: The samples were collected for the beach watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 44224, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Balboa Court

LOE ID: 74329

Pollutant: Enterococcus
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples:	22
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 22 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Balboa Court site (BW761).
Temporal Representation:	Samples were collected approximately once a week from April 2, 2008 to September 23, 2008 (dry weather data only).
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44224, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Balboa Court

LOE ID:	74330
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	22
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 22 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Balboa Court site.
Temporal Representation:	Samples were collected approximately once a week from April 2008 to September 2008.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44224, Indicator Bacteria 040655 Region 9

Mission Bay Shoreline, at Balboa Court

LOE ID:	74331
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	25
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed BW data for Mission Bay Shoreline, at Balboa Court to determine beneficial use support and results are as follows: 0 of 25 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The Water Quality Control Plan (Basin Plan 2011)states the following: At all areas where shellfish may be harvested for human consumption, ten percent of the samples collected during any 30-day period shall not exceed 230 MPN/100mL.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Mission Bay Shoreline, at Balboa Court was collected at 1 monitoring site [Balboa Ct.]
Temporal Representation:	Data was collected over the time period 4/2/2008-9/23/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44224, Indicator Bacteria Region 9

Mission Bay Shoreline, at Balboa Court

LOE ID:	74332
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	22
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 22 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Balboa Court site.
Temporal Representation:	Samples were collected approximately once a week from January 2008 to September 2008.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44224, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Balboa Court

LOE ID:	31115
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	36
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2001 through October 2007. A total of 148 dry month (April through October) single samples were collected with 36 dry month geomeans calculated. None of the 36 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Balboa Court, San Diego, California. Station identification number is MB-225.
Temporal Representation:	Samples were collected from June 2001 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44224, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Balboa Court

LOE ID:	31114	040657

Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	44
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2001 through October 2007. A total of 188 dry month (April through October) single samples were collected with 44 dry month geomeans calculated. One of the 44 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Balboa Court, San Diego, California. Station identification number is MB-225.
Temporal Representation:	Samples were collected from June 2001 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44224, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Balboa Court

LOE ID:	31116
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	44
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2001 through October 2007. A total of 109 dry month (April through October) single samples were collected with 44 dry month geomeans calculated. None of the 44 geomeans exceeded the geomean water quality objective.

Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Balboa Court, San Diego, California. Station identification number is MB-225.
Temporal Representation:	Samples were collected from June 2001 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44224, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Balboa Court

LOE ID:	30339
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2933
Number of Exceedances:	959
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Below is a copy of the 2006 LOE for the data supporting the listing of Mission Bay Shoreline: Available data indicate sufficient exceedances of bacterial indicator objectives. There were 576 out of 3662 samples exceeding the single sample maximum for enterococci, 959 out of 2933 exceedances of the geomean enterococci, and 333 out samples exceeding the single sample maximum for fecal coliform (USEPA, 2007).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Title 17 C.C.R. Section 7958 states: Based on a single sample, the density of bacteria in water from each sampling station at a public beach or public water contact sports area shall not exceed: (A) 1,000 total coliform bacteria per 100 milliliters, if the ratio of fecal/total coliform bacteria exceeds 0.1; or (B) 10,000 total coliform bacteria per 100 milliliters; or (C) 400 fecal coliform bacteria per 100 milliliters; or (D) 104 enterococcus bacteria per 100 milliliters. Based on the mean of the logarithms of the results of at least five weekly samples during

	any 30-day sampling period, the density of bacteria in water from any sampling station at a public beach or public water contact sports area, shall not exceed: (A) 1,000 total coliform bacteria per 100 milliliters; or (B) 200 fecal coliform bacteria per 100 milliliters; or (C) 35 enterococcus bacteria per 100 milliliters (DHS, 1999).
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	In 2006, data from sampling sites along the Mission Bay shoreline were aggregated for the assessment. For 2008, the 2006 Mission Bay Shoreline segment has been split into smaller segments and each represents an area near the sampling location of the data being assessed. 'Mission Bay Shoreline, at Balboa Court' is one of the sampling locations for Mission Bay Shoreline and is considered to be part of the original listing
Temporal Representation:	From 03/21/2000-10/30/2005.
Environmental Conditions:	
QAPP Information:	Data record: 2000-2005, San Diego County Health Dept.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44224, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Balboa Court

LOE ID:	30108
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	17
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were 17 beach advisory days for this location. When a bacteriological sample exceeds water quality standards, signs are posted indicating that waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 to December 2007. Data used was the number of days the beach was posted with an Advisory when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	County of Orange. March 2007. Annual Ocean and Bay Water Quality Report, 2006 Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	

Guideline Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Spatial Representation:	Bacteriological monitoring samples were collected at Balboa Court in Mission Bay.
Temporal Representation:	The beach advisory covers the time frame of January 2001 -December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44224, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Balboa Court

LOE ID:	30781
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	191
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2001 through December 2007. A total of 192 single samples were collected of which 191 are dry weather (AB411) samples with zero samples exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Balboa Court, San Diego, California. Station identification number is MB-225.
Temporal Representation:	Samples were collected from June 2001 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44224, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Balboa Court

LOE ID:	28603	040661
Pollutant:	Total Coliform	
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Shellfish Harvesting	
Number of Samples:	1	
Number of Exceedances:	1	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2001 through December 2007. A total of 192 single samples were collected with one sample correlated with a storm event. This sample exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.	
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005). Comparisons are also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Balboa Court, San Diego, California. Station identification number is MB-225.	
Temporal Representation:	Samples were collected from June 2001 through December 2007.	
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44224, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Balboa Court

LOE ID:	30544
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation	040662
Number of Samples:	190	
Number of Exceedances:	9	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data June 2001 through December 2007. A total of 191 single samples were collected of which 190 are dry weather (AB411) samples with nine samples exceeding the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Balboa Court, San Diego, California. Station identification number is MB-225.	
Temporal Representation:	Samples were collected from June 2001 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44224, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Balboa Court

LOE ID:	28601
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	192
Number of Exceedances:	11
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2001 through December 2007. A total of 192 single samples were collected with 11 samples exceeded the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental

Protection Agency 040663

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Balboa Court, San Diego, California. Station identification number is MB-225.
Temporal Representation: Samples were collected from June 2001 through December 2007.
Environmental Conditions:
QAPP Information: Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s): County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44224, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Balboa Court

LOE ID: 28604

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 192
Number of Exceedances: 1

Data and Information Type: PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality: Beach monitoring data was collected by the County of San Diego from June 2001 through December 2007. A total of 192 single samples were collected with one sample exceeding the single sample water quality objective.
Data Reference: National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: Geomean: Total coliform density shall not exceed 1,000 per 100ml;

Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference: Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected from Balboa Court, San Diego, California. Station identification number is MB-225.
Temporal Representation: Samples were collected from June 2001 through December 2007.
Environmental Conditions:
QAPP Information: Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s): County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44224, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Balboa Court 040664

LOE ID:	28605
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2001 through December 2007. A total of 192 single samples were collected with one samples correlated with a storm event. This sample exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Balboa Court, San Diego, California. Station identification number is MB-225.
Temporal Representation:	Samples were collected from June 2001 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Mission Bay Shoreline, at Bonita Cove
Water Body ID: CAC907520002009042220212 7
Water Body Type: Coastal & Bay Shoreline

DECISION ID 43760 Region 9
Mission Bay Shoreline, at Bonita Cove

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not Delist from 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Do Not Delist from 303(d) list (TMDL required list)(2012)
Revision Status Revised
Sources: Source Unknown
Expected TMDL Completion Date: 2019
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for removal from the CWA section 303(d) List under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Sixteen lines of evidence are available in the administrative record to assess this pollutant. With the latest data, 120 of 461 single samples exceed the water quality objective for total coliform of a SSM of 230/100 ml for the protection of SHELL.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, 120 of 461 single samples exceed the water quality objective for total coliform of a SSM of 230/100 ml for the protection of SHELL and this exceeds the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 43760, Indicator Bacteria Region 9
Mission Bay Shoreline, at Bonita Cove

LOE ID: 28691

Pollutant: Fecal Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use:	Water Contact Recreation	040666
Number of Samples:	418	
Number of Exceedances:	45	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 418 single samples were collected with 45 samples exceeding the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Bonita Cove, San Diego, California. Station identification number is MB-170.	
Temporal Representation:	Samples were collected from January 1999 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43760, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Bonita Cove

LOE ID:	28678
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	71
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 418 single samples were collected and 71 geomeans calculated. None of the 71 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).

Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Bonita Cove, San Diego, California. Station identification number is MB-170.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43760, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Bonita Cove

LOE ID:	77604
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Zero of the zero samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The Water Quality Control Plan for the San Diego Basin states that at all areas where shellfish may be harvested for human consumption, the median total coliform concentration throughout the water column for any 30-day period shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from one site at Mission Bay Shoreline, at Bonita Cove (Mariners), north end.
Temporal Representation:	Two samples were collected on July 7, 2008 and September 1, 2008, respectively.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43760, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Bonita Cove

LOE ID:	74333

Pollutant:	Total Coliform	040668
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Shellfish Harvesting	
Number of Samples:	2	
Number of Exceedances:	1	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed BW data for Mission Bay Shoreline, at Bonita Cove to determine beneficial use support and results are as follows: one of two samples exceed the criterion for Coliform, Total.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The Water Quality Control Plan (Basin Plan 2011)states the following: At all areas where shellfish may be harvested for human consumption, ten percent of the samples collected during any 30-day period shall not exceed 230 MPN/100mL.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Mission Bay Shoreline, at Bonita Cove was collected at one monitoring site [Bonita Cove (north end)]	
Temporal Representation:	Data was collected on 07/07/2008 and 09/01/2008, respectively.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43760, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Bonita Cove

LOE ID:	31156
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	36
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through August 2004. A total of 234 dry month (April through October) single samples were collected with 36 dry month geomeans calculated. One of the 36 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).

Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Bonita Cove, San Diego, California. Station identification number is MB-170.
Temporal Representation:	Samples were collected from April 1999 through August 2004.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43760, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Bonita Cove

LOE ID:	31155
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	36
Number of Exceedances:	14
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through August 2004. A total of 235 dry month (April through October) single samples were collected with 36 dry month geomeans calculated. 14 of the 36 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Bonita Cove, San Diego, California. Station identification number is MB-170.
Temporal Representation:	Samples were collected from April 1999 through August 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43760, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Bonita Cove 040670

LOE ID:	31157
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	36
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through August 2004. A total of 233 dry month (April through October) single samples were collected with 36 dry month geomeans calculated. None of the 36 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Bonita Cove, San Diego, California. Station identification number is MB-170.
Temporal Representation:	Samples were collected from April 1999 through August 2004.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43760, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Bonita Cove

LOE ID:	30782
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	442
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 459 single samples were collected of which 442 are dry

	weather (AB411) samples with four samples exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Bonita Cove, San Diego, California. Station identification number is MB-170.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43760, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Bonita Cove

LOE ID:	30529
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	402
Number of Exceedances:	42
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 402 dry weather single samples were collected with 42 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	

Guideline Reference:	040672
Spatial Representation:	Samples were collected from Bonita Cove, San Diego, California. Station identification number is MB-170.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43760, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Bonita Cove

LOE ID:	28736
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	459
Number of Exceedances:	5
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 459 single samples were collected with five samples exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Bonita Cove, San Diego, California. Station identification number is MB-170.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43760, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Bonita Cove

LOE ID:	28745

Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	78
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 459 single samples were collected with 78 monthly geomeans calculated. One of the 78 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Bonita Cove, San Diego, California. Station identification number is MB-170.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43760, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Bonita Cove

LOE ID:	28649
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	17
Number of Exceedances:	8
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 459 single samples were collected with 17 samples correlated with a storm event. Eight of the 17 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal

	information. 040674
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Bonita Cove, San Diego, California. Station identification number is MB-170.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43760, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Bonita Cove

LOE ID:	28663
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	461
Number of Exceedances:	80
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 461 single samples were collected with 80 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005.

	Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Bonita Cove, San Diego, California. Station identification number is MB-170.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43760, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Bonita Cove

LOE ID:	28655
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	17
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 461 single samples were collected with 17 samples correlated with a storm event. Four of the 17 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Bonita Cove, San Diego, California. Station identification number is MB-170.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach

	monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43760, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Bonita Cove

LOE ID:	28683
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	16
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 418 single samples were collected with 16 samples correlated with a storm event. Three of the 16 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Bonita Cove, San Diego, California. Station identification number is MB-170.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.

QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43760, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Bonita Cove

LOE ID:	28656
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	78
Number of Exceedances:	19
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 461 single samples were collected with 78 monthly geomeans calculated. Nineteen of the 78 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Bonita Cove, San Diego, California. Station identification number is MB-170.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43760, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Bonita Cove

LOE ID:	30340
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2933

Number of Exceedances:	959	040678
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Below is a copy of the 2006 LOE for the data supporting the listing of Mission Bay Shoreline: Available data indicate sufficient exceedances of bacterial indicator objectives. There were 576 out of 3662 samples exceeding the single sample maximum for enterococci, 959 out of 2933 exceedances of the geomean enterococci, and 333 out samples exceeding the single sample maximum for fecal coliform (USEPA, 2007).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Title 17 C.C.R. Section 7958 states: Based on a single sample, the density of bacteria in water from each sampling station at a public beach or public water contact sports area shall not exceed: (A) 1,000 total coliform bacteria per 100 milliliters, if the ratio of fecal/total coliform bacteria exceeds 0.1; or (B) 10,000 total coliform bacteria per 100 milliliters; or (C) 400 fecal coliform bacteria per 100 milliliters; or (D) 104 enterococcus bacteria per 100 milliliters. Based on the mean of the logarithms of the results of at least five weekly samples during any 30-day sampling period, the density of bacteria in water from any sampling station at a public beach or public water contact sports area, shall not exceed: (A) 1,000 total coliform bacteria per 100 milliliters; or (B) 200 fecal coliform bacteria per 100 milliliters; or (C) 35 enterococcus bacteria per 100 milliliters (DHS, 1999).	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	In 2006, data from sampling sites along the Mission Bay shoreline were aggregated for the assessment. For 2008, the 2006 Mission Bay Shoreline segment has been split into smaller segments and each represents an area near the sampling location of the data being assessed. 'Mission Bay Shoreline, at Bonita Cove' is one of the sampling locations for Mission Bay Shoreline and is considered to be part of the original listing	
Temporal Representation:	From 03/21/2000-10/30/2005.	
Environmental Conditions:		
QAPP Information:	Data record: 2000-2005, San Diego County Health Dept.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43760, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Bonita Cove

LOE ID:	28742
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	17
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 459 single samples were collected with 17 samples

	correlated with a storm event. One of the 17 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Bonita Cove, San Diego, California. Station identification number is MB-170.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43760, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Bonita Cove

LOE ID:	30109
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	-N/A
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	102
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were 102 beach advisory days for this location. When a bacteriological sample exceeds water quality standards, signs are posted indicating that waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 to December 2007. Data used was the number of days the beach was posted with an Advisory when the ocean or bay failed to meet the

	bacteriological standards. 040680
Data Reference:	County of Orange. March 2007. Annual Ocean and Bay Water Quality Report, 2006 Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Spatial Representation:	Bacteriological monitoring samples were collected at Bonita Cove in Mission Bay.
Temporal Representation:	The beach advisory covers the time frame of January 2001 -December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43760, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Bonita Cove

LOE ID:	28650
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	459
Number of Exceedances:	119
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 459 single samples were collected with 119 samples exceeded the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at Bonita Cove, San Diego, California. Station identification number is MB-170.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43760, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Bonita Cove

LOE ID:	30545
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	444
Number of Exceedances:	76
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 461 single samples were collected of which 444 are dry weather (AB411) samples with 76 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Bonita Cove, San Diego, California. Station identification number is MB-170.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Mission Bay Shoreline, at Campland
Water Body ID: CAC906400002009042220532 8
Water Body Type: Coastal & Bay Shoreline

DECISION ID 43800 Region 9
Mission Bay Shoreline, at Campland

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not Delist from 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Do Not Delist from 303(d) list (TMDL required list)(2012)
Revision Status Revised
Sources: Source Unknown
Expected TMDL Completion Date: 2025
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for removal from the CWA section 303(d) List under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Sixteen lines of evidence are available in the administrative record to assess this pollutant. With new data for Total Coliform, 247 of the 576 samples exceed the Water Quality Objective of a single sample maximum of 230 /100 ml for Total Coliform for Shell Fish Harvesting. With new data for Enterococcus, 41 out of 144 samples exceed the Water Quality Objective of a geomean of 35/100 ml for REC-1 beneficial use for AB411 period.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. 247 of 576 samples exceeded the Water Quality Objective of a single sample maximum of 230 /100 ml for Total Coliform for Shell Fish Harvesting; and 41 out of 144 samples exceed the Water Quality Objective of a geomean of 35/100 ml for REC-1 beneficial use for AB411 period. The above exceed the allowable frequency listed in Table 4.2 and Section 4.3 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 43800, Indicator Bacteria Region 9
Mission Bay Shoreline, at Campland

LOE ID: 28673

Pollutant: Enterococcus
LOE Subgroup: Pollutant-Water

Matrix:	Water	040683
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	492	
Number of Exceedances:	124	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 492 single samples were collected with 124 samples exceeding the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Campland, San Diego, California. The monitoring station identification number is MB-080.	
Temporal Representation:	Samples were collected from January 1999 through October 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43800, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Campland

LOE ID:	28675
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	85
Number of Exceedances:	38
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 492 single samples were collected with 85 monthly geomeans calculated. Thirty eight of the 85 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. 040684 Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Campland, San Diego, California. The monitoring station identification number is MB-080.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43800, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Campland

LOE ID:	77605
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	84
Number of Exceedances:	30
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Thirty of the 84 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The Water Quality Control Plan for the San Diego Basin states that at all areas where shellfish may be harvested for human consumption, the median total coliform concentration throughout the water column for any 30-day period shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Mission Bay Shoreline, at Campland.
Temporal Representation:	The samples were collected from April 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43800, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Campland

LOE ID:	74337
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	85
Number of Exceedances:	22
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Twenty two of the 85 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Campland site. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Temporal Representation:	Samples were collected approximately once a week from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43800, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Campland

LOE ID:	74338
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	84
Number of Exceedances:	2
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Two of the 84 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	

Guideline Reference:	040686
Spatial Representation:	Samples were collected at Campland site.
Temporal Representation:	Samples were collected approximately once a week from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43800, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Campland

LOE ID:	74339
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	96
Number of Exceedances:	15
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed BW data for Mission Bay Shoreline, at Campland to determine beneficial use support and results are as follows: 15 of 96 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The Water Quality Control Plan (Basin Plan 2011)states the following: At all areas where shellfish may be harvested for human consumption, ten percent of the samples collected during any 30-day period shall not exceed 230 MPN/100mL.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Mission Bay Shoreline, at Campland was collected at 1 monitoring site [Campland swimming beach]
Temporal Representation:	Data was collected over the time period April 2008 to August 2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43800, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Campland

LOE ID:	74340
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	85
Number of Exceedances:	0

Data and Information Type:	Not Specified 040687
Data Used to Assess Water Quality:	Zero of the 85 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Campland site.
Temporal Representation:	Samples were collected approximately once a week from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43800, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Campland

LOE ID:	31158
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	59
Number of Exceedances:	19
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 335 dry month (April through October) single samples were collected with 59 dry month geomeans calculated. 19 of the 59 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Campland, San Diego, California. The monitoring station identification number is MB-080.
Temporal Representation:	Samples were collected from April 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the

QAPP Information Reference(s):	County of San Diego, Department Public Health Laboratory Quality Assurance Manual. County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43800, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Campland

LOE ID:	31159
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	53
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 285 dry month (April through October) single samples were collected with 53 dry month geomeans calculated. 4 of the 53 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Campland, San Diego, California. The monitoring station identification number is MB-080.
Temporal Representation:	Samples were collected from April 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43800, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Campland

LOE ID:	31160
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	59	040689
Number of Exceedances:	2	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 336 dry month (April through October) single samples were collected with 59 dry month geomeans calculated. 2 of the 59 geomeans exceeded the geomean water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Campland, San Diego, California. Station identification number is MB-080.	
Temporal Representation:	Samples were collected from April 1999 through October 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43800, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Campland

LOE ID:	30110
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	-N/A
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	378
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were 378 beach advisory days for this location. When a bacteriological sample exceeds water quality standards, signs are posted indicating that waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 to December 2007. Data used was the number of days the beach was posted with an Advisory when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	County of Orange. March 2007. Annual Ocean and Bay Water Quality Report, 2006 Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report

SWAMP Data:	Non-SWAMP	040690
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.	
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960	
Evaluation Guideline:		
Guideline Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Spatial Representation:	Bacteriological monitoring samples were collected at Campland in Mission Bay.	
Temporal Representation:	The beach advisory covers the time frame of January 2001 -December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43800, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Campland

LOE ID:	30783
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	472
Number of Exceedances:	5
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 492 single samples were collected of which 472 are dry weather (AB411) samples with five samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Campland, San Diego, California. Station identification is MB-

	080. 040691
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43800, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Campland

LOE ID:	28738
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	20
Number of Exceedances:	8
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through Octoeber 2007. A total of 492 single samples were collected with 20 samples correlated with a storm event. Eight of the 20 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Campland, San Diego, California. Station identification number is MB-080.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance

Line of Evidence (LOE) for Decision ID 43800, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Campland

LOE ID:	28647
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	492
Number of Exceedances:	217
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 492 single samples were collected with 217 samples exceeded the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Campland, San Diego, California. Station identification number is MB-080.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43800, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Campland

LOE ID:	30530
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	418
Number of Exceedances:	77
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999

	through October 2007. A total of 418 dry weather (AB411) single samples were collected with 77 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Campland, San Diego, California. The monitoring station identification number is MB-080.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43800, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Campland

LOE ID:	28633
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	20
Number of Exceedances:	17
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 492 single samples were collected with 20 samples correlated with a storm event. Seventeen of the 20 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:	040694
Guideline Reference:	
Spatial Representation:	Samples were collected from Campland, San Diego, California. Station location ID is MB-080.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43800, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Campland

LOE ID:	30341
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2933
Number of Exceedances:	959
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Below is a copy of the 2006 LOE for the data supporting the listing of Mission Bay Shoreline: Available data indicate sufficient exceedances of bacterial indicator objectives. There were 576 out of 3662 samples exceeding the single sample maximum for enterococci, 959 out of 2933 exceedances of the geomean enterococci, and 333 out samples exceeding the single sample maximum for fecal coliform (USEPA, 2007).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Title 17 C.C.R. Section 7958 states: Based on a single sample, the density of bacteria in water from each sampling station at a public beach or public water contact sports area shall not exceed: (A) 1,000 total coliform bacteria per 100 milliliters, if the ratio of fecal/total coliform bacteria exceeds 0.1; or (B) 10,000 total coliform bacteria per 100 milliliters; or (C) 400 fecal coliform bacteria per 100 milliliters; or (D) 104 enterococcus bacteria per 100 milliliters. Based on the mean of the logarithms of the results of at least five weekly samples during any 30-day sampling period, the density of bacteria in water from any sampling station at a public beach or public water contact sports area, shall not exceed: (A) 1,000 total coliform bacteria per 100 milliliters; or (B) 200 fecal coliform bacteria per 100 milliliters; or (C) 35 enterococcus bacteria per 100 milliliters (DHS, 1999).
Objective/Criterion Reference:	Placeholder reference 2006 303(d)

Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	In 2006, data from sampling sites along the Mission Bay shoreline were aggregated for the assessment. For 2008, the 2006 Mission Bay Shoreline segment has been split into smaller segments and each represents an area near the sampling location of the data being assessed. 'Mission Bay Shoreline, at Campland' is one of the sampling locations for Mission Bay Shoreline and is considered to be part of the original listing
Temporal Representation:	From 03/21/2000-10/30/2005.
Environmental Conditions:	
QAPP Information:	Data record: 2000-2005, San Diego County Health Dept.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43800, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Campland

LOE ID:	28737
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	85
Number of Exceedances:	9
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 492 single samples were collected with 85 monthly geomeans calculated. Nine of the 85 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Campland, San Diego, California. Station identification number is MB-080.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43800, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Campland

LOE ID:	28739
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	492
Number of Exceedances:	13
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 492 single samples were collected with 13 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Campland, San Diego, California. Station identification is MB-080.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43800, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Campland

LOE ID:	30546
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	471
Number of Exceedances:	110
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 492 single samples were collected of which 471 are dry weather (AB411) samples with 110 samples exceeding the single sample water quality objective.

Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007 040697
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Campland, San Diego, California. The monitoring station identification number is MB-080.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43800, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Campland

LOE ID:	28684
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	20
Number of Exceedances:	13
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 438 single samples were collected with 20 samples correlated with a storm event. Of the 21 samples, 13 exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:	040698
Guideline Reference:	
Spatial Representation:	Samples were collected from Campland, San Diego, California. The monitoring station identification number is MB-080.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43800, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Campland

LOE ID:	28685
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	438
Number of Exceedances:	90
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 438 single samples were collected with 90 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Campland, San Diego, California. The monitoring station identification number is MB-080.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43800, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Campland

LOE ID:	28695
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	78
Number of Exceedances:	7
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 438 single samples were collected and 78 geomeans calculated. Seven of the 78 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Campland, San Diego, California. The monitoring station identification number is MB-080.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43800, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Campland

LOE ID:	28674
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	21
Number of Exceedances:	14
Data and Information Type:	PWS pathogen monitoring (ambient water)

Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 492 single samples were collected with 21 samples correlated with a storm event. Fourteen of the 18 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Campland, San Diego, California. The monitoring station identification number is MB-080.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Mission Bay Shoreline, at De Anza Cove
Water Body ID: CAC906400002009042221061 2
Water Body Type: Coastal & Bay Shoreline

DECISION ID 44431 Region 9
Mission Bay Shoreline, at De Anza Cove

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal from the CWA section 303(d) List under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Sixteen lines of evidence are available in the administrative record to assess this pollutant. With the new information of Total Coliform, 196 of the 640 samples exceed the Water Quality Objective of a Single Sample Maximum of 230 /100 ml for the protection of SHELL beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. 196 of the 640 samples exceed the Water Quality Objective for Total Coliform of a Single Sample Maximum of 230 /100 ml for the protection of SHELL beneficial use, and this exceeds the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 44431, Indicator Bacteria Region 9
Mission Bay Shoreline, at De Anza Cove

LOE ID:	30547
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation	040702
Number of Samples:	421	
Number of Exceedances:	65	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 440 single samples were collected of which 421 are dry weather (AB411) samples with 65 samples exceeding the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at De Anza Cove near storm drain, San Diego, California. Station identification number is MB-070.	
Temporal Representation:	Samples were collected from January 1999 through October 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44431, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at De Anza Cove

LOE ID:	30342
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2933
Number of Exceedances:	959
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Below is a copy of the 2006 LOE for the data supporting the listing of Mission Bay Shoreline: Available data indicate sufficient exceedances of bacterial indicator objectives. There were 576 out of 3662 samples exceeding the single sample maximum for enterococci, 959 out of 2933 exceedances of the geomean enterococci, and 333 out samples exceeding the single sample maximum for fecal coliform (USEPA, 2007).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Title 17 C.C.R. Section 7958 states: Based on a single sample, the density of bacteria in water from each sampling station at a public beach or public water contact sports area shall not exceed: (A) 1,000 total coliform bacteria per 100 milliliters, if the ratio of fecal/total coliform bacteria exceeds 0.1; or (B) 10,000 total coliform bacteria per 100 milliliters; or (C) 400 fecal coliform bacteria per 100 milliliters; or (D) 104 enterococcus bacteria per 100 milliliters. Based on the mean of the logarithms of the results of at least five weekly samples during any 30-day sampling period, the density of bacteria in water from any sampling station at a public beach or public water contact sports area, shall not exceed: (A) 1,000 total coliform bacteria per 100 milliliters; or (B) 200 fecal coliform bacteria per 100 milliliters; or (C) 35 enterococcus bacteria per 100 milliliters (DHS, 1999).
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	In 2006, data from sampling sites along the Mission Bay shoreline were aggregated for the assessment. For 2008, the 2006 Mission Bay Shoreline segment has been split into smaller segments and each represents an area near the sampling location of the data being assessed. 'Mission Bay Shoreline, at De Anza Cove' is one of the sampling locations for Mission Bay Shoreline and is considered to be part of the original listing
Temporal Representation:	From 03/21/2000-10/30/2005.
Environmental Conditions:	
QAPP Information:	Data record: 2000-2005, San Diego County Health Dept.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44431, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at De Anza Cove

LOE ID:	31213
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	51
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 283 dry month (April through October) single samples were collected with 51 dry month geomeans calculated. 4 of the 51 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at De Anza Cove near storm drain, San Diego, California. Station identification number is MB-070.
Temporal Representation:	Samples were collected from April 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44431, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at De Anza Cove

LOE ID:	31214
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	60
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 324 dry month (April through October) single samples were collected with 60 dry month geomeans calculated. 2 of the 60 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at De Anza Cove near storm drain, San Diego, California. Station identification number is MB-070.
Temporal Representation:	Samples were collected from April 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44431, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at De Anza Cove

LOE ID:	30111	040705

Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	-N/A
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	168
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were 168 beach advisory days for this location. When a bacteriological sample exceeds water quality standards, signs are posted indicating that waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 to December 2007. Data used was the number of days the beach was posted with an Advisory when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	County of Orange. March 2007. Annual Ocean and Bay Water Quality Report, 2006 Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Spatial Representation:	Bacteriological monitoring samples were collected at De Anza Cove in Mission Bay.
Temporal Representation:	The beach advisory covers the time frame of January 2001 -December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44431, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at De Anza Cove

LOE ID:	30784
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	419
Number of Exceedances:	7
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 436 single samples were collected of which 419 are dry weather (AB411) samples with seven samples exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at De Anza Cove near storm drain, San Diego, California. Station identification number is MB-070.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44431, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at De Anza Cove

LOE ID:	30531
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	377
Number of Exceedances:	56
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 377 dry weather (AB411) single samples were collected with 56 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml;

	Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at De Anza Cove near storm drain, San Diego, California. Station identification number is MB-070.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44431, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at De Anza Cove

LOE ID:	28572
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	81
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 440 single samples were collected with 81 monthly geomeans calculated. Two of the 81 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at De Anza Cove near storm drain, San Diego, California. Station identification number is MB-070.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44431, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at De Anza Cove

LOE ID:	28573
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	73
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 395 single samples were collected and 73 geomeans calculated. Three of the 73 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at De Anza Cove near storm drain, San Diego, California. Station identification number is MB-070.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44431, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at De Anza Cove

LOE ID:	28574
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	81
Number of Exceedances:	25
Data and Information Type:	PWS pathogen monitoring (ambient water)

Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 440 single samples were collected with 81 monthly geomeans calculated. Twenty five of the 81 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at De Anza Cove near storm drain, San Diego, California. Station identification number is MB-070.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44431, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at De Anza Cove

LOE ID:	28565
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	17
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 436 single samples were collected with 17 samples correlated with a storm event. Three of the 17 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).

Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at De Anza Cove near storm drain, San Diego, California. Station identification number is MB-070.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44431, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at De Anza Cove

LOE ID:	28566
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	395
Number of Exceedances:	65
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 395 single samples were collected with 65 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at De Anza Cove near storm drain, San Diego, California. Station identification number is MB-070.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	

QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44431, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at De Anza Cove

LOE ID:	28568
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	18
Number of Exceedances:	9
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 395 single samples were collected with 18 samples correlated with a storm event. Nine of the 18 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at De Anza Cove near storm drain, San Diego, California. Station identification number is MB-070.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44431, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at De Anza Cove

LOE ID:	28562
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water

Matrix:	Water	040712
Fraction:	None	
Beneficial Use:	Shellfish Harvesting	
Number of Samples:	436	
Number of Exceedances:	149	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 436 single samples were collected with 149 samples exceeded the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at DeAnza Cove near storm drain, San Diego, California. Station identification number is MB-070.	
Temporal Representation:	Samples were collected from January 1999 through October 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44431, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at De Anza Cove

LOE ID:	28563
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	17
Number of Exceedances:	12
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 436 single samples were collected with 17 samples correlated with a storm event. Twelve of the 17 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data:	Non-SWAMP	040713
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at De Anza Cove near storm drain, San Diego, California. Station identification number is MB-070.	
Temporal Representation:	Samples were collected from January 1999 through October 2007.	
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44431, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at De Anza Cove

LOE ID:	28564
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	436
Number of Exceedances:	10
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 436 single samples were collected with 10 samples exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	

Guideline Reference:	040714
Spatial Representation:	Samples were collected at De Anza Cove near storm drain, San Diego, California. Station identification number is MB-070.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44431, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at De Anza Cove

LOE ID:	28569
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	440
Number of Exceedances:	76
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 440 single samples were collected with 76 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at De Anza Cove near storm drain, San Diego, California. Station identification number is MB-070.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44431, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at De Anza Cove

LOE ID:	28571
Pollutant:	Enterococcus

LOE Subgroup:	Pollutant-Water	040715
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	19	
Number of Exceedances:	11	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 440 single samples were collected with 19 samples correlated with a storm event. Eleven of the 19 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.	
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at De Anza Cove near storm drain, San Diego, California. Station identification number is MB-070.	
Temporal Representation:	Samples were collected from January 1999 through October 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44431, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at De Anza Cove

LOE ID:	31212
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	60
Number of Exceedances:	14
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 327 dry month (April through October) single samples were collected with 60 dry month geomeans calculated. 14 of the 60 geomeans exceeded the

geomean water quality objective. 040716

Data Reference: Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: Geomean: Enterococcus density shall not exceed 35 per 100 ml.

Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).

Objective/Criterion Reference: Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at De Anza Cove near storm drain, San Diego, California. Station identification number is MB-070.

Temporal Representation: Samples were collected from April 1999 through October 2007.

Environmental Conditions:

QAPP Information: Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.

QAPP Information Reference(s): County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44431, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at De Anza Cove

LOE ID: 74341

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Shellfish Harvesting

Number of Samples: 204
Number of Exceedances: 47

Data and Information Type: PATHOGEN MONITORING

Data Used to Assess Water Quality: Water Board staff assessed bw data for Mission Bay Shoreline, at De Anza Cove to determine beneficial use support and results are as follows: 47 of 204 samples exceed the criterion for Coliform, Total.

Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The Water Quality Control Plan (Basin Plan 2011)states the following: At all areas where shellfish may be harvested for human consumption, ten percent of the samples collected during any 30-day period shall not exceed 230 MPN/100mL.

Objective/Criterion Reference: Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Data for this line of evidence for Mission Bay Shoreline, at De Anza Cove was collected at 2 monitoring sites [De Anza Cove west, De Anza Cove]

Temporal Representation: Data was collected over the time period 1/13/2005-8/24/2010.

Environmental Conditions: Staff is not aware of any special conditions that might affect interpretation of the data.

QAPP Information: The samples were collected for the Beach Watch program.

QAPP Information Reference(s): 040717

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Mission Bay Shoreline, at Fanual Park
Water Body ID: CAC907510002009042220483 6
Water Body Type: Coastal & Bay Shoreline

DECISION ID 44432 Region 9
Mission Bay Shoreline, at Fanual Park

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal from the CWA section 303(d) List under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Sixteen lines of evidence are available in the administrative record to assess this pollutant. Considering the latest Total Coliform data, 74 of the 420 samples exceed the criteria for Total Coliform of a SSM of 230/100 ml for the protection of SHELL.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Considering the latest Total Coliform data, 74 of the 420 samples exceed the criteria for Total Coliform of a SSM of 230/100 ml for the protection of SHELL and this exceeds the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 44432, Indicator Bacteria Region 9
Mission Bay Shoreline, at Fanual Park

LOE ID:	28672
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation	040719
Number of Samples:	356	
Number of Exceedances:	41	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 356 single samples were collected with 41 samples exceeding the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Fanuel Park, San Diego, California. Station identification number is MB-120.	
Temporal Representation:	Samples were collected from January 1999 through October 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44432, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Fanual Park

LOE ID:	28665
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	15
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 356 single samples were collected with 15 samples correlated with a storm event. Four of the 15 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Fanuel Park, San Diego, California. Station identification number is MB-120.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44432, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Fanual Park

LOE ID:	77606
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	59
Number of Exceedances:	3
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Three of the 59 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The Water Quality Control Plan for the San Diego Basin states that at all areas where shellfish may be harvested for human consumption, the median total coliform concentration throughout the water column for any 30-day period shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Mission Bay Shoreline, at Fanual Park.
Temporal Representation:	The samples were collected from April 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44432, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Fanual Park 040721

LOE ID:	74343
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	60
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 60 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Fanuel Park site.
Temporal Representation:	Samples were collected approximately once a week from April 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44432, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Fanual Park

LOE ID:	74344
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	60
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 60 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Fanuel Park site.

Temporal Representation: Samples were collected approximately once a week from April 2008 to August 2010.
Environmental Conditions:
QAPP Information: The samples were collected for the beach watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 44432, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Fanual Park

LOE ID: 74345

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Shellfish Harvesting

Number of Samples: 68
Number of Exceedances: 6

Data and Information Type: PATHOGEN MONITORING
Data Used to Assess Water Quality: Water Board staff assessed BW data for Mission Bay Shoreline, at Fanual Park to determine beneficial use support and results are as follows: 6 of 68 samples exceed the criterion for Coliform, Total.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The Water Quality Control Plan (Basin Plan 2011)states the following: At all areas where shellfish may be harvested for human consumption, ten percent of the samples collected during any 30-day period shall not exceed 230 MPN/100mL.
Objective/Criterion Reference: Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Data for this line of evidence for Mission Bay Shoreline, at Fanual Park was collected at 1 monitoring site [Fanuel Park]
Temporal Representation: Data was collected over the time period 4/2/2008-8/24/2010.
Environmental Conditions: Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 44432, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Fanual Park

LOE ID: 74346

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 60
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Zero of the 60 geomeans exceeded the objective.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Fanuel Park site.
Temporal Representation:	Samples were collected approximately once a week from April 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44432, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Fanual Park

LOE ID:	30343
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2933
Number of Exceedances:	959
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Below is a copy of the 2006 LOE information for the data used to support the listing of Mission Bay Shoreline: Available data indicate sufficient exceedances of bacterial indicator objectives. There were 576 out of 3662 samples exceeding the single sample maximum for enterococci, 959 out of 2933 exceedances of the geomean enterococci, and 333 out samples exceeding the single sample maximum for fecal coliform (USEPA, 2007).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Title 17 C.C.R. Section 7958 states: Based on a single sample, the density of bacteria in water from each sampling station at a public beach or public water contact sports area shall not exceed: (A) 1,000 total coliform bacteria per 100 milliliters, if the ratio of fecal/total coliform bacteria exceeds 0.1; or (B) 10,000 total coliform bacteria per 100 milliliters; or (C) 400 fecal coliform bacteria per 100 milliliters; or (D) 104 enterococcus bacteria per 100 milliliters. Based on the mean of the logarithms of the results of at least five weekly samples during any 30-day sampling period, the density of bacteria in water from any sampling station at a public beach or public water contact sports area, shall not exceed: (A) 1,000 total coliform bacteria per 100 milliliters; or (B) 200 fecal coliform bacteria per 100 milliliters; or (C) 35 enterococcus bacteria per 100 milliliters (DHS, 1999).
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	In 2006, data from sampling sites along the Mission Bay shoreline were aggregated for the assessment. For 2008, the 2006 Mission Bay Shoreline segment has been split into smaller segments and each represents an area near the sampling location of the data being assessed. 'Mission Bay Shoreline, at Fanual Park' is one of the sampling locations for Mission Bay Shoreline and is considered to be part of the original listing
Temporal Representation:	From 03/21/2000-10/30/2005.
Environmental Conditions:	
QAPP Information:	Data record: 2000-2005, San Diego County Health Dept.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44432, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Fanual Park

LOE ID:	31163
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	59
Number of Exceedances:	6
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 297 dry month (April through October) single samples were collected with 59 dry month geomeans calculated. 6 of the 59 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Fanuel Park, San Diego, California. Station identification number is MB-120.
Temporal Representation:	Samples were collected from April 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44432, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Fanual Park

LOE ID:	31161

Pollutant:	Enterococcus	040725
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	59	
Number of Exceedances:	1	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 301 dry month (April through October) single samples were collected with 59 dry month geomeans calculated. 1 of the 59 geomeans exceeded the geomean water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Fanuel Park, San Diego, California. Station identification number is MB-120.	
Temporal Representation:	Samples were collected from April 1999 through October 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44432, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Fanual Park

LOE ID:	31162
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	51
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 250 dry month (April through October) single samples were collected with 51 dry month geomeans calculated. 1 of the 51 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Fanuel Park, San Diego, California. Station identification number is MB-120.
Temporal Representation:	Samples were collected from April 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44432, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Fanual Park

LOE ID:	30112
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	-N/A
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	48
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were 48 beach advisory days for this location. When a bacteriological sample exceeds water quality standards, signs are posted indicating that waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 to December 2007. Data used was the number of days the beach was posted with an Advisory when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	County of Orange. March 2007. Annual Ocean and Bay Water Quality Report, 2006 Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.

Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960	040727
Evaluation Guideline:		
Guideline Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Spatial Representation:	Bacteriological monitoring samples were collected at Fanuel Park in Mission Bay.	
Temporal Representation:	The beach advisory covers the time frame of January 2001 -December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44432, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Fanual Park

LOE ID:	30785
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	337
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 352 single samples of which 337 are dry weather (AB411) samples were collected with two samples exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Fanuel Park, San Diego, California. Station identification is MB-120.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44432, Indicator Bacteria 040728 Region 9

Mission Bay Shoreline, at Fanual Park

LOE ID:	30532
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	300
Number of Exceedances:	19
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 300 dry weather (AB411) single samples were collected with 19 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Fanuel Park, San Diego, California. Station identification number is MB-120.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44432, Indicator Bacteria Region 9

Mission Bay Shoreline, at Fanual Park

LOE ID:	30548
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	341
Number of Exceedances:	37
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999

	through October 2007. A total of 356 single samples were collected of which 349 are dry weather (ABN411) samples with 37 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Fanuel Park, San Diego, California. Station identification number is MB-120.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44432, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Fanual Park

LOE ID:	28735
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	15
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 352 single samples were collected with 15 samples correlated with a storm event. None of the 15 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005.

	Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency 040730
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Fanuel Park, San Diego, California. Station identification number is MB-120.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44432, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Fanual Park

LOE ID:	28731
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	352
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 352 single samples were collected with 2 samples exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Fanuel Park, San Diego, California. Station identification is MB-120.
Temporal Representation:	Samples were collected from January 1999 through October 2007.

Environmental Conditions:	040731
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44432, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Fanual Park

LOE ID:	28651
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	15
Number of Exceedances:	7
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 352 single samples were collected with 15 samples correlated with a storm event. Seven of the 15 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Fanuel Park, San Diego, California. Station location ID is MB-120.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44432, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Fanual Park 040732

LOE ID:	28688
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	14
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 314 single samples were collected with 14 samples correlated with a storm event. Three of the 14 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Fanuel Park, San Diego, California. Station identification number is MB-120.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44432, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Fanual Park

LOE ID:	28689
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	314
Number of Exceedances:	22
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 314 single samples were collected with 22 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Fanuel Park, San Diego, California. Station identification number is MB-120.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44432, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Fanual Park

LOE ID:	28654
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	352
Number of Exceedances:	68
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 352 single samples were collected with 68 samples exceeded the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Fanuel Park, San Diego, California. Station identification number is MB-120.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44432, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Fanual Park

LOE ID:	28693
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	70
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 314 single samples were collected and 70 geomeans calculated. One of the 70 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Fanuel Park, San Diego, California. Station identification number is MB-120.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44432, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Fanual Park

LOE ID:	28677

Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	78
Number of Exceedances:	12
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 356 single samples were collected with 78 monthly geomeans calculated. Twelve of the 78 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Fanuel Park, San Diego, California. Station identification number is MB-120.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44432, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Fanual Park

LOE ID:	28743
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	78
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 352 single samples were collected with 78 monthly geomeans calculated. Two of the 78 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program,

	2007. AB 411 monitoring data 1999 to 2007	040736
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Fanuel Park, San Diego, California. Station identification number is MB-120.	
Temporal Representation:	Samples were collected from January 1999 through October 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Mission Bay Shoreline, at Fiesta Island Bridge
Water Body ID: CAC907110002009042221255 0
Water Body Type: Coastal & Bay Shoreline

DECISION ID 43617 Region 9
Mission Bay Shoreline, at Fiesta Island Bridge

Pollutant: Indicator Bacteria
Final Listing Decision: Delist from 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Delist from 303(d) list (TMDL required list)(2012)
Revision Status Revised
Reason for Delisting: Applicable WQS attained; reason for recovery unspecified
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for removal from the CWA section 303(d) List under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Fifteen lines of evidence are available in the administrative record to assess this pollutant. With the new data for Enterococcus, one of the 65 samples exceeded the 30-day geomean criterion of 35 cfu/100 ml for enterococcus in marine water for REC-1 beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the new data for Enterococcus, one of the 65 samples exceeded the 30-day geomean criterion of 35 cfu/100 ml for enterococcus in marine water for REC-1 beneficial use and this does not exceed the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be removed from the section 303(d) list because applicable water quality standards for the pollutant are not being exceeded.

Line of Evidence (LOE) for Decision ID 43617, Indicator Bacteria Region 9
Mission Bay Shoreline, at Fiesta Island Bridge

LOE ID: 31217

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples:	43	040738
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 171 dry month (April through October) single samples were collected with 43 dry month geomeans calculated. None of the 43 geomeans exceeded the geomean water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Fiesta Island Bridge, San Diego, California. Station identification number is MB-010.	
Temporal Representation:	Samples were collected from April 1999 through October 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43617, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Fiesta Island Bridge

LOE ID:	28549
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	237
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 237 single samples were collected with one sample exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml

	(SWRCB, 2005). 040739
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Fiesta Island Bridge, San Diego, California. Station identification number is MB-010.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43617, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Fiesta Island Bridge

LOE ID:	28553
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	14
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 206 single samples were collected with 14 samples correlated with a storm event. Three of the 14 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Fiesta Island Bridge, San Diego, California. Station identification number is MB-010.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.

	Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43617, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Fiesta Island Bridge

LOE ID:	28557
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	48
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 206 single samples were collected and 48 geomeans calculated. None of the 48 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Fiesta Island Bridge, San Diego, California. Station identification number is MB-010.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43617, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Fiesta Island Bridge

LOE ID:	30786
Pollutant:	Total Coliform

LOE Subgroup:	Pollutant-Water	040741
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	222	
Number of Exceedances:	1	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 237 single samples were collected of which 222 are dry weather (AB411) samples with one sample exceeding the single sample water quality objective.	
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Fiesta Island Bridge, San Diego, California. Station identification number is MB-010.	
Temporal Representation:	Samples were collected from January 1999 through October 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43617, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Fiesta Island Bridge

LOE ID:	31216
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	34
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 140 dry month (April through October) single samples were collected with 34 dry month geomeans calculated. None of the 34 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program,

	2007. AB 411 monitoring data 1999 to 2007	040742

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Fiesta Island Bridge, San Diego, California. Station identification number is MB-010.
Temporal Representation:	Samples were collected from April 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43617, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Fiesta Island Bridge

LOE ID:	31215
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	43
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 180 dry month (April through October) single samples were collected with 43 dry month geomeans calculated. 1 of the 43 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Fiesta Island Bridge, San Diego, California. Station identification number is MB-010.

Temporal Representation:	Samples were collected from April 1999 through October 2007.	040743
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43617, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Fiesta Island Bridge

LOE ID:	30113
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	-N/A
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	6
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were six beach advisory days for this location. When a bacteriological sample exceeds water quality standards, signs are posted indicating that waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 to December 2007. Data used was the number of days the beach was posted with an Advisory when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	County of Orange. March 2007. Annual Ocean and Bay Water Quality Report, 2006 Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Spatial Representation:	Bacteriological monitoring samples were collected at Fiesta Island Bridge in Mission Bay.
Temporal Representation:	The beach advisory covers the time frame of January 2001 -December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43617, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Fiesta Island Bridge 040744

LOE ID:	30344
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2933
Number of Exceedances:	959
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Below is a copy of the 2006 LOE information for the data used to support the listing of Mission Bay Shoreline: Available data indicate sufficient exceedances of bacterial indicator objectives. There were 576 out of 3662 samples exceeding the single sample maximum for enterococci, 959 out of 2933 exceedances of the geomean enterococci, and 333 out samples exceeding the single sample maximum for fecal coliform (USEPA, 2007).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Title 17 C.C.R. Section 7958 states: Based on a single sample, the density of bacteria in water from each sampling station at a public beach or public water contact sports area shall not exceed: (A) 1,000 total coliform bacteria per 100 milliliters, if the ratio of fecal/total coliform bacteria exceeds 0.1; or (B) 10,000 total coliform bacteria per 100 milliliters; or (C) 400 fecal coliform bacteria per 100 milliliters; or (D) 104 enterococcus bacteria per 100 milliliters. Based on the mean of the logarithms of the results of at least five weekly samples during any 30-day sampling period, the density of bacteria in water from any sampling station at a public beach or public water contact sports area, shall not exceed: (A) 1,000 total coliform bacteria per 100 milliliters; or (B) 200 fecal coliform bacteria per 100 milliliters; or (C) 35 enterococcus bacteria per 100 milliliters (DHS, 1999).
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	In 2006, data from sampling sites along the Mission Bay shoreline were aggregated for the assessment. For 2008, the 2006 Mission Bay Shoreline segment has been split into smaller segments and each represents an area near the sampling location of the data being assessed. 'Mission Bay Shoreline, at Fiesta Island Bridge' is one of the sampling locations for Mission Bay Shoreline and is considered to be part of the original listing
Temporal Representation:	From 03/21/2000-10/30/2005.
Environmental Conditions:	
QAPP Information:	Data record: 2000-2005, San Diego County Health Dept.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43617, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Fiesta Island Bridge

LOE ID:	28554
Pollutant:	Enterococcus

LOE Subgroup:	Pollutant-Water	040745
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	245	
Number of Exceedances:	22	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 245 single samples were collected with 22 samples exceeding the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Fiesta Island Bridge, San Diego, California. Station identification number is MB-010.	
Temporal Representation:	Samples were collected from January 1999 through October 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43617, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Fiesta Island Bridge

LOE ID:	74350
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	22
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 22 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not

	exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Fiesta Island Bridge site.
Temporal Representation:	Samples were collected approximately once a week from April 2008 to September 2008.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43617, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Fiesta Island Bridge

LOE ID:	74349
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	24
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed BW data for Mission Bay Shoreline, at Fiesta Island Bridge to determine beneficial use support and results are as follows: 0 of 24 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The Water Quality Control Plan (Basin Plan 2011)states the following: At all areas where shellfish may be harvested for human consumption, ten percent of the samples collected during any 30-day period shall not exceed 230 MPN/100mL.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Mission Bay Shoreline, at Fiesta Island Bridge was collected at 1 monitoring site [Fiesta Island Bridge]
Temporal Representation:	Data was collected over the time period 4/2/2008-9/23/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43617, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Fiesta Island Bridge

LOE ID:	74348
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	22
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 22 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Fiesta Island Bridge site.
Temporal Representation:	Samples were collected approximately once a week from April 2008 to September 2008.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43617, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Fiesta Island Bridge

LOE ID:	74347
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	22
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 22 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Fiesta Island Bridge site.
Temporal Representation:	Samples were collected approximately once a week from April 2008 to September 2008.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43617, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Fiesta Island Bridge 040748

LOE ID:	77607
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	21
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Zero of the twenty-one samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The Water Quality Control Plan for the San Diego Basin states that at all areas where shellfish may be harvested for human consumption, the median total coliform concentration throughout the water column for any 30-day period shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Mission Bay Shoreline, at Fiesta Island Bridge.
Temporal Representation:	The samples were collected from April 2008 to September 2008.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43617, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Fiesta Island Bridge

LOE ID:	28547
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	237
Number of Exceedances:	34
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 237 single samples were collected with 34 samples exceeded the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Fiesta Island Bridge, San Diego, California. Station identification number is MB-010.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43617, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Fiesta Island Bridge

LOE ID:	28548
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	15
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 237 single samples were collected with 15 samples correlated with a storm event. Four of the 15 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005). Comparisons are also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Fiesta Island Bridge, San Diego, California. Station identification number is MB-010.
Temporal Representation:	Samples were collected from January 1999 through October 2007.

Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43617, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Fiesta Island Bridge

LOE ID:	28558
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	57
Number of Exceedances:	8
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 245 single samples were collected with 57 monthly geomeans calculated. Eight of the 57 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Fiesta Island Bridge, San Diego, California. Station identification number is MB-010.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43617, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Fiesta Island Bridge

LOE ID:	30533	040751
Pollutant:	Fecal Coliform	
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	192	
Number of Exceedances:	12	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 192 dry weather (AB411) single samples were collected with 12 samples exceeding the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Fiesta Island Bridge, San Diego, California. Station identification number is MB-010.	
Temporal Representation:	Samples were collected from January 1999 through October 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43617, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Fiesta Island Bridge

LOE ID:	30550
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	230
Number of Exceedances:	16
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 245 single samples were collected of which 230 are dry weather (AB411) samples with 16 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program,

	2007. AB 411 monitoring data 1999 to 2007 040752
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Fiesta Island Bridge, San Diego, California. Station identification number is MB-010.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43617, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Fiesta Island Bridge

LOE ID:	28556
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	57
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 237 single samples were collected with 57 monthly geomeans calculated. None of the 57 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Fiesta Island Bridge, San Diego, California. Station identification number is MB-010.

Temporal Representation:	Samples were collected from January 1999 through October 2007. 040753
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43617, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Fiesta Island Bridge

LOE ID:	28555
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	15
Number of Exceedances:	6
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 245 single samples were collected with 15 samples correlated with a storm event. Six of the 15 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Fiesta Island Bridge, San Diego, California. Station identification number is MB-010.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43617, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Fiesta Island Bridge

LOE ID:	28552
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	206
Number of Exceedances:	15
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 206 single samples were collected with 15 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Fiesta Island Bridge, San Diego, California. Station identification number is MB-010.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43617, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Fiesta Island Bridge

LOE ID:	28550
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	15
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)

Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 237 single samples were collected with 15 samples correlated with a storm event. None of the 15 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Fiesta Island Bridge, San Diego, California. Station identification number is MB-010.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Mission Bay Shoreline, at Leisure Lagoon
Water Body ID: CAC906400002009042221171 7
Water Body Type: Coastal & Bay Shoreline

DECISION ID 43805 **Region 9**
Mission Bay Shoreline, at Leisure Lagoon

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal from the CWA section 303(d) List under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Sixteen lines of evidence are available in the administrative record to assess this pollutant. One hundred and fifty six of the 570 samples exceed the WQO of a SSM of 230 / 100ml for total coliform for the protection of SHELL.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One hundred and fifty six of the 570 samples exceed the WQO of a SSM of 230 / 100ml for total coliform for the protection of SHELL and this exceeds the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 43805, Indicator Bacteria **Region 9**
Mission Bay Shoreline, at Leisure Lagoon

LOE ID:	30534
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation	040757
Number of Samples:	330	
Number of Exceedances:	16	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 330 dry weather (AB411) single samples were collected with 16 samples exceeding the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Leisure Lagoon near storm drain, San Diego, California. Station identification number is MB-050.	
Temporal Representation:	Samples were collected from January 1999 through October 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43805, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Leisure Lagoon

LOE ID:	30551
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	376
Number of Exceedances:	31
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 394 single samples were collected of which 376 are dry weather (AB411) samples with 31 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB,

	2005). 040758
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Leisure Lagoon near storm drain, San Diego, California. Station identification number is MB-050.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43805, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Leisure Lagoon

LOE ID:	28599
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	73
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 348 single samples were collected and 73 geomeans calculated. One of the 73 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Leisure Lagoon near storm drain, San Diego, California. Station identification number is MB-050.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43805, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Leisure Lagoon 040759

LOE ID:	28600
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	80
Number of Exceedances:	17
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 394 single samples were collected with 80 monthly geomeans calculated. Seventeen of the 80 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Leisure Lagoon near storm drain, San Diego, California. Station identification number is MB-050.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43805, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Leisure Lagoon

LOE ID:	28589
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	392
Number of Exceedances:	114
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 392 single samples were collected with 114 samples

exceeded the single sample water quality objective. 040760

Data Reference: Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).

Objective/Criterion Reference: Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Leisure Lagoon near storm drain, San Diego, California. Station identification number is MB-050.

Temporal Representation: Samples were collected from January through October 2007.

Environmental Conditions:

QAPP Information: Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.

QAPP Information Reference(s): County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43805, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Leisure Lagoon

LOE ID: 28590

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Shellfish Harvesting

Number of Samples: 18
Number of Exceedances: 12

Data and Information Type: PWS pathogen monitoring (ambient water)

Data Used to Assess Water Quality: Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 391 single samples were collected with 18 samples correlated with a storm event. Twelve of the 18 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.

Data Reference: National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).

Objective/Criterion Reference: Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:
Guideline Reference:

Spatial Representation:	Samples were collected at Leisure Lagoon near storm drain, San Diego, California. Station identification number is MB-050.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43805, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Leisure Lagoon

LOE ID:	28591
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	391
Number of Exceedances:	9
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 391 single samples were collected with nine samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Leisure Lagoon near storm drain, San Diego, California. Station identification number is MB-050.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43805, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Leisure Lagoon 040762

LOE ID:	28598
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	80
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 391 single samples were collected with 80 monthly geomeans calculated. Three of the 80 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Leisure Lagoon near storm drain, San Diego, California. Station identification number is MB-050.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43805, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Leisure Lagoon

LOE ID:	31218
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	60
Number of Exceedances:	6
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 299 dry month (April through October) single samples were

	collected with 60 dry month geomeans calculated. 6 of the 60 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Leisure Lagoon near storm drain, San Diego, California. Station identification number is MB-050.
Temporal Representation:	Samples were collected from April 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43805, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Leisure Lagoon

LOE ID:	31219
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	52
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 254 dry month (April through October) single samples were collected with 52 dry month geomeans calculated. 1 of the 52 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at Leisure Lagoon near storm drain, San Diego, California. Station identification number is MB-050.
Temporal Representation:	Samples were collected from April 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43805, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Leisure Lagoon

LOE ID:	31220
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	60
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 297 dry month (April through October) single samples were collected with 60 dry month geomeans calculated. 2 of the 60 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Leisure Lagoon near storm drain, San Diego, California. Station identification number is MB-050.
Temporal Representation:	Samples were collected from April 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43805, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Leisure Lagoon

LOE ID:	30115
Pollutant:	Indicator Bacteria

LOE Subgroup:	Health Advisories	040765
Matrix:	-N/A	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	2555	
Number of Exceedances:	68	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were 68 beach advisory days for this location. When a bacteriological sample exceeds water quality standards, signs are posted indicating that waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 to December 2007. Data used was the number of days the beach was posted with an Advisory when the ocean or bay failed to meet the bacteriological standards.	
Data Reference:	County of Orange. March 2007. Annual Ocean and Bay Water Quality Report, 2006 Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.	
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960	
Evaluation Guideline:		
Guideline Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Spatial Representation:	Bacteriological monitoring samples were collected at Leisure Lagoon in Mission Bay.	
Temporal Representation:	The beach advisory covers the time frame of January 2001 -December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43805, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Leisure Lagoon

LOE ID:	28592
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	18
Number of Exceedances:	3

Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 391 single samples were collected with 18 samples correlated with a storm event. Three of the 18 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Leisure Lagoon near storm drain, San Diego, California. Station identification number is MB-050.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43805, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Leisure Lagoon

LOE ID:	28593
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	348
Number of Exceedances:	23
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 348 single samples were collected with 23 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program,

	2007. AB 411 monitoring data 1999 to 2007	040767

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Leisure Lagoon near storm drain, San Diego, California. Station identification number is MB-050.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43805, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Leisure Lagoon

LOE ID:	28594
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	18
Number of Exceedances:	7
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 348 single samples were collected with 18 samples correlated with a storm event. Seven of the 18 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	

Guideline Reference:	040768
Spatial Representation:	Samples were collected at Leisure Lagoon near storm drain, San Diego, California. Station identification number is MB-050.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43805, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Leisure Lagoon

LOE ID:	28595
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	394
Number of Exceedances:	42
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 394 single samples were collected with 42 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Leisure Lagoon near storm drain, San Diego, California. Station identification number is MB-050.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43805, Indicator Bacteria 040769 Region 9

Mission Bay Shoreline, at Leisure Lagoon

LOE ID:	28596
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	18
Number of Exceedances:	11
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 394 single samples were collected with 18 samples correlated with a storm event. Eleven of the 18 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Leisure Lagoon near storm drain, San Diego, California. Station identification number is MB-050.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43805, Indicator Bacteria Region 9

Mission Bay Shoreline, at Leisure Lagoon

LOE ID:	74352

Pollutant:	Total Coliform	040770
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Shellfish Harvesting	
Number of Samples:	186	
Number of Exceedances:	44	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed bw data for Mission Bay Shoreline, at Leisure Lagoon to determine beneficial use support and results are as follows: 44 of 186 samples exceed the criterion for Coliform, Total.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The Water Quality Control Plan (Basin Plan 2011)states the following: At all areas where shellfish may be harvested for human consumption, ten percent of the samples collected during any 30-day period shall not exceed 230 MPN/100mL.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Mission Bay Shoreline, at Leisure Lagoon was collected at 2 monitoring sites [Leisure Lagoon swim area, Leisure Lagoon drain] The data for these two stations were averaged when sampled on the same day. The stations are within 200 meters.	
Temporal Representation:	Data was collected over the time period 1/13/2005-8/24/2010.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43805, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Leisure Lagoon

LOE ID:	74353
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	178
Number of Exceedances:	42
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed bw data for Mission Bay Shoreline, at Leisure Lagoon to determine beneficial use support and results are as follows: 42 of 178 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The Water Quality Control Plan (Basin Plan 2011)states the following: At all areas where shellfish may be harvested for human consumption, ten percent of the samples collected during any 30-day period shall not exceed 230 MPN/100mL.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Mission Bay Shoreline, at Leisure Lagoon was collected at 1 monitoring site [MB-053]
Temporal Representation:	Data was collected over the time period 5/3/2005-8/24/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43805, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Leisure Lagoon

LOE ID:	30787
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	373
Number of Exceedances:	6
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 391 single samples were collected of which 373 are dry weather (AB411) samples with sixsamples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Leisure Lagoon near storm drain, San Diego, California. Station identification number is MB-050.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43805, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Leisure Lagoon

LOE ID:	30346

Pollutant:	Indicator Bacteria	040772
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	2933	
Number of Exceedances:	959	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Below is a copy of the 2006 LOE information for the data used to support the listing of Mission Bay Shoreline: Available data indicate sufficient exceedances of bacterial indicator objectives. There were 576 out of 3662 samples exceeding the single sample maximum for enterococci, 959 out of 2933 exceedances of the geomean enterococci, and 333 out samples exceeding the single sample maximum for fecal coliform (USEPA, 2007).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Title 17 C.C.R. Section 7958 states: Based on a single sample, the density of bacteria in water from each sampling station at a public beach or public water contact sports area shall not exceed: (A) 1,000 total coliform bacteria per 100 milliliters, if the ratio of fecal/total coliform bacteria exceeds 0.1; or (B) 10,000 total coliform bacteria per 100 milliliters; or (C) 400 fecal coliform bacteria per 100 milliliters; or (D) 104 enterococcus bacteria per 100 milliliters. Based on the mean of the logarithms of the results of at least five weekly samples during any 30-day sampling period, the density of bacteria in water from any sampling station at a public beach or public water contact sports area, shall not exceed: (A) 1,000 total coliform bacteria per 100 milliliters; or (B) 200 fecal coliform bacteria per 100 milliliters; or (C) 35 enterococcus bacteria per 100 milliliters (DHS, 1999).	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	In 2006, data from sampling sites along the Mission Bay shoreline were aggregated for the assessment. For 2008, the 2006 Mission Bay Shoreline segment has been split into smaller segments and each represents an area near the sampling location of the data being assessed. 'Mission Bay Shoreline, at Leisure Lagoon' is one of the sampling locations for Mission Bay Shoreline and is considered to be part of the original listing	
Temporal Representation:	From 03/21/2000-10/30/2005.	
Environmental Conditions:		
QAPP Information:	Data record: 2000-2005, San Diego County Health Dept.	
QAPP Information Reference(s):		

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Mission Bay Shoreline, at North Crown Point
Water Body ID: CAC906400002009042220592 1
Water Body Type: Coastal & Bay Shoreline

DECISION ID 43882 **Region 9**
Mission Bay Shoreline, at North Crown Point

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal from the CWA section 303(d) List under section 4.2 and 4.3 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Sixteen lines of evidence are available in the administrative record to assess this pollutant. With the latest information, 12 of the 121 samples exceed the Water Quality Criteria for enterococcus of a geomean of 35 cfu/100 ml for REC-1 in AB411 period, and 63 out of 380 exceed the WQ criteria for total coliform of a geomean of 70 cfu/ 100 ml for SHELL.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest information, 12 of the 121 samples exceed the Water Quality Objective (WQO) for enterococcus of a geomean of 35 cfu/100 ml for REC-1 in AB411 period, and 63 out of 380 exceed the WQO for total coliform of a geomean of 70 cfu/ 100 ml for SHELL.and this exceeds the allowable frequency listed in Table 4.2 and under section 4.3 (for AB 411 period) of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 43882, Indicator Bacteria **Region 9**
Mission Bay Shoreline, at North Crown Point

LOE ID:	31222
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water

Matrix:	Water	040774
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	60	
Number of Exceedances:	9	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 295 dry month (April through October) single samples were collected with 60 dry month geomeans calculated. 9 of the 60 geomeans exceeded the geomean water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from N. Crown Point, San Diego, California. The monitoring station identification number is MB-090.	
Temporal Representation:	Samples were collected from April 1999 through October 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43882, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at North Crown Point

LOE ID:	28657
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	20
Number of Exceedances:	10
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2006. A total of 312 single samples were collected with 20 samples correlated with a storm event. Ten of the 20 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station

	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from N. Crown Point, San Diego, California. The monitoring station identification number is MB-090.
Temporal Representation:	Samples were collected from January 1999 through October 2006.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43882, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at North Crown Point

LOE ID:	30552
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	292
Number of Exceedances:	27
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2006. A total of 312 single samples were collected of which 292 are dry weather (AB411) samples with 27 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005.

	Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

040776

Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from N. Crown Point, San Diego, California. The monitoring station identification number is MB-090.
Temporal Representation:	Samples were collected from January 1999 through October 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43882, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at North Crown Point

LOE ID:	31224
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	60
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 291 dry month (April through October) single samples were collected with 60 dry month geomeans calculated. 1 of the 60 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from N. Crown Point, San Diego, California. Station identification number is MB-090.
Temporal Representation:	Samples were collected from April 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43882, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at North Crown Point 040777

LOE ID:	31223
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	51
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 250 dry month (April through October) single samples were collected with 51 dry month geomeans calculated. 1 of the 51 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from N. Crown Point, San Diego, California. The monitoring station identification number is MB-090.
Temporal Representation:	Samples were collected from April 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43882, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at North Crown Point

LOE ID:	30536
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	249
Number of Exceedances:	14
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2006. A total of 249 dry weather (AB411) single samples were collected

	with 14 samples exceeding the single sample water quality objective. 040778
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from N. Crown Point, San Diego, California. The monitoring station identification number is MB-090.
Temporal Representation:	Samples were collected from January 1999 through October 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43882, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at North Crown Point

LOE ID:	74358
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	61
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 61 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Wildlife Refuge fence site.
Temporal Representation:	Samples were collected approximately once a week from April 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43882, Indicator Bacteria 040779 Region 9

Mission Bay Shoreline, at North Crown Point

LOE ID:	74357
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	70
Number of Exceedances:	2
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed BW data for Mission Bay Shoreline, at North Crown Point to determine beneficial use support and results are as follows: 2 of 70 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The Water Quality Control Plan (Basin Plan 2011)states the following: At all areas where shellfish may be harvested for human consumption, ten percent of the samples collected during any 30-day period shall not exceed 230 MPN/100mL.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Mission Bay Shoreline, at North Crown Point was collected at 1 monitoring site [Wildlife Refuge fence]
Temporal Representation:	Data was collected over the time period April 2008 to August 2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43882, Indicator Bacteria Region 9

Mission Bay Shoreline, at North Crown Point

LOE ID:	74356
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	61
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 61 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Wildlife Refuge fence site.
Temporal Representation:	Samples were collected approximately once a week from April 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43882, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at North Crown Point

LOE ID:	74355
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	61
Number of Exceedances:	3
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Three of the 61 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Wildlife Refuge fence site.
Temporal Representation:	Samples were collected approximately once a week from April 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43882, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at North Crown Point

LOE ID:	30347
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	2933	040781
Number of Exceedances:	959	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Below is a copy of the 2006 LOE information for the data used to support the listing of Mission Bay Shoreline: Available data indicate sufficient exceedances of bacterial indicator objectives. There were 576 out of 3662 samples exceeding the single sample maximum for enterococci, 959 out of 2933 exceedances of the geomean enterococci, and 333 out samples exceeding the single sample maximum for fecal coliform (USEPA, 2007).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Title 17 C.C.R. Section 7958 states: Based on a single sample, the density of bacteria in water from each sampling station at a public beach or public water contact sports area shall not exceed: (A) 1,000 total coliform bacteria per 100 milliliters, if the ratio of fecal/total coliform bacteria exceeds 0.1; or (B) 10,000 total coliform bacteria per 100 milliliters; or (C) 400 fecal coliform bacteria per 100 milliliters; or (D) 104 enterococcus bacteria per 100 milliliters. Based on the mean of the logarithms of the results of at least five weekly samples during any 30-day sampling period, the density of bacteria in water from any sampling station at a public beach or public water contact sports area, shall not exceed: (A) 1,000 total coliform bacteria per 100 milliliters; or (B) 200 fecal coliform bacteria per 100 milliliters; or (C) 35 enterococcus bacteria per 100 milliliters (DHS, 1999).	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	In 2006, data from sampling sites along the Mission Bay shoreline were aggregated for the assessment. For 2008, the 2006 Mission Bay Shoreline segment has been split into smaller segments and each represents an area near the sampling location of the data being assessed. 'Mission Bay Shoreline, at North Crown Point' is one of the sampling locations for Mission Bay Shoreline and is considered to be part of the original listing	
Temporal Representation:	From 03/21/2000-10/30/2005.	
Environmental Conditions:		
QAPP Information:	Data record: 2000-2005, San Diego County Health Dept.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43882, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at North Crown Point

LOE ID:	28730
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	19
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999

through October 2006. A total of 310 single samples were collected with 19 samples correlated with a storm event. Two of the 19 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.

Data Reference: National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: Geomean: Total coliform density shall not exceed 1,000 per 100ml;

Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).

Objective/Criterion Reference: Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected from N. Crown Point, San Diego, California. Station identification number is MB-090.

Temporal Representation: Samples were collected from January 1999 through October 2006.

Environmental Conditions:

QAPP Information: Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.

QAPP Information Reference(s): County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43882, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at North Crown Point

LOE ID: 77610

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Shellfish Harvesting

Number of Samples: 60
Number of Exceedances: 0

Data and Information Type: PATHOGEN MONITORING

Data Used to Assess Water Quality: None of the sixty samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.

Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The Water Quality Control Plan for the San Diego Basin states that at all areas where shellfish may be harvested for human consumption, the median total coliform concentration throughout the water column for any 30-day period shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.

Objective/Criterion Reference: Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	040783
Guideline Reference:	
Spatial Representation:	The samples were collected at Mission Bay Shoreline, at North Crown Point (wildlife refuge fence)
Temporal Representation:	The samples were collected from April 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43882, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at North Crown Point

LOE ID:	28744
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	69
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2006. A total of 312 single samples were collected with 69 monthly geomeans calculated. Two of the 69 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from N. Crown Point, San Diego, California. Station identification number is MB-090.
Temporal Representation:	Samples were collected from January 1999 through October 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43882, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at North Crown Point

LOE ID:	28681
Pollutant:	Fecal Coliform

LOE Subgroup:	Pollutant-Water	040784
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	269	
Number of Exceedances:	19	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2006. A total of 269 single samples were collected with 19 samples exceeding the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from N. Crown Point, San Diego, California. The monitoring station identification number is MB-090.	
Temporal Representation:	Samples were collected from January 1999 through October 2006.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43882, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at North Crown Point

LOE ID:	28680
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	20
Number of Exceedances:	5
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2006. A total of 269 single samples were collected with 20 samples correlated with a storm event. Of the 20 samples, five exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station

	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from N. Crown Point, San Diego, California. The monitoring station identification number is MB-090.
Temporal Representation:	Samples were collected from January 1999 through October 2006.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43882, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at North Crown Point

LOE ID:	28661
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	312
Number of Exceedances:	37
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2006. A total of 312 single samples were collected with 37 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental

Protection Agency 040786

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected from N. Crown Point, San Diego, California. The monitoring station identification number is MB-090.
Temporal Representation: Samples were collected from January 1999 through October 2006.
Environmental Conditions:
QAPP Information: Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s): County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43882, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at North Crown Point

LOE ID: 30120

Pollutant: Indicator Bacteria
LOE Subgroup: Health Advisories
Matrix: -N/A
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 2555
Number of Exceedances: 66

Data and Information Type: PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality: For the period from January 2001 to December 2007, there were 66 beach advisory days for this location. When a bacteriological sample exceeds water quality standards, signs are posted indicating that waters have exceeded public health standards.

Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 to December 2007. Data used was the number of days the beach was posted with an Advisory when the ocean or bay failed to meet the bacteriological standards.
Data Reference: County of Orange. March 2007. Annual Ocean and Bay Water Quality Report, 2006 Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: California Code of Regulations. Title 17, Section 7960.

(a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference: California Code of Regulations, Title 17, Section 7960

Evaluation Guideline:
Guideline Reference: Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Spatial Representation: Bacteriological monitoring samples were collected at North Crown Point in Mission Bay.
Temporal Representation: The beach advisory covers the time frame of January 2001 -December 2007.

Environmental Conditions:	040787
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43882, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at North Crown Point

LOE ID:	28642
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	19
Number of Exceedances:	11
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2006. A total of 310 single samples were collected with 19 samples correlated with a storm event. Eleven of the 19 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005). Comparisons are also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from N. Crown Point, San Diego, California. Station location ID is MB-090.
Temporal Representation:	Samples were collected from January 1999 through October 2006.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43882, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at North Crown Point

LOE ID:	28641
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	310
Number of Exceedances:	61
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from Januray 1999 through October 2006. A total of 310 single samples were collected with 61 samples exceeded the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at N. Crown Point, San Diego, California. Station identification number is MB-090.
Temporal Representation:	Samples were collected from Januray 1999 through October 2006
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43882, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at North Crown Point

LOE ID:	28694
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	60
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2006. A total of 269 single samples were collected and 60 geomeans

	calculated. Three of the 60 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from N. Crown Point, San Diego, California. The monitoring station identification number is MB-090.
Temporal Representation:	Samples were collected from January 1999 through October 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43882, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at North Crown Point

LOE ID:	28664
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	69
Number of Exceedances:	15
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2006. A total of 312 single samples were collected with 69 monthly geomeans calculated. Fifteen of the 69 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected from N. Crown Point, San Diego, California. The monitoring station identification number is MB-090.
Temporal Representation:	Samples were collected from January 1999 through October 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43882, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at North Crown Point

LOE ID:	28729
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	310
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2006. A total of 310 single samples were collected with four samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from N. Crown Point, San Diego, California. Station identification is MB-090.
Temporal Representation:	Samples were collected from January 1999 through October 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43882, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at North Crown Point

LOE ID:	30788
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	040791
Beneficial Use:	Water Contact Recreation	
Number of Samples:	291	
Number of Exceedances:	2	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2006. A total of 310 single samples were collected of which 291 are dry weather (AB411) samples with two samples exceeding the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from N. Crown Point, San Diego, California. Station identification is MB-090.	
Temporal Representation:	Samples were collected from January 1999 through October 2006.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Mission Bay Shoreline, at Sail Bay
Water Body ID: CAC907510002009042220435 2
Water Body Type: Coastal & Bay Shoreline

DECISION ID 44258 Region 9
Mission Bay Shoreline, at Sail Bay

Pollutant: Indicator Bacteria
Final Listing Decision: Delist from 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Delist from 303(d) list (TMDL required list)(2012)
Revision Status Revised
Reason for Delisting: Applicable WQS attained; reason for recovery unspecified
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for removal from the CWA section 303(d) List under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Fifteen lines of evidence are available in the administrative record to assess this pollutant. With the latest information, 29 of the 277 samples exceeded the WQO for total coliform of a single sample maximum of 230 cfu/100 ml for SHELL.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. 29 of the 277 samples exceeded the WQO for total coliform of a single sample maximum of 230 cfu/100 ml for SHELL and this does not exceed the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be removed from the section 303(d) list because applicable water quality standards for the pollutant are not being exceeded.

Line of Evidence (LOE) for Decision ID 44258, Indicator Bacteria Region 9
Mission Bay Shoreline, at Sail Bay

LOE ID: 28645

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Shellfish Harvesting

Number of Samples:	14	040793
Number of Exceedances:	8	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 245 single samples were collected with 14 samples correlated with a storm event. Eight of the 14 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.	
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Sail Bay, San Diego, California. Station identification number is MB-130.	
Temporal Representation:	Samples were collected from January 1999 through December 2007.	
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44258, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Sail Bay

LOE ID:	28732
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	58
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 245 single samples were collected with 58 monthly geomeans calculated. None of the 58 geomeans exceeded the geomean water quality objective.

Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007 040794
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Sail Bay, San Diego, California. Station identification number is MB-130.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44258, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Sail Bay

LOE ID:	74361
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	32
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed BW data for Mission Bay Shoreline, at Sail Bay to determine beneficial use support and results are as follows: 0 of 32 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The Water Quality Control Plan (Basin Plan 2011)states the following: At all areas where shellfish may be harvested for human consumption, ten percent of the samples collected during any 30-day period shall not exceed 230 MPN/100mL.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Mission Bay Shoreline, at Sail Bay was collected at 2 monitoring sites [Santa Clara Cove, S end, Whiting Ct Catamaran]
Temporal Representation:	Data was collected over the time period 1/17/2008-9/23/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44258, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Sail Bay

LOE ID:	74360
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	23
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 23 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Sail Bay site.
Temporal Representation:	Samples were collected approximately once a week from January 2008 to September 2008.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44258, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Sail Bay

LOE ID:	74359
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	23
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 23 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not

exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009 940796

Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at the Sail Bay site.
Temporal Representation: Samples were collected approximately once a week from January 2008 to September 2008.
Environmental Conditions:
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 44258, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Sail Bay

LOE ID: 28692

Pollutant: Fecal Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 50
Number of Exceedances: 0

Data and Information Type: PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality: Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 205 single samples were collected and 50 geomeans calculated. None of the 50 geomeans exceeded the geomean water quality objective.
Data Reference: Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: Geomean; Fecal coliform density shall not exceed 200 per 100 ml;

Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference: Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected from Sail Bay, San Diego, California. Station identification number is MB-130.
Temporal Representation: Samples were collected from January 1999 through December 2007.
Environmental Conditions:
QAPP Information: Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s): County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44258, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Sail Bay

LOE ID: 28741

Pollutant:	Total Coliform	040797
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	14	
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 245 single samples were collected with 14 samples correlated with a storm event. None of the 14 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.	
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Sail Bay, San Diego, California. Station identification number is MB-130.	
Temporal Representation:	Samples were collected from January 1999 through December 2007.	
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44258, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Sail Bay

LOE ID:	30553
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	232
Number of Exceedances:	13
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 246 single samples were collected of which 232 are dry weather (AB411) samples with 13 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Sail Bay, San Diego, California. Station identification number is MB-130.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44258, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Sail Bay

LOE ID:	30789
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	231
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 245 single samples were collected of which 231 are dry weather (AB411) samples with no sample exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml;

	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Sail Bay, San Diego, California. Station identification number is MB-130.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44258, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Sail Bay

LOE ID:	77611
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	23
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	None of the twenty-three samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The Water Quality Control Plan for the San Diego Basin states that at all areas where shellfish may be harvested for human consumption, the median total coliform concentration throughout the water column for any 30-day period shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Mission Bay Shoreline, at Sail Bay at stations Sail Bay and Santa Clara Pl., north side.
Temporal Representation:	The samples were collected from January 2008 to September 2008.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44258, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Sail Bay

LOE ID:	28653	040800
Pollutant:	Total Coliform	
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Shellfish Harvesting	
Number of Samples:	245	
Number of Exceedances:	29	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April1999 through December 2007. A total of 245 single samples were collected with 29 samples exceeded the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Sail Bay, San Diego, California. Station identification number is MB-130.	
Temporal Representation:	Samples were collected from January 1999 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44258, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Sail Bay

LOE ID:	31230
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	45
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 180 dry month (April through October) single samples were collected with X45 dry month geomeans calculated. 2 of the 45 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data:	Non-SWAMP	040801
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Sail Bay, San Diego, California. Station identification number is MB-130.	
Temporal Representation:	Samples were collected from April 1999 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44258, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Sail Bay

LOE ID:	28690
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	205
Number of Exceedances:	7
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 205 single samples were collected with seven samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Sail Bay, San Diego, California. Station identification number is MB-130.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the

QAPP Information Reference(s):	County of San Diego, Department Public Health Laboratory Quality Assurance Manual. County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44258, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Sail Bay

LOE ID:	30537
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	192
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 192 dry weather (AB411) single samples were collected with 4 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Sail Bay, San Diego, California. Station identification number is MB-130.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44258, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Sail Bay

LOE ID:	28660
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	246

Number of Exceedances:	15	040803
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 246 single samples were collected with 15 samples exceeding the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Sail Bay, San Diego, California. Station identification number is MB-130.	
Temporal Representation:	Samples were collected from January 1999 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44258, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Sail Bay

LOE ID:	28659
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	14
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 246 single samples were collected with 14 samples correlated with a storm event. Two of the 14 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml.

	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Sail Bay, San Diego, California. Station identification number is MB-130.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44258, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Sail Bay

LOE ID:	30142
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	-N/A
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	11
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were 11 beach advisory days for this location. When a bacteriological sample exceeds water quality standards, signs are posted indicating that waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 to December 2007. Data used was the number of days the beach was posted with an Advisory when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	County of Orange. March 2007. Annual Ocean and Bay Water Quality Report, 2006 Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-

	contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Spatial Representation:	Bacteriological monitoring samples were collected at Sail Bay in Mission Bay.
Temporal Representation:	The beach advisory covers the time frame of January 2001 -December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44258, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Sail Bay

LOE ID:	28666
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	58
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 246 single samples were collected with 58 monthly geomeans calculated. Four of the 58 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Sail Bay, San Diego, California. Station identification number is MB-130.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44258, Indicator Bacteria 040806 **Region 9**

Mission Bay Shoreline, at Sail Bay

LOE ID:	28679
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	13
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 205 single samples were collected with 13 samples correlated with a storm event. Three of the 13 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Sail Bay, San Diego, California. Station identification number is MB-130.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44258, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Sail Bay

LOE ID:	30348

Pollutant:	Indicator Bacteria	040807
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	2933	
Number of Exceedances:	959	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Below is a copy of the 2006 LOE information for the data used to support the listing of Mission Bay Shoreline: Available data indicate sufficient exceedances of bacterial indicator objectives. There were 576 out of 3662 samples exceeding the single sample maximum for enterococci, 959 out of 2933 exceedances of the geomean enterococci, and 333 out samples exceeding the single sample maximum for fecal coliform (USEPA, 2007).	
Data Reference:	Placeholder reference 2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Title 17 C.C.R. Section 7958 states: Based on a single sample, the density of bacteria in water from each sampling station at a public beach or public water contact sports area shall not exceed: (A) 1,000 total coliform bacteria per 100 milliliters, if the ratio of fecal/total coliform bacteria exceeds 0.1; or (B) 10,000 total coliform bacteria per 100 milliliters; or (C) 400 fecal coliform bacteria per 100 milliliters; or (D) 104 enterococcus bacteria per 100 milliliters. Based on the mean of the logarithms of the results of at least five weekly samples during any 30-day sampling period, the density of bacteria in water from any sampling station at a public beach or public water contact sports area, shall not exceed: (A) 1,000 total coliform bacteria per 100 milliliters; or (B) 200 fecal coliform bacteria per 100 milliliters; or (C) 35 enterococcus bacteria per 100 milliliters (DHS, 1999).	
Objective/Criterion Reference:	Placeholder reference 2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	In 2006, data from sampling sites along the Mission Bay shoreline were aggregated for the assessment. For 2008, the 2006 Mission Bay Shoreline segment has been split into smaller segments and each represents an area near the sampling location of the data being assessed. 'Mission Bay Shoreline, at Sail Bay' is one of the sampling locations for Mission Bay Shoreline and is considered to be part of the original listing	
Temporal Representation:	From 03/21/2000-10/30/2005.	
Environmental Conditions:		
QAPP Information:	Data record: 2000-2005, San Diego County Health Dept.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44258, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Sail Bay

LOE ID:	31232
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation	040808
Number of Samples:	45	
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 179 dry month (April through October) single samples were collected with 45 dry month geomeans calculated. None of the 45 geomeans exceeded the geomean water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Sail Bay, San Diego, California. Station identification number is MB-130.	
Temporal Representation:	Samples were collected from April 1999 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44258, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Sail Bay

LOE ID:	31231
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	37
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 139 dry month (April through October) single samples were collected with X dry month geomeans calculated. None of the 37 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml;

	Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Sail Bay, San Diego, California. Station identification number is MB-130.
Temporal Representation:	Samples were collected from April 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44258, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Sail Bay

LOE ID:	28733
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	245
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 245 single samples were collected with no sample exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Sail Bay, San Diego, California. Station identification number is MB-130.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance

Line of Evidence (LOE) for Decision ID 44258, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Sail Bay

LOE ID:	74362
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	23
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 23 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Sail Bay site.
Temporal Representation:	Samples were collected approximately once a week from January 2008 to September 2008.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Mission Bay Shoreline, at Visitors Center
Water Body ID: CAC906400002009042221130 9
Water Body Type: Coastal & Bay Shoreline

DECISION ID 43959 Region 9
Mission Bay Shoreline, at Visitors Center

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal from the CWA section 303(d) List under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Fifteen lines of evidence are available in the administrative record to assess this pollutant. Two hundred and seventeen of the 666] samples exceed the Water Quality Objective for Total Coliform of a SSM of 230 cfu/100 ml for the protection of SHELL beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Two hundred and seventeen of the 666] samples exceed the Water Quality Objective for Total Coliform of a SSM of 230 cfu/100 ml for the protection of SHELL beneficial use and this exceeds the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 43959, Indicator Bacteria Region 9
Mission Bay Shoreline, at Visitors Center

LOE ID:	31242
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation	040812
Number of Samples:	60	
Number of Exceedances:	20	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 359 dry month (April through October) single samples were collected with 60 dry month geomeans calculated. 20 of the 60 geomeans exceeded the geomean water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Visitor's Center near storm drain, San Diego, California. Station identification number is MB-060.	
Temporal Representation:	Samples were collected from April1999 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43959, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Visitors Center

LOE ID:	31244
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	60
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 356 dry month (April through October) single samples were collected with 60 dry month geomeans calculated. 3 of the 60 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml;

	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Visitor's Center near storm drain, San Diego, California. Station identification number is MB-060.
Temporal Representation:	Samples were collected from April 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43959, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Visitors Center

LOE ID:	31243
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	52
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 315 dry month (April through October) single samples were collected with 52 dry month geomeans calculated. One of the 52 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Visitor's Center near storm drain, San Diego, California. Station identification number is MB-060.
Temporal Representation:	Samples were collected from April 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43959, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Visitors Center

LOE ID:	30350
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2933
Number of Exceedances:	959
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Below is a copy of the 2006 LOE information for the data used to support the listing of Mission Bay Shoreline: Available data indicate sufficient exceedances of bacterial indicator objectives. There were 576 out of 3662 samples exceeding the single sample maximum for enterococci, 959 out of 2933 exceedances of the geomean enterococci, and 333 out samples exceeding the single sample maximum for fecal coliform (USEPA, 2007).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Title 17 C.C.R. Section 7958 states: Based on a single sample, the density of bacteria in water from each sampling station at a public beach or public water contact sports area shall not exceed: (A) 1,000 total coliform bacteria per 100 milliliters, if the ratio of fecal/total coliform bacteria exceeds 0.1; or (B) 10,000 total coliform bacteria per 100 milliliters; or (C) 400 fecal coliform bacteria per 100 milliliters; or (D) 104 enterococcus bacteria per 100 milliliters. Based on the mean of the logarithms of the results of at least five weekly samples during any 30-day sampling period, the density of bacteria in water from any sampling station at a public beach or public water contact sports area, shall not exceed: (A) 1,000 total coliform bacteria per 100 milliliters; or (B) 200 fecal coliform bacteria per 100 milliliters; or (C) 35 enterococcus bacteria per 100 milliliters (DHS, 1999).
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	In 2006, data from sampling sites along the Mission Bay shoreline were aggregated for the assessment. For 2008, the 2006 Mission Bay Shoreline segment has been split into smaller segments and each represents an area near the sampling location of the data being assessed. 'Mission Bay Shoreline, at Visitors Center' is one of the sampling locations for Mission Bay Shoreline and is considered to be part of the original listing
Temporal Representation:	From 03/21/2000-10/30/2005.
Environmental Conditions:	
QAPP Information:	Data record: 2000-2005, San Diego County Health Dept.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43959, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Visitors Center

LOE ID:	74382	040815

Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	88
Number of Exceedances:	8
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed bw data for Mission Bay Shoreline, at Visitors Center to determine beneficial use support and results are as follows: 8 of 88 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The Water Quality Control Plan (Basin Plan 2011)states the following: At all areas where shellfish may be harvested for human consumption, ten percent of the samples collected during any 30-day period shall not exceed 230 MPN/100mL.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Mission Bay Shoreline, at Visitors Center was collected at 1 monitoring site [drain S of Visitor's Cntr]
Temporal Representation:	Data was collected over the time period 1/9/2008-8/31/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43959, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Visitors Center

LOE ID:	28585
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	81
Number of Exceedances:	7
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 528 single samples were collected with 81 monthly geomeans calculated. Seven of the 81 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml;

	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Visitor's Center near storm drain, San Diego, California. Station identification number is MB-060.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43959, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Visitors Center

LOE ID:	28584
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	18
Number of Exceedances:	10
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 490 single samples were collected with 18 samples correlated with a storm event. Ten of the 18 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Visitor's Center near storm drain, San Diego, California. Station identification number is MB-060.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	

QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43959, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Visitors Center

LOE ID:	28583
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	490
Number of Exceedances:	117
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 490 single samples were collected with 117 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Visitor's Center near storm drain, San Diego, California. Station identification number is MB-060.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43959, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Visitors Center

LOE ID:	28582
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	17	040818
Number of Exceedances:	7	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 445 single samples were collected with 17 samples correlated with a storm event. Seven of the 17 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.	
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005). Comparisons are also made only for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Visitor's Center near storm drain, San Diego, California. Station identification number is MB-060.	
Temporal Representation:	Samples were collected from January 1999 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43959, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Visitors Center

LOE ID:	28588
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	81
Number of Exceedances:	37
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 490 single samples were collected with 81 monthly geomeans calculated. Thirty seven of the 81 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Visitor's Center near storm drain, San Diego, California. Station identification number is MB-060.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43959, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Visitors Center

LOE ID:	28586
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	74
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 445 single samples were collected and 74 geomeans calculated. Four of the 74 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Visitor's Center near storm drain, San Diego, California. Station identification number is MB-060.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	

QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43959, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Visitors Center

LOE ID:	28581
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	445
Number of Exceedances:	79
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 445 single samples were collected with 79 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Visitor's Center near storm drain, San Diego, California. Station identification number is MB-060.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43959, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Visitors Center

LOE ID:	28578
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting

Number of Samples:	17	040821
Number of Exceedances:	12	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 528 single samples were collected with 17 samples correlated with a storm event. Twelve of the 17 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.	
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Visitor's Center near storm drain, San Diego, California. Station identification number is MB-060.	
Temporal Representation:	Samples were collected from January 1999 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43959, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Visitors Center

LOE ID:	28576
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	528
Number of Exceedances:	209
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 528 single samples were collected with 209 samples exceeded the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005.

	Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency 040822
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Visitor's Center near storm drain, San Diego, California. Station identification number is MB-060.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43959, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Visitors Center

LOE ID:	28580
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	17
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 528 single samples were collected with 17 samples correlated with a storm event. Three of the 17 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Visitor's Center near storm drain, San Diego, California. Station identification number is MB-060.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach

	monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43959, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Visitors Center

LOE ID:	28579
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	528
Number of Exceedances:	11
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 528 single samples were collected with 11 samples exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Visitor's Center near storm drain, San Diego, California. Station identification number is MB-060.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43959, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Visitors Center

LOE ID:	30555
Pollutant:	Enterococcus

LOE Subgroup:	Pollutant-Water	040824
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	472	
Number of Exceedances:	107	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 490 single samples were collected of which 472 are dry weather (AB411) samples with 107 samples exceeding the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Visitor's Center near storm drain, San Diego, California. Station identification number is MB-060.	
Temporal Representation:	Samples were collected from January 1999 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43959, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Visitors Center

LOE ID:	30539
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	428
Number of Exceedances:	72
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 428 dry weather (AB411) single samples were collected with 72 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Visitor's Center near storm drain, San Diego, California. Station identification number is MB-060.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43959, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Visitors Center

LOE ID:	30791
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	511
Number of Exceedances:	8
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 528 single samples were collected of which 511 are dry weather (AB411) samples with eight samples exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Visitor's Center near storm drain, San Diego, California. Station identification number is MB-060.
Temporal Representation:	Samples were collected from January 1999 through December 2007.

Environmental Conditions:	040826
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43959, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Visitors Center

LOE ID:	30158
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	-N/A
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	477
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were 477 beach advisory days for this location. When a bacteriological sample exceeds water quality standards, signs are posted indicating that waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 to December 2007. Data used was the number of days the beach was posted with an Advisory when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	County of Orange. March 2007. Annual Ocean and Bay Water Quality Report, 2006 Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Spatial Representation:	Bacteriological monitoring samples were collected at the Visitors Center in Mission Bay.
Temporal Representation:	The beach advisory covers the time frame of January 2001 -December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Scripps HA, at Avenida de la Playa at La Jolla Shores Beach
Water Body ID: CAC906300002009042216050 1
Water Body Type: Coastal & Bay Shoreline

DECISION ID 44415 Region 9
Pacific Ocean Shoreline, Scripps HA, at Avenida de la Playa at La Jolla Shores Beach

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Delist from 303(d) list (being addressed by USEPA approved TMDL)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Reason for Delisting:	Applicable WQS attained; reason for recovery unspecified
TMDL Name:	Bacteria Impaired Waters I (creeks and beach shorelines)
TMDL Project Code:	169
Date TMDL Approved by USEPA:	06/22/2011
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal from the CWA section 303(d) List under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Fourteen lines of evidence are available in the administrative record to assess this pollutant. With the latest data, 40 of 280 samples exceed the water quality objective for total coliform of a single sample maximum of 230/100ml for the protection of SHELL beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, 40 of 280 samples exceed the water quality objective for total coliform of a single sample maximum of 230/100ml for the protection of SHELL beneficial use and this does not exceed the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be removed from the section 303(d) list because applicable water quality standards for the pollutant are not being exceeded.

Line of Evidence (LOE) for Decision ID 44415, Indicator Bacteria Region 9
Pacific Ocean Shoreline, Scripps HA, at Avenida de la Playa at La Jolla Shores Beach

LOE ID:	75095
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	040828
Beneficial Use:	Water Contact Recreation	
Number of Samples:	56	
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Zero of the 56 geomeans exceeded the objective.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at the Avenida de la Playa at La Jolla Shores Beach site.	
Temporal Representation:	Samples were collected from January 2008 to August 2010.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44415, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Avenida de la Playa at La Jolla Shores Beach

LOE ID:	75096
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	56
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 56 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Avenida de la Playa at La Jolla Shores Beach site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44415, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Avenida de la Playa at La Jolla Shores Beach 040829

LOE ID:	75097
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	67
Number of Exceedances:	1
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed bw data for Pacific Ocean Shoreline, Scripps HA, at Avenida de la Playa at La Jolla Shores Beach to determine beneficial use support and results are as follows: 1 of 67 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Scripps HA, at Avenida de la Playa at La Jolla Shores Beach was collected at 1 monitoring site [La Jolla Shores Beach (FM-080)]
Temporal Representation:	Data was collected over the time period 1/3/2008-8/25/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44415, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Avenida de la Playa at La Jolla Shores Beach

LOE ID:	75098
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	52
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 52 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at the Avenida de la Playa at La Jolla Shores Beach site.
Temporal Representation: Samples were collected from January 2008 to August 2010.
Environmental Conditions:
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 44415, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Avenida de la Playa at La Jolla Shores Beach

LOE ID: 77675

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Shellfish Harvesting

Number of Samples: 52
Number of Exceedances: 0

Data and Information Type: PATHOGEN MONITORING
Data Used to Assess Water Quality: Zero of the 52 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: The samples were collected at Pacific Ocean Shoreline, Scripps HA, at Avenida de la Playa at La Jolla Shores Beach.
Temporal Representation: The samples were collected from January 2008 to August 2010.
Environmental Conditions:
QAPP Information: The samples were collected for the beach watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 44415, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Avenida de la Playa at La Jolla Shores Beach

LOE ID: 29153

Pollutant: Fecal Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples:	216	040831
Number of Exceedances:	9	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2003. A total of 216 single samples were collected with 9 samples exceeding the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml. Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Avenida de la Playa at La Jolla Shores Beach, La Jolla, California. Station identification number is FH-080.	
Temporal Representation:	Samples were collected from January 1999 through December 2003.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44415, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Avenida de la Playa at La Jolla Shores Beach

LOE ID:	29154
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	49
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2003. A total of 213 single samples were collected with 49 geomeans calculated. From the 49 geomeans, none exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml. Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental

Protection Agency 040832

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Avenida de la Playa at La Jolla Shores Beach, La Jolla, California. Station identification number is FH-080.

Temporal Representation: Samples were collected from January 1999 through December 2003.

Environmental Conditions:

QAPP Information: Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.

QAPP Information Reference(s): County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44415, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Avenida de la Playa at La Jolla Shores Beach

LOE ID: 29177

Pollutant: Indicator Bacteria
LOE Subgroup: Health Advisories
Matrix: -N/A
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 2555
Number of Exceedances: 23

Data and Information Type: PWS pathogen monitoring (ambient water)

Data Used to Assess Water Quality: For the period from January 2001 to December 2007, there were 23 beach advisory days for this section of shoreline. Bacteriological samples are collected on a weekly basis at ocean and bay locations in San Diego County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that an advisory for waters have exceeded public health standards.

Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 - December 2007. Data used was the number of days the beach was advisories were issued when the ocean or bay failed to meet the bacteriological standards.

Data Reference: Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: California Code of Regulations. Title 17, Section 7960.

(a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.

Objective/Criterion Reference: California Code of Regulations, Title 17, Section 7960

Evaluation Guideline:

Guideline Reference: Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Spatial Representation: Bacteriological monitoring samples were collected at at Avenida de la Playa at La Jolla

	Shores Beach, La Jolla, California. 040833
Temporal Representation:	The beach advisory covers the time frame of January January 2001 to December 2007.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of San Diego's Quality Assessment/Quality Control document
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44415, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Avenida de la Playa at La Jolla Shores Beach

LOE ID:	29148
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	213
Number of Exceedances:	39
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2003. A total of 213 single samples were collected with 39 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the California Ocean Plan the median coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Avenida de la Playa at La Jolla Shores Beach, La Jolla, California. Station identification number is FH-080.
Temporal Representation:	Samples were collected from January 1999 through December 2003.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44415, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Avenida de la Playa at La Jolla Shores Beach

LOE ID:	29149
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting

Number of Samples:	9
Number of Exceedances:	7
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2003. A total of 213 single samples were collected with 9 correlated with a storm event. Seven of the 9 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the California Ocean Plan the median coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Avenida de la Playa at La Jolla Shores Beach, La Jolla, California. Station identification number is FH-080.
Temporal Representation:	Samples were collected from January 1999 through December 2003.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44415, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Avenida de la Playa at La Jolla Shores Beach

LOE ID:	29150
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	213
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2003. A total of 213 single samples were collected with two samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program,

	2007. AB 411 monitoring data 1999 to 2007	040835

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: Geomean:Total coliform density shall not exceed 1,000 per 100ml;

Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).

Objective/Criterion Reference: Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Avenida de la Playa at La Jolla Shores Beach, La Jolla, California. Station identification number is FH-080.

Temporal Representation: Samples were collected from January 1999 through December 2003.

Environmental Conditions:

QAPP Information: Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.

QAPP Information Reference(s): County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44415, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Avenida de la Playa at La Jolla Shores Beach

LOE ID: 29151

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 49
Number of Exceedances: 1

Data and Information Type: PWS pathogen monitoring (ambient water)

Data Used to Assess Water Quality: Beach monitoring data was collected by the County of San Diego from January 1999 through December 2003. A total of 213 single samples were collected with 49 monthly geomeans calculated. From the 49 geomeans, only one exceeded the geomean water quality objective.

Data Reference: National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: Geomean:Total coliform density shall not exceed 1,000 per 100ml;

Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).

Objective/Criterion Reference: Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:
Guideline Reference:

Spatial Representation:	Samples were collected at Avenida de la Playa at La Jolla Shores Beach, La Jolla, California. Station identification number is FH-080.
Temporal Representation:	Samples were collected from January 1999 through December 2003.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44415, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Avenida de la Playa at La Jolla Shores Beach

LOE ID:	29152
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2003. A total of 213 single samples were collected with 9 samples correlated with a storm event. From the 9 samples, none exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean:Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Avenida de la Playa at La Jolla Shores Beach, La Jolla, California. Station identification number is FH-080.
Temporal Representation:	Samples were collected from January 1999 through December 2003.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.

QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44415, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Avenida de la Playa at La Jolla Shores Beach

LOE ID:	29155
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	11
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2006. A total of 216 single samples were collected with 11 samples correlated with a storm event. From the 11 samples, one exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml. Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Avenida de la Playa at La Jolla Shores Beach, La Jolla, California. Station identification number is FH-080.
Temporal Representation:	Samples were collected from January 1999 through December 2003.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44415, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Avenida de la Playa at La Jolla Shores Beach

LOE ID:	29156
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	202
Number of Exceedances:	22
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2003. A total of 202 single samples were collected with 22 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Avenida de la Playa at La Jolla Shores Beach, La Jolla, California. Station identification number is FH-080.
Temporal Representation:	Samples were collected from January 1999 through December 2003.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44415, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Avenida de la Playa at La Jolla Shores Beach

LOE ID:	29157
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	46
Number of Exceedances:	5
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2006. A total of 202 single samples were collected with 46 monthly geomeans were calculated. From the 46 geomeans, five exceeded the geomean water quality objective.

Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007 040839
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Avenida de la Playa at La Jolla Shores Beach, La Jolla, California. Station identification number is FH-080.
Temporal Representation:	Samples were collected from January 1999 through December 2003.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44415, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Avenida de la Playa at La Jolla Shores Beach

LOE ID:	29158
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	10
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2003. A total of 202 single samples were collected with 10 samples correlated with a storm event. From the 10 samples, four exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:	040840
Guideline Reference:	
Spatial Representation:	Samples were collected at Avenida de la Playa at La Jolla Shores Beach, La Jolla, California. Station identification number is FH-080.
Temporal Representation:	Samples were collected from January 1999 through December 2003.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44415, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Avenida de la Playa at La Jolla Shores Beach

LOE ID:	30652
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	192
Number of Exceedances:	18
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2003. A total of 202 single samples were collected of which 192 are dry weather (AB411) samples with 18 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Avenida de la Playa at La Jolla Shores Beach, La Jolla, California. Station identification number is FH-080.
Temporal Representation:	Samples were collected from January 1999 through December 2003.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance

Line of Evidence (LOE) for Decision ID 44415, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Avenida de la Playa at La Jolla Shores Beach

LOE ID:	30751
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	205
Number of Exceedances:	8
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2003. A total of 216 single samples were collected of which 205 are dry weather (AB411) samples with eight samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml. Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Avenida de la Playa at La Jolla Shores Beach, La Jolla, California. Station identification number is FH-080.
Temporal Representation:	Samples were collected from January 1999 through December 2003.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44415, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Avenida de la Playa at La Jolla Shores Beach

LOE ID:	31181
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	57
Number of Exceedances:	4

Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 253 dry month (April through October) single samples were collected with 57 dry month geomeans calculated. Four of the 57 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Avenida de la Playa at La Jolla Shores Beach, La Jolla, California. Station identification number is FM-080.
Temporal Representation:	Samples were collected from April 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44415, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Avenida de la Playa at La Jolla Shores Beach

LOE ID:	31182
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	53
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 215 dry month (April through October) single samples were collected with 53 dry month geomeans calculated. None of the 53 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml. Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental

Protection Agency 040843

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Avenida de la Playa at La Jolla Shores Beach, La Jolla, California. Station identification number is FM-080.
Temporal Representation: Samples were collected from April 1999 through October 2003.
Environmental Conditions:
QAPP Information: Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s): County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44415, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Avenida de la Playa at La Jolla Shores Beach

LOE ID: 31183

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 57
Number of Exceedances: 1

Data and Information Type: PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality: Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 252 dry month (April through October) single samples were collected with 57 dry month geomeans calculated. One of the 57 geomeans exceeded the geomean water quality objective.
Data Reference: National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: Geomean:Total coliform density shall not exceed 1,000 per 100ml;

Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference: Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Avenida de la Playa at La Jolla Shores Beach, La Jolla, California. Station identification number is FM-080.
Temporal Representation: Samples were collected from April 1999 through October 2003.
Environmental Conditions:
QAPP Information: Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s): County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44415, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Avenida de la Playa at La Jolla Shores Beach

040844

LOE ID:	30858
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	204
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2003. A total of 213 single samples were collected of which 204 are dry weather (AB411) samples and two of those samples exceeded the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean:Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Avenida de la Playa at La Jolla Shores Beach, La Jolla, California. Station identification number is FH-080.
Temporal Representation:	Samples were collected from January 1999 through December 2003.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Scripps HA, at Bonair St at Windansea Beach
Water Body ID: CAC906300002009042216524 6
Water Body Type: Coastal & Bay Shoreline

DECISION ID 44329 **Region 9**
Pacific Ocean Shoreline, Scripps HA, at Bonair St at Windansea Beach

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Fourteen lines of evidence are available in the administrative record to assess this pollutant. With the latest data, 1 of 47 geomean samples exceed the water quality objective for enterococcus for the protection of REC-1 beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, 1 of 47 geomean samples exceed the water quality objective for enterococcus for the protection of REC-1 beneficial use and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 44329, Indicator Bacteria **Region 9**
Pacific Ocean Shoreline, Scripps HA, at Bonair St at Windansea Beach

LOE ID: 75108

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 6

Number of Exceedances:	0	040846

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Zero of the 6 geomeans exceeded the objective.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at the Bonair St at Windansea Beach site.
Temporal Representation: Samples were collected from January 2008 to August 2010.
Environmental Conditions:
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 44329, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Bonair St at Windansea Beach

LOE ID: 31180

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 29
Number of Exceedances: 0

Data and Information Type: PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality: Beach monitoring data was collected by the County of San Diego from April 1999 through September 2007. A total of 89 dry month (April through October) single samples were collected with 29 dry month geomeans calculated. None of the 29 geomeans exceeded the geomean water quality objective.
Data Reference: Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: Geomean: Total coliform density shall not exceed 1,000 per 100ml;

Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference: Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected from Bonair St at Windansea Beach, San Diego, California. Station identification number is FM-050.
Temporal Representation: Samples were collected from April 1999 through September 2007.
Environmental Conditions:
QAPP Information: Quality control for the bacteria analysis portion was conducted in accordance with the

QAPP Information Reference(s):	County of San Diego, Department Public Health Laboratory Quality Assurance Manual. County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44329, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Bonair St at Windansea Beach

LOE ID:	75105
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 6 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Bonair St at Windansea Beach site.
Temporal Representation:	Samples were collected from January 2008 to August 2008.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44329, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Bonair St at Windansea Beach

LOE ID:	75106
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 6 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.

Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at the Bonair St at Windansea Beach site.
Temporal Representation: Samples were collected from January 2008 to August 2010.
Environmental Conditions:
QAPP Information: The samples were collected for the beach watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 44329, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Bonair St at Windansea Beach

LOE ID: 75107

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Shellfish Harvesting

Number of Samples: 10
Number of Exceedances: 0

Data and Information Type: PATHOGEN MONITORING
Data Used to Assess Water Quality: Water Board staff assessed bw data for Pacific Ocean Shoreline, Scripps HA, at Bonair St at Windansea Beach to determine beneficial use support and results are as follows: 0 of 10 samples exceed the criterion for Coliform, Total.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Data for this line of evidence for Pacific Ocean Shoreline, Scripps HA, at Bonair St at Windansea Beach was collected at 1 monitoring site [Bonair]
Temporal Representation: Data was collected over the time period 1/22/2008-8/27/2008.
Environmental Conditions: Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 44329, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Bonair St at Windansea Beach

LOE ID: 30859

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples:	136	040849
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 145 single samples were collected of which 136 are dry weather (AB411) samples with none of those samples exceeding the single sample water quality objective.	
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Bonair St at Windansea Beach, San Diego, California. Station identification is FM-050.	
Temporal Representation:	Samples were collected from January 1999 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44329, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Bonair St at Windansea Beach

LOE ID:	31178
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	30
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through September 2007. A total of 90 dry month (April through October) single samples were collected with 30 dry month geomeans calculated. None of the 30 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml.

	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Bonair St at Windansea Beach, San Diego, California. The monitoring station identification number is FM-050.
Temporal Representation:	Samples were collected from April 1999 through September 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44329, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Bonair St at Windansea Beach

LOE ID:	31179
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	30
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through September 2007. A total of 90 dry month (April through October) single samples were collected with 30 dry month geomeans calculated. None of the 30 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Bonair St at Windansea Beach, San Diego, California. The monitoring station identification number is FM-050.
Temporal Representation:	Samples were collected from April 1999 through September 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44329, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Bonair St at Windansea Beach

LOE ID:	28872
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	9
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 145 single samples were collected with nine samples correlated with a storm event. Three of the nine samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Bonair St at Windansea Beach, San Diego, California. Station location ID is FM-050.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44329, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Bonair St at Windansea Beach

LOE ID:	28869
Pollutant:	Total Coliform

LOE Subgroup:	Pollutant-Water	040852
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Shellfish Harvesting	
Number of Samples:	145	
Number of Exceedances:	13	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 145 single samples were collected with 13 exceeding the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Bonair St at Windansea Beach, San Diego, California. Station identification number is FM-050.	
Temporal Representation:	Samples were collected from January 1999 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44329, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Bonair St at Windansea Beach

LOE ID:	28873
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	145
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 145 single samples were collected with no samples exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; 040853 Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Bonair St at Windansea Beach, San Diego, California. Station identification is FM-050.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44329, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Bonair St at Windansea Beach

LOE ID:	28875
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	43
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 145 single samples were collected with 43 monthly geomeans calculated. None of the geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Bonair St at Windansea Beach, San Diego, California. Station identification number is FM-050.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.

QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44329, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Bonair St at Windansea Beach

LOE ID:	28876
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 145 single samples were collected with nine samples correlated with a storm event. None of the nine samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Bonair St at Windansea Beach, San Diego, California. Station identification number is FM-050.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44329, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Bonair St at Windansea Beach

LOE ID:	28882
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	134
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 134 single samples were collected with two samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Bonair St at Windansea Beach, San Diego, California. The monitoring station identification number is FH-050.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44329, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Bonair St at Windansea Beach

LOE ID:	28883
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	41
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 134 single samples were collected with 41 monthly geomeans calculated. One of the 41 geomeans exceeded the geomean water quality objective.

Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007 040856
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Bonair St at Windansea Beach, San Diego, California. The monitoring station identification number is FH-050.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44329, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Bonair St at Windansea Beach

LOE ID:	28884
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 134 single samples were collected with 8 samples correlated with a storm event. None of the 8 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:	040857
Guideline Reference:	
Spatial Representation:	Samples were collected from Bonair/Windansea Beach, San Diego, California. The monitoring station identification number is FM-050.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44329, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Bonair St at Windansea Beach

LOE ID:	30653
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	126
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 134 single samples were collected of which 126 are dry weather (AB411) samples with two samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Bonair St at Windansea Beach, San Diego, California. The monitoring station identification number is FH-050.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance

Line of Evidence (LOE) for Decision ID 44329, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Bonair St at Windansea Beach

LOE ID:	77677
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Zero of the six samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, Scripps HA, at Belmont Park at Mission Beach
Temporal Representation:	The samples were collected from January 2008 to August 2008.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44329, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Bonair St at Windansea Beach

LOE ID:	28885
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	-N/A
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were no beach advisory days for this section of shoreline. Bacteriological samples are collected on a weekly basis at ocean and bay locations in San Diego County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that an advisory for waters have

exceeded public health standards. 040859

Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 - December 2007. Data used was the number of days the beach was advisories were issued when the ocean or bay failed to meet the bacteriological standards.

Data Reference: Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: California Code of Regulations. Title 17, Section 7960.

(a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.

Objective/Criterion Reference: California Code of Regulations, Title 17, Section 7960

Evaluation Guideline:

Guideline Reference: Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Spatial Representation: Samples were collected from Bonair St at Windansea Beach, San Diego, California. The monitoring station identification number is FH-050.

Temporal Representation: The beach advisory covers the time frame of January January 2001 to December 2007.

Environmental Conditions:

QAPP Information: Samples were collected in compliance with County of San Diego's Quality Assessment/Quality Control document

QAPP Information Reference(s): County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44329, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Bonair St at Windansea Beach

LOE ID: 28878

Pollutant: Fecal Coliform

LOE Subgroup: Pollutant-Water

Matrix: Water

Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 145

Number of Exceedances: 4

Data and Information Type: PWS pathogen monitoring (ambient water)

Data Used to Assess Water Quality: Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 145 single samples were collected with four samples exceeding the single sample water quality objective.

Data Reference: Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: Geomean; Fecal coliform density shall not exceed 200 per 100 ml;

	Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Bonair St at Windansea Beach, San Diego, California. The monitoring station identification number is FH-050.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44329, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Bonair St at Windansea Beach

LOE ID:	30752
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	137
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 145 single samples were collected of which 137 are dry weather (AB411) samples with three samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Bonair St at Windansea Beach, San Diego, California. The monitoring station identification number is FH-050.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44329, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Bonair St at Windansea Beach

LOE ID:	28880
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	44
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 145 single samples were collected and 44 geomeans calculated. None of the geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Bonair St at Windansea Beach, San Diego, California. The monitoring station identification number is FH-050.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44329, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Bonair St at Windansea Beach

LOE ID:	28881
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	8
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)

Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 145 single samples were collected with eight samples correlated with a storm event. Among the eight samples only one exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Bonair St at Windansea Beach, San Diego, California. The monitoring station identification number is FH-050.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Scripps HA, at Crystal Pier
Water Body ID: CAC906300002009042217155 3
Water Body Type: Coastal & Bay Shoreline

DECISION ID 45603 Region 9
Pacific Ocean Shoreline, Scripps HA, at Crystal Pier

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Fifteen lines of evidence are available in the administrative record to assess this pollutant. With the latest data, one of 84 geomean samples exceed the water quality objective for enterococcus for the protection of REC-1.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, one of 84 geomean samples exceed the water quality objective for enterococcus for the protection of REC-1 and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 45603, Indicator Bacteria Region 9
Pacific Ocean Shoreline, Scripps HA, at Crystal Pier

LOE ID: 29185

Pollutant: Enterococcus
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 263

Number of Exceedances:	8	040864
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 263 single samples were collected with 8 samples exceeding the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Crystal Pier, San Diego, California. Station identification number is FM-020.	
Temporal Representation:	Samples were collected from January 1999 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 45603, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Crystal Pier

LOE ID:	30655
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	256
Number of Exceedances:	8
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 263 single samples were collected of which 256 are dry weather (AB411) samples with eight samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental

Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Crystal Pier, San Diego, California. Station identification number is FM-020.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 45603, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Crystal Pier

LOE ID:	29184
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 240 single samples were collected with 7 samples correlated with a storm event. None of the 7 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Crystal Pier, San Diego, California. Station identification number is FM-020.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the

	full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 45603, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Crystal Pier

LOE ID:	31173
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	60
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 233 dry month (April through October) single samples were collected with 60 dry month geomeans calculated. One of the 60 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Crystal Pier, San Diego, California. Station identification number is FM-020.
Temporal Representation:	Samples were collected from April 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 45603, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Crystal Pier

LOE ID:	30755
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	040867
Beneficial Use:	Water Contact Recreation	
Number of Samples:	233	
Number of Exceedances:	5	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 240 single samples were collected of which 233 are dry weather (AB411) samples with five samples exceeding the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Crystal Pier, San Diego, California. Station identification number is FM-020.	
Temporal Representation:	Samples were collected from January 1999 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 45603, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Crystal Pier

LOE ID:	75123
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	21
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 21 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.

Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at the Crystal Pier site.
Temporal Representation: Samples were collected from April 2008 to September 2008.
Environmental Conditions:
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 45603, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Crystal Pier

LOE ID: 75122

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Shellfish Harvesting

Number of Samples: 24
Number of Exceedances: 0

Data and Information Type: PATHOGEN MONITORING
Data Used to Assess Water Quality: Water Board staff assessed bw data for Pacific Ocean Shoreline, Scripps HA, at Crystal Pier to determine beneficial use support and results are as follows: 0 of 24 samples exceed the criterion for Coliform, Total.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Data for this line of evidence for Pacific Ocean Shoreline, Scripps HA, at Crystal Pier was collected at 1 monitoring site [Crystal Pier]
Temporal Representation: Data was collected over the time period 4/14/2008-9/30/2008.
Environmental Conditions: Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 45603, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Crystal Pier

LOE ID: 75121

Pollutant: Fecal Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples:	21	040869
Number of Exceedances:	0	

Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 21 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Crystal Pier site.
Temporal Representation:	Samples were collected from April 2008 to September 2008.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 45603, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Crystal Pier

LOE ID:	75120
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	21
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 21 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Crystal Pier site.
Temporal Representation:	Samples were collected from April 2008 to September 2008.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 45603, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Crystal Pier 040870

LOE ID:	29183
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	240
Number of Exceedances:	5
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 240 single samples were collected with 5 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Crystal Pier, San Diego, California. Station identification number is FM-020.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 45603, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Crystal Pier

LOE ID:	29182
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 276 single samples were collected with 8 samples correlated with a storm event. None of the 8 samples exceeded the single sample water

	quality objective. 040871
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Crystal Pier, San Diego, California. Station identification number is FM-020.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 45603, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Crystal Pier

LOE ID:	29181
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	276
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 276 single samples were collected with zero sample exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml;

	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Crystal Pier, San Diego, California. Station identification number is FM-020.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 45603, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Crystal Pier

LOE ID:	31175
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	60
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 234 dry month (April through October) single samples were collected with 60 dry month geomeans calculated. None of the 60 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml;
	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Crystal Pier, San Diego, California. Station identification number is FM-020.
Temporal Representation:	Samples were collected from April 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance

Line of Evidence (LOE) for Decision ID 45603, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Crystal Pier

LOE ID:	31174
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	50
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 199 dry month (April through October) single samples were collected with 50 dry month geomeans calculated. None of the 50 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Crystal Pier, San Diego, California. Station identification number is FM-020.
Temporal Representation:	Samples were collected from April 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 45603, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Crystal Pier

LOE ID:	30862
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	268
Number of Exceedances:	0

Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 276 single samples were collected of which 268 are dry weather (AB411) samples with zero sample exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Crystal Pier, San Diego, California. Station identification number is FM-020.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 45603, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Crystal Pier

LOE ID:	29180
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	8
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 276 single samples were collected with 8 samples correlated with a storm event. Four of the 8 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Crystal Pier, San Diego, California. Station identification number is FM-020.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 45603, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Crystal Pier

LOE ID:	77679
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	21
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Zero of the 21 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, Scripps HA, at Crystal Pier.
Temporal Representation:	The samples were collected from April 2008 to September 2008.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 45603, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Crystal Pier

LOE ID:	29179
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	276
Number of Exceedances:	24
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April1999 through December 2007. A total of 276 single samples were collected with 24 samples exceeded the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005). Comparisons were also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Crystal Pier, San Diego, California. Station identification number is FM-020.
Temporal Representation:	Samples were collected from April1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 45603, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Crystal Pier

LOE ID:	29189
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	63
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)

Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 263 single samples were collected with 63 monthly geomeans calculated. One of the 63 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Crystal Pier, San Diego, California. Station identification number is FM-020.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 45603, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Crystal Pier

LOE ID:	29186
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 263 single samples were collected with 7 samples correlated with a storm event. None of the 7 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).

Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Crystal Pier, San Diego, California. Station identification number is FM-020.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 45603, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Crystal Pier

LOE ID:	29187
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	66
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 276 single samples were collected with 66 monthly geomeans calculated. None of the 66 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Crystal Pier, San Diego, California. Station identification number is FM-020.
Temporal Representation:	Samples were collected from January 1999 through December 2007.

Environmental Conditions:	040879
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 45603, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Crystal Pier

LOE ID:	29188
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	59
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 240 single samples were collected and 59 geomeans calculated. None of the 59 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Crystal Pier, San Diego, California. Station identification number is FM-020.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 45603, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Crystal Pier

LOE ID:	29269
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	-N/A
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	2555
Number of Exceedances:	5
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were five beach advisory days for this section of shoreline. Bacteriological samples are collected on a weekly basis at ocean and bay locations in San Diego County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that an advisory for waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 - December 2007. Data used was the number of days the beach was advisories were issued when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Spatial Representation:	Bacteriological monitoring samples were collected at El Paseo Grande at La Jolla Shores Beach, La Jolla, California.
Temporal Representation:	The beach closures covers the time frame of January January 2001 to December 2007.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of San Diego's Quality Assessment/Quality Control document
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

DECISION ID 50008 Region 9

Pacific Ocean Shoreline, Scripps HA, at Crystal Pier

Pollutant:	**Trash**
Final Listing Decision:	**List on 303(d) list (being addressed by action other than TMDL)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected Attainment Date:	2029
Implementation Action Other than TMDL:	Collected effort of public, agencies, organizations, and permittees. Methods include street sweeping, education programs on littering, installation of trash-catching devices on storm drains.
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.7 of

the Listing Policy. Under this section when all other listing factors do not result in the listing of a water segment but information indicates non-attainment of standards, a water segment shall be evaluated to determine whether the weight of evidence demonstrates that water quality standard is not attained. If the weight of evidence indicates non-attainment, the water segment shall be placed on the CWA section 303(d) List.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for placing this water segment-pollutant combination from the CWA section 303(d) List. This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The following information indicates that the water quality standard is not being attained: The total weight of trash (lbs) collected on 6/23/07, 6/28/08, 6/27/09, and 6/26/10 was 1,277.15. However, using the metric, Coastkeeper classified this water body as medium for trash impairment. However, any trash found is an exceedance and needs to be addressed by an action other than a TMDL.
3. This process is scientifically defensible and reproducible.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 50008, Trash **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Crystal Pier

LOE ID:	75138
Pollutant:	Trash
LOE Subgroup:	Pollutant-Nuisance
Matrix:	Not Recorded
Fraction:	None
Beneficial Use:	Non-Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Occurrence of conditions judged to cause impairment
Data Used to Assess Water Quality:	The San Diego Coastkeeper conducts trash cleanups and uses a metric (pounds of trash collected per volunteer) to compare levels of trash across beaches and categorizes beaches as either low, medium, high or severe, based on this 6/23/07, 6/28/08, 6/27/09, and 6/26/10 for this water body. The total weight of trash (lbs) collected on these dates was 1,277.15. However, using the metric, Coastkeeper classified this water body as medium for trash impairment.
Data Reference:	Data for Trash, Nutrients, and Pathogens in Region 9, 2007-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Floating Material Waters shall not contain floating material, including solids, liquids, foams, and scum in concentrations which cause nuisance or adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Pacific Beach - Crystal Pier.
Temporal Representation:	Four cleanups occurred on 6/23/07, 6/28/08, 6/27/09, and 6/26/10.
Environmental Conditions:	
QAPP Information:	San Diego Coastkeeper QAPP was provided.
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Scripps HA, at El Paseo Grande at La Jolla Shores Beach
Water Body ID: CAC906300002009042215545 0
Water Body Type: Coastal & Bay Shoreline

DECISION ID 44298 **Region 9**

Pacific Ocean Shoreline, Scripps HA, at El Paseo Grande at La Jolla Shores Beach

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Thirteen lines of evidence are available in the administrative record to assess this pollutant. With the latest data, five of 187 samples exceed the water quality objective for total coliform of a SSM of 230/100ml for the protection of SHELL.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, five of 187 samples exceed the water quality objective for total coliform of a SSM of 230/100ml for the protection of SHELL and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 44298, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at El Paseo Grande at La Jolla Shores Beach

LOE ID: 29168

Pollutant: Enterococcus
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 65

Number of Exceedances:	0	040883
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from May 1999 through December 2007. A total of 188 single samples were collected with 65 monthly geomeans calculated. None of the geomeans exceeded the geomean water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at El Paseo Grande at La Jolla Shores Beach, La Jolla, California. Station identification number is EH-340.	
Temporal Representation:	Samples were collected from May 1999 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44298, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at El Paseo Grande at La Jolla Shores Beach

LOE ID:	29167
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	189
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from May 1999 through December 2007. A total of 189 single samples were collected with four samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Paseo Grande at La Jolla Shores Beach, La Jolla, California. Station identification number is EH-340.
Temporal Representation:	Samples were collected from May 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44298, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at El Paseo Grande at La Jolla Shores Beach

LOE ID:	29160
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	7
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from May 1999 through December 2006. A total of 185 single samples were collected with 7 samples correlated with a storm event. Two of the 7 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the California Ocean Plan the median coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml (SWRCB, 2005). Comparisons were also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Paseo Grande at La Jolla Shores Beach, La Jolla, California. Station identification number is EH-340.
Temporal Representation:	Samples were collected from May 1999 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff

	because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44298, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at El Paseo Grande at La Jolla Shores Beach

LOE ID:	30863
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	178
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from May 1999 through December 2007. A total of 185 single samples were collected of which 178 are dry weather (AB411) samples with one sample exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100 ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Paseo Grande at La Jolla Shores Beach, La Jolla, California. Station identification number is EH-340.
Temporal Representation:	Samples were collected from May 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44298, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at El Paseo Grande at La Jolla Shores Beach

LOE ID:	31172
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation	040886
Number of Samples:	48	
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from May 1999 through October 2007. A total of 141 dry month (April through October) single samples were collected with 48 dry month geomeans calculated. None of the 48 geomeans exceeded the geomean water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100 ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at El Paseo Grande at La Jolla Shores Beach, La Jolla, California. Station identification number is EH-340.	
Temporal Representation:	Samples were collected from May 1999 through October 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44298, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at El Paseo Grande at La Jolla Shores Beach

LOE ID:	31171
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	50
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from May 1999 through October 2007. A total of 144 dry month (April through October) single samples were collected with 50 dry month geomeans calculated. One of the 50 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100 ml;

	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Paseo Grande at La Jolla Shores Beach, La Jolla, California. Station identification number is EH-340.
Temporal Representation:	Samples were collected from May 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44298, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at El Paseo Grande at La Jolla Shores Beach

LOE ID:	31170
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	50
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from May 1999 through October 2007. A total of 144 dry month (April through October) single samples were collected with 50 dry month geomeans calculated. None of the 50 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml.
	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Paseo Grande at La Jolla Shores Beach, La Jolla, California. Station identification number is EH-340.
Temporal Representation:	Samples were collected from May 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44298, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at El Paseo Grande at La Jolla Shores Beach

LOE ID:	75139
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed bw data for Pacific Ocean Shoreline, Scripps HA, at El Paseo Grande at La Jolla Shores Beach to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Scripps HA, at El Paseo Grande at La Jolla Shores Beach was collected at 1 monitoring site [El Paseo Grande (NR)]
Temporal Representation:	Data was collected over the time period 1/8/2008-7/2/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44298, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at El Paseo Grande at La Jolla Shores Beach

LOE ID:	29166
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from May 1999 through December 2007. A total of 188 single samples were collected with six samples correlated with a storm event. None of the six samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional

	Temperature and Precipitation Listings by Station 040889 Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Paseo Grande at La Jolla Shores Beach, La Jolla, California. Station identification number is EH-340.
Temporal Representation:	Samples were collected from May 1999 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44298, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at El Paseo Grande at La Jolla Shores Beach

LOE ID:	29165
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	65
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from May 1999 through December 2007. A total of 188 single samples were collected with 65 monthly geomeans calculated. None of the geomean exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005.

	Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency 040890
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Paseo Grande at La Jolla Shores Beach, La Jolla, California. Station identification number is EH-340.
Temporal Representation:	Samples were collected from May 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44298, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at El Paseo Grande at La Jolla Shores Beach

LOE ID:	29164
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	188
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from May 1999 through December 2007. A total of 188 single samples were collected with two samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Paseo Grande at La Jolla Shores Beach, La Jolla, California. Station identification number is EH-340.
Temporal Representation:	Samples were collected from May 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44298, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at El Paseo Grande at La Jolla Shores Beach

LOE ID:	29163
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	7
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from May 1999 through December 2007. A total of 185 single samples were collected with seven samples correlated with a storm event. One of the seven samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100 ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Paseo Grande at La Jolla Shores Beach, La Jolla, California. Station identification number is EH-340.
Temporal Representation:	Samples were collected from May 1999 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44298, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at El Paseo Grande at La Jolla Shores Beach

LOE ID:	29162
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	040892
Beneficial Use:	Water Contact Recreation	
Number of Samples:	63	
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from May 1999 through December 2007. A total of 185 single samples were collected with 63 monthly geomeans calculated. None of the geomeans exceeded the geomean water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100 ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at El Paseo Grande at La Jolla Shores Beach, La Jolla, California. Station identification number is EH-340.	
Temporal Representation:	Samples were collected from May 1999 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44298, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at El Paseo Grande at La Jolla Shores Beach

LOE ID:	29178
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	-N/A
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were no beach advisory days for this section of shoreline. Bacteriological samples are collected on a weekly basis at ocean and bay locations in San Diego County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that an advisory for waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 - December 2007. Data used was the number of days the beach was advisories were issued when the ocean or bay failed to meet the

	bacteriological standards. 040893
Data Reference:	Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Spatial Representation:	Bacteriological monitoring samples were collected at El Paseo Grande at La Jolla Shores Beach, La Jolla, California.
Temporal Representation:	The beach closures advisory the time frame of January January 2001 to December 2007.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of San Diego's Quality Assessment/Quality Control document
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44298, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at El Paseo Grande at La Jolla Shores Beach

LOE ID:	30756
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	188
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from May 1999 through December 2007. A total of 188 single samples were collected with two samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:	040894
Guideline Reference:	
Spatial Representation:	Samples were collected at El Paseo Grande at La Jolla Shores Beach, La Jolla, California. Station identification number is EH-340.
Temporal Representation:	Samples were collected from May 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44298, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at El Paseo Grande at La Jolla Shores Beach

LOE ID:	29161
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	185
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from May 1999 through December 2007. A total of 185 single samples were collected with two sample exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100 ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Paseo Grande at La Jolla Shores Beach, La Jolla, California. Station identification number is EH-340.
Temporal Representation:	Samples were collected from May 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44298, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at El Paseo Grande at La Jolla Shores Beach

LOE ID:	29159

Pollutant:	Total Coliform	040895
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Shellfish Harvesting	
Number of Samples:	185	
Number of Exceedances:	5	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from May 1999 through December 2007. A total of 185 single samples were collected with five samples exceeding the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the California Ocean Plan the median coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at El Paseo Grande at La Jolla Shores Beach, La Jolla, California. Station identification number is EH-340.	
Temporal Representation:	Samples were collected from May 1999 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44298, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at El Paseo Grande at La Jolla Shores Beach

LOE ID:	29169
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	7
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from May 1999 through December 2007. A total of 189 single samples were collected with 7 samples correlated with a storm event. Two of the 7 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at El Paseo Grande at La Jolla Shores Beach, La Jolla, California. Station identification number is EH-340.
Temporal Representation:	Samples were collected from May 1999 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44298, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at El Paseo Grande at La Jolla Shores Beach

LOE ID:	30656
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	182
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from May 1999 through December 2007. A total of 189 single samples were collected of which 182 are dry weather (AB411) samples with two samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:	040897
Guideline Reference:	
Spatial Representation:	Samples were collected at El Paseo Grande at La Jolla Shores Beach, La Jolla, California. Station identification number is EH-340.
Temporal Representation:	Samples were collected from May 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Scripps HA, at Grand Ave, Pacific Beach
Water Body ID: CAC906300002009042217210 0
Water Body Type: Coastal & Bay Shoreline

DECISION ID 44290 Region 9
Pacific Ocean Shoreline, Scripps HA, at Grand Ave, Pacific Beach

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Fourteen lines of evidence are available in the administrative record to assess this pollutant. With the latest data, 3 of 93 geomean samples exceed the water quality objective for enterococcus for the protection of REC-1 beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, 3 of 93 geomean samples exceed the water quality objective for enterococcus for the protection of REC-1 beneficial use and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 44290, Indicator Bacteria Region 9
Pacific Ocean Shoreline, Scripps HA, at Grand Ave, Pacific Beach

LOE ID: 29113

Pollutant: Enterococcus
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 74

Number of Exceedances:	3	040899

Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through December 2007. A total of 274 single samples were collected with 74 monthly geomeans calculated. Three of the 74 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Grand avenue, Pacific Beach, California. Station identification number is EH-250.
Temporal Representation:	Samples were collected from April 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44290, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Grand Ave, Pacific Beach

LOE ID:	29135
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	6
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through December 2007. A total of 274 single samples were collected with 6 samples correlated with a storm event. One of the 6 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB,

	2005). 040900
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Grand avenue, Pacific Beach, California. Station identification number is EH-250.
Temporal Representation:	Samples were collected from April 1999 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44290, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Grand Ave, Pacific Beach

LOE ID:	29174
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	-N/A
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	5
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were five beach advisory days for this section of shoreline. Bacteriological samples are collected on a weekly basis at ocean and bay locations in San Diego County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that an advisory for waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 - December 2007. Data used was the number of days the beach was advisories were issued when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	Department of Environmental Health, Land and Water Quality Division, San Diego County Beach Closure and Advisory Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-

	contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Spatial Representation:	Bacteriological monitoring samples were collected at Grand avenue, Pacific Beach, California.
Temporal Representation:	The beach advisory covers the time frame of January January 2001 to December 2007.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of San Diego's Quality Assessment/Quality Control document
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44290, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Grand Ave, Pacific Beach

LOE ID:	29104
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	273
Number of Exceedances:	10
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through December 2007. A total of 273 single samples were collected with 10 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Grand avenue, Pacific Beach, California. Station identification number is EH-250.
Temporal Representation:	Samples were collected from April1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44290, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Grand Ave, Pacific Beach 040902

LOE ID:	29105
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through December 2007. A total of 273 single samples were collected with six samples correlated with a storm event. None of the six samples samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Grand avenue, Pacific Beach, California. Station identification number is EH-250.
Temporal Representation:	Samples were collected from April1999 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44290, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Grand Ave, Pacific Beach

LOE ID:	29106
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation
Number of Samples:	273
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through December 2007. A total of 273 single samples were collected with no sample exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Grand avenue, Pacific Beach, California. Station identification number is EH-250.
Temporal Representation:	Samples were collected from April1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44290, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Grand Ave, Pacific Beach

LOE ID:	29112
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	274
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through December 2007. A total of 274 single samples were collected with 4 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB,

	2005). 040904
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Grand avenue, Pacific Beach, California. Station identification number is EH-250.
Temporal Representation:	Samples were collected from April1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44290, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Grand Ave, Pacific Beach

LOE ID:	29134
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through December 2007. A total of 273 single samples with 6 samples correlated with a storm event. None of 6 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Grand avenue, Pacific Beach, California. Station identification number is EH-250.
Temporal Representation:	Samples were collected from April1999 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.

	Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44290, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Grand Ave, Pacific Beach

LOE ID:	29107
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	74
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through December 2007. A total of 273 single samples were collected with 74 geomeans calculated. None of the geoemans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Grand avenue, Pacific Beach, California. Station identification number is EH-250.
Temporal Representation:	Samples were collected from April1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44290, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Grand Ave, Pacific Beach

LOE ID:	29109
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water

Matrix:	Water	040906
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	253	
Number of Exceedances:	1	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through December 2007. A total of 253 single samples were collected with one sample exceeding the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml; Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Grand avenue, Pacific Beach, California. Station identification number is EH-250.	
Temporal Representation:	Samples were collected from April 1999 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44290, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Grand Ave, Pacific Beach

LOE ID:	29110
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	73
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through December 2007. A total of 253 single samples were collected with 73 monthly geomeans calculated. None of the geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml;

	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Grand avenue, Pacific Beach, California. Station identification number is EH-250.
Temporal Representation:	Samples were collected from April1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44290, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Grand Ave, Pacific Beach

LOE ID:	29111
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through December 2007. A total of 253 single samples were collected with five samples correlated with a storm event. None of the five samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml; Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Grand avenue, Pacific Beach, California. Station identification number is EH-250.
Temporal Representation:	Samples were collected from April1999 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event

	was defined as 0.2 inches of rainfall within a 72 hour period. 040908 Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44290, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Grand Ave, Pacific Beach

LOE ID:	30757
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	248
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through December 2007. A total of 253 single samples were collected of which 248 are dry weather (AB411) samples with one sample exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml; Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Grand avenue, Pacific Beach, California. Station identification number is EH-250.
Temporal Representation:	Samples were collected from April 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44290, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Grand Ave, Pacific Beach

LOE ID:	30657

Pollutant:	Enterococcus	040909
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	268	
Number of Exceedances:	3	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through December 2007. A total of 274 single samples were collected of which 268 are dry weather (AB411) samples with three samples exceeding the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Grand avenue, Pacific Beach, California. Station identification number is EH-250.	
Temporal Representation:	Samples were collected from April1999 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44290, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Grand Ave, Pacific Beach

LOE ID:	31168
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	59
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 226 dry month (April through October) single samples were collected with 59 dry month geomeans calculated. None of the 59 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data:	Non-SWAMP	040910
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml; Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Grand avenue, Pacific Beach, California. Station identification number is EH-250.	
Temporal Representation:	Samples were collected from April 1999 through October 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44290, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Grand Ave, Pacific Beach

LOE ID:	30864
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	267
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through December 2007. A total of 273 single samples were collected of which 267 are dry weather (AB411) samples with none of those samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Grand avenue, Pacific Beach, California. Station identification number is EH-250.
Temporal Representation:	Samples were collected from April1999 through December 2007.
Environmental Conditions:	

QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44290, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Grand Ave, Pacific Beach

LOE ID:	31169
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	60
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 246 dry month (April through October) single samples were collected with 60 dry month geomeans calculated. None of the 60 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Grand avenue, Pacific Beach, California. Station identification number is EH-250.
Temporal Representation:	Samples were collected from April 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44290, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Grand Ave, Pacific Beach

LOE ID:	31167
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	60
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 247 dry month (April through October) single samples were collected with 60 dry month geomeans calculated. None of the 60 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Grand avenue, Pacific Beach, California. Station identification number is EH-250.
Temporal Representation:	Samples were collected from April 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44290, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Grand Ave, Pacific Beach

LOE ID:	75140
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	19
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 19 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	

Guideline Reference: 040913

Spatial Representation: Samples were collected at the Grand Ave Pacific Beach site.
Temporal Representation: Samples were collected from April 2008 to September 2008.
Environmental Conditions:
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 44290, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Grand Ave, Pacific Beach

LOE ID: 75141

Pollutant: Fecal Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 19
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Zero of the 19 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at the Grand Ave Pacific Beach site.
Temporal Representation: Samples were collected from April 2008 to September 2008.
Environmental Conditions:
QAPP Information: The samples were collected for the beach watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 44290, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Grand Ave, Pacific Beach

LOE ID: 75142

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Shellfish Harvesting

Number of Samples: 22
Number of Exceedances: 0

Data and Information Type: PATHOGEN MONITORING
Data Used to Assess Water Quality: Water Board staff assessed bw data for Pacific Ocean Shoreline, Scripps HA, at Grand Ave,

	Pacific Beach to determine beneficial use support and results are as follows: 0 of 22 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Scripps HA, at Grand Ave, Pacific Beach was collected at 1 monitoring site [Grand Ave.]
Temporal Representation:	Data was collected over the time period 4/14/2008-9/22/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44290, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Grand Ave, Pacific Beach

LOE ID:	75143
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	19
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 19 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Grand Ave Pacific Beach site.
Temporal Representation:	Samples were collected from April 2008 to September 2008.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44290, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Grand Ave, Pacific Beach

LOE ID:	77680

Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	19
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Zero of the nineteen samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, Scripps HA, at Grand Ave, Pacific Beach.
Temporal Representation:	The samples were collected from April 2008 to September 2008.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Scripps HA, at La Jolla Cove
Water Body ID: CAC906300002009042216252O
Water Body Type: Coastal & Bay Shoreline

DECISION ID 44420 Region 9
Pacific Ocean Shoreline, Scripps HA, at La Jolla Cove

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Delist from 303(d) list (being addressed by USEPA approved TMDL)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Reason for Delisting:	Applicable WQS attained; reason for recovery unspecified
TMDL Name:	Bacteria Impaired Waters I (creeks and beach shorelines)
TMDL Project Code:	169
Date TMDL Approved by USEPA:	06/22/2011
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal from the CWA section 303(d) List under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Fourteen lines of evidence are available in the administrative record to assess this pollutant. With the latest data, 55 of 374 samples exceed the water quality objective for total coliform of a single sample maximum of 230/100ml.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3.With the latest data, 55 of 374 samples exceed the water quality objective for total coliform of a single sample maximum of 230/100ml and this does not exceed the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be removed from the section 303(d) list because applicable water quality standards for the pollutant are not being exceeded.

Line of Evidence (LOE) for Decision ID 44420, Indicator Bacteria Region 9
Pacific Ocean Shoreline, Scripps HA, at La Jolla Cove

LOE ID:	31164
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	040917
Beneficial Use:	Water Contact Recreation	
Number of Samples:	60	
Number of Exceedances:	1	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 251 dry month (April through October) single samples were collected with 60 dry month geomeans calculated. One of the 60 geomeans exceeded the geomean water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from La Jolla Cove, San Diego, California. Station identification number is FM-070.	
Temporal Representation:	Samples were collected from April 1999 through October 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44420, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at La Jolla Cove

LOE ID:	31166
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	60
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 251 dry month (April through October) single samples were collected with 60 dry month geomeans calculated. None of the 60 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; 040918 Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from La Jolla Cove, San Diego, California. Station identification number is FM-070.
Temporal Representation:	Samples were collected from April 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44420, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at La Jolla Cove

LOE ID:	30658
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	271
Number of Exceedances:	5
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 280 single samples were collected of which 271 are dry weather (AB411) samples with five samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from La Jolla Cove, San Diego, California. Station identification number is FM-070.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.

QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

040919

Line of Evidence (LOE) for Decision ID 44420, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at La Jolla Cove

LOE ID:	30758
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	243
Number of Exceedances:	8
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 252 single samples were collected of which 243 are dry weather (AB411) samples with eight samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from La Jolla Cove, San Diego, California. Station identification number is FM-070.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44420, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at La Jolla Cove

LOE ID:	30865
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	282	040920
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 292 single samples were collected of which 282are dry weather (AB411) samples with none of those samples exceeding the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from La Jolla Cove, San Diego, California. Station identification number is FM-070.	
Temporal Representation:	Samples were collected from January 1999 through October 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44420, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at La Jolla Cove

LOE ID:	29255
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	63
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 280 single samples were collected with 63 monthly geomeans calculated. One of the 63 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).

Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from La Jolla Cove, San Diego, California. Station identification number is FM-070.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44420, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at La Jolla Cove

LOE ID:	29254
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	59
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 252 single samples were collected and 59 geomeans calculated. None of the 59 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from La Jolla Cove, San Diego, California. Station identification number is FM-070.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44420, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at La Jolla Cove 040922

LOE ID:	29253
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	66
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 292 single samples were collected with 66 monthly geomeans calculated. None of the 66 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from La Jolla Cove, San Diego, California. Station identification number is FM-070.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44420, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at La Jolla Cove

LOE ID:	29250
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	9
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 252 single samples were collected with nine samples

	correlated with a storm event. One of the nine samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from La Jolla Cove, San Diego, California. Station identification number is FM-070.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44420, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at La Jolla Cove

LOE ID:	29249
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	252
Number of Exceedances:	9
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 252 single samples were collected with 9 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; 040924 Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from La Jolla Cove, San Diego, California. Station identification number is FM-070.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44420, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at La Jolla Cove

LOE ID:	29248
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	10
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 292 single samples were collected with 10 samples correlated with a storm event. One of the 10 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from La Jolla Cove, San Diego, California. Station identification number is FM-070.

Temporal Representation:	Samples were collected from January 1999 through December 2007. 040925
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44420, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at La Jolla Cove

LOE ID:	29247
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	292
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 292 single samples were collected with one sample exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from La Jolla Cove, San Diego, California. Station identification number is FM-070.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44420, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at La Jolla Cove

LOE ID:	29252
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 280 single samples were collected with nine samples correlated with a storm event. None of the nine samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from La Jolla Cove, San Diego, California. Station identification number is FM-070.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44420, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at La Jolla Cove

LOE ID:	29251
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	040927
Beneficial Use:	Water Contact Recreation	
Number of Samples:	280	
Number of Exceedances:	5	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 280 single samples were collected with 5 samples exceeding the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from La Jolla Cove, San Diego, California. Station identification number is FM-070.	
Temporal Representation:	Samples were collected from January 1999 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44420, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at La Jolla Cove

LOE ID:	75206
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	67
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 67 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.

Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the La Jolla Cove site.
Temporal Representation:	Samples were collected from April 2008 to September 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44420, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at La Jolla Cove

LOE ID:	29246
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	9
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 292 single samples were collected with nine samples correlated with a storm event. Two of the nine samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from La Jolla Cove, San Diego, California. Station identification number is FM-070.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.

QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44420, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at La Jolla Cove

LOE ID:	29226
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	292
Number of Exceedances:	51
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 292 single samples were collected with 51 samples exceeded the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at La Jolla Cove, San Diego, California. Station identification number is FM-070.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44420, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at La Jolla Cove

LOE ID:	29277
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	-N/A
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	9
Data and Information Type:	PWS pathogen monitoring (ambient water)

Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were nine beach advisory days for this section of shoreline. Bacteriological samples are collected on a weekly basis at ocean and bay locations in San Diego County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that an advisory for waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 - December 2007. Data used was the number of days the beach was advisories were issued when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Spatial Representation:	Bacteriological monitoring samples were collected at La Jolla Cove in La Jolla, California.
Temporal Representation:	The beach advisory covers the time frame of January January 2001 to December 2007.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of San Diego's Quality Assessment/Quality Control document
QAPP Information Reference(s):	County of San Diego. 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44420, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at La Jolla Cove

LOE ID:	77681
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	67
Number of Exceedances:	4
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Four of the 67 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for

	human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, Scripps HA, at La Jolla Cove.
Temporal Representation:	The samples were collected from April 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44420, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at La Jolla Cove

LOE ID:	75180
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	67
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 67 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the La Jolla Cove site.
Temporal Representation:	Samples were collected from April 2008 to September 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44420, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at La Jolla Cove

LOE ID:	75179
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation	040932
Number of Samples:	67	
Number of Exceedances:	3	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Three of the 67 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at the La Jolla Cove site.	
Temporal Representation:	Samples were collected from April 2008 to August 2010.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44420, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at La Jolla Cove

LOE ID:	75205
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	82
Number of Exceedances:	4
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed bw data for Pacific Ocean Shoreline, Scripps HA, at La Jolla Cove to determine beneficial use support and results are as follows: 4 of 82 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Scripps HA, at La Jolla Cove was collected at 1 monitoring site [La Jolla Cove]
Temporal Representation:	Data was collected over the time period 4/14/2008-8/25/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.

QAPP Information Reference(s): 040933

Line of Evidence (LOE) for Decision ID 44420, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at La Jolla Cove

LOE ID:	31165
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	50
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 211 dry month (April through October) single samples were collected with 50 dry month geomeans calculated. None of the 50 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from La Jolla Cove, San Diego, California. Station identification number is FM-070.
Temporal Representation:	Samples were collected from April 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

DECISION ID 50011 **Region 9**

Pacific Ocean Shoreline, Scripps HA, at La Jolla Cove

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. One of the One samples exceed the Evaluation Guideline for Arsenic.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of One samples exceeded the Evaluation Guideline for Arsenic and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50011, Arsenic **Region 9**

Pacific Ocean Shoreline, Scripps HA, at La Jolla Cove

LOE ID:	75158
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The one sample did exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal. Ten percent of the total arsenic result was used to estimate of the amount of inorganic arsenic in the sample; this number was screened against the guideline.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for arsenic in shellfish tissue is 0.0052 ppm. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; OEHHA, 2004)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment

Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene
Air Toxics Hotspots Program Risk Assessment Guidelines. Part II Technical Support Document for Describing Available Cancer Potency Values.

Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site LJLJ
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/22/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID 50012 Region 9

Pacific Ocean Shoreline, Scripps HA, at La Jolla Cove

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Cadmium. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Evaluation Guideline for Cadmium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50012, Cadmium Region 9

Pacific Ocean Shoreline, Scripps HA, at La Jolla Cove

LOE ID: 75159

Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The sample did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for cadmium in shellfish tissue is 3.3 ppm. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; USEPA, 2000)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Guidance for Assessing Chemical Contaminant Data for Use In Fish Advisories Volume 1: Fish Sampling and Analysis
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site LJLJ
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/22/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID 50013 Region 9

Pacific Ocean Shoreline, Scripps HA, at La Jolla Cove

Pollutant:	**Chlordane**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Chlordane.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Evaluation Guideline for Chlordane and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50013, Chlordane **Region 9**

Pacific Ocean Shoreline, Scripps HA, at La Jolla Cove

LOE ID:	75160
Pollutant:	Chlordane
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal. Chlordane result was calculated by summing the results for chlordane isomers: cis- and trans-nonachlor, alpha- and gamma-chlordane, and oxychlordane.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for total chlordane in shellfish tissue is 6.0 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate

	of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site LJLJ
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/22/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID 50014 Region 9

Pacific Ocean Shoreline, Scripps HA, at La Jolla Cove

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Chlorpyrifos. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Evaluation Guideline for Chlorpyrifos and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50014, Chlorpyrifos Region 9

Pacific Ocean Shoreline, Scripps HA, at La Jolla Cove 040939

LOE ID:	75169
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for chlorpyrifos in shellfish tissue is 1,000 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; USEPA, 2000)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Guidance for Assessing Chemical Contaminant Data for Use In Fish Advisories Volume 1: Fish Sampling and Analysis
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site LJLJ
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/22/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID 50015 Region 9

Pacific Ocean Shoreline, Scripps HA, at La Jolla Cove

Pollutant:	**Dieldrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**

Last Listing Cycle's Final Listing Decision:	New Decision	040940
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Dieldrin.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Evaluation Guideline for Dieldrin and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50015, Dieldrin **Region 9**

Pacific Ocean Shoreline, Scripps HA, at La Jolla Cove

LOE ID:	75170
Pollutant:	Dieldrin
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The results did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for dieldrin in shellfish tissue is 0.49 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site LJLJ
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/22/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID **50016** **Region 9**

Pacific Ocean Shoreline, Scripps HA, at La Jolla Cove

Pollutant:	**Endosulfan**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Endosulfan. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Evaluation Guideline for Endosulfan and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50016, Endosulfan **Region 9**

Pacific Ocean Shoreline, Scripps HA, at La Jolla Cove

LOE ID:	75171
Pollutant:	Endosulfan
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal. Total Endosulfan result was calculated by summing Endosulfan I and Endosulfan II.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for endosulfan (I and II) in shellfish tissue is 20,000 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; USEPA, 2000)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Guidance for Assessing Chemical Contaminant Data for Use In Fish Advisories Volume 1: Fish Sampling and Analysis
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site LJLJ
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/22/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID **50017** **Region 9**

Pacific Ocean Shoreline, Scripps HA, at La Jolla Cove

040943

Pollutant:	**Endrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Endrin. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Evaluation Guideline for Endrin and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50017, Endrin — Region 9

Pacific Ocean Shoreline, Scripps HA, at La Jolla Cove

LOE ID:	75178
Pollutant:	Endrin
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s)

	that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for endrin in shellfish tissue is 1,000 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; USEPA, 2000)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Guidance for Assessing Chemical Contaminant Data for Use In Fish Advisories Volume 1: Fish Sampling and Analysis
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site LJLJ
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/22/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID 50018 Region 9

Pacific Ocean Shoreline, Scripps HA, at La Jolla Cove

Pollutant:	**Heptachlor epoxide**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Heptachlor epoxide. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Evaluation Guideline for Heptachlor epoxide and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50018, Heptachlor epoxide **Region 9**

Pacific Ocean Shoreline, Scripps HA, at La Jolla Cove

LOE ID:	75181
Pollutant:	Heptachlor epoxide
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for heptachlor epoxide in shellfish tissue is 1.4 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; OEHHA, 1999)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Public Health Goal for Heptachlor and Heptachlor Epoxide in Drinking Water
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site LJLJ
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/22/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/

QAPP Information Reference(s): 040946

DECISION ID 50019 Region 9

Pacific Ocean Shoreline, Scripps HA, at La Jolla Cove

Pollutant:	**Hexachlorobenzene/ HCB**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Hexachlorobenzene/ HCB.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Evaluation Guideline for Hexachlorobenzene/ HCB and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50019, Hexachlorobenzene/ HCB Region 9

Pacific Ocean Shoreline, Scripps HA, at La Jolla Cove

LOE ID:	75190
Pollutant:	Hexachlorobenzene/ HCB
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for hexachlorobenzene in shellfish tissue is 4.3 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; OEHHA, 2005)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Air Toxics Hotspots Program Risk Assessment Guidelines. Part II Technical Support Document for Describing Available Cancer Potency Values.
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site LJLJ
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/22/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID 50020 Region 9

Pacific Ocean Shoreline, Scripps HA, at La Jolla Cove

Pollutant:	**Lindane/gamma Hexachlorocyclohexane (gamma-HCH)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Lindane/gamma Hexachlorocyclohexane (gamma-HCH).

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.

3. Zero of One samples exceeded the Evaluation Guideline for Lindane/gamma Hexachlorocyclohexane (gamma-HCH) and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 040948
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50020, Lindane/gamma Hexachlorocyclohexane (gamma-HCH) **Region 9**

Pacific Ocean Shoreline, Scripps HA, at La Jolla Cove

LOE ID:	75191
Pollutant:	Lindane/gamma Hexachlorocyclohexane (gamma-HCH)
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for lindane in shellfish tissue is 7.1 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; OEHHA, 2005)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Air Toxics Hotspots Program Risk Assessment Guidelines. Part II Technical Support Document for Describing Available Cancer Potency Values.
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site LJLJ
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on

	1/22/2008	040949

Environmental Conditions:

QAPP Information: Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/

QAPP Information Reference(s):

DECISION ID 50021 — Region 9

Pacific Ocean Shoreline, Scripps HA, at La Jolla Cove

Pollutant:	**Mercury**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Mercury.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Evaluation Guideline for Mercury and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50021, Mercury — Region 9

Pacific Ocean Shoreline, Scripps HA, at La Jolla Cove

LOE ID:	75192
Pollutant:	Mercury
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	1

Number of Exceedances:	0	040950
Data and Information Type:	Shellfish surveys	
Data Used to Assess Water Quality:	The sample did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.	
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:	The USEPA 304(a) recommended water quality criterion for concentrations of methylmercury in shellfish tissue (wet weight) is 0.2 ppm. (Brodberg, R.K., and G.A. Pollock, 1999; USEPA, 2001)	
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Water Quality Criterion for the Protection of Human Health: Methylmercury. Final. United States Environmental Protection Agency Office of Science and Technology Office of Water. EPA-823-R-01-001. January 2001	
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site LJLJ	
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/22/2008	
Environmental Conditions:		
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/	
QAPP Information Reference(s):		

DECISION ID 50022 Region 9

Pacific Ocean Shoreline, Scripps HA, at La Jolla Cove

Pollutant:	**Mirex**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Mirex.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.040951
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Evaluation Guideline for Mirex and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50022, Mirex **Region 9**

Pacific Ocean Shoreline, Scripps HA, at La Jolla Cove

LOE ID:	75198
Pollutant:	Mirex
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The non detect result was not included in the assessment since the reporting limit was above the evaluation guideline. MDL were provided by NOAA Federal and RL were calculated by multiplying 3.18 by the MDL.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for mirex in shellfish tissue is 0.43 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; OEHHA, 1992)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Expedited Cancer Potency Values and Proposed Regulatory Levels for Certain Proposition 65 Carcinogens.
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site LJLJ
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on

	1/22/2008	040952

Environmental Conditions:

QAPP Information: Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/

QAPP Information Reference(s):

DECISION ID 50023 — Region 9

Pacific Ocean Shoreline, Scripps HA, at La Jolla Cove

Pollutant:	**PAHs (Polycyclic Aromatic Hydrocarbons)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for PAHs (Polycyclic Aromatic Hydrocarbons).

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Evaluation Guideline for PAHs (Polycyclic Aromatic Hydrocarbons) and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50023, PAHs (Polycyclic Aromatic Hydrocarbons) — Region 9

Pacific Ocean Shoreline, Scripps HA, at La Jolla Cove

LOE ID:	75199
Pollutant:	PAHs (Polycyclic Aromatic Hydrocarbons)
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	1

Number of Exceedances:	0	040953
Data and Information Type:	Shellfish surveys	
Data Used to Assess Water Quality:	The sample did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal. The total PAHs were calculated as the potency equivalency concentration or the sum of the toxic equivalency factors multiplied by the concentrations of: Acenaphthene, Acenaphthylene, Anthracene, Benz[a]anthracene, Benzo[a]pyrene, Benzo[b]fluoranthene, Benzo[g,h,i]perylene, Benzo[k]fluoranthene, Dibenzo[a,h]anthracene, Chrysene, Fluoranthene, Fluorene, Indeno[1,2,3-c,d]pyrene, Phenanthrene, and Pyrene.	
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for polycyclic aromatic hydrocarbons in shellfish tissue is 1.1 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; USEPA, 2000)	
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Guidance for Assessing Chemical Contaminant Data for Use In Fish Advisories Volume 1: Fish Sampling and Analysis	
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site LJLJ	
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/22/2008	
Environmental Conditions:		
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/	
QAPP Information Reference(s):		

DECISION ID	**50024**	**Region 9**
Pacific Ocean Shoreline, Scripps HA, at La Jolla Cove		

Pollutant:	**PCBs (Polychlorinated biphenyls)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for PCBs (Polychlorinated biphenyls).

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Evaluation Guideline for PCBs (Polychlorinated biphenyls) and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50024, PCBs (Polychlorinated biphenyls) Region 9

Pacific Ocean Shoreline, Scripps HA, at La Jolla Cove

LOE ID:	75200
Pollutant:	PCBs (Polychlorinated biphenyls)
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The sample did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal. Total PCB was assessed for as follows: PCB aroclors and congeners were summed separately and the sum that yielded the highest value was used for the assessment.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for polychlorinated biphenyls in shellfish tissue is 3.9 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental

	Health Hazard Assessment 040955 Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site LJLJ
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/22/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID 50025 Region 9

Pacific Ocean Shoreline, Scripps HA, at La Jolla Cove

Pollutant:	**Selenium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Selenium. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Evaluation Guideline for Selenium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50025, Selenium Region 9

Pacific Ocean Shoreline, Scripps HA, at La Jolla Cove

LOE ID: 75204

Pollutant:	Selenium	040956
LOE Subgroup:	Pollutant-Tissue	
Matrix:	Tissue	
Fraction:	Shellfish	
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	Shellfish surveys	
Data Used to Assess Water Quality:	The sample did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.	
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for selenium in shellfish tissue is 11 ppm. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day. A background dietary consuption rate of 0.114 mg/day is applied for this micronutrient. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008)	
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene	
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site LJLJ	
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/22/2008	
Environmental Conditions:		
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/	
QAPP Information Reference(s):		

DECISION ID 50026 Region 9

Pacific Ocean Shoreline, Scripps HA, at La Jolla Cove

Pollutant:	**Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD).

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Evaluation Guideline for Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD) and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50026, Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD) **Region 9**

Pacific Ocean Shoreline, Scripps HA, at La Jolla Cove

LOE ID:	75207
Pollutant:	Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD)
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The sample did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal. The total DDTs were calculated as the sum of 4,4- and 2,4- isomers of DDT, DDE, and DDD.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for total DDT in shellfish tissue is 23 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999;

	Klasing, S., and R. Brodberg, 2008) 040958
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site LJLJ
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/22/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Scripps HA, at Pacific Beach Point , Pacific Beach
Water Body ID: CAC906300002009042217105 7
Water Body Type: Coastal & Bay Shoreline

DECISION ID 42716 **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Pacific Beach Point , Pacific Beach

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not Delist from 303(d) list (being addressed with USEPA approved TMDL)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
TMDL Name:	Bacteria Impaired Waters I (creeks and beach shorelines)
TMDL Project Code:	169
Date TMDL Approved by USEPA:	06/22/2011
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal from the CWA section 303(d) List under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Fourteen lines of evidence are available in the administrative record to assess this pollutant. With the latest data, 44 of 149 geomean samples exceed the water quality objective (WQO) for enterococcus for the protection of REC-1 beneficial use, and 160 of 504 samples exceed the SSM WQO for total coliform for the protection of SHELL beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, 44 of 149 geomean samples exceed the water quality objective (WQO) for enterococcus for the protection of REC-1 beneficial use, and 160 of 504 samples exceed the SSM WQO for total coliform for the protection of SHELL beneficial use and this exceeds the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 42716, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Pacific Beach Point , Pacific Beach

LOE ID:	77682
Pollutant:	Total Coliform

LOE Subgroup:	Pollutant-Water	040960
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Shellfish Harvesting	
Number of Samples:	64	
Number of Exceedances:	6	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Six of the 64 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, Scripps HA, at Pacific Beach Point , Pacific Beach.	
Temporal Representation:	The samples were collected from January 2008 to August 2010.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the beach watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 42716, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Pacific Beach Point , Pacific Beach

LOE ID:	75217
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	65
Number of Exceedances:	14
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Fourteen of the 65 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at the Pacific Beach Point site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 42716, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Pacific Beach Point , Pacific Beach

LOE ID:	75218
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	63
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 63 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Pacific Beach Point site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 42716, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Pacific Beach Point , Pacific Beach

LOE ID:	75219
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	74
Number of Exceedances:	4
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed bw data for Pacific Ocean Shoreline, Scripps HA, at Pacific Beach Point , Pacific Beach to determine beneficial use support and results are as follows: 4

of 74 samples exceed the criterion for Coliform, Total. 040962

Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.

Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:

Guideline Reference:

Spatial Representation: Data for this line of evidence for Pacific Ocean Shoreline, Scripps HA, at Pacific Beach Point , Pacific Beach was collected at 1 monitoring site [P.B. Point]

Temporal Representation: Data was collected over the time period 1/14/2008-8/25/2010.

Environmental Conditions: Staff is not aware of any special conditions that might affect interpretation of the data.

QAPP Information: The samples were collected for the Beach Watch program.

QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 42716, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Pacific Beach Point , Pacific Beach

LOE ID: 75220

Pollutant: Total Coliform

LOE Subgroup: Pollutant-Water

Matrix: Water

Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 64

Number of Exceedances: 0

Data and Information Type: Not Specified

Data Used to Assess Water Quality: Zero of the 64 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.

Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.

Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:

Guideline Reference:

Spatial Representation: Samples were collected at the pacific Beach Point site.

Temporal Representation: Samples were collected from January 2008 to August 2010.

Environmental Conditions:

QAPP Information: The samples were collected for the Beach Watch program.

QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 42716, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Pacific Beach Point , Pacific Beach

LOE ID: 30866

Pollutant:	Total Coliform	040963
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	419	
Number of Exceedances:	10	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April1999 through November 2007. A total of 430 single samples were collected of which 419 are dry weather (AB411) samples with 10 of those samples exceeding the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml. Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected inside Pacific Beach Point , Pacific Beach, California. Station identification number is EH-255.	
Temporal Representation:	Samples were collected from April1999 through November 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 42716, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Pacific Beach Point , Pacific Beach

LOE ID:	31138
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	60
Number of Exceedances:	35
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 381 dry month (April through October) single samples were collected with 60 dry month geomeans calculated. Thirty-five of the 60 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected inside Pacific Beach Point , Pacific Beach, California. Station identification number is EH-255.
Temporal Representation:	Samples were collected from April 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42716, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Pacific Beach Point , Pacific Beach

LOE ID:	31139
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	60
Number of Exceedances:	7
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 344 dry month (April through October) single samples were collected with 60 dry month geomeans calculated. Seven of the 60 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml; Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected inside Pacific Beach Point , Pacific Beach, California. Station identification number is EH-255.
Temporal Representation:	Samples were collected from April 1999 through October 2007.

Environmental Conditions:	040965
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42716, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Pacific Beach Point , Pacific Beach

LOE ID:	31140
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	60
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 342 dry month (April through October) single samples were collected with 60 dry month geomeans calculated. Three of the 60 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml. Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected inside Pacific Beach Point , Pacific Beach, California. Station identification number is EH-255.
Temporal Representation:	Samples were collected from April 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42716, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Pacific Beach Point , Pacific Beach

LOE ID:	30759
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation
Number of Samples:	443
Number of Exceedances:	66
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through November 2007. A total of 454 single samples were collected of which 443 are dry weather (AB411) samples with 66 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml; Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected inside Pacific Beach Point , Pacific Beach, California. Station identification number is EH-255.
Temporal Representation:	Samples were collected from April1999 through November 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42716, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Pacific Beach Point , Pacific Beach

LOE ID:	30659
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	479
Number of Exceedances:	125
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through November 2007. A total of 491 single samples were collected of which 479 are dry weather (AB411) samples with 125 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB,

	2005). 040967
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected inside Pacific Beach Point , Pacific Beach, California. Station identification number is EH-255.
Temporal Representation:	Samples were collected from April 1999 through November 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42716, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Pacific Beach Point , Pacific Beach

LOE ID:	29098
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	454
Number of Exceedances:	66
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through November 2007. A total of 454 single samples were collected with 66 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml; Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected inside Pacific Beach Point , Pacific Beach, California. Station identification number is EH-255.
Temporal Representation:	Samples were collected from April1999 through November 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42716, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Pacific Beach Point , Pacific Beach 040968

LOE ID:	29099
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	84
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through November 2007. A total of 454 single samples were collected with 84 monthly geomeans calculated. Two of the 84 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml; Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected inside Pacific Beach Point , Pacific Beach, California. Station identification number is EH-255.
Temporal Representation:	Samples were collected from April 1999 through November 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42716, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Pacific Beach Point , Pacific Beach

LOE ID:	29100
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	11
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through November 2007. A total of 454 single samples were collected with 11 samples correlated with a storm event. None of the 11 samples exceeded the single sample water quality

	objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml; Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected inside Pacific Beach Point , Pacific Beach, California. Station identification number is EH-255.
Temporal Representation:	Samples were collected from April1999 through November 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42716, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Pacific Beach Point , Pacific Beach

LOE ID:	29101
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	491
Number of Exceedances:	129
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through November 2007. A total of 491 single samples were collected with 129 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	

Guideline Reference:	040970
Spatial Representation:	Samples were collected inside Pacific Beach Point , Pacific Beach, California. Station identification number is EH-255.
Temporal Representation:	Samples were collected from April 1999 through November 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42716, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Pacific Beach Point , Pacific Beach

LOE ID:	29093
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	430
Number of Exceedances:	156
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April1999 through November 2007. A total of 430 single samples were collected with 156 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected inside Pacific Beach Point , Pacific Beach, California. Station identification number is EH-255.
Temporal Representation:	Samples were collected from April1999 through November 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42716, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Pacific Beach Point , Pacific Beach

LOE ID:	29094
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	040971
Beneficial Use:	Shellfish Harvesting	
Number of Samples:	11	
Number of Exceedances:	4	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April1999 through November 2007. A total of 430 single samples were collected with 11 samples correlated with a storm event. Four of the 11 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.	
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected inside Pacific Beach Point , Pacific Beach, California. Station identification number is EH-255.	
Temporal Representation:	Samples were collected from April1999 through November 2007.	
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 42716, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Pacific Beach Point , Pacific Beach

LOE ID:	29095
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	430
Number of Exceedances:	10
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April1999 through

	November 2007. A total of 430 single samples were collected with 10 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml. Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected inside Pacific Beach Point , Pacific Beach, California. Station identification number is EH-255.
Temporal Representation:	Samples were collected from April1999 through November 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42716, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Pacific Beach Point , Pacific Beach

LOE ID:	29096
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	84
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through November 2007. A total of 430 single samples were collected with 84 monthly geomeans calculated. From the 84 geomeans, three exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml. Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected inside Pacific Beach Point , Pacific Beach, California. Station identification number is EH-255.
Temporal Representation:	Samples were collected from April1999 through November 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42716, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Pacific Beach Point , Pacific Beach

LOE ID:	29097
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	11
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April1999 through November 2007. A total of 430 single samples were collected with 11 samples correlated with a storm event. None of the 11 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml. Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected inside Pacific Beach Point , Pacific Beach, California. Station identification number is EH-255.
Temporal Representation:	Samples were collected from April1999 through November 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42716, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Pacific Beach Point , Pacific Beach

LOE ID:	29173	040974
Pollutant:	Indicator Bacteria	
LOE Subgroup:	Health Advisories	
Matrix:	-N/A	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	2555	
Number of Exceedances:	465	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were eight beach advisory days for this section of shoreline. Bacteriological samples are collected on a weekly basis at ocean and bay locations in San Diego County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that an advisory for waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 - December 2007. Data used was the number of days the beach was advisories were issued when the ocean or bay failed to meet the bacteriological standards.	
Data Reference:	Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.	
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960	
Evaluation Guideline:		
Guideline Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Spatial Representation:	Bacteriological monitoring samples were collected inside Pacific Beach Point , Pacific Beach, California.	
Temporal Representation:	The beach advisory covers the time frame of January January 2001 to December 2007.	
Environmental Conditions:		
QAPP Information:	Samples were collected in compliance with County of San Diego's Quality Assessment/Quality Control document	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 42716, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Pacific Beach Point , Pacific Beach

LOE ID:	29102
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation
Number of Samples:	84
Number of Exceedances:	30
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through November 2007. A total of 491 single samples were collected with 84 monthly geomeans calculated. From the 84 geomeans, 30 exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected inside Pacific Beach Point , Pacific Beach, California. Station identification number is EH-255.
Temporal Representation:	Samples were collected from April1999 through November 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42716, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Pacific Beach Point , Pacific Beach

LOE ID:	29103
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	12
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through November 2007. A total of 491 single samples were collected with 12 samples correlated with a storm event. From the 12 samples, four exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected inside Pacific Beach Point , Pacific Beach, California. Station identification number is EH-255.
Temporal Representation:	Samples were collected from April1999 through November 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Scripps HA, at Playa del Norte at Windansea Beach
Water Body ID: CAC906300002009042217001 2
Water Body Type: Coastal & Bay Shoreline

DECISION ID 43156 Region 9
Pacific Ocean Shoreline, Scripps HA, at Playa del Norte at Windansea Beach

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Fourteen lines of evidence are available in the administrative record to assess this pollutant. With the latest data, 1 of 133 geomean samples exceed the water quality objective for enterococcus for the protection of REC-1 beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, 1 of 133 geomean samples exceed the water quality objective for enterococcus for the protection of REC-1 beneficial use and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 43156, Indicator Bacteria Region 9
Pacific Ocean Shoreline, Scripps HA, at Playa del Norte at Windansea Beach

LOE ID: 30660

Pollutant: Enterococcus
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 293

Number of Exceedances:	2	040978
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through December 2007. A total of 302 single samples were collected of which 293 are dry weather (AB411) samples with two samples exceding the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Playa del Norte at Windansea Beach, San Diego, California. Station identification number is EH-280.	
Temporal Representation:	Samples were collected from April 1999 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43156, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Playa del Norte at Windansea Beach

LOE ID:	29170
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	-N/A
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were two beach advisory days for this section of shoreline. Bacteriological samples are collected on a weekly basis at ocean and bay locations in San Diego County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that an advisory for waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 - December 2007. Data used was the number of days the beach was advisories were issued when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Spatial Representation:	Samples were collected at Playa del Norte at Windansea Beach, San Diego, California. Station identification number is EH-280.
Temporal Representation:	The beach advisory covers the time frame of January January 2001 to December 2007.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of San Diego's Quality Assessment/Quality Control document
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43156, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Playa del Norte at Windansea Beach

LOE ID:	28912
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through December 2007. A total of 302 single samples were collected with nine samples correlated with a storm event. None of the nine samples exceed the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	

Guideline Reference:	040980
Spatial Representation:	Samples were collected at Playa del Norte at Windansea Beach, San Diego, California. Station identification number is EH-280.
Temporal Representation:	Samples were collected from April 1999 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43156, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Playa del Norte at Windansea Beach

LOE ID:	28911
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	76
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through December 2007. A total of 302 single samples were collected with 76 monthly geomeans calculated. From the 76 geomeans, only one exceded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Playa del Norte at Windansea Beach, San Diego, California. Station identification number is EH-280.
Temporal Representation:	Samples were collected from April 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43156, Indicator Bacteria 040981 **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Playa del Norte at Windansea Beach

LOE ID:	31154
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	60
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 229 dry month (April through October) single samples were collected with 60 dry month geomeans calculated. None of the 60 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Playa del Norte at Windansea Beach, San Diego, California. Station identification number is EH-280.
Temporal Representation:	Samples were collected from April 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43156, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Playa del Norte at Windansea Beach

LOE ID:	31153
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	59
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)

Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 205 dry month (April through October) single samples were collected with 59 dry month geomeans calculated. None of the 59 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml; Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Playa del Norte at Windansea Beach, San Diego, California. Station identification number is EH-280.
Temporal Representation:	Samples were collected from April 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43156, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Playa del Norte at Windansea Beach

LOE ID:	31152
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	60
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 230 dry month (April through October) single samples were collected with 60 dry month geomeans calculated. None of the 60 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:	040983
Guideline Reference:	
Spatial Representation:	Samples were collected at Playa del Norte at Windansea Beach, San Diego, California. Station identification number is EH-280.
Temporal Representation:	Samples were collected from April 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43156, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Playa del Norte at Windansea Beach

LOE ID:	75226
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	73
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed bw data for Pacific Ocean Shoreline, Scripps HA, at Playa del Norte at Windansea Beach to determine beneficial use support and results are as follows: 0 of 73 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Scripps HA, at Playa del Norte at Windansea Beach was collected at 1 monitoring site [Playa Del Norte]
Temporal Representation:	Data was collected over the time period 1/3/2008-8/18/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43156, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Playa del Norte at Windansea Beach

LOE ID:	28910
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	302
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through December 2007. A total of 302 single samples were collected with two samples exceding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Playa del Norte at Windansea Beach, San Diego, California. Station identification number is EH-280.
Temporal Representation:	Samples were collected from April 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43156, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Playa del Norte at Windansea Beach

LOE ID:	28909
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through December 2007. A total of 261 single samples were collected with seven samples correlated with a storm event. None of the seven samples exceed the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml; 040985 Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Playa del Norte at Windansea Beach, San Diego, California. Station identification number is EH-280.
Temporal Representation:	Samples were collected from April 1999 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43156, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Playa del Norte at Windansea Beach

LOE ID:	28906
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through December 2007. A total of 301 single samples were collected with nine samples correlated with a storm event. None of the nine samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Playa del Norte at Windansea Beach, San Diego, California. Station identification number is EH-280.
Temporal Representation:	Samples were collected from April 1999 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43156, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Playa del Norte at Windansea Beach

LOE ID:	28905
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	76
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through December 2007. A total of 301 single samples were collected and 76 monthly geomeans calculated. None of the 76 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Playa del Norte at Windansea Beach, San Diego, California. Station identification number is EH-280.
Temporal Representation:	Samples were collected from April 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance

Line of Evidence (LOE) for Decision ID 43156, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Playa del Norte at Windansea Beach

LOE ID:	28904
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	301
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through December 2007. A total of 301 single samples were collected with no samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Playa del Norte at Windansea Beach, San Diego, California. Station identification number is EH-280.
Temporal Representation:	Samples were collected from April 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43156, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Playa del Norte at Windansea Beach

LOE ID:	28908
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	75
Number of Exceedances:	0

Data and Information Type:	PWS pathogen monitoring (ambient water) 040988
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through December 2007. A total of 261 single samples were collected with 75 geomeans calculated. None of the 75 geomeans exceed the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml; Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Playa del Norte at Windansea Beach, San Diego, California. Station identification number is EH-280.
Temporal Representation:	Samples were collected from April 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43156, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Playa del Norte at Windansea Beach

LOE ID:	28902
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	301
Number of Exceedances:	7
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through December 2007. A total of 301 single samples were collected with seven samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at Playa del Norte at Windansea Beach, San Diego, California. Station identification number is EH-280.
Temporal Representation:	Samples were collected from April 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43156, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Playa del Norte at Windansea Beach

LOE ID:	28907
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	261
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through December 2007. A total of 261 single samples were collected with one sample exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml; Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Playa del Norte at Windansea Beach, San Diego, California. Station identification number is EH-280.
Temporal Representation:	Samples were collected from April 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43156, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Playa del Norte at Windansea Beach

LOE ID:	77683
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	040990
Beneficial Use:	Shellfish Harvesting	
Number of Samples:	57	
Number of Exceedances:	0	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Zero of the 57 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, Scripps HA, at Playa del Norte at Windansea Beach.	
Temporal Representation:	The samples were collected from January 2008 to August 2010.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the beach watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43156, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Playa del Norte at Windansea Beach

LOE ID:	75227
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	57
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 57 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Playa del Norte at Windansea Beach site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	

QAPP Information:	The samples were collected for the Beach Watch program.	040991
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43156, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Playa del Norte at Windansea Beach

LOE ID:	28903
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	9
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through December 2007. A total of 301 single samples were collected with nine samples correlated with a storm event. From the nine samples, two exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Playa del Norte at Windansea Beach, San Diego, California. Station identification number is EH-280.
Temporal Representation:	Samples were collected from April 1999 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43156, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Playa del Norte at Windansea Beach

LOE ID:	75225

Pollutant:	Fecal Coliform	040992
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	57	
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Zero of the 57 geomeans exceeded the objective.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at the Playa del Norte at Windansea Beach site.	
Temporal Representation:	Samples were collected from January 2008 to August 2010.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the beach watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43156, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Playa del Norte at Windansea Beach

LOE ID:	75221
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	57
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 57 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Playa del Norte at Windansea Beach site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43156, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Playa del Norte at Windansea Beach

LOE ID:	30867
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	292
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through December 2007. A total of 301 single samples were collected of which 292 are dry weather (AB411) samples and none of those samples exceeded the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Playa del Norte at Windansea Beach, San Diego, California. Station identification number is EH-280.
Temporal Representation:	Samples were collected from April 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43156, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Playa del Norte at Windansea Beach

LOE ID:	30760
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	254
Number of Exceedances:	1

Data and Information Type:	PWS pathogen monitoring (ambient water) 040994
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through December 2007. A total of 261 single samples were collected of which 254 are dry weather (AB411) samples with one sample exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml; Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Playa del Norte at Windansea Beach, San Diego, California. Station identification number is EH-280.
Temporal Representation:	Samples were collected from April 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Scripps HA, at Ravina
Water Body ID: CAC906300002009042216443 0
Water Body Type: Coastal & Bay Shoreline

DECISION ID 43594 Region 9
Pacific Ocean Shoreline, Scripps HA, at Ravina

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Delist from 303(d) list (being addressed by USEPA approved TMDL)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Reason for Delisting:	Applicable WQS attained; reason for recovery unspecified
TMDL Name:	Bacteria Impaired Waters I (creeks and beach shorelines)
TMDL Project Code:	169
Date TMDL Approved by USEPA:	06/22/2011
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal from the CWA section 303(d) List under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Fifteen lines of evidence are available in the administrative record to assess this pollutant. With the latest data, 57 of 378 samples exceed the water quality objective for total coliform of a single sample maximum of 230/100 ml..

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, 57 of 378 samples exceed the water quality objective for total coliform of a single sample maximum of 230/100 ml and this does not exceed the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be removed from the section 303(d) list because applicable water quality standards for the pollutant are not being exceeded.

Line of Evidence (LOE) for Decision ID 43594, Indicator Bacteria Region 9
Pacific Ocean Shoreline, Scripps HA, at Ravina

LOE ID:	30868
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	040996
Beneficial Use:	Water Contact Recreation	
Number of Samples:	302	
Number of Exceedances:	3	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 313 single samples were collected of which 302 are dry weather AB411 samples. Of the 302 dry weather samples three exceeded the single sample water quality objective.	
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Ravina, San Diego, California. Station identification number is EH-300.	
Temporal Representation:	Samples were collected from January 1999 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43594, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Ravina

LOE ID:	30761
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	272
Number of Exceedances:	8
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 281 single samples were collected of which 272 are dry weather (AB411) samples with eight samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data:	Non-SWAMP	040997
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Ravina, San Diego, California. Station identification number is EH-300.	
Temporal Representation:	Samples were collected from January 1999 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43594, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Ravina

LOE ID:	30661
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	294
Number of Exceedances:	17
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 304 single samples were collected of which 294 are dry weather (AB411) samples with 17 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Ravina, San Diego, California. Station identification number is EH-300.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	

QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43594, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Ravina

LOE ID:	29272
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	-N/A
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	5
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were five beach advisory days for this section of shoreline. Bacteriological samples are collected on a weekly basis at ocean and bay locations in San Diego County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that an advisory for waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 - December 2007. Data used was the number of days the beach was advisories were issued when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Spatial Representation:	Samples were collected at Ravina at Windansea Beach, La Jolla, California.
Temporal Representation:	The beach advisory covers the time frame of January January 2001 to December 2007.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of San Diego's Quality Assessment/Quality Control document
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43594, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Ravina 040999

LOE ID:	29204
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	313
Number of Exceedances:	54
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April1999 through December 2007. A total of 313 single samples were collected with 54 samples exceeded the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005). Comparisons were also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Ravina, San Diego, California. Station identification number is EH-300.
Temporal Representation:	Samples were collected from April1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43594, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Ravina

LOE ID:	29207
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	11
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 313 single samples were collected with 11 samples correlated with a storm event. One of the 11 samples exceeded the single sample water

	quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Ravina, San Diego, California. Station identification number is EH-300.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43594, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Ravina

LOE ID:	29206
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	313
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 313 single samples were collected with four samples exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Ravina, San Diego, California. Station identification number is EH-300.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43594, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Ravina

LOE ID:	29205
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	11
Number of Exceedances:	5
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 313 single samples were collected with 11 samples correlated with a storm event. Five of the 11 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Ravina, San Diego, California. Station identification number is EH-300.
Temporal Representation:	Samples were collected from January 1999 through December 2007.

Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43594, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Ravina

LOE ID:	29214
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	73
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 304 single samples were collected with 73 monthly geomeans calculated. Two of the 73 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Ravina, San Diego, California. Station identification number is EH-300.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43594, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Ravina

LOE ID:	29213	041003

Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	72
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 281 single samples were collected and 72 geomeans calculated. None of the 72 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Ravina, San Diego, California. Station identification number is EH-300.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43594, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Ravina

LOE ID:	29212
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	76
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 313 single samples were collected with 76 monthly geomeans calculated. One of the 76 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program,

	2007. AB 411 monitoring data 1999 to 2007	041004

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Ravina, San Diego, California. Station identification number is EH-300.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43594, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Ravina

LOE ID:	29211
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	10
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 304 single samples were collected with 10 samples correlated with a storm event. Two of the 10 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	

Guideline Reference:	041005
Spatial Representation:	Samples were collected from Ravina, San Diego, California. Station identification number is EH-300.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43594, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Ravina

LOE ID:	29210
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	304
Number of Exceedances:	19
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 304 single samples were collected with 19 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Ravina, San Diego, California. Station identification number is EH-300.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43594, Indicator Bacteria 041006 Region 9

Pacific Ocean Shoreline, Scripps HA, at Ravina

LOE ID:	29209
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	9
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 281 single samples were collected with 9 samples correlated with a storm event. One of the 9 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Ravina, San Diego, California. Station identification number is EH-300.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43594, Indicator Bacteria Region 9

Pacific Ocean Shoreline, Scripps HA, at Ravina

LOE ID:	29208

Pollutant:	Fecal Coliform	041007
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	281	
Number of Exceedances:	9	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 281 single samples were collected with 9 samples exceeding the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Ravina, San Diego, California. Station identification number is EH-300.	
Temporal Representation:	Samples were collected from January 1999 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43594, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Ravina

LOE ID:	77684
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	55
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Zero of the 55 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for

	human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, Scripps HA, at Ravina.
Temporal Representation:	The samples were collected from April 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43594, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Ravina

LOE ID:	75231
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	55
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 55 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Ravina site.
Temporal Representation:	Samples were collected from April 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43594, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Ravina

LOE ID:	75230
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Shellfish Harvesting	041009
Number of Samples:	65	
Number of Exceedances:	3	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed bw data for Pacific Ocean Shoreline, Scripps HA, at Ravina to determine beneficial use support and results are as follows: 3 of 65 samples exceed the criterion for Coliform, Total.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Scripps HA, at Ravina was collected at 1 monitoring site [Ravina south Nicholson Pt]	
Temporal Representation:	Data was collected over the time period 4/1/2008-8/25/2010.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43594, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Ravina

LOE ID:	75229
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	55
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 55 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Ravina site.
Temporal Representation:	Samples were collected from April 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.

QAPP Information Reference(s): 041010

Line of Evidence (LOE) for Decision ID 43594, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Ravina

LOE ID:	75228
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	55
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 55 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Ravina site.
Temporal Representation:	Samples were collected from April 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43594, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Ravina

LOE ID:	31150
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	55
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 230 dry month (April through October) single samples were collected with 55 dry month geomeans calculated. None of the 55 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data:	Non-SWAMP	041011
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Ravina, San Diego, California. Station identification number is EH-300.	
Temporal Representation:	Samples were collected from April 1999 through October 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43594, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Ravina

LOE ID:	31149
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	60
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 262 dry month (April through October) single samples were collected with 60 dry month geomeans calculated. One of the 60geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Ravina, San Diego, California. Station identification number is EH-300.
Temporal Representation:	Samples were collected from April 1999 through October 2007.
Environmental Conditions:	

QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43594, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Ravina

LOE ID:	31151
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	60
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 261 dry month (April through October) single samples were collected with 60 dry month geomeans calculated. None of the 60 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Ravina, San Diego, California. Station identification number is EH-300.
Temporal Representation:	Samples were collected from April 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Scripps HA, at Scripps Pier at La Jolla Shores Beach
Water Body ID: CAC906300002009042215464 6
Water Body Type: Coastal & Bay Shoreline

DECISION ID 42743 Region 9
Pacific Ocean Shoreline, Scripps HA, at Scripps Pier at La Jolla Shores Beach

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Fourteen lines of evidence are available in the administrative record to assess this pollutant. With the latest data, one of 80 geomean samples exceed the water quality objective for enterococcus for the protection of REC-1 beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, one of 80 geomean samples exceed the water quality objective for enterococcus for the protection of REC-1 beneficial use and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 42743, Indicator Bacteria Region 9
Pacific Ocean Shoreline, Scripps HA, at Scripps Pier at La Jolla Shores Beach

LOE ID: 75237

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Shellfish Harvesting

Number of Samples: 27

Number of Exceedances:	1	041014

Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed bw data for Pacific Ocean Shoreline, Scripps HA, at Scripps Pier at La Jolla Shores Beach to determine beneficial use support and results are as follows: 1 of 27 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Scripps HA, at Scripps Pier at La Jolla Shores Beach was collected at 1 monitoring site [Scripps Pier S]
Temporal Representation:	Data was collected over the time period 4/1/2008-5/21/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 42743, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Scripps Pier at La Jolla Shores Beach

LOE ID:	30662
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	240
Number of Exceedances:	7
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from March 1999 through December 2007. A total of 247 single samples were collected of which 240 are dry weather (AB411) samples with seven exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Scripps Pier at La Jolla Shores Beach, La Jolla, California. Station identification number is EH-350.

Temporal Representation:	Samples were collected from March 1999 through December 2007. 041015
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42743, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Scripps Pier at La Jolla Shores Beach

LOE ID:	77685
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	22
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Zero of the twenty-two samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, Scripps HA, at Scripps Pier at La Jolla Shores Beach.
Temporal Representation:	The samples were collected from April 2008 to May 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 42743, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Scripps Pier at La Jolla Shores Beach

LOE ID:	75238
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	22
Number of Exceedances:	0

Data and Information Type:	Not Specified 041016
Data Used to Assess Water Quality:	Zero of the 22 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the La Jolla Shores Beach site.
Temporal Representation:	Samples were collected from April 2008 to May 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 42743, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Scripps Pier at La Jolla Shores Beach

LOE ID:	28925
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	58
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from March 1999 through December 2007. A total of 247 single samples were collected with 58 monthly geomean collected. From the 58 geomeans, only one geomean exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Scripps Pier at La Jolla Shores Beach, La Jolla, California. Station identification number is EH-350.
Temporal Representation:	Samples were collected from March 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the

QAPP Information Reference(s):	County of San Diego, Department Public Health Laboratory Quality Assurance Manual. County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42743, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Scripps Pier at La Jolla Shores Beach

LOE ID:	28913
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	248
Number of Exceedances:	9
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from March1999 through December 2007. A total of 248 single samples were collected with nine samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Scripps Pier at La Jolla Shores Beach, La Jolla, California. Station identification number is EH-350.
Temporal Representation:	Samples were collected from March 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42743, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Scripps Pier at La Jolla Shores Beach

LOE ID:	28914
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	7
Number of Exceedances:	2

Data and Information Type:	PWS pathogen monitoring (ambient water) 041018
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from March 1999 through December 2007. A total of 248 single samples were collected with seven samples correlated with a storm event. Two of the seven samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Scripps Pier at La Jolla Shores Beach, La Jolla, California. Station identification number is EH-350.
Temporal Representation:	Samples were collected from March 1999 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42743, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Scripps Pier at La Jolla Shores Beach

LOE ID:	31146
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	60
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 240 dry month (April through October) single samples were collected with 60 dry month geomeans calculated. None of the 60 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data:	Non-SWAMP	041019
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Scripps Pier at La Jolla Shores Beach, La Jolla, California. Station identification number is EH-350.	
Temporal Representation:	Samples were collected from April 1999 through October 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 42743, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Scripps Pier at La Jolla Shores Beach

LOE ID:	31147
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	50
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 200 dry month (April through October) single samples were collected with 50 dry month geomeans calculated. One of the 50 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml; Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Scripps Pier at La Jolla Shores Beach, La Jolla, California. Station identification number is EH-350.
Temporal Representation:	Samples were collected from April 1999 through October 2007.
Environmental Conditions:	

QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42743, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Scripps Pier at La Jolla Shores Beach

LOE ID:	31148
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	60
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 240 dry month (April through October) single samples were collected with 60 dry month geomeans calculated. None of the 60 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Scripps Pier at La Jolla Shores Beach, La Jolla, California. Station identification number is EH-350.
Temporal Representation:	Samples were collected from April 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42743, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Scripps Pier at La Jolla Shores Beach

LOE ID:	28918
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from March 1999 through December 2007. A total of 248 single samples were collected and seven samples correlated with a storm event. None of the seven samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Scripps Pier at La Jolla Shores Beach, La Jolla, California. Station identification number is EH-350.
Temporal Representation:	Samples were collected from March 1999 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42743, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Scripps Pier at La Jolla Shores Beach

LOE ID:	28921
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	209
Number of Exceedances:	6
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from March 1999 through December 2007. A total of 209 single samples were collected with six samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program,

	2007. AB 411 monitoring data 1999 to 2007	041022

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml; Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Scripps Pier at La Jolla Shores Beach, La Jolla, California. Station identification number is EH-350.
Temporal Representation:	Samples were collected from March 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42743, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Scripps Pier at La Jolla Shores Beach

LOE ID:	29171
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	-N/A
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	8
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were eight beach advisory days for this section of shoreline. Bacteriological samples are collected on a weekly basis at ocean and bay locations in San Diego County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that an advisory for waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 - December 2007. Data used was the number of days the beach was advisories were issued when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	Department of Environmental Health, Land and Water Quality Division, San Diego County Beach Closure and Advisory Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-

	contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Spatial Representation:	Bacteriological monitoring samples were collected at Scripps Pier at La Jolla Shores Beach, La Jolla, California.
Temporal Representation:	The beach advisory covers the time frame of January January 2001 to December 2007.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of San Diego's Quality Assessment/Quality Control document
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42743, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Scripps Pier at La Jolla Shores Beach

LOE ID:	75232
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	22
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 22 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the La Jolla Shores Beach site.
Temporal Representation:	Samples were collected from April 2008 to May 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 42743, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Scripps Pier at La Jolla Shores Beach

LOE ID:	28924
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water

Matrix:	Water	041024
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	247	
Number of Exceedances:	8	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from March 1999 through December 2007. A total of 247 single samples were collected with eight exceeding the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Scripps Pier at La Jolla Shores Beach, La Jolla, California. Station identification number is EH-350.	
Temporal Representation:	Samples were collected from March 1999 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 42743, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Scripps Pier at La Jolla Shores Beach

LOE ID:	28915
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	248
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from March 1999 through December 2007. A total of 248 single samples were collected with no samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml;

	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Scripps Pier at La Jolla Shores Beach, La Jolla, California. Station identification number is EH-350.
Temporal Representation:	Samples were collected from March 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42743, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Scripps Pier at La Jolla Shores Beach

LOE ID:	28923
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from March 1999 through December 2007. A total of 209 single samples were collected and six samples correlated with a storm event. From the six samples, none exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml; Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Scripps Pier at La Jolla Shores Beach, La Jolla, California. Station identification number is EH-350.
Temporal Representation:	Samples were collected from March 1999 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event

	was defined as 0.2 inches of rainfall within a 72 hour period. 041026 Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42743, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Scripps Pier at La Jolla Shores Beach

LOE ID:	28926
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	7
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from March 1999 through December 2007. A total of 247 single samples were collected with seven samples correlated with a storm event. From the seven samples, only one exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Scripps Pier at La Jolla Shores Beach, La Jolla, California. Station identification number is EH-350.
Temporal Representation:	Samples were collected from March 1999 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through

March. 041027

QAPP Information: Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.

QAPP Information Reference(s): County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42743, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Scripps Pier at La Jolla Shores Beach

LOE ID: 28922

Pollutant: Fecal Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 52
Number of Exceedances: 0

Data and Information Type: PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality: Beach monitoring data was collected by the County of San Diego from March 1999 through December 2007. A total of 209 single samples were collected and 52 geomeans calculated. From the 52 geomeans, none exceeded the geomean water quality objective.
Data Reference: Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: Geomean: Fecal coliform density shall not exceed 200 per 100ml;

Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference: Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Scripps Pier at La Jolla Shores Beach, La Jolla, California. Station identification number is EH-350.
Temporal Representation: Samples were collected from March 1999 through December 2007.
Environmental Conditions:
QAPP Information: Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s): County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42743, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Scripps Pier at La Jolla Shores Beach

LOE ID: 30869

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples:	241
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from March 1999 through December 2007. A total of 248 single samples were collected of which 241 are dry weather (AB411) samples with none of those samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Scripps Pier at La Jolla Shores Beach, La Jolla, California. Station identification number is EH-350.
Temporal Representation:	Samples were collected from March 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42743, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Scripps Pier at La Jolla Shores Beach

LOE ID:	28917
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	59
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from March 1999 through December 2007. A total of 248 single samples were collected and 59 monthly geomeans calculated. None of the geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100 ml (SWRCB, 2005).

Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Scripps Pier at La Jolla Shores Beach, La Jolla, California. Station identification number is EH-350.
Temporal Representation:	Samples were collected from March 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42743, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Scripps Pier at La Jolla Shores Beach

LOE ID:	30762
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	203
Number of Exceedances:	6
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from March 1999 through December 2007. A total of 209 single samples were collected of which 203 are dry weather (AB411) samples with six samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml; Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Scripps Pier at La Jolla Shores Beach, La Jolla, California. Station identification number is EH-350.
Temporal Representation:	Samples were collected from March 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 42743, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Scripps Pier at La Jolla Shores Beach 041030

LOE ID:	75236
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	22
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 22 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the La Jolla Shores Beach site.
Temporal Representation:	Samples were collected from April 2008 to May 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Scripps HA, at South Casa Beach
Water Body ID: CAC906300002009042216343 1
Water Body Type: Coastal & Bay Shoreline

DECISION ID 46230 Region 9
Pacific Ocean Shoreline, Scripps HA, at South Casa Beach

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Fifteen lines of evidence are available in the administrative record to assess this pollutant. With the latest data, 0 of 92 geomean samples exceed the water quality objective for enterococcus for the protection of REC-1 beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, 0 of 92 geomean samples exceed the water quality objective for enterococcus for the protection of REC-1 beneficial use and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 46230, Indicator Bacteria Region 9
Pacific Ocean Shoreline, Scripps HA, at South Casa Beach

LOE ID: 77686

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Shellfish Harvesting

Number of Samples: 49

Number of Exceedances:	0	041032

Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Zero of the 49 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, Scripps HA, at South Casa Beach.
Temporal Representation:	The samples were collected from April 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 46230, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at South Casa Beach

LOE ID:	31145
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	46
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 2001 through October 2007. A total of 178 dry month (April through October) single samples were collected with 46 dry month geomeans calculated. None of the 46 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from South Casa Beach, San Diego, California. Station

	identification number is EH-305. 041033
Temporal Representation:	Samples were collected from April 2001 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 46230, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at South Casa Beach

LOE ID:	30763
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	144
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from February 2001 through October 2007. A total of 146 single samples were collected of which 144 are dry weather (AB411) samples with two samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from South Casa Beach, San Diego, California. Station identification number is EH-305.
Temporal Representation:	Samples were collected from February 2001 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 46230, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at South Casa Beach

LOE ID:	30663
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	041034
Beneficial Use:	Water Contact Recreation	
Number of Samples:	181	
Number of Exceedances:	5	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from February 2001 through October 2007. A total of 183 single samples were collected of which 181 are dry weather (AB411) samples with five samples exceeding the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from South Casa Beach, San Diego, California. Station identification number is EH-305.	
Temporal Representation:	Samples were collected from February 2001 through October 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 46230, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at South Casa Beach

LOE ID:	30870
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	180
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from February 2001 through October 2007. A total of 182 single samples were collected of which 180 are dry weather (AB411) samples with one of those samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data:	Non-SWAMP	041035
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from South Casa Beach, San Diego, California. Station identification number is EH-305.	
Temporal Representation:	Samples were collected from February 2001 through October 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 46230, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at South Casa Beach

LOE ID:	75239
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	49
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 49 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the South Casa Beach site.
Temporal Representation:	Samples were collected from April 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 46230, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at South Casa Beach

LOE ID:	75240	041036

Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	49
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 49 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the South Casa Beach site.
Temporal Representation:	Samples were collected from April 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 46230, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at South Casa Beach

LOE ID:	75241
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	59
Number of Exceedances:	2
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed bw data for Pacific Ocean Shoreline, Scripps HA, at South Casa Beach to determine beneficial use support and results are as follows: 2 of 59 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	

Guideline Reference:	041037
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Scripps HA, at South Casa Beach was collected at 1 monitoring site [South Casa beach]
Temporal Representation:	Data was collected over the time period 4/14/2008-8/25/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 46230, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at South Casa Beach

LOE ID:	75242
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	49
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 49 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the South Casa Beach site.
Temporal Representation:	Samples were collected from April 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 46230, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at South Casa Beach

LOE ID:	31143
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	46
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)

Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 2001 through October 2007. A total of 178 dry month (April through October) single samples were collected with 46 dry month geomeans calculated. None of the 46 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from South Casa Beach, San Diego, California. Station identification number is EH-305.
Temporal Representation:	Samples were collected from April 2001 through October 2007
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 46230, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at South Casa Beach

LOE ID:	31144
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	37
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 2001 through October 2007. A total of 142 dry month (April through October) single samples were collected with 37 dry month geomeans calculated. None of the 37 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:	041039
Guideline Reference:	
Spatial Representation:	Samples were collected from South Casa Beach, San Diego, California. Station identification number is EH-305.
Temporal Representation:	Samples were collected from April 2001 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 46230, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at South Casa Beach

LOE ID:	29222
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from February 2001 through October 2007. A total of 183 single samples were collected with two samples correlated with a storm event. None of the two samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from South Casa Beach, San Diego, California. Station identification number is EH-305.
Temporal Representation:	Samples were collected from February 2001 through October 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through

March. 041040

QAPP Information: Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.

QAPP Information Reference(s): County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 46230, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at South Casa Beach

LOE ID: 29223

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 42
Number of Exceedances: 0

Data and Information Type: PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality: Beach monitoring data was collected by the County of San Diego from February 2001 through October 2007. A total of 182 single samples were collected with 42 monthly geomeans calculated. None of the 42 geomeans exceeded the geomean water quality objective.
Data Reference: Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: Geomean: Total coliform density shall not exceed 1,000 per 100ml;

Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference: Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected from South Casa Beach, San Diego, California. Station identification number is EH-305.
Temporal Representation: Samples were collected from February 2001 through October 2007.
Environmental Conditions:
QAPP Information: Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s): County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 46230, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at South Casa Beach

LOE ID: 29224

Pollutant: Fecal Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use:	Water Contact Recreation	041041
Number of Samples:	36	
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from February 2001 through October 2007. A total of 146 single samples were collected and 36 geomeans calculated. None of the 36 geomeans exceeded the geomean water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from South Casa Beach, San Diego, California. Station identification number is EH-305.	
Temporal Representation:	Samples were collected from February 2001 through October 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 46230, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at South Casa Beach

LOE ID:	29225
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	43
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 183 single samples were collected with 43 monthly geomeans calculated. None of the geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB,

	2005). 041042
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from South Casa Beach, San Diego, California. Station identification number is EH-305.
Temporal Representation:	Samples were collected from February 2001 through October 2007
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 46230, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at South Casa Beach

LOE ID:	29220
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from February 2001 through October 2007. A total of 146 single samples were collected with two samples correlated with a storm event. None of the two samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from South Casa Beach, San Diego, California. Station identification number is EH-305.
Temporal Representation:	Samples were collected from February 2001 through October 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.

	Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 46230, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at South Casa Beach

LOE ID:	29221
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	183
Number of Exceedances:	5
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from February 2001 through October 2007. A total of 183 single samples were collected with five samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from South Casa Beach, San Diego, California. Station identification number is EH-305.
Temporal Representation:	Samples were collected from February 2001 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 46230, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at South Casa Beach

LOE ID:	29215
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	041044
Beneficial Use:	Shellfish Harvesting	
Number of Samples:	182	
Number of Exceedances:	13	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from February 2001 through October 2007. A total of 182 single samples were collected with 13 samples exceeded the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005). Comparisons were also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at South Casa Beach, San Diego, California. Station identification number is EH-305.	
Temporal Representation:	Samples were collected from February 2001 through October 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 46230, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at South Casa Beach

LOE ID:	29216
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from February 2001 through October 2007. A total of 182 single samples were collected with two samples correlated with a storm event. None of the samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from South Casa Beach, San Diego, California. Station identification number is EH-305.
Temporal Representation:	Samples were collected from February 2001 through October 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 46230, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at South Casa Beach

LOE ID:	29217
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	182
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from February 2001 through October 2007. A total of 182 single samples were collected with one sample exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:	041046
Guideline Reference:	
Spatial Representation:	Samples were collected from South Casa Beach, San Diego, California. Station identification number is EH-305.
Temporal Representation:	Samples were collected from February 2001 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 46230, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at South Casa Beach

LOE ID:	29219
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	146
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from February 2001 through October 2007. A total of 146 single samples were collected with two samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from South Casa Beach, San Diego, California. Station identification number is EH-305.
Temporal Representation:	Samples were collected from February 2001 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 46230, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at South Casa Beach

LOE ID:	29218

Pollutant:	Total Coliform	041047
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	2	
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from February 2001 through October 2007. A total of 182 single samples were collected with two samples correlated with a storm event. None of the two samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.	
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from South Casa Beach, San Diego, California. Station identification number is EH-305.	
Temporal Representation:	Samples were collected from February 2001 through October 2007.	
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 46230, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at South Casa Beach

LOE ID:	29273
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	-N/A
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	2555
Number of Exceedances:	9
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were nine beach advisory days for this section of shoreline. Bacteriological samples are collected on a weekly basis at ocean and bay locations in San Diego County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that an advisory for waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 - December 2007. Data used was the number of days the beach was advisories were issued when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Spatial Representation:	Bacteriological monitoring samples were collected at South Casa Beach in La Jolla, California.
Temporal Representation:	The beach advisory covers the time frame of January January 2001 to December 2007.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of San Diego's Quality Assessment/Quality Control document
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Scripps HA, at Tourmaline Surf Park, Pacific Beach
Water Body ID: CAC906300002009042217053O
Water Body Type: Coastal & Bay Shoreline

DECISION ID 44135 **Region 9**
Pacific Ocean Shoreline, Scripps HA, at Tourmaline Surf Park, Pacific Beach

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Fourteen lines of evidence are available in the administrative record to assess this pollutant. With the latest data, one of 153 geomean samples exceed the water quality objective for enterococcus for the protection of REC-1 beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, one of 153 geomean samples exceed the water quality objective for enterococcus for the protection of REC-1 beneficial use and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 44135, Indicator Bacteria **Region 9**
Pacific Ocean Shoreline, Scripps HA, at Tourmaline Surf Park, Pacific Beach

LOE ID: 29084

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 284

Number of Exceedances:	0	041050
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 284 single samples were collected with no samples exceeding the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml. Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Tourmaline Surf Park, Pacific Beach, California. Station ID number is FM-030.	
Temporal Representation:	Samples were collected from January 1999 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44135, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Tourmaline Surf Park, Pacific Beach

LOE ID:	29085
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	70
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 284 single samples were collected with 70 monthly geomeans calculated. None of the geomeans exceeded geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml. Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Tourmaline Surf Park, Pacific Beach, California. Station ID number is FM-030.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44135, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Tourmaline Surf Park, Pacific Beach

LOE ID:	29172
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	-N/A
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	225
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were 225 beach advisory days for this section of shoreline. Bacteriological samples are collected on a weekly basis at ocean and bay locations in San Diego County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that an advisory for waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 - December 2007. Data used was the number of days the beach was advisories were issued when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	Department of Environmental Health, Land and Water Quality Division, San Diego County Beach Closure and Advisory Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Spatial Representation:	Bacteriological monitoring samples were collected at Tourmaline Surf Park, Pacific Beach, California.

Temporal Representation:	The beach advisory covers the time frame of January January 2001 to December 2007.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of San Diego's Quality Assessment/Quality Control document
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44135, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Tourmaline Surf Park, Pacific Beach

LOE ID:	29092
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	19
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 274 single samples were collected with 19 samples correlated with a storm event. From the 19 samples, four exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Tourmaline Surf Park, Pacific Beach, California. Station ID number is FM-030.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44135, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Tourmaline Surf Park, Pacific Beach

LOE ID:	29091
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	67
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 274 single samples were collected with 67 monthly geomeans calculated. From the 69 geomeans, one exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Tourmaline Surf Park, Pacific Beach, California. Station ID number is FM-030.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44135, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Tourmaline Surf Park, Pacific Beach

LOE ID:	29083
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	19
Number of Exceedances:	11

Data and Information Type:	PWS pathogen monitoring (ambient water) 041054
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 284 single samples were collected with 19 samples correlated with a storm event. From the 19 samples, 11 exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Tourmaline Surf Park, Pacific Beach, California. Station ID number is FM-030.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44135, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Tourmaline Surf Park, Pacific Beach

LOE ID:	77687
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	85
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Zero of the 85 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for

	human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, Scripps HA, at Tourmaline Surf Park, Pacific Beach
Temporal Representation:	The samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44135, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Tourmaline Surf Park, Pacific Beach

LOE ID:	30664
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	255
Number of Exceedances:	6
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 274 single samples were collected of which 255 are dry weather (AB411) samples with six samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Tourmaline Surf Park, Pacific Beach, California. Station ID number is FM-030.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44135, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Tourmaline Surf Park, Pacific Beach 041056

LOE ID:	30764
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	220
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 237 single samples were collected of which 220 are dry weather (AB411) samples with one sample exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml; Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Tourmaline Surf Park, Pacific Beach, California. Station ID number is FM-030.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44135, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Tourmaline Surf Park, Pacific Beach

LOE ID:	29090
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	274
Number of Exceedances:	10
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 274 single samples were collected with 10 samples

	exceeding the single sample water quality objective. 041057
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Tourmaline Surf Park, Pacific Beach, California. Station ID number is FM-030.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44135, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Tourmaline Surf Park, Pacific Beach

LOE ID:	29089
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	17
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 237 single samples were collected with 17 samples correlated with a storm event. Three of the 17 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml; Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Tourmaline Surf Park, Pacific Beach, California. Station ID number is FM-030.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44135, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Tourmaline Surf Park, Pacific Beach

LOE ID:	29088
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	66
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 237 single samples were collected with 66 monthly geomeans calculated. None of the 66 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml; Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Tourmaline Surf Park, Pacific Beach, California.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance

Line of Evidence (LOE) for Decision ID 44135, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Tourmaline Surf Park, Pacific Beach

LOE ID:	30871
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	265
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 284 single samples were collected of which 265 are dry weather (AB411) samples and none of those samples exceeded the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml. Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Tourmaline Surf Park, Pacific Beach, California. Station ID number is FM-030.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44135, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Tourmaline Surf Park, Pacific Beach

LOE ID:	29087
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	237
Number of Exceedances:	4

Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 237 single samples were collected with four samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml; Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Tourmaline Surf Park, Pacific Beach, California. Station ID number is FM-030.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44135, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Tourmaline Surf Park, Pacific Beach

LOE ID:	75248
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	86
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 86 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Tourmaline Surf Park site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.

QAPP Information Reference(s): 041061

Line of Evidence (LOE) for Decision ID 44135, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Tourmaline Surf Park, Pacific Beach

LOE ID:	75249
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	86
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 86 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Tourmaline Surf Park site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44135, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Tourmaline Surf Park, Pacific Beach

LOE ID:	75250
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	103
Number of Exceedances:	1
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed bw data for Pacific Ocean Shoreline, Scripps HA, at Tourmaline Surf Park, Pacific Beach to determine beneficial use support and results are as follows: 1 of 103 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100

mL. 041062

Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Data for this line of evidence for Pacific Ocean Shoreline, Scripps HA, at Tourmaline Surf Park, Pacific Beach was collected at 1 monitoring site [Tourmaline drain outlet]
Temporal Representation: Data was collected over the time period 1/3/2008-8/25/2010.
Environmental Conditions: Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 44135, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Tourmaline Surf Park, Pacific Beach

LOE ID: 75251

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 85
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Zero of the 84 geomeans exceeded the objective.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at the Tourmaline Surf Park site.
Temporal Representation: Samples were collected from January 2008 to August 2010.
Environmental Conditions:
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 44135, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Tourmaline Surf Park, Pacific Beach

LOE ID: 29086

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 19
Number of Exceedances: 0

Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 282 single samples were collected with 19 samples correlated with a storm event. None of the samples exceeded the water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml. Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Tourmaline Surf Park, Pacific Beach, California. Station ID number is FM-030.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44135, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Tourmaline Surf Park, Pacific Beach

LOE ID:	31137
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	48
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 177 dry month (April through October) single samples were collected with 48 dry month geomeans calculated. One of the 48 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program,

	2007. AB 411 monitoring data 1999 to 2007	041064

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Tourmaline Surf Park, Pacific Beach, California. Station ID number is FM-030.
Temporal Representation:	Samples were collected from April 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44135, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Tourmaline Surf Park, Pacific Beach

LOE ID:	31141
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	44
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 199 through October 2007. A total of 146 dry month (April through October) single samples were collected with 44 dry month geomeans calculated. None of the 44 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml; Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Tourmaline Surf Park, Pacific Beach, California.
Temporal Representation:	Samples were collected from April 1999 through October 2007.

Environmental Conditions:	041065
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44135, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Tourmaline Surf Park, Pacific Beach

LOE ID:	31142
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	48
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 174 dry month (April through October) single samples were collected with 48 dry month geomeans calculated. None of the 48 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml. Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Tourmaline Surf Park, Pacific Beach, California. Station ID number is FM-030.
Temporal Representation:	Samples were collected from April 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44135, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Tourmaline Surf Park, Pacific Beach

LOE ID:	29082
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Shellfish Harvesting	041066
Number of Samples:	284	
Number of Exceedances:	31	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 284 single samples were collected with 31 samples exceeding the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Tourmaline Surf Park, Pacific Beach, California. Station ID number is FM-030.	
Temporal Representation:	Samples were collected from January 1999 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

DECISION ID 50036 Region 9

Pacific Ocean Shoreline, Scripps HA, at Tourmaline Surf Park, Pacific Beach

Pollutant:	**Trash**
Final Listing Decision:	**List on 303(d) list (being addressed by action other than TMDL)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected Attainment Date:	2029
Implementation Action Other than TMDL:	Collected effort of public, agencies, organizations, and permittees. Methods include street sweeping, education programs on littering, installation of trash-catching devices on storm drains.
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.7 of the Listing Policy. Under this section when all other listing factors do not result in the listing of a water segment but information indicates non-attainment of standards, a water segment shall be evaluated to determine whether the weight of evidence demonstrates that water quality standard is not attained. If the weight of evidence indicates non-attainment, the water segment shall be placed on the CWA section 303(d) List.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for placing this water segment-pollutant combination from the CWA section 303(d) List. This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The following information indicates that the water quality standard is not being attained: Coastkeeper cleanups occurred on 2/24/07, 2/23/08, 2/28/09, and 3/6/10 for this water body. The total weight of trash (lbs) collected on these dates was 3,180. Using the metric, Coastkeeper classified this water body

as high for trash impairment. However, any trash found is an exceedance and needs to be addressed by an action other than a TMDL.
3. This process is scientifically defensible and reproducible.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 50036, Trash **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Tourmaline Surf Park, Pacific Beach

LOE ID:	75252
Pollutant:	Trash
LOE Subgroup:	Pollutant-Nuisance
Matrix:	Not Recorded
Fraction:	Not Recorded
Beneficial Use:	Non-Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Occurrence of conditions judged to cause impairment
Data Used to Assess Water Quality:	The San Diego Coastkeeper conducts trash cleanups and uses a metric (pounds of trash collected per volunteer) to compare levels of trash across beaches and categorizes beaches as either low, medium, high or severe, based on this metric. Coastkeeper cleanups occurred on 2/24/07, 2/23/08, 2/28/09, and 3/6/10 for this water body. The total weight of trash (lbs) collected on these dates was 3,180. However, using the metric, Coastkeeper classified this water body as high for trash impairment.
Data Reference:	Data for Trash, Nutrients, and Pathogens in Region 9, 2007-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Floating Material Waters shall not contain floating material, including solids, liquids, foams, and scum in concentrations which cause nuisance or adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Tourmaline - Pacific Ocean.
Temporal Representation:	Four cleanups occurred on 2/24/07, 2/23/08, 2/28/09, and 3/6/10.
Environmental Conditions:	
QAPP Information:	San Diego Coastkeeper QAPP was provided.
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Scripps HA, at Vista de la Playa, Windansea Beach
Water Body ID: CAC906300002009042216481 1
Water Body Type: Coastal & Bay Shoreline

DECISION ID 50038 **Region 9**
Pacific Ocean Shoreline, Scripps HA, at Vista de la Playa, Windansea Beach

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Seven lines of evidence are available in the administrative record to assess this pollutant. Using data from 1999 to 2007, one of 57 samples exceed the water quality objective for enterococcus of a single sample maximum of 104/100ml for the protection of REC-1, and 0 of 56 samples exceed the WQO for total coliform of a SSM of 230/100ml.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Using data from 1999 to 2007, one of 57 samples exceed the water quality objective for enterococcus of a single sample maximum of 104/100ml for the protection of REC-1, and 0 of 56 samples exceed the WQO for total coliform of a SSM of 230/100ml and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 50038, Indicator Bacteria **Region 9**
Pacific Ocean Shoreline, Scripps HA, at Vista de la Playa, Windansea Beach

LOE ID: 28977

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Shellfish Harvesting

Number of Samples:	56
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through December 2007. A total of 56 single samples were collected with no samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Vista de la Playa, Windansea Beach, La Jolla, California. Station identification number is EH-290.
Temporal Representation:	Samples were collected from April 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 50038, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Vista de la Playa, Windansea Beach

LOE ID:	29120
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	57
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through December 2007. A total of 57 single samples were collected with one sample exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Vista de la Playa, Windansea Beach, La Jolla, California. Station identification number is EH-290.
Temporal Representation:	Samples were collected from April 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 50038, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Vista de la Playa, Windansea Beach

LOE ID:	29121
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	20
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through December 2007. A total of 57 single samples were collected with 20 monthly goemeans calculated. Two of the geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Vista de la Playa, Windansea Beach, La Jolla, California. Station identification number is EH-290.
Temporal Representation:	Samples were collected from April 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 50038, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Vista de la Playa, Windansea Beach

LOE ID:	29119

Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	20
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through December 2007. A total of 57 single samples were collected with 20 monthly geomeans calculated. None of the geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Vista de la Playa, Windansea Beach, La Jolla, California. Station identification number is EH-290.
Temporal Representation:	Samples were collected from April 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 50038, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Vista de la Playa, Windansea Beach

LOE ID:	29118
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	57
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through December 2007. A total of 57 single samples were collected no samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data:	Non-SWAMP	041072
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Vista de la Playa, Windansea Beach, La Jolla, California. Station identification number is EH-290.	
Temporal Representation:	Samples were collected from April 1999 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 50038, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Vista de la Playa, Windansea Beach

LOE ID:	29116
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	19
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through December 2007. A total of 56 single samples were collected with 19 monthly geomeans calculated. None of the geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml. Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Vista de la Playa, Windansea Beach, La Jolla, California. Station identification number is EH-290.
Temporal Representation:	Samples were collected from April 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the

QAPP Information Reference(s):	County of San Diego, Department Public Health Laboratory Quality Assurance Manual. County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 50038, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Vista de la Playa, Windansea Beach

LOE ID:	29117
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	19
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through December 2007. A total of 56 single samples were collected with 19 monthly geomeans calculated. None of the geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml. Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Vista de la Playa, Windansea Beach, La Jolla, California. Station identification number is EH-290.
Temporal Representation:	Samples were collected from April 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 50038, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Vista de la Playa, Windansea Beach

LOE ID:	29175
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555

Number of Exceedances:	0	041074
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were no beach advisory days for this section of shoreline. Bacteriological samples are collected on a weekly basis at ocean and bay locations in San Diego County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that an advisory for waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 - December 2007. Data used was the number of days the beach was advisories were issued when the ocean or bay failed to meet the bacteriological standards.	
Data Reference:	Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.	
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960	
Evaluation Guideline:		
Guideline Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Spatial Representation:	Bacteriological monitoring samples were collected at Vista de la Playa, Windansea Beach, La Jolla, California.	
Temporal Representation:	The beach advisory covers the time frame of January January 2001 to December 2007.	
Environmental Conditions:		
QAPP Information:	Samples were collected in compliance with County of San Diego's Quality Assessment/Quality Control document	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Scripps HA, at Whispering Sands Beach, Nicholson Point, La Jolla
Water Body ID: CAC906300002009042216383 6
Water Body Type: Coastal & Bay Shoreline

DECISION ID 46281 **Region 9**
Pacific Ocean Shoreline, Scripps HA, at Whispering Sands Beach, Nicholson Point, La Jolla

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Thirteen lines of evidence are available in the administrative record to assess this pollutant. With the latest data, 14 of 160 samples exceed the water quality objective for total coliform of a SSM of 230/100ml for the protection of SHELL.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3.With the latest data, 14 of 160 samples exceed the water quality objective for total coliform of a SSM of 230/100ml for the protection of SHELL and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 46281, Indicator Bacteria **Region 9**
Pacific Ocean Shoreline, Scripps HA, at Whispering Sands Beach, Nicholson Point, La Jolla

LOE ID: 29126

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Shellfish Harvesting

Number of Samples: 5

Number of Exceedances:	1	041076

Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 1999 through December 2007. A total of 157 single samples were collected with five samples correlated with a storm event. Only one sample exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the California Ocean Plan the median coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Whispering Sands Beach Â– Nicholson Point, La Jolla, California. Station identification number is FH-060.
Temporal Representation:	Samples were collected from June 1999 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 46281, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Whispering Sands Beach, Nicholson Point, La Jolla

LOE ID:	29129
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 1999 through December 2007. A total of 157 single samples were collected with 5 samples correlated with a storm event. None of the 5 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional

	Temperature and Precipitation Listings by Station 041077 Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml; Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Whispering Sands Beach Â– Nicholson Point, La Jolla, California. Station identification number is FH-060.
Temporal Representation:	Samples were collected from June 1999 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 46281, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Whispering Sands Beach, Nicholson Point, La Jolla

LOE ID:	29128
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	69
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 1999 through December 2007. A total of 157 single samples were collected with 69 monthly geomeans calculated. One of the geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml; Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005.

	Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Whispering Sands Beach Â– Nicholson Point, La Jolla, California. Station identification number is FH-060.
Temporal Representation:	Samples were collected from June 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 46281, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Whispering Sands Beach, Nicholson Point, La Jolla

LOE ID:	75073
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	3
Number of Exceedances:	1
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed bw data for Pacific Ocean Shoreline, Scripps HA, at Whispering Sands Beach, Nicholson Point, La Jolla to determine beneficial use support and results are as follows: 1 of 3 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Scripps HA, at Whispering Sands Beach, Nicholson Point, La Jolla was collected at 1 monitoring site [Coast Blvd.-Nicholson Pt]
Temporal Representation:	Data was collected over the time period 1/2/2008-4/1/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 46281, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Whispering Sands Beach, Nicholson Point, La Jolla

LOE ID:	29130
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water

Matrix:	Water	041079
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	158	
Number of Exceedances:	4	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 1999 through December 2007. A total of 158 single samples were collected with four samples exceeding the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Whispering Sands Beach Â– Nicholson Point, La Jolla, California. Station identification number is FH-060.	
Temporal Representation:	Samples were collected from June 1999 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 46281, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Whispering Sands Beach, Nicholson Point, La Jolla

LOE ID:	29131
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	68
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 1999 through December 2007. A total of 158 single samples were collected with 68 monthly geomeans calculated. From the 68 geomeans, three exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml.

	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Whispering Sands Beach Â– Nicholson Point, La Jolla, California. Station identification number is FH-060.
Temporal Representation:	Samples were collected from June 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 46281, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Whispering Sands Beach, Nicholson Point, La Jolla

LOE ID:	29132
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	5
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 1999 through December 2007. A total of 158 single samples were collected with five samples correlated with a storm event. From the five samples, one exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005). Comparisons are also made for days with matching bacteria and storm event data. A storm event is defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Whispering Sands Beach Â– Nicholson Point, La Jolla,

California. Station identification number is FH-060. 041081

Temporal Representation: Samples were collected from June 1999 through December 2007.

Environmental Conditions:

QAPP Information: Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.

QAPP Information Reference(s): County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 46281, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Whispering Sands Beach, Nicholson Point, La Jolla

LOE ID: 31136

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 49
Number of Exceedances: 1

Data and Information Type: PWS pathogen monitoring (ambient water)

Data Used to Assess Water Quality: Beach monitoring data was collected by the County of San Diego from June 1999 through October 2007. A total of 124 dry month (April through October) single samples were collected with 49 dry month geomeans calculated. One of the 49 geomeans exceeded the geomean water quality objective.

Data Reference: Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: Geomean: Total coliform density shall not exceed 1,000 per 100ml;

Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).

Objective/Criterion Reference: Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Whispering Sands Beach Â– Nicholson Point, La Jolla, California. Station identification number is FH-060.

Temporal Representation: Samples were collected from June 1999 through October 2007.

Environmental Conditions:

QAPP Information: Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.

QAPP Information Reference(s): County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 46281, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Whispering Sands Beach, Nicholson Point, La Jolla

LOE ID: 29176

Pollutant: Indicator Bacteria
LOE Subgroup: Health Advisories
Matrix: -N/A

Fraction:	None	041082
Beneficial Use:	Water Contact Recreation	
Number of Samples:	2555	
Number of Exceedances:	2	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were two beach advisory days for this section of shoreline. Bacteriological samples are collected on a weekly basis at ocean and bay locations in San Diego County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that an advisory for waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 - December 2007. Data used was the number of days the beach was advisories were issued when the ocean or bay failed to meet the bacteriological standards.	
Data Reference:	Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.	
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960	
Evaluation Guideline:		
Guideline Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Spatial Representation:	Bacteriological monitoring samples were collected at Whispering Sands Beach Â– Nicholson Point, La Jolla, California.	
Temporal Representation:	The beach advisory covers the time frame of January January 2001 to December 2007.	
Environmental Conditions:		
QAPP Information:	Samples were collected in compliance with County of San Diego's Quality Assessment/Quality Control document	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 46281, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Whispering Sands Beach, Nicholson Point, La Jolla

LOE ID:	31134
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	49
Number of Exceedances:	0

Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 1999 through October 2007. A total of 125 dry month (April through October) single samples were collected with 49 dry month geomeans calculated. None of the 49 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Whispering Sands Beach Â– Nicholson Point, La Jolla, California. Station identification number is FH-060.
Temporal Representation:	Samples were collected from June 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 46281, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Whispering Sands Beach, Nicholson Point, La Jolla

LOE ID:	30872
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	157
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 1999 through December 2007. A total of 157 single samples were collected of which 152 are dry weather (AB411) samples and none of those samples exceeded the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental

Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Whispering Sands Beach Â– Nicholson Point, La Jolla, California. Station identification number is FH-060.
Temporal Representation:	Samples were collected from June 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 46281, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Whispering Sands Beach, Nicholson Point, La Jolla

LOE ID:	30665
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	153
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 1999 through December 2007. A total of 158 single samples were collected of which 153 are dry weather (AB411) samples with three samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Whispering Sands Beach Â– Nicholson Point, La Jolla, California. Station identification number is FH-060.
Temporal Representation:	Samples were collected from June 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 46281, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Whispering Sands Beach, Nicholson Point, La Jolla

LOE ID:	30765	041085

Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	152
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 1999 through December 2007. A total of 157 single samples were collected of which 152 are dry weather (AB411) samples with zero sample exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml; Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Whispering Sands Beach Â– Nicholson Point, La Jolla, California. Station identification number is FH-060.
Temporal Representation:	Samples were collected from June 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 46281, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Whispering Sands Beach, Nicholson Point, La Jolla

LOE ID:	29125
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 1999 through December 2007. A total of 157 single samples were collected with five samples correlated with a storm event. None of the samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.

Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station 041086 Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Whispering Sands Beach Â– Nicholson Point, La Jolla, California. Station identification number is FH-060.
Temporal Representation:	Samples were collected from June 1999 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 46281, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Whispering Sands Beach, Nicholson Point, La Jolla

LOE ID:	29124
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	68
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 1999 through December 2007. A total of 157 single samples were collected with 68 monthly geomeans calculated. None of the geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).

Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Whispering Sands Beach Â– Nicholson Point, La Jolla, California. Station identification number is FH-060.
Temporal Representation:	Samples were collected from June 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 46281, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Whispering Sands Beach, Nicholson Point, La Jolla

LOE ID:	29123
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	157
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 1999 through December 2007. A total of 157 single samples were collected with no sample exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Whispering Sands Beach Â– Nicholson Point, La Jolla, California. Station identification number is FH-060.
Temporal Representation:	Samples were collected from June 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 46281, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Whispering Sands Beach, Nicholson Point, La Jolla 041088

LOE ID:	29122
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	157
Number of Exceedances:	13
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 1999 through December 2007. A total of 157 single samples were collected with 13 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the California Ocean Plan the median coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Whispering Sands Beach Â– Nicholson Point, La Jolla, California. Station identification number is FH-060.
Temporal Representation:	Samples were collected from June 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 46281, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Whispering Sands Beach, Nicholson Point, La Jolla

LOE ID:	31135
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	50
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 1999 through October 2007. A total of 126 dry month (April through October) single samples were collected with 50 dry month geomeans calculated. None of the 50 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program,

	2007. AB 411 monitoring data 1999 to 2007	041089

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml; Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Whispering Sands Beach Â– Nicholson Point, La Jolla, California. Station identification number is FH-060.
Temporal Representation:	Samples were collected from June 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 46281, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Whispering Sands Beach, Nicholson Point, La Jolla

LOE ID:	29127
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	157
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 1999 through December 2007. A total of 157 single samples were collected with zero sample exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml; Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Whispering Sands Beach Â– Nicholson Point, La Jolla, California. Station identification number is FH-060.
Temporal Representation:	Samples were collected from June 1999 through December 2007.

Environmental Conditions:	041090
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Mission Bay Shoreline, at Tecolote Shores
Water Body ID: CAC906500002009042809202 5
Water Body Type: Coastal & Bay Shoreline

DECISION ID 43511 Region 9
Mission Bay Shoreline, at Tecolote Shores

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not Delist from 303(d) list (being addressed with USEPA approved TMDL)**
Last Listing Cycle's Final Listing Decision:	Do Not Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown | Unknown Nonpoint Source | Unknown Point Source
TMDL Name:	Bacteria Impaired Waters I (creeks and beach shorelines)
TMDL Project Code:	169
Date TMDL Approved by USEPA:	06/22/2011
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal on the CWA section 303(d) List under sections 2.2 and 4.3 of the Listing Policy. Under Section 4.3 of the Policy, a minimum of one line of evidence is needed to assess listing status.

Sixteen lines of evidence are available in the administrative record to assess this pollutant.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List. There is sufficient justification to place it in the Being Addressed portion of the CWA 303(d) List because a TMDL has been completed and approved by RWQCB and USEPA, and is expected to result in attainment of the standard.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, 54 of 484 samples exceeded the water quality objective for enterococcus of a single sample maximum of 104/100ml for the protection of REC-1 and 96 of 496 samples exceed the water quality objective for total coliform of 230/100 ml for the protection of SHELL< and these exceed the allowable frequency listed in Section 4.3 and Table 3.2 of the Listing Policy.
4. The was approved by USEPA on 06/22/2011. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 43511, Indicator Bacteria Region 9
Mission Bay Shoreline, at Tecolote Shores

LOE ID:	77614
Pollutant:	Total Coliform

LOE Subgroup:	Pollutant-Water	041092
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Shellfish Harvesting	
Number of Samples:	103	
Number of Exceedances:	1	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	One of the 103 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The Water Quality Control Plan for the San Diego Basin states that at all areas where shellfish may be harvested for human consumption, the median total coliform concentration throughout the water column for any 30-day period shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected at Mission Bay Shoreline, at Tecolote Shores stations Tecolote playground, watercraft area and Tecolote Shores, swim area.	
Temporal Representation:	The samples were collected from April 2008 to August 2010 at the playground station and from June 2009 to August 2010 at the swim area station.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the beach watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43511, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Tecolote Shores

LOE ID:	30538
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	316
Number of Exceedances:	14
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 316 dry weather (AB411) single samples were collected with 14 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml;

	Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Tecolote Shores near storm drain, San Diego, California. Station identification number is MB-040.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43511, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Tecolote Shores

LOE ID:	74371
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	70
Number of Exceedances:	4
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Four of the 70 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Tecolote playground watercraft area site.
Temporal Representation:	Samples were collected approximately once a week from April 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43511, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Tecolote Shores

LOE ID:	74372
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water

Matrix:	Water	041094
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	34	
Number of Exceedances:	1	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	One of the 34 geomeans exceeded the objective.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at the Tecolote Shores, swim area site.	
Temporal Representation:	Samples were collected approximately once a week from June 2009 to August 2010.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43511, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Tecolote Shores

LOE ID:	74373
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	70
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 70 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Tecolote playground, watercraft area site.
Temporal Representation:	Samples were collected approximately once a week from April 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43511, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Tecolote Shores

LOE ID:	74374
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	34
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 34 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Tecolote Shores, swim area site.
Temporal Representation:	Samples were collected approximately once a week from June 2009 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43511, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Tecolote Shores

LOE ID:	74375
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	122
Number of Exceedances:	6
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed BW data for Mission Bay Shoreline, at Tecolote Shores to determine beneficial use support and results are as follows: 6 of 122 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The Water Quality Control Plan (Basin Plan 2011)states the following: At all areas where shellfish may be harvested for human consumption, ten percent of the samples collected during any 30-day period shall not exceed 230 MPN/100mL.

Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	041096

Evaluation Guideline:
Guideline Reference:

Spatial Representation:	Data for this line of evidence for Mission Bay Shoreline, at Tecolote Shores was collected at 2 monitoring sites [Tecolote Shores watercraft, Tecolote Shores swim area]
Temporal Representation:	Data was collected over the time period 4/2/2008-8/24/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43511, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Tecolote Shores

LOE ID:	74376
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	70
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 70 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation:	Samples were collected at the Tecolote playground site.
Temporal Representation:	Samples were collected approximately once a week from April 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43511, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Tecolote Shores

LOE ID:	74377
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	34

Number of Exceedances:	0	041097

Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 34 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Tecolote Shores, swim area site.
Temporal Representation:	Samples were collected approximately once a week from June 2009 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43511, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Tecolote Shores

LOE ID:	30150
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	-N/A
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	61
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were 61 beach advisory days for this location. When a bacteriological sample exceeds water quality standards, signs are posted indicating that waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 to December 2007. Data used was the number of days the beach was posted with an Advisory when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	County of Orange. March 2007. Annual Ocean and Bay Water Quality Report, 2006 Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960

Evaluation Guideline:	041098
Guideline Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Spatial Representation:	Bacteriological monitoring samples were collected at Tecolote Shores in Mission Bay.
Temporal Representation:	The beach advisory covers the time frame of January 2001 -December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43511, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Tecolote Shores

LOE ID:	30349
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2933
Number of Exceedances:	959
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Below is a copy of the 2006 LOE information for the data used to support the listing of Mission Bay Shoreline: Available data indicate sufficient exceedances of bacterial indicator objectives. There were 576 out of 3662 samples exceeding the single sample maximum for enterococci, 959 out of 2933 exceedances of the geomean enterococci, and 333 out samples exceeding the single sample maximum for fecal coliform (USEPA, 2007).
Data Reference:	Placeholder reference 2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Title 17 C.C.R. Section 7958 states: Based on a single sample, the density of bacteria in water from each sampling station at a public beach or public water contact sports area shall not exceed: (A) 1,000 total coliform bacteria per 100 milliliters, if the ratio of fecal/total coliform bacteria exceeds 0.1; or (B) 10,000 total coliform bacteria per 100 milliliters; or (C) 400 fecal coliform bacteria per 100 milliliters; or (D) 104 enterococcus bacteria per 100 milliliters. Based on the mean of the logarithms of the results of at least five weekly samples during any 30-day sampling period, the density of bacteria in water from any sampling station at a public beach or public water contact sports area, shall not exceed: (A) 1,000 total coliform bacteria per 100 milliliters; or (B) 200 fecal coliform bacteria per 100 milliliters; or (C) 35 enterococcus bacteria per 100 milliliters (DHS, 1999).
Objective/Criterion Reference:	Placeholder reference 2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	In 2006, data from sampling sites along the Mission Bay shoreline were aggregated for the assessment. For 2008, the 2006 Mission Bay Shoreline segment has been split into smaller

	segments and each represents an area near the sampling location of the data being assessed. 'Mission Bay Shoreline, at Tecolote Shores' is one of the sampling locations for Mission Bay Shoreline and is considered to be part of the original listing
Temporal Representation:	From 03/21/2000-10/30/2005.
Environmental Conditions:	
QAPP Information:	Data record: 2000-2005, San Diego County Health Dept.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43511, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Tecolote Shores

LOE ID:	31237
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	51
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 246 dry month (April through October) single samples were collected with 51 dry month geomeans calculated. One of the 51 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Tecolote Shores near storm drain, San Diego, California. Station identification number is MB-040.
Temporal Representation:	Samples were collected from April 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43511, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Tecolote Shores

LOE ID:	31238
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	041100
Beneficial Use:	Water Contact Recreation	
Number of Samples:	60	
Number of Exceedances:	3	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 287 dry month (April through October) single samples were collected with 60 dry month geomeans calculated. 3 of the 60 geomeans exceeded the geomean water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Tecolote Shores near storm drain, San Diego, California. Station identification number is MB-040.	
Temporal Representation:	Samples were collected from April 1999 through October 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43511, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Tecolote Shores

LOE ID:	31235
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	60
Number of Exceedances:	5
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 292 dry month (April through October) single samples were collected with 60 dry month geomeans calculated. 5 of the 60 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. 041101 Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Tecolote Shores near storm drain, San Diego, California. Station identification number is MB-040.
Temporal Representation:	Samples were collected from April 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43511, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Tecolote Shores

LOE ID:	30790
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	356
Number of Exceedances:	6
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 374 single samples were collected of which 356 are dry weather (AB411) samples with six samples exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Tecolote Shores near storm drain, San Diego, California. Station identification number is MB-040.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	

QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43511, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Tecolote Shores

LOE ID:	30554
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	361
Number of Exceedances:	47
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 381 single samples were collected of which 361 are dry weather (AB411) samples with 47 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Tecolote Shores near storm drain, San Diego, California. Station identification number is MB-040.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43511, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Tecolote Shores

LOE ID:	28780
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting

Number of Samples:	374
Number of Exceedances:	90
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 374 single samples were collected with 90 samples exceeded the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Tecolote Shores near storm drain, San Diego, California. Station identification number is MB-040.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43511, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Tecolote Shores

LOE ID:	28781
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	18
Number of Exceedances:	12
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 374 single samples were collected with 18 samples correlated with a storm event. Twelve of the 18 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).

Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Tecolote Shores near storm drain, San Diego, California. Station identification number is MB-040.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43511, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Tecolote Shores

LOE ID:	28782
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	76
Number of Exceedances:	15
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 381 single samples were collected with 76 monthly geomeans calculated. Fifteen of the 76 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Tecolote Shores near storm drain, San Diego, California. Station identification number is MB-040.
Temporal Representation:	Samples were collected from January 1999 through October 2007.

Environmental Conditions:	041105
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43511, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Tecolote Shores

LOE ID:	28783
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	20
Number of Exceedances:	10
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 381 single samples were collected with 20 samples correlated with a storm event. Ten of the 20 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Tecolote Shores near storm drain, San Diego, California. Station identification number is MB-040.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43511, Indicator Bacteria 041106 Region 9

Mission Bay Shoreline, at Tecolote Shores

LOE ID:	28784
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	381
Number of Exceedances:	57
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 381 single samples were collected with 57 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Tecolote Shores near storm drain, San Diego, California. Station identification number is MB-040.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43511, Indicator Bacteria Region 9

Mission Bay Shoreline, at Tecolote Shores

LOE ID:	28785
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	68
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999

	through October 2007. A total of 335 single samples were collected and 68 geomeans calculated. One of the 68 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Tecolote Shores near storm drain, San Diego, California. Station identification number is MB-040.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43511, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Tecolote Shores

LOE ID:	28786
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	19
Number of Exceedances:	10
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 335 single samples were collected with 19 samples correlated with a storm event. Ten of the 19 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental

Protection Agency 041108

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Tecolote Shores near storm drain, San Diego, California. Station identification number is MB-040.
Temporal Representation: Samples were collected from January 1999 through October 2007.
Environmental Conditions: Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.

Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information: Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s): County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43511, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Tecolote Shores

LOE ID: 28787

Pollutant: Fecal Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 335
Number of Exceedances: 24

Data and Information Type: PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality: Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 335 single samples were collected with 24 samples exceeding the single sample water quality objective.
Data Reference: Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: Geomean; Fecal coliform density shall not exceed 200 per 100 ml;

Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference: Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Tecolote Shores near storm drain, San Diego, California. Station identification number is MB-040.
Temporal Representation: Samples were collected from January 1999 through October 2007.
Environmental Conditions:
QAPP Information: Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.

QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43511, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Tecolote Shores

LOE ID:	28788
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	76
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 374 single samples were collected with 76 monthly geomeans calculated. Four of the 76 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Tecolote Shores near storm drain, San Diego, California. Station identification number is MB-040.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43511, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Tecolote Shores

LOE ID:	28789
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	374

Number of Exceedances:	13	041110

Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 374 single samples were collected with 13 samples exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Tecolote Shores near storm drain, San Diego, California. Station identification number is MB-040.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43511, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Tecolote Shores

LOE ID:	28790
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	18
Number of Exceedances:	7
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2007. A total of 374 single samples were collected with 18 samples correlated with a storm event. Seven of the 18 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; 041111 Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Tecolote Shores near storm drain, San Diego, California. Station identification number is MB-040.
Temporal Representation:	Samples were collected from January 1999 through October 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43511, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Tecolote Shores

LOE ID:	81130
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	123
Number of Exceedances:	7
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed BW data for Mission Bay Shoreline, at Tecolote Shores to determine beneficial use support and results are as follows: 7 of 123 samples collected during the AB411 period exceed the SSM criterion for enterococcus.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum for enterococcus: do not exceed 104/100 ml (San Diego Regional Board Basin Plan 2008)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Mission Bay Shoreline, at Tecolote Shores was collected at 2 monitoring sites [Tecolote Shores watercraft, Tecolote Shores swim area]
Temporal Representation:	Data was collected over the AB411 time period 4/2/2008-8/24/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.

QAPP Information Reference(s): 041112

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Linda Lane
Water Body ID: CAC9013000020090428111104
Water Body Type: Coastal & Bay Shoreline

DECISION ID 44206 Region 9
Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Linda Lane

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Reason for Delisting:	Applicable WQS attained; reason for recovery unspecified
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal from the CWA section 303(d) List under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Twelve lines of evidence are available in the administrative record to assess this pollutant. With the latest data, 15 of 166 samples exceed the water quality objective for enterococcus of a geomean of 35/100ml in a 30-day period for the protection of REC-1.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, 15 of 166 samples exceed the water quality objective for enterococcus of a geomean of 35/100ml in a 30-day period for the protection of REC-1 and this does not exceed the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be removed from the section 303(d) list because applicable water quality standards for the pollutant are not being exceeded.

Line of Evidence (LOE) for Decision ID 44206, Indicator Bacteria Region 9
Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Linda Lane

LOE ID:	30979
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	20	041114
Number of Exceedances:	1	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange within the time period from May 2004 through December 2006. A total of 20 monthly geomeans were calculated for data collected within the time frame of April 1st to October 31st (AB411 data) during the aforementioned time period. Of the 20 geomeans one exceeded the geomean water quality objective.	
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml over a 30 day period (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, San Clemente City Beach at Linda Lane Park, station id LINDAL. This location is found at the western end of Linda Lane Park in San Clemente.	
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) during the aforementioned time period.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 44206, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Linda Lane

LOE ID:	30317
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Water Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006. For the 2008 assessment , the 2006 listed coastline 'Pacific Ocean Shoreline, San Clemente HA' was split into smaller segments and each represents an area near the sampling location of the data being assessed. This segment 'Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Linda Lane' is one of the sampling locations. This LOE is a copy of the 2006 listing placeholder LOE for Pacific Ocean Shoreline, San Clemente HA and is considered by the Regional Board to be applicable to this more specific segment formed from the split.
Data Reference:	Placeholder reference pre-2006 303(d)

SWAMP Data:	Non-SWAMP	041115
Water Quality Objective/Criterion:	Unspecified	
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:		
Temporal Representation:		
Environmental Conditions:		
QAPP Information:	Unspecified	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44206, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Linda Lane

LOE ID:	28803
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	32
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 548 single samples were collected with 32 monthly geomeans calculated. None of the 32 geomeans exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, San Clemente City Beach at Linda Lane Park, station id LINDAL. This location is found at the western end of Linda Lane Park in San Clemente.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44206, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Linda Lane

LOE ID:	28802

Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	547
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 548 single samples were collected with 2 samples exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, San Clemente City Beach at Linda Lane Park, station id LINDAL. This location is found at the western end of Linda Lane Park in San Clemente.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44206, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Linda Lane

LOE ID:	30727
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	535
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 548 single samples were collected of which 535 are dry weather (AB411) samples with two samples exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, San Clemente City Beach at Linda Lane Park, station id LINDAL. This location is found at the western end of Linda Lane Park in San Clemente.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44206, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Linda Lane

LOE ID:	30977
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	20
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange within the time period from May 2004 through December 2006. A total of 20 monthly geomeans were calculated for data collected within the time frame of April 1st to October 31st (AB411 data) during the aforementioned time period. Of the 20 geomeans zero exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml over a 30 day period (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, San Clemente City Beach at Linda Lane Park, station id LINDAL. This location is found at the western end of Linda Lane Park in San Clemente.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) during the aforementioned time period.
Environmental Conditions:	

QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44206, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Linda Lane

LOE ID:	30624
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	536
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 548 single samples were collected of which 536 are dry weather (AB411) samples with four samples exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, San Clemente City Beach at Linda Lane Park, station id LINDAL. This location is found at the western end of Linda Lane Park in San Clemente.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44206, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Linda Lane

LOE ID:	28801
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	12
Number of Exceedances:	1

Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 548 single samples were collected with 12 samples correlated with a storm event. From the 12 samples, one exceeded the water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, San Clemente City Beach at Linda Lane Park, station id LINDAL. This location is found at the western end of Linda Lane Park in San Clemente.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006. Rainfall data was available for the same time period.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44206, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Linda Lane

LOE ID:	30832
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	536
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 548 single samples were collected of which 536 are dry weather (AB411) samples with four of those samples exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater

	Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2004 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, San Clemente City Beach at Linda Lane Park, station id LINDAL. This location is found at the western end of Linda Lane Park in San Clemente.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44206, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Linda Lane

LOE ID:	74762
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	134
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	None of the 134 samples exceeded the total coliform objective. For these stations, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean for total coliform shall not exceed more than 1000/100ml. Water Quality Control Plan for the San Diego Basin. Water Quality Control Plan for Ocean Waters.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Coastal Stormdrain at Linda Lane (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44206, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Linda Lane

LOE ID:	74761
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	147
Number of Exceedances:	1
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	One of the 147 samples exceeded the total coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample total coliform concentration shall not exceed more than 10000/100ml. Water Quality Control Plan for Ocean Waters of California. Region 9 Basion Plan.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from coastal stormdrain at Linda Lane(surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44206, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Linda Lane

LOE ID:	74760
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	134
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	None of the 134 geomeans exceeded the fecal coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.

SWAMP Data:	Non-SWAMP	041122
Water Quality Objective/Criterion:	The geometric mean for fecal coliform shall not exceed more than 200/100ml. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected from Coastal Stormdrain atLinda Lane (surfzone upcoast and surfzone downcoast).	
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.	
Environmental Conditions:		
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44206, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Linda Lane

LOE ID:	74759
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	147
Number of Exceedances:	1
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	One of the 147 samples exceeded the fecal coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample fecal coliform concentration shall not exceed more than 400/100ml. Water Quality Control Plan for Ocean Waters of California. Region 9 Basion Plan.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from coastal stormdrain at Linda Lane (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44206, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Linda Lane

LOE ID:	74758	041123

Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	134
Number of Exceedances:	12
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Twelve of the 134 geomeans exceeded the enterococcus objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean for enterococcus shall not exceed 35 MPN/100 mL. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Coastal Stormdrain at Linda Lane (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44206, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Linda Lane

LOE ID:	74735
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	147
Number of Exceedances:	8
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Eight of the 147 samples exceeded the enterococcus objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample enterococcus concentration shall not exceed more than 104/100ml. Water Quality Control Plan for Ocean Waters of California. Region 9 Basion Plan.

Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from coastal stormdrainat Linda Lane (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44206, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Linda Lane

LOE ID:	28804
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 548 single samples were collected with 12 samples correlated with a storm event. None of the 12 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program, Bacteria Shoreline Data, 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, San Clemente City Beach at Linda Lane Park, station id LINDAL. This location is found at the western end of Linda Lane Park in San Clemente.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006. Rainfall data was available for the same time period.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the

	full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44206, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Linda Lane

LOE ID:	28798
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	12
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 548 single samples were collected with 12 samples correlated with a storm event. From the 12 samples, three exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, San Clemente City Beach at Linda Lane Park, station id LINDAL. This location is found at the western end of Linda Lane Park in San Clemente.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006. Rainfall data was available for the same time period.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44206, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Linda Lane

LOE ID:	28797
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	548
Number of Exceedances:	23
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 548 single samples were collected with 23 exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, San Clemente City Beach at Linda Lane Park, station id LINDAL. This location is found at the western end of Linda Lane Park in San Clemente.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44206, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Linda Lane

LOE ID:	28800
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	32
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 548 single samples were collected and 32 monthly geomeans calculated. None of the 32 geomeans exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007

SWAMP Data:	Non-SWAMP	041127
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, San Clemente City Beach at Linda Lane Park, station id LINDAL. This location is found at the western end of Linda Lane Park in San Clemente.	
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 44206, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Linda Lane

LOE ID:	28799
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	548
Number of Exceedances:	5
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 548 single samples were collected with 5 samples exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, San Clemente City Beach at Linda Lane Park, station id LINDAL. This location is found at the western end of Linda Lane Park in San Clemente.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.

QAPP Information Reference(s): County of Orange. Quality Assurance/Quality Control Manual, February 2004 044128

Line of Evidence (LOE) for Decision ID 44206, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Linda Lane

LOE ID:	28807
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	12
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 548 single samples were collected with 12 samples correlated with a storm event. From the 12 samples, three exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, San Clemente City Beach at Linda Lane Park, station id LINDAL. This location is found at the western end of Linda Lane Park in San Clemente.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006. Rainfall data was available for the same time period.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44206, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Linda Lane

LOE ID: 28806

Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	32
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 548 single samples were collected and 32 monthly geomeans calculated. From the 32 geomeans, three exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, San Clemente City Beach at Linda Lane Park, station id LINDAL. This location is found at the western end of Linda Lane Park in San Clemente.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44206, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Linda Lane

LOE ID:	28805
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	548
Number of Exceedances:	7
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 548 single samples were collected with seven samples exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, San Clemente City Beach at Linda Lane Park, station id LINDAL. This location is found at the western end of Linda Lane Park in San Clemente.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44206, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Linda Lane

LOE ID:	30978
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	20
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange within the time period from May 2004 through December 2006. A total of 20 monthly geomeans were calculated for data collected within the time frame of April 1st to October 31st (AB411 data) during the aforementioned time period. Of the 20 geomeans zero exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml over a 30 day period (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, San Clemente HA, San Clemente City Beach at Linda Lane Park, station id LINDAL. This location is found at the western end of Linda Lane Park in San Clemente.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) during the aforementioned time period.
Environmental Conditions:	

QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Mariposa Lane
Water Body ID: CAC9013000020090428110412
Water Body Type: Coastal & Bay Shoreline

DECISION ID 44031 Region 9
Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Mariposa Lane

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Reason for Delisting:	Applicable WQS attained; reason for recovery unspecified
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal from the CWA section 303(d) List under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Ten lines of evidence are available in the administrative record to assess this pollutant. With the latest data, 11 of the 166 geomean samples exceed the water quality objective for enterococcus of 35/100ml in a 30-day period for the protection of REC-1.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, 11 of the 166 geomean samples exceed the water quality objective for enterococcus of 35/100ml in a 30-day period for the protection of REC-1 and this does not exceed the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be removed from the section 303(d) list because applicable water quality standards for the pollutant are not being exceeded.

Line of Evidence (LOE) for Decision ID 44031, Indicator Bacteria Region 9
Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Mariposa Lane

LOE ID:	74789
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	147	041133
Number of Exceedances:	2	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Two of the 147 samples exceeded the total coliform objective. For these stations, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The single sample total coliform concentration shall not exceed more than 10000/100ml. Water Quality Control Plan for Ocean Waters of California. Region 9 Basion Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected from coastal stormdrain West Mariposa (surfzone upcoast and surfzone downcoast).	
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.	
Environmental Conditions:		
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44031, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Mariposa Lane

LOE ID:	74788
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	134
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	None of the 134 geomeans exceeded the fecal coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean for fecal coliform shall not exceed more than 200/100ml. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Coastal Stormdrain at West Mariposa (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.

Environmental Conditions: 041134
QAPP Information: The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 44031, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Mariposa Lane

LOE ID: 74787

Pollutant: Fecal Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 147
Number of Exceedances: 2

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Two of the 147 samples exceeded the fecal coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.
Data Reference: Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The single sample fecal coliform concentration shall not exceed more than 400/100ml. Water Quality Control Plan for Ocean Waters of California. Region 9 Basion Plan.
Objective/Criterion Reference: Water Quality Control Plan for the San Diego Basin
California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: The samples were collected from coastal stormdrain West Mariposa (surfzone upcoast and surfzone downcoast).
Temporal Representation: The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:
QAPP Information: The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 44031, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Mariposa Lane

LOE ID: 74786

Pollutant: Enterococcus
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 134
Number of Exceedances: 9

Data and Information Type:	Not Specified 041135
Data Used to Assess Water Quality:	Nine of the 134 geomeans exceeded the enterococcus objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean for enterococcus shall not exceed 35 MPN/100 mL. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Coastal Stormdrain at West Mariposa (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44031, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Mariposa Lane

LOE ID:	30982
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	20
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange within the time period from May 2004 through December 2006. A total of 20 monthly geomeans were calculated for data collected within the time frame of April 1st to October 31st (AB411 data) during the aforementioned time period. Of the 20 geomeans zero exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml over a 30 day period(SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from San Clemente City Beach at Mariposa Lane, station id MARIPO, in the San Clemente HA. This station location is found near the intersection of

	West Escalones and West Mariposa in San Clemente. 041136
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) during the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44031, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Mariposa Lane

LOE ID:	30980
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	20
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange within the time period from May 2004 through December 2006. A total of 20 monthly geomeans were calculated for data collected within the time frame of April 1st to October 31st (AB411 data) during the aforementioned time period. Of the 20geomeans zero exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml over a 30 day period(SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from San Clemente City Beach at Mariposa Lane, station id MARIPO, in the San Clemente HA. This station location is found near the intersection of West Escalones and West Mariposa in San Clemente.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) during the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44031, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Mariposa Lane

LOE ID:	30981
Pollutant:	Fecal Coliform

LOE Subgroup:	Pollutant-Water	041137
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	20	
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange within the time period from May 2004 through December 2006. A total of 20 monthly geomeans were calculated for data collected within the time frame of April 1st to October 31st (AB411 data) during the aforementioned time period. Of the 20 geomeans zeroexceeded the geomean water quality objective.	
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml over a 30 day period (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from San Clemente City Beach at Mariposa Lane, station id MARIPO, in the San Clemente HA. This station location is found near the intersection of West Escalones and West Mariposa in San Clemente.	
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) during the aforementioned time period.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 44031, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Mariposa Lane

LOE ID:	74763
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	147
Number of Exceedances:	8
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Eight of the 147 samples exceeded the enterococcus objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	The single sample enterococcus concentration shall not exceed more than 104/100ml. Water Quality Control Plan for Ocean Waters of California. Region 9 Basion Plan.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from coastal stormdrain West Mariposa (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44031, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Mariposa Lane

LOE ID:	28809
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	10
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 548 single samples were collected with 10 samples correlated with a storm event. From those 10 samples, two exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from San Clemente City Beach at Mariposa Lane, station id MARIPO, in the San Clemente HA. This station location is found near the intersection of West Escalones and West Mariposa in San Clemente.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006. Rainfall data was available for the same time period.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the

	full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44031, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Mariposa Lane

LOE ID:	28808
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	548
Number of Exceedances:	35
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 548 single samples were collected with 35 exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program, Bacteria Shoreline Data, 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from San Clemente City Beach at Mariposa Lane, station id MARIPO, in the San Clemente HA. This station location is found near the intersection of West Escalones and West Mariposa in San Clemente.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44031, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Mariposa Lane

LOE ID:	74790
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	134	041140
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	None of the 134 samples exceeded the total coliform objective. For these stations, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The geometric mean for total coliform shall not exceed more than 1000/100ml. Water Quality Control Plan for the San Diego Basin. Water Quality Control Plan for Ocean Waters.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected from Coastal Stormdrain at West Mariposa (surfzone upcoast and surfzone downcoast).	
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.	
Environmental Conditions:		
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44031, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Mariposa Lane

LOE ID:	28814
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	32
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 547 single samples were collected with 32 monthly geomeans calculated. None of the geomeans exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected from San Clemente City Beach at Mariposa Lane, station id MARIPO, in the San Clemente HA. This station location is found near the intersection of West Escalones and West Mariposa in San Clemente.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44031, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Mariposa Lane

LOE ID:	28813
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	547
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 547 single samples were collected with three samples exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from San Clemente City Beach at Mariposa Lane, station id MARIPO, in the San Clemente HA. This station location is found near the intersection of West Escalones and West Mariposa in San Clemente.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44031, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Mariposa Lane

LOE ID:	28812
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation
Number of Samples:	10
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 548 single samples were collected 10 samples correlated with a storm event. From the 10 samples, only one exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program, Bacteria Shoreline Data, 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from San Clemente City Beach at Mariposa Lane, station id MARIPO, in the San Clemente HA. This station location is found near the intersection of West Escalones and West Mariposa in San Clemente.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006. Rainfall data was available for the same time period.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44031, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Mariposa Lane

LOE ID:	30728
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	537
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)

Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 547 single samples were collected of which 537 are dry weather (AB411) samples with three samples exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from San Clemente City Beach at Mariposa Lane, station id MARIPO, in the San Clemente HA. This station location is found near the intersection of West Escalones and West Mariposa in San Clemente.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44031, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Mariposa Lane

LOE ID:	30833
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	538
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 548 single samples were collected of which 538 are dry weather (AB411) samples with two of those samples exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected from San Clemente City Beach at Mariposa Lane, station id MARIPO, in the San Clemente HA. This station location is found near the intersection of West Escalones and West Mariposa in San Clemente.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44031, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Mariposa Lane

LOE ID:	30626
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	538
Number of Exceedances:	5
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 548 single samples were collected of which 538 are dry weather (AB411) samples with five samples exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from San Clemente City Beach at Mariposa Lane, station id MARIPO, in the San Clemente HA. This station location is found near the intersection of West Escalones and West Mariposa in San Clemente.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44031, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Mariposa Lane

LOE ID:	30318
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded

Beneficial Use:	Water Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006. For the 2008 assessment , the 2006 listed coastline 'Pacific Ocean Shoreline, San Clemente HA' was split into smaller segments that each represent an area near the sampling location of the data being assessed. This segment 'Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Mariposa Lane' is one of the sampling locations. This LOE is a copy of the 2006 listing placeholder LOE for Pacific Ocean Shoreline, San Clemente HA and is considered by the Regional Board to be applicable to this more specific segment formed from the split.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	
Temporal Representation:	
Environmental Conditions:	
QAPP Information:	Unspecified
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44031, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Mariposa Lane

LOE ID:	28818
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	10
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 548 single samples were collected with 10 samples correlated with a storm event. From the 10 samples, two exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml;

Objective/Criterion Reference:	Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005). Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from San Clemente City Beach at Mariposa Lane, station id MARIPO, in the San Clemente HA. This station location is found near the intersection of West Escalones and West Mariposa in San Clemente.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006. Rainfall data was available for the same time period.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44031, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Mariposa Lane

LOE ID:	28817
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	32
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 548 single samples were collected with 32 monthly geomeans calculated. From the 32 geomeans, two exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from San Clemente City Beach at Mariposa Lane, station id MARIPO, in the San Clemente HA. This station location is found near the intersection of

	West Escalones and West Mariposa in San Clemente. 041147
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44031, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Mariposa Lane

LOE ID:	28816
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	548
Number of Exceedances:	7
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 548 single samples were collected with seven samples exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program, Bacteria Shoreline Data, 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from San Clemente City Beach at Mariposa Lane, station id MARIPO, in the San Clemente HA. This station location is found near the intersection of West Escalones and West Mariposa in San Clemente.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44031, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Mariposa Lane

LOE ID:	28811
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	32
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 548 single samples were collected with 32 monthly geomean calculated. None fo the monthly geomeans exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from San Clemente City Beach at Mariposa Lane, station id MARIPO, in the San Clemente HA. This station location is found near the intersection of West Escalones and West Mariposa in San Clemente.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44031, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Mariposa Lane

LOE ID:	28810
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	548
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 548 single samples were collected with three samples exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from San Clemente City Beach at Mariposa Lane, station id MARIPO, in the San Clemente HA. This station location is found near the intersection of West Escalones and West Mariposa in San Clemente.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44031, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Mariposa Lane

LOE ID:	28815
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	10
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 547 single samples were collected with 10 samples correlated with a storm event. None of the samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from San Clemente City Beach at Mariposa Lane, station id MARIPO, in the San Clemente HA. This station location is found near the intersection of West Escalones and West Mariposa in San Clemente.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006. Rainfall data was available for the same time period.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff

	because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Dana Point HSA, at Camel Point
Water Body ID: CAC9011400020090505111518
Water Body Type: Coastal & Bay Shoreline

DECISION ID 42707 **Region 9**
Pacific Ocean Shoreline, Dana Point HSA, at Camel Point

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Ten lines of evidence are available in the administrative record to assess this pollutant. Including the latest data, 59 of the 1127 samples exceed the water quality objective for total coliform of a SSM of 230/100ml for the protection of SHELL beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Including the latest data, 59 of the 1127 samples exceed the water quality objective for total coliform of a SSM of 230/100ml for the protection of SHELL beneficial use and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 42707, Indicator Bacteria **Region 9**
Pacific Ocean Shoreline, Dana Point HSA, at Camel Point

LOE ID: 29231

Pollutant: Fecal Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 984

Number of Exceedances:	10	041152
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. There were 984 individual samples with 10 samples exceeding the single sample maximum water quality objective for fecal coliform.	
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Camel Point, station id S7, in the Dana Point HSA. Lat/Long: 33.50499/-117.74845.	
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 42707, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Camel Point

LOE ID:	29234
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	982
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 982. There were 982 individual samples collected with none exceeding the single sample maximum water quality objective for total coliform.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	

Guideline Reference:	041153
Spatial Representation:	Samples were collected from Camel Point, station id S7, in the Dana Point HSA. Lat/Long: 33.50499/-117.74845.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 42707, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Camel Point

LOE ID:	31068
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	56
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange within the time period from January 1999 through December 2006. A total of 56 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 56 geomeans zero exceeded the geomean water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml over a 30 day period (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Camel Point, station id S7, in the Dana Point HSA. Lat/Long: 33.50499/-117.74845.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 42707, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Camel Point

LOE ID:	31067

Pollutant:	Total Coliform	041154
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	56	
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange within the time period from January 1999 through December 2006. A total of 56 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 56 geomeans zero exceeded the geomean water quality objective.	
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml over a 30 day period (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Camel Point, station id S7, in the Dana Point HSA. Lat/Long: 33.50499/-117.74845.	
Temporal Representation:	Samples were collected weekly from January 1999 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 42707, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Camel Point

LOE ID:	74636
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	145
Number of Exceedances:	6
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed BW data for Pacific Ocean Shoreline, Dana Point HSA, at Camel Point to determine beneficial use support and results are as follows: 6 of 145 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Dana Point HSA, at Camel Point was collected at 2 monitoring sites [Aliso Beach - South, Camel Point]
Temporal Representation:	Data was collected over the time period 1/3/2008-8/30/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 42707, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Camel Point

LOE ID:	31069
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	56
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange within the time period from January 1999 through December 2006. A total of 36 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 56 geomeans zero exceeded the geomean water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml over a 30 day period (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Camel Point, station id S7, in the Dana Point HSA. Lat/Long: 33.50499/-117.74845.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 42707, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Camel Point 041156

LOE ID:	29136
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	982
Number of Exceedances:	53
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. There were 982 individual samples collected with 53 exceeding the shellfish single sample maximum water quality objective for total coliform.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan, the median total coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Camel Point, station id S7, in the Dana Point HSA. Lat/Long: 33.50499/-117.74845.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 42707, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Camel Point

LOE ID:	29244
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	108
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. There were 893 individual samples collected and 108 monthly geomeans calculated. None of the geomeans exceeded the geomean water quality objective for total coliform.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final

	Report	041157

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Camel Point, station id S7, in the Dana Point HSA. Lat/Long: 33.50499/-117.74845.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 42707, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Camel Point

LOE ID:	29245
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	51
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. There were 982 individual samples. Between March 2002 and December 2007, 51 samples were correlated with storm events. None of the 51 samples exceeded the single sample maximum water quality objective for total coliform. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected from Camel Point, station id S7, in the Dana Point HSA. Lat/Long: 33.50499/-117.74845.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 42707, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Camel Point

LOE ID:	29195
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	108
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. There were 880 individual samples with 108 monthly geomeans calculated. From the 108 geomeans 4 exceeded the geomean water quality objective for enterococcus.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Camel Point, station id S7, in the Dana Point HSA. Lat/Long: 33.50499/-117.74845.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 42707, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Camel Point 041159

LOE ID:	29196
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	969
Number of Exceedances:	60
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. There were 969 individual samples with 60 exceeding the single sample maximum water quality objective for enterococcus.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Camel Point, station id S7, in the Dana Point HSA. Lat/Long: 33.50499/-117.74845.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 42707, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Camel Point

LOE ID:	29197
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	108
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. There were 984 individual samples and 108 geomeans calculated. Of the 108 geomeans, none exceeded the geomean water quality objective for fecal coliform.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final

	Report	041160

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Camel Point, station id S7, in the Dana Point HSA. Lat/Long: 33.50499/-117.74845.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 42707, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Camel Point

LOE ID:	29137
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	51
Number of Exceedances:	18
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange January 1999 through December 2007. There were 982 individual samples collected. For the period from March 2002 through December 2007, 51 samples were correlated with a storm event. From the 51 samples, 18 exceeded the shellfish single sample maximum water quality objective for total coliform. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan, the median total coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Camel Point, station id S7, in the Dana Point HSA. Lat/Long:

	33.50499/-117.74845. 041161
Temporal Representation:	Samples were collected weekly from January 1999 through December 2006; however, rainfall data is only available from March 2002 through December 2006.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 42707, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Camel Point

LOE ID:	29194
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	51
Number of Exceedances:	13
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. There were 969 individual samples collected. For the period between March 2002 and December 2007, 51 samples were correlated with a storm evernt. Of the 51 samples, 13 exceeded the single sample maximum water quality objective for enterococcus. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Camel Point, station id S7, in the Dana Point HSA. Lat/Long: 33.50499/-117.74845.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however,

	rainfall data is only available from March 2002 through December 2007. 041162
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 42707, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Camel Point

LOE ID:	29230
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	51
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. There were 984 individual samples. From the period of March 2002 through December 2007, 51 samples were correlated with storm events. Of these 51 samples, two exceeded the single sample maximum water quality objective for fecal coliform. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Camel Point, station id S7, in the Dana Point HSA. Lat/Long: 33.50499/-117.74845.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff

	because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Dana Point HSA, at Dana Strands Surfzone at Dana Strands Rd
Water Body ID: CAC9011400020090505130453
Water Body Type: Coastal & Bay Shoreline

DECISION ID 44493 **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Dana Strands Surfzone at Dana Strands Rd

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Original
Reason for Delisting:	Applicable WQS attained; reason for recovery unspecified
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

In 2006, 'Pacific Ocean Shoreline, Dana Point HSA' was listed for Indicator Bacteria. For 2008, the 2006 Dana Point HSA segment has been split into smaller segments and each represents an area near the sampling location of the data being assessed. 'Pacific Ocean Shoreline, Dana Point HSA, at Dana Strands Surfzone at Dana Strands Rd' is one of the sampling locations for Pacific Ocean Shoreline, Dana Point HSA and is considered to be part of the original listing.

For this 2008 assessment, the Regional Board has chosen to replace the 'indicator bacteria' listing with separate assessments of the specific indicator bacteria, such as coliform, fecal coliform, and enterococcus, for removal or non-removal from the 303(d) list.

This pollutant is being considered for removal from the section 303(d) list under section 4.3 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Six lines of evidence are available in the administrative record to assess this pollutant. Seven of samples exceeded the water quality objective for Shellfish Harvesting. Two out of 117 samples exceeded the single sample objective objective for enterococcus, Zero out of 116 samples exceeded the single sample objective for fecal coliform, and Zero out of 117 samples exceeded contact recreation the single sample maximum evaluation guideline for Total Coliform.

This water body segment is identified as an AB411 beach and data collected during the time frame of April 1st to October 31st (dry weather) is assessed using a four percent exceedance percentage (section 4.3 of Listing Policy). There are three additional lines of evidence for dry weather single sample. Zero of 108 samples exceeded the recreational use single sample criteria for Total Coliform and Fecal Coliform, and Two out of 108 samples exceeded the objective for Enterococcus.

In LOEs 29517, 29521, 29550, and 29529 the Regional Board calculated exceedances for samples taken only during storm events. This information was not used in determining listing decisions, but is of interest to the Regional Board and has been included as additional anecdotal information.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for removing this water segment-pollutant combination from the section 303(d) list.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Seven of 117 samples exceeded the Shellfish Harvesting water quality objective, and 0 of 117 single samples and 0 of 15 calculated geomeans exceed the water contact recreation water quality objective.

None of these exceed the allowable frequency listed in Table 4.2 of the Listing Policy041165
4. . Zero of 108 samples exceeded the recreational use single sample criteria for Total Coliform and Fecal Coliform, and Two out of 108 samples exceeded the objective for Enterococcus . This does not exceed the allowable limit listed in Table 4.2 (at a four percent exceedance percentage Â– AB411) of the Listing Policy.
5. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be removed from the section 303(d) list because applicable water quality standards for the pollutant are not being exceeded.

Line of Evidence (LOE) for Decision ID 44493, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Dana Strands Surfzone at Dana Strands Rd

LOE ID:	29233
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	-N/A
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 1999 to June 2006, there were and two beach postings days for this section of shoreline. Bacteriological samples are collected on a weekly basis at approximately 150 ocean and bay location in Orange County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of Orange in their Annual Ocean and Bay Water Quality Report, March 2007. The reporting period was from January 2000 -December 2006. Data used was the number of days the beach was posting when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	County of Orange. March 2007. Annual Ocean and Bay Water Quality Report, 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Bacteriological monitoring samples were collected at Salt Creek Beach Park at Dana Strands Road
Temporal Representation:	The beach posting covers the time frame of January 1999 -June 2006.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of Orange's Quality Assessment/Quality Control document (County of Orange, 2004).

QAPP Information Reference(s): 041166

Line of Evidence (LOE) for Decision ID 44493, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Dana Strands Surfzone at Dana Strands Rd

LOE ID:	30298
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Water Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006. For the 2008 assessment , the 2006 listed coastline 'Pacific Ocean Shoreline, Dana Point HSA' was split into smaller segments that each represent an area near the sampling location of the data being assessed. This segment Pacific Ocean Shoreline, Dana Point HSA, at Dana Strands Surfzone at Dana Strands Rd is one of the sampling locations. This LOE is a copy of the 2006 listing placeholder LOE for Pacific Ocean Shoreline, Dana Point HSA and is considered by the Regional Board to be applicable to this more specific segment formed from the split.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	
Temporal Representation:	
Environmental Conditions:	
QAPP Information:	Unspecified
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44493, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Dana Strands Surfzone at Dana Strands Rd

LOE ID:	29516
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	117
Number of Exceedances:	7
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the City of Dana Point from a November 2005

	through January 2007. There were 117 individual samples collected with seven exceeding the shellfish single sample maximum water quality objective for total coliform.
Data Reference:	Ocean Bacteriological Data Evaluation for Dana Point HSA, City of Dana Point, November 2005 - December 2006.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan, the median total coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Dana Strands at Dana Strands road, station id S1, in the Dana Point HSA. Lat/Long: 33.46959/-117.71826.
Temporal Representation:	Samples were collected weekly from November 2005 through January 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44493, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Dana Strands Surfzone at Dana Strands Rd

LOE ID:	29517
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the City of Dana Point from a November 2005 through January 2007. There were 117 individual samples collected with nine samples correlated with a storm event. None of the nine samples exceeded the shellfish single sample maximum water quality objective for total coliform. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Ocean Bacteriological Data Evaluation for Dana Point HSA, City of Dana Point, November 2005 - December 2006.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan, the median total coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Dana Strands at Dana Strands road, station id S1, in the Dana Point HSA. Lat/Long: 33.46959/-117.71826.

Temporal Representation:	Samples were collected weekly from November 2005 through January 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44493, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Dana Strands Surfzone at Dana Strands Rd

LOE ID:	29521
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the City of Dana Point from a November 2005 through January 2007. There were 117 individual samples collected with nine samples correlated with a storm event. None of the nine samples exceeded the single sample maximum water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Ocean Bacteriological Data Evaluation for Dana Point HSA, City of Dana Point, November 2005 - December 2006.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Dana Strands at Dana Strands road, station id S1, in the Dana Point HSA. Lat/Long: 33.46959/-117.71826.
Temporal Representation:	Samples were collected weekly from November 2005 through January 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance

	with the County of Orange Quality Assessment/Quality Control document.041169
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44493, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Dana Strands Surfzone at Dana Strands Rd

LOE ID:	29518
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	117
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the City of Dana Point from a November 2005 through January 2007. There were 117 individual samples collected with no samples exceeding the single sample maximum water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for Dana Point HSA, City of Dana Point, November 2005 - December 2006.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Dana Strands at Dana Strands road, station id S1, in the Dana Point HSA. Lat/Long: 33.46959/-117.71826.
Temporal Representation:	Samples were collected weekly from November 2005 through January 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44493, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Dana Strands Surfzone at Dana Strands Rd

LOE ID:	29519
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	15
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)

Data Used to Assess Water Quality:	Beach monitoring data was collected by the City of Dana Point from a November 2005 through January 2007. There were 117 individual samples collected with 15 monthly geomeans calculated. None of the geomeans exceeded the geomean water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for Dana Point HSA, City of Dana Point, November 2005 - December 2006.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Dana Strands at Dana Strands road, station id S1, in the Dana Point HSA. Lat/Long: 33.46959/-117.71826.
Temporal Representation:	Samples were collected weekly from November 2005 through January 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44493, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Dana Strands Surfzone at Dana Strands Rd

LOE ID:	30688
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	108
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the City of Dana Point from a November 2005 through January 2007. There were 116 individual samples collected of which 108 are dry weather (AB411) samples with no samples exceeding the single sample maximum water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for Dana Point HSA, City of Dana Point, November 2005 - December 2006.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected from Dana Strands at Dana Strands road, station id S1, in the Dana Point HSA. Lat/Long: 33.46959/-117.71826.
Temporal Representation:	Samples were collected weekly from November 2005 through January 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44493, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Dana Strands Surfzone at Dana Strands Rd

LOE ID:	30802
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	108
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the City of Dana Point from a November 2005 through January 2007. There were 117 individual samples collected of which 108 are dry weather (AB411) samples with no samples exceeding the single sample maximum water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for Dana Point HSA, City of Dana Point, November 2005 - December 2006.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Dana Strands at Dana Strands road, station id S1, in the Dana Point HSA. Lat/Long: 33.46959/-117.71826.
Temporal Representation:	Samples were collected weekly from November 2005 through January 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44493, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Dana Strands Surfzone at Dana Strands Rd

LOE ID:	29548
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation	041172
Number of Samples:	117	
Number of Exceedances:	2	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the City of Dana Point from a November 2005 through January 2007. There were 117 individual samples collected with two samples exceeding the single sample water quality objective.	
Data Reference:	Ocean Bacteriological Data Evaluation for Dana Point HSA, City of Dana Point, November 2005 - December 2006.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Dana Strands at Dana Strands road, station id S1, in the Dana Point HSA. Lat/Long: 33.46959/-117.71826.	
Temporal Representation:	Samples were collected weekly from November 2005 through January 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 44493, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Dana Strands Surfzone at Dana Strands Rd

LOE ID:	29549
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	15
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the City of Dana Point from a November 2005 through January 2007. There were 117 individual samples collected with 15 monthly geomeans calculated. None of the monthly geomeans exceeded the geomean water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for Dana Point HSA, City of Dana Point, November 2005 - December 2006.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental

Protection Agency 041173

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected from Dana Strands at Dana Strands road, station id S1, in the Dana Point HSA. Lat/Long: 33.46959/-117.71826.
Temporal Representation: Samples were collected weekly from November 2005 through January 2007.
Environmental Conditions:
QAPP Information: Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s): County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44493, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Dana Strands Surfzone at Dana Strands Rd

LOE ID: 29550

Pollutant: Enterococcus
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 9
Number of Exceedances: 0

Data and Information Type: PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality: Beach monitoring data was collected by the City of Dana Point from a November 2005 through January 2007. There were 117 individual samples collected with nine samples correlated witha storm event. None of the storm samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference: Ocean Bacteriological Data Evaluation for Dana Point HSA, City of Dana Point, November 2005 - December 2006.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml;

Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference: Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected from Dana Strands at Dana Strands road, station id S1, in the Dana Point HSA. Lat/Long: 33.46959/-117.71826.
Temporal Representation: Samples were collected weekly from November 2005 through January 2007.
Environmental Conditions: Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.

Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information: Quality control for the bacteria analysis portion of this study was conducted in accordance

	with the County of Orange Quality Assessment/Quality Control document.041174
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44493, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Dana Strands Surfzone at Dana Strands Rd

LOE ID:	29524
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	116
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the City of Dana Point from a November 2005 through January 2007. There were 116 individual samples collected with no samples exceeding the single sample maximum water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for Dana Point HSA, City of Dana Point, November 2005 - December 2006.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Dana Strands at Dana Strands road, station id S1, in the Dana Point HSA. Lat/Long: 33.46959/-117.71826.
Temporal Representation:	Samples were collected weekly from November 2005 through January 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44493, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Dana Strands Surfzone at Dana Strands Rd

LOE ID:	29527
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	15
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)

Data Used to Assess Water Quality:	Beach monitoring data was collected by the City of Dana Point from a November 2005 through January 2007. There were 116 individual samples collected and 15 monthly geomeans calculated. None of the geomeans exceeded the geomean water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for Dana Point HSA, City of Dana Point, November 2005 - December 2006.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Dana Strands at Dana Strands road, station id S1, in the Dana Point HSA. Lat/Long: 33.46959/-117.71826.
Temporal Representation:	Samples were collected weekly from November 2005 through January 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44493, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Dana Strands Surfzone at Dana Strands Rd

LOE ID:	29529
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the City of Dana Point from a November 2005 through January 2007. There were 116 individual samples collected with eight samples correlated with a storm event. None of the storm samples exceeded the geomean water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Ocean Bacteriological Data Evaluation for Dana Point HSA, City of Dana Point, November 2005 - December 2006.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	

Guideline Reference:	041176
Spatial Representation:	Samples were collected from Dana Strands at Dana Strands road, station id S1, in the Dana Point HSA. Lat/Long: 33.46959/-117.71826.
Temporal Representation:	Samples were collected weekly from November 2005 through January 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44493, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Dana Strands Surfzone at Dana Strands Rd

LOE ID:	30566
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	108
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the City of Dana Point from a November 2005 through January 2007. There were 117 individual samples collected of which 108 are dry weather (AB 411) samples with two samples exceeding the single sample water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for Dana Point HSA, City of Dana Point, November 2005 - December 2006.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Dana Strands at Dana Strands road, station id S1, in the Dana Point HSA. Lat/Long: 33.46959/-117.71826.
Temporal Representation:	Samples were collected weekly from November 2005 through January 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Dana Point HSA, at Laguna Lido
Water Body ID: CAC9011400020090505122717
Water Body Type: Coastal & Bay Shoreline

DECISION ID 43267 **Region 9**
Pacific Ocean Shoreline, Dana Point HSA, at Laguna Lido

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Eleven lines of evidence are available in the administrative record to assess this pollutant. Including the latest data, two of the 229 samples exceed the water quality objective for enterococcus of a geomean of 35/100ml in a 30-day period for the protection of REC-1.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Including the latest data, two of the 229 samples exceed the water quality objective for enterococcus of a geomean of 35/100ml in a 30-day period for the protection of REC-1 and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 43267, Indicator Bacteria **Region 9**
Pacific Ocean Shoreline, Dana Point HSA, at Laguna Lido

LOE ID: 77601

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Shellfish Harvesting

Number of Samples: 121

Number of Exceedances:	0	041178
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	None of the 121 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, Dana Point HSA, at Laguna Lido.	
Temporal Representation:	The samples were collected from January 2008 to January 2010.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the beach watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43267, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Laguna Lido

LOE ID:	29237
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	108
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange between January 1999 and December 2007. There were 928 individual samples collected and 108 monthly geomeans calculated. None of the 108 geomeans exceed the water contact recreation geomean water quality objective for total coliform.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Laguna Lido, station id S5, in the Dana Point HSA. Lat/Long: 33.50051/-117.74504.

Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43267, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Laguna Lido

LOE ID:	29236
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	51
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange between January 1999 and December 2007. There were 928 individual samples collected. Between March 2002 and December 2007, 51 samples were correlated with storm events. None of the 51 samples exceed the water contact recreation single sample maximum water quality objective for total coliform. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005). Comparisons to water quality objectives were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Laguna Lido, station id S5, in the Dana Point HSA. Lat/Long: 33.50051/-117.74504.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance

	with the County of Orange Quality Assessment/Quality Control document.041180
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43267, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Laguna Lido

LOE ID:	29201
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	108
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange between January 1999 and December 2007. There were 930 individual samples collected with 108 monthly geomeans calculated. From the 108 geomeans, none exceeded the water contact recreation geomean water quality objective for fecal coliform.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Laguna Lido, station id S5, in the Dana Point HSA. Lat/Long: 33.50051/-117.74504.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43267, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Laguna Lido

LOE ID:	29145
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	51
Number of Exceedances:	8

Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from between January 1999 and December 2007. There were 929 individual samples collected. For the period between March 2002 and December 2007, 51 samples were correlated with storm events. From the 51 storm events, 8 samples exceeded the water contact recreation single sample maximum water quality objective for enterococcus. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Laguna Lido, station id S5, in the Dana Point HSA. Lat/Long: 33.50051/-117.74504.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43267, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Laguna Lido

LOE ID:	29142
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	928
Number of Exceedances:	64
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through Decembery 2007. There were 928 individual samples collected with 64 exceeding the shellfish single sample maximum water quality objective for total coliform.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final

	Report	041182

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan, the median total coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Laguna Lido, station id S5, in the Dana Point HSA. Lat/Long: 33.50051/-117.74504.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43267, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Laguna Lido

LOE ID:	29143
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	929
Number of Exceedances:	45
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange between January 1999 and December 2007. There were 929 individual samples collected with 45 samples exceeding the water contact recreation single sample maximum water quality objective for enterococcus.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Laguna Lido, station id S5, in the Dana Point HSA. Lat/Long: 33.50051/-117.74504.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	

QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43267, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Laguna Lido

LOE ID:	29144
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	108
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange between January 1999 and December 2007. There were 929 individual samples collected with 108 monthly geomeans calculated. From the 108 geomeans, 2 exceeded the water contact recreation geomean water quality objective for enterococcus.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Laguna Lido, station id S5, in the Dana Point HSA. Lat/Long: 33.50051/-117.74504.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43267, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Laguna Lido

LOE ID:	29139
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting

Number of Samples:	51
Number of Exceedances:	18
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. There were 928 individual samples collected. Between March 2002 and December 2007, 51 samples were correlated with storm events. From the 51 storm samples, 18 exceeded the shellfish single sample maximum water quality objective for total coliform. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan, the median total coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Laguna Lido, station id S5, in the Dana Point HSA. Lat/Long: 33.50051/-117.74504.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43267, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Laguna Lido

LOE ID:	29200
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	930
Number of Exceedances:	14
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange between January 1999 and December 2007. There were 930 individual samples collected with 14 samples exceeding the water contact recreation single sample maximum water quality objective for fecal

	coliform. 041185
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Laguna Lido, station id S5, in the Dana Point HSA. Lat/Long: 33.50051/-117.74504.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43267, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Laguna Lido

LOE ID:	29198
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	51
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange between January 1999 and December 2007. There were 930 individual samples collected with 108 monthly geomeans calculated. For the period of March 2002 through December 2007, 51 samples coule be correlated with storm events. Of the 51 storm events, only one sample exceeded the water contact recreation single sample maximum water quality objective for fecal coliform. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005). Comparisons to water quality objectives were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005.

	Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Laguna Lido, station id S5, in the Dana Point HSA. Lat/Long: 33.50051/-117.74504.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	County of Orange Quality Assessment/Quality Control document (County of Orange, 2004).
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43267, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Laguna Lido

LOE ID:	29241
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	928
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange between January 1999 and December 2007. There were 928 individual samples collected with no samples exceeding the water contact recreation single sample maximum water quality objective for total coliform.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Laguna Lido, station id S5, in the Dana Point HSA. Lat/Long: 33.50051/-117.74504.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43267, Indicator Bacteria 041187 Region 9

Pacific Ocean Shoreline, Dana Point HSA, at Laguna Lido

LOE ID:	31072
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	56
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Orange County collected Beach monitoring data within the time period from January 1999 through December 2006. A total of 56 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 56 geomeans zero exceeded the geomean water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml within any 30 day period (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Laguna Lido, station id S5, in the Dana Point HSA. Lat/Long: 33.50051/-117.74504.
Temporal Representation:	Samples were collected at least once a week within the time period from January 1999 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43267, Indicator Bacteria Region 9

Pacific Ocean Shoreline, Dana Point HSA, at Laguna Lido

LOE ID:	31071
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	56

Number of Exceedances:	0	041188
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Orange County collected Beach monitoring data within the time period from January 1999 through December 2006. A total of 56 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 56 geomeans 13 exceeded the geomean water quality objective.	
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml over a 30 day period (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Laguna Lido, station id S5, in the Dana Point HSA. Lat/Long: 33.50051/-117.74504.	
Temporal Representation:	Samples were collected at least once a week within the time period from January 1999 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 43267, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Laguna Lido

LOE ID:	31070
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	56
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange within the time period from January 1999 through December 2006. A total of 56 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 56 geomeans four exceeded the geomean water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml over a 30 day period (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005.

	Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Laguna Lido, station id S5, in the Dana Point HSA. Lat/Long: 33.50051/-117.74504.
Temporal Representation:	Samples were collected weekly from January 1999 through Decembery 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43267, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Laguna Lido

LOE ID:	74654
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	121
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 121 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Laguna Lido Apartment site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43267, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Laguna Lido

LOE ID:	74653
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	121
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 121 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Laguna Lido Apartment site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43267, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Laguna Lido

LOE ID:	74481
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	121
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 121 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Laguna Lido Apartment site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43267, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Laguna Lido

LOE ID:	74480

Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	142
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed BW data for Pacific Ocean Shoreline, Dana Point HSA, at Laguna Lido to determine beneficial use support and results are as follows: 0 of 142 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Dana Point HSA, at Laguna Lido was collected at 1 monitoring site [Laguna Lido Apartment]
Temporal Representation:	Data was collected over the time period 1/3/2008-8/30/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch Beach
Water Body ID: CAC9011400020090505125551
Water Body Type: Coastal & Bay Shoreline

DECISION ID 43463 **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch Beach

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not Delist from 303(d) list (being addressed with USEPA approved TMDL)**
Last Listing Cycle's Final Listing Decision:	Do Not Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
TMDL Name:	Bacteria Impaired Waters I (creeks and beach shorelines)
TMDL Project Code:	169
Date TMDL Approved by USEPA:	06/22/2011
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal on the CWA section 303(d) List under sections 2.2 and 4.2 of the Listing Policy. Under Section 4.2 of the Policy, a minimum of one line of evidence is needed to assess listing status.

Eleven lines of evidence are available in the administrative record to assess this pollutant.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List. There is sufficient justification to place it in the Being Addressed portion of the CWA 303(d) List because a TMDL has been completed and approved by RWQCB and USEPA, and is expected to result in attainment of the standard.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, 154 of 212 geomean samples exceed the water quality objective for enterococcus for the protection of REC-1, 56 of 217 geomean samples exceed the WQO for total coliform for the protection of REC-1, and 73 of 198 exceed the WQO for total coliform for the protection of SHELL, and these exceed the allowable frequency listed in Table 4.2 of the Listing Policy.
4. The Bacteria TMDL for 20 beaches/creeks was approved by USEPA on 06/22/2011.
5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 43463, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch Beach

LOE ID: 30803

Pollutant:	Total Coliform	041193
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	95	
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the City of Dana Point from a January 2005 through January 2007. There were 105 individual samples collected of which 95 are dry weather (AB411) samples with no samples exceeding the single sample maximum water quality objective.	
Data Reference:	Ocean Bacteriological Data Evaluation for Dana Point HSA, City of Dana Point, November 2005 - December 2006.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were taken at a sampling station located north of the Salt Creek outlet at the surfzone of Monarch Beach (station id OSL25). Lat/Long: 33.48172/-117.72595.	
Temporal Representation:	Samples were collected weekly from January 2005 through January 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 43463, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch Beach

LOE ID:	74528
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	149
Number of Exceedances:	70
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Seventy of the 149 samples exceeded the enterococcus objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample enterococcus concentration shall not exceed more than 104/100ml.

	Water Quality Control Plan for the San Diego Basin. California Ocean Plan. 041194
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Coastal Salt Creek Mouth (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43463, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch Beach

LOE ID:	74529
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	138
Number of Exceedances:	125
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	One hundred twenty-five of the 138 geomeans exceeded the enterococcus objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean for enterococcus shall not exceed 35 MPN/100 mL. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Salt Creek Mouth (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43463, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch Beach

LOE ID:	74792
Pollutant:	Total Coliform

LOE Subgroup:	Pollutant-Water	041195
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	40	
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Zero of the 40 geomeans exceeded the objective.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the total coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected Monarch Beach.	
Temporal Representation:	Samples were collected from January 2008 to October 2009.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43463, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch Beach

LOE ID:	74793
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	14
Number of Exceedances:	13
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Thirteen of the fourteen geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the total coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected Salt Creek.
Temporal Representation:	Samples were collected from January 2008 to October 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43463, Indicator Bacteria 041196 **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch Beach

LOE ID:	75110
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	40
Number of Exceedances:	10
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Ten of the 40 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected Monarch Beach.
Temporal Representation:	Samples were collected from January 2008 to October 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43463, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch Beach

LOE ID:	75111
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	19
Number of Exceedances:	19
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Nineteen of the 19 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected Salt Creek.
Temporal Representation:	Samples were collected from January 2008 to October 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43463, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch Beach

LOE ID:	75112
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	149
Number of Exceedances:	17
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Seventeen of the 149 samples exceeded the fecal coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample fecal coliform concentration shall not exceed more than 400/100ml. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Salt Creek Mouth (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43463, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch Beach

LOE ID:	75113
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	138
Number of Exceedances:	11

Data and Information Type:	Not Specified 041198
Data Used to Assess Water Quality:	Eleven of the 138 geomeans exceeded the fecal coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean for fecal coliform shall not exceed more than 200/100ml. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Salt Creek Mouth (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43463, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch Beach

LOE ID:	75114
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	19
Number of Exceedances:	17
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Seventeen of the 19 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for fecal coliform states that the fecal coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected Salt Creek.
Temporal Representation:	Samples were collected from January 2008 to October 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43463, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch Beach

LOE ID:	75115	041199

Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	40
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 40 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for fecal coliform states that the fecal coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected Monarch Beach.
Temporal Representation:	Samples were collected from January 2008 to October 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43463, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch Beach

LOE ID:	30297
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Water Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006. For the 2008 assessment , the 2006 listed coastline'Pacific Ocean Shoreline, Dana Point HSA' was split into smaller segments that each represent an area near the sampling location of the data being assessed. This segment 'Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch Beach' is one of the sampling locations. This LOE is a copy of the 2006 listing placeholder LOE for Pacific Ocean Shoreline, Dana Point HSA and is considered by the Regional Board to be applicable to this more specific segment formed from the split.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified

Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)	041200
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:		
Temporal Representation:		
Environmental Conditions:		
QAPP Information:	Unspecified	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43463, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch Beach

LOE ID:	77602
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	58
Number of Exceedances:	36
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Thirty-six of the fifty-eight samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch. At two sites, Monarch Beach - North and Salt Creek.
Temporal Representation:	The samples were collected from January 2008 to October 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43463, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch Beach

LOE ID:	75153
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting

Number of Samples:	93
Number of Exceedances:	43
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed BW data for Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch to determine beneficial use support and results are as follows: 43 of 93 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch was collected at 2 monitoring sites [MONARCH BEACH NORTH, SALT CREEK]
Temporal Representation:	Data was collected over the time period 1/3/2008-10/27/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43463, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch Beach

LOE ID:	75154
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	138
Number of Exceedances:	43
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Forty-three of the 138 samples exceeded the total coliform objective. For these stations, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean for total coliform shall not exceed more than 1000/100ml. Water Quality Control Plan for the San Diego Basin. Water Quality Control Plan for Ocean Waters.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected fromSalt Creek Mouth (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	

QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43463, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch Beach

LOE ID:	30689
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	94
Number of Exceedances:	5
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the City of Dana Point from a January 2005 through January 2007. There were 105 individual samples collected of which 94 are dry weather (AB411) samples with five samples exceeding the single sample water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for Dana Point HSA, City of Dana Point, November 2005 - December 2006.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were taken at a sampling station located north of the Salt Creek outlet at the surfzone of Monarch Beach (station id OSL25). Lat/Long: 33.48172/-117.72595.
Temporal Representation:	Samples were collected weekly from January 2005 through January 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43463, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch Beach

LOE ID:	29561
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	8
Number of Exceedances:	0

Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the City of Dana Point from a January 2005 through January 2007. There were 63 individual samples collected with eight samples correlated with a storm event. None of the storm samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Ocean Bacteriological Data Evaluation for Dana Point HSA, City of Dana Point, November 2005 - December 2006.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were taken at a sampling station located north of the Salt Creek outlet at the surfzone of Monarch Beach (station id OSL25). Lat/Long: 33.48172/-117.72595.
Temporal Representation:	Samples were collected weekly from January 2005 through January 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43463, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch Beach

LOE ID:	29560
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	15
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the City of Dana Point from a January 2005 through January 2007. There were 63 individual samples collected with 15 monthly geomeans calculated. None of the geomeans exceeded the geomean water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for Dana Point HSA, City of Dana Point, November 2005 - December 2006.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml;

041204

Objective/Criterion Reference:	Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005). Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were taken at a sampling station located north of the Salt Creek outlet at the surfzone of Monarch Beach (station id OSL25). Lat/Long: 33.48172/-117.72595.
Temporal Representation:	Samples were collected weekly from January 2005 through January 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43463, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch Beach

LOE ID:	29559
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	63
Number of Exceedances:	6
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the City of Dana Point from a January 2005 through January 2007. There were 63 individual samples collected with 6 samples exceeding the single sample water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for Dana Point HSA, City of Dana Point, November 2005 - December 2006.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml;
Objective/Criterion Reference:	Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005). Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were taken at a sampling station located north of the Salt Creek outlet at the surfzone of Monarch Beach (station id OSL25). Lat/Long: 33.48172/-117.72595.
Temporal Representation:	Samples were collected weekly from January 2005 through January 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43463, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch Beach

LOE ID:	29558	041205
Pollutant:	Fecal Coliform	
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	11	
Number of Exceedances:	1	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the City of Dana Point from a January 2005 through January 2007. There were 105 individual samples collected with 11 samples correlated with a storm event. One of the 11 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.	
Data Reference:	Ocean Bacteriological Data Evaluation for Dana Point HSA, City of Dana Point, November 2005 - December 2006.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were taken at a sampling station located north of the Salt Creek outlet at the surfzone of Monarch Beach (station id OSL25). Lat/Long: 33.48172/-117.72595.	
Temporal Representation:	Samples were collected weekly from January 2005 through January 2007.	
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 43463, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch Beach

LOE ID:	29552
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	10
Number of Exceedances:	1

Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the City of Dana Point from a January 2005 through January 2007. There were 105 individual samples collected with 10 samples correlated with a storm event. One of the 10 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Ocean Bacteriological Data Evaluation for Dana Point HSA, City of Dana Point, November 2005 - December 2006.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan, the median total coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were taken at a sampling station located north of the Salt Creek outlet at the surfzone of Monarch Beach (station id OSL25). Lat/Long: 33.48172/-117.72595.
Temporal Representation:	Samples were collected weekly from January 2005 through January 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43463, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch Beach

LOE ID:	29551
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	105
Number of Exceedances:	30
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the City of Dana Point from a January 2005 through January 2007. There were 105 individual samples collected with 30 exceeding the shellfish single sample maximum water quality objective for total coliform.
Data Reference:	Ocean Bacteriological Data Evaluation for Dana Point HSA, City of Dana Point, November 2005 - December 2006.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan, the median total coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml (SWRCB, 2005).

Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were taken at a sampling station located north of the Salt Creek outlet at the surfzone of Monarch Beach (station id OSL25). Lat/Long: 33.48172/-117.72595.
Temporal Representation:	Samples were collected weekly from January 2005 through January 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43463, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch Beach

LOE ID:	29555
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	10
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the City of Dana Point from a January 2005 through January 2007. There were 105 individual samples collected with 10 samples correlated with a storm event. None of the 10 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Ocean Bacteriological Data Evaluation for Dana Point HSA, City of Dana Point, November 2005 - December 2006.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were taken at a sampling station located north of the Salt Creek outlet at the surfzone of Monarch Beach (station id OSL25). Lat/Long: 33.48172/-117.72595.
Temporal Representation:	Samples were collected weekly from January 2005 through January 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.

QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43463, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch Beach

LOE ID:	29554
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	25
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the City of Dana Point from a January 2005 through January 2007. There were 105 individual samples collected with 25 monthly geomeans calculated. None of the geomeans exceeded the geomean water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for Dana Point HSA, City of Dana Point, November 2005 - December 2006.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were taken at a sampling station located north of the Salt Creek outlet at the surfzone of Monarch Beach (station id OSL25). Lat/Long: 33.48172/-117.72595.
Temporal Representation:	Samples were collected weekly from January 2005 through January 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43463, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch Beach

LOE ID:	29553
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	105
Number of Exceedances:	0

Data and Information Type:	PWS pathogen monitoring (ambient water) 041209
Data Used to Assess Water Quality:	Beach monitoring data was collected by the City of Dana Point from a January 2005 through January 2007. There were 105 individual samples collected with no samples exceeding the single sample maximum water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for Dana Point HSA, City of Dana Point, November 2005 - December 2006.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were taken at a sampling station located north of the Salt Creek outlet at the surfzone of Monarch Beach (station id OSL25). Lat/Long: 33.48172/-117.72595.
Temporal Representation:	Samples were collected weekly from January 2005 through January 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43463, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch Beach

LOE ID:	30567
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	63
Number of Exceedances:	6
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the City of Dana Point from a January 2005 through January 2007. There were 63 individual samples collected of which 55 are dry weather (AB 411) samples with 6 samples exceeding the single sample water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for Dana Point HSA, City of Dana Point, November 2005 - December 2006.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were taken at a sampling station located north of the Salt Creek outlet at the

	surfzone of Monarch Beach (station id OSL25). Lat/Long: 33.48172/-117.72595
Temporal Representation:	Samples were collected weekly from January 2005 through January 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43463, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch Beach

LOE ID:	29557
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	24
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the City of Dana Point from a January 2005 through January 2007. There were 105 individual samples collected with 24 monthly geomeans calculated. None of the geomeans exceeded the geomean water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for Dana Point HSA, City of Dana Point, November 2005 - December 2006.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were taken at a sampling station located north of the Salt Creek outlet at the surfzone of Monarch Beach (station id OSL25). Lat/Long: 33.48172/-117.72595.
Temporal Representation:	Samples were collected weekly from January 2005 through January 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43463, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch Beach

LOE ID:	75155
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	149	041211
Number of Exceedances:	5	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Five of the 149 samples exceeded the total coliform objective. For these stations, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The single sample total coliform concentration shall not exceed more than 10000/100ml. Water Quality Control Plan for the San Diego Basin. Water Quality Control Plan for Ocean Waters.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected from Salt Creek Mouth (surfzone upcoast and surfzone downcoast).	
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.	
Environmental Conditions:		
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43463, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch Beach

LOE ID:	29232
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	-N/A
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	461
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2000 to December 2006, there were and 461 beach postings days for this section of shoreline. Bacteriological samples are collected on a weekly basis at approximately 150 ocean and bay location in Orange County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of Orange in their Annual Ocean and Bay Water Quality Report, March 2007. The reporting period was from January 2000 -December 2006. Data used was the number of days the beach was posting when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	County of Orange. March 2007. Annual Ocean and Bay Water Quality Report, 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the

	standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Bacteriological monitoring samples were collected at Monarch Beach, Salt Creek County Beach, Dana Strands, and Ocean Institute Beach. The posting covers 3 miles of beach shoreline.
Temporal Representation:	The beach posting covers the time frame of January 2000 -December 2006.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of Orange's Quality Assessment/Quality Control document (County of Orange, 2004).
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43463, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch Beach

LOE ID:	29556
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	105
Number of Exceedances:	6
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the City of Dana Point from a January 2005 through January 2007. There were 105 individual samples collected with six samples exceeding the single sample water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for Dana Point HSA, City of Dana Point, November 2005 - December 2006.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were taken at a sampling station located north of the Salt Creek outlet at the surfzone of Monarch Beach (station id OSL25). Lat/Long: 33.48172/-117.72595.
Temporal Representation:	Samples were collected weekly from January 2005 through January 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

DECISION ID **49736** 041213 **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch Beach

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the Seven samples exceed the Water Quality Criteria for Arsenic. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Seven samples exceeded the Water Quality Criteria for Arsenic and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49736, Arsenic **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch Beach

LOE ID:	74513
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the seven samples exceeded the water quality objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California's Ocean Plan Table B lists 6-month median concentration of 8 ug/L to protect aquatic life in marine waters.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation:	Samples were collected from SCM-1 and SCM-1d located on the Pacific Coast-Monarch Beach, at the mouth of Salt Creek.
Temporal Representation:	Samples were collected from SCM-1 on 9/7/2006, 12/27/2006, 10/11/2007, and 1/24/2008. Samples were collected from SCM-1d on 10/11/2007, 5/14/2008, 10/1/2008, 12/15/2008, and 4/28/2008.
Environmental Conditions:	Samples were collected from stormwater runoff on 12/15/2008, 1/24/2008, and 12/27/2006, the remainder were dry weather samples.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID 49738 Region 9

Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch Beach

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the Nine samples exceed the Water Quality Criteria Cadmium. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Nine samples exceeded the Water Quality Criteria Cadmium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49738, Cadmium Region 9

Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch Beach

LOE ID:	74514
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	Dissolved	041215
Beneficial Use:	Marine Habitat	
Number of Samples:	9	
Number of Exceedances:	1	
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)	
Data Used to Assess Water Quality:	One of the nine samples exceeded the water quality objective.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California's Ocean Plan Table B lists 6-month median concentration of 1 ug/L to protect aquatic life in marine waters.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from SCM-1 and SCM-1d located on the Pacific Coast-Monarch Beach, at the mouth of Salt Creek.	
Temporal Representation:	Samples were collected from SCM-1 on 9/7/2006, 12/27/2006, 10/11/2007, and 1/24/2008. Samples were collected from SCM-1d on 10/11/2007, 5/14/2008, 10/1/2008, 12/15/2008, and 4/28/2008.	
Environmental Conditions:	Samples were collected from stormwater runoff on 12/15/2008, 1/24/2008, and 12/27/2006, the remainder were dry weather samples.	
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.	
QAPP Information Reference(s):		

DECISION ID 49740 Region 9

Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch Beach

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the Nine samples exceed the Water Quality Criteria Chlorpyrifos.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Nine samples exceeded the Water Quality Criteria for Chlorpyrifos and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49740, Chlorpyrifos **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch Beach

LOE ID:	74525
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the nine samples exceeded the Criteria Continuous Concentration for Chlorpyrifos of 9 ng/L. The reporting limit for the non-detect sample was 10 ng/L which is greater than the evaluation guideline, therefore these data are not of sufficient resolution to determine if water quality standards are being achieved.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Marine communities, including vertebrate, invertebrate, and plant species, shall not be degraded. (2009 CA Ocean Plan)
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The Criteria Continuous Concentration (four day average) for chlorpyrifos in saltwater is 9 ng/L.
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game
Spatial Representation:	Samples were collected at site SCM-1 and SCM-1d from Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch.
Temporal Representation:	Samples were collected at Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch site SCM-1 in September and December of 2006; October 2007; and January of 2008. Samples from SCM-1d were collected in October 2007; May, October and December of 2008; April of 2009.
Environmental Conditions:	According to the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010, samples were collected during the dry season and storm events.
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

DECISION ID 49742 **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch Beach

Pollutant: **Copper**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**

Last Listing Cycle's Final Listing Decision:	New Decision	041217
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1, one line(s) of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. One of the five samples exceed the Objective for dissolved copper in marine habitat.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of the five samples exceed the Objective for dissolved copper in marine habitat and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to [SECTION 3.11/4.11] of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49742, Copper **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch Beach

LOE ID:	74526
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	5
Number of Exceedances:	1
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	One of the five samples exceeded the water quality objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California's Ocean Plan Table B lists 6-month median concentration of 3 ug/L to protect aquatic life in marine waters.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from SCM-1d located on the Pacific Coast-Monarch Beach, at the mouth of Salt Creek.

Temporal Representation:	Samples were collected from SCM-1d on 10/11/2007, 5/14/2008, 10/1/2008, 12/15/2008, and 4/28/2009.
Environmental Conditions:	Samples were collected from stormwater runoff on 12/15/2008.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID 49750 Region 9

Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch Beach

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the Nine samples exceed the Water Quality Criteria for Diazinon. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Nine samples exceeded the Water Quality Criteria for Diazinon and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49750, Diazinon Region 9

Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch Beach

LOE ID:	74527
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)

Data Used to Assess Water Quality:	None of nine samples exceeded the maximum concentration for Diazinon criteria of 820.0 ng/L.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Marine communities, including vertebrate, invertebrate, and plant species, shall not be degraded. (2009 CA Ocean Plan)
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The Criteria Continuous Concentration for diazinon in saltwater is 820 ng/L.
Guideline Reference:	Aquatic Life Ambient Water Quality Criteria for Diazinon
Spatial Representation:	Samples were collected at site SCM-1 and SCM-1d from Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch
Temporal Representation:	Samples were collected at Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch site SCM-1 in September and December of 2006; October 2007; and January of 2008. Samples from SCM-1d were collected in October 2007; May, October and December of 2008; April of 2009.
Environmental Conditions:	According to the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010, samples were collected during the dry season and storm events.
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

DECISION ID 49745 Region 9

Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch Beach

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the Nine samples exceed the Water Quality Criteria for Lead. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Nine samples exceeded the Water Quality Criteria for Lead and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the

applicable beneficial use support rating. 041220

Line of Evidence (LOE) for Decision ID 49745, Lead **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch Beach

LOE ID:	75116
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the nine samples exceeded the water quality objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California's Ocean Plan Table B lists 6-month median concentration of 2 ug/L to protect aquatic life in marine waters.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from SCM-1 and SCM-1d located on the Pacific Coast-Monarch Beach, at the mouth of Salt Creek.
Temporal Representation:	Samples were collected from SCM-1 on 9/7/2006, 12/27/2006, 10/11/2007, and 1/24/2008. Samples were collected from SCM-1d on 10/11/2007, 5/14/2008, 10/1/2008, 12/15/2008, and 4/28/2008.
Environmental Conditions:	Samples were collected from stormwater runoff on 12/15/2008, 1/24/2008, and 12/27/2006, the remainder were dry weather samples.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID 49749 **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch Beach

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1, one line(s) of evidence are necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of five samples exceed the water quality objective for malathion for the protection of marine aquatic life. Based on the readily available data and information, the weight of evidence indicates that there is

sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of five samples exceed the water quality objective for malathion for the protection of marine aquatic life and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to [SECTION 3.11/4.11] of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49749, Malathion **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch Beach

LOE ID:	75133
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Zero of five samples tested for Malathion exceeded the maximum concentration for Malathion of 100 ng/L .
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Marine communities, including vertebrate, invertebrate, and plant species, shall not be degraded. (2009 CA Ocean Plan)
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The maximum (Instantaneous) concentration for Malathion in saltwater is 100 ng/L.
Guideline Reference:	Quality Criteria for Water. USEPA Office of Water and Hazardous Materials. Washington, D.C
Spatial Representation:	Samples were collected at site SCM-1 and SCM-1d from Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch.
Temporal Representation:	Samples were collected at Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at site SCM-1d in October 2007; May, October and December of 2008; April of 2009.
Environmental Conditions:	According to the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010, samples were collected during the dry season and storm events.
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

DECISION ID **49753** 041222 **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch Beach

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1, one line(s) of evidence are necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of five samples exceed the water quality objective for Nickel for the protection of Marine habitat beneficial use. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of five samples exceed the water quality objective for Nickel for the protection of Marine habitat beneficial use and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to [SECTION 3.11/4.11] of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 49753, Nickel **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch Beach

LOE ID:	75135
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Water Board staff assessed Orange County Stormwater Program data for Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch Beach to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Nickel.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California's Ocean Plan Table B lists 6-month median concentration of 5 ug/L to protect

	aquatic life in marine waters. 041223
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from SCM-1d located on the Pacific Coast-Monarch Beach, at the mouth of Salt Creek.
Temporal Representation:	Samples were collected from SCM-1d on 10/11/07, 5/14/08, 10/1/08, 12/15/08 and 4/28/09.
Environmental Conditions:	Samples were collected from stormwater runoff on 12/15/2008, the remainder were dry weather samples.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	Quality Assurance Project Plan for the Orange County Stormwater Program.

DECISION ID 49755 Region 9

Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch Beach

Pollutant:	**Nitrogen, ammonia (Total Ammonia)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the Nine samples exceed the Water Quality Objective for Nitrogen, ammonia (Total Ammonia). Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Nine samples exceeded the Water Quality Objective for Nitrogen, ammonia (Total Ammonia) and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49755, Nitrogen, ammonia (Total Ammonia) Region 9

Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch Beach

LOE ID:	75136
Pollutant:	Nitrogen, ammonia (Total Ammonia)
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	Total	041224
Beneficial Use:	Marine Habitat	
Number of Samples:	9	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	None of nine sample medians exceeded the water quality objective for total ammonia. Each samples was calculated a median using the sample and all other samples taken previously within a 180-day period.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. The Ocean Plan objective for total ammonia as nitrogen is a moving 6-month median of 600 ug/L.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at station SCM1.	
Temporal Representation:	Samples were collected from September 2006 to April 2009.	
Environmental Conditions:		
QAPP Information:	A signed QAPP was included with the stated goal of ensuring the consistent collection of accurate water quality information that will used to satisfy the objectives of the Orange County Stormwater Program.	
QAPP Information Reference(s):		

DECISION ID 49756 Region 9

Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch Beach

Pollutant:	**Selenium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the Seven samples exceed the Water Quality Objective for Selenium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Seven samples exceeded the Water Quality Objective for Selenium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available

	indicating that standards are not met.	041225
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.	

Line of Evidence (LOE) for Decision ID 49756, Selenium **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch Beach

LOE ID:	75137
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Water Board staff assessed Orange County Stormwater Program data for Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch Beach to determine beneficial use support and results are as follows: 0 of 7 samples exceed the criterion for Selenium.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California's Ocean Plan Table B lists 6-month median concentration of 15 ug/L to protect aquatic life in marine waters.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from SCM-1 and SCM-1d located on the Pacific Coast-Monarch Beach, at the mouth of Salt Creek.
Temporal Representation:	Samples were collected from SCM-1 on 9/7/2006, 12/27/2006, 10/11/2007, and 1/24/2008. Samples were collected from SCM-1d on 10/11/2007, 5/14/2008, 10/1/2008, 12/15/2008, and 4/28/2008.
Environmental Conditions:	Samples were collected from stormwater runoff on 12/15/2008, 1/24/2008, and 12/27/2006, the remainder were dry weather samples.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	Quality Assurance Project Plan for the Orange County Stormwater Program.

DECISION ID 49757 **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch Beach

Pollutant:	**Silver**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the Nine samples exceed the Water Quality Criteria for Silver. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Nine samples exceeded the Water Quality Criteria for Silver and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49757, Silver **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch Beach

LOE ID:	75152
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the nine samples exceeded the water quality objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California's Ocean Plan Table B lists 6-month median concentration of 0.7 ug/L to protect aquatic life in marine waters.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from SCM-1 and SCM-1d located on the Pacific Coast-Monarch Beach, at the mouth of Salt Creek.
Temporal Representation:	Samples were collected from SCM-1 on 9/7/2006, 12/27/2006, 10/11/2007, and 1/24/2008. Samples were collected from SCM-1d on 10/11/2007, 5/14/2008, 10/1/2008, 12/15/2008, and 4/28/2008.
Environmental Conditions:	Samples were collected from stormwater runoff on 12/15/2008, 1/24/2008, and 12/27/2006, the remainder were dry weather samples.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality

QAPP Information Reference(s): Assurance Management Plan for the Orange County Stormwater Program041227

DECISION ID	49760	Region 9
Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch Beach		

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the Nine samples exceed the Water Quality Criteria for Zinc. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Nine samples exceeded the Water Quality Criteria for Zinc and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49760, Zinc	**Region 9**
Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch Beach	

LOE ID:	74794
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the nine samples exceeded the water quality objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	California's Ocean Plan Table B lists 6-month median concentration of 20 ug/L to protect aquatic life in marine waters.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from SCM-1 and SCM-1d located on the Pacific Coast-Monarch Beach, at the mouth of Salt Creek.
Temporal Representation:	Samples were collected from SCM-1 on 9/7/2006, 12/27/2006, 10/11/2007, and 1/24/2008. Samples were collected from SCM-1d on 10/11/2007, 5/14/2008, 10/1/2008, 12/15/2008, and 4/28/2008.
Environmental Conditions:	Samples were collected from stormwater runoff on 12/15/2008, 1/24/2008, and 12/27/2006, the remainder were dry weather samples.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Dana Point HSA, at South of Salt Creek outlet at Salt Creek Service Road
Water Body ID: CAC9011400020090505130202
Water Body Type: Coastal & Bay Shoreline

DECISION ID 43039 **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at South of Salt Creek outlet at Salt Creek Service Road

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Reason for Delisting:	Applicable WQS attained; reason for recovery unspecified
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal from the CWA section 303(d) List under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Fifteen lines of evidence are available in the administrative record to assess this pollutant. In the latest data, four of the 152 samples exceeded the water quality objective for enterococcus of a geomean of 35/100ml in a 30-day period for the protection of REC-1.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. In the latest data, four of the 152 samples exceeded the water quality objective for enterococcus of a geomean of 35/100ml in a 30-day period for the protection of REC-1 and this does not exceed the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be removed from the section 303(d) list because applicable water quality standards for the pollutant are not being exceeded.

Line of Evidence (LOE) for Decision ID 43039, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at South of Salt Creek outlet at Salt Creek Service Road

LOE ID:	30299
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Water Contact Recreation

Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006. For the 2008 assessment , the 2006 listed coastline 'Pacific Ocean Shoreline, Dana Point HSA' was split into smaller segments that each represent an area near the sampling location of the data being assessed. This segment 'Pacific Ocean Shoreline, Dana Point HSA, at South of Salt Creek outlet at Salt Creek Service Road' is one of the sampling locations. This LOE is a copy of the 2006 listing placeholder LOE for Pacific Ocean Shoreline, Dana Point HSA and is considered by the Regional Board to be applicable to this more specific segment formed from the split.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	
Temporal Representation:	
Environmental Conditions:	
QAPP Information:	Unspecified
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43039, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at South of Salt Creek outlet at Salt Creek Service Road

LOE ID:	77618
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	152
Number of Exceedances:	11
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Eleven of the 152 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, Dana Point HSA, at South of Salt Creek outlet at Salt Creek Service Road.
Temporal Representation:	The samples were collected from January 2008 through August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43039, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at South of Salt Creek outlet at Salt Creek Service Road

LOE ID:	29591
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	142
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the City of Dana Point from a November 2005 through January 2007. There were 142 individual samples collected with three samples exceeding the single sample water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for Dana Point HSA, City of Dana Point, November 2005 - December 2006.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were taken at a sampling station located south of the Salt Creek outlet at Salt Creek Service Road (station id S2) Lat/Long: 33.47926/-117.72423.
Temporal Representation:	Samples were collected weekly from November 2005 through January 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43039, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at South of Salt Creek outlet at Salt Creek Service Road

LOE ID:	30804
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	133
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the City of Dana Point from a November 2005 through January 2007. There were 142 individual samples collected of which 133 are dry weather (AB411) samples with none exceeding the single sample maximum water quality objective for total coliform.
Data Reference:	Ocean Bacteriological Data Evaluation for Dana Point HSA, City of Dana Point, November 2005 - December 2006.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were taken at a sampling station located south of the Salt Creek outlet at Salt Creek Service Road (station id S2) Lat/Long: 33.47926/-117.72423.
Temporal Representation:	Samples were collected weekly from November 2005 through January 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43039, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at South of Salt Creek outlet at Salt Creek Service Road

LOE ID:	30690
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	133
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the City of Dana Point from a November 2005 through January 2007. There were 142 individual samples collected of which 133 are dry weather (AB411) samples with no samples exceeding the single sample water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for Dana Point HSA, City of Dana Point, November 2005 - December 2006.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental

Protection Agency 041233

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were taken at a sampling station located south of the Salt Creek outlet at Salt Creek Service Road (station id S2) Lat/Long: 33.47926/-117.72423.
Temporal Representation: Samples were collected weekly from November 2005 through January 2007.
Environmental Conditions:
QAPP Information: Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s): County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43039, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at South of Salt Creek outlet at Salt Creek Service Road

LOE ID: 29583

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Shellfish Harvesting

Number of Samples: 142
Number of Exceedances: 13

Data and Information Type: PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality: Beach monitoring data was collected by the City of Dana Point from a November 2005 through January 2007. There were 142 individual samples collected with 13 exceeding the shellfish single sample maximum water quality objective for total coliform.
Data Reference: Ocean Bacteriological Data Evaluation for Dana Point HSA, City of Dana Point, November 2005 - December 2006.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: From the Ocean Plan, the median total coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference: Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were taken at a sampling station located south of the Salt Creek outlet at Salt Creek Service Road (station id S2) Lat/Long: 33.47926/-117.72423.
Temporal Representation: Samples were collected weekly from November 2005 through January 2007.
Environmental Conditions:
QAPP Information: Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s): County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43039, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at South of Salt Creek outlet at Salt Creek Service Road

LOE ID: 29636

Pollutant: Indicator Bacteria
LOE Subgroup: Health Advisories

Matrix:	-N/A	041234
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	2555	
Number of Exceedances:	461	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	For the period from January 2000 to December 2006, there were and 461 beach postings days for this section of shoreline. Bacteriological samples are collected on a weekly basis at approximately 150 ocean and bay location in Orange County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of Orange in their Annual Ocean and Bay Water Quality Report, March 2007. The reporting period was from January 2000 -December 2006. Data used was the number of days the beach was posting when the ocean or bay failed to meet the bacteriological standards.	
Data Reference:	County of Orange. March 2007. Annual Ocean and Bay Water Quality Report, 2006	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.	
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Bacteriological monitoring samples were collected at Monarch Beach, Salt Creek County Beach, Dana Strands, and Ocean Institute Beach. The posting covers 3 miles of beach shoreline.	
Temporal Representation:	The beach posting covers the time frame of January 2000 -December 2006.	
Environmental Conditions:		
QAPP Information:	Samples were collected in compliance with County of Orange's Quality Assessment/Quality Control document (County of Orange, 2004).	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43039, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at South of Salt Creek outlet at Salt Creek Service Road

LOE ID:	29584
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	9
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the City of Dana Point from a November 2005

	through January 2007. There were 142 individual samples collected with nine samples correlated with a storm event. Two of the nine samples exceeded the single sample water quality objective for total coliform. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Ocean Bacteriological Data Evaluation for Dana Point HSA, City of Dana Point, November 2005 - December 2006.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan, the median total coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were taken at a sampling station located south of the Salt Creek outlet at Salt Creek Service Road (station id S2) Lat/Long: 33.47926/-117.72423.
Temporal Representation:	Samples were collected weekly from November 2005 through January 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43039, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at South of Salt Creek outlet at Salt Creek Service Road

LOE ID:	29589
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	15
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the City of Dana Point from a November 2005 through January 2007. There were 142 individual samples collected with 15 monthly geomeans calculated. None of the geomeans exceeded the geomean water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for Dana Point HSA, City of Dana Point, November 2005 - December 2006.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).

Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were taken at a sampling station located south of the Salt Creek outlet at Salt Creek Service Road (station id S2) Lat/Long: 33.47926/-117.72423.
Temporal Representation:	Samples were collected weekly from November 2005 through January 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43039, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at South of Salt Creek outlet at Salt Creek Service Road

LOE ID:	29590
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the City of Dana Point from a November 2005 through January 2007. There were 142 individual samples collected with nine samples correlated with a storm event. None of the storm samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Ocean Bacteriological Data Evaluation for Dana Point HSA, City of Dana Point, November 2005 - December 2006.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were taken at a sampling station located south of the Salt Creek outlet at Salt Creek Service Road (station id S2) Lat/Long: 33.47926/-117.72423.
Temporal Representation:	Samples were collected weekly from November 2005 through January 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through

March. 041237

QAPP Information: Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.

QAPP Information Reference(s): County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43039, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at South of Salt Creek outlet at Salt Creek Service Road

LOE ID: 29592

Pollutant: Enterococcus
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 15
Number of Exceedances: 0

Data and Information Type: PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality: Beach monitoring data was collected by the City of Dana Point from a November 2005 through January 2007. There were 142 individual samples collected with 15 monthly geomeans calculated. None of the geomeans exceeded the geomean water quality objective.
Data Reference: Ocean Bacteriological Data Evaluation for Dana Point HSA, City of Dana Point, November 2005 - December 2006.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml;

Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference: Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were taken at a sampling station located south of the Salt Creek outlet at Salt Creek Service Road (station id S2) Lat/Long: 33.47926/-117.72423.
Temporal Representation: Samples were collected weekly from November 2005 through January 2007.
Environmental Conditions:
QAPP Information: Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s): County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43039, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at South of Salt Creek outlet at Salt Creek Service Road

LOE ID: 29593

Pollutant: Enterococcus
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 9

Number of Exceedances:	0	041238

Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the City of Dana Point from a November 2005 through January 2007. There were 142 individual samples collected with nine samples correlated with a storm event. None of the nine samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Ocean Bacteriological Data Evaluation for Dana Point HSA, City of Dana Point, November 2005 - December 2006.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were taken at a sampling station located south of the Salt Creek outlet at Salt Creek Service Road (station id S2) Lat/Long: 33.47926/-117.72423.
Temporal Representation:	Samples were collected weekly from November 2005 through January 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43039, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at South of Salt Creek outlet at Salt Creek Service Road

LOE ID:	29585
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	142
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the City of Dana Point from a November 2005 through January 2007. There were 142 individual samples collected with none exceeding the shellfish single sample maximum water quality objective for total coliform.
Data Reference:	Ocean Bacteriological Data Evaluation for Dana Point HSA, City of Dana Point, November 2005 - December 2006.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were taken at a sampling station located south of the Salt Creek outlet at Salt Creek Service Road (station id S2) Lat/Long: 33.47926/-117.72423.
Temporal Representation:	Samples were collected weekly from November 2005 through January 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43039, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at South of Salt Creek outlet at Salt Creek Service Road

LOE ID:	29586
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	15
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the City of Dana Point from a November 2005 through January 2007. There were 142 individual samples collected with 15 monthly goemeans calculated. None of the geomeans exceeded the geomean water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for Dana Point HSA, City of Dana Point, November 2005 - December 2006.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were taken at a sampling station located south of the Salt Creek outlet at Salt Creek Service Road (station id S2) Lat/Long: 33.47926/-117.72423.
Temporal Representation:	Samples were collected weekly from November 2005 through January 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43039, Indicator Bacteria 041240 **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at South of Salt Creek outlet at Salt Creek Service Road

LOE ID:	29587
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the City of Dana Point from a November 2005 through January 2007. There were 142 individual samples collected with nine samples correlated with a storm event. None of the storm samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Ocean Bacteriological Data Evaluation for Dana Point HSA, City of Dana Point, November 2005 - December 2006.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were taken at a sampling station located south of the Salt Creek outlet at Salt Creek Service Road (station id S2) Lat/Long: 33.47926/-117.72423.
Temporal Representation:	Samples were collected weekly from November 2005 through January 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43039, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at South of Salt Creek outlet at Salt Creek Service Road

LOE ID:	29588
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation
Number of Samples:	142
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the City of Dana Point from a November 2005 through January 2007. There were 142 individual samples collected with no samples exceeding the single sample water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for Dana Point HSA, City of Dana Point, November 2005 - December 2006.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were taken at a sampling station located south of the Salt Creek outlet at Salt Creek Service Road (station id S2) Lat/Long: 33.47926/-117.72423.
Temporal Representation:	Samples were collected weekly from November 2005 through January 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43039, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at South of Salt Creek outlet at Salt Creek Service Road

LOE ID:	74795
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	152
Number of Exceedances:	4
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Four of the 152 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Salt Creek Beach site.

Temporal Representation:	Samples were collected from January 2008 to August 2010.	041242
Environmental Conditions:		
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43039, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at South of Salt Creek outlet at Salt Creek Service Road

LOE ID:	74796
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	152
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 152 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Salt Creek Beach site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43039, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at South of Salt Creek outlet at Salt Creek Service Road

LOE ID:	74797
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	171
Number of Exceedances:	13
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Beach Watch data for Pacific Ocean Shoreline, Dana Point HSA, at South of Salt Creek outlet at Salt Creek Service Road to determine beneficial use support and results are as follows: 13 of 171 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.

SWAMP Data:	Non-SWAMP	041243
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Dana Point HSA, at South of Salt Creek outlet at Salt Creek Service Road was collected at 1 monitoring site [South End of Ritz Cove]	
Temporal Representation:	Data was collected over the time period 1/3/2008-8/30/2010.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43039, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at South of Salt Creek outlet at Salt Creek Service Road

LOE ID:	74798
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	152
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 152 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Salt Creek Beach site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43039, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at South of Salt Creek outlet at Salt Creek Service Road

LOE ID:	30568
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation
Number of Samples:	133
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the City of Dana Point from a November 2005 through January 2007. There were 142 individual samples collected of which 133 are dry weather (AB 411) samples with three samples exceeding the single sample water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for Dana Point HSA, City of Dana Point, November 2005 - December 2006.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were taken at a sampling station located south of the Salt Creek outlet at Salt Creek Service Road (station id S2) Lat/Long: 33.47926/-117.72423.
Temporal Representation:	Samples were collected weekly from November 2005 through January 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Dana Point HSA, at Table Rock Drive
Water Body ID: CAC9011400020090505124341
Water Body Type: Coastal & Bay Shoreline

DECISION ID 43466 Region 9
Pacific Ocean Shoreline, Dana Point HSA, at Table Rock Drive

Pollutant: Indicator Bacteria
Final Listing Decision: Delist from 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Delist from 303(d) list (TMDL required list)(2012)
Revision Status Revised
Reason for Delisting: Applicable WQS attained; reason for recovery unspecified
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for removal from the CWA section 303(d) List under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Eleven lines of evidence are available in the administrative record to assess this pollutant. Including the latest data, one of the 229 samples exceeded the water quality objective for enterococcus of a geomean of 35/100ml in a 30-day period for the protection of REC-1

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. one of the 229 samples exceeded the water quality objective for enterococcus of a geomean of 35/100ml in a 30-day period for the protection of REC-1 and this does not exceed the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be removed from the section 303(d) list because applicable water quality standards for the pollutant are not being exceeded.

Line of Evidence (LOE) for Decision ID 43466, Indicator Bacteria Region 9
Pacific Ocean Shoreline, Dana Point HSA, at Table Rock Drive

LOE ID: 31073

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples:	56	041246
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Orange County collected Beach monitoring data within the time period from January 1999 through December 2006. A total of 56 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 56 geomeans zero exceeded the geomean water quality objective.	
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml within any 30 day period (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Table Rock Drive, station id S6, in the Dana Point HSA. Lat/Long: 33.50339/-117.74719.	
Temporal Representation:	Samples were collected at least once a week within the time period from January 1999 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 43466, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Table Rock Drive

LOE ID:	30296
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Water Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006. For the 2008 assessment , the 2006 listed coastline 'Pacific Ocean Shoreline, Dana Point HSA' was split into smaller segments that each represent an area near the sampling location of the data being assessed. This segment 'Pacific Ocean Shoreline, Dana Point HSA, at Table Rock Drive' is one of the sampling locations. This LOE is a copy of the 2006 listing placeholder LOE for Pacific Ocean Shoreline, Dana Point HSA and is considered by the Regional Board to be applicable to this more specific segment formed from the split.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	
Temporal Representation:	
Environmental Conditions:	
QAPP Information:	Unspecified
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43466, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Table Rock Drive

LOE ID:	77619
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	121
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Zero of the 121 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, Dana Point HSA, at Table Rock Drive.
Temporal Representation:	The samples were collected from January 2008 through August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43466, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Table Rock Drive

LOE ID:	31074
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation
Number of Samples:	56
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Orange County collected Beach monitoring data within the time period from January 1999 through December 2006. A total of 56 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 56 geomeans zeroexceeded the geomean water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml within any 30 day period (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Table Rock Drive, station id S6, in the Dana Point HSA. Lat/Long: 33.50339/-117.74719.
Temporal Representation:	Samples were collected at least once a week within the time period from January 1999 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43466, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Table Rock Drive

LOE ID:	31075
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	56
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Orange County collected Beach monitoring data within the time period from January 1999 through December 2006. A total of 56 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 56 geomeans zero exceeded the geomean water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml within any 30 day period (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Table Rock Drive, station id S6, in the Dana Point HSA. Lat/Long: 33.50339/-117.74719.
Temporal Representation:	Samples were collected at least once a week within the time period from January 1999 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43466, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Table Rock Drive

LOE ID:	74799
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	121
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 121 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Table Rock site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43466, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Table Rock Drive

LOE ID:	29190
Pollutant:	Enterococcus

LOE Subgroup:	Pollutant-Water	041250
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	930	
Number of Exceedances:	21	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. There were 930 individual samples collected. From the 930 samples, 21 exceeded the single sample maximum water quality objective for enterococcus.	
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Table Rock Drive, station id S6, in the Dana Point HSA. Lat/Long: 33.50339/-117.74719.	
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 43466, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Table Rock Drive

LOE ID:	29228
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	108
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. There were 931 individual samples collected and 108 monthly geomeans calculated. From the 108 geomeans, none exceeded the geomean water quality objective for fecal coliform.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml;
	Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Table Rock Drive, station id S6, in the Dana Point HSA. Lat/Long: 33.50339/-117.74719.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43466, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Table Rock Drive

LOE ID:	29227
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	51
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. There were 931 individual samples collected. For the period between March 2002 and December 2007, 51 samples could be correlated with a storm event. From the 51 samples two exceeded the single sample maximum water quality objective for fecal coliform. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml;
	Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected from Table Rock Drive, station id S6, in the Dana Point HSA. Lat/Long: 33.50339/-117.74719.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43466, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Table Rock Drive

LOE ID:	29203
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	931
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. There were 931 individual samples collected and two of those samples exceeded the single sample maximum water quality objective for fecal coliform.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Table Rock Drive, station id S6, in the Dana Point HSA. Lat/Long: 33.50339/-117.74719.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43466, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Table Rock Drive

LOE ID:	29141
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	929
Number of Exceedances:	34
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. There were 929 individual samples collected with 34 exceeding the shellfish single sample maximum water quality objective for total coliform.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan, the median total coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Table Rock Drive, station id S6, in the Dana Point HSA. Lat/Long: 33.50339/-117.74719.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43466, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Table Rock Drive

LOE ID:	29147
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	51
Number of Exceedances:	11

Data and Information Type:	PWS pathogen monitoring (ambient water) 041254
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. There were 930 individual samples collected. For the period between March 2002 and December 2007, 51 samples could be correlated with a storm event. From the 51 storm event samples, 11 exceeded the single sample maximum water quality objective for enterococcus. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Table Rock Drive, station id S6, in the Dana Point HSA. Lat/Long: 33.50339/-117.74719.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43466, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Table Rock Drive

LOE ID:	29140
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	51
Number of Exceedances:	19
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. There were 929 individual samples collected. For the period between March 2002 through December 2007 51 samples could be associated with storm events. Of those 51 samples 19 exceeded the shellfish single sample maximum water quality objective for total coliform. This information will not be used in determining a listing decision, but is of

	interest to the Regional Board and has been included here as additional and total information.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan, the median total coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml (SWRCB, 2005). Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Table Rock Drive, station id S6, in the Dana Point HSA. Lat/Long: 33.50339/-117.74719.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2006; however, rainfall data is only available from March 2002 through December 2006.
Environmental Conditions:	
QAPP Information:	County of Orange Quality Assessment/Quality Control document (County of Orange, 2004).
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43466, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Table Rock Drive

LOE ID:	29146
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	108
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. There were 930 individual samples collected and 108 monthly geomeans calculated. From the 108 geomeans, only one exceeded the geomean water quality objective for enterococcus.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005.

	Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Table Rock Drive, station id S6, in the Dana Point HSA. Lat/Long: 33.50339/-117.74719.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43466, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Table Rock Drive

LOE ID:	29242
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	929
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. There were 929 individual samples collected and none exceeded single sample maximum water quality objective for total coliform.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005). Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Table Rock Drive, station id S6, in the Dana Point HSA. Lat/Long: 33.50339/-117.74719.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43466, Indicator Bacteria 041257 **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Table Rock Drive

LOE ID:	29238
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	51
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. There were 929 individual samples collected. Between March 2002 and December 2007, 51 samples were associated with stom events. None of the 51 samples exceeded the single sample maximum water quality objective for total coliform. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Table Rock Drive, station id S6, in the Dana Point HSA. Lat/Long: 33.50339/-117.74719.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43466, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Table Rock Drive

LOE ID:	29235
Pollutant:	Total Coliform

LOE Subgroup:	Pollutant-Water	041258
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	108	
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. There were 929 individual samples collected and 108 monthly geomeans calculated. None of the 108 geomeans exceeded the geomean water quality objective for total coliform.	
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Table Rock Drive, station id S6, in the Dana Point HSA. Lat/Long: 33.50339/-117.74719.	
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 43466, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Table Rock Drive

LOE ID:	74825
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	121
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 121 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at the Table Rock site.
Temporal Representation: Samples were collected from January 2008 to August 2010.
Environmental Conditions:
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 43466, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Table Rock Drive

LOE ID: 74824

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Shellfish Harvesting

Number of Samples: 142
Number of Exceedances: 1

Data and Information Type: PATHOGEN MONITORING
Data Used to Assess Water Quality: Water Board staff assessed Beach Watch data for Pacific Ocean Shoreline, Dana Point HSA, at Table Rock Drive to determine beneficial use support and results are as follows: 1 of 142 samples exceed the criterion for Coliform, Total.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Data for this line of evidence for Pacific Ocean Shoreline, Dana Point HSA, at Table Rock Drive was collected at 1 monitoring site [Table Rock]
Temporal Representation: Data was collected over the time period 1/3/2008-8/30/2010.
Environmental Conditions: Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 43466, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Table Rock Drive

LOE ID: 74823

Pollutant: Fecal Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 121

Number of Exceedances:	0	041260

Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 121 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Table Rock site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Dana Point HSA, at Thousand Steps Beach
Water Body ID: CAC9011400020090505124705
Water Body Type: Coastal & Bay Shoreline

DECISION ID 44731 **Region 9**
Pacific Ocean Shoreline, Dana Point HSA, at Thousand Steps Beach

Pollutant: Indicator Bacteria
Final Listing Decision: Delist from 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Delist from 303(d) list (TMDL required list)(2012)
Revision Status Revised
Reason for Delisting: Applicable WQS attained; reason for recovery unspecified
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for removal from the CWA section 303(d) List under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Eleven lines of evidence are available in the administrative record to assess this pollutant. Including the latest data, zero of the 229 samples exceeded the water quality objective for enterococcus of a geomean of 35/100ml in a 30-day period for the protection of REC-1.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Including the latest data, zero of the 229 samples exceeded the water quality objective for enterococcus of a geomean of 35/100ml in a 30-day period for the protection of REC-1 and this does not exceed the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be removed from the section 303(d) list because applicable water quality standards for the pollutant are not being exceeded.

Line of Evidence (LOE) for Decision ID 44731, Indicator Bacteria **Region 9**
Pacific Ocean Shoreline, Dana Point HSA, at Thousand Steps Beach

LOE ID: 30295

Pollutant: Indicator Bacteria
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Not Recorded

Beneficial Use: Water Contact Recreation

Number of Samples:	0	041262
Number of Exceedances:	0	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006. For the 2008 assessment , the 2006 listed coastline 'Pacific Ocean Shoreline, Dana Point HSA' was split into smaller segments that each represent an area near the sampling location of the data being assessed. This segment 'Pacific Ocean Shoreline, Dana Point HSA, at Thousand Steps Beach' is one of the sampling locations. This LOE is a copy of the 2006 listing placeholder LOE for Pacific Ocean Shoreline, Dana Point HSA and is considered by the Regional Board to be applicable to this more specific segment formed from the split.	
Data Reference:	Placeholder reference pre-2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Unspecified	
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:		
Temporal Representation:		
Environmental Conditions:		
QAPP Information:	Unspecified	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44731, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Thousand Steps Beach

LOE ID:	77620
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	121
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Zero of the 121 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, Dana Point HSA, at Thousand Steps Beach.
Temporal Representation:	The samples were collected from January 2008 through August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44731, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Thousand Steps Beach

LOE ID:	31078
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	56
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Orange County collected Beach monitoring data within the time period from January 1999 through December 2006. A total of 56 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 56 geomeans zero exceeded the geomean water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml within any 30 day period (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Thousand Steps Beach, station id S4, in the Dana Point HSA. Lat/Long: 33.49756/-117.74138.
Temporal Representation:	Samples were collected at least once a week within the time period from January 1999 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44731, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Thousand Steps Beach

LOE ID:	29243
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	041264
Beneficial Use:	Water Contact Recreation	
Number of Samples:	108	
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Shoreline monitoring data was collected by the County of Orange from January 1999 through December 2007. Beach monitoring data was collected by the County of Orange. There were 930 individual samples collected with 108 monthly geomeans calculated. From the 108 monthly geomeans, none exceeded the water contact recreation geomean water quality objective for total coliform.	
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Ocean Plan the objectives are: Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Thousand Steps Beach, station id S4, in the Dana Point HSA. Lat/Long: 33.49756/-117.74138.	
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 44731, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Thousand Steps Beach

LOE ID:	29138
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	930
Number of Exceedances:	36
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline monitoring data was collected by the County of Orange from January 1999 through December 2007. The number of samples collected was 930 individual samples. From the 930 samples, 36 exceeded the single sample maximum water quality objective for shellfish harvesting.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report

SWAMP Data:	Non-SWAMP	041265
Water Quality Objective/Criterion:	From the Ocean Plan, the median total coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Thousand Steps Beach, station id S4, in the Dana Point HSA. Lat/Long: 33.49756/-117.74138.	
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 44731, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Thousand Steps Beach

LOE ID:	29240
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	930
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline monitoring data was collected by the County of Orange from January 1999 through December 2007. The number of samples collected was 930 individual samples. Of the 930 samples, none exceeded the water contact recreation single sample maximum water quality objective for total coliform.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the objectives are: Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Thousand Steps Beach, station id S4, in the Dana Point HSA. Lat/Long: 33.49756/-117.74138.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event

	was defined as 0.2 inches of rainfall within a 72 hour period. 041266 Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44731, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Thousand Steps Beach

LOE ID:	29239
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	51
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of Orange from January 1999 through December 2007. A total of 930 individual bacteria samples were collected. From March 2002 to December 2007, 51 samples were correlated with storm events. Of the 51 storm event samples, none exceeded the water contact recreation single sample maximum water quality objective for total coliform. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the objectives are: Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Thousand Steps Beach, station id S4, in the Dana Point HSA. Lat/Long: 33.49756/-117.74138.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through

March. 041267

QAPP Information: Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.

QAPP Information Reference(s): County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44731, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Thousand Steps Beach

LOE ID: 29229

Pollutant: Fecal Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 930
Number of Exceedances: 1

Data and Information Type: PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality: Shoreline beach monitoring data was collected by the County of Orange from January 1999 through December 2007. The number of samples included 930 individual bacteria samples and 108 monthly geomeans were calculated. From the 930 samples, only one exceeded the water contact recreation single sample maximum water quality objective for fecal coliform.
Data Reference: Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml;

Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference: Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected from Thousand Steps Beach, station id S4, in the Dana Point HSA. Lat/Long: 33.49756/-117.74138.
Temporal Representation: Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:
QAPP Information: Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s): County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44731, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Thousand Steps Beach

LOE ID: 29202

Pollutant: Fecal Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples:	51	041268
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. There were 930 individual samples collected. For the period between March 2002 and December 2007, 51 samples were correlated with storm event samples and none exceeded the water contact recreation single sample maximum water quality objective for fecal coliform. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.	
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Thousand Steps Beach, station id S4, in the Dana Point HSA. Lat/Long: 33.49756/-117.74138.	
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.	
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 44731, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Thousand Steps Beach

LOE ID:	31077
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	56
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Orange County collected Beach monitoring data within the time period from January 1999 through December 2006. A total of 56 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 56

	geomeans zero exceeded the geomean water quality objective 041269
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml within any 30 day period (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Thousand Steps Beach, station id S4, in the Dana Point HSA. Lat/Long: 33.49756/-117.74138.
Temporal Representation:	Samples were collected at least once a week within the time period from January 1999 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44731, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Thousand Steps Beach

LOE ID:	29199
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	108
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of Orange from January 1999 through December 2007. The number of samples included 930 individual bacteria samples and 108 monthly geomeans were calculated. From the 108 geomeans, none exceeded the water contact recreation geomean water quality objective for fecal coliform.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Thousand Steps Beach, station id S4, in the Dana Point HSA.

	Lat/Long: 33.49756/-117.74138. 041270
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44731, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Thousand Steps Beach

LOE ID:	29191
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	51
Number of Exceedances:	11
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orangefrom January 1999 through December 2007. There were 938 individual samples collected. Between March 2002 and December 2007, 51 samples were associated with storm events. From the 51 samples, 11 exceeded the water contact recreation single sample maximum water quality objective for enterococcus. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Thousand Steps Beach, station id S4, in the Dana Point HSA. Lat/Long: 33.49756/-117.74138.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.

QAPP Information Reference(s): County of Orange. Quality Assurance/Quality Control Manual, February 2004 041271

Line of Evidence (LOE) for Decision ID 44731, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Thousand Steps Beach

LOE ID:	74829
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	121
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 121 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Thousand Steps Beach site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44731, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Thousand Steps Beach

LOE ID:	74828
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	142
Number of Exceedances:	1
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Beach Watch data for Pacific Ocean Shoreline, Dana Point HSA, at Thousand Steps Beach to determine beneficial use support and results are as follows: 1 of 142 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100

mL. 041272

Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Data for this line of evidence for Pacific Ocean Shoreline, Dana Point HSA, at Thousand Steps Beach was collected at 1 monitoring site [Thousand Steps Beach]
Temporal Representation: Data was collected over the time period 1/3/2008-8/30/2010.
Environmental Conditions: Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 44731, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Thousand Steps Beach

LOE ID: 74827

Pollutant: Fecal Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 121
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Zero of the 121 geomeans exceeded the objective.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at the Thousand Steps Beach site.
Temporal Representation: Samples were collected from January 2008 to August 2010.
Environmental Conditions:
QAPP Information: The samples were collected for the beach watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 44731, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Thousand Steps Beach

LOE ID: 74826

Pollutant: Enterococcus
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 121
Number of Exceedances: 0

Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 121 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Thousand Steps Beach site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44731, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Thousand Steps Beach

LOE ID:	29193
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	938
Number of Exceedances:	26
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. There were 938 individual samples collected with 26 exceeding the water contact recreation single sample maximum water quality objective for enterococcus.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Thousand Steps Beach, station id S4, in the Dana Point HSA. Lat/Long: 33.49756/-117.74138.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44731, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Thousand Steps Beach

LOE ID:	29192
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	108
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. There were 938 individual samples collected and 108 monthly geomeans were calculated. From the 108 geomeans, none exceeded the water contact recreation geomean water quality objective for enterococcus.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Thousand Steps Beach, station id S4, in the Dana Point HSA. Lat/Long: 33.49756/-117.74138.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44731, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Thousand Steps Beach

LOE ID:	31076
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	56
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)

Data Used to Assess Water Quality:	Orange County collected Beach monitoring data within the time period from January 1999 through December 2006. A total of 56 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 56 geomeans one exceeded the geomean water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the objective is: Geomean: Total coliform density shall not exceed 1,000 per 100ml within any 30 day period (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Thousand Steps Beach, station id S4, in the Dana Point HSA. Lat/Long: 33.49756/-117.74138.
Temporal Representation:	Samples were collected at least once a week within the time period from January 1999 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44731, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Thousand Steps Beach

LOE ID:	29133
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	51
Number of Exceedances:	16
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline monitoring data was collected by the County of Orange from January 1999 through December 2007. The number of samples collected was 930 individual samples. For the period between March 2002 and December 2007, 51 samples were associated with storm events. Of the 51 storm event samples, 16 exceeded the single sample maximum water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan, the median total coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005.

Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:
Guideline Reference:

Spatial Representation:	Samples were collected from Thousand Steps Beach, station id S4, in the Dana Point HSA. Lat/Long: 33.49756/-117.74138.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Laguna Beach HSA, at Bluebird Canyon
Water Body ID: CAC9011200020090505110014
Water Body Type: Coastal & Bay Shoreline

DECISION ID 44508 **Region 9**
Pacific Ocean Shoreline, Laguna Beach HSA, at Bluebird Canyon

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Reason for Delisting:	Applicable WQS attained; reason for recovery unspecified
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal from the CWA section 303(d) List under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Nine lines of evidence are available in the administrative record to assess this pollutant. Including the latest data, 11 of the 367 samples exceeded the water quality objective for enterococcus of a geomean of 35/100 ml in a 30-day period for the protection of REC-1.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Including the latest data, 11 of the 367 samples exceeded the water quality objective for enterococcus of a geomean of 35/100 ml in a 30-day period for the protection of REC-1 and this does not exceed the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be removed from the section 303(d) list because applicable water quality standards for the pollutant are not being exceeded.

Line of Evidence (LOE) for Decision ID 44508, Indicator Bacteria **Region 9**
Pacific Ocean Shoreline, Laguna Beach HSA, at Bluebird Canyon

LOE ID:	29314
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	939	041278
Number of Exceedances:	15	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. A total of 939 single samples were collected with 15 samples exceeding the single sample water quality objective.	
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Bluebird Canyon, station id S15, in the Laguna HSA. Lat/Long: 33.52963/-117.77359.	
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 44508, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Bluebird Canyon

LOE ID:	29315
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	108
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. A total of 939 single samples were collected with 108 monthly goemeans calculated. Of the 108 geomeans, none exceeded the geomean water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:	041279
Guideline Reference:	
Spatial Representation:	Samples were collected from Bluebird Canyon, station id S15, in the Laguna HSA. Lat/Long: 33.52963/-117.77359.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44508, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Bluebird Canyon

LOE ID:	29316
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	50
Number of Exceedances:	6
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. A total of 939 single samples were collected. From March 2002 through December 2007, 50 samples were correlated with storm evernts. Of the 50 samples, six exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Bluebird Canyon, station id S15, in the Laguna HSA. Lat/Long: 33.52963/-117.77359.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through

	March. 041280
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44508, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Bluebird Canyon

LOE ID:	29325
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	-N/A
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	204
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2000 to December 2006, there were and 204 beach postings days for this section of shoreline. Bacteriological samples are collected on a weekly basis at approximately 150 ocean and bay location in Orange County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of Orange in their Annual Ocean and Bay Water Quality Report, March 2007. The reporting period was from January 2000 -December 2006. Data used was the number of days the beach was posting when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	County of Orange. March 2007. Annual Ocean and Bay Water Quality Report, 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Bacteriological monitoring samples were collected at Aliso Beach and South Laguna Beach in Orange County, California. Beaches included Emerald Bay, Crescent Bay, Laguna Main Beach, Hotel Laguna, Bluebird Canyon, Victoria Beach and Blue Lagoon. The posting covers 4.4 miles of beach shoreline.
Temporal Representation:	The beach closures covers the time frame of January 2000 -December 2006.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of Orange's Quality Assessment/Quality Control document (County of Orange, 2004).
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44508, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Bluebird Canyon

LOE ID:	29309	041281

Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	939
Number of Exceedances:	108
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. A total of 939 single samples were collected with 108 exceeding the single sample water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Bluebird Canyon, station id S15, in the Laguna HSA. Lat/Long: 33.52963/-117.77359.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44508, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Bluebird Canyon

LOE ID:	29310
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	51
Number of Exceedances:	18
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. A total of 939 single samples. Between March 2002 and December 2007, 51 samples were correlated with storm events. Of the 51 samples, 18 exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.

Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Bluebird Canyon, station id S15, in the Laguna HSA. Lat/Long: 33.52963/-117.77359.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44508, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Bluebird Canyon

LOE ID:	29311
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	939
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. There were 939 individual samples with three exceeding the single sample water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental

Protection Agency 041283

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected from Bluebird Canyon, station id S15, in the Laguna HSA. Lat/Long: 33.52963/-117.77359.

Temporal Representation: Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.

Environmental Conditions:

QAPP Information: Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.

QAPP Information Reference(s): County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44508, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Bluebird Canyon

LOE ID: 29276

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Shellfish Harvesting

Number of Samples: 51
Number of Exceedances: 26

Data and Information Type: PWS pathogen monitoring (ambient water)

Data Used to Assess Water Quality: Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. There were 939 individual samples collected with 51 samples correlated with storm events. Of the 51 samples, 26 exceeded single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.

Data Reference: Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: From the Ocean Plan, the median total coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml (SWRCB, 2005).

Objective/Criterion Reference: Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected from Bluebird Canyon, station id S15, in the Laguna HSA. Lat/Long: 33.52963/-117.77359.

Temporal Representation: Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.

Environmental Conditions: Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.

Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through

March. 041284

QAPP Information: Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.

QAPP Information Reference(s): County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44508, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Bluebird Canyon

LOE ID: 29296

Pollutant: Enterococcus
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 108
Number of Exceedances: 11

Data and Information Type: PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality: Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. A total of 939 single samples were collected with 108 monthly geomeans calculated. Of the 108 geomeans, 11 exceeded the geomean water quality objective.
Data Reference: Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml;

Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference: Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected from Bluebird Canyon, station id S15, in the Laguna HSA. Lat/Long: 33.52963/-117.77359.
Temporal Representation: Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:
QAPP Information: Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s): County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44508, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Bluebird Canyon

LOE ID: 29280

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Shellfish Harvesting

Number of Samples: 939

Number of Exceedances:	134	041285

Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. There were 939 individual samples collected with 134 exceeding the single sample water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan, the median total coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Bluebird Canyon, station id S15, in the Laguna HSA. Lat/Long: 33.52963/-117.77359.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44508, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Bluebird Canyon

LOE ID:	29312
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	108
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. There were 939 individual samples with 108 monthly geomeans calculated. Of the 108 geomeans, none exceeded the geomean water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected from Bluebird Canyon, station id S15, in the Laguna HSA. Lat/Long: 33.52963/-117.77359.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44508, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Bluebird Canyon

LOE ID:	29313
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	51
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. From March 2002 through December 2007, 51 samples correlated with storm events. Of the 51 samples, four exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Bluebird Canyon, station id S15, in the Laguna HSA. Lat/Long: 33.52963/-117.77359.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.

QAPP Information Reference(s): County of Orange. Quality Assurance/Quality Control Manual, February 2004 041287

Line of Evidence (LOE) for Decision ID 44508, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Bluebird Canyon

LOE ID:	74880
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	149
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 149 samples exceeded the enterococcus objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample enterococcus concentration shall not exceed more than 104/100ml. Water Quality Control Plan for Ocean Waters of California. Region 9 Basion Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from site BLUBRD, Coastal Stormdrain at Bluebird Canyon Drive (surzone upcoast and downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to April 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44508, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Bluebird Canyon

LOE ID:	31079
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	56
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Orange County collected Beach monitoring data within the time period from January 1999 through December 2006. A total of 56 monthly geomeans were calculated for data collected during the time frame of

	April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 56 geomeans zero exceeded the geomean water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml within any 30 day period (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Bluebird Canyon, station id S15, in the Laguna HSA. Lat/Long: 33.52963/-117.77359.
Temporal Representation:	Samples were collected at least once a week within the time period from January 1999 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44508, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Bluebird Canyon

LOE ID:	30301
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Water Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006. For the 2008 assessment , the 2006 listed coastline 'Pacific Ocean Shoreline, Laguna Beach HSA' was split into smaller segments and each represents an area near the sampling location of the data being assessed. This segment 'Pacific Ocean Shoreline, Laguna Beach HSA, at Bluebird Canyon' is one of the sampling locations. This LOE is a copy of the 2006 listing placeholder LOE for Pacific Ocean Shoreline, Laguna Beach HSA and is considered by the Regional Board to be applicable to this more specific segment formed from the split.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	041289
Temporal Representation:	
Environmental Conditions:	
QAPP Information:	Unspecified
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44508, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Bluebird Canyon

LOE ID:	31080
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	56
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Orange County collected Beach monitoring data within the time period from January 1999 through December 2006. A total of 56 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 56 geomeans zero exceeded the geomean water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml within any 30 day period (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Bluebird Canyon, station id S15, in the Laguna HSA. Lat/Long: 33.52963/-117.77359.
Temporal Representation:	Samples were collected at least once a week within the time period from January 1999 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44508, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Bluebird Canyon

LOE ID:	31081
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation
Number of Samples:	56
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Orange County collected Beach monitoring data within the time period from January 1999 through December 2006. A total of 56 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 56 geomeans zero exceeded the geomean water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml within any 30 day period (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Bluebird Canyon, station id S15, in the Laguna HSA. Lat/Long: 33.52963/-117.77359.
Temporal Representation:	Samples were collected at least once a week within the time period from January 1999 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44508, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Bluebird Canyon

LOE ID:	77624
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	121
Number of Exceedances:	3
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Three of the 121 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria

	objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, Laguna Beach HSA, at Bluebird Canyon.
Temporal Representation:	The samples were collected from January 2008 through August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44508, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Bluebird Canyon

LOE ID:	74881
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	138
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	None of the 138 geomeans exceeded the enterococcus objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean for enterococcus shall not exceed 35 MPN/100 mL. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Coastal Stormdrain at Bluebird Canyon Drive (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44508, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Bluebird Canyon

LOE ID:	74882
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water

Matrix:	Water	041292
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	121	
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Zero of the 121 geomeans exceeded the objective.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at the Bluebird Canyon site.	
Temporal Representation:	Samples were collected from January 2008 to August 2010.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44508, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Bluebird Canyon

LOE ID:	74883
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	138
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	None of the 138 geomeans exceeded the fecal coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean for fecal coliform shall not exceed more than 200/100ml. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Coastal Coastal Stormdrain at Bluebird Canyon Drive (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	

QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44508, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Bluebird Canyon

LOE ID:	74901
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	149
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 149 samples exceeded the fecal coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample fecal coliform concentration shall not exceed more than 400/100ml. Water Quality Control Plan for Ocean Waters of California. Region 9 Basion Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from site BLUBRD, Coastal Stormdrain at Bluebird Canyon Drive (surfzone upcoast and downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to June 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44508, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Bluebird Canyon

LOE ID:	74902
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	121
Number of Exceedances:	0
Data and Information Type:	Not Specified

Data Used to Assess Water Quality:	Zero of the 121 geomeans exceeded the objective.	041294
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at the Bluebird Canyon site.	
Temporal Representation:	Samples were collected from January 2008 to August 2010.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the beach watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44508, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Bluebird Canyon

LOE ID:	74903
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	142
Number of Exceedances:	5
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Beach Watch data for Pacific Ocean Shoreline, Laguna Beach HSA, at Bluebird Canyon to determine beneficial use support and results are as follows: 5 of 142 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Laguna Beach HSA, at Bluebird Canyon was collected at 1 monitoring site [Bluebird Canyon]
Temporal Representation:	Data was collected over the time period 1/3/2008-8/30/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44508, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Bluebird Canyon

LOE ID:	74904

Pollutant:	Total Coliform	041295
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	138	
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	None of the 138 samples exceeded the total coliform objective. For these stations, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The geometric mean for total coliform shall not exceed more than 1000/100ml. Water Quality Control Plan for the San Diego Basin. Water Quality Control Plan for Ocean Waters.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected from Coastal Stormdrain at Bluebird Canyon Drive (surfzone upcoast and surfzone downcoast).	
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.	
Environmental Conditions:		
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44508, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Bluebird Canyon

LOE ID:	74905
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	149
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 149 samples exceeded the total coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample total coliform concentration shall not exceed more than 10000/100ml. Water Quality Control Plan for Ocean Waters of California. Region 9 Basion Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from site BLUBRD, Coastal Stormdrain at Bluebird Canyon Drive (surfzone upcoast and downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to June 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44508, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Bluebird Canyon

LOE ID:	74906
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	121
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 121 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Bluebird Canyon site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Hotel
Water Body ID: CAC9011200020090505105553
Water Body Type: Coastal & Bay Shoreline

DECISION ID 49812 **Region 9**
Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Hotel

Pollutant: Arsenic
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Water Quality Criteria for Arsenic.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Water Quality Criteria for Arsenic and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49812, Arsenic **Region 9**
Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Hotel

LOE ID: 74976

Pollutant: Arsenic
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total Dissolved

Beneficial Use: Marine Habitat

Number of Samples:	1	041298
Number of Exceedances:	0	
Data and Information Type:	Non-fixed station physical/chemical (conv + toxicants during key seasons and flows)	
Data Used to Assess Water Quality:	The sample did not exceed the water quality objective.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California's Ocean Plan Table B lists 6-month median concentration of 8 ug/L to protect aquatic life in marine waters.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The sample was collected from station LB-4d.	
Temporal Representation:	The sample was collected on 12/15/2008.	
Environmental Conditions:	The sample is representative of wet conditions.	
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.	
QAPP Information Reference(s):		

DECISION ID 49813 Region 9

Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Hotel

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Water Quality Criteria for Copper. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Water Quality Criteria for Copper and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49813, Copper 041299 **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Hotel

LOE ID:	74977
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Non-fixed station physical/chemical (conv + toxicants during key seasons and flows)
Data Used to Assess Water Quality:	The sample did not exceed the water quality objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California's Ocean Plan Table B lists 6-month median concentration of 3 ug/L to protect aquatic life in marine waters.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The sample was collected from station LB-4d.
Temporal Representation:	The sample was collected on 12/15/2008.
Environmental Conditions:	The sample is representative of wet conditions.
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

DECISION ID 49814 **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Hotel

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Water Quality Criteria for Lead.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.

3. Zero of One samples exceeded the Water Quality Criteria for Lead and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49814, Lead **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Hotel

LOE ID:	75005
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Non-fixed station physical/chemical (conv + toxicants during key seasons and flows)
Data Used to Assess Water Quality:	The sample did not exceed the water quality objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California's Ocean Plan Table B lists 6-month median concentration of 2 ug/L to protect aquatic life in marine waters.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The sample was collected from station LB-4d.
Temporal Representation:	The sample was collected on 12/15/2008.
Environmental Conditions:	The sample is representative of wet conditions.
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

DECISION ID 49815 **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Hotel

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One sample exceed the Water Quality Objective for Nickel. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Water Quality Objective for Nickel and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49815, Nickel **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Hotel

LOE ID:	75006
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Non-fixed station physical/chemical (conv + toxicants during key seasons and flows)
Data Used to Assess Water Quality:	Water Board staff assessed Orange County Stormwater Program data for Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Hotel to determine beneficial use support and results are as follows: Zero of One samples exceed the criterion for Nickel.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California's Ocean Plan Table B lists 6-month median concentration of 2 ug/L to protect aquatic life in marine waters.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The sample was collected from station LB-4d.
Temporal Representation:	The sample was collected on 12/15/2008.
Environmental Conditions:	The sample is representative of wet conditions.
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.

QAPP Information Reference(s): Quality Assurance Project Plan for the Orange County Stormwater Program 041302

DECISION ID 49817 Region 9

Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Hotel

Pollutant:	**Nitrogen, ammonia (Total Ammonia)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Water Quality Criteria Nitrogen, ammonia (Total Ammonia).

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Water Quality Criteria Nitrogen, ammonia (Total Ammonia) and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49817, Nitrogen, ammonia (Total Ammonia) Region 9

Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Hotel

LOE ID:	75007
Pollutant:	Nitrogen, ammonia (Total Ammonia)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Marine Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	The single sample did not exceed the objective for ammonia.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. The Ocean Plan objective for total ammonia as nitrogen is a moving 6-month median of 600 ug/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The sample was collected at Laguna Avenue.
Temporal Representation:	The sample was collected on 12/15/08.
Environmental Conditions:	
QAPP Information:	A signed QAPP was included with the stated goal of ensuring the consistent collection of accurate water quality information that will used to satisfy the objectives of the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID 49819 Region 9

Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Hotel

Pollutant:	**Selenium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Water Quality Criteria for Selenium. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Water Quality Criteria for Selenium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49819, Selenium Region 9

Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Hotel

LOE ID:	75008
Pollutant:	Selenium

LOE Subgroup:	Pollutant-Water	041304
Matrix:	Water	
Fraction:	Total Dissolved	
Beneficial Use:	Marine Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	Non-fixed station physical/chemical (conv + toxicants during key seasons and flows)	
Data Used to Assess Water Quality:	The sample did not exceed the water quality objective.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California's Ocean Plan Table B lists 6-month median concentration of 15 ug/L to protect aquatic life in marine waters.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The sample was collected from station LB-4d.	
Temporal Representation:	The sample was collected on 12/15/2008.	
Environmental Conditions:	The sample is representative of wet conditions.	
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.	
QAPP Information Reference(s):		

DECISION ID 49820 Region 9

Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Hotel

Pollutant:	**Silver**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Water Quality Criteria for Silver.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Water Quality Criteria for Silver and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49820, Silver **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Hotel

LOE ID:	75009
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Non-fixed station physical/chemical (conv + toxicants during key seasons and flows)
Data Used to Assess Water Quality:	The sample did not exceed the water quality objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California's Ocean Plan Table B lists 6-month median concentration of 0.7 ug/L to protect aquatic life in marine waters.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The sample was collected from station LB-4d.
Temporal Representation:	The sample was collected on 12/15/2008.
Environmental Conditions:	The sample is representative of wet conditions.
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

DECISION ID 49821 **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Hotel

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Water Quality Criteria for Zinc. Based on the readily available data and information, the weight of evidence indicates that there is

sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Water Quality Criteria for Zinc and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49821, Zinc **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Hotel

LOE ID:	75035
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Non-fixed station physical/chemical (conv + toxicants during key seasons and flows)
Data Used to Assess Water Quality:	The sample did not exceed the water quality objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California's Ocean Plan Table B lists 6-month median concentration of 20 ug/L to protect aquatic life in marine waters.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The sample was collected from station LB-4d.
Temporal Representation:	The sample was collected on 12/15/2008.
Environmental Conditions:	The sample is representative of wet conditions.
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

DECISION ID 44485 **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Hotel

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Delist from 303(d) list (TMDL required list)**

Last Listing Cycle's Final Listing Decision:	Delist from 303(d) list (TMDL required list)(2012)	041307
Revision Status	Original	
Reason for Delisting:	Applicable WQS attained; reason for recovery unspecified	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for removal from the CWA section 303(d) List under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Nine lines of evidence are available in the administrative record to assess this pollutant. Including the latest data, 12 of the 246 samples exceeded the water quality objective for enterococcus of a geomean of 35/100ml in a 30-day period for the use of REC-1.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Including the latest data, 12 of the 246 samples exceeded the water quality objective for enterococcus of a geomean of 35/100ml in a 30-day period for the use of REC-1 and this does not exceed the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be removed from the section 303(d) list because applicable water quality standards for the pollutant are not being exceeded.

Line of Evidence (LOE) for Decision ID 44485, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Hotel

LOE ID:	75033
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	149
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	None of the 149 samples exceeded the total coliform objective. For these stations, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample total coliform concentration shall not exceed more than 10000/100ml. Water Quality Control Plan for the San Diego Basin. Water Quality Control Plan for Ocean Waters.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	

Guideline Reference:	041308
Spatial Representation:	The samples were collected from Coastal Stormdrain at Laguna Avenue (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44485, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Hotel

LOE ID:	75034
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	138
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	None of the 138 samples exceeded the total coliform objective. For these stations, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean for total coliform shall not exceed more than 1000/100ml. Water Quality Control Plan for the San Diego Basin. Water Quality Control Plan for Ocean Waters.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Coastal Stormdrain at Laguna Avenue (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44485, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Hotel

LOE ID:	75032
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Shellfish Harvesting	041309
Number of Samples:	144	
Number of Exceedances:	4	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed Beach Watch data for Pacific Ocean Shoreline, Laguna Beach HSA, at Projection at Laguna Hotel to determine beneficial use support and results are as follows: 4 of 144 samples exceed the criterion for Coliform, Total.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Laguna Beach HSA, at Projection at Laguna Hotel was collected at 1 monitoring site [Laguna Hotel]	
Temporal Representation:	Data was collected over the time period 1/3/2008-8/30/2010.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44485, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Hotel

LOE ID:	77963
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	123
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	None of the 123 samples exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Laguna Beach HSA, at Projection at Laguna Hotel was collected at 1 monitoring site [Laguna Hotel]
Temporal Representation:	Data was collected over the time period 1/3/2008-8/30/2010.

Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44485, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Hotel

LOE ID:	31096
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	56
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Orange County collected Beach monitoring data within the time period from January 1999 through December 2006. A total of 56 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 56 geomeans zero exceeded the geomean water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml within any 30 day period (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Laguna Hotel (the projection of the hotel), station id S16, in the Laguna HSA. Lat/Long: 33.54087/-117.78361.
Temporal Representation:	Samples were collected at least once a week within the time period from January 1999 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44485, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Hotel

LOE ID:	31095
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	56
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Orange County collected Beach monitoring data within the time period from January 1999 through December 2006. A total of 56 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 56 geomeans zero exceeded the geomean water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml within any 30 day period (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Laguna Hotel (the projection of the hotel), station id S16, in the Laguna HSA. Lat/Long: 33.54087/-117.78361.
Temporal Representation:	Samples were collected at least once a week within the time period from January 1999 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44485, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Hotel

LOE ID:	31094
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	56
Number of Exceedances:	7
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Orange County collected Beach monitoring data within the time period from January 1999 through December 2006. A total of 56 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 56 geomeans seven exceeded the geomean water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml within any 30 day period

	(SWRCB, 2005). 041312
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Laguna Hotel (the projection of the hotel), station id S16, in the Laguna HSA. Lat/Long: 33.54087/-117.78361.
Temporal Representation:	Samples were collected at least once a week within the time period from January 1999 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44485, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Hotel

LOE ID:	75004
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	138
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	None of the 138 geomeans exceeded the fecal coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean for fecal coliform shall not exceed more than 200/100ml. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Coastal Stormdrain at Laguna Avenue (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44485, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Hotel

LOE ID:	75003
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	149
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	None of the 149 samples exceeded the fecal coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample fecal coliform concentration shall not exceed more than 400/100ml. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Coastal Stormdrain at Laguna Avenue (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44485, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Hotel

LOE ID:	74979
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	138
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	None of the 138 geomeans exceeded the enterococcus objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean for enterococcus shall not exceed 35 MPN/100 mL. Water Quality

	Control Plan for the San Diego Basin. California Ocean Plan. 041314
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Coastal Stormdrain at Laguna Avenue (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44485, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Hotel

LOE ID:	74978
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	149
Number of Exceedances:	3
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Three of the 149 samples exceeded the enterococcus objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample enterococcus concentration shall not exceed more than 104/100ml.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin. California Ocean Plan. Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Coastal Stormdrain at Laguna Avenue (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44485, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Hotel

LOE ID:	29302

Pollutant:	Fecal Coliform	041315
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	51	
Number of Exceedances:	3	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange January 1999 through December 2007. A total of 919 single samples were collected. Between March 2002 and December 2007, 51 samples were correlated with a storm event. Of those 51 samples, three exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.	
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Laguna Hotel (the projection of the hotel), station id S16, in the Laguna HSA. Lat/Long: 33.54087/-117.78361.	
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.	
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 44485, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Hotel

LOE ID:	29301
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	108	041316
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. A total of 919 single samples were collected with 108 monthly geomeans calculated. Of those 108 geomeans, none exceeded the geomean water quality objective.	
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Laguna Hotel (the projection of the hotel), station id S16, in the Laguna HSA. Lat/Long: 33.54087/-117.78361.	
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 44485, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Hotel

LOE ID:	29300
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	919
Number of Exceedances:	13
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. A total of 919 single samples were collected with 13 samples exceeding the single sample water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:	041317
Guideline Reference:	
Spatial Representation:	Samples were collected from Laguna Hotel (the projection of the hotel), station id S16, in the Laguna HSA. Lat/Long: 33.54087/-117.78361.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44485, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Hotel

LOE ID:	29299
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	51
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. A total of 918 single samples. Between March 2002 and December 2007, 51 samples were correlated with a storm event. Of those 51 samples, 3 exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Laguna Hotel (the projection of the hotel), station id S16, in the Laguna HSA. Lat/Long: 33.54087/-117.78361.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through

March. 041318

QAPP Information: Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.

QAPP Information Reference(s): County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44485, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Hotel

LOE ID: 29298

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 108
Number of Exceedances: 0

Data and Information Type: PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality: Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. A total of 918 single samples with 108 monthly geomeans calculated. Of the 108 geomeans, none exceeded the geomean water quality objective.
Data Reference: Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;

Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference: Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected from Laguna Hotel (the projection of the hotel), station id S16, in the Laguna HSA. Lat/Long: 33.54087/-117.78361.
Temporal Representation: Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:
QAPP Information: Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s): County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44485, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Hotel

LOE ID: 29297

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 918

Number of Exceedances:	4	041319

Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. A total of 918 single samples were collected with 4 samples exceeding the single sample water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Laguna Hotel (the projection of the hotel), station id S16, in the Laguna HSA. Lat/Long: 33.54087/-117.78361.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44485, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Hotel

LOE ID:	29285
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	108
Number of Exceedances:	12
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. A total of 919 single samples were collected and 108 geomeans calculated. Of the 108 geomeans, 12 exceeded the geomean water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	

Guideline Reference:	041320
Spatial Representation:	Samples were collected from Laguna Hotel (the projection of the hotel), station id S16, in the Laguna HSA. Lat/Long: 33.54087/-117.78361.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44485, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Hotel

LOE ID:	29278
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	918
Number of Exceedances:	113
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. A total of 918 single samples with 113 samples exceeding the single sample water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan, the median total coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Laguna Hotel (the projection of the hotel), station id S16, in the Laguna HSA. Lat/Long: 33.54087/-117.78361.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44485, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Hotel

LOE ID:	29289
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	041321
Beneficial Use:	Water Contact Recreation	
Number of Samples:	919	
Number of Exceedances:	80	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. A total of 919 single samples were collected with 80 samples exceeding the single sample water quality objective.	
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Laguna Hotel (the projection of the hotel), station id S16, in the Laguna HSA. Lat/Long: 33.54087/-117.78361.	
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 44485, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Hotel

LOE ID:	29287
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	51
Number of Exceedances:	20
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. A total of 919 single samples were collected with 51 samples were correlated with a storm event. Of the 51 samples, 20 exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station

SWAMP Data:	Non-SWAMP	041322
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Laguna Hotel (the projection of the hotel), station id S16, in the Laguna HSA. Lat/Long: 33.54087/-117.78361.	
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.	
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 44485, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Hotel

LOE ID:	29323
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	-N/A
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	204
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2000 to December 2006, there were and 204 beach postings days for this section of shoreline. Bacteriological samples are collected on a weekly basis at approximately 150 ocean and bay location in Orange County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of Orange in their Annual Ocean and Bay Water Quality Report, March 2007. The reporting period was from January 2000 -December 2006. Data used was the number of days the beach was posting when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	County of Orange. March 2007. Annual Ocean and Bay Water Quality Report, 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the

	Department, after taking into consideration the causes therefor, may at his discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Bacteriological monitoring samples were collected at Aliso Beach and South Laguna Beach in Orange County, California. Beaches included Emerald Bay, Crescent Bay, Laguna Main Beach, Hotel Laguna, Bluebird Canyon, Victoria Beach and Blue Lagoon. The posting covers 4.4 miles of beach shoreline.
Temporal Representation:	The beach posting covers the time frame of January 2000 -December 2006.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of Orange's Quality Assessment/Quality Control document (County of Orange, 2004).
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44485, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Hotel

LOE ID:	29274
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	51
Number of Exceedances:	28
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. A total of 918 single samples were collected. Between March 2002 and December 2007, 51 samples were correlated with a storm event. Of those 51 samples, 28 exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan, the median total coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Laguna Hotel (the projection of the hotel), station id S16, in the Laguna HSA. Lat/Long: 33.54087/-117.78361.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event

was defined as 0.2 inches of rainfall within a 72 hour period. 041324

Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.

QAPP Information: Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.

QAPP Information Reference(s): County of Orange. Quality Assurance/Quality Control Manual, February 2004

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Laguna Beach HSA, at Dumond Drive at Victoria Beach
Water Body ID: CAC9011200020090505110718
Water Body Type: Coastal & Bay Shoreline

DECISION ID 44471 Region 9
Pacific Ocean Shoreline, Laguna Beach HSA, at Dumond Drive at Victoria Beach

Pollutant: Indicator Bacteria
Final Listing Decision: Delist from 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Delist from 303(d) list (TMDL required list)(2012)
Revision Status Revised
Reason for Delisting: Applicable WQS attained; reason for recovery unspecified
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for removal from the CWA section 303(d) List under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Nine lines of evidence are available in the administrative record to assess this pollutant. Including the latest data, two of 368 samples exceeded the water quality objective for enterococcus of a geomean of 35/100ml in a 30-day period for the protection of REC-1.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Including the latest data, two of 368 samples exceeded the water quality objective for enterococcus of a geomean of 35/100ml in a 30-day period for the protection of REC-1 and this does not exceed the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be removed from the section 303(d) list because applicable water quality standards for the pollutant are not being exceeded.

Line of Evidence (LOE) for Decision ID 44471, Indicator Bacteria Region 9
Pacific Ocean Shoreline, Laguna Beach HSA, at Dumond Drive at Victoria Beach

LOE ID: 29324

Pollutant: Indicator Bacteria
LOE Subgroup: Health Advisories
Matrix: -N/A
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples:	2555	041326
Number of Exceedances:	204	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	For the period from January 2000 to December 2006, there were and 204 beach postings days for this section of shoreline. Bacteriological samples are collected on a weekly basis at approximately 150 ocean and bay location in Orange County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of Orange in their Annual Ocean and Bay Water Quality Report, March 2007. The reporting period was from January 2000 -December 2006. Data used was the number of days the beach was posting when the ocean or bay failed to meet the bacteriological standards.	
Data Reference:	County of Orange. March 2007. Annual Ocean and Bay Water Quality Report, 2006	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.	
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Bacteriological monitoring samples were collected at Aliso Beach and South Laguna Beach in Orange County, California. Beaches included Emerald Bay, Crescent Bay, Laguna Main Beach, Hotel Laguna, Bluebird Canyon, Victoria Beach and Blue Lagoon. The posting covers 4.4 miles of beach shoreline.	
Temporal Representation:	The beach posting covers the time frame of January 2000 -December 2006.	
Environmental Conditions:		
QAPP Information:	Samples were collected in compliance with County of Orange's Quality Assessment/Quality Control document (County of Orange, 2004).	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44471, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Dumond Drive at Victoria Beach

LOE ID:	74950
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	122
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 122 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Victoria Beach site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44471, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Dumond Drive at Victoria Beach

LOE ID:	29307
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	108
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. There were 911 individual samples with 108 monthly geomean calculated. None of the 108 goemeans exceeded the fecal coliform geomean water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Dumond Dr, station id S14, in the Laguna HSA. Lat/Long: 33.51919/-117.76302.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44471, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Dumond Drive at Victoria Beach

LOE ID:	29308

Pollutant:	Fecal Coliform	041328
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	51	
Number of Exceedances:	2	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. There were 911 individual samples with 51 associated with storm events. Two of the 51 samples exceeded the fecal coliform water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.	
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Dumond Dr, station id S14, in the Laguna HSA. Lat/Long: 33.51919/-117.76302.	
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.	
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 44471, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Dumond Drive at Victoria Beach

LOE ID:	29288
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	51

Number of Exceedances:	11	041329

Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. There were 911 individual samples with 51 samples correlated with storm events. Of the 51 samples, 11 exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Dumond Dr, station id S14, in the Laguna HSA. Lat/Long: 33.51919/-117.76302.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2006; however, rainfall data is only available from March 2002 through December 2006.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44471, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Dumond Drive at Victoria Beach

LOE ID:	29284
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	108
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. There were 911 individual samples with 108 monthly geomeans calculated. Of the 108 geomeans, only 2 exceeded the geomean water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Dumond Dr, station id S14, in the Laguna HSA. Lat/Long: 33.51919/-117.76302.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44471, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Dumond Drive at Victoria Beach

LOE ID:	29270
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	51
Number of Exceedances:	15
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. There were 911 individual samples. Of the 911 samples, 51 were associated with a storm event. Fifteen of the 51 samples exceeded the shellfish single sample maximum water quality objective for total coliform. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan, the median total coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Dumond Dr, station id S14, in the Laguna HSA. Lat/Long: 33.51919/-117.76302.

Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44471, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Dumond Drive at Victoria Beach

LOE ID:	29303
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	911
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. There were 911 individual samples with two exceeding the single sample maximum for total coliform.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Dumond Dr, station id S14, in the Laguna HSA. Lat/Long: 33.51919/-117.76302.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44471, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Dumond Drive at Victoria Beach

LOE ID:	29304

Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	108
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. There were 911 individual samples and 108 monthly geomeans calculated. None of the geomeans exceeded the geomean water quality objective
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Lagunita Place, station id S14, in the Laguna HSA. Lat/Long: 33.51919/-117.76302.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44471, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Dumond Drive at Victoria Beach

LOE ID:	29305
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	51
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. There were 911 individual samples with 51 samples correlated with a storm event. Two of the 51 samples exceeded the total coliform single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report

	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Dumond Dr, station id S14, in the Laguna HSA. Lat/Long: 33.51919/-117.76302.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44471, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Dumond Drive at Victoria Beach

LOE ID:	29281
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	911
Number of Exceedances:	44
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. There were 911 individual samples collected with 44 exceeding the shellfish single sample maximum water quality objective for total coliform.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan, the median total coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	

Guideline Reference:	041334
Spatial Representation:	Samples were collected from Dumond Dr, station id S14, in the Laguna HSA. Lat/Long: 33.51919/-117.76302.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44471, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Dumond Drive at Victoria Beach

LOE ID:	29282
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	911
Number of Exceedances:	46
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. There were 911 individual samples with 46 samples exceeding the single sample maximum water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Dumond Dr, station id S14, in the Laguna HSA. Lat/Long: 33.51919/-117.76302.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44471, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Dumond Drive at Victoria Beach

LOE ID:	31101
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water

Matrix:	Water	041335
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	56	
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Orange County collected Beach monitoring data within the time period from January 1999 through December 2006. A total of 56 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 56 geomeans zero exceeded the geomean water quality objective.	
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml within any 30 day period (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005, Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Dumond Dr, station id S14, in the Laguna HSA. Lat/Long: 33.51919/-117.76302.	
Temporal Representation:	Samples were collected at least once a week within the time period from January 1999 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 44471, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Dumond Drive at Victoria Beach

LOE ID:	31102
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	56
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Orange County collected Beach monitoring data within the time period from January 1999 through December 2006. A total of 56 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 56 geomeans zero exceeded the geomean water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml within any 30 day period (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Dumond Dr, station id S14, in the Laguna HSA. Lat/Long: 33.51919/-117.76302.
Temporal Representation:	Samples were collected at least once a week within the time period from January 1999 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44471, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Dumond Drive at Victoria Beach

LOE ID:	74926
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	149
Number of Exceedances:	1
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	One of the 149 samples exceeded the enterococcus objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample enterococcus concentration shall not exceed more than 104/100ml. Water Quality Control Plan for Ocean Waters of California. Region 9 Basion Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from site DUMOND, Coastal Stormdrain at Dumond Drive (surzone upcoast and surzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to April 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44471, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Dumond Drive at Victoria Beach

LOE ID:	74927
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	138
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	None of the 138 geomeans exceeded the enterococcus objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean for enterococcus shall not exceed 35 MPN/100 mL. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Coastal Stormdrain at Dumond Drive (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44471, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Dumond Drive at Victoria Beach

LOE ID:	74928
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	122
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 122 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Victoria Beach site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44471, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Dumond Drive at Victoria Beach

LOE ID:	74929
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	149
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 149 samples exceeded the fecal coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample fecal coliform concentration shall not exceed more than 400/100ml. Water Quality Control Plan for Ocean Waters of California. Region 9 Basion Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from site DUMOND, Coastal Stormdrain at Dumond Drive (surzone upcoast and downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to April 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44471, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Dumond Drive at Victoria Beach

LOE ID:	74930
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water

Matrix:	Water	041339
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	138	
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	None of the 138 geomeans exceeded the fecal coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The geometric mean for fecal coliform shall not exceed more than 200/100ml. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected from Coastal Stormdrain at Dumond Drive (surfzone upcoast and surfzone downcoast).	
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.	
Environmental Conditions:		
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44471, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Dumond Drive at Victoria Beach

LOE ID:	74931
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	122
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 122 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Victoria Beach site.

Temporal Representation:	Samples were collected from January 2008 to August 2010.	041340
Environmental Conditions:		
QAPP Information:	The samples were collected for the beach watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44471, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Dumond Drive at Victoria Beach

LOE ID:	30304
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Water Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006. For the 2008 assessment , the 2006 listed coastline 'Pacific Ocean Shoreline, Laguna Beach HSA' was split into smaller segments and each represents an area near the sampling location of the data being assessed. This segment 'Pacific Ocean Shoreline, Laguna Beach HSA, at Lagunita Place' is one of the sampling locations. This LOE is a copy of the 2006 listing placeholder LOE for Pacific Ocean Shoreline, Laguna Beach HSA and is considered by the Regional Board to be applicable to this more specific segment formed from the split.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	
Temporal Representation:	
Environmental Conditions:	
QAPP Information:	Unspecified
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44471, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Dumond Drive at Victoria Beach

LOE ID:	31100
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	56
Number of Exceedances:	1

Data and Information Type:	PWS pathogen monitoring (ambient water) 041341
Data Used to Assess Water Quality:	Orange County collected Beach monitoring data within the time period from January 1999 through December 2006. A total of 56 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 56 geomeans one exceeded the geomean water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml within any 30 day period (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Lagunita Place, station id S14, in the Laguna HSA. Lat/Long: 33.51919/-117.76302.
Temporal Representation:	Samples were collected at least once a week within the time period from January 1999 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44471, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Dumond Drive at Victoria Beach

LOE ID:	77625
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	122
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Zero of the 122 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, Laguna Beach HSA, at Dumond Drive at Victoria Beach.
Temporal Representation:	The samples were collected from January 2008 through August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44471, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Dumond Drive at Victoria Beach

LOE ID:	74947
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	143
Number of Exceedances:	1
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Beach Watch data for Pacific Ocean Shoreline, Laguna Beach HSA, at Dumond Drive at Victoria Beach to determine beneficial use support and results are as follows: 1 of 143 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Laguna Beach HSA, at Dumond Drive at Victoria Beach was collected at 1 monitoring site [Victoria Beach]
Temporal Representation:	Data was collected over the time period 1/3/2008-8/30/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44471, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Dumond Drive at Victoria Beach

LOE ID:	74948
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	149
Number of Exceedances:	1

Data and Information Type:	Not Specified	041343
Data Used to Assess Water Quality:	One of the 149 samples exceeded the total coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The single sample total coliform concentration shall not exceed more than 10000/100ml. Water Quality Control Plan for Ocean Waters of California. Region 9 Basion Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected from site DUMOND, Coastal Stormdrain at Dumond Drive (surzone upcoast and surfzone downcoast).	
Temporal Representation:	The samples were collected once a week from July 2006 to April 2009.	
Environmental Conditions:		
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44471, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Dumond Drive at Victoria Beach

LOE ID:	74949
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	138
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	None of the 138 samples exceeded the total coliform objective. For these stations, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean for total coliform shall not exceed more than 1000/100ml. Water Quality Control Plan for the San Diego Basin. Water Quality Control Plan for Ocean Waters.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Coastal Stormdrain at Dumond Drive (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring

	Program.	041344
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44471, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Dumond Drive at Victoria Beach

LOE ID:	29306
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	911
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. There were 911 individual samples with four samples exceeding the fecal coliform single sample water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Dumond Dr, station id S14, in the Laguna HSA. Lat/Long: 33.51919/-117.76302.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Laguna Beach HSA, at Main Beach
Water Body ID: CAC9011200020090505104552
Water Body Type: Coastal & Bay Shoreline

DECISION ID 44695 **Region 9**
Pacific Ocean Shoreline, Laguna Beach HSA, at Main Beach

Pollutant: Indicator Bacteria
Final Listing Decision: Delist from 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Do Not Delist from 303(d) list (TMDL required list)(2012)
Revision Status Revised
Reason for Delisting: Applicable WQS attained; due to restoration activities
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for removal from the CWA section 303(d) List under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Fifteen lines of evidence are available in the administrative record to assess this pollutant. Using the latest data collected in 2008 and 2009, zero of 17 samples exceed the water quality criteria for geomean of total coliform of 1000/100ml.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Two diversion systems were installed upstream of the subject beach in 2007 to improve beach water quality especially during AB411 period. Using the latest data collected in 2008 and 2009, zero of 17 samples exceed the water quality criteria for geomean of total coliform of 1000/100ml, and this does not exceed the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be removed from the section 303(d) list because applicable water quality standards for the pollutant are not being exceeded.

Line of Evidence (LOE) for Decision ID 44695, Indicator Bacteria **Region 9**
Pacific Ocean Shoreline, Laguna Beach HSA, at Main Beach

LOE ID: 29317

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples:	459
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. A total of 459 samples were collected with three samples exceeding the single sample water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Main Beach, station id OLB00, in the Laguna HSA. Lat/Long: 33.54244/-117.78659.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44695, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Main Beach

LOE ID:	75066
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	35
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 35 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Laguna Main Beach site.
Temporal Representation:	Samples were collected from January 2008 to October 2009.

Environmental Conditions:		041347
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44695, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Main Beach

LOE ID:	29319
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	49
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. A total of 459 samples were collected. Between March 2002 and December 2007, 49 samples were correlated with a storm event. Of the 49 samples, only one exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Main Beach, station id OLB00, in the Laguna HSA. Lat/Long: 33.54244/-117.78659.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange, Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44695, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Main Beach

LOE ID:	29320
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	449
Number of Exceedances:	10
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. A total of 449 samples were collected with 10 exceeding the single sample maximum water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Main Beach, station id OLB00, in the Laguna HSA. Lat/Long: 33.54244/-117.78659.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44695, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Main Beach

LOE ID:	29321
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	107
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. A total of 449 samples were collected with 107 geomeans calculated. Of the 107 geomean, only one exceeded the geomean water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Main Beach, station id OLB00, in the Laguna HSA. Lat/Long: 33.54244/-117.78659.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44695, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Main Beach

LOE ID:	29322
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	49
Number of Exceedances:	5
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. A total of 449 samples were collected. Between March 2002 and December 2007, 49 samples were correlated with a storm event. Of the 49 samples, five exceeded the single sample maximum water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Main Beach, station id OLB00, in the Laguna HSA. Lat/Long:

	33.54244/-117.78659. 041350
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44695, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Main Beach

LOE ID:	29326
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	-N/A
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	204
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2000 to December 2006, there were and 204 beach postings days for this section of shoreline. Bacteriological samples are collected on a weekly basis at approximately 150 ocean and bay location in Orange County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of Orange in their Annual Ocean and Bay Water Quality Report, March 2007. The reporting period was from January 2000 -December 2006. Data used was the number of days the beach was posting when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	County of Orange. March 2007. Annual Ocean and Bay Water Quality Report, 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Bacteriological monitoring samples were collected at Aliso Beach and South Laguna Beach in Orange County, California. Beaches included Emerald Bay, Crescent Bay, Laguna Main Beach, Hotel Laguna, Bluebird Canyon, Victoria Beach and Blue Lagoon. The posting covers 4.4 miles of beach shoreline.

Temporal Representation:	The beach posting covers the time frame of January 2000 -December 2006 641351
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of Orange's Quality Assessment/Quality Control document (County of Orange, 2004).
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44695, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Main Beach

LOE ID:	29275
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	49
Number of Exceedances:	9
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. A total of 459 single samples were collected. Between March 2002 and December 2007, 49 samples correlated with a storm event. Of the 49 samples, nine exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan, the median total coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Main Beach, station id OLB00, in the Laguna HSA. Lat/Long: 33.54244/-117.78659.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44695, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Main Beach 041352

LOE ID:	29290
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	447
Number of Exceedances:	23
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. A total of 447 samples were collected with 23 exceeding the single sample maximum water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Main Beach, station id OLB00, in the Laguna HSA. Lat/Long: 33.54244/-117.78659.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44695, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Main Beach

LOE ID:	29279
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	459
Number of Exceedances:	39
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. A total of 459 single samples with 39 samples exceeding the single sample

	water quality objective. 041353
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan, the median total coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Main Beach, station id OLB00, in the Laguna HSA. Lat/Long: 33.54244/-117.78659.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44695, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Main Beach

LOE ID:	29294
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	49
Number of Exceedances:	11
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. A total of 447 samples were collected. Between March 2002 and December 2007, 49 samples were associated with a storm event. Of the 49 samples, 11 exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected from Main Beach, station id OLB00, in the Laguna HSA. Lat/Long: 33.54244/-117.78659.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44695, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Main Beach

LOE ID:	29295
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	106
Number of Exceedances:	5
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. A total of 447 samples were collected and 106 monthly geomeans calculated. Of the 106 geomeans, five exceeded the geomean water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Main Beach, station id OLB00, in the Laguna HSA. Lat/Long: 33.54244/-117.78659.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44695, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Main Beach 041355

LOE ID:	31097
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	56
Number of Exceedances:	15
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Orange County collected Beach monitoring data within the time period from January 1999 through December 2006. A total of 56 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 56 geomeans 15 exceeded the geomean water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml within any 30 day period (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Main Beach, station id OLB00, in the Laguna HSA. Lat/Long: 33.54244/-117.78659.
Temporal Representation:	Samples were collected at least once a week within the time period from January 1999 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44695, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Main Beach

LOE ID:	31099
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	56
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Orange County collected Beach monitoring data within the time period from January 1999

	through December 2006. 041356 A total of 56 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 56 geomeans zero exceeded the geomean water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml within any 30 day period (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Main Beach, station id OLB00, in the Laguna HSA. Lat/Long: 33.54244/-117.78659.
Temporal Representation:	Samples were collected at least once a week within the time period from January 1999 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44695, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Main Beach

LOE ID:	30305
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Water Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006. For the 2008 assessment , the 2006 listed coastline 'Pacific Ocean Shoreline, Laguna Beach HSA' was split into smaller segments that each represent an area near the sampling location of the data being assessed. This segment 'Pacific Ocean Shoreline, Laguna Beach HSA, at Main Beach' is one of the sampling locations. This LOE is a copy of the 2006 listing placeholder LOE for Pacific Ocean Shoreline, Laguna Beach HSA and is considered by the Regional Board to be applicable to this more specific segment formed from the split.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	Unspecified

Guideline Reference:	Placeholder reference pre-2006 303(d)	041357

Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	Placeholder reference pre-2006 303(d)

Line of Evidence (LOE) for Decision ID 44695, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Main Beach

LOE ID:	31098
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	56
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Orange County collected Beach monitoring data within the time period from January 1999 through December 2006. A total of 56 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 56 geomeans zero exceeded the geomean water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml within any 30 day period (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Main Beach, station id OLB00, in the Laguna HSA. Lat/Long: 33.54244/-117.78659.
Temporal Representation:	Samples were collected at least once a week within the time period from January 1999 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44695, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Main Beach

LOE ID:	77626
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water

Matrix:	Water	041358
Fraction:	None	
Beneficial Use:	Shellfish Harvesting	
Number of Samples:	35	
Number of Exceedances:	0	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Zero of the 35 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, Laguna Beach HSA, at Main Beach.	
Temporal Representation:	The samples were collected from January 2008 through October 2009.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the beach watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44695, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Main Beach

LOE ID:	81135
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 35 geomeans collected during the AB411 period exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Laguna Main Beach site.
Temporal Representation:	Samples were collected from April 2008 to October 2009.

Environmental Conditions: 041359
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 44695, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Main Beach

LOE ID: 75036

Pollutant: Enterococcus
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 149
Number of Exceedances: 5

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Five of the 149 samples exceeded the enterococcus objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.
Data Reference: Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The single sample enterococcus concentration shall not exceed more than 104/100ml.
Objective/Criterion Reference: Water Quality Control Plan for Ocean Waters of California. Region 9 Basion Plan. California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: The samples were collected from Laguna Canyon Channel (surfzone upcoast and surfzone downcoast).
Temporal Representation: The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:
QAPP Information: The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 44695, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Main Beach

LOE ID: 75037

Pollutant: Enterococcus
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 138
Number of Exceedances: 7

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Seven of the 138 geomeans exceeded the enterococcus objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values

was used for the geomean calculation. 041360

Data Reference: Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The geometric mean for enterococcus shall not exceed 35 MPN/100 mL. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.

Objective/Criterion Reference: Water Quality Control Plan for the San Diego Basin
California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: The samples were collected from Laguna Canyon Channel at Main Beach (surfzone upcoast and surfzone downcoast).

Temporal Representation: The samples were collected once a week from July 2006 to 2009.

Environmental Conditions:

QAPP Information: The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.

QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 44695, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Main Beach

LOE ID: 75038

Pollutant: Enterococcus
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 35
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Zero of the 35 geomeans exceeded the objective.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.

Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at the Laguna Main Beach site.
Temporal Representation: Samples were collected from January 2008 to October 2009.
Environmental Conditions:
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 44695, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Main Beach

LOE ID: 75060

Pollutant:	Fecal Coliform	041361
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	149	
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Zero of the 149 samples exceeded the fecal coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The single sample fecal coliform concentration shall not exceed more than 400/100ml. Water Quality Control Plan for Ocean Waters of California. Region 9 Basion Plan.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected from Laguna Canyon Channel(surfzone upcoast and surfzone downcoast).	
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.	
Environmental Conditions:		
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44695, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Main Beach

LOE ID:	75061
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	138
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	None of the 138 geomeans exceeded the fecal coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean for fecal coliform shall not exceed more than 200/100ml. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:	041362
Guideline Reference:	
Spatial Representation:	The samples were collected from Laguna Canyon Channel at Main Beach (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44695, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Main Beach

LOE ID:	75062
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	35
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 35 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Laguna Main Beach site.
Temporal Representation:	Samples were collected from January 2008 to October 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44695, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Main Beach

LOE ID:	75063
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	58
Number of Exceedances:	3

Data and Information Type:	PATHOGEN MONITORING 041363
Data Used to Assess Water Quality:	Water Board staff assessed Beach Watch data for Pacific Ocean Shoreline, Laguna Beach HSA, at Main Beach to determine beneficial use support and results are as follows: 3 of 58 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Laguna Beach HSA, at Main Beach was collected at 1 monitoring site [LAGUNA MAIN BEACH]
Temporal Representation:	Data was collected over the time period 1/3/2008-10/27/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44695, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Main Beach

LOE ID:	75064
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	149
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 149 samples exceeded the total coliform objective. For these stations, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample total coliform concentration shall not exceed more than 10000/100ml. Water Quality Control Plan for Ocean Waters of California. Region 9 Basion Plan.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from LB-3 and Mainbc, Laguna Canyon Channel (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44695, Indicator Bacteria 041364 **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Main Beach

LOE ID:	75065
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	138
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	None of the 138 samples exceeded the total coliform objective. For these stations, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean for total coliform shall not exceed more than 1000/100ml. Water Quality Control Plan for the San Diego Basin. Water Quality Control Plan for Ocean Waters.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Laguna Canyon Channel at Main Beach (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44695, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Main Beach

LOE ID:	29318
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	108
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. A total of 459 samples were collected and 108 geomeans calculated. None of the 108 geomeans exceeded the geomean water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Main Beach, station id OLB00, in the Laguna HSA. Lat/Long: 33.54244/-117.78659.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

DECISION ID 49823 Region 9

Pacific Ocean Shoreline, Laguna Beach HSA, at Main Beach

Pollutant:	**Toxicity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. One of the One samples exhibited water Toxicity. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of One samples exhibited water Toxicity and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49823, Toxicity Region 9

Pacific Ocean Shoreline, Laguna Beach HSA, at Main Beach

LOE ID:	74662
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Marine Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to test for toxicity. One of the one samples exhibited statistically and biologically significant toxicity. The toxicity tests that exhibited significant toxicity included Mysid biomass.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control. Additionally, the biological significance of the sample was evaluted by determining whether the sample response was lower than the evaluation threshold.
Guideline Reference:	
Spatial Representation:	The sample was collected at station LB-3u Laguna Canyon Channel.
Temporal Representation:	The sample was collected in February 2010.
Environmental Conditions:	
QAPP Information:	The data collected under the Quality Assurance Management Plan for The Orange County Stormwater Program. The SWAMP measurement quality objectives were followed for toxicity data. The performance of toxicity bioassays and evaluation of reference toxicants were performed using USEPA and Standard Methods.
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Lower San Juan HSA, at North Beach Creek
Water Body ID: CAC9012000020090505154613
Water Body Type: Coastal & Bay Shoreline

DECISION ID 43790 **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at North Beach Creek

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not Delist from 303(d) list (being addressed with USEPA approved TMDL)**
Last Listing Cycle's Final Listing Decision:	Do Not Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Natural Sources | Source Unknown | Unknown Nonpoint Source | Urban Runoff/Storm Sewers
TMDL Name:	Bacteria Impaired Waters I (creeks and beach shorelines)
TMDL Project Code:	169
Date TMDL Approved by USEPA:	06/22/2011
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal on the CWA section 303(d) List under sections 2.2 and 3.2 of the Listing Policy. Under Section 3.2 of the Policy, a minimum of one line of evidence is needed to assess listing status.

Nine lines of evidence are available in the administrative record to assess this pollutant.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List. There is sufficient justification to place it in the Being Addressed portion of the CWA 303(d) List because a TMDL has been completed and approved by RWQCB and USEPA, and is expected to result in attainment of the standard.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section [NUMBER] of the Policy.
2. The data used satisfies the data quantity requirements of section NUMBER of the Policy.
3. With the latest data, 108 out of 181 and 70 out of 149 single samples exceed the water quality objective for enterococcus for geomean and SSM criteria, respectively, for REC-1 protection, 33 of 181 geomean samples exceed the water quality objective for fecal coliform for REC-1, and 45 of 57 samples exceed the WQO for total coliform for SHELL, and these exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. The Bacteria TMDL for 20 beaches/creeks was approved by USEPA on 06/22/2011.
5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 43790, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at North Beach Creek

LOE ID: 74910

Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	149
Number of Exceedances:	22
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Twenty-two of the 4149 samples exceeded the fecal coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample fecal coliform concentration shall not exceed more than 400/100ml. Water Quality Control Plan for Ocean Waters of California. Region 9 Basion Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from site DSB5, North Beach Creek at Doheny State Beach (surzone upcoast and downcoast).
Temporal Representation:	The samples were collected in from 2007 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43790, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at North Beach Creek

LOE ID:	74890
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	43
Number of Exceedances:	22
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Twenty two of the 43 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	

Guideline Reference: 041369

Spatial Representation: Samples were collected at the North Beach site.
Temporal Representation: Samples were collected from January 2008 to October 2009.
Environmental Conditions:
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 43790, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at North Beach Creek

LOE ID: 74912

Pollutant: Fecal Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 43
Number of Exceedances: 3

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Three of the 43 geomeans exceeded the objective.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at the North Beach site.
Temporal Representation: Samples were collected from January 2008 to October 2009.
Environmental Conditions:
QAPP Information: The samples were collected for the beach watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 43790, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at North Beach Creek

LOE ID: 74911

Pollutant: Fecal Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 138
Number of Exceedances: 30

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Thirty of the 138 geomeans exceeded the fecal coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.

Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009. 041370
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean for fecal coliform shall not exceed more than 200/100ml. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from North Beach Creek at Doheny State Beach (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43790, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at North Beach Creek

LOE ID:	74889
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	138
Number of Exceedances:	86
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Eighty-six of the 138 geomeans exceeded the enterococcus objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean for enterococcus shall not exceed 35 MPN/100 mL. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from North Beach Creek at Doheny State Beach (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43790, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at North Beach Creek 041371

LOE ID:	74888
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	149
Number of Exceedances:	70
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Seventy of the 149 samples exceeded the enterococcus objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample enterococcus concentration shall not exceed more than 104/100ml. Water Quality Control Plan for Ocean Waters of California. Region 9 Basion Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from site DSB5, North Beach Creek at Doheny State Beach (surzone upcoast and downcoast).
Temporal Representation:	The samples were collected in from 2007 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43790, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at North Beach Creek

LOE ID:	77640
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	57
Number of Exceedances:	45
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Forty-five of the 57 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for

	human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, Lower San Juan HSA, at North Beach Creek at stations North Beach and North Beach Creek.
Temporal Representation:	The samples were collected from January 2008 through October 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43790, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at North Beach Creek

LOE ID:	30310
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Water Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006. For the 2008 assessment , the 2006 listed coastline 'Pacific Ocean Shoreline, Lower San Juan HSA' was split into smaller segments and each represents an area near the sampling location of the data being assessed. This segment 'Pacific Ocean Shoreline, Lower San Juan HSA, at North Beach Creek' is one of the sampling locations. This LOE is a copy of the 2006 listing placeholder LOE for Pacific Ocean Shoreline, Lower San Juan HSA and is considered by the Regional Board to be applicable to this more specific segment formed from the split.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	
Temporal Representation:	
Environmental Conditions:	
QAPP Information:	unspecified
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43790, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at North Beach Creek

LOE ID:	74936	041373

Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	42
Number of Exceedances:	5
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Five of the 42 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the North Beach site.
Temporal Representation:	Samples were collected from January 2008 to October 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43790, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at North Beach Creek

LOE ID:	74935
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	138
Number of Exceedances:	20
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Twenty of the 138 samples exceeded the total coliform objective. For these stations, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean for total coliform shall not exceed more than 1000/100ml. Water Quality Control Plan for the San Diego Basin. Water Quality Control Plan for Ocean Waters.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	The samples were collected from North Beach Creek at Doheny State Beach (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43790, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at North Beach Creek

LOE ID:	74934
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	149
Number of Exceedances:	6
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Six of the 149 samples exceeded the total coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample total coliform concentration shall not exceed more than 10000/100ml. Water Quality Control Plan for Ocean Waters of California. Region 9 Basion Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from site DSB5, North Beach Creek at Doheny State Beach (surzone upcoast and downcoast).
Temporal Representation:	The samples were collected in from 2007 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43790, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at North Beach Creek

LOE ID:	74933
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting

Number of Samples:	94	041375
Number of Exceedances:	53	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed Beach Watch data for Pacific Ocean Shoreline, Lower San Juan HSA, at North Beach Creek to determine beneficial use support and results are as follows: 53 of 94 samples exceed the criterion for Coliform, Total.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Lower San Juan HSA, at North Beach Creek was collected at 2 monitoring sites [NORTH BEACH, NORTH BEACH CREEK]	
Temporal Representation:	Data was collected over the time period 1/3/2008-10/29/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

DECISION ID **49840** **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at North Beach Creek

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the Zero samples exceed the Water Quality Criteria for Chlorpyrifos.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Zero samples exceeded the Water Quality Criteria Chlorpyrifos and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the

applicable beneficial use support rating. 041376

Line of Evidence (LOE) for Decision ID 49840, Chlorpyrifos **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at North Beach Creek

LOE ID:	74886
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	The Reporting Limit of 10 ng/L is higher than the criteria of 9ng/L which makes the data not usable.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Marine communities, including vertebrate, invertebrate, and plant species, shall not be degraded. (2009 CA Ocean Plan)
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The Criteria Continuous Concentration (four day average) for chlorpyrifos in saltwater is 9 ng/L.
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game
Spatial Representation:	Sample was collected at site DSB5-d from Pacific Ocean Shoreline, Lower San Juan HSA, at North Beach Creek.
Temporal Representation:	Sample was collected in December of 2008.
Environmental Conditions:	According to the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010, samples were collected during the dry season and storm events.
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

DECISION ID 49841 **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at North Beach Creek

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the Zero samples exceed the Water Quality Criteria for Diazinon.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Water Quality Criteria for Diazinon and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49841, Diazinon **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at North Beach Creek

LOE ID:	74887
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	One sample did not exceed the maximum concentration for Diazinon criteria of 820.0 ng/L.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Marine communities, including vertebrate, invertebrate, and plant species, shall not be degraded. (2009 Ocean Plan)
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The Criteria Continuous Concentration for diazinon in saltwater is 820 ng/L.
Guideline Reference:	Aquatic Life Ambient Water Quality Criteria for Diazinon
Spatial Representation:	Sample was collected at site DSB5-d from Pacific Ocean Shoreline, Lower San Juan HSA, at North Beach Creek.
Temporal Representation:	Sample was collected in December of 2008.
Environmental Conditions:	According to the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010, samples were collected during the dry season and storm events.
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

DECISION ID 49842 Region 9

Pacific Ocean Shoreline, Lower San Juan HSA, at North Beach Creek

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Water Quality Criteria Malathion.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Water Quality Criteria for Malathion and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49842, Malathion Region 9

Pacific Ocean Shoreline, Lower San Juan HSA, at North Beach Creek

LOE ID:	74913
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	One sample tested for Malathion did not exceed the maximum concentration for Malathion of 100 ng/L.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Marine communities, including vertebrate, invertebrate, and plant species, shall not be

degraded. (2009 Ocean Plan) 041379

Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline: The maximum (Instantaneous) concentration for Malathion in saltwater is 100 ng/L.

Guideline Reference: Quality Criteria for Water. USEPA Office of Water and Hazardous Materials. Washington, D.C

Spatial Representation: Sample was collected at site DSB5-d from Pacific Ocean Shoreline, Lower San Juan HSA, at North Beach Creek.

Temporal Representation: Sample was collected in December of 2008.

Environmental Conditions: According to the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010, samples were collected during the dry season and storm events.

QAPP Information: Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.

QAPP Information Reference(s):

DECISION ID 49843 Region 9

Pacific Ocean Shoreline, Lower San Juan HSA, at North Beach Creek

Pollutant: **Nitrogen, ammonia (Total Ammonia)**

Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**

Last Listing Cycle's Final Listing Decision: New Decision

Revision Status Revised

Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Water Quality Criteria Nitrogen, ammonia (Total Ammonia).

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Water Quality Criteria Nitrogen, ammonia (Total Ammonia) and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49843, Nitrogen, ammonia (Total Ammonia) Region 9

Pacific Ocean Shoreline, Lower San Juan HSA, at North Beach Creek

LOE ID: 74932

Pollutant:	Nitrogen, ammonia (Total Ammonia)	041380
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	Total	
Beneficial Use:	Marine Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	The single sample did not exceeded the water quality objective for total ammonia.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. The Ocean Plan objective for total ammonia as nitrogen is a 6-month median of 600 ug/L.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The sample was collected at station DSB5.	
Temporal Representation:	The sample was collected on 12/15/08.	
Environmental Conditions:		
QAPP Information:	A signed QAPP was included with the stated goal of ensuring the consistent collection of accurate water quality information that will used to satisfy the objectives of the Orange County Stormwater Program.	
QAPP Information Reference(s):		

DECISION ID 49844 Region 9

Pacific Ocean Shoreline, Lower San Juan HSA, at North Beach Creek

Pollutant:	**Toxicity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. One of the One samples exhibited water toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of One samples exhibited water toxicity and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49844, Toxicity **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at North Beach Creek

LOE ID:	74954
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Marine Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to test for water toxicity. One of the one samples exhibited statistically and biologically significant toxicity. The toxicity tests include Mysid Biomass and Survival.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control. Additionally, the biological significance of the sample is evaluated by determining whether the sample response is lower than the evaluation threshold.
Guideline Reference:	
Spatial Representation:	The samples were collected at stations DSB5d North Beach Creek.
Temporal Representation:	The sample was collected in December 2008.
Environmental Conditions:	
QAPP Information:	The data collected under the Quality Assurance Management Plan for The Orange County Stormwater Program. The SWAMP measurement quality objectives were followed for toxicity data. The performance of toxicity bioassays and evaluation of reference toxicants were performed using USEPA and Standard Methods.
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Lower San Juan HSA, at North Doheny State Park Campground
Water Body ID: CAC9013000020090505155824
Water Body Type: Coastal & Bay Shoreline

DECISION ID 43665 **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at North Doheny State Park Campground

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not Delist from 303(d) list (being addressed with USEPA approved TMDL)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
TMDL Name:	Bacteria Impaired Waters I (creeks and beach shorelines)
TMDL Project Code:	169
Date TMDL Approved by USEPA:	06/22/2011
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal on the CWA section 303(d) List under sections 2.2 and 3.2 of the Listing Policy. Under section 3.2 of the Policy, a minimum of one line of evidence is needed to assess listing status.

Eleven lines of evidence are available in the administrative record to assess this pollutant.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List. There is sufficient justification to place it in the Being Addressed portion of the CWA 303(d) List because a TMDL has been completed and approved by RWQCB and USEPA, and is expected to result in attainment of the standard.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, 94 of 408 geomean samples exceed the water quality objective for enterococcus for the protection of REC-1 and 79 of 270 samples exceed the single sample maximum WQO for enterococcus, and these exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. The Bacteria TMDL for 20 beaches/creeks was approved by USEPA on 06/22/2011.
5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 43665, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at North Doheny State Park Campground

LOE ID: 29362

Pollutant:	Fecal Coliform	041383
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	123	
Number of Exceedances:	4	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 123 single samples were collected with four exceeding the single sample water quality objective.	
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program, Bacteria Shoreline Data, 2002 through 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: : Fecal coliform density shall not exceed 200 per 100ml Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; (SWRCB, 2005)	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	There is one sampling location at North Doheny State Park Campground, DSB4, in the Lower San Juan HSA. This location is found in Doheny State Beach, approximately 200 yards south of San Juan Creek, Dana Point (Latitude 33.46070, Longitude -117.67749).	
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 43665, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at North Doheny State Park Campground

LOE ID:	29360
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 123 single samples were collected and 6 samples were correlated with a storm event. None of the 6 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional

	Temperature and Precipitation Listings by Station 041384 The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: : Fecal coliform density shall not exceed 200 per 100ml Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; (SWRCB, 2005)
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location at North Doheny State Park Campground, DSB4, in the Lower San Juan HSA. This location is found in Doheny State Beach, approximately 200 yards south of San Juan Creek, Dana Point (Latitude 33.46070, Longitude -117.67749).
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43665, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at North Doheny State Park Campground

LOE ID:	29564
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	32
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 123 single samples were collected and 32 monthly geomeans calculated. From the 32 geomeans, none exceeding the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml. Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005.

	Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location at North Doheny State Park Campground, DSB4, in the Lower San Juan HSA. This location is found in Doheny State Beach, approximately 200 yards south of San Juan Creek, Dana Point (Latitude 33.46070, Longitude -117.67749).
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43665, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at North Doheny State Park Campground

LOE ID:	30952
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	20
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange within the time period from May 2004 through December 2006. A total of 20 monthly geomeans were calculated for data collected within the time frame of April 1st to October 31st (AB411 data) during the aforementioned time period. Of the 20 geomeans 0 exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml. over a 30 day period
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location at North Doheny State Park Campground, DSB4, in the Lower San Juan HSA. This location is found in Doheny State Beach, approximately 200 yards south of San Juan Creek, Dana Point (Latitude 33.46070, Longitude -117.67749).
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) during the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43665, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at North Doheny State Park Campground 041386

LOE ID:	30956
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	20
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange within the time period from May 2004 through December 2006. A total of 20 monthly geomeans were calculated for data collected within the time frame of April 1st to October 31st (AB411 data) during the aforementioned time period. Of the 20 geomeans zero exceeded the geomean water quality objective
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml over a 30 day period
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location at North Doheny State Park Campground, DSB4, in the Lower San Juan HSA. This location is found in Doheny State Beach, approximately 200 yards south of San Juan Creek, Dana Point (Latitude 33.46070, Longitude -117.67749).
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) during the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43665, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at North Doheny State Park Campground

LOE ID:	29375
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	-N/A
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2920
Number of Exceedances:	2571
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2000 to December 2007, there were and 2571 beach postings

	days for this section of shoreline. Bacteriological samples are collected on a weekly basis at approximately 150 ocean and bay location in Orange County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of Orange in their Annual Ocean and Bay Water Quality Report, March 2007. The reporting period was from January 2000 -December 2007. Data used was the number of days the beach was posting when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	County of Orange. March 2007. Annual Ocean and Bay Water Quality Report, 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Beach posting data was for posting for Doheny State Park beach.
Temporal Representation:	The beach posting covers the time frame of January 2000 -December 2007.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of Orange's Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43665, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at North Doheny State Park Campground

LOE ID:	30698
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	117
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 123 single samples were collected of which 117 are dry weather (AB411) samples with four exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: : Fecal coliform density shall not exceed 200 per 100ml Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; (SWRCB, 2005)
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005.

	Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location at North Doheny State Park Campground, DSB4, in the Lower San Juan HSA. This location is found in Doheny State Beach, approximately 200 yards south of San Juan Creek, Dana Point (Latitude 33.46070, Longitude -117.67749).
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43665, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at North Doheny State Park Campground

LOE ID:	30813
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	117
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 123 single samples were collected of which 117 are dry weather (AB411) samples with none exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml. Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location at North Doheny State Park Campground, DSB4, in the Lower San Juan HSA. This location is found in Doheny State Beach, approximately 200 yards south of San Juan Creek, Dana Point (Latitude 33.46070, Longitude -117.67749).
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43665, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at North Doheny State Park Campground

LOE ID:	74982
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	121
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 121 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Three Arch Bay site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43665, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at North Doheny State Park Campground

LOE ID:	74983
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	285
Number of Exceedances:	4
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Beach Watch data for Pacific Ocean Shoreline, Lower San Juan HSA, at North Doheny State Park Campground to determine beneficial use support and results are as follows: 4 of 285 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Lower San Juan HSA, at North Doheny State Park Campground was collected at 2 monitoring sites [10000' SOUTH OUTFALL, Dana Strands - Selva Ramp]
Temporal Representation:	Data was collected over the time period 1/3/2008-8/30/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43665, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at North Doheny State Park Campground

LOE ID:	74984
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	134
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	None of the 134 samples exceeded the total coliform objective. For these stations, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean for total coliform shall not exceed more than 1000/100ml. Water Quality Control Plan for the San Diego Basin. Water Quality Control Plan for Ocean Waters.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Coastal Stormdrain at Doheny State Beach (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43665, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at North Doheny State Park Campground

LOE ID:	74985
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	147	041391
Number of Exceedances:	1	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	One of the 147 samples exceeded the fecal coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The single sample total coliform concentration shall not exceed more than 10000/100ml. Water Quality Control Plan for Ocean Waters of California. Region 9 Basion Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected from site DSB4, Coastal Stormdrain at Doheny State Beach (surzone upcoast and surzone downcoast).	
Temporal Representation:	The samples were collected in February 2007.	
Environmental Conditions:		
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43665, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at North Doheny State Park Campground

LOE ID:	74955
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	147
Number of Exceedances:	46
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Forty-six of the 147 samples exceeded the enterococcus objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample enterococcus concentration shall not exceed more than 104/100ml. Water Quality Control Plan for Ocean Waters of California. Region 9 Basion Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from site DSB4, Coastal Stormdrain at Doheny State Beach (surzone upcoast and downcoast).
Temporal Representation:	The samples were collected in February 2007.

Environmental Conditions:	041392
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43665, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at North Doheny State Park Campground

LOE ID:	74956
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	134
Number of Exceedances:	76
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Seventy-six of the 134 geomeans exceeded the enterococcus objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean for enterococcus shall not exceed 35 MPN/100 mL. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Coastal Stormdrain at Doheny State Beach (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43665, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at North Doheny State Park Campground

LOE ID:	74957
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	121
Number of Exceedances:	0

Data and Information Type:	Not Specified	041393
Data Used to Assess Water Quality:	Zero one of the 121 geomeans exceeded the objective.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at the Dana Strands - Selva Ramp site.	
Temporal Representation:	Samples were collected from January 2008 to August 2010.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43665, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at North Doheny State Park Campground

LOE ID:	74958
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	121
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero one of the 121 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Three Arch Bay site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43665, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at North Doheny State Park Campground

LOE ID:	74959
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	041394
Beneficial Use:	Water Contact Recreation	
Number of Samples:	147	
Number of Exceedances:	9	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Nine of the 147 samples exceeded the fecal coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The single sample fecal coliform concentration shall not exceed more than 400/100ml. Water Quality Control Plan for Ocean Waters of California. Region 9 Basion Plan.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected from site DSB4, Coastal Stormdrain at Doheny State Beach (surzone upcoast and downcoast).	
Temporal Representation:	The samples were collected in February 2007.	
Environmental Conditions:		
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43665, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at North Doheny State Park Campground

LOE ID:	74986
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	121
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 121 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Dana Strands - Selva Ramp site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	

QAPP Information:	The samples were collected for the Beach Watch program.	041395
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43665, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at North Doheny State Park Campground

LOE ID:	30959
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	20
Number of Exceedances:	8
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange within the time period from May 2004 through December 2006. A total of 20 monthly geomeans were calculated for data collected within the time frame of April 1st to October 31st (AB411 data) during the aforementioned time period. Of the 20 geomeans calculated eight exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. over a 30 day period
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location at North Doheny State Park Campground, DSB4, in the Lower San Juan HSA. This location is found in Doheny State Beach, approximately 200 yards south of San Juan Creek, Dana Point (Latitude 33.46070, Longitude -117.67749).
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) during the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43665, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at North Doheny State Park Campground

LOE ID:	75010
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	121

Number of Exceedances:	0	041396

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Zero of the 121 geomeans exceeded the objective.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at the Three Arch Bay site.
Temporal Representation: Samples were collected from January 2008 to August 2010.
Environmental Conditions:
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 43665, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at North Doheny State Park Campground

LOE ID: 77641

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Shellfish Harvesting

Number of Samples: 242
Number of Exceedances: 0

Data and Information Type: PATHOGEN MONITORING
Data Used to Assess Water Quality: Zero of the 242 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: The samples were collected at Pacific Ocean Shoreline, Lower San Juan HSA, at North Doheny State Park Campground.
Temporal Representation: The samples were collected from January 2008 through August 2010.
Environmental Conditions:
QAPP Information: The samples were collected for the beach watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 43665, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at North Doheny State Park Campground 041397

LOE ID:	74980
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	134
Number of Exceedances:	1
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	One of the 134 geomeans exceeded the fecal coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean for fecal coliform shall not exceed more than 200/100ml. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Coastal Stormdrain at Doheny State Beach (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43665, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at North Doheny State Park Campground

LOE ID:	74981
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	121
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 121 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.

Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Dana Strands - Selva Ramp site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43665, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at North Doheny State Park Campground

LOE ID:	29361
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	32
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 547 single samples were collected and 32 monthly geomeans calculated. None of the 32 geomeans exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: : Fecal coliform density shall not exceed 200 per 100ml Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; (SWRCB, 2005)
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location at North Doheny State Park Campground, DSB4, in the Lower San Juan HSA. This location is found in Doheny State Beach, approximately 200 yards south of San Juan Creek, Dana Point (Latitude 33.46070, Longitude -117.67749).
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43665, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at North Doheny State Park Campground

LOE ID:	29347
Pollutant:	Enterococcus

LOE Subgroup:	Pollutant-Water	041399
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	123	
Number of Exceedances:	33	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 123 single samples were collected with 33 exceeding the single sample water quality objective.	
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	There is one sampling location at North Doheny State Park Campground, DSB4, in the Lower San Juan HSA. This location is found in Doheny State Beach, approximately 200 yards south of San Juan Creek, Dana Point (Latitude 33.46070, Longitude -117.67749).	
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 43665, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at North Doheny State Park Campground

LOE ID:	29348
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	32
Number of Exceedances:	18
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 548 single samples were collected and 32 monthly geomeans calculated. Of the 32 geomeans, 18 exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. 041400 Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location at North Doheny State Park Campground, DSB4, in the Lower San Juan HSA. This location is found in Doheny State Beach, approximately 200 yards south of San Juan Creek, Dana Point (Latitude 33.46070, Longitude -117.67749).
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43665, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at North Doheny State Park Campground

LOE ID:	30576
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	541
Number of Exceedances:	28
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 548 single samples were collected of which 541 are dry weather (AB411) samples with 28 exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location at North Doheny State Park Campground, DSB4, in the Lower San Juan HSA. This location is found in Doheny State Beach, approximately 200 yards south of San Juan Creek, Dana Point (Latitude 33.46070, Longitude -117.67749).
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.

QAPP Information Reference(s): County of Orange. Quality Assurance/Quality Control Manual, February 2004 024401

Line of Evidence (LOE) for Decision ID 43665, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at North Doheny State Park Campground

LOE ID:	29565
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	123
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 123 single samples were collected with none exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml. Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location at North Doheny State Park Campground, DSB4, in the Lower San Juan HSA. This location is found in Doheny State Beach, approximately 200 yards south of San Juan Creek, Dana Point (Latitude 33.46070, Longitude -117.67749).
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43665, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at North Doheny State Park Campground

LOE ID:	29341
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	6
Number of Exceedances:	5

Data and Information Type:	PWS pathogen monitoring (ambient water) 041402
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 123 single samples were collected with 6 samples correlated with a storm event. Of the 6 samples, 5 exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program, Bacteria Shoreline Data, 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location located at North Doheny State Park Campground, DSB4, in the Lower San Juan HSA. This location is found in Doheny State Beach, approximately 200 yards south of San Juan Creek, Dana Point (Latitude 33.46070, Longitude -117.67749).
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange, Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43665, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at North Doheny State Park Campground

LOE ID:	29329
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	123
Number of Exceedances:	22
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2004 through December 2006. A total of 123 single samples were collected with 22 samples exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program, Bacteria Shoreline Data, 2002 through 2007

SWAMP Data:	Non-SWAMP	041403
Water Quality Objective/Criterion:	From the Ocean Plan, the median total coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	There is one sampling location at North Doheny State Park Campground, DSB4, in the Lower San Juan HSA. This location is found in Doheny State Beach, approximately 200 yards south of San Juan Creek, Dana Point (Latitude 33.46070, Longitude -117.67749).	
Temporal Representation:	Samples were collected at least once a week from January 2004 through December 2006.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 43665, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at North Doheny State Park Campground

LOE ID:	29563
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 123 single samples were collected with 6 samples correlated with a storm event. None of the 6 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml. Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location at North Doheny State Park Campground, DSB4, in the Lower San Juan HSA. This location is found in Doheny State Beach, approximately 200 yards south of San Juan Creek, Dana Point (Latitude 33.46070, Longitude -117.67749).

Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43665, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at North Doheny State Park Campground

LOE ID:	29331
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	6
Number of Exceedances:	6
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2004 through December 2006. A total of 123 single samples were collected with 6 samples associated with storm events. Of those 6 samples, six exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan, the median total coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location at North Doheny State Park Campground, DSB4, in the Lower San Juan HSA. This location is found in Doheny State Beach, approximately 200 yards south of San Juan Creek, Dana Point (Latitude 33.46070, Longitude -117.67749).
Temporal Representation:	Samples were collected at least once a week from January 2004 through December 2006.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.

QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Lower San Juan HSA, at San Juan Creek
Water Body ID: CAC9012000020090505155231
Water Body Type: Coastal & Bay Shoreline

DECISION ID 44645 **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at San Juan Creek

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not Delist from 303(d) list (being addressed with USEPA approved TMDL)**
Last Listing Cycle's Final Listing Decision:	Do Not Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Natural Sources | Source Unknown | Unknown Nonpoint Source | Urban Runoff/Storm Sewers
TMDL Name:	Bacteria Impaired Waters I (creeks and beach shorelines)
TMDL Project Code:	169
Date TMDL Approved by USEPA:	06/22/2011
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal on the CWA section 303(d) List under sections 2.2 and 3.2 of the Listing Policy. Under Section 3.2 of the Policy, a minimum of one line of evidence is needed to assess listing status.

Fifteen lines of evidence are available in the administrative record to assess this pollutant.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List. There is sufficient justification to place it in the Being Addressed portion of the CWA 303(d) List because a TMDL has been completed and approved by RWQCB and USEPA, and is expected to result in attainment of the standard.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, 197 of 230 geomean samples, 116 of 230 geomean samples, and 84 of 228 geomean samples exceed the water quality objectives for enterococcus, fecal coliform, and total coliform, respectively, for the protection of REC-1 beneficial use, and 51 of 51 geomean samples exceed the WQO for total coliform for the protection of SHELL beneficial use, and these exceed the allowable frequency listed in Table [NUMBER] of the Listing Policy.
4. The Bacteria TMDL for 20 beaches/creeks was approved by USEPA on 06/11/2011.
5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 44645, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at San Juan Creek

LOE ID: 75040

Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	53
Number of Exceedances:	53
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Fifty three of the 53 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the SJC Mouth site.
Temporal Representation:	Samples were collected from September 2008 to January 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44645, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at San Juan Creek

LOE ID:	75041
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	153
Number of Exceedances:	34
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Thirty-four of the 153 samples exceeded the fecal coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample fecal coliform concentration shall not exceed more than 400/100ml. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from San Juan Creek Mouth (surfzone upcoast and surfzone

	downcoast). 041408
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44645, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at San Juan Creek

LOE ID:	75042
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	145
Number of Exceedances:	51
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Fifty-one of the 145 geomeans exceeded the fecal coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean for fecal coliform shall not exceed more than 200/100ml. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from San Juan Creek Mouth (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44645, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at San Juan Creek

LOE ID:	75043
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	53

Number of Exceedances:	53	041409

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Fifty-three of the 53 geomeans exceeded the objective.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at the SJC Mouth site.
Temporal Representation: Samples were collected from September 2008 to January 2010.
Environmental Conditions:
QAPP Information: The samples were collected for the beach watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 44645, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at San Juan Creek

LOE ID: 75071

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Shellfish Harvesting

Number of Samples: 64
Number of Exceedances: 63

Data and Information Type: PATHOGEN MONITORING
Data Used to Assess Water Quality: Water Board staff assessed Beach Watch data for Pacific Ocean Shoreline, Lower San Juan HSA, at San Juan Creek to determine beneficial use support and results are as follows: 63 of 64 samples exceed the criterion for Coliform, Total.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Data for this line of evidence for Pacific Ocean Shoreline, Lower San Juan HSA, at San Juan Creek was collected at 1 monitoring site [SJC Mouth]
Temporal Representation: Data was collected over the time period 9/15/2008-1/4/2010.
Environmental Conditions: Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 44645, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at San Juan Creek

LOE ID:	29368
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	12
Number of Exceedances:	7
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 547 single samples were collected with 12 samples correlated with a storm event. From the 12 samples, seven exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The only sampling station is located at San Juan Beach Creek 1, SJC1, in the Lower San Juan HSA Doheny State Beach, Dana Point (Latitude 33.461930, Longitude -117.684010).
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44645, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at San Juan Creek

LOE ID:	29369
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation	041411
Number of Samples:	32	
Number of Exceedances:	12	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 547 single samples were collected with 32 monthy geomeans calculated. From the 32 geomeans, 12 exceeded the geomean water quality objective.	
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; (SWRCB, 2005)	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The only sampling station is located at San Juan Beach Creek 1, SJC1, in the Lower San Juan HSA Doheny State Beach, Dana Point (Latitude 33.461930, Longitude -117.684010).	
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 44645, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at San Juan Creek

LOE ID:	29370
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	547
Number of Exceedances:	48
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 547 single samples were collected with 48 samples exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; (SWRCB, 2005)
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005.

	Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The only sampling station is located at San Juan Beach Creek 1, SJC1, in the Lower San Juan HSA Doheny State Beach, Dana Point (Latitude 33.461930, Longitude -117.684010).
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44645, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at San Juan Creek

LOE ID:	29340
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	12
Number of Exceedances:	12
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 548 single samples were collected with 12 samples correlated with a storm event. All 12 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The only sampling station is located at San Juan Beach Creek 1, SJC1, in the Lower San Juan HSA Doheny State Beach, Dana Point (Latitude 33.461930, Longitude -117.684010).
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff

	because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44645, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at San Juan Creek

LOE ID:	29566
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	548
Number of Exceedances:	9
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 548 single samples were collected with nine samples exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml. Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The only sampling station is located at San Juan Beach Creek 1, SJC1, in the Lower San Juan HSA Doheny State Beach, Dana Point (Latitude 33.461930, Longitude -117.684010).
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44645, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at San Juan Creek

LOE ID:	29351
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	548	041414
Number of Exceedances:	128	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 548 single samples were collected with 128 samples exceeding the single sample water quality objective.	
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The only sampling station is located at San Juan Beach Creek 1, SJC1, in the Lower San Juan HSA Doheny State Beach, Dana Point (Latitude 33.461930, Longitude -117.684010).	
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 44645, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at San Juan Creek

LOE ID:	29376
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	-N/A
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	2292
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2000 to December 2006, there were and 2292 beach postings days for this section of shoreline. Bacteriological samples are collected on a weekly basis at approximately 150 ocean and bay location in Orange County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of Orange in their Annual Ocean and Bay Water Quality Report, March 2007. The reporting period was from January 2000 -December 2006. Data used was the number of days the beach was posting when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	County of Orange. March 2007. Annual Ocean and Bay Water Quality Report, 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960.

	(a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Bacteriological monitoring samples were collected at North Beach, 250' North of San Juan Creek, San Juan Creek/Ocean Interface, 250' South of San Juan Creek, 1000' South of Outfall, 2000' South of Outfall, 3000' South of Outfall and 4000' South of Outfall. The posting covers 1.1 miles of beach shoreline.
Temporal Representation:	The beach closures covers the time frame of January 2000 -December 2006.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of Orange's Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44645, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at San Juan Creek

LOE ID:	30577
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	536
Number of Exceedances:	116
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 548 single samples were collected of which 536 are dry weather (AB411) samples with 116 samples exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The only sampling station is located at San Juan Beach Creek 1, SJC1, in the Lower San Juan HSA Doheny State Beach, Dana Point (Latitude 33.461930, Longitude -117.684010).
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance

	with the County of Orange Quality Assessment/Quality Control document.041416
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44645, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at San Juan Creek

LOE ID:	29570
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	12
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 548 single samples were collected with 12 samples correlated with a storm event. Of the 12 samples, two exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program, Bacteria Shoreline Data, 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml. Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The only sampling station is located at San Juan Beach Creek 1, SJC1, in the Lower San Juan HSA Doheny State Beach, Dana Point (Latitude 33.461930, Longitude -117.684010).
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44645, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at San Juan Creek

LOE ID:	29349

Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	32
Number of Exceedances:	25
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 548 single samples were collected and 32 monthly geomeans calculated. From the 32 geomeans, 25 exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The only sampling station is located at San Juan Beach Creek 1, SJC1, in the Lower San Juan HSA Doheny State Beach, Dana Point (Latitude 33.461930, Longitude -117.684010).
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44645, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at San Juan Creek

LOE ID:	29571
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	32
Number of Exceedances:	7
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 548 single samples were collected with 32 monthly geomeans calculated. Of the 32 geomeans, seven exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml. Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The only sampling station is located at San Juan Beach Creek 1, SJC1, in the Lower San Juan HSA Doheny State Beach, Dana Point (Latitude 33.461930, Longitude -117.684010).
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44645, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at San Juan Creek

LOE ID:	30699
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	535
Number of Exceedances:	41
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 547 single samples were collected of which 535 are dry weather (AB411) samples with 41 samples exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; (SWRCB, 2005)
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The only sampling station is located at San Juan Beach Creek 1, SJC1, in the Lower San Juan HSA Doheny State Beach, Dana Point (Latitude 33.461930, Longitude -117.684010).
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44645, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at San Juan Creek

LOE ID:	30960
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	20
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange within the time period from May 2004 through December 2006. A total of 20 monthly geomeans were calculated for data collected within the time frame of April 1st to October 31st (AB411 data) during the aforementioned time period. Of the 20 geomeans two exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml. over a 30 day period
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The only sampling station is located at San Juan Beach Creek 1, SJC1, in the Lower San Juan HSA Doheny State Beach, Dana Point (Latitude 33.461930, Longitude -117.684010).
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) during the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44645, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at San Juan Creek

LOE ID:	30963
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	20
Number of Exceedances:	5
Data and Information Type:	PWS pathogen monitoring (ambient water)

Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange within the time period from May 2004 through December 2006. A total of 20 monthly geomeans were calculated for data collected within the time frame of April 1st to October 31st (AB411 data) during the aforementioned time period. Of the 20 geomeans five exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml over a 30 day period
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The only sampling station is located at San Juan Beach Creek 1, SJC1, in the Lower San Juan HSA Doheny State Beach, Dana Point (Latitude 33.461930, Longitude -117.684010).
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) during the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44645, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at San Juan Creek

LOE ID:	30814
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	536
Number of Exceedances:	7
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 548 single samples were collected of which 536 are dry weather (AB411) samples with seven samples exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml. Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	The only sampling station is located at San Juan Beach Creek 1, SJC1, in the Lower San Juan HSA Doheny State Beach, Dana Point (Latitude 33.461930, Longitude -117.684010).
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44645, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at San Juan Creek

LOE ID:	75072
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	153
Number of Exceedances:	7
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Seven of the 153 samples exceeded the total coliform objective. For these stations, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample total coliform concentration shall not exceed more than 10000/100ml. Water Quality Control Plan for the San Diego Basin. Water Quality Control Plan for Ocean Waters.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from San Juan Creek Mouth (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44645, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at San Juan Creek

LOE ID:	74668
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	145
Number of Exceedances:	26
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Twenty-six of the 145 samples exceeded the total coliform objective. For these stations, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean for total coliform shall not exceed more than 1000/100ml. Water Quality Control Plan for the San Diego Basin. Water Quality Control Plan for Ocean Waters.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from San Juan Creek Mouth (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44645, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at San Juan Creek

LOE ID:	74669
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	51
Number of Exceedances:	51
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Fifty-one of the 51 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the SJC Mouth site.
Temporal Representation:	Samples were collected from September 2008 to January 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44645, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at San Juan Creek

LOE ID:	30962
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	20
Number of Exceedances:	13
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange within the time period from May 2004 through December 2006. A total of 20 monthly geomeans were calculated for data collected within the time frame of April 1st to October 31st (AB411 data) during the aforementioned time period. Of the 20 geomeans 13 exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml over a 30 day period
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The only sampling station is located at San Juan Beach Creek 1, SJC1, in the Lower San Juan HSA Doheny State Beach, Dana Point (Latitude 33.461930, Longitude -117.684010).
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) during the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44645, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at San Juan Creek

LOE ID:	30311
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Water Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING

Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006. For the 2008 assessment , the 2006 listed coastline 'Pacific Ocean Shoreline, Lower San Juan HSA' was split into smaller segments and each represents an area near the sampling location of the data being assessed. This segment 'Pacific Ocean Shoreline, Lower San Juan HSA, at San Juan Creek' is one of the sampling locations. This LOE is a copy of the 2006 listing placeholder LOE for Pacific Ocean Shoreline, Lower San Juan HSA and is considered by the Regional Board to be applicable to this more specific segment formed from the split.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	
Temporal Representation:	
Environmental Conditions:	
QAPP Information:	Unspecified
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44645, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at San Juan Creek

LOE ID:	77642
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	51
Number of Exceedances:	51
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Fifty-one of the 51 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, Lower San Juan HSA, at San Juan Creek.
Temporal Representation:	The samples were collected from September 2008 to January 2010.
Environmental Conditions:	

QAPP Information:	The samples were collected for the beach watch program.	041425
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44645, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at San Juan Creek

LOE ID:	75015
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	153
Number of Exceedances:	87
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Eighty-seven of the 153 samples exceeded the enterococcus objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample enterococcus concentration shall not exceed more than 104/100ml. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from San Juan Creek Mouth (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44645, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at San Juan Creek

LOE ID:	75039
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	145
Number of Exceedances:	119
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	One hundred nineteen of the 145 geomeans exceeded the enterococcus objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The higher

	of the two values was used for the geomean calculation. 041426
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean for enterococcus shall not exceed 35 MPN/100 mL. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from San Juan Creek Mouth (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

DECISION ID 49846 Region 9

Pacific Ocean Shoreline, Lower San Juan HSA, at San Juan Creek

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. One of the Six samples exceed the Water Quality Criteria for Cadmium. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of Six samples exceeded the Water Quality Criteria for Cadmium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49846, Cadmium Region 9

Pacific Ocean Shoreline, Lower San Juan HSA, at San Juan Creek 041427

LOE ID:	75011
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Zero of the one sample exceeded the water quality objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California's Ocean Plan Table B lists 6-month median concentration of 1 ug/L to protect aquatic life in marine waters.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from SJC-1d on the Pacific Coast near the mouth of San Juan Creek.
Temporal Representation:	Samples were collected from SJC-1d on 5/13/2008.
Environmental Conditions:	
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID 49847 Region 9

Pacific Ocean Shoreline, Lower San Juan HSA, at San Juan Creek

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the Five samples exceed the Water Quality Criteria for Chlorpyrifos.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Five samples exceeded the Water Quality Criteria for Chlorpyrifos and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial

use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49847, Chlorpyrifos **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at San Juan Creek

LOE ID:	75012
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	None of the five samples exceeded the Criteria Continuous Concentration for Chlorpyrifos of 9 ng/L. The reporting limit for the non-detect sample was 10 ng/L which is greater than the evaluation guideline, therefore these data are not of sufficient resolution to determine if water quality standards are being achieved.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Marine communities, including vertebrate, invertebrate, and plant species, shall not be degraded. (2009 CA Ocean Plan)
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The Criteria Continuous Concentration (four day average) for chlorpyrifos in saltwater is 9 ng/L.
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game
Spatial Representation:	Samples were collected at Pacific Ocean Shoreline, Lower San Juan HSA, at San Juan Creek, site SJC1d.
Temporal Representation:	Samples were collected at SJC1d in 2008.
Environmental Conditions:	According to the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010, samples were collected during the dry season and storm events.
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

DECISION ID 49848 **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at San Juan Creek

Pollutant: **Copper**

Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	041429
Last Listing Cycle's Final Listing Decision:	New Decision	
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One lines of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the OBJECTIVE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the OBJECTIVE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49848, Copper **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at San Juan Creek

LOE ID:	75013
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Zero of the one sample exceeded the water quality objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California's Ocean Plan Table B lists 6-month median concentration of 3 ug/L (total) to protect aquatic life in marine waters.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from SJC-1d on the Pacific Coast at the mouth of San Juan Creek.
Temporal Representation:	Samples were collected from SJC-1d on 5/13/2008.

Environmental Conditions:	Samples were collected from stormwater runoff on 12/27/06 and 1/24/08, the remainder were dry weather samples.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID 49849 Region 9

Pacific Ocean Shoreline, Lower San Juan HSA, at San Juan Creek

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the Six samples exceed the Water Quality Criteria for Diazinon. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Six samples exceeded the Water Quality Criteria for Diazinon and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49849, Diazinon Region 9

Pacific Ocean Shoreline, Lower San Juan HSA, at San Juan Creek

LOE ID:	75014
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Zero of one sample exceed the maximum concentration for Diazinon criteria of 820.0 ng/L.

Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009. 041431
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Marine communities, including vertebrate, invertebrate, and plant species, shall not be degraded. (2009 CA Ocean Plan)
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The Criteria Continuous Concentration for diazinon in saltwater is 820 ng/L.
Guideline Reference:	Aquatic Life Ambient Water Quality Criteria for Diazinon
Spatial Representation:	One sample was collected at Pacific Ocean Shoreline, Lower San Juan HSA, at SJC1d.
Temporal Representation:	One sample was collected at SJC1d in 2008.
Environmental Conditions:	According to the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010, samples were collected during the dry season and storm events.
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

DECISION ID 49850 Region 9

Pacific Ocean Shoreline, Lower San Juan HSA, at San Juan Creek

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the Six samples exceed the Water Quality Criteria for Lead. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Six samples exceeded the Water Quality Criteria for Lead and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49850, Lead Region 9

Pacific Ocean Shoreline, Lower San Juan HSA, at San Juan Creek

LOE ID:	75044
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Zero of the one sample exceeded the water quality objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California's Ocean Plan Table B lists 6-month median concentration of 2 ug/L to protect aquatic life in marine waters.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The sample was collected from SJC-1d on the Pacific Coast at the mouth of San Juan Creek.
Temporal Representation:	The sample was collected from SJC-1d on 5/13/2008.
Environmental Conditions:	
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID 49851 Region 9

Pacific Ocean Shoreline, Lower San Juan HSA, at San Juan Creek

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. One of the Six samples exceed the Water Quality Criteria for Malathion.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of Six samples exceeded the Water Quality Criteria for Malathion and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully

supported using table 3.1. 041433
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49851, Malathion **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at San Juan Creek

LOE ID:	75045
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Zero of one sample exceeded the maximum concentration for Malathion of 100 ng/L.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Marine communities, including vertebrate, invertebrate, and plant species, shall not be degraded. (2009 CA Ocean Plan)
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The maximum (Instantaneous) concentration for Malathion in saltwater is 100 ng/L.
Guideline Reference:	Quality Criteria for Water. USEPA Office of Water and Hazardous Materials. Washington, D.C
Spatial Representation:	One sample was collected at Pacific Ocean Shoreline, Lower San Juan HSA, at San Juan Creek, at SJC1d.
Temporal Representation:	One sample was collected at SJC1d in 2008.
Environmental Conditions:	According to the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010, samples were collected during the dry season and storm events.
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

DECISION ID 49852 **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at San Juan Creek

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the one sample exceed the OBJECTIVE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the OBJECTIVE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49852, Nickel **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at San Juan Creek

LOE ID:	75067
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Zero of the one sample exceeded the water quality objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California's Ocean Plan Table B lists 6-month median concentration of 5 ug/L total nickel to protect aquatic life in marine waters.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from SJC-1d on the Pacific Coast at the mouth of San Juan Creek.
Temporal Representation:	Samples were collected from SJC-1d on 5/13/2008.
Environmental Conditions:	Samples were collected from stormwater runoff on 12/27/06 and 1/24/08, the remainder were dry weather samples.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID 49854 **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at San Juan Creek

Pollutant:	**Selenium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceed the Water Quality Criteria Selenium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the Water Quality Criteria for Selenium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49854, Selenium **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at San Juan Creek

LOE ID:	75069
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Zero of one sample exceeded the water quality objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California's Ocean Plan Table B lists 6-month median concentration of 15 ug/L to protect aquatic life in marine waters.

Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from SJC-1d on the Pacific Coast at the mouth of San Juan Creek.
Temporal Representation:	Samples were collected from SJC-1d on 5/13/2008.
Environmental Conditions:	
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID 49855 Region 9

Pacific Ocean Shoreline, Lower San Juan HSA, at San Juan Creek

Pollutant:	**Silver**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the Six samples exceed the Water Quality Criteria for Silver. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Six samples exceeded the Water Quality Criteria for Silver and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49855, Silver Region 9

Pacific Ocean Shoreline, Lower San Juan HSA, at San Juan Creek

LOE ID:	75070
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Marine Habitat

Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the one sample exceeded the water quality objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California's Ocean Plan Table B lists 6-month median concentration of 0.7 ug/L to protect aquatic life in marine waters.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from SJC-1d on the Pacific Coast at the mouth of San Juan Creek.
Temporal Representation:	Sample was collected from SJC-1d on 5/13/2008.
Environmental Conditions:	
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID 49857 Region 9

Pacific Ocean Shoreline, Lower San Juan HSA, at San Juan Creek

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the Six samples exceed the Water Quality Criteria for Zinc.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Six samples exceeded the Water Quality Criteria for Zinc and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49857, Zinc 041438 **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at San Juan Creek

LOE ID:	74671
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the one sample exceeded the water quality objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California's Ocean Plan Table B lists 6-month median concentration of 20 ug/L to protect aquatic life in marine waters.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from SJC-1d on the Pacific Coast at the mouth of San Juan Creek.
Temporal Representation:	Samples were collected from SJC-1d on 5/13/2008.
Environmental Conditions:	Samples were collected from stormwater runoff on 12/27/06 and 1/24/08, the remainder were dry weather samples.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Lower San Juan HSA, at South Doheny State Park Campground
Water Body ID: CAC9013000020090505162035
Water Body Type: Coastal & Bay Shoreline

DECISION ID 49858 **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at South Doheny State Park Campground

Pollutant: Arsenic
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the Two samples exceed the Water Quality Criteria Arsenic.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Two samples exceeded the Water Quality Criteria for Zinc and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49858, Arsenic **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at South Doheny State Park Campground

LOE ID: 74672

Pollutant: Arsenic
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Dissolved

Beneficial Use: Marine Habitat

Number of Samples:	2	041440
Number of Exceedances:	0	
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)	
Data Used to Assess Water Quality:	None of the two samples exceeded the water quality objective.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California's Ocean Plan Table B lists 6-month median concentration of 8 ug/L to protect aquatic life in marine waters.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from DSB-1d and DSB-5d located on the Pacific coast within influence of North Beach Creek.	
Temporal Representation:	Samples were collected on 12/15/2008.	
Environmental Conditions:	Samples were collected from stormwater runoff.	
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.	
QAPP Information Reference(s):		

DECISION ID 49859 Region 9

Pacific Ocean Shoreline, Lower San Juan HSA, at South Doheny State Park Campground

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the Two samples exceed the Water Quality Criteria for Cadmium. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Two samples exceeded the Water Quality Criteria for Cadmium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49859, Cadmium 041441 **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at South Doheny State Park Campground

LOE ID:	74673
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the two samples exceeded the water quality objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California's Ocean Plan Table B lists 6-month median concentration of 1 ug/L to protect aquatic life in marine waters.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from DSB-1d and DSB-5d located on the Pacific coast within influence of North Beach Creek.
Temporal Representation:	Samples were collected on 12/15/2008.
Environmental Conditions:	Samples were collected from stormwater runoff.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID 49861 **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at South Doheny State Park Campground

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the Two samples exceed the Water Quality Criteria for Copper.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.

3. Zero of Two samples exceeded the Water Quality Criteria for Copper and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49861, Copper **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at South Doheny State Park Campground

LOE ID:	74696
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the two samples exceeded the water quality objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California's Ocean Plan Table B lists 6-month median concentration of 3 ug/L to protect aquatic life in marine waters.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from DSB-1d and DSB-5d located on the Pacific coast within influence of North Beach Creek.
Temporal Representation:	Samples were collected on 12/15/2008.
Environmental Conditions:	Samples were collected from stormwater runoff.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID 49862 **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at South Doheny State Park Campground

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Water Quality Criteria for Diazinon. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Water Quality Criteria for Diazinon and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49862, Diazinon **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at South Doheny State Park Campground

LOE ID:	74697
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	One sample tested for Diazinon did not exceed the criteria of 820.0 ng/L.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Marine communities, including vertebrate, invertebrate, and plant species, shall not be degraded. (2009 Ocean Plan)
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The Criteria Continuous Concentration for diazinon in saltwater is 820 ng/L.
Guideline Reference:	Aquatic Life Ambient Water Quality Criteria for Diazinon
Spatial Representation:	Sample was collected from Pacific Ocean Shoreline, Lower San Juan HSA, at South Doheny State Park Campground.
Temporal Representation:	Sample was collected in December of 2008.
Environmental Conditions:	According to the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010, samples were collected during the dry season and storm events.
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the

development of this QAMP, therefore the quality of these data are unknown. 041444

QAPP Information Reference(s):

DECISION ID 49863 Region 9

Pacific Ocean Shoreline, Lower San Juan HSA, at South Doheny State Park Campground

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the Two samples exceed the Water Quality Criteria for Lead. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Two samples exceeded the Water Quality Criteria for Lead and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49863, Lead Region 9

Pacific Ocean Shoreline, Lower San Juan HSA, at South Doheny State Park Campground

LOE ID:	74724
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the two samples exceeded the water quality objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	California's Ocean Plan Table B lists 6-month median concentration of 2 ug/L to protect aquatic life in marine waters.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from DSB-1d and DSB-5d located on the Pacific coast within influence of North Beach Creek.
Temporal Representation:	Samples were collected on 12/15/2008.
Environmental Conditions:	Samples were collected from stormwater runoff.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID 49864 Region 9

Pacific Ocean Shoreline, Lower San Juan HSA, at South Doheny State Park Campground

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Water Quality Criteria for Malathion. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Water Quality Criteria for Malathion and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49864, Malathion Region 9

Pacific Ocean Shoreline, Lower San Juan HSA, at South Doheny State Park Campground

LOE ID:	74725
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water

Matrix:	Water	041446
Fraction:	Total Dissolved	
Beneficial Use:	Marine Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)	
Data Used to Assess Water Quality:	One sample tested for Malathion did not exceed the maximum concentration for Malathion of 100 ng/L.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Marine communities, including vertebrate, invertebrate, and plant species, shall not be degraded. (2009 Ocean Plan)	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:	The maximum (Instantaneous) concentration for Malathion in saltwater is 100 ng/L.	
Guideline Reference:	Quality Criteria for Water. USEPA Office of Water and Hazardous Materials. Washington, D.C	
Spatial Representation:	Sample was collected from Pacific Ocean Shoreline, Lower San Juan HSA, at South Doheny State Park Campground.	
Temporal Representation:	Sample was collected in December of 2008.	
Environmental Conditions:	According to the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010, samples were collected during the dry season and storm events.	
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.	
QAPP Information Reference(s):		

DECISION ID 49865 Region 9

Pacific Ocean Shoreline, Lower San Juan HSA, at South Doheny State Park Campground

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the Two samples exceed the Water Quality Criteria for Nickel.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Two samples exceeded the Water Quality Criteria for Nickel and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully

supported using table 3.1. 041447
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49865, Nickel **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at South Doheny State Park Campground

LOE ID:	74726
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the two samples exceeded the water quality objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California's Ocean Plan Table B lists 6-month median concentration of 5 ug/L to protect aquatic life in marine waters.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from DSB-1d and DSB-5d located on the Pacific coast within influence of North Beach Creek.
Temporal Representation:	Samples were collected on 12/15/2008.
Environmental Conditions:	Samples were collected from stormwater runoff.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID 49866 **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at South Doheny State Park Campground

Pollutant:	**Nitrogen, ammonia (Total Ammonia)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Water Quality Criteria for Nitrogen, ammonia (Total Ammonia).

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Water Quality Criteria for Nitrogen, ammonia (Total Ammonia) and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49866, Nitrogen, ammonia (Total Ammonia) Region 9

Pacific Ocean Shoreline, Lower San Juan HSA, at South Doheny State Park Campground

LOE ID:	74727
Pollutant:	Nitrogen, ammonia (Total Ammonia)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Marine Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	The single sample did not exceeded the water quality objective for total ammonia.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. The Ocean Plan objective for total ammonia as nitrogen is a 6-month median of 600 ug/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The sample was collected at station DSB1.
Temporal Representation:	The sample was collected on 12/15/08.
Environmental Conditions:	
QAPP Information:	A signed QAPP was included with the stated goal of ensuring the consistent collection of accurate water quality information that will used to satisfy the objectives of the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID 49872 Region 9

Pacific Ocean Shoreline, Lower San Juan HSA, at South Doheny State Park Campground 041449

Pollutant:	**Selenium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One lines of evidence is available in the administrative record to assess this pollutant. Zero of the Two samples exceed the Water Quality Criteria for Selenium. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Two samples exceeded the Water Quality Criteria for Selenium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49872, Selenium — Region 9

Pacific Ocean Shoreline, Lower San Juan HSA, at South Doheny State Park Campground

LOE ID:	74728
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the two samples exceeded the water quality objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California's Ocean Plan Table B lists 6-month median concentration of 15 ug/L to protect aquatic life in marine waters.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	

Guideline Reference:	041450
Spatial Representation:	Samples were collected from DSB-1d and DSB-5d located on the Pacific coast within influence of North Beach Creek.
Temporal Representation:	Samples were collected on 12/15/2008.
Environmental Conditions:	Samples were collected from stormwater runoff.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID 49873 Region 9

Pacific Ocean Shoreline, Lower San Juan HSA, at South Doheny State Park Campground

Pollutant:	**Silver**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the Two samples exceed the Water Quality Criteria for Silver. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Two samples exceeded the Water Quality Criteria for Silver and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49873, Silver Region 9

Pacific Ocean Shoreline, Lower San Juan HSA, at South Doheny State Park Campground

LOE ID:	74729
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	2

Number of Exceedances:	0	041451

Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the two samples exceeded the water quality objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California's Ocean Plan Table B lists 6-month median concentration of 0.7 ug/L to protect aquatic life in marine waters.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from DSB-1d and DSB-5d located on the Pacific coast within influence of North Beach Creek.
Temporal Representation:	Samples were collected on 12/15/2008.
Environmental Conditions:	Samples were collected from stormwater runoff.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID 49874 Region 9

Pacific Ocean Shoreline, Lower San Juan HSA, at South Doheny State Park Campground

Pollutant:	**Toxicity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exhibited water toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3.Zero of One samples exhibited water toxicity and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49874, Toxicity Region 9

Pacific Ocean Shoreline, Lower San Juan HSA, at South Doheny State Park Campground 041452

LOE ID:	74753
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Marine Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to test for water toxicity. None of the samples exhibited statistically significant toxicity.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected at stations DSB1 Coastal Stormdrain.
Temporal Representation:	The sample was collected in December 2008.
Environmental Conditions:	
QAPP Information:	The data collected under the Quality Assurance Management Plan for The Orange County Stormwater Program. The SWAMP measurement quality objectives were followed for toxicity data. The performance of toxicity bioassays and evaluation of reference toxicants were performed using USEPA and Standard Methods.
QAPP Information Reference(s):	

DECISION ID **49876** **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at South Doheny State Park Campground

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the Two samples exceed the Water Quality Criteria for Zinc. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that: 041453
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Two samples exceeded the Water Quality Criteria for Zinc and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49876, Zinc **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at South Doheny State Park Campground

LOE ID:	74754
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the two samples exceeded the water quality objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California's Ocean Plan Table B lists 6-month median concentration of 20 ug/L to protect aquatic life in marine waters.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from DSB-1d and DSB-5d located on the Pacific coast within influence of North Beach Creek.
Temporal Representation:	Samples were collected on 12/15/2008.
Environmental Conditions:	Samples were collected from stormwater runoff.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID 44451 **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at South Doheny State Park Campground

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (being addressed by USEPA approved TMDL)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised

Sources:	Source Unknown	041454
TMDL Name:	Bacteria Impaired Waters I (creeks and beach shorelines)	
TMDL Project Code:	169	
Date TMDL Approved by USEPA:	06/22/2011	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for removal on the CWA section 303(d) List under sections 2.2 and 3.2 of the Listing Policy. Under Section 3.2 of the Policy, a minimum of one line of evidence is needed to assess listing status.

Eleven lines of evidence are available in the administrative record to assess this pollutant.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List. There is sufficient justification to place it in the Being Addressed portion of the CWA 303(d) List because a TMDL has been completed and approved by RWQCB and USEPA, and is expected to result in attainment of the standard.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, 78 of 166 geomean samples and 72 of 271 single samples exceed the water quality objectives for enterococcus and these exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. The Bacteria TMDL for 20 beach/creeks was approved by USEPA on 06/22/2011.
5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 44451, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at South Doheny State Park Campground

LOE ID:	30966
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	20
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange within the time period from May 2004 through December 2006. A total of 20 monthly geomeans were calculated for data collected within the time frame of April 1st to October 31st (AB411 data) during the aforementioned time period. Of the 20 geomeans zero exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml over a 30 day period

Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling at South Doheny State Park Campground, DSB1, in the Lower San Juan HSA. This location is found in Doheny State Beach, Dana Point.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) during the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44451, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at South Doheny State Park Campground

LOE ID:	30964
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	20
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange within the time period from May 2004 through December 2006. A total of 20 monthly geomeans were calculated for data collected within the time frame of April 1st to October 31st (AB411 data) during the aforementioned time period. Of the 20 geomeans zero exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml. over a 30 day period
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling at South Doheny State Park Campground, DSB1, in the Lower San Juan HSA. This location is found in Doheny State Beach, Dana Point.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) during the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44451, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at South Doheny State Park Campground 041456

LOE ID:	74723
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	134
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	None of the 134 geomeans exceeded the fecal coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean for fecal coliform shall not exceed more than 200/100ml. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Coastal Stormdrain at Doheny State Beach (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44451, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at South Doheny State Park Campground

LOE ID:	74751
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	147
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 147 samples exceeded the total coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	The single sample total coliform concentration shall not exceed more than 10000/100ml. Water Quality Control Plan for Ocean Waters of California. Region 9 Basion Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from site DSB1, Coastal Stormdrain at Doheny State Beach (surzone upcoast and downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to June 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44451, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at South Doheny State Park Campground

LOE ID:	74752
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	134
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	None of the 134 samples exceeded the total coliform objective. For these stations, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean for total coliform shall not exceed more than 1000/100ml. Water Quality Control Plan for the San Diego Basin. Water Quality Control Plan for Ocean Waters.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Coastal Stormdrain at Doheny State Beach (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44451, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at South Doheny State Park Campground

LOE ID:	74700

Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	147
Number of Exceedances:	7
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Seven of the 147 samples exceeded the fecal coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample fecal coliform concentration shall not exceed more than 400/100ml. Water Quality Control Plan for Ocean Waters of California. Region 9 Basion Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from site DSB1, Coastal Stormdrain at Doheny State Beach (surzone upcoast and downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to June 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44451, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at South Doheny State Park Campground

LOE ID:	74699
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	134
Number of Exceedances:	66
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Sixty-six of the 134 geomeans exceeded the enterococcus objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean for enterococcus shall not exceed 35 MPN/100 mL. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: The samples were collected from Coastal Stormdrain at Doheny State Beach (surfzone upcoast and surfzone downcoast).
Temporal Representation: The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:
QAPP Information: The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 44451, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at South Doheny State Park Campground

LOE ID: 74698

Pollutant: Enterococcus
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 147
Number of Exceedances: 42

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Forty-two of the 147 samples exceeded the enterococcus objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.
Data Reference: Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The single sample enterococcus concentration shall not exceed more than 104/100ml. Water Quality Control Plan for Ocean Waters of California. Region 9 Basion Plan.
Objective/Criterion Reference: Water Quality Control Plan for the San Diego Basin
California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: The samples were collected from site DSB1, Coastal Stormdrain at Doheny State Beach (surzone upcoast and surfzone downcoast).
Temporal Representation: The samples were collected once a week from July 2006 to June 2009.
Environmental Conditions:
QAPP Information: The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 44451, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at South Doheny State Park Campground

LOE ID: 30700

Pollutant: Fecal Coliform
LOE Subgroup: Pollutant-Water

Matrix:	Water	041460
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	537	
Number of Exceedances:	2	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 547 single samples were collected of which 537are dry weather (AB411) samples with two samples exceeding the single sample water quality objective.	
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; (SWRCB, 2005)	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	There is one sampling at South Doheny State Park Campground, DSB1, in the Lower San Juan HSA. This location is found in Doheny State Beach, Dana Point.	
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 44451, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at South Doheny State Park Campground

LOE ID:	29357
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	124
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 124 single samples were collected with three samples exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml

	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; (SWRCB, 2005)
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling at South Doheny State Park Campground, DSB1, in the Lower San Juan HSA. This location is found in Doheny State Beach, Dana Point.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44451, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at South Doheny State Park Campground

LOE ID:	29365
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	6
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 124 single samples were collected with 6 samples correlated with a storm event. From the 6 samples, one exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml
	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling at South Doheny State Park Campground, DSB1, in the Lower San Juan HSA. This location is found in Doheny State Beach, Dana Point.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.

QAPP Information Reference(s): County of Orange. Quality Assurance/Quality Control Manual, February 2004 02449462

Line of Evidence (LOE) for Decision ID 44451, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at South Doheny State Park Campground

LOE ID:	29567
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	124
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 124 single samples were collected with none exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml. Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling at South Doheny State Park Campground, DSB1, in the Lower San Juan HSA. This location is found in Doheny State Beach, Dana Point.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44451, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at South Doheny State Park Campground

LOE ID:	29568
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)

Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 124 single samples were collected with 6 samples correlated with a storm event. None of the 6 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml. Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling at South Doheny State Park Campground, DSB1, in the Lower San Juan HSA. This location is found in Doheny State Beach, Dana Point.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44451, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at South Doheny State Park Campground

LOE ID:	29366
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	32
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 124 single samples were collected with 32 geomeans calculated. From the 32 geomeans, one exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml 041464 Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; (SWRCB, 2005)
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling at South Doheny State Park Campground, DSB1, in the Lower San Juan HSA. This location is found in Doheny State Beach, Dana Point.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44451, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at South Doheny State Park Campground

LOE ID:	29513
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	32
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 124 single samples were collected with 32 geomeans calculated. From the 32 geomeans, one exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml. Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling at South Doheny State Park Campground, DSB1, in the Lower San Juan HSA. This location is found in Doheny State Beach, Dana Point.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44451, Indicator Bacteria 041465 Region 9

Pacific Ocean Shoreline, Lower San Juan HSA, at South Doheny State Park Campground

LOE ID:	29332
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	6
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 124 single samples were collected with 6 samples correlated with a storm event. From the 6 samples, 4 exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling at South Doheny State Park Campground, DSB1, in the Lower San Juan HSA. This location is found in Doheny State Beach, Dana Point.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44451, Indicator Bacteria Region 9

Pacific Ocean Shoreline, Lower San Juan HSA, at South Doheny State Park Campground

LOE ID:	29377
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	-N/A
Fraction:	None

Beneficial Use:	Water Contact Recreation
Number of Samples:	2920
Number of Exceedances:	2571
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2000 to December 2007, there were and 2571 beach postings days for this section of shoreline. Bacteriological samples are collected on a weekly basis at approximately 150 ocean and bay location in Orange County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of Orange in their Annual Ocean and Bay Water Quality Report, March 2007. The reporting period was from January 2000 -December 2007. Data used was the number of days the beach was posting when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	County of Orange. March 2007. Annual Ocean and Bay Water Quality Report, 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The beach postings were for all of Doheny State Park beach.
Temporal Representation:	The beach posting covers the time frame of January 2000 -December 2007.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of Orange's Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44451, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at South Doheny State Park Campground

LOE ID:	29344
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	32
Number of Exceedances:	12
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 124 single samples were collected with 32 geomeans calculated. From the 32 geomeans, 12 exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling at South Doheny State Park Campground, DSB1, in the Lower San Juan HSA. This location is found in Doheny State Beach, Dana Point.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44451, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at South Doheny State Park Campground

LOE ID:	29345
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	124
Number of Exceedances:	30
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 124 single samples were collected with 30 exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling at South Doheny State Park Campground, DSB1, in the Lower San Juan HSA. This location is found in Doheny State Beach, Dana Point.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance

	with the County of Orange Quality Assessment/Quality Control document.041468
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44451, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at South Doheny State Park Campground

LOE ID:	29346
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	6
Number of Exceedances:	6
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 124 single samples were collected with 6 samples correlated with storm events. From the 6 samples, 6 exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program, Bacteria Shoreline Data, 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling at South Doheny State Park Campground, DSB1, in the Lower San Juan HSA. This location is found in Doheny State Beach, Dana Point.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44451, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at South Doheny State Park Campground

LOE ID:	29330
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting

Number of Samples:	124
Number of Exceedances:	20
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 124 single samples were collected with 20 exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program, Bacteria Shoreline Data, 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling at South Doheny State Park Campground, DSB1, in the Lower San Juan HSA. This location is found in Doheny State Beach, Dana Point.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44451, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at South Doheny State Park Campground

LOE ID:	30578
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	538
Number of Exceedances:	38
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 547 single samples were collected of which 538 are dry weather (AB411) samples with 38 exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program, Bacteria Shoreline Data, 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:	041470
Guideline Reference:	
Spatial Representation:	There is one sampling at South Doheny State Park Campground, DSB1, in the Lower San Juan HSA. This location is found in Doheny State Beach, Dana Point.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44451, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at South Doheny State Park Campground

LOE ID:	30965
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	20
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange within the time period from May 2004 through December 2006. A total of 20 monthly geomeans were calculated for data collected within the time frame of April 1st to October 31st (AB411 data) during the aforementioned time period. Of the 20 geomeans four exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. over a 30 day period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling at South Doheny State Park Campground, DSB1, in the Lower San Juan HSA. This location is found in Doheny State Beach, Dana Point.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) during the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44451, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at South Doheny State Park Campground

LOE ID:	30815
Pollutant:	Total Coliform

LOE Subgroup:	Pollutant-Water	041471
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	538	
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 548 single samples were collected of which 538 are dry weather (AB411) samples with none exceeding the single sample water quality objective.	
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program, Bacteria Shoreline Data, 2002 through 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml. Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	There is one sampling at South Doheny State Park Campground, DSB1, in the Lower San Juan HSA. This location is found in Doheny State Beach, Dana Point.	
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

DECISION ID 49860 Region 9

Pacific Ocean Shoreline, Lower San Juan HSA, at South Doheny State Park Campground

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the Zero samples exceed the Water Quality Criteria Chlorpyrifos.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.

3. Zero of Zero samples exceeded the Water Quality Criteria for Chlorpyrifos and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49860, Chlorpyrifos **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at South Doheny State Park Campground

LOE ID:	74695
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	The Reporting Limit of 10 ng/L is higher than the criteria of 9ng/L which makes the data not usable.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Marine communities, including vertebrate, invertebrate, and plant species, shall not be degraded. (2009 Ocean Plan)
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The Criteria Continuous Concentration (four day average) for chlorpyrifos in saltwater is 9 ng/L.
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game
Spatial Representation:	Sample was collected from Pacific Ocean Shoreline, Lower San Juan HSA, at South Doheny State Park Campground.
Temporal Representation:	Sample was collected in December of 2008.
Environmental Conditions:	According to the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010, samples were collected during the dry season and storm events.
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, San Clemente HA, at South Capistrano Beach at Beach Road
Water Body ID: CAC9013000020090505160142
Water Body Type: Coastal & Bay Shoreline

DECISION ID 43737 **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Capistrano Beach at Beach Road

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (being addressed by USEPA approved TMDL)**
Last Listing Cycle's Final Listing Decision:	Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
TMDL Name:	Bacteria Impaired Waters I (creeks and beach shorelines)
TMDL Project Code:	169
Date TMDL Approved by USEPA:	06/22/2011
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Fourteen lines of evidence are available in the administrative record to assess this pollutant. With the latest data, 67 of 166 geomean samples exceed the water quality objective for enterococcus for the protection of REC-1 beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, 67 of 166 geomean samples exceed the water quality objective for enterococcus for the protection of REC-1 beneficial use and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 43737, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Capistrano Beach at Beach Road

LOE ID:	30636
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	041474
Beneficial Use:	Water Contact Recreation	
Number of Samples:	121	
Number of Exceedances:	15	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 127 single samples were collected of which 121 are dry weather (AB411) samples with 15 exceeding the single sample water quality objective.	
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	There is one sampling location at South Capistrano Beach at Beach Road, CSBBR1, in the Lower San Juan HAS at Capistrano Beach/Dana Point. Lat/Long: 33.45311/-117.66536.	
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 43737, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Capistrano Beach at Beach Road

LOE ID:	30737
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	120
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 126 single samples were collected of which 120 are dry weather (AB411) samples with three exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; (SWRCB,

	2005) 041475
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location located at South Capistrano Beach at Beach Road, CSBBR1, in the Lower San Juan HAS at Capistrano Beach/Dana Point. Lat/Long: 33.45311/-117.66536.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43737, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Capistrano Beach at Beach Road

LOE ID:	30993
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	20
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange within the time period from May 2004 through December 2006. A total of 20 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 20 geomeans zero exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml over a 30 day period
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location located at South Capistrano Beach at Beach Road, CSBBR1, in the Lower San Juan HAS at Capistrano Beach/Dana Point. Lat/Long: 33.45311/-117.66536.
Temporal Representation:	Samples were collected at least once a week within the time period from May 2004 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period. AB411 excludes the consideration of wet weather data.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.

QAPP Information Reference(s): County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43737, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Capistrano Beach at Beach Road

LOE ID:	30994
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	20
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange within the time period from May 2004 through December 2006. A total of 20 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 20 geomeans zero exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. over a 30 day period (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling located at South Capistrano Beach at Beach Road, CSBBR1, in the Lower San Juan HAS at Capistrano Beach/Dana Point. Lat/Long: 33.45311/-117.66536.
Temporal Representation:	Samples were collected at least once a week within the time period from May 2004 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43737, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Capistrano Beach at Beach Road

LOE ID:	30992
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	20

Number of Exceedances:	0	041477

Data and Information Type: PWS pathogen monitoring (ambient water)

Data Used to Assess Water Quality: Beach monitoring data was collected by the County of Orange within the time period from May 2004 through December 2006. A total of 20 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 20 geomeans zero exceeded the geomean water quality objective.

Data Reference: The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program, Bacteria Shoreline Data, 2002 through 2007

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: Geomean: Total coliform density shall not exceed 1,000 per 100ml over a 30 day period (SWRCB, 2005).

Objective/Criterion Reference: Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:

Guideline Reference:

Spatial Representation: There is one sampling located at South Capistrano Beach at Beach Road, CSBBR1, in the Lower San Juan HAS at Capistrano Beach/Dana Point. Lat/Long: 33.45311/-117.66536.

Temporal Representation: Samples were collected at least once a week within the time period from May 2004 through December 2006.
The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period.

Environmental Conditions:

QAPP Information: Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.

QAPP Information Reference(s): County of Orange, Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43737, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Capistrano Beach at Beach Road

LOE ID: 74923

Pollutant: Enterococcus

LOE Subgroup: Pollutant-Water

Matrix: Water

Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 134

Number of Exceedances: 55

Data and Information Type: Not Specified

Data Used to Assess Water Quality: Fifty-five of the 134 geomeans exceeded the enterococcus objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.

Data Reference: Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The geometric mean for enterococcus shall not exceed 35 MPN/100 mL. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.

Objective/Criterion Reference: Water Quality Control Plan for the San Diego Basin
California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:

Guideline Reference:	041478
Spatial Representation:	The samples were collected from Coastal Stormdrain at Capistrano Beach (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43737, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Capistrano Beach at Beach Road

LOE ID:	74924
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	147
Number of Exceedances:	31
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Thirty-one of the 147 samples exceeded the enterococcus objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample enterococcus concentration shall not exceed more than 104/100ml. Water Quality Control Plan for Ocean Waters of California. Region 9 Basion Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from site CSBBR1, Coastal Stormdrain at Capistrano Beach(surzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to June 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43737, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Capistrano Beach at Beach Road

LOE ID:	74941
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation	041479
Number of Samples:	147	
Number of Exceedances:	5	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Five of the 147 samples exceeded the fecal coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The single sample fecal coliform concentration shall not exceed more than 400/100ml. Water Quality Control Plan for Ocean Waters of California. Region 9 Basion Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected from site CSBBR1, Coastal Stormdrain at Capistrano Beach(surzone upcoast and downcoast).	
Temporal Representation:	The samples were collected once a week from July 2006 to June 2009.	
Environmental Conditions:		
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43737, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Capistrano Beach at Beach Road

LOE ID:	74942
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	134
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	None of the 134 geomeans exceeded the fecal coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean for fecal coliform shall not exceed more than 200/100ml. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Coastal Stormdrain at Capistrano Beach (surfzone

upcoast and surfzone downcoast). 041480

Temporal Representation: The samples were collected once a week from July 2006 to 2009.

Environmental Conditions:

QAPP Information: The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.

QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 43737, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Capistrano Beach at Beach Road

LOE ID: 74943

Pollutant: Total Coliform

LOE Subgroup: Pollutant-Water

Matrix: Water

Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 147

Number of Exceedances: 1

Data and Information Type: Not Specified

Data Used to Assess Water Quality: One of the 147 samples exceeded the total coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.

Data Reference: Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The single sample total coliform concentration shall not exceed more than 10000/100ml. Water Quality Control Plan for Ocean Waters of California. Region 9 Basion Plan.

Objective/Criterion Reference: Water Quality Control Plan for the San Diego Basin
California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:

Guideline Reference:

Spatial Representation: The samples were collected from site CSBBR1, Coastal Stormdrain at Capistrano Beach(surzone upcoast).

Temporal Representation: The samples were collected once a week from July 2006 to June 2009.

Environmental Conditions:

QAPP Information: The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.

QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 43737, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Capistrano Beach at Beach Road

LOE ID: 74944

Pollutant: Total Coliform

LOE Subgroup: Pollutant-Water

Matrix: Water

Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 134

Number of Exceedances:	0	041481
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	None of the 134 samples exceeded the total coliform objective. For these stations, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The geometric mean for total coliform shall not exceed more than 1000/100ml. Water Quality Control Plan for the San Diego Basin. Water Quality Control Plan for Ocean Waters.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected from Coastal Stormdrainat Capistrano Beach (surfzone upcoast and surfzone downcoast).	
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.	
Environmental Conditions:		
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43737, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Capistrano Beach at Beach Road

LOE ID:	29373
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	-N/A
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	1307
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2000 to December 2007 there were and 1307 beach postings days for this section of shoreline. Bacteriological samples are collected on a weekly basis at approximately 150 ocean and bay location in Orange County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of Orange in their Annual Ocean and Bay Water Quality Report, March 2007. The reporting period was from January 2000 -December 2006. Data used was the number of days the beach was posting when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	County of Orange. March 2007. Annual Ocean and Bay Water Quality Report, 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion

	close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Beach posting data covers all Capistrano County Beach.
Temporal Representation:	The beach posting covers the time frame of January 2000 -December 2007.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of Orange's Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43737, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Capistrano Beach at Beach Road

LOE ID:	29336
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	127
Number of Exceedances:	16
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 127 single samples were collected with 16 exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From The Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location at South Capistrano Beach at Beach Road, CSBBR1, in the Lower San Juan HAS at Capistrano Beach/Dana Point. Lat/Long: 33.45311/-117.66536.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43737, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Capistrano Beach at Beach Road

LOE ID:	29337

Pollutant:	Enterococcus	041483
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	6	
Number of Exceedances:	3	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 127 single samples were collected with 6 of those samples correlated with a storm event. From the 6 samples 3 exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.	
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program, Bacteria Shoreline Data, 2002 through 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	There is one sampling location at South Capistrano Beach at Beach Road, CSBBR1, in the Lower San Juan HAS at Capistrano Beach/Dana Point. Lat/Long: 33.45311/-117.66536.	
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.	
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 43737, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Capistrano Beach at Beach Road

LOE ID:	29562
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	127	041484
Number of Exceedances:	1	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 127 single samples were collected with one sample exceeding the single sample water quality objective.	
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml. Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	There is one sampling location at South Capistrano Beach at Beach Road, CSBBR1, in the Lower San Juan HAS at Capistrano Beach/Dana Point. Lat/Long: 33.45311/-117.66536.	
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 43737, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Capistrano Beach at Beach Road

LOE ID:	29350
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	32
Number of Exceedances:	12
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 548 single samples were collected and 32 monthly geomeans calculated. From the 32 geomeans, 12 exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:
Guideline Reference:

Spatial Representation: There is one sampling located at South Capistrano Beach at Beach Road, CSBBR1, in the Lower San Juan HAS at Capistrano Beach/Dana Point. Lat/Long: 33.45311/-117.66536.
Temporal Representation: Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:
QAPP Information: Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s): County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43737, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Capistrano Beach at Beach Road

LOE ID: 29364

Pollutant: Fecal Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 32
Number of Exceedances: 0

Data and Information Type: PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality: Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 547 single samples were collected with 32 monthly geomeans calculated. None of the geomeans exceeded the geomean water quality objective.
Data Reference: The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program, Bacteria Shoreline Data, 2002 through 2007

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: Geomean: Fecal coliform density shall not exceed 200 per 100ml

Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; (SWRCB, 2005)
Objective/Criterion Reference: Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:
Guideline Reference:

Spatial Representation: There is one sampling location located at South Capistrano Beach at Beach Road, CSBBR1, in the Lower San Juan HAS at Capistrano Beach/Dana Point. Lat/Long: 33.45311/-117.66536.
Temporal Representation: Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:
QAPP Information: Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s): County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43737, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Capistrano Beach at Beach Road

LOE ID: 29367

Pollutant:	Fecal Coliform	041486
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	126	
Number of Exceedances:	3	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 126 single samples were collected with three exceeding the single sample water quality objective.	
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program, Bacteria Shoreline Data, 2002 through 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; (SWRCB, 2005)	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	There is one sampling location located at South Capistrano Beach at Beach Road, CSBBR1, in the Lower San Juan HAS at Capistrano Beach/Dana Point. Lat/Long: 33.45311/-117.66536.	
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 43737, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Capistrano Beach at Beach Road

LOE ID:	29569
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	32
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 548 single samples were collected with 32 monthly geomeans calculated. None of the geomeans exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program, Bacteria Shoreline Data, 2002 through 2007
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml. Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling located at South Capistrano Beach at Beach Road, CSBBR1, in the Lower San Juan HAS at Capistrano Beach/Dana Point. Lat/Long: 33.45311/-117.66536.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43737, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Capistrano Beach at Beach Road

LOE ID:	29511
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 127 single samples were collected with 6 correlated with a storm event. None of the 6 sample exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml. Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005). Comparison to water quality objectives were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	There is one sampling location located at South Capistrano Beach at Beach Road, CSBBR1, in the Lower San Juan HSA at Capistrano Beach/Dana Point. Lat/Long: 33.45311/-117.66536.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43737, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Capistrano Beach at Beach Road

LOE ID:	29363
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 126 single samples were collected with 6 samples correlated with a storm event. None of the 6 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program, Bacteria Shoreline Data, 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; (SWRCB, 2005)
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location located at South Capistrano Beach at Beach Road, CSBBR1, in the Lower San Juan HAS at Capistrano Beach/Dana Point. Lat/Long: 33.45311/-117.66536.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.

QAPP Information Reference(s): County of Orange. Quality Assurance/Quality Control Manual, February 2004 024489

Line of Evidence (LOE) for Decision ID 43737, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Capistrano Beach at Beach Road

LOE ID:	29333
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	6
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 127 single samples were collected with 6 samples correlated with a storm event. From the 6 samples, 4 exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From The Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location located at South Capistrano Beach at Beach Road, CSBBR1, in the Lower San Juan HSA at Capistrano Beach/Dana Point. Lat/Long: 33.45311/-117.66536.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43737, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Capistrano Beach at Beach Road

LOE ID:	29339
Pollutant:	Enterococcus

LOE Subgroup:	Pollutant-Water	041490
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	127	
Number of Exceedances:	18	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 127 single samples were collected with 18 exceeding the single sample water quality objective.	
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	There is one sampling location at South Capistrano Beach at Beach Road, CSBBR1, in the Lower San Juan HAS at Capistrano Beach/Dana Point. Lat/Long: 33.45311/-117.66536.	
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 43737, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Capistrano Beach at Beach Road

LOE ID:	30842
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	121
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 127 single samples were collected of which 121 are dry weather (AB411) samples with one of those samples exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml. 041491 Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location at South Capistrano Beach at Beach Road, CSBBR1, in the Lower San Juan HAS at Capistrano Beach/Dana Point. Lat/Long: 33.45311/-117.66536.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43737, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Capistrano Beach at Beach Road

LOE ID:	30309
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Water Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006. For the 2008 assessment , the 2006 listed coastline 'Pacific Ocean Shoreline, Lower San Juan HSA' was split into smaller segments and each represents an area near the sampling location of the data being assessed. This segment 'Pacific Ocean Shoreline, Lower San Juan HSA, at South Capistrano Beach at Beach Road' is one of the sampling locations. This LOE is a copy of the 2006 listing placeholder LOE for Pacific Ocean Shoreline, Lower San Juan HSA and is considered by the Regional Board to be applicable to this more specific segment formed from the split.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	
Temporal Representation:	
Environmental Conditions:	
QAPP Information:	Unspecified
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Tijuana HU, at 3/4 mile North of Tijuana River
Water Body ID: CAC911110002009050513445 4
Water Body Type: Coastal & Bay Shoreline

DECISION ID 43385 **Region 9**
Pacific Ocean Shoreline, Tijuana HU, at 3/4 mile North of Tijuana River

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Natural Sources | Source Unknown | Unknown Nonpoint Source | Urban Runoff/Storm Sewers
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal from the CWA section 303(d) List under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Sixteen lines of evidence are available in the administrative record to assess this pollutant. Including latest data, 38 of the 203samples exceed the water quality objective for enterococcus of a geomean of 35/100ml in a 30-day period for the protection of REC-1 beneficial use, and 109 of 369 exceed the WQO for total coliform of a single sample maximum of 70/100 ml for the protection of SHELL.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Including latest data, 38 of the 203samples exceed the water quality objective for enterococcus of a geomean of 35/100ml in a 30-day period for the protection of REC-1 beneficial use, and 109 of 369 exceed the WQO for total coliform of a single sample maximum of 70/100 ml for the protection of SHELL and this exceeds the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 43385, Indicator Bacteria **Region 9**
Pacific Ocean Shoreline, Tijuana HU, at 3/4 mile North of Tijuana River

LOE ID:	31131
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	041493
Beneficial Use:	Water Contact Recreation	
Number of Samples:	25	
Number of Exceedances:	4	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 114 dry month (April through October) single samples were collected with 25 dry month geomeans calculated. Four of the 25 geomeans exceeded the geomean water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at 3/4 mi North of Tijuana River, Imperial Beach, California. Station identification number is IB-040.	
Temporal Representation:	Samples were collected from June 2004 through October 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43385, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at 3/4 mile North of Tijuana River

LOE ID:	31132
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	25
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 112 dry month (April through October) single samples were collected with 25 dry month geomeans calculated. One of the 25 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at 3/4 mi North of Tijuana River, Imperial Beach, California. Station identification number is IB-040.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43385, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at 3/4 mile North of Tijuana River

LOE ID:	30352
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Water Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006. For the 2008 assessment , the 2006 listed coastline 'Pacific Ocean Shoreline, Tijuana HU' was split into smaller segments and each represents an area near the sampling location of the data being assessed. This segment 'Pacific Ocean Shoreline, Tijuana HU, at 3/4 mile North of Tijuana River' is one of the sampling locations. This LOE is a copy of the 2006 listing placeholder LOE for Pacific Ocean Shoreline, Tijuana HU and is considered by the Regional Board to be applicable to this more specific segment formed from the split.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	
Temporal Representation:	
Environmental Conditions:	
QAPP Information:	Unspecified
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43385, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at 3/4 mile North of Tijuana River

LOE ID:	30873
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	189
Number of Exceedances:	29
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 209 single samples were collected of which 189 are dry weather (AB411) samples with 29 of those samples exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at 3/4 mi North of the Tijuana River, San Diego, California. Station identification number is IB-040.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43385, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at 3/4 mile North of Tijuana River

LOE ID:	75074
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	158	041496
Number of Exceedances:	30	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Thirty of the 158 geomeans exceeded the objective.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected three fourths of a mile north of Tijuana River site.	
Temporal Representation:	Samples were collected from January 2008 to August 2010.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43385, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at 3/4 mile North of Tijuana River

LOE ID:	29382
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	20
Number of Exceedances:	11
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 209 single samples were collected with 20 samples correlated with a storm event. Eleven of the 20 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005). Comparisons were also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:	041497
Guideline Reference:	
Spatial Representation:	Samples were collected at 3/4 mi North of the Tijuana River, Imperial Beach, California. Station identification number is IB-040.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43385, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at 3/4 mile North of Tijuana River

LOE ID:	29381
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	209
Number of Exceedances:	40
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 209 single samples were collected with 40 samples exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at 3/4 mi North of the Tijuana River, San Diego, California. Station identification number is IB-040.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43385, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at 3/4 mile North of Tijuana River 041498

LOE ID:	29380
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	20
Number of Exceedances:	16
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 209 single samples were collected with 20 samples correlated with a storm event. Sixteen of the 20 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005). Comparisons are also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at 3/4 mi North of Tijuana River, Imperial, California. Station identification number is IB-040.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43385, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at 3/4 mile North of Tijuana River

LOE ID:	29379
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting

Number of Samples:	209	041499
Number of Exceedances:	67	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 209 single samples were collected with 67 samples exceeded the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005). Comparisons were also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at 3/4 mi North of Tijuana River, San Diego, California. Station identification number is IB-040.	
Temporal Representation:	Samples were collected from January 2004 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43385, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at 3/4 mile North of Tijuana River

LOE ID:	75077
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	157
Number of Exceedances:	15
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Fifteen of the 157 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected three fourths of a mile north of Tijuana River site.

Temporal Representation:	Samples were collected from January 2008 to August 2010.	041500
Environmental Conditions:		
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43385, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at 3/4 mile North of Tijuana River

LOE ID:	75076
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	160
Number of Exceedances:	42
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed bw data for Pacific Ocean Shoreline, Tijuana HU, at 3/4 mile North of Tijuana River to determine beneficial use support and results are as follows: 42 of 160 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Tijuana HU, at 3/4 mile North of Tijuana River was collected at 1 monitoring site [3/4 mi. N of TJ River]
Temporal Representation:	Data was collected over the time period 1/2/2008-8/24/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43385, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at 3/4 mile North of Tijuana River

LOE ID:	75075
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	158
Number of Exceedances:	11
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Eleven of the 158 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected three fourths of a mile north of Tijuana River site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43385, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at 3/4 mile North of Tijuana River

LOE ID:	29440
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	-N/A
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were two beach advisory days for this section of shoreline. Bacteriological samples are collected on a weekly basis at ocean and bay locations in San Diego County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that an advisory for waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 - December 2007. Data used was the number of days the beach was advisories were issued when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Spatial Representation:	Bacteriological monitoring samples were collected at 3/4 mi North of Tijuana River, Imperial Beach, California.
Temporal Representation:	The beach advisory covers the time frame of January January 2001 to December 2007.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of San Diego's Quality Assessment/Quality Control document
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43385, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at 3/4 mile North of Tijuana River

LOE ID:	77688
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	156
Number of Exceedances:	61
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Sixty-one of the 156 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, Tijuana HU, at 3/4 mile North of Tijuana River.
Temporal Representation:	The samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43385, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at 3/4 mile North of Tijuana River

LOE ID:	29388
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	45	041503
Number of Exceedances:	5	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 207 single samples were collected and 45 geomeans calculated. Five of the 45 geomeans exceeded the geomean water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at 3/4 mi North of Tijuana River, Imperial Beach, California. Station identification number is IB-040.	
Temporal Representation:	Samples were collected from January 2004 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43385, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at 3/4 mile North of Tijuana River

LOE ID:	29387
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	45
Number of Exceedances:	7
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 209 single samples were collected with 45 monthly geomeans calculated. Seven of the 45 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).

Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at 3/4 mi North of Tijuana River, Imperial Beach, California. Station identification number is IB-040.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43385, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at 3/4 mile North of Tijuana River

LOE ID:	29386
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	26
Number of Exceedances:	11
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 209 single samples were collected with 26 samples correlated with a storm event. Eleven of the 26 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005). Comparisons are also made for days with matching bacteria and storm event data. A storm event is defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at 3/4 mi North of Tijuana River, Imperial Beach, California. Station identification number is IB-040.

Temporal Representation:	Samples were collected from January 2004 through December 2007. 041505
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43385, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at 3/4 mile North of Tijuana River

LOE ID:	29385
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	209
Number of Exceedances:	35
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 209 single samples were collected with 35 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at 3/4 mi North of the Tijuana River, Imperial Beach, California. Station identification number is IB-040.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43385, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at 3/4 mile North of Tijuana River

LOE ID:	29384
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	041506
Beneficial Use:	Water Contact Recreation	
Number of Samples:	20	
Number of Exceedances:	11	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 207 single samples were collected with 20 samples correlated with a storm event. Eleven of the 20 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.	
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005). Comparisons are also made only for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at 3/4 mi North of the Tijuana River, Imperial Beach, California. Station identification number is IB-040.	
Temporal Representation:	Samples were collected from January 2004 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43385, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at 3/4 mile North of Tijuana River

LOE ID:	29383
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	207
Number of Exceedances:	38
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004

	through December 2007. A total of 207 single samples were collected with 38 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at 3/4 mi North of Tijuana River, Imperial Beach, California. Station identification number is IB-040.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43385, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at 3/4 mile North of Tijuana River

LOE ID:	29389
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	45
Number of Exceedances:	8
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 209 single samples were collected with 45 monthly geomeans calculated. Eight of the 45 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	

Guideline Reference:	041508
Spatial Representation:	Samples were collected at 3/4 mi North of Tijuana River, Imperial Beach, California. Station identification number is IB-040.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43385, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at 3/4 mile North of Tijuana River

LOE ID:	30766
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	187
Number of Exceedances:	27
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 207 single samples were collected of which 187 are dry weather (AB411) samples with 27 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at 3/4 mi North of Tijuana River, Imperial Beach, California. Station identification number is IB-040.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43385, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at 3/4 mile North of Tijuana River

LOE ID:	31133	041509

Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	25
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 114 dry month (April through October) single samples were collected with 25 dry month geomeans calculated. Two of the 25 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at 3/4 mi North of Tijuana River, Imperial Beach, California. Station identification number is IB-040.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43385, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at 3/4 mile North of Tijuana River

LOE ID:	30666
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	183
Number of Exceedances:	24
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 209 single samples were collected of which 183 are dry weather (AB411) samples with 24 samples exceeding the single sample water quality

	objective. 041510
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at 3/4 mi North of the Tijuana River, Imperial Beach, California. Station identification number is IB-040.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Tijuana HU, at the US Border
Water Body ID: CAC9111100020090505135528
Water Body Type: Coastal & Bay Shoreline

DECISION ID 43615 **Region 9**
Pacific Ocean Shoreline, Tijuana HU, at the US Border

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Natural Sources | Source Unknown | Unknown Nonpoint Source | Urban Runoff/Storm Sewers
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal from the CWA section 303(d) List under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Fifteen lines of evidence are available in the administrative record to assess this pollutant. With the latest data, 106 of 345 samples exceed the water quality objective for total coliform of a SSM of 230/100ml for the protection of SHELL beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, 106 of 345 samples exceed the water quality objective for total coliform of a SSM of 230/100ml for the protection of SHELL beneficial use and this exceeds the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 43615, Indicator Bacteria **Region 9**
Pacific Ocean Shoreline, Tijuana HU, at the US Border

LOE ID:	77689
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Shellfish Harvesting	041512
Number of Samples:	149	
Number of Exceedances:	65	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Sixty-five of the 149 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, Tijuana HU, at the US Border.	
Temporal Representation:	The samples were collected from January 2008 to August 2010.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the beach watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43615, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at the US Border

LOE ID:	29441
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	-N/A
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	40
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were forty beach advisory days for this section of shoreline. Bacteriological samples are collected on a weekly basis at ocean and bay locations in San Diego County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that an advisory for waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 - December 2007. Data used was the number of days the beach was advisories were issued when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960.

	(a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Spatial Representation:	Bacteriological monitoring samples were collected at the North Side of the Border Fence, Imperial Beach, California.
Temporal Representation:	The beach advisory covers the time frame of January January 2001 to December 2007.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of San Diego's Quality Assessment/Quality Control document
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43615, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at the US Border

LOE ID:	29400
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	45
Number of Exceedances:	7
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 192 single samples were collected with 45 monthly geomeans calculated. Seven of the 45 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Border Fence North Side, Imperial Beach, California. Station identification number is IB-010.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	

QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43615, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at the US Border

LOE ID:	29399
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	45
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 192 single samples were collected and 45 geomeans calculated. Four of the 45 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Border Fence North Side, Imperial Beach, California. Station identification number is IB-010.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43615, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at the US Border

LOE ID:	29398
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation	041515
Number of Samples:	45	
Number of Exceedances:	4	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 192 single samples were collected with 45 monthly geomeans calculated. Four of the 45 geomeans exceeded the geomean water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Border Fence North Side, Imperial Beach, California. Station identification number is IB-010.	
Temporal Representation:	Samples were collected from January 2004 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43615, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at the US Border

LOE ID:	29396
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	192
Number of Exceedances:	27
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 192 single samples were collected with 27 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml.

	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Border Fence North Side, Imperial Beach, California. Station identification number is IB-010.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43615, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at the US Border

LOE ID:	29395
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	13
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 192 single samples were collected with 13 samples correlated with a storm event. Four of the 13 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005). Comparisons are also made only for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at Border Fence North Side, Imperial Beach, California. Station identification number is IB-010.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43615, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at the US Border

LOE ID:	29394
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	192
Number of Exceedances:	24
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 192 single samples were collected with 24 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Border Fence North Side, Imperial Beach, California. Station identification number is IB-010.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43615, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at the US Border

LOE ID:	29393
Pollutant:	Total Coliform

LOE Subgroup:	Pollutant-Water	041518
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	13	
Number of Exceedances:	5	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 192 single samples were collected with 13 samples correlated with a storm event. Five of the 13 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.	
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005). Comparisons were also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Border Fence North Side, Imperial Beach, California. Station identification number is IB-010.	
Temporal Representation:	Samples were collected from January 2004 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43615, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at the US Border

LOE ID:	29392
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	192
Number of Exceedances:	28

Data and Information Type:	PWS pathogen monitoring (ambient water) 041519
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 192 single samples were collected with 28 samples exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Border Fence North Side, Imperial Beach, California. Station identification number is IB-010.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43615, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at the US Border

LOE ID:	30670
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	179
Number of Exceedances:	18
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 192 single samples were collected of which 179 are dry weather (AB411) samples with 18 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005.

	Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

041520

Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Border Fence North Side, Imperial Beach, California. Station identification number is IB-010.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43615, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at the US Border

LOE ID:	30770
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	179
Number of Exceedances:	20
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 192 single samples were collected of which 179 are dry weather (AB411) samples with 20 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Border Fence North Side, Imperial Beach, California. Station identification number is IB-010.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43615, Indicator Bacteria 041521 Region 9

Pacific Ocean Shoreline, Tijuana HU, at the US Border

LOE ID:	30356
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Water Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006. For the 2008 assessment , the 2006 listed coastline 'Pacific Ocean Shoreline, Tijuana HU' was split into smaller segments and each represents an area near the sampling location of the data being assessed. This segment 'Pacific Ocean Shoreline, Tijuana HU, at the US Border' is one of the sampling locations. This LOE is a copy of the 2006 listing placeholder LOE for Pacific Ocean Shoreline, Tijuana HU and is considered by the Regional Board to be applicable to this more specific segment formed from the split.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	
Temporal Representation:	
Environmental Conditions:	
QAPP Information:	Unspecified
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43615, Indicator Bacteria Region 9

Pacific Ocean Shoreline, Tijuana HU, at the US Border

LOE ID:	29390
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	192
Number of Exceedances:	60
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 192 single samples were collected with 60 samples exceeded the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program,

	2007. AB 411 monitoring data 1999 to 2007 041522
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005). Comparisons were also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Border Fence North Side, Imperial Beach, California. Station identification number is IB-010.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43615, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at the US Border

LOE ID:	29391
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	13
Number of Exceedances:	11
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 192 single samples were collected with 13 samples correlated with a storm event. Eleven of the 13 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005). Comparisons are also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Border Fence North Side, Imperial Beach, California. Station identification number is IB-010.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43615, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at the US Border

LOE ID:	29397
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	13
Number of Exceedances:	9
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 192 single samples were collected with 13 samples correlated with a storm event. Nine of the 13 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005). Comparisons are also made for days with matching bacteria and storm event data. A storm event is defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Border Fence North Side, Imperial Beach, California. Station identification number is IB-010.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the

QAPP Information Reference(s):	County of San Diego, Department Public Health Laboratory Quality Assurance Manual. County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43615, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at the US Border

LOE ID:	31120
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	25
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 2004 through October 2007. A total of 107 dry month (April through October) single samples were collected with 25 dry month geomeans calculated. One of the 25 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Border Fence North Side, Imperial Beach, California. Station identification number is IB-010.
Temporal Representation:	Samples were collected from April 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43615, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at the US Border

LOE ID:	31121
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation	041525
Number of Samples:	25	
Number of Exceedances:	1	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 2004 through October 2007. A total of 107 dry month (April through October) single samples were collected with 25 dry month geomeans calculated. One of the 25 geomeans exceeded the geomean water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Border Fence North Side, Imperial Beach, California. Station identification number is IB-010.	
Temporal Representation:	Samples were collected from April 2004 through October 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43615, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at the US Border

LOE ID:	31119
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	25
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 2004 through October 2007. A total of 107 dry month (April through October) single samples were collected with 25 dry month geomeans calculated. One of the 25 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml.

	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Border Fence North Side, Imperial Beach, California. Station identification number is IB-010.
Temporal Representation:	Samples were collected from April 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43615, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at the US Border

LOE ID:	30877
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	179
Number of Exceedances:	23
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 192 single samples were collected of which 179 are dry weather (AB411) samples with 23 of those samples exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Border Fence North Side, Imperial Beach, California. Station identification number is IB-010.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	

QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43615, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at the US Border

LOE ID:	75147
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	150
Number of Exceedances:	35
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Thirty five of the 150 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the US Border Fence site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43615, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at the US Border

LOE ID:	75144
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	150
Number of Exceedances:	39
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Thirty nine of the 150 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected US border fence site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43615, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at the US Border

LOE ID:	75145
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	150
Number of Exceedances:	26
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Twenty six of the 150 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the US Border fence site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43615, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at the US Border

LOE ID:	75146
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	153
Number of Exceedances:	46

Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed bw data for Pacific Ocean Shoreline, Tijuana HU, at Border to determine beneficial use support and results are as follows: 46 of 153 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Tijuana HU, at Border was collected at 1 monitoring site [Border Fence N side]
Temporal Representation:	Data was collected over the time period 1/2/2008-8/24/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Tijuana HU, at end of Seacoast Drive
Water Body ID: CAC911110002009050513125 9
Water Body Type: Coastal & Bay Shoreline

DECISION ID 44227 **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at end of Seacoast Drive

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not Delist from 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Do Not Delist from 303(d) list (TMDL required list)(2012)
Revision Status Revised
Sources: Natural Sources | Source Unknown | Unknown Nonpoint Source | Urban Runoff/Storm Sewers
Expected TMDL Completion Date: 2019
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for removal from the CWA section 303(d) List under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Sixteen lines of evidence are available in the administrative record to assess this pollutant. With the latest data, 38 of 219 geomean samples exceed the water quality objective for enterococcus for REC-1 and 108 of 410 samples exceed the water quality objective for SSM for SHELL.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, 38 of 219 geomean samples exceed the water quality objective for enterococcus for REC-1 and 108 of 410 samples exceed the water quality objective for SSM for SHELL and this exceeds the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 44227, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at end of Seacoast Drive

LOE ID: 75125

Pollutant: Enterococcus
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use:	Water Contact Recreation	041531
Number of Samples:	175	
Number of Exceedances:	32	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Thirty two of the 175 geomeans exceeded the objective.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at the Monument Road site.	
Temporal Representation:	Samples were collected from January 2008 to August 2010.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44227, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at end of Seacoast Drive

LOE ID:	30669
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	203
Number of Exceedances:	22
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 232 single samples were collected of which 203 are dry weather (AB411) samples with 22samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at End of Seacoast Dr., San Diego, California. Station identification number is IB-050.

Temporal Representation:	Samples were collected from January 2004 through December 2007. 041532
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44227, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at end of Seacoast Drive

LOE ID:	77691
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	174
Number of Exceedances:	63
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Sixty-three of the 174 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, Tijuana HU, at end of Seacoast Drive.
Temporal Representation:	The samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44227, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at end of Seacoast Drive

LOE ID:	29434
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	44
Number of Exceedances:	3

Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 220 single samples were collected and 44 geomeans calculated. Three of the 44 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at End of Seacoast Dr., San Diego, California. Station identification number is IB-050.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44227, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at end of Seacoast Drive

LOE ID:	29433
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	44
Number of Exceedances:	6
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 232 single samples were collected with 44 monthly geomeans calculated. Six of the 44 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental

Protection Agency 041534

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at End of Seacoast Dr., San Diego, California. Station identification number is IB-050.

Temporal Representation: Samples were collected from January 2004 through December 2007.

Environmental Conditions:

QAPP Information: Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.

QAPP Information Reference(s): County of Orange. Quality Assurance/Quality Control Manual, February 2004
County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44227, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at end of Seacoast Drive

LOE ID: 29447

Pollutant: Indicator Bacteria
LOE Subgroup: Health Advisories
Matrix: -N/A
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 2555
Number of Exceedances: 7

Data and Information Type: PWS pathogen monitoring (ambient water)

Data Used to Assess Water Quality: For the period from January 2001 to December 2007, there were seven beach advisory days for this section of shoreline. Bacteriological samples are collected on a weekly basis at ocean and bay locations in San Diego County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that an advisory for waters have exceeded public health standards.

Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 - December 2007. Data used was the number of days the beach was advisories were issued when the ocean or bay failed to meet the bacteriological standards.

Data Reference: Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: California Code of Regulations. Title 17, Section 7960.

(a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.

Objective/Criterion Reference: California Code of Regulations, Title 17, Section 7960

Evaluation Guideline:
Guideline Reference: Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Spatial Representation:	Bacteriological monitoring samples were collected at the end of Seacoast Drive, Imperial Beach, California.
Temporal Representation:	The beach advisory covers the time frame of January January 2001 to December 2007.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of San Diego's Quality Assessment/Quality Control document
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44227, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at end of Seacoast Drive

LOE ID:	29427
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	20
Number of Exceedances:	8
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 232single samples were collected with 20 samples correlated with a storm event. Eight of the 20 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005). Comparisons were also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at End of Seacoast Dr., San Diego, California. Station identification number is IB-050.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44227, Indicator Bacteria 041536 **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at end of Seacoast Drive

LOE ID:	29426
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	232
Number of Exceedances:	32
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 232 single samples were collected with 32 samples exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at End of Seacoast Dr., San Diego, California. Station identification number is IB-050.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44227, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at end of Seacoast Drive

LOE ID:	29425
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	20
Number of Exceedances:	14

Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 232 single samples were collected with 20 samples correlated with a storm event. Fourteen of the 20 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005). Comparisons are also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at End of Seacoast Dr., San Diego, California. Station identification number is IB-050.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44227, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at end of Seacoast Drive

LOE ID:	29430
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	232
Number of Exceedances:	34
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 232 single samples were collected with 34 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml.

	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at End of Seacoast Dr., San Diego, California. Station identification number is IB-050.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44227, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at end of Seacoast Drive

LOE ID:	29429
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	20
Number of Exceedances:	9
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 220 single samples were collected with 20 samples correlated with a storm event. Nine of the 20 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005). Comparisons are also made only for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at End of Seacoast Dr., San Diego, California. Station identification number is IB-050.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44227, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at end of Seacoast Drive

LOE ID:	29428
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	220
Number of Exceedances:	35
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 220 single samples were collected with 35 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at End of Seacoast Dr., San Diego, California. Station identification number is IB-050.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44227, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at end of Seacoast Drive

LOE ID:	31123

Pollutant:	Fecal Coliform	041540
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	25	
Number of Exceedances:	1	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 122 dry month (April through October) single samples were collected with 25 dry month geomeans calculated. One of the 25 geomeans exceeded the geomean water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at End of Seacoast Dr., San Diego, California. Station identification number is IB-050.	
Temporal Representation:	Samples were collected from June 2004 through October 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44227, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at end of Seacoast Drive

LOE ID:	29435
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	44
Number of Exceedances:	6
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 232 single samples were collected with 44 monthly geomeans calculated. Six of the 44 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program,

	2007. AB 411 monitoring data 1999 to 2007 041541
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at End of Seacoast Dr., San Diego, California. Station identification number is IB-050.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44227, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at end of Seacoast Drive

LOE ID:	29424
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	232
Number of Exceedances:	67
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 232 single samples were collected with 67 samples exceeded the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005). Comparisons were also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at End of Seacoast Dr., San Diego, California. Station identification number is IB-050.

Temporal Representation:	Samples were collected from January 2004 through December 2007. 041542
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44227, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at end of Seacoast Drive

LOE ID:	31124
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	25
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 131 dry month (April through October) single samples were collected with 25 dry month geomeans calculated. One of the 25 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at End of Seacoast Dr., San Diego, California. Station identification number is IB-050.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44227, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at end of Seacoast Drive

LOE ID:	30355
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water

Matrix:	Water	041543
Fraction:	Not Recorded	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	0	
Number of Exceedances:	0	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006. For the 2008 assessment , the 2006 listed coastline 'Pacific Ocean Shoreline, Tijuana HU' was split into smaller segments and each represents an area near the sampling location of the data being assessed. This segment 'Pacific Ocean Shoreline, Tijuana HU, at end of Seacoast Drive' is one of the sampling locations. This LOE is a copy of the 2006 listing placeholder LOE for Pacific Ocean Shoreline, Tijuana HU and is considered by the Regional Board to be applicable to this more specific segment formed from the split.	
Data Reference:	Placeholder reference pre-2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Unspecified	
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:		
Temporal Representation:		
Environmental Conditions:		
QAPP Information:	Unspecified	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44227, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at end of Seacoast Drive

LOE ID:	31122
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	25
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 131 dry month (April through October) single samples were collected with 25 dry month geomeans calculated. One of the 25 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB,

	2005). 041544
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at End of Seacoast Dr., San Diego, California. Station identification number is IB-050.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44227, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at end of Seacoast Drive

LOE ID:	30876
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	212
Number of Exceedances:	24
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 232 single samples were collected of which 212 are dry weather (AB411) samples with 24 of those samples exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at End of Seacoast Dr., San Diego, California. Station identification number is IB-050.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.

QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44227, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at end of Seacoast Drive

LOE ID:	30769
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	200
Number of Exceedances:	26
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 220 single samples were collected of which 200 are dry weather (AB411) samples with 26 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at End of Seacoast Dr., San Diego, California. Station identification number is IB-050.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44227, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at end of Seacoast Drive

LOE ID:	75128
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	175
Number of Exceedances:	8
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Eight of the 175 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the end of Seacoast Drive site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44227, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at end of Seacoast Drive

LOE ID:	75127
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	178
Number of Exceedances:	41
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed bw data for Pacific Ocean Shoreline, Tijuana HU, at end of Seacoast Drive to determine beneficial use support and results are as follows: 41 of 178 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Tijuana HU, at end of Seacoast Drive was collected at 1 monitoring site [End of Seacoast Dr]
Temporal Representation:	Data was collected over the time period 1/2/2008-8/24/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44227, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at end of Seacoast Drive 041547

LOE ID:	29431
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	29
Number of Exceedances:	12
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 232 single samples were collected with 29 samples correlated with a storm event. Twelve of the 29 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005). Comparisons are also made for days with matching bacteria and storm event data. A storm event is defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at End of Seacoast Dr., San Diego, California. Station identification number is IB-050.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44227, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at end of Seacoast Drive

LOE ID:	75126
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation	041548
Number of Samples:	174	
Number of Exceedances:	5	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Five of the 174 geomeans exceeded the objective.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at the end of Seacoast Drive site.	
Temporal Representation:	Samples were collected from January 2008 to August 2010.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the beach watch program.	
QAPP Information Reference(s):		

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Tijuana HU, at Monument Road
Water Body ID: CAC9111100020090505135322
Water Body Type: Coastal & Bay Shoreline

DECISION ID 43448 **Region 9**
Pacific Ocean Shoreline, Tijuana HU, at Monument Road

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not Delist from 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Do Not Delist from 303(d) list (TMDL required list)(2012)
Revision Status Revised
Sources: Natural Sources | Source Unknown | Unknown Nonpoint Source | Urban Runoff/Storm Sewers
Expected TMDL Completion Date: 2019
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for removal from the CWA section 303(d) List under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Sixteen lines of evidence are available in the administrative record to assess this pollutant. With the latest data, 50 of 199 geomean samples exceed the water quality objective (WQO) for enterococcus for the protection of REC-1 and 115 of 351 samples exceed the SSM WQO for total coliform, and 33 of 198 geomean samples exceed the WQO for fecal coliform for REC-1.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, 50 of 199 geomean samples exceed the water quality objective (WQO) for enterococcus for the protection of REC-1 and 115 of 351 samples exceed the SSM WQO for total coliform, and 33 of 198 geomean samples exceed the WQO for fecal coliform for REC-1 and this exceeds the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 43448, Indicator Bacteria **Region 9**
Pacific Ocean Shoreline, Tijuana HU, at Monument Road

LOE ID: 31129

Pollutant: Fecal Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water

Fraction:	None	041550
Beneficial Use:	Water Contact Recreation	
Number of Samples:	25	
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 107 dry month (April through October) single samples were collected with 25 dry month geomeans calculated. None of the 25 geomeans exceeded the geomean water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Monument Rd., Imperial Beach, California. Station identification number is IB-020.	
Temporal Representation:	Samples were collected from June 2004 through October 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43448, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at Monument Road

LOE ID:	30874
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	180
Number of Exceedances:	25
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 194 single samples were collected of which 180 are dry weather (AB411) samples with 25 of those samples exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Monument Rd., Imperial Beach, California. Station identification number is IB-020.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43448, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at Monument Road

LOE ID:	75132
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	154
Number of Exceedances:	46
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Forty six of the 154 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Monument Road site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43448, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at Monument Road

LOE ID:	75131	041552

Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	157
Number of Exceedances:	58
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed bw data for Pacific Ocean Shoreline, Tijuana HU, at Monument Road to determine beneficial use support and results are as follows: 58 of 157 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Tijuana HU, at Monument Road was collected at 1 monitoring site [Monument Rd.]
Temporal Representation:	Data was collected over the time period 1/2/2008-8/24/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43448, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at Monument Road

LOE ID:	75130
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	153
Number of Exceedances:	30
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Thirty of the 153 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at the Monument Road site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43448, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at Monument Road

LOE ID:	75129
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	154
Number of Exceedances:	44
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Forty four of the 154 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for enterococcus states that the enterococcus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Monument Road site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43448, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at Monument Road

LOE ID:	77692
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	153
Number of Exceedances:	71
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Seventy-one of the 153 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.

SWAMP Data:	Non-SWAMP	041554
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, Tijuana HU, at Monument Road.	
Temporal Representation:	The samples were collected from January 2008 to August 2010.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the beach watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43448, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at Monument Road

LOE ID:	30353
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Water Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006. For the 2008 assessment , the 2006 listed coastline 'Pacific Ocean Shoreline, Tijuana HU' was split into smaller segments and each represents an area near the sampling location of the data being assessed. This segment 'Pacific Ocean Shoreline, Tijuana HU, at Monument Road' is one of the sampling locations. This LOE is a copy of the 2006 listing placeholder LOE for Pacific Ocean Shoreline, Tijuana HU and is considered by the Regional Board to be applicable to this more specific segment formed from the split.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	
Temporal Representation:	
Environmental Conditions:	
QAPP Information:	Unspecified
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43448, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at Monument Road

LOE ID:	30767
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	180
Number of Exceedances:	25
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 194 single samples were collected of which 180 are dry weather (AB411) samples with 25 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Monument Rd., Imperial Beach, California. Station identification number is IB-020.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43448, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at Monument Road

LOE ID:	31128
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	25
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 107 dry month (April through October) single samples were

	collected with 25 dry month geomeans calculated. None of the 25 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Monument Rd., Imperial Beach, California. Station identification number is IB-020.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43448, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at Monument Road

LOE ID:	29406
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	14
Number of Exceedances:	7
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 194 single samples were collected with 14 samples correlated with a storm event. Seven of the 14 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).

	Comparisons are also made only for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Monument Rd., Imperial Beach, California. . Station identification number is IB-020.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43448, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at Monument Road

LOE ID:	29405
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	194
Number of Exceedances:	32
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 194 single samples were collected with 32 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Monument Rd., Imperial Beach, California. Station identification number is IB-020.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance

Line of Evidence (LOE) for Decision ID 43448, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at Monument Road

LOE ID:	29411
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	45
Number of Exceedances:	6
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 194 single samples were collected with 45 monthly geomeans calculated. Six of the 45 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Monument Rd., Imperial Beach, California. Station identification number is IB-020.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43448, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at Monument Road

LOE ID:	29410
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	45

Number of Exceedances:	3	041559

Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 194 single samples were collected and 45 geomeans calculated. Three of the 45 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Monument Rd., Imperial Beach, California. Station identification number is IB-020.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43448, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at Monument Road

LOE ID:	29409
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	45
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 194 single samples were collected with 45 monthly geomeans calculated. Four of the 45 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005.

	Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency 041560
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Monument Rd., Imperial Beach, California. Station identification number is IB-020.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43448, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at Monument Road

LOE ID:	29408
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	14
Number of Exceedances:	8
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 194 single samples were collected with 14 samples correlated with a storm event. Eight of the 14 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005). Comparisons are also made for days with matching bacteria and storm event data. A storm event is defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Monument Rd., Imperial Beach, California. Station identification number is IB-020.
Temporal Representation:	Samples were collected from January 2004 through December 2007.

Environmental Conditions: 041561
QAPP Information: Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s): County of Orange. Quality Assurance/Quality Control Manual, February 2004
County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43448, Indicator Bacteria **Region 9**
Pacific Ocean Shoreline, Tijuana HU, at Monument Road

LOE ID: 29407

Pollutant: Enterococcus
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 194
Number of Exceedances: 24

Data and Information Type: PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality: Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 194 single samples were collected with 24 samples exceeding the single sample water quality objective.
Data Reference: Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: Geomean: Enterococcus density shall not exceed 35 per 100 ml.

Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference: Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Monument Rd., Imperial Beach, California. Station identification number is IB-020.
Temporal Representation: Samples were collected from January 2004 through December 2007.
Environmental Conditions:
QAPP Information: Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s): County of Orange. Quality Assurance/Quality Control Manual, February 2004
County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43448, Indicator Bacteria **Region 9**
Pacific Ocean Shoreline, Tijuana HU, at Monument Road

LOE ID: 30667

Pollutant: Enterococcus
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use:	Water Contact Recreation
Number of Samples:	180
Number of Exceedances:	16
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 194 single samples were collected of which 180 are dry weather (AB411) samples with 16 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Monument Rd., Imperial Beach, California. Station identification number is IB-020.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43448, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at Monument Road

LOE ID:	29442
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	-N/A
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were two beach advisory days for this section of shoreline. Bacteriological samples are collected on a weekly basis at ocean and bay locations in San Diego County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that an advisory for waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 - December 2007. Data used was the number of

	days the beach was advisories were issued when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Spatial Representation:	Bacteriological monitoring samples were collected at the Monument Road, Imperial Beach, California.
Temporal Representation:	The beach advisory covers the time frame of January January 2001 to December 2007.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of San Diego's Quality Assessment/Quality Control document
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43448, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at Monument Road

LOE ID:	29401
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	194
Number of Exceedances:	57
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 194 single samples were collected with 57 samples exceeded the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005). Comparisons were also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Monument Rd., Imperial Beach, California. Station identification number is IB-020.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43448, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at Monument Road

LOE ID:	29404
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	14
Number of Exceedances:	6
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 194 single samples were collected with 14 samples correlated with a storm event. Six of the 14 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005). Comparisons were also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Monument Rd., Imperial Beach, California. Station identification number is IB-020.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the

QAPP Information Reference(s):	County of San Diego, Department Public Health Laboratory Quality Assurance Manual. County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43448, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at Monument Road

LOE ID:	31130
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	25
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 107 dry month (April through October) single samples were collected with 25 dry month geomeans calculated. None of the 25 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Monument Rd., Imperial Beach, California. Station identification number is IB-020.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43448, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at Monument Road

LOE ID:	29402
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Shellfish Harvesting	041566
Number of Samples:	14	
Number of Exceedances:	11	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 194 single samples were collected with 14 samples correlated with a storm event. Eleven of the 14 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.	
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005). Comparisons are also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Monument Rd., Imperial Beach, California. Station identification number is IB-020.	
Temporal Representation:	Samples were collected from January 2004 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43448, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at Monument Road

LOE ID:	29403
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	194
Number of Exceedances:	31
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 194 single samples were collected with 31 samples exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station

	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Monument Rd., Imperial Beach, California. Station identification number is IB-020.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Tijuana HU, at Tijuana River mouth
Water Body ID: CAC911110002009050513495 1
Water Body Type: Coastal & Bay Shoreline

DECISION ID 43860 **Region 9**
Pacific Ocean Shoreline, Tijuana HU, at Tijuana River mouth

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not Delist from 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Do Not Delist from 303(d) list (TMDL required list)(2012)
Revision Status Revised
Sources: Natural Sources | Source Unknown | Unknown Nonpoint Source | Urban Runoff/Storm Sewers
Expected TMDL Completion Date: 2019
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for removal from the CWA section 303(d) List under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Fifteen lines of evidence are available in the administrative record to assess this pollutant. With the latest data, 83 of 215 geomean samples exceed the water quality objective (WQO) for enterococcus for the protection of REC-1, 172 of 400 samples exceed the SSM WQO for total coliform for the protection of SHELL, additionally, geomean samples also exceed allowable exceedance rates for fecal coliform and total coliform for the protection of REC-1.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, 83 of 215 geomean samples exceed the water quality objective (WQO) for enterococcus for the protection of REC-1, 172 of 400 samples exceed the SSM WQO for total coliform for the protection of SHELL,and this exceeds the allowable frequency listed in Table 4.2 of the Listing Policy. Additionally, geomean samples also exceed allowable exceedance rates for fecal coliform and total coliform for the protection of REC-1 .
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 43860, Indicator Bacteria **Region 9**
Pacific Ocean Shoreline, Tijuana HU, at Tijuana River mouth

LOE ID: 30668

Pollutant: Enterococcus

LOE Subgroup:	Pollutant-Water	041569
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	200	
Number of Exceedances:	53	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 227 single samples were collected of which 200 are dry weather (AB411) samples with 53 samples exceeding the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Tijuana Rivermouth, San Diego, California. Station identification number is IB-030.	
Temporal Representation:	Samples were collected from January 2004 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43860, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at Tijuana River mouth

LOE ID:	29412
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	227
Number of Exceedances:	100
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 227 single samples were collected with 100 samples exceeded the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data:	Non-SWAMP	041570
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005). Comparisons were also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Tijuana Rivermouth, San Diego, California. Station identification number is IB-030.	
Temporal Representation:	Samples were collected from January 2004 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43860, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at Tijuana River mouth

LOE ID:	31125
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	25
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 116 dry month (April through October) single samples were collected with 25 dry month geomeans calculated. Four of the 25 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Tijuana Rivermouth, San Diego, California. Station identification number is IB-030.
Temporal Representation:	Samples were collected from June 2004 through October 2007.

Environmental Conditions:	041571
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43860, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at Tijuana River mouth

LOE ID:	31126
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	25
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 115 dry month (April through October) single samples were collected with 25 dry month geomeans calculated. Four of the 25 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Tijuana Rivermouth, San Diego, California. Station identification number is IB-030.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43860, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at Tijuana River mouth

LOE ID:	31127
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	041572
Beneficial Use:	Water Contact Recreation	
Number of Samples:	25	
Number of Exceedances:	4	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 116 dry month (April through October) single samples were collected with 25 dry month geomeans calculated. Four of the 25 geomeans exceeded the geomean water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Tijuana Rivermouth, San Diego, California. Station identification number is IB-030.	
Temporal Representation:	Samples were collected from June 2004 through October 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43860, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at Tijuana River mouth

LOE ID:	29416
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	224
Number of Exceedances:	69
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 224 single samples were collected with 69 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; 041573 Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Tijuana Rivermouth, San Diego, California. Station identification number is IB-030.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43860, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at Tijuana River mouth

LOE ID:	29417
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	20
Number of Exceedances:	15
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 224 single samples were collected with 20 samples correlated with a storm event. Fifteen of the 20 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005). Comparisons are also made only for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	

Guideline Reference:	041574
Spatial Representation:	Samples were collected at Tijuana Rivermouth, San Diego, California. Station identification number is IB-030.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43860, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at Tijuana River mouth

LOE ID:	29418
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	227
Number of Exceedances:	68
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 227 single samples were collected with 68 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Tijuana Rivermouth, San Diego, California. Station identification number is IB-030.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43860, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at Tijuana River mouth

LOE ID:	29419

Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	27
Number of Exceedances:	15
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 227 single samples were collected with 27 samples correlated with a storm event. Fifteen of the 27 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005). Comparisons are also made for days with matching bacteria and storm event data. A storm event is defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Tijuana Rivermouth, San Diego, California. Station identification number is IB-030.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43860, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at Tijuana River mouth

LOE ID:	30768
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	204

Number of Exceedances:	54	041576
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 224 single samples were collected of which 204 are dry weather (AB411) samples with 54 samples exceeding the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Tijuana Rivermouth, San Diego, California. Station identification number is IB-030.	
Temporal Representation:	Samples were collected from January 2004 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43860, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at Tijuana River mouth

LOE ID:	30354
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Water Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006. For the 2008 assessment , the 2006 listed coastline 'Pacific Ocean Shoreline, Tijuana HU' was split into smaller segments and each represents an area near the sampling location of the data being assessed. This segment 'Pacific Ocean Shoreline, Tijuana HU, at Tijuana River mouth' is one of the sampling locations. This LOE is a copy of the 2006 listing placeholder LOE for Pacific Ocean Shoreline, Tijuana HU and is considered by the Regional Board to be applicable to this more specific segment formed from the split.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Unspecified	041577
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:		
Temporal Representation:		
Environmental Conditions:		
QAPP Information:	Unspecified	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43860, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at Tijuana River mouth

LOE ID:	29422
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	45
Number of Exceedances:	13
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 227 single samples were collected with 45 monthly geomeans calculated. Thirteen of the 45 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Tijuana Rivermouth, San Diego, California. Station identification number is IB-030.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43860, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at Tijuana River mouth

LOE ID:	29413	041578

Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	20
Number of Exceedances:	18
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 227 single samples were collected with 20 samples correlated with a storm event. Eighteen of the 20 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005). Comparisons are also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Tijuana Rivermouth, San Diego, California. Station identification number is IB-030.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43860, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at Tijuana River mouth

LOE ID:	29414
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	227
Number of Exceedances:	68

Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 227 single samples were collected with 68 samples exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Tijuana Rivermouth, San Diego, California. Station identification number is IB-030.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43860, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at Tijuana River mouth

LOE ID:	29415
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	20
Number of Exceedances:	14
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 227 single samples were collected with 20 samples correlated with a storm event. Fourteen of the 20 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; 041580 Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005). Comparisons were also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Tijuana Rivermouth, San Diego, California. Station identification number is IB-030.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43860, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at Tijuana River mouth

LOE ID:	29445
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	-N/A
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	8
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were eight beach advisory days for this section of shoreline. Bacteriological samples are collected on a weekly basis at ocean and bay locations in San Diego County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that an advisory for waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 - December 2007. Data used was the number of days the beach was advisories were issued when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	Department of Environmental Health, Land and Water Quality Division, San Diego County Beach Closure and Advisory Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-

	contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Spatial Representation:	Bacteriological monitoring samples were collected at the Tijuana Rivermouth, Imperial Beach, California.
Temporal Representation:	The beach closures advisory the time frame of January January 2001 to December 2007.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of San Diego's Quality Assessment/Quality Control document
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43860, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at Tijuana River mouth

LOE ID:	29420
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	45
Number of Exceedances:	11
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 227 single samples were collected with 45 monthly geomeans calculated. Eleven of the 45 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Tijuana Rivermouth, San Diego, California. Station identification number is IB-030.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance

Line of Evidence (LOE) for Decision ID 43860, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at Tijuana River mouth

LOE ID:	29421
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	45
Number of Exceedances:	12
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 224 single samples were collected and 45 geomeans calculated. Twelve of the 45 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Tijuana Rivermouth, San Diego, California. Station identification number is IB-030.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43860, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at Tijuana River mouth

LOE ID:	77693
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	169
Number of Exceedances:	92

Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Ninety-two of the 169 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected atPacific Ocean Shoreline, Tijuana HU, at Tijuana River mouth.
Temporal Representation:	The samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43860, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at Tijuana River mouth

LOE ID:	75148
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	170
Number of Exceedances:	70
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Seventy of the 170 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Tijuana River mouth site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43860, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at Tijuana River mouth

LOE ID:	75149	041584

Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	170
Number of Exceedances:	49
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Forty nine of the 170 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Tijuana River mouth site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43860, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at Tijuana River mouth

LOE ID:	75150
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	173
Number of Exceedances:	72
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed bw data for Pacific Ocean Shoreline, Tijuana HU, at Tijuana River mouth to determine beneficial use support and results are as follows: 72 of 173 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Tijuana HU, at Tijuana River mouth was collected at 1 monitoring site [Tijuana Rivermouth]
Temporal Representation:	Data was collected over the time period 1/2/2008-8/24/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43860, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at Tijuana River mouth

LOE ID:	75151
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	170
Number of Exceedances:	56
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Fifty six of the 170 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Tijuana River mouth site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43860, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at Tijuana River mouth

LOE ID:	30875
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	207
Number of Exceedances:	54
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 227 single samples were collected of which 207 are dry weather (AB411) samples with 54 of those samples exceeding the single sample water quality objective.

Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Tijuana Rivermouth, San Diego, California. Station identification number is IB-030.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Scripps HA, at Coastal Blvd Gazebo
Water Body ID: CAC906300002009052016470 1
Water Body Type: Coastal & Bay Shoreline

DECISION ID 43503 Region 9
Pacific Ocean Shoreline, Scripps HA, at Coastal Blvd Gazebo

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Original
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Fourteen lines of evidence are available in the administrative record to assess this pollutant. With the latest data, one of 79 geomean samples exceed the water quality objective for enterococcus for the protection of REC-1.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, one of 79 geomean samples exceed the water quality objective for enterococcus for the protection of REC-1 and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 43503, Indicator Bacteria Region 9
Pacific Ocean Shoreline, Scripps HA, at Coastal Blvd Gazebo

LOE ID: 30654

Pollutant: Enterococcus
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 148

Number of Exceedances:	4	041588

Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 150 single samples were collected of which 148 are dry weather (AB411) samples with four samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Coast Blvd Gazebo, La Jolla, California. Station identification number is EH-303.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43503, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Coastal Blvd Gazebo

LOE ID:	77678
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	45
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Zero of the 45 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	

Guideline Reference:	041589
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, Scripps HA, at Coastal Blvd Gazebo
Temporal Representation:	The samples were collected from April 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43503, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Coastal Blvd Gazebo

LOE ID:	75109
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	46
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 46 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Coastal Blvd Gazebo site.
Temporal Representation:	Samples were collected from April 2008 to August 2008.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43503, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Coastal Blvd Gazebo

LOE ID:	75117
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	46
Number of Exceedances:	0
Data and Information Type:	Not Specified

Data Used to Assess Water Quality:	Zero of the 5 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Coastal Blvd Gazebo site.
Temporal Representation:	Samples were collected from April 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43503, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Coastal Blvd Gazebo

LOE ID:	31187
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	39
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 2002 through October 2007. A total of 148 dry month (April through October) single samples were collected with 39 dry month geomeans calculated. None of the 39 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Coast Blvd Gazebo, La Jolla, California. Station identification number is EH-303.
Temporal Representation:	Samples were collected from April 2002 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.

QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

041591

Line of Evidence (LOE) for Decision ID 43503, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Coastal Blvd Gazebo

LOE ID:	30861
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	148
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 150 single samples were collected of which 148 are dry weather (AB411) samples with one of those samples exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Coast Blvd Gazebo, La Jolla, California. Station identification number is EH-303.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43503, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Coastal Blvd Gazebo

LOE ID:	31176
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	39
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 2002 through October 2007. A total of 148 dry month (April through October) single samples were collected with 39 dry month geomeans calculated. One of the 39 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Coast Blvd Gazebo, La Jolla, California. Station identification number is EH-303.
Temporal Representation:	Samples were collected from April 2002 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43503, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Coastal Blvd Gazebo

LOE ID:	75118
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	55
Number of Exceedances:	1
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed bw data for Pacific Ocean Shoreline, Scripps HA, at Coastal Blvd Gazebo to determine beneficial use support and results are as follows: 1 of 55 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:	041593
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Scripps HA, at Coastal Blvd Gazebo was collected at 1 monitoring site [Coast Blvd gazebo]
Temporal Representation:	Data was collected over the time period 4/14/2008-8/25/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43503, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Coastal Blvd Gazebo

LOE ID:	75119
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	45
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 45 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Coastal Blvd Gazebo site.
Temporal Representation:	Samples were collected from April 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43503, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Coastal Blvd Gazebo

LOE ID:	30754
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	112
Number of Exceedances:	2

Data and Information Type:	PWS pathogen monitoring (ambient water) 041594
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 114 single samples were collected of which 112 are dry weather (AB411) samples with two samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Coast Blvd Gazebo, La Jolla, California. Station identification number is EH-303.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43503, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Coastal Blvd Gazebo

LOE ID:	31177
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	30
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 2002 through October 2007. A total of 112 dry month (April through October) single samples were collected with 30 dry month geomeans calculated. None of the 30 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Coast Blvd Gazebo, La Jolla, California. Station identification number is EH-303.
Temporal Representation:	Samples were collected from April 2002 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43503, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Coastal Blvd Gazebo

LOE ID:	29661
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 150 single samples were collected with 2 samples correlated with a storm event. None of the 2 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Coast Blvd Gazebo, La Jolla, California. Station identification number is EH-303.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.

QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43503, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Coastal Blvd Gazebo

LOE ID:	29662
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	150
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 150 single samples were collected with one sample exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Coast Blvd Gazebo, La Jolla, California. Station identification number is EH-303.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43503, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Coastal Blvd Gazebo

LOE ID:	29667
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation	041597
Number of Samples:	2	
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 150 single samples were collected with two samples correlated with a storm event. None of the samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.	
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Coast Blvd Gazebo, La Jolla, California. Station identification number is EH-303.	
Temporal Representation:	Samples were collected from January 1999 through December 2007.	
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43503, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Coastal Blvd Gazebo

LOE ID:	29669
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	26
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)

Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 114 single samples were collected and 26 geomeans calculated. None of the 26 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Coast Blvd Gazebo, La Jolla, California. Station identification number is EH-303.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43503, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Coastal Blvd Gazebo

LOE ID:	29673
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	-N/A
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	18
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were 18 beach advisory days for this section of shoreline. Bacteriological samples are collected on a weekly basis at ocean and bay locations in San Diego County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that an advisory for waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 - December 2007. Data used was the number of days the beach was advisories were issued when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960.

	(a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Spatial Representation:	Samples were collected from Coast Blvd Gazebo, La Jolla, California. Station identification number is EH-303.
Temporal Representation:	The beach advisory covers the time frame of January January 2001 to December 2007.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of San Diego's Quality Assessment/Quality Control document
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43503, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Coastal Blvd Gazebo

LOE ID:	29663
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 150 single samples were collected with 2 samples correlated with a storm event. None of the 2 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected from Coast Blvd Gazebo, La Jolla, California. Station identification number is EH-303.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43503, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Coastal Blvd Gazebo

LOE ID:	29664
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	114
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 114 single samples were collected with 2 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Coast Blvd Gazebo, La Jolla, California. Station identification number is EH-303.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43503, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Coastal Blvd Gazebo

LOE ID:	29665
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	041601
Beneficial Use:	Water Contact Recreation	
Number of Samples:	2	
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 114 single samples were collected with two samples correlated with a storm event. Neither sample exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.	
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Coast Blvd Gazebo, La Jolla, California. Station identification number is EH-303.	
Temporal Representation:	Samples were collected from January 1999 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43503, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Coastal Blvd Gazebo

LOE ID:	29666
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	150
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 150 single samples were collected with four samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data:	Non-SWAMP	041602
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Coast Blvd Gazebo, La Jolla, California. Station identification number is EH-303.	
Temporal Representation:	Samples were collected from January 1999 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43503, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Coastal Blvd Gazebo

LOE ID:	29660
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	150
Number of Exceedances:	22
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April1999 through December 2007. A total of 150 single samples were collected with 22 samples exceeded the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Coastal Blvd Gazebo, San Diego, California. Station identification number is EH-303.
Temporal Representation:	Samples were collected from April1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance

Line of Evidence (LOE) for Decision ID 43503, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Coastal Blvd Gazebo

LOE ID:	29668
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	33
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 150 single samples were collected with 33 monthly geomeans calculated. None of the 33 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Coast Blvd Gazebo, La Jolla, California. Station identification number is EH-303.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43503, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Coastal Blvd Gazebo

LOE ID:	29670
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	33
Number of Exceedances:	1

Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through December 2007. A total of 150 single samples were collected with 33 monthly geomeans calculated. One of the 33 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Coast Blvd Gazebo, La Jolla, California. Station identification number is EH-303.
Temporal Representation:	Samples were collected from January 1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Scripps HA, at Vallecitos Court at La Jolla Shores Beach
Water Body ID: CAC906300002009052016564 3
Water Body Type: Coastal & Bay Shoreline

DECISION ID 43095 **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Vallecitos Court at La Jolla Shores Beach

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not Delist from 303(d) list (being addressed with USEPA approved TMDL)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
TMDL Name:	Bacteria Impaired Waters I (creeks and beach shorelines)
TMDL Project Code:	169
Date TMDL Approved by USEPA:	06/22/2011
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal from the CWA section 303(d) List under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Eight lines of evidence are available in the administrative record to assess this pollutant. With the latest data, six of the 34 samples exceed the water quality objective for total coliform of a SSM of 230/100ml for the protection of SHELL beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, six of the 34 samples exceed the water quality objective for total coliform of a SSM of 230/100ml for the protection of SHELL beneficial use and this exceeds the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 43095, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Vallecitos Court at La Jolla Shores Beach

LOE ID:	75253
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	041606
Beneficial Use:	Shellfish Harvesting	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed bw data for Pacific Ocean Shoreline, Scripps HA, at Vallecitos Court at La Jolla Shores Beach to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Coliform, Total.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Scripps HA, at Vallecitos Court at La Jolla Shores Beach was collected at 1 monitoring site [Vallecitos (NR)]	
Temporal Representation:	Data was collected on a single day 2/5/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43095, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Vallecitos Court at La Jolla Shores Beach

LOE ID:	29672
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	-N/A
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were one beach advisory days for this section of shoreline. Bacteriological samples are collected on a weekly basis at ocean and bay locations in San Diego County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that an advisory for waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 - December 2007. Data used was the number of days the beach was advisories were issued when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	Department of Environmental Health, Land and Water Quality Division, San Diego County Beach Closure and Advisory Report
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. 041607 (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Spatial Representation:	Samples were collected at Vallecitos Court at La Jolla Shores Beach, La Jolla, California. Station identification number is EH-320.
Temporal Representation:	The beach advisory covers the time frame of January January 2001 to December 2007.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of San Diego's Quality Assessment/Quality Control document
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43095, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Vallecitos Court at La Jolla Shores Beach

LOE ID:	29657
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	19
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through December 2007. A total of 33 single samples were collected with 19 monthly geomeans calculated. From the 19 geomeans, none exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml; Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Vallecitos Court at La Jolla Shores Beach, La Jolla, California. Station identification number is EH-320.
Temporal Representation:	Samples were collected from April1999 through December 2007.

Environmental Conditions:	041608
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43095, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Vallecitos Court at La Jolla Shores Beach

LOE ID:	29658
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	33
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through December 2007. A total of 33 single samples were collected with four samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Vallecitos Court at La Jolla Shores Beach, La Jolla, California. Station identification number is EH-320.
Temporal Representation:	Samples were collected from April1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43095, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Vallecitos Court at La Jolla Shores Beach

LOE ID:	29659
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	19
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through ecember 2007. A total of 33 single samples were collected with 19 geomeans calculated. Three of the 23 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Vallecitos Court at La Jolla Shores Beach, La Jolla, California. Station identification number is EH-320.
Temporal Representation:	Samples were collected from April1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43095, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Vallecitos Court at La Jolla Shores Beach

LOE ID:	29654
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	33
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April1999 through December 2007. A total of 33 single samples were collected with no samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005.

	Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Vallecitos Court at La Jolla Shores Beach, La Jolla, California. Station identification number is EH-320.
Temporal Representation:	Samples were collected from April1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43095, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Vallecitos Court at La Jolla Shores Beach

LOE ID:	29655
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	19
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April1999 through December 2007. A total of 20 single samples were collected with 19 monthly geomeans calculated. None of the geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Vallecitos Court at La Jolla Shores Beach, La Jolla, California. Station identification number is EH-320.
Temporal Representation:	Samples were collected from April1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43095, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Vallecitos Court at La Jolla Shores Beach

LOE ID:	29656
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	33
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through December 2007. A total of 33 single samples were collected with one samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml; Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Vallecitos Court at La Jolla Shores Beach, La Jolla, California. Station identification number is EH-320.
Temporal Representation:	Samples were collected from April1999 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43095, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Vallecitos Court at La Jolla Shores Beach

LOE ID:	29653
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	33
Number of Exceedances:	6
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April1999 through December 2007. A total of 33 single samples were collected with six samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program,

	2007. AB 411 monitoring data 1999 to 2007	041612
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Vallecitos Court at La Jolla Shores Beach, La Jolla, California. Station identification number is EH-320.	
Temporal Representation:	Samples were collected from April1999 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

DECISION ID 48178 Region 9

Pacific Ocean Shoreline, Scripps HA, at Vallecitos Court at La Jolla Shores Beach

Pollutant:	**Trash**
Final Listing Decision:	**List on 303(d) list (being addressed by action other than TMDL)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected Attainment Date:	2029
Implementation Action Other than TMDL:	Collected effort of public, agencies, organizations, and permittees. Methods include street sweeping, education programs on littering, installation of trash-catching devices on storm drains.
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.7 of the Listing Policy. Under this section when all other listing factors do not result in the listing of a water segment but information indicates non-attainment of standards, a water segment shall be evaluated to determine whether the weight of evidence demonstrates that water quality standard is not attained. If the weight of evidence indicates non-attainment, the water segment shall be placed on the CWA section 303(d) List. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for placing this water segment-pollutant combination from the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The following information indicates that the water quality standard is not being attained: Coastkeeper cleanups occurred on 9/29/07, 9/6/08 and 9/5/09 for this water body. The total weight of trash (lbs) collected on these dates was 507. However, using the metric, Coastkeeper classified this water body as low for trash impairment. However, any trash found is an exceedance and needs to be addressed by an action other than a TMDL. 3. This process is scientifically defensible and reproducible.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 48178, Trash Region 9

Pacific Ocean Shoreline, Scripps HA, at Vallecitos Court at La Jolla Shores Beach

041613

LOE ID:	75254
Pollutant:	Trash
LOE Subgroup:	Pollutant-Nuisance
Matrix:	Not Recorded
Fraction:	None
Beneficial Use:	Non-Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Occurrence of conditions judged to cause impairment
Data Used to Assess Water Quality:	The San Diego Coastkeeper conducts trash cleanups and uses a metric (pounds of trash collected per volunteer) to compare levels of trash across beaches and categorizes beaches as either low, medium, high or severe, based on this metric. Coastkeeper cleanups occurred on 9/29/07, 9/6/08 and 9/5/09 for this water body. The total weight of trash (lbs) collected on these dates was 507. However, using the metric, Coastkeeper classified this water body as low for trash impairment.
Data Reference:	Data for Trash, Nutrients, and Pathogens in Region 9, 2007-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Floating Material Waters shall not contain floating material, including solids, liquids, foams, and scum in concentrations which cause nuisance or adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	La Jolla Shores.
Temporal Representation:	Three cleanups occurred on 9/29/07, 9/6/08, and 9/5/09.
Environmental Conditions:	
QAPP Information:	San Diego Coastkeeper QAPP was provided.
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Aliso HSA, at Aliso Beach - middle
Water Body ID: CAC9011300020090525212958
Water Body Type: Coastal & Bay Shoreline

DECISION ID 43112 **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Aliso Beach - middle

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not Delist from 303(d) list (being addressed with USEPA approved TMDL)**
Last Listing Cycle's Final Listing Decision:	Do Not Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Agriculture | Municipal Point Sources | Other
TMDL Name:	Bacteria Impaired Waters I (creeks and beach shorelines)
TMDL Project Code:	169
Date TMDL Approved by USEPA:	06/22/2011
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

In 2006, 'Pacific Ocean Shoreline, Aliso HSA' was listed for Indicator Bacteria. For 2008, the 2006 Aliso HSA segment has been split into smaller segments that each represent an area near the sampling location of the data being assessed. 'Pacific Ocean Shoreline, Aliso HSA, at Aliso Beach middle' is one of the sampling locations for Pacific Ocean Shoreline, Aliso HSA and is considered to be part of the original listing.

This pollutant is being considered for removal from the section 303(d) list under section 4.3 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Eleven lines of evidence are available in the administrative record to assess this pollutant. Two hundred-one of the 994 samples exceed the water quality objective for Shellfish Harvesting. Nineteen out of 108 samples exceeded the contact recreation objective for Enterococcus, and Zero out of 108 samples exceeded the contact recreation objective for Fecal Coliform.

In LOEs 29720 and 29723, 29729, 29726 the Regional Board calculated exceedances for samples taken only during storm events. This information was not used in determining listing decisions, but is of interest to the Regional Board and has been included as additional anecdotal information.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the section 303(d) list.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Two hundred-one of the 994 samples exceed the water quality objective for Shellfish Harvesting. Nineteen out of 108 samples exceeded the contact recreation objective for Enterococcus, and Zero out of 108 samples exceeded the contact recreation objective for Fecal Coliform and this exceeds the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Board Review and Conclusion:
The geomeans for LOE 31082 were calculated incorrectly. State Water Board staff corrected the error.

	This does not change the decision.	041615
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.	

Line of Evidence (LOE) for Decision ID 43112, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Aliso Beach - middle

LOE ID:	29723
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	49
Number of Exceedances:	7
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline monitoring data was collected by the County of Orange from January 1999 through December 2007. The number of samples collected was 994 with 49 samples correlated with a storm event. From the 49 samples, seven exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the sampling station Aliso Beach Middle, station code S9, in the Aliso Beach HSA. Lat/Long: 33.50962/-117.75237.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. Bacteria monitoring data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43112, Indicator Bacteria 041616 Region 9

Pacific Ocean Shoreline, Aliso HSA, at Aliso Beach - middle

LOE ID:	31082
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	56
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Orange County collected Beach monitoring data within the time period from January 1999 through December 2006. A total of 56 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 56 geomeans 0 exceeded the geomean water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml within any 30 day period (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the sampling station Aliso Beach Middle, station code S9, in the Aliso Beach HSA. Lat/Long: 33.50962/-117.75237.
Temporal Representation:	Samples were collected at least once a week within the time period from January 1999 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43112, Indicator Bacteria Region 9

Pacific Ocean Shoreline, Aliso HSA, at Aliso Beach - middle

LOE ID:	29725
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	108

Number of Exceedances:	0	041617

Data and Information Type: PWS pathogen monitoring (ambient water)

Data Used to Assess Water Quality: Shoreline monitoring data was collected by the County of Orange from January 1999 through December 2007. The total number of samples collected was 906. From the 906 samples, 108 monthly geomeans were calculated with none exceeding the water contact recreation geomean water quality objective for fecal coliform.

Data Reference: Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml;

Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).

Objective/Criterion Reference: Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:

Guideline Reference:

Spatial Representation: Samples were collected from the sampling station Aliso Beach Middle, station code S9, in the Aliso Beach HSA. Lat/Long: 33.50962/-117.75237.

Temporal Representation: Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.

Environmental Conditions:

QAPP Information: Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.

QAPP Information Reference(s): County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43112, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Aliso Beach - middle

LOE ID: 29726

Pollutant: Fecal Coliform

LOE Subgroup: Pollutant-Water

Matrix: Water

Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 50

Number of Exceedances: 15

Data and Information Type: PWS pathogen monitoring (ambient water)

Data Used to Assess Water Quality: Shoreline samples were collected by the County of Orange from January 1999 through December 2007. The number of samples collected was 906. Between March 2002 and December 2007, 50 samples were correlated with storm events. From the 50 storm event samples, 15 exceeded the water contact recreation single sample maximum water quality objective for fecal coliform. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.

Data Reference: Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the sampling station Aliso Beach Middle, station code S9, in the Aliso Beach HSA. Lat/Long: 33.50962/-117.75237.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. Bacteria monitoring data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43112, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Aliso Beach - middle

LOE ID:	29727
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	982
Number of Exceedances:	119
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline monitoring data was collected by the County of Orange from January 1999 through December 2007. The number of samples collected was 982 for enterococcus. Of the 982 samples, 119 exceeded the water contact recreation single sample maximum objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the objectives are: Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	

Guideline Reference:	041619
Spatial Representation:	Samples were collected from the sampling station Aliso Beach Middle, station code S9, in the Aliso Beach HSA. Lat/Long: 33.50962/-117.75237.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43112, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Aliso Beach - middle

LOE ID:	29728
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	108
Number of Exceedances:	19
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline monitoring data collected by the County of Orange from January 1999 through December 2007. There were 982 single samples collected for enterococcus. From the 982 samples, 108 monthly geomeans were calculated with 19 exceeding the water contact recreation objective for enterococcus.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the objectives are: Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the sampling station Aliso Beach Middle, station code S9, in the Aliso Beach HSA. Lat/Long: 33.50962/-117.75237.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43112, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Aliso Beach - middle

LOE ID:	29729
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	51
Number of Exceedances:	25
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline monitoring data was collected my the County of Orange from January 1999 through December 2007. There were 893 single samples collected. Between March 2002 and December 2007, 51 samples were correlated with storm events. Of the 51 storm event samples, 25 exceeded the water contact recreation single sample water quality objective for enterococcus. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the objectives are: Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the sampling station Aliso Beach Middle, station code S9, in the Aliso Beach HSA. Lat/Long: 33.50962/-117.75237.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. Bacteria monitoring data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43112, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Aliso Beach - middle

LOE ID:	29719
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	041621
Beneficial Use:	Shellfish Harvesting	
Number of Samples:	994	
Number of Exceedances:	201	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Shoreline monitoring data was collected by the County of Orange from January 1999 through December 2007. The number of samples collected was 994. From the 994 samples, 201 exceeded the single sample maximum shellfish water quality objective.	
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Ocean Plan, the median total coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from the sampling station Aliso Beach Middle, station code S9, in the Aliso Beach HSA. Lat/Long: 33.50962/-117.75237.	
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 43112, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Aliso Beach - middle

LOE ID:	29720
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	49
Number of Exceedances:	33
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline monitoring data was collected by the County of Orange from January 1999 through December 2006. The total number of single samples collected was 994. From March 2002 through December 2007, 49 samples were associated with storm events. Of the 49 samples, 33 exceeded the single sample maximum water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan, the median total coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the sampling station Aliso Beach Middle, station code S9, in the Aliso Beach HSA. Lat/Long: 33.50962/-117.75237.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. Bacteria monitoring data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43112, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Aliso Beach - middle

LOE ID:	29721
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	994
Number of Exceedances:	16
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline monitoring data was collected by the County of Orange from January 1999 through December 2007. The number of samples collected was 994. From the 994 samples, 16 exceeded the single sample maximum water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	

Guideline Reference:	041623
Spatial Representation:	Samples were collected from the sampling station Aliso Beach Middle, station code S9, in the Aliso Beach HSA. Lat/Long: 33.50962/-117.75237.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43112, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Aliso Beach - middle

LOE ID:	29722
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	108
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline monitoring data was collected by the County of Orange from January 1999 through December 2007. The number of samples collected was 994 and 108 monthly geomeans calculated. None of the geomeans exceeded the geomean water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the sampling station Aliso Beach Middle, station code S9, in the Aliso Beach HSA. Lat/Long: 33.50962/-117.75237.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43112, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Aliso Beach - middle

LOE ID:	29732

Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	-N/A
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	144
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2000 to December 2006, there were 144 beach postings days for this section of shoreline. Bacteriological samples are collected on a weekly basis at approximately 150 ocean and bay location in Orange County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of Orange in their Annual Ocean and Bay Water Quality Report, March 2007. The reporting period was from January 2000 -December 2006. Data used was the number of days the beach was posting when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	County of Orange. March 2007. Annual Ocean and Bay Water Quality Report, 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Bacteriological monitoring samples were collected at Aliso Beach and South Laguna Beach in Orange County, California. Beaches included Goff Island Beach, Treasure Island Beach, Aliso North, Aliso Middle, Aliso South, Camel Point, Table Rock, Laguna Lido, 9th Street/1000 Steps, and Three Arch Bay. The posting covers two miles of beach shoreline.
Temporal Representation:	The beach posting covers the time frame of January 2000 -December 2006.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of Orange's Quality Assessment/Quality Control document (County of Orange, 2004).
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43112, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Aliso Beach - middle

LOE ID:	31083
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	56

Number of Exceedances:	0	041625

Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Orange County collected Beach monitoring data within the time period from January 1999 through December 2006. A total of 56 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 56 geomeans zero exceeded the geomean water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml within any 30 day period (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the sampling station Aliso Beach Middle, station code S9, in the Aliso Beach HSA. Lat/Long: 33.50962/-117.75237.
Temporal Representation:	Samples were collected at least once a week within the time period from January 1999 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43112, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Aliso Beach - middle

LOE ID:	31084
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	56
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Orange County collected Beach monitoring data within the time period from January 1999 through December 2006. A total of 56 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 56 geomeans three exceeded the geomean water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	From the Ocean Plan the objectives are: Geomean: Enterococcus density shall not exceed 35 per 100 ml within any 30 day period (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the sampling station Aliso Beach Middle, station code S9, in the Aliso Beach HSA. Lat/Long: 33.50962/-117.75237.
Temporal Representation:	Samples were collected at least once a week within the time period from January 1999 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43112, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Aliso Beach - middle

LOE ID:	30293
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Water Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006. For the 2008 assessment , the 2006 listed coastline 'Pacific Ocean Shoreline, Aliso HSA' was split into smaller segments and each represents an area near the sampling location of the data being assessed. This segment 'Pacific Ocean Shoreline, Aliso HSA, at Aliso Beach middle' is one of the sampling locations. This LOE is a copy of the 2006 listing placeholder LOE for Pacific Ocean Shoreline, Aliso HSA and is considered by the Regional Board to be applicable to this more specific segment formed from the split.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	
Temporal Representation:	
Environmental Conditions:	
QAPP Information:	Unspecified
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43112, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Aliso Beach - middle

LOE ID:	29724
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	906
Number of Exceedances:	49
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline monitoring data was collected by the County of Orange from January 1999 through Decembery 2007. The number of samples collected was 906. From the 906 samples, 49 exceeded the water contact recreation single sample maximum water quality objective for fecal coliform.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the sampling station Aliso Beach Middle, station code S9, in the Aliso Beach HSA. Lat/Long: 33.50962/-117.75237.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Aliso HSA, at Aliso Beach - north
Water Body ID: CAC9011300020090525211559
Water Body Type: Coastal & Bay Shoreline

DECISION ID 44397 **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Aliso Beach - north

Pollutant: **Indicator Bacteria**
Final Listing Decision: **Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Delist from 303(d) list (TMDL required list)(2012)
Revision Status Revised
Reason for Delisting: Applicable WQS attained; reason for recovery unspecified
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for removal from the CWA section 303(d) List under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Twelve lines of evidence are available in the administrative record to assess this pollutant. With the latest data, three of the 229 samples exceeded the Water Quality Objective for enterococcus of a geomean of 35 cfu/100 ml in a 30-day period for the protection of REC-1.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Twelve lines of evidence are available in the administrative record to assess this pollutant. With the latest data, three of the 229 samples exceeded the Water Quality Objective for enterococcus of a geomean of 35 cfu/100 ml in a 30-day period for the protection of REC-1 and this does not exceed the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be removed from the section 303(d) list because applicable water quality standards for the pollutant are not being exceeded.

Line of Evidence (LOE) for Decision ID 44397, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Aliso Beach - north

LOE ID: 29686

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Shellfish Harvesting

Number of Samples:	976
Number of Exceedances:	86
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by County of Orange from January 1999 through December 2007. For total coliform, 976 individual samples were collected with 86 of the samples exceeding the single sample maximum objective for shellfish harvesting.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan, the median total coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from sampling station Aliso Beach North, station id S10, of the Aliso Beach HSA. Lat/Long: 33.51162/-117.75463
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44397, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Aliso Beach - north

LOE ID:	29691
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	975
Number of Exceedances:	14
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. There were a total of 975 samples collected. From the 975 samples, 14 exceeded the water contact recreation single sample maximum water quality objective for fecal coliform.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml;

	Geomean: Fecal coliform density shall not exceed 200 per 100ml. 041630
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from sampling station Aliso Beach North, station id S10, of the Aliso Beach HSA. Lat/Long: 33.51162/-117.75463.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. Bacteria monitoring data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44397, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Aliso Beach - north

LOE ID:	77583
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	121
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	None of the 121 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, Aliso HSA, at Aliso Beach - north, Treasure Island stairs.
Temporal Representation:	The samples were collected from January 2008 through August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44397, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Aliso Beach - north

LOE ID:	74506
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	121
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 121 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Treasure Island stairs site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44397, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Aliso Beach - north

LOE ID:	74505
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	143
Number of Exceedances:	4
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed BW data for Pacific Ocean Shoreline, Aliso HSA, at Aliso Beach - north to determine beneficial use support and results are as follows: 4 of 143 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.

Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009 041632

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Data for this line of evidence for Pacific Ocean Shoreline, Aliso HSA, at Aliso Beach - north was collected at 1 monitoring site [Treasure Island Stairs]
Temporal Representation: Data was collected over the time period 1/3/2008-8/30/2010.
Environmental Conditions: Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 44397, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Aliso Beach - north

LOE ID: 74504

Pollutant: Fecal Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 121
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Zero of the 121 geomeans exceeded the objective.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at the Treasure Island stairs site.
Temporal Representation: Samples were collected approximately once a week from January 2008 to August 2010.
Environmental Conditions:
QAPP Information: The samples were collected for the beach watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 44397, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Aliso Beach - north

LOE ID: 74493

Pollutant: Enterococcus
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 121
Number of Exceedances: 1

Data and Information Type:	Not Specified	041633
Data Used to Assess Water Quality:	One of the 121 geomeans exceeded the objective.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Treasure Island stairs site.	
Temporal Representation:	Samples were collected from January 2008 to August 2010.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44397, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Aliso Beach - north

LOE ID:	31087
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	56
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Orange County collected Beach monitoring data within the time period from January 1999 through December 2006. A total of 56 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 56 geomeans zero exceeded the geomean water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. within any 30 day period
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from sampling station Aliso Beach North, station id S10, of the Aliso Beach HSA. Lat/Long: 33.51162/-117.75463.
Temporal Representation:	Samples were collected at least once a week within the time period from January 1999 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period.
Environmental Conditions:	

QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44397, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Aliso Beach - north

LOE ID:	31086
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	56
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Orange County collected Beach monitoring data within the time period from January 1999 through December 2006. A total of 56 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 56 geomeans zero exceeded the geomean water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml. within any 30 day period
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from sampling station Aliso Beach North, station id S10, of the Aliso Beach HSA. Lat/Long: 33.51162/-117.75463.
Temporal Representation:	Samples were collected at least once a week within the time period from January 1999 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44397, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Aliso Beach - north

LOE ID:	31085
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation	041635
Number of Samples:	56	
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Orange County collected Beach monitoring data within the time period from January 1999 through December 2006. A total of 56 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 56 geomeans 0 exceeded the geomean water quality objective.	
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml within any 30 day period (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from sampling station Aliso Beach North, station id S10, of the Aliso Beach HSA. Lat/Long: 33.51162/-117.75463	
Temporal Representation:	Samples were collected at least once a week within the time period from January 1999 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 44397, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Aliso Beach - north

LOE ID:	29690
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	51
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. For total coliform, 976 individual samples were collected. For the period of March 2002 through December 2006, 51 individual samples correlated with rainfall events. Of those 51 storm event samples, two exceeded the single sample maximum water quality objective for total coliform. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final

	Report 041636 National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from sampling station Aliso Beach North, station id S10, of the Aliso Beach HSA. Lat/Long: 33.51162/-117.75463
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. Bacteria monitoring data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44397, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Aliso Beach - north

LOE ID:	29689
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	108
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange January 1999 through December 2007. For total coliform, 976 individual samples were collected and 108 monthly geomeans calculated. From the 108 geomeans, none of the geomeans exceeded monthly geomean objective for total coliform.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental

Protection Agency 041637

Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from sampling station Aliso Beach North, station id S10, of the Aliso Beach HSA. Lat/Long: 33.51162/-117.75463
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44397, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Aliso Beach - north

LOE ID:	29688
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	976
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange January 1999 through December 2007. For total coliform, 976 individual samples were collected. From the 976 samples, four samples exceeded the single sample maximum water quality objective for total coliform.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from sampling station Aliso Beach North, station id S10, of the Aliso Beach HSA. Lat/Long: 33.51162/-117.75463
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	County of Orange Quality Assessment/Quality Control document (County of Orange, 2004).
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44397, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Aliso Beach - north

LOE ID:	29687
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	51
Number of Exceedances:	23
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline data was collected by County of Orange for bacteria monitoring from January 1999 through December 2007. There were a total of 976 individual samples collected. From March 2002 through December 2007, 51 samples were correlated with rainfall events. Of the 51 storm event samples, 23 exceeded the single sample maximum shellfish standard for total coliform. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan, the median total coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from sampling station Aliso Beach North, station id S10, of the Aliso Beach HSA. Lat/Long: 33.51162/-117.75463
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. Bacteria monitoring data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44397, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Aliso Beach - north

LOE ID:	29696
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation
Number of Samples:	51
Number of Exceedances:	11
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. There were 959 individual samples collected. Between March 2002 and December 2007, 51 samples were correlated with storm events. From the 51 storm event samples, 11 exceeded the water contact recreation single sample maximum objective for enterococcus. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from sampling station Aliso Beach North, station id S10, of the Aliso Beach HSA. Lat/Long: 33.51162/-117.75463.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. Bacteria monitoring data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44397, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Aliso Beach - north

LOE ID:	29730
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	-N/A
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	144

Data and Information Type:	PWS pathogen monitoring (ambient water) 041640
Data Used to Assess Water Quality:	For the period from January 2000 to December 2006, there were 144 beach postings days for this section of shoreline. Bacteriological samples are collected on a weekly basis at approximately 150 ocean and bay location in Orange County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of Orange in their Annual Ocean and Bay Water Quality Report, March 2007. The reporting period was from January 2000 -December 2006. Data used was the number of days the beach was posting when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	County of Orange. March 2007. Annual Ocean and Bay Water Quality Report, 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Bacteriological monitoring samples were collected at Aliso Beach and South Laguna Beach in Orange County, California. Beaches included Goff Island Beach, Treasure Island Beach, Aliso North, Aliso Middle, Aliso South, Camel Point, Table Rock, Laguna Lido, 9th Street/1000 Steps, and Three Arch Bay. The posting covers two miles of beach shoreline.
Temporal Representation:	The beach posting covers the time frame of January 2000 -December 2006.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of Orange's Quality Assessment/Quality Control document (County of Orange, 2004).
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44397, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Aliso Beach - north

LOE ID:	30185
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Water Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006. For the 2008 assessment , the 2006 listed coastline 'Pacific Ocean Shoreline, Aliso HSA' was split into smaller segments and each represents an area near the sampling location of the data being assessed. This segment 'Pacific Ocean Shoreline, Aliso HSA, at Aliso Beach north' is one of the sampling locations. This LOE is a copy of the 2006 listing placeholder LOE for Pacific Ocean Shoreline, Aliso HSA and is considered by the Regional Board to be

	applicable to this more specific segment formed from the split.	041641
Data Reference:	Placeholder reference pre-2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Unspecified	
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:		
Temporal Representation:		
Environmental Conditions:		
QAPP Information:	Unspecified	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44397, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Aliso Beach - north

LOE ID:	29695
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	108
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. There were 959 individual samples collected with 108 monthly geomeans calculated. From the 108 monthly geomeans, 2 exceeded the water quality objective for enterococcus.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from sampling station Aliso Beach North, station id S10, of the Aliso Beach HSA. Lat/Long: 33.51162/-117.75463.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44397, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Aliso Beach - north

LOE ID:	29694
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	959
Number of Exceedances:	33
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. There were 959 individual samples collected for enterococcus. Of the 959 samples, 33 exceeded the single sample maximum objective for enterococcus.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from sampling station Aliso Beach North, station id S10, of the Aliso Beach HSA. Lat/Long: 33.51162/-117.75463.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44397, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Aliso Beach - north

LOE ID:	29693
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	51
Number of Exceedances:	4

Data and Information Type:	PWS pathogen monitoring (ambient water) 041643
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. There were 975 individual samples collected. Between March 2002 and December 2007, 51 samples were correlated with storm events. Of the 51 samples, 4 exceeded the water contact recreation single sample maximum water quality objective for fecal coliform. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from sampling station Aliso Beach North, station id S10, of the Aliso Beach HSA. Lat/Long: 33.51162/-117.75463.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. Bacteria monitoring data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44397, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Aliso Beach - north

LOE ID:	29692
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	108
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. There were 975 individual samples collected and 108 monthly geomeans calculated. From the 108 geomeans, none exceeded the water contact recreation geomean water quality objective for fecal coliform.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final

	Report 041644 National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from sampling station Aliso Beach North, station id S10, of the Aliso Beach HSA. Lat/Long: 33.51162/-117.75463.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. Bacteria monitoring data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Dana Point HSA, at Aliso Beach - south
Water Body ID: CAC9011300020090525213500
Water Body Type: Coastal & Bay Shoreline

DECISION ID 44198 **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Aliso Beach - south

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Original
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: In 2006, 'Pacific Ocean Shoreline, Dana Point HSA' was listed for Indicator Bacteria. For 2008, the 2006 Dana Point HSA segment has been split into smaller segments and each represents an area near the sampling location of the data being assessed. 'Pacific Ocean Shoreline, Dana Point HSA, at Aliso Beach south' is one of the sampling locations for Pacific Ocean Shoreline, Dana Point HSA and is considered to be part of the original listing.

For this 2008 assessment, the Regional Board has chosen to replace the 'indicator bacteria' listing with separate assessments of the specific indicator bacteria, such as coliform, fecal coliform, and enterococcus, for removal or non-removal from the 303(d) list.

Ten lines of evidence are available in the administrative record to assess this pollutant. Sixty-eight of 974 samples exceeded the water quality objective for Shellfish Harvesting. Fourty-Eight of the 959 samples exceeded the contact recreation objective for Enterococcus, Nine out of 975 samples exceeded the contact recreation objective for Fecal Coliform, and Two out of 974 samples exceeded the Evaluation Guideline for Total Coliform.

The coastal beach at this water segment is identified as an AB411 beach. To comply with the requirements of AB411 the dry weather data collected during the time frame of April 1st to October 31st is assessed using a four percent exceedance percentage, as described in section 3.3 and 4.3 of the Listing Policy. An assessment for the dry weather single geometric mean calculation was conducted and one additional line of evidence is available in the administrative record. Two of 56 geometric mean calculations exceeded the criteria for recreational use for Total Coliform, Zero out of 56 samples exceeded the objective for Enterococcus, and Fecal Coliform, and this does not exceed the allowable limit based on the application of a four percent exceedance percentage (AB411) to section 3.3 of the Listing Policy.

In LOEs 29709 29711, 29718, 29715, and the Regional Board calculated exceedances for samples taken only during storm events. This information was not used in determining listing decisions, but is of interest to the Regional Board and has been included as additional anecdotal information.This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.

3. Sixty-eight of 974 samples exceeded the Shellfish Harvesting water quality objective and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Sixty-eight of 974 samples exceeded the water quality objective for Shellfish Harvesting. Fourty-Eight of the 959 samples exceeded the contact recreation objective for Enterococcus, Nine out of 975 samples exceeded the contact recreation objective for Fecal Coliform, and Two out of 974 samples exceeded the Evaluation Guideline for Total Coliform and this does not exceed the allowable limit based on the application of a four percent exceedance percentage (AB411) to section 3.3 of the Listing Policy.
5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 44198, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Aliso Beach - south

LOE ID:	29708
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	974
Number of Exceedances:	68
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of Orange from January 1999 through December 2007. The number of samples collected for total coliform analysis was 974. Of the 974 samples, 68 exceeded the single sample maximum total coliform standard for shellfish harvesting.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan, the median total coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the station Aliso Beach South, station id S8, in the Aliso Beach HSA. Lat/Long: 33.50755/-117.75087.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44198, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Aliso Beach - south 041647

LOE ID:	31055
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	56
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange within the time period from January 1999 through December 2006. A total of 56 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 56 geomeans 2 exceeded the geomean water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the station Aliso Beach South, station id S8, in the Aliso Beach HSA. Lat/Long: 33.50755/-117.75087.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44198, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Aliso Beach - south

LOE ID:	29710
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	974
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of Orange from January 1999

	through December 2007. The number of samples included 974 individual bacteria samples. From the 974 samples, two samples exceeded single sample maximum water quality objective for water contact recreation.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the station Aliso Beach South, station id S8, in the Aliso Beach HSA. Lat/Long: 33.50755/-117.75087.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44198, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Aliso Beach - south

LOE ID:	29711
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	51
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of Orange from January 1999 through December 2007. A total of samples 974 individual bacteria samples were collected. From March 2002 to December 2007, 51 samples were correlated with storm events. Of the 51 storm event samples, only one sample exceeded the water contact recreation single sample maximum water quality objective for total coliform. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml.

Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the station Aliso Beach South, station id S8, in the Aliso Beach HSA. Lat/Long: 33.50755/-117.75087.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. Bacteria monitoring data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44198, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Aliso Beach - south

LOE ID:	29712
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	108
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline monitoring data was collected by the County of Orange from January 1999 through December 2007. The number of samples included 974 individual bacteria samples and 108 monthly geomeans were calculated. From the 108 geomeans, , none exceeded the water contact recreation geomean water quality objective for total coliform.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the station Aliso Beach South, station id S8, in the Aliso Beach HSA. Lat/Long: 33.50755/-117.75087.

Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44198, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Aliso Beach - south

LOE ID:	29713
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	975
Number of Exceedances:	9
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of Orange from January 1999 through December 2007. A total of 975 samples were collected. From the 975 samples, 9 exceeded the water contact recreation single sample maximum water quality objective for fecal coliform.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the station Aliso Beach South, station id S8, in the Aliso Beach HSA. Lat/Long: 33.50755/-117.75087.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44198, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Aliso Beach - south

LOE ID:	29714
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	041651
Beneficial Use:	Water Contact Recreation	
Number of Samples:	108	
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of Orange from January 1999 through December 2007. The total number of samples collected was 975. From the 975 samples, 108 monthly geomeans were calculated with none exceeding the water contact recreation geomean water quality objective.	
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml.	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from the station Aliso Beach South, station id S8, in the Aliso Beach HSA. Lat/Long: 33.50755/-117.75087.	
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 44198, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Aliso Beach - south

LOE ID:	29715
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	50
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of Orange from January 1999 through December 2007. The total number of samples collected was 975. Between March 2002 and December 2007, 50 were correlated with storm events. From the 50 storm event samples, 3 exceeded the water contact recreation single sample maximum water quality objective for fecal coliform. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final

	Report 041652 National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the station Aliso Beach South, station id S8, in the Aliso Beach HSA. Lat/Long: 33.50755/-117.75087.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. Bacteria monitoring data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44198, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Aliso Beach - south

LOE ID:	29716
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	959
Number of Exceedances:	48
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of Orange from January 1999 through December 2007. The total number of samples collected was 959. From the 959 samples, 48 exceeded the single sample maximum objective for enterococcus.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005.

	Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency 041653
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the station Aliso Beach South, station id S8, in the Aliso Beach HSA. Lat/Long: 33.50755/-117.75087.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44198, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Aliso Beach - south

LOE ID:	29717
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	108
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of Orange from January 1999 through December 2007. The number of samples included 959 individual bacteria samples and 108 monthly geomeans were calculated. Of the 108 geomeans, only one exceeded the water contact objective for enterococcus.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the station Aliso Beach South, station id S8, in the Aliso Beach HSA. Lat/Long: 33.50755/-117.75087.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44198, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Aliso Beach - south 041654

LOE ID:	29718
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	51
Number of Exceedances:	15
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of Orange from January 1999 through December 2007. The number of samples collected was 959. Betweem March 2002 and December 2007, 51 samples were correlated with storm events. Of the 51 storm event samples, 15 exceeded the water contact recreation single sample maximum for enterococcus. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the station Aliso Beach South, station id S8, in the Aliso Beach HSA. Lat/Long: 33.50755/-117.75087.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. Bacteria monitoring data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44198, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Aliso Beach - south

LOE ID:	29731
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories

Matrix:	-N/A	041655
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	2555	
Number of Exceedances:	144	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	For the period from January 2000 to December 2006, there were 144 beach postings days for this section of shoreline. Bacteriological samples are collected on a weekly basis at approximately 150 ocean and bay location in Orange County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of Orange in their Annual Ocean and Bay Water Quality Report, March 2007. The reporting period was from January 2000 -December 2006. Data used was the number of days the beach was posting when the ocean or bay failed to meet the bacteriological standards.	
Data Reference:	County of Orange. March 2007. Annual Ocean and Bay Water Quality Report, 2006	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.	
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Bacteriological monitoring samples were collected at Aliso Beach and South Laguna Beach in Orange County, California. Beaches included Goff Island Beach, Treasure Island Beach, Aliso North, Aliso Middle, Aliso South, Camel Point, Table Rock, Laguna Lido, 9th Street/1000 Steps, and Three Arch Bay. The posting covers two miles of beach shoreline.	
Temporal Representation:	The beach posting covers the time frame of January 2000 -December 2006.	
Environmental Conditions:		
QAPP Information:	Samples were collected in compliance with County of Orange's Quality Assessment/Quality Control document (County of Orange, 2004).	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44198, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Aliso Beach - south

LOE ID:	30186
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Water Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING

Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006. For the 2008 assessment , the 2006 listed coastline 'Pacific Ocean Shoreline, Dana Point HSA' was split into smaller segments and each represents an area near the sampling location of the data being assessed. This segment 'Pacific Ocean Shoreline, Dana Point HSA, at Aliso Beach south' is one of the sampling locations. This LOE is a copy of the 2006 listing placeholder LOE for Pacific Ocean Shoreline, Dana Point HSA and is considered by the Regional Board to be applicable to this more specific segment formed from the split.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	
Temporal Representation:	
Environmental Conditions:	
QAPP Information:	Unspecified
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44198, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Aliso Beach - south

LOE ID:	31060
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	56
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange within the time period from January 1999 through December 2006. A total of 56 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 56 geomeans zero exceeded the geomean water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. over a 30 day period
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the station Aliso Beach South, station id S8, in the Aliso Beach

	HSA. Lat/Long: 33.50755/-117.75087. 041657
Temporal Representation:	Samples were collected weekly from January 1999 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44198, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Aliso Beach - south

LOE ID:	31058
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	56
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange within the time period from January 1999 through December 2006. A total of 56 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 56 geomeans zero exceeded the geomean water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml. over a 30 day period
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the station Aliso Beach South, station id S8, in the Aliso Beach HSA. Lat/Long: 33.50755/-117.75087.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44198, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Aliso Beach - south

LOE ID:	29709
Pollutant:	Total Coliform

LOE Subgroup:	Pollutant-Water	041658
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Shellfish Harvesting	
Number of Samples:	51	
Number of Exceedances:	23	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of Orange from January 1999 through December 2007. The total number of samples was 974. From March 2002 through December 2007, 51 samples were correlated with storm events. Of the 51 storm event samples, 23 exceeded the single sample maximum objective for shellfish harvesting. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.	
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Ocean Plan, the median total coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml.	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from the station Aliso Beach South, station id S8, in the Aliso Beach HSA. Lat/Long: 33.50755/-117.75087.	
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.	
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. Bacteria monitoring data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Aliso HSA, at Aliso Creek mouth
Water Body ID: CAC9011300020090525212513
Water Body Type: Coastal & Bay Shoreline

DECISION ID 43047 Region 9
Pacific Ocean Shoreline, Aliso HSA, at Aliso Creek mouth

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal from the CWA section 303(d) List under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Eleven lines of evidence are available in the administrative record to assess this pollutant. Combining the latest data with old data, 97 of the 223 samples exceed the Water Quality Objective for enterococcus of a geomean of 35 cfu/100ml in a 30-day period for the protection of REC-1. Multiple samples also do not meet the respective WQOs for fecal coliform and total coliform.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Combining the latest data with old data, 97 out of 223 samples exceed the Water Quality Objective for enterococcus of a geomean of 35 cfu/100ml in a 30-day period for the protection of REC-1 and this exceeds the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 43047, Indicator Bacteria Region 9
Pacific Ocean Shoreline, Aliso HSA, at Aliso Creek mouth

LOE ID:	74509
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation
Number of Samples:	148
Number of Exceedances:	12
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Twelve of the 148 samples exceeded the enterococcus objective. For these water bodies, samples were collected from surfzone upcoast and surfzone downcoast. These results represent the higher of the two values.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample enterococcus concentration shall not exceed more than 104/100ml. Water Quality Control Plan for Ocean Waters of California. Region 9 Basion Plan.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from site ACM1 Aliso Creek Mouth (surzone upcoast and downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to June 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43047, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Aliso Creek mouth

LOE ID:	74524
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	148
Number of Exceedances:	2
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Two of the 148 samples exceeded the total coliform objective. For these water bodies, samples were collected from surfzone upcoast and surfzone downcoast. These results represent the higher of the two values.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample total coliform concentration shall not exceed more than 10,000/100ml. Water Quality Control Plan for Ocean Waters of California. Region 9 Basion Plan.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:
Guideline Reference:

Spatial Representation: The samples were collected from site ACM1 Aliso Creek Mouth (surzone upcoast amd surfzone downcoast).
Temporal Representation: The samples were collected once a week from July 2006 to June 2009.
Environmental Conditions:
QAPP Information: The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 43047, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Aliso Creek mouth

LOE ID: 74532

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 134
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: None of the 134 samples exceeded the total coliform objective. For these stations, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.
Data Reference: Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The geometric mean for total coliform shall not exceed more than 1000/100ml. Water Quality Control Plan for the San Diego Basin. Water Quality Control Plan for Ocean Waters.
Objective/Criterion Reference: Water Quality Control Plan for the San Diego Basin
California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: The samples were collected from Aliso Creek Mouth (surfzone upcoast and surfzone downcoast).
Temporal Representation: The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:
QAPP Information: The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 43047, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Aliso Creek mouth

LOE ID: 74518

Pollutant: Enterococcus
LOE Subgroup: Pollutant-Water
Matrix: Water

Fraction:	None	041662
Beneficial Use:	Water Contact Recreation	
Number of Samples:	134	
Number of Exceedances:	8	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Eight of the 134 geomeans exceeded the enterococcus objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The geometric mean for enterococcus shall not exceed 35 MPN/100 mL. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected from Aliso Creek Mouth (surfzone upcoast and surfzone downcoast).	
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.	
Environmental Conditions:		
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43047, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Aliso Creek mouth

LOE ID:	74519
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	148
Number of Exceedances:	2
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Two of the 148 samples exceeded the fecal coliform objective. For these water bodies, samples were collected from surfzone upcoast and surfzone downcoast. These results represent the higher of the two values.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample fecal coliform concentration shall not exceed more than 400/100ml. Water Quality Control Plan for Ocean Waters of California. Region 9 Basion Plan.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	041663
Guideline Reference:	
Spatial Representation:	The samples were collected from site ACM1 Aliso Creek Mouth (surzone upcoast and downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to June 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43047, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Aliso Creek mouth

LOE ID:	74520
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	134
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	None of the 134 geomeans exceeded the fecal coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean for fecal coliform shall not exceed more than 200/100ml. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Coastal Aliso Creek Mouth (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43047, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Aliso Creek mouth

LOE ID:	31093
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation
Number of Samples:	51
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Orange County collected Beach monitoring data within the time period from January 1999 through December 2006. A total of 51 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 51 geomeans two exceeded the geomean water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the objectives are: Geomean: Enterococcus density shall not exceed 35 per 100 ml within any 30 day period (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the station C1 located near the mouth of Aliso Creek in the Aliso Beach HSA. representing approximately 0.29 miles of shoreline. Lat/Long:33.51051/-117.75286.
Temporal Representation:	Samples were collected at least once a week within the time period from January 1999 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43047, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Aliso Creek mouth

LOE ID:	31091
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	51
Number of Exceedances:	51
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Orange County collected Beach monitoring data within the time period from January 1999 through December 2006. A total of 51 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 51 geomeans 51 exceeded the geomean water quality objective.

Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the objectives are: Geomean: Total coliform density shall not exceed 1,000 per 100ml within any 30 day period (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the station C1 located near the mouth of Aliso Creek in the Aliso Beach HSA. representing approximately 0.29 miles of shoreline. Lat/Long:33.51051/-117.75286.
Temporal Representation:	Samples were collected at least once a week within the time period from January 1999 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43047, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Aliso Creek mouth

LOE ID:	31092
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	51
Number of Exceedances:	31
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Orange County collected Beach monitoring data within the time period from January 1999 through December 2006. A total of 56 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 51 geomeans 31 exceeded the geomean water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the objectives are: Geomean: Fecal coliform density shall not exceed 200 per 100ml within any 30 day period (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental

Protection Agency 041666

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected from the station C1 located near the mouth of Aliso Creek in the Aliso Beach HSA. representing approximately 0.29 miles of shoreline. Lat/Long:33.51051/-117.75286.

Temporal Representation: Samples were collected at least once a week within the time period from January 1999 through December 2006.
The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period.

Environmental Conditions:

QAPP Information: Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.

QAPP Information Reference(s): County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43047, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Aliso Creek mouth

LOE ID: 29734

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 782
Number of Exceedances: 93

Data and Information Type: Fixed station physical/chemical monitoring (conventional pollutants only)

Data Used to Assess Water Quality: Shoreline beach monitoring data was collected by the County of Orange from January 1999 through May 2006. The number of samples collected was 782 individual bacteria samples. From the 782 samples, 93 samples exceeded single sample maximum water quality objective.

Data Reference: Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: From the Ocean Plan the objectives are:

Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;

Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).

Objective/Criterion Reference: Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected from the station C1 located near the mouth of Aliso Creek in the Aliso Beach HSA. representing approximately 0.29 miles of shoreline. Lat/Long: 33.51051/-117.75286.

Temporal Representation: Samples were collected weekly from January 1999 through May 2006; however, rainfall data is only available from March 2002 through December 2006.

Environmental Conditions:

QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43047, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Aliso Creek mouth

LOE ID:	29735
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	89
Number of Exceedances:	84
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Eighty-four of 89 monthly geomeans exceeded the geomean water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the objectives are: Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the station C1 located near the mouth of Aliso Creek in the Aliso Beach HSA. representing approximately 0.29 miles of shoreline. Lat/Long:33.51051/-117.75286.
Temporal Representation:	Samples were collected weekly from January 1999 through May 2006; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43047, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Aliso Creek mouth

LOE ID:	29736
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	44

Number of Exceedances:	22	041668

Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline monitoring data was collected by the County of Orange from January 1999 through May 2006. Total number of total coliform samples was 782. Between March 2002 and December 2006, 44 samples were correlated with storm events. From the 44 samples, 22 exceeded the single sample maximum. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the objectives are: Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005). Comparisons to water quality objectives were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the station C1 located near the mouth of Aliso Creek in the Aliso Beach HSA. representing approximately 0.29 miles of shoreline. Lat/Long:33.51051/-117.75286.
Temporal Representation:	Samples were collected weekly from January 1999 through May 2006; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43047, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Aliso Creek mouth

LOE ID:	29737
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	789
Number of Exceedances:	234
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline monitoring data was collected by the County of Orange from January 1999 through May 2006. Total number of fecal coliform samples collected was 789 with 234 exceeding the single sample maximum.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report

	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station 041669
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the objectives are: Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the station C1 located near the mouth of Aliso Creek in the Aliso Beach HSA. representing approximately 0.29 miles of shoreline. Lat/Long:33.51051/-117.75286.
Temporal Representation:	Samples were collected weekly from January 1999 through May 2006; however, rainfall data is only available from March 2002 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43047, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Aliso Creek mouth

LOE ID:	29738
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	89
Number of Exceedances:	54
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline monitoring data was collected by the County of Orange from 1999 through 2006. Total number of fecal coliform samples was 789 and 89 monthly geomeans were calculated. Of the 89 geomeans, 54 exceeded the geomean water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the objectives are: Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:	041670
Guideline Reference:	
Spatial Representation:	Samples were collected from the station C1 located near the mouth of Aliso Creek in the Aliso Beach HSA. representing approximately 0.29 miles of shoreline. Lat/Long:33.51051/-117.75286.
Temporal Representation:	Samples were collected weekly from January 1999 through May 2006; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43047, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Aliso Creek mouth

LOE ID:	30187
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Water Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006. For the 2008 assessment , the 2006 listed coastline 'Pacific Ocean Shoreline, Aliso HSA' was split into smaller segments and each represents an area near the sampling location of the data being assessed. This segment 'Pacific Ocean Shoreline, Aliso HSA, at Aliso Beach, at Aliso Creek mouth' is one of the sampling locations. This LOE is a copy of the 2006 listing placeholder LOE for Pacific Ocean Shoreline, Aliso HSA and is considered by the Regional Board to be applicable to this more specific segment formed from the split.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	
Temporal Representation:	
Environmental Conditions:	
QAPP Information:	Unspecified
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43047, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Aliso Creek mouth

LOE ID:	29739
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water

Matrix:	Water	041671
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	44	
Number of Exceedances:	28	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Shoreline monitoring data was collected by the County of Orange from 1999 through 2006. Total number of fecal coliform samples was 789. Between March 2002 and December 2006, 44 samples were correlated with rainfalll events with 28 exceeding the single sample maximum. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.	
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Ocean Plan the objectives are: Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005). Comparisons to water quality objectives were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Spatial Representation:	Samples were collected from the station C1 located near the mouth of Aliso Creek in the Aliso Beach HSA. representing approximately 0.29 miles of shoreline. Lat/Long:33.51051/-117.75286.	
Temporal Representation:	Samples were collected weekly from January 1999 through May 2006; however, rainfall data is only available from March 2002 through December 2007	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 43047, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Aliso Creek mouth

LOE ID:	29740
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	778

Number of Exceedances:	491	041672

Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline monitoring data was collected by the County of Orange from 1999 through 2006. Total number of samples collected was 778 with 491 samples exceeding the single sample maximum.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the objectives are: Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the station C1 located near the mouth of Aliso Creek in the Aliso Beach HSA. representing approximately 0.29 miles of shoreline. Lat/Long:33.51051/-117.75286.
Temporal Representation:	Samples were collected weekly from January 1999 through May 2006; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43047, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Aliso Creek mouth

LOE ID:	29741
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	89
Number of Exceedances:	89
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline monitoring data was collected by the County of Orange from 1999 through 2006. Total number of Enterococcus samples was 778 and 89 monthly geomeans were calculated. Allof the geomeans exceeded the geomean water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the objectives are:

041673

	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the station C1 located near the mouth of Aliso Creek in the Aliso Beach HSA. representing approximately 0.29 miles of shoreline. Lat/Long:33.51051/-117.75286.
Temporal Representation:	Samples were collected weekly from January 1999 through May 2006; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43047, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Aliso Creek mouth

LOE ID:	29742
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	48
Number of Exceedances:	43
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline monitoring data was collected by the County of Orange from 1999 through 2006. Total number of Enterococcus samples was 778. Between March 2002 and December 2006, 48 samples were correlated with rainfalll events with 43 exceeding the single sample maximum objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the objectives are: Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005). Comparisons to water quality objectives were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:	041674
Guideline Reference:	
Spatial Representation:	Samples were collected from the station C1 located near the mouth of Aliso Creek in the Aliso Beach HSA. representing approximately 0.29 miles of shoreline. Lat/Long:33.51051/-117.75286.
Temporal Representation:	Samples were collected weekly from January 1999 through May 2006; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

DECISION ID 49660 Region 9

Pacific Ocean Shoreline, Aliso HSA, at Aliso Creek mouth

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the Five samples exceed the Water Quality Criteria for Chlorpyrifos. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Five samples exceeded the Water Quality Criteria for Chlorpyrifos and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49660, Chlorpyrifos Region 9

Pacific Ocean Shoreline, Aliso HSA, at Aliso Creek mouth

LOE ID:	74507
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved

Beneficial Use:	Marine Habitat	041675
Number of Samples:	5	
Number of Exceedances:	0	
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)	
Data Used to Assess Water Quality:	None of the five samples exceeded the Criteria Continuous Concentration for Chlorpyrifos of 9 ng/L. However, for three samples the Reporting limit exceeded the evaluation guideline and these data were not usable.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California's Ocean Plan states that, "The concentration of organic materials in marine sediments shall not be increased to levels that would degrade marine life.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:	The Criteria Continuous Concentration for chlorpyrifos in saltwater is 9 ng/L.	
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game	
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, Aliso HSA, at Aliso Creek mouth at locations ACM-1 and ACM-1d.	
Temporal Representation:	Samples were collected in September 2006; June, September and December 2007; and January 2008.	
Environmental Conditions:	Samples were collected in the dry season and during storm events.	
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefor the quality of these data are unknown. For three samples the Reporting Limit of 10 ng/L is higher than the criteria of 9ng/L which makes these data not usable.	
QAPP Information Reference(s):		

DECISION ID 49661 Region 9

Pacific Ocean Shoreline, Aliso HSA, at Aliso Creek mouth

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the Eight samples exceed the Water Quality Criteria for Diazinon.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Eight samples exceeded the Water Quality Criteria for Diazinon and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully

supported using table 3.1. 041676
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49661, Diazinon **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Aliso Creek mouth

LOE ID:	74508
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the eight samples exceeded the Criteria Continuous Concentration for diazinon of 820 ng/L.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California's Ocean Plan states that, "The concentration of organic materials in marine sediments shall not be increased to levels that would degrade marine life.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The Criteria Continuous Concentration for diazinon in saltwater is 820 ng/L.
Guideline Reference:	Aquatic Life Ambient Water Quality Criteria for Diazinon
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, Aliso HSA, at Aliso Creek mouth at locations ACM-1 and ACM-1d.
Temporal Representation:	Samples were collected from ACM-1 on September and December in 2006; and January of 2008. Samples were collected from ACM-1d on October 2007; May, October, December 2008; and April 2009.
Environmental Conditions:	Samples were collected in the dry season and during storm events.
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefor the quality of these data are unknown.
QAPP Information Reference(s):	

DECISION ID 49662 **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Aliso Creek mouth

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the Eight samples exceed the Water Quality Criteria for Malathion.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Eight samples exceeded the Water Quality Criteria for Malathion and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49662, Malathion **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Aliso Creek mouth

LOE ID:	74521
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the eight samples exceeded the maximum concentration for Malathion of 100 ng/L.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California's Ocean Plan states that, "The concentration of organic materials in marine sediments shall not be increased to levels that would degrade marine life.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The maximum (Instantaneous) concentration for Malathion in saltwater is 100 ng/L.
Guideline Reference:	Quality Criteria for Water. USEPA Office of Water and Hazardous Materials. Washington, D.C
Spatial Representation:	Samples were collected from Pacific Ocean Shoreline, Aliso HSA, at Aliso Creek mouth at locations ACM-1 and ACM-1d.
Temporal Representation:	Samples were collected from ACM-1 on September and December in 2006; and January of 2008. Samples were collected from ACM-1d on October 2007; May, October, December 2008; and April 2009.
Environmental Conditions:	Samples were collected in the dry season and during storm events.

QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefor the quality of these data are unknown.
QAPP Information Reference(s):	

DECISION ID 49663 Region 9

Pacific Ocean Shoreline, Aliso HSA, at Aliso Creek mouth

Pollutant:	**Nitrogen, ammonia (Total Ammonia)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the Eight samples exceed the Water Quality Objective for Nitrogen, ammonia (Total Ammonia). Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Eight samples exceeded the Nitrogen, ammonia (Total Ammonia) and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49663, Nitrogen, ammonia (Total Ammonia) Region 9

Pacific Ocean Shoreline, Aliso HSA, at Aliso Creek mouth

LOE ID:	74522
Pollutant:	Nitrogen, ammonia (Total Ammonia)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Marine Habitat
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	None of eight sample medians exceeded the water quality objective for total ammonia. Each samples was calculated a median using the sample and all other samples taken previously

	within a 180-day period. 041679
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. The Ocean Plan objective for total ammonia as nitrogen is a moving 6-month median of 600 ug/L.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at station ACM-1.
Temporal Representation:	Samples were collected from September 2006 to April 2009.
Environmental Conditions:	
QAPP Information:	A signed QAPP was included with the stated goal of ensuring the consistent collection of accurate water quality information that will used to satisfy the objectives of the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID 49667 Region 9

Pacific Ocean Shoreline, Aliso HSA, at Aliso Creek mouth

Pollutant:	**pH**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Water Quality Objective for pH. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Water Quality Objective for pH and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49667, pH Region 9

Pacific Ocean Shoreline, Aliso HSA, at Aliso Creek mouth 041680

LOE ID:	74523
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Numeric data generated from 1 sample of pH data had no exceedences.
Data Reference:	Data for bacteria in various waterbodies, Feb. 2005-May 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In bays and estuaries the pH shall not be depressed below 7.0 nor raised above 9.0.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the Aliso Creek at mouth - estuary station.
Temporal Representation:	One sample was collected on 5/5/2007.
Environmental Conditions:	
QAPP Information:	NPDES quality assurance.
QAPP Information Reference(s):	

DECISION ID 49665 Region 9

Pacific Ocean Shoreline, Aliso HSA, at Aliso Creek mouth

Pollutant:	**Toxicity**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2029
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Three of six samples exhibited water toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Three of six samples exhibited water toxicity and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.

4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 49665, Toxicity **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Aliso Creek mouth

LOE ID:	74533
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Marine Habitat
Number of Samples:	6
Number of Exceedances:	3
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Six samples were collected to test for toxicity. Three of the nine samples exhibited statistically and biologically significant toxicity. The toxicity tests that exhibited significant toxicity included Mysid biomass and survival and Purple Urchin development and fertilization.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control. Additionally, the biological significance of the sample was evaluted by determining whether the sample response was lower than the evaluation threshold.
Guideline Reference:	
Spatial Representation:	The samples were collected at station ACM1d in the ocean close to Aliso Creek Mouth.
Temporal Representation:	The samples were collected from October 2007 to February 2010.
Environmental Conditions:	
QAPP Information:	The data collected under the Quality Assurance Management Plan for The Orange County Stormwater Program. The SWAMP measurement quality objectives were followed for toxicity data. The performance of toxicity bioassays and evaluation of reference toxicants were performed using USEPA and Standard Methods.
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Aliso HSA, at Blue Lagoon
Water Body ID: CAC9011300020090525211046
Water Body Type: Coastal & Bay Shoreline

DECISION ID 43054 Region 9
Pacific Ocean Shoreline, Aliso HSA, at Blue Lagoon

Pollutant: Indicator Bacteria
Final Listing Decision: Delist from 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Delist from 303(d) list (TMDL required list)(2012)
Revision Status Revised
Reason for Delisting: Applicable WQS attained; reason for recovery unspecified
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal from the CWA section 303(d) List under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Twelve lines of evidence are available in the administrative record to assess this pollutant. With the latest data, five of the 390 samples exceeded the Water Quality Objective for enterococcus of a geomean of 35 cfu/100ml in a 30-day period for the protection of REC-1.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Twelve lines of evidence are available in the administrative record to assess this pollutant. With the latest data, five of the 390 samples exceeded the Water Quality Objective for enterococcus of a geomean of 35 cfu/100ml in a 30-day period for the protection of REC-1 and this does not exceed the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be removed from the section 303(d) list because applicable water quality standards for the pollutant are not being exceeded.

Line of Evidence (LOE) for Decision ID 43054, Indicator Bacteria Region 9
Pacific Ocean Shoreline, Aliso HSA, at Blue Lagoon

LOE ID: 74540

Pollutant: Fecal Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples:	126
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	None of the 126 geomeans exceeded the fecal coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean for fecal coliform shall not exceed more than 200/100ml. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Coastal Coastal Stormdrain at Blue Lagoon Drive (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43054, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Blue Lagoon

LOE ID:	74544
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	126
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	None of the 126 samples exceeded the total coliform objective. For these stations, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean for total coliform shall not exceed more than 1000/100ml. Water Quality Control Plan for the San Diego Basin. Water Quality Control Plan for Ocean Waters.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Coastal Stormdrain at Blue Lagoon Drive (surfzone upcoast and surfzone downcoast).

Temporal Representation:	The samples were collected once a week from July 2006 to 2009. 041684
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43054, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Blue Lagoon

LOE ID:	74542
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	121
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 121 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Blue Lagoon site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43054, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Blue Lagoon

LOE ID:	74543
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	143
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 143 samples exceeded the total coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample total coliform concentration shall not exceed more than 10000/100ml. Water Quality Control Plan for Ocean Waters of California. Region 9 Basion Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from site BLULGN, Coastal Stormdrain at Blue Lagoon Drive (surzone upcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to June 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43054, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Blue Lagoon

LOE ID:	77584
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	121
Number of Exceedances:	3
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Three of the 121 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, Aliso HSA, at Blue Lagoon.
Temporal Representation:	The samples were collected from January 2008 through August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43054, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Blue Lagoon

LOE ID:	74536	041686

Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	126
Number of Exceedances:	2
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Two of the 126 geomeans exceeded the enterococcus objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean for enterococcus shall not exceed 35 MPN/100 mL. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Coastal Stormdrain at Blue Lagoon Drive (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43054, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Blue Lagoon

LOE ID:	74537
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	121
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 121 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline: 041687
Guideline Reference:

Spatial Representation: Samples were collected at the Blue Lagoon site.
Temporal Representation: Samples were collected approximately once a week from January 2008 to August 2010.
Environmental Conditions:
QAPP Information: The samples were collected for the beach watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 43054, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Blue Lagoon

LOE ID: 29700

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 108
Number of Exceedances: 0

Data and Information Type: PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality: Shoreline beach monitoring data was collected by the County of Orange January 1999 through December 2007. The number of samples included 934 individual bacteria samples and 108 monthly geomeans were calculated. From the 108 geomeans, none exceeded geomean water quality objective for water contact recreation.
Data Reference: Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;

Geomean: Total coliform density shall not exceed 1,000 per 100ml.
Objective/Criterion Reference: Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected from Blue Lagoon, station id S13, in the Aliso Beach HSA. (lat/long: 33.51689/-117.76118)
Temporal Representation: Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:
QAPP Information: Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s): County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43054, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Blue Lagoon

LOE ID: 29699

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water

Fraction:	None	041688
Beneficial Use:	Water Contact Recreation	
Number of Samples:	934	
Number of Exceedances:	1	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of Orange from January 1999 through December 2007. The number of samples included 934 individual bacteria samples and 108 monthly geomeans were calculated. From the 934 samples, one sample exceeded single sample maximum water quality objective for water contact recreation.	
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml.	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Blue Lagoon, station id S13, in the Aliso Beach HSA. (lat/long: 33.51689/-117.76118)	
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 43054, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Blue Lagoon

LOE ID:	29698
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	51
Number of Exceedances:	14
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of Orange from January 1999 through December 2007. The number of samples collected for total coliform analysis was 934. Between March 2002 and December 2007, 51 samples could be associated with storm events. Of these 51 samples, 14 exceeded the single sample maximum total coliform standard for shellfish harvesting. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional

	Temperature and Precipitation Listings by Station	041689

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan, the median total coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Blue Lagoon, station id S13, in the Aliso Beach HSA. (lat/long: 33.51689/-117.76118)
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. Bacteria monitoring data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43054, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Blue Lagoon

LOE ID:	29697
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	934
Number of Exceedances:	46
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of Orange from January 1999 through December 2007. The number of samples collected for total coliform analysis was 934. Of the 934 samples, 46 exceeded the single sample maximum total coliform standard for shellfish harvesting.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan, the median total coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected from Blue Lagoon, station id S13, in the Aliso Beach HSA. (lat/long: 33.51689/-117.76118)
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43054, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Blue Lagoon

LOE ID:	74538
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	143
Number of Exceedances:	1
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	One of the 131 samples exceeded the fecal coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample fecal coliform concentration shall not exceed more than 400/100ml. Water Quality Control Plan for Ocean Waters of California. Region 9 Basion Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from site BLULGN, Coastal Stormdrain at Blue Lagoon Drive (surzone upcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to June 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43054, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Blue Lagoon

LOE ID:	29707
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	51
Number of Exceedances:	7
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. There were 934 individual samples collected with 51 samples correlated with storm events. From the 51 storm event samples, 7 exceeded the water contact recreation single sample maximum water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Blue Lagoon, station id S13, in the Aliso Beach HSA. (lat/long: 33.51689/-117.76118)
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. Bacteria monitoring data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43054, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Blue Lagoon

LOE ID:	30322
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Water Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.

	For the 2008 assessment , the 2006 listed coastline 'Pacific Ocean Shoreline, Aliso HSA' was split into smaller segments and each represents an area near the sampling location of the data being assessed. This segment 'Pacific Ocean Shoreline, Aliso HSA, at Blue Lagoon' is one of the sampling locations. This LOE is a copy of the 2006 listing placeholder LOE for Pacific Ocean Shoreline, Aliso HSA and is considered by the Regional Board to be applicable to this more specific segment formed from the split.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	
Temporal Representation:	
Environmental Conditions:	
QAPP Information:	Unspecified
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43054, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Blue Lagoon

LOE ID:	74535
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	121
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 121 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Blue Lagoon site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43054, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Blue Lagoon

LOE ID:	29706

Pollutant:	Enterococcus	041693
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	108	
Number of Exceedances:	2	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. There were 934 individual samples collected with 108 monthly geomeans calculated. From the 108 monthly geomeans, 2 exceeded the water contact recreation geomean water quality objective.	
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Blue Lagoon, station id S13, in the Aliso Beach HSA. (lat/long: 33.51689/-117.76118)	
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43054, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Blue Lagoon

LOE ID:	29705
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	934
Number of Exceedances:	48
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of Orange from January 1999 through December 2007. The number of samples collected was 934 bacteria samples. Of the 934 samples, 48 exceeded the water contact recreation single sample maximum water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report

SWAMP Data:	Non-SWAMP	041694
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Blue Lagoon, station id S13, in the Aliso Beach HSA. (lat/long: 33.51689/-117.76118)	
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 43054, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Blue Lagoon

LOE ID:	29704
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	51
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of Orange from January 1999 through December 2007. The number of samples collected was 934 bacteria samples. From March 2002 to December 2007, 51 samples were correlated with storm events. Of the 51 storm event samples, only one sample exceeded the water contact recreation single sample maximum water quality objective for fecal coliform. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Blue Lagoon, station id S13, in the Aliso Beach HSA. (lat/long:

	33.51689/-117.76118) 041695
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. Bacteria monitoring data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43054, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Blue Lagoon

LOE ID:	29703
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	108
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of Orange from January 1999 through December 2007. The number of samples included 934 individual bacteria samples and 108 monthly geomeans were calculated. From the 108 geomeans, none of the geomeans exceeded fecal coliform water quality objective for water contact recreation.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Blue Lagoon, station id S13, in the Aliso Beach HSA. (lat/long: 33.51689/-117.76118)
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43054, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Blue Lagoon

LOE ID:	29702
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	934
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of Orange from January 1999 through December 2007. The number of samples included 934 individual bacteria samples and 108 monthly geomeans were calculated. From the 934 samples, four samples exceeded single sample maximum water quality objective for water contact recreation.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Blue Lagoon, station id S13, in the Aliso Beach HSA. (lat/long: 33.51689/-117.76118)
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43054, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Blue Lagoon

LOE ID:	29701
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	51
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of Orange from January 1999 through December 2006. The total number of samples collected was 934 individual bacteria samples. Between March 2002 and December 2007, 51 samples were associated with a storm event. From the 51 samples, none exceeded single sample maximum water quality

	objective for water contact recreation. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml.
Objective/Criterion Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Blue Lagoon, station id S13, in the Aliso Beach HSA. (lat/long: 33.51689/-117.76118)
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. Bacteria monitoring data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43054, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Blue Lagoon

LOE ID:	29733
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	-N/A
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	204
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2000 to December 2006, there were and 204 beach postings days for this section of shoreline. Bacteriological samples are collected on a weekly basis at approximately 150 ocean and bay location in Orange County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of Orange in their Annual Ocean and Bay Water Quality Report, March 2007. The reporting period was from January 2000 -December 2006. Data used was the number of days the beach was posting when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	County of Orange. March 2007. Annual Ocean and Bay Water Quality Report, 2006

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Bacteriological monitoring samples were collected at Aliso Beach and South Laguna Beach in Orange County, California. Beaches included Emerald Bay, Crescent Bay, Laguna Main Beach, Hotel Laguna, Bluebird Canyon, Victoria Beach and Blue Lagoon. The posting covers 4.4 miles of beach shoreline.
Temporal Representation:	The beach posting covers the time frame of January 2000 -December 2006.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of Orange's Quality Assessment/Quality Control document (County of Orange, 2004).
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43054, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Blue Lagoon

LOE ID:	74534
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	143
Number of Exceedances:	3
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Three of the 143 samples exceeded the enterococcus objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample enterococcus concentration shall not exceed more than 104/100ml. Water Quality Control Plan for Ocean Waters of California. Region 9 Basion Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from site BLULGN, Coastal Stormdrain at Blue Lagoon Drive (surzone upcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to June 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan

	for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43054, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Blue Lagoon

LOE ID:	31090
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	56
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Orange County collected Beach monitoring data within the time period from January 1999 through December 2006. A total of 56 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 56 geomeans zero exceeded the geomean water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml within any 30 day period (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Blue Lagoon, station id S13, in the Aliso Beach HSA. (lat/long: 33.51689/-117.76118)
Temporal Representation:	Samples were collected at least once a week within the time period from January 1999 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43054, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Blue Lagoon

LOE ID:	31089
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	56
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Orange County collected Beach monitoring data within the time period from January 1999 through December 2006. A total of 56 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 56 geomeans zero exceeded the geomean water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml \within any 30 day period (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Blue Lagoon, station id S13, in the Aliso Beach HSA. (lat/long: 33.51689/-117.76118)
Temporal Representation:	Samples were collected at least once a week within the time period from January 1999 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43054, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Blue Lagoon

LOE ID:	31088
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	56
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Orange County collected Beach monitoring data within the time period from January 1999 through December 2006. A total of 56 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 56 geomeans two exceeded the geomean water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml. within any 30 day period

Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Blue Lagoon, station id S13, in the Aliso Beach HSA. (lat/long: 33.51689/-117.76118)
Temporal Representation:	Samples were collected at least once a week within the time period from January 1999 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43054, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Blue Lagoon

LOE ID:	74541
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	143
Number of Exceedances:	2
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed BW data for Pacific Ocean Shoreline, Aliso HSA, at Blue Lagoon to determine beneficial use support and results are as follows: 2 of 142 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Aliso HSA, at Blue Lagoon was collected at 1 monitoring site [Blue Lagoon]
Temporal Representation:	Data was collected over the time period January 2008 to August 2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, San Clemente HA, at South Capistrano County Beach
Water Body ID: CAC9013000020090526120147
Water Body Type: Coastal & Bay Shoreline

DECISION ID 43951 **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Capistrano County Beach

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not Delist from 303(d) list (being addressed with USEPA approved TMDL)**
Last Listing Cycle's Final Listing Decision:	Do Not Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
TMDL Name:	Bacteria Impaired Waters I (creeks and beach shorelines)
TMDL Project Code:	169
Date TMDL Approved by USEPA:	06/22/2011
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal from the CWA section 303(d) List under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Twelve lines of evidence are available in the administrative record to assess this pollutant. With the latest data, 77 of 166 geomean samples exceed the water quality objective for enterococcus for the protection of REC-1 beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, 77 of 166 geomean samples exceed the water quality objective for enterococcus for the protection of REC-1 beneficial use and this exceeds the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 43951, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Capistrano County Beach

LOE ID:	74945
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	041703
Beneficial Use:	Water Contact Recreation	
Number of Samples:	147	
Number of Exceedances:	36	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Thirty-six of the 147 samples exceeded the enterococcus objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The single sample enterococcus concentration shall not exceed more than 104/100ml. Water Quality Control Plan for Ocean Waters of California. Region 9 Basion Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected from site CSBMP1, Coastal Stormdrain at Capistrano Beach (surzone upcoast and surfzone downcoast).	
Temporal Representation:	The samples were collected once a week from July 2006 to June 2009.	
Environmental Conditions:		
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43951, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Capistrano County Beach

LOE ID:	74946
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	134
Number of Exceedances:	65
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Sixty-five of the 134 geomeans exceeded the enterococcus objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean for enterococcus shall not exceed 35 MPN/100 mL. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	The samples were collected from Coastal Stormdrain at Capistrano Beach (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43951, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Capistrano County Beach

LOE ID:	30738
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	121
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 127 single samples were collected of which 121 are dry weather (AB411) samples with three exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; (SWRCB, 2005)
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location at South Capistrano County Beach, CSBMP1, in the Lower San Juan HSA. This location is found near the southern border of County of Orange Beach Park, in Capistrano Beach/Dana Point. Lat/Long: 33.45403/-117.66666.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43951, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Capistrano County Beach

LOE ID:	30997
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water

Matrix:	Water	041705
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	20	
Number of Exceedances:	3	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange within the time period from May 2004 through December 2006. A total of 20 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 20 geomeans three exceeded the geomean water quality objective.	
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program, Bacteria Shoreline Data, 2002 through 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. over a 30 day period (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	There is one sampling location at South Capistrano County Beach, CSBMP1, in the Lower San Juan HSA. This location is found near the southern border of County of Orange Beach Park, in Capistrano Beach/Dana Point. Lat/Long: 33.45403/-117.66666.	
Temporal Representation:	Samples were collected at least once a week within the time period from May 2004 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period. AB411 excludes the consideration of wet weather data.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 43951, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Capistrano County Beach

LOE ID:	30996
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	20
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange within the time period from May 2004 through December 2006. A total of 20 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 20 geomeans zero exceeded the geomean water quality objective.

Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml; over a 30 day period (SWRCB, 2005)
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location at South Capistrano County Beach, CSBMP1, in the Lower San Juan HSA. This location is found near the southern border of County of Orange Beach Park, in Capistrano Beach/Dana Point. Lat/Long: 33.45403/-117.66666.
Temporal Representation:	Samples were collected at least once a week within the time period from May 2004 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period. AB411 excludes the consideration of wet weather data.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43951, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Capistrano County Beach

LOE ID:	30995
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	20
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange within the time period from May 2004 through December 2006. A total of 20 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 20 geomeans zero exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml. over a 30 day period (SWRCB 2005)
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	There is one sampling location at South Capistrano County Beach, CSBMP1, in the Lower San Juan HSA. This location is found near the southern border of County of Orange Beach Park, in Capistrano Beach/Dana Point. Lat/Long: 33.45403/-117.66666.
Temporal Representation:	Samples were collected at least once a week within the time period from May 2004 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43951, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Capistrano County Beach

LOE ID:	30843
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	536
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 548 single samples were collected of which 536 are dry weather (AB411) samples with one of those samples exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml. Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location at South Capistrano County Beach, CSBMP1, in the Lower San Juan HSA. This location is found near the southern border of County of Orange Beach Park, in Capistrano Beach/Dana Point. Lat/Long: 33.45403/-117.66666.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43951, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Capistrano County Beach

LOE ID:	29683

Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	32
Number of Exceedances:	12
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 548 single samples were collected and 32 monthly geomeans were calculated. From the 32 geomeans, 12 exceeded geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location at South Capistrano County Beach, CSBMP1, in the Lower San Juan HSA. This location is found near the southern border of County of Orange Beach Park, in Capistrano Beach/Dana Point. Lat/Long: 33.45403/-117.66666.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43951, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Capistrano County Beach

LOE ID:	29682
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	127
Number of Exceedances:	29
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 127 single samples were collected with 29 samples exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007

SWAMP Data:	Non-SWAMP	041709
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	There is one sampling location at South Capistrano County Beach, CSBMP1, in the Lower San Juan HSA. This location is found near the southern border of County of Orange Beach Park, in Capistrano Beach/Dana Point. Lat/Long: 33.45403/-117.66666.	
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 43951, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Capistrano County Beach

LOE ID:	29681
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	6
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 127 single samples were collected with 6 samples correlated with a storm event. From the 6 samples, one exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location at South Capistrano County Beach, CSBMP1, in the Lower

	San Juan HSA. This location is found near the southern border of County of Orange Beach Park, in Capistrano Beach/Dana Point. Lat/Long: 33.45403/-117.66666.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43951, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Capistrano County Beach

LOE ID:	29680
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	32
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 547 single samples were collected with 32 monthly geomean calculated. From the 32 geomeans, two exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; (SWRCB, 2005)
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location at South Capistrano County Beach, CSBMP1, in the Lower San Juan HSA. This location is found near the southern border of County of Orange Beach Park, in Capistrano Beach/Dana Point. Lat/Long: 33.45403/-117.66666.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43951, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Capistrano County Beach

LOE ID:	29679
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	127
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 127 single samples were collected with four exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; (SWRCB, 2005)
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location at South Capistrano County Beach, CSBMP1, in the Lower San Juan HSA. This location is found near the southern border of County of Orange Beach Park, in Capistrano Beach/Dana Point. Lat/Long: 33.45403/-117.66666.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43951, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Capistrano County Beach

LOE ID:	29685
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	-N/A
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	1307
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2000 to December 2007, there were and 1307 beach postings days for this section of shoreline. Bacteriological samples are collected on a weekly basis at approximately 150 ocean and bay location in Orange County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that waters have

exceeded public health standards. 041712

Data and information on the number of beach posting were summarized by the County of Orange in their Annual Ocean and Bay Water Quality Report, March 2007. The reporting period was from January 2000 -December 2007. Data used was the number of days the beach was posting when the ocean or bay failed to meet the bacteriological standards.

Data Reference: County of Orange. March 2007. Annual Ocean and Bay Water Quality Report, 2006

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: California Code of Regulations. Title 17, Section 7960.

(a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.

Objective/Criterion Reference: California Code of Regulations, Title 17, Section 7960

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Beach posting information was for all of Capistrano County Beach.
Temporal Representation: The beach posting covers the time frame of January 2000 -December 2007.
Environmental Conditions:
QAPP Information: Samples were collected in compliance with County of Orange's Quality Assessment/Quality Control document.
QAPP Information Reference(s): County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43951, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Capistrano County Beach

LOE ID: 29678

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 6
Number of Exceedances: 0

Data and Information Type: PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality: Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 127 single samples were collected with 6 samples correlated with a storm event. None of the 6 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.

Data Reference: National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: Geomean: Total coliform density shall not exceed 1,000 per 100ml.

Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).

Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location at South Capistrano County Beach, CSBMP1, in the Lower San Juan HSA. This location is found near the southern border of County of Orange Beach Park, in Capistrano Beach/Dana Point. Lat/Long: 33.45403/-117.66666.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43951, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Capistrano County Beach

LOE ID:	29677
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	32
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 548 single samples were collected with 32 monthly geomeans calculated. None of the 32 geomeans exceeded the geomean water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml. Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location at South Capistrano County Beach, CSBMP1, in the Lower San Juan HSA. This location is found near the southern border of County of Orange Beach Park, in Capistrano Beach/Dana Point. Lat/Long: 33.45403/-117.66666.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43951, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Capistrano County Beach 041714

LOE ID:	29684
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	6
Number of Exceedances:	6
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 127 single samples were collected with 6 samples correlated with a storm event. From the 6 samples, 6 exceeded single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location at South Capistrano County Beach, CSBMP1, in the Lower San Juan HSA. This location is found near the southern border of County of Orange Beach Park, in Capistrano Beach/Dana Point. Lat/Long: 33.45403/-117.66666.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43951, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Capistrano County Beach

LOE ID:	29676
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	041715
Beneficial Use:	Water Contact Recreation	
Number of Samples:	127	
Number of Exceedances:	1	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 127 single samples were collected with one sample exceeding the single sample water quality objective.	
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml. Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	There is one sampling location at South Capistrano County Beach, CSBMP1, in the Lower San Juan HSA. This location is found near the southern border of County of Orange Beach Park, in Capistrano Beach/Dana Point. Lat/Long: 33.45403/-117.66666.	
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 43951, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Capistrano County Beach

LOE ID:	29675
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	6
Number of Exceedances:	5
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 127 single samples were collected with 6 samples correlated with a storm event. From those 6 samples, 5 exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007

SWAMP Data:	Non-SWAMP	041716
Water Quality Objective/Criterion:	From The Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	There is one sampling location at South Capistrano County Beach, CSBMP1, in the Lower San Juan HSA. This location is found near the southern border of County of Orange Beach Park, in Capistrano Beach/Dana Point. Lat/Long: 33.45403/-117.66666.	
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.	
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 43951, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Capistrano County Beach

LOE ID:	29674
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	127
Number of Exceedances:	26
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 127 single samples were collected with 26 exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From The Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location at South Capistrano County Beach, CSBMP1, in the Lower San Juan HSA. This location is found near the southern border of County of Orange Beach

	Park, in Capistrano Beach/Dana Point. Lat/Long: 33.45403/-117.66666. 041717
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43951, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Capistrano County Beach

LOE ID:	74970
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	134
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 134 samples exceeded the total coliform objective. For these stations, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean for total coliform shall not exceed more than 1000/100ml. Water Quality Control Plan for the San Diego Basin. Water Quality Control Plan for Ocean Waters.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Coastal Stormdrain at Capistrano Beach (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43951, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Capistrano County Beach

LOE ID:	74969
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	147
Number of Exceedances:	0

Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 147 samples exceeded the total coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample total coliform concentration shall not exceed more than 10000/100ml. Water Quality Control Plan for Ocean Waters of California. Region 9 Basion Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from site CSBMP1, Coastal Stormdrain at Capistrano Beach (surzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to June 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43951, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Capistrano County Beach

LOE ID:	30637
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	121
Number of Exceedances:	23
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from May 2004 through December 2006. A total of 127 single samples were collected of which 121 are dry weather (AB411) samples with 23 samples exceeding the single sample water quality objective.
Data Reference:	The National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit, Coastal Storm Drain Outfall Program. Bacteria Shoreline Data. 2002 through 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	There is one sampling location at South Capistrano County Beach, CSBMP1, in the Lower

	San Juan HSA. This location is found near the southern border of County of Orange Beach Park, in Capistrano Beach/Dana Point. Lat/Long: 33.45403/-117.66666.
Temporal Representation:	Samples were collected at least once a week from May 2004 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43951, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Capistrano County Beach

LOE ID:	30312
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Water Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006. For the 2008 assessment , the 2006 listed coastline 'Pacific Ocean Shoreline, Lower San Juan HSA' was split into smaller segments and each represents an area near the sampling location of the data being assessed. This segment 'Pacific Ocean Shoreline, Lower San Juan HSA, at South Capistrano County Beach' is one of the sampling locations. This LOE is a copy of the 2006 listing placeholder LOE for Pacific Ocean Shoreline, Lower San Juan HSA and is considered by the Regional Board to be applicable to this more specific segment formed from the split.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	
Temporal Representation:	
Environmental Conditions:	
QAPP Information:	Unspecified
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43951, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Capistrano County Beach

LOE ID:	74968
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	134
Number of Exceedances:	2
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Two of the 134 geomeans exceeded the fecal coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean for fecal coliform shall not exceed more than 200/100ml. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Coastal Stormdrain at Capistrano Beach (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43951, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Clemente HA, at South Capistrano County Beach

LOE ID:	74967
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	147
Number of Exceedances:	7
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Seven of the 147 samples exceeded the fecal coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample fecal coliform concentration shall not exceed more than 400/100ml. Water Quality Control Plan for Ocean Waters of California. Region 9 Basion Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from site CSBMP1, Coastal Stormdrain at Capistrano Beach (surzone upcoast and surfzone downcoast).

Temporal Representation:	The samples were collected once a week from July 2006 to June 2009. 041721
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Buena Vista Creek HA, at Buena Vista Lagoon Outlet
Water Body ID: CAC904210002009060211240 4
Water Body Type: Coastal & Bay Shoreline

DECISION ID 44011 Region 9
Pacific Ocean Shoreline, Buena Vista Creek HA, at Buena Vista Lagoon Outlet

Pollutant: Indicator Bacteria
Final Listing Decision: Delist from 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Delist from 303(d) list (TMDL required list)(2012)
Revision Status Revised
Reason for Delisting: Applicable WQS attained; reason for recovery unspecified
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for removal from the CWA section 303(d) List under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Thirteen lines of evidence are available in the administrative record to assess this pollutant. With the latest data, 13 of the 168 samples exceeded the Water Quality Objective for total coliform of a single sample maximum of 230/100 ml.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, 13 of the 168 samples exceeded the Water Quality Objective for total coliform of a single sample maximum of 230/100 ml, and this does not exceed the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be removed from the section 303(d) list because applicable water quality standards for the pollutant are not being exceeded.

Line of Evidence (LOE) for Decision ID 44011, Indicator Bacteria Region 9
Pacific Ocean Shoreline, Buena Vista Creek HA, at Buena Vista Lagoon Outlet

LOE ID: 29754

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Shellfish Harvesting

Number of Samples:	3	041723
Number of Exceedances:	1	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. The number of samples collected for total coliform analysis was 112. Of the 112 samples, three were correlated with a storm event. Of the three samples, only one exceeded the single sample maximum total coliform standard for shellfish harvesting. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.	
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Ocean Plan, the median total coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml.	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from the station Buena Vista Lagoon Outlet, station id EH-440, in the Carlsbad State Beach. Lat/Long: 33.08670/-117.31329.	
Temporal Representation:	Samples were collected from June 2004 through October 2007.	
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44011, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Buena Vista Creek HA, at Buena Vista Lagoon Outlet

LOE ID:	29756
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	25
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. The number of samples collected for total coliform analysis was 112 with 25 monthly geomeans calculated. None of the geomeans exceeded the geomean water quality objective.

Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station 041724 Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005). Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the station Buena Vista Lagoon Outlet, station id EH-440, in the Carlsbad State Beach. Lat/Long: 33.08670/-117.31329.
Temporal Representation:	Samples were collected weekly from June 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44011, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Buena Vista Creek HA, at Buena Vista Lagoon Outlet

LOE ID:	29765
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	-N/A
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	11
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were 11 beach advisory days for this section of shoreline. Bacteriological samples are collected on a weekly basis at ocean and bay locations in San Diego County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that an advisory for waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 - December 2007. Data used was the number of days the beach was advisories were issued when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the

	Department, after taking into consideration the causes therefor, may at his discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Bacteriological monitoring samples were collected at Buena Vista Lagoon Outlet at Carlsbad State Beach, Carlsbad, CA.
Temporal Representation:	The beach advisory covers the time frame of January January 2001 to December 2007.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of San Diego's Quality Assessment/Quality Control document
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44011, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Buena Vista Creek HA, at Buena Vista Lagoon Outlet

LOE ID:	74588
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	56
Number of Exceedances:	2
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed bw data for Pacific Ocean Shoreline, Buena Vista Creek HA, at Buena Vista Lagoon Outlet to determine beneficial use support and results are as follows: 2 of 56 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Buena Vista Creek HA, at Buena Vista Lagoon Outlet was collected at 1 monitoring site [Buena Vista Lagoon outlet]
Temporal Representation:	Data was collected over the time period 4/3/2008 -7/6/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44011, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Buena Vista Creek HA, at Buena Vista Lagoon Outlet

LOE ID:	31347

Pollutant:	Enterococcus	041726
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	26	
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 2002 through October 2007. A total of 98 dry month (April through October) single samples were collected with 26 dry month geomeans calculated. Zero of the 26 geomeans exceeded the geomean water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from the station Buena Vista Lagoon Outlet, station id EH-440, in the Carlsbad State Beach. Lat/Long: 33.08670/-117.31329.	
Temporal Representation:	Samples were collected from July 2002 through October 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44011, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Buena Vista Creek HA, at Buena Vista Lagoon Outlet

LOE ID:	31348
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	21
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 2002 through October 2007. A total of 66 dry month (April through October) single samples were collected with 21 dry month geomeans calculated. Zero of the 21 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data:	Non-SWAMP	041727
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from the station Buena Vista Lagoon Outlet, station id EH-440, in the Carlsbad State Beach. Lat/Long: 33.08670/-117.31329.	
Temporal Representation:	Samples were collected from July 2002 through October 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44011, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Buena Vista Creek HA, at Buena Vista Lagoon Outlet

LOE ID:	30306
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Water Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006. For the 2008 assessment , the 2006 listed coastline 'Pacific Ocean Shoreline, Buena Vista Creek HA' was split into smaller segments that each represent an area near the sampling location of the data being assessed. This segment 'Pacific Ocean Shoreline, Buena Vista creek HA, at Buena Vista Lagoon Outlet' is one of the sampling locations. This LOE is a copy of the 2006 listing placeholder LOE for Pacific Ocean Shoreline, Buena Vista Creek HA and is considered by the Regional Board to be applicable to this more specific segment formed from the split.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	
Temporal Representation:	
Environmental Conditions:	
QAPP Information:	Unspecified
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44011, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Buena Vista Creek HA, at Buena Vista Lagoon Outlet

LOE ID:	29764
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	3
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 112 single samples were collected with three samples correlated with a storm event. One of the three single samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005). Comparisons to water quality objectives were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the station Buena Vista Lagoon Outlet, station id EH-440, in the Carlsbad State Beach. Lat/Long: 33.08670/-117.31329.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44011, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Buena Vista Creek HA, at Buena Vista Lagoon Outlet

LOE ID:	30559
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation
Number of Samples:	109
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 112 single samples were collected of which 109 are dry weather (AB411) samples with three sample exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the station Buena Vista Lagoon Outlet, station id EH-440, in the Carlsbad State Beach. Lat/Long: 33.08670/-117.31329.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44011, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Buena Vista Creek HA, at Buena Vista Lagoon Outlet

LOE ID:	29759
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from October 2004 through April 2007. A total of 72 single samples were collected with 1 sample correlated with a storm event. The sample did not exceed the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml;

041730

Objective/Criterion Reference:	Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005). Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the station Buena Vista Lagoon Outlet, station id EH-440, in the Carlsbad State Beach. Lat/Long: 33.08670/-117.31329.
Temporal Representation:	Samples were collected from October 2004 through April 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44011, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Buena Vista Creek HA, at Buena Vista Lagoon Outlet

LOE ID:	29758
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	72
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through April 2007. A total of 72 single samples were collected with two samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml;
Objective/Criterion Reference:	Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005). Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the station Buena Vista Lagoon Outlet, station id EH-440, in the Carlsbad State Beach. Lat/Long: 33.08670/-117.31329.
Temporal Representation:	Samples were collected from June 2004 through April 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44011, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Buena Vista Creek HA, at Buena Vista Lagoon Outlet 041731

LOE ID:	29757
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	3
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. The number of samples collected for total coliform analysis was 112 with three samples correlated with a storm event. Only one of the three samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005). Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the station Buena Vista Lagoon Outlet, station id EH-440, in the Carlsbad State Beach. Lat/Long: 33.08670/-117.31329.
Temporal Representation:	Samples were collected weekly from June 2004 through October 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44011, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Buena Vista Creek HA, at Buena Vista Lagoon Outlet

LOE ID:	30680
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	041732
Beneficial Use:	Water Contact Recreation	
Number of Samples:	71	
Number of Exceedances:	2	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through April 2007. A total of 72 single samples were collected of which 71 are dry weather (AB411) samples with two samples exceeding the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from the station Buena Vista Lagoon Outlet, station id EH-440, in the Carlsbad State Beach. Lat/Long: 33.08670/-117.31329.	
Temporal Representation:	Samples were collected from June 2004 through April 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44011, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Buena Vista Creek HA, at Buena Vista Lagoon Outlet

LOE ID:	29760
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through April 2007. A total of 72 single samples were collected with 17 geomeans calculated. None of the geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).

Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the station Buena Vista Lagoon Outlet, station id EH-440, in the Carlsbad State Beach. Lat/Long: 33.08670/-117.31329.
Temporal Representation:	Samples were collected from June 2004 through April 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44011, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Buena Vista Creek HA, at Buena Vista Lagoon Outlet

LOE ID:	29761
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	112
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 112 single samples were collected with four sample exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the station Buena Vista Lagoon Outlet, station id EH-440, in the Carlsbad State Beach. Lat/Long: 33.08670/-117.31329.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44011, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Buena Vista Creek HA, at Buena Vista Lagoon Outlet

LOE ID:	29762	041734
Pollutant:	Enterococcus	
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	25	
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data were collected by the County of San Diego from June 2004 through October 2007. A total of 112 single samples were collected with 25 monthly geomeans calculated. None of the 25 geomeans exceeded the geomean water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from the station Buena Vista Lagoon Outlet, station id EH-440, in the Carlsbad State Beach. Lat/Long: 33.08670/-117.31329.	
Temporal Representation:	Samples were collected from June 2004 through October 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44011, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Buena Vista Creek HA, at Buena Vista Lagoon Outlet

LOE ID:	31349
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	26
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 2002 through October 2007. A total of 98 dry month (April through October) single samples were collected with 26 dry month geomeans calculated. Zero of the 26 geomeans exceeded the geomean water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station

	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005). Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the station Buena Vista Lagoon Outlet, station id EH-440, in the Carlsbad State Beach. Lat/Long: 33.08670/-117.31329.
Temporal Representation:	Samples were collected weekly from July 2002 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44011, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Buena Vista Creek HA, at Buena Vista Lagoon Outlet

LOE ID:	29755
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	112
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. The number of samples collected for total coliform analysis was 112. Of the 112 samples, three exceeded the single sample maximum total coliform standard.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml. Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the station Buena Vista Lagoon Outlet, station id EH-440, in the Carlsbad State Beach. Lat/Long: 33.08670/-117.31329.
Temporal Representation:	Samples were collected weekly during the swimming season from June 2004 through October 2007.
Environmental Conditions:	

QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44011, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Buena Vista Creek HA, at Buena Vista Lagoon Outlet

LOE ID:	29753
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	112
Number of Exceedances:	11
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. The number of samples collected for total coliform analysis was 112. Of the 112 samples, 11 exceeded the single sample maximum total coliform standard for shellfish harvesting.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan, the median total coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the station Buena Vista Lagoon Outlet, station id EH-440, in the Carlsbad State Beach. Lat/Long: 33.08670/-117.31329.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Buena Vista Creek HA, at Carlsbad State Beach at Carlsbad Village
Water Body ID: CAC904210002009060213310 2
Water Body Type: Coastal & Bay Shoreline

DECISION ID 43662 **Region 9**

Pacific Ocean Shoreline, Buena Vista Creek HA, at Carlsbad State Beach at Carlsbad Village

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Reason for Delisting:	Applicable WQS attained; reason for recovery unspecified
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal from the CWA section 303(d) List under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Fourteen lines of evidence are available in the administrative record to assess this pollutant. Including the newest data, zero of the 44 samples collected in AB411 period exceeded the water quality objective for enterococcus of a geomean of 35/100 ml in a rolling 30-day period.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Including the newest data, zero of the 44 samples collected in AB411 period exceeded the water quality objective for enterococcus of a geomean of 35/100 ml in a rolling 30-day period and this does not exceed the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be removed from the section 303(d) list because applicable water quality standards for the pollutant are not being exceeded.

Line of Evidence (LOE) for Decision ID 43662, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Buena Vista Creek HA, at Carlsbad State Beach at Carlsbad Village

LOE ID:	29773
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	17	041738
Number of Exceedances:	1	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007 (and once in February 2004). A total of 59 single samples were collected with 17 geomeans calculated. One of the 17 geomeans exceeded the geomean water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Carlsbad State Beach at Carlsbad Village Drive, station id EH-475. Lat/Long: 33.15710/ -117.35312.	
Temporal Representation:	Samples were collected from June 2004 through October 2007, and once in February 2004.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43662, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Buena Vista Creek HA, at Carlsbad State Beach at Carlsbad Village

LOE ID:	29772
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 59 single samples were collected with one sample correlated with a storm event. The storm sample did not exceed the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005.

	Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Carlsbad State Beach at Carlsbad Village Drive, station id EH-475. Lat/Long: 33.15710/ -117.35312.
Temporal Representation:	Samples were collected from June 2004 through October 2007, and once in February 2004.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. Bacteria monitoring data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43662, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Buena Vista Creek HA, at Carlsbad State Beach at Carlsbad Village

LOE ID:	29771
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	59
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007 (and once in February 2004). A total of 59 single samples were collected with only one sample exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Carlsbad State Beach at Carlsbad Village Drive, station id EH-475. Lat/Long: 33.15710/ -117.35312.
Temporal Representation:	Samples were collected during the swimming season from June 2004 through October 2007, and once in February 2004.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.

QAPP Information Reference(s): County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006 041740

Line of Evidence (LOE) for Decision ID 43662, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Buena Vista Creek HA, at Carlsbad State Beach at Carlsbad Village

LOE ID: 77592

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Shellfish Harvesting

Number of Samples: 18
Number of Exceedances: 0

Data and Information Type: PATHOGEN MONITORING
Data Used to Assess Water Quality: None of the eighteen samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: The samples were collected atPacific Ocean Shoreline, Buena Vista Creek HA, at Carlsbad State Beach at Carlsbad Village.
Temporal Representation: The samples were collected from April 2008 through September 2008.
Environmental Conditions:
QAPP Information: The samples were collected for the beach watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 43662, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Buena Vista Creek HA, at Carlsbad State Beach at Carlsbad Village

LOE ID: 29769

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 26
Number of Exceedances: 0

Data and Information Type: PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality: Shoreline beach monitoring data was collected by the County of San Diego from Samples were collected from June 2004 through October 2007 (and once in February 2004). The number of samples collected for total coliform analysis was 93 with 20 monthly geomeans

	calculated. None of the geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005). Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Carlsbad State Beach, at Carlsbad Village Drive, station id EH-475. Lat/Long: 33.15710/ -117.35312.
Temporal Representation:	Samples were collected during the swimming season from June 2004 through October 2007, and once in February 2004.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43662, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Buena Vista Creek HA, at Carlsbad State Beach at Carlsbad Village

LOE ID:	29768
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	93
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from June 2004 through October 2007 (and once in February 2004). The number of samples collected for total coliform analysis was 93. None of the samples exceeded the single sample maximum total coliform standard.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005). Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected Carlsbad State Beach at Carlsbad Village Drive, station id EH-475. Lat/Long: 33.15710/ -117.35312.
Temporal Representation:	Samples were collected during the swimming season from June 2004 through October

	2007, and once in February 2004. 041742
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43662, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Buena Vista Creek HA, at Carlsbad State Beach at Carlsbad Village

LOE ID:	29766
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	93
Number of Exceedances:	5
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. The number of samples collected for total coliform analysis was 93 with five samples exceeding the single sample maximum total coliform standard for shellfish harvesting.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan, the median total coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Carlsbad State Beach, at Carlsbad Village Drive, station id EH-475. Lat/Long: 33.15710/ -117.35312.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43662, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Buena Vista Creek HA, at Carlsbad State Beach at Carlsbad Village

LOE ID:	30307
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Water Contact Recreation

Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006. For the 2008 assessment , the 2006 listed coastline 'Pacific Ocean Shoreline, Buena Vista Creek HA' was split into smaller segments that each represent an area near the sampling location of the data being assessed. This segment 'Pacific Ocean Shoreline, Buena Vista creek HA, at Carlsbad State Beach at Carlsbad Village' is one of the sampling locations. This LOE is a copy of the 2006 listing placeholder LOE for Pacific Ocean Shoreline, Buena Vista Creek HA and is considered by the Regional Board to be applicable to this more specific segment formed from the split.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	
Temporal Representation:	
Environmental Conditions:	
QAPP Information:	Unspecified
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43662, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Buena Vista Creek HA, at Carlsbad State Beach at Carlsbad Village

LOE ID:	29778
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. The number of samples collected for total coliform analysis was 93. Of the 93 samples, only two were correlated with a storm event. Neither sample exceeded the single sample maximum total coliform standard for shellfish harvesting. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007, AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan, the median total coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml.

Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the Carlsbad State Beach, at Carlsbad Village Drive, station id EH-475. Lat/Long: 33.15710/ -117.35312.
Temporal Representation:	Samples were collected from June 2004 through October 2007, and once in February 2004.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43662, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Buena Vista Creek HA, at Carlsbad State Beach at Carlsbad Village

LOE ID:	29770
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from June 2004 through October 2007 (and once in February 2004). The number of samples collected for total coliform analysis was 93 with only two samples correlated with a storm event. The two samples did not exceed the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005). Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected from the Carlsbad State Beach, in at Carlsbad Village Drive, station id EH-475. Lat/Long: 33.15710/ -117.35312.
Temporal Representation:	Samples were collected during the swimming season from June 2004 through October 2007, and once in February 2004.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43662, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Buena Vista Creek HA, at Carlsbad State Beach at Carlsbad Village

LOE ID:	29776
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	-N/A
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were no beach advisory days for this section of shoreline. Bacteriological samples are collected on a weekly basis at ocean and bay locations in San Diego County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that an advisory for waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 - December 2007. Data used was the number of days the beach was advisories were issued when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Bacteriological monitoring samples were collected at Carlsbad Village Drive at Carlsbad State Beach, Carlsbad, CA.
Temporal Representation:	The beach advisory covers the time frame of January January 2001 to December 2007.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of San Diego's Quality Assessment/Quality Control document
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43662, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Buena Vista Creek HA, at Carlsbad State Beach at Carlsbad Village

LOE ID:	29775
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007 (and once in February 2004). A total of 92 single samples were collected with two samples correlated with a storm event. Neither of the two storm samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005). Comparisons to water quality objectives were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Carlsbad State Beach,at Carlsbad Village Drive, station id EH-475. Lat/Long: 33.15710/ -117.35312.
Temporal Representation:	Samples were collected from June 2004 through October 2007, and once in February 2004.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the

QAPP Information Reference(s):	County of San Diego, Department Public Health Laboratory Quality Assurance Manual. County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43662, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Buena Vista Creek HA, at Carlsbad State Beach at Carlsbad Village

LOE ID:	29777
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	26
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data were collected by the County of San Diego from June 2004 through October 2007 (and once in February 2004). A total of 92 single samples were collected with 26 monthly geomeans calculated. Only one of the 26 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Carlsbad State Beach, at Carlsbad Village Drive, station id EH-475. Lat/Long: 33.15710/ -117.35312.
Temporal Representation:	Samples were collected from June 2004 through October 2007, and once in February 2004.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43662, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Buena Vista Creek HA, at Carlsbad State Beach at Carlsbad Village

LOE ID:	74596
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	18
Number of Exceedances:	0

Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 18 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Carlsbad State Beach, Carlsbad Village site.
Temporal Representation:	Samples were collected roughly once per week from April 2008 to September 2008.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43662, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Buena Vista Creek HA, at Carlsbad State Beach at Carlsbad Village

LOE ID:	74595
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	21
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed BW data for Pacific Ocean Shoreline, Buena Vista Creek HA, at Carlsbad State Beach at Carlsbad Village to determine beneficial use support and results are as follows: 0 of 21 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Buena Vista Creek HA, at Carlsbad State Beach at Carlsbad Village was collected at 1 monitoring site [Carlsbad Village Drive]
Temporal Representation:	Data was collected over the time period 4/18/2008-9/25/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43662, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Buena Vista Creek HA, at Carlsbad State Beach at Carlsbad Village 041749

LOE ID:	74594
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	18
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 18 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Carlsbad State Beach, Carlsbad Village site.
Temporal Representation:	Samples were collected approximately once a week from April 2008 to September 2008.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43662, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Buena Vista Creek HA, at Carlsbad State Beach at Carlsbad Village

LOE ID:	31256
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	26
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from Samples were collected from July 2002 through October 2007. A total of 93 dry month (April through October) single samples were collected with 26 dry month geomeans calculated. None of the 26 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005). Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;

Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Carlsbad State Beach, at Carlsbad Village Drive, station id EH-475. Lat/Long: 33.15710/ -117.35312.
Temporal Representation:	Samples were collected from July 2002 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43662, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Buena Vista Creek HA, at Carlsbad State Beach at Carlsbad Village

LOE ID:	31255
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 2002 through October 2007. A total of 59 dry month (April through October) single samples were collected with 17 dry month geomeans calculated. None of the 17 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Carlsbad State Beach at Carlsbad Village Drive, station id EH-475. Lat/Long: 33.15710/ -117.35312.
Temporal Representation:	Samples were collected from July 2002 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43662, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Buena Vista Creek HA, at Carlsbad State Beach at Carlsbad Village

LOE ID:	30681
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	58
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007 (and once in February 2004). A total of 59 single samples were collected of which 58 are dry weather (AB411) samples with only one sample exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Carlsbad State Beach at Carlsbad Village Drive, station id EH-475. Lat/Long: 33.15710/ -117.35312.
Temporal Representation:	Samples were collected during the swimming season from June 2004 through October 2007, and once in February 2004.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43662, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Buena Vista Creek HA, at Carlsbad State Beach at Carlsbad Village

LOE ID:	30560
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	90
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007 (and once in February 2004). A total of 92 single samples were collected of which 90 are dry weather (AB411) samples with only one sample exceeding the single sample water quality objective.

Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Carlsbad State Beach, at Carlsbad Village Drive, station id EH-475. Lat/Long: 33.15710/ -117.35312.
Temporal Representation:	Samples were collected from June 2004 through October 2007, and once in February 2004.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43662, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Buena Vista Creek HA, at Carlsbad State Beach at Carlsbad Village

LOE ID:	31254
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	26
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data were collected by the County of San Diego from July 2002 through October 2007. A total of 92 dry month (April through October) single samples were collected with 26 dry month geomeans calculated. None of the 26 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Carlsbad State Beach, at Carlsbad Village Drive, station id EH-475. Lat/Long: 33.15710/ -117.35312.
Temporal Representation:	Samples were collected from July 2002 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the

QAPP Information Reference(s):	County of San Diego, Department Public Health Laboratory Quality Assurance Manual. County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43662, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Buena Vista Creek HA, at Carlsbad State Beach at Carlsbad Village

LOE ID:	29774
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	92
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007 (and once in February 2004). A total of 92 single samples were collected with only one sample exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Carlsbad State Beach, at Carlsbad Village Drive, station id EH-475. Lat/Long: 33.15710/ -117.35312.
Temporal Representation:	Samples were collected from June 2004 through October 2007, and once in February 2004.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43662, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Buena Vista Creek HA, at Carlsbad State Beach at Carlsbad Village

LOE ID:	74589
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	18
Number of Exceedances:	0

Data and Information Type:	Not Specified	041754
Data Used to Assess Water Quality:	Zero of the 18 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at the Carlsbad State Beach at Carlsbad Village site.	
Temporal Representation:	Samples were collected roughly once per week from April 2008 to September 2008.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Buena Vista Creek HA, at Carlsbad State Beach at Pine Ave
Water Body ID: CAC904210002009060213382 0
Water Body Type: Coastal & Bay Shoreline

DECISION ID 43672 **Region 9**

Pacific Ocean Shoreline, Buena Vista Creek HA, at Carlsbad State Beach at Pine Ave

Pollutant: **Indicator Bacteria**
Final Listing Decision: **Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Delist from 303(d) list (TMDL required list)(2012)
Revision Status Original
Reason for Delisting: Flaws in original listing
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

In 2006, 'Pacific Ocean Shoreline, Buena Vista Creek HA' was listed for Indicator Bacteria. For 2008, the 2006 Buena Vista Creek HA segment has been split into smaller segments that each represent an area near the sampling location of the data being assessed. 'Pacific Ocean Shoreline, Buena Vista Creek HA, at Carlsbad State Beach at Pine Ave' is one of the sampling locations for Pacific Ocean Shoreline, Buena Vista Creek HA and is considered to be part of the original listing.

This pollutant is being considered for removal from the section 303(d) list under section 4.3 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Seven lines of evidence are available in the administrative record to assess this pollutant. Zero of samples exceeded the Total Coloform water quality objective for Shellfish Harvesting, and Zero of the 27 samples exceeded the contact recreation objective for Enterococcus, Fecal Coliform, or Total Coliform.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for removing this water segment-pollutant combination from the section 303(d) list.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of samples exceeded the Total Coloform water quality objective for Shellfish Harvesting, and Zero of the 27 samples exceeded the contact recreation objective for Enterococcus, Fecal Coliform, or Total Coliform and this does not exceed the allowable frequency listed in Table 4.2 of the Listing Policy.

4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be removed from the section 303(d) list because applicable water quality standards for the pollutant are not being exceeded.

Line of Evidence (LOE) for Decision ID 43672, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Buena Vista Creek HA, at Carlsbad State Beach at Pine Ave 041756

LOE ID:	29785
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	87
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from April 1999 through October 2006. The total number of samples collected was 87 with no samples exceeding the water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Carlsbad State Beach, at Pine Avenue, station id EH-470. Lat/Long: 33.15540/ -117.35140.
Temporal Representation:	Samples were collected from April 1999 through October 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43672, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Buena Vista Creek HA, at Carlsbad State Beach at Pine Ave

LOE ID:	29781
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	27
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from Samples were collected from April 1999 through October 2006. The number of samples collected for total coliform analysis was 87 with 27 monthly geomeans calculated. None of the geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program,

	2007. AB 411 monitoring data 1999 to 2007	041757

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005). Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Carlsbad State Beach, at Pine Avenue, station id EH-470. Lat/Long: 33.15540/ -117.35140.
Temporal Representation:	Samples were collected from April 1999 through October 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43672, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Buena Vista Creek HA, at Carlsbad State Beach at Pine Ave

LOE ID:	29789
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	27
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from Samples were collected from April 1999 through October 2006. The number of samples collected for total coliform analysis was 87 with 27 monthly geomeans calculated. None of the geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Carlsbad State Beach, at Pine Avenue, station id EH-470. Lat/Long: 33.15540/ -117.35140.
Temporal Representation:	Samples were collected from April 1999 through October 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.

QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43672, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Buena Vista Creek HA, at Carlsbad State Beach at Pine Ave

LOE ID:	29788
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	27
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from Samples were collected from April 1999 through October 2006. The number of samples collected for total coliform analysis was 87 with 27 monthly geomeans calculated. None of the geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Carlsbad State Beach, at Pine Avenue, station id EH-470. Lat/Long: 33.15540/ -117.35140.
Temporal Representation:	Samples were collected from April 1999 through October 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43672, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Buena Vista Creek HA, at Carlsbad State Beach at Pine Ave

LOE ID:	30308
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Water Contact Recreation
Number of Samples:	0
Number of Exceedances:	0

Data and Information Type:	PATHOGEN MONITORING 041759
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006. For the 2008 assessment , the 2006 listed coastline 'Pacific Ocean Shoreline, Buena Vista Creek HA' was split into smaller segments that each represent an area near the sampling location of the data being assessed. This segment 'Pacific Ocean Shoreline, Buena Vista creek HA, at Carlsbad State Beach at Pine Ave' is one of the sampling locations. This LOE is a copy of the 2006 listing placeholder LOE for Pacific Ocean Shoreline, Buena Vista Creek HA and is considered by the Regional Board to be applicable to this more specific segment formed from the split.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	
Temporal Representation:	
Environmental Conditions:	
QAPP Information:	Unspecified
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43672, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Buena Vista Creek HA, at Carlsbad State Beach at Pine Ave

LOE ID:	29780
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	87
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from April 1999 through October 2006. The total number of samples collected was 87 with no samples exceeding the water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan, the median total coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Carlsbad State Beach, at Pine Avenue, station id EH-470. Lat/Long: 33.15540/ -117.35140.

Temporal Representation:	Samples were collected from April 99 through October 2006.	041760
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43672, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Buena Vista Creek HA, at Carlsbad State Beach at Pine Ave

LOE ID:	29779
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	-N/A
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were no beach advisory days for this section of shoreline. Bacteriological samples are collected on a weekly basis at ocean and bay locations in San Diego County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that an advisory for waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 - December 2007. Data used was the number of days the beach was advisories were issued when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Bacteriological monitoring samples were collected at Pine Avenue at Carlsbad State Beach, Carlsbad, CA.
Temporal Representation:	The beach closures advisory the time frame of January January 2001 to December 2007.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of San Diego's Quality Assessment/Quality Control document
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43672, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Buena Vista Creek HA, at Carlsbad State Beach at Pine Ave 041761

LOE ID:	29784
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	87
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from April 1999 through October 2006. The total number of samples collected was 87 with no samples exceeding the water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005). Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Carlsbad State Beach, at Pine Avenue, station id EH-470. Lat/Long: 33.15540/ -117.35140.
Temporal Representation:	Samples were collected from April 1999 through October 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43672, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Buena Vista Creek HA, at Carlsbad State Beach at Pine Ave

LOE ID:	29786
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	87
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from April 1999 through October 2006. The total number of samples collected was 87 with no samples exceeding the water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Carlsbad State Beach, at Pine Avenue, station id EH-470. Lat/Long: 33.15540/ -117.35140.
Temporal Representation:	Samples were collected from April 1999 through October 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, San Luis Rey HU, Oceanside Pier at Pier View Way
Water Body ID: CAC903110002009062615094 4
Water Body Type: Coastal & Bay Shoreline

DECISION ID 44345 **Region 9**
Pacific Ocean Shoreline, San Luis Rey HU, Oceanside Pier at Pier View Way

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Fourteen lines of evidence are available in the administrative record to assess this pollutant. With the latest data, four of 81 geomean samples exceed the water quality objective for enterococcus for the protection of REC-1.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, four of 81 geomean samples exceed the water quality objective for enterococcus for the protection of REC-1 and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 44345, Indicator Bacteria **Region 9**
Pacific Ocean Shoreline, San Luis Rey HU, Oceanside Pier at Pier View Way

LOE ID: 30252

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Shellfish Harvesting

Number of Samples: 173

Number of Exceedances:	12	041764

Data and Information Type: PWS pathogen monitoring (ambient water)

Data Used to Assess Water Quality: Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 173 single samples were collected with 12 samples exceeded the single sample water quality objective.

Data Reference: Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005). Comparisons were also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. In 2006, Â‘Pacific Ocean Shoreline, San Luis Rey HUÂ’ was listed for Indicator Bacteria. For 2008, the 2006 San Luis Rey HU segment has been split into smaller segments and each represents an area near the sampling location of the data being assessed. Â‘Pacific Ocean Shoreline, San Luis Rey HU, Oceanside Pier at Pier View Way' is one of the sampling locations for Pacific Ocean Shoreline, San Luis Rey HU, and is considered to be part of the original listing.

For this 2008 assessment, the Regional Board has chosen to replace the Â‘indicator bacteriaÂ’ listing with separate assessments of the specific indicator bacteria, such as total coliform, fecal coliform, and enterococcus, for removal or non-removal from the 303(d) list.

Objective/Criterion Reference: Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:

Guideline Reference:

Spatial Representation: Samples were collected at Oceanside Pier (at Pier View Way), San Diego, California. Department of Environmental Health identification number is OC-080.

Temporal Representation: Samples were collected from January 2004 through December 2007.

Environmental Conditions:

QAPP Information: Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.

QAPP Information Reference(s): County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44345, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, Oceanside Pier at Pier View Way

LOE ID: 75082

Pollutant: Enterococcus

LOE Subgroup: Pollutant-Water

Matrix: Water

Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 47

Number of Exceedances: 4

Data and Information Type: Not Specified

Data Used to Assess Water Quality: Four of the 47 geomeans exceeded the objective.

Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The geometric mean standard for entercoccus states that the entercoccus density shall not

exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009 9941765

Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at the Oceanside Pier at Pier View Way site.
Temporal Representation: Samples were collected from January 2008 to August 2009.
Environmental Conditions:
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 44345, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, Oceanside Pier at Pier View Way

LOE ID: 30246

Pollutant: Enterococcus
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 173
Number of Exceedances: 2

Data and Information Type: PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality: Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 173 single samples were collected with two samples exceeding the single sample water quality objective.
Data Reference: Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference: Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Oceanside Pier (at Pier View Way), San Diego, California. Department of Environmental Health identification number is OC-080.
Temporal Representation: Samples were collected from January 2004 through December 2007.
Environmental Conditions:
QAPP Information: Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s): County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44345, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, Oceanside Pier at Pier View Way

LOE ID: 30647

Pollutant: Enterococcus
LOE Subgroup: Pollutant-Water

Matrix:	Water	041766
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	163	
Number of Exceedances:	1	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 173 single samples were collected of which 163 are dry weather (AB411) samples with one sample exceeding the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Oceanside Pier (at Pier View Way), San Diego, California. Department of Environmental Health identification number is OC-080.	
Temporal Representation:	Samples were collected from January 2004 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44345, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, Oceanside Pier at Pier View Way

LOE ID:	30242
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	173
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 173 single samples were collected with no sample exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Oceanside Pier (at Pier View Way), San Diego, California. Department of Environmental Health identification number is OC-080.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44345, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, Oceanside Pier at Pier View Way

LOE ID:	30854
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	163
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 173 single samples were collected of which 163 are dry weather (AB411) samples and none of those samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Oceanside Pier (at Pier View Way), San Diego, California. Department of Environmental Health identification number is OC-080.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44345, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, Oceanside Pier at Pier View Way

LOE ID:	30251
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	10
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from February 2004 through December 2007. A total of 173 single samples were collected with ten samples correlating with a storm event. Two of the ten samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005). Comparisons are also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Oceanside Pier (at Pier View Way), San Diego, California. Department of Environmental Health identification number is OC-080.
Temporal Representation:	Samples were collected from February 2004 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44345, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, Oceanside Pier at Pier View Way

LOE ID:	77672

Pollutant:	Total Coliform	041769
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Shellfish Harvesting	
Number of Samples:	47	
Number of Exceedances:	4	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Four of the 47 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, San Luis Rey HU, Oceanside Pier at Pier View Way.	
Temporal Representation:	The samples were collected from January 2008 to August 2009.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the beach watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44345, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, Oceanside Pier at Pier View Way

LOE ID:	30256
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	-N/A
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	17
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were 17 beach advisory days for this section of shoreline. When a bacteriological sample exceeds water quality standards, signs are posted indicating that an advisory for waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 - December 2007. Data used was the number of days the beach was advisories were issued when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Spatial Representation:	Beach advisories were posted at the Oceanside City Beach at Pierview Way in Oceanside, CA.
Temporal Representation:	The beach advisory covers the time frame of January January 2001 to December 2007.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of San Diego's Quality Assessment/Quality Control document
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44345, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, Oceanside Pier at Pier View Way

LOE ID:	30250
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	34
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 173 single samples were collected with 34 monthly geomeans calculated. None of the 34 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Oceanside Pier (at Pier View Way), San Diego, California. Department of Environmental Health identification number is OC-080.

Temporal Representation:	Samples were collected from January 2004 through December 2007. 041771
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44345, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, Oceanside Pier at Pier View Way

LOE ID:	30249
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	34
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 173 single samples were collected and 34 geomeans calculated. None of the 34 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Oceanside Pier (at Pier View Way), San Diego, California. Department of Environmental Health identification number is OC-080.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44345, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, Oceanside Pier at Pier View Way

LOE ID:	30245
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	10

Number of Exceedances:	0	041772

Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from February 2004 through December 2007. A total of 173 single samples were collected with ten samples correlated with a storm event. None of the ten samples exceeded the single sample water quality objective. In 2006, Â'Pacific Ocean Shoreline, San Luis Rey HUÂ' was listed for Indicator Bacteria. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005). Comparisons are also made only for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Oceanside Pier (at Pier View Way), San Diego, California. Department of Environmental Health identification number is OC-080.
Temporal Representation:	Samples were collected from February 2004 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44345, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, Oceanside Pier at Pier View Way

LOE ID:	30244
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	173
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004

	through December 2007. A total of 173 single samples were collected with no sample exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Oceanside Pier (at Pier View Way), San Diego, California. Department of Environmental Health identification number is OC-080.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44345, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, Oceanside Pier at Pier View Way

LOE ID:	31199
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	25
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 104 dry month (April through October) single samples were collected with 25 dry month geomeans calculated. None of the 25 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Oceanside Pier (at Pier View Way), San Diego, California. Department of Environmental Health identification number is OC-080.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	

QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44345, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, Oceanside Pier at Pier View Way

LOE ID:	31198
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	25
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 104 dry month (April through October) single samples were collected with 25 dry month geomeans calculated. None of the 25 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Oceanside Pier (at Pier View Way), San Diego, California. Department of Environmental Health identification number is OC-080.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44345, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, Oceanside Pier at Pier View Way

LOE ID:	31197
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	25
Number of Exceedances:	0

Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 104 dry month (April through October) single samples were collected with 25 dry month geomeans calculated. None of the 25 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Oceanside Pier (at Pier View Way), San Diego, California. Department of Environmental Health identification number is OC-080.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44345, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, Oceanside Pier at Pier View Way

LOE ID:	30243
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	10
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from February 2004 through December 2007. A total of 173 single samples were collected with ten samples correlated with a storm event. None of the ten samples exceeded the single sample water quality objective. In 2006, Â‘Pacific Ocean Shoreline, San Luis Rey HUÂ’ was listed for Indicator Bacteria. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005). Comparisons were also made for days with matching bacteria and storm event data. A

	storm event was defined as 0.2 inches of rainfall within a 72 hour period. 041776
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Oceanside Pier (at Pier View Way), San Diego, California. Department of Environmental Health identification number is OC-080.
Temporal Representation:	Samples were collected from February 2004 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44345, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, Oceanside Pier at Pier View Way

LOE ID:	30248
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	34
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 173 single samples were collected with 34 monthly geomeans calculated. None of the 34 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Oceanside Pier (at Pier View Way), San Diego, California. Department of Environmental Health identification number is OC-080.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the

QAPP Information Reference(s):	County of San Diego, Department Public Health Laboratory Quality Assurance Manual. County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44345, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, Oceanside Pier at Pier View Way

LOE ID:	75085
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	47
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 47 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Oceanside Pier at Pier View Way site.
Temporal Representation:	Samples were collected from January 2008 to August 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44345, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, Oceanside Pier at Pier View Way

LOE ID:	30746
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	163
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 173 single samples were collected of which 163 are dry weather (AB411) samples with no sample exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data:	Non-SWAMP	041778
Water Quality Objective/Criterion:	Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Oceanside Pier (at Pier View Way), San Diego, California. Department of Environmental Health identification number is OC-080.	
Temporal Representation:	Samples were collected from January 2004 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44345, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, Oceanside Pier at Pier View Way

LOE ID:	75084
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	55
Number of Exceedances:	3
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed bw data for Pacific Ocean Shoreline, San Luis Rey HU, Oceanside Pier at Pier View Way to determine beneficial use support and results are as follows: 3 of 55 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, San Luis Rey HU, Oceanside Pier at Pier View Way was collected at 1 monitoring site [Pier View Way]
Temporal Representation:	Data was collected over the time period 1/9/2008-8/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44345, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, Oceanside Pier at Pier View Way

LOE ID:	75083	041779

Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	47
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 47 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Oceanside Pier at Pier View Way site.
Temporal Representation:	Samples were collected from January 2008 to August 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44345, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, Oceanside Pier at Pier View Way

LOE ID:	30247
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	10
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from February 2004 through December 2007. A total of 173 single samples were collected with ten samples correlating with a storm event. One of the ten samples exceeded the single sample water quality objective. In 2006, Â‘Pacific Ocean Shoreline, San Luis Rey HUÂ’ was listed for Indicator Bacteria. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB,

2005). 041780

Comparisons are also made for days with matching bacteria and storm event data. A storm event is defined as 0.2 inches of rainfall within a 72 hour period.

Objective/Criterion Reference: Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Oceanside Pier (at Pier View Way), San Diego, California. Department of Environmental Health identification number is OC-080.

Temporal Representation: Samples were collected from February 2004 through December 2007.

Environmental Conditions: Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.

Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.

QAPP Information: Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.

QAPP Information Reference(s): County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

DECISION ID 49998 Region 9

Pacific Ocean Shoreline, San Luis Rey HU, Oceanside Pier at Pier View Way

Pollutant: **Trash**
Final Listing Decision: **List on 303(d) list (being addressed by action other than TMDL)**
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Sources: Source Unknown
Expected Attainment Date: 2029
Implementation Action Other than TMDL: Collected effort of public, agencies, organizations, and permittees. Methods include street sweeping, education programs on littering, installation of trash-catching devices on storm drains.
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.7 of the Listing Policy. Under this section when all other listing factors do not result in the listing of a water segment but information indicates non-attainment of standards, a water segment shall be evaluated to determine whether the weight of evidence demonstrates that water quality standard is not attained. If the weight of evidence indicates non-attainment, the water segment shall be placed on the CWA section 303(d) List.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for placing this water segment-pollutant combination from the CWA section 303(d) List. This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The following information indicates that the water quality standard is not being attained: Coastkeeper cleanups occurred on 5/12/07, 3/8/08, 3/14/09 and 3/13/10 for this water body. The total weight of trash (lbs) collected on these dates was 1,147.25. Using the metric, Coastkeeper classified this water body as medium for trash impairment. However, any trash found is an exceedance and needs to be addressed by an action other than a TMDL.
3. This process is scientifically defensible and reproducible.

Regional Board Decision After review of the available data and information, RWQCB staff concludes that the water body-

Recommendation: pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 49998, Trash **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, Oceanside Pier at Pier View Way

LOE ID:	75086
Pollutant:	Trash
LOE Subgroup:	Pollutant-Nuisance
Matrix:	Not Recorded
Fraction:	None
Beneficial Use:	Non-Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Occurrence of conditions judged to cause impairment
Data Used to Assess Water Quality:	The San Diego Coastkeeper conducts trash cleanups and uses a metric (pounds of trash collected per volunteer) to compare levels of trash across beaches and categorizes beaches as either low, medium, high or severe, based on this metric. Coastkeeper cleanups occurred on 5/12/07, 3/8/08, 3/14/09 and 3/13/10 for this water body. The total weight of trash (lbs) collected on these dates was 1,147.25. However, using the metric, Coastkeeper classified this water body as medium for trash impairment.
Data Reference:	Data for Trash, Nutrients, and Pathogens in Region 9, 2007-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Floating Material Waters shall not contain floating material, including solids, liquids, foams, and scum in concentrations which cause nuisance or adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Oceanside pier at pier view way.
Temporal Representation:	Four cleanups that occurred on 5/12/07, 3/8/08, 3/14/09 and 3/13/10.
Environmental Conditions:	
QAPP Information:	QAPP provided from the San Diego Coastkeeper.
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth
Water Body ID: CAC9031100020090626115722
Water Body Type: Coastal & Bay Shoreline

DECISION ID 44090 **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not Delist from 303(d) list (being addressed with USEPA approved TMDL)**
Last Listing Cycle's Final Listing Decision:	Do Not Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
TMDL Name:	Bacteria Impaired Waters I (creeks and beach shorelines)
TMDL Project Code:	169
Date TMDL Approved by USEPA:	06/22/2011
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal on the CWA section 303(d) List under sections 2.2 and 4.2 of the Listing Policy. Under Section 4.2 of the Policy, a minimum of one line of evidence is needed to assess listing status.

Thirteen lines of evidence are available in the administrative record to assess this pollutant.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List. There is sufficient justification to place it in the Being Addressed portion of the CWA 303(d) List because a TMDL has been completed and approved by RWQCB and USEPA, and is expected to result in attainment of the standard.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section [NUMBER] of the Policy.
2. The data used satisfies the data quantity requirements of section NUMBER of the Policy.
3. With the latest data, 17 of 92 geomean samples exceed the water quality objective (WQO) for enterococcus for the protection of REC-1 beneficial use, and 201of 608 samples exceed the SSM WQO for total coliform for the protection of SHELL beneficial use, and these exceed the allowable frequency listed in Table 4.2 of the Listing Policy.
4. The Bacteria TMDL for 20 beaches and creeks was approved by USEPA on 06/22/2011.
5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 44090, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth

LOE ID: 75211

Pollutant:	Enterococcus	041783
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	47	
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Zero of the 47 geomeans exceeded the objective.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at the Harbor Beach site.	
Temporal Representation:	Samples were collected from January 2008 to February 2009.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44090, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth

LOE ID:	30176
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Water Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006. For the 2008 assessment , the 2006 listed coastline 'Pacific Ocean Shoreline, San Luis Rey HU' was split into smaller segments and each represents an area near the sampling location of the data being assessed. This segment 'Pacific Ocean Shoreline, San Luis Rey HU, Oceanside Pier at San Luis Rey River mouth' is one of the sampling locations. This LOE is a copy of the 2006 listing placeholder LOE for Pacific Ocean Shoreline, San Luis Rey HU and is considered by the Regional Board to be applicable to this more specific segment formed from the split.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)

Evaluation Guideline: 041784
Guideline Reference:

Spatial Representation:
Temporal Representation:
Environmental Conditions:
QAPP Information: Unspecified
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 44090, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth

LOE ID: 75213

Pollutant: Fecal Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 47
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Zero of the 47 geomeans exceeded the objective.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at the Harbor Beach site.
Temporal Representation: Samples were collected from January 2008 to February 2009.
Environmental Conditions:
QAPP Information: The samples were collected for the beach watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 44090, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth

LOE ID: 75214

Pollutant: Fecal Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 203
Number of Exceedances: 18

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Eighteen of the 203 geomeans exceeded the objective.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the San Luis Rey river outlet site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44090, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth

LOE ID:	77671
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	250
Number of Exceedances:	85
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Eighty-five of the 250 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth at stations Harbor Beach and San Luis Rey River outlet, south jetty.
Temporal Representation:	The samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44090, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth

LOE ID:	75245
Pollutant:	Total Coliform

LOE Subgroup:	Pollutant-Water	041786
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Shellfish Harvesting	
Number of Samples:	266	
Number of Exceedances:	69	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed bw data for Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth to determine beneficial use support and results are as follows: 69 of 266 samples exceed the criterion for Coliform, Total.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth was collected at 2 monitoring sites [Harbor Beach, San Luis Rey River outlet]	
Temporal Representation:	Data was collected over the time period 1/9/2008-8/26/2010.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44090, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth

LOE ID:	75246
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	47
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 47 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Harbor Beach site.

Temporal Representation:	Samples were collected from January 2008 to February 2009.	041787
Environmental Conditions:		
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44090, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth

LOE ID:	75247
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	203
Number of Exceedances:	13
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Thirteen of the 203 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the San Luis Rey river outlet site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44090, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth

LOE ID:	30853
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	327
Number of Exceedances:	7
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 342 single samples were collected of which 327 are dry weather (AB411) samples with seven of those samples exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station

	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Luis Rey River Outlet South, San Diego, California. Station identification number is OC-100.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44090, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth

LOE ID:	30203
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	13
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 282 single samples were collected with 13 samples correlated with a storm event. Four of the 13 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Luis Rey River Outlet South, San Diego, California. Station identification number is OC-100.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44090, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth

LOE ID:	30747
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	269
Number of Exceedances:	22
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 282 single samples were collected of which 269 are dry weather (AB411) samples with 22 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Luis Rey River Outlet South, San Diego, California. Station identification number is OC-100.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the

QAPP Information Reference(s):	County of San Diego, Department Public Health Laboratory Quality Assurance Manual. County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44090, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth

LOE ID:	31194
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	26
Number of Exceedances:	6
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 2004 through October 2007. A total of 200 dry month (April through October) single samples were collected with 26 dry month geomeans calculated. Six of the 26 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Luis Rey River Outlet South, San Diego, California. Station identification number is OC-100.
Temporal Representation:	Samples were collected from April 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44090, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth

LOE ID:	31195
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation	041791
Number of Samples:	26	
Number of Exceedances:	1	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 2004 through October 2007. A total of 157 dry month (April through October) single samples were collected with 26 dry month geomeans calculated. One of the 26 geomeans exceeded the geomean water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at San Luis Rey River Outlet South, San Diego, California. Station identification number is OC-100.	
Temporal Representation:	Samples were collected from April 2004 through October 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44090, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth

LOE ID:	31196
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	26
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 2004 through October 2007. A total of 200 dry month (April through October) single samples were collected with 26 dry month geomeans calculated. One of the 26 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml;

	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Luis Rey River Outlet South, San Diego, California. Station identification number is OC-100.
Temporal Representation:	Samples were collected from April 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44090, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth

LOE ID:	30198
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	342
Number of Exceedances:	132
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 342 single samples were collected with 132 samples exceeded the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Luis Rey River Outlet South, Oceanside, California. Department of Environmental Health identification number is OC-100.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44090, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth

LOE ID:	30199
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	15
Number of Exceedances:	9
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 342 single samples were collected with 15 samples correlated with a storm event. Nine of the 15 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Luis Rey River Outlet South, San Diego, California. Station identification number is OC-100.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44090, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth

LOE ID:	30208

Pollutant:	Enterococcus	041794
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	45	
Number of Exceedances:	17	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 342 single samples were collected with 45 monthly geomeans calculated. Seventeen of the 45 geomeans exceeded the geomean water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at San Luis Rey River Outlet South, San Diego, California. Station identification number is OC-100.	
Temporal Representation:	Samples were collected from January 2004 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44090, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth

LOE ID:	30253
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	-N/A
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	457
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were 457 beach advisory days for this section of shoreline. When a bacteriological sample exceeds water quality standards, signs are posted indicating that an advisory for waters have exceeded public health standards.

	Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 - December 2007. Data used was the number of days the beach was advisories were issued when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Spatial Representation:	Beach advisories were posted at the San Luis Rey rivermouth in Oceanside, CA.
Temporal Representation:	The beach advisory covers the time frame of January January 2001 to December 2007.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of San Diego's Quality Assessment/Quality Control document
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44090, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth

LOE ID:	30204
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	342
Number of Exceedances:	49
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 342 single samples were collected with 49 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005.

	Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Luis Rey River Outlet South, San Diego, California. Station identification number is OC-100.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44090, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth

LOE ID:	30205
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	15
Number of Exceedances:	7
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 342 single samples were collected with 15 samples correlated with a storm event. Seven of the 15 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Luis Rey River Outlet South, San Diego, California. Station identification number is OC-100.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.

	Analyzing only storm water bacteria data is important because the majority of the beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44090, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth

LOE ID:	30206
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	45
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 342 single samples were collected with 45 monthly geomeans calculated. Three of the 45 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Luis Rey River Outlet South, San Diego, California. Station identification number is OC-100.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44090, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth

LOE ID:	30207

Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	45
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 282 single samples were collected and 45 geomeans calculated. Three of the 45 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Luis Rey River Outlet South, San Diego, California. Station identification number is OC-100.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44090, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth

LOE ID:	30648
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	327
Number of Exceedances:	42
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 342 single samples were collected of which 327 are dry weather (AB411) samples with 42 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program,

	2007. AB 411 monitoring data 1999 to 2007	041799

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Luis Rey River Outlet South, San Diego, California. Station identification number is OC-100.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44090, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth

LOE ID:	30200
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	342
Number of Exceedances:	10
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 342 single samples were collected with 10 samples exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at San Luis Rey River Outlet South, San Diego, California. Station identification number is OC-100.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44090, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth

LOE ID:	30201
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	15
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 342 single samples were collected with 15 samples correlated with a storm event. Three of the 15 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Luis Rey River Outlet South, San Diego, California. Station identification number is OC-100.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through

	March. 041801
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44090, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth

LOE ID:	30202
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	282
Number of Exceedances:	26
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 282 single samples were collected with 26 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Luis Rey River Outlet South, San Diego, California. Station identification number is OC-100.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44090, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth

LOE ID:	75212
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation
Number of Samples:	203
Number of Exceedances:	51
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Fifty-one of the 203 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the San Luis Rey river outlet site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

DECISION ID 49981 Region 9

Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. One of the One samples exceed the Evaluation Guideline for Arsenic.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of One samples exceeded the Evaluation Guideline for Arsenic and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49981, Arsenic **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth

LOE ID:	75196
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Fish fillet
Beneficial Use:	Shellfish Harvesting
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The one sample did exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal. Ten percent of the total arsenic result was used to estimate of the amount of inorganic arsenic in the sample; this number was screened against the guideline.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for arsenic in shellfish tissue is 0.0052 ppm. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; OEHHA, 2004)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Air Toxics Hotspots Program Risk Assessment Guidelines. Part II Technical Support Document for Describing Available Cancer Potency Values.
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site Oceanside Municipal Beach Jetty (OSBJ).
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/16/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID **49982** **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth 041804

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Cadmium. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Evaluation Guideline for Cadmium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49982, Cadmium — Region 9

Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth

LOE ID:	75197
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Fish fillet
Beneficial Use:	Shellfish Harvesting
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The sample did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental

	physiological responses in human, plant, animal, or aquatic life. 041805
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for cadmium in shellfish tissue is 3.3 ppm. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; USEPA, 2000)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Guidance for Assessing Chemical Contaminant Data for Use In Fish Advisories Volume 1: Fish Sampling and Analysis
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site Oceanside Municipal Beach Jetty (OSBJ).
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/16/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID 49983 Region 9

Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth

Pollutant:	**Chlordane**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Chlordane. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Evaluation Guideline for Chlordane and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision	After review of the available data and information, RWQCB staff concludes that the water body-

Recommendation:	pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49983, Chlordane **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth

LOE ID:	75201
Pollutant:	Chlordane
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Fish fillet
Beneficial Use:	Shellfish Harvesting
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal. Chlordane result was calculated by summing the results for chlordane isomers: cis- and trans-nonachlor, alpha- and gamma-chlordane, and oxychlordane.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for total chlordane in shellfish tissue is 6.0 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site Oceanside Municipal Beach Jetty (OSBJ).
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/16/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID 49984 Region 9

Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Chlorpyrifos. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Evaluation Guideline for Chlorpyrifos and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49984, Chlorpyrifos Region 9

Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth

LOE ID:	75202
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Fish fillet
Beneficial Use:	Shellfish Harvesting
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009, State Water Resources Control Board

SWAMP Data:	Non-SWAMP	041808
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for chlorpyrifos in shellfish tissue is 1,000 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; USEPA, 2000)	
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Guidance for Assessing Chemical Contaminant Data for Use In Fish Advisories Volume 1: Fish Sampling and Analysis	
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site Oceanside Municipal Beach Jetty (OSBJ).	
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/16/2008	
Environmental Conditions:		
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/	
QAPP Information Reference(s):		

DECISION ID 49985 Region 9

Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth

Pollutant:	**Dieldrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. One of the One samples exceed the Evaluation Guideline for Dieldrin. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of One samples exceeded the Evaluation Guideline for Dieldrin and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial

use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49985, Dieldrin **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth

LOE ID:	75203
Pollutant:	Dieldrin
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Fish fillet
Beneficial Use:	Shellfish Harvesting
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The result did exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for dieldrin in shellfish tissue is 0.49 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site Oceanside Municipal Beach Jetty (OSBJ).
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/16/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and

mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program
Additional background information can be found at:
http://ccma.nos.noaa.gov/stressors/pollution/nsandt/

QAPP Information Reference(s):

DECISION ID 49986 Region 9

Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth

Pollutant:	**Endosulfan**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Endosulfan. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Evaluation Guideline for Endosulfan and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49986, Endosulfan Region 9

Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth

LOE ID:	75209
Pollutant:	Endosulfan
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Fish fillet
Beneficial Use:	Shellfish Harvesting
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1

	minus the percentage of moisture content expressed as a decimal. Total Endosulfan result was calculated by summing Endosulfan I and Endosulfan II.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for endosulfan (I and II) in shellfish tissue is 20,000 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; USEPA, 2000)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Guidance for Assessing Chemical Contaminant Data for Use In Fish Advisories Volume 1: Fish Sampling and Analysis
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site Oceanside Municipal Beach Jetty (OSBJ).
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/16/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID 49987 Region 9

Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth

Pollutant:	**Endrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Endrin. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that: 041812
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Evaluation Guideline for Endrin and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49987, Endrin **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth

LOE ID:	75210
Pollutant:	Endrin
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Fish fillet
Beneficial Use:	Shellfish Harvesting
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for endrin in shellfish tissue is 1,000 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; USEPA, 2000)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Guidance for Assessing Chemical Contaminant Data for Use In Fish Advisories Volume 1: Fish Sampling and Analysis
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site Oceanside Municipal Beach Jetty (OSBJ).

Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/16/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID 49988 Region 9

Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth

Pollutant:	**Heptachlor epoxide**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Heptachlor epoxide. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Evaluation Guideline for Heptachlor epoxide and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49988, Heptachlor epoxide Region 9

Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth

LOE ID:	75222
Pollutant:	Heptachlor epoxide
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Fish fillet
Beneficial Use:	Shellfish Harvesting

Number of Samples:	1	041814
Number of Exceedances:	0	
Data and Information Type:	Shellfish surveys	
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.	
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for heptachlor epoxide in shellfish tissue is 1.4 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; OEHHA, 1999)	
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Public Health Goal for Heptachlor and Heptachlor Epoxide in Drinking Water	
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site Oceanside Municipal Beach Jetty (OSBJ).	
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/16/2008	
Environmental Conditions:		
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/	
QAPP Information Reference(s):		

DECISION ID 49989 Region 9

Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth

Pollutant:	**Hexachlorobenzene/ HCB**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Hexachlorobenzene/ HCB.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Evaluation Guideline for Hexachlorobenzene/ HCB and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49989, Hexachlorobenzene/ HCB **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth

LOE ID:	75223
Pollutant:	Hexachlorobenzene/ HCB
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Fish fillet
Beneficial Use:	Shellfish Harvesting
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for hexachlorobenzene in shellfish tissue is 4.3 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; OEHHA, 2005)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs,

Selenium, and Toxaphene 041816
Air Toxics Hotspots Program Risk Assessment Guidelines. Part II Technical Support Document for Describing Available Cancer Potency Values.

Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site Oceanside Municipal Beach Jetty (OSBJ).
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/16/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID 49990 Region 9

Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth

Pollutant:	**Lindane/gamma Hexachlorocyclohexane (gamma-HCH)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Lindane/gamma Hexachlorocyclohexane (gamma-HCH). Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Evaluation Guideline for Lindane/gamma Hexachlorocyclohexane (gamma-HCH) and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49990, Lindane/gamma Hexachlorocyclohexane (gamma-HCH) Region 9

Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth

LOE ID: 75224

Pollutant:	Lindane/gamma Hexachlorocyclohexane (gamma-HCH)	041817
LOE Subgroup:	Pollutant-Tissue	
Matrix:	Tissue	
Fraction:	Fish fillet	
Beneficial Use:	Shellfish Harvesting	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	Shellfish surveys	
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.	
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for lindane in shellfish tissue is 7.1 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; OEHHA, 2005)	
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Air Toxics Hotspots Program Risk Assessment Guidelines. Part II Technical Support Document for Describing Available Cancer Potency Values.	
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site Oceanside Municipal Beach Jetty (OSBJ).	
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/16/2008	
Environmental Conditions:		
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/	
QAPP Information Reference(s):		

DECISION ID 49991 Region 9

Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth

Pollutant:	**Mercury**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised

Impairment from Pollutant or Pollution:	Pollutant	041818

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Mercury.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Evaluation Guideline for Mercury and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49991, Mercury **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth

LOE ID:	75233
Pollutant:	Mercury
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Fish fillet
Beneficial Use:	Shellfish Harvesting
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The sample did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The USEPA 304(a) recommended water quality criterion for concentrations of methylmercury in shellfish tissue (wet weight) is 0.2 ppm. (Brodberg, R.K., and G.A. Pollock, 1999; USEPA, 2001)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California

Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment
Water Quality Criterion for the Protection of Human Health: Methylmercury. Final. United States Environmental Protection Agency Office of Science and Technology Office of Water. EPA-823-R-01-001. January 2001

Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site Oceanside Municipal Beach Jetty (OSBJ).
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/16/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID 49992 Region 9

Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth

Pollutant:	**Mirex**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the Zero samples exceed the Evaluation Guideline for Mirex. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Zero samples exceeded the Evaluation Guideline Mirex for and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49992, Mirex Region 9

Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth

LOE ID: 75234

Pollutant:	Mirex
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Fish fillet
Beneficial Use:	Shellfish Harvesting
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The detected not quantifiable result was not included in the assessment since the reporting limit was above the evaluation guideline. MDL were provided by NOAA Federal and RL were calculated by multiplying 3.18 by the MDL.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for mirex in shellfish tissue is 0.43 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; OEHHA, 1992)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Expedited Cancer Potency Values and Proposed Regulatory Levels for Certain Proposition 65 Carcinogens.
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site Oceanside Municipal Beach Jetty (OSBJ).
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/16/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID 49993 Region 9

Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth

Pollutant:	**PAHs (Polycyclic Aromatic Hydrocarbons)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised

Impairment from Pollutant or Pollution:	Pollutant	041821
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for PAHs (Polycyclic Aromatic Hydrocarbons). Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Evaluation Guideline for PAHs (Polycyclic Aromatic Hydrocarbons) and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.	
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.	

Line of Evidence (LOE) for Decision ID 49993, PAHs (Polycyclic Aromatic Hydrocarbons) **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth

LOE ID:	75235
Pollutant:	PAHs (Polycyclic Aromatic Hydrocarbons)
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Fish fillet
Beneficial Use:	Shellfish Harvesting
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The result did exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal. The total PAHs were calculated as the potency equivalency concentration or the sum of the toxic equivalency factors multiplied by the concentrations of: Acenaphthene, Acenaphthylene, Anthracene, Benz[a]anthracene, Benzo[a]pyrene, Benzo[b]fluoranthene, Benzo[g,h,i]perylene, Benzo[k]fluoranthene, Dibenzo[a,h]anthracene, Chrysene, Fluoranthene, Fluorene, Indeno[1,2,3-c,d]pyrene, Phenanthrene, and Pyrene.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for polycyclic aromatic hydrocarbons in shellfish tissue is 1.1 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; USEPA, 2000)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Guidance for Assessing Chemical Contaminant Data for Use In Fish Advisories Volume 1: Fish Sampling and Analysis
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site Oceanside Municipal Beach Jetty (OSBJ).
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/16/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID 49994 Region 9

Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth

Pollutant:	**PCBs (Polychlorinated biphenyls)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for PCBs (Polychlorinated biphenyls). Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Evaluation Guideline for PCBs (Polychlorinated biphenyls) and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and

information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49994, PCBs (Polychlorinated biphenyls) Region 9

Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth

LOE ID:	75243
Pollutant:	PCBs (Polychlorinated biphenyls)
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Fish fillet
Beneficial Use:	Shellfish Harvesting
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal. Total PCB was assessed for as follows: PCB aroclors and congeners were summed separately and the sum that yielded the highest value was used for the assessment.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for polychlorinated biphenyls in shellfish tissue is 3.9 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site Oceanside Municipal Beach Jetty (OSBJ).
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/16/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID 49995 Region 9

Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth 041824

Pollutant:	**Selenium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Selenium. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Evaluation Guideline for Selenium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49995, Selenium — Region 9

Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth

LOE ID:	75244
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Fish fillet
Beneficial Use:	Shellfish Harvesting
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The sample did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental

	physiological responses in human, plant, animal, or aquatic life. 041825
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for selenium in shellfish tissue is 11 ppm. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day. A background dietary consuption rate of 0.114 mg/day is applied for this micronutrient. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site Oceanside Municipal Beach Jetty (OSBJ).
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/16/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID 49996 Region 9

Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth

Pollutant:	**Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD). Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Evaluation Guideline for Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD) and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and

information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49996, Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD) **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth

LOE ID:	75081
Pollutant:	Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD)
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Fish fillet
Beneficial Use:	Shellfish Harvesting
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal. The total DDTs were calculated as the sum of 4,4- and 2,4- isomers of DDT, DDE, and DDD.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for total DDT in shellfish tissue is 23 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site Oceanside Municipal Beach Jetty (OSBJ).
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/16/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, San Luis Rey HU, at Pier at Surfrider Way
Water Body ID: CAC903110002009062615003 1
Water Body Type: Coastal & Bay Shoreline

DECISION ID 44137 **Region 9**
Pacific Ocean Shoreline, San Luis Rey HU, at Pier at Surfrider Way

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Fourteen lines of evidence are available in the administrative record to assess this pollutant. With the latest data, 5 of 81 geomean samples exceed the water quality objective for enterococcus for the protection of REC-1 beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, 5 of 81 geomean samples exceed the water quality objective for enterococcus for the protection of REC-1 beneficial use and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 44137, Indicator Bacteria **Region 9**
Pacific Ocean Shoreline, San Luis Rey HU, at Pier at Surfrider Way

LOE ID: 77669

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Shellfish Harvesting

Number of Samples: 47

Number of Exceedances:	3	041828
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Three of the 47 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, San Luis Rey HU, at Pier at Surfrider Way.	
Temporal Representation:	The samples were collected from January 2008 to February 2009.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the beach watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44137, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at Pier at Surfrider Way

LOE ID:	30855
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	160
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 171 single samples were collected of which 160 are dry weather (AB411) samples and none of those samples exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at Oceanside Pier (at Surfrider Way), San Diego, California. Department of Environmental Health identification number is OC-090.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44137, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at Pier at Surfrider Way

LOE ID:	30217
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	34
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 170 single samples were collected and 34 geomeans calculated. None of the 34 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Oceanside Pier (at Surfrider Way), San Diego, California. Department of Environmental Health identification number is OC-090.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44137, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at Pier at Surfrider Way

LOE ID:	30216
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	34
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 171 single samples were collected with 34 monthly geomeans calculated. None of the 34 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Oceanside Pier (at Surfrider Way), San Diego, California. Department of Environmental Health identification number is OC-090.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44137, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at Pier at Surfrider Way

LOE ID:	30649
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	160
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 171 single samples were collected of which 160 are dry weather (AB411) samples with one sample exceding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:	041831
Guideline Reference:	
Spatial Representation:	Samples were collected at Oceanside Pier (at Surfrider Way), San Diego, California. Department of Environmental Health identification number is OC-090.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44137, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at Pier at Surfrider Way

LOE ID:	31193
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	25
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 102 dry month (April through October) single samples were collected with 25 dry month geomeans calculated. None of the 25 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Oceanside Pier (at Surfrider Way), San Diego, California. Department of Environmental Health identification number is OC-090.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44137, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at Pier at Surfrider Way

LOE ID:	31192
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water

Matrix:	Water	041832
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	25	
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 101 dry month (April through October) single samples were collected with 25 dry month geomeans calculated. None of the 25 geomeans exceeded the geomean water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml;	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Oceanside Pier (at Surfrider Way), San Diego, California. Department of Environmental Health identification number is OC-090.	
Temporal Representation:	Samples were collected from June 2004 through October 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44137, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at Pier at Surfrider Way

LOE ID:	30748
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	170
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 170 single samples were collected of which 159 are dry weather (AB411) samples with zero samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).

Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Oceanside Pier (at Surfrider Way), San Diego, California. Department of Environmental Health identification number is OC-090.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44137, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at Pier at Surfrider Way

LOE ID:	30220
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	171
Number of Exceedances:	6
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 171 single samples were collected with six samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005). Comparisons were also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Oceanside Pier (at Surfrider Way), San Diego, California. Department of Environmental Health identification number is OC-090.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44137, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at Pier at Surfrider Way 041834

LOE ID:	30219
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	11
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from February 2004 through December 2007. A total of 171 single samples were collected with 11 samples correlated with a storm event. Two of the 11 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005). Comparisons are also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Oceanside Pier (at Surfrider Way), San Diego, California. Department of Environmental Health identification number is OC-090.
Temporal Representation:	Samples were collected from February 2004 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44137, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at Pier at Surfrider Way

LOE ID:	30218
Pollutant:	Enterococcus

LOE Subgroup:	Pollutant-Water	041835
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	34	
Number of Exceedances:	1	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 171 single samples were collected with 34 monthly geomeans calculated. One of the 34 geomeans exceeded the geomean water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml.	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Oceanside Pier (at Surfrider Way), San Diego, California. Department of Environmental Health identification number is OC-090.	
Temporal Representation:	Samples were collected from January 2004 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44137, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at Pier at Surfrider Way

LOE ID:	30211
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	11
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from February 2004 through December 2007. A total of 171 single samples were collected with 11 samples correlated with a storm event. None of the 11 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005). Comparisons were also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Oceanside Pier (at Surfrider Way), San Diego, California. Department of Environmental Health identification number is OC-090.
Temporal Representation:	Samples were collected from February 2004 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44137, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at Pier at Surfrider Way

LOE ID:	30214
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	171
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 171 single samples were collected with two samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	

Guideline Reference:	041837
Spatial Representation:	Samples were collected at Oceanside Pier (at Surfrider Way), San Diego, California. Department of Environmental Health identification number is OC-090.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44137, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at Pier at Surfrider Way

LOE ID:	30212
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	11
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from February 2004 through December 2007. A total of 170 single samples were collected with 11 samples correlating with a storm event. None of the 11 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005). Comparisons are also made only for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Oceanside Pier (at Surfrider Way), San Diego, California. Department of Environmental Health identification number is OC-090.
Temporal Representation:	Samples were collected from February 2004 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through

March. 041838

QAPP Information: Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.

QAPP Information Reference(s): County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44137, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at Pier at Surfrider Way

LOE ID: 30210

Pollutant: Fecal Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 170
Number of Exceedances: 0

Data and Information Type: PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality: Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 170 single samples were collected with no sample exceeding the single sample water quality objective.
Data Reference: Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference: Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Oceanside Pier (at Surfrider Way), San Diego, California. Department of Environmental Health identification number is OC-090.
Temporal Representation: Samples were collected from January 2004 through December 2007.
Environmental Conditions:
QAPP Information: Quality control for the bacteria analysis portion was conducted in accordance with
QAPP Information Reference(s): County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44137, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at Pier at Surfrider Way

LOE ID: 30209

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 171
Number of Exceedances: 0

Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 171 single samples were collected with no sample exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Oceanside Pier (at Surfrider Way), San Diego, California. Department of Environmental Health identification number is OC-090.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44137, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at Pier at Surfrider Way

LOE ID:	30215
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	11
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from February 2004 through December 2007. A total of 171 single samples were collected with 11 samples correlating with a storm event. One of the 11 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).

	Comparisons are also made for days with matching bacteria and storm event data. A storm event is defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Oceanside Pier (at Surfrider Way), San Diego, California. Department of Environmental Health identification number is OC-090.
Temporal Representation:	Samples were collected from February 2004 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44137, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at Pier at Surfrider Way

LOE ID:	30254
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	-N/A
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	5
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were five beach advisory days for this section of shoreline. When a bacteriological sample exceeds water quality standards, signs are posted indicating that an advisory for waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 - December 2007. Data used was the number of days the beach was advisories were issued when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	Department of Environmental Health, Land and Water Quality Division, San Diego County Beach Closure and Advisory Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-

	contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Spatial Representation:	Beach advisories were posted at the Oceanside City Beach at Surfrider Way in Oceanside, CA.
Temporal Representation:	The beach advisory covers the time frame of January January 2001 to December 2007.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of San Diego's Quality Assessment/Quality Control document
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44137, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at Pier at Surfrider Way

LOE ID:	31191
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	25
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 102 dry month (April through October) single samples were collected with 25 dry month geomeans calculated. None of the 25 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Oceanside Pier (at Surfrider Way), San Diego, California. Department of Environmental Health identification number is OC-090.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44137, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at Pier at Surfrider Way 041842

LOE ID:	75188
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	47
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 47 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Surfrider Way site.
Temporal Representation:	Samples were collected from January 2008 to February 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44137, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at Pier at Surfrider Way

LOE ID:	75187
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	53
Number of Exceedances:	3
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed bw data for Pacific Ocean Shoreline, San Luis Rey HU, at Pier at Surfrider Way to determine beneficial use support and results are as follows: 3 of 53 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	

Guideline Reference:	041843
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, San Luis Rey HU, at Pier at Surfrider Way was collected at 1 monitoring site [Surfrider Way]
Temporal Representation:	Data was collected over the time period 1/9/2008-2/2/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44137, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at Pier at Surfrider Way

LOE ID:	75185
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	47
Number of Exceedances:	4
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Four of the 47 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Surfrider Way site.
Temporal Representation:	Samples were collected from January 2008 to February 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44137, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at Pier at Surfrider Way

LOE ID:	75186
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	47
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 47 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Surfrider Way site.
Temporal Representation:	Samples were collected from January 2008 to February 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, San Luis Rey HU, at Pier at Tyson Way
Water Body ID: CAC904100002009062615160 1
Water Body Type: Coastal & Bay Shoreline

DECISION ID 43450 Region 9
Pacific Ocean Shoreline, San Luis Rey HU, at Pier at Tyson Way

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Fifteen lines of evidence are available in the administrative record to assess this pollutant. With the latest data, 8 of 164 geomean samples exceed the water quality objective for enterococcus for the protection of REC-1 beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, 8 of 164 geomean samples exceed the water quality objective for enterococcus for the protection of REC-1 beneficial use and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 43450, Indicator Bacteria Region 9
Pacific Ocean Shoreline, San Luis Rey HU, at Pier at Tyson Way

LOE ID: 75193

Pollutant: Fecal Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 130

Number of Exceedances:	0	041846

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Zero of the 130 geomeans exceeded the objective.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at the Tyson Way site.
Temporal Representation: Samples were collected from January 2008 to August 2010.
Environmental Conditions:
QAPP Information: The samples were collected for the beach watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 43450, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at Pier at Tyson Way

LOE ID: 75194

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Shellfish Harvesting

Number of Samples: 133
Number of Exceedances: 8

Data and Information Type: PATHOGEN MONITORING
Data Used to Assess Water Quality: Water Board staff assessed bw data for Pacific Ocean Shoreline, San Luis Rey HU, at Pier at Tyson Way to determine beneficial use support and results are as follows: 8 of 133 samples exceed the criterion for Coliform, Total.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Data for this line of evidence for Pacific Ocean Shoreline, San Luis Rey HU, at Pier at Tyson Way was collected at 1 monitoring site [Tyson Street]
Temporal Representation: Data was collected over the time period 1/9/2008-8/23/2010.
Environmental Conditions: Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 43450, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at Pier at Tyson Way

LOE ID:	75195
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	130
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 130 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Tyson Street site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43450, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at Pier at Tyson Way

LOE ID:	75189
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	130
Number of Exceedances:	8
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Eight of the 130 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Tyson Street site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.

Environmental Conditions:		041848
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43450, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at Pier at Tyson Way

LOE ID:	31189
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	25
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 103 dry month (April through October) single samples were collected with 25 dry month geomeans calculated. None of the 25 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Oceanside Pier (at Tyson Street), San Diego, California. Department of Environmental Health identification number is OC-050.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43450, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at Pier at Tyson Way

LOE ID:	31190
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	25
Number of Exceedances:	0

Data and Information Type:	PWS pathogen monitoring (ambient water) 041849
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 103 dry month (April through October) single samples were collected with 25 dry month geomeans calculated. None of the 25 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Oceanside Pier (at Tyson Street), San Diego, California. Department of Environmental Health identification number is OC-050.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43450, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at Pier at Tyson Way

LOE ID:	30749
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	167
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 184 single samples were collected of which 167 are dry weather (AB411) samples with one sample exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Oceanside Pier (at Tyson Street), San Diego, California.

	Department of Environmental Health identification number is OC-050. 041850
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43450, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at Pier at Tyson Way

LOE ID:	31188
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	25
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 103 dry month (April through October) single samples were collected with 25 dry month geomeans calculated. One of the 25 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Oceanside Pier (at Tyson Street), San Diego, California. Department of Environmental Health identification number is OC-050.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43450, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at Pier at Tyson Way

LOE ID:	30257
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	-N/A
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	2555
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were four beach advisory days for this section of shoreline. When a bacteriological sample exceeds water quality standards, signs are posted indicating that an advisory for waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 - December 2007. Data used was the number of days the beach was advisories were issued when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	Department of Environmental Health, Land and Water Quality Division, San Diego County Beach Closure and Advisory Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Spatial Representation:	Beach advisories were posted at the Oceanside City Beach at Tyson Street in Oceanside, CA.
Temporal Representation:	The beach advisory covers the time frame of January January 2001 to December 2007.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of San Diego's Quality Assessment/Quality Control document
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43450, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at Pier at Tyson Way

LOE ID:	30259
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	17
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from February 2004 through December 2007. A total of 184 single samples were collected with 17 samples

	correlating with a storm event. Two of the 17 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005). Comparisons were also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Oceanside Pier (at Tyson Street), San Diego, California. Department of Environmental Health identification number is OC-050.
Temporal Representation:	Samples were collected from February 2004 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43450, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at Pier at Tyson Way

LOE ID:	30261
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	184
Number of Exceedances:	5
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 184 single samples were collected with five samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Oceanside Pier (at Tyson Street), San Diego, California. Department of Environmental Health identification number is OC-050.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43450, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at Pier at Tyson Way

LOE ID:	30262
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	17
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from February 2004 through December 2007. A total of 184 single samples were collected with 17 samples correlating with a storm event. Four of the 17 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005). Comparisons are also made only for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Oceanside Pier (at Tyson Street), San Diego, California. Department of Environmental Health identification number is OC-050.

Temporal Representation:	Samples were collected from February 2004 through December 2007. 041854
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43450, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at Pier at Tyson Way

LOE ID:	30265
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	34
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 184 single samples were collected with 34 monthly geomeans calculated. None of the 34geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Oceanside Pier (at Tyson Street), San Diego, California. Department of Environmental Health identification number is OC-050.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43450, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at Pier at Tyson Way

LOE ID:	30266

Pollutant:	Enterococcus	041855
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	34	
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 184 single samples were collected with 34 monthly geomeans calculated. None of the 34 geomeans exceeded the geomean water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml.	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Oceanside Pier (at Tyson Street), San Diego, California. Department of Environmental Health identification number is OC-050.	
Temporal Representation:	Samples were collected from January 2004 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43450, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at Pier at Tyson Way

LOE ID:	30267
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	17
Number of Exceedances:	6
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from February 2004 through December 2007. A total of 184 single samples were collected with 17 samples correlating with a storm event. Six of the 17 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program,

	2007. AB 411 monitoring data 1999 to 2007 041856
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005). Comparisons are also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Oceanside Pier (at Tyson Street), San Diego, California. Department of Environmental Health identification number is OC-050.
Temporal Representation:	Samples were collected from February 2004 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43450, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at Pier at Tyson Way

LOE ID:	30650
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	167
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 184 single samples were collected of which 167 are dry weather (AB411) samples with zero samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental

Protection Agency 041857

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Oceanside Pier (at Tyson Street), San Diego, California. Department of Environmental Health identification number is OC-050.
Temporal Representation: Samples were collected from January 2004 through December 2007.
Environmental Conditions:
QAPP Information: Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s): County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43450, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at Pier at Tyson Way

LOE ID: 30263

Pollutant: Enterococcus
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 184
Number of Exceedances: 5

Data and Information Type: PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality: Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 184 single samples were collected with five samples exceeding the single sample water quality objective.
Data Reference: Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference: Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Oceanside Pier (at Tyson Street), San Diego, California. Department of Environmental Health identification number is OC-050.
Temporal Representation: Samples were collected from January 2004 through December 2007.
Environmental Conditions:
QAPP Information: Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s): County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43450, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at Pier at Tyson Way

LOE ID: 30264

Pollutant:	Enterococcus	041858
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	17	
Number of Exceedances:	5	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from February 2004 through December 2007. A total of 184 single samples were collected with 17 samples correlating with a storm event. Five of the 17 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.	
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005). Comparisons are also made for days with matching bacteria and storm event data. A storm event is defined as 0.2 inches of rainfall within a 72 hour period.	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Oceanside Pier (at Tyson Street), San Diego, California. Department of Environmental Health identification number is OC-050.	
Temporal Representation:	Samples were collected from February 2004 through December 2007.	
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43450, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at Pier at Tyson Way

LOE ID:	30258
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation	041859
Number of Samples:	184	
Number of Exceedances:	2	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 184 single samples were collected with two samples exceeding the single sample water quality objective.	
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Oceanside Pier (at Tyson Street), San Diego, California. Department of Environmental Health identification number is OC-050.	
Temporal Representation:	Samples were collected from January 2004 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43450, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at Pier at Tyson Way

LOE ID:	30268
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	184
Number of Exceedances:	9
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 184 single samples were collected with nine samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005). Comparisons were also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period

Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Oceanside Pier (at Tyson Street), San Diego, California. Department of Environmental Health identification number is OC-050.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43450, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at Pier at Tyson Way

LOE ID:	30856
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	167
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 184 single samples were collected of which 167 are dry weather (AB411) samples and none of those exceeded the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Oceanside Pier (at Tyson Street), San Diego, California. Department of Environmental Health identification number is OC-050.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43450, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at Pier at Tyson Way 041861

LOE ID:	30269
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	44
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 184 single samples were collected with 44 monthly geomeans calculated. None of the geomeans exceeded the water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Oceanside Pier (at Tyson Street), San Diego, California. Department of Environmental Health identification number is OC-050.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43450, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Luis Rey HU, at Pier at Tyson Way

LOE ID:	77670
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	130
Number of Exceedances:	8
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Eight of the 130 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, San Luis Rey HU, at Pier at Surfrider Way.
Temporal Representation:	The samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Scripps HA, at Childrens Pool
Water Body ID: CAC906300002009062611181 3
Water Body Type: Coastal & Bay Shoreline

DECISION ID 43824 **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Childrens Pool

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not Delist from 303(d) list (being addressed with USEPA approved TMDL)**
Last Listing Cycle's Final Listing Decision:	Do Not Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
TMDL Name:	Bacteria Impaired Waters I (creeks and beach shorelines)
TMDL Project Code:	169
Date TMDL Approved by USEPA:	06/22/2011
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for removal from the section 303(d) list under section 4.3 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Ten lines of evidence are available in the administrative record to assess this pollutant. Eighty-three of 106 samples exceed the Shellefish Harvesting water quality objective for Total Coliform. Two out of 106 samples exceeded the contact recreation single sample maximum evaluation guideline for total Coliform. Eleven out of 35 monthly geomeans exceeded the contact recreation evaluation guideline for Total Coliform. Fifty-Five out of 106 samples exceeded the contact recreation single sample maximum objective for Fecal Coiliform. Four out of 34 monthly geomeans exceeded the contact recreation objective for fecal coliform. Four out of 106 samples exceeded the contact recreation single sample maximum and five out of 34 monthly geomeans exceeded the objective for enterococcus.

This water body segment is identified as an AB411 beach and data collected during the time frame of April 1st to October 31st (dry weather) is assessed using a four percent exceedance percentage (section 4.3 of Listing Policy). There are fhree additional lines of evidence for dry weather single sample. Two of 100 samples exceeded the recreational use single sample criteria. Fifty-Two out of 100 samples exceeded the contact recreation objective for fecal coliform and six out of 26 dry month geomeans exceeded the contact recreation objective for enterococcus.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the section 303(d) list.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Eighty-three of 106 samples exceed the Shellefish Harvesting water quality objective for Total Coliform. Two out of 106 samples exceeded the contact recreation single sample maximum evaluation guideline for total Coliform. Eleven out of 35 monthly geomeans exceeded the contact recreation evaluation guideline for Total Coliform. Fifty-Five out of 106 samples exceeded the contact recreation single sample maximum objective for Fecal Coiliform. Four out of 34 monthly geomeans exceeded the contact recreation objective for fecal coliform. Four out of 106 samples exceeded the contact recreation single sample maximum and five out of 34 monthly geomeans exceeded the objective for enterococcus and this exceeds the allowable frequency listed in Table 4.2 of the Listing Policy.

4. There are fhree additional lines of evidence for dry weather single sample. Two of 100 samples exceeded the recreational use single sample criteria. Fifty-Two out of 100 samples exceeded the contact recreation objective for fecal coliform and six out of 26 dry month geomeans exceeded the contact recreation objective for enterococcus, and this does not exceed the allowable limit listed in Table 4.2 (at a four percent exceedance percentage Â– AB411) of the Listing Policy.
5. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 43824, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Childrens Pool

LOE ID:	30337
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Water Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006. For the 2008 assessment , the 2006 listed coastline 'Pacific Ocean Shoreline, Scripps HA' was split into smaller segments and each represents an area near the sampling location of the data being assessed. This segment 'Pacific Ocean Shoreline, Scripps HA, at Childrens Pool' is one of the sampling locations. This LOE is a copy of the 2006 listing placeholder LOE for Pacific Ocean Shoreline, Scripps HA and is considered by the Regional Board to be applicable to this more specific segment formed from the split.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	
Temporal Representation:	
Environmental Conditions:	
QAPP Information:	Unspecified
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43824, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Childrens Pool

LOE ID:	30860
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water

Matrix:	Water	041865
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	100	
Number of Exceedances:	2	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2003. A total of 106 single samples were collected of which 100 are dry weather (AB411) samples with two of those samples exceeding the single sample water quality objective.	
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Children's Pool, La Jolla, California. Station identification number is EH-310.	
Temporal Representation:	Samples were collected from April 1999 through October 2003.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43824, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Childrens Pool

LOE ID:	30708
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2003. A total of 106 single samples were collected with six samples correlated with a storm event. None of the six samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program,

	2007. AB 411 monitoring data 1999 to 2007	041866

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Childrens Pool, La Jolla, California. Station identification number is EH-310.
Temporal Representation:	Samples were collected from April 1999 through October 2003.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43824, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Childrens Pool

LOE ID:	30709
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	106
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2003. A total of 106 single samples were collected with two samples exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Children's Pool, La Jolla, California. Station identification number is EH-310.
Temporal Representation:	Samples were collected from April 1999 through October 2003.
Environmental Conditions:	

QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43824, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Childrens Pool

LOE ID:	30710
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	35
Number of Exceedances:	11
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2003. Eleven of 35 monthly geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Children's Pool, La Jolla, California. Station identification number is EH-310.
Temporal Representation:	Samples were collected from April 1999 through October 2003.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43824, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Childrens Pool

LOE ID:	30711
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	6
Number of Exceedances:	1

Data and Information Type:	PWS pathogen monitoring (ambient water) 041868
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2003. A total of 150 six samples were correlated with a storm event. One of the six samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Childrens Pool, La Jolla, California. Station identification number is EH-310.
Temporal Representation:	Samples were collected from April 1999 through October 2003.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43824, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Childrens Pool

LOE ID:	30706
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	34
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2003 . Four of the 34 monthly geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; 041869
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Children's Pool, La Jolla, California. Station identification number is EH-310.
Temporal Representation:	Samples were collected from April 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43824, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Childrens Pool

LOE ID:	30701
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	106
Number of Exceedances:	83
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2003. A total of 106 single samples were collected with 83 exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Childrens Pool, La Jolla, California. Station identification number is EH-310.
Temporal Representation:	Samples were collected from April 1999 through October 2003.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43824, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Childrens Pool

LOE ID:	30702
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	6
Number of Exceedances:	5
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2003. A total of 106 single samples were collected with six samples correlated with a storm event. Five of the six storm samples exceeded the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Children's Pool, La Jolla, California. Station identification number is EH-310.
Temporal Representation:	Samples were collected from April 1999 through October 2003.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43824, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Childrens Pool

LOE ID:	30753
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	100
Number of Exceedances:	52
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2003 and there were 106 total samples of which 100 are dry weather (AB411) samples. Fifty-two of the dry weatehr samples exceeded the single sample water quality objective.

Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Children's Pool, La Jolla, California. Station identification number is EH-310.
Temporal Representation:	Samples were collected from April 1999 through October 2003.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43824, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Childrens Pool

LOE ID:	30195
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	2555
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there was a year round beach advisory for this section of shoreline due to the presence of marine mammals. When a bacteriological sample exceeds water quality standards, signs are posted indicating that an advisory for waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 - December 2007. Data used was the number of days the beach was advisories were issued when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards

	as set forth in 7957 and 7958 above are met.	041872
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960	
Evaluation Guideline:		
Guideline Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Spatial Representation:	Samples were collected from Children's Pool, La Jolla, California.	
Temporal Representation:	The beach advisories covers the time frame of January 2001 to December 2007.	
Environmental Conditions:		
QAPP Information:	Samples were collected in compliance with County of San Diego's Quality Assessment/Quality Control document	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43824, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Childrens Pool

LOE ID:	31341
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	26
Number of Exceedances:	6
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through OCtober 2003. A total of 71 dry month (April through October) single samples were collected with 26 dry month geomeans calculated. Six of the 26 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Children's Pool, La Jolla, California. Station identification number is EH-310.
Temporal Representation:	Samples were collected from April 1999 through October 2003.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43824, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Childrens Pool

LOE ID:	30703	041873

Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	106
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2003. A total of 106 single samples were collected with four samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Childrens's Pool, La Jolla, California. Station identification number is EH-310.
Temporal Representation:	Samples were collected from April 1999 through December 2003.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43824, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Childrens Pool

LOE ID:	30704
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	34
Number of Exceedances:	5
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2003. Five of 34 monthly geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Children's Pool, La Jolla, California. Station identification number is EH-310.
Temporal Representation:	Samples were collected from April 1999 through October 2003.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43824, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Childrens Pool

LOE ID:	30705
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	106
Number of Exceedances:	55
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2003. Fifty-five of 106 samples exceeded the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Children's Pool, La Jolla, California. Station identification number is EH-310.
Temporal Representation:	Samples were collected from April 1999 through October 2003.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43824, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Childrens Pool

LOE ID:	30707
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	6
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2003. Three of the six storm samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Childrens Pool, La Jolla, California. Station identification number is EH-310.
Temporal Representation:	Samples were collected from April 1999 through October 2003.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Mission Bay at Dana Landing
Water Body ID: CAB9075200020090712235307
Water Body Type: Bay & Harbor

DECISION ID 44114 **Region 9**
Mission Bay at Dana Landing

Pollutant: Copper
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Original
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. The sample did not exceed the water quality objective for copper.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of one sample exceeded the copper water quality objective and this sample size is insufficient to determine with the power and confidence of the Listing Policy if standards are not met. A minimum of two samples is needed for application of table 3.1
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 44114, Copper **Region 9**
Mission Bay at Dana Landing

LOE ID: 30278

Pollutant: Copper
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Dissolved

Beneficial Use: Estuarine Habitat

Aquatic Life Use:	Marine Habitat	041877
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)	
Data Used to Assess Water Quality:	Water column samples were collected for the Regional Harbor Monitoring Program in Mission Bay. Three samples were collected at station M2. The mean of the three samples does not exceed the acute or chronic water quality objective.	
Data Reference:	Extent and Magnitude of Copper Contamination in Marinas of the San Diego Region, California. Technical Report 483	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the CTR, the dissolved copper chronic criterion is 3.1 ppb and the acute criterion is 4.8 ppb.	
Objective/Criterion Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	One station (M2) was sampled in Dana Landing Basin in Mission Bay at upper, middle, and lower levels within the water column.	
Temporal Representation:	Samples were collected on August 15, 2005.	
Environmental Conditions:		
QAPP Information:	Samples were collected in accorance with SCCWRP's Quality Assurance Project Plan for Marina Copper Monitoring Study.	
QAPP Information Reference(s):		

DECISION ID	43985	Region 9
Mission Bay at Dana Landing		

Pollutant:	**Toxicity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the section 303(d) list under section 3.6 of the Listing Policy.

One line of evidence are available in the administrative record to assess this pollutant. The sample did not exceed the water quality objective for toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of one sample exceeded the toxicity water quality objective and this sample size is insufficient to determine with the power and confidence of the Listing Policy if standards are not met. A minimum of two samples is needed for application of table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: 041878

Line of Evidence (LOE) for Decision ID 43985, Toxicity **Region 9**

Mission Bay at Dana Landing

LOE ID:	30283
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Estuarine Habitat
Aquatic Life Use:	Marine Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	A toxicity test was conducted using the upper water column sample on the mussel Mytilus galloprovincialis at one location for the Extent and Magnitude of Copper Contamination Study. Toxicity was not observed.
Data Reference:	Extent and Magnitude of Copper Contamination in Marinas of the San Diego Region, California. Technical Report 483
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan on toxicity, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The threshold for toxicity was less than 80% development relative to the control test species (Schiff et al, 2006)
Guideline Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA Extent and Magnitude of Copper Contamination in Marinas of the San Diego Region, California. Technical Report 483
Spatial Representation:	One station was sampled in Dana Landing Basin (M2) in Mission Bay. Water samples were collected at upper, middle and lower levels within the water column at each station however toxicity was only conducted on the upper samples.
Temporal Representation:	Samples were collected on August 15, 2005.
Environmental Conditions:	
QAPP Information:	Quality assurance conducted according to the Quality Assurance Project Plan for Marina Copper Monitoring Study.
QAPP Information Reference(s):	Quality Assurance Project Plan, Marina Copper Monitoring Study. SWRCB Agreement No. 04-236-190-0. A

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Mission Bay at Quivira Basin
Water Body ID: CAB907520002009071223394 5
Water Body Type: Bay & Harbor

DECISION ID 43506 **Region 9**
Mission Bay at Quivira Basin

Pollutant: Toxicity
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Original
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the section 303(d) list under section 3.6 of the Listing Policy.

One line of evidence is available in the administrative record to assess this pollutant. The sample did not exceed the water quality objective for toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of one sample exceeded the toxicity water quality objective and this sample size is insufficient to determine with the power and confidence of the Listing Policy if standards are not met. A minimum of two samples is needed for application of table 3.1.
4. Pursuant to SECTION 3.11of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 43506, Toxicity **Region 9**
Mission Bay at Quivira Basin

LOE ID: 30282

Pollutant: Toxicity
LOE Subgroup: Toxicity
Matrix: Water
Fraction: None

Beneficial Use: Estuarine Habitat
Aquatic Life Use: Marine Habitat

Number of Samples: 1
Number of Exceedances: 0

Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	A toxicity test was conducted using the upper water column sample on the mussel Mytilus galloprovincialis at three locations for the Extent and Magnitude of Copper Contamination Study. Toxicity was not observed.
Data Reference:	Extent and Magnitude of Copper Contamination in Marinas of the San Diego Region, California. Technical Report 483
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan on toxicity, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The threshold for toxicity was less than 80% development relative to the control test species (Schiff et al, 2006).
Guideline Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA Extent and Magnitude of Copper Contamination in Marinas of the San Diego Region, California. Technical Report 483
Spatial Representation:	One station was sampled in Quivera Basin (M1) in Mission Bay. Water samples were collected at upper, middle and lower levels within the water column at each station however toxicity was only conducted on the upper samples.
Temporal Representation:	Samples were collected on August 15, 2005.
Environmental Conditions:	
QAPP Information:	Quality assurance conducted according to the Quality Assurance Project Plan for Marina Copper Monitoring Study.
QAPP Information Reference(s):	

DECISION ID	44024	Region 9
Mission Bay at Quivira Basin		

Pollutant:	**Copper**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown | Unknown Nonpoint Source | Unknown Point Source
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Four of the samples exceed the water quality objective for copper.

Based on the readily available data and information, the weight of evidence indicates that there is

sufficient justification in favor of placing this water segment-pollutant combination on the 1998 Section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. All four samples exceed the copper water quality objective and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 44024, Copper **Region 9**

Mission Bay at Quivira Basin

LOE ID:	30279
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Estuarine Habitat
Aquatic Life Use:	Marine Habitat
Number of Samples:	3
Number of Exceedances:	3
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Three water samples were collected in Quivera Basin of Mission Bay by the Regional Harbor Monitoring Program Pilot Project. Two of the three samples exceeded the acute criteria and all three exceeding the chronic criteria.
Data Reference:	Regional Harbor Monitoring Program Pilot Project 2005-06 Regional Harbor Monitoring Program Pilot Project 2006-07
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the CTR, the dissolved copper chronic criterion is 3.1 ppb and the acute criterion is 4.8 ppb.
Objective/Criterion Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	One station (M1M) was sampled in 2005 and two stations (M206M and M306M) were sampled in 2006 from Quivera Basin, Mission Bay.
Temporal Representation:	Samples were collected on August 15, 2005 and August 22, 2006.
Environmental Conditions:	
QAPP Information:	Quality assurance conducted according to the Quality Assurance Project Plan for San Diego Regional Harbor Monitoring Program Pilot Project.
QAPP Information Reference(s):	Quality Assurance Project Plan for San Diego Regional Harbor Monitoring Program Pilot Project.

Line of Evidence (LOE) for Decision ID 44024, Copper **Region 9**

Mission Bay at Quivira Basin

LOE ID:	30280
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Estuarine Habitat
Aquatic Life Use:	Marine Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	The mean of the three water column samples exceed the chronic water quality objective but not the acute water quality objective. The upper sample exceeds the CTR values for both acute and chronic objective. The mid sample exceeds only the chronic CTR value. The deep sample does not exceed either water quality objectives.
Data Reference:	Extent and Magnitude of Copper Contamination in Marinas of the San Diego Region, California. Technical Report 483
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the CTR, the dissolved copper chronic criterion is 3.1 ppb and the acute criterion is 4.8 ppb.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	One station (M1) was sampled in Quivera Basin of Mission Bay. Each station was sampled at upper, middle and lower levels within the water column to total three samples.
Temporal Representation:	The sampling occurred on August 15, 2005.
Environmental Conditions:	
QAPP Information:	Quality assurance conducted according to the Marina Copper Monitoring Study Quality Assurance Plan, June 2005.
QAPP Information Reference(s):	Quality Assurance Project Plan, Marina Copper Monitoring Study. SWRCB Agreement No. 04-236-190-0. A

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Mission Bay (area at Santa Barbara Cove)
Water Body ID: CAB9075100020090713000515
Water Body Type: Bay & Harbor

DECISION ID 44053 **Region 9**
Mission Bay (area at Santa Barbara Cove)

Pollutant: Copper
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Original
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 one line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. None of the samples exceed the water quality objective for copper.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. The lone sample did not exceed the copper water quality objective and this sample size is insufficient to determine with the power and confidence of the Listing Policy if standards are not met. A minimum of two samples is needed for application of table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 44053, Copper **Region 9**
Mission Bay (area at Santa Barbara Cove)

LOE ID: 30281

Pollutant: Copper
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Estuarine Habitat

Aquatic Life Use:	Marine Habitat	041884
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)	
Data Used to Assess Water Quality:	One station in Santa Barbara Cove in Mission Bay was sampled for dissolved copper. Each station was sampled at upper, middle, and lower levels within the water column to total three samples. The mean of the three water samples did not exceed the acute or chronic objective. None of the individual samples exceeded the water quality objectives.	
Data Reference:	Extent and Magnitude of Copper Contamination in Marinas of the San Diego Region, California. Technical Report 483	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the CTR, the dissolved copper chronic criterion is 3.1 ppb and the acute criterion is 4.8 ppb.	
Objective/Criterion Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	One station (M3) was sampled in Santa Barbara Cove Basin, Mission Bay.	
Temporal Representation:	The sample was collected on August 15, 2005.	
Environmental Conditions:		
QAPP Information:	Quality assurance conducted according to the Quality Assurance Project Plan for the Marina Copper Monitoring Study.	
QAPP Information Reference(s):	Quality Assurance Project Plan, Marina Copper Monitoring Study. SWRCB Agreement No. 04-236-190-0. A	

DECISION ID 43461 Region 9

Mission Bay (area at Santa Barbara Cove)

Pollutant:	**Toxicity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the section 303(d) list under section 3.6 of the Listing Policy.

One lines of evidence is available in the administrative record to assess this pollutant. None of the samples exceed the water quality objective for toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of one sample exceeded the toxicity water quality objective and this sample size is insufficient to determine with the power and confidence of the Listing Policy if standards are not met. A minimum of two samples is needed for application of table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 43461, Toxicity **Region 9**

Mission Bay (area at Santa Barbara Cove)

LOE ID:	30284
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Estuarine Habitat
Aquatic Life Use:	Marine Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	A toxicity test was conducted using the upper water column sample on the mussel Mytilus galloprovincialis at one location for the Extent and Magnitude of Copper Contamination Study. Toxicity was not observed.
Data Reference:	Extent and Magnitude of Copper Contamination in Marinas of the San Diego Region, California. Technical Report 483
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan on toxicity, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The threshold for toxicity was less than 80% development relative to the control test species (Schiff et al, 2006)
Guideline Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA Extent and Magnitude of Copper Contamination in Marinas of the San Diego Region, California. Technical Report 483
Spatial Representation:	One station was sampled in Santa Barbara Cove (M3) in Mission Bay. Water samples were collected at upper, middle and lower levels within the water column at each station however toxicity was only conducted on the upper samples.
Temporal Representation:	Samples were collected on August 15, 2005.
Environmental Conditions:	
QAPP Information:	Quality assurance conducted according to the Quality Assurance Project Plan for Marina Copper Monitoring Study.
QAPP Information Reference(s):	Quality Assurance Project Plan, Marina Copper Monitoring Study. SWRCB Agreement No. 04-236-190-0. A

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Dana Point HSA, at Aliso Beach at West Street
Water Body ID: CAC9011400020090725220259
Water Body Type: Coastal & Bay Shoreline

DECISION ID 44408 **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Aliso Beach at West Street

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Delist from 303(d) list (being addressed by USEPA approved TMDL)**
Last Listing Cycle's Final Listing Decision:	Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Reason for Delisting:	Applicable WQS attained; reason for recovery unspecified
TMDL Name:	Bacteria Impaired Waters I (creeks and beach shorelines)
TMDL Project Code:	169
Date TMDL Approved by USEPA:	06/22/2011
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal from the CWA section 303(d) List under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Thirteen lines of evidence are available in the administrative record to assess this pollutant. With the latest data, 2 of 186 geomean samples exceed the water quality objective for enterococcus for the protection of REC-1 beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, 2 of 186 geomean samples exceed the water quality objective for enterococcus for the protection of REC-1 beneficial use and this does not exceed the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be removed from the section 303(d) list because applicable water quality standards for the pollutant are not being exceeded.

Line of Evidence (LOE) for Decision ID 44408, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Aliso Beach at West Street

LOE ID:	74628
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	041887
Beneficial Use:	Water Contact Recreation	
Number of Samples:	138	
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	None of the 138 geomeans exceeded the enterococcus objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The geometric mean for enterococcus shall not exceed 35 MPN/100 mL. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected from Coastal Stormdrain at West Street (surfzone upcoast and surfzone downcoast).	
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.	
Environmental Conditions:		
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44408, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Aliso Beach at West Street

LOE ID:	30300
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Water Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006. For the 2008 assessment , the 2006 listed coastline 'Pacific Ocean Shoreline, Dana Point HSA' was split into smaller segments and each represents an area near the sampling location of the data being assessed. This segment 'Pacific Ocean Shoreline, Dana Point HSA, at Aliso Beach at West Street' is one of the sampling locations. This LOE is a copy of the 2006 listing placeholder LOE for Pacific Ocean Shoreline, Dana Point HSA and is considered by the Regional Board to be applicable to this more specific segment formed from the split.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Unspecified	041888
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:		
Temporal Representation:		
Environmental Conditions:		
QAPP Information:	Unspecified	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44408, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Aliso Beach at West Street

LOE ID:	74630
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	138
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	None of the 138 geomeans exceeded the fecal coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean for fecal coliform shall not exceed more than 200/100ml. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Coastal Stormdrain at West Street (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44408, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Aliso Beach at West Street

LOE ID:	74631
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation
Number of Samples:	149
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	None of the 149 samples exceeded the total coliform objective. For these stations, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample total coliform concentration shall not exceed more than 10000/100ml. Water Quality Control Plan for the San Diego Basin. Water Quality Control Plan for Ocean Waters.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Trafalgar Coastal Stormdrain at West Street (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44408, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Aliso Beach at West Street

LOE ID:	74632
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	138
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	None of the 138 samples exceeded the total coliform objective. For these stations, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean for total coliform shall not exceed more than 1000/100ml. Water Quality Control Plan for the San Diego Basin. Water Quality Control Plan for Ocean Waters.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	The samples were collected from Coastal Stormdrain at West Street (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44408, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Aliso Beach at West Street

LOE ID:	74627
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	149
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	None of the 149 samples exceeded the enterococcus objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample enterococcus concentration shall not exceed more than 104/100ml. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Coastal Stormdrain at West Street (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44408, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Aliso Beach at West Street

LOE ID:	30598
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of Orange from January 2004 through December 2007. From the five storm event samples, none exceeded the water quality objective for fecal coliform. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the station West St. Dana Point HSA.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. Bacteria monitoring data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44408, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Aliso Beach at West Street

LOE ID:	30599
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	198
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of Orange from January 2004 through December 2007. From the 198 samples, none exceeded the water quality objective for water contact recreation.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the station West St in the Dana Point HSA.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44408, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Aliso Beach at West Street

LOE ID:	30600
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of Orange from January 2004 through December 2007. None of the five storm samples exceeded the water contact recreation single sample maximum water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the station West St. in the Dana Point HSA.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. Bacteria monitoring data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm

	water runoff because much of the wet season for Southern California occurs from November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44408, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Aliso Beach at West Street

LOE ID:	30591
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	198
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of Orange from January 2004 through December 2007. Two of 198 samples exceeded the single sample maximum for shellfish harvesting.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan, the median total coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the station West St, in the Dana Point HSA.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44408, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Aliso Beach at West Street

LOE ID:	30596
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	198

Number of Exceedances:	0	041894

Data and Information Type: PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality: Shoreline beach monitoring data was collected by the County of Orange from January 2004 through December 2007. From the 198 samples, none exceeded the water quality objective for fecal coliform.
Data Reference: Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml;
Objective/Criterion Reference: Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected from the station West St, Dana Point HSA.
Temporal Representation: Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:
QAPP Information: Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s): County of Orange, Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44408, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Aliso Beach at West Street

LOE ID: 30597

Pollutant: Fecal Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 48
Number of Exceedances: 0

Data and Information Type: PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality: Shoreline beach monitoring data was collected by the County of Orange from January 2004 through December 2007. None of the 48 monthly geomeans exceeded the geomean water quality objective.
Data Reference: Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: Geomean: Fecal coliform density shall not exceed 200 per 100ml.
Objective/Criterion Reference: Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:
Guideline Reference:

Spatial Representation:	Samples were collected from the station West St. in the Dana Point HSA. 041895
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44408, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Aliso Beach at West Street

LOE ID:	30592
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of Orange from January 2004 through December 2007. Of the five storm event samples, none exceeded the single sample maximum objective for shellfish harvesting. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan, the median total coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the station West St, in the Dana Point HSA.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. Bacteria monitoring data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44408, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Aliso Beach at West Street

LOE ID:	30605	041896

Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	1460
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2004 to December 2007, there were two beach postings days for this section of shoreline. When a bacteriological sample exceeds water quality standards, signs are posted indicating that waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of Orange in their Annual Ocean and Bay Water Quality Report, March 2007. The reporting period was from January 2000 - December 2007. Data used was the number of days the beach was posting when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	County of Orange. March 2007. Annual Ocean and Bay Water Quality Report, 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Bacteriological monitoring samples were collected at West St. Aliso Beach.
Temporal Representation:	The beach posting covers the time frame of January 2004 -December 2007.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of Orange's Quality Assessment/Quality Control document (County of Orange, 2004).
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44408, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Aliso Beach at West Street

LOE ID:	30687
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	193
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of Orange from January 2004

	through December 2007. There is 198 samples, of which 193 are dry weather (AB411) samples and none exceed the water quality objective for fecal coliform.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the station West St, Dana Point HSA.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44408, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Aliso Beach at West Street

LOE ID:	30801
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	193
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of Orange from January 2004 through December 2007. There are a total of 198 samples of which 193 are dry weather (AB411) samples and none exceeded the water quality objective for water contact recreation.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the station West St in the Dana Point HSA.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	

QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44408, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Aliso Beach at West Street

LOE ID:	30601
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	48
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline monitoring data was collected by the County of Orange from January 2004 through December 2007. None of the geomeans exceeded the geomean water quality objective for total coliform.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the station West St.in the Dana Point HSA.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44408, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Aliso Beach at West Street

LOE ID:	30593
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	198
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)

Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of Orange from January 2004 through December 2007. Four of 198 samples exceeded the single sample maximum objective for enterococcus.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the station West St. Dana Point HSA.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44408, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Aliso Beach at West Street

LOE ID:	30594
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	5
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of Orange from January 2004 through December 2007. Of the five storm event samples, two exceeded the single sample maximum for enterococcus. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected from the station West St. in the Dana Point HSA.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. Bacteria monitoring data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44408, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Aliso Beach at West Street

LOE ID:	30595
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	48
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of Orange from January 2004 through December 2007. Two of 48 monthly geomeans exceeded the water contact objective for enterococcus.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the station West St. Dana Point HSA.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44408, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Aliso Beach at West Street

LOE ID:	74629

Pollutant:	Fecal Coliform	041901
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	149	
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	None of the 149 samples exceeded the fecal coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The single sample fecal coliform concentration shall not exceed more than 400/100ml. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected from Coastal Stormdrain at West Street (surfzone upcoast and surfzone downcoast).	
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.	
Environmental Conditions:		
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.	
QAPP Information Reference(s):		

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Beach at Cleo Street
Water Body ID: CAC9011200020090725164440
Water Body Type: Coastal & Bay Shoreline

DECISION ID 44563 **Region 9**
Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Beach at Cleo Street

Pollutant: Indicator Bacteria
Final Listing Decision: Delist from 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Delist from 303(d) list (TMDL required list)(2012)
Revision Status Revised
Reason for Delisting: Applicable WQS attained; reason for recovery unspecified
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal from the CWA section 303(d) List under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Eight lines of evidence are available in the administrative record to assess this pollutant. Including the latest data, six of the 186 samples exceeded the water quality objective for enterococcus of a geomean of 35/100 ml in a 30-day period for the protection of REC-1.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Including the latest data, six of the 186 samples exceeded the water quality objective for enterococcus of a geomean of 35/100 ml in a 30-day period for the protection of REC-1 and this does not exceed the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be removed from the section 303(d) list because applicable water quality standards for the pollutant are not being exceeded.

Line of Evidence (LOE) for Decision ID 44563, Indicator Bacteria **Region 9**
Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Beach at Cleo Street

LOE ID: 74973

Pollutant: Fecal Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples:	138	041903
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	None of the 138 geomeans exceeded the fecal coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The geometric mean for fecal coliform shall not exceed more than 200/100ml. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected from Cleo St. Stormdrain (surfzone upcoast and surfzone downcoast).	
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.	
Environmental Conditions:		
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44563, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Beach at Cleo Street

LOE ID:	30581
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	5
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2004 through December 2007. There were 196 individual samples collected with 5 samples correlated with storm events. Of the five samples, one exceeded single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan, the median total coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:	041904
Guideline Reference:	
Spatial Representation:	Samples were collected from Cleo St, in the Laguna HSA.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44563, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Beach at Cleo Street

LOE ID:	74952
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	138
Number of Exceedances:	4
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Four of the 138 geomeans exceeded the enterococcus objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean for enterococcus shall not exceed 35 MPN/100 mL. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Cleo St. Stormdrain (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44563, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Beach at Cleo Street

LOE ID:	74951

Pollutant:	Enterococcus	041905
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	149	
Number of Exceedances:	6	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Six of the 149 samples exceeded the enterococcus objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The single sample enterococcus concentration shall not exceed more than 104/100ml. Water Quality Control Plan for Ocean Waters of California. Region 9 Basion Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected from site CLEO, Cleo St. Stormdrain at Cleo Street (surzone upcoast and surzone downcoast).	
Temporal Representation:	The samples were collected once a week from July 2006 to June 2009.	
Environmental Conditions:		
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44563, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Beach at Cleo Street

LOE ID:	30580
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	196
Number of Exceedances:	8
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2007 through December 2007. There were 196 individual samples collected with 8 exceeding the single sample water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan, the median total coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005.

	Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Cleo St, in the Laguna HSA.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44563, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Beach at Cleo Street

LOE ID:	30582
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	196
Number of Exceedances:	7
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2004 through December 2007. A total of 196 single samples were collected with seven exceeding the single sample water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Cleo St. in the Laguna HSA.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44563, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Beach at Cleo Street

LOE ID:	30585
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation
Number of Samples:	196
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2004 through December 2007. There were 196 individual samples with none exceeding the single sample water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Cleo St, in the Laguna HSA.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44563, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Beach at Cleo Street

LOE ID:	30587
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2004 through December 2007. Five were samples correlated with storm event with no samples exceeding the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Bluebird Canyon, station id S15, in the Laguna HSA. Lat/Long: 33.52963/-117.77359.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44563, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Beach at Cleo Street

LOE ID:	30303
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Water Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006. For the 2008 assessment , the 2006 listed coastline 'Pacific Ocean Shoreline, Laguna Beach HSA' was split into smaller segments and each represents an area near the sampling location of the data being assessed. This segment 'Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Beach at Cleo Street' is one of the sampling locations. This LOE is a copy of the 2006 listing placeholder LOE for Pacific Ocean Shoreline, Laguna Beach HSA and is considered by the Regional Board to be applicable to this more specific segment formed from the split.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Unspecified
Temporal Representation:	Unspecified
Environmental Conditions:	Unspecified
QAPP Information:	Unspecified
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44563, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Beach at Cleo Street 041909

LOE ID:	30586
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	48
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2004 through December 2007. Forty-eight monthly geomeans calculated with none exceeding the geomean water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Cleo St. in the Laguna HSA.
Temporal Representation:	Samples were collected weekly from January 2007 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange, Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44563, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Beach at Cleo Street

LOE ID:	30590
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2004 through December 2007. Five samples were correlated with storm events with none exceeding the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional

	Temperature and Precipitation Listings by Station	041910

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml;
Objective/Criterion Reference: Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected from Cleo St. in the Laguna HSA.
Temporal Representation: Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions: Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.

Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.

QAPP Information: Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s): County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44563, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Beach at Cleo Street

LOE ID: 30589

Pollutant: Fecal Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 48
Number of Exceedances: 0

Data and Information Type: PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality: Beach monitoring data was collected by the County of Orange from January 2004 through December 2007. A total of 48 monthly goemeans were calculated. None exceeded the geomean water quality objective.
Data Reference: Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference: Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected from Cleo St. in the Laguna HSA.
Temporal Representation: Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:
QAPP Information: Quality control for the bacteria analysis portion of this study was conducted in accordance

	with the County of Orange Quality Assessment/Quality Control document.041911
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44563, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Beach at Cleo Street

LOE ID:	30588
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	196
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2004 through December 2007. A total of 196 single samples were collected with one sample exceeding the single sample water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Cleo St in Laguna Beach HSA.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44563, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Beach at Cleo Street

LOE ID:	74974
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	149
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 149 samples exceeded the total coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.

Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009. 041912
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample total coliform concentration shall not exceed more than 10000/100ml. Water Quality Control Plan for Ocean Waters of California. Region 9 Basion Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from site CLEO, Cleo St. Stormdrain at Cleo Street (surzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to June 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44563, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Beach at Cleo Street

LOE ID:	30584
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	48
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2004 through December 2007. Of the 48 geomeans, two exceeded the geomean water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Cleo St. in the Laguna HSA. Lat/Long: 33.52963/-117.77359.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44563, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Beach at Cleo Street

LOE ID:	30583
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	5
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2004 through December 2007. Five samples were correlated with storm events. One of the five samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Cleo St. in the Laguna HSA.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44563, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Beach at Cleo Street

LOE ID:	74975
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	138
Number of Exceedances:	0

Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	None of the 138 samples exceeded the total coliform objective. For these stations, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean for total coliform shall not exceed more than 1000/100ml. Water Quality Control Plan for the San Diego Basin. Water Quality Control Plan for Ocean Waters.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Cleo St. Stormdrain (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44563, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Beach at Cleo Street

LOE ID:	30808
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	191
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2004 through December 2007. There were 196 individual samples of which 191 are dry weather (AB411) samples with none exceeding the single sample water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Cleo St, in the Laguna HSA.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance

	with the County of Orange Quality Assessment/Quality Control document.041915
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44563, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Beach at Cleo Street

LOE ID:	30694
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	191
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 2004 through December 2007. A total of 196 single samples were collected of which 191 are dry weather (AB411) samples with zero samples exceeding the single sample water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Cleo St in Laguna Beach HSA.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44563, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Beach at Cleo Street

LOE ID:	74953
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	149
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 149 samples exceeded the fecal coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.

Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009. 041916
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample fecal coliform concentration shall not exceed more than 400/100ml. Water Quality Control Plan for Ocean Waters of California. Region 9 Basion Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from site CLEO, Cleo St. Stormdrain at Cleo Street (surzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to June 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, San Joaquin Hills HSA, at Crescent Bay Beach
Water Body ID: CAC9011100020091022115657
Water Body Type: Coastal & Bay Shoreline

DECISION ID 44323 **Region 9**
Pacific Ocean Shoreline, San Joaquin Hills HSA, at Crescent Bay Beach

Pollutant: Indicator Bacteria
Final Listing Decision: Delist from 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Delist from 303(d) list (TMDL required list)(2012)
Revision Status Revised
Reason for Delisting: Applicable WQS attained; reason for recovery unspecified
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for removal from the CWA section 303(d) List under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Eleven lines of evidence are available in the administrative record to assess this pollutant. With the latest data, zero of 142 geomean samples exceed the water quality objective for enterococcus for the protection of REC-1.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, zero of 142 geomean samples exceed the water quality objective for enterococcus for the protection of REC-1 and this does not exceed the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be removed from the section 303(d) list because applicable water quality standards for the pollutant are not being exceeded.

Line of Evidence (LOE) for Decision ID 44323, Indicator Bacteria **Region 9**
Pacific Ocean Shoreline, San Joaquin Hills HSA, at Crescent Bay Beach

LOE ID: 30427

Pollutant: Enterococcus
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples:	106	041918
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. A total of 436 single samples were collected and 106 monthly geomeans calculated. None of the 106 geomeans exceeded the geomean water quality objective.	
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Crescent Bay Beach, station id OLB 05, in the San Joaquin HSA. Lat/Long: 33.54658/-117.80147	
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 44323, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Joaquin Hills HSA, at Crescent Bay Beach

LOE ID:	75163
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	36
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 36 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Crescent Bay Beach site.
Temporal Representation:	Samples were collected from January 2008 to October 2009.
Environmental Conditions:	

QAPP Information:	The samples were collected for the beach watch program.	041919
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44323, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Joaquin Hills HSA, at Crescent Bay Beach

LOE ID:	30441
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	448
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. A total of 448 single samples were collected and none exceeded the single sample water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Crescent Bay Beach, station id OLB 05, in the San Joaquin HSA. Lat/Long: 33.54658/-117.80147
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44323, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Joaquin Hills HSA, at Crescent Bay Beach

LOE ID:	30444
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	49
Number of Exceedances:	0

Data and Information Type:	PWS pathogen monitoring (ambient water) 041920
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. A total of 448 single samples were collected. Between March 2002 and December 2007, 49 samples were correlated with storm events. None of the 49 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Crescent Bay Beach, station id OLB 05, in the San Joaquin HSA. Lat/Long: 33.54658/-117.80147
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44323, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Joaquin Hills HSA, at Crescent Bay Beach

LOE ID:	30445
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	108
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. A total of 448 single samples were collected and 108 monthly geomeans calculated. None of the geomeans exceeded the geomean water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report

SWAMP Data:	Non-SWAMP	041921
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Crescent Bay Beach, station id OLB 05, in the San Joaquin HSA. Lat/Long: 33.54658/-117.80147	
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 44323, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Joaquin Hills HSA, at Crescent Bay Beach

LOE ID:	31104
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	56
Number of Exceedances:	5
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Orange County collected Beach monitoring data within the time period from January 1999 through December 2006. A total of 56 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 56 geomeans five exceeded the geomean water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The 30-day Geometric Mean for total coliform density shall not exceed 1000 per 100 ml
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Crescent Bay Beach, station id OLB 05, in the San Joaquin HSA. Lat/Long: 33.54658/-117.80147
Temporal Representation:	Samples were collected at least once a week within the time period from January 1999 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period.
Environmental Conditions:	

QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44323, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Joaquin Hills HSA, at Crescent Bay Beach

LOE ID:	31105
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	56
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Orange County collected Beach monitoring data within the time period from January 1999 through December 2006. A total of 56 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 56 geomeans zero exceeded the geomean water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The 30-day Geometric Mean for fecal coliform density shall not exceed 200 per 100 ml
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Crescent Bay Beach, station id OLB 05, in the San Joaquin HSA. Lat/Long: 33.54658/-117.80147
Temporal Representation:	Samples were collected at least once a week within the time period from January 1999 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44323, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Joaquin Hills HSA, at Crescent Bay Beach

LOE ID:	31106
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	56	041923
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Orange County collected Beach monitoring data within the time period from January 1999 through December 2006. A total of 56 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 56 geomeans zero exceeded the geomean water quality objective.	
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The 30-day Geometric mean for enterococcus density shall not exceed 35 per 100 ml	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005, Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Crescent Bay Beach, station id OLB 05, in the San Joaquin HSA. Lat/Long: 33.54658/-117.80147	
Temporal Representation:	Samples were collected at least once a week within the time period from January 1999 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange, Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 44323, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Joaquin Hills HSA, at Crescent Bay Beach

LOE ID:	30422
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	49
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. A total of 448 single samples were collected. Between March 2002 and December 2007, 49 samples were correlated with a storm event. Of those 49 samples, two exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	From the Ocean Plan, the median total coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Crescent Bay Beach, station id OLB 05, in the San Joaquin HSA. Lat/Long: 33.54658/-117.80147
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44323, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Joaquin Hills HSA, at Crescent Bay Beach

LOE ID:	30420
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Water Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006. For the 2008 assessment , the 2006 listed coastline 'Pacific Ocean Shoreline, San Joaquin Hills HSA' was split into smaller segments and each represents an area near the sampling location of the data being assessed. This segment 'Pacific Ocean Shoreline, San Joaquin Hills HSA, at Heisler Park North' is one of the sampling locations. This LOE is a copy of the 2006 listing placeholder LOE for Pacific Ocean Shoreline, San Joaquin Hills HSA and is considered by the Regional Board to be applicable to this more specific segment formed from the split.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	

Temporal Representation:	041925
Environmental Conditions:	
QAPP Information:	Unspecified
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44323, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Joaquin Hills HSA, at Crescent Bay Beach

LOE ID:	30436
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	49
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. A total of 441 single samples were collected. Between March 2002 and December 2007, 49 samples were correlated with a storm event. Of the 49 samples, none exeeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Crescent Bay Beach, station id OLB 05, in the San Joaquin HSA. Lat/Long: 33.54658/-117.80147
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44323, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Joaquin Hills HSA, at Crescent Bay Beach 041926

LOE ID:	30437
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	441
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. A total of 441 single samples were collected with only one sample exceeding the single sample water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Crescent Bay Beach, station id OLB 05, in the San Joaquin HSA. Lat/Long: 33.54658/-117.80147
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44323, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Joaquin Hills HSA, at Crescent Bay Beach

LOE ID:	30423
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	448
Number of Exceedances:	9
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. A total of 448 single samples were collected with eight samples exceeding the single sample water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final

	Report	041927

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan, the median total coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Crescent Bay Beach, station id OLB 05, in the San Joaquin HSA. Lat/Long: 33.54658/-117.80147
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44323, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Joaquin Hills HSA, at Crescent Bay Beach

LOE ID:	30430
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	49
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. Between March 2002 and December 2007, 49 samples were correlated with a storm event. Of the 49 samples, two exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
Evaluation Guideline:	

Guideline Reference:	041928
Spatial Representation:	Samples were collected from Crescent Bay Beach, station id OLB 05, in the San Joaquin HSA. Lat/Long: 33.54658/-117.80147
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44323, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Joaquin Hills HSA, at Crescent Bay Beach

LOE ID:	30431
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	436
Number of Exceedances:	5
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. A total of 436 single samples were collected with five exeeding the single sample water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Crescent Bay Beach, station id OLB 05, in the San Joaquin HSA. Lat/Long: 33.54658/-117.80147
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44323, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Joaquin Hills HSA, at Crescent Bay Beach 041929

LOE ID:	77668
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	36
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Zero of the 36 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, San Joaquin Hills HSA, at Crescent Bay Beach.
Temporal Representation:	The samples were collected from January 2008 to October 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44323, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Joaquin Hills HSA, at Crescent Bay Beach

LOE ID:	75164
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	59
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed bw data for Pacific Ocean Shoreline, San Joaquin Hills HSA, at Crescent Bay Beach to determine beneficial use support and results are as follows: 0 of 59 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for

human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.

Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Data for this line of evidence for Pacific Ocean Shoreline, San Joaquin Hills HSA, at Crescent Bay Beach was collected at 1 monitoring site [CRESCENT BAY]
Temporal Representation: Data was collected over the time period 1/3/2008-10/27/2009.
Environmental Conditions: Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 44323, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Joaquin Hills HSA, at Crescent Bay Beach

LOE ID: 75165

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 36
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Zero of the 36 geomeans exceeded the objective.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at the Crescent Bay Beach site.
Temporal Representation: Samples were collected from January 2008 to October 2009.
Environmental Conditions:
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 44323, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Joaquin Hills HSA, at Crescent Bay Beach

LOE ID: 75162

Pollutant: Enterococcus
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 36

Number of Exceedances:	0	041931

Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 36 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Crescent Bay Beach site.
Temporal Representation:	Samples were collected from January 2008 to October 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44323, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Joaquin Hills HSA, at Crescent Bay Beach

LOE ID:	30434
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	107
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. A total of 441 single samples were collected with 107 geomeans calculated. Of the 107 geomeans, none exeeded the geomean water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Crescent Bay Beach, station id OLB 05, in the San Joaquin HSA. Lat/Long: 33.54658/-117.80147
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.

QAPP Information Reference(s): County of Orange. Quality Assurance/Quality Control Manual, February 2004 041932

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, San Joaquin Hills HSA, at Emerald Bay Beach
Water Body ID: CAC9011100020091022114130
Water Body Type: Coastal & Bay Shoreline

DECISION ID 44529 **Region 9**
Pacific Ocean Shoreline, San Joaquin Hills HSA, at Emerald Bay Beach

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Original
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Ten lines of evidence are available in the administrative record to assess this pollutant. With the latest data, one of 244 geomean samples exceed the water quality objective for enterococcus for the protection of REC-1 beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, one of 244 geomean samples exceed the water quality objective for enterococcus for the protection of REC-1 beneficial use and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 44529, Indicator Bacteria **Region 9**
Pacific Ocean Shoreline, San Joaquin Hills HSA, at Emerald Bay Beach

LOE ID: 30439

Pollutant: Indicator Bacteria
LOE Subgroup: Health Advisories
Matrix: -N/A
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 1460

Number of Exceedances:	4	041934

Data and Information Type: PWS pathogen monitoring (ambient water)

Data Used to Assess Water Quality: For the period from January 2004 to December 2007, there were and 4 beach postings days for this section of shoreline. Bacteriological samples are collected on a weekly basis at approximately 150 ocean and bay location in Orange County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that waters have exceeded public health standards.

Data and information on the number of beach posting were summarized by the County of Orange in their Annual Ocean and Bay Water Quality Report, March 2007. The reporting period was from January 2004 -December 2007. Data used was the number of days the beach was posting when the ocean or bay failed to meet the bacteriological standards.

Data Reference: County of Orange. March 2007. Annual Ocean and Bay Water Quality Report, 2006

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: California Code of Regulations. Title 17, Section 7960.

(a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.

Objective/Criterion Reference: California Code of Regulations, Title 17, Section 7960

Evaluation Guideline:

Guideline Reference:

Spatial Representation: Bacteriological monitoring samples was collected at Emerald Bay beach shoreline.

Temporal Representation: The beach posting covers the time frame of January 2004 -December 2007.

Environmental Conditions:

QAPP Information: Samples were collected in compliance with County of Orange's Quality Assessment/Quality Control document (County of Orange, 2004).

QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 44529, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Joaquin Hills HSA, at Emerald Bay Beach

LOE ID: 31107

Pollutant: Total Coliform

LOE Subgroup: Pollutant-Water

Matrix: Water

Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 56

Number of Exceedances: 0

Data and Information Type: PWS pathogen monitoring (ambient water)

Data Used to Assess Water Quality: Orange County collected Beach monitoring data within the time period from January 1999 through December 2006.
A total of 56 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 56 geomeans zero exceeded the geomean water quality objective.

Data Reference: Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion:	The 30-day Geometric Mean for total coliform density shall not exceed 1000 per 100 ml
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Emerald Bay Beach, station id OLB 10, in the San Joaquin HSA. Lat/Long: 33.55099/-117.80801.
Temporal Representation:	Samples were collected at least once a week within the time period from January 1999 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44529, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Joaquin Hills HSA, at Emerald Bay Beach

LOE ID:	30424
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	452
Number of Exceedances:	6
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. A total of 452 single samples were collected with six samples exceeding the single sample water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan, the median total coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Emerald Bay Beach, station id OLB 10, in the San Joaquin HSA. Lat/Long: 33.55099/-117.80801.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44529, Indicator Bacteria 041936 Region 9

Pacific Ocean Shoreline, San Joaquin Hills HSA, at Emerald Bay Beach

LOE ID:	30425
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	49
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. A total of 452 single samples were collected. Between March 2002 and December 2007, 49 samples were associated with a storm event. From the 49 samples, three samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan, the median total coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Emerald Bay Beach, station id OLB 10, in the San Joaquin HSA. Lat/Long: 33.55099/-117.80801.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44529, Indicator Bacteria Region 9

Pacific Ocean Shoreline, San Joaquin Hills HSA, at Emerald Bay Beach

LOE ID:	30426
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water

Matrix:	Water	041937
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	49	
Number of Exceedances:	2	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. A total of 438 single samples were collected. Between March 2002 and December 2007, 49 samples were correlated with a storm event. Of the 49 samples, only two exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.	
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Emerald Bay Beach, station id OLB 10, in the San Joaquin HSA. Lat/Long: 33.55099/-117.80801.	
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.	
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 44529, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Joaquin Hills HSA, at Emerald Bay Beach

LOE ID:	30421
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Water Contact Recreation
Number of Samples:	0
Number of Exceedances:	0

Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006. For the 2008 assessment , the 2006 listed coastline 'Pacific Ocean Shoreline, San Joaquin Hills HSA' was split into smaller segments and each represents an area near the sampling location of the data being assessed. This segment 'Pacific Ocean Shoreline, San Joaquin Hills HSA, at Emerald Bay Beach' is one of the sampling locations. This LOE is a copy of the 2006 listing placeholder LOE for Pacific Ocean Shoreline, San Joaquin Hills HSA and is considered by the Regional Board to be applicable to this more specific segment formed from the split.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	
Temporal Representation:	
Environmental Conditions:	
QAPP Information:	Unspecified
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44529, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Joaquin Hills HSA, at Emerald Bay Beach

LOE ID:	31108
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	56
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Orange County collected Beach monitoring data within the time period from January 1999 through December 2006. A total of 56 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 56 geomeans zero exceeded the geomean water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The 30-day Geometric Mean for fecal coliform density shall not exceed 200 per 100 ml
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected from Emerald Bay Beach, station id OLB 10, in the San Joaquin HSA. Lat/Long: 33.55099/-117.80801.
Temporal Representation:	Samples were collected at least once a week within the time period from January 1999 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44529, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Joaquin Hills HSA, at Emerald Bay Beach

LOE ID:	31109
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	56
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Orange County collected Beach monitoring data within the time period from January 1999 through December 2006. A total of 56 monthly geomeans were calculated for data collected during the time frame of April 1st to October 31st (AB411 data) within the aforementioned time period. Of the 56 geomeans one exceeded the geomean water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The 30-day Geometric mean for enterococcus density shall not exceed 35 per 100 ml
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Emerald Bay Beach, station id OLB 10, in the San Joaquin HSA. Lat/Long: 33.55099/-117.80801.
Temporal Representation:	Samples were collected at least once a week within the time period from January 1999 through December 2006. The data assessed is AB411 data which is data collected during the time frame of April 1st to October 31st (summer months) within the aforementioned time period.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44529, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Joaquin Hills HSA, at Emerald Bay Beach

LOE ID:	30432

Pollutant:	Fecal Coliform	041940
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	445	
Number of Exceedances:	2	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. A total of 445 single samples were collected with two exceeding the single sample water quality objective.	
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Emerald Bay Beach, station id OLB 10, in the San Joaquin HSA. Lat/Long: 33.55099/-117.80801.	
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44529, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Joaquin Hills HSA, at Emerald Bay Beach

LOE ID:	30433
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	107
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. A total of 445 single samples were collected with 107 monthly geomeans calculated. None of the 107 geomeans exceeded the geomean water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100ml; 400 ml Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Emerald Bay Beach, station id OLB 10, in the San Joaquin HSA. Lat/Long: 33.55099/-117.80801.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44529, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Joaquin Hills HSA, at Emerald Bay Beach

LOE ID:	30440
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	108
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. A total of 452 single samples were collected and 108 monthly geomeans calculated. None of the 108 geomeans exceeded the geomean water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Emerald Bay Beach, station id OLB 10, in the San Joaquin HSA. Lat/Long: 33.55099/-117.80801.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44529, Indicator Bacteria 041942 **Region 9**

Pacific Ocean Shoreline, San Joaquin Hills HSA, at Emerald Bay Beach

LOE ID:	30442
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	452
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. A total of 452 single samples were collected with none exceeding the single sample water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Emerald Bay Beach, station id OLB 10, in the San Joaquin HSA. Lat/Long: 33.55099/-117.80801.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44529, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Joaquin Hills HSA, at Emerald Bay Beach

LOE ID:	30443
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	49
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. A total of 452 single samples were collected. Between March 2002 and

	December 2007, 49 samples were correlated with a storm event. None of the 49 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml; Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Emerald Bay Beach, station id OLB 10, in the San Joaquin HSA. Lat/Long: 33.55099/-117.80801.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44529, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Joaquin Hills HSA, at Emerald Bay Beach

LOE ID:	30428
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	438
Number of Exceedances:	6
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. A total of 438 single samples were collected with six samples exceeding the single sample water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml;

041944

Objective/Criterion Reference:	Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005). Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Emerald Bay Beach, station id OLB 10, in the San Joaquin HSA. Lat/Long: 33.55099/-117.80801.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44529, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Joaquin Hills HSA, at Emerald Bay Beach

LOE ID:	30429
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	106
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. A total of 438 single samples were collected and 106 monthly geomeans calculated. Of the 106 geomeans, only one geomean exceeded the geomean water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml;
Objective/Criterion Reference:	Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005). Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Emerald Bay Beach, station id OLB 10, in the San Joaquin HSA. Lat/Long: 33.55099/-117.80801.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44529, Indicator Bacteria 041945 Region 9

Pacific Ocean Shoreline, San Joaquin Hills HSA, at Emerald Bay Beach

LOE ID:	30435
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	49
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of Orange from January 1999 through December 2007. A total of 445 single samples were collected. Between March 2002 and December 2007 49 samples were correlated with a storm event. None of the 49 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006, Final Report National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Emerald Bay Beach, station id OLB 10, in the San Joaquin HSA. Lat/Long: 33.55099/-117.80801.
Temporal Representation:	Samples were collected weekly from January 1999 through December 2007; however, rainfall data is only available from March 2002 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 44529, Indicator Bacteria Region 9

Pacific Ocean Shoreline, San Joaquin Hills HSA, at Emerald Bay Beach

LOE ID:	75166
Pollutant:	Enterococcus

LOE Subgroup:	Pollutant-Water	041946
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	149	
Number of Exceedances:	3	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Three of the 149 samples exceeded the enterococcus objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The single sample enterococcus concentration shall not exceed more than 104/100ml. Water Quality Control Plan for Ocean Waters of California. Region 9 Basion Plan.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected from Emrld coastal stormdrain(surfzone upcoast and surfzone downcoast).	
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.	
Environmental Conditions:		
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44529, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Joaquin Hills HSA, at Emerald Bay Beach

LOE ID:	75167
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	138
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	None of the 138 geomeans exceeded the enterococcus objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean for enterococcus shall not exceed 35 MPN/100 mL. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	

Guideline Reference:	041947
Spatial Representation:	The samples were collected from Coastal Stormdrain at Valley Inn Drive (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44529, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Joaquin Hills HSA, at Emerald Bay Beach

LOE ID:	75168
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	149
Number of Exceedances:	1
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	One of the 149 samples exceeded the fecal coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample fecal coliform concentration shall not exceed more than 400/100ml. Water Quality Control Plan for Ocean Waters of California. Region 9 Basion Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Emrld coastal stormdrain (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44529, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Joaquin Hills HSA, at Emerald Bay Beach

LOE ID:	75172
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation	041948
Number of Samples:	138	
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	None of the 138 geomeans exceeded the fecal coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The geometric mean for fecal coliform shall not exceed more than 200/100ml. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected from Coastal Stormdrain at Valley Inn Drive (surfzone upcoast and surfzone downcoast).	
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.	
Environmental Conditions:		
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44529, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Joaquin Hills HSA, at Emerald Bay Beach

LOE ID:	75173
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	149
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 149 samples exceeded the total coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample total coliform concentration shall not exceed more than 10000/100ml. Water Quality Control Plan for Ocean Waters of California. Region 9 Basion Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Emrld coastal stormdrain (surfzone upcoast and surfzone

	downcoast). 041949
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44529, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Joaquin Hills HSA, at Emerald Bay Beach

LOE ID:	75174
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	138
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	None of the 138 samples exceeded the total coliform objective. For these stations, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean for total coliform shall not exceed more than 1000/100ml. Water Quality Control Plan for the San Diego Basin. Water Quality Control Plan for Ocean Waters.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Coastal Stormdrain at Valley Inn Drive (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name:	Pacific Ocean Shoreline, San Diego HU, at Stub Jetty, south of the San Diego River outlet, near Cape May Avenue
Water Body ID:	**CAC907110002009102711145 4**
Water Body Type:	**Coastal & Bay Shoreline**

DECISION ID 44221 Region 9

Pacific Ocean Shoreline, San Diego HU, at Stub Jetty, south of the San Diego River outlet, near Cape May Avenue

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (being addressed by USEPA approved TMDL)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
TMDL Name:	Bacteria Impaired Waters I (creeks and beach shorelines)
TMDL Project Code:	169
Date TMDL Approved by USEPA:	06/22/2011
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Fourteen lines of evidence are available in the administrative record to assess this pollutant. With the latest data, 29 of 146 geomean samples exceed the water quality objective for total coliform for the protection of SHELL beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, 29 of 146 geomean samples exceed the water quality objective for total coliform for the protection of SHELL beneficial use and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 44221, Indicator Bacteria Region 9

Pacific Ocean Shoreline, San Diego HU, at Stub Jetty, south of the San Diego River outlet, near Cape May Avenue

LOE ID:	75000
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water

Matrix:	Water	041951
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	146	
Number of Exceedances:	5	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Five of the 146 geomeans exceeded the objective.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at the Stub Jetty site, south of the San Diego River outlet, near Cape May Ave.	
Temporal Representation:	Samples were collected from January 2008 to August 2010.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44221, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Diego HU, at Stub Jetty, south of the San Diego River outlet, near Cape May Avenue

LOE ID:	30395
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	249
Number of Exceedances:	27
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from August 2003 through December 2007. The number of samples collected for total coliform analysis was 249 with 27 samples exceeding the single sample maximum total coliform standard for shellfish harvesting.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan, the median total coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at the Stub Jetty, south of the San Diego River outlet, near Cape May Avenue, Station id PL110. Lat/ Long: 32.756700/ -117.251700.
Temporal Representation:	Samples were collected weekly from August 2003 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44221, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Diego HU, at Stub Jetty, south of the San Diego River outlet, near Cape May Avenue

LOE ID:	75002
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	154
Number of Exceedances:	8
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed bw data for Pacific Ocean Shoreline, San Diego HU, at Stub Jetty, south of the San Diego River outlet, near Cape May Avenue to determine beneficial use support and results are as follows: 8 of 154 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, San Diego HU, at Stub Jetty, south of the San Diego River outlet, near Cape May Avenue was collected at 1 monitoring site [Stub Jetty, south side]
Temporal Representation:	Data was collected over the time period 1/5/2008-8/24/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44221, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Diego HU, at Stub Jetty, south of the San Diego River outlet, near Cape May Avenue

LOE ID:	75024
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	146
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 146 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Stub Jetty site, south of the San Diego River outlet near Cape May Avenue.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44221, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Diego HU, at Stub Jetty, south of the San Diego River outlet, near Cape May Avenue

LOE ID:	77658
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	146
Number of Exceedances:	29
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Twenty-nine of the 146 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, San Diego HU, at Stub Jetty, south of the San Diego River outlet, near Cape May Avenue.
Temporal Representation:	The samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44221, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Diego HU, at Stub Jetty, south of the San Diego River outlet, near Cape May Avenue

LOE ID:	30414
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	249
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from August 2003 through December 2007. The number of samples collected for total coliform analysis was 249. Only one of the samples exceeded the single sample maximum total coliform standard.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005). Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Stub Jetty, south of the San Diego River outlet, near Cape May Avenue, Station id PL110. Lat/ Long: 32.756700/ -117.251700.
Temporal Representation:	Samples were collected weekly from August 2003 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44221, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Diego HU, at Stub Jetty, south of the San Diego River outlet, near Cape May Avenue

LOE ID:	30415
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	22
Number of Exceedances:	1

Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from August 2003 through December 2007. The number of samples collected for total coliform analysis was 249 with 22 samples correlated with a storm event. Only one of the storm samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005). Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Stub Jetty, south of the San Diego River outlet, near Cape May Avenue, Station id PL110. Lat/ Long: 32.756700/ -117.251700.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44221, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Diego HU, at Stub Jetty, south of the San Diego River outlet, near Cape May Avenue

LOE ID:	30398
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	249
Number of Exceedances:	13
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from August 2003 through December 2007. A total of 249 single samples were collected with 13 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Stub Jetty, south of the San Diego River outlet, near Cape May Avenue, Station id PL110. Lat/ Long: 32.756700/ -117.251700.
Temporal Representation:	Samples were collected weekly from August 2003 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44221, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Diego HU, at Stub Jetty, south of the San Diego River outlet, near Cape May Avenue

LOE ID:	30404
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	246
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from August 2003 through December 2007. A total of 246 single samples were collected with four of the samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Stub Jetty, south of the San Diego River outlet, near Cape May Avenue, Station id PL110. Lat/ Long: 32.756700/ -117.251700.
Temporal Representation:	Samples were collected weekly from August 2003 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.

QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

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Line of Evidence (LOE) for Decision ID 44221, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Diego HU, at Stub Jetty, south of the San Diego River outlet, near Cape May Avenue

LOE ID:	30408
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	22
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from August 2003 through December 2007. A total of 233 single samples were collected with 22 samples correlated with a storm event. Only one of the storm samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Stub Jetty, south of the San Diego River outlet, near Cape May Avenue, Station id PL110. Lat/ Long: 32.756700/ -117.251700.
Temporal Representation:	Samples were collected weekly from August 2003 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44221, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Diego HU, at Stub Jetty, south of the San Diego River outlet, near Cape May Avenue

LOE ID:	30409
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	48
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from August 2003 through December 2007. A total of 233 single samples were collected with 48 geomeans calculated. None of the geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Stub Jetty, south of the San Diego River outlet, near Cape May Avenue, Station id PL110. Lat/ Long: 32.756700/ -117.251700.
Temporal Representation:	Samples were collected weekly from August 2003 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44221, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Diego HU, at Stub Jetty, south of the San Diego River outlet, near Cape May Avenue

LOE ID:	30410
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	48
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from Samples were collected from August 2003 through December 2007. The number of samples collected for total coliform analysis was 249 with 48monthly geomeans calculated. None of the geomeans exceeded the geomean water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005). Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005.

	Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Stub Jetty, south of the San Diego River outlet, near Cape May Avenue, Station id PL110. Lat/ Long: 32.756700/ -117.251700.
Temporal Representation:	Samples were collected weekly from August 2003 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44221, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Diego HU, at Stub Jetty, south of the San Diego River outlet, near Cape May Avenue

LOE ID:	30402
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	22
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from August 2003 through December 2007. A total of 249 single samples were collected with 22 samples correlated with a storm event. Three of the storm samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the San Diego HU, at the Stub Jetty, south of the San Diego River outlet, near Cape May Avenue, Station id PL110. Lat/ Long: 32.756700/ -117.251700.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the

	full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44221, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Diego HU, at Stub Jetty, south of the San Diego River outlet, near Cape May Avenue

LOE ID:	30403
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	48
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data were collected by the County of San Diego from August 2003 through December 2007. A total of 236 single samples were collected with 48 monthly geomeans calculated. None of the geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Stub Jetty, south of the San Diego River outlet, near Cape May Avenue, Station id PL110. Lat/ Long: 32.756700/ -117.251700.
Temporal Representation:	Samples were collected weekly from August 2003 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44221, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Diego HU, at Stub Jetty, south of the San Diego River outlet, near Cape May Avenue

LOE ID:	31227
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation
Number of Samples:	28
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from August 2003 through October 2007. A total of 142 dry month (April through October) single samples were collected with 28 dry month geomeans calculated. None of the 28 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Stub Jetty, south of the San Diego River outlet, near Cape May Avenue, Station id PL110. Lat/ Long: 32.756700/ -117.251700.
Temporal Representation:	Samples were collected weekly from August 2003 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44221, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Diego HU, at Stub Jetty, south of the San Diego River outlet, near Cape May Avenue

LOE ID:	31228
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	28
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from August 2003 through October 2007. A total of 140 dry month (April through October) single samples were collected with 28 dry month geomeans calculated. None of the 28 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).

Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Stub Jetty, south of the San Diego River outlet, near Cape May Avenue, Station id PL110. Lat/ Long: 32.756700/ -117.251700.
Temporal Representation:	Samples were collected weekly from August 2003 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44221, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Diego HU, at Stub Jetty, south of the San Diego River outlet, near Cape May Avenue

LOE ID:	31229
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	28
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from August 2004 through October 2007. A total of 142 dry month (April through October) single samples were collected with 28 dry month geomeans calculated. None of the 28 geomeans exceeded the geomean water quality objective. .
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005). Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Stub Jetty, south of the San Diego River outlet, near Cape May Avenue, Station id PL110. Lat/ Long: 32.756700/ -117.251700.
Temporal Representation:	Samples were collected weekly from August 2003 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44221, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Diego HU, at Stub Jetty, south of the San Diego River outlet, near Cape May Avenue

LOE ID:	75001
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	146
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 146 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Stub Jetty site, south of the San Diego River outlet, near Cape May Avenue.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44221, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Diego HU, at Stub Jetty, south of the San Diego River outlet, near Cape May Avenue

LOE ID:	30394
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	22
Number of Exceedances:	12
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from August 2003 through December 2007. The number of samples collected for total coliform analysis was 249 with 22 of the samples correlated with a storm event. Twelve of the storm samples exceeded the single sample maximum total coliform standard for shellfish harvesting. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program,

	2007. AB 411 monitoring data 1999 to 2007	041964

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan, the median total coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Stub Jetty, south of the San Diego River outlet, near Cape May Avenue, Station id PL110. Lat/ Long: 32.756700/ -117.251700.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44221, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Diego HU, at Stub Jetty, south of the San Diego River outlet, near Cape May Avenue

LOE ID:	30845
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	227
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from August 2003 through December 2007. The number of samples collected for total coliform analysis was 249 of which 227 are dry weather (AB411) samples and none of those samples exceeded the single sample maximum total coliform standard.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005). Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Stub Jetty, south of the San Diego River outlet, near Cape May Avenue, Station id PL110. Lat/ Long: 32.756700/ -117.251700.
Temporal Representation:	Samples were collected weekly from August 2003 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44221, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Diego HU, at Stub Jetty, south of the San Diego River outlet, near Cape May Avenue

LOE ID:	30419
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	13
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were 13 beach advisory days for this section of shoreline. Bacteriological samples are collected on a weekly basis at ocean and bay locations in San Diego County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that an advisory for waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 - December 2007. Data used was the number of days the beach was advisories were issued when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Spatial Representation:	Beach advisories were posted at San Diego River Mouth at Stub Jetty, San Diego, CA.

Temporal Representation:	The beach advisory covers the time frame of January January 2001 to December 2007.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of San Diego's Quality Assessment/Quality Control document
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44221, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Diego HU, at Stub Jetty, south of the San Diego River outlet, near Cape May Avenue

LOE ID:	30639
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	227
Number of Exceedances:	10
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from August 2003 through December 2007. A total of 249 single samples were collected of which 227 are dry weather (AB411) samples with 10 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Stub Jetty, south of the San Diego River outlet, near Cape May Avenue, Station id PL110. Lat/ Long: 32.756700/ -117.251700.
Temporal Representation:	Samples were collected weekly from August 2003 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44221, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Diego HU, at Stub Jetty, south of the San Diego River outlet, near Cape May Avenue

LOE ID:	30740
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	224
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from August 2003 through December 2007. A total of 246 single samples were collected of which 224 are dry weather (AB411) samples with three of the samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Stub Jetty, south of the San Diego River outlet, near Cape May Avenue, Station id PL110. Lat/ Long: 32.756700/ -117.251700.
Temporal Representation:	Samples were collected weekly from August 2003 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

DECISION ID 49383 Region 9

Pacific Ocean Shoreline, San Diego HU, at Stub Jetty, south of the San Diego River outlet, near Cape May Avenue

Pollutant:	**Trash**
Final Listing Decision:	**List on 303(d) list (being addressed by action other than TMDL)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected Attainment Date:	2025
Implementation Action Other than TMDL:	The new trash control objectives apply. The trash found at this site, during cleanups that occurred on 11/22/08 and 11/28/09, are considered exceedances. The objectives are implemented as a conditional prohibition of discharge. Trash control amendments are the regulatory actions to be taken. Collected effort of public, agencies, organizations, and permittees. Methods include street sweeping, education programs on littering, installation of trash-catching devices on storm drains
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.7 of the Listing Policy. Under this section when all other listing factors do not result in the listing of a water segment but information indicates non-attainment of standards, a water segment shall be evaluated to determine whether the weight of evidence demonstrates that water quality standard is not attained. If the weight of evidence indicates non-attainment, the water segment shall be placed on the CWA section 303(d) List. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for placing this water segment-pollutant combination from the CWA section 303(d)

List. This conclusion is based on the staff findings that: 041968
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The following information indicates that the water quality standard is not being attained: Coastkeeper cleanups occurred on 11/22/08 and 11/28/09 for this water body. The total weight of trash (lbs) collected on these dates was 748.25. Using the metric, Coastkeeper classified this water body as medium for trash impairment. However, any trash found is an exceedance and needs to be addressed by an action other than a TMDL.
3. This process is scientifically defensible and reproducible.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 49383, Trash **Region 9**

Pacific Ocean Shoreline, San Diego HU, at Stub Jetty, south of the San Diego River outlet, near Cape May Avenue

LOE ID:	75025
Pollutant:	Trash
LOE Subgroup:	Pollutant-Nuisance
Matrix:	Not Recorded
Fraction:	None
Beneficial Use:	Non-Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Occurrence of conditions judged to cause impairment
Data Used to Assess Water Quality:	The San Diego Coastkeeper conducts trash cleanups and uses a metric (pounds of trash collected per volunteer) to compare levels of trash across beaches and categorizes beaches as either low, medium, high or severe, based on this metric. Coastkeeper cleanups occurred on 11/22/08 and 11/28/09 for this water body. The total weight of trash (lbs) collected on these dates was 748.25. However, using the metric, Coastkeeper classified this water body as medium for trash impairment.
Data Reference:	Data for Trash, Nutrients, and Pathogens in Region 9, 2007-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Floating Material Waters shall not contain floating material, including solids, liquids, foams, and scum in concentrations which cause nuisance or adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Ocean Beach Jetty.
Temporal Representation:	Two cleanups occurred on 11/22/08 and 11/28/09.
Environmental Conditions:	
QAPP Information:	San Diego Coastkeeper QAPP was provided.
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, San Diego HU, at the San Diego River outlet, at Dog Beach
Water Body ID: CAC907110002009110413105 0
Water Body Type: Coastal & Bay Shoreline

DECISION ID 44291 **Region 9**

Pacific Ocean Shoreline, San Diego HU, at the San Diego River outlet, at Dog Beach

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not Delist from 303(d) list (being addressed with USEPA approved TMDL)**
Last Listing Cycle's Final Listing Decision:	Do Not Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
TMDL Name:	Bacteria Impaired Waters I (creeks and beach shorelines)
TMDL Project Code:	169
Date TMDL Approved by USEPA:	06/22/2011
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal on the CWA section 303(d) List under sections 2.2 and [SECTION] of the Listing Policy. Under [SECTION] of the Policy, a minimum of one line of evidence is needed to assess listing status.

Fourteen lines of evidence are available in the administrative record to assess this pollutant.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List. There is sufficient justification to place it in the Being Addressed portion of the CWA 303(d) List because a TMDL has been completed and approved by RWQCB and USEPA, and is expected to result in attainment of the standard.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Thirteen of 60 geomean samples collected prior to 2008 exceeded the water quality objective for enterococcus and with the latest data, 168 of 705 single samples exceed the SSM WQO for total coliform for SHELL and these exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. The Bacteria TMDL for 20 beaches/creeks was approved by USEPA on 06/22/2011.
5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 44291, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Diego HU, at the San Diego River outlet, at Dog Beach

LOE ID:	31234
Pollutant:	Fecal Coliform

LOE Subgroup:	Pollutant-Water	041970
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	57	
Number of Exceedances:	1	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 364 dry month (April through October) single samples were collected with 57 dry month geomeans calculated. One of the 57 geomeans exceeded the geomean water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from the San Diego HU, at the San Diego River outlet, at Dog Beach, Station id FM-010. Lat/ Long: 32.756700/ -177.251700.	
Temporal Representation:	Samples were collected weekly from April 1999 through October 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44291, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Diego HU, at the San Diego River outlet, at Dog Beach

LOE ID:	30411
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	28
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. The number of samples collected for total coliform analysis was 505 with 28 samples correlated with a storm event. Four of the storm samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program,

	2007. AB 411 monitoring data 1999 to 2007	041971

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005). Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the San Diego HU, at the San Diego River outlet, at Dog Beach, Station id FM-010. Lat/ Long: 32.756700/ -177.251700.
Temporal Representation:	Samples were collected weekly from January 1999 through October 2002, and April 2003 through December 2007.
Environmental Conditions:	Comparisons were also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44291, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Diego HU, at the San Diego River outlet, at Dog Beach

LOE ID:	30407
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	508
Number of Exceedances:	47
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2002, and April 2003 through December 2007. A total of 508 single samples were collected with 47 of the samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the San Diego HU, at the San Diego River outlet, at Dog Beach, Station id FM-010. Lat/ Long: 32.756700/ -177.251700.
Temporal Representation:	Samples were collected weekly from January 1999 through October 2002, and April 2003 through December 2007.

Environmental Conditions:	041972
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44291, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Diego HU, at the San Diego River outlet, at Dog Beach

LOE ID:	30406
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	24
Number of Exceedances:	6
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2002, and April 2003 through December 2007. A total of 508 single samples were collected with 24 samples correlated with a storm event. Six of the storm samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005). Comparisons to water quality objectives were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the San Diego HU, at the San Diego River outlet, at Dog Beach, Station id FM-010. Lat/ Long: 32.756700/ -177.251700.
Temporal Representation:	Samples were collected weekly from January 1999 through October 2002, and April 2003 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44291, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Diego HU, at the San Diego River outlet, at Dog Beach

LOE ID:	31236

Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	60
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 441 dry month (April through October) single samples were collected with 60 dry month geomeans calculated. One of the 60 geomeans exceeded the geomean water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005). Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the San Diego HU, at the San Diego River outlet, at Dog Beach, Station id FM-010. Lat/ Long: 32.756700/ -177.251700.
Temporal Representation:	Samples were collected weekly from April 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44291, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Diego HU, at the San Diego River outlet, at Dog Beach

LOE ID:	30846
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	477
Number of Exceedances:	6
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from January 1999 through October 2002, and April 2003 through December 2007. The number of samples collected for total coliform analysis was 505 of which 477 are dry weather (AB411) samples with six of those samples exceeding the single sample maximum total coliform standard.

Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station 041974 Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005). Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the San Diego HU, at the San Diego River outlet, at Dog Beach, Station id FM-010. Lat/ Long: 32.756700/ -177.251700.
Temporal Representation:	Samples were collected weekly from January 1999 through October 2002, and April 2003 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44291, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Diego HU, at the San Diego River outlet, at Dog Beach

LOE ID:	30405
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	83
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2002, and April 2003 through December 2007. A total of 508 single samples were collected with 83 geomeans calculated. None of the geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the San Diego HU, at the San Diego River outlet, at Dog Beach, Station id FM-010. Lat/ Long: 32.756700/ -177.251700.

Temporal Representation:	Samples were collected weekly from January 1999 through October 2002, and April 2003 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44291, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Diego HU, at the San Diego River outlet, at Dog Beach

LOE ID:	30401
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	492
Number of Exceedances:	66
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2002, and April 2003 through December 2007. A total of 492 single samples were collected with 66 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the San Diego HU, at the San Diego River outlet, at Dog Beach, Station id FM-010. Lat/ Long: 32.756700/ -177.251700.
Temporal Representation:	Samples were collected weekly from January 1999 through October 2002, and April 2003 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44291, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Diego HU, at the San Diego River outlet, at Dog Beach

LOE ID:	30400
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation
Number of Samples:	27
Number of Exceedances:	9
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2002, and April 2003 through December 2007. A total of 492 single samples were collected with 27 samples correlated with a storm event. Nine of the storm samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005). Comparisons to water quality objectives were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the San Diego HU, at the San Diego River outlet, at Dog Beach, Station id FM-010. Lat/ Long: 32.756700/ -177.251700.
Temporal Representation:	Samples were collected weekly from January 1999 through October 2002, and April 2003 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44291, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Diego HU, at the San Diego River outlet, at Dog Beach

LOE ID:	30399
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	85
Number of Exceedances:	13
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data were collected by the County of San Diego from January 1999 through October 2002, and April 2003 through December 2007. A total of 492 single samples were collected with 85 monthly geomeans calculated. Thirteen of the geomeans exceeded the geomean water quality objective.

Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the San Diego HU, at the San Diego River outlet, at Dog Beach, Station id FM-010. Lat/ Long: 32.756700/ -177.251700.
Temporal Representation:	Samples were collected weekly from January 1999 through October 2002, and April 2003 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44291, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Diego HU, at the San Diego River outlet, at Dog Beach

LOE ID:	75029
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	188
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 188 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the San Diego River outlet site near Dog Beach.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44291, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Diego HU, at the San Diego River outlet, at Dog Beach

LOE ID:	75028	041978

Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	200
Number of Exceedances:	19
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed bw data for Pacific Ocean Shoreline, San Diego HU, at the San Diego River outlet, at Dog Beach to determine beneficial use support and results are as follows: 19 of 200 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, San Diego HU, at the San Diego River outlet, at Dog Beach was collected at 1 monitoring site [San Diego River outlet]
Temporal Representation:	Data was collected over the time period 1/3/2008-8/25/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44291, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Diego HU, at the San Diego River outlet, at Dog Beach

LOE ID:	75027
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	189
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 189 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at the San Diego River outlet site at Dog Beach.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44291, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Diego HU, at the San Diego River outlet, at Dog Beach

LOE ID:	75026
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	189
Number of Exceedances:	11
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Eleven of the 189 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the San Diego River outlet at Dog Beach site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44291, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Diego HU, at the San Diego River outlet, at Dog Beach

LOE ID:	30397
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	28
Number of Exceedances:	18
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from January 1999 through October 2002, and April 2003 through December 2007. The number of samples collected for total coliform analysis was 505 with 28 of the samples correlated with a storm event. Eighteen of the storm samples exceeded the single sample maximum total

	coliform standard for shellfish harvesting. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan, the median total coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the San Diego HU, at the San Diego River outlet, at Dog Beach, Station id FM-010. Lat/ Long: 32.756700/ -177.251700.
Temporal Representation:	Samples were collected weekly from January 1999 through October 2002, and April 2003 through December 2007.
Environmental Conditions:	Comparisons were also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44291, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Diego HU, at the San Diego River outlet, at Dog Beach

LOE ID:	30396
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	505
Number of Exceedances:	149
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from January 1999 through October 2002, and April 2003 through December 2007. The number of samples collected for total coliform analysis was 505 with 149 samples exceeding the single sample maximum total coliform standard for shellfish harvesting.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan, the median total coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	

Guideline Reference:	041981
Spatial Representation:	Samples were collected from the San Diego HU, at the San Diego River outlet, at Dog Beach, Station id FM-010. Lat/ Long: 32.756700/ -177.251700.
Temporal Representation:	Samples were collected weekly from January 1999 through October 2002, and April 2003 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44291, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Diego HU, at the San Diego River outlet, at Dog Beach

LOE ID:	77659
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	187
Number of Exceedances:	34
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Thirty-four of the 187 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, San Diego HU, at the San Diego River outlet, at Dog Beach.
Temporal Representation:	The samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44291, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Diego HU, at the San Diego River outlet, at Dog Beach

LOE ID:	31393
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation
Number of Samples:	484
Number of Exceedances:	41
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2002, and April 2003 through December 2007. A total of 508 single samples were collected of which 484 are dry weather (AB411) samples with 41 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the San Diego HU, at the San Diego River outlet, at Dog Beach, Station id FM-010. Lat/ Long: 32.756700/ -177.251700.
Temporal Representation:	Samples were collected weekly from January 1999 through October 2002, and April 2003 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44291, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Diego HU, at the San Diego River outlet, at Dog Beach

LOE ID:	30418
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	154
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were 154 beach advisory days for this section of shoreline. Bacteriological samples are collected on a weekly basis at ocean and bay locations in San Diego County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that an advisory for waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 - December 2007. Data used was the number of days the beach was advisories were issued when the ocean or bay failed to meet the bacteriological standards.

Data Reference:	Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report 041983
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Spatial Representation:	Beach advisories were posted at San Diego River Mouth at Dog Beach, San Diego, CA.
Temporal Representation:	The beach advisory covers the time frame of January January 2001 to December 2007.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of San Diego's Quality Assessment/Quality Control document
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44291, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Diego HU, at the San Diego River outlet, at Dog Beach

LOE ID:	30412
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	505
Number of Exceedances:	10
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from January 1999 through October 2002, and April 2003 through December 2007. The number of samples collected for total coliform analysis was 505. Ten of the samples exceeded the single sample maximum total coliform standard.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005). Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	

Guideline Reference:	041984
Spatial Representation:	Samples were collected from the San Diego HU, at the San Diego River outlet, at Dog Beach, Station id FM-010. Lat/ Long: 32.756700/ -177.251700.
Temporal Representation:	Samples were collected weekly from January 1999 through October 2002, and April 2003 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44291, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Diego HU, at the San Diego River outlet, at Dog Beach

LOE ID:	30413
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	87
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from Samples were collected from Samples were collected weekly from January 1999 through October 2002, and April 2003 through December 2007. The number of samples collected for total coliform analysis was 505 with 87 monthly geomeans calculated. Only one of the geomeans exceeded the geomean water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005). Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the San Diego HU, at the San Diego River outlet, at Dog Beach, Station id FM-010. Lat/ Long: 32.756700/ -177.251700.
Temporal Representation:	Samples were collected weekly from January 1999 through October 2002, and April 2003 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44291, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Diego HU, at the San Diego River outlet, at Dog Beach

LOE ID:	30640
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	465
Number of Exceedances:	57
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 1999 through October 2002, and April 2003 through December 2007. A total of 492 single samples were collected of which 465 are dry weather (AB411) samples with 57 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the San Diego HU, at the San Diego River outlet, at Dog Beach, Station id FM-010. Lat/ Long: 32.756700/ -177.251700.
Temporal Representation:	Samples were collected weekly from January 1999 through October 2002, and April 2003 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44291, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Diego HU, at the San Diego River outlet, at Dog Beach

LOE ID:	30369
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	1501
Number of Exceedances:	310
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	For the 2008 assessment , the 2006 listed coastline 'Pacific Ocean Shoreline, San Diego HU' was split into smaller segments and each represents an area near the sampling location of the data being assessed. This is a copy of the 2006 listing placeholder LOE for Pacific Ocean Shoreline, San Diego HU and is considered by the Regional Board to be applicable

to this more specific segment (at the San Diego River outlet, at Dog Beach) formed from the split.

A total of 1,501 analyses were performed from 1999 through 2003. Of these, there were 75 out of 476 exceedances for enterococcus standards, 56 out of 493 exceedances for single-sample fecal coliform criteria and 96 our of 493 30-day average exceedances. For total coliform, there were 83 out of 532 exceedances. Exceedances occurred during both wet and dry seasons (City of San Diego, 2004).

Data Reference: Placeholder reference 2006 303(d)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: San Diego RWQCB Basin Plan 1994:
Enterococcus: 35 colonies/100 ml (30-day average), 104 colonies per 100 ml (single sample).
Fecal coliform (FC): 200 colonies/100 mL (30-day average), 400 colonies/100mL(single sample).
Total coliform (TC): 1,000 colonies/100 mL (30-day average), 10,000 colonies/100 mL (single sample, FC/TC ratio is <0.1), 1,000 colonies/100mL (single sample, FC/TC ratio is >0.1).

Objective/Criterion Reference: Placeholder reference 2006 303(d)

Evaluation Guideline:
Guideline Reference:

Spatial Representation: San Diego River Mouth (a.k.a. Dog Beach). This site is located on the south side of the mouth of the San Diego River. "Ten stations were monitored at the San Diego River mouth site during this time: one at the sampling site, eight as far as 2,000 ft. to the left, and one 100 ft to the right of the site."

Temporal Representation: Data were available for this assessment from 01/1999 through 10/2003. Samples were collected during both the wet and dry seasons.

Environmental Conditions: There were several sewage spills from 1999 through 2003 that impacted the site. However, there were not enough elevated bacterial levels associated with the spills to reduce the total number of exceedances below the allowable threshold.

Southern California has three distinct weather/hydrological conditions: summer dry weather, winter dry weather, and storm events. The data set used in this analysis includes summer and winter season data. Whether or not storm event samples are included in the data set are not known. For future water quality assessments, the RWQCB may classify bacteria samples as summer dry, winter dry, or storm event samples to ensure adequate representation of all three weather/hydrological conditions.

QAPP Information: QA Info Missing
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 44291, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Diego HU, at the San Diego River outlet, at Dog Beach

LOE ID: 31233

Pollutant: Enterococcus
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 60
Number of Exceedances: 13

Data and Information Type: PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality: Beach monitoring data was collected by the County of San Diego from April 1999 through October 2007. A total of 440 dry month (April through October) single samples were

	collected with 60 dry month geomeans calculated. Thirteen of the 60 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the San Diego HU, at the San Diego River outlet, at Dog Beach, Station id FM-010. Lat/ Long: 32.756700/ -177.251700.
Temporal Representation:	Samples were collected weekly from April 1999 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name:	Pacific Ocean Shoreline, San Dieguito HU, at San Dieguito Lagoon Mouth at Seascape Beach Park
Water Body ID:	**CAC905110002009102621452 9**
Water Body Type:	**Coastal & Bay Shoreline**

DECISION ID 43539 Region 9

Pacific Ocean Shoreline, San Dieguito HU, at San Dieguito Lagoon Mouth at Seascape Beach Park

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Reason for Delisting:	Applicable WQS attained; reason for recovery unspecified
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal from the CWA section 303(d) List under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Thirteen lines of evidence are available in the administrative record to assess this pollutant. With the latest data, zero of 74 geomean samples exceed the water quality objective (WQO) for enterococcus for the protection of REC-1, and 11 of 151 samples exceed the SSM WQO for total coliform for the protection of SHELL.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, zero of 74 geomean samples exceed the water quality objective (WQO) for enterococcus for the protection of REC-1, and 11 of 151 samples exceed the SSM WQO for total coliform for the protection of SHELL and this does not exceed the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be removed from the section 303(d) list because applicable water quality standards for the pollutant are not being exceeded.

Line of Evidence (LOE) for Decision ID 43539, Indicator Bacteria Region 9

Pacific Ocean Shoreline, San Dieguito HU, at San Dieguito Lagoon Mouth at Seascape Beach Park

LOE ID:	31211
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation
Number of Samples:	25
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 91 dry month (April through October) single samples were collected with 25 dry month geomeans calculated. None of the 25 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Seascape Beach Park, San Diego, California. Station identification number is EH-390.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43539, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Dieguito HU, at San Dieguito Lagoon Mouth at Seascape Beach Park

LOE ID:	30371
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Water Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006. For the 2008 assessment , the 2006 listed coastline 'Pacific Ocean Shoreline, San Dieguito HU' was split into smaller segments and each represents an area near the sampling location of the data being assessed. This segment 'Pacific Ocean Shoreline, San Dieguito HU, at San Dieguito Lagoon Mouth at Seascape Beach Park' is one of the sampling locations. This LOE is a copy of the 2006 listing placeholder LOE for Pacific Ocean Shoreline, San Dieguito HU and is considered by the Regional Board to be applicable to this more specific segment

	formed from the split.	041990
Data Reference:	Placeholder reference pre-2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Unspecified	
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:		
Temporal Representation:		
Environmental Conditions:		
QAPP Information:	Unspecified	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43539, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Dieguito HU, at San Dieguito Lagoon Mouth at Seascape Beach Park

LOE ID:	30378
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	26
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 94 single samples were collected with 26 monthly geomeans calculated. None of the 26 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Seascape Beach Park, San Diego, California. Station identification number is EH-390.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43539, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Dieguito HU, at San Dieguito Lagoon Mouth at Seascape Beach Park

LOE ID:	30379
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	94
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 94 single samples were collected with one sample exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Seascape Beach Park, San Diego, California. Station identification number is EH-390.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43539, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Dieguito HU, at San Dieguito Lagoon Mouth at Seascape Beach Park

LOE ID:	30389
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	26
Number of Exceedances:	0

Data and Information Type:	PWS pathogen monitoring (ambient water) 041992
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 94 single samples were collected with 26 monthly geomeans calculated. None of the 26 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Seascape Beach Park, San Diego, California. Station identification number is EH-390.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43539, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Dieguito HU, at San Dieguito Lagoon Mouth at Seascape Beach Park

LOE ID:	30848
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	93
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 94 single samples of which 93 are dry weather (AB411) samples were collected with none of those samples exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).

Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Seascape Beach Park, San Diego, California. Station identification number is EH-390.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43539, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Dieguito HU, at San Dieguito Lagoon Mouth at Seascape Beach Park

LOE ID:	30642
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	93
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 94 single samples were collected of which 93 are dry weather (AB411) samples with one sample exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Seascape Beach Park, San Diego, California. Station identification number is EH-390.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43539, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Dieguito HU, at San Dieguito Lagoon Mouth at Seascape Beach Park

LOE ID:	30372
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 94 single samples were collected with one sample correlated with a storm event. This sample exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005). Comparisons are also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Seascape Beach Park, San Diego, California. Station identification number is EH-390.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43539, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Dieguito HU, at San Dieguito Lagoon Mouth at Seascape Beach Park

LOE ID:	30374
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Shellfish Harvesting	041995
Number of Samples:	94	
Number of Exceedances:	10	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 94 single samples were collected with 10 samples exceeded the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005). Comparisons were also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Seascape Beach Park, San Diego, California. Station identification number is EH-390.	
Temporal Representation:	Samples were collected from January 2004 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43539, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Dieguito HU, at San Dieguito Lagoon Mouth at Seascape Beach Park

LOE ID:	30377
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 94 single samples were collected with one sample correlated with a storm event. No sample exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005). Comparisons are also made for days with matching bacteria and storm event data. A storm event is defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Seascape Beach Park, San Diego, California. Station identification number is EH-390.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43539, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Dieguito HU, at San Dieguito Lagoon Mouth at Seascape Beach Park

LOE ID:	30390
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	64
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 94 single samples were collected with no sample exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at Seascape Beach Park, San Diego, California. Station identification number is EH-390.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43539, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Dieguito HU, at San Dieguito Lagoon Mouth at Seascape Beach Park

LOE ID:	30391
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 94 single samples were collected with 1 sample correlated with a storm event. None exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005). Comparisons were also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Seascape Beach Park, San Diego, California. Station identification number is EH-390.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43539, Indicator Bacteria 041998 Region 9

Pacific Ocean Shoreline, San Dieguito HU, at San Dieguito Lagoon Mouth at Seascape Beach Park

LOE ID:	30417
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	73
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were 73 beach advisory days for this section of shoreline. Bacteriological samples are collected on a weekly basis at ocean and bay locations in San Diego County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that an advisory for waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 - December 2007. Data used was the number of days the beach was advisories were issued when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Spatial Representation:	Beach advisories were posted at San Dieguito River Beach, Del Mar, CA.
Temporal Representation:	The beach advisory covers the time frame of January January 2001 to December 2007.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of San Diego's Quality Assessment/Quality Control document
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43539, Indicator Bacteria Region 9

Pacific Ocean Shoreline, San Dieguito HU, at San Dieguito Lagoon Mouth at Seascape Beach Park

LOE ID:	30383
Pollutant:	Fecal Coliform

LOE Subgroup:	Pollutant-Water	041999
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	55	
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 55 single samples were collected with no sample exceeding the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Seascape Beach Park, San Diego, California. Station identification number is EH-390.	
Temporal Representation:	Samples were collected from January 2004 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43539, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Dieguito HU, at San Dieguito Lagoon Mouth at Seascape Beach Park

LOE ID:	30384
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	16
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 55 single samples were collected and 16 geomeans calculated. None of the 16 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Seascape Beach Park, San Diego, California. Station identification number is EH-390.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43539, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Dieguito HU, at San Dieguito Lagoon Mouth at Seascape Beach Park

LOE ID:	30385
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 55 single samples were collected with no sample correlated with a storm event. No sample exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005). Comparisons are also made only for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	

Guideline Reference:	042001
Spatial Representation:	Samples were collected at Seascape Beach Park, San Diego, California. Station identification number is EH-390.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43539, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Dieguito HU, at San Dieguito Lagoon Mouth at Seascape Beach Park

LOE ID:	77661
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	47
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Zero of the 47 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, San Dieguito HU, at San Dieguito Lagoon Mouth at Seascape Beach Park.
Temporal Representation:	The samples were collected from April 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43539, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Dieguito HU, at San Dieguito Lagoon Mouth at Seascape Beach Park

LOE ID:	75055
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation	042002
Number of Samples:	48	
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Zero of the 48 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at the Seascape Beach Park site.	
Temporal Representation:	Samples were collected from April 2008 to January 2010.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43539, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Dieguito HU, at San Dieguito Lagoon Mouth at Seascape Beach Park

LOE ID:	75056
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	48
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 48 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Seascape Beach Park site.
Temporal Representation:	Samples were collected from April 2008 to January 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43539, Indicator Bacteria 042003 **Region 9**

Pacific Ocean Shoreline, San Dieguito HU, at San Dieguito Lagoon Mouth at Seascape Beach Park

LOE ID:	75057
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	57
Number of Exceedances:	1
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed bw data for Pacific Ocean Shoreline, San Dieguito HU, at San Dieguito Lagoon Mouth at Seascape Beach Park to determine beneficial use support and results are as follows: 1 of 57 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, San Dieguito HU, at San Dieguito Lagoon Mouth at Seascape Beach Park was collected at 1 monitoring site [Seascape Beach Park]
Temporal Representation:	Data was collected over the time period 4/17/2008-8/24/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43539, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Dieguito HU, at San Dieguito Lagoon Mouth at Seascape Beach Park

LOE ID:	75058
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	48
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 48 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Seascape Beach Park site.
Temporal Representation:	Samples were collected from April 2008 to January 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43539, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Dieguito HU, at San Dieguito Lagoon Mouth at Seascape Beach Park

LOE ID:	31209
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	25
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 91 dry month (April through October) single samples were collected with 25 dry month geomeans calculated. None of the 25 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Seascape Beach Park, San Diego, California. Station identification number is EH-390.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43539, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Dieguito HU, at San Dieguito Lagoon Mouth at Seascape Beach Park 042005

LOE ID:	31210
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	15
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 52 dry month (April through October) single samples were collected with 15 dry month geomeans calculated. None of the 15 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Seascape Beach Park, San Diego, California. Station identification number is EH-390.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name:	Pacific Ocean Shoreline, San Dieguito HU, at San Dieguito Lagoon Mouth at San Dieguito River Beach
Water Body ID:	**CAC905110002009102621554 4**
Water Body Type:	**Coastal & Bay Shoreline**

DECISION ID **43899** **Region 9**

Pacific Ocean Shoreline, San Dieguito HU, at San Dieguito Lagoon Mouth at San Dieguito River Beach

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not Delist from 303(d) list (being addressed with USEPA approved TMDL)**
Last Listing Cycle's Final Listing Decision:	Do Not Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
TMDL Name:	Bacteria Impaired Waters I (creeks and beach shorelines)
TMDL Project Code:	169
Date TMDL Approved by USEPA:	06/22/2011
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal from the CWA section 303(d) List under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Fourteen lines of evidence are available in the administrative record to assess this pollutant. With the latest data, 95 of 457 samples exceed the water quality objective for total coliform of a SSM of 230/100ml for the protection of SHELL beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, 95 of 457 samples exceed the water quality objective for total coliform of a SSM of 230/100ml for the protection of SHELL beneficial use and this exceeds the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 43899, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Dieguito HU, at San Dieguito Lagoon Mouth at San Dieguito River Beach

LOE ID:	30386
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water

Matrix:	Water	042007
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	30	
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 183 single samples were collected and 30 geomeans calculated. None of the 30 geomeans exceeded the geomean water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at San Dieguito River Beach, San Diego, California. Station identification number is EH-380.	
Temporal Representation:	Samples were collected from January 2004 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43899, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Dieguito HU, at San Dieguito Lagoon Mouth at San Dieguito River Beach

LOE ID:	30387
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	183
Number of Exceedances:	8
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 183 single samples were collected with 8 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; 042008 Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Dieguito River Beach, San Diego, California. Station identification number is EH-380.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43899, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Dieguito HU, at San Dieguito Lagoon Mouth at San Dieguito River Beach

LOE ID:	30641
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	279
Number of Exceedances:	11
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 286 single samples were collected of which 279 are dry weather (AB411) samples with 11 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Dieguito River Beach, San Diego, California. Station identification number is EH-380.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the

QAPP Information Reference(s):	County of San Diego, Department Public Health Laboratory Quality Assurance Manual. County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43899, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Dieguito HU, at San Dieguito Lagoon Mouth at San Dieguito River Beach

LOE ID:	30380
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	7
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 286 single samples were collected with 7 samples correlated with a storm event. Two of the 7 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005). Comparisons are also made for days with matching bacteria and storm event data. A storm event is defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Dieguito River Beach, San Diego, California. Station identification number is EH-380.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43899, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Dieguito HU, at San Dieguito Lagoon Mouth at San Dieguito River Beach

LOE ID:	30381	042010

Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	44
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 286 single samples were collected with 44 monthly geomeans calculated. Three of the 44 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Dieguito River Beach, San Diego, California. Station identification number is EH-380.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43899, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Dieguito HU, at San Dieguito Lagoon Mouth at San Dieguito River Beach

LOE ID:	30388
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	44
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 287 single samples were collected with 44 monthly geomeans calculated. Two of the 44 geomeans exceeded the geomean water quality

	objective. 042011
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Dieguito River Beach, San Diego, California. Station identification number is EH-380.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43899, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Dieguito HU, at San Dieguito Lagoon Mouth at San Dieguito River Beach

LOE ID:	31221
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	25
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 193 dry month (April through October) single samples were collected with 25 dry month geomeans calculated. Two of the 25 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at San Dieguito River Beach, San Diego, California. Station identification number is EH-380.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43899, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Dieguito HU, at San Dieguito Lagoon Mouth at San Dieguito River Beach

LOE ID:	31226
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	25
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 193 dry month (April through October) single samples were collected with 25 dry month geomeans calculated. One of the 25 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Dieguito River Beach, San Diego, California. Station identification number is EH-380.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43899, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Dieguito HU, at San Dieguito Lagoon Mouth at San Dieguito River Beach

LOE ID:	77660

Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	155
Number of Exceedances:	15
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Fifteen of the 155 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, San Dieguito HU, at San Dieguito Lagoon Mouth at San Dieguito River Beach.
Temporal Representation:	The samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43899, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Dieguito HU, at San Dieguito Lagoon Mouth at San Dieguito River Beach

LOE ID:	75030
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	157
Number of Exceedances:	5
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Five of the 157 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at the San Dieguito Lagoon Mouth site at San Dieguito River Beach.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43899, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Dieguito HU, at San Dieguito Lagoon Mouth at San Dieguito River Beach

LOE ID:	75031
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	156
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 156 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the San Dieguito Lagoon Mouth at San Dieguito River Beach site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43899, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Dieguito HU, at San Dieguito Lagoon Mouth at San Dieguito River Beach

LOE ID:	75053
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	170
Number of Exceedances:	16
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed bw data for Pacific Ocean Shoreline, San Dieguito HU, at San Dieguito Lagoon Mouth at San Dieguito River Beach to determine beneficial use support

	and results are as follows: 16 of 170 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, San Dieguito HU, at San Dieguito Lagoon Mouth at San Dieguito River Beach was collected at 1 monitoring site [San Dieguito River outlet]
Temporal Representation:	Data was collected over the time period 1/9/2008-8/26/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43899, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Dieguito HU, at San Dieguito Lagoon Mouth at San Dieguito River Beach

LOE ID:	75054
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	156
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 156 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Dieguito Lagoon Mouth at San Dieguito River Beach site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43899, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Dieguito HU, at San Dieguito Lagoon Mouth at San Dieguito River Beach

LOE ID:	30370
Pollutant:	Indicator Bacteria

LOE Subgroup:	Pollutant-Water	042016
Matrix:	Water	
Fraction:	Not Recorded	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	0	
Number of Exceedances:	0	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006. For the 2008 assessment , the 2006 listed coastline 'Pacific Ocean Shoreline, San Dieguito HU' was split into smaller segments and each represents an area near the sampling location of the data being assessed. This segment 'Pacific Ocean Shoreline, San Dieguito HU, at San Dieguito Lagoon Mouth at San Dieguito River Beach' is one of the sampling locations. This LOE is a copy of the 2006 listing placeholder LOE for Pacific Ocean Shoreline, San Dieguito HU and is considered by the Regional Board to be applicable to this more specific segment formed from the split.	
Data Reference:	Placeholder reference pre-2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Unspecified	
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:		
Temporal Representation:		
Environmental Conditions:		
QAPP Information:	Unspecified	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43899, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Dieguito HU, at San Dieguito Lagoon Mouth at San Dieguito River Beach

LOE ID:	30741
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	179
Number of Exceedances:	7
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 183 single samples were collected of which 179 are dry weather (AB411) samples with seven samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml;

	Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Dieguito River Beach, San Diego, California. Station identification number is EH-380.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43899, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Dieguito HU, at San Dieguito Lagoon Mouth at San Dieguito River Beach

LOE ID:	30847
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	280
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 287 single samples were collected of which 280 are dry weather (AB411) samples with one of those samples exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Dieguito River Beach, San Diego, California. Station identification number is EH-380.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	

QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43899, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Dieguito HU, at San Dieguito Lagoon Mouth at San Dieguito River Beach

LOE ID:	30382
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	4
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 183 single samples were collected with 4 samples correlated with a storm event. One of the 4 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005). Comparisons are also made only for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Dieguito River Beach, San Diego, California. Station identification number is EH-380.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43899, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Dieguito HU, at San Dieguito Lagoon Mouth at San Dieguito River Beach

LOE ID:	31225
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	16
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from June 2004 through October 2007. A total of 112 dry month (April through October) single samples were collected with 16 dry month geomeans calculated. None of the 16 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Dieguito River Beach, San Diego, California. Station identification number is EH-380.
Temporal Representation:	Samples were collected from June 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43899, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Dieguito HU, at San Dieguito Lagoon Mouth at San Dieguito River Beach

LOE ID:	30373
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	287
Number of Exceedances:	79
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 287 single samples were collected with 79 samples

	exceeded the single sample water quality objective. 042020
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005). Comparisons were also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Dieguito River Beach, San Diego, California. Station identification number is EH-380.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43899, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Dieguito HU, at San Dieguito Lagoon Mouth at San Dieguito River Beach

LOE ID:	30375
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	7
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 287 single samples were collected with 7 samples correlated with a storm event. Four of the 7 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005). Comparisons are also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005.

	Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Dieguito River Beach, San Diego, California. Station identification number is EH-380.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43899, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Dieguito HU, at San Dieguito Lagoon Mouth at San Dieguito River Beach

LOE ID:	30376
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	286
Number of Exceedances:	13
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 286 single samples were collected with 13 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Dieguito River Beach, San Diego, California. Station identification number is EH-380.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43899, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Dieguito HU, at San Dieguito Lagoon Mouth at San Dieguito River Beach 042022

LOE ID:	30416
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	73
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were 73 beach advisory days for this section of shoreline. Bacteriological samples are collected on a weekly basis at ocean and bay locations in San Diego County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that an advisory for waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 - December 2007. Data used was the number of days the beach was advisories were issued when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Spatial Representation:	Beach advisories were posted at San Dieguito River Beach, Del Mar, CA.
Temporal Representation:	The beach advisory covers the time frame of January January 2001 to December 2007.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of San Diego's Quality Assessment/Quality Control document
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43899, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Dieguito HU, at San Dieguito Lagoon Mouth at San Dieguito River Beach

LOE ID:	30392
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	042023
Beneficial Use:	Water Contact Recreation	
Number of Samples:	287	
Number of Exceedances:	2	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 287 single samples were collected with 2 samples exceeding the single sample water quality objective.	
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at San Dieguito River Beach, San Diego, California. Station identification number is EH-380.	
Temporal Representation:	Samples were collected from January 2004 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43899, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Dieguito HU, at San Dieguito Lagoon Mouth at San Dieguito River Beach

LOE ID:	30393
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	7
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 287 single samples were collected with 7 samples correlated with a storm event. One of the 7 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional

	Temperature and Precipitation Listings by Station 042024 Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005). Comparisons were also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at San Dieguito River Beach, San Diego, California. Station identification number is EH-380.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004 County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Loma Alta HSA, Oceanside at Wisconsin Street
Water Body ID: CAC904100002009102521154 2
Water Body Type: Coastal & Bay Shoreline

DECISION ID 44540 Region 9
Pacific Ocean Shoreline, Loma Alta HSA, Oceanside at Wisconsin Street

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Original
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Fifteen lines of evidence are available in the administrative record to assess this pollutant. Including the latest data, one of the 57 samples exceed the water quality objective for enterococcus of a geomean of 35/100ml in a 30-day period for the protection of REC-1.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Including the latest data, one of the 57 samples exceed the water quality objective for enterococcus of a geomean of 35/100ml in a 30-day period for the protection of REC-1 and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 44540, Indicator Bacteria Region 9
Pacific Ocean Shoreline, Loma Alta HSA, Oceanside at Wisconsin Street

LOE ID: 30573

Pollutant: Enterococcus
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 97

Number of Exceedances:	1	042026

Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 100 single samples were collected of which 97 are dry weather (AB411) samples with one sample exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Wisconsin Street, Oceanside, California. Station identification number is EH-490.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44540, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Loma Alta HSA, Oceanside at Wisconsin Street

LOE ID:	30452
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	100
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 100 single samples were collected with two samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental

Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Wisconsin Street, Oceanside, California. Station identification number is EH-490.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44540, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Loma Alta HSA, Oceanside at Wisconsin Street

LOE ID:	30453
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	59
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 59 single samples were collected with one sample exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Wisconsin Street, Oceanside, California. Station identification number is EH-490.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44540, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Loma Alta HSA, Oceanside at Wisconsin Street

LOE ID:	30454	042028
Pollutant:	Fecal Coliform	
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	16	
Number of Exceedances:	1	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 59 single samples were collected and 16 geomeans calculated. One of the 16 geomeans exceeded the geomean water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Wisconsin Street, Oceanside, California. Station identification number is EH-490.	
Temporal Representation:	Samples were collected from January 2004 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44540, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Loma Alta HSA, Oceanside at Wisconsin Street

LOE ID:	30455
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 59 single samples were collected with one sample correlated with a storm event. This sample did not exceed the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.

Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Wisconsin Street, Oceanside, California. Station identification number is EH-490.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44540, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Loma Alta HSA, Oceanside at Wisconsin Street

LOE ID:	30447
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	-N/A
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were no beach advisory days for this section of shoreline. Bacteriological samples are collected on a weekly basis at ocean and bay locations in San Diego County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that an advisory for waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 - December 2007. Data used was the number of days the beach was advisories were issued when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	Department of Environmental Health, Land and Water Quality Division, San Diego County

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Bacteriological monitoring samples were collected at Wisconsin Street on Oceanside City Beach, Oceanside, CA.
Temporal Representation:	The beach advisory covers the time frame of January January 2001 to December 2007.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of San Diego's Quality Assessment/Quality Control document
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44540, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Loma Alta HSA, Oceanside at Wisconsin Street

LOE ID:	30810
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	97
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 100 single samples were collected of which 97 are dry weather (AB411) samples with one sample exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at Wisconsin Street, Oceanside, California. Station identification number is EH-490.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44540, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Loma Alta HSA, Oceanside at Wisconsin Street

LOE ID:	30448
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	3
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 100 single samples were collected with three samples correlated with a storm event. One of the three samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005). Comparisons are also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Wisconsin Street, Oceanside, California. Station identification number is EH-490.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the

QAPP Information Reference(s):	County of San Diego, Department Public Health Laboratory Quality Assurance Manual. County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44540, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Loma Alta HSA, Oceanside at Wisconsin Street

LOE ID:	30449
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	100
Number of Exceedances:	8
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 100 single samples were collected with eight samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Wisconsin Street, Oceanside, California. Station identification number is EH-490.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44540, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Loma Alta HSA, Oceanside at Wisconsin Street

LOE ID:	30450
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	3
Number of Exceedances:	1

Data and Information Type:	PWS pathogen monitoring (ambient water) 042033
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 100 single samples were collected with three samples correlated with a storm event. One of the three samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Wisconsin Street, Oceanside, California. Station identification number is EH-490.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44540, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Loma Alta HSA, Oceanside at Wisconsin Street

LOE ID:	30451
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	25
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 100 single samples were collected with 25 monthly geomeans calculated. One of the 25 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program,

	2007. AB 411 monitoring data 1999 to 2007	042034

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Wisconsin Street, Oceanside, California. Station identification number is EH-490.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44540, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Loma Alta HSA, Oceanside at Wisconsin Street

LOE ID:	30695
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	58
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 59 single samples were collected of which 58 are dry weather (AB411) samples with no sample exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Wisconsin Street, Oceanside, California. Station identification number is EH-490.

Temporal Representation:	Samples were collected from January 2004 through December 2007. 042035
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44540, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Loma Alta HSA, Oceanside at Wisconsin Street

LOE ID:	30456
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	25
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 100 single samples were collected with 25 monthly geomeans calculated. None of the 25 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Wisconsin Street, Oceanside, California. Station identification number is EH-490.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44540, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Loma Alta HSA, Oceanside at Wisconsin Street

LOE ID:	30457
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation
Number of Samples:	100
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 100 single samples were collected with one sample exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Wisconsin Street, Oceanside, California. Station identification number is EH-490.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44540, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Loma Alta HSA, Oceanside at Wisconsin Street

LOE ID:	30458
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 100 single samples were collected with three samples correlated with a storm event. None of the three samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data:	Non-SWAMP	042037
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Wisconsin Street, Oceanside, California. Station identification number is EH-490.	
Temporal Representation:	Samples were collected from January 2004 through December 2007.	
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44540, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Loma Alta HSA, Oceanside at Wisconsin Street

LOE ID:	31342
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	26
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 2002 through October 2007. A total of 101 dry month (April through October) single samples were collected with 26 dry month geomeans calculated. One of the 26 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:	042038
Guideline Reference:	
Spatial Representation:	Samples were collected at Wisconsin Street, Oceanside, California. Station identification number is EH-490.
Temporal Representation:	Samples were collected from July 2002 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44540, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Loma Alta HSA, Oceanside at Wisconsin Street

LOE ID:	31343
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	17
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 2002 through October 2007. A total of 60 dry month (April through October) single samples were collected with 17 dry month geomeans calculated. One of the 17 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Wisconsin Street, Oceanside, California. Station identification number is EH-490.
Temporal Representation:	Samples were collected from July 2002 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44540, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Loma Alta HSA, Oceanside at Wisconsin Street

LOE ID:	31344

Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	26
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 2002 through October 2007. A total of 101 dry month (April through October) single samples were collected with 26 dry month geomeans calculated. Zero of the 26 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Wisconsin Street, Oceanside, California. Station identification number is EH-490.
Temporal Representation:	Samples were collected from July 2002 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44540, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Loma Alta HSA, Oceanside at Wisconsin Street

LOE ID:	74694
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	32
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 32 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.

SWAMP Data:	Non-SWAMP	042040
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at the Wisconsin Street site.	
Temporal Representation:	Samples were collected from January 2008 to October 2009.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44540, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Loma Alta HSA, Oceanside at Wisconsin Street

LOE ID:	74716
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	32
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 32 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Wisconsin Street site.
Temporal Representation:	Samples were collected from January 2008 to October 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44540, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Loma Alta HSA, Oceanside at Wisconsin Street

LOE ID:	74717
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Shellfish Harvesting	042041
Number of Samples:	40	
Number of Exceedances:	0	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed Beach Watch data for Pacific Ocean Shoreline, Loma Alta HSA, Oceanside at Wisconsin Street to determine beneficial use support and results are as follows: 0 of 40 samples exceed the criterion for Coliform, Total.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Loma Alta HSA, Oceanside at Wisconsin Street was collected at 1 monitoring site [Wisconsin Street]	
Temporal Representation:	Data was collected over the time period 4/3/2008-10/29/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44540, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Loma Alta HSA, Oceanside at Wisconsin Street

LOE ID:	74718
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	32
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 32 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Wisconsin Street site.
Temporal Representation:	Samples were collected from January 2008 to October 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.

QAPP Information Reference(s): 042042

Line of Evidence (LOE) for Decision ID 44540, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Loma Alta HSA, Oceanside at Wisconsin Street

LOE ID:	77628
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	32
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Zero of the 32 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, Loma Alta HSA, Oceanside at Wisconsin Street.
Temporal Representation:	The samples were collected from April 2008 through October 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, El Salto HSA, Oceanside at Cassidy Street
Water Body ID: CAC904210002009102522023 2
Water Body Type: Coastal & Bay Shoreline

DECISION ID 44709 Region 9
Pacific Ocean Shoreline, El Salto HSA, Oceanside at Cassidy Street

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for removal from the CWA section 303(d) List under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Fifteen lines of evidence are available in the administrative record to assess this pollutant. Including the latest data, 14 of the 170 samples exceeded the water quality objective for enterococcus of a geomean of 35/100 ml in a 30-day period for the protection of REC-1.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Including the latest data, 14 of the 170 samples exceeded the water quality objective for enterococcus of a geomean of 35/100 ml in a 30-day period for the protection of REC-1 and this does not exceed the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be removed from the section 303(d) list because applicable water quality standards for the pollutant are not being exceeded.

Line of Evidence (LOE) for Decision ID 44709, Indicator Bacteria Region 9
Pacific Ocean Shoreline, El Salto HSA, Oceanside at Cassidy Street

LOE ID: 30459

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Shellfish Harvesting

Number of Samples: 185

Number of Exceedances:	15	042044
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 185 single samples were collected with 15 samples exceeded the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Cassidy Street, Oceanside, California. Station identification number is OC-020.	
Temporal Representation:	Samples were collected from January 2004 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44709, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, El Salto HSA, Oceanside at Cassidy Street

LOE ID:	30460
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	16
Number of Exceedances:	8
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 185 single samples were collected with 16 samples correlated with a storm event. Eight of the16 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005). Comparisons are also made for days with matching bacteria and storm event data. A storm

	event was defined as 0.2 inches of rainfall within a 72 hour period. 042045
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Cassidy Street, Oceanside, California. Station identification number is OC-020.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44709, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, El Salto HSA, Oceanside at Cassidy Street

LOE ID:	30469
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	16
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 185 single samples were collected with 16 samples correlated with a storm event. One of the 16 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	

Guideline Reference:	042046
Spatial Representation:	Samples were collected at Cassidy Street, Oceanside, California. Station identification number is OC-020.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44709, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, El Salto HSA, Oceanside at Cassidy Street

LOE ID:	30468
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	44
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 185 single samples were collected with 44 monthly geomeans calculated. None of the 44 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Cassidy Street, Oceanside, California. Station identification number is OC-020.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44709, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, El Salto HSA, Oceanside at Cassidy Street

LOE ID:	30467
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	-N/A
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were four beach advisory days for this section of shoreline. Bacteriological samples are collected on a weekly basis at ocean and bay locations in San Diego County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that an advisory for waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 - December 2007. Data used was the number of days the beach was advisories were issued when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Bacteriological monitoring samples were collected at Cassidy Street on Oceanside Beach, Oceanside, CA.
Temporal Representation:	The beach advisory covers the time frame of January January 2001 to December 2007.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of San Diego's Quality Assessment/Quality Control document
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44709, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, El Salto HSA, Oceanside at Cassidy Street

LOE ID:	30466
Pollutant:	Fecal Coliform

LOE Subgroup:	Pollutant-Water	042048
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	185	
Number of Exceedances:	5	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 185 single samples were collected with five samples exceeding the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Cassidy Street, Oceanside, California. Station identification number is OC-020.	
Temporal Representation:	Samples were collected from January 2004 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44709, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, El Salto HSA, Oceanside at Cassidy Street

LOE ID:	30805
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	169
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 185 single samples were collected of which 169 are dry weather (AB411) samples with one sample exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Cassidy Street, Oceanside, California. Station identification number is OC-020.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44709, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, El Salto HSA, Oceanside at Cassidy Street

LOE ID:	30569
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	169
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 185 single samples were collected of which 169 are dry weather (AB411) sampleswith two samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Cassidy Street, Oceanside, California. Station identification number is OC-020.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the

QAPP Information Reference(s):	County of San Diego, Department Public Health Laboratory Quality Assurance Manual. County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44709, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, El Salto HSA, Oceanside at Cassidy Street

LOE ID:	31283
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	26
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 2002 through October 2007. A total of 103 dry month (April through October) single samples were collected with 26 dry month geomeans calculated. None of the 26 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Cassidy Street, Oceanside, California. Station identification number is OC-020.
Temporal Representation:	Samples were collected from July 2002 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44709, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, El Salto HSA, Oceanside at Cassidy Street

LOE ID:	31281
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	26	042051
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 2002 through October 2007. A total of 103 dry month (April through October) single samples were collected with 26 dry month geomeans calculated. None of the 26 geomeans exceeded the geomean water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Cassidy Street, Oceanside, California. Station identification number is OC-020.	
Temporal Representation:	Samples were collected from July 2002 through October 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44709, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, El Salto HSA, Oceanside at Cassidy Street

LOE ID:	31280
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	26
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 2002 through October 2007. A total of 103 dry month (April through October) single samples were collected with 26 dry month geomeans calculated. Two of the 26 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).

Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Cassidy Street, Oceanside, California. Station identification number is OC-020.
Temporal Representation:	Samples were collected from July 2002 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44709, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, El Salto HSA, Oceanside at Cassidy Street

LOE ID:	74830
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	126
Number of Exceedances:	12
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Twelve of the 126 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Oceanside, at Cassidy Street site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44709, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, El Salto HSA, Oceanside at Cassidy Street

LOE ID:	74850
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting

Number of Samples:	44
Number of Exceedances:	6
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Beach Watch data for Pacific Ocean Shoreline, El Salto HSA, Oceanside at Cassidy Street to determine beneficial use support and results are as follows: 6 of 44 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, El Salto HSA, Oceanside at Cassidy Street was collected at 1 monitoring site [Cassidy Street]
Temporal Representation:	Data was collected over the time period 1/9/2008-8/9/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44709, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, El Salto HSA, Oceanside at Cassidy Street

LOE ID:	77621
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	126
Number of Exceedances:	13
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Thirteen of the 126 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, El Salto HSA, Oceanside at Cassidy Street.
Temporal Representation:	The samples were collected from January 2008 through August 2010.

Environmental Conditions: 042054
QAPP Information: The samples were collected for the beach watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 44709, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, El Salto HSA, Oceanside at Cassidy Street

LOE ID: 74851

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 126
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Zero of the 126 geomeans exceeded the objective.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at the Oceanside, Cassidy Street site.
Temporal Representation: Samples were collected from January 2008 to August 2010.
Environmental Conditions:
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 44709, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, El Salto HSA, Oceanside at Cassidy Street

LOE ID: 30465

Pollutant: Fecal Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 16
Number of Exceedances: 4

Data and Information Type: PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality: Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 185 single samples were collected with 16 samples correlated with a storm event. Four of the 16 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference: National Weather Service Forecast Office, San Diego, California, Chronological Regional

	Temperature and Precipitation Listings by Station 042055 Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Cassidy Street, Oceanside, California. Station identification number is OC-020.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44709, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, El Salto HSA, Oceanside at Cassidy Street

LOE ID:	74831
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	126
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 126 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Oceanside, Cassidy Street site.

Temporal Representation:	Samples were collected from January 2008 to August 2010.	042056
Environmental Conditions:		
QAPP Information:	The samples were collected for the beach watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44709, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, El Salto HSA, Oceanside at Cassidy Street

LOE ID:	30464
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	44
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 185 single samples were collected and 44 geomeans calculated. None of the 44 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Cassidy Street, Oceanside, California. Station identification number is OC-020.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44709, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, El Salto HSA, Oceanside at Cassidy Street

LOE ID:	30691
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	169	042057
Number of Exceedances:	1	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 185 single samples were collected of which 169 are dry weather (AB411) samples with one sample exceeding the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Cassidy Street, Oceanside, California. Station identification number is OC-020.	
Temporal Representation:	Samples were collected from January 2004 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44709, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, El Salto HSA, Oceanside at Cassidy Street

LOE ID:	30463
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	185
Number of Exceedances:	7
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 185 single samples were collected with seven samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005.

	Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency 042058
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Cassidy Street, Oceanside, California. Station identification number is OC-020.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44709, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, El Salto HSA, Oceanside at Cassidy Street

LOE ID:	30462
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	16
Number of Exceedances:	5
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 185 single samples were collected with 16 samples correlated with a storm event. Five of the 16 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Cassidy Street, Oceanside, California. Station identification number is OC-020.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach

	monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44709, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, El Salto HSA, Oceanside at Cassidy Street

LOE ID:	30461
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	44
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 185 single samples were collected with 44 monthly geomeans calculated. Two of the 44 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Cassidy Street, Oceanside, California. Station identification number is OC-020.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44709, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, El Salto HSA, Oceanside at Cassidy Street

LOE ID:	30470
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water

Matrix:	Water	042060
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	185	
Number of Exceedances:	2	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 185 single samples were collected with two samples exceeding the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Cassidy Street, Oceanside, California. Station identification number is OC-020.	
Temporal Representation:	Samples were collected from January 2004 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Loma Alta HSA, at Loma Alta Creek mouth
Water Body ID: CAC904100002009110417114 0
Water Body Type: Coastal & Bay Shoreline

DECISION ID 43811 Region 9
Pacific Ocean Shoreline, Loma Alta HSA, at Loma Alta Creek mouth

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Natural Sources | Nonpoint Source | Point Source | Source Unknown
Expected TMDL Completion Date:	2019
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal from the CWA section 303(d) List under section 4.2 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. Based on the place holder LOE, this water body is a split segment of a water body previously demonstrated impaired for indicator bacteria. No new information is available to demonstrate improvement of water quality at this segment.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3.Based on the place holder LOE, this water body is a split segment of a water body previously demonstrated impaired for indicator bacteria. No new information is available to demonstrate improvement of water quality at this segment.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 43811, Indicator Bacteria Region 9
Pacific Ocean Shoreline, Loma Alta HSA, at Loma Alta Creek mouth

LOE ID:	30472
Pollutant:	Indicator Bacteria
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded

Beneficial Use:	Water Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006. For the 2008 assessment , the 2006 listed coastline 'Pacific Ocean Shoreline, Loma Alta HSA' was split into smaller segments and each represents an area near the sampling location of the data being assessed. This segment 'Pacific Ocean Shoreline, Loma Alta HSA, Oceanside at Loma Alta Creek mouth' is one of the sampling locations. This LOE is a copy of the 2006 listing placeholder LOE for Pacific Ocean Shoreline, Loma Alta HSA and is considered by the Regional Board to be applicable to this more specific segment formed from the split.
Data Reference:	Placeholder reference pre-2006 303(d)
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Unspecified
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	
Temporal Representation:	
Environmental Conditions:	
QAPP Information:	Unspecified
QAPP Information Reference(s):	

DECISION ID 49825 Region 9

Pacific Ocean Shoreline, Loma Alta HSA, at Loma Alta Creek mouth

Pollutant:	**Trash**
Final Listing Decision:	**List on 303(d) list (being addressed by action other than TMDL)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected Attainment Date:	2029
Implementation Action Other than TMDL:	Collected effort of public, agencies, organizations, and permittees. Methods include street sweeping, education programs on littering, installation of trash-catching devices on storm drains.
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.7 of the Listing Policy. Under this section when all other listing factors do not result in the listing of a water segment but information indicates non-attainment of standards, a water segment shall be evaluated to determine whether the weight of evidence demonstrates that water quality standard is not attained. If the weight of evidence indicates non-attainment, the water segment shall be placed on the CWA section 303(d) List. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for placing this water segment-pollutant combination from the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The following information indicates that the water quality standard is not being attained: Coastkeeper cleanups occurred on 6/9/07,6/14/08, 6/13/09 and 6/12/10 for this water body. The total weight of trash

(lbs) collected on these dates was 1,028.8. However, using the metric, Coastkeeper classified this water body as severe for trash impairment. However, any trash found is an exceedance and needs to be addressed by an action other than a TMDL.
3. This process is scientifically defensible and reproducible.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 49825, Trash **Region 9**

Pacific Ocean Shoreline, Loma Alta HSA, at Loma Alta Creek mouth

LOE ID:	74689
Pollutant:	Trash
LOE Subgroup:	Pollutant-Nuisance
Matrix:	Not Recorded
Fraction:	None
Beneficial Use:	Non-Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Occurrence of conditions judged to cause impairment
Data Used to Assess Water Quality:	The San Diego Coastkeeper conducts trash cleanups and uses a metric (pounds of trash collected per volunteer) to compare levels of trash across beaches and categorizes beaches as either low, medium, high or severe, based on this metric. Coastkeeper cleanups occurred on 6/9/07,6/14/08, 6/13/09 and 6/12/10 for this water body. The total weight of trash (lbs) collected on these dates was 1,028.8. However, using the metric, Coastkeeper classified this water body as severe for trash impairment.
Data Reference:	Data for Trash, Nutrients, and Pathogens in Region 9, 2007-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Floating Material Waters shall not contain floating material, including solids, liquids, foams, and scum in concentrations which cause nuisance or adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Oceanside - Buccanneer Beach.
Temporal Representation:	Four cleanups that occurred on 6/9/07,6/14/08, 6/13/09 and 6/12/10.
Environmental Conditions:	
QAPP Information:	San Diego Coastkeeper QAPP provided.
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Batiquitos HSA, at Moonlight State Beach (Cottonwood Creek outlet)
Water Body ID: CAC904510002009102614290 8
Water Body Type: Coastal & Bay Shoreline

DECISION ID 43762 Region 9
Pacific Ocean Shoreline, Batiquitos HSA, at Moonlight State Beach (Cottonwood Creek outlet)

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not Delist from 303(d) list (being addressed with USEPA approved TMDL)**
Last Listing Cycle's Final Listing Decision:	Do Not Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
TMDL Name:	Bacteria Impaired Waters I (creeks and beach shorelines)
TMDL Project Code:	169
Date TMDL Approved by USEPA:	06/22/2011
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal on the CWA section 303(d) List under sections 2.2 and [SECTION] of the Listing Policy. Under [SECTION] of the Policy, a minimum of one line of evidence is needed to assess listing status.

Fifteen lines of evidence are available in the administrative record to assess this pollutant.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List. There is sufficient justification to place it in the Being Addressed portion of the CWA 303(d) List because a TMDL has been completed and approved by RWQCB and USEPA, and is expected to result in attainment of the standard.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
3. With the latest data, 99 of 427 samples and 59 of 155 samples exceed the water quality objectives for total coliform of a single sample maximum of 230/100ml and of a geomean in a 30-day period of 70/100 ml, respectively, and these exceed the allowable frequency listed in Table 4.2 of the Listing Policy.
4. The Bacteria TMDL for 20 beaches and creeks was approved by USEPA on 06/22/2011.
5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 43762, Indicator Bacteria Region 9
Pacific Ocean Shoreline, Batiquitos HSA, at Moonlight State Beach (Cottonwood Creek outlet)

LOE ID:	30474
Pollutant:	Indicator Bacteria

LOE Subgroup:	Pollutant-Water	042065
Matrix:	Water	
Fraction:	Not Recorded	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	0	
Number of Exceedances:	0	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006. For the 2008 assessment , the 2006 listed coastline 'Pacific Ocean Shoreline, San Marcos HA' was renamed Batiquitos HSA and was split into smaller segments that each represent an area near the sampling location of the data being assessed. This segment 'Pacific Ocean Shoreline, Batiquitos HSA, at Moonlight State Beach (Cottonwood Creek outlet)' is one of the sampling locations. This LOE is a copy of the 2006 listing placeholder LOE for Pacific Ocean Shoreline, San Marcos HA and is considered by the Regional Board to be applicable to this more specific segment formed from the split.	
Data Reference:	Placeholder reference pre-2006 303(d)	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Unspecified	
Objective/Criterion Reference:	Placeholder reference pre-2006 303(d)	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:		
Temporal Representation:		
Environmental Conditions:		
QAPP Information:	Unspecified	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43762, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at Moonlight State Beach (Cottonwood Creek outlet)

LOE ID:	77585
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	155
Number of Exceedances:	59
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Fifty nine of the 155 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the

objectives were taken. 042066

Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: The samples were collected at Pacific Ocean Shoreline, Batiquitos HSA, at Moonlight State Beach (Cottonwood Creek outlet).

Temporal Representation: The samples were collected from January 2008 through August 2010.

Environmental Conditions:

QAPP Information: The samples were collected for the beach watch program.

QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 43762, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at Moonlight State Beach (Cottonwood Creek outlet)

LOE ID: 30477

Pollutant: Enterococcus
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 38
Number of Exceedances: 1

Data and Information Type: PWS pathogen monitoring (ambient water)

Data Used to Assess Water Quality: Beach monitoring data was collected by the County of San Diego from March 2004 through December 2007. A total of 258 single samples were collected with 38 monthly geomeans calculated. One of the 38 geomeans exceeded the geomean water quality objective.

Data Reference: Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: Geomean: Enterococcus density shall not exceed 35 per 100 ml.

Objective/Criterion Reference: Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Moonlight State Beach (Cottonwood Creek outlet), San Diego, California. Department of Environmental Health identification number is EH-420.

Temporal Representation: Samples were collected from March 2004 through December 2007.

Environmental Conditions:

QAPP Information: Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.

QAPP Information Reference(s): County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43762, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at Moonlight State Beach (Cottonwood Creek outlet)

LOE ID: 30480

Pollutant: Fecal Coliform
LOE Subgroup: Pollutant-Water

Matrix:	Water	042067
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	29	
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from March 2004 through December 2007. A total of 166 single samples were collected and 29 geomeans calculated. None of the 29 geomeans exceeded the geomean water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml;	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Moonlight State Beach (Cottonwood Creek outlet), San Diego, California. Department of Environmental Health identification number is EH-420.	
Temporal Representation:	Samples were collected from March 2004 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43762, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at Moonlight State Beach (Cottonwood Creek outlet)

LOE ID:	30481
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	166
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from March 2004 through December 2007. A total of 166 single samples were collected with three samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental

Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Moonlight State Beach (Cottonwood Creek outlet), San Diego, California. Department of Environmental Health identification number is EH-420.
Temporal Representation:	Samples were collected from March 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43762, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at Moonlight State Beach (Cottonwood Creek outlet)

LOE ID:	30482
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	3
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from March 2004 through December 2007. A total of 166 single samples were collected with three samples correlating with a storm event. One of the three samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Moonlight State Beach (Cottonwood Creek outlet), San Diego, California. Department of Environmental Health identification number is EH-420.
Temporal Representation:	Samples were collected from March 2004 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.

QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43762, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at Moonlight State Beach (Cottonwood Creek outlet)

LOE ID:	30483
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	-N/A
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	78
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there were and 78 beach advisory days for this section of shoreline. Bacteriological samples are collected on a weekly basis at ocean and bay locations in San Diego County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that an advisory for waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 - December 2007. Data used was the number of days the beach was advisories were issued when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Bacteriological monitoring samples were collected at Moonlight beach in Encinitas, CA.
Temporal Representation:	The beach advisory covers the time frame of January January 2001 to December 2007.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of San Diego's Quality Assessment/Quality Control document
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43762, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at Moonlight State Beach (Cottonwood Creek outlet)

LOE ID:	30484	042070

Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from March 2004 through December 2007. A total of 258 single samples were collected with five samples correlating with a storm event. None of the five samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Moonlight State Beach (Cottonwood Creek outlet), San Diego, California. Department of Environmental Health identification number is EH-420.
Temporal Representation:	Samples were collected from March 2004 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43762, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at Moonlight State Beach (Cottonwood Creek outlet)

LOE ID:	30486
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	38	042071
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from March 2004 through December 2007. A total of 258 single samples were collected with 38 monthly geomeans calculated. None of the 38 geomeans exceeded the geomean water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml;	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Moonlight State Beach (Cottonwood Creek outlet), San Diego, California. Department of Environmental Health identification number is EH-420.	
Temporal Representation:	Samples were collected from March 2004 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43762, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at Moonlight State Beach (Cottonwood Creek outlet)

LOE ID:	31246
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	20
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 2002 through October 2007. A total of 124 dry month (April through October) single samples were collected with 20 dry month geomeans calculated. None of the 20 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at Moonlight State Beach (Cottonwood Creek outlet), San Diego, California. Department of Environmental Health identification number is EH-420.
Temporal Representation:	Samples were collected from July 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43762, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at Moonlight State Beach (Cottonwood Creek outlet)

LOE ID:	31247
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	26
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 2002 through October 2007. A total of 202 dry month (April through October) single samples were collected with 26 dry month geomeans calculated. None of the 26 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Moonlight State Beach (Cottonwood Creek outlet), San Diego, California. Department of Environmental Health identification number is EH-420.
Temporal Representation:	Samples were collected from July 2002 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43762, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at Moonlight State Beach (Cottonwood Creek outlet)

LOE ID:	31245
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation	042073
Number of Samples:	26	
Number of Exceedances:	1	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from July 2002 through October 2007. A total of 202 dry month (April through October) single samples were collected with 26 dry month geomeans calculated. 1 of the 26 geomeans exceeded the geomean water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml.	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Moonlight State Beach (Cottonwood Creek outlet), San Diego, California. Department of Environmental Health identification number is EH-420.	
Temporal Representation:	Samples were collected from July 2002 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43762, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at Moonlight State Beach (Cottonwood Creek outlet)

LOE ID:	30475
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	5
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from March 2004 through December 2007. A total of 258 single samples were collected with five samples correlating with a storm event. Two of the five samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).

Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Moonlight State Beach (Cottonwood Creek outlet), San Diego, California. Department of Environmental Health identification number is EH-420.
Temporal Representation:	Samples were collected from March 2004 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43762, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at Moonlight State Beach (Cottonwood Creek outlet)

LOE ID:	30485
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	258
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from March 2004 through December 2007. A total of 258 single samples were collected with two samples exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Moonlight State Beach (Cottonwood Creek outlet), San Diego, California. Department of Environmental Health identification number is EH-420.
Temporal Representation:	Samples were collected from March 2004 through December 2007.
Environmental Conditions:	

QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43762, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at Moonlight State Beach (Cottonwood Creek outlet)

LOE ID:	30792
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	253
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from March 2004 through December 2007. A total of 258 single samples were collected of which 253 are dry weather (AB411) samples with two samples exceeding the single sample water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Moonlight State Beach (Cottonwood Creek outlet), San Diego, California. Department of Environmental Health identification number is EH-420.
Temporal Representation:	Samples were collected from March 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43762, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at Moonlight State Beach (Cottonwood Creek outlet)

LOE ID:	30556
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	253	042076
Number of Exceedances:	20	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from March 2004 through December 2007. A total of 258 single samples were collected of which 253 are dry weather (AB411) samples with 20 samples exceeding the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Moonlight State Beach (Cottonwood Creek outlet), San Diego, California. Department of Environmental Health identification number is EH-420.	
Temporal Representation:	Samples were collected from March 2004 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43762, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at Moonlight State Beach (Cottonwood Creek outlet)

LOE ID:	74552
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	156
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 156 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Cottonwood Creek outlet site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.

QAPP Information Reference(s): 042077

Line of Evidence (LOE) for Decision ID 43762, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at Moonlight State Beach (Cottonwood Creek outlet)

LOE ID:	74553
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	156
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 156 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Cottonwood Creek outlet site.
Temporal Representation:	Samples were collected approximately once a week from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43762, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at Moonlight State Beach (Cottonwood Creek outlet)

LOE ID:	74554
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	169
Number of Exceedances:	19
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed BW data for Pacific Ocean Shoreline, Batiquitos HSA, at Moonlight State Beach (Cottonwood Creek outlet) to determine beneficial use support and results are as follows: 19 of 169 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100

mL. 042078

Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Data for this line of evidence for Pacific Ocean Shoreline, Batiquitos HSA, at Moonlight State Beach (Cottonwood Creek outlet) was collected at 1 monitoring site [Cottonwood Creek outlet]
Temporal Representation: Data was collected over the time period Jauary 2008 through August 2010.
Environmental Conditions: Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 43762, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at Moonlight State Beach (Cottonwood Creek outlet)

LOE ID: 74555

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 156
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Zero of the 156 geomeans exceeded the objective.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at the Cottonwood Creek outlet site.
Temporal Representation: Samples were collected from January 2008 to August 2010.
Environmental Conditions:
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 43762, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at Moonlight State Beach (Cottonwood Creek outlet)

LOE ID: 30678

Pollutant: Fecal Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 163

Number of Exceedances:	2	042079
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from March 2004 through December 2007. A total of 166 single samples were collected of which 163 are dry weather (AB411) samples with two samples exceeding the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Moonlight State Beach (Cottonwood Creek outlet), San Diego, California. Department of Environmental Health identification number is EH-420.	
Temporal Representation:	Samples were collected from March 2004 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43762, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at Moonlight State Beach (Cottonwood Creek outlet)

LOE ID:	30478
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	5
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from March 2004 through December 2007. A total of 258 single samples were collected with five samples correlating with a storm event. One of the five samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Moonlight State Beach (Cottonwood Creek outlet), San Diego, California. Department of Environmental Health identification number is EH-420.
Temporal Representation:	Samples were collected from March 2004 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43762, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at Moonlight State Beach (Cottonwood Creek outlet)

LOE ID:	30479
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	258
Number of Exceedances:	21
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from March 2004 through December 2007. A total of 258 single samples were collected with 21 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Moonlight State Beach (Cottonwood Creek outlet), San Diego, California. Department of Environmental Health identification number is EH-420.
Temporal Representation:	Samples were collected from March 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43762, Indicator Bacteria 042081 **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at Moonlight State Beach (Cottonwood Creek outlet)

LOE ID:	30476
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	258
Number of Exceedances:	80
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from March 2004 through December 2007. A total of 258 single samples were collected with 80 samples exceeded the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Moonlight State Beach (Cottonwood Creek outlet), San Diego, California. Department of Environmental Health identification number is EH-420.
Temporal Representation:	Samples were collected from March 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

DECISION ID 49675 **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at Moonlight State Beach (Cottonwood Creek outlet)

Pollutant:	**Trash**
Final Listing Decision:	**List on 303(d) list (being addressed by action other than TMDL)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected Attainment Date:	2029
Implementation Action Other than TMDL:	Collected effort of public, agencies, organizations, and permittees. Methods include street sweeping, education programs on littering, installation of trash-catching devices on storm drains.
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.7 of the Listing Policy. Under this section when all other listing factors do not result in the listing of a water segment but information indicates non-attainment of standards, a water segment shall be evaluated to

determine whether the weight of evidence demonstrates that water quality standard is not attained. If the weight of evidence indicates non-attainment, the water segment shall be placed on the CWA section 303(d) List.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for placing this water segment-pollutant combination from the CWA section 303(d) List. This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The following information indicates that the water quality standard is not being attained: Coastkeeper cleanups occurred on 1/13/07, 1/12/08, 1/10/09, 2/19/10, and 7/17/10 for this water body. The total weight of trash (lbs) collected on these dates was 1,143, using the metric, Coastkeeper classified this water body as high for trash impairment However, any trash found is an exceedance and needs to be addressed by an action other than a TMDL.
3. This process is scientifically defensible and reproducible.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 49675, Trash **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at Moonlight State Beach (Cottonwood Creek outlet)

LOE ID:	74556
Pollutant:	Trash
LOE Subgroup:	Pollutant-Nuisance
Matrix:	Not Recorded
Fraction:	None
Beneficial Use:	Non-Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Occurrence of conditions judged to cause impairment
Data Used to Assess Water Quality:	The San Diego Coastkeeper conducts trash cleanups and uses a metric (pounds of trash collected per volunteer) to compare levels of trash across beaches and categorizes beaches as either low, medium, high or severe, based on this metric. Coastkeeper cleanups occurred on 1/13/07, 1/12/08, 1/10/09, 2/19/10, and 7/17/10 for this water body. The total weight of trash (lbs) collected on these dates was 1,143. However, using the metric, Coastkeeper classified this water body as high for trash impairment.
Data Reference:	Data for Trash, Nutrients, and Pathogens in Region 9, 2007-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Floating Material Waters shall not contain floating material, including solids, liquids, foams, and scum in concentrations which cause nuisance or adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Encinitas - Moonlight Beach.
Temporal Representation:	Five cleanups that occurred on 1/13/07, 1/12/08, 1/10/09, 2/19/10, and 7/17/10.
Environmental Conditions:	
QAPP Information:	San Diego Coastkeeper QAPP was provided.
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Coronado HA, at NASNI Beach/North Beach C
Water Body ID: CAC910100002009111611041 6
Water Body Type: Coastal & Bay Shoreline

DECISION ID 44567 **Region 9**
Pacific Ocean Shoreline, Coronado HA, at NASNI Beach/North Beach C

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Fifteen lines of evidence are available in the administrative record to assess this pollutant. Including the latest data, zero of the 15 samples exceed the water quality objective for enterococcus of a geomean of 35/100ml in a 30-day period for the protection of REC-1.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Including the latest data, zero of the 15 samples exceed the water quality objective for enterococcus of a geomean of 35/100ml in a 30-day period for the protection of REC-1 and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 44567, Indicator Bacteria **Region 9**
Pacific Ocean Shoreline, Coronado HA, at NASNI Beach/North Beach C

LOE ID: 30493

Pollutant: Enterococcus
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 311

Number of Exceedances:	2	042084
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 311 single samples were collected with 2 samples exceeding the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at NASNI Beach/North Beach "C" Coronado, California. Station identification number is EH-062.	
Temporal Representation:	Samples were collected from January 2004 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 44567, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at NASNI Beach/North Beach C

LOE ID:	74615
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	176
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 176 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the NASNI Beach/North Beach "C" site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	

QAPP Information:	The samples were collected for the Beach Watch program.	042085
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44567, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at NASNI Beach/North Beach C

LOE ID:	30684
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	188
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 194 single samples were collected of which 188 are dry weather (AB411) samples with no sample exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at NASNI Beach/North Beach "C" Coronado, California. Station identification number is EH-062.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44567, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at NASNI Beach/North Beach C

LOE ID:	30492
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	6

Number of Exceedances:	0	042086

Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 194 single samples were collected with 6 samples correlated with a storm event. None of the 6 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at NASNI Beach/North Beach "C" Coronado, California. Station identification number is EH-062.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44567, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at NASNI Beach/North Beach C

LOE ID:	30494
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 311 single samples were collected with 6 samples correlated with a storm event. None of the 6 samples exceeded the single sample water

	quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at NASNI Beach/North Beach "C" Coronado, California. Station identification number is EH-062.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44567, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at NASNI Beach/North Beach C

LOE ID:	30488
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	6
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 311 single samples were collected with 6 samples correlated with a storm event. One of the 6 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program,

	2007. AB 411 monitoring data 1999 to 2007	042088

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005). Comparisons are also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at NASNI Beach/North Beach "C", Coronado, California. Station identification number is EH-062.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44567, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at NASNI Beach/North Beach C

LOE ID:	30489
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	311
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 311 single samples were collected with no sample exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental

Protection Agency 042089

Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at NASNI Beach/North Beach "C" Coronado, California. Station identification number is EH-062.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44567, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at NASNI Beach/North Beach C

LOE ID:	31265
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	26
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 2004 through October 2007. A total of 184 dry month (April through October) single samples were collected with 26 dry month geomeans calculated. None of the 26 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at NASNI Beach/North Beach "C" Coronado, California. Station identification number is EH-062.
Temporal Representation:	Samples were collected from April 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44567, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at NASNI Beach/North Beach C

LOE ID:	31264
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 2004 through October 2007. A total of 105 dry month (April through October) single samples were collected with 17 dry month geomeans calculated. None of the 17 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at NASNI Beach/North Beach "C" Coronado, California. Station identification number is EH-062.
Temporal Representation:	Samples were collected from April 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44567, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at NASNI Beach/North Beach C

LOE ID:	31263
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	26
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 2004 through October 2007. A total of 184 dry month (April through October) single samples were collected with 26 dry month geomeans calculated. None of the 26 geomeans exceeded the

	geomean water quality objective. 042091
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at NASNI Beach/North Beach "C", Coronado, California. Station identification number is EH-062.
Temporal Representation:	Samples were collected from April 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44567, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at NASNI Beach/North Beach C

LOE ID:	30498
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there was one beach advisory days for this section of shoreline. Bacteriological samples are collected on a weekly basis at ocean and bay locations in San Diego County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that an advisory for waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 - December 2007. Data used was the number of days the beach was advisories were issued when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	Department of Environmental Health, Land and Water Quality Division. San Diego County Beach Closure and Advisory Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the

	Department, after taking into consideration the causes therefor, may at his or her discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Spatial Representation:	Bacteriological monitoring samples were collected at Naval Air Station North Island, North Beach C, Coronado, CA.
Temporal Representation:	The beach advisory covers the time frame of January January 2001 to December 2007.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of San Diego's Quality Assessment/Quality Control document
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44567, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at NASNI Beach/North Beach C

LOE ID:	30497
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	45
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 311 single samples were collected with 45 monthly geomeans calculated. None of the 45 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at NASNI Beach/North Beach "C", Coronado, California. Station identification number is EH-062.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.

QAPP Information Reference(s): County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44567, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at NASNI Beach/North Beach C

LOE ID: 30496

Pollutant: Fecal Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 31
Number of Exceedances: 0

Data and Information Type: PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality: Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 194 single samples were collected and 31 geomeans calculated. None of the 31 geomeans exceeded the geomean water quality objective.
Data Reference: Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: Geomean; Fecal coliform density shall not exceed 200 per 100 ml;

Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference: Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at NASNI Beach/North Beach "C" Coronado, California. Station identification number is EH-062.
Temporal Representation: Samples were collected from January 2004 through December 2007.
Environmental Conditions:
QAPP Information: Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s): County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44567, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at NASNI Beach/North Beach C

LOE ID: 30491

Pollutant: Fecal Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 194
Number of Exceedances: 0

Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 194 single samples were collected with no sample exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at NASNI Beach/North Beach "C" Coronado, California. Station identification number is EH-062.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44567, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at NASNI Beach/North Beach C

LOE ID:	30490
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 311 single samples were collected with 6 samples correlated with a storm event. None of the 6 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml

	(SWRCB, 2005). 042095
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at NASNI Beach/North Beach "C" Coronado, California. Station identification number is EH-062.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44567, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at NASNI Beach/North Beach C

LOE ID:	77595
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	176
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	None of the 176 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, Coronado HA, at NASNI Beach/North Beach C.
Temporal Representation:	The samples were collected from January 2008 through August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44567, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at NASNI Beach/North Beach C

LOE ID:	30487
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	311
Number of Exceedances:	6
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 311 single samples were collected with 6 samples exceeded the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at NASNI Beach/North Beach "C" Coronado, California. Station identification number is EH-062.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44567, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at NASNI Beach/North Beach C

LOE ID:	74611
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	190
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed BW data for Pacific Ocean Shoreline, Coronado HA, at NASNI Beach/North Beach C to determine beneficial use support and results are as follows: 0 of

	190 samples exceed the criterion for Coliform, Total.	042097
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Coronado HA, at NASNI Beach/North Beach C was collected at 1 monitoring site [NASNI beach / North Bch 'C']	
Temporal Representation:	Data was collected over the time period 1/3/2008-8/26/2010.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44567, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at NASNI Beach/North Beach C

LOE ID:	74610
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	158
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 158 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the NASNI Beach/North Beach "C" site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44567, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at NASNI Beach/North Beach C

LOE ID:	74609
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water

Matrix:	Water	042098
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	176	
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Zero of the 176 geomeans exceeded the objective.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at the NASNI Beach/North Beach "C" site.	
Temporal Representation:	Samples were collected from January 2008 to August 2010.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44567, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at NASNI Beach/North Beach C

LOE ID:	30563
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	305
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 311 single samples were collected of which 305 are dry weather samples (AB411) with 2 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at NASNI Beach/North Beach "C" Coronado, California. Station identification number is EH-062.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44567, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at NASNI Beach/North Beach C

LOE ID:	30495
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	44
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 311 single samples were collected with 44 monthly geomeans calculated. None of the 44 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at NASNI Beach/North Beach "C" Coronado, California. Station identification number is EH-062.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 44567, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at NASNI Beach/North Beach C

LOE ID:	30798
Pollutant:	Total Coliform

LOE Subgroup:	Pollutant-Water	042100
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	305	
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 311 single samples were collected of which 305 are dry weather (AB411) samples with no sample exceeding the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at NASNI Beach/North Beach "C" Coronado, California. Station identification number is EH-062.	
Temporal Representation:	Samples were collected from January 2004 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Coronado HA, at Navy Fence/Ocean Blvd
Water Body ID: CAC910100002009110323233 0
Water Body Type: Coastal & Bay Shoreline

DECISION ID 43583 **Region 9**
Pacific Ocean Shoreline, Coronado HA, at Navy Fence/Ocean Blvd

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Fifteen lines of evidence are available in the administrative record to assess this pollutant. Including the latest data, two of the 229 samples exceed the water quality objective for enterococcus of a geomean of 35/100 ml in a 30-day period for the protection of REC-1 beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Including the latest data, two of the 229 samples exceed the water quality objective for enterococcus of a geomean of 35/100 ml in a 30-day period for the protection of REC-1 beneficial use and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 43583, Indicator Bacteria **Region 9**
Pacific Ocean Shoreline, Coronado HA, at Navy Fence/Ocean Blvd

LOE ID: 74616

Pollutant: Enterococcus
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 180

Number of Exceedances:	0	042102

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Zero of the 180 geomeans exceeded the objective.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at the Navy Fence/Ocean Blvd site.
Temporal Representation: Samples were collected from January 2008 to August 2010.
Environmental Conditions:
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 43583, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Navy Fence/Ocean Blvd

LOE ID: 74617

Pollutant: Fecal Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 164
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Zero of the 164 geomeans exceeded the objective.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at the Navy Fence/Ocean Blvd site.
Temporal Representation: Samples were collected from January 2008 to August 2010.
Environmental Conditions:
QAPP Information: The samples were collected for the beach watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 43583, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Navy Fence/Ocean Blvd

LOE ID: 74618

Pollutant: Total Coliform

LOE Subgroup:	Pollutant-Water	042103
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Shellfish Harvesting	
Number of Samples:	193	
Number of Exceedances:	3	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed BW data for Pacific Ocean Shoreline, Coronado HA, at Navy Fence/Ocean Blvd to determine beneficial use support and results are as follows: 3 of 193 samples exceed the criterion for Coliform, Total.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Coronado HA, at Navy Fence/Ocean Blvd was collected at 1 monitoring site [Navy Fence (A)]	
Temporal Representation:	Data was collected over the time period 1/3/2008-8/26/2010.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43583, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Navy Fence/Ocean Blvd

LOE ID:	74619
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	179
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 179 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Navy Fence/Ocean Blvd site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.

Environmental Conditions: 042104
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 43583, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Navy Fence/Ocean Blvd

LOE ID: 77596

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Shellfish Harvesting

Number of Samples: 180
Number of Exceedances: 0

Data and Information Type: PATHOGEN MONITORING
Data Used to Assess Water Quality: None of the 180 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: The samples were collected at Pacific Ocean Shoreline, Coronado HA, at Navy Fence/Ocean Blvd.
Temporal Representation: The samples were collected from January 2008 through August 2010.
Environmental Conditions:
QAPP Information: The samples were collected for the beach watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 43583, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Navy Fence/Ocean Blvd

LOE ID: 30506

Pollutant: Enterococcus
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 335
Number of Exceedances: 18

Data and Information Type: PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality: Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 335 single samples were collected with 18 samples

exceeding the single sample water quality objective. 042105

Data Reference: Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: Geomean: Enterococcus density shall not exceed 35 per 100 ml.

Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).

Objective/Criterion Reference: Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Navy Fence/Ocean Blvd., Coronado, California. Station identification number is EH-060.

Temporal Representation: Samples were collected from January 2004 through December 2007.

Environmental Conditions:

QAPP Information: Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.

QAPP Information Reference(s): County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43583, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Navy Fence/Ocean Blvd

LOE ID: 30507

Pollutant: Enterococcus
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 19
Number of Exceedances: 13

Data and Information Type: PWS pathogen monitoring (ambient water)

Data Used to Assess Water Quality: Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 335 single samples were collected with 19 samples correlated with a storm event. Thirteen of the 19 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.

Data Reference: National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: Geomean: Enterococcus density shall not exceed 35 per 100 ml.

Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).

Comparisons are also made for days with matching bacteria and storm event data. A storm event is defined as 0.2 inches of rainfall within a 72 hour period.

Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Navy Fence/Ocean Blvd., Coronado, California. Station identification number is EH-060.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43583, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Navy Fence/Ocean Blvd

LOE ID:	30508
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	44
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 335 single samples were collected with 44 monthly geomeans calculated. None of the 44 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Navy Fence/Ocean Blvd., Coronado, California. Station identification number is EH-060.
Temporal Representation:	Samples were collected from January 2004 through December 2007.

Environmental Conditions:	042107
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43583, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Navy Fence/Ocean Blvd

LOE ID:	31266
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	26
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 2004 through October 2007. A total of 190 dry month (April through October) single samples were collected with 26 dry month geomeans calculated. None of the 26 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Navy Fence/Ocean Blvd., Coronado, California. Station identification number is EH-060.
Temporal Representation:	Samples were collected from April 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43583, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Navy Fence/Ocean Blvd

LOE ID:	31267
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation	042108
Number of Samples:	18	
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 2004 through October 2007. A total of 110 dry month (April through October) single samples were collected with 18 dry month geomeans calculated. None of the 18 geomeans exceeded the geomean water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Navy Fence/Ocean Blvd., Coronado, California. Station identification number is EH-060.	
Temporal Representation:	Samples were collected from April 2004 through October 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43583, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Navy Fence/Ocean Blvd

LOE ID:	31268
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	26
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from April 2004 through October 2007. A total of 190 dry month (April through October) single samples were collected with 26 dry month geomeans calculated. None of the 26 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml;

	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Navy Fence/Ocean Blvd., Coronado, California. Station identification number is EH-060.
Temporal Representation:	Samples were collected from April 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43583, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Navy Fence/Ocean Blvd

LOE ID:	30500
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	335
Number of Exceedances:	29
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 335 single samples were collected with 29 samples exceeded the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Navy Fence/Ocean Blvd., Coronado, California. Station identification number is EH-060.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43583, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Navy Fence/Ocean Blvd 042110

LOE ID:	30501
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	19
Number of Exceedances:	14
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 335 single samples were collected with 19 samples correlated with a storm event. Fourteen of the 19 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan the median coliform density shall not exceed 70 per 100ml, and not more than 10 percent of the samples shall exceed 230 per 100ml (SWRCB, 2005). Comparisons are also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Navy Fence/Ocean Blvd., Coronado, California. Station identification number is EH-060.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43583, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Navy Fence/Ocean Blvd

LOE ID:	30502
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	335

Number of Exceedances:	3	042111
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 335 single samples were collected with 3 samples exceeding the single sample water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Navy Fence/Ocean Blvd., Coronado, California. Station identification number is EH-060.	
Temporal Representation:	Samples were collected from January 2004 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43583, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Navy Fence/Ocean Blvd

LOE ID:	30503
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	19
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 335 single samples were collected with 19 samples correlated with a storm event. Three of the 19 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml;

	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Navy Fence/Ocean Blvd., San Diego, California. Station identification number is EH-060.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	Comparisons were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period. Analyzing only storm water bacteria data is important because the majority of beach monitoring data covers the months of April through October. The data may not capture the full impacts of seasonal storm events and high bacteria levels due to storm water runoff because much of the wet season for Southern California occurs in November through March.
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43583, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Navy Fence/Ocean Blvd

LOE ID:	30504
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	215
Number of Exceedances:	10
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 215 single samples were collected with 10 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Navy Fence/Ocean Blvd., Coronado, California. Station identification number is EH-060.

Temporal Representation:	Samples were collected from January 2004 through December 2007. 042113
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43583, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Navy Fence/Ocean Blvd

LOE ID:	30505
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	19
Number of Exceedances:	7
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 215 single samples were collected with 19 samples correlated with a storm event. Seven of the 19 samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Navy Fence/Ocean Blvd., Coronado, California. Station identification number is EH-060.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43583, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Navy Fence/Ocean Blvd

LOE ID:	30509

Pollutant:	Fecal Coliform	042114
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	32	
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 215 single samples were collected and 32 geomeans calculated. None of the 32 geomeans exceeded the geomean water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Navy Fence/Ocean Blvd., Coronado, California. Station identification number is EH-060.	
Temporal Representation:	Samples were collected from January 2004 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43583, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Navy Fence/Ocean Blvd

LOE ID:	30510
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	49
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 335 single samples were collected with 49 monthly geomeans calculated. Two of the 49 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data:	Non-SWAMP	042115
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Navy Fence/Ocean Blvd., Coronado, California. Station identification number is EH-060.	
Temporal Representation:	Samples were collected from January 2004 through December 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43583, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Navy Fence/Ocean Blvd

LOE ID:	30799
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	316
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 335 single samples were collected of which 316 are dry weather (AB411) samples with zero samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml; Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Navy Fence/Ocean Blvd., Coronado, California. Station identification number is EH-060.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	

QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43583, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Navy Fence/Ocean Blvd

LOE ID:	30685
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	196
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 215 single samples were collected of which 196 are dry weather (AB411) samples with three samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean; Fecal coliform density shall not exceed 200 per 100 ml; Single Sample Maximum; Fecal coliform density shall not exceed 400 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Navy Fence/Ocean Blvd., Coronado, California. Station identification number is EH-060.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43583, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Navy Fence/Ocean Blvd

LOE ID:	30564
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	316
Number of Exceedances:	5
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 335 single samples were collected of which 316 are dry weather (AB411) samples with 5 samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml. Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Navy Fence/Ocean Blvd., Coronado, California. Station identification number is EH-060.
Temporal Representation:	Samples were collected from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43583, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Coronado HA, at Navy Fence/Ocean Blvd

LOE ID:	30499
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2555
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2001 to December 2007, there was four beach advisory days for this section of shoreline. Bacteriological samples are collected on a weekly basis at ocean and bay locations in San Diego County. When a bacteriological sample exceeds water quality standards, signs are posted indicating that an advisory for waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of San Diego in their annual San Diego County Beach Closure and Advisory Reports. The reporting period was from January 2001 - December 2007. Data used was the number of days the beach was advisories were issued when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	Department of Environmental Health, Land and Water Quality Division, San Diego County

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960. (a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Spatial Representation:	Bacteriological monitoring samples were collected at Naval Air Station North Island North Beach A, Coronado, CA.
Temporal Representation:	The beach advisory covers the time frame of January January 2001 to December 2007.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of San Diego's Quality Assessment/Quality Control document
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at Seaside State Park
Water Body ID: CAC904610002009110412061 4
Water Body Type: Coastal & Bay Shoreline

DECISION ID 43808 Region 9
Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at Seaside State Park

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Ten lines of evidence are available in the administrative record to assess this pollutant. With the latest data, zero of 169 geomean samples exceed the water quality objective for enterococcus for the protection of REC-1.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, zero of 169 geomean samples exceed the water quality objective for enterococcus for the protection of REC-1 and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 43808, Indicator Bacteria Region 9
Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at Seaside State Park

LOE ID: 30743

Pollutant: Fecal Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 171

Number of Exceedances:	1	042120

Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 187 single samples were collected of which 171 are dry weather (AB411) samples with one sample exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the San Elijo HSA, from Seaside Beach, at Station SE-030, Lat/ Long : 33.00264/ -117.28735.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43808, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at Seaside State Park

LOE ID:	30850
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	172
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. The number of samples collected for total coliform analysis was 188 of which 172 are dry weather (AB411) samples and none of those samples exceeded the single sample maximum total coliform standard.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005). Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the San Elijo HSA, from Seaside Beach, at Station SE-030, Lat/ Long : 33.00264/ -117.28735.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43808, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at Seaside State Park

LOE ID:	30514
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	187
Number of Exceedances:	4
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. The number of samples collected for total coliform analysis was 187 with 4 samples exceeding the single sample maximum total coliform standard for shellfish harvesting. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan, the median total coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the San Elijo HSA, from Seaside Beach, at Station SE-030, Lat/ Long : 33.00264/ -117.28735.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43808, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at Seaside State Park

LOE ID:	30513	042122

Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	16
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. The number of samples collected for total coliform analysis was 188. Sixteen of the samples were correlated with a storm event. Three of the 16 storm samples exceeded the single sample maximum total coliform standard for shellfish harvesting. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Ocean Plan, the median total coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the San Elijo HSA, from Seaside Beach, at Station SE-030, Lat/ Long : 33.00264/ -117.28735.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	Comparisons were also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43808, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at Seaside State Park

LOE ID:	30521
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	188
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)

Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. The number of samples collected for total coliform analysis was 188. None of the samples exceeded the single sample maximum total coliform standard.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005). Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the San Elijo HSA, from Seaside Beach, at Station SE-030, Lat/ Long : 33.00264/ -117.28735.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43808, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at Seaside State Park

LOE ID:	30522
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	34
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from Samples were collected from January 2004 through December 2007. The number of samples collected for total coliform analysis was 188 with 34 monthly geomeans calculated. None of the geomeans exceeded the geomean water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005). Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:	042124
Guideline Reference:	
Spatial Representation:	Samples were collected from the San Elijo HSA, from Seaside Beach, at Station SE-030, Lat/ Long : 33.00264/ -117.28735.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43808, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at Seaside State Park

LOE ID:	30516
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	16
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 187 single samples were collected with 16 samples correlated with a storm event. Two of the storm samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005). Comparisons to water quality objectives were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the San Elijo HSA, from Seaside Beach, at Station SE-030, Lat/ Long : 33.00264/ -117.28735.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43808, Indicator Bacteria 042125 **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at Seaside State Park

LOE ID:	30517
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	187
Number of Exceedances:	3
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 187 single samples were collected with three samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the San Elijo HSA, from Seaside Beach, at Station SE-030, Lat/ Long : 33.00264/ -117.28735.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43808, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at Seaside State Park

LOE ID:	30519
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	35
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 187 single samples were collected with 35 geomeans calculated. None of the geomeans exceeded the geomean water quality objective.

Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the San Elijo HSA, from Seaside Beach, at Station SE-030, Lat/ Long : 33.00264/ -117.28735.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43808, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at Seaside State Park

LOE ID:	30520
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	187
Number of Exceedances:	2
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 187 single samples were collected with two samples exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the San Elijo HSA, from Seaside Beach, at Station SE-030, Lat/ Long : 33.00264/ -117.28735.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.

QAPP Information Reference(s): County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006 042127

Line of Evidence (LOE) for Decision ID 43808, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at Seaside State Park

LOE ID: 30518

Pollutant: Fecal Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 16
Number of Exceedances: 1

Data and Information Type: PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality: Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 187 single samples were collected with 16 samples correlated with a storm event. Only one of the storm samples exceeded the single sample water quality objective. This information will not be used in determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference: National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station
Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).

Comparisons to water quality objectives were made for all data and data associated with storm events. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
Objective/Criterion Reference: Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected from the San Elijo HSA, from Seaside Beach, at Station SE-030, Lat/ Long : 33.00264/ -117.28735.
Temporal Representation: Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:
QAPP Information: Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s): County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43808, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at Seaside State Park

LOE ID: 31203

Pollutant: Enterococcus
LOE Subgroup: Pollutant-Water
Matrix: Water

Fraction:	None	042128
Beneficial Use:	Water Contact Recreation	
Number of Samples:	26	
Number of Exceedances:	0	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from May 2004 through October 2007. A total of 108 dry month (April through October) single samples were collected with 26 dry month geomeans calculated. None of the 26 geomeans exceeded the geomean water quality objective.	
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from the San Elijo HSA, from Seaside Beach, at Station SE-030, Lat/ Long : 33.00264/ -117.28735.	
Temporal Representation:	Samples were collected weekly from May 2004 through October 2007.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.	
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006	

Line of Evidence (LOE) for Decision ID 43808, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at Seaside State Park

LOE ID:	31205
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	26
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from May 2004 through October 2007. A total of 109 dry month (April through October) single samples were collected with 26 dry month geomeans calculated. None of the 26 geomeans exceeded the geomean water quality objective.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005). Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the San Elijo HSA, from Seaside Beach, at Station SE-030, Lat/ Long : 33.00264/ -117.28735.
Temporal Representation:	Samples were collected weekly from May 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43808, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at Seaside State Park

LOE ID:	31204
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	26
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from May 2004 through October 2007. A total of 108 dry month (April through October) single samples were collected with 26 dry month geomeans calculated. None of the 26 geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml; Geomean: Fecal coliform density shall not exceed 200 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the San Elijo HSA, from Seaside Beach, at Station SE-030, Lat/ Long : 33.00264/ -117.28735.
Temporal Representation:	Samples were collected weekly from May 2004 through October 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43808, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at Seaside State Park 042130

LOE ID:	30644
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	171
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. A total of 187 single samples were collected of which 171 are dry weather (AB411) samples with one sample exceeding the single sample water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the San Elijo HSA, from Seaside Beach, at Station SE-030, Lat/ Long : 33.00264/ -117.28735.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the County of San Diego, Department Public Health Laboratory Quality Assurance Manual.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43808, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at Seaside State Park

LOE ID:	30523
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	16
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Shoreline beach monitoring data was collected by the County of San Diego from January 2004 through December 2007. The number of samples collected for total coliform analysis was 188 with 16 samples correlated with a storm event. None of the storm samples exceeded the single sample water quality objective. This information will not be used in

	determining a listing decision, but is of interest to the Regional Board and has been included here as additional anecdotal information.
Data Reference:	National Weather Service Forecast Office, San Diego, California, Chronological Regional Temperature and Precipitation Listings by Station Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005). Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the San Elijo HSA, from Seaside Beach, at Station SE-030, Lat/ Long : 33.00264/ -117.28735.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	Comparisons were also made for days with matching bacteria and storm event data. A storm event was defined as 0.2 inches of rainfall within a 72 hour period.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of San Diego's Quality beach monitoring program.
QAPP Information Reference(s):	County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

Line of Evidence (LOE) for Decision ID 43808, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at Seaside State Park

LOE ID:	74710
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	134
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 134 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Seaside State Park site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43808, Indicator Bacteria 042132 Region 9

Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at Seaside State Park

LOE ID:	74709
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	137
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed bw data for Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at Seaside State Park to determine beneficial use support and results are as follows: 0 of 137 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at Seaside State Park was collected at 1 monitoring site [Seaside State Park]
Temporal Representation:	Data was collected over the time period 1/2/2008-8/23/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43808, Indicator Bacteria Region 9

Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at Seaside State Park

LOE ID:	74708
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	134
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 134 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.

Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009 042133

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at the Seaside State Park site.
Temporal Representation: Samples were collected from January 2008 to August 2010.
Environmental Conditions:
QAPP Information: The samples were collected for the beach watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 43808, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at Seaside State Park

LOE ID: 74687

Pollutant: Enterococcus
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 134
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Zero of the 134 geomeans exceeded the objective.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at the Seaside State Park site.
Temporal Representation: Samples were collected from January 2008 to August 2010.
Environmental Conditions:
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 43808, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at Seaside State Park

LOE ID: 77665

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Shellfish Harvesting

Number of Samples: 134
Number of Exceedances: 0

Data and Information Type: PATHOGEN MONITORING

Data Used to Assess Water Quality:	Zero of the 134 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at Seaside State Park.
Temporal Representation:	The samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43808, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at Seaside State Park

LOE ID:	30515
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	35
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data were collected by the County of San Diego from January 2004 through December 2007. A total of 187 single samples were collected with 35 monthly geomeans calculated. None of the geomeans exceeded the geomean water quality objective.
Data Reference:	Department of Environmental Health, Ocean & Bay Recreational Water Quality Program, 2007. AB 411 monitoring data 1999 to 2007
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml; Geomean: Enterococcus density shall not exceed 35 per 100 ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the San Elijo HSA, from Seaside Beach, at Station SE-030, Lat/ Long : 33.00264/ -117.28735.
Temporal Representation:	Samples were collected weekly from January 2004 through December 2007.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion was conducted in accordance with the

QAPP Information Reference(s):	County of San Diego, Department Public Health Laboratory Quality Assurance Manual. County of San Diego, 2006. Department Public Health Laboratory, Quality Assurance Manual, December 2006

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: San Luis Rey River, Upper (east of Interstate 15)
Water Body ID: CAR9031200020091029163808
Water Body Type: River & Stream

DECISION ID 51982 **Region 9**
San Luis Rey River, Upper (east of Interstate 15)

Pollutant: Ammonia
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeded the criterion or guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the criterion or guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51982, Ammonia **Region 9**
San Luis Rey River, Upper (east of Interstate 15)

LOE ID: 76221

Pollutant: Nitrogen, ammonia (Total Ammonia)
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Municipal & Domestic Supply

Number of Samples:	1	042137
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Luis Rey River, Upper (east of Interstate 15) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Ammonia As N, Total.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Basin Plan: No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	EPA's Lifetime Health advisory level for total ammonia is 30.0 mg/L as stated on page 8 of the 2006 edition of the drinking water standards and health advisories. This Advisory Level is defined as "the concentration of a chemical in drinking water that is not expected to cause any adverse noncarcinogenic effects for up to ten days of exposure."	
Guideline Reference:	2006 edition of the drinking water standards and health advisories, EPA 822-R-03-013	
Spatial Representation:	Data for this line of evidence for San Luis Rey River, Upper (east of Interstate 15) was collected at 1 monitoring site [San Luis Rey River @ Couser Canyon Pass]	
Temporal Representation:	Data was collected on a single day 5/15/2003.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID **52072** **Region 9**

San Luis Rey River, Upper (east of Interstate 15)

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one sample exceed the beneficial use guidelines.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the guidelines and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52072, Arsenic **Region 9**

San Luis Rey River, Upper (east of Interstate 15)

LOE ID:	76234
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Luis Rey River, Upper (east of Interstate 15) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for arsenic is 0.01 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals, CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Luis Rey River, Upper (east of Interstate 15) was collected at 1 monitoring site [San Luis Rey River, Couser Cyn Rd. - 903_SMC01717]
Temporal Representation:	Data was collected on a single day 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

Line of Evidence (LOE) for Decision ID 52072, Arsenic **Region 9**

San Luis Rey River, Upper (east of Interstate 15)

LOE ID:	76222
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING 042139
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Luis Rey River, Upper (east of Interstate 15) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The dissolved arsenic criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved arsenic is 0.150 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Luis Rey River, Upper (east of Interstate 15) was collected at 1 monitoring site [San Luis Rey River, Couser Cyn Rd. - 903_SMC01717]
Temporal Representation:	Data was collected on a single day 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

DECISION ID 50752 Region 9

San Luis Rey River, Upper (east of Interstate 15)

Pollutant:	**Bifenthrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the zero samples exceed the beneficial use guidelines. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of zero samples exceeded the guideline. The sample was not used in the assessment due to a reporting limit that was higher than the guideline. The sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50752, Bifenthrin **Region 9**

San Luis Rey River, Upper (east of Interstate 15)

LOE ID:	76236
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Luis Rey River, Upper (east of Interstate 15) to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Bifenthrin.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The UC Davis Criteria for Bifenthrin for the protection of aquatic organisms is a 4 day average of 0.0006 ug/L (Fojut et al. 2012).
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for San Luis Rey River, Upper (east of Interstate 15) was collected at 1 monitoring site [San Luis Rey River, Couser Cyn Rd. - 903_SMC01717]
Temporal Representation:	Data was collected on a single day 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

DECISION ID 49067 **Region 9**

San Luis Rey River, Upper (east of Interstate 15)

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the eight samples exceed the beneficial use guidelines.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of eight samples exceeded the guidelines and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49067, Cadmium **Region 9**

San Luis Rey River, Upper (east of Interstate 15)

LOE ID:	76238
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Luis Rey River, Upper (east of Interstate 15) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for cadmium is 0.005 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Luis Rey River, Upper (east of Interstate 15) was collected at 1 monitoring site [San Luis Rey River, Couser Cyn Rd. - 903_SMC01717]
Temporal Representation:	Data was collected on a single day 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

Line of Evidence (LOE) for Decision ID 49067, Cadmium **Region 9**

San Luis Rey River, Upper (east of Interstate 15)

LOE ID:	76249	042142

Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Luis Rey River, Upper (east of Interstate 15) to determine beneficial use support and results are as follows: 0 of 7 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California, 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Luis Rey River, Upper (east of Interstate 15) was collected at 1 monitoring site [San Luis Rey River @ Couser Canyon Pass]
Temporal Representation:	Data was collected 5/15/2003 - 6/9/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 49067, Cadmium **Region 9**

San Luis Rey River, Upper (east of Interstate 15)

LOE ID:	76251
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for San Luis Rey River, Upper (east of Interstate 15) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.

SWAMP Data:	Non-SWAMP	042143
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for San Luis Rey River, Upper (east of Interstate 15) was collected at 1 monitoring site [San Luis Rey River, Couser Cyn Rd. - 903_SMC01717]	
Temporal Representation:	Data was collected on a single day 6/3/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.	

Line of Evidence (LOE) for Decision ID 49067, Cadmium **Region 9**

San Luis Rey River, Upper (east of Interstate 15)

LOE ID:	76250
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Luis Rey River, Upper (east of Interstate 15) to determine beneficial use support and results are as follows: 0 of 7 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for cadmium is 0.005 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Luis Rey River, Upper (east of Interstate 15) was collected at 1 monitoring site [San Luis Rey River @ Couser Canyon Pass]
Temporal Representation:	Data was collected 5/15/2003 - 6/9/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **50755** **Region 9**

San Luis Rey River, Upper (east of Interstate 15)

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of four samples exceed the guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of four samples exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50755, Chlorpyrifos **Region 9**

San Luis Rey River, Upper (east of Interstate 15)

LOE ID:	78124
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Luis Rey River, Upper (east of Interstate 15) to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for chlorpyrifos is 2.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for San Luis Rey River, Upper (east of Interstate 15) was collected at 1 monitoring site [San Luis Rey River @ Couser Canyon Pass]
Temporal Representation:	Data was collected over the time period 6/12/2006-6/9/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 52077 Region 9

San Luis Rey River, Upper (east of Interstate 15)

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeded the guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52077, Chromium Region 9

San Luis Rey River, Upper (east of Interstate 15)

LOE ID:	76252
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water

Matrix:	Water	042146
Fraction:	Dissolved	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for San Luis Rey River, Upper (east of Interstate 15) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for San Luis Rey River, Upper (east of Interstate 15) was collected at 1 monitoring site [San Luis Rey River, Couser Cyn Rd. - 903_SMC01717]	
Temporal Representation:	Data was collected on a single day 6/3/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.	

DECISION ID	**52090**	**Region 9**
San Luis Rey River, Upper (east of Interstate 15)		

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the nine samples exceed the beneficial use guidelines. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.

3. Zero of nine samples exceeded the guidelines and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52090, Copper **Region 9**
San Luis Rey River, Upper (east of Interstate 15)

LOE ID:	75985
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Luis Rey River, Upper (east of Interstate 15) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Luis Rey River, Upper (east of Interstate 15) was collected at 1 monitoring site [San Luis Rey River @ Couser Canyon Pass]
Temporal Representation:	Data was collected 5/15/2003 - 6/9/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 52090, Copper **Region 9**
San Luis Rey River, Upper (east of Interstate 15)

LOE ID:	75986
Pollutant:	Copper

LOE Subgroup:	Pollutant-Water	042148
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	8	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Luis Rey River, Upper (east of Interstate 15) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Secondary MCL for copper is 1.0 mg/L (Title 22 California Code of Regulations).	
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for San Luis Rey River, Upper (east of Interstate 15) was collected at 1 monitoring site [San Luis Rey River @ Couser Canyon Pass]	
Temporal Representation:	Data was collected 5/15/2003 - 6/9/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 52090, Copper **Region 9**

San Luis Rey River, Upper (east of Interstate 15)

LOE ID:	75987
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for San Luis Rey River, Upper (east of Interstate 15) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each

	sample and varies based on the ambient hardness during sampling. Section 131.38(b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Luis Rey River, Upper (east of Interstate 15) was collected at 1 monitoring site [San Luis Rey River, Couser Cyn Rd. - 903_SMC01717]
Temporal Representation:	Data was collected on a single day 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

Line of Evidence (LOE) for Decision ID 52090, Copper **Region 9**

San Luis Rey River, Upper (east of Interstate 15)

LOE ID:	75988
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Luis Rey River, Upper (east of Interstate 15) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for copper is 1.0 mg/L (Title 22 California Code of Regulations).
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Luis Rey River, Upper (east of Interstate 15) was collected at 1 monitoring site [San Luis Rey River, Couser Cyn Rd. - 903_SMC01717]
Temporal Representation:	Data was collected on a single day 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

DECISION ID 50772 **Region 9**

San Luis Rey River, Upper (east of Interstate 15)

Pollutant:	**Cypermethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**

Last Listing Cycle's Final Listing Decision:	New Decision	042150
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the zero samples exceed the beneficial use guidelines.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of zero samples exceeded the guideline. The sample was not used in the assessment due to a reporting limit that was higher than the guideline. The sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50772, Cypermethrin **Region 9**

San Luis Rey River, Upper (east of Interstate 15)

LOE ID:	75989
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Luis Rey River, Upper (east of Interstate 15) to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Cypermethrin, total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day

	average concentration of cypermethrin does not exceed 0.0002 ug/L and the 1-h average concentration does not exceed 0.001 ug/L. Fojut et al. 2012)
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for San Luis Rey River, Upper (east of Interstate 15) was collected at 1 monitoring site [San Luis Rey River, Couser Cyn Rd. - 903_SMC01717]
Temporal Representation:	Data was collected on a single day 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

DECISION ID 50774 Region 9

San Luis Rey River, Upper (east of Interstate 15)

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the four samples exceed the beneficial use guidelines. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of four samples exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50774, Diazinon Region 9

San Luis Rey River, Upper (east of Interstate 15)

LOE ID:	76000
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Luis Rey River, Upper (east of Interstate 15) to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Data for this line of evidence for San Luis Rey River, Upper (east of Interstate 15) was collected at 1 monitoring site [San Luis Rey River @ Couser Canyon Pass]
Temporal Representation:	Data was collected over the time period 6/12/2006-6/9/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 50774, Diazinon **Region 9**

San Luis Rey River, Upper (east of Interstate 15)

LOE ID:	78116
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Luis Rey River, Upper (east of Interstate 15) to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for diazinon is 1.4 Âµg/L.

Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for San Luis Rey River, Upper (east of Interstate 15) was collected at 1 monitoring site [San Luis Rey River @ Couser Canyon Pass]
Temporal Representation:	Data was collected over the time period 6/12/2006-6/9/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 52100 Region 9

San Luis Rey River, Upper (east of Interstate 15)

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the seven samples exceed the beneficial use guideline for Municipal and Domestic use. Zero of the eight samples exceed the beneficial use guideline for Warm Freshwater Habitat use. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the seven samples exceed the beneficial use guideline for Municipal and Domestic use. Zero of the eight samples exceed the beneficial use guideline for Warm Freshwater Habitat use. The sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52100, Lead Region 9

San Luis Rey River, Upper (east of Interstate 15)

LOE ID:	76004
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved

Beneficial Use:	Municipal & Domestic Supply	042154
Number of Samples:	7	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Luis Rey River, Upper (east of Interstate 15) to determine beneficial use support and results are as follows: 0 of 7 samples exceed the criterion for Lead.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for Lead is 0.015 mg/L (Title 22 of the California Code of Regulations).	
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for San Luis Rey River, Upper (east of Interstate 15) was collected at 1 monitoring site [San Luis Rey River @ Couser Canyon Pass]	
Temporal Representation:	Data was collected 5/15/2003 - 6/9/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 52100, Lead **Region 9**

San Luis Rey River, Upper (east of Interstate 15)

LOE ID:	76016
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for San Luis Rey River, Upper (east of Interstate 15) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition

Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Luis Rey River, Upper (east of Interstate 15) was collected at 1 monitoring site [San Luis Rey River, Couser Cyn Rd. - 903_SMC01717]
Temporal Representation:	Data was collected on a single day 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

Line of Evidence (LOE) for Decision ID 52100, Lead **Region 9**

San Luis Rey River, Upper (east of Interstate 15)

LOE ID:	76003
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Luis Rey River, Upper (east of Interstate 15) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Luis Rey River, Upper (east of Interstate 15) was collected at 1 monitoring site [San Luis Rey River @ Couser Canyon Pass]
Temporal Representation:	Data was collected 5/15/2003 - 6/9/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 50788 **Region 9**

San Luis Rey River, Upper (east of Interstate 15)

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**

Last Listing Cycle's Final Listing Decision:	New Decision	042156
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the four samples exceed the beneficial use guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of four samples exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50788, Malathion **Region 9**

San Luis Rey River, Upper (east of Interstate 15)

LOE ID:	78117
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Luis Rey River, Upper (east of Interstate 15) to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Malathion.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for malathion is 100 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013

Spatial Representation:	Data for this line of evidence for San Luis Rey River, Upper (east of Interstate 15) was collected at 1 monitoring site [San Luis Rey River @ Couser Canyon Pass]
Temporal Representation:	Data was collected over the time period 6/12/2006-6/9/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 52103 — Region 9

San Luis Rey River, Upper (east of Interstate 15)

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeded the guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52103, Nickel — Region 9

San Luis Rey River, Upper (east of Interstate 15)

LOE ID:	76017
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for San Luis Rey River, Upper (east of Interstate 15) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Luis Rey River, Upper (east of Interstate 15) was collected at 1 monitoring site [San Luis Rey River, Couser Cyn Rd. - 903_SMC01717]
Temporal Representation:	Data was collected on a single day 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

DECISION ID 51978 Region 9

San Luis Rey River, Upper (east of Interstate 15)

Pollutant:	**Nitrate/Nitrite (Nitrite + Nitrate as N)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the three samples exceed the beneficial use guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of three samples exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision	After review of the available data and information, RWQCB staff concludes that the water body-

Recommendation: pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51978, Nitrate/Nitrite (Nitrite + Nitrate as N) **Region 9**

San Luis Rey River, Upper (east of Interstate 15)

LOE ID:	76019
Pollutant:	Nitrate/Nitrite (Nitrite + Nitrate as N)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Luis Rey River, Upper (east of Interstate 15) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nitrate/Nitrite as N.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrate + nitrite (as N) is 10.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Luis Rey River, Upper (east of Interstate 15) was collected at 1 monitoring site [San Luis Rey River, Couser Cyn Rd. - 903_SMC01717]
Temporal Representation:	Data was collected on a single day 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

Line of Evidence (LOE) for Decision ID 51978, Nitrate/Nitrite (Nitrite + Nitrate as N) **Region 9**

San Luis Rey River, Upper (east of Interstate 15)

LOE ID:	76018
Pollutant:	Nitrate/Nitrite (Nitrite + Nitrate as N)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Luis Rey River, Upper (east

	of Interstate 15) to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Nitrate/Nitrite as N.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrate + nitrite (as N) is 10.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Luis Rey River, Upper (east of Interstate 15) was collected at 1 monitoring site [San Luis Rey River @ Couser Canyon Pass]
Temporal Representation:	Data was collected over the time period 5/16/2003-9/9/2003.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 51981 Region 9

San Luis Rey River, Upper (east of Interstate 15)

Pollutant:	**Nitrogen, Nitrite**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the three samples exceed the beneficial use guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of three samples exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51981, Nitrogen, Nitrite Region 9

San Luis Rey River, Upper (east of Interstate 15) 042161

LOE ID:	76039
Pollutant:	Nitrogen, Nitrite
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Luis Rey River, Upper (east of Interstate 15) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nitrite as N.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrite (as N) is 1.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals, CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Luis Rey River, Upper (east of Interstate 15) was collected at 1 monitoring site [San Luis Rey River, Couser Cyn Rd. - 903_SMC01717]
Temporal Representation:	Data was collected on a single day 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

Line of Evidence (LOE) for Decision ID 51981, Nitrogen, Nitrite **Region 9**

San Luis Rey River, Upper (east of Interstate 15)

LOE ID:	76038
Pollutant:	Nitrogen, Nitrite
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Luis Rey River, Upper (east of Interstate 15) to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Nitrite as N.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrite (as N) is 1.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Luis Rey River, Upper (east of Interstate 15) was collected at 1 monitoring site [San Luis Rey River @ Couser Canyon Pass]
Temporal Representation:	Data was collected over the time period 5/15/2003-9/9/2003.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 50800 Region 9

San Luis Rey River, Upper (east of Interstate 15)

Pollutant:	**Temperature, water**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Two of 12 samples exceed the guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Two of 12 samples exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50800, Temperature, water Region 9

San Luis Rey River, Upper (east of Interstate 15)

LOE ID:	76040
Pollutant:	Temperature, water
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	042163
Beneficial Use:	Cold Freshwater Habitat	
Number of Samples:	12	
Number of Exceedances:	2	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Two of the 12 samples exceeded the evaluation guideline for temperature in this water body.	
Data Reference:	Data for Trash, Nutrients, and Pathogens in Region 9, 2007-2010.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Board that such alteration in temperature does not adversely affect beneficial uses. At no time or place shall the temperature of any COLD water be increased more than 5Â°F above the natural receiving water temperature.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	Inland Fishes of California (Moyle 1976) states that for rainbow trout the optimum range for growth and completion of most life stages is 13-21 degrees C (page 129).	
Guideline Reference:	Inland Fishes of California	
Spatial Representation:	Samples were collected at the following stations: SLR-060-Couser Canyon bridge SLR-090-CNF picnic site	
Temporal Representation:	Samples were collected between February, 2009 and December, 2009.	
Environmental Conditions:		
QAPP Information:	San Diego Regional Water Quality Assessment and Outreach Project Quality Assurance Project Plan Prepared by: Clay Clifton (San Diego Coastkeeper, Local Project Sponsor Manager), Bob Stafford (San Diego Stream Team), Dr. Rick Gersberg (San Diego State University), Bryan Bjorndal (Assure Controls, Inc.), and Morgan Justice-Black (I Love A Clean San Diego).	
QAPP Information Reference(s):		

DECISION ID 52107 Region 9

San Luis Rey River, Upper (east of Interstate 15)

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the seven samples exceed the beneficial use guideline for Municipal and Domestic use. Zero of the eight samples exceed the beneficial use guideline for Warm Freshwater Habitat use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.

3. Zero of the seven samples exceed the beneficial use guideline for Municipal and Domestic use. Zero of the eight samples exceed the beneficial use guideline for Warm Freshwater Habitat use. The sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52107, Zinc **Region 9**

San Luis Rey River, Upper (east of Interstate 15)

LOE ID:	76057
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for San Luis Rey River, Upper (east of Interstate 15) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Luis Rey River, Upper (east of Interstate 15) was collected at 1 monitoring site [San Luis Rey River, Couser Cyn Rd. - 903_SMC01717]
Temporal Representation:	Data was collected on a single day 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

Line of Evidence (LOE) for Decision ID 52107, Zinc **Region 9**

San Luis Rey River, Upper (east of Interstate 15)

LOE ID:	76056

Pollutant:	Zinc	042165
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	Dissolved	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	7	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Luis Rey River, Upper (east of Interstate 15) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for San Luis Rey River, Upper (east of Interstate 15) was collected at 1 monitoring site [San Luis Rey River @ Couser Canyon Pass]	
Temporal Representation:	Data was collected 5/15/2003 - 6/9/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 52107, Zinc **Region 9**

San Luis Rey River, Upper (east of Interstate 15)

LOE ID:	76042
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Luis Rey River, Upper (east of Interstate 15) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for zinc is 5.0 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for San Luis Rey River, Upper (east of Interstate 15) was collected at 1 monitoring site [San Luis Rey River @ Couser Canyon Pass]
Temporal Representation:	Data was collected 5/15/2003 - 6/9/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 51700 Region 9

San Luis Rey River, Upper (east of Interstate 15)

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. Three lines of evidence are available in the administrative record to assess this pollutant. Data from 2003 to 2009 show that 6 of 8 samples exceed the water quality objective for enterococcus of 61/100ml in fresh water for the protection of REC-1.. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Data from 2003 to 2009 show that 6 of 8 samples exceed the water quality objective for enterococcus of 61/100ml in fresh water for the protection of REC-1 and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 51700, Indicator Bacteria Region 9

San Luis Rey River, Upper (east of Interstate 15)

LOE ID: 76002

Pollutant:	Fecal Coliform	042167
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	8	
Number of Exceedances:	3	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Luis Rey River, Upper (east of Interstate 15) to determine beneficial use support and results are as follows: 3 of 8 samples exceed the criterion for Coliform, Fecal.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the fecal coliform concentration shall not exceed 400 MPN/100 ml.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for San Luis Rey River, Upper (east of Interstate 15) was collected at 1 monitoring site [San Luis Rey River @ Couser Canyon Pass]	
Temporal Representation:	Data was collected over the time period 5/15/2003-6/9/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 51700, Indicator Bacteria **Region 9**

San Luis Rey River, Upper (east of Interstate 15)

LOE ID:	76001
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	8
Number of Exceedances:	6
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Luis Rey River, Upper (east of Interstate 15) to determine beneficial use support and results are as follows: 6 of 8 samples exceed the criterion for Enterococci.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Samples shall not exceed 61 organisms per 100 ml for enterococcus in waters designated for REC I beneficial use (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Luis Rey River, Upper (east of Interstate 15) was collected at 1 monitoring site [San Luis Rey River @ Couser Canyon Pass]
Temporal Representation:	Data was collected over the time period 5/15/2003-6/9/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 51700, Indicator Bacteria **Region 9**

San Luis Rey River, Upper (east of Interstate 15)

LOE ID:	76041
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	8
Number of Exceedances:	1
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Luis Rey River, Upper (east of Interstate 15) to determine beneficial use support and results are as follows: 1 of 8 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxicsubstances in concentrations which are toxic to,or which produce detrimental physiologicalresponses in human, plant, animal, or indigenousaquatic life (Basin Plan).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In waters designated for water contact recreation (REC I), the total coliform concentration shall not exceed 10000 MPN/100 ml (CDPH 2006).
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.
Spatial Representation:	Data for this line of evidence for San Luis Rey River, Upper (east of Interstate 15) was collected at 1 monitoring site [San Luis Rey River @ Couser Canyon Pass]
Temporal Representation:	Data was collected over the time period 5/15/2003-6/9/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 34619 **Region 9**

San Luis Rey River, Upper (east of Interstate 15)

Pollutant: **Selenium**

Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	042169
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)	
Revision Status	Original	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. None of the three samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of three samples exceeded the selenium water quality objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34619, Selenium **Region 9**

San Luis Rey River, Upper (east of Interstate 15)

LOE ID:	30917
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Eight water samples were collected at San Luis Rey River station 903SLSLR2 on May 2004, September 2004, March 2005, and April 2005. None of the three samples showed excessive selenium concentrations according to results in California's Surface Water Ambient Monitoring Program Report, 2007.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	CTR Freshwater Chronic (CCC) 5 ug/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:		042170
Guideline Reference:		
Spatial Representation:	Water samples were collected at San Luis Rey River station 903SLSLR2.	
Temporal Representation:	Samples were collected on May 2004, September 2004, March 2005, and April 2005.	
Environmental Conditions:		
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.	
QAPP Information Reference(s):		

DECISION ID 44436 **Region 9**

San Luis Rey River, Upper (east of Interstate 15)

Pollutant:	**Sulfates**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 one line of evidence is necessary to assess listing status. One line of evidence are available in the administrative record to assess this pollutant. None of the samples exceed the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of four samples exceeded the sulfate water quality objective and this sample size is insufficient to determine with the power and confidence of the Listing Policy if standards are not met. A minimum of five samples is needed for application of table 3.2. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 44436, Sulfates **Region 9**

San Luis Rey River, Upper (east of Interstate 15)

LOE ID:	30916
Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	4	042171
Number of Exceedances:	0	
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)	
Data Used to Assess Water Quality:	Eight water samples were collected at San Luis Rey River station 903SLSLR2 on May 2004, September 2004, March 2005, and April 2005. None of four samples showed excessive sulfate concentrations according to results in California's Surface Water Ambient Monitoring Program Report, 2007.	
Data Reference:	Monitoring data for Region 9	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	The recommended secondary drinking water standard for sulfate is 250 mg/l (RWQCB, 2007).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Water samples were collected at San Luis Rey River station 903SLSLR2.	
Temporal Representation:	Samples were collected on May 2004, September 2004, March 2005, and April 2005.	
Environmental Conditions:		
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.	
QAPP Information Reference(s):		

DECISION ID 35149 Region 9

San Luis Rey River, Upper (east of Interstate 15)

Pollutant:	**Phosphorus**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2023
Impairment from Pollutant or Pollution:	Pollution

Regional Board Conclusion:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Four of the four samples exceed the water quality objective for Phosphorus.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Four of four samples exceeded the water quality objective for Phosphorus and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 35149, Phosphorus **Region 9**

San Luis Rey River, Upper (east of Interstate 15)

LOE ID:	30947
Pollutant:	Benthic Community Effects
LOE Subgroup:	Adverse Biological Responses
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	27
Number of Exceedances:	22
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Twenty-seven samples of IBI data were taken from May 1998 to 2007 at six sampling sites. Of the total number of samples, twenty-two of the samples exceeded the IBI impairment threshold.
Data Reference:	Fish and Game IBI Data 2007 SDRWQCB Bioassessment Data
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. (SDRWQCB, 1995)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at eight sites: 903SLSLR3, 903SLSLR6, 903SLRR39, 903SLRRPG, 903SLR3, and 903WE0798 on San Luis Rey River.
Temporal Representation:	Sampling occurred during one to seven events annually from May 1998 to 2007 except in 2002.
Environmental Conditions:	
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Project Plan for the California Stream Bioassessment Procedure and the State of California, California Monitoring an Assessment Program: "CMAP", Quality Assurance Project Plan.
QAPP Information Reference(s):	State of California, California Monitoring and Assessment Program: "CMAP". Quality Assurance Project Plan for the California Stream Bioassessment Procedure The San Diego Stream Team Quality Assurance Project Plan

Line of Evidence (LOE) for Decision ID 35149, Phosphorus **Region 9**

San Luis Rey River, Upper (east of Interstate 15)

LOE ID:	30945

Pollutant:	Phosphorus	042173
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	Total	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	4	
Number of Exceedances:	4	
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)	
Data Used to Assess Water Quality:	All four samples exceed the water quality objective according to results in the Surface Water Ambient Monitoring Program Report, 2007. Samples were collected at each site on the following four dates, May 18-19, 2004, September 13- 14, 2004, March 1- 2, 2005, April 18- 20, 2005.	
Data Reference:	Monitoring data for Region 9	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. Water Quality Control Plan for the San Diego Basin Goal of 0.1 mg/L for total phosphorus in streams and other flowing waters. (RWQCB, 2007)	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:	Water Quality Control Plan for the San Diego Basin	
Spatial Representation:	Samples were collected at station San Luis Rey River 2 (station id: 903SLSLR2 lat/long: 33.26190/-116.80889)	
Temporal Representation:	Samples were collected at each site on the following four dates, May 18-19, 2004, September 13- 14, 2004, March 1- 2, 2005, April 18- 20, 2005.	
Environmental Conditions:	The first two sampling events occurred during declining and minimum base flow respectively. The third occurred between storm events and the fourth during high base flow.	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.	
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA	

DECISION ID 35862 Region 9

San Luis Rey River, Upper (east of Interstate 15)

Pollutant:	**Total Nitrogen as N**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. (with update to table 3.1)

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Five of the

eight samples exceed the water quality objective for Nitrogen. 042174

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Five of eight samples exceed the water quality objective for Nitrogen and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 35862, Total Nitrogen as N **Region 9**

San Luis Rey River, Upper (east of Interstate 15)

LOE ID:	30946
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	5
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Five of eight samples exceed the water quality objective according to results in the Surface Water Ambient Monitoring Program Report, 2007. Samples were collected at each site on the following four dates, May 18-19, 2004, September 13-14, 2004, March 1-2, 2005, April 18- 20, 2005.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. (RWQCB, 2007) A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used. (RWQCB, 2007)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin

Spatial Representation:	Samples were collected at monitoring station San Luis Rey River 2 (station 903SLSLR2 lat/long: 33.26190/-116.80889)
Temporal Representation:	Samples were collected at each site on the following four dates, May 18-19, 2004, September 13-14, 2004, March 1-2, 2005, April 18- 20, 2005.
Environmental Conditions:	The first two sampling events occurred during declining and minimum base flow respectively. The third sample occurred between storm events and the fourth during high base flow.
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 35862, Total Nitrogen as N **Region 9**

San Luis Rey River, Upper (east of Interstate 15)

LOE ID:	30947
Pollutant:	Benthic Community Effects
LOE Subgroup:	Adverse Biological Responses
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	27
Number of Exceedances:	22
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Twenty-seven samples of IBI data were taken from May 1998 to 2007 at six sampling sites. Of the total number of samples, twenty-two of the samples exceeded the IBI impairment threshold.
Data Reference:	Fish and Game IBI Data 2007 SDRWQCB Bioassessment Data
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. (SDRWQCB, 1995)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at eight sites: 903SLSLR3, 903SLSLR6, 903SLRR39, 903SLRRPG, 903SLR3, and 903WE0798 on San Luis Rey River.
Temporal Representation:	Sampling occurred during one to seven events annually from May 1998 to 2007 except in 2002.
Environmental Conditions:	
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Project Plan for the California Stream Bioassessment Procedure and the State of California, California Monitoring an Assessment Program: "CMAP", Quality Assurance Project Plan.

QAPP Information Reference(s): State of California, California Monitoring and Assessment Program: "CMAP" 042176
Quality Assurance Project Plan for the California Stream Bioassessment Procedure
The San Diego Stream Team Quality Assurance Project Plan

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Santa Ysabel Creek (above Sutherland Reservoir)
Water Body ID: CAR9055300020091030161135
Water Body Type: River & Stream

DECISION ID 37541 **Region 9**
Santa Ysabel Creek (above Sutherland Reservoir)

Pollutant: **Alkalinity as CaCO3 | Ammonia | Manganese | Nickel | Orthophosphate | Total Kjeldahl Nitrogen (TKN) | Total Suspended Solids (TSS)**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status Original
Impairment from Pollutant or Pollution: Pollution

Regional Board Conclusion: These pollutants are being considered for placement on the section 303(d) list under section 3.1 and 3.2 of the Listing Policy. Under section 3.1 and 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess these pollutants. None of the 30 samples exceed the Basin Plan water quality objective for these multiple pollutants.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 30 samples exceed the Basin Plan water quality objective for these multiple pollutants, and this does not exceed the allowable frequency listed in Table 3.1 and 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 37541, Multiple Pollutants **Region 9**
Santa Ysabel Creek (above Sutherland Reservoir)

LOE ID: 30951

Pollutant: Alkalinity as CaCO3 | Ammonia | Manganese | Nickel | Orthophosphate | Total Kjeldahl Nitrogen (TKN) | Total Suspended Solids (TSS)
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Not Recorded

Beneficial Use: Municipal & Domestic Supply

Number of Samples:	30	042178
Number of Exceedances:	0	
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)	
Data Used to Assess Water Quality:	30 samples were collected at Santa Ysabel Creek station 911TLAP04 during the months of January 2003, April 2003, and May 2003 for conventional inorganics analyses, none of the 30 samples exceeded evaluation concentrations (SWAMP, 2007).	
Data Reference:	Monitoring data for Region 9	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Alkalinity as CaCO3 20 mg/l, ammonia as N 0.025 mg/l, nitrite as N 1.mg/l, nitrogen total Kjeldahl (If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used), ortho phosphate as P total 0.05 mg/l, sulfate 250 mg/l, total suspended solids narrative: Waters shall not contain suspended solids in concentrations of solids that cause nuisance or adversely affect beneficial uses.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at Santa Ysabel Creek station 911TLAP04; (Latitude 33.1277, Longitude -116.6790). (Station name seems incorrect. Coordinates show 905YSA04.)	
Temporal Representation:	Samples were collected during the months of January 2003, April 2003, and May 2003.	
Environmental Conditions:		
QAPP Information:	Quality controls for chemical analyses were conducted in accordance with the California Surface Water Ambient Monitoring Program.	
QAPP Information Reference(s):		

DECISION ID 37749 Region 9

Santa Ysabel Creek (above Sutherland Reservoir)

Pollutant:	**Metals**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollution

Regional Board Conclusion:

Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle.

These pollutants are being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess these pollutants. None of the 33 samples exceed the Basin Plan water quality objectives for these metal pollutants.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 33 samples exceed the Basin Plan water quality objectives for these metal pollutants and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 37749, Metals **Region 9**

Santa Ysabel Creek (above Sutherland Reservoir)

LOE ID:	30954
Pollutant:	Metals
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	33
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	33 samples were collected at Santa Ysabel Creek station 905SDYSA4 during the months of January 2003, April 2003, and May 2003 for metals analyses, none of the 33 samples exceeded evaluation concentrations (SWAMP, 2007).
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The Maximum Contaminant Level (MCL) for aluminum is 1. mg /l (ppb). Water Quality Control for the San Diego Basin. 2007. The dissolved chronic criterion for the following metals applies: arsenic 150 Âµg/l (ppb), cadmium 2.2 Âµg/l (ppb), copper 9.0 Âµg/l (ppb), selenium 5.0 Âµg/l (ppb), zinc 120 Âµg/l (ppb), chromium 11 Âµg/l (ppb), manganese 0.05 mg/l, nickel 52 Âµg/l (ppb), lead 2.5 Âµg/l (ppb), and silver 3.4Âµg/l (ppb). California Toxics Rule. 2007.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Water samples were collected at Santa Ysabel Creek station 905SDYSA4; (Latitude 33.1276, Longitude -116.6791).
Temporal Representation:	Samples were collected during the months of January 2003, April 2003, and May 2003.
Environmental Conditions:	
QAPP Information:	Quality controls for chemical analyses were conducted in accordance with the California Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	

DECISION ID 37145 **Region 9**

Santa Ysabel Creek (above Sutherland Reservoir)

Pollutant:	**Toxicity**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion	2021

Date:	042180
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. This pollutant is being considered for placement on the section 303(d) list under section 3.1 and 3.9 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Three lines of evidence are available in the administrative record to assess this pollutant. Five of the eight samples exceed the water quality objective for Toxicity. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Five of the eight samples exceed the water quality objective for Toxicity and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	Region 9 data was not included in the 2012 Integrated Report so all decisions are carried over from the 2010 listing cycle. After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 37145, Toxicity **Region 9**

Santa Ysabel Creek (above Sutherland Reservoir)

LOE ID:	30961
Pollutant:	Benthic Community Effects
LOE Subgroup:	Adverse Biological Responses
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	5
Number of Exceedances:	4
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Five samples of IBI data were taken from June 2000 to June 2005 at two sampling sites. Of the total number of samples, four of the samples exceeded the IBI impairment threshold.
Data Reference:	Fish and Game IBI Data
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. (SDRWQCB, 1995)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at two sites: 905SYCH79 and 905WE0679 on Santa Ysabel Creek.
Temporal Representation:	Sampling occurred during one to two events every other year from June 2000 to June 2005.
Environmental Conditions:	
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Project Plan for the California Stream Bioassessment Procedure and the State of California, California Monitoring an Assessment Program: "CMAP", Quality Assurance Project Plan.
QAPP Information Reference(s):	State of California, California Monitoring and Assessment Program: "CMAP". Quality Assurance Project Plan for the California Stream Bioassessment Procedure The San Diego Stream Team Quality Assurance Project Plan

Line of Evidence (LOE) for Decision ID 37145, Toxicity **Region 9**

Santa Ysabel Creek (above Sutherland Reservoir)

LOE ID:	30958
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Two samples were collected at Santa Ysabel Creek station 905SDYSA4 in January and April 2003, they showed significant toxicity levels (SL) in the following tests: Hyalella azteca survival and growth- None of the two samples were toxic.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.
Guideline Reference:	Monitoring data for Region 9
Spatial Representation:	Sediment samples were collected at a station on Santa Ysabel Creek 4 (905SDYSA4).
Temporal Representation:	Sample from Santa Ysabel Creek were collected on January 2003 and April 2003.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 37145, Toxicity **Region 9**

Santa Ysabel Creek (above Sutherland Reservoir)

042182

LOE ID:	30957
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	5
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Six samples were collected at Santa Ysabel Creek stations 905SDYSA4 and 905SDYSA7 from January to May 2003, they showed significant toxicity levels (SL) in the following tests: Selenastrum algae growth test - five of the six samples. Ceriodaphnia dubia survival/reproductive test - two of the six samples.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.
Guideline Reference:	Monitoring data for Region 9
Spatial Representation:	Water samples were collected at a station on Santa Ysabel Creek 4 (905SDYSA4) and Santa Ysabel Creek 4 (905SDYSA7).
Temporal Representation:	Water samples from Santa Ysabel Creek were collected on January 2003, April 2003, and May 2003.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Santa Ysabel Creek (below Sutherland Reservoir)
Water Body ID: CAR9052100020091030160355
Water Body Type: River & Stream

DECISION ID 49295 **Region 9**
Santa Ysabel Creek (below Sutherland Reservoir)

Pollutant: Alkalinity as CaCO3
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the two samples exceed the guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of two samples exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49295, Alkalinity as CaCO3 **Region 9**
Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID: 76649

Pollutant: Alkalinity as CaCO3
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Warm Freshwater Habitat

Number of Samples: 2

Number of Exceedances:	0	042184

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Alkalinity as CaCO3.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Alkalinity as CaCO3 criteria for the protection of freshwater aquatic life is 20000 ug/L (National Recommended Water Quality Criteria, 2009).
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected over the time period 4/29/2009-5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 49295, Alkalinity as CaCO3 **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76650
Pollutant:	Alkalinity as CaCO3
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Alkalinity as CaCO3.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Alkalinity as CaCO3 criteria for the protection of freshwater aquatic life is 20000 ug/L (National Recommended Water Quality Criteria, 2009).
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]

Temporal Representation:	Data was collected over the time period 4/29/2009-5/6/2009.	042185
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID 49310 Region 9

Santa Ysabel Creek (below Sutherland Reservoir)

Pollutant:	**Aluminum**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. The one sample did not exceed the guidelines.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. The one sample did not exceed the guidelines and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49310, Aluminum Region 9

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76651
Pollutant:	Aluminum
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Aluminum.

Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	042186
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan for the San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The California Secondary MCL for aluminum is 0.2 mg/L (Title 22 California Code of Regulations).	
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.	
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]	
Temporal Representation:	Data was collected on a single day 5/6/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 49310, Aluminum **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76652
Pollutant:	Aluminum
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Aluminum.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The National Recommended Water Quality Critiera for the protection of aquatic life from aluminum is the chronic continuous concentration (expressed as a 4-day average) of 87 ug/L.
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 49310, Aluminum **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir) 042187

LOE ID:	76653
Pollutant:	Aluminum
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Aluminum.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The National Recommended Water Quality Critiera for the protection of aquatic life from aluminum is the chronic continuous concentration (expressed as a 4-day average) of 87 ug/L.
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 51990 Region 9

Santa Ysabel Creek (below Sutherland Reservoir)

Pollutant:	**Ammonia (Unionized)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of one sample exceed the beneficial use guideline or objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that: 042188
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the objective or guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51990, Ammonia (Unionized) **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76654
Pollutant:	Ammonia (Unionized)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	0 of 1 samples exceed the water objective for un-ionized ammonia (NH3) at 0.025 mg/l (as N). Un-ionized ammonia (as N) was calculated from Total Ammonia (as N) from monthly samples reported in the data. The calculated un-ionized ammonia (as N) values was then established and compared to the un-ionized Ammonia (as N) at 0.025 mg/L in the RB9 Basin Plan.
Data Reference:	Statewide Perennial Streams Assessment 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan, San Diego Region (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. The discharge of wastes shall not cause concentrations of un-ionized ammonia (NH3) to exceed 0.025 mg/l (as N) in inland surface waters, enclosed bays and estuaries and coastal lagoons.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at 905PS0026 (Santa Ysabel Creek).
Temporal Representation:	Samples collected on 5/13/2008.
Environmental Conditions:	
QAPP Information:	SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51990, Ammonia (Unionized) **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID: 76655

Pollutant:	Nitrogen, ammonia (Total Ammonia)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Ammonia As N, Total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Basin Plan: No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	EPA's Lifetime Health advisory level for total ammonia is 30.0 mg/L as stated on page 8 of the 2006 edition of the drinking water standards and health advisories. This Advisory Level is defined as "the concentration of a chemical in drinking water that is not expected to cause any adverse noncarcinogenic effects for up to ten days of exposure."
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 49312 Region 9

Santa Ysabel Creek (below Sutherland Reservoir)

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Five lines of evidence are available in the administrative record to assess this pollutant. The one sample did not exceed the guideline or objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.

3. The one sample did not exceed the guideline or objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49312, Arsenic **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76656
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for arsenic is 33 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 4/29/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 49312, Arsenic **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76660
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	Dissolved	042191
Beneficial Use:	Cold Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	The dissolved arsenic criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved arsenic is 0.150 mg/L (California Toxics Rule, 2000).	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]	
Temporal Representation:	Data was collected on a single day 5/6/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 49312, Arsenic **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76659
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for arsenic is 0.01 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was

	collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 49312, Arsenic **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76658
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The dissolved arsenic criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved arsenic is 0.150 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 49312, Arsenic **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76657
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for arsenic is 33 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 4/29/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 51741 Region 9

Santa Ysabel Creek (below Sutherland Reservoir)

Pollutant:	**Benthic Community Effects**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Benthic Community Effects is being considered for placement on the CWA section 303(d) List under sections 3.9 and 3.1 of the Listing Policy. Under section 3.9, an additional line of evidence associating Benthic Community Effects with a water or sediment concentration of pollutant(s) is necessary to assess listing status. Based on the readily available data and information, the weight of evidence provides sufficient justification for not placing Benthic Community Effects in this water segment on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used does satisfy the data quantity requirements of section 6.1.5 of the Policy. 3. Pursuant to section 3.9 of the Listing Policy, the water does not exhibit significant degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index. 4. Pursuant to section 3.9 of the Listing Policy, the water segment does not have associated pollutant(s) samples that exceed water quality objectives. 5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not being met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 51741, Benthic Community Effects Region 9

Santa Ysabel Creek (below Sutherland Reservoir) 042194

LOE ID:	72792
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	The one sample collected had an IBI score above 40. The IBI score for this site was 56.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	Development of a Benthic Index of Biotic Integrity (B-IBI) for Wadeable Streams in Northern Coastal California and its Application to Regional 305(b) Assessment
Spatial Representation:	The sample was collected from Santa Ysabel Creek below Clevenger Cyn. Cr.
Temporal Representation:	The sample was collected in April 2009.
Environmental Conditions:	
QAPP Information:	Samples were collected for the SWAMP RWB9 Stormwater Monitoring Council CY 2009.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51741, Benthic Community Effects **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76689
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate water toxicity. The sample exhibited significant toxicity. The toxicity test included survival and reproduction of Ceriodaphnia dubia. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).

Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	042195
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL, Significant compared to negative control based on statistical test, less than stated alpha level, AND less than the evaluation threshold (both criteria are met).	
Guideline Reference:		
Spatial Representation:	The sample was collected at station 905S01953.	
Temporal Representation:	The sample was collected in May 2009.	
Environmental Conditions:		
QAPP Information:	Data quality is good. Data results were recorded in the SWAMP database and followed SWAMP protocols.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 51741, Benthic Community Effects **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76688
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Dissolved Solids.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Dissolved Solids objective for the protection of aquatic life according to Table 3-2 for Santa Ysabel Creek (below Sutherland Reservoir) within the San Dieguito Hydrologic Unit is 500 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51741, Benthic Community Effects 042196 Region 9

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76687
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Dissolved Solids.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Dissolved Solids objective for the protection of aquatic life according to Table 3-2 for Santa Ysabel Creek (below Sutherland Reservoir) within the San Dieguito Hydrologic Unit is 500 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51741, Benthic Community Effects Region 9

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76661
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	The IBI score for this water body is 39 which indicates that this water body may be considered to have impaired conditions.
Data Reference:	RWB9 Status Sampling 2007 and 2008
SWAMP Data:	SWAMP

Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at the following station: 905SDYSA7-Santa Ysabel Creek 7
Temporal Representation:	Surveys done May 6, 2008.
Environmental Conditions:	
QAPP Information:	Data collected following SWAMP QA protocols for the RWB9 Status Sampling 2007 and 2008 water quality monitoring project.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 51741, Benthic Community Effects **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76667
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Selenium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The selenium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater is 0.005 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51741, Benthic Community Effects **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76665

Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Selenium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The selenium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater is 0.005 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51741, Benthic Community Effects **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	79545
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	A total of four samples were taken from four stations along Santa Ysabel Creek. The CSCI scores for this stream are above the 0.79 threshold, and therefore not exceeding the water quality objective for the aquatic life beneficial use.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009 RWB9 Status Sampling 2007 and 2008 Statewide Perennial Streams Assessment 2008 Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008. Region 9 CSCI Scores & Water Body Information
SWAMP Data:	SWAMP

Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.
Guideline Reference:	The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.
Spatial Representation:	905SDC-TWAS-2 905SDYSA7 905S01953 905PS0026
Temporal Representation:	Samples were collected in 2008 and 2009
Environmental Conditions:	
QAPP Information:	Data collected following SWAMP QA protocols for the RWB9 Status Sampling 2007 and 2008 water quality monitoring project.
QAPP Information Reference(s):	RWB9 Stormwater Monitoring Council CY 2009 RWB9 Status Sampling 2007 and 2008 Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008. Bioassessment Data for Various Pollutants from Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.

Line of Evidence (LOE) for Decision ID 51741, Benthic Community Effects **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	72793
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	The one sample collected had an IBI score above 40. The IBI score for this site was 40.
Data Reference:	Statewide Perennial Streams Assessment 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are

	converted to an IBI score then summed. These cumulative scores are then averaged. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	Development of a Benthic Index of Biotic Integrity (B-IBI) for Wadeable Streams in Northern Coastal California and its Application to Regional 305(b) Assessment
Spatial Representation:	The samples were collected from Santa Ysabel Creek.
Temporal Representation:	The sample was collected in May 2008.
Environmental Conditions:	
QAPP Information:	Samples were collected for the Statewide Perennial Streams Assessment 2008 following SWAMP protocols and stored in the SWAMP database.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51741, Benthic Community Effects **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	30955
Pollutant:	Benthic Community Effects
LOE Subgroup:	Adverse Biological Responses
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	One sample of IBI data was taken from May 2001 at one sampling site. The sample exceeded the IBI impairment threshold.
Data Reference:	Fish and Game IBI Data
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. (SDRWQCB, 1995)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	The sample was collected at one site: 905SYCNTx on Santa Ysabel Creek.
Temporal Representation:	Sampling occurred on May 22, 2001.
Environmental Conditions:	
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Project Plan for the California Stream Bioassessment Procedure and the State of California, California Monitoring an Assessment Program: "CMAP", Quality Assurance Project Plan.
QAPP Information Reference(s):	State of California, California Monitoring and Assessment Program: "CMAP". Quality Assurance Project Plan for the California Stream Bioassessment Procedure The San Diego Stream Team Quality Assurance Project Plan

DECISION ID 49344 Region 9

Santa Ysabel Creek (below Sutherland Reservoir)

Pollutant:	**Bifenthrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. The one sample did not exceed the aquatic life guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. The one sample did not exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49344, Bifenthrin Region 9

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76662
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Bifenthrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP

Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Bifenthrin does not exceed 0.0006 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 49344, Bifenthrin **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76663
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Bifenthrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Bifenthrin does not exceed 0.0006 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 49376 **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**

Last Listing Cycle's Final Listing Decision:	New Decision	042203
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Five lines of evidence are available in the administrative record to assess this pollutant. The one sample did not exceed the guideline or objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. The one sample did not exceed the guideline or objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49376, Cadmium **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76629
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Cadmium to protect aquatic life in freshwater. The dissolved Cadmium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition

Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 49376, Cadmium **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76664
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for cadmium is 4.98 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 4/29/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 49376, Cadmium **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76628
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved

Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Cadmium to protect aquatic life in freshwater. The dissolved Cadmium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 49376, Cadmium **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76627
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for cadmium is 4.98 mg/Kg dry weight (MacDonald et al.

	2000). 042206
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 4/29/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 49376, Cadmium **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76630
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for cadmium is 0.005 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 49421 **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

Pollutant:	**Chloride**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of

the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. The samples do not exceed the beneficial use guidelines.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the samples exceeded the beneficial use guidelines. The sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49421, Chloride **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76632
Pollutant:	Chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chloride.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The recommended secondary maximum contamination level acceptable to consumers of drinking water is 250 mg/L.
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 49421, Chloride 042208 **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76634
Pollutant:	Chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chloride.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Chloride objective for the protection of aquatic life according to Table 3-2 for Santa Ysabel Creek (below Sutherland Reservoir) within the San Dieguito Hydrologic Unit is 250 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 49421, Chloride **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76633
Pollutant:	Chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chloride.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP

Water Quality Objective/Criterion:	The recommended secondary maximum contamination level acceptable to consumers of drinking water is 250 mg/L.
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 49377 Region 9

Santa Ysabel Creek (below Sutherland Reservoir)

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Five lines of evidence are available in the administrative record to assess this pollutant. The one sample did not exceed the guideline or objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. The one sample did not exceed the guideline or objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49377, Chromium Region 9

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76635
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment

Fraction:	Total	042210
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for chromium is 111 mg/Kg dry weight (MacDonald et al. 2000).	
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31	
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]	
Temporal Representation:	Data was collected on a single day 4/29/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 49377, Chromium **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76636
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for

	sediment-dwelling organisms) for chromium is 111 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 4/29/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 49377, Chromium **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76639
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium. Since the chromium species was not identified, the data point(s) were assessed using both the Chromium III criteria which is hardness-dependent, and the criterion continuous concentration (4-day average) to protect aquatic life in freshwater for chromium VI which is 11 ug/L and is not hardness dependent.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved chromium to protect aquatic life in freshwater. The dissolved Chromium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 49377, Chromium **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76638

Pollutant:	Chromium	042212
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	Total	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for total chromium is 0.05 mg/L (Title 22 of the California Code of Regulations).	
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]	
Temporal Representation:	Data was collected on a single day 5/6/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 49377, Chromium **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76637
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium. Since the chromium species was not identified, the data point(s) were assessed using both the Chromium III criteria which is hardness-dependent, and the criterion continuous concentration (4-day average) to protect aquatic life in freshwater for chromium VI which is 11 ug/L and is not hardness dependent.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Chromium to protect aquatic life in freshwater. The dissolved Chromium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula

	for the metals criterion. 042213
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 49379 Region 9

Santa Ysabel Creek (below Sutherland Reservoir)

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Five lines of evidence are available in the administrative record to assess this pollutant. The one sample did not exceed the guideline or objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. The one sample did not exceed the guideline or objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49379, Copper Region 9

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76641
Pollutant:	Copper
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total

Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for copper is 149 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 4/29/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 49379, Copper **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76642
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Copper to protect aquatic life in freshwater. The dissolved Copper criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	

Guideline Reference:	042215
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 49379, Copper **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76643
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for copper is 1.0 mg/L (Title 22 California Code of Regulations).
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 49379, Copper **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76644
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING 042216
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved copper to protect aquatic life in freshwater. The dissolved copper criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 49379, Copper **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76640
Pollutant:	Copper
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for copper is 149 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 4/29/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.

QAPP Information:	The SWAMP QAPP (2008) was followed.	042217
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID 49345 **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

Pollutant:	**Cyfluthrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. The one sample did not exceed the aquatic life guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. The one sample did not exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49345, Cyfluthrin **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76646
Pollutant:	Cyfluthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cyfluthrin, total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009

SWAMP Data:	SWAMP	042218
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of lambda-cyhalothrin does not exceed 0.0005 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Mixtures of lambda-cyhalothrin and other pyrethroids should be considered in an additive manner. (Fojut et al. 2012)Â	
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.	
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]	
Temporal Representation:	Data was collected on a single day 5/6/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 49345, Cyfluthrin **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76645
Pollutant:	Cyfluthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cyfluthrin, total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of lambda-cyhalothrin does not exceed 0.0005 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Mixtures of lambda-cyhalothrin and other pyrethroids should be considered in an additive manner. (Fojut et al. 2012)Â
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 49346 Region 9

Santa Ysabel Creek (below Sutherland Reservoir)

Pollutant:	**Cyhalothrin, Lambda**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. The one sample did not exceed the aquatic life guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. The one sample did not exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49346, Cyhalothrin, Lambda Region 9

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76648
Pollutant:	Cyhalothrin, Lambda
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cyhalothrin, lambda, total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP

Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Cyhalothrin, lambda, total does not exceed 0.0005 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 49346, Cyhalothrin, Lambda **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76647
Pollutant:	Cyhalothrin, Lambda
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cyhalothrin, lambda, total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Cyhalothrin, lambda, total does not exceed 0.0005 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 49347 **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

Pollutant:	**Cypermethrin**	042221
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	
Last Listing Cycle's Final Listing Decision:	New Decision	
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. The one sample did not exceed the aquatic life guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. The one sample did not exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49347, Cypermethrin **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76740
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	One of one sample result was not used in the assessment because the laboratory data was non-detect and the method detection limit was above the guideline and therefore the results could not be quantified with the level of certainty required by the Listing Policy
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day

	average concentration of cypermethrin does not exceed 0.0002 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Fojut et al. 2012)
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 49347, Cypermethrin **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76741
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	One of one sample result was not used in the assessment because the laboratory data was non-detect and the method detection limit was above the guideline and therefore the results could not be quantified with the level of certainty required by the Listing Policy
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of cypermethrin does not exceed 0.0002 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Fojut et al. 2012)
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 49348 **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

Pollutant:	**Deltamethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision

Revision Status	Revised	042223
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. The one sample did not exceed the aquatic life guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. The one sample did not exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49348, Deltamethrin **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76742
Pollutant:	Deltamethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Deltamethrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for Deltamethrin is the maximum acceptable toxicant concentration (MATC) of 0.02 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was

	collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 49348, Deltamethrin **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76743
Pollutant:	Deltamethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Deltamethrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for Deltamethrin is the maximum acceptable toxicant concentration (MATC) of 0.02 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 49349 **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

Pollutant:	**Esfenvalerate/Fenvalerate**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. The one

sample did not exceed the aquatic life guideline. 042225

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. The one sample did not exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49349, Esfenvalerate/Fenvalerate **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76748
Pollutant:	Esfenvalerate/Fenvalerate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Esfenvalerate/Fenvalerate, total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to the USEPA Office of Pesticide Programs Ecotoxicity database, the aquatic life EC50 for Esfenvalerate/Fenvalerate is 0.9 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 49349, Esfenvalerate/Fenvalerate **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir) 042226

LOE ID:	76744
Pollutant:	Esfenvalerate/Fenvalerate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Esfenvalerate/Fenvalerate, total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to the USEPA Office of Pesticide Programs Ecotoxicity database, the aquatic life EC50 for Esfenvalerate/Fenvalerate is 0.9 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 49353 Region 9

Santa Ysabel Creek (below Sutherland Reservoir)

Pollutant:	**Fenpropathrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. The one sample did not exceed the aquatic life guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.

2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy
3. The one sample did not exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49353, Fenpropathrin **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76750
Pollutant:	Fenpropathrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Fenpropathrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for Fenpropathrin is the median lethal concentration (LC50; 2.2 ug/L).
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 49353, Fenpropathrin **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76749
Pollutant:	Fenpropathrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total

Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Fenpropathrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for Fenpropathrin is the median lethal concentration (LC50; 2.2 ug/L).
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 49381 Region 9

Santa Ysabel Creek (below Sutherland Reservoir)

Pollutant:	**Iron**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. The one sample did not exceed the guideline or objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. The one sample did not exceed the guideline or objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49381, Iron **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76753
Pollutant:	Iron
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Iron.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Iron objective for the protection of aquatic life according to Table 3-2 for Santa Ysabel Creek (below Sutherland Reservoir) within the San Dieguito Hydrologic Unit is 0.3 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 49381, Iron **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76752
Pollutant:	Iron
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Iron.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for iron is 0.3 mg/L (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 49381, Iron **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76751
Pollutant:	Iron
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Iron.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Iron objective for the protection of aquatic life according to Table 3-2 for Santa Ysabel Creek (below Sutherland Reservoir) within the San Dieguito Hydrologic Unit is 0.3 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 49382 Region 9

Santa Ysabel Creek (below Sutherland Reservoir) 042231

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Four lines of evidence are available in the administrative record to assess this pollutant. The one sample did not exceed the guideline or objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. The one sample did not exceed the guideline or objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49382, Lead — Region 9

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76756
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Lead to protect aquatic life in freshwater. The dissolved Lead criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling.

	Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 49382, Lead **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76757
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved lead to protect aquatic life in freshwater. The dissolved lead criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 49382, Lead **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76754
Pollutant:	Lead
LOE Subgroup:	Pollutant-Sediment

Matrix:	Sediment	042233
Fraction:	Total	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for lead is 128 mg/Kg dry weight (MacDonald et al. 2000).	
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31	
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]	
Temporal Representation:	Data was collected on a single day 4/29/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 49382, Lead **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76755
Pollutant:	Lead
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for

	sediment-dwelling organisms) for lead is 128 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 4/29/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 49422 Region 9

Santa Ysabel Creek (below Sutherland Reservoir)

Pollutant:	**Manganese**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Four lines of evidence are available in the administrative record to assess this pollutant. One of one sample exceeds for the aquatic life beneficial use and one of two samples exceeds the Municipal & Domestic Supply beneficial use. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Only one of one or one of two samples exceeded the guideline or objective. The sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49422, Manganese Region 9

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76760
Pollutant:	Manganese
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Manganese.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for manganese is 0.05 mg/L (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 49422, Manganese **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76761
Pollutant:	Manganese
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Manganese.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Manganese objective for the protection of aquatic life according to Table 3-2 for Santa Ysabel Creek (below Sutherland Reservoir) within the San Dieguito Hydrologic Unit is 0.05 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.

QAPP Information:	The SWAMP QAPP (2008) was followed.	042236
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 49422, Manganese **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76759
Pollutant:	Manganese
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Manganese.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for manganese is 0.05 mg/L (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 49422, Manganese **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76758
Pollutant:	Manganese
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Manganese.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009

SWAMP Data:	SWAMP	042237
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Manganese objective for the protection of aquatic life according to Table 3-2 for Santa Ysabel Creek (below Sutherland Reservoir) within the San Dieguito Hydrologic Unit is 0.05 mg/L.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]	
Temporal Representation:	Data was collected on a single day 5/6/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID 49380 Region 9

Santa Ysabel Creek (below Sutherland Reservoir)

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Five lines of evidence are available in the administrative record to assess this pollutant. The one sample did not exceed the guideline or objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. The one sample did not exceed the guideline or objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49380, Nickel Region 9

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76762

Pollutant:	Nickel	042238
LOE Subgroup:	Pollutant-Sediment	
Matrix:	Sediment	
Fraction:	Total	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for nickel is 48.6 mg/Kg dry weight (MacDonald et al. 2000).	
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31	
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]	
Temporal Representation:	Data was collected on a single day 4/29/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 49380, Nickel **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76765
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nickel is 0.1 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR

Evaluation Guideline:	042239
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 49380, Nickel **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76763
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for nickel is 48.6 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 4/29/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 49380, Nickel **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76766
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat

Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Nickel to protect aquatic life in freshwater. The dissolved Nickel criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 49380, Nickel **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76764
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Nickel to protect aquatic life in freshwater. The dissolved Nickel criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 51995 Region 9

Santa Ysabel Creek (below Sutherland Reservoir)

Pollutant:	**Nitrate/Nitrite (Nitrite + Nitrate as N)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one sample for each LOE exceeded the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample for each LOEs exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met. This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51995, Nitrate/Nitrite (Nitrite + Nitrate as N) Region 9

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76768
Pollutant:	Nitrate/Nitrite (Nitrite + Nitrate as N)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	0 of 1 samples exceed the water quality objective for Nitrate + Nitrite (as N). The Nitrate + Nitrite (as N) MCL objective is 10 mg/L.
Data Reference:	Statewide Perennial Streams Assessment 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan, San Diego Region (SDRWQCB 2011): Waters designated for MUN shall not contain concentrations of chemical constituents in excess of the MCL specified in Title 22 of the California Code of Regulations. The Nitrate + Nitrite (as N) MCL is 10 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Spatial Representation:	Samples were collected at 905PS0026 (Santa Ysabel Creek).
Temporal Representation:	Samples collected on 5/13/2008.
Environmental Conditions:	
QAPP Information:	SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 51995, Nitrate/Nitrite (Nitrite + Nitrate as N) Region 9

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76767
Pollutant:	Nitrate/Nitrite (Nitrite + Nitrate as N)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nitrate/Nitrite as N.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrate + nitrite (as N) is 10.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 51997 Region 9

Santa Ysabel Creek (below Sutherland Reservoir) 042243

Pollutant:	**Nitrogen, Nitrate**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. The one sample did not exceed the guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. The one sample did not exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51997, Nitrogen, Nitrate — Region 9

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76769
Pollutant:	Nitrogen, Nitrate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	0 of 1 samples exceed the water quality objective for Nitrite (as N). The Nitrite (as N) MCL objective is 1 mg/L. The datum is reported as underneath the quantitation limit. This quantitation limit is less than or equal to the water quality standard, the value will be considered as meeting the water quality standard, objective, criterion, or evaluation guideline.
Data Reference:	Statewide Perennial Streams Assessment 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan, San Diego Region (SDRWQCB 2011): Waters designated for MUN shall not contain concentrations of chemical constituents in excess of the MCL

	specified in Title 22 of the California Code of Regulations. The Nitrite (as N) MCL is 1 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Spatial Representation:	Samples were collected at 905PS0026 (Santa Ysabel Creek).
Temporal Representation:	Samples collected on 5/13/2008.
Environmental Conditions:	
QAPP Information:	SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 52000 Region 9

Santa Ysabel Creek (below Sutherland Reservoir)

Pollutant:	**Nitrogen, Nitrite**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. The one sample did not exceed the guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. The one sample did not exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52000, Nitrogen, Nitrite Region 9

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76770
Pollutant:	Nitrogen, Nitrite
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	1	042245
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nitrite as N.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrite (as N) is 1.0 mg/L (Title 22 of the California Code of Regulations).	
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]	
Temporal Representation:	Data was collected on a single day 5/6/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID 49471 Region 9

Santa Ysabel Creek (below Sutherland Reservoir)

Pollutant:	**Oxygen, Dissolved**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. Three lines of evidence are available in the administrative record to assess this pollutant. None of the samples exceed the criterion. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the samples exceeded the criterion and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49471, Oxygen, Dissolved 042246 Region 9

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76771
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Oxygen, Dissolved.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan, San Diego Basin, Warm Water Habitat Objective, Chapter III, General Objectives for all Inland Surface Waters, Enclosed Bays and Estuaries states the following: The dissolved oxygen concentration for warm water habitats shall not be reduced below 5.0 mg/l at any time.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 4/29/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 49471, Oxygen, Dissolved Region 9

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76772
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Oxygen, Dissolved.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP

Water Quality Objective/Criterion:	Water Quality Control Plan, San Diego Basin, Cold Water Habitat Objective, Chapter III, General Objectives for all Inland Surface Waters, Enclosed Bays and Estuaries states the following: The dissolved oxygen concentration for cold water habitats shall not be reduced below 8.0 mg/l at any time.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 4/29/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 49471, Oxygen, Dissolved **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76773
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Numeric data generated from 1 sample of Dissolved Oxygen concentrations had no exceedence.
Data Reference:	Statewide Perennial Streams Assessment 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	From the Basin Plan: Dissolved oxygen levels shall not be less than 5.0 mg/l in inland surface waters with designated MAR or WARM beneficial uses or less than 6.0 mg/l in waters with designated COLD beneficial uses. The annual mean dissolved oxygen concentrations shall not be less than 7 mg/l more than 10% of the time.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	One sample was collected from the 905PS0026 station.
Temporal Representation:	One sample was collected in May 2008.
Environmental Conditions:	
QAPP Information:	NPDES quality assurance.
QAPP Information Reference(s):	

DECISION ID 49355 **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

Pollutant:	**Permethrin, total**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final	New Decision

Listing Decision:		042248
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. The one sample did not exceed the aquatic life guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. The one sample did not exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49355, Permethrin, total **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76775
Pollutant:	Permethrin, total
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Permethrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Permethrin does not exceed 0.002 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.

Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 49355, Permethrin, total **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76774
Pollutant:	Permethrin, total
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Permethrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Permethrin does not exceed 0.002 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 49423 **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

Pollutant:	**Selenium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of

the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Four lines of evidence are available in the administrative record to assess this pollutant. One of one sample exceeds for the aquatic life beneficial use and zero of one sample exceeds the Municipal & Domestic Supply beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Only one of one or zero of one samples exceeded the guideline or objective. The sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49423, Selenium **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76667
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Selenium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The selenium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater is 0.005 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.

QAPP Information Reference(s): Surface Water Ambient Monitoring Program Quality Assurance Program Plan 042251

Line of Evidence (LOE) for Decision ID 49423, Selenium **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76666
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Selenium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The Maximum Contaminant Level for selenium in the Basin Plan is 0.01 mg/L.
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 49423, Selenium **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76665
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Selenium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP

Water Quality Objective/Criterion:	The selenium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater is 0.005 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 49424 Region 9

Santa Ysabel Creek (below Sutherland Reservoir)

Pollutant:	**Silver**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Three lines of evidence are available in the administrative record to assess this pollutant. The one sample did not exceed the guideline or objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. The one sample did not exceed the guideline or objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49424, Silver Region 9

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76668
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	Total	042253
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Silver.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan for the San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The California Secondary MCL for silver is 0.1 mg/L (Title 22 California Code of Regulations).	
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.	
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]	
Temporal Representation:	Data was collected on a single day 5/6/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 49424, Silver **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76669
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Silver.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Silver to protect aquatic life in freshwater. The dissolved Silver criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 49424, Silver **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76670
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Silver.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Silver to protect aquatic life in freshwater. The dissolved Silver criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 49487 **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

Pollutant:	**Specific Conductivity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of

the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. One of one samples exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of one samples exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49487, Specific Conductivity **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76676
Pollutant:	Specific Conductivity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Conductivity(Us).
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for specific conductance is 900 uS/cm (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 4/29/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 49489 **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

Pollutant:	**Sulfates**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. zero of one samples exceed the objectives.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples exceeded the objectives and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49489, Sulfates **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76677
Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Sulfate.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that

	adversely affect beneficial uses. 042257
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for sulfate is 250 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 49489, Sulfates **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76678
Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Sulfate.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Sulfate objective for the protection of aquatic life according to Table 3-2 for Santa Ysabel Creek (below Sutherland Reservoir) within the San Dieguito Hydrologic Unit is 250 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 49489, Sulfates **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76679
Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	042258
Beneficial Use:	Cold Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Sulfate.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Sulfate objective for the protection of aquatic life according to Table 3-2 for Santa Ysabel Creek (below Sutherland Reservoir) within the San Dieguito Hydrologic Unit is 250 mg/L.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]	
Temporal Representation:	Data was collected on a single day 5/6/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID 49491 Region 9

Santa Ysabel Creek (below Sutherland Reservoir)

Pollutant:	**Temperature, water**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. zero of one samples exceed the guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49491, Temperature, water **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76680
Pollutant:	Temperature, water
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Water Temperature.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Board that such alteration in temperature does not adversely affect beneficial uses. At no time or place shall the temperature of any COLD water be increased more than 5Â°F above the natural receiving water temperature.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Inland Fishes of California (Moyle 1976) states that for rainbow trout the optimum range for growth and completion of most life stages is 13-21 degrees C (page 129).
Guideline Reference:	Inland Fishes of California
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 4/29/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 49493 **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

Pollutant:	**Total Dissolved Solids**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. One of one samples exceed the objectives.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of one samples exceeded the objectives and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49493, Total Dissolved Solids **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76681
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Dissolved Solids.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for Dissolved Solids is 500 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 49493, Total Dissolved Solids **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir) 042261

LOE ID:	76688
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Dissolved Solids.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Dissolved Solids objective for the protection of aquatic life according to Table 3-2 for Santa Ysabel Creek (below Sutherland Reservoir) within the San Dieguito Hydrologic Unit is 500 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 49493, Total Dissolved Solids **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76687
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Dissolved Solids.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists

	objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Dissolved Solids objective for the protection of aquatic life according to Table 3-2 for Santa Ysabel Creek (below Sutherland Reservoir) within the San Dieguito Hydrologic Unit is 500 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 51756 Region 9

Santa Ysabel Creek (below Sutherland Reservoir)

Pollutant:	**Toxicity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. One of the one sample exceed the GUIDELINE. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of one sample exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51756, Toxicity Region 9

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76689
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None

Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate water toxicity. The sample exhibited significant toxicity. The toxicity test included survival and reproduction of Ceriodaphnia dubia. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL, Significant compared to negative control based on statistical test, less than stated alpha level, AND less than the evaluation threshold (both criteria are met).
Guideline Reference:	
Spatial Representation:	The sample was collected at station 905S01953.
Temporal Representation:	The sample was collected in May 2009.
Environmental Conditions:	
QAPP Information:	Data quality is good. Data results were recorded in the SWAMP database and followed SWAMP protocols.
QAPP Information Reference(s):	

DECISION ID 49496 Region 9

Santa Ysabel Creek (below Sutherland Reservoir)

Pollutant:	**Turbidity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of one samples exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum

of 26 samples is needed to determine if a beneficial use is fully supported using table 3-2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49496, Turbidity **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76690
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	0 of 1 exceed the water quality objective.
Data Reference:	Statewide Perennial Streams Assessment 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan, San Diego Region (SDRWQCB 2011): Table 3-2 states that the Turbidity for Santa Ysabel is 20 (NTU). Concentrations not to be exceeded more than 10% of the time during any one year period.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at 905PS0026 (Santa Ysabel Creek).
Temporal Representation:	Samples were collected on 5/13/2008.
Environmental Conditions:	
QAPP Information:	SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 49425 **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Five lines of evidence are available in the administrative record to assess this pollutant. The one

sample did not exceed the guideline or objective. 042265

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. The one sample did not exceed the guideline or objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49425, Zinc **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76698
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	The California Secondary MCL for zinc is 5.0 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 49425, Zinc **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76699
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Zinc to protect aquatic life in freshwater. The dissolved Zinc criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 49425, Zinc **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76691
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be

	maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for zinc is 459 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 4/29/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 49425, Zinc **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76700
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Zinc to protect aquatic life in freshwater. The dissolved Zinc criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 5/6/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 49425, Zinc **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76692

Pollutant:	Zinc	042268
LOE Subgroup:	Pollutant-Sediment	
Matrix:	Sediment	
Fraction:	Total	
Beneficial Use:	Cold Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for zinc is 459 mg/Kg dry weight (MacDonald et al. 2000).	
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31	
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]	
Temporal Representation:	Data was collected on a single day 4/29/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID 49481 Region 9

Santa Ysabel Creek (below Sutherland Reservoir)

Pollutant:	**pH**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. zero of one samples exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum

of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2. 0342269
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49481, pH **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76776
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for pH.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	In inland surface waters the pH shall not be depressed below 6.5 nor raised above 8.5.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]
Temporal Representation:	Data was collected on a single day 4/29/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 49481, pH **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76777
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	042270
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Santa Ysabel Creek (below Sutherland Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for pH.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	In inland surface waters the pH shall not be depressed below 6.5 nor raised above 8.5.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Santa Ysabel Creek (below Sutherland Reservoir) was collected at 1 monitoring site [Santa Ysabel Creek below Clevenger Cyn. Cr. - 905S01953]	
Temporal Representation:	Data was collected on a single day 4/29/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 49481, pH **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	76778
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Numeric data generated from 1 sample collected had no exceedences.
Data Reference:	Statewide Perennial Streams Assessment 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	In inland surface waters[,] the pH shall not be depressed below 6.5 nor raised above 8.5.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from the 905PS0026 station.
Temporal Representation:	One sample was collected in May 2008
Environmental Conditions:	
QAPP Information:	SWAMP QAPP
QAPP Information Reference(s):	

DECISION ID 34084 **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

Pollutant:	**PAHs (Polycyclic Aromatic Hydrocarbons)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final	Do Not List on 303(d) list (TMDL required list)(2012)

Listing Decision:		042271
Revision Status	Original	
Impairment from Pollutant or Pollution:	Pollution	

Regional Board Conclusion:

The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 and 3.9 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. None of the 129 samples exceed the Basin Plan water quality objective for polycyclic aromatic hydrocarbons.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 129 samples exceed the Basin Plan water quality objective for polycyclic aromatic hydrocarbons and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.

4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 34084, PAHs (Polycyclic Aromatic Hydrocarbons) **Region 9**

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	30955
Pollutant:	Benthic Community Effects
LOE Subgroup:	Adverse Biological Responses
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	One sample of IBI data was taken from May 2001 at one sampling site. The sample exceeded the IBI impairment threshold.
Data Reference:	Fish and Game IBI Data
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the San Diego Basin Plan the objective is: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. (SDRWQCB, 1995)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	The Index of Biological Integrity (IBI) is an analytical tool that can be used to assess the biological and physical condition of streams and rivers within a zero to one hundred scoring range: Very Poor 0-19, Poor 20-39, Fair 40-59, Good 60- 79, Very Good 80-100. The IBI score of 39 was set as an impairment threshold because it is a statistical criterion of two standard deviations below the mean reference site score which defines the boundary between 'fair' and 'poor' IBI creek conditions. (Ode, p. 9)
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	The sample was collected at one site: 905SYCNTx on Santa Ysabel Creek.
Temporal Representation:	Sampling occurred on May 22, 2001.
Environmental Conditions:	
QAPP Information:	Quality Control for collection and identification was conducted in accordance with the Quality Assurance Project Plan for the California Stream Bioassessment Procedure and the State of California, California Monitoring an Assessment Program: "CMAP", Quality Assurance Project Plan.
QAPP Information Reference(s):	State of California, California Monitoring and Assessment Program: "CMAP". Quality Assurance Project Plan for the California Stream Bioassessment Procedure The San Diego Stream Team Quality Assurance Project Plan

Line of Evidence (LOE) for Decision ID 34084, PAHs (Polycyclic Aromatic Hydrocarbons) Region 9

Santa Ysabel Creek (below Sutherland Reservoir)

LOE ID:	30953
Pollutant:	PAHs (Polycyclic Aromatic Hydrocarbons)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	129
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	129 samples were collected at Santa Ysabel Creek station 901SJBEL2 during the months of January 2003, April 2003, and May 2003 for Polycyclic Aromatic Hydrocarbons (PAHs) analyses, none of the 129 samples exceeded evaluation concentrations (SWAMP, 2007).
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water designated for use as domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels (MCL 0.0002mg/l) specified in California Code of Regulations, Title 22, Table 64444-A of section 64444 (Organic Chemicals) which is incorporated by reference into this plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Santa Ysabel Creek station 901SJBEL2; (Latitude 33.0862, Longitude -116.9166). (Station name incorrect. Coordinates show 905YSA7.)
Temporal Representation:	Samples were collected during the months of January 2003, April 2003, and May 2003.
Environmental Conditions:	
QAPP Information:	Quality controls for chemical analyses were conducted in accordance with the California Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Sweetwater River, Upper (above Sweetwater Reservoir)
Water Body ID: CAR9092100020091030151520
Water Body Type: River & Stream

DECISION ID 51176 **Region 9**
Sweetwater River, Upper (above Sweetwater Reservoir)

Pollutant: 1,2,3-Trichloropropane
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the zero samples exceed the beneficial use guidelines.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of zero samples exceeded the guideline. The samples were not used in the assessment due to reporting limits that were higher than the guideline. The sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51176, 1,2,3-Trichloropropane **Region 9**
Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID: 77047

Pollutant: 1,2,3-Trichloropropane
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples:	0	042274
Number of Exceedances:	0	
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)	
Data Used to Assess Water Quality:	This data is not of sufficient resolution to determine if standards are being achieved, the reporting limit for the non-detected sample is greater than the criteria used to determine if water quality standards are being met.	
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological response in human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The public health goal for 1,2,3-Trichloropropane is 0.0007 ug/L.	
Guideline Reference:	Public Health Goal for 1,2,3-Trichloropropane in Drinking Water	
Spatial Representation:	The sample was collected from Low Flow Barrier at Sweetwater River, Upper (above Sweetwater Reservoir).	
Temporal Representation:	The sample was collected on January 15th 2007.	
Environmental Conditions:	No environmental conditions were reported.	
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.	
QAPP Information Reference(s):		

DECISION ID	**51188**	**Region 9**
Sweetwater River, Upper (above Sweetwater Reservoir)		

Pollutant:	**2,4,5-TP (Silvex)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of one samples exceeded the criterion or guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeded the criterion or guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and

information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51188, 2,4,5-TP (Silvex) **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	77048
Pollutant:	2,4,5-TP (Silvex)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	The sample did not exceed the water quality objective for 2,4,5-TP, thought to be protective of drinking water.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological response in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	USEPA National Recomm. WQ Criteria, water + fish consump. in drinking water is 10 ug/L.
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	The sample was collected from Low Flow Barrier at Sweetwater River, Upper (above Sweetwater Reservoir)
Temporal Representation:	The sample was collected on January 15th 2007.
Environmental Conditions:	No environmental conditions were reported.
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.
QAPP Information Reference(s):	

DECISION ID **51189** **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

Pollutant:	**2,4-D (2,4-Dichlorophenoxy acetic acid)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeded the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51189, 2,4-D (2,4-Dichlorophenoxy acetic acid) Region 9

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	77049
Pollutant:	2,4-D (2,4-Dichlorophenoxy acetic acid)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	The sample did not exceed the water quality objective for 2,4-D, thought to be protective of drinking water.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water designated for use as domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels specified in California Code of Regulations, Title 22, Table 64444-A of section 64444 (Organic Chemicals) which is incorporated by reference into this plan. This incorporation byreference is prospective including future changes to the incorporated provisions as the changes take effect. (See Table 3-5).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California primary MCL in drinking water is 70 ug/L.
Guideline Reference:	
Spatial Representation:	The sample was collected from Low Flow Barrier at Sweetwater River, Upper (above Sweetwater Reservoir)
Temporal Representation:	The sample was collected on January 15th 2007.
Environmental Conditions:	No environmental conditions were reported.
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.
QAPP Information Reference(s):	

DECISION ID **51190** **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

Pollutant:	**Alachlor**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeded the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51190, Alachlor **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	77063
Pollutant:	Alachlor
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	The sample did not exceed the water quality objective for alachlor, thought to be protective of drinking water.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water designated for use as domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels

	specified in California Code of Regulations, Title 22, Table 64444-A of section 64444 (Organic Chemicals) which is incorporated by reference into this plan. This incorporation byreference is prospective including future changes to the incorporated provisions as the changes take effect. (See Table 3-5).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California primary MCL for alachlor in drinking water is 2 ug/L.
Guideline Reference:	
Spatial Representation:	The sample was collected from Low Flow Barrier at Sweetwater River, Upper (above Sweetwater Reservoir).
Temporal Representation:	The sample was collected on January 15th 2007.
Environmental Conditions:	No environmental conditions were reported.
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.
QAPP Information Reference(s):	

DECISION ID 51296 Region 9

Sweetwater River, Upper (above Sweetwater Reservoir)

Pollutant:	**Aldrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one sample exceeds the municipal and domestic criterion. Zero of the zero sample exceeds the warm freshwater criterion. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the one sample exceeds the municipal and domestic criterion. Zero of the zero sample exceeds the warm freshwater criterion. The sample size for the municipal beneficial use is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. The samples for the warm freshwater beneficial use were not used in the assessment due to reporting limits that were higher than the guideline. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51296, Aldrin Region 9

Sweetwater River, Upper (above Sweetwater Reservoir) 042279

LOE ID:	77066
Pollutant:	Aldrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	This data is not of sufficient resolution to determine if standards are being achieved: the detection limit is greater than the criteria used to determine if water quality standards are being met.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The concentrations of toxic substances in the water column, sediments or biota shall not adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Calif. Toxic Rule (USEPA) for other waters for aldrin is 0.00014 ug/L.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	The sample was collected from Low Flow Barrier at Sweetwater River, Upper (above Sweetwater Reservoir).
Temporal Representation:	The sample was collected on January 15th 2007.
Environmental Conditions:	No environmental conditions were reported.
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 51296, Aldrin **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	77065
Pollutant:	Aldrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	This data is not of sufficient resolution to determine if standards are being achieved: the detection limit is greater than the criteria used to determine if water quality standards are being met.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms..
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Calif. Toxic Rule for sources of drinking water for aldrin is 0.00013 ug/L.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	The sample was collected from Low Flow Barrier at Sweetwater River, Upper (above Sweetwater Reservoir).
Temporal Representation:	The sample was collected on January 15th 2007.
Environmental Conditions:	No environmental conditions were reported.
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.
QAPP Information Reference(s):	

DECISION ID 53388 Region 9

Sweetwater River, Upper (above Sweetwater Reservoir)

Pollutant:	**Ammonia**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the one samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53388, Ammonia Region 9

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	77082	042281

Pollutant:	Nitrogen, ammonia (Total Ammonia)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, Upper (above Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Ammonia As N, Total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Basin Plan: No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	EPA's Lifetime Health advisory level for total ammonia is 30.0 mg/L as stated on page 8 of the 2006 edition of the drinking water standards and health advisories. This Advisory Level is defined as "the concentration of a chemical in drinking water that is not expected to cause any adverse noncarcinogenic effects for up to ten days of exposure."
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Sweetwater River, Upper (above Sweetwater Reservoir) was collected at 1 monitoring site [Sweetwater River @ Old Bridge]
Temporal Representation:	Data was collected on a single day 6/11/2003.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 52188 Region 9

Sweetwater River, Upper (above Sweetwater Reservoir)

Pollutant:	**Antimony**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. One of two samples exceeded guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of two samples exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52188, Antimony **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	77083
Pollutant:	Antimony
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	1
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	One of the two detected results exceeded the MCL. The reporting limits for eleven non-detect samples were greater than the MCL, therefore these data could not be used in this assessment.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The CA Department of Health Services maximum contamination level (MCL) thought to be protective of drinking water for antimony is 6 ug/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Low Flow Barrier at approximately 32 43'11.12"N /-116 57'1.71"W and from Sweetwater River Influent at approximately 32 42'14.97"N / -116 57'36.85"W. Both sample sites are part of Sweetwater River, Upper (above Sweetwater Reservoir).
Temporal Representation:	A sample was collected from Sweetwater River Influent in June of 2006. From 2007-2009, samples were collected from both Sweetwater River Influent and Low Flow Barrier biannually during the months of January and June/July.
Environmental Conditions:	
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.
QAPP Information Reference(s):	

DECISION ID **52204** 042283 **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant for aquatic life. Zero of the fifteen samples exceed the CRITERIA. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of fifteen samples exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52204, Arsenic **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	77085
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, Upper (above Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	The California Maximum Contaminant Level for arsenic is 0.01 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sweetwater River, Upper (above Sweetwater Reservoir) was collected at 1 monitoring site [Sweetwater River, upper - 909_SMC00282]
Temporal Representation:	Data was collected on a single day 6/9/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

Line of Evidence (LOE) for Decision ID 52204, Arsenic **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	77099
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Zero of eight samples exceed the objective for MUN.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	From the Basin Plan: For all waters with a municipal beneficial use, the WQO for Arsenic is 0.05 mg/L.
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected from Low Flow Barrier at approximately 32 43'11.12"N /-116 57'1.71"W and from Sweetwater River Influent at approximately 32 42'14.97"N / -116 57'36.85"W. Both sample sites are part of Sweetwater River, Upper (above Sweetwater Reservoir).
Temporal Representation:	A sample was collected from Sweetwater River Influent in June of 2006. From 2007-2009, samples were collected from both Sweetwater River Influent and Low Flow Barrier biannually during the months of January and June/July.
Environmental Conditions:	
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 52204, Arsenic **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	77098	042285

Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	14
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the fourteen samples tested for Arsenic exceeded the CTR criteria of 0.15 mg/L.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule lists criterion continuous concentrations (expressed as a 4-day average) for arsenic to protect aquatic life in freshwater. The CTR criteria for arsenic is 0.15 mg/L. ref2557
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Low Flow Barrier at approximately 32 43'11.12"N /-116 57'1.71"W and from Sweetwater River Influent at approximately 32 42'14.97"N / -116 57'36.85"W. Both sample sites are part of Sweetwater River, Upper (above Sweetwater Reservoir).
Temporal Representation:	A sample was collected from Sweetwater River Influent in June of 2006. From 2007-2009, samples were collected from both Sweetwater River Influent and Low Flow Barrier biannually during the months of January and June/July.
Environmental Conditions:	
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 52204, Arsenic **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	77084
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, Upper (above Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.

Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The dissolved arsenic criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved arsenic is 0.150 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sweetwater River, Upper (above Sweetwater Reservoir) was collected at 1 monitoring site [Sweetwater River, upper - 909_SMC00282]
Temporal Representation:	Data was collected on a single day 6/9/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

DECISION ID 51191 Region 9

Sweetwater River, Upper (above Sweetwater Reservoir)

Pollutant:	**Atrazine**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeded the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51191, Atrazine Region 9

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	77100
Pollutant:	Atrazine
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	The sample did not exceed the water quality objective for Atrazine, thought to be protective of drinking water.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water designated for use as domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels specified in California Code of Regulations, Title 22, Table 64444-A of section 64444 (Organic Chemicals) which is incorporated by reference into this plan. This incorporation byreference is prospective including future changes to the incorporated provisions as the changes take effect. (See Table 3-5).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California primary MCL is 1.0 ug/L for drinking water.
Guideline Reference:	
Spatial Representation:	The sample was collected from Low Flow Barrier at Sweetwater River, Upper (above Sweetwater Reservoir).
Temporal Representation:	The sample was collected on January 15th 2007.
Environmental Conditions:	No environmental conditions were reported.
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.
QAPP Information Reference(s):	

DECISION ID 52196 Region 9

Sweetwater River, Upper (above Sweetwater Reservoir)

Pollutant:	**Barium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of 13 samples exceeded guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 13 samples exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52196, Barium **Region 9**
Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	77101
Pollutant:	Barium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	13
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the thirteen samples exceeded the MCL.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The CA Department of Health Services maximum contamination level (MCL) thought to be protective of drinking water for barium is 1,000 ug/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Low Flow Barrier at approximately 32 43'11.12"N /-116 57'1.71"W and from Sweetwater River Influent at approximately 32 42'14.97"N / -116 57'36.85"W. Both sample sites are part of Sweetwater River, Upper (above Sweetwater Reservoir).
Temporal Representation:	A sample was collected from Sweetwater River Influent in June of 2006. From 2007-2009, samples were collected from both Sweetwater River Influent and Low Flow Barrier biannually during the months of January and June/July.
Environmental Conditions:	
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.
QAPP Information Reference(s):	

DECISION ID 51192 **Region 9**
Sweetwater River, Upper (above Sweetwater Reservoir)

Pollutant:	**Benzo(a)pyrene (3,4-Benzopyrene -7-d)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeded the guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51192, Benzo(a)pyrene (3,4-Benzopyrene -7-d) Region 9

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	76860
Pollutant:	Benzo(a)pyrene (3,4-Benzopyrene -7-d)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	This data is not of sufficient resolution to determine if standards are being achieved: the detection limit is greater than the criteria used to determine if water quality standards are being met.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological response in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Toxics Rule (USEPA) for sources of drinking water for Benzo(a)pyrene is

	0.0044 ug/L.	042290
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Spatial Representation:	The sample was collected from Low Flow Barrier at Sweetwater River, Upper (above Sweetwater Reservoir).	
Temporal Representation:	The sample was collected on January 15th 2007.	
Environmental Conditions:	No environmental conditions were reported.	
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.	
QAPP Information Reference(s):		

DECISION ID 52202 **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

Pollutant:	**Beryllium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 13 samples exceed the beneficial use guideline for Municipal and Domestic use. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the 13 samples exceed the beneficial use guideline for Municipal and Domestic use. The sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52202, Beryllium **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	76861
Pollutant:	Beryllium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	13
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the thirteen samples exceeded the MCL.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The CA Department of Health Services maximum contamination level (MCL) thought to be protective of drinking water for beryllium is 4 ug/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Low Flow Barrier at approximately 32 43'11.12"N /-116 57'1.71"W and from Sweetwater River Influent at approximately 32 42'14.97"N / -116 57'36.85"W. Both sample sites are part of Sweetwater River, Upper (above Sweetwater Reservoir).
Temporal Representation:	A sample was collected from Sweetwater River Influent in June of 2006. From 2007-2009, samples were collected from both Sweetwater River Influent and Low Flow Barrier biannually during the months of January and June/July.
Environmental Conditions:	
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.
QAPP Information Reference(s):	

DECISION ID 51180 Region 9

Sweetwater River, Upper (above Sweetwater Reservoir)

Pollutant:	**Bifenthrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the zero samples exceed the beneficial use guidelines.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of zero samples exceeded the guideline. The samples were not used in the assessment due to reporting limits that were higher than the guideline. The sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available

indicating that standards are not met. 042292

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51180, Bifenthrin **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	78147
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, Upper (above Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Bifenthrin.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The UC Davis Criteria for Bifenthrin for the protection of aquatic organisms is a 4 day average of 0.0006 ug/L (Fojut et al. 2012).
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Sweetwater River, Upper (above Sweetwater Reservoir) was collected at 1 monitoring site [Sweetwater River, upper - 909_SMC00282]
Temporal Representation:	Data was collected on a single day 6/9/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

DECISION ID 51193 **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

Pollutant:	**Bromacil**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeded the guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51193, Bromacil **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	76882
Pollutant:	Bromacil
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	The sample did not exceed the water quality objective for Bromacil, thought to be protective of drinking water.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological response in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA, OPP Drinking Water Health Advisory - non cancer, is 70 ug/L for drinking water.
Guideline Reference:	
Spatial Representation:	The sample was collected from Low Flow Barrier at Sweetwater River, Upper (above Sweetwater Reservoir).
Temporal Representation:	The sample was collected on January 15th 2007.
Environmental Conditions:	No environmental conditions were reported.
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical &

Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.

QAPP Information Reference(s):

DECISION ID	52205	Region 9
Sweetwater River, Upper (above Sweetwater Reservoir)		

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Six lines of evidence are available in the administrative record to assess this pollutant. Zero of nine, zero of one, and zero of 13 samples exceed the beneficial use guideline for Municipal and Domestic use. Zero of the 10 and zero of 14 samples exceed the beneficial use guideline for Warm Freshwater Habitat use. Samples are not combined for each beneficial use since the fraction is different for each LOE. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of nine, zero of one, and zero of 13 samples exceed the beneficial use guideline for Municipal and Domestic use. Zero of the 10 and zero of 14 samples exceed the beneficial use guideline for Warm Freshwater Habitat use. The sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52205, Cadmium	**Region 9**
Sweetwater River, Upper (above Sweetwater Reservoir)	

LOE ID:	76884
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING 042295
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Sweetwater River, Upper (above Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 9 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for cadmium is 0.005 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sweetwater River, Upper (above Sweetwater Reservoir) was collected at 2 monitoring sites [Sweetwater River @ Old Bridge, Sweetwater River @ Steele Canyon Road]
Temporal Representation:	Data was collected 6/11/2003 - 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 52205, Cadmium **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	76909
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	13
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	The detection limits for the thirteen non-detect samples were less than the objective value and therefore are meeting the objective.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Total cadmium levels should not exceed the California Department of Public Health Primary MCL of 5 ug/L.
Guideline Reference:	
Spatial Representation:	Samples were collected from Low Flow Barrier at approximately 32 43'11.12"N /-116 57'1.71"W and from Sweetwater River Influent at approximately 32 42'14.97"N / -116 57'36.85"W. Both sample sites are part of Sweetwater River, Upper (above Sweetwater Reservoir).
Temporal Representation:	A sample was collected from Sweetwater River Influent in June of 2006. From 2007-2009, samples were collected from both Sweetwater River Influent and Low Flow Barrier

	biannually during the months of January and June/July.	042296
Environmental Conditions:		
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 52205, Cadmium **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	76907
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, Upper (above Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for cadmium is 0.005 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sweetwater River, Upper (above Sweetwater Reservoir) was collected at 1 monitoring site [Sweetwater River, upper - 909_SMC00282]
Temporal Representation:	Data was collected on a single day 6/9/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

Line of Evidence (LOE) for Decision ID 52205, Cadmium **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	76883
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	9
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Sweetwater River, Upper (above Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 9 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sweetwater River, Upper (above Sweetwater Reservoir) was collected at 2 monitoring sites [Sweetwater River @ Old Bridge, Sweetwater River @ Steele Canyon Road]
Temporal Representation:	Data was collected 6/11/2003 - 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 52205, Cadmium **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	76908
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	14
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the fourteen samples tested for Cadmium exceeded the hardness adjusted CTR criteria.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. ref2557
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority

	toxic pollutants for the State of California. 7/1/2011 Edition	042298

Spatial Representation:	Samples were collected from Low Flow Barrier at approximately 32 43'11.12"N /-116 57'1.71"W and from Sweetwater River Influent at approximately 32 42'14.97"N / -116 57'36.85"W. Both sample sites are part of Sweetwater River, Upper (above Sweetwater Reservoir).
Temporal Representation:	A sample was collected from Sweetwater River Influent in June of 2006. From 2007-2009, samples were collected from both Sweetwater River Influent and Low Flow Barrier biannually during the months of January and June/July.
Environmental Conditions:	
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 52205, Cadmium **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	76885
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Sweetwater River, Upper (above Sweetwater Reservoir) to determine beneficial use support and results are as follows: 1 of 0 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sweetwater River, Upper (above Sweetwater Reservoir) was collected at 1 monitoring site [Sweetwater River, upper - 909_SMC00282]
Temporal Representation:	Data was collected on a single day 6/9/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

DECISION ID 51369 Region 9

Sweetwater River, Upper (above Sweetwater Reservoir) 042299

Pollutant:	**Carbaryl**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. The one sample did not exceed the criterion.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. The one sample did not exceed the criterion and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51369, Carbaryl — Region 9

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	76910
Pollutant:	Carbaryl
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	The sample did not exceed the water quality objective for carbaryl, thought to be protective of freshwater aquatic life.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	The National Recomended WQ Criteria, 4-day average, is 2.1 ug/L for freshwater aquatic life.
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	The sample was collected from Low Flow Barrier at Sweetwater River, Upper (above Sweetwater Reservoir).
Temporal Representation:	The sample was collected on January 15th 2007.
Environmental Conditions:	No environmental conditions were reported.
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.
QAPP Information Reference(s):	

DECISION ID 51307 Region 9

Sweetwater River, Upper (above Sweetwater Reservoir)

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the five samples exceed the municipal and domestic guideline. Zero of the zero sample exceeds the warm freshwater guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the five samples exceed the municipal and domestic guideline. Zero of the zero sample exceeds the warm freshwater guideline. The sample size for the municipal beneficial use is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. The samples for the warm freshwater beneficial use were not used in the assessment due to reporting limits that were higher than the guideline. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51307, Chlorpyrifos Region 9

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID: 78154

Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, Upper (above Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for chlorpyrifos is 2.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Sweetwater River, Upper (above Sweetwater Reservoir) was collected at 2 monitoring sites [Sweetwater River @ Steele Canyon Road, Sweetwater River @ Old Bridge]
Temporal Representation:	Data was collected over the time period 5/1/2006-6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 51307, Chlorpyrifos **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	76924
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, Upper (above Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).
Spatial Representation:	Data for this line of evidence for Sweetwater River, Upper (above Sweetwater Reservoir) was collected at 2 monitoring sites [Sweetwater River @ Steele Canyon Road, Sweetwater River @ Old Bridge]
Temporal Representation:	Data was collected over the time period 5/1/2006-6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 52214 Region 9

Sweetwater River, Upper (above Sweetwater Reservoir)

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Six lines of evidence are available in the administrative record to assess this pollutant. Zero of 13 samples exceed the beneficial use guideline for Municipal and Domestic use. Zero of the 1 and zero of 14 samples exceed the beneficial use guideline for Warm Freshwater Habitat use. Samples are not combined for for warm Freshwater since the fraction is different for each LOE. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 13 samples exceed the beneficial use guideline for Municipal and Domestic use. Zero of the 1 and zero of 14 samples exceed the beneficial use guideline for Warm Freshwater Habitat use. The sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52214, Chromium **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	76939
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	13
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the thirteen samples exceeded the MCL.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The CA Department of Health Services maximum contamination level (MCL) thought to be protective of drinking water for chromium, total is 50 ug/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Low Flow Barrier at approximately 32 43'11.12"N /-116 57'1.71"W and from Sweetwater River Influent at approximately 32 42'14.97"N / -116 57'36.85"W. Both sample sites are part of Sweetwater River, Upper (above Sweetwater Reservoir)
Temporal Representation:	A sample was collected from Sweetwater River Influent in June of 2006. From 2007-2009, samples were collected from both Sweetwater River Influent and Low Flow Barrier biannually during the months of January and June/July.
Environmental Conditions:	
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 52214, Chromium **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	76925
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for

	Sweetwater River, Upper (above Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sweetwater River, Upper (above Sweetwater Reservoir) was collected at 1 monitoring site [Sweetwater River, upper - 909_SMC00282]
Temporal Representation:	Data was collected on a single day 6/9/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

Line of Evidence (LOE) for Decision ID 52214, Chromium **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	76938
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	14
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the fourteen samples tested for Chromium exceeded the hardness adjusted CTR criteria.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Low Flow Barrier at approximately 32 43'11.12"N /-116

	57'1.71"W and from Sweetwater River Influent at approximately 32 42'14.97"N 117 -116 57'36.85"W. Both sample sites are part of Sweetwater River, Upper (above Sweetwater Reservoir).
Temporal Representation:	A sample was collected from Sweetwater River Influent in June of 2006. From 2007-2009, samples were collected from both Sweetwater River Influent and Low Flow Barrier biannually during the months of January and June/July.
Environmental Conditions:	
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.
QAPP Information Reference(s):	

DECISION ID 52215 Region 9

Sweetwater River, Upper (above Sweetwater Reservoir)

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Five lines of evidence are available in the administrative record to assess this pollutant. Zero of the ten samples exceed the beneficial use guideline for Municipal and Domestic use. One of the eight samples exceed the beneficial use guideline for Warm Freshwater Habitat use. The samples for the two beneficial uses cannot be combined since the fractions for the LOEs are not the same. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the ten samples exceed the beneficial use guideline for Municipal and Domestic use. One of the eight samples exceed the beneficial use guideline for Warm Freshwater Habitat use. The sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52215, Copper Region 9

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	76940
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water

Matrix:	Water	042306
Fraction:	None	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	9	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Sweetwater River, Upper (above Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 9 samples exceed the criterion for Cadmium.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Sweetwater River, Upper (above Sweetwater Reservoir) was collected at 2 monitoring sites [Sweetwater River @ Old Bridge, Sweetwater River @ Steele Canyon Road]	
Temporal Representation:	Data was collected 6/11/2003 - 6/3/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 52215, Copper **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	76941
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Sweetwater River, Upper (above Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 9 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for copper is 1.0 mg/L (Title 22 California Code of

	Regulations). 042307
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sweetwater River, Upper (above Sweetwater Reservoir) was collected at 2 monitoring sites [Sweetwater River @ Old Bridge, Sweetwater River @ Steele Canyon Road]
Temporal Representation:	Data was collected 6/11/2003 - 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 52215, Copper **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	76942
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Sweetwater River, Upper (above Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sweetwater River, Upper (above Sweetwater Reservoir) was collected at 1 monitoring site [Sweetwater River, upper - 909_SMC00282]
Temporal Representation:	Data was collected on a single day 6/9/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

Line of Evidence (LOE) for Decision ID 52215, Copper **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir) 042308

LOE ID:	76954
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, Upper (above Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for copper is 1.0 mg/L (Title 22 California Code of Regulations).
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sweetwater River, Upper (above Sweetwater Reservoir) was collected at 1 monitoring site [Sweetwater River, upper - 909_SMC00282]
Temporal Representation:	Data was collected on a single day 6/9/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

Line of Evidence (LOE) for Decision ID 52215, Copper **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	76955
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	14
Number of Exceedances:	1
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	One of the fourteen samples tested for Copper exceeded the hardness adjusted CTR criteria.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36

	(section 131.36 revised at 57 FR 60848, December 22, 1992).	042309
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Spatial Representation:	Samples were collected from Low Flow Barrier at approximately 32 43'11.12"N /-116 57'1.71"W and from Sweetwater River Influent at approximately 32 42'14.97"N / -116 57'36.85"W. Both sample sites are part of Sweetwater River, Upper (above Sweetwater Reservoir).	
Temporal Representation:	A sample was collected from Sweetwater River Influent in June of 2006. From 2007-2009, samples were collected from both Sweetwater River Influent and Low Flow Barrier biannually during the months of January and June/July.	
Environmental Conditions:		
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.	
QAPP Information Reference(s):		

DECISION ID 52197 Region 9

Sweetwater River, Upper (above Sweetwater Reservoir)

Pollutant:	**Cyanide**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of 13 samples exceeded guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 13 samples exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52197, Cyanide Region 9

Sweetwater River, Upper (above Sweetwater Reservoir) 042310

LOE ID:	76956
Pollutant:	Cyanide
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	13
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	All thirteen samples were reported as non-detect. The reporting limits were larger than the criteria of 5.2 ug/L used to assess water quality.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule lists criterion continuous concentrations (expresesed as a 4-day average) for cyanide to protect aquatic life in freshwater. The criteria for cyanide is 5.2 ug/L
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Low Flow Barrier at approximately 32 43'11.12"N /-116 57'1.71"W and from Sweetwater River Influent at approximately 32 42'14.97"N / -116 57'36.85"W. Both sample sites are part of Sweetwater River, Upper (above Sweetwater Reservoir).
Temporal Representation:	A sample was collected from Sweetwater River Influent in June of 2006. From 2007-2009, samples were collected from both Sweetwater River Influent and Low Flow Barrier biannually during the months of January and June/July.
Environmental Conditions:	
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.
QAPP Information Reference(s):	

DECISION ID **51182** **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

Pollutant:	**Cypermethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the zero samples exceed the beneficial use guidelines.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of zero samples exceeded the guideline. The samples were not used in the assessment due to reporting limits that were higher than the guideline. The sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51182, Cypermethrin **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	78160
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, Upper (above Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Cypermethrin, total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of cypermethrin does not exceed 0.0002 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Fojut et al. 2012)
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Sweetwater River, Upper (above Sweetwater Reservoir) was collected at 1 monitoring site [Sweetwater River, upper - 909_SMC00282]
Temporal Representation:	Data was collected on a single day 6/9/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.

QAPP Information Reference(s): Quality Assurance Project Plan from the CRG Marine Laboratories and SM 042312 Workplan.

DECISION ID 51183 Region 9

Sweetwater River, Upper (above Sweetwater Reservoir)

Pollutant:	**DDD (Dichlorodiphenyldichloroethane)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the zero sample exceed the beneficial use guidelines.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of zero sample exceeded the guideline. The sample was not used in the assessment due to reporting limits that were higher than the guideline. The sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51183, DDD (Dichlorodiphenyldichloroethane) Region 9

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	76970
Pollutant:	DDD (Dichlorodiphenyldichloroethane)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	This data is not of sufficient resolution to determine if standards are being achieved: the detection limit is greater than the criteria used to determine if water quality standards are being met.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.

SWAMP Data:	Non-SWAMP	042313
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The 4,4'-DDD criterion for the protection of human health from the consumption of water and organisms is 0.00031 ug/L (USEPA Nationally Recommended Criteria, 2006).	
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology	
Spatial Representation:	The sample was collected from Low Flow Barrier at Sweetwater River, Upper (above Sweetwater Reservoir).	
Temporal Representation:	The sample was collected on January 15th 2007.	
Environmental Conditions:	No environmental conditions were reported.	
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.	
QAPP Information Reference(s):		

DECISION ID 51184 Region 9

Sweetwater River, Upper (above Sweetwater Reservoir)

Pollutant:	**DDE (Dichlorodiphenyldichloroethylene)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the zero sample exceed the beneficial use guidelines. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of zero sample exceeded the guideline. The sample was not used in the assessment due to reporting limits that were higher than the guideline. The sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51184, DDE (Dichlorodiphenyldichloroethylene) Region 9

Sweetwater River, Upper (above Sweetwater Reservoir) 042314

LOE ID:	76971
Pollutant:	DDE (Dichlorodiphenyldichloroethylene)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	This data is not of sufficient resolution to determine if standards are being achieved: the detection limit is greater than the criteria used to determine if water quality standards are being met.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The 4,4'-DDE criterion for the protection of human health from the consumption of water and organisms is 0.00022 ug/L (USEPA Nationally Recommended Criteria, 2006).
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	The sample was collected from Low Flow Barrier at Sweetwater River, Upper (above Sweetwater Reservoir)
Temporal Representation:	The sample was collected on January 15th 2007.
Environmental Conditions:	No environmental conditions were reported.
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.
QAPP Information Reference(s):	

DECISION ID **51185** **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

Pollutant:	**DDT (Dichlorodiphenyltrichloroethane)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the zero sample exceed the beneficial use guidelines.

Based on the readily available data and information, the weight of evidence indicates that there is

sufficient justification against placing this water segment-pollutant combination on the 2010 section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of zero sample exceeded the guideline. The sample was not used in the assessment due to reporting limits that were higher than the guideline. The sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51185, DDT (Dichlorodiphenyltrichloroethane) Region 9

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	76972
Pollutant:	DDT (Dichlorodiphenyltrichloroethane)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	This data is not of sufficient resolution to determine if standards are being achieved: the detection limit is greater than the criteria used to determine if water quality standards are being met.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Calif. Toxics Rule for other waters is 0.00059 ug/L for DDT for freshwater aquatic life.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	The sample was collected from Low Flow Barrier at Sweetwater River, Upper (above Sweetwater Reservoir).
Temporal Representation:	The sample was collected on January 15th 2007.
Environmental Conditions:	No environmental conditions were reported.
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.
QAPP Information Reference(s):	

DECISION ID **51194** **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

Pollutant:	**Dalapon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeded the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51194, Dalapon **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	76969
Pollutant:	Dalapon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	The sample did not exceed the water quality objective for Dalapon, thought to be protective of drinking water.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water designated for use as domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels

	specified in California Code of Regulations, Title 22, Table 64444-A of section 64444 (Organic Chemicals) which is incorporated by reference into this plan. This incorporation byreference is prospective including future changes to the incorporated provisions as the changes take effect. (See Table 3-5).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California primary MCL is 200 ug/L for drinking water.
Guideline Reference:	
Spatial Representation:	The sample was collected from Low Flow Barrier at Sweetwater River, Upper (above Sweetwater Reservoir).
Temporal Representation:	The sample was collected on January 15th 2007.
Environmental Conditions:	No environmental conditions were reported.
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.
QAPP Information Reference(s):	

DECISION ID 53381 Region 9

Sweetwater River, Upper (above Sweetwater Reservoir)

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the six samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of six samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53381, Diazinon Region 9

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	78166

Pollutant:	Diazinon	042318
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	5	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, Upper (above Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Diazinon.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The USEPA drinking water health advisory for diazinon is 1.4 Âµg/L.	
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013	
Spatial Representation:	Data for this line of evidence for Sweetwater River, Upper (above Sweetwater Reservoir) was collected at 2 monitoring sites [Sweetwater River @ Steele Canyon Road, Sweetwater River @ Old Bridge]	
Temporal Representation:	Data was collected over the time period 5/1/2006-6/3/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 53381, Diazinon **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	76980
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, Upper (above Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column,

	sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Data for this line of evidence for Sweetwater River, Upper (above Sweetwater Reservoir) was collected at 2 monitoring sites [Sweetwater River @ Steele Canyon Road, Sweetwater River @ Old Bridge]
Temporal Representation:	Data was collected over the time period 5/1/2006-6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 53381, Diazinon **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	76981
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	The sample did not exceed the water quality objective of 0.1 ug/L for Diazinon, thought to be protective of freshwater aquatic life.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Dept. of Fish & Game WQ Criteria, 4-day average, for diazinon is 0.1 ug/L for freshwater aquatic life.
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	The sample was collected from Low Flow Barrier at Sweetwater River, Upper (above Sweetwater Reservoir).
Temporal Representation:	The sample was collected on January 15th 2007.
Environmental Conditions:	No environmental conditions were reported.
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.
QAPP Information Reference(s):	

DECISION ID **51372** **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

Pollutant:	**Dicamba**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. The one sample did not exceed the guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. The one sample did not exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51372, Dicamba **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	76982
Pollutant:	Dicamba
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	The sample did not exceed the water quality objective for Dicambra, thought to be protective of drinking water..
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The concentrations of toxic substances in the water column, sediments or biota shall not adversely affect beneficial uses.

Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	042321
Evaluation Guideline:	The USEPA, OPP Drinking Water Health Advisory-non-cancer, is 4000 ug/L for drinking water.	
Guideline Reference:		
Spatial Representation:	The sample was collected from Low Flow Barrier at Sweetwater River, Upper (above Sweetwater Reservoir).	
Temporal Representation:	The sample was collected on January 15th 2007.	
Environmental Conditions:	No environmental conditions were reported.	
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.	
QAPP Information Reference(s):		

DECISION ID 51325 **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

Pollutant:	**Dieldrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one sample exceed the beneficial use guidelines. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the one sample exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51325, Dieldrin **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	76983
Pollutant:	Dieldrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	Total	042322
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)	
Data Used to Assess Water Quality:	This data is not of sufficient resolution to determine if standards are being achieved: the detection limit is greater than the criteria used to determine if water quality standards are being met.	
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The concentrations of toxic substances in the water column, sediments or biota shall not adversely affect beneficial uses.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The California Toxics Rule (USEPA) for sources of drinking water is 0.00014 ug/L.	
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Spatial Representation:	The sample was collected from Low Flow Barrier at Sweetwater River, Upper (above Sweetwater Reservoir).	
Temporal Representation:	The sample was collected on January 15th 2007.	
Environmental Conditions:	No environmental conditions were reported.	
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 51325, Dieldrin **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	76991
Pollutant:	Dieldrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	The sample did not exceed the water quality objective for Dieldrin, thought to be protective of freshwater aquatic life.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The concentrations of toxic substances in the water column, sediments or biota shall not adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Toxics Rule (USEPA) for dieldrin is 0.056 ug/L for protection of freshwater aquatic life.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority

Spatial Representation:	The sample was collected from Low Flow Barrier at Sweetwater River, Upper (above Sweetwater Reservoir).
Temporal Representation:	The sample was collected on January 15th 2007.
Environmental Conditions:	No environmental conditions were reported.
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.
QAPP Information Reference(s):	

DECISION ID 51195 Region 9

Sweetwater River, Upper (above Sweetwater Reservoir)

Pollutant:	**Dinoseb**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeded the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51195, Dinoseb Region 9

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	76992
Pollutant:	Dinoseb
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	1	042324
Number of Exceedances:	0	
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)	
Data Used to Assess Water Quality:	The sample did not exceed the water quality objective for Dinoseb, thought to be protective of drinking water.	
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The concentrations of toxic substances in the water column, sediments or biota shall not adversely affect beneficial uses.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The California primary MCL for Dinoseb is 7 ug/L for drinking water.	
Guideline Reference:	Maximum Contaminant Levels for organic and inorganic chemicals, CCR	
Spatial Representation:	The sample was collected from Low Flow Barrier at Sweetwater River, Upper (above Sweetwater Reservoir).	
Temporal Representation:	The sample was collected on January 15th 2007.	
Environmental Conditions:	No environmental conditions were reported.	
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.	
QAPP Information Reference(s):		

DECISION ID **51196** **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

Pollutant:	**Dioxin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeded the criterion. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeded the criterion and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51196, Dioxin **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	76993
Pollutant:	Dioxin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	This data is not of sufficient resolution to determine if standards are being achieved, the reporting limit for the non-detected sample is greater than the criteria used to determine if water quality standards are being met.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The concentrations of toxic substances in the water column, sediments or biota shall not adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Toxic Rule for 2,3,7,8-TCDD (Dioxin) is 0.013 pg/L for sources of drinking water.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	The sample was collected from Low Flow Barrier at Sweetwater River, Upper (above Sweetwater Reservoir).
Temporal Representation:	The sample was collected on January 15th 2007.
Environmental Conditions:	No environmental conditions were reported.
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.
QAPP Information Reference(s):	

DECISION ID 51197 **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

Pollutant:	**Diuron**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeded the guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51197, Diuron **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	76994
Pollutant:	Diuron
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	The sample did not exceed the water quality objective for Diuron, thought to be protective of drinking water.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The concentrations of toxic substances in the water column, sediments or biota shall not adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA, Health Advisory, as a drinking water level is 2 ug/L. This constituent is likely a carcinogen and so the risk level is one in a million.
Guideline Reference:	2012 Edition of the Drinking Water Standards and Health Advisories
Spatial Representation:	The sample was collected from Low Flow Barrier at Sweetwater River, Upper (above Sweetwater Reservoir).
Temporal Representation:	The sample was collected on January 15th 2007.
Environmental Conditions:	No environmental conditions were reported.
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.
QAPP Information Reference(s):	

DECISION ID **51198** **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir) 042327

Pollutant:	**Endrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeded the criterion.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the criterion and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51198, Endrin — Region 9

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	77005
Pollutant:	Endrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	None of the samples exceeded the criterion.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The concentrations of toxic substances in the water column, sediments or biota shall not adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Toxics Rule (USEPA), 4-day average total, is 0.76 ug/L.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority

Spatial Representation:	The sample was collected from Low Flow Barrier at Sweetwater River, Upper (above Sweetwater Reservoir).
Temporal Representation:	The sample was collected on January 15th 2007.
Environmental Conditions:	No environmental conditions were reported.
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.
QAPP Information Reference(s):	

DECISION ID 51336 Region 9

Sweetwater River, Upper (above Sweetwater Reservoir)

Pollutant:	**Heptachlor**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one sample exceeds the beneficial use guidelines. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the one sample exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51336, Heptachlor Region 9

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	77016
Pollutant:	Heptachlor
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	1	042329
Number of Exceedances:	0	
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)	
Data Used to Assess Water Quality:	This data is not of sufficient resolution to determine if standards are being achieved: the detection limit is greater than the criteria used to determine if water quality standards are being met.	
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The concentrations of toxic substances in the water column, sediments or biota shall not adversely affect beneficial uses.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The California Toxics Rule (USEPA) for Heptachlor is 0.0038ug/L for protection of freshwater habitat.	
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Spatial Representation:	The sample was collected from Low Flow Barrier at Sweetwater River, Upper (above Sweetwater Reservoir).	
Temporal Representation:	The sample was collected on January 15th 2007.	
Environmental Conditions:	No environmental conditions were reported.	
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 51336, Heptachlor **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	77008
Pollutant:	Heptachlor
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	This data is not of sufficient resolution to determine if standards are being achieved: the detection limit is greater than the criteria used to determine if water quality standards are being met.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The concentrations of toxic substances in the water column, sediments or biota shall not adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Toxics Rule (USEPA) for Heptachlor for sources of drinking water is 0.00021 ug/L.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition

Spatial Representation:	The sample was collected from Low Flow Barrier at Sweetwater River, Upper (above Sweetwater Reservoir).
Temporal Representation:	The sample was collected on January 15th 2007.
Environmental Conditions:	No environmental conditions were reported.
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.
QAPP Information Reference(s):	

DECISION ID 52982 Region 9

Sweetwater River, Upper (above Sweetwater Reservoir)

Pollutant:	**Iron**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of 14 samples exceeded the guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 14 samples did not exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52982, Iron Region 9

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	77017
Pollutant:	Iron
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	14
Number of Exceedances:	0

Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the fourteen samples tested for iron exceeded the numeric criteria of 1 mg/L to protect warm freshwater habitat.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	National Recommended Water Quality Criteria Continuous Concentrations are intended protect freshwater aquatic organisms from chronic exposures and are expressed as 4-day average concentrations. The numeric criteria for iron is 1 mg/L Ref16
Guideline Reference:	National recommended water quality criteria: 2002. EPA-822-R-02-047 Washington, D.C. USEPA
Spatial Representation:	Samples were collected from Low Flow Barrier at approximately 32 43'11.12"N /-116 57'1.71"W and from Sweetwater River Influent at approximately 32 42'14.97"N / -116 57'36.85"W. Both sample sites are part of Sweetwater River, Upper (above Sweetwater Reservoir).
Temporal Representation:	A sample was collected from Sweetwater River Influent in June of 2006. From 2007-2009, samples were collected from both Sweetwater River Influent and Low Flow Barrier biannually during the months of January and June/July.
Environmental Conditions:	
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.
QAPP Information Reference(s):	

DECISION ID 52986 Region 9

Sweetwater River, Upper (above Sweetwater Reservoir)

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant for aquatic life. Zero of the twenty-four samples exceed the CRITERIA.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of twenty-four samples exceeded the CRITERIA and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 52986, Lead **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	77034
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	14
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	7 samples were collected at Low Flow Barrier and 7 samples were collected at Sweetwater River Influent.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Maximum Contaminant Level for lead is 0.015 mg/L (Title 22 of the California Code of Regulations).
Guideline Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Spatial Representation:	Samples were collected from Low Flow Barrier at approximately 32 43'11.12"N /-116 57'1.71"W and from Sweetwater River Influent at approximately 32 42'14.97"N / -116 57'36.85"W. Both sample sites are part of Sweetwater River, Upper (above Sweetwater Reservoir).
Temporal Representation:	A sample was collected from Sweetwater River Influent in June of 2006. From 2007-2009, samples were collected from both Sweetwater River Influent and Low Flow Barrier biannually during the months of January and June/July.
Environmental Conditions:	
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 52986, Lead **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	77019
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	9	042333
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Sweetwater River, Upper (above Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 9 samples exceed the criterion for Cadmium.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for lead is 0.015 mg/L (Title 22 of the California Code of Regulations).	
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Sweetwater River, Upper (above Sweetwater Reservoir) was collected at 2 monitoring sites [Sweetwater River @ Old Bridge, Sweetwater River @ Steele Canyon Road]	
Temporal Representation:	Data was collected 6/11/2003 - 6/3/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 52986, Lead **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	77018
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Sweetwater River, Upper (above Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 9 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Data for this line of evidence for Sweetwater River, Upper (above Sweetwater Reservoir) was collected at 2 monitoring sites [Sweetwater River @ Old Bridge, Sweetwater River @ Steele Canyon Road]
Temporal Representation:	Data was collected 6/11/2003 - 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 52986, Lead **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	77033
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	14
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	One of fourteen samples tested for Lead exceeded the hardness adjusted CTR criteria.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. ref2557
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Low Flow Barrier at approximately 32 43'11.12"N /-116 57'1.71"W and from Sweetwater River Influent at approximately 32 42'14.97"N / -116 57'36.85"W. Both sample sites are part of Sweetwater River, Upper (above Sweetwater Reservoir).
Temporal Representation:	A sample was collected from Sweetwater River Influent in June of 2006. From 2007-2009, samples were collected from both Sweetwater River Influent and Low Flow Barrier biannually during the months of January and June/July.
Environmental Conditions:	
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 52986, Lead **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	77020	042335

Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Sweetwater River, Upper (above Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sweetwater River, Upper (above Sweetwater Reservoir) was collected at 1 monitoring site [Sweetwater River, upper - 909_SMC00282]
Temporal Representation:	Data was collected on a single day 6/9/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

DECISION ID 51340 Region 9

Sweetwater River, Upper (above Sweetwater Reservoir)

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the five samples exceed the beneficial use guidelines. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of five samples exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51340, Malathion **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	77035
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, Upper (above Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Malathion.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Sweetwater River, Upper (above Sweetwater Reservoir) was collected at 2 monitoring sites [Sweetwater River @ Steele Canyon Road, Sweetwater River @ Old Bridge]
Temporal Representation:	Data was collected over the time period 5/1/2006-6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 51340, Malathion **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	78175	042337

Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, Upper (above Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Malathion.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for malathion is 100 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Sweetwater River, Upper (above Sweetwater Reservoir) was collected at 2 monitoring sites [Sweetwater River @ Steele Canyon Road, Sweetwater River @ Old Bridge]
Temporal Representation:	Data was collected over the time period 5/1/2006-6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID	**52201**	**Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

Pollutant:	**Mercury**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the zero samples exceed the beneficial use guideline for Municipal and Domestic use. Zero of the 14 samples exceed the beneficial use guideline for Warm Freshwater Habitat use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that: 042338
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the zero samples exceed the beneficial use guideline for Municipal and Domestic use. Zero of the 14 samples exceed the beneficial use guideline for Warm Freshwater Habitat use. The sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52201, Mercury **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	77051
Pollutant:	Mercury
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	The reporting limits for the thirteen non-detect samples were greater than the criteria, therefore these data could not be used in this assessment.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule criteria to protect human health exposure to elemental mercury is 0.05 ug/L.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Low Flow Barrier at approximately 32 43'11.12"N /-116 57'1.71"W and from Sweetwater River Influent at approximately 32 42'14.97"N / -116 57'36.85"W. Both sample sites are part of Sweetwater River, Upper (above Sweetwater Reservoir).
Temporal Representation:	A sample was collected from Sweetwater River Influent in June of 2006. From 2007-2009, samples were collected from both Sweetwater River Influent and Low Flow Barrier biannually during the months of January and June/July.
Environmental Conditions:	
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 52201, Mercury **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir) 042339

LOE ID:	77050
Pollutant:	Mercury
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	14
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the fourteen samples tested for mercury exceeded the numeric criteria of 0.77 ug/L, promulgated to protect warm freshwater habitat.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	National Recommended Water Quality Criteria Continuous Concentrations are intended protect freshwater aquatic organisms from chronic exposures and are expressed as 4-day average concentrations. Criterion derived from data for inorganic mercury (II), but is applied to total mercury. It will probably be underprotective if a substantial portion of mercury in the water column is methylmercury. Derivation of criterion did not consider exposure through the diet, which is probably important for aquatic life occupying upper trophic levels. The numeric criteria for mercury is 0.77 ug/L.
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Samples were collected from Low Flow Barrier at approximately 32 43'11.12"N /-116 57'1.71"W and from Sweetwater River Influent at approximately 32 42'14.97"N / -116 57'36.85"W. Both sample sites are part of Sweetwater River, Upper (above Sweetwater Reservoir).
Temporal Representation:	A sample was collected from Sweetwater River Influent in June of 2006. From 2007-2009, samples were collected from both Sweetwater River Influent and Low Flow Barrier biannually during the months of January and June/July.
Environmental Conditions:	
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.
QAPP Information Reference(s):	

DECISION ID **53165** **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of

the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. None of the samples exceed the beneficial use guidelines.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the samples exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53165, Nickel **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	77069
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	14
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the fourteen samples tested for Nickel exceeded the hardness adjusted CTR criteria.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. ref2557
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Low Flow Barrier at approximately 32 43'11.12"N /-116 57'1.71"W and from Sweetwater River Influent at approximately 32 42'14.97"N / -116 57'36.85"W. Both sample sites are part of Sweetwater River, Upper (above Sweetwater Reservoir).

Temporal Representation:	A sample was collected from Sweetwater River Influent in June of 2006. From 2007-2009, samples were collected from both Sweetwater River Influent and Low Flow Barrier biannually during the months of January and June/July.
Environmental Conditions:	
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 53165, Nickel **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	77068
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Sweetwater River, Upper (above Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sweetwater River, Upper (above Sweetwater Reservoir) was collected at 1 monitoring site [Sweetwater River, upper - 909_SMC00282]
Temporal Representation:	Data was collected on a single day 6/9/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

DECISION ID 53385 **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

Pollutant:	**Nitrogen, Nitrate**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final	New Decision

Listing Decision:		042342
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. Zero of the seven samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of seven samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53385, Nitrogen, Nitrate **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	77072
Pollutant:	Nitrogen, Nitrate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Six samples were collected with no samples detecting nitrite as N. However, it cannot be determined whether the reporting limit was below the water quality objective and therefore whether samples met the water quality objective.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	San Diego Region Basin Plan: Water designated for use as MUN shall not contain concentrations of inorganic chemicals in excess of the MCL set in the California Code of Regulations. The California MCL for nitrite as N is 1 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Low Flow Barrier On Sweetwater River.

Temporal Representation:	Samples were collected biannually from 2007 to 2009.	042343
Environmental Conditions:		
QAPP Information:	Data was submitted with an unsigned water quality monitoring plan.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 53385, Nitrogen, Nitrate **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	77071
Pollutant:	Nitrate/Nitrite (Nitrite + Nitrate as N)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, Upper (above Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nitrate/Nitrite as N.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrate + nitrite (as N) is 10.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sweetwater River, Upper (above Sweetwater Reservoir) was collected at 1 monitoring site [Sweetwater River, upper - 909_SMC00282]
Temporal Representation:	Data was collected on a single day 6/9/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

Line of Evidence (LOE) for Decision ID 53385, Nitrogen, Nitrate **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	77070
Pollutant:	Nitrogen, Nitrate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of six samples exceed the objective for nitrate (as N) at 10 mg/L. 4 of 6 samples are

	reported as non-detects. These non-detects are less than or equal to the water quality standard, the value will be considered as meeting the water quality standard, objective, criterion, or evaluation guideline.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The Water Quality Control Plan, San Diego Basin: Waters designated for MUN shall not contain concentrations of chemical constituents in excess of the MCL specified in Title 22 of the California Code of Regulations. The nitrate (as N) MCL is 10 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Low Flow Barrier On Sweetwater River.
Temporal Representation:	Samples were collected biannually from 2007 to 2009.
Environmental Conditions:	
QAPP Information:	Data was submitted with an unsigned water quality monitoring plan.
QAPP Information Reference(s):	

DECISION ID 53386 Region 9

Sweetwater River, Upper (above Sweetwater Reservoir)

Pollutant:	**Nitrogen, Nitrite**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the three samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of three samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53386, Nitrogen, Nitrite Region 9

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	77086	042345

Pollutant:	Nitrogen, Nitrite
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, Upper (above Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nitrite as N.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrite (as N) is 1.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sweetwater River, Upper (above Sweetwater Reservoir) was collected at 1 monitoring site [Sweetwater River, upper - 909_SMC00282]
Temporal Representation:	Data was collected on a single day 6/9/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

Line of Evidence (LOE) for Decision ID 53386, Nitrogen, Nitrite **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	77087
Pollutant:	Nitrogen, Nitrite
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, Upper (above Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Nitrite as N.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrite (as N) is 1.0 mg/L (Title 22 of the California Code of Regulations).

Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR 042346
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sweetwater River, Upper (above Sweetwater Reservoir) was collected at 1 monitoring site [Sweetwater River @ Old Bridge]
Temporal Representation:	Data was collected over the time period 6/11/2003-6/12/2003.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 51187 Region 9

Sweetwater River, Upper (above Sweetwater Reservoir)

Pollutant:	**PCBs (Polychlorinated biphenyls)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the zero sample exceed the beneficial use guidelines. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of zero sample exceeded the guideline. The sample was not used in the assessment due to reporting limits that were higher than the guideline. The sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51187, PCBs (Polychlorinated biphenyls) Region 9

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	77088
Pollutant:	PCBs (Polychlorinated biphenyls)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total

Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	This data is not of sufficient resolution to determine if standards are being achieved: the detection limit is greater than the criteria used to determine if water quality standards are being met.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The concentrations of toxic substances in the water column, sediments or biota shall not adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Toxics Rule (USEPA) for PCBs is 0.014 ug/L for protection of freshwater aquatic habitat.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	The sample was collected from Low Flow Barrier at Sweetwater River, Upper (above Sweetwater Reservoir).
Temporal Representation:	The sample was collected on January 15th 2007.
Environmental Conditions:	No environmental conditions were reported.
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.
QAPP Information Reference(s):	

DECISION ID 51199 Region 9

Sweetwater River, Upper (above Sweetwater Reservoir)

Pollutant:	**Pentachlorophenol (PCP)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeded the criterion.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the criterion and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available

indicating that standards are not met. 042348

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51199, Pentachlorophenol (PCP) **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	77089
Pollutant:	Pentachlorophenol (PCP)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	The sample did not exceed the water quality objective for Pentachlorophenol. The PH collected on 01/23/07 was 7.91.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The concentrations of toxic substances in the water column, sediments or biota shall not adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Toxics Rule (USEPA), 4-day average at pH 7.8, is 15 ug/L for pentachlorophenol for freshwater aquatic life.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	The sample was collected from Low Flow Barrier at Sweetwater River, Upper (above Sweetwater Reservoir).
Temporal Representation:	The samples were collected between Jan. 15, 2007.
Environmental Conditions:	No environmental conditions were reported.
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.
QAPP Information Reference(s):	

DECISION ID 52198 **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

Pollutant:	**Silver**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of 14 samples exceeded guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 14 samples exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52198, Silver **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	77102
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	14
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	All fourteen samples were reported as non-detect. The reporting limits were larger than the criteria used to assess water quality.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion maximum concentrations for silver to protect aquatic life in freshwater (1-hour average). The dissolved silver criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used. ref2557
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Low Flow Barrier at approximately 32 43'11.12"N /-116 57'1.71"W and from Sweetwater River Influent at approximately 32 42'14.97"N / -116

	57'36.85"W. Both sample sites are part of Sweetwater River, Upper (above Sweetwater Reservoir).
Temporal Representation:	A sample was collected from Sweetwater River Influent in June of 2006. From 2007-2009, samples were collected from both Sweetwater River
Environmental Conditions:	
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.
QAPP Information Reference(s):	

DECISION ID 51353 Region 9

Sweetwater River, Upper (above Sweetwater Reservoir)

Pollutant:	**Temperature, water**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Two of eleven samples exceeded the guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Two of eleven samples exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51353, Temperature, water Region 9

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	77103
Pollutant:	Temperature, water
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	11

Number of Exceedances:	2	042351
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Two of the 11 samples exceeded the evaluation guideline for temperature in this water body.	
Data Reference:	Data for Trash, Nutrients, and Pathogens in Region 9, 2007-2010.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Board that such alteration in temperature does not adversely affect beneficial uses. At no time or place shall the temperature of any COLD water be increased more than 5Â°F above the natural receiving water temperature.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	Inland Fishes of California (Moyle 1976) states that for rainbow trout the optimum range for growth and completion of most life stages is 13-21 degrees C (page 129). Since there is no evaluation guideline for assessing temperature for the warm freshwater aquatic life beneficial use, this line of evidence will not be used for Listing Decisions in the 2012 Integrated Report and will be retired for said Listing cycle.	
Guideline Reference:	Fish introductions in CA: History and impact on native fishes. Davis, CA: University of CA, Davis	
Spatial Representation:	Samples were collected at the following station: SWT-030-SR 94 East	
Temporal Representation:	Samples were collected between January, 2009 and July, 2010.	
Environmental Conditions:		
QAPP Information:	San Diego Regional Water Quality Assessment and Outreach Project Quality Assurance Project Plan Prepared by: Clay Clifton (San Diego Coastkeeper, Local Project Sponsor Manager), Bob Stafford (San Diego Stream Team), Dr. Rick Gersberg (San Diego State University), Bryan Bjorndal (Assure Controls, Inc.), and Morgan Justice-Black (I Love A Clean San Diego).	
QAPP Information Reference(s):		

DECISION ID 52199 Region 9

Sweetwater River, Upper (above Sweetwater Reservoir)

Pollutant:	**Thallium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 12 samples exceeded guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 12 samples exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.

4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52199, Thallium **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	77104
Pollutant:	Thallium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the twelve samples exceeded the MCL. The reporting limits for one of the non-detect samples was greater than the MCL, therefore this data could not be used in this assessment.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The CA Department of Health Services maximum contamination level (MCL) thought to be protective of drinking water for thallium is 2 ug/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Low Flow Barrier at approximately 32 43'11.12"N /-116 57'1.71"W and from Sweetwater River Influent at approximately 32 42'14.97"N / -116 57'36.85"W. Both sample sites are part of Sweetwater River, Upper (above Sweetwater Reservoir)
Temporal Representation:	A sample was collected from Sweetwater River Influent in June of 2006. From 2007-2009, samples were collected from both Sweetwater River Influent and Low Flow Barrier biannually during the months of January and June/July.
Environmental Conditions:	
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.
QAPP Information Reference(s):	

DECISION ID **51186** **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

Pollutant:	**Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final	New Decision

Listing Decision:		042353
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the zero sample exceed the beneficial use guidelines.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of zero sample exceeded the guideline. The sample was not used in the assessment due to reporting limits that were higher than the guideline. The sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51186, Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD) **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	76863
Pollutant:	Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	This data is not of sufficient resolution to determine if standards are being achieved: the detection limit is greater than the criteria used to determine if water quality standards are being met.The 4,4' DDT criterion is applicable to Total DDT. Total DDT is the sum of 4,4- and 2,4-isomers of DDT, DDE, and DDD.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	The Calif. Toxics Rule for other waters is 0.001 ug/L for DDT for freshwater aquatic life.
Guideline Reference:	0.0001
Spatial Representation:	The sample was collected from Low Flow Barrier at Sweetwater River, Upper (above Sweetwater Reservoir).
Temporal Representation:	The sample was collected on January 15th 2007.
Environmental Conditions:	No environmental conditions were reported.
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.
QAPP Information Reference(s):	

DECISION ID 51349 Region 9

Sweetwater River, Upper (above Sweetwater Reservoir)

Pollutant:	**Toxaphene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one sample exceeds the beneficial use criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the one sample exceeded the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51349, Toxaphene Region 9

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	76864
Pollutant:	Toxaphene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	This data is not of sufficient resolution to determine if standards are being achieved: the detection limit is greater than the criteria used to determine if water quality standards are being met.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The concentrations of toxic substances in the water column, sediments or biota shall not adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Toxics Rule (USEPA), 4-day average, total, is 0.0002 ug/L for freshwater aquatic life.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	The sample was collected from Low Flow Barrier at Sweetwater River, Upper (above Sweetwater Reservoir).
Temporal Representation:	The sample was collected on January 15th 2007.
Environmental Conditions:	No environmental conditions were reported.
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 51349, Toxaphene **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	76865
Pollutant:	Toxaphene
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	This data is not of sufficient resolution to determine if standards are being achieved: the detection limit is greater than the criteria used to determine if water quality standards are being met.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The concentrations of toxic substances in the water column, sediments or biota shall not adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Toxics Rule (USEPA) for sources of drinking water is 0.00073 ug/L.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition

Spatial Representation:	The sample was collected from Low Flow Barrier at Sweetwater River, Upper (above Sweetwater Reservoir).
Temporal Representation:	The sample was collected on January 15th 2007.
Environmental Conditions:	No environmental conditions were reported.
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.
QAPP Information Reference(s):	

DECISION ID 43752 Region 9

Sweetwater River, Upper (above Sweetwater Reservoir)

Pollutant:	**Toxicity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. One of the five samples exceed the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of the five samples exceed the water quality objective and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 43752, Toxicity Region 9

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	30898
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	1

Data and Information Type:	Ambient toxicity testing (chronic)	042357
Data Used to Assess Water Quality:	Toxicity was observed in the following data from the Storm Water Ambient Monitoring Program Selenastrum capricornutum- None of four samples showed significant toxicity levels. Ceriodaphnia dubia; One of four samples were toxic.	
Data Reference:	Monitoring data for Region 9	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (RWQCB, 2007).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.	
Guideline Reference:	Monitoring data for Region 9	
Spatial Representation:	Samples were collected from the monitoring station Sweetwater River 3 on the main stem of the Sweetwater River.	
Temporal Representation:	Samples were taken between June and September 2005 and January and April 2006.	
Environmental Conditions:		
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California Surface Water Ambient Monitoring Program.	
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA	

Line of Evidence (LOE) for Decision ID 43752, Toxicity **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	76867
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to test for toxicity. None of the samples exhibited statistically and biologically significant toxicity. The toxicity tests included survival and reproduction of Ceriodaphnia dubia.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the

	control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control. Additionally, the biological significance of the sample is evaluted by determining whether the sample response is lower than the evaluation threshold.
Guideline Reference:	
Spatial Representation:	The samples were collected from site 909_SMC00282, Sweetwater River, upper.
Temporal Representation:	The samples were collected in June 2009.
Environmental Conditions:	
QAPP Information:	This data was collected for the Regional Monitoring Of Southern California's Coastal Watersheds - Stormwater Monitoring Coalition Bioassessment Working Group. CRG Marine Laboratories Quality Assurance Program Document was provided.
QAPP Information Reference(s):	e-mail clarifying QAPP information

DECISION ID 51200 Region 9

Sweetwater River, Upper (above Sweetwater Reservoir)

Pollutant:	**Trifluralin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. The one sample does not exceed the evaluation guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeded the evaluation guideline, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51200, Trifluralin Region 9

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	76887
Pollutant:	Trifluralin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total

Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	The sample did not exceed the water quality objective for Trifluralin, thought to be protective of drinking water.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The concentrations of toxic substances in the water column, sediments or biota shall not adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA IRIS cancer risk level is 5 ug/L for drinking water.
Guideline Reference:	IRIS Database Calculations (summary)
Spatial Representation:	The sample was collected from Low Flow Barrier at Sweetwater River, Upper (above Sweetwater Reservoir).
Temporal Representation:	The sample was collected on January 15th 2007.
Environmental Conditions:	No environmental conditions were reported.
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.
QAPP Information Reference(s):	

DECISION ID 53174 Region 9

Sweetwater River, Upper (above Sweetwater Reservoir)

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Three lines of evidence are available in the administrative record to assess this pollutant. None of the samples exceed the beneficial use guidelines. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the samples exceeded the guidelines and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision	After review of the available data and information, RWQCB staff concludes that the water body-

Recommendation:	pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.	14230

Line of Evidence (LOE) for Decision ID 53174, Zinc **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	76891
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	14
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the fourteen samples tested for Zinc exceeded the hardness adjusted CTR criteria.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. ref2557
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Low Flow Barrier at approximately 32 43'11.12"N /-116 57'1.71"W and from Sweetwater River Influent at approximately 32 42'14.97"N / -116 57'36.85"W. Both sample sites are part of Sweetwater River, Upper (above Sweetwater Reservoir).
Temporal Representation:	A sample was collected from Sweetwater River Influent in June of 2006. From 2007-2009, samples were collected from both Sweetwater River Influent and Low Flow Barrier biannually during the months of January and June/July.
Environmental Conditions:	
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 53174, Zinc **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	76888
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved

Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Sweetwater River, Upper (above Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 7 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for zinc is 5.0 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Sweetwater River, Upper (above Sweetwater Reservoir) was collected at 2 monitoring sites [Sweetwater River @ Old Bridge, Sweetwater River @ Steele Canyon Road]
Temporal Representation:	Data was collected 6/11/2003 - 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 53174, Zinc **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	76889
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Sweetwater River, Upper (above Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 9 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition

Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sweetwater River, Upper (above Sweetwater Reservoir) was collected at 2 monitoring sites [Sweetwater River @ Old Bridge, Sweetwater River @ Steele Canyon Road]
Temporal Representation:	Data was collected 6/11/2003 - 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 53174, Zinc **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	76890
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Sweetwater River, Upper (above Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sweetwater River, Upper (above Sweetwater Reservoir) was collected at 1 monitoring site [Sweetwater River, upper - 909_SMC00282]
Temporal Representation:	Data was collected on a single day 6/9/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

DECISION ID 53382 **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

Pollutant:	**alpha.-BHC (Benzenehexachloride or alpha-HCH)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the zero samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of zero samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53382, alpha.-BHC (Benzenehexachloride or alpha-HCH) Region 9

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	77067
Pollutant:	alpha.-BHC (Benzenehexachloride or alpha-HCH)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	This data is not of sufficient resolution to determine if standards are being achieved: the detection limit is greater than the criteria used to determine if water quality standards are being met.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	The Calif. Toxics Rule (USEPA) for sources of drinking water for alpha-BHC is 0.0039 ug/L.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	The sample was collected from Low Flow Barrier at Sweetwater River, Upper (above Sweetwater Reservoir).
Temporal Representation:	The sample was collected on January 15th 2007.
Environmental Conditions:	No environmental conditions were reported.
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.
QAPP Information Reference(s):	

DECISION ID 53383 Region 9

Sweetwater River, Upper (above Sweetwater Reservoir)

Pollutant:	**beta-BHC (Benzenehexachloride or beta-HCH)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53383, beta-BHC (Benzenehexachloride or beta-HCH) Region 9

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	76862
Pollutant:	beta-BHC (Benzenehexachloride or beta-HCH)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total

Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	This data is not of sufficient resolution to determine if standards are being achieved: the detection limit is greater than the criteria used to determine if water quality standards are being met.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Toxics Rule (USEPA) for sources of drinking water is 0.014 ug/L.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	The sample was collected from Low Flow Barrier at Sweetwater River, Upper (above Sweetwater Reservoir).
Temporal Representation:	The sample was collected on January 15th 2007.
Environmental Conditions:	No environmental conditions were reported.
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.
QAPP Information Reference(s):	

DECISION ID 52187 Region 9

Sweetwater River, Upper (above Sweetwater Reservoir)

Pollutant:	**Aluminum**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2027
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Seven of the 14 samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.

3. Seven of 14 samples exceed the criteria, and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 52187, Aluminum **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	77081
Pollutant:	Aluminum
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	14
Number of Exceedances:	7
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Seven of fourteen samples tested for aluminum exceeded the numeric criteria of 0.087 mg/L to protect warm freshwater habitat.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	National Recommended Water Quality Criteria Continuous Concentrations are intended protect aquatic organisms from chronic exposures (expressed as 4-day average concentration) in freshwater. The numeric criteria o or aluminum is 0.087 mg/L.
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Samples were collected from Low Flow Barrier at approximately 32 43'11.12"N /-116 57'1.71"W and from Sweetwater River Influent at approximately 32 42'14.97"N / -116 57'36.85"W. Both sample sites are part of Sweetwater River, Upper (above Sweetwater Reservoir).
Temporal Representation:	A sample was collected from Sweetwater River Influent in June of 2006. From 2007-2009, samples were collected from both Sweetwater River Influent and Low Flow Barrier biannually during the months of January and June/July.
Environmental Conditions:	
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.
QAPP Information Reference(s):	

DECISION ID **51753** **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

Pollutant: **Benthic Community Effects**

Final Listing Decision:	**List on 303(d) list (TMDL required list)**	042367
Last Listing Cycle's Final Listing Decision:	New Decision	
Revision Status	Revised	
Sources:	Hydromodification | Resource Extraction | Source Unknown | Unknown Nonpoint Source | Unknown Point Source | Urban Runoff/Storm Sewers	
Expected TMDL Completion Date:	2025	
Impairment from Pollutant or Pollution:	Pollutant	
Regional Board Conclusion:	Benthic Community Effects is being considered for placement on the CWA section 303(d) List under sections 3.9 and 3.1 of the Listing Policy. Under section 3.9, an additional line of evidence associating Benthic Community Effects with a water or sediment concentration of pollutant(s) is necessary to assess listing status. Based on the readily available data and information, the weight of evidence provides sufficient justification for placing Benthic Community Effects in this water segment on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Pursuant to section 3.9 of the Listing Policy, the water exhibits significant degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index. 4. Pursuant to section 3.9 of the Listing Policy, the water segment has associated pollutant(s) samples that exceed water quality objectives. 5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are being met.	
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant(s) contributes to or causes the problem.	

Line of Evidence (LOE) for Decision ID 51753, Benthic Community Effects **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	77081
Pollutant:	Aluminum
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	14
Number of Exceedances:	7
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Seven of fourteen samples tested for aluminum exceeded the numeric criteria of 0.087 mg/L to protect warm freshwater habitat.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	National Recommended Water Quality Criteria Continuous Concentrations 42368 intended protect aquatic organisms from chronic exposures (expressed as 4-day average concentration) in freshwater. The numeric criteria o or aluminum is 0.087 mg/L.
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Samples were collected from Low Flow Barrier at approximately 32 43'11.12"N /-116 57'1.71"W and from Sweetwater River Influent at approximately 32 42'14.97"N / -116 57'36.85"W. Both sample sites are part of Sweetwater River, Upper (above Sweetwater Reservoir).
Temporal Representation:	A sample was collected from Sweetwater River Influent in June of 2006. From 2007-2009, samples were collected from both Sweetwater River Influent and Low Flow Barrier biannually during the months of January and June/July.
Environmental Conditions:	
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 51753, Benthic Community Effects **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	72768
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	9
Number of Exceedances:	9
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Nine of the nine samples collected had IBI scores below 40. tr11c NPDES bioassessment
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the State or Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	Development of a Benthic Index of Biotic Integrity (B-IBI) for Wadeable Streams in Northern Coastal California and its Application to Regional 305(b) Assessment
Spatial Representation:	The samples were collected at stations SR-94 and SR-TWAS-1 Sweetwater River.
Temporal Representation:	The samples were collected twice a year in May and October from 2002 to 2010.
Environmental Conditions:	
QAPP Information:	The data was collected under the Southern California Regional Watershed Monitoring

QAPP Information Reference(s):	Program Bioassessment Quality Assurance Project Plan, June 25, 2009. 042369 Quality Assurance Project Plan for SWAMP Bioassessment and Freshwater Bioassessment.

Line of Evidence (LOE) for Decision ID 51753, Benthic Community Effects **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	76859
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	The one sample collected had an IBI score above 40. The score was 52.9. SMC bioassessment
Data Reference:	Bioassessment Data for Various Pollutants from Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the State or Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	
Spatial Representation:	The sample was collected at 909_SMC00282, Sweetwater River, upper.
Temporal Representation:	The sample was collected in June 2009.
Environmental Conditions:	
QAPP Information:	The data was collected under the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan, June 25, 2009.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 51753, Benthic Community Effects **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	30893
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	4	042370
Number of Exceedances:	1	
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)	
Data Used to Assess Water Quality:	One of the four samples collected at Sweetwater River exceed the water quality objective of 5 Âµg/L for dissolved selenium according to results in California Surface Water Ambient Monitoring Program Report, 2007. Samples for Sweetwater River were collected in June 2005, September 2005, January 2006, and April 2006.	
Data Reference:	Monitoring data for Region 9	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	CTR Freshwater Chronic (CCC) 5 ug/L. (U.S. EPA, 2000).	
Objective/Criterion Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA	
Evaluation Guideline:		
Guideline Reference:	Water Quality Control Plan for the San Diego Basin	
Spatial Representation:	Water samples were collected at Sweetwater River stations 909SSWR03.	
Temporal Representation:	Samples for Sweetwater River were collected in May 2005, September 2005, January 2006, and April 2006.	
Environmental Conditions:		
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California Surface Water Ambient Monitoring Program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 51753, Benthic Community Effects **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	79676
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	4
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	A total of nine samples were taken at one station on the Sweetwater River. Four of the nine samples were below the 0.79 threshold, and therefore exceeding the water quality objective for the aquatic life beneficial use. One sample was not scored due to low organism counts
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008. Region 9 CSCI Scores & Water Body Information
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in

	a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.
Guideline Reference:	The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.
Spatial Representation:	The samples were collected at station SR-94 (SR-TWAS-1 is co-located)
Temporal Representation:	The samples were collected from 2002 to 2009.
Environmental Conditions:	
QAPP Information:	The data was collected under the County of San Diego NPDES MS4 Copermittees Receiving Waters Monitoring and Reporting Program.
QAPP Information Reference(s):	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008. Quality Assurance Project Plan for SWAMP Bioassessment and Freshwater Bioassessment.

Line of Evidence (LOE) for Decision ID 51753, Benthic Community Effects **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	77090
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	13
Number of Exceedances:	7
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	Seven of the thirteen samples tested for Selenium exceeded the CTR criteria of 0.005 mg/L.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The CTR criteria for selenium is 0.005 mg/L. ref2557
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Low Flow Barrier at approximately 32 43'11.12"N /-116 57'1.71"W and from Sweetwater River Influent at approximately 32 42'14.97"N / -116 57'36.85"W. Both sample sites are part of Sweetwater River, Upper (above Sweetwater Reservoir).
Temporal Representation:	A sample was collected from Sweetwater River Influent in June of 2006. From 2007-2009, samples were collected from both Sweetwater River Influent and Low Flow Barrier biannually during the months of January and June/July.
Environmental Conditions:	
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical &

	Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 51753, Benthic Community Effects **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	79675
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	One sample was collected from one station. The CSCI score was above the 0.79 threshold, and therefore the site is not exceeding the water quality objective for the aquatic life beneficial use.
Data Reference:	Bioassessment Data for Various Pollutants from Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009. Region 9 CSCI Scores & Water Body Information
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.
Guideline Reference:	The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.
Spatial Representation:	The sample was collected at 909_SMC00282, Sweetwater River, upper.
Temporal Representation:	The sample was collected in June 2009.
Environmental Conditions:	
QAPP Information:	The data was collected under the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan, June 25, 2009.
QAPP Information Reference(s):	e-mail clarifying QAPP information Bioassessment Data for Various Pollutants from Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.

Line of Evidence (LOE) for Decision ID 51753, Benthic Community Effects **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	30896	042373
Pollutant:	Total Nitrogen as N	
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	4	
Number of Exceedances:	2	
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)	
Data Used to Assess Water Quality:	Two of the four samples collected exceed the water quality objective according to results in the Surface Water Ambient Monitoring Program Report, 2007. Samples were collected on June 1 and September 7, 2005, January 31 and April 11, 2006.	
Data Reference:	Monitoring data for Region 9	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. (RWQCB, 2007) A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used. (RWQCB, 2007)	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:	Water Quality Control Plan for the San Diego Basin	
Spatial Representation:	Samples were collected from the monitoring station Sweetwater River 3 (station id: 909SSWR03 lat/long: 32.97877/-117.23506), located on the main stem of the Sweetwater River.	
Temporal Representation:	Samples were collected on June 1 and September 7, 2005, January 31 and April 11, 2006.	
Environmental Conditions:	The above sampling events occurred during dry weather declining base flow, dry weather minimum base flow, wet weather between storm events, and wet weather high base flow, respectively.	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.	
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA	

DECISION ID **51729** **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. Data from 2003 to 2009 show that 8 of 11 single samples exceed the water quality objective for enterococcus of 61/100ml for the protection of REC-1.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Data from 2003 to 2009 show that 8 of 11 single samples exceed the water quality objective for enterococcus of 61/100ml for the protection of REC-1 and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 51729, Indicator Bacteria **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	77006
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	11
Number of Exceedances:	8
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, Upper (above Sweetwater Reservoir) to determine beneficial use support and results are as follows: 8 of 11 samples exceed the criterion for Enterococci.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Samples shall not exceed 61 organisms per 100 ml for enterococcus in waters designated for REC I beneficial use (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sweetwater River, Upper (above Sweetwater Reservoir) was collected at 2 monitoring sites [Sweetwater River @ Old Bridge, Sweetwater River @ Steele Canyon Road]
Temporal Representation:	Data was collected over the time period 6/11/2003-6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.

QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 51729, Indicator Bacteria **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	77007
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	11
Number of Exceedances:	3
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, Upper (above Sweetwater Reservoir) to determine beneficial use support and results are as follows: 3 of 11 samples exceed the criterion for Coliform, Fecal.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the fecal coliform concentration shall not exceed 400 MPN/100 ml.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sweetwater River, Upper (above Sweetwater Reservoir) was collected at 2 monitoring sites [Sweetwater River @ Old Bridge, Sweetwater River @ Steele Canyon Road]
Temporal Representation:	Data was collected over the time period 6/11/2003-6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 51729, Indicator Bacteria **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	77105
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	11
Number of Exceedances:	4

Data and Information Type:	PATHOGEN MONITORING	042376
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, Upper (above Sweetwater Reservoir) to determine beneficial use support and results are as follows: 4 of 11 samples exceed the criterion for Coliform, Total.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxicsubstances in concentrations which are toxic to,or which produce detrimental physiologicalresponses in human, plant, animal, or indigenousaquatic life (Basin Plan).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In waters designated for water contact recreation (REC I), the total coliform concentration shall not exceed 10000 MPN/100 ml (CDPH 2006).	
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.	
Spatial Representation:	Data for this line of evidence for Sweetwater River, Upper (above Sweetwater Reservoir) was collected at 2 monitoring sites [Sweetwater River @ Old Bridge, Sweetwater River @ Steele Canyon Road]	
Temporal Representation:	Data was collected over the time period 6/11/2003-6/3/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID 44381 Region 9

Sweetwater River, Upper (above Sweetwater Reservoir)

Pollutant:	**Selenium**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2027
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Eight of the 17 samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Eight of 17 samples exceed the criteria, and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 44381, Selenium **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	30893
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	1
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	One of the four samples collected at Sweetwater River exceed the water quality objective of 5 Âµg/L for dissolved selenium according to results in California Surface Water Ambient Monitoring Program Report, 2007. Samples for Sweetwater River were collected in June 2005, September 2005, January 2006, and April 2006.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	CTR Freshwater Chronic (CCC) 5 ug/L. (U.S. EPA, 2000).
Objective/Criterion Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Water samples were collected at Sweetwater River stations 909SSWR03.
Temporal Representation:	Samples for Sweetwater River were collected in May 2005, September 2005, January 2006, and April 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44381, Selenium **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	77090
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Not Recorded
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	13
Number of Exceedances:	7
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)

Data Used to Assess Water Quality:	Seven of the thirteen samples tested for Selenium exceeded the CTR criteria of 0.005 mg/L.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The CTR criteria for selenium is 0.005 mg/L. ref2557
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	Samples were collected from Low Flow Barrier at approximately 32 43'11.12"N /-116 57'1.71"W and from Sweetwater River Influent at approximately 32 42'14.97"N / -116 57'36.85"W. Both sample sites are part of Sweetwater River, Upper (above Sweetwater Reservoir).
Temporal Representation:	A sample was collected from Sweetwater River Influent in June of 2006. From 2007-2009, samples were collected from both Sweetwater River Influent and Low Flow Barrier biannually during the months of January and June/July.
Environmental Conditions:	
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.
QAPP Information Reference(s):	

DECISION ID 43750 Region 9

Sweetwater River, Upper (above Sweetwater Reservoir)

Pollutant:	**Total Nitrogen as N**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2027
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. Two of four samples exceed the water quality objective for stimulatory substances.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Two of four samples exceed the water quality objective for stimulatory substances and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 43750, Total Nitrogen as N **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	30896
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	2
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Two of the four samples collected exceed the water quality objective according to results in the Surface Water Ambient Monitoring Program Report, 2007. Samples were collected on June 1 and September 7, 2005, January 31 and April 11, 2006.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. (RWQCB, 2007) A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used. (RWQCB, 2007)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected from the monitoring station Sweetwater River 3 (station id: 909SSWR03 lat/long: 32.97877/-117.23506), located on the main stem of the Sweetwater River.
Temporal Representation:	Samples were collected on June 1 and September 7, 2005, January 31 and April 11, 2006.
Environmental Conditions:	The above sampling events occurred during dry weather declining base flow, dry weather minimum base flow, wet weather between storm events, and wet weather high base flow, respectively.
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

DECISION ID **51305** **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

Pollutant: **Chlordane**

Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	042380
Last Listing Cycle's Final Listing Decision:	New Decision	
Revision Status	Original	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the zero samples exceed the criterion.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of zero samples exceeded the criterion. The samples were not used in the assessment due to reporting limits that were higher than the guideline. The sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51305, Chlordane **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	76922
Pollutant:	Chlordane
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	This data is not of sufficient resolution to determine if standards are being achieved: the detection limit is greater than the criteria used to determine if water quality standards are being met.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	The California Toxics Rule (USEPA) for sources of drinking water is 0.00057 ug/L.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	The sample was collected from Low Flow Barrier at Sweetwater River, Upper (above Sweetwater Reservoir).
Temporal Representation:	The sample was collected on January 15th 2007.
Environmental Conditions:	No environmental conditions were reported.
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 51305, Chlordane **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	76923
Pollutant:	Chlordane
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	This data is not of sufficient resolution to determine if standards are being achieved: the detection limit is greater than the criteria used to determine if water quality standards are being met.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Toxics Rule (USEPA) for other waters is 0.00059 ug/L for freshwater aquatic life.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	The sample was collected from Low Flow Barrier at Sweetwater River, Upper (above Sweetwater Reservoir).
Temporal Representation:	The sample was collected on January 15th 2007.
Environmental Conditions:	No environmental conditions were reported.
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.
QAPP Information Reference(s):	

DECISION ID 51329 **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

Pollutant:	**Endosulfan**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one sample exceeded the beneficial use guidelines.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the one samples exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51329, Endosulfan **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	77003
Pollutant:	Endosulfan
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	This data is not of sufficient resolution to determine if standards are being achieved: the detection limit is greater than the criteria used to determine if water quality standards are being met.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The concentrations of toxic substances in the water column, sediments or biota shall not adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The National Toxics Rule (USEPA), 4-day average, total, is 0.036 ug/L for Endosulfan.

Guideline Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants; States' Compliances
Spatial Representation:	The sample was collected from Low Flow Barrier at Sweetwater River, Upper (above Sweetwater Reservoir).
Temporal Representation:	The sample was collected on January 15th 2007.
Environmental Conditions:	No environmental conditions were reported.
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.
QAPP Information Reference(s):	

042383

Line of Evidence (LOE) for Decision ID 51329, Endosulfan **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	76995
Pollutant:	Endosulfan
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	The sample did not exceed the water quality objective for Endosulfan, thought to be protective of drinking water.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The concentrations of toxic substances in the water column, sediments or biota shall not adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Toxics Rule for sources of drinking water is 110 ug/L for Endosulfan.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	The sample was collected from Low Flow Barrier at Sweetwater River, Upper (above Sweetwater Reservoir).
Temporal Representation:	The sample was collected on January 15th 2007.
Environmental Conditions:	No environmental conditions were reported.
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.
QAPP Information Reference(s):	

DECISION ID 51344 **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

Pollutant:	**Methoxychlor**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision

Revision Status	Original	042384
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one sample exceeds the municipal and domestic objective. Zero of the zero sample exceeds the warm freshwater criterion.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the one sample exceeds the municipal and domestic criterion. Zero of the zero sample exceeds the warm freshwater criterion. The sample size for the municipal beneficial use is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. The samples for the warm freshwater beneficial use were not used in the assessment due to reporting limits that were higher than the guideline.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 51344, Methoxychlor **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	77052
Pollutant:	Methoxychlor
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	The sample did not exceed the water quality objective for Methoxychlor, thought to be protective of drinking water.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The concentrations of toxic substances in the water column, sediments or biota shall not adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California primary MCL for methoxychlor is 30 ug/L for drinking water.
Guideline Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Spatial Representation:	The sample was collected from Low Flow Barrier at Sweetwater River, Upper (above Sweetwater Reservoir).

Temporal Representation:	The sample was collected on January 15th 2007.	042385
Environmental Conditions:	No environmental conditions were reported.	
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 51344, Methoxychlor **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	77053
Pollutant:	Methoxychlor
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	This data is not of sufficient resolution to determine if standards are being achieved: the detection limit is greater than the criteria used to determine if water quality standards are being met.
Data Reference:	Data for Various Pollutants in Sweetwater Authority, 2000-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The concentrations of toxic substances in the water column, sediments or biota shall not adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	National Recommended Water Quality Criteria for methoxychlor is 0.03 ug/L for protection of freshwater habitat.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	The sample was collected from Low Flow Barrier at Sweetwater River, Upper (above Sweetwater Reservoir).
Temporal Representation:	The sample was collected on January 15th 2007.
Environmental Conditions:	No environmental conditions were reported.
QAPP Information:	Samples were collected for as part of California Department of Health Services (CADHS) Inorganic Chemicals / Title 22 Primary Inorganic Standards and CADHS General Physical & Minerals / Title 22 Secondary Inorganic Standards because of the water is a source of drinking water.
QAPP Information Reference(s):	

DECISION ID **44401** **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

Pollutant:	**Phosphorus**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. None of the four samples exceed the water quality objective for phosphorus.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of four samples exceeded the total phosphorus water quality objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 44401, Phosphorus **Region 9**

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	30890
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	None of the four samples collected exceed the water quality objective according to results in the Surface Water Ambient Monitoring Program Report, 2007. Samples were collected on June 1, 2005, September 7, 2005, January 31, 2006 and April 11, 2006.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. (RWQCB, 2007) Water Quality Control Plan for the San Diego Basin Goal of 0.1 mg/L for total phosphorus in streams and other flowing waters. (RWQCB, 2007)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin

Spatial Representation:	Samples were collected from the monitoring station Sweetwater River 3 (station id: 909SSWR03 lat/long: 32.97877/-117.23506), located on the main stem of the Sweetwater River.
Temporal Representation:	Samples were collected on June 1, 2005, September 7, 2005, January 31, 2006 and April 11, 2006.
Environmental Conditions:	The above sampling events occurred during dry weather declining base flow, dry weather minimum base flow, wet weather between storm events, and wet weather high base flow, respectively.
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California's Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

DECISION ID 44189 Region 9

Sweetwater River, Upper (above Sweetwater Reservoir)

Pollutant:	**Sulfates**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 one line of evidence are necessary to assess listing status. One line of evidence are available in the administrative record to assess this pollutant. None of the samples exceed the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of four samples exceeded the sulfate water quality objective and this sample size is insufficient to determine with the power and confidence of the Listing Policy if standards are not met. A minimum of five samples is needed for application of table 3.2. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 44189, Sulfates Region 9

Sweetwater River, Upper (above Sweetwater Reservoir)

LOE ID:	30887
Pollutant:	Sulfates
LOE Subgroup:	Pollution
Matrix:	Water

Fraction:	None	042388
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	4	
Number of Exceedances:	0	
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)	
Data Used to Assess Water Quality:	None of four samples collected in Sweetwater River show excessive sulfate concentrations according to results in California Surface Water Ambient Monitoring Program Report, 2007. Samples were collected in September 2005, June 2005, February 2006, and April 2006.	
Data Reference:	Monitoring data for Region 9	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	The recommended secondary drinking water standard for sulfate is 250 mg/l (RWQCB, 2007).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Water samples were collected at Sweetwater River Stations 909SSWR03.	
Temporal Representation:	Samples were collected in September 2005, June 2005, February 2006, and April 2006.	
Environmental Conditions:		
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California Surface Water Ambient Monitoring Program.	
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Sweetwater River, Lower (below Sweetwater Reservoir)
Water Body ID: CAR9091200020091030145725
Water Body Type: River & Stream

DECISION ID 44311 **Region 9**

Sweetwater River, Lower (below Sweetwater Reservoir)

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not Delist from 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: List on 303(d) list (TMDL required list)(2012)
Revision Status Revised
Sources: Source Unknown
Expected TMDL Completion Date: 2021
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for removal from the CWA section 303(d) List under section 4.3 of the Listing Policy. Under section 4.3 a single line of evidence is necessary to assess listing status.

Five lines of evidence are available in the administrative record to assess this pollutant.
Enterococcus
28 of 32 samples exceed the single sample objective for water contact recreation.
Fecal coliform
18 of 32 samples exceed the single sample objective for water contact recreation.
Total coliform
9 of 17 samples exceed the single sample objective for water contact recreation.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Samples and exceedences are as follows:
Enterococcus
28 of 32 samples exceed the single sample objective for water contact recreation.
Fecal coliform
18 of 32 samples exceed the single sample objective for water contact recreation.
Total coliform
9 of 17 samples exceed the single sample objective for water contact recreation.
The enterococcus, fecal coliform, and total coliform samples exceed the allowable frequency listed in Table 4.2 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 44311, Indicator Bacteria **Region 9**

Sweetwater River, Lower (below Sweetwater Reservoir) 042390

LOE ID:	30901
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	15
Number of Exceedances:	13
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Thirteen of fifteen samples collected exceed the water quality objective according to results in the San Diego County Municipal Copermittees Annual Progress Report, 2007. Samples were collected two to four times a year from 2002-2006.
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, no more than 10% of the samples during any 30-day period for waters designated for contact recreation shall exceed 400 per 100 ml. From the Basin Plan, no more than 10% of the samples for waters designated for contact recreation shall exceed 400 per 100 ml (RWQCB, 2007)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at the mass loading station located near the lower boundary of the watershed in Bonita, just north of Bonita Road and adjacent to the Plaza Bonita Road Bridge
Temporal Representation:	Samples were collected two to four times a year from 2002-2006.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 44311, Indicator Bacteria **Region 9**

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	77026
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	17
Number of Exceedances:	5
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, Lower (below Sweetwater Reservoir) to determine beneficial use support and results are as follows: 5 of 17 samples exceed the criterion for Coliform, Fecal.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the fecal coliform concentration shall not exceed 400 MPN/100 ml.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sweetwater River, Lower (below Sweetwater Reservoir) was collected at 2 monitoring sites [Sweetwater River @ Plaza Bonita Road and Sweetwater River @ Willow Road,]
Temporal Representation:	Data was collected over the time period 6/19/2003-6/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 44311, Indicator Bacteria **Region 9**

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	77024
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	17
Number of Exceedances:	13
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, Lower (below Sweetwater Reservoir) to determine beneficial use support and results are as follows: 13 of 17 samples exceed the criterion for Enterococci.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Samples shall not exceed 61 organisms per 100 ml for enterococcus in waters designated for REC I beneficial use (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sweetwater River, Lower (below Sweetwater Reservoir) was collected at 2 monitoring sites [Sweetwater River @ Plaza Bonita Road and Sweetwater River @ Willow Road,]
Temporal Representation:	Data was collected over the time period 6/19/2003-6/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 44311, Indicator Bacteria **Region 9**

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	77096
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	17
Number of Exceedances:	9
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, Lower (below Sweetwater Reservoir) to determine beneficial use support and results are as follows: 9 of 17 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxicsubstances in concentrations which are toxic to,or which produce detrimental physiologicalresponses in human, plant, animal, or indigenousaquatic life (Basin Plan).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In waters designated for water contact recreation (REC I), the total coliform concentration shall not exceed 10000 MPN/100 ml (CDPH 2006).
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.
Spatial Representation:	Data for this line of evidence for Sweetwater River, Lower (below Sweetwater Reservoir) was collected at 2 monitoring sites [Sweetwater River @ Plaza Bonita Road and Sweetwater River @ Willow Road,]
Temporal Representation:	Data was collected over the time period 6/19/2003-6/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 44311, Indicator Bacteria **Region 9**

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	30900
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	15
Number of Exceedances:	15
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	All fifteen samples collected exceed the water quality objective for Enterococcus and thirteen of fifteen samples collected exceed the water quality objective for Fecal Coliform according to results in the San Diego County Municipal Copermittees Annual Progress Report, 2007. Samples were collected two to four times a year from 2002-2006.

Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report	042393
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Basin Plan, the most stringent of the US EPA bacteriological criteria for enterococcus sets a maximum limit at 61 colonies per 100mL (RWQCB, 2007).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:	Water Quality Control Plan for the San Diego Basin	
Spatial Representation:	Samples were collected at the mass loading station located near the lower boundary of the watershed in Bonita, just north of Bonita Road and adjacent to the Plaza Bonita Road Bridge	
Temporal Representation:	Samples were collected two to four times a year from 2002-2006.	
Environmental Conditions:	Samples were collected during wet weather.	
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit	
QAPP Information Reference(s):		

DECISION ID 44310 Region 9

Sweetwater River, Lower (below Sweetwater Reservoir)

Pollutant:	**Selenium**
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for removal from the CWA section 303(d) List under section 4.1 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status. One line of evidence for this cycle is available in the administrative record to assess this pollutant. Zero of the 19 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 19 samples from this cycle exceeded the criteria, and this number of samples is insufficient to delist with the power and confidence of the Listing Policy. A minimum of 28 samples is needed to determine if a beneficial use is fully supported using table 4.1. 4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 44310, Selenium Region 9

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	78180	042394

Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	19
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, Lower (below Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 19 samples exceed the criterion for Selenium.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The selenium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater is 0.005 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sweetwater River, Lower (below Sweetwater Reservoir) was collected at 1 monitoring site [Sweetwater River - 909SR-MLS]
Temporal Representation:	Data was collected over the time period 2/17/2002-10/5/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 44310, Selenium **Region 9**

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	30892
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Four of the four samples collected at Sweetwater River exceed the water quality objective of 5 Âµg/L for dissolved selenium according to results in California Surface Water Ambient Monitoring Program Report, 2007. Samples for Sweetwater River were collected in May 2005, September 2005, January 2006, and April 2006.
Data Reference:	Monitoring data for Region 9

SWAMP Data:	SWAMP	042395
Water Quality Objective/Criterion:	CTR Freshwater Chronic (CCC) 5 ug/L. (U.S. EPA, 2000).	
Objective/Criterion Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA	
Evaluation Guideline:		
Guideline Reference:	Water Quality Control Plan for the San Diego Basin	
Spatial Representation:	Water samples were collected at Sweetwater River stations 909SSWR08.	
Temporal Representation:	Samples for Sweetwater River were collected in May 2005, September 2005, January 2006, and April 2006.	
Environmental Conditions:		
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California Surface Water Ambient Monitoring Program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 44310, Selenium **Region 9**

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	30915
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	15
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	None of 15 samples collected at Sweetwater River exceed the water quality objective of 5 Âµg/L for dissolved selenium. Samples for Sweetwater River were collected in from February 2002 to February 2006.
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	CTR Freshwater Chronic (CCC) 5 ug/L. (U.S. EPA, 2000).
Objective/Criterion Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Water samples were collected at Sweetwater River just North of Bonita Rd
Temporal Representation:	Samples for Sweetwater River were collected February 2002 to February 2006.
Environmental Conditions:	
QAPP Information:	Quality assurance procedures in compliance with Weston Solutions Quality Assurance Manual.
QAPP Information Reference(s):	Weston Solutions, 2004. Quality Management Manual. March 2004 (Revised December 2009).

DECISION ID 43751 **Region 9**

Sweetwater River, Lower (below Sweetwater Reservoir)

Pollutant:	**Toxicity**	042396
Final Listing Decision:	**Do Not Delist from 303(d) list (TMDL required list)**	
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)	
Revision Status	Revised	
Sources:	Source Unknown	
Expected TMDL Completion Date:	2021	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for removal from the CWA section 303(d) List under section 4.6 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record from this cycle to assess pollutant. Fifteen of the 20 samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Fifteen of 20 samples from this cycle exceeded the Criteria and this exceeds the allowable frequency listed in Table 4.1 of the Listing Policy.
4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 43751, Toxicity **Region 9**

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	76855
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to test for toxicity. One of the samples exhibited statistically and biologically significant toxicity. The failed toxicity tests included survival and reproduction of Ceriodaphnia dubia.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control. Additionally, the biological significance of the sample is evaluted by determining whether the sample response is lower than the evaluation threshold.
Guideline Reference:	
Spatial Representation:	The samples were collected from site 909_SMC01258, Sweetwater River, lower.
Temporal Representation:	The samples were collected in June 2009.
Environmental Conditions:	
QAPP Information:	This data was collected for the Regional Monitoring Of Southern California's Coastal Watersheds - Stormwater Monitoring Coalition Bioassessment Working Group. CRG Marine Laboratories Quality Assurance Program Document was provided.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 43751, Toxicity **Region 9**

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	77097
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	19
Number of Exceedances:	10
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Nineteen samples were collected to test for toxicity. Ten of the 19 samples exhibited statistically significant toxicity. The toxicity tests that exhibited significant toxicity included growth of Selenastrum capriconutum and survival and reproduction of Ceriodaphnia dubia.
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected at station 909SR-MLS Sweetwater River.
Temporal Representation:	The samples were collected from 2002 to 2008.
Environmental Conditions:	
QAPP Information:	The data was collected under the County of San Diego Co-Permittees Receiving Waters Urban Runoff Monitoring and Reporting Program (Order No. 2007-01). Data quality is good.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 43751, Toxicity **Region 9**

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	30897

Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	15
Number of Exceedances:	8
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Toxicity was observed in the following tests. Selenastrum capricornutum- Seven of fifteen samples collected were found to be toxic. Ceriodaphnia dubia survival and reproduction: Five of 15 tests were found to be toxic. Hyalella azteca; No samples were toxic. Data was collected by San Diego County for their urban runoff monitoring program.
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Samples were found to exhibit toxicity when the No Observed Effect Concentration (NOEC) or median lethal concentration (LC50) for any given species was estimated to be less than 100% of the test sample concentration.
Guideline Reference:	Waste Discharge Requirements for Discharges of Urban Runoff From the Municipal Separate Storm Sewer Systems Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego, the San Diego Unified Port District, and the San Diego County Regional Airport. Order No. R9-2007-0001
Spatial Representation:	Samples were collected from the Sweetwater River at Bonita Rd near Plaza Bonita.
Temporal Representation:	Samples were taken between February 2002 and February 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance Weston's quality assurance plan.
QAPP Information Reference(s):	Weston Solutions, 2004. Quality Management Manual. March 2004 (Revised December 2009).

Line of Evidence (LOE) for Decision ID 43751, Toxicity **Region 9**

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	30899
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Ambient toxicity testing (chronic)

Data Used to Assess Water Quality:	Toxicity was observed in the following data from the Storm Water Ambient Monitoring Program Selenastrum capricornutum- All three samples showed significant toxicity levels. Hyalella azteca - One of one samples were toxic for Hyalella growth in sediment.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.
Guideline Reference:	Monitoring data for Region 9
Spatial Representation:	Samples were collected from the monitoring station Sweetwater River 8 located on the main stem of the Sweetwater River.
Temporal Representation:	Samples were taken between May 2005, September 2005, and January 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

DECISION ID 53455 Region 9

Sweetwater River, Lower (below Sweetwater Reservoir)

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence is available in the administrative record to assess this pollutant. Zero of the 20 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 20 samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision	After review of the available data and information, RWQCB staff concludes that the water body-

Recommendation: pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded. 042400

Line of Evidence (LOE) for Decision ID 53455, Arsenic **Region 9**

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	76931
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, Lower (below Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The dissolved arsenic criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved arsenic is 0.150 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sweetwater River, Lower (below Sweetwater Reservoir) was collected at 1 monitoring site [Sweetwater River, lower - 909_SMC01258]
Temporal Representation:	Data was collected on a single day 6/21/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

Line of Evidence (LOE) for Decision ID 53455, Arsenic **Region 9**

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	78155
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	19
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, Lower (below Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 19 samples exceed the criterion for Arsenic.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The dissolved arsenic criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved arsenic is 0.150 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sweetwater River, Lower (below Sweetwater Reservoir) was collected at 1 monitoring site [Sweetwater River - 909SR-MLS]
Temporal Representation:	Data was collected over the time period 2/17/2002-10/5/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID 51636 Region 9

Sweetwater River, Lower (below Sweetwater Reservoir)

Pollutant:	**Bifenthrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the zero samples exceed the beneficial use guidelines. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of zero samples exceeded the guideline. The samples were not used in the assessment due to reporting limits that were higher than the guideline. The sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and

information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51636, Bifenthrin **Region 9**

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	76950
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, Lower (below Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Bifenthrin.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Bifenthrin does not exceed 0.0006 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Sweetwater River, Lower (below Sweetwater Reservoir) was collected at 1 monitoring site [Sweetwater River - 909SR-MLS]
Temporal Representation:	Data was collected on a single day 10/5/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID 53456 **Region 9**

Sweetwater River, Lower (below Sweetwater Reservoir)

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or	Pollutant

Pollution: 042403

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. Zero of the 35 samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 35 samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 53456, Cadmium **Region 9**

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	76952
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	15
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Sweetwater River, Lower (below Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 15 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sweetwater River, Lower (below Sweetwater Reservoir) was collected at 2 monitoring sites [Sweetwater River @ Plaza Bonita Road, Sweetwater River @ Willow Road]

Temporal Representation:	Data was collected 6/19/2003 - 6/4/2009. 042404
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 53456, Cadmium **Region 9**

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	76962
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, Lower (below Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The dissolved cadmium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved cadmium is 0.0022 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sweetwater River, Lower (below Sweetwater Reservoir) was collected at 1 monitoring site [Sweetwater River, lower - 909_SMC01258]
Temporal Representation:	Data was collected on a single day 6/21/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

Line of Evidence (LOE) for Decision ID 53456, Cadmium **Region 9**

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	78161
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	19

Number of Exceedances:	1	042405
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, Lower (below Sweetwater Reservoir) to determine beneficial use support and results are as follows: 1 of 19 samples exceed the criterion for Cadmium.	
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The dissolved cadmium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved cadmium is 0.0022 mg/L (California Toxics Rule, 2000).	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Sweetwater River, Lower (below Sweetwater Reservoir) was collected at 1 monitoring site [Sweetwater River - 909SR-MLS]	
Temporal Representation:	Data was collected over the time period 2/17/2002-10/5/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.	

DECISION ID 53458 Region 9

Sweetwater River, Lower (below Sweetwater Reservoir)

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 18 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the 18 samples exceed the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision	After review of the available data and information, RWQCB staff concludes that the water body-

Recommendation: pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded. 042406

Line of Evidence (LOE) for Decision ID 53458, Chromium **Region 9**
Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	76985
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Sweetwater River, Lower (below Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 17 samples exceed the criterion for Chromium.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Chromium to protect aquatic life in freshwater. The dissolved Chromium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sweetwater River, Lower (below Sweetwater Reservoir) was collected at 1 monitoring site [Sweetwater River - 909SR-MLS]
Temporal Representation:	Data was collected over the time period 2/17/2002-10/5/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 53458, Chromium **Region 9**
Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	76984
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Sweetwater River, Lower (below Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sweetwater River, Lower (below Sweetwater Reservoir) was collected at 1 monitoring site [Sweetwater River, lower - 909_SMC01258]
Temporal Representation:	Data was collected on a single day 6/21/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

DECISION ID 53459 Region 9

Sweetwater River, Lower (below Sweetwater Reservoir)

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. Zero of the 33 samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 33 samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 53459, Copper **Region 9**

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	76986
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	15
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Sweetwater River, Lower (below Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sweetwater River, Lower (below Sweetwater Reservoir) was collected at 2 monitoring sites [Sweetwater River @ Plaza Bonita Road, Sweetwater River @ Willow Road]
Temporal Representation:	Data was collected 6/19/2003 - 6/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 53459, Copper **Region 9**

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	76988
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Sweetwater River, Lower (below Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sweetwater River, Lower (below Sweetwater Reservoir) was collected at 1 monitoring site [Sweetwater River, lower - 909_SMC01258]
Temporal Representation:	Data was collected on a single day 6/21/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

Line of Evidence (LOE) for Decision ID 53459, Copper **Region 9**

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	76997
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Sweetwater River, Lower (below Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 17 samples exceed the criterion for Copper.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Copper to protect aquatic life in freshwater. The dissolved Copper criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority

toxic pollutants for the State of California. 7/1/2011 Edition 042410

Evaluation Guideline:
Guideline Reference:

Spatial Representation:	Data for this line of evidence for Sweetwater River, Lower (below Sweetwater Reservoir) was collected at 1 monitoring site [Sweetwater River - 909SR-MLS]
Temporal Representation:	Data was collected over the time period 2/17/2002-10/5/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID 51637 Region 9

Sweetwater River, Lower (below Sweetwater Reservoir)

Pollutant:	**Cypermethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the zero samples exceed the beneficial use guidelines. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of zero samples exceeded the guideline. The samples were not used in the assessment due to reporting limits that were higher than the guideline. The sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51637, Cypermethrin Region 9

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	78169
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Water

Matrix:	Water	042411
Fraction:	None	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	0	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, Lower (below Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Cypermethrin, total.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of cypermethrin does not exceed 0.0002 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Fojut et al. 2012)	
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.	
Spatial Representation:	Data for this line of evidence for Sweetwater River, Lower (below Sweetwater Reservoir) was collected at 1 monitoring site [Sweetwater River, lower - 909_SMC01258]	
Temporal Representation:	Data was collected on a single day 6/21/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.	

Line of Evidence (LOE) for Decision ID 51637, Cypermethrin **Region 9**

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	76998
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, Lower (below Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Cypermethrin, total.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall

	not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of cypermethrin does not exceed 0.0002 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Fojut et al. 2012)
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Sweetwater River, Lower (below Sweetwater Reservoir) was collected at 1 monitoring site [Sweetwater River - 909SR-MLS]
Temporal Representation:	Data was collected on a single day 10/5/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID 51638 Region 9

Sweetwater River, Lower (below Sweetwater Reservoir)

Pollutant:	**Deltamethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeded the beneficial use guidelines. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one samples exceeded the guideline. The sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51638, Deltamethrin Region 9

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	77011
Pollutant:	Deltamethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, Lower (below Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Deltamethrin.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for Deltamethrin is the maximum acceptable toxicant concentration (MATC) of 0.02 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Sweetwater River, Lower (below Sweetwater Reservoir) was collected at 1 monitoring site [Sweetwater River - 909SR-MLS]
Temporal Representation:	Data was collected on a single day 10/5/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID 53461 Region 9

Sweetwater River, Lower (below Sweetwater Reservoir)

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Three lines of evidence are available in the administrative record to assess this pollutant. Considering the nation-wide ban of diazinon which went into effect on January 1, 2005, data from 2005 and on were evaluated in the assessment, and zero of nine samples exceed the Criteria in LOE #77012.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Considering the nation-wide ban of diazinon which went into effect on January 1, 2005, data from 2005 and on were evaluated in the assessment, and zero of nine samples exceed the Criteria in LOE #77012 and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 53461, Diazinon **Region 9**

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	77014
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	19
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, Lower (below Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 19 samples exceed the criterion for Diazinon.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water lifetime health advisory for diazinon is 1 Âµg/L.
Guideline Reference:	2011 Edition of the Drinking Water Standards and Health Advisories
Spatial Representation:	Data for this line of evidence for Sweetwater River, Lower (below Sweetwater Reservoir) was collected at 1 monitoring site [Sweetwater River - 909SR-MLS]
Temporal Representation:	Data was collected over the time period 2/17/2002-10/5/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston

Line of Evidence (LOE) for Decision ID 53461, Diazinon **Region 9**

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	77013
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, Lower (below Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 8 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Data for this line of evidence for Sweetwater River, Lower (below Sweetwater Reservoir) was collected at 3 monitoring sites [Sweetwater River @ Plaza Bonita Road, Sweetwater River @ Willow Road, Sweetwater River @ Plaza Bonita Road]
Temporal Representation:	Data was collected over the time period 5/4/2006-6/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 53461, Diazinon **Region 9**

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	77012
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	9
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING 042416
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, Lower (below Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 9 samples exceed the criterion for Diazinon.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Data for this line of evidence for Sweetwater River, Lower (below Sweetwater Reservoir) was collected at 1 monitoring site [Sweetwater River - 909SR-MLS]
Temporal Representation:	Data was collected over the time period 2/11/2005 -10/5/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 53461, Diazinon **Region 9**

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	78174
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, Lower (below Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 8 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for diazinon is 1.4 Âµg/L.

Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Sweetwater River, Lower (below Sweetwater Reservoir) was collected at 3 monitoring sites [Sweetwater River @ Plaza Bonita Road, Sweetwater River @ Willow Road, Sweetwater River @ Plaza Bonita Road]
Temporal Representation:	Data was collected over the time period 5/4/2006-6/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 51639 Region 9

Sweetwater River, Lower (below Sweetwater Reservoir)

Pollutant:	**Esfenvalerate/Fenvalerate**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the one sample exceeded the beneficial use guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeded the guideline. The sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51639, Esfenvalerate/Fenvalerate Region 9

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	77025
Pollutant:	Esfenvalerate/Fenvalerate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	1	042418
Number of Exceedances:	0	

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, Lower (below Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Esfenvalerate.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to the USEPA Office of Pesticide Programs Ecotoxicity database, the aquatic life EC50 for Esfenvalerate is 0.9 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Sweetwater River, Lower (below Sweetwater Reservoir) was collected at 1 monitoring site [Sweetwater River - 909SR-MLS]
Temporal Representation:	Data was collected on a single day 10/5/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID 53460 Region 9

Sweetwater River, Lower (below Sweetwater Reservoir)

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Four lines of evidence are available in the administrative record to assess this pollutant. Zero of the 15 samples exceed the beneficial use guideline for Municipal and Domestic use. Zero of the 33 samples exceed the beneficial use guideline for Warm Freshwater Habitat use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the 33 samples exceed the beneficial use guideline for Warm Freshwater Habitat use and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.

	4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 53460, Lead **Region 9**

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	77043
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Sweetwater River, Lower (below Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 17 samples exceed the criterion for Lead.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Lead to protect aquatic life in freshwater. The dissolved Lead criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sweetwater River, Lower (below Sweetwater Reservoir) was collected at 1 monitoring site [Sweetwater River - 909SR-MLS]
Temporal Representation:	Data was collected over the time period 2/17/2002-10/5/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 53460, Lead **Region 9**

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	77041
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	Dissolved	042420
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	15	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Sweetwater River, Lower (below Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 15 samples exceed the criterion for Lead.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Sweetwater River, Lower (below Sweetwater Reservoir) was collected at 2 monitoring sites [Sweetwater River @ Plaza Bonita Road, Sweetwater River @ Willow Road]	
Temporal Representation:	Data was collected 6/19/2003 - 6/4/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 53460, Lead **Region 9**

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	77042
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Sweetwater River, Lower (below Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.

	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sweetwater River, Lower (below Sweetwater Reservoir) was collected at 1 monitoring site [Sweetwater River, lower - 909_SMC01258]
Temporal Representation:	Data was collected on a single day 6/21/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

Line of Evidence (LOE) for Decision ID 53460, Lead **Region 9**

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	77027
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	15
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Sweetwater River, Lower (below Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 15 samples exceed the lead guideline.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for lead is 0.015 mg/L (Title 22 of the California Code of Regulations). The level is also known as an action level under the Lead and Copper Rule.
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sweetwater River, Lower (below Sweetwater Reservoir) was collected at 2 monitoring sites [Sweetwater River @ Plaza Bonita Road, Sweetwater River @ Willow Road]
Temporal Representation:	Data was collected 6/19/2003 - 6/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 53462 Region 9

Sweetwater River, Lower (below Sweetwater Reservoir) 042422

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two line of evidence are available in the administrative record to assess this pollutant. Two of the 24 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Two of 24 samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 53462, Malathion — Region 9

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	77059
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	16
Number of Exceedances:	2
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, Lower (below Sweetwater Reservoir) to determine beneficial use support and results are as follows: 2 of 16 samples exceed the criterion for Malathion.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).

Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	042423
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.	
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology	
Spatial Representation:	Data for this line of evidence for Sweetwater River, Lower (below Sweetwater Reservoir) was collected at 1 monitoring site [Sweetwater River - 909SR-MLS]	
Temporal Representation:	Data was collected over the time period 12/16/2002-10/5/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.	

Line of Evidence (LOE) for Decision ID 53462, Malathion **Region 9**

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	78176
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, Lower (below Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 8 samples exceed the criterion for Malathion.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for malathion is 100 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Sweetwater River, Lower (below Sweetwater Reservoir) was collected at 3 monitoring sites [Sweetwater River @ Plaza Bonita Road, Sweetwater River @ Willow Road, Sweetwater River @ Plaza Bonita Road]
Temporal Representation:	Data was collected over the time period 5/4/2006-6/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 53462, Malathion **Region 9**

Sweetwater River, Lower (below Sweetwater Reservoir) 042424

LOE ID:	77060
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, Lower (below Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 8 samples exceed the criterion for Malathion.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Sweetwater River, Lower (below Sweetwater Reservoir) was collected at 3 monitoring sites [Sweetwater River @ Plaza Bonita Road, Sweetwater River @ Willow Road, Sweetwater River @ Plaza Bonita Road]
Temporal Representation:	Data was collected over the time period 5/4/2006-6/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 53462, Malathion **Region 9**

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	77044
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	16
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, Lower (below Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 16 samples exceed the criterion for Malathion.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works

	Watershed Protection Program, 2001-2008.	042425
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The USEPA drinking water lifetime health advisory for malathion is 500 Âµg/L.	
Guideline Reference:	2011 Edition of the Drinking Water Standards and Health Advisories	
Spatial Representation:	Data for this line of evidence for Sweetwater River, Lower (below Sweetwater Reservoir) was collected at 1 monitoring site [Sweetwater River - 909SR-MLS]	
Temporal Representation:	Data was collected over the time period 12/16/2002-10/5/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.	

DECISION ID 53463 Region 9

Sweetwater River, Lower (below Sweetwater Reservoir)

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 18 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 18 samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 53463, Nickel Region 9

Sweetwater River, Lower (below Sweetwater Reservoir) 042426

LOE ID:	77061
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Sweetwater River, Lower (below Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sweetwater River, Lower (below Sweetwater Reservoir) was collected at 1 monitoring site [Sweetwater River, lower - 909_SMC01258]
Temporal Representation:	Data was collected on a single day 6/21/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

Line of Evidence (LOE) for Decision ID 53463, Nickel **Region 9**

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	77062
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Sweetwater River, Lower (below Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 17 samples exceed the criterion for Nickel.

Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008. 042427
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Nickel to protect aquatic life in freshwater. The dissolved Nickel criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sweetwater River, Lower (below Sweetwater Reservoir) was collected at 1 monitoring site [Sweetwater River - 909SR-MLS]
Temporal Representation:	Data was collected over the time period 2/17/2002-10/5/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID 52014 Region 9

Sweetwater River, Lower (below Sweetwater Reservoir)

Pollutant:	**Nitrate/Nitrite (Nitrite + Nitrate as N)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 20 samples exceed the beneficial use guidelines. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 20 samples exceeded the guideline and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 52014, Nitrate/Nitrite (Nitrite + Nitrate as N) Region 9

Sweetwater River, Lower (below Sweetwater Reservoir) 042428

LOE ID:	77078
Pollutant:	Nitrate/Nitrite (Nitrite + Nitrate as N)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, Lower (below Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nitrate/Nitrite as N.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrate + nitrite (as N) is 10.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sweetwater River, Lower (below Sweetwater Reservoir) was collected at 1 monitoring site [Sweetwater River, lower - 909_SMC01258]
Temporal Representation:	Data was collected on a single day 6/21/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

Line of Evidence (LOE) for Decision ID 52014, Nitrate/Nitrite (Nitrite + Nitrate as N) **Region 9**

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	78178
Pollutant:	Nitrate/Nitrite (Nitrite + Nitrate as N)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	19
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, Lower (below Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 19 samples exceed the criterion for Nitrate/Nitrite as N.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrate + nitrite (as N) is 10.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sweetwater River, Lower (below Sweetwater Reservoir) was collected at 1 monitoring site [Sweetwater River - 909SR-MLS]
Temporal Representation:	Data was collected over the time period 2/17/2002-10/5/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID 52016 Region 9

Sweetwater River, Lower (below Sweetwater Reservoir)

Pollutant:	**Nitrogen, Nitrite**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 22 samples exceed the beneficial use guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 22 samples exceeded the guideline and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52016, Nitrogen, Nitrite Region 9

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	78179
Pollutant:	Nitrogen, Nitrite
LOE Subgroup:	Pollutant-Water

Matrix:	Water	042430
Fraction:	None	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	19	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, Lower (below Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 19 samples exceed the criterion for Nitrite as N.	
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrite (as N) is 1.0 mg/L (Title 22 of the California Code of Regulations).	
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Sweetwater River, Lower (below Sweetwater Reservoir) was collected at 1 monitoring site [Sweetwater River - 909SR-MLS]	
Temporal Representation:	Data was collected over the time period 2/17/2002-10/5/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.	

Line of Evidence (LOE) for Decision ID 52016, Nitrogen, Nitrite **Region 9**

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	77080
Pollutant:	Nitrogen, Nitrite
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, Lower (below Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nitrite as N.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrite (as N) is 1.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR

Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sweetwater River, Lower (below Sweetwater Reservoir) was collected at 1 monitoring site [Sweetwater River, lower - 909_SMC01258]
Temporal Representation:	Data was collected on a single day 6/21/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

Line of Evidence (LOE) for Decision ID 52016, Nitrogen, Nitrite **Region 9**

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	77079
Pollutant:	Nitrogen, Nitrite
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, Lower (below Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Nitrite as N.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrite (as N) is 1.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals, CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sweetwater River, Lower (below Sweetwater Reservoir) was collected at 2 monitoring sites [Sweetwater River @ Plaza Bonita Road, Sweetwater River @ Willow Road]
Temporal Representation:	Data was collected over the time period 6/19/2003-6/24/2003.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 52017 **Region 9**

Sweetwater River, Lower (below Sweetwater Reservoir)

Pollutant:	**Nitrogen, ammonia (Total Ammonia)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision

Revision Status	Revised	042432
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of two samples exceeded the guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of two samples exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52017, Nitrogen, ammonia (Total Ammonia) Region 9

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	76919
Pollutant:	Nitrogen, ammonia (Total Ammonia)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, Lower (below Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Ammonia As N, Total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Basin Plan: No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	EPA's Lifetime Health advisory level for total ammonia is 30.0 mg/L as stated on page 8 of the 2006 edition of the drinking water standards and health advisories. This Advisory Level is defined as "the concentration of a chemical in drinking water that is not expected to cause any adverse noncarcinogenic effects for up to ten days of exposure."

Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Sweetwater River, Lower (below Sweetwater Reservoir) was collected at 2 monitoring sites [Sweetwater River @ Plaza Bonita Road, Sweetwater River @ Willow Road]
Temporal Representation:	Data was collected over the time period 6/19/2003-6/24/2003.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 53464 **Region 9**

Sweetwater River, Lower (below Sweetwater Reservoir)

Pollutant:	**Temperature, water**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line(s) of evidence are necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of 0 samples exceeds the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 0 samples exceeds the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2. 4. Pursuant to section 3.2 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53464, Temperature, water **Region 9**

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	77095
Pollutant:	Temperature, water
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	0	042434
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	0 of the 0 samples exceeded the evaluation guideline for temperature in this water body.	
Data Reference:	Data for Trash, Nutrients, and Pathogens in Region 9, 2007-2010.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Board that such alteration in temperature does not adversely affect beneficial uses. At no time or place shall the temperature of any COLD water be increased more than 5Â°F above the natural receiving water temperature.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	Inland Fishes of California (Moyle 1976) states that for rainbow trout the optimum range for growth and completion of most life stages is 13-21 degrees C (page 129). Since there is no evaluation guideline for assessing temperature for the warm freshwater aquatic life beneficial use, this line of evidence will not be used for Listing Decisions in the 2012 Integrated Report and will be retired for said Listing cycle.	
Guideline Reference:	Fish introductions in CA: History and impact on native fishes. Davis, CA: University of CA, Davis	
Spatial Representation:	Samples were collected at the following stations: SWT-010-Plaza Bonita Rd. SWT-020-S17 Sweetwater Rd.	
Temporal Representation:	Samples were collected between January, 2009 and July, 2010.	
Environmental Conditions:		
QAPP Information:	San Diego Regional Water Quality Assessment and Outreach Project Quality Assurance Project Plan Prepared by: Clay Clifton (San Diego Coastkeeper, Local Project Sponsor Manager), Bob Stafford (San Diego Stream Team), Dr. Rick Gersberg (San Diego State University), Bryan Bjorndal (Assure Controls, Inc.), and Morgan Justice-Black (I Love A Clean San Diego).	
QAPP Information Reference(s):		

DECISION ID 53465 Region 9

Sweetwater River, Lower (below Sweetwater Reservoir)

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. One of the 33 samples exceed the Criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of the 33 samples exceed the Criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.

4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 53465, Zinc **Region 9**

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	78146
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	19
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, Lower (below Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 19 samples exceed the criterion for Zinc.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for zinc is 5.0 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Sweetwater River, Lower (below Sweetwater Reservoir) was collected at 1 monitoring site [Sweetwater River - 909SR-MLS]
Temporal Representation:	Data was collected over the time period 2/17/2002-10/5/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 53465, Zinc **Region 9**

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	76858
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Warm Freshwater Habitat	042436
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Sweetwater River, Lower (below Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Sweetwater River, Lower (below Sweetwater Reservoir) was collected at 1 monitoring site [Sweetwater River, lower - 909_SMC01258]	
Temporal Representation:	Data was collected on a single day 6/21/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.	

Line of Evidence (LOE) for Decision ID 53465, Zinc **Region 9**

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	76856
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	15
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Sweetwater River, Lower (below Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	The California Secondary MCL for zinc is 5.0 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Sweetwater River, Lower (below Sweetwater Reservoir) was collected at 2 monitoring sites [Sweetwater River @ Plaza Bonita Road, Sweetwater River @ Willow Road]
Temporal Representation:	Data was collected 6/19/2003 - 6/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 53465, Zinc **Region 9**

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	76877
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	17
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	State Water Board staff assessed County of San Diego NDPES data for Sweetwater River, Lower (below Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 17 samples exceed the criterion for Zinc.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Zinc to protect aquatic life in freshwater. The dissolved Zinc criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sweetwater River, Lower (below Sweetwater Reservoir) was collected at 1 monitoring site [Sweetwater River - 909SR-MLS]
Temporal Representation:	Data was collected over the time period 2/17/2002-10/5/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 53465, Zinc **Region 9**

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	76857	042438

Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	15
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Sweetwater River, Lower (below Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California, 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sweetwater River, Lower (below Sweetwater Reservoir) was collected at 2 monitoring sites [Sweetwater River @ Plaza Bonita Road, Sweetwater River @ Willow Road]
Temporal Representation:	Data was collected 6/19/2003 - 6/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 51757 Region 9

Sweetwater River, Lower (below Sweetwater Reservoir)

Pollutant:	**Benthic Community Effects**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Hydromodification | Illicit Connections/Illegal Hook-ups/Dry Weather Flows | Source Unknown | Unknown Nonpoint Source | Unknown Point Source | Urban Runoff/Storm Sewers
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Benthic Community Effects is being considered for placement on the CWA section 303(d) List under sections 3.9 and 3.1 of the Listing Policy. Under section 3.9, an additional line of evidence associating Benthic Community Effects with a water or sediment concentration of pollutant(s) is necessary to assess listing status.

Based on the readily available data and information, the weight of evidence provides sufficient justification for placing Benthic Community Effects in this water segment on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Pursuant to section 3.9 of the Listing Policy, the water exhibits significant degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index.
4. Pursuant to section 3.9 of the Listing Policy, the water segment has associated pollutant(s) samples that exceed water quality objectives.
5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are being met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant(s) contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 51757, Benthic Community Effects **Region 9**

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	76949
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	The one sample collected had an IBI score below 40. The score was 14.3. SMC bioassessment
Data Reference:	Bioassessment Data for Various Pollutants from Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the State or Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	
Spatial Representation:	The sample was collected at 909_SMC01258, Sweetwater River, lower.
Temporal Representation:	The sample was collected in May 2009.
Environmental Conditions:	
QAPP Information:	The data was collected under the Southern California Regional Watershed Monitoring

	Program Bioassessment Quality Assurance Project Plan, June 25, 2009. 042440
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 51757, Benthic Community Effects **Region 9**

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	77930
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	14
Number of Exceedances:	3
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, Lower (below Sweetwater Reservoir) to determine beneficial use support and results are as follows: 3 of 14 samples exceed the criterion for Chlorpyrifos. Three sample results were not used in the assessment because the laboratory data reporting limit(s) was above the objective and therefore the results could not be quantified with the level of certainty required by the Listing Policy.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.014 ug/L (Siepmann and Finlayson 2000).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).
Spatial Representation:	Data for this line of evidence for Sweetwater River, Lower (below Sweetwater Reservoir) was collected at 1 monitoring site [Sweetwater River - 909SR-MLS]
Temporal Representation:	Data was collected over the time period 2/17/2002-10/5/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 51757, Benthic Community Effects **Region 9**

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	79678
Pollutant:	Benthic-Macroinvertebrate Bioassessments

LOE Subgroup:	Population/Community Degradation	042441
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	12	
Number of Exceedances:	10	
Data and Information Type:	Benthic macroinvertebrate surveys	
Data Used to Assess Water Quality:	A total of twelve samples were taken at three stations. Ten of the samples were below the 0.79 threshold, and therefore exceeding the water quality objective for the aquatic life beneficial use. Two of the samples were not scored due to low organism counts.	
Data Reference:	RWB9 Status Sampling 2007 and 2008 Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008. Bioassessment Data for Various Pollutants from Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009. Region 9 CSCI Scores & Water Body Information	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.	
Guideline Reference:	The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.	
Spatial Representation:	The samples were collected at stations: SR-WS (SR-MLS), SMC01258, 909SSWR08	
Temporal Representation:	The samples were collected from 2002 to 2009.	
Environmental Conditions:		
QAPP Information:	Data collected following SWAMP QA protocols for the RWB9 Status Sampling 2007 and 2008 water quality monitoring project, the County of San Diego NPDES MS4 Copermittees Receiving Waters Monitoring and Reporting Program, and the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan.	
QAPP Information Reference(s):	RWB9 Status Sampling 2007 and 2008 Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008. Quality Assurance Project Plan for SWAMP Bioassessment and Freshwater Bioassessment. Bioassessment Data for Various Pollutants from Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.	

Line of Evidence (LOE) for Decision ID 51757, Benthic Community Effects **Region 9**

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	76933

Pollutant:	Benthic-Macroinvertebrate Bioassessments	042442
LOE Subgroup:	Population/Community Degradation	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	1	
Data and Information Type:	Benthic macroinvertebrate surveys	
Data Used to Assess Water Quality:	The IBI score for this water body was 9 which indicates that this water body may be considered to have impaired conditions.	
Data Reference:	RWB9 Status Sampling 2007 and 2008	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.	
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13	
Spatial Representation:	Samples were collected at the following station: 909SSWR08-Sweetwater River 8.	
Temporal Representation:	Surveys done May 5, 2008.	
Environmental Conditions:		
QAPP Information:	Data collected following SWAMP QA protocols for the RWB9 Status Sampling 2007 and 2008 water quality monitoring project.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 51757, Benthic Community Effects **Region 9**

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	77097
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	19
Number of Exceedances:	10
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Nineteen samples were collected to test for toxicity. Ten of the 19 samples exhibited statistically significant toxicity. The toxicity tests that exhibited significant toxicity included growth of Selenastrum capriconutum and survival and reproduction of Ceriodaphnia dubia.
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life

Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	042443
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.	
Guideline Reference:		
Spatial Representation:	The samples were collected at station 909SR-MLS Sweetwater River.	
Temporal Representation:	The samples were collected from 2002 to 2008.	
Environmental Conditions:		
QAPP Information:	The data was collected under the County of San Diego Co-Permittees Receiving Waters Urban Runoff Monitoring and Reporting Program (Order No. 2007-01). Data quality is good.	
QAPP Information Reference(s):	e-mail clarifying QAPP information	

Line of Evidence (LOE) for Decision ID 51757, Benthic Community Effects **Region 9**

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	77012
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, Lower (below Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 9 samples exceed the criterion for Diazinon.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Data for this line of evidence for Sweetwater River, Lower (below Sweetwater Reservoir) was collected at 1 monitoring site [Sweetwater River - 909SR-MLS]
Temporal Representation:	Data was collected over the time period 2/11/2005 -10/5/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 51757, Benthic Community Effects 042444 Region 9

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	77059
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	16
Number of Exceedances:	2
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, Lower (below Sweetwater Reservoir) to determine beneficial use support and results are as follows: 2 of 16 samples exceed the criterion for Malathion.
Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for Sweetwater River, Lower (below Sweetwater Reservoir) was collected at 1 monitoring site [Sweetwater River - 909SR-MLS]
Temporal Representation:	Data was collected over the time period 12/16/2002-10/5/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

Line of Evidence (LOE) for Decision ID 51757, Benthic Community Effects Region 9

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	76855
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1

Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to test for toxicity. One of the samples exhibited statistically and biologically significant toxicity. The failed toxicity tests included survival and reproduction of Ceriodaphnia dubia.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control. Additionally, the biological significance of the sample is evaluted by determining whether the sample response is lower than the evaluation threshold.
Guideline Reference:	
Spatial Representation:	The samples were collected from site 909_SMC01258, Sweetwater River, lower.
Temporal Representation:	The samples were collected in June 2009.
Environmental Conditions:	
QAPP Information:	This data was collected for the Regional Monitoring Of Southern California's Coastal Watersheds - Stormwater Monitoring Coalition Bioassessment Working Group. CRG Marine Laboratories Quality Assurance Program Document was provided.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 51757, Benthic Community Effects **Region 9**

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	30888
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	15
Number of Exceedances:	11
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Eleven of 15 samples collected exceed the water quality objective. Since a maximum of four samples were collected at most in a one year period, any exceedance results in an annual exceedance frequency greater than 10% according to the San Diego County Municipal Copermittees Annual Progress Report, 2007. Samples were collected two to four times a year from 2002-2006.
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, concentrations of total dissolved solids cannot exceed 1500 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at the mass loading station located near the lower boundary of the watershed in Bonita, just north of Bonita Road and adjacent to the Plaza Bonita Road Bridge
Temporal Representation:	Samples were collected two to four times a year from 2002-2006.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 51757, Benthic Community Effects **Region 9**

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	30897
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	15
Number of Exceedances:	8
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Toxicity was observed in the following tests. Selenastrum capricornutum- Seven of fifteen samples collected were found to be toxic. Ceriodaphnia dubia survival and reproduction: Five of 15 tests were found to be toxic. Hyalella azteca; No samples were toxic. Data was collected by San Diego County for their urban runoff monitoring program.
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Samples were found to exhibit toxicity when the No Observed Effect Concentration (NOEC) or median lethal concentration (LC50) for any given species was estimated to be less than 100% of the test sample concentration.
Guideline Reference:	Waste Discharge Requirements for Discharges of Urban Runoff From the Municipal Separate Storm Sewer Systems Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego, the San Diego Unified Port District, and the San Diego County Regional Airport. Order No. R9-2007-0001
Spatial Representation:	Samples were collected from the Sweetwater River at Bonita Rd near Plaza Bonita.
Temporal Representation:	Samples were taken between February 2002 and February 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance Weston's quality assurance plan.
QAPP Information Reference(s):	Weston Solutions, 2004. Quality Management Manual. March 2004 (Revised December 2009).

Line of Evidence (LOE) for Decision ID 51757, Benthic Community Effects **Region 9**

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	30899
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Ambient toxicity testing (chronic)
Data Used to Assess Water Quality:	Toxicity was observed in the following data from the Storm Water Ambient Monitoring Program Selenastrum capricornutum- All three samples showed significant toxicity levels. Hyalella azteca - One of one samples were toxic for Hyalella growth in sediment.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, all waters shall be free of toxic substances that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to SWAMP, waters are considered toxic when samples show significant toxicity levels (SWAMP code Â‘SLÂ’) when compared to a negative control. Significant toxicity is determined when statistical tests result in an alpha of less than 5% and percent control values less than the evaluation threshold.
Guideline Reference:	Monitoring data for Region 9
Spatial Representation:	Samples were collected from the monitoring station Sweetwater River 8 located on the main stem of the Sweetwater River.
Temporal Representation:	Samples were taken between May 2005, September 2005, and January 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

Line of Evidence (LOE) for Decision ID 51757, Benthic Community Effects **Region 9**

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	30889
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	15
Number of Exceedances:	15
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	All fifteen samples collected exceed the water quality objective according to results in the

	San Diego County Municipal Copermittees Annual Progress Report, 2007042448 Samples were collected two to four times a year from 2002-2006.
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. (RWQCB, 2007) Water Quality Control Plan for the San Diego Basin Goal of 0.1 mg/L for total phosphorus in streams and other flowing waters. (RWQCB, 2007)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at the mass loading station located near the lower boundary of the watershed in Bonita, just north of Bonita Road and adjacent to the Plaza Bonita Road Bridge
Temporal Representation:	Samples were collected two to four times a year from 2002-2006.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 51757, Benthic Community Effects **Region 9**

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	30894
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Health Advisories
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	15
Number of Exceedances:	13
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Thirteen of fifteen samples collected exceed the water quality objective according to results in the San Diego County Municipal Copermittees Annual Progress Report, 2007. Samples were collected two to four times a year from 2002-2006.
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. (RWQCB, 2007) A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used. (RWQCB, 2007)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	042449
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Samples were collected at the mass loading station located near the lower boundary of the watershed in Bonita, just north of Bonita Road and adjacent to the Plaza Bonita Road Bridge.
Temporal Representation:	Samples were collected two to four times a year from 2002-2006.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 51757, Benthic Community Effects **Region 9**

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	30892
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	4
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Four of the four samples collected at Sweetwater River exceed the water quality objective of 5 Âµg/L for dissolved selenium according to results in California Surface Water Ambient Monitoring Program Report, 2007. Samples for Sweetwater River were collected in May 2005, September 2005, January 2006, and April 2006.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	CTR Freshwater Chronic (CCC) 5 ug/L. (U.S. EPA, 2000).
Objective/Criterion Reference:	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. U.S. Environmental Protection Agency, Region IX, Water Division, San Francisco, CA
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin
Spatial Representation:	Water samples were collected at Sweetwater River stations 909SSWR08.
Temporal Representation:	Samples for Sweetwater River were collected in May 2005, September 2005, January 2006, and April 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 51757, Benthic Community Effects **Region 9**

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	72770
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None

Beneficial Use:	Warm Freshwater Habitat	042450
Number of Samples:	11	
Number of Exceedances:	11	
Data and Information Type:	Benthic macroinvertebrate surveys	
Data Used to Assess Water Quality:	Eleven of the eleven samples collected had IBI scores below 40. tr11c NPDES bioassessment	
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the State or Regional Board. Region 9 Basin Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.	
Guideline Reference:	Development of a Benthic Index of Biotic Integrity (B-IBI) for Wadeable Streams in Northern Coastal California and its Application to Regional 305(b) Assessment	
Spatial Representation:	The samples were collected at stations SR-MLS and SR-WS Sweetwater River.	
Temporal Representation:	The samples were collected twice a year in May and October from 2002 to 2010.	
Environmental Conditions:		
QAPP Information:	The data was collected under the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan, June 25, 2009.	
QAPP Information Reference(s):	Quality Assurance Project Plan for SWAMP Bioassessment and Freshwater Bioassessment.	

DECISION ID 53457 Region 9

Sweetwater River, Lower (below Sweetwater Reservoir)

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Three of the 14 samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that: 042451
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Three of the 14 samples exceed the criteria and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 53457, Chlorpyrifos **Region 9**

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	76975
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, Lower (below Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).
Spatial Representation:	Data for this line of evidence for Sweetwater River, Lower (below Sweetwater Reservoir) was collected at 3 monitoring sites [Sweetwater River @ Plaza Bonita Road, Sweetwater River @ Willow Road, Sweetwater River @ Plaza Bonita Road]
Temporal Representation:	Data was collected over the time period 5/4/2006-6/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 53457, Chlorpyrifos **Region 9**

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	78163
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, Lower (below Sweetwater Reservoir) to determine beneficial use support and results are as follows: 0 of 8 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for chlorpyrifos is 2.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Sweetwater River, Lower (below Sweetwater Reservoir) was collected at 3 monitoring sites [Sweetwater River @ Plaza Bonita Road, Sweetwater River @ Willow Road, Sweetwater River @ Plaza Bonita Road]
Temporal Representation:	Data was collected over the time period 5/4/2006-6/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 53457, Chlorpyrifos **Region 9**

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	77930
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	14
Number of Exceedances:	3
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, Lower (below Sweetwater Reservoir) to determine beneficial use support and results are as follows: 3 of 14 samples exceed the criterion for Chlorpyrifos. Three sample results were not used in the assessment because the laboratory data reporting limit(s) was above the objective and therefore the results could not be quantified with the level of certainty required by the Listing Policy.

Data Reference:	Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.014 ug/L (Siepmann and Finlayson 2000).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).
Spatial Representation:	Data for this line of evidence for Sweetwater River, Lower (below Sweetwater Reservoir) was collected at 1 monitoring site [Sweetwater River - 909SR-MLS]
Temporal Representation:	Data was collected over the time period 2/17/2002-10/5/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Weston, the Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products were followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Weston, The Regional Monitoring Workgroup Urban Runoff Monitoring Final Report Methods Sections and Statements of Work, and Weston Solutions Inc. Desk Reference for Quality Control Of Work Products.

DECISION ID 38315 Region 9

Sweetwater River, Lower (below Sweetwater Reservoir)

Pollutant:	**Sulfates**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 one line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. All three of the samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. All three of the samples exceeded the sulfate water quality objective and this sample size is insufficient to determine with the power and confidence of the Listing Policy if standards are not met. A minimum of five samples is needed for application of table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available

indicating that standards are not met. 042454

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 38315, Sulfates **Region 9**

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	30886
Pollutant:	Sulfates
LOE Subgroup:	Pollution
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	3
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Three of three samples collected at Sweetwater River show excessive sulfate concentrations according to results in California Surface Water Ambient Monitoring Program Report, 2007. Samples were collected in January 2003, April 2003, and May 2003.
Data Reference:	Monitoring data for Region 9
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The recommended secondary drinking water standard for sulfate is 250 mg/l (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Water samples were collected at Sweetwater River Stations 909SSWR08.
Temporal Representation:	Samples were collected in January 2003, April 2003, and May 2003
Environmental Conditions:	
QAPP Information:	Quality control for the chemical analysis portion of this study was conducted in accordance with the California Surface Water Ambient Monitoring Program.
QAPP Information Reference(s):	2002. Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. California Department of Fish and Game, Monterey, CA

DECISION ID 43867 **Region 9**

Sweetwater River, Lower (below Sweetwater Reservoir)

Pollutant:	**Nitrogen**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the

Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. 02455

One line of evidence are available in the administrative record to assess this pollutant. Thirteen of the 15 samples exceed the water quality objective for total nitrogen.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Thirteen of 15 samples exceed the total nitrogen water quality objective and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 43867, Nitrogen **Region 9**

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	30894
Pollutant:	Total Nitrogen as N
LOE Subgroup:	Health Advisories
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	15
Number of Exceedances:	13
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Thirteen of fifteen samples collected exceed the water quality objective according to results in the San Diego County Municipal Copermittees Annual Progress Report, 2007. Samples were collected two to four times a year from 2002-2006.
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. (RWQCB, 2007) A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/L total phosphorus, P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1, on a weight to weight basis shall be used. (RWQCB, 2007)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	Water Quality Control Plan for the San Diego Basin

Spatial Representation:	Samples were collected at the mass loading station located near the lower boundary of the watershed in Bonita, just north of Bonita Road and adjacent to the Plaza Bonita Road Bridge.
Temporal Representation:	Samples were collected two to four times a year from 2002-2006.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit
QAPP Information Reference(s):	

DECISION ID 43923 Region 9

Sweetwater River, Lower (below Sweetwater Reservoir)

Pollutant:	**Phosphorus**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. All 15 of the samples exceed the water quality objective for phosphorus. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. All 15 samples exceed the phosphorus water quality objective and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 43923, Phosphorus Region 9

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	30889
Pollutant:	Phosphorus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	15	042457
Number of Exceedances:	15	
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)	
Data Used to Assess Water Quality:	All fifteen samples collected exceed the water quality objective according to results in the San Diego County Municipal Copermittees Annual Progress Report, 2007. Samples were collected two to four times a year from 2002-2006.	
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Water bodies shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. (RWQCB, 2007) Water Quality Control Plan for the San Diego Basin Goal of 0.1 mg/L for total phosphorus in streams and other flowing waters. (RWQCB, 2007)	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:	Water Quality Control Plan for the San Diego Basin	
Spatial Representation:	Samples were collected at the mass loading station located near the lower boundary of the watershed in Bonita, just north of Bonita Road and adjacent to the Plaza Bonita Road Bridge	
Temporal Representation:	Samples were collected two to four times a year from 2002-2006.	
Environmental Conditions:	Samples were collected during wet weather.	
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit	
QAPP Information Reference(s):		

DECISION ID 44400 Region 9

Sweetwater River, Lower (below Sweetwater Reservoir)

Pollutant:	**Total Dissolved Solids**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2012)
Revision Status	Original
Sources:	Source Unknown
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: The decision has not changed from the previous listing cycle. No new data were assessed for the current listing cycle. Therefore, the previous conclusion remains unchanged, and is as follows:

This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Eleven of 15 samples exceed the water quality objective for total dissolved solids.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Eleven of 15 samples exceed the total dissolved solids and this exceeds the allowable frequency

listed in Table 3.2 of the Listing Policy. 042458
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

Line of Evidence (LOE) for Decision ID 44400, Total Dissolved Solids **Region 9**

Sweetwater River, Lower (below Sweetwater Reservoir)

LOE ID:	30888
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	15
Number of Exceedances:	11
Data and Information Type:	Fixed station physical/chemical monitoring (conventional pollutants only)
Data Used to Assess Water Quality:	Eleven of 15 samples collected exceed the water quality objective. Since a maximum of four samples were collected at most in a one year period, any exceedance results in an annual exceedance frequency greater than 10% according to the San Diego County Municipal Copermittees Annual Progress Report, 2007. Samples were collected two to four times a year from 2002-2006.
Data Reference:	Urban Runoff Monitoring, Volume 1- Final Report
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	From the Basin Plan, concentrations of total dissolved solids cannot exceed 1500 mg/L. This concentration is not to be exceeded more than 10% of the time during any one year period (RWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the mass loading station located near the lower boundary of the watershed in Bonita, just north of Bonita Road and adjacent to the Plaza Bonita Road Bridge
Temporal Representation:	Samples were collected two to four times a year from 2002-2006.
Environmental Conditions:	Samples were collected during wet weather.
QAPP Information:	QA/QC conducted according to Federal Regulations under requirements of a NPDES permit
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at Baby Beach
Water Body ID: CAC9011400020091116103327
Water Body Type: Coastal & Bay Shoreline

DECISION ID 43763 **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at Baby Beach

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not Delist from 303(d) list (being addressed with USEPA approved TMDL)**
Last Listing Cycle's Final Listing Decision:	Do Not Delist from 303(d) list (TMDL required list)(2012)
Revision Status	Revised
Sources:	See TMDL documentation | Surface Runoff
TMDL Name:	Bacteria TMDL for San Diego Bay and Dana Point Harbor Shorelines
TMDL Project Code:	659
Date TMDL Approved by USEPA:	10/26/2009
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for removal on the CWA section 303(d) List under sections 2.2 and [SECTION] of the Listing Policy. Under [SECTION] of the Policy, a minimum of one line of evidence is needed to assess listing status.

Seven lines of evidence are available in the administrative record to assess this pollutant.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the CWA section 303(d) List. There is sufficient justification to place it in the Being Addressed portion of the CWA 303(d) List because a TMDL has been completed and approved by RWQCB and USEPA, and is expected to result in attainment of the standard.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. 176 of 571 samples exceed the SSM objective for total coliform (for SHELL) and these exceed the allowable frequency listed in Table 4.2 of the Listing Policy.
4. The Bacteria TMDL for baby beach and shelter island was approved by USEPA on 10/26/2009.
5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be removed from the section 303(d) list because applicable water quality standards for the pollutant are being exceeded.

Line of Evidence (LOE) for Decision ID 43763, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at Baby Beach

LOE ID:	74637
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water

Matrix:	Water	042460
Fraction:	None	
Beneficial Use:	Shellfish Harvesting	
Number of Samples:	247	
Number of Exceedances:	38	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed bw data for Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at Baby Beach to determine beneficial use support and results are as follows: 38 of 247 samples exceed the criterion for Coliform, Total.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at Baby Beach was collected at 4 monitoring sites [WEST END/BABY BEACH, BUOY LINE/BABY BEACH, SWIM AREA/BABY BEACH, EAST END/BABY BEACH] These stations are within 200 meters of eachother but were not averaged for this assessment.	
Temporal Representation:	Data was collected over the time period 1/3/2008-8/26/2010.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 43763, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at Baby Beach

LOE ID:	30908
Pollutant:	Indicator Bacteria
LOE Subgroup:	Health Advisories
Matrix:	-N/A
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	For the period from January 2000 to December 2006, there were 4433 beach postings days for all of Dana Point Harbor. When a bacteriological sample exceeds water quality standards, signs are posted indicating that waters have exceeded public health standards. Data and information on the number of beach posting were summarized by the County of Orange in their Annual Ocean and Bay Water Quality Report, March 2007. The reporting period was from January 2000 -December 2006. Data used was the number of days the beach was posting when the ocean or bay failed to meet the bacteriological standards.
Data Reference:	County of Orange. March 2007. Annual Ocean and Bay Water Quality Report, 2006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Code of Regulations. Title 17, Section 7960.

	(a) When a public beach or public water-contact sports area fails to meet any of the standards as set forth in Section 7957 or 7958 above, the local health officer or the Department, after taking into consideration the causes therefor, may at his or its discretion close, post with warning signs, or otherwise restrict use of said public beach or public water-contact sports area, until such time as corrective action has been taken and the standards as set forth in 7957 and 7958 above are met.
Objective/Criterion Reference:	California Code of Regulations, Title 17, Section 7960
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Bacteriological monitoring samples were collected at Dana Point Harbor (Fuel Dock, Baby Beach, Pilgrim Dock, Youth Dock, Harbor Entrance, Guest Dock, Harbor Patrol Dock and M Dock).
Temporal Representation:	The beach posting covers the time frame of January 2000 -December 2006.
Environmental Conditions:	
QAPP Information:	Samples were collected in compliance with County of Orange's Quality Assessment/Quality Control document (County of Orange, 2004).
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43763, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at Baby Beach

LOE ID:	95653
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	434
Number of Exceedances:	55
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed beach monitoring data for Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at Baby Beach to determine beneficial use support and results are as follows: 55 of 434 samples exceed the criterion for Enterococcus.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that for the protection of REC-1 activities, the concentration of enterococcus should not exceed 104/100ml.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at Baby Beach was collected at 4 monitoring sites BDP 12, 13, 14, and 15. These stations are within 200 meters of eachother but were not averaged for this assessment.
Temporal Representation:	Data was collected over the time period 2002 to 2006. Due to the installation of dry-weather diverter in 2005, only data from January 4, 2006 and beyond were included in the assessment.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43763, Indicator Bacteria 042462 **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at Baby Beach

LOE ID:	81134
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	154
Number of Exceedances:	14
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed bw data for Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at Baby Beach to determine beneficial use support and results are as follows: 14 of 154 samples exceed the criterion for Enterococcus.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that for the protection of REC-1 activities, the median concentration of enterococcus should not exceed 35/100ml in a 30-day period .
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at Baby Beach was collected at 4 monitoring sites [WEST END/BABY BEACH, BUOY LINE/BABY BEACH, SWIM AREA/BABY BEACH, EAST END/BABY BEACH] These stations are within 200 meters of eachother but were not averaged for this assessment.
Temporal Representation:	Data was collected over the time period 1/3/2008-8/26/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43763, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at Baby Beach

LOE ID:	81133
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	247
Number of Exceedances:	23
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed bw data for Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at Baby Beach to determine beneficial use support and results are as follows: 23 of 247 samples exceed the criterion for Enterococcus.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	The California Ocean Plan states that for the protection of REC-1 activities, the concentration of enterococcus should not exceed 104/100ml.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at Baby Beach was collected at 4 monitoring sites [WEST END/BABY BEACH, BUOY LINE/BABY BEACH, SWIM AREA/BABY BEACH, EAST END/BABY BEACH] These stations are within 200 meters of eachother but were not averaged for this assessment.
Temporal Representation:	Data was collected over the time period 1/3/2008-8/26/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43763, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at Baby Beach

LOE ID:	81132
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	248
Number of Exceedances:	3
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed bw data for Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at Baby Beach to determine beneficial use support and results are as follows: 3 of 248 samples exceed the criterion for Coliform, Fecal.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that for the protection of REC-1 activities, the concentration of fecal coliform should not exceed 400/100ml.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at Baby Beach was collected at 4 monitoring sites [WEST END/BABY BEACH, BUOY LINE/BABY BEACH, SWIM AREA/BABY BEACH, EAST END/BABY BEACH] These stations are within 200 meters of eachother but were not averaged for this assessment.
Temporal Representation:	Data was collected over the time period 1/3/2008-8/26/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 43763, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at Baby Beach

LOE ID:	30905

Pollutant:	Total Coliform	042464
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Shellfish Harvesting	
Number of Samples:	324	
Number of Exceedances:	138	
Data and Information Type:	PWS pathogen monitoring (ambient water)	
Data Used to Assess Water Quality:	Beach monitoring data was collected from a January 2002 through December 2006. One hundred thirty-eight of 324 samples exceeded the shellfish single sample maximum water quality objective for total coliform.	
Data Reference:	Ocean Bacteriological Data Evaluation for Dana Point HSA, City of Dana Point, November 2005 - December 2006.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	From the Ocean Plan, the median total coliform density shall not exceed 70 per 100 ml, and not more than 10 percent of the samples shall exceed 230 per 100 ml (SWRCB, 2005).	
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected from Dana Point Harbor at Baby Beach (station IDs, BDP 12, 13, 14 and 15), in the Dana Point HSA.	
Temporal Representation:	Samples were collected weekly from January 2002 through December 2006.	
Environmental Conditions:		
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.	
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004	

Line of Evidence (LOE) for Decision ID 43763, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at Baby Beach

LOE ID:	30910
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	35
Number of Exceedances:	1
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected from January 2006 through December 2006. One of 35 monthly geomeans exceeded the geomean water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for Dana Point HSA, City of Dana Point, November 2005 - December 2006.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Fecal coliform density shall not exceed 200 per 100ml.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental

Protection Agency 042465

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected from Dana Point Harbor, (station id BDP 12, 13, 14, and 15), in the Dana Point HSA.
Temporal Representation: Samples were collected weekly from January 2002 through December 2006.
Environmental Conditions:
QAPP Information: Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s): County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43763, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at Baby Beach

LOE ID: 30909

Pollutant: Fecal Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 324
Number of Exceedances: 37

Data and Information Type: PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality: Beach monitoring data was collected from a January 2002 through December 2006. Thirty-seven of 324 samples exceeded the single sample maximum water quality objective.
Data Reference: Ocean Bacteriological Data Evaluation for Dana Point HSA, City of Dana Point, November 2005 - December 2006.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: Single Sample Maximum: Fecal coliform density shall not exceed 400 per 100 ml;
Objective/Criterion Reference: Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected from Dana Point Harbor at Baby Beach, (station id BDP 12, 13,14 and 15), in the Dana Point HSA.
Temporal Representation: Samples were collected weekly from January 2002 through December 2006.
Environmental Conditions:
QAPP Information: Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s): County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43763, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at Baby Beach

LOE ID: 30912

Pollutant: Enterococcus
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use:	Water Contact Recreation
Number of Samples:	35
Number of Exceedances:	9
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected from a January 2002 through December 2006. Nine of 35 monthly geomeans exceeded the geomean water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for Dana Point HSA, City of Dana Point, November 2005 - December 2006.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Enterococcus density shall not exceed 35 per 100 ml.
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Dana Point Harbor, (station id BDP 12, 13, 14, and 15), in the Dana Point HSA.
Temporal Representation:	Samples were collected weekly from January 2002 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43763, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at Baby Beach

LOE ID:	30911
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	324
Number of Exceedances:	103
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected from January 2002 through December 2006. One hundred-three of 324 samples exceeded the single sample water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for Dana Point HSA, City of Dana Point, November 2005 - December 2006.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Enterococcus density shall not exceed 104 per 100 ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California, California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Dana Point Harbor, (station id BDP 12, 13, 14, and 15), in the

	Dana Point HSA. 042467
Temporal Representation:	Samples were collected weekly from January 2002 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43763, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at Baby Beach

LOE ID:	30907
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	35
Number of Exceedances:	0
Data and Information Type:	PWS pathogen monitoring (ambient water)
Data Used to Assess Water Quality:	Beach monitoring data was collected January 2002 through December 2006. None of the monthly geomeans exceeded the geomean water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for Dana Point HSA, City of Dana Point, November 2005 - December 2006.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Geomean: Total coliform density shall not exceed 1,000 per 100ml (SWRCB, 2005).
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Dana Point Harbor at Baby Beach (station id BDP 12, 13, 14 and 15), in the Dana Point HSA.
Temporal Representation:	Samples were collected weekly from Janaury 2002 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43763, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at Baby Beach

LOE ID:	30906
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	324
Number of Exceedances:	2

Data and Information Type:	PWS pathogen monitoring (ambient water) 042468
Data Used to Assess Water Quality:	Beach monitoring data was collected from a Janaury 2002 through December 2006. Two of 324 individual samples collected exceeded the single sample maximum water quality objective.
Data Reference:	Ocean Bacteriological Data Evaluation for Dana Point HSA, City of Dana Point, November 2005 - December 2006.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Single Sample Maximum: Total coliform density shall not exceed 10,000 per 100ml;
Objective/Criterion Reference:	Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Dana Point Harbor at Baby Beach, (station ID BDP 12, 13, 14 and 15), in the Dana Point HSA.
Temporal Representation:	Samples were collected weekly from January 2002 through December 2006.
Environmental Conditions:	
QAPP Information:	Quality control for the bacteria analysis portion of this study was conducted in accordance with the County of Orange Quality Assessment/Quality Control document.
QAPP Information Reference(s):	County of Orange. Quality Assurance/Quality Control Manual, February 2004

Line of Evidence (LOE) for Decision ID 43763, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at Baby Beach

LOE ID:	81131
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	247
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed bw data for Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at Baby Beach to determine beneficial use support and results are as follows: 38 of 247 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that for the protection of REC-1 activities, the concentration of total coliform should not exceed 10,000/100ml.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at Baby Beach was collected at 4 monitoring sites [WEST END/BABY BEACH, BUOY LINE/BABY BEACH, SWIM AREA/BABY BEACH, EAST END/BABY BEACH] These stations are within 200 meters of eachother but were not averaged for this assessment.
Temporal Representation:	Data was collected over the time period 1/3/2008-8/26/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.

QAPP Information Reference(s): 042469

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Mission Bay
Water Body ID: CAB906300002011071400254 6
Water Body Type: Bay & Harbor

DECISION ID 49435 **Region 9**
Mission Bay

Pollutant: Arsenic
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. One of the One samples exceed the Evaluation Guideline for Arsenic.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of One samples exceeded the Evaluation Guideline for Arsenic and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 3.1 samples is needed to determine if a beneficial use is fully supported using table 16.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49435, Arsenic **Region 9**
Mission Bay

LOE ID: 74312

Pollutant: Arsenic
LOE Subgroup: Pollutant-Tissue
Matrix: Tissue
Fraction: Shellfish

Beneficial Use: Commercial or recreational collection of fish, shellfish, or organisms

Number of Samples:	1	042471
Number of Exceedances:	1	
Data and Information Type:	Shellfish surveys	
Data Used to Assess Water Quality:	The one sample did exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal. Ten percent of the total arsenic result was used to estimate of the amount of inorganic arsenic in the sample; this number was screened against the guideline.	
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for arsenic in shellfish tissue is 0.0052 ppm. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; OEHHA, 2004)	
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Air Toxics Hotspots Program Risk Assessment Guidelines. Part II Technical Support Document for Describing Available Cancer Potency Values.	
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site MBVB, Mission Bay Ventura Bridge.	
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 12/7/2007	
Environmental Conditions:		
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/	
QAPP Information Reference(s):		

DECISION ID	**49438**	**Region 9**
Mission Bay		

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence are available in the administrative record to assess this pollutant. Zero of the One

samples exceed the Evaluation Guideline for Cadmium. 042472

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Evaluation Guideline for Cadmium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49438, Cadmium **Region 9**

Mission Bay

LOE ID:	74313
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The sample did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for cadmium in shellfish tissue is 3.3 ppm. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; USEPA, 2000)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Guidance for Assessing Chemical Contaminant Data for Use In Fish Advisories Volume 1:

	Fish Sampling and Analysis	042473

Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site MBVB, Mission Bay Ventura Bridge.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 12/7/2007
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID 49439 — Region 9

Mission Bay

Pollutant:	**Chlordane**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Chlordane. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Evaluation Guideline for Chlordane and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49439, Chlordane — Region 9

Mission Bay

LOE ID:	74314
Pollutant:	Chlordane
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue

Fraction:	Shellfish	042474
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	Shellfish surveys	
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal. Chlordane result was calculated by summing the results for chlordane isomers: cis- and trans-nonachlor, alpha- and gamma-chlordane, and oxychlordane.	
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for total chlordane in shellfish tissue is 6.0 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008)	
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene	
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site MBVB, Mission Bay Ventura Bridge.	
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 12/7/2007	
Environmental Conditions:		
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/	
QAPP Information Reference(s):		

DECISION ID	**49440**	**Region 9**
Mission Bay		

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Chlorpyrifos. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Evaluation Guideline for Chlorpyrifos and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49440, Chlorpyrifos **Region 9**

Mission Bay

LOE ID:	74315
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for chlorpyrifos in shellfish tissue is 1,000 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; USEPA, 2000)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California

Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment
Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene
Guidance for Assessing Chemical Contaminant Data for Use In Fish Advisories Volume 1: Fish Sampling and Analysis

Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site MBVB, Mission Bay Ventura Bridge.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 12/7/2007
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID 49441 — Region 9

Mission Bay

Pollutant:	**Dieldrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Dieldrin. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Evaluation Guideline for Dieldrin and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49441, Dieldrin — Region 9

Mission Bay

LOE ID:	74316
Pollutant:	Dieldrin
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The results did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for dieldrin in shellfish tissue is 0.49 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site MBVB, Mission Bay Ventura Bridge.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 12/7/2007
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID	**49443**	**Region 9**
Mission Bay		

Pollutant:	**Endosulfan**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision

Revision Status	Revised	042478
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Endosulfan.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Evaluation Guideline for Endosulfan and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49443, Endosulfan **Region 9**

Mission Bay

LOE ID:	74317
Pollutant:	Endosulfan
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal. Total Endosulfan result was calculated by summing Endosulfan I and Endosulfan II.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for endosulfan (I and II) in shellfish tissue is 20,000 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; USEPA, 2000)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Guidance for Assessing Chemical Contaminant Data for Use In Fish Advisories Volume 1: Fish Sampling and Analysis
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site MBVB, Mission Bay Ventura Bridge.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 12/7/2007
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID	49445	Region 9
Mission Bay		

Pollutant:	**Endrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Endrin. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Evaluation Guideline for Endrin and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49445, Endrin **Region 9**

Mission Bay

LOE ID:	74318
Pollutant:	Endrin
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for endrin in shellfish tissue is 1,000 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; USEPA, 2000)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Guidance for Assessing Chemical Contaminant Data for Use In Fish Advisories Volume 1: Fish Sampling and Analysis
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site MBVB, Mission Bay Ventura Bridge.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 12/7/2007
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID **49446** **Region 9**

Mission Bay 042481

Pollutant:	**Heptachlor epoxide**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Heptachlor epoxide.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Evaluation Guideline for Heptachlor Epoxide and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 49446, Heptachlor epoxide — Region 9

Mission Bay

LOE ID:	74319
Pollutant:	Heptachlor epoxide
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or

	aquatic organisms.	042482
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for heptachlor epoxide in shellfish tissue is 1.4 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; OEHHA, 1999)	
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Public Health Goal for Heptachlor and Heptachlor Epoxide in Drinking Water	
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site MBVB, Mission Bay Ventura Bridge.	
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 12/7/2007	
Environmental Conditions:		
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/	
QAPP Information Reference(s):		

DECISION ID	49448	Region 9
Mission Bay		

Pollutant:	**Hexachlorobenzene/ HCB**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Hexachlorobenzene/ HCB. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Evaluation Guideline for Hexachlorobenzene/ HCB and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision	After review of the available data and information, RWQCB staff concludes that the water body-

Recommendation:	pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.	14243

Line of Evidence (LOE) for Decision ID 49448, Hexachlorobenzene/ HCB **Region 9**

Mission Bay

LOE ID:	74320
Pollutant:	Hexachlorobenzene/ HCB
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for hexachlorobenzene in shellfish tissue is 4.3 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; OEHHA, 2005)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Air Toxics Hotspots Program Risk Assessment Guidelines. Part II Technical Support Document for Describing Available Cancer Potency Values.
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site MBVB, Mission Bay Ventura Bridge.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 12/7/2007
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID	49450	Region 9
Mission Bay		

Pollutant:	**Lindane/gamma Hexachlorocyclohexane (gamma-HCH)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Lindane/gamma Hexachlorocyclohexane (gamma-HCH).

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Evaluation Guideline for Lindane/gamma Hexachlorocyclohexane (gamma-HCH) and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49450, Lindane/gamma Hexachlorocyclohexane (gamma-HCH)	**Region 9**
Mission Bay	

LOE ID:	74321
Pollutant:	Lindane/gamma Hexachlorocyclohexane (gamma-HCH)
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for lindane in shellfish tissue is 7.1 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; OEHHA, 2005)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Air Toxics Hotspots Program Risk Assessment Guidelines. Part II Technical Support Document for Describing Available Cancer Potency Values.
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site MBVB, Mission Bay Ventura Bridge.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 12/7/2007
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID	49453	Region 9
Mission Bay		

Pollutant:	**Mirex**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the Zero samples exceed the Evaluation Guideline for Mirex. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.

2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy
3. Zero of Zero samples exceeded the Evaluation Guideline for Mirex and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49453, Mirex **Region 9**

Mission Bay

LOE ID:	74323
Pollutant:	Mirex
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The non detect result was not included in the assessment since the reporting limit was above the evaluation guideline. MDL were provided by NOAA Federal and RL were calculated by multiplying 3.18 by the MDL.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for mirex in shellfish tissue is 0.43 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; OEHHA, 1992)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Expedited Cancer Potency Values and Proposed Regulatory Levels for Certain Proposition 65 Carcinogens.
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site MBVB, Mission Bay Ventura Bridge.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 12/7/2007

Environmental Conditions: 042487

QAPP Information: Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/

QAPP Information Reference(s):

DECISION ID 49457 Region 9

Mission Bay

Pollutant:	**PAHs (Polycyclic Aromatic Hydrocarbons)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for PAHs (Polycyclic Aromatic Hydrocarbons).

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Evaluation Guideline for PAHs (Polycyclic Aromatic Hydrocarbons) and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49457, PAHs (Polycyclic Aromatic Hydrocarbons) Region 9

Mission Bay

LOE ID:	77214
Pollutant:	PAHs (Polycyclic Aromatic Hydrocarbons)
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	1
Number of Exceedances:	0

Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The sample did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal. The total PAHs were calculated as the potency equivalency concentration or the sum of the toxic equivalency factors multiplied by the concentrations of: Acenaphthene, Acenaphthylene, Anthracene, Benz[a]anthracene, Benzo[a]pyrene, Benzo[b]fluoranthene, Benzo[g,h,i]perylene, Benzo[k]fluoranthene, Dibenzo[a,h]anthracene, Chrysene, Fluoranthene, Fluorene, Indeno[1,2,3-c,d]pyrene, Phenanthrene, and Pyrene.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for polycyclic aromatic hydrocarbons in shellfish tissue is 1.1 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; USEPA, 2000)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Guidance for Assessing Chemical Contaminant Data for Use In Fish Advisories Volume 1: Fish Sampling and Analysis
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site MBVB, Mission Bay Ventura Bridge.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 12/7/2007
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID	**49463**	**Region 9**
Mission Bay		

Pollutant:	**Selenium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Selenium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Evaluation Guideline for Selenium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49463, Selenium **Region 9**

Mission Bay

LOE ID:	74325
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The sample did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for selenium in shellfish tissue is 11 ppm. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day. A background dietary consuption rate of 0.114 mg/day is applied for this micronutrient. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene

Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site MBVB, Mission Bay Ventura Bridge.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 12/7/2007
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID **49464** **Region 9**

Mission Bay

Pollutant:	**Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD). Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Evaluation Guideline for Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD) and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49464, Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD) **Region 9**

Mission Bay

LOE ID:	74326
Pollutant:	Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD)
LOE Subgroup:	Pollutant-Tissue

Matrix:	Tissue	042491
Fraction:	Shellfish	
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	Shellfish surveys	
Data Used to Assess Water Quality:	The sample did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal. The total DDTs were calculated as the sum of 4,4- and 2,4- isomers of DDT, DDE, and DDD.	
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for total DDT in shellfish tissue is 23 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008)	
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene	
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site MBVB, Mission Bay Ventura Bridge.	
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 12/7/2007	
Environmental Conditions:		
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/	
QAPP Information Reference(s):		

DECISION ID	**49467**	**Region 9**
Mission Bay		

Pollutant:	**Toxicity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. One of Three samples exhibited sediment toxicity. Based on the readily available data and information, the weight of evidence indicates that there is SUFFICIENT justification AGAINST placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of the Three samples exhibited sediment toxicity and this sample size is INSUFFICIENT to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49467, Toxicity **Region 9**

Mission Bay

LOE ID:	74327
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Sediment
Fraction:	None
Beneficial Use:	Estuarine Habitat
Number of Samples:	3
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Three samples were collected to test for toxicity. One of the three samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius. Each sample is a sediment composites from three different sites.
Data Reference:	Data for Various Pollutants from Ambient Bay and Lagoon, 2003-2005.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The the composite samples were 906MB_2003, samples collected at sites

	906_MB3L1_2004, 906_MB3M1_2003, and 906_MB3R1_2003. Composite 906MB_2004 samples were collected 906_MB3L1_2004 and 906_MB3R1_2004. Composite 906MB_2005 samples were collected at sites, 906_MB1R1_2005, 906_MB2M1_2005, and 906_MB3R3_2005.
Temporal Representation:	The samples were collected in 2003, 2004, and 2005.
Environmental Conditions:	
QAPP Information:	The data was collected under the County of San Diego Ambient Bay and Lagoon Monitoring Project 2003-2005. Annual Report for the Receiving Waters and Urban Runoff Monitoring section covered under the San Diego County Municipal National Pollutant Discharge Elimination System (NPDES) Permit (RWQCB-Order NO. R9-2007-0001).
QAPP Information Reference(s):	e-mail clarifying QAPP information

DECISION ID 49452 Region 9
Mission Bay

Pollutant:	**Mercury**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Atmospheric Deposition | Source Unknown
Expected TMDL Completion Date:	2027
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.4 and 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. Two lines of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Mercury. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Pursuant to Section 3.4 of the listing policy, there is a published State of California Office of Environmental Health Hazard Assessment Health Advisory for Eating Fish From San Diego Bay due to PCBs and Mercury.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 49452, Mercury Region 9
Mission Bay

LOE ID:	95682
Pollutant:	Mercury
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Fish fillet
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms

Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Fish tissue analysis
Data Used to Assess Water Quality:	Samples were collected bay-wide as part of the State of California's Coastal Fish Contamination Program (Assembly Bill 2872) and through the Surface Water Ambient Monitoring Program. These data were collected from 1999-2009 and were assessed by State of California staff at the Office of Environmental Health Hazard Assessment. These data are available in the California Environmental Data Exchange Network Database.
Data Reference:	Toxic Substances Monitoring Program data for years 1992-2002 and Coastal Fish Contamination Program for years 1 and 2. State Water Resources Control Board Contaminants in Fish from the California Coast, 2009-2010: Summary Report on a Two-Year Screening Survey. A Report of the Surface Water Ambient Monitoring Program (SWAMP). California State Water Resources Control Board, Sacramento, CA.
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	State of California Office of Environmental Health Hazard Assessment Health Advisory and Guidelines for Eating Fish From Mission Bay. October 2013. Section 3.4 of the Listing Policy Specifically states: "3.4 Health Advisories A water segment shall be placed on the section 303(d) list if a health advisory against the consumption of edible resident organisms, or a shellfish harvesting ban has been issued by the Office of Environmental Health Hazard Assessment (OEHHA), or Department of Health Services and there is a designated or existing fish consumption beneficial use for the segment. In addition, water segment-specific data must be available indicating the evaluation guideline for tissue is exceeded." This waterbody has a health advisory against the consumption of edible resident fish due to elevated levels of Mercury in fillet tissue.
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Water Quality Criterion for the Protection of Human Health: Methylmercury. Final. United States Environmental Protection Agency Office of Science and Technology Office of Water. EPA-823-R-01-001. January 2001
Spatial Representation:	Samples were collected bay-wide as part of the State of California's Coastal Fish Contamination Program (Assembly Bill 2872) and Surface Water Ambient Monitoring Program.
Temporal Representation:	Representative samples of locally abundant species were collected from 1999 to 2009.
Environmental Conditions:	
QAPP Information:	Samples collected and analyzed by State of California monitoring programs. Data and quality assurance/quality control report for trace metals. Coastal fish contaminant project year 2, 1999-2000. Screening Study of Bioaccumulation on the California Coast Quality Assurance Program Plan 2009.
QAPP Information Reference(s):	Data and quality assurance/quality control report for trace metals. Coastal fish contaminant project year 2, 1999-2000 Contaminants in Fish from the California Coast, 2009-2010: Summary Report on a Two-Year Screening Survey. A Report of the Surface Water Ambient Monitoring Program (SWAMP). California State Water Resources Control Board, Sacramento, CA.

Line of Evidence (LOE) for Decision ID 49452, Mercury **Region 9**

Mission Bay 042495

LOE ID:	74322
Pollutant:	Mercury
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The sample did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The USEPA 304(a) recommended water quality criterion for concentrations of methylmercury in shellfish tissue (wet weight) is 0.2 ppm. (Brodberg, R.K., and G.A. Pollock, 1999; USEPA, 2001)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Water Quality Criterion for the Protection of Human Health: Methylmercury. Final. United States Environmental Protection Agency Office of Science and Technology Office of Water. EPA-823-R-01-001. January 2001
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site MBVB, Mission Bay Ventura Bridge.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 12/7/2007
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID **49461** **Region 9**

Mission Bay

Pollutant:	**PCBs (Polychlorinated biphenyls)**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown

Expected TMDL Completion Date:	2027	042496
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.4 and 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Pursuant to Section 3.4 of the listing policy, there is a published State of California Office of Environmental Health Hazard Assessment Health Advisory for Eating Fish From San Diego Bay due to PCBs and Mercury.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 49461, PCBs (Polychlorinated biphenyls) **Region 9**

Mission Bay

LOE ID:	95681
Pollutant:	PCBs (Polychlorinated biphenyls)
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Fish fillet
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Fish tissue analysis
Data Used to Assess Water Quality:	Samples were collected bay-wide as part of the State of California's Coastal Fish Contamination Program (Assembly Bill 2872) and through the Surface Water Ambient Monitoring Program. These data were collected from 1999-2009 and were assessed by State of California staff at the Office of Environmental Health Hazard Assessment. These data are available in the California Environmental Data Exchange Network Database.
Data Reference:	Toxic Substances Monitoring Program data for years 1992-2002 and Coastal Fish Contamination Program for years 1 and 2. State Water Resources Control Board Contaminants in Fish from the California Coast, 2009-2010: Summary Report on a Two-Year Screening Survey. A Report of the Surface Water Ambient Monitoring Program (SWAMP). California State Water Resources Control Board, Sacramento, CA.
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	State of California Office of Environmental Health Hazard Assessment Health Advisory and

	Guidelines for Eating Fish From Mission Bay. October 2013. Section 3.4 of the Listing Policy Specifically states: "3.4 Health Advisories A water segment shall be placed on the section 303(d) list if a health advisory against the consumption of edible resident organisms, or a shellfish harvesting ban has been issued by the Office of Environmental Health Hazard Assessment (OEHHA), or Department of Health Services and there is a designated or existing fish consumption beneficial use for the segment. In addition, water segment-specific data must be available indicating the evaluation guideline for tissue is exceeded." This waterbody has a health advisory against the consumption of edible resident fish due to elevated levels of PCBs in fillet tissue.
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Water Quality Criterion for the Protection of Human Health: Methylmercury. Final. United States Environmental Protection Agency Office of Science and Technology Office of Water. EPA-823-R-01-001. January 2001
Spatial Representation:	Samples were collected bay-wide as part of the State of California's Coastal Fish Contamination Program (Assembly Bill 2872) and Surface Water Ambient Monitoring Program.
Temporal Representation:	Representative samples of locally abundant species were collected from 1999 to 2009.
Environmental Conditions:	
QAPP Information:	Samples collected and analyzed by State of California monitoring programs. Data and quality assurance/quality control report for trace metals. Coastal fish contaminant project year 2, 1999-2000. Screening Study of Bioaccumulation on the California Coast Quality Assurance Program Plan 2009.
QAPP Information Reference(s):	Data and quality assurance/quality control report for trace metals. Coastal fish contaminant project year 2, 1999-2000 Contaminants in Fish from the California Coast, 2009-2010: Summary Report on a Two-Year Screening Survey. A Report of the Surface Water Ambient Monitoring Program (SWAMP). California State Water Resources Control Board, Sacramento, CA.

Line of Evidence (LOE) for Decision ID 49461, PCBs (Polychlorinated biphenyls) Region 9

Mission Bay

LOE ID:	74324
Pollutant:	PCBs (Polychlorinated biphenyls)
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal. Total PCB was assessed for as follows: PCB aroclors and congeners were summed separately and the sum that yielded the highest value was used for the assessment.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board

SWAMP Data:	Non-SWAMP	042498
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for polychlorinated biphenyls in shellfish tissue is 3.9 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008)	
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene	
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site MBVB, Mission Bay Ventura Bridge.	
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 12/7/2007	
Environmental Conditions:		
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/	
QAPP Information Reference(s):		

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, San Joaquin Hills HSA, at Heisler Park
Water Body ID: CAC9011100020110512164024
Water Body Type: Coastal & Bay Shoreline

DECISION ID 49978 **Region 9**
Pacific Ocean Shoreline, San Joaquin Hills HSA, at Heisler Park

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Six lines of evidence are available in the administrative record to assess this pollutant. Data from 2006 to 2009 shows that zero of 138 geomean samples exceed the water quality objective for enterococcus for the protection of REC-1 beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Data from 2006 to 2009 shows that zero of 138 geomean samples exceed the water quality objective for enterococcus for the protection of REC-1 beneficial use and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 49978, Indicator Bacteria **Region 9**
Pacific Ocean Shoreline, San Joaquin Hills HSA, at Heisler Park

LOE ID: 75182

Pollutant: Fecal Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 138

Number of Exceedances:	0	042500

Data and Information Type: Not Specified

Data Used to Assess Water Quality: None of the 138 geomeans exceeded the fecal coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.

Data Reference: Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The geometric mean for fecal coliform shall not exceed more than 200/100ml. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.

Objective/Criterion Reference: Water Quality Control Plan for the San Diego Basin
California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:

Guideline Reference:

Spatial Representation: The samples were collected from Heisler Park Stormdrain (surfzone upcoast and surfzone downcoast).

Temporal Representation: The samples were collected once a week from July 2006 to 2009.

Environmental Conditions:

QAPP Information: The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.

QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 49978, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Joaquin Hills HSA, at Heisler Park

LOE ID: 75183

Pollutant: Total Coliform

LOE Subgroup: Pollutant-Water

Matrix: Water

Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 149

Number of Exceedances: 0

Data and Information Type: Not Specified

Data Used to Assess Water Quality: Zero of the 149 samples exceeded the total coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.

Data Reference: Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The single sample total coliform concentration shall not exceed more than 10000/100ml. Water Quality Control Plan for Ocean Waters of California. Region 9 Basion Plan.

Objective/Criterion Reference: Water Quality Control Plan for the San Diego Basin
California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:

Guideline Reference:

Spatial Representation: The samples were collected from site HEISLR, Heisler Park Stormdrain at High Drive (surfzone upcoast and downcoast).

Temporal Representation: The samples were collected once a week from July 2006 to April 2009.

Environmental Conditions:

QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49978, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Joaquin Hills HSA, at Heisler Park

LOE ID:	75177
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	149
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 149 samples exceeded the fecal coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample fecal coliform concentration shall not exceed more than 400/100ml. Water Quality Control Plan for Ocean Waters of California. Region 9 Basion Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from site HEISLR, Heisler Park Stormdrain at High Drive (surfzone upcoast and downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to April 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49978, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Joaquin Hills HSA, at Heisler Park

LOE ID:	75175
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	149
Number of Exceedances:	0
Data and Information Type:	Not Specified

Data Used to Assess Water Quality:	Zero of the 149 samples exceeded the enterococcus objective. For this station, 2 samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample enterococcus concentration shall not exceed more than 104/100ml. Water Quality Control Plan for Ocean Waters of California. Region 9 Basion Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from site HEISLR, Heisler Park Stormdrain at High Drive (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to April 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49978, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Joaquin Hills HSA, at Heisler Park

LOE ID:	75176
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	138
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	None of the 138 geomeans exceeded the enterococcus objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean for enterococcus shall not exceed 35 MPN/100 mL. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Heisler Park Stormdrain (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.

QAPP Information Reference(s): 042503

Line of Evidence (LOE) for Decision ID 49978, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Joaquin Hills HSA, at Heisler Park

LOE ID:	75184
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	138
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	None of the 138 samples exceeded the total coliform objective. For these stations, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean for total coliform shall not exceed more than 1000/100ml. Water Quality Control Plan for the San Diego Basin. Water Quality Control Plan for Ocean Waters.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Heisler Park Stormdrain (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, San Joaquin Hills HSA, at Aster Street
Water Body ID: CAC9011100020110512165314
Water Body Type: Coastal & Bay Shoreline

DECISION ID 49945 **Region 9**
Pacific Ocean Shoreline, San Joaquin Hills HSA, at Aster Street

Pollutant: Cadmium
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the Three samples exceed the Water Quality Objective for Cadmium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Three samples exceeded the Water Quality Objective for Cadmium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49945, Cadmium **Region 9**
Pacific Ocean Shoreline, San Joaquin Hills HSA, at Aster Street

LOE ID: 74739

Pollutant: Cadmium
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total Dissolved

Beneficial Use: Marine Habitat

Number of Samples:	3	042505
Number of Exceedances:	0	
Data and Information Type:	Non-fixed station physical/chemical (conv + toxicants during key seasons and flows)	
Data Used to Assess Water Quality:	None of the three samples exceed the water quality objective.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California's Ocean Plan Table B lists 6-month median concentration of 1 ug/L to protect aquatic life in marine waters.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	All three samples were collected from station LB-2d.	
Temporal Representation:	Samples were collected from 2007 and 2008.	
Environmental Conditions:	All samples are representative of dry conditions.	
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.	
QAPP Information Reference(s):		

DECISION ID 49946 Region 9

Pacific Ocean Shoreline, San Joaquin Hills HSA, at Aster Street

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the Two samples exceed the Water Quality Criteria for Chlorpyrifos. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Two samples exceeded the Water Quality Criteria for Chlorpyrifos and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49946, Chlorpyrifos 042506 **Region 9**

Pacific Ocean Shoreline, San Joaquin Hills HSA, at Aster Street

LOE ID:	74740
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of two samples exceeded the Criteria Continuous Concentration for Chlorpyrifos of 9 ng/L, however for one sample the reporting limit was 10 ng/L which is greater than the evaluation guideline, therefore this data is not usable.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Marine communities, including vertebrate, invertebrate, and plant species, shall not be degraded.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The Criteria Continuous Concentration for chlorpyrifos in saltwater is 9 ng/L.
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game
Spatial Representation:	Samples were collected from site LB-2.
Temporal Representation:	Samples were collected 2007 to 2008.
Environmental Conditions:	
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

DECISION ID 49947 **Region 9**

Pacific Ocean Shoreline, San Joaquin Hills HSA, at Aster Street

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the Three samples exceed the Water Quality Objective for Copper. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

042507

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Three samples exceeded the Water Quality Objective for Copper and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49947, Copper **Region 9**

Pacific Ocean Shoreline, San Joaquin Hills HSA, at Aster Street

LOE ID:	74741
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	Non-fixed station physical/chemical (conv + toxicants during key seasons and flows)
Data Used to Assess Water Quality:	All three samples did not exceed the water quality objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California's Ocean Plan Table B lists 6-month median concentration of 3 ug/L to protect aquatic life in marine waters.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	All three samples were collected from station LB-2d.
Temporal Representation:	Samples were collected from 2007 and 2008.
Environmental Conditions:	All samples are representative of dry conditions.
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

DECISION ID 49948 **Region 9**

Pacific Ocean Shoreline, San Joaquin Hills HSA, at Aster Street

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised

Impairment from Pollutant or Pollution:	Pollutant	042508
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the Six samples exceed the Water Quality Criteria for Diazinon. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Six samples exceeded the Water Quality Criteria for Diazinon and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.	
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.	

Line of Evidence (LOE) for Decision ID 49948, Diazinon **Region 9**

Pacific Ocean Shoreline, San Joaquin Hills HSA, at Aster Street

LOE ID:	74742
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the six samples exceed the maximum concentration for Diazinon criteria of 820.0 ng/L.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Marine communities, including vertebrate, invertebrate, and plant species, shall not be degraded.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The Criteria Continuous Concentration for diazinon in saltwater is 820 ng/L.
Guideline Reference:	Aquatic Life Ambient Water Quality Criteria for Diazinon
Spatial Representation:	Samples were collected from site NI-1d.
Temporal Representation:	Samples were collected from 2007 to 2009.
Environmental Conditions:	
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance

Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.

QAPP Information Reference(s):

DECISION ID	49949	Region 9
Pacific Ocean Shoreline, San Joaquin Hills HSA, at Aster Street		

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the Three samples exceed the Water Quality Objective for Lead. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Three samples exceeded the Water Quality Objective for Lead and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49949, Lead	**Region 9**
Pacific Ocean Shoreline, San Joaquin Hills HSA, at Aster Street	

LOE ID:	74764
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	Non-fixed station physical/chemical (conv + toxicants during key seasons and flows)
Data Used to Assess Water Quality:	None of the three samples exceed the water quality objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.

SWAMP Data:	Non-SWAMP	042510
Water Quality Objective/Criterion:	California's Ocean Plan Table B lists 6-month median concentration of 2 ug/L to protect aquatic life in marine waters.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	All three samples were collected from station LB-2d.	
Temporal Representation:	Samples were collected from 2007 and 2008.	
Environmental Conditions:	All samples are representative of dry conditions.	
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.	
QAPP Information Reference(s):		

DECISION ID 49950 Region 9

Pacific Ocean Shoreline, San Joaquin Hills HSA, at Aster Street

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the Four samples exceed the Water Quality Criteria for Malathion. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Four samples exceeded the Water Quality Criteria for Malathion and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49950, Malathion Region 9

Pacific Ocean Shoreline, San Joaquin Hills HSA, at Aster Street

LOE ID:	74765
Pollutant:	Malathion

LOE Subgroup:	Pollutant-Water	042511
Matrix:	Water	
Fraction:	Total Dissolved	
Beneficial Use:	Marine Habitat	
Number of Samples:	4	
Number of Exceedances:	0	
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)	
Data Used to Assess Water Quality:	None of the samples exceeded the maximum concentration for Malathion of 100 ng/L.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Marine communities, including vertebrate, invertebrate, and plant species, shall not be degraded.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:	The maximum (Instantaneous) concentration for Malathion in saltwater is 100 ng/L.	
Guideline Reference:	Quality Criteria for Water. USEPA Office of Water and Hazardous Materials. Washington, D.C	
Spatial Representation:	Samples were collected from site LB-2.	
Temporal Representation:	Samples were collected between 5/21/08 and 9/13/07.	
Environmental Conditions:		
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.	
QAPP Information Reference(s):		

DECISION ID 49955 Region 9

Pacific Ocean Shoreline, San Joaquin Hills HSA, at Aster Street

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the Zero samples exceed the Water Quality Objective for Nickel.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Zero samples exceeded the Water Quality Objective for Nickel and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49955, Nickel **Region 9**

Pacific Ocean Shoreline, San Joaquin Hills HSA, at Aster Street

LOE ID:	74766
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Non-fixed station physical/chemical (conv + toxicants during key seasons and flows)
Data Used to Assess Water Quality:	The reporting limits for all three non-detect samples exceed the water quality objective, these data could not be used in the assessment.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California's Ocean Plan Table B lists 6-month median concentration of 2 ug/L to protect aquatic life in marine waters.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	All three samples were collected from station LB-2d.
Temporal Representation:	Samples were collected from 2007 and 2008.
Environmental Conditions:	All samples are representative of dry conditions.
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

DECISION ID 49956 **Region 9**

Pacific Ocean Shoreline, San Joaquin Hills HSA, at Aster Street

Pollutant:	**Nitrogen, ammonia (Total Ammonia)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the Three samples exceed the Water Quality Objective for Nitrogen, ammonia (Total Ammonia).

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Three samples exceeded the Water Quality Objective for Nitrogen, ammonia (Total Ammonia) and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49956, Nitrogen, ammonia (Total Ammonia) Region 9

Pacific Ocean Shoreline, San Joaquin Hills HSA, at Aster Street

LOE ID:	74767
Pollutant:	Nitrogen, ammonia (Total Ammonia)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Marine Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	None of three sample medians exceeded the water quality objective for total ammonia. Each samples was calculated a median using the sample and all other samples taken previously within a 180-day period.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. The Ocean Plan objective for total ammonia as nitrogen is a moving 6-month median of 600 ug/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Aster Street LBD2.
Temporal Representation:	Samples were collected on 9/13/07, 5/21/08 and 10/2/08.
Environmental Conditions:	
QAPP Information:	A signed QAPP was included with the stated goal of ensuring the consistent collection of accurate water quality information that will used to satisfy the objectives of the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID **49957** 042514 **Region 9**

Pacific Ocean Shoreline, San Joaquin Hills HSA, at Aster Street

Pollutant:	**Oxygen, Dissolved**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the Three samples exceed the Water Quality Objective for Dissolved Oxygen. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Three samples exceeded the Water Quality Objective for Dissolved Oxygen and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49957, Oxygen, Dissolved **Region 9**

Pacific Ocean Shoreline, San Joaquin Hills HSA, at Aster Street

LOE ID:	74768
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Numeric data generated from 3 minimums of Dissolved Oxygen concentrations had no exceedences.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Dissolved oxygen levels shall not be less than 5.0 mg/l in inland surface waters with designated MAR or WARM beneficial uses. The annual mean dissolved oxygen

	concentration shall not be less than 7 mg/l more than 10% of the time.	042515
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected from the LB-2d station.
Temporal Representation: Samples were collected once in 2007 and twice in 2008.
Environmental Conditions:
QAPP Information: NPDES quality assurance.
QAPP Information Reference(s):

DECISION ID 49965 Region 9

Pacific Ocean Shoreline, San Joaquin Hills HSA, at Aster Street

Pollutant: **Selenium**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the Three samples exceed the Water Quality Objective for Selenium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Three samples exceeded the Water Quality Objective for Selenium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49965, Selenium Region 9

Pacific Ocean Shoreline, San Joaquin Hills HSA, at Aster Street

LOE ID: 74769

Pollutant: Selenium
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total Dissolved

Beneficial Use: Marine Habitat

Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	Non-fixed station physical/chemical (conv + toxicants during key seasons and flows)
Data Used to Assess Water Quality:	None of the three samples exceed the water quality objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California's Ocean Plan Table B lists 6-month median concentration of 15 ug/L to protect aquatic life in marine waters.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	All three samples were collected from station LB-2d.
Temporal Representation:	Samples were collected from 2007 and 2008.
Environmental Conditions:	All samples are representative of dry conditions.
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

DECISION ID 49971 Region 9

Pacific Ocean Shoreline, San Joaquin Hills HSA, at Aster Street

Pollutant:	**Silver**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the Three samples exceed the Water Quality Objective for Silver. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Three samples exceeded the Water Quality Objective for Silver and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49971, Silver **Region 9**

Pacific Ocean Shoreline, San Joaquin Hills HSA, at Aster Street

LOE ID:	74770
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	Non-fixed station physical/chemical (conv + toxicants during key seasons and flows)
Data Used to Assess Water Quality:	None of the three samples exceed the water quality objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California's Ocean Plan Table B lists 6-month median concentration of 0.7 ug/L to protect aquatic life in marine waters.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	All three samples were collected from station LB-2d.
Temporal Representation:	Samples were collected from 2007 and 2008.
Environmental Conditions:	All samples are representative of dry conditions.
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

DECISION ID 49974 **Region 9**

Pacific Ocean Shoreline, San Joaquin Hills HSA, at Aster Street

Pollutant:	**Toxicity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. One of the Three samples exhibited water toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.

2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 942518
3. One of Three samples exhibited water toxicity and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49974, Toxicity **Region 9**

Pacific Ocean Shoreline, San Joaquin Hills HSA, at Aster Street

LOE ID:	75156
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Marine Habitat
Number of Samples:	3
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Three samples were collected to test for toxicity. One of the three samples exhibited statistically significant toxicity. The toxicity tests that exhibited significant toxicity included Purple Urchin development.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected at station LB-2d Coastal Stormdrain.
Temporal Representation:	The samples were collected in September and May 2007 and October 2008.
Environmental Conditions:	
QAPP Information:	The data collected under the Quality Assurance Management Plan for The Orange County Stormwater Program. The SWAMP measurement quality objectives were followed for toxicity data. The performance of toxicity bioassays and evaluation of reference toxicants were performed using USEPA and Standard Methods.
QAPP Information Reference(s):	

DECISION ID 49975 **Region 9**

Pacific Ocean Shoreline, San Joaquin Hills HSA, at Aster Street

Pollutant: **Zinc**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**

Last Listing Cycle's Final Listing Decision:	New Decision	042519
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the Three samples exceed the Water Quality Objective for Zinc.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Three samples exceeded the Water Quality Objective for Zinc and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49975, Zinc **Region 9**

Pacific Ocean Shoreline, San Joaquin Hills HSA, at Aster Street

LOE ID:	75157
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	Non-fixed station physical/chemical (conv + toxicants during key seasons and flows)
Data Used to Assess Water Quality:	None of the three samples exceed the water quality objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California's Ocean Plan Table B lists 6-month median concentration of 20 ug/L to protect aquatic life in marine waters.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	All three samples were collected from station LB-2d.
Temporal Representation:	Samples were collected from 2007 and 2008.

Environmental Conditions:	All samples are representative of dry conditions.	042520
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.	
QAPP Information Reference(s):		

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Laguna Beach HSA, at Pearl Street
Water Body ID: CAC9011100020110822095920
Water Body Type: Coastal & Bay Shoreline

DECISION ID 49824 Region 9
Pacific Ocean Shoreline, Laguna Beach HSA, at Pearl Street

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Six lines of evidence are available in the administrative record to assess this pollutant. Using the latest data, four of the 131samples exceed the water quality objective for enterococcus of a geomean of 35/100ml in a 30-day period for the protection of REC-1.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Using the latest data, four of the 131samples exceed the water quality objective for enterococcus of a geomean of 35/100ml in a 30-day period for the protection of REC-1 and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 49824, Indicator Bacteria Region 9
Pacific Ocean Shoreline, Laguna Beach HSA, at Pearl Street

LOE ID: 74664

Pollutant: Enterococcus
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 131

Number of Exceedances:	4	042522

Data and Information Type: Not Specified

Data Used to Assess Water Quality: Four of the 131 geomeans exceeded the enterococcus objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.

Data Reference: Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The geometric mean for enterococcus shall not exceed 35 MPN/100 mL. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.

Objective/Criterion Reference: Water Quality Control Plan for the San Diego Basin
California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:

Guideline Reference:

Spatial Representation: The samples were collected from Coastal Stormdrain Between Pearl and Agate Streets (surfzone upcoast and surfzone downcoast).

Temporal Representation: The samples were collected once a week from July 2006 to 2009.

Environmental Conditions:

QAPP Information: The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.

QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 49824, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Pearl Street

LOE ID: 74663

Pollutant: Enterococcus

LOE Subgroup: Pollutant-Water

Matrix: Water

Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 146

Number of Exceedances: 4

Data and Information Type: Not Specified

Data Used to Assess Water Quality: Four of the 146 samples exceeded the enterococcus objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.

Data Reference: Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The single sample enterococcus concentration shall not exceed more than 104/100ml. Water Quality Control Plan for Ocean Waters of California. Region 9 Basion Plan.

Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:

Guideline Reference:

Spatial Representation: The samples were collected from coastal stormdrain between Pearl and Agate streets (surfzone upcoast and surfzone downcoast).

Temporal Representation: The samples were collected once a week from July 2006 to 2009.

Environmental Conditions:

QAPP Information: The samples were collected and analyzed under the Quality Assurance Management Plan

	for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49824, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Pearl Street

LOE ID:	74666
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	131
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	None of the 131 geomeans exceeded the fecal coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean for fecal coliform shall not exceed more than 200/100ml. Water Quality Control Plan for the San Diego Basin. California Ocean Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Coastal StormdrainBetween Pearl and Agate Streets (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49824, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Pearl Street

LOE ID:	74688
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	131
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	None of the 131 samples exceeded the total coliform objective. For these stations, samples

	were collected from surfzone upcoast and surfzone downcoast. The higher of the two values was used for the geomean calculation.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean for total coliform shall not exceed more than 1000/100ml. Water Quality Control Plan for the San Diego Basin. Water Quality Control Plan for Ocean Waters.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from Coastal Stormdrain Between Pearl and Agate Streets(surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49824, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Pearl Street

LOE ID:	74667
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	146
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 146 samples exceeded the total coliform objective. For these stations, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample total coliform concentration shall not exceed more than 10000/100ml. Water Quality Control Plan for Ocean Waters of California. Region 9 Basion Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from coastal stormdrain between Pearl and Agate Streets (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49824, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Pearl Street

LOE ID:	74665
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	146
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 146 samples exceeded the fecal coliform objective. For this station, samples were collected from surfzone upcoast and surfzone downcoast. The results represent the higher of the two values.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The single sample fecal coliform concentration shall not exceed more than 400/100ml. Water Quality Control Plan for Ocean Waters of California. Region 9 Basion Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from coastal stormdrain between Pearl and Agate Street (surfzone upcoast and surfzone downcoast).
Temporal Representation:	The samples were collected once a week from July 2006 to 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed under the Quality Assurance Management Plan for The Orange County Stormwater Program. Coastal Stormdrain Outfall Monitoring Program.
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Dana Point HSA, at Niguel Marine Life Refuge
Water Body ID: CAC9011400020110512155207
Water Body Type: Coastal & Bay Shoreline

DECISION ID 49703 **Region 9**
Pacific Ocean Shoreline, Dana Point HSA, at Niguel Marine Life Refuge

Pollutant: Arsenic
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the Five samples exceed the Water Quality Objective for Arsenic.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Five samples exceeded the Water Quality Objective for Arsenic and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49703, Arsenic **Region 9**
Pacific Ocean Shoreline, Dana Point HSA, at Niguel Marine Life Refuge

LOE ID: 74482

Pollutant: Arsenic
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total Dissolved

Beneficial Use: Marine Habitat

Number of Samples:	5	042527
Number of Exceedances:	0	
Data and Information Type:	Non-fixed station physical/chemical (conv + toxicants during key seasons and flows)	
Data Used to Assess Water Quality:	None of the five samples exceed the water quality objective.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California's Ocean Plan Table B lists 6-month median concentration of 8 ug/L to protect aquatic life in marine waters.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	All five samples were collected from station NI-1d.	
Temporal Representation:	Samples were collected from 2007 through 2009.	
Environmental Conditions:	One sample was collected after a storm event.	
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.	
QAPP Information Reference(s):		

DECISION ID 49708 Region 9

Pacific Ocean Shoreline, Dana Point HSA, at Niguel Marine Life Refuge

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the Five samples exceed the Water Quality Objective for Cadmium. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Five samples exceeded the Water Quality Objective for Cadmium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49708, Cadmium 042528 **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Niguel Marine Life Refuge

LOE ID:	74483
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	Non-fixed station physical/chemical (conv + toxicants during key seasons and flows)
Data Used to Assess Water Quality:	None of the five samples exceed the water quality objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California's Ocean Plan Table B lists 6-month median concentration of 1 ug/L to protect aquatic life in marine waters.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	All five samples were collected from station NI-1d.
Temporal Representation:	Samples were collected from 2007 through 2009.
Environmental Conditions:	One sample was collected after a storm event.
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

DECISION ID 49713 **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Niguel Marine Life Refuge

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the Two samples exceed the Water Quality Criteria for Chlorpyrifos.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.

3. Zero of Two samples exceeded the Water Quality Critier for Chlorpyrifos and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49713, Chlorpyrifos **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Niguel Marine Life Refuge

LOE ID:	74484
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of two samples exceeded the Criteria Continuous Concentration for Chlorpyrifos of 9 ng/L. However, the reporting limits for three non-detect samples were 10 ng/L which is greater than the evaluation guideline, therefore these data were not usable.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Marine communities, including vertebrate, invertebrate, and plant species, shall not be degraded.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The Criteria Continuous Concentration for chlorpyrifos in saltwater is 9 ng/L.
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game
Spatial Representation:	Samples were collected at site N1-d
Temporal Representation:	Samples were collected 2007 to 2009.
Environmental Conditions:	
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

DECISION ID 49715 **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Niguel Marine Life Refuge

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision

Revision Status	Revised	042530
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the Five samples exceed the Water Quality Objective for Copper.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Five samples exceeded the Water Quality Objective for Copper and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49715, Copper **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Niguel Marine Life Refuge

LOE ID:	74485
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	Non-fixed station physical/chemical (conv + toxicants during key seasons and flows)
Data Used to Assess Water Quality:	None of the five samples exceed the water quality objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California's Ocean Plan Table B lists 6-month median concentration of 3 ug/L to protect aquatic life in marine waters.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	All five samples were collected from station NI-1d.
Temporal Representation:	Samples were collected from 2007 through 2009.
Environmental Conditions:	One sample was collected after a storm event.
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance

Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.

QAPP Information Reference(s):

DECISION ID	49717	Region 9
Pacific Ocean Shoreline, Dana Point HSA, at Niguel Marine Life Refuge		

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the Five samples exceed the Water Quality Criteria for Diazinon.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Five samples exceeded the Water Quality Criteria for Diazinon and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49717, Diazinon	Region 9
Pacific Ocean Shoreline, Dana Point HSA, at Niguel Marine Life Refuge	

LOE ID:	74486
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the five samples exceeded the Criteria Continuous Concentration for diazinon of 820 ng/L.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California's Ocean Plan states that, "The concentration of organic materials in marine sediments shall not be increased to levels that would degrade marine life.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The Criteria Continuous Concentration for diazinon in saltwater is 820 ng/L.
Guideline Reference:	Aquatic Life Ambient Water Quality Criteria for Diazinon
Spatial Representation:	Samples were collected at site NI-1d.
Temporal Representation:	Samples were collected 2007 to 2009
Environmental Conditions:	
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefor the quality of these data are unknown.
QAPP Information Reference(s):	

DECISION ID 49719 Region 9

Pacific Ocean Shoreline, Dana Point HSA, at Niguel Marine Life Refuge

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the Five samples exceed the Water Quality Objective for Lead. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Five samples exceeded the Water Quality Objective for Lead and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49719, Lead Region 9

Pacific Ocean Shoreline, Dana Point HSA, at Niguel Marine Life Refuge

LOE ID: 74494

Pollutant:	Lead	042533
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	Total Dissolved	
Beneficial Use:	Marine Habitat	
Number of Samples:	5	
Number of Exceedances:	0	
Data and Information Type:	Non-fixed station physical/chemical (conv + toxicants during key seasons and flows)	
Data Used to Assess Water Quality:	None of the five samples exceed the water quality objective.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California's Ocean Plan Table B lists 6-month median concentration of 2 ug/L to protect aquatic life in marine waters.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	All five samples were collected from station NI-1d.	
Temporal Representation:	Samples were collected from 2007 through 2009.	
Environmental Conditions:	One sample was collected after a storm event.	
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.	
QAPP Information Reference(s):		

DECISION ID 49720 Region 9

Pacific Ocean Shoreline, Dana Point HSA, at Niguel Marine Life Refuge

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the Five samples exceed the Water Quality Criteria for Malathion.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Five samples exceeded the Water Quality Criteria for Malathion and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49720, Malathion **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Niguel Marine Life Refuge

LOE ID:	74495
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	None of the five samples exceeded the maximum concentration for Malathion of 100 ng/L.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Marine communities, including vertebrate, invertebrate, and plant species, shall not be degraded.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The maximum (Instantaneous) concentration for Malathion in saltwater is 100 ng/L.
Guideline Reference:	Quality Criteria for Water. USEPA Office of Water and Hazardous Materials. Washington, D.C
Spatial Representation:	Samples were collected at site NI-1d.
Temporal Representation:	Samples were collected 2007 to 2009.
Environmental Conditions:	
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

DECISION ID 49725 **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Niguel Marine Life Refuge

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the Five samples exceed the Water Quality Objective for Nickel.

042535

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Five samples exceeded the Water Quality Objective Nickel and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49725, Nickel **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Niguel Marine Life Refuge

LOE ID:	74497
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	Non-fixed station physical/chemical (conv + toxicants during key seasons and flows)
Data Used to Assess Water Quality:	The five samples did not exceed the objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California's Ocean Plan Table B lists 6-month median concentration of 5 ug/L to protect aquatic life in marine waters.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	All five samples were collected from station NI-1d.
Temporal Representation:	Samples were collected from 2007 through 2009.
Environmental Conditions:	One sample was collected after a storm event.
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

DECISION ID 49727 **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Niguel Marine Life Refuge

Pollutant: **Nitrogen, ammonia (Total Ammonia)**

Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	042536
Last Listing Cycle's Final Listing Decision:	New Decision	
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the Five samples exceed the Water Quality Objective Nitrogen, ammonia (Total Ammonia).

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Five samples exceeded the Water Quality Objective for Nitrogen, ammonia (Total Ammonia) and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49727, Nitrogen, ammonia (Total Ammonia) **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Niguel Marine Life Refuge

LOE ID:	74498
Pollutant:	Nitrogen, ammonia (Total Ammonia)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Marine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	None of five sample medians exceeded the water quality objective for total ammonia. Each samples was calculated a median using the sample and all other samples taken previously within a 180-day period.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. The Ocean Plan objective for total ammonia as nitrogen is a moving 6-month median of 600 ug/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:		042537
Guideline Reference:		

Spatial Representation:	Samples were collected at station NI-1.
Temporal Representation:	Samples were collected from September 2007 to April 2009.
Environmental Conditions:	
QAPP Information:	A signed QAPP was included with the stated goal of ensuring the consistent collection of accurate water quality information that will used to satisfy the objectives of the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID 49728 **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Niguel Marine Life Refuge

Pollutant:	**Selenium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the Five samples exceed the Water Quality Objective for Selenium. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Five samples exceeded the Water Quality Objective for Selenium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49728, Selenium **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Niguel Marine Life Refuge

LOE ID:	74499
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Marine Habitat

Number of Samples:	5	042538
Number of Exceedances:	0	
Data and Information Type:	Non-fixed station physical/chemical (conv + toxicants during key seasons and flows)	
Data Used to Assess Water Quality:	None of the five samples exceed the water quality objective.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California's Ocean Plan Table B lists 6-month median concentration of 15 ug/L to protect aquatic life in marine waters.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	All five samples were collected from station NI-1d.	
Temporal Representation:	Samples were collected from 2007 through 2009.	
Environmental Conditions:	One sample was collected after a storm event.	
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.	
QAPP Information Reference(s):		

DECISION ID 49730 Region 9

Pacific Ocean Shoreline, Dana Point HSA, at Niguel Marine Life Refuge

Pollutant:	**Silver**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the Five samples exceed the Water Quality Objective for Silver. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Five samples exceeded the Water Quality Objective for Silver and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49730, Silver 042539 **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Niguel Marine Life Refuge

LOE ID:	74500
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	Non-fixed station physical/chemical (conv + toxicants during key seasons and flows)
Data Used to Assess Water Quality:	None of the five samples exceed the water quality objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California's Ocean Plan Table B lists 6-month median concentration of 0.7 ug/L to protect aquatic life in marine waters.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	All five samples were collected from station NI-1d.
Temporal Representation:	Samples were collected from 2007 through 2009.
Environmental Conditions:	One sample was collected after a storm event.
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

DECISION ID 49734 **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Niguel Marine Life Refuge

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the Five samples exceed the Water Quality Criteria for Zinc.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.

3. Zero of Five samples exceeded the Water Quality Criteria for Zinc and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49734, Zinc **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Niguel Marine Life Refuge

LOE ID:	74512
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Marine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	Non-fixed station physical/chemical (conv + toxicants during key seasons and flows)
Data Used to Assess Water Quality:	None of the five samples exceed the water quality objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California's Ocean Plan Table B lists 6-month median concentration of 20 ug/L to protect aquatic life in marine waters.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	All five samples were collected from station NI-1d.
Temporal Representation:	Samples were collected from 2007 through 2009.
Environmental Conditions:	One sample was collected after a storm event.
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline at Dana Point
Water Body ID: CAC9011400020110713230657
Water Body Type: Coastal & Bay Shoreline

DECISION ID 49582 **Region 9**
Pacific Ocean Shoreline at Dana Point

Pollutant: Arsenic
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. One of the One samples exceed the Evaluation Guideline for Arsenic.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of One samples exceeded the Evaluation Guideline for Arsenic and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49582, Arsenic **Region 9**
Pacific Ocean Shoreline at Dana Point

LOE ID: 74602

Pollutant: Arsenic
LOE Subgroup: Pollutant-Tissue
Matrix: Tissue
Fraction: Shellfish

Beneficial Use: Commercial or recreational collection of fish, shellfish, or organisms

Number of Samples:	1	042542
Number of Exceedances:	1	
Data and Information Type:	Shellfish surveys	
Data Used to Assess Water Quality:	The one sample did exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal. Ten percent of the total arsenic result was used to estimate of the amount of inorganic arsenic in the sample; this number was screened against the guideline.	
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for arsenic in shellfish tissue is 0.0052 ppm. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; OEHHA, 2004)	
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Air Toxics Hotspots Program Risk Assessment Guidelines. Part II Technical Support Document for Describing Available Cancer Potency Values.	
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site DNPT.	
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/8/2008	
Environmental Conditions:		
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/	
QAPP Information Reference(s):		

DECISION ID 49610 Region 9

Pacific Ocean Shoreline at Dana Point

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One

samples exceed the Evaluation Guideline for Cadmium. 042543

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Evaluation Guideline for Cadmium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49610, Cadmium **Region 9**

Pacific Ocean Shoreline at Dana Point

LOE ID:	74603
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The sample did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for cadmium in shellfish tissue is 3.3 ppm. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; USEPA, 2000)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Guidance for Assessing Chemical Contaminant Data for Use In Fish Advisories Volume 1:

Fish Sampling and Analysis 042544

Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site DNPT.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/8/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID 49615 Region 9

Pacific Ocean Shoreline at Dana Point

Pollutant:	**Chlordane**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Chlordane. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Evaluation Guideline for Chlordane and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49615, Chlordane Region 9

Pacific Ocean Shoreline at Dana Point

LOE ID:	74612
Pollutant:	Chlordane
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue

Fraction:	Shellfish	042545
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	Shellfish surveys	
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal. Chlordane result was calculated by summing the results for chlordane isomers: cis- and trans-nonachlor, alpha- and gamma-chlordane, and oxychlordane.	
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for total chlordane in shellfish tissue is 6.0 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008)	
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene	
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site DNPT.	
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/8/2008	
Environmental Conditions:		
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/	
QAPP Information Reference(s):		

DECISION ID 49617 **Region 9**

Pacific Ocean Shoreline at Dana Point

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Chlorpyrifos. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Evaluation Guideline for Chlorpyrifos and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49617, Chlorpyrifos **Region 9**

Pacific Ocean Shoreline at Dana Point

LOE ID:	74613
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for chlorpyrifos in shellfish tissue is 1,000 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; USEPA, 2000)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California

Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment
Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene
Guidance for Assessing Chemical Contaminant Data for Use In Fish Advisories Volume 1: Fish Sampling and Analysis

Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site DNPT.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/8/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID 49621 Region 9

Pacific Ocean Shoreline at Dana Point

Pollutant:	**Dieldrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Dieldrin. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Evaluation Guideline for Dieldrin and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49621, Dieldrin Region 9

Pacific Ocean Shoreline at Dana Point

LOE ID:	74614
Pollutant:	Dieldrin
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The results did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for dieldrin in shellfish tissue is 0.49 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site DNPT.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/8/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID 49623 **Region 9**

Pacific Ocean Shoreline at Dana Point

Pollutant:	**Endosulfan**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision

Revision Status	Revised	042549
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Endosulfan.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Evaluation Guideline for Endosulfan and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49623, Endosulfan **Region 9**

Pacific Ocean Shoreline at Dana Point

LOE ID:	74623
Pollutant:	Endosulfan
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal. Total Endosulfan result was calculated by summing Endosulfan I and Endosulfan II.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for endosulfan (I and II) in shellfish tissue is 20,000 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; USEPA, 2000)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Guidance for Assessing Chemical Contaminant Data for Use In Fish Advisories Volume 1: Fish Sampling and Analysis
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site DNPT.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/8/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID	49624	Region 9
Pacific Ocean Shoreline at Dana Point		

Pollutant:	**Endrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Endrin. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Evaluation Guideline for Endrin and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49624, Endrin **Region 9**

Pacific Ocean Shoreline at Dana Point

LOE ID:	74624
Pollutant:	Endrin
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for endrin in shellfish tissue is 1,000 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; USEPA, 2000)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Guidance for Assessing Chemical Contaminant Data for Use In Fish Advisories Volume 1: Fish Sampling and Analysis
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site DNPT.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/8/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID **49625** **Region 9**

Pacific Ocean Shoreline at Dana Point 042552

Pollutant:	**Heptachlor epoxide**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Hepachlor epoxide.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Evaluation Guideline for Heptachlor epoxide and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49625, Heptachlor epoxide — Region 9

Pacific Ocean Shoreline at Dana Point

LOE ID:	74625
Pollutant:	Heptachlor epoxide
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s)

	that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for heptachlor epoxide in shellfish tissue is 1.4 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; OEHHA, 1999)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Public Health Goal for Heptachlor and Heptachlor Epoxide in Drinking Water
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site DNPT.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/8/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID 49626 Region 9

Pacific Ocean Shoreline at Dana Point

Pollutant:	**Hexachlorobenzene/ HCB**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Hexachlorobenzene/ HCB. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Evaluation Guideline for Hexachlorobenzene/ HCB and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49626, Hexachlorobenzene/ HCB **Region 9**

Pacific Ocean Shoreline at Dana Point

LOE ID:	74633
Pollutant:	Hexachlorobenzene/ HCB
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for hexachlorobenzene in shellfish tissue is 4.3 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; OEHHA, 2005)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Air Toxics Hotspots Program Risk Assessment Guidelines. Part II Technical Support Document for Describing Available Cancer Potency Values.
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site DNPT.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/8/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at:

QAPP Information Reference(s):

DECISION ID 49628 **Region 9**

Pacific Ocean Shoreline at Dana Point

Pollutant:	**Lindane/gamma Hexachlorocyclohexane (gamma-HCH)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Lindane/gamma Hexachlorocyclohexane (gamma-HCH).

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Evaluation Guideline for Lindane/gamma Hexachlorocyclohexane (gamma-HCH) and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49628, Lindane/gamma Hexachlorocyclohexane (gamma-HCH) **Region 9**

Pacific Ocean Shoreline at Dana Point

LOE ID:	74634
Pollutant:	Lindane/gamma Hexachlorocyclohexane (gamma-HCH)
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.

Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. 042556 Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for lindane in shellfish tissue is 7.1 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; OEHHA, 2005)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Air Toxics Hotspots Program Risk Assessment Guidelines. Part II Technical Support Document for Describing Available Cancer Potency Values.
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site DNPT.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/8/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID 49630 Region 9

Pacific Ocean Shoreline at Dana Point

Pollutant:	**Mercury**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Mercury.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.042557
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Evaluation Guideline for Mercury and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49630, Mercury **Region 9**

Pacific Ocean Shoreline at Dana Point

LOE ID:	74635
Pollutant:	Mercury
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The sample did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The USEPA 304(a) recommended water quality criterion for concentrations of methylmercury in shellfish tissue (wet weight) is 0.2 ppm. (Brodberg, R.K., and G.A. Pollock, 1999; USEPA, 2001)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Water Quality Criterion for the Protection of Human Health: Methylmercury. Final. United States Environmental Protection Agency Office of Science and Technology Office of Water. EPA-823-R-01-001. January 2001
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site DNPT.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/8/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and

mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program
Additional background information can be found at:
http://ccma.nos.noaa.gov/stressors/pollution/nsandt/

QAPP Information Reference(s):

DECISION ID 49632 Region 9
Pacific Ocean Shoreline at Dana Point

Pollutant:	**Mirex**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Mirex. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Evaluation Guideline for Mirex and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49632, Mirex Region 9
Pacific Ocean Shoreline at Dana Point

LOE ID:	74644
Pollutant:	Mirex
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The non detect result was not included in the assessment since the reporting limit was above the evaluation guideline. MDL were provided by NOAA Federal and RL were

	calculated by multiplying 3.18 by the MDL. 042559
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for mirex in shellfish tissue is 0.43 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; OEHHA, 1992)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Expedited Cancer Potency Values and Proposed Regulatory Levels for Certain Proposition 65 Carcinogens.
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site DNPT.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/8/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID 49634 Region 9

Pacific Ocean Shoreline at Dana Point

Pollutant:	**PAHs (Polycyclic Aromatic Hydrocarbons)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for PAHs (Polycyclic Aromatic Hydrocarbons).

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.042560
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Evaluation Guideline for PAHs (Polycyclic Aromatic Hydrocarbons) and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49634, PAHs (Polycyclic Aromatic Hydrocarbons) Region 9

Pacific Ocean Shoreline at Dana Point

LOE ID:	74645
Pollutant:	PAHs (Polycyclic Aromatic Hydrocarbons)
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The result did not exceed the screening criteria. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal. The total PAHs were calculated as the potency equivalency concentration or the sum of the toxic equivalency factors multiplied by the concentrations of: Acenaphthene, Acenaphthylene, Anthracene, Benz[a]anthracene, Benzo[a]pyrene, Benzo[b]fluoranthene, Benzo[g,h,i]perylene, Benzo[k]fluoranthene, Dibenzo[a,h]anthracene, Chrysene, Fluoranthene, Fluorene, Indeno[1,2,3-c,d]pyrene, Phenanthrene, and Pyrene.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for polycyclic aromatic hydrocarbons in shellfish tissue is 1.1 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; USEPA, 2000)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Guidance for Assessing Chemical Contaminant Data for Use In Fish Advisories Volume 1: Fish Sampling and Analysis

Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site DNPT.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/8/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID 49635 **Region 9**

Pacific Ocean Shoreline at Dana Point

Pollutant:	**PCBs (Polychlorinated biphenyls)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for PCBs (Polychlorinated biphenyls). Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Evaluation Guideline for PCBs (Polychlorinated biphenyls) and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49635, PCBs (Polychlorinated biphenyls) **Region 9**

Pacific Ocean Shoreline at Dana Point

LOE ID:	74646
Pollutant:	PCBs (Polychlorinated biphenyls)
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish

Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal. Total PCB was assessed for as follows: PCB aroclors and congeners were summed separately and the sum that yielded the highest value was used for the assessment.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for polychlorinated biphenyls in shellfish tissue is 3.9 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site DNPT.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/8/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID 49637 Region 9

Pacific Ocean Shoreline at Dana Point

Pollutant:	**Selenium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Selenium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Evaluation Guideline for Selenium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49637, Selenium **Region 9**

Pacific Ocean Shoreline at Dana Point

LOE ID:	74477
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The sample did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for selenium in shellfish tissue is 11 ppm. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day. A background dietary consuption rate of 0.114 mg/day is applied for this micronutrient. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene

Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site DNPT.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/8/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID 49638 **Region 9**

Pacific Ocean Shoreline at Dana Point

Pollutant:	**Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD). Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Evaluation Guideline for Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD) and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49638, Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD) **Region 9**

Pacific Ocean Shoreline at Dana Point

LOE ID:	74478
Pollutant:	Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD)
LOE Subgroup:	Pollutant-Tissue

Matrix:	Tissue	042565
Fraction:	Shellfish	
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	Shellfish surveys	
Data Used to Assess Water Quality:	The results did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal. The total DDTs were calculated as the sum of 4,4- and 2,4- isomers of DDT, DDE, and DDD.	
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for total DDT in shellfish tissue is 23 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008)	
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene	
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site DNPT.	
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/8/2008	
Environmental Conditions:		
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/	
QAPP Information Reference(s):		

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, San Onofre Valley HSA, at San Onofre State Beach at Churchs Beach
Water Body ID: CAC9015100020111101110839
Water Body Type: Coastal & Bay Shoreline

DECISION ID 50000 **Region 9**

Pacific Ocean Shoreline, San Onofre Valley HSA, at San Onofre State Beach at Churchs Beach

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2, one line(s) of evidence are necessary to assess listing status.

Five lines of evidence are available in the administrative record to assess this pollutant. Data from 2008 to 2010 shows that 0 of 16 geomean samples exceed the water quality objective for enterococcus for the protection of REC-1 beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Data from 2008 to 2010 shows that 0 of 16 geomean samples exceed the water quality objective for enterococcus for the protection of REC-1 beneficial use and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to [SECTION 3.11/4.11] of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 50000, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Onofre Valley HSA, at San Onofre State Beach at Churchs Beach

LOE ID: 75091

Pollutant: Enterococcus
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples:	16
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 16 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the San Onofre State Beach at Churchs Beach site.
Temporal Representation:	Samples were collected from April 2008 to December 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 50000, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Onofre Valley HSA, at San Onofre State Beach at Churchs Beach

LOE ID:	77674
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	16
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Zero of the 16 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, San Onofre Valley HSA, at San Onofre State Beach at Churchs Beach.
Temporal Representation:	The samples were collected from April 2008 to December 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 50000, Indicator Bacteria 042568 **Region 9**

Pacific Ocean Shoreline, San Onofre Valley HSA, at San Onofre State Beach at Churchs Beach

LOE ID:	75094
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	16
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 16 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the San Onofre State Beach at Churchs Beach site.
Temporal Representation:	Samples were collected from April 2008 to December 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 50000, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Onofre Valley HSA, at San Onofre State Beach at Churchs Beach

LOE ID:	75093
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	23
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed bw data for Pacific Ocean Shoreline, San Onofre Valley HSA, at San Onofre State Beach at Churchs Beach to determine beneficial use support and results are as follows: 0 of 23 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, San Onofre Valley HSA, at San Onofre State Beach at Churchs Beach was collected at 1 monitoring site [Church's San Onofre Crk]
Temporal Representation:	Data was collected over the time period 4/3/2008-12/22/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 50000, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Onofre Valley HSA, at San Onofre State Beach at Churchs Beach

LOE ID:	75092
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	16
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 16 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the San Onofre State Beach at Charchs Beach site.
Temporal Representation:	Samples were collected from April 2008 to December 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name:	Pacific Ocean Shoreline, Los Monos HSA, at South Carlsbad State Beach (near Palomar Airport Road)
Water Body ID:	**CAC904310002011110110135 7**
Water Body Type:	**Coastal & Bay Shoreline**

DECISION ID 49830 Region 9

Pacific Ocean Shoreline, Los Monos HSA, at South Carlsbad State Beach (near Palomar Airport Road)

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. Five lines of evidence are available in the administrative record to assess this pollutant. Including the latest data, zero of the 128 samples exceed the water quality objective for enterococcus of a geomean of 35/100ml in a 30-day period for the protection of REC-1. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Including the latest data, zero of the 128 samples exceed the water quality objective for enterococcus of a geomean of 35/100ml in a 30-day period for the protection of REC-1 and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 49830, Indicator Bacteria Region 9

Pacific Ocean Shoreline, Los Monos HSA, at South Carlsbad State Beach (near Palomar Airport Road)

LOE ID:	74747
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	128	042571
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Zero of the 128 geomeans exceeded the objective.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at the Palomar Airport site.	
Temporal Representation:	Samples were collected from January 2008 to August 2010.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 49830, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Los Monos HSA, at South Carlsbad State Beach (near Palomar Airport Road)

LOE ID:	74748
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	128
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 128 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Palomar Airport site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49830, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Los Monos HSA, at South Carlsbad State Beach (near Palomar Airport Road)

LOE ID:	74749

Pollutant:	Total Coliform	042572
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Shellfish Harvesting	
Number of Samples:	135	
Number of Exceedances:	0	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed Beach Watch data for Pacific Ocean Shoreline, Los Monos HSA, at South Carlsbad State Beach (near Palomar Airport Road) to determine beneficial use support and results are as follows: 0 of 135 samples exceed the criterion for Coliform, Total.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Los Monos HSA, at South Carlsbad State Beach (near Palomar Airport Road) was collected at 1 monitoring site [Palomar Airport]	
Temporal Representation:	Data was collected over the time period 1/7/2008-8/23/2010.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 49830, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Los Monos HSA, at South Carlsbad State Beach (near Palomar Airport Road)

LOE ID:	74750
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	128
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 128 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Samples were collected at the Palomar Airport site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49830, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Los Monos HSA, at South Carlsbad State Beach (near Palomar Airport Road)

LOE ID:	77631
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	128
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Zero of the 128 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, Los Monos HSA, at South Carlsbad State Beach (near Palomar Airport Road).
Temporal Representation:	The samples were collected from January 2008 through August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Los Monos HSA, at Carlsbad State Beach at Warm Water Jetty
Water Body ID: CAC904310002011110110390 4
Water Body Type: Coastal & Bay Shoreline

DECISION ID 49828 **Region 9**

Pacific Ocean Shoreline, Los Monos HSA, at Carlsbad State Beach at Warm Water Jetty

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollution

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Five lines of evidence are available in the administrative record to assess this pollutant. Using 2008-2010 data, two of the 53 samples exceed the water quality objective for enterococcus of a geomean of 35/100 ml in a 30-day period for the protection of REC-1 beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Using 2008-2010 data, two of the 53 samples exceed the water quality objective for enterococcus of a geomean of 35/100 ml in a 30-day period for the protection of REC-1 beneficial use and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 49828, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Los Monos HSA, at Carlsbad State Beach at Warm Water Jetty

LOE ID: 74719

Pollutant: Enterococcus
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 53

Number of Exceedances:	2	042575

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Two of the 53 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at the Warm Water Jetty site.
Temporal Representation: Samples were collected from April 2008 to August 2010.
Environmental Conditions:
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 49828, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Los Monos HSA, at Carlsbad State Beach at Warm Water Jetty

LOE ID: 74720

Pollutant: Fecal Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 53
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Zero of the 53 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at the Warm Water Jetty site.
Temporal Representation: Samples were collected from April 2008 to August 2010.
Environmental Conditions:
QAPP Information: The samples were collected for the beach watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 49828, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Los Monos HSA, at Carlsbad State Beach at Warm Water Jetty

LOE ID:	77629
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	53
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Zero of the 53 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, Los Monos HSA, at Carlsbad State Beach at Warm Water Jetty.
Temporal Representation:	The samples were collected from April 2008 through August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49828, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Los Monos HSA, at Carlsbad State Beach at Warm Water Jetty

LOE ID:	74722
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	53
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 53 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.

Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Warm Water Jetty site.
Temporal Representation:	Samples were collected from April 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49828, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Los Monos HSA, at Carlsbad State Beach at Warm Water Jetty

LOE ID:	74721
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	62
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Beach Watch data for Pacific Ocean Shoreline, Los Monos HSA, at Carlsbad State Beach at Warm Water Jetty to determine beneficial use support and results are as follows: 0 of 62 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Los Monos HSA, at Carlsbad State Beach at Warm Water Jetty was collected at 1 monitoring site [Warm Water Jetty]
Temporal Representation:	Data was collected over the time period 4/3/2008-8/26/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Los Monos HSA, Carlsbad State Beach at Tamarack Ave
Water Body ID: CAC904310002011110110445 2
Water Body Type: Coastal & Bay Shoreline

DECISION ID 49831 **Region 9**
Pacific Ocean Shoreline, Los Monos HSA, Carlsbad State Beach at Tamarack Ave

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Five lines of evidence are available in the administrative record to assess this pollutant. Using 2008 to 2010 data, zero of the 71 samples exceed the water quality objective for enterococcus of a geomean of 35/100ml in a 30-day period for the protection of REC-1.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Using 2008 to 2010 data, zero of the 71 samples exceed the water quality objective for enterococcus of a geomean of 35/100ml in a 30-day period for the protection of REC-1 and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 49831, Indicator Bacteria **Region 9**
Pacific Ocean Shoreline, Los Monos HSA, Carlsbad State Beach at Tamarack Ave

LOE ID:	74772
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	71

Number of Exceedances:	0	042579

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Zero of the 71 geomeans exceeded the objective.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at the Tamarack Ave site.
Temporal Representation: Samples were collected from January 2008 to August 2010.
Environmental Conditions:
QAPP Information: The samples were collected for the beach watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 49831, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Los Monos HSA, Carlsbad State Beach at Tamarack Ave

LOE ID: 77632

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Shellfish Harvesting

Number of Samples: 71
Number of Exceedances: 0

Data and Information Type: PATHOGEN MONITORING
Data Used to Assess Water Quality: Zero of the 71 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: The samples were collected at Pacific Ocean Shoreline, Los Monos HSA, at South Carlsbad State Beach (near Palomar Airport Road).
Temporal Representation: The samples were collected from January 2008 through August 2010.
Environmental Conditions:
QAPP Information: The samples were collected for the beach watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 49831, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Los Monos HSA, Carlsbad State Beach at Tamarack Ave 042580

LOE ID:	74773
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	91
Number of Exceedances:	1
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Beach Watch data for Pacific Ocean Shoreline, Los Monos HSA, Carlsbad State Beach at Tamarack Ave to determine beneficial use support and results are as follows: 1 of 91 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Los Monos HSA, Carlsbad State Beach at Tamarack Ave was collected at 1 monitoring site [Tamarack Av]
Temporal Representation:	Data was collected over the time period 1/2/2008-8/26/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49831, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Los Monos HSA, Carlsbad State Beach at Tamarack Ave

LOE ID:	74774
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	71
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 71 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:	042581
Guideline Reference:	
Spatial Representation:	Samples were collected at the Tamarack Ave site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49831, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Los Monos HSA, Carlsbad State Beach at Tamarack Ave

LOE ID:	74771
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	71
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 71 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Tamarack Ave site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

DECISION ID 49832 **Region 9**

Pacific Ocean Shoreline, Los Monos HSA, Carlsbad State Beach at Tamarack Ave

Pollutant:	**Trash**
Final Listing Decision:	**List on 303(d) list (being addressed by action other than TMDL)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected Attainment Date:	2029
Implementation Action Other than TMDL:	Collected effort of public, agencies, organizations, and permittees. Methods include street sweeping, education programs on littering, installation of trash-catching devices on storm drains.
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.7 of the Listing Policy. Under this section when all other listing factors do not result in the listing of a water

segment but information indicates non-attainment of standards, a water segment shall be evaluated to determine whether the weight of evidence demonstrates that water quality standard is not attained. If the weight of evidence indicates non-attainment, the water segment shall be placed on the CWA section 303(d) List.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for placing this water segment-pollutant combination from the CWA section 303(d) List. This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The following information indicates that the water quality standard is not being attained: The San Diego Coastkeeper cleanups occurred on 8/11/07, 8/9/08, 8/8/09, 8/7/10 for this water body. The total weight of trash (lbs) collected on these dates was 536.25. However, using the metric, Coastkeeper classified this water body as medium for trash impairment. Coastkeeper cleanups also occurred on 2/10/07, 2/9/08, 2/14/09, and 2/13/10 for this water body. The total weight of trash (lbs) collected on these dates was 1,271.4. However, using the metric, Coastkeeper classified this water body as high for trash impairment. Any trash found is an exceedance and needs to be addressed by an action other than a TMDL.
3. This process is scientifically defensible and reproducible.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 49832, Trash **Region 9**

Pacific Ocean Shoreline, Los Monos HSA, Carlsbad State Beach at Tamarack Ave

LOE ID:	74775
Pollutant:	Trash
LOE Subgroup:	Pollutant-Nuisance
Matrix:	Not Recorded
Fraction:	None
Beneficial Use:	Non-Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Occurrence of conditions judged to cause impairment
Data Used to Assess Water Quality:	The San Diego Coastkeeper conducts trash cleanups and uses a metric (pounds of trash collected per volunteer) to compare levels of trash across beaches and categorizes beaches as either low, medium, high or severe, based on this metric. Coastkeeper cleanups occurred on 8/11/07, 8/9/08, 8/8/09, 8/7/10 for this water body. The total weight of trash (lbs) collected on these dates was 536.25. However, using the metric, Coastkeeper classified this water body as medium for trash impairment.
Data Reference:	Data for Trash, Nutrients, and Pathogens in Region 9, 2007-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Floating Material Waters shall not contain floating material, including solids, liquids, foams, and scum in concentrations which cause nuisance or adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Carlsbad - Tamarack Beach. Two lines of evidence are being created for this water body (Pacific Ocean Shoreline, Los Monos HSA, Carlsbad State Beach at Tamarack Ave) because cleanups that occurred at Carlsbad - Ponto Jetty were less than 200 meters away.
Temporal Representation:	Four cleanups occurred on 8/11/07, 8/9/08, 8/8/09, 8/7/10.
Environmental Conditions:	

QAPP Information:	San Diego Coastkeeper QAPP provided.	042583
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 49832, Trash **Region 9**

Pacific Ocean Shoreline, Los Monos HSA, Carlsbad State Beach at Tamarack Ave

LOE ID:	74776
Pollutant:	Trash
LOE Subgroup:	Pollutant-Nuisance
Matrix:	Not Recorded
Fraction:	None
Beneficial Use:	Non-Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Occurrence of conditions judged to cause impairment
Data Used to Assess Water Quality:	The San Diego Coastkeeper conducts trash cleanups and uses a metric (pounds of trash collected per volunteer) to compare levels of trash across beaches and categorizes beaches as either low, medium, high or severe, based on this metric. Coastkeeper cleanups occurred on 2/10/07, 2/9/08, 2/14/09, and 2/13/10 for this water body. The total weight of trash (lbs) collected on these dates was 1,271.4. However, using the metric, Coastkeeper classified this water body as high for trash impairment.
Data Reference:	Data for Trash, Nutrients, and Pathogens in Region 9, 2007-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Floating Material Waters shall not contain floating material, including solids, liquids, foams, and scum in concentrations which cause nuisance or adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Carlsbad - Ponto Jetty. Two lines of evidence are being created for this water body (Pacific Ocean Shoreline, Los Monos HSA, Carlsbad State Beach at Tamarack Ave) because cleanups that occurred at Carlsbad - Tamarack State Beach were less than 200 meters away.
Temporal Representation:	Four cleanups that occurred on 2/10/07, 2/9/08, 2/14/09, and 2/13/10.
Environmental Conditions:	
QAPP Information:	San Diego Coastkeeper QAPP was provided.
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Batiquitos HSA, at South Carlsbad State Beach (near Pointsettia Lane)
Water Body ID: CAC904510002011110110 0109
Water Body Type: Coastal & Bay Shoreline

DECISION ID 49679 **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at South Carlsbad State Beach (near Pointsettia Lane)

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Five lines of evidence are available in the administrative record to assess this pollutant. Zero of the 128 samples exceed the Water Quality Objective for enterococcus of a geomean of 35/100ml in a 30-day period for the protection of REC-1 beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the 128 samples exceed the Water Quality Objective for enterococcus of a geomean of 35/100ml in a 30-day period for the protection of REC-1 beneficial use and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 49679, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at South Carlsbad State Beach (near Pointsettia Lane)

LOE ID:	74576
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	128

Number of Exceedances:	0	042585

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Zero of the 128 geomeans exceeded the objective.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at the Poinsettia Lane site.
Temporal Representation: Samples were collected from January 2008 to August 2010.
Environmental Conditions:
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 49679, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at South Carlsbad State Beach (near Pointsettia Lane)

LOE ID: 74573

Pollutant: Enterococcus
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 128
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Zero of the 128 geomeans exceeded the objective.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at the Poinsettia Lane site.
Temporal Representation: Samples were collected from January 2008 to August 2010.
Environmental Conditions:
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 49679, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at South Carlsbad State Beach (near Pointsettia Lane)

LOE ID: 77589

Pollutant: Total Coliform

LOE Subgroup:	Pollutant-Water	042586
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Shellfish Harvesting	
Number of Samples:	128	
Number of Exceedances:	0	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	None of the 128 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, Batiquitos HSA, at South Carlsbad State Beach (near Pointsettia Lane).	
Temporal Representation:	The samples were collected from January 2008 through August 2010.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the beach watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 49679, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at South Carlsbad State Beach (near Pointsettia Lane)

LOE ID:	74575
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	134
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed BW data for Pacific Ocean Shoreline, Batiquitos HSA, at South Carlsbad State Beach (near Pointsettia Lane) to determine beneficial use support and results are as follows: 0 of 134 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	

Guideline Reference:	042587
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Batiquitos HSA, at South Carlsbad State Beach (near Pointsettia Lane) was collected at 1 monitoring site [Poinsettia Lane]
Temporal Representation:	Data was collected over the time period 1/7/2008-8/23/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49679, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at South Carlsbad State Beach (near Pointsettia Lane)

LOE ID:	74574
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	128
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 128 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Pointsettia Lane site.
Temporal Representation:	Samples were collected approximately once a week from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name:	Pacific Ocean Shoreline, Batiquitos HSA, at South Carlsbad State Beach (near Ponto Drive and Island Way)
Water Body ID:	**CAC904510002011110110044 3**
Water Body Type:	**Coastal & Bay Shoreline**

DECISION ID 49680 Region 9

Pacific Ocean Shoreline, Batiquitos HSA, at South Carlsbad State Beach (near Ponto Drive and Island Way)

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. Five lines of evidence are available in the administrative record to assess this pollutant. Zero of the 128 samples exceed the Water Quality Objective for enterococcus of a geomean of 35/100ml in a 30-day period for the protection of REC-1 beneficial use. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3.Zero of the 128 samples exceed the Water Quality Objective for enterococcus of a geomean of 35/100ml in a 30-day period for the protection of REC-1 beneficial use and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 49680, Indicator Bacteria Region 9

Pacific Ocean Shoreline, Batiquitos HSA, at South Carlsbad State Beach (near Ponto Drive and Island Way)

LOE ID:	74578
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	128	042589
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Zero of the 128 geomeans exceeded the objective.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at the Ponto Drive site.	
Temporal Representation:	Samples were collected approximately once a week from January 2008 to August 2010.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the beach watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 49680, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at South Carlsbad State Beach (near Ponto Drive and Island Way)

LOE ID:	77590
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	128
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	None of the 128 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, Batiquitos HSA, at South Carlsbad State Beach (near Ponto Drive and Island Way).
Temporal Representation:	The samples were collected from January 2008 through August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49680, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at South Carlsbad State Beach (near Ponto Drive and Island Way) 042590

LOE ID:	74583
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	128
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 128 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Ponto Drive site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49680, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at South Carlsbad State Beach (near Ponto Drive and Island Way)

LOE ID:	74577
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	128
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 128 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Ponto Drive site.

Temporal Representation:	Samples were collected from January 2008 to August 2010.	042591
Environmental Conditions:		
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 49680, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at South Carlsbad State Beach (near Ponto Drive and Island Way)

LOE ID:	74579
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	134
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed BW data for Pacific Ocean Shoreline, Batiquitos HSA, at South Carlsbad State Beach (near Ponto Drive and Island Way) to determine beneficial use support and results are as follows: 0 of 134 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Batiquitos HSA, at South Carlsbad State Beach (near Ponto Drive and Island Way) was collected at 1 monitoring site [Ponto Drive]
Temporal Representation:	Data was collected over the time period 1/7/2008-8/24/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Batiquitos HSA, at South Carlsbad State Beach (Encina Creek Outlet)
Water Body ID: CAC904510002011110110082 5
Water Body Type: Coastal & Bay Shoreline

DECISION ID 49678 **Region 9**
Pacific Ocean Shoreline, Batiquitos HSA, at South Carlsbad State Beach (Encina Creek Outlet)

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. Five lines of evidence are available in the administrative record to assess this pollutant. Zero of the 128 samples exceed the Water Quality Objective for enterococcus of a geomean of 35/100ml in a 30-day period for the protection of REC-1 beneficial use. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the 128 samples exceed the Water Quality Objective for enterococcus of a geomean of 35/100ml in a 30-day period for the protection of REC-1 beneficial use and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 49678, Indicator Bacteria **Region 9**
Pacific Ocean Shoreline, Batiquitos HSA, at South Carlsbad State Beach (Encina Creek Outlet)

LOE ID:	77588
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	128

Number of Exceedances:	0	042593

Data and Information Type: PATHOGEN MONITORING
Data Used to Assess Water Quality: None of the 128 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: The samples were collected at Pacific Ocean Shoreline, Batiquitos HSA, at South Carlsbad State Beach (Encina Creek Outlet).
Temporal Representation: The samples were collected from January 2008 through August 2010.
Environmental Conditions:
QAPP Information: The samples were collected for the beach watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 49678, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at South Carlsbad State Beach (Encina Creek Outlet)

LOE ID: 74572

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 128
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Zero of the 128 geomeans exceeded the objective.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at the Encina Creek outlet site.
Temporal Representation: Samples were collected from January 2008 to August 2010.
Environmental Conditions:
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 49678, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at South Carlsbad State Beach (Encina Creek Outlet) 042594

LOE ID:	74567
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	134
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed BW data for Pacific Ocean Shoreline, Batiquitos HSA, at South Carlsbad State Beach (Encina Creek Outlet) to determine beneficial use support and results are as follows: 0 of 134 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Batiquitos HSA, at South Carlsbad State Beach (Encina Creek Outlet) was collected at 1 monitoring site [Encina Creek outlet]
Temporal Representation:	Data was collected over the time period 1/7/2008-8/23/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49678, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at South Carlsbad State Beach (Encina Creek Outlet)

LOE ID:	74566
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	128
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 128 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at the Encina Creek outlet site.
Temporal Representation: Samples were collected approximately once a week from January 2008 to August 2010.
Environmental Conditions:
QAPP Information: The samples were collected for the beach watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 49678, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Batiquitos HSA, at South Carlsbad State Beach (Encina Creek Outlet)

LOE ID: 74565

Pollutant: Enterococcus
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 128
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Zero of the 128 geomeans exceeded the objective.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at the Encina Creek outlet site.
Temporal Representation: Samples were collected from January 2008 to August 2010.
Environmental Conditions:
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline at Cardiff Reef
Water Body ID: CAC904610002011071323221 2
Water Body Type: Coastal & Bay Shoreline

DECISION ID 49495 Region 9
Pacific Ocean Shoreline at Cardiff Reef

Pollutant: Arsenic
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. One of the One samples exceed the Evaluation Guideline for Arsenic.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of One samples exceeded the Evaluation Guideline for Arsenic and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49495, Arsenic Region 9
Pacific Ocean Shoreline at Cardiff Reef

LOE ID: 74539

Pollutant: Arsenic
LOE Subgroup: Pollutant-Tissue
Matrix: Tissue
Fraction: Shellfish

Beneficial Use: Commercial or recreational collection of fish, shellfish, or organisms

Number of Samples:	1	042597
Number of Exceedances:	1	
Data and Information Type:	Shellfish surveys	
Data Used to Assess Water Quality:	The one sample did exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal. Ten percent of the total arsenic result was used to estimate of the amount of inorganic arsenic in the sample; this number was screened against the guideline.	
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for arsenic in shellfish tissue is 0.0052 ppm. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; OEHHA, 2004)	
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Air Toxics Hotspots Program Risk Assessment Guidelines. Part II Technical Support Document for Describing Available Cancer Potency Values.	
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from Cardiff Reef in the City of Encinitas, site CDRF.	
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/20/2008	
Environmental Conditions:		
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/	
QAPP Information Reference(s):		

DECISION ID 49500 Region 9

Pacific Ocean Shoreline at Cardiff Reef

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the

One samples exceed the Evaluation Guideline for Cadmium. 042598

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Evaluation Guideline for Cadmium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49500, Cadmium **Region 9**

Pacific Ocean Shoreline at Cardiff Reef

LOE ID:	74547
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The sample did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for cadmium in shellfish tissue is 3.3 ppm. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; USEPA, 2000)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Guidance for Assessing Chemical Contaminant Data for Use In Fish Advisories Volume 1:

	Fish Sampling and Analysis	042599

Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from Cardiff Reef in the City of Encinitas, site CDRF.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/20/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID 49501 — Region 9

Pacific Ocean Shoreline at Cardiff Reef

Pollutant:	**Chlordane**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Chlordane.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Evaluation Guideline for Chlordane and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49501, Chlordane — Region 9

Pacific Ocean Shoreline at Cardiff Reef

LOE ID:	74548
Pollutant:	Chlordane
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue

Fraction:	Shellfish	042600
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	Shellfish surveys	
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal. Chlordane result was calculated by summing the results for chlordane isomers: cis- and trans-nonachlor, alpha- and gamma-chlordane, and oxychlordane.	
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for total chlordane in shellfish tissue is 6.0 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008)	
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene	
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from Cardiff Reef in the City of Encinitas, site CDRF.	
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/20/2008	
Environmental Conditions:		
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/	
QAPP Information Reference(s):		

DECISION ID 49502 **Region 9**

Pacific Ocean Shoreline at Cardiff Reef

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence are available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Chlorpyrifos. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Evaluation Guideline for Chlorpyrifos and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49502, Chlorpyrifos **Region 9**

Pacific Ocean Shoreline at Cardiff Reef

LOE ID:	74549
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for chlorpyrifos in shellfish tissue is 1,000 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; USEPA, 2000)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California

Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment
Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene
Guidance for Assessing Chemical Contaminant Data for Use In Fish Advisories Volume 1: Fish Sampling and Analysis

Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from Cardiff Reef in the City of Encinitas, site CDRF.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/20/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID 49504 Region 9

Pacific Ocean Shoreline at Cardiff Reef

Pollutant:	**Dieldrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Dieldrin. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Evaluation Guideline for Dieldrin and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49504, Dieldrin Region 9

Pacific Ocean Shoreline at Cardiff Reef

LOE ID:	74557
Pollutant:	Dieldrin
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The results did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for dieldrin in shellfish tissue is 0.49 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from Cardiff Reef in the City of Encinitas, site CDRF.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/20/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID 49506 Region 9

Pacific Ocean Shoreline at Cardiff Reef

Pollutant:	**Endosulfan**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision

Revision Status	Revised	042604
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Endosulfan.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Evaluation Guideline for Endosulfan and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49506, Endosulfan **Region 9**

Pacific Ocean Shoreline at Cardiff Reef

LOE ID:	74558
Pollutant:	Endosulfan
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal. Total Endosulfan result was calculated by summing Endosulfan I and Endosulfan II.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for endosulfan (I and II) in shellfish tissue is 20,000 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; USEPA, 2000)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Guidance for Assessing Chemical Contaminant Data for Use In Fish Advisories Volume 1: Fish Sampling and Analysis
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from Cardiff Reef in the City of Encinitas, site CDRF.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/20/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID 49509 Region 9

Pacific Ocean Shoreline at Cardiff Reef

Pollutant:	**Endrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Endrin. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Evaluation Guideline for Endrin and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49509, Endrin **Region 9**

Pacific Ocean Shoreline at Cardiff Reef

LOE ID:	74559
Pollutant:	Endrin
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for endrin in shellfish tissue is 1,000 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; USEPA, 2000)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Guidance for Assessing Chemical Contaminant Data for Use In Fish Advisories Volume 1: Fish Sampling and Analysis
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from Cardiff Reef in the City of Encinitas, site CDRF.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/20/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID **49517** **Region 9**

Pacific Ocean Shoreline at Cardiff Reef 042607

Pollutant:	**Heptachlor epoxide**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Heptachlor epoxide. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Evaluation Guideline for Heptachlor Epoxide and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49517, Heptachlor epoxide — Region 9

Pacific Ocean Shoreline at Cardiff Reef

LOE ID:	74569
Pollutant:	Heptachlor epoxide
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s)

	that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for heptachlor epoxide in shellfish tissue is 1.4 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; OEHHA, 1999)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Public Health Goal for Heptachlor and Heptachlor Epoxide in Drinking Water
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from Cardiff Reef in the City of Encinitas, site CDRF.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/20/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID 49519 Region 9

Pacific Ocean Shoreline at Cardiff Reef

Pollutant:	**Hexachlorobenzene/ HCB**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Hexachlorobenzene/ HCB. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Evaluation Guideline for Hexachlorobenzene/ HCB and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49519, Hexachlorobenzene/ HCB **Region 9**

Pacific Ocean Shoreline at Cardiff Reef

LOE ID:	74570
Pollutant:	Hexachlorobenzene/ HCB
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for hexachlorobenzene in shellfish tissue is 4.3 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; OEHHA, 2005)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Air Toxics Hotspots Program Risk Assessment Guidelines. Part II Technical Support Document for Describing Available Cancer Potency Values.
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from Cardiff Reef in the City of Encinitas, site CDRF.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/20/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at:

QAPP Information Reference(s):

DECISION ID 49494 Region 9

Pacific Ocean Shoreline at Cardiff Reef

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Five lines of evidence are available in the administrative record to assess this pollutant. Three of the 101 samples exceed the Water Quality Objective for Total Coliform of a SSM of 230 cfu/100 ml for the protection of SHELL beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Five lines of evidence are available in the administrative record to assess this pollutant. Three of the 101 samples exceed the Water Quality Objective for Total Coliform of a SSM of 230 cfu/100 ml for the protection of SHELL beneficial use and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 49494, Indicator Bacteria Region 9

Pacific Ocean Shoreline at Cardiff Reef

LOE ID:	77617
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	97
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	None of the 97 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.

SWAMP Data:	Non-SWAMP	042611
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline at Cardiff Reef station Tide Beach Park.	
Temporal Representation:	The samples were collected from February 2008 through August 2010.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the beach watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 49494, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline at Cardiff Reef

LOE ID:	74593
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	136
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 136 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Tide Beach Park site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49494, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline at Cardiff Reef

LOE ID:	74592
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	042612
Beneficial Use:	Shellfish Harvesting	
Number of Samples:	101	
Number of Exceedances:	3	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed BeachWatch data for Pacific Ocean Shoreline, San Elijo HSA, at Tide Beach Park to determine beneficial use support and results are as follows: 3 of 101 samples exceed the criterion for Coliform, Total.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, San Elijo HSA, at Tide Beach Park was collected at 1 monitoring site [Tide Beach center]	
Temporal Representation:	Data was collected over the time period 02/25/2008-8/23/2010.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 49494, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline at Cardiff Reef

LOE ID:	74560
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	135
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 135 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Tide Beach Park site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.

QAPP Information Reference(s): 042613

Line of Evidence (LOE) for Decision ID 49494, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline at Cardiff Reef

LOE ID:	74568
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	136
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 136 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Tide Beach Park site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

DECISION ID 49522 **Region 9**

Pacific Ocean Shoreline at Cardiff Reef

Pollutant:	**Lindane/gamma Hexachlorocyclohexane (gamma-HCH)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Lindane/gamma Hexachlorocyclohexane (gamma-HCH).

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.

3. Zero of One samples exceeded the Evaluation Guideline for Lindane/gamma Hexachlorocyclohexane (gamma-HCH) and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 042614
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49522, Lindane/gamma Hexachlorocyclohexane (gamma-HCH) **Region 9**

Pacific Ocean Shoreline at Cardiff Reef

LOE ID:	74571
Pollutant:	Lindane/gamma Hexachlorocyclohexane (gamma-HCH)
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for lindane in shellfish tissue is 7.1 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; OEHHA, 2005)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Air Toxics Hotspots Program Risk Assessment Guidelines. Part II Technical Support Document for Describing Available Cancer Potency Values.
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from Cardiff Reef in the City of Encinitas, site CDRF.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on

	1/20/2008	042615

Environmental Conditions:

QAPP Information: Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/

QAPP Information Reference(s):

DECISION ID 49526 — Region 9

Pacific Ocean Shoreline at Cardiff Reef

Pollutant:	**Mercury**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Mercury.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Evaluation Guideline for Mercury and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49526, Mercury — Region 9

Pacific Ocean Shoreline at Cardiff Reef

LOE ID:	74580
Pollutant:	Mercury
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	1

Number of Exceedances:	0	042616
Data and Information Type:	Shellfish surveys	
Data Used to Assess Water Quality:	The sample did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.	
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:	The USEPA 304(a) recommended water quality criterion for concentrations of methylmercury in shellfish tissue (wet weight) is 0.2 ppm. (Brodberg, R.K., and G.A. Pollock, 1999; USEPA, 2001)	
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Water Quality Criterion for the Protection of Human Health: Methylmercury. Final. United States Environmental Protection Agency Office of Science and Technology Office of Water. EPA-823-R-01-001. January 2001	
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from Cardiff Reef in the City of Encinitas, site CDRF.	
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/20/2008	
Environmental Conditions:		
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/	
QAPP Information Reference(s):		

DECISION ID 49549 Region 9

Pacific Ocean Shoreline at Cardiff Reef

Pollutant:	**Mirex**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Mirex.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.042617
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Evaluation Guideline for Mirex and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49549, Mirex **Region 9**

Pacific Ocean Shoreline at Cardiff Reef

LOE ID:	74581
Pollutant:	Mirex
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for mirex in shellfish tissue is 0.43 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; OEHHA, 1992)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Expedited Cancer Potency Values and Proposed Regulatory Levels for Certain Proposition 65 Carcinogens.
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from Cardiff Reef in the City of Encinitas, site CDRF.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on

	1/20/2008	042618

Environmental Conditions:

QAPP Information: Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/

QAPP Information Reference(s):

DECISION ID 49550 — Region 9

Pacific Ocean Shoreline at Cardiff Reef

Pollutant:	**PAHs (Polycyclic Aromatic Hydrocarbons)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for PAHs (Polycyclic Aromatic Hydrocarbons).

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Evaluation Guideline for PAHs (Polycyclic Aromatic Hydrocarbons) and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49550, PAHs (Polycyclic Aromatic Hydrocarbons) — Region 9

Pacific Ocean Shoreline at Cardiff Reef

LOE ID:	74582
Pollutant:	PAHs (Polycyclic Aromatic Hydrocarbons)
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	1

Number of Exceedances:	0	042619
Data and Information Type:	Shellfish surveys	
Data Used to Assess Water Quality:	The result does not exceed the the screening level. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal. The total PAHs were calculated as the potency equivalency concentration or the sum of the toxic equivalency factors multiplied by the concentrations of: Acenaphthene, Acenaphthylene, Anthracene, Benz[a]anthracene, Benzo[a]pyrene, Benzo[b]fluoranthene, Benzo[g,h,i]perylene, Benzo[k]fluoranthene, Dibenzo[a,h]anthracene, Chrysene, Fluoranthene, Fluorene, Indeno[1,2,3-c,d]pyrene, Phenanthrene, and Pyrene.	
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for polycyclic aromatic hydrocarbons in shellfish tissue is 1.1 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; USEPA, 2000)	
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Guidance for Assessing Chemical Contaminant Data for Use In Fish Advisories Volume 1: Fish Sampling and Analysis	
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from Cardiff Reef in the City of Encinitas, site CDRF.	
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/20/2008	
Environmental Conditions:		
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/	
QAPP Information Reference(s):		

DECISION ID	**49553**	**Region 9**
Pacific Ocean Shoreline at Cardiff Reef		

Pollutant:	**PCBs (Polychlorinated biphenyls)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status.

042620

One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for PCBs (Polychlorinated biphenyls).

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Evaluation Guideline for PCBs (Polychlorinated biphenyls) and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49553, PCBs (Polychlorinated biphenyls) **Region 9**

Pacific Ocean Shoreline at Cardiff Reef

LOE ID:	74590
Pollutant:	PCBs (Polychlorinated biphenyls)
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal. Total PCB was assessed for as follows: PCB aroclors and congeners were summed separately and the sum that yielded the highest value was used for the assessment.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for polychlorinated biphenyls in shellfish tissue is 3.9 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental

	Health Hazard Assessment 042621 Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from Cardiff Reef in the City of Encinitas, site CDRF.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/20/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID 49559 Region 9

Pacific Ocean Shoreline at Cardiff Reef

Pollutant:	**Selenium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Selenium. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Evaluation Guideline for Selenium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49559, Selenium Region 9

Pacific Ocean Shoreline at Cardiff Reef

LOE ID: 74591

Pollutant:	Selenium	042622
LOE Subgroup:	Pollutant-Tissue	
Matrix:	Tissue	
Fraction:	Shellfish	
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	Shellfish surveys	
Data Used to Assess Water Quality:	The sample did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.	
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for selenium in shellfish tissue is 11 ppm. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day. A background dietary consuption rate of 0.114 mg/day is applied for this micronutrient. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008)	
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene	
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from Cardiff Reef in the City of Encinitas, site CDRF.	
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/20/2008	
Environmental Conditions:		
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/	
QAPP Information Reference(s):		

DECISION ID	49565	Region 9
Pacific Ocean Shoreline at Cardiff Reef		

Pollutant:	**Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD).

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Evaluation Guideline for Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD) and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49565, Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD) **Region 9**

Pacific Ocean Shoreline at Cardiff Reef

LOE ID:	74601
Pollutant:	Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD)
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The result exceeded the the screening level. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal. The total DDTs were calculated as the sum of 4,4- and 2,4- isomers of DDT, DDE, and DDD.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for total DDT in shellfish tissue is 23 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999;

	Klasing, S., and R. Brodberg, 2008) 042624
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from Cardiff Reef in the City of Encinitas, site CDRF.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 1/20/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Rancho Santa Fe HSA, at Fletcher Cove Beach
Water Body ID: CAC904610002011102715054 3
Water Body Type: Coastal & Bay Shoreline

DECISION ID 49915 Region 9
Pacific Ocean Shoreline, Rancho Santa Fe HSA, at Fletcher Cove Beach

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Five lines of evidence are available in the administrative record to assess this pollutant. With data from 2008 to 2010, zero of the 138 samples exceed the water quality objective for enterococcus of a geomean of 35/100 ml in a 30-day period for the protection of REC-1.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With data from 2008 to 2010, zero of the 138 samples exceed the water quality objective for enterococcus of a geomean of 35/100 ml in a 30-day period for the protection of REC-1 and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 49915, Indicator Bacteria Region 9
Pacific Ocean Shoreline, Rancho Santa Fe HSA, at Fletcher Cove Beach

LOE ID:	77651
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	139

Number of Exceedances:	0	042626

Data and Information Type: PATHOGEN MONITORING
Data Used to Assess Water Quality: Zero of the 139 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: The samples were collected at Pacific Ocean Shoreline, Rancho Santa Fe HSA, at Fletcher Cove Beach.
Temporal Representation: The samples were collected from January 2008 to August 2010.
Environmental Conditions:
QAPP Information: The samples were collected for the beach watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 49915, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Rancho Santa Fe HSA, at Fletcher Cove Beach

LOE ID: 75022

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 139
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Zero of the 139 geomeans exceeded the objective.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at the Fletcher Cove Beach site.
Temporal Representation: Samples were collected from January 2008 to August 2010.
Environmental Conditions:
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 49915, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Rancho Santa Fe HSA, at Fletcher Cove Beach 042627

LOE ID:	75021
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	142
Number of Exceedances:	9
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Beach Watch data for Pacific Ocean Shoreline, Rancho Santa Fe HSA, at Fletcher Cove Beach to determine beneficial use support and results are as follows: 9 of 142 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Rancho Santa Fe HSA, at Fletcher Cove Beach was collected at 1 monitoring site [Fletcher Cove outlet]
Temporal Representation:	Data was collected over the time period 1/2/2008-8/23/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49915, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Rancho Santa Fe HSA, at Fletcher Cove Beach

LOE ID:	75020
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	139
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 139 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline: 042628
Guideline Reference:

Spatial Representation: Samples were collected at the Fletcher Cove Beach site.
Temporal Representation: Samples were collected from January 2008 to August 2010.
Environmental Conditions:
QAPP Information: The samples were collected for the beach watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 49915, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Rancho Santa Fe HSA, at Fletcher Cove Beach

LOE ID: 75019

Pollutant: Enterococcus
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 138
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Zero of the 138 geomeans exceeded the objective.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at the Fletcher Cove Beach site.
Temporal Representation: Samples were collected from January 2008 to August 2010.
Environmental Conditions:
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at Las Olas (Georges)
Water Body ID: CAC904610002011102715114 7
Water Body Type: Coastal & Bay Shoreline

DECISION ID 49939 **Region 9**
Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at Las Olas (Georges)

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Five lines of evidence are available in the administrative record to assess this pollutant. Data from 2008 to 2010 shows that zero of 134 geomean samples exceed the water quality objective for enterococcus for the protection of REC-1.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Data from 2008 to 2010 shows that zero of 134 geomean samples exceed the water quality objective for enterococcus for the protection of REC-1 and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 49939, Indicator Bacteria **Region 9**
Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at Las Olas (Georges)

LOE ID: 74658

Pollutant: Enterococcus
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 134

Number of Exceedances:	0	042630

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Zero of the 134 geomeans exceeded the objective.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at the Las Olas (Georges) site.
Temporal Representation: Samples were collected from January 2008 to August 2010.
Environmental Conditions:
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 49939, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at Las Olas (Georges)

LOE ID: 77663

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Shellfish Harvesting

Number of Samples: 134
Number of Exceedances: 1

Data and Information Type: PATHOGEN MONITORING
Data Used to Assess Water Quality: One of the 134 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: The samples were collected at Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at Las Olas (Georges).
Temporal Representation: The samples were collected from January 2008 to August 2010.
Environmental Conditions:
QAPP Information: The samples were collected for the beach watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 49939, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at Las Olas (Georges) 042631

LOE ID:	74659
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	134
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 134 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Las Olas (Georges) site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49939, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at Las Olas (Georges)

LOE ID:	74660
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	137
Number of Exceedances:	2
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed bw data for Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at Las Olas (Georges) to determine beneficial use support and results are as follows: 2 of 137 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	

Guideline Reference:	042632
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at Las Olas (Georges) was collected at 1 monitoring site [Las Olas (Georges)]
Temporal Representation:	Data was collected over the time period 1/2/2008-8/23/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49939, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at Las Olas (Georges)

LOE ID:	74661
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	134
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 134 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Las Olas (Georges) site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at Chart House parking
Water Body ID: CAC904610002011102715152 9
Water Body Type: Coastal & Bay Shoreline

DECISION ID 49938 **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at Chart House parking

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Five lines of evidence are available in the administrative record to assess this pollutant. Data from 2008 to 2010 shows that zero of 134 geomean samples exceed the water quality objective for enterococcus for the protection of REC-1 beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Data from 2008 to 2010 shows that zero of 134 geomean samples exceed the water quality objective for enterococcus for the protection of REC-1 beneficial use and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 49938, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at Chart House parking

LOE ID: 75059

Pollutant: Enterococcus
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 134

Number of Exceedances:	0	042634

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Zero of the 134 geomeans exceeded the objective.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at the Chart House parking site.
Temporal Representation: Samples were collected from January 2008 to August 2010.
Environmental Conditions:
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 49938, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at Chart House parking

LOE ID: 74656

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Shellfish Harvesting

Number of Samples: 137
Number of Exceedances: 5

Data and Information Type: PATHOGEN MONITORING
Data Used to Assess Water Quality: Water Board staff assessed bw data for Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at Chart House parking to determine beneficial use support and results are as follows: 5 of 137 samples exceed the criterion for Coliform, Total.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Data for this line of evidence for Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at Chart House parking was collected at 1 monitoring site [Charthouse parking]
Temporal Representation: Data was collected over the time period 1/2/2008-8/23/2010.
Environmental Conditions: Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 49938, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at Chart House parking

LOE ID:	74657
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	134
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 134 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Chart House parking site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49938, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at Chart House parking

LOE ID:	77662
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	134
Number of Exceedances:	1
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	One of the 134 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	

Guideline Reference:	042636
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at Chart House parking.
Temporal Representation:	The samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49938, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at Chart House parking

LOE ID:	74655
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	134
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 134 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Chart House parking site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline at Scripps Reef
Water Body ID: CAC906300002011071323261 6
Water Body Type: Coastal & Bay Shoreline

DECISION ID 49639 **Region 9**
Pacific Ocean Shoreline at Scripps Reef

Pollutant: Arsenic
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. One of the One samples exceed the Evaluation Guideline for Arsenic.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of One samples exceeded the Evaluation Guideline for Arsenic and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49639, Arsenic **Region 9**
Pacific Ocean Shoreline at Scripps Reef

LOE ID: 74479

Pollutant: Arsenic
LOE Subgroup: Pollutant-Tissue
Matrix: Tissue
Fraction: Shellfish

Beneficial Use: Commercial or recreational collection of fish, shellfish, or organisms

Number of Samples:	1	042638
Number of Exceedances:	1	
Data and Information Type:	Shellfish surveys	
Data Used to Assess Water Quality:	The one sample did exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal. Ten percent of the total arsenic result was used to estimate of the amount of inorganic arsenic in the sample; this number was screened against the guideline.	
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for arsenic in shellfish tissue is 0.0052 ppm. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; OEHHA, 2004)	
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Air Toxics Hotspots Program Risk Assessment Guidelines. Part II Technical Support Document for Describing Available Cancer Potency Values.	
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site SCRF.	
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 2/6/2008	
Environmental Conditions:		
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/	
QAPP Information Reference(s):		

DECISION ID 49640 Region 9

Pacific Ocean Shoreline at Scripps Reef

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One

samples exceed the Evaluation Guideline for Cadmium. 042639

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Evaluation Guideline for Cadmium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49640, Cadmium **Region 9**

Pacific Ocean Shoreline at Scripps Reef

LOE ID:	74487
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The sample did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for cadmium in shellfish tissue is 3.3 ppm. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; USEPA, 2000)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Guidance for Assessing Chemical Contaminant Data for Use In Fish Advisories Volume 1:

	Fish Sampling and Analysis	042640

Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site SCRF.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 2/6/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID 49641 Region 9

Pacific Ocean Shoreline at Scripps Reef

Pollutant:	**Chlordane**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Chlordane. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Evaluation Guideline for Chlordane and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49641, Chlordane Region 9

Pacific Ocean Shoreline at Scripps Reef

LOE ID:	74488
Pollutant:	Chlordane
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue

Fraction:	Shellfish	042641
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	Shellfish surveys	
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal. Chlordane result was calculated by summing the results for chlordane isomers: cis- and trans-nonachlor, alpha- and gamma-chlordane, and oxychlordane.	
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for total chlordane in shellfish tissue is 6.0 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008)	
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene	
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site SCRF.	
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 2/6/2008	
Environmental Conditions:		
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/	
QAPP Information Reference(s):		

DECISION ID 49643 Region 9

Pacific Ocean Shoreline at Scripps Reef

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Chlorpyrifos. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Evaluation Guideline for Chlorpyrifos and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49643, Chlorpyrifos **Region 9**

Pacific Ocean Shoreline at Scripps Reef

LOE ID:	74489
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for chlorpyrifos in shellfish tissue is 1,000 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; USEPA, 2000)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California

Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment
Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene
Guidance for Assessing Chemical Contaminant Data for Use In Fish Advisories Volume 1: Fish Sampling and Analysis

Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site SCRF.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 2/6/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID 49644 Region 9

Pacific Ocean Shoreline at Scripps Reef

Pollutant:	**Dieldrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Dieldrin. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Evaluation Guideline for Dieldrin and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49644, Dieldrin Region 9

Pacific Ocean Shoreline at Scripps Reef

LOE ID:	74501
Pollutant:	Dieldrin
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The results did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for dieldrin in shellfish tissue is 0.49 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site SCRF.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 2/6/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID 49645 Region 9

Pacific Ocean Shoreline at Scripps Reef

Pollutant:	**Endosulfan**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision

Revision Status	Revised	042645
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Endosulfan.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Evaluation Guideline for Endosulfan and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49645, Endosulfan **Region 9**

Pacific Ocean Shoreline at Scripps Reef

LOE ID:	74502
Pollutant:	Endosulfan
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal. Total Endosulfan result was calculated by summing Endosulfan I and Endosulfan II.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for endosulfan (I and II) in shellfish tissue is 20,000 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; USEPA, 2000)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Guidance for Assessing Chemical Contaminant Data for Use In Fish Advisories Volume 1: Fish Sampling and Analysis
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site SCRF.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 2/6/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID	49646	Region 9
Pacific Ocean Shoreline at Scripps Reef		

Pollutant:	**Endrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Endrin. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Evaluation Guideline for Endrin and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49646, Endrin **Region 9**

Pacific Ocean Shoreline at Scripps Reef

LOE ID:	74503
Pollutant:	Endrin
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for endrin in shellfish tissue is 1,000 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; USEPA, 2000)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Guidance for Assessing Chemical Contaminant Data for Use In Fish Advisories Volume 1: Fish Sampling and Analysis
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site SCRF.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 2/6/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID **49648** **Region 9**

Pacific Ocean Shoreline at Scripps Reef 042648

Pollutant:	**Heptachlor epoxide**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Heptachlor epoxide.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Evaluation Guideline for Hepachlor epoxide and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49648, Heptachlor epoxide — Region 9

Pacific Ocean Shoreline at Scripps Reef

LOE ID:	74515
Pollutant:	Heptachlor epoxide
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s)

	that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for heptachlor epoxide in shellfish tissue is 1.4 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; OEHHA, 1999)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Public Health Goal for Heptachlor and Heptachlor Epoxide in Drinking Water
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site SCRF.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 2/6/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID 49649 Region 9

Pacific Ocean Shoreline at Scripps Reef

Pollutant:	**Hexachlorobenzene/ HCB**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Hexachlorobenzene/ HCB. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Evaluation Guideline for Hexachlorobenzene/ HCB and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49649, Hexachlorobenzene/ HCB **Region 9**

Pacific Ocean Shoreline at Scripps Reef

LOE ID:	74516
Pollutant:	Hexachlorobenzene/ HCB
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for hexachlorobenzene in shellfish tissue is 4.3 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; OEHHA, 2005)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Air Toxics Hotspots Program Risk Assessment Guidelines. Part II Technical Support Document for Describing Available Cancer Potency Values.
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site SCRF.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 2/6/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at:

QAPP Information Reference(s):

DECISION ID	49650	Region 9
Pacific Ocean Shoreline at Scripps Reef		

Pollutant:	**Lindane/gamma Hexachlorocyclohexane (gamma-HCH)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Lindane/gamma Hexachlorocyclohexane (gamma-HCH).

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Evaluation Guideline for Lindane/gamma Hexachlorocyclohexane (gamma-HCH) and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49650, Lindane/gamma Hexachlorocyclohexane (gamma-HCH)	Region 9
Pacific Ocean Shoreline at Scripps Reef	

LOE ID:	74517
Pollutant:	Lindane/gamma Hexachlorocyclohexane (gamma-HCH)
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.

Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for lindane in shellfish tissue is 7.1 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; OEHHA, 2005)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Air Toxics Hotspots Program Risk Assessment Guidelines. Part II Technical Support Document for Describing Available Cancer Potency Values.
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site SCRF.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 2/6/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID 49653 Region 9

Pacific Ocean Shoreline at Scripps Reef

Pollutant:	**Mercury**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Mercury.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.042653
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Evaluation Guideline for Mercury and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49653, Mercury **Region 9**

Pacific Ocean Shoreline at Scripps Reef

LOE ID:	74530
Pollutant:	Mercury
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The sample did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The USEPA 304(a) recommended water quality criterion for concentrations of methylmercury in shellfish tissue (wet weight) is 0.2 ppm. (Brodberg, R.K., and G.A. Pollock, 1999; USEPA, 2001)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Water Quality Criterion for the Protection of Human Health: Methylmercury. Final. United States Environmental Protection Agency Office of Science and Technology Office of Water. EPA-823-R-01-001. January 2001
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site SCRF.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 2/6/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and

mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program
Additional background information can be found at:
http://ccma.nos.noaa.gov/stressors/pollution/nsandt/

QAPP Information Reference(s):

DECISION ID	49654	Region 9
Pacific Ocean Shoreline at Scripps Reef		

Pollutant:	**Mirex**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the Zero samples exceed the Evaluation Guideline for Mirex. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Zero samples exceeded the Evaluation Guideline for Mirex and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49654, Mirex	**Region 9**
Pacific Ocean Shoreline at Scripps Reef	

LOE ID:	74531
Pollutant:	Mirex
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The detected not quantifiable result was not included in the assessment since the reporting limit was above the evaluation guideline. MDL were provided by NOAA Federal and RL

	were calculated by multiplying 3.18 by the MDL. 042655
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for mirex in shellfish tissue is 0.43 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; OEHHA, 1992)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Expedited Cancer Potency Values and Proposed Regulatory Levels for Certain Proposition 65 Carcinogens.
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site SCRF.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 2/6/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID 49655 Region 9

Pacific Ocean Shoreline at Scripps Reef

Pollutant:	**PAHs (Polycyclic Aromatic Hydrocarbons)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for PAHs (Polycyclic Aromatic Hydrocarbons).

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.042656
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Evaluation Guideline for PAHs (Polycyclic Aromatic Hydrocarbons) and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49655, PAHs (Polycyclic Aromatic Hydrocarbons) Region 9

Pacific Ocean Shoreline at Scripps Reef

LOE ID:	77215
Pollutant:	PAHs (Polycyclic Aromatic Hydrocarbons)
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal. The total PAHs were calculated as the potency equivalency concentration or the sum of the toxic equivalency factors multiplied by the concentrations of: Acenaphthene, Acenaphthylene, Anthracene, Benz[a]anthracene, Benzo[a]pyrene, Benzo[b]fluoranthene, Benzo[g,h,i]perylene, Benzo[k]fluoranthene, Dibenzo[a,h]anthracene, Chrysene, Fluoranthene, Fluorene, Indeno[1,2,3-c,d]pyrene, Phenanthrene, and Pyrene.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for polycyclic aromatic hydrocarbons in shellfish tissue is 1.1 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008; USEPA, 2000)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene Guidance for Assessing Chemical Contaminant Data for Use In Fish Advisories Volume 1: Fish Sampling and Analysis

Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site SCRF.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 2/6/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID 49657 **Region 9**

Pacific Ocean Shoreline at Scripps Reef

Pollutant:	**PCBs (Polychlorinated biphenyls)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for PCBs (Polychlorinated biphenyls). Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Evaluation Guideline for PCBs (Polychlorinated biphenyls) and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49657, PCBs (Polychlorinated biphenyls) **Region 9**

Pacific Ocean Shoreline at Scripps Reef

LOE ID:	74490
Pollutant:	PCBs (Polychlorinated biphenyls)
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish

Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal. Total PCB was assessed for as follows: PCB aroclors and congeners were summed separately and the sum that yielded the highest value was used for the assessment.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for polychlorinated biphenyls in shellfish tissue is 3.9 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site SCRF.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 2/6/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID 49658 Region 9

Pacific Ocean Shoreline at Scripps Reef

Pollutant:	**Selenium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Selenium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Evaluation Guideline for Selenium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49658, Selenium **Region 9**

Pacific Ocean Shoreline at Scripps Reef

LOE ID:	74491
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Shellfish
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Shellfish surveys
Data Used to Assess Water Quality:	The sample did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal.
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for selenium in shellfish tissue is 11 ppm. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day. A background dietary consuption rate of 0.114 mg/day is applied for this micronutrient. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008)
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene

Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site SCRF.
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 2/6/2008
Environmental Conditions:	
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/
QAPP Information Reference(s):	

DECISION ID 49659 **Region 9**

Pacific Ocean Shoreline at Scripps Reef

Pollutant:	**Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.5 of the Listing Policy. Under section 3.5 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Evaluation Guideline for Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD). Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Evaluation Guideline for Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD) and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49659, Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD) **Region 9**

Pacific Ocean Shoreline at Scripps Reef

LOE ID:	74492
Pollutant:	Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD)
LOE Subgroup:	Pollutant-Tissue

Matrix:	Tissue	042661
Fraction:	Shellfish	
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	Shellfish surveys	
Data Used to Assess Water Quality:	The result did not exceed the guideline. Data were reported on a dry weight basis and were converted to a wet weight basis by multiplying the dry-weight concentration by a factor of 1 minus the percentage of moisture content expressed as a decimal. The total DDTs were calculated as the sum of 4,4- and 2,4- isomers of DDT, DDE, and DDD.	
Data Reference:	State Mussel Watch Program Data 1977-2000; Winter 2007-Winter 2009. State Water Resources Control Board	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Region: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:	The modified OEHHA Fish Contaminant Goal for total DDT in shellfish tissue is 23 ppb. This screening level assumes an average body weight of 70 kg and a consumption rate of 21 g/day for a 30 year exposure over a 70-year lifetime. This constituent is a carcinogen therefore the risk level is set to one in a million. (Brodberg, R.K., and G.A. Pollock, 1999; Klasing, S., and R. Brodberg, 2008)	
Guideline Reference:	Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene	
Spatial Representation:	Samples are collected by hand from three sub-locations for each site. The composite sample was collected from site SCRF.	
Temporal Representation:	Representative samples of locally abundant species were collected during the winter on 2/6/2008	
Environmental Conditions:		
QAPP Information:	Samples were collected as part of the State Water Board's Mussel Watch Program which is a part of the National Oceanic Administration's (NOAAs) National Status and Trends (NS&T). Mussels are shipped to NOAAs contract labs for analysis of trace constituents and mussel condition. Analytical protocols follow those approved by NOAAs NS&T Program Additional background information can be found at: http://ccma.nos.noaa.gov/stressors/pollution/nsandt/	
QAPP Information Reference(s):		

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Mission Bay Shoreline, La Cima Drive at Crown Point Shores
Water Body ID: CAC906300002011102711384 2
Water Body Type: Coastal & Bay Shoreline

DECISION ID 49434 **Region 9**
Mission Bay Shoreline, La Cima Drive at Crown Point Shores

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Five lines of evidence are available in the administrative record to assess this pollutant. Four of the 35 samples exceed the Water Quality Objective for enterococci of a geomean of 35 cfu/100 ml in a 30-day period for the protection of REC-1.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Four of the 35 samples exceed the Water Quality Objective for enterococci of a geomean of 35 cfu/100 ml in a 30-day period for the protection of REC-1 and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 49434, Indicator Bacteria **Region 9**
Mission Bay Shoreline, La Cima Drive at Crown Point Shores

LOE ID: 74383

Pollutant: Enterococcus
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 35

Number of Exceedances:	4	042663

Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Four of the 35 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Crown Point site.
Temporal Representation:	Samples were collected approximately once a week from June 2009 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49434, Indicator Bacteria **Region 9**

Mission Bay Shoreline, La Cima Drive at Crown Point Shores

LOE ID:	77616
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	35
Number of Exceedances:	3
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Three of the 35 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The Water Quality Control Plan for the San Diego Basin states that at all areas where shellfish may be harvested for human consumption, the median total coliform concentration throughout the water column for any 30-day period shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Mission Bay Shoreline, La Cima Drive at Crown Point Shores.
Temporal Representation:	The samples were collected from June 2009 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49434, Indicator Bacteria **Region 9**

Mission Bay Shoreline, La Cima Drive at Crown Point Shores

LOE ID:	74384
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	35
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 35 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Crown Point site.
Temporal Representation:	Samples were collected approximately once a week from June 2009 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49434, Indicator Bacteria **Region 9**

Mission Bay Shoreline, La Cima Drive at Crown Point Shores

LOE ID:	74386
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	35
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 35 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not

	exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Crown Point site.
Temporal Representation:	Samples were collected approximately once a week from June 2009 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49434, Indicator Bacteria **Region 9**

Mission Bay Shoreline, La Cima Drive at Crown Point Shores

LOE ID:	74385
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	41
Number of Exceedances:	2
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed BW data for Mission Bay Shoreline, La Cima Drive at Crown Point Shores to determine beneficial use support and results are as follows: 2 of 41 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The Water Quality Control Plan (Basin Plan 2011)states the following: At all areas where shellfish may be harvested for human consumption, ten percent of the samples collected during any 30-day period shall not exceed 230 MPN/100mL.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Mission Bay Shoreline, La Cima Drive at Crown Point Shores was collected at 1 monitoring site [Crown Point drain]
Temporal Representation:	Data was collected over the time period 6/23/2009-8/24/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Scripps HA, at La Jolla Hermosa Park
Water Body ID: CAC906300002011102714163 7
Water Body Type: Coastal & Bay Shoreline

DECISION ID 50027 **Region 9**
Pacific Ocean Shoreline, Scripps HA, at La Jolla Hermosa Park

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2, one line(s) of evidence are necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of six sample exceed the water quality objective for total coliform of a single sample maximum of 230/100ml.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of six sample exceed the water quality objective for total coliform of a single sample maximum of 230/100ml and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to [SECTION 3.11/4.11] of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50027, Indicator Bacteria **Region 9**
Pacific Ocean Shoreline, Scripps HA, at La Jolla Hermosa Park

LOE ID: 75208

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Shellfish Harvesting

Number of Samples:	6	042667
Number of Exceedances:	0	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed bw data for Pacific Ocean Shoreline, Scripps HA, at La Jolla Hermosa Park to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Coliform, Total.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Scripps HA, at La Jolla Hermosa Park was collected at 1 monitoring site [Bird Rock]	
Temporal Representation:	Data was collected over the time period 2/29/2008-1/26/2010.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Mission Bay Shoreline, at Santa Clara Point
Water Body ID: CAC907510002011102711154 0
Water Body Type: Coastal & Bay Shoreline

DECISION ID 49431 Region 9
Mission Bay Shoreline, at Santa Clara Point

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollution

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 one line(s) of evidence are necessary to assess listing status.

Five lines of evidence are available in the administrative record to assess this pollutant. With the latest data, zero of 22 geomean samples exceed the water quality objective for enterococcus for the protection of REC-1 beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With the latest data, zero of 22 geomean samples exceed the water quality objective for enterococcus for the protection of REC-1 beneficial use and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 49431, Indicator Bacteria Region 9
Mission Bay Shoreline, at Santa Clara Point

LOE ID: 77612

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Shellfish Harvesting

Number of Samples:	21	042669
Number of Exceedances:	0	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	None of the twenty-one samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The Water Quality Control Plan for the San Diego Basin states that at all areas where shellfish may be harvested for human consumption, the median total coliform concentration throughout the water column for any 30-day period shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected at Mission Bay Shoreline, at Santa Clara Point at station Mission Bay, Sail Bay (MB-135).	
Temporal Representation:	The samples were collected from April 2008 to September 2008.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the beach watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 49431, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Santa Clara Point

LOE ID:	74364
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	22
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 22 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Mission Bay, Sail Bay site.
Temporal Representation:	Samples were collected approximately once a week from January 2008 to September 2008.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49431, Indicator Bacteria 042670 Region 9

Mission Bay Shoreline, at Santa Clara Point

LOE ID:	74366
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	22
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 20 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Mission Bay, Sail Bay site.
Temporal Representation:	Samples were collected approximately once a week from January 2008 to September 2008.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49431, Indicator Bacteria Region 9

Mission Bay Shoreline, at Santa Clara Point

LOE ID:	74365
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	24
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed BW data for Mission Bay Shoreline, at Santa Clara Point to determine beneficial use support and results are as follows: 0 of 27 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The Water Quality Control Plan (Basin Plan 2011)states the following: At all areas where shellfish may be harvested for human consumption, ten percent of the samples collected during any 30-day period shall not exceed 230 MPN/100mL.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Mission Bay Shoreline, at Santa Clara Point was collected at 1 monitoring site [Santa Clara Pt. East]
Temporal Representation:	Data was collected over the time period 04/02/2008-9/23/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49431, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Santa Clara Point

LOE ID:	74363
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	22
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 22 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Mission Bay, Sail Bay site.
Temporal Representation:	Samples were collected approximately once a week from January 2008 to September 2008.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Mission Bay Shoreline, at Ventura Cove
Water Body ID: CAC907510002011102711273 7
Water Body Type: Coastal & Bay Shoreline

DECISION ID 49433 **Region 9**
Mission Bay Shoreline, at Ventura Cove

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 and 3.3 of the Listing Policy. Under section 3.2 and 3.3, a single line of evidence is necessary to assess listing status.

Five lines of evidence are available in the administrative record to assess this pollutant. With samples collected in the AB 411 period, zero of the 22 samples exceed the Water Quality Objective for enterococcus of a geomean of 35 cfu/100 ml in a 30-day period.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. With samples collected in the AB 411 period, zero of the 22 samples exceed the Water Quality Objective for enterococcus of a geomean of 35 cfu/100 ml in a 30-day period.and this does not exceed the allowable frequency listed in Table 3.2 and under section 3.3 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 49433, Indicator Bacteria **Region 9**
Mission Bay Shoreline, at Ventura Cove

LOE ID: 74380

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Shellfish Harvesting

Number of Samples:	24	042673
Number of Exceedances:	1	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed BW data for Mission Bay Shoreline, at Ventura Cove to determine beneficial use support and results are as follows: 1 of 24 samples exceed the criterion for Coliform, Total.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The Water Quality Control Plan (Basin Plan 2011)states the following: At all areas where shellfish may be harvested for human consumption, ten percent of the samples collected during any 30-day period shall not exceed 230 MPN/100mL.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Mission Bay Shoreline, at Ventura Cove was collected at 1 monitoring site [Ventura Cove]	
Temporal Representation:	Data was collected over the time period 4/2/2008-9/23/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 49433, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Ventura Cove

LOE ID:	74381
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	22
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 22 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Ventura Cove site.
Temporal Representation:	Samples were collected approximately once a week from April 2008 to September 2008.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49433, Indicator Bacteria 042674 **Region 9**

Mission Bay Shoreline, at Ventura Cove

LOE ID:	77615
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	21
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Zero of the 21 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The Water Quality Control Plan for the San Diego Basin states that at all areas where shellfish may be harvested for human consumption, the median total coliform concentration throughout the water column for any 30-day period shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Mission Bay Shoreline, at Ventura Cove.
Temporal Representation:	The samples were collected from April 2008 to September 2008.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49433, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Ventura Cove

LOE ID:	74379
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	22
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 22 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Ventura Cove site.
Temporal Representation:	Samples were collected approximately once a week from April 2008 to September 2008.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49433, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Ventura Cove

LOE ID:	74378
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	22
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 22 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Ventura Cove site.
Temporal Representation:	Samples were collected approximately once a week from April 2008 to September 2008.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Mission Bay Shoreline, at Bonita Cove (eastern shore)
Water Body ID: CAC907510002011110111470 0
Water Body Type: Coastal & Bay Shoreline

DECISION ID 48741 **Region 9**
Mission Bay Shoreline, at Bonita Cove (eastern shore)

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.3 of the Listing Policy. Under section 3.3 a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. In LOE 74334, twenty-nine of the 204 samples exceed the Water Quality Objective for enterococci of a geomean of 35 /100 ml.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3.Twenty-nine of 204 samples exceed the Water Quality Objective for enterococci of a geomean of 35 /100 ml and this exceeds the allowable frequency for the AB411 period referred to in Session 3.3 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 48741, Indicator Bacteria **Region 9**
Mission Bay Shoreline, at Bonita Cove (eastern shore)

LOE ID:	74334
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation	042677
Number of Samples:	204	
Number of Exceedances:	29	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Twenty-nine of the 204 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at the Bonita Cove eastern shore site.	
Temporal Representation:	Samples were collected approximately once a week from May 3, 2005 to August 31, 2010.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 48741, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Bonita Cove (eastern shore)

LOE ID:	74335
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	204
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 204 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Bonita Cove eastern shore site.
Temporal Representation:	Samples were collected approximately once a week from May 3, 2005 to August 31, 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 48741, Indicator Bacteria 042678 **Region 9**

Mission Bay Shoreline, at Bonita Cove (eastern shore)

LOE ID:	74336
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	204
Number of Exceedances:	3
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Three of the 204 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Bonita Cove eastern shore site.
Temporal Representation:	Samples were collected approximately once a week from May 3, 2005 to August 31, 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Mission Bay Shoreline, at Ski Beach at Vacation Isle
Water Body ID: CAC907520002011102711514 4
Water Body Type: Coastal & Bay Shoreline

DECISION ID 49432 **Region 9**
Mission Bay Shoreline, at Ski Beach at Vacation Isle

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Five lines of evidence are available in the administrative record to assess this pollutant. Seven of the 62 samples exceed the Water Quality Objective for enterococcus of a geomean of 35 cfu/100 ml in a 30-day period for the protection of REC-1 beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Seven of the 62 samples exceed the Water Quality Objective for enterococcus of a geomean of 35 cfu/100 ml in a 30-day period for the protection of REC-1 beneficial use.and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 49432, Indicator Bacteria **Region 9**
Mission Bay Shoreline, at Ski Beach at Vacation Isle

LOE ID:	74368
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation	042680
Number of Samples:	62	
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Zero of the 62 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at the Vacation Isle (MB-203) site.	
Temporal Representation:	Samples were collected approximately once a week from April 2008 to August 2010.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the beach watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 49432, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Ski Beach at Vacation Isle

LOE ID:	74369
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	71
Number of Exceedances:	5
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed BW data for Mission Bay Shoreline, at Ski Beach at Vacation Isle to determine beneficial use support and results are as follows: 5 of 71 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The Water Quality Control Plan (Basin Plan 2011)states the following: At all areas where shellfish may be harvested for human consumption, ten percent of the samples collected during any 30-day period shall not exceed 230 MPN/100mL.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Mission Bay Shoreline, at Ski Beach at Vacation Isle was collected at 1 monitoring site [Ski Beach]
Temporal Representation:	Data was collected over the time period April 2008 to August 2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.

QAPP Information Reference(s): 042681

Line of Evidence (LOE) for Decision ID 49432, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Ski Beach at Vacation Isle

LOE ID:	74370
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	62
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 62 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Vacation Isle (MB-203) site.
Temporal Representation:	Samples were collected approximately once a week from April 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49432, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Ski Beach at Vacation Isle

LOE ID:	77613
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	62
Number of Exceedances:	10
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Ten of the 62 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The Water Quality Control Plan for the San Diego Basin states that at all areas where

	shellfish may be harvested for human consumption, the median total coliform concentration throughout the water column for any 30-day period shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Mission Bay Shoreline, at Ski Beach at Vacation Isle at station Vacation Isle (MB-203).
Temporal Representation:	The samples were collected from April 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49432, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Ski Beach at Vacation Isle

LOE ID:	74367
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	62
Number of Exceedances:	7
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Seven of the 62 geomeans exceeded the objective. The samples were collected during dry weather from April through October only. According to the listing Policy section 3.3 a four percent exceedance frequency should be used.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Vacation Isle (MB-203) site.
Temporal Representation:	Samples were collected approximately once a week from April 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Mission Bay Shoreline, at Enchanted Cove
Water Body ID: CAC907520002011102713440 2
Water Body Type: Coastal & Bay Shoreline

DECISION ID 49428 **Region 9**
Mission Bay Shoreline, at Enchanted Cove

Pollutant:	**Trash**
Final Listing Decision:	**List on 303(d) list (being addressed by action other than TMDL)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected Attainment Date:	2029
Implementation Action Other than TMDL:	Collected effort of public, agencies, organizations, and permittees. Methods include street sweeping, education programs on littering, installation of trash-catching devices on storm drains.
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.7 of the Listing Policy. Under this section when all other listing factors do not result in the listing of a water segment but information indicates non-attainment of standards, a water segment shall be evaluated to determine whether the weight of evidence demonstrates that water quality standard is not attained. If the weight of evidence indicates non-attainment, the water segment shall be placed on the CWA section 303(d) List.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for placing this water segment-pollutant combination from the CWA section 303(d) List. This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The following information indicates that the water quality standard is not being attained: Coastkeeper cleanups occurred on 5/24/08, 5/23/09, and 5/22/10 for this water body. The total weight of trash (lbs) collected on these dates was 2,064.25. However, using the metric, Coastkeeper classified this water body as severe for trash impairment. However, any trash found is an exceedance and needs to be addressed by an action other than a TMDL.
3. This process is scientifically defensible and reproducible.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 49428, Trash **Region 9**
Mission Bay Shoreline, at Enchanted Cove

LOE ID:	74342
Pollutant:	Trash
LOE Subgroup:	Pollutant-Nuisance
Matrix:	Not Recorded
Fraction:	None
Beneficial Use:	Non-Contact Recreation

Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Occurrence of conditions judged to cause impairment
Data Used to Assess Water Quality:	The San Diego Coastkeeper conducts trash cleanups and uses a metric (pounds of trash collected per volunteer) to compare levels of trash across beaches and categorizes beaches as either low, medium, high or severe, based on this metric. Coastkeeper cleanups occurred on 5/24/08, 5/23/09, and 5/22/10 for this water body. The total weight of trash (lbs) collected on these dates was 2,064.25. However, using the metric, Coastkeeper classified this water body as severe for trash impairment.
Data Reference:	Data for Trash, Nutrients, and Pathogens in Region 9, 2007-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Floating Material Waters shall not contain floating material, including solids, liquids, foams, and scum in concentrations which cause nuisance or adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Fiesta Island - Mission Bay.
Temporal Representation:	Three cleanups occurred on 5/24/08, 5/23/09, and 5/22/10.
Environmental Conditions:	
QAPP Information:	San Diego Coastkeeper QAPP was provided.
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Tijuana HU, at Cortez Avenue
Water Body ID: CAC9111100020111027092832
Water Body Type: Coastal & Bay Shoreline

DECISION ID 50041 **Region 9**
Pacific Ocean Shoreline, Tijuana HU, at Cortez Avenue

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Five lines of evidence are available in the administrative record to assess this pollutant. Data of 2008 to 2010 shows that 10 of 18 samples exceed the water quality objective for total coliform of a geomean of 70/100ml in a 30-day period, and 9 of 38 exceed the water quality objective for total coliform of a SSM of 230/100ml for the protection of SHELL.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Data of 2008 to 2010 shows that 10 of 18 samples exceed the water quality objective for total coliform of a geomean of 70/100ml in a 30-day period, and 9 of 38 exceed the water quality objective for total coliform of a SSM of 230/100ml for the protection of SHELL and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 50041, Indicator Bacteria **Region 9**
Pacific Ocean Shoreline, Tijuana HU, at Cortez Avenue

LOE ID:	77690
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	042686
Beneficial Use:	Shellfish Harvesting	
Number of Samples:	18	
Number of Exceedances:	10	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Eighteen of the ten samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, Tijuana HU, at Cortez Avenue.	
Temporal Representation:	The samples were collected from January 2008 to June 2010.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the beach watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 50041, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at Cortez Avenue

LOE ID:	75080
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	38
Number of Exceedances:	9
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed bw data for Pacific Ocean Shoreline, Tijuana HU, at Cortez Avenue to determine beneficial use support and results are as follows: 9 of 38 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Tijuana HU, at Cortez Avenue

	was collected at 1 monitoring site [Cortez Ave] 042687
Temporal Representation:	Data was collected over the time period 1/10/2008-6/3/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 50041, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at Cortez Avenue

LOE ID:	75079
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	18
Number of Exceedances:	2
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Two of the 18 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Cortez Avenue site.
Temporal Representation:	Samples were collected from January 2008 to June 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 50041, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at Cortez Avenue

LOE ID:	75078
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	18
Number of Exceedances:	4
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Four eight of the 18 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Cortez Avenue site.
Temporal Representation:	Samples were collected from January 2008 to June 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 50041, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Tijuana HU, at Cortez Avenue

LOE ID:	75124
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	18
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 18 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Cortez Avenue site.
Temporal Representation:	Samples were collected from January 2008 to June 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: San Dieguito Lagoon, Lower Basin
Water Body ID: CAE9051100020111216092905
Water Body Type: Estuary

DECISION ID 49055 **Region 9**
San Dieguito Lagoon, Lower Basin

Pollutant: Toxicity
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. Zero of the 3 samples exceed the Objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the 3 samples exceeded the Objective and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 49055, Toxicity **Region 9**
San Dieguito Lagoon, Lower Basin

LOE ID: 72836

Pollutant: Toxicity
LOE Subgroup: Toxicity
Matrix: Sediment
Fraction: None

Beneficial Use: Estuarine Habitat

Number of Samples: 3
Number of Exceedances: 0

Data and Information Type: TOXICITY TESTING

Data Used to Assess Water Quality:	Three samples were collected to test for toxicity. Zero of the three samples exhibited statistically significant toxicity. The toxicity tests included survival of Eohaustorius estuarius. Each sample is a sediment composites from three different sites.
Data Reference:	Data for Various Pollutants from Ambient Bay and Lagoon, 2003-2005.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL. SL is defined as the result being significant compared to the negative control based on a statistical test, less than stated the alpha level, AND less than the evaluation threshold.
Guideline Reference:	Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms. Fourth Edition. Office of Water, U.S. Environmental Protection Agency. Washington, D.C. EPA-821-R-02-013
Spatial Representation:	The the composite samples were 907SDL_2003, samples collected at sites 905_SDL1L1_2003, 905_SDL2L1_2003, and 905_SDL2M1_2003. Composite 907SDL_2004 samples were collected 905_SDL2M1_2004, 905_SDL2R1_2004 and 905_SDL3R1_2004. Composite 907SDL_2005 samples were collected at sites, 905_SDL2M1_2005, 905_SDL2L1_2005, and 905_SDL2R4_2005.
Temporal Representation:	The samples were collected in 2003, 2004, and 2005.
Environmental Conditions:	
QAPP Information:	The data was collected under the County of San Diego Ambient Bay and Lagoon Monitoring Project 2003-2005. Annual Report for the Receiving Waters and Urban Runoff Monitoring section covered under the San Diego County Municipal National Pollutant Discharge
QAPP Information Reference(s):	Quality Assurance Project Plan from Enviromatrix Analyticial Rev. 18.

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Tijeras Canyon
Water Body ID: CAR9012000020110512160100
Water Body Type: River & Stream

DECISION ID 52043 **Region 9**
Tijeras Canyon

Pollutant: Ammonia
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeded the criterion or guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52043, Ammonia **Region 9**
Tijeras Canyon

LOE ID: 76829

Pollutant: Ammonia (Unionized)
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Warm Freshwater Habitat

Number of Samples: 1

Number of Exceedances:	0	042692
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	The single sample did not have a detectable amount of ammonia. No corresponding pH or temperature data were available to calculate or estimate an ammonia objective.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. The San Diego Basin Plan objective for unionized ammonia is 0.025 mg/L as N.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The sample was collected at station SMC00873.	
Temporal Representation:	The sample was collected on 5/18/09.	
Environmental Conditions:		
QAPP Information:	A signed QAPP was included with the stated goal of ensuring the consistent collection of accurate water quality information that will used to satisfy the objectives of the Orange County Stormwater Program.	
QAPP Information Reference(s):		

DECISION ID	**50500**	**Region 9**
Tijeras Canyon		

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. The one sample did not exceed the guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. The one sample did not exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50500, Arsenic 042693 Region 9

Tijeras Canyon

LOE ID:	76817
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	The sample did not exceed the objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The CTR for arsenic is 150 ug/L.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	This sample was collected at Tijeras Creek, site SMC00873.
Temporal Representation:	Sample was collected in May 2009.
Environmental Conditions:	The sample is representative of dry weather.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID 51765 Region 9

Tijeras Canyon

Pollutant:	**Benthic Community Effects**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Benthic Community Effects is being considered for placement on the CWA section 303(d) List under sections 3.9 and 3.1 of the Listing Policy. Under section 3.9, an additional line of evidence associating Benthic Community Effects with a water or sediment concentration of pollutant(s) is necessary to assess listing status. Based on the readily available data and information, the weight of evidence provides sufficient justification for not placing Benthic Community Effects in this water segment on the CWA section 303(d) List.

This conclusion is based on the staff findings that: 042694
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Pursuant to section 3.9 of the Listing Policy, the water does exhibit significant degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index.
4. Pursuant to section 3.9 of the Listing Policy, the water segment does not have associated pollutant(s) samples that exceed water quality objectives.
5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not being met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51765, Benthic Community Effects **Region 9**

Tijeras Canyon

LOE ID:	80744
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	One sample was collected at one station in Tijeras Creek. The CSCI score was below the 0.79 threshold, and is therefore exceeding the water quality objective for the aquatic life beneficial use.
Data Reference:	RWB9 Status Sampling 2007 and 2008 Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008. Region 9 CSCI Scores & Water Body Information
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.
Guideline Reference:	The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.

Spatial Representation:	The sample was collected at SMC00873
Temporal Representation:	The sample was collected in 2009
Environmental Conditions:	
QAPP Information:	Data collected following SWAMP QA protocols for the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan
QAPP Information Reference(s):	RWB9 Status Sampling 2007 and 2008 Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008. Quality Assurance Project Plan for SWAMP Bioassessment and Freshwater Bioassessment.

DECISION ID 50501 Region 9

Tijeras Canyon

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. The one sample did not exceed the guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. The one sample did not exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50501, Cadmium Region 9

Tijeras Canyon

LOE ID:	76818
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	1	042696
Number of Exceedances:	0	
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)	
Data Used to Assess Water Quality:	The sample did not exceed the objective.	
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.	
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Spatial Representation:	This sample was collected at Tijeras Creek, site SMC00873.	
Temporal Representation:	Sample was collected in May 2009.	
Environmental Conditions:	The sample is representative of dry weather.	
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.	
QAPP Information Reference(s):		

DECISION ID	**50517**	**Region 9**
Tijeras Canyon		

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. The one sample did not exceed the guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. The one sample did not exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the waterbody-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50517, Chlorpyrifos **Region 9**

Tijeras Canyon

LOE ID:	76819
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	This sample did not exceed the continuous concentration (four day average) for chlorpyrifos in freshwater is 14.0 ng/L.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column,sediments or biota at concentration(s) that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The Criteria Continuous Concentration (four day average) for chlorpyrifos in freshwater is 14.0 ng/L.
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game
Spatial Representation:	This sample was collected at Tijeras Creek, site SMC00873
Temporal Representation:	Sample was collected in May 2009.
Environmental Conditions:	
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

DECISION ID **50502** **Region 9**

Tijeras Canyon

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. The one sample did not exceed the guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. The one sample did not exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50502, Chromium **Region 9**

Tijeras Canyon

LOE ID:	76822
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	The sample did not exceed the objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	This sample was collected at Tijeras Creek, site SMC00873.
Temporal Representation:	Sample was collected in May 2009.
Environmental Conditions:	The sample is representative of dry weather.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality

QAPP Information Reference(s): Assurance Management Plan for the Orange County Stormwater Program042699

DECISION ID	50503	Region 9
Tijeras Canyon		

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. The one sample did not exceed the guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. The one sample did not exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50503, Copper	**Region 9**
Tijeras Canyon	

LOE ID:	76823
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	The sample did not exceed the objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	This sample was collected at Tijeras Creek, site SMC00873.
Temporal Representation:	Sample was collected in May 2009.
Environmental Conditions:	The sample is representative of dry weather.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID 50522 **Region 9**

Tijeras Canyon

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. The one sample did not exceed the guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. The one sample did not exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50522, Diazinon **Region 9**

Tijeras Canyon

LOE ID:	76824
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	One sample did not exceed the continuous concentration for Diazinon criteria of 0.1 ug/L.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column,sediments or biota at concentration(s) that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	This samples was collected at Tijeras Creek, site SMC00873.
Temporal Representation:	This sample was collected in May of 2009.
Environmental Conditions:	
QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

DECISION ID	**50504**	**Region 9**
Tijeras Canyon		

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. The one sample did not exceed the guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. The one sample did not exceed the guideline and this sample size is insufficient to determine, with

the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 50504, Lead **Region 9**
Tijeras Canyon

LOE ID:	76825
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	The sample did not exceed the objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	This sample was collected at Tijeras Creek, site SMC00873.
Temporal Representation:	Sample was collected in May 2009.
Environmental Conditions:	The sample is representative of dry weather.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID **50523** **Region 9**
Tijeras Canyon

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision

Revision Status	Revised	042703
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. The one sample did not exceed the guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. The one sample did not exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50523, Malathion **Region 9**

Tijeras Canyon

LOE ID:	76826
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	This sample did not exceed the maximum (Instantaneous) concentration for Malathion in freshwater of 100 ng/L.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column,sediments or biota at concentration(s) that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The maximum (Instantaneous) concentration for Malathion in freshwater is 100 ng/L.
Guideline Reference:	Quality Criteria for Water. USEPA Office of Water and Hazardous Materials. Washington, D.C
Spatial Representation:	Sample was collected at Tijeras Creek, site SMC00873.
Temporal Representation:	Sample was collected in May 2009.
Environmental Conditions:	

QAPP Information:	Data were submitted with the County of Orange Stormwater Program Quality Assurance Management Plan (QAMP) dated January 2010. However, data were collected prior to the development of this QAMP, therefore the quality of these data are unknown.
QAPP Information Reference(s):	

DECISION ID	50506	Region 9
Tijeras Canyon		

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. The one sample did not exceed the guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. The one sample did not exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50506, Nickel	**Region 9**
Tijeras Canyon	

LOE ID:	76828
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	The sample did not exceed the objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.

SWAMP Data:	Non-SWAMP	042705
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.	
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Spatial Representation:	This sample was collected at Tijeras Creek, site SMC00873.	
Temporal Representation:	Sample was collected in May 2009.	
Environmental Conditions:	The sample is representative of dry weather.	
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.	
QAPP Information Reference(s):		

DECISION ID	50507	Region 9
Tijeras Canyon		

Pollutant:	**Selenium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. The one sample did not exceed the guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. The one sample did not exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50507, Selenium **Region 9**

Tijeras Canyon 042706

LOE ID:	76830
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	The sample did not exceed the objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The CTR for selenium is 5.0 ug/L.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	This sample was collected at Tijeras Creek, site SMC00873.
Temporal Representation:	Sample was collected in May 2009.
Environmental Conditions:	The sample is representative of dry weather.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID **50509** **Region 9**

Tijeras Canyon

Pollutant:	**Silver**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. The one sample did not exceed the guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.042707
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. The one sample did not exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50509, Silver Tijeras Canyon **Region 9**

LOE ID:	76831
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	The sample did not exceed the objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion maximum concentrations for silver to protect aquatic life in freshwater (1-hour average). The dissolved silver criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	This sample was collected at Tijeras Creek, site SMC00873.
Temporal Representation:	Sample was collected in May 2009.
Environmental Conditions:	The sample is representative of dry weather.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

DECISION ID 50510 Tijeras Canyon **Region 9**

Pollutant:	**Zinc**	042708
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	
Last Listing Cycle's Final Listing Decision:	New Decision	
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. The one sample did not exceed the guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. The one sample did not exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50510, Zinc **Region 9**

Tijeras Canyon

LOE ID:	76832
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Fixed station physical/chemical (conventional plus toxic pollutants)
Data Used to Assess Water Quality:	The sample did not exceed the objective.
Data Reference:	Data for Various Waterbodies in Region 8 and Region 9, 2006-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to

	protect aquatic life in freshwater. The dissolved criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	This sample was collected at Tijeras Creek, site SMC00873.
Temporal Representation:	Sample was collected in May 2009.
Environmental Conditions:	The sample is representative of dry weather.
QAPP Information:	Samples were collected and analyzed in accordance with the signed and certified, Quality Assurance Management Plan for the Orange County Stormwater Program.
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Hot Spring Canyon Creek (Orange County)
Water Body ID: CAR9012000020110828152507
Water Body Type: River & Stream

DECISION ID 47840 **Region 9**
Hot Spring Canyon Creek (Orange County)

Pollutant: Alkalinity as CaCO3
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the Water Quality Criteria for Alkalinity, Carbonate as CaCO3.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Water Quality Criteria for Alkalinity, Carbonate as CaCO3 and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47840, Alkalinity as CaCO3 **Region 9**
Hot Spring Canyon Creek (Orange County)

LOE ID: 73851

Pollutant: Alkalinity as CaCO3
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Cold Freshwater Habitat

Number of Samples:	1	042711
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Hot Spring Canyon Creek (Orange County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Alkalinity as CaCO3.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The Alkalinity as CaCO3 criteria for the protection of freshwater aquatic life is 20000 ug/L (National Recommended Water Quality Criteria, 2009).	
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology	
Spatial Representation:	Data for this line of evidence for Hot Spring Canyon Creek (Orange County) was collected at 1 monitoring site [Hot Spring Canyon Creek ~1.2mi above Hwy 74 - 901S01705]	
Temporal Representation:	Data was collected on a single day 5/14/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID 47841 Region 9

Hot Spring Canyon Creek (Orange County)

Pollutant:	**Aluminum**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the Water Quality Criteria for Aluminum.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples exceeded the Water Quality Criteria for Aluminum and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and

information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47841, Aluminum **Region 9**

Hot Spring Canyon Creek (Orange County)

LOE ID:	73853
Pollutant:	Aluminum
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Hot Spring Canyon Creek (Orange County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Aluminum.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The National Recommended Water Quality Critiera for the protection of aquatic life from aluminum is the chronic continuous concentration (expressed as a 4-day average) of 87 ug/L.
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for Hot Spring Canyon Creek (Orange County) was collected at 1 monitoring site [Hot Spring Canyon Creek ~1.2mi above Hwy 74 - 901S01705]
Temporal Representation:	Data was collected on a single day 5/14/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 47842 **Region 9**

Hot Spring Canyon Creek (Orange County)

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary and under section 3.6 at least two lines of evidence are necessary to assess listing status.

One lines of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the California Toxics Rule Objective for Arsenic.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples exceeded the California Toxics Rule Objective for Arsenic and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47842, Arsenic **Region 9**

Hot Spring Canyon Creek (Orange County)

LOE ID:	73857
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Hot Spring Canyon Creek (Orange County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for arsenic is 33 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Hot Spring Canyon Creek (Orange County) was collected at 1 monitoring site [Hot Spring Canyon Creek ~1.2mi above Hwy 74 - 901S01705]
Temporal Representation:	Data was collected on a single day 5/14/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47842, Arsenic **Region 9**

Hot Spring Canyon Creek (Orange County)

LOE ID:	73859
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Hot Spring Canyon Creek (Orange County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The dissolved arsenic criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved arsenic is 0.150 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Hot Spring Canyon Creek (Orange County) was collected at 1 monitoring site [Hot Spring Canyon Creek ~1.2mi above Hwy 74 - 901S01705]
Temporal Representation:	Data was collected on a single day 5/14/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 47843 **Region 9**

Hot Spring Canyon Creek (Orange County)

Pollutant:	**Benthic Community Effects**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Benthic Community Effects is being considered for placement on the CWA section 303(d) List under sections 3.9 and 3.1 of the Listing Policy. Under section 3.9, an additional line of evidence associating Benthic Community Effects with a water or sediment concentration of pollutant(s) is necessary to assess listing status. Based on the readily available data and information, the weight of evidence provides sufficient justification for not placing Benthic Community Effects in this water segment on the CWA section 303(d) List.

This conclusion is based on the staff findings that: 042715
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Pursuant to section 3.9 of the Listing Policy, the water does not exhibit significant degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index.
4. Pursuant to section 3.9 of the Listing Policy, the water segment does not have associated pollutant(s) samples that exceed water quality objectives.
5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not being met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. Furthermore, what data is available does not indicate that the benthic community exhibits degradation when compared to reference.

Line of Evidence (LOE) for Decision ID 47843, Benthic Community Effects — Region 9

Hot Spring Canyon Creek (Orange County)

LOE ID:	80745
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	The CSCI score for this site is above the 0.79 threshold, and is therefore not exceeding the water quality objective for the aquatic life beneficial use.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009 Region 9 CSCI Scores & Water Body Information
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.
Guideline Reference:	The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.
Spatial Representation:	Samples were collected at the following station: 901S01705-Hot Spring Canyon Creek

	~1.2mi above Hwy 74	042716
Temporal Representation:	Surveys done May 14, 2009.	
Environmental Conditions:		
QAPP Information:	Data collected following SWAMP QA protocols for the Southern California Stormwater Monitoring Coalition Project.	
QAPP Information Reference(s):	RWB9 Stormwater Monitoring Council CY 2009	

Line of Evidence (LOE) for Decision ID 47843, Benthic Community Effects **Region 9**

Hot Spring Canyon Creek (Orange County)

LOE ID:	73860
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	The IBI score for this water body was 47 which indicates that this water body is not considered to have impaired conditions.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at the following station: 901S01705-Hot Spring Canyon Creek ~1.2mi above Hwy 74
Temporal Representation:	Surveys done May 14, 2009.
Environmental Conditions:	
QAPP Information:	Data collected following SWAMP QA protocols for the Southern California Stormwater Monitoring Coalition Project.
QAPP Information Reference(s):	

DECISION ID 47844 **Region 9**

Hot Spring Canyon Creek (Orange County)

Pollutant:	**Bifenthrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the one samples exceed the Water Quality Criteria for Bifenthrin. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one samples exceeded the Water Quality Criteria for Bifenthrin and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47844, Bifenthrin **Region 9**

Hot Spring Canyon Creek (Orange County)

LOE ID:	73862
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Hot Spring Canyon Creek (Orange County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Bifenthrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Bifenthrin does not exceed 0.0006 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Hot Spring Canyon Creek (Orange County) was collected at 1 monitoring site [Hot Spring Canyon Creek ~1.2mi above Hwy 74 - 901S01705]
Temporal Representation:	Data was collected on a single day 5/14/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.

QAPP Information:	The SWAMP QAPP (2008) was followed.	042718
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID 47845 **Region 9**

Hot Spring Canyon Creek (Orange County)

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary and under section 3.6 at least two lines of evidence are necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the California Toxics Rule Objective for Cadmium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples exceeded the California Toxics Rule Objective for Cadmium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47845, Cadmium **Region 9**

Hot Spring Canyon Creek (Orange County)

LOE ID:	73864
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Hot Spring Canyon Creek (Orange County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.

Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	042719
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for cadmium is 4.98 mg/Kg dry weight (MacDonald et al. 2000).	
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31	
Spatial Representation:	Data for this line of evidence for Hot Spring Canyon Creek (Orange County) was collected at 1 monitoring site [Hot Spring Canyon Creek ~1.2mi above Hwy 74 - 901S01705]	
Temporal Representation:	Data was collected on a single day 5/14/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 47845, Cadmium **Region 9**

Hot Spring Canyon Creek (Orange County)

LOE ID:	73865
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Hot Spring Canyon Creek (Orange County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Cadmium to protect aquatic life in freshwater. The dissolved Cadmium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Hot Spring Canyon Creek (Orange County) was collected at 1 monitoring site [Hot Spring Canyon Creek ~1.2mi above Hwy 74 - 901S01705]
Temporal Representation:	Data was collected on a single day 5/14/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 47846 **Region 9**

Hot Spring Canyon Creek (Orange County)

Pollutant:	**Chloride**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Basin Plan Objective for Chloride.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of One samples exceeded the Basin Plan Objective for Chloride and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47846, Chloride **Region 9**

Hot Spring Canyon Creek (Orange County)

LOE ID:	73867
Pollutant:	Chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Hot Spring Canyon Creek (Orange County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chloride.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP

Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Chloride objective for the protection of aquatic life according to Table 3-2 for Hot Spring Canyon Creek (Orange County) within the San Juan Hydrologic Unit is 250 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Hot Spring Canyon Creek (Orange County) was collected at 1 monitoring site [Hot Spring Canyon Creek ~1.2mi above Hwy 74 - 901S01705]
Temporal Representation:	Data was collected on a single day 5/14/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47846, Chloride **Region 9**

Hot Spring Canyon Creek (Orange County)

LOE ID:	73868
Pollutant:	Chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Hot Spring Canyon Creek (Orange County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chloride.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Chloride objective for the protection of aquatic life according to Table 3-2 for Hot Spring Canyon Creek (Orange County) within the San Juan Hydrologic Unit is 250 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Hot Spring Canyon Creek (Orange County) was collected at 1 monitoring site [Hot Spring Canyon Creek ~1.2mi above Hwy 74 - 901S01705]
Temporal Representation:	Data was collected on a single day 5/14/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 47847 **Region 9**

Hot Spring Canyon Creek (Orange County)

Pollutant: Chromium

Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	042722
Last Listing Cycle's Final Listing Decision:	New Decision	
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary and under section 3.6 at least two lines of evidence are necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the One samples exceed the California Toxics Rule Objective for Chromium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples exceeded the California Toxics Rule Objective for Chromium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47847, Chromium **Region 9**

Hot Spring Canyon Creek (Orange County)

LOE ID:	73872
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Hot Spring Canyon Creek (Orange County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium. Since the chromium species was not identified, the data point(s) were assessed using both the Chromium III criteria which is hardness-dependent, and the criterion continuous concentration (4-day average) to protect aquatic life in freshwater for chromium VI which is 11 ug/L and is not hardness dependent.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved chromium to protect aquatic life in freshwater. The dissolved Chromium criterion in

	freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Hot Spring Canyon Creek (Orange County) was collected at 1 monitoring site [Hot Spring Canyon Creek ~1.2mi above Hwy 74 - 901S01705]
Temporal Representation:	Data was collected on a single day 5/14/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47847, Chromium **Region 9**

Hot Spring Canyon Creek (Orange County)

LOE ID:	73871
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Hot Spring Canyon Creek (Orange County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium. Since the chromium species was not identified, the data point(s) were assessed using both the Chromium III criteria which is hardness-dependent, and the criterion continuous concentration (4-day average) to protect aquatic life in freshwater for chromium VI which is 11 ug/L and is not hardness dependent.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Chromium to protect aquatic life in freshwater. The dissolved Chromium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Hot Spring Canyon Creek (Orange County) was collected at 1 monitoring site [Hot Spring Canyon Creek ~1.2mi above Hwy 74 - 901S01705]
Temporal Representation:	Data was collected on a single day 5/14/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47847, Chromium **Region 9**

Hot Spring Canyon Creek (Orange County) 042724

LOE ID:	73870
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Hot Spring Canyon Creek (Orange County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for chromium is 111 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Hot Spring Canyon Creek (Orange County) was collected at 1 monitoring site [Hot Spring Canyon Creek ~1.2mi above Hwy 74 - 901S01705]
Temporal Representation:	Data was collected on a single day 5/14/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47847, Chromium **Region 9**

Hot Spring Canyon Creek (Orange County)

LOE ID:	73869
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Hot Spring Canyon Creek (Orange County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP

Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for chromium is 111 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Hot Spring Canyon Creek (Orange County) was collected at 1 monitoring site [Hot Spring Canyon Creek ~1.2mi above Hwy 74 - 901S01705]
Temporal Representation:	Data was collected on a single day 5/14/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 47848 Region 9

Hot Spring Canyon Creek (Orange County)

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the California Toxics Rule Objective for copper. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one samples exceeded the California Toxics Rule Objective for copper and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47848, Copper Region 9

Hot Spring Canyon Creek (Orange County)

LOE ID:	73876	042726

Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Hot Spring Canyon Creek (Orange County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved copper to protect aquatic life in freshwater. The dissolved copper criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Hot Spring Canyon Creek (Orange County) was collected at 1 monitoring site [Hot Spring Canyon Creek ~1.2mi above Hwy 74 - 901S01705]
Temporal Representation:	Data was collected on a single day 5/14/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47848, Copper **Region 9**

Hot Spring Canyon Creek (Orange County)

LOE ID:	73874
Pollutant:	Copper
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Hot Spring Canyon Creek (Orange County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce

	detrimental physiological responses in, human, plant, animal, or aquatic life 42727
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for copper is 149 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Hot Spring Canyon Creek (Orange County) was collected at 1 monitoring site [Hot Spring Canyon Creek ~1.2mi above Hwy 74 - 901S01705]
Temporal Representation:	Data was collected on a single day 5/14/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 47849 Region 9

Hot Spring Canyon Creek (Orange County)

Pollutant:	**Cyfluthrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the Water Quality Criteria for Cyfluthrin. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one samples exceeded the Water Quality Criteria for Cyfluthrin and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47849, Cyfluthrin Region 9

Hot Spring Canyon Creek (Orange County)

LOE ID:	73878
Pollutant:	Cyfluthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	Total	042728
Beneficial Use:	Cold Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Hot Spring Canyon Creek (Orange County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cyfluthrin, total.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of lambda-cyhalothrin does not exceed 0.0005 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Mixtures of lambda-cyhalothrin and other pyrethroids should be considered in an additive manner. (Fojut et al. 2012)Â	
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.	
Spatial Representation:	Data for this line of evidence for Hot Spring Canyon Creek (Orange County) was collected at 1 monitoring site [Hot Spring Canyon Creek ~1.2mi above Hwy 74 - 901S01705]	
Temporal Representation:	Data was collected on a single day 5/14/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID 47850 Region 9

Hot Spring Canyon Creek (Orange County)

Pollutant:	**Cyhalothrin, Lambda**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the Water Quality Criteria for Cyhalothrin, Lambda.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples exceeded the Water Quality Criteria for Cyhalothrin, Lambda and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is

fully supported using table 3.1. 042729
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47850, Cyhalothrin, Lambda **Region 9**

Hot Spring Canyon Creek (Orange County)

LOE ID:	73880
Pollutant:	Cyhalothrin, Lambda
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Hot Spring Canyon Creek (Orange County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cyhalothrin, lambda, total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Cyhalothrin, lambda, total does not exceed 0.0005 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Hot Spring Canyon Creek (Orange County) was collected at 1 monitoring site [Hot Spring Canyon Creek ~1.2mi above Hwy 74 - 901S01705]
Temporal Representation:	Data was collected on a single day 5/14/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 47851 **Region 9**

Hot Spring Canyon Creek (Orange County)

Pollutant:	**Cypermethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the Water Quality Criteria for Cypermethrin.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples exceeded the Water Quality Criteria for Cypermethrin and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47851, Cypermethrin **Region 9**

Hot Spring Canyon Creek (Orange County)

LOE ID:	73882
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	One of one sample result was not used in the assessment because the laboratory data was non-detect and the method detection limit was above the guideline and therefore the results could not be quantified with the level of certainty required by the Listing Policy
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of cypermethrin does not exceed 0.0002 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Fojut et al. 2012)
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Hot Spring Canyon Creek (Orange County) was collected

	at 1 monitoring site [Hot Spring Canyon Creek ~1.2mi above Hwy 74 - 901S0705]
Temporal Representation:	Data was collected on a single day 5/14/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 47852 Region 9

Hot Spring Canyon Creek (Orange County)

Pollutant:	**Deltamethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the water quality criteria for Deltamethrin.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples exceeded the Water Quality Criteria for Delthamethrin and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47852, Deltamethrin Region 9

Hot Spring Canyon Creek (Orange County)

LOE ID:	73884
Pollutant:	Deltamethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Hot Spring Canyon Creek (Orange County) to

	determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Deltamethrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for Deltamethrin is the maximum acceptable toxicant concentration (MATC) of 0.02 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Hot Spring Canyon Creek (Orange County) was collected at 1 monitoring site [Hot Spring Canyon Creek ~1.2mi above Hwy 74 - 901S01705]
Temporal Representation:	Data was collected on a single day 5/14/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 47853 Region 9

Hot Spring Canyon Creek (Orange County)

Pollutant:	**Esfenvalerate/Fenvalerate**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the Water Quality Criteria for Esfenvalerate/Fenvalerate. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one samples exceeded the Water Quality Criteria for Esfenvalerate/Fenvalerate and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47853, Esfenvalerate/Fenvalerate Region 9

Hot Spring Canyon Creek (Orange County) 042733

LOE ID:	73886
Pollutant:	Esfenvalerate/Fenvalerate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Hot Spring Canyon Creek (Orange County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Esfenvalerate/Fenvalerate, total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to the USEPA Office of Pesticide Programs Ecotoxicity database, the aquatic life EC50 for Esfenvalerate/Fenvalerate is 0.9 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Hot Spring Canyon Creek (Orange County) was collected at 1 monitoring site [Hot Spring Canyon Creek ~1.2mi above Hwy 74 - 901S01705]
Temporal Representation:	Data was collected on a single day 5/14/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 47854 Region 9

Hot Spring Canyon Creek (Orange County)

Pollutant:	**Fenpropathrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the Water Quality Criteria for Fenpropathrin. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.

2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples exceeded the Water Quality Criteria for Fenpropathrin and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

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Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47854, Fenpropathrin **Region 9**

Hot Spring Canyon Creek (Orange County)

LOE ID:	73888
Pollutant:	Fenpropathrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Hot Spring Canyon Creek (Orange County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Fenpropathrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for Fenpropathrin is the median lethal concentration (LC50; 2.2 ug/L).
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Hot Spring Canyon Creek (Orange County) was collected at 1 monitoring site [Hot Spring Canyon Creek ~1.2mi above Hwy 74 - 901S01705]
Temporal Representation:	Data was collected on a single day 5/14/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 47855 **Region 9**

Hot Spring Canyon Creek (Orange County)

Pollutant:	**Iron**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision

Revision Status	Revised	042735
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the Basin Plan Objective for Iron.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples exceeded the Basin Plan Objective for Iron and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47855, Iron **Region 9**

Hot Spring Canyon Creek (Orange County)

LOE ID:	73890
Pollutant:	Iron
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Hot Spring Canyon Creek (Orange County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Iron.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Iron objective for the protection of aquatic life according to Table 3-2 for Hot Spring Canyon Creek (Orange County) within the San Juan Hydrologic Unit is 0.3 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Data for this line of evidence for Hot Spring Canyon Creek (Orange County) was collected at 1 monitoring site [Hot Spring Canyon Creek ~1.2mi above Hwy 74 - 901S01705]
Temporal Representation:	Data was collected on a single day 5/14/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 47856 Region 9

Hot Spring Canyon Creek (Orange County)

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary and under section 3.6 at least two lines of evidence are necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the California Toxics Rule Objective for Lead. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the California Toxics Rule Objective for Lead and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47856, Lead Region 9

Hot Spring Canyon Creek (Orange County)

LOE ID:	73894
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING 042737
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Hot Spring Canyon Creek (Orange County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved lead to protect aquatic life in freshwater. The dissolved lead criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Hot Spring Canyon Creek (Orange County) was collected at 1 monitoring site [Hot Spring Canyon Creek ~1.2mi above Hwy 74 - 901S01705]
Temporal Representation:	Data was collected on a single day 5/14/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47856, Lead **Region 9**

Hot Spring Canyon Creek (Orange County)

LOE ID:	73892
Pollutant:	Lead
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Hot Spring Canyon Creek (Orange County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for lead is 128 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Hot Spring Canyon Creek (Orange County) was collected at 1 monitoring site [Hot Spring Canyon Creek ~1.2mi above Hwy 74 - 901S01705]
Temporal Representation:	Data was collected on a single day 5/14/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.

QAPP Information:	The SWAMP QAPP (2008) was followed.	042738
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID 47857 **Region 9**

Hot Spring Canyon Creek (Orange County)

Pollutant:	**Manganese**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Site Specific Objective for Manganese in the Hot Spring Canyon Creek (Orange County).

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples exceeded the Site Specific Objective for Manganese in the Hot Spring Canyon Creek (Orange County), and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47857, Manganese **Region 9**

Hot Spring Canyon Creek (Orange County)

LOE ID:	73896
Pollutant:	Manganese
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Hot Spring Canyon Creek (Orange County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Manganese.

Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	042739
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Manganese objective for the protection of aquatic life according to Table 3-2 for Hot Spring Canyon Creek (Orange County) within the San Juan Hydrologic Unit is 0.05 mg/L.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Hot Spring Canyon Creek (Orange County) was collected at 1 monitoring site [Hot Spring Canyon Creek ~1.2mi above Hwy 74 - 901S01705]	
Temporal Representation:	Data was collected on a single day 5/14/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID 47858 Region 9

Hot Spring Canyon Creek (Orange County)

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the One samples exceed the California Toxics Rule Objective for Nickel. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one samples exceeded the California Toxics Rule Objective for Nickel and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47858, Nickel Region 9

Hot Spring Canyon Creek (Orange County)

LOE ID:	73900	042740

Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Hot Spring Canyon Creek (Orange County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Nickel to protect aquatic life in freshwater. The dissolved Nickel criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Hot Spring Canyon Creek (Orange County) was collected at 1 monitoring site [Hot Spring Canyon Creek ~1.2mi above Hwy 74 - 901S01705]
Temporal Representation:	Data was collected on a single day 5/14/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47858, Nickel **Region 9**

Hot Spring Canyon Creek (Orange County)

LOE ID:	73898
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Hot Spring Canyon Creek (Orange County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce

	detrimental physiological responses in, human, plant, animal, or aquatic life 42741
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for nickel is 48.6 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Hot Spring Canyon Creek (Orange County) was collected at 1 monitoring site [Hot Spring Canyon Creek ~1.2mi above Hwy 74 - 901S01705]
Temporal Representation:	Data was collected on a single day 5/14/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 47911 Region 9

Hot Spring Canyon Creek (Orange County)

Pollutant:	**Nitrogen, ammonia (Total Ammonia)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the Water Quality Criteria for Nitrogen. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one samples exceeded the Water Quality Criteria for Nitrogen and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47911, Nitrogen, ammonia (Total Ammonia) Region 9

Hot Spring Canyon Creek (Orange County)

LOE ID:	73855
Pollutant:	Nitrogen, ammonia (Total Ammonia)
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	Total	042742
Beneficial Use:	Cold Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Hot Spring Canyon Creek (Orange County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Ammonia as N, Total.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	Aquatic Life Ambient Water Quality Criteria for Ammonia â€“ Freshwater (USEPA 2013): the 30-day rolling average concentration (criterion continuous concentration or CCC) of total ammonia nitrogen(in mg TAN/L) in freshwater are not to be exceeded more than once every three years on average. The CCC values are based on pH and temperature. The CCC formula is found on page 46 and the table of CCC values is on page 49.	
Guideline Reference:	Aquatic Life Ambient Water Quality Criteria for Ammonia - Freshwater 2013	
Spatial Representation:	Data for this line of evidence for Hot Spring Canyon Creek (Orange County) was collected at 1 monitoring site [Hot Spring Canyon Creek ~1.2mi above Hwy 74 - 901S01705]	
Temporal Representation:	Data was collected on a single day 5/14/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID 47859 Region 9

Hot Spring Canyon Creek (Orange County)

Pollutant:	**Oxygen, Dissolved**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. One of the One samples exceed the Basin Plan Objective for Oxygen, Dissolved.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of One samples exceeded the Oxygen, Dissolved and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using

table 3.2. 042743
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47859, Oxygen, Dissolved **Region 9**

Hot Spring Canyon Creek (Orange County)

LOE ID:	73902
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Hot Spring Canyon Creek (Orange County) to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Oxygen, Dissolved.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan, San Diego Basin, Cold Water Habitat Objective, Chapter III, General Objectives for all Inland Surface Waters, Enclosed Bays and Estuaries states the following: The dissolved oxygen concentration for cold water habitats shall not be reduced below 8.0 mg/l at any time.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Hot Spring Canyon Creek (Orange County) was collected at 1 monitoring site [Hot Spring Canyon Creek ~1.2mi above Hwy 74 - 901S01705]
Temporal Representation:	Data was collected on a single day 5/14/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47859, Oxygen, Dissolved **Region 9**

Hot Spring Canyon Creek (Orange County)

LOE ID:	73901
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	1	042744
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Hot Spring Canyon Creek (Orange County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Oxygen, Dissolved.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan, San Diego Basin, Warm Water Habitat Objective, Chapter III, General Objectives for all Inland Surface Waters, Enclosed Bays and Estuaries states the following: The dissolved oxygen concentration for warm water habitats shall not be reduced below 5.0 mg/l at any time.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Hot Spring Canyon Creek (Orange County) was collected at 1 monitoring site [Hot Spring Canyon Creek ~1.2mi above Hwy 74 - 901S01705]	
Temporal Representation:	Data was collected on a single day 5/14/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID **47860** **Region 9**

Hot Spring Canyon Creek (Orange County)

Pollutant:	**Permethrin, total**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Water Quality Criteria for Permethrin. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Water Quality Criteria for Permethrin and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the

applicable beneficial use support rating. 042745

Line of Evidence (LOE) for Decision ID 47860, Permethrin, total **Region 9**

Hot Spring Canyon Creek (Orange County)

LOE ID:	73831
Pollutant:	Permethrin, total
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Hot Spring Canyon Creek (Orange County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Permethrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Permethrin does not exceed 0.002 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Hot Spring Canyon Creek (Orange County) was collected at 1 monitoring site [Hot Spring Canyon Creek ~1.2mi above Hwy 74 - 901S01705]
Temporal Representation:	Data was collected on a single day 5/14/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 47861 **Region 9**

Hot Spring Canyon Creek (Orange County)

Pollutant:	**Selenium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the One samples exceed the California Toxics Rule Objective for Selenium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples exceeded the California Toxics Rule Objective for Selenium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47861, Selenium **Region 9**

Hot Spring Canyon Creek (Orange County)

LOE ID:	73835
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Hot Spring Canyon Creek (Orange County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Selenium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The selenium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater is 0.005 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Hot Spring Canyon Creek (Orange County) was collected at 1 monitoring site [Hot Spring Canyon Creek ~1.2mi above Hwy 74 - 901S01705]
Temporal Representation:	Data was collected on a single day 5/14/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 47862 **Region 9**

Hot Spring Canyon Creek (Orange County)

Pollutant:	**Silver**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the California Toxics Rule Objective for Silver.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples exceeded the California Toxics Rule Objective for Silver and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47862, Silver **Region 9**

Hot Spring Canyon Creek (Orange County)

LOE ID:	73837
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Hot Spring Canyon Creek (Orange County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Silver.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Silver to protect aquatic life in freshwater. The dissolved Silver criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.

Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Hot Spring Canyon Creek (Orange County) was collected at 1 monitoring site [Hot Spring Canyon Creek ~1.2mi above Hwy 74 - 901S01705]
Temporal Representation:	Data was collected on a single day 5/14/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 47863 Region 9

Hot Spring Canyon Creek (Orange County)

Pollutant:	**Sulfates**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the Site Specific Objective for Sulfates in Hot Springs Canyon Creek (Orange County). Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one samples exceeded the Site Specific Objective for Sulfates in Hot Springs Canyon Creek (Orange County) and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47863, Sulfates Region 9

Hot Spring Canyon Creek (Orange County)

LOE ID:	73839
Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Hot Spring Canyon Creek (Orange County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Sulfate.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Sulfate objective for the protection of aquatic life according to Table 3-2 for Hot Spring Canyon Creek (Orange County) within the San Juan Hydrologic Unit is 250 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Hot Spring Canyon Creek (Orange County) was collected at 1 monitoring site [Hot Spring Canyon Creek ~1.2mi above Hwy 74 - 901S01705]
Temporal Representation:	Data was collected on a single day 5/14/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 47864 Region 9

Hot Spring Canyon Creek (Orange County)

Pollutant:	**Temperature, water**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the Basin Plan Objective for Temperature, water.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples exceeded the Basin Plan Objective for Temperature, water and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47864, Temperature, water **Region 9**

Hot Spring Canyon Creek (Orange County)

LOE ID:	73840
Pollutant:	Temperature, water
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Hot Spring Canyon Creek (Orange County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Water Temperature.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Board that such alteration in temperature does not adversely affect beneficial uses. At no time or place shall the temperature of any COLD water be increased more than 5Â°F above the natural receiving water temperature.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Inland Fishes of California (Moyle 1976) states that for rainbow trout the optimum range for growth and completion of most life stages is 13-21 degrees C (page 129).
Guideline Reference:	Inland Fishes of California
Spatial Representation:	Data for this line of evidence for Hot Spring Canyon Creek (Orange County) was collected at 1 monitoring site [Hot Spring Canyon Creek ~1.2mi above Hwy 74 - 901S01705]
Temporal Representation:	Data was collected on a single day 5/14/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 47865 **Region 9**

Hot Spring Canyon Creek (Orange County)

Pollutant:	**Total Dissolved Solids**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the One samples exceed the Basin Plan Objective for Total Dissolved Solids.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples exceeded the Basin Plan Objective for Total Dissolved Solids and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47865, Total Dissolved Solids **Region 9**

Hot Spring Canyon Creek (Orange County)

LOE ID:	73842
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Hot Spring Canyon Creek (Orange County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Dissolved Solids.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Dissolved Solids objective for the protection of aquatic life according to Table 3-2 for Hot Spring Canyon Creek (Orange County) within the San Juan Hydrologic Unit is 500 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Hot Spring Canyon Creek (Orange County) was collected at 1 monitoring site [Hot Spring Canyon Creek ~1.2mi above Hwy 74 - 901S01705]
Temporal Representation:	Data was collected on a single day 5/14/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 48920 Region 9

Hot Spring Canyon Creek (Orange County)

Pollutant:	**Toxicity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. One of the One samples exceed the exhibited water toxicity.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of One samples exhibited water toxicity and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48920, Toxicity Region 9

Hot Spring Canyon Creek (Orange County)

LOE ID:	73843
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to evaluate water toxicity. The sample exhibited significant toxicity. The toxicity test included survival and reproduction of Ceriodaphnia dubia. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP

Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL, Significant compared to negative control based on statistical test, less than stated alpha level, AND less than the evaluation threshold (both criteria are met).
Guideline Reference:	
Spatial Representation:	The sample was collected at station 901S01705.
Temporal Representation:	The sample was collected in May 2009.
Environmental Conditions:	
QAPP Information:	Data quality is good. Data results were recorded in the SWAMP database and followed SWAMP protocols.
QAPP Information Reference(s):	

DECISION ID 47866 Region 9

Hot Spring Canyon Creek (Orange County)

Pollutant:	**Turbidity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Basin Plan Objective for Turbidity. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one samples exceeded the Basin Plan Objective for Turbidity and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47866, Turbidity Region 9

Hot Spring Canyon Creek (Orange County)

LOE ID:	73845	042754

Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Hot Spring Canyon Creek (Orange County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Turbidity(NTU).
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Turbidity(NTU) objective for the protection of aquatic life according to Table 3-2 for Hot Spring Canyon Creek (Orange County) within the San Juan Hydrologic Unit is 20 NTU.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Hot Spring Canyon Creek (Orange County) was collected at 1 monitoring site [Hot Spring Canyon Creek ~1.2mi above Hwy 74 - 901S01705]
Temporal Representation:	Data was collected on a single day 5/14/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID	**47867**	**Region 9**
Hot Spring Canyon Creek (Orange County)		

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary and under section 3.6 at least two lines of evidence are necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the California Toxics Rule Objective for Zinc.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.

3. Zero of one samples exceeded the California Toxics Rule Objective for Zinc and the sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47867, Zinc **Region 9**

Hot Spring Canyon Creek (Orange County)

LOE ID:	73847
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Hot Spring Canyon Creek (Orange County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for zinc is 459 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Hot Spring Canyon Creek (Orange County) was collected at 1 monitoring site [Hot Spring Canyon Creek ~1.2mi above Hwy 74 - 901S01705]
Temporal Representation:	Data was collected on a single day 5/14/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 47867, Zinc **Region 9**

Hot Spring Canyon Creek (Orange County)

LOE ID:	73849
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	Dissolved	042756
Beneficial Use:	Cold Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Hot Spring Canyon Creek (Orange County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Zinc to protect aquatic life in freshwater. The dissolved Zinc criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Hot Spring Canyon Creek (Orange County) was collected at 1 monitoring site [Hot Spring Canyon Creek ~1.2mi above Hwy 74 - 901S01705]	
Temporal Representation:	Data was collected on a single day 5/14/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID 47868 Region 9

Hot Spring Canyon Creek (Orange County)

Pollutant:	**pH**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the Basin Plan Objective for pH.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples exceeded the Basin Plan Objective for pH and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available

indicating that standards are not met. 042757

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47868, pH **Region 9**

Hot Spring Canyon Creek (Orange County)

LOE ID:	73833
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Hot Spring Canyon Creek (Orange County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for pH.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	In inland surface waters the pH shall not be depressed below 6.5 nor raised above 8.5.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Hot Spring Canyon Creek (Orange County) was collected at 1 monitoring site [Hot Spring Canyon Creek ~1.2mi above Hwy 74 - 901S01705]
Temporal Representation:	Data was collected on a single day 5/14/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Adobe Creek (Riverside County)
Water Body ID: CAR9022100020110825104941
Water Body Type: River & Stream

DECISION ID 48723 **Region 9**
Adobe Creek (Riverside County)

Pollutant: **Benthic Community Effects**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: Benthic Community Effects is being considered for placement on the CWA section 303(d) List under sections 3.9 and 3.1 of the Listing Policy. Under section 3.9, an additional line of evidence associating Benthic Community Effects with a water or sediment concentration of pollutant(s) is necessary to assess listing status.

Based on the readily available data and information, the weight of evidence provides sufficient justification for not placing Benthic Community Effects in this water segment on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Pursuant to section 3.9 of the Listing Policy, the water does not exhibit significant degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index.
4. Pursuant to section 3.9 of the Listing Policy, the water segment does not have associated pollutant(s) samples that exceed water quality objectives.
5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not being met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. Furthermore, what data is available does not indicate that the benthic community exhibits degradation when compared to reference.

Line of Evidence (LOE) for Decision ID 48723, Benthic Community Effects **Region 9**
Adobe Creek (Riverside County)

LOE ID: 72848

Pollutant: Benthic-Macroinvertebrate Bioassessments
LOE Subgroup: Population/Community Degradation
Matrix: Water
Fraction: None

Beneficial Use: Cold Freshwater Habitat

Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	The IBI score for this water body was 49 which indicates that this water body is not considered to have impaired conditions.
Data Reference:	RWB9 Status Sampling 2007 and 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at the following station: 902SMADO2 (Adobe Creek 2).
Temporal Representation:	Survey done June 5, 2007.
Environmental Conditions:	
QAPP Information:	Data collected following SWAMP QA protocols for the RWB9 Status Sampling 2007 and 2008 water quality monitoring project.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 48723, Benthic Community Effects **Region 9**

Adobe Creek (Riverside County)

LOE ID:	79429
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	The CSCI score for this site is above the 0.79 threshold, and is therefore not exceeding the water quality objective for the aquatic life beneficial use.
Data Reference:	RWB9 Status Sampling 2007 and 2008 Region 9 CSCI Scores & Water Body Information
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in

	a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.
Guideline Reference:	The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.
Spatial Representation:	Samples were collected at the following station: 902SMADO2 (Adobe Creek 2).
Temporal Representation:	Survey done June 5, 2007.
Environmental Conditions:	
QAPP Information:	Data collected following SWAMP QA protocols for the RWB9 Status Sampling 2007 and 2008 water quality monitoring project.
QAPP Information Reference(s):	RWB9 Status Sampling 2007 and 2008

DECISION ID 48715 Region 9

Adobe Creek (Riverside County)

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.3 of the Listing Policy. Under section 3.3 a single line of evidence is necessary to assess listing status. Three lines of evidence are available in the administrative record to assess this pollutant. Zero of the two samples exceed the single sample objective for enterococcus. Zero of two samples exceed the single sample objectives for fecal and total coliform. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of two samples exceed the singles sample objective and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48715, Indicator Bacteria Region 9

Adobe Creek (Riverside County)

LOE ID:	72775
Pollutant:	Total Coliform

LOE Subgroup:	Pollutant-Water	042761
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	2	
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Zero of the two samples exceeded the total coliform objective.	
Data Reference:	Data for Various Pollutants in Riverside County, 2007-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life. Basin Plan for the San Diego Basin.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The total coliform concentration shall not exceed more than 10000/100 ml. Guidance for Fresh Water Beaches (CDPH).	
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.	
Spatial Representation:	The samples were collected at Adobe Creek.	
Temporal Representation:	Samples were collected on Oct 22, 2008 and May 21, 2009.	
Environmental Conditions:		
QAPP Information:	No QAPP was submitted. Sampling was done by municipalities in Riverside County pursuant to the Riverside County Municipal Stormwater Permit.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 48715, Indicator Bacteria **Region 9**

Adobe Creek (Riverside County)

LOE ID:	72773
Pollutant:	Escherichia coli (E. coli)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the two samples exceeded the E. Coli objective.
Data Reference:	Data for Various Pollutants in Riverside County, 2007-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The E. coli concentration shall not exceed more than 235/100 ml. USEPA Ambient Water Quality Criteria for Bacteria - 1986.
Objective/Criterion Reference:	Ambient Water Quality Criteria for Bacteria - 1986. EPA440/5-84-002
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Adobe Creek.
Temporal Representation:	Samples were collected on Oct 22, 2008 and May 21, 2009.

Environmental Conditions: 042762
QAPP Information: No QAPP was submitted. Sampling was done by municipalities in Riverside County pursuant to the Riverside County Municipal Stormwater Permit.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 48715, Indicator Bacteria **Region 9**

Adobe Creek (Riverside County)

LOE ID: 72774

Pollutant: Fecal Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 2
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Zero of the two samples exceeded the fecal coliform objective.
Data Reference: Data for Various Pollutants in Riverside County, 2007-2009.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The Fecal Coliform concentration shall not exceed more than 400/100 ml. Water Quality Control Plan for The San Diego Basin.
Objective/Criterion Reference: Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:
Guideline Reference:

Spatial Representation: The samples were collected at Adobe Creek.
Temporal Representation: Samples were collected on Oct 22, 2008 and May 21, 2009.
Environmental Conditions:
QAPP Information: No QAPP was submitted. Sampling was done by municipalities in Riverside County pursuant to the Riverside County Municipal Stormwater Permit.
QAPP Information Reference(s):

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Stone Creek (San Diego County)
Water Body ID: CAR9022200020110820082651
Water Body Type: River & Stream

DECISION ID 51747 **Region 9**
Stone Creek (San Diego County)

Pollutant: Benthic Community Effects
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollution

Regional Board Conclusion:

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 51747, Benthic Community Effects **Region 9**
Stone Creek (San Diego County)

LOE ID: 76948

Pollutant: Benthic-Macroinvertebrate Bioassessments
LOE Subgroup: Population/Community Degradation
Matrix: Water
Fraction: None

Beneficial Use: Cold Freshwater Habitat

Number of Samples: 2
Number of Exceedances: 0

Data and Information Type: Benthic macroinvertebrate surveys
Data Used to Assess Water Quality: All of the IBI scores for this water body were above 40 which indicates that this water body is not considered to have impaired conditions.
Data Reference: RWB9 Status Sampling 2007 and 2008

SWAMP Data: SWAMP

Water Quality Objective/Criterion: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference: Water Quality Control Plan for the San Diego Basin

Evaluation Guideline: The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference: A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams.

	Environmental Management. Volume 35, number 1 (2005): pp. 1-13 042764
Spatial Representation:	Samples were collected at the following station: 902SMSTN1-Stone Creek 1.
Temporal Representation:	Surveys done June 5, 2007 and May 6, 2008.
Environmental Conditions:	
QAPP Information:	Data collected following SWAMP QA protocols for the RWB9 Status Sampling 2007 and 2008 water quality monitoring project.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 51747, Benthic Community Effects **Region 9**

Stone Creek (San Diego County)

LOE ID:	79477
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	The CSCI scores for this site are above the 0.79 threshold, and therefore the site is not exceeding the water quality objective for the aquatic life beneficial use.
Data Reference:	RWB9 Status Sampling 2007 and 2008 Region 9 CSCI Scores & Water Body Information
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.
Guideline Reference:	The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.
Spatial Representation:	Samples were collected at the following station: 902SMSTN1-Stone Creek 1.
Temporal Representation:	Surveys done June 5, 2007 and May 6, 2008.
Environmental Conditions:	
QAPP Information:	Data collected following SWAMP QA protocols for the RWB9 Status Sampling 2007 and 2008 water quality monitoring project.
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: East Channel Creek
Water Body ID: CAR9031100020110812103625
Water Body Type: River & Stream

DECISION ID 48412 **Region 9**
East Channel Creek

Pollutant: Cadmium
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 7 samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 7 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48412, Cadmium **Region 9**
East Channel Creek

LOE ID: 73504

Pollutant: Cadmium
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Warm Freshwater Habitat

Number of Samples: 7

Number of Exceedances:	0	042766
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for East Channel Creek to determine beneficial use support and results are as follows: 0 of 7 samples exceed the criterion for Cadmium.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for East Channel Creek was collected at 1 monitoring site [East Channel Creek @ Hutchinson Street and Hidden Lake Lane]	
Temporal Representation:	Data was collected 6/3/2003 - 5/28/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID	**48421**	**Region 9**
East Channel Creek		

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of 0 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 0 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision	After review of the available data and information, RWQCB staff concludes that the water body-

Recommendation:	pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.	14267

Line of Evidence (LOE) for Decision ID 48421, Chlorpyrifos **Region 9**

East Channel Creek

LOE ID:	73505
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for East Channel Creek to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).
Spatial Representation:	Data for this line of evidence for East Channel Creek was collected at 1 monitoring site [East Channel Creek @ Hutchinson Street and Hidden Lake Lane]
Temporal Representation:	Data was collected over the time period 9/29/2005-5/28/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **48413** **Region 9**

East Channel Creek

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 7 samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 7 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48413, Copper East Channel Creek **Region 9**

LOE ID:	73506
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for East Channel Creek to determine beneficial use support and results are as follows: 0 of 7 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for East Channel Creek was collected at 1 monitoring site [East Channel Creek @ Hutchinson Street and Hidden Lake Lane]

Temporal Representation:	Data was collected 6/3/2003 - 5/28/2009.	042769
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID 48422 Region 9

East Channel Creek

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of 5 samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 5 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48422, Diazinon Region 9

East Channel Creek

LOE ID:	73507
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for East Channel Creek to determine

	beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Data for this line of evidence for East Channel Creek was collected at 1 monitoring site [East Channel Creek @ Hutchinson Street and Hidden Lake Lane]
Temporal Representation:	Data was collected over the time period 9/29/2005-5/28/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID	48416	Region 9
East Channel Creek		

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of 7 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 7 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48416, Lead **Region 9**

East Channel Creek

LOE ID:	73510
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for East Channel Creek to determine beneficial use support and results are as follows: 0 of 7 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for East Channel Creek was collected at 1 monitoring site [East Channel Creek @ Hutchinson Street and Hidden Lake Lane]
Temporal Representation:	Data was collected 6/3/2003 - 5/28/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **48423** **Region 9**

East Channel Creek

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of 5 samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 5 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48423, Malathion **Region 9**

East Channel Creek

LOE ID:	73511
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for East Channel Creek to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Malathion.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for East Channel Creek was collected at 1 monitoring site [East Channel Creek @ Hutchinson Street and Hidden Lake Lane]
Temporal Representation:	Data was collected over the time period 9/29/2005-5/28/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID	48426	042773 Region 9
East Channel Creek		

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of 7 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 7 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48426, Zinc	**Region 9**
East Channel Creek	

LOE ID:	73513
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for East Channel Creek to determine beneficial use support and results are as follows: 0 of 7 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life

	in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for East Channel Creek was collected at 1 monitoring site [East Channel Creek @ Hutchinson Street and Hidden Lake Lane]
Temporal Representation:	Data was collected 6/3/2003 - 5/28/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 48425 Region 9

East Channel Creek

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2029
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.3 of the Listing Policy. Under section 3.3 a single line of evidence is necessary to assess listing status. Three lines of evidence are available in the administrative record to assess this pollutant. Data from 2003 to 2009 show that 7 of 7 single samples exceed the water quality objective for enterococcus of a SSM of 61/100ml in fresh water for the protection of REC-1 beneficial use. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Data from 2003 to 2009 show that 7 of 7 single samples exceed the water quality objective for enterococcus of a SSM of 61/100ml in fresh water for the protection of REC-1 beneficial use and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 48425, Indicator Bacteria Region 9

East Channel Creek

LOE ID:	73512	042775

Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	7
Number of Exceedances:	1
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for East Channel Creek to determine beneficial use support and results are as follows: 1 of 7 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxicsubstances in concentrations which are toxic to,or which produce detrimental physiologicalresponses in human, plant, animal, or indigenousaquatic life (Basin Plan).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In waters designated for water contact recreation (REC I), the total coliform concentration shall not exceed 10000 MPN/100 ml (CDPH 2006).
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.
Spatial Representation:	Data for this line of evidence for East Channel Creek was collected at 1 monitoring site [East Channel Creek @ Hutchinson Street and Hidden Lake Lane]
Temporal Representation:	Data was collected over the time period 6/3/2003-5/28/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48425, Indicator Bacteria **Region 9**

East Channel Creek

LOE ID:	73509
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	7
Number of Exceedances:	3
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for East Channel Creek to determine beneficial use support and results are as follows: 3 of 7 samples exceed the criterion for Coliform, Fecal.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.

SWAMP Data:	Non-SWAMP	042776
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the fecal coliform concentration shall not exceed 400 MPN/100 ml.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for East Channel Creek was collected at 1 monitoring site [East Channel Creek @ Hutchinson Street and Hidden Lake Lane]	
Temporal Representation:	Data was collected over the time period 6/3/2003-5/28/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 48425, Indicator Bacteria **Region 9**

East Channel Creek

LOE ID:	73508
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	7
Number of Exceedances:	7
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for East Channel Creek to determine beneficial use support and results are as follows: 7 of 7 samples exceed the criterion for Enterococci.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Samples shall not exceed 61 organisms per 100 ml for enterococcus in waters designated for REC I beneficial use (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for East Channel Creek was collected at 1 monitoring site [East Channel Creek @ Hutchinson Street and Hidden Lake Lane]
Temporal Representation:	Data was collected over the time period 6/3/2003-5/28/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Green Canyon Creek
Water Body ID: CAR9031200020110809151245
Water Body Type: River & Stream

DECISION ID 47412 **Region 9**
Green Canyon Creek

Pollutant: Cadmium
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the 14 samples exceed the California Toxics Rule Objective for Cadmium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 14 samples exceeded the California Toxics Rule Objective for Cadmium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47412, Cadmium **Region 9**
Green Canyon Creek

LOE ID: 73755

Pollutant: Cadmium
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Warm Freshwater Habitat

Number of Samples:	14	042778
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Green Canyon Creek to determine beneficial use support and results are as follows: 0 of 8 samples exceed the criterion for Cadmium.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Green Canyon Creek was collected at 2 monitoring sites [Green Canyon Creek @ Sycamore Drive, Ostrich Farm Creek at Highway 76]	
Temporal Representation:	Data was collected 6/2/2003 - 6/9/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID	**47413**	**Region 9**
Green Canyon Creek		

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the zero samples exceed the Water Quality Criteria fro Chlorpyrifos. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of zero samples exceeded the Water Quality Criteria for Chlorpyrifos and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47413, Chlorpyrifos **Region 9**

Green Canyon Creek

LOE ID:	73756
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Green Canyon Creek to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).
Spatial Representation:	Data for this line of evidence for Green Canyon Creek was collected at 2 monitoring sites [Green Canyon Creek @ Sycamore Drive, Ostrich Farm Creek at Highway 76]
Temporal Representation:	Data was collected over the time period 9/29/2005-6/9/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **47414** **Region 9**

Green Canyon Creek

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised

Impairment from Pollutant or Pollution:	Pollutant	042780
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the 14 samples exceed the California Toxics Rule Objective for Copper. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 14 samples exceeded the California Toxics Rule Objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.	
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.	

Line of Evidence (LOE) for Decision ID 47414, Copper **Region 9**

Green Canyon Creek

LOE ID:	73757
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	14
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Green Canyon Creek to determine beneficial use support and results are as follows: 0 of 14 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Data for this line of evidence for Green Canyon Creek was collected at 2 monitoring sites [Green Canyon Creek @ Sycamore Drive, Ostrich Farm Creek at Highway 76]
Temporal Representation:	Data was collected 6/2/2003 - 6/9/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 47415 Region 9

Green Canyon Creek

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the 9 samples exceed the Evaluation Guideline for Diazinon. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 9 samples exceeded the Evaluation Guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47415, Diazinon Region 9

Green Canyon Creek

LOE ID:	73758
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	9

Number of Exceedances:	0	042782
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Green Canyon Creek to determine beneficial use support and results are as follows: 0 of 9 samples exceed the criterion for Diazinon.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).	
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game	
Spatial Representation:	Data for this line of evidence for Green Canyon Creek was collected at 2 monitoring sites [Green Canyon Creek @ Sycamore Drive, Ostrich Farm Creek at Highway 76]	
Temporal Representation:	Data was collected over the time period 9/29/2005-6/9/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID	**47418**	**Region 9**
Green Canyon Creek		

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the 14 samples exceed the California Toxics Rule Objective for Lead.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 14 samples exceeded the California Toxics Rule for Lead and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47418, Lead **Region 9**

Green Canyon Creek

LOE ID:	73761
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	14
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Green Canyon Creek to determine beneficial use support and results are as follows: 0 of 14 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Green Canyon Creek was collected at 2 monitoring sites [Green Canyon Creek @ Sycamore Drive, Ostrich Farm Creek at Highway 76]
Temporal Representation:	Data was collected 6/2/2003 - 6/9/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **47419** **Region 9**

Green Canyon Creek

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the nine samples exceed the Water Quality Criteria for Malathion. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of nine samples exceeded the Water Quality Criteria for Malathion and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47419, Malathion **Region 9**

Green Canyon Creek

LOE ID:	73762
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Green Canyon Creek to determine beneficial use support and results are as follows: 0 of 9 samples exceed the criterion for Malathion.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Green Canyon Creek was collected at 2 monitoring sites [Green Canyon Creek @ Sycamore Drive, Ostrich Farm Creek at Highway 76]
Temporal Representation:	Data was collected over the time period 9/29/2005-6/9/2009.

Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 47423 Region 9

Green Canyon Creek

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the 14 samples exceed the California Toxics Rule Objective for zinc.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 14 samples exceeded the California Toxics Rule Objective for zinc and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47423, Zinc Region 9

Green Canyon Creek

LOE ID:	73764
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	14
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Green Canyon Creek to

	determine beneficial use support and results are as follows: 0 of 14 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Green Canyon Creek was collected at 2 monitoring sites [Ostrich Farm Creek at Highway 76, Green Canyon Creek @ Sycamore Drive]
Temporal Representation:	Data was collected over the time period 6/2/2003-6/3/2003.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID	47416	Region 9
Green Canyon Creek		

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.3 of the Listing Policy. Under section 3.3 a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. Eighteen of the 18 samples exceed the Single Sample Maximum Objective for Enterococcus, Ten out of 18 samples exceeded the Single Sample Maximum Objective for Fecal Coliform, and Five out of 18 samples exceeded the Single Sample Maximum Guideline for Total Coliform.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Eighteen of the 18 samples exceed the Single Sample Maximum Objective for Enterococcus, Ten out of 18 samples exceeded the Single Sample Maximum Objective for Fecal Coliform, and Five out of 18 samples exceeded the Single Sample Maximum Guideline for Total Coliform, and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 47416, Indicator Bacteria **Region 9**

Green Canyon Creek

LOE ID:	73760
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	18
Number of Exceedances:	10
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Green Canyon Creek to determine beneficial use support and results are as follows: 10 of 18 samples exceed the criterion for Coliform, Fecal.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the fecal coliform concentration shall not exceed 400 MPN/100 ml.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Green Canyon Creek was collected at 2 monitoring sites [Ostrich Farm Creek at Highway 76, Green Canyon Creek @ Sycamore Drive]
Temporal Representation:	Data was collected over the time period 6/2/2003-6/9/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47416, Indicator Bacteria **Region 9**

Green Canyon Creek

LOE ID:	73759
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	18
Number of Exceedances:	18

Data and Information Type:	PATHOGEN MONITORING	042788
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Green Canyon Creek to determine beneficial use support and results are as follows: 18 of 18 samples exceed the criterion for Enterococci.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Samples shall not exceed 61 organisms per 100 ml for enterococcus in waters designated for REC I beneficial use (Water Quality Control Plan for the San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Green Canyon Creek was collected at 2 monitoring sites [Ostrich Farm Creek at Highway 76, Green Canyon Creek @ Sycamore Drive]	
Temporal Representation:	Data was collected over the time period 6/2/2003-6/9/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 47416, Indicator Bacteria **Region 9**

Green Canyon Creek

LOE ID:	73763
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	18
Number of Exceedances:	5
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Green Canyon Creek to determine beneficial use support and results are as follows: 5 of 18 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxicsubstances in concentrations which are toxic to,or which produce detrimental physiologicalresponses in human, plant, animal, or indigenousaquatic life (Basin Plan).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In waters designated for water contact recreation (REC I), the total coliform concentration shall not exceed 10000 MPN/100 ml (CDPH 2006).
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.
Spatial Representation:	Data for this line of evidence for Green Canyon Creek was collected at 2 monitoring sites [Ostrich Farm Creek at Highway 76, Green Canyon Creek @ Sycamore Drive]
Temporal Representation:	Data was collected over the time period 6/2/2003-6/9/2009.

Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Live Oak Creek (San Diego County)
Water Body ID: CAR9031200020110809154741
Water Body Type: River & Stream

DECISION ID 48186 **Region 9**
Live Oak Creek (San Diego County)

Pollutant: Benthic-Macroinvertebrate Bioassessments
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: Benthic Community Effects is being considered for placement on the CWA section 303(d) List under sections 3.9 of the Listing Policy. Under section 3.9, an additional line of evidence associating the Benthic Community Effects with a water or sediment concentration of pollutants is necessary to assess listing status. One lines of evidence is/are available in the administrative record to assess this indicator. One of One samples exceeded the Evaluation Guideline for Benthic Community Effects.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing Benthic Community Effects in this water segment on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of One samples exceeded the Index of Biological Integrity (IBI) value of ?poor? water quality for this area and this sample size is insufficient to determine with the power and confidence of the Listing Policy if standards are not met. A minimum of 2 samples is needed to determine impairment using Table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48186, Benthic-Macroinvertebrate Bioassessments **Region 9**
Live Oak Creek (San Diego County)

LOE ID: 74132

Pollutant: Benthic-Macroinvertebrate Bioassessments
LOE Subgroup: Population/Community Degradation
Matrix: Water
Fraction: None

Beneficial Use: Warm Freshwater Habitat

Number of Samples:	1	042791
Number of Exceedances:	1	
Data and Information Type:	Benthic macroinvertebrate surveys	
Data Used to Assess Water Quality:	The IBI score for this water body is 26 which indicates that this water body may be considered to have impaired conditions.	
Data Reference:	RWB9 Status Sampling 2007 and 2008	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.	
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13	
Spatial Representation:	Samples were collected at the following station: 903SLGRD2 (Gird Creek 2 at Oak Cliff Drive).	
Temporal Representation:	Surveys done May 9, 2008.	
Environmental Conditions:		
QAPP Information:	Data collected following SWAMP QA protocols for the RWB9 Status Sampling 2007 and 2008 water quality monitoring project.	
QAPP Information Reference(s):		

DECISION ID 48187 Region 9

Live Oak Creek (San Diego County)

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the Twelve samples exceed the California Toxics Rule Objective for Cadmium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Twelve samples exceeded the California Toxics Rule Objective for Cadmium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48187, Cadmium **Region 9**

Live Oak Creek (San Diego County)

LOE ID:	74133
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Live Oak Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 12 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Live Oak Creek (San Diego County) was collected at 2 monitoring sites [Live Oak Creek @ Oak Cliff Drive, Live Oak Creek at Highway 76]
Temporal Representation:	Data was collected July 2003 - June 2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **48188** **Region 9**

Live Oak Creek (San Diego County)

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the Zero samples exceed the Water Quality Criteria for Chlorpyrifos. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Zero samples exceeded the Water Quality Criteria for Chlorpyrifos and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48188, Chlorpyrifos **Region 9**

Live Oak Creek (San Diego County)

LOE ID:	74134
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Live Oak Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).

Spatial Representation:	Data for this line of evidence for Live Oak Creek (San Diego County) was collected at 2 monitoring sites [Live Oak Creek @ Oak Cliff Drive, Live Oak Creek at Highway 76]
Temporal Representation:	Data was collected over the time period 9/29/2005-6/9/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 48190 Region 9

Live Oak Creek (San Diego County)

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the Twelve samples exceed the California Toxics Rule Objective for Copper. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Twelve samples exceeded the California Toxics Rule Objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48190, Copper Region 9

Live Oak Creek (San Diego County)

LOE ID:	74135
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	12
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Live Oak Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California, 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Live Oak Creek (San Diego County) was collected at 2 monitoring sites [Live Oak Creek @ Oak Cliff Drive, Live Oak Creek at Highway 76]
Temporal Representation:	Data was collected July 2003 - June 2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 48191 Region 9

Live Oak Creek (San Diego County)

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a Single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the Nine samples exceed the Water Quality Criteria for Diazinon.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Nine samples exceeded the Water Quality Criteria for Diazinon and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision

After review of the available data and information, RWQCB staff concludes that the water body-

Recommendation: pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. 14276

Line of Evidence (LOE) for Decision ID 48191, Diazinon **Region 9**

Live Oak Creek (San Diego County)

LOE ID:	74136
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Live Oak Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 9 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Data for this line of evidence for Live Oak Creek (San Diego County) was collected at 2 monitoring sites [Live Oak Creek @ Oak Cliff Drive, Live Oak Creek at Highway 76]
Temporal Representation:	Data was collected over the time period 9/29/2005-6/9/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 48194 **Region 9**

Live Oak Creek (San Diego County)

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of

the Listing Policy. Under section 3.1 a Single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. One of the Twelve samples exceed the California Toxics Rule Objective for Lead.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of Twelve samples exceeded the California Toxics Rule Objective for Lead and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48194, Lead **Region 9**

Live Oak Creek (San Diego County)

LOE ID:	74139
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	12
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Live Oak Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Live Oak Creek (San Diego County) was collected at 2 monitoring sites [Live Oak Creek @ Oak Cliff Drive, Live Oak Creek at Highway 76]
Temporal Representation:	Data was collected July 2003 - June 2009.

Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 48196 Region 9

Live Oak Creek (San Diego County)

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the Nine samples exceed the Water Quality Criteria for Malathion.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Nine samples exceeded the Water Quality Criteria for Malathion and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48196, Malathion Region 9

Live Oak Creek (San Diego County)

LOE ID:	74140
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Live Oak Creek (San Diego

	County) to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Malathion.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Live Oak Creek (San Diego County) was collected at 2 monitoring sites [Live Oak Creek @ Oak Cliff Drive, Live Oak Creek at Highway 76]
Temporal Representation:	Data was collected over the time period 9/29/2005-6/9/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 48199 Region 9

Live Oak Creek (San Diego County)

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a Single line of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the Twelve samples exceed the California Toxics Rule Objective for Zinc. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Twelve samples exceeded the California Toxics Rule Objective for Zinc and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48199, Zinc **Region 9**

Live Oak Creek (San Diego County)

LOE ID:	74142
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Live Oak Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Live Oak Creek (San Diego County) was collected at 2 monitoring sites [Live Oak Creek @ Oak Cliff Drive, Live Oak Creek at Highway 76]
Temporal Representation:	Data was collected July 2003 - June 2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 48192 **Region 9**

Live Oak Creek (San Diego County)

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.3 of the Listing Policy. Under section 3.3 a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. Twelve of the Twelve samples exceed the Single Sample Maximum Objective for Enterococcus, Five out of Twelve samples exceeded the Single Sample Maxiumum Objective for Fecal Coliform, and Six out of Twelve samples exceeded the Single Sample Maximum Guideline for Total Coliform.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Twelve of the Twelve samples exceed the Single Sample Maximum Objective for Enterococcus, Five out of Twelve samples exceeded the Single Sample Maxiumum Objective for Fecal Coliform, and Six out of Twelve samples exceeded the Single Sample Maximum Guideline for Total Coliform and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 48192, Indicator Bacteria **Region 9**

Live Oak Creek (San Diego County)

LOE ID:	74137
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	12
Number of Exceedances:	12
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Live Oak Creek (San Diego County) to determine beneficial use support and results are as follows: 12 of 12 samples exceed the criterion for Enterococci.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Samples shall not exceed 61 organisms per 100 ml for enterococcus in waters designated for REC I beneficial use (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Live Oak Creek (San Diego County) was collected at 2 monitoring sites [Live Oak Creek @ Oak Cliff Drive, Live Oak Creek at Highway 76]
Temporal Representation:	Data was collected over the time period 7/1/2003-6/9/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix

Line of Evidence (LOE) for Decision ID 48192, Indicator Bacteria **Region 9**

Live Oak Creek (San Diego County)

LOE ID:	74141
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	12
Number of Exceedances:	6
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Live Oak Creek (San Diego County) to determine beneficial use support and results are as follows: 6 of 12 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxicsubstances in concentrations which are toxic to,or which produce detrimental physiologicalresponses in human, plant, animal, or indigenousaquatic life (Basin Plan).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In waters designated for water contact recreation (REC I), the total coliform concentration shall not exceed 10000 MPN/100 ml (CDPH 2006).
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.
Spatial Representation:	Data for this line of evidence for Live Oak Creek (San Diego County) was collected at 2 monitoring sites [Live Oak Creek @ Oak Cliff Drive, Live Oak Creek at Highway 76]
Temporal Representation:	Data was collected over the time period 7/1/2003-6/9/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48192, Indicator Bacteria **Region 9**

Live Oak Creek (San Diego County)

LOE ID:	74138
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	12
Number of Exceedances:	5
Data and Information Type:	PATHOGEN MONITORING

Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Live Oak Creek (San Diego County) to determine beneficial use support and results are as follows: 5 of 12 samples exceed the criterion for Coliform, Fecal.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the fecal coliform concentration shall not exceed 400 MPN/100 ml.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Live Oak Creek (San Diego County) was collected at 2 monitoring sites [Live Oak Creek @ Oak Cliff Drive, Live Oak Creek at Highway 76]
Temporal Representation:	Data was collected over the time period 7/1/2003-6/9/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Moosa Canyon, South Fork
Water Body ID: CAR9031300020110812104345
Water Body Type: River & Stream

DECISION ID 48124 **Region 9**
Moosa Canyon, South Fork

Pollutant: Cadmium
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the eight samples exceed the CRITERION for protection of the Aquatic Life beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 8 samples exceeded the CRITERIA for aquatic life which is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48124, Cadmium **Region 9**
Moosa Canyon, South Fork

LOE ID: 74408

Pollutant: Cadmium
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Warm Freshwater Habitat

Number of Samples: 8

Number of Exceedances:	0	042805
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Moosa Canyon, South Fork to determine beneficial use support and results are as follows: 0 of 8 samples exceed the criterion for Cadmium.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Moosa Canyon, South Fork was collected at 2 monitoring sites [Old 395 Creek @ 29013 Champagne Blvd. (Old Hwy 395), Old 395 Creek @ Old Hwy 395 (below outfall pipe next to pole # P719838)]	
Temporal Representation:	Data was collected in 2003, 2004, 2006, 2007,and 2009	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID	**48119**	**Region 9**
Moosa Canyon, South Fork		

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the zero samples exceed the CRITERION for protection of the Aquatic Life beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 0 samples exceeded the CRITERIA for aquatic life which is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48119, Chlorpyrifos **Region 9**

Moosa Canyon, South Fork

LOE ID:	74409
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Moosa Canyon, South Fork to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).
Spatial Representation:	Data for this line of evidence for Moosa Canyon, South Fork was collected at 2 monitoring sites [Old 395 Creek @ Old Hwy 395 (below outfall pipe next to pole # P719838), Old 395 Creek @ 29013 Champagne Blvd. (Old Hwy 395)]
Temporal Representation:	Data was collected over the time period 6/12/2006-6/9/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **48126** **Region 9**

Moosa Canyon, South Fork

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised

Impairment from Pollutant or Pollution:	Pollutant	042807
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the eight samples exceed the CRITERION for protection of the Aquatic Life beneficial use. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 8 samples exceeded the CRITERIA for aquatic life which is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.	
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.	

Line of Evidence (LOE) for Decision ID 48126, Copper **Region 9**

Moosa Canyon, South Fork

LOE ID:	74410
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Moosa Canyon, South Fork to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Data for this line of evidence for Moosa Canyon, South Fork was collected at 2 monitoring sites [Old 395 Creek @ 29013 Champagne Blvd. (Old Hwy 395), Old 395 Creek @ Old Hwy 395 (below outfall pipe next to pole # P719838)]
Temporal Representation:	Data was collected in 2003, 2004, 2006, 2007,and 2009
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 48120 Region 9

Moosa Canyon, South Fork

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the four samples exceed the CRITERION for protection of the Aquatic Life beneficial use. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 4 samples exceeded the CRITERIA for aquatic life which is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48120, Diazinon Region 9

Moosa Canyon, South Fork

LOE ID:	74411
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Moosa Canyon, South Fork to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Data for this line of evidence for Moosa Canyon, South Fork was collected at 2 monitoring sites [Old 395 Creek @ Old Hwy 395 (below outfall pipe next to pole # P719838), Old 395 Creek @ 29013 Champagne Blvd. (Old Hwy 395)]
Temporal Representation:	Data was collected over the time period 6/12/2006-6/9/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **48128** **Region 9**

Moosa Canyon, South Fork

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the eight samples exceed the CRITERION for protection of the Aquatic Life beneficial use. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 8 samples exceeded the CRITERIA for aquatic life which is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision	After review of the available data and information, RWQCB staff concludes that the water body-

Recommendation:	pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48128, Lead **Region 9**

Moosa Canyon, South Fork

LOE ID:	74414
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Moosa Canyon, South Fork to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Moosa Canyon, South Fork was collected at 2 monitoring sites [Old 395 Creek @ 29013 Champagne Blvd. (Old Hwy 395), Old 395 Creek @ Old Hwy 395 (below outfall pipe next to pole # P719838)]
Temporal Representation:	Data was collected in 2003, 2004, 2006, 2007,and 2009
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **48122** **Region 9**

Moosa Canyon, South Fork

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the four samples exceed the CRITERION for protection of the Aquatic Life beneficial use. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 4 samples exceeded the CRITERIA for aquatic life which is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48122, Malathion **Region 9**

Moosa Canyon, South Fork

LOE ID:	74415
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Moosa Canyon, South Fork to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Malathion.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Moosa Canyon, South Fork was collected at 2 monitoring sites [Old 395 Creek @ Old Hwy 395 (below outfall pipe next to pole # P719838), Old 395 Creek @ 29013 Champagne Blvd. (Old Hwy 395)]
Temporal Representation:	Data was collected over the time period 6/12/2006-6/9/2009.

Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 48131 Region 9

Moosa Canyon, South Fork

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the eight samples exceed the CRITERION for protection of the Aquatic Life beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 8 samples exceeded the CRITERIA for aquatic life which is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48131, Zinc Region 9

Moosa Canyon, South Fork

LOE ID:	74417
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Moosa Canyon, South Fork to determine beneficial use support and results are as follows: 0 of 2 samples exceed the

	criterion for Zinc. 042813
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Moosa Canyon, South Fork was collected at 2 monitoring sites [Old 395 Creek @ 29013 Champagne Blvd. (Old Hwy 395), Old 395 Creek @ Old Hwy 395 (below outfall pipe next to pole # P719838)]
Temporal Representation:	Data was collected in 2003, 2004, 2006, 2007,and 2009
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID	48134	Region 9
Moosa Canyon, South Fork		

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2027
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.3 of the Listing Policy. Under section 3.3 a single line of evidence is necessary to assess listing status. Three lines of evidence are available in the administrative record to assess this pollutant. Seven of the eight samples exceed the objective for enterococcus. Six of eight samples exceed the objective for fecal coliform and one of eight samples exceed the objective for total coliform. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Seven of eight and six of eight samples exceed the objectives and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality

standards are exceeded and a pollutant contributes to or causes the problem. 042814

Line of Evidence (LOE) for Decision ID 48134, Indicator Bacteria **Region 9**

Moosa Canyon, South Fork

LOE ID:	74412
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	8
Number of Exceedances:	7
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Moosa Canyon, South Fork to determine beneficial use support and results are as follows: 7 of 8 samples exceed the criterion for Enterococci.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Samples shall not exceed 61 organisms per 100 ml for enterococcus in waters designated for REC I beneficial use (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Moosa Canyon, South Fork was collected at 2 monitoring sites [Old 395 Creek @ 29013 Champagne Blvd. (Old Hwy 395), Old 395 Creek @ Old Hwy 395 (below outfall pipe next to pole # P719838)]
Temporal Representation:	Data was collected over the time period 5/15/2003-6/9/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48134, Indicator Bacteria **Region 9**

Moosa Canyon, South Fork

LOE ID:	74413
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	8
Number of Exceedances:	6
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Moosa Canyon, South Fork to

	determine beneficial use support and results are as follows: 6 of 8 samples exceed the criterion for Coliform, Fecal.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the fecal coliform concentration shall not exceed 400 MPN/100 ml.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Moosa Canyon, South Fork was collected at 2 monitoring sites [Old 395 Creek @ 29013 Champagne Blvd. (Old Hwy 395), Old 395 Creek @ Old Hwy 395 (below outfall pipe next to pole # P719838)]
Temporal Representation:	Data was collected over the time period 5/15/2003-6/9/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48134, Indicator Bacteria **Region 9**

Moosa Canyon, South Fork

LOE ID:	74416
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	8
Number of Exceedances:	1
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Moosa Canyon, South Fork to determine beneficial use support and results are as follows: 1 of 8 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxicsubstances in concentrations which are toxic to,or which produce detrimental physiologicalresponses in human, plant, animal, or indigenousaquatic life (Basin Plan).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In waters designated for water contact recreation (REC I), the total coliform concentration shall not exceed 10000 MPN/100 ml (CDPH 2006).
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.
Spatial Representation:	Data for this line of evidence for Moosa Canyon, South Fork was collected at 2 monitoring sites [Old 395 Creek @ 29013 Champagne Blvd. (Old Hwy 395), Old 395 Creek @ Old Hwy 395 (below outfall pipe next to pole # P719838)]
Temporal Representation:	Data was collected over the time period 5/15/2003-6/9/2009.

Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Gomez Creek
Water Body ID: CAR9032100020110302003234
Water Body Type: River & Stream

DECISION ID 47400 **Region 9**
Gomez Creek

Pollutant: Temperature, water
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One lines of evidence is available in the administrative record to assess this pollutant. Zero of the eight samples exceed the Evaluation Guideline for temperature, water.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of eight samples exceeded the Evaluation Guideline for temperature, water and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47400, Temperature, water **Region 9**
Gomez Creek

LOE ID: 73774

Pollutant: Temperature, water
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Cold Freshwater Habitat

Number of Samples:	8	042818
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	None of the 8 samples exceeded the evaluation guideline for temperature in this water body.	
Data Reference:	Data for Trash, Nutrients, and Pathogens in Region 9, 2007-2010.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Board that such alteration in temperature does not adversely affect beneficial uses. At no time or place shall the temperature of any COLD water be increased more than 5Â°F above the natural receiving water temperature.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	Evaluation Guideline: Inland Fishes of California (Moyle 1976) states that for rainbow trout the optimum range for growth and completion of most life stages is 13-21 degrees C (page 129).	
Guideline Reference:	Fish introductions in CA: History and impact on native fishes. Davis, CA: University of CA, Davis	
Spatial Representation:	Samples were collected at station SLR-070 (Gomez Creek from Rice Canyon).	
Temporal Representation:	Samples were collected between February, 2009 and July, 2010.	
Environmental Conditions:		
QAPP Information:	San Diego Regional Water Quality Assessment and Outreach Project Quality Assurance Project Plan Prepared by: Clay Clifton (San Diego Coastkeeper, Local Project Sponsor Manager), Bob Stafford (San Diego Stream Team), Dr. Rick Gersberg (San Diego State University), Bryan Bjorndal (Assure Controls, Inc.), and Morgan Justice-Black (I Love A Clean San Diego).	
QAPP Information Reference(s):		

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Couser Canyon Creek
Water Body ID: CAR9032100020110812102801
Water Body Type: River & Stream

DECISION ID 48351 **Region 9**
Couser Canyon Creek

Pollutant: Cadmium
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of 6 samples exceed the criteria for COLD and 0 of 6 samples exceed the criteria for MUN.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 6 samples exceed the criteria for COLD and 0 of 6 samples exceed the criteria for MUN and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table _____.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48351, Cadmium **Region 9**
Couser Canyon Creek

LOE ID: 73408

Pollutant: Cadmium
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Municipal & Domestic Supply

Number of Samples:	6	042820
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Couser Canyon Creek to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Cadmium.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for cadmium is 0.005 mg/L (Title 22 of the California Code of Regulations).	
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Couser Canyon Creek was collected at 1 monitoring site [Couser Canyon Creek @ Couser Canyon Road]	
Temporal Representation:	Data was collected over the time period 5/24/2004-6/8/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 48351, Cadmium **Region 9**

Couser Canyon Creek

LOE ID:	73409
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Couser Canyon Creek to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Data for this line of evidence for Couser Canyon Creek was collected at 1 monitoring site [042821 Couser Canyon Creek @ Couser Canyon Road]
Temporal Representation:	Data was collected over the time period 5/24/2004-6/8/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 48359 Region 9

Couser Canyon Creek

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of 0 samples exceed the criteria for COLD and 0 of 5 samples exceed the criteria for MUN. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 0 samples exceed the criteria for COLD and 0 of 5 samples exceed the criteria for MUN and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48359, Chlorpyrifos Region 9

Couser Canyon Creek

LOE ID:	73410
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Couser Canyon Creek to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).
Spatial Representation:	Data for this line of evidence for Couser Canyon Creek was collected at 1 monitoring site [Couser Canyon Creek @ Couser Canyon Road]
Temporal Representation:	Data was collected over the time period 8/10/2004-6/8/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48359, Chlorpyrifos **Region 9**

Couser Canyon Creek

LOE ID:	78012
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Couser Canyon Creek to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for chlorpyrifos is 2.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013

Spatial Representation:	Data for this line of evidence for Couser Canyon Creek was collected at 1 monitoring site [Couser Canyon Creek @ Couser Canyon Road]
Temporal Representation:	Data was collected over the time period 8/10/2004-6/8/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 48360 Region 9
Couser Canyon Creek

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of 7 samples exceed the criteria for COLD and 0 of 7 samples exceed the criteria for MUN. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 7 samples exceed the criteria for COLD and 0 of 7 samples exceed the criteria for MUN and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48360, Copper Region 9
Couser Canyon Creek

LOE ID:	73417
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7

Number of Exceedances:	0	042824

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Couser Canyon Creek to determine beneficial use support and results are as follows: 0 of 7 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for copper is 1.0 mg/L (Title 22 California Code of Regulations).
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Couser Canyon Creek was collected at 1 monitoring site [Couser Canyon Creek @ Couser Canyon Road]
Temporal Representation:	Data was collected over the time period 5/24/2004-6/8/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48360, Copper **Region 9**

Couser Canyon Creek

LOE ID:	73418
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Couser Canyon Creek to determine beneficial use support and results are as follows: 0 of 7 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Couser Canyon Creek was collected at 1 monitoring site [

	Couser Canyon Creek @ Couser Canyon Road]	042825
Temporal Representation:	Data was collected over the time period 5/24/2004-6/8/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID 48361 Region 9

Couser Canyon Creek

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of 5 samples exceed the criteria for COLD and 0 of 5 samples exceed the criteria for MUN.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 5 samples exceed the criteria for COLD and 0 of 5 samples exceed the criteria for MUN and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48361, Diazinon Region 9

Couser Canyon Creek

LOE ID:	73419
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	5
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	042826
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Couser Canyon Creek to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Diazinon.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).	
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game	
Spatial Representation:	Data for this line of evidence for Couser Canyon Creek was collected at 1 monitoring site [Couser Canyon Creek @ Couser Canyon Road]	
Temporal Representation:	Data was collected over the time period 8/10/2004-6/8/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 48361, Diazinon **Region 9**

Couser Canyon Creek

LOE ID:	78013
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Couser Canyon Creek to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for diazinon is 1.4 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Couser Canyon Creek was collected at 1 monitoring site [Couser Canyon Creek @ Couser Canyon Road]

Temporal Representation:	Data was collected over the time period 8/10/2004-6/8/2009. 042827
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 48352 Region 9

Couser Canyon Creek

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of 6 samples exceed the criteria for COLD and 0 of 6 samples exceed the criteria for MUN.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 6 samples exceed the criteria for COLD and 0 of 6 samples exceed the criteria for MUN and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table _____.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48352, Lead Region 9

Couser Canyon Creek

LOE ID:	73428
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Couser Canyon Creek to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Couser Canyon Creek was collected at 1 monitoring site [Couser Canyon Creek @ Couser Canyon Road]
Temporal Representation:	Data was collected over the time period 5/24/2004-6/8/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48352, Lead **Region 9**

Couser Canyon Creek

LOE ID:	73429
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Couser Canyon Creek to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for Lead is 0.015 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Couser Canyon Creek was collected at 1 monitoring site [Couser Canyon Creek @ Couser Canyon Road]
Temporal Representation:	Data was collected over the time period 5/24/2004-6/8/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.

QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **48362** **Region 9**

Couser Canyon Creek

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of 5 samples exceed the criteria for COLD and 0 of 5 samples exceed the criteria for MUN. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 5 samples exceed the criteria for COLD and 0 of 5 samples exceed the criteria for MUN and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48362, Malathion **Region 9**

Couser Canyon Creek

LOE ID:	73430
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Couser Canyon Creek to determine beneficial use support and results are as follows: 0 of 5 samples exceed the

	criterion for Malathion. 042830
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Couser Canyon Creek was collected at 1 monitoring site [Couser Canyon Creek @ Couser Canyon Road]
Temporal Representation:	Data was collected over the time period 8/10/2004-6/8/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48362, Malathion **Region 9**

Couser Canyon Creek

LOE ID:	78014
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Couser Canyon Creek to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Malathion.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for malathion is 100 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Couser Canyon Creek was collected at 1 monitoring site [Couser Canyon Creek @ Couser Canyon Road]
Temporal Representation:	Data was collected over the time period 8/10/2004-6/8/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.

QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Rev. 8 matrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **48364** **Region 9**

Couser Canyon Creek

Pollutant:	**Nitrate/Nitrite (Nitrite + Nitrate as N)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. One of 1 sample exceeds the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of 1 sample exceeds the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48364, Nitrate/Nitrite (Nitrite + Nitrate as N) **Region 9**

Couser Canyon Creek

LOE ID:	73431
Pollutant:	Nitrate/Nitrite (Nitrite + Nitrate as N)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Couser Canyon Creek to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Nitrate/Nitrite as N.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrate + nitrite (as N) is 10.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Couser Canyon Creek was collected at 1 monitoring site [Couser Canyon Creek @ Couser Canyon Road]
Temporal Representation:	Data was collected on a single day 8/10/2004.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 48365 Region 9

Couser Canyon Creek

Pollutant:	**Nitrogen, Nitrite**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of 2 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 2 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48365, Nitrogen, Nitrite Region 9

Couser Canyon Creek

LOE ID:	73437

Pollutant:	Nitrogen, Nitrite	042833
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	2	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Couser Canyon Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Nitrite as N.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrite (as N) is 1.0 mg/L (Title 22 of the California Code of Regulations).	
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals, CCR	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Couser Canyon Creek was collected at 1 monitoring site [Couser Canyon Creek @ Couser Canyon Road]	
Temporal Representation:	Data was collected over the time period 8/10/2004-8/11/2004.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID	**48366**	**Region 9**
Couser Canyon Creek		

Pollutant:	**Nitrogen, ammonia (Total Ammonia)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of 1 sample exceeds the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 1 sample exceeds the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16

samples is needed to determine if a beneficial use is fully supported using table 3.1. 042834
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48366, Nitrogen, ammonia (Total Ammonia) **Region 9**

Couser Canyon Creek

LOE ID:	73407
Pollutant:	Nitrogen, ammonia (Total Ammonia)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Couser Canyon Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Ammonia As N, Total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Basin Plan: No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	EPA's Lifetime Health advisory level for total ammonia is 30.0 mg/L as stated on page 8 of the 2006 edition of the drinking water standards and health advisories. This Advisory Level is defined as "the concentration of a chemical in drinking water that is not expected to cause any adverse noncarcinogenic effects for up to ten days of exposure."
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Couser Canyon Creek was collected at 1 monitoring site [Couser Canyon Creek @ Couser Canyon Road]
Temporal Representation:	Data was collected on a single day 8/10/2004.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **48353** **Region 9**

Couser Canyon Creek

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final	New Decision

Listing Decision:		042835
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of 6 samples exceed the criteria for COLD and 0 of 6 samples exceed the criteria for MUN.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 6 samples exceed the criteria for COLD and 0 of 6 samples exceed the criteria for MUN and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table _____.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48353, Zinc **Region 9**

Couser Canyon Creek

LOE ID:	73439
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Couser Canyon Creek to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for zinc is 5.0 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.

Spatial Representation:	Data for this line of evidence for Couser Canyon Creek was collected at 1 monitoring site [Couser Canyon Creek @ Couser Canyon Road]
Temporal Representation:	Data was collected over the time period 5/24/2004-6/8/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48353, Zinc **Region 9**

Couser Canyon Creek

LOE ID:	73440
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Couser Canyon Creek to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Couser Canyon Creek was collected at 1 monitoring site [Couser Canyon Creek @ Couser Canyon Road]
Temporal Representation:	Data was collected over the time period 5/24/2004-6/8/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **48363** **Region 9**

Couser Canyon Creek

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised

Sources:	Source Unknown	042837
Expected TMDL Completion Date:	2029	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.3 of the Listing Policy. Under section 3.3 a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. Data from 2006 to 2009 show that 6 of 6 single samples exceed the water quality objective for enterococcus of a SSM of 61/100 ml in fresh water for the protection of REC-1 beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Data from 2006 to 2009 show that 6 of 6 single samples exceed the water quality objective for enterococcus of a SSM of 61/100 ml in fresh water for the protection of REC-1 beneficial use and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 48363, Indicator Bacteria **Region 9**

Couser Canyon Creek

LOE ID:	73438
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	6
Number of Exceedances:	3
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Couser Canyon Creek to determine beneficial use support and results are as follows: 3 of 6 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxicsubstances in concentrations which are toxic to,or which produce detrimental physiologicalresponses in human, plant, animal, or indigenousaquatic life (Basin Plan).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In waters designated for water contact recreation (REC I), the total coliform concentration shall not exceed 10000 MPN/100 ml (CDPH 2006).

Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Date: November 1997. California Department of Public Health.
Spatial Representation:	Data for this line of evidence for Couser Canyon Creek was collected at 1 monitoring site [Couser Canyon Creek @ Couser Canyon Road]
Temporal Representation:	Data was collected over the time period 5/24/2004-6/8/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48363, Indicator Bacteria **Region 9**

Couser Canyon Creek

LOE ID:	73420
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	6
Number of Exceedances:	6
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Couser Canyon Creek to determine beneficial use support and results are as follows: 6 of 6 samples exceed the criterion for Enterococci.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Samples shall not exceed 61 organisms per 100 ml for enterococcus in waters designated for REC I beneficial use (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Couser Canyon Creek was collected at 1 monitoring site [Couser Canyon Creek @ Couser Canyon Road]
Temporal Representation:	Data was collected over the time period 5/24/2004-6/8/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48363, Indicator Bacteria **Region 9**

Couser Canyon Creek

LOE ID:	73427
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation
Number of Samples:	6
Number of Exceedances:	2
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Couser Canyon Creek to determine beneficial use support and results are as follows: 2 of 6 samples exceed the criterion for Coliform, Fecal.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the fecal coliform concentration shall not exceed 400 MPN/100 ml.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Couser Canyon Creek was collected at 1 monitoring site [Couser Canyon Creek @ Couser Canyon Road]
Temporal Representation:	Data was collected over the time period 5/24/2004-6/8/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: San Marcos, Lake, drain to central southwest fork of lake
Water Body ID: CAR9045200020110620105350
Water Body Type: River & Stream

DECISION ID 50556 **Region 9**
San Marcos, Lake, drain to central southwest fork of lake

Pollutant: Cadmium
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the Five samples exceed the Water Quality Criteria for Cadmium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Five samples exceeded the Water Quality Criteria for Cadmium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50556, Cadmium **Region 9**
San Marcos, Lake, drain to central southwest fork of lake

LOE ID: 76082

Pollutant: Cadmium
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Cold Freshwater Habitat

Number of Samples:	6	042841
Number of Exceedances:	1	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Marcos, Lake, drain to central southwest fork of lake to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for San Marcos, Lake, drain to central southwest fork of lake was collected at 1 monitoring site [Storm Drain Outfall to Lake San Marcos @ End of San Marino Drive]	
Temporal Representation:	Data was collected once yearly between July 2004 and June 2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID **50557** **Region 9**

San Marcos, Lake, drain to central southwest fork of lake

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the Five samples exceed the Water Quality Criteria for Chlorpyrifos.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Five samples exceeded the Water Quality Criteria for Chlorpyrifos and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available

indicating that standards are not met. 042842

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50557, Chlorpyrifos **Region 9**

San Marcos, Lake, drain to central southwest fork of lake

LOE ID:	76098
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Marcos, Lake, drain to central southwest fork of lake to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).
Spatial Representation:	Data for this line of evidence for San Marcos, Lake, drain to central southwest fork of lake was collected at 1 monitoring site [Storm Drain Outfall to Lake San Marcos @ End of San Marino Drive]
Temporal Representation:	Data was collected over the time period 7/20/2004-6/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 50559 **Region 9**

San Marcos, Lake, drain to central southwest fork of lake

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final	New Decision

Listing Decision:		042843
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the Six samples exceed the Water Quality Criteria for Dazinon.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Six samples exceeded the Water Quality Criteria for Diazinon and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50559, Diazinon **Region 9**

San Marcos, Lake, drain to central southwest fork of lake

LOE ID:	76101
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Marcos, Lake, drain to central southwest fork of lake to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).

Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Data for this line of evidence for San Marcos, Lake, drain to central southwest fork of lake was collected at 1 monitoring site [Storm Drain Outfall to Lake San Marcos @ End of San Marino Drive]
Temporal Representation:	Data was collected over the time period 7/20/2004-6/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 50561 Region 9

San Marcos, Lake, drain to central southwest fork of lake

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. One of the Eleven samples exceed the Water Quality Criteria for Copper. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of Eleven samples exceeded the Water Quality Criteria for Copper and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50561, Lead Region 9

San Marcos, Lake, drain to central southwest fork of lake

LOE ID:	76122
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved

Beneficial Use:	Warm Freshwater Habitat	042845
Number of Samples:	5	
Number of Exceedances:	1	
Data and Information Type:	Non-fixed station physical/chemical (conventional + toxicants)	
Data Used to Assess Water Quality:	One of the five samples exceeded the criteria of 3.2 ug/L. One of the samples was reported as "ND" without a reporting limit, therefore this data was not used in the assessment.	
Data Reference:	Data for Various Pollutants in Region 9, 2002-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.	
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Spatial Representation:	A sample was collected from the Central southwest fork at a station called CAR13.	
Temporal Representation:	Samples were collected annually in the summer months during the years: 2004 through 2008. An additional sample was collected in 2004.	
Environmental Conditions:		
QAPP Information:	The samples were collected and analyzed by the County of San Diego as part of their storm water program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 50561, Lead **Region 9**

San Marcos, Lake, drain to central southwest fork of lake

LOE ID:	76121
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Marcos, Lake, drain to central southwest fork of lake to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority

toxic pollutants for the State of California. 7/1/2011 Edition 042846

Evaluation Guideline:
Guideline Reference:

Spatial Representation:	Data for this line of evidence for San Marcos, Lake, drain to central southwest fork of lake was collected at 1 monitoring site [Storm Drain Outfall to Lake San Marcos @ End of San Marino Drive]
Temporal Representation:	Data was collected once yearly between July 2004 and June 2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 50562 Region 9

San Marcos, Lake, drain to central southwest fork of lake

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the Six samples exceed the Water Quality Criteria for Malathion. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Six samples exceeded the Water Quality Criteria for Malathion and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50562, Malathion Region 9

San Marcos, Lake, drain to central southwest fork of lake

LOE ID:	76123
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	042847
Beneficial Use:	Cold Freshwater Habitat	
Number of Samples:	6	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Marcos, Lake, drain to central southwest fork of lake to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Malathion.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.	
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013	
Spatial Representation:	Data for this line of evidence for San Marcos, Lake, drain to central southwest fork of lake was collected at 1 monitoring site [Storm Drain Outfall to Lake San Marcos @ End of San Marino Drive]	
Temporal Representation:	Data was collected over the time period 7/20/2004-6/11/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID 50563 Region 9

San Marcos, Lake, drain to central southwest fork of lake

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. One of the 17 samples exceed the Water Quality Criteria for Zinc.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of 17 samples exceeded the Water Quality Criteria for Zinc and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.

	4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50563, Zinc **Region 9**

San Marcos, Lake, drain to central southwest fork of lake

LOE ID:	76137
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Marcos, Lake, drain to central southwest fork of lake to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Marcos, Lake, drain to central southwest fork of lake was collected at 1 monitoring site [Storm Drain Outfall to Lake San Marcos @ End of San Marino Drive]
Temporal Representation:	Data was collected once yearly between July 2004 and June 2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 50563, Zinc **Region 9**

San Marcos, Lake, drain to central southwest fork of lake

LOE ID:	76138
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	Dissolved	042849
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	11	
Number of Exceedances:	1	
Data and Information Type:	Non-fixed station physical/chemical (conventional + toxicants)	
Data Used to Assess Water Quality:	One of the eleven samples exceed the hardness adjusted criteria.	
Data Reference:	Data for Various Pollutants in Region 9, 2002-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.	
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Spatial Representation:	Samples were collected from San Marcos, Lake, drain to central southwest fork of lake from Site CAR04 (lower San Marcos Creek), CAR13 (Central southwest fork), and Site CAR14 (Central southeast fork).	
Temporal Representation:	Samples were collected on 7/20/2004, 9/16/2004, 9/28/2005, 6/22/2006, 7/18/2007, and 7/21/2008.	
Environmental Conditions:		
QAPP Information:	The samples were collected and analyzed by the County of San Diego as part of their storm water program.	
QAPP Information Reference(s):		

DECISION ID	50558	Region 9
San Marcos, Lake, drain to central southwest fork of lake		

Pollutant:	**Copper**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2027
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Two of the Eleven samples exceed the Water Quality Criteria for Copper.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.042850
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Two of Eleven samples exceed the Water Quality Criteria for Copper and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 50558, Copper **Region 9**

San Marcos, Lake, drain to central southwest fork of lake

LOE ID:	76099
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Marcos, Lake, drain to central southwest fork of lake to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Marcos, Lake, drain to central southwest fork of lake was collected at 1 monitoring site [Storm Drain Outfall to Lake San Marcos @ End of San Marino Drive]
Temporal Representation:	Data was collected once yearly between July 2004 and June 2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 50558, Copper **Region 9**

San Marcos, Lake, drain to central southwest fork of lake

LOE ID:	76100

Pollutant:	Copper	042851
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	Dissolved	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	5	
Number of Exceedances:	2	
Data and Information Type:	Non-fixed station physical/chemical (conventional + toxicants)	
Data Used to Assess Water Quality:	Two of five samples exceeded the criteria of 9.3 ug/L.	
Data Reference:	Data for Various Pollutants in Region 9, 2002-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.	
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Spatial Representation:	A sample was collected from the Central southwest fork at a station called CAR13.	
Temporal Representation:	Samples were collected annually in the summer months during the years: 2004 through 2008. An additional sample was collected in 2004.	
Environmental Conditions:		
QAPP Information:	The samples were collected and analyzed by the County of San Diego as part of their storm water program.	
QAPP Information Reference(s):		

DECISION ID **50560** **Region 9**

San Marcos, Lake, drain to central southwest fork of lake

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. Three lines of evidence are available in the administrative record to assess this pollutant. Seven of the Seven samples exceed the Water Quality Objective for Enterococcus, Seven out of Seven samples exceeded the Water Quality Objective for Fecal Coliform, and Six out of Seven samples exceeded the Evaluation Guideline for Total Coliform. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section

303(d) List. 042852

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Seven of the Seven samples exceed the Water Quality Objective for Enterococcus, Seven out of Seven samples exceeded the Water Quality Objective for Fecal Coliform, and Six out of Seven samples exceeded the Evaluation Guideline for Total Coliform and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 50560, Indicator Bacteria **Region 9**

San Marcos, Lake, drain to central southwest fork of lake

LOE ID:	76120
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	7
Number of Exceedances:	7
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Marcos, Lake, drain to central southwest fork of lake to determine beneficial use support and results are as follows: 7 of 7 samples exceed the criterion for Coliform, Fecal.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the fecal coliform concentration shall not exceed 400 MPN/100 ml.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Marcos, Lake, drain to central southwest fork of lake was collected at 1 monitoring site [Storm Drain Outfall to Lake San Marcos @ End of San Marino Drive]
Temporal Representation:	Data was collected over the time period 7/20/2004-6/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 50560, Indicator Bacteria **Region 9**

San Marcos, Lake, drain to central southwest fork of lake

LOE ID:	76124	042853

Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	7
Number of Exceedances:	6
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Marcos, Lake, drain to central southwest fork of lake to determine beneficial use support and results are as follows: 6 of 7 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxicsubstances in concentrations which are toxic to,or which produce detrimental physiologicalresponses in human, plant, animal, or indigenousaquatic life (Basin Plan).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In waters designated for water contact recreation (REC I), the total coliform concentration shall not exceed 10000 MPN/100 ml (CDPH 2006).
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.
Spatial Representation:	Data for this line of evidence for San Marcos, Lake, drain to central southwest fork of lake was collected at 1 monitoring site [Storm Drain Outfall to Lake San Marcos @ End of San Marino Drive]
Temporal Representation:	Data was collected over the time period 7/20/2004-6/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 50560, Indicator Bacteria **Region 9**

San Marcos, Lake, drain to central southwest fork of lake

LOE ID:	76102
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	7
Number of Exceedances:	7
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Marcos, Lake, drain to central southwest fork of lake to determine beneficial use support and results are as follows: 7 of 7 samples exceed the criterion for Enterococci.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Samples shall not exceed 61 organisms per 100 ml for enterococcus in waters designated for REC I beneficial use (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Marcos, Lake, drain to central southwest fork of lake was collected at 1 monitoring site [Storm Drain Outfall to Lake San Marcos @ End of San Marino Drive]
Temporal Representation:	Data was collected over the time period 7/20/2004-6/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: San Marcos, Lake, drain to central southeast fork of lake
Water Body ID: CAR9045200020110620113356
Water Body Type: River & Stream

DECISION ID 50525 **Region 9**
San Marcos, Lake, drain to central southeast fork of lake

Pollutant: Cadmium
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the Five samples exceed the Water Quality Criteria for Cadmium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Five samples exceeded the Water Quality Criteria for Cadmium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50525, Cadmium **Region 9**
San Marcos, Lake, drain to central southeast fork of lake

LOE ID: 76044

Pollutant: Cadmium
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Cold Freshwater Habitat

Number of Samples:	5	042856
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Marcos, Lake, drain to central southeast fork of lake to determine beneficial use support and results are as follows: 1 of 11 samples exceed the criterion for Cadmium.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for San Marcos, Lake, drain to central southeast fork of lake was collected at 1 monitoring sites [Tributary to Lake San Marcos @ End of El Chico Lane]	
Temporal Representation:	Data was collected 7/20/2004 - 6/11/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID **50526** **Region 9**

San Marcos, Lake, drain to central southeast fork of lake

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the Zero samples exceed the Water Quality Criteria for Chlorpyrifos.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Zero samples exceeded the Water Quality Criteria for Chlorpyrifos and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50526, Chlorpyrifos **Region 9**

San Marcos, Lake, drain to central southeast fork of lake

LOE ID:	76045
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Marcos, Lake, drain to central southeast fork of lake to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).
Spatial Representation:	Data for this line of evidence for San Marcos, Lake, drain to central southeast fork of lake was collected at 1 monitoring site [Tributary to Lake San Marcos @ End of El Chico Lane]
Temporal Representation:	Data was collected over the time period 7/20/2004-6/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 50527 **Region 9**

San Marcos, Lake, drain to central southeast fork of lake

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised

Impairment from Pollutant or Pollution:	Pollutant	042858

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. One of the Nine samples exceed the Water Quality Criteria for Copper.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of Nine samples exceeded the Water Quality Criteria for Copper and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50527, Copper **Region 9**

San Marcos, Lake, drain to central southeast fork of lake

LOE ID:	76046
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Marcos, Lake, drain to central southeast fork of lake to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Data for this line of evidence for San Marcos, Lake, drain to central southeast fork of lake was collected at 1 monitoring sites [Tributary to Lake San Marcos @ End of El Chico Lane]
Temporal Representation:	Data was collected 7/20/2004 - 6/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 50527, Copper **Region 9**

San Marcos, Lake, drain to central southeast fork of lake

LOE ID:	76047
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	1
Data and Information Type:	Non-fixed station physical/chemical (conventional + toxicants)
Data Used to Assess Water Quality:	One of the four samples exceeded the criteria of 9.3 ug/L.
Data Reference:	Data for Various Pollutants in Region 9, 2002-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	A sample was collected from the Central southeast fork at a station called CAR14.
Temporal Representation:	Samples were collected annually in the summer months during the years: 2004 through 2008 (data from 2005 was not reported).
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed by the County of San Diego as part of their storm water program.
QAPP Information Reference(s):	

DECISION ID 50547 **Region 9**

San Marcos, Lake, drain to central southeast fork of lake

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised

Impairment from Pollutant or Pollution:	Pollutant	042860

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the Five samples exceed the Water Quality Criteria for Dizinon.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Five samples exceeded the Water Quality Criteria for Dazinon and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50547, Diazinon **Region 9**

San Marcos, Lake, drain to central southeast fork of lake

LOE ID:	76061
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Marcos, Lake, drain to central southeast fork of lake to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game

Spatial Representation:	Data for this line of evidence for San Marcos, Lake, drain to central southeast fork of lake was collected at 1 monitoring site [Tributary to Lake San Marcos @ End of El Chico Lane]
Temporal Representation:	Data was collected over the time period 7/20/2004-6/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 50549 Region 9

San Marcos, Lake, drain to central southeast fork of lake

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.3 of the Listing Policy. Under section 3.3 a single line of evidence is necessary to assess listing status. Three lines of evidence are available in the administrative record to assess this pollutant. Four of Five samples exceed the Water Quality Objective for Enterococcus, Three of the Five samples exceeded the water quality objective for Total Coliform. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Four of Five samples exceed the Water Quality Objective for Enterococcus, Three of the Five samples exceeded the water quality objective for Total Coliform and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50549, Indicator Bacteria Region 9

San Marcos, Lake, drain to central southeast fork of lake

LOE ID:	76063
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	5
Number of Exceedances:	3
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Marcos, Lake, drain to central southeast fork of lake to determine beneficial use support and results are as follows: 3 of 5 samples exceed the criterion for Coliform, Fecal.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the fecal coliform concentration shall not exceed 400 MPN/100 ml.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Marcos, Lake, drain to central southeast fork of lake was collected at 1 monitoring site [Tributary to Lake San Marcos @ End of El Chico Lane]
Temporal Representation:	Data was collected over the time period 7/20/2004-6/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 50549, Indicator Bacteria **Region 9**

San Marcos, Lake, drain to central southeast fork of lake

LOE ID:	76079
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	5
Number of Exceedances:	4
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Marcos, Lake, drain to central southeast fork of lake to determine beneficial use support and results are as follows: 4 of 5 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxicsubstances in concentrations which are toxic to,or which produce detrimental physiologicalresponses in human, plant, animal, or indigenousaquatic life (Basin Plan).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In waters designated for water contact recreation (REC I), the total coliform concentration shall not exceed 10000 MPN/100 ml (CDPH 2006).
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.

Spatial Representation:	Data for this line of evidence for San Marcos, Lake, drain to central southeast fork of lake was collected at 1 monitoring site [Tributary to Lake San Marcos @ End of El Chico Lane]
Temporal Representation:	Data was collected over the time period 7/20/2004-6/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 50549, Indicator Bacteria **Region 9**

San Marcos, Lake, drain to central southeast fork of lake

LOE ID:	76062
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	5
Number of Exceedances:	4
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Marcos, Lake, drain to central southeast fork of lake to determine beneficial use support and results are as follows: 4 of 5 samples exceed the criterion for Enterococci.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Samples shall not exceed 61 organisms per 100 ml for enterococcus in waters designated for REC I beneficial use (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Marcos, Lake, drain to central southeast fork of lake was collected at 1 monitoring site [Tributary to Lake San Marcos @ End of El Chico Lane]
Temporal Representation:	Data was collected over the time period 7/20/2004-6/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **50553** **Region 9**

San Marcos, Lake, drain to central southeast fork of lake

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the Eight samples exceed the Water Quality Criteria for Lead.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the Eight samples exceed the Water Quality Criteria for Lead and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50553, Lead **Region 9**

San Marcos, Lake, drain to central southeast fork of lake

LOE ID:	76064
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Marcos, Lake, drain to central southeast fork of lake to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Marcos, Lake, drain to central southeast fork of lake

	was collected at 1 monitoring sites [Tributary to Lake San Marcos @ End of Chico Lane]
Temporal Representation:	Data was collected 7/20/2004 - 6/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 50553, Lead **Region 9**

San Marcos, Lake, drain to central southeast fork of lake

LOE ID:	76065
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	Non-fixed station physical/chemical (conventional + toxicants)
Data Used to Assess Water Quality:	None of the three samples exceeded the criteria of 3.2 ug/L. One of the samples was reported as "ND" without a reporting limit, therefore this data was not used in the assessment.
Data Reference:	Data for Various Pollutants in Region 9, 2002-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	A sample was collected from the Central southeast fork at a station called CAR14.
Temporal Representation:	Samples were collected annually in the summer months during the years: 2004 through 2008 (data from 2005 was not reported).
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed by the County of San Diego as part of their storm water program.
QAPP Information Reference(s):	

DECISION ID 50554 **Region 9**

San Marcos, Lake, drain to central southeast fork of lake

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised

Impairment from Pollutant or Pollution:	Pollutant	042866
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the Five samples exceed the . Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Five samples exceeded the Water Quality Criteria for Malathion and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.	
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.	

Line of Evidence (LOE) for Decision ID 50554, Malathion **Region 9**

San Marcos, Lake, drain to central southeast fork of lake

LOE ID:	76078
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Marcos, Lake, drain to central southeast fork of lake to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Malathion.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013

Spatial Representation:	Data for this line of evidence for San Marcos, Lake, drain to central southeast fork of lake was collected at 1 monitoring site [Tributary to Lake San Marcos @ End of El Chico Lane]
Temporal Representation:	Data was collected over the time period 7/20/2004-6/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 50555 Region 9

San Marcos, Lake, drain to central southeast fork of lake

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence is available in the administrative record to assess this pollutant. Zero of the Eight samples exceed the Water Quality Criteria for Lead. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Eight samples exceeded the Water Quality Criteria for Lead and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50555, Zinc Region 9

San Marcos, Lake, drain to central southeast fork of lake

LOE ID:	76081
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0

Data and Information Type:	Non-fixed station physical/chemical (conventional + toxicants)
Data Used to Assess Water Quality:	None of the three samples exceeded the criteria of 120 ug/L. One of the samples was reported as "ND" without a reporting limit, therefore this data was not used in the assessment.
Data Reference:	Data for Various Pollutants in Region 9, 2002-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Inland surface waters, enclosed bays, and estuaries shall not contain toxic pollutants in excess of the numerical objectives applicable to California specified in 40 CFR 131.36 (section 131.36 revised at 57 FR 60848, December 22, 1992).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion. If no hardness data were available, a value of 100 mg/L was used.
Guideline Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Spatial Representation:	A sample was collected from the Central southeast fork at a station called CAR14.
Temporal Representation:	Samples were collected annually in the summer months during the years: 2004 through 2008 (data from 2005 was not reported).
Environmental Conditions:	
QAPP Information:	The samples were collected and analyzed by the County of San Diego as part of their storm water program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 50555, Zinc **Region 9**

San Marcos, Lake, drain to central southeast fork of lake

LOE ID:	76080
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Marcos, Lake, drain to central southeast fork of lake to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	

Guideline Reference:	042869
Spatial Representation:	Data for this line of evidence for San Marcos, Lake, drain to central southeast fork of lake was collected at 1 monitoring sites [Tributary to Lake San Marcos @ End of El Chico Lane]
Temporal Representation:	Data was collected 7/20/2004 - 6/11/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: San Marcos Creek, unnamed fork at Twin Oaks Valley Road
Water Body ID: CAR9045300020110812113554
Water Body Type: River & Stream

DECISION ID 50188 **Region 9**
San Marcos Creek, unnamed fork at Twin Oaks Valley Road

Pollutant: Cadmium
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the Two samples exceed the Water Quality Criteria for Cadmium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Two samples exceeded the Water Quality Criteria for Cadmium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50188, Cadmium **Region 9**
San Marcos Creek, unnamed fork at Twin Oaks Valley Road

LOE ID: 76257

Pollutant: Cadmium
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Dissolved

Beneficial Use: Warm Freshwater Habitat

Number of Samples:	2	042871
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Marcos Creek, unnamed fork at Twin Oaks Valley Road to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Cadmium.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for San Marcos Creek, unnamed fork at Twin Oaks Valley Road was collected at 1 monitoring site [San Marcos Creek @ Olive Street and Sycamore Drive]	
Temporal Representation:	Data was collected 9/28/2005 - 6/27/2006.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID **50192** **Region 9**

San Marcos Creek, unnamed fork at Twin Oaks Valley Road

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the Zero samples exceed the Water Quality Criteria for Chlorpyrifos.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Zero samples exceeded the Water Quality Criteria for Chlorpyrifos and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available

indicating that standards are not met. 042872

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50192, Chlorpyrifos **Region 9**

San Marcos Creek, unnamed fork at Twin Oaks Valley Road

LOE ID:	75990
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Marcos Creek, unnamed fork at Twin Oaks Valley Road to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Chlorpyrifos. The reporting limit for this assessment was less than the objective for this pollutant, and therefore none of the samples could be used to assess water quality.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).
Spatial Representation:	Data for this line of evidence for San Marcos Creek, unnamed fork at Twin Oaks Valley Road was collected at 1 monitoring site [San Marcos Creek @ Olive Street and Sycamore Drive]
Temporal Representation:	Data was collected over the time period 9/28/2005-6/27/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 50193 **Region 9**

San Marcos Creek, unnamed fork at Twin Oaks Valley Road

Pollutant: **Copper**

Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	042873
Last Listing Cycle's Final Listing Decision:	New Decision	
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the Two samples exceed the Water Quality Criteria for Copper.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Two samples exceeded the Water Quality Criteria for Copper and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.11.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50193, Copper **Region 9**

San Marcos Creek, unnamed fork at Twin Oaks Valley Road

LOE ID:	75991
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Marcos Creek, unnamed fork at Twin Oaks Valley Road to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority

toxic pollutants for the State of California. 7/1/2011 Edition 042874

Evaluation Guideline:
Guideline Reference:

Spatial Representation:	Data for this line of evidence for San Marcos Creek, unnamed fork at Twin Oaks Valley Road was collected at 1 monitoring site [San Marcos Creek @ Olive Street and Sycamore Drive]
Temporal Representation:	Data was collected 9/28/2005 - 6/27/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 50194 Region 9

San Marcos Creek, unnamed fork at Twin Oaks Valley Road

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the Two samples exceed the Water Quality Criteria for Copper. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Two samples exceeded the Water Quality Criteria for Copper and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50194, Diazinon Region 9

San Marcos Creek, unnamed fork at Twin Oaks Valley Road

LOE ID:	75992
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	042875
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	2	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Marcos Creek, unnamed fork at Twin Oaks Valley Road to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Diazinon.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).	
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game	
Spatial Representation:	Data for this line of evidence for San Marcos Creek, unnamed fork at Twin Oaks Valley Road was collected at 1 monitoring site [San Marcos Creek @ Olive Street and Sycamore Drive]	
Temporal Representation:	Data was collected over the time period 9/28/2005-6/27/2006.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID 50191 Region 9

San Marcos Creek, unnamed fork at Twin Oaks Valley Road

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.3 of the Listing Policy. Under section 3.3 a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. Two of the Two samples exceeded the Water Quality Objective for Enterococcus, One of the Two samples exceed the Water Quality Objective for Fecal Coliform, and Two of the Two samples exceeded the Evaluation Guideline for Total Coliform.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.

2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy 942876
3. Two of the Two samples exceeded the Water Quality Objective for Enterococcus, One of the Two samples exceed the Water Quality Objective for Fecal Coliform, and Two of the Two samples exceeded the Evaluation Guideline for Total Coliform and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50191, Indicator Bacteria **Region 9**

San Marcos Creek, unnamed fork at Twin Oaks Valley Road

LOE ID:	76007
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2
Number of Exceedances:	2
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Marcos Creek, unnamed fork at Twin Oaks Valley Road to determine beneficial use support and results are as follows: 2 of 2 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxicsubstances in concentrations which are toxic to,or which produce detrimental physiologicalresponses in human, plant, animal, or indigenousaquatic life (Basin Plan).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In waters designated for water contact recreation (REC I), the total coliform concentration shall not exceed 10000 MPN/100 ml (CDPH 2006).
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.
Spatial Representation:	Data for this line of evidence for San Marcos Creek, unnamed fork at Twin Oaks Valley Road was collected at 1 monitoring site [San Marcos Creek @ Olive Street and Sycamore Drive]
Temporal Representation:	Data was collected over the time period 9/28/2005-6/27/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 50191, Indicator Bacteria **Region 9**

San Marcos Creek, unnamed fork at Twin Oaks Valley Road

LOE ID:	75994
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2
Number of Exceedances:	1
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Marcos Creek, unnamed fork at Twin Oaks Valley Road to determine beneficial use support and results are as follows: 1 of 2 samples exceed the criterion for Coliform, Fecal.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the fecal coliform concentration shall not exceed 400 MPN/100 ml.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Marcos Creek, unnamed fork at Twin Oaks Valley Road was collected at 1 monitoring site [San Marcos Creek @ Olive Street and Sycamore Drive]
Temporal Representation:	Data was collected over the time period 9/28/2005-6/27/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 50191, Indicator Bacteria **Region 9**

San Marcos Creek, unnamed fork at Twin Oaks Valley Road

LOE ID:	75993
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2
Number of Exceedances:	2
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Marcos Creek, unnamed fork at Twin Oaks Valley Road to determine beneficial use support and results are as follows: 2 of 2 samples exceed the criterion for Enterococci.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Samples shall not exceed 61 organisms per 100 ml for enterococcus in waters designated for REC I beneficial use (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Marcos Creek, unnamed fork at Twin Oaks Valley Road was collected at 1 monitoring site [San Marcos Creek @ Olive Street and Sycamore Drive]
Temporal Representation:	Data was collected over the time period 9/28/2005-6/27/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 50195 Region 9

San Marcos Creek, unnamed fork at Twin Oaks Valley Road

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. One of the Two samples exceed the Water Quality Criteria for Lead. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Two samples exceeded the Water Quality Criteria for Lead and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50195, Lead Region 9

San Marcos Creek, unnamed fork at Twin Oaks Valley Road

LOE ID:	76005

Pollutant:	Lead	042879
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	Dissolved	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	2	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Marcos Creek, unnamed fork at Twin Oaks Valley Road to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for San Marcos Creek, unnamed fork at Twin Oaks Valley Road was collected at 1 monitoring site [San Marcos Creek @ Olive Street and Sycamore Drive]	
Temporal Representation:	Data was collected 9/28/2005 - 6/27/2006.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID **50196** **Region 9**

San Marcos Creek, unnamed fork at Twin Oaks Valley Road

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the Two samples exceed the Water Quality Criteria for Malathion.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.042880
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Two samples exceeded the Water Quality Criteria for Malathion and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50196, Malathion **Region 9**

San Marcos Creek, unnamed fork at Twin Oaks Valley Road

LOE ID:	76006
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Marcos Creek, unnamed fork at Twin Oaks Valley Road to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Malathion.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for San Marcos Creek, unnamed fork at Twin Oaks Valley Road was collected at 1 monitoring site [San Marcos Creek @ Olive Street and Sycamore Drive]
Temporal Representation:	Data was collected over the time period 9/28/2005-6/27/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 50197 **Region 9**

San Marcos Creek, unnamed fork at Twin Oaks Valley Road

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the Two samples exceed the Water Quality Criteria for Zinc.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Two samples exceeded the Water Quality Criteria for Zinc and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50197, Zinc **Region 9**

San Marcos Creek, unnamed fork at Twin Oaks Valley Road

LOE ID:	76008
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Marcos Creek, unnamed fork at Twin Oaks Valley Road to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the

	hardness dependent formula for the metals criterion. 042882
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Marcos Creek, unnamed fork at Twin Oaks Valley Road was collected at 1 monitoring site [San Marcos Creek @ Olive Street and Sycamore Drive]
Temporal Representation:	Data was collected 9/28/2005 - 6/27/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: San Elijo Creek (San Diego County)
Water Body ID: CAR9046100020110816103441
Water Body Type: River & Stream

DECISION ID 49160 **Region 9**
San Elijo Creek (San Diego County)

Pollutant: Cadmium
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 14 samples exceed the objective for Cadmium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the 14 samples exceed the objective for the Cold Freshwater Habitat beneficial use and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples are needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49160, Cadmium **Region 9**
San Elijo Creek (San Diego County)

LOE ID: 75706

Pollutant: Cadmium
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Municipal & Domestic Supply

Number of Samples:	14	042884
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Elijo Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 14 samples exceed the criterion for Cadmium.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for cadmium is 0.005 mg/L (Title 22 of the California Code of Regulations).	
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for San Elijo Creek (San Diego County) was collected at 2 monitoring sites [San Elijo Creek @ El Camino Real, San Elijo Creek @ La Granada]	
Temporal Representation:	Data was collected 6/10/2003 - 5/26/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 49160, Cadmium **Region 9**

San Elijo Creek (San Diego County)

LOE ID:	75705
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	14
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Elijo Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 14 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Data for this line of evidence for San Elijo Creek (San Diego County) was collected at 2 monitoring sites [San Elijo Creek @ El Camino Real, San Elijo Creek @ La Granada]
Temporal Representation:	Data was collected 6/10/2003 - 5/26/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 49161 Region 9

San Elijo Creek (San Diego County)

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 10 samples exceed the objective for Cadmium. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the 10 samples exceed the objective for the Municipal & Domestic Supply beneficial use and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples are needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49161, Chlorpyrifos Region 9

San Elijo Creek (San Diego County)

LOE ID:	78102
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	10
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Elijo Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 10 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for chlorpyrifos is 2.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for San Elijo Creek (San Diego County) was collected at 2 monitoring sites [San Elijo Creek @ La Granada, San Elijo Creek @ El Camino Real]
Temporal Representation:	Data was collected over the time period 9/23/2005-5/26/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 49161, Chlorpyrifos **Region 9**

San Elijo Creek (San Diego County)

LOE ID:	75713
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Elijo Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).

Spatial Representation:	Data for this line of evidence for San Elijo Creek (San Diego County) was collected at 2 monitoring sites [San Elijo Creek @ La Granada, San Elijo Creek @ El Camino Real]
Temporal Representation:	Data was collected over the time period 9/23/2005-5/26/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 49162 — Region 9

San Elijo Creek (San Diego County)

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 14 samples exceed the objective for Copper. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the 14 samples exceed the objective for the Cold Freshwater Habitat beneficial use and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples are needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49162, Copper — Region 9

San Elijo Creek (San Diego County)

LOE ID:	75714
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	14

Number of Exceedances:	0	042888

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Elijo Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for copper is 1.0 mg/L (Title 22 California Code of Regulations).
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Elijo Creek (San Diego County) was collected at 2 monitoring sites [San Elijo Creek @ El Camino Real, San Elijo Creek @ La Granada]
Temporal Representation:	Data was collected 6/10/2003 - 5/26/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 49162, Copper **Region 9**

San Elijo Creek (San Diego County)

LOE ID:	75715
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	14
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Elijo Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Elijo Creek (San Diego County) was collected at 2

	monitoring sites [San Elijo Creek @ El Camino Real, San Elijo Creek @ La Cima Cada]
Temporal Representation:	Data was collected 6/10/2003 - 5/26/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 49163 Region 9

San Elijo Creek (San Diego County)

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 8 samples exceed the objective for Diazinon.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the 8 samples exceed the objective for the Cold Freshwater Habitat beneficial use and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples are needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49163, Diazinon Region 9

San Elijo Creek (San Diego County)

LOE ID:	75716
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING 042890
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Elijo Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 8 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Data for this line of evidence for San Elijo Creek (San Diego County) was collected at 2 monitoring sites [San Elijo Creek @ La Granada, San Elijo Creek @ El Camino Real]
Temporal Representation:	Data was collected over the time period 9/23/2005-5/26/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 49163, Diazinon **Region 9**

San Elijo Creek (San Diego County)

LOE ID:	78103
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	10
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Elijo Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 10 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for diazinon is 1.4 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for San Elijo Creek (San Diego County) was collected at 2 monitoring sites [San Elijo Creek @ La Granada, San Elijo Creek @ El Camino Real]

Temporal Representation:	Data was collected over the time period 9/23/2005-5/26/2009. 042891
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 49164 Region 9

San Elijo Creek (San Diego County)

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 14 samples exceed the objective for Lead.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the 14 samples exceed the objective for the Cold Freshwater Habitat beneficial use and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples are needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49164, Lead Region 9

San Elijo Creek (San Diego County)

LOE ID:	75732
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	14
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Elijo Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 14 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for Lead is 0.015 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Elijo Creek (San Diego County) was collected at 2 monitoring sites [San Elijo Creek @ El Camino Real, San Elijo Creek @ La Granada]
Temporal Representation:	Data was collected 6/10/2003 - 5/26/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 49164, Lead **Region 9**

San Elijo Creek (San Diego County)

LOE ID:	75731
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	14
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Elijo Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Elijo Creek (San Diego County) was collected at 2 monitoring sites [San Elijo Creek @ El Camino Real, San Elijo Creek @ La Granada]
Temporal Representation:	Data was collected 6/10/2003 - 5/26/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.

QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 49165 Region 9

San Elijo Creek (San Diego County)

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 8 samples exceed the objective for Malathion. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the 8 samples exceed the objective for the Cold Freshwater Habitat beneficial use and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples are needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49165, Malathion Region 9

San Elijo Creek (San Diego County)

LOE ID:	75743
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	8
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Elijo Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 8 samples

exceed the criterion for Malathion. 042894

Data Reference: Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).

Objective/Criterion Reference: Water Quality Control Plan for the San Diego Basin

Evaluation Guideline: The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.

Guideline Reference: 2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013

Spatial Representation: Data for this line of evidence for San Elijo Creek (San Diego County) was collected at 2 monitoring sites [San Elijo Creek @ La Granada, San Elijo Creek @ El Camino Real]

Temporal Representation: Data was collected over the time period 9/23/2005-5/26/2009.

Environmental Conditions: Staff is not aware of any special conditions that might affect interpretation of the data.

QAPP Information: The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.

QAPP Information Reference(s): Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 49165, Malathion **Region 9**

San Elijo Creek (San Diego County)

LOE ID: 78104

Pollutant: Malathion

LOE Subgroup: Pollutant-Water

Matrix: Water

Fraction: None

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 10

Number of Exceedances: 0

Data and Information Type: PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality: Water Board staff assessed County of San Diego data for San Elijo Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 10 samples exceed the criterion for Malathion.

Data Reference: Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).

Objective/Criterion Reference: Water Quality Control Plan for the San Diego Basin

Evaluation Guideline: The USEPA drinking water health advisory for malathion is 100 Âµg/L.

Guideline Reference: 2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013

Spatial Representation: Data for this line of evidence for San Elijo Creek (San Diego County) was collected at 2 monitoring sites [San Elijo Creek @ La Granada, San Elijo Creek @ El Camino Real]

Temporal Representation: Data was collected over the time period 9/23/2005-5/26/2009.

Environmental Conditions: Staff is not aware of any special conditions that might affect interpretation of the data.

QAPP Information: The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.

QAPP Information Reference(s): Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, 542895 matrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 49168 Region 9

San Elijo Creek (San Diego County)

Pollutant:	**Nitrate/Nitrite (Nitrite + Nitrate as N)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the 1 samples exceed the objective for Nitrate/Nitrite (Nitrite + Nitrate as N).

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the 1 samples exceed the objective for the Municipal & Domestic Supply beneficial use and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples are needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49168, Nitrate/Nitrite (Nitrite + Nitrate as N) Region 9

San Elijo Creek (San Diego County)

LOE ID:	75744
Pollutant:	Nitrate/Nitrite (Nitrite + Nitrate as N)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Elijo Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nitrate/Nitrite as N.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the

	County of San Diego, 2003-2009.	042896

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrate + nitrite (as N) is 10.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Elijo Creek (San Diego County) was collected at 1 monitoring site [San Elijo Creek @ El Camino Real]
Temporal Representation:	Data was collected on a single day 6/13/2003.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 49169 Region 9

San Elijo Creek (San Diego County)

Pollutant:	**Nitrogen, Nitrite**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the 2 samples exceed the objective for Nitrogen, Nitrite . Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the 2 samples exceed the objective for the Municipal & Domestic Supply beneficial use and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples are needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49169, Nitrogen, Nitrite Region 9

San Elijo Creek (San Diego County)

LOE ID:	75745	042897

Pollutant:	Nitrogen, Nitrite
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Elijo Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Nitrite as N.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrite (as N) is 1.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Elijo Creek (San Diego County) was collected at 2 monitoring sites [San Elijo Creek @ La Granada, San Elijo Creek @ El Camino Real]
Temporal Representation:	Data was collected on a single day 6/10/2003.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 49166 Region 9

San Elijo Creek (San Diego County)

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 14 samples exceed the objective for Zinc.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.

3. Zero of the 14 samples exceed the objective for the Cold Freshwater Habitat beneficial use and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples are needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49166, Zinc **Region 9**

San Elijo Creek (San Diego County)

LOE ID:	75756
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	14
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Elijo Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Elijo Creek (San Diego County) was collected at 2 monitoring sites [San Elijo Creek @ El Camino Real, San Elijo Creek @ La Granada]
Temporal Representation:	Data was collected 6/10/2003 - 5/26/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 49166, Zinc **Region 9**

San Elijo Creek (San Diego County)

LOE ID:	75747

Pollutant:	Zinc	042899
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	14	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Elijo Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Zinc.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The California Secondary MCL for zinc is 5.0 mg/L (Title 22 California Code of Regulations).	
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.	
Spatial Representation:	Data for this line of evidence for San Elijo Creek (San Diego County) was collected at 2 monitoring sites [San Elijo Creek @ El Camino Real, San Elijo Creek @ La Granada]	
Temporal Representation:	Data was collected 6/10/2003 - 5/26/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID 49167 Region 9

San Elijo Creek (San Diego County)

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. Three lines of evidence are available in the administrative record to assess this pollutant. Data from 2003 to 2009 show that 16 of 18, 5 of 18, and 5 of 18 single samples exceed the water quality objectives for SSMs of enterococcus, fecal coliform, and total coliform, respectively, for the protection of REC-1. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that: 042900
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Data from 2003 to 2009 show that 16 of 18, 5 of 18, and 5 of 18 single samples exceed the water quality objectives for SSMs of enterococcus, fecal coliform, and total coliform, respectively, for the protection of REC-1 and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 49167, Indicator Bacteria **Region 9**

San Elijo Creek (San Diego County)

LOE ID:	75730
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	18
Number of Exceedances:	5
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Elijo Creek (San Diego County) to determine beneficial use support and results are as follows: 5 of 18 samples exceed the criterion for Coliform, Fecal.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the fecal coliform concentration shall not exceed 400 MPN/100 ml.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Elijo Creek (San Diego County) was collected at 2 monitoring sites [San Elijo Creek @ La Granada, San Elijo Creek @ El Camino Real]
Temporal Representation:	Data was collected over the time period 6/10/2003-5/26/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 49167, Indicator Bacteria **Region 9**

San Elijo Creek (San Diego County)

LOE ID:	75729
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water

Matrix:	Water	042901
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	18	
Number of Exceedances:	16	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Elijo Creek (San Diego County) to determine beneficial use support and results are as follows: 16 of 18 samples exceed the criterion for Enterococci.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Samples shall not exceed 61 organisms per 100 ml for enterococcus in waters designated for REC I beneficial use (Water Quality Control Plan for the San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for San Elijo Creek (San Diego County) was collected at 2 monitoring sites [San Elijo Creek @ La Granada, San Elijo Creek @ El Camino Real]	
Temporal Representation:	Data was collected over the time period 6/10/2003-5/26/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 49167, Indicator Bacteria **Region 9**

San Elijo Creek (San Diego County)

LOE ID:	75746
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	18
Number of Exceedances:	5
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Elijo Creek (San Diego County) to determine beneficial use support and results are as follows: 5 of 18 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxicsubstances in concentrations which are toxic to,or which produce detrimental physiologicalresponses in human, plant, animal, or indigenousaquatic life (Basin Plan).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	In waters designated for water contact recreation (REC I), the total coliform concentration shall not exceed 10000 MPN/100 ml (CDPH 2006).
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.
Spatial Representation:	Data for this line of evidence for San Elijo Creek (San Diego County) was collected at 2 monitoring sites [San Elijo Creek @ La Granada, San Elijo Creek @ El Camino Real]
Temporal Representation:	Data was collected over the time period 6/10/2003-5/26/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 49170 Region 9

San Elijo Creek (San Diego County)

Pollutant:	**Nitrogen, ammonia (Total Ammonia)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the 2 samples exceed the objective for Nitrogen, ammonia (Total Ammonia). Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the 2 samples exceed the objective for the Municipal & Domestic Supply beneficial use and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples are needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49170, Nitrogen, ammonia (Total Ammonia) Region 9

San Elijo Creek (San Diego County)

LOE ID:	75704
Pollutant:	Nitrogen, ammonia (Total Ammonia)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Elijo Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Ammonia As N, Total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Basin Plan: No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	EPA's Lifetime Health advisory level for total ammonia is 30.0 mg/L as stated on page 8 of the 2006 edition of the drinking water standards and health advisories. This Advisory Level is defined as "the concentration of a chemical in drinking water that is not expected to cause any adverse noncarcinogenic effects for up to ten days of exposure."
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for San Elijo Creek (San Diego County) was collected at 2 monitoring sites [San Elijo Creek @ La Granada, San Elijo Creek @ El Camino Real]
Temporal Representation:	Data was collected on a single day 6/10/2003.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue
Water Body ID: CAR9046100020110816104056
Water Body Type: River & Stream

DECISION ID 49100 **Region 9**
San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue

Pollutant: Cadmium
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 4 samples exceed the objective for Cadmium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the 4 samples exceed the objective for the Cold Freshwater Habitat beneficial use and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples are needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49100, Cadmium **Region 9**
San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue

LOE ID: 75759

Pollutant: Cadmium
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Municipal & Domestic Supply

Number of Samples:	4	042905
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for cadmium is 0.005 mg/L (Title 22 of the California Code of Regulations).	
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue was collected at 1 monitoring site [Tributary of San Elijo Creek @ San Elijo Road]	
Temporal Representation:	Data was collected between June 2006 and May 2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 49100, Cadmium **Region 9**

San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue

LOE ID:	75758
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Data for this line of evidence for San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue was collected at 1 monitoring site [Tributary of San Elijo Creek @ San Elijo Road]
Temporal Representation:	Data was collected between June 2006 and May 2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 49105 Region 9

San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the four samples exceed the Chlorpyrifos criteria for Municipal & Domestic Supply. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the four samples exceed the Chlorpyrifos criteria for Municipal & Domestic Supply and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.1 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49105, Chlorpyrifos Region 9

San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue

LOE ID:	75760
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat

Number of Samples:	0	042907
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Chlorpyrifos. The reporting limit (RL) of this assessment method is less than the water quality criteria for this applicable beneficial use. As a result of this we cannot confidently state that the beneficial use is not impaired by the presence of this pollutant. All four samples must be thrown out.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000).	
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).	
Spatial Representation:	Data for this line of evidence for San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue was collected at 1 monitoring site [Tributary of San Elijo Creek @ San Elijo Road]	
Temporal Representation:	Data was collected over the time period 6/20/2006-5/26/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 49105, Chlorpyrifos **Region 9**

San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue

LOE ID:	78109
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column,

	sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for chlorpyrifos is 2.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue was collected at 1 monitoring site [Tributary of San Elijo Creek @ San Elijo Road]
Temporal Representation:	Data was collected over the time period 6/20/2006-5/26/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 49132 Region 9

San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 4 samples exceed the objective for Copper. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the 4 samples exceed the objective for the Cold Freshwater Habitat beneficial use and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples are needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49132, Copper Region 9

San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue

LOE ID:	75770
Pollutant:	Copper

LOE Subgroup:	Pollutant-Water	042909
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	4	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Secondary MCL for copper is 1.0 mg/L (Title 22 California Code of Regulations).	
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue was collected at 1 monitoring site [Tributary of San Elijo Creek @ San Elijo Road]	
Temporal Representation:	Data was collected on a single day 6/10/2003.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 49132, Copper **Region 9**

San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue

LOE ID:	75771
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the

	hardness dependent formula for the metals criterion. 042910
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue was collected at 1 monitoring site [Tributary of San Elijo Creek @ San Elijo Road]
Temporal Representation:	Data was collected on a single day 6/10/2003.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 49133 Region 9

San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 4 samples exceed the objective for Diazinon. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the 4 samples exceed the objective for the Cold Freshwater Habitat beneficial use and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples are needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49133, Diazinon Region 9

San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue

LOE ID:	75772
Pollutant:	Diazinon

LOE Subgroup:	Pollutant-Water	042911
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Cold Freshwater Habitat	
Number of Samples:	4	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Diazinon.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).	
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game	
Spatial Representation:	Data for this line of evidence for San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue was collected at 1 monitoring site [Tributary of San Elijo Creek @ San Elijo Road]	
Temporal Representation:	Data was collected over the time period 6/20/2006-5/26/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 49133, Diazinon **Region 9**

San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue

LOE ID:	78110
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for diazinon is 1.4 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue was collected at 1 monitoring site [Tributary of San Elijo Creek @ San Elijo Road]
Temporal Representation:	Data was collected over the time period 6/20/2006-5/26/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 49134 Region 9

San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 4 samples exceed the objective for Lead. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the 4 samples exceed the objective for the Cold Freshwater Habitat beneficial use and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples are needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49134, Lead Region 9

San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue

LOE ID: 75784

Pollutant:	Lead	042913
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	4	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for cadmium is 0.015 mg/L (Title 22 of the California Code of Regulations).	
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals, CCR	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue was collected at 1 monitoring site [Tributary of San Elijo Creek @ San Elijo Road]	
Temporal Representation:	Data was collected between June 2006 and May 2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 49134, Lead **Region 9**

San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue

LOE ID:	75785
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies

	based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue was collected at 1 monitoring site [Tributary of San Elijo Creek @ San Elijo Road]
Temporal Representation:	Data was collected on a single day 6/10/2003.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 49135 Region 9

San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 4 samples exceed the objective for Malathion. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the 4 samples exceed the objective for the Cold Freshwater Habitat beneficial use and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples are needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49135, Malathion Region 9

San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue

LOE ID: 75796

Pollutant:	Malathion	042915
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Cold Freshwater Habitat	
Number of Samples:	4	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Malathion.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.	
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013	
Spatial Representation:	Data for this line of evidence for San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue was collected at 1 monitoring site [Tributary of San Elijo Creek @ San Elijo Road]	
Temporal Representation:	Data was collected over the time period 6/20/2006-5/26/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 49135, Malathion **Region 9**

San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue

LOE ID:	78112
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Malathion.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for malathion is 100 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue was collected at 1 monitoring site [Tributary of San Elijo Creek @ San Elijo Road]
Temporal Representation:	Data was collected over the time period 6/20/2006-5/26/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 49136 Region 9

San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue

Pollutant:	**Nitrogen, Nitrite**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 4 samples exceed the objective for Nitrogen, Nitrite . Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the 4 samples exceed the objective for the Municipal & Domestic Supply beneficial use and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples are needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49136, Nitrogen, Nitrite Region 9

San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue

LOE ID: 75797

Pollutant:	Nitrogen, Nitrite	042917
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nitrite as N.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrite (as N) is 1.0 mg/L (Title 22 of the California Code of Regulations).	
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals, CCR	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue was collected at 1 monitoring site [Tributary of San Elijo Creek @ San Elijo Road]	
Temporal Representation:	Data was collected on a single day 6/10/2003.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID 49137 Region 9

San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue

Pollutant:	**Nitrogen, ammonia (Total Ammonia)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 4 samples exceed the objective for Nitrogen, ammonia (Total Ammonia).

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the 1 samples exceed the objective for the Municipal & Domestic Supply beneficial use and

this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples are needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49137, Nitrogen, ammonia (Total Ammonia) Region 9

San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue

LOE ID:	75757
Pollutant:	Nitrogen, ammonia (Total Ammonia)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Ammonia As N, Total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Basin Plan: No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	EPA's Lifetime Health advisory level for total ammonia is 30.0 mg/L as stated on page 8 of the 2006 edition of the drinking water standards and health advisories. This Advisory Level is defined as "the concentration of a chemical in drinking water that is not expected to cause any adverse noncarcinogenic effects for up to ten days of exposure."
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue was collected at 1 monitoring site [Tributary of San Elijo Creek @ San Elijo Road]
Temporal Representation:	Data was collected on a single day 6/10/2003.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 49138 Region 9

San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue

Pollutant:	**Zinc**	042919
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	
Last Listing Cycle's Final Listing Decision:	New Decision	
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 4 samples exceed the objective for Zinc.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the 4 samples exceed the objective for the Cold Freshwater Habitat beneficial use and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples are needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49138, Zinc **Region 9**

San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue

LOE ID:	75799
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	The California Secondary MCL for zinc is 5.0 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue was collected at 1 monitoring site [Tributary of San Elijo Creek @ San Elijo Road]
Temporal Representation:	Data was collected on a single day 6/10/2003.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 49138, Zinc **Region 9**

San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue

LOE ID:	75800
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue was collected at 1 monitoring site [Tributary of San Elijo Creek @ San Elijo Road]
Temporal Representation:	Data was collected on a single day 6/10/2003.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 49147 **Region 9**

San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue

Pollutant:	**Indicator Bacteria**	042921
Final Listing Decision:	**List on 303(d) list (TMDL required list)**	
Last Listing Cycle's Final Listing Decision:	New Decision	
Revision Status	Revised	
Sources:	Source Unknown	
Expected TMDL Completion Date:	2025	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for removal from the section 303(d) list under section 3.3 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. Six out of 6 samples exceed the Contact Recreation Beneficial use water quality objective enterococcus, Five out of 7 samples exceeded the Water Contact Recreation Use Objective for Fecal Coliform, and 4 out of 7 samples exceeded the Water Contact Recreation use Objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the section 303(d) list. This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Six out of 6 samples exceed the Contact Recreation Beneficial use water quality objective enterococcus, Five out of 7 samples exceeded the Water Contact Recreation Use Objective for Fecal Coliform, and 4 out of 7 samples exceeded the Water Contact Recreation use Objective.
and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 49147, Indicator Bacteria **Region 9**

San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue

LOE ID:	75798
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	7
Number of Exceedances:	4
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue to determine beneficial use support and results are as follows: 4 of 7 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxicsubstances in concentrations which are toxic to,or which produce detrimental physiologicalresponses in human, plant, animal, or

	indigenousaquatic life (Basin Plan).	042922
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In waters designated for water contact recreation (REC I), the total coliform concentration shall not exceed 10000 MPN/100 ml (CDPH 2006).	
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.	
Spatial Representation:	Data for this line of evidence for San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue was collected at 1 monitoring site [Tributary of San Elijo Creek @ San Elijo Road]	
Temporal Representation:	Data was collected over the time period 6/10/2003-5/26/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 49147, Indicator Bacteria **Region 9**

San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue

LOE ID:	75783
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	7
Number of Exceedances:	5
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue to determine beneficial use support and results are as follows: 5 of 7 samples exceed the criterion for Coliform, Fecal.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the fecal coliform concentration shall not exceed 400 MPN/100 ml.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue was collected at 1 monitoring site [Tributary of San Elijo Creek @ San Elijo Road]
Temporal Representation:	Data was collected over the time period 6/10/2003-5/26/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 49147, Indicator Bacteria **Region 9**

San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue

LOE ID:	75782
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	6
Number of Exceedances:	6
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue to determine beneficial use support and results are as follows: 6 of 6 samples exceed the criterion for Enterococci.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Samples shall not exceed 61 organisms per 100 ml for enterococcus in waters designated for REC I beneficial use (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue was collected at 1 monitoring site [Tributary of San Elijo Creek @ San Elijo Road]
Temporal Representation:	Data was collected over the time period 6/10/2003-5/26/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: La Zanja Canyon
Water Body ID: CAR9051100020110816110901
Water Body Type: River & Stream

DECISION ID 48151 **Region 9**
La Zanja Canyon

Pollutant: Cadmium
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the Five samples exceed the California Toxics Rule Objective for Cadmium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Five samples exceeded the California Toxics Rule Objective for Cadmium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48151, Cadmium **Region 9**
La Zanja Canyon

LOE ID: 74070

Pollutant: Cadmium
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Warm Freshwater Habitat

Number of Samples:	5	042925
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for La Zanja Canyon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Cadmium.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for La Zanja Canyon was collected at 1 monitoring site [La Zanja Canyon Creek @ Rancho Santa Fe Farms Road]	
Temporal Representation:	Data was collected yearly in 2004 and from 2006 to 2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID	**48152**	**Region 9**
La Zanja Canyon		

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the Zero samples exceed the Water Quality Criteria for Chlorpryifos. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Zero samples exceeded the Water Quality Criteria for Chlorpryifos and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48152, Chlorpyrifos **Region 9**

La Zanja Canyon

LOE ID:	74071
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for La Zanja Canyon to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).
Spatial Representation:	Data for this line of evidence for La Zanja Canyon was collected at 1 monitoring site [La Zanja Canyon Creek @ Rancho Santa Fe Farms Road]
Temporal Representation:	Data was collected over the time period 8/12/2004-6/18/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **48157** **Region 9**

La Zanja Canyon

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised

Impairment from Pollutant or Pollution:	Pollutant	042927
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the Five samples exceed the California Toxics Rule Objective for Copper. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Five samples exceeded the California Toxics Rule Objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.	
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.	

Line of Evidence (LOE) for Decision ID 48157, Copper **Region 9**

La Zanja Canyon

LOE ID:	74072
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for La Zanja Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Data for this line of evidence for La Zanja Canyon was collected at 1 monitoring site [La Zanja Canyon Creek @ Rancho Santa Fe Farms Road]
Temporal Representation:	Data was collected yearly in 2004 and from 2006 to 2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 48159 — Region 9
La Zanja Canyon

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the Five samples exceed the Evaluation Guideline for Diazinon. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Five samples exceeded the Evaluation Guideline for Diazinon and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48159, Diazinon — Region 9
La Zanja Canyon

LOE ID:	74073
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	5

Number of Exceedances:	0	042929
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for La Zanja Canyon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Diazinon.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).	
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game	
Spatial Representation:	Data for this line of evidence for La Zanja Canyon was collected at 1 monitoring site [La Zanja Canyon Creek @ Rancho Santa Fe Farms Road]	
Temporal Representation:	Data was collected over the time period 8/12/2004-6/18/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID	**48172**	**Region 9**
La Zanja Canyon		

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the Five samples exceed the California Toxics Rule Objective for Lead.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Five samples exceeded the California Toxics Rule Objective for Lead and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48172, Lead **Region 9**

La Zanja Canyon

LOE ID:	74076
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for La Zanja Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for La Zanja Canyon was collected at 1 monitoring site [La Zanja Canyon Creek @ Rancho Santa Fe Farms Road]
Temporal Representation:	Data was collected yearly in 2004 and from 2006 to 2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **48173** **Region 9**

La Zanja Canyon

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the Five samples exceed the Water Quality Criteria for Malathion. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Five samples exceeded the Water Quality Criteria for Malathion and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48173, Malathion **Region 9**

La Zanja Canyon

LOE ID:	74077
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for La Zanja Canyon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Malathion.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for La Zanja Canyon was collected at 1 monitoring site [La Zanja Canyon Creek @ Rancho Santa Fe Farms Road]
Temporal Representation:	Data was collected over the time period 8/12/2004-6/18/2009.

Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 48175 Region 9
La Zanja Canyon

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the Five samples exceed the California Toxics Rule Objective for Zinc. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Five samples exceeded the California Toxics Rule Objective for Zinc and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48175, Zinc Region 9
La Zanja Canyon

LOE ID:	74079
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for La Zanja Canyon to

	determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for La Zanja Canyon was collected at 1 monitoring site [La Zanja Canyon Creek @ Rancho Santa Fe Farms Road]
Temporal Representation:	Data was collected yearly in 2004 and from 2006 to 2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID	48170	Region 9
La Zanja Canyon		

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.3 of the Listing Policy. Under section 3.3 a single line of evidence is necessary to assess listing status. Three lines of evidence are available in the administrative record to assess this pollutant. Five of the Five samples exceed the Single Sample Maximum Objective for Enterococcus, Four out of Five samples exceeded the Single Sample Maximum Objective for Fecal Coliform, and One out of Five samples exceeded the Single Sample Maximum Guideline for Total Coliform. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Five of the Five samples exceed the Single Sample Maximum Objective for Enterococcus, Four out of Five samples exceeded the Single Sample Maximum Objective for Fecal Coliform, and One out of Five samples exceeded the Single Sample Maximum Guideline for Total Coliform and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48170, Indicator Bacteria **Region 9**

La Zanja Canyon

LOE ID:	74078
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	5
Number of Exceedances:	1
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for La Zanja Canyon to determine beneficial use support and results are as follows: 1 of 5 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxicsubstances in concentrations which are toxic to,or which produce detrimental physiologicalresponses in human, plant, animal, or indigenousaquatic life (Basin Plan).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In waters designated for water contact recreation (REC I), the total coliform concentration shall not exceed 10000 MPN/100 ml (CDPH 2006).
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.
Spatial Representation:	Data for this line of evidence for La Zanja Canyon was collected at 1 monitoring site [La Zanja Canyon Creek @ Rancho Santa Fe Farms Road]
Temporal Representation:	Data was collected over the time period 8/12/2004-6/18/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48170, Indicator Bacteria **Region 9**

La Zanja Canyon

LOE ID:	74075
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation

Number of Samples:	5
Number of Exceedances:	4
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for La Zanja Canyon to determine beneficial use support and results are as follows: 4 of 5 samples exceed the criterion for Coliform, Fecal.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the fecal coliform concentration shall not exceed 400 MPN/100 ml.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for La Zanja Canyon was collected at 1 monitoring site [La Zanja Canyon Creek @ Rancho Santa Fe Farms Road]
Temporal Representation:	Data was collected over the time period 8/12/2004-6/18/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48170, Indicator Bacteria **Region 9**

La Zanja Canyon

LOE ID:	74074
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	5
Number of Exceedances:	5
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for La Zanja Canyon to determine beneficial use support and results are as follows: 5 of 5 samples exceed the criterion for Enterococci.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Samples shall not exceed 61 organisms per 100 ml for enterococcus in waters designated for REC I beneficial use (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for La Zanja Canyon was collected at 1 monitoring site [La Zanja Canyon Creek @ Rancho Santa Fe Farms Road]

Temporal Representation:	Data was collected over the time period 8/12/2004-6/18/2009.	042936
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: San Dieguito River, unnamed tributary below Hodges Dam
Water Body ID: CAR9051100020111104113223
Water Body Type: River & Stream

DECISION ID 49171 **Region 9**
San Dieguito River, unnamed tributary below Hodges Dam

Pollutant: Cadmium
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the 5 samples exceed the objective for Cadmium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the 5 samples exceed the objective for the Warm Freshwater Habitat beneficial use and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples are needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49171, Cadmium **Region 9**
San Dieguito River, unnamed tributary below Hodges Dam

LOE ID: 75839

Pollutant: Cadmium
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Warm Freshwater Habitat

Number of Samples:	5	042938
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Dieguito River, unnamed tributary below Hodges Dam to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Cadmium.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for San Dieguito River, unnamed tributary below Hodges Dam was collected at 1 monitoring site [Green Valley Creek @ Rancho Bernardo Road]	
Temporal Representation:	Data was collected 8/12/2004 - 6/18/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID **49173** **Region 9**

San Dieguito River, unnamed tributary below Hodges Dam

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the zero samples exceed the Chlorpyrifos criteria for Municipal & Domestic Supply.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the zero samples exceed the Chlorpyrifos criteria for Municipal & Domestic Supply and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.1 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49173, Chlorpyrifos **Region 9**

San Dieguito River, unnamed tributary below Hodges Dam

LOE ID:	75840
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Dieguito River, unnamed tributary below Hodges Dam to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).
Spatial Representation:	Data for this line of evidence for San Dieguito River, unnamed tributary below Hodges Dam was collected at 1 monitoring site [Green Valley Creek @ Rancho Bernardo Road]
Temporal Representation:	Data was collected over the time period 8/12/2004-6/18/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 49183 **Region 9**

San Dieguito River, unnamed tributary below Hodges Dam

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised

Impairment from Pollutant or Pollution:	Pollutant	042940
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the 5 samples exceed the objective for Copper. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the 5 samples exceed the objective for the Cold Freshwater Habitat beneficial use and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples are needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.	
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.	

Line of Evidence (LOE) for Decision ID 49183, Copper **Region 9**

San Dieguito River, unnamed tributary below Hodges Dam

LOE ID:	75841
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Dieguito River, unnamed tributary below Hodges Dam to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Data for this line of evidence for San Dieguito River, unnamed tributary below Hodges Dam was collected at 1 monitoring site [Green Valley Creek @ Rancho Bernardo Road]
Temporal Representation:	Data was collected 8/12/2004 - 6/18/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 49185 Region 9

San Dieguito River, unnamed tributary below Hodges Dam

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the 5 samples exceed the objective for Diazinon. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the 5 samples exceed the objective for the Warm Freshwater Habitat beneficial use and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples are needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49185, Diazinon Region 9

San Dieguito River, unnamed tributary below Hodges Dam

LOE ID:	75658
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	5

Number of Exceedances:	0	042942
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Dieguito River, unnamed tributary below Hodges Dam to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Diazinon.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).	
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game	
Spatial Representation:	Data for this line of evidence for San Dieguito River, unnamed tributary below Hodges Dam was collected at 1 monitoring site [Green Valley Creek @ Rancho Bernardo Road]	
Temporal Representation:	Data was collected over the time period 8/12/2004-6/18/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID 49188 Region 9

San Dieguito River, unnamed tributary below Hodges Dam

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollution

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 5 samples exceed the objective for Lead.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the 5 samples exceed the objective for the Warm Freshwater Habitat beneficial use and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples are needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49188, Lead **Region 9**

San Dieguito River, unnamed tributary below Hodges Dam

LOE ID:	75661
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Dieguito River, unnamed tributary below Hodges Dam to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Dieguito River, unnamed tributary below Hodges Dam was collected at 1 monitoring site [Green Valley Creek @ Rancho Bernardo Road]
Temporal Representation:	Data was collected 8/12/2004 - 6/18/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 49189 **Region 9**

San Dieguito River, unnamed tributary below Hodges Dam

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 5 samples exceed the objective for Malathion. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the 4 samples exceed the objective for the Warm Freshwater Habitat beneficial use and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples are needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49189, Malathion **Region 9**

San Dieguito River, unnamed tributary below Hodges Dam

LOE ID:	75662
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Dieguito River, unnamed tributary below Hodges Dam to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Malathion.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for San Dieguito River, unnamed tributary below Hodges Dam was collected at 1 monitoring site [Green Valley Creek @ Rancho Bernardo Road]
Temporal Representation:	Data was collected over the time period 8/12/2004-6/18/2009.

Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 49190 Region 9

San Dieguito River, unnamed tributary below Hodges Dam

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the 5 samples exceed the objective for Zinc. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the 5 samples exceed the objective for the Warm Freshwater Habitat beneficial use and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples are needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49190, Zinc Region 9

San Dieguito River, unnamed tributary below Hodges Dam

LOE ID:	75703
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Dieguito River,

	unnamed tributary below Hodges Dam to determine beneficial use support 04/29/16 results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Dieguito River, unnamed tributary below Hodges Dam was collected at 1 monitoring site [Green Valley Creek @ Rancho Bernardo Road]
Temporal Representation:	Data was collected 8/12/2004 - 6/18/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 49187 Region 9

San Dieguito River, unnamed tributary below Hodges Dam

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for removal from the section 303(d) list under section 3.3 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status. Three lines of evidence are available in the administrative record to assess this pollutant. Five out of 5 samples exceed the Contact Recreation Beneficial use water quality objective enterococcus, two out of 7 samples exceeded the Water Contact Recreation Use Objective for Fecal Coliform, and one out of 7 samples exceeded the Water Contact Recreation use Objective for Total Coliform. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the section 303(d) list. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Five out of 5 samples exceed the Contact Recreation Beneficial use water quality objective enterococcus, two out of 7 samples exceeded the Water Contact Recreation Use Objective for Fecal Coliform, and one out of 7 samples exceeded the Water Contact Recreation use Objective for Total Coliform and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy. 4. Pursuant to section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.
Regional Board Decision	After review of the available data and information, RWQCB staff concludes that the water body-

Recommendation: pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 49187, Indicator Bacteria **Region 9**

San Dieguito River, unnamed tributary below Hodges Dam

LOE ID:	75659
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	5
Number of Exceedances:	5
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Dieguito River, unnamed tributary below Hodges Dam to determine beneficial use support and results are as follows: 5 of 5 samples exceed the criterion for Enterococci.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Samples shall not exceed 61 organisms per 100 ml for enterococcus in waters designated for REC I beneficial use (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Dieguito River, unnamed tributary below Hodges Dam was collected at 1 monitoring site [Green Valley Creek @ Rancho Bernardo Road]
Temporal Representation:	Data was collected over the time period 8/12/2004-6/18/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 49187, Indicator Bacteria **Region 9**

San Dieguito River, unnamed tributary below Hodges Dam

LOE ID:	75660
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	5
Number of Exceedances:	2
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Dieguito River, unnamed

	tributary below Hodges Dam to determine beneficial use support and results are as follows: 2 of 5 samples exceed the criterion for Coliform, Fecal.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the fecal coliform concentration shall not exceed 400 MPN/100 ml.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Dieguito River, unnamed tributary below Hodges Dam was collected at 1 monitoring site [Green Valley Creek @ Rancho Bernardo Road]
Temporal Representation:	Data was collected over the time period 8/12/2004-6/18/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 49187, Indicator Bacteria **Region 9**

San Dieguito River, unnamed tributary below Hodges Dam

LOE ID:	75702
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	5
Number of Exceedances:	1
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Dieguito River, unnamed tributary below Hodges Dam to determine beneficial use support and results are as follows: 1 of 5 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxicsubstances in concentrations which are toxic to,or which produce detrimental physiologicalresponses in human, plant, animal, or indigenousaquatic life (Basin Plan).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In waters designated for water contact recreation (REC I), the total coliform concentration shall not exceed 10000 MPN/100 ml (CDPH 2006).
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.
Spatial Representation:	Data for this line of evidence for San Dieguito River, unnamed tributary below Hodges Dam was collected at 1 monitoring site [Green Valley Creek @ Rancho Bernardo Road]
Temporal Representation:	Data was collected over the time period 8/12/2004-6/18/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix

	Analytical and Dry Weather Monitoring Program Rev. 8 was followed. 042949
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Ironside Creek
Water Body ID: CAR9055400020110828180822
Water Body Type: River & Stream

DECISION ID 47915 **Region 9**
Ironside Creek

Pollutant: **Benthic Community Effects**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: Benthic Community Effects is being considered for placement on the CWA section 303(d) List under sections 3.9 and 3.1 of the Listing Policy. Under section 3.9, an additional line of evidence associating Benthic Community Effects with a water or sediment concentration of pollutant(s) is necessary to assess listing status.

Based on the readily available data and information, the weight of evidence provides sufficient justification for not placing Benthic Community Effects in this water segment on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Pursuant to section 3.9 of the Listing Policy, the water does not exhibit significant degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index.
4. Pursuant to section 3.9 of the Listing Policy, the water segment does not have associated pollutant(s) samples that exceed water quality objectives.
5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not being met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. Furthermore, what data is available does not indicate that the benthic community exhibits degradation when compared to reference.

Line of Evidence (LOE) for Decision ID 47915, Benthic Community Effects **Region 9**
Ironside Creek

LOE ID: 80831

Pollutant: Benthic-Macroinvertebrate Bioassessments
LOE Subgroup: Population/Community Degradation
Matrix: Water
Fraction: None

Beneficial Use: Cold Freshwater Habitat

Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	The CSCI score for this site is above the 0.79 threshold, and is therefore not exceeding the water quality objective for the aquatic life beneficial use.
Data Reference:	RWB9 Status Sampling 2007 and 2008 Region 9 CSCI Scores & Water Body Information
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.
Guideline Reference:	The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.
Spatial Representation:	Samples were collected at the following station: 905SDISS2
Temporal Representation:	Surveys done 2008
Environmental Conditions:	
QAPP Information:	Data collected following SWAMP QA protocols for the RWB9 Status Sampling 2007 and 2008 water quality monitoring project.
QAPP Information Reference(s):	RWB9 Status Sampling 2007 and 2008

Line of Evidence (LOE) for Decision ID 47915, Benthic Community Effects **Region 9**

Ironside Creek

LOE ID:	73905
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	The IBI score for this water body was below 43 which indicates that this water body is not considered to have impaired conditions.
Data Reference:	RWB9 Status Sampling 2007 and 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or

	that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at the following station: 905SDISS2 (Ironside Creek).
Temporal Representation:	Surveys done May 8, 2008.
Environmental Conditions:	
QAPP Information:	Data collected following SWAMP QA protocols for the RWB9 Status Sampling 2007 and 2008 water quality monitoring project.
QAPP Information Reference(s):	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: McGonigle Canyon
Water Body ID: CAR9061000020110906121011
Water Body Type: River & Stream

DECISION ID 47896 **Region 9**
McGonigle Canyon

Pollutant: Arsenic
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the CRITERION for protection of the aquatic life beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 1 samples exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47896, Arsenic **Region 9**
McGonigle Canyon

LOE ID: 74279

Pollutant: Toxicity
LOE Subgroup: Toxicity
Matrix: Water
Fraction: None

Beneficial Use: Warm Freshwater Habitat

Number of Samples: 1

Number of Exceedances:	1	042954
Data and Information Type:	TOXICITY TESTING	
Data Used to Assess Water Quality:	One sample was collected to test for toxicity. One of the samples exhibited statistically and biologically significant toxicity. The failed toxicity tests included survival and reproduction of Ceriodaphnia dubia.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control. Additionally, the biological significance of the sample is evaluted by determining whether the sample response is lower than the evaluation threshold.	
Guideline Reference:		
Spatial Representation:	The samples were collected from site 906_SMC01158, McGonigle Canyon.	
Temporal Representation:	The samples were collected in June 2009.	
Environmental Conditions:		
QAPP Information:	This data was collected for the Regional Monitoring Of Southern California's Coastal Watersheds - Stormwater Monitoring Coalition Bioassessment Working Group. CRG Marine Laboratories Quality Assurance Program Document was provided.	
QAPP Information Reference(s):	e-mail clarifying QAPP information	

Line of Evidence (LOE) for Decision ID 47896, Arsenic **Region 9**

McGonigle Canyon

LOE ID:	74265
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for McGonigle Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The dissolved arsenic criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved arsenic is 0.150 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	

Guideline Reference:	042955
Spatial Representation:	Data for this line of evidence for McGonigle Canyon was collected at 1 monitoring site [McGonigle Canyon - 906_SMC01158]
Temporal Representation:	Data was collected on a single day 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

DECISION ID 47901 Region 9

McGonigle Canyon

Pollutant:	**Benthic Community Effects**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Benthic Community Effects is being considered for placement on the CWA section 303(d) List under sections 3.9 and 3.1 of the Listing Policy. Under section 3.9, an additional line of evidence associating Benthic Community Effects with a water or sediment concentration of pollutant(s) is necessary to assess listing status. Based on the readily available data and information, the weight of evidence provides sufficient justification for not placing Benthic Community Effects in this water segment on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Pursuant to section 3.9 of the Listing Policy, the water does exhibit significant degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index. 4. Pursuant to section 3.9 of the Listing Policy, the water segment does not have a sufficient sample size of associated pollutant(s) samples that exceed water quality objectives. 5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not being met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47901, Benthic Community Effects Region 9

McGonigle Canyon

LOE ID:	72800
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1

Number of Exceedances:	1	042956
Data and Information Type:	Benthic macroinvertebrate surveys	
Data Used to Assess Water Quality:	The one sample collected had an IBI score below 40. The score was 1.4. tr11e SMC bioassessment	
Data Reference:	Bioassessment Data for Various Pollutants from Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the State or Regional Board. Region 9 Basin Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.	
Guideline Reference:	Development of a Benthic Index of Biotic Integrity (B-IBI) for Wadeable Streams in Northern Coastal California and its Application to Regional 305(b) Assessment	
Spatial Representation:	The sample was collected at 906_SMC01158, McGonigle Canyon.	
Temporal Representation:	The sample was collected in May 2009.	
Environmental Conditions:		
QAPP Information:	The data was collected under the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan, June 25, 2009.	
QAPP Information Reference(s):	Quality Assurance Project Plan for Southern California Regional Watershed Monitoring Program Bioassessment, Version 1.0, and Freshwater Bioassessment from Weston Solutions.	

Line of Evidence (LOE) for Decision ID 47901, Benthic Community Effects **Region 9**

McGonigle Canyon

LOE ID:	79567
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	The one sample collected was below the 0.79 threshold, and is therefore exceeding the water quality objective for the aquatic life beneficial use.
Data Reference:	Bioassessment Data for Various Pollutants from Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009. Region 9 CSCI Scores & Water Body Information
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of

	species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.
Guideline Reference:	The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.
Spatial Representation:	The sample was collected at 906_SMC01158, McGonigle Canyon.
Temporal Representation:	The sample was collected in May 2009.
Environmental Conditions:	
QAPP Information:	The Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan
QAPP Information Reference(s):	Quality Assurance Project Plan for Southern California Regional Watershed Monitoring Program Bioassessment, Version 1.0, and Freshwater Bioassessment from Weston Solutions.

DECISION ID	47900	Region 9
McGonigle Canyon		

Pollutant:	**Bifenthrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the Zero samples exceed the CRITERION for protection of the aquatic life beneficial use. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 0 samples exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47900, Bifenthrin **Region 9**

McGonigle Canyon

LOE ID:	74279
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to test for toxicity. One of the samples exhibited statistically and biologically significant toxicity. The failed toxicity tests included survival and reproduction of Ceriodaphnia dubia.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control. Additionally, the biological significance of the sample is evaluted by determining whether the sample response is lower than the evaluation threshold.
Guideline Reference:	
Spatial Representation:	The samples were collected from site 906_SMC01158, McGonigle Canyon.
Temporal Representation:	The samples were collected in June 2009.
Environmental Conditions:	
QAPP Information:	This data was collected for the Regional Monitoring Of Southern California's Coastal Watersheds - Stormwater Monitoring Coalition Bioassessment Working Group. CRG Marine Laboratories Quality Assurance Program Document was provided.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 47900, Bifenthrin **Region 9**

McGonigle Canyon

LOE ID:	78058
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for McGonigle Canyon 42959 determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Bifenthrin.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The UC Davis Criteria for Bifenthrin for the protection of aquatic organisms is a 4 day average of 0.0006 ug/L (Fojut et al. 2012).
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for McGonigle Canyon was collected at 1 monitoring site [McGonigle Canyon - 906_SMC01158]
Temporal Representation:	Data was collected on a single day 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

DECISION ID	47905	Region 9
McGonigle Canyon		

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the CRITERION for protection of the aquatic life beneficial use. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 1 samples exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47905, Cadmium **Region 9**

McGonigle Canyon

LOE ID:	74279
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to test for toxicity. One of the samples exhibited statistically and biologically significant toxicity. The failed toxicity tests included survival and reproduction of Ceriodaphnia dubia.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control. Additionally, the biological significance of the sample is evaluted by determining whether the sample response is lower than the evaluation threshold.
Guideline Reference:	
Spatial Representation:	The samples were collected from site 906_SMC01158, McGonigle Canyon.
Temporal Representation:	The samples were collected in June 2009.
Environmental Conditions:	
QAPP Information:	This data was collected for the Regional Monitoring Of Southern California's Coastal Watersheds - Stormwater Monitoring Coalition Bioassessment Working Group. CRG Marine Laboratories Quality Assurance Program Document was provided.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 47905, Cadmium **Region 9**

McGonigle Canyon

LOE ID:	74270
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for McGonigle Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The dissolved cadmium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved cadmium is 0.0022 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for McGonigle Canyon was collected at 1 monitoring site [McGonigle Canyon - 906_SMC01158]
Temporal Representation:	Data was collected on a single day 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

DECISION ID	47906	Region 9
McGonigle Canyon		

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the CRITERION for protection of the aquatic life beneficial use. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 1 samples exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47906, Chromium 042962 Region 9

McGonigle Canyon

LOE ID:	74279
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to test for toxicity. One of the samples exhibited statistically and biologically significant toxicity. The failed toxicity tests included survival and reproduction of Ceriodaphnia dubia.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control. Additionally, the biological significance of the sample is evaluted by determining whether the sample response is lower than the evaluation threshold.
Guideline Reference:	
Spatial Representation:	The samples were collected from site 906_SMC01158, McGonigle Canyon.
Temporal Representation:	The samples were collected in June 2009.
Environmental Conditions:	
QAPP Information:	This data was collected for the Regional Monitoring Of Southern California's Coastal Watersheds - Stormwater Monitoring Coalition Bioassessment Working Group. CRG Marine Laboratories Quality Assurance Program Document was provided.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 47906, Chromium Region 9

McGonigle Canyon

LOE ID:	74273
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for McGonigle

	Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for McGonigle Canyon was collected at 1 monitoring site [McGonigle Canyon - 906_SMC01158]
Temporal Representation:	Data was collected on a single day 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

DECISION ID	**47907**	**Region 9**
McGonigle Canyon		

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the CRITERION for protection of the aquatic life beneficial use. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 1 samples exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47907, Copper **Region 9**

McGonigle Canyon

LOE ID:	74279
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to test for toxicity. One of the samples exhibited statistically and biologically significant toxicity. The failed toxicity tests included survival and reproduction of Ceriodaphnia dubia.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control. Additionally, the biological significance of the sample is evaluted by determining whether the sample response is lower than the evaluation threshold.
Guideline Reference:	
Spatial Representation:	The samples were collected from site 906_SMC01158, McGonigle Canyon.
Temporal Representation:	The samples were collected in June 2009.
Environmental Conditions:	
QAPP Information:	This data was collected for the Regional Monitoring Of Southern California's Coastal Watersheds - Stormwater Monitoring Coalition Bioassessment Working Group. CRG Marine Laboratories Quality Assurance Program Document was provided.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 47907, Copper **Region 9**

McGonigle Canyon

LOE ID:	74274
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	042965
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for McGonigle Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for McGonigle Canyon was collected at 1 monitoring site [McGonigle Canyon - 906_SMC01158]	
Temporal Representation:	Data was collected on a single day 6/3/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.	

DECISION ID	**47912**	**Region 9**
McGonigle Canyon		

Pollutant:	**Cypermethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the Zero samples exceed the CRITERION for protection of the aquatic life beneficial use. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 0 samples exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and

information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47912, Cypermethrin **Region 9**

McGonigle Canyon

LOE ID:	74279
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to test for toxicity. One of the samples exhibited statistically and biologically significant toxicity. The failed toxicity tests included survival and reproduction of Ceriodaphnia dubia.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control. Additionally, the biological significance of the sample is evaluted by determining whether the sample response is lower than the evaluation threshold.
Guideline Reference:	
Spatial Representation:	The samples were collected from site 906_SMC01158, McGonigle Canyon.
Temporal Representation:	The samples were collected in June 2009.
Environmental Conditions:	
QAPP Information:	This data was collected for the Regional Monitoring Of Southern California's Coastal Watersheds - Stormwater Monitoring Coalition Bioassessment Working Group. CRG Marine Laboratories Quality Assurance Program Document was provided.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 47912, Cypermethrin **Region 9**

McGonigle Canyon

LOE ID:	78059
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0

Number of Exceedances:	0	042967

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for McGonigle Canyon to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Cypermethrin, total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of cypermethrin does not exceed 0.0002 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Fojut et al. 2012)
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for McGonigle Canyon was collected at 1 monitoring site [McGonigle Canyon - 906_SMC01158]
Temporal Representation:	Data was collected on a single day 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

DECISION ID	**47908**	**Region 9**
McGonigle Canyon		

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the CRITERION for protection of the aquatic life beneficial use. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 1 samples exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision	After review of the available data and information, RWQCB staff concludes that the water body-

Recommendation: pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47908, Lead **Region 9**

McGonigle Canyon

LOE ID:	74279
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to test for toxicity. One of the samples exhibited statistically and biologically significant toxicity. The failed toxicity tests included survival and reproduction of Ceriodaphnia dubia.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control. Additionally, the biological significance of the sample is evaluted by determining whether the sample response is lower than the evaluation threshold.
Guideline Reference:	
Spatial Representation:	The samples were collected from site 906_SMC01158, McGonigle Canyon.
Temporal Representation:	The samples were collected in June 2009.
Environmental Conditions:	
QAPP Information:	This data was collected for the Regional Monitoring Of Southern California's Coastal Watersheds - Stormwater Monitoring Coalition Bioassessment Working Group. CRG Marine Laboratories Quality Assurance Program Document was provided.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 47908, Lead **Region 9**

McGonigle Canyon

LOE ID:	74277
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	1	042969
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for McGonigle Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for McGonigle Canyon was collected at 1 monitoring site [McGonigle Canyon - 906_SMC01158]	
Temporal Representation:	Data was collected on a single day 6/3/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.	

DECISION ID	**47909**	**Region 9**
McGonigle Canyon		

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the CRITERION for protection of the aquatic life beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 1 samples exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47909, Nickel **Region 9**

McGonigle Canyon

LOE ID:	74279
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to test for toxicity. One of the samples exhibited statistically and biologically significant toxicity. The failed toxicity tests included survival and reproduction of Ceriodaphnia dubia.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control. Additionally, the biological significance of the sample is evaluted by determining whether the sample response is lower than the evaluation threshold.
Guideline Reference:	
Spatial Representation:	The samples were collected from site 906_SMC01158, McGonigle Canyon.
Temporal Representation:	The samples were collected in June 2009.
Environmental Conditions:	
QAPP Information:	This data was collected for the Regional Monitoring Of Southern California's Coastal Watersheds - Stormwater Monitoring Coalition Bioassessment Working Group. CRG Marine Laboratories Quality Assurance Program Document was provided.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 47909, Nickel **Region 9**

McGonigle Canyon

LOE ID:	74278
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Warm Freshwater Habitat	042971
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for McGonigle Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for McGonigle Canyon was collected at 1 monitoring site [McGonigle Canyon - 906_SMC01158]	
Temporal Representation:	Data was collected on a single day 6/3/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.	

DECISION ID	**47913**	**Region 9**
McGonigle Canyon		

Pollutant:	**Toxicity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. One of the one samples exceed the objective for protection of the aquatic life beneficial use. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of one samples exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.

4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47913, Toxicity **Region 9**

McGonigle Canyon

LOE ID:	74279
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to test for toxicity. One of the samples exhibited statistically and biologically significant toxicity. The failed toxicity tests included survival and reproduction of Ceriodaphnia dubia.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control. Additionally, the biological significance of the sample is evaluted by determining whether the sample response is lower than the evaluation threshold.
Guideline Reference:	
Spatial Representation:	The samples were collected from site 906_SMC01158, McGonigle Canyon.
Temporal Representation:	The samples were collected in June 2009.
Environmental Conditions:	
QAPP Information:	This data was collected for the Regional Monitoring Of Southern California's Coastal Watersheds - Stormwater Monitoring Coalition Bioassessment Working Group. CRG Marine Laboratories Quality Assurance Program Document was provided.
QAPP Information Reference(s):	e-mail clarifying QAPP information

DECISION ID **47910** **Region 9**

McGonigle Canyon

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision

Revision Status	Revised	042973
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the CRITERION for protection of the aquatic life beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 1 samples exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47910, Zinc **Region 9**

McGonigle Canyon

LOE ID:	74279
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to test for toxicity. One of the samples exhibited statistically and biologically significant toxicity. The failed toxicity tests included survival and reproduction of Ceriodaphnia dubia.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control. Additionally, the biological significance of the sample is evaluted by determining

	whether the sample response is lower than the evaluation threshold. 042974
Guideline Reference:	
Spatial Representation:	The samples were collected from site 906_SMC01158, McGonigle Canyon.
Temporal Representation:	The samples were collected in June 2009.
Environmental Conditions:	
QAPP Information:	This data was collected for the Regional Monitoring Of Southern California's Coastal Watersheds - Stormwater Monitoring Coalition Bioassessment Working Group. CRG Marine Laboratories Quality Assurance Program Document was provided.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 47910, Zinc **Region 9**

McGonigle Canyon

LOE ID:	74280
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for McGonigle Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for McGonigle Canyon was collected at 1 monitoring site [McGonigle Canyon - 906_SMC01158]
Temporal Representation:	Data was collected on a single day 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Tecolote Creek, South Fork
Water Body ID: CAR9065000020110906151725
Water Body Type: River & Stream

DECISION ID 53298 **Region 9**
Tecolote Creek, South Fork

Pollutant: Arsenic
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeded the guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53298, Arsenic **Region 9**
Tecolote Creek, South Fork

LOE ID: 77093

Pollutant: Arsenic
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Dissolved

Beneficial Use: Warm Freshwater Habitat

Number of Samples: 1

Number of Exceedances:	0	042976
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Tecolote Creek, South Fork to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The dissolved arsenic criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved arsenic is 0.150 mg/L (California Toxics Rule, 2000).	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Tecolote Creek, South Fork was collected at 1 monitoring site [Tecolote Creek, S. Fork - 906_SMC01046]	
Temporal Representation:	Data was collected on a single day 5/21/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.	

DECISION ID	**51760**	**Region 9**
Tecolote Creek, South Fork		

Pollutant:	**Benthic Community Effects**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	Benthic Community Effects is being considered for placement on the CWA section 303(d) List under sections 3.9 and 3.1 of the Listing Policy. Under section 3.9, an additional line of evidence associating Benthic Community Effects with a water or sediment concentration of pollutant(s) is necessary to assess listing status. Based on the readily available data and information, the weight of evidence provides sufficient justification for not placing Benthic Community Effects in this water segment on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Pursuant to section 3.9 of the Listing Policy, the water does exhibit significant degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index. 4. Pursuant to section 3.9 of the Listing Policy, the water segment does have associated pollutant(s) samples that exceed water quality objectives. 5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not being met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and

information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51760, Benthic Community Effects **Region 9**

Tecolote Creek, South Fork

LOE ID:	76893
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to test for toxicity. One of the samples exhibited statistically and biologically significant toxicity. The failed toxicity tests included survival and reproduction of Ceriodaphnia dubia.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control. Additionally, the biological significance of the sample is evaluted by determining whether the sample response is lower than the evaluation threshold.
Guideline Reference:	
Spatial Representation:	The samples were collected from site 906_SMC01046, Tecolote Creek, S. Fork.
Temporal Representation:	The samples were collected in June 2009.
Environmental Conditions:	
QAPP Information:	This data was collected for the Regional Monitoring Of Southern California's Coastal Watersheds - Stormwater Monitoring Coalition Bioassessment Working Group. CRG Marine Laboratories Quality Assurance Program Document was provided.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 51760, Benthic Community Effects **Region 9**

Tecolote Creek, South Fork

LOE ID:	72799
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1

Number of Exceedances:	1	042978
Data and Information Type:	Benthic macroinvertebrate surveys	
Data Used to Assess Water Quality:	The one sample collected had an IBI score below 40. The score was 11.4. tr11e SMC bioassessment	
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the State or Regional Board. Region 9 Basin Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.	
Guideline Reference:	Development of a Benthic Index of Biotic Integrity (B-IBI) for Wadeable Streams in Northern Coastal California and its Application to Regional 305(b) Assessment	
Spatial Representation:	The sample was collected at 906_SMC01046, Tecolote Creek, S. Fork.	
Temporal Representation:	The sample was collected in May 2009.	
Environmental Conditions:		
QAPP Information:	The data was collected under the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan, June 25, 2009.	
QAPP Information Reference(s):	Quality Assurance Project Plan for SWAMP Bioassessment and Freshwater Bioassessment.	

Line of Evidence (LOE) for Decision ID 51760, Benthic Community Effects **Region 9**

Tecolote Creek, South Fork

LOE ID:	79698
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	One sample was taken from one stations in Tecolote Creek (south fork tributary). The CSCI was below the 0.79 threshold, and therefore exceeding the water quality objective for the aquatic life beneficial use.
Data Reference:	Bioassessment Data for Various Pollutants from Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009. Region 9 CSCI Scores & Water Body Information
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of

	species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.
Guideline Reference:	The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.
Spatial Representation:	The samples were collected at stations SMC01046
Temporal Representation:	The sample was collected in 2009
Environmental Conditions:	
QAPP Information:	Data collected following the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan.
QAPP Information Reference(s):	e-mail clarifying QAPP information Bioassessment Data for Various Pollutants from Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.

DECISION ID	**51660**	**Region 9**
Tecolote Creek, South Fork		

Pollutant:	**Bifenthrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the three samples exceed the beneficial use guidelines. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of three samples exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	

Line of Evidence (LOE) for Decision ID 51660, Bifenthrin	**Region 9**

Tecolote Creek, South Fork 042980

LOE ID:	78184
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Tecolote Creek, South Fork to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Bifenthrin.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The UC Davis Criteria for Bifenthrin for the protection of aquatic organisms is a 4 day average of 0.0006 ug/L (Fojut et al. 2012).
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Tecolote Creek, South Fork was collected at 1 monitoring site [Tecolote Creek, S. Fork - 906_SMC01046]
Temporal Representation:	Data was collected on a single day 5/21/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

DECISION ID **53299** **Region 9**

Tecolote Creek, South Fork

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeded the guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53299, Cadmium **Region 9**

Tecolote Creek, South Fork

LOE ID:	77107
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Tecolote Creek, South Fork to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Tecolote Creek, South Fork was collected at 1 monitoring site [Tecolote Creek, S. Fork - 906_SMC01046]
Temporal Representation:	Data was collected on a single day 5/21/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

DECISION ID 53300 **Region 9**

Tecolote Creek, South Fork

042982

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeded the guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53300, Chromium — Region 9

Tecolote Creek, South Fork

LOE ID:	77110
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Tecolote Creek, South Fork to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to

	protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Tecolote Creek, South Fork was collected at 1 monitoring site [Tecolote Creek, S. Fork - 906_SMC01046]
Temporal Representation:	Data was collected on a single day 5/21/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

DECISION ID 53301 Region 9

Tecolote Creek, South Fork

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeded the guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53301, Copper Region 9

Tecolote Creek, South Fork

LOE ID:	76868
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water

Matrix:	Water	042984
Fraction:	Dissolved	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Tecolote Creek, South Fork to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Tecolote Creek, South Fork was collected at 1 monitoring site [Tecolote Creek, S. Fork - 906_SMC01046]	
Temporal Representation:	Data was collected on a single day 5/21/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.	

DECISION ID	**51663**	**Region 9**
Tecolote Creek, South Fork		

Pollutant:	**Cypermethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the zero samples exceed the beneficial use guidelines. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.

3. Zero of zero samples exceeded the guideline. The samples were not used in the assessment due to reporting limits that were higher than the guideline. The sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51663, Cypermethrin **Region 9**

Tecolote Creek, South Fork

LOE ID:	78148
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Tecolote Creek, South Fork to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Cypermethrin, total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of cypermethrin does not exceed 0.0002 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Fojut et al. 2012)
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Tecolote Creek, South Fork was collected at 1 monitoring site [Tecolote Creek, S. Fork - 906_SMC01046]
Temporal Representation:	Data was collected on a single day 5/21/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

DECISION ID **53302** **Region 9**

Tecolote Creek, South Fork

Pollutant: **Lead**

Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	042986
Last Listing Cycle's Final Listing Decision:	New Decision	
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeded the guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53302, Lead **Region 9**

Tecolote Creek, South Fork

LOE ID:	76872
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Tecolote Creek, South Fork to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.

Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Tecolote Creek, South Fork was collected at 1 monitoring site [Tecolote Creek, S. Fork - 906_SMC01046]
Temporal Representation:	Data was collected on a single day 5/21/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

042987

DECISION ID 53303 Region 9

Tecolote Creek, South Fork

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeded the guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53303, Nickel Region 9

Tecolote Creek, South Fork

LOE ID:	76892
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved

Beneficial Use:	Warm Freshwater Habitat	042988
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Tecolote Creek, South Fork to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Tecolote Creek, South Fork was collected at 1 monitoring site [Tecolote Creek, S. Fork - 906_SMC01046]	
Temporal Representation:	Data was collected on a single day 5/21/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.	

DECISION ID	**53304**	**Region 9**
Tecolote Creek, South Fork		

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeded the guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.

	4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53304, Zinc **Region 9**

Tecolote Creek, South Fork

LOE ID:	76894
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Tecolote Creek, South Fork to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Tecolote Creek, South Fork was collected at 1 monitoring site [Tecolote Creek, S. Fork - 906_SMC01046]
Temporal Representation:	Data was collected on a single day 5/21/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

DECISION ID **51731** **Region 9**

Tecolote Creek, South Fork

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision

Revision Status	Revised	042990
Sources:	Source Unknown	
Expected TMDL Completion Date:	2025	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Data from 2007 to 2010 show that 21 of 26 and 14 of 27 samples exceed the water quality objectives for enterococcus and fecal coliform for the protection of REC-1 beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Data from 2007 to 2010 show that 21 of 26 and 14 of 27 samples exceed the water quality objectives for enterococcus and fecal coliform for the protection of REC-1 beneficial use and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 51731, Indicator Bacteria **Region 9**

Tecolote Creek, South Fork

LOE ID:	76870
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	26
Number of Exceedances:	21
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Twenty-one of the twenty-six samples exceeded the enterococcus objective.
Data Reference:	Data for Various Pollutants in the City of San Diego Tecolote Creek, 2007-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The enterococcus concentration shall not exceed more than 61/100 ml. Water Quality Control Plan for the San Diego Basin.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from 10 stations on Tecolote Creek. Sites 14, 14UP, 14 UP2, 15, 16, 17, 18, 19, 24 and 5. Results for sites 14 and 14UP were averaged because they

are within 200 meters. 042991

Temporal Representation: Samples were collected between September 2007 and March 2010.
Environmental Conditions:
QAPP Information: No QAPP was submitted. The data was collected for the Tecolted Creek Bacterial Sourcee Tracking Investigation and used for background for the City of San Diego Bacteria TMDL.

QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 51731, Indicator Bacteria **Region 9**

Tecolote Creek, South Fork

LOE ID: 76871

Pollutant: Fecal Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 27
Number of Exceedances: 14

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Fourteen of the twenty-seven samples exceeded the fecal Coliform objective.
Data Reference: Data for Various Pollutants in the City of San Diego Tecolote Creek, 2007-2010.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The Fecal Coliform concentration shall not exceed more than 400/100 ml. Water Quality Control Plan for the San Diego Basin.
Objective/Criterion Reference: Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:
Guideline Reference:

Spatial Representation: The samples were collected from 10 stations on Tecolote Creek. Sites 14, 14UP, 14 UP2, 15, 16, 17, 18, 19, 24 and 5. Results for sites 14 and 14UP were averaged because they ware within 200 meters of each other.
Temporal Representation: Samples were collected between September 2007 and March 2010.
Environmental Conditions:
QAPP Information: No QAPP was submitted. The data was collected for the Tecolted Creek Bacterial Sourcee Tracking Investigation and used for background for the City of San Diego Bacteria TMDL.

QAPP Information Reference(s):

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Murphy Canyon
Water Body ID: CAR9071100020110906133850
Water Body Type: River & Stream

DECISION ID 48274 **Region 9**
Murphy Canyon

Pollutant: Arsenic
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the CRITERIA.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48274, Arsenic **Region 9**
Murphy Canyon

LOE ID: 74430

Pollutant: Arsenic
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Warm Freshwater Habitat

Number of Samples: 1

Number of Exceedances:	0	042993
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Murphy Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Arsenic.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The dissolved arsenic criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved arsenic is 0.150 mg/L (California Toxics Rule, 2000).	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Murphy Canyon was collected at 1 monitoring site [Murphy Canyon - 907_SMC01990]	
Temporal Representation:	Data was collected on a single day 6/3/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.	

Line of Evidence (LOE) for Decision ID 48274, Arsenic **Region 9**

Murphy Canyon

LOE ID:	74442
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to test for toxicity. None of the samples exhibited statistically significant toxicity. The toxicity tests included survival and reproduction of Ceriodaphnia dubia.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	

Spatial Representation:	The samples were collected from site 907_SMC01990, Murphy Canyon .
Temporal Representation:	The samples were collected in June 2009.
Environmental Conditions:	
QAPP Information:	This data was collected for the Regional Monitoring Of Southern California's Coastal Watersheds - Stormwater Monitoring Coalition Bioassessment Working Group. CRG Marine Laboratories Quality Assurance Program Document was provided.
QAPP Information Reference(s):	e-mail clarifying QAPP information

DECISION ID 51714 Region 9

Murphy Canyon

Pollutant:	**Benthic Community Effects**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

Benthic Community Effects is being considered for placement on the CWA section 303(d) List under sections 3.9 and 3.1 of the Listing Policy. Under section 3.9, an additional line of evidence associating Benthic Community Effects with a water or sediment concentration of pollutant(s) is necessary to assess listing status.

Based on the readily available data and information, the weight of evidence provides sufficient justification for not placing Benthic Community Effects in this water segment on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Pursuant to section 3.9 of the Listing Policy, the water does exhibit significant degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index.
4. Pursuant to section 3.9 of the Listing Policy, the water segment does not have associated pollutant(s) samples that exceed water quality objectives.
5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not being met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51714, Benthic Community Effects Region 9

Murphy Canyon

LOE ID:	72802
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1

Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	The one sample collected had an IBI score below 40. The score was 10. tr11e SMC bioassessment
Data Reference:	Bioassessment Data for Various Pollutants from Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the State or Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	Development of a Benthic Index of Biotic Integrity (B-IBI) for Wadeable Streams in Northern Coastal California and its Application to Regional 305(b) Assessment
Spatial Representation:	The sample was collected at 907_SMC01990, Murphy Canyon.
Temporal Representation:	The sample was collected in May 2009.
Environmental Conditions:	
QAPP Information:	The data was collected under the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan, June 25, 2009.
QAPP Information Reference(s):	Quality Assurance Project Plan for Southern California Regional Watershed Monitoring Program Bioassessment, Version 1.0, and Freshwater Bioassessment from Weston Solutions.

Line of Evidence (LOE) for Decision ID 51714, Benthic Community Effects **Region 9**

Murphy Canyon

LOE ID:	79634
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	One sample was taken at one station. The one sample was below the 0.79 threshold, and is therefore exceeding the water quality objective for the aquatic life beneficial use.
Data Reference:	Bioassessment Data for Various Pollutants from Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009. Region 9 CSCI Scores & Water Body Information
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration,

	or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.
Guideline Reference:	The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.
Spatial Representation:	The sample was collected at 907_SMC01990, Murphy Canyon.
Temporal Representation:	The sample was collected in May 2009.
Environmental Conditions:	
QAPP Information:	The data was collected under the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan, June 25, 2009.
QAPP Information Reference(s):	Quality Assurance Project Plan for Southern California Regional Watershed Monitoring Program Bioassessment, Version 1.0, and Freshwater Bioassessment from Weston Solutions.

DECISION ID	48275	Region 9
Murphy Canyon		

Pollutant:	**Bifenthrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the zero samples (one sample analyzed, but detection limit is greater than criteria)exceed the CRITERIA. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of zero samples exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48275, Bifenthrin 042997 Region 9

Murphy Canyon

LOE ID:	74442
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to test for toxicity. None of the samples exhibited statistically significant toxicity. The toxicity tests included survival and reproduction of Ceriodaphnia dubia.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected from site 907_SMC01990, Murphy Canyon .
Temporal Representation:	The samples were collected in June 2009.
Environmental Conditions:	
QAPP Information:	This data was collected for the Regional Monitoring Of Southern California's Coastal Watersheds - Stormwater Monitoring Coalition Bioassessment Working Group. CRG Marine Laboratories Quality Assurance Program Document was provided.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 48275, Bifenthrin Region 9

Murphy Canyon

LOE ID:	78068
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Murphy Canyon to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for

	Bifenthrin. 042998
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The UC Davis Criteria for Bifenthrin for the protection of aquatic organisms is a 4 day average of 0.0006 ug/L (Fojut et al. 2012).
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Murphy Canyon was collected at 1 monitoring site [Murphy Canyon - 907_SMC01990]
Temporal Representation:	Data was collected on a single day 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

DECISION ID 48276 Region 9

Murphy Canyon

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One line of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the CRITERIA. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one samples exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48276, Cadmium Region 9

Murphy Canyon 042999

LOE ID:	74433
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Murphy Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The dissolved cadmium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved cadmium is 0.0022 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Murphy Canyon was collected at 1 monitoring site [Murphy Canyon - 907_SMC01990]
Temporal Representation:	Data was collected on a single day 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

Line of Evidence (LOE) for Decision ID 48276, Cadmium **Region 9**

Murphy Canyon

LOE ID:	74442
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to test for toxicity. None of the samples exhibited statistically significant toxicity. The toxicity tests included survival and reproduction of Ceriodaphnia dubia.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.

SWAMP Data:	Non-SWAMP	043000
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.	
Guideline Reference:		
Spatial Representation:	The samples were collected from site 907_SMC01990, Murphy Canyon .	
Temporal Representation:	The samples were collected in June 2009.	
Environmental Conditions:		
QAPP Information:	This data was collected for the Regional Monitoring Of Southern California's Coastal Watersheds - Stormwater Monitoring Coalition Bioassessment Working Group. CRG Marine Laboratories Quality Assurance Program Document was provided.	
QAPP Information Reference(s):	e-mail clarifying QAPP information	

DECISION ID	48277	Region 9
Murphy Canyon		

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the CRITERIA. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one samples exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48277, Chromium	Region 9
Murphy Canyon	

LOE ID:	74436	043001

Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Murphy Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chromium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Murphy Canyon was collected at 1 monitoring site [Murphy Canyon - 907_SMC01990]
Temporal Representation:	Data was collected on a single day 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

Line of Evidence (LOE) for Decision ID 48277, Chromium **Region 9**

Murphy Canyon

LOE ID:	74442
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to test for toxicity. None of the samples exhibited statistically significant toxicity. The toxicity tests included survival and reproduction of Ceriodaphnia dubia.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected from site 907_SMC01990, Murphy Canyon .
Temporal Representation:	The samples were collected in June 2009.
Environmental Conditions:	
QAPP Information:	This data was collected for the Regional Monitoring Of Southern California's Coastal Watersheds - Stormwater Monitoring Coalition Bioassessment Working Group. CRG Marine Laboratories Quality Assurance Program Document was provided.
QAPP Information Reference(s):	e-mail clarifying QAPP information

DECISION ID 48278 Region 9

Murphy Canyon

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One line of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the CRITERIA. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one samples exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48278, Copper Region 9

Murphy Canyon

LOE ID:	74437
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Murphy Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Murphy Canyon was collected at 1 monitoring site [Murphy Canyon - 907_SMC01990]
Temporal Representation:	Data was collected on a single day 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

Line of Evidence (LOE) for Decision ID 48278, Copper **Region 9**

Murphy Canyon

LOE ID:	74442
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to test for toxicity. None of the samples exhibited statistically significant toxicity. The toxicity tests included survival and reproduction of Ceriodaphnia dubia.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater

	Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009. 043004
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected from site 907_SMC01990, Murphy Canyon .
Temporal Representation:	The samples were collected in June 2009.
Environmental Conditions:	
QAPP Information:	This data was collected for the Regional Monitoring Of Southern California's Coastal Watersheds - Stormwater Monitoring Coalition Bioassessment Working Group. CRG Marine Laboratories Quality Assurance Program Document was provided.
QAPP Information Reference(s):	e-mail clarifying QAPP information

DECISION ID	48279	Region 9
Murphy Canyon		

Pollutant:	**Cypermethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One line of evidence are available in the administrative record to assess this pollutant. Zero of the zero samples (one sample collected but method detection limit is greater than the criteria) exceed the CRITERIA. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of zero samples exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 3.1 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48279, Cypermethrin	Region 9

Murphy Canyon 043005

LOE ID:	74442
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to test for toxicity. None of the samples exhibited statistically significant toxicity. The toxicity tests included survival and reproduction of Ceriodaphnia dubia.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected from site 907_SMC01990, Murphy Canyon .
Temporal Representation:	The samples were collected in June 2009.
Environmental Conditions:	
QAPP Information:	This data was collected for the Regional Monitoring Of Southern California's Coastal Watersheds - Stormwater Monitoring Coalition Bioassessment Working Group. CRG Marine Laboratories Quality Assurance Program Document was provided.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 48279, Cypermethrin **Region 9**

Murphy Canyon

LOE ID:	78069
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Murphy Canyon to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Cypermethrin, total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater

	Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009. 043006
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of cypermethrin does not exceed 0.0002 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Fojut et al. 2012)
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Murphy Canyon was collected at 1 monitoring site [Murphy Canyon - 907_SMC01990]
Temporal Representation:	Data was collected on a single day 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

DECISION ID	**48281**	**Region 9**
Murphy Canyon		

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One line of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the CRITERIA. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one samples exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	

Line of Evidence (LOE) for Decision ID 48281, Lead	**Region 9**
Murphy Canyon	

LOE ID:	74440	043007

Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Murphy Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Murphy Canyon was collected at 1 monitoring site [Murphy Canyon - 907_SMC01990]
Temporal Representation:	Data was collected on a single day 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

Line of Evidence (LOE) for Decision ID 48281, Lead **Region 9**

Murphy Canyon

LOE ID:	74442
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to test for toxicity. None of the samples exhibited statistically significant toxicity. The toxicity tests included survival and reproduction of Ceriodaphnia dubia.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected from site 907_SMC01990, Murphy Canyon .
Temporal Representation:	The samples were collected in June 2009.
Environmental Conditions:	
QAPP Information:	This data was collected for the Regional Monitoring Of Southern California's Coastal Watersheds - Stormwater Monitoring Coalition Bioassessment Working Group. CRG Marine Laboratories Quality Assurance Program Document was provided.
QAPP Information Reference(s):	e-mail clarifying QAPP information

DECISION ID 48283 Region 9

Murphy Canyon

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One line of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the CRITERIA. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one samples exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48283, Nickel Region 9

Murphy Canyon

LOE ID:	74442
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to test for toxicity. None of the samples exhibited statistically significant toxicity. The toxicity tests included survival and reproduction of Ceriodaphnia dubia.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected from site 907_SMC01990, Murphy Canyon .
Temporal Representation:	The samples were collected in June 2009.
Environmental Conditions:	
QAPP Information:	This data was collected for the Regional Monitoring Of Southern California's Coastal Watersheds - Stormwater Monitoring Coalition Bioassessment Working Group. CRG Marine Laboratories Quality Assurance Program Document was provided.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Line of Evidence (LOE) for Decision ID 48283, Nickel **Region 9**

Murphy Canyon

LOE ID:	74441
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Murphy Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nickel.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Murphy Canyon was collected at 1 monitoring site [Murphy Canyon - 907_SMC01990]
Temporal Representation:	Data was collected on a single day 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

DECISION ID 48288 Region 9

Murphy Canyon

Pollutant:	**Toxicity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 a single line(s) of evidence are necessary to assess listing status. One line of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the OBJECTIVE. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeded the OBJECTIVE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48288, Toxicity Region 9

Murphy Canyon 043011

LOE ID:	74442
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to test for toxicity. None of the samples exhibited statistically significant toxicity. The toxicity tests included survival and reproduction of Ceriodaphnia dubia.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected from site 907_SMC01990, Murphy Canyon .
Temporal Representation:	The samples were collected in June 2009.
Environmental Conditions:	
QAPP Information:	This data was collected for the Regional Monitoring Of Southern California's Coastal Watersheds - Stormwater Monitoring Coalition Bioassessment Working Group. CRG Marine Laboratories Quality Assurance Program Document was provided.
QAPP Information Reference(s):	e-mail clarifying QAPP information

DECISION ID **48286** **Region 9**

Murphy Canyon

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One line of evidence are available in the administrative record to assess this pollutant. Zero of the one sample exceed the CRITERIA. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section

303(d) List. 043012

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48286, Zinc **Region 9**

Murphy Canyon

LOE ID:	74443
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Murphy Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Murphy Canyon was collected at 1 monitoring site [Murphy Canyon - 907_SMC01990]
Temporal Representation:	Data was collected on a single day 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and SMC Workplan.

Line of Evidence (LOE) for Decision ID 48286, Zinc **Region 9**

Murphy Canyon 043013

LOE ID:	74442
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One sample was collected to test for toxicity. None of the samples exhibited statistically significant toxicity. The toxicity tests included survival and reproduction of Ceriodaphnia dubia.
Data Reference:	Data for Metals, Nutrients, Inorganics, Pesticides and Toxicity from the Stormwater Monitoring Coalition Regional Monitoring of Southern California Coastal Watersheds, 2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. The t-test is used to determine if there is a statistically significant decrease in organism response in the sample as compared to the control.
Guideline Reference:	
Spatial Representation:	The samples were collected from site 907_SMC01990, Murphy Canyon .
Temporal Representation:	The samples were collected in June 2009.
Environmental Conditions:	
QAPP Information:	This data was collected for the Regional Monitoring Of Southern California's Coastal Watersheds - Stormwater Monitoring Coalition Bioassessment Working Group. CRG Marine Laboratories Quality Assurance Program Document was provided.
QAPP Information Reference(s):	e-mail clarifying QAPP information

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Eucalyptus Hills Creek
Water Body ID: CAR9071200020110816160800
Water Body Type: River & Stream

DECISION ID 47383 **Region 9**
Eucalyptus Hills Creek

Pollutant: Cadmium
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence are necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the seven samples exceed the Basin Plan Objective for cadmium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of seven samples exceeded the Basin Plan Objective for cadmium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47383, Cadmium **Region 9**
Eucalyptus Hills Creek

LOE ID: 73666

Pollutant: Cadmium
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Cold Freshwater Habitat

Number of Samples:	7	043015
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Eucalyptus Hills Creek to determine beneficial use support and results are as follows: 0 of 7 samples exceed the criterion for Cadmium.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Eucalyptus Hills Creek was collected at 1 monitoring site [Eucalyptus Hills Creek @ Riverside Drive (Storm Drain Channel)]	
Temporal Representation:	Data was collected from 6/9/2003 - 6/15/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID	**47384**	**Region 9**
Eucalyptus Hills Creek		

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the zero samples exceed the Evaluation Guideline for Chlorpyrifos. Seven samples were collected between 8/24/2004 and 7/19/2009, all samples were non detects, however as per the management guidance document on quantitation limits all seven of the samples had to be thrown out.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of zero samples exceeded the Evaluation Guideline for Chlorpyrifos and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.

	4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47384, Chlorpyrifos **Region 9**

Eucalyptus Hills Creek

LOE ID:	73667
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Eucalyptus Hills Creek to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).
Spatial Representation:	Data for this line of evidence for Eucalyptus Hills Creek was collected at 1 monitoring site [Eucalyptus Hills Creek @ Riverside Drive (Storm Drain Channel)]
Temporal Representation:	Data was collected over the time period 8/19/2004-6/15/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **47385** **Region 9**

Eucalyptus Hills Creek

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final	New Decision

Listing Decision:		043017
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. Zero of the seven samples exceed the California Toxics Rule Objective for copper.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of seven samples exceeded the California Toxics Rule for copper and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47385, Copper **Region 9**

Eucalyptus Hills Creek

LOE ID:	73668
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Eucalyptus Hills Creek to determine beneficial use support and results are as follows: 0 of 7 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition

Evaluation Guideline:	043018
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Eucalyptus Hills Creek was collected at 1 monitoring site [Eucalyptus Hills Creek @ Riverside Drive (Storm Drain Channel)]
Temporal Representation:	Data was collected from 6/9/2003 - 6/15/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 47389 **Region 9**

Eucalyptus Hills Creek

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the seven samples exceed the California Toxics Rule Objective for lead. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of seven samples exceeded the California Toxics Rule Objective for copper and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47389, Lead **Region 9**

Eucalyptus Hills Creek

LOE ID:	73672
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat

Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Eucalyptus Hills Creek to determine beneficial use support and results are as follows: 0 of 7 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Eucalyptus Hills Creek was collected at 1 monitoring site [Eucalyptus Hills Creek @ Riverside Drive (Storm Drain Channel)]
Temporal Representation:	Data was collected from 6/9/2003 - 6/15/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **47390** **Region 9**

Eucalyptus Hills Creek

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the seven samples exceed the USEPA criteria for Malathion.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of seven samples exceeded the USEPA Criteria for Malathion and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available

	indicating that standards are not met.	043020
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.	

Line of Evidence (LOE) for Decision ID 47390, Malathion **Region 9**

Eucalyptus Hills Creek

LOE ID:	73673
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Eucalyptus Hills Creek to determine beneficial use support and results are as follows: 0 of 7 samples exceed the criterion for Malathion.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Eucalyptus Hills Creek was collected at 1 monitoring site [Eucalyptus Hills Creek @ Riverside Drive (Storm Drain Channel)]
Temporal Representation:	Data was collected over the time period 8/19/2004-6/15/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **47392** **Region 9**

Eucalyptus Hills Creek

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the seven samples exceed the California Toxics Rule Objective for Zinc.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of seven samples exceeded the California Toxics Rule Objective for Zinc and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47392, Zinc **Region 9**

Eucalyptus Hills Creek

LOE ID:	73675
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Eucalyptus Hills Creek to determine beneficial use support and results are as follows: 0 of 7 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Eucalyptus Hills Creek was collected at 1 monitoring site [

	Eucalyptus Hills Creek @ Riverside Drive (Storm Drain Channel)] 043022
Temporal Representation:	Data was collected from 6/9/2003 - 6/15/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 47386 Region 9

Eucalyptus Hills Creek

Pollutant:	**Diazinon**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence are available in the administrative record to assess this pollutant. Two of the 7 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Two of 7 samples exceed the criteria and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 47386, Diazinon Region 9

Eucalyptus Hills Creek

LOE ID:	73669
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	2

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	043023
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Eucalyptus Hills Creek to determine beneficial use support and results are as follows: 2 of 7 samples exceed the criterion for Diazinon.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).	
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game	
Spatial Representation:	Data for this line of evidence for Eucalyptus Hills Creek was collected at 1 monitoring site [Eucalyptus Hills Creek @ Riverside Drive (Storm Drain Channel)]	
Temporal Representation:	Data was collected over the time period 8/19/2004-6/15/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID	48839	Region 9
Eucalyptus Hills Creek		

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2029
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.3 of the Listing Policy. Under section 3.3 a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. Eight of the Eight samples exceed the Single Sample Maximum Objective for Enterococcus, Seven out of Seven samples exceeded the Single Sample Maximum Objective for Fecal Coliform, and Seven out of Seven samples exceeded the Single Sample Maximum Guideline for Total Coliform.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Eight of the Eight samples exceed the Single Sample Maximum Objective for Enterococcus, Seven out of Seven samples exceeded the Single Sample Maximum Objective for Fecal Coliform, and Seven out of Seven samples exceeded the Single Sample Maximum Guideline for Total Coliform, and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.

4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 48839, Indicator Bacteria **Region 9**

Eucalyptus Hills Creek

LOE ID:	73670
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	8
Number of Exceedances:	8
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Eucalyptus Hills Creek to determine beneficial use support and results are as follows: 8 of 8 samples exceed the criterion for Enterococci.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Samples shall not exceed 61 organisms per 100 ml for enterococcus in waters designated for REC I beneficial use (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Eucalyptus Hills Creek was collected at 1 monitoring site [Eucalyptus Hills Creek @ Riverside Drive (Storm Drain Channel)]
Temporal Representation:	Data was collected over the time period 6/9/2003-7/29/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48839, Indicator Bacteria **Region 9**

Eucalyptus Hills Creek

LOE ID:	73674
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	7

Number of Exceedances:	7	043025

Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Eucalyptus Hills Creek to determine beneficial use support and results are as follows: 7 of 7 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxicsubstances in concentrations which are toxic to,or which produce detrimental physiologicalresponses in human, plant, animal, or indigenousaquatic life (Basin Plan).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In waters designated for water contact recreation (REC I), the total coliform concentration shall not exceed 10000 MPN/100 ml (CDPH 2006).
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.
Spatial Representation:	Data for this line of evidence for Eucalyptus Hills Creek was collected at 1 monitoring site [Eucalyptus Hills Creek @ Riverside Drive (Storm Drain Channel)]
Temporal Representation:	Data was collected over the time period 6/9/2003-7/29/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48839, Indicator Bacteria **Region 9**

Eucalyptus Hills Creek

LOE ID:	73671
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	7
Number of Exceedances:	7
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Eucalyptus Hills Creek to determine beneficial use support and results are as follows: 7 of 7 samples exceed the criterion for Coliform, Fecal.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the fecal coliform concentration shall not exceed 400 MPN/100 ml.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Eucalyptus Hills Creek was collected at 1 monitoring site [

	Eucalyptus Hills Creek @ Riverside Drive (Storm Drain Channel)]	043026
Temporal Representation:	Data was collected over the time period 6/9/2003-7/29/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Oak Creek (San Diego County)
Water Body ID: CAR9071400020110817144602
Water Body Type: River & Stream

DECISION ID 48280 **Region 9**
Oak Creek (San Diego County)

Pollutant: Cadmium
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples exceeded the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48280, Cadmium **Region 9**
Oak Creek (San Diego County)

LOE ID: 74451

Pollutant: Cadmium
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Cold Freshwater Habitat

Number of Samples: 1

Number of Exceedances:	0	043028
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Oak Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Oak Creek (San Diego County) was collected at 1 monitoring site [Oak Creek @ Olde Highway 80]	
Temporal Representation:	Data was collected on a single day 5/21/2003.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID	**48282**	**Region 9**
Oak Creek (San Diego County)		

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one samples exceeded the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision	After review of the available data and information, RWQCB staff concludes that the water body-

Recommendation: pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48282, Copper **Region 9**
Oak Creek (San Diego County)

LOE ID:	74452
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Oak Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Oak Creek (San Diego County) was collected at 1 monitoring site [Oak Creek @ Olde Highway 80]
Temporal Representation:	Data was collected on a single day 5/21/2003.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **48287** **Region 9**
Oak Creek (San Diego County)

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.3 of

the Listing Policy. Under section 3.3 a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. Two of the two samples exceed the objective for enterococcus. Two of two samples exceed the objective for fecal coliform and two of two samples exceed the objective for total coliform.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Two of Two samples exceed the objectives and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48287, Indicator Bacteria **Region 9**

Oak Creek (San Diego County)

LOE ID:	74454
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2
Number of Exceedances:	2
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Oak Creek (San Diego County) to determine beneficial use support and results are as follows: 2 of 2 samples exceed the criterion for Coliform, Fecal.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the fecal coliform concentration shall not exceed 400 MPN/100 ml.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Oak Creek (San Diego County) was collected at 1 monitoring site [Oak Creek @ Olde Highway 80]
Temporal Representation:	Data was collected over the time period 5/21/2003-9/11/2003.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.

QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48287, Indicator Bacteria **Region 9**

Oak Creek (San Diego County)

LOE ID:	74456
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2
Number of Exceedances:	2
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Oak Creek (San Diego County) to determine beneficial use support and results are as follows: 2 of 2 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxicsubstances in concentrations which are toxic to,or which produce detrimental physiologicalresponses in human, plant, animal, or indigenousaquatic life (Basin Plan).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In waters designated for water contact recreation (REC I), the total coliform concentration shall not exceed 10000 MPN/100 ml (CDPH 2006).
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.
Spatial Representation:	Data for this line of evidence for Oak Creek (San Diego County) was collected at 1 monitoring site [Oak Creek @ Olde Highway 80]
Temporal Representation:	Data was collected over the time period 5/21/2003-9/11/2003.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48287, Indicator Bacteria **Region 9**

Oak Creek (San Diego County)

LOE ID:	74453
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2
Number of Exceedances:	2

Data and Information Type:	PATHOGEN MONITORING	043032
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Oak Creek (San Diego County) to determine beneficial use support and results are as follows: 2 of 2 samples exceed the criterion for Enterococci.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Samples shall not exceed 61 organisms per 100 ml for enterococcus in waters designated for REC I beneficial use (Water Quality Control Plan for the San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Oak Creek (San Diego County) was collected at 1 monitoring site [Oak Creek @ Olde Highway 80]	
Temporal Representation:	Data was collected over the time period 5/21/2003-9/11/2003.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID	**48284**	**Region 9**
Oak Creek (San Diego County)		

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one samples exceeded the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48284, Lead 043033 **Region 9**

Oak Creek (San Diego County)

LOE ID:	74455
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Oak Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Oak Creek (San Diego County) was collected at 1 monitoring site [Oak Creek @ Olde Highway 80]
Temporal Representation:	Data was collected on a single day 5/21/2003.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **48285** **Region 9**

Oak Creek (San Diego County)

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples exceeded the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48285, Zinc **Region 9**

Oak Creek (San Diego County)

LOE ID:	74457
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Oak Creek (San Diego County) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Oak Creek (San Diego County) was collected at 1 monitoring site [Oak Creek @ Olde Highway 80]
Temporal Representation:	Data was collected on a single day 5/21/2003.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: San Vicente Creek (San Diego County), unnamed tributary at Arena Drive
Water Body ID: CAR9072300020110817151013
Water Body Type: River & Stream

DECISION ID 49123 **Region 9**
San Vicente Creek (San Diego County), unnamed tributary at Arena Drive

Pollutant: Cadmium
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. Zero of the two samples exceed the CRITERIA.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of two samples exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49123, Cadmium **Region 9**
San Vicente Creek (San Diego County), unnamed tributary at Arena Drive

LOE ID: 76273

Pollutant: Cadmium
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 2

Number of Exceedances:	0	043036

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Vicente Creek (San Diego County), unnamed tributary at Arena Drive to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for cadmium is 0.005 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Vicente Creek (San Diego County), unnamed tributary at Arena Drive was collected at 1 monitoring site [Tributary of San Vicente Creek @ San Vicente Road]
Temporal Representation:	Data was collected on 6/23/2003 and 5/11/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 49123, Cadmium **Region 9**

San Vicente Creek (San Diego County), unnamed tributary at Arena Drive

LOE ID:	76272
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Vicente Creek (San Diego County), unnamed tributary at Arena Drive to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Data for this line of evidence for San Vicente Creek (San Diego County), unnamed tributary at Arena Drive was collected at 1 monitoring site [Tributary of San Vicente Creek @ San Vicente Road]
Temporal Representation:	Data was collected on 6/23/2003 and 5/11/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 49124 Region 9

San Vicente Creek (San Diego County), unnamed tributary at Arena Drive

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the zero samples exceed the CRITERIA. One sample was collected, but the detection limit is greater than the criteria for warm freshwater habitat. Zero of the one sample exceeded the guideline for drinking water (MUN). Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of zero samples (WARM) and zero of one samples (MUN) exceeded the CRITERIA (WARM) or GUIDELINE (MUN) and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49124, Chlorpyrifos Region 9

San Vicente Creek (San Diego County), unnamed tributary at Arena Drive

LOE ID:	78128
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Vicente Creek (San Diego County), unnamed tributary at Arena Drive to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for chlorpyrifos is 2.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for San Vicente Creek (San Diego County), unnamed tributary at Arena Drive was collected at 1 monitoring site [Tributary of San Vicente Creek @ San Vicente Road]
Temporal Representation:	Data was collected on a single day 5/11/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 49124, Chlorpyrifos **Region 9**

San Vicente Creek (San Diego County), unnamed tributary at Arena Drive

LOE ID:	76274
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Vicente Creek (San Diego County), unnamed tributary at Arena Drive to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000).

Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 04-03. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).
Spatial Representation:	Data for this line of evidence for San Vicente Creek (San Diego County), unnamed tributary at Arena Drive was collected at 1 monitoring site [Tributary of San Vicente Creek @ San Vicente Road]
Temporal Representation:	Data was collected on a single day 5/11/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 49125 Region 9

San Vicente Creek (San Diego County), unnamed tributary at Arena Drive

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One line of evidence are available in the administrative record to assess this pollutant. Zero of the two samples exceed the CRITERIA. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of two samples exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49125, Copper Region 9

San Vicente Creek (San Diego County), unnamed tributary at Arena Drive

LOE ID:	76280
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Vicente Creek (San Diego County), unnamed tributary at Arena Drive to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for copper is 1.0 mg/L (Title 22 California Code of Regulations).
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Vicente Creek (San Diego County), unnamed tributary at Arena Drive was collected at 1 monitoring site [Tributary of San Vicente Creek @ San Vicente Road]
Temporal Representation:	Data was collected on 6/23/2003 and 5/11/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 49125, Copper **Region 9**

San Vicente Creek (San Diego County), unnamed tributary at Arena Drive

LOE ID:	76279
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Vicente Creek (San Diego County), unnamed tributary at Arena Drive to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition

Evaluation Guideline:
Guideline Reference:

Spatial Representation:	Data for this line of evidence for San Vicente Creek (San Diego County), unnamed tributary at Arena Drive was collected at 1 monitoring site [Tributary of San Vicente Creek @ San Vicente Road]
Temporal Representation:	Data was collected on 6/23/2003 and 5/11/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 49126 — Region 9

San Vicente Creek (San Diego County), unnamed tributary at Arena Drive

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the one sample exceed the GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49126, Diazinon — Region 9

San Vicente Creek (San Diego County), unnamed tributary at Arena Drive

LOE ID:	76281
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Warm Freshwater Habitat	043042
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Vicente Creek (San Diego County), unnamed tributary at Arena Drive to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Diazinon.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).	
Guideline Reference:	Water quality for diazinon, Memorandum to J. Karkoski, Central Valley RWQCB, Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game	
Spatial Representation:	Data for this line of evidence for San Vicente Creek (San Diego County), unnamed tributary at Arena Drive was collected at 1 monitoring site [Tributary of San Vicente Creek @ San Vicente Road]	
Temporal Representation:	Data was collected on a single day 5/11/2006.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 49126, Diazinon **Region 9**

San Vicente Creek (San Diego County), unnamed tributary at Arena Drive

LOE ID:	78129
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Vicente Creek (San Diego County), unnamed tributary at Arena Drive to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	The USEPA drinking water health advisory for diazinon is 1.4 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for San Vicente Creek (San Diego County), unnamed tributary at Arena Drive was collected at 1 monitoring site [Tributary of San Vicente Creek @ San Vicente Road]
Temporal Representation:	Data was collected on a single day 5/11/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 53446 Region 9

San Vicente Creek (San Diego County), unnamed tributary at Arena Drive

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2,one line(s) of evidence are necessary to assess listing status. Three lines of evidence are available in the administrative record to assess this pollutant. Two of two samples exceed the water quality objective for enterococcus of a SSM of 61/100 ml for the protection of REC-1 beneficial use. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Two of two samples exceed the water quality objective for enterococcus of a SSM of 61/100 ml for the protection of REC-1 beneficial use and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2. 4. Pursuant to [SECTION 3.11/4.11] of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 53446, Indicator Bacteria Region 9

San Vicente Creek (San Diego County), unnamed tributary at Arena Drive

LOE ID:	76284
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation
Number of Samples:	2
Number of Exceedances:	2
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Vicente Creek (San Diego County), unnamed tributary at Arena Drive to determine beneficial use support and results are as follows: 2 of 2 samples exceed the criterion for Coliform, Fecal.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the fecal coliform concentration shall not exceed 400 MPN/100 ml.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Vicente Creek (San Diego County), unnamed tributary at Arena Drive was collected at 1 monitoring site [Tributary of San Vicente Creek @ San Vicente Road]
Temporal Representation:	Data was collected over the time period 6/23/2003-5/11/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 53446, Indicator Bacteria **Region 9**

San Vicente Creek (San Diego County), unnamed tributary at Arena Drive

LOE ID:	76294
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Vicente Creek (San Diego County), unnamed tributary at Arena Drive to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxicsubstances in concentrations which are toxic to,or which produce detrimental physiologicalresponses in human, plant, animal, or indigenousaquatic life (Basin Plan).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In waters designated for water contact recreation (REC I), the total coliform concentration

	shall not exceed 10000 MPN/100 ml (CDPH 2006). 043045
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.
Spatial Representation:	Data for this line of evidence for San Vicente Creek (San Diego County), unnamed tributary at Arena Drive was collected at 1 monitoring site [Tributary of San Vicente Creek @ San Vicente Road]
Temporal Representation:	Data was collected over the time period 6/23/2003-5/11/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 53446, Indicator Bacteria **Region 9**

San Vicente Creek (San Diego County), unnamed tributary at Arena Drive

LOE ID:	76283
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2
Number of Exceedances:	2
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Vicente Creek (San Diego County), unnamed tributary at Arena Drive to determine beneficial use support and results are as follows: 2 of 2 samples exceed the criterion for Enterococci.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Samples shall not exceed 61 organisms per 100 ml for enterococcus in waters designated for REC I beneficial use (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Vicente Creek (San Diego County), unnamed tributary at Arena Drive was collected at 1 monitoring site [Tributary of San Vicente Creek @ San Vicente Road]
Temporal Representation:	Data was collected over the time period 6/23/2003-5/11/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 49131 **Region 9**

San Vicente Creek (San Diego County), unnamed tributary at Arena Drive

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**

Last Listing Cycle's Final Listing Decision:	New Decision	043046
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. Zero of the two samples exceed the CRITERIA.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of two samples exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49131, Lead **Region 9**

San Vicente Creek (San Diego County), unnamed tributary at Arena Drive

LOE ID:	76285
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Vicente Creek (San Diego County), unnamed tributary at Arena Drive to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition

Evaluation Guideline:	043047
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Vicente Creek (San Diego County), unnamed tributary at Arena Drive was collected at 1 monitoring site [Tributary of San Vicente Creek @ San Vicente Road]
Temporal Representation:	Data was collected on 6/23/2003 and 5/11/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 49131, Lead **Region 9**

San Vicente Creek (San Diego County), unnamed tributary at Arena Drive

LOE ID:	76286
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Vicente Creek (San Diego County), unnamed tributary at Arena Drive to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for Lead is 0.015 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals, CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Vicente Creek (San Diego County), unnamed tributary at Arena Drive was collected at 1 monitoring site [Tributary of San Vicente Creek @ San Vicente Road]
Temporal Representation:	Data was collected on 6/23/2003 and 5/11/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 49139 **Region 9**

San Vicente Creek (San Diego County), unnamed tributary at Arena Drive

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final	New Decision

Listing Decision:		043048
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. Zero of the one sample exceed the GUIDELINE.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49139, Malathion **Region 9**

San Vicente Creek (San Diego County), unnamed tributary at Arena Drive

LOE ID:	78130
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Vicente Creek (San Diego County), unnamed tributary at Arena Drive to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Malathion.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for malathion is 100 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013

Spatial Representation:	Data for this line of evidence for San Vicente Creek (San Diego County), unnamed tributary at Arena Drive was collected at 1 monitoring site [Tributary of San Vicente Creek @ San Vicente Road]
Temporal Representation:	Data was collected on a single day 5/11/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 49139, Malathion **Region 9**

San Vicente Creek (San Diego County), unnamed tributary at Arena Drive

LOE ID:	76291
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Vicente Creek (San Diego County), unnamed tributary at Arena Drive to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Malathion.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for San Vicente Creek (San Diego County), unnamed tributary at Arena Drive was collected at 1 monitoring site [Tributary of San Vicente Creek @ San Vicente Road]
Temporal Representation:	Data was collected on a single day 5/11/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 49140 **Region 9**

San Vicente Creek (San Diego County), unnamed tributary at Arena Drive

Pollutant:	**Nitrate/Nitrite (Nitrite + Nitrate as N)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision

Revision Status	Revised	043050
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. Zero of the one sample exceed the CRITERIA.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49140, Nitrate/Nitrite (Nitrite + Nitrate as N) **Region 9**

San Vicente Creek (San Diego County), unnamed tributary at Arena Drive

LOE ID:	76292
Pollutant:	Nitrate/Nitrite (Nitrite + Nitrate as N)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Vicente Creek (San Diego County), unnamed tributary at Arena Drive to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nitrate/Nitrite as N.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrate + nitrite (as N) is 10.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Vicente Creek (San Diego County), unnamed tributary at Arena Drive was collected at 1 monitoring site [Tributary of San Vicente Creek @ San

	Vicente Road]	043051
Temporal Representation:	Data was collected on a single day 6/24/2003.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID 49142 Region 9

San Vicente Creek (San Diego County), unnamed tributary at Arena Drive

Pollutant:	**Nitrogen, Nitrite**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. Zero of the two samples exceed the CRITERIA.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of two samples exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49142, Nitrogen, Nitrite Region 9

San Vicente Creek (San Diego County), unnamed tributary at Arena Drive

LOE ID:	76293
Pollutant:	Nitrogen, Nitrite
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Vicente Creek (San Diego County), unnamed tributary at Arena Drive to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Nitrite as N.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrite (as N) is 1.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Vicente Creek (San Diego County), unnamed tributary at Arena Drive was collected at 1 monitoring site [Tributary of San Vicente Creek @ San Vicente Road]
Temporal Representation:	Data was collected over the time period 6/23/2003-6/24/2003.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 49141 Region 9

San Vicente Creek (San Diego County), unnamed tributary at Arena Drive

Pollutant:	**Nitrogen, ammonia (Total Ammonia)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One line of evidence are available in the administrative record to assess this pollutant. Zero of the one sample exceed the GUIDELINE. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one samples exceeded the GUIDELINE and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49141, Nitrogen, ammonia (Total Ammonia) 043053 **Region 9**

San Vicente Creek (San Diego County), unnamed tributary at Arena Drive

LOE ID:	76271
Pollutant:	Nitrogen, ammonia (Total Ammonia)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Vicente Creek (San Diego County), unnamed tributary at Arena Drive to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Ammonia As N, Total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Basin Plan: No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	EPA's Lifetime Health advisory level for total ammonia is 30.0 mg/L as stated on page 8 of the 2006 edition of the drinking water standards and health advisories. This Advisory Level is defined as "the concentration of a chemical in drinking water that is not expected to cause any adverse noncarcinogenic effects for up to ten days of exposure."
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for San Vicente Creek (San Diego County), unnamed tributary at Arena Drive was collected at 1 monitoring site [Tributary of San Vicente Creek @ San Vicente Road]
Temporal Representation:	Data was collected on a single day 6/23/2003.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 49143 **Region 9**

San Vicente Creek (San Diego County), unnamed tributary at Arena Drive

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One line of evidence are available in the administrative record to assess this pollutant. Zero of the two

samples exceed the CRITERIA. 043054

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of two samples exceeded the CRITERIA and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of sixteen samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49143, Zinc **Region 9**

San Vicente Creek (San Diego County), unnamed tributary at Arena Drive

LOE ID:	76301
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Vicente Creek (San Diego County), unnamed tributary at Arena Drive to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Vicente Creek (San Diego County), unnamed tributary at Arena Drive was collected at 1 monitoring site [Tributary of San Vicente Creek @ San Vicente Road]
Temporal Representation:	Data was collected on 6/23/2003 and 5/11/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.

QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 49143, Zinc **Region 9**

San Vicente Creek (San Diego County), unnamed tributary at Arena Drive

LOE ID:	76295
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Vicente Creek (San Diego County), unnamed tributary at Arena Drive to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for zinc is 5.0 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for San Vicente Creek (San Diego County), unnamed tributary at Arena Drive was collected at 1 monitoring site [Tributary of San Vicente Creek @ San Vicente Road]
Temporal Representation:	Data was collected on 6/23/2003 and 5/11/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Casa de Oro Creek
Water Body ID: CAR9091200020110812132234
Water Body Type: River & Stream

DECISION ID 48264 **Region 9**
Casa de Oro Creek

Pollutant: Cadmium
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of 15 samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 15 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48264, Cadmium **Region 9**
Casa de Oro Creek

LOE ID: 73150

Pollutant: Cadmium
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Warm Freshwater Habitat

Number of Samples: 13

Number of Exceedances:	0	043057
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Casa de Oro Creek to determine beneficial use support and results are as follows: 0 of 13 samples exceed the criterion for Cadmium.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Casa de Oro Creek was collected at 2 monitoring sites [Casa de Oro Creek @ Kenwood Drive and Barbic Court, Casa de Oro Creek @ Valencia Street/Kings View Circle]	
Temporal Representation:	Data was collected from 1/2/2003 through 1/16/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID	48265	Region 9
Casa de Oro Creek		

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One line of evidence are available in the administrative record to assess this pollutant. Zero of 0 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 0 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48265, Chlorpyrifos **Region 9**

Casa de Oro Creek

LOE ID:	73151
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Casa de Oro Creek to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).
Spatial Representation:	Data for this line of evidence for Casa de Oro Creek was collected at 2 monitoring sites [Casa de Oro Creek @ Valencia Street/Kings View Circle, Casa de Oro Creek @ Kenwood Drive and Barbic Court]
Temporal Representation:	Data was collected over the time period 9/26/2005-6/16/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **48266** **Region 9**

Casa de Oro Creek

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised

Impairment from Pollutant or Pollution:	Pollutant	043059

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. One of 13 samples exceed the critera.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of 13 samples exceed the critera and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48266, Copper **Region 9**

Casa de Oro Creek

LOE ID:	73152
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	13
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Casa de Oro Creek to determine beneficial use support and results are as follows: 0 of 13 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Data for this line of evidence for Casa de Oro Creek was collected at 2 monitoring sites [Casa de Oro Creek @ Kenwood Drive and Barbic Court, Casa de Oro Creek @ Valencia Street/Kings View Circle]
Temporal Representation:	Data was collected from 1/2/2003 through 1/16/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 48267 Region 9

Casa de Oro Creek

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of 9 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 9 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48267, Diazinon Region 9

Casa de Oro Creek

LOE ID:	73153
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	9
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Casa de Oro Creek to determine beneficial use support and results are as follows: 0 of 9 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Data for this line of evidence for Casa de Oro Creek was collected at 2 monitoring sites [Casa de Oro Creek @ Valencia Street/Kings View Circle, Casa de Oro Creek @ Kenwood Drive and Barbic Court]
Temporal Representation:	Data was collected over the time period 9/26/2005-6/16/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID	**48268**	**Region 9**
Casa de Oro Creek		

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. One of 13 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of 13 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision	After review of the available data and information, RWQCB staff concludes that the water body-

Recommendation:	pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48268, Lead **Region 9**

Casa de Oro Creek

LOE ID:	73154
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	13
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Casa de Oro Creek to determine beneficial use support and results are as follows: 0 of 13 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Casa de Oro Creek was collected at 2 monitoring sites [Casa de Oro Creek @ Kenwood Drive and Barbic Court, Casa de Oro Creek @ Valencia Street/Kings View Circle]
Temporal Representation:	Data was collected from 1/2/2003 through 1/16/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **48289** **Region 9**

Casa de Oro Creek

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of 9 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 9 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48289, Malathion **Region 9**

Casa de Oro Creek

LOE ID:	73155
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Casa de Oro Creek to determine beneficial use support and results are as follows: 0 of 9 samples exceed the criterion for Malathion.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Casa de Oro Creek was collected at 2 monitoring sites [Casa de Oro Creek @ Valencia Street/Kings View Circle, Casa de Oro Creek @ Kenwood Drive and Barbic Court]
Temporal Representation:	Data was collected over the time period 9/26/2005-6/16/2009.

Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 48290 — Region 9

Casa de Oro Creek

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of 13 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 13 samples exceed the criteria and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48290, Zinc — Region 9

Casa de Oro Creek

LOE ID:	73156
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	13
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Casa de Oro Creek to determine beneficial use support and results are as follows: 0 of 13 samples exceed the

	criterion for Zinc. 043065
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Casa de Oro Creek was collected at 2 monitoring sites [Casa de Oro Creek @ Kenwood Drive and Barbic Court, Casa de Oro Creek @ Valencia Street/Kings View Circle]
Temporal Representation:	Data was collected from 1/2/2003 through 1/16/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Spring Valley Creek
Water Body ID: CAR9091200020110812135958
Water Body Type: River & Stream

DECISION ID 49569 **Region 9**
Spring Valley Creek

Pollutant: Arsenic
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the three samples exceed the criterion.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of three samples exceeded the criterion and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49569, Arsenic **Region 9**
Spring Valley Creek

LOE ID: 77114

Pollutant: Arsenic
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Warm Freshwater Habitat

Number of Samples: 3

Number of Exceedances:	0	043067
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Spring Valley Creek to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Arsenic.	
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The dissolved arsenic criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved arsenic is 0.150 mg/L (California Toxics Rule, 2000).	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Spring Valley Creek was collected at 1 monitoring site [Drainage Channel @ Quarry Rd. & Swap Meet Rd.]	
Temporal Representation:	Data was collected over the time period 7/31/2008-3/31/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.	

DECISION ID	**49575**	**Region 9**
Spring Valley Creek		

Pollutant:	**Azinphos-methyl (Guthion)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the zero samples exceed the beneficial use guidelines. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of zero samples exceeded the guideline. The samples were not used in the assessment due to reporting limits that were higher than the guideline. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49575, Azinphos-methyl (Guthion) **Region 9**

Spring Valley Creek

LOE ID:	78185
Pollutant:	Azinphos-methyl (Guthion)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Spring Valley Creek to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Azinphos methyl.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The National Recommended Water Quality Criteria for Azinphos Methyl (Guthion) for the protection of freshwater aquatic life is a maximum of 0.01 ug/l.
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for Spring Valley Creek was collected at 1 monitoring site [Drainage Channel @ Quarry Rd. & Swap Meet Rd.]
Temporal Representation:	Data was collected on a single day 3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID **49664** **Region 9**

Spring Valley Creek

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. None of the samples exceed the criterion.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the samples exceeded the criterion and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49664, Cadmium **Region 9**

Spring Valley Creek

LOE ID:	77115
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Spring Valley Creek to determine beneficial use support and results are as follows: 0 of 12 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California, 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Spring Valley Creek was collected at 2 monitoring sites [Drainage Channel @ Quarry Rd. & Swap Meet Rd., Spring Valley Creek @ Valencia Street/Kings View Circle]
Temporal Representation:	Data was collected over the time period 6/24/2003-6/16/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 49664, Cadmium **Region 9**

Spring Valley Creek

LOE ID:	77116
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Spring Valley Creek to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Cadmium.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Spring Valley Creek was collected at 1 monitoring site [Drainage Channel @ Quarry Rd. & Swap Meet Rd. - 909SWT07]
Temporal Representation:	Data was collected over the time period 7/31/2008-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID **49642** **Region 9**

Spring Valley Creek

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the zero

samples exceed the beneficial use guidelines. 043071

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of zero samples exceeded the guideline. The samples were not used in the assessment due to reporting limits that were higher than the guideline. The sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49642, Chlorpyrifos **Region 9**

Spring Valley Creek

LOE ID:	77119
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Spring Valley Creek to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).
Spatial Representation:	Data for this line of evidence for Spring Valley Creek was collected at 2 monitoring sites [Spring Valley Creek @ Valencia Street/Kings View Circle, Drainage Channel @ Quarry Rd. & Swap Meet Rd.]
Temporal Representation:	Data was collected over the time period 9/26/2005-6/16/2009.

Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 49677 Region 9

Spring Valley Creek

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of three samples exceeded the guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the three samples did not exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49677, Chromium Region 9

Spring Valley Creek

LOE ID:	77120
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Spring

	Valley Creek to determine beneficial use support and results are as follows: 0 of 13 samples exceed the criterion for Chromium.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Spring Valley Creek was collected at 1 monitoring site [Drainage Channel @ Quarry Rd. & Swap Meet Rd. - 909SWT07]
Temporal Representation:	Data was collected over the time period 7/31/2008-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID	49682	Region 9
Spring Valley Creek		

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 15 samples exceed the beneficial use guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 15 samples exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49682, Copper **Region 9**
Spring Valley Creek

LOE ID:	77121
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Spring Valley Creek to determine beneficial use support and results are as follows: 0 of 12 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Spring Valley Creek was collected at 2 monitoring sites [Drainage Channel @ Quarry Rd. & Swap Meet Rd., Spring Valley Creek @ Valencia Street/Kings View Circle]
Temporal Representation:	Data was collected over the time period 6/24/2003-6/16/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 49682, Copper **Region 9**
Spring Valley Creek

LOE ID:	77122
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING 043075
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Spring Valley Creek to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Copper.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Spring Valley Creek was collected at 1 monitoring site [Drainage Channel @ Quarry Rd. & Swap Meet Rd. - 909SWT07]
Temporal Representation:	Data was collected over the time period 7/31/2008-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID	**49666**	**Region 9**
Spring Valley Creek		

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. None of the samples exceed the beneficial use guidelines. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of the samples exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and

information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49666, Diazinon **Region 9**

Spring Valley Creek

LOE ID:	77128
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Spring Valley Creek to determine beneficial use support and results are as follows: 0 of 9 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Data for this line of evidence for Spring Valley Creek was collected at 2 monitoring sites [Spring Valley Creek @ Valencia Street/Kings View Circle, Drainage Channel @ Quarry Rd. & Swap Meet Rd.]
Temporal Representation:	Data was collected over the time period 9/26/2005-6/16/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 49666, Diazinon **Region 9**

Spring Valley Creek

LOE ID:	78187
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3

Number of Exceedances:	0	043077
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Spring Valley Creek to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Diazinon.	
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).	
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game	
Spatial Representation:	Data for this line of evidence for Spring Valley Creek was collected at 1 monitoring site [Drainage Channel @ Quarry Rd. & Swap Meet Rd.]	
Temporal Representation:	Data was collected over the time period 7/31/2008-3/31/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.	

DECISION ID	**49668**	**Region 9**
Spring Valley Creek		

Pollutant:	**Dimethoate**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. The one sample did not exceed the guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. The one sample did not exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and

information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49668, Dimethoate **Region 9**

Spring Valley Creek

LOE ID:	77943
Pollutant:	Dimethoate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Spring Valley Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Dimethoate.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for Dimethoate is the median lethal concentration (LC50; 43 ug/L).
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Spring Valley Creek was collected at 1 monitoring site [Drainage Channel @ Quarry Rd. & Swap Meet Rd.]
Temporal Representation:	Data was collected on a single day 3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID **49671** **Region 9**

Spring Valley Creek

Pollutant:	**Disulfoton**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. The one sample did not exceed the beneficial use guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. The one sample did not exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49671, Disulfoton **Region 9**

Spring Valley Creek

LOE ID:	77944
Pollutant:	Disulfoton
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Spring Valley Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Disulfoton.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for disulfoton is 0.05 Âµg/L (US EPA 1973 guidance)..
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for Spring Valley Creek was collected at 1 monitoring site [Drainage Channel @ Quarry Rd. & Swap Meet Rd.]
Temporal Representation:	Data was collected on a single day 3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID	49672	043080 Region 9
Spring Valley Creek		

Pollutant:	**Ethoprop**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. The one sample did not exceed the beneficial use guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. The one sample did not exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49672, Ethoprop	**Region 9**
Spring Valley Creek	

LOE ID:	77945
Pollutant:	Ethoprop
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Spring Valley Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Ethoprop.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic

	life (Water Quality Control Plan,San Diego Basin).	043081
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The evaluation guideline for Ethoprop is the maximum acceptable toxicant concentration (MATC) of 1.4 ug/L.	
Guideline Reference:	OPP Pesticide Ecotoxicity Database.	
Spatial Representation:	Data for this line of evidence for Spring Valley Creek was collected at 1 monitoring site [Drainage Channel @ Quarry Rd. & Swap Meet Rd.]	
Temporal Representation:	Data was collected on a single day 3/31/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.	

DECISION ID 49773 Region 9

Spring Valley Creek

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.3 of the Listing Policy. Under section 3.3 a single line of evidence are necessary to assess listing status. One lines of evidence is available in the administrative record to assess this pollutant. Zero of the Three samples exceed the single objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of three samples exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49773, Indicator Bacteria Region 9

Spring Valley Creek

LOE ID:	77129
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	043082
Beneficial Use:	Non-Contact Recreation	
Number of Samples:	3	
Number of Exceedances:	0	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Spring Valley Creek to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Coliform, Fecal.	
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	In waters designated for non contact recreation (REC 2), the fecal coliform concentration shall not exceed 4000 MPN/100 ml (Basin Plan).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Spring Valley Creek was collected at 1 monitoring site [Drainage Channel @ Quarry Rd. & Swap Meet Rd.]	
Temporal Representation:	Data was collected over the time period 7/31/2008-3/31/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.	

DECISION ID	49694	Region 9
Spring Valley Creek		

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 15 samples exceed the beneficial use guidelines. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 15 samples exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49694, Lead **Region 9**

Spring Valley Creek

LOE ID:	77136
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Spring Valley Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Spring Valley Creek was collected at 2 monitoring sites [Drainage Channel @ Quarry Rd. & Swap Meet Rd., Spring Valley Creek @ Valencia Street/Kings View Circle]
Temporal Representation:	Data was collected over the time period 6/24/2003-6/16/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 49694, Lead **Region 9**

Spring Valley Creek

LOE ID:	77135
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Spring Valley Creek to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Lead.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Spring Valley Creek was collected at 1 monitoring site [Drainage Channel @ Quarry Rd. & Swap Meet Rd. - 909SWT07]
Temporal Representation:	Data was collected over the time period 7/31/2008-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID	**49761**	**Region 9**
Spring Valley Creek		

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 12 samples exceed the beneficial use guidelines.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 12 samples exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available

indicating that standards are not met. 043085

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49761, Malathion **Region 9**

Spring Valley Creek

LOE ID:	78188
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Spring Valley Creek to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Malathion.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for Spring Valley Creek was collected at 1 monitoring site [Drainage Channel @ Quarry Rd. & Swap Meet Rd.]
Temporal Representation:	Data was collected over the time period 7/31/2008-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 49761, Malathion **Region 9**

Spring Valley Creek

LOE ID:	77137
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Spring Valley Creek to determine beneficial use support and results are as follows: 0 of 9 samples exceed the criterion for Malathion.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Spring Valley Creek was collected at 2 monitoring sites [Spring Valley Creek @ Valencia Street/Kings View Circle, Drainage Channel @ Quarry Rd. & Swap Meet Rd.]
Temporal Representation:	Data was collected over the time period 9/26/2005-6/16/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **49673** **Region 9**

Spring Valley Creek

Pollutant:	**Methidathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. The one sample did not exceed the beneficial use guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. The one sample did not exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49673, Methidathion **Region 9**

Spring Valley Creek

LOE ID:	77947
Pollutant:	Methidathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Spring Valley Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Methidathion.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for Methidathion is the maximum acceptable toxicant concentration (MATC) of 0.86 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Spring Valley Creek was collected at 1 monitoring site [Drainage Channel @ Quarry Rd. & Swap Meet Rd.]
Temporal Representation:	Data was collected on a single day 3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID **49676** **Region 9**

Spring Valley Creek

Pollutant:	**Methyl Parathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of

the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. The one sample did not exceed the beneficial use guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. The one sample did not exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49676, Methyl Parathion **Region 9**

Spring Valley Creek

LOE ID:	77950
Pollutant:	Methyl Parathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Spring Valley Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Parathion, Methyl.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. There shall be no increase in hazardous chemical concentrations found in bottom sediments or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Department of Fish and Game instantaneous criteria for Methyl Parathion is 0.08 ug/L.
Guideline Reference:	Hazard Assessment of the Insecticide Methyl Parathion to Aquatic Organisms in the Sacramento River System. California Department of Fish and Game. Environmental Services Division. Administrative Report 92-1
Spatial Representation:	Data for this line of evidence for Spring Valley Creek was collected at 1 monitoring site [Drainage Channel @ Quarry Rd. & Swap Meet Rd.]
Temporal Representation:	Data was collected on a single day 3/31/2009.

Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID 49735 Region 9

Spring Valley Creek

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. One of three samples did not exceed the guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of three samples did not exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49735, Nickel Region 9

Spring Valley Creek

LOE ID:	77141
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Spring Valley Creek to determine beneficial use support and results are as follows: 0 of 3 samples

	exceed the criterion for Nickel. 043090
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Spring Valley Creek was collected at 1 monitoring site [Drainage Channel @ Quarry Rd. & Swap Meet Rd. - 909SWT07]
Temporal Representation:	Data was collected over the time period 7/31/2008-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID	**49652**	**Region 9**
Spring Valley Creek		

Pollutant:	**Parathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the zero samples exceed the beneficial use guidelines. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of zero samples exceeded the guideline. The samples were not used in the assessment due to reporting limits that were higher than the guideline. The sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49652, Parathion **Region 9**

Spring Valley Creek

LOE ID:	77951
Pollutant:	Parathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Spring Valley Creek to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Parathion, Ethyl.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. There shall be no increase in hazardous chemical concentrations found in bottom sediments or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The criterion continuous concentraion for Parathion, Ethyl is 0.013 ug/l from the National Recommended Water Quality Criteria.
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for Spring Valley Creek was collected at 1 monitoring site [Drainage Channel @ Quarry Rd. & Swap Meet Rd.]
Temporal Representation:	Data was collected on a single day 3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID **49770** **Region 9**

Spring Valley Creek

Pollutant:	**Phorate**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. The one sample

did not exceed the guideline. 043092

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. The one sample did not exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49770, Phorate **Region 9**

Spring Valley Creek

LOE ID:	77952
Pollutant:	Phorate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Spring Valley Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Phorate.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for Phorate is the median lethal concentration (LC50; 2 ug/L).
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Spring Valley Creek was collected at 1 monitoring site [Drainage Channel @ Quarry Rd. & Swap Meet Rd.]
Temporal Representation:	Data was collected on a single day 3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID	49772	043093 Region 9
Spring Valley Creek		

Pollutant:	**Phosmet**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. The one sample did not exceed the guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. The one sample did not exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49772, Phosmet	**Region 9**
Spring Valley Creek	

LOE ID:	77953
Pollutant:	Phosmet
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Spring Valley Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Phosmet.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic

	life (Water Quality Control Plan,San Diego Basin).	043094
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	According to the USEPA Office of Pesticide Programs Ecotoxicity database, the aquatic life EC50 for Phosmet is 5.6 ug/L.	
Guideline Reference:	OPP Pesticide Ecotoxicity Database.	
Spatial Representation:	Data for this line of evidence for Spring Valley Creek was collected at 1 monitoring site [Drainage Channel @ Quarry Rd. & Swap Meet Rd.]	
Temporal Representation:	Data was collected on a single day 3/31/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.	

DECISION ID 49743 Region 9

Spring Valley Creek

Pollutant:	**Selenium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. One of three samples exceed the guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of three samples exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49743, Selenium Region 9

Spring Valley Creek

LOE ID:	77142
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	043095
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	3	
Number of Exceedances:	1	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Spring Valley Creek to determine beneficial use support and results are as follows: 1 of 3 samples exceed the criterion for Selenium.	
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The selenium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater is 0.005 mg/L (California Toxics Rule, 2000).	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Spring Valley Creek was collected at 1 monitoring site [Drainage Channel @ Quarry Rd. & Swap Meet Rd.]	
Temporal Representation:	Data was collected over the time period 7/31/2008-3/31/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.	

DECISION ID	**49748**	**Region 9**
Spring Valley Creek		

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 15 samples exceed the beneficial use guidelines.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 15 samples exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49748, Zinc **Region 9**

Spring Valley Creek

LOE ID:	77145
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Spring Valley Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Spring Valley Creek was collected at 2 monitoring sites [Drainage Channel @ Quarry Rd. & Swap Meet Rd., Spring Valley Creek @ Valencia Street/Kings View Circle]
Temporal Representation:	Data was collected over the time period 6/24/2003-6/16/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 49748, Zinc **Region 9**

Spring Valley Creek

LOE ID:	77146
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved

Beneficial Use:	Warm Freshwater Habitat	043097
Number of Samples:	3	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Spring Valley Creek to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Zinc.	
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Spring Valley Creek was collected at 1 monitoring site [Drainage Channel @ Quarry Rd. & Swap Meet Rd. - 909SWT07]	
Temporal Representation:	Data was collected over the time period 7/31/2008-3/31/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Helix Street Drain
Water Body ID: CAR9091200020110920112136
Water Body Type: River & Stream

DECISION ID 47832 **Region 9**
Helix Street Drain

Pollutant: Cadmium
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the six samples exceed the California Toxics Rule Objective for Cadmium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of six samples exceeded the California Toxics Rule Objective for Cadmium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47832, Cadmium **Region 9**
Helix Street Drain

LOE ID: 73806

Pollutant: Cadmium
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Warm Freshwater Habitat

Number of Samples:	6	043099
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Helix Street Drain to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Cadmium.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Helix Street Drain was collected at 1 monitoring site [Helix Street Drainage Next to Hwy 94]	
Temporal Representation:	Data was collected 7/2/2003 - 6/16/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID	**47833**	**Region 9**
Helix Street Drain		

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the Zero samples exceed the Water Quality Criteria for Chlorpyrifos.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of zero samples exceeded the Water Quality Criteria for Chlorpyrifos and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47833, Chlorpyrifos **Region 9**

Helix Street Drain

LOE ID:	73807
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Helix Street Drain to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).
Spatial Representation:	Data for this line of evidence for Helix Street Drain was collected at 1 monitoring site [Helix Street Drainage Next to Hwy 94]
Temporal Representation:	Data was collected over the time period 6/28/2006-6/16/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **47834** **Region 9**

Helix Street Drain

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised

Impairment from Pollutant or Pollution:	Pollutant	043101

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the Six samples exceed the California Toxics Rule Objective for Copper.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of six samples exceeded the California Toxics Rule Objective for Copper and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47834, Copper **Region 9**

Helix Street Drain

LOE ID:	73808
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Helix Street Drain to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Data for this line of evidence for Helix Street Drain was collected at 1 monitoring site [Helix Street Drainage Next to Hwy 94]
Temporal Representation:	Data was collected 7/2/2003 - 6/16/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 47835 Region 9

Helix Street Drain

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the four samples exceed the Water Quality Criteria for Diazinon. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of four samples exceeded the Water Quality Criteria for Diazinon and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47835, Diazinon Region 9

Helix Street Drain

LOE ID:	73809
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4

Number of Exceedances:	0	043103
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Helix Street Drain to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Diazinon.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).	
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game	
Spatial Representation:	Data for this line of evidence for Helix Street Drain was collected at 1 monitoring site [Helix Street Drainage Next to Hwy 94]	
Temporal Representation:	Data was collected over the time period 6/28/2006-6/16/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID	**47836**	**Region 9**
Helix Street Drain		

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the six samples exceed the California Toxics Rule Objective for Lead.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of six samples exceeded the California Toxics Rule Objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47836, Lead **Region 9**

Helix Street Drain

LOE ID:	73810
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Helix Street Drain to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Helix Street Drain was collected at 1 monitoring site [Helix Street Drainage Next to Hwy 94]
Temporal Representation:	Data was collected 7/2/2003 - 6/16/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **47837** **Region 9**

Helix Street Drain

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the four samples exceed the Water Qaulity Criteria for Malathion. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of four samples exceeded the Water Quality Criteria for Malathion and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47837, Malathion **Region 9**

Helix Street Drain

LOE ID:	73811
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Helix Street Drain to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Malathion.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Helix Street Drain was collected at 1 monitoring site [Helix Street Drainage Next to Hwy 94]
Temporal Representation:	Data was collected over the time period 6/28/2006-6/16/2009.

Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **47838** **Region 9**

Helix Street Drain

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the six samples exceed the California Toxics Rule Objective for Zinc. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of six samples exceeded the California Toxics Rule Objective for zinc and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47838, Zinc **Region 9**

Helix Street Drain

LOE ID:	73812
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Helix Street Drain to

	determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Helix Street Drain was collected at 1 monitoring site [Helix Street Drainage Next to Hwy 94]
Temporal Representation:	Data was collected 7/2/2003 - 6/16/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: San Miguel Creek
Water Body ID: CAR9091200020110920134551
Water Body Type: River & Stream

DECISION ID 49087 **Region 9**
San Miguel Creek

Pollutant: Cadmium
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the seven samples exceed the criterion.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of seven samples exceeded the criterion and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49087, Cadmium **Region 9**
San Miguel Creek

LOE ID: 76034

Pollutant: Cadmium
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Warm Freshwater Habitat

Number of Samples: 7

Number of Exceedances:	0	043109
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Miguel Creek to determine beneficial use support and results are as follows: 0 of 7 samples exceed the criterion for Cadmium.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for San Miguel Creek was collected at 1 monitoring site [San Miguel Creek @ Bonita Road]	
Temporal Representation:	Data was collected 6/24/2003 - 6/4/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID	**49093**	**Region 9**
San Miguel Creek		

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the zero samples exceed the criterion. The samples were not used in the assessment due to reporting limits that were above the guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of zero samples exceeded the criterion and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49093, Chlorpyrifos **Region 9**

San Miguel Creek

LOE ID:	76035
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Miguel Creek to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).
Spatial Representation:	Data for this line of evidence for San Miguel Creek was collected at 1 monitoring site [San Miguel Creek @ Bonita Road]
Temporal Representation:	Data was collected over the time period 5/19/2005-6/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **49094** **Region 9**

San Miguel Creek

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or	Pollutant

Pollution: 043111

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the seven samples exceed the criterion.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of seven samples exceeded the criterion and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49094, Copper **Region 9**

San Miguel Creek

LOE ID:	76036
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Miguel Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Miguel Creek was collected at 1 monitoring site [San

	Miguel Creek @ Bonita Road]	043112
Temporal Representation:	Data was collected 6/24/2003 - 6/4/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID 49097 Region 9

San Miguel Creek

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the five samples exceed the criterion.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of five samples exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49097, Diazinon Region 9

San Miguel Creek

LOE ID:	76037
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Miguel Creek to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).
Guideline Reference:	Water quality for diazinon, Memorandum to J. Karkoski, Central Valley RWQCB, Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Data for this line of evidence for San Miguel Creek was collected at 1 monitoring site [San Miguel Creek @ Bonita Road]
Temporal Representation:	Data was collected over the time period 5/19/2005-6/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID	49095	Region 9
San Miguel Creek		

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the seven samples exceed the criterion. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of seven samples exceeded the criterion and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49095, Lead **Region 9**

San Miguel Creek

LOE ID:	76053
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Miguel Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Miguel Creek was collected at 1 monitoring site [San Miguel Creek @ Bonita Road]
Temporal Representation:	Data was collected 6/24/2003 - 6/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **49098** **Region 9**

San Miguel Creek

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the five

samples exceed the criterion. 043115

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of five samples exceeded the criterion and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49098, Malathion **Region 9**

San Miguel Creek

LOE ID:	76054
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for San Miguel Creek to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Malathion.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for San Miguel Creek was collected at 1 monitoring site [San Miguel Creek @ Bonita Road]
Temporal Representation:	Data was collected over the time period 5/19/2005-6/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID	49096	Region 9
San Miguel Creek		

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the seven samples exceed the criterion. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of seven samples exceeded the criterion and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49096, Zinc	**Region 9**
San Miguel Creek	

LOE ID:	76055
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for San Miguel Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for San Miguel Creek was collected at 1 monitoring site [San Miguel Creek @ Bonita Road]
Temporal Representation:	Data was collected 6/24/2003 - 6/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Sweetwater Flood Control Channel
Water Body ID: CAR9091200020111216093712
Water Body Type: River & Stream

DECISION ID 50056 **Region 9**
Sweetwater Flood Control Channel

Pollutant: 2-Methylnaphthalene
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of five samples exceed the sediment guidelines.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the five samples exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50056, 2-Methylnaphthalene **Region 9**
Sweetwater Flood Control Channel

LOE ID: 78373

Pollutant: 2-Methylnaphthalene
LOE Subgroup: Pollutant-Sediment
Matrix: Sediment
Fraction: Total

Beneficial Use: Estuarine Habitat

Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Sweetwater Flood Control Channel to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for 2-Methylnaphthalene.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for 2-Methylnaphthalene is 201.28 ng/g dry weight (MacDonald et al., 1996).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for Sweetwater Flood Control Channel was collected at 5 monitoring sites [909_6052, 909_6057, 909_6060, 909_6065, 909_6069]
Temporal Representation:	Data was collected on a single day 7/10/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID 50057 Region 9

Sweetwater Flood Control Channel

Pollutant:	**Antimony**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of five samples exceed the sediment guidelines.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the five samples exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50057, Antimony **Region 9**

Sweetwater Flood Control Channel

LOE ID:	78374
Pollutant:	Antimony
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Sweetwater Flood Control Channel to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Antimony.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Antimony is 25 ug/g dry weight (Long and Morgan, 1990).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for Sweetwater Flood Control Channel was collected at 5 monitoring sites [909_6052, 909_6057, 909_6060, 909_6065, 909_6069]
Temporal Representation:	Data was collected on a single day 7/10/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID 50058 **Region 9**

Sweetwater Flood Control Channel

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of

the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of five samples exceed the sediment guidelines.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the five samples exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50058, Arsenic **Region 9**

Sweetwater Flood Control Channel

LOE ID:	78375
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Sweetwater Flood Control Channel to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Arsenic.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Arsenic is 70 ug/g dry weight (Long et al., 1995).
Guideline Reference:	Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuary sediments. Environmental Management. 19, (1): 81-97
Spatial Representation:	Data for this line of evidence for Sweetwater Flood Control Channel was collected at 5 monitoring sites [909_6052, 909_6057, 909_6060, 909_6065, 909_6069]
Temporal Representation:	Data was collected on a single day 7/10/2008.

Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID 50059 Region 9

Sweetwater Flood Control Channel

Pollutant:	**Benzo(a)anthracene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of five samples exceed the sediment guidelines.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the five samples exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50059, Benzo(a)anthracene Region 9

Sweetwater Flood Control Channel

LOE ID:	78376
Pollutant:	Benzo(a)anthracene
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Sweetwater Flood Control Channel to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for

	Benzo(a)anthracene.	043123
Data Reference:	Data for Various Pollutants from Bight, 2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for Benzo(a)anthracene is 692.53 ng/g dry weight (MacDonald et al., 1996).	
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278	
Spatial Representation:	Data for this line of evidence for Sweetwater Flood Control Channel was collected at 5 monitoring sites [909_6052, 909_6057, 909_6060, 909_6065, 909_6069]	
Temporal Representation:	Data was collected on a single day 7/10/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.	

DECISION ID	50060	Region 9
Sweetwater Flood Control Channel		

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of five samples exceed the sediment guidelines. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the five samples exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50060, Cadmium 043124 **Region 9**

Sweetwater Flood Control Channel

LOE ID:	78377
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Sweetwater Flood Control Channel to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Cadmium.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for Cadmium is 4.21 ng/g dry weight (MacDonald et al., 1996).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for Sweetwater Flood Control Channel was collected at 5 monitoring sites [909_6052, 909_6057, 909_6060, 909_6065, 909_6069]
Temporal Representation:	Data was collected on a single day 7/10/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID 50061 **Region 9**

Sweetwater Flood Control Channel

Pollutant:	**Chlordane**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of five samples exceed the sediment guidelines.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the five samples exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50061, Chlordane **Region 9**

Sweetwater Flood Control Channel

LOE ID:	78378
Pollutant:	Chlordane
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Sweetwater Flood Control Channel to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Chlordane, Total.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Total Chlordane is 6 ng/g dry weight (Long and Morgan, 1990).
Guideline Reference:	The potential for biological effects of sediment-sorbed contaminants tested in the National Status of Trends Program. NOAA Technical Memorandum NOS OMA 52. Seattle, WA: National Oceanic and Atmospheric Administration
Spatial Representation:	Data for this line of evidence for Sweetwater Flood Control Channel was collected at 5 monitoring sites [909_6052, 909_6057, 909_6060, 909_6065, 909_6069]
Temporal Representation:	Data was collected on a single day 7/10/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID **50062** 043126 **Region 9**

Sweetwater Flood Control Channel

Pollutant:	**Chromium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of five samples exceed the sediment guidelines.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the five samples exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50062, Chromium **Region 9**

Sweetwater Flood Control Channel

LOE ID:	78379
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Sweetwater Flood Control Channel to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Chromium.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Chromium is 370 ug/g dry weight (Long et al., 1995).
Guideline Reference:	Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuary sediments. Environmental Management. 19, (1): 81-97
Spatial Representation:	Data for this line of evidence for Sweetwater Flood Control Channel was collected at 5 monitoring sites [909_6052, 909_6057, 909_6060, 909_6065, 909_6069]
Temporal Representation:	Data was collected on a single day 7/10/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID 50064 Region 9

Sweetwater Flood Control Channel

Pollutant:	**Chrysene (C1-C4)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of five samples exceed the sediment guidelines. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the five samples exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50064, Chrysene (C1-C4) Region 9

Sweetwater Flood Control Channel

LOE ID: 78380

Pollutant:	Chrysene (C1-C4)	043128
LOE Subgroup:	Pollutant-Sediment	
Matrix:	Sediment	
Fraction:	Total	
Beneficial Use:	Estuarine Habitat	
Number of Samples:	5	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Sweetwater Flood Control Channel to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Chrysene.	
Data Reference:	Data for Various Pollutants from Bight, 2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for Chrysene is 845.98 ng/g dry weight (MacDonald et al., 1996).	
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278	
Spatial Representation:	Data for this line of evidence for Sweetwater Flood Control Channel was collected at 5 monitoring sites [909_6052, 909_6057, 909_6060, 909_6065, 909_6069]	
Temporal Representation:	Data was collected on a single day 7/10/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.	

DECISION ID 50087 Region 9

Sweetwater Flood Control Channel

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of five samples exceed the sediment guidelines.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.

2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 943129
3. Zero of the five samples exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 50087, Copper **Region 9**
Sweetwater Flood Control Channel

LOE ID:	78381
Pollutant:	Copper
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Sweetwater Flood Control Channel to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Copper.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Copper is 270 ug/g dry weight (Long et al., 1995).
Guideline Reference:	Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuary sediments. Environmental Management. 19, (1): 81-97
Spatial Representation:	Data for this line of evidence for Sweetwater Flood Control Channel was collected at 5 monitoring sites [909_6052, 909_6057, 909_6060, 909_6065, 909_6069]
Temporal Representation:	Data was collected on a single day 7/10/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID 50089 **Region 9**
Sweetwater Flood Control Channel

Pollutant:	**Dibenz[a,h]anthracene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or	Pollutant

Pollution: 043130

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of five samples exceed the sediment guidelines.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the five samples exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50089, Dibenz[a,h]anthracene **Region 9**

Sweetwater Flood Control Channel

LOE ID:	78382
Pollutant:	Dibenz[a,h]anthracene
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Sweetwater Flood Control Channel to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Dibenzo(a, h)anthracene.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Dibenzo(a, h)anthracene is 260 ng/g dry weight (Long et al., 1995).
Guideline Reference:	Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuary sediments. Environmental Management. 19, (1): 81-97

Spatial Representation:	Data for this line of evidence for Sweetwater Flood Control Channel was collected at 5 monitoring sites [909_6052, 909_6057, 909_6060, 909_6065, 909_6069]
Temporal Representation:	Data was collected on a single day 7/10/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID 50091 Region 9

Sweetwater Flood Control Channel

Pollutant:	**Endrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of five samples exceed the sediment guidelines.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the five samples exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50091, Endrin Region 9

Sweetwater Flood Control Channel

LOE ID:	78383
Pollutant:	Endrin
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Sweetwater Flood Control Channel to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Endrin.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the sediment quality guideline (predictive of sediment toxicity for sediment-dwelling organisms) for Endrin is 0.76 ug/g oc (Fairey et al., 2001).
Guideline Reference:	Technical basis for deriving sediment criteria for nonionic organic contaminants for the protection of benthic organisms by using equilibrium partitioning. EPA822-R-93-011. Washington, D.C.: Office of Water, USEPA
Spatial Representation:	Data for this line of evidence for Sweetwater Flood Control Channel was collected at 5 monitoring sites [909_6052, 909_6057, 909_6060, 909_6065, 909_6069]
Temporal Representation:	Data was collected on a single day 7/10/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID 50135 Region 9

Sweetwater Flood Control Channel

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.3 of the Listing Policy. Under section 3.3 a single line of evidence are necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant.
Enterococcus
Zero of five samples exceed the single sample objective for water contact recreation.
Fecal coliform
Zero of five samples exceed the single sample objective for water contact recreation and non-contact recreation.
Total coliform
Zero of 5 samples exceed the single sample objective for water contact recreation.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Samples and exceedences are as follows:
Enterococcus
Zero of five samples exceed the single sample objective for water contact recreation.
Fecal coliform

Zero of five samples exceed the single sample objective for water contact recreation and non-contact recreation.
Total coliform
Zero of 5 samples exceed the single sample objective for water contact recreation.

The sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to section 3.1 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50135, Indicator Bacteria **Region 9**

Sweetwater Flood Control Channel

LOE ID:	77039
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Non-Contact Recreation
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater Flood Control Channel to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Coliform, Fecal.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters designated for non contact recreation (REC 2), the fecal coliform concentration shall not exceed 4000 MPN/100 ml (Basin Plan).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sweetwater Flood Control Channel was collected at 5 monitoring sites [Sweetwater River, Sweetwater River, Sweetwater River, Sweetwater River, Sweetwater River]
Temporal Representation:	Data was collected on a single day 7/10/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 50135, Indicator Bacteria **Region 9**

Sweetwater Flood Control Channel

LOE ID:	77040
Pollutant:	Fecal Coliform

LOE Subgroup:	Pollutant-Water	043134
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	5	
Number of Exceedances:	0	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater Flood Control Channel to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Coliform, Fecal.	
Data Reference:	Data for Various Pollutants from Bight, 2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the fecal coliform concentration shall not exceed 400 MPN/100 ml.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Sweetwater Flood Control Channel was collected at 5 monitoring sites [Sweetwater River, Sweetwater River, Sweetwater River, Sweetwater River, Sweetwater River]	
Temporal Representation:	Data was collected on a single day 7/10/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.	

Line of Evidence (LOE) for Decision ID 50135, Indicator Bacteria **Region 9**

Sweetwater Flood Control Channel

LOE ID:	77023
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater Flood Control Channel to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Enterococci.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Samples shall not exceed 61 organisms per 100 ml for enterococcus in waters designated for REC I beneficial use (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Data for this line of evidence for Sweetwater Flood Control Channel was collected at 5 monitoring sites [Sweetwater River, Sweetwater River, Sweetwater River, Sweetwater River, Sweetwater River]
Temporal Representation:	Data was collected on a single day 7/10/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 50135, Indicator Bacteria **Region 9**

Sweetwater Flood Control Channel

LOE ID:	76854
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater Flood Control Channel to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxicsubstances in concentrations which are toxic to,or which produce detrimental physiologicalresponses in human, plant, animal, or indigenousaquatic life (Basin Plan).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In waters designated for water contact recreation (REC I), the total coliform concentration shall not exceed 10000 MPN/100 ml (CDPH 2006).
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.
Spatial Representation:	Data for this line of evidence for Sweetwater Flood Control Channel was collected at 5 monitoring sites [Sweetwater River, Sweetwater River, Sweetwater River, Sweetwater River, Sweetwater River]
Temporal Representation:	Data was collected on a single day 7/10/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID **50093** **Region 9**

Sweetwater Flood Control Channel

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of five samples exceed the sediment guidelines. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the five samples exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50093, Lead **Region 9**

Sweetwater Flood Control Channel

LOE ID:	78384
Pollutant:	Lead
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Sweetwater Flood Control Channel to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Lead.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for Lead is 112.18 ug/g dry weight (MacDonald et al., 1996).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for Sweetwater Flood Control Channel was collected at 5

	monitoring sites [909_6052, 909_6057, 909_6060, 909_6065, 909_6069]043137
Temporal Representation:	Data was collected on a single day 7/10/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID 50095 **Region 9**

Sweetwater Flood Control Channel

Pollutant:	**Lindane/gamma Hexachlorocyclohexane (gamma-HCH)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of five samples exceed the sediment guidelines.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the five samples exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50095, Lindane/gamma Hexachlorocyclohexane (gamma-HCH) **Region 9**

Sweetwater Flood Control Channel

LOE ID:	78385
Pollutant:	Lindane/gamma Hexachlorocyclohexane (gamma-HCH)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	043138
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Sweetwater Flood Control Channel to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for HCH, Gamma.	
Data Reference:	Data for Various Pollutants from Bight, 2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In marine and estuarine sediments the sediment quality guideline (predictive of sediment toxicity for sediment-dwelling organisms) for HCH, gamma(Lindane; BHC, gamma) is 0.37 ug/g oc (Fairey et al., 2001).	
Guideline Reference:	An evaluation of methods for calculating mean sediment quality guideline quotients as indicators of contamination and acute toxicity to amphipods by chemical mixtures. Environmental Toxicology and Chemistry. 20(10): 2276-2286	
Spatial Representation:	Data for this line of evidence for Sweetwater Flood Control Channel was collected at 5 monitoring sites [909_6052, 909_6057, 909_6060, 909_6065, 909_6069]	
Temporal Representation:	Data was collected on a single day 7/10/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.	

DECISION ID 50097 Region 9

Sweetwater Flood Control Channel

Pollutant:	**Mercury**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of five samples exceed the sediment guidelines.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the five samples exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and

information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50097, Mercury **Region 9**

Sweetwater Flood Control Channel

LOE ID:	78386
Pollutant:	Mercury
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Sweetwater Flood Control Channel to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Mercury.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the sediment quality guideline (predictive of sediment toxicity for sediment-dwelling organisms) for Mercury is 2.1 ug/g (PTI Environmental Services, 1991).
Guideline Reference:	Pollutants of concern in Puget Sound. EPA 910/9-91-003. Seattle, WA: U.S. Environmental Protection Agency
Spatial Representation:	Data for this line of evidence for Sweetwater Flood Control Channel was collected at 5 monitoring sites [909_6052, 909_6057, 909_6060, 909_6065, 909_6069]
Temporal Representation:	Data was collected on a single day 7/10/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID 50101 **Region 9**

Sweetwater Flood Control Channel

Pollutant:	**PAHs (Polycyclic Aromatic Hydrocarbons)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of five samples exceed the sediment guidelines for high molecular weight PAHs, low molecular weight PAHs, and total PAHs.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the five samples exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50101, PAHs (Polycyclic Aromatic Hydrocarbons) Region 9

Sweetwater Flood Control Channel

LOE ID:	78387
Pollutant:	PAHs (Polycyclic Aromatic Hydrocarbons)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Sweetwater Flood Control Channel to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for PAH, High molecular weight.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for High molecular weight PAHs is 9600 ng/g dry weight (Long et al., 1995).
Guideline Reference:	Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuary sediments. Environmental Management. 19, (1): 81-97
Spatial Representation:	Data for this line of evidence for Sweetwater Flood Control Channel was collected at 5 monitoring sites [909_6052, 909_6057, 909_6060, 909_6065, 909_6069]
Temporal Representation:	Data was collected on a single day 7/10/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.

QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.	043141

Line of Evidence (LOE) for Decision ID 50101, PAHs (Polycyclic Aromatic Hydrocarbons) **Region 9**

Sweetwater Flood Control Channel

LOE ID:	78388
Pollutant:	PAHs (Polycyclic Aromatic Hydrocarbons)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Sweetwater Flood Control Channel to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for PAH, Low molecular weight.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Low molecular weight PAHs is 1442 ng/g dry weight (Long et al., 1995).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for Sweetwater Flood Control Channel was collected at 5 monitoring sites [909_6052, 909_6057, 909_6060, 909_6065, 909_6069]
Temporal Representation:	Data was collected on a single day 7/10/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Line of Evidence (LOE) for Decision ID 50101, PAHs (Polycyclic Aromatic Hydrocarbons) **Region 9**

Sweetwater Flood Control Channel

LOE ID:	78389
Pollutant:	PAHs (Polycyclic Aromatic Hydrocarbons)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Sweetwater Flood Control Channel to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for

	PAHs (Polycyclic Aromatic Hydrocarbons).	043142
Data Reference:	Data for Various Pollutants from Bight, 2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In marine and estuarine sediments the sediment quality guideline (predictive of sediment toxicity for sediment-dwelling organisms) for Total PAHs is 1800 ug/g (Fairey et al., 2001).	
Guideline Reference:	An evaluation of methods for calculating mean sediment quality guideline quotients as indicators of contamination and acute toxicity to amphipods by chemical mixtures. Environmental Toxicology and Chemistry. 20(10): 2276-2286	
Spatial Representation:	Data for this line of evidence for Sweetwater Flood Control Channel was collected at 5 monitoring sites [909_6052, 909_6057, 909_6060, 909_6065, 909_6069]	
Temporal Representation:	Data was collected on a single day 7/10/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.	

DECISION ID 50112 Region 9

Sweetwater Flood Control Channel

Pollutant:	**PCBs (Polychlorinated biphenyls)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of five samples exceed the sediment guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the five samples exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50112, PCBs (Polychlorinated biphenyls) 043143 **Region 9**

Sweetwater Flood Control Channel

LOE ID:	78390
Pollutant:	PCBs (Polychlorinated biphenyls)
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Sweetwater Flood Control Channel to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for PCB, Total.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the sediment quality guideline (predictive of sediment toxicity for sediment-dwelling organisms) for Total PCBs is 400 ng/g (MacDonald et al., 2000b).
Guideline Reference:	Development and evaluation of consensus-based sediment effect concentrations for polychlorinated biphenyls. Environmental Toxicology and Chemistry. 19(5): 1403-1413
Spatial Representation:	Data for this line of evidence for Sweetwater Flood Control Channel was collected at 5 monitoring sites [909_6052, 909_6057, 909_6060, 909_6065, 909_6069]
Temporal Representation:	Data was collected on a single day 7/10/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID 50130 **Region 9**

Sweetwater Flood Control Channel

Pollutant:	**Phenanthrene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of five samples exceed the sediment guidelines.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the five samples exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50130, Phenanthrene **Region 9**

Sweetwater Flood Control Channel

LOE ID:	78391
Pollutant:	Phenanthrene
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Sweetwater Flood Control Channel to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Phenanthrene.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for Phenanthrene is 543.53 ng/g dry weight (MacDonald et al., 1996).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for Sweetwater Flood Control Channel was collected at 5 monitoring sites [909_6052, 909_6057, 909_6060, 909_6065, 909_6069]
Temporal Representation:	Data was collected on a single day 7/10/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID **50131** **Region 9**

Sweetwater Flood Control Channel 043145

Pollutant:	**Pyrene**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of five samples exceed the sediment guidelines.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the five samples exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50131, Pyrene — Region 9

Sweetwater Flood Control Channel

LOE ID:	78392
Pollutant:	Pyrene
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Sweetwater Flood Control Channel to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Pyrene.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce

	detrimental physiological responses in, human, plant, animal, or aquatic life 043146
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for Pyrene is 1397.4 ng/g dry weight (MacDonald et al., 1996).
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278
Spatial Representation:	Data for this line of evidence for Sweetwater Flood Control Channel was collected at 5 monitoring sites [909_6052, 909_6057, 909_6060, 909_6065, 909_6069]
Temporal Representation:	Data was collected on a single day 7/10/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

DECISION ID 50132 Region 9

Sweetwater Flood Control Channel

Pollutant:	**Silver**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. One line of evidence is available in the administrative record to assess this pollutant. Zero of five samples exceed the sediment guidelines. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the five samples exceed the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50132, Silver Region 9

Sweetwater Flood Control Channel

LOE ID:	78371
Pollutant:	Silver

LOE Subgroup:	Pollutant-Sediment	043147
Matrix:	Sediment	
Fraction:	Total	
Beneficial Use:	Estuarine Habitat	
Number of Samples:	5	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Sweetwater Flood Control Channel to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Silver.	
Data Reference:	Data for Various Pollutants from Bight, 2008.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In marine and estuarine sediments the probable effect level (predictive of sediment toxicity for sediment-dwelling organisms) for Silver is 1.77 ug/g dry weight (MacDonald et al., 1996).	
Guideline Reference:	Development and evaluation of sediment quality guidelines for Florida coastal waters. Ecotoxicology 5: 253-278	
Spatial Representation:	Data for this line of evidence for Sweetwater Flood Control Channel was collected at 5 monitoring sites [909_6052, 909_6057, 909_6060, 909_6065, 909_6069]	
Temporal Representation:	Data was collected on a single day 7/10/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.	

DECISION ID 50134 Region 9

Sweetwater Flood Control Channel

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.6 of the Listing Policy. Under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

One line of evidence is available in the administrative record to assess this pollutant. Zero of five samples exceed the sediment guidelines.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the five samples exceed the guideline and this sample size is insufficient to determine, with

the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50134, Zinc **Region 9**

Sweetwater Flood Control Channel

LOE ID:	78372
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Estuarine Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Bight data for Sweetwater Flood Control Channel to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Zinc.
Data Reference:	Data for Various Pollutants from Bight, 2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In marine and estuarine sediments the effects range median (predictive of sediment toxicity for sediment-dwelling organisms) for Zinc is 410 ug/g dry weight (Long et al., 1995).
Guideline Reference:	Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuary sediments. Environmental Management. 19, (1): 81-97
Spatial Representation:	Data for this line of evidence for Sweetwater Flood Control Channel was collected at 5 monitoring sites [909_6052, 909_6057, 909_6060, 909_6065, 909_6069]
Temporal Representation:	Data was collected on a single day 7/10/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from Southern California Bight was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from Southern California Bight.

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Long Canyon Creek (Lower Sweetwater Watershed)
Water Body ID: CAR9091200020111216103137
Water Body Type: River & Stream

DECISION ID 48200 **Region 9**
Long Canyon Creek (Lower Sweetwater Watershed)

Pollutant: **Benthic Community Effects**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: Benthic Community Effects is being considered for placement on the CWA section 303(d) List under sections 3.9 and 3.1 of the Listing Policy. Under section 3.9, an additional line of evidence associating Benthic Community Effects with a water or sediment concentration of pollutant(s) is necessary to assess listing status.

Based on the readily available data and information, the weight of evidence provides sufficient justification for not placing Benthic Community Effects in this water segment on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Pursuant to section 3.9 of the Listing Policy, the water does exhibit significant degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index.
4. Pursuant to section 3.9 of the Listing Policy, the water segment does not have associated pollutant(s) samples that exceed water quality objectives.
5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not being met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48200, Benthic Community Effects **Region 9**
Long Canyon Creek (Lower Sweetwater Watershed)

LOE ID: 79677

Pollutant: Benthic-Macroinvertebrate Bioassessments
LOE Subgroup: Population/Community Degradation
Matrix: Water
Fraction: None

Beneficial Use: Warm Freshwater Habitat

Number of Samples:	1	043150
Number of Exceedances:	1	
Data and Information Type:	Benthic macroinvertebrate surveys	
Data Used to Assess Water Quality:	One sample was collected from one station on Long Canyon Creek. The one samples was below the 0.79 threshold, and is therefore exceeding the water quality objective for the aquatic life beneficial use.	
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008. Region 9 CSCI Scores & Water Body Information	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.	
Guideline Reference:	Development of a Benthic Index of Biotic Integrity (B-IBI) for Wadeable Streams in Northern Coastal California and its Application to Regional 305(b) Assessment The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.	
Spatial Representation:	The sample was collected at station SR-AD Long Canyon Creek.	
Temporal Representation:	The sample was collected in October 2002.	
Environmental Conditions:		
QAPP Information:	The data was collected under the County of San Diego NPDES MS4 Copermittees Receiving Waters Monitoring and Reporting Program.	
QAPP Information Reference(s):	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008. Quality Assurance Project Plan for SWAMP Bioassessment and Freshwater Bioassessment.	

Line of Evidence (LOE) for Decision ID 48200, Benthic Community Effects **Region 9**

Long Canyon Creek (Lower Sweetwater Watershed)

LOE ID:	72769
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	The one sample collected had an IBI score below 40. tr11c NPDES bioassessment

Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008. 043151
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the State or Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	Development of a Benthic Index of Biotic Integrity (B-IBI) for Wadeable Streams in Northern Coastal California and its Application to Regional 305(b) Assessment
Spatial Representation:	The sample was collected at station SR-AD Long Canyon Creek.
Temporal Representation:	The sample was collected in October 2002.
Environmental Conditions:	
QAPP Information:	The data was collected under the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan, June 25, 2009.
QAPP Information Reference(s):	Quality Assurance Project Plan for SWAMP Bioassessment and Freshwater Bioassessment.

DECISION ID 48201 Region 9

Long Canyon Creek (Lower Sweetwater Watershed)

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a Single line of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the Seven samples exceed the California Toxics Rule Objective for Cadmium. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Seven samples exceeded the California Toxics Rule Objective for Cadmium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision	After review of the available data and information, RWQCB staff concludes that the water body-

Recommendation: pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48201, Cadmium **Region 9**

Long Canyon Creek (Lower Sweetwater Watershed)

LOE ID:	74163
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Long Canyon Creek (Lower Sweetwater Watershed) to determine beneficial use support and results are as follows: 0 of 7 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Long Canyon Creek (Lower Sweetwater Watershed) was collected at 1 monitoring site [Long Canyon Creek @ Bonita Road near Acacia Ave.]
Temporal Representation:	Data was collected on a single day 6/24/2003 - 6/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 48205 **Region 9**

Long Canyon Creek (Lower Sweetwater Watershed)

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of

the Listing Policy. Under section 3.1 a Single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the Zero samples exceed the Water Quality Criteria for Chlorpryifos.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Zero samples exceeded the Water Quality Criteria for Chlorpryifos and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48205, Chlorpyrifos **Region 9**

Long Canyon Creek (Lower Sweetwater Watershed)

LOE ID:	74164
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Long Canyon Creek (Lower Sweetwater Watershed) to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).
Spatial Representation:	Data for this line of evidence for Long Canyon Creek (Lower Sweetwater Watershed) was

	collected at 1 monitoring site [Long Canyon Creek @ Bonita Road near Acacia Ave.] 04/15/14
Temporal Representation:	Data was collected over the time period 5/19/2005-6/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 48208 Region 9

Long Canyon Creek (Lower Sweetwater Watershed)

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the Seven samples exceed the California Toxics Rule Objective for Copper. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Seven samples exceeded the California Toxics Rule Objective for Copper and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48208, Copper Region 9

Long Canyon Creek (Lower Sweetwater Watershed)

LOE ID:	74165
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING 043155
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Long Canyon Creek (Lower Sweetwater Watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Long Canyon Creek (Lower Sweetwater Watershed) was collected at 1 monitoring site [Long Canyon Creek @ Bonita Road near Acacia Ave.]
Temporal Representation:	Data was collected on a single day 6/24/2003 - 6/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 48212 Region 9

Long Canyon Creek (Lower Sweetwater Watershed)

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a Single line of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the Five samples exceed the Water Quality Criteria for Diazinon. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Five samples exceeded the Water Quality Criteria for Diazinon and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and

information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48212, Diazinon	Region 9
Long Canyon Creek (Lower Sweetwater Watershed)	

LOE ID:	74166
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Long Canyon Creek (Lower Sweetwater Watershed) to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Data for this line of evidence for Long Canyon Creek (Lower Sweetwater Watershed) was collected at 1 monitoring site [Long Canyon Creek @ Bonita Road near Acacia Ave.]
Temporal Representation:	Data was collected over the time period 5/19/2005-6/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 48221	Region 9
Long Canyon Creek (Lower Sweetwater Watershed)	

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a Single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the Seven samples exceed the California Toxics Rule Objective for Lead.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Seven samples exceeded the California Toxics Rule Objective for Lead and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48221, Lead **Region 9**

Long Canyon Creek (Lower Sweetwater Watershed)

LOE ID:	74169
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Long Canyon Creek (Lower Sweetwater Watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Long Canyon Creek (Lower Sweetwater Watershed) was collected at 1 monitoring site [Long Canyon Creek @ Bonita Road near Acacia Ave.]
Temporal Representation:	Data was collected on a single day 6/24/2003 - 6/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix

QAPP Information Reference(s):	Analytical and Dry Weather Monitoring Program Rev. 8 was followed. 043158 Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 48223 Region 9

Long Canyon Creek (Lower Sweetwater Watershed)

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a Single line of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the Five samples exceed the Water Quality Criteria for Malathion. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Five samples exceeded the Water Quality Criteria for Malathion and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48223, Malathion Region 9

Long Canyon Creek (Lower Sweetwater Watershed)

LOE ID:	74170
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Long Canyon Creek (Lower Sweetwater Watershed) to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Malathion.

Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Long Canyon Creek (Lower Sweetwater Watershed) was collected at 1 monitoring site [Long Canyon Creek @ Bonita Road near Acacia Ave.]
Temporal Representation:	Data was collected over the time period 5/19/2005-6/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 48225 Region 9

Long Canyon Creek (Lower Sweetwater Watershed)

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a Single line of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the Seven samples exceed the California Toxics Rule Objective for Zinc. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Seven samples exceeded the California Toxics Rule Objective for Zinc and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48225, Zinc Region 9

Long Canyon Creek (Lower Sweetwater Watershed) 043160

LOE ID:	74172
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Long Canyon Creek (Lower Sweetwater Watershed) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Long Canyon Creek (Lower Sweetwater Watershed) was collected at 1 monitoring site [Long Canyon Creek @ Bonita Road near Acacia Ave.]
Temporal Representation:	Data was collected on a single day 6/24/2003 - 6/4/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **48215** **Region 9**

Long Canyon Creek (Lower Sweetwater Watershed)

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.3 of the Listing Policy. Under section 3.3 a single line of evidence is necessary to assess listing status. Three lines of evidence are available in the administrative record to assess this pollutant. Six of the Six samples exceed the Single Sample maximum Objective for Enterococcus, Four out of Six samples

exceeded the Single Sample Maximum Objective for Fecal Coliform, and Three out of Six samples exceeded the Single Sample Maximum Guideline for Total Coliform.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Six of the Six samples exceed the Single Sample maximum Objective for Enterococcus, Four out of Six samples exceeded the Single Sample Maximum Objective for Fecal Coliform, and Three out of Six samples exceeded the Single Sample Maximum Guideline for Total Coliform, and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48215, Indicator Bacteria **Region 9**

Long Canyon Creek (Lower Sweetwater Watershed)

LOE ID:	74171
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	6
Number of Exceedances:	3
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Long Canyon Creek (Lower Sweetwater Watershed) to determine beneficial use support and results are as follows: 3 of 6 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxicsubstances in concentrations which are toxic to,or which produce detrimental physiologicalresponses in human, plant, animal, or indigenousaquatic life (Basin Plan).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In waters designated for water contact recreation (REC I), the total coliform concentration shall not exceed 10000 MPN/100 ml (CDPH 2006).
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.
Spatial Representation:	Data for this line of evidence for Long Canyon Creek (Lower Sweetwater Watershed) was collected at 1 monitoring site [Long Canyon Creek @ Bonita Road near Acacia Ave.]
Temporal Representation:	Data was collected over the time period 6/24/2003-7/28/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix

	Analytical and Dry Weather Monitoring Program Rev. 8 was followed. 043162
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48215, Indicator Bacteria **Region 9**

Long Canyon Creek (Lower Sweetwater Watershed)

LOE ID:	74167
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	6
Number of Exceedances:	6
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Long Canyon Creek (Lower Sweetwater Watershed) to determine beneficial use support and results are as follows: 6 of 6 samples exceed the criterion for Enterococci.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Samples shall not exceed 61 organisms per 100 ml for enterococcus in waters designated for REC I beneficial use (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Long Canyon Creek (Lower Sweetwater Watershed) was collected at 1 monitoring site [Long Canyon Creek @ Bonita Road near Acacia Ave.]
Temporal Representation:	Data was collected over the time period 6/24/2003-7/28/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48215, Indicator Bacteria **Region 9**

Long Canyon Creek (Lower Sweetwater Watershed)

LOE ID:	74168
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	6
Number of Exceedances:	4
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Long Canyon Creek (Lower

	Sweetwater Watershed) to determine beneficial use support and results are as follows: 4 of 6 samples exceed the criterion for Coliform, Fecal.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the fecal coliform concentration shall not exceed 400 MPN/100 ml.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Long Canyon Creek (Lower Sweetwater Watershed) was collected at 1 monitoring site [Long Canyon Creek @ Bonita Road near Acacia Ave.]
Temporal Representation:	Data was collected over the time period 6/24/2003-7/28/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Steele Canyon
Water Body ID: CAR9092100020110812150007
Water Body Type: River & Stream

DECISION ID 52007 **Region 9**
Steele Canyon

Pollutant: Ammonia
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of three samples exceeded the guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of three samples exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52007, Ammonia **Region 9**
Steele Canyon

LOE ID: 77155

Pollutant: Nitrogen, ammonia (Total Ammonia)
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 3

Number of Exceedances:	0	043165

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Steele Canyon to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Ammonia As N, Total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Basin Plan: No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	EPA's Lifetime Health advisory level for total ammonia is 30.0 mg/L as stated on page 8 of the 2006 edition of the drinking water standards and health advisories. This Advisory Level is defined as "the concentration of a chemical in drinking water that is not expected to cause any adverse noncarcinogenic effects for up to ten days of exposure."
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Steele Canyon was collected at 1 monitoring site [Indian Springs Creek @ Highway 94]
Temporal Representation:	Data was collected over the time period 6/11/2003-8/19/2004.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID	**49794**	**Region 9**
Steele Canyon		

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the nine samples exceed the beneficial use guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of nine samples exceeded the guidelines and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49794, Cadmium **Region 9**

Steele Canyon

LOE ID:	77157
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Steele Canyon to determine beneficial use support and results are as follows: 0 of 9 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for cadmium is 0.005 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals, CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Steele Canyon was collected at 2 monitoring sites [Tributary of Sweetwater River @ Millar Ranch Road south of Hwy 94, Indian Springs Creek @ Highway 94]
Temporal Representation:	Data was collected 6/11/2003 - 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 49794, Cadmium **Region 9**

Steele Canyon

LOE ID:	77156
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	9
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Steele Canyon to determine beneficial use support and results are as follows: 0 of 9 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California, 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Steele Canyon was collected at 2 monitoring sites [Tributary of Sweetwater River @ Millar Ranch Road south of Hwy 94, Indian Springs Creek @ Highway 94]
Temporal Representation:	Data was collected 6/11/2003 - 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID	**49809**	**Region 9**
Steele Canyon		

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the five samples exceed the beneficial use guideline for Municipal and Domestic Supply and zero of zero samples exceed the criterion for aquatic life. The samples for aquatic life were not used in the assessment due to reporting limits that were higher than the guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of five samples exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49809, Chlorpyrifos **Region 9**

Steele Canyon

LOE ID:	78189
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Steele Canyon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for chlorpyrifos is 2.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Steele Canyon was collected at 2 monitoring sites [Tributary of Sweetwater River @ Millar Ranch Road south of Hwy 94, Indian Springs Creek @ Highway 94]
Temporal Representation:	Data was collected over the time period 5/1/2006-6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 49809, Chlorpyrifos **Region 9**

Steele Canyon

LOE ID:	77158
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	0	043169
Number of Exceedances:	0	

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Steele Canyon to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).
Spatial Representation:	Data for this line of evidence for Steele Canyon was collected at 2 monitoring sites [Tributary of Sweetwater River @ Millar Ranch Road south of Hwy 94, Indian Springs Creek @ Highway 94]
Temporal Representation:	Data was collected over the time period 5/1/2006-6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID	49804	Region 9
Steele Canyon		

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the nine samples exceed the beneficial use guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of nine samples exceeded the guidelines and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.

	4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49804, Copper **Region 9**

Steele Canyon

LOE ID:	77163
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Steele Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for copper is 1.0 mg/L (Title 22 California Code of Regulations).
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Steele Canyon was collected at 2 monitoring sites [Tributary of Sweetwater River @ Millar Ranch Road south of Hwy 94, Indian Springs Creek @ Highway 94]
Temporal Representation:	Data was collected 6/11/2003 - 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 49804, Copper **Region 9**

Steele Canyon

LOE ID:	77162
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Steele Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Steele Canyon was collected at 2 monitoring sites [Tributary of Sweetwater River @ Millar Ranch Road south of Hwy 94, Indian Springs Creek @ Highway 94]
Temporal Representation:	Data was collected 6/11/2003 - 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **49816** **Region 9**

Steele Canyon

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the five samples exceed the beneficial use guidelines.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of five samples exceeded the guidelines and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available

indicating that standards are not met. 043172

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49816, Diazinon **Region 9**

Steele Canyon

LOE ID:	78190
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Steele Canyon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for diazinon is 1.4 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Steele Canyon was collected at 2 monitoring sites [Tributary of Sweetwater River @ Millar Ranch Road south of Hwy 94, Indian Springs Creek @ Highway 94]
Temporal Representation:	Data was collected over the time period 5/1/2006-6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 49816, Diazinon **Region 9**

Steele Canyon

LOE ID:	77164
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Steele Canyon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Data for this line of evidence for Steele Canyon was collected at 2 monitoring sites [Tributary of Sweetwater River @ Millar Ranch Road south of Hwy 94, Indian Springs Creek @ Highway 94]
Temporal Representation:	Data was collected over the time period 5/1/2006-6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID	49805	Region 9
Steele Canyon		

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the nine samples exceed the beneficial use guidelines.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of nine samples exceeded the guidelines and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available

indicating that standards are not met. 043174

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49805, Lead **Region 9**

Steele Canyon

LOE ID:	77167
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Steele Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Steele Canyon was collected at 2 monitoring sites [Tributary of Sweetwater River @ Millar Ranch Road south of Hwy 94, Indian Springs Creek @ Highway 94]
Temporal Representation:	Data was collected 6/11/2003 - 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 49805, Lead **Region 9**

Steele Canyon

LOE ID:	77168
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Steele Canyon to determine beneficial use support and results are as follows: 0 of 9 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for Lead is 0.015 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Steele Canyon was collected at 2 monitoring sites [Tributary of Sweetwater River @ Millar Ranch Road south of Hwy 94, Indian Springs Creek @ Highway 94]
Temporal Representation:	Data was collected 6/11/2003 - 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **49818** **Region 9**

Steele Canyon

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the five samples exceed the beneficial use guidelines.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of five samples exceeded the guidelines and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49818, Malathion **Region 9**

Steele Canyon

LOE ID:	77169
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Steele Canyon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Malathion.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Steele Canyon was collected at 2 monitoring sites [Tributary of Sweetwater River @ Millar Ranch Road south of Hwy 94, Indian Springs Creek @ Highway 94]
Temporal Representation:	Data was collected over the time period 5/1/2006-6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 49818, Malathion **Region 9**

Steele Canyon

LOE ID:	78191
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Steele Canyon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Malathion.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for malathion is 100 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Steele Canyon was collected at 2 monitoring sites [Tributary of Sweetwater River @ Millar Ranch Road south of Hwy 94, Indian Springs Creek @ Highway 94]
Temporal Representation:	Data was collected over the time period 5/1/2006-6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID	**52004**	**Region 9**
Steele Canyon		

Pollutant:	**Nitrate/Nitrite (Nitrite + Nitrate as N)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. One of three samples exceeded the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of three samples exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52004, Nitrate/Nitrite (Nitrite + Nitrate as N) **Region 9**

Steele Canyon

LOE ID:	77170
Pollutant:	Nitrate/Nitrite (Nitrite + Nitrate as N)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Steele Canyon to determine beneficial use support and results are as follows: 1 of 3 samples exceed the criterion for Nitrate/Nitrite as N.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrate + nitrite (as N) is 10.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals, CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Steele Canyon was collected at 1 monitoring site [Indian Springs Creek @ Highway 94]
Temporal Representation:	Data was collected over the time period 9/17/2003-5/23/2005.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **52005** **Region 9**

Steele Canyon

Pollutant:	**Nitrogen, Nitrite**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of five samples exceeded the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of five samples exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52005, Nitrogen, Nitrite **Region 9**

Steele Canyon

LOE ID:	77171
Pollutant:	Nitrogen, Nitrite
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Steele Canyon to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Nitrite as N.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrite (as N) is 1.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Steele Canyon was collected at 1 monitoring site [Indian Springs Creek @ Highway 94]
Temporal Representation:	Data was collected over the time period 6/11/2003-5/23/2005.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **49806** **Region 9**
Steele Canyon

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the nine samples exceed the beneficial use guidelines.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of nine samples exceeded the guidelines and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49806, Zinc **Region 9**
Steele Canyon

LOE ID:	77173
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Steele Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for zinc is 5.0 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Steele Canyon was collected at 2 monitoring sites [Tributary of Sweetwater River @ Millar Ranch Road south of Hwy 94, Indian Springs Creek @ Highway 94]
Temporal Representation:	Data was collected 6/11/2003 - 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 49806, Zinc **Region 9**

Steele Canyon

LOE ID:	77174
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	9
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Steele Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Steele Canyon was collected at 2 monitoring sites [Tributary of Sweetwater River @ Millar Ranch Road south of Hwy 94, Indian Springs Creek @ Highway 94]
Temporal Representation:	Data was collected 6/11/2003 - 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID	49822	043182 Region 9
Steele Canyon		

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.3 of the Listing Policy. Under section 3.3 a single line of evidence are necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant.
Enterococcus
Nine of 10 samples exceeds the single sample for water contact recreation.
Fecal coliform
Five of 10 samples exceeds the single sample for water contact recreation.
Total coliform
Two of 10 samples exceeds the single sample for water contact recreation.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Samples and exceedences are as follows:
Enterococcus
Nine of 10 samples exceeds the single sample for water contact recreation.
Fecal coliform
Five of 10 samples exceeds the single sample for water contact recreation.
Total coliform
Two of 10 samples exceeds the single sample for water contact recreation.
The enterococcus and fecal coliform samples exceed the allowable frequency listed in Table 3.2 of the Listing Policy. The total coliform sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to section 3.1 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 49822, Indicator Bacteria	**Region 9**
Steele Canyon	

LOE ID:	77165
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation	043183
Number of Samples:	10	
Number of Exceedances:	9	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Steele Canyon to determine beneficial use support and results are as follows: 9 of 10 samples exceed the criterion for Enterococci.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Samples shall not exceed 61 organisms per 100 ml for enterococcus in waters designated for REC I beneficial use (Water Quality Control Plan for the San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Steele Canyon was collected at 2 monitoring sites [Indian Springs Creek @ Highway 94, Tributary of Sweetwater River @ Millar Ranch Road south of Hwy 94]	
Temporal Representation:	Data was collected over the time period 6/11/2003-8/6/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 49822, Indicator Bacteria **Region 9**

Steele Canyon

LOE ID:	77172
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	10
Number of Exceedances:	2
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Steele Canyon to determine beneficial use support and results are as follows: 2 of 10 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxicsubstances in concentrations which are toxic to,or which produce detrimental physiologicalresponses in human, plant, animal, or indigenousaquatic life (Basin Plan).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In waters designated for water contact recreation (REC I), the total coliform concentration shall not exceed 10000 MPN/100 ml (CDPH 2006).

Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Date: November 1997. California Department of Public Health.
Spatial Representation:	Data for this line of evidence for Steele Canyon was collected at 2 monitoring sites [Indian Springs Creek @ Highway 94, Tributary of Sweetwater River @ Millar Ranch Road south of Hwy 94]
Temporal Representation:	Data was collected over the time period 6/11/2003-8/6/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 49822, Indicator Bacteria **Region 9**

Steele Canyon

LOE ID:	77166
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	10
Number of Exceedances:	5
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Steele Canyon to determine beneficial use support and results are as follows: 5 of 10 samples exceed the criterion for Coliform, Fecal.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the fecal coliform concentration shall not exceed 400 MPN/100 ml.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Steele Canyon was collected at 2 monitoring sites [Indian Springs Creek @ Highway 94, Tributary of Sweetwater River @ Millar Ranch Road south of Hwy 94]
Temporal Representation:	Data was collected over the time period 6/11/2003-8/6/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper)
Water Body ID: CAR9092100020110816120152
Water Body Type: River & Stream

DECISION ID 47985 **Region 9**
Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper)

Pollutant: Ammonia
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the CRITERION for protection of the MUN beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 1 samples exceeded the CRITERIA for MUN which is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47985, Ammonia **Region 9**
Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper)

LOE ID: 74294

Pollutant: Nitrogen, ammonia (Total Ammonia)
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 1

Number of Exceedances:	0	043186
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Ammonia As N, Total.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Basin Plan: No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	EPA's Lifetime Health advisory level for total ammonia is 30.0 mg/L as stated on page 8 of the 2006 edition of the drinking water standards and health advisories. This Advisory Level is defined as "the concentration of a chemical in drinking water that is not expected to cause any adverse noncarcinogenic effects for up to ten days of exposure."	
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013	
Spatial Representation:	Data for this line of evidence for Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper) was collected at 1 monitoring site [Mexican Canyon Creek @ Jamul Road]	
Temporal Representation:	Data was collected on a single day 6/19/2003.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID	**47932**	**Region 9**
Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper)		

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the seven samples exceed the CRITERION for protection of the MUN beneficial use and zero of seven exceed the criterion for protection of the aquatic life beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 7 samples exceeded the CRITERIA for MUN and Zero of 7 samples exceeded the criteria for Aquatic Life. This sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available

indicating that standards are not met. 043187

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47932, Cadmium **Region 9**

Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper)

LOE ID:	74296
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper) to determine beneficial use support and results are as follows: 0 of 7 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for cadmium is 0.005 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper) was collected at 1 monitoring site [Mexican Canyon Creek @ Jamul Road]
Temporal Representation:	Data was collected 6/19/2003 - 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47932, Cadmium **Region 9**

Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper)

LOE ID:	74295
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	7

Number of Exceedances:	0	043188
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper) to determine beneficial use support and results are as follows: 0 of 7 samples exceed the criterion for Cadmium.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper) was collected at 1 monitoring site [Mexican Canyon Creek @ Jamul Road]	
Temporal Representation:	Data was collected 6/19/2003 - 6/3/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID **47962** **Region 9**

Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper)

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the four samples exceed the CRITERION for protection of the MUN beneficial use and zero of zero exceed the criterion for protection of the aquatic life beneficial use. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 4 samples exceeded the CRITERIA for MUN and Zero of 0 samples exceeded the criteria for Aquatic Life. This sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47962, Chlorpyrifos **Region 9**

Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper)

LOE ID:	78063
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper) to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for chlorpyrifos is 2.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper) was collected at 1 monitoring site [Mexican Canyon Creek @ Jamul Road]
Temporal Representation:	Data was collected over the time period 5/9/2006-6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47962, Chlorpyrifos **Region 9**

Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper)

LOE ID:	74297
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0

Number of Exceedances:	0	043190
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper) to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Chlorpyrifos.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000).	
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).	
Spatial Representation:	Data for this line of evidence for Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper) was collected at 1 monitoring site [Mexican Canyon Creek @ Jamul Road]	
Temporal Representation:	Data was collected over the time period 5/9/2006-6/3/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID **47964** **Region 9**

Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper)

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the seven samples exceed the CRITERION for protection of the MUN beneficial use and zero of seven exceed the criterion for protection of the aquatic life beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 7 samples exceeded the CRITERIA for MUN and Zero of 7 samples exceeded the criteria for Aquatic Life. This sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.

4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47964, Copper **Region 9**

Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper)

LOE ID:	74299
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for copper is 1.0 mg/L (Title 22 California Code of Regulations).
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper) was collected at 1 monitoring site [Mexican Canyon Creek @ Jamul Road]
Temporal Representation:	Data was collected 6/19/2003 - 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47964, Copper **Region 9**

Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper)

LOE ID:	74298
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	7	043192
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper) was collected at 1 monitoring site [Mexican Canyon Creek @ Jamul Road]	
Temporal Representation:	Data was collected 6/19/2003 - 6/3/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID **47969** **Region 9**

Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper)

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the four samples exceed the CRITERION for protection of the MUN beneficial use and zero of four exceed the criterion for protection of the aquatic life beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 4 samples exceeded the CRITERIA for MUN and Zero of 4 samples exceeded the criteria for Aquatic Life. This sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available

indicating that standards are not met. 043193

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47969, Diazinon **Region 9**

Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper)

LOE ID:	78064
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper) to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for diazinon is 1.4 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper) was collected at 1 monitoring site [Mexican Canyon Creek @ Jamul Road]
Temporal Representation:	Data was collected over the time period 5/9/2006-6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47969, Diazinon **Region 9**

Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper)

LOE ID:	74300
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	4	043194
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper) to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Diazinon.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).	
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game	
Spatial Representation:	Data for this line of evidence for Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper) was collected at 1 monitoring site [Mexican Canyon Creek @ Jamul Road]	
Temporal Representation:	Data was collected over the time period 5/9/2006-6/3/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID 47965 Region 9

Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper)

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the seven samples exceed the CRITERION for protection of the MUN beneficial use and zero of seven exceed the criterion for protection of the aquatic life beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 7 samples exceeded the CRITERIA for MUN and Zero of 7 samples exceeded the criteria for Aquatic Life. This sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available

indicating that standards are not met. 043195

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47965, Lead **Region 9**

Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper)

LOE ID:	74303
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper) to determine beneficial use support and results are as follows: 0 of 7 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for Lead is 0.015 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper) was collected at 1 monitoring site [Mexican Canyon Creek @ Jamul Road]
Temporal Representation:	Data was collected 6/19/2003 - 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47965, Lead **Region 9**

Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper)

LOE ID:	74304
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	7

Number of Exceedances:	0	043196
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper) was collected at 1 monitoring site [Mexican Canyon Creek @ Jamul Road]	
Temporal Representation:	Data was collected 6/19/2003 - 6/3/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID **47982** **Region 9**

Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper)

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the four samples exceed the CRITERION for protection of the MUN beneficial use and zero of four exceed the criterion for protection of the aquatic life beneficial use. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 4 samples exceeded the CRITERIA for MUN and Zero of 4 samples exceeded the criteria for Aquatic Life. This sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47982, Malathion **Region 9**

Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper)

LOE ID:	74305
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper) to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Malathion.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper) was collected at 1 monitoring site [Mexican Canyon Creek @ Jamul Road]
Temporal Representation:	Data was collected over the time period 5/9/2006-6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47982, Malathion **Region 9**

Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper)

LOE ID:	78065
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	4	043198
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper) to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Malathion.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The USEPA drinking water health advisory for malathion is 100 Âµg/L.	
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013	
Spatial Representation:	Data for this line of evidence for Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper) was collected at 1 monitoring site [Mexican Canyon Creek @ Jamul Road]	
Temporal Representation:	Data was collected over the time period 5/9/2006-6/3/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID	47983	Region 9

Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper)

Pollutant:	**Nitrate/Nitrite (Nitrite + Nitrate as N)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. One of the two samples exceed the CRITERION for protection of the MUN beneficial use. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of 2 samples exceeded the CRITERIA for MUN which is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and

information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47983, Nitrate/Nitrite (Nitrite + Nitrate as N) **Region 9**

Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper)

LOE ID:	74306
Pollutant:	Nitrate/Nitrite (Nitrite + Nitrate as N)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper) to determine beneficial use support and results are as follows: 1 of 2 samples exceed the criterion for Nitrate/Nitrite as N.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrate + nitrite (as N) is 10.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper) was collected at 1 monitoring site [Mexican Canyon Creek @ Jamul Road]
Temporal Representation:	Data was collected over the time period 9/17/2003-5/23/2005.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **47989** **Region 9**

Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper)

Pollutant:	**Nitrogen, Nitrite**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the four samples exceed the CRITERION for protection of the MUN beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 4 samples exceeded the CRITERIA for MUN which is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47989, Nitrogen, Nitrite **Region 9**

Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper)

LOE ID:	74307
Pollutant:	Nitrogen, Nitrite
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper) to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Nitrite as N.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrite (as N) is 1.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper) was collected at 1 monitoring site [Mexican Canyon Creek @ Jamul Road]
Temporal Representation:	Data was collected over the time period 6/19/2003-5/23/2005.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 47966 **Region 9**

Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper) 043201

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the seven samples exceed the CRITERION for protection of the MUN beneficial use and zero of seven exceed the criterion for protection of the aquatic life beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 7 samples exceeded the CRITERIA for MUN and Zero of 7 samples exceeded the criteria for Aquatic Life. This sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47966, Zinc — Region 9

Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper)

LOE ID:	74309
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that

	adversely affect beneficial uses. (Water Quality Control Plan, San Diego Basin)
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for zinc is 5.0 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper) was collected at 1 monitoring site [Mexican Canyon Creek @ Jamul Road]
Temporal Representation:	Data was collected 6/19/2003 - 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47966, Zinc **Region 9**

Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper)

LOE ID:	74310
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper) was collected at 1 monitoring site [Mexican Canyon Creek @ Jamul Road]
Temporal Representation:	Data was collected 6/19/2003 - 6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 47967 **Region 9**

Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper)

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2027
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.3 of the Listing Policy. Under section 3.3 a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. Seven of the seven samples exceed the objective for enterococcus. Four of seven samples exceed the objective for fecal coliform and zero of seven samples exceed the objective for total coliform.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Seven of seven samples exceed the objective and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 47967, Indicator Bacteria **Region 9**

Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper)

LOE ID:	74301
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	7
Number of Exceedances:	7
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper) to determine beneficial use support and results are as follows: 7 of 7 samples exceed the criterion for Enterococci.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Samples shall not exceed 61 organisms per 100 ml for enterococcus in waters designated for REC I beneficial use (Water Quality Control Plan for the San Diego Basin).

Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	043204
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper) was collected at 1 monitoring site [Mexican Canyon Creek @ Jamul Road]	
Temporal Representation:	Data was collected over the time period 6/19/2003-6/3/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 47967, Indicator Bacteria **Region 9**

Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper)

LOE ID:	74302
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	7
Number of Exceedances:	4
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper) to determine beneficial use support and results are as follows: 4 of 7 samples exceed the criterion for Coliform, Fecal.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the fecal coliform concentration shall not exceed 400 MPN/100 ml.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper) was collected at 1 monitoring site [Mexican Canyon Creek @ Jamul Road]
Temporal Representation:	Data was collected over the time period 6/19/2003-6/3/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47967, Indicator Bacteria **Region 9**

Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper)

LOE ID:	74308
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water

Matrix:	Water	043205
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	7	
Number of Exceedances:	0	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper) to determine beneficial use support and results are as follows: 0 of 7 samples exceed the criterion for Coliform, Total.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxicsubstances in concentrations which are toxic to,or which produce detrimental physiologicalresponses in human, plant, animal, or indigenousaquatic life (Basin Plan).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In waters designated for water contact recreation (REC I), the total coliform concentration shall not exceed 10000 MPN/100 ml (CDPH 2006).	
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.	
Spatial Representation:	Data for this line of evidence for Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper) was collected at 1 monitoring site [Mexican Canyon Creek @ Jamul Road]	
Temporal Representation:	Data was collected over the time period 6/19/2003-6/3/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Jamacha Creek
Water Body ID: CAR9092100020110816162953
Water Body Type: River & Stream

DECISION ID 47916 **Region 9**
Jamacha Creek

Pollutant: Cadmium
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the six samples exceed the California Toxics Rule Objective for Cadmium.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of six samples exceeded the California Toxics Rule Objective for Cadmium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47916, Cadmium **Region 9**
Jamacha Creek

LOE ID: 73909

Pollutant: Cadmium
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Warm Freshwater Habitat

Number of Samples:	6	043207
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Jamacha Creek to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Cadmium.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Jamacha Creek was collected at 1 monitoring site [Jamacha Creek @ Jamacha Road near Willow Glen Drive]	
Temporal Representation:	Data was collected once yearly from 7/12/2004 - 6/16/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 47916, Cadmium **Region 9**

Jamacha Creek

LOE ID:	73910
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Jamacha Creek to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for cadmium is 0.005 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Data for this line of evidence for Jamacha Creek was collected at 1 monitoring site [04320 Jamacha Creek @ Jamacha Road near Willow Glen Drive]
Temporal Representation:	Data was collected once yearly from 7/12/2004 - 6/16/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 47917 Region 9

Jamacha Creek

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the Four samples exceed the Evaluation Guideline for Chlorpyrifos. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Four samples exceeded the Evaluation Guideline for Chlorpryifos and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47917, Chlorpyrifos Region 9

Jamacha Creek

LOE ID:	78041
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Jamacha Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for chlorpyrifos is 2.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Jamacha Creek was collected at 1 monitoring site [Jamacha Creek @ Jamacha Road near Willow Glen Drive]
Temporal Representation:	Data was collected over the time period 5/1/2006-6/16/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47917, Chlorpyrifos **Region 9**

Jamacha Creek

LOE ID:	73911
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Jamacha Creek to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).

Spatial Representation:	Data for this line of evidence for Jamacha Creek was collected at 1 monitoring site [Jamacha Creek @ Jamacha Road near Willow Glen Drive]
Temporal Representation:	Data was collected over the time period 5/1/2006-6/16/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 47918 — Region 9

Jamacha Creek

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the Six samples exceed the California Toxics Rule Objective for Copper. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Six samples exceeded the California Toxics Rule Objective for copper and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47918, Copper — Region 9

Jamacha Creek

LOE ID:	73913
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6

Number of Exceedances:	0	043211

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Jamacha Creek to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for copper is 1.0 mg/L (Title 22 California Code of Regulations).
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Jamacha Creek was collected at 1 monitoring site [Jamacha Creek @ Jamacha Road near Willow Glen Drive]
Temporal Representation:	Data was collected once yearly from 7/12/2004 - 6/16/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47918, Copper **Region 9**

Jamacha Creek

LOE ID:	73912
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Jamacha Creek to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Jamacha Creek was collected at 1 monitoring site [

	Jamacha Creek @ Jamacha Road near Willow Glen Drive]	043212
Temporal Representation:	Data was collected once yearly from 7/12/2004 - 6/16/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID 47919 Region 9

Jamacha Creek

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the Four samples exceed the Water Quality Criteria Diazinon.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Four samples exceeded the Water Quality Criteria for Diazinon and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47919, Diazinon Region 9

Jamacha Creek

LOE ID:	78042
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING 043213
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Jamacha Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for diazinon is 1.4 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Jamacha Creek was collected at 1 monitoring site [Jamacha Creek @ Jamacha Road near Willow Glen Drive]
Temporal Representation:	Data was collected over the time period 5/1/2006-6/16/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47919, Diazinon **Region 9**

Jamacha Creek

LOE ID:	73914
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Jamacha Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Data for this line of evidence for Jamacha Creek was collected at 1 monitoring site [Jamacha Creek @ Jamacha Road near Willow Glen Drive]

Temporal Representation:	Data was collected over the time period 5/1/2006-6/16/2009. 043214
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 47922 Region 9

Jamacha Creek

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the six samples exceed the California Toxics Rule Objective for Lead. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of six samples exceeded the California Toxics Rule Objective for Lead and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47922, Lead Region 9

Jamacha Creek

LOE ID:	73917
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Jamacha Creek to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Jamacha Creek was collected at 1 monitoring site [Jamacha Creek @ Jamacha Road near Willow Glen Drive]
Temporal Representation:	Data was collected once yearly from 7/12/2004 - 6/16/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47922, Lead **Region 9**

Jamacha Creek

LOE ID:	73918
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Jamacha Creek to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for Lead is 0.015 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Jamacha Creek was collected at 1 monitoring site [Jamacha Creek @ Jamacha Road near Willow Glen Drive]
Temporal Representation:	Data was collected once yearly from 7/12/2004 - 6/16/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.

QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 47923 Region 9
Jamacha Creek

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the four samples exceed the Water Quality Criteria for Malathion. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of four samples exceeded the Water Quality Criteria for Malathion and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47923, Malathion Region 9
Jamacha Creek

LOE ID:	73919
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Jamacha Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for

	Malathion. 043217
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Jamacha Creek was collected at 1 monitoring site [Jamacha Creek @ Jamacha Road near Willow Glen Drive]
Temporal Representation:	Data was collected over the time period 5/1/2006-6/16/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47923, Malathion **Region 9**

Jamacha Creek

LOE ID:	78043
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Jamacha Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Malathion.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for malathion is 100 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Jamacha Creek was collected at 1 monitoring site [Jamacha Creek @ Jamacha Road near Willow Glen Drive]
Temporal Representation:	Data was collected over the time period 5/1/2006-6/16/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.

QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, 04/2018 Matrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 47925 Region 9

Jamacha Creek

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the Six samples exceed the California Toxics Rule for Zinc. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Six samples exceeded the California Toxics Rule Objective for Zinc and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47925, Zinc Region 9

Jamacha Creek

LOE ID:	73907
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Jamacha Creek to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the

	County of San Diego, 2003-2009.	043219

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for zinc is 5.0 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Jamacha Creek was collected at 1 monitoring site [Jamacha Creek @ Jamacha Road near Willow Glen Drive]
Temporal Representation:	Data was collected once yearly from 7/12/2004 - 6/16/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47925, Zinc **Region 9**

Jamacha Creek

LOE ID:	73908
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Jamacha Creek to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Jamacha Creek was collected at 1 monitoring site [Jamacha Creek @ Jamacha Road near Willow Glen Drive]
Temporal Representation:	Data was collected once yearly from 7/12/2004 - 6/16/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID	47920	Region 9
Jamacha Creek		

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.3 of the Listing Policy. Under section 3.3 a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. Five of the five samples exceed the Single Sample Maximum Objective for Enterococcus, Three out of Five samples exceeded the Single Sample Maximum Objective for Fecal Coliform, and Five out of Five samples exceeded the Single Sample Maximum Guideline for Total Coliform.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Five of the five samples exceed the Single Sample Maximum Objective for Enterococcus, Three out of Five samples exceeded the Single Sample Maximum Objective for Fecal Coliform, and Five out of Five samples exceeded the Single Sample Maximum Guideline for Total Coliform, and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 47920, Indicator Bacteria	Region 9
Jamacha Creek	

LOE ID:	73915
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	5
Number of Exceedances:	5
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Jamacha Creek to determine beneficial use support and results are as follows: 5 of 5 samples exceed the criterion for

	Enterococci. 043221
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Samples shall not exceed 61 organisms per 100 ml for enterococcus in waters designated for REC I beneficial use (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Jamacha Creek was collected at 1 monitoring site [Jamacha Creek @ Jamacha Road near Willow Glen Drive]
Temporal Representation:	Data was collected over the time period 7/12/2004-7/31/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47920, Indicator Bacteria **Region 9**

Jamacha Creek

LOE ID:	73916
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	5
Number of Exceedances:	3
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Jamacha Creek to determine beneficial use support and results are as follows: 3 of 5 samples exceed the criterion for Coliform, Fecal.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the fecal coliform concentration shall not exceed 400 MPN/100 ml.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Jamacha Creek was collected at 1 monitoring site [Jamacha Creek @ Jamacha Road near Willow Glen Drive]
Temporal Representation:	Data was collected over the time period 7/12/2004-7/31/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

LOE ID:	73920
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	5
Number of Exceedances:	5
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Jamacha Creek to determine beneficial use support and results are as follows: 5 of 5 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxicsubstances in concentrations which are toxic to,or which produce detrimental physiologicalresponses in human, plant, animal, or indigenousaquatic life (Basin Plan).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In waters designated for water contact recreation (REC I), the total coliform concentration shall not exceed 10000 MPN/100 ml (CDPH 2006).
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.
Spatial Representation:	Data for this line of evidence for Jamacha Creek was collected at 1 monitoring site [Jamacha Creek @ Jamacha Road near Willow Glen Drive]
Temporal Representation:	Data was collected over the time period 7/12/2004-7/31/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Mexican Canyon Creek (western tributary to Sweetwater River, Upper)
Water Body ID: CAR9092100020110907113210
Water Body Type: River & Stream

DECISION ID 48005 **Region 9**
Mexican Canyon Creek (western tributary to Sweetwater River, Upper)

Pollutant: Ammonia
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the CRITERION for protection of the MUN beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 1 samples exceeded the CRITERIA for MUN which is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48005, Ammonia **Region 9**
Mexican Canyon Creek (western tributary to Sweetwater River, Upper)

LOE ID: 74311

Pollutant: Nitrogen, ammonia (Total Ammonia)
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 1

Number of Exceedances:	0	043224
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Mexican Canyon Creek (western tributary to Sweetwater River, Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Ammonia As N, Total.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Basin Plan: No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	EPA's Lifetime Health advisory level for total ammonia is 30.0 mg/L as stated on page 8 of the 2006 edition of the drinking water standards and health advisories. This Advisory Level is defined as "the concentration of a chemical in drinking water that is not expected to cause any adverse noncarcinogenic effects for up to ten days of exposure."	
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013	
Spatial Representation:	Data for this line of evidence for Mexican Canyon Creek (western tributary to Sweetwater River, Upper) was collected at 1 monitoring site [Mexican Canyon Creek @ Campo Road near Jamacha Road]	
Temporal Representation:	Data was collected on a single day 7/2/2003.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID 47992 Region 9

Mexican Canyon Creek (western tributary to Sweetwater River, Upper)

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the seven samples exceed the CRITERION for protection of the MUN beneficial use and zero of seven exceed the criterion for protection of the aquatic life beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 7 samples exceeded the CRITERIA for MUN and Zero of 7 samples exceeded the criteria for Aquatic Life. This sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.

4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47992, Cadmium **Region 9**

Mexican Canyon Creek (western tributary to Sweetwater River, Upper)

LOE ID:	74281
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Mexican Canyon Creek (western tributary to Sweetwater River, Upper) to determine beneficial use support and results are as follows: 0 of 7 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for cadmium is 0.005 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Mexican Canyon Creek (western tributary to Sweetwater River, Upper) was collected at 1 monitoring site [Mexican Canyon Creek @ Campo Road near Jamacha Road]
Temporal Representation:	Data was collected 7/2/2003 - 6/16/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47992, Cadmium **Region 9**

Mexican Canyon Creek (western tributary to Sweetwater River, Upper)

LOE ID:	74282
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Mexican Canyon Creek (western tributary to Sweetwater River, Upper) to determine beneficial use support and results are as follows: 0 of 7 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Mexican Canyon Creek (western tributary to Sweetwater River, Upper) was collected at 1 monitoring site [Mexican Canyon Creek @ Campo Road near Jamacha Road]
Temporal Representation:	Data was collected 7/2/2003 - 6/16/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 48007 Region 9

Mexican Canyon Creek (western tributary to Sweetwater River, Upper)

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the four samples exceed the CRITERION for protection of the MUN beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 4 samples exceeded the CRITERIA for MUN which is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available

indicating that standards are not met. 043227

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48007, Chlorpyrifos **Region 9**

Mexican Canyon Creek (western tributary to Sweetwater River, Upper)

LOE ID:	78060
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Mexican Canyon Creek (western tributary to Sweetwater River, Upper) to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for chlorpyrifos is 2.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Mexican Canyon Creek (western tributary to Sweetwater River, Upper) was collected at 1 monitoring site [Mexican Canyon Creek @ Campo Road near Jamacha Road]
Temporal Representation:	Data was collected over the time period 5/16/2006-6/16/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 47994 **Region 9**

Mexican Canyon Creek (western tributary to Sweetwater River, Upper)

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the seven samples exceed the CRITERION for protection of the MUN beneficial use and zero of seven exceed the criterion for protection of the aquatic life beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 7 samples exceeded the CRITERIA for MUN and Zero of 7 samples exceeded the criteria for Aquatic Life. This sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47994, Copper **Region 9**

Mexican Canyon Creek (western tributary to Sweetwater River, Upper)

LOE ID:	74283
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Mexican Canyon Creek (western tributary to Sweetwater River, Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Data for this line of evidence for Mexican Canyon Creek (western tributary to Sweetwater River, Upper) was collected at 1 monitoring site [Mexican Canyon Creek @ Campo Road near Jamacha Road]
Temporal Representation:	Data was collected 7/2/2003 - 6/16/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47994, Copper **Region 9**

Mexican Canyon Creek (western tributary to Sweetwater River, Upper)

LOE ID:	74284
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Mexican Canyon Creek (western tributary to Sweetwater River, Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for copper is 1.0 mg/L (Title 22 California Code of Regulations).
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Mexican Canyon Creek (western tributary to Sweetwater River, Upper) was collected at 1 monitoring site [Mexican Canyon Creek @ Campo Road near Jamacha Road]
Temporal Representation:	Data was collected 7/2/2003 - 6/16/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 47999 **Region 9**

Mexican Canyon Creek (western tributary to Sweetwater River, Upper)

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or	Pollutant

Pollution: 043230

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the four samples exceed the CRITERION for protection of the MUN beneficial use and zero of four exceed the criterion for protection of the aquatic life beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 4 samples exceeded the CRITERIA for MUN and Zero of 4 samples exceeded the criteria for Aquatic Life. This sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47999, Diazinon **Region 9**

Mexican Canyon Creek (western tributary to Sweetwater River, Upper)

LOE ID:	78061
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Mexican Canyon Creek (western tributary to Sweetwater River, Upper) to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for diazinon is 1.4 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Mexican Canyon Creek (western tributary to Sweetwater

	River, Upper) was collected at 1 monitoring site [Mexican Canyon Creek @ Campo Road near Jamacha Road]
Temporal Representation:	Data was collected over the time period 5/16/2006-6/16/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47999, Diazinon **Region 9**

Mexican Canyon Creek (western tributary to Sweetwater River, Upper)

LOE ID:	74285
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Mexican Canyon Creek (western tributary to Sweetwater River, Upper) to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Data for this line of evidence for Mexican Canyon Creek (western tributary to Sweetwater River, Upper) was collected at 1 monitoring site [Mexican Canyon Creek @ Campo Road near Jamacha Road]
Temporal Representation:	Data was collected over the time period 5/16/2006-6/16/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 47995 **Region 9**

Mexican Canyon Creek (western tributary to Sweetwater River, Upper)

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision

Revision Status	Revised	043232
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the seven samples exceed the CRITERION for protection of the MUN beneficial use and zero of seven exceed the criterion for protection of the aquatic life beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 7 samples exceeded the CRITERIA for MUN and Zero of 7 samples exceeded the criteria for Aquatic Life. This sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47995, Lead **Region 9**

Mexican Canyon Creek (western tributary to Sweetwater River, Upper)

LOE ID:	74288
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Mexican Canyon Creek (western tributary to Sweetwater River, Upper) to determine beneficial use support and results are as follows: 0 of 7 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for Lead is 0.015 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Data for this line of evidence for Mexican Canyon Creek (western tributary to Sweetwater River, Upper) was collected at 1 monitoring site [Mexican Canyon Creek @ Campo Road near Jamacha Road]
Temporal Representation:	Data was collected 7/2/2003 - 6/16/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47995, Lead **Region 9**

Mexican Canyon Creek (western tributary to Sweetwater River, Upper)

LOE ID:	74289
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Mexican Canyon Creek (western tributary to Sweetwater River, Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Mexican Canyon Creek (western tributary to Sweetwater River, Upper) was collected at 1 monitoring site [Mexican Canyon Creek @ Campo Road near Jamacha Road]
Temporal Representation:	Data was collected 7/2/2003 - 6/16/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 48009 **Region 9**

Mexican Canyon Creek (western tributary to Sweetwater River, Upper)

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final	New Decision

Listing Decision:		043234
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of the four samples exceed the CRITERION for protection of the MUN beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 4 samples exceeded the CRITERIA for MUN which is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48009, Malathion **Region 9**

Mexican Canyon Creek (western tributary to Sweetwater River, Upper)

LOE ID:	78062
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Mexican Canyon Creek (western tributary to Sweetwater River, Upper) to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Malathion.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for malathion is 100 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013

Spatial Representation:	Data for this line of evidence for Mexican Canyon Creek (western tributary to Sweetwater River, Upper) was collected at 1 monitoring site [Mexican Canyon Creek @ Campo Road near Jamacha Road]
Temporal Representation:	Data was collected over the time period 5/16/2006-6/16/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 48006 Region 9

Mexican Canyon Creek (western tributary to Sweetwater River, Upper)

Pollutant:	**Nitrogen, Nitrite**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the CRITERION for protection of the MUN beneficial use. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 1 samples exceeded the CRITERIA for MUN which is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48006, Nitrogen, Nitrite Region 9

Mexican Canyon Creek (western tributary to Sweetwater River, Upper)

LOE ID:	74290
Pollutant:	Nitrogen, Nitrite
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Mexican Canyon Creek (western tributary to Sweetwater River, Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nitrite as N.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrite (as N) is 1.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Mexican Canyon Creek (western tributary to Sweetwater River, Upper) was collected at 1 monitoring site [Mexican Canyon Creek @ Campo Road near Jamacha Road]
Temporal Representation:	Data was collected on a single day 7/2/2003.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 47998 Region 9

Mexican Canyon Creek (western tributary to Sweetwater River, Upper)

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the seven samples exceed the CRITERION for protection of the MUN beneficial use and zero of seven exceed the criterion for protection of the aquatic life beneficial use. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 7 samples exceeded the CRITERIA for MUN and Zero of 7 samples exceeded the criteria for Aquatic Life. This sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and

information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47998, Zinc **Region 9**

Mexican Canyon Creek (western tributary to Sweetwater River, Upper)

LOE ID:	74292
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Mexican Canyon Creek (western tributary to Sweetwater River, Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for zinc is 5.0 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Mexican Canyon Creek (western tributary to Sweetwater River, Upper) was collected at 1 monitoring site [Mexican Canyon Creek @ Campo Road near Jamacha Road]
Temporal Representation:	Data was collected 7/2/2003 - 6/16/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47998, Zinc **Region 9**

Mexican Canyon Creek (western tributary to Sweetwater River, Upper)

LOE ID:	74293
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Mexican Canyon Creek (western tributary to Sweetwater River, Upper) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Mexican Canyon Creek (western tributary to Sweetwater River, Upper) was collected at 1 monitoring site [Mexican Canyon Creek @ Campo Road near Jamacha Road]
Temporal Representation:	Data was collected 7/2/2003 - 6/16/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 48002 Region 9

Mexican Canyon Creek (western tributary to Sweetwater River, Upper)

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2027
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.3 of the Listing Policy. Under section 3.3 a single line of evidence is necessary to assess listing status. Three lines of evidence are available in the administrative record to assess this pollutant. Five of the six samples exceed the objective for enterococcus. One of six samples exceed the objective for fecal coliform and two of six samples exceed the objective for total coliform. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Five of six samples exceed the objective and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 48002, Indicator Bacteria **Region 9**

Mexican Canyon Creek (western tributary to Sweetwater River, Upper)

LOE ID:	74287
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	6
Number of Exceedances:	1
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Mexican Canyon Creek (western tributary to Sweetwater River, Upper) to determine beneficial use support and results are as follows: 1 of 6 samples exceed the criterion for Coliform, Fecal.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the fecal coliform concentration shall not exceed 400 MPN/100 ml.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Mexican Canyon Creek (western tributary to Sweetwater River, Upper) was collected at 1 monitoring site [Mexican Canyon Creek @ Campo Road near Jamacha Road]
Temporal Representation:	Data was collected over the time period 7/2/2003-8/7/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48002, Indicator Bacteria **Region 9**

Mexican Canyon Creek (western tributary to Sweetwater River, Upper)

LOE ID:	74291
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	6
Number of Exceedances:	2

Data and Information Type:	PATHOGEN MONITORING	043240
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Mexican Canyon Creek (western tributary to Sweetwater River, Upper) to determine beneficial use support and results are as follows: 2 of 6 samples exceed the criterion for Coliform, Total.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxicsubstances in concentrations which are toxic to,or which produce detrimental physiologicalresponses in human, plant, animal, or indigenousaquatic life (Basin Plan).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In waters designated for water contact recreation (REC I), the total coliform concentration shall not exceed 10000 MPN/100 ml (CDPH 2006).	
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.	
Spatial Representation:	Data for this line of evidence for Mexican Canyon Creek (western tributary to Sweetwater River, Upper) was collected at 1 monitoring site [Mexican Canyon Creek @ Campo Road near Jamacha Road]	
Temporal Representation:	Data was collected over the time period 7/2/2003-8/7/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 48002, Indicator Bacteria **Region 9**

Mexican Canyon Creek (western tributary to Sweetwater River, Upper)

LOE ID:	74286
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	6
Number of Exceedances:	5
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Mexican Canyon Creek (western tributary to Sweetwater River, Upper) to determine beneficial use support and results are as follows: 5 of 6 samples exceed the criterion for Enterococci.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Samples shall not exceed 61 organisms per 100 ml for enterococcus in waters designated for REC I beneficial use (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Mexican Canyon Creek (western tributary to Sweetwater River, Upper) was collected at 1 monitoring site [Mexican Canyon Creek @ Campo Road

	near Jamacha Road]	043241
Temporal Representation:	Data was collected over the time period 7/2/2003-8/7/2008.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Harbison Canyon
Water Body ID: CAR9092300020110816134701
Water Body Type: River & Stream

DECISION ID 47750 **Region 9**
Harbison Canyon

Pollutant: **Benthic Community Effects**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: Benthic Community Effects is being considered for placement on the CWA section 303(d) List under sections 3.9 and 3.1 of the Listing Policy. Under section 3.9, an additional line of evidence associating Benthic Community Effects with a water or sediment concentration of pollutant(s) is necessary to assess listing status.

Based on the readily available data and information, the weight of evidence provides sufficient justification for not placing Benthic Community Effects in this water segment on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Pursuant to section 3.9 of the Listing Policy, the water does not exhibit significant degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index.
4. Pursuant to section 3.9 of the Listing Policy, the water segment does not have associated pollutant(s) samples that exceed water quality objectives.
5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not being met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47750, Benthic Community Effects **Region 9**
Harbison Canyon

LOE ID: 73814

Pollutant: Benthic-Macroinvertebrate Bioassessments
LOE Subgroup: Population/Community Degradation
Matrix: Water
Fraction: None

Beneficial Use: Warm Freshwater Habitat

Number of Samples:	1	043243
Number of Exceedances:	1	
Data and Information Type:	Benthic macroinvertebrate surveys	
Data Used to Assess Water Quality:	The IBI score for this water body was 27 which indicates that this water body may be considered to have impaired conditions.	
Data Reference:	RWB9 Status Sampling 2007 and 2008	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.	
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13	
Spatial Representation:	Samples were collected at the following station: 909SHAR02 (Harbison Canyon Creek 2).	
Temporal Representation:	Survey done May 8, 2008.	
Environmental Conditions:		
QAPP Information:	Data collected following SWAMP QA protocols for the RWB9 Status Sampling 2007 and 2008 water quality monitoring project.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 47750, Benthic Community Effects **Region 9**

Harbison Canyon

LOE ID:	79683
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	One sample was taken one location on Harbison Canyon Creek. The CSCI score for this site is above the 0.79 threshold, and is therefore not exceeding the water quality objective for the aquatic life beneficial use.
Data Reference:	RWB9 Status Sampling 2007 and 2008 Region 9 CSCI Scores & Water Body Information
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in

	a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.
Guideline Reference:	The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.
Spatial Representation:	Samples were collected at the following station: 909SHAR02 (Harbison Canyon Creek 2).
Temporal Representation:	Survey done May 8, 2008.
Environmental Conditions:	
QAPP Information:	Data collected following SWAMP QA protocols for the RWB9 Status Sampling 2007 and 2008 water quality monitoring project.
QAPP Information Reference(s):	RWB9 Status Sampling 2007 and 2008

DECISION ID 47751 Region 9

Harbison Canyon

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the Seven samples exceed the California Toxics Rule Objective for Cadmium. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Seven samples exceeded the California Toxics Rule Objective for Cadmium and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47751, Cadmium Region 9

Harbison Canyon

LOE ID:	73816

Pollutant:	Cadmium	043245
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	7	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Harbison Canyon to determine beneficial use support and results are as follows: 0 of 7 samples exceed the criterion for Cadmium.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for cadmium is 0.005 mg/L (Title 22 of the California Code of Regulations).	
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals, CCR	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Harbison Canyon was collected at 1 monitoring site [Harbison Canyon Creek @ Collier Way near Harbison Canyon Road]	
Temporal Representation:	Data was collected 6/2/2003 - 6/17/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 47751, Cadmium **Region 9**

Harbison Canyon

LOE ID:	73815
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Harbison Canyon to determine beneficial use support and results are as follows: 0 of 7 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the

	hardness dependent formula for the metals criterion. 043246
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Harbison Canyon was collected at 1 monitoring site [Harbison Canyon Creek @ Collier Way near Harbison Canyon Road]
Temporal Representation:	Data was collected 6/2/2003 - 6/17/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 47752 Region 9

Harbison Canyon

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the four samples exceed the Evaluation Guideline for Chlorpyrifos. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of four samples exceeded the Evaluation Guideline for Chlorpyrifos and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47752, Chlorpyrifos Region 9

Harbison Canyon

LOE ID:	78037
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water

Matrix:	Water	043247
Fraction:	None	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	4	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Harbison Canyon to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Chlorpyrifos.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The USEPA drinking water health advisory for chlorpyrifos is 2.1 Âµg/L.	
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013	
Spatial Representation:	Data for this line of evidence for Harbison Canyon was collected at 1 monitoring site [Harbison Canyon Creek @ Collier Way near Harbison Canyon Road]	
Temporal Representation:	Data was collected over the time period 5/3/2006-6/17/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 47752, Chlorpyrifos **Region 9**

Harbison Canyon

LOE ID:	73817
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Harbison Canyon to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).
Spatial Representation:	Data for this line of evidence for Harbison Canyon was collected at 1 monitoring site [Harbison Canyon Creek @ Collier Way near Harbison Canyon Road]
Temporal Representation:	Data was collected over the time period 5/3/2006-6/17/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 47753 Region 9

Harbison Canyon

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the Seven samples exceed the California Toxics Rule Objective for Copper. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Seven samples exceeded the California Toxics Rule Objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47753, Copper Region 9

Harbison Canyon

LOE ID:	73819
Pollutant:	Copper

LOE Subgroup:	Pollutant-Water	043249
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	7	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Harbison Canyon to determine beneficial use support and results are as follows: 0 of 7 samples exceed the criterion for Copper.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Secondary MCL for copper is 1.0 mg/L (Title 22 California Code of Regulations).	
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Harbison Canyon was collected at 1 monitoring site [Harbison Canyon Creek @ Collier Way near Harbison Canyon Road]	
Temporal Representation:	Data was collected 6/2/2003 - 6/17/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 47753, Copper **Region 9**

Harbison Canyon

LOE ID:	73818
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Harbison Canyon to determine beneficial use support and results are as follows: 0 of 7 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.

Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Harbison Canyon was collected at 1 monitoring site [Harbison Canyon Creek @ Collier Way near Harbison Canyon Road]
Temporal Representation:	Data was collected 6/2/2003 - 6/17/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 47754 Region 9

Harbison Canyon

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the four samples exceed the Water Quality Criteria for Diazinon. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of four samples exceeded the Water Quality Criteria for Diazinon and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47754, Diazinon Region 9

Harbison Canyon

LOE ID:	73820
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	043251
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	4	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Harbison Canyon to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Diazinon.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).	
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game	
Spatial Representation:	Data for this line of evidence for Harbison Canyon was collected at 1 monitoring site [Harbison Canyon Creek @ Collier Way near Harbison Canyon Road]	
Temporal Representation:	Data was collected over the time period 5/3/2006-6/17/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 47754, Diazinon **Region 9**

Harbison Canyon

LOE ID:	78039
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Harbison Canyon to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).

Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	043252
Evaluation Guideline:	The USEPA drinking water health advisory for diazinon is 1.4 Âµg/L.	
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013	
Spatial Representation:	Data for this line of evidence for Harbison Canyon was collected at 1 monitoring site [Harbison Canyon Creek @ Collier Way near Harbison Canyon Road]	
Temporal Representation:	Data was collected over the time period 5/3/2006-6/17/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID 47757 Region 9

Harbison Canyon

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the Seven samples exceed the California Toxics Rule Objective for Lead.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of seven samples exceeded the California Toxics Rule Objective for Lead and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47757, Lead Region 9

Harbison Canyon

LOE ID:	73829
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Harbison Canyon to determine beneficial use support and results are as follows: 0 of 7 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for Lead is 0.015 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Harbison Canyon was collected at 1 monitoring site [Harbison Canyon Creek @ Collier Way near Harbison Canyon Road]
Temporal Representation:	Data was collected 6/2/2003 - 6/17/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47757, Lead **Region 9**

Harbison Canyon

LOE ID:	73828
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Harbison Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition

Evaluation Guideline:	043254
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Harbison Canyon was collected at 1 monitoring site [Harbison Canyon Creek @ Collier Way near Harbison Canyon Road]
Temporal Representation:	Data was collected once yearly from July 2003 to June 2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 47758 Region 9

Harbison Canyon

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the four samples exceed the Water Quality Criteria for Malathion. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of four samples exceeded the Water Quality Criteria for Malathion and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47758, Malathion Region 9

Harbison Canyon

LOE ID:	73792
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Harbison Canyon to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Malathion.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Harbison Canyon was collected at 1 monitoring site [Harbison Canyon Creek @ Collier Way near Harbison Canyon Road]
Temporal Representation:	Data was collected over the time period 5/3/2006-6/17/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47758, Malathion **Region 9**

Harbison Canyon

LOE ID:	78040
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Harbison Canyon to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Malathion.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for malathion is 100 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013

Spatial Representation:	Data for this line of evidence for Harbison Canyon was collected at 1 monitoring site [Harbison Canyon Creek @ Collier Way near Harbison Canyon Road]
Temporal Representation:	Data was collected over the time period 5/3/2006-6/17/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 48145 Region 9
Harbison Canyon

Pollutant:	**Nitrogen, Nitrite**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the Two samples exceed the Basin Plan Objective for Nitrogen, Nitrite. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of Two samples exceeded the Basin Plan Objective for Nitrogen, Nitrite and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48145, Nitrogen, Nitrite Region 9
Harbison Canyon

LOE ID:	73793
Pollutant:	Nitrogen, Nitrite
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2

Number of Exceedances:	0	043257
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Harbison Canyon to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Nitrite as N.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrite (as N) is 1.0 mg/L (Title 22 of the California Code of Regulations).	
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Harbison Canyon was collected at 1 monitoring site [Harbison Canyon Creek @ Collier Way near Harbison Canyon Road]	
Temporal Representation:	Data was collected over the time period 7/2/2003-7/3/2003.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID	**48146**	**Region 9**
Harbison Canyon		

Pollutant:	**Nitrogen, ammonia (Total Ammonia)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the One samples exceed the Basin Plan Objective for Nitrogen, ammonia (Total Ammonia). Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of One samples exceeded the Basin Plan Objective for Nitrogen, ammonia (Total Ammonia) and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the

applicable beneficial use support rating. 043258

Line of Evidence (LOE) for Decision ID 48146, Nitrogen, ammonia (Total Ammonia) **Region 9**

Harbison Canyon

LOE ID:	73813
Pollutant:	Nitrogen, ammonia (Total Ammonia)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Harbison Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Ammonia As N, Total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Basin Plan: No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	EPA's Lifetime Health advisory level for total ammonia is 30.0 mg/L as stated on page 8 of the 2006 edition of the drinking water standards and health advisories. This Advisory Level is defined as "the concentration of a chemical in drinking water that is not expected to cause any adverse noncarcinogenic effects for up to ten days of exposure."
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Harbison Canyon was collected at 1 monitoring site [Harbison Canyon Creek @ Collier Way near Harbison Canyon Road]
Temporal Representation:	Data was collected on a single day 7/2/2003.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **47760** **Region 9**

Harbison Canyon

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the Seven samples exceed the California Toxics Rule Objective for Zinc.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Seven samples exceeded the California Toxics Rule Objective for Zinc and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47760, Zinc **Region 9**

Harbison Canyon

LOE ID:	73796
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Harbison Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Harbison Canyon was collected at 1 monitoring site [Harbison Canyon Creek @ Collier Way near Harbison Canyon Road]
Temporal Representation:	Data was collected once yearly from July 2003 to June 2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix

	Analytical and Dry Weather Monitoring Program Rev. 8 was followed. 043260
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47760, Zinc **Region 9**

Harbison Canyon

LOE ID:	73795
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Harbison Canyon to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for zinc is 5.0 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Harbison Canyon was collected at 1 monitoring site [Harbison Canyon Creek @ Collier Way near Harbison Canyon Road]
Temporal Representation:	Data was collected once yearly from July 2003 to June 2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **47755** **Region 9**

Harbison Canyon

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.3 of the Listing Policy. Under section 3.3 a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. Five of the Six samples exceed the Single Sample Maximum Objective for Enterocccus, Three out of Six samples exceeded the Single Sample Maximum Objective for Fecal Coliform, and One out of Six samples exceeded the Single Sample Maximum Guideline for Total Coliform.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Five of the Six samples exceed the Single Sample Maximum Objective for Enterocccus, Three out of Six samples exceeded the Single Sample Maximum Objective for Fecal Coliform, and One out of Six samples exceeded the Single Sample Maximum Guideline for Total Coliform and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 47755, Indicator Bacteria **Region 9**

Harbison Canyon

LOE ID:	73794
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	6
Number of Exceedances:	1
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Harbison Canyon to determine beneficial use support and results are as follows: 1 of 6 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxicsubstances in concentrations which are toxic to,or which produce detrimental physiologicalresponses in human, plant, animal, or indigenousaquatic life (Basin Plan).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In waters designated for water contact recreation (REC I), the total coliform concentration shall not exceed 10000 MPN/100 ml (CDPH 2006).
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.
Spatial Representation:	Data for this line of evidence for Harbison Canyon was collected at 1 monitoring site [Harbison Canyon Creek @ Collier Way near Harbison Canyon Road]
Temporal Representation:	Data was collected over the time period 7/2/2003-8/5/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.

QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47755, Indicator Bacteria **Region 9**

Harbison Canyon

LOE ID:	73826
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	6
Number of Exceedances:	5
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Harbison Canyon to determine beneficial use support and results are as follows: 5 of 6 samples exceed the criterion for Enterococci.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Samples shall not exceed 61 organisms per 100 ml for enterococcus in waters designated for REC I beneficial use (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Harbison Canyon was collected at 1 monitoring site [Harbison Canyon Creek @ Collier Way near Harbison Canyon Road]
Temporal Representation:	Data was collected over the time period 7/2/2003-8/5/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 47755, Indicator Bacteria **Region 9**

Harbison Canyon

LOE ID:	73827
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	6
Number of Exceedances:	3
Data and Information Type:	PATHOGEN MONITORING

Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Harbison Canyon to determine beneficial use support and results are as follows: 3 of 6 samples exceed the criterion for Coliform, Fecal.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the fecal coliform concentration shall not exceed 400 MPN/100 ml.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Harbison Canyon was collected at 1 monitoring site [Harbison Canyon Creek @ Collier Way near Harbison Canyon Road]
Temporal Representation:	Data was collected over the time period 7/2/2003-8/5/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Sweetwater River, North Fork, unnamed tributary at Tavern Road
Water Body ID: CAR9092600020111215111039
Water Body Type: River & Stream

DECISION ID 52135 **Region 9**
Sweetwater River, North Fork, unnamed tributary at Tavern Road

Pollutant: Aluminum
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeded the guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52135, Aluminum **Region 9**
Sweetwater River, North Fork, unnamed tributary at Tavern Road

LOE ID: 76878

Pollutant: Aluminum
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 1

Number of Exceedances:	0	043265

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, North Fork, unnamed tributary at Tavern Road to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Aluminum.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for aluminum is 0.2 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Sweetwater River, North Fork, unnamed tributary at Tavern Road was collected at 1 monitoring site [North Fork of Sweetwater River @ Tavern Road]
Temporal Representation:	Data was collected on a single day 3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID	**52023**	**Region 9**

Sweetwater River, North Fork, unnamed tributary at Tavern Road

Pollutant:	**Ammonia**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeded the guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52023, Ammonia **Region 9**

Sweetwater River, North Fork, unnamed tributary at Tavern Road

LOE ID:	76879
Pollutant:	Nitrogen, ammonia (Total Ammonia)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, North Fork, unnamed tributary at Tavern Road to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Ammonia As N, Total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Basin Plan: No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	EPA's Lifetime Health advisory level for total ammonia is 30.0 mg/L as stated on page 8 of the 2006 edition of the drinking water standards and health advisories. This Advisory Level is defined as "the concentration of a chemical in drinking water that is not expected to cause any adverse noncarcinogenic effects for up to ten days of exposure."
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Sweetwater River, North Fork, unnamed tributary at Tavern Road was collected at 1 monitoring site [North Fork of Sweetwater River @ Tavern Road]
Temporal Representation:	Data was collected on a single day 5/14/2003.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 52142 **Region 9**

Sweetwater River, North Fork, unnamed tributary at Tavern Road

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the three samples exceed the beneficial use guideline for Municipal and Domestic use. Zero of the three samples exceed the beneficial use guideline for Warm Freshwater Habitat use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the three samples exceed the beneficial use guideline for Municipal and Domestic use. Zero of the three samples exceed the beneficial use guideline for Warm Freshwater Habitat use. The sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52142, Arsenic **Region 9**

Sweetwater River, North Fork, unnamed tributary at Tavern Road

LOE ID:	76880
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, North Fork, unnamed tributary at Tavern Road to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Arsenic.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The dissolved arsenic criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved arsenic is 0.150 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sweetwater River, North Fork, unnamed tributary at Tavern Road was collected at 1 monitoring site [North Fork of Sweetwater River @ Tavern Road]
Temporal Representation:	Data was collected over the time period 7/31/2008-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern

	Watersheds Report was followed. 043268
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 52142, Arsenic **Region 9**

Sweetwater River, North Fork, unnamed tributary at Tavern Road

LOE ID:	76881
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, North Fork, unnamed tributary at Tavern Road to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Arsenic.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for arsenic is 0.01 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sweetwater River, North Fork, unnamed tributary at Tavern Road was collected at 1 monitoring site [North Fork of Sweetwater River @ Tavern Road]
Temporal Representation:	Data was collected over the time period 7/31/2008-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID 51118 **Region 9**

Sweetwater River, North Fork, unnamed tributary at Tavern Road

Pollutant:	**Azinphos-methyl (Guthion)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the zero samples exceed the beneficial use guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of zero samples exceeded the guideline. The samples were not used in the assessment due to reporting limits that were higher than the guideline. The sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51118, Azinphos-methyl (Guthion) **Region 9**

Sweetwater River, North Fork, unnamed tributary at Tavern Road

LOE ID:	78149
Pollutant:	Azinphos-methyl (Guthion)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, North Fork, unnamed tributary at Tavern Road to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Azinphos methyl.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The National Recommended Water Quality Criteria for Azinphos Methyl (Guthion) for the protection of freshwater aquatic life is a maximum of 0.01 ug/l.
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for Sweetwater River, North Fork, unnamed tributary at Tavern Road was collected at 1 monitoring site [North Fork of Sweetwater River @ Tavern Road]
Temporal Representation:	Data was collected on a single day 3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID 52136 Region 9

Sweetwater River, North Fork, unnamed tributary at Tavern Road

Pollutant:	**Barium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeded the guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52136, Barium Region 9

Sweetwater River, North Fork, unnamed tributary at Tavern Road

LOE ID:	76902
Pollutant:	Barium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, North Fork, unnamed tributary at Tavern Road to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Barium.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for barium is 1 mg/L (Title 22 of the California

	Code of Regulations). 043271
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sweetwater River, North Fork, unnamed tributary at Tavern Road was collected at 1 monitoring site [North Fork of Sweetwater River @ Tavern Road]
Temporal Representation:	Data was collected on a single day 3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID 52137 Region 9

Sweetwater River, North Fork, unnamed tributary at Tavern Road

Pollutant:	**Beryllium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeded the guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52137, Beryllium Region 9

Sweetwater River, North Fork, unnamed tributary at Tavern Road

LOE ID:	76903
Pollutant:	Beryllium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total

Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, North Fork, unnamed tributary at Tavern Road to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Beryllium.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for beryllium is 0.004 mg/L 9 (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sweetwater River, North Fork, unnamed tributary at Tavern Road was collected at 1 monitoring site [North Fork of Sweetwater River @ Tavern Road]
Temporal Representation:	Data was collected on a single day 3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID 52148 Region 9

Sweetwater River, North Fork, unnamed tributary at Tavern Road

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the seven samples and zero of three samples exceed the beneficial use guideline for Municipal and Domestic use. The samples for Municipal could not be added since the fractions are different. Zero of the ten samples exceed the beneficial use guideline for Warm Freshwater Habitat use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the seven samples and zero of three samples exceed the beneficial use guideline for Municipal and Domestic use. Zero of the ten samples exceed the beneficial use guideline for Warm Freshwater Habitat use. The sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.

4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52148, Cadmium **Region 9**

Sweetwater River, North Fork, unnamed tributary at Tavern Road

LOE ID:	76905
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, North Fork, unnamed tributary at Tavern Road to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Cadmium.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for cadmium is 0.005 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sweetwater River, North Fork, unnamed tributary at Tavern Road was collected at 1 monitoring site [North Fork of Sweetwater River @ Tavern Road]
Temporal Representation:	Data was collected over the time period 7/31/2008-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 52148, Cadmium **Region 9**

Sweetwater River, North Fork, unnamed tributary at Tavern Road

LOE ID:	76904
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3

Number of Exceedances:	0	043274

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, North Fork, unnamed tributary at Tavern Road to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Cadmium.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The dissolved cadmium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved cadmium is 0.0022 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sweetwater River, North Fork, unnamed tributary at Tavern Road was collected at 1 monitoring site [North Fork of Sweetwater River @ Tavern Road]
Temporal Representation:	Data was collected over the time period 7/31/2008-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 52148, Cadmium **Region 9**

Sweetwater River, North Fork, unnamed tributary at Tavern Road

LOE ID:	76906
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Sweetwater River, North Fork, unnamed tributary at Tavern Road to determine beneficial use support and results are as follows: 0 of 7 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Data for this line of evidence for Sweetwater River, North Fork, unnamed tributary at Tavern Road was collected at 1 monitoring site [North Fork of Sweetwater River @ Tavern Road]
Temporal Representation:	Data was collected 5/14/2003 - 6/17/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 52148, Cadmium **Region 9**

Sweetwater River, North Fork, unnamed tributary at Tavern Road

LOE ID:	76920
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Sweetwater River, North Fork, unnamed tributary at Tavern Road to determine beneficial use support and results are as follows: 0 of 7 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for cadmium is 0.005 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sweetwater River, North Fork, unnamed tributary at Tavern Road was collected at 1 monitoring site [North Fork of Sweetwater River @ Tavern Road]
Temporal Representation:	Data was collected 5/14/2003 - 6/17/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 51120 **Region 9**

Sweetwater River, North Fork, unnamed tributary at Tavern Road

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Four lines of evidence are available in the administrative record to assess this pollutant. Zero of the seven samples exceed the municipal and domestic supply guideline. Zero of the three samples exceed the warm freshwater habitat guideline. The samples for LOE 76921 were not used in the assessment due to reporting limits that were higher than the guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the seven samples exceed the municipal and domestic supply guideline. Zero of the three samples exceed the warm freshwater habitat guideline. The samples for LOE 76921 were not used in the assessment due to reporting limits that were higher than the guideline. The sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51120, Chlorpyrifos **Region 9**

Sweetwater River, North Fork, unnamed tributary at Tavern Road

LOE ID:	76921
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, North Fork, unnamed tributary at Tavern Road to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho

	Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response, California Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).
Spatial Representation:	Data for this line of evidence for Sweetwater River, North Fork, unnamed tributary at Tavern Road was collected at 1 monitoring site [North Fork of Sweetwater River @ Tavern Road]
Temporal Representation:	Data was collected over the time period 5/16/2006-6/17/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 51120, Chlorpyrifos **Region 9**

Sweetwater River, North Fork, unnamed tributary at Tavern Road

LOE ID:	78152
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, North Fork, unnamed tributary at Tavern Road to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for chlorpyrifos is 2.1 Âµg/L.
Guideline Reference:	2011 Edition of the Drinking Water Standards and Health Advisories
Spatial Representation:	Data for this line of evidence for Sweetwater River, North Fork, unnamed tributary at Tavern Road was collected at 1 monitoring site [North Fork of Sweetwater River @ Tavern Road]
Temporal Representation:	Data was collected over the time period 7/31/2008-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 51120, Chlorpyrifos **Region 9**

Sweetwater River, North Fork, unnamed tributary at Tavern Road

LOE ID:	78153
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	043278
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	4	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, North Fork, unnamed tributary at Tavern Road to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Chlorpyrifos.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The USEPA drinking water health advisory for chlorpyrifos is 2.1 Âµg/L.	
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013	
Spatial Representation:	Data for this line of evidence for Sweetwater River, North Fork, unnamed tributary at Tavern Road was collected at 1 monitoring site [North Fork of Sweetwater River @ Tavern Road]	
Temporal Representation:	Data was collected over the time period 5/16/2006-6/17/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 51120, Chlorpyrifos **Region 9**

Sweetwater River, North Fork, unnamed tributary at Tavern Road

LOE ID:	78151
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, North Fork, unnamed tributary at Tavern Road to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L

	(Siepmann and Finlayson 2000). 043279
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).
Spatial Representation:	Data for this line of evidence for Sweetwater River, North Fork, unnamed tributary at Tavern Road was collected at 1 monitoring site [North Fork of Sweetwater River @ Tavern Road]
Temporal Representation:	Data was collected over the time period 7/31/2008-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID 52143 Region 9

Sweetwater River, North Fork, unnamed tributary at Tavern Road

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the six samples and zero of three samples exceed the beneficial use guideline for Municipal and Domestic use. The samples for Municipal could not be added since the fractions are different. Zero of the six samples exceed the beneficial use guideline for Warm Freshwater Habitat use. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of the six samples and zero of three samples exceed the beneficial use guideline for Municipal and Domestic use. Zero of the six samples exceed the beneficial use guideline for Warm Freshwater Habitat use. The sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52143, Copper Region 9

Sweetwater River, North Fork, unnamed tributary at Tavern Road

LOE ID:	76934

Pollutant:	Copper	043280
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	Dissolved	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	6	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Sweetwater River, North Fork, unnamed tributary at Tavern Road to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Sweetwater River, North Fork, unnamed tributary at Tavern Road was collected at 1 monitoring site [North Fork of Sweetwater River @ Tavern Road]	
Temporal Representation:	Data was collected 5/14/2003 - 6/17/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 52143, Copper **Region 9**

Sweetwater River, North Fork, unnamed tributary at Tavern Road

LOE ID:	76936
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, North Fork, unnamed tributary at Tavern Road to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Copper.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for copper is 1.0 mg/L (Title 22 California Code of

	Regulations). 043281
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sweetwater River, North Fork, unnamed tributary at Tavern Road was collected at 1 monitoring site [North Fork of Sweetwater River @ Tavern Road]
Temporal Representation:	Data was collected over the time period 7/31/2008-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 52143, Copper **Region 9**

Sweetwater River, North Fork, unnamed tributary at Tavern Road

LOE ID:	76935
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Sweetwater River, North Fork, unnamed tributary at Tavern Road to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for copper is 1.0 mg/L (Title 22 California Code of Regulations).
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sweetwater River, North Fork, unnamed tributary at Tavern Road was collected at 1 monitoring site [North Fork of Sweetwater River @ Tavern Road]
Temporal Representation:	Data was collected 5/14/2003 - 6/17/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 51132 **Region 9**

Sweetwater River, North Fork, unnamed tributary at Tavern Road

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**

Last Listing Cycle's Final Listing Decision:	New Decision	043282
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Four lines of evidence are available in the administrative record to assess this pollutant. Zero of the seven samples exceed the municipal and domestic supply guideline. Zero of the seven samples exceed the warm freshwater habitat guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of seven samples exceeded the guidelines and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51132, Diazinon **Region 9**

Sweetwater River, North Fork, unnamed tributary at Tavern Road

LOE ID:	78159
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, North Fork, unnamed tributary at Tavern Road to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for diazinon is 1.4 Âµg/L.

Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-09-013
Spatial Representation:	Data for this line of evidence for Sweetwater River, North Fork, unnamed tributary at Tavern Road was collected at 1 monitoring site [North Fork of Sweetwater River @ Tavern Road]
Temporal Representation:	Data was collected over the time period 5/16/2006-6/17/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 51132, Diazinon **Region 9**

Sweetwater River, North Fork, unnamed tributary at Tavern Road

LOE ID:	78158
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, North Fork, unnamed tributary at Tavern Road to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Diazinon.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for diazinon is 1.4 Âµg/L.
Guideline Reference:	2011 Edition of the Drinking Water Standards and Health Advisories
Spatial Representation:	Data for this line of evidence for Sweetwater River, North Fork, unnamed tributary at Tavern Road was collected at 1 monitoring site [North Fork of Sweetwater River @ Tavern Road]
Temporal Representation:	Data was collected over the time period 7/31/2008-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 51132, Diazinon **Region 9**

Sweetwater River, North Fork, unnamed tributary at Tavern Road

LOE ID:	78157
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Warm Freshwater Habitat	043284
Number of Samples:	3	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, North Fork, unnamed tributary at Tavern Road to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Diazinon.	
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).	
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game	
Spatial Representation:	Data for this line of evidence for Sweetwater River, North Fork, unnamed tributary at Tavern Road was collected at 1 monitoring site [North Fork of Sweetwater River @ Tavern Road]	
Temporal Representation:	Data was collected over the time period 7/31/2008-3/31/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.	

Line of Evidence (LOE) for Decision ID 51132, Diazinon **Region 9**

Sweetwater River, North Fork, unnamed tributary at Tavern Road

LOE ID:	76937
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, North Fork, unnamed tributary at Tavern Road to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous

	concentration (Finlayson, 2004). 043285
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Data for this line of evidence for Sweetwater River, North Fork, unnamed tributary at Tavern Road was collected at 1 monitoring site [North Fork of Sweetwater River @ Tavern Road]
Temporal Representation:	Data was collected over the time period 5/16/2006-6/17/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 51134 Region 9

Sweetwater River, North Fork, unnamed tributary at Tavern Road

Pollutant:	**Dimethoate**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of one sample exceed the municipal and domestic supply and the warm freshwater habitat guidelines. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeded the guidelines and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51134, Dimethoate Region 9

Sweetwater River, North Fork, unnamed tributary at Tavern Road

LOE ID:	77925
Pollutant:	Dimethoate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, North Fork, unnamed tributary at Tavern Road to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Dimethoate.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Department of Health Services archived advisory level for dimethoate is 1 Âµg/L.
Guideline Reference:	CDPH Archived Advisory Levels for Drinking Water. Archived Advisory Levels are currently considered Notification Levels.
Spatial Representation:	Data for this line of evidence for Sweetwater River, North Fork, unnamed tributary at Tavern Road was collected at 1 monitoring site [North Fork of Sweetwater River @ Tavern Road]
Temporal Representation:	Data was collected on a single day 3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 51134, Dimethoate **Region 9**

Sweetwater River, North Fork, unnamed tributary at Tavern Road

LOE ID:	77926
Pollutant:	Dimethoate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, North Fork, unnamed tributary at Tavern Road to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Dimethoate.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for Dimethoate is the median lethal concentration (LC50; 43 ug/L).
Guideline Reference:	OPP Pesticide Ecotoxicity Database.

Spatial Representation:	Data for this line of evidence for Sweetwater River, North Fork, unnamed tributary at Tavern Road was collected at 1 monitoring site [North Fork of Sweetwater River @ Tavern Road]
Temporal Representation:	Data was collected on a single day 3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID 51136 Region 9

Sweetwater River, North Fork, unnamed tributary at Tavern Road

Pollutant:	**Disulfoton**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of one sample exceed the municipal and domestic supply and the warm freshwater habitat guidelines. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeded the guidelines and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51136, Disulfoton Region 9

Sweetwater River, North Fork, unnamed tributary at Tavern Road

LOE ID:	77928
Pollutant:	Disulfoton
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING 043288
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, North Fork, unnamed tributary at Tavern Road to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Disulfoton.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for disulfoton is 0.05 Âµg/L (US EPA 1973 guidance).
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for Sweetwater River, North Fork, unnamed tributary at Tavern Road was collected at 1 monitoring site [North Fork of Sweetwater River @ Tavern Road]
Temporal Representation:	Data was collected on a single day 3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 51136, Disulfoton **Region 9**

Sweetwater River, North Fork, unnamed tributary at Tavern Road

LOE ID:	77927
Pollutant:	Disulfoton
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, North Fork, unnamed tributary at Tavern Road to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Disulfoton.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for disulfoton is 0.7 Âµg/L.
Guideline Reference:	2011 Edition of the Drinking Water Standards and Health Advisories
Spatial Representation:	Data for this line of evidence for Sweetwater River, North Fork, unnamed tributary at Tavern Road was collected at 1 monitoring site [North Fork of Sweetwater River @ Tavern Road]
Temporal Representation:	Data was collected on a single day 3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.

QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID 51151 Region 9

Sweetwater River, North Fork, unnamed tributary at Tavern Road

Pollutant:	**Ethoprop**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceed the warm freshwater habitat guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51151, Ethoprop Region 9

Sweetwater River, North Fork, unnamed tributary at Tavern Road

LOE ID:	77929
Pollutant:	Ethoprop
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, North Fork, unnamed tributary at Tavern Road to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Ethoprop.

Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2004-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for Ethoprop is the maximum acceptable toxicant concentration (MATC) of 1.4 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Sweetwater River, North Fork, unnamed tributary at Tavern Road was collected at 1 monitoring site [North Fork of Sweetwater River @ Tavern Road]
Temporal Representation:	Data was collected on a single day 3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID 52138 Region 9

Sweetwater River, North Fork, unnamed tributary at Tavern Road

Pollutant:	**Iron**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. One of three samples exceededed the guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of three samples exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52138, Iron Region 9

Sweetwater River, North Fork, unnamed tributary at Tavern Road

LOE ID:	76977
Pollutant:	Iron
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, North Fork, unnamed tributary at Tavern Road to determine beneficial use support and results are as follows: 1 of 3 samples exceed the criterion for Iron.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for iron is 0.3 mg/L (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sweetwater River, North Fork, unnamed tributary at Tavern Road was collected at 1 monitoring site [North Fork of Sweetwater River @ Tavern Road]
Temporal Representation:	Data was collected over the time period 7/31/2008-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID 52145 Region 9

Sweetwater River, North Fork, unnamed tributary at Tavern Road

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the seven samples exceed the beneficial use guideline for Municipal and Domestic use. Zero of the seven samples exceed the beneficial use guideline for Warm Freshwater Habitat use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.

2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 943292
3. Zero of the seven samples exceed the beneficial use guideline for Municipal and Domestic use. Zero of the seven samples exceed the beneficial use guideline for Warm Freshwater Habitat use. The sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52145, Lead **Region 9**

Sweetwater River, North Fork, unnamed tributary at Tavern Road

LOE ID:	76979
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Sweetwater River, North Fork, unnamed tributary at Tavern Road to determine beneficial use support and results are as follows: 0 of 7 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for lead is 0.015 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sweetwater River, North Fork, unnamed tributary at Tavern Road was collected at 1 monitoring site [North Fork of Sweetwater River @ Tavern Road]
Temporal Representation:	Data was collected 5/14/2003 - 6/17/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 52145, Lead **Region 9**

Sweetwater River, North Fork, unnamed tributary at Tavern Road

LOE ID:	76978
Pollutant:	Lead

LOE Subgroup:	Pollutant-Water	043293
Matrix:	Water	
Fraction:	Dissolved	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	7	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Sweetwater River, North Fork, unnamed tributary at Tavern Road to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Sweetwater River, North Fork, unnamed tributary at Tavern Road was collected at 1 monitoring site [North Fork of Sweetwater River @ Tavern Road]	
Temporal Representation:	Data was collected 5/14/2003 - 6/17/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID **51155** **Region 9**

Sweetwater River, North Fork, unnamed tributary at Tavern Road

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Four lines of evidence are available in the administrative record to assess this pollutant. Zero of the seven samples exceed the municipal and domestic supply guideline. Zero of the seven samples exceed the warm freshwater habitat guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.

2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.943294
3. Zero of seven samples exceeded the guidelines and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51155, Malathion **Region 9**

Sweetwater River, North Fork, unnamed tributary at Tavern Road

LOE ID:	78165
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, North Fork, unnamed tributary at Tavern Road to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Malathion.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for malathion is 100 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Sweetwater River, North Fork, unnamed tributary at Tavern Road was collected at 1 monitoring site [North Fork of Sweetwater River @ Tavern Road]
Temporal Representation:	Data was collected over the time period 5/16/2006-6/17/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 51155, Malathion **Region 9**

Sweetwater River, North Fork, unnamed tributary at Tavern Road

LOE ID:	78167
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water

Matrix:	Water	043295
Fraction:	None	
Beneficial Use:	Warm Freshwater Habitat	
Number of Samples:	3	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, North Fork, unnamed tributary at Tavern Road to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Malathion.	
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.	
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology	
Spatial Representation:	Data for this line of evidence for Sweetwater River, North Fork, unnamed tributary at Tavern Road was collected at 1 monitoring site [North Fork of Sweetwater River @ Tavern Road]	
Temporal Representation:	Data was collected over the time period 7/31/2008-3/31/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.	

Line of Evidence (LOE) for Decision ID 51155, Malathion **Region 9**

Sweetwater River, North Fork, unnamed tributary at Tavern Road

LOE ID:	76989
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, North Fork, unnamed tributary at Tavern Road to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Malathion.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).

Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	043296
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.	
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013	
Spatial Representation:	Data for this line of evidence for Sweetwater River, North Fork, unnamed tributary at Tavern Road was collected at 1 monitoring site [North Fork of Sweetwater River @ Tavern Road]	
Temporal Representation:	Data was collected over the time period 5/16/2006-6/17/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 51155, Malathion **Region 9**

Sweetwater River, North Fork, unnamed tributary at Tavern Road

LOE ID:	78164
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, North Fork, unnamed tributary at Tavern Road to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Malathion.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for malathion is 100 Âµg/L.
Guideline Reference:	2011 Edition of the Drinking Water Standards and Health Advisories
Spatial Representation:	Data for this line of evidence for Sweetwater River, North Fork, unnamed tributary at Tavern Road was collected at 1 monitoring site [North Fork of Sweetwater River @ Tavern Road]
Temporal Representation:	Data was collected over the time period 7/31/2008-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID 51138 **Region 9**

Sweetwater River, North Fork, unnamed tributary at Tavern Road

Pollutant:	**Methidathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**

Last Listing Cycle's Final Listing Decision:	New Decision	043297
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of one sample exceed the municipal and domestic supply and the warm freshwater habitat guidelines.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the guidelines and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51138, Methidathion **Region 9**

Sweetwater River, North Fork, unnamed tributary at Tavern Road

LOE ID:	77932
Pollutant:	Methidathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, North Fork, unnamed tributary at Tavern Road to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Methidathion.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Based on USEPA IRIS reference dose (RfD) as a drinking water level, the drinking water health advisory level for methidathion is 7 Âµg/L.
Guideline Reference:	IRIS Database Calculations (summary)

Spatial Representation:	Data for this line of evidence for Sweetwater River, North Fork, unnamed tributary at Tavern Road was collected at 1 monitoring site [North Fork of Sweetwater River @ Tavern Road]
Temporal Representation:	Data was collected on a single day 3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 51138, Methidathion **Region 9**

Sweetwater River, North Fork, unnamed tributary at Tavern Road

LOE ID:	77933
Pollutant:	Methidathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, North Fork, unnamed tributary at Tavern Road to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Methidathion.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for Methidathion is the maximum acceptable toxicant concentration (MATC) of 0.86 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Sweetwater River, North Fork, unnamed tributary at Tavern Road was collected at 1 monitoring site [North Fork of Sweetwater River @ Tavern Road]
Temporal Representation:	Data was collected on a single day 3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID 51153 **Region 9**

Sweetwater River, North Fork, unnamed tributary at Tavern Road

Pollutant:	**Methyl Parathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or	Pollutant

Pollution: 043299

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceed the warm freshwater habitat guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51153, Methyl Parathion **Region 9**

Sweetwater River, North Fork, unnamed tributary at Tavern Road

LOE ID:	77934
Pollutant:	Methyl Parathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, North Fork, unnamed tributary at Tavern Road to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Parathion, Methyl.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. There shall be no increase in hazardous chemical concentrations found in bottom sediments or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Department of Fish and Game instantaneous criteria for Methyl Parathion is 0.08 ug/L.
Guideline Reference:	Hazard Assessment of the Insecticide Methyl Parathion to Aquatic Organisms in the Sacramento River System. California Department of Fish and Game. Environmental Services Division. Administrative Report 92-1

Spatial Representation:	Data for this line of evidence for Sweetwater River, North Fork, unnamed tributary at Tavern Road was collected at 1 monitoring site [North Fork of Sweetwater River @ Tavern Road]
Temporal Representation:	Data was collected on a single day 3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID 52140 Region 9

Sweetwater River, North Fork, unnamed tributary at Tavern Road

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of three samples exceeded the guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of three samples exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52140, Nickel Region 9

Sweetwater River, North Fork, unnamed tributary at Tavern Road

LOE ID:	76999
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING 043301
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, North Fork, unnamed tributary at Tavern Road to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Nickel.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nickel is 0.1 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sweetwater River, North Fork, unnamed tributary at Tavern Road was collected at 1 monitoring site [North Fork of Sweetwater River @ Tavern Road]
Temporal Representation:	Data was collected over the time period 7/31/2008-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID 52021 Region 9

Sweetwater River, North Fork, unnamed tributary at Tavern Road

Pollutant:	**Nitrate/Nitrite (Nitrite + Nitrate as N)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. One of one sample exceeded the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of one sample exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52021, Nitrate/Nitrite (Nitrite + Nitrate as N) Region 9

Sweetwater River, North Fork, unnamed tributary at Tavern Road 043302

LOE ID:	77000
Pollutant:	Nitrate/Nitrite (Nitrite + Nitrate as N)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, North Fork, unnamed tributary at Tavern Road to determine beneficial use support and results are as follows: 1 of 1 samples exceed the criterion for Nitrate/Nitrite as N.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrate + nitrite (as N) is 10.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sweetwater River, North Fork, unnamed tributary at Tavern Road was collected at 1 monitoring site [North Fork of Sweetwater River @ Tavern Road]
Temporal Representation:	Data was collected on a single day 9/15/2003.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **52022** **Region 9**

Sweetwater River, North Fork, unnamed tributary at Tavern Road

Pollutant:	**Nitrogen, Nitrite**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of six samples exceeded the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.043303
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of six samples exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52022, Nitrogen, Nitrite **Region 9**

Sweetwater River, North Fork, unnamed tributary at Tavern Road

LOE ID:	77002
Pollutant:	Nitrogen, Nitrite
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, North Fork, unnamed tributary at Tavern Road to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Nitrite as N.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrite (as N) is 1.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sweetwater River, North Fork, unnamed tributary at Tavern Road was collected at 1 monitoring site [North Fork of Sweetwater River @ Tavern Road]
Temporal Representation:	Data was collected over the time period 5/14/2003-9/16/2003.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 52022, Nitrogen, Nitrite **Region 9**

Sweetwater River, North Fork, unnamed tributary at Tavern Road

LOE ID:	77001
Pollutant:	Nitrogen, Nitrite
LOE Subgroup:	Pollutant-Water

Matrix:	Water	043304
Fraction:	None	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	3	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, North Fork, unnamed tributary at Tavern Road to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Nitrite as N.	
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrite (as N) is 1.0 mg/L (Title 22 of the California Code of Regulations).	
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Sweetwater River, North Fork, unnamed tributary at Tavern Road was collected at 1 monitoring site [North Fork of Sweetwater River @ Tavern Road]	
Temporal Representation:	Data was collected over the time period 7/31/2008-3/31/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.	

DECISION ID 51119 Region 9

Sweetwater River, North Fork, unnamed tributary at Tavern Road

Pollutant:	**Parathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the zero samples exceed the beneficial use guidelines.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of zero samples exceeded the guideline. The samples were not used in the assessment due to reporting limits that were higher than the guideline. The sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available

	indicating that standards are not met.	043305
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.	

Line of Evidence (LOE) for Decision ID 51119, Parathion **Region 9**

Sweetwater River, North Fork, unnamed tributary at Tavern Road

LOE ID:	77935
Pollutant:	Parathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, North Fork, unnamed tributary at Tavern Road to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Parathion, Ethyl.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. There shall be no increase in hazardous chemical concentrations found in bottom sediments or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The criterion continuous concentraion for Parathion, Ethyl is 0.013 ug/l from the National Recommended Water Quality Criteria.
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for Sweetwater River, North Fork, unnamed tributary at Tavern Road was collected at 1 monitoring site [North Fork of Sweetwater River @ Tavern Road]
Temporal Representation:	Data was collected on a single day 3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID **51149** **Region 9**

Sweetwater River, North Fork, unnamed tributary at Tavern Road

Pollutant:	**Phorate**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or	Pollutant

Pollution: 043306

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of one sample exceed the municipal and domestic supply and the warm freshwater habitat guidelines.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the guidelines and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51149, Phorate **Region 9**

Sweetwater River, North Fork, unnamed tributary at Tavern Road

LOE ID:	77936
Pollutant:	Phorate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, North Fork, unnamed tributary at Tavern Road to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Phorate.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for Phorate is the median lethal concentration (LC50; 2 ug/L).
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Sweetwater River, North Fork, unnamed tributary at Tavern Road was collected at 1 monitoring site [North Fork of Sweetwater River @ Tavern Road]
Temporal Representation:	Data was collected on a single day 3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.

QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 51149, Phorate **Region 9**

Sweetwater River, North Fork, unnamed tributary at Tavern Road

LOE ID:	77937
Pollutant:	Phorate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, North Fork, unnamed tributary at Tavern Road to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Phorate.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The national health advisory level for phorate is 0.7 Âµg/L.
Guideline Reference:	Volume I Drinking Water and Health
Spatial Representation:	Data for this line of evidence for Sweetwater River, North Fork, unnamed tributary at Tavern Road was collected at 1 monitoring site [North Fork of Sweetwater River @ Tavern Road]
Temporal Representation:	Data was collected on a single day 3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID 51150 **Region 9**

Sweetwater River, North Fork, unnamed tributary at Tavern Road

Pollutant:	**Phosmet**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of one

sample exceed the municipal and domestic supply and the warm freshwater habitat guidelines.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the guidelines and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51150, Phosmet **Region 9**

Sweetwater River, North Fork, unnamed tributary at Tavern Road

LOE ID:	77938
Pollutant:	Phosmet
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, North Fork, unnamed tributary at Tavern Road to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Phosmet.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to the USEPA Office of Pesticide Programs Ecotoxicity database, the aquatic life EC50 for Phosmet is 5.6 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Sweetwater River, North Fork, unnamed tributary at Tavern Road was collected at 1 monitoring site [North Fork of Sweetwater River @ Tavern Road]
Temporal Representation:	Data was collected on a single day 3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 51150, Phosmet 043309 **Region 9**

Sweetwater River, North Fork, unnamed tributary at Tavern Road

LOE ID:	77939
Pollutant:	Phosmet
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, North Fork, unnamed tributary at Tavern Road to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Phosmet.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Based on USEPA IRIS reference dose (RfD) as a drinking water level, the drinking water health advisory level for phosmet is 140 Âµg/L.
Guideline Reference:	IRIS Database Calculations (summary)
Spatial Representation:	Data for this line of evidence for Sweetwater River, North Fork, unnamed tributary at Tavern Road was collected at 1 monitoring site [North Fork of Sweetwater River @ Tavern Road]
Temporal Representation:	Data was collected on a single day 3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID 52146 **Region 9**

Sweetwater River, North Fork, unnamed tributary at Tavern Road

Pollutant:	**Selenium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the three samples exceed the beneficial use guideline for Municipal and Domestic use. Zero of the three samples exceed the beneficial use guideline for Warm Freshwater Habitat use.

Based on the readily available data and information, the weight of evidence indicates that there is

sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the three samples exceed the beneficial use guideline for Municipal and Domestic use. Zero of the three samples exceed the beneficial use guideline for Warm Freshwater Habitat use. The sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52146, Selenium **Region 9**

Sweetwater River, North Fork, unnamed tributary at Tavern Road

LOE ID:	77028
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, North Fork, unnamed tributary at Tavern Road to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Selenium.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The Maximum Contaminant Level for selenium in the Basin Plan is 0.01 mg/L (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sweetwater River, North Fork, unnamed tributary at Tavern Road was collected at 1 monitoring site [North Fork of Sweetwater River @ Tavern Road]
Temporal Representation:	Data was collected over the time period 7/31/2008-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 52146, Selenium **Region 9**

Sweetwater River, North Fork, unnamed tributary at Tavern Road

LOE ID:	77015
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, North Fork, unnamed tributary at Tavern Road to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Selenium.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The selenium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater is 0.005 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sweetwater River, North Fork, unnamed tributary at Tavern Road was collected at 1 monitoring site [North Fork of Sweetwater River @ Tavern Road]
Temporal Representation:	Data was collected over the time period 7/31/2008-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID 52141 Region 9

Sweetwater River, North Fork, unnamed tributary at Tavern Road

Pollutant:	**Silver**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeded the guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.

2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52141, Silver Sweetwater River, North Fork, unnamed tributary at Tavern Road **Region 9**

LOE ID:	77029
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, North Fork, unnamed tributary at Tavern Road to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Silver.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for silver is 0.1 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Sweetwater River, North Fork, unnamed tributary at Tavern Road was collected at 1 monitoring site [North Fork of Sweetwater River @ Tavern Road]
Temporal Representation:	Data was collected on a single day 3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID 52144 Sweetwater River, North Fork, unnamed tributary at Tavern Road **Region 9**

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision

Revision Status	Revised	043313
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the seven samples and zero of three samples exceed the beneficial use guideline for Municipal and Domestic use. The samples for Municipal could not be added since the fractions are different. Zero of the seven samples exceed the beneficial use guideline for Warm Freshwater Habitat use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of the seven samples and zero of three samples exceed the beneficial use guideline for Municipal and Domestic use. Zero of the seven samples exceed the beneficial use guideline for Warm Freshwater Habitat use. The sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52144, Zinc **Region 9**

Sweetwater River, North Fork, unnamed tributary at Tavern Road

LOE ID:	77045
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Sweetwater River, North Fork, unnamed tributary at Tavern Road to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for zinc is 5.0 mg/L (Title 22 California Code of Regulations).

Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Sweetwater River, North Fork, unnamed tributary at Tavern Road was collected at 1 monitoring site [North Fork of Sweetwater River @ Tavern Road]
Temporal Representation:	Data was collected 5/14/2003 - 6/17/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 52144, Zinc **Region 9**

Sweetwater River, North Fork, unnamed tributary at Tavern Road

LOE ID:	77032
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, North Fork, unnamed tributary at Tavern Road to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Zinc.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for zinc is 5.0 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Sweetwater River, North Fork, unnamed tributary at Tavern Road was collected at 1 monitoring site [North Fork of Sweetwater River @ Tavern Road]
Temporal Representation:	Data was collected over the time period 7/31/2008-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 52144, Zinc **Region 9**

Sweetwater River, North Fork, unnamed tributary at Tavern Road

LOE ID:	77046
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Warm Freshwater Habitat

Number of Samples:	7
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Sweetwater River, North Fork, unnamed tributary at Tavern Road to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sweetwater River, North Fork, unnamed tributary at Tavern Road was collected at 1 monitoring site [North Fork of Sweetwater River @ Tavern Road]
Temporal Representation:	Data was collected 5/14/2003 - 6/17/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **51727** **Region 9**

Sweetwater River, North Fork, unnamed tributary at Tavern Road

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Four lines of evidence are available in the administrative record to assess this pollutant. Data from 2003 to 2009 show that 10 of 10, and 7 of 10 samples exceed the water quality objectives for enterococcus and fecal coliform of SSMs of 61/100ml and 400/100ml, respectively for the protection of REC-1.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.

3. Data from 2003 to 2009 show that 10 of 10, and 7 of 10 samples exceed the water quality objectives for enterococcus and fecal coliform of SSMs of 61/100ml and 400/100ml, respectively for the protection of REC-1 and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 51727, Indicator Bacteria **Region 9**

Sweetwater River, North Fork, unnamed tributary at Tavern Road

LOE ID:	76976
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	7
Number of Exceedances:	5
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, North Fork, unnamed tributary at Tavern Road to determine beneficial use support and results are as follows: 5 of 7 samples exceed the criterion for Coliform, Fecal.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the fecal coliform concentration shall not exceed 400 MPN/100 ml.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sweetwater River, North Fork, unnamed tributary at Tavern Road was collected at 1 monitoring site [North Fork of Sweetwater River @ Tavern Road]
Temporal Representation:	Data was collected over the time period 5/14/2003-6/17/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 51727, Indicator Bacteria **Region 9**

Sweetwater River, North Fork, unnamed tributary at Tavern Road

LOE ID:	76965
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation	043317
Number of Samples:	3	
Number of Exceedances:	3	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, North Fork, unnamed tributary at Tavern Road to determine beneficial use support and results are as follows: 3 of 3 samples exceed the criterion for Enterococci.	
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Samples shall not exceed 61 organisms per 100 ml for enterococcus in waters designated for REC I beneficial use (Water Quality Control Plan for the San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Sweetwater River, North Fork, unnamed tributary at Tavern Road was collected at 1 monitoring site [North Fork of Sweetwater River @ Tavern Road]	
Temporal Representation:	Data was collected over the time period 7/31/2008-3/31/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.	

Line of Evidence (LOE) for Decision ID 51727, Indicator Bacteria **Region 9**

Sweetwater River, North Fork, unnamed tributary at Tavern Road

LOE ID:	76967
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Non-Contact Recreation
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, North Fork, unnamed tributary at Tavern Road to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Coliform, Fecal.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters designated for non contact recreation (REC 2), the fecal coliform concentration shall not exceed 4000 MPN/100 ml (Basin Plan).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sweetwater River, North Fork, unnamed tributary at Tavern Road was collected at 1 monitoring site [North Fork of Sweetwater River @ Tavern Road]
Temporal Representation:	Data was collected over the time period 7/31/2008-3/31/2009.

Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 51727, Indicator Bacteria **Region 9**

Sweetwater River, North Fork, unnamed tributary at Tavern Road

LOE ID:	76968
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	3
Number of Exceedances:	2
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, North Fork, unnamed tributary at Tavern Road to determine beneficial use support and results are as follows: 2 of 3 samples exceed the criterion for Coliform, Fecal.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the fecal coliform concentration shall not exceed 400 MPN/100 ml.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sweetwater River, North Fork, unnamed tributary at Tavern Road was collected at 1 monitoring site [North Fork of Sweetwater River @ Tavern Road]
Temporal Representation:	Data was collected over the time period 7/31/2008-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 51727, Indicator Bacteria **Region 9**

Sweetwater River, North Fork, unnamed tributary at Tavern Road

LOE ID:	77030
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	3
Number of Exceedances:	1
Data and Information Type:	PATHOGEN MONITORING

Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, North Fork, unnamed tributary at Tavern Road to determine beneficial use support and results are as follows: 1 of 3 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxicsubstances in concentrations which are toxic to,or which produce detrimental physiologicalresponses in human, plant, animal, or indigenousaquatic life (Basin Plan).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In waters designated for water contact recreation (REC I), the total coliform concentration shall not exceed 10000 MPN/100 ml (CDPH 2006).
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.
Spatial Representation:	Data for this line of evidence for Sweetwater River, North Fork, unnamed tributary at Tavern Road was collected at 1 monitoring site [North Fork of Sweetwater River @ Tavern Road]
Temporal Representation:	Data was collected over the time period 7/31/2008-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 51727, Indicator Bacteria **Region 9**

Sweetwater River, North Fork, unnamed tributary at Tavern Road

LOE ID:	76966
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	7
Number of Exceedances:	7
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, North Fork, unnamed tributary at Tavern Road to determine beneficial use support and results are as follows: 7 of 7 samples exceed the criterion for Enterococci.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Samples shall not exceed 61 organisms per 100 ml for enterococcus in waters designated for REC I beneficial use (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sweetwater River, North Fork, unnamed tributary at Tavern Road was collected at 1 monitoring site [North Fork of Sweetwater River @ Tavern Road]
Temporal Representation:	Data was collected over the time period 5/14/2003-6/17/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix

	Analytical and Dry Weather Monitoring Program Rev. 8 was followed. 043320
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 51727, Indicator Bacteria **Region 9**

Sweetwater River, North Fork, unnamed tributary at Tavern Road

LOE ID:	77031
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	7
Number of Exceedances:	1
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, North Fork, unnamed tributary at Tavern Road to determine beneficial use support and results are as follows: 1 of 7 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxicsubstances in concentrations which are toxic to,or which produce detrimental physiologicalresponses in human, plant, animal, or indigenousaquatic life (Basin Plan).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In waters designated for water contact recreation (REC I), the total coliform concentration shall not exceed 10000 MPN/100 ml (CDPH 2006).
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.
Spatial Representation:	Data for this line of evidence for Sweetwater River, North Fork, unnamed tributary at Tavern Road was collected at 1 monitoring site [North Fork of Sweetwater River @ Tavern Road]
Temporal Representation:	Data was collected over the time period 5/14/2003-6/17/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 52139 **Region 9**

Sweetwater River, North Fork, unnamed tributary at Tavern Road

Pollutant:	**Manganese**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2027
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Two of three samples exceeded the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Two of three samples exceeded the objective, and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 52139, Manganese **Region 9**

Sweetwater River, North Fork, unnamed tributary at Tavern Road

LOE ID:	76990
Pollutant:	Manganese
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	2
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Sweetwater River, North Fork, unnamed tributary at Tavern Road to determine beneficial use support and results are as follows: 2 of 3 samples exceed the criterion for Manganese.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for manganese is 0.05 mg/L (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Sweetwater River, North Fork, unnamed tributary at Tavern Road was collected at 1 monitoring site [North Fork of Sweetwater River @ Tavern Road]
Temporal Representation:	Data was collected over the time period 7/31/2008-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Viejas Creek
Water Body ID: CAR9093300020110816135529
Water Body Type: River & Stream

DECISION ID 52049 **Region 9**
Viejas Creek

Pollutant: Ammonia
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeded the guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one sample exceeded the guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52049, Ammonia **Region 9**
Viejas Creek

LOE ID: 77176

Pollutant: Nitrogen, ammonia (Total Ammonia)
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Municipal & Domestic Supply

Number of Samples: 1

Number of Exceedances:	0	043324
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Viejas Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Ammonia As N, Total.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Basin Plan: No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	EPA's Lifetime Health advisory level for total ammonia is 30.0 mg/L as stated on page 8 of the 2006 edition of the drinking water standards and health advisories. This Advisory Level is defined as "the concentration of a chemical in drinking water that is not expected to cause any adverse noncarcinogenic effects for up to ten days of exposure."	
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013	
Spatial Representation:	Data for this line of evidence for Viejas Creek was collected at 1 monitoring site [Viejas Creek @ Via Viejas below Private Lake]	
Temporal Representation:	Data was collected on a single day 5/14/2003.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID	**50524**	**Region 9**
Viejas Creek		

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of six samples did not exceed the criterion or objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of six samples did not exceed the criterion or objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50524, Cadmium **Region 9**

Viejas Creek

LOE ID:	77178
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Viejas Creek to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Viejas Creek was collected at 1 monitoring site [Viejas Creek @ Via Viejas below Private Lake]
Temporal Representation:	Data was collected 5/14/2003 - 6/2/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 50524, Cadmium **Region 9**

Viejas Creek

LOE ID:	77177
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Viejas Creek to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for cadmium is 0.005 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals, CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Viejas Creek was collected at 1 monitoring site [Viejas Creek @ Via Viejas below Private Lake]
Temporal Representation:	Data was collected 5/14/2003 - 6/2/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID	**50533**	**Region 9**
Viejas Creek		

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of four samples exceeded the guideline for Municipal & Domestic Supply and zero of zero samples exceeded the guideline for cold freshwater. The samples were not used in the assessment for cold freshwater due to reporting limits that were higher than the guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of four samples exceeded the guideline for Municipal & Domestic Supply. The sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50533, Chlorpyrifos **Region 9**

Viejas Creek

LOE ID:	78192
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Viejas Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for chlorpyrifos is 2.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Viejas Creek was collected at 1 monitoring site [Viejas Creek @ Via Viejas below Private Lake]
Temporal Representation:	Data was collected over the time period 5/16/2006-6/2/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 50533, Chlorpyrifos **Region 9**

Viejas Creek

LOE ID:	77179
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	0

Number of Exceedances:	0	043328
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Viejas Creek to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Chlorpyrifos.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000).	
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).	
Spatial Representation:	Data for this line of evidence for Viejas Creek was collected at 1 monitoring site [Viejas Creek @ Via Viejas below Private Lake]	
Temporal Representation:	Data was collected over the time period 5/16/2006-6/2/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID	**50530**	**Region 9**
Viejas Creek		

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of six samples did not exceed the criterion or guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of six samples did not exceed the criterion or guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available

indicating that standards are not met. 043329

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50530, Copper **Region 9**

Viejas Creek

LOE ID:	77181
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Viejas Creek to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Viejas Creek was collected at 1 monitoring site [Viejas Creek @ Via Viejas below Private Lake]
Temporal Representation:	Data was collected 5/14/2003 - 6/2/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 50530, Copper **Region 9**

Viejas Creek

LOE ID:	77180
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved

Beneficial Use:	Municipal & Domestic Supply	043330
Number of Samples:	6	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Viejas Creek to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Copper.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Secondary MCL for copper is 1.0 mg/L (Title 22 California Code of Regulations).	
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Viejas Creek was collected at 1 monitoring site [Viejas Creek @ Via Viejas below Private Lake]	
Temporal Representation:	Data was collected on a single day 5/14/2003.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID	**50545**	**Region 9**
Viejas Creek		

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of four samples exceeded the guideline for Municipal & Domestic Supply and one of four samples exceeded the guideline for cold freshwater. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of four samples exceeded the guideline for Municipal & Domestic Supply and one of four samples exceeded the guideline for cold freshwater. The sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50545, Diazinon **Region 9**

Viejas Creek

LOE ID:	77182
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Viejas Creek to determine beneficial use support and results are as follows: 1 of 4 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Data for this line of evidence for Viejas Creek was collected at 1 monitoring site [Viejas Creek @ Via Viejas below Private Lake]
Temporal Representation:	Data was collected over the time period 5/16/2006-6/2/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 50545, Diazinon **Region 9**

Viejas Creek

LOE ID:	78193
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Viejas Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for diazinon is 1.4 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Viejas Creek was collected at 1 monitoring site [Viejas Creek @ Via Viejas below Private Lake]
Temporal Representation:	Data was collected over the time period 5/16/2006-6/2/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID	**50548**	**Region 9**
Viejas Creek		

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.3 of the Listing Policy. Under section 3.3 a single line of evidence are necessary to assess listing status. Three lines of evidence are available in the administrative record to assess this pollutant. Enterococcus Three of five samples exceed the single sample objective for water contact recreation. Fecal coliform One of five samples exceed the single sample objective for water contact recreation. Total coliform Zero of 5 samples exceed the single sample objective for water contact recreation. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Samples and exceedences are as follows: Three lines of evidence are available in the administrative record to assess this pollutant.

	Enterococcus 043333 Three of five samples exceed the single sample objective for water contact recreation. Fecal coliform One of five samples exceed the single sample objective for water contact recreation. Total coliform Zero of 5 samples exceed the single sample objective for water contact recreation. The sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2. 4. Pursuant to section 3.1 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50548, Indicator Bacteria **Region 9**

Viejas Creek

LOE ID:	77184
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	5
Number of Exceedances:	1
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Viejas Creek to determine beneficial use support and results are as follows: 1 of 5 samples exceed the criterion for Coliform, Fecal.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the fecal coliform concentration shall not exceed 400 MPN/100 ml.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Viejas Creek was collected at 1 monitoring site [Viejas Creek @ Via Viejas below Private Lake]
Temporal Representation:	Data was collected over the time period 5/14/2003-7/30/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 50548, Indicator Bacteria **Region 9**

Viejas Creek

LOE ID:	77183	043334

Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	5
Number of Exceedances:	3
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Viejas Creek to determine beneficial use support and results are as follows: 3 of 5 samples exceed the criterion for Enterococci.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Samples shall not exceed 61 organisms per 100 ml for enterococcus in waters designated for REC I beneficial use (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Viejas Creek was collected at 1 monitoring site [Viejas Creek @ Via Viejas below Private Lake]
Temporal Representation:	Data was collected over the time period 5/14/2003-7/30/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 50548, Indicator Bacteria **Region 9**

Viejas Creek

LOE ID:	77189
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Viejas Creek to determine beneficial use support and results are as follows: 0 of 5 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxicsubstances in concentrations which are toxic to,or

	which produce detrimental physiologicalresponses in human, plant, animal, or indigenousaquatic life (Basin Plan).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In waters designated for water contact recreation (REC I), the total coliform concentration shall not exceed 10000 MPN/100 ml (CDPH 2006).
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.
Spatial Representation:	Data for this line of evidence for Viejas Creek was collected at 1 monitoring site [Viejas Creek @ Via Viejas below Private Lake]
Temporal Representation:	Data was collected over the time period 5/14/2003-7/30/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 50531 Region 9

Viejas Creek

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of six samples exceeded the criterion or guideline. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of six samples exceeded the criterion or guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50531, Lead Region 9

Viejas Creek

LOE ID:	77185

Pollutant:	Lead	043336
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	Dissolved	
Beneficial Use:	Cold Freshwater Habitat	
Number of Samples:	6	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Viejas Creek to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Lead.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Viejas Creek was collected at 1 monitoring site [Viejas Creek @ Via Viejas below Private Lake]	
Temporal Representation:	Data was collected 5/14/2003 - 6/2/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 50531, Lead **Region 9**

Viejas Creek

LOE ID:	77186
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Viejas Creek to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	The California Maximum Contaminant Level for Lead is 0.015 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Viejas Creek was collected at 1 monitoring site [Viejas Creek @ Via Viejas below Private Lake]
Temporal Representation:	Data was collected 5/14/2003 - 6/2/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 50546 Region 9
Viejas Creek

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of four samples exceeded the guideline for Municipal & Domestic Supply and zero of four samples exceeded the guideline for cold freshwater. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of four samples exceeded the guideline for Municipal & Domestic Supply and zero of four samples exceeded the guideline for cold freshwater. The sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50546, Malathion Region 9
Viejas Creek

LOE ID:	78194
Pollutant:	Malathion

LOE Subgroup:	Pollutant-Water	043338
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	4	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Viejas Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Malathion.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The USEPA drinking water health advisory for malathion is 100 Âµg/L.	
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013	
Spatial Representation:	Data for this line of evidence for Viejas Creek was collected at 1 monitoring site [Viejas Creek @ Via Viejas below Private Lake]	
Temporal Representation:	Data was collected over the time period 5/16/2006-6/2/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 50546, Malathion **Region 9**

Viejas Creek

LOE ID:	77187
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Viejas Creek to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Malathion.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).

Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	043339
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.	
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013	
Spatial Representation:	Data for this line of evidence for Viejas Creek was collected at 1 monitoring site [Viejas Creek @ Via Viejas below Private Lake]	
Temporal Representation:	Data was collected over the time period 5/16/2006-6/2/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID 52045 Region 9
Viejas Creek

Pollutant:	**Nitrogen, Nitrite**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of one sample exceeded the objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one sample exceeded the objective and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 52045, Nitrogen, Nitrite Region 9
Viejas Creek

LOE ID:	77188
Pollutant:	Nitrogen, Nitrite
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Viejas Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nitrite as N.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrite (as N) is 1.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Viejas Creek was collected at 1 monitoring site [Viejas Creek @ Via Viejas below Private Lake]
Temporal Representation:	Data was collected on a single day 5/14/2003.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID	**50532**	**Region 9**
Viejas Creek		

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of six samples exceeded the criterion or guideline.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of six samples exceeded the criterion or guideline and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50532, Zinc **Region 9**

Viejas Creek

LOE ID:	77191
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Viejas Creek to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Viejas Creek was collected at 1 monitoring site [Viejas Creek @ Via Viejas below Private Lake]
Temporal Representation:	Data was collected 5/14/2003 - 6/2/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 50532, Zinc **Region 9**

Viejas Creek

LOE ID:	77190
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Viejas Creek to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for zinc is 5.0 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Viejas Creek was collected at 1 monitoring site [Viejas Creek @ Via Viejas below Private Lake]
Temporal Representation:	Data was collected 5/14/2003 - 6/2/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Olive Vista Creek
Water Body ID: CAR9103300020110817160101
Water Body Type: River & Stream

DECISION ID 48305 **Region 9**
Olive Vista Creek

Pollutant: Cadmium
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the two samples exceed the objective for protection of the aquatic life beneficial uses. Zero of the two samples exceed the objective for protection of the MUN beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of two samples exceeded the objective for aquatic life and zero of two samples exceeded the objective for the MUN beneficial use. This sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48305, Cadmium **Region 9**
Olive Vista Creek

LOE ID: 74460

Pollutant: Cadmium
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Municipal & Domestic Supply

Number of Samples:	2	043344
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Olive Vista Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Cadmium.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for cadmium is 0.005 mg/L (Title 22 of the California Code of Regulations).	
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Olive Vista Creek was collected at 1 monitoring site [Olive Vista Creek @ Olive Vista Drive]	
Temporal Representation:	Data was collected on 5/23/2005 and 5/9/2006.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 48305, Cadmium **Region 9**

Olive Vista Creek

LOE ID:	74459
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Olive Vista Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Data for this line of evidence for Olive Vista Creek was collected at 1 monitoring site [Olive Vista Creek @ Olive Vista Drive]
Temporal Representation:	Data was collected on 5/23/2005 and 5/9/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 48311 Region 9

Olive Vista Creek

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the zero samples exceed the objective for protection of the aquatic life beneficial uses. Zero of the two samples exceed the objective for protection of the MUN beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of zero samples exceeded the objective for aquatic life and zero of two samples exceeded the objective for the MUN beneficial use. This sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

Line of Evidence (LOE) for Decision ID 48311, Chlorpyrifos Region 9

Olive Vista Creek

LOE ID:	78070
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Olive Vista Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for chlorpyrifos is 2.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Olive Vista Creek was collected at 1 monitoring site [Olive Vista Creek @ Olive Vista Drive]
Temporal Representation:	Data was collected over the time period 5/23/2005-5/9/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48311, Chlorpyrifos **Region 9**

Olive Vista Creek

LOE ID:	74461
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Olive Vista Creek to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).
Spatial Representation:	Data for this line of evidence for Olive Vista Creek was collected at 1 monitoring site [Olive

	Vista Creek @ Olive Vista Drive]	043347
Temporal Representation:	Data was collected over the time period 5/23/2005-5/9/2006.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID 48306 Region 9

Olive Vista Creek

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the two samples exceed the objective for protection of the aquatic life beneficial uses. Zero of the two samples exceed the objective for protection of the MUN beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of two samples exceeded the objective for aquatic life and zero of two samples exceeded the objective for the MUN beneficial use. This sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48306, Copper Region 9

Olive Vista Creek

LOE ID:	74463
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING 043348
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Olive Vista Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for copper is 1.0 mg/L (Title 22 California Code of Regulations).
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Olive Vista Creek was collected at 1 monitoring site [Olive Vista Creek @ Olive Vista Drive]
Temporal Representation:	Data was collected on 5/23/2005 and 5/9/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48306, Copper **Region 9**

Olive Vista Creek

LOE ID:	74462
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Olive Vista Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Olive Vista Creek was collected at 1 monitoring site [Olive Vista Creek @ Olive Vista Drive]
Temporal Representation:	Data was collected on 5/23/2005 and 5/9/2006.

Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 48308 Region 9

Olive Vista Creek

Pollutant:	**Diazinon**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the two samples exceed the objective for protection of the aquatic life beneficial uses. Zero of the two samples exceed the objective for protection of the MUN beneficial use. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of two samples exceeded the objective for aquatic life and zero of two samples exceeded the objective for the MUN beneficial use. This sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48308, Diazinon Region 9

Olive Vista Creek

LOE ID:	78071
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Olive Vista Creek to determine

	beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for diazinon is 1.4 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Olive Vista Creek was collected at 1 monitoring site [Olive Vista Creek @ Olive Vista Drive]
Temporal Representation:	Data was collected over the time period 5/23/2005-5/9/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48308, Diazinon **Region 9**

Olive Vista Creek

LOE ID:	74464
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Olive Vista Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Data for this line of evidence for Olive Vista Creek was collected at 1 monitoring site [Olive Vista Creek @ Olive Vista Drive]
Temporal Representation:	Data was collected over the time period 5/23/2005-5/9/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.

QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **48313** **Region 9**

Olive Vista Creek

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.3 of the Listing Policy. Under section 3.3 a single line(s) of evidence are necessary to assess listing status. Three lines of evidence are available in the administrative record to assess this pollutant. Two of the zero samples exceed the objective for enterococcus. One of the two samples exceed the objective for fecal coliform and zero out of two samples exceed the objective for total coliform. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Two of the zero samples exceed the objective for enterococcus. One of the two samples exceed the objective for fecal coliform and zero out of two samples exceed the objective for total coliform. This sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48313, Indicator Bacteria **Region 9**

Olive Vista Creek

LOE ID:	74472
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Olive Vista Creek to determine

	beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxicsubstances in concentrations which are toxic to,or which produce detrimental physiologicalresponses in human, plant, animal, or indigenousaquatic life (Basin Plan).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In waters designated for water contact recreation (REC I), the total coliform concentration shall not exceed 10000 MPN/100 ml (CDPH 2006).
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.
Spatial Representation:	Data for this line of evidence for Olive Vista Creek was collected at 1 monitoring site [Olive Vista Creek @ Olive Vista Drive]
Temporal Representation:	Data was collected over the time period 5/23/2005-5/9/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48313, Indicator Bacteria **Region 9**

Olive Vista Creek

LOE ID:	74465
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2
Number of Exceedances:	2
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Olive Vista Creek to determine beneficial use support and results are as follows: 2 of 2 samples exceed the criterion for Enterococci.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Samples shall not exceed 61 organisms per 100 ml for enterococcus in waters designated for REC I beneficial use (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Olive Vista Creek was collected at 1 monitoring site [Olive Vista Creek @ Olive Vista Drive]
Temporal Representation:	Data was collected over the time period 5/23/2005-5/9/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix

	Analytical and Dry Weather Monitoring Program Rev. 8 was followed. 043353
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48313, Indicator Bacteria **Region 9**

Olive Vista Creek

LOE ID:	74466
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2
Number of Exceedances:	1
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Olive Vista Creek to determine beneficial use support and results are as follows: 1 of 2 samples exceed the criterion for Coliform, Fecal.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the fecal coliform concentration shall not exceed 400 MPN/100 ml.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Olive Vista Creek was collected at 1 monitoring site [Olive Vista Creek @ Olive Vista Drive]
Temporal Representation:	Data was collected over the time period 5/23/2005-5/9/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **48307** **Region 9**

Olive Vista Creek

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the two samples exceed the objective for protection of the aquatic life beneficial uses. Zero of the two samples exceed the objective for protection of the MUN beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of two samples exceeded the objective for aquatic life and zero of two samples exceeded the objective for the MUN beneficial use. This sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48307, Lead **Region 9**

Olive Vista Creek

LOE ID:	74468
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Olive Vista Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for Lead is 0.015 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Olive Vista Creek was collected at 1 monitoring site [Olive Vista Creek @ Olive Vista Drive]
Temporal Representation:	Data was collected on 5/23/2005 and 5/9/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48307, Lead **Region 9**

Olive Vista Creek 043355

LOE ID:	74467
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Olive Vista Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Olive Vista Creek was collected at 1 monitoring site [Olive Vista Creek @ Olive Vista Drive]
Temporal Representation:	Data was collected on 5/23/2005 and 5/9/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **48309** **Region 9**

Olive Vista Creek

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the two samples exceed the objective for protection of the aquatic life beneficial uses. Zero of the two samples exceed the objective for protection of the MUN beneficial use. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section

303(d) List. 043356

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of two samples exceeded the objective for aquatic life and zero of two samples exceeded the objective for the MUN beneficial use. This sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48309, Malathion **Region 9**

Olive Vista Creek

LOE ID:	78072
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Olive Vista Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Malathion.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for malathion is 100 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Olive Vista Creek was collected at 1 monitoring site [Olive Vista Creek @ Olive Vista Drive]
Temporal Representation:	Data was collected over the time period 5/23/2005-5/9/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48309, Malathion **Region 9**

Olive Vista Creek

LOE ID:	74469
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Olive Vista Creek to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Malathion.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Olive Vista Creek was collected at 1 monitoring site [Olive Vista Creek @ Olive Vista Drive]
Temporal Representation:	Data was collected over the time period 5/23/2005-5/9/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **48314** **Region 9**

Olive Vista Creek

Pollutant:	**Nitrate/Nitrite (Nitrite + Nitrate as N)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the objective for protection of the MUN beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.043358
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of two samples exceeded the objective for the MUN beneficial use. This sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48314, Nitrate/Nitrite (Nitrite + Nitrate as N) **Region 9**

Olive Vista Creek

LOE ID:	74470
Pollutant:	Nitrate/Nitrite (Nitrite + Nitrate as N)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Olive Vista Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nitrate/Nitrite as N.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrate + nitrite (as N) is 10.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Olive Vista Creek was collected at 1 monitoring site [Olive Vista Creek @ Olive Vista Drive]
Temporal Representation:	Data was collected on a single day 5/23/2005.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID **48315** **Region 9**

Olive Vista Creek

Pollutant:	**Nitrogen, Nitrite**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**

Last Listing Cycle's Final Listing Decision:	New Decision	043359
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the objective for protection of the MUN beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of two samples exceeded the objective for the MUN beneficial use. This sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48315, Nitrogen, Nitrite **Region 9**

Olive Vista Creek

LOE ID:	74471
Pollutant:	Nitrogen, Nitrite
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Olive Vista Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Nitrite as N.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrite (as N) is 1.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Data for this line of evidence for Olive Vista Creek was collected at 1 monitoring site [Olive Vista Creek @ Olive Vista Drive]
Temporal Representation:	Data was collected on a single day 5/23/2005.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 48310 Region 9

Olive Vista Creek

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line(s) of evidence are necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the two samples exceed the objective for protection of the aquatic life beneficial uses. Zero of the two samples exceed the objective for protection of the MUN beneficial use. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of two samples exceeded the objective for aquatic life and zero of two samples exceeded the objective for the MUN beneficial use. This sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 48310, Zinc Region 9

Olive Vista Creek

LOE ID:	74474
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Olive Vista Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Olive Vista Creek was collected at 1 monitoring site [Olive Vista Creek @ Olive Vista Drive]
Temporal Representation:	Data was collected on 5/23/2005 and 5/9/2006.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 48310, Zinc **Region 9**

Olive Vista Creek

LOE ID:	74473
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Olive Vista Creek to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for zinc is 5.0 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Olive Vista Creek was collected at 1 monitoring site [Olive Vista Creek @ Olive Vista Drive]

Temporal Representation:	Data was collected on 5/23/2005 and 5/9/2006.	043362
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Tijuana River, Upper (Cottonwood Creek confluence to 1st border crossing)
Water Body ID: CAR9112100020110828192152
Water Body Type: River & Stream

DECISION ID 51774 **Region 9**
Tijuana River, Upper (Cottonwood Creek confluence to 1st border crossing)

Pollutant: Benthic Community Effects
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: Benthic Community Effects is being considered for placement on the CWA section 303(d) List under sections 3.9 and 3.1 of the Listing Policy. Under section 3.9, an additional line of evidence associating Benthic Community Effects with a water or sediment concentration of pollutant(s) is necessary to assess listing status.

Based on the readily available data and information, the weight of evidence provides sufficient justification for not placing Benthic Community Effects in this water segment on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Pursuant to section 3.9 of the Listing Policy, the water does exhibit significant degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index.
4. Pursuant to section 3.9 of the Listing Policy, the water segment does not have associated pollutant(s) samples that exceed water quality objectives.
5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not being met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 51774, Benthic Community Effects **Region 9**
Tijuana River, Upper (Cottonwood Creek confluence to 1st border crossing)

LOE ID: 76812

Pollutant: Benthic-Macroinvertebrate Bioassessments
LOE Subgroup: Population/Community Degradation
Matrix: Water
Fraction: None

Beneficial Use: Warm Freshwater Habitat

Number of Samples:	1	043364
Number of Exceedances:	1	
Data and Information Type:	Benthic macroinvertebrate surveys	
Data Used to Assess Water Quality:	The IBI score for this water body was 14 which indicates that this water body may be considered to have impaired conditions.	
Data Reference:	RWB9 Status Sampling 2007 and 2008	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.	
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13	
Spatial Representation:	Samples were collected at the following station: 911TTJR01-Tijuana River 1.	
Temporal Representation:	Surveys done May 5, 2008.	
Environmental Conditions:		
QAPP Information:	Data collected following SWAMP QA protocols for the RWB9 Status Sampling 2007 and 2008 water quality monitoring project.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 51774, Benthic Community Effects **Region 9**

Tijuana River, Upper (Cottonwood Creek confluence to 1st border crossing)

LOE ID:	79695
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Warm Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	One sample were taken at one station on the Tijuana River near the Cottonwood confluence. The CSCI score is below the 0.79 threshold, and therefore exceeding the water quality objective for the aquatic life beneficial use. It is important to note that the O/E portion of the CSCI for this site includes portions of the watershed that are in Mexico. The pMMI portion of the CSCI was examined for the site score. The result is less thabn 0.5 and thus is outside the reference distribution.
Data Reference:	RWB9 Status Sampling 2007 and 2008 Region 9 CSCI Scores & Water Body Information
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.
Guideline Reference:	Development of a Benthic Index of Biotic Integrity (B-IBI) for Wadeable Streams in Northern Coastal California and its Application to Regional 305(b) Assessment
Spatial Representation:	The samples were collected at station 911TTJR01
Temporal Representation:	The sample was collected in 2008
Environmental Conditions:	
QAPP Information:	Data collected following SWAMP QA protocols for the RWB9 Status Sampling 2007 and 2008 water quality monitoring project
QAPP Information Reference(s):	RWB9 Status Sampling 2007 and 2008

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pine Valley Creek (Lower)
Water Body ID: CAR9113000020110816114851
Water Body Type: River & Stream

DECISION ID 53177 **Region 9**
Pine Valley Creek (Lower)

Pollutant: Alkalinity as CaCO3
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the three samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of three samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53177, Alkalinity as CaCO3 **Region 9**
Pine Valley Creek (Lower)

LOE ID: 75397

Pollutant: Alkalinity as CaCO3
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Cold Freshwater Habitat

Number of Samples: 3

Number of Exceedances:	0	043367
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 3 of 3 samples exceed the criterion for Alkalinity as CaCO3.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The Alkalinity as CaCO3 criteria for the protection of freshwater aquatic life is 20000 ug/L (National Recommended Water Quality Criteria, 2009).	
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 3 monitoring sites [Pine Valley Creek below Secret Cyn. Cr. - 911S02058, Pine Valley Creek ~2.3mi above Secret Cyn. Cr. - 911S00538, Pine Valley Creek ~3.8mi above Secret Cyn. Cr. - 911S03354]	
Temporal Representation:	Data was collected on a single day 5/5/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID	53178	Region 9
Pine Valley Creek (Lower)		

Pollutant:	**Aluminum**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the three samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of three samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and

information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53178, Aluminum **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75413
Pollutant:	Aluminum
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Aluminum.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The National Recommended Water Quality Critiera for the protection of aquatic life from aluminum is the chronic continuous concentration (expressed as a 4-day average) of 87 ug/L.
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 3 monitoring sites [Pine Valley Creek below Secret Cyn. Cr. - 911S02058, Pine Valley Creek ~2.3mi above Secret Cyn. Cr. - 911S00538, Pine Valley Creek ~3.8mi above Secret Cyn. Cr. - 911S03354]
Temporal Representation:	Data was collected on a single day 5/5/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 53178, Aluminum **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75399
Pollutant:	Aluminum
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Aluminum.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for aluminum is 0.2 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 1 monitoring site [Pine Valley Creek @ Old Highway 80]
Temporal Representation:	Data was collected on a single day 3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 53178, Aluminum **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75398
Pollutant:	Aluminum
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Aluminum.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for aluminum is 0.2 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 3 monitoring sites [Pine Valley Creek below Secret Cyn. Cr. - 911S02058, Pine Valley Creek ~2.3mi above Secret Cyn. Cr. - 911S00538, Pine Valley Creek ~3.8mi above Secret Cyn. Cr. - 911S03354]
Temporal Representation:	Data was collected on a single day 5/5/2009.

Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 53180 Region 9

Pine Valley Creek (Lower)

Pollutant:	**Arsenic**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status; under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Three lines of evidence are available in the administrative record to assess this pollutant. Zero of three sample (sediment) exceeded the evaluation guideline and zero of 5 samples (water) exceeded the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of three samples (sediment) and zero of five samples (water) exceeded the guideline/objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53180, Arsenic Region 9

Pine Valley Creek (Lower)

LOE ID:	75440
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING 043371
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Arsenic.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for arsenic is 0.01 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 1 monitoring site [Pine Valley Creek @ Old Highway 80]
Temporal Representation:	Data was collected over the time period 7/31/2008-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 53180, Arsenic **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75441
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Arsenic.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The dissolved arsenic criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved arsenic is 0.150 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 1 monitoring site [Pine Valley Creek @ Old Highway 80]
Temporal Representation:	Data was collected over the time period 7/31/2008-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.

QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 53180, Arsenic **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75439
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Arsenic.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The dissolved arsenic criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater for dissolved arsenic is 0.150 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 3 monitoring sites [Pine Valley Creek below Secret Cyn. Cr. - 911S02058, Pine Valley Creek ~2.3mi above Secret Cyn. Cr. - 911S00538, Pine Valley Creek ~3.8mi above Secret Cyn. Cr. - 911S03354]
Temporal Representation:	Data was collected on a single day 5/5/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 53180, Arsenic **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75429
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Lower) to determine

	beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Arsenic.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for arsenic is 0.01 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 3 monitoring sites [Pine Valley Creek below Secret Cyn. Cr. - 911S02058, Pine Valley Creek ~2.3mi above Secret Cyn. Cr. - 911S00538, Pine Valley Creek ~3.8mi above Secret Cyn. Cr. - 911S03354]
Temporal Representation:	Data was collected on a single day 5/5/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 53180, Arsenic **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75427
Pollutant:	Arsenic
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Arsenic.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for arsenic is 33 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 3 monitoring sites [Pine Valley Creek ~2.3mi above Secret Cyn. Cr. - 911S00538, Pine Valley Creek ~3.8mi above Secret Cyn. Cr. - 911S03354, Pine Valley Creek below Secret Cyn. Cr. - 911S02058]
Temporal Representation:	Data was collected on a single day 5/5/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.

DECISION ID	53181	Region 9
Pine Valley Creek (Lower)		

Pollutant:	**Azinphos-methyl (Guthion)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the 0 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 0 samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53181, Azinphos-methyl (Guthion)	**Region 9**
Pine Valley Creek (Lower)	

LOE ID:	78082
Pollutant:	Azinphos-methyl (Guthion)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Azinphos methyl.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The National Recommended Water Quality Criteria for Azinphos Methyl (Guthion) for the protection of freshwater aquatic life is a maximum of 0.01 ug/l.
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 1 monitoring site [Pine Valley Creek @ Old Highway 80]
Temporal Representation:	Data was collected on a single day 3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID 53182 — Region 9

Pine Valley Creek (Lower)

Pollutant:	**Barium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the one samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53182, Barium — Region 9

Pine Valley Creek (Lower)

LOE ID: 75442

Pollutant:	Barium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Barium.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for barium is 1 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals, CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 1 monitoring site [Pine Valley Creek @ Old Highway 80]
Temporal Representation:	Data was collected on a single day 3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID	51720	Region 9
Pine Valley Creek (Lower)		

Pollutant:	**Benthic Community Effects**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

Benthic Community Effects is being considered for placement on the CWA section 303(d) List under sections 3.9 and 3.1 of the Listing Policy. Under section 3.9, an additional line of evidence associating Benthic Community Effects with a water or sediment concentration of pollutant(s) is necessary to assess listing status.

Based on the readily available data and information, the weight of evidence provides sufficient justification for not placing Benthic Community Effects in this water segment on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used does satisfy the data quantity requirements of section 6.1.5 of the Policy.
3. Pursuant to section 3.9 of the Listing Policy, the water does not exhibit significant degradation in biological populations and/or communities as compared to reference site(s) using the California Stream Condition Index.

4. Pursuant to section 3.9 of the Listing Policy, the water segment does not have associated pollutant(s) samples that exceed water quality objectives.
5. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not being met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 51720, Benthic Community Effects **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75443
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	The IBI scores for this water body were above 40 which indicates that this water body is not considered to have impaired conditions.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at the following stations: 911S00538-Pine Valley Creek ~2.3mi above Secret Cyn. Cr. 911S02058-Pine Valley Creek below Secret Cyn. Cr. 911S03354-Pine Valley Creek ~3.8mi above Secret Cyn. Cr.
Temporal Representation:	Surveys done May 9, 2009.
Environmental Conditions:	
QAPP Information:	Data collected following SWAMP QA protocols for the Southern California Stormwater Monitoring Coalition Project.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 51720, Benthic Community Effects **Region 9**

Pine Valley Creek (Lower)

LOE ID:	79682
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water

Fraction:	None	043378
Beneficial Use:	Cold Freshwater Habitat	
Number of Samples:	8	
Number of Exceedances:	0	
Data and Information Type:	Benthic macroinvertebrate surveys	
Data Used to Assess Water Quality:	A total of seven stations were sampled on Pine Valley Creek and its main tributary, Indian Creek, upstream of Barrett reservoir. Zero of seven samples had CSCI score below the 0.79 threshold and is therefore exceeding the water quality objective for the aquatic life beneficial use.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009 RWB9 Status Sampling 2007 and 2008 Region 9 CSCI Scores & Water Body Information	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.	
Guideline Reference:	The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.	
Spatial Representation:	Samples were collected at the following stations: 911S02058, 911S00538, 911S03354, 911S01818, 911NCPCRx, 911TJNPC2, 911TJIND2	
Temporal Representation:	Surveys done from 2007 to 2009.	
Environmental Conditions:		
QAPP Information:	Data collected following SWAMP QA protocols for the Southern California Stormwater Monitoring Coalition Project.	
QAPP Information Reference(s):	RWB9 Stormwater Monitoring Council CY 2009 RWB9 Status Sampling 2007 and 2008	

DECISION ID	**53183**	**Region 9**
Pine Valley Creek (Lower)		

Pollutant:	**Beryllium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. 0 of the 1 samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 1 samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53183, Beryllium **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75454
Pollutant:	Beryllium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Beryllium.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for beryllium is 0.004 mg/L 9 (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 1 monitoring site [Pine Valley Creek @ Old Highway 80]
Temporal Representation:	Data was collected on a single day 3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID	53185	043380 Region 9
Pine Valley Creek (Lower)		

Pollutant:	**Bifenthrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the three samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of three samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53185, Bifenthrin **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75456
Pollutant:	Bifenthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Bifenthrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses.

Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	043381
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Bifenthrin does not exceed 0.0006 ug/L.	
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 3 monitoring sites [Pine Valley Creek below Secret Cyn. Cr. - 911S02058, Pine Valley Creek ~2.3mi above Secret Cyn. Cr. - 911S00538, Pine Valley Creek ~3.8mi above Secret Cyn. Cr. - 911S03354]	
Temporal Representation:	Data was collected on a single day 5/5/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID **53186** **Region 9**

Pine Valley Creek (Lower)

Pollutant:	**Cadmium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status; under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Four lines of evidence are available in the administrative record to assess this pollutant. Zero of three sample (sediment) exceeded the evaluation guideline and zero of 11 samples (water) exceeded the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of three samples (sediment) and zero of 11 samples (water) exceeded the guideline/objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53186, Cadmium **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75475	043382

Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California, 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 1 monitoring site [Pine Valley Creek @ Old Highway 80]
Temporal Representation:	Data was collected 5/28/2003 - 6/2/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 53186, Cadmium **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75472
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Cadmium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP

Water Quality Objective/Criterion:	The California Maximum Contaminant Level for cadmium is 0.005 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 3 monitoring sites [Pine Valley Creek below Secret Cyn. Cr. - 911S02058, Pine Valley Creek ~2.3mi above Secret Cyn. Cr. - 911S00538, Pine Valley Creek ~3.8mi above Secret Cyn. Cr. - 911S03354]
Temporal Representation:	Data was collected on a single day 5/5/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 53186, Cadmium **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75256
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Cadmium.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 1 monitoring site [Pine Valley Creek @ Old Highway 80 - 911TIJ02]
Temporal Representation:	Data was collected over the time period 7/31/2008-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 53186, Cadmium **Region 9**

Pine Valley Creek (Lower) 043384

LOE ID:	75474
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Cadmium.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for cadmium is 0.005 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 1 monitoring site [Pine Valley Creek @ Old Highway 80]
Temporal Representation:	Data was collected 5/28/2003 - 6/2/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 53186, Cadmium **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75476
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Cadmium.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	The California Maximum Contaminant Level for cadmium is 0.005 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 1 monitoring site [Pine Valley Creek @ Old Highway 80]
Temporal Representation:	Data was collected over the time period 7/31/2008-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 53186, Cadmium **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75458
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Cadmium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for cadmium is 4.98 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 3 monitoring sites [Pine Valley Creek ~3.8mi above Secret Cyn. Cr. - 911S03354, Pine Valley Creek ~2.3mi above Secret Cyn. Cr. - 911S00538, Pine Valley Creek below Secret Cyn. Cr. - 911S02058]
Temporal Representation:	Data was collected on a single day 5/5/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 53186, Cadmium **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75473
Pollutant:	Cadmium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Cadmium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Cadmium to protect aquatic life in freshwater. The dissolved Cadmium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 3 monitoring sites [Pine Valley Creek below Secret Cyn. Cr. - 911S02058, Pine Valley Creek ~2.3mi above Secret Cyn. Cr. - 911S00538, Pine Valley Creek ~3.8mi above Secret Cyn. Cr. - 911S03354]
Temporal Representation:	Data was collected on a single day 5/5/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID	**53187**	**Region 9**
Pine Valley Creek (Lower)		

Pollutant:	**Chloride**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the three samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of three samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53187, Chloride **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75260
Pollutant:	Chloride
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Chloride.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Chloride objective for the protection of aquatic life according to Table 3-2 for Pine Valley Creek (Lower) within the Tijuana Hydrologic Unit is 250 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 3 monitoring sites [Pine Valley Creek below Secret Cyn. Cr. - 911S02058, Pine Valley Creek ~2.3mi above Secret Cyn. Cr. - 911S00538, Pine Valley Creek ~3.8mi above Secret Cyn. Cr. - 911S03354]
Temporal Representation:	Data was collected on a single day 5/5/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 53187, Chloride **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75258

Pollutant:	Chloride	043388
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	3	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Chloride.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	The recommended secondary maximum contamination level acceptable to consumers of drinking water is 250 mg/L.	
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 3 monitoring sites [Pine Valley Creek below Secret Cyn. Cr. - 911S02058, Pine Valley Creek ~2.3mi above Secret Cyn. Cr. - 911S00538, Pine Valley Creek ~3.8mi above Secret Cyn. Cr. - 911S03354]	
Temporal Representation:	Data was collected on a single day 5/5/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID	**53188**	**Region 9**
Pine Valley Creek (Lower)		

Pollutant:	**Chlorpyrifos**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the two samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of two samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53188, Chlorpyrifos **Region 9**

Pine Valley Creek (Lower)

LOE ID:	78074
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for chlorpyrifos is 2.1 Âµg/L.
Guideline Reference:	2011 Edition of the Drinking Water Standards and Health Advisories
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 1 monitoring site [Pine Valley Creek @ Old Highway 80]
Temporal Representation:	Data was collected over the time period 7/31/2008-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 53188, Chlorpyrifos **Region 9**

Pine Valley Creek (Lower)

LOE ID:	78075
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	4	043390
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Chlorpyrifos.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The USEPA drinking water health advisory for chlorpyrifos is 2.1 Âµg/L.	
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 1 monitoring site [Pine Valley Creek @ Old Highway 80]	
Temporal Representation:	Data was collected over the time period 5/2/2006-6/2/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 53188, Chlorpyrifos **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75269
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department

	of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 1 monitoring site [Pine Valley Creek @ Old Highway 80]
Temporal Representation:	Data was collected over the time period 5/2/2006-6/2/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 53188, Chlorpyrifos **Region 9**

Pine Valley Creek (Lower)

LOE ID:	78073
Pollutant:	Chlorpyrifos
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Chlorpyrifos.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater criterion continuous concentration to protect aquatic organisms is 0.015 ug/L (Siepmann and Finlayson 2000).
Guideline Reference:	Water quality criteria for diazinon and chlorpyrifos. Administrative Report 00-3. Rancho Cordova, CA: Pesticide Investigations Unit, Office of Spills and Response. CA Department of Fish and Game (with minor corrections to significant figures as described in Beaulaurier et al., 2005).
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 1 monitoring site [Pine Valley Creek @ Old Highway 80]
Temporal Representation:	Data was collected over the time period 7/31/2008-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID 53190 **Region 9**

Pine Valley Creek (Lower)

Pollutant: Chromium

Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	043392
Last Listing Cycle's Final Listing Decision:	New Decision	
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status; under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Three lines of evidence are available in the administrative record to assess this pollutant. Zero of three sample (sediment) exceeded the evaluation guideline and zero of 5 samples (water) exceeded the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of three samples (sediment) and zero of five samples (water) exceeded the guideline/objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53190, Chromium **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75271
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Chromium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce

	detrimental physiological responses in, human, plant, animal, or aquatic life 043393
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for chromium is 111 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 3 monitoring sites [Pine Valley Creek ~2.3mi above Secret Cyn. Cr. - 911S00538, Pine Valley Creek ~3.8mi above Secret Cyn. Cr. - 911S03354, Pine Valley Creek below Secret Cyn. Cr. - 911S02058]
Temporal Representation:	Data was collected on a single day 5/5/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 53190, Chromium **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75285
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Chromium. Since the chromium species was not identified, the data point(s) were assessed using both the Chromium III criteria which is hardness-dependent, and the criterion continuous concentration (4-day average) to protect aquatic life in freshwater for chromium VI which is 11 ug/L and is not hardness dependent.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved chromium to protect aquatic life in freshwater. The dissolved Chromium criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 3 monitoring sites [Pine Valley Creek below Secret Cyn. Cr. - 911S02058, Pine Valley Creek ~2.3mi above Secret Cyn. Cr. - 911S00538, Pine Valley Creek ~3.8mi above Secret Cyn. Cr. - 911S03354]
Temporal Representation:	Data was collected on a single day 5/5/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.

QAPP Information Reference(s): Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 53190, Chromium **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75287
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Chromium.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 1 monitoring site [Pine Valley Creek @ Old Highway 80 - 911TIJ02]
Temporal Representation:	Data was collected over the time period 7/31/2008-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 53190, Chromium **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75284
Pollutant:	Chromium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	043395
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Chromium.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for total chromium is 0.05 mg/L (Title 22 of the California Code of Regulations).	
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 3 monitoring sites [Pine Valley Creek below Secret Cyn. Cr. - 911S02058, Pine Valley Creek ~2.3mi above Secret Cyn. Cr. - 911S00538, Pine Valley Creek ~3.8mi above Secret Cyn. Cr. - 911S03354]	
Temporal Representation:	Data was collected on a single day 5/5/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID	**53198**	**Region 9**
Pine Valley Creek (Lower)		

Pollutant:	**Copper**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status; under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Four lines of evidence are available in the administrative record to assess this pollutant. Zero of three sample (sediment) exceeded the evaluation guideline and zero of 11 samples (water) exceeded the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of three samples (sediment) and zero of 11 samples (water) exceeded the guideline/objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and

information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53198, Copper **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75305
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 1 monitoring site [Pine Valley Creek @ Old Highway 80]
Temporal Representation:	Data was collected 5/28/2003 - 6/2/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 53198, Copper **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75304
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Copper.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved copper to protect aquatic life in freshwater. The dissolved copper criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 3 monitoring sites [Pine Valley Creek below Secret Cyn. Cr. - 911S02058, Pine Valley Creek ~2.3mi above Secret Cyn. Cr. - 911S00538, Pine Valley Creek ~3.8mi above Secret Cyn. Cr. - 911S03354]
Temporal Representation:	Data was collected on a single day 5/5/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 53198, Copper **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75303
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Copper.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for copper is 1.0 mg/L (Title 22 California Code of Regulations).
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 3 monitoring sites [Pine Valley Creek below Secret Cyn. Cr. - 911S02058, Pine Valley Creek ~2.3mi above Secret Cyn. Cr. - 911S00538, Pine Valley Creek ~3.8mi above Secret Cyn. Cr. - 911S03354]

Temporal Representation:	Data was collected on a single day 5/5/2009. 043398
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 53198, Copper **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75320
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Copper.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 1 monitoring site [Pine Valley Creek @ Old Highway 80 - 911TIJ02]
Temporal Representation:	Data was collected over the time period 7/31/2008-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 53198, Copper **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75319
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	2	043399
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Copper.	
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Secondary MCL for copper is 1.0 mg/L (Title 22 California Code of Regulations).	
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 1 monitoring site [Pine Valley Creek @ Old Highway 80]	
Temporal Representation:	Data was collected over the time period 7/31/2008-3/31/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.	

Line of Evidence (LOE) for Decision ID 53198, Copper **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75306
Pollutant:	Copper
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Copper.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for copper is 1.0 mg/L (Title 22 California Code of Regulations).
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 1 monitoring site [Pine Valley Creek @ Old Highway 80]
Temporal Representation:	Data was collected 5/28/2003 - 6/2/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.

QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 53198, Copper Pine Valley Creek (Lower) **Region 9**

LOE ID:	75301
Pollutant:	Copper
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Copper.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for copper is 149 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 3 monitoring sites [Pine Valley Creek ~2.3mi above Secret Cyn. Cr. - 911S00538, Pine Valley Creek ~3.8mi above Secret Cyn. Cr. - 911S03354, Pine Valley Creek below Secret Cyn. Cr. - 911S02058]
Temporal Representation:	Data was collected on a single day 5/5/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 53199 **Region 9**
Pine Valley Creek (Lower)

Pollutant:	**Cyfluthrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the three samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of three samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53199, Cyfluthrin **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75322
Pollutant:	Cyfluthrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Cyfluthrin, total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of lambda-cyhalothrin does not exceed 0.0005 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Mixtures of lambda-cyhalothrin and other pyrethroids should be considered in an additive manner. (Fojut et al. 2012)Â
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 3 monitoring sites [Pine Valley Creek below Secret Cyn. Cr. - 911S02058, Pine Valley Creek ~2.3mi above Secret Cyn. Cr. - 911S00538, Pine Valley Creek ~3.8mi above Secret Cyn. Cr. - 911S03354]
Temporal Representation:	Data was collected on a single day 5/5/2009.

Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 53200 Region 9

Pine Valley Creek (Lower)

Pollutant:	**Cyhalothrin, Lambda**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the three samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of three samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53200, Cyhalothrin, Lambda Region 9

Pine Valley Creek (Lower)

LOE ID:	75335
Pollutant:	Cyhalothrin, Lambda
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Cyhalothrin, lambda, total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009

SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Cyhalothrin, lambda, total does not exceed 0.0005 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 3 monitoring sites [Pine Valley Creek below Secret Cyn. Cr. - 911S02058, Pine Valley Creek ~2.3mi above Secret Cyn. Cr. - 911S00538, Pine Valley Creek ~3.8mi above Secret Cyn. Cr. - 911S03354]
Temporal Representation:	Data was collected on a single day 5/5/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID 53202 Region 9

Pine Valley Creek (Lower)

Pollutant:	**Cypermethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the three samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of three samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53202, Cypermethrin Region 9

Pine Valley Creek (Lower)

LOE ID:	75337
Pollutant:	Cypermethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Three of three sample results were not used in the assessment because the laboratory data was non-detect and the method detection limit was above the guideline and therefore the results could not be quantified with the level of certainty required by the Listing Policy
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of cypermethrin does not exceed 0.0002 ug/L and if the 1-h average concentration does not exceed 0.001 ug/L. Fojut et al. 2012)
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 3 monitoring sites [Pine Valley Creek below Secret Cyn. Cr. - 911S02058, Pine Valley Creek ~2.3mi above Secret Cyn. Cr. - 911S00538, Pine Valley Creek ~3.8mi above Secret Cyn. Cr. - 911S03354]
Temporal Representation:	Data was collected on a single day 5/5/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID	**53205**	**Region 9**
Pine Valley Creek (Lower)		

Pollutant:	**Deltamethrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the three samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of three samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53205, Deltamethrin **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75339
Pollutant:	Deltamethrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Deltamethrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for Deltamethrin is the maximum acceptable toxicant concentration (MATC) of 0.02 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 3 monitoring sites [Pine Valley Creek below Secret Cyn. Cr. - 911S02058, Pine Valley Creek ~2.3mi above Secret Cyn. Cr. - 911S00538, Pine Valley Creek ~3.8mi above Secret Cyn. Cr. - 911S03354]
Temporal Representation:	Data was collected on a single day 5/5/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **53211** **Region 9**

Pine Valley Creek (Lower)

Pollutant: **Diazinon**

Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	043406
Last Listing Cycle's Final Listing Decision:	New Decision	
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 6 samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 6 samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53211, Diazinon **Region 9**

Pine Valley Creek (Lower)

LOE ID:	78077
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Diazinon.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for diazinon is 1.4 Âµg/L.
Guideline Reference:	2011 Edition of the Drinking Water Standards and Health Advisories

Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 1 monitoring site [Pine Valley Creek @ Old Highway 80]
Temporal Representation:	Data was collected over the time period 7/31/2008-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 53211, Diazinon **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75351
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Diazinon.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous concentration (Finlayson, 2004).
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 1 monitoring site [Pine Valley Creek @ Old Highway 80]
Temporal Representation:	Data was collected over the time period 5/2/2006-6/2/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 53211, Diazinon **Region 9**

Pine Valley Creek (Lower)

LOE ID:	78078
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	043408
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	4	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Diazinon.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The USEPA drinking water health advisory for diazinon is 1.4 Âµg/L.	
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 1 monitoring site [Pine Valley Creek @ Old Highway 80]	
Temporal Representation:	Data was collected over the time period 5/2/2006-6/2/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 53211, Diazinon **Region 9**

Pine Valley Creek (Lower)

LOE ID:	78076
Pollutant:	Diazinon
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Diazinon.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The freshwater chronic value for diazinon is 0.1 ug/L, expressed as a continuous

	concentration (Finlayson, 2004). 043409
Guideline Reference:	Water quality for diazinon. Memorandum to J. Karkoski, Central Valley RWQCB. Rancho Cordova, CA: Pesticide Investigation Unit, CA Department of Fish and Game
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 1 monitoring site [Pine Valley Creek @ Old Highway 80]
Temporal Representation:	Data was collected over the time period 7/31/2008-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID 53215 Region 9

Pine Valley Creek (Lower)

Pollutant:	**Dimethoate**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the one samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53215, Dimethoate Region 9

Pine Valley Creek (Lower)

LOE ID:	77801
Pollutant:	Dimethoate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply

Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Dimethoate.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Department of Health Services archived advisory level for dimethoate is 1 Âµg/L.
Guideline Reference:	CDPH Archived Advisory Levels for Drinking Water. Archived Advisory Levels are currently considered Notification Levels.
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 1 monitoring site [Pine Valley Creek @ Old Highway 80]
Temporal Representation:	Data was collected on a single day 3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 53215, Dimethoate **Region 9**

Pine Valley Creek (Lower)

LOE ID:	77802
Pollutant:	Dimethoate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Dimethoate.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for Dimethoate is the median lethal concentration (LC50; 43 ug/L).
Guideline Reference:	OPP Pesticide Ecotoxicity Database.

Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 1 monitoring site [Pine Valley Creek @ Old Highway 80]
Temporal Representation:	Data was collected on a single day 3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID 47237 Region 9

Pine Valley Creek (Lower)

Pollutant:	**Disulfoton**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 one line(s) of evidence are necessary to assess the listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the one samples exceed the guideline for the protection of the MUN beneficial use and zero of one samples exceed the guideline for the protection of the aquatic life beneficial use. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one samples exceeded the guidelines and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 47237, Disulfoton Region 9

Pine Valley Creek (Lower)

LOE ID:	77804
Pollutant:	Disulfoton
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Disulfoton.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for disulfoton is 0.05 Âµg/L (US EPA 1973 guidance).
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 1 monitoring site [Pine Valley Creek @ Old Highway 80]
Temporal Representation:	Data was collected on a single day 3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 47237, Disulfoton **Region 9**

Pine Valley Creek (Lower)

LOE ID:	77803
Pollutant:	Disulfoton
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Disulfoton.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for disulfoton is 0.7 Âµg/L.
Guideline Reference:	2011 Edition of the Drinking Water Standards and Health Advisories
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 1 monitoring site [Pine Valley Creek @ Old Highway 80]
Temporal Representation:	Data was collected on a single day 3/31/2009.

Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID 53217 Region 9
Pine Valley Creek (Lower)

Pollutant:	**Esfenvalerate/Fenvalerate**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the three samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of three samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53217, Esfenvalerate/Fenvalerate Region 9
Pine Valley Creek (Lower)

LOE ID:	75366
Pollutant:	Esfenvalerate/Fenvalerate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for

	Esfenvalerate/Fenvalerate, total.	043414
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	According to the USEPA Office of Pesticide Programs Ecotoxicity database, the aquatic life EC50 for Esfenvalerate/Fenvalerate is 0.9 ug/L.	
Guideline Reference:	OPP Pesticide Ecotoxicity Database.	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 3 monitoring sites [Pine Valley Creek below Secret Cyn. Cr. - 911S02058, Pine Valley Creek ~2.3mi above Secret Cyn. Cr. - 911S00538, Pine Valley Creek ~3.8mi above Secret Cyn. Cr. - 911S03354]	
Temporal Representation:	Data was collected on a single day 5/5/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID **53224** **Region 9**

Pine Valley Creek (Lower)

Pollutant:	**Ethoprop**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the one samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53224, Ethoprop **Region 9**

Pine Valley Creek (Lower) 043415

LOE ID:	77805
Pollutant:	Ethoprop
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Ethoprop.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for Ethoprop is the maximum acceptable toxicant concentration (MATC) of 1.4 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 1 monitoring site [Pine Valley Creek @ Old Highway 80]
Temporal Representation:	Data was collected on a single day 3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID **53229** **Region 9**

Pine Valley Creek (Lower)

Pollutant:	**Fenpropathrin**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the three samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that: 043416
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of three samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53229, Fenpropathrin **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75377
Pollutant:	Fenpropathrin
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Fenpropathrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for Fenpropathrin is the median lethal concentration (LC50; 2.2 ug/L).
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 3 monitoring sites [Pine Valley Creek below Secret Cyn. Cr. - 911S02058, Pine Valley Creek ~2.3mi above Secret Cyn. Cr. - 911S00538, Pine Valley Creek ~3.8mi above Secret Cyn. Cr. - 911S03354]
Temporal Representation:	Data was collected on a single day 5/5/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **53230** **Region 9**

Pine Valley Creek (Lower)

Pollutant: **Iron**

Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**	043417
Last Listing Cycle's Final Listing Decision:	New Decision	
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the three samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of three samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53230, Iron **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75385
Pollutant:	Iron
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Iron.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for iron is 0.3 mg/L (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 3 monitoring sites [Pine Valley Creek below Secret Cyn. Cr. - 911S02058, Pine Valley Creek ~2.3mi above Secret Cyn. Cr. - 911S00538, Pine Valley Creek ~3.8mi above Secret Cyn. Cr. - 911S03354]
Temporal Representation:	Data was collected on a single day 5/5/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 53230, Iron **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75387
Pollutant:	Iron
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Iron.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for iron is 0.3 mg/L (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 1 monitoring site [Pine Valley Creek @ Old Highway 80]
Temporal Representation:	Data was collected over the time period 7/31/2008-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 53230, Iron **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75386
Pollutant:	Iron
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	3

Number of Exceedances:	0	043419
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Iron.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Iron objective for the protection of aquatic life according to Table 3-2 for Pine Valley Creek (Lower) within the Tijuana Hydrologic Unit is 0.3 mg/L.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 3 monitoring sites [Pine Valley Creek below Secret Cyn. Cr. - 911S02058, Pine Valley Creek ~2.3mi above Secret Cyn. Cr. - 911S00538, Pine Valley Creek ~3.8mi above Secret Cyn. Cr. - 911S03354]	
Temporal Representation:	Data was collected on a single day 5/5/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID	**53232**	**Region 9**
Pine Valley Creek (Lower)		

Pollutant:	**Lead**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status; under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Four lines of evidence are available in the administrative record to assess this pollutant. Zero of three sample (sediment) exceeded the evaluation guideline and zero of 11 samples (water) exceeded the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of three samples (sediment) and zero of 11 samples (water) exceeded the guideline/objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available

indicating that standards are not met. 043420

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53232, Lead **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75404
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 6 samples exceed the criterion for Lead.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for Lead is 0.015 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 1 monitoring site [Pine Valley Creek @ Old Highway 80]
Temporal Representation:	Data was collected 5/28/2003 - 6/2/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 53232, Lead **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75405
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	6

Number of Exceedances:	0	043421
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Lead.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.	
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 1 monitoring site [Pine Valley Creek @ Old Highway 80]	
Temporal Representation:	Data was collected 5/28/2003 - 6/2/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

Line of Evidence (LOE) for Decision ID 53232, Lead **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75402
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Lead.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition

Evaluation Guideline:	043422
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 1 monitoring site [Pine Valley Creek @ Old Highway 80 - 911TIJ02]
Temporal Representation:	Data was collected over the time period 7/31/2008-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 53232, Lead **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75401
Pollutant:	Lead
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Lead.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved lead to protect aquatic life in freshwater. The dissolved lead criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 3 monitoring sites [Pine Valley Creek below Secret Cyn. Cr. - 911S02058, Pine Valley Creek ~2.3mi above Secret Cyn. Cr. - 911S00538, Pine Valley Creek ~3.8mi above Secret Cyn. Cr. - 911S03354]
Temporal Representation:	Data was collected on a single day 5/5/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 53232, Lead **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75388
Pollutant:	Lead
LOE Subgroup:	Pollutant-Sediment

Matrix:	Sediment	043423
Fraction:	Total	
Beneficial Use:	Cold Freshwater Habitat	
Number of Samples:	3	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Lead.	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for lead is 128 mg/Kg dry weight (MacDonald et al. 2000).	
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 3 monitoring sites [Pine Valley Creek ~2.3mi above Secret Cyn. Cr. - 911S00538, Pine Valley Creek ~3.8mi above Secret Cyn. Cr. - 911S03354, Pine Valley Creek below Secret Cyn. Cr. - 911S02058]	
Temporal Representation:	Data was collected on a single day 5/5/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID	**53234**	**Region 9**
Pine Valley Creek (Lower)		

Pollutant:	**Malathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollution

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 6 samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 6 samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and

confidence of the Listing Policy, the applicable beneficial use support rating. 043424
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53234, Malathion **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75417
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Malathion.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 1 monitoring site [Pine Valley Creek @ Old Highway 80]
Temporal Representation:	Data was collected over the time period 5/2/2006-6/2/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 53234, Malathion **Region 9**

Pine Valley Creek (Lower)

LOE ID:	78080
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 4 samples exceed the criterion for Malathion.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for malathion is 100 Âµg/L.
Guideline Reference:	2006 edition of the drinking water standards and health advisories, EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 1 monitoring site [Pine Valley Creek @ Old Highway 80]
Temporal Representation:	Data was collected over the time period 5/2/2006-6/2/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 53234, Malathion **Region 9**

Pine Valley Creek (Lower)

LOE ID:	78081
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Malathion.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA national ambient water quality criteria for freshwater aquatic life instantaneous maximum for malathion is 0.1 Âµg/L.

Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 1 monitoring site [Pine Valley Creek @ Old Highway 80]
Temporal Representation:	Data was collected over the time period 7/31/2008-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 53234, Malathion **Region 9**

Pine Valley Creek (Lower)

LOE ID:	78079
Pollutant:	Malathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Malathion.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The USEPA drinking water health advisory for malathion is 100 Âµg/L.
Guideline Reference:	2011 Edition of the Drinking Water Standards and Health Advisories
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 1 monitoring site [Pine Valley Creek @ Old Highway 80]
Temporal Representation:	Data was collected over the time period 7/31/2008-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID **53235** **Region 9**

Pine Valley Creek (Lower)

Pollutant:	**Manganese**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised

Impairment from Pollutant or Pollution:	Pollutant	043427

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the three samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of three samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53235, Manganese **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75419
Pollutant:	Manganese
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Manganese.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for manganese is 0.05 mg/L (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 3 monitoring sites [Pine Valley Creek below Secret Cyn. Cr. - 911S02058, Pine Valley Creek ~2.3mi above Secret Cyn. Cr. - 911S00538, Pine Valley Creek ~3.8mi above Secret Cyn. Cr. - 911S03354]

Temporal Representation:	Data was collected on a single day 5/5/2009.	043428
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 53235, Manganese **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75431
Pollutant:	Manganese
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Manganese.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL for manganese is 0.05 mg/L (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 1 monitoring site [Pine Valley Creek @ Old Highway 80]
Temporal Representation:	Data was collected over the time period 7/31/2008-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 53235, Manganese **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75430
Pollutant:	Manganese
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Lower) to determine

	beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Manganese.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Manganese objective for the protection of aquatic life according to Table 3-2 for Pine Valley Creek (Lower) within the Tijuana Hydrologic Unit is 0.05 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 3 monitoring sites [Pine Valley Creek below Secret Cyn. Cr. - 911S02058, Pine Valley Creek ~2.3mi above Secret Cyn. Cr. - 911S00538, Pine Valley Creek ~3.8mi above Secret Cyn. Cr. - 911S03354]
Temporal Representation:	Data was collected on a single day 5/5/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID	**53236**	**Region 9**
Pine Valley Creek (Lower)		

Pollutant:	**Methidathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the one samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53236, Methidathion **Region 9**

Pine Valley Creek (Lower) 043430

LOE ID:	77806
Pollutant:	Methidathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Methidathion.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Based on USEPA IRIS reference dose (RfD) as a drinking water level, the drinking water health advisory level for methidathion is 7 Âµg/L.
Guideline Reference:	IRIS Database Calculations (summary)
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 1 monitoring site [Pine Valley Creek @ Old Highway 80]
Temporal Representation:	Data was collected on a single day 3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 53236, Methidathion **Region 9**

Pine Valley Creek (Lower)

LOE ID:	77807
Pollutant:	Methidathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Methidathion.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The evaluation guideline for Methidathion is the maximum acceptable toxicant concentration (MATC) of 0.86 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 1 monitoring site [Pine Valley Creek @ Old Highway 80]
Temporal Representation:	Data was collected on a single day 3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID 53238 Region 9

Pine Valley Creek (Lower)

Pollutant:	**Methyl Parathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the one samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of one samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53238, Methyl Parathion Region 9

Pine Valley Creek (Lower)

LOE ID:	77808

Pollutant:	Methyl Parathion	043432
LOE Subgroup:	Pollutant-Water	
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Cold Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Parathion, Methyl.	
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. There shall be no increase in hazardous chemical concentrations found in bottom sediments or aquatic life (Water Quality Control Plan,San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The California Department of Fish and Game instantaneous criteria for Methyl Parathion is 0.08 ug/L.	
Guideline Reference:	Hazard Assessment of the Insecticide Methyl Parathion to Aquatic Organisms in the Sacramento River System. California Department of Fish and Game. Environmental Services Division. Administrative Report 92-1	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 1 monitoring site [Pine Valley Creek @ Old Highway 80]	
Temporal Representation:	Data was collected on a single day 3/31/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.	

DECISION ID	**53239**	**Region 9**
Pine Valley Creek (Lower)		

Pollutant:	**Nickel**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status; under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List.

Three lines of evidence are available in the administrative record to assess this pollutant. Zero of three sample (sediment) exceeded the evaluation guideline and zero of 5 samples (water) exceeded the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is

sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of three samples (sediment) and zero of five samples (water) exceeded the guideline/objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53239, Nickel **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75444
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Nickel.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for nickel is 48.6 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 3 monitoring sites [Pine Valley Creek ~2.3mi above Secret Cyn. Cr. - 911S00538, Pine Valley Creek ~3.8mi above Secret Cyn. Cr. - 911S03354, Pine Valley Creek below Secret Cyn. Cr. - 911S02058]
Temporal Representation:	Data was collected on a single day 5/5/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 53239, Nickel **Region 9**

Pine Valley Creek (Lower) 043434

LOE ID:	75446
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Nickel.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nickel is 0.1 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 3 monitoring sites [Pine Valley Creek below Secret Cyn. Cr. - 911S02058, Pine Valley Creek ~2.3mi above Secret Cyn. Cr. - 911S00538, Pine Valley Creek ~3.8mi above Secret Cyn. Cr. - 911S03354]
Temporal Representation:	Data was collected on a single day 5/5/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 53239, Nickel **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75447
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Nickel.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Nickel to

	protect aquatic life in freshwater. The dissolved Nickel criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 3 monitoring sites [Pine Valley Creek below Secret Cyn. Cr. - 911S02058, Pine Valley Creek ~2.3mi above Secret Cyn. Cr. - 911S00538, Pine Valley Creek ~3.8mi above Secret Cyn. Cr. - 911S03354]
Temporal Representation:	Data was collected on a single day 5/5/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 53239, Nickel **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75448
Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Nickel.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nickel is 0.1 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 1 monitoring site [Pine Valley Creek @ Old Highway 80]
Temporal Representation:	Data was collected over the time period 7/31/2008-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 53239, Nickel **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75459

Pollutant:	Nickel
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Nickel.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California, 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 1 monitoring site [Pine Valley Creek @ Old Highway 80 - 911TIJ02]
Temporal Representation:	Data was collected over the time period 7/31/2008-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID	**53240**	**Region 9**
Pine Valley Creek (Lower)		

Pollutant:	**Nitrate/Nitrite (Nitrite + Nitrate as N)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the five samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that: 043437
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of five samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53240, Nitrate/Nitrite (Nitrite + Nitrate as N) **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75460
Pollutant:	Nitrate/Nitrite (Nitrite + Nitrate as N)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Nitrate/Nitrite as N.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrate + nitrite (as N) is 10.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 3 monitoring sites [Pine Valley Creek below Secret Cyn. Cr. - 911S02058, Pine Valley Creek ~2.3mi above Secret Cyn. Cr. - 911S00538, Pine Valley Creek ~3.8mi above Secret Cyn. Cr. - 911S03354]
Temporal Representation:	Data was collected on a single day 5/5/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 53240, Nitrate/Nitrite (Nitrite + Nitrate as N) **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75461
Pollutant:	Nitrate/Nitrite (Nitrite + Nitrate as N)
LOE Subgroup:	Pollutant-Water

Matrix:	Water	043438
Fraction:	None	
Beneficial Use:	Municipal & Domestic Supply	
Number of Samples:	2	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Nitrate/Nitrite as N.	
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrate + nitrite (as N) is 10.0 mg/L (Title 22 of the California Code of Regulations).	
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 1 monitoring site [Pine Valley Creek @ Old Highway 80]	
Temporal Representation:	Data was collected over the time period 7/1/2004-7/2/2004.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.	

DECISION ID	**53241**	**Region 9**
Pine Valley Creek (Lower)		

Pollutant:	**Nitrogen, Nitrite**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this pollutant. Zero of the 7 samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of 7 samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available

indicating that standards are not met. 043439

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53241, Nitrogen, Nitrite **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75462
Pollutant:	Nitrogen, Nitrite
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Nitrite as N.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrite (as N) is 1.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 3 monitoring sites [Pine Valley Creek below Secret Cyn. Cr. - 911S02058, Pine Valley Creek ~2.3mi above Secret Cyn. Cr. - 911S00538, Pine Valley Creek ~3.8mi above Secret Cyn. Cr. - 911S03354]
Temporal Representation:	Data was collected on a single day 5/5/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 53241, Nitrogen, Nitrite **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75463
Pollutant:	Nitrogen, Nitrite
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Nitrite as N.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrite (as N) is 1.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 1 monitoring site [Pine Valley Creek @ Old Highway 80]
Temporal Representation:	Data was collected over the time period 5/28/2003-7/1/2004.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 53241, Nitrogen, Nitrite **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75464
Pollutant:	Nitrogen, Nitrite
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Nitrite as N.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Maximum Contaminant Level for nitrite (as N) is 1.0 mg/L (Title 22 of the California Code of Regulations).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 1 monitoring site [Pine Valley Creek @ Old Highway 80]
Temporal Representation:	Data was collected over the time period 7/31/2008-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.

QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.	043441

DECISION ID	53242	Region 9
Pine Valley Creek (Lower)		

Pollutant:	**Nitrogen, ammonia (Total Ammonia)**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the three samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of three samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53242, Nitrogen, ammonia (Total Ammonia)	**Region 9**
Pine Valley Creek (Lower)	

LOE ID:	75415
Pollutant:	Nitrogen, ammonia (Total Ammonia)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Ammonia as N, Total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009

SWAMP Data:	SWAMP	043442
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	Aquatic Life Ambient Water Quality Criteria for Ammonia â€“ Freshwater (USEPA 2013): the 30-day rolling average concentration (criterion continuous concentration or CCC) of total ammonia nitrogen(in mg TAN/L) in freshwater are not to be exceeded more than once every three years on average. The CCC values are based on pH and temperature. The CCC formula is found on page 46 and the table of CCC values is on page 49.	
Guideline Reference:	Aquatic Life Ambient Water Quality Criteria for Ammonia - Freshwater 2013	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 3 monitoring sites [Pine Valley Creek below Secret Cyn. Cr. - 911S02058, Pine Valley Creek ~2.3mi above Secret Cyn. Cr. - 911S00538, Pine Valley Creek ~3.8mi above Secret Cyn. Cr. - 911S03354]	
Temporal Representation:	Data was collected on a single day 5/5/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 53242, Nitrogen, ammonia (Total Ammonia) Region 9

Pine Valley Creek (Lower)

LOE ID:	75416
Pollutant:	Nitrogen, ammonia (Total Ammonia)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Ammonia As N, Total.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Basin Plan: No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	EPA's Lifetime Health advisory level for total ammonia is 30.0 mg/L as stated on page 8 of the 2006 edition of the drinking water standards and health advisories. This Advisory Level is defined as "the concentration of a chemical in drinking water that is not expected to cause any adverse noncarcinogenic effects for up to ten days of exposure."
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 3 monitoring sites [Pine Valley Creek below Secret Cyn. Cr. - 911S02058, Pine Valley Creek ~2.3mi above Secret Cyn. Cr. - 911S00538, Pine Valley Creek ~3.8mi above Secret Cyn. Cr. - 911S03354]
Temporal Representation:	Data was collected on a single day 5/5/2009.

Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 53242, Nitrogen, ammonia (Total Ammonia) Region 9

Pine Valley Creek (Lower)

LOE ID:	75425
Pollutant:	Nitrogen, ammonia (Total Ammonia)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Ammonia As N, Total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Basin Plan: No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	EPA's Lifetime Health advisory level for total ammonia is 30.0 mg/L as stated on page 8 of the 2006 edition of the drinking water standards and health advisories. This Advisory Level is defined as "the concentration of a chemical in drinking water that is not expected to cause any adverse noncarcinogenic effects for up to ten days of exposure."
Guideline Reference:	2006 edition of the drinking water standards and health advisories. EPA 822-R-03-013
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 1 monitoring site [Pine Valley Creek @ Old Highway 80]
Temporal Representation:	Data was collected over the time period 5/28/2003-7/1/2004.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

DECISION ID 53243 Region 9

Pine Valley Creek (Lower)

Pollutant:	**Oxygen, Dissolved**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of

the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the three samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of three samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53243, Oxygen, Dissolved **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75478
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Oxygen, Dissolved.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan, San Diego Basin, Cold Water Habitat Objective, Chapter III, General Objectives for all Inland Surface Waters, Enclosed Bays and Estuaries states the following: The dissolved oxygen concentration for cold water habitats shall not be reduced below 8.0 mg/l at any time.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 3 monitoring sites [Pine Valley Creek below Secret Cyn. Cr. - 911S02058, Pine Valley Creek ~2.3mi above Secret Cyn. Cr. - 911S00538, Pine Valley Creek ~3.8mi above Secret Cyn. Cr. - 911S03354]
Temporal Representation:	Data was collected on a single day 5/5/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.

QAPP Information:	The SWAMP QAPP (2008) was followed.	043445
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID **53244** **Region 9**

Pine Valley Creek (Lower)

Pollutant:	**Parathion**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the zero samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of zero samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53244, Parathion **Region 9**

Pine Valley Creek (Lower)

LOE ID:	77809
Pollutant:	Parathion
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 0 samples exceed the criterion for Parathion, Ethyl.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.

SWAMP Data:	Non-SWAMP	043446
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. There shall be no increase in hazardous chemical concentrations found in bottom sediments or aquatic life (Water Quality Control Plan,San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The criterion continuous concentraion for Parathion, Ethyl is 0.013 ug/l from the National Recommended Water Quality Criteria.	
Guideline Reference:	National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 1 monitoring site [Pine Valley Creek @ Old Highway 80]	
Temporal Representation:	Data was collected on a single day 3/31/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.	

DECISION ID 53245 Region 9

Pine Valley Creek (Lower)

Pollutant:	**Permethrin, total**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. One of the three samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. One of three samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53245, Permethrin, total Region 9

Pine Valley Creek (Lower)

LOE ID:	75480
Pollutant:	Permethrin, total
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	1
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 1 of 3 samples exceed the criterion for Permethrin.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	UC Davis Aquatic Life Criteria: Aquatic life should not be affected unacceptably if the 4-day average concentration of Permethrin does not exceed 0.002 ug/L.
Guideline Reference:	Aquatic life water quality criteria derived via the UC Davis method: II. Pyrethroid insecticides. Reviews of Environmental Contamination and Toxicology 216:51-103.
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 3 monitoring sites [Pine Valley Creek below Secret Cyn. Cr. - 911S02058, Pine Valley Creek ~2.3mi above Secret Cyn. Cr. - 911S00538, Pine Valley Creek ~3.8mi above Secret Cyn. Cr. - 911S03354]
Temporal Representation:	Data was collected on a single day 5/5/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID	**53247**	**Region 9**
Pine Valley Creek (Lower)		

Pollutant:	**Phorate**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the one samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that: 043448
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53247, Phorate **Region 9**

Pine Valley Creek (Lower)

LOE ID:	77798
Pollutant:	Phorate
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Phorate.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The national health advisory level for phorate is 0.7 Âµg/L.
Guideline Reference:	Volume I Drinking Water and Health
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 1 monitoring site [Pine Valley Creek @ Old Highway 80]
Temporal Representation:	Data was collected on a single day 3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 53247, Phorate **Region 9**

Pine Valley Creek (Lower)

LOE ID:	77797
Pollutant:	Phorate

LOE Subgroup:	Pollutant-Water	043449
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Cold Freshwater Habitat	
Number of Samples:	1	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Phorate.	
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The evaluation guideline for Phorate is the median lethal concentration (LC50; 2 ug/L).	
Guideline Reference:	OPP Pesticide Ecotoxicity Database.	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 1 monitoring site [Pine Valley Creek @ Old Highway 80]	
Temporal Representation:	Data was collected on a single day 3/31/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.	

DECISION ID	**53248**	**Region 9**
Pine Valley Creek (Lower)		

Pollutant:	**Phosmet**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the one samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of one samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

	4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53248, Phosmet **Region 9**

Pine Valley Creek (Lower)

LOE ID:	77800
Pollutant:	Phosmet
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Phosmet.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Based on USEPA IRIS reference dose (RfD) as a drinking water level, the drinking water health advisory level for phosmet is 140 Âµg/L.
Guideline Reference:	IRIS Database Calculations (summary)
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 1 monitoring site [Pine Valley Creek @ Old Highway 80]
Temporal Representation:	Data was collected on a single day 3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 53248, Phosmet **Region 9**

Pine Valley Creek (Lower)

LOE ID:	77799
Pollutant:	Phosmet
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat

Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Phosmet.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	According to the USEPA Office of Pesticide Programs Ecotoxicity database, the aquatic life EC50 for Phosmet is 5.6 ug/L.
Guideline Reference:	OPP Pesticide Ecotoxicity Database.
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 1 monitoring site [Pine Valley Creek @ Old Highway 80]
Temporal Representation:	Data was collected on a single day 3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID	**53249**	**Region 9**
Pine Valley Creek (Lower)		

Pollutant:	**Selenium**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Zero of the 5 samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of 5 samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision	After review of the available data and information, RWQCB staff concludes that the water body-

Recommendation:	pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53249, Selenium **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75272
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Selenium.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The selenium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater is 0.005 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 1 monitoring site [Pine Valley Creek @ Old Highway 80]
Temporal Representation:	Data was collected over the time period 7/31/2008-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 53249, Selenium **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75275
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Selenium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The selenium criterion continuous concentration (expressed as a 4-day average) to protect aquatic life in freshwater is 0.005 mg/L (California Toxics Rule, 2000).
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 3 monitoring sites [Pine Valley Creek below Secret Cyn. Cr. - 911S02058, Pine Valley Creek ~2.3mi above Secret Cyn. Cr. - 911S00538, Pine Valley Creek ~3.8mi above Secret Cyn. Cr. - 911S03354]
Temporal Representation:	Data was collected on a single day 5/5/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 53249, Selenium **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75274
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Selenium.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The Maximum Contaminant Level for selenium in the Basin Plan is 0.01 mg/L.
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 3 monitoring sites [Pine Valley Creek below Secret Cyn. Cr. - 911S02058, Pine Valley Creek ~2.3mi above Secret Cyn. Cr. - 911S00538, Pine Valley Creek ~3.8mi above Secret Cyn. Cr. - 911S03354]
Temporal Representation:	Data was collected on a single day 5/5/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 53249, Selenium 043454 **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75262
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Selenium.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The Maximum Contaminant Level for selenium in the Basin Plan is 0.01 mg/L (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 1 monitoring site [Pine Valley Creek @ Old Highway 80]
Temporal Representation:	Data was collected over the time period 7/31/2008-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID **53253** **Region 9**

Pine Valley Creek (Lower)

Pollutant:	**Silver**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the three samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that: 043455
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of three samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53253, Silver Pine Valley Creek (Lower) **Region 9**

LOE ID:	75290
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Silver.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Silver to protect aquatic life in freshwater. The dissolved Silver criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 3 monitoring sites [Pine Valley Creek below Secret Cyn. Cr. - 911S02058, Pine Valley Creek ~2.3mi above Secret Cyn. Cr. - 911S00538, Pine Valley Creek ~3.8mi above Secret Cyn. Cr. - 911S03354]
Temporal Representation:	Data was collected on a single day 5/5/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 53253, Silver Pine Valley Creek (Lower) **Region 9**

LOE ID:	75276

Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Silver.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for silver is 0.1 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 3 monitoring sites [Pine Valley Creek below Secret Cyn. Cr. - 911S02058, Pine Valley Creek ~2.3mi above Secret Cyn. Cr. - 911S00538, Pine Valley Creek ~3.8mi above Secret Cyn. Cr. - 911S03354]
Temporal Representation:	Data was collected on a single day 5/5/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 53253, Silver **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75277
Pollutant:	Silver
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Silver.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	The California Secondary MCL for silver is 0.1 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 1 monitoring site [Pine Valley Creek @ Old Highway 80]
Temporal Representation:	Data was collected on a single day 3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID 53257 Region 9

Pine Valley Creek (Lower)

Pollutant:	**Specific Conductivity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the three samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of three samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53257, Specific Conductivity Region 9

Pine Valley Creek (Lower)

LOE ID:	75291
Pollutant:	Specific Conductivity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Municipal & Domestic Supply	043458
Number of Samples:	3	
Number of Exceedances:	0	
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Conductivity(Us).	
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan for the San Diego Basin).	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:	The California Secondary MCL for specific conductance is 900 uS/cm (Title 22 California Code of Regulations).	
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 3 monitoring sites [Pine Valley Creek below Secret Cyn. Cr. - 911S02058, Pine Valley Creek ~2.3mi above Secret Cyn. Cr. - 911S00538, Pine Valley Creek ~3.8mi above Secret Cyn. Cr. - 911S03354]	
Temporal Representation:	Data was collected on a single day 5/5/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

DECISION ID	**53263**	**Region 9**
Pine Valley Creek (Lower)		

Pollutant:	**Sulfates**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the three samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of three samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision	After review of the available data and information, RWQCB staff concludes that the water body-

Recommendation: pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53263, Sulfates **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75292
Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Sulfate.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for sulfate is 250 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 3 monitoring sites [Pine Valley Creek below Secret Cyn. Cr. - 911S02058, Pine Valley Creek ~2.3mi above Secret Cyn. Cr. - 911S00538, Pine Valley Creek ~3.8mi above Secret Cyn. Cr. - 911S03354]
Temporal Representation:	Data was collected on a single day 5/5/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 53263, Sulfates **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75307
Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING

Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Sulfate.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Sulfate objective for the protection of aquatic life according to Table 3-2 for Pine Valley Creek (Lower) within the Tijuana Hydrologic Unit is 250 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 3 monitoring sites [Pine Valley Creek below Secret Cyn. Cr. - 911S02058, Pine Valley Creek ~2.3mi above Secret Cyn. Cr. - 911S00538, Pine Valley Creek ~3.8mi above Secret Cyn. Cr. - 911S03354]
Temporal Representation:	Data was collected on a single day 5/5/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID	**53264**	**Region 9**
Pine Valley Creek (Lower)		

Pollutant:	**Temperature, water**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Three of the three samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Three of three samples exceeded the criteria and this does exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, additional data and information is available indicating that standards may be met. Two additional lines of evidence are available.

First, the location of the sampling and timing may not be representative of steelhead habitat utilization in San Mateo, and samples were taken as grabs. Critical information needed to assess temperatures for steelhead include growth periods (spring and fall) as well as summer daytime maximums in documented oversummering habitat.

Second, the criteria of 21 degrees as a limit is not necessarily applicable to southern California steelhead, which have been shown to have higher temperature tolerance. See Spina Environ Biol Fish

(2007) 80:23Â–34. 043461

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53264, Temperature, water **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75308
Pollutant:	Temperature, water
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	3
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 3 of 3 samples exceed the criterion for Water Temperature.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Board that such alteration in temperature does not adversely affect beneficial uses. At no time or place shall the temperature of any COLD water be increased more than 5Â°F above the natural receiving water temperature.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Inland Fishes of California (Moyle 1976) states that for rainbow trout the optimum range for growth and completion of most life stages is 13-21 degrees C (page 129).
Guideline Reference:	Inland Fishes of California
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 3 monitoring sites [Pine Valley Creek below Secret Cyn. Cr. - 911S02058, Pine Valley Creek ~2.3mi above Secret Cyn. Cr. - 911S00538, Pine Valley Creek ~3.8mi above Secret Cyn. Cr. - 911S03354]
Temporal Representation:	Data was collected on a single day 5/5/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **53266** **Region 9**

Pine Valley Creek (Lower)

Pollutant:	**Total Dissolved Solids**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or	Pollutant

Pollution: 043462

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the three samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of three samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53266, Total Dissolved Solids **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75325
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Dissolved Solids.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Dissolved Solids objective for the protection of aquatic life according to Table 3-2 for Pine Valley Creek (Lower) within the Tijuana Hydrologic Unit is 500 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 3 monitoring sites [Pine Valley Creek below Secret Cyn. Cr. - 911S02058, Pine Valley Creek ~2.3mi above Secret Cyn. Cr. - 911S00538, Pine Valley Creek ~3.8mi above Secret Cyn. Cr. -

	911S03354]	043463
Temporal Representation:	Data was collected on a single day 5/5/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 53266, Total Dissolved Solids **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75311
Pollutant:	Total Dissolved Solids
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Dissolved Solids.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for Dissolved Solids is 500 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 3 monitoring sites [Pine Valley Creek below Secret Cyn. Cr. - 911S02058, Pine Valley Creek ~2.3mi above Secret Cyn. Cr. - 911S00538, Pine Valley Creek ~3.8mi above Secret Cyn. Cr. - 911S03354]
Temporal Representation:	Data was collected on a single day 5/5/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **53267** **Region 9**

Pine Valley Creek (Lower)

Pollutant:	**Toxicity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the three samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of three samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53267, Toxicity **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75326
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	Three samples were collected to evaluate water toxicity. None of the samples exhibited significant toxicity. The toxicity test included survival and reproduction of Ceriodaphnia dubia. One sample can have multiple toxicity test results but will be counted only once. One sample is defined as being collected on the same day at the same location with the same lab sample id (if provided).
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	Toxicity is defined as a statistically significant effect in the sample exposure compared to the control using EPA-recommended hypothesis testing. For SWAMP data exceedances are counted with the significant effect code SL, Significant compared to negative control based on statistical test, less than stated alpha level, AND less than the evaluation threshold (both criteria are met).
Guideline Reference:	
Spatial Representation:	The samples were collected at stations 911S00538, 911S03354, and 911S02058.
Temporal Representation:	The samples were collected in May 2009.
Environmental Conditions:	

QAPP Information:	Data quality is good. Data results were recorded in the SWAMP database and followed SWAMP protocols.
QAPP Information Reference(s):	

DECISION ID	53268	Region 9
Pine Valley Creek (Lower)		

Pollutant:	**Turbidity**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the two samples exceed the criteria. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of two samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53268, Turbidity	Region 9
Pine Valley Creek (Lower)	

LOE ID:	75328
Pollutant:	Turbidity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Turbidity(NTU).
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009

SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): Table 3-2 lists objectives by Hydrologic Unit, Hydrologic Area, and Hydrologic Sub-area. The Turbidity(NTU) objective for the protection of aquatic life according to Table 3-2 for Pine Valley Creek (Lower) within the Tijuana Hydrologic Unit is 20 NTU.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 2 monitoring sites [Pine Valley Creek below Secret Cyn. Cr. - 911S02058, Pine Valley Creek ~2.3mi above Secret Cyn. Cr. - 911S00538]
Temporal Representation:	Data was collected on a single day 5/5/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID	53270	Region 9
Pine Valley Creek (Lower)		

Pollutant:	**Zinc**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under sections 3.1 and 3.6 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status; under section 3.6 at least two lines of evidence are necessary to assess listing status for pollutants sediment, and pollutant concentrations in sediment must be associated with sediment toxicity to justify adding that pollutant to the CWA section 303(d) List. Three lines of evidence are available in the administrative record to assess this pollutant. Zero of three sample (sediment) exceeded the evaluation guideline and zero of 11 samples (water) exceeded the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. Zero of three samples (sediment) and zero of 11 samples (water) exceeded the guideline/objective, and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 16 samples is needed to determine if a beneficial use is fully supported using table 3.1. 4. Pursuant to SECTION 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53270, Zinc 043467 Region 9

Pine Valley Creek (Lower)

LOE ID:	75341
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Sediment
Matrix:	Sediment
Fraction:	Total
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Zinc.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	Water Quality Control Plan for the San Diego Basin (SDRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In freshwater sediments the probable effect concentration (predictive of sediment toxicity for sediment-dwelling organisms) for zinc is 459 mg/Kg dry weight (MacDonald et al. 2000).
Guideline Reference:	Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Environmental Contamination and Toxicology. 39: 20-31
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 3 monitoring sites [Pine Valley Creek ~2.3mi above Secret Cyn. Cr. - 911S00538, Pine Valley Creek ~3.8mi above Secret Cyn. Cr. - 911S03354, Pine Valley Creek below Secret Cyn. Cr. - 911S02058]
Temporal Representation:	Data was collected on a single day 5/5/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 53270, Zinc Region 9

Pine Valley Creek (Lower)

LOE ID:	75342
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Zinc.

Data Reference:	RWB9 Stormwater Monitoring Council CY 2009	043468
SWAMP Data:	SWAMP	
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan for the San Diego Basin).	
Objective/Criterion Reference:	Maximum Contaminant Levels for organic and inorganic chemicals. CCR	
Evaluation Guideline:	The California Secondary MCL for zinc is 5.0 mg/L (Title 22 California Code of Regulations).	
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 3 monitoring sites [Pine Valley Creek below Secret Cyn. Cr. - 911S02058, Pine Valley Creek ~2.3mi above Secret Cyn. Cr. - 911S00538, Pine Valley Creek ~3.8mi above Secret Cyn. Cr. - 911S03354]	
Temporal Representation:	Data was collected on a single day 5/5/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The SWAMP QAPP (2008) was followed.	
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan	

Line of Evidence (LOE) for Decision ID 53270, Zinc **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75343
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan, San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for zinc is 5.0 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 1 monitoring site [Pine Valley Creek @ Old Highway 80]
Temporal Representation:	Data was collected 5/28/2003 - 6/2/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 53270, Zinc **Region 9**

Pine Valley Creek (Lower) 043469

LOE ID:	75354
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego DWM data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 1 samples exceed the criterion for Zinc.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 1 monitoring site [Pine Valley Creek @ Old Highway 80]
Temporal Representation:	Data was collected 5/28/2003 - 6/2/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 53270, Zinc **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75353
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Zinc.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009

SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	California Toxics Rule (CTR) lists criterion continuous concentrations for dissolved Zinc to protect aquatic life in freshwater. The dissolved Zinc criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 3 monitoring sites [Pine Valley Creek below Secret Cyn. Cr. - 911S02058, Pine Valley Creek ~2.3mi above Secret Cyn. Cr. - 911S00538, Pine Valley Creek ~3.8mi above Secret Cyn. Cr. - 911S03354]
Temporal Representation:	Data was collected on a single day 5/5/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

Line of Evidence (LOE) for Decision ID 53270, Zinc **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75355
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego Dept. of Public Works data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Zinc.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. California Toxics Rule (CTR) lists criterion continuous concentrations (4-day average) to protect aquatic life in freshwater. The criterion in freshwater is hardness dependent for each sample and varies based on the ambient hardness during sampling. Section (b)(1) in CTR contains the hardness dependent formula for the metals criterion.
Objective/Criterion Reference:	Code of Federal Regulations 40 part 131.38 Establishment of numeric criteria for priority toxic pollutants for the State of California. 7/1/2011 Edition
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 1 monitoring site [Pine Valley Creek @ Old Highway 80 - 911TIJ02]
Temporal Representation:	Data was collected over the time period 7/31/2008-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern

	Watersheds Report was followed. 043471
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 53270, Zinc **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75344
Pollutant:	Zinc
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for Zinc.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses. (Water Quality Control Plan,San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Secondary MCL for zinc is 5.0 mg/L (Title 22 California Code of Regulations).
Guideline Reference:	Secondary Maximum Contaminant Levels and Compliance. CCR title 22 section 64449.
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 1 monitoring site [Pine Valley Creek @ Old Highway 80]
Temporal Representation:	Data was collected over the time period 7/31/2008-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

DECISION ID 53272 **Region 9**

Pine Valley Creek (Lower)

Pollutant:	**pH**
Final Listing Decision:	**Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the CWA section 303(d) List under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Zero of the two samples exceed the criteria.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of two samples exceeded the criteria and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. The number of samples is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 53272, pH **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75261
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed SWAMP data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 2 samples exceed the criterion for pH.
Data Reference:	RWB9 Stormwater Monitoring Council CY 2009
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	In inland surface waters the pH shall not be depressed below 6.5 nor raised above 8.5.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 2 monitoring sites [Pine Valley Creek below Secret Cyn. Cr. - 911S02058, Pine Valley Creek ~2.3mi above Secret Cyn. Cr. - 911S00538]
Temporal Representation:	Data was collected on a single day 5/5/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The SWAMP QAPP (2008) was followed.
QAPP Information Reference(s):	Surface Water Ambient Monitoring Program Quality Assurance Program Plan

DECISION ID **53497** **Region 9**

Pine Valley Creek (Lower)

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**

Last Listing Cycle's Final Listing Decision:	New Decision	043473
Revision Status	Revised	
Sources:	Source Unknown	
Expected TMDL Completion Date:	2025	
Impairment from Pollutant or Pollution:	Pollutant	

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Four lines of evidence are available in the administrative record to assess this pollutant. Data from 2003 to 2009 show that 10 of 11 and 5 of 11 single samples exceed the water quality objectives for enterococcus and total coliform for the protection of REC-1 beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Data from 2003 to 2009 show that 10 of 11 and 5 of 11 single samples exceed the water quality objectives for enterococcus and total coliform for the protection of REC-1 beneficial use and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 53497, Indicator Bacteria **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75373
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	8
Number of Exceedances:	3
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 3 of 8 samples exceed the criterion for Coliform, Fecal.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the fecal coliform concentration shall not exceed 400 MPN/100 ml.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	043474
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 1 monitoring site [Pine Valley Creek @ Old Highway 80]
Temporal Representation:	Data was collected over the time period 5/28/2003-7/30/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 53497, Indicator Bacteria **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75374
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Non-Contact Recreation
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Coliform, Fecal.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	In waters designated for non contact recreation (REC 2), the fecal coliform concentration shall not exceed 4000 MPN/100 ml (Basin Plan).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 1 monitoring site [Pine Valley Creek @ Old Highway 80]
Temporal Representation:	Data was collected over the time period 7/31/2008-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 53497, Indicator Bacteria **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75375
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Water Contact Recreation	043475
Number of Samples:	3	
Number of Exceedances:	0	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Coliform, Fecal.	
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	In waters designated for water contact recreation (REC I), the fecal coliform concentration shall not exceed 400 MPN/100 ml.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 1 monitoring site [Pine Valley Creek @ Old Highway 80]	
Temporal Representation:	Data was collected over the time period 7/31/2008-3/31/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.	

Line of Evidence (LOE) for Decision ID 53497, Indicator Bacteria **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75364
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	8
Number of Exceedances:	7
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 7 of 8 samples exceed the criterion for Enterococci.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Samples shall not exceed 61 organisms per 100 ml for enterococcus in waters designated for REC I beneficial use (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 1 monitoring site [Pine Valley Creek @ Old Highway 80]

Temporal Representation:	Data was collected over the time period 5/28/2003-7/30/2008. 043476
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 53497, Indicator Bacteria **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75363
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	3
Number of Exceedances:	3
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 3 of 3 samples exceed the criterion for Enterococci.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Samples shall not exceed 61 organisms per 100 ml for enterococcus in waters designated for REC I beneficial use (Water Quality Control Plan for the San Diego Basin).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 1 monitoring site [Pine Valley Creek @ Old Highway 80]
Temporal Representation:	Data was collected over the time period 7/31/2008-3/31/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.

Line of Evidence (LOE) for Decision ID 53497, Indicator Bacteria **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75310
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	8
Number of Exceedances:	4

Data and Information Type:	PATHOGEN MONITORING 043477
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 4 of 8 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Metals, Nutrients, Inorganics, Organics, Pathogens, and Pesticides from the County of San Diego, 2003-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxicsubstances in concentrations which are toxic to,or which produce detrimental physiologicalresponses in human, plant, animal, or indigenousaquatic life (Basin Plan).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In waters designated for water contact recreation (REC I), the total coliform concentration shall not exceed 10000 MPN/100 ml (CDPH 2006).
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 1 monitoring site [Pine Valley Creek @ Old Highway 80]
Temporal Representation:	Data was collected over the time period 5/28/2003-7/30/2008.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8 was followed.
QAPP Information Reference(s):	Quality Assurance Project Plan from the Truesdail Laboratories, Rev. 12, Enviromatrix Analytical and Dry Weather Monitoring Program Rev. 8.

Line of Evidence (LOE) for Decision ID 53497, Indicator Bacteria **Region 9**

Pine Valley Creek (Lower)

LOE ID:	75309
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	3
Number of Exceedances:	1
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed County of San Diego data for Pine Valley Creek (Lower) to determine beneficial use support and results are as follows: 1 of 3 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Nutrients from the County of San Diego Southern Watersheds, 2008-2009.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxicsubstances in concentrations which are toxic to,or which produce detrimental physiologicalresponses in human, plant, animal, or indigenousaquatic life (Basin Plan).
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	In waters designated for water contact recreation (REC I), the total coliform concentration shall not exceed 10000 MPN/100 ml (CDPH 2006).
Guideline Reference:	Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Public Health.
Spatial Representation:	Data for this line of evidence for Pine Valley Creek (Lower) was collected at 1 monitoring

	site [Pine Valley Creek @ Old Highway 80]	043478
Temporal Representation:	Data was collected over the time period 7/31/2008-3/31/2009.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report was followed.	
QAPP Information Reference(s):	Quality Assurance Project Plan from the CRG Marine Laboratories and Southern Watersheds Report.	

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Indian Creek (San Diego County)
Water Body ID: CAR9114100020110828154029
Water Body Type: River & Stream

DECISION ID 47914 **Region 9**
Indian Creek (San Diego County)

Pollutant: Benthic Community Effects
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.9 of the Listing Policy. Under section 3.9 at least two lines of evidence are necessary to assess impairment listing status.

One line of evidence is available in the administrative record to assess this pollutant. Zero of the Two samples exceed the Evaluation Guideline for Benthic Community Effects.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Two samples exceeded the Evaluation Guideline for Benthic Community Effects.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list.

Line of Evidence (LOE) for Decision ID 47914, Benthic Community Effects **Region 9**
Indian Creek (San Diego County)

LOE ID: 95302

Pollutant: Benthic-Macroinvertebrate Bioassessments
LOE Subgroup: Population/Community Degradation
Matrix: Water
Fraction: None

Beneficial Use: Cold Freshwater Habitat

Number of Samples: 2
Number of Exceedances: 0

Data and Information Type: Benthic macroinvertebrate surveys

Data Used to Assess Water Quality:	The scores for this water body were both greater than 0.92 indicating a reference condition
Data Reference:	RWB9 Status Sampling 2007 and 2008 Region 9 CSCI Scores & Water Body Information
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The California Stream Condition Index (CSCI) is a biological scoring tool that helps aquatic resource managers translate complex data about benthic macroinvertebrates found living in a stream into an overall measure of stream health. The CSCI score is calculated by comparing the expected condition with actual (observed) results (Rhen, A.C. et al., 2015). CSCI scores range from 0 (highly degraded) to greater than 1 (equivalent to reference). CSCI scoring of biological condition are as follows (per the scientific paper supporting the development of the CSCI scoring tool): greater than or equal to 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, less than or equal to 0.62 = very likely altered condition. Sites with scores below 0.79 are considered to have exceeded the water quality objective for the aquatic life beneficial use.
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13 The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams. Region 9 CSCI Scores & Water Body Information
Spatial Representation:	Samples were collected at the following station: 911TJIND2 (Indian Creek 2).
Temporal Representation:	Survey done 2007 and 2008.
Environmental Conditions:	
QAPP Information:	Data collected following SWAMP QA protocols for the RWB9 Status Sampling 2007 and 2008 water quality monitoring project.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 47914, Benthic Community Effects **Region 9**

Indian Creek (San Diego County)

LOE ID:	73906
Pollutant:	Benthic-Macroinvertebrate Bioassessments
LOE Subgroup:	Population/Community Degradation
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Number of Samples:	2
Number of Exceedances:	1
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	The IBI scores for this water body were 39 and 47. A score under 40 indicates that this water body may be considered to have impaired conditions so one of these scores exceeds the evaluation guideline for this water body.
Data Reference:	RWB9 Status Sampling 2007 and 2008
SWAMP Data:	SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams. Environmental Management. Volume 35, number 1 (2005): pp. 1-13
Spatial Representation:	Samples were collected at the following station: 911TJIND2 (Indian Creek 2).
Temporal Representation:	Survey done June 5, 2007.
Environmental Conditions:	
QAPP Information:	Data collected following SWAMP QA protocols for the RWB9 Status Sampling 2007 and 2008 water quality monitoring project.
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: De Luz Creek, unnamed tributary at De Luz Murrieta Road
Water Body ID: CAR9022100020120308112123
Water Body Type: River & Stream

DECISION ID 50721 **Region 9**
De Luz Creek, unnamed tributary at De Luz Murrieta Road

Pollutant: **Benthic Community Effects**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: Benthic Community Effects is being considered for placement on the section 303(d) list under sections 3.9 and 3.2 of the Listing Policy. Under section 3.9, an additional line of evidence associating the Benthic Community Effects with a water or sediment concentration of pollutants is necessary to assess listing status.

Three lines of evidence are available in the administrative record to assess this indicator. Zero of Three samples exceeded the water quality objective for Benthic-Macroinvertebrate Bio-assessments.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing Benthic Community Effects in this water segment on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of Three samples exceeded the water quality objective for Benthic-Macroinvertebrate Bio-assessments and this sample size is insufficient to determine the power and confidence of the listing policy the applicable beneficial use support rating. A minimum of 16 samples are needed to determine if a beneficial use is fully supported using table 3.1.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 50721, Benthic Community Effects **Region 9**
De Luz Creek, unnamed tributary at De Luz Murrieta Road

LOE ID: 73477

Pollutant: Benthic-Macroinvertebrate Bioassessments
LOE Subgroup: Population/Community Degradation
Matrix: Water
Fraction: None

Beneficial Use: Cold Freshwater Habitat

Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	Benthic macroinvertebrate surveys
Data Used to Assess Water Quality:	Nonne of the four samples collected had IBI scores below 40. NPDES bioassessment
Data Reference:	Data for Various Pollutants from the County of San Diego Copermittees Receiving Waters Monitoring and Reporting Program, 2001-2008.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant or animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the State or Regional Board. Region 9 Basin Plan.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	The IBI is a multi-metric assessment that employs biological metrics that respond to a habitat or water quality impairment. Each of the biological metrics measured at a site are converted to an IBI score then summed. These cumulative scores are then ranked. For the Southern California IBI, sites with scores below 40 are considered to have impaired conditions.
Guideline Reference:	
Spatial Representation:	The samples were collected at station REF-DLC3, De Luz Creek.
Temporal Representation:	The samples were collected in October 2002, 2003 and 2004.
Environmental Conditions:	
QAPP Information:	The data was collected under the Southern California Regional Watershed Monitoring Program Bioassessment Quality Assurance Project Plan, June 25, 2009.
QAPP Information Reference(s):	e-mail clarifying QAPP information

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Mission Bay Shoreline, at Fiesta Island northwest shore
Water Body ID: CAC907520002012070514100 8
Water Body Type: Coastal & Bay Shoreline

DECISION ID 49429 **Region 9**
Mission Bay Shoreline, at Fiesta Island northwest shore

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2, one line(s) of evidence are necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. For the evaluation on SSM, three of the nine samples exceed the WQO for total coliform of 230/100 ml for the protection of SHELL beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. For the evaluation on SSM, three of the nine samples exceed the WQO for total coliform of 230/100 ml for the protection of SHELL beneficial use.
and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to [SECTION 3.11/4.11] of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49429, Indicator Bacteria **Region 9**
Mission Bay Shoreline, at Fiesta Island northwest shore

LOE ID: 74351

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use:	Shellfish Harvesting	043485
Number of Samples:	9	
Number of Exceedances:	3	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed BW data for Mission Bay Shoreline, at Fiesta Island northwest shore to determine beneficial use support and results are as follows: 3 of 9 samples exceed the criterion for Coliform, Total.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The Water Quality Control Plan (Basin Plan 2011)states the following: At all areas where shellfish may be harvested for human consumption, ten percent of the samples collected during any 30-day period shall not exceed 230 MPN/100mL.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Mission Bay Shoreline, at Fiesta Island northwest shore was collected at 1 monitoring site [Fiesta Island, NW shore]	
Temporal Representation:	Data was collected over the time period 9/16/2008-3/3/2010.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 49429, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at Fiesta Island northwest shore

LOE ID:	77608
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	4
Number of Exceedances:	2
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Two of the four samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The Water Quality Control Plan for the San Diego Basin states that at all areas where shellfish may be harvested for human consumption, the median total coliform concentration throughout the water column for any 30-day period shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Mission Bay Shoreline, at Fiesta Island northwest shore.

Temporal Representation:	The samples were collected from September 2008 to March 2010.	043486
Environmental Conditions:		
QAPP Information:	The samples were collected for the beach watch program.	
QAPP Information Reference(s):		

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at guest dock
Water Body ID: CAC9011400020120705133809
Water Body Type: Coastal & Bay Shoreline

DECISION ID 49696 **Region 9**
Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at guest dock

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Five lines of evidence are available in the administrative record to assess this pollutant. Using data from 2008 to 2010, ten of the 38 samples exceed the water quality objective for total coliform of a geomean of 70/100ml in a 30-day period for the protection of SHELL.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Using data from 2008 to 2010, ten of the 38 samples exceed the water quality objective for total coliform of a geomean of 70/100ml in a 30-day period for the protection of SHELL and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 49696, Indicator Bacteria **Region 9**
Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at guest dock

LOE ID: 74638

Pollutant: Enterococcus
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 38

Number of Exceedances:	1	043488

Data and Information Type: Not Specified
Data Used to Assess Water Quality: One of the 38 geomeans exceeded the objective.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at the Dana Point Harbor guest dock site.
Temporal Representation: Samples were collected from January 2008 to August 2010.
Environmental Conditions:
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 49696, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at guest dock

LOE ID: 74639

Pollutant: Fecal Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 38
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Zero of the 38 geomeans exceeded the objective.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at guest dock at Dana Point Harbor site.
Temporal Representation: Samples were collected from January 2008 to August 2010.
Environmental Conditions:
QAPP Information: The samples were collected for the beach watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 49696, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at guest dock

LOE ID: 77598

Pollutant: Total Coliform

LOE Subgroup:	Pollutant-Water	043489
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Shellfish Harvesting	
Number of Samples:	145	
Number of Exceedances:	18	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	18 of the 145 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at guest dock.	
Temporal Representation:	The samples were collected from January 2005 through October 2009.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the beach watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 49696, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at guest dock

LOE ID:	74641
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	38
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 38 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Dana Point Harbor guest dock site.

Temporal Representation:	Samples were collected from January 2008 to August 2010.	043490
Environmental Conditions:		
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 49696, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at guest dock

LOE ID:	74640
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	60
Number of Exceedances:	6
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed BW data for Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at guest dock to determine beneficial use support and results are as follows: 6 of 60 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at guest dock was collected at 1 monitoring site [GUEST DOCK]
Temporal Representation:	Data was collected over the time period 1/3/2008-8/26/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at harbor entrance
Water Body ID: CAC9011400020120705134457
Water Body Type: Coastal & Bay Shoreline

DECISION ID 49698 **Region 9**
Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at harbor entrance

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Five lines of evidence are available in the administrative record to assess this pollutant. Using data from 2008 to 2010, nine of the 87 samples exceed the water quality objective for enterococcus of a geomean of 35/100ml in a 30-day period for the protection of REC-1.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Using data from 2008 to 2010, nine of the 87 samples exceed the water quality objective for enterococcus of a geomean of 35/100ml in a 30-day period for the protection of REC-1 and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 49698, Indicator Bacteria **Region 9**
Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at harbor entrance

LOE ID: 74642

Pollutant: Enterococcus
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 87

Number of Exceedances:	9	043492

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Nine of the 87 geomeans exceeded the objective.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at the Dana Point Harbor, harbor entrance site.
Temporal Representation: Samples were collected from January 2008 to January 2010.
Environmental Conditions:
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 49698, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at harbor entrance

LOE ID: 74647

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Shellfish Harvesting

Number of Samples: 104
Number of Exceedances: 3

Data and Information Type: PATHOGEN MONITORING
Data Used to Assess Water Quality: Water Board staff assessed BW data for Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at harbor entrance to determine beneficial use support and results are as follows: 3 of 104 samples exceed the criterion for Coliform, Total.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Data for this line of evidence for Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at harbor entrance was collected at 1 monitoring site [HARBOR ENTRANCE]
Temporal Representation: Data was collected over the time period 1/3/2008-1/11/2010.
Environmental Conditions: Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 49698, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at harbor entrance

LOE ID:	74648
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	86
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 86 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Dana Point Harbor, harbor entrance site.
Temporal Representation:	Samples were collected from January 2008 to January 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49698, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at harbor entrance

LOE ID:	77599
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	86
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	None of the 86 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	

Guideline Reference:	043494
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at harbor entrance.
Temporal Representation:	The samples were collected from January 2008 to January 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49698, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at harbor entrance

LOE ID:	74643
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	86
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 86 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at guest dock at Dana Point Harbor, harbor entrance site.
Temporal Representation:	Samples were collected from January 2008 to January 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at patrol dock
Water Body ID: CAC9011400020120705134834
Water Body Type: Coastal & Bay Shoreline

DECISION ID 49699 Region 9
Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at patrol dock

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (being addressed by USEPA approved TMDL)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
TMDL Name:	Bacteria Impaired Waters I (creeks and beach shorelines)
TMDL Project Code:	169
Date TMDL Approved by USEPA:	06/22/2011
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Five lines of evidence are available in the administrative record to assess this pollutant. Thirty of the 39 samples exceed the water quality objective for total coliform of a geomean of 70/100ml in a 30-day period for the protection of SHELL beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Thirty of the 39 samples exceed the water quality objective for total coliform of a geomean of 70/100ml in a 30-day period for the protection of SHELL beneficial use and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 49699, Indicator Bacteria Region 9
Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at patrol dock

LOE ID:	74649
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	043496
Beneficial Use:	Water Contact Recreation	
Number of Samples:	39	
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Zero of the 39 geomeans exceeded the objective.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at guest dock at Dana Point Harbor, patrol dock site.	
Temporal Representation:	Samples were collected from January 2008 to August 2010.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 49699, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at patrol dock

LOE ID:	74652
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	39
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 39 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at guest dock at Dana Point Harbor, patrol dock site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49699, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at patrol dock 043497

LOE ID:	74650
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	39
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 39 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at guest dock at Dana Point Harbor, patrol dock site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49699, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at patrol dock

LOE ID:	74651
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	62
Number of Exceedances:	11
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed BW data for Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at patrol dock to determine beneficial use support and results are as follows: 11 of 62 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	

Guideline Reference:	043498
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at patrol dock was collected at 1 monitoring site [HARBOR PATROL DOCK]
Temporal Representation:	Data was collected over the time period 1/3/2008-8/27/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49699, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at patrol dock

LOE ID:	77600
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	39
Number of Exceedances:	30
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Thirty of the thirty-nine samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at patrol dock.
Temporal Representation:	The samples were collected from January 2008 to October 2009 and two days in August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Laguna Beach HSA, at Broadway Creek
Water Body ID: CAC9011200020120705104435
Water Body Type: Coastal & Bay Shoreline

DECISION ID 49808 **Region 9**
Pacific Ocean Shoreline, Laguna Beach HSA, at Broadway Creek

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (being addressed by USEPA approved TMDL)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
TMDL Name:	Bacteria Impaired Waters I (creeks and beach shorelines)
TMDL Project Code:	169
Date TMDL Approved by USEPA:	06/22/2011
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Four lines of evidence are available in the administrative record to assess this pollutant. Using 2008 and 2009 data, 12 of the 12 samples exceed the water quality objective for total coliform of a SSM of 230/100ml for the protection of SHELL, and 12 of the 14 samples exceed the water quality objective for enterococcus of a SSM of 104/100ml for the use of REC-1.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Using 2008 and 2009 data, 12 of the 12 samples exceed the water quality objective for total coliform of a SSM of 230/100ml for the protection of SHELL, and 12 of the 14 samples exceed the water quality objective for enterococcus of a SSM of 104/100ml for the use of REC-1, and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 49808, Indicator Bacteria **Region 9**
Pacific Ocean Shoreline, Laguna Beach HSA, at Broadway Creek

LOE ID:	80844
Pollutant:	Enterococcus

LOE Subgroup:	Pollutant-Water	043500
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	14	
Number of Exceedances:	12	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Twelve of the 14 samples exceeded the objective.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The single sample maximum standard for entercoccus states that the entercoccus density shall not exceed 104 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected Broadway Creek.	
Temporal Representation:	Samples were collected from November 2008 to October 2009.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 49808, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Broadway Creek

LOE ID:	74908
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2
Number of Exceedances:	2
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Two of the two geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Broadway Creek site.
Temporal Representation:	Samples were collected from November 2008 to October 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49808, Indicator Bacteria 043501 **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Broadway Creek

LOE ID:	74907
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	2
Number of Exceedances:	2
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Two of the two geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected Broadway Creek.
Temporal Representation:	Samples were collected from November 2008 to October 2009.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49808, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Laguna Beach HSA, at Broadway Creek

LOE ID:	74925
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	12
Number of Exceedances:	12
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Beach Watch data for Pacific Ocean Shoreline, Laguna Beach HSA, at Broadway Creek to determine beneficial use support and results are as follows: 12 of 12 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Laguna Beach HSA, at Broadway Creek was collected at 1 monitoring site [BROADWAY CREEK]
Temporal Representation:	Data was collected over the time period 11/25/2008-10/27/2009.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Lower San Juan HSA, 10000 feet south of outfall
Water Body ID: CAC9013000020120705131722
Water Body Type: Coastal & Bay Shoreline

DECISION ID 49834 **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, 10000 feet south of outfall

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (being addressed by USEPA approved TMDL)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
TMDL Name:	Bacteria Impaired Waters I (creeks and beach shorelines)
TMDL Project Code:	169
Date TMDL Approved by USEPA:	06/22/2011
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

[NUMBER] lines of evidence are available in the administrative record to assess this pollutant. Data from 2008 to 2010 suggests that 39 of the 92 samples exceed the water quality objective for enterococcus of a geomean of 35/100 ml in a 30-day period for the protection of REC-1.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Data from 2008 to 2010 suggests that 39 of the 92 samples exceed the water quality objective for enterococcus of a geomean of 35/100 ml in a 30-day period for the protection of REC-1 and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 49834, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, 10000 feet south of outfall

LOE ID:	74806
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	043504
Beneficial Use:	Water Contact Recreation	
Number of Samples:	92	
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Zero of the 92 geomeans exceeded the objective.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at the 10000' South Outfall site.	
Temporal Representation:	Samples were collected from January 2008 to January 2010.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 49834, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, 10000 feet south of outfall

LOE ID:	77634
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	92
Number of Exceedances:	10
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Ten of the 92 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, Lower San Juan HSA, 10000 feet south of outfall.
Temporal Representation:	The samples were collected from January 2008 through January 2010.
Environmental Conditions:	

QAPP Information:	The samples were collected for the beach watch program.	043505
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 49834, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, 10000 feet south of outfall

LOE ID:	74803
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	92
Number of Exceedances:	39
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Thirty-nine of the 92 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for enterococcus states that the coliform density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the 10000' South Outfall site.
Temporal Representation:	Samples were collected from January 2008 to January 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49834, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, 10000 feet south of outfall

LOE ID:	74804
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	92
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 92 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at the 10000' South Outfall site.
Temporal Representation: Samples were collected from January 2008 to January 2010.
Environmental Conditions:
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 49834, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, 10000 feet south of outfall

LOE ID: 74805

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Shellfish Harvesting

Number of Samples: 110
Number of Exceedances: 9

Data and Information Type: PATHOGEN MONITORING
Data Used to Assess Water Quality: Water Board staff assessed Beach Watch data for Pacific Ocean Shoreline, Lower San Juan HSA, 10000 feet south of outfall to determine beneficial use support and results are as follows: 9 of 110 samples exceed the criterion for Coliform, Total.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Data for this line of evidence for Pacific Ocean Shoreline, Lower San Juan HSA, 10000 feet south of outfall was collected at 1 monitoring site [10000' South Outfall]
Temporal Representation: Data was collected over the time period 1/3/2008-1/11/2010.
Environmental Conditions: Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Lower San Juan HSA, 2000 feet south of outfall
Water Body ID: CAC9013000020120705105510
Water Body Type: Coastal & Bay Shoreline

DECISION ID 49835 **Region 9**
Pacific Ocean Shoreline, Lower San Juan HSA, 2000 feet south of outfall

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (being addressed by USEPA approved TMDL)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
TMDL Name:	Bacteria Impaired Waters I (creeks and beach shorelines)
TMDL Project Code:	169
Date TMDL Approved by USEPA:	06/22/2011
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Five lines of evidence are available in the administrative record to assess this pollutant. Data from 2008 to 2010 shows that 44 of the 93 samples exceed the water quality objective for enterococcus of a geomean of 35/100ml in a 30-day period for the protection of REC-1, and 22 of 94 samples exceed the WQO for total coliform of a geomean of 70/100ml in a 30-day period for the protection of SHELL.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Data from 2008 to 2010 shows that 44 of the 93 samples exceed the water quality objective for enterococcus of a geomean of 35/100ml in a 30-day period for the protection of REC-1, and 22 of 94 samples exceed the WQO for total coliform of a geomean of 70/100ml in a 30-day period for the protection of SHELL, and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 49835, Indicator Bacteria **Region 9**
Pacific Ocean Shoreline, Lower San Juan HSA, 2000 feet south of outfall

LOE ID:	74834
Pollutant:	Total Coliform

LOE Subgroup:	Pollutant-Water	043508
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	94	
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	None of the 94 geomeans exceeded the objective.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at the 2000' South Outfall site.	
Temporal Representation:	Samples were collected from January 2008 to January 2010.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 49835, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, 2000 feet south of outfall

LOE ID:	77635
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	94
Number of Exceedances:	22
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Twenty-two of the 94 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, Lower San Juan HSA, 2000 feet south of outfall.

Temporal Representation:	The samples were collected from January 2008 through January 2010. 043509
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49835, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, 2000 feet south of outfall

LOE ID:	74833
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	113
Number of Exceedances:	19
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Beach Watch data for Pacific Ocean Shoreline, Lower San Juan HSA, 2000 feet south of outfall to determine beneficial use support and results are as follows: 19 of 113 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Lower San Juan HSA, 2000 feet south of outfall was collected at 1 monitoring site [2000' South Outfall]
Temporal Representation:	Data was collected over the time period 1/3/2008-8/27/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49835, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, 2000 feet south of outfall

LOE ID:	74832
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	94
Number of Exceedances:	4
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Four of the 94 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the 2000' South Outfall site.
Temporal Representation:	Samples were collected from January 2008 to January 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49835, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, 2000 feet south of outfall

LOE ID:	74807
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	93
Number of Exceedances:	44
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Forty-four of the 93 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for enterococcus states that the coliform density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the 2000' South Outfall site.
Temporal Representation:	Samples were collected from January 2008 to January 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Lower San Juan HSA, 3000 feet south of outfall
Water Body ID: CAC9013000020120705105910
Water Body Type: Coastal & Bay Shoreline

DECISION ID 49836 **Region 9**
Pacific Ocean Shoreline, Lower San Juan HSA, 3000 feet south of outfall

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (being addressed by USEPA approved TMDL)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
TMDL Name:	Bacteria Impaired Waters I (creeks and beach shorelines)
TMDL Project Code:	169
Date TMDL Approved by USEPA:	06/22/2011
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Five lines of evidence are available in the administrative record to assess this pollutant. Data from 2008 to 2010 shows that 41 of the 94 samples exceed the water quality objective for enterococcus of a geomean of 35/100ml for the protection of REC-1, and 23 of the 94 samples exceed the WQO for the total coliform of a geomean of 70/100 ml for the protection of SHELL.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Data from 2008 to 2010 shows that 41 of the 94 samples exceed the water quality objective for enterococcus of a geomean of 35/100ml for the protection of REC-1, and 23 of the 94 samples exceed the WQO for the total coliform of a geomean of 70/100 ml for the protection of SHELL and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 49836, Indicator Bacteria **Region 9**
Pacific Ocean Shoreline, Lower San Juan HSA, 3000 feet south of outfall

LOE ID: 74838

Pollutant: Total Coliform

LOE Subgroup:	Pollutant-Water	043512
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	94	
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Zero of the 94 geomeans exceeded the objective.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at the 3000' South Outfall site.	
Temporal Representation:	Samples were collected from January 2008 to January 2010.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 49836, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, 3000 feet south of outfall

LOE ID:	77636
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	94
Number of Exceedances:	23
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Twenty-three of the 94 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, Lower San Juan HSA, 3000 feet south of outfall.

Temporal Representation:	The samples were collected from January 2008 through January 2010. 043513
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49836, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, 3000 feet south of outfall

LOE ID:	74836
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	94
Number of Exceedances:	1
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	One of the 94 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the 3000' South Outfall site.
Temporal Representation:	Samples were collected from January 2008 to January 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49836, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, 3000 feet south of outfall

LOE ID:	74837
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	112
Number of Exceedances:	15
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Beach Watch data for Pacific Ocean Shoreline, Lower San Juan HSA, 3000 feet south of outfall to determine beneficial use support and results are as follows: 15 of 112 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Lower San Juan HSA, 3000 feet south of outfall was collected at 1 monitoring site [3000' South Outfall]
Temporal Representation:	Data was collected over the time period 1/3/2008-1/11/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49836, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, 3000 feet south of outfall

LOE ID:	74835
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	94
Number of Exceedances:	41
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Forty-one of the 94 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for enterococcus states that the coliform density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the 3000' South Outfall site.
Temporal Representation:	Samples were collected from January 2008 to January 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Lower San Juan HSA, 4000 feet south of outfall
Water Body ID: CAC9013000020120705110227
Water Body Type: Coastal & Bay Shoreline

DECISION ID 49837 **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, 4000 feet south of outfall

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (being addressed by USEPA approved TMDL)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
TMDL Name:	Bacteria Impaired Waters I (creeks and beach shorelines)
TMDL Project Code:	169
Date TMDL Approved by USEPA:	06/22/2011
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Five lines of evidence are available in the administrative record to assess this pollutant. Data from 2008 to 2010 shows that 35 of the 93 samples exceed the water quality objective for enterococcus (geomean) for REC-1, 19 of the 92 exceed the objective for total coliform (geomean) for SHELL.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Data from 2008 to 2010 shows that 35 of the 93 samples exceed the water quality objective for enterococcus (geomean) for REC-1, 19 of the 92 exceed the objective for total coliform (geomean) for SHELL and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 49837, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, 4000 feet south of outfall

LOE ID:	74859
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	043516
Beneficial Use:	Shellfish Harvesting	
Number of Samples:	110	
Number of Exceedances:	12	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed Beach Watch data for Pacific Ocean Shoreline, Lower San Juan HSA, 4000 feet south of outfall to determine beneficial use support and results are as follows: 12 of 110 samples exceed the criterion for Coliform, Total.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Lower San Juan HSA, 4000 feet south of outfall was collected at 1 monitoring site [4000' South Outfall]	
Temporal Representation:	Data was collected over the time period 1/3/2008-1/11/2010.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 49837, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, 4000 feet south of outfall

LOE ID:	77637
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	92
Number of Exceedances:	19
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Nineteen of the 92 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, Lower San Juan HSA, 4000 feet south of outfall.
Temporal Representation:	The samples were collected from January 2008 through January 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49837, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, 4000 feet south of outfall

LOE ID:	74860
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	92
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 92 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the 4000' South Outfall site.
Temporal Representation:	Samples were collected from January 2008 to January 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49837, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, 4000 feet south of outfall

LOE ID:	74858
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	93
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 93 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	The geometric mean standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the 4000' South Outfall site.
Temporal Representation:	Samples were collected from January 2008 to January 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49837, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, 4000 feet south of outfall

LOE ID:	74839
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	93
Number of Exceedances:	35
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Thirty-five of the 93 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for enterococcus states that the coliform density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the 4000' South Outfall site.
Temporal Representation:	Samples were collected from January 2008 to January 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Lower San Juan HSA, 5000 feet south of outfall
Water Body ID: CAC9013000020120705130851
Water Body Type: Coastal & Bay Shoreline

DECISION ID 49838 **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, 5000 feet south of outfall

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (being addressed by USEPA approved TMDL)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
TMDL Name:	Bacteria Impaired Waters I (creeks and beach shorelines)
TMDL Project Code:	169
Date TMDL Approved by USEPA:	06/22/2011
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Five lines of evidence are available in the administrative record to assess this pollutant. Data from 2008 to 2010 shows that 45 of the 93 samples exceed the water quality objective for enterococcus (geomean) for REC-1, and 24 of the 92 samples exceed the objective for total coliform (geomean) for SHELL.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Data from 2008 to 2010 shows that 45 of the 93 samples exceed the water quality objective for enterococcus (geomean) for REC-1, and 24 of the 92 samples exceed the objective for total coliform (geomean) for SHELL and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.

4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 49838, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, 5000 feet south of outfall

LOE ID:	74864
Pollutant:	Total Coliform

LOE Subgroup:	Pollutant-Water	043520
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Water Contact Recreation	
Number of Samples:	92	
Number of Exceedances:	0	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Zero of the 92 geomeans exceeded the objective.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at the 5000' South Outfall site.	
Temporal Representation:	Samples were collected from January 2008 to January 2010.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 49838, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, 5000 feet south of outfall

LOE ID:	77638
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	92
Number of Exceedances:	24
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Twenty-four of the 92 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, Lower San Juan HSA, 5000 feet south of outfall.

Temporal Representation: The samples were collected from January 2008 through January 2010. 043521
Environmental Conditions:
QAPP Information: The samples were collected for the beach watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 49838, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, 5000 feet south of outfall

LOE ID: 74861

Pollutant: Enterococcus
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 93
Number of Exceedances: 45

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Forty-five of the 93 geomeans exceeded the objective.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The geometric mean standard for enterococcus states that the coliform density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at the 5000' South Outfall site.
Temporal Representation: Samples were collected from January 2008 to January 2010.
Environmental Conditions:
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 49838, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, 5000 feet south of outfall

LOE ID: 74862

Pollutant: Fecal Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 93
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Zero of the 93 geomeans exceeded the objective.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The geometric mean standard for fecal coliform states that the coliform density shall not

exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009 093522

Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at the 5000' South Outfall site.
Temporal Representation: Samples were collected from January 2008 to January 2010.
Environmental Conditions:
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 49838, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, 5000 feet south of outfall

LOE ID: 74863

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Shellfish Harvesting

Number of Samples: 110
Number of Exceedances: 15

Data and Information Type: PATHOGEN MONITORING
Data Used to Assess Water Quality: Water Board staff assessed Beach Watch data for Pacific Ocean Shoreline, Lower San Juan HSA, 5000 feet south of outfall to determine beneficial use support and results are as follows: 15 of 110 samples exceed the criterion for Coliform, Total.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Data for this line of evidence for Pacific Ocean Shoreline, Lower San Juan HSA, 5000 feet south of outfall was collected at 1 monitoring site [5000' South Outfall]
Temporal Representation: Data was collected over the time period 1/3/2008-1/11/2010.
Environmental Conditions: Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Lower San Juan HSA, 7500 feet south of outfall
Water Body ID: CAC9013000020120705131358
Water Body Type: Coastal & Bay Shoreline

DECISION ID 49839 **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, 7500 feet south of outfall

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (being addressed by USEPA approved TMDL)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
TMDL Name:	Bacteria Impaired Waters I (creeks and beach shorelines)
TMDL Project Code:	169
Date TMDL Approved by USEPA:	06/22/2011
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Five lines of evidence are available in the administrative record to assess this pollutant. Data from 2008 to 2010 shows that 24 of 87 samples exceed the water quality objective for enterococcus of a geomean of 35/100 ml in a 30-day period for the protection of REC-1.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Data from 2008 to 2010 shows that 24 of 87 samples exceed the water quality objective for enterococcus of a geomean of 35/100 ml in a 30-day period for the protection of REC-1 and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 49839, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, 7500 feet south of outfall

LOE ID:	74865
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water

Fraction:	None	043524
Beneficial Use:	Water Contact Recreation	
Number of Samples:	87	
Number of Exceedances:	24	
Data and Information Type:	Not Specified	
Data Used to Assess Water Quality:	Twenty-four of the 87 geomeans exceeded the objective.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The geometric mean standard for enterococcus states that the coliform density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Samples were collected at the 7500' South Outfall site.	
Temporal Representation:	Samples were collected from January 2008 to January 2010.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 49839, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, 7500 feet south of outfall

LOE ID:	74866
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	87
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 87 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the 7500' South Outfall site.
Temporal Representation:	Samples were collected from January 2008 to January 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49839, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, 7500 feet south of outfall 043525

LOE ID:	77639
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	87
Number of Exceedances:	12
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Twelve of the 87 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, Lower San Juan HSA, 7500 feet south of outfall.
Temporal Representation:	The samples were collected from January 2008 through January 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49839, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, 7500 feet south of outfall

LOE ID:	74885
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	87
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 87 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at the 7500' South Outfall site.
Temporal Representation: Samples were collected from January 2008 to January 2010.
Environmental Conditions:
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 49839, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, 7500 feet south of outfall

LOE ID: 74884

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Shellfish Harvesting

Number of Samples: 105
Number of Exceedances: 11

Data and Information Type: PATHOGEN MONITORING
Data Used to Assess Water Quality: Water Board staff assessed Beach Watch data for Pacific Ocean Shoreline, Lower San Juan HSA, 7500 feet south of outfall to determine beneficial use support and results are as follows: 11 of 105 samples exceed the criterion for Coliform, Total.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Data for this line of evidence for Pacific Ocean Shoreline, Lower San Juan HSA, 7500 feet south of outfall was collected at 1 monitoring site [7500' South Outfall]
Temporal Representation: Data was collected over the time period 1/3/2008-1/11/2010.
Environmental Conditions: Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Lower San Juan HSA, at surfzone outfall at Doheny State Beach
Water Body ID: CAC9012000020120705142358
Water Body Type: Coastal & Bay Shoreline

DECISION ID 49877 **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at surfzone outfall at Doheny State Beach

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (being addressed by USEPA approved TMDL)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
TMDL Name:	Bacteria Impaired Waters I (creeks and beach shorelines)
TMDL Project Code:	169
Date TMDL Approved by USEPA:	06/22/2011
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Five lines of evidence are available in the administrative record to assess this pollutant. Data of 2008 to 2010 show that 59 of the 93 samples exceed the water quality objective (WQO) for enterococcus (geomean) for REC-1, and 50 of the 93 samples exceed the WQO for total coliform (geomean) for SHELL.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Data of 2008 to 2010 show that 59 of the 93 samples exceed the water quality objective (WQO) for enterococcus (geomean) for REC-1, and 50 of the 93 samples exceed the WQO for total coliform (geomean) for SHELL and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.

4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 49877, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at surfzone outfall at Doheny State Beach

LOE ID:	77643
Pollutant:	Total Coliform

LOE Subgroup:	Pollutant-Water	043528
Matrix:	Water	
Fraction:	None	
Beneficial Use:	Shellfish Harvesting	
Number of Samples:	93	
Number of Exceedances:	50	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Fifty of the 93 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, Lower San Juan HSA, at surfzone outfall at Doheny State Beach.	
Temporal Representation:	The samples were collected from September 2008 to January 2010.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the beach watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 49877, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at surfzone outfall at Doheny State Beach

LOE ID:	74778
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	93
Number of Exceedances:	8
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Eight nine of the 93 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the surfzone outfall site.

Temporal Representation:	Samples were collected from January 2008 to January 2010.	043529
Environmental Conditions:		
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 49877, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at surfzone outfall at Doheny State Beach

LOE ID:	74755
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	93
Number of Exceedances:	59
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Fifty-nine of the 93 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the SJC Mouth site.
Temporal Representation:	Samples were collected from January 2008 to January 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49877, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at surfzone outfall at Doheny State Beach

LOE ID:	74757
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	111
Number of Exceedances:	39
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Beach Watch data for Pacific Ocean Shoreline, Lower San Juan HSA, at surfzone outfall at Doheny State Beach to determine beneficial use support and results are as follows: 39 of 111 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP

Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Lower San Juan HSA, at surfzone outfall at Doheny State Beach was collected at 1 monitoring site [Surfzone at Outfall]
Temporal Representation:	Data was collected over the time period 1/3/2008-1/11/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49877, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, at surfzone outfall at Doheny State Beach

LOE ID:	74756
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	92
Number of Exceedances:	13
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Thirteen of the 92 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the surfzone outfall site.
Temporal Representation:	Samples were collected from January 2008 to January 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Scripps HA, at Belmont Park at Mission Beach (near Ventura Place)
Water Body ID: CAC907510002012070514151 4
Water Body Type: Coastal & Bay Shoreline

DECISION ID 50003 **Region 9**
Pacific Ocean Shoreline, Scripps HA, at Belmont Park at Mission Beach (near Ventura Place)

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Five lines of evidence are available in the administrative record to assess this pollutant. Data of 2008 to 2010 shows that zero of 145 geomean samples exceed the water quality objective for enterococcus for the protection of REC-1 beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Data of 2008 to 2010 shows that zero of 145 geomean samples exceed the water quality objective for enterococcus for the protection of REC-1 beneficial use and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 50003, Indicator Bacteria **Region 9**
Pacific Ocean Shoreline, Scripps HA, at Belmont Park at Mission Beach (near Ventura Place)

LOE ID: 75104

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 144

Number of Exceedances:	0	043532

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Zero of the 144 geomeans exceeded the objective.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at the Belmont Park at Mission Beach site.
Temporal Representation: Samples were collected from January 2008 to August 2010.
Environmental Conditions:
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 50003, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Belmont Park at Mission Beach (near Ventura Place)

LOE ID: 75103

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Shellfish Harvesting

Number of Samples: 152
Number of Exceedances: 4

Data and Information Type: PATHOGEN MONITORING
Data Used to Assess Water Quality: Water Board staff assessed bw data for Pacific Ocean Shoreline, Scripps HA, at Belmont Park at Mission Beach to determine beneficial use support and results are as follows: 4 of 152 samples exceed the criterion for Coliform, Total.
Data Reference: Data for Region 9 Beach Watch.

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference: California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Data for this line of evidence for Pacific Ocean Shoreline, Scripps HA, at Belmont Park at Mission Beach was collected at 1 monitoring site [Belmont Park]
Temporal Representation: Data was collected over the time period 1/5/2008-8/24/2010.
Environmental Conditions: Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information: The samples were collected for the Beach Watch program.
QAPP Information Reference(s):

Line of Evidence (LOE) for Decision ID 50003, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Belmont Park at Mission Beach (near Ventura Place)

LOE ID:	75102
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	144
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 144 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Belmont Park at Mission Beach site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 50003, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Belmont Park at Mission Beach (near Ventura Place)

LOE ID:	75101
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	145
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 145 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Belmont Park at Mission Beach site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.

Environmental Conditions:		043534
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 50003, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Belmont Park at Mission Beach (near Ventura Place)

LOE ID:	77676
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	144
Number of Exceedances:	1
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	One of the 144 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, Scripps HA, at Belmont Park at Mission Beach
Temporal Representation:	The samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Mission Bay Shoreline, at North Cove Beach at Vacation Isle
Water Body ID: CAC907520002012070514270 8
Water Body Type: Coastal & Bay Shoreline

DECISION ID 49430 Region 9
Mission Bay Shoreline, at North Cove Beach at Vacation Isle

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL Completion Date:	2025
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Fifty seven of the 89 samples exceed the Water Quality Criterion for total coliform of a geomean of 70 cfu/100 ml in a 30-day period for the protection of SHELL beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Fifty seven of 89 samples exceed the Water Quality Criterion for total coliform of a geomean of 70 cfu/100 ml in a 30-day period for the protection of SHELL beneficial use and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 49430, Indicator Bacteria Region 9
Mission Bay Shoreline, at North Cove Beach at Vacation Isle

LOE ID:	74354
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None

Beneficial Use:	Shellfish Harvesting	043536
Number of Samples:	98	
Number of Exceedances:	23	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	Water Board staff assessed BW data for Mission Bay Shoreline, at North Cove Beach at Vacation Isle to determine beneficial use support and results are as follows: 23 of 98 samples exceed the criterion for Coliform, Total.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The Water Quality Control Plan (Basin Plan 2011)states the following: At all areas where shellfish may be harvested for human consumption, ten percent of the samples collected during any 30-day period shall not exceed 230 MPN/100mL.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Data for this line of evidence for Mission Bay Shoreline, at North Cove Beach at Vacation Isle was collected at 1 monitoring site [North Cove beach]	
Temporal Representation:	Data was collected over the time period April 2008 to August 2010.	
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.	
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 49430, Indicator Bacteria **Region 9**

Mission Bay Shoreline, at North Cove Beach at Vacation Isle

LOE ID:	77609
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	89
Number of Exceedances:	57
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Fifty-seven of the 89 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The Water Quality Control Plan for the San Diego Basin states that at all areas where shellfish may be harvested for human consumption, the median total coliform concentration throughout the water column for any 30-day period shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Mission Bay Shoreline, at Fiesta Island northwest shore.

Temporal Representation:	The samples were collected from April 2008 to August 2010.	043537
Environmental Conditions:		
QAPP Information:	The samples were collected for the beach watch program.	
QAPP Information Reference(s):		

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Aliso HSA, at Treasure Island Pier
Water Body ID: CAC9011300020120705162144
Water Body Type: Coastal & Bay Shoreline

DECISION ID 49674 **Region 9**
Pacific Ocean Shoreline, Aliso HSA, at Treasure Island Pier

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Five lines of evidence are available in the administrative record to assess this pollutant. Using the latest data, zero of the 122 samples exceed the Water Quality Objective for enterococcus of a geomean of 35/100ml in a 30-day period for the protection of REC-1.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Five lines of evidence are available in the administrative record to assess this pollutant. Using the latest data, zero of the 122 samples exceed the Water Quality Objective for enterococcus of a geomean of 35/100ml in a 30-day period for the protection of REC-1 and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 49674, Indicator Bacteria **Region 9**
Pacific Ocean Shoreline, Aliso HSA, at Treasure Island Pier

LOE ID: 77586

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Shellfish Harvesting

Number of Samples:	122	043539
Number of Exceedances:	0	
Data and Information Type:	PATHOGEN MONITORING	
Data Used to Assess Water Quality:	None of the 122 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.	
Data Reference:	Data for Region 9 Beach Watch.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.	
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, Aliso HSA, at Treasure Island Pier..	
Temporal Representation:	The samples were collected from January 2008 through August 2010.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the beach watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 49674, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Treasure Island Pier

LOE ID:	74550
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	144
Number of Exceedances:	1
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed BW data for Pacific Ocean Shoreline, Aliso HSA, at Treasure Island Pier to determine beneficial use support and results are as follows: 1 of 144 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Aliso HSA, at Treasure Island Pier was collected at 1 monitoring site [Treasure Island Pier]
Temporal Representation:	Data was collected over the time period January 2008 through August 2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.

QAPP Information Reference(s): 043540

Line of Evidence (LOE) for Decision ID 49674, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Treasure Island Pier

LOE ID:	74546
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	122
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 122 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Treasure Island site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49674, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Treasure Island Pier

LOE ID:	74545
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	122
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 122 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for entercoccus states that the entercoccus density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009

Evaluation Guideline:		043541
Guideline Reference:		
Spatial Representation:	Samples were collected at the Treasure Island site.	
Temporal Representation:	Samples were collected from January 2008 to August 2010.	
Environmental Conditions:		
QAPP Information:	The samples were collected for the Beach Watch program.	
QAPP Information Reference(s):		

Line of Evidence (LOE) for Decision ID 49674, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Aliso HSA, at Treasure Island Pier

LOE ID:	74551
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	122
Number of Exceedances:	0
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Zero of the 122 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the Treasure Island site.
Temporal Representation:	Samples were collected from January 2008 to August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Lower San Juan HSA, 1000 feet south of outfall
Water Body ID: CAC9013000020120706135545
Water Body Type: Coastal & Bay Shoreline

DECISION ID 49833 **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, 1000 feet south of outfall

Pollutant:	**Indicator Bacteria**
Final Listing Decision:	**List on 303(d) list (being addressed by USEPA approved TMDL)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
TMDL Name:	Bacteria Impaired Waters I (creeks and beach shorelines)
TMDL Project Code:	169
Date TMDL Approved by USEPA:	06/22/2011
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

Five lines of evidence are available in the administrative record to assess this pollutant. Data from 2008 to 2010 suggests that 36 out of 89 samples exceed the water quality objective for enterococcus of a geomean of 35/100ml in a 30-day period for the protection of REC-1; and 21 out of 89 samples exceed the water quality objective for total coliform of a geomean of 70/100ml in a 30-day period for the protection of SHELL.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Data from 2008 to 2010 suggests that 36 out of 89 samples exceed the water quality objective for enterococcus of a geomean of 35/100ml in a 30-day period for the protection of REC-1; and 21 out of 89 samples exceed the water quality objective for total coliform of a geomean of 70/100ml in a 30-day period for the protection of SHELL, and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 49833, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, 1000 feet south of outfall

LOE ID: 74802

Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	89
Number of Exceedances:	1
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	One of the 89 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for total coliform states that the coliform density shall not exceed 1000 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the 1000' South Outfall site.
Temporal Representation:	Samples were collected from January 2008 to January 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49833, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, 1000 feet south of outfall

LOE ID:	74800
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	89
Number of Exceedances:	2
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Two of the 89 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for fecal coliform states that the coliform density shall not exceed 200 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the 1000' South Outfall site.
Temporal Representation:	Samples were collected from January 2008 to January 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.

QAPP Information Reference(s): 043544

Line of Evidence (LOE) for Decision ID 49833, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, 1000 feet south of outfall

LOE ID:	74777
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	89
Number of Exceedances:	36
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	Thirty-six of the 89 geomeans exceeded the objective.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The geometric mean standard for enterococcus states that the coliform density shall not exceed 35 per 100 mL. Water Quality Control Plan for Ocean Waters 2009.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at the 1000' South Outfall site.
Temporal Representation:	Samples were collected from January 2008 to January 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49833, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, 1000 feet south of outfall

LOE ID:	77633
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	89
Number of Exceedances:	21
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Twenty-one of the 89 samples exceeded the objective of 70 mpn/100ml applied as a rolling 30 day geomean.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, the median total coliform density shall not exceed 70 per 100 mL. Staff applied the objective as a rolling 30 day geometric mean consistent with other state bacteria

	objectives and with guidance from the National Shellfish Sanitation Program from which the objectives were taken.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at Pacific Ocean Shoreline, Lower San Juan HSA, 1000 feet south of outfall.
Temporal Representation:	The samples were collected from January 2008 through August 2010.
Environmental Conditions:	
QAPP Information:	The samples were collected for the beach watch program.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49833, Indicator Bacteria **Region 9**

Pacific Ocean Shoreline, Lower San Juan HSA, 1000 feet south of outfall

LOE ID:	74801
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Shellfish Harvesting
Number of Samples:	107
Number of Exceedances:	17
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Beach Watch data for Pacific Ocean Shoreline, Lower San Juan HSA, 1000 feet south of outfall to determine beneficial use support and results are as follows: 17 of 107 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Lower San Juan HSA, 1000 feet south of outfall was collected at 1 monitoring site [1000' South Outfall]
Temporal Representation:	Data was collected over the time period 1/3/2008-1/11/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Lower Ysidora HSA, north of Santa Margarita River
Water Body ID: CAC902110002012070516335 0
Water Body Type: Coastal & Bay Shoreline

DECISION ID 49879 **Region 9**
Pacific Ocean Shoreline, Lower Ysidora HSA, north of Santa Margarita River

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2, one line(s) of evidence is necessary to assess listing status.

One line of evidence are available in the administrative record to assess this pollutant. Two of the two samples exceed the water quality objective for total coliform of a SSM of 230/100ml for the protection of SHELL beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Two of the two samples exceed the water quality objective for total coliform of a SSM of 230/100ml for the protection of SHELL beneficial use and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to [SECTION 3.11/4.11] of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49879, Indicator Bacteria **Region 9**
Pacific Ocean Shoreline, Lower Ysidora HSA, north of Santa Margarita River

LOE ID: 74780

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Shellfish Harvesting

Number of Samples:	2
Number of Exceedances:	2
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Beach Watch data for Pacific Ocean Shoreline, Lower Ysidora HSA, north of Santa Margarita River to determine beneficial use support and results are as follows: 2 of 2 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Lower Ysidora HSA, north of Santa Margarita River was collected at 1 monitoring site [Santa Margarita River (NR)]
Temporal Representation:	Data was collected over the time period 2/24/2010-2/25/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Otay Valley HA, north of Palm Avenue Jetty
Water Body ID: CAC910200002012070516422 2
Water Body Type: Coastal & Bay Shoreline

DECISION ID 49908 **Region 9**
Pacific Ocean Shoreline, Otay Valley HA, north of Palm Avenue Jetty

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2, one line(s) of evidence are necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. Zero of three samples exceed the water quality objective for total coliform of a SSM of 230/100ml for the protection of SHELL beneficial use.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Zero of three samples exceed the water quality objective for total coliform of a SSM of 230/100ml for the protection of SHELL beneficial use and this sample size is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating. A minimum of 26 samples is needed to determine if a beneficial use is fully supported using table 3.2.
4. Pursuant to [SECTION 3.11/4.11] of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49908, Indicator Bacteria **Region 9**
Pacific Ocean Shoreline, Otay Valley HA, north of Palm Avenue Jetty

LOE ID: 74961

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Shellfish Harvesting

Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PATHOGEN MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed Beach Watch data for Pacific Ocean Shoreline, Otay Valley HA, north of Palm Avenue Jetty to determine beneficial use support and results are as follows: 0 of 3 samples exceed the criterion for Coliform, Total.
Data Reference:	Data for Region 9 Beach Watch.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Ocean Plan states that at all areas where shellfish may be harvested for human consumption, not more than 10 percent of the samples shall exceed 230 per 100 mL.
Objective/Criterion Reference:	California Ocean Plan Water Quality Control Plan Ocean Waters of California 2009
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Data for this line of evidence for Pacific Ocean Shoreline, Otay Valley HA, north of Palm Avenue Jetty was collected at 1 monitoring site [Palm Ave]
Temporal Representation:	Data was collected over the time period 5/25/2008-5/6/2010.
Environmental Conditions:	Staff is not aware of any special conditions that might affect interpretation of the data.
QAPP Information:	The samples were collected for the Beach Watch program.
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at parking lot entrance
Water Body ID: CAC904610002012090511300 6
Water Body Type: Coastal & Bay Shoreline

DECISION ID 49940 Region 9
Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at parking lot entrance

Pollutant:	**Trash**
Final Listing Decision:	**List on 303(d) list (being addressed by action other than TMDL)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected Attainment Date:	2029
Implementation Action Other than TMDL:	Collected effort of public, agencies, organizations, and permittees. Methods include street sweeping, education programs on littering, installation of trash-catching devices on storm drains.
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.7 of the Listing Policy. Under this section when all other listing factors do not result in the listing of a water segment but information indicates non-attainment of standards, a water segment shall be evaluated to determine whether the weight of evidence demonstrates that water quality standard is not attained. If the weight of evidence indicates non-attainment, the water segment shall be placed on the CWA section 303(d) List.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for placing this water segment-pollutant combination from the CWA section 303(d) List. This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The following information indicates that the water quality standard is not being attained: Coastkeeper cleanups occurred on 03/10/07, 11/10/07 and 11/8/08 for this water body. The total weight of trash (lbs) collected on these dates was 188 and 784. Using the metric, Coastkeeper classified this water body as low and medium for trash impairment. However, any trash found is an exceedance and needs to be addressed by an action other than a TMDL.
3. This process is scientifically defensible and reproducible.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 49940, Trash Region 9
Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at parking lot entrance

LOE ID:	74681
Pollutant:	Trash
LOE Subgroup:	Pollutant-Nuisance
Matrix:	Not Recorded
Fraction:	None
Beneficial Use:	Non-Contact Recreation

Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Occurrence of conditions judged to cause impairment
Data Used to Assess Water Quality:	The San Diego Coastkeeper conducts trash cleanups and uses a metric (pounds of trash collected per volunteer) to compare levels of trash across beaches and categorizes beaches as either low, medium, high or severe, based on this metric. Coastkeeper cleanups occurred on 11/10/07 and 11/8/08 for this water body. The total weight of trash (lbs) collected on these dates was 784. However, using the metric, Coastkeeper classified this water body as medium for trash impairment.
Data Reference:	Data for Trash, Nutrients, and Pathogens in Region 9, 2007-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Floating Material Waters shall not contain floating material, including solids, liquids, foams, and scum in concentrations which cause nuisance or adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Seaside Beach - Cardiff. Two lines of evidence are being created for this water body (Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at parking lot entrance) because cleanups that occurred at Cardiff State Beach were less than 200 meters away.
Temporal Representation:	Two cleanups occurred on 11/10/07 and 11/8/08.
Environmental Conditions:	
QAPP Information:	San Diego Coastkeeper QAPP was provided.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 49940, Trash **Region 9**

Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at parking lot entrance

LOE ID:	74682
Pollutant:	Trash
LOE Subgroup:	Pollutant-Nuisance
Matrix:	Not Recorded
Fraction:	None
Beneficial Use:	Non-Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Occurrence of conditions judged to cause impairment
Data Used to Assess Water Quality:	The San Diego Coastkeeper conducts trash cleanups and uses a metric (pounds of trash collected per volunteer) to compare levels of trash across beaches and categorizes beaches as either low, medium, high or severe, based on this metric. Coastkeeper cleanups occurred on 3/10/07 for this water body. The total weight of trash (lbs) collected on this date was 188. However, using the metric, Coastkeeper classified this water body as low for trash impairment.
Data Reference:	Data for Trash, Nutrients, and Pathogens in Region 9, 2007-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Floating Material Waters shall not contain floating material, including solids, liquids, foams, and scum in concentrations which cause nuisance or adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	

Spatial Representation:	Cardiff State Beach. Two lines of evidence are being created for this water body (Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at parking lot entrance) because cleanups that occurred at Seaside Beach - Cardiff were less than 200 meters away.
Temporal Representation:	One cleanups occurred on 3/10/07.
Environmental Conditions:	
QAPP Information:	San Diego Coastkeeper QAPP was provided.
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Torrey Pines State Beach, at North Beach Entrance parking lot
Water Body ID: CAC906100002012090511372 2
Water Body Type: Coastal & Bay Shoreline

DECISION ID 50047 **Region 9**
Pacific Ocean Shoreline, Torrey Pines State Beach, at North Beach Entrance parking lot

Pollutant:	**Trash**
Final Listing Decision:	**List on 303(d) list (being addressed by action other than TMDL)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected Attainment Date:	2029
Implementation Action Other than TMDL:	Collected effort of public, agencies, organizations, and permittees. Methods include street sweeping, education programs on littering, installation of trash-catching devices on storm drains.
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.7 of the Listing Policy. Under this section when all other listing factors do not result in the listing of a water segment but information indicates non-attainment of standards, a water segment shall be evaluated to determine whether the weight of evidence demonstrates that water quality standard is not attained. If the weight of evidence indicates non-attainment, the water segment shall be placed on the CWA section 303(d) List.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for placing this water segment-pollutant combination from the CWA section 303(d) List. This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The following information indicates that the water quality standard is not being attained: Coastkeeper cleanups occurred on 10/13/07, 10/11/08, and 10/10/09 for this water body. The total weight of trash (lbs) collected on these dates was 825.5. Using the metric, Coastkeeper classified this water body as low for trash impairment. However, any trash found is an exceedance and needs to be addressed by an action other than a TMDL.
3. This process is scientifically defensible and reproducible.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 50047, Trash **Region 9**
Pacific Ocean Shoreline, Torrey Pines State Beach, at North Beach Entrance parking lot

LOE ID:	75161
Pollutant:	Trash
LOE Subgroup:	Pollutant-Nuisance
Matrix:	Not Recorded
Fraction:	None
Beneficial Use:	Non-Contact Recreation

Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Occurrence of conditions judged to cause impairment
Data Used to Assess Water Quality:	The San Diego Coastkeeper conducts trash cleanups and uses a metric (pounds of trash collected per volunteer) to compare levels of trash across beaches and categorizes beaches as either low, medium, high or severe, based on this metric. Coastkeeper cleanups occurred on 10/13/07, 10/11/08, and 10/10/09 for this water body. The total weight of trash (lbs) collected on these dates was 825.5. However, using the metric, Coastkeeper classified this water body as low for trash impairment.
Data Reference:	Data for Trash, Nutrients, and Pathogens in Region 9, 2007-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Floating Material Waters shall not contain floating material, including solids, liquids, foams, and scum in concentrations which cause nuisance or adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Torrey Pines State Beach.
Temporal Representation:	Three cleanups occurred on 10/13/07, 10/11/08, and 10/10/09.
Environmental Conditions:	
QAPP Information:	San Diego Coastkeeper QAPP was provided.
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Scripps HA, at North Lane at Windansea Beach
Water Body ID: CAC906300002012090511410 4
Water Body Type: Coastal & Bay Shoreline

DECISION ID 50028 **Region 9**
Pacific Ocean Shoreline, Scripps HA, at North Lane at Windansea Beach

Pollutant:	**Trash**
Final Listing Decision:	**List on 303(d) list (being addressed by action other than TMDL)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected Attainment Date:	2029
Implementation Action Other than TMDL:	Collected effort of public, agencies, organizations, and permittees. Methods include street sweeping, education programs on littering, installation of trash-catching devices on storm drains.
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.7 of the Listing Policy. Under this section when all other listing factors do not result in the listing of a water segment but information indicates non-attainment of standards, a water segment shall be evaluated to determine whether the weight of evidence demonstrates that water quality standard is not attained. If the weight of evidence indicates non-attainment, the water segment shall be placed on the CWA section 303(d) List.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for placing this water segment-pollutant combination from the CWA section 303(d) List. This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The following information indicates that the water quality standard is not being attained: Coastkeeper cleanups occurred on 1/27/07 and 1/26/08 for this water body. The total weight of trash (lbs) collected on these dates was 481. Using the metric, Coastkeeper classified this water body as high for trash impairment. However, any trash found is an exceedance and needs to be addressed by an action other than a TMDL.
3. This process is scientifically defensible and reproducible.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 50028, Trash **Region 9**
Pacific Ocean Shoreline, Scripps HA, at North Lane at Windansea Beach

LOE ID:	75215
Pollutant:	Trash
LOE Subgroup:	Pollutant-Nuisance
Matrix:	Not Recorded
Fraction:	None
Beneficial Use:	Non-Contact Recreation

Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Occurrence of conditions judged to cause impairment
Data Used to Assess Water Quality:	The San Diego Coastkeeper conducts trash cleanups and uses a metric (pounds of trash collected per volunteer) to compare levels of trash across beaches and categorizes beaches as either low, medium, high or severe, based on this metric. Coastkeeper cleanups occurred on 1/27/07 and 1/26/08 for this water body. The total weight of trash (lbs) collected on these dates was 481. However, using the metric, Coastkeeper classified this water body as high for trash impairment.
Data Reference:	Data for Trash, Nutrients, and Pathogens in Region 9, 2007-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Floating Material Waters shall not contain floating material, including solids, liquids, foams, and scum in concentrations which cause nuisance or adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Windansea Beach.
Temporal Representation:	Two cleanups occurred on 1/27/07 and 1/26/08.
Environmental Conditions:	
QAPP Information:	San Diego Coastkeeper QAPP was provided.
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Scripps HA, at Pacific Beach Drive, Pacific Beach
Water Body ID: CAC906300002012090511442 7
Water Body Type: Coastal & Bay Shoreline

DECISION ID 50029 **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Pacific Beach Drive, Pacific Beach

Pollutant:	**Trash**
Final Listing Decision:	**List on 303(d) list (being addressed by action other than TMDL)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected Attainment Date:	2029
Implementation Action Other than TMDL:	Collected effort of public, agencies, organizations, and permittees. Methods include street sweeping, education programs on littering, installation of trash-catching devices on storm drains.
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.7 of the Listing Policy. Under this section when all other listing factors do not result in the listing of a water segment but information indicates non-attainment of standards, a water segment shall be evaluated to determine whether the weight of evidence demonstrates that water quality standard is not attained. If the weight of evidence indicates non-attainment, the water segment shall be placed on the CWA section 303(d) List.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for placing this water segment-pollutant combination from the CWA section 303(d) List. This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The following information indicates that the water quality standard is not being attained: Coastkeeper cleanups occurred on 8/25/07, 8/23/08, and 8/22/09 for this water body. The total weight of trash (lbs) collected on these dates was 741. Using the metric, Coastkeeper classified this water body as medium for trash impairment. However, any trash found is an exceedance and needs to be addressed by an action other than a TMDL.
3. This process is scientifically defensible and reproducible.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 50029, Trash **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Pacific Beach Drive, Pacific Beach

LOE ID:	75216
Pollutant:	Trash
LOE Subgroup:	Ancillary Evidence Effluent Data
Matrix:	Not Recorded
Fraction:	None
Beneficial Use:	Non-Contact Recreation

Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Occurrence of conditions judged to cause impairment
Data Used to Assess Water Quality:	The San Diego Coastkeeper conducts trash cleanups and uses a metric (pounds of trash collected per volunteer) to compare levels of trash across beaches and categorizes beaches as either low, medium, high or severe, based on this metric. Coastkeeper cleanups occurred on 8/25/07, 8/23/08, and 8/22/09 for this water body. The total weight of trash (lbs) collected on these dates was 741. However, using the metric, Coastkeeper classified this water body as medium for trash impairment.
Data Reference:	Data for Trash, Nutrients, and Pathogens in Region 9, 2007-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Floating Material Waters shall not contain floating material, including solids, liquids, foams, and scum in concentrations which cause nuisance or adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Pacific Beach Drive.
Temporal Representation:	Three cleanups occurred on 8/25/07, 8/23/08, and 8/22/09.
Environmental Conditions:	
QAPP Information:	San Diego Coastkeeper QAPP was provided.
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name:	Pacific Ocean Shoreline, Scripps HA, at Belmont Park at Mission Beach (near San Fernando Place)
Water Body ID:	**CAC907510002012090511503 2**
Water Body Type:	**Coastal & Bay Shoreline**

DECISION ID 50002 Region 9

Pacific Ocean Shoreline, Scripps HA, at Belmont Park at Mission Beach (near San Fernando Place)

Pollutant:	**Trash**
Final Listing Decision:	**List on 303(d) list (being addressed by action other than TMDL)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected Attainment Date:	2029
Implementation Action Other than TMDL:	Collected effort of public, agencies, organizations, and permittees. Methods include street sweeping, education programs on littering, installation of trash-catching devices on storm drains.
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.7 of the Listing Policy. Under this section when all other listing factors do not result in the listing of a water segment but information indicates non-attainment of standards, a water segment shall be evaluated to determine whether the weight of evidence demonstrates that water quality standard is not attained. If the weight of evidence indicates non-attainment, the water segment shall be placed on the CWA section 303(d) List.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for placing this water segment-pollutant combination from the CWA section 303(d) List. This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The following information indicates that the water quality standard is not being attained: Coastkeeper cleanups occurred on 10/25/08, 4/14/07, 7/26/08, 7/25/09, and 7/24/10 for this water body. The total weight of trash (lbs) collected on 10/25/08 was 123 and the total weight of trash collected on the rest of the dates was 1,121.25. Using the metric, Coastkeeper classified this water body as low and medium for trash impairment. However, any trash found is an exceedance and needs to be addressed by an action other than a TMDL.
3. This process is scientifically defensible and reproducible.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

Line of Evidence (LOE) for Decision ID 50002, Trash Region 9

Pacific Ocean Shoreline, Scripps HA, at Belmont Park at Mission Beach (near San Fernando Place)

LOE ID:	75100
Pollutant:	Trash
LOE Subgroup:	Pollutant-Nuisance
Matrix:	Not Recorded
Fraction:	None

Beneficial Use:	Non-Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Occurrence of conditions judged to cause impairment
Data Used to Assess Water Quality:	The San Diego Coastkeeper conducts trash cleanups and uses a metric (pounds of trash collected per volunteer) to compare levels of trash across beaches and categorizes beaches as either low, medium, high or severe, based on this metric. Coastkeeper cleanups occurred on 4/14/07, 7/26/08, 7/25/09, and 7/24/10 for this water body. The total weight of trash (lbs) collected on these dates was 1,121.25. However, using the metric, Coastkeeper classified this water body as medium for trash impairment.
Data Reference:	Data for Trash, Nutrients, and Pathogens in Region 9, 2007-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Floating Material Waters shall not contain floating material, including solids, liquids, foams, and scum in concentrations which cause nuisance or adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	South Mission Beach. Two lines of evidence are being created for this water body (Pacific Ocean Shoreline, Scripps HA, at Belmont Park, Mission Beach) because cleanups that occurred at Mission Beach - Belmont Park were less than 200 meters away.
Temporal Representation:	Four cleanups occurred on 4/14/07, 7/26/08, 7/25/09, and 7/24/10.
Environmental Conditions:	
QAPP Information:	San Diego Coastkeeper QAPP was provided.
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 50002, Trash **Region 9**

Pacific Ocean Shoreline, Scripps HA, at Belmont Park at Mission Beach (near San Fernando Place)

LOE ID:	75099
Pollutant:	Trash
LOE Subgroup:	Pollutant-Nuisance
Matrix:	Not Recorded
Fraction:	Dissolved
Beneficial Use:	Non-Contact Recreation
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	Occurrence of conditions judged to cause impairment
Data Used to Assess Water Quality:	The San Diego Coastkeeper conducts trash cleanups and uses a metric (pounds of trash collected per volunteer) to compare levels of trash across beaches and categorizes beaches as either low, medium, high or severe, based on this metric. Coastkeeper cleanups occurred on 10/25/08 for this water body. The total weight of trash (lbs) collected on this date was 123. However, using the metric, Coastkeeper classified this water body as low for trash impairment.
Data Reference:	Data for Trash, Nutrients, and Pathogens in Region 9, 2007-2010.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Floating Material Waters shall not contain floating material, including solids, liquids, foams, and scum in concentrations which cause nuisance or adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin

Evaluation Guideline:	043561
Guideline Reference:	
Spatial Representation:	Mission Beach - Belmont Park. Two lines of evidence are being created for this water body (Pacific Ocean Shoreline, Scripps HA, at Belmont Park, Mission Beach) because cleanups that occurred at South Mission Beach were less than 200 meters away.
Temporal Representation:	One cleanup occurred on 10/25/08.
Environmental Conditions:	
QAPP Information:	San Diego Coastkeeper QAPP was provided.
QAPP Information Reference(s):	

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Point Loma HA, at Sunset Cliffs and Froude Street
Water Body ID: CAC908100002012090511542 2
Water Body Type: Coastal & Bay Shoreline

DECISION ID 49913 Region 9
Pacific Ocean Shoreline, Point Loma HA, at Sunset Cliffs and Froude Street

Pollutant:	**Trash**
Final Listing Decision:	**List on 303(d) list (being addressed by action other than TMDL)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected Attainment Date:	2029
Implementation Action Other than TMDL:	Collected effort of public, agencies, organizations, and permittees. Methods include street sweeping, education programs on littering, installation of trash-catching devices on storm drains.
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.7 of the Listing Policy. Under this section when all other listing factors do not result in the listing of a water segment but information indicates non-attainment of standards, a water segment shall be evaluated to determine whether the weight of evidence demonstrates that water quality standard is not attained. If the weight of evidence indicates non-attainment, the water segment shall be placed on the CWA section 303(d) List.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for placing this water segment-pollutant combination from the CWA section 303(d) List. This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The following information indicates that the water quality standard is not being attained: Coastkeeper cleanups occurred on 7/27/07, 4/12/08, 4/11/09, and 4/10/2010 for this water body. The total weight of trash (lbs) collected on these dates was 3,076. However, using the metric, Coastkeeper classified this water body as severe for trash impairment. However, any trash found is an exceedance and needs to be addressed by an action other than a TMDL.
3. This process is scientifically defensible and reproducible.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49913, Trash Region 9
Pacific Ocean Shoreline, Point Loma HA, at Sunset Cliffs and Froude Street

LOE ID:	75018
Pollutant:	Trash
LOE Subgroup:	Pollutant-Nuisance
Matrix:	Not Recorded
Fraction:	None

Beneficial Use:	Non-Contact Recreation	043563
Number of Samples:	0	
Number of Exceedances:	0	
Data and Information Type:	Occurrence of conditions judged to cause impairment	
Data Used to Assess Water Quality:	The San Diego Coastkeeper conducts trash cleanups and uses a metric (pounds of trash collected per volunteer) to compare levels of trash across beaches and categorizes beaches as either low, medium, high or severe, based on this metric. Coastkeeper cleanups occurred on 7/27/07, 4/12/08, 4/11/09, and 4/10/2010 for this water body. The total weight of trash (lbs) collected on these dates was 3,076. However, using the metric, Coastkeeper classified this water body as severe for trash impairment.	
Data Reference:	Data for Trash, Nutrients, and Pathogens in Region 9, 2007-2010.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Floating Material Waters shall not contain floating material, including solids, liquids, foams, and scum in concentrations which cause nuisance or adversely affect beneficial uses.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Sunset Cliffs.	
Temporal Representation:	Four cleanups occurred on 7/27/07, 4/12/08, 4/11/09, and 4/10/2010.	
Environmental Conditions:		
QAPP Information:	San Diego Coastkeeper QAPP was provided.	
QAPP Information Reference(s):		

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Supporting Information

Regional Board 9 - San Diego Region

Water Body Name: Pacific Ocean Shoreline, Coronado HA, at G Ave, Central Beach
Water Body ID: CAC910100002012090511574 6
Water Body Type: Coastal & Bay Shoreline

DECISION ID 49686 Region 9
Pacific Ocean Shoreline, Coronado HA, at G Ave, Central Beach

Pollutant:	**Trash**
Final Listing Decision:	**List on 303(d) list (being addressed by action other than TMDL)**
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected Attainment Date:	2029
Implementation Action Other than TMDL:	Collected effort of public, agencies, organizations, and permittees. Methods include street sweeping, education programs on littering, installation of trash-catching devices on storm drains.
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.7 of the Listing Policy. Under this section when all other listing factors do not result in the listing of a water segment but information indicates non-attainment of standards, a water segment shall be evaluated to determine whether the weight of evidence demonstrates that water quality standard is not attained. If the weight of evidence indicates non-attainment, the water segment shall be placed on the CWA section 303(d) List.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for placing this water segment-pollutant combination from the CWA section 303(d) List. This conclusion is based on the staff findings that:
1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The following information indicates that the water quality standard is not being attained: Coastkeeper cleanups occurred on 3/24/07, 3/22/08, 3/28/09, and 3/27/10 for this water body. The total weight of trash (lbs) collected on these dates was 1,057.5. Using the metric, Coastkeeper classified this water body as medium for trash impairment. However, any trash found is an exceedance and needs to be addressed by an action other than a TMDL.
3. This process is scientifically defensible and reproducible.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

Line of Evidence (LOE) for Decision ID 49686, Trash Region 9
Pacific Ocean Shoreline, Coronado HA, at G Ave, Central Beach

LOE ID:	74604
Pollutant:	Trash
LOE Subgroup:	Pollutant-Nuisance
Matrix:	Not Recorded
Fraction:	None

Beneficial Use:	Non-Contact Recreation	043565
Number of Samples:	0	
Number of Exceedances:	0	
Data and Information Type:	Occurrence of conditions judged to cause impairment	
Data Used to Assess Water Quality:	The San Diego Coastkeeper conducts trash cleanups and uses a metric (pounds of trash collected per volunteer) to compare levels of trash across beaches and categorizes beaches as either low, medium, high or severe, based on this metric. Coastkeeper cleanups occurred on 3/24/07, 3/22/08, 3/28/09, and 3/27/10 for this water body. The total weight of trash (lbs) collected on these dates was 1,057.5. However, using the metric, Coastkeeper classified this water body as medium for trash impairment.	
Data Reference:	Data for Trash, Nutrients, and Pathogens in Region 9, 2007-2010.	
SWAMP Data:	Non-SWAMP	
Water Quality Objective/Criterion:	Floating Material Waters shall not contain floating material, including solids, liquids, foams, and scum in concentrations which cause nuisance or adversely affect beneficial uses.	
Objective/Criterion Reference:	Water Quality Control Plan for the San Diego Basin	
Evaluation Guideline:		
Guideline Reference:		
Spatial Representation:	Coronado City Beach.	
Temporal Representation:	Four cleanups occurred on 3/24/07, 3/22/08, 3/28/09, and 3/27/10.	
Environmental Conditions:		
QAPP Information:	San Diego Coastkeeper QAPP was provided.	
QAPP Information Reference(s):		

043566

Region 9
San Diego Regional Water Quality Control Board

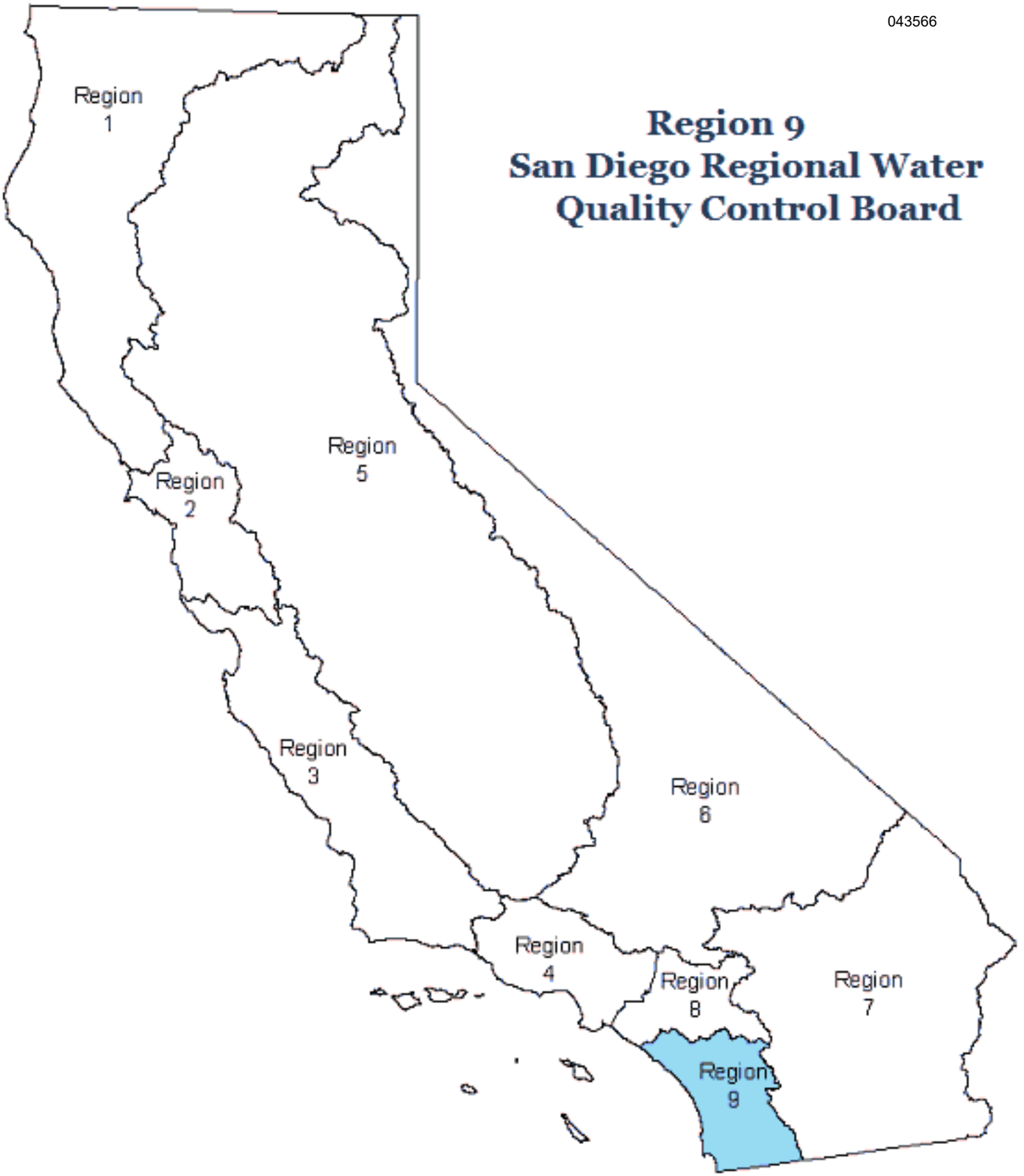

Draft California 2014 Integrated Report (303(d) List/305(b) Report) Supporting Information

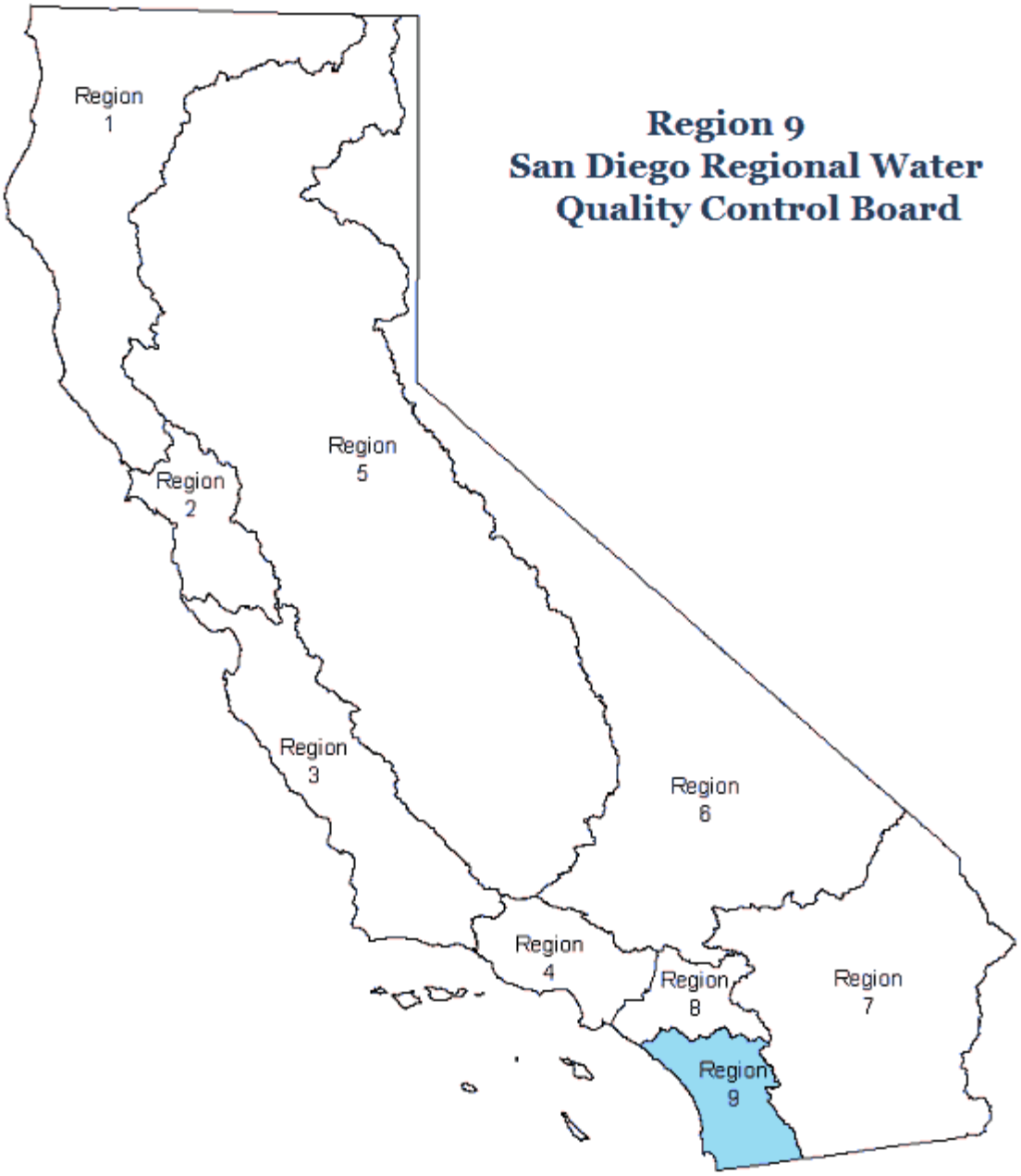

Draft

Draft California 2014 Integrated Report (303(d) List/305(b) Report)

Supporting Information

REGIONAL BOARD 9 - SAN DIEGO REGION

- **New or Revised Fact Sheets**
  These lines of evidence and/or decisions, which were developed during the last listing cycle, are new or have been revised.
- **Original Fact Sheets**
  These lines of evidence and/or decisions were developed during the last listing cycle.

New or Revised Fact Sheets

Delist from 303(d) list (TMDL required list)	Regional Board 9

- Agua Hedionda Lagoon
  - Indicator Bacteria (34464)
- Arroyo Trabuco Creek
  - Diazinon (42259)
- Chollas Creek
  - Cadmium (33808)
- Forester Creek
  - Oxygen, Dissolved (46216)
  - pH (32669)
- Long Canyon Creek (tributary to Murrieta Creek)
  - Indicator Bacteria (43281)
- Los Penasquitos Creek
  - Selenium (43248)
- Miramar Reservoir
  - Nitrogen (43118)
- Mission Bay Shoreline, at Balboa Court
  - Indicator Bacteria (44224)

- Mission Bay Shoreline, at Fiesta Island Bridge 043569
  - Indicator Bacteria (43617)
- Mission Bay Shoreline, at Sail Bay
  - Indicator Bacteria (44258)
- Murray Reservoir
  - Nitrogen (42320)
  - pH (33495)
- Pacific Ocean Shoreline, Aliso HSA, at Aliso Beach - north
  - Indicator Bacteria (44397)
- Pacific Ocean Shoreline, Aliso HSA, at Blue Lagoon
  - Indicator Bacteria (43054)
- Pacific Ocean Shoreline, Buena Vista Creek HA, at Buena Vista Lagoon Outlet
  - Indicator Bacteria (44011)
- Pacific Ocean Shoreline, Buena Vista Creek HA, at Carlsbad State Beach at Carlsbad Village
  - Indicator Bacteria (43662)
- Pacific Ocean Shoreline, Dana Point HSA, at South of Salt Creek outlet at Salt Creek Service Road
  - Indicator Bacteria (43039)
- Pacific Ocean Shoreline, Dana Point HSA, at Table Rock Drive
  - Indicator Bacteria (43466)
- Pacific Ocean Shoreline, Dana Point HSA, at Thousand Steps Beach
  - Indicator Bacteria (44731)
- Pacific Ocean Shoreline, Laguna Beach HSA, at Bluebird Canyon
  - Indicator Bacteria (44508)
- Pacific Ocean Shoreline, Laguna Beach HSA, at Dumond Drive at Victoria Beach
  - Indicator Bacteria (44471)
- Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Beach at Cleo Street
  - Indicator Bacteria (44563)
- Pacific Ocean Shoreline, Laguna Beach HSA, at Main Beach
  - Indicator Bacteria (44695)
- Pacific Ocean Shoreline, San Clemente HA, at Capistrano Shores at North Ole Hanson Beach
  - Indicator Bacteria (43373)
- Pacific Ocean Shoreline, San Clemente HA, at Riviera Beach
  - Indicator Bacteria (44201)
- Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Linda Lane
  - Indicator Bacteria (44206)
- Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Mariposa Lane
  - Indicator Bacteria (44031)

- Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at South Trafalgar St Beach
  - Indicator Bacteria (44022)
- Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Trafalgar Canyon outlet
  - Indicator Bacteria (43497)
- Pacific Ocean Shoreline, San Dieguito HU, at San Dieguito Lagoon Mouth at Seascape Beach Park
  - Indicator Bacteria (43539)
- Pacific Ocean Shoreline, San Joaquin Hills HSA, at Crescent Bay Beach
  - Indicator Bacteria (44323)
- Pine Valley Creek (Upper)
  - Turbidity (33692)
- Prima Deshecha Creek
  - Nickel (43494)
- San Vicente Creek (San Diego County)
  - Benthic Community Effects (43872)
- San Vicente Reservoir
  - Color (42880)
  - Nitrogen (37158)

Delist from 303(d) list (being addressed by USEPA approved TMDL) — Regional Board 9

- Pacific Ocean Shoreline, Dana Point HSA, at Aliso Beach at West Street
  - Indicator Bacteria (44408)
- Pacific Ocean Shoreline, Scripps HA, at Avenida de la Playa at La Jolla Shores Beach
  - Indicator Bacteria (44415)
- Pacific Ocean Shoreline, Scripps HA, at La Jolla Cove
  - Indicator Bacteria (44420)
- Pacific Ocean Shoreline, Scripps HA, at Ravina
  - Indicator Bacteria (43594)

Do Not Delist from 303(d) list (TMDL required list) — Regional Board 9

- Agua Hedionda Creek
  - Selenium (33134)
  - Toxicity (42896)
- Aliso Creek
  - Selenium (43129)
  - Toxicity (46397)

- Arroyo Trabuco Creek
  - Toxicity (42387)
- Buena Creek
  - Nitrate and Nitrite (33503)
- Buena Vista Creek
  - Selenium (42422)
- Cottonwood Creek (San Marcos Creek watershed)
  - DDT (Dichlorodiphenyltrichloroethane) (33515)
  - Toxicity (33142)
- Cottonwood Creek (Tijuana River watershed)
  - Selenium (42288)
- Dana Point Harbor
  - Copper (43226)
  - Toxicity (42684)
  - Zinc (42746)
- English Canyon
  - Selenium (43273)
  - Toxicity (33502)
- Escondido Creek
  - Indicator Bacteria (42668)
  - Selenium (44424)
  - Sulfates (34087)
  - Toxicity (42803)
- Famosa Slough and Channel
  - Eutrophic (34004)
- Laguna Canyon Channel
  - Toxicity (43324)
- Loma Alta Creek
  - Selenium (43254)
  - Toxicity (43222)
- Loma Alta Slough
  - Eutrophic (34649)
  - Indicator Bacteria (44598)
- Los Penasquitos Creek
  - Toxicity (42736)
- Loveland Reservoir
  - Aluminum (33045)
- Mission Bay Shoreline, at Bahia Point
  - Indicator Bacteria (43165)
- Mission Bay Shoreline, at Bonita Cove

- Indicator Bacteria (43760) 043572

- Mission Bay Shoreline, at Campland
  - Indicator Bacteria (43800)

- Mission Bay Shoreline, at De Anza Cove
  - Indicator Bacteria (44431)

- Mission Bay Shoreline, at Fanual Park
  - Indicator Bacteria (44432)

- Mission Bay Shoreline, at Leisure Lagoon
  - Indicator Bacteria (43805)

- Mission Bay Shoreline, at North Crown Point
  - Indicator Bacteria (43882)

- Mission Bay Shoreline, at Visitors Center
  - Indicator Bacteria (43959)

- Murrieta Creek
  - Phosphorus (33387)

- Pacific Ocean Shoreline, Aliso HSA, at Aliso Creek mouth
  - Indicator Bacteria (43047)

- Pacific Ocean Shoreline, Imperial Beach Pier
  - Indicator Bacteria (43312)

- Pacific Ocean Shoreline, Loma Alta HSA, at Loma Alta Creek mouth
  - Indicator Bacteria (43811)

- Pacific Ocean Shoreline, Point Loma HA, at Bermuda Ave
  - Indicator Bacteria (32922)

- Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at San Elijo Lagoon
  - Indicator Bacteria (43876)

- Pacific Ocean Shoreline, San Mateo Canyon HA, at San Mateo Creek outlet
  - Indicator Bacteria (44426)

- Pacific Ocean Shoreline, Tijuana HU, at 3/4 mile North of Tijuana River
  - Indicator Bacteria (43385)

- Pacific Ocean Shoreline, Tijuana HU, at Monument Road
  - Indicator Bacteria (43448)

- Pacific Ocean Shoreline, Tijuana HU, at Tijuana River mouth
  - Indicator Bacteria (43860)

- Pacific Ocean Shoreline, Tijuana HU, at end of Seacoast Drive
  - Indicator Bacteria (44227)

- Pacific Ocean Shoreline, Tijuana HU, at the US Border

- Indicator Bacteria (43615) 043573

- Prima Deshecha Creek
  - Cadmium (36180)

- Rainbow Creek
  - Iron (33947)

- Redhawk Channel
  - Indicator Bacteria (43592)

- Rose Creek
  - Toxicity (43399)

- San Diego Bay
  - PCBs (Polychlorinated biphenyls) (33669)

- San Diego Bay Shoreline, Downtown Anchorage
  - Benthic Community Effects (35140)

- San Diego Bay Shoreline, Tidelands Park
  - Indicator Bacteria (44200)

- San Diego Bay Shoreline, Vicinity of B St and Broadway Piers
  - Indicator Bacteria (44435)

- San Diego Bay Shoreline, at Bayside Park (J Street)
  - Indicator Bacteria (43599)

- San Diego Bay Shoreline, near Chollas Creek
  - Benthic Community Effects (35142)

- San Diego Bay Shoreline, near Coronado Bridge
  - Benthic Community Effects (35211)

- San Diego Bay Shoreline, near sub base
  - Benthic Community Effects (43380)

- San Diego River (Lower)
  - Oxygen, Dissolved (34487)

- San Dieguito River
  - Toxicity (43139)

- San Elijo Lagoon
  - Indicator Bacteria (34573)

- San Juan Creek
  - DDE (Dichlorodiphenyldichloroethylene) (33513)
  - Indicator Bacteria (41422)
  - Selenium (43131)
  - Toxicity (37571)

- San Luis Rey River, Lower (west of Interstate 15)

- Indicator Bacteria (43548)
- Toxicity (43691)

- San Marcos Creek
  - DDE (Dichlorodiphenyldichloroethylene) (33035)
  - Toxicity (34726)

- San Vicente Creek (San Diego County)
  - Ammonia as Nitrogen (43873)
  - Toxicity (44832)

- Sandia Creek
  - Iron (44568)
  - Sulfates (33520)
  - Total Dissolved Solids (43160)

- Santa Gertrudis Creek
  - Indicator Bacteria (44673)

- Santa Margarita River (Lower)
  - Indicator Bacteria (43092)

- Santa Margarita River (Upper)
  - Toxicity (37431)

- Segunda Deshecha Creek
  - Toxicity (44886)
  - Turbidity (34534)

- Soledad Canyon
  - Sediment Toxicity (34023)

- Sweetwater River, Lower (below Sweetwater Reservoir)
  - Indicator Bacteria (44311)
  - Selenium (44310)
  - Toxicity (43751)

- Tecolote Creek
  - Cadmium (37924)
  - Copper (33826)
  - Lead (33829)
  - Selenium (42796)
  - Toxicity (36097)
  - Zinc (33849)

- Temecula Creek
  - Phosphorus (34014)

- Tijuana River
  - Indicator Bacteria (44653)
  - Selenium (43338)
  - Toxicity (43056)

- Tijuana River Estuary
  - Indicator Bacteria (34382)
  - Lead (41510)

- Warm Springs Creek (Riverside County)
  - Indicator Bacteria (42792)

Do Not Delist from 303(d) list (being addressed with USEPA approved TMDL)	Regional Board 9

- Aliso Creek
  - Indicator Bacteria (46398)
- Chollas Creek
  - Copper (34268)
  - Lead (44282)
  - Zinc (34327)
- Forester Creek
  - Indicator Bacteria (34007)
- Mission Bay Shoreline, at Tecolote Shores
  - Indicator Bacteria (43511)
- Pacific Ocean Shoreline, Aliso HSA, at Aliso Beach - middle
  - Indicator Bacteria (43112)
- Pacific Ocean Shoreline, Batiquitos HSA, at Moonlight State Beach (Cottonwood Creek outlet)
  - Indicator Bacteria (43762)
- Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at Baby Beach
  - Indicator Bacteria (43763)
- Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch Beach
  - Indicator Bacteria (43463)
- Pacific Ocean Shoreline, Lower San Juan HSA, at North Beach Creek
  - Indicator Bacteria (43790)
- Pacific Ocean Shoreline, Lower San Juan HSA, at North Doheny State Park Campground
  - Indicator Bacteria (43665)
- Pacific Ocean Shoreline, Lower San Juan HSA, at San Juan Creek
  - Indicator Bacteria (44645)
- Pacific Ocean Shoreline, Miramar Reservoir HA, at Los Penasquitos River mouth
  - Indicator Bacteria (44844)
- Pacific Ocean Shoreline, San Clemente HA, at Poche Beach
  - Indicator Bacteria (44202)
- Pacific Ocean Shoreline, San Clemente HA, at South Capistrano County Beach
  - Indicator Bacteria (43951)
- Pacific Ocean Shoreline, San Diego HU, at the San Diego River outlet, at Dog Beach
  - Indicator Bacteria (44291)

- Pacific Ocean Shoreline, San Dieguito HU, at San Dieguito Lagoon Mouth at San Dieguito River Beach
  - Indicator Bacteria (43899)
- Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth
  - Indicator Bacteria (44090)
- Pacific Ocean Shoreline, Scripps HA, at Childrens Pool
  - Indicator Bacteria (43824)
- Pacific Ocean Shoreline, Scripps HA, at Pacific Beach Point , Pacific Beach
  - Indicator Bacteria (42716)
- Pacific Ocean Shoreline, Scripps HA, at Vallecitos Court at La Jolla Shores Beach
  - Indicator Bacteria (43095)
- Rainbow Creek
  - Nitrogen (33865)
  - Phosphorus (43695)
- San Diego Bay Shoreline, Shelter Island Shoreline Park
  - Indicator Bacteria (34011)
- San Diego River (Lower)
  - Indicator Bacteria (44931)
- San Dieguito River
  - Indicator Bacteria (41468)
- Tecolote Creek
  - Indicator Bacteria (36746)

Do Not Delist from 303(d) list (being addressed with action other than TMDL) — Regional Board 9

- Santa Margarita Lagoon
  - Eutrophic (34567)

Do Not List on 303(d) list (TMDL required list) — Regional Board 9

- Adobe Creek (Riverside County)
  - Benthic Community Effects (48723)
  - Indicator Bacteria (48715)
- Agua Hedionda Creek
  - Anthracene (47426)
  - Antimony (47462)
  - Arsenic (47425)
  - Benzo(a)anthracene (47427)
  - Benzo(a)pyrene (3,4-Benzopyrene -7-d) (47428)
  - Cadmium (47431)
  - Chlordane (47432)

- Chromium (47439)
- Chrysene (C1-C4) (47440)
- Copper (47441)
- Cyfluthrin (47443)
- Cyhalothrin, Lambda (47446)
- DDD (Dichlorodiphenyldichloroethane) (47449)
- DDT (Dichlorodiphenyltrichloroethane) (47451)
- Deltamethrin (47452)
- Diazinon (47453)
- Dieldrin (47454)
- Endrin (47456)
- Esfenvalerate/Fenvalerate (47457)
- Fenpropathrin (47458)
- Fluoranthene (47459)
- Fluorene (47460)
- Lead (47463)
- Lindane/gamma Hexachlorocyclohexane (gamma-HCH) (47466)
- Mercury (47469)
- Methyl Parathion (47470)
- Naphthalene (47471)
- Nickel (47472)
- Nitrate/Nitrite (Nitrite + Nitrate as N) (47473)
- Nitrogen, Nitrite (47475)
- PAHs (Polycyclic Aromatic Hydrocarbons) (47476)
- PCBs (Polychlorinated biphenyls) (47477)
- Phenanthrene (47479)
- Pyrene (47480)
- Surfactants (MBAS) (47481)
- Zinc (47482)

- Agua Hedionda Lagoon
  - 2-Methylnaphthalene (47483)
  - Ammonia (Unionized) (47484)
  - Antimony (47485)
  - Arsenic (47491)
  - Benzo(a)anthracene (47492)
  - Cadmium (47495)
  - Chlordane (47496)
  - Chlorpyrifos (47506)
  - Chromium (47508)
  - Chrysene (C1-C4) (47509)
  - Copper (47510)
  - Dibenz[a,h]anthracene (47512)
  - Dieldrin (47513)
  - Endosulfan (47514)
  - Endrin (47515)
  - Heptachlor epoxide (47516)
  - Hexachlorobenzene/ HCB (47521)
  - Lead (47526)
  - Lindane/gamma Hexachlorocyclohexane (gamma-HCH) (47527)
  - Mercury (47529)
  - Mirex (47533)
  - PAHs (Polycyclic Aromatic Hydrocarbons) (47535)
  - PCBs (Polychlorinated biphenyls) (47559)
  - Phenanthrene (47560)
  - Pyrene (47573)
  - Selenium (47572)
  - Silver (47575)
  - Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD) (47576)
  - Zinc (47579)

- pH (47580)

043578

- Aliso Creek
  - Alkalinity as CaCO3 (47599)
  - Aluminum (47600)
  - Arsenic (47601)
  - Bifenthrin (47605)
  - Cadmium (47606)
  - Chloride (47610)
  - Chlorpyrifos (47611)
  - Chromium (47612)
  - Copper (47617)
  - Cyfluthrin (47619)
  - Cyhalothrin, Lambda (47622)
  - Cypermethrin (47623)
  - Deltamethrin (47625)
  - Diazinon (33824)
  - Esfenvalerate/Fenvalerate (47624)
  - Fenpropathrin (47633)
  - Iron (47635)
  - Lead (47637)
  - Manganese (47704)
  - Mercury (47705)
  - Nickel (47706)
  - Nitrogen, ammonia (Total Ammonia) (47709)
  - Oxygen, Dissolved (47779)
  - Permethrin, total (53337)
  - Silver (47781)
  - Sulfates (47784)
  - Total Dissolved Solids (47786)
  - Turbidity (47789)
  - Zinc (47790)
  - pH (47791)

- Aliso Creek (mouth)
  - Arsenic (61526)
  - Cadmium (47591)
  - Chromium (47592)
  - Copper (47593)
  - Lead (47594)
  - Nickel (47595)
  - Selenium (47596)
  - Silver (47597)
  - Zinc (47598)

- Alpine Creek
  - Cadmium (48211)
  - Chlorpyrifos (48273)
  - Copper (48213)
  - Diazinon (48217)
  - Lead (48218)
  - Malathion (48269)
  - Nitrogen, Nitrite (48271)
  - Nitrogen, ammonia (Total Ammonia) (48270)
  - Zinc (48272)

- Arroyo Trabuco Creek
  - Ammonia (Unionized) (47799)
  - Arsenic (47800)

- Cadmium (47801)
- Chlorpyrifos (47802)
- Chromium (47803)
- Copper (47804)
- Lead (47805)
- Mercury (63087)
- Nickel (47808)
- Oxygen, Dissolved (47809)
- Selenium (47810)
- Silver (47811)
- Temperature, water (47812)
- Zinc (47813)
- pH (47814)

- Batiquitos Lagoon
  - 2-Methylnaphthalene (47817)
  - Antimony (47818)
  - Arsenic (47819)
  - Benzo(a)anthracene (47820)
  - Cadmium (47821)
  - Chlordane (47822)
  - Chromium (47823)
  - Chrysene (C1-C4) (47824)
  - Copper (47825)
  - Dibenz[a,h]anthracene (47826)
  - Endrin (47827)
  - Lead (47828)
  - Lindane/gamma Hexachlorocyclohexane (gamma-HCH) (47829)
  - Mercury (47830)
  - PAHs (Polycyclic Aromatic Hydrocarbons) (47831)
  - PCBs (Polychlorinated biphenyls) (47893)
  - Phenanthrene (47894)
  - Pyrene (47895)
  - Silver (47897)
  - Zinc (47898)

- Bell Canyon Creek
  - Ammonia (Unionized) (47972)
  - Arsenic (47973)
  - Benthic Community Effects (42338)
  - Cadmium (47974)
  - Chlorpyrifos (47975)
  - Chromium (47976)
  - Copper (47978)
  - Diazinon (47979)
  - Lead (47981)
  - Malathion (47984)
  - Nickel (47987)
  - Oxygen, Dissolved (47988)
  - Selenium (47991)
  - Silver (47993)
  - Temperature, water (47996)
  - Zinc (47997)
  - pH (48000)

- Boulder Creek (San Diego County)
  - Benthic Community Effects (43879)
  - Toxicity (42339)

- Buena Creek 043580
  - Cadmium (48030)
  - Chlorpyrifos (48034)
  - Copper (48031)
  - Diazinon (48035)
  - Lead (48032)
  - Malathion (48037)
  - Nitrogen, Nitrite (48039)
  - Nitrogen, ammonia (Total Ammonia) (48040)
  - Zinc (48033)

- Buena Vista Creek
  - Arsenic (48044)
  - Cadmium (48045)
  - Chlorpyrifos (48080)
  - Chromium (48081)
  - Copper (48082)
  - Cypermethrin (48106)
  - Deltamethrin (48107)
  - Diazinon (48084)
  - Esfenvalerate/Fenvalerate (48117)
  - Lead (48101)
  - Malathion (48102)
  - Nickel (48104)
  - Zinc (48105)

- Campo Creek
  - Arsenic (48195)
  - Azinphos-methyl (Guthion) (48226)
  - Benthic Community Effects (42270)
  - Cadmium (48197)
  - Chlorpyrifos (48207)
  - Chromium (48233)
  - Copper (48206)
  - Diazinon (48232)
  - Dimethoate (48234)
  - Disulfoton (48235)
  - Ethoprop (48237)
  - Lead (48202)
  - Malathion (48203)
  - Methidathion (48236)
  - Methyl Parathion (48238)
  - Nickel (48241)
  - Parathion (48943)
  - Phorate (48239)
  - Phosmet (48240)
  - Selenium (48242)
  - Zinc (48204)

- Carroll Canyon
  - Arsenic (48244)
  - Bifenthrin (48245)
  - Cadmium (48246)
  - Chlorpyrifos (48247)
  - Chromium (48248)
  - Copper (48249)
  - Cypermethrin (48250)
  - Deltamethrin (48251)
  - Diazinon (48252)

- Esfenvalerate/Fenvalerate (48253)
- Lead (48254)
- Malathion (48255)
- Nickel (48256)
- Nitrate/Nitrite (Nitrite + Nitrate as N) (48259)
- Nitrogen, Nitrite (48260)
- Selenium (48257)
- Zinc (48258)

- Casa de Oro Creek
  - Cadmium (48264)
  - Chlorpyrifos (48265)
  - Copper (48266)
  - Diazinon (48267)
  - Lead (48268)
  - Malathion (48289)
  - Zinc (48290)

- Cedar Creek (San Diego County)
  - Alkalinity as CaCO3 (51651)
  - Aluminum (51652)
  - Arsenic (51653)
  - Benthic Community Effects (42271)
  - Bifenthrin (51655)
  - Cadmium (51661)
  - Chloride (51662)
  - Chromium (51664)
  - Copper (51668)
  - Cyfluthrin (51669)
  - Cyhalothrin, Lambda (51670)
  - Cypermethrin (51673)
  - Deltamethrin (51675)
  - Esfenvalerate/Fenvalerate (51677)
  - Fenpropathrin (51679)
  - Iron (51680)
  - Lead (51725)
  - Manganese (51726)
  - Nickel (51728)
  - Nitrate/Nitrite (Nitrite + Nitrate as N) (51736)
  - Nitrogen, Nitrite (51738)
  - Nitrogen, ammonia (Total Ammonia) (51737)
  - Oxygen, Dissolved (51739)
  - Permethrin, total (51740)
  - Selenium (51743)
  - Silver (51744)
  - Specific Conductivity (51746)
  - Sulfates (51748)
  - Temperature, water (51750)
  - Total Dissolved Solids (51752)
  - Toxicity (51755)
  - Turbidity (51761)
  - Zinc (51829)
  - pH (51742)

- Chicarita Creek
  - Benthic Community Effects (42283)

- Chocolate Creek
  - Benthic Community Effects (44302)

- Cadmium (53449)
- Chlorpyrifos (53438)
- Copper (53450)
- Diazinon (53442)
- Lead (53451)
- Malathion (53443)
- Nitrogen, Nitrite (53453)
- Nitrogen, ammonia (Total Ammonia) (53448)
- Zinc (53452)

- Chollas Creek
  - Arsenic (53133)
  - Benthic Community Effects (43572)
  - Chlordane (50632)
  - Chromium (53134)
  - Cyfluthrin (50634)
  - Cyhalothrin, Lambda (50639)
  - DDD (Dichlorodiphenyldichloroethane) (50642)
  - DDE (Dichlorodiphenyldichloroethylene) (50643)
  - DDT (Dichlorodiphenyltrichloroethane) (50644)
  - Deltamethrin (50645)
  - Dieldrin (50648)
  - Endrin (50655)
  - Esfenvalerate/Fenvalerate (50656)
  - Fenpropathrin (50660)
  - Fipronil (50670)
  - Fipronil Sulfide (50672)
  - Fipronil Sulfone (50673)
  - Lindane/gamma Hexachlorocyclohexane (gamma-HCH) (50674)
  - Nickel (53025)
  - Permethrin, total (50685)
  - Selenium (53037)
  - Temperature, water (53135)
  - Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD) (50661)

- Cottonwood Creek (San Marcos Creek watershed)
  - Bifenthrin (48291)
  - Chlordane (48292)
  - Chlorpyrifos (48335)
  - Cyfluthrin (48294)
  - Cyhalothrin, Lambda (48295)
  - Cypermethrin (48293)
  - DDD (Dichlorodiphenyldichloroethane) (48296)
  - DDE (Dichlorodiphenyldichloroethylene) (48297)
  - Deltamethrin (48298)
  - Diazinon (48299)
  - Dieldrin (48300)
  - Endrin (48301)
  - Esfenvalerate/Fenvalerate (48302)
  - Fenpropathrin (48303)
  - Fipronil (48332)
  - Fipronil Sulfide (48337)
  - Fipronil Sulfone (48338)
  - Lindane/gamma Hexachlorocyclohexane (gamma-HCH) (48304)
  - Permethrin, total (48341)
  - Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD) (48342)

- Cottonwood Creek (Tijuana River watershed)
  - Alkalinity as CaCO3 (47221)

Aluminum (47223)
- Arsenic (47224)
- Benthic Community Effects (43573)
- Bifenthrin (47225)
- Cadmium (47229)
- Chloride (47226)
- Chlorpyrifos (47230)
- Chromium (47255)
- Copper (47256)
- Cyfluthrin (47257)
- Cyhalothrin, Lambda (47258)
- Cypermethrin (47259)
- Deltamethrin (47260)
- Diazinon (47261)
- Esfenvalerate/Fenvalerate (47262)
- Fenpropathrin (47263)
- Iron (47265)
- Lead (47290)
- Malathion (47291)
- Manganese (47292)
- Nitrate/Nitrite (Nitrite + Nitrate as N) (49006)
- Nitrogen, Nitrite (49008)
- Nitrogen, ammonia (Total Ammonia) (47294)
- Oxygen, Dissolved (47295)
- Permethrin, total (47296)
- Silver (47298)
- Specific Conductivity (47299)
- Sulfates (47300)
- Temperature, water (47301)
- Total Dissolved Solids (47302)
- Toxicity (47304)
- Zinc (47309)
- pH (47297)

- Couser Canyon Creek
  - Cadmium (48351)
  - Chlorpyrifos (48359)
  - Copper (48360)
  - Diazinon (48361)
  - Lead (48352)
  - Malathion (48362)
  - Nitrate/Nitrite (Nitrite + Nitrate as N) (48364)
  - Nitrogen, Nitrite (48365)
  - Nitrogen, ammonia (Total Ammonia) (48366)
  - Zinc (48353)

- Cristianitos Creek
  - Arsenic (48367)
  - Chromium (48368)
  - Copper (48369)
  - Lead (48372)
  - Mercury (48370)
  - Nickel (48374)
  - Nitrate (48377)
  - Oxygen, Dissolved (48378)
  - Temperature, water (48381)
  - Zinc (48371)
  - pH (48373)

Dana Point Harbor
- Ammonia (Unionized) (48389)
- Arsenic (48400)
- Cadmium (48401)
- Chlorpyrifos (48402)
- Diazinon (48404)
- Lead (48407)
- Malathion (48408)
- Nickel (48405)
- Selenium (48406)
- Silver (48409)
- pH (48411)

- De Luz Creek
  - Benthic Community Effects (44303)
  - Cadmium (47876)
  - Chlorpyrifos (47877)
  - Copper (33638)
  - Diazinon (47902)
  - Indicator Bacteria (49194)
  - Lead (47903)
  - Malathion (47904)
  - Nitrogen, Nitrite (52988)
  - Nitrogen, ammonia (Total Ammonia) (52989)
  - Zinc (33640)
  - pH (33699)

- De Luz Creek, unnamed tributary at De Luz Murrieta Road
  - Benthic Community Effects (50721)

- Doane Creek
  - Benthic Community Effects (44371)
  - Temperature, water (49038)

- Dulzura Creek
  - Benthic Community Effects (49039)

- East Channel Creek
  - Cadmium (48412)
  - Chlorpyrifos (48421)
  - Copper (48413)
  - Diazinon (48422)
  - Lead (48416)
  - Malathion (48423)
  - Zinc (48426)

- Encinitas Creek
  - Ammonia (Unionized) (48427)
  - Oxygen, Dissolved (48430)
  - Temperature, water (48428)
  - pH (48429)

- English Canyon
  - Ammonia (Unionized) (48432)
  - Arsenic (48433)
  - Cadmium (48435)
  - Chlorpyrifos (48436)
  - Chromium (48440)

- Copper (48441)
- Diazinon (33033)
- Lead (48442)
- Malathion (48437)
- Nickel (48443)
- Oxygen, Dissolved (48446)
- Silver (48444)
- Zinc (48445)
- pH (48447)

- Escondido Creek
  - Alkalinity as CaCO3 (47719)
  - Aluminum (47721)
  - Antimony (43690)
  - Arsenic (33881)
  - Cadmium (33942)
  - Chlordane (47726)
  - Chloride (47727)
  - Chlorpyrifos (47729)
  - Chromium (total) (42884)
  - Copper (33960)
  - Cyfluthrin (47730)
  - Cyhalothrin, Lambda (47731)
  - Cypermethrin (47732)
  - Deltamethrin (47733)
  - Diazinon (47734)
  - Dieldrin (47735)
  - Endrin (47736)
  - Esfenvalerate/Fenvalerate (47737)
  - Fenpropathrin (47738)
  - Iron (47739)
  - Lead (47740)
  - Lindane/gamma Hexachlorocyclohexane (gamma-HCH) (47741)
  - Methyl Parathion (47743)
  - Nickel (33968)
  - Nitrate/Nitrite (Nitrite + Nitrate as N) (48464)
  - Nitrogen, Nitrite (48475)
  - Nitrogen, ammonia (Total Ammonia) (48476)
  - PCBs (Polychlorinated biphenyls) (47744)
  - Permethrin, total (47745)
  - Silver (33634)
  - Specific Conductivity (47746)
  - Surfactants (MBAS) (47747)
  - Temperature, water (47748)
  - Turbidity (33880)
  - Zinc (32838)
  - pH (34042)

- Eucalyptus Hills Creek
  - Cadmium (47383)
  - Chlorpyrifos (47384)
  - Copper (47385)
  - Lead (47389)
  - Malathion (47390)
  - Zinc (47392)

- Felicita Creek
  - Cadmium (33312)
  - Chlorpyrifos (47393)

- Copper (43082)
- Diazinon (47394)
- Malathion (47396)
- Zinc (32552)

- Forester Creek
  - Arsenic (48358)
  - Bifenthrin (48383)
  - Cadmium (48384)
  - Chlordane (sediment) (48385)
  - Chlorpyrifos (48386)
  - Chromium (48387)
  - Copper (48388)
  - Cyfluthrin (48390)
  - Cyhalothrin, Lambda (48391)
  - Cypermethrin (48392)
  - DDD (Dichlorodiphenyldichloroethane) (48393)
  - DDE (Dichlorodiphenyldichloroethylene) (48394)
  - DDT (Dichlorodiphenyltrichloroethane) (48395)
  - Deltamethrin (48396)
  - Diazinon (48398)
  - Dieldrin (sediment) (48399)
  - Endrin (48403)
  - Esfenvalerate/Fenvalerate (48760)
  - Fenpropathrin (48761)
  - Lead (48324)
  - Lindane/gamma Hexachlorocyclohexane (gamma-HCH) (48762)
  - Malathion (48321)
  - Mercury (48763)
  - Methyl Parathion (48772)
  - Nickel (48773)
  - Nitrate/Nitrite (Nitrite + Nitrate as N) (49101)
  - Nitrogen, Nitrite (49104)
  - PCBs (Polychlorinated biphenyls) (52037)
  - Permethrin, total (52038)
  - Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD) (49106)
  - Toxicity (49108)
  - Zinc (49107)

- Fry Creek
  - Benthic Community Effects (44229)

- Gird Creek
  - Benthic Community Effects (42651)

- Gomez Creek
  - Temperature, water (47400)

- Gopher Creek
  - Chlorpyrifos (47402)
  - Copper (47404)
  - Diazinon (47405)
  - Malathion (47409)
  - Zinc (47411)

- Green Canyon Creek
  - Cadmium (47412)
  - Chlorpyrifos (47413)

- Copper (47414)
- Diazinon (47415)
- Lead (47418)
- Malathion (47419)
- Zinc (47423)

- Green Valley Creek
  - Antimony (33251)
  - Arsenic (32614)
  - Cadmium (33391)
  - Chromium (33339)
  - Copper (46269)
  - Cypermethrin (47585)
  - Deltamethrin (47586)
  - Diazinon (47587)
  - Esfenvalerate/Fenvalerate (47648)
  - Lead (47649)
  - Malathion (47650)
  - Nickel (33069)
  - Nitrate/Nitrite (Nitrite + Nitrate as N) (48586)
  - Nitrogen, Nitrite (48587)
  - Selenium (33402)
  - Surfactants (MBAS) (47651)

- Harbison Canyon
  - Benthic Community Effects (47750)
  - Cadmium (47751)
  - Chlorpyrifos (47752)
  - Copper (47753)
  - Diazinon (47754)
  - Lead (47757)
  - Malathion (47758)
  - Nitrogen, Nitrite (48145)
  - Nitrogen, ammonia (Total Ammonia) (48146)
  - Zinc (47760)

- Hatfield Creek
  - Cadmium (47761)
  - Chlorpyrifos (47762)
  - Copper (47763)
  - Diazinon (47764)
  - Indicator Bacteria (47765)
  - Lead (47767)
  - Malathion (47768)
  - Zinc (47770)

- Helix Street Drain
  - Cadmium (47832)
  - Chlorpyrifos (47833)
  - Copper (47834)
  - Diazinon (47835)
  - Lead (47836)
  - Malathion (47837)
  - Zinc (47838)

- Hodges, Lake
  - Aluminum (33417)
  - Ammonia as Nitrogen (44169)
  - Chromium (46365)

- Hot Spring Canyon Creek (Orange County)
  - Alkalinity as CaCO3 (47840)
  - Aluminum (47841)
  - Arsenic (47842)
  - Benthic Community Effects (47843)
  - Bifenthrin (47844)
  - Cadmium (47845)
  - Chloride (47846)
  - Chromium (47847)
  - Copper (47848)
  - Cyfluthrin (47849)
  - Cyhalothrin, Lambda (47850)
  - Cypermethrin (47851)
  - Deltamethrin (47852)
  - Esfenvalerate/Fenvalerate (47853)
  - Fenpropathrin (47854)
  - Iron (47855)
  - Lead (47856)
  - Manganese (47857)
  - Nickel (47858)
  - Nitrogen, ammonia (Total Ammonia) (47911)
  - Oxygen, Dissolved (47859)
  - Permethrin, total (47860)
  - Selenium (47861)
  - Silver (47862)
  - Sulfates (47863)
  - Temperature, water (47864)
  - Total Dissolved Solids (47865)
  - Toxicity (48920)
  - Turbidity (47866)
  - Zinc (47867)
  - pH (47868)

- Indian Creek (San Diego County)
  - Benthic Community Effects (47914)

- Iron Springs Creek
  - Benthic Community Effects (44230)

- Ironside Creek
  - Benthic Community Effects (47915)

- Jamacha Creek
  - Cadmium (47916)
  - Chlorpyrifos (47917)
  - Copper (47918)
  - Diazinon (47919)
  - Lead (47922)
  - Malathion (47923)
  - Zinc (47925)

- Jamul Creek
  - Aluminum (47968)
  - Arsenic (47971)
  - Azinphos-methyl (Guthion) (48003)
  - Barium (48008)
  - Beryllium (48010)

- Cadmium (48015)
- Chlorpyrifos (48017)
- Chromium (48018)
- Copper (48019)
- Diazinon (48020)
- Dimethoate (48021)
- Disulfoton (48022)
- Ethoprop (48024)
- Indicator Bacteria (48023)
- Iron (48026)
- Lead (48027)
- Malathion (48028)
- Manganese (48029)
- Methidathion (48070)
- Methyl Parathion (48075)
- Nickel (48085)
- Nitrate/Nitrite (Nitrite + Nitrate as N) (48089)
- Nitrogen, Nitrite (48125)
- Nitrogen, ammonia (Total Ammonia) (48127)
- Parathion (48092)
- Phorate (48096)
- Phosmet (48097)
- Selenium (48100)
- Silver (48123)
- Zinc (48108)

- Keys Creek
  - Arsenic (48139)
  - Benthic Community Effects (44312)
  - Bifenthrin (48141)
  - Cadmium (48142)
  - Chlorpyrifos (48611)
  - Copper (48607)
  - Cypermethrin (48617)
  - Diazinon (48627)
  - Lead (48638)
  - Malathion (48641)
  - Toxicity (48644)
  - Zinc (48643)

- King Creek
  - Alkalinity as CaCO3 (51830)
  - Aluminum (51831)
  - Arsenic (51832)
  - Benthic Community Effects (53336)
  - Bifenthrin (51837)
  - Cadmium (51840)
  - Chloride (51848)
  - Chromium (51850)
  - Copper (51862)
  - Cyfluthrin (51864)
  - Cyhalothrin, Lambda (51868)
  - Cypermethrin (51871)
  - Deltamethrin (51875)
  - Esfenvalerate/Fenvalerate (51876)
  - Fenpropathrin (51877)
  - Iron (51878)
  - Lead (51879)
  - Manganese (51881)
  - Nickel (51885)

- Nitrate/Nitrite (Nitrite + Nitrate as N) (51905)
- Nitrogen, Nitrite (51920)
- Nitrogen, ammonia (Total Ammonia) (51919)
- Oxygen, Dissolved (51921)
- Permethrin, total (51922)
- Selenium (51924)
- Silver (51925)
- Specific Conductivity (51926)
- Sulfates (51927)
- Temperature, water (51928)
- Total Dissolved Solids (51929)
- Toxicity (51930)
- Turbidity (51951)
- Zinc (51954)
- pH (51923)

- Kit Carson Creek
  - Benthic Community Effects (43934)

- Kitchen Creek
  - Benthic Community Effects (43839)
  - Oxygen, Dissolved (32527)
  - pH (43323)

- La Zanja Canyon
  - Cadmium (48151)
  - Chlorpyrifos (48152)
  - Copper (48157)
  - Diazinon (48159)
  - Lead (48172)
  - Malathion (48173)
  - Zinc (48175)

- Laguna Canyon Channel
  - Alkalinity as CaCO3 (48176)
  - Aluminum (48177)
  - Arsenic (48179)
  - Bifenthrin (48182)
  - Cadmium (48185)
  - Chloride (48646)
  - Chromium (48649)
  - Copper (48654)
  - Cyfluthrin (48714)
  - Cyhalothrin, Lambda (48716)
  - Cypermethrin (48717)
  - Deltamethrin (48719)
  - Esfenvalerate/Fenvalerate (48720)
  - Fenpropathrin (48742)
  - Iron (48743)
  - Lead (48744)
  - Manganese (48745)
  - Mercury (62900)
  - Nickel (48746)
  - Nitrogen, ammonia (Total Ammonia) (48747)
  - Oxygen, Dissolved (48748)
  - Permethrin, total (48751)
  - Selenium (48749)
  - Silver (48750)
  - Sulfates (48752)

- Total Dissolved Solids (48753)
- Turbidity (48755)
- Zinc (48756)
- pH (48758)

- Lawson Creek
  - Benthic Community Effects (42812)
  - Metals (42770)

- Live Oak Creek (San Diego County)
  - Benthic-Macroinvertebrate Bioassessments (48186)
  - Cadmium (48187)
  - Chlorpyrifos (48188)
  - Copper (48190)
  - Diazinon (48191)
  - Lead (48194)
  - Malathion (48196)
  - Zinc (48199)

- Loma Alta Creek
  - Arsenic (49263)
  - Cadmium (49266)
  - Chlorpyrifos (49397)
  - Chromium (49399)
  - Copper (49400)
  - Cypermethrin (49401)
  - Deltamethrin (49402)
  - Diazinon (49405)
  - Esfenvalerate/Fenvalerate (49406)
  - Lead (49407)
  - Malathion (49408)
  - Nickel (49409)
  - Zinc (49410)

- Long Canyon (Cottonwood wshed) (from 0.2 mile upstream to 0.4 miles downstream of Troy Canyon)
  - Benthic Community Effects (43336)
  - Oxygen, Dissolved (44018)
  - pH (43886)

- Long Canyon Creek (Lower Sweetwater Watershed)
  - Benthic Community Effects (48200)
  - Cadmium (48201)
  - Chlorpyrifos (48205)
  - Copper (48208)
  - Diazinon (48212)
  - Lead (48221)
  - Malathion (48223)
  - Zinc (48225)

- Los Coches Creek
  - Cadmium (47444)
  - Chlorpyrifos (47445)
  - Copper (47455)
  - Lead (47464)
  - Malathion (47468)
  - Zinc (47465)

- Los Penasquitos Creek

- Arsenic (47474)
- Cadmium (47498)
- Chlordane (47502)
- Chromium (47503)
- Copper (47499)
- Cyfluthrin (47539)
- Cyhalothrin, Lambda (47540)
- Cypermethrin (47541)
- DDD (Dichlorodiphenyldichloroethane) (47542)
- DDE (Dichlorodiphenyldichloroethylene) (47549)
- DDT (Dichlorodiphenyltrichloroethane) (47550)
- Deltamethrin (47553)
- Diazinon (47555)
- Dieldrin (47556)
- Endrin (47557)
- Esfenvalerate/Fenvalerate (47589)
- Fenpropathrin (47602)
- Fipronil (47603)
- Fipronil Sulfide (47604)
- Fipronil Sulfone (47607)
- Lead (47500)
- Lindane/gamma Hexachlorocyclohexane (gamma-HCH) (47608)
- Malathion (47609)
- Nickel (47504)
- Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD) (47551)
- Zinc (47501)

- Los Penasquitos Lagoon
  - 2-Methylnaphthalene (52865)
  - Antimony (52866)
  - Arsenic (52867)
  - Benzo(a)anthracene (52868)
  - Cadmium (sediment) (52869)
  - Chlordane (52870)
  - Chromium (52871)
  - Chrysene (C1-C4) (52872)
  - Copper (52873)
  - Dibenz[a,h]anthracene (52874)
  - Endrin (52875)
  - Indicator Bacteria (53454)
  - Lead (52876)
  - Lindane/gamma Hexachlorocyclohexane (gamma-HCH) (52877)
  - Mercury (52878)
  - PAHs (Polycyclic Aromatic Hydrocarbons) | Toxicity (52879)
  - PCBs (Polychlorinated biphenyls) (52880)
  - Phenanthrene (52881)
  - Pyrene (52882)
  - Silver (52883)
  - Zinc (52884)

- Loveland Reservoir
  - Antimony (33046)
  - Arsenic (33205)
  - Barium (33047)
  - Beryllium (33357)
  - Cadmium (44020)
  - Chromium (33295)
  - Copper (32730)
  - Cyanide (47881)
  - Indicator Bacteria (47887)

- Iron (33381)
- Lead (47891)
- Mercury (44409)
- Nickel (33383)
- Nitrogen, Nitrate (47892)
- Selenium (33378)
- Silver (32665)
- Thallium (32666)
- Zinc (32709)

- McGonigle Canyon
  - Arsenic (47896)
  - Benthic Community Effects (47901)
  - Bifenthrin (47900)
  - Cadmium (47905)
  - Chromium (47906)
  - Copper (47907)
  - Cypermethrin (47912)
  - Lead (47908)
  - Nickel (47909)
  - Toxicity (47913)
  - Zinc (47910)

- Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper)
  - Ammonia (47985)
  - Cadmium (47932)
  - Chlorpyrifos (47962)
  - Copper (47964)
  - Diazinon (47969)
  - Lead (47965)
  - Malathion (47982)
  - Nitrate/Nitrite (Nitrite + Nitrate as N) (47983)
  - Nitrogen, Nitrite (47989)
  - Zinc (47966)

- Mexican Canyon Creek (western tributary to Sweetwater River, Upper)
  - Ammonia (48005)
  - Cadmium (47992)
  - Chlorpyrifos (48007)
  - Copper (47994)
  - Diazinon (47999)
  - Lead (47995)
  - Malathion (48009)
  - Nitrogen, Nitrite (48006)
  - Zinc (47998)

- Mission Bay
  - Arsenic (49435)
  - Cadmium (49438)
  - Chlordane (49439)
  - Chlorpyrifos (49440)
  - Dieldrin (49441)
  - Endosulfan (49443)
  - Endrin (49445)
  - Heptachlor epoxide (49446)
  - Hexachlorobenzene/ HCB (49448)
  - Lindane/gamma Hexachlorocyclohexane (gamma-HCH) (49450)
  - Mirex (49453)
  - PAHs (Polycyclic Aromatic Hydrocarbons) (49457)

- Selenium (49463)
- Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD) (49464)
- Toxicity (49467)

- Mission Bay Shoreline, La Cima Drive at Crown Point Shores
  - Indicator Bacteria (49434)

- Mission Bay Shoreline, at Fiesta Island northwest shore
  - Indicator Bacteria (49429)

- Mission Bay Shoreline, at Santa Clara Point
  - Indicator Bacteria (49431)

- Mission Bay Shoreline, at Ventura Cove
  - Indicator Bacteria (49433)

- Moosa Canyon Creek
  - Arsenic (48038)
  - Benthic Community Effects (48116)
  - Bifenthrin (48041)
  - Cadmium (48043)
  - Chlorpyrifos (48111)
  - Chromium (48051)
  - Copper (48046)
  - Cypermethrin (48112)
  - Diazinon (48114)
  - Lead (48047)
  - Malathion (48115)
  - Nickel (48048)
  - Toxicity (42906)
  - Zinc (48049)

- Moosa Canyon, South Fork
  - Cadmium (48124)
  - Chlorpyrifos (48119)
  - Copper (48126)
  - Diazinon (48120)
  - Lead (48128)
  - Malathion (48122)
  - Zinc (48131)

- Moro Canyon Creek
  - Indicator Bacteria (48261)
  - Oxygen, Dissolved (48262)
  - pH (48263)

- Murphy Canyon
  - Arsenic (48274)
  - Benthic Community Effects (51714)
  - Bifenthrin (48275)
  - Cadmium (48276)
  - Chromium (48277)
  - Copper (48278)
  - Cypermethrin (48279)
  - Lead (48281)
  - Nickel (48283)
  - Toxicity (48288)

Zinc (48286)

- Murrieta Creek
  - Aluminum (33429)
  - Chromium (33306)
  - Oxygen, Dissolved (48180)
  - pH (34135)

- Oak Creek (San Diego County)
  - Cadmium (48280)
  - Copper (48282)
  - Indicator Bacteria (48287)
  - Lead (48284)
  - Zinc (48285)

- Olive Vista Creek
  - Cadmium (48305)
  - Chlorpyrifos (48311)
  - Copper (48306)
  - Diazinon (48308)
  - Indicator Bacteria (48313)
  - Lead (48307)
  - Malathion (48309)
  - Nitrate/Nitrite (Nitrite + Nitrate as N) (48314)
  - Nitrogen, Nitrite (48315)
  - Zinc (48310)

- Otay River
  - Benthic Community Effects (48478)
  - Temperature, water (48477)

- Pacific Ocean Shoreline at Cardiff Reef
  - Arsenic (49495)
  - Cadmium (49500)
  - Chlordane (49501)
  - Chlorpyrifos (49502)
  - Dieldrin (49504)
  - Endosulfan (49506)
  - Endrin (49509)
  - Heptachlor epoxide (49517)
  - Hexachlorobenzene/ HCB (49519)
  - Indicator Bacteria (49494)
  - Lindane/gamma Hexachlorocyclohexane (gamma-HCH) (49522)
  - Mercury (49526)
  - Mirex (49549)
  - PAHs (Polycyclic Aromatic Hydrocarbons) (49550)
  - PCBs (Polychlorinated biphenyls) (49553)
  - Selenium (49559)
  - Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD) (49565)

- Pacific Ocean Shoreline at Dana Point
  - Arsenic (49582)
  - Cadmium (49610)
  - Chlordane (49615)
  - Chlorpyrifos (49617)
  - Dieldrin (49621)
  - Endosulfan (49623)
  - Endrin (49624)

- Heptachlor epoxide (49625)
- Hexachlorobenzene/ HCB (49626)
- Lindane/gamma Hexachlorocyclohexane (gamma-HCH) (49628)
- Mercury (49630)
- Mirex (49632)
- PAHs (Polycyclic Aromatic Hydrocarbons) (49634)
- PCBs (Polychlorinated biphenyls) (49635)
- Selenium (49637)
- Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD) (49638)

- Pacific Ocean Shoreline at Scripps Reef
  - Arsenic (49639)
  - Cadmium (49640)
  - Chlordane (49641)
  - Chlorpyrifos (49643)
  - Dieldrin (49644)
  - Endosulfan (49645)
  - Endrin (49646)
  - Heptachlor epoxide (49648)
  - Hexachlorobenzene/ HCB (49649)
  - Lindane/gamma Hexachlorocyclohexane (gamma-HCH) (49650)
  - Mercury (49653)
  - Mirex (49654)
  - PAHs (Polycyclic Aromatic Hydrocarbons) (49655)
  - PCBs (Polychlorinated biphenyls) (49657)
  - Selenium (49658)
  - Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD) (49659)

- Pacific Ocean Shoreline, Aliso HSA, at Aliso Creek mouth
  - Chlorpyrifos (49660)
  - Diazinon (49661)
  - Malathion (49662)
  - Nitrogen, ammonia (Total Ammonia) (49663)
  - pH (49667)

- Pacific Ocean Shoreline, Aliso HSA, at Treasure Island Pier
  - Indicator Bacteria (49674)

- Pacific Ocean Shoreline, Batiquitos HSA, at South Carlsbad State Beach (Batiquitos Lagoon Outlet)
  - Indicator Bacteria (43230)

- Pacific Ocean Shoreline, Batiquitos HSA, at South Carlsbad State Beach (Encina Creek Outlet)
  - Indicator Bacteria (49678)

- Pacific Ocean Shoreline, Batiquitos HSA, at South Carlsbad State Beach (near Pointsettia Lane)
  - Indicator Bacteria (49679)

- Pacific Ocean Shoreline, Batiquitos HSA, at South Carlsbad State Beach (near Ponto Drive and Island Way)
  - Indicator Bacteria (49680)

- Pacific Ocean Shoreline, Batiquitos HSA, at Swamis Beach
  - Indicator Bacteria (43019)

- Pacific Ocean Shoreline, Coronado HA, at Avenida del Sol
  - Indicator Bacteria (44718)

- Pacific Ocean Shoreline, Coronado HA, at Loma Ave/ Central Beach

- Indicator Bacteria (43266) 043597

- Pacific Ocean Shoreline, Coronado HA, at NASNI Beach/North Beach C
  - Indicator Bacteria (44567)

- Pacific Ocean Shoreline, Coronado HA, at Navy Fence/Ocean Blvd
  - Indicator Bacteria (43583)

- Pacific Ocean Shoreline, Coronado HA, at Silver Strand (north end, Oceanside)
  - Indicator Bacteria (43950)

- Pacific Ocean Shoreline, Dana Point HSA, at Camel Point
  - Indicator Bacteria (42707)

- Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at guest dock
  - Indicator Bacteria (49696)

- Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at harbor entrance
  - Indicator Bacteria (49698)

- Pacific Ocean Shoreline, Dana Point HSA, at Laguna Lido
  - Indicator Bacteria (43267)

- Pacific Ocean Shoreline, Dana Point HSA, at Niguel Marine Life Refuge
  - Arsenic (49703)
  - Cadmium (49708)
  - Chlorpyrifos (49713)
  - Copper (49715)
  - Diazinon (49717)
  - Lead (49719)
  - Malathion (49720)
  - Nickel (49725)
  - Nitrogen, ammonia (Total Ammonia) (49727)
  - Selenium (49728)
  - Silver (49730)
  - Zinc (49734)

- Pacific Ocean Shoreline, Dana Point HSA, at Salt Creek outlet at Monarch Beach
  - Arsenic (49736)
  - Cadmium (49738)
  - Chlorpyrifos (49740)
  - Copper (49742)
  - Diazinon (49750)
  - Lead (49745)
  - Malathion (49749)
  - Nickel (49753)
  - Nitrogen, ammonia (Total Ammonia) (49755)
  - Selenium (49756)
  - Silver (49757)
  - Zinc (49760)

- Pacific Ocean Shoreline, El Salto HSA, Oceanside at Cassidy Street
  - Indicator Bacteria (44709)

- Pacific Ocean Shoreline, El Salto HSA, Oceanside at St Malo Beach
  - Indicator Bacteria (36340)

- Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Hotel
  - Arsenic (49812)
  - Copper (49813)
  - Lead (49814)
  - Nickel (49815)
  - Nitrogen, ammonia (Total Ammonia) (49817)
  - Selenium (49819)
  - Silver (49820)
  - Zinc (49821)

- Pacific Ocean Shoreline, Laguna Beach HSA, at Main Beach
  - Toxicity (49823)

- Pacific Ocean Shoreline, Laguna Beach HSA, at Pearl Street
  - Indicator Bacteria (49824)

- Pacific Ocean Shoreline, Loma Alta HSA, Oceanside at Forester Street
  - Indicator Bacteria (44564)

- Pacific Ocean Shoreline, Los Monos HSA, Carlsbad State Beach at Tamarack Ave
  - Indicator Bacteria (49831)

- Pacific Ocean Shoreline, Los Monos HSA, at Carlsbad State Beach at Warm Water Jetty
  - Indicator Bacteria (49828)

- Pacific Ocean Shoreline, Los Monos HSA, at South Carlsbad State Beach (near Cerezo Drive)
  - Indicator Bacteria (42724)

- Pacific Ocean Shoreline, Los Monos HSA, at South Carlsbad State Beach (near Palomar Airport Road)
  - Indicator Bacteria (49830)

- Pacific Ocean Shoreline, Lower San Juan HSA, at North Beach Creek
  - Chlorpyrifos (49840)
  - Diazinon (49841)
  - Malathion (49842)
  - Nitrogen, ammonia (Total Ammonia) (49843)
  - Toxicity (49844)

- Pacific Ocean Shoreline, Lower San Juan HSA, at San Juan Creek
  - Cadmium (49846)
  - Chlorpyrifos (49847)
  - Copper (49848)
  - Diazinon (49849)
  - Lead (49850)
  - Malathion (49851)
  - Nickel (49852)
  - Selenium (49854)
  - Silver (49855)
  - Zinc (49857)

- Pacific Ocean Shoreline, Lower San Juan HSA, at South Doheny State Park Campground
  - Arsenic (49858)
  - Cadmium (49859)
  - Copper (49861)
  - Diazinon (49862)
  - Lead (49863)

- Malathion (49864)
- Nickel (49865)
- Nitrogen, ammonia (Total Ammonia) (49866)
- Selenium (49872)
- Silver (49873)
- Toxicity (49874)
- Zinc (49876)

- Pacific Ocean Shoreline, Lower Ysidora HSA, at Camp Pendleton
  - Indicator Bacteria (44483)

- Pacific Ocean Shoreline, Lower Ysidora HSA, north of Santa Margarita River
  - Indicator Bacteria (49879)

- Pacific Ocean Shoreline, Mission San Diego HSA, at Newport Ave
  - Indicator Bacteria (42310)

- Pacific Ocean Shoreline, Mission San Diego HSA, at Ocean Beach pier at Narrangaset
  - Indicator Bacteria (42291)

- Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty
  - Arsenic (49884)
  - Cadmium (49885)
  - Chlordane (49886)
  - Chlorpyrifos (49888)
  - Dieldrin (49889)
  - Endosulfan (49891)
  - Endrin (49892)
  - Heptachlor epoxide (49898)
  - Hexachlorobenzene/ HCB (49899)
  - Lindane/gamma Hexachlorocyclohexane (gamma-HCH) (49900)
  - Mercury (49901)
  - Mirex (49902)
  - PAHs (Polycyclic Aromatic Hydrocarbons) (49903)
  - PCBs (Polychlorinated biphenyls) (49905)
  - Selenium (49906)
  - Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD) (49907)

- Pacific Ocean Shoreline, Otay Valley HA, north of Palm Avenue Jetty
  - Indicator Bacteria (49908)

- Pacific Ocean Shoreline, Point Loma HA, at Ladera Street
  - Indicator Bacteria (42335)

- Pacific Ocean Shoreline, Point Loma HA, at Lighthouse
  - Indicator Bacteria (44225)

- Pacific Ocean Shoreline, Point Loma HA, at Point Loma Treatment Plant
  - Indicator Bacteria (43016)

- Pacific Ocean Shoreline, Rancho Santa Fe HSA, at Fletcher Cove Beach
  - Indicator Bacteria (49915)

- Pacific Ocean Shoreline, Rancho Santa Fe HSA, at Powerhouse Park
  - Indicator Bacteria (44264)

- Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Projection of Las Palmeras 043600
  - Indicator Bacteria (32378)
- Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, 450 ft North of Pier
  - Indicator Bacteria (44099)
- Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, Trafalgar Street Beach
  - Indicator Bacteria (44651)
- Pacific Ocean Shoreline, San Clemente HA, at San Clemente State Beach, Projection of Avenida Calafia
  - Indicator Bacteria (32368)
- Pacific Ocean Shoreline, San Clemente HA, at South Poche Beach at Capistrano Shores
  - Indicator Bacteria (44379)
- Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at Chart House parking
  - Indicator Bacteria (49938)
- Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at Las Olas (Georges)
  - Indicator Bacteria (49939)
- Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at Seaside State Park
  - Indicator Bacteria (43808)
- Pacific Ocean Shoreline, San Elijo HSA, at San Elijo State Beach (Main Entrance)
  - Indicator Bacteria (44346)
- Pacific Ocean Shoreline, San Elijo HSA, at San Elijo State Beach (Pipes area)
  - Indicator Bacteria (43701)
- Pacific Ocean Shoreline, San Joaquin Hills HSA, at Aster Street
  - Cadmium (49945)
  - Chlorpyrifos (49946)
  - Copper (49947)
  - Diazinon (49948)
  - Lead (49949)
  - Malathion (49950)
  - Nickel (49955)
  - Nitrogen, ammonia (Total Ammonia) (49956)
  - Oxygen, Dissolved (49957)
  - Selenium (49965)
  - Silver (49971)
  - Toxicity (49974)
  - Zinc (49975)
- Pacific Ocean Shoreline, San Joaquin Hills HSA, at Heisler Park
  - Indicator Bacteria (49978)
- Pacific Ocean Shoreline, San Luis Rey HU, Oceanside Pier at Pier View Way
  - Indicator Bacteria (44345)
- Pacific Ocean Shoreline, San Luis Rey HU, at Pier at Surfrider Way
  - Indicator Bacteria (44137)
- Pacific Ocean Shoreline, San Luis Rey HU, at Pier at Tyson Way

- Indicator Bacteria (43450) 043601

- Pacific Ocean Shoreline, San Luis Rey HU, at San Luis Rey River mouth
  - Arsenic (49981)
  - Cadmium (49982)
  - Chlordane (49983)
  - Chlorpyrifos (49984)
  - Dieldrin (49985)
  - Endosulfan (49986)
  - Endrin (49987)
  - Heptachlor epoxide (49988)
  - Hexachlorobenzene/ HCB (49989)
  - Lindane/gamma Hexachlorocyclohexane (gamma-HCH) (49990)
  - Mercury (49991)
  - Mirex (49992)
  - PAHs (Polycyclic Aromatic Hydrocarbons) (49993)
  - PCBs (Polychlorinated biphenyls) (49994)
  - Selenium (49995)
  - Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD) (49996)

- Pacific Ocean Shoreline, San Onofre Valley HSA, at San Onofre State Beach at Churchs Beach
  - Indicator Bacteria (50000)

- Pacific Ocean Shoreline, Scripps HA, at Belmont Park at Mission Beach (near Ventura Place)
  - Indicator Bacteria (50003)

- Pacific Ocean Shoreline, Scripps HA, at Bonair St at Windansea Beach
  - Indicator Bacteria (44329)

- Pacific Ocean Shoreline, Scripps HA, at Crystal Pier
  - Indicator Bacteria (45603)

- Pacific Ocean Shoreline, Scripps HA, at El Paseo Grande at La Jolla Shores Beach
  - Indicator Bacteria (44298)

- Pacific Ocean Shoreline, Scripps HA, at Grand Ave, Pacific Beach
  - Indicator Bacteria (44290)

- Pacific Ocean Shoreline, Scripps HA, at La Jolla Cove
  - Arsenic (50011)
  - Cadmium (50012)
  - Chlordane (50013)
  - Chlorpyrifos (50014)
  - Dieldrin (50015)
  - Endosulfan (50016)
  - Endrin (50017)
  - Heptachlor epoxide (50018)
  - Hexachlorobenzene/ HCB (50019)
  - Lindane/gamma Hexachlorocyclohexane (gamma-HCH) (50020)
  - Mercury (50021)
  - Mirex (50022)
  - PAHs (Polycyclic Aromatic Hydrocarbons) (50023)
  - PCBs (Polychlorinated biphenyls) (50024)
  - Selenium (50025)
  - Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD) (50026)

- Pacific Ocean Shoreline, Scripps HA, at La Jolla Hermosa Park

- Indicator Bacteria (50027) 043602

- Pacific Ocean Shoreline, Scripps HA, at Playa del Norte at Windansea Beach
  - Indicator Bacteria (43156)

- Pacific Ocean Shoreline, Scripps HA, at Scripps Pier at La Jolla Shores Beach
  - Indicator Bacteria (42743)

- Pacific Ocean Shoreline, Scripps HA, at South Casa Beach
  - Indicator Bacteria (46230)

- Pacific Ocean Shoreline, Scripps HA, at Tourmaline Surf Park, Pacific Beach
  - Indicator Bacteria (44135)

- Pacific Ocean Shoreline, Scripps HA, at Vista de la Playa, Windansea Beach
  - Indicator Bacteria (50038)

- Pacific Ocean Shoreline, Scripps HA, at Whispering Sands Beach, Nicholson Point, La Jolla
  - Indicator Bacteria (46281)

- Pacific Ocean Shoreline, Torrey Pines State Beach, Anderson Canyon
  - Indicator Bacteria (41392)

- Pine Valley Creek (Lower)
  - Alkalinity as CaCO3 (53177)
  - Aluminum (53178)
  - Arsenic (53180)
  - Azinphos-methyl (Guthion) (53181)
  - Barium (53182)
  - Benthic Community Effects (51720)
  - Beryllium (53183)
  - Bifenthrin (53185)
  - Cadmium (53186)
  - Chloride (53187)
  - Chlorpyrifos (53188)
  - Chromium (53190)
  - Copper (53198)
  - Cyfluthrin (53199)
  - Cyhalothrin, Lambda (53200)
  - Cypermethrin (53202)
  - Deltamethrin (53205)
  - Diazinon (53211)
  - Dimethoate (53215)
  - Disulfoton (47237)
  - Esfenvalerate/Fenvalerate (53217)
  - Ethoprop (53224)
  - Fenpropathrin (53229)
  - Iron (53230)
  - Lead (53232)
  - Malathion (53234)
  - Manganese (53235)
  - Methidathion (53236)
  - Methyl Parathion (53238)
  - Nickel (53239)
  - Nitrate/Nitrite (Nitrite + Nitrate as N) (53240)
  - Nitrogen, Nitrite (53241)
  - Nitrogen, ammonia (Total Ammonia) (53242)

Oxygen, Dissolved (53243)
- Parathion (53244)
- Permethrin, total (53245)
- Phorate (53247)
- Phosmet (53248)
- Selenium (53249)
- Silver (53253)
- Specific Conductivity (53257)
- Sulfates (53263)
- Temperature, water (53264)
- Total Dissolved Solids (53266)
- Toxicity (53267)
- Turbidity (53268)
- Zinc (53270)
- pH (53272)

- Pine Valley Creek (Upper)
  - Alkalinity as CaCO3 (53306)
  - Aluminum (53307)
  - Arsenic (53308)
  - Benthic Community Effects (43722)
  - Bifenthrin (53309)
  - Cadmium (53310)
  - Chloride (53311)
  - Chromium (53312)
  - Copper (53313)
  - Cyfluthrin (53314)
  - Cyhalothrin, Lambda (53315)
  - Cypermethrin (53316)
  - Deltamethrin (53317)
  - Esfenvalerate/Fenvalerate (53318)
  - Fenpropathrin (53319)
  - Iron (53320)
  - Lead (53321)
  - Manganese (53322)
  - Nickel (53323)
  - Nitrate/Nitrite (Nitrite + Nitrate as N) (53324)
  - Nitrite as Nitrite NO2 (33181)
  - Nitrogen, Nitrite (53325)
  - Nitrogen, ammonia (Total Ammonia) (53327)
  - Oxygen, Dissolved (33115)
  - Permethrin, total (53328)
  - Phosphorus (32840)
  - Selenium (53329)
  - Silver (53330)
  - Specific Conductivity (53331)
  - Sulfates (53332)
  - Temperature, water (53333)
  - Total Dissolved Solids (33167)
  - Toxicity (53334)
  - Zinc (53335)
  - pH (33116)

- Prima Deshecha Creek
  - Ammonia (48500)
  - Arsenic (48501)
  - Chlorpyrifos (48504)
  - Chromium (48502)
  - Copper (48503)
  - Diazinon (48505)

- Lead (48506)
- Mercury (48508)
- Oxygen, Dissolved (48512)
- Selenium (48513)
- Silver (48509)
- Zinc (48510)
- pH (48511)

- Rainbow Creek
  - Antimony (53028)
  - Arsenic (44268)
  - Barium (53032)
  - Benthic Community Effects (43756)
  - Beryllium (53033)
  - Cadmium (50049)
  - Chromium (50048)
  - Copper (43501)
  - Lead (50050)
  - Manganese (33855)
  - Mercury (33597)
  - Nickel (50051)
  - Nitrate (53034)
  - Selenium (53035)
  - Silver (53036)
  - Turbidity (43596)
  - Zinc (34101)

- Rattlesnake Creek
  - Benthic Community Effects (44296)

- Redhawk Channel
  - Oxygen, Dissolved (53338)
  - pH (50052)

- Reidy Canyon Creek
  - Ammonia (48531)
  - Cadmium (48515)
  - Chlorpyrifos (48523)
  - Copper (48516)
  - Diazinon (48522)
  - Lead (48517)
  - Malathion (48520)
  - Nitrate/Nitrite (Nitrite + Nitrate as N) (48528)
  - Nitrogen, Nitrite (43957)
  - Zinc (48518)

- Rose Creek
  - Arsenic (48570)
  - Bifenthrin (48594)
  - Cadmium (48573)
  - Chromium (48580)
  - Copper (48581)
  - Cypermethrin (48597)
  - Lead (48582)
  - Nickel (48595)
  - Zinc (48596)

- Salt Creek (Orange County)

- Ammonia (48619)
- Arsenic (48629)
- Cadmium (48635)
- Chlorpyrifos (48636)
- Chromium (48623)
- Copper (48625)
- Diazinon (48637)
- Lead (48624)
- Nickel (48626)
- Selenium (48628)
- Silver (48620)
- Zinc (48622)
- pH (48630)

- San Diego Bay
  - Arsenic (52947)
  - Cadmium (52948)
  - Chlordane (52949)
  - Chlorpyrifos (52950)
  - Dieldrin (52951)
  - Endosulfan (52952)
  - Endrin (52953)
  - Heptachlor epoxide (52954)
  - Hexachlorobenzene/ HCB (52955)
  - Lindane/gamma Hexachlorocyclohexane (gamma-HCH) (52956)
  - Mirex (52957)
  - Selenium (52961)
  - Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD) (52962)

- San Diego Bay Shoreline, at Bessemer Street
  - Indicator Bacteria (48316)

- San Diego Bay Shoreline, at Glorietta Bay
  - Indicator Bacteria (43806)

- San Diego Bay Shoreline, at Spanish Landing
  - Indicator Bacteria (41588)

- San Diego Bay Shoreline, near sub base
  - Arsenic | Cadmium | Chlordane | Chromium (total) | Copper | Lead | Mercury | Nickel | PAHs (Polycyclic Aromatic Hydrocarbons) | PCBs (Polychlorinated biphenyls) | Silver (43491)

- San Diego Bay Shoreline; Kellogg Street Beach
  - Indicator Bacteria (44519)

- San Diego River (Lower)
  - 2-Methylnaphthalene (49144)
  - Antimony (49145)
  - Arsenic (49146)
  - Benzo(a)anthracene (49148)
  - Bifenthrin (49150)
  - Chlordane (49152)
  - Chlorpyrifos (49153)
  - Chromium (49154)
  - Chrysene (C1-C4) (49155)
  - Copper (49156)
  - Cypermethrin (49157)
  - Deltamethrin (49158)

- Diazinon (49392)
- Dibenz[a,h]anthracene (49455)
- Endrin (49458)
- Esfenvalerate/Fenvalerate (49466)
- Lead (49469)
- Lindane/gamma Hexachlorocyclohexane (gamma-HCH) (49470)
- Malathion (49472)
- Mercury (49473)
- Nickel (49474)
- Nitrate/Nitrite (Nitrite + Nitrate as N) (49475)
- Nitrogen, Nitrite (49476)
- PAHs (Polycyclic Aromatic Hydrocarbons) (49477)
- PCBs (Polychlorinated biphenyls) (49478)
- Phenanthrene (51359)
- Pyrene (51363)
- Selenium (51364)
- Silver (51366)
- Surfactants (MBAS) (51367)
- Zinc (51374)
- pH (49479)

- San Diego River (Upper)
  - Alkalinity as CaCO3 (51463)
  - Aluminum (51465)
  - Arsenic (51468)
  - Benthic Community Effects (51733)
  - Bifenthrin (51494)
  - Cadmium (51495)
  - Chloride (51496)
  - Chlorpyrifos (51515)
  - Chromium (51502)
  - Copper (51511)
  - Cyfluthrin (51517)
  - Cyhalothrin, Lambda (51518)
  - Cypermethrin (51519)
  - Deltamethrin (51520)
  - Diazinon (51521)
  - Esfenvalerate/Fenvalerate (51522)
  - Fenpropathrin (51523)
  - Iron (51524)
  - Lead (51526)
  - Malathion (51530)
  - Manganese (51533)
  - Nickel (51536)
  - Nitrate/Nitrite (Nitrite + Nitrate as N) (51550)
  - Nitrogen, Nitrite (51558)
  - Nitrogen, ammonia (Total Ammonia) (51554)
  - Permethrin, total (51561)
  - Selenium (51601)
  - Silver (51622)
  - Specific Conductivity (51630)
  - Temperature, water (52009)
  - Total Dissolved Solids (36791)
  - Toxicity (51634)
  - Turbidity (51635)
  - Zinc (51640)
  - pH (51592)

- San Dieguito Lagoon, Lower Basin
  - Toxicity (49055)

- San Dieguito River
  - Arsenic (49032)
  - Benthic-Macroinvertebrate Bioassessments (49769)
  - Bifenthrin (49340)
  - Cadmium (49373)
  - Chlorpyrifos (49378)
  - Chromium (49384)
  - Copper (49393)
  - Cypermethrin (49733)
  - Deltamethrin (49741)
  - Diazinon (49732)
  - Esfenvalerate/Fenvalerate (49729)
  - Lead (49386)
  - Malathion (49726)
  - Nickel (49731)
  - Selenium (49721)
  - Temperature, water (49723)
  - Zinc (49685)

- San Dieguito River, unnamed tributary below Hodges Dam
  - Cadmium (49171)
  - Chlorpyrifos (49173)
  - Copper (49183)
  - Diazinon (49185)
  - Lead (49188)
  - Malathion (49189)
  - Zinc (49190)

- San Elijo Creek (San Diego County)
  - Cadmium (49160)
  - Chlorpyrifos (49161)
  - Copper (49162)
  - Diazinon (49163)
  - Lead (49164)
  - Malathion (49165)
  - Nitrate/Nitrite (Nitrite + Nitrate as N) (49168)
  - Nitrogen, Nitrite (49169)
  - Zinc (49166)

- San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue
  - Cadmium (49100)
  - Chlorpyrifos (49105)
  - Copper (49132)
  - Diazinon (49133)
  - Lead (49134)
  - Malathion (49135)
  - Nitrogen, Nitrite (49136)
  - Nitrogen, ammonia (Total Ammonia) (49137)
  - Zinc (49138)

- San Elijo Lagoon
  - 2-Methylnaphthalene (48449)
  - Antimony (53351)
  - Arsenic (53353)
  - Benzo(a)anthracene (53354)
  - Cadmium (53355)
  - Chlordane (53356)
  - Chromium (53357)

- Chrysene (C1-C4) (53358)
- Copper (53350)
- Dibenz[a,h]anthracene (53359)
- Endrin (53360)
- Lead (53361)
- Lindane/gamma Hexachlorocyclohexane (gamma-HCH) (53362)
- Mercury (53363)
- PAHs (Polycyclic Aromatic Hydrocarbons) (53364)
- PCBs (Polychlorinated biphenyls) (53366)
- Phenanthrene (53367)
- Pyrene (53368)
- Silver (53369)
- Zinc (53370)

- San Juan Creek
  - Alkalinity as CaCO3 (49037)
  - Aluminum (48754)
  - Ammonia (51974)
  - Arsenic (48757)
  - Benthic-Macroinvertebrate Bioassessments (40411)
  - Bifenthrin (48759)
  - Cadmium (48774)
  - Chlordane (48775)
  - Chloride (48791)
  - Chlorpyrifos (48862)
  - Chromium (48904)
  - Copper (48910)
  - Cyfluthrin (48912)
  - Cyhalothrin, Lambda (48917)
  - Cypermethrin (48919)
  - DDD (Dichlorodiphenyldichloroethane) (48466)
  - DDT (Dichlorodiphenyltrichloroethane) | Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD) (49031)
  - Deltamethrin (48992)
  - Diazinon (43102)
  - Dieldrin (48925)
  - Endrin (48929)
  - Esfenvalerate/Fenvalerate (48933)
  - Fenpropathrin (48936)
  - Fipronil (48941)
  - Fipronil Sulfide (48944)
  - Fipronil Sulfone (48945)
  - Iron (48947)
  - Lead (48995)
  - Lindane/gamma Hexachlorocyclohexane (gamma-HCH) (48946)
  - Malathion (48964)
  - Manganese (48966)
  - Mercury (49000)
  - Methyl Parathion (49003)
  - Nickel (49009)
  - PCBs (Polychlorinated biphenyls) (49034)
  - Permethrin, total (49035)
  - Silver (49036)
  - Sulfates (48969)
  - Temperature, water (48978)
  - Total Dissolved Solids (48982)
  - Turbidity (48986)
  - Zinc (48989)
  - pH (33410)

- San Juan Creek (mouth)

- Selenium (62982) 043609

- San Luis Rey River, Lower (west of Interstate 15)
  - Arsenic (49040)
  - Cadmium (49051)
  - Chlorpyrifos (50703)
  - Chromium (50637)
  - Copper (50675)
  - Cypermethrin (50704)
  - Deltamethrin (50709)
  - Diazinon (50730)
  - Esfenvalerate/Fenvalerate (50739)
  - Lead (50701)
  - Malathion (50740)
  - Nickel (52069)
  - Selenium (37417)
  - Temperature, water (50741)
  - Zinc (52109)

- San Luis Rey River, Upper (east of Interstate 15)
  - Ammonia (51982)
  - Arsenic (52072)
  - Bifenthrin (50752)
  - Cadmium (49067)
  - Chlorpyrifos (50755)
  - Chromium (52077)
  - Copper (52090)
  - Cypermethrin (50772)
  - Diazinon (50774)
  - Lead (52100)
  - Malathion (50788)
  - Nickel (52103)
  - Nitrate/Nitrite (Nitrite + Nitrate as N) (51978)
  - Nitrogen, Nitrite (51981)
  - Temperature, water (50800)
  - Zinc (52107)

- San Marcos Creek
  - Arsenic (50055)
  - Bifenthrin (50099)
  - Cadmium (50106)
  - Chlordane (50111)
  - Chlorpyrifos (50116)
  - Chromium (50125)
  - Copper (50133)
  - Cyfluthrin (50146)
  - Cyhalothrin, Lambda (50158)
  - Cypermethrin (50744)
  - DDD (Dichlorodiphenyldichloroethane) (50156)
  - DDT (Dichlorodiphenyltrichloroethane) (50157)
  - Deltamethrin (50160)
  - Diazinon (50161)
  - Dieldrin (50162)
  - Endrin (50163)
  - Esfenvalerate/Fenvalerate (50165)
  - Fenpropathrin (50166)
  - Fipronil (50168)
  - Fipronil Sulfide (50169)
  - Fipronil Sulfone (50170)

Lead (50172)
- Lindane/gamma Hexachlorocyclohexane (gamma-HCH) (50177)
- Malathion (50178)
- Nickel (50745)
- Oxygen, Dissolved (50746)
- Permethrin, total (50747)
- Temperature, water (50749)
- Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD) (50748)
- Zinc (50750)
- pH (50751)

- San Marcos Creek, unnamed fork at Twin Oaks Valley Road
  - Cadmium (50188)
  - Chlorpyrifos (50192)
  - Copper (50193)
  - Diazinon (50194)
  - Indicator Bacteria (50191)
  - Lead (50195)
  - Malathion (50196)
  - Zinc (50197)

- San Marcos Lake
  - Indicator Bacteria (50511)
  - Lead (50512)
  - Nickel (50513)
  - Oxygen, Dissolved (50514)
  - Zinc (50515)
  - pH (50516)

- San Marcos, Lake, drain to central southeast fork of lake
  - Cadmium (50525)
  - Chlorpyrifos (50526)
  - Copper (50527)
  - Diazinon (50547)
  - Indicator Bacteria (50549)
  - Lead (50553)
  - Malathion (50554)
  - Zinc (50555)

- San Marcos, Lake, drain to central southwest fork of lake
  - Cadmium (50556)
  - Chlorpyrifos (50557)
  - Diazinon (50559)
  - Lead (50561)
  - Malathion (50562)
  - Zinc (50563)

- San Mateo Creek (San Diego County)
  - Alkalinity as CaCO3 (52901)
  - Aluminum (52927)
  - Arsenic (52929)
  - Benthic Community Effects (43123)
  - Bifenthrin (52944)
  - Cadmium (52945)
  - Chloride (52975)
  - Chromium (52977)
  - Copper (52990)
  - Cyfluthrin (52991)
  - Cyhalothrin, Lambda (52992)

- Cypermethrin (52993)
- Deltamethrin (52994)
- Esfenvalerate/Fenvalerate (52995)
- Fenpropathrin (52996)
- Iron (52997)
- Lead (52998)
- Manganese (52999)
- Mercury (53000)
- Nickel (53001)
- Nitrogen, ammonia (Total Ammonia) (53002)
- Oxygen, Dissolved (53003)
- Permethrin, total (53009)
- Selenium (53010)
- Silver (53011)
- Sulfates (53012)
- Temperature, water (53013)
- Total Dissolved Solids (53027)
- Toxicity (52932)
- Turbidity (53029)
- Zinc (53030)
- pH (53031)

- San Miguel Creek
  - Cadmium (49087)
  - Chlorpyrifos (49093)
  - Copper (49094)
  - Diazinon (49097)
  - Lead (49095)
  - Malathion (49098)
  - Zinc (49096)

- San Vicente Creek (San Diego County)
  - Cadmium (49109)
  - Chlorpyrifos (49110)
  - Copper (49111)
  - Diazinon (49112)
  - Lead (49113)
  - Malathion (49114)
  - Nitrate/Nitrite (Nitrite + Nitrate as N) (49119)
  - Nitrogen, Nitrite (49121)
  - Nitrogen, ammonia (Total Ammonia) (49120)
  - Zinc (49122)

- San Vicente Creek (San Diego County), unnamed tributary at Arena Drive
  - Cadmium (49123)
  - Chlorpyrifos (49124)
  - Copper (49125)
  - Diazinon (49126)
  - Indicator Bacteria (53446)
  - Lead (49131)
  - Malathion (49139)
  - Nitrate/Nitrite (Nitrite + Nitrate as N) (49140)
  - Nitrogen, Nitrite (49142)
  - Nitrogen, ammonia (Total Ammonia) (49141)
  - Zinc (49143)

- San Vicente Reservoir
  - Ammonia (43569)
  - Chromium (33311)

- Phosphorus (43570)

043612

- Sandia Creek
  - Aldicarb (48209)
  - Aldicarb sulfone (48214)
  - Aldicarb sulfoxide (48216)
  - Aldrin (48219)
  - Alkalinity as CaCO3 (48222)
  - Aluminum (43108)
  - Antimony (33028)
  - Arsenic (36728)
  - Benthic Community Effects (43771)
  - Beryllium (32823)
  - Bifenthrin (48397)
  - Cadmium (44614)
  - Carbaryl (48414)
  - Carbofuran (48415)
  - Chloride (43052)
  - Chlorpyrifos (48417)
  - Chromium (32824)
  - Copper (44615)
  - Cyfluthrin (48418)
  - Cyhalothrin, Lambda (48420)
  - Cypermethrin (48424)
  - Deltamethrin (48431)
  - Diazinon (48434)
  - Endrin (48231)
  - Esfenvalerate/Fenvalerate (48438)
  - Fenpropathrin (48439)
  - Indicator Bacteria (51174)
  - Lead (48448)
  - Malathion (48450)
  - Mercury (33925)
  - Methiocarb (51115)
  - Methomyl (48451)
  - Nickel (37259)
  - Oxamyl (Vydate) (51117)
  - Oxygen, Dissolved (51154)
  - Pendimethalin (51156)
  - Permethrin, total (51158)
  - Simazine (51168)
  - Specific Conductivity (51167)
  - Temperature, water (51169)
  - Thallium (33864)
  - Toxicity (51170)
  - Turbidity (37239)
  - Zinc (33744)
  - pH (43710)

- Santa Margarita Lagoon
  - 2-Methylnaphthalene (47977)
  - Antimony (47980)
  - Arsenic (47990)
  - Benzo(a)anthracene (48004)
  - Cadmium (48011)
  - Chlordane (48012)
  - Chromium (48013)
  - Chrysene (C1-C4) (48016)
  - Copper (48110)
  - Dibenz[a,h]anthracene (48129)

- Endrin (48130)
- Indicator Bacteria (50566)
- Lead (48133)
- Lindane/gamma Hexachlorocyclohexane (gamma-HCH) (48137)
- Mercury (48138)
- PAHs (Polycyclic Aromatic Hydrocarbons) (48140)
- PCBs (Polychlorinated biphenyls) (48143)
- Phenanthrene (48144)
- Pyrene (48147)
- Silver (48148)
- Toxicity (48149)
- Zinc (48150)

- Santa Margarita River (Lower)
  - 2-Methylnaphthalene (47505)
  - Antimony (47438)
  - Arsenic (47437)
  - Benzo(a)anthracene (47507)
  - Bifenthrin (47518)
  - Cadmium (47361)
  - Chlordane (47435)
  - Chromium (47362)
  - Chrysene (C1-C4) (47436)
  - Copper (47442)
  - Cyfluthrin (47519)
  - Cyhalothrin, Lambda (47525)
  - Cypermethrin (47528)
  - DDD (Dichlorodiphenyldichloroethane) (47531)
  - DDE (Dichlorodiphenyldichloroethylene) (47532)
  - DDT (Dichlorodiphenyltrichloroethane) (47534)
  - Deltamethrin (47536)
  - Diazinon (47564)
  - Dibenz[a,h]anthracene (47537)
  - Dieldrin (47538)
  - Endrin (47543)
  - Esfenvalerate/Fenvalerate (47544)
  - Fenpropathrin (47545)
  - Lead (47434)
  - Lindane/gamma Hexachlorocyclohexane (gamma-HCH) (47552)
  - Mercury (33317)
  - Methyl Parathion (47546)
  - Nickel (47565)
  - Nitrate/Nitrite (Nitrite + Nitrate as N) (47567)
  - Nitrogen, Nitrite (47568)
  - PAHs (Polycyclic Aromatic Hydrocarbons) (47558)
  - PCBs (Polychlorinated biphenyls) (47554)
  - Permethrin, total (47547)
  - Phenanthrene (47561)
  - Pyrene (47562)
  - Selenium (47566)
  - Silver (47563)
  - Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD) (47548)
  - Zinc (47569)

- Santa Margarita River (Upper)
  - Alkalinity as CaCO3 (47930)
  - Alkalinity as CaCO3 | Ammonia | Manganese | Nickel | Orthophosphate | Total Kjeldahl Nitrogen (TKN) | Total Suspended Solids (TSS) (44289)
  - Aluminum (47571)
  - Antimony (47574)

- Arsenic (47613)
- Benthic Community Effects (51181)
- Bifenthrin (47614)
- Cadmium (47616)
- Chloride (47618)
- Chlorpyrifos (47620)
- Chromium (47621)
- Copper (47629)
- Cyfluthrin (47578)
- Cyhalothrin, Lambda (47630)
- Cypermethrin (47631)
- Deltamethrin (47644)
- Diazinon (47645)
- Esfenvalerate/Fenvalerate (47646)
- Fenpropathrin (47661)
- Lead (47659)
- Malathion (47664)
- Metals (38589)
- Nickel (47673)
- Nitrate/Nitrite (Nitrite + Nitrate as N) (47677)
- Nitrogen, Nitrite (47679)
- Nitrogen, ammonia (Total Ammonia) (47682)
- Oxygen, Dissolved (47931)
- Permethrin, total (47687)
- Selenium (47698)
- Silver (47702)
- Specific Conductivity (47933)
- Sulfates (47710)
- Temperature, water (47934)
- Total Dissolved Solids (47927)
- Turbidity (47935)
- Zinc (47711)
- pH (47771)

- Santa Maria Creek
  - Ammonia (51983)
  - Cadmium (49118)
  - Chlorpyrifos (49273)
  - Copper (49127)
  - Diazinon (49280)
  - Indicator Bacteria (51709)
  - Lead (49130)
  - Malathion (49282)
  - Nitrogen, Nitrite (51984)
  - Zinc (49269)

- Santa Ysabel Creek (below Sutherland Reservoir)
  - Alkalinity as CaCO3 (49295)
  - Aluminum (49310)
  - Ammonia (Unionized) (51990)
  - Arsenic (49312)
  - Benthic Community Effects (51741)
  - Bifenthrin (49344)
  - Cadmium (49376)
  - Chloride (49421)
  - Chromium (49377)
  - Copper (49379)
  - Cyfluthrin (49345)
  - Cyhalothrin, Lambda (49346)
  - Cypermethrin (49347)

- Deltamethrin (49348)
- Esfenvalerate/Fenvalerate (49349)
- Fenpropathrin (49353)
- Iron (49381)
- Lead (49382)
- Manganese (49422)
- Nickel (49380)
- Nitrate/Nitrite (Nitrite + Nitrate as N) (51995)
- Nitrogen, Nitrate (51997)
- Nitrogen, Nitrite (52000)
- Oxygen, Dissolved (49471)
- Permethrin, total (49355)
- Selenium (49423)
- Silver (49424)
- Specific Conductivity (49487)
- Sulfates (49489)
- Temperature, water (49491)
- Total Dissolved Solids (49493)
- Toxicity (51756)
- Turbidity (49496)
- Zinc (49425)
- pH (49481)

- Segunda Deshecha Creek
  - Alkalinity as CaCO3 (49503)
  - Aluminum (49426)
  - Ammonia (52002)
  - Arsenic (49427)
  - Bifenthrin (49360)
  - Cadmium (49444)
  - Chloride (49507)
  - Chromium (49447)
  - Copper (49449)
  - Cyhalothrin, Lambda (49364)
  - Cypermethrin (49366)
  - Deltamethrin (49367)
  - Diazinon (49563)
  - Esfenvalerate/Fenvalerate (49368)
  - Fenpropathrin (49369)
  - Iron (49462)
  - Lead (49451)
  - Manganese (49465)
  - Mercury (49468)
  - Nickel (49454)
  - Oxygen, Dissolved (49512)
  - Permethrin, total (49370)
  - Sulfates (49518)
  - Total Dissolved Solids (49525)
  - Zinc (49456)
  - pH (49515)

- Soledad Canyon
  - Anthracene (50801)
  - Arsenic (52123)
  - Benzo(a)anthracene (50802)
  - Benzo(a)pyrene (3,4-Benzopyrene -7-d) (50803)
  - Bifenthrin (50804)
  - Cadmium (52124)
  - Chlordane (50805)
  - Chlorpyrifos (50806)

- Chromium (52125)
- Chrysene (C1-C4) (50807)
- Copper (52126)
- Cyfluthrin (51110)
- Cyhalothrin, Lambda (51111)
- Cypermethrin (51109)
- DDD (Dichlorodiphenyldichloroethane) (50808)
- DDE (Dichlorodiphenyldichloroethylene) (50809)
- DDT (Dichlorodiphenyltrichloroethane) (50810)
- Deltamethrin (51112)
- Diazinon (50811)
- Dieldrin (50812)
- Endrin (50813)
- Esfenvalerate/Fenvalerate (51113)
- Fenpropathrin (51114)
- Fluoranthene (51097)
- Fluorene (51098)
- Lindane/gamma Hexachlorocyclohexane (gamma-HCH) (51101)
- Methyl Parathion (51102)
- Naphthalene (51103)
- Nickel (52127)
- PAHs (Polycyclic Aromatic Hydrocarbons) (51104)
- PCBs (Polychlorinated biphenyls) (51105)
- Permethrin, total (51116)
- Phenanthrene (51106)
- Pyrene (51107)
- Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD) (51108)
- Zinc (52128)

- Spring Valley Creek
  - Arsenic (49569)
  - Azinphos-methyl (Guthion) (49575)
  - Cadmium (49664)
  - Chlorpyrifos (49642)
  - Chromium (49677)
  - Copper (49682)
  - Diazinon (49666)
  - Dimethoate (49668)
  - Disulfoton (49671)
  - Ethoprop (49672)
  - Indicator Bacteria (49773)
  - Lead (49694)
  - Malathion (49761)
  - Methidathion (49673)
  - Methyl Parathion (49676)
  - Nickel (49735)
  - Parathion (49652)
  - Phorate (49770)
  - Phosmet (49772)
  - Selenium (49743)

- Steele Canyon
  - Ammonia (52007)
  - Cadmium (49794)
  - Chlorpyrifos (49809)
  - Copper (49804)
  - Diazinon (49816)
  - Lead (49805)
  - Malathion (49818)
  - Nitrate/Nitrite (Nitrite + Nitrate as N) (52004)

- Nitrogen, Nitrite (52005)
- Zinc (49806)

- Stone Creek (San Diego County)
  - Benthic Community Effects (51747)

- Sutherland Reservoir
  - Aluminum (43643)

- Sweetwater Flood Control Channel
  - 2-Methylnaphthalene (50056)
  - Antimony (50057)
  - Arsenic (50058)
  - Benzo(a)anthracene (50059)
  - Cadmium (50060)
  - Chlordane (50061)
  - Chromium (50062)
  - Chrysene (C1-C4) (50064)
  - Copper (50087)
  - Dibenz[a,h]anthracene (50089)
  - Endrin (50091)
  - Indicator Bacteria (50135)
  - Lead (50093)
  - Lindane/gamma Hexachlorocyclohexane (gamma-HCH) (50095)
  - Mercury (50097)
  - PAHs (Polycyclic Aromatic Hydrocarbons) (50101)
  - PCBs (Polychlorinated biphenyls) (50112)
  - Phenanthrene (50130)
  - Pyrene (50131)
  - Silver (50132)
  - Zinc (50134)

- Sweetwater Reservoir
  - Alachlor (37545)
  - Chromium (43042)
  - Diazinon (50167)
  - Indicator Bacteria (50198)
  - Nitrogen, Nitrate (52010)
  - Simazine (33084)

- Sweetwater River, Lower (below Sweetwater Reservoir)
  - Arsenic (53455)
  - Bifenthrin (51636)
  - Cadmium (53456)
  - Chromium (53458)
  - Copper (53459)
  - Cypermethrin (51637)
  - Deltamethrin (51638)
  - Diazinon (53461)
  - Esfenvalerate/Fenvalerate (51639)
  - Lead (53460)
  - Malathion (53462)
  - Nickel (53463)
  - Nitrate/Nitrite (Nitrite + Nitrate as N) (52014)
  - Nitrogen, Nitrite (52016)
  - Nitrogen, ammonia (Total Ammonia) (52017)
  - Temperature, water (53464)
  - Zinc (53465)

- Sweetwater River, North Fork, unnamed tributary at Tavern Road
  - Aluminum (52135)
  - Ammonia (52023)
  - Arsenic (52142)
  - Azinphos-methyl (Guthion) (51118)
  - Barium (52136)
  - Beryllium (52137)
  - Cadmium (52148)
  - Chlorpyrifos (51120)
  - Copper (52143)
  - Diazinon (51132)
  - Dimethoate (51134)
  - Disulfoton (51136)
  - Ethoprop (51151)
  - Iron (52138)
  - Lead (52145)
  - Malathion (51155)
  - Methidathion (51138)
  - Methyl Parathion (51153)
  - Nickel (52140)
  - Nitrate/Nitrite (Nitrite + Nitrate as N) (52021)
  - Nitrogen, Nitrite (52022)
  - Parathion (51119)
  - Phorate (51149)
  - Phosmet (51150)
  - Selenium (52146)
  - Silver (52141)
  - Zinc (52144)

- Sweetwater River, Upper (above Sweetwater Reservoir)
  - 1,2,3-Trichloropropane (51176)
  - 2,4,5-TP (Silvex) (51188)
  - 2,4-D (2,4-Dichlorophenoxy acetic acid) (51189)
  - Alachlor (51190)
  - Aldrin (51296)
  - Ammonia (53388)
  - Antimony (52188)
  - Arsenic (52204)
  - Atrazine (51191)
  - Barium (52196)
  - Benzo(a)pyrene (3,4-Benzopyrene -7-d) (51192)
  - Beryllium (52202)
  - Bifenthrin (51180)
  - Bromacil (51193)
  - Cadmium (52205)
  - Carbaryl (51369)
  - Chlorpyrifos (51307)
  - Chromium (52214)
  - Copper (52215)
  - Cyanide (52197)
  - Cypermethrin (51182)
  - DDD (Dichlorodiphenyldichloroethane) (51183)
  - DDE (Dichlorodiphenyldichloroethylene) (51184)
  - DDT (Dichlorodiphenyltrichloroethane) (51185)
  - Dalapon (51194)
  - Diazinon (53381)
  - Dicamba (51372)
  - Dieldrin (51325)
  - Dinoseb (51195)
  - Dioxin (51196)

- Diuron (51197)
- Endrin (51198)
- Heptachlor (51336)
- Iron (52982)
- Lead (52986)
- Malathion (51340)
- Mercury (52201)
- Nickel (53165)
- Nitrogen, Nitrate (53385)
- Nitrogen, Nitrite (53386)
- PCBs (Polychlorinated biphenyls) (51187)
- Pentachlorophenol (PCP) (51199)
- Silver (52198)
- Temperature, water (51353)
- Thallium (52199)
- Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD) (51186)
- Toxaphene (51349)
- Toxicity (43752)
- Trifluralin (51200)
- Zinc (53174)
- alpha.-BHC (Benzenehexachloride or alpha-HCH) (53382)
- beta-BHC (Benzenehexachloride or beta-HCH) (53383)

- Switzer Creek
  - Bifenthrin (50201)
  - Chlordane (50460)
  - Chlorpyrifos (50476)
  - Cyfluthrin (50205)
  - Cyhalothrin, Lambda (50435)
  - Cypermethrin (50437)
  - DDE (Dichlorodiphenyldichloroethylene) (50467)
  - DDT (Dichlorodiphenyltrichloroethane) (50469)
  - Deltamethrin (50438)
  - Diazinon (50477)
  - Dieldrin (50472)
  - Endrin (50474)
  - Esfenvalerate/Fenvalerate (50447)
  - Fenpropathrin (50450)
  - Fipronil (50487)
  - Fipronil Sulfide (50488)
  - Fipronil Sulfone (50489)
  - Lindane/gamma Hexachlorocyclohexane (gamma-HCH) (50475)
  - Permethrin, total (50454)
  - Toxicity (53493)

- Sycamore Canyon
  - pH (48189)

- Tecolote Creek
  - Arsenic (53184)
  - Benthic-Macroinvertebrate Bioassessments (33284)
  - Chlorpyrifos (51641)
  - Chromium (53292)
  - Deltamethrin (51656)
  - Esfenvalerate/Fenvalerate (51659)
  - Nickel (53293)

- Tecolote Creek, South Fork
  - Arsenic (53298)

- Benthic Community Effects (51760)
- Bifenthrin (51660)
- Cadmium (53299)
- Chromium (53300)
- Copper (53301)
- Cypermethrin (51663)
- Lead (53302)
- Nickel (53303)
- Zinc (53304)

- Telegraph Canyon Creek
  - Benthic Community Effects (44159)

- Temecula Creek
  - Oxygen, Dissolved (47963)
  - pH (47960)

- Tijeras Canyon
  - Ammonia (52043)
  - Arsenic (50500)
  - Benthic Community Effects (51765)
  - Cadmium (50501)
  - Chlorpyrifos (50517)
  - Chromium (50502)
  - Copper (50503)
  - Diazinon (50522)
  - Lead (50504)
  - Malathion (50523)
  - Nickel (50506)
  - Selenium (50507)
  - Silver (50509)
  - Zinc (50510)

- Tijuana River
  - Antimony (47156)
  - Arsenic (47150)
  - Bifenthrin (47151)
  - Chlordane (47313)
  - Chromium (48052)
  - Copper (53166)
  - Cyfluthrin (53168)
  - Cyhalothrin, Lambda (53169)
  - DDD (Dichlorodiphenyldichloroethane) (53171)
  - DDE (Dichlorodiphenyldichloroethylene) (53175)
  - DDT (Dichlorodiphenyltrichloroethane) (53176)
  - Deltamethrin (53179)
  - Dieldrin (53201)
  - Endrin (53206)
  - Esfenvalerate/Fenvalerate (53213)
  - Fenpropathrin (53222)
  - Lead (32713)
  - Lindane/gamma Hexachlorocyclohexane (gamma-HCH) (53228)
  - Mercury (53231)
  - Methyl Parathion (53246)
  - Nickel (43374)
  - PCBs (Polychlorinated biphenyls) (53250)
  - Permethrin, total (53260)
  - Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD) (53269)
  - Zinc (53273)

- Tijuana River Estuary
  - 2-Methylnaphthalene (52218)
  - Antimony (52226)
  - Benzo(a)anthracene (52237)
  - Cadmium (52241)
  - Chlordane (52243)
  - Chlorpyrifos (52244)
  - Chromium (52263)
  - Chrysene (C1-C4) (52267)
  - Copper (52274)
  - Dibenz[a,h]anthracene (52276)
  - Dieldrin (52277)
  - Endosulfan (52280)
  - Heptachlor epoxide (52286)
  - Hexachlorobenzene/ HCB (52291)
  - Lindane/gamma Hexachlorocyclohexane (gamma-HCH) (52296)
  - Mercury (52298)
  - Mirex (52301)
  - PAHs (Polycyclic Aromatic Hydrocarbons) (52305)
  - PCBs (Polychlorinated biphenyls) (52813)
  - Phenanthrene (52814)
  - Pyrene (52815)
  - Selenium (52816)
  - Silver (52817)
  - Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD) (52818)
  - Zinc (52820)

- Tijuana River, Upper (Cottonwood Creek confluence to 1st border crossing)
  - Benthic Community Effects (51774)

- Troy Canyon (to 0.3 mile upstream from confluence w Long Canyon)
  - Benthic Community Effects (44682)

- Viejas Creek
  - Ammonia (52049)
  - Cadmium (50524)
  - Chlorpyrifos (50533)
  - Copper (50530)
  - Diazinon (50545)
  - Indicator Bacteria (50548)
  - Lead (50531)
  - Malathion (50546)
  - Nitrogen, Nitrite (52045)
  - Zinc (50532)

- Weaver Creek
  - Benthic Community Effects (43995)

- Wilson Creek (San Diego County)
  - Benthic Community Effects (44677)

- Wood Canyon (Orange County)
  - Ammonia (52055)
  - Arsenic (50550)
  - Cadmium (50551)
  - Chlorpyrifos (50582)
  - Chromium (50575)

- Copper (50576)
- Lead (50552)
- Malathion (50584)
- Nickel (50578)
- Oxygen, Dissolved (50586)
- Silver (50580)
- Zinc (50581)
- pH (50599)

List on 303(d) list (TMDL required list)	Regional Board 9

- Agua Hedionda Creek
  - Benthic Community Effects (43871)
  - Bifenthrin (47429)
  - Chlorpyrifos (47433)
  - Cypermethrin (47447)
  - Indicator Bacteria (42264)
  - Malathion (47467)

- Agua Hedionda Lagoon
  - Toxicity (47577)

- Aliso Creek
  - Benthic Community Effects (44339)
  - Malathion (47640)

- Aliso Creek (mouth)
  - Toxicity (62899)

- Alpine Creek
  - Indicator Bacteria (53440)

- Alvarado Creek
  - Nitrogen (42850)

- Arroyo Trabuco Creek
  - Benthic Community Effects (45845)
  - Indicator Bacteria (47816)
  - Malathion (47806)

- Barrett Lake
  - Phosphorus (42328)

- Batiquitos Lagoon
  - Toxicity (47899)

- Bell Canyon Creek
  - Toxicity (53411)

- Buena Creek
  - Indicator Bacteria (48036)
  - Nitrogen (44287)
  - Phosphorus (33504)

- Buena Vista Creek
  - Benthic Community Effects (43878)
  - Bifenthrin (48042)

- Buena Vista Lagoon
  - Toxicity (48184)

- Campo Creek
  - Indicator Bacteria (48243)

- Carroll Canyon
  - Benthic Community Effects (44190)
  - Toxicity (48949)

- Chocolate Creek
  - Indicator Bacteria (53447)
  - Nitrogen (42678)
  - Phosphorus (43144)

- Chollas Creek
  - Bifenthrin (49066)
  - Chlorpyrifos (50633)
  - Cypermethrin (50641)
  - Malathion (50683)

- Cloverdale Creek
  - Nitrogen (44129)

- Cottonwood Creek (San Marcos Creek watershed)
  - Benthic Community Effects (43602)
  - Nitrogen (43224)
  - Phosphorus (44292)

- Cottonwood Creek (Tijuana River watershed)
  - Indicator Bacteria (49002)

- Couser Canyon Creek
  - Indicator Bacteria (48363)

- Cristianitos Creek
  - Cadmium (48375)
  - Indicator Bacteria (48376)
  - Selenium (48379)

- Dana Point Harbor
  - Indicator Bacteria (34003)
  - Oxygen, Dissolved (48410)

- De Luz Creek
  - Nitrogen (33583)

- East Channel Creek
  - Indicator Bacteria (48425)

- Encinitas Creek

- Benthic Community Effects (44341)
- Phosphorus (33095)

- English Canyon
  - Benthic Community Effects (51688)
  - Phosphorus (42810)
  - Total Nitrogen as N (42811)

- Escondido Creek
  - Benthic Community Effects (46213)
  - Bifenthrin (47722)
  - Malathion (47742)

- Eucalyptus Hills Creek
  - Diazinon (47386)
  - Indicator Bacteria (48839)

- Felicita Creek
  - 1,4-Dioxane (63386)
  - Indicator Bacteria (47398)
  - Tetrachloroethylene/PCE (63384)
  - Trichloroethylene/TCE (63385)

- Forester Creek
  - Benthic Community Effects (51692)
  - Nitrogen (42728)

- Gopher Creek
  - Indicator Bacteria (47406)

- Green Canyon Creek
  - Indicator Bacteria (47416)

- Green Valley Creek
  - Benthic Community Effects (44219)
  - Bifenthrin (47583)
  - Chlorpyrifos (47584)
  - Total Nitrogen as N (42727)

- Harbison Canyon
  - Indicator Bacteria (47755)

- Jamacha Creek
  - Indicator Bacteria (47920)

- Keys Creek
  - Indicator Bacteria (48632)
  - Nitrogen (43330)

- La Zanja Canyon
  - Indicator Bacteria (48170)

- Laguna Canyon Channel
  - Benthic Community Effects (48645)
  - Indicator Bacteria (48801)
  - Phosphorus (43194)

- Total Nitrogen as N (43329)

- Live Oak Creek (San Diego County)
  - Indicator Bacteria (48192)

- Loma Alta Creek
  - Benthic Community Effects (44526)
  - Bifenthrin (49396)

- Long Canyon Creek (Lower Sweetwater Watershed)
  - Indicator Bacteria (48215)

- Long Canyon Creek (tributary to Murrieta Creek)
  - Nitrogen (44458)
  - Phosphorus (43253)

- Los Coches Creek
  - Indicator Bacteria (47461)
  - Nitrogen (43119)
  - Phosphorus (44602)

- Los Penasquitos Creek
  - Benthic Community Effects (43909)
  - Bifenthrin (47497)
  - Chlorpyrifos (47517)
  - Phosphate (33885)

- Los Penasquitos Lagoon
  - Toxicity (52885)

- Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper)
  - Indicator Bacteria (47967)

- Mexican Canyon Creek (western tributary to Sweetwater River, Upper)
  - Indicator Bacteria (48002)

- Mission Bay
  - Mercury (49452)
  - PCBs (Polychlorinated biphenyls) (49461)

- Mission Bay Shoreline, at Bonita Cove (eastern shore)
  - Indicator Bacteria (48741)

- Mission Bay Shoreline, at North Cove Beach at Vacation Isle
  - Indicator Bacteria (49430)

- Mission Bay Shoreline, at Ski Beach at Vacation Isle
  - Indicator Bacteria (49432)

- Moosa Canyon Creek
  - Indicator Bacteria (48050)
  - Nitrogen (42371)
  - Phosphorus (44652)

- Moosa Canyon, South Fork

- Indicator Bacteria (48134)

- Morena Reservoir
  - Nitrogen (44184)

- Moro Canyon Creek
  - Nitrogen (43125)
  - Phosphorus (42334)

- Murrieta Creek
  - Indicator Bacteria (42284)
  - Toxicity (44246)

- Oceanside Harbor
  - Toxicity (42666)

- Oso Creek (lower)
  - Nitrogen (43534)
  - Phosphorus (43302)
  - Selenium (44429)

- Otay Reservoir, Lower
  - Phosphorus (43242)

- Pacific Ocean Shoreline, Aliso HSA, at Aliso Creek mouth
  - Toxicity (49665)

- Pacific Ocean Shoreline, Tijuana HU, at Cortez Avenue
  - Indicator Bacteria (50041)

- Paradise Creek, HSA 908.320
  - Phosphorus (43648)

- Pine Valley Creek (Lower)
  - Indicator Bacteria (53497)

- Poggi Canyon Creek
  - Nitrogen (43074)

- Poway Creek
  - Nitrogen (43500)

- Prima Deshecha Creek
  - Indicator Bacteria (48514)
  - Malathion (48507)
  - Nitrogen (43927)

- Rainbow Creek
  - Aluminum (33789)

- Reidy Canyon Creek
  - Indicator Bacteria (48532)
  - Phosphorus (32634)

- Rose Creek

- Benthic Community Effects (43634)

- Salt Creek (Orange County)
  - Benthic Community Effects (48640)
  - Malathion (48639)
  - Toxicity (48633)

- San Diego Bay
  - Mercury (53136)
  - PAHs (Polycyclic Aromatic Hydrocarbons) (52959)

- San Diego Bay Shoreline, G Street Pier
  - Indicator Bacteria (33221)

- San Diego River (Lower)
  - Benthic Community Effects (51732)
  - Cadmium (49151)
  - Nitrogen (43059)
  - Toxicity (51375)

- San Diego River (Upper)
  - Indicator Bacteria (53420)
  - Oxygen, Dissolved (51560)
  - Sulfates (52018)

- San Dieguito River, unnamed tributary below Hodges Dam
  - Indicator Bacteria (49187)

- San Elijo Creek (San Diego County)
  - Indicator Bacteria (49167)

- San Elijo Creek (San Diego County), unnamed tributary at San Elijo Avenue
  - Indicator Bacteria (49147)

- San Elijo Lagoon
  - Toxicity (53371)

- San Juan Creek
  - Benthic Community Effects (43761)
  - Oxygen, Dissolved (49033)

- San Luis Rey River, Lower (west of Interstate 15)
  - Benthic Community Effects (44297)
  - Bifenthrin (49041)

- San Luis Rey River, Upper (east of Interstate 15)
  - Indicator Bacteria (51700)

- San Marcos Creek
  - Benthic Community Effects (43723)
  - Indicator Bacteria (53496)

- San Marcos Lake
  - Ammonia as Nitrogen (44877)
  - Copper (50505)

- Phosphorus (44428)

- San Marcos, Lake, drain to central southwest fork of lake
  - Copper (50558)
  - Indicator Bacteria (50560)

- San Mateo Creek (San Diego County)
  - Indicator Bacteria (53495)

- San Vicente Creek (San Diego County)
  - Indicator Bacteria (53445)
  - Phosphorus (43874)

- Sandia Creek
  - Ammonia (Unionized) (48227)
  - Manganese (37708)
  - Nitrogen (43855)
  - Selenium (37554)
  - Silver (43122)

- Santa Gertrudis Creek
  - Nitrogen (43057)

- Santa Margarita River (Lower)
  - Benthic Community Effects (49149)
  - Chlorpyrifos (47511)
  - Nitrogen (43126)
  - Toxicity (43103)

- Santa Margarita River (Upper)
  - Indicator Bacteria (50567)
  - Iron (47653)
  - Manganese (47668)
  - Nitrogen (43136)

- Segunda Deshecha Creek
  - Benthic Community Effects (51745)
  - Indicator Bacteria (51713)
  - Malathion (49566)
  - Nitrogen (43140)
  - Selenium (49459)

- Steele Canyon
  - Indicator Bacteria (49822)

- Sutherland Reservoir
  - Nitrogen (43651)
  - Phosphorus (43121)

- Sweetwater River, Lower (below Sweetwater Reservoir)
  - Benthic Community Effects (51757)
  - Chlorpyrifos (53457)

- Sweetwater River, North Fork, unnamed tributary at Tavern Road
  - Indicator Bacteria (51727)
  - Manganese (52139)

- Sweetwater River, Upper (above Sweetwater Reservoir)
  - Aluminum (52187)
  - Benthic Community Effects (51753)
  - Indicator Bacteria (51729)
  - Selenium (44381)
  - Total Nitrogen as N (43750)

- Sycamore Canyon
  - Oxygen, Dissolved (48183)

- Tecate Creek
  - Nitrogen (43237)
  - Phosphorus (42788)

- Tecolote Creek
  - Benthic Community Effects (44332)
  - Bifenthrin (53376)
  - Cypermethrin (53377)
  - Diazinon (53378)

- Tecolote Creek, South Fork
  - Indicator Bacteria (51731)

- Telegraph Canyon Creek
  - Nitrogen (32905)

- Temecula Creek
  - Indicator Bacteria (42027)

- Tijuana River
  - Ammonia as Nitrogen (42754)
  - Benthic Community Effects (43772)
  - Cadmium (47312)
  - Chlorpyrifos (47314)
  - Diazinon (47157)
  - Malathion (53233)

- Tijuana River Estuary
  - Toxicity (52819)

- Wood Canyon (Orange County)
  - Benthic Community Effects (43928)
  - Diazinon (50583)
  - Selenium (50579)

List on 303(d) list (being addressed by USEPA approved TMDL)	Regional Board 9

- Los Penasquitos Lagoon
  - Sedimentation/Siltation (36260)

- Pacific Ocean Shoreline, Dana Point HSA, at Dana Point Harbor at patrol dock
  - Indicator Bacteria (49699)

- Pacific Ocean Shoreline, Laguna Beach HSA, at Broadway Creek
  - Indicator Bacteria (49808)
- Pacific Ocean Shoreline, Lower San Juan HSA, 1000 feet south of outfall
  - Indicator Bacteria (49833)
- Pacific Ocean Shoreline, Lower San Juan HSA, 10000 feet south of outfall
  - Indicator Bacteria (49834)
- Pacific Ocean Shoreline, Lower San Juan HSA, 2000 feet south of outfall
  - Indicator Bacteria (49835)
- Pacific Ocean Shoreline, Lower San Juan HSA, 3000 feet south of outfall
  - Indicator Bacteria (49836)
- Pacific Ocean Shoreline, Lower San Juan HSA, 4000 feet south of outfall
  - Indicator Bacteria (49837)
- Pacific Ocean Shoreline, Lower San Juan HSA, 5000 feet south of outfall
  - Indicator Bacteria (49838)
- Pacific Ocean Shoreline, Lower San Juan HSA, 7500 feet south of outfall
  - Indicator Bacteria (49839)
- Pacific Ocean Shoreline, Lower San Juan HSA, at South Doheny State Park Campground
  - Indicator Bacteria (44451)
- Pacific Ocean Shoreline, Lower San Juan HSA, at surfzone outfall at Doheny State Beach
  - Indicator Bacteria (49877)
- Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach at Pier
  - Indicator Bacteria (42681)
- Pacific Ocean Shoreline, San Clemente HA, at San Clemente City Beach, North Beach
  - Indicator Bacteria (43328)
- Pacific Ocean Shoreline, San Clemente HA, at South Capistrano Beach at Beach Road
  - Indicator Bacteria (43737)
- Pacific Ocean Shoreline, San Diego HU, at Stub Jetty, south of the San Diego River outlet, near Cape May Avenue
  - Indicator Bacteria (44221)

List on 303(d) list (being addressed by action other than TMDL)	Regional Board 9

- Mission Bay Shoreline, at Enchanted Cove
  - Trash (49428)
- Pacific Ocean Shoreline, Batiquitos HSA, at Moonlight State Beach (Cottonwood Creek outlet)
  - Trash (49675)
- Pacific Ocean Shoreline, Coronado HA, at G Ave, Central Beach
  - Trash (49686)

- Pacific Ocean Shoreline, Imperial Beach Pier
  - Trash (49768)
- Pacific Ocean Shoreline, Loma Alta HSA, at Loma Alta Creek mouth
  - Trash (49825)
- Pacific Ocean Shoreline, Los Monos HSA, Carlsbad State Beach at Tamarack Ave
  - Trash (49832)
- Pacific Ocean Shoreline, Mission San Diego HSA, at Ocean Beach pier at Narrangaset
  - Trash (49883)
- Pacific Ocean Shoreline, Point Loma HA, at Sunset Cliffs and Froude Street
  - Trash (49913)
- Pacific Ocean Shoreline, Rancho Santa Fe HSA, at Powerhouse Park
  - Trash (49917)
- Pacific Ocean Shoreline, San Diego HU, at Stub Jetty, south of the San Diego River outlet, near Cape May Avenue
  - Trash (49383)
- Pacific Ocean Shoreline, San Elijo HSA, at Cardiff State Beach at parking lot entrance
  - Trash (49940)
- Pacific Ocean Shoreline, San Luis Rey HU, Oceanside Pier at Pier View Way
  - Trash (49998)
- Pacific Ocean Shoreline, Scripps HA, at Belmont Park at Mission Beach (near San Fernando Place)
  - Trash (50002)
- Pacific Ocean Shoreline, Scripps HA, at Crystal Pier
  - Trash (50008)
- Pacific Ocean Shoreline, Scripps HA, at North Lane at Windansea Beach
  - Trash (50028)
- Pacific Ocean Shoreline, Scripps HA, at Pacific Beach Drive, Pacific Beach
  - Trash (50029)
- Pacific Ocean Shoreline, Scripps HA, at Tourmaline Surf Park, Pacific Beach
  - Trash (50036)
- Pacific Ocean Shoreline, Scripps HA, at Vallecitos Court at La Jolla Shores Beach
  - Trash (48178)
- Pacific Ocean Shoreline, Torrey Pines State Beach, at North Beach Entrance parking lot
  - Trash (50047)

REGIONAL BOARD 9 - SAN DIEGO REGION

- New or Revised Fact Sheets

These lines of evidence and/or decisions, which were developed during the last listing cycle, are new or have been revised.

- **Original Fact Sheets**
  These lines of evidence and/or decisions were developed during the last listing cycle.

ORIGINAL FACT SHEETS

Delist from 303(d) list (TMDL required list)	Regional Board 9

- Agua Hedionda Creek
  - Sulfates (44465)
- Agua Hedionda Lagoon
  - Sedimentation/Siltation (43540)
- Buena Creek
  - Phosphate (44130)
- Hodges, Lake
  - Total Dissolved Solids (33093)
- Long Canyon (Cottonwood wshed) (from 0.2 mile upstream to 0.4 miles downstream of Troy Canyon)
  - Total Dissolved Solids (43162)
- Long Canyon Creek (tributary to Murrieta Creek)
  - Total Dissolved Solids (33406)
- Pacific Ocean Shoreline, Buena Vista Creek HA, at Carlsbad State Beach at Pine Ave
  - Indicator Bacteria (43672)
- Pacific Ocean Shoreline, Dana Point HSA, at Dana Strands Surfzone at Dana Strands Rd
  - Indicator Bacteria (44493)
- Pacific Ocean Shoreline, Laguna Beach HSA, at Laguna Hotel
  - Indicator Bacteria (44485)
- Pine Valley Creek (Upper)
  - Indicator Bacteria (34185)
- San Diego Bay Shoreline, Chula Vista Marina
  - Indicator Bacteria (34706)
- San Diego Bay Shoreline, near Switzer Creek
  - Lindane/gamma Hexachlorocyclohexane (gamma-HCH) (43693)
- San Vicente Reservoir
  - Manganese (32754)
  - pH (44566)

- Temecula Creek
  - Nitrogen (43130)

Do Not Delist from 303(d) list (TMDL required list) — Regional Board 9

- Agua Hedionda Creek
  - Total Dissolved Solids (33728)
- Aliso Creek
  - Phosphorus (34545)
- Buena Vista Creek
  - Toxicity (33524)
- Cloverdale Creek
  - Total Dissolved Solids (34002)
- Encinitas Creek
  - Selenium (43314)
- Escondido Creek
  - DDT (Dichlorodiphenyltrichloroethane) (33920)
  - Manganese (33919)
  - Phosphate (33133)
  - Total Dissolved Solids (33685)
- Felicita Creek
  - Total Dissolved Solids (33343)
- Forester Creek
  - Total Dissolved Solids (32406)
- Green Valley Creek
  - Sulfates (33345)
- Hodges, Lake
  - Color (33448)
  - Nitrogen (32608)
  - Phosphorus (32607)
- Kit Carson Creek
  - Total Dissolved Solids (33039)
- Mission Bay (area at mouth of Tecolote Creek only)
  - Eutrophic (33089)
  - Lead (32712)
- Otay Reservoir, Lower
  - Color (32800)
- Pacific Ocean Shoreline, Imperial Beach Pier
  - PCBs (Polychlorinated biphenyls) (33949)

- Prima Deshecha Creek
  - Phosphorus (33809)
  - Turbidity (44624)

- San Diego Bay Shoreline, near sub base
  - Toxicity (43801)

- Santa Margarita River (Upper)
  - Phosphorus (34470)

- Segunda Deshecha Creek
  - Phosphorus (34533)

- Sutherland Reservoir
  - Color (44395)

- Tijuana River Estuary
  - Low Dissolved Oxygen (33318)

Do Not Delist from 303(d) list (being addressed with USEPA approved TMDL) — Regional Board 9

- Chollas Creek
  - Diazinon (32356)

Do Not List on 303(d) list (TMDL required list) — Regional Board 9

- Agua Hedionda Creek
  - DDE (Dichlorodiphenyldichloroethylene) (47450)
  - Permethrin, total (47478)
  - Turbidity (33729)

- Agua Hedionda Lagoon
  - Invasive Species (34302)

- Alvarado Creek
  - Benthic Community Effects (44402)

- Barrett Lake
  - Aluminum (33636)
  - Antimony (33868)
  - Arsenic (33869)
  - Barium (45728)
  - Cadmium (33870)
  - Chloride (33303)
  - Chromium (total) (33304)
  - Copper (33916)
  - Ethylbenzene (33951)
  - Fluoride (33670)
  - Iron (43068)
  - Mercury (33897)
  - Nickel (33847)

- Picloram (33963)
- Selenium (33964)
- Sodium (43247)
- Sulfates (34022)
- Toluene (33961)
- Total Dissolved Solids (34037)
- Total Trihalomethane (TTHM) (43001)
- Turbidity (33962)
- Zinc (45726)

- Black Canyon
  - Benthic Community Effects (43002)

- Boden Canyon
  - Benthic Community Effects (43419)

- Buena Vista Creek
  - Chloride (33981)
  - Sulfates (33593)
  - Total Dissolved Solids (33718)
  - Turbidity (34057)

- Chocolate Creek
  - Sulfates (44028)

- Cloverdale Creek
  - Sulfates (42286)

- Cold Stream (San Diego County)
  - Benthic Community Effects (42287)

- Conejos Creek
  - Benthic Community Effects (44163)

- Cottonwood Creek (San Marcos Creek watershed)
  - Turbidity (33129)

- Cottonwood Creek (Tijuana River watershed)
  - Nickel (47293)
  - Turbidity (47307)

- Cristianitos Creek
  - Silver (48380)

- De Luz Creek
  - Arsenic (33846)
  - Boron (34550)
  - Chloride (44263)
  - Cyanide (33586)
  - Fluoride (33585)
  - Mercury (34609)
  - Oil and Grease (33704)
  - Phosphorus (33772)
  - Surfactants (MBAS) (43770)
  - Total Dissolved Solids (33637)

- Del Dios Creek
  - Chloride (33263)
  - Mercury (33455)
  - Nitrate as Nitrate (NO3) (32528)
  - Sulfates (32731)
  - Total Dissolved Solids (32545)
  - Turbidity (33499)

- Devils Canyon Creek
  - Benthic Community Effects (42683)

- El Capitan Lake
  - 1,1,1-Trichloroethane (34602)
  - 1,1,2,2-Tetrachloroethane (34689)
  - 1,1,2-Trichloroethane (33882)
  - 1,1-Dichloroethylene (DCE)/ Vinylidene Chloride (33657)
  - 1,2,4-Trichlorobenzene (33532)
  - 1,2-Dibromo-3-chloropropane (DBCP) (33781)
  - 1,2-Dichloroethane (33653)
  - 1,2-Dichloroethylene,-trans (33845)
  - 1,2-Dichloropropane (34058)
  - Alachlor (34625)
  - Aluminum (33554)
  - Antimony (34106)
  - Arsenic (33838)
  - Atrazine (33163)
  - Barium (33918)
  - Benzene (33645)
  - Benzo(a)pyrene (3,4-Benzopyrene -7-d) (34626)
  - Beryllium (32525)
  - Cadmium (33599)
  - Carbofuran (33730)
  - Carbon tetrachloride (33646)
  - Chlordane (33604)
  - Chloride (46163)
  - Chlorobenzene (mono) (33598)
  - Chromium (total) (33600)
  - Copper (33797)
  - Endrin (34627)
  - Ethylbenzene (33938)
  - Fluoride (33526)
  - Glyphosate (33539)
  - Heptachlor (43605)
  - Heptachlor epoxide (34608)
  - Hexachlorobenzene/ HCB (43646)
  - Hexachlorocyclopentadiene (43394)
  - Iron (34795)
  - Lindane/gamma Hexachlorocyclohexane (gamma-HCH) (33652)
  - Mercury (43192)
  - Methoxychlor (33534)
  - Molinate (43613)
  - Nickel (46329)
  - Odor threshold number (33697)
  - Oxamyl (Vydate) (33320)
  - PCBs (Polychlorinated biphenyls) (43749)
  - Pentachlorophenol (PCP) (33603)
  - Picloram (32560)
  - Selenium (43537)
  - Silver (43091)
  - Simazine (43037)

- Styrene (42872)
- Sulfates (32353)
- Tetrachloroethylene/PCE (33866)
- Thallium (44006)
- Toluene (43972)
- Total Dissolved Solids (32438)
- Total Suspended Solids (TSS) (33791)
- Toxaphene (33673)
- Trichloroethylene/TCE (43426)
- Trichlorofluoromethane (CFC-11) (33687)
- Turbidity (33215)
- Uranium (33724)
- Vinyl chloride (43443)
- Zinc (33536)
- cis-1,2-Dichloroethylene (33895)
- meta-para xylenes (33896)
- o-Dichlorobenzene (33782)
- o-Xylene (33955)
- p-Dichlorobenzene (DCB) (43391)

- Encinitas Creek
  - Diazinon (33112)
  - Nitrogen (42670)
  - Total Dissolved Solids (33792)
  - Turbidity (33763)

- Escondido Creek
  - Beryllium (33879)
  - Boron (44234)
  - Mercury (34091)
  - Oxygen, Dissolved (35906)
  - Thallium (33620)

- Felicita Creek
  - 2,4,5-TP (Silvex) (33174)
  - 2,4-D (2,4-Dichlorophenoxy acetic acid) (33173)
  - Alachlor (33297)
  - Antimony (33248)
  - Arsenic (33249)
  - Atrazine (46214)
  - Barium (33480)
  - Benzo(a)pyrene (3,4-Benzopyrene -7-d) (33298)
  - Beryllium (33277)
  - Chlordane (33214)
  - Chromium (33313)
  - Dinoseb (33262)
  - Endrin (33478)
  - Heptachlor (33479)
  - Heptachlor epoxide (33109)
  - Hexachlorobenzene/ HCB (33414)
  - Hexachlorocyclopentadiene (33296)
  - Lead (47395)
  - Manganese (33314)
  - Methoxychlor (33110)
  - Nickel (33252)
  - Nitrite as Nitrite NO2 (33329)
  - Pentachlorophenol (PCP) (33473)
  - Picloram (42885)
  - Selenium (33253)

- Silver (33254)
- Simazine (46215)
- Thallium (33255)
- Turbidity (33413)

- Forester Creek
  - Sulfates (42809)
  - Turbidity (33283)

- French Creek (San Diego County)
  - Benthic Community Effects (43317)

- Gopher Creek
  - Benthic Community Effects (42652)
  - Cadmium (47401)
  - Lead (47408)

- Green Valley Creek
  - Aluminum (32796)
  - Barium (32615)
  - Beryllium (32616)
  - Mercury (33031)
  - Picloram (32795)
  - Silver (33403)
  - Thallium (33404)
  - Zinc (46270)

- Hodges, Lake
  - 1,1,1-Trichloroethane (46366)
  - 1,1,2,2-Tetrachloroethane (33481)
  - 1,1,2-Trichloroethane (33401)
  - 1,1-Dichloroethylene (DCE)/ Vinylidene Chloride (46321)
  - 1,2,4-Trichlorobenzene (32609)
  - 1,2-Dibromo-3-chloropropane (DBCP) (46318)
  - 1,2-Dichloroethane (33622)
  - 1,2-Dichloroethylene,-trans (33074)
  - 1,2-Dichloropropane (46376)
  - Alachlor (33446)
  - Antimony (33418)
  - Arsenic (33394)
  - Atrazine (33447)
  - Barium (33407)
  - Benzene (46375)
  - Benzo(a)pyrene (3,4-Benzopyrene -7-d) (33677)
  - Cadmium (33113)
  - Carbofuran (32674)
  - Carbon tetrachloride (33091)
  - Chlordane (33315)
  - Chloride (33316)
  - Chlorobenzene (mono) (33325)
  - Copper (33449)
  - Dissolved oxygen saturation (43315)
  - Endrin (33691)
  - Ethylbenzene (33741)
  - Fluoride (33460)
  - Glyphosate (32732)
  - Heptachlor (46374)
  - Heptachlor epoxide (33191)
  - Hexachlorobenzene/ HCB (33237)

- Hexachlorocyclopentadiene (33238)
- Iron (33461)
- Methoxychlor (33397)
- Molinate (32675)
- Nickel (33371)
- Nitrate as Nitrate (NO3) (33680)
- Nitrite as Nitrite NO2 (32595)
- Oxamyl (Vydate) (32718)
- PCBs (Polychlorinated biphenyls) (46373)
- Pentachlorophenol (PCP) (46319)
- Picloram (46368)
- Selenium (32550)
- Silver (33103)
- Simazine (33398)
- Styrene (32554)
- Sulfates (33412)
- Tetrachloroethylene/PCE (32602)
- Toluene (46320)
- Toxaphene (32546)
- Trichloroethylene/TCE (33375)
- Trichlorofluoromethane (CFC-11) (33376)
- Uranium (33065)
- Vinyl chloride (33384)
- Zinc (33066)
- cis-1,2-Dichloroethylene (33385)
- meta-para xylenes (33386)
- o-Xylene (32553)

- Jamul Creek
  - Alkalinity as CaCO3 | Ammonia as Nitrogen | Manganese | Nickel | Orthophosphate | Total Kjeldahl Nitrogen (TKN) | Total Suspended Solids (TSS) (43265)
  - Benthic Community Effects (43574)
  - Metals (44226)
  - PAHs (Polycyclic Aromatic Hydrocarbons) (42757)

- Keys Creek
  - Phosphorus (43933)

- Kit Carson Creek
  - Picloram (33090)
  - Simazine (32646)
  - Total Suspended Solids (TSS) (33276)
  - Turbidity (33400)

- Kitchen Creek
  - Total Dissolved Solids (35501)
  - Turbidity (33469)

- La Posta Creek
  - Ammonia as Nitrogen | Nickel | Phosphorus | Total Nitrogen as N (44151)
  - Benthic Community Effects (43897)
  - Metals (33098)
  - PAHs (Polycyclic Aromatic Hydrocarbons) (33145)
  - PCBs (Polychlorinated biphenyls) (43362)

- Lawson Creek
  - Ammonia as Nitrogen | Phosphorus | Sulfates | Total Nitrogen as N (44593)
  - PCBs (Polychlorinated biphenyls) (42804)

- Loma Alta Creek
  - Total Dissolved Solids (32439)
  - Turbidity (32888)

- Long Canyon (Cottonwood wshed) (from 0.2 mile upstream to 0.4 miles downstream of Troy Canyon)
  - Habitat Assessment (Streams) (34024)

- Los Penasquitos Creek
  - Permethrin, total (47615)
  - Turbidity (32613)

- Loveland Reservoir
  - 1,1,1-Trichloroethane (33151)
  - 1,1,2,2-Tetrachloroethane (33465)
  - 1,1,2-Trichloroethane (33216)
  - 1,1-Dichloroethylene (DCE)/ Vinylidene Chloride (33168)
  - 1,2,4-Trichlorobenzene (33219)
  - 1,2-Dichloroethylene,-trans (33169)
  - Alachlor (32654)
  - Atrazine (33509)
  - Benzene (33279)
  - Carbofuran (33510)
  - Chloride (44021)
  - Chlorobenzene (mono) (33280)
  - Dichloromethane (33236)
  - Ethylbenzene (33466)
  - Fluoride (33431)
  - Lindane/gamma Hexachlorocyclohexane (gamma-HCH) (33511)
  - Molinate (33487)
  - Simazine (32962)
  - Styrene (33450)
  - Sulfates (33350)
  - Tetrachloroethylene/PCE (33451)
  - Thiobencarb/Bolero (33467)
  - Toluene (44351)
  - Total Dissolved Solids (33365)
  - Trichloroethylene/TCE (33291)
  - Vinyl chloride (33292)
  - cis-1,2-Dichloroethylene (33328)
  - meta-para xylenes (43035)
  - o-Dichlorobenzene (33427)
  - o-Xylene (44692)
  - p-Dichlorobenzene (DCB) (33482)

- Miramar Reservoir
  - 1,1,1-Trichloroethane (33547)
  - 1,1,2,2-Tetrachloroethane (33926)
  - 1,1,2-Trichloroethane (33199)
  - 1,1-Dichloroethylene (DCE)/ Vinylidene Chloride (34089)
  - 1,2,4-Trichlorobenzene (34035)
  - 1,2-Dibromo-3-chloropropane (DBCP) (35101)
  - 1,2-Dichloroethane (33771)
  - 1,2-Dichloroethylene,-trans (33956)
  - 1,2-Dichloropropane (34630)
  - Alachlor (33650)
  - Aluminum (42337)
  - Ammonia (43107)
  - Antimony (33690)

- Arsenic (32986)
- Atrazine (33651)
- Barium (34623)
- Benzene (33707)
- Benzo(a)pyrene (3,4-Benzopyrene -7-d) (33017)
- Carbofuran (33878)
- Carbon tetrachloride (43060)
- Chlordane (33544)
- Chloride (43838)
- Chlorobenzene (mono) (33335)
- Chromium (32988)
- Color (33980)
- Copper (33654)
- Endrin (33029)
- Ethylbenzene (33937)
- Fluoride (33655)
- Glyphosate (34034)
- Heptachlor (33021)
- Heptachlor epoxide (33076)
- Hexachlorobenzene/ HCB (34099)
- Hexachlorocyclopentadiene (34100)
- Iron (33531)
- Lindane/gamma Hexachlorocyclohexane (gamma-HCH) (35100)
- Manganese (33750)
- Methoxychlor (33617)
- Molinate (34020)
- Nickel (33802)
- Oxamyl (Vydate) (34043)
- PCBs (Polychlorinated biphenyls) (33649)
- Pentachlorophenol (PCP) (32982)
- Picloram (32887)
- Selenium (34038)
- Simazine (33618)
- Sodium (34039)
- Styrene (43034)
- Sulfates (33533)
- Tetrachloroethylene/PCE (33854)
- Toluene (33611)
- Total Dissolved Solids (33519)
- Toxaphene (34021)
- Trichloroethylene/TCE (33914)
- Trichlorofluoromethane (CFC-11) (33915)
- Turbidity (33612)
- Uranium (34419)
- Vinyl chloride (33548)
- Zinc (33613)
- cis-1,2-Dichloroethylene (33549)
- meta-para xylenes (33639)
- o-Dichlorobenzene (34025)
- o-Xylene (33853)
- p-Dichlorobenzene (DCB) (32987)
- pH (33684)

- Mission Bay (area at Santa Barbara Cove)
  - Copper (44053)
  - Toxicity (43461)

- Mission Bay at Dana Landing
  - Copper (44114)
  - Toxicity (43985)

- Mission Bay at Quivira Basin
  - Toxicity (43506)

- Morena Reservoir
  - Aluminum (33815)
  - Antimony (33540)
  - Arsenic (33541)
  - Barium (33233)
  - Cadmium (33172)
  - Chloride (33212)
  - Chromium (33681)
  - Copper (33190)
  - Fluoride (32404)
  - Iron (32405)
  - Nickel (43032)
  - Oxygen, Dissolved (42301)
  - Picloram (32655)
  - Selenium (33122)
  - Sulfates (33170)
  - Toluene (33498)
  - Total Dissolved Solids (32658)
  - Turbidity (42687)
  - Zinc (42718)

- Murray Reservoir
  - 1,1,1-Trichloroethane (32589)
  - 1,1,2,2-Tetrachloroethane (33632)
  - 1,1,2-Trichloroethane (33941)
  - 1,1-Dichloroethylene (DCE)/ Vinylidene Chloride (34019)
  - 1,2,4-Trichlorobenzene (44631)
  - 1,2-Dibromo-3-chloropropane (DBCP) (34082)
  - 1,2-Dichloroethane (43965)
  - 1,2-Dichloroethylene,-trans (33287)
  - 1,2-Dichloropropane (33521)
  - Alachlor (33619)
  - Aluminum (32688)
  - Ammonia (44560)
  - Antimony (32689)
  - Arsenic (42762)
  - Atrazine (33799)
  - Barium (32650)
  - Benzene (33665)
  - Benzo(a)pyrene (3,4-Benzopyrene -7-d) (44561)
  - Carbofuran (33608)
  - Carbon tetrachloride (33812)
  - Chlordane (33607)
  - Chloride (32652)
  - Chlorobenzene (mono) (34065)
  - Chromium (32881)
  - Color (32819)
  - Copper (32820)
  - Endrin (33610)
  - Ethylbenzene (34066)
  - Fluoride (32703)
  - Glyphosate (32586)
  - Heptachlor (43568)
  - Heptachlor epoxide (33625)
  - Hexachlorobenzene/ HCB (44034)

- Hexachlorocyclopentadiene (33876)
- Indicator Bacteria (42321)
- Iron (32704)
- Lindane/gamma Hexachlorocyclohexane (gamma-HCH) (33844)
- Manganese (43050)
- Methoxychlor (33666)
- Molinate (33823)
- Nickel (32518)
- Oxamyl (Vydate) (43339)
- Oxygen, Dissolved (42730)
- PCBs (Polychlorinated biphenyls) (44413)
- Pentachlorophenol (PCP) (44344)
- Picloram (42501)
- Selenium (43357)
- Simazine (34601)
- Styrene (43554)
- Sulfates (43078)
- Tetrachloroethylene/PCE (44331)
- Toluene (34770)
- Total Dissolved Solids (33281)
- Toxaphene (42737)
- Trichloroethylene/TCE (33232)
- Trichlorofluoromethane (CFC-11) (44054)
- Turbidity (33282)
- Uranium (43208)
- Vinyl chloride (33077)
- Zinc (32535)
- meta-para xylenes (33852)
- o-Dichlorobenzene (34083)
- o-Xylene (33602)
- p-Dichlorobenzene (DCB) (42765)

- Murrieta Creek
  - Antimony (32720)
  - Arsenic (33488)
  - Benthic Community Effects (44295)
  - Beryllium (33019)
  - Boron (42649)
  - Cadmium (33067)
  - Chloride (33428)
  - Cyanide (43413)
  - Fluoride (43061)
  - Mercury (32726)
  - Nickel (32620)
  - Oil and Grease (33332)
  - Selenium (32621)
  - Silver (33256)
  - Sulfates (33331)
  - Surfactants (MBAS) (42752)
  - Thallium (43231)
  - Total Dissolved Solids (33483)
  - Turbidity (33484)
  - Zinc (33330)

- Noble Canyon Creek
  - Benthic Community Effects (43712)
  - Oxygen, Dissolved (42799)
  - Total Dissolved Solids (33635)
  - pH (42682)

- Oso Creek (at Mission Viejo Golf Course)
  - Boron (33319)
  - Diazinon (33124)
  - Fluoride (33701)

- Otay Reservoir, Lower
  - 1,2-Dibromo-3-chloropropane (DBCP) (33178)
  - Aluminum (32676)
  - Antimony (43097)
  - Arsenic (32978)
  - Barium (32979)
  - Beryllium (33228)
  - Boron (33030)
  - Cadmium (33125)
  - Chlordane (33152)
  - Chloride (44138)
  - Chromium (32799)
  - Copper (32696)
  - Endrin (43559)
  - Fluoride (42797)
  - Glyphosate (41520)
  - Heptachlor (33243)
  - Heptachlor epoxide (33132)
  - Hexachlorobenzene/ HCB (33185)
  - Hexachlorocyclopentadiene (33186)
  - Lindane/gamma Hexachlorocyclohexane (gamma-HCH) (42756)
  - Mercury (33052)
  - Methoxychlor (44505)
  - Nickel (32805)
  - Picloram (32383)
  - Selenium (32964)
  - Silver (33177)
  - Sulfates (32579)
  - Thallium (42750)
  - Toluene (32630)
  - Total Dissolved Solids (32618)
  - Toxaphene (33153)
  - Turbidity (33053)
  - Zinc (33054)
  - meta-para xylenes (42751)
  - o-Xylene (43145)

- Pacific Ocean Shoreline, Dana Point HSA, at Aliso Beach - south
  - Indicator Bacteria (44198)

- Pacific Ocean Shoreline, Loma Alta HSA, Oceanside at Wisconsin Street
  - Indicator Bacteria (44540)

- Pacific Ocean Shoreline, Lower San Juan HSA, at South Doheny State Park Campground
  - Chlorpyrifos (49860)

- Pacific Ocean Shoreline, San Joaquin Hills HSA, at Emerald Bay Beach
  - Indicator Bacteria (44529)

- Pacific Ocean Shoreline, Scripps HA, at Coastal Blvd Gazebo
  - Indicator Bacteria (43503)

- Paleta Creek

- Arsenic (41404)
- Cadmium (42881)
- Chromium (43587)
- Nickel (43616)
- Selenium (43656)
- Silver (42983)
- Zinc (43571)

- Pauma Creek
  - Benthic Community Effects (43858)

- Poggi Canyon Creek
  - DDT (Dichlorodiphenyltrichloroethane) (33299)
  - Selenium (43673)

- Rainbow Creek
  - Boron (33723)
  - Chloride (44364)
  - Cyanide (34013)
  - Fluoride (43676)
  - Oil and Grease (43611)
  - Surfactants (MBAS) (42353)
  - pH (33596)

- Rattlesnake Creek
  - Total Dissolved Solids (43597)
  - Turbidity (33790)

- Reidy Canyon Creek
  - Nitrogen (32605)
  - Turbidity (32624)

- Roblar Creek
  - Benthic Community Effects (43847)

- Rose Creek
  - Diazinon (33036)

- San Diego Bay
  - Copper (33415)

- San Diego Bay Shoreline, Vicinity of B St and Broadway Piers
  - Copper (33416)

- San Diego Bay Shoreline, at Silver Strand Beach (bayside)
  - Indicator Bacteria (44399)

- San Diego Bay Shoreline, at South Bay Power Plant
  - Chlorine (33342)
  - Copper (33048)
  - Oxygen, Dissolved (32664)
  - Temperature, water (33408)

- San Diego Bay Shoreline, near Chollas Creek
  - Indicator Bacteria (33573)

- San Diego Bay Shoreline, near sub base
  - Cadmium | Chlordane | DDT (Dichlorodiphenyltrichloroethane) | Mercury | PAHs (Polycyclic Aromatic Hydrocarbons) | Tributyltin TBT (Tributylstanne) (44025)

- San Diego River (Upper)
  - Excess Algal Growth (33623)
  - Foam/Flocs/Scum/Oil Slicks (43100)
  - Sediment (33624)
  - Taste and odor (32811)
  - Trash (43381)

- San Elijo Creek (San Diego County)
  - Nitrogen, ammonia (Total Ammonia) (49170)

- San Juan Creek (mouth)
  - Arsenic (62916)
  - Chlorpyrifos (62918)
  - Chromium (62919)
  - Diazinon (62921)
  - Lead (62923)
  - Malathion (62924)
  - Silver (62942)
  - Zinc (62945)

- San Luis Rey River, Lower (west of Interstate 15)
  - Sulfates (43141)

- San Luis Rey River, Upper (east of Interstate 15)
  - Selenium (34619)
  - Sulfates (44436)

- San Marcos Creek
  - Total Dissolved Solids (37435)
  - Turbidity (33523)

- San Marcos Lake
  - Foam/Flocs/Scum/Oil Slicks (43066)
  - Total Dissolved Solids (32744)

- San Vicente Creek (San Diego County)
  - Sulfates (44573)
  - pH (44544)

- San Vicente Reservoir
  - Aluminum (43170)
  - Antimony (37221)
  - Arsenic (37222)
  - Barium (33309)
  - Benzene (33310)
  - Copper (33486)
  - Fluoride (32600)
  - Iron (43159)
  - Nickel (36873)
  - Pentachlorophenol (PCP) (43714)
  - Picloram (32619)
  - Selenium (33658)
  - Silver (34629)

- Simazine (37277)
- Thallium (33576)
- Toluene (34012)
- Total Dissolved Solids (43578)
- Turbidity (32692)
- Uranium (43692)
- Zinc (38025)
- meta-para xylenes (41463)
- o-Xylene (43715)

- Sandia Creek
  - Boron (37507)
  - Cyanide (38011)
  - Fluoride (33805)
  - Oil and Grease (33727)
  - Phosphorus (33726)
  - Surfactants (MBAS) (44288)

- Santa Margarita River (Lower)
  - Sulfates (43402)

- Santa Margarita River (Upper)
  - PAHs (Polycyclic Aromatic Hydrocarbons) (43135)
  - PCBs (Polychlorinated biphenyls) (44273)

- Santa Ysabel Creek (above Sutherland Reservoir)
  - Alkalinity as CaCO3 | Ammonia | Manganese | Nickel | Orthophosphate | Total Kjeldahl Nitrogen (TKN) | Total Suspended Solids (TSS) (37541)
  - Metals (37749)

- Santa Ysabel Creek (below Sutherland Reservoir)
  - PAHs (Polycyclic Aromatic Hydrocarbons) (34084)

- Segunda Deshecha Creek
  - Cyfluthrin (49362)
  - Silver (49460)

- Spring Valley Creek
  - Zinc (49748)

- Sutherland Reservoir
  - Antimony (44275)
  - Arsenic (33009)
  - Barium (33154)
  - Cadmium (33111)
  - Chloride (43727)
  - Chromium (33242)
  - Copper (37862)
  - Fluoride (33234)
  - Mercury (33051)
  - Nickel (37892)
  - Pentachlorophenol (PCP) (33182)
  - Picloram (43623)
  - Selenium (37963)
  - Sulfates (43151)
  - Toluene (33104)
  - Total Dissolved Solids (44674)

- Turbidity (33105)
- Zinc (33118)

- Sweetwater Reservoir
  - 1,1,1-Trichloroethane (43969)
  - 1,1,2,2-Tetrachloroethane (37843)
  - 1,1,2-Trichloroethane (32660)
  - 1,1-Dichloroethylene (DCE)/ Vinylidene Chloride (33042)
  - 1,2,4-Trichlorobenzene (37173)
  - 1,2-Dichloroethane (37788)
  - 1,2-Dichloroethylene,-trans (33492)
  - 1,2-Dichloropropane (37697)
  - Aluminum (37677)
  - Antimony (33374)
  - Arsenic (33388)
  - Atrazine (33454)
  - Barium (33389)
  - Benzene (33278)
  - Beryllium (33443)
  - Cadmium (33102)
  - Carbofuran (32734)
  - Carbon tetrachloride (33049)
  - Chloride (33217)
  - Chlorobenzene (mono) (33264)
  - Copper (33150)
  - Dichloromethane (38119)
  - Ethylbenzene (33079)
  - Fluoride (33162)
  - Glyphosate (37698)
  - Iron (38106)
  - Lindane/gamma Hexachlorocyclohexane (gamma-HCH) (33260)
  - Manganese (37761)
  - Mercury (33225)
  - Molinate (33083)
  - Nickel (33226)
  - Selenium (44469)
  - Silver (33227)
  - Styrene (33038)
  - Sulfates (33362)
  - Tetrachloroethylene/PCE (38041)
  - Thallium (33477)
  - Thiobencarb/Bolero (33075)
  - Toluene (33224)
  - Total Dissolved Solids (33032)
  - Trichloroethylene/TCE (33459)
  - Vinyl chloride (33472)
  - Zinc (32662)
  - cis-1,2-Dichloroethylene (33323)
  - meta-para xylenes (33087)
  - o-Dichlorobenzene (38290)
  - o-Xylene (44545)
  - p-Dichlorobenzene (DCB) (32729)
  - pH (33018)

- Sweetwater River, Lower (below Sweetwater Reservoir)
  - Sulfates (38315)

- Sweetwater River, Upper (above Sweetwater Reservoir)
  - Chlordane (51305)

  - Endosulfan (51329)
  - Methoxychlor (51344)
  - Phosphorus (44401)
  - Sulfates (44189)

- Switzer Creek
  - Arsenic (42789)
  - Cadmium (43228)
  - Chromium (38166)
  - DDD (Dichlorodiphenyldichloroethane) (50464)
  - Nickel (43063)

- Sycamore Canyon
  - Chloride (33627)

- Tecolote Creek
  - Oil and Grease (43069)
  - Total Dissolved Solids (33175)
  - pH (38349)

- Temecula Creek
  - Benthic Community Effects (43915)
  - Boron (33567)
  - Surfactants (MBAS) (33566)
  - Turbidity (37925)

- Tijuana River
  - Cypermethrin (53170)
  - Thallium (32711)

- Tijuana River Estuary
  - Arsenic (52234)
  - Endrin (52282)
  - Solids (41464)
  - Synthetic Organics (40563)
  - pH (33747)

List on 303(d) list (TMDL required list)	Regional Board 9

- Agua Hedionda Creek
  - Manganese (32810)
  - Nitrogen (33011)
  - Phosphorus (42357)

- Aliso Creek
  - Nitrogen (42917)

- Alvarado Creek
  - Selenium (43846)

- Arroyo Trabuco Creek
  - Nitrogen (42285)
  - Phosphorus (34172)

- Barrett Lake
  - Color (33584)
  - Manganese (33542)
  - Perchlorate (42336)
  - Total Nitrogen as N (45902)
  - pH (33940)

- Buena Creek
  - DDT (Dichlorodiphenyltrichloroethane) (33072)

- Buena Vista Lagoon
  - Indicator Bacteria (34484)
  - Nutrients (34498)
  - Sedimentation/Siltation (42423)

- Chollas Creek
  - Nitrogen (43346)
  - Phosphorus (44572)
  - Trash (43167)

- Cloverdale Creek
  - Phosphorus (34001)

- Cottonwood Creek (San Marcos Creek watershed)
  - Selenium (46059)

- De Luz Creek
  - Iron (46111)
  - Manganese (34599)
  - Sulfates (33683)

- El Capitan Lake
  - Color (33601)
  - Manganese (42774)
  - Phosphorus (44703)
  - Total Nitrogen as N (43926)
  - pH (32680)

- Encinitas Creek
  - Toxicity (43313)

- English Canyon
  - Benzo[b]fluoranthene (33516)
  - Dieldrin (33023)

- Escondido Creek
  - Nitrogen (43310)

- Felicita Creek
  - Aluminum (33247)

- Forester Creek
  - Phosphorus (44281)
  - Selenium (42648)

- Green Valley Creek

- Chloride (33338)
- Manganese (33340)
- Pentachlorophenol (PCP) (46271)

- Guajome Lake
  - Eutrophic (34647)

- Hodges, Lake
  - Manganese (32735)
  - Mercury (32549)
  - Turbidity (33094)
  - pH (33305)

- Jamul Creek
  - Toxicity (43270)

- Keys Creek
  - Selenium (43217)

- Kit Carson Creek
  - Pentachlorophenol (PCP) (33352)

- Long Canyon Creek (tributary to Murrieta Creek)
  - Chlorpyrifos (43219)
  - Iron (43326)
  - Manganese (43363)

- Los Coches Creek
  - Selenium (42782)

- Los Penasquitos Creek
  - Indicator Bacteria (43282)
  - Nitrogen (42783)
  - Total Dissolved Solids (32612)

- Loveland Reservoir
  - Manganese (33382)
  - Oxygen, Dissolved (33159)
  - pH (33463)

- Mission Bay (area at mouth of Rose Creek only)
  - Eutrophic (33706)
  - Lead (41989)

- Mission Bay at Quivira Basin
  - Copper (44024)

- Morena Reservoir
  - Ammonia (44098)
  - Color (33682)
  - Manganese (33445)
  - Phosphorus (42720)
  - pH (33491)

- Moro Canyon Creek

- Selenium (42852)
  - Toxicity (43527)

- Murrieta Creek
  - Chlorpyrifos (42375)
  - Copper (33307)
  - Iron (33420)
  - Manganese (33419)
  - Nitrogen (43555)

- Oceanside Harbor
  - Copper (44036)

- Oso Creek (at Mission Viejo Golf Course)
  - Chloride (34925)
  - Sulfates (33700)
  - Total Dissolved Solids (34850)

- Oso Creek (lower)
  - Toxicity (42685)

- Otay Reservoir, Lower
  - Ammonia (32559)
  - Iron (32878)
  - Manganese (32804)
  - Nitrogen (43345)
  - pH (32382)

- Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty
  - Indicator Bacteria (42675)

- Paleta Creek
  - Copper (43588)
  - Lead (41664)

- Paradise Creek, HSA 908.320
  - Selenium (44863)

- Poggi Canyon Creek
  - Toxicity (43633)

- Poway Creek
  - Selenium (43499)
  - Toxicity (44462)

- Rainbow Creek
  - Sulfates (36317)
  - Total Dissolved Solids (33806)

- Redhawk Channel
  - Chlorpyrifos (43085)
  - Copper (43600)
  - Diazinon (43668)
  - Iron (43204)
  - Manganese (43669)
  - Nitrogen (43644)

- Phosphorus (43113)
- Total Dissolved Solids (43114)

- Rose Creek
  - Selenium (36872)

- San Diego Bay Shoreline, 32nd St San Diego Naval Station
  - Benthic Community Effects (44918)
  - Sediment Toxicity (34113)

- San Diego Bay Shoreline, Chula Vista Marina
  - Copper (33346)

- San Diego Bay Shoreline, Downtown Anchorage
  - Sediment Toxicity (35141)

- San Diego Bay Shoreline, North of 24th Street Marine Terminal
  - Benthic Community Effects (34320)
  - Sediment Toxicity (35121)

- San Diego Bay Shoreline, Seventh Street Channel
  - Benthic Community Effects (34077)
  - Sediment Toxicity (33850)

- San Diego Bay Shoreline, Vicinity of B St and Broadway Piers
  - Benthic Community Effects (34654)
  - Sediment Toxicity (34709)

- San Diego Bay Shoreline, at Americas Cup Harbor
  - Copper (37281)

- San Diego Bay Shoreline, at Coronado Cays
  - Copper (33341)

- San Diego Bay Shoreline, at Glorietta Bay
  - Copper (33220)

- San Diego Bay Shoreline, at Harbor Island (East Basin)
  - Copper (33164)

- San Diego Bay Shoreline, at Harbor Island (West Basin)
  - Copper (44898)

- San Diego Bay Shoreline, at Marriott Marina
  - Copper (33165)

- San Diego Bay Shoreline, near Chollas Creek
  - Sediment Toxicity (35199)

- San Diego Bay Shoreline, near Coronado Bridge
  - Sediment Toxicity (35212)

- San Diego Bay Shoreline, near Switzer Creek
  - Chlordane (44920)

PAHs (Polycyclic Aromatic Hydrocarbons) (44697) 043654

- San Diego River (Lower)
  - Manganese (44492)
  - Phosphorus (34467)
  - Total Dissolved Solids (43058)

- San Dieguito River
  - Benthic Community Effects (36832)
  - Nitrogen (43093)
  - Phosphorus (43138)
  - Total Dissolved Solids (43664)

- San Elijo Lagoon
  - Eutrophic (34554)
  - Sedimentation/Siltation (34744)

- San Juan Creek
  - Nitrogen (43657)
  - Phosphorus (32893)

- San Juan Creek (mouth)
  - Cadmium (62917)
  - Copper (62920)
  - Nickel (62927)
  - Nitrogen, ammonia (Total Ammonia) (62928)

- San Luis Rey River, Lower (west of Interstate 15)
  - Chloride (34482)
  - Nitrogen (43658)
  - Phosphorus (37416)
  - Total Dissolved Solids (34548)

- San Luis Rey River, Upper (east of Interstate 15)
  - Phosphorus (35149)
  - Total Nitrogen as N (35862)

- San Marcos Creek
  - Phosphorus (33514)
  - Selenium (43708)

- San Marcos Lake
  - Nutrients (32745)

- San Mateo Creek (San Diego County)
  - Invasive Species (62966)

- San Vicente Creek (San Diego County)
  - Total Nitrogen as N (44543)

- San Vicente Reservoir
  - Chloride (43115)
  - Sulfates (44819)

- Santa Gertrudis Creek
  - Chlorpyrifos (37136)

- Copper (43071)
- Iron (43679)
- Manganese (44195)
- Phosphorus (43680)

- Santa Margarita River (Lower)
  - Phosphorus (43390)

- Santa Ysabel Creek (above Sutherland Reservoir)
  - Toxicity (37145)

- Soledad Canyon
  - Selenium (44274)

- Sutherland Reservoir
  - Iron (44516)
  - Manganese (33050)
  - pH (33064)

- Sweetwater Reservoir
  - Oxygen, Dissolved (33235)

- Sweetwater River, Lower (below Sweetwater Reservoir)
  - Nitrogen (43867)
  - Phosphorus (43923)
  - Total Dissolved Solids (44400)

- Switzer Creek
  - Copper (43031)
  - Lead (43239)
  - Zinc (43294)

- Tecate Creek
  - Selenium (43218)

- Tecolote Creek
  - Nitrogen (38167)
  - Phosphorus (43252)
  - Turbidity (44909)

- Telegraph Canyon Creek
  - Selenium (32596)

- Temecula Creek
  - Chlorpyrifos (43283)
  - Copper (42511)
  - Total Dissolved Solids (33302)
  - Toxicity (42672)

- Tijuana River
  - Eutrophic (40562)
  - Low Dissolved Oxygen (44569)
  - Pesticides (43166)
  - Phosphorus (43333)
  - Sedimentation/Siltation (43580)
  - Solids (34466)

- Surfactants (MBAS) (42793)
- Synthetic Organics (43320)
- Total Nitrogen as N (43581)
- Trace Elements (44587)
- Trash (34451)

- Tijuana River Estuary
  - Eutrophic (34508)
  - Nickel (33828)
  - Pesticides (34064)
  - Thallium (34079)
  - Trash (33705)
  - Turbidity (33667)

- Warm Springs Creek (Riverside County)
  - Chlorpyrifos (44683)
  - Iron (42738)
  - Manganese (44590)
  - Nitrogen (43143)
  - Phosphorus (32587)

List on 303(d) list (being addressed by USEPA approved TMDL) — Regional Board 9

- Aliso Creek (mouth)
  - Indicator Bacteria (34761)

- Chollas Creek
  - Indicator Bacteria (34499)

- San Diego Bay, Shelter Island Yacht Basin
  - Copper, Dissolved (35184)

- San Juan Creek (mouth)
  - Indicator Bacteria (34549)

List on 303(d) list (being addressed by action other than TMDL) — Regional Board 9

- San Diego Bay Shoreline, between Sampson and 28th Streets
  - Copper (34109)
  - Mercury (34200)
  - PAHs (Polycyclic Aromatic Hydrocarbons) (34260)
  - PCBs (Polychlorinated biphenyls) (41722)
  - Zinc (35139)

Draft California 2014 Integrated Report (303(d) List/305(b) Report
Miscellaneous Changes Report

Region	Water Body	Water Body ID	Water Body Type	Change Type	Change Information
9	Agua Hedionda Lagoon	CAE9043100019990209154022	Estuary	Update	the mapped representation of the water body was extended to represent new data received this cycle
9	Chollas Creek	CAR9082200019990208140725	River & Stream	Correction	Waterbody remapped as upstream trace to more accurately represent impairments
9	Cottonwood Creek (San Marcos Creek watershed)	CAR9045100020011009142248	River & Stream	Update	the mapped representation of the water body was extended to represent new data received this cycle
9	Encinitas Creek	CAR9045100019991117144759	River & Stream	Update	the mapped representation of the water body was extended to represent new data received this cycle
9	Forester Creek	CAR9071300020010924120240	River & Stream	Update	the mapped representation of the water body was extended to represent new data received this cycle
9	Laguna Canyon Channel	CAR9011200020011025105029	River & Stream	Update	the mapped representation of the water body was extended to represent new data received this cycle
9	Paradise Creek, HSA 908.320	CAR9091200019991117092131	River & Stream	Correction	the mapped representation of the water body was extended to represent new data received this cycle
9	Rainbow Creek	CAR9022200019980803102333	River & Stream	Update	the mapped representation of the water body was extended to represent new data received this cycle
9	San Diego River (Lower)	CAR9071100020011025101606	River & Stream	Update	the mapped representation of the water body was extended to represent new data received this cycle
9	San Juan Creek	CAR9012000020011025103828	River & Stream	Update	the mapped representation of the water body was extended to represent new data received this cycle
9	San Marcos Lake	CAL9045200019991117152408	Lake & Reservoir	Correction	Waterbody moved to correct location

Draft California 2014 Integrated Report (303(d) List/305(b) Report
Miscellaneous Changes Report

Region	Water Body	Water Body ID	Water Body Type	Change Type	Change Information
9	Sandia Creek	CAR9022200019991117132333	River & Stream	Update	the mapped representation of the water body was extended to represent new data received this cycle
9	Segunda Deshecha Creek	CAR9013000020010924101553	River & Stream	Update	the mapped representation of the water body was extended to represent new data received this cycle
9	Tijuana River	CAR9111100019990208133940	River & Stream	Update	Waterbody remapped to represent more current flow path
9	Wilson Creek (San Diego County)	CAR9113000020090204021246	River & Stream	Update	the mapped representation of the water body was extended to represent new data received this cycle

* The GIS files for the 2012 Integrated Report (all assessed waters) and 303(d) List of Water Quality Limited Segments (USEPA approved) were created for reporting purposes by the SWRCB and RWQCB. These GIS representations of the areal extent of assessed and 303(d) waters are estimated and should not be considered authoritative for the development of TMDLs (Total Maximum Daily Loads) or other regulatory actions. The TMDL effort may ultimately address more or less area. Mapping the all assessed and 303(d) listed waters is a work in progress and will be updated during each listing cycle to better define the

CWA Sections 305(b)/303(d) Integrated Report

Regional Board 9 - San Diego Region References

- Comments
- Data and Information
- List Approval Process
- QA Document
- Standards and Guidelines

Comments

Parent #	Ref #	Description	Date Received
	3566	Bailey, Michael. 2009. Comments on the 2008 Integrated Report.	09/07/2009
	3482	Center for Biological Diversity. 2009. Center for Biological Diversity Comments on the 2008 Integrated Report.	10/26/2009
	3483	Center for Biological Diversity. 2008. Center for Biological Diversity Comments on the 2008 Integrated Report.	06/11/2008
	3484	Center for Biological Diversity. 2007. Center for Biological Diversity Comments on the 2008 Integrated Report.	02/27/2007
	3486	City of Carlsbad. 2009. City of Carlsbad Comments on the 2008 Integrated Report.	10/26/2009
	3485	City of Carlsbad. 2009. City of Carlsbad Comments on the 2008 Integrated Report.	09/15/2009
	3487	City of Chula Vista. 2009. City of Chula Vista Comments on the 2008 Integrated Report.	10/26/2009
	3488	City of Del Mar. 2009. City of Del Mar Comments on the 2008 Integrated Report.	10/26/2009
	3489	City of El Cajon. 2009. City of El Cajon Comments on the 2008 Integrated Report.	10/26/2009
	3490	City of Encinitas. 2009. City of Encinitas Comments on the 2008 Integrated Report.	10/22/2009
3491	3494	City of Escondido. 2009. City of Escondido Additional Comments on the 2008 Integrated Report .	11/02/2009
	3491	City of Escondido. 2009. City of Escondido Comments on the 2008 Integrated Report.	10/26/2009
3491	3492	City of Escondido. 2009. City of Escondido Comments on the 2008 Integrated Report (Attachment 1).	10/26/2009
3491	3493	City of Escondido. 2009. City of Escondido Comments on the 2008 Integrated Report (Attachment 2).	10/26/2009
	3529	City of La Mesa. 2009. City of La Mesa Comments on the 2008 Integrated Report.	10/26/2009
	3530	City of Oceanside. 2009. City of Oceanside Comments on the 2008 Integrated Report.	10/23/2009
	3531	City of Poway. 2009. City of Poway Comments on the 2008 Integrated Report .	10/26/2009
	3532	City of San Diego. 2009. City of San Diego Comments on the 2008 Integrated Report.	10/26/2009
3532	3539	City of San Diego. 2009. City of San Diego Comments on the 2008 Integrated Report (Table).	10/26/2009
	3533	City of San Diego . 2009. City of San Diego Public Utilities District Comments on the 2008 Integrated Report.	10/26/2009
3532	3538	City of San Diego . 2009. City of San Diego Stormwater Department Comments on the 2008 Integrated Report.	10/23/2009
3534	3535	City of San Marcos. 2009. City of San Marcos Comments on the 2008 Integrated Report (2).	10/26/2009
	3534	City of San Marcos. 2009. City of San Marcos Comments on the 2008 Integrated Report (1).	09/22/2009
	3536	City of Santee. 2009. City of Santee comments on the 2008 Integrated Report .	10/26/2009
	3537	City of Vista. 2009. City of Vista comments on the 2008 Integrated Report.	09/14/2009
	3565	Clapper, Kacen. 2009. Comments on the 2008 Integrated report.	09/29/2009

	3540	County of San Diego. 2009. County of San Diego comments on the 2008 Integrated Report .	043660	10/26/2009
3542	3543	Orange County. 2009. Orange County comments on the 2008 Integrated Report (2).		10/26/2009
	3542	Orange County. 2009. Orange County Comments on the 2008 Integrated Report .		09/14/2009
	3544	Port of San Diego. 2009. Port of San Diego Comments on the 2008 Integrated Report .		10/26/2009
	3545	Rancho Mission Viejo. 2009. Rancho Mission Viejo Comments on the 2008 Integrated Report .		10/26/2009
	3546	Riverside County Flood Control District. 2009. Riverside County Flood Control District Comments on the 2008 Integrated Report .		10/26/2009
	3549	San Diego Coastkeeper. 2009. San Diego Coastkeeper Comments on the 2008 Integrated Report .		10/26/2009
	3547	San Diego County. 2009. San Diego County Land Use and Environmental Group Comments on the 2008 Integrated Report.		09/14/2009
	3548	San Diego County Public Works. 2009. San Diego County Public Works Comments on the 2008 Integrated Report .		09/14/2009
	3541	San Diego RWQCB. 2009. Oral Comments Provided by Todd Snyder, County of San Diego, and Amanda Carr, County of Orange, and Responses From the November 11, 2009 Regional Board Meeeting.		11/18/2009
	3550	San Diego River Park Foundation. 2009. San Diego River Park Foundation Comments on the 2008 Integrated Report .		10/26/2009
	3564	Sousa, Amanda. 2009. Comments on the 2008 Integrated Report.		10/26/2009
	3480	US EPA Region 9. 2009. US EPA Region 9 Comments on the 2008 Integrated Report.		10/26/2009
	3479	US Marine Corps. 2009. US Marine Corps Comments on the 2008 Integrated Report.		10/23/2009
	3481	US Navy. 2009. US Navy Comments on the 2008 Integrated Report.		10/26/2009

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Data and Information

Parent #	Ref #	Description	Date Received
	4013	County of San Diego - Dept of Public Works. Data for Various Pollutants from the County of San Diego Department of Public Works Watershed Protection Program, 2001-2008. .	08/05/2010
	2597	Schiff, Kenneth and Steve Carter. 2007. Monitoring and Modeling of Chollas, Switzer, and Paleta Creek, Southern California Coastal Water Research Project.	01/01/2008
	3882	AC/S Environmental Security Stormwater Branch Marine Corps Base - Camp Pendleton . Data for Various Pollutants in the Santa Margarita River Watershed, 2007-2009. .	08/30/2010
	1241	Anderson, B., J. Hunt, S. Tudor, J. Newman, R. Tjeerdema, R. Fairey, J. Oakden, C. Bentz, C.J. Wilson, F. LaCaro, G. Kapahi, M. Stephenson, M. Puckett, J. Anderson, E.R. Long, T. Fleming, and K. Summers. 1997. Chemistry Toxicity and Benthic Community Conditions In Sediments of Selected Southern CA Bays and Estuaries.	07/25/2003
	3232	Anderson, Brian, John Hunt, and Bryn Phillips. 2005. TMDL Sediment Quality Assessment Study at the B Street/Broadway Piers, Downtown Anchorage, and Switzer Creek, San Diego PHASE II.	01/01/2009
	1555	Bizzarri, T. 2000. Mtbe and The Future of Clean Water In Lakeside CA.	07/25/2003
	2779	Brown and Caldwell. 2006. Report Summarizing Comments from the Port of San Diego Requesting Delisting of the San Diego Bay Shoreline, Point Loma Hydrologic Area .	03/03/2007
	2778	Brown and Caldwell. 2005. Monitoring Plan: Summary of Recommendations for Sampling of Bacterial Indicators at the B Steeet and G Street Piers .	03/03/2006
	303	CDM Federal Programs Corporation. 2001. Framework monitoring plan for the Santa Margarita River watershed, CA. Temecula, CA: U.S. Bureau of Reclamation.	09/20/2006
	2924	California Department of Fish and Game Water Pollution Control Laboratory Aquatic Bioassessment Laboratory. 2002. Quality Assurance Project Plan for the California Stream Bioassessment Procedure.	01/15/2002

	2553	California Department of Health Service. 2007. Perchlorate in California Drinking Water: Update and Overview.	09/01/2007
	2891	California Regional Water Quality Control Board: Region 9. 2006. Fact Sheets Supporting Revision of the Section 303(d) List, California Water Quality Control Board. San Diego Region 9 .	01/01/2008
	3207	California State Water Resource Board. 1996. CHEMISTRY, TOXICITY AND BENTHIC COMMUNITY CONDITIONS IN SEDIMENTS OF THE SAN DIEGO BAY REGION FINAL REPORT.	01/01/2008
	4314	Chad Loflen. 2016. Region 9 CSCI Scores & Water Body Information .	07/06/2016
	2541	Chee, Mike . 2005. Email correspondence from T. Michael Chee of NASSCO to John Robertus of the San Diego Regional Water Quality Control Board, regarding trash conditions at mouth of Chollas Creek..	01/10/2005
	3289	Chiu, Wayne. 2009. Proposal to Remove/Delist Agua Hedionda Lagoon from the Clean Water Act Section 303(d) List of Water Quality Limited Segments for Sedimentation. Memorandum from Wayne Chiu to Alan Monji. July 28, 2009.	07/28/2009
	1238	Christopher, Foe, Linda Deanovic and Dave Hinton. 1998. Staff Report of The CA Environmental Protection Agency RWQCB Central Valley Region Toxicity Identification Evaluations of Orchard Dormant Spray Storm Runoff.	07/25/2003
	2566	Cities of Orange County. 2008. Orange County Stormwater Program. 2004-2007. Unified Annual Progress Reports, Program Effectiveness Assessment (San Diego Region).	01/01/2008
	3301	City of Carlsbad. 2009. Bacteria Monitoring Data for Agua Hedionda Lagoon. July 22, 2009.	07/22/2009
3511	3512	City of Carlsbad. 2009. Attached Data from the City of Carlsbad for Agua Hedionda Lagoon Bacteria Delisting Analysis.	07/22/2009
3511	3513	City of Carlsbad. 2009. Letter Dated July 22, 2008, from Elaine Lukey, Information to Support Reassessment and Delisting of Indicator Bacteria in Agua Hedionda Lagoon .	07/22/2009
	3208	City of Carlsbad. 2008. Shoreline Monitoring Data for Pine St, City of Carlsbad. 2008.	01/01/2008
	3201	City of Dana Point. 2007. Ocean Bacteriological Data Evaluation for Dana Point HSA, City of Dana Point, November 2005 - December 2006..	04/19/2007
	309	City of Encinitas. 2004. Water quality data and information submittal for Pacific Ocean shoreline, San Marcos HA (90451000). Encinitas, CA.	09/20/2006
	310	City of Encinitas. 2003. Cottonwood Creek and Encinitas Creek bioassessment study. Encinitas, CA.	09/20/2006
	1353	City of Encinitas. 2000. Municipal Storm Water Permit Compliance Reports (90-42) Batiquitos Lagoon 904.510.	07/25/2003
	1357	City of Encinitas. 2000. Municipal Stormwater Permit Compliance Reports (90-42) Cotton Wood Creek 904.	07/25/2003
	1362	City of Encinitas. 2000. Municipal Stormwater Permit Compliance (9.0-40) San Eligo Lagdon 904.610.	07/25/2003
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	2911	City of Escondido. 2007. City of Escondido's Quarterly Baseline Self Monitoring Reports for Calendar Years 1999-2003 .	01/01/2007
	2971	City of Laguna Beach. 2008. Supporting Data for the Ocean Bacteriological Data Evaluation for City of Laguna Beach, 1999 through 2006 .	01/01/2008
	297	City of Oceanside. 2000. Laboratory results-San Luis Rey River at Bonsall. Oceanside, CA.	05/15/2001
	2554	City of San Diego. Water Department, Water Quality Monitoring Data for Drinking Source Water Reservoirs. January 2005 to December 2006.	01/01/2007
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Please refer to the "Statewide Reference" (next page) for the complete list of Standards and Guidelines.

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Comments

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CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

RESOLUTION NO. R9-2010-0066

APPROVAL OF THE HYDROMODIFICATION MANAGEMENT PLAN FOR THE COUNTY OF SAN DIEGO, THE INCORPORATED CITIES OF SAN DIEGO COUNTY, THE SAN DIEGO UNIFIED PORT DISTRICT, AND THE SAN DIEGO COUNTY REGIONAL AIRPORT AUTHORITY

The California Regional Water Quality Control Board, San Diego Region (hereinafter San Diego Water Board) finds that:

1. San Diego Water Board Order No. R9-2007-0001 (National Pollutant Discharge Elimination System (NPDES) Permit No. CAS0108758), *Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego County, the San Diego Unified Port District, and the San Diego County Regional Airport Authority*, was adopted on January 24, 2007, and prescribes requirements for the control of pollutant discharges from MS4s within San Diego County.

2. Provisions D.1.g and J.2.a of Order No. R9-2007-0001 require the County of San Diego, the incorporated cities of San Diego County, the San Diego Unified Port District, and the San Diego County Regional Airport Authority (Copermittees) to submit a Hydromodification Management Plan (HMP) to manage increases in runoff discharge rates and durations from all Priority Development Projects (PDPs), where such increased rates and durations are likely to cause increased erosion of channel bed and banks, sediment pollutant generation, or other impacts to beneficial uses and stream habitat due to increased erosive force.

3. Provision J.2.a of Order No. R9-2007-0001 requires the Copermittees to submit a Draft HMP within 2 years of adoption of the Order and a Final HMP for San Diego Water Board approval within 180 days of receiving comments from the San Diego Water Board on the Draft HMP. Provision D.1.g.(5) of Order No. R9-2007-0001 states that 180 days after approval of the HMP by the San Diego Water Board, each Copermittee shall incorporate the HMP into its local Standard Urban Storm Water Mitigation Plan (SUSMP) and ensure implementation for all applicable PDPs.

4. Pursuant to Provision J.2.a. of Order No. R9-2007-0001, by letter dated January 21, 2009, the County of San Diego submitted a Draft HMP on behalf of the Copermittees to the San Diego Water Board for review and comment. By letter dated June 29, 2009, the San Diego Water Board provided written comments on the Draft HMP to the Copermittees. By letter dated

December 29, 2009, the County of San Diego submitted a Final HMP on behalf of the Copermittees to the San Diego Water Board.

5. On January 14, 2010, the San Diego Water Board posted the Final HMP on the San Diego Water Board's website and initiated a 30-day public review and comment period. The San Diego Water Board received 3 comment letters on the Final HMP, and has considered these comments in identifying necessary revisions to the Final HMP as set forth in this Resolution.

6. The San Diego Water Board reviewed the Final HMP for compliance with Provision D.1.g of Order No. R9-2007-0001. Conclusions from this review are presented in Findings a-e below.

   a. Section 6 of the Final HMP includes a decision matrix to guide users in choosing or sizing appropriate hydromodification mitigation facilities. The decision matrix and accompanying text states that a maximum drawdown time of 72-hours is allowed, which corresponds to standards set forth by the County Department of Environmental Health (DEH) for vector control. As DEH standards are subject to change, it is more appropriate to state generic drawdown requirements in meeting this design specification.

   b. The Final HMP does not include development of a Quality Assurance Project Plan (QAPP) for water quality monitoring or geomorphic assessment described in the HMP Monitoring Plan. A QAPP is necessary to ensure consistency and data reliability.

   c. Various assumptions were made in calculations of critical flows (flows which initiate sediment movement and cause erosion). Assumptions included designating typical configurations to local channels since data describing such configurations is sparse. Local geomorphic data is needed to validate or refine these assumptions to improve the accuracy of calculated critical flows, and refine design standards and other HMP requirements as necessary. PDPs, if conditioned to do so, can provide such data as part of the land development permitting process. To include data for undeveloped areas, the Copermittees must supplement the local data where no PDPs are planned.

   d. Section 8 of the Final HMP describes monitoring and best management practice (BMP) evaluation, including flow based sediment monitoring. Section 8 proposes a minimum of 5 monitoring points throughout San Diego County over a period of 2 rainy seasons. This proposed monitoring is inadequate for purposes of assessing effectiveness of HMP implementation, as required by provision D.1.g(1)(k) of Order No. R9-2007-0001. Substantially more data are needed to better quantify flow based sediment concentrations associated with the typical range of

channel dimensions and materials, contributing watershed sizes, land uses, vegetative cover, and rainfall patterns (and subsequent flow) in receiving waters throughout San Diego County. In addition to increased spatial coverage, monitoring is needed over several rainy seasons for increased temporal coverage because Copermittees will need to distinguish erosion caused by anthropogenic activities from naturally occurring erosion in order to assess the effectiveness of the HMP.

e. Section 8 of the Final HMP states that the details of the HMP Monitoring Plan for San Diego County will continue to evolve and be improved over time, and that this improvement process will be based in part on the analysis of collected data. The Final HMP states that, as more data are collected and as field issues associated with the data collection are refined, the HMP Monitoring Plan can be fine-tuned to most accurately assess the effects of the hydromodification flow control facilities. However, the Final HMP does not contain a commitment with a specific timeframe to verify and/or refine the assumptions, findings, and requirements of the HMP in light of newly gathered data. Neglecting to include such a commitment gives no assurance that the assumptions, findings, and requirements of the HMP will ever be revisited.

7. Modifications to the Final HMP are necessary to address the deficiencies identified in Findings a-e, and to satisfy the requirements of Order No. R9-2007-0001.

8. Tentative Resolution No. R9-2010-0066 was provided to the Copermittees and made available to interested persons and the public on April 7, 2010 for review and comment. Tentative Resolution No. R9-2010-0066 was made available for a second round of comments on July 2, 2010. The San Diego Water Board received written comments and heard all comments concerning the Tentative Resolution at its meeting on July 14, 2010. Comments were responded to in writing or responded to orally at the Board meeting.

9. Implementation of an approved HMP is required by Order No. R9-2007-0001, an NPDES permit previously adopted by the San Diego Water Board. Approval of the HMP, as modified by this Resolution, is also exempt from the requirements of the California Environmental Quality Act pursuant to California Water Code section 13389.

10. Rainwater harvesting is the collection of storm water for future beneficial reuse. Rainwater harvesting is a highly effective BMP and should be used to the maximum extent practicable to meet the HMP requirements.

THEREFORE BE IT RESOLVED THAT

The San Diego Water Board hereby approves the Final HMP dated December 29, 2009 with the following revisions:

1. Section 6, Figure 6-2 –Mitigation Criteria and Implementation, and Figure 6-3 –Mitigation Criteria and Implementation. Change nodes 5 and 17 from "Verify 72 hour Drawdown Time" to "Verify Necessary Drawdown Time," and revise all accompanying discussion as needed.

2. Section 8, Monitoring and BMP Evaluation. Replace Section 8 of HMP with revised Section 8 dated July 14, 2010. In addition to the proposed monitoring stations, add 2 monitoring stations (1 highly susceptible and 1 medium susceptible) on downstream locations where development with less than 40 percent impervious area in the sub-watershed has occurred.

3. As required by Order No. R9-2007-0001, each Copermittee shall incorporate the approved HMP into its local SUSMP and implement the HMP for all applicable PDPs by January 14, 2011. Failure to do so will result in non-compliance with Order No. R9-2007-0001.

I, David W. Gibson, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of a resolution adopted by the California Regional Water Quality Control Board, San Diego Region, on July 14, 2010.

DAVID W. GIBSON
Executive Officer

California Regional Water Quality Control Board

San Diego Region
9174 Sky Park Court, San Diego, CA 92123-4340
(916) 341-5455 • FAX (916) 341-5463
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Linda S. Adams
Secretary for Environmental Protection

Arnold Schwarzenegger
Governor

GENERAL WASTE DISCHARGE REQUIREMENTS
FOR DISCHARGES OF HYDROSTATIC TEST WATER AND POTABLE WATER TO SURFACE WATERS AND STORM DRAINS OR OTHER CONVEYANCE SYSTEMS WITHIN THE SAN DIEGO REGION

ORDER NO. R9-2010-0003
NPDES NO. CAG679001

A Discharger, as described in the following table that has complied with the requirements for coverage under this General "Waste Discharge Requirements" (WDR or Order), is subject to waste discharge requirements, once permit coverage is effective, as set forth in this Order.

Table 1. Discharger Information

Dischargers	Water distributors (also called purveyors), water districts, municipalities, private entities, and other persons, that have been issued a water supply permit by the California Department of Public Health, or federal military installations, that discharge hydrostatic test water and/or potable water to surface waters within the San Diego Region and storm drains or other conveyance system tributary thereto (pursuant to Section 402 of the Clean Water Act) that do not cause, have a reasonable potential to cause, or contribute to instream excursion above any applicable State or Federal water quality objectives criteria or cause acute or chronic toxicity in the receiving water.

Table 2. Discharge Location

Discharge Point	Effluent Description	Discharge Point Latitude	Discharge Point Longitude	Receiving Water
001	Hydrostatic test water and potable water discharges resulting from testing of pipelines, tanks, and vessels that are dedicated to drinking water purveyance and storage as well.	**Various**	**Various**	Inland Surface Waters, Enclosed Bays, Harbors, Lagoons, Estuaries, and the Pacific Ocean.

California Regional Water Quality Control Board

San Diego Region
9174 Sky Park Court, San Diego, CA 92123-4340
(916) 341-5455 • FAX (916) 341-5463
www.waterboards.ca.gov/sandiego

Table 3. Administrative Information

This Order was adopted by the San Diego Water Board on:	**September 8, 2010**
This Order shall become effective on:	**November 1, 2010**
This Order shall expire on:	**October 31, 2015**
The U.S. Environmental Protection Agency and the California Regional Water Quality Control Board, San Diego Region have classified these discharges as minor discharges. In accordance with Section 2200, Title 23 of the California Code of Regulation, the threat to water quality and complexity of the discharge is determined to be category 3C.	

I, David W. Gibson, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on September 8, 2010.

David W. Gibson
Executive Officer

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I. DISCHARGE INFORMATION

This Order is intended to cover discharges of hydrostatic test water and potable water to various receiving surface waters within the San Diego Region. The San Diego Region covers a large portion of San Diego County, portions of south Orange County, and the southwestern portion of Riverside County based on hydrologic drainage areas.

Discharges regulated by this Order include, but are not limited to, potable and hydrostatic test discharges resulting from testing, repair, and maintenance of pipelines, tanks, and vessels dedicated to drinking water purveyance. Additional information on discharges covered by this Order can be found in Section III. B of this Order and the Fact Sheet, Section I.C.

The federal Clean Water Act requires that point source discharges of pollutants to waters of the United States be permitted in accordance with the National Pollutant Discharge Elimination System (NPDES). NPDES Regulations, 40 CFR 122.28, provides for the issuance of general permits to regulate discharges of waste which result from similar operations, are the same type of waste, require the same effluent limitations, and require similar monitoring.

Certain pollutants potentially contained in hydrostatic test water and/or potable water discharges threaten to cause or contribute to excursions above narrative and numeric water quality objections contained in state and federal regulations. These types of discharges could therefore pose a chronic or acute toxicity risk to freshwater and saltwater aquatic animal and plant life. Pollutants of concern include, but are not limited to, chlorine and chlorination by-products, total dissolved solids, turbidity, total suspended solids, and sedimentation. Increased volume, velocity, rate, and duration of discharges may also contribute to erosion of natural channels.

II. PERMIT INFORMATION

A. Eligibility Criteria

1. This Order is applicable to existing and future discharges of hydrostatic test water and potable water to surface waters within the San Diego Region.

2. To be authorized by this General Order, Dischargers must demonstrate that the discharge or proposed discharge meets the following criteria:

   a. Pollutant concentrations in the discharge shall not cause violation of any applicable water quality objective for the receiving waters, including Discharge Specifications of this WDR;

   b. The discharge shall not cause acute or chronic toxicity in receiving waters;

   c. The discharge shall need minimal or no waste treatment systems to meet the requirements of this Order. De-chlorination is considered to be

"minimal treatment".

d. The Discharger has explored and considered alternative methods of disposal, such as water conservation, reuse of water and groundwater recharge, and has determined no feasible or economical alternative method of disposal exist. Pursuant to Section 2 of Article X of the California Constitution, water resources of the State shall be put to beneficial use to the fullest extent of which they are capable.

B. Enrollment

Each of the persons listed below have been issued a water supply permit by the California Department of Public Health, or is a federal military installation, and owns or operates potable water distribution facilities and have a potential to discharge hydrostatic test water and/or potable water to waters of the United States within the San Diego Region and thus require enrollment under this Order:

Table 4. Water Distributors, Water Districts, Municipalities, and Private Entities in the San Diego Region*

Cal-Am Water	Padre Dam Municipal Water District
Carlsbad Municipal Water District	Rainbow Municipal Water District
City of Del Mar	Ramona Municipal Water District
City of Escondido	Rancho California Water District
City of Oceanside	Rancho Pauma Mutual Water Company
City of Poway	Rincon Del Diablo Municipal Water District
City of San Diego	San Diego County Water Authority
Eastern Municipal Water District	San Dieguito Water District
El Toro Water District	Santa Fe Irrigation District
Elsinore Valley Municipal Water District	Santa Margarita Water District
Fallbrook Public Utility District	South Coast Water District
Helix Water District	Sweetwater Authority
Irvine Ranch Water District	Valley Center Municipal Water District
Laguna Beach County Water District	Vallecitos Water District
Lakeside Water District	Vista Irrigation District
Metropolitan Water District of Southern California	Marine Corps Base Camp Pendleton
Moulton Niguel Water District	US Navy Public Works
Olivenhain Municipal Water District	Western Municipal Water District
Otay Water District	Yuima Municipal Water District

* Other persons may be added at the discretion of the San Diego Water Board.

To obtain coverage under this Order a Discharger must submit the following to the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board):

1. A Notice of Intent (NOI) at least 60 days before the planned commencement of discharge (see Attachment B).

2. A report for each discharge event proposed over the fiscal year (July 1-June 30) that is expected to result in a discharge of 1 acre-ft/day (325,850 gallons/day) or greater. The reports should include, at a minimum, the following:

    a. Description of the proposed discharge (i.e. repair of potable water line, maintenance, etc.);
    b. The proposed discharge date(s) and amount(s) (in gallons per day);
    c. The duration of the proposed discharge;
    d. The affected receiving water or the location of the MS4 storm drain;
    e. Dechlorination method (if applicable); and
    f. A map identifying agencies jurisdiction (overall areas where discharges could occur).

3. Payment of the application fee, equal to the first annual fee, made payable to State Water Resources Control Board or "SWRCB."

The WDR NOI, including, the application fee, and other attachments, must be submitted to the following address:

CRWQCB – San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123

Attn: Hydrostatic Test Water and Potable Water Discharges
Core Regulatory Unit
NOTICE OF INTENT

C. Coverage

Coverage will be effective when all of the following have occurred:

1. The Discharger has submitted a complete NOI application, as determined by the San Diego Water Board; and

2. The San Diego Water Board issues the Discharger a Notice of Enrollment, which may include additional or increased monitoring due to specific circumstances of the discharge, and any other additional requirements. Pursuant to the State of California Discharger's Bill of Rights, the San Diego Water Board shall notify the applicant that the application has been received within 30 days of receipt.

3. Dischargers currently enrolled in Order No. R9-2002-0020 will be automatically re-enrolled under this Order (i.e. a new NOI does not need to be submitted). All existing enrollees, however, shall submit updated contact information within 60 days after adoption of this Order. Contact information shall include: 1) Agency Contact Person, 2) Permit Compliance Contact Person, and 3) Billing Contact Person. Contact information shall be reviewed by each enrollee on an annual basis and any changes shall be reported to the San Diego Water Board within 60 days of the change. If a Discharger does not wish to continue coverage under this Order, a written request (Notice of Termination) shall be submitted to the San Diego Water Board (see Section D below).

D. Termination of Discharges

Dischargers shall submit a written request referred to as a "Notice of Termination (NOT)" to this San Diego Water Board when coverage under this Order is no longer required. The NOT letter constitutes a notice that the Discharger (and his/her agent) of the site has ceased the discharge of hydrostatic test water and/or potable water under this Order.

The NOT should include "Notice of Termination (NOT)" In the subject line, the Waste Discharge Identification Number (WDID No.) assigned to the Enrollee by the San Diego Water Board when enrolled in the Order, the name and address of the water distributors (purveyor), water district, municipality, or private entity, and be signed and dated in accordance with the signatory requirements of the Order. The Discharger shall continue to comply with the requirements of the Order until the San Diego Water Board approves the NOT. Submittal of a NOT letter does not guarantee termination. Approval of the NOT does not relieve the Discharger's responsibility for paying any applicable outstanding invoices of annual fees as a result of enrollment under this Order.

E. Transferring Ownership

Enrollment under the Order is not transferable. In the event of any change in control or ownership of land or waste discharge facilities presently owned or controlled by the enrolled Discharger, the Discharger must notify the new succeeding owner or operator of the existence of this Order by letter 120 days prior to property transfer, a copy of which must be immediately forwarded to the San Diego Water Board office. Additionally, the Discharger must submit a NOT to the San Diego Water Board. The new succeeding owner or operator must submit a new NOI in application of enrollment under this Order.

III. Findings

The San Diego Water Board finds:

A. Background

On August 14, 2002, this San Diego Water Board adopted Order No. R9-2002-0020 NPDES No. CAG679001 General Waste Discharge Requirements for discharges of hydrostatic test water and potable water to surface waters within the San Diego Region. There are currently 36 Dischargers enrolled under this General Permit.

This Order supersedes Order No. 2002-0020. The NPDES No. CAG679001 remains the same. Dischargers enrolled under previous Order No. 2002-0020 will be automatically enrolled in this Order.

B. Discharge Description

This Order covers existing and proposed discharges of hydrostatic test water and potable water discharges to various receiving water within the San Diego Region. The San Diego Region covers a large portion of San Diego County, portions of South Orange County, and the southwestern portion of Riverside County based on hydrologic drainage areas.

Hydrostatic test water discharges are those discharges resulting from testing of pipelines, tanks, and vessels that are dedicated to drinking water purveyance and storage.

Potable water discharges include discharges resulting from repair, maintenance, and disinfection of pipelines, tanks, vessels, and reservoirs dedicated to drinking water purveyance and storage. This Order does not apply to water transfers. Water transfers are not subject to regulation under the NPDES permitting system.

Hydrostatic test and/or potable water discharges less than 1 acre-ft/day (325,850 gallons/day) are exempt from the Section X (Reporting Requirements) of the Monitoring and Reporting Program if the discharge is directly into an MS4 drain or the discharge is into a dry/seasonal stream (blue-line streams shown on USGS topographic maps), creek, river, etc. but will percolate and/or evaporate prior to reaching any surface water that is present downstream. All discharges are subject to the implementation of Best Management Practices (BMPs).

C. Legal Authorities

This Order is issued pursuant to sections 402 of the Federal Clean Water Act (CWA) and implementing regulations adopted by the U.S. Environmental Protection Agency (USEPA) and chapter 5.5, division 7 of the California Water Code (commencing with section 13370). It shall serve as a NPDES permit for

point source discharges from this facility to surface waters. This Order also serves as Waste Discharge Requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the Water Code (commencing with section 13260).

States may request authority to issue general NPDES permits pursuant to 40 CFR section 122.28. On June 8, 1989, the California State Water Resources Control Board (State Board) submitted an application to USEPA requesting revisions to its NPDES Program in accordance with 40 CFR sections 122.28, 123.62, and 403.10. The application included a request to add WDR authority to its approved NPDES Program. On September 22, 1989, USEPA, Region 9, approved the State Board's request and granted authorization for the State of California to issue general NPDES permits.

D. Background and Rationale for Requirements

The San Diego Water Board developed the requirements in this Order based on information submitted as part of the applications for several like agencies, individuals, and entities, through monitoring and reporting programs, and through special studies. Attachments A through G, which contain background information and rationale for Order requirements, are hereby incorporated into this Order and constitute part of the Findings for this Order.

E. California Environmental Quality Act (CEQA)

Under Water Code section 13389, this action to adopt an NPDES permit is exempt from the provisions of CEQA, Public Resources Code sections 21100-21177.

F. Technology-Based Effluent Limitations (TBELs)

Section 301(b) of the CWA and implementing USEPA permit regulations at section 122.44, title 40 of the Code of Federal Regulations[1], require that permits include conditions meeting applicable technology-based requirements at a minimum, and any more stringent effluent limitations necessary to meet applicable water quality standards.

This Order includes numeric-TBELs for total residual chlorine and pH.

G. Water Quality-Based Effluent Limitations (WQBELs)

Section 301(b) of the CWA and section 122.44(d) require that permits include limitations more stringent than applicable federal technology-based requirements where necessary to achieve applicable water quality standards.

Section 122.44(d)(1)(i) mandates that permits include effluent limitations for all pollutants that are or may be discharged at levels that have the reasonable

[1] All further statutory references are to title 40 of the Code of Federal Regulations unless otherwise indicated.

potential to cause or contribute to an exceedance of a water quality standard, including numeric and narrative objectives within a standard. Where reasonable potential has been established for a pollutant, but there is no numeric criterion or objective for the pollutant, water quality-based effluent limitations (WQBELs) must be established using: (1) USEPA criteria guidance under CWA section 304(a), supplemented where necessary by other relevant information; (2) an indicator parameter for the pollutant of concern; or (3) a calculated numeric water quality criterion, such as a proposed state criterion or policy interpreting the state's narrative criterion, supplemented with other relevant information, as provided in section 122.44(d)(1)(vi).

H. Water Quality Control Plan

The San Diego Water Board's Water Quality Control Plan for the San Diego Basin (hereinafter Basin Plan) designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters addressed through the Basin Plan. The Basin Plan was adopted by the San Diego Water Board on September 8, 1994, and was subsequently approved by the State Board on December 13, 1994. Subsequent revisions to the Basin Plan have also been adopted by the San Diego Water Board and the State Board.

In addition, State Board Resolution No. 88-63 establishes state policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal and domestic supplies. Requirements of this Order specifically implement the applicable provisions of the Basin Plan and State Board policy.

I. National Toxics Rule (NTR) and California Toxics Rule (CTR)

USEPA adopted the NTR on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the NTR applied in California. On May 18, 2000, USEPA adopted the CTR. The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants.

J. State Implementation Policy

On March 2, 2000, the State Board adopted the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP). The SIP became effective on April 28, 2000, with respect to the priority pollutant criteria promulgated for California by USEPA through the NTR and to the priority pollutant objectives established by the regional boards in their Basin Plans, with the exception of the provision on alternate test procedures for individual discharges that have been approved by the USEPA Regional Administrator. The alternate test procedures provision became effective on May 22, 2000. The SIP became effective on May

18, 2000. The SIP includes procedures for determining the need for WQBELs and for calculating WQBELs. The SIP also requires Dischargers to submit sufficient data to make the determination, and if necessary to calculate the WQBELs. The State Board adopted amendments to the SIP on February 24, 2005, that became effective on July 13, 2005. The SIP establishes implementation provisions for priority pollutant criteria and objectives, and provisions for chronic toxicity control. Requirements of this Order implement the SIP.

Section 5.3 of the SIP provides that the Regional Water Quality Control Board may, after compliance with the California Environmental Quality Act (CEQA), allow short-term or seasonal exceptions to meeting the priority pollutants criteria/objectives if determined to be necessary to implement control measures either:

1. for resource or pest management (i.e., vector or weed control, pest eradication, or fishery management) conducted by public entities or mutual water companies to fulfill statutory requirements, including but not limited to, those in the California Fish and Game, Food and Agriculture, Health and Safety, and Harbors and Navigation Codes; or

2. regarding drinking water conducted to fulfill statutory requirements under the federal Safe Drinking Water Act or the California Health and Safety Code. Such categorical exceptions may also be granted for draining water supply reservoirs, canals, and pipelines for maintenance, for draining municipal storm water conveyances for cleaning or maintenance, or for draining water treatment facilities for cleaning or maintenance.

No current SIP exception applies to this discharge; however, the enrollees (Dischargers) may need to seek a SIP exception from CTR criteria based on data obtained during the life of this permit.

K. Compliance Schedules and Interim Requirements – Not Applicable

L. California Ocean Plan

The State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, and 2005. The State Water Board adopted the latest amendment on April 21, 2005 and it became effective on February 14, 2006. The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean. The Ocean Plan identifies beneficial uses of ocean waters of the State to be protected as summarized below:

Table 5. Ocean Plan Beneficial Uses

Discharge Point	Receiving Water	Beneficial Uses
Outfall 001	Pacific Ocean	Industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture; preservation and enhancement of designated Areas of Special Biological Significance (ASBS); rare and endangered species; marine habitat; fish spawning and shellfish harvesting

In order to protect the beneficial uses, the Ocean Plan establishes water quality objectives and a program of implementation. Requirements of this Order implement the Ocean Plan.

M. Alaska Rule

On March 30, 2000, USEPA revised its regulation that specifies when new and revised State and Tribal water quality standards (WQS) become effective for CWA purposes (40 CFR section 131.21, 65 FR 24641, April 27, 2000). Under the revised regulation (also known as the Alaska rule), USEPA must approve new and revised standards submitted to USEPA after May 30, 2000, before being used for CWA purposes. The final rule also provides that standards already in effect and submitted to USEPA by May 30, 2000, may be used for CWA purposes, whether or not approved by USEPA.

N. Stringency of Requirements for Individual Pollutants

This Order contains technology-based effluent limitations for individual pollutants. The technology-based effluent limitations consist of restrictions on total residual chlorine and pH. Restrictions on total residual chlorine and pH are discussed in the Fact Sheet. This Order's technology-based pollutant restrictions implement the minimum, applicable federal technology-based requirements.

O. Antidegradation Policy

Section 131.12 of 40 CFR requires that State water quality standards include an antidegradation policy consistent with the federal policy. The State Board established California's antidegradation policy in State Board Resolution No. 68-16. Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The regional boards' Basin Plans implement, and incorporate by reference, both the State and federal antidegradation policies. As discussed in detail in the Fact Sheet, the permitted discharges are consistent with the antidegradation provision of 40 CFR section 131.12 and State Board Resolution No. 68-16.

P. Anti-Backsliding Requirements

Sections 402(o)(2) and 303(d)(4) of the CWA and federal regulations of 40 CFR section 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations may be relaxed. All effluent limitations in this Order are at least as stringent as the effluent limitations in the previous Order.

Q. Endangered Species Act

This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 U.S.C.A. sections 1531 to 1544). This Order requires compliance with effluent limits, receiving water limits, and other requirements to protect the beneficial uses of waters of the state. The Discharger is responsible for meeting all requirements of the applicable Endangered Species Act.

R. Monitoring and Reporting

Section 122.48 of 40 CFR requires that all NPDES permits specify requirements for recording and reporting monitoring results. Sections 13267 and 13383 of the CWC authorize the regional boards to require technical and monitoring reports. The Monitoring and Reporting Program (MRP) establishes monitoring and reporting requirements to implement federal and State requirements. This MRP is provided in Attachment E.

S. Standard and Special Provisions

Standard Provisions, which in accordance with 40 CFR sections 122.41 and 122.42 apply to all NPDES discharges and must be included in every NPDES permit, are provided in Attachment D. The San Diego Water Board has also included in this WDR special provisions applicable to the enrolled Dischargers. A rationale for the special provisions contained in this Order is provided in the attached Fact Sheet (Attachment F).

T. Provisions and Requirements Implementing State Law.

The provisions/requirements in subsections **<IV.A, IV.C, and IV.G >** of this Order are included to implement state law only. These provisions/requirements are not required or authorized under the federal CWA; consequently, violations of these provisions/requirements are not subject to the enforcement remedies that are available for NPDES violations.

U. Notification of Interested Parties

The San Diego Water Board has notified the Dischargers, interested agencies and persons of its intent to prescribe WDRs for these discharges, and has provided them with an opportunity to submit their written comments and recommendations. Notification details are provided in the Fact Sheet of this Order.

V. Consideration of Public Comment

The San Diego Water Board, in a public meeting, heard and considered all comments pertaining to the discharges. Details of the Public Hearing are provided in the Fact Sheet of this Order.

THEREFORE, IT IS HEREBY ORDERED, that this Order supersedes Order No. R9-2002-0020 except for enforcement purposes, and, in order to meet the provisions contained in division 7 of the Water Code (commencing with section 13000) and regulations adopted thereunder, and the provisions of the federal Clean Water Act (CWA) and regulations and guidelines adopted thereunder, the Discharger shall comply with the requirements in this Order.

IV. Discharge Prohibitions

A. The discharge of hydrostatic test and/or potable water to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in Water Code section 13050, is prohibited.

B. The discharge of hydrostatic test and/or potable water shall not cause, have a reasonable potential to cause, or contribute to exceedances of any applicable criterion promulgated by USEPA pursuant to section 303 of the CWA, or water quality objective adopted by the State or regional boards.

C. The discharge of hydrostatic test and/or potable water to areas designated by the State Board as being Areas of Special Biological Significance (ASBS) is prohibited. Discharges shall be located a sufficient distance from such designated areas to assure maintenance of natural water quality conditions in these areas.

D. The addition of pollutants to hydrostatic test and/or potable water discharges is prohibited, except where authorized by this permit.

E. The discharge of hydrostatic test and/or potable water to waters within the San Diego Region is prohibited unless an NOI has been submitted, and the San Diego Water Board has provided the Discharger with a written Notice of Enrollment identifying the discharge subject to waste discharge requirements.

F. Compliance with Discharge Prohibitions contained in the Basin Plan is required as a condition of this Order.

G. Discharges of hydrostatic test and/or potable water in a manner, or to a location which have not been specifically regulated by waste discharge requirements of this Order are prohibited.

H. The discharge of hydrostatic test and/or potable water that cause or contribute to the violation of water quality standards (designated beneficial uses and water quality objectives developed to protect beneficial uses) is prohibited.

V. Effluent Limitations

A. The discharge of Hydrostatic Test Water and/or Potable Water shall not contain constituents in excess of the following:

Table 6. Effluent Limitations

Parameter	Units	Effluent Limitation
Total Residual Chlorine	mg/L	0.1[1]
pH	Units	Within the limits of 6.0 and 9.0 at all times

1. Compliance with Effluent Limitation shall be determined as specified in Section VIII.A of this Order

B. Land Discharge Specifications (Not Applicable)

C. Reclamation Specifications (Not Applicable)

VI. Receiving Water Limitations

A. Surface Water Limitations

1. The discharge shall at all times be in conformance with applicable water quality standards, including but not limited to all applicable provisions contained in (1) the San Diego Water Board's *Water Quality Control Plan for the San Diego Basin* (Basin Plan), including beneficial uses, water quality objectives, and implementation plans; (2) State Water Board plans for water quality control including the (a) *Water Quality Control Plan For Control Of Temperature In The Coastal And Interstate Waters And Enclosed Bays And Estuaries (*Thermal Plan), and (b) the *California Ocean Plan* (Ocean Plan)*,* including beneficial uses, water quality objectives, and implementation plans*;* (3) State Water Board policies for water quality control including the (a) *Water Quality Control Policy for the Enclosed Bays and Estuaries of California,* (b) *Policy For Implementation Of Toxics Standards For Inland Surface Waters Enclosed Bays, and Estuaries Of California;* and *(c)* the *Statement of Policy with Respect to Maintaining High Quality of Waters in California* (State Water Board Resolution No. 68-16) *and (*4) priority pollutant criteria promulgated by the U.S. Environmental Protection Agency (U.S. EPA) through the (a) National Toxics Rule (NTR)[1] (promulgated on December 22, 1992 and amended on May 4, 1995) and (b) *California Toxics Rule* (CTR) [2]. [3]

2. The discharge shall not cause an excursion above any applicable narrative or numeric water quality objective contained in the Basin Plan, Thermal Plan, Ocean Plan or any applicable priority pollutant criteria promulgated by the U.S. Environmental Protection Agency (U.S. EPA) through the NTR or CTR.

B. Groundwater Limitations (Not Applicable)

[1] 40 CFR 131.36
[2] 65 Fed. Register 31682-31719 (May 18, 2000), adding Section 131.38 to 40 CFR
[3] If a water quality objective and a CTR criterion are in effect for the same priority pollutant, the more stringent of the two applies

VII. Provisions

A. Standard Provisions

1. The Discharger shall comply with all applicable Standard Provisions included in Attachment D of this Order.

2. San Diego Water Board Standard Provisions. The Discharger shall comply with the following provisions:

   a. The Discharger shall comply with all requirements and conditions of this Order. Any permit non-compliance constitutes a violation of the CWA and/or the CWC and is grounds for enforcement action, permit termination, revocation and reissuance, or modification, or for denial of an application for permit renewal, modification, or reissuance.

   b. The Discharger shall comply with all applicable federal, state, and local laws and regulations for handling, transport, treatment, or disposal of waste or the discharge of waste to waters of the state in a manner which causes or threatens to cause a condition of pollution, contamination or nuisance as those terms are defined in CWC 13050.

   c. No discharge of waste into waters of the state, whether or not the discharge is made pursuant to WDRs, shall create a vested right to continue the discharge. All discharges of waste into waters of the state are privileges, not rights.

   d. For the purposes of this Order, the term “permittee” used in parts of 40 CFR incorporated into this Order by reference and/or applicable to this Order shall have the same meaning as the term “Discharger” or “Enrollee” used elsewhere in this Order.

   e. This Order expires on October 31, 2015, after which, the terms and conditions of this Order are automatically continued pending issuance of a new WDR, provided that all requirements of USEPA’s NPDES regulations at 40 CFR 122.6 and the State’s regulations at CCR Title 23, Section 2235.4 regarding the continuation of expired Orders and waste discharge requirements are met.

   f. A copy of this Order shall be made available to all personnel/staff (including field staff) involved with the compliance of this Order.

   g. The Discharger shall comply with any interim limitations established by addendum, enforcement action, or revised waste discharge requirements that have been or may be adopted by the Regional Water Board.

   h. Failure to comply with provisions or requirements of this Order, or violation of other applicable laws or regulations governing discharges of Hydrostatic

and/or Potable Water, may subject the Discharger to administrative or civil liabilities, criminal penalties, and/or other enforcement remedies to ensure compliance. Additionally, certain violations may subject the Discharger to civil or criminal enforcement from appropriate local, state, or federal law enforcement entities.

i. In the event the Discharger does not comply or will be unable to comply for any reason, with any prohibition, effluent limitation, discharge specification, or receiving water limitation of this Order, the Discharger shall notify the San Diego Water Board by telephone (858) 467-2952 within 24 hours of having knowledge of such noncompliance, and shall confirm this notification in writing within five days, unless the San Diego Water Board waives confirmation. The written notification shall contain a description of the noncompliance and its cause; the period of non-compliance including exact dates and times, and if noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

j. The Discharger is required to retain records, including all monitoring information and copies of all reports required by this Order, for five years unless directed otherwise by the San Diego Water Board.

k. This Order may be modified, revoked and reissued, or terminated for cause due to promulgation of amended regulations, receipt of USEPA guidance concerning regulated activities, judicial decision, or in accordance with 40 Code of Federal Regulations (CFR) 122.62, 122.63, 122.64, and 124.5.

l. Enrollment in this Order is temporary. Dischargers enrolled in this Order planning to discharge hydrostatic test water and potable water discharges after the expiration date of October 31, 2015 may be subject to new prohibitions or requirements based on the re-issuance of this Order after October 31, 2015.

m. The enrollee shall take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this Order and the Notice of Enrollment from the San Diego Water Board, including such accelerated or additional monitoring as may be necessary to determine the nature, and effect of the non-complying discharge.

n. This Order or the Notice of Enrollment from the San Diego Water Board, may be modified, revoked and reissued, or terminated for cause including, but not limited to, the following:

(1) Violation of any terms or conditions of this Order or the Notice of Enrollment from the San Diego Water Board;

(2) Obtaining enrollment in this Order, or a Notice of Enrollment from the San Diego Water Board, by misrepresentation or failure to disclose fully all relevant facts;

(3) A change in any condition that requires either a temporary or permanent reduction or elimination of the discharge subject to waste discharge requirements; or

(4) A finding that monitoring "indicator" pollutants listed in this Order do not ensure compliance with water quality criteria or objectives for the pollutants expected to be represented by the "indicator" pollutants.

o. The filing of a request by the enrollee for modification, revocation and reissuance, or termination of this Order or an associated discharge Notice of Enrollment from the San Diego Water Board, or a notification of planned change in or anticipated noncompliance with this Order or discharge Notice of Enrollment does not stay any condition of this Order or the Notice of Enrollment from the San Diego Water Board.

p. Notwithstanding Provision 2.d above, if any applicable toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant and that standard or prohibition is more stringent than any limitation on the pollutant in this Order, the San Diego Water Board may institute proceedings under these regulations to modify or revoke and reissue this Order to conform to the toxic effluent standard or prohibition.

q. In addition to any other grounds specified herein, this Order or a Notice of Enrollment from the San Diego Water Board shall be modified or revoked at any time if, on the basis of any data, the San Diego Water Board determines that continued discharges may cause unreasonable degradation of the aquatic environment.

r. The San Diego Water Board or the Director of the USEPA may require any person requesting enrollment under this Order or subject to waste discharge requirements under this Order to apply for and obtain an individual NPDES permit. Cases where an individual NPDES permit may be required include but are not limited to those described in 40 CFR 122.28 (b)(3).

s. It shall not be a defense for the enrollee in an enforcement action that effluent limitation violations are a result of analytical variability rendering the results inaccurate. The validity of the testing results, whether or not the enrollee has monitored or sampled more frequently than required by this Order, shall not be a defense to an enforcement action.

t. The enrollee shall take all reasonable steps to minimize or prevent any discharge in violation of this Order which has a reasonable likelihood of adversely affecting human health or the environment.

u. For the purposes of this Order, the term permit, general permit, and WDR, shall have the same meaning as the term Order used elsewhere in this Order.

B. Monitoring and Reporting Program Requirements

The Discharger shall comply with the MRP, and future revisions thereto, in Attachment E of this Order.

C. Special Provisions

1. Reopener Provisions (Not Applicable)

2. Special Studies, Technical Reports and Additional Monitoring Requirements (Not Applicable)

3. Best Management Practices

   This Order contains requirements to reduce the discharge of pollutants, other than those that have effluent limitations in Section V.A of this Order, to the maximum extent practicable (MEP) for all discharges regardless of discharge volume. The Discharger has established a set of Best Management Practices (BMPs) that address discharges associated with hydrostatic test water and/or potable water, including unplanned discharges. The BMPs, established previously under Order No. R9-2002-0020, include source control BMPs to minimize contact between pollutants and flow (e.g. rerouting of flow to prevent the discharge, erosion, which can lead to sedimentation in discharge) as well as treatment control BMPs to remove pollutants present in the discharge water before it enters receiving waters, including storm drains and other conveyance systems. This Order requires Dischargers to re-evaluate their previously established BMPs to ensure the adequacy of compliance with this Order. Implementation of BMPs shall not interfere with necessary repair operations or impact public health and safety. A copy of the BMPs shall be submitted to the San Diego Water Board, if requested.

4. Compliance Schedules (Not Applicable)

5. Construction, Operation and Maintenance Specifications (Not Applicable)

6. Special Provisions for Municipal Facilities (POTWs Only) (Not Applicable)

7. Other Special Provisions (Not Applicable)

8. Regional Monitoring Program

The San Diego Water Board may, with cooperation of permit Enrollees and after due public notice, modify the Monitoring Program for Order No. R9-2010-0003 to enable the Discharger to participate in comprehensive regional monitoring activities conducted in the Southern California Bight during the term of this permit.

The San Diego Water Board may also, with cooperation of permit Enrollees and after due public notice, modify the Monitoring Program of Order No. R9-2010-0003 to enable the Discharger to participate in watershed monitoring, such as monitoring conducted by municipal separate storm water system (MS4) Dischargers and monitoring conducted as part of the Surface Water Ambient Monitoring Program (SWAMP). The Discharger may be required to participate and coordinate with State and local agencies and other Dischargers within the San Diego Region in development and implementation of a regional watershed monitoring program as directed by the Executive Officer.

The intent of a regional monitoring program is to maximize the efforts of all monitoring partners using a more cost effective monitoring design and to best utilize the pooled resources of the region. During a coordinated sampling effort, the Discharger's sampling and analytical effort may be reallocated to provide a regional assessment of the impact of the discharge of hydrostatic and/or potable water to the Southern California Bight or of the condition of the watersheds.

VIII. Compliance Determination

Compliance with the effluent limitations contained in Section V of this Order will be determined as specified below:

A. Effluent Limitation

Compliance with the effluent limitation shall be determined based on the 90th percentile of all samples obtained during the discharge event. Non-compliance for each event will be considered separately.

Attachment A – Definitions

Areas of Special Biological Significance (ASBS)
Those areas designated by the State Water Board as ocean areas requiring protection of species or biological communities to the extent that alteration of natural water quality is undesirable. All Areas of Special Biological Significance are also classified as a subset of STATE WATER QUALITY PROTECTION AREAS.

In the San Diego Region, Areas of Special Biological Significance include the following:

- La Jolla, San Diego County
- San Diego – Scripps, San Diego County
- Heisler Park, Orange County
- Irvine Coast, Orange County

Bioaccumulative Pollutants: those substances taken up by an organism from its surrounding medium through gill membranes, epithelial tissue, or from food and subsequently concentrated and retained in the body of the organism.

Carcinogenic Pollutants: substances that are known to cause cancer in living organisms.

Coefficient of Variation (*CV*): a measure of the data variability and is calculated as the estimated standard deviation divided by the arithmetic mean of the observed values.

Detected, but Not Quantified (DNQ): those sample results less than the Reporting Level (RL), but greater than or equal to the laboratory's Method Detection Limit (MDL).

Discharge Event: An activity resulting in a discharge to surface waters in the same vicinity and over a specified time period. For example, release of water from a 1-mile section of pipeline at various locations along the pipeline over a 3-day period is considered a single discharge event.

Enclosed Bays: indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost harbor works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays include, but are not limited to, Humboldt Bay, Bodega Harbor, Tomales Bay, Drake's Estero, San Francisco Bay, Morro Bay, Los Angeles-Long Beach Harbor, Upper and Lower Newport Bay, Mission Bay, and San Diego Bay. Enclosed bays do not include inland surface waters or ocean waters.

Estimated Chemical Concentration: the estimated chemical concentration that results from the confirmed detection of the substance by the analytical method below the Minimum Level value.

Estuaries: waters, including coastal lagoons, located at the mouths of streams that serve as areas of mixing for fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered

estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and seawater. Estuarine waters include~~d~~, but are not limited to, the Sacramento-San Joaquin Delta, as defined in Water Code section 12220, Suisun Bay, Carquinez Strait downstream to the Carquinez Bridge, and appropriate areas of the Smith, Mad, Eel, Noyo, Russian, Klamath, San Diego, and Otay rivers. Estuaries do not include inland surface waters or ocean waters.

Initial Dilution: the process which results in the rapid and irreversible turbulent mixing of wastewater with ocean water around the point of discharge. For a submerged buoyant discharge, characteristic of most municipal and industrial wastes that are released from the submarine outfalls, the momentum of the discharge and its initial buoyancy act together to produce turbulent mixing. Initial dilution in this case is completed when the diluting wastewater ceases to rise in the water column and first begins to spread horizontally.

For shallow water submerged discharges, surface discharges, and nonbuoyant discharges, characteristic of cooling water wastes and some individual discharges, turbulent mixing results primarily from the momentum of discharge. Initial dilution, in these cases, is considered to be completed when the momentum induced velocity of the discharge ceases to produce significant mixing of the waste, or the diluting plume reaches a fixed distance from the discharge to be specified by the San Diego Water Board, whichever results in the lower
estimate for initial dilution.

Inland Surface Waters: all surface waters of the State that do not include the ocean, enclosed bays, or estuaries. Inland surface water consist of freshwater and do not have any measurable salinity.

Instantaneous Maximum Effluent Limitation: the highest allowable value for any single grab sample or aliquot (i.e., each grab sample or aliquot is independently compared to the instantaneous maximum limitation).

Instantaneous Minimum Effluent Limitation: the lowest allowable value for any single grab sample or aliquot (i.e., each grab sample or aliquot is independently compared to the instantaneous minimum limitation).

Kelp Beds: for purposes of the bacteriological standards of the Ocean plan, are significant aggregations of marine algae of the genera Macrocystis and Nereocystis. Kelp beds include the total foliage canopy of Macrocystis and Nereocystis plants throughout the water column.

Method Detection Limit (MDL): the minimum concentration of a substance that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero, as defined in title 40 of the Code of Federal Regulations, Part 136, Attachment B, revised as of July 3, 1999.

Minimum Level (ML): the concentration at which the entire analytical system must give a recognizable signal and acceptable calibration point. The ML is the concentration in a

sample that is equivalent to the concentration of the lowest calibration standard analyzed by a specific analytical procedure, assuming that all the method specified sample weights, volumes, and processing steps have been followed.

Mixing Zone: A limited volume of receiving water that is allocated for mixing with a wastewater discharge where water quality criteria can be exceeded without causing adverse effects to the overall water body.

Natural Light: Reduction of natural light may be determined by the San Diego Water Board by measurement of light transmissivity or total irradiance, or both, according to the monitoring needs of the San Diego Water Board.

Not Detected (ND): those sample results less than the laboratory's MDL.

Notice of Enrollment: A notice from the San Diego Water Board to the Discharger that the NOI application has been accepted and the Discharge Event(s) is enrolled in this Order. The Notice of Enrollment will specify the discharge flow limit, any additional or increase in monitoring due to specific circumstances of the discharge, or other requirements.

Notice of Intent (NOI): A form completed and signed by a Discharger notifying the San Diego Water Board that the Discharger is applying for enrollment under the terms and conditions of the Order and will comply with the Order for hydrostatic and potable water discharge activity at various locations within the Dischargers jurisdiction or conveyance system.

Notice of Termination (NOT): A letter completed and signed by a Discharger notifying the San Diego Water Board that the Discharger no longer wishes to discharge under the Order. Submission of a NOT constitutes notice that the owner (and his/her agent) of the site identified on the letter has ceased discharge groundwater associated with groundwater extraction activities at the site under this Order.

Ocean Waters: the territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the State Board's California Ocean Plan.

Persistent pollutants: substances for which degradation or decomposition in the environment is nonexistent or very slow.

Potable Water: Water that is safe for drinking.

Public Water [Supply] System: A system for the provision to the public of piped water [provided] for human consumption through pipes or other constructed conveyances if such a system has at least fifteen service connections or regularly serves at least twenty-five individuals.

Raw water: Water that is taken from the environment with the intent to subsequently treat or purify to produce potable water.

Reporting Level (RL): the ML (and its associated analytical method) chosen by the Discharger for reporting and compliance determination from the MLs included in this WDR. The MLs included in this Order correspond to approved analytical methods for reporting a sample result that are selected by the San Diego Water Board either from Appendix 4 of the SIP in accordance with section 2.4.2 of the SIP, or established in accordance with section 2.4.3 of the SIP. The ML is based on the proper application of method-based analytical procedures for sample preparation and the absence of any matrix interferences. Other factors may be applied to the ML depending on the specific sample preparation steps employed. For example, the treatment typically applied in cases where there are matrix-effects is to dilute the sample or sample aliquot by a factor of ten. In such cases, this additional factor must be applied to the ML in the computation of the RL.

Shellfish: organisms identified by the California Department of Public Health as shellfish for public health purposes (i.e., mussels, clams and oysters).

Significant difference is defined as a statistically significant difference in the means of two distributions of sampling results at the 95 percent confidence level.

Source of Drinking Water: any water designated as municipal or domestic supply (MUN) in a regional board Basin Plan.

Waste: As defined in California Water Code section 13050(d), “Waste” includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal. Waste as used in the Ocean Plan, waste includes a Discharger’s total discharge, of whatever origin, i.e., gross, not net, discharge.

Water Transfer: an activity that conveys or connects waters of the United States without subjecting the transferred water to intervening industrial, municipal, or commercial use.

Waters of the State: any surface water or groundwater, including saline waters, within the boundaries of the state.

Waters of the United States or waters of the U.S.: (40 e-CFR 122.2, March 20, 2007) (a) All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate “wetlands;” (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, “wetlands,” sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purposes by

industries in interstate commerce; (d) All impoundments of waters otherwise defined as waters of the United States under this definition; (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial sea; and (g) “Wetlands” adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA (other than cooling ponds as defined in 40 CFR 423.11(m) which also meet the criteria of this definition) are not waters of the United States. This exclusion applies only to manmade bodies of water which neither were originally created in waters of the United States (such as disposal area in wetlands) nor resulted from the impoundment of waters of the United States. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with EPA.

Attachment B – Notice of Intent Form

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

NOTICE OF INTENT

TO COMPLY WITH THE TERMS AND CONDITIONS OF THE GENERAL WASTE DISCHARGE REQUIREMENTS FOR THE DISCHARGES OF HYDROSTATIC TEST WATER AND POTABLE WATER TO SURFACE WATERS AND STORM DRAINS OR OTHER CONVEYANCE SYSTEMS, SAN DIEGO REGION
(ORDER No. R9-2010-0003, NPDES NO. CAG679001)

I. Stipulation of Applicability and Certification

☐ **<AGENCY NAME>** has obtained and currently has a valid Water Supply permit from the California Department of Public Health or is a federal military installation

☐ **<AGENCY NAME>** has determined that the discharges of hydrostatic test water and potable water will be to surface waters within the San Diego Region and that any violation of effluent limitations will be subject to Mandatory Minimum Penalties under California Water Code section 13385(h) and (i).

☐ **<AGENCY NAME>** has determined that this discharge is eligible for enrollment in this General "Waste Discharge Requirements" (WDR or Order) and the discharge will comply with the Discharge Specifications of this Order.

☐ All other alternative methods of disposal, such as water conservation and reuse of water, have been explored and considered and determined to be economically infeasible.

☐ **<AGENCY NAME>** has read Order No. R9-2010-0003 and hereby certifies that:

1. **<AGENCY NAME>** understands the requirements of Order No. R9-2010-0003.
2. The enclosed information describing proposed discharges of hydrostatic test water and potable water is accurate and describes a discharge that meets the requirements of Order No. R9-2010-0003, which is the applicable general hydrostatic test water and potable water discharge permit.
3. **<AGENCY NAME>** will comply with all terms, conditions, and requirements of Order No. R9-2010-0003.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. In addition, I certify that the provisions of the permit, including the criteria for eligibility will be complied with.	
A. Printed Name:	
B. Signature*:	C. Date:
D. Agency and Title:	

* The appropriate person must sign the application form.
Acceptable signatures are:
1. for a corporation, a principal executive officer of at least the level of senior vice-president;
2. for a partnership or individual (sole proprietorship), a general partner or the proprietor;
3. for a governmental or public agency, either a principal executive officer or ranking elected/appointed official.

II. Items Required for Determining Eligibility

- ☐ A. A complete NOI
- ☐ B. First annual report in accordance with Section II.B.2 of this Order
- ☐ C. A map identifying agencies jurisdiction (overall areas where discharges could occur).
- ☐ D. Application fee (which is equal to the annual fee)

III. Reason For Filing

☐ New Discharge

☐ Change in Ownership/Operation*

☐ Update Contact Information*

☐ Other _____

* Complete Sections I, III, and IV-VII

IV. Contractor/Operator[1]

Name			
Mailing Address			
City	State	ZIP	Phone
Contact Person			
☐ Contractor	☐ Operator	☐ Contractor/Operator	

V. Property Owner[2]

Name			
Mailing Address			
City	State	ZIP	Phone
Contact Person			

VI. Responsible Party for Compliance with Order No. R9-2010-0003

☐ Same as Property Owner			
Name			
Mailing Address			
City	State	ZIP	Phone
Contact Person			

VII. Contact Information and Billing Address

Name			
Mailing Address			
City	State	ZIP	Phone
Contact Person			

[1] If additional contractors/operators are involved, provide the information in a supplementary attachment.
[2] If additional property owners are involved, provide the information in a supplementary attachment.

VIII. Discharge Information

A. Will treatment be required to meet the Discharge Specifications of this Order?

☐ Yes ☐ No

If Yes, describe.

_____

_____

IX. Application Fee

The initial fee and annual fee are based upon the type of pollutants to be discharged or potentially discharged.

Make checks payable to "State Water Resources Control Board" and include "Hydrostatic Test Water and Potable Water Discharges" in the "memo" field.

Category 3 Lowest Threat to Water Quality
Discharges that require minimal or no treatment systems to meet limits and pose no significant threat to the environment. (Current fee is $1,200 plus $252 surcharge = $1,452)

X. ANTIDEGRADATION POLICIES

A. ☐ Statement of compliance with 40 CFR 131.12 and State Water Resources Control Board Resolution No. 68-16 (attach) (collectively antidegradation policies)

40 CFR 131.12 Antidegradation policy.
(a) The State shall develop and adopt a statewide antidegradation policy and identify the methods for implementing such policy pursuant to this subpart. The antidegradation policy and implementation methods shall, at a minimum, be consistent with the following:
(1) Existing instream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected.
(2) Where the quality of the waters exceed levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water, that quality shall be maintained and protected unless the State finds, after full satisfaction of the intergovernmental coordination and public participation provisions of the State's continuing planning process, that allowing lower water quality is necessary to accommodate important economic or social development in the area in which the waters are located. In allowing such degradation or lower water quality, the State shall assure water quality adequate to protect existing uses fully. Further, the State shall assure that there shall be achieved the highest statutory and regulatory requirements for all new and existing point sources and all cost-effective and reasonable best management practices for nonpoint source control.
(3) Where high quality waters constitute an outstanding National resource, such as waters of National and State parks and wildlife refuges, and waters of exceptional recreational or ecological significance, that water quality shall be maintained and protected.
(4) In those cases where potential water quality impairment associated with a thermal discharge is involved, the antidegradation policy and implementing method shall be consistent with section 316 of the Act.

RESOLUTION NO, 68-16
STATEMENT OF POLICY WITH RESPECT TO MAINTAINING HIGH QUALITY OF WATERS IN CALIFORNIA
WHEREAS the California Legislature has declared that it is the policy of the State that the granting of permits and licenses for unappropriated water and the disposal of wastes into the waters of the State shall be so regulated as to achieve highest water quality consistent with maximum benefit to the people of the State and shall be controlled so as to promote the peace, health, safety and welfare of the people of the State; and
WHEREAS water quality control policies have been and are being adopted for waters of the State; and
WHEREAS the quality of some waters of the State is higher than that established by the adopted policies and it is the intent and purpose of this Board that such higher quality shall be maintained to the maximum extent possible consistent with the declaration of the Legislature;

NOW, THEREFORE, BE IT RESOLVED:
1. Whenever the existing quality of water is better than the quality established in policies as of the date on which such policies become effective, such existing high quality will be maintained until it has been demonstrated to the State that any change will be consistent with maximum benefit to the people of the State, will not unreasonably affect present and anticipated beneficial use of such water and will not result in water quality less than that prescribed in the policies.
2. Any activity which produces or may produce a waste or increased volume or concentration of waste and which discharges or proposes to discharge to existing high quality waters will be required to meet waste discharge requirements which will result in the best practicable treatment or control of the discharge necessary to assure that (a) a pollution or nuisance will not occur, and (b) the highest water quality consistent with maximum benefit to the people of the State will be maintained.
3. In implementing this policy, the Secretary of the Interior will be kept advised and will be provided with such information as he will need to discharge his responsibilities under the Federal Water Pollution Control Act.

BE IT FURTHER RESOLVED that a copy of this resolution be forwarded to the Secretary of the Interior as part of California's water quality control policy submission.
CERTIFICATION
The undersigned, Executive Officer of the State Water Resources Control Board, does hereby certify that the foregoing is a full, true, and correct copy of a resolution duly and regularly adopted at a meeting of the State Water Resources Control Board held on October 24, 1968.
Dated: October 28, 1968
Kerry W. Mulligan, Executive Officer
State Water Resources Control Board

XI. CALIFORNIA CONSTITUTION COMPLIANCE

A. ☐ Discuss the potential uses of the hydrostatic test water and potable water, efforts made to ensure use to the fullest extent possible and compliance with Article 10, Section 2 of the California Constitution (attach)

CALIFORNIA CONSTITUTION
ARTICLE 10 WATER
SEC. 2. It is hereby declared that because of the conditions prevailing in this State the general welfare requires that the water resources of the State be put to beneficial use to the fullest extent of which they are capable, and that the waste or unreasonable use or unreasonable method of use of water be prevented, and that the conservation of such waters is to be exercised with a view to the reasonable and beneficial use thereof in the interest of the people and for the public welfare. The right to water or to the use or flow of water in or from any natural stream or water course in this State is and shall be limited to such water as shall be reasonably required for the beneficial use to be served, and such right does not and shall not extend to the waste or unreasonable use or unreasonable method of use or unreasonable method of diversion of water. Riparian rights in a stream or water course attach to, but to no more than so much of the flow thereof as may be required or used consistently with this section, for the purposes for which such lands are, or may be made adaptable, in view of such reasonable and beneficial uses; provided, however, that nothing herein contained shall be construed as depriving any riparian owner of the reasonable use of water of the stream to which the owner's land is riparian under reasonable methods of diversion and use, or as depriving any appropriator of water to which the appropriator is lawfully entitled.

This section shall be self-executing, and the Legislature may also enact laws in the furtherance of the policy in this section contained.

Submit the NOI, first annual fee, map, and other attachments to the following address:

CRWQCB – San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123

Attn: Hydrostatic Test Water and Potable Water Discharges
Core Regulatory Unit
NOTICE OF INTENT

XII. STATE USE ONLY

WDID:	Staff Initials:	Status: ☐ Complete ☐ Incomplete ☐ Withdrawn
Date NOI Received:	Check #:	
Date NOI Processed:	Fee Amount Received: $	
Comments:		

Attachment C – (Not applicable)

Attachment D – Standard Provisions

I. Standard Provisions – Permit Compliance

A. Duty to Comply

1. The Discharger must comply with all of the conditions of this Order. Any noncompliance constitutes a violation of the Clean Water Act (CWA) and the California Water Code (CWC) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application [40 CFR §122.41(a)].

2. The Discharger shall comply with effluent standards or prohibitions established under section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if this Order has not been modified to incorporate the requirement [40 CFR §122.41(a)(1)].

B. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for a Discharger in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this Order [40 CFR §122.41(c)].

C. Duty to Mitigate

The Discharger shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this Order that has a reasonable likelihood of adversely affecting human health or the environment [40 CFR §122.41(d)].

D. Proper Operation and Maintenance

The Discharger shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Discharger to achieve compliance with the conditions of this Order. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems that are installed by a Discharger only when necessary to achieve compliance with the conditions of this Order [40 CFR §122.41(e)].

E. Property Rights

1. This Order does not convey any property rights of any sort or any exclusive privileges [40 CFR §122.41(g)].

2. The issuance of this Order does not authorize any injury to persons or property or invasion of other private rights, or any infringement of State or local law or regulations [40 CFR §122.5(c)].

F. Inspection and Entry

The Discharger shall allow the San Diego Water Board, State Water Board, United States Environmental Protection Agency (USEPA), and/or their authorized representatives (including an authorized contractor acting as their representative), upon the presentation of credentials and other documents, as may be required by law, to [40 CFR §122.41(i)] [CWC 13383(c)]:

1. Enter upon the Discharger's premises where a regulated facility or activity is located or conducted, or where records are kept under the conditions of this Order [40 CFR §122.41(i)(1)];

2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this Order [40 CFR §122.41(i)(2)];

3. Inspect and photograph, at reasonable times, any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Order [40 CFR §122.41(i)(3)];

4. Sample or monitor, at reasonable times, for the purposes of assuring Order compliance or as otherwise authorized by the CWA or the CWC, any substances or parameters at any location [40 CFR §122.41(i)(4)].

G. Bypass

1. Definitions

a. "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility [40 CFR §122.41(m)(1)(i)].

b. "Severe property damage" means substantial physical damage to property, damage to the treatment facilities, which causes them to become inoperable, or substantial and permanent loss of natural resources that can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production [40 CFR §122.41(m)(1)(ii)].

2. Bypass not exceeding limitations – The Discharger may allow any bypass to occur which does not cause exceedances of effluent limitations, but only if it is for essential maintenance to assure efficient operation. These bypasses

are not subject to the provisions listed in Standard Provisions – Permit Compliance I.G.3, I.G.4, and I.G.5 below [40 CFR §122.41(m)(2)].

3. Prohibition of bypass – Bypass is prohibited, and the San Diego Water Board may take enforcement action against a Discharger for bypass, unless [40 CFR §122.41(m)(4)(i)]:

a. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage [40 CFR §122.41(m)(4)(A)];

b. There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass that occurred during normal periods of equipment downtime or preventive maintenance [40 CFR §122.41(m)(4)(i)(B)]; and

c. The Discharger submitted notice to the San Diego Water Board as required under Standard Provision – Permit Compliance I.G.5 below [40 CFR §122.41(m)(4)(i)(C)].

4. The San Diego Water Board may approve an anticipated bypass, after considering its adverse effects, if the San Diego Water Board determines that it will meet the three conditions listed in Standard Provisions – Permit Compliance I.G.3 above [40 CFR §122.41(m)(4)(ii)].

5. Notice

a. Anticipated bypass. If the Discharger knows in advance of the need for a bypass, it shall submit a notice, if possible at least 10 days before the date of the bypass [40 CFR §122.41(m)(3)(i)].

b. Unanticipated bypass. The Discharger shall submit notice of an unanticipated bypass as required in Standard Provisions - Reporting V.E below (24-hour notice) [40 CFR §122.41(m)(3)(ii)].

H. Upset

Upset means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Discharger. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation [40 CFR §122.41(n)(1)].

1. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent

limitations if the requirements of paragraph H.2 of this section are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review [40 CFR §122.41(n)(2)].

2. **Conditions necessary for a demonstration of upset**. A Discharger who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs or other relevant evidence that [40 CFR §122.41(n)(3)]:

   a. An upset occurred and that the Discharger can identify the cause(s) of the upset [40 CFR §122.41(n)(3)(i)];

   b. The permitted facility was, at the time, being properly operated [40 CFR §122.41(n)(3)(ii)];

   c. The Discharger submitted notice of the upset as required in Standard Provisions – Reporting V.E.2.b below (24-hr notice) [40 CFR §122.41(n)(3)(iii)]; and

   d. The Discharger complied with any remedial measures required under Standard Provisions – Permit Compliance I.C above [40 CFR §122.41(n)(3)(iv)].

3. **Burden of proof.** In any enforcement proceeding, the Discharger seeking to establish the occurrence of an upset has the burden of proof [40 CFR §122.41(n)(4)].

II. Standard Provisions – Permit Action

A. General

This Order may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Discharger for modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any Order condition. [40 C.F.R. § 122.41(f)].

B. Duty to Reapply

If the Discharger wishes to continue an activity regulated by this Order after the expiration date of this Order, the Discharger must apply for and obtain a new permit [*40 CFR §122.41(b)*].

For the purposes of this General Order, if the Discharger wishes to continue an activity regulated by this Order after the expiration date of this Order, the Discharger may need to apply for and obtain authorization as required by the new permit.

C. Transfers

This Order is not transferable to any person except after notice to the San Diego Water Board. The San Diego Water Board may require modification or revocation and reissuance this Order to change the name of the Discharger and incorporate such other requirements as may be necessary under the CWA and the CWC [*40 CFR §122.41(l)(3)*] [*40 CFR §122.61*].

For the purposes of this General Order, a new owner or operator shall instead submit an NOI application to enroll in this Order and the previous owner or operator shall submit a NOT.

III. Standard Provisions – Monitoring

A. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity [40 CFR §122.41(j)(1)].

B. Monitoring results must be conducted according to test procedures under Part 136 or, in the case of sludge use or disposal, approved under Part 136 unless otherwise specified in Part 503 unless other test procedures have been specified in this Order [40 CFR §122.41(j)(4)] [40 CFR §122.44(i)(1)(iv)].

IV. Standard Provisions – Records

A. Except for records of monitoring information required by this Order related to the Discharger's sewage sludge use and disposal activities, which shall be retained for a period of at least five years (or longer as required by Part 503), the Discharger shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this Order, and records of all data used to complete the application for this Order, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board Executive Officer at any time [40 CFR §122.41(j)(2)].

For the purposes of this General Order, the Discharger shall maintain all records for a minimum of five years.

B. Records of monitoring information shall include:

1. The date, exact place, and time of sampling or measurements [40 CFR §122.41(j)(3)(i)];

2. The individual(s) who performed the sampling or measurements [40 CFR §122.41(j)(3)(ii)];

3. The date(s) analyses were performed [40 CFR §122.41(j)(3)(iii)];

4. The individual(s) who performed the analyses [40 CFR §122.41(j)(3)(iv)];

5. The analytical techniques or methods used [40 CFR §122.41(j)(3)(v)]; and

6. The results of such analyses [40 CFR §122.41(j)(3)(vi)].

C. Claims of confidentiality for the following information will be denied [40 CFR §122.7(b)]:

1. The name and address of any permit applicant or Discharger [40 CFR §122.7(b)(1)]; and

2. Permit applications and attachments, permits and effluent data [40 CFR §122.7(b)(2)].

V. Standard Provisions – Reporting

A. Duty to Provide Information

The Discharger shall furnish to the San Diego Water Board, State Board, or USEPA within a reasonable time, any information which the San Diego Water Board, State Board, or USEPA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this Order or to determine compliance with this Order. Upon request, the Discharger shall also furnish to the San Diego Water Board, State Board, or USEPA copies of records required to be kept by this Order [*40 CFR §122.41(h)*] [*CWC 13267*].

B. Signatory and Certification Requirements

1. All applications, reports, or information submitted to the San Diego Water Board, State Board, and/or USEPA shall be signed and certified in accordance with Standard Provisions – Reporting V.B.2, V.B.3, V.B.4, and V.B.5 below [40 CFR §122.41(k)].

2. All permit applications shall be signed as follows:

a. For a corporation: By a responsible corporate officer. For the purpose of this section, a responsible corporate officer means: (i) A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures [40 CFR §122.22(a)(1)];

b. For a partnership or sole proprietorship: by a general partner or the proprietor, respectively [40 CFR §122.22(a)(2)]; or

c. For a municipality, State, federal, or other public agency: by either a principal executive officer or ranking elected official. For purposes of this provision, a principal executive officer of a federal agency includes: (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrators of USEPA) [40 CFR §122.22(a)(3)].

3. All reports required by this Order and other information requested by the San Diego Water Board, State Board, or USEPA shall be signed by a person described in paragraph (B.2) of this provision, or by a duly authorized representative of that person. A person is a duly authorized representative only if:

a. The authorization is made in writing by a person described in paragraph (B.2) of this provision [40 CFR §122.22(b)(1)];

b. The authorization specified either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company (a duly authorized representative may thus be either a named individual or any individual occupying a named position) [40 CFR §122.22(b)(2)]; and

c. The written authorization is submitted to the San Diego Water Board, State Board, or USEPA [40 CFR §122.22(b)(3)].

4. If an authorization under Standard Provisions – Reporting V.B.3 above is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of Standard Provisions - Reporting V.B.3 above must be submitted to the San Diego Water Board, State Board or USEPA prior to or together with any reports, information, or applications, to be signed by an authorized representative [40 CFR §122.22(c)].

5. Any person signing a document under Standard Provisions – Reporting V.B.2 or V.B.3 above shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations" [*40 CFR §122.22(d)*].

C. Monitoring Reports

1. Monitoring results shall be reported at the intervals specified in the Monitoring and Reporting Program (Attachment E) in this Order [40 CFR §122.41(l)(4)].

2. Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the San Diego Water Board or State Board for reporting results of monitoring of sludge use or disposal practices [40 CFR §122.41(l)(4)(i)].

3. If the Discharger monitors any pollutant more frequently than required by this Order using test procedures approved under Part 136 or, in the case of sludge use or disposal, approved under Part 136 unless otherwise specified in Part 503, or as specified in this Order, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the San Diego Water Board [40 CFR §122.41(l)(4)(ii)].

4. Calculations for all limitations, which require averaging of measurements, shall utilize an arithmetic mean unless otherwise specified in this Order [40 CFR §122.41(l)(4)(iii)].

D. Compliance Schedules

Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this Order, shall be submitted no later than 14 days following each schedule date [*40 CFR §122.41(l)(5)*].

E. Twenty-Four Hour Reporting

1. The Discharger shall report any noncompliance that may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the Discharger becomes aware of the circumstances. A written submission shall also be provided within five (5) days of the time the Discharger becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance [40 CFR §122.41(l)(6)(i)].

2. The following shall be included as information that must be reported within 24 hours under this paragraph [40 CFR §122.41(l)(6)(ii)]:

a. Any unanticipated bypass that exceeds any effluent limitation in this Order [40 CFR §122.41(l)(6)(ii)(A)].

b. Any upset that exceeds any effluent limitation in this Order [40 CFR §122.41(l)(6)(ii)(B)].

c. Violation of a maximum daily discharge limitation for any of the pollutants listed in this Order to be reported within 24 hours [40 CFR §122.41(l)(6)(ii)(C)].

3. The San Diego Water Board may waive the above-required written report under this provision on a case-by-case basis if an oral report has been received within 24 hours [40 CFR §122.41(l)(6)(iii)].

F. Planned Changes

The Discharger shall give notice to the San Diego Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required under this provision only when [40 CFR §122.41(l)(1)]:

1. The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR §122.29(b) [40 CFR §122.41(l)(1)(i)]; or

2. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants that are not subject to effluent limitations in this Order. [40 CFR §122.41(l)(1)(ii)];

3. The alteration or addition results in a significant change in the Discharger's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan [40 CFR §122.41(l)(1)(iii)].

G. Anticipated Noncompliance

The Discharger shall give advance notice to the San Diego Water Board or State Board of any planned changes in the permitted facility or activity that may result in noncompliance with General Order requirements [40 CFR §122.41(l)(2)].

H. Other Noncompliance

The Discharger shall report all instances of noncompliance not reported under Standard Provisions – Reporting V.C, V.D, and V.E at the time monitoring reports are submitted. The reports shall contain the information listed in Standard Provision – Reporting V.E above [40 CFR §122.41(l)(7)].

I. Other Information

When the Discharger becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the San Diego Water Board, State Board, or USEPA, the Discharger shall promptly submit such facts or information [*40 CFR §122.41(l)(8)*].

VI. Standard Provisions – Enforcement

A. The San Diego Water Board is authorized to enforce the terms of this permit under several provisions of the Water Code, including, but not limited to, sections 13385, 13386, and 13387

VII. Additional Provisions – Notification Levels –N/A

Attachment E – Monitoring and Reporting Program (MRP)

Title 40 of the Code of Federal Regulations (CFR) section 122.48 requires that all National Pollutant Discharge Elimination System (NPDES) permits specify monitoring and reporting requirements. California Water Code sections 13267 and 13383 also authorize the California Regional Water Quality Control Board (San Diego Water Board) to require technical and monitoring reports. This Order establishes monitoring and reporting requirements, which implement the federal and California regulations.

I. GENERAL MONITORING PROVISIONS

A. Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge. Another waste stream, body of water, or substance shall not dilute the monitored discharge.

B. Monitoring must be conducted according to USEPA test procedures approved under 40 CFR section 136, Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act as amended, unless other test procedures are specified in this Order and/or by the appropriate San Diego Water Board. Monitoring for total residual chlorine, total dissolved solids, temperature, and pH may done using an appropriate field measurement device.

C. If the Discharger monitors any pollutant more frequently than required by this Order using test procedures approved under 40 CFR section 136, or as specified in this Order or by the appropriate San Diego Water Board, the results of the monitoring shall be included in the calculation and reporting of the data submitted in the Discharger's Annual Report. The increased frequency of monitoring shall also be reported.

D. Calculations for all limitations, which require averaging of measurements, shall utilize an arithmetic mean unless otherwise specified in this Order.

E. Use of flow measurement devices and methods shall be consistent with industry practices. All monitoring instruments and devices used by the Discharger to fulfill the monitoring program shall be properly maintained and calibrated to ensure reliability and accuracy.

F. If laboratory services are used, records and monitoring information shall include:

1. The date, exact location, and time of sampling or measurements;
2. The name(s) of individual(s) who performed the sampling or measurements;
3. The date(s) analysis were performed;
4. The name(s) of the laboratory and individual(s) who performed the analyses;
5. The analytical techniques or methods used; and
6. The results of such analyses

II. MONITORING LOCATIONS

The Discharger shall establish monitoring locations, for each discharge event, to demonstrate compliance with effluent limitations, discharge specifications, and other requirements in this Order.

III. INFLUENT MONITORING REQUIREMENTS- NOT APPLICABLE

IV. EFFLUENT MONITORING REQUIREMENTS

A. Additional monitoring for individual discharges may be required, where necessary, to show that during the term of the discharge, applicable water quality objectives will be maintained.

B. Discharge Monitoring

Discharge monitoring shall be conducted as follows:

Table E-1 Distribution System Monitoring[1]

CONSTITUENTS	UNITS[2]	SAMPLE TYPE[3]	FREQUENCY OF REPORTING
Total Dissolved[4] Solids (TDS)	mg/l	Annual average of Grab Samples	Annual

1. Samples may be obtained at Water Treatment Plant.
2. mg/l = milligram per liter
3 A grab sample is an individual sample of at least 200 milliliters collected over a period not exceeding 15 minutes.
4 Conductivity measurements can be used to show compliance with Order No. R9-2010-0003 (0.67 mg/L TDS contribute to 1 microsiemens per centimeter)

Table E-2 Effluent Monitoring for Discharge Events

CONSTITUENTS	UNITS[1]	TYPE[2]	FREQUENCY OF MONITORING[4]
Flow[3]	GPD	N/A	Daily
Total Residual Chlorine	mg/l	Field Sample	During the first 30 minutes of each discharge and as necessary thereafter to determine compliance with the effluent limitations of this Order
pH	Units	Field Sample	“

1 GPD = gallons per day, mg/l = milligrams per liter
2 A field sample is an individual sample collected at the location of discharge and analyzed immediately upon collection.
3 A daily flow log shall be maintained indicating the daily volume (gallons per day) of waste discharged.
4. During periods of extended discharges, no more than one analysis per week (7 days) is required

Laboratories analyzing monitoring samples shall be certified by the Department of Public Health, in accordance with the provision of Water Code Section 13176, and must include quality assurance/quality control data with their reports.

The results of such analysis shall be reported in the annual report. If a Discharger monitors the above constituents more frequently than required by this Order, then the results of such monitoring shall be included in the calculation and reporting of the data submitted in the annual report.

C. The Discharger shall retain records of all monitoring information, including all calibration and maintenance records and continuous monitoring data, copies of all reports and supporting documentation required by this Order, and records of all data used to complete the application for this Order, for a period of at least five years from the date of the sample, measurement, report, or application. This period may be extended by request of this San Diego Water Board. These records shall include:

1. The date, place, and time of site inspections, sampling, visual observation, and/or measurement;
2. The individual(s) who performed the site inspections, sampling, visual observations, and/or measurements;
3. Flow measurements (if required) and duration of discharge;
4. The estimated volume of discharge;
5. The date and time of analyses;
6. The laboratory, staff, or wholesaler who performed the analyses; and
7. Analytical results.

V. WHOLE EFFLUENT TOXICITY TESTING REQUIREMENTS- NOT APPLICABLE

VI. LAND DISCHARGE MONITORING REQUIREMENTS- NOT APPLICABLE

VII. RECLAMATION MONITORING REQUIREMENTS - NOT APPLICABLE

VIII. RECEIVING WATER MONITORING REQUIREMENTS – SURFACE WATER

A. Receiving water monitoring shall apply to discharges directly into a receiving water and consist of visual observations for clarity, erosion, and sedimentation within one hour after each discharge event, at the point of discharge. Receiving water monitoring shall also include measurements of turbidity and temperature 100 feet upstream and 100 feet downstream of the discharge point. The Discharger shall also discuss any turbidity plumes created by the discharge including a description (e.g. color, extent, duration, etc.) of any turbidity plumes.

Table E-3 Receiving Water Monitoring

VISUAL OBSERVATIONS	POINT OF DISCHARGE	100-FT UP-STREAM	100-FT DOWN-STREAM
Turbidity	Within 1 hour after discharge event	Within 1 hour after discharge event	Within 1 hour after discharge event
Erosion	"	"	"
Sedimentation	"	"	"

B. Additional receiving water monitoring for individual Dischargers may be required, where necessary, to show that during the term of the discharge, applicable surface water quality objectives will be maintained.

IX. OTHER MONITORING REQUIREMENTS

CTR and Ocean Plan Monitoring

Reporting requirements for the data to be submitted are listed below.

Table E-4 CTR and Ocean Plan Monitoring[1]

Parameter	Units	Sample Type	Minimum Sampling Frequency	Sampling Method
CTR Priority Pollutants	µg/L	Grab	1/year	[2]
OCEAN PLAN TABLE B PARAMETERS FOR PROTECTION OF MARINE AQUATIC LIFE				
Ammonia Nitrogen, Total (as N)	µg/L	Grab	1/year	[2]
Phenolic Compounds (nonchlorinated)	µg/L	Grab	1/year	[2]
Phenolic Compounds (chlorinated)	µg/L	Grab	1/year	[2]
HCH[6]	µg/L	Grab	1/year	[2]
Radioactivity	pci/l	Grab	1/year	[2]
OCEAN PLAN TABLE B PARAMETERS FOR PROTECTION OF HUMAN HEALTH – NON CARCINOGENS				
Tributyltin	µg/L	Grab	1/year	[2]
OCEAN PLAN TABLE B PARAMETERS FOR PROTECTION OF HUMAN HEALTH – CARCINOGENS				
1,3-dichloropropene	µg/L	Grab	1/year	[2]
Halomethanes	µg/L	Grab	1/year	[2]
PAHs	µg/L	Grab	1/year	[2]
TCDD equivalents	µg/L	Grab	1/year	[2]

1. Monitoring to be conducted on water obtained from MWD by San Diego County Water Authority (SDCWA).
2. Enrollees may use approved test methods for drinking water analysis in accordance with 40 CFR Part 141 if the methods are substantially equivalent to the Methods in 40 CFR Part 136 in both precision and accuracy as it relates to the determination of compliance with CTR and Ocean Plan objectives.

X. REPORTING REQUIREMENTS

A monitoring report shall be submitted annually to the San Diego Water Board in accordance with the schedule in Section X.H.3 of the Monitoring and Reporting Program. The report shall include the following sections:

A. Past Discharge Events

The report shall include a summary of all discharge events that (a) exceeded 1 acre-ft/day (325,850 gallons/day), including unplanned discharge events, and (b) were less than 1 acre-ft/day (325,850 gallons/day) and did not meet the exemption criteria in Section III.B of this Order, that occurred during the reporting period. The report shall include, at a minimum, the following information:

1. Date and duration of discharge;
2. Location of discharge;
3. The average flow rate (in gallons per minute, GPM);
4. Total discharge flow volume; (in gallons)
5. The affected receiving water or the location of the MS4 storm drain;
6. The extent of sedimentation and erosion as a result of the discharge (if applicable);
7. Reason for the discharge; and
8. Results of any sampling conducted;

B. System Wide Summary

The summary shall include, at a minimum, the following:

1. Total volume of water distributed by the agency;
2. Total volume of water discharged from planned discharges; and
3. Total volume of water discharged from un-planned discharges.

C. Scheduled Discharge Events

The report shall include a summary of all discharge events proposed over the next fiscal year that exceed 1 acre-ft/day (325,850 gallons/day). The report shall include, at a minimum, the following:

1. Reason for the proposed discharge;
2. The proposed discharge date and amount (in gallons per day);
3. The duration of the proposed discharge;
4. The affected receiving water or the location of the MS4 storm drain; and
5. Dechlorination method (if applicable).

A Windows XP compatible compact disc (CD) shall also be submitted containing the data described above for the fiscal year. The disk shall be labeled with the Discharger's name, Monitoring and Reporting Program No. R9-2010-0003, NPDES No. CAG679001, and the fiscal year. The information submitted shall be fully compatible with Microsoft EXCEL version 2003. In order to safeguard the integrity of the information submitted on disk against errors caused by accidental changes, all information should be write protected. This can be done with Microsoft EXCEL version 2003 by choosing "Protection" from Tools Menu, and choosing "Protect Sheet". If more than one sheet is created, protect every sheet with the same password. Any form of data protection may be used which will allow San Diego Water Board staff to open the file and copy the data to a new file. This procedure will safeguard the integrity of information submitted on computer disk to the San Diego Water Board. An EXCEL template of the database will be provided by the San Diego Water Board before the first annual report is due.

D. One week prior to any planned discharge (greater than 1 acre-ft/day) from a location not yet reported, the discharger shall notify the San Diego Water Board staff by phone, fax or email indicating the following:

1. Characterization of the proposed discharge;
2. Location of the discharge;
3. The estimated average and maximum daily flow rates;
4. The frequency and duration of the discharge;
5. The affected receiving water(s);
6. A description of the proposed dechlorination method (if appropriate);

E. Unplanned Discharges. A report shall be submitted for all emergency discharges meeting any one of the following:

- Discharge is greater than 1 acre-ft/day;
- Any amount if the discharge causes or contributes to an impairment of the beneficial use of the receiving water (i.e. such as a fish kill).

The report shall be submitted within 24 hours after the Discharger becomes aware of the release and shall include, at a minimum, the following:

1. Date, time, and duration of discharge;
2. Location of discharge;
3. Discharged volume (GPD);
4. Affected receiving water; and
5. Extent of sedimentation and erosion as a result of the discharge.

When reporting emergencies, the Discharger shall include pictures of the affected receiving water (if applicable) and areas in which sedimentation and erosion have occurred (if applicable).

F. General Monitoring and Reporting Requirements

1. The Enrollee shall give advance notice to the San Diego Water Board of any planned changes in the permitted facility or activity that may result in non compliance with the requirements of this Order or the Enrollment Letter.

2. Reports for annual proposed discharges, as described in Section X.B of the MRP, shall be submitted on an annual basis (per fiscal year) starting with the initial application for enrollment.

3. All reports submitted in response to this Order shall comply with signatory requirements set forth in the Standard Provisions.

G. Self Monitoring Reports (SMRs) to State and San Diego Water Board

1. At any time during the term of this permit, the State or San Diego Water Board may notify the Discharger to electronically submit Self-Monitoring Reports (SMRs) using the State Board's California Integrated Water Quality System (CIWQS) Program Web site (http://www.waterboards.ca.gov/ciwqs/index.html). Until such notification is given, the Discharger shall submit hard copy SMRs The CIWQS Web site will provide additional directions for SMR submittal in the event there will be service interruption for electronic submittal.

2. The Discharger shall submit annual monitoring results to the San Diego Water Board in accordance with the due date specified below. The Discharger shall submit annual SMRs including the results of all required monitoring using USEPA-approved test methods or other test methods specified in this Order. If the Discharger monitors any pollutant more frequently than required by this Order, the results of this monitoring shall be included in the calculations and reporting of the data submitted in the SMR.

3. Monitoring periods and reporting for all required monitoring shall be completed in accordance with the following schedule:

Table E-8. Monitoring Periods and Reporting Schedule

Sampling Frequency	Monitoring For this Order Begins On	Monitoring Period	SMR Due Date
Each discharge event not exempt from the MRP	September 1, 2010	July 1 through June 30	**30 days from the end of the monitoring period**

4. The Discharger shall submit SMRs in accordance with the following requirements:

   a. The Discharger shall arrange all reported data in a tabular format. The data shall be summarized to clearly illustrate whether the discharge is in compliance with effluent limitations. The Discharger is not required to duplicate the submittal of data that are entered in a tabular format within CIWQS. When electronic submittal of data is required and CIWQS does not provide for entry into a tabular format within the system, the Discharger shall electronically submit the data in a tabular format as an attachment. An Excel template will be provided by the San Diego Water Board before the first annual report is due.

   b. The Discharger shall attach a cover letter to the SMR. The information contained in the cover letter shall clearly identify violations of this Order; discuss corrective actions taken or planned; and the proposed time schedule for corrective actions. Identified violations must include a description of the requirement that was violated and a description of the violation.

   c. SMRs must be submitted to the appropriate San Diego Water Board, signed and certified as required by the Standard Provisions (Attachment D).

H. Self-Monitoring Reports (SMRs) to EPA

When requested by USEPA, the Discharger shall also complete and submit Self-Monitoring Reports to USEPA. The submittal date shall be specified in the request.

I. Other Reports (Not Applicable)

Attachment F – Fact Sheet

As described in section III of this Order, this Fact Sheet includes the legal requirements and technical rationale that serve as the basis for the requirements of this Order.

I. DISCHARGE INFORMATION

A. Introduction

Potable water supply in southern California is provided through a complex distribution system that is operated by many different institutional entities. The major water sources for southern California are the northern California State Water Project and the Colorado River. Drinking water is usually a blend from both sources to help reduce the concentration of total dissolved solids (TDS), which is found to be in high concentrations in Colorado River water. Metropolitan Water District (MWD) is the primary wholesale provider of the imported water in the San Diego Region. MWD serves 26 member agencies, comprising 14 cities, 11 municipal water districts, and 1 county authority. The county authority is operating in San Diego County [San Diego County Water Authority (SDCWA)]. Riverside County's main water suppliers are Eastern and Western Municipal Water District, both member agencies of MWD. The Municipal Water District of Orange County supplies the part of Orange County that is located in the San Diego Region, and is also a member agency of MWD.

Water distributors (also called purveyors), water districts, and municipalities, have to conduct periodic repair and maintenance work on their distribution system, which usually results in discharges of potable water to various receiving waters within the San Diego Region. Repair and maintenance work may include water line draining for addition of new service connections, draining for internal inspections, draining for valve replacements, or water line flushing for water quality reasons.

Water purveyors, water districts, and municipalities, may also conduct hydrostatic testing on pipelines, tanks, and vessels dedicated to drinking water purveyance and storage and have a need to dispose of this test water to surface waters.

All the above mentioned discharges can be categorized as waste, pursuant to Porter-Cologne Water Quality Control Act (Chapter 2, Section 13050), since the water is discharged for the purpose of disposal and not reused for beneficial purposes.

On average, the San Diego County Water Authority discharges approximately 40-60 million gallons of potable water each year during basic repair and maintenance projects. Discharges from water districts and municipalities are usually less than 20 million gallons each year and are the result of fire hydrant flushing, water quality flushing, water line breaks and leaks, etc.

Certain pollutants potentially contained in potable water and/or hydrostatic test water discharges threaten to cause or contributes to excursions above narrative and numeric water quality objectives contained in state and federal regulations. These types of discharges could therefore pose a chronic or acute toxicity risk to freshwater and saltwater aquatic animal and plant life. For example, hydrostatic testing of pipelines, tanks, etc., often results in a discharge of super-chlorinated water that is needed for the initial disinfection. Super-chlorinated water can have a chlorine concentration of more than 25 milligrams per liter (mg/L). In drinking water, the Maximum Disinfecting Residual Level (MDRL) is set by the Department of Public Health and is to be no more than 4 mg/L. Typically, the chlorine concentration in drinking water ranges from 0.5 - 2.5 mg/L. However, the acute sensitivity of freshwater species, when exposed to total residual chlorine, ranges from 0.028 mg/L to 0.7 mg/L (*Quality Criteria for Water, 1986)*. Other pollutants of concern include TDS and total suspended solids.

In order to minimize potential impacts from hydrostatic test water and potable water discharges on the beneficial uses of surface waters within the San Diego Region, Order No. R9-2010-0003 requires the application of best available technology economically achievable (BAT) for the removal of pollutants commonly found in potable water and/or hydrostatic test water discharges. The discharges of these pollutants, in compliance with BAT-based effluent limitations, are not expected to have a significant impact on the beneficial uses of surface waters within the San Diego Region.

This Order establishes requirements regulating the discharge of hydrostatic test water and/or potable from public water purveyors into surface waters within San Diego County and tributaries and storm drains or other conveyance systems tributary thereto.

For the purposes of this Order, references to the “Discharger” or “permittee” in applicable federal and state laws, regulations, plans, or policy are held to be equivalent to references to the Discharger herein.

B. Background

In 1972, the Federal Water Pollution Control Act, currently referred to as the Federal Clean Water Act (CWA), was amended to provide that the discharge of pollutants to waters of the United States from any point source is prohibited, unless the discharge is in compliance with a National Pollutant Discharge Elimination System (NPDES) permit. The federal regulations allow authorized states to issue either general permits or individual permits to regulate discharges of pollutants to waters of the United States.

On August 14, 2002, the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) issued a general permit for discharges of hydrostatic test water and potable water to surface waters and other conveyance

systems within the San Diego Region (Order No. R9-2002-0020). The permit expired on August 14, 2007. The terms and conditions of the current Order have been administratively extended and remain in effect until new Waste Discharge Requirements and NPDES permit are adopted pursuant to this Order.

C. Discharge Description

Existing and proposed discharges of hydrostatic test water and potable water to various receiving waters within the San Diego Region. The San Diego Region covers a large portion of San Diego County, the southwestern portion of Orange County, and the southwestern portion of Riverside County based on hydrologic drainage areas.

Hydrostatic test water discharges are those discharges resulting from testing of pipelines, tanks, and vessels that are dedicated to drinking water purveyance and storage.

Potable water discharges include discharges resulting from repair, maintenance, and disinfection of pipelines, tanks, vessels, and reservoirs dedicated to drinking water purveyance and storage.

On June 13, 2008 EPA issued a regulation to clarify that water transfers are not subject to regulation under the NPDES permitting program, so long as pollutants are not introduced by the water transfer activity itself. The Water Transfers Rule defines water transfers as an activity that conveys or connects waters of the United States without subjecting the transferred water to intervening industrial, municipal, or commercial use. This permit does not apply to water transfers.

Discharges associated with potable water well drilling, construction, development, potable well redevelopment, potable well rehabilitation, potable well purging, and aquifer testing will no longer be covered under this Order. These discharges may be covered under General Order No.'s R9-2007-0034, NPDES No. CAG919001 or R9-2008-0002, NPDES No. CAG919002 (General Groundwater Dewatering Permits).

Discharges from private entities are no longer covered under this Order. The San Diego Water Board intends to draft a general permit for low threat discharges in the future. The general permit for low threat dischargers is intended to cover private entities that discharge hydrostatic and/or potable water, testing of newly constructed non-drinking water pipelines, tanks, and vessels, and may cover discharges associated with potable water well drilling, construction, development, potable well redevelopment, potable well rehabilitation, potable well purging, and aquifer testing.

Discharges less than 1 acre-ft/day (325,850 gallons/day) are exempt from Section X (Reporting Requirements) of the Monitoring and Reporting Program if the

discharge is directly into an MS4 drain or the discharge is into a dry/seasonal stream (blue-line streams shown on USGS topographic maps), creek, river, etc. but will percolate and/or evaporate prior to reaching any surface water that is present downstream. All discharges are subject to the implementation of BMPs.

II. PERMIT INFORMATION

This Order supersedes Order No. R9-2002-0020 and covers discharges of hydrostatic test water and potable water to surface waters within the San Diego Region. Dischargers previously enrolled under Order No. R9-2002-0020, with the exception of private entities, will be automatically enrolled under this permit unless the San Diego Water Board receives a written Notice of Termination (NOT) from the Discharger certifying permit overage is no longer necessary. Existing Dischargers shall submit updated contact information to the San Diego Water Board within 60 days after adoption of this Order.

All new Dischargers shall submit an application for the proposed discharge at least 60 days before the start of the new discharge. Details on permit coverage and the application process are discussed in detail on the following sections.

A. Eligibility Criteria

To be authorized by this General Order, Dischargers must have been issued a water supply permit by the California Department of Public Health, or is a federal military installation, and must demonstrate that the discharge or proposed discharge meets the following criteria:

1. Pollutant concentrations in the discharge shall not cause violation of any applicable water quality objective for the receiving waters, including Discharge Specifications of this WDR.

2. The discharge shall not cause acute or chronic toxicity in receiving waters;

3. The discharge shall need minimal or no waste treatment systems to meet the requirements of this Order. De-chlorination is considered to be “minimal treatment”.

4. The Discharger has explored and considered alternative methods of disposal, such as water conservation, reuse of water and groundwater recharge, and has determined no feasible or economical alternative method of disposal exist. Pursuant to Section 2 of Article X of the California Constitution, water resources of the State shall be put to beneficial use to the fullest extent of which they are capable.

B. Enrollment

Each of the persons listed below have been issued a water supply permit by the California Department of Public Health, or is a federal military installation, and owns or operates potable water distribution facilities and have a potential to discharge hydrostatic test water and/or potable water to waters of the United States within the San Diego Region and thus require enrollment under this Order:

Table F-1. Water Distributors, Water Districts, Municipalities, and Private Entities in the San Diego Region*

Cal-Am Water	Padre Dam Municipal Water District
Carlsbad Municipal Water District	Rainbow Municipal Water District
City of Del Mar	Ramona Municipal Water District
City of Escondido	Rancho California Water District
City of Oceanside	Rancho Pauma Mutual Water Company
City of Poway	Rincon Del Diablo Municipal Water District
City of San Diego	San Diego County Water Authority
Eastern Municipal Water District	San Dieguito Water District
El Toro Water District	Santa Fe Irrigation District
Elsinore Valley Municipal Water District	Santa Margarita Water District
Fallbrook Public Utility District	South Coast Water District
Helix Water District	Sweetwater Authority
Irvine Ranch Water District	Valley Center Municipal Water District
Laguna Beach County Water District	Vallecitos Water District
Lakeside Water District	Vista Irrigation District
Metropolitan Water District of Southern California	Marine Corps Base Camp Pendleton
Moulton Nigel Water District	US Navy Public Works
Olivenhain Municipal Water District	Western Municipal Water District
Otay Water District	Yuima Municipal Water District

*Other persons may be added at the discretion of the San Diego Water Board.

To obtain coverage under this Order a Discharger must submit the following to the San Diego Water Board:

1. A Notice of Intent (NOI) at least 60 days before the planned commencement of discharge (see Attachment B).

2. A report for each discharge event proposed during the fiscal year that is expected to result in a discharge of 1 acre-ft/day (325,850 gallons/day) or

greater. The reports should include, at a minimum, the following:

a. Description of the proposed discharge (i.e. repair of potable water line, maintenance, etc.);
b. The proposed discharge date and amount (in gallons per day);
c. The duration of the proposed discharge;
d. The affected receiving water or the location of the MS4 storm drain;
e. Dechlorination method (if applicable); and
f. A map showing the agencies jurisdiction (overall areas where discharges could occur).

3. Payment of the application fee, equal to the first annual fee, made payable to State Water Resources Control Board or "SWRCB."

The WDR NOI, including, the application fee, and other attachments, must be submitted to the following address:

CRWQCB – San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123

Attn: Hydrostatic Test Water and Potable Water Discharges
Core Regulatory Unit
NOTICE OF INTENT

C. Coverage

Coverage will be effective when all of the following have occurred:

1. The Discharger has submitted a complete NOI application, as determined by the San Diego Water Board; and

2. The San Diego Water Board issues the Discharger a Notice of Enrollment, which may include additional or increase monitoring due to specific circumstances of the discharge, and any other additional requirements. Pursuant to the State of California Discharger's Bill of Rights, the San Diego Water Board shall notify the applicant that the application has been received within 30 days of receipt.

3. Dischargers currently enrolled under Order No. R9-2002-0020 will be automatically re-enrolled under this Order (i.e. a new NOI does not need to be submitted). All existing enrollees, however, shall submit updated contact information within 60 days after adoption of this Order. Contact information shall include: 1) Agency Contact Person, 2) Permit Compliance Contact Person, and 3) Billing Contact Person. Contact information shall be reviewed by each enrollee on an annual basis and any changes shall be reported to the

San Diego Water Board within 60 days of the change. If a Discharger does not wish to continue coverage under this Order, a written request (Notice of Termination) shall be submitted to the San Diego Water Board (see Section D below).

D. Termination of Discharges

Dischargers shall submit a written request referred to as a "Notice of Termination (NOT)" to this San Diego Water Board when coverage under this Order is no longer required. The NOT letter constitutes a notice that the Discharger (and his/her agent) of the site has ceased the discharge of hydrostatic test water and/or potable water under this Order.

The NOT should include "Notice of Termination (NOT)" In the subject line, the Waste Discharge Identification Number (WDID) assigned to the Enrollee by the San Diego Water Board when enrolled in the Order, the name and address of the water distributors (purveyor), water district, municipality, or private entity, and be signed and dated in accordance with the signatory requirements of the Order. The Discharger shall continue to comply with the requirements of the Order until the San Diego Water Board approves the NOT. Submittal of a NOT letter does not guarantee termination. Approval of the NOT does not relieve the Discharger's responsibility for paying any applicable outstanding invoices of annual fees as a result of enrollment under this Order.

E. Transferring Ownership

Enrollment under the Order is not transferable. In the event of any change in control or ownership of land or waste discharge facilities presently owned or controlled by the enrolled Discharger, the Discharger must notify the new succeeding owner or operator of the existence of this Order by letter 120 days prior to property transfer, a copy of which must be immediately forwarded to the San Diego Water Board office. Additionally, the Discharger must submit a NOT to the San Diego Water Board. The new succeeding owner or operator must submit a new NOI in application of enrollment under this Order.

F. Description of Wastewater and Biosolids Treatment or Controls – Not Applicable

G. Discharge Points and Receiving Waters

All surface waters within the San Diego Region are potential receiving waters for discharges of potable water and hydrostatic test water by water purveyors and other entities enrolling under this general NPDES permit. This includes inland surface waters, enclosed bays, harbors, lagoons, estuaries, and the ocean.

Storm drains are not designed to maximize initial dilution; therefore, this Order uses zero initial dilution factor. In addition, the San Diego Water Board has the practice not to consider dilution when setting water quality-based effluent limitations for discharges to bays and estuaries unless the dilution ratio is verified with field data. Since this is an Order without existing data points, no dilution credit is considered for the discharge.

H. Summary of Existing Requirements

Order No. R9-2002-0020, which this WDR replaces, requires the Discharger not to exceed the Effluent Limitations for total residual chlorine and pH, and to monitor and report total dissolved solids and temperature. Receiving water monitoring includes visual observations for turbidity, erosion, and sedimentation.

I. Compliance Summary - Not Applicable

J. Planned Changes - Not Applicable

III. APPLICABLE PLANS, POLICIES, AND REGULATIONS

The requirements contained in this WDR are based on the requirements and authorities described in this section.

A. Legal Authorities

This Order is issued pursuant to CWA section 402and implementing regulations adopted by the USEPA and Chapter 5.5, Division 7 of the California Water Code (CWC). It shall serve as an NPDES permit for point source discharges from hydrostatic test water and potable water to surface waters within the San Diego Region. This Order also serves as Waste Discharge Requirements (WDRs) pursuant to Article 4, Chapter 4 of the CWC for discharges that are not subject to regulation under CWA section 402.

States may request authority to issue general NPDES permits pursuant to 40 CFR section 122.28. On June 8, 1989, the State Board submitted an application to the USEPA requesting revisions to its NPDES Program in accordance with 40 CFR 122.28, 123.62, and 403.10. The application included a request to add WDR authority to its approved NPDES Program. On September 22, 1989, the USEPA, Region 9, approved the State Board's request and granted authorization for the State to issue general NPDES permits.

Pursuant to NPDES regulations at 40 CFR 122.28 (a) (2) general permits may regulate point source discharges that:

1. Involve the same or substantially similar types of operations,
2. Discharge the same types of wastes,
3. Require the same effluent limitations,

4. Require the same or similar monitoring, and
5. In the opinion of the Executive Officer, are more appropriately controlled under a general permit than under individual permits.

B. California Environmental Quality Act (CEQA)

This action to adopt a NPDES permit is exempt from the provisions of CEQA (Public Resources Code section 21100, et seq.) in accordance with CWC section 13389 for the following reasons: 1) A Discharger cannot obtain coverage under this Order if pollutants in the discharge, cause, contribute, or have the reasonable potential to cause or contribute to a water quality standards violation; 2) The permit requires Dischargers to monitor and report the discharge to ensure the Dischargers will not cause a violation; and 3) The San Diego Water Board's granting of the exceptions does not have the potential for causing significant adverse environmental effects. See California Code of Regulations, Title 14, section 15061(b)(3).

C. State and Federal Regulations, Policies, and Plans

1. Water Quality Control Plan

The *Comprehensive Water Quality Control Plan, San Diego Basin* (9) (hereinafter Basin Plan) was adopted by the San Diego Water Board on September 8, 1994 and subsequently approved by the State Water Resources Control Board (SWRCB) on December 13, 1994. Subsequent revisions to the Basin Plan have also been adopted by the San Diego Water Board and approved by the SWRCB. The Basin Plan designates beneficial uses and narrative and numerical water quality objectives, and prohibitions that are applicable to the discharges regulated under this Order. The applicable prohibitions of the Basin Plan have been incorporated into this Order. The applicable numerical water quality objectives have been incorporates herein as *Attachment G*.

In addition, State Board Resolution No. 88-63 requires that, with certain exceptions, the San Diego Water Board assigns the municipal and domestic supply use to water bodies that do not have beneficial uses listed in the Basin Plans.

The Basin Plan identifies the following beneficial uses of surface waters in the San Diego Region to be protected (not all surface waters have all of the beneficial uses listed below):

- Municipal and domestic supply;
- Agricultural supply;
- Groundwater recharge;
- Freshwater replenishment;
- Contact water recreation;
- Non-contact water recreation;
- Commercial and sport fishing;
- Preservation of rare, threatened or

- Hydropower generation;
- Warm freshwater habitat;
- Cold freshwater habitat;
- Inland saline water habitat;
- Estuarine habitat;
- Aquaculture;
- Industrial service and process supply;
- Navigation;
- endangered species;
- Marine habitat;
- Migration of aquatic organisms;
- Shellfish harvesting;
- Spawning, reproduction, and/or early development;
- Wildlife habitat;
- Preservation of areas of special biological significance; and
- Mariculture.

In order to protect these beneficial uses, the Basin Plan establishes water quality objectives (for bacterial, physical, chemical, and biological characteristics, and for radioactivity), general requirements for management of waste discharge to the bays/harbors, quality requirements for waste discharges (effluent water quality requirements), discharge prohibitions, and general provisions.

Historically, water supply TDS concentrations have varied significantly from below 400 mg/l to above 700 mg/l. A higher percentage of Colorado River water typically correlates to a higher TDS concentration. Colorado River water has an average TDS concentration of 700 mg/l (compared to the average TDS concentration of 250 mg/l in State Water Project water). Drinking water supplied to nearly all of the water agencies is typically a blend of Colorado River water and State Water Project water to help reduce concentration of TDS. Over the years, the amount of State Water Project water available for blending has reduced, in turn increasing TDS concentration in drinking water within the San Diego Region. Currently approximately 80 percent of the water distributed within the San Diego Region comes from the Colorado River.

Increasing salinity in both surface and ground waters within this region is an issue that is affected by a variety of discharge types and other factors and may be addressed in the future by a Basin Plan amendment.

Also, it is anticipated that since the discharges of hydrostatic test water and/or potable water regulated by this Order are short in duration and intermittent these discharges are not expected to cause excursions of the Basin Plan water quality objectives and the impacts to the receiving waters are considered to be less than significant. Furthermore, the Enrollees have little or no control over the source water TDS that is received for this region.

At this time it is impractical and economically infeasible for the water agencies to provide treatment of imported water to reduce TDS concentrations prior to distributing the water to their customers.

2. National Toxics Rule (NTR) and California Toxics Rule (CTR)

USEPA adopted the NTR on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About 40 criteria in the NTR applied in California. On May 18, 2000, USEPA adopted the CTR. The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants which are discharged to inland surface waters, bays, and estuaries.

3. State Implementation Policy (SIP)

On March 2, 2000 the SWRCB, in Resolution No. 2000-15, adopted a Policy for Implementation of Toxic Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (Implementation Policy). The Implementation Policy establishes:

(a) implementation provisions for priority pollutant criteria promulgated by the U.S. EPA through the NTR and the CTR, and for priority pollutant objectives established in the Basin Plan;

(b) monitoring requirements for 2,3,7,8-TCDD (tetrachlorodibenzo-p-dioxin) equivalents; and

(c) chronic toxicity control provisions.

The CTR regulations and the Implementation Policy are applicable to the discharges described in this General Permit. It is the Dischargers responsibility to provide all data and other information requested by the San Diego Water Board for use in determining whether the proposed discharge may cause, have a reasonable potential to cause, or contribute to an excursion above any applicable priority pollutant criterion or objective. A reasonable potential analysis of the submitted data is required to determine which Priority Pollutants require effluent limitations.

Section 5.3 of the Implementation Policy (Exceptions) states that the RWQCB may, after compliance with the California Environmental Quality Act (CEQA), grant exemptions for certain short-term or seasonal discharge categories from meeting the priority pollutant criteria/objectives of the CTR if it is determined to be necessary to implement control measures regarding drinking water conducted to fulfill statutory requirements under the federal Safe Drinking Water Act or the California Health and Safety Code.

Such categorical exceptions may also be granted for draining water supply reservoirs, canals, and pipelines for maintenance and for draining water

treatment facilities for cleaning or maintenance. No exemptions are granted at this time however, the enrollees (Dischargers) may need to seek a SIP exception from CTR criteria based on data obtained during the life of this permit.

CALIFORNIA TOXICS RULE-REASONABLE POTENTIAL ANALYSIS

The SDCWA distributes water to water districts within San Diego County. Approximately 90% of the water used in San Diego County is delivered from SDCWAs distribution system. The remaining 10 % are made up of groundwater and/or treated rainwater. SDCWA purchases the water directly from Metropolitan Water District (MWD). Riverside and Orange County's main water suppliers are Eastern and Western Municipal Water District, respectively, who also purchase water from MWD.

On September 29, 2009 and October 29, 2009, San Diego County Water Authority (SDCWA) submitted analytical results of testing conducted on potable water from a water treatment plant and/or the distribution system. The sampling was conducted on September 16, 2008 and September 3, 2009, respectively, and was analyzed by Test America Laboratory. Potable water was analyzed for all Priority Pollutants listed in the CTR using EPA approved methods for drinking water (other than those specified in 40 CFR Part 136). The EPA methods used for the analysis of drinking water are adequate for evaluating compliance with applicable water quality objectives. The San Diego Water Board considers the CTR analysis results as being representative of the potable water distributed by the water suppliers in the San Diego Region.

Water quality standards and objectives for fish and aquatic life are often more restrictive than the standards and objectives for human health requiring methods with low detection levels.

Analytical results indicate the potable water may not meet certain criteria/objectives of the CTR including but not limited to trihalomethanes and metals. This Order requires the enrollees (Dischargers) to obtain additional analytical data to allow the San Diego Water Board to conduct a reasonable potential analysis. Enrollees may use approved test for drinking water analysis in accordance with 40 CFR Part 141 if the methods are substantially equivalent to the methods in 40 CFR Part 136 in both precision and accuracy as it related to the determination of compliance with the CTR objectives. Once the data is gathered and analyzed, an RPA will be conducted to determine which parameters, if any, will need an exception to the SIP. If data demonstrates a consistent exceedance of water quality standards or objectives during the sampling events, additional monitoring may be needed.

4. Ocean Plan

The State Board adopted the Water Quality Control Plan for Ocean Waters of California (Ocean Plan) in 2005, it was approved by USEPA, and became effective on February 14, 2006. The Ocean Plan identifies the following beneficial uses of state ocean waters to be protected:

- Industrial water supply
- Aesthetic enjoyment
- Non-contact water recreation
- Preservation and enhancement of Areas of Special Biological Significance
- Fish migration
- Fish spawning
- Navigation
- Water contact recreation
- Ocean commercial and sport fishing
- Preservation and enhancement of rare and endangered species
- Marine habitat
- Shellfish harvesting
- Mariculture

In order to protect the above beneficial uses, the Ocean Plan establishes water quality objectives (for bacteriological, physical, chemical, and biological characteristics, and for radioactivity), general requirements for management of waste discharged to the ocean, quality requirements for waste discharges (effluent quality requirements), discharge prohibitions, and general provisions.

Limits derived from the Ocean Plan have not been included in this WDR.

5. Alaska Rule

On March 30, 2000, USEPA revised its regulation that specifies when new and revised state and tribal water quality standards (WQS) become effective for CWA purposes (40 C.F.R. § 131.21, 65 Fed. Reg. 24641 (April 27, 2000)). Under the revised regulation (also known as the Alaska rule), new and revised standards submitted to USEPA after May 30, 2000, must be approved by USEPA before being used for CWA purposes. The final rule also provides that standards already in effect and submitted to USEPA by May 30, 2000, may be used for CWA purposes, whether or not approved by USEPA.

6. Antidegradation Policy

Section 131.12 requires that the state water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. Resolution No. 68-16 requires that existing water quality be maintained unless degradation is justified based on specific findings. The Regional Water Board's Basin Plan implements, and incorporates by reference, both the state and federal antidegradation policies. The permitted discharge must be consistent with the

antidegradation provision of section 131.12 and State Water Board Resolution No. 68-16.

7. Anti-Backsliding Requirements

Sections 402(o)(2) and 303(d)(4) of the CWA and 40 CFR section 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require that effluent limitations in a reissued permit must be as stringent as those in the previous permit, with some exceptions in which limitations may be relaxed. All effluent limitations in the renewed permit are at least as stringent as the effluent limitations in the previous permit.

8. Monitoring and Reporting Requirements

Section 122.48 of 40 CFR requires that all NPDES permits specify requirements for recording and reporting monitoring results. Sections 13267 and 13383 of the CWC authorize the regional boards to require technical and monitoring reports. The MRP establishes monitoring and reporting requirements to implement Federal and State requirements. This MRP is provided in Attachment E.

D. Impaired Water Bodies on CWA 303(d) List

The federal Clean Water Act requires States to identify and make a list of surface water bodies that are polluted. These water bodies, referred to in law as "water quality limited segments," do not meet water quality standards even after discharges of wastes from point sources have been treated by the minimum required levels of pollution control technology. Wastewater treatment plants, a city's storm drain system, or a boat yard, are a few examples of point sources that discharge wastes to surface waters. States are required to compile the water bodies into a list, referred to as the "Clean Water Act Section 303(d) List of Water Quality Limited Segments" (303(d) List). States must also prioritize the water bodies on the list and develop action plans, called total maximum daily loads (TMDLs) to improve the water quality.

The State Board updated the 2004-2006 303(d) List for California on October 25, 2006, and EPA approved it on November 30, 2006.

There are approximately 100 impaired water bodies on the 303(d) List in the San Diego Region. Most TMDLs for water bodies within the San Diego Region are under development or have not been started. However, four TMDLs for the San Diego Region need only State Board approval to be complete, and three are already complete. Of the three completed TMDLs, two impact the water quality of San Diego Bay and the third impacts the water quality of Rainbow Creek.

E. Other Plans, Polices and Regulations- Not Applicable

IV. RATIONALE FOR EFFLUENT LIMITATIONS AND DISCHARGE SPECIFICATIONS

The CWA requires point source Dischargers to control the amount of conventional, non-conventional, and toxic pollutants that are discharged into the waters of the United States. The control of pollutants discharged is established through effluent limitations and other requirements in NPDES permits. Effluent limitations are based on the following principles:

A. 40 CFR section 122.44(a) requires that permits include applicable technology-based limitations and standards;

B. 40 CFR section 122.44(d) requires that permits include water quality-based effluent limitations to attain and maintain applicable numeric and narrative water quality criteria to protect the beneficial uses of the receiving water. Where numeric water quality criteria have not been established, three options exist to protect water quality: 1) 40 CFR section 122.44(d) specifies that WQBELs may be established using USEPA criteria guidance under CWA section 304(a); 2) proposed state criteria or a state policy interpreting narrative criteria supplemented with other relevant information may be used; or 3) an indicator parameter may be established;

C. Any discharge of hydrostatic test and/or potable water threatens to cause or contribute to excursions above numeric water quality objectives contained in the Basin Plan;

D. 40 CFR section 122.44(l) requires that when a permit is renewed or reissued, effluent limitations must be at least as stringent as the effluent limitations in the previous permit. Since this permit is a renewal of a previous permit, anti-backsliding is applicable and the following pollutants are included:

Total Residual Chlorine pH

E. Discharge Prohibitions

Discharges under this Order are required to be nontoxic. Toxicity is the adverse response of organisms to chemicals or physical agents. This prohibition is based on the Basin Plan, which requires that all waters be maintained free of toxic substances in concentrations that are lethal or produce other detrimental responses in aquatic organisms. Detrimental responses include, but are not limited to, decreased growth rate and decreased reproductive success of resident or indicator species. The Basin Plan also requires waters to be free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, or animal life. This objective applies regardless of whether the toxicity is caused by a single substance or the interactive effect of multiple substances.

F. Technology-Based Effluent Limitations (TBELs)

1. Scope and Authority

The CWA requires that TBELs be established based on several levels of controls:

Best Practicable Treatment Control Technology (BPT) represents the average of the best performance by plants within an industrial category or subcategory. The BPT standards apply to toxic, conventional, and nonconventional pollutants.

Best Available Technology Economically Achievable (BAT) represents the best existing performance of treatment technologies that are economically achievable within an industrial point source category. The BAT standards apply to toxic and nonconventional pollutants.

Best Conventional Pollutant Control Technology (BCT) represents the control from existing industrial point sources of conventional pollutants including BOD, TSS, fecal coliform, pH, and oil and grease. The BCT standard is established after considering the “cost reasonableness” of the relationship between the cost of attaining a reduction in effluent discharge and the benefits that would result, and also the cost effectiveness of additional industrial treatment beyond BPT.

New Source Performance Standards (NSPS) represent the best available demonstrated control technology standards. The intent of NSPS guidelines is to set limitations that represent state-of-the-art treatment technology for new sources.

The CWA requires USEPA to develop Effluent Limitations, Guidelines and Standards (ELGs) representing application of BPT, BAT, BCT, and NSPS. Section 402(a)(1) of the CWA and 40 CFR section 125.3 of the NPDES regulations authorize the use of Best Professional Judgment (BPJ) to derive technology-based effluent limitations on a case-by-case basis where ELGs are not available for certain industrial categories and/or pollutants of concern. Where BPJ is used, the permit writer must consider specific factors outlined in 40 CFR section 125.3.

2. Applicable Technology-Based Effluent Limitations

This Order includes numeric-Technology Based effluent limitations for total residual chlorine and pH.

G. Water Quality-Based Effluent Limitations (WQBELs)

1. Scope and Authority

As specified in 40 CFR section 122.44(d)(1)(i), permits are required to include WQBELs for pollutants (including toxicity) that are or may be discharged at levels that cause, have reasonable potential to cause, or contribute to an excursion above any state water quality standard. The process for determining reasonable potential and calculating WQBELs when necessary is intended to protect the designated uses of the receiving water as specified in the Basin Plan, achieve applicable water quality objectives and criteria contained in state plans and policies, and meet water quality criteria in the CTR and NTR.

2. Applicable Beneficial Uses and Water Quality Criteria and Objectives

The designated beneficial uses of surface waters throughout the State may include municipal, domestic, industrial, and agricultural supply; water contact and non-contact recreation; navigation; groundwater recharge and freshwater replenishment; hydropower generation; wildlife habitat; cold freshwater and warm freshwater habitat; fish migration and fish spawning; marine habitat; estuarine habitat; shellfish harvesting; ocean commercial and sport fishing; areas of special biological significance; and preservation of rare and endangered species. To the extent that the Basin Plan designates additional or different beneficial uses, the Basin Plan shall control.

3. Determining the Need for WQBELs

All applicable provisions of sections 301 and 402 of the CWA must be met for NPDES permits for discharges to surface waters. These provisions require controls of pollutant discharges that utilize BAT and BCT to reduce pollutant and any more stringent controls necessary to meet water quality standards.

As specified in the SIP, the San Diego Water Board shall conduct an analysis for each priority pollutant with applicable criterion or objective to determine if a water quality-based effluent limitation is required.

This Order requires the Dischargers to obtain data to analyze effluent from their distribution system for compliance with the CTR criteria.

4. WQBEL Calculations

The Effluent WQBELs were calculated using a statistical approach with the following considerations and assumptions:

No dilution credit is considered for the discharge. Therefore, the discharge must comply with the Water Quality Objective at the point of discharge.

5. **Whole Effluent Toxicity (WET)** – Not Applicable

H. Final Effluent Limitations

1. Anti-Backsliding Effluent Limitations

All effluent limitations in this Order are at least as stringent as the effluent limitations in the previous Order.

2. Satisfaction of Antidegradation Policy

Discharges in conformance with the requirements of this Order will not result in a lowering of water quality and therefore conform to antidegradation requirements specified in Resolution No. 68-16, which incorporates the federal antidegradation policy at 40 CFR 131.12 where, as here, it is applicable.

3. Stringency of Requirements for Individual Pollutants

Both the beneficial uses and the water quality objectives have been approved pursuant to federal law and are the applicable federal water quality standards. All beneficial uses and water quality objectives contained in the Basin Plan were approved under state law and submitted to and approved by USEPA prior to May 30, 2000. Any water quality objectives and beneficial uses submitted to USEPA prior to May 30, 2000, but not approved by USEPA before that date, are nonetheless "applicable water quality standards for purposes of the CWA" pursuant to section 131.21(c)(1). Collectively, this Order's restrictions on individual pollutants are no more stringent than required to implement the requirements of the CWA.

Final Effluent Limitations have been outlined in Table F-1 below:

Table F-2 Summary of Water Quality-based Effluent Limitations Table

Parameter	Units	Effluent Limitations
Total Residual Chlorine	mg/L	0.1
pH	Units	Between 6.0 and 9.0 at all times

I. Interim Effluent Limitations (Not Applicable)

J. Land Discharge Specifications (Not Applicable)

K. Reclamation Specifications (Not Applicable)

V. RATIONALE FOR RECEIVING WATER LIMITATIONS

States are required to adopt numeric criteria where they are necessary to protect designated uses. (CWA §§ 303(a) – 303(c)). The San Diego Water Board adopted numeric criteria in the Basin Plan. The Basin Plan is a regulatory reference for meeting the State and Federal requirements for water quality control. (40 CFR 131.20). State Board Resolution 68-16, the Antidegradation Policy, does not allow changes in water quality less than that prescribed in Water Quality Control Plans (Basin Plans). The Basin Plan states that; "The numerical and narrative water quality objectives define the least stringent standards that the Regional Water Board will apply to regional waters in order to protect the beneficial uses."

A. Surface Water Limitations

1. The discharge shall at all times be in conformance with applicable water quality standards, including but not limited to all applicable provisions contained in (1) the San Diego Water Board's *Water Quality Control Plan for the San Diego Basin* (Basin Plan), including beneficial uses, water quality objectives, and implementation plans; (2) State Water Board plans for water quality control including the (a) *Water Quality Control Plan For Control Of Temperature In The Coastal And Interstate Waters And Enclosed Bays And Estuaries (*Thermal Plan), and (b) the *California Ocean Plan* (Ocean Plan)*,* including beneficial uses, water quality objectives, and implementation plans*;* (3) State Water Board policies for water quality control including the (a) *Water Quality Control Policy for the Enclosed Bays and Estuaries of California,* (b) *Policy For Implementation Of Toxics Standards For Inland Surface Waters, Enclosed Bays, and Estuaries Of California;* and (c) the *Statement of Policy with Respect to Maintaining High Quality of Waters in California* (State Water Board Resolution No. 68-16) *and (*4) priority pollutant criteria promulgated by the U.S. Environmental Protection Agency (U.S. EPA) through the (a) National Toxics Rule (NTR)[1] (promulgated on December 22, 1992 and amended on May 4, 1995) and (b) *California Toxics Rule (CTR)* [2]. [3]

2. The discharge not by itself, or jointly with any other discharge(s), cause an excursion above any applicable narrative or numeric water quality objective contained in the Basin Plan, Thermal Plan, Ocean Plan or any applicable priority pollutant criteria promulgated by the U.S. Environmental Protection Agency (U.S. EPA) through the NTR or CTR.

[1] 40 CFR 131.36
[2] 65 Fed. Register 31682-31719 (May 18, 2000), adding Section 131.38 to 40 CFR
[3] If a water quality objective and a CTR criterion are in effect for the same priority pollutant, the more stringent of the two applies

B. Groundwater – Not Applicable

VI. RATIONALE FOR MONITORING AND REPORTING REQUIREMENTS

Section 122.48 of 40 CFR requires all NPDES permits to specify recording and reporting of monitoring results. Sections 13267 and 13383 of the CWC authorize the San Diego Water Board to require technical and monitoring reports. The MRP, Attachment E of this Order, establishes monitoring and reporting requirements to implement federal and state requirements. The following provides the rationale for the monitoring and reporting requirements contained in the MRP for this permit.

A. Influent Monitoring- (Not applicable)

B. Effluent Monitoring

The Discharger is required to conduct monitoring of the permitted discharge in order to determine compliance with permit conditions. Monitoring requirements are given in the Monitoring and Reporting Program (Attachment E) of this Order. This provision requires compliance with the monitoring and reporting program, and is based on 40 CFR 122.44(i), 122.62, 122.63 and 124.5. The self monitoring program (SMP) is a standard requirement in almost all NPDES permits (including the proposed Order) issued by the San Diego Water Board. In addition to containing definitions of terms, it specifies general sampling/analytical protocols and the requirements of reporting of spills, violations, and routine monitoring data in accordance with NPDES regulations, the California Water Code, and regional water board's policies. Pollutants to be monitored include all pollutants for which effluent limitations are specified.

C. Whole Effluent Toxicity (WET) Testing Requirements – Not Applicable

D. Receiving Water Monitoring

Section 13267 of the California Water Code states, in part,

> "(a) A regional board, in establishing … waste discharge requirements … may investigate the quality of any waters of the state within its region" and "(b) (1) In conducting an investigation … the regional board may require that any person who … discharges … waste … that could affect the quality of waters within its region shall furnish, under penalty of perjury, technical or monitoring program reports which the regional board requires. The burden, including costs, of these reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports."

The attached Monitoring and Reporting Program is issued pursuant to CWC section 13267. The Monitoring and Reporting Program is necessary to determine

compliance with these waste discharge requirements. The Discharger is responsible for the discharges of waste subject to this Order.

E. Other Monitoring Requirements

CTR and Ocean Plan Monitoring

In accordance with the State Implementation Policy and the Ocean Plan, the Enrollees must submit data the San Diego Water Board to: (1) determine if water-quality based effluent limitations are required; and (2) to calculate effluent limitations, if required.

San Diego County Water Authority (SDCWA) has agreed to submit CTR and Ocean Plan water quality data on behalf of all Enrollees within the San Diego Region. The San Diego Water Board will consider the CTR and Ocean Plan analysis as being representative of the potable water distributed within the San Diego Region.

Upon the San Diego Water Board's evaluation of the submitted data, further monitoring of any or all of the priority pollutants may be required.

Reporting requirements for the data to be submitted are listed below.

Table F-3 - CTR and Ocean Plan Monitoring[1]

Parameter	Units	Sample Type	Minimum Sampling Frequency	Sampling Method
CTR Priority Pollutants	µg/L	Grab	1/year	[2]
OCEAN PLAN TABLE B PARAMETERS FOR PROTECTION OF MARINE AQUATIC LIFE				
Ammonia Nitrogen, Total (as N)	µg/L	Grab	1/year	[2]
Phenolic Compounds (nonchlorinated)	µg/L	Grab	1/year	[2]
Phenolic Compounds (chlorinated)	µg/L	Grab	1/year	[2]
HCH[6]	µg/L	Grab	1/year	[2]
Radioactivity	pci/l	Grab	1/year	[2]
OCEAN PLAN TABLE B PARAMETERS FOR PROTECTION OF HUMAN HEALTH – NON CARCINOGENS				
Tributyltin	µg/L	Grab	1/year	[2]
OCEAN PLAN TABLE B PARAMETERS FOR PROTECTION OF HUMAN HEALTH – CARCINOGENS				
1,3-dichloropropene	µg/L	Grab	1/year	[2]
Halomethanes	µg/L	Grab	1/year	[2]
PAHs	µg/L	Grab	1/year	[2]
TCDD equivalents	µg/L	Grab	1/year	[2]

1. Monitoring to be conducted on water obtained from MWD by San Diego County Water Authority (SDCWA).
2.Enrollees may use approved test methods for drinking water analysis in accordance with 40 CFR Part 141 if the methods are substantially equivalent to the Methods in 40 CFR Part 136 in both precision and accuracy as it relates to the determination of compliance with CTR and Ocean Plan objectives.

VII. RATIONALE FOR PROVISIONS

A. Standard Provisions

Standard Provisions, which apply to all NPDES permits in accordance with section 122.41, and additional conditions applicable to specified categories of permits in accordance with section 122.42, are provided in Attachment D. The Discharger must comply with all standard provisions and with those additional conditions that are applicable under section 122.42.

Section 122.41(a)(1) and (b) through (n) establish conditions that apply to all State-issued NPDES permits. These conditions must be incorporated into the permits either expressly or by reference. If incorporated by reference, a specific citation to the regulations must be included in the Order. Section 123.25(a)(12) allows the state to omit or modify conditions to impose more stringent requirements. In accordance with section 123.25, this Order omits federal conditions that address enforcement authority specified in sections 122.41(j)(5) and (k)(2) because the enforcement authority under the Water Code is more stringent. In lieu of these conditions, this Order incorporates by reference Water Code section 13387(e).

B. Special Provisions

1. Reopener Provisions (Not Applicable)

2. Special Studies and Additional Monitoring Requirements (Not Applicable)

3. Best Management Practices and Pollution Prevention Plan

Best Management Practices (BMPs) shall be utilized during all discharge events (regardless of discharge volume).

This Order contains requirements to reduce the discharge of pollutants, other than those that have effluent limitations in Section V.A of this Order, to the maximum extent practicable (MEP) for all discharges regardless of discharge volume. The Discharger has establish a set of Best Management Practices that address discharges associated with hydrostatic test water and/or potable water, including emergencies and discharges of raw water. The BMPs, established previously under Order No. R9-2002-0020, include source control BMPs to minimize contact between pollutants and flow (e.g. rerouting of flow to prevent the discharge, erosion, which can lead to sedimentation in discharge) as well as treatment control BMPs to remove pollutants present in the discharge water before it enters receiving waters, including storm drains and other conveyance systems. This Order requires Dischargers to re-evaluate their previously established BMPs to ensure the adequacy of compliance with this Order.

Implementation of BMPs shall not interfere with necessary repair operations or impact public health and safety. A copy of the BMPs shall be submitted to the San Diego Water Board, if requested.

4. **Compliance Schedules** (Not Applicable)

5. **Construction, Operation, and Maintenance Specifications** (Not Applicable)

6. **Special Provisions for Municipal Facilities** (POTWs Only) (Not Applicable)

7. **Other Special Provisions** (Not Applicable)

VIII. PUBLIC PARTICIPATION

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) is considering the reissuance of waste discharge requirements (WDRs) that will serve as a National Pollutant Discharge Elimination System (NPDES) permit for Hydrostatic Test Water and Potable Water Discharges. As a step in the WDR adoption process, the Regional Water Board staff has developed tentative WDRs. The San Diego Water Board encourages public participation in the WDR adoption process.

A. Notification of Interested Parties

The San Diego Water Board has notified the Discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for these discharges and has provided them with an opportunity to submit their written comments and recommendations. The draft tentative Order was posted on the San Diego Water Board's webpage on June 25, 2010, and notification published in the San Diego Union Tribune newspaper on June 25, 2010.

B. Written Comments

Interested persons are invited to submit written comments concerning these tentative WDRs. Comments must be submitted either in person or by mail to the Executive Officer at the San Diego Water Board at the address above on the cover page of this Order.

To be fully responded to by staff and considered by the San Diego Water Board, written comments must be received at the San Diego Water Board offices by 5:00 p.m. on August 4, 2010.

C. Public Hearing

The San Diego Water Board plans to hold a public hearing on the tentative Order during its regular meeting on the following date and at the following location:

Date: **September 8, 2010**
Location: **Water Quality Control Board**
Regional Board Meeting Room
9174 Sky Park Court
San Diego, California

Interested persons are invited to attend. At the public hearing, the San Diego Water Board will hear testimony pertinent to the discharge and Order. Oral testimony will be heard; however, for accuracy of the record, important testimony should be in writing.

Please be aware that dates and venues may change. Our Web address is http://www.waterboards.ca.gov/sandiego/ where you can access the current agenda for changes in dates and locations.

D. Waste Discharge Requirements Petitions

Any aggrieved person may petition the State Water Resources Control Board to review the decision of the San Diego Water Board regarding the final WDRs. The petition must be submitted within 30 days of the San Diego Water Board's action to the following address:

State Water Resources Control Board
Office of Chief Counsel
P.O. Box 100, 1001 I Street
Sacramento, CA 95812-0100

E. Information and Copying

Order-related documents, tentative effluent limitations and special provisions, comments received, and other information are on file and may be inspected at the address above at any time between 8:30 a.m. and 4:45 p.m., Monday through Friday. A partial list of these items are on the San Diego Water Board's web site at: http://www.waterboards.ca.gov/sandiego/

Copying of documents may be arranged through the San Diego Water Board by calling (858) 467-2952.

F. Register of Interested Persons

Any person interested in being placed on the mailing list for information regarding the Order was invited to contact the San Diego Water Board, reference this Order, and provide a name, address, and telephone number.

G. Additional Information

Requests for additional information or questions regarding this draft Order may be directed to Michelle Mata at (858) 467-2981 or at: mmata@waterboards.ca.gov. Request for additional information or questions regarding the final adopted Order may be directed to Whitney Ghoram at (858) 467-2967 or at: wghoram@waterboards.ca.gov.

This Order will expire on October 31, 2015.

WATER QUALITY OBJECTIVES BY HYDROLOGIC UNIT

The discharge of potable and/or hydrostatic test water within a watershed/stream reach shall not cause the receiving water to exceed the following concentrations:

Inland Surface Waters		Hydrologic Unit Basin Number	Constituents (mg/l or as noted)												
			TDS	Cl	SO_4	%Na	N&P	Fe	Mn	MBAS	B	ODOR	Turb NTU	Color Units	F
SAN JUAN HYDROLOGIC UNIT		**901.00**													
Laguna	HA	1.10	1000	400	500	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Mission Viejo	HA	1.20	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
San Clemente	HA	1.30	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
San Mateo Canyon	HA	1.40	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
San Onofre	HA	1.50	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
SANTA MARGARITA HYDROLOGIC UNIT		**902.00**													
Ysidora	HA	2.10	750	300	300	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Deluz	HA	2.20	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Deluz Creek	HSA [b]	2.21	750	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Gavilan	HAS [b]	2.22	750	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Murrieta	HA	2.30	750	300	300	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Auld	HA	2.40	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Pechanga	HA	2.50	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Wolf	HAS [b]	2.52	750	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Wilson	HA	2.60	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Cave Rocks	HA	2.70	750	300	300	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Aguanga	HA	2.80	750	300	300	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Oakgrove	HA	2.90	750	300	300	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0

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			TDS	Cl	SO_4	%Na	N&P	Fe	Mn	MBAS	B	ODOR	Turb NTU	Color Units	F
SAN LUIS REY HYDROLOGIC UNIT		**903.00**													
Lower San Luis	HA	3.10	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Monserat	HA	3.20	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Warner Valley	HA	3.30	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
CARLSBAD HYDROLOGIC UNIT		**904.00**													
Loma Alta	HA	4.10	-	-	-	-	-	-	-	-	-	none	20	20	1.0
Buena Vista Creek	HA	4.20	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Agua Hedionda	HA	4.30	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Encinas	HA	4.40	-	-	-	-	-	-	-	-	-	none	20	20	1.0
San Marcos	HA	4.50	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Escondido Creek	HA	4.60	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
CARLSBAD HYDROLOGIC UNIT		**905.00**													
Solana Beach	HA	5.10	750	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Hodges	HA	5.20	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
San Pasqual	HA	5.30	750	300	300	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Santa Maria Valley	HA	5.40	750	300	300	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Santa Ysabel	HA	5.50	750	300	300	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
PENASQUITOS HYDROLOGIC UNIT		**906.00**													
Miramar Reservoir	HA	6.10	750	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Poway	HA	6.20	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0

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			TDS	Cl	SO_4	%Na	N&P	Fe	Mn	MBAS	B	ODOR	Turb NTU	Color Units	F
Scripps	HA	6.30	-	-	-	-	a	-	-	-	-	none	20	20	-
Miramar	HA	6.40	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Tecolote	HA	6.50	-	-	-	-	a	-	-	-	-	none	20	20	-
SAN DIEGO HYDROLOGIC UNIT		**907.00**													
Lower San Diego	HA	7.10	1000	400	500	60	a	0.3	0.05	0.5	1.0	none	20	20	-
Mission San Diego	HSA	7.11	1500	400	500	60	a	1.0	1.00	0.5	1.0	none	20	20	-
Santee	HSA [c]	7.12	1000	400	500	60	a	1.0	1.0	0.5	1.0	none	20	20	-
Santee	HSA [d]	7.12	1500	400	500	60	a	1.0	1.00	0.5	1.0	none	20	20	-
San Vicente	HA	7.20	300	50	65	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
El Capitan	HA	7.30	300	50	65	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Boulder Creek	HA	7.40	300	50	65	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
PUEBLO SAN DIEGO HYDROLOGIC UNIT		**908.00**													
Point Loma	HA	8.10	-	-	-	-	-	-	-	-	-	none	20	20	-
San Diego Mesa	HA	8.20	-	-	-	-	-	-	-	-	-	none	20	20	-
National City	HA	8.30	-	-	-	-	-	-	-	-	-	none	20	20	-
SWEETWATER HYDROLOGIC UNIT		**909.00**													
Lower Sweetwater	HA	9.10	1500	500	500	60	a	0.3	0.05	0.5	0.75	none	20	20	-
Middle Sweetwater	HA	9.20	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Upper Sweetwater	HA	9.30	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0

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			TDS	Cl	SO_4	%Na	N&P	Fe	Mn	MBAS	B	ODOR	Turb NTU	Color Units	F
OTAY HYDROLOGIC UNIT		**910.00**													
Coronado	HA	10.10	-	-	-	-	-	-	-	-	-	-	-	-	-
Otay Valley	HA	10.20	1000	400	500	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Dulzura	HA	10.30	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
TIJUANA HYDROLOGIC UNIT		**911.00**													
Tijuana Valley	HA	11.10	-	-	-	-	-	-	-	-	-	-	-	-	-
San Ysidro	HSA	11.11	2100	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Potrero	HA	11.20	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Barrett Lake	HA	11.30	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Monument	HA	11.40	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Morena	HA	11.50	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Cottonwood	HA	11.60	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Cameron	HA	11.70	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Campo	HA	11.80	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0

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California Regional Water Quality Control Board 043770

San Diego Region

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http:// www.waterboards.ca.gov/sandiego

TO: Acting Chairman Destache and San Diego Regional Water Quality Control Board Members

FROM: Catherine George Hagan, Senior Staff Counsel
Office of Chief Counsel

DATE: October 26, 2010

SUBJECT: **Tentative Order No. R9-2010-0016, Regulation of Non-Storm Water Discharges, Consideration of Economics and Unfunded State Mandates**

During the California Regional Water Quality Control Board, San Diego Region's (San Diego Water Board) proceedings last year to consider and reissue National Pollutant Discharge Elimination System (NPDES) Waste Discharge Requirements for Discharges of Runoff from the Municipal Separate Storm Sewer Systems (MS4s) draining the watersheds of Orange County within the San Diego Region (the Orange County MS4 permit), San Diego Water Board members requested that Board counsel respond to public comments and Board member questions on issues such as Water Board regulation of non-storm water discharges, unfunded state mandates and the extent of applicable requirements to consider economic information in adopting MS4 permits. Similar legal comments have been raised in the San Diego Water Board's proceeding to consider Tentative Order No. R9-2010-0016. the Riverside County MS4 Permit (Tentative Order). This legal memorandum, provided for your consideration along with Responses to Comments, addresses some of the key legal issues and has been updated to reflect recent legal developments since the Orange County MS4 proceeding ending in December of 2009.

I. Regulation of Non-Storm Water Discharges

Commenters assert that regardless of whether a discharge is composed entirely of storm water or non-storm water, any pollutants discharged *from* an MS4 are subject to the maximum extent practicable (MEP) standard and related iterative process, despite the Clean Water Act's (CWA) more stringent requirement that discharges of non-storm water into an MS4 be "effectively prohibited." Copermittees in the Orange County MS4 permit proceeding made essentially the same argument there to oppose proposed numeric effluent limitations for non-storm water discharges. Numeric effluent limitations were not adopted for the Orange County MS4 permit and are not proposed in this Tentative Order. But commenters raise the argument that non-storm water discharges from the MS4 need only be subject to the MEP standard and related iterative process in their objections to the Tentative Order's requirement that the Copermittees must effectively prohibit certain categories of previously

exempt non-storm water discharges, now identified as sources of pollutants, from entering the MS4.

For reasons stated in the Responses to Comments and elaborated on below, Board counsel does not agree with the comments that conclude non-storm water discharges from the MS4 are subject only to the MEP standard. The CWA employs the strategy of prohibiting the discharge of any pollutant from a point source into waters of the United States unless the discharger of the pollutant(s) obtains an NPDES permit pursuant to CWA Section 402. The 1987 amendment to the CWA includes provision 402(p) that specifically addresses NPDES permitting requirements for storm water discharges from MS4s. Section 402(p) prohibits the discharge of pollutants from specified MS4s to waters of the United States except as authorized by an NPDES permit and identifies two substantive standards for MS4 storm water permits. MS4 permits (1) "shall include a requirement to effectively prohibit non-stormwater discharges into the storm sewers[ ]" and (2) "shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or State determines appropriate for the control of such pollutants." (CWA § 402(p)(3)(B)(ii-iii).)

In November 1990, the United States Environmental Protection Agency (USEPA) published regulations addressing storm water discharges from MS4s. (Vol. 55 Federal Register (Fed. Reg.) 47990 and following (Nov. 16, 1990) (Phase I Final Rule).) The regulations establish minimum requirements for MS4 permits, and generally focus on the requirement that MS4s implement programs to reduce the amount of pollutants found in storm water discharges to the MEP. The Clean Water Act's municipal storm water MEP standard does not require storm water discharges to strictly meet water quality standards, as is required for other NPDES permitted discharges. Compliance is achieved through an iterative approach of continuous implementation of improved best management practices (BMPs). This distinction reflects Congress's recognition that variability in flow and intensity of storm events render difficult strict compliance with water quality standards by MS4 permittees. In describing the controls that permits must include to reduce pollutants in storm water discharges to the MEP, the statute states that the controls shall include: "management practices, control techniques and system, design and engineering methods, and such other provisions as the [permit writer] determines appropriate for the control of such pollutants." (CWA § 402(p)(3)(B)(iii).)

In contrast, non-storm water discharges from the MS4 that are not authorized by separate NPDES permits, nor specifically exempted (see 40 C.F.R. § 122.26(d)(2)(iv)(B)), are subject to requirements under the NPDES program, including discharge prohibitions, technology-based effluent limitations and water quality-based effluent limitations. (40 C.F.R. § 122.44.) The regulations also require the MS4's program to include an element to detect and remove illicit discharges and improper disposal into the storm sewer. (40 CFR § 122.26(d)(2)(iv)(B).)

While "non-storm water" is not defined in the CWA or federal regulations, the federal regulations define "illicit discharge" as "any discharge to a municipal separate storm sewer that is not composed entirely of storm water and that is not covered by an NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer and discharges resulting from fire fighting activities)." (Id., at § 122.26(b)(2).) This definition is the most closely applicable definition of "non-storm water" contained in federal law. As

stated in the Phase I Final Rule, USEPA added the illicit discharge program requirement to begin implementation of the 'effective prohibition' requirement to detect and control certain non-storm water discharges to their municipal system. USEPA stated: "Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit (other than the permit for the discharge from the [MS4])." (55 Fed. Reg. 47990, 47995 (Nov. 16, 1990).)[1]

Thus, federal law mandates that permits issued to MS4s must require management practices that will result in reducing storm water pollutants to the MEP yet at the same time requires that non-storm water discharges be effectively prohibited from entering the MS4. The argument that non-storm water discharges, prohibited from entry into the MS4 in the first instance, should be held to comply with only the less stringent MEP standard developed for storm water discharges is contrary to and potentially renders the "effectively prohibit" requirement in section 402(p)(3)(B)(ii) meaningless. Consistent with federal law, unless non-storm water discharges to the MS4 are authorized by a separate NPDES permit or are specifically exempted under federal regulations, non-storm water discharges are appropriately subject to the effective prohibition requirement in the CWA and regional water boards are not limited by the iterative MEP approach to storm water regulation in crafting appropriate regulations for non-storm water discharges.

B. Obligation to Consider Cost (Water Code § 13241)

Many commenters assert that provisions in the Tentative Order are new permit terms that exceed federal law and therefore the San Diego Water Board is required, but has failed, to consider factors in Water Code section 13241, including cost information, prior to approving the Tentative Order.

In *City of Burbank v. State Water Resources Control Board, et al.* ((2005) 35 Cal.4th 613) (*Burbank*), the California Supreme Court considered whether regional water boards must

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[1]As released for public comment, the Tentative Order included reference to State Water Board Order WQ 2009-0008 as a precedential order on the topic of regulation of non-storm water discharges. The memorandum prepared by Board counsel for the Orange County MS4 permit included citations to State Water Board Order WQ 2009-0008 in support of the above conclusions. State Water Board Order WQ 2009-0008 arose from the State Water Board's review of amendments to a Los Angeles Water Board MS4 permit to incorporate the implementation of summer dry weather Total Maximum Daily Load waste load allocations. In July 2010, the Superior Court for Los Angeles County remanded the Los Angeles Water Board's permitting action based upon procedural irregularities at the adoption hearing. This remand had the result of setting aside and voiding State Water Board Order WQ 2009-0008. The court set aside the order "without prejudice to the State Water Resources Control Board's consideration of the matters addressed in Order WQ 2009-0008 based on any new administrative record that may come before it . . . ." (*County of Los Angeles, et al. v. State Water Resources Control Board, California Regional Water Quality Control Board, Los Angeles Region, et al.,* Case No. BS1222724 (July 16, 2010) Judgment Granting Writ of Mandate, Exhibit 1, p. 2.). Thus, although commenters are correct that State Water Board Order WQ 2009-0008 is no longer a precedential State Water Board order (and was voided and set aside on October 11, 2010) and references to its precedential effect have been removed through errata, its substantive provisions were not reviewed by the court and it is appropriate for the San Diego Water Board to continue to agree with its reasoning, based upon evaluation of applicable federal authorities.

comply with Water Code section 13241 by taking into account the costs a permit holder will incur in complying with permit requirements when issuing waste discharge requirements under Water Code section 13263, subdivision (a). The court concluded that whether it is necessary to consider such cost information "depends on whether those restrictions meet or exceed the requirements of the federal Clean Water Act." (*Burbank,* 35 Cal.4th at 627.) The court reasoned that "[Water Code s]ection 13377 specifies that wastewater discharge permits must meet the federal standards set by federal law. In effect, section 13377 forbids a regional board's consideration of any economic hardship on the part of the permit holder if doing so would result in the dilution of the requirements set by Congress in the Clean Water Act. That act prohibits the discharge of pollutants into the navigable waters of the United States unless there is compliance with federal law (33 U.S.C. § 1322(a)), and publicly operated wastewater treatment plants such as those before us here must comply with the act's clean water standards, regardless of cost [citations]. Because [Water Code] section 13263 cannot authorize what federal law forbids, it cannot authorize a regional board, when issuing a wastewater discharge permit, to use compliance costs to justify pollutant restrictions that do not comply with federal clean water standards." (*Burbank,* 35 Cal.4th at 625.)

Therefore, while the *Burbank* decision does require an analysis of Water Code section 13241 factors including cost when the state adopts permit conditions that are more stringent than federal law (*id. at 618*) the Tentative Order, including Finding F.6., reflects that all of the challenged provisions of the Tentative Order are required to implement federal law. Thus, the Regional Board is not required to consider economic information to justify a "dilution of the requirements" established in federal law. Nonetheless, as staff has noted extensively in Responses to Comments, to the extent that economic information has been provided in connection with compliance and as to other costs associated with challenged permit provisions, the Tentative Order reflects staff has fully considered this information.

C. Unfunded State Mandates

Commenters in this proceeding have raised the issue of unfunded state mandates in connection with many of the proposed permit provisions. Some commenters have argued that a number of the provisions in the Tentative Order go beyond what is required under federal law and therefore constitute unfunded state mandates that may not be imposed without necessary funding first being provided to the Copermittees. Other commenters assert that the San Diego Water Board lacks jurisdiction to render an opinion on whether any of the Tentative Order's provisions exceed federal law and findings to that effect should be removed. Board counsel disagrees with both types of comments.

State Mandate Law

Briefly, Section 6 of Article XIII B of the California Constitution provides, in relevant part: "Whenever the Legislature or any state agency mandates a new program or higher level of service on any local government, the State shall provide a subvention of funds to reimburse that local government for the costs of the program or higher level of service . . . ." These subvention requirements are commonly referred to as a prohibition on unfunded state mandates. The California Supreme Court has recognized that requirements that flow from federal requirements are not state mandates and are therefore exempt from reimbursement

requirements. The Commission on State Mandates (Commission) evaluates local government "test claims" that seek reimbursement for claimed unfunded state mandates. This evaluation culminates with the Commission's written decision, which is a final agency action that may be challenged in superior court. Under mandates law, eligible local governments will receive a reimbursement for each fiscal year that the state mandate remains in effect. The reimbursement is provided as a line item in the Budget Act. If the Legislature fails to provide a subvention of funds, the local government may file a lawsuit to have the mandate declared unenforceable.

Recent Commission Proceedings

In September 2009, the Commission issued a Final Statement of Decision in a storm water permit Test Claim filed by the County of Los Angeles and several additional copermittee test claimants. (*Municipal Storm Water and Urban Runoff Discharges,* 03-TC-04, 03-TC-19, 03-TC-20, and 03-TC-21 (Los Angeles Regional Water Quality Control Board Order No. 01-182 (July 31, 2009) (Los Angeles Test Claim).) The Commission found that all but one of the challenged provisions issued by the Los Angeles Water Board in its MS4 permit did not qualify as unfunded state mandates as they did "not impose costs mandated by the state within the meaning of article XIII B, section 6 of the California Constitution because the claimants have fee authority (under Cal. Const. article XI, § 7) within the meaning of Government Code section 17556, subdivision (d), sufficient to pay for the activities in those parts of the permit." (Los Angeles Test Claim, Statement of Decision, p. 2.)

In March 2010, the Commission issued its final decision in the San Diego County Test Claim, in which 19 of 21 copermittees challenged multiple provisions in Order No. R9-2007-0001 (National Pollutant Discharge Elimination System (NPDES) No. CAS0108758), Waste Discharge Requirements for Discharges of Urban Runoff From the Municipal Separate Storm Sewer Systems (MS4s) within San Diego County (San Diego Test Claim). The Commission partially approved the test claim finding the following permit provisions to be state mandates subject to subvention: (1) conduct and report on street sweeping activities; (2) clean and report on storm sewer cleaning; (3) implement a regional urban runoff management program; (4) assess program effectiveness; (5) conduct public education and outreach; and (6) collaborate among copermittees to implement the program. The Commission found hydromodification and low impact development requirements to be state mandates, but not reimbursable mandates because the local agencies could charge fees for these programs.

In its final decisions, the Commission acknowledged that federal regulations require the co-permittees to secure NPDES permit coverage for their storm water discharges and that NPDES permits must include specific controls. But in the Commission's view, the lack of an explicit provision in the federal regulations replicating the permit requirements results in the permit establishing state as opposed to federal mandates. The State Water Board, together with the San Diego Water Board (concerning the San Diego Test Claim) and the Los Angeles Water Board (concerning the Los Angeles Test Claim), disagree that the respective permits exceed the federal mandate in the CWA and have filed petitions for writ of mandate in Sacramento County Superior Court to challenge the final Commission actions. In the

meantime, the provisions found to be reimbursable remain fully enforceable and must be complied with by the copermittees.[2]

With this background, commenters are correct that one factor to be considered in determining whether a requirement is an unfunded state mandate is whether the requirement goes beyond, or exceeds, what is required by federal law. Based upon a Test Claim proceeding to challenge a particular permit in this Tentative Order (once adopted), the Commission will decide whether a particular provision of an adopted order qualifies as an unfunded state mandate for which reimbursement is required. The Commission does not determine the validity of any particular provision; it addresses only whether the State or the local government will be required to pay for that provision. The San Diego Water Board is not, as some commenters assert, precluded from adopting otherwise lawful permit provisions simply because the Commission may subsequently determine that the provisions require reimbursement by the State.

Other commenters assert that the Tentative Order should be silent on the issue of unfunded mandates because the San Diego Water Board lacks jurisdiction to make such a determination. As stated above, the Commission will administratively decide whether one or more provisions are reimbursable mandates. However, it is entirely appropriate for the San Diego Water Board to set forth its legal bases to support the provisions in the Tentative Order, finding them to be necessary and appropriate to meet the federal MEP standard.

Board counsel will be available to answer any questions you may have at the hearing on the Tentative Order.

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[2] See attached memorandum from State Water Board Chief Counsel Michael Lauffer to Regional Water Board Executive Officers.

Linda S. Adams
Secretary for Environmental Protection

State Water Resources Control Board

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Arnold Schwarzenegger
Governor

TO: Regional Water Board Executive Officers **[via email only]**

FROM: Michael A.M. Lauffer
Chief Counsel
OFFICE OF CHIEF COUNSEL

DATE: May 20, 2010

SUBJECT: RECENT DECISIONS ISSUED BY THE COMMISSION ON STATE MANDATES CONCERNING MUNICIPAL STORM WATER PERMITS

In two recent decisions, the Commission on State Mandates (Commission) found that certain provisions within two municipal storm water permits constituted reimbursable state mandates within the meaning of the California Constitution. The Los Angeles Regional Water Quality Control Board (Los Angeles Water Board), the San Diego Regional Water Quality Control Board (San Diego Water Board), and the State Water Resources Control Board (State Water Board) (collectively, the Water Boards) will challenge these decisions in court. In the meantime, regional water quality control boards (regional water boards) should understand the immediate effects of the decisions.

This memorandum briefly summarizes the two decisions and provides information on their immediate consequences, so that the regional water boards have a common understanding of the decisions.

BACKGROUND

State Mandates Law

Section 6 of Article XIII B of the California Constitution provides, in relevant part: "Whenever the Legislature or any state agency mandates a new program or higher level of service on any local government, the State shall provide a subvention of funds to reimburse that local government for the costs of the program or higher level of service. . . ." These subvention requirements are commonly referred to as a prohibition on unfunded state mandates.

Local governments seeking reimbursement for state mandates must file test claims with the Commission. The Commission evaluates test claims and determines whether laws or "executive orders" that are the subject of the test claim constitute state mandates. If the Commission determines a law or executive order is a state mandate, it then determines whether the local government can assess fees to offset the cost of the state mandate. If the

Commission determines the local government cannot assess fees for the state mandate, the state must provide a subvention of funds.

Subsequent proceedings before the Commission determine the local governments entitled to reimbursement and the amount of the reimbursement. Under mandates law, eligible local governments will receive a reimbursement for each fiscal year that the state mandate remains in effect. The reimbursement is provided as a line item in the Budget Act. If the Legislature fails to provide a subvention of funds, the local government may file a suit to have the mandate declared unenforceable.[1]

The Los Angeles Decision

In 2003 and 2007, the County of Los Angeles and 14 cities within the county (the Los Angeles claimants) submitted test claims 03-TC-04, 03-TC-19, 03-TC-20, and 03-TC-21. The test claims asserted that provisions of Los Angeles Water Board Order 01-182 constitute reimbursable state mandates. Order 01-182 is the 2001 renewal of the municipal storm water permit for Los Angeles County and most of its incorporated cities, and serves as a national pollutant discharge elimination system (NPDES) permit. The permit provisions require the Los Angeles claimants to install and maintain trash receptacles at specified transit stops and to inspect certain industrial, construction, and commercial facilities for compliance with local and/or state storm water requirements.

On September 3, 2009, the Commission issued a final decision entitled *In re Test Claim On: Los Angeles Regional Quality Control Board Order No. 01-182, Case Nos.: 03-TC-04, 03-TC-19, 03-TC-20, 03-TC-21* (Los Angeles Decision). The Los Angeles Decision partially approved the test claims. The Commission found the trash receptacle requirement to be a reimbursable state mandate.

The San Diego Decision

In 2007, the County of San Diego and 21 cities within the county (the San Diego claimants) submitted test claim 07-TC-09. The test claim asserted that many provisions of San Diego Water Board Order R9-2007-0001 constitute reimbursable state mandates. Order R9-2007-0001 is the 2007 renewal of the municipal storm water permit for San Diego County and many of its incorporated cities, and serves as an NPDES permit. The challenged permit provisions require the San Diego claimants to: (1) conduct and report on street sweeping activities; (2) clean and report on storm sewer cleaning; (3) implement a regional urban runoff management program; (4) assess program effectiveness; (5) conduct public education and outreach; (6) collaborate among co-permittees to implement the program; (7) implement hydromodification management plans; and (8) implement plans for low impact development.

On March 30, 2010, the Commission issued a final decision entitled *In re Test Claim on: San Diego Regional Quality Control Board Order No. R9-2007-0001, Case No. 07-TC-09* (San Diego Decision). The San Diego Decision partially approved the test claim. The

[1] Gov. Code, § 17612, subd. (c).

Commission's decision took the relatively narrow Los Angeles Decision to its logical conclusion. The Commission found the following permit requirements to be reimbursable state mandates: (1) conduct and report on street sweeping activities; (2) conduct and report on storm sewer cleaning activities; (3) implement a regional urban runoff management program; (4) assess program effectiveness; (5) conduct public education and outreach; and (6) collaborate among co-permittees to implement the program. The Commission found the hydromodification and low impact development requirements to be state mandates, but not reimbursable mandates because the local agencies could charge fees to pay for these programs.

DISCUSSION

The Water Boards will challenge both the Los Angeles and San Diego decisions and seek to have them overturned on a variety of grounds. In the meantime, the Office of Chief Counsel has received questions from the various regional water boards about the immediate consequences of the decisions. The summary below responds to many of those questions, both in terms of what the decisions do – and do not – mean for the municipal storm water program.

1. *The Decisions' Direct Effects Are Limited to the Storm Water Permits Identified in the Test Claims*

The decisions directly affect only the municipal storm water permits identified by the two test claims. That is, the effect of the decisions is limited to the provisions of Los Angeles Water Board Order 01-182 and San Diego Order R9-2007-0001 identified by the Commission as reimbursable state mandates. No other municipal storm water permits (or provisions therein) in California are directly affected by the decisions, even if those permits contain similar provisions.

2. *The Decisions' Effects Cannot Extend to Storm Water Permits Issued to State or Federal Agencies*

Under federal storm water regulations, entities that operate municipal separate storm sewer systems are subject to NPDES permitting requirements. Municipal separate storm sewer systems include systems owned or operated by federal and state agencies. For example, the California Department of Transportation is currently regulated by a municipal storm water permit.

Because state and federal agencies cannot receive state reimbursement pursuant to Article XIII B of the California Constitution, the Commission does not have any jurisdiction over municipal storm water permits issued to those agencies. Reimbursement requirements can only apply to mandates imposed upon "local government."[2]

[2] Cal. Const., art. XIII B, § 6, subd. (a).

3. *The Claimants Must Continue to Comply With the Permits While the Reimbursement Phase Proceeds*

The Los Angeles and San Diego claimants must, respectively, continue to comply with all provisions of their municipal storm water permits. These permits are still valid in their entirety. The Commission proceedings were not about validity of the permits; the proceedings are and have always been about funding. The Commission has determined that the state must reimburse the claimants for the costs of complying with the identified permit provisions, not that the provisions are invalid.

While, as described below, a provision of state law could affect the permits' enforceability should the state fail to provide reimbursement, that provision cannot apply until the Legislature considers a local government claims bill towards the end of the reimbursement phase or affirmatively indicates that it will not provide reimbursement for a specific fiscal year as part of a Budget Act.[3] The reimbursement phase includes, but is not limited to, the Commission's adoption of Parameters and Guidelines, the State Controller's adoption of Claiming Instructions, and the Legislature's consideration of a local government claims bill as part of the annual Budget Act.

4. *If the Legislature Does Not Provide Reimbursement, the Provisions May Become Unenforceable as a Matter of State Law*

As mentioned above, the Legislature ultimately considers a local government claims bill in order to provide the necessary reimbursement. At that point, the Legislature could choose not to provide a reimbursement of funds in the annual Budget Act. If the legislature deletes funding from the annual Budget Act, the affected municipalities could bring suit in Sacramento Superior Court to render unenforceable the permit provisions identified by the Commission as reimbursable mandates.[4] For that fiscal year, the provisions would be unenforceable for the purposes of state law.[5] Alternatively, the Legislature may affirmatively indicate that it will not provide a reimbursement for a particular fiscal year, which as a matter of state law suspends the mandate.[6]

CONCLUSION

The Los Angeles and San Diego decisions could have significant long-term consequences on California's municipal storm water program, but the immediate effects are limited. While the Water Boards' challenges to the Commission's decisions are pending, the regional water boards should understand the following: (1) the decisions' effects are limited to the storm water permits identified in the test claims; (2) the decisions' effects cannot extend to storm water permits issued to state or federal agencies; (3) the claimants must continue to comply with the permits

[3] Gov. Code, § 17581, subd. (a).

[4] *Id.*, § 17612, subd. (c).

[5] *Ibid.* It is unclear whether a legislative failure to provide the required reimbursement would relieve the permittees of their obligations under federal law to comply with the permits.

[6] *Id.*, § 17581, subd. (a).

while the reimbursement phase proceeds; and (4) the provisions may become unenforceable as a matter of state law if the legislature does not provide reimbursement or affirmatively indicates that it will not provide a reimbursement.

If you have any questions about this matter, please contact Alex P. Mayer of my staff at (916) 341-5051.

cc: **[All via email only]**

Dorothy Rice, EXEC
Jonathan Bishop, EXEC
Tom Howard, EXEC
Darrin Polhemus, DWQ
AEOs
Regional Board Attorneys

CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
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California Regional Water Quality Control Board, San Diego Region

June 20, 2013

Mary Anne Skorpanich
OC Watersheds
Orange County Public Works Department
2301 N. Glassell Street
Orange, CA 92865-2773

In reply refer to / attn:
Place ID: 658018Lwalsh

Ms. Skorpanich:

Subject: Conditional Finding of Adequacy for the December 16, 2011 Model Water Quality Management Plan (Model WQMP) for South Orange County MS4 Permit Order No. R9-2009-0002, NPDES No. CAS108740

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) reviewed the South Orange County Model Water Quality Management Plan (Model WQMP) dated December 16, 2011 submitted by the South Orange County Copermittees. The Model WQMP is required under section F.1.d of Order No. R9-2009-0002, *Waste Discharge Requirements for Discharges of Runoff from the Municipal Separate Storm Sewer Systems (MS4) Draining the Watershed of the County of Orange, the Incorporated Cities of Orange County, and the Orange County Flood Control District with the San Diego Region* ("Order"). The Model WQMP provides guidance for preparation of a local Standard Stormwater Mitigation Plan (SSMP) for priority development projects under the jurisdiction of South Orange County Copermitees regulated under the Order. The Model WQMP also describes minimum Best Management Practices (BMPs) that must be incorporated into Priority Development Projects to reduce discharges of non-storm water runoff and storm water pollutants and prevent such discharges from causing or contributing to a violation of water quality standards.

San Diego Water Board staff held a teleconference on May 30, 2013 with the County of Orange, the Principal Copermittee of the South Orange County Storm Water Program, to discuss staff's comments on the Model WQMP. Based on this discussion and staff's review of the Model WQMP, the San Diego Water Board finds the Model WQMP to be adequate and in compliance with section F.1.d of the Order, provided the Model WQMP is revised to address the following four items:

1) The Model WQMP must be revised to clarify that effective December 16, 2012, ***in addition*** (emphasis added) to the Priority Development Project categories described in section F.1.d(2) of the Order, all pollutant generating development or redevelopment projects that result in the disturbance of one or more acres of land will be considered Priority Development Projects.

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2) Model WQMP section 7.II-1.5, and any other appropriate tables and figures, must be revised to clarify that public agency street, road, highway, and freeway Priority Development Projects are subject to the treatment control and hydromodification requirements in section F.1.d of the Order. Priority Development Projects which employ a green street design approach must meet the treatment control and hydromodification standards set forth in section F.1.d of the Order to be in compliance with the Order.

3) The Model WQMP must be revised to clarify within the Priority Development Project determination process that private road Priority Development Projects are subject to the requirements of section F.1.d of the Order.

4) The Model WQMP must be revised to include a discussion notifying Copermittees that each local SSMP must implement a process to verify compliance with the Model WQMP requirements. The process must also include identification of the roles and responsibilities of various municipal departments in implementing the Model WQMP requirements. The full discussion in each local SSMP must comply with requirements in section F.1.d(9) of the Order.

Please note that section F.1 of the Order provides that South Orange County Copermittees must update their own local SSMP, and amended ordinances consistent with the Model WQMP within 180 days of the date of this letter. Accordingly each South Orange County Area Copermittee must, no later than December 20, 2013, adopt their own local SSMP incorporating all requirements of the Model WQMP (as revised under the terms of this letter) in accordance with section F.1 of the Order.

In the subject line of any response, please include the requested "**In reply refer to:**" information located in the heading of this letter. For questions pertain to the subject matter, please contact Laurie Walsh at (858) 467-2970 or lwalsh@waterboards.ca.gov.

Respectfully,

David W. Gibson
Executive Officer
San Diego Regional Water Quality Control Board

DWG:dtb esb:law

cc: Distribution list via email: Orange County Copermittees

043793

Tech Staff Info & Use	
Order No.	R9-2009-0002
Party (GT/CIWQS) ID	
File No.	n/a
WDID	n/a
NPDES No.	CAS108740
Reg. Measure ID	
Place ID	658018
Person ID	n/a
Inspection ID	n/a

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California Regional Water Quality Control Board, San Diego Region

July 31, 2013

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Manager
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In reply refer to / attn:
CW-658018Lwalsh

Subject: San Diego Water Board Comments on Revised South Orange County Hydromodification Management Plan (HMP) dated October 25, 2012 required by MS4 Permit Order No. R9-2009-0002, NPDES No. CAS108740

Ms. Skorpanich,

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) reviewed the proposed Final South Orange County Hydromodification Management Plan dated October 25, 2012 (proposed Final HMP). The proposed Final HMP was submitted by Orange County Copermittees in response to the San Diego Water Board's comment letter dated April 25, 2012. The Hydromodification Management Plan (HMP) is required under section F.1.h of Order No. R9-2009-0002, *Waste Discharge Requirements for Discharges of Runoff from the Municipal Separate Storm Sewer Systems (MS4) Draining the Watershed of the County of Orange, the Incorporated Cities of Orange County, and the Orange County Flood Control District with the San Diego Region* ("Order"). The HMP defines minimum requirements to manage runoff flow from a developed area (i.e. discharge rates and durations) to ensure that runoff from Priority Development Projects does not increase erosion, sedimentation, lateral bank migration, or impacts to in-stream vegetation.

Based on review of the proposed Final HMP and the Orange County Copermittees' responses to comments submitted by the San Diego Water Board and other interested persons, the Board finds the proposed Final HMP to be adequate and in compliance with section F.1.h of the Order, provided the proposed Final HMP is revised to address the following three items:

1) The proposed Final HMP must be revised to clarify that Copermittees have the discretion to exempt from the hydromodification requirements in section F.1.h of the Order (as described in section F.1.h.(3)) only 1) Priority Development Projects (PDPs) discharging storm water runoff directly into underground storm drains that discharge directly to bays or the ocean; and 2) PDPs discharging runoff into conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to ocean waters, enclosed bays, estuaries, or water storage reservoirs and lakes).

The proposed Final HMP currently allows Copermittees the discretion to exempt PDPs from the hydromodification requirements in section F.1.h of the Order , if PDPs discharge to engineered channel sections that have the capacity to convey the 10-year ultimate condition discharge (see proposed Final HMP section 4.3.i), if the PDP is an in-stream flood control project or if the PDP is an in-stream restoration project (see proposed Final HMP section 4.3.ii), and if the PDP discharges directly to or discharges indirectly to (via an engineered conveyance system designed to convey the 10-year ultimate condition) specific large river sections (see proposed Final HMP section 4.3.iii). The Order does not provide for these exemptions and they should be removed from the proposed Final HMP.

2) The proposed Final HMP must be revised to clearly state what is required of all municipal street, road, highway, and freeway projects that fit the definition of a PDP. Municipal roadway PDPs must meet the pollutant removal requirements found in section F.1.d. of the Order and hydromodification requirements found in section F.1.h of the Order. The Order does not provide for green street exemptions. Municipal street, road, highway, and freeway PDPs that employ a green street design approach must comply with the treatment control and hydromodification standards set forth in section F.1.d of the Order.

3) The proposed Final HMP must be revised to clearly state the questions to be answered by the monitoring program. Section 6.0 of the proposed Final HMP describes the monitoring requirements to assess the effectiveness of the proposed Final HMP. The South Orange County Copermittees note that this proposed final HMP has in large part been based on the San Diego County HMP, which was already approved by the San Diego Regional Board. The San Diego County HMP includes a Monitoring and BMP Evaluation approach developed to answer three specific questions to: 1) confirm that the HMP appropriately defines the flow duration that initiates movement of channel bed or bank materials, 2) confirm that the mitigation facilities adequately meet the flow duration design criteria outlined in the HMP, and 3) confirm the effect of development on downstream cross section incision and widening. The monitoring program presented in the proposed Final HMP should be modified to to include a question driven monitoring program approach consistent with the San Diego Water Board's adopted Regional Monitoring Framework[1], and the approved San Diego County HMP. Incorporating a question driven monitoring approach should assist South Orange County Copermittees in answering the staff's original comment that asked "*how the proposed monitoring would accomplish an "effectiveness assessment" given the monitoring locations and monitoring frequencies proposed.*"

[1] See San Diego Water Board Resolution No. R9-2012-0069, *Resolution in Support of A Regional Monitoring Framework* adopted on December 12, 2012 and the November 2012 supporting document entitled *A Framework for Monitoring and Assessment in the San Diego Region* which can be accessed at:
http://www.waterboards.ca.gov/rwqcb9/water_issues/programs/swamp/index.shtml

The Copermittees should incorporate the revisions described in this letter into the Final HMP and implement the Final HMP for all PDPs no later than December 20, 2013. Pursuant to the San Diego Water Board Executive Officer's letter dated June 20, 2013, the South Orange County Copermittees must adopt their own local Standard Storm Water Mitigation Plans (SSMPs) incorporating all requirements of the Model WQMP (as revised under the terms of the June 20, 2013 letter) no later than December 20, 2013. Setting the same due date for implementation of both the local SSMPs and the Final HMP is intended to facilitate efficient compliance with both requirements.

In the subject line of any response, please include the requested "**In reply refer to:**" information located in the heading of this letter. For questions pertain to the subject matter, please contact Laurie Walsh at (858) 467-2970 or lwalsh@waterboards.ca.gov.

Respectfully,

David W. Gibson
Executive Officer
San Diego Regional Water Quality Control Board

DWG:dtb esb:law
cc: Distribution list via email: Orange County Copermittees

Tech Staff Info & Use	
Order No.	R9-2009-0002
Party (GT/CIWQS) ID	525473 (Orange Cnty MS4 Copermittees)
File No.	n/a
WDID	n/a
NPDES No.	CAS108740
Reg. Measure ID	332672
Place ID	CW-658018
Person ID	n/a
Inspection ID	n/a

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California Water Boards

California Regional Water Quality Control Board, San Diego Region

September 16, 2013

Mr. Jason E. Uhley
Chief of Wateshed Protection Division
Riverside County Flood Control and
Water Conservation District
1995 Market Street
Riverside, CA 92501

In reply refer to:
Place ID: 252901:dquach

Subject: Conditional Finding of Adequacy for the Water Quality Management Plan (Model WQMP) for the Santa Margarita Region of Riverside County, MS4 Permit Order No. R9-2010-0016, NPDES No. CAS0108766

Mr. Uhley:

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) has reviewed the South Riverside County Model Water Quality Management Plan (Model WQMP) submitted July 9, 2012 on behalf of the County of Riverside Copermittees within the San Diego Region. The Model WQMP is required under section F.1.d of Order No. R9-2010-0016, *Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4) Draining the County of Riverside, the Incorporated Cities of Riverside County, and the Riverside County Flood Control and Water Conservation District within the San Diego Region* (Order). The Model WQMP provides guidance for preparation of a project-specific WQMP for priority development projects under the jurisdiction of South Riverside County Copermittees regulated under the Order. The Model WQMP also describes minimum Best Management Practices (BMPs) that must be incorporated into priority development projects to reduce discharges of pollutants in storm water to the maximum extent practicable, and to prevent such discharges from causing or contributing to a violation of water quality standards.

The Model WQMP substantially meets the requirements of the Order. However, there are sections of the Model WQMP noted below that have reinterpreted permit language in a way that does not meet the specific requirements of the Order. The San Diego Water Board finds the Model WQMP to not be in compliance with section F.1.d of the Order until the Model WQMP is revised to address the following items:

1) The Model WQMP must be revised to delete the word "net" in the sentence "Where a Redevelopment ... a net increase of less than fifty percent" and in the sentence "Where a Redevelopment ... a net increase of more than fifty percent" of Section 1.1.2.a on page 8. The Order does not include the word "net" in the permit language.

2) The Model WQMP must be revised to delete the following italicized statement on page 8: " *Note that when determining the 50% rule applies to a redevelopment project, impervious areas that are removed and replaced are not counted (that is, credit is given for removal of existing impervious square footage*)." The Order does not allow a credit for the removal of existing impervious square footage in determining the 50% rule.

3) The Model WQMP must be revised to delete Section 1.2, Requirements For Public Works Projects, entirely beginning on page 8 and ending on page 10. The Order establishes development planning requirements based on project criteria and does not allow for exemptions solely on the basis that the project is a Copermittee Public Works Project. Public Works Projects meeting the Priority Development Project criteria listed in section F.1 of the Order must meet retention and hydromodification requirements.

4) The Model WQMP must be revised to delete the entire paragraph on Page 12 beginning with the sentence "If a subdivision map being proposed is purely to subdivide land... as applicable at the time those Discretionary Approval are sought." This paragraph is not consistent with the definition of "project" which is defined consistent with the California Environmental Quality Act as referenced on page 6 of the Model WQMP.

5) The Model WQMP must be revised to clarify that all Copermittees must implement a process to verify compliance with the Model WQMP requirements. The process must include identification of the roles and responsibilities of various municipal departments in implementing the Model WQMP requirements. The full discussion in each local Standard Storm Water Mitigation Plan (SSMP) must comply with requirements in section F.1.d(9) of the Order.

Please note that section F.1 of the Order requires that South Riverside County Copermittees update their own local SSMP and amend local ordinances consistent with the Model WQMP within 180 days of this letter. Accordingly, each South Riverside County Copermittee must, no later than **March 5, 2014**, adopt their own local SSMP incorporating all requirements of the Model WQMP (as revised under the terms of this letter) in accordance with section F.1 of the Order.

In addressing the above comments the South Riverside County Copermittees may wish to consider submitting an application for early coverage under the San Diego Water Board's recently adopted Order No. R9-2013-0001, *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements For Discharges From The Municipal Separate Storm Sewer Systems (MS4s) Draining The Watersheds Within The San Diego Region* (San Diego Regional MS4 Permit). The San Diego Regional MS4 Permit provides a flexible approach to meeting the development planning requirements that may provide for some of the Model WQMP language the South Riverside County Copermittees are seeking. For example, San Diego Regional MS4 Permit section 3.b.(3) allows retrofitting or redevelopment of existing paved alleys, streets or roads that are designed and constructed in accordance with the USEPA Green Streets, to be exempt from meeting the Priority

Development Project requirements. Copermitee Public Work Projects under this category could use the exemption, whereas the current Order does not provide for that.

In the subject line of any response, please include the requested "**In reply refer to:**" information located in the heading of this letter. For questions pertain to the subject matter, please contact Dat Quach at (858) 467-2978 or Dquach@waterboards.ca.gov.

Respectfully,

David W. Gibson
Executive Officer
San Diego Regional Water Quality Control Board

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Tech Staff Info & Use	
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WDID	
NPDES No.	CAS108766
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Person ID	n/a
Inspection ID	n/a

CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

California Regional Water Quality Control Board, San Diego Region

December 9, 2013

Mary Anne Skorpanich
Manager, OC Watersheds
Orange County Public Works
2301 N. Glassell Street
Orange, California 92865-2773

In reply refer to:
PIN number CW-658018:lwalsh

Subject: South Orange County Hydromodification Management Plan Exemptions and Early Enrollment Under Order No. R9-2013-0001

Ms. Skorpanich:

This is a follow-up to my meetings with you in August and October 2013 as well as your recent letter dated November 22, 2013 regarding the South Orange County Copermittees (Copermittees) request to continue granting hydromodification management best management practice (BMP) requirement exemptions for Priority Development Projects discharging to "large river" reaches. The term "large rivers" refers to low gradient reaches with a very wide flood plain for which the contributing drainage area exceeds 100 square miles and with a 100-year design flow in excess of 20,000 cubic feet per second (cfs).

As you know, the requirements of the South Orange County Municipal Separate Storm Sewer System (MS4) Permit, Order No. 2009-0002 (Order), do not provide for large river exemptions. By letter dated July 31, 2013, the San Diego Water Board concluded that the proposed *Final South Orange County Hydromodification Management Plan* dated October 25, 2012 (Proposed Final HMP) was adequate and in compliance with section F.I.h of the MS4 Order, provided in part that the HMP be revised to remove the large river exemption and other exemptions not authorized under the Order no later than December 20, 2013.

In your November 22 letter you requested that the current MS4 Order be amended to allow the Copermittees to continue allowing appropriate hydromodification management BMP requirement exemptions after December 20. I cannot recommend that the San Diego Water Board expend the time and resources necessary to amend the current MS4 Order at this time in light of the considerable effort put into development of the newly adopted Regional MS4 permit, Order No. R9-2013-0001, over the past two years. Moreover, the HMP requirements of the current MS4 Order were adopted in December 2009 after a similar comprehensive two year development process involving workshops, meetings, presentations and extensive opportunities for the Copermittees to review various drafts of the Tentative MS4 Order and provide written comments. The Regional MS4 permit is the San Diego Water Board's vehicle for advancing the storm water program through comprehensive, creative, and effective storm water regulation and enrollment of the Copermittees in that permit is one of the Board's top

priorities.

In my most recent meeting with you on October 21, 2013, I described an option for your consideration that could provide the flexibility for the continued granting of appropriate hydromodification management BMP requirement exemptions with only a relatively brief interruption after December 20, 2013. I encourage the Copermittees to submit a Report of Waste Discharge (ROWD) as soon as possible to begin the early enrollment process described in section II.F.6 of the Regional MS4 Permit. It would be necessary for the Copermittees to submit supporting technical justification for proposed exemptions from hydromodification management BMP requirements in the ROWD. If the San Diego Water Board concurs with the supporting justification, the proposed exemptions could be effective immediately upon enrollment. Please note that under section F.1.b.(1) of the Regional MS4 Permit, the Copermittees would have 24 months from date of enrollment to develop a Water Quality Improvement Plan. At that time, any exemptions allowed in the HMP upon enrollment would expire unless the Copermittees perform the optional Watershed Management Area Analysis, and include supporting rationale for the exemptions.

Under the early enrollment process, the Copermittees would have the opportunity for public comment and a hearing for the San Diego Water Board to consider modifications to the Regional MS4 Permit. During our October 21 meeting you indicated that the Copermittee comments and request for modifications to the Regional MS4 Permit may be limited to only a few topics regarding bacteria TMDLs and hydromodification management concerns. If that were the case, the comment period and hearing could follow submission of the ROWD in fairly short order. Alternatively the San Diego Water Board might also consider a request by the Copermittees to early enroll under the Regional MS4 Permit in a two-step process with a limited initial Board hearing to accomplish the enrollment, followed by a second hearing within six months to consider more substantive comments and requests for permit modification by the Copermittees. This two-step hearing process is not the preferred alternative due to the time and resources that would need to be invested by both the San Diego Water Board and the Copermittees. In addition, I cannot guarantee at this time that the San Diego Water Board members would agree to the two-step hearing process approach.

Please reconsider applying for early coverage under the Regional MS4 Permit. I do think it offers a number of real advantages for the Copermittees not only in terms of the potential for addressing your concerns on hydromodification management BMP exemptions but also in terms of the enhanced ability for the Copermittees to more flexibly deploy resources to achieve water quality improvement goals.

In the subject line of any response, please include the Primary Identification Number (PIN) CW-658018:lwalsh. If you would like to discuss this matter further please contact me at (619) 521-3007, email: David.Gibson@waterboards.ca.gov or Laurie Walsh at (619) 521-3373, email: Laurie.Walsh@waterboards.ca.gov.

Respectfully,

David W. Gibson
Executive Officer
California Regional Water Quality Control Board, San Diego Region

DWG:dtb:esb:cma

cc: Distribution list via email: Orange County Copermittees

Tech Staff Info & Use	
Order No.	R9-2009-0002
Party ID	525472
NPDES No.	CAS108740
Reg. Measure ID	332672
Place ID	CW-658018

California Water Boards

Edmund G. Brown Jr.
Governor

Matthew Rodriquez
Secretary for Environmental Protection

California Regional Water Quality Control Board, San Diego Region

April 8, 2014

Via email only

In reply refer to / attn:
CW-749045:wchiu

Jason E. Uhley
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Subject: San Diego Water Board Comments on Proposed Final Santa Margarita Region (SMR) Hydromodification Management Plan (HMP) dated March 2014 Required by Order No. R9-2010-0016, NPDES No. CAS0108766

Mr. Uhley:

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) reviewed the proposed final Santa Margarita Region (SMR) Hydromodification Management Plan (HMP) dated March 2014. The proposed final SMR HMP was submitted by Riverside County Copermittees (Copermittees) in response to the San Diego Water Board's comment letter dated September 11, 2013. The development and implementation of the HMP is required under section F.1.h of Order No. R9-2010-0016, *Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4) Draining the County of Riverside, the Incorporated Cities of Riverside County, and the Riverside County Flood Control and Water Conservation District with the San Diego Region* (Order). The HMP defines minimum requirements to manage runoff discharge rates and durations from Priority Development Projects (PDPs) to prevent or reduce the potential for downstream increases of erosion, sedimentation, lateral bank migration, or impacts to in-stream vegetation.

Based on review of the proposed final SMR HMP and the Copermittees' responses to comments submitted by the San Diego Water Board and other interested persons, the proposed final SMR HMP is found to be inadequate and out of compliance with the requirements under section F.1.h of the Order, until the proposed final SMR HMP is revised to address the following items:

1) The last part of Step C in Section 2.3.ii of the proposed final SMR HMP still includes the "waivers" that would not require a PDP to consider sediment loss. Pursuant to Section F.1.h.(1)(d) of the Order, PDPs are required to implement control measures so that the design of the project and/or control measures compensate for the loss of sediment supply due to development. Unless a PDP is provided an exemption from the HMP

requirements, the requirement to compensate for loss of sediment supply is required for all PDPs. The last part of Step C in Section 2.3.ii of the proposed final SMR HMP with the heading "Provision for waiver of sediment assessment" must be removed to be in compliance with Section F.1.h.(1)(d) of the Order.

2) Section 3.2 of the proposed final SMR HMP still includes several exemptions that would not necessarily require a PDP to implement control measures to meet the performance standards established pursuant to Sections F.1.h.(1)(a)-(c) of the Order. Unless the Copermittees have provided sufficient evidence, data, documentation, and justification that a PDP meeting the conditions of a proposed exemption would also be able to meet the performance standards established pursuant to Section F.1.h.(1)(a)-(c) of the Order, the San Diego Water Board Executive Officer will not find the proposed exemption to be acceptable. The following revisions to Section 3.2 in the proposed final SMR HMP are required to be in compliance with Sections F.1.h.(1)(d) and F.1.h.(4)(c) of the Order:

   a) The Concrete-Lined & Artificially Hardened and Engineered Channel Exempt Areas under Section 3.2.i of the proposed final SMR HMP must clearly state that the exemption does not apply to PDPs that discharge to Engineered, Partially Hardened and Maintained (EPHM) and Engineered, Earthen and Maintained (EEM) channels. In addition, Table 3 and Figures 10 through 12 must be revised to only include channels and areas where there are concrete-lined and/or Engineered, Fully Hardened and Maintained (EFHM) channels from the point of discharge for a potential PDP all the way to the reservoirs identified in Table 4, or Large River Reaches identified under Table 5 in Section 3.2.ii of the proposed final SMR HMP.

   b) The Exemption for Stable Receiving Waters under Section 3.2.iii of the proposed final SMR HMP must be removed.

   c) The Exemption for Hydrologic and Sediment Control Matching Below a Minimum Orifice Size under Section 3.2.iv of the proposed final SMR HMP must be removed.

   d) The Exemption for 72 Hour Drawdown Requirement under Section 3.2.v of the proposed final SMR HMP must be removed.

3) Section 3.3.ii of the proposed final SMR HMP includes the statement, "Routine roadway maintenance projects that maintain the original line and grade, hydraulic capacity, original purpose of the facility, or emergency roadway maintenance activities that are required to protect public health and safety are exempt from HMP Performance Standards." This statement is not consistent with the exemptions allowed under Section F1.h.(4) of the Order. If any of these types of "routine roadway maintenance projects" meet the definition of a PDP, they are required to implement control measures to meet the performance standards established pursuant to Sections F.1.h.(1)(a)-(c) of the Order.

If, however, any of these types of "routine roadway maintenance projects" do not meet the definition of a PDP and/or do not meet the definition of a redevelopment project, the project is not required to implement control measures to meet the performance standards in the HMP, as established pursuant to Sections F.1.h.(1)(a)-(c) of the Order. The definition of a PDP is provided under Section F.1.d.(1) of the Order. According to the definition of "Redevelopment" in Attachment C to the Order, "Redevelopment does not include trenching and resurfacing associated with utility work; resurfacing existing roadways; new sidewalk construction, pedestrian ramps, or bikelane on existing roads; and routine replacement of damaged pavement, such as pothole repair."

The statement must be removed from Section 3.3.ii of the proposed final SMR HMP to be in compliance with Sections F.1.h.(1)(d) and F.1.h.(4) of the Order. As an alternative, the Copermittees may revise the statement to indicate the types of "routine roadway maintenance projects" that would not be required to implement HMP requirements because they do not meet the definition of a PDP and/or a redevelopment project.

The Copermittees must incorporate the revisions described in this letter into the final SMR HMP and require implementation of the final SMR HMP for all PDPs **no later than July 11, 2014** to be in compliance with the requirements under Section F.1.h of the Order. Please provide a copy of the final SMR HMP with incorporated revisions to the San Diego Water Board by July 11, 2014.

The Copermittees may revisit the proposed additional HMP exemptions not allowed for the current Order when the Riverside County Copermittees submit the Report of Waste Discharge (ROWD) for coverage under Order No. R9-2013-0001 (Regional MS4 Permit) in 2015. Any proposed new HMP exemptions will need technical justification and have to be part of the larger Watershed Management Area Analysis that also identifies restoration and retrofit opportunities.

In the subject line of any response, please include the requested "**In reply refer to:**" information located in the heading of this letter. For questions pertain to the subject matter, please contact Wayne Chiu at (619) 521-3354 or wchiu@waterboards.ca.gov.

Respectfully,

David W. Gibson
Executive Officer
San Diego Regional Water Quality Control Board

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Tech Staff Info & Use	
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Place ID	749045

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
2375 Northside Drive, Suite 100, San Diego, CA 92108
Phone (619) 516-1990 · Fax (619) 516-1994

ORDER R9-2015-0013
NPDES NO. CAG919003

GENERAL WASTE DISCHARGE REQUIREMENTS FOR GROUNDWATER EXTRACTION DISCHARGES TO SURFACE WATERS WITHIN THE SAN DIEGO REGION

Groundwater extraction discharges from groundwater control systems to waters of the United States (also referred to herein as surface waters) in the San Diego Region are subject to waste discharge requirements (WDRs) as set forth in this National Pollutant Discharge Elimination System (NPDES) General Permit (Order), and as authorized by a Notice of Applicability (NOA) issued by the California Regional Water Quality Control Board, San Diego Region's (San Diego Water Board) Executive Officer. Definitions of terms used in this Order are contained in Attachment A. Definitions of key terms describing the purpose of this Order are also set forth below:

Table 1. Definitions for the Purpose of this Order

Groundwater Extraction Discharge	The discharge of groundwater removed from the ground or drainage collection systems to lower groundwater levels or pressures, control or eliminate groundwater seepage or leakage, stabilize slopes and other earth structures, or form part of a system to remediate groundwater contamination. Groundwater extraction discharges are associated with groundwater control systems employed in construction and foundation dewatering projects, trench and ditch dewatering projects, monitoring wells, tank removal projects, groundwater remediation projects, permanent groundwater drainage and seepage control projects, and other similar activities. The term as used in this Order does not include permanent groundwater extraction discharges to San Diego Bay or reaches of its tributaries under tidal influence with the exception of the discharge to San Diego Bay from the permanent groundwater drainage control system at One America Plaza in the City of San Diego.
Discharger	Any person that is authorized to discharge extracted groundwater under this Order through an NOA issued by the San Diego Water Board.
Waters of the United States	Generally refers to surface waters, as defined for the purposes of the federal Clean Water Act. For the purpose of this Order, the terms "surface water", and "receiving water" are interchangeably used to mean "waters of the United States," unless noted otherwise.

Table 2. Administrative Information

This Order was adopted by the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) on:	**June 24, 2015**
This Order shall become effective on:	**October 1, 2015,**
This Order shall expire on:	**September 30, 2020**
The U.S. Environmental Protection Agency (U. S. EPA) and the San Diego Water Board have classified these discharges as follows:	**Minor**

I, David W. Gibson, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of the Order adopted by the California Regional Water Quality Control Board, San Diego Region, on June 24, 2015.

David W. Gibson, Executive Officer

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I. SCOPE OF ORDER COVERAGE

This Order is an NPDES General Permit that regulates groundwater extraction discharges to surface waters within the San Diego Region, as set forth below. Groundwater extraction discharges associated with a specific project regulated under this Order may be single discharges at one identified location or multiple groundwater discharges at multiple locations to waters of the U.S. within the San Diego Region.

This Order requires persons discharging, or proposing to discharge, extracted groundwater to waters of the U.S. in the San Diego Region as described in section I.A of this Order, excluding those persons that meet the exception criteria identified in section I.B of this Order, to obtain NPDES regulatory coverage through enrollment in this General NPDES Order.

A. Discharges Regulated Under This Order

This Order regulates groundwater extraction discharges that include but are not limited to:

1. Groundwater extraction discharges from the following sources:

a. Construction dewatering;
b. Foundation drains[1];
c. Water from crawl space pumps;
d. Water from footing drains[1];
e. Trench and ditch dewatering;
f. Storage tank removal;
g. Monitoring well monitoring and testing;
h. Groundwater remediation[2];
i. Permanent groundwater drainage and seepage control projects to surface waters other than San Diego Bay[3]; and
j. Other similar activities.

2. Groundwater extraction discharges that have been determined by the San Diego Water Board through a reasonable potential analysis (RPA) to not adversely affect beneficial uses of the receiving waters with treatment controls and managed through best management practices pursuant to the terms and conditions of this Order;

3. Groundwater extraction discharges not otherwise excluded under section I.B. of this Order; and

4. Groundwater extraction discharges authorized by an NOA issued by the San Diego Water Board Executive Officer as described in section II.B of this Order.

B. Discharges Not Regulated Under This Order

This Order does not regulate any of the following groundwater extraction discharges.

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[1] Categories are included if the system is designed to be located at or below the groundwater table to actively or passively extract groundwater during any part of the year.

[2] Groundwater remediation may also include, but is not limited to, passive groundwater infiltration to a municipal separate storm sewer system (MS4) from a known identified groundwater remediation site, as determined by the San Diego Water Board.

[3] Permanent groundwater extraction discharges from One America Plaza in the City of San Diego, CA that were previously regulated under Order No. R9-2007-0034 are not subject to this exclusion and are eligible for coverage under this Order, subject to the terms and conditions of the Order.

1. Groundwater extraction discharges that are not within the scope of this Order as described in section I and/or are not authorized by a NOA issued by the San Diego Water Board Executive Officer;
2. Permanent groundwater extraction discharges to San Diego Bay and its tributaries under tidal influence except as provided in section I. of this Order. Permanent groundwater extraction discharges refers to long-term discharges from groundwater control systems for completed structures needed to lower groundwater levels, reduce hydrostatic pressure, or control infiltration and leakage of groundwater into below ground completed structures;
3. Passive discharges of groundwater from any source other than as specified in section I.A.1;
4. Direct groundwater extraction discharges into areas designated by the State Water Resources Control Board (State Water Board) as Areas of Special Biological Significance (ASBS);
5. Groundwater extraction discharges that are comingled with other non-groundwater wastewater flows or types of waste;
6. Groundwater extraction discharges determined by the San Diego Water Board to be sufficiently regulated by another NPDES permit including but not limited to any one of the following:
   a. Order No. 2006-0008-DWQ, NPDES No. CAG990002, General National Pollutant Discharge Elimination System (NPDES) Permit For Discharges From Utility Vaults And Underground Structures To Surface Waters, and any reissuance;
   b. Order No. R9-2013-0001, NPDES No. CAS0109266, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region (MS4 Permit) and any reissuance;
   c. Order No. 2012-0011-DWQ, NPDES No. CAS000003, National Pollutant Discharge Elimination System (NPDES) Permit, Waste Discharge Requirements (WDRS) for State of California, Department of Transportation, and any reissuance;
   d. Order No. 2014-0194-DWQ, NPDES No. CAG140001, Statewide General National Pollutant Discharge Elimination System (NPDES) Permit For Drinking Water System Discharges To Waters of the United States, and any reissuance; or
   e. Order No. R9-2013-0001- DWQ, National Pollutant Discharge Elimination System (NPDES) General Permit No. CAS000004 and WDRs for Storm Water Discharges from Small Municipal Separate Storm Sewer Systems (MS4s), and any reissuance. The Discharger must have an established agreement with the Small MS4 Copermitee having jurisdiction to discharge into its MS4 and the San Diego Water Board must concur that the agreement provides sufficient regulation of the groundwater extraction discharge through the Small MS4 General Permit.
7. Groundwater extraction discharges in compliance with the instructions of an On-Scene Coordinator pursuant to 40 CFR part 300 (*The National Oil and Hazardous Substances Pollution Contingency Plan*) or 33 CFR section 153.10(e) (Pollution by Oil and Hazardous Substances);
8. Groundwater extraction discharges into a sanitary sewer system leading to a federally, publically, or privately owned treatment works;
9. Groundwater extraction discharges that do not discharge to waters of the U.S. or otherwise require an NPDES permit under federal law; and

10. Groundwater extraction discharges from a post construction single family residential home, unless such a discharge has been determined to cause or contribute to a condition of pollution or nuisance. This determination may be made by the San Diego Water Board or by the appropriate local agency with the San Diego Water Board's concurrence.

II. APPLICATION REQUIREMENTS

A. Notice of Intent (NOI) Required Elements

To obtain coverage under this Order, a Discharger must submit a complete NOI application package to the San Diego Water Board office at least 60 days before proposed commencement of the discharge. The application must include all of the following items to be deemed complete:

1. **Notice of Intent (NOI) Form**. A NOI Form (see Attachment C of this Order), completed in accordance with the form instructions, including all specified attachments. The NOI must be signed and certified in accordance with Signatory and Certification Requirements contained in section V.B of Attachment D Standard Provisions of this Order.

2. **Treatment Facility Certification Report.** If the groundwater extraction discharge will need treatment to comply with the effluent limitations, then the NOI must include a report describing and certifying the adequacy of each component of the treatment facilities prepared by a California licensed professional engineer, competent and proficient in the field pertinent to the report and qualified to prepare such report. The report shall also certify the following:

   a. All treatment facility startup and operation instruction manuals are adequate and available to operating personnel;

   b. Adequate treatment facility maintenance and testing (if treatment facilities are on "standby") schedules are included in the treatment facility operations manual;

   c. Treatment facilities and appurtenances will be fully operational, as designed prior to the commencement of discharge ; and

   d. Influent and effluent sampling locations or ports are located in areas where samples representative of the waste stream to be monitored can be obtained.

   The design engineer shall affix his/her signature and engineering license number to this certification report.

3. **Disposal Alternative Analysis**. An evaluation of a range of alternative disposal methods to the proposed extracted groundwater discharge to surface waters including reasons and conclusions as to why it is technically or economically infeasible to implement these alternatives. Alternative disposal methods[1] include but are not limited to the following:

   a. Collection and recycling of the extracted groundwater for a direct beneficial use, including landscape or agricultural irrigation, dust control, soil compaction during earthwork activities, or other appropriate uses in lieu of potable drinking water supplies;

   b. Reinjection of the extracted groundwater;

   c. Discharge of the extracted groundwater to an MS4 that employs low impact development practices or flows into storm water capture basins to evaporate or recharge groundwater; and

[1] The Discharger shall consult with the San Diego Water Board if any alternative disposal methods are subject to regulation under separate waste discharge requirements.

d. Discharge of the extracted groundwater to a sanitary sewer system leading to a federally, publically, or privately owned treatment works.

4. **MS4 Operator Notification**. Dischargers proposing to discharge extracted groundwater to an MS4 shall include with their NOI, documentation demonstrating that they have notified the MS4 operator of the point of proposed discharge into the MS4. Consistent with California Water Code (CWC) section 13002 and 40 CFR section 122.5(c), this Order is not intended to affect any separate legal authority an MS4 owner may have to prohibit a discharge or to require the Discharger to obtain any permits or approvals from the MS4 owner before initiating discharges into the MS4.

5. **Reasonable Potential Analysis (RPA)**. The results of a reasonable potential analysis described in Appendix C-1 of this Order to provide direction to the Discharger and the San Diego Water Board for determining if a pollutant in the proposed groundwater extraction discharge causes, has the reasonable potential to cause, or contributes to an excursion above any applicable State water quality objective or federal water quality criteria in accordance with 40 CFR section 122.44(d)(1)(iii).

6. **Monitoring and Reporting Program (MRP)**. A proposed MRP, as specified in section III.A of the MRP in attachment E of this Order.

7. **Project Map**. A scaled project map(s) that identifies the following:

   a. The essential features of the groundwater control and extraction system including the extent of any drawdown;

   b. All known groundwater contamination sites and plumes within 0.5 miles of each groundwater extraction point to be used in the groundwater control system;

   c. The receiving waters for each proposed groundwater extraction discharge; and

   d. If discharge of extracted groundwater into a MS4 is proposed, the MS4 that will receive the groundwater extraction discharge.

8. **Supplemental Information**. Upon request, the Discharger must submit any additional supplemental information that the San Diego Water Board deems necessary to determine whether the discharge meets the criteria for coverage under this Order, or to prescribe an appropriate MRP, or both.

9. **Application Fee**. Payment of the application fee, equal to the first annual fee, made payable to "SWRCB." In accordance with California Code of Regulations (CCR) title 23, division 3, chapter 9, Waste Discharge Reports and Requirements, article 1, Fees. The fee regulations can be accessed at http://www.waterboards.ca.gov/resources/fees/#npdes.

The NOI Application must be submitted to the following address:

San Diego Water Board
2375 Northside Drive, Suite 100
San Diego, CA 92108

Attn: Groundwater Extraction Permit
Source Control Regulation Unit
NOTICE OF INTENT

The San Diego Water Board is implementing a Paperless Office system to reduce paper use. Please convert all submissions with attachments to a searchable Portable Document Format (PDF) and submit the documents on a compact disk.

B. Notice of Applicability (NOA)

The NOI and each element thereof is subject to San Diego Water Board approval. After the Discharger's application package is deemed complete and eligible for coverage under this Order by the San Diego Water Board, the Board will issue a NOA to the Discharger. The NOA may include additional site-specific monitoring requirements and requirements due to specific circumstances of the groundwater extraction discharge. Regulatory coverage for the groundwater extraction discharge described in the application package commences with the date of issuance of the NOA and the Discharger is authorized to discharge extracted groundwater commencing with the NOA issuance date.

C. Notice of Exclusion (NOEX)

The San Diego Water Board may issue a Notice of Exclusion (NOEX), which denies coverage under this Order because the proposed groundwater extraction discharge is not covered within the scope of this Order, terminates permit coverage of an existing discharge for cause, or requires the Discharger to submit an application for an individual WDR. A NOEX is a notice that indicates that the discharge is not eligible for coverage under this Order and states the reason why.

D. Dischargers Covered Under Prior NPDES Order Nos. R9-2007-0034 or R9-2008-0002

Existing Dischargers subject to San Diego Water Board Order Nos. R9-2007-0034 or R9-2008-0002 (referred to in this Order as existing Dischargers) will continue coverage under those Orders for one year following the date of adoption for this Order. After June 24, 2016, all Notices of Enrollment issued under Order Nos. R9-2007-0034 or R9-2008-0002 will be terminated. Existing Dischargers shall submit a complete NOI package as described in section II.A of this Order (excluding the fee) no later than March 24, 2016 or else risk losing permit coverage.

E. Notice of Applicability (NOA) Modification

The Discharger may submit a written request, for modification of a NOA, to the San Diego Water Board. The request for NOA modification shall include "Request for NOA Amendment" in the subject line; the Waste Discharge Identification Number (WDID) assigned to the Discharger in the original NOA; the name and address of the Discharger; all of the information the Discharger believes is necessary for the San Diego Water Board to evaluate the request for modification; and shall be signed and certified by the Discharger in accordance with the signatory requirements in section V.B of Attachment D, Standard Provisions for this Order, Signatory and Certification Requirements. A request for modification of an NOA does not require resubmittal of the entire NOI package, but the San Diego Water Board may ask for supplemental information as necessary to determine if the requested modification is appropriate.The submittal of a request by the Discharger for modification of the NOA does not stay any condition of this Order and the Discharger shall continue to comply with this Order and the NOA until further notice from the San Diego Water Board.

F. Notice of Termination (NOT)

To terminate coverage under this Order, the Discharger must submit a complete and accurate Notice of Termination (NOT), to the San Diego Water Board. The NOT provides notice that the Discharger has ceased the discharge of extracted groundwater associated with the groundwater control activities at the site under this Order.

The NOT should include "Notice of Termination" in the subject line, the Waste Discharge Identification Number (WDID) assigned to the project by the San Diego Water Board in the NOA, and the name and address of the Discharger. The NOT must be signed and dated by the Discharger in accordance with the signatory requirements in section V.B of Attachment D, Standard Provisions for this Order, Signatory and Certification Requirements of this Order. The Discharger's coverage under this Order will terminate on the date specified in a coverage termination notice issued by the San Diego Water Board and the Discharger will no longer be authorized to discharge extracted groundwater under this Order. The San Diego Water Board's coverage termination notice in no way prevents the Board from taking enforcement action for any violations of the Order by the Discharger.

Prior to receiving the coverage termination notice the Discharger shall continue to comply with the requirements of this Order including payment of any applicable fees and outstanding invoices, and submittal of any required reports.

G. Transfer of Ownership

The NOA authorizing coverage for the discharge of extracted groundwater for a specific groundwater control project is not transferable. In the event of any planned change in ownership of land or waste discharge facilities presently owned by the Discharger, the Discharger must notify the new succeeding owner, by letter 120 days prior to property transfer, of the obligation to apply for coverage under this Order for the extracted groundwater discharge. A copy of this notification shall be promptly submitted to the San Diego Water Board. Additionally, the Discharger must submit a NOT to the San Diego Water Board. The new succeeding owner must submit a new NOI application package for coverage under this Order prior to discharging extracted groundwater.

III. FINDINGS

The San Diego Water Board finds:

A. Background. This Order supersedes NPDES Order Nos. R9-2007-0034 and R9-2008-0002. Dischargers enrolled under Order Nos. R9-2007-0034 and R9-2008-0002 must obtain coverage under this new Order within 365 days after the effective date of this Order to continue their discharge under WDRs in this Order. Dischargers may continue to discharge under the terms of the previous Orders for up to 365 days after the effective date of this Order or until they receive a new NOA from the San Diego Water Board.

B. Legal Authorities. This Order serves as WDRs pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).This Order is also issued pursuant to section 402 of the CWA and implementing regulations adopted by the U.S. Environmental Protection Agency (U.S. EPA) and chapter 5.5, division 7 of the CWC (commencing with section 13370). This Order also serves as a general NPDES permit for point source discharges from approved facilities to surface waters and storm water conveyances discharging to surface waters. The San Diego Water Board is authorized to issue general NPDES permits pursuant to U.S. EPA approval issued in 1989.

C. Background and Rationale for Requirements. The San Diego Water Board developed the requirements in this Order based on information submitted as part of the NOI applications for individual groundwater extraction facilities, through MRPs, and other available information. The Fact Sheet (Attachment F), which contains background information and rationale for the requirements of this Order, is hereby incorporated into this Order and constitutes part of the Findings of this Order. Attachments A through F and Attachment G are also incorporated into this Order.

D. Provisions and Requirements Implementing State Law. The provisions/requirements in subsections VI.B of this Order are included to implement state law only. These provisions/requirements are not required or authorized under the federal CWA; consequently, violations of these provisions/requirements are not subject to the enforcement remedies that are available for NPDES violations.

E. Notification of Interested Parties. The San Diego Water Board notified the Dischargers covered under Orders No. R9-2007-0034 and R9-2008-0002 and interested agencies and persons of its intent to prescribe waste discharge requirements for these discharges and provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet (Attachment F) of this Order.

F. Consideration of Public Comment. The San Diego Water Board, in a public meeting, heard and considered all comments pertaining to the discharge of extracted groundwater. Details of the Public Hearing are provided in the Fact Sheet (Attachment F) of this Order.

THEREFORE, IT IS HEREBY ORDERED that this Order supersedes Order Nos. R9-2007-0034 and R9-2008-0002, except for enforcement purposes and for coverage of existing discharges until they timely enroll in this Order, and in order to meet the provisions contained in division 7 of the CWC (commencing with section 13000) and regulations adopted thereunder, and the provisions of the CWA and regulations and guidelines adopted thereunder, the Discharger shall comply with the requirements in this Order. This action in no way prevents the San Diego Water Board from taking enforcement action for past violations of the previous Orders.

IV. DISCHARGE PROHIBITIONS

A. The discharge of extracted groundwater at a location, for a purpose or duration, or in a manner, different from that described in section I of this Order, the NOI, or the NOA is prohibited.

B. The discharge of extracted groundwater to areas designated by the State Water Board as Areas of Special Biological Significance (ASBS) is prohibited except as provided in an exception issued by State Water Board pursuant to provisions of the Ocean Plan. Discharges shall be located a sufficient distance from such designated areas to assure maintenance of natural water quality conditions in these areas. Heisler Park Ecological Reserve, located in coastal waters near the City of Laguna Beach, the San Diego-La Jolla Ecological Reserve, and the San Diego Marine Life Refuge, located in coastal waters near La Jolla, a community of the City of San Diego, are ASBS designated by the State Water Board.

C. The discharge of extracted groundwater in excess of the flowrate specified in an NOA is prohibited, unless the Discharger obtains a revised discharge NOA authorizing an increased flowrate that is issued pursuant to section II.E above.

D. The addition of pollutants to extracted groundwater to be discharged to surface waters within the San Diego Region is prohibited. The only exception to this prohibition is that chemicals may be added to extracted groundwater to control biofouling in treatment systems and enhance treatment, provided that the extracted groundwater discharged meets the effluent limitations for such chemicals and toxicity established by this Order and any additional requirements specified in the discharge NOA issued by the San Diego Water Board. In the NOI, the Discharger must notify the San Diego Water Board of the types and amounts of any such chemicals proposed to be added to the extracted groundwater.

E. The discharge of extracted groundwater to surface waters within the San Diego Region is prohibited unless a complete NOI has been submitted, as determined by the San Diego Water

Board, and the San Diego Water Board has issued an NOA for the discharge; or the discharge is regulated by a separate NPDES permit.

F. Permanent groundwater extraction discharges to San Diego Bay from a groundwater control system are prohibited[1]. Permanent groundwater extraction discharges refers to long term discharges from groundwater control systems for a completed structure, needed to lower groundwater levels, reduce hydrostatic pressure or control infiltration and leakage of groundwater into below ground completed structures.

G. The discharge of extracted groundwater must comply with Discharge Prohibitions contained in the Water Quality *Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan)* and *chapter 4 of the Water Quality Control Plan for the San Diego Basin* (Basin Plan). These prohibitions are incorporated into this Order as if fully set forth herein and are summarized in Attachment G of this Order.

H. Pursuant to the TMDL wasteload allocations (WLAs), summarized in Attachment B of this Order, discharges including copper to the Shelter Island Yacht Basin (SIYB) watershed are prohibited. A monitoring result of non-detect using approved analytical laboratory methods and minimum levels for copper is required to comply with this Discharge Prohibition.

I. Pursuant to the TMDL WLAs, summarized in Attachment B of this Order, discharges including diazinon to Chollas Creek, are prohibited. A monitoring result of non-detect using approved methods and minimum levels is deemed to be in compliance with this discharge prohibition.

J. Pursuant to the TMDL WLAs, summarized in Attachment B of this Order, the discharge of total coliform, fecal coliform, and enterococci bacteria to the water quality segments identified in sections V and VI of Attachment B are prohibited. A monitoring result of non-detect using approved methods and minimum levels is deemed to comply with this Discharge Prohibition.

K. Pursuant to the TMDL WLAs, summarized in Attachment B of this Order, the discharge of total nitrogen and total phosphorus to Rainbow Creek is prohibited. A monitoring result of non-detect using approved methods and minimum levels for total nitrogen and total phosphorus is deemed to comply with this Discharge Prohibition.

L. Pursuant to the TMDL WLAs, summarized in Attachment B of this Order, the discharge of dissolved copper, lead, and zinc to Chollas Creek, above the effluent limitations specified in Table 4, is prohibited. A monitoring result of non-detect using approved methods and minimum levels for dissolved copper, lead, and zinc is deemed to comply with this Discharge Prohibition.

M. Pursuant to the TMDL WLAs, summarized in Attachment B of this Order, the discharge of sediment to Los Penasquitos Lagoon is prohibited. A monitoring result of non-detect using approved methods and minimum levels for settleable solids and total suspended solids is deemed to comply with this Discharge Prohibition.

V. EFFLUENT LIMITATIONS AND DISCHARGE SPECIFICATIONS

The Discharger shall maintain compliance with the effluent limitations applicable to the receiving waters as specified below at the Discharge Point described in the NOA, with compliance measured as described in the MRP in Attachment E of this Order and the NOA.

A. Effluent Limitations – Freshwater Inland Surface Waters including Lakes, Reservoirs, and Buena Vista Lagoon

[1] Permanent groundwater extraction discharges to San Diego Bay from the groundwater control system employed for the structure at One America Plaza in the City of San Diego are excluded from this prohibition.

Freshwater criteria apply where receiving water salinities are 1 part per thousand and below and at locations where this occurs 95% or more of the time. Saltwater criteria apply at receiving water salinities of 10 parts per thousand and above and at locations where this occurs 95% of the time. Where receiving water salinities are between 1 and 10 parts per thousand, the more stringent of freshwater or saltwater criteria applies.

1. **Metals Effluent Limitations**

   a. Discharges to inland freshwater surface waters shall not exceed the effluent limitations specified in Table 3 below:

Table 3. Hardness-Dependent Metal Limitations for Freshwater Inland Surface Waters[3]

Parameter[1]	Units[2]	Hardness (mg/L)					
		Up to 200		200 - 300		300 and above	
		AMEL	MDEL	AMEL	MDEL	AMEL	MDEL
Cadmium	µg/L	3.5	7.0	4.8	9.6	6.0	12
Copper[3]	µg/L	14	28	20	39	25	50
Lead[3]	µg/L	6.3	13	11	21	15	31
Nickel	µg/L	77	150	110	220	140	280
Silver	µg/L	6.7	13	13	27	22	44
Zinc[3]	µg/L	110	210	150	300	190	390

[1] All metal effluent limitations are expressed as total recoverable metal.
[2] The concentraton-based effluent limitations stated in the table above are also applicable as mass-based effluent limitations expressed as lbs/day which are calculated as follows: Parameter Concentration (if expressed as mg/L) x Flow Limit (expressed as MGD) x 8.34 (conversion factor) = Mass-based Effluent Limitation expressed as lbs/day. Parameter Concentration (ifexpressed as µg/L) x Flow Limit (expressed as MGD) x 0.00834 (conversion factor) = Mass-based Effluent Limitation expressed as lbs/day. The Flow Limit (MGD) value used in this equaton shall be the Discharger's maximum allowable flow rate limit specified in the NOA. The discharge shall not cause the calculated mass-based effluent limitations to be exceeded.
[3] Discharges to Chollas Creek shall not exceed the effluent limitations established in section V.A.1.b of this Order.

   b. Discharges to Chollas Creek shall not exceed the following effluent limitations for copper, lead, and zinc specified in Table 4 below:

Table 4. Hardness-Dependent Metal Limitations for Chollas Creek[2]

Parameter[1]	Units	Hardness (mg/L)					
		Up to 200		200 - 300		300 and above	
		AMEL	MDEL	AMEL	MDEL	AMEL	MDEL
Copper	µg/L	11.6	23.2	16.8	33.8	21.5	43.2
Lead	µg/L	3.9	7.8	5.6	12.0	8.1	16.1
Zinc	µg/L	94.4	189.4	133.1	267.0	169.9	340.8

[1] All metal effluent limitations are expressed as total recoverable metal.
[2] See Attachment A for definitions of abbreviations and a glossary of common terms used in this Order.

2. **Municipal Freshwater Inland Surface Waters.** Discharges to freshwater inland surface waters, with a designated domestic and municipal supply (MUN) beneficial use, shall not exceed the effluent limitations specified in Table 5 below:

Table 5. Effluent Limitations for Discharges to Freshwater Inland Surface Waters with MUN Beneficial Use

Parameters	Units[6]	Effluent Limitations

		AMEL	MDEL	Instantaneous Maximum
Applicable to All Dischargers				
Settleable Solids	ml/L	0.1	--	0.2
Total Suspended Solids	mg/L	30	--	50
Turbidity	NTU	--	--	20[1]
Chronic Toxicity	Pass/Fail	--	Pass[2]	--
pH	standard units	--	--	6.5 – 8.5[3]
Based on Results of Reasonable Potential Analysis				
Hydrogen Sulfide	µg/L	2.0	4.0	10
Xylene	µg/L	--	--	5
Chlorinated Phenolics	µg/L	--	--	1
Remaining Base/Neutral Compounds[4]	µg/L	--	--	10
Total Petroleum Hydrocarbons	mg/L	--	--	0.5
Percent Sodium	%	--	--	60
Total Nitrogen[7]	mg/L	1.0	--	2.0
Total Phosphorus[7]	mg/L	0.1	--	0.2
Methylene Blue Active Substances (MBAS)	mg/L	--	--	0.5
Fluoride	mg/L	--	--	1.0
Total Residual Chlorine	µg/L	2.0	8.0	10
Dissolved Oxygen	mg/L	--	--	5.0/6.0[5]
Iron, Total Recoverable	mg/L	--	--	0.3
Manganese, Total Recoverable	mg/L	--	--	0.05
Total Coliform[8]	MPN/100 mL	--	--	1,000
Fecal Coliform[8]	MPN/100 mL	--	--	200
Enterococci[8]	MPN/100 mL	--	--	[8]
Dibromochloropropane	µg/L	--	--	0.2
Ethylene Dibromide	µg/L	--	--	0.02
Methyl-Tert-Butyl Ether (MTBE)	µg/L	--	--	5
Antimony, Total Recoverable	µg/L	14	28	--
Arsenic, Total Recoverable	µg/L	120	250	--
Chromium (III) , Total Recoverable	µg/L	530	1,100	--
Chromium (VI) , Total Recoverable	µg/L	8.0	16	--
Mercury, Total Recoverable	µg/L	0.05	0.1	--
Selenium, Total Recoverable	µg/L	4.1	8.2	--
Thallium, Total Recoverable	µg/L	1.7	3.4	--
Cyanide, Total	µg/L	4.3	8.5	--
2,3,7,8 TCDD	µg/L	1.3E-08	2.6E-08	--
TCDD Equivalents	µg/L	1.3E-08	2.6E-08	--
Acrolein	µg/L	320	640	--
Acrylonitrile	µg/L	0.06	0.12	--
Benzene	µg/L	1.2	2.4	--

Parameters	Units[6]	Effluent Limitations		
		AMEL	MDEL	Instantaneous Maximum
Bromoform	µg/L	4.3	8.6	--
Carbon Tetrachloride	µg/L	0.25	0.50	--
Chlorobenzene	µg/L	680	1,400	--
Chlorodibromomethane	µg/L	0.40	0.80	--
Dichlorobromomethane	µg/L	0.56	1.1	--
1,2-Dichloroethane	µg/L	0.38	0.76	--
1,1-Dichloroethylene	µg/L	0.1	0.1	--
1,2-Dichloropropane	µg/L	0.52	1.0	--
1,3-Dichloropropylene	µg/L	10	20	--
Ethylbenzene	µg/L	3,100	6,200	--
Methyl Bromide	µg/L	48	96	--
Methylene Chloride	µg/L	4.7	9.4	--
1,1,2,2-Tetrachloroethane	µg/L	0.17	0.34	--
Tetrachloroethylene	µg/L	0.8	1.6	--
Toluene	µg/L	6,800	14,000	--
1,2-Trans-Dichloroethylene	µg/L	700	1,400	--
1,1,2-Trichloroethane	µg/L	0.60	1.2	--
Trichloroethylene	µg/L	2.7	5.4	--
Vinyl Chloride	µg/L	2.0	4.0	--
2-Chlorophenol	µg/L	120	240	--
2,4-Dichlorophenol	µg/L	93	190	--
2,4-Dimethylphenol	µg/L	540	1,100	--
4,6-dinitro-o-resol	µg/L	13	27	--
2,4-Dinitrophenol	µg/L	70	140	--
Pentachlorophenol	µg/L	0.28	0.56	--
Phenol	µg/L	21,000	42,000	--
2,4,6-Trichlorophenol	µg/L	2.1	4.2	--
Acenaphthene	µg/L	1,200	2,400	--
Anthracene	µg/L	9,600	19,000	--
Benzidine	µg/L	0.00012	0.00024	--
Benzo(a)Anthracene	µg/L	0.0044	0.0088	--
Benzo(a)Pyrene	µg/L	0.0044	0.0088	--
Benzo(b)Fluoranthene	µg/L	0.0044	0.0088	--
Benzo(k)Fluoranthene	µg/L	0.0044	0.0088	--
Bis(2-Chloroethyl)Ether	µg/L	0.031	0.062	--
Bis(2-Chloroisopropyl)Ether	µg/L	1,400	2,800	--
Bis(2-Ethylhexyl)Phthalate	µg/L	1.8	3.6	--
Butylbenzyl Phthalate	µg/L	3,000	6,000	--
2-Chloronaphthalene	µg/L	1,700	3,400	--
Chrysene	µg/L	0.0044	0.0088	--
Dibenzo(a,h)Anthracene	µg/L	0.0044	0.0088	--
1,2-Dichlorobenzene	µg/L	2,700	5,400	--
1,3-Dichlorobenzene	µg/L	400	800	--
1,4-Dichlorobenzene	µg/L	400	800	--
3,3 Dichlorobenzidine	µg/L	0.04	0.080	--

Parameters	Units[6]	Effluent Limitations		
		AMEL	MDEL	Instantaneous Maximum
Diethyl Phthalate	µg/L	23,000	46,000	--
Dimethyl Phthalate	µg/L	310,000	630,000	--
Di-n-Butyl Phthalate	µg/L	2,700	5,400	--
2,4-Dinitrotoluene	µg/L	0.11	0.22	--
1,2-Diphenylhydrazine	µg/L	0.04	0.080	--
Fluoranthene	µg/L	300	600	--
Fluorene	µg/L	1,300	2,600	--
Hexachlorobenzene	µg/L	0.00075	0.0015	--
Hexachlorobutadiene	µg/L	0.44	0.88	--
Hexachlorocyclopentadiene	µg/L	240	480	--
Hexachloroethane	µg/L	1.9	3.8	--
Indeno(1,2,3-cd)Pyrene	µg/L	0.0044	0.0088	--
Isophorone	µg/L	8.4	17	--
Nitrobenzene	µg/L	17.0	34	--
N-Nitrosodimethylamine	µg/L	0.0007	0.0014	--
N-Nitrosodi-n-Propylamine	µg/L	0.005	0.010	--
N-Nitrosodiphenylamine	µg/L	5.0	10	--
Pyrene	µg/L	960	1,900	--
Aldrin	µg/L	0.00013	0.00026	--
alpha-BHC	µg/L	0.0039	0.0078	--
beta-BHC	µg/L	0.014	0.028	--
gamma-BHC	µg/L	0.019	0.038	--
Chlordane	µg/L	0.00057	0.0011	--
4,4'-DDT	µg/L	0.00059	0.0012	--
4,4'-DDE	µg/L	0.00059	0.0012	--
4,4'-DDD	µg/L	0.00083	0.0017	--
Dieldrin	µg/L	0.00014	0.00028	--
alpha-Endosulfan	µg/L	0.046	0.092	--
beta-Endosulfan	µg/L	0.046	0.092	--
Endosulfan Sulfate	µg/L	110	220	--
Endrin	µg/L	0.029	0.059	--
Endrin Aldehyde	µg/L	0.76	1.5	--
Heptachlor	µg/L	0.00021	0.00042	--
Heptachlor Epoxide	µg/L	0.00010	0.00020	--
PCBs sum	µg/L	0.00017	0.00034	--
Toxaphene	µg/L	0.00016	0.00033	--

[1] In addition to an instantaneous maximum of 20 NTU, the discharge shall not exceed the ambient turbidity of the surface water at any time.
[2] As specified in section IV of the MRP, Attachment E of this permit.
[3] pH shall remain within the limits of 6.5 and 8.5 s.u. at all times.
[4] As defined using Method 6410.
[5] Dissolved oxygen shall not be less than 5.0 mg/L at any time in waters with designated warm fresh-water habitat beneficial use or less than 6.0 mg/L in waters with designated cold fresh-water habitat beneficial use.
[6] The concentraton-based effluent limitations stated in the table above are also applicable as mass-based effluent limitations expressed as lbs/day which are calculated as follows: Parameter Concentration (if expressed as mg/L) x Flow Limit (expressed as MGD) x 8.34 (conversion factor) =

Mass-based Effluent Limitation expressed as lbs/day. Parameter Concentration (if expressed as µg/L) x Flow Limit (expressed as MGD) x 0.00834 (conversion factor) = Mass-based Effluent Limitation expressed as lbs/day. The Flow Limit (MGD) value used in this equaton shall be the Discharger's maximum allowable flow rate limit specified in the NOA. The discharge shall not cause the calculated mass-based effluent limitations to be exceeded.

[7] For discharges to Rainbow Creek and its sub-watershed, the AMEL and Instantaneous Maximum are non-detect for total nitrogen and total phosphorus using approved analytical laboratory methods and minimum levels in compliance with Discharge Prohibition K.

[8] For discharges to Forrester Creek, as specified in section VI of Attachment B, the effluent limitations are non-detect for total coliform, fecal coliform and enterococcus using approved analytical laboratory methods and minimum levels in compliance with Discharge Prohibition J.

3. **Non-Municipal Freshwater Inland Surface Waters, including Buena Vista Lagoon.** Discharges to freshwater inland surface waters, without a designated domestic and municipal supply (MUN) beneficial use, shall not exceed the effluent limitations specified in Table 6. below:

Table 6. Effluent Limitations for Discharges to Freshwater Inland Surface Waters without MUN Beneficial Use

Parameter	Units[6]	Effluent Limitations		
		AMEL	MDEL	Instantaneous Maximum
Applicable to All Dischargers				
Settleable Solids	ml/L	0.1	--	0.2
Total Suspended Solids	mg/L	30	--	50
Turbidity	NTU	--	--	20[1]
Chronic Toxicity	Pass/Fail	--	Pass[2]	--
pH	standard units	--	--	6.5 – 8.5[3]
Based on Results of Reasonable Potential Analysis				
Hydrogen Sulfide	µg/L	2.0	4.0	10
Xylene	µg/L	--	--	5.0
Chlorinated Phenolics	µg/L	--	--	10
Remaining Base/Neutral Compounds[4]	µg/L	--	--	10
Total Petroleum Hydrocarbons	mg/L	--	--	0.5
Percent Sodium	%	--	--	60
Total Nitrogen	mg/L	1.0	--	2.0
Total Phosphorus	mg/L	0.1	--	0.2
Methylene Blue Active Substances (MBAS)	mg/L	--	--	0.5
Fluoride	mg/L	--	--	1.0
Total Residual Chlorine	µg/L	2.0	8.0	10
Dissolved Oxygen	mg/L	--	--	5.0/6.0[5]
Iron, Total Recoverable[9]	mg/L	--	--	0.3
Manganese, Total Recoverable[9]	mg/L	--	--	0.05
Total Coliform[8]	MPN/100 mL	--	--	1,000
Fecal Coliform[8]	MPN/100 mL	--	--	200
Enterococci[8]	MPN/100 mL	--	--	[8]
Dibromochloropropane	µg/L	--	--	0.2
Ethylene Dibromide	µg/L	--	--	0.02
Antimony, Total Recoverable	µg/L	4,300	8,600	--

Parameter	Units[6]	Effluent Limitations		
		AMEL	MDEL	Instantaneous Maximum
Arsenic, Total Recoverable	µg/L	120	250	--
Chromium (III) , Total Recoverable	µg/L	340	670	--
Chromium (VI) , Total Recoverable	µg/L	8.0	16	--
Mercury, Total Recoverable	µg/L	0.051	0.10	--
Selenium, Total Recoverable	µg/L	4.1	8.2	--
Thallium, Total Recoverable	µg/L	6.3	13	--
Cyanide, Total	µg/L	4.3	8.5	--
2,3,7,8 TCDD	µg/L	1.40E-08	2.81E-08	--
TCDD Equivalents	µg/L	1.40E-08	2.81E-08	--
Acrolein	µg/L	780	1,600	--
Acrylonitrile	µg/L	0.66	1.3	--
Benzene	µg/L	71	140	--
Bromoform	µg/L	360	720	--
Carbon Tetrachloride	µg/L	4.4	8.8	--
Chlorobenzene	µg/L	21,000	42,000	--
Chlorodibromomethane	µg/L	34	68	--
Dichlorobromomethane	µg/L	46	92	--
1,2-Dichloroethane	µg/L	99	200	--
1,1-Dichloroethylene	µg/L	3.2	6.4	--
1,2-Dichloropropane	µg/L	39	78	--
1,3-Dichloropropylene	µg/L	1,700	3,400	--
Ethylbenzene	µg/L	29,000	58,000	--
Methyl Bromide	µg/L	4,000	8,000	--
Methylene Chloride	µg/L	1,600	3,200	--
1,1,2,2-Tetrachloroethane	µg/L	11	22	--
Tetrachloroethylene	µg/L	8.9	18	--
Toluene	µg/L	200,000	400,000	--
1,2-Trans-Dichloroethylene	µg/L	140,000	280,000	--
1,1,2-Trichloroethane	µg/L	42	84	--
Trichloroethylene	µg/L	81	160	--
Vinyl Chloride	µg/L	530	1,100	--
2-Chlorophenol	µg/L	400	800	--
2,4-Dichlorophenol	µg/L	790	1,600	--
2,4-Dimethylphenol	µg/L	2,300	4,600	--
4,6-dinitro-o-resol (aka2-methyl-4,6-Dinitrophenol)	µg/L	765	1,500	--
2,4-Dinitrophenol	µg/L	14,000	28,000	--
Pentachlorophenol	µg/L	4.3	8.7	--
Phenol	µg/L	4,600,000	9,200,000	--
2,4,6-Trichlorophenol	µg/L	6.5	13	--
Acenaphthene	µg/L	2,700	5,400	--
Anthracene	µg/L	110,000	220,000	--
Benzidine	µg/L	0.00054	0.0011	--
Benzo(a)Anthracene	µg/L	0.049	0.098	--

Parameter	Units[6]	Effluent Limitations		
		AMEL	MDEL	Instantaneous Maximum
Benzo(a)Pyrene	µg/L	0.049	0.098	--
Benzo(b)Fluoranthene	µg/L	0.049	0.098	--
Benzo(k)Fluoranthene	µg/L	0.049	0.098	--
Bis(2-Chloroethyl)Ether	µg/L	1.4	2.8	--
Bis(2-Chloroisopropyl)Ether	µg/L	170,000	340,000	--
Bis(2-Ethylhexyl)Phthalate	µg/L	5.9	12	--
Butylbenzyl Phthalate	µg/L	5,200	10,000	--
2-Chloronaphthalene	µg/L	4,300	8,600	--
Chrysene	µg/L	0.049	0.098	--
Dibenzo(a,h)Anthracene	µg/L	0.049	0.098	--
1,2-Dichlorobenzene	µg/L	17,000	34,000	--
1,3-Dichlorobenzene	µg/L	2,600	5,200	--
1,4-Dichlorobenzene	µg/L	2,600	5,200	--
3,3 Dichlorobenzidine	µg/L	0.077	0.15	--
Diethyl Phthalate	µg/L	120,000	240,000	--
Dimethyl Phthalate	µg/L	2,900,000	5,800,000	--
Di-n-Butyl Phthalate	µg/L	12,000	24,000	--
2,4-Dinitrotoluene	µg/L	9.1	18	--
1,2-Diphenylhydrazine	µg/L	0.54	1.1	--
Fluoranthene	µg/L	370	740	--
Fluorene	µg/L	14,000	28,000	--
Hexachlorobenzene	µg/L	0.00077	0.0015	--
Hexachlorobutadiene	µg/L	50	100	--
Hexachlorocyclopentadiene	µg/L	17,000	34,000	--
Hexachloroethane	µg/L	8.9	18	--
Indeno(1,2,3-cd)Pyrene	µg/L	0.049	0.098	--
Isophorone	µg/L	600	1,200	--
Nitrobenzene	µg/L	1,900	3,800	--
N-Nitrosodimethylamine	µg/L	8.1	16	--
N-Nitrosodi-n-Propylamine	µg/L	1.4	2.8	--
Pyrene	µg/L	11,000	22,000	--
Aldrin	µg/L	0.00014	0.00028	--
alpha-BHC	µg/L	0.013	0.026	--
beta-BHC	µg/L	0.046	0.092	--
gamma-BHC	µg/L	0.063	0.13	--
Chlordane	µg/L	0.00059	0.0012	--
4,4'-DDT	µg/L	0.00059	0.0012	--
4,4'-DDE (linked to DDT)	µg/L	0.00059	0.0012	--
4,4'-DDD	µg/L	0.00084	0.0017	--
Dieldrin	µg/L	0.00014	0.00028	--
alpha-Endosulfan	µg/L	0.046	0.091	--
beta-Endosulfan	µg/L	0.046	0.091	--
Endosulfan Sulfate	µg/L	240	481	--
Endrin	µg/L	0.029	0.059	--
Endrin Aldehyde	µg/L	0.81	1.6	--

Parameter	Units[6]	Effluent Limitations		
		AMEL	MDEL	Instantaneous Maximum
Heptachlor	µg/L	0.0002	0.0004	--
Heptachlor Epoxide	µg/L	0.00011	0.00022	--
PCBs sum	µg/L	0.00017	0.00034	--
Toxaphene	µg/L	0.00016	0.00033	--
Diazinon[7]	µg/L	ND	ND	

[1] In addition to an instantaneous maximum of 20 NTU, the discharge shall not exceed the ambient turbidity of the surface water at any time.
[2] As specified in section IV of the MRP, Attachment E of this permit.
[3] pH shall remain within the limits of 6.5 and 8.5 s.u. at all times.
[4] As defined using Method 6410.
[5] Dissolved oxygen shall not be less than 5.0mg/L at any time in waters with designated warm fresh-water habitat beneficial use or less than 6.0 mg/L in waters with cold fresh-water habitat beneficial use. pH shall remain within the limits of 6.5 and 8.5 s.u. at all times.
[6] The concentraton-based effluent limitations stated in the table above are also applicable as mass-based effluent limitations expressed as lbs/day which are calculated as follows: Parameter Concentration (if expressed as mg/L) x Flow Limit (expressed as MGD) x 8.34 (conversion factor) = Mass-based Effluent Limitation expressed as lbs/day. Parameter Concentration (if expressed as µg/L) x Flow Limit (expressed as MGD) x 0.00834 (conversion factor) = Mass-based Effluent Limitation expressed as lbs/day. The Flow Limit (MGD) value used in this equaton shall be the Discharger's maximum allowable flow rate limit specified in the NOA. The discharge shall not cause the calculated mass-based effluent limitations to be exceeded.
[7] For discharges to Chollas Creek and its sub-watershed, the AMEL and MDEL are non-detect for diazinon using approved analytical laboratory methods and minimum levels for diazinon in compliance with Discharge Prohibition I.
[8] For discharges to Aliso Creek and its tributaries including the mouth, San Juan Creek including the mouth, Tecolote Creek, San Diego River, and Chollas Creek (specific reaches of these creeks are specified in section VI of Attachment B), the effluent limitations are non-detect for total coliform, fecal coliform and enterococcus using approved analytical laboratory methods and minimum levels in compliance with Discharge Prohibition J.
[9] For the Mission San Diego (7.11) and Sycamore Canyon (7.12) Hydrographic Subareas, the effluent limitation for iron shall be 1.0 mg/L and the effluent limitation for manganese shall be 1.0 mg/L. Sycamore Canyon Subarea, a portion of the Santee Hydrologic Subarea, includes the watersheds of the following north-south trending canyons: Oak Creek, Spring Canyon, Little Sycamore Canyon, Quail Canyon, and Sycamore Canyon. The Sycamore Canyon Subarea extends eastward from the Mission San Diego hydrologic sub area (HSA) to the confluence of the San Diego River and Forester Creek, immediately south of the Santee Lakes.

B. Effluent Limitations – Saltwater Inland Surface Waters, Not Including Bays and Estuaries

Freshwater criteria apply where receiving water salinities are 1 part per thousand and below and at locations where this occurs 95% or more of the time. Saltwater criteria apply at receiving water salinities of 10 parts per thousand and above and at locations where this occurs 95% of the time. Where receiving water salinities are between 1 and 10 parts per thousand the more stringent of freshwater or saltwater criteria applies.

1. Discharges to saltwater inland surface waters, but not including bays and estuaries, shall not exceed the effluent limitations specified in Table 7 below.

Table 7. Effluent Limitations for Discharges to Saltwater Inland Surface Waters, Not Including Bays and Estuaries

Parameters	Units[6]	Effluent Limitations		
		AMEL	MDEL	Instantaneous Maximum
Applicable to All Dischargers				
Settleable Solids	ml/L	0.1	--	0.2
Total Suspended Solids	mg/L	30	--	50
Turbidity	NTU	--	--	20[1]
Chronic Toxicity	Pass/Fail	--	Pass[2]	--
pH	standard units	--	--	6.5 – 8.5[3]
Based on Results of Reasonable Potential Analysis				
Hydrogen Sulfide	µg/L	2.0	4.0	10
Xylene	µg/L	--	--	5.0
Chlorinated Phenolics	µg/L	--	--	10
Remaining Base/Neutral Compounds[4]	µg/L	--	--	10
Total Petroleum Hydrocarbons	mg/L	--	--	0.5
Percent Sodium	%	--	--	60
Total Nitrogen	mg/L	1.0	--	2.0
Total Phosphorus	mg/L	0.1	--	0.2
Methylene Blue Active Substances (MBAS)	mg/L	--	--	0.5
Fluoride	mg/L	--	--	1.0
Total Residual Chlorine	µg/L	2.0	8.0	10
Dissolved Oxygen	mg/L	--	--	5.0/6.0[5]
Iron, Total Recoverable	mg/L			0.3
Manganese, Total Recoverable	mg/L			0.05
Total Coliform	MPN/100 mL	--	--	1,000
Fecal Coliform	MPN/100 mL	--	--	200
Dibromochloropropane	µg/L	--	--	0.2
Ethylene Dibromide	µg/L	--	--	0.02
Antimony, Total Recoverable	µg/L	4,300	8,600	--
Arsenic, Total Recoverable	µg/L	30	59	--
Cadmium, Total Recoverable	µg/L	7.7	1.5	--
Chromium (VI) , Total Recoverable	µg/L	41	83	--
Copper, Total Recoverable	µg/L	2.9	5.8	--
Lead, Total Recoverable	µg/L	7.0	14	--
Mercury, Total Recoverable	µg/L	0.051	0.01	--
Nickel, Total Recoverable	µg/L	6.8	14	--
Selenium, Total Recoverable	µg/L	58	120	--
Silver, Total Recoverable	µg/L	1.1	2.2	--
Thallium, Total Recoverable	µg/L	6.3	13	--
Zinc, Total Recoverable	µg/L	47	95	--
Cyanide, Total	µg/L	0.50	1	--
2,3,7,8 TCDD	µg/L	1.4E-08	2.8E-08	--
TCDD Equivalents	µg/L	1.4E-08	2.8E-08	--
Acrolein	µg/L	780	1,600	--
Acrylonitrile	µg/L	0.66	1.3	--

Parameters	Units[6]	Effluent Limitations		
		AMEL	MDEL	Instantaneous Maximum
Benzene	µg/L	71	140	--
Bromoform	µg/L	360	720	--
Carbon Tetrachloride	µg/L	4.4	8.8	--
Chlorobenzene	µg/L	21,000	42,000	--
Chlorodibromomethane	µg/L	34	68	--
Dichlorobromomethane	µg/L	46	92	--
1,2-Dichloroethane	µg/L	99	200	--
1,1-Dichloroethylene	µg/L	3.2	6.4	--
1,2-Dichloropropane	µg/L	39	78	--
1,3-Dichloropropylene	µg/L	1,700	3,400	--
Ethylbenzene	µg/L	29,000	58,000	--
Methyl Bromide	µg/L	4,000	8,000	--
Methylene Chloride	µg/L	1,600	3,200	--
1,1,2,2-Tetrachloroethane	µg/L	11	22	--
Tetrachloroethylene	µg/L	8.9	18	--
Toluene	µg/L	200,000	400,000	--
1,2-Trans-Dichloroethylene	µg/L	140,000	280,000	--
1,1,2-Trichloroethane	µg/L	42	84	--
Trichloroethylene	µg/L	81	160	--
Vinyl Chloride	µg/L	530	1,000	--
2-Chlorophenol	µg/L	400	800	--
2,4-Dichlorophenol	µg/L	790	1,600	--
2,4-Dimethylphenol	µg/L	2,300	4,600	--
4,6-dinitro-o-resol (aka2-methyl-4,6-Dinitrophenol)	µg/L	770	1,500	--
2,4-Dinitrophenol	µg/L	14,000	28,000	--
Pentachlorophenol	µg/L	6.5	13	--
Phenol	µg/L	4,600,000	9,000,000	--
2,4,6-Trichlorophenol	µg/L	6.5	13	--
Acenaphthene	µg/L	2,700	5,400	--
Anthracene	µg/L	110,000	220,000	--
Benzidine	µg/L	0.00054	0.0011	--
Benzo(a)Anthracene	µg/L	0.049	0.098	--
Benzo(a)Pyrene	µg/L	0.049	0.098	--
Benzo(b)Fluoranthene	µg/L	0.049	0.098	--
Benzo(k)Fluoranthene	µg/L	0.049	0.098	--
Bis(2-Chloroethyl)Ether	µg/L	1.4	2.8	--
Bis(2-Chloroisopropyl)Ether	µg/L	170,000	340,000	--
Bis(2-Ethylhexyl)Phthalate	µg/L	5.9	12	--
Butylbenzyl Phthalate	µg/L	5,200	10,000	--
2-Chloronaphthalene	µg/L	4,300	8,600	--
Chrysene	µg/L	0.049	0.098	--
Dibenzo(a,h)Anthracene	µg/L	0.049	0.098	--
1,2-Dichlorobenzene	µg/L	17,000	34,000	--

Parameters	Units[6]	Effluent Limitations		
		AMEL	MDEL	Instantaneous Maximum
1,3-Dichlorobenzene	µg/L	2,600	5,200	--
1,4-Dichlorobenzene	µg/L	2,600	5,200	--
3,3 Dichlorobenzidine	µg/L	0.077	0.15	--
Diethyl Phthalate	µg/L	120,000	240,000	--
Dimethyl Phthalate	µg/L	2,900,000	5,800,000	--
Di-n-Butyl Phthalate	µg/L	12,000	24,000	--
2,4-Dinitrotoluene	µg/L	9.1	18	--
1,2-Diphenylhydrazine	µg/L	0.54	1.1	--
Fluoranthene	µg/L	370	740	--
Fluorene	µg/L	14,000	28,000	--
Hexachlorobenzene	µg/L	0.00077	0.0015	--
Hexachlorobutadiene	µg/L	50	100	--
Hexachlorocyclopentadiene	µg/L	17,000	34,000	--
Hexachloroethane	µg/L	8.9	18	--
Indeno(1,2,3-cd)Pyrene	µg/L	0.049	0.098	--
Isophorone	µg/L	600	1,200	--
Nitrobenzene	µg/L	1,900	3,800	--
N-Nitrosodimethylamine	µg/L	8.1	16	--
N-Nitrosodi-n-Propylamine	µg/L	1.4	2.8	--
N-Nitrosodiphenylamine	µg/L	16	32	--
Pyrene	µg/L	11,000	22,000	--
Aldrin	µg/L	0.00014	0.00028	--
alpha-BHC	µg/L	0.013	0.026	--
beta-BHC	µg/L	0.046	0.092	--
gamma-BHC	µg/L	0.063	0.13	--
Chlordane	µg/L	0.00059	0.0012	--
4,4'-DDT	µg/L	0.00059	0.0012	--
4,4'-DDE (linked to DDT)	µg/L	0.00059	0.0012	--
4,4'-DDD	µg/L	0.00084	0.0017	--
Dieldrin	µg/L	0.00014	0.00028	--
alpha-Endosulfan	µg/L	0.0071	0.014	--
beta-Endosulfan	µg/L	0.0071	0.014	--
Endosulfan Sulfate	µg/L	240	480	--
Endrin	µg/L	0.0018	0.0038	--
Endrin Aldehyde	µg/L	0.81	1.6	--
Heptachlor	µg/L	0.00021	0.00042	--
Heptachlor Epoxide	µg/L	0.00011	0.00022	--
PCBs sum	µg/L	0.00017	0.00034	--
Toxaphene	µg/L	0.00016	0.00032	--

[1] In addition to an instantaneous maximum of 20 NTU, the discharge shall not exceed the ambient turbidity of the surface water at any time.
[2] As specified in section IV of the MRP, Attachment E of this permit.
[3] pH shall remain within the limits of 6.5 and 8.5 s.u. at all times.
[4] As defined using Method 6410.

[5] Dissolved oxygen shall not be less than 5.0 mg/L at any time in waters with designated warm fresh-water habitat beneficial use or less than 6.0 mg/L in waters with designated cold fresh-water habitat beneficial use.

[6] The concentraton-based effluent limitations stated in the table above are also applicable as mass-based effluent limitations expressed as lbs/day which are calculated as follows: Parameter Concentration (if expressed as mg/L) x Flow Limit (expressed as MGD) x 8.34 (conversion factor) = Mass-based Effluent Limitation expressed as lbs/day. Parameter Concentration (if expressed as µg/L) x Flow Limit (expressed as MGD) x 0.00834 (conversion factor) = Mass-based Effluent Limitation expressed as lbs/day. The Flow Limit (MGD) value used in this equaton shall be the Discharger's maximum allowable flow rate limit specified in the NOA. The discharge shall not cause the calculated mass-based effluent limitations to be exceeded.

C. Effluent Limitations - Bays and Estuaries, including San Diego Bay but not including Buena Vista Lagoon

1. Discharges to bays and estuaries, including temporary discharges to San Diego Bay, but not including Buena Vista Lagoon, shall not exceed the effluent limitations specified in Table 8 below.

Table 8. Effluent Limitations for Discharges to Bays and Estuaries, including San Diego Bay, but not including Buena Vista Lagoon

Parameters	Units[9]	Effluent Limitations				
		AMEL	AWEL	MDEL	Instantaneous Maximum[1]	6-Month Median
Applicable to All Dischargers						
Settleable Solids	ml/L	1.0	1.5	--	3.0	--
Total Suspended Solids	mg/L	30	--	--	50	--
Turbidity	NTU	75	100	--	225	--
Chronic Toxicity	Pass/Fail	--	--	Pass[2]	--	--
pH	s.u.	--	--	--	6.0 – 9.0[3] 7.0 – 8.5	--
Based on Results of Reasonable Potential Analysis						
Hydrogen Sulfide	µg/L	2.0	--	4.0	10	--
Xylene	µg/L	--	--	--	5.0	--
Chlorinated Phenolics	µg/L	--	--	4.0	10	1
Base/Neutral Compounds[4]	µg/L	--	--	--	10	--
Total Petroleum Hydrocarbons	µg/L	--	--	--	500	--
Total Residual Chlorine	µg/L	--		8.0	60	2.0
Ammonia, Total	µg/L	--	--	2,400	6,000	600
Total Nitrogen	mg/L	--	--	--	2.0	1.0
Total Phosphorus	mg/L	--	--	--	0.2	0.1
Dissolved Oxygen	mg/L	--	--	--	5.0[5]	--
Methyl-tert-butyl Ether	µg/L	--	--	--	5.0	--
Antimony, Total Recoverable	µg/L	4,300	--	8,600	--	--
Arsenic, Total Recoverable	µg/L	30	--	59	--	--
Cadmium , Total Recoverable	µg/L	7.7	--	15	--	--
Chromium (VI), Total Recoverable	µg/L	41	--	83	--	--

Parameters	Units[9]	Effluent Limitations				
		AMEL	AWEL	MDEL	Instantaneous Maximum[1]	6-Month Median
Copper, Total Recoverable[10]	µg/L	2.9	--	5.8	--	--
Lead, Total Recoverable	µg/L	7.0	--	14	--	--
Mercury, Total Recoverable	µg/L	0.051	--	0.1	--	--
Nickel, Total Recoverable	µg/L	6.78	--	13.6	--	--
Selenium, Total Recoverable	µg/L	58	--	120	--	--
Silver, Total Recoverable	µg/L	1.11	--	2.24	--	--
Thallium, Total Recoverable	µg/L	6.3	--	13	--	--
Tributyltin	µg/L	0.0014	--	--	--	--
Zinc, Total Recoverable	µg/L	47	--	95	--	--
Cyanide, total	µg/L	0.50	--	1.00	--	--
TCDD Equivalents[6]	µg/L	3.90E-09	--	--	--	--
Acrolein	µg/L	780	--	1,600	--	--
Acrylonitrile	µg/L	0.66	--	1.3	--	--
Benzene	µg/L	--	--	--	5.0	--
Carbon Tetrachloride	µg/L	0.9	--	--	--	--
Chlorobenzene	µg/L	2,100	--	42,000	--	--
Chlorodibromomethane	µg/L	34	--	68	--	--
Dichlorobromomethane	µg/L	46	--	92	--	--
Dichloromethane	µg/L	450	--	--	5.0	--
1,2-Dichloroethane	µg/L	28	--	--	--	--
1,1-Dichloroethylene	µg/L	3.2	--	6.4	--	--
1,2-Dichloropropane	µg/L	39	--	78	--	--
1,3-Dichloropropylene	µg/L	1,700	--	3,400	--	--
Ethylbenzene	µg/L	--	--	--	5.0	--
Phenolic Compounds (non-chlorinated)	µg/L	--	--	1,200	300	30
1,1,2,2-Tetrachloroethane	µg/L	2.3	--	--	--	--
Tetrachloroethylene	µg/L	2.0	--	--	--	--
Toluene	µg/L	--	--	--	5.0	--
1,2-Trans-Dichloroethylene	µg/L	140,000	--	280,000	--	--
1,1,1-trichloroethane	µg/L	540,000	--	--	--	--
1,1,2-Trichloroethane	µg/L	9.4	--	--	--	--
Trichloroethylene	µg/L	27	--	--	--	--
Vinyl Chloride	µg/L	36	--	--	--	--
Chlorophenol	µg/L	400	--	800	--	--
2,4-Dichlorophenol	µg/L	790	--	1,600	--	--
2,4-Dimethylphenol	µg/L	2,300	--	4,600	--	--
4,6-dinitro-o-resol (aka2-methyl-4,6-Dinitrophenol)	µg/L	770	--	1,500	--	--
2,4-Dinitrophenol	µg/L	14,000	--	28,000	--	--
Pentachlorophenol	µg/L	6.5	--	13	--	--
Phenol	µg/L	4,600,00	--	9,200,000	--	--

Parameters	Units[9]	Effluent Limitations				
		AMEL	AWEL	MDEL	Instantaneous Maximum[1]	6-Month Median
2,4,6-Trichlorophenol	µg/L	6.5	--	13	--	--
Acenaphthene	µg/L	2,700	--	5,400	--	--
Anthracene	µg/L	110,000	--	220,000	--	--
Benzidine	µg/L	0.00054	--	0.0011	--	--
Benzo(a)Anthracene	µg/L	0.049	--	0.098	--	--
Benzo(a)Pyrene	µg/L	0.049	--	0.098	--	--
Benzo(b)Fluoranthene	µg/L	0.049	--	0.098	--	--
Benzo(k)Fluoranthene	µg/L	0.049	--	0.098	--	--
Bis(2-Chloroethyl)Ether	µg/L	1.4	--	2.8	--	--
Bis(2-Chloroisopropyl)Ether	µg/L	170,000	--	340,000	--	--
Bis(2-Ethylhexyl)Phthalate	µg/L	5.9	--	12	--	--
Butylbenzyl Phthalate	µg/L	5,200	--	10,000	--	--
2-Chloronaphthalene	µg/L	4,300	--	8,600	--	--
Chrysene	µg/L	0.049	--	0.098	--	--
Dibenzo(a,h)Anthracene	µg/L	0.049	--	0.098	--	--
1,2-Dichlorobenzene	µg/L	17,000	--	34,000	--	--
1,3-Dichlorobenzene	µg/L	2,600	--	5,200	--	--
1,4-Dichlorobenzene	µg/L	2,600	--	5,200	--	--
3,3 Dichlorobenzidine	µg/L	0.077	--	0.15	--	--
Diethyl Phthalate	µg/L	120,000	--	240,000	--	--
Dimethyl Phthalate	µg/L	2,900,000	--	5,800,000	--	--
Di-n-Butyl Phthalate	µg/L	12,000	--	24,000	--	--
2,4-Dinitrotoluene	µg/L	9.1	--	18	--	--
1,2-Diphenylhydrazine	µg/L	0.51	--	1.08	--	--
Fluoranthene	µg/L	370	--	742	--	--
Fluorene	µg/L	14,000	--	28,000	--	--
Hexachlorobenzene	µg/L	0.00077	--	0.0015	--	--
Hexachlorobutadiene	µg/L	50	--	100	--	--
Hexachlorocyclopentadiene	µg/L	17,000	--	3,400	--	--
Hexachloroethane	µg/L	8.9	--	18	--	--
Indeno(1,2,3-cd)Pyrene	µg/L	0.049	--	0.098	--	--
Isophorone	µg/L	600	--	1,200	--	--
Nitrobenzene	µg/L	1,900	--	3,800	--	--
N-Nitrosodimethylamine	µg/L	8.1	--	16	--	--
N-Nitrosodi-n-Propylamine	µg/L	1.4	--	2.8	--	--
N-Nitrosodiphenylamine	µg/L	16	--	32	--	--
Polynuclear Aromatic Hydrocarbons (PAHs)	µg/L	0.088	--	--	--	--
Pyrene	µg/L	11,000	--	22,000	--	--
Aldrin	µg/L	0.00014	--	0.00028	--	--
Chlordane	µg/L	0.00059	--	0.0012	--	--
4,4'-DDT	µg/L	0.00059	--	0.0012	--	--
4,4'-DDE (linked to DDT)	µg/L	0.00059	--	0.0012	--	--
4,4'-DDD	µg/L	0.00084	--	00.0017	--	--

Parameters	Units[9]	Effluent Limitations				
		AMEL	AWEL	MDEL	Instantaneous Maximum[1]	6-Month Median
Dieldrin	µg/L	0.00014	--	0.00028	--	--
Endosulfan	µg/L	--	--	0.018	0.027	0.009
Endrin	µg/L	0.0023	--	0.0038	--	--
Endrin Aldehyde	µg/L	0.81	--	1.63	--	--
Halomethanes[7]	µg/L	--	--	--	5.0	--
Heptachlor	µg/L	0.00021	--	0.00042	--	--
Heptachlor Epoxide	µg/L	0.00011	--	0.00022	--	--
Hexachlorocyclohexane (HCH)[8]	µg/L	--	--	0.008	0.012	0.004
PCBs sum	µg/L	0.00017	--	0.00034	--	--
Toxaphene	µg/L	0.00020	--	0.00033	--	--

[1] Instantaneous Maximum Effluent Limitation.

[2] As specified in section IV of the MRP, Attachment E of this permit.

[3] All bays and harbors shall be within 6.0 and 9.0 s.u. at all times. All saline lagoons (all lagoons with the exception of Buena Vista Lagoon) and estuaries of the region shall be within 7.0 and 8.5 s.u. at all times.

[4] As defined using Method 6410.

[5] Applied as an instantaneous minimum effluent limitation.

[6] The sum of the concentrations of chlorinated dibenzodioxins (2,3,7,8-CDDs) and chlorinated dibenzofurans (2,3,7,8-CDFs) multiplied by their respective toxicity factors, as shown in the table below:

Isomer Group	Toxicity Equivalence Factor
2,3,7,8-tetra CDD	1.0
2,3,7,8-penta CDD	0.5
2,3,7,8-hexa CDDs	0.1
2,3,7,8-hepta CDD	0.01
Octa CDD	0.001
2,3,7,8- tetra CDF	0.1
1,2,3,7,8-penta CDF	0.05
2,3,4,7,8-penta CDF	0.5
2,3,7,8-hexa CDFs	0.1
2,3,7,8-hepta CDFs	0.01
Octa CDF	0.001

[7] The sum of bromoform, bromethane and chloromethane.

[8] The sum of the alpha, beta, gamma, and delta isomers of hexachlorocyclohexane.

[9] The concentraton-based effluent limitations stated in the table above are also applicable as mass-based effluent limitations expressed as lbs/day which are calculated as follows: Parameter Concentration (if expressed as mg/L) x Flow Limit (expressed as MGD) x 8.34 (conversion factor) = Mass-based Effluent Limitation expressed as lbs/day. Parameter Concentration (if expressed as µg/L) x Flow Limit (expressed as MGD) x 0.00834 (conversion factor) = Mass-based Effluent Limitation expressed as lbs/day. The Flow Limit (MGD) value used in this equaton shall be the Discharger's maximum allowable flow rate limit specified in the NOA. The discharge shall not cause the calculated mass-based effluent limitations to be exceeded.

[10] For discharges to the Shelter Island Yacht Basin and its sub-watershed, the AMEL and MDEL are non-detect for total recoverable copper using approved analytical laboratory methods and minimum levels for copper in compliance with Discharge Prohibition H.

2. Discharges to bays and estuaries, not including Buena Vista Lagoon, shall not exceed the effluent limitations for bacteria specified below:

Table 9. Bacteria Effluent Limitations for Discharges to Bays and Estuaries not Including Buena Vista Lagoon[1]

Parameters	Units	Effluent Limitations	
		30 day geometric mean	Single Sample Maximum
Total Coliform	Organisms/ 100 mL	1,000	10,000
Fecal Coliform	Organisms/ 100 mL	200	400
Enterococcus	Organisms/ 100 mL	35	104

[1] For discharges to Shelter Island Shoreline Park and its sub-watershed, the effluent limitations are non-detect for total coliform, fecal coliform and enterococcus using approved analytical laboratory methods and minimum levels in compliance with Discharge Prohibition J.

D. Effluent Limitations – Surf Zone of the Pacific Ocean

1. Discharges to the surf zone of the Pacific Ocean bounded by the shoreline and a distance of 1,000 feet from the shoreline or the 30-foot depth contour, whichever is further from the shoreline, and in areas outside this zone designated with the contact water recreation use (REC-1) shall not exceed the effluent limitations specified below.

Table 10. Effluent Limitations for Discharges to the Surf Zone of the Pacific Ocean

Parameter	Units[11]	Effluent Limitations				
		AMEL	AWEL	6-month median	Daily Maximum	Instantaneous Maximum[1]
Applicable to All Dischargers						
Grease and Oil	mg/L	25	40	--	--	75
Suspended Solids	mg/L	60[3]	--	--	--	--
Settleable Solids	mL/L	1.0	1.5	--	--	3.0
Turbidity	NTU	75	100	--	--	225
pH	s.u.	--	--	--	--	6.0 – 9.0
Based on Results of Reasonable Potential Analysis						
Dissolved Oxygen	mg/L	--	--	--	--	5.0[2]
Arsenic, Total Recoverable	µg/L	--	--	23	120	310
Cadmium, Total Recoverable	µg/L	--	--	4	16	40
Chromium VI, Total Recoverable	µg/L	--	--	8	32	80
Copper, Total Recoverable	µg/L	--	--	6	42	110
Lead, Total Recoverable	µg/L	--	--	8	32	80
Mercury, Total Recoverable	µg/L	--	--	0.16	0.64	1.6
Nickel, Total Recoverable	µg/L	--	--	20	80	200
Selenium, Total Recoverable	µg/L	--	--	60	240	600
Silver, Total Recoverable	µg/L	--	--	2.3	11	28
Zinc, Total Recoverable	µg/L	--	--	56	300	780
Cyanide, Total	µg/L	--	--	4	16	40
Total Chlorine Residual	µg/L	--	--	8	32	240

Parameter	Units[11]	Effluent Limitations				
		AMEL	AWEL	6-month median	Daily Maximum	Instantaneous Maximum[1]
Ammonia (expressed as nitrogen)	µg/L	--	--	2,400	9,600	24,000
Acute Toxicity	TUa	--	--	NA	0.3	NA
Chronic Toxicity	TUc	--	--	NA	1	NA
Phenolic Compounds (non-chlorinated)	µg/L	--	--	120	480	1,200
Chlorinated Phenolics	µg/L	--	--	4	16	40
Endosulfan	µg/L	--	--	0.036	0.072	0.11
Endrin	µg/L	--	--	0.008	0.016	0.024
HCH[4]	µg/L	--	--	0.016	0.032	0.048
Acrolein	µg/L	880	--	--	--	--
Antimony	µg/L	4,800	--	--	--	--
Bis(2-chloroethoxy) Methane	µg/L	18	--	--	--	--
Bis(2-chloroisopropyl) ether	µg/L	4,800	--	--	--	--
Chlorobenzene	µg/L	2,300	--	--	--	--
Chromium (III)	µg/L	760,000	--	--	--	--
Di-n-butyl Phthalate	µg/L	14,000	--	--	--	--
Dichlorobenzenes	µg/L	20,000	--	--	--	--
Diethyl Phthalate	µg/L	130,000	--	--	--	--
Dimethyl Phthalate	µg/L	3,300,000	--	--	--	--
4,6-dinitro-2-methylphenol	µg/L	880	--	--	--	--
2,4-dinitrophenol	µg/L	16	--	--	--	--
Ethylbenzene	µg/L	16,000	--	--	--	--
Fluoranthene	µg/L	60	--	--	--	--
Hexachlorocyclopentadiene	µg/L	230	--	--	--	--
Nitrobenzene	µg/L	20	--	--	--	--
Thallium	µg/L	8	--	--	--	--
Toluene	µg/L	340,000	--	--	--	--
Total Petroleum Hydrocarbons	µg/L	--	--	--	--	500
Tributyltin	µg/L	0.0056	--	--	--	--
1,1,1-trichloroethane	µg/L	2,200,000	--	--	--	--
Xylene	µg/L	--	--	--	--	5.0
Acrylonitrile	µg/L	0.4	--	--	--	--
Aldrin	µg/L	0.000088	--	--	--	--
Benzene	µg/L	24	--	--	--	--
Benzidine	µg/L	0.00028	--	--	--	--
Beryllium	µg/L	0.13	--	--	--	--
Bis(2-chloroethyl) Ether	µg/L	0.18	--	--	--	--
Bis(2-ethlyhexyl) Phthalate	µg/L	14	--	--	--	--
Carbon Tetrachloride	µg/L	3.6	--	--	--	--
Chlordane[5]	µg/L	0.000092	--	--	--	--
Chlorodibromethane	µg/L	34	--	--	--	--
Chloroform	µg/L	520	--	--	--	--
DDT[6]	µg/L	0.00068	--	--	--	--
1,4-dichlorobenzene	µg/L	72	--	--	--	--
3,3'-dichlorobenzidine	µg/L	0.032	--	--	--	--

Parameter	Units[11]	Effluent Limitations				
		AMEL	AWEL	6-month median	Daily Maximum	Instantaneous Maximum[1]
1,2-dichloroethane	µg/L	110	--	--	--	--
1,1-dichloroethylene	µg/L	3.6	--	--	--	--
Dichlorobromomethane	µg/L	25	--	--	--	--
Dichloromethane	µg/L	1,800	--	--	--	--
1,3-dichloropropene	µg/L	36	--	--	--	--
Dieldrin	µg/L	0.00016	--	--	--	--
2,4-dinitrotoluene	µg/L	10	--	--	--	--
1,2-diphenylhydrazine	µg/L	0.64	--	--	--	--
Halomethanes[7]	µg/L	520	--	--	--	--
Heptachlor	µg/L	0.0002	--	--	--	--
Heptachlor Epoxide	µg/L	0.00008	--	--	--	--
Hexachlorobenzene	µg/L	0.00084	--	--	--	--
Hexachlorobutadiene	µg/L	56	--	--	--	--
Hexachloroethane	µg/L	10	--	--	--	--
Isophorone	µg/L	2,900	--	--	--	--
N-nitrosodimethylamine	µg/L	29	--	--	--	--
N-nitrosodi-N-propylamine	µg/L	1.5	--	--	--	--
N-nitrosodiphenylamine	µg/L	10	--	--	--	--
PAHs[8]	µg/L	0.035	--	--	--	--
PCBs[9]	µg/L	0.000076	--	--	--	--
TCDD equivalents[10]	µg/L	1.6E-08	--	--	--	--
1,1,2,2-tetrachloroethane	µg/L	9.2	--	--	--	--
Tetrachloroethylene	µg/L	8	--	--	--	--
Toxaphene	µg/L	0.00084	--	--	--	--
Trichloroethylene	µg/L	110	--	--	--	--
1,1,2-trichloroethane	µg/L	38	--	--	--	--
2,4,6-trichlorophenol	µg/L	1.2	--	--	--	--
Vinyl Chloride	µg/L	140	--	--	--	--

[1] Instantaneous maximum effluent limitation.
[2] Applied as an instantaneous minimum.
[3] The Discharger shall remove 75 percent of the suspended solids as a monthly average unless the average monthly influent is 80 mg/L or less, then the effluent limit shall be 60 mg/L.
[4] HCH shall mean the sum of the alpha, beta, gamma, and delta isomers of hexachlorocyclohexane.
[5] Chlordane shall mean the sum of chlordane-alpha, chlordane-gamma, chlordene-alpha, chlordene-gamma, nonachlor-alpha, nonachlor-gamma, and oxychlordane.
[6] DDT shall mean the sum of 4,4'-DDT; 2,4'-DDT; 4,4'-DDE; 2,4'-DDE; 4,4'-DDD; and 2,4'-DDD.
[7] Halomethanes shall mean the sum of bromoform, bromomethane and chloromethane.
[8] PAHs shall mean the sum of acenaphthylene, anthracene, 1,2-benzanthracene, 3,4-benzofluoranthene, benzo[k]fluoranthene, 1,12-benzoperylene, benzo[a]pyrene, chrysene, dibenzo[a,h]anthracene, fluorene, indeno[1,2,3-cd]pyrene, phenanthrene and pyrene.
[9] PCBs shall mean the sum of chlorinated biphenyls whose analytical characteristics resemble those of aroclor-1016, aroclor-1221, aroclor-1232, aroclor-1242, aroclor-1248, aroclor-1254, and aroclor-1260.
[10] TCDD equivalents shall mean the sum of the concentrations of chlorinated dibenzodioxins (2,3,7,8-CDDs) and chlorinated dibenzofurans (2,3,7,8-CDFs) multiplied by their respective toxicity factors, as shown in the table below:

Isomer Group	Toxicity Equivalence Factor
2,3,7,8-tetra CDD	1.0
2,3,7,8-penta CDD	0.5
2,3,7,8-hexa CDDs	0.1
2,3,7,8-hepta CDD	0.01
Octa CDD	0.001
2,3,7,8- tetra CDF	0.1
1,2,3,7,8-penta CDF	0.05
2,3,4,7,8-penta CDF	0.5
2,3,7,8-hexa CDFs	0.1
2,3,7,8-hepta CDFs	0.01
Octa CDF	0.001

[11] The concentraton-based effluent limitations stated in the table above are also applicable as mass-based effluent limitations expressed as lbs/day which are calculated as follows: Parameter Concentration (if expressed as mg/L) x Flow Limit (expressed as MGD) x 8.34 (conversion factor) = Mass-based Effluent Limitation expressed as lbs/day. Parameter Concentration (if expressed as µg/L) x Flow Limit (expressed as MGD) x 0.00834 (conversion factor) = Mass-based Effluent Limitation expressed as lbs/day. The Flow Limit (MGD) value used in this equaton shall be the Discharger's maximum allowable flow rate limit specified in the NOA. The discharge shall not cause the calculated mass-based effluent limitations to be exceeded.

2. Discharges to the surf zone of the Pacific Ocean shall not exceed the effluent limitations for bacteria specified below:

Table 11. Bacteria Effluent Limitations for Discharges to the Surf Zone

Parameters	Units	Effluent Limitations[2]	
		30 day geometric mean	Single Sample Maximum
Total coliform	Organisms/ 100 mL	1,000	10,000[1]
Fecal Coliform	Organisms/ 100 mL	200	400
Enterococcus	Organisms/ 100 mL	35	104

[1] or 1000 when the ratio of fecal:total coliform exceeds 0.1.
[2] For discharges to Baby Beach in Dana Point, and the beaches specified in section VI.of Attachment B, the effluent limitations are non-detect for total coliform, fecal coliform and enterococcus using approved analytical laboratory methods and minimum levels in compliance with Discharge Prohibition J.

3. At all areas where shellfish may be harvested for human consumption, as determined by the Regional Water Board, the monthly median total coliform density shall not exceed 70/100 mL, and not more than 10 percent of the samples shall exceed 230/100 mL.

VI. RECEIVING WATER LIMITATIONS

The receiving water limitations set forth below for waters of the U.S. in the San Diego Region are based on applicable water quality standards contained in State water quality control plans and policies and federal regulations and are a required part of this Order. The discharge of waste regulated under this Order shall not cause or contribute to violations of receiving water limitations applicable to the authorized receiving water as set forth below:

A. Water Quality Objectives and Criteria

The discharge of waste shall not cause violations of water quality objectives, federal pollutant criteria or other provisions applicable to the authorized receiving water as contained in the State water quality control plans and policies and federal regulations set forth below:

1. The San Diego Water Board's Basin Plan, including beneficial uses, water quality objectives, and implementation plans;
2. State Water Board water quality control plans and policies including the:
   - **a.** Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries (Thermal Plan);
   - **b.** Water Quality Control Plan for Ocean Waters of California (Ocean Plan);
   - **c.** Water Quality Control Policy for the Enclosed Bays and Estuaries of California;
   - **d.** Policy for Implementation of Toxics Standards for Inland Surface Waters, and Enclosed Bays, and Estuaries of California (SIP); and
   - **e.** Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality.
3. Priority pollutant criteria promulgated by the U.S. EPA through the:
   - **a.** National Toxics Rule (NTR)[1] (promulgated on December 22, 1992 and amended on May 4, 1995); and
   - **b.** California Toxics Rule (CTR).[2,3]

B. Receiving Water Limitations for Inland Surface Waters

1. Bacterial Characteristics

- **a.** In waters designated for contact recreation (REC-1), the fecal coliform concentration based on a minimum of not less than five samples for any 30-day period, shall not exceed a log mean 200/100 mL, nor shall more than 10 percent of the total samples during any 30-day period exceed 400/100 mL. [Basin Plan]
- **b.** At all areas where shellfish may be harvested for human consumption, as determined by the San Diego Water Board, the median total coliform density shall not exceed 70 per 100 mL throughout the water column, and not more than 10 percent of the samples shall exceed 230 per 100 mL for a five-tube decimal dilution test or 330 organisms per 100 ml when a three-tube decimal dilution test is used. [Basin Plan]
- **c.** In waters designated for non-contact recreation (REC-2) and not designated for contact recreation (REC-1), the average fecal coliform concentrations for any 30- day period, shall not exceed 2,000 organisms per 100 ml nor shall more than 10 percent of samples collected during any 30-day period exceed 4,000 organisms per 100 ml. [Basin Plan]

2. Physical Characteristics

- **a.** Waters shall not contain oils, greases, waxes, or other materials in concentrations which result in a visible film or coating on the surface of the water or on objects in the water, or which cause nuisance or which otherwise adversely affect beneficial uses. [Basin Plan]

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[1] 40 CFR Section 131.36.
[2] 65 Federal Register 31682-31719 (May 18, 2000), adding section 131.38 to 40 CFR.
[3] If a water quality objective and a CTR criterion are in effect for the same priority pollutant, the more stringent of the two applies.

b. Waters shall not contain floating material, including solids, liquids, foams, and scum in concentrations which cause nuisance or adversely affect beneficial uses. [Basin Plan]

c. Waters shall be free of coloration that causes nuisance or adversely affects beneficial uses. [Basin Plan]

d. The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses. [Basin Plan]

e. Waters shall not contain suspended and settleable solids in concentrations of solids that cause nuisance or adversely affect beneficial uses. [Basin Plan]

f. Waters shall not contain taste or odor producing substances at concentrations which cause a nuisance or adversely affect beneficial uses. [Basin Plan]

g. Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses. Inland surface waters shall not contain turbidity in excess of the numerical objective described in Table 3-2 of the Basin Plan. [Basin Plan]

3. Chemical Charateristics

a. The dissolved oxygen concentration shall not at any time be less than 5.0 mg/L. The annual mean dissolved oxygen concentration shall not be less than 7 mg/L more than 10% of the time. [Basin Plan]

b. The pH shall not be changed at any time more than 0.2 units from normal ambient pH. The pH shall not be depressed below 7.0 nor raised above 9.0. [Basin Plan]

c. Waters shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. [Basin Plan]

d. The discharge of wastes shall not cause concentrations of un-ionized ammonia (NH3) to exceed 0.025 mg/l (as N). [Basin Plan]

e. No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms. [Basin Plan]

f. The discharge of waste to inland surface waters designated for use as domestic or municipal supply (MUN) shall not contribute to concentrations of toxics in excess of the maximum contaminant levels (MCLs) for inorganic pollutants set forth in the CCR, title 22, division 4, chapter 15, article 4.1, section 64435 and organic pollutants set forth in title 22, division 4, chapter 15, article 5.5, Section 64444A.

g. The discharge of waste to inland surface waters shall not contribute to concentrations in excess of the mineral objectives specified in Table 3-2 of the Basin Plan.

4. Radioactivity Characteristics

a. Radionuclides shall not be present in concentrations that are deleterious to human, plant, animal, or aquatic life nor that result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal or aquatic life. [Basin Plan]

b. The radioactivity in the receiving waters shall not exceed limits specified in title 17, division 1, chapter 5, subchapter 4, group 3, article 1, section 30253 of the CCR.

5. Toxicity Characteristics

a. All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the San Diego Water Board. [Basin Plan]

C. Receiving Water Limitations for Bays, Estuaries, and Coastal Lagoons

1. Bacterial Characteristics

a. At all areas where shellfish may be harvested for human consumption, as determined by the San Diego Water Board, the median total coliform density shall not exceed 70 per 100 mL throughout the water column, and not more than 10 percent of the samples shall exceed 230 per 100 mL for a five-tube decimal dilution test or 330 organisms per 100 ml when a three-tube decimal dilution test is used. [Basin Plan]

b. In bays and estuaries designated for contact recreation (REC-1), the most probable number of total coliform organisms in the upper 60 feet of the water column shall be less than 1,000 organisms per 100 ml (10 organisms per ml); provided that not more than 20 percent of the samples at any sampling station, in any 30-day period, may exceed 1,000 organisms per 100 ml (10 per ml); and provided further that no single sample as described below is exceeded. The most probable number of total coliform organisms in the upper 60 feet of the water column in no single sample when verified by a repeat sample taken within 48 hours shall exceed 10,000 organisms per 100 ml (100 organisms per ml). [Basin Plan]

c. In waters designated for non-contact recreation (REC-2) and not designated for contact recreation (REC-1), the average fecal coliform concentrations for any 30- day period, shall not exceed 2,000 organisms per 100 ml nor shall more than 10 percent of samples collected during any 30-day period exceed 4,000 organisms per 100 ml. [Basin Plan]

d. In San Diego Bay where bay waters are used for whole fish handling, the density of E. coli shall not exceed 7 organisms per mL in more than 20 percent of any 20 daily consecutive samples of bay water. [Basin Plan]

2. Physical Characteristics

a. Waters shall not contain oils, greases, waxes, or other materials in concentrations which result in a visible film or coating on the surface of the water or on objects in the water, or which cause nuisance or which otherwise adversely affect beneficial uses. [Basin Plan]

b. Waters shall not contain floating material, including solids, liquids, foams, and scum in concentrations which cause nuisance or adversely affect beneficial uses. [Basin Plan]

c. Waters shall be free of coloration that causes nuisance or adversely affects beneficial uses. [Basin Plan]

d. The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses. [Basin Plan]

e. Waters shall not contain suspended and settleable solids in concentrations of solids that cause nuisance or adversely affect beneficial uses. [Basin Plan]

f. Waters shall not contain taste or odor producing substances at concentrations which cause a nuisance or adversely affect beneficial uses. [Basin Plan]

g. Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses. The transparency of waters in lagoons and estuaries shall not be less than 50% of the depth at locations where measurement is made by means of a standard Secchi disk, except where lesser transparency is caused by rainfall runoff from undisturbed natural areas and dredging projects conducted in conformance with waste discharge requirements of the San Diego Water Board. With these two exceptions, increases in turbidity attributable to controllable water quality factors shall not exceed 20% over natural turbidity levels at locations with a natural turbidity of 0 to 50 NTU; 10 NTU at locations with a natural turbidity of 50 to 100 NTU; and 10% over the natural turbidity level in locations with a natural turbidity of greater than 100 NTU. [Basin Plan]

h. Within San Diego Bay, the transparency of bay waters, insofar as it may be influenced by any controllable factor, either directly or through induced conditions, shall not be less than 8 feet in more than 20 percent of the readings in any zone, as measured by a standard Secchi disk. Wherever the water is less than 10 feet deep, the Secchi disk reading shall not be less than 80 percent of the depth in more than 20 percent of the readings in any zone. [Basin Plan]

3. Chemical Charateristics

a. The dissolved oxygen concentration shall not at any time be less than 5.0 mg/L. The annual mean dissolved oxygen concentration shall not be less than 7 mg/L more than 10% of the time. [Basin Plan]

b. The pH shall not be changed at any time more than 0.2 units from normal ambient pH. The pH shall not be depressed below 7.0 nor raised above 9.0. [Basin Plan]

c. Waters shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses. [Basin Plan]

d. The discharge of wastes shall not cause concentrations of un-ionized ammonia (NH3) to exceed 0.025 mg/l (as N). [Basin Plan]

e. No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms. [Basin Plan]

f. The discharge of waste to inland surface waters designated for use as domestic or municipal supply (MUN) shall not contribute to concentrations of toxics in excess of the maximum contaminant levels (MCLs) for inorganic pollutants set forth in the CCR, Title 22, Division 4, Chapter 15, Article 4.1, Section 64435 and organic pollutants set forth in Title 22, Division 4, Chapter 15, Article 5.5, Section 64444A.

4. Radioactivity Characteristics

a. Radionuclides shall not be present in concentrations that are deleterious to human, plant, animal, or aquatic life nor that result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal or aquatic life. [Basin Plan]

b. The radioactivity in the receiving waters shall not exceed limits specified in title 17, division 1, chapter 5, subchapter 4, group 3, article 1, section 30253 of the CCR.

5. Toxicity Characteristics

a. All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic

life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the San Diego Water Board. [Basin Plan]

b. Pollutants in sediments shall not be present in quantities that, alone or in combination, are toxic to benthic communities. [Bays and Estuaries Plan]

c. Pollutants shall not be present in sediments at levels that will bioaccumulate in aquatic life to levels that are harmful to human health. [Bays and Estuaries Plan]

D. Receiving Water Limitations for Ocean Waters

1. Bacterial Characteristics

For discharges of waste to the Pacific Ocean, within a zone bounded by the shoreline and a distance of 1,000 feet from the shoreline or the 30-foot depth contour, whichever is further from the shoreline, and in areas outside this zone used for water contact sports, as determined by the San Diego Water Board (waters designated as REC-1), the following bacterial objectives shall be maintained throughout the water column [Ocean Plan]:

a. 30-day Geometric Mean – The following standards are based on the geometric mean of the five most recent samples from each site:

i. Total coliform density shall not exceed 1,000 per 100 ml;
ii. Fecal coliform density shall not exceed 200 per 100 ml; and
iii. Enterococcus density shall not exceed 35 per 100 ml.

b. Single Sample Maximum

i. Total coliform density shall not exceed 10,000 per 100 ml;
ii. Fecal coliform density shall not exceed 400 per 100 ml;
iii. Enterococcus density shall not exceed 104 per 100 ml; and
iv. Total coliform density shall not exceed 1,000 per 100 ml when the fecal coliform/total coliform ratio exceeds 0.1.

2. Physical Characteristics

a. Floating particulates and grease and oil shall not be visible [Ocean Plan].

b. The discharge of waste shall not cause aesthetically undesirable discoloration of the ocean surface [Ocean Plan].

c. Natural light shall not be significantly reduced at any point [Ocean Plan].

d. The rate of deposition of inert solids and the characteristics of inert solids in ocean sediments shall not be changed such that benthic communities are degraded [Ocean Plan].

3. Chemical Characteristics

a. The dissolved oxygen concentration shall not at any time be depressed more than 10 percent from that which occurs naturally, as the result of the discharge of oxygen demanding waste materials [Ocean Plan].

b. The pH shall not be changed at any time more than 0.2 units which occur naturally [Ocean Plan].

c. The dissolved sulfide concentration of waters in and near sediments shall not be significantly increased above the present under natural conditions [Ocean Plan].

d. The concentration of substances set forth in chapter II, table 1 of the Ocean Plan (2012), in marine sediments shall not be increased to levels which would degrade indigenous biota [Ocean Plan].

e. The concentration of organic materials in marine sediments shall not be increased to levels that would degrade marine life [Ocean Plan].

f. Nutrient materials shall not cause objectionable aquatic growths or degrade indigenous biota [Ocean Plan].

g. Numerical water quality objectives contained in chapter II, table 1 of the Ocean Plan [Ocean Plan].

4. Biological Characteristics

a. Marine communities, including vertebrate, invertebrate, and plant species, shall not be degraded [Ocean Plan].

b. The natural taste, odor, color of fish, shellfish, or other marine resources used for human consumption shall not be altered [Ocean Plan].

c. The concentration of organic materials in fish, shellfish, or other marine resources used for human consumption shall not bioaccumulate to levels that are harmful to human health [Ocean Plan].

5. Radioactivity Characterisitcs

a. The discharge of radioactive waste shall not degrade marine life [Ocean Plan].

VII. PROVISIONS

A. Standard Provisions

1. Federal Standard Provisions. The Discharger shall comply with all Standard Provisions included in Attachment D of this Order.

2. San Diego Water Board Standard Provisions. The Discharger shall comply with the following provisions. In the event that there is any conflict, duplication, or overlap between provisions specified by this Order, the more stringent provision shall apply:

a. The Discharger shall comply with all applicable federal, state, and local laws and regulations for handling, transport, treatment, or disposal of waste.

b. A copy of this Order and the NOA shall be maintained onsite at the groundwater extraction facility, and shall be available to operating personnel, at all times.

c. The Discharger shall take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with the discharge requirements of this Order and the NOA, including the completion of such accelerated or additional monitoring as may be necessary and required through a CWC sections 13267 and 13383 to determine the nature, extent, and effect of the noncomplying discharge.

B. Monitoring and Reporting Program (MRP) Requirements

1. The Discharger shall comply with the MRP, and any future revisions thereto, in Attachment E of this Order, including any additional monitoring requirements specified in the NOA.

2. Notifications required to be provided to this San Diego Water Board shall be made to:

E-mail – sandiego@waterboards.ca.gov

Telephone – (619) 516-1990
Facsimile – (619) 516-1994

C. Special Provisions

1. Special Studies, Technical Reports and Additional Monitoring Requirements

a. Toxicity Reduction Requirements

If the discharge causes or contributes to chronic toxicity in the effluent, a Toxicity Reduction Evaluation (TRE) shall be required as defined in section IV of the MRP. The San Diego Water Board shall require the Discharger to conduct a TRE if repeated tests reveal toxicity as a result of waste discharge under this Order. The Discharger shall take all reasonable steps to control toxicity once the source of toxicity is identified. Failure to conduct the required toxicity tests or a TRE shall result in the establishment of effluent limitations for chronic toxicity under this Order and/or appropriate enforcement action.

2. Other Special Provisions

a. The Discharger shall dispose of solids removed from liquid wastes in a manner that is consistent with title 27 of the CCR and approved by the San Diego Water Board.

b. This Order expires on September 30, 2020, after which, the terms and conditions of this permit are automatically continued pending issuance of a new Order, provided that all requirements of U.S. EPA's NPDES regulations at 40 CFR section 122.6 and the State's regulations at CCR title 23, section 2235.4 regarding the continuation of expired NPDES Permits and waste discharge requirements are met.

c. The San Diego Water Board or Director of the U.S. EPA may require a person requesting coverage under this Order or subject to waste discharge requirements under this Order to apply for and obtain an individual NPDES permit. Cases where an individual NPDES permit may be required include, but are not limited to those described in 40 CFR sections 122.28(b)(3)(i) and (b)(3)(ii).

VIII. REOPENER PROVISIONS

This Order, or coverage under this Order, may be amended, modified, revoked and/or reissued, or terminated for cause at any time prior to its expiration in accordance with the provisions of 40 CFR sections 122.44, 122.62 to 122.64, 125.62, and 125.62, including, but not limited to, any of the following circumstances:

A. Violation of any terms or conditions of this Order or the NOA from the San Diego Water Board;

B. Obtaining enrollment under this Order , or a NOA from the San Diego Water Board, by misrepresentation or failure to disclose fully all relevant facts;

C. A change in any condition that requires or results in either a temporary or permanent reduction or elimination of the authorized discharge;

D. A finding based on data or other sources, by the San Diego Water Board, that continued discharges may cause unreasonable degradation of the aquatic environment;

E. Modification is warranted to address acute or chronic toxicity in groundwater extraction discharges or receiving waters through new or revised effluent limitations or other permit toxicity requirements or to implement new, revised, or newly interpreted water quality standards applicable to acute or chronic toxicity;

F. Modification is warranted to address an applicable toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) promulgated under section 307 (a) of the CWA for a toxic pollutant where that standard or prohibition is more stringent than any limitation on the pollutant in this Order;

G. Modification is warranted to include new Minimum Levels (MLs) in accordance with the provisions set forth in 40 CFR parts 122 and 124;

H. Modification is warranted to incorporate a new or revised water quality objective that has come into effect or applicable requirements of a total maximum daily load (TMDL) that is adopted or revised;

I. Modification is warranted to incorporate additional effluent limitations, prohibitions, and requirements, based on the results of additional monitoring required by the MRP (Attachment E) of this Order; or

J. Modification of the receiving waters MRP and/or special studies requirements of this Order is necessary for cause, including but not limited to a) revisions necessary to implement recommendations from Southern California Coastal Water Research Project (SCCWRP); b) revisions necessary to develop, refine, implement, and/or coordinate a regional monitoring program; and/or c) revisions necessary to develop and implement improved monitoring and assessment programs in keeping with San Diego Water Board Resolution No. R9-2012-0069, Resolution in Support of a Regional Monitoring Framework.

The filing of a request by the Discharger for modifications, revocation and reissuance, or termination of this Order, or a notification of planned change in or anticipated noncompliance with this Order does not stay any condition of this Order.

IX. COMPLIANCE DETERMINATION

Compliance with the effluent limitations contained in section IV of this Order will be determined as specified below:

A. General

Compliance with effluent limitations shall be determined using sample reporting protocols defined below and in the MRP in Attachment E of this Order. For purposes of reporting and administrative enforcement by the San Diego Water Board, the Discharger shall be deemed out of compliance with effluent limitations if the concentration of the constituent in the monitoring sample is greater than the effluent limitation and greater than or equal to the minimum level (ML) or lowest quantifiable level.

B. Multiple Sample Data

When determining compliance with an AMEL or MDEL for priority pollutants and more than one sample result is available, the Discharger shall compute the arithmetic mean unless the data set contains one or more reported determinations of “Detected, but Not Quantified” (DNQ) or “Not Detected” (ND). In those cases, the Discharger shall compute the median in place of the arithmetic mean in accordance with the following procedure:

1. The data set shall be ranked from low to high, ranking the reported ND determinations lowest, DNQ determinations next, followed by quantified values (if any). The order of the individual ND or DNQ determinations is unimportant.
2. The median value of the data set shall be determined. If the data set has an odd number of data points, then the median is the middle value. If the data set has an even number of data points, then the median is the average of the two values around the middle unless one or

both of the points are ND or DNQ, in which case the median value shall be the lower of the two data points where DNQ is lower than a value and ND is lower than DNQ.

C. Sample Reporting Protocol

1. The Discharger must report with each sample result the acceptable reported ML and the laboratory's current Method Detection Limit (MDL).
2. The Discharger must also report results of analytical determinations for the presence of chemical constituents in a sample using the following reporting protocols:
   a. Sample results greater than or equal to the reported ML must be reported "as measured by the laboratory (i.e., the measured chemical concentration in the sample).
   b. Sample results less than the reported ML, but greater than or equal to the laboratory's MDL, must be reported as "Detected, but Not Quantified", or DNQ. For the purposes of data collection, the laboratory shall write the estimated chemical concentration next to DNQ as well as the words "Estimated Concentration" (may be shortened to "Est. Conc."). The laboratory may, if such information is available, include numerical estimates of the data quality for the reported result. Numerical estimates of data quality may be percent accuracy (+/- a percentage of the reported value), numerical ranges (low to high), or any other means considered appropriate by the laboratory.
   c. Sample results less than the laboratory's MDL shall be reported as "Not Detected," or ND.
   d. Dischargers are to instruct laboratories to establish calibration standards so that the ML value (or its equivalent if there is differential treatment of samples relative to calibration standards) is the lowest calibration standard. At no time is the Discharger to use analytical data derived from extrapolation beyond the lowest point of the calibration curve.

D. Compliance with Average Monthly Effluent Limitation (AMEL)

If the average (or when applicable, the median determined by subsection B above for multiple sample data) of daily discharges over a calendar month exceeds the AMEL for a given parameter, this will represent a single violation for the purpose of assessing mandatory minimum penalties under CWC section 13385, though the Discharger will be considered out of compliance for each discharge day of that month for that parameter (e.g., resulting in 31 days of non-compliance in a 31-day month) for discretionary penalties. If only a single sample is taken during the calendar month and the analytical result for that sample exceeds the AMEL, the Discharger will be considered out of compliance for all days when a discharge occurs. For any one calendar month during which no sample (daily discharge) is taken, no compliance determination can be made for that calendar month and no penalty assessed.

E. Compliance with Average Weekly Effluent Limitation (AWEL)

If the average (or when applicable, the median determined by subsection B above for multiple sample data) of daily discharges over a calendar week (Sunday through Saturday) exceeds the AWEL for a given parameter, this will represent a single violation for the purpose of assessing mandatory minimum penalties under CWC section 13385, though the Discharger will be considered out of compliance for each discharge day of that week for that parameter (e.g., resulting in seven days of non-compliance) for discretionary penalties. If only a single sample is taken during the calendar month and the analytical result for that sample exceeds the AWEL, the Discharger will be considered out of compliance only for days when the discharge occurs. For any one calendar week during which no sample (daily discharge) is taken, no compliance determination can be made for that calendar week and no penalty assessed.

F. Compliance with Maximum Daily Effluent Limitation (MDEL)

The MDEL shall apply to flow weighted 24-hour composite samples, or grab samples, as specified in the MRP (Attachment E). If a daily discharge exceeds the MDEL for a given parameter, an alleged violation will be flagged and the Discharger will be considered out of compliance for that parameter for that one day only within the reporting period. For any one day during which no sample is taken, no compliance determination can be made for that day.

G. Compliance with Instantaneous Minimum Effluent Limitation

If the analytical result of a single sample is lower than the instantaneous minimum effluent limitation for a parameter, a violation will be flagged and the Discharger will be considered out of compliance for that parameter for that single sample. Non-compliance for each sample will be considered separately (e.g., the results of two grab samples taken within a calendar day that are both lower than the instantaneous minimum effluent limitation would result in two instances of noncompliance with the instantaneous minimum effluent limitation.

H. Compliance with Instantaneous Maximum Effluent Limitation

If the analytical result of a single sample is higher than the instantaneous maximum effluent limitation for a parameter, a violation will be flagged and the Discharger will be considered out of compliance for that parameter for that single sample. Non-compliance for each sample will be considered separately (e.g., the results of two grab samples taken within a calendar day that both exceed the instantaneous maximum effluent limitation would result in two instances of noncompliance with the instantaneous maximum effluent limitation).

I. Six-Month Median Effluent Limitation (SMEL)

The Discharger shall determine the six-month median effluent value (SMEV) for a given parameter by calculating the statistical median of all daily effluent values (DEVs) for each parameter within each six-month calendar period (January-June and July-December). The SMEV determination for a given six-month calendar period shall not include DEVs from any other six-month calendar period. If only a single DEV is obtained for a parameter during a six-month calendar period, that DEV shall be considered the SMEV for that parameter for that given six-month calendar period. The SMEV shall be attributed to each day of the six-month calendar period for determination of compliance with the six-month median effluent limitation (SMEL) for a given parameter for each day of that given six-month calendar period, resulting in approximately 180 days of non-compliance depending on the number of days in the six-month calendar period. If the SMEV exceeds the six-month median, the Discharger will be considered out of compliance for each day for the six-month period. The SMEV cannot be determined for any six month calendar period during which no DEV is obtained.

J. Median Monthly Effluent Limit (MMEL)

If the median result of three independent toxicity tests, conducted within the same calendar month, and analyzed using the Test for Significant Toxicity (TST) is a “fail” (i.e. two out of three is “fail”), this will represent a single violation for the purpose of assessing mandatory minimum penalties under CWC section 13385, though the Discharger will be considered out of compliance for each discharge day of that month for that parameter (e.g., resulting in 31 days of non-compliance in a 31-day month) for discretionary penalties. If the median result is “fail”, the Discharger will be considered out of compliance for days when the discharge occurs. For any one calendar month during which fewer than three samples are taken, no compliance determination can be made for that calendar month.

K. Chronic Toxicity

The discharge is subject to determination of "Pass" or "Fail" from chronic toxicity tests using the Test of Significant Toxicity (TST) statistical t-test approach described in *National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document* (EPA 833-R-10-003, 2010), Appendix A, Figure A-1, Table A-1, and Appendix B, Table B-1.
The null hypothesis (Ho) for the TST statistical approach is:

Ho = Mean discharge instream waste concentration (IWC) response ≤ 0.75 × Mean control response.

A test result that rejects this null hypothesis is reported as "Pass". A test result that does not reject this null hypothesis is reported as "Fail". The relative "Percent Effect" at the discharge IWC is defined and reported as:

$$\text{Percent Effect} = \frac{\text{(Mean control response - Mean discharge IWC response)}}{\text{(Mean control response)}} \times 100$$

This is a t-test (formally Student's t-Test), a statistical analysis comparing two sets of replicate observations—in the case of whole effluent toxicity (WET), only two test concentrations (i.e., a control and IWC). The purpose of this statistical test is to determine if the means of the two sets of observations are different (i.e., if the IWC or receiving water concentration differs from the control (the test result is "Pass" or "Fail")). The Welch's t-test employed by the TST statistical approach is an adaptation of Student's t-test and is used with two samples having unequal variances.

The MDEL for chronic toxicity is exceeded and a violation will be flagged when a chronic toxicity test, analyzed using the TST statistical approach, results in "Fail" and the "Percent Effect" is ≥ 50%.

The chronic toxicity MDEL is set at the IWC for the discharge (100% effluent) and expressed in units of the TST statistical approach ("Pass" or "Fail", "Percent Effect"). All NPDES effluent compliance monitoring for the chronic toxicity MDEL shall be reported using only the 100% effluent concentration and negative control, expressed in units of the TST. The TST hypothesis (Ho) (see above) is statistically analyzed using the IWC and a negative control. Effluent toxicity tests shall be run using a multi-concentration test design when required by *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms* (USEPA 2002, EPA-821-R-02-013). The San Diego Board's review of reported toxicity test results will include review of concentration-response patterns as appropriate (see Fact Sheet discussion at IV.C.5). As described in the bioassay laboratory audit directives to the San Jose Creek Water Quality Laboratory from the State Water Resources Control Board dated August 7, 2014, and from the USEPA dated December 24, 2013, the Percent Minimum Significant Difference (PMSD) criteria only apply to compliance reporting for the NOEC and the sublethal statistical endpoints of the NOEC, and therefore are not used to interpret TST results. Standard Operating Procedures used by the toxicity testing laboratory to identify and report valid, invalid, anomalous, or inconclusive effluent (and receiving water) toxicity test measurement results from the TST statistical approach, including those that incorporate a consideration of concentration-response patterns, must be submitted to the San Diego Water Board (40 CFR section 122.41(h)). The San Diego Water Board will make a final determination as to whether a toxicity test result is valid, and may consult with the Discharger, USEPA, the State Water Board's Quality Assurance Officer, or the State Water Board's Environmental Laboratory Accreditation Program as needed. The Board may consider results of any Toxicity Reduction Evaluation / Toxicity Identification Evaluation (TRE/TIE) studies in an enforcement action.

ATTACHMENT A – ABBREVIATIONS AND DEFINITIONS

Part 1. – Abbreviations

Abbreviation	Definition
AMEL	Average Monthly Effluent Limitation
ASBS	Areas of Special Biological Significance
AWEL	Average Weekly Effluent Limitation
Basin Plan	Water Quality Control Plan for the San Diego Basin
BAT	Best Available Technology Economically Achievable
BCT	Best Conventional Pollutant Control Technology
BMP	Best Management Practice(s)
BPJ	Best Professional Judgement
BPT	Best Practicable Treatment Control Technology
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
CIWQS	California Integrated Water Quality System
CFR	Code of Federal Regulations
CTR	California Toxics Rule
CV	Coefficient of Variation
CWA	Clean Water Act
CWC	California Water Code
DDT	Dichlorodiphenyltrichloroethane
Dm	Initial Dilution
DNQ	Detected, but Not Quantified
ECA	Effluent Concentration Allowance
ELAP	Environmental Laboratory Accreditation Program
ELG	Effluent Limitation Guidelines
gpd	Gallons per Day
HCH	Hexachlorocyclohexane
IWC	Instream waste concentration
µg	Microgram
µg/L	Micrograms per Liter
lbs/day	Pounds per Day
LC 50	Percent Waste Giving 50 Percent Survival of Test Organisms
LTA	Long Term Average
mg/L	Milligrams per Liter
ml/L	Milliliters per Liter
MBAS	Methylene Blue Activated Substances
MCL	Maximum Contaminant Levels
MDEL	Maximum Daily Effluent Limitation
MDL	Method Detection Limit
MER	Mass Emission Rate
MGD	Million Gallons per Day
ML	Minimal Level
MPN	Most Probable Number
MRP	Monitoring and Reporting Program
MS4	Municipal Separate Storm Sewer System
MTBE	Methyl-tert-butyl ether
MUN	Municipal and Domestic Supply Beneficial Use
ND	Not Detected

Abbreviation	Definition
NTU	Nephelometric Turbidity Unit
NPDES	National Pollutant Discharge Elimination System
NOA	Notice of Applicability
NOEL	No Observed Effect Level
NOEX	Notice of Exclusion
NOI	Notice of Intent
NOT	Notice of Termination
NSPS	New Source Performance Standard
NTR	National Toxics Rule
Ocean Plan	California Ocean Plan, Water Quality Control Plan Ocean Waters Of California
PAH	Polynuclear Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyls
PDF	Portable Document Format
REC-1	Contact Water Recreation Beneficial Use
REC-2	Non-contact Water Recreation Beneficial Use
RL	Reporting Level
RMD	Regulatory Management Decision
RPA	Reasonable Potential Analysis
RWD	Report of Waste Discharge
San Diego Water Board	California Regional Water Quality Control Board, San Diego Region
SCCWRP	Southern California Coastal Waters Research Project
SHELL	Shellfish Harvesting Beneficial Use
SIP	Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California
SIYB	Shelter Island Yacht Basin
SMR	Self Monitoring Report
State Water Board	State Water Resources Control Board
TBEL	Technology-Based Effluent Limitations
TCDD	Tetrachlorodibenzo dioxin and congeners
Thermal Plan	Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries
TIE	Toxicity Identification Evaluation
TMDL	Total Maximum Daily Load
TRE	Toxicity Reduction Evaluation
TSS	Total Suspended Solids
TST	Test of Significant Toxicity
TUa	Toxic Units Acute
TUc	Toxic Units Chronic
USEPA	United Stated Environmental Protection Agency
U.S.	United States
WDID	Waste Discharge Identification number
WDR	Waste Discharge Requirements
WER	Water Effect Ratio
WET	Whole Effluent Toxicity
WLA	Wasteload Allocations
WQBEL	Water Quality-Based Effluent Limitations
WQS	Water Quality Standards

Part 2. – Glossary of Common Terms

Average Monthly Effluent Limitation (AMEL)
The highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month.

Average Weekly Effluent Limitation (AWEL)
The highest allowable average of daily discharges over a calendar week (Sunday through Saturday), calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week.

Clean Water Act (CWA)
The Federal Water Pollution Control Act enacted by Public Law 92-500 as amended by Public Laws 95-217, 95-576, 96-483.

Chronic Toxicity
This parameter shall be used to measure the acceptability of waters for supporting a healthy biota until improved methods are developed to evaluate biological response.

Contamination
"Contamination" means an impairment of the quality of the waters of the state by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. "Contamination" includes any equivalent effect resulting from the disposal of waste, whether or not waters of the state are affected. [CWC section 13050(k)]

Daily Discharge
Daily Discharge is defined as either: (1) the total mass of the constituent discharged over the calendar day (12:00 am through 11:59 pm) or any 24-hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g., concentration).

The daily discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day or other 24-hour period defined as a day) or by the arithmetic mean of analytical results from one or more grab samples taken over the course of the day.

For composite sampling, if 1 day is defined as a 24-hour period other than a calendar day, the analytical result for the 24-hour period will be considered as the result for the calendar day in which the 24-hour period ends.

Detected, but Not Quantified (DNQ)
DNQ are those sample results less than the RL, but greater than or equal to the laboratory's MDL. Sample results reported as DNQ are estimated concentrations.

Discharger
Any person that is authorized to discharge extracted groundwater under this Order through an approved NOA issued by the San Diego Water Board.

Effluent Concentration Allowance (ECA)

ECA is a value derived from the water quality criterion/objective, dilution credit, and ambient background concentration that is used, in conjunction with the coefficient of variation for the effluent monitoring data, to calculate a long-term average (LTA) discharge concentration. The ECA has the same meaning as waste load allocation (WLA) as used in U.S. EPA guidance (Technical Support Document For Water Quality-based Toxics Control, March 1991, second printing, EPA/505/2-90-001).

Enclosed Bays
Enclosed Bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost harbor works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays of the San Diego Region include, but are not limited to, Mission Bay, and San Diego Bay. Enclosed bays do not include inland surface waters or ocean waters.

Estuaries
Estuaries means waters, including coastal lagoons, located at the mouths of streams that serve as areas of mixing for fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and seawater. Estuarine waters of the San Diego Region include, but are not limited to, the Tijuana River Estuary, the Mouth of San Diego River, Famosa Slough and Channel, Los Penasquitos Lagoon, San Dieguito Lagoon, Batiquitos Lagoon, San Elijo Lagoon, Agua Hedionda Lagoon, Buena Vista Lagoon, Loma Alta Slough, Mouth of San Luis Rey River, Santa Margarita Lagoon, Aliso Creek Mouth, San Juan Creek Mouth, San Mateo Creek Mouth, and the San Onofre Creek Mouth. . Estuaries do not include inland surface waters or ocean waters.

Extraction
Extraction is the act of forcibly withdrawing groundwater from the sub surface. Extraction through mechanical means is termed “active” extraction, such as when using pumps to extract groundwater. Alternatively, “passive” extraction is through the use of gravity, such as with a french drain or weep hole.

Groundwater
Groundwater means any water, except capillary moisture, located beneath the land surface in soil pore spaces and in the fractures of rock formations or beneath the bed of any river, stream, lake, reservoir, or other body of surface water, whatever the subsurface geologic structure in which such water stands, flows, percolates or otherwise occurs.

Groundwater Extraction Discharge
The discharge of groundwater removed from the ground or drainage collection systems to lower groundwater levels or pressures, control or eliminate groundwater seepage or leakage, stabilize slopes and other earth structures or form part of a system to remediate groundwater contamination. Groundwater extraction discharges are associated with groundwater control systems employed in construction and foundation dewatering projects, trench and ditch dewatering projects, underground monitoring wells, tank removal projects, groundwater remediation projects, permanent groundwater drainage and seepage control projects and other similar activities. The term as used in this Order does not include permanent groundwater extraction discharges to San Diego Bay or its tributaries under tidal influence with the exception of the discharge to San Diego Bay from the permanent groundwater drainage control system at One America Plaza in the City of San Diego

Hardness
A characteristic of water caused mainly by the salts of calcium and magnesium, such as bicarbonate, carbonate, sulfate, chloride and nitrate. Hardness or total hardness is generally defined as the sum of the calcium and magnesium concentrations expressed in milligrams per liter of equivalent calcium carbonate.

Inland Surface Waters
All surface waters of the San Diego Region exclusive of the waters of the Pacific Ocean, enclosed bays and estuaries, coastal lagoons, and groundwaters. Inland Surface Waters includes reservoirs and lakes.

Instantaneous Maximum Effluent Limitation
The highest allowable value for any single grab sample or aliquot (i.e., each grab sample or aliquot is independently compared to the instantaneous maximum limitation).

Instantaneous Minimum Effluent Limitation
The lowest allowable value for any single grab sample or aliquot (i.e., each grab sample or aliquot is independently compared to the instantaneous minimum limitation).

Maximum Daily Effluent Limitation (MDEL)
The highest allowable daily discharge of a pollutant, over a calendar day (or 24-hour period). For pollutants with limitations expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

Median
The middle measurement in a set of data. The median of a set of data is found by first arranging the measurements in order of magnitude (either increasing or decreasing order). If the number of measurements (n) is odd, then the median = $X_{(n+1)/2}$. If n is even, then the median = $(X_{n/2} + X_{(n/2)+1})/2$ (i.e., the midpoint between the n/2 and n/2+1).

Method Detection Limit (MDL)
MDL is the minimum concentration of a substance that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero, as defined in in 40 CFR part 136, Attachment B, revised as of July 3, 1999.

Minimum Level (ML)
ML is the concentration at which the entire analytical system must give a recognizable signal and acceptable calibration point. The ML is the concentration in a sample that is equivalent to the concentration of the lowest calibration standard analyzed by a specific analytical procedure, assuming that all the method specified sample weights, volumes, and processing steps have been followed.

MS4 Operator
The municipal separate storm sewer system (MS4) operator is the entity responsible for the operation of its local MS4 subject to an MS4 NPDES Permit.

Not Detected (ND)
Sample results which are less than the laboratory's MDL.

Nuisance
"Nuisance" means anything which meets all of the following requirements: (1) Is injurious to health, or is

indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. (2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. (3) Occurs during, or as a result of, the treatment or disposal of waste. [Water Code section 13050(m).

Ocean Waters
The territorial marine waters of the state as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the State Water Board's California Ocean Plan

Pollutants
Substances defined in Clean Water Act section 502(6) (33 U.S.C. section 1362(6)), and incorporated by reference into CWC section 13373.

Pollution
"Pollution" means an alteration of the quality of the waters of the state by waste to a degree which unreasonably affects either of the following: (A) The waters for beneficial uses. (B) Facilities which serve these beneficial uses. "Pollution" may include "contamination." [Water Code section 13050(l)

Reporting Level (RL)
The RL is the ML (and its associated analytical method) chosen by the Discharger for reporting and compliance determination from the MLs included in this Order, including an additional factor if applicable as discussed herein. The MLs included in this Order correspond to approved analytical methods for reporting a sample result that are selected by the San Diego Water Board either from Appendix 4 of the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (SIP) in accordance with section 2.4.2 of the SIP or established in accordance with section 2.4.3 of the SIP. The ML is based on the proper application of method-based analytical procedures for sample preparation and the absence of any matrix interferences. Other factors may be applied to the ML depending on the specific sample preparation steps employed. For example, the treatment typically applied in cases where there are matrix-effects is to dilute the sample or sample aliquot by a factor of ten. In such cases, this additional factor must be applied to the ML in the computation of the RL.

Standard Deviation (σ)
Standard Deviation is a measure of variability that is calculated as follows:

$$\sigma = (\sum[(x - \mu)^2]/(n - 1))^{0.5}$$

where:
x is the observed value;
μ is the arithmetic mean of the observed values; and
n is the number of samples.

Test of Significant Toxicity (TST)
A statistical approach used to analyze toxicity test data. The TST incorporates a restated null hypothesis, Welch's t-test, and biological effect thresholds for chronic and acute toxicity.

Toxicity Reduction Evaluation (TRE)
TRE is a study conducted in a step-wise process designed to identify the causative agents of effluent or ambient toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in toxicity. The first steps of the TRE consist of the collection of data relevant to the toxicity, including additional toxicity testing, and an evaluation of facility operations and maintenance practices, and best management practices. A Toxicity Identification Evaluation (TIE) may be required as part of the TRE, if appropriate. (A TIE is a set of procedures to identify the specific chemical(s) responsible for toxicity. These procedures are performed in three phases (characterization, identification, and confirmation) using aquatic organism toxicity tests.)

Water Quality Standards
Water quality standards, as defined in CWA Section 303(c) and 40 CFR section 131.6, consist of 1) the beneficial uses of a water body, 2) criteria (referred to as water quality objectives in California law) to protect those uses, and 3) an anti-degradation policy. Under state law, the water boards establish beneficial uses and water quality objectives in their water quality control or basin plans. Together with an anti-degradation policy (State Water Board Resolution 68-16), these beneficial uses and water quality objectives serve as water quality standards under the CWA. In CWA parlance, state beneficial uses are called “designated uses” and state water quality objectives are called “criteria.” Throughout this Order, the relevant term is used depending on the statutory scheme. The water quality standards described in section V of this Order are enforceable receiving water limitations for the surface water bodies for which they are established.

Waters of the United States
Waters of the United States are defined as: “(a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate “wetlands;” (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, “wetlands,” sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purpose by industries in interstate commerce; (d) All impoundments of waters otherwise defined as waters of the United States under this definition: (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial seas; and (g) “Wetlands” adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area’s status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA.” (40 CFR 122.2)

ATTACHMENT B – APPLICABLE TOTAL MAXIMUM DAILY LOADS

TOTAL MAXIMUM DAILY LOADS APPLICABLE TO ORDER NO. R9-2015-0013

This attachment presents the wasteload allocations (WLAs) of the Total Maximum Daily Loads (TMDLs) adopted by the San Diego Water Board and approved by U.S. EPA under Clean Water Act section 303(c), applicable to discharges regulated under this Order. This attachment discusses the applicability of the following TMDLs within the San Diego Region:

I. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed

II. Total Maximum Daily Load for Dissolved Copper in Shelter Island Yacht Basin

III. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed

IV. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek

V. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

VI. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

VII. Total Maximum Daily Load for Sedimentation in Los Penasquitos Lagoon

I. Total Maximum Daily Load for Diazinon in Chollas Creek Watershed

A. Applicability

1. TMDL Basin Plan Amendment: Resolution No. R9-2002-0123

2. TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	August 14, 2002
State Water Board Approval Date:	July 16, 2003
Office of Administrative Law Approval Date:	September 11, 2003
U.S. EPA Approval Date:	November 3, 2003

3. TMDL Effective Date: September 11, 2003

4. Watershed Management Area: San Diego Bay

5. Water Body: Chollas Creek

B. Final TMDL Compliance Requirements

Resolution No. R9-2002-0123 establishes WLAs for the discharge of diazinon to Chollas Creek from MS4 systems for the City of San Diego, City of Lemon Grove, City of La Mesa, San Diego Unified Port District, County of San Diego, and CalTrans. Resolution No. R9-2002-0123 does not establish an applicable WLA for the discharge of extracted groundwater, effectively

resulting in a prohibition to discharge diazinon to Chollas Creek. Consistent with the requirements of Resolution No. R9-2002-0123, Order No. R9-2007-0034 prohibited the discharge of diazinon to Chollas Creek. Consistent with the requirements of Resolution No. R9-2002-0123, this Order prohibits the discharge of diazinon to Chollas Creek in section IV of this Order.

II. Total Maximum Daily Loads for Dissolved Copper in Shelter Island Yacht Basin

A. Applicability

1. TMDL Basin Plan Amendment: Resolution No. R9-2005-0019

2. TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	September 22, 2005
Office of Administrative Law Approval Date:	December 2, 2005
U.S. EPA Approval Date:	February 8, 2006

3. TMDL Effective Date: December 2, 2005

4. Watershed Management Area: San Diego Bay

5. Water Body: Shelter Island Yacht Basin

B. Final TMDL Compliance Requirements

Resolution No. R9-2005-0019 establishes WLAs for the discharge of copper into Shelter Island Yacht Basin (SIYB). Identified Dischargers of copper loading include the San Diego Unified Port District, SIYB marina owner/operators, persons owning boats moored in SIYB, SIYB underwater hull cleaners, and the City of San Diego MS4. The TMDL does not provide WLAs or reserved assimilative capacity for additional point sources. Consistent with the requirements of Resolution No. R9-2005-0019, Order No. R9-2007-0034 prohibited the discharge of copper to Shelter Island Yacht Basin. Consistent with the requirements of Resolution No. R9-2005-0019 this Order prohibits the discharge of copper to Shelter Island Yacht Basin in section IV of this Order.

III. Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in Rainbow Creek Watershed

A. Applicability

1. TMDL Basin Plan Amendment: Resolution No. R9-2005-0036

2. TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 9, 2005
State Water Board Approval Date:	November 16, 2005
Office of Administrative Law Approval Date:	February 1, 2006
U.S. EPA Approval Date:	March 22, 2006

3. TMDL Effective Date: February 1, 2006

4. Watershed Management Area: Santa Margarita River

5. Water Body: Rainbow Creek

B. Final TMDL Compliance Requirements

Resolution No. R9-2005-0036 establishes WLAs and LAs for the discharge of total nitrogen and total phosphorus into Rainbow Creek. Identified dischargers of total nitrogen and total phosphorus loading include Caltrans, County of San Diego, and other nonpoint dischargers.

The TMDL provides WLAs of 2 percent of the total annual TMDL for both total nitrogen and total phosphorus for additional point sources, however the TMDL Implementation Action Plan does not provide for the assignment of WLAs to unidentified point source discharges, effectively resulting in the prohibition of discharges of total nitrogen and total phosphorus into Rainbow Creek.

IV. Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek

A. Applicability

1. TMDL Basin Plan Amendment: Resolution No. R9-2007-0043

2. TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2007
State Water Board Approval Date:	July 15, 2008
Office of Administrative Law Approval Date:	October 22, 2008
U.S. EPA Approval Date:	December 18, 2008

3. TMDL Effective Date: October 22, 2008

4. Watershed Management Area: San Diego Bay

5. Water Body: Chollas Creek

B. Final TMDL Compliance Requirements

Resolution No. R9-2007-0043 establishes WLAs for the discharge of copper, lead and zinc to Chollas Creek from point sources. Specifically, Resolution No. R9-2007-0043 states, “Actions to meet the WLAs in discharges to Chollas Creek will be required in WDRs that regulate MS4 discharges, industrial facility and construction activity storm water discharges, and groundwater extraction discharges in the Chollas Creek watershed.”

The TMDL establishes concentration-based WLAs set equal to 90 percent of the numeric water quality objectives for copper, lead, and zinc, as defined in the California Toxics Rule. Because the concentration of these metals resulting in toxic effects varies significantly with hardness, the resulting WLAs are hardness dependent.

Table B-1: Final Receiving Water Limitations Expressed as Concentrations in Chollas Creek

Constituent	Exposure Duration	Applicable WLA (µg/L)	Averaging Period
Dissolved Copper	Acute	$(0.96) \times e^{[0.9422 \times \ln(\text{hardness}) - 1.700]} \times \text{WER}$[1]	1 hour
	Chronic	$(0.96) \times e^{[0.8545 \times \ln(\text{hardness}) - 1.702]} \times \text{WER}$[1]	4 days
Dissolved Lead	Acute	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 1.460]} \times \text{WER}$[1]	1 hour
	Chronic	$[1.46203 - 0.145712 \times \ln(\text{hardness})] \times e^{[1.273 \times \ln(\text{hardness}) - 4.705]} \times \text{WER}$[1]	4 days
Dissolved Zinc	Acute	$(0.978) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}$[1]	1 hour
	Chronic	$(0.986) \times e^{[0.8473 \times \ln(\text{hardness}) + 0.884]} \times \text{WER}$[1]	4 days

[1] The Water Effect Ratio (WER) is assumed to be 1.0 unless there is a site-specific and chemical-specific WER provided in the Basin Plan.

Table B-2: Resulting WLAs for Various Hardness Values

Parameter[1]	Units	Hardness (mg/L)					
		Up to 200		200 - 300		300 and above	
		Acute	Chronic	Acute	Chronic	Acute	Chronic
Copper	µg/L	23.2	14.6	34.1	20.6	44.7	26.4
Lead	µg/L	123	4.8	188	7.3	253	9.8
Zinc	µg/L	190	191	268	270	341	344

[1] All metals are expressed as total recoverable.

Consistent with the procedures specified in the SIP, and provided in section IV.C.5 of Attachment F, final hardness dependent, water quality-based effluent limitations for copper, lead, and zinc have been established for discharges to Chollas Creek. Resolution No. R9-2007-0043 requires that regulated extracted groundwater discharges to Chollas Creek must meet the WLAs at the initiation of the discharge, thus compliance with the effluent limitations in secton IV of this Order is required upon the effective date of this Order.

Additionally, Resolution No. R9-2007-0043 required Dischargers that discharge to Chollas Creek to monitor the receiving water for the purpose of assessing the effectiveness of the management practices implemented to meet the TMDL allocations. As such, receiving water monitoring for copper, lead, and zinc has been established in this Order for Dischargers to Chollas Creek.

V. Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

A. Applicability

1. TMDL Basin Plan Amendment: Resolution No. R9-2008-0027

2. TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 11, 2008
State Water Board Approval Date:	June 16, 2009
Office of Administrative Law Approval Date:	September 15, 2009
U.S. EPA Approval Date:	October 26, 2009

3. TMDL Effective Date: September 15, 2009

4. Watershed Management Areas: See Table Below

5. Water Bodies: See Table Below

Table B-3: Applicability of Total Maximum Daily Loads for Indicator Bacteria Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay

Watershed Management Area	Water Body	Segment or Area	Responsible Dischargers
South Orange County	Dana Point Harbor	Baby Beach	City of Dana Point County of Orange
San Diego Bay	San Diego Bay	Shelter Island Shoreline Park	San Diego Unified Port

B. Final TMDL Compliance Requirements

Resolution No. R9-2008-0027 establishes WLAs for the discharge of indicator bacteria to Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay. The indentified point sources are limited to MS4s.

Attachment A of Resolution No. R9-2008-0027 states, “The only allowable point source identified was urban runoff discharged from MS4s, which was assigned a WLA for each watershed.” However, section (B)(1) of Attachment A further states, “The TMDLs will be implemented primarily by reissuing or revising the existing NPDES waste discharge requirements for MS4 discharges to include water quality based effluent limitations (WQBELs) that are consistent with the assumptions and requirements of the bacteria WLAs for MS4 discharges, though there may be other or new point sources. NPDES requirements should be issued, reissued, or revised as expeditiously as practicable to incorporate WQBELs derived from the TMDL WLAs.” Based on the statements made within the TMDL, although the TMDL does not establish a WLA for individual point sources, the TMDL recognizes that point sources exist and that WQBELs must be established as NPDES permit requirements.

For point sources currently regulated under NPDES requirements, the TMDL requires WQBELs that are consistent with the assumptions and requirements of the WLAs should be incorporated

into NPDES requirements. Currently the only WLAs are for MS4s, and the TMDL does not provide additional guidance on how to derive WQBELs from the TMDL WLAs. However, the TMDL does prescribe a total loading for the indicator bacteria under wet and dry conditions. In both cases, the entire available loading has been provided to municipal MS4 Dischargers, thus no remaining assimilative capacity exists for point source. Thus, the available WLA remaining for point sources is zero, and groundwater extraction discharges of indicator bacteria to the applicable receiving waters must be prohibited in section IV this Order.

VI. Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)

A. Applicability

1. TMDL Basin Plan Amendment: Resolution No. R9-2010-0001

2. TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	February 10, 2010
State Water Board Approval Date:	December 14, 2010
Office of Administrative Law Approval Date:	April 4, 2011
U.S. EPA Approval Date:	June 22, 2011

3. TMDL Effective Date: April 4, 2011

4. Watershed Management Areas: See Table Below

5. Water Bodies: See Table Below

Table B-4: Applicability of Total Maximum Daily Loads for Indicator Bacteria Project I - Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)

Watershed Management Area and Watershed	Water Body	Segment or Area
South Orange County San Joaquin Hills HAS (901.11) and Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Drive – Riviera Way
		at Heisler Park - North
		at Main Laguna Beach
		Laguna Beach at Ocean Avenue
		Laguna Beach at Cleo Street
		Arch Cove at Bluebird Canyon Road
		Laguna Beach at Dumond Drive
South Orange County Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place / Blue Lagoon Place at Aliso Beach
	Aliso Creek	Entire reach (7.2 miles) and associated tributaries: - Aliso Hills Channel - English Canyon Creek - Dairy Fork Creek - Sulfur Creek - Wood Canyon Creek
	Aliso Creek Mouth	At mouth
South Orange	Pacific Ocean Shoreline	Aliso Beach at West Street

Watershed Management Area and Watershed	Water Body	Segment or Area
County Dana Point HSA (901.14)		Aliso Beach at Table Rock Drive
		100 Steps Beach at Pacific Coast Hwy at hospital (9th Avenue)
		at Salt Creek (large outlet)
		Salt Creek Beach at Salt Creek service road
		Salt Creek Beach at Strand Road
South Orange County Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	at San Juan Creek
	San Juan Creek	lower 1 mile
	San Juan Creek Mouth	At mouth
South Orange County San Clemente HA (901.30)	Pacific Ocean Shoreline	At Poche Beach
		Ole Hanson Beach Club Beach at Pico Drain
		San Clemente City Beach at El Portal Street Stairs
		San Clemente City Beach at Mariposa Street
		San Clemente City Beach at Linda Lane
		San Clemente City Beach at South Linda Lane
		San Clemente City Beach at Lifeguard Headquarters
		Under San Clemente Municipal Pier
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)
		San Clemente State Beach at Riviera Beach
		Can Clemente State Beach at Cypress Shores
San Luis Rey River San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River mouth
Carlsbad San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach
San Dieguito River San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon mouth
Penasquitos Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)
Mission Bay Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande
		La Jolla Shores Beach at

Watershed Management Area and Watershed	Water Body	Segment or Area
		Caminito del Oro
		La Jolla Shores Beach at Vallecitos
		La Jolla Shores Beach at Avenida de la Playa
		at Casa Beach, Children's Pool
		South Casa Beach at Coast Boulevard
		Whispering Sands Beach at Ravina Street
		Windansea Beach at Vista de la Playa
		Windansea Beach at Bonair Street
		Windansea Beach at Playa del Norte
		Windansea Beach at Palomar Avenue
		at Tourmaline Surf Park
		Pacific Beach at Grand Avenue
Mission Bay Tecolote HA (906.50)	Tecolote Creek	Entire reach and tributaries
San Diego River Mission San Diego HSA (907.11) and Santee HSA (907.12)	Forrester Creek	lower 1 mile
	San Diego River	lower 6 miles
	Pacific Ocean Shoreline	at San Diego River mouth at Dog Beach
San Diego Bay Chollas HSA (908.22)	Chollas Creek	lower 1.2 miles

B. Final TMDL Compliance Requirements

Resolution No. R9-2010-0001 establishes WLAs and LAs for the discharge of indicator bacteria to twenty beaches and creeks in the San Diego Region. The TMDL identifies Phase I and Phase II MS4s, Caltrans, publically owned treatment works (and associated collection systems), and CAFOs. Section 7(h)(2)(A)(vi) of Attachment A to Resolution No. R9-2010-0001 states that unidentified point sources have not been assigned WLAs, which is equivalent to being assigned a WLA of zero, and that no discharge of bacteria are expected or allowed from unidentified point sources under the wet or dry weather TMDLs. Thus, discharges of indicator bacteria to the twenty beaches and creeks identified in the TMDL in groundwater extraction discharges are prohibited in section IV of this Order.

VII. Total Maximum Daily Load for Sedimentation in Los Penasquitos Lagoon

A. Applicability

1. TMDL Basin Plan Amendment: Resolution No. R9-2012-0033

2. TMDL Adoption and Approval Dates:

San Diego Water Board Adoption Date:	June 13, 2012
State Water Board Approval Date:	January 21, 2014
Office of Administrative Law Approval Date:	July 14, 2014
U.S. EPA Approval Date:	October 30, 2014

3. TMDL Effective Date: July14, 2014

4. Watershed Management Areas: Penasquitos

5. Water Bodies: Los Penasquitos Lagoon

B. Final TMDL Compliance Requirements

Resolution No. R9-2012-0033 establishes WLAs and LAs for the discharge of sediment to Los Penasquitos Lagoon. Resolution No. R9-2012-0033 does not establish an applicable WLA for the discharge of extracted groundwater, effectively resulting in a prohibition of sediment from extracted groundwater to Los Penasquitos Lagoon. For the purposes of this Order, the discharge of sediment to Los Penasquitos Lagoon is prohibited.

ATTACHMENT C – NOTICE OF INTENT (NOI)

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

Notice of Intent Application Package for Coverage Under
Order No. R9-2015-0013
NPDES NO. CAG919003
General Waste Discharge Requirements for
Groundwater Extraction Discharges to
Surface Waters the San Diego Region

This application package constitutes a Notice of Intent (NOI) pursuant to secton II.A of Order No, R9-2015-0013. You must provide complete factual information on each item requested below including Form 200 (completed and signed in accordance with the form instructions) and additional sheets as necessary to provide the information requested. If you have any questions on the completion of any part of the NOI application, please contact the San Diego Water Board at 2375 Northside Drive, Suite 100, San Diego, CA 92108, Phone (619) 516-1990 · Fax (619) 516-1994.

I. STIPULATION OF APPLICABILITY AND CERTIFICATION

☐ I have determined that the extracted groundwater waste discharge will be to waters of the U.S. within the San Diego Region.

☐ I have determined that this discharge is eligible for enrollment in this General "Waste Discharge Requirements" (WDR) because the discharge will comply with the Discharge Specifications of this Order.

☐ I have reviewed Order No. R9-2015-0013 and hereby certify the following:

1. I understand the requirements of Order No. R9-2015-0013;
2. The enclosed information describing the proposed groundwater extraction waste discharge is accurate and describes a discharge that meets the requirements of Order No. R9-2015-0013;
3. I will comply with all terms, conditions, and requirements of Order No. R9-2015-0013.

I certify under penalty of law that this document, Form 200, including all attachments, and supplemental information were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those directly responsible for gathering the information, the information submitted is true, accurate, and complete to the best of my knowledge and belief. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. Signature:

I. STIPULATION OF APPLICABILITY AND CERTIFICATION	
B. Printed Name:	C. Date:
D. Title and Organization:	
E. Mailing Address including email	

II. ITEMS REQUIRED FOR DETERMINING ELIGIBILITY FOR DISCHARGE COVERAGE UNDER ORDER NO. 2015-0013. ***(Include the following information as stipulated in section II.A of Order No. R9-02015-0013 as Attachments to this form) Check the appropriate box below to designate each attachment included.***

☐ A. Treatment Facility Certification Report

☐ B. Disposal Alternative Analyis. An assessment of alternatives to discharging extracted groundwater waste and why it is technically or economically infeasible to implement these alternatives.

☐ C. MS4 Operator Notification. If discharging to an MS4, provide proof of notification to the appropriate municipality or owner of the MS4.

☐ D. An initial pollutant scan pursuant to Appendix C-1 of the NOI.

☐ E. Monitoring and Reporting Program (MRP). A sampling and monitoring program as specified section III.A of the MRP.

☐ F. Project Map. A scaled appropriate project map(s).

☐ G. A completed and signed Form 200 (*Application/Report of Waste Discharge, General Information for Waste Discharge Requirements or NPDES Permit*). This form can be accessed at http://www.waterboards.ca.gov/publications_forms/forms/

III. GROUNDWATER EXTRACTION INFORMATION

A. Check the appropriate box below to describe to the nature of Groundwater Extraction Activity:

1. ☐ Subsurface Activity

   a.☐ Foundation b.☐ Tunneling c.☐ Construction d.☐ Footing

   e.☐ Trench and Ditch e.☐ Tank removal

   f.☐ Other _____

2. ☐ Remediation Project

3. ☐ Well Development

4. ☐ Other _____

B. Does this project require the applicant to apply for and obtain separate CWA section 401 certification, NPDES permit, waste discharge requirements?

1. ☐ No 2. ☐ Yes

If yes, please include a separate attachment providing details on what type of permit is required. (i.e. Construction storm water permit, CWA section 401 Certification, WDR, UST or cleanup project, etc.)

C. Designate the proposed discharge duration and discharge commencement date

1. Proposed Start Date of Groundwater Extraction Discharge: _____

2. Estimated Duration of Groundwater Extraction Discharge: _____

D. 1.☐ Describe in a separate attachment the historical use of the land within the cone/radius of influence for groundwater drawdown.

2.☐ Identify in a separate attachment all known contamination sites and groundwater contaminant plumes within one half mile of each proposed groundwater extraction point used in the project.

i. Attach a source of contamination description and a list of constituents characterizing the plume contaminants.

ii. Attach site assessment report(s) for each identified site or plume. (If available)

E. Discharge Location and Salinity of Receving Waters

Specify the location of the proposed discharge on the project map, check the appropriate box(es) below to describe the discharge location.

1. ☐ Storm Drain discharge to receving water,

2. ☐ Discharge directly into receiving water,

3. ☐ Characterize the salinity of the receiving water at the proposed groundwater extraction discharge point and provide supporting documentation in a separate attachment.

F. Pollutant Scan

2.☐ Please provide the results of the analysis of untreated groundwater to be extracted as specified in Appendix C-1 and Attachment E, section II.B of Order No. R9-2015-0013 for the proposed receiving water type.

IV. RECEIVING WATER INFORMATION (provide information on separate sheets if necessary)

A. Name receiving waterbody for each proposed discharge point: (e.g.San Diego River, Rainbow Creek, Pacific Ocean, etc.)

B. Describe the receiving water body type : (inland surface waters creek, river, bay, estuary, ocean, etc.)

Specify Hydrologic Subarea Number(s) for the point(s) of discharge to receiving waters. This information is contained in the San Diego Water Board's, *Water Quality Control Plan for the San Diego Basin* (Basin Plan) which can be accessed at http://www.waterboards.ca.gov/sandiego/water_issues/programs/basin_plan/index.shtml

C. Is the extracted groundwater discharged directly to a municipal separate storm sewer system (MS4)? 1.☐ Yes 2.☐ No

2. If "Yes", provide the name of the owner or operator of the municipal separate storm sewer system (MS4)

D. Do receiving waters flow seasonally? 1.☐ Yes 2.☐ No

E. How many discharge points are proposed? _____

Distance between multiple discharge points _____

Include the following information on the Project Map or a separate map:
Location of each Discharge Point: Example: Outfall 001 (Latitude and Longitude)

F. Provide the proposed discharge flow volume in terms of millions of gallons perday (MGD) or gallons per day (gpd):

1. Maximum Daily Discharge Flowrate: _____

2. Average Daily Flowrate: _____

3. Basis for flowrate estimates (provide on additional sheets)

G. Total Maximum Daily Loads (TMDLs) applicable to each receving water body:

1. Are any of the receving water bodies listed on the current Clean Water Act secton 303(d) list for a constituent in the proposed groundwater extracton discharge(s)? (See http://www.waterboards.ca.gov/water_issues/programs/tmdl/ for current Clean Water Act section 303(d) listing)

☐ Yes ☐ No

If "Yes" list the receving water bodies specified on the Clean Water Act secton 303(d) list and the constituent(s) causing the impairment.

2.. Do the receving water body(ies) have applicable Total Maximum Daily Loads wasteload allocations at the point of discharge as described in Attachment B of Order No. R9-2015-0013?

☐ Yes ☐ No

If yes, list the pollutants subject to an applicable TMDL wasteload allocation:

V. APPLICATION FEE

Please provide the appropriate applicable fee. The initial fee and annual fee are based upon the type of pollutants to be discharged or potentially discharged. For the current fee schedule, please visit the State Water Board's fee website at: http://www.waterboards.ca.gov/resources/fees/ or contact the San Diego Water Board.

Please make check payable to "SWRCB" and include the Project name in the "memo" field.

☐ **Category 3 Lowest Threat to Water Quality**
The discharge will not require any treatment or require minimal treatment.

☐ **Category 2 Moderate Threat to Water Quality**
The discharge will be from a well that has a contaminated site within the radius of influence.

☐ **Category 1 Highest Threat to Water Quality**
The discharge will require treatment to meet effluent limitations.

Submit the NOI, first annual fee, map, and other attachments to the following address:

San Diego Water Board
2375 Northside Drive, Suite 100
San Diego, CA 92108

Attn: Groundwater Extraction
Source Control Regulation Unit
NOTICE OF INTENT

The San Diego Water Board is implementing a Paperless Office system to reduce paper use. Please convert all submissions with attachments to a searchable Portable Document Format (PDF) and submit the documents on a compact disk.

APPENDIX C-1 to
Notice of Intent Form for
Order NO. R9-2015-0013
NPDES NO. CAG919003
General National Pollutant Discharge Elimination System Permit for Groundwater Extraction Discharges to Waters of the United States Within the San Diego Region

REASONABLE POTENTIAL ANALYSIS PROCEDURE FOR DETERMINING WHICH WATER QUALITY OBJECTIVES OR CRITERIA REQUIRE EFFLUENT LIMITATIONS

To obtain coverage under this Order, the Discharger must complete a reasonable potential analysis (RPA) as set forth below and submit the applicable portions of this form as an attachment to the Notice of Intent (NOI).

In addition to minimum technology-based effluent limitations (TBELs), the Clean Water Act in section 301(b)(1)(C) requires that National Pollutant Discharge Elimination System (NPDES) permits include any more stringent effluent limitations necessary to achieve water quality standards[1]. Permit effluent limitations implementing water quality standards are called water quality-based effluent limitations (WQBELs). NPDES permits must limit and control all pollutants that are or may be discharged at a level that will cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard including narrative criteria". The analysis that is performed to determine what pollutants require WQBELs is commonly referred to as the reasonable potential analysis.

The purpose of the following procedure is to provide direction to the Discharger for determining if a pollutant in the proposed groundwater extraction discharge causes, has the reasonable potential to cause, or contributes to an excursion above any applicable State water quality objective or federal water quality criteria in accordance with 40 CFR section 122.44 (d)(1)(iii). The Discharger will be required to comply with WQBELs for all pollutants identified as having "reasonable potential" under the terms and conditions of this Order.

Step 1 Identify Pollutants in the Groundwater

The Discharger must obtain and analyze (using appropriate sampling and laboratory methods) a representative sample(s) of the untreated groundwater that is proposed for extraction, potentially treated, and discharged under this Order.

The Discharger shall sample the groundwater for the pollutants identified in the applicable tables below in sections A, B, C, and D of this Attachment. These Tables are organized based on the receiving water type and the beneficial uses designated for the receiving water in Chapter II of the *Water Quality Control Plan For The San Diego Basin (2011)* (Basin Plan). The Basin Plan can be accessed at:

http://www.swrcb.ca.gov/sandiego/water_issues/programs/basin_plan/index.shtml

If the receiving water and the applicable beneficial uses are not identified in the Basin Plan, the applicable beneficial uses shall be the beneficial uses designated for the first downstream water body for which the receiving water is a tributary. Please contact the San Diego Water Board if assistance is needed for identifying applicable beneficial uses of the receving water.

[1] Water quality standards, as defined in Clean Water Act (CWA) section 303(c), consist of the beneficial uses of a water body and criteria (referred to as water quality objectives in California) to protect those uses and an antidegradation policy.

The Discharger shall determine the observed maximum pollutant concentrations in the groundwater based on the sample results. The analytical method(s) used must be capable of achieving a detection limit at or below the minimum levels as defined in Attachment A.2 of this Order; otherwise, a written explanation must be provided. For data reported as non-detect, or detected but not quantified (DNQ), please refer to the Ocean Plan for discharges to the Ocean or the SIP for all other discharges, regarding rules for including such data.

Step 2. Determine Total Hardness of the Freshwater Receiving Water if Discharge to Freshwater Inland Surface Waters is Proposed

Certain water quality objectives/criteria for freshwater inland receiving water bodies are hardness dependent and therefore must be adjusted for hardness levels in the receiving waters. If a discharge of extracted groundwater to freshwater inland surface receiving waters is proposed, the Discharger must obtain and analyze a representative sample(s) of the upstream receiving water for total hardness expressed as mg/L of calcium carbonate ($CaCO_3$). If multiple samples are taken, then the lowest value for total hardness must be used for determining reasonable potential.

If a representative sample cannot be obtained upstream of the proposed discharge location, the Discharger shall obtain the sample no more than 100 feet downstream of the proposed discharge location. Samples greater than 100 feet but less than 600 feet downstream may be obtained provided another discharge or site is not impacting hardness within the receiving water. If the receiving water is comprised entirely of effluent, the Discharger may analyze the effluent for hardness in lieu of the receiving water.

Step 3. Conduct the Reasonable Potential Analysis (RPA) to Determine if a Water Quality-Based Effluent Limitation (WQBEL) is Required

The Discharger shall conduct the RPA as specified in section II of the MRP in Attachment E of this Order and report the results for each constituent in the “Sample Result” column of the applicable table below in sections A, B, C, and D of this Attachment. The Discharger shall then compare the sample result for the constituent to the corresponding water quality objective/criteria trigger value for that constituent. If the sample result is greater than the trigger value, the Discharger shall indicate reasonable potential exists by entering “yes” into the “Reasonable Potential?” column. If the sample result is equal to or less than the applicable trigger value, the Discharger shall indicate reasonable potential does not exist by entering “no” into the “Reasonable Potential?” column.

The Discharger shall also identify if the proposed discharge is at a location subject to a Total Maximum Daily Load (TMDL) as described in Attachment B of this Order. If a discharge into a receiving water reach subject to a TMDL is proposed, the Discharger shall indicate presumptive reasonable potential exists by entering “presumptive-yes” into the “Reasonable Potential?” column for the pollutant subject to a TMDL.

As explained in more detail in the Fact Sheet, Attachment F of this Order, groundwater extraction discharges are considered to presumptively have reasonable potential for grease and oil, total suspended soilds, settleable solids, turbidity, and pH which are subject to TBELs. In addition, groundwater extraction discharges are considered to presumptively have a reasonable potential for chronic toxicity due to the uncertainty of toxic effects resulting from limited monitoring data, the potential for the presence of a variety of pollutants from groundwater contamination sites and plumes in close proximity proximity to the groundwater extraction site and the potential for toxic synergistic reactions of pollutants the extracted groundwater discharge.

Table A: Parameters with Presumptive Reasonable Potential for all Discharges

Parameter	Units	Sample Result	Water Quality Objective/Criteria Trigger Value	Reasonable Potential? (yes/no)
Grease and Oil	mg/L		Automatic	Presumptive - yes
Total Suspended Solids	mg/L		Automatic	Presumptive - yes
Settleable Solids	mL/L		Automatic	Presumptive - yes
Turbidity	NTU		Automatic	Presumptive - yes
Chronic Toxicity	TUc		Automatic	Presumptive - yes
pH	s.u.		Automatic	Presumptive - yes

Effluent limitation and monitoring requirements for the parameters in Table A are required regardless of the groundwater sample analysis results.

The San Diego Water Board reserves the right to re-evaluate the Discharger's RPA to incorporate additional representative data or relevant information, pursuant to the specifications in section 1.1 of the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (SIP) and the *Water Quality Control Plan for Ocean Waters of California, California Ocean Plan* (Ocean Plan).

The certification statement and statement of perjury on the NOI form are applicable to all attachments of the NOI, and are applicable to the results of the RPA reported in the tables set forth below.

A. Reasonable Potential Analysis (RPA) – Freshwater Inland Surface Waters

Freshwater criteria apply where receiving water salinities are 1 part per thousand and below and at locations where this occurs 95% or more of the time. Saltwater criteria apply at receiving water salinities of 10 parts per thousand and above and at locations where this occurs 95% of the time. Where receiving water salinities are between 1 and 10 parts per thousand the more stringent of freshwater or saltwater criteria applies. If a Discharger is not certain of the salinity for the receiving water at the point of discharge, then a salinity sample of the receiving water must be taken and reported to the San Diego Water Board, to provide data determining the appropriate water quality criteria to apply.

1. All Inland Freshwater Surface Waters.

a. For proposed discharges to inland freshwater surface waters, the Discharger shall provide effluent sample results for the parameters specified in the table below. The Discharger shall compare the sample result to the applicable water quality objective/criteria trigger value criteria as adjusted by the receiving water total hardness. If the sample result is greater than or equal to the applicable trigger value criteria, the Discharger shall indicate reasonable potential exists for that parameter by putting "yes" in the Reasonable Potential column. If the sample result is less than the applicable trigger value criteria, the Discharger may indicate reasonable potential does not exist for that parameter by putting "no" in the Reasonable Potential column.

The Discharger shall provide the upstream hardness concentration of the receiving water in the space below. If there is no flow upstream of the discharge point, the Discharger shall provide the value for effluent hardness concentration in the space below:

Total Hardness Value: _____

Table B: RPA for Discharges to Freshwater Inland Surface Waters

Parameter[1]	Units	Sample Result	Water Quality Objective/Criteria Trigger Value[3]			Reasonable Potential? (yes/no)
			Receiving Water Total Hardness (mg/L)			
			Less than 200?	Within the range of 200 – 300?	Greater than 300?	
Cadmium	µg/L		4.3	5.8	7.3	
Copper[2]	µg/L		16.9	23.9	30.5	
Lead[2]	µg/L		7.7	12.9	18.6	
Nickel	µg/L		94	132	169	
Silver	µg/L		13.4	26.9	44.1	
Zinc[2]	µg/L		216	304	388	

[1] All metals are expressed as total recoverable.
[2] Discharges to Chollas Creek have automatic reasonable potential for copper, lead, and zinc.
[3] Source of Water Quality Objectives/Criteria is described in Attachment F, Fact Sheet.

b. Chollas Creek is listed on the Clean Water Act section 303(d) list as impaired for copper, lead, and zinc. Accordingly groundwater extraction discharges to Chollas Creek are presumptively classified as having reasonable potential for copper, lead, and zinc.

Is the extracted groundwater proposed for discharge to Chollas Creek?
1.☐ Yes 2.☐ No

c. Freshwater Receiving Waters Designated MUN. For proposed discharges to freshwater receiving waters with a designated domestic and municipal supply (MUN) beneficial use, the Discharger shall provide groundwater sample results for the parameters specified in the table below.

Is the extracted groundwater proposed for discharge to a freshwater receiving waters with a designated MUN beneficial use?

1.☐ Yes 2.☐ No

If yes, continue with the RPA in this section. If no, use the RPA in section A.2 of this attachment, for freshwater receiving waters, including Buena Vista Lagoon, not designated MUN.

Receiving Waters designated as having a municipal and domestic supply (MUN) beneficial use are identified in Tables 2-2 through 2-4 in Chapter II of the Water Quality Control Plan For The San Diego Basin (2011) (Basin Plan). The Basin Plan can be accessed at:

http://www.swrcb.ca.gov/sandiego/water_issues/programs/basin_plan/index.shtml

The Discharger shall compare the sample result to the applicable water quality objective/criteria trigger value. If the sample result is greater than or equal to the applicable trigger value criteria, the Discharger shall indicate reasonable potential exists for that parameter by putting "yes" in the Reasonable Potential column. If the sample result is less than the applicable trigger value criteria, the Discharger may indicate reasonable potential does not exist for that parameter by putting "no" in the Reasonable Potential column.

Table C: RPA for Discharges to Freshwater Receiving Waters Designated MUN

Parameters	Units	Sample Result	Water Quality Objective/Criteria Trigger Value	Reasonable Potential? (yes/no)
Hydrogen Sulfide	µg/L		2.0	
Xylene	µg/L		5.0	
Chlorinated Phenolics	µg/L		1.0	
Remaining Base/Neutral Compounds[1]	µg/L		10	
Total Petroleum Hydrocarbons	mg/L		0.5	
Percent Sodium	%		60	
Total Nitrogen	mg/L		1.0	
Total Phosphorus	mg/L		0.1	
Methylene Blue Active Substances (MBAS)	mg/L		0.5	
Fluoride	mg/L		1.0	
Total Residual Chlorine[2]	µg/L		2.0	
Dissolved Oxygen	mg/L		5.0/6.0[3]	
Iron, Total Recoverable	mg/L		0.3	
Manganese, Total Recoverable	mg/L		0.05	
Total Coliform[4]	MPN/100 mL		1,000	
Fecal Coliform[4]	MPN/100 mL		200	
Dibromochloropropane	µg/L		0.2	
Ethylene Dibromide	µg/L		0.02	
Methyl-Tert-Butyl Ether (MTBE)	µg/L		5.0	
Antimony, Total Recoverable	ug/L		14	
Arsenic, Total Recoverable	ug/L		150	
Chromium (III) , Total Recoverable	ug/L		640	
Chromium (VI) , Total Recoverable	ug/L		11	
Mercury, Total Recoverable	ug/L		0.05	
Selenium, Total Recoverable	ug/L		5.0	
Thallium, Total Recoverable	ug/L		1.7	
Cyanide, Total	ug/L		5.2	

Parameters	Units	Sample Result	Water Quality Objective/Criteria Trigger Value	Reasonable Potential? (yes/no)
2,3,7,8 TCDD	ug/L		1.3E-08	
TCDD Equivalents[5]	ug/L		1.3E-08	
Acrolein	ug/L		320	
Acrylonitrile	ug/L		0.06	
Benzene	ug/L		0.56	
Bromoform	ug/L		4.3	
Carbon Tetrachloride	ug/L		0.25	
Chlorobenzene	ug/L		680	
Chlorodibromomethane	ug/L		0.40	
Dichlorobromomethane	ug/L		0.56	
1,2-Dichloroethane	ug/L		0.38	
1,1-Dichloroethylene	ug/L		0.1	
1,2-Dichloropropane	ug/L		0.52	
1,3-Dichloropropylene	ug/L		10	
Ethylbenzene	ug/L		3,100	
Methyl Bromide	ug/L		48	
Methylene Chloride	ug/L		4.7	
1,1,2,2-Tetrachloroethane	ug/L		0.17	
Tetrachloroethylene	ug/L		0.8	
Toluene	ug/L		6,800	
1,2-Trans-Dichloroethylene	ug/L		700	
1,1,2-Trichloroethane	ug/L		0.60	
Trichloroethylene	ug/L		2.7	
Vinyl Chloride	ug/L		2.0	
2-Chlorophenol	ug/L		120	
2,4-Dichlorophenol	ug/L		93	
2,4-Dimethylphenol	ug/L		540	
4,6-dinitro-o-resol	ug/L		13	
2,4-Dinitrophenol	ug/L		70	
Pentachlorophenol	ug/L		0.28	
Phenol	ug/L		21,000	
2,4,6-Trichlorophenol	ug/L		2.1	
Acenaphthene	ug/L		1,200	
Anthracene	ug/L		9,600	
Benzidine	ug/L		0.00012	
Benzo(a)Anthracene	ug/L		0.0044	
Benzo(a)Pyrene	ug/L		0.0044	
Benzo(b)Fluoranthene	ug/L		0.0044	
Benzo(k)Fluoranthene	ug/L		0.0044	
Bis(2-Chloroethyl)Ether	ug/L		0.031	
Bis(2-Chloroisopropyl)Ether	ug/L		1,400	
Bis(2-Ethylhexyl)Phthalate	ug/L		1.8	
Butylbenzyl Phthalate	ug/L		3,000	
2-Chloronaphthalene	ug/L		1,700	
Chrysene	ug/L		0.0044	
Dibenzo(a,h)Anthracene	ug/L		0.0044	
1,2-Dichlorobenzene	ug/L		2,700	
1,3-Dichlorobenzene	ug/L		400	
1,4-Dichlorobenzene	ug/L		400	
3,3 Dichlorobenzidine	ug/L		0.04	

Parameters	Units	Sample Result	Water Quality Objective/Criteria Trigger Value	Reasonable Potential? (yes/no)
Diethyl Phthalate	ug/L		23,000	
Dimethyl Phthalate	ug/L		310,000	
Di-n-Butyl Phthalate	ug/L		2,700	
2,4-Dinitrotoluene	ug/L		0.11	
1,2-Diphenylhydrazine	ug/L		0.04	
Fluoranthene	ug/L		300	
Fluorene	ug/L		1,300	
Hexachlorobenzene	ug/L		0.00075	
Hexachlorobutadiene	ug/L		0.44	
Hexachlorocyclopentadiene	ug/L		240	
Hexachloroethane	ug/L		1.9	
Indeno(1,2,3-cd)Pyrene	ug/L		0.0044	
Isophorone	ug/L		8.4	
Nitrobenzene	ug/L		17	
N-Nitrosodimethylamine	ug/L		0.0007	
N-Nitrosodi-n-Propylamine	ug/L		0.005	
N-Nitrosodiphenylamine	ug/L		5.0	
Pyrene	ug/L		960	
Aldrin	ug/L		0.00013	
alpha-BHC	ug/L		0.0039	
beta-BHC	ug/L		0.014	
gamma-BHC	ug/L		0.019	
Chlordane[6]	ug/L		0.00057	
4,4'-DDT	ug/L		0.00059	
4,4'-DDE	ug/L		0.00059	
4,4'-DDD	ug/L		0.00083	
Dieldrin	ug/L		0.00014	
alpha-Endosulfan	ug/L		0.056	
beta-Endosulfan	ug/L		0.056	
Endosulfan Sulfate	ug/L		110	
Endrin	ug/L		0.036	
Endrin Aldehyde	ug/L		0.76	
Heptachlor	ug/L		0.00021	
Heptachlor Epoxide	ug/L		0.00010	
PCBs sum[7]	ug/L		0.00017	
Toxaphene	ug/L		0.0002	

[1] As defined using Method 6410.

[2] Reasonable potential for total residual chlorine shall be “Presumptive-yes”, regardless of effluent sample results if the effluent is disinfected or otherwise chlorinated prior to discharge.

[3] Shall not be less than 5.0 at any time in waters with designated warm fresh-water habitat beneficial use or less than 6.0 in waters with cold fresh-water habitat beneficial use.

[4] Monitoring for total coliform, fecal coliform and enterococcus is only required if the groundwater extraction activity is associated with sewage collection or treatment.

[5] TCDD Equivalents shall mean the sum of the concentrations of chlorinated dibenzodioxins (2,3,7,8-CDDs) and chlorinated dibenzofurans (2,3,7,8-CDFs) multiplied by their respective toxicity factors, as shown in the table below:

Isomer Group	Toxicity Equivalence Factor
2,3,7,8-tetra CDD	1.0
2,3,7,8-penta CDD	0.5
2,3,7,8-hexa CDDs	0.1
2,3,7,8-hepta CDD	0.01

Isomer Group	Toxicity Equivalence Factor
Octa CDD	0.001
2,3,7,8- tetra CDF	0.1
1,2,3,7,8-penta CDF	0.05
2,3,4,7,8-penta CDF	0.5
2,3,7,8-hexa CDFs	0.1
2,3,7,8-hepta CDFs	0.01
Octa CDF	0.001

[6] Chordane shall mean the sum ofchlordane-alpha, chlordane-gamma, nonachlor-alpha, nonachlor-gamma, and oxychlordane.

[7] PCBs sum shall mean the sum of chlorinated biphenyls whose analytical characteristics resemble those of acoclor-1221, aroclor-1232, aroclor-1242, aroclor-1248, aroclor-1254, and aroclor-1260.

2. Freshwater Receiving Waters, including Buena Vista Lagoon, Not Designated MUN.

For discharges to freshwater receiving waters without the designated domestic and municipal supply (MUN) beneficial use, the Discharger shall provide groundwater sample results for the parameters specified in the table below. The Discharger shall compare the sample result to the applicable water quality objective/criteria trigger value. If the sample result is greater than or equal to the applicable trigger value, the Discharger shall indicate reasonable potential exists for that parameter by putting “yes” in the “Reasonable Potential?” column. If the sample result is less than the applicable trigger value criteria, the Discharger may indicate reasonable potential does not exist for that parameter by putting “no” in the Reasonable Potential column.

Table D: RPA for Discharges to Freshwater Receiving Waters, including Buena Vista Lagoon, that are Not Designated MUN

Parameter	Unit	Sample Result	Water Quality Objective/Criteria Trigger Value	Reasonable Potential? (yes/no)
Hydrogen Sulfide	µg/L		2.0	
Xylene	µg/L		5.0	
Chlorinated Phenolics	µg/L		10	
Remaining Base/Neutral Compounds[1]	µg/L		10	
Total Petroleum Hydrocarbons	mg/L		0.5	
Percent Sodium	%		60	
Total Nitrogen	mg/L		1.0	
Total Phosphorus	mg/L		0.1	
Methylene Blue Active Substances (MBAS)	mg/L		0.5	
Fluoride	mg/L		1.0	
Total Residual Chlorine[2]	µg/L		2.0	
Dissolved Oxygen	mg/L		5.0/6.0[3]	
Iron, Total Recoverable	mg/L		0.3	
Manganese, Total Recoverable	mg/L		0.05	
Total Coliform[4]	MPN/100 mL		1,000	
Fecal Coliform[4]	MPN/100 mL		200	
Dibromochloropropane	µg/L		0.2	
Ethylene Dibromide	µg/L		0.02	
Antimony, Total Recoverable	ug/L		4,300	
Arsenic, Total Recoverable	ug/L		150	
Chromium (III) , Total Recoverable	ug/L		410	

Parameter	Unit	Sample Result	Water Quality Objective/Criteria Trigger Value	Reasonable Potential? (yes/no)
Chromium (VI) , Total Recoverable	ug/L		11	
Mercury, Total Recoverable	ug/L		0.051	
Selenium, Total Recoverable	ug/L		5.0	
Thallium, Total Recoverable	ug/L		6.3	
Cyanide, Total	ug/L		5.2	
2,3,7,8 TCDD	ug/L		1.40E-08	
TCDD Equivalents[6]	ug/L		1.40E-08	
Acrolein	ug/L		780	
Acrylonitrile	ug/L		0.66	
Benzene	ug/L		71	
Bromoform	ug/L		360	
Carbon Tetrachloride	ug/L		4.4	
Chlorobenzene	ug/L		21,000	
Chlorodibromomethane	ug/L		34	
Dichlorobromomethane	ug/L		46	
1,2-Dichloroethane	ug/L		99	
1,1-Dichloroethylene	ug/L		3.2	
1,2-Dichloropropane	ug/L		39	
1,3-Dichloropropylene	ug/L		1,700	
Ethylbenzene	ug/L		29,000	
Methyl Bromide	ug/L		4,000	
Methylene Chloride	ug/L		1,600	
1,1,2,2-Tetrachloroethane	ug/L		11	
Tetrachloroethylene	ug/L		8.9	
Toluene	ug/L		200,000	
1,2-Trans-Dichloroethylene	ug/L		140,000	
1,1,2-Trichloroethane	ug/L		42	
Trichloroethylene	ug/L		81	
Vinyl Chloride	ug/L		530	
2-Chlorophenol	ug/L		400	
2,4-Dichlorophenol	ug/L		790	
2,4-Dimethylphenol	ug/L		2,300	
4,6-dinitro-o-resol (aka2-methyl-4,6-Dinitrophenol)	ug/L		765	
2,4-Dinitrophenol	ug/L		14,000	
Pentachlorophenol	ug/L		6.7	
Phenol	ug/L		4,600,000	
2,4,6-Trichlorophenol	ug/L		6.5	
Acenaphthene	ug/L		2,700	
Anthracene	ug/L		110,000	
Benzidine	ug/L		0.00054	
Benzo(a)Anthracene	ug/L		0.049	
Benzo(a)Pyrene	ug/L		0.049	
Benzo(b)Fluoranthene	ug/L		0.049	
Benzo(k)Fluoranthene	ug/L		0.049	
Bis(2-Chloroethyl)Ether	ug/L		1.4	

Parameter	Unit	Sample Result	Water Quality Objective/Criteria Trigger Value	Reasonable Potential? (yes/no)
Bis(2-Chloroisopropyl)Ether	ug/L		170,000	
Bis(2-Ethylhexyl)Phthalate	ug/L		5.9	
Butylbenzyl Phthalate	ug/L		5,200	
2-Chloronaphthalene	ug/L		4,300	
Chrysene	ug/L		0.049	
Dibenzo(a,h)Anthracene	ug/L		0.049	
1,2-Dichlorobenzene	ug/L		17,000	
1,3-Dichlorobenzene	ug/L		2,600	
1,4-Dichlorobenzene	ug/L		2,600	
3,3 Dichlorobenzidine	ug/L		0.08	
Diethyl Phthalate	ug/L		120,000	
Dimethyl Phthalate	ug/L		2,900,000	
Di-n-Butyl Phthalate	ug/L		12,000	
2,4-Dinitrotoluene	ug/L		9.1	
1,2-Diphenylhydrazine	ug/L		0.54	
Fluoranthene	ug/L		370	
Fluorene	ug/L		14,000	
Hexachlorobenzene	ug/L		0.00077	
Hexachlorobutadiene	ug/L		50	
Hexachlorocyclopentadiene	ug/L		17,000	
Hexachloroethane	ug/L		8.9	
Indeno(1,2,3-cd)Pyrene	ug/L		0.049	
Isophorone	ug/L		600	
Nitrobenzene	ug/L		1,900	
N-Nitrosodimethylamine	ug/L		8.1	
N-Nitrosodi-n-Propylamine	ug/L		1.4	
Pyrene	ug/L		11,000	
Aldrin	ug/L		0.00014	
alpha-BHC	ug/L		0.013	
beta-BHC	ug/L		0.046	
gamma-BHC	ug/L		0.063	
Chlordane[7]	ug/L		0.00059	
4,4'-DDT	ug/L		0.00059	
4,4'-DDE (linked to DDT)	ug/L		0.00059	
4,4'-DDD	ug/L		0.00084	
Dieldrin	ug/L		0.00014	
alpha-Endosulfan	ug/L		0.056	
beta-Endosulfan	ug/L		0.056	
Endosulfan Sulfate	ug/L		240	
Endrin	ug/L		0.036	
Endrin Aldehyde	ug/L		0.81	
Heptachlor	ug/L		0.0002	
Heptachlor Epoxide	ug/L		0.00011	
PCBs sum[8]	ug/L		0.00017	
Toxaphene	ug/L		0.0002	

[1] As defined using Method 6410.

[2] Reasonable potential for total residual chorine shall be "Presumptive yes", regardless of effluent sample results if the effluent is disinfected or otherwise chlorinated prior to discharge.

[3] Shall not be less than 5.0 at any time in waters with designated warm fresh-water habitat beneficial use or less than 6.0 in waters with cold fresh-water habitat beneficial use.

[4] Monitoring for total coliform, fecal coliform, and enterococcus is only required if the groundwater extraction activity is associated with sewage collection or treatment.

[6] TCDD Equivalents shall mean the sum of the concentrations of chlorinated dibenzodioxins (2,3,7,8-CDDs) and chlorinated dibenzofurans (2,3,7,8-CDFs) multiplied by their respective toxicity factors, as shown in the table below:

Isomer Group	Toxicity Equivalence Factor
2,3,7,8-tetra CDD	1.0
2,3,7,8-penta CDD	0.5
2,3,7,8-hexa CDDs	0.1
2,3,7,8-hepta CDD	0.01
Octa CDD	0.001
2,3,7,8- tetra CDF	0.1
1,2,3,7,8-penta CDF	0.05
2,3,4,7,8-penta CDF	0.5
2,3,7,8-hexa CDFs	0.1
2,3,7,8-hepta CDFs	0.01
Octa CDF	0.001

[7] Chlordane shall mean the sum of chlordane-alpha, chlordane-gamma, nonachlor-alpha, nonachlor-gamma, and oxychlordane.

[8] PCBs sum shall mean the sum of chlorinated biphenyls whose analytical characteristics resemble those of aroclor-1221, aroclor-1232, aroclor-12342, aroclor-1248, aroclor-1254, and aroclor-1260.

B. Reasonable Potential Analysis (RPA) – Saltwater Inland Surface Waters, Not Including Bays and Estuaries

Freshwater criteria apply where receiving water salinities are 1 part per thousand and below and at locations where this occurs 95% or more of the time. Saltwater criteria apply at receiving water salinities of 10 parts per thousand and above and at locations where this occurs 95% of the time. Where receiving water salinities are between 1 and 10 parts per thousand the more stringent of freshwater or saltwater criteria applies. If a Discharger is not certain of the salinity for the receiving water at the point of discharge, then a sample of the receiving water must be taken, analyzed for salinity, and reported to the San Diego Water Board with the NOI. This information is needed determine the appropriate water quality criteria to apply. When a receiving water sample is unable to be taken, then the salinity of the groundwater may be used in lieu of the receiving water salinity.

1. For discharges to saltwater inland surface receiving waters, not including bays and estuaries, the Discharger shall provide groundwater sample results for the parameters specified in the table below. The Discharger shall compare the sample result to the applicable water quality objective/criteria trigger value. If the sample result is greater than or equal to the applicable trigger value, the Discharger shall indicate reasonable potential exists for that parameter by putting "yes" in the Reasonable Potential column. If the sample result is less than the applicable trigger value, the Discharger may indicate reasonable potential does not exist for that parameter by putting "no" in the Reasonable Potential column.

Table E: RPA for Discharges to Marine Surface Waters, Not Including Bays and Estuaries

Parameters	Units	Sample Result	Water Quality Objective/Criteria Trigger Value	Reasonable Potential? (yes/no)
Hydrogen Sulfide	µg/L		2.0	
Xylene	µg/L		5.0	
Chlorinated Phenolics	µg/L		1.0	
Remaining Base/Neutral Compounds[1]	µg/L		10	
Total Petroleum Hydrocarbons	mg/L		0.5	
Percent Sodium	%		60	
Total Nitrogen	mg/L		1.0	
Total Phosphorus	mg/L		0.1	
Methylene Blue Active Substances (MBAS)	mg/L		0.5	
Fluoride	mg/L		1.0	
Total Residual Chlorine[2]	µg/L		2.0	
Dissolved Oxygen	mg/L		5.0/6.0[3]	
Iron, Total Recoverable	mg/L		0.3	
Manganese, Total Recoverable	mg/L		0.05	
Total Coliform[4]	MPN/100 mL		1,000	
Fecal Coliform[4]	MPN/100 mL		200	
Dibromochloropropane	µg/L		0.2	
Ethylene Dibromide	µg/L		0.02	
Antimony, Total Recoverable	ug/L		4,300	
Arsenic, Total Recoverable	ug/L		36	
Cadmium, Total Recoverable	ug/L		9.4	
Chromium (VI) , Total Recoverable	ug/L		50	
Copper, Total Recoverable	ug/L		3.7	
Lead, Total Recoverable	ug/L		8.5	
Mercury, Total Recoverable	ug/L		0.051	
Nickel, Total Recoverable	ug/L		8.3	
Selenium, Total Recoverable	ug/L		71	
Silver, Total Recoverable	ug/L		2.2	
Thallium, Total Recoverable	ug/L		6.3	
Zinc, Total Recoverable	ug/L		86	
Cyanide, Total	ug/L		1.0	
2,3,7,8 TCDD	ug/L		1.4E-08	
TCDD Equivalents[5]	ug/L		1.4E-08	
Acrolein	ug/L		780	
Acrylonitrile	ug/L		0.66	
Benzene	ug/L		71	
Bromoform	ug/L		360	
Carbon Tetrachloride	ug/L		4.4	
Chlorobenzene	ug/L		21,000	
Chlorodibromomethane	ug/L		34	
Dichlorobromomethane	ug/L		46	
1,2-Dichloroethane	ug/L		99	
1,1-Dichloroethylene	ug/L		3.2	
1,2-Dichloropropane	ug/L		39	
1,3-Dichloropropylene	ug/L		1,700	
Ethylbenzene	ug/L		29,000	

Parameters	Units	Sample Result	Water Quality Objective/Criteria Trigger Value	Reasonable Potential? (yes/no)
Methyl Bromide	ug/L		4,000	
Methylene Chloride	ug/L		1,600	
1,1,2,2-Tetrachloroethane	ug/L		11	
Tetrachloroethylene	ug/L		8.9	
Toluene	ug/L		200,000	
1,2-Trans-Dichloroethylene	ug/L		140,000	
1,1,2-Trichloroethane	ug/L		42	
Trichloroethylene	ug/L		81	
Vinyl Chloride	ug/L		530	
2-Chlorophenol	ug/L		400	
2,4-Dichlorophenol	ug/L		790	
2,4-Dimethylphenol	ug/L		2,300	
4,6-dinitro-o-resol (aka2-methyl-4,6-Dinitrophenol)	ug/L		770	
2,4-Dinitrophenol	ug/L		14,000	
Pentachlorophenol	ug/L		7.9	
Phenol	ug/L		4,600,000	
2,4,6-Trichlorophenol	ug/L		6.5	
Acenaphthene	ug/L		2,700	
Anthracene	ug/L		110,000	
Benzidine	ug/L		0.00054	
Benzo(a)Anthracene	ug/L		0.049	
Benzo(a)Pyrene	ug/L		0.049	
Benzo(b)Fluoranthene	ug/L		0.049	
Benzo(k)Fluoranthene	ug/L		0.049	
Bis(2-Chloroethyl)Ether	ug/L		1.4	
Bis(2-Chloroisopropyl)Ether	ug/L		170,000	
Bis(2-Ethylhexyl)Phthalate	ug/L		5.9	
Butylbenzyl Phthalate	ug/L		5,200	
2-Chloronaphthalene	ug/L		4,300	
Chrysene	ug/L		0.049	
Dibenzo(a,h)Anthracene	ug/L		0.049	
1,2-Dichlorobenzene	ug/L		17,000	
1,3-Dichlorobenzene	ug/L		2,600	
1,4-Dichlorobenzene	ug/L		2,600	
3,3 Dichlorobenzidine	ug/L		0.077	
Diethyl Phthalate	ug/L		120,000	
Dimethyl Phthalate	ug/L		2,900,000	
Di-n-Butyl Phthalate	ug/L		12,000	
2,4-Dinitrotoluene	ug/L		9.1	
1,2-Diphenylhydrazine	ug/L		0.54	
Fluoranthene	ug/L		370	
Fluorene	ug/L		14,000	
Hexachlorobenzene	ug/L		0.00077	
Hexachlorobutadiene	ug/L		50	
Hexachlorocyclopentadiene	ug/L		17,000	
Hexachloroethane	ug/L		8.9	
Indeno(1,2,3-cd)Pyrene	ug/L		0.049	
Isophorone	ug/L		600	
Nitrobenzene	ug/L		1,900	

Parameters	Units	Sample Result	Water Quality Objective/Criteria Trigger Value	Reasonable Potential? (yes/no)
N-Nitrosodimethylamine	ug/L		8.1	
N-Nitrosodi-n-Propylamine	ug/L		1.4	
N-Nitrosodiphenylamine	ug/L		16	
Pyrene	ug/L		11,000	
Aldrin	ug/L		0.00014	
alpha-BHC	ug/L		0.013	
beta-BHC	ug/L		0.046	
gamma-BHC	ug/L		0.063	
Chlordane[6]	ug/L		0.00059	
4,4'-DDT	ug/L		0.00059	
4,4'-DDE (linked to DDT)	ug/L		0.00059	
4,4'-DDD	ug/L		0.00084	
Dieldrin	ug/L		0.00014	
alpha-Endosulfan	ug/L		0.0087	
beta-Endosulfan	ug/L		0.0087	
Endosulfan Sulfate	ug/L		240	
Endrin	ug/L		0.0023	
Endrin Aldehyde	ug/L		0.81	
Heptachlor	ug/L		0.00021	
Heptachlor Epoxide	ug/L		0.00011	
PCBs sum[7]	ug/L		0.00017	
Toxaphene	ug/L		0.0002	

[1] As defined using Method 6410.

[2] Reasonable potential for total residual chorine shall be “Presumptive-yes”, regardless of effluent sample results if the effluent is disinfected or otherwise chlorinated prior to discharge.

[3] Shall not be less than 5.0 at any time in waters with designated warm fresh-water habitat beneficial use or less than 6.0 in waters with cold fresh-water habitat beneficial use.

[4] Monitoring for total coliform, fecal coliform and enterococcus is only required if the groundwater extraction activity is associated with sewage collection or treatment.

[5] TCDD Equivalents shall mean the sum of the concentrations of chlorinated dibenzodioxins (2,3,7,8-CDDs) and chlorinated dibenzofurans (2,3,7,8-CDFs) multiplied by their respective toxicity factors, as shown in the table below:

Isomer Group	Toxicity Equivalence Factor
2,3,7,8-tetra CDD	1.0
2,3,7,8-penta CDD	0.5
2,3,7,8-hexa CDDs	0.1
2,3,7,8-hepta CDD	0.01
Octa CDD	0.001
2,3,7,8- tetra CDF	0.1
1,2,3,7,8-penta CDF	0.05
2,3,4,7,8-penta CDF	0.5
2,3,7,8-hexa CDFs	0.1
2,3,7,8-hepta CDFs	0.01
Octa CDF	0.001

[6] Chlordane shall mean the sum of chlordane-alpha, chlordane-gamma, nonachlor-alpha, nonachlor-gamma, and oxychlordane.

[7] PCBs sum shall mean the sum of chlorinated biphenyls whose analytical characteristics resemble those of aroclor-1221, aroclor-1232, aroclor-12342, aroclor-1248, aroclor-1254, and aroclor-1260.

C. Reasonable Potential Analysis (RPA) - Bays and Estuaries, not including Buena Vista Lagoon

1. For discharges to bays and estuaries, not including Buena Vista Lagoon, the Discharger shall provide groundwater sample results for the parameters specified in the table below. The Discharger shall compare the sample result to the applicable water quality objective/criteria trigger value. If the sample result is greater than or equal to the applicable trigger value, the Discharger shall indicate reasonable potential exists for that parameter by putting "yes" in the Reasonable Potential column. If the sample result is less than the applicable trigger value, the Discharger may indicate reasonable potential does not exist for that parameter by putting "no" in the Reasonable Potential column.

Table F: RPA for Discharges to Bays and Estuaries, not including Buena Vista Lagoon

Parameters	Units	Sample Result	Water Quality Objective/Criteria Trigger Value	Reasonable Potential? (yes/no)
Hydrogen Sulfide	µg/L		2.0	
Xylene	µg/L		5.0	
Chlorinated Phenolics	µg/L		1.0	
Base/Neutral Compounds[1]	µg/L		10	
Total Petroleum Hydrocarbons	µg/L		500	
Total Residual Chlorine[2]	µg/L		8.0	
Ammonia, Total	µg/L		600	
Total Nitrogen[3]	mg/L		1.0	
Total Phosphorus[3]	mg/L		0.1	
Dissolved Oxygen	mg/L		5.0[4]	
Total Coliform[5]	MPN/100ml		1,000	
Fecal Coliform[5]	MPN/100ml		200	
Enterococcus[5]	MPN/100ml		35	
Methyl-tert-butyl Ether	µg/L		5.0	
Antimony, Total Recoverable	ug/L		4,300	
Arsenic, Total Recoverable	ug/L		36	
Cadmium , Total Recoverable	ug/L		9.4	
Chromium (VI), Total Recoverable	ug/L		50	
Copper, Total Recoverable	ug/L		3.7	
Lead, Total Recoverable	ug/L		8.5	
Mercury, Total Recoverable	ug/L		0.051	
Nickel, Total Recoverable	ug/L		8.3	
Selenium, Total Recoverable	ug/L		71	
Silver, Total Recoverable	ug/L		2.2	
Thallium, Total Recoverable	ug/L		6.3	
Tributyltin	µg/L		0.0014	
Zinc, Total Recoverable	ug/L		86	
Cyanide, total	ug/L		1.0	
TCDD Equivalents[6]	ug/L		3.90E-09	
Acrolein	ug/L		780	
Acrylonitrile	ug/L		0.66	
Benzene	ug/L		5.0	
Carbon Tetrachloride	ug/L		0.9	
Chlorobenzene	ug/L		21,000	
Chlorodibromomethane	ug/L		34	
Dichlorobromomethane	ug/L		46	

Parameters	Units	Sample Result	Water Quality Objective/Criteria Trigger Value	Reasonable Potential? (yes/no)
Dichloromethane	µg/L		5.0	
1,2-Dichloroethane	ug/L		28	
1,1-Dichloroethylene	ug/L		3.2	
1,2-Dichloropropane	ug/L		39	
1,3-Dichloropropylene	ug/L		1,700	
Ethylbenzene	ug/L		50	
Phenolic Compounds (non-chlorinated)	µg/L		30	
1,1,2,2-Tetrachloroethane	ug/L		2.3	
Tetrachloroethylene	ug/L		2.0	
Toluene	ug/L		5.0	
1,2-Trans-Dichloroethylene	ug/L		140,000	
1,1,1-trichloroethane	µg/L		540,000	
1,1,2-Trichloroethane	ug/L		9.4	
Trichloroethylene	ug/L		27	
Vinyl Chloride	ug/L		36	
Chlorophenol	ug/L		400	
2,4-Dichlorophenol	ug/L		790	
2,4-Dimethylphenol	ug/L		2,300	
4,6-dinitro-o-resol (aka2-methyl-4,6-Dinitrophenol)	ug/L		770	
2,4-Dinitrophenol	ug/L		14,000	
Pentachlorophenol	ug/L		7.9	
Phenol	ug/L		4,600,000	
2,4,6-Trichlorophenol	ug/L		6.5	
Acenaphthene	ug/L		2,700	
Anthracene	ug/L		110,000	
Benzidine	ug/L		0.00054	
Benzo(a)Anthracene	ug/L		0.049	
Benzo(a)Pyrene	ug/L		0.049	
Benzo(b)Fluoranthene	ug/L		0.049	
Benzo(k)Fluoranthene	ug/L		0.049	
Bis(2-Chloroethyl)Ether	ug/L		1.4	
Bis(2-Chloroisopropyl)Ether	ug/L		170,000	
Bis(2-Ethylhexyl)Phthalate	ug/L		5.9	
Butylbenzyl Phthalate	ug/L		5,200	
2-Chloronaphthalene	ug/L		4,300	
Chrysene	ug/L		0.049	
Dibenzo(a,h)Anthracene	ug/L		0.049	
1,2-Dichlorobenzene	ug/L		17,000	
1,3-Dichlorobenzene	ug/L		2,600	
1,4-Dichlorobenzene	ug/L		2,600	
3,3 Dichlorobenzidine	ug/L		0.077	
Diethyl Phthalate	ug/L		120,000	
Dimethyl Phthalate	ug/L		2,900,000	
Di-n-Butyl Phthalate	ug/L		12,000	
2,4-Dinitrotoluene	ug/L		9.1	

Parameters	Units	Sample Result	Water Quality Objective/Criteria Trigger Value	Reasonable Potential? (yes/no)
1,2-Diphenylhydrazine	ug/L		0.51	
Fluoranthene	ug/L		370	
Fluorene	ug/L		14,000	
Hexachlorobenzene	ug/L		0.00077	
Hexachlorobutadiene	ug/L		50	
Hexachlorocyclopentadiene	ug/L		17,000	
Hexachloroethane	ug/L		8.9	
Indeno(1,2,3-cd)Pyrene	ug/L		0.049	
Isophorone	ug/L		600	
Nitrobenzene	ug/L		1,900	
N-Nitrosodimethylamine	ug/L		8.1	
N-Nitrosodi-n-Propylamine	ug/L		1.4	
N-Nitrosodiphenylamine	ug/L		16	
Polynuclear Aromatic Hydrocarbons (PAHs)	µg/L		0.088	
Pyrene	ug/L		11,000	
Aldrin	ug/L		0.00014	
Chlordane[8]	ug/L		0.00059	
4,4'-DDT	ug/L		0.00059	
4,4'-DDE (linked to DDT)	ug/L		0.00059	
4,4'-DDD	ug/L		0.00084	
Dieldrin	ug/L		0.00014	
Endosulfan	ug/L		0.009	
Endrin	ug/L		0.0023	
Endrin Aldehyde	ug/L		0.81	
Halomethanes[7]	µg/L		5.0	
Heptachlor	ug/L		0.00021	
Heptachlor Epoxide	ug/L		0.00011	
Hexachlorocyclohexane (HCH)[8]	µg/L		0.004	
PCBs sum [10]	ug/L		0.00017	
Toxaphene	ug/L		0.0002	

[1] As defined using Method 6410.

[2] Reasonable potential for total residual chlorine shall be “Presumptive-yes”, regardless of effluent sample results if the effluent is disinfected or otherwise chlorinated prior to discharge.

[3] Applicable only to discharges to saline lagoons (all lagoons with the exception of Buena Vista Lagoon) and estuaries of the region.

[4] Applied as an instantaneous minimum effluent limitation.

[5] Monitoring for total coliform, fecal coliform and enterococcus is only required if the groundwater extraction activity is associated with sewage collection or treatment.

[6] TCDD equivalents shall mean the sum of the concentrations of chlorinated dibenzodioxins (2,3,7,8-CDDs) and chlorinated dibenzofurans (2,3,7,8-CDFs) multiplied by their respective toxicity factors, as shown in the table below:

Isomer Group	Toxicity Equivalence Factor
2,3,7,8-tetra CDD	1.0
2,3,7,8-penta CDD	0.5
2,3,7,8-hexa CDDs	0.1
2,3,7,8-hepta CDD	0.01
Octa CDD	0.001

Isomer Group	Toxicity Equivalence Factor
2,3,7,8- tetra CDF	0.1
1,2,3,7,8-penta CDF	0.05
2,3,4,7,8-penta CDF	0.5
2,3,7,8-hexa CDFs	0.1
2,3,7,8-hepta CDFs	0.01
Octa CDF	0.001

[7] Halomethanes shall be reported as the sum of bromoform, bromethane and chloromethane.
[8] Chlordane shall mean the sum of chlordane-alpha, chlordane-gamma, nonachlor-alpha, nonachlor-gamma, and oxychlordane.
[9] Hexachlorocyclohexane shall be reported as the sum of the alpha, beta, gamma, and delta isomers of hexachlorocyclohexane.
[10] PCBs sum shall mean the sum of chlorinated biphenyls whose analytical characteristics resemble those of aroclor-1221, aroclor-1232, aroclor-12342, aroclor-1248, aroclor-1254, and aroclor-1260.

D. Reasonable Potential Analysis (RPA) – Surf Zone of the Pacific Ocean

1. For discharges to the surf zone of the Pacific Ocean shall provide groundwater sample results for the parameters specified in the table below. The Discharger shall compare the sample result to the applicable water quality objective/criteria trigger value. The sample result is greater than or equal to the applicable trigger value, the Discharger shall indicate reasonable potential exists for that parameter by putting “yes” in the Reasonable Potential column. If the sample result is less than the applicable trigger value criteria, the Discharger may indicate reasonable potential does not exist for that parameter by putting “no” in the Reasonable Potential column.

Table G: RPA for Discharges to the Surf Zone of the Pacific Ocean

Parameter	Units	Sample Result	Water Quality Objective/Criteria Trigger Value	Reasonable Potential? (yes/no)
Dissolved Oxygen	mg/L		5.0	
Total Coliform[1]	MPN/100mL		1,000/70[2]	
Fecal Coliform[1]	MPN/100mL		200	
Enterococcus[1]	MPN/100mL		35	
Arsenic, Total Recoverable	ug/l		23	
Cadmium, Total Recoverable	ug/l		4.0	
Chromium VI, Total Recoverable	ug/l		8.0	
Copper, Total Recoverable	ug/l		6.0	
Lead, Total Recoverable	ug/l		8.0	
Mercury, Total Recoverable	ug/l		0.16	
Nickel, Total Recoverable	ug/l		20	
Selenium, Total Recoverable	ug/l		60	
Silver, Total Recoverable	ug/l		2.3	
Zinc, Total Recoverable	ug/l		56	
Cyanide, Total	ug/l		4.0	
Total Chlorine Residual[3]	ug/l		8.0	
Ammonia (expressed as nitrogen)	ug/l		2,400	
Phenolic Compounds (non-chlorinated)	ug/l		120	
Chlorinated Phenolics	ug/l		4.0	
Endosulfan	ug/l		0.036	
Endrin	ug/l		0.008	

Parameter	Units	Sample Result	Water Quality Objective/Criteria Trigger Value	Reasonable Potential? (yes/no)
HCH[4]	ug/l		0.016	
Acrolein	ug/l		880	
Antimony	ug/l		4,800	
Bis(2-chloroethoxy) Methane	ug/l		17.6	
Bis(2-chloroisopropyl) ether	ug/l		4,800	
Chlorobenzene	ug/l		2,300	
Chromium (III)	ug/l		760,000	
Di-n-butyl Phthalate	ug/l		14,000	
Dichlorobenzenes	ug/l		20,000	
Diethyl Phthalate	ug/l		130,000	
Dimethyl Phthalate	ug/l		3,300,000	
4,6-dinitro-2-methylphenol	ug/l		880	
2,4-dinitrophenol	ug/l		16	
Ethylbenzene	ug/l		16,000	
Fluoranthene	ug/l		60	
Hexachlorocyclopentadiene	ug/l		230	
Nitrobenzene	ug/l		20	
Thallium	ug/l		8.0	
Toluene	ug/l		340,000	
Total Petroleum Hydrocarbons	µg/L		500	
Tributyltin	ug/l		0.0056	
1,1,1-trichloroethane	ug/l		2,200,000	
Xylene	µg/		5.0	
Acrylonitrile	ug/l		0.4	
Aldrin	ug/l		0.000088	
Benzene	ug/l		24	
Benzidine	ug/l		0.00028	
Beryllium	ug/l		0.13	
Bis(2-chloroethyl) Ether	ug/l		0.18	
Bis(2-ethlyhexyl) Phthalate	ug/l		14	
Carbon Tetrachloride	ug/l		3.6	
Chlordane[5]	ug/l		0.000092	
Chlorodibromethane	ug/l		34	
Chloroform	ug/l		520	
DDT[6]	ug/l		0.00068	
1,4-dichlorobenzene	ug/l		72	
3,3'-dichlorobenzidine	ug/l		0.0324	
1,2-dichloroethane	ug/l		110	
1,1-dichloroethylene	ug/l		3.6	
Dichlorobromomethane	ug/l		25	
Dichloromethane	ug/l		1,800	
1,3-dichloropropene	ug/l		36	
Dieldrin	ug/l		0.00016	
2,4-dinitrotoluene	ug/l		10	
1,2-diphenylhydrazine	ug/l		0.64	
Halomethanes[7]	ug/l		520	

Parameter	Units	Sample Result	Water Quality Objective/Criteria Trigger Value	Reasonable Potential? (yes/no)
Heptachlor	ug/l		0.0002	
Heptachlor Epoxide	ug/l		0.00008	
Hexachlorobenzene	ug/l		0.00084	
Hexachlorobutadiene	ug/l		56	
Hexachloroethane	ug/l		10	
Isophorone	ug/l		2,900	
N-nitrosodimethylamine	ug/l		29	
N-nitrosodi-N-propylamine	ug/l		1.5	
N-nitrosodiphenylamine	ug/l		10	
PAHs[8]	ug/l		0.035	
PCBs[9]	ug/l		0.000076	
TCDD equivalents[10]	ug/l		1.6E-08	
1,1,2,2-tetrachloroethane	ug/l		9.2	
Tetrachloroethylene	ug/l		8.0	
Toxaphene	ug/l		0.00084	
Trichloroethylene	ug/l		110	
1,1,2-trichloroethane	ug/l		38	
2,4,6-trichlorophenol	ug/l		1.2	
Vinyl Chloride	ug/l		140	

[1] Only required if the groundwater extraction is related to sewage collection or treatment.
[2] For receiving waters with a beneficial use of SHELL, the applicable water quality objective is 70 MPN/100mL.
[3] Reasonable potential for total residual chlorine shall be “Presumptive-yes”, regardless of effluent sample results if the effluent is disinfected or otherwise chlorinated prior to discharge.
[4] HCH shall mean the sum of the alpha, beta, gamma, and delta isomers of hexachlorocyclohexane.
[5] Chlordane shall mean the sum of chlordane-alpha, chlordane-gamma, nonachlor-alpha, nonachlor-gamma, and oxychlordane.
[6] DDT shall mean the sum of 4,4-DDT; 2,4-DDT; 4,4-DDE; 2,4-DDE; 4,4-DDD; and 2,4-DDD.
[7] Halomethanes shall mean the sum of bromoform, bromomethane, and chloromethane.
[8] PAHs shall mean the sum of acenaphthylene, anthracene, 1,2-benzanthracene, 3,4-benzofluoranthene, benzo[k]fluoranthene, 1,12-benzoperylene, benzo[a]pyrene, chrysene, dibenzo[ah]anthracene, fluorene, indeno[1,2,3-cd]pyrene, phenanthrene and pyrene.
[9] PCBs shall mean the sum of chlorinated biphenyls whose analytical characteristics resemble those of aroclor-1221, aroclor-1232, aroclor-1242, aroclor-1248, aroclor-1254, and aroclor-1260.
[10] TCDD equivalents shall mean the sum of the concentrations of chlorinated dibenzodioxins (2,3,7,8-CDDs) and chlorinated dibenzofurans (2,3,7,8-CDFs) multiplied by their respective toxicity factors, as shown in the table below:

Isomer Group	Toxicity Equivalence Factor
2,3,7,8-tetra CDD	1.0
2,3,7,8-penta CDD	0.5
2,3,7,8-hexa CDDs	0.1
2,3,7,8-hepta CDD	0.01
Octa CDD	0.001
2,3,7,8- tetra CDF	0.1
1,2,3,7,8-penta CDF	0.05
2,3,4,7,8-penta CDF	0.5
2,3,7,8-hexa CDFs	0.1
2,3,7,8-hepta CDFs	0.01
Octa CDF	0.001

ATTACHMENT D – STANDARD PROVISIONS

I. STANDARD PROVISIONS – PERMIT COMPLIANCE

A. Duty to Comply

1. The Discharger must comply with all of the conditions of this Order. Any noncompliance constitutes a violation of the Clean Water Act (CWA) and the California Water Code (CWC) and is grounds for enforcement action, for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application. (40 CFR section 122.41(a).)

2. The Discharger shall comply with effluent standards or prohibitions established under section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions, even if this Order has not yet been modified to incorporate the requirement. (40 CFR section 122.41(a)(1).)

B. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for a Discharger in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this Order. (40 CFR section 122.41(c).)

C. Duty to Mitigate

The Discharger shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this Order that has a reasonable likelihood of adversely affecting human health or the environment. (40 CFR section 122.41(d).)

D. Proper Operation and Maintenance

The Discharger shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Discharger to achieve compliance with the conditions of this Order. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems that are installed by a Discharger only when necessary to achieve compliance with the conditions of this Order. (40 CFR section 122.41(e).)

E. Property Rights

1. This Order does not convey any property rights of any sort or any exclusive privileges. (40 CFR section 122.41(g).)

2. The issuance of this Order does not authorize any injury to persons or property or invasion of other private rights, or any infringement of state or local law or regulations. (40 CFR section 122.5(c).)

F. Inspection and Entry

The Discharger shall allow the San Diego Water Board, State Water Board, U.S. EPA, and/or their authorized representatives (including an authorized contractor acting as their representative), upon the presentation of credentials and other documents, as may be required by law, to (40 CFR section 122.41(i); Wat. Code, section 13383):

1. Enter upon the Discharger's premises where a regulated facility or activity is located or conducted, or where records are kept under the conditions of this Order (40 CFR section 122.41(i)(1));

2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this Order (40 CFR section 122.41(i)(2));

3. Inspect and photograph, at reasonable times, any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Order (40 CFR section 122.41(i)(3)); and

4. Sample or monitor, at reasonable times, for the purposes of assuring Order compliance or as otherwise authorized by the CWA or the CWC, any substances or parameters at any location. (40 CFR section 122.41(i)(4).)

G. Bypass

1. Definitions

a. "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. (40 CFR section 122.41(m)(1)(i).)

b. "Severe property damage" means substantial physical damage to property, damage to the treatment facilities, which causes them to become inoperable, or substantial and permanent loss of natural resources that can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production. (40 CFR section 122.41(m)(1)(ii).)

2. Bypass not exceeding limitations. The Discharger may allow any bypass to occur which does not cause exceedances of effluent limitations, but only if it is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions listed in Standard Provisions – Permit Compliance I.G.3, I.G.4, and I.G.5 below. (40 CFR section 122.41(m)(2).)

3. Prohibition of bypass. Bypass is prohibited, and the San Diego Water Board may take enforcement action against a Discharger for bypass, unless (40 CFR section 122.41(m)(4)(i)):

a. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage (40 CFR section 122.41(m)(4)(i)(A));

b. There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering

judgment to prevent a bypass that occurred during normal periods of equipment downtime or preventive maintenance (40 CFR section 122.41(m)(4)(i)(B)); and

c. The Discharger submitted notice to the San Diego Water Board as required under Standard Provisions – Permit Compliance I.G.5 below. (40 CFR section 122.41(m)(4)(i)(C).)

4. The San Diego Water Board may approve an anticipated bypass, after considering its adverse effects, if the San Diego Water Board determines that it will meet the three conditions listed in Standard Provisions – Permit Compliance I.G.3 above. (40 CFR section 122.41(m)(4)(ii).)

5. Notice

a. Anticipated bypass. If the Discharger knows in advance of the need for a bypass, it shall submit a notice, if possible at least 10 days before the date of the bypass. (40 CFR section 122.41(m)(3)(i).)

b. Unanticipated bypass. The Discharger shall submit notice of an unanticipated bypass as required in Standard Provisions - Reporting V.E below (24-hour notice). (40 CFR section 122.41(m)(3)(ii).)

H. Upset

Upset means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Discharger. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. (40 CFR section 122.41(n)(1).)

1. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of Standard Provisions – Permit Compliance I.H.2 below are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. (40 CFR section 122.41(n)(2).)

2. Conditions necessary for a demonstration of upset. A Discharger who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs or other relevant evidence that (40 CFR section 122.41(n)(3)):

a. An upset occurred and that the Discharger can identify the cause(s) of the upset (40 CFR section 122.41(n)(3)(i));

b. The permitted facility was, at the time, being properly operated (40 CFR section 122.41(n)(3)(ii));

c. The Discharger submitted notice of the upset as required in Standard Provisions – Reporting V.E.2.b below (24-hour notice) (40 CFR section 122.41(n)(3)(iii)); and

d. The Discharger complied with any remedial measures required under Standard Provisions – Permit Compliance I.C above. (40 CFR section 122.41(n)(3)(iv).)

3. Burden of proof. In any enforcement proceeding, the Discharger seeking to establish the occurrence of an upset has the burden of proof. (40 CFR section 122.41(n)(4).)

II. STANDARD PROVISIONS – PERMIT ACTION

A. General

This Order may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Discharger for modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any Order condition as to that Discharger. (40 CFR section 122.41(f).)

B. Duty to Reapply

If the Discharger wishes to continue an activity regulated by this Order after the expiration date of this Order, the Discharger must apply for and obtain coverage under the new reissued permit in accordance with procedures therein, and must comply with all conditions of the new permit. (40 CFR section 122.41(a) & (b))

C. Transfers

The NOA to discharge under this Order is not transferable to any person. The San Diego Water Board requires revocation and reissuance of the NOA to change the name of the Discharger and incorporate such other requirements as may be necessary under the CWA and the CWC. (40 CFR section 122.41(l)(3); section 122.61.)

III. STANDARD PROVISIONS – MONITORING

A. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. (40 CFR section 122.41(j)(1).)

B. Monitoring results must be conducted according to test procedures under 40 CFR part 136 or, in the case of sludge use or disposal, approved under 40 CFR part 136 unless otherwise specified in 40 CFR part 503 unless other test procedures have been specified in this Order. (40 CFR section 122.41(j)(4); section 122.44(i)(1)(iv).)

IV. STANDARD PROVISIONS – RECORDS

A. Except for records of monitoring information required by this Order related to the Discharger's sewage sludge use and disposal activities, which shall be retained for a period of at least five years (or longer as required by 40 CFR part 503), the Discharger shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this Order, and records of all data used to complete the application for this Order, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board Executive Officer at any time. (40 CFR section 122.41(j)(2).)

B. Records of monitoring information shall include:

1. The date, exact place, and time of sampling or measurements (40 CFR section 122.41(j)(3)(i));

2. The individual(s) who performed the sampling or measurements (40 CFR section 122.41(j)(3)(ii));

3. The date(s) analyses were performed (40 CFR section 122.41(j)(3)(iii));

4. The individual(s) who performed the analyses (40 CFR section 122.41(j)(3)(iv));

5. The analytical techniques or methods used (40 CFR section 122.41(j)(3)(v)); and

6. The results of such analyses. (40 CFR section 122.41(j)(3)(vi).)

C. Claims of confidentiality for the following information will be denied (40 CFR section 122.7(b)):

1. The name and address of any permit applicant or Discharger (40 CFR section 122.7(b)(1)); and

2. Permit applications and attachments, permits and effluent data. (40 CFR section 122.7(b)(2).)

V. STANDARD PROVISIONS – REPORTING

A. Duty to Provide Information

The Discharger shall furnish to the San Diego Water Board, State Water Board, or U.S. EPA within a reasonable time, any information which the San Diego Water Board, State Water Board, or U.S. EPA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this Order or to determine compliance with this Order. Upon request, the Discharger shall also furnish to the San Diego Water Board, State Water Board, or U.S. EPA copies of records required to be kept by this Order. (40 CFR section 122.41(h); CWC section 13267.)

B. Signatory and Certification Requirements

1. All applications, reports, or information submitted to the San Diego Water Board, State Water Board, and/or U.S. EPA shall be signed and certified in accordance with Standard Provisions – Reporting V.B.2, V.B.3, V.B.4, and V.B.5 below. (40 CFR section 122.41(k).)

2. All permit applications shall be signed as follows:

a. For a corporation: All permit applications shall be signed by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means: (i) A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive

measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures. (40 CFR section 122.22(a)(1).)

b. For a partnership or sole proprietorship: All permit applications shall be signed by a general partner or the proprietor, respectively. (40 CFR section 122.22(a)(2).)

c. For a municipality, state, federal, or other public agency: All permit applications shall be signed by either a principal executive officer or ranking elected official. For purposes of this provision, a principal executive officer of a federal agency includes: (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrators of U.S. EPA). (40 CFR section 122.22(a)(3).).

3. All reports required by this Order and other information requested by the San Diego Water Board, State Water Board, or U.S. EPA shall be signed by a person described in Standard Provisions – Reporting V.B.2 above, or by a duly authorized representative of that person. A person is a duly authorized representative only if:

a. The authorization is made in writing by a person described in Standard Provisions – Reporting V.B.2 above (40 CFR section 122.22(b)(1));

b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) (40 CFR section 122.22(b)(2)); and

c. The written authorization is submitted to the San Diego Water Board and State Water Board. (40 CFR section 122.22(b)(3).)

4. If an authorization under Standard Provisions – Reporting V.B.3 above is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of Standard Provisions – Reporting V.B.3 above must be submitted to the San Diego Water Board and State Water Board prior to or together with any reports, information, or applications, to be signed by an authorized representative. (40 CFR section 122.22(c).)

5. Any person signing a document under Standard Provisions – Reporting V.B.2 or V.B.3 above shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for

submitting false information, including the possibility of fine and imprisonment for knowing violations." (40 CFR section 122.22(d).)

C. Monitoring Reports

1. Monitoring results shall be reported at the intervals specified in the Monitoring and Reporting Program (Attachment E) in this Order. (40 CFR section 122.41(l)(4).)

2. Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the San Diego Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices. (40 CFR section 122.41(l)(4)(i).)

3. If the Discharger monitors any pollutant more frequently than required by this Order using test procedures approved under 40 CFR part 136, or another method required for an industry-specific waste stream under 40 CFR subchapters N or O, the results of such monitoring shall be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the San Diego Water Board. (40 CFR section 122.41(l)(4)(ii).)

4. Calculations for all limitations, which require averaging of measurements, shall utilize an arithmetic mean unless otherwise specified in this Order. (40 CFR section 122.41(l)(4)(iii).)

D. Compliance Schedules

Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this Order, shall be submitted no later than 14 days following each schedule date. (40 CFR section 122.41(l)(5).)

E. Twenty-Four Hour Reporting

1. The Discharger shall report any noncompliance that may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the Discharger becomes aware of the circumstances. A written submission shall also be provided within five (5) days of the time the Discharger becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. (40 CFR section 122.41(l)(6)(i).)

2. The following shall be included as information that must be reported within 24 hours under this paragraph (40 CFR section 122.41(l)(6)(ii)):

    a. Any unanticipated bypass that exceeds any effluent limitation in this Order. (40 CFR section 122.41(l)(6)(ii)(A).)

    b. Any upset that exceeds any effluent limitation in this Order. (40 CFR section 122.41(l)(6)(ii)(B).)

3. The San Diego Water Board may waive the above-required written report under this provision on a case-by-case basis if an oral report has been received within 24 hours. (40 CFR section 122.41(l)(6)(iii).)

F. Planned Changes

The Discharger shall give notice to the San Diego Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required under this provision only when (40 CFR section 122.41(l)(1)):

1. The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in section 122.29(b) (40 CFR section 122.41(l)(1)(i)); or

2. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants that are not subject to effluent limitations in this Order. (40 CFR section 122.41(l)(1)(ii).)

3. The alteration or addition results in a significant change in the Discharger's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. (40 CFRsection 122.41(l)(1)(iii).)

G. Anticipated Noncompliance

The Discharger shall give advance notice to the San Diego Water Board or State Water Board of any planned changes in the permitted facility or activity that may result in noncompliance with this Order's requirements. (40 CFR section 122.41(l)(2).)

H. Other Noncompliance

The Discharger shall report all instances of noncompliance not reported under Standard Provisions – Reporting V.C, V.D, and V.E above at the time monitoring reports are submitted. The reports shall contain the information listed in Standard Provision – Reporting V.E above. (40 CFR section 122.41(l)(7).)

I. Other Information

When the Discharger becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the San Diego Water Board**,** State Water Board, or U.S. EPA, the Discharger shall promptly submit such facts or information. (40 CFR section 122.41(l)(8).)

VI. STANDARD PROVISIONS – ENFORCEMENT

A. The San Diego Water Board is authorized to enforce the terms of this permit and individual Notices of Applicability under several provisions of the CWC, including, but not limited to, sections 13385, 13386, and 13387.

VII. ADDITIONAL PROVISIONS – NOTIFICATION LEVELS

A. Non-Municipal Facilities

Existing manufacturing, commercial, mining, and silvicultural Dischargers shall notify the San Diego Water Board as soon as they know or have reason to believe (40 CFR section 122.42(a)):

1. That any activity has occurred or will occur that would result in the discharge, on a routine or frequent basis, of any toxic pollutant that is not limited in this Order, if that discharge will exceed the highest of the following "notification levels" (40 CFR section 122.42(a)(1)):

a. 100 micrograms per liter (µg/L) (40 CFR section 122.42(a)(1)(i));

b. 200 µg/L for acrolein and acrylonitrile; 500 µg/L for 2,4-dinitrophenol and 2-methyl-4,6-dinitrophenol; and 1 milligram per liter (mg/L) for antimony (40 CFR section 122.42(a)(1)(ii));

c. Five (5) times the maximum concentration value reported for that pollutant in the Report of Waste Discharge (40 CFR section 122.42(a)(1)(iii)); or

d. The level established by the San Diego Water Board in accordance with section 122.44(f). (40 CFR section 122.42(a)(1)(iv).)

2. That any activity has occurred or will occur that would result in the discharge, on a non-routine or infrequent basis, of any toxic pollutant that is not limited in this Order, if that discharge will exceed the highest of the following “notification levels" (40 CFR section 122.42(a)(2)):

a. 500 micrograms per liter (µg/L) (40 CFR section 122.42(a)(2)(i));

b. 1 milligram per liter (mg/L) for antimony (40 CFR section 122.42(a)(2)(ii));

c. Ten (10) times the maximum concentration value reported for that pollutant in the Report of Waste Discharge (40 CFR section 122.42(a)(2)(iii)); or

d. The level established by the San Diego Water Board in accordance with section 122.44(f). (40 CFR section 122.42(a)(2)(iv).)

ATTACHMENT E – MONITORING AND REPORTING PROGRAM

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ATTACHMENT E – MONITORING AND REPORTING PROGRAM (MRP)

Section 308 of the federal Clean Water Act (CWA) and the Code of Federal Regulations (40 CFR section 122.48) requires that all NPDES permits specify monitoring and reporting requirements. CWC sections 13267 and 13383 also authorize the San Diego Water Board to establish monitoring, reporting, and recordkeeping requirements. Pursuant to this authority this Monitoring and Reporting Program (MRP) establishes conditions for the Discharger to conduct routine or episodic self-monitoring of the discharges regulated under this Order at specified monitoring locations. The MRP requires the Discharger to report the results to the San Diego Water Board with the information necessary to evaluate discharge characteristics and compliance status.

The purpose of the MRP is to determine and ensure compliance with effluent limitations and other requirements established in this Order, assess treatment efficiency, characterize effluents, and characterize the receiving water and the effects of the discharge on the receiving water. The MRP also specifies requirements concerning the proper use, maintenance, and installation of monitoring equipment and methods, and the monitoring type intervals and frequency necessary to yield data that are representative of the activities and discharges regulated under this Order.

Each monitoring section contains an introductory paragraph summarizing why the monitoring is needed and the key management questions the monitoring is designed to answer. In developing the list of key management questions the San Diego Water Board considered four basic types of information for each question:

- Management Information Need – Why does the San Diego Water Board need to know the answer?
- Monitoring Criteria – What monitoring will be conducted for deriving an answer to the question?
- Expected Product – How should the answer be expressed and reported?
- Possible Management Actions – What actions will be potentially influenced by the answer?

I. GENERAL MONITORING PROVISIONS

A. Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge. All samples effluent shall be taken at the monitoring locations identified in the representative sampling and analysis program and, unless otherwise specified, before the monitored flow joins or is diluted by any other waste stream, body of water, or substance. Monitoring locations shall not be changed without notification to and the approval of the San Diego Water Board.

B. Monitoring must be conducted according to United States Environmental Protection Agency (U.S. EPA) test procedures approved at 40 CFR part 136, *Guidelines Establishing Test Procedures for the Analysis of Pollutants under the Clean Water Act (CWA)* as amended, unless other test procedures are specified in this Order and attachments thereof or the Notice of Applicability (NOA) issued by the San Diego Water Board. Alternative test procedures not specified in this Order may also be subject to U.S. EPA approval.

C. A copy of the monitoring and reports signed, and certified as required by Attachment D, Standard Provisions V.B, of this Order, shall be submitted to the San Diego Water Board at the address listed in section VI.B.5.c of this MRP.

At any time during the term of this Order, the State or San Diego Water Board may notify the Discharger to electronically submit Self-Monitoring Reports (SMRs) using the State Water Board's California Integrated Water Quality System (CIWQS) Program web site

(http://www.waterboards.ca.gov/water_issues/programs/ciwqs/)Until such notification is given, the Discharger shall submit hard copy SMRs to the San Diego Water Board. The CIWQS web site will provide additional directions for SMR submittal in the event there will be service interruption for electronic submittal.

The San Diego Water Board is implementing a Paperless Office system to reduce paper use, increase efficiency, and provide a more effective way for Board staff, the public and interested parties to view water quality documents in electronic form. Please convert all regulatory documents, submissions, materials, and correspondence that would normally be submitted as hard copies to a searchable Portable Document Format (PDF). Data may be submitted in Excel spreadsheets. Documents that are less than 50 MB should be emailed to SanDiego@waterboards.ca.gov. Documents that are 50MB or larger should be transferred to a disk and mailed to the San Diego Water Board's street address.

D. The Discharger shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring, instrumentation, copies of all reports required by this Order and this MRP, and records of all data used to complete the application for this Order. Records shall be maintained for a minimum of five years from the date of sample, measurement, report, or application. This period may be extended by request of this San Diego Water Board or by the U.S. EPA at any time.

E. All analyses shall be performed in a laboratory certified to perform such analyses by the State Water Resources Control Board, Division of Drinking Water, in accordance with the provision of CWC section 13176 or by a laboratory approved by the San Diego Water Board. The laboratory must be accredited under the Environmental Laboratory Accreditation program (ELAP) to ensure the quality of analytical data used for regulatory purposes to meet the requirements of this Order. Additional information on ELAP can be accessed at: http://www.waterboards.ca.gov/drinking_water/certlic/labs/index.shtml.

F. The Discharger shall report in its cover letter all instances of noncompliance including those already reported under Attachment D, section V.H of this Order at the time monitoring reports are submitted. The reports shall contain the information listed in Attachment D, section V.E of this Order.

G. Records of monitoring information shall include information required under Attachment D, Standard Provisions, sections IV and V, of this Order.

H. All monitoring instruments and devices used by the Discharger to fulfill the prescribed monitoring program shall be properly maintained and calibrated as necessary to ensure their continued accuracy. All flow measurement devices shall be calibrated at least once per year to ensure continued accuracy of the devices.

I. Monitoring results shall be reported at intervals and in a manner specified in this Order, this MRP and the NOA.

II. EFFLUENT MONITORING REQUIREMENTS

Effluent monitoring is the collection and analysis of samples or measurements of effluents, after all treatment processes, to determine and quantify contaminants and to demonstrate compliance with applicable effluent limitations, standards, and other requirements of this Order.

Effluent monitoring is necessary to address the following questions:

- Does the effluent comply with permit effluent limitations, and other requirements of this Order, thereby ensuring that water quality standards are achieved in the receiving water?
- What is the mass of constituents that are discharged daily, monthly and annually?
- Is the effluent concentration or mass changing over time?
- Are all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Discharger to achieve compliance with the conditions of this Order being well operated and maintained?

A. Effluent Sampling and Analysis Program

1. Dischargers who are enrolling under this Order shall prepare and submit a sampling and analysis program as an attachment to the NOI as discussed in Attachment C of this Order. The sampling and analysis program shall identify applicable monitoring locations for each discharge location, and provide the supporting rationale for choosing those locations. The sampling and analysis program shall specify (1) monitoring for all pollutants for which effluent limitations are anticipated as indicated in section II.B of this MRP and Attachment C of this Order; (2) analytical methods consistent with the requirements of 40 CFR section 136.3, and minimum levels consistent with the requirements of the SIP and Ocean Plan; and (3) monitoring frequencies consistent with the frequencies specified in section III.B of this MRP.
2. The San Diego Water Board may specify increased monitoring requirements on a case-by-case basis in the NOA as necessary to ensure that applicable water quality objectives are maintained in the receiving water.
3. The Discharger shall calculate and report the mass emission rate (MER) of the constituent for each sample taken. The MER shall be calculated in accordance with the effluent limitations specified in section V of this Order.

B. Effluent Monitoring Parameters

Those monitoring parameters, specified below, that were identified as having reasonable potential or otherwise labeled as “Presumptive-Yes” under the procedures in Appendix C-1 of this Order, shall be incorporated into the sampling and analysis program submitted with the NOI.

Unless otherwise approved by the San Diego Water Board, effluent monitoring samples shall be collected as grab samples.

1. Freshwater Inland Surface Waters

a. All Freshwater Inland Surface Waters, including Buena Vista Lagoon.

For discharges to freshwater inland surface waters, the Discharger shall monitor effluent for those monitoring parameters specified in Table E-1 below that were identified as having reasonable potential or otherwise labeled as “Presumptive-Yes” under the procedures in Appendix C-1 of this Order. Freshwater criteria apply where receiving water salinities are 1 part per thousand and below and at locations where this occurs 95% or more of the time. Saltwater criteria apply at receiving water salinities of 10 parts per thousand and above and at locations where this occurs 95% of the time.

Table E-1. Effluent Monitoring for Hardness Dependent Metals

Parameter	Units	Monitoring Frequency Based on Average Monthly Flowrate	
		≥100,000 gpd	<100,000 gpd
Cadmium, Total Recoverable[1]	µg/L	1/Month	1/Quarter
Copper, Total Recoverable [1]	µg/L	1/Month	1/Quarter
Lead, Total Recoverable [1]	µg/L	1/Month	1/Quarter
Nickel, Total Recoverable[1]	µg/L	1/Month	1/Quarter
Silver, Total Recoverable[1]	µg/L	1/Month	1/Quarter
Zinc, Total Recoverable [1]	µg/L	1/Month	1/Quarter

[1] Receiving water shall be monitored for hardness in accordance with section III.A.2 of this MRP.

b. **Freshwater Inland Surface Receiving Waters designated MUN.** For discharges to freshwater inland receiving waters, with a designated domestic and municipal supply (MUN) beneficial use, the Discharger shall monitor effluent for those monitoring parameters specified in Table E-2 below that were identified as having reasonable potential or otherwise labeled as "Presumptive-Yes" under the procedures in Appendix C-1 of this Order.

Table E-2. Effluent Monitoring for Discharges to Freshwater Receiving Waters (MUN)

Parameters	Units	Monitoring Frequency Based on Average Monthly Flowrate	
		≥100,000 gpd	<100,000 gpd
Flow	MGD	1/Day	1/Month
Settleable Solids	ml/L	1/Month	1/Month
Total Suspended Solids	mg/L	1/Month	1/Month
Turbidity	NTU	1/Month	1/Month
Chronic Toxicity[1]	Pass/Fail	1/Quarter	1/6-Months
pH	s.u.	1/Month	1/Month
Hydrogen Sulfide	µg/L	1/Quarter	1/Quarter
Xylene	µg/L	1/Month[2]	1/Quarter
Chlorinated Phenolics	µg/L	1/Month[2]	1/Quarter
Remaining Base/Neutral Compounds[3]	µg/L	1/Month[2]	1/Quarter
Total Petroleum Hydrocarbons	mg/L	1/Month[2]	1/Quarter
Percent Sodium	%	1/Quarter	1/Quarter
Total Nitrogen	mg/L	1/Month	1/Quarter
Total Phosphorus	mg/L	1/Month	1/Quarter
Methylene Blue Active Substances (MBAS)	mg/L	1/Quarter	1/Quarter
Fluoride	mg/L	1/Quarter	1/Quarter
Total Residual Chlorine	µg/L	1/Day	1/Week
Dissolved Oxygen	mg/L	1/Month	1/Month
Iron, Total Recoverable	mg/L	1/Month	1/Quarter
Manganese, Total Recoverable	mg/L	1/Month	1/Quarter
Total Coliform	MPN/100 mL	1/Month	1/Quarter
Fecal Coliform	MPN/100 mL	1/Month	1/Quarter
Dibromochloropropane	µg/L	1/Month[2]	1/Quarter
Ethylene Dibromide	µg/L	1/Month[2]	1/Quarter

Parameters	Units	Monitoring Frequency Based on Average Monthly Flowrate	
		≥100,000 gpd	<100,000 gpd
Methyl-Tert-Butyl Ether (MTBE)	µg/L	1/Month[2]	1/Quarter
Antimony, Total Recoverable	ug/L	1/Month[2]	1/Quarter
Arsenic, Total Recoverable	ug/L	1/Month[2]	1/Quarter
Chromium (III) , Total Recoverable	ug/L	1/Month[2]	1/Quarter
Chromium (VI) , Total Recoverable	ug/L	1/Month[2]	1/Quarter
Mercury, Total Recoverable	ug/L	1/Month[2]	1/Quarter
Selenium, Total Recoverable	ug/L	1/Month[2]	1/Quarter
Thallium, Total Recoverable	ug/L	1/Month[2]	1/Quarter
Cyanide, Total	ug/L	1/Month[2]	1/Quarter
2,3,7,8 TCDD	ug/L	1/Month[2]	1/Quarter
TCDD Equivalents[4]	ug/L	1/Month[2]	1/Quarter
Acrolein	ug/L	1/Month[2]	1/Quarter
Acrylonitrile	ug/L	1/Month[2]	1/Quarter
Benzene	ug/L	1/Month[2]	1/Quarter
Bromoform	ug/L	1/Month[2]	1/Quarter
Carbon Tetrachloride	ug/L	1/Month[2]	1/Quarter
Chlorobenzene	ug/L	1/Month[2]	1/Quarter
Chlorodibromomethane	ug/L	1/Month[2]	1/Quarter
Dichlorobromomethane	ug/L	1/Month[2]	1/Quarter
1,2-Dichloroethane	ug/L	1/Month[2]	1/Quarter
1,1-Dichloroethylene	ug/L	1/Month[2]	1/Quarter
1,2-Dichloropropane	ug/L	1/Month[2]	1/Quarter
1,3-Dichloropropylene	ug/L	1/Month[2]	1/Quarter
Ethylbenzene	ug/L	1/Month[2]	1/Quarter
Methyl Bromide	ug/L	1/Month[2]	1/Quarter
Methylene Chloride	ug/L	1/Month[2]	1/Quarter
1,1,2,2-Tetrachloroethane	ug/L	1/Month[2]	1/Quarter
Tetrachloroethylene	ug/L	1/Month[2]	1/Quarter
Toluene	ug/L	1/Month[2]	1/Quarter
1,2-Trans-Dichloroethylene	ug/L	1/Month[2]	1/Quarter
1,1,2-Trichloroethane	ug/L	1/Month[2]	1/Quarter
Trichloroethylene	ug/L	1/Month[2]	1/Quarter
Vinyl Chloride	ug/L	1/Month[2]	1/Quarter
2-Chlorophenol	ug/L	1/Month[2]	1/Quarter
2,4-Dichlorophenol	ug/L	1/Month[2]	1/Quarter
2,4-Dimethylphenol	ug/L	1/Month[2]	1/Quarter
4,6-dinitro-o-resol	ug/L	1/Month[2]	1/Quarter
2,4-Dinitrophenol	ug/L	1/Month[2]	1/Quarter
Pentachlorophenol	ug/L	1/Month[2]	1/Quarter
Phenol	ug/L	1/Month[2]	1/Quarter
2,4,6-Trichlorophenol	ug/L	1/Month[2]	1/Quarter
Acenaphthene	ug/L	1/Month[2]	1/Quarter
Anthracene	ug/L	1/Month[2]	1/Quarter
Benzidine	ug/L	1/Month[2]	1/Quarter

Parameters	Units	Monitoring Frequency Based on Average Monthly Flowrate	
		≥100,000 gpd	<100,000 gpd
Benzo(a)Anthracene	ug/L	1/Month[2]	1/Quarter
Benzo(a)Pyrene	ug/L	1/Month[2]	1/Quarter
Benzo(b)Fluoranthene	ug/L	1/Month[2]	1/Quarter
Benzo(k)Fluoranthene	ug/L	1/Month[2]	1/Quarter
Bis(2-Chloroethyl)Ether	ug/L	1/Month[2]	1/Quarter
Bis(2-Chloroisopropyl)Ether	ug/L	1/Month[2]	1/Quarter
Bis(2-Ethylhexyl)Phthalate	ug/L	1/Month[2]	1/Quarter
Butylbenzyl Phthalate	ug/L	1/Month[2]	1/Quarter
2-Chloronaphthalene	ug/L	1/Month[2]	1/Quarter
Chrysene	ug/L	1/Month[2]	1/Quarter
Dibenzo(a,h)Anthracene	ug/L	1/Month[2]	1/Quarter
1,2-Dichlorobenzene	ug/L	1/Month[2]	1/Quarter
1,3-Dichlorobenzene	ug/L	1/Month[2]	1/Quarter
1,4-Dichlorobenzene	ug/L	1/Month[2]	1/Quarter
3,3 Dichlorobenzidine	ug/L	1/Month[2]	1/Quarter
Diethyl Phthalate	ug/L	1/Month[2]	1/Quarter
Dimethyl Phthalate	ug/L	1/Month[2]	1/Quarter
Di-n-Butyl Phthalate	ug/L	1/Month[2]	1/Quarter
2,4-Dinitrotoluene	ug/L	1/Month[2]	1/Quarter
1,2-Diphenylhydrazine	ug/L	1/Month[2]	1/Quarter
Fluoranthene	ug/L	1/Month[2]	1/Quarter
Fluorene	ug/L	1/Month[2]	1/Quarter
Hexachlorobenzene	ug/L	1/Month[2]	1/Quarter
Hexachlorobutadiene	ug/L	1/Month[2]	1/Quarter
Hexachlorocyclopentadiene	ug/L	1/Month[2]	1/Quarter
Hexachloroethane	ug/L	1/Month[2]	1/Quarter
Indeno(1,2,3-cd)Pyrene	ug/L	1/Month[2]	1/Quarter
Isophorone	ug/L	1/Month[2]	1/Quarter
Nitrobenzene	ug/L	1/Month[2]	1/Quarter
N-Nitrosodimethylamine	ug/L	1/Month[2]	1/Quarter
N-Nitrosodi-n-Propylamine	ug/L	1/Month[2]	1/Quarter
N-Nitrosodiphenylamine	ug/L	1/Month[2]	1/Quarter
Pyrene	ug/L	1/Month[2]	1/Quarter
Aldrin	ug/L	1/Month[2]	1/Quarter
alpha-BHC	ug/L	1/Month[2]	1/Quarter
beta-BHC	ug/L	1/Month[2]	1/Quarter
gamma-BHC	ug/L	1/Month[2]	1/Quarter
Chlordane[5]	ug/L	1/Month[2]	1/Quarter
4,4'-DDT	ug/L	1/Month[2]	1/Quarter
4,4'-DDE	ug/L	1/Month[2]	1/Quarter
4,4'-DDD	ug/L	1/Month[2]	1/Quarter
Dieldrin	ug/L	1/Month[2]	1/Quarter
alpha-Endosulfan	ug/L	1/Month[2]	1/Quarter
beta-Endosulfan	ug/L	1/Month[2]	1/Quarter

Parameters	Units	Monitoring Frequency Based on Average Monthly Flowrate	
		≥100,000 gpd	<100,000 gpd
Endosulfan Sulfate	ug/L	1/Month[2]	1/Quarter
Endrin	ug/L	1/Month[2]	1/Quarter
Endrin Aldehyde	ug/L	1/Month[2]	1/Quarter
Heptachlor	ug/L	1/Month[2]	1/Quarter
Heptachlor Epoxide	ug/L	1/Month[2]	1/Quarter
PCBs sum[6]	ug/L	1/Month[2]	1/Quarter
Toxaphene	ug/L	1/Month[2]	1/Quarter

[1] Chronic toxicity shall be determined as specified in section IV of this MRP.

[2] If the pollutant is not detected in the effluent for six consecutive months, the monitoring frequency for this pollutant may be reduced to once per quarter. Upon detection of this pollutant in the effluent, the monitoring frequency shall return to monthly.

[3] As defined using Method 6410.

[4] TCDD equivalents shall be reported as the sum of the concentrations of chlorinated dibenzodioxins (2,3,7,8-CDDs) and chlorinated dibenzofurans (2,3,7,8-CDFs) multiplied by their respective toxicity factors, as shown in the table below:

Isomer Group	Toxicity Equivalence Factor
2,3,7,8-tetra CDD	1.0
2,3,7,8-penta CDD	0.5
2,3,7,8-hexa CDDs	0.1
2,3,7,8-hepta CDD	0.01
Octa CDD	0.001
2,3,7,8- tetra CDF	0.1
1,2,3,7,8-penta CDF	0.05
2,3,4,7,8-penta CDF	0.5
2,3,7,8-hexa CDFs	0.1
2,3,7,8-hepta CDFs	0.01
Octa CDF	0.001

[5] Chlordane shall be reported as the sum of chlordane-alpha, chlordane-gamma, nonachlor-alpha, nonachlor-gamma, and oxychlordane.

[6] PCBs shall be reported as the sum of chlorinated biphenyls whose analytical characteristics resemble those of aroclor-1221, aroclor-1232, aroclor-1242, aroclor-1248, aroclor-1254, and aroclor-1260.

c. Non-Municipal Freshwater Receiving Waters, including Buena Vista Lagoon.

For discharges to freshwater inland surface receiving waters, without a designated domestic and municipal supply (MUN) beneficial use, the Discharger shall monitor effluent for those monitoring parameters specified in Table E-3 below that were identified as having reasonable potential or otherwise labeled as “Presumptive-Yes” under the procedures in Appendix C-1 of this Order.

Table E-3. Effluent Monitoring for Discharges to Non-Municipal Freshwater Receiving Waters, including Buena Vista Lagoon (non-MUN)

Parameter	Unit	Monitoring Frequency Based on Average Monthly Flowrate	
		≥100,000 gpd	<100,000 gpd
Flow	MGD	1/Day	1/Month
Settleable Solids	ml/L	1/Month	1/Month
Total Suspended Solids	mg/L	1/Month	1/Month
Turbidity	NTU	1/Month	1/Month
Chronic Toxicity[1]	Pass/Fail	1/Quarter	1/6-Months
pH	s.u.	1/Month	1/Month
Hydrogen Sulfide	µg/L	1/Quarter	1/Quarter
Xylene	µg/L	1/Month[2]	1/Quarter
Chlorinated Phenolics	µg/L	1/Month[2]	1/Quarter
Remaining Base/Neutral Compounds[3]	µg/L	1/Month[2]	1/Quarter
Total Petroleum Hydrocarbons	mg/L	1/Month[2]	1/Quarter
Percent Sodium	%	1/Quarter	1/Quarter
Total Nitrogen	mg/L	1/Month	1/Quarter
Total Phosphorus	mg/L	1/Month	1/Quarter
Methylene Blue Active Substances (MBAS)	mg/L	1/Quarter	1/Quarter
Fluoride	mg/L	1/Quarter	1/Quarter
Total Residual Chlorine	µg/L	1/Day	1/Week
Dissolved Oxygen	mg/L	1/Month	1/Month
Iron, Total Recoverable	mg/L	1/Month	1/Quarter
Manganese, Total Recoverable	mg/L	1/Month	1/Quarter
Total Coliform	MPN/100 mL	1/Month	1/Quarter
Fecal Coliform	MPN/100 mL	1/Month	1/Quarter
Dibromochloropropane	µg/L	1/Month[2]	1/Quarter
Ethylene Dibromide	µg/L	1/Month[2]	1/Quarter
Antimony, Total Recoverable	ug/L	1/Month[2]	1/Quarter
Arsenic, Total Recoverable	ug/L	1/Month[2]	1/Quarter
Chromium (III) , Total Recoverable	ug/L	1/Month[2]	1/Quarter
Chromium (VI) , Total Recoverable	ug/L	1/Month[2]	1/Quarter
Mercury, Total Recoverable	ug/L	1/Month[2]	1/Quarter
Selenium, Total Recoverable	ug/L	1/Month[2]	1/Quarter
Thallium, Total Recoverable	ug/L	1/Month[2]	1/Quarter
Cyanide, Total	ug/L	1/Month[2]	1/Quarter
2,3,7,8 TCDD	ug/L	1/Month[2]	1/Quarter
TCDD Equivalents[4]	ug/L	1/Month[2]	1/Quarter
Acrolein	ug/L	1/Month[2]	1/Quarter
Acrylonitrile	ug/L	1/Month[2]	1/Quarter
Benzene	ug/L	1/Month[2]	1/Quarter
Bromoform	ug/L	1/Month[2]	1/Quarter
Carbon Tetrachloride	ug/L	1/Month[2]	1/Quarter
Chlorobenzene	ug/L	1/Month[2]	1/Quarter
Chlorodibromomethane	ug/L	1/Month[2]	1/Quarter
Dichlorobromomethane	ug/L	1/Month[2]	1/Quarter

Parameter	Unit	Monitoring Frequency Based on Average Monthly Flowrate	
		≥100,000 gpd	<100,000 gpd
1,2-Dichloroethane	ug/L	1/Month[2]	1/Quarter
1,1-Dichloroethylene	ug/L	1/Month[2]	1/Quarter
1,2-Dichloropropane	ug/L	1/Month[2]	1/Quarter
1,3-Dichloropropylene	ug/L	1/Month[2]	1/Quarter
Ethylbenzene	ug/L	1/Month[2]	1/Quarter
Methyl Bromide	ug/L	1/Month[2]	1/Quarter
Methylene Chloride	ug/L	1/Month[2]	1/Quarter
1,1,2,2-Tetrachloroethane	ug/L	1/Month[2]	1/Quarter
Tetrachloroethylene	ug/L	1/Month[2]	1/Quarter
Toluene	ug/L	1/Month[2]	1/Quarter
1,2-Trans-Dichloroethylene	ug/L	1/Month[2]	1/Quarter
1,1,2-Trichloroethane	ug/L	1/Month[2]	1/Quarter
Trichloroethylene	ug/L	1/Month[2]	1/Quarter
Vinyl Chloride	ug/L	1/Month[2]	1/Quarter
2-Chlorophenol	ug/L	1/Month[2]	1/Quarter
2,4-Dichlorophenol	ug/L	1/Month[2]	1/Quarter
2,4-Dimethylphenol	ug/L	1/Month[2]	1/Quarter
4,6-dinitro-o-resol (aka2-methyl-4,6-Dinitrophenol)	ug/L	1/Month[2]	1/Quarter
2,4-Dinitrophenol	ug/L	1/Month[2]	1/Quarter
Pentachlorophenol	ug/L	1/Month[2]	1/Quarter
Phenol	ug/L	1/Month[2]	1/Quarter
2,4,6-Trichlorophenol	ug/L	1/Month[2]	1/Quarter
Acenaphthene	ug/L	1/Month[2]	1/Quarter
Anthracene	ug/L	1/Month[2]	1/Quarter
Benzidine	ug/L	1/Month[2]	1/Quarter
Benzo(a)Anthracene	ug/L	1/Month[2]	1/Quarter
Benzo(a)Pyrene	ug/L	1/Month[2]	1/Quarter
Benzo(b)Fluoranthene	ug/L	1/Month[2]	1/Quarter
Benzo(k)Fluoranthene	ug/L	1/Month[2]	1/Quarter
Bis(2-Chloroethyl)Ether	ug/L	1/Month[2]	1/Quarter
Bis(2-Chloroisopropyl)Ether	ug/L	1/Month[2]	1/Quarter
Bis(2-Ethylhexyl)Phthalate	ug/L	1/Month[2]	1/Quarter
Butylbenzyl Phthalate	ug/L	1/Month[2]	1/Quarter
2-Chloronaphthalene	ug/L	1/Month[2]	1/Quarter
Chrysene	ug/L	1/Month[2]	1/Quarter
Dibenzo(a,h)Anthracene	ug/L	1/Month[2]	1/Quarter
1,2-Dichlorobenzene	ug/L	1/Month[2]	1/Quarter
1,3-Dichlorobenzene	ug/L	1/Month[2]	1/Quarter
1,4-Dichlorobenzene	ug/L	1/Month[2]	1/Quarter
3,3 Dichlorobenzidine	ug/L	1/Month[2]	1/Quarter
Diethyl Phthalate	ug/L	1/Month[2]	1/Quarter
Dimethyl Phthalate	ug/L	1/Month[2]	1/Quarter
Di-n-Butyl Phthalate	ug/L	1/Month[2]	1/Quarter
2,4-Dinitrotoluene	ug/L	1/Month[2]	1/Quarter
1,2-Diphenylhydrazine	ug/L	1/Month[2]	1/Quarter

Parameter	Unit	Monitoring Frequency Based on Average Monthly Flowrate	
		≥100,000 gpd	<100,000 gpd
Fluoranthene	ug/L	1/Month[2]	1/Quarter
Fluorene	ug/L	1/Month[2]	1/Quarter
Hexachlorobenzene	ug/L	1/Month[2]	1/Quarter
Hexachlorobutadiene	ug/L	1/Month[2]	1/Quarter
Hexachlorocyclopentadiene	ug/L	1/Month[2]	1/Quarter
Hexachloroethane	ug/L	1/Month[2]	1/Quarter
Indeno(1,2,3-cd)Pyrene	ug/L	1/Month[2]	1/Quarter
Isophorone	ug/L	1/Month[2]	1/Quarter
Nitrobenzene	ug/L	1/Month[2]	1/Quarter
N-Nitrosodimethylamine	ug/L	1/Month[2]	1/Quarter
N-Nitrosodi-n-Propylamine	ug/L	1/Month[2]	1/Quarter
Pyrene	ug/L	1/Month[2]	1/Quarter
Aldrin	ug/L	1/Month[2]	1/Quarter
alpha-BHC	ug/L	1/Month[2]	1/Quarter
beta-BHC	ug/L	1/Month[2]	1/Quarter
gamma-BHC	ug/L	1/Month[2]	1/Quarter
Chlordane[5]	ug/L	1/Month[2]	1/Quarter
4,4'-DDT	ug/L	1/Month[2]	1/Quarter
4,4'-DDE (linked to DDT)	ug/L	1/Month[2]	1/Quarter
4,4'-DDD	ug/L	1/Month[2]	1/Quarter
Dieldrin	ug/L	1/Month[2]	1/Quarter
alpha-Endosulfan	ug/L	1/Month[2]	1/Quarter
beta-Endosulfan	ug/L	1/Month[2]	1/Quarter
Endosulfan Sulfate	ug/L	1/Month[2]	1/Quarter
Endrin	ug/L	1/Month[2]	1/Quarter
Endrin Aldehyde	ug/L	1/Month[2]	1/Quarter
Heptachlor	ug/L	1/Month[2]	1/Quarter
Heptachlor Epoxide	ug/L	1/Month[2]	1/Quarter
PCBs sum[6]	ug/L	1/Month[2]	1/Quarter
Toxaphene	ug/L	1/Month[2]	1/Quarter

[1] Chronic toxicity shall be determined as specified in section IV of this MRP.

[2] If the pollutant is not detected in the effluent for six consecutive months, the monitoring frequency for this pollutant may be reduced to once per quarter. Upon detection in the effluent, the monitoring frequency shall return to monthly.

[3] As defined using Method 6410.

[4] TCDD equivalents shall be reported as the sum of the concentrations of chlorinated dibenzodioxins (2,3,7,8-CDDs) and chlorinated dibenzofurans (2,3,7,8-CDFs) multiplied by their respective toxicity factors, as shown in the table below:

Isomer Group	Toxicity Equivalence Factor
2,3,7,8-tetra CDD	1.0
2,3,7,8-penta CDD	0.5
2,3,7,8-hexa CDDs	0.1
2,3,7,8-hepta CDD	0.01
Octa CDD	0.001
2,3,7,8- tetra CDF	0.1
1,2,3,7,8-penta CDF	0.05
2,3,4,7,8-penta CDF	0.5

Isomer Group	Toxicity Equivalence Factor
2,3,7,8-hexa CDFs	0.1
2,3,7,8-hepta CDFs	0.01
Octa CDF	0.001

[5] Chlordane shall be reported as the the sum of chlordane-alpha, chlordane-gamma, nonachlor-alpha, nonachlor-gamma, and oxychlordane.

[6] PCBs shall be reported as the sum of chlorinated biphenyls whose analytical characteristics resemble those of aroclor-1221, aroclor-1232, aroclor-1242, aroclor-1248, aroclor-1254, and aroclor-1260.

2. Effluent Monitoring – Saltwater Inland Surface Waters, Not Including Bays and Estuaries

For discharges to inland saltwater receiving waters, but not including bays and estuaries, the Discharger shall monitor effluent for those monitoring parameters specified in Table E-4 below that were identified as having reasonable potential or otherwise labeled as "Presumptive-yes" under the procedures in Appendix C-1 of this Order. Freshwater criteria apply where receiving water salinities are 1 part per thousand and below and at locations where this occurs 95% or more of the time. Saltwater criteria apply at receiving water salinities of 10 parts per thousand and above and at locations where this occurs 95% of the time.

Table E-4. Effluent Monitoring for Discharges to Saltwater Inland Surface Waters, not including Bays and Estuaries

Parameters	Units	Monitoring Frequency Based on Average Monthly Flowrate	
		≥100,000 gpd	<100,000 gpd
Flow	MGD	1/Day	1/Month
Settleable Solids	ml/L	1/Month	1/Month
Total Suspended Solids	mg/L	1/Month	1/Month
Turbidity	NTU	1/Month	1/Month
Chronic Toxicity[1]	Pass/Fail	1/Quarter	1/6-Months
pH	s.u.	1/Month	1/Month
Hydrogen Sulfide	µg/L	1/Quarter	1/Quarter
Xylene	µg/L	1/Month[2]	1/Quarter
Chlorinated Phenolics	µg/L	1/Month[2]	1/Quarter
Remaining Base/Neutral Compounds[3]	µg/L	1/Month[2]	1/Quarter
Total Petroleum Hydrocarbons	mg/L	1/Month[2]	1/Quarter
Percent Sodium	%	1/Quarter	1/Quarter
Total Nitrogen	mg/L	1/Month	1/Quarter
Total Phosphorus	mg/L	1/Month	1/Quarter
Methylene Blue Active Substances (MBAS)	mg/L	1/Quarter	1/Quarter
Fluoride	mg/L	1/Quarter	1/Quarter
Total Residual Chlorine	µg/L	1/Day	1/Week
Dissolved Oxygen	mg/L	1/Month	1/Month
Iron, Total Recoverable	mg/L	1/Month	1/Quarter
Manganese, Total Recoverable	mg/L	1/Month	1/Quarter
Total Coliform	MPN/100 mL	1/Month	1/Quarter
Fecal Coliform	MPN/100 mL	1/Month	1/Quarter
Dibromochloropropane	µg/L	1/Month[2]	1/Quarter

Parameters	Units	Monitoring Frequency Based on Average Monthly Flowrate	
		≥100,000 gpd	<100,000 gpd
Ethylene Dibromide	µg/L	1/Month[2]	1/Quarter
Antimony, Total Recoverable	ug/L	1/Month[2]	1/Quarter
Arsenic, Total Recoverable	ug/L	1/Month[2]	1/Quarter
Cadmium, Total Recoverable	ug/L	1/Month[2]	1/Quarter
Chromium (VI) , Total Recoverable	ug/L	1/Month[2]	1/Quarter
Copper, Total Recoverable	ug/L	1/Month[2]	1/Quarter
Lead, Total Recoverable	ug/L	1/Month[2]	1/Quarter
Mercury, Total Recoverable	ug/L	1/Month[2]	1/Quarter
Nickel, Total Recoverable	ug/L	1/Month[2]	1/Quarter
Selenium, Total Recoverable	ug/L	1/Month[2]	1/Quarter
Silver, Total Recoverable	ug/L	1/Month[2]	1/Quarter
Thallium, Total Recoverable	ug/L	1/Month[2]	1/Quarter
Zinc, Total Recoverable	ug/L	1/Month[2]	1/Quarter
Cyanide, Total	ug/L	1/Month[2]	1/Quarter
2,3,7,8 TCDD	ug/L	1/Month[2]	1/Quarter
TCDD Equivalents[4]	ug/L	1/Month[2]	1/Quarter
Acrolein	ug/L	1/Month[2]	1/Quarter
Acrylonitrile	ug/L	1/Month[2]	1/Quarter
Benzene	ug/L	1/Month[2]	1/Quarter
Bromoform	ug/L	1/Month[2]	1/Quarter
Carbon Tetrachloride	ug/L	1/Month[2]	1/Quarter
Chlorobenzene	ug/L	1/Month[2]	1/Quarter
Chlorodibromomethane	ug/L	1/Month[2]	1/Quarter
Dichlorobromomethane	ug/L	1/Month[2]	1/Quarter
1,2-Dichloroethane	ug/L	1/Month[2]	1/Quarter
1,1-Dichloroethylene	ug/L	1/Month[2]	1/Quarter
1,2-Dichloropropane	ug/L	1/Month[2]	1/Quarter
1,3-Dichloropropylene	ug/L	1/Month[2]	1/Quarter
Ethylbenzene	ug/L	1/Month[2]	1/Quarter
Methyl Bromide	ug/L	1/Month[2]	1/Quarter
Methylene Chloride	ug/L	1/Month[2]	1/Quarter
1,1,2,2-Tetrachloroethane	ug/L	1/Month[2]	1/Quarter
Tetrachloroethylene	ug/L	1/Month[2]	1/Quarter
Toluene	ug/L	1/Month[2]	1/Quarter
1,2-Trans-Dichloroethylene	ug/L	1/Month[2]	1/Quarter
1,1,2-Trichloroethane	ug/L	1/Month[2]	1/Quarter
Trichloroethylene	ug/L	1/Month[2]	1/Quarter
Vinyl Chloride	ug/L	1/Month[2]	1/Quarter
2-Chlorophenol	ug/L	1/Month[2]	1/Quarter
2,4-Dichlorophenol	ug/L	1/Month[2]	1/Quarter
2,4-Dimethylphenol	ug/L	1/Month[2]	1/Quarter
4,6-dinitro-o-resol (aka2-methyl-4,6-Dinitrophenol)	ug/L	1/Month[2]	1/Quarter
2,4-Dinitrophenol	ug/L	1/Month[2]	1/Quarter
Pentachlorophenol	ug/L	1/Month[2]	1/Quarter

Parameters	Units	Monitoring Frequency Based on Average Monthly Flowrate	
		≥100,000 gpd	<100,000 gpd
Phenol	ug/L	1/Month[2]	1/Quarter
2,4,6-Trichlorophenol	ug/L	1/Month[2]	1/Quarter
Acenaphthene	ug/L	1/Month[2]	1/Quarter
Anthracene	ug/L	1/Month[2]	1/Quarter
Benzidine	ug/L	1/Month[2]	1/Quarter
Benzo(a)Anthracene	ug/L	1/Month[2]	1/Quarter
Benzo(a)Pyrene	ug/L	1/Month[2]	1/Quarter
Benzo(b)Fluoranthene	ug/L	1/Month[2]	1/Quarter
Benzo(k)Fluoranthene	ug/L	1/Month[2]	1/Quarter
Bis(2-Chloroethyl)Ether	ug/L	1/Month[2]	1/Quarter
Bis(2-Chloroisopropyl)Ether	ug/L	1/Month[2]	1/Quarter
Bis(2-Ethylhexyl)Phthalate	ug/L	1/Month[2]	1/Quarter
Butylbenzyl Phthalate	ug/L	1/Month[2]	1/Quarter
2-Chloronaphthalene	ug/L	1/Month[2]	1/Quarter
Chrysene	ug/L	1/Month[2]	1/Quarter
Dibenzo(a,h)Anthracene	ug/L	1/Month[2]	1/Quarter
1,2-Dichlorobenzene	ug/L	1/Month[2]	1/Quarter
1,3-Dichlorobenzene	ug/L	1/Month[2]	1/Quarter
1,4-Dichlorobenzene	ug/L	1/Month[2]	1/Quarter
3,3 Dichlorobenzidine	ug/L	1/Month[2]	1/Quarter
Diethyl Phthalate	ug/L	1/Month[2]	1/Quarter
Dimethyl Phthalate	ug/L	1/Month[2]	1/Quarter
Di-n-Butyl Phthalate	ug/L	1/Month[2]	1/Quarter
2,4-Dinitrotoluene	ug/L	1/Month[2]	1/Quarter
1,2-Diphenylhydrazine	ug/L	1/Month[2]	1/Quarter
Fluoranthene	ug/L	1/Month[2]	1/Quarter
Fluorene	ug/L	1/Month[2]	1/Quarter
Hexachlorobenzene	ug/L	1/Month[2]	1/Quarter
Hexachlorobutadiene	ug/L	1/Month[2]	1/Quarter
Hexachlorocyclopentadiene	ug/L	1/Month[2]	1/Quarter
Hexachloroethane	ug/L	1/Month[2]	1/Quarter
Indeno(1,2,3-cd)Pyrene	ug/L	1/Month[2]	1/Quarter
Isophorone	ug/L	1/Month[2]	1/Quarter
Nitrobenzene	ug/L	1/Month[2]	1/Quarter
N-Nitrosodimethylamine	ug/L	1/Month[2]	1/Quarter
N-Nitrosodi-n-Propylamine	ug/L	1/Month[2]	1/Quarter
N-Nitrosodiphenylamine	ug/L	1/Month[2]	1/Quarter
Pyrene	ug/L	1/Month[2]	1/Quarter
Aldrin	ug/L	1/Month[2]	1/Quarter
alpha-BHC	ug/L	1/Month[2]	1/Quarter
beta-BHC	ug/L	1/Month[2]	1/Quarter
gamma-BHC	ug/L	1/Month[2]	1/Quarter
Chlordane[5]	ug/L	1/Month[2]	1/Quarter
4,4'-DDT	ug/L	1/Month[2]	1/Quarter
4,4'-DDE (linked to DDT)	ug/L	1/Month[2]	1/Quarter

Parameters	Units	Monitoring Frequency Based on Average Monthly Flowrate	
		≥100,000 gpd	<100,000 gpd
4,4'-DDD	ug/L	1/Month[2]	1/Quarter
Dieldrin	ug/L	1/Month[2]	1/Quarter
alpha-Endosulfan	ug/L	1/Month[2]	1/Quarter
beta-Endosulfan	ug/L	1/Month[2]	1/Quarter
Endosulfan Sulfate	ug/L	1/Month[2]	1/Quarter
Endrin	ug/L	1/Month[2]	1/Quarter
Endrin Aldehyde	ug/L	1/Month[2]	1/Quarter
Heptachlor	ug/L	1/Month[2]	1/Quarter
Heptachlor Epoxide	ug/L	1/Month[2]	1/Quarter
PCBs sum[6]	ug/L	1/Month[2]	1/Quarter
Toxaphene	ug/L	1/Month[2]	1/Quarter

[1] Chronic toxicity shall be determined as specified in section IV of this MRP.

[2] If the pollutant is not detected in the effluent for six consecutive months, the monitoring frequency for this pollutant may be reduced to once per quarter. Upon detection in the effluent, the monitoring frequency shall return to monthly.

[3] As defined using Method 6410.

[4] TCDD equivalents shall be reported as the the sum of the concentrations of chlorinated dibenzodioxins (2,3,7,8-CDDs) and chlorinated dibenzofurans (2,3,7,8-CDFs) multiplied by their respective toxicity factors, as shown in the table below:

Isomer Group	Toxicity Equivalence Factor
2,3,7,8-tetra CDD	1.0
2,3,7,8-penta CDD	0.5
2,3,7,8-hexa CDDs	0.1
2,3,7,8-hepta CDD	0.01
Octa CDD	0.001
2,3,7,8- tetra CDF	0.1
1,2,3,7,8-penta CDF	0.05
2,3,4,7,8-penta CDF	0.5
2,3,7,8-hexa CDFs	0.1
2,3,7,8-hepta CDFs	0.01
Octa CDF	0.001

[5] Chlordane shall be reported as the sum of chlordane-alpha, chlordane-gamma, nonachlor-alpha, nonachlor-gamma, and oxychlordane.

[6] PCBs shall be reported as the sum of chlorinated biphenyls whose analytical characteristics resemble those of aroclor-1221, aroclor-1232, aroclor-1242, aroclor-1248, aroclor-1254, and aroclor-1260.

3. Effluent Monitoring - Bays, Lagoons, and Estuaries, not including Buena Vista Lagoon

For discharges to bays and estuaries, not including Buena Vista Lagoon, the Discharger shall monitor effluent for those monitoring parameters specified in Table E-5 below that were identified as having reasonable potential or otherwise labeled as “Presumptive-yes” under the procderes in Appendix C-1 of this Order.

Table E-5. Effluent Monitoring for Discharges to Bays, Lagoons, and Estuaries, not including Buena Vista Lagoon

Parameters	Units	Monitoring Frequency Based on Average Monthly Flowrate	
		≥100,000 gpd	<100,000 gpd
Flow	MGD	1/Day	1/Month
Settleable Solids	ml/L	1/Month	1/Month
Total Suspended Solids	mg/L	1/Month	1/Month
Turbidity	NTU	1/Month	1/Month
Chronic Toxicity[1]	Pass/Fail	1/Quarter	1/6-Months
pH	s.u.	1/Month	1/Month
Hydrogen Sulfide	µg/L	1/Quarter	1/Quarter
Xylene	µg/L	1/Month[2]	1/Quarter
Chlorinated Phenolics	µg/L	1/Month[2]	1/Quarter
Base/Neutral Compounds[3]	µg/L	1/Month	1/Quarter
Total Petroleum Hydrocarbons	µg/L	1/Month[2]	1/Quarter
Total Residual Chlorine	µg/L	1/Day	1/Week
Ammonia, Total	µg/L	1/Month	1/Quarter
Total Nitrogen	mg/L	1/Month	1/Quarter
Total Phosphorus	mg/L	1/Month	1/Quarter
Dissolved Oxygen	mg/L	1/Month	1/Month
Total Coliform[4]	MPN/100ml	1/Month	1/Quarter
Fecal Coliform[4]	MPN/100ml	1/Month	1/Quarter
Enterococcus[4]	MPN/100ml	1/Month	1/Quarter
Methyl-tert-butyl Ether	µg/L	1/Month	1/Quarter
Antimony, Total Recoverable	ug/L	1/Month	1/Quarter
Arsenic, Total Recoverable	ug/L	1/Month	1/Quarter
Cadmium , Total Recoverable	ug/L	1/Month	1/Quarter
Chromium (VI), Total Recoverable	ug/L	1/Month	1/Quarter
Copper, Total Recoverable	ug/L	1/Month	1/Quarter
Lead, Total Recoverable	ug/L	1/Month	1/Quarter
Mercury, Total Recoverable	ug/L	1/Month	1/Quarter
Nickel, Total Recoverable	ug/L	1/Month	1/Quarter
Selenium, Total Recoverable	ug/L	1/Month	1/Quarter
Silver, Total Recoverable	ug/L	1/Month	1/Quarter
Thallium, Total Recoverable	ug/L	1/Month	1/Quarter
Zinc, Total Recoverable	ug/L	1/Month	1/Quarter
Tributyltin	µg/L	1/Month[2]	1/Quarter
Cyanide, total	ug/L	1/Month[2]	1/Quarter
TCDD Equivalents[4]	ug/L	1/Month[2]	1/Quarter
Acrolein	ug/L	1/Month[2]	1/Quarter

Parameters	Units	Monitoring Frequency Based on Average Monthly Flowrate	
		≥100,000 gpd	<100,000 gpd
Acrylonitrile	ug/L	1/Month[2]	1/Quarter
Benzene	ug/L	1/Month[2]	1/Quarter
Carbon Tetrachloride	ug/L	1/Month[2]	1/Quarter
Chlorobenzene	ug/L	1/Month[2]	1/Quarter
Chlorodibromomethane	ug/L	1/Month[2]	1/Quarter
Dichlorobromomethane	ug/L	1/Month[2]	1/Quarter
Dichloromethane	µg/L	1/Month[2]	1/Quarter
1,2-Dichloroethane	ug/L	1/Month[2]	1/Quarter
1,1-Dichloroethylene	ug/L	1/Month[2]	1/Quarter
1,2-Dichloropropane	ug/L	1/Month[2]	1/Quarter
1,3-Dichloropropylene	ug/L	1/Month[2]	1/Quarter
Ethylbenzene	ug/L	1/Month[2]	1/Quarter
Phenolic Compounds (non-chlorinated)	µg/L	1/Month[2]	1/Quarter
1,1,2,2-Tetrachloroethane	ug/L	1/Month[2]	1/Quarter
Tetrachloroethylene	ug/L	1/Month[2]	1/Quarter
Toluene	ug/L	1/Month[2]	1/Quarter
1,2-Trans-Dichloroethylene	ug/L	1/Month[2]	1/Quarter
1,1,1-trichloroethane	µg/L	1/Month[2]	1/Quarter
1,1,2-Trichloroethane	ug/L	1/Month[2]	1/Quarter
Trichloroethylene	ug/L	1/Month[2]	1/Quarter
Vinyl Chloride	ug/L	1/Month[2]	1/Quarter
Chlorophenol	ug/L	1/Month[2]	1/Quarter
2,4-Dichlorophenol	ug/L	1/Month[2]	1/Quarter
2,4-Dimethylphenol	ug/L	1/Month[2]	1/Quarter
4,6-dinitro-o-resol (aka2-methyl-4,6-Dinitrophenol)	ug/L	1/Month[2]	1/Quarter
2,4-Dinitrophenol	ug/L	1/Month[2]	1/Quarter
Pentachlorophenol	ug/L	1/Month[2]	1/Quarter
Phenol	ug/L	1/Month[2]	1/Quarter
2,4,6-Trichlorophenol	ug/L	1/Month[2]	1/Quarter
Acenaphthene	ug/L	1/Month[2]	1/Quarter
Anthracene	ug/L	1/Month[2]	1/Quarter
Benzidine	ug/L	1/Month[2]	1/Quarter
Benzo(a)Anthracene	ug/L	1/Month[2]	1/Quarter
Benzo(a)Pyrene	ug/L	1/Month[2]	1/Quarter
Benzo(b)Fluoranthene	ug/L	1/Month[2]	1/Quarter
Benzo(k)Fluoranthene	ug/L	1/Month[2]	1/Quarter
Bis(2-Chloroethyl)Ether	ug/L	1/Month[2]	1/Quarter
Bis(2-Chloroisopropyl)Ether	ug/L	1/Month[2]	1/Quarter
Bis(2-Ethylhexyl)Phthalate	ug/L	1/Month[2]	1/Quarter
Butylbenzyl Phthalate	ug/L	1/Month[2]	1/Quarter
2-Chloronaphthalene	ug/L	1/Month[2]	1/Quarter
Chrysene	ug/L	1/Month[2]	1/Quarter
Dibenzo(a,h)Anthracene	ug/L	1/Month[2]	1/Quarter
1,2-Dichlorobenzene	ug/L	1/Month[2]	1/Quarter
1,3-Dichlorobenzene	ug/L	1/Month[2]	1/Quarter

Parameters	Units	Monitoring Frequency Based on Average Monthly Flowrate	
		≥100,000 gpd	<100,000 gpd
1,4-Dichlorobenzene	ug/L	1/Month[2]	1/Quarter
3,3 Dichlorobenzidine	ug/L	1/Month[2]	1/Quarter
Diethyl Phthalate	ug/L	1/Month[2]	1/Quarter
Dimethyl Phthalate	ug/L	1/Month[2]	1/Quarter
Di-n-Butyl Phthalate	ug/L	1/Month[2]	1/Quarter
2,4-Dinitrotoluene	ug/L	1/Month[2]	1/Quarter
1,2-Diphenylhydrazine	ug/L	1/Month[2]	1/Quarter
Fluoranthene	ug/L	1/Month[2]	1/Quarter
Fluorene	ug/L	1/Month[2]	1/Quarter
Hexachlorobenzene	ug/L	1/Month[2]	1/Quarter
Hexachlorobutadiene	ug/L	1/Month[2]	1/Quarter
Hexachlorocyclopentadiene	ug/L	1/Month[2]	1/Quarter
Hexachloroethane	ug/L	1/Month[2]	1/Quarter
Indeno(1,2,3-cd)Pyrene	ug/L	1/Month[2]	1/Quarter
Isophorone	ug/L	1/Month[2]	1/Quarter
Nitrobenzene	ug/L	1/Month[2]	1/Quarter
N-Nitrosodimethylamine	ug/L	1/Month[2]	1/Quarter
N-Nitrosodi-n-Propylamine	ug/L	1/Month[2]	1/Quarter
N-Nitrosodiphenylamine	ug/L	1/Month[2]	1/Quarter
Polynuclear Aromatic Hydrocarbons (PAHs)	µg/L	1/Month[2]	1/Quarter
Pyrene	ug/L	1/Month[2]	1/Quarter
Aldrin	ug/L	1/Month[2]	1/Quarter
Chlordane[5]	ug/L	1/Month[2]	1/Quarter
4,4'-DDT	ug/L	1/Month[2]	1/Quarter
4,4'-DDE (linked to DDT)	ug/L	1/Month[2]	1/Quarter
4,4'-DDD	ug/L	1/Month[2]	1/Quarter
Dieldrin	ug/L	1/Month[2]	1/Quarter
Endosulfan	ug/L	1/Month[2]	1/Quarter
Endrin	ug/L	1/Month[2]	1/Quarter
Endrin Aldehyde	ug/L	1/Month[2]	1/Quarter
Halomethanes[6]	µg/L	1/Month[2]	1/Quarter
Heptachlor	ug/L	1/Month[2]	1/Quarter
Heptachlor Epoxide	ug/L	1/Month[2]	1/Quarter
Hexachlorocyclohexane (HCH)[7]	µg/L	1/Month[2]	1/Quarter
PCBs sum[8]	ug/L	1/Month[2]	1/Quarter
Toxaphene	ug/L	1/Month[2]	1/Quarter

[1] Chronic toxicity shall be determined as specified in section IV of this MRP.

[2] If the pollutant is not detected in the effluent for six consecutive months, the monitoring frequency for this pollutant may be reduced to once per quarter. Upon detection in the effluent, monitoring shall return to monthly.

[3] As defined using Method 6410.

[4] TCDD equivalents shall be reported as the sum of the concentrations of chlorinated dibenzodioxins (2,3,7,8-CDDs) and chlorinated dibenzofurans (2,3,7,8-CDFs) multiplied by their respective toxicity factors, as shown in the table below:

Isomer Group	Toxicity Equivalence Factor
2,3,7,8-tetra CDD	1.0
2,3,7,8-penta CDD	0.5
2,3,7,8-hexa CDDs	0.1
2,3,7,8-hepta CDD	0.01
Octa CDD	0.001
2,3,7,8- tetra CDF	0.1
1,2,3,7,8-penta CDF	0.05
2,3,4,7,8-penta CDF	0.5
2,3,7,8-hexa CDFs	0.1
2,3,7,8-hepta CDFs	0.01
Octa CDF	0.001

[5] Chlordane shall be reported as the sum of chlordane-alpha, chlordane-gamma, nonachlor-alpha, nonachlor-gamma, and oxychlordane.
[6] Halomethanes shall be reported as the sum of bromoform, bromethane and chloromethane.
[7] Hexachlorocyclohexane shall be reported as the sum of the alpha, beta, gamma, and delta isomers of hexachlorocyclohexane.
[8] PCBs sum shall be reported as the sum of chlorinated biphenyls whose analytical characteristics resemble those of aroclor-1221, aroclor-1232, aroclor-1242, aroclor-1248, aroclor-1254, and aroclor-1260.

4. Effluent Monitoring – Surf Zone of the Pacific Ocean

For discharges to the surf zone of the Pacific Ocean, the Discharger shall monitor effluent for those monitoring parameters specified in Table E-6 below that were identified as having reasonable potential or otherwise labeled as “Presumptive-Yes” under the procedures in Appendix C-1 of this Order.

Table E-6. Effluent Monitoring for Discharges to the Pacific Ocean (Surf Zone)

Parameter	Units	Monitoring Frequency Based on Average Monthly Flowrate	
		≥100,000 gpd	<100,000 gpd
Flow	MGD	1/Day	1/Month
Grease and Oil	mg/L	1/Month	1/Month
Suspended Solids	mg/L	1/Month	1/Month
Settleable Solids	mL/L	1/Month	1/Month
Turbidity	NTU	1/Month	1/Month
Acute Toxicity[1]	TUa	1/Quarter	1/6-Months
Chronic Toxicity[1]	TUc	1/Quarter	1/6-Months
pH	s.u.	1/Month	1/Month
Dissolved Oxygen	mg/L	1/Month	1/Month
Total Coliform	MPN/100mL	1/Month	1/Quarter
Fecal Coliform	MPN/100mL	1/Month	1/Quarter
Enterococcus	MPN/100mL	1/Month	1/Quarter
Arsenic, Total Recoverable	ug/l	1/Month	1/Quarter
Cadmium, Total Recoverable	ug/l	1/Month	1/Quarter
Chromium VI, Total Recoverable	ug/l	1/Month	1/Quarter
Copper, Total Recoverable	ug/l	1/Month	1/Quarter
Lead, Total Recoverable	ug/l	1/Month	1/Quarter

Parameter	Units	Monitoring Frequency Based on Average Monthly Flowrate	
		≥100,000 gpd	<100,000 gpd
Mercury, Total Recoverable	ug/l	1/Month	1/Quarter
Nickel, Total Recoverable	ug/l	1/Month	1/Quarter
Selenium, Total Recoverable	ug/l	1/Month	1/Quarter
Silver, Total Recoverable	ug/l	1/Month	1/Quarter
Zinc, Total Recoverable	ug/l	1/Month	1/Quarter
Cyanide, Total	ug/l	1/Month	1/Quarter
Total Chlorine Residual	ug/l	1/Day	1/Week
Ammonia (expressed as nitrogen)	ug/l	1/Month	1/Quarter
Phenolic Compounds (non-chlorinated)	ug/l	1/Month[2]	1/Quarter
Chlorinated Phenolics	ug/l	1/Month[2]	1/Quarter
Endosulfan	ug/l	1/Month[2]	1/Quarter
Endrin	ug/l	1/Month[2]	1/Quarter
HCH[3]	ug/l	1/Month[2]	1/Quarter
Acrolein	ug/l	1/Month[2]	1/Quarter
Antimony	ug/l	1/Month[2]	1/Quarter
Bis(2-chloroethoxy) Methane	ug/l	1/Month[2]	1/Quarter
Bis(2-chloroisopropyl) ether	ug/l	1/Month[2]	1/Quarter
Chlorobenzene	ug/l	1/Month[2]	1/Quarter
Chromium (III)	ug/l	1/Month[2]	1/Quarter
Di-n-butyl Phthalate	ug/l	1/Month[2]	1/Quarter
Dichlorobenzenes	ug/l	1/Month[2]	1/Quarter
Diethyl Phthalate	ug/l	1/Month[2]	1/Quarter
Dimethyl Phthalate	ug/l	1/Month[2]	1/Quarter
4,6-dinitro-2-methylphenol	ug/l	1/Month[2]	1/Quarter
2,4-dinitrophenol	ug/l	1/Month[2]	1/Quarter
Ethylbenzene	ug/l	1/Month[2]	1/Quarter
Fluoranthene	ug/l	1/Month[2]	1/Quarter
Hexachlorocyclopentadiene	ug/l	1/Month[2]	1/Quarter
Nitrobenzene	ug/l	1/Month[2]	1/Quarter
Thallium	ug/l	1/Month[2]	1/Quarter
Toluene	ug/l	1/Month[2]	1/Quarter
Total Petroleum Hydrocarbons	µg/L	1/Month[2]	1/Quarter
Tributyltin	ug/l	1/Month[2]	1/Quarter
1,1,1-trichloroethane	ug/l	1/Month[2]	1/Quarter
Xylene	µg/	1/Month[2]	1/Quarter
Acrylonitrile	ug/l	1/Month[2]	1/Quarter
Aldrin	ug/l	1/Month[2]	1/Quarter
Benzene	ug/l	1/Month[2]	1/Quarter
Benzidine	ug/l	1/Month[2]	1/Quarter
Beryllium	ug/l	1/Month[2]	1/Quarter
Bis(2-chloroethyl) Ether	ug/l	1/Month[2]	1/Quarter
Bis(2-ethlyhexyl) Phthalate	ug/l	1/Month[2]	1/Quarter
Carbon Tetrachloride	ug/l	1/Month[2]	1/Quarter
Chlordane[4]	ug/l	1/Month[2]	1/Quarter

Parameter	Units	Monitoring Frequency Based on Average Monthly Flowrate	
		≥100,000 gpd	<100,000 gpd
Chlorodibromethane	ug/l	1/Month[2]	1/Quarter
Chloroform	ug/l	1/Month[2]	1/Quarter
DDT[5]	ug/l	1/Month[2]	1/Quarter
1,4-dichlorobenzene	ug/l	1/Month[2]	1/Quarter
3,3'-dichlorobenzidine	ug/l	1/Month[2]	1/Quarter
1,2-dichloroethane	ug/l	1/Month[2]	1/Quarter
1,1-dichloroethylene	ug/l	1/Month[2]	1/Quarter
Dichlorobromomethane	ug/l	1/Month[2]	1/Quarter
Dichloromethane	ug/l	1/Month[2]	1/Quarter
1,3-dichloropropene	ug/l	1/Month[2]	1/Quarter
Dieldrin	ug/l	1/Month[2]	1/Quarter
2,4-dinitrotoluene	ug/l	1/Month[2]	1/Quarter
1,2-diphenylhydrazine	ug/l	1/Month[2]	1/Quarter
Halomethanes[6]	ug/l	1/Month[2]	1/Quarter
Heptachlor	ug/l	1/Month[2]	1/Quarter
Heptachlor Epoxide	ug/l	1/Month[2]	1/Quarter
Hexachlorobenzene	ug/l	1/Month[2]	1/Quarter
Hexachlorobutadiene	ug/l	1/Month[2]	1/Quarter
Hexachloroethane	ug/l	1/Month[2]	1/Quarter
Isophorone	ug/l	1/Month[2]	1/Quarter
N-nitrosodimethylamine	ug/l	1/Month[2]	1/Quarter
N-nitrosodi-N-propylamine	ug/l	1/Month[2]	1/Quarter
N-nitrosodiphenylamine	ug/l	1/Month[2]	1/Quarter
PAHs[7]	ug/l	1/Month[2]	1/Quarter
PCBs[8]	ug/l	1/Month[2]	1/Quarter
TCDD equivalents[9]	ug/l	1/Month[2]	1/Quarter
1,1,2,2-tetrachloroethane	ug/l	1/Month[2]	1/Quarter
Tetrachloroethylene	ug/l	1/Month[2]	1/Quarter
Toxaphene	ug/l	1/Month[2]	1/Quarter
Trichloroethylene	ug/l	1/Month[2]	1/Quarter
1,1,2-trichloroethane	ug/l	1/Month[2]	1/Quarter
2,4,6-trichlorophenol	ug/l	1/Month[2]	1/Quarter
Vinyl Chloride	ug/l	1/Month[2]	1/Quarter

[1] Acute toxicity and chronic toxicity shall be determined as specified in section IV of this MRP.

[2] If the pollutant is not detected in the effluent for six consecutive months, the monitoring frequency for this pollutant may be reduced to once per quarter. Upon detection in the effluent, the monitoring frequency shall return to monthly.

[3] Hexachlorocyclohexane (HCH) shall be reported as the sum of the alpha, beta, gamma, and delta isomers of hexachlorocyclohexane.

[4] Chordane shall be reported as the the sum of chlordane-alpha, chlordane-gamma, nonachlor-alpha, nonachlor-gamma, and oxychlordane.

[5] DDT shall be reported as the sum of 4,4-DDT; 2,4-DDT; 4,4-DDE; 2,4-DDE; 4,4-DDD; and 2,4-DDD.

[6] Halomethanes shall be reported as the sum of bromoform, bromomethane, and chloromethane.

[7] PAHs shall be reported as the sum of acenaphthylene, anthracene, 1,2-benzanthracene, 3,4-benzofluoranthene, benzo[k]fluoranthene, 1,12-benzoperylene, benzo[a]pyrene, chrysene, dibenzo[ah]anthracene, fluorene, indeno[1,2,3-cd]pyrene, phenanthrene and pyrene.

[8] PCBs shall be reported as the sum of chlorinated biphenyls whose analytical characteristics resemble those of aroclor-1221, aroclor-1232, aroclor-1242, aroclor-1248, aroclor-1254, and aroclor-1260.

[9] TCDD equivalents shall be reported as the sum of the concentrations of chlorinated dibenzodioxins (2,3,7,8-CDDs) and chlorinated dibenzofurans (2,3,7,8-CDFs) multiplied by their respective toxicity factors, as shown in the table below:

Isomer Group	Toxicity Equivalence Factor
2,3,7,8-tetra CDD	1.0
2,3,7,8-penta CDD	0.5
2,3,7,8-hexa CDDs	0.1
2,3,7,8-hepta CDD	0.01
Octa CDD	0.001
2,3,7,8- tetra CDF	0.1
1,2,3,7,8-penta CDF	0.05
2,3,4,7,8-penta CDF	0.5
2,3,7,8-hexa CDFs	0.1
2,3,7,8-hepta CDFs	0.01
Octa CDF	0.001

5. Effluent Monitoring – For Discharges That Do Not Require Treatment to Comply With Effluent Limitations

For discharges that do not require treatment to comply with effluent limitations, the Discharger shall monitor the discharge for the parameters specified in Table E-7 below, unless such monitoring is determined by the San Diego Water Board to be technologically or economically infeasible based on site-specific considerations. In that event, monitoring shall be conducted as specified in the NOA.

Table E-7. Effluent Monitoring for Discharges that do not Require Treatment to Meet Effluent Limitations

Parameters	Units	Monitoring Frequency Based on Average Monthly Flowrate	
		≥100,000 gpd	<100,000 gpd
Flow	MGD	1/week	1/Month
Settleable Solids	ml/L	1/6-Months	1/6-Months
Total Suspended Solids	mg/L	1/6-Months	1/6-Months
Turbidity	NTU	1/Month	1/Month
Chronic Toxicity[1]	Pass/Fail	1/Year	1/Year
pH	s.u.	1/Month	1/Month

[1] Chronic toxicity shall be determined as specified in section IV of this MRP.

III. WHOLE EFFLUENT TOXICITY TESTING REQUIREMENTS

A. Discharges to Inland Surface Waters, Bays, Lagoons, and Estuaries

Whole effluent toxicity (WET) refers to the overall aggregate toxic effect of an effluent measured directly by an aquatic toxicity test(s). The control of WET is one approach this Order uses to control the discharge of toxic pollutants. WET tests evaluate the 1) aggregate toxic effects of all chemicals in the effluent including additive, synergistic, and antagonistic toxicity effects; 2) the toxicity effects of unmeasured chemicals in the effluent; and 3)

variability in bioavailability of the chemicals in the effluent.

Monitoring to assess the overall toxicity of the effluent is required to answer the following questions:

- Does the effluent comply with permit effluent limitations for toxicity thereby ensuring that water quality standards are achieved in the receiving water?
- If the effluent does not comply with permit effluent limitations for toxicity, are unmeasured pollutants causing risk to aquatic life?
- If the effluent does not comply with permit effluent limitations for toxicity, are pollutants in combinations causing risk to aquatic life?

1. Chronic Toxicity

a. Effluent Limitation

i. The MDEL for chronic toxicity is exceeded and a violation will be flagged when a toxicity test results in a "Fail" in accordance with the TST approach and the percent effect is greater than or equal to 0.50.

ii. A median monthly effluent limitation is exceeded and a violation will be flagged when the median results of three independent toxicity tests, conducted within the same calendar month, and analyzed using the TST (i.e., two out of three) is a "Fail".

iii. The determination of "Pass" or "Fail" at the IWC of 100 percent effluent is determined using the TST approach described in *National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document* (EPA 833-R-10-003).

Pass

A test result that rejects the null hypothesis (Ho) below is reported as "Pass" in accordance with the TST approach:

Ho: Mean response (100 percent effluent) ≤ 0.75 x Control mean response

Fail

A test that does not reject the null hypothesis above is reported as "Fail" in accordance with the TST approach.

Percent Effect

The percent effect at the IWC is calculated for each chronic toxicity test result using the following equation:

$$\% \text{ Effect at IWC} = \frac{Mean\ Control\ Response - Mean\ IWC\ Response}{Mean\ Control\ Response}\ x\ 100$$

b. Species and Test Methods

The Discharger shall conduct chronic toxicity on a representative sample which shall include one vertebrate, one invertebrate and one aquatic plant during the first required monitoring period.

The Discharger shall follow the methods for chronic toxicity tests as established in Code of Federal Regulations, title 40, section 136.3. The U.S. Environmental Protection Agency (U.S. EPA) method manuals referenced therein include *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater*

Organisms, Fourth Edition (EPA-821-R-02-013), and *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms, Third Edition* (EPA-821-R-02-014). Additional methods for chronic toxicity monitoring are outlined in *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms, First Edition* (EPA-600-R- 95-136).

For discharges to marine and estuarine waters, the Discharger shall conduct a static renewal toxicity test with the topsmelt, *Atherinops affinis* (Larval Survival and Growth Test Method 1006.01); a static non-renewal toxicity test with the giant kelp, *Macrocystis pyrifera* (Germination and Growth Test Method 1009.0); and a static non-renewal toxicity test with the purple sea urchin, *Strongylocentrotus purpuratus*, (Embryo-larval Development Test Method). For discharges to fresh water surface water, the Discharger shall conduct a static renewal toxicity test with one vertebrate, one aquatic plant, and one invertebrate species.

If laboratory-held cultures of the topsmelt, *Atherinops affinis*, are not available for testing, then the Discharger shall conduct a static renewal toxicity test with the inland silverside, *Menidia beryllina* (Larval Survival and Growth Test Method 1006.01), found in the third edition of *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms* (EPA-821-R-02-014,2002; Table IA, 40 CFR part 136). Additional species may be used by the Discharger if approved by the San Diego Water Board.

All toxicity tests shall be conducted as soon as possible following sample collection. The 36-hour sample holding time for test initiation shall be targeted. However, no more than 72 hours shall elapse before the conclusion of sample collection and test initiation.

c. Reporting

The Discharger shall report the results of reasonable potential analysis, species sensitivity screenings, and routine toxicity tests to the San Diego Water Board as either a “Pass” or a “Fail” at the IWC, in accordance with the TST approach and provide the calculated percent effect at the IWC.

d. Chronic Toxicity Exceedance Follow-up Action

A chronic toxicity test result during routine monitoring indicating a “Fail” with a percent effect at or above 0.50 is an exceedance of the chronic toxicity limitation. The Discharger shall:

i. Implement corrective actions to identify and abate the source of toxicity within 24 hours from the time the Discharger becomes aware of the exceedance.

ii. Conduct an additional chronic toxicity test within two weeks of being notified of the failed test results. If the follow-up test results in a “Pass”, no further action is required. If the follow-up test results in a “Fail” at a percent effect greater than or equal to 0.25, the Discharger shall conduct accelerated monitoring every 2 weeks over a 6 week period. All toxicity tests conducted during an accelerated monitoring schedule shall, at a minimum, include the IWC and four additional concentrations. The additional effluent concentrations should provide useful information regarding the intensity and persistence of the toxic effect(s).

iii. If one or more of the accelerated tests results in a “Fail” with a percent effect equal to or greater than 0.25, the Discharger shall implement an approved TRE Work Plan as specified in section IV.D of this MRP. The requirement for a TRE may be waived by the San Diego Water Board on a case-be-case basis if implementation of a

previously approved TRE Work Plan is already underway for the sampled discharge point.

B. Discharges to the Pacific Ocean

1. Acute Toxicity

a. Species and Test Methods

Acute toxicity testing shall be performed using either a marine fish or invertebrate species in accordance with the procedures established by the U.S. EPA guidance manual, *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, 5th Edition, October 2002* (EPA-821-R-02-012).

b. Reporting

The Discharger shall report the results of reasonable potential analyses and routine toxicity tests to the San Diego Water Board as TUa, as defined in the Ocean Plan and in the formula below. Compliance with the acute toxicity effluent limitation shall be determined using the following formula:

TUa = 100 / 96-hour LC_{50}

where: the LC_{50} is the percent waste giving 50 percent survival of test organisms.

When it is not possible to measure the 96-hour LC_{50} due to greater than 50 percent survival of the test species in 100 percent waste, the toxicity concentration shall be calculated by the expression:

TUa = (log[100-S])/1.7

where: S is the percent survival in 100 percent effluent. If S is greater than 99 percent, TUa shall be reported as zero.

c. Acute Toxicity Exceedance Follow-up Action

An acute toxicity test result during routine monitoring greater than 0.3 TUa is an exceedance of the acute toxicity limitation. The Discharger shall:

i. Implement corrective actions to identify and abate the source of toxicity within 24 hours from the time the Discharger becomes aware of the exceedance.

ii. Conduct an additional acute toxicity test within two weeks of being notified of the failed test results. If the follow-up test results in are below 0.3 TUa, no further action is required. If the follow-up test is greater than 0.3 TUa, the Discharger shall implement an approved TRE Work Plan as specified in section IV.D of this MRP. The requirement for a TRE may be waived by the San Diego Water Board on a case-by-case basis if implementation of a previously approved TRE Work Plan is already underway for the sampled discharge point.

2. Chronic Toxicity

a. Species and Test Methods

Critical life stage toxicity tests shall be performed to measure chronic toxicity. Testing shall be performed using methods outlined in *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms* (EPAl600/R-951136, 1995) or *Procedures Manual for Conducting Toxicity Tests Developed by the Marine Bioassay Project* (State Water Board, 1996).

A screening period for chronic toxicity shall be conducted during the first monitoring event after authorization to discharge under this Order. The screening period shall

consist of a minimum of one test using a minimum of three test species with approved test protocols from the Ocean Plan. Repeat screenings and/or screening periods may be utilized by the Discharger if necessary to identify the most sensitive species. The test species shall include a fish, an invertebrate, and an aquatic plant identified from Table E-7. After the screening period, the most sensitive test species shall be used for routine monitoring during the permit cycle. Control and dilution water should be lab water as appropriate. If dilution water is different from the culture water, then culture water should be used in a second control. The sensitivity of the test organisms to a reference toxicant shall be determined concurrently with each bioassay test and reported with test results.

Table E-8. Approved Test for Chronic Toxicity (Ocean Plan)

Species	Test	Tier [1]	Reference [2]
giant kelp, *Macrocystis pyrifera*	percent germination; germ tube length	1	a, c
red abalone, *Haliotis rufescens*	abnormal shell development	1	a, c
oyster, *Crassostrea gigas*; mussels, *Mytilus spp*.	abnormal shell development; percent survival	1	a, c
urchin, *Strongylocentrotus purpuratus*; sand dollar, *Dendraster excentricus*	percent normal development	1	a, c
urchin, *Strongylocentrotus purpuratus*; sand dollar, *Dendraster excentricus*	percent fertilization	1	a, c
shrimp, *Homesimysis costata*	percent survival; growth	1	a, c
shrimp, *Mysidopsis bahia*	percent survival; fecundity	2	b, d
topsmelt, *Atherinops affinis*	larval growth rate; percent survival	1	a, c
Silversides, *Menidia beryllina*	larval growth rate; percent survival	2	b, d

[1] First tier methods are preferred for compliance monitoring.

[2] Protocol References:

a. Chapman, G.A., D.L. Denton, and J.M. Lazorchak. 1995. Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms. U.S. EPA Report No. EPA/600/R-95/136.

b. Klemm, D.J., G.E. Morrison, T.J. Norberg-King, W.J. Peltier, and M.A. Heber. 1994. Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water to Marine and Estuarine Organisms. U.S. EPA Report No. EPA-600-4-91-003.

c. SWRCB 1996. Procedures Manual for Conducting Toxicity Tests Developed by the Marine Bioassay Project. 96-1WQ.

d. Weber, C.I., W.B. Horning, I.I., D.J. Klemm, T.W. Nieheisel, P.A. Lewis, E.L. Robinson, J. Menkedick and F. Kessler 9eds). 1998. Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms. EPA/600/4-87/028. National Information Service, Springfield, VA.

b. Reporting

The Discharger shall report the results of RPA, species sensitivity screenings, and routine toxicity tests to the San Diego Water Board as TUc, as defined in the Ocean Plan and in the formula below. Compliance with the chronic toxicity effluent limitation for the Pacific Ocean shall be determined using the following formula:

TUc = 100/NOEL

Where the no observed effect level (NOEL) is expressed as the maximum percent effluent or receiving water that causes no observed effect on a test organism.

c. Chronic Toxicity Exceedance Follow-up Action

A chronic toxicity test result during routine monitoring greater than 1 TUc is an exceedance of the chronic toxicity limitation. The Discharger shall do the following:

i. Implement corrective action to identify and abate the source of toxicity within 24 hours from the time the Discharger becomes aware of the exceedance.

ii. Conduct an additional chronic toxicity test within two weeks of being notified of the effluent limit exceedance. If the follow-up test results are less than or equal to 1 TUc no further action is required. If the follow-up test results are greater than 1 TUc, the Discharger shall conduct accelerated monitoring every 2 weeks over a 6 week period.

iii. If one or more of the accelerated test results exceed 1 TUc, the Discharger shall implement an approved TRE Work Plan as specified in section IV.D of this MRP. The requirement for a TRE may be waived by the San Diego Water Board on a case-by-case basis if implementation of a previously approved TRE Work Plan is already underway for the sampled discharge point.

C. Quality Assurance (QA)

Quality assurance (QA) measures, instructions, and other recommendations and requirements are found in the test methods manual previously referenced. Additional requirements are specified as follows:

1. Effluent dilution water and control water should be prepared and used as specified in the test methods manuals, *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, Fifth Edition* (EPA-821- R-02-012) and *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms* (EPAl600/R-951136, 1995). If the dilution water is different from test organism culture water, then a second control using culture water shall also be used.

2. If organisms are not cultured in-house, then concurrent testing with a reference toxicant shall be conducted. If organisms are cultured in-house, then monthly reference toxicant testing is sufficient. Reference toxicant tests and effluent toxicity tests shall be conducted using the same test conditions (e.g., same test duration, etc.).

3. All multi-concentration reference toxicant test results must be reviewed and reported according to U.S. EPA guidance on the evaluation of concentration-response relationships found in *Method Guidance and Recommendations for Whole Effluent Toxicity (WET) Testing* (40 CFR part 136) (EPA 821-B-00-004, 2000).

4. If either the reference toxicant or effluent toxicity tests do not meet all test acceptability criteria in the test methods manual, then the Discharger shall resample and retest within 14 days.

D. Toxicity Reduction Evaluation (TRE)

1. TRE Work Plan Submittal. The Discharger shall prepare and submit a TRE Work plan to the San Diego Water Board no later than 30 days from the time the Discharger becomes aware that a TRE work plan is required by section IV.A or IV.B of this Order.

2. TRE Work Plan. The TRE Work Plan shall be in conformance with the U.S. EPA manual "Generalized Methodology for Conducting Industrial Toxicity Reduction Evaluations (EPA/60012-88/070, 1989)."

The TRE Work Plan shall include the following information:

a. A description of the actions to be undertaken by the Discharger to investigate, identify, and correct the causes of toxicity;

b. If the MDEL noncompliance has not been corrected, the amount of time it is expected to continue;

c. A description of the steps taken or planned to reduce, eliminate and prevent recurrence of the MDEL noncompliance; and

d. A schedule for completion of all activities and submission of a final report.

3. **TRE Work Plan Implementation**. The Discharger shall implement the TRE Work Plan unless otherwise directed in writing by the San Diego Water Board. The Discharger shall comply with any additional conditions set by the San Diego Water Board.

4. **TRE Progress Reports**. The Discharger shall prepare and provide written semiannual progress reports that: (1) describe the actions that have been taken toward achieving compliance with the acute or chronic toxicity limitation for the previous six months; (2) describe all activities including, data collection and other field activities which are scheduled for the next year and provide other information relating to the progress of work; (3) identify any modifications to the compliance plans that the Discharger proposed to the San Diego Water Board or that have been approved by San Diego Water Board during the previous six months; and (4) include information regarding all delays encountered or anticipated that may affect the future schedule for completion of the actions required to attain compliance with the limitation, and a description of all efforts made to mitigate those delays or anticipated delays. These progress reports shall be submitted to the San Diego Water Board by the (15th) day of June and December of each year following the adoption of this Order. Submission of these progress reports shall continue until compliance with the limitation is achieved.

5. **Toxicity Identification Evaluation (TIE)**. Based upon the magnitude and persistence of the acute and chronic toxicity, the Discharger may initiate a Toxicity Identification Evaluation (TIE) as part of a TRE to identify the causes of toxicity using the same species and test method and, as guidance, U.S. EPA manuals: *Methods for Aquatic Toxicity Identification Evaluations: Phase I Toxicity Characterization Procedures* (EPA/600/6-91 1003, 1991); *Methods for Aquatic Toxicity Identification Evaluations, Phase 1/ Toxicity Identification Procedures for Samples Exhibiting Acute and Chronic Toxicity* (EPA/600/R-92/080, 1993); *Methods for Aquatic Toxicity Identification Evaluations, Phase 1/1 Toxicity Confirmation Procedures for Samples Exhibiting Acute and Chronic Toxicity* (EPA/600/R-92/081, 1993); *and Marine Toxicity Identification Evaluation (TIE): Phase I Guidance Document* (EPA/600/R-96-054, 1996). If a TIE is undertaken, the Discharger shall prepare and submit a work plan to the San Diego Water Board containing the following elements and comply with any conditions set by the Board:

a. Criteria for initiating a TIE on a sample;

b. Roles and responsibilities of the team conducting the TIE;

c. Study design, sample treatments, and chemical analysis;

d. Data evaluation and communication;

e. Follow-up actions; and

f. A schedule for completion of all activities and submission of a final report.

E. Additional Reporting of Toxicity Monitoring Results

1. The Discharger shall submit a full laboratory report for all toxicity testing as an attachment to the monitoring report. The laboratory report shall contain: the toxicity test results; the dates

of sample collection and initiation of each toxicity test; all results for effluent parameters monitored concurrently with the toxicity test(s).

2. The Discharger shall provide the actual test endpoint responses for the control (i.e., the control mean) and the IWC (i.e., the IWC mean) for each toxicity test to facilitate the review of test results and determination of reasonable potential for toxicity by the permitting authority.

3. The Discharger shall notify the San Diego Water Board in writing within 14 days of receipt of any test result with an exceedance of the toxicity limit. This notification shall describe actions the ischarger has taken or will take to investigate, identify, and correct the causes of toxicity; the status of actions required by this permit; and schedule for actions not yet completed; or reason(s) that no action has been taken.

IV. RECEIVING WATER MONITORING REQUIREMENTS

The receiving water monitoring requirements set forth below are designed to measure the effects of the groundwater extracton discharge on the receiving waters. The receiving water monitoring program is intended to answer the following questions:

- Does the receiving water meet water quality standards?
- Are the receiving water conditions getting better or worse over time?
- What is the relative contribution of the Facility discharge to pollution in the receiving water

A. Sample Collection

1. The Dischargers shall obtain an upstream sample of the receiving water if the discharge is to a river or stream; or from an area unaffected by the discharge for other receiving waters, and analyze the sample for turbidity and report the results monthly.

2. For discharges to surf zones within the Pacific Ocean, in lieu of obtaining turbidity samples in unaffected areas, the Discharger shall submit a monthly report describing (e.g., color, extent, duration, etc.) any turbidity plumes caused by the discharge.

3. Dischargers to Chollas Creek shall monitor once a year directly upstream and approximately 100 feet downstream of the discharge location for total hardness, expressed as calcium carbonate CaCO3, copper, lead, and zinc. All metals shall be reported as total recoverable metals.

4. If a representative sample cannot be obtained upstream of the proposed discharge location, the Discharger shall obtain the sample 100 feet downstream within 100 feet of the proposed discharge location. If the receiving water is comprised entirely of effluent, the Discharger may analyze the effluent for hardness in lieu of the receiving water.

5. The San Diego Water Board may increase receiving water monitoring requirements in the NOA on a case-by-case basis. Additional receiving water monitoring for individual discharges may be required, where necessary, to demonstrate that during the term of the discharge, applicable surface water quality objectives are being maintained.

V. REPORTING REQUIREMENTS

A. General Monitoring and Reporting Requirements

1. The Discharger shall comply with all Standard Provisions (Attachment D) related to monitoring, reporting, and recordkeeping.

2. The Discharger shall report all instances of noncompliance at the time monitoring reports are submitted.

B. Self-Monitoring Report (SMR) Submittal

1. At any time during the term of this Order, the State or San Diego Water Board may notify the Discharger to electronically submit Self-Monitoring Reports (SMRs) using the State Water Board's California Integrated Water Quality System (CIWQS) Program web site (http://www.waterboards.ca.gov/water_issues/programs/ciwqs/). Until such notification is given, the Discharger shall submit hard copy SMRs. The CIWQS web site provides additional directions for SMR submittal in the event there will be service interruption for electronic submittal..

   SMRs must be signed and certified as required by the Standard Provisions (Attachment D). The Discharger shall maintain sufficient staffing and resources to ensure SMR submittals are complete and timely. This includes provision for training and supervision of individuals on how to prepare and submit SMRs.

2. The Discharger shall report in the SMR the results for all monitoring specified in this MRP under sections II through V. The Discharger shall submit monthly SMRs including the results of all required monitoring using U.S. EPA-approved test methods or other test methods specified in this Order. SMRs are to include all new monitoring results obtained since the last SMR was submitted. If the Discharger monitors any pollutant more frequently than required by this Order, the results of this monitoring shall be included in the calculations and reporting of the data submitted in the SMR.

3. Monitoring periods and SMR submittals for all required monitoring shall be completed according to the following schedule:

Table E-9. Monitoring Periods and Reporting Schedule

Sampling Frequency/ Report Type	Monitoring Period Begins On…	Monitoring Period	SMR Due Date
Daily Weekly Monthly	First day of calendar month following permit effective date or on permit effective date if that date is first day of the month	1st day of calendar month through last day of calendar month	By the 30th day of the following month
Quarterly	Closest of January 1, April 1, July 1, or October 1 following (or on) permit effective date	January 1 through March 31 April 1 through June 30 July 1 through September 30 October 1 through December 31	April 30 July 30 October 30 January 30
Semiannual (once every 6 Months)	Closest of January 1 or July 1 following (or on) permit effective date	January 1 through June 30 July 1 through December 31	July 30 January 30
Annual	January 1 following (or on) permit effective date	January 1 through December 31	March 1

4. **Report Protocols.** The Discharger shall report with each sample result the applicable reported Minimum Level (reported ML) and the current Method Detection Limit (MDL), as determined by the procedure in 40 CFR part 136.

   The Discharger shall report the results of analytical determinations for the presence of chemical constituents in a sample using the following protocols:

a. Sample results greater than or equal to the reported ML shall be reported as measured by the laboratory (i.e., the measured chemical concentration in the sample).

b. Sample results less than the reported ML, but greater than or equal to the laboratory's MDL, shall be reported as "Detectable, but Not Quantified", or DNQ. The estimated chemical concentration of the sample shall also be reported.

For purposes of data collection, the laboratory shall write the estimated chemical concentration next to DNQ. The laboratory may, if such information is available, include numerical estimates of the data quality for the reported result. Numerical estimates of data quality may be percent accuracy (± a percentage of the reported value), numerical ranges (low to high), or any other means considered appropriate by the laboratory.

c. Sample results less than the laboratory's MDL shall be reported as "Not Detected" or ND.

d. The Discharger shall instruct laboratories to establish calibration standards so that the ML value (or its equivalent if there is differential treatment of samples relative to calibration standards) is the lowest calibration standard. At no time is the Discharger to use analytical data derived from extrapolation beyond the lowest point of the calibration curve.

5. **Compliance Determination.** Compliance with effluent limitations for reportable pollutants shall be determined using sample reporting protocols defined above and in Attachment A of this Order. For purposes of reporting and administrative enforcement by the San Diego Water Board and State Water Board, the Discharger shall be deemed out of compliance with effluent limitations if the concentration of the reportable pollutant in the monitoring sample is greater than the effluent limitation and greater than or equal to the reported Minimum Level (ML).

6. **Multiple Sample Data.** When determining compliance with a measure of central tendency (arithmetic mean, geometric mean, median, etc.) of multiple sample analyses and the data set contains one or more reported determinations of "Detected, but Not Quantified" (DNQ) or "Not Detected" (ND), the Discharger shall compute the median in place of the arithmetic mean in accordance with the following procedure:

   a. The data set shall be ranked from low to high, ranking the reported ND determinations lowest, DNQ determinations next, followed by quantified values (if any). The order of the individual ND or DNQ determinations is unimportant.

   b. The median value of the data set shall be determined. If the data set has an odd number of data points, then the median is the middle value. If the data set has an even number of data points, then the median is the average of the two values around the middle unless one or both of the points are ND or DNQ, in which case the median value shall be the lower of the two data points where DNQ is lower than a value and ND is lower than DNQ.

7. **Violations.** The SMRs shall clearly identify any violations of this Order and its cause; the period of noncompliance, including exact dates and times; and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance violations of this Order.

8. **Report Format**. The SMR shall be formatted in accordance with the following requirements:

   a. All reported data shall be arranged in a tabular format. The data shall be summarized to clearly illustrate whether the discharge is in compliance with the effluent limitations of

this Order. The Discharger is not required to duplicate the submittal of data that is entered in a tabular format within CIWQS. When electronic submittal of data is required and CIWQS does not provide for entry into a tabular format within the system, the Discharger shall electronically submit the data in a tabular format as an attachment.

b. The Discharger shall attach a cover letter to the SMR. The information contained in the cover letter shall clearly identify violations of the Order as specifed in section B.7 above. All regulatory documents, submissions, materials, and correspondence that are normally submitted as hard copies shall be converted to a searchable Portable Document Format (PDF). Data may be submitted in Excel spreadsheets. Documents that are less than 50 MB should be emailed to SanDiego@waterboards.ca.gov. Documents that are 50MB or larger should be transferred to a disk and mailed to the address listed above.

c. SMRs must be submitted to the San Diego Water Board, signed and certified as required by the Standard Provisions of this Order (Attachment D, section V.B), to the address listed below:

California Regional Water Quality Control Board, San Diego Region
2375 Northside Drive, Suite 100
San Diego, CA 92108
Attn: Groundwater Extraction to San Diego Region
Core Regulatory Unit
Self Monitoring Report

C. Annual Summary of Monitoring Data

If the duration of discharge is six months or more, the Discharger shall submit a summary of monitoring data for the previous year to the San Diego Water Board prior to March 1st of each year. The annual report shall contain both tabular and graphical summaries of the previous year's data.

D. Report of Discharge Termination

When the groundwater extraction discharge is terminated, the Discharger is required under section II.F of this Order to submit a written request, referred to as a Notice of Termination (NOT), to the San Diego Water Board stating the termination date of the discharge and requesting termination of enrollment.

ATTACHMENT F – FACT SHEET

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ATTACHMENT F – FACT SHEET

As described in section II.C of the Order, the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) incorporates this fact sheet as findings of the San Diego Water Board supporting the issuance of this Order. This fact sheet includes the legal requirements and technical rationale that serve as the basis for the requirements of this Order.

I. DISCHARGE INFORMATION

A. Introduction

This Order is an NPDES Order that regulates groundwater extraction discharges to surface waters within the San Diego Region. Groundwater extraction discharges regulated under this Order include untreated and treated extracted groundwater from groundwater control systems employed in construction dewatering projects, foundation dewatering projects, trench and ditch dewatering projects, storage tank removal projects, monitoring wells, groundwater remediation projects, permanent[1] groundwater drainage and seepage control projects to surface waters, and other similar activities. Groundwater extraction discharges regulated under this Order are comprised solely of groundwater that has been determined by the San Diego Water Board, through a reasonable potential analysis, to not adversely affect beneficial uses of the receiving waters when properly treated and managed through best management practices pursuant to the terms and condtions of this Order. Groundwater extraction discharges associated with a specfic project regulated under this Order may be single discharges at one identified location or multiple groundwater discharges at multiple locations to waters of the U.S. within the San Diego Region.

Title 40 of the Code of Federal Regulations (40 CFR) section 122.28 provides for the issuance of general permits to regulate discharges of waste which result from similar operations, are the same type of waste, require the same effluent limitations, requires similar monitoring, and are more appropriately regulated under a general permit rather than individual permits. Existing and proposed discharges of groundwater extraction waste to waters within the San Diego Region from groundwater control systems employed in construction dewatering projects, foundation dewatering projects , trench and ditch dewatering projects, storage tank removal projects, monitoring wells, groundwater remediation projects, permanent groundwater drainage and seepage control projects to surface waters and other similar activities: 1) result from similar operations (all involve extraction and discharge of groundwater), 2) are the same type of waste (all are groundwater), 3) require similar effluent limitations for the protection of beneficial uses, 4) require the issuance of a permit in a short time period because the nature of most projects is short term, 5) require similar monitoring, and 6) are more appropriately regulated under a general permit rather than an individual permit.

Discharges of groundwater to receiving waters within the San Diego Region that obtain coverage under this Order are required to comply with the effluent limitations, discharge prohibitions, receiving water limitations and monitoring requirements contained in this Order and additional requirements established in a Notice of Applicability (NOA) in a manner that protects the beneficial uses of the receiving waters.

[1]The permanent groundwater extraction discharge from the One America Plaza dewatrering system in the City of San Diego, California that was previously regulated under Order No. R9-2007-0034 is not subject to this exclusion and is eligible for coverage under this Order, subject to the terms and conditons of this Order.

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B. Background

In 1972, the Federal Water Pollution Control Act, currently referred to as the federal Clean Water Act (CWA), was amended to provide that the discharge of pollutants to waters of the U.S. from any point source is prohibited, unless the discharge is in compliance with a NPDES permit. The federal regulations allow authorized states to issue either general permits or individual permits to regulate discharges of pollutants to waters of the U.S. On April 23, 1990, the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) issued a general permit for the temporary discharge of groundwater extraction waste discharges to San Diego Bay (Order No. 90-31). Order No. 90-31 has been reissued three times on May 16, 1995 (Order No. 95-25), June 14, 2000 (Order No. 2000-90), and October 10, 2007 (Order No. R9-2007-0034). In addition, on January 28, 1991, the San Diego Water Board issued a general permit for groundwater remediation and dewatering wastes discharges to surface waters within the San Diego Region except for San Diego Bay (Order No. 91-10). Order No.91-10 was reissued three times on June 13, 1996 (Order No. 96-41), October 10, 2001 (Order No. 2001-96), and March 12, 2008 (Order No. R9-2008-0002).

Due to the similarities in discharges and operations addressed in each general permit (groundwater extraction discharges for remediation, and various types of dewatering projects), and to provide consistent requirements throughout the San Diego Region for similar discharges, and reduce the administrative burden of two general permits for similar facilities/operations, the San Diego Water Board has elected to issue a single general permit for the discharge of groundwater extraction and dewatering to all surface waters within the San Diego Region. This single Order addresses both temporary discharges of groundwater extraction to the San Diego Bay[2], and discharges of groundwater remediation and dewatering wastes either temporary or permanent to all other receiving waters within the San Diego Region.

Order No. 2000-90 regulated temporary groundwater extraction discharges to San Diego Bay and prohibited permanent groundwater extraction discharges. However, Order No. 2000-90 excluded three pre-existing permanent groundwater extraction discharges from the prohibition that were regulated under Order No. 95-25 when Order No. 2000-90 was adopted. The three groundwater extraction discharges were the City of San Diego, San Diego Convention Center permanent dewatering system, the Embassy Suites Hotel permanent dewatering system, and the One America Plaza permanent dewatering system. On March 12, 2003, the City of San Diego was issued an individual NPDES permit for the City of San Diego, San Diego Convention Center permanent dewatering system discharge. Order No. R9-2007-0034 continued to regulate the Embassy Suites Hotel and One America Plaza permanent dewatering system discharges and to exclude them from the prohibition against permanent groundwater extraction discharges to San Diego Bay.

As of the date of adoption of this Order, the only existing permanent groundwater extraction discharge to San Diego Bay regulated under Order No. R9-2007-0034 is the One America Plaza permanent dewatering system discharge and it may continue to be regulated under the terms and conditons of this Order or alternatively may be regulated under an individual NPDES permit.

[2] The permanent groundwater extraction discharge from the One America Plaza dewatering system in the City of San Diego, California that was previously regulated under Order No. R9-2007-0034 is not subject to this exclusion and is eligible for coverage under this Order, subject to the terms and conditons of this Order.

C. Discharge Description

Underground excavation projects often require extraction of groundwater on a temporary or permanent basis to maintain dry conditions at the site or reduce structure uplift pressures. Depending on soil types and site history, extracted groundwater may contain pollutants from a variety of sources, including but not limited to: hydrogen sulfide from decomposing organic materials; petroleum hydrocarbons from leaking underground storage tanks and fuel lines; solvents and metals from industrial practices that historically led to discharges or spills; bacteria and viruses from sewage wastewater collection system leakage; and nutrients, fertilizer (phosphorus and nitrogen compounds), herbicides, and pesticides from runoff.

When groundwater is extracted from wells or sumps, as occurs during some dewatering schemes, hydraulic gradients are generated, which draws the groundwater toward the well or sump. If dewatering is carried out on or near a site which has a historic legacy of groundwater pollution, the hydraulic gradients may cause pollutants from the existing contamination to move and migrate toward the dewatering system. The pollutants may emerge in the groundwater and the subsequent discharge of the groundwater, without adequate treatment to reduce pollutant levels can adversely affect beneficial uses of the surface receiving waters.

In addition to construction related groundwater extraction discharges, groundwater remediation projects may also require the discharge of treated extracted groundwater to surface waters. The extraction of contaminated groundwater with subsequent treatment to reduce pollutant levels is a widely used ground water remediation technology. In this process contaminated ground water is brought to the surface and is coupled with physical, biological, or chemical treatment processes to reduce pollutant levels prior to discharge to a surface water body.

D. Summary of Previous Requirements

Dischargers regulated under Order Nos. R9-2007-0034 and R9-2008-0002 as well as new similarly situated Dischargers are expected to seek coverage under this Order.

1. Order Nos. R9-2007-0034 and R9-2008-0002 established water quality-based effluent limitations (WQBELs) for extracted groundwater discharges to inland surface waters, bays and harbors (excluding San Diego Bay), San Diego Bay (and tributaries), lagoons and estuaries, and the surf zone of the Pacific Ocean. The effluent limitations were based on applicable water quality criteria/objectives, as specified in the following applicable State water quality control plans:

a. The California Toxics Rule (CTR) and National Toxics Rule (NTR) as specified in the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (2005)(SIP);

b. The Water Quality Control Plan for the San Diego Basin (Basin Plan) (1995);

c. The Water Quality Control Policy for the Enclosed Bays and Estuaries of California; and

d. The Water Quality Control Plan, Ocean Waters of California (Ocean Plan) (2005).

2. Order Nos. R9-2007-0034 and R9-2008-0002 also contained the following discharge prohibitions:

a. The discharge of wastewater at a location, or in a manner different from that described in section I, the NOI, or the NOA is prohibited.

b. The discharge of wastewater shall not create or cause conditions of nuisance or pollution.

c. The discharge shall not cause, have a reasonable potential to cause, or contribute to an in-stream excursion above any applicable criterion promulgated by U.S. EPA pursuant to section 303 of the CWA, or water quality objective adopted by the State or San Diego Water Boards.

d. The discharge of waste to areas designated by the State Water Board as being of special (ASBS) biological significance is prohibited. Discharges shall be located a sufficient distance from such designated areas to assure maintenance of natural water quality conditions in these areas.

e. The discharge of groundwater extraction wastes from a specific site in excess of the flowrate specified in the NOA from the San Diego Water Board is prohibited, unless the enrollee obtains a revised discharge NOA authorizing an increased flowrate.

f. The addition of pollutants to extracted groundwater to be discharged to surface waters within the San Diego Region/San Diego Bay is prohibited. The only exception to this prohibition is that chemicals may be added to extracted groundwater to control biofouling in treatment systems, provided that extracted groundwater discharged meets the effluent limitations established for such chemicals, and in the discharge NOA issued by the San Diego Water Board.

g. The discharge of groundwater extraction wastes to surface waters within the San Diego Region is prohibited unless after receiving a complete NOI, the Regional Board has provided the Discharger with a written NOA identifying the discharge subject to waste discharge requirements.

h. Discharges of wastes to San Diego Bay from permanent groundwater extraction operations are prohibited except for permanent dewatering systems for the Embassy Suites Hotel and One America Plaza until such time that these Dischargers receive an individual permit (Order No. R9-2007-0034 only).

i. The discharge of groundwater extraction wastes from a groundwater remediation operation after the date groundwater has been remediated to the satisfaction of the San Diego Water Board is prohibited.

j. Compliance with Discharge Prohibitions contained in the Basin Plan is also required as a condition.

k. Discharges of wastes in a manner, or to a location which have not been specifically regulated are prohibited.

l. The discharge of any radiological, chemical, or biological warfare agent, or high level radiological waste is prohibited.

m. The dumping or deposition, from shore, of oil, garbage, trash, or other solid municipal, industrial, or agricultural waste directly into waters subject to tidal action or adjacent to waters subject to tidal action in any manner which may permit it to be washed into waters subject to tidal action is prohibited.

n. The dumping or deposition of chemical agents or explosives into waters subject to tidal action is prohibited.

o. The discharge of copper within extracted groundwater to the Shelter Island Basin watershed or the Shelter Island Basin within San Diego Bay is prohibited (Order No. R9-2007-0034 only).

p. The discharge of diazinon from extracted groundwater to Chollas Creek or from Chollas Creek to San Diego Bay is prohibited (Order No. R9-2007-0034 only).

II. PERMIT INFORMATION

A. Eligibility Criteria

Discharges covered by this Order are limited to discharges of extracted groundwater from groundwater control systems employed in construction dewatering projects, foundation dewatering projects, trench and ditch dewatering projects, storage tank removal projects, monitoring wells, groundwater remediation projects, permanent groundwater drainage and seepage control projects to surface waters other than San Diego Bay and other similar activities discharging to surface waters.

Permanent groundwater extraction discharges to the San Diego Bay are not eligible for coverage under this Order, with the exception of the One America Plaza permanent dewatering system. Permanent groundwater extraction discharges for the purposes of this Order refers to long term discharges from groundwater control systems for completed structures needed to lower groundwater levels, reduce hydrostatic pressure or control infiltration and leakage of groundwater into below ground completed structures.

Order No. 2000-90 established requirements that recognized the capacity of San Diego Bay to assimilate pollutants is limited. In order to protect the beneficial uses of San Diego Bay waters from excessive loading of pollutants that would be a result of increasing numbers of waste discharges to San Diego Bay, groundwater extraction waste discharges to San Diego Bay from permanent operations was prohibitied. This Order retains the limited exception for One America Plaza to obtain coverage to continue permanent discharges of dewatering wastes. The capacity of San Diego Bay to assimilate pollutants continues to be limited and the continued prohibition of discharges from permanent groundwater extraction operations to San Diego Bay under this Order will reduce the potential number and duration of discharges to San Diego Bay as in accordance with underlying principles of the federal Clean Water Act (Section 101(a)(1)) and the Water Quality Control Policy for Enclosed Bays and Estuaries of California.

Dischargers eligible for coverage under this Order must meet the following criteria:

1. The groundwater extraction discharge must be to surface waters within the San Diego Region, as set forth in secton I of this Order. Groundwater extraction discharges include untreated or treated extracted groundwater from groundwater control systems employed in construction dewatering projects, foundation dewatering projects, trench and ditch dewatering projects, storage tank removal projects, monitoring wells, groundwater remediation projects, permanent groundwater drainage and seepage control projects to surface waters other than San Diego Bay[3] and other similaractivities.
2. The groundwater extraction discharge must be comprised solely of groundwater that has been determined by the San Diego Water Board through a RPA to not adversely affect beneficial uses of the receiving waters when properly treated andmanaged through best management practices (BMPs) pursuant to the terms and condtions of this Order.
3. Groundwater extraction discharges regulated under this Order may be single discharges at one identified location or multiple groundwater discharges at multiple locations to surface waters throughout the San Diego Region.

[3] Permanent groundwater extraction discharges from groundwarter extraction activities at One America Plaza in the City of San Diego, California that were previously regulated under Order No. R9-2007-0034 are not subject to this exclusion and are eligible for coverage under this Order, subject to the terms and conditons of the Order.

This Order does not regulate any of the following groundwater extraction discharges:

1. Groundwater extraction discharges that are not within the scope of this Order as described in section I and/or are not authorized by a NOA issued by the San Diego Water Board Executive Officer;
2. Permanent groundwater extraction discharges to San Diego Bay and its tributaries under tidal influence except as provided in section I of this Order;
3. Passive discharges of groundwater that flow by gravity from footing drains, foundation drains, building perimeter drains, and other similar groundwater control sources;
4. Direct groundwater extraction discharges into areas designated by the State Water Resources Control Board as an ASBS;
5. Groundwater extraction discharges that are comingled with other non-groundwater wastewater flows or types of waste;
6. Groundwater extraction discharges determined by the San Diego Water Board to be sufficiently regulated by another NPDES permit including but not limited any one of the following:
    a. Order No.2006-0008-DWQ, NPDES No. CAG990002, *General National Pollutant Discharge Elimination System (NPDES) Permit For Discharges From Utility Vaults And Underground Structures To Surface Waters,* and any reissuance;
    b. Order No. R9-2013-0001, NPDES No. CAS0109266, *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region (MS4 Permit)* , and any reissuance*;*
    c. Order No. 2012-0011-DWQ, NPDES No. CAS000003, National Pollutant Discharge Elimination System (NPDES) Permit, Waste Discharge Requirements (WDRS) for State of California, Department of Transportation, and any reissuance;
    d. Order No.2014-0194-DWQ, NPDES No. CAG140001, *Statewide General National Pollutant Discharge Elimination System (NPDES) Permit For Drinking Water System Discharges To Waters of the United States,* and any reissuance; or
    e. Order No. R9-2013-0001-DWQ, National Pollutant Discharge Elimination System (NPDES) General Permit No. CAS000004 and Waste Discharge Requirements (WDRs) for Storm Water Discharges from Small Municipal Separate Storm Sewer Systems (MS4s), and any reissuance. The Discharger must have an established agreement with the Small MS4 Copermitee having jurisdiction to discharge into its MS4 and the San Diego Water Board must concur that the agreement provides sufficient regulation of the groundwater extraction discharge through the Small MS4 General Permit.
7. Groundwater extraction discharges in compliance with the the instructions of an On-Scene Coordinator pursuant to 40 CFR part 300 (*The National Oil and Hazardous Substances Pollution Contingency Plan*) or 33 CFR section 153.10(e) (Pollution by Oil and Hazardous Substances);
8. Groundwater extraction discharges into a sanitary sewer sytem leading to a federally, publically, or privately owned treatment works; or
9. Groundwater extraction discharges that do not discharge to waters of the U.S. or otherwise require an NPDES permit under federal law.

10. Groundwater extraction discharges from a post-construction single family residential home or lot, unless such a discharge has been determined to cause or contribute to a condition of pollution or nuisance. Such determination may be made by the San Diego Water Board or by the appropriate local agency with the San Diego Water Board's concurrence. In general, this Order's requirements for treatment, monitoring, and reporting are unnecessarily burdensome for a single family home owner who discharges low volumes of groundwater. Where necessary, these homeowners should be encouraged to retain, infiltrate, reuse, or evaporate the extracted groundwater, rather than discharging to waters of the U.S. The San Diego Water Board retains the discretion to require such a discharger to enroll in this Order if the discharge has the potential to cause or contribute to a condition of pollution or nuisance. Such determinations will be made on a case by case basis.

B. Notice of Intent (NOI)

The purpose of this Order is to facilitate regulation of discharges from groundwater extraction activities as described in section I of this Fact Sheet. To obtain coverage under this Order , the Discharger must submit a Notice of Intent (NOI) Form, a project map(s), an initial pollutant scan (Appendix C-1), and first annual fee. The NOI Form must be completed in accordance with the instructions and signed to be valid. Signing the certification on the NOI Form signifies that the Discharger intends to comply with the terms and conditions of this Order.

To obtain coverage under this Order the Discharger must submit the following information to the San Diego Water Board:

1. NOI. A completed NOI Form (Attachment C), with all specified attachments.

2. Treatment Facility Certification Report. If the groundwater extraction discharge will need treatment to comply with the effluent limitations, then the NOI must include a report describing and certifying the adequacy of each component of the treatment facilities prepared by a California licensed professional engineer, competent and proficient in the field pertinent to the report and qualified to prepare such report. The report shall also certify the following:

a. All treatment facility startup and operation instruction manuals are adequate and available to operating personnel;

b. Adequate treatment facility maintenance and testing (if treatment facilities are on "standby") schedules are included in the treatment facility operations manual;

c. Treatment facilities and appurtenances will be be fully operational, as designed prior to the commencement of discharge ; and

d. Influent and effluent sampling locations or ports are located in areas where samples representative of the waste stream to be monitored can be obtained.

e. The design engineer shall affix his/her signature and engineering license number to this certification report

3. Disposal Alternative Analysis. Consistent with section 2, Article X of the California Constitution, and section 275 of the CWC on preventing waste and unreasonable use of waters of the state, this San Diego Water Board encourages, wherever practical, water conservation and/or reuse of wastewater. To obtain coverage under this Order, the Discharger must first investigate the feasibility of a range of alternative disposal methods to the proposed extracted groundwater discharge to surface waters including reasons and conclusions as to why it is technically or economically infeasible to implement these alternative disposal methods. Alternative disposal methods include but are not limited to:

a. Collection and recycling of the extracted groundwater for a direct beneficial use, including landscape or agricultural irrigation, dust control, soil compaction during earthwork activities, or other appropriate uses in lieu of potable drinking water supplies;

b. Reinjection of the extracted groundwater to the subsurface;

c. Discharge of the extracted groundwater to an MS4 that employs low impact development practices or flows into storm water capture basins to recharge groundwater; and

d. Discharge of the extracted groundwater to a sanitary sewer system leading to a federally, publicly, or privately owned treatment works.

4. **MS4 Operator Notification**. Dischargers proposing to discharge extracted groundwater to an MS4 shall include with their NOI, documentation demonstrating that they have notified the MS4 operator at the point of proposed discharge into the MS4. This requirement encourages communication between Dischargers enrolled under this Order and local agencies responsible for MS4s in an effort to reduce misunderstandings and concerns over the types of discharges covered by this Order. Consistent with CWC section 13002 and 40 CFR section 122.5(c), this Order is not intended to affect any separate legal authority an MS4 operator may have to prohibit a discharge or to require the Discharger to obtain any permits or approvals from the MS4 operator before initiating discharges into the MS4.

5. **Reasonable Potential Analysis**. The results of a reasonable potential analysis described in Appendix C-1 of this Order provides direction to the Discharger and the San Diego Water Board for determining if a pollutant in the proposed groundwater extraction discharge causes, has the reasonable potential to cause, or contributes to an excursion above any applicable State water quality objective or federal water quality criteria in accordance with 40 CFR section 122.44 (d)(1)(iii).

6. **Monitoring and Reporting Program (MRP)**. A sampling, monitoring, and reporting program, as specified in section III.A of the MRP in Attachment E of this Order.

7. **Project Map**. A project map(s) that shows the essential features of the groundwater extraction system within the San Diego Water Board boundary, identifies all known groundwater contamination sites and plumes within a half mile of each groundwater extraction point to be used in the dewatering project, the corresponding surface water, and if discharging into a MS4, the storm drain to which water will be discharged.

8. **Supplemental Informaton**. Upon request, the Discharger must submit any additional information that the San Diego Water Board deems necessary to determine whether the discharge meets the criteria for coverage under this Order, and to prescribe an appropriate MRP.

9. **Application Fee**. Payment of the application fee, equal to the first annual fee, made payable to "SWRCB." The fee for enrollment under this Order is based on California Code of Regulations (CCR), title 23, division 3, chapter 9, Waste Discharge Reports and Requirements, article 1, Fees which is available at http://www.waterboards.ca.gov/resources/fees/#npdes.

   The NOI form is included in this Order as Attachment C. The NOI, including map(s), the application fee, and other attachments, must be submitted to the following address:

   San Diego Water Board

2375 Northside Drive, Suite 100
San Diego, CA 92108

Attn: Groundwater Extraction Permit
Source Control Regulation Unit
NOTICE OF INTENT

The San Diego Water Board is implementing a Paperless Office system to reduce our paper use. Please convert all submissions with attachments to a searchable Portable Document Format (PDF) and submit the documents on a compact disk.

C. Deadline for NOI Submittal

a. Existing Dischargers that were previously authorized to discharge under Order Nos. R9-2007-0034 and R9-2008-0002 must submit a complete NOI package; the NOI package must include all required attachments including the alternative disposal analysis and, if applicable, notification to the MS4 owner, to the San Diego Water Board by March 24, 2016. Existing Dischargers applying for coverage under this Order are also required to collect representative untreated groundwater sample(s) and conduct the reasonable potential analysis described in Appendix C-1 of this Order to provide direction to the Discharger for determining if a pollutant in the proposed groundwater extraction discharge causes, has the reasonable potential to cause, or contributes to an excursion above any applicable State water quality objective or federal water quality criteria in accordance with 40 CFR section 122.44 (d)(1)(iii). The Discharger must submit the NOI package to the San Diego Water Board by March 25, 2016, **or else risk losing permit coverage**. Existing discharges will be considered ineligible for regulation under this Order, if the analytical test results of any constituent other than the pollutants with effluent limitations in section IV of this Order exceeds the applicable water quality objective/criteria screening values described in Appendix C-1 to Attachment C of this Order.

b. New Dischargers, previously unregulated under Order No. R9-2007-0034 or Order No. R9-2008-0002, must file a complete NOI package at least 60 days before the proposed commencement of the discharge.

D. Failure to Submit an NOI for an Existing Discharge

A Discharger, regulated under Order No. R9-2007-0034 or Order No. R9-2008-0002 prior to adoption of this Order, failing to submit a complete NOI no later than nine months after adoption of this Order, will risk losing permit coverage and may be subject to an enforcement action, including assessment of administrative or judicial penalties, as allowed pursuant to applicable provisions of the CWA and the CWC including section 13261 thereof.

E. Coverage under this Order

1. Notice of Applicability (NOA)

Upon receipt of a complete NOI submittal as described in section I.B of this Order, the San Diego Water Board shall determine the applicability of this Order to the propsed groundwater extracton discharge. The NOI and each element thereof are subject to San Diego Water Board approval. If the discharge is eligible for coverage under this Order, the San Diego Water Board will issue a NOA, to the Discharger, authorizing the discharge under the terms and conditions of this Order. The NOA will prescribe specified monitoring and reporting requirements, and any other project specific requirements due to the site specific circumstances of the discharge. The San Diego Water Board may issue an NOA

and require a Discharger to comply with the conditions of this Order even if the Discharger has not submitted an NOI to be covered by this Order, as required in section II.B of this Order.

2. Notice of Discharge Commencement

New Dischargers must notify the San Diego Water Board of the time and date for commencement of the new groundwater extracton discharge(s) authorized under the NOA at least seven days prior to initiating a discharge.

3. Notice of Applicability (NOA) Modificaton

The Discharger may submit a written request for modification of an NOA to to the San Diego Water Board. The request for NOA modification shall include "Request for NOA Amendment" in the subject line, the Waste Discharge Identification Number (WDID) assigned to the Discharger in the original NOA, the name and address of the Discharger, all of the information the Discharger believes is necessary for the San Diego Water Board to evaluate the request for modification, and shall be signed and certified by the Discharger in accordance with the signatory requirements in Attachment D, Standard Provisions section V of this Order. A request for modification of an NOA does not require resubmittal of the entire NOA package, but the San Diego Water Board may ask for supplemental information as necessary to determine if the requested modification is appropriate. The submittal of a request by the Discharger for modification of the NOA does not stay any condition of this Order and the Discharger shall continue to comply with this Order and the NOA until further notice from the San Diego Water Board.

F. Notice of Exclusion (NOEX)

The San Diego Water Board may issue a Notice of Exclusion (NOEX), which denies coverage under this Order because the proposed groundwater extraction discharge is not covered within the scope of this Order, terminates permit coverage of an existing discharge for cause, or requires the Discharger to submit an application for an individual NPDES permit or, for discharges to land, WDRs. An NOEX will indicate that the discharge is not eligible for coverage under this Order and state the reasons why.

G. Notice of Termination (NOT)

To terminate coverage under this Order, the Discharger must submit a complete and accurate Notice of Termination (NOT), to the San Diego Water Board. The NOT provides notice that the Discharger has ceased the discharge of extracted groundwater associated with the groundwater control activities at the site under this Order. The Discharger's coverage under this Order will terminate on the date specified in a coverage termination acknowledgment notice issued by the San Diego Water Board and the Discharger will no longer be authorized to discharge extracted groundwater under this Order. The San Diego Water Board's coverage termination notice in no way prevents the Board from taking enforcement action for any violations of the Order by the Discharger.

Prior to receving the coverage termination notice the Discharger must continue to comply with the requirements of this Order including payment of any applicable fees and outstanding invoices and submittal of any required reports. The Discharger will also continue to be subject to enforcement action on any existing violations of this Order both prior to and after issueance of the coverage termination notice.

H. Change of Authorization

Eligible Dischargers already covered under other NPDES permits for groundwater extraction discharges may submit a complete NOI for coverage under this Order. Dischargers who submit a complete NOI under this Order are not required to submit an individual permit application. The San Diego Water Board may request additional information and may determine that a Discharger is not eligible for coverage under this Orderand should be regulated under an individual or other general NPDES permit or, for discharges to land, under WDRs. If the San Diego Water Board issues a separate NPDES permit or WDRs, then the applicability of this Order to the discharge is immediately terminated on the effective date of such NPDES permit or WDRs.

I. Transferring Ownership

The NOA authorizing coverage for the discharge of extracted groundwater under this Order for a specific groundwater control project is not transferable. In the event of any planned change in ownership of land or waste discharge facilities presently owned by the Discharger, the Discharger must notify the new succeeding owner, by letter 120 days prior to property transfer, of the of the obligation to apply for coverage under this Order for the extracted groundwater discharge. A copy of this notification shall be promptly submitted to the San Diego Water Board. Additionally, the Discharger must submit a NOT to the San Diego Water Board. The new succeeding owner or operator must submit a new NOI package applying for coverage under this Order prior to discharging extracted groundwater.

J. Basis for Fee

Section 2200 (Annual Fee Schedule) of title 23 of the CCR requires that all discharges subject to waste discharge requirements shall pay an annual fee.

K. Discharge Points and Receiving Waters

Groundwater extraction discharges associated with a specific project regulated under this Order may be single discharges at one identified location or multiple groundwater discharges at multiple locations to surface waters throughout the San Diego Region. The applicable receiving waters and discharge points must be identified in the completed NOI.

The San Diego Region has continuous and ephemeral rivers and streams, bays, estuaries, lagoons, and approximately 85 miles of Pacific Ocean coastline. No receiving waters covered under the terms and conditions of this Order have been designated as outstanding national resource waters by the State Water Board. However, Heisler Park Ecological Reserve, located in coastal waters near the City of Laguna Beach and the San Diego-La Jolla Ecological Reserve, and the San Diego Marine Life Refuge, located in coastal waters near La Jolla a community of the City of San Diego, have been designated an ASBS by the State Water Board. The Water Quality Control Plan for Ocean Waters of California (Ocean Plan) contains the following prohibitions applicable to ASBS:

> *"Waste shall not be discharged to areas designated as being of special biological significance. Discharges shall be located a sufficient distance from such designated areas to assure maintenance of natural water quality conditions in these areas."*

This Order prohibits the discharge of extraction waste to these designated ASBS.

This Order contains effluent limitations which may require the application of ‘best available treatment economically achievable’ (BAT) for the removal of pollutants from discharges of extracted groundwater authorized by a NOA. This Order requires the Discharger to certify the adequacy of each component of treatment facilities or a contingency plan prior to initiating a discharge. The Discharger’s certification report must contain a requirement-by-requirement

analysis, based on accepted engineering practice, of how the contingency plan or process and physical design of the facilities will ensure compliance with this Order.

III. APPLICABLE PLANS, POLICIES, AND REGULATIONS

The requirements contained in this Order are based on the requirements and authorities described in this section.

A. Legal Authorities

This Order serves as WDRs pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260). This Order is also issued pursuant to section 402 of the CWA and implementing regulations adopted by the U.S. EPA and chapter 5.5, division 7 of the CWC (commencing with section 13370). It shall serve as an NPDES permit for point source discharges from this facility to surface waters. States may request authority to issue general NPDES permits pursuant to 40 CFR section 122.28. On June 8, 1989, the State Water Resources Control Board (State Water Board) submitted an application to U.S. EPA requesting revisions to its NPDES Program in accordance with 40 CFR sections 122.28, 123.62, and 403.10. The application included a request to add general NPDES permit authority to its approved NPDES Program. On September 22, 1989, U.S. EPA, Region 9, approved the State Water Board's request and granted authorization for the State of California to issue general NPDES permits.

B. California Environmental Quality Act (CEQA)

Under CWC section 13389, this action to adopt an NPDES permit is exempt from the provisions of Chapter 3 of CEQA, (commencing with section 21100) of division 13 of the Public Resources Code.

C. State and Federal Laws, Regulations, Policies, and Plans

1. **Water Quality Control Plan.** The San Diego Water Board adopted *Water Quality Control Plan for the San Diego Basin* (Basin Plan) on September 8, 1994 that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives. The Basin Plan was subsequently approved by the State Water Board on December 13, 1994. Subsequent revisions to the Basin Plan have also been adopted by the San Diego Water Board and approved by the State Water Board. The Basin Plan designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters addressed through the Basin Plan. In addition, State Water Board Resolution No. 88-63 requires that, with certain exceptions, the San Diego Water Board assign the municipal and domestic supply use to water bodies that do not have beneficial uses listed in the Basin Plan. Because of marine water influence in the potential receiving waters, total dissolved solids (TDS) levels may exceed 3,000 milligrams per liter (mg/L) for some receiving waters, and thereby meet an exception to State Water Board Resolution No. 88-63. The municipal and domestic supply beneficial use designation, therefore does not apply to receiving waters that exceed 3,000 mg/L of total dissolved solids for entities permitted under this Order.

   The Basin Plan identifies the following beneficial uses of surface waters in the San Diego Region to be protected (not all surface waters have all of the beneficial uses listed below):

   - Municipal and domestic supply (MUN);
   - Industrial service and process supply (PROC);
   - Preservation of rare, threatened
   - Migration of aquatic organisms (MIGR);
   - Commercial and sport fishing (COMM);
   - Spawning, reproduction, and/or

or Endangered species (BIOL);
- Navigation (NAV);
- Marine habitat (MAR);
- Contact water recreation (REC-1);
- Aquaculture (AQUA);
- Non-contact water recreation (REC-2);
early development (SPWN);
- Preservation of areas of special biological significance (BIOL);
- Shellfish harvesting (SHELL);
- Estuarine Habitat (EST); and
- Wildlife Habitat (WILD).

2. **California Ocean Plan.** The State Water Board adopted the *Water Quality Control Plan for Ocean Waters of California, California Ocean Plan* (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, 2005, 2009, and 2012. The State Water Board adopted the latest amendment on October 16, 2012, and it became effective on August 19, 2013. The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean. The Ocean Plan identifies beneficial uses of ocean waters of the State to be protected as summarized below:

- Industrial water supply;
- Aesthetic enjoyment;
- Non-contact water recreation;
- Preservation of areas of special biological significance;
- Fish migration;
- Fish spawning;
- Navigation;
- Water contact recreation;
- Ocean commercial and sport fishing;
- Preservation and enhancement of rare and endangered species;
- Marine habitat;
- Shellfish harvesting; and
- Mariculture.

3. **Thermal Plan.** The State Water Board adopted the *Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California* (Thermal Plan) on January 7, 1971, and amended this plan on September 18, 1975.

4. **National Toxics Rule (NTR) and California Toxics Rule (CTR).** U.S. EPA adopted the NTR on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the NTR applied in California. On May 18, 2000, U.S. EPA adopted the CTR. The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain federal water quality criteria for priority pollutants.

5. **State Implementation Policy.** On March 2, 2000, the State Water Board adopted the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (State Implementation Policy or SIP). The SIP became effective on April 28, 2000, with respect to the priority pollutant criteria promulgated for California by the U.S. EPA through the NTR and to the priority pollutant objectives established by the San Diego Water Board in the Basin Plan. The SIP became effective on May 18, 2000, with respect to the priority pollutant criteria promulgated by the U.S. EPA through the CTR. The State Water Board adopted amendments to the SIP on February 24, 2005, that became effective on July 13, 2005. The SIP implementation provisions for priority pollutant criteria promulgated by the U.S. EPA through the NTR and the CTR, and for priority pollutant

objectives established in the Basin Plan; monitoring requirements for 2,3,7,8-TCDD (tetrachlorodibenzo-p-dioxin)equivalents; and chronic toxicity control provisions.

6. **Alaska Rule.** On March 30, 2000, U.S. EPA revised its regulation that specifies when new and revised state and tribal water quality standards (WQS) become effective for CWA purposes. (40 CFR section 131.21; 65 Fed. Reg. 24641 (April 27, 2000).) Under the revised regulation (also known as the Alaska Rule), new and revised standards submitted to U.S. EPA after May 30, 2000, must be approved by U.S. EPA before being used for CWA purposes. The final rule also provides that standards already in effect and submitted to U.S. EPA by May 30, 2000, may be used for CWA purposes, whether or not approved by U.S. EPA.
7. **Antidegradation Policy.** 40 CFR section 131.12 requires that the state water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution 68-16. Resolution 68-16 is deemed to incorporate the federal antidegradation policy where the federal policy applies under federal law. Resolution 68-16 requires that existing water quality be maintained unless degradation is justified based on specific findings. The San Diego Water Board's Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies. The permitted discharge must be consistent with the antidegradation provision of 40 CFR section 131.12 and State Water Board Resolution 68-16. This Order meets the requirements of the federal and State antidegradation policies, as discussed in detail in section IV.D.2 of this Fact Sheet.
8. **Anti-Backsliding Requirements.** Sections 402(o) and 303(d)(4) of the CWA and federal regulations at 40 CFR section 122.44(l) restrict backsliding in NPDES permits. These anti-backsliding provisions require that effluent limitations in a reissued permit must be as stringent as those in the previous permit, with some exceptions in which limitations may be relaxed. This Order meets all anti-backsliding requirements.
9. **Monitoring and Reporting.** Federal regulations at 40 CFR section 122.48 require that all NPDES permits specify requirements for recording and reporting monitoring results. sections 13267 and 13383 of the CWC authorize the San Diego Water Boards to require technical and monitoring reports. The MRP establishes monitoring and reporting requirements to implement federal and State requirements. This MRP is provided as Attachment E.

D. Impaired Water Bodies on CWA 303(d) List

The federal CWA requires states to identify and make a list of surface water bodies that are polluted. These water bodies, referred to in law as "water quality limited segments," do not meet water quality standards even after discharges of wastes from point sources have been treated by the minimum required levels of pollution control technology. States are required to compile the water bodies into a list, referred to as the "CWA Section 303(d) List of Water Quality Limited Segments" (303(d) List). States must also prioritize the water bodies on the list and develop action plans, called total maximum daily loads (TMDLs) to improve the water quality.

The San Diego Water Board has adopted TMDLs that have been approved by the State Water Resource Control Board Office of Administrative Law and by the U.S. EPA. The following TMDLs have been considered during the drafting of this Order and have been implemented for the appropriate receiving water:

- Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek) Indicator Bacteria TMDLs (Resolution No. R9-2010-0001);

- Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay Indicator Bacteria TMDLs (Resolution No. R9-2008-0027);
- Chollas Creek Copper, Lead, and Zinc TMDLs (Resolution No. R9-2007-0043);
- Rainbow Creek Nitrogen and Phosphorus TMDLs (Resolution No. R9-2005-0036);
- Shelter Island Yacht Basin Dissolved Copper TMDL (Resolution No. R9-2005-0019);
- Chollas Creek Diazinon TMDL (Resolution No. R9-2002-0123); and
- Los Penasquitos Lagoon Sediment TMDL (Resolution No. R9-2012-0033)

A summary of the applicable TMDLs is provided in Attachment B of this Order. All applicable TMDLs, with the exception of Resolution No. R9-2007-0043 (a concentration-based TMDL for copper, lead, and zinc in Chollas Creek), either prohibit the discharge of the applicable pollutants to the receiving water or establish a waste load allocations (WLAs) for discharges covered under this Order. As such, these TMDLs are implemented as Discharge Prohibitions III.I, III.J, III.K, and III.L of this Order.

Section IV of Attachment B, and section IV.C.5 of this Fact Sheet, discuss the application of WLA-based effluent limitations and receiving water monitoring for copper, lead, and zinc which have been established for discharges to Chollas Creek.

E. Other Plans, Polices and Regulations – Not Applicable

IV. RATIONALE FOR EFFLUENT LIMITATIONS AND DISCHARGE SPECIFICATIONS

The CWA requires point source Dischargers to control the amount of conventional, non-conventional, and toxic pollutants that are discharged into the waters of the U.S. The control of pollutants discharged is established through effluent limitations and other requirements in NPDES permits. There are two principal bases for effluent limitations in the CFR: 40 CFR section 122.44(a) requires that permits include applicable TBELs and standards; and 40 CFR section 122.44(d) requires that permits include WQBELs necessary to attain and maintain applicable numeric and narrative water quality criteria to protect the beneficial uses of the receiving water.

A. Discharge Prohibitions

Discharge prohibitions contained in the Order are consistent with discharge prohibitions included in Order Nos. R9-2007-0034 and R9-2008-0002 (the previous Orders regulating the discharge of extracted groundwater), and discharge prohibitions necessary to implement applicable water quality plans and policies.

1. Discharge Prohibitions III.A, III.C, III.E, III.F, and III.G are based on 40 CFR section 122.21(1), duty to apply, and CWC section 13260, which requires filing an application and a Report of Waste Discharge before discharges may occur. Discharges not described in the permit application (NOI package), and subsequently not considered for coverage under this Order are prohibited.
2. Discharge Prohibition III.B is based on the requirements of the Ocean Plan and prohibits the discharge of wastes to areas designated as being of special biological significance.
3. Discharge Prohibition III.D minimizes the amount and types of pollutants that are discharged into receiving waters and is consistent with the requirements of Order Nos. R9-2007-0034 and R9-2008-0002.

4. Discharge Prohibition III.H implements the requirements of the Basin Plan, Ocean Plan, Estuaries Plan, and section 13050 of the CWC.

5. Discharge Prohibitions III.I, III.J, III.K, and III.L are based on the requirements of the Basin Plan, and implement TMDLs, as further discussed in Attachment B.

B. Technology-Based Effluent Limitations (TBELs)

1. Scope and Authority

Section 301(b) of the CWA and implementing U.S. EPA permit regulations at 40 CFR section 122.44 require that permits include conditions meeting applicable technology-based requirements at a minimum, and any more stringent effluent limitations necessary to meet applicable water quality standards. The discharge authorized by the Order must meet minimum federal technology-based requirements based on Best Professional Judgment (BPJ) in accordance with 40 CFR section 125.3. The CWA requires that TBELs be established based on several levels of controls:

a. Best practicable treatment control technology (BPT) represents the average of the best performance by facilities within an industrial category or subcategory. BPT standards apply to toxic, conventional, and non-conventional pollutants.

b. Best available technology economically achievable (BAT) represents the best existing performance of treatment technologies that are economically achievable within an industrial point source category. BAT standards apply to toxic and non-conventional pollutants.

c. Best conventional pollutant control technology (BCT) represents the control from existing industrial point sources of conventional pollutants including biochemical oxygen demand, total suspended solids, fecal coliform, pH, and oil and grease. The BCT standard is established after considering the “cost reasonableness” of the relationship between the cost of attaining a reduction in effluent discharge and the benefits that would result, and also the cost effectiveness of additional industrial treatment beyond BPT.

d. New source performance standards (NSPS) represent the best available demonstrated control technology standards. The intent of NSPS guidelines is to set limitations that represent state-of-the-art treatment technology for new sources.

The CWA requires U.S. EPA to develop effluent limitation guidelines (ELGs) representing the application of BPT, BAT, BCT, and NSPS. Section 402(a)(1) of the CWA and 40 CFR section 125.3 authorize the use of BPJ to derive TBELs on a case-by-case basis where ELGs are not available for certain industrial categories and/or pollutants of concern. Where BPJ is used, the permit writer must consider specific factors outlined in 40 CFR section 125.3.

Further, Table A of the Ocean Plan establishes technology-based requirements for conventional pollutants (suspended solids, settleable solids, oil and grease, turbidity, and pH) for industrial Dischargers for which ELGs have not been established.

2. Applicable TBELs

Effluent limitations for suspended solids, settleable solids, oil and grease, turbidity, and pH were established in Order No. R9-2008-0002 based on Table 2 (formerly Table A) of the Ocean Plan. Consistent with Order No. R9-2008-0002 and the requirements of the Ocean Plan, these limitations have been established in this Order for discharges to the Pacific Ocean.

Table F-1. Ocean Plan Table 2 Limitations

Parameters	Units	Effluent Limitations		
		Average Monthly	Weekly Average	Instantaneous Maximum
Oil and Grease	mg/L	25	40	75
Settleable Solids	ml/L	1.0	1.5	3.0
Total Suspended Solids	mg/L	60	--	--
Turbidity	NTU	75	100	225
pH	s.u.	--	--	7.0 – 9.0

C. Water Quality-Based Effluent Limitations (WQBELs)

Water quality-based effluent limitations (WQBELs) have been derived to implement water quality objectives and criteria that protect beneficial uses. Both the beneficial uses and the water quality objectives and criteria have been approved pursuant to federal law. U.S. EPA also approved the SIP and Ocean Plan procedures for calculating individual WQBELs for discharges to inland surface waters and to the Pacific Ocean.

A summary of all applicable WQBELs and the corresponding rationale for the WQBELs is provided in section IV.D.4 of this fact sheet.

1. Scope and Authority

CWA Section 301(b) and 40 CFR section 122.44(d) require that permits include limitations more stringent than applicable federal technology-based requirements where necessary to achieve applicable water quality standards, including numeric and narrative objectives within a standard.

40 CFR section 122.44(d)(1)(i) requires that permits include effluent limitations for all pollutants that are or may be discharged at levels that have the reasonable potential to cause or contribute to an exceedance of a water quality standard, including numeric and narrative objectives within a standard. Where reasonable potential has been established for a pollutant, but there is no numeric criterion or objective for the pollutant, WQBELs must be established by using the following: (1) U.S. EPA criteria guidance under CWA section 304(a), supplemented where necessary by other relevant information; (2) an indicator parameter for the pollutant of concern; or (3) a calculated numeric water quality criterion, such as a proposed state criterion or policy interpreting the state's narrative criterion, supplemented with other relevant information, as provided in 40 CFR section 122.44(d)(1)(vi).

The process for determining reasonable potential and calculating WQBELs, when necessary, is to ensure protection of the designated uses of receiving waters as specified in the Basin Plan and attainment of applicable water quality objectives and criteria that are contained in other state plans and policies, or any applicable water quality criteria contained in the CTR and NTR.

2. Applicable Beneficial Uses and Water Quality Criteria and Objectives

This Order authorizes certain discharges to inland surface waters, enclosed bays and estuaries, and the Pacific Ocean within the San Diego Region. Beneficial uses of these receiving waters are designated in chapter 2 of the Basin Plan, and section I of the Ocean Plan. The water quality criteria applicable to these receiving waters are established by the NTR, CTR, the Basin Plan, and the Ocean Plan. Water quality criteria and objectives

established in the NTR, CTR, the Basin Plan, and Ocean are applicable to these beneficial uses.

a. **Basin Plan.** The designated beneficial uses of surface waters throughout the State are summarized in section III.C.1 of this fact sheet. The Basin Plan establishes water quality objectives for conventional, non-conventional, and toxic pollutants based on these designated beneficial uses.

b. **Ocean Plan.** The Ocean Plan specifies procedures for the implementation of water quality objectives for discharges to the Pacific Ocean. The beneficial uses of the Pacific Ocean are summarized in section III.C.2 of this fact sheet.

c. **Thermal Plan.** The Thermal Plan establishes water quality objectives for inland and coastal waters throughout the State.

d. **State Implementation Plan (SIP).** The SIP specifies procedures for the implementation of CTR/NTR water quality criteria for the discharge of non-stormwater discharges to inland surface waters and enclosed bays and estuaries.

3. Determining the Need for WQBELs for Discharges to Inland Surface Waters, Enclosed Bays, Lagoons, and Estuaries

The determination for a discharge to cause or contribute to an exceedance of applicable water quality criteria, and the establishment of effluent limitations prescribed under this Order for discharges to inland surface waters, enclosed bays, and estuaries, are calculated assuming no dilution. Eligible Dischargers are required to collect and analyze a representative sample of untreated groundwater for parameters with applicable water quality criteria/objectives, as specified in section II of the MRP prior to receiving authorization to discharge under this Order. Untreated groundwater, and not final effluent, must be sampled and characterized for the purposes of the reasonable potential analysis: 1) to provide a conservative measurement of the concentration of the pollutants that may be potentially discharged to the receiving water; 2) because some groundwater extraction discharges may not need treatment prior to discharge; and 3) to allow for a determination if treatment or additional controls will be necessary to meet applicable water quality objectives/criteria.

a. Toxic Parameters (CTR/NTR)

In accordance with section 1.3 of the SIP, the San Diego Water Board conducts a reasonable potential analysis for each pollutant with an applicable criterion or objective to determine if a WQBEL is required. Water quality data from representative sample(s) are compared with the corresponding water quality objective/criteria-based triggers. The parameter(s) with a value exceeding the applicable trigger is considered to have reasonable potential to exceed water quality criterion or objective and the corresponding WQBEL(s) and monitoring requirements are prescribed in the NOA for the discharge.

In addition to applicable NTR and CTR criteria, Order No. R9-2008-0002 established effluent limitations for dibromochloropropane and ethylene dibromide based on primary maximum contaminant levels (MCLs) for the protection of human health. Further, Order No. R9-2008-0002 established an effluent limitation for methyl tertiary butyl ether (MTBE) based on a secondary MCL for discharges to receiving waters with a municipal beneficial use. This Order incorporates criteria for dibromochloropropane, ethylene dibromide, and MTBE for the protection of receiving waters with the municipal beneficial use.

b. TMDL-based Parameters

The San Diego Water Board developed TMDL-based WLAs for copper, lead, and zinc in Chollas Creek (Resolution No. R9-2007-0043). The effluent limitations for these pollutants were established regardless of whether or not there is reasonable potential for the pollutants to be present in the discharge at levels that would cause or contribute to an exceedance of water quality criteria. The San Diego Water Board developed water quality-based effluent limitations for these pollutants pursuant to 40 CFR section 122.44(d)(1)(vii), which does not require or contemplate a reasonable potential analysis. Similarly, the SIP at section 1.3 recognizes that reasonable potential analysis is not appropriate if a TMDL has been developed.

c. Basin Plan Parameters

The San Diego Water Board must evaluate the potential for discharges to contribute to an exceedance of water quality objectives established in the Basin Plan. Reasonable potential to cause or contribute to an exceedance of water quality objectives shall be evaluated by comparing the sample data to a water quality objective-based trigger. The parameter(s) with a value exceeding the applicable water quality objective-based trigger is considered to have reasonable potential to exceed the water quality objective and the corresponding WQBEL(s) and monitoring requirements are prescribed in the NOA for the discharge. Consistent with Order No. R9-2008-0002, Basin Plan water quality objectives for the following parameters will be evaluated for reasonable potential:

- Percent Sodium
- Total Nitrogen
- Total Phosphorus
- MBAS
- Dissolved Oxygen
- Fluoride
- Dissolved Oxygen
- Iron
- Manganese

Extracted groundwater discharged to inland surface waters may contain inconsistent levels of settleable and suspended solids, impacting the ability to accurately evaluate reasonable potential to exceed applicable water quality objectives with limited data during the NOI process. Thus, effluent limitations for turbidity shall be established independent of sampling results submitted by Dischargers for discharges to inland surface waters. However, consistent with Order No. R9-2007-0034 and R9-2008-0002, turbidity effluent limitations for discharges to bays and estuaries shall be based on Table 2 of the Ocean Plan.

The Basin Plan established water quality objectives for pH throughout the San Diego Region. Based on the requirements of the Basin Plan, instantaneous effluent limitations for pH are included in this Order.

d. Pathogens

Order No. R9-2008-0002 established an instantaneous effluent limitation for total coliform of 1,000 MPN/100 mL. The effluent limitation is consistent with the water quality objective for Bays and Estuaries used for contact recreation. Consistent with Order No. R9-2008-0002, and to protect the contact recreation beneficial uses of bays and estuaries to which inland waters may be tributary, the effluent limitation for total coliform has been carried over.

Order No. R9-2008-0002 established an instantaneous effluent limitation for fecal coliform of 200 MPN/100 mL based on anti-backsliding considerations. In addition, the

effluent limitation established is consistent with the 30-day log mean water quality objective established in the Basin Plan for receiving waters used for contact recreation. Consistent with State and federal anti-backsliding regulations, and to protect the contact recreation beneficial uses of inland surface waters, the effluent limitation for fecal coliform has been carried over.

The discharge of extracted groundwater is not expected to contain significant concentrations of indicator bacteria, unless directly related to a sewer collection system or treatment plant. Thus, only discharges associated with sewage collection or treatment must be evaluated for reasonable potential for indicator bacteria. Discharges, not associated with sewage collection or treatment, are assumed to contain insignificant concentrations of indicator bacteria.

e. Specific Criteria and Objectives for Bays and Estuaries

Water quality data from representative sample(s) are compared with the corresponding water quality objective/criteria-based triggers. The parameter(s) with a value exceeding the applicable trigger is considered to have reasonable potential to exceed the water quality objective and the corresponding WQBEL(s) and monitoring requirements are prescribed in the NOA for the discharge.

Receiving water characteristics and marine life present in bays and estuaries within the San Diego Region closely resemble those found in the Pacific Ocean. Thus, in addition to applicable CTR/NTR criteria and Basin Plan criteria, Order Nos. R9-2007-0034 and R9-2008-0002 considered criteria for a number of pollutants established in the Ocean Plan. Based on State and federal anti-backsliding requirements, these criteria are incorporated into this Order.

i. Toxics

Order No. R9-2008-0002 (and Order No. R9-2007-0034 for many of the same parameters) consider criteria for a number of pollutants established in the Ocean Plan, including:

- Total Residual Chlorine
- Tributyltin
- Tetrachloroethylene
- Chlorinated Phenolics
- 1,1,2,2-tetrachlorethane
- 1,1,1-trichloroethane
- 1,1,2-trichloroethane
- 1,2-dichloroethane
- Phenolic Compounds (non-chlorinated)
- Trichloroethylene
- Vinyl Chloride
- Carbon Tetrachloride
- Ammonia
- Endosulfan
- Hexachlorocyclohexane (HCH)
- Dichloromethane
- PAHs
- TCDD Equivalents

The CTR does not establish criteria for total residual chlorine, tributyltin, phenolic compounds or 1,1,1-trichloroethane for receiving waters without a municipal and domestic beneficial use. Water quality objectives in the Ocean Plan for 1,1,2-trichloroethane; 1,2-dichloroethane; dichloromethane (methylene chloride), tetrachloroethylene, trichloroethylene, vinyl chloride, carbon tetrachloride, TCDD-equivalents, endosulfan, and HCH are more stringent than applicable CTR criteria. For endosulfan, the CTR prescribes criteria for both alpha and beta-endosulfan of 8.7 ng/L each and 240 µg/L for endosulfan sulfate. The lowest Ocean Plan criteria for endosulfan is 9 ng/L. However, the Ocean Plan criteria is

for endosulfan, which includes alpha and beta-endosulfan, and endosulfan sulfate, and is thus more stringent than the combined CTR criteria for alpha and beta-endosulfan and endosulfan sulfate. Similarly, the Ocean Plan criteria for HCH (sum of alpha, beta, gamma, and delta isomers of hexachlorocyclohexane) is more stringent than any single isomer established in the CTR.

Order No. R9-2008-0002 established average monthly and maximum daily effluent limitations for chlorinated phenolics, citing the CTR as the source for these limitations. However, the CTR does not establish water quality criteria for "chlorinated phenolics". The CTR does establish water quality standards for numerous chlorinated phenolic isomers. Consistent with the CTR, this Order considers criteria for the chlorinated phenolic isomers specified in the CTR, and does not carry over the average monthly and maximum daily effluent limitation for "chlorinated phenolics" as a group, established in Order No. R9-2008-0002. This Order does carry over the instantaneous maximum and 6-month median criteria established Order No. R9-2008-0002 and establishes a revised maximum daily effluent limitation, based on the Ocean Plan. This criteria is less stringent than the limitations contained in Order No. R9-2008-0002. However, the criteria referenced in Order No. R9-2008-0002 for "chlorinated phenolics" based on the CTR appears to be a technical mistake, and backsliding in this case is consistent with the specifications of section 402(o)(2) of the CWA. Further, the application of WQBELs for chlorinated phenolics based on the Ocean Plan, and for the individual chlorinated phenolics based on the CTR, will be protective of water quality.

Order No. R9-2008-0002 establishes an effluent limitation for halomethane that is more stringent than the CTR criteria for bromoform and bromomethane. Because halomethanes include these two pollutants, the effluent limitation for halomethanes is protective of CTR criteria for bromoform and bromomethane and has been applied in this Order.

ii. MTBE

Although the San Diego Bay is not designated as a municipal and domestic water source, Order Nos. R9-2007-0034 and R9-2008-0002 established an instantaneous maximum effluent limitation of 5 µg/L for methyl-tert-butyl ether (MTBE) based on a secondary MCL. This Order carries over the criteria for MTBE based on State and federal anti-backsliding regulations.

iii. Ammonia

Order No. R9-2008-0002 established effluent limitations for ammonia based on the Ocean Plan. The Basin Plan establishes a water quality objective for un-ionized ammonia of 0.025 mg/L that are also applicable to inland waters, bays, and estuaries. Un-ionized ammonia is ph, salinity, and temperature dependent. To determine the appropriate water quality-based effluent limitation for total ammonia, receiving water data for San Diego Bay from the April 2012 final report, *Characterizing the Spatial and Temporal Variation of Key Physical Water Quality Parameters in San Diego Bay: The importance of Continuous Baseline Data when Evaluating Physical, Biological, and Chemical Process*, prepared for the Environmental Services Department of the San Diego Unified Port District by Tierra Data, Inc, and receiving water data from Station No. 093 (Mission Bay Offshore) from the Coastal Data Information Program provided by SCRIPPS Institute of Oceanography were considered. The highest annual receiving water temperature between 2010 through 2013 ranged from 15.9 to 17.9 degrees Celsius. Data for

salinity was limited from March 2010 through October 2011. Average monthly salinity data within the San Diego Bay ranged from 32.15 ppt to 35.56 ppt. The pH of sea water, which is largely determined by the bicarbonate/borate concentration, is typically in the range of 7.5 and 8.5 standard units. Assuming conservative values (temperature of 17.9 °C, salinity of 32 ppt, and pH of 8.2 standard units), total ammonia water quality objectives were derived from the un-ionized ammonia concentrations using the following formula (*Ambient Water Quality Criteria for Ammonia [saltwater] – 1989*, U.S. EPA Publication 440/5-88-004, U.S. EPA, 1989):

For salinity > 10 ppt: fraction of $NH_3 = \frac{1}{1+10^{(pK-pH)}}$

Where:

pK = 9.245 + 0.116(I) + 0.0324*(298-T) + 0.0415*(P)/T*
I = the molal ionic strength of saltwater = 19.9273(S)/(1000-1.005109*S)*
S = salinity (parts per thousand)
T = temperature in Kelvin
P = pressure (one atmosphere)

The resulting water quality objective for total ammonia is 670 µg/L. The Basin Plan does not specify how to implement the water quality objective for ammonia; however, nutrient objectives are often applied annually to account for seasonal variation. Assuming an annual average effluent limitation of 670 µg/L, the 6-month median criteria of 600 µg/L established in Order No. R9-2008-0002 based on the Ocean Plan is more stringent. Thus, the Ocean Plan criteria for ammonia appears protective of the water quality objective for un-ionized ammonia, and have been carried over.

Order No. R9-2008-0002 established instantaneous maximum effluent limitations equal to the 30-day geometric mean water quality objectives for total coliform (1,000 MPN/100 mL) and fecal coliform (200 MPN/100 mL). The effluent limitation for fecal coliform is protective of the REC-1 beneficial uses of the receiving waters within this category and has been carried over. The effluent limitation for total coliform is not protective of the beneficial use of SHELL present in the receiving waters within this category. The effluent limitation for total coliform has been established consistent with the water quality objectives for total coliform for the protection of SHELL. Order No. R9-2008-0002 does not establish effluent limitations for enterococci. This Order establishes effluent limitations for enterococci based on the water quality objectives established in the Basin Plan for areas designated as a beach due to the REC-1 beneficial use.

iv. Turbidity

Order No. R9-2008-0002 establishes a maximum daily effluent limitation for turbidity of 2.2 µg/L based on the CTR for discharges to bays and harbors. This effluent limitation for turbidity is in addition to another effluent limitation for turbidity expressed in NTU, also for discharges to bays and harbors. This duplicative limitation appears to be a mistake. The CTR does not establish turbidity water quality criteria, and turbidity units are expressed as NTU, not µg/L. Thus, the maximum daily effluent limitation of 2.2 µg/L for turbidity has been removed because a maximum daily effluent limitation for turbidity expressed in µg/L is unsupported. The average monthly, average weekly, and instantaneous maximum effluent limitations

established in Order No. R9-2008-0002 are consistent with the Ocean Plan and have been carried over.

v. Pathogens

Order Nos. R9-2007-0034 and R9-2008-0002 established instantaneous maximum effluent limitations equal to the 30-day geometric mean water quality objectives for total coliform (1,000 MPN/100 mL) and fecal coliform (200 MPN/100 mL). The effluent limitation for fecal coliform is protective of the REC-1 beneficial uses of the receiving waters within this category. The effluent limitation for total coliform is not protective of the beneficial use of SHELL present in the receiving waters within this category. Criteria for total coliform have been established consistent with the water quality objectives for total coliform for the protection of SHELL. Order No. R9-2008-0002 does not evaluate criteria for enterococci. This Order incorporates criteria for enterococci based on the water quality objectives established in the Basin Plan for the REC-1 beneficial use.

4. Determining the Need for WQBELs for Discharges to the Pacific Ocean

Eligible Dischargers are required to collect and analyze a representative sample of untreated groundwater for parameters with applicable water quality criteria/objectives, as specified in Appendix C-1 of this Order prior to receiving authorization to discharge under this Order. Untreated groundwater, and not final effluent, shall be monitored for the purposes of conducting the reasonable potential analysis: 1) to provide a conservative measurement of the concentration of the pollutants that may be discharged to the receiving water; 2) because some groundwater extraction activities may not need to provide treatment prior to discharge; and 3) to allow for a determination if treatment or additional controls will be necessary to meet applicable water quality objectives/criteria.

a. Toxic Pollutants (Table 1 of the Ocean Plan)

In accordance with Appendix VI of the Ocean Plan, the San Diego Water Board conducts a reasonable potential analysis for each pollutant with an applicable criterion or objective to determine if a WQBEL is required. Water quality data from representative sample(s) are compared with the corresponding applicable water quality objective triggers. These triggers have been developed based on the procedures specified in Appendix VI of the Ocean Plan that would result in reasonable potential within the initial pollutant scan conducted pursuant to Appendix C-1 of Attachment C of this Order. The parameters with a value exceeding the applicable water quality criteria-based trigger are considered to have reasonable potential to exceed water quality objective and the corresponding WQBEL(s) and monitoring requirements are prescribed in the NOA for the discharge.

The determination for a discharge to cause or contribute to an exceedance of applicable water quality objectives, and the establishment of effluent limitations prescribed under this Order for discharges to the surf zone of the Pacific Ocean, are calculated assuming a dilution of 3 : 1 (seawater : effluent).

The initial dilution factor is carried over from Order No. R9-2008-0002 based on a preliminary dilution model submitted by Professor Gerhard H. Jirka, School of Civil and Environmental Engineering, Cornell University, for a dewatering project associated with construction of the United States Section of the International Boundary and Water Commission's South Bay International Wastewater Treatment Plant's ocean outfall near

Tijuana, Mexico. Order No. R9-2008-0002 states that this particular model assumes the following:

i. Mixing of the dewatering discharge is primarily controlled by wave-induced turbulence and longshore conditions;

ii. 0.55 meter wave height with a 15 second period occurring with a 95 percent exceedance probability;

iii. A longshore velocity of 5 to 10 centimeters per second; and

iv. A near-shore beach slope of 3 percent.

The model results in an initial dilution ratio of six. Since the model does not represent topographic and wave conditions throughout the San Diego Region, the initial dilution factor for discharges to surf zones was halved to ensure the conservative application of water quality objectives and the protection of beneficial uses.

Order No. R9-2008-0002 applied the 3 : 1 dilution factor to all pollutants specified in Table 1 (previously Table B) of the Ocean Plan, with the exception of acute and chronic toxicity. Because extracted groundwater addressed under this Order may discharge to a variety of locations along the Pacific Ocean coast line within the San Diego Region, applying WET limitations without dilution provides additional protection from potential synergistic effects to aquatic life from the pollutants present in the effluent, and ensures that discharges that occur under unanticipated receiving water conditions will not negatively impact aquatic life. Consistent with Order No. R9-2008-0002, this Order applies acute and chronic toxicity criteria without dilution.

b. Pathogens

Criteria for total coliform, fecal coliform, and enterococcus are based on section III.B of the Ocean Plan. These criteria are consistent with those established in Order No. R9-2008-0002.

5. WQBEL Calculations

a. Toxic Parameters (CTR/NTR) and Applicable WLAs for Chollas Creek (copper, lead, and zinc)

The procedures for calculating WQBELs for CTR and NTR criteria are specified in the U.S. EPA's Technical Support Document for Water Quality-Based Toxics Control (TSD) of 1991 (USEPA/505 /2-90-001) and the SIP, and were used to calculate the WQBELs for CTR and NTR parameters in this Order.

The following example demonstrates the method for calculating WQBELs for NTR/CTR parameters for this Order. This example demonstrates the WQBELs for copper to an inland surface waterbody with a designated beneficial use of municipal and domestic supply (MUN).

Step 1: For each constituent requiring an effluent limit, identify the applicable water quality criteria or objective. For each criterion, determine the effluent concentration allowance (ECA) using the following steady state equation:

$ECA = C + D(C-B)$ when $C>B$, and

$ECA = C$ when $C \leq B$,

Where C = The priority pollutant criterion/objective, adjusted if necessary for hardness and translators. The applicable hardness assumed

is this example is 400 $CaCO_3$.

D = The dilution credit, and

B = The ambient background concentration

As discussed above, this Order does not allow dilution; therefore:

ECA = C

When a WLA has been established through a TMDL for a parameter, the applicable WLA is set equal to the ECA. See Attachment B for a discussion of applicable WLAs established through a TMDL. For this example, it is assumed that the discharge is to a waterbody where there is no TMDL applicable, and the criteria provided in the CTR for the protection of aquatic life is used.

$C = ECA_{acute} = 54$ µg/L

$C = ECA_{chronic} = 31$ µg/L

Step 2: For each ECA based on aquatic life criterion/objective, determine the long term average discharge condition (LTA) by multiplying the ECA by a factor (multiplier). The multiplier is a statistically based factor that adjusts the ECA to account for effluent variability. The value of the multiplier varies depending on the coefficient of variation (CV) of the data set and whether it is an acute or chronic criterion/objective. Table 1 of the SIP provides pre-calculated values for the multipliers based on the value of the CV. Equations to develop the multipliers in place of using values in the tables are provided in section 1.4, Step 3 of the SIP and will not be repeated here.

$LTA_{acute} = ECA_{acute} \times Multiplier_{acute99}$

$LTA_{chronic} = ECA_{chronic} \times Multiplier_{chronic99}$

The CV for the data set must be determined before the multipliers can be selected and will vary depending on the number of samples and the standard deviation of a data set. If the data set is less than 10 samples, or at least 80% of the samples in the data set are reported as non-detect, the CV shall be set equal to 0.6. Because WQBELs will be calculated based on the results of a single monitoring event, a CV of 0.6 has been applied.

The following data were used to develop the acute and chronic LTAs using equations provided in section 1.4, Step 3 of the SIP (Table 1 of the SIP also provides this data up to three decimals):

No. of Samples	CV	ECA $Multiplier_{acute}$	ECA $Multiplier_{chronic}$
1	0.6	0.321	0.527

Total recoverable copper:

$LTA_{acute} = 54$ µg/L x 0.321 = 17

$LTA_{chronic} = 9.5$ µg/L x 0.527 = 16

Step 3: Select the most limiting (lowest) of the LTA:

For total recoverable copper, the most limiting LTA is $LTA_{chronic}$.

LTA = 16

Step 4: Calculate the WQBELs by multiplying the LTA by a factor (multiplier). WQBELs are expressed as AMEL and MDEL. The multiplier is a statistically based factor that adjusts the LTA for the averaging periods and exceedance frequencies of the criteria/objectives and the effluent limitations. The value of the multiplier varies depending on the probability basis, the CV of the data set, the number of samples (for AMEL) and whether it is a monthly or daily limit. Table 2 of the SIP provides pre-calculated values for the multipliers based on the value of the CV and the number of samples. Equations to develop the multipliers in place of using values in the tables are provided in section 1.4, Step 5 of the SIP and will not be repeated here.

$AMEL_{aquaticlife} = LTA \times AMEL_{multiplier95}$

$MDEL_{aquaticlife} = LTA \times MDEL_{multiplier99}$

AMEL multipliers are based on a 95th percentile occurrence probability, and the MDEL multipliers are based on a 99th percentile occurrence probability. If the number of samples is less than four (4), the default number of samples to be used is four (4).

The following data were used to develop the AMEL and MDEL for effluent limitations using equations provided in section 1.4, Step 5 of the SIP:

No of Samples Per Month	CV	$Multiplier_{MDEL99}$	$Multiplier_{AMEL95}$
4	0.6	3.11	1.55

Total recoverable copper:

AMEL = 16 µg/L x 1.55 = 25

MDEL = 16 µg/L x 3.11 = 50

Step 5: For the ECA based on human health, set the AMEL equal to the $ECA_{human\ health}$:

$AMEL_{human\ health} = ECA_{human\ health}$

Total recoverable copper:

$AMEL_{human\ health}$ = 1,300 µg/L

Step 6: Calculate the MDEL for human health by multiplying the AMEL by the ratio of $Multiplier_{MDEL}$ to the $Multiplier_{AMEL}$. Table 2 of the SIP provides pre-calculated ratios to be used in this calculation based on the CV and the number of samples.

$MDEL_{human\ health} = AMEL_{human\ health} \times (Multiplier_{MDEL}/Multiplier_{AMEL})$

Total recoverable copper:

$MDEL_{human\ health}$ = 1,300 µg/L x 2.01 = 2,608 µg/L

Step 7: Select the lower of the AMEL and MDEL based on aquatic life and human health as the WQBEL for this Order.

For total recoverable copper used in this example, the WQBELs based on aquatic life criteria would be applied. These limitations are expected to be protective of beneficial uses. Final WQBELs are summarized in section IV.D.4 of this Fact Sheet.

b. Toxic Parameters (Table 1 of the Ocean Plan)

From the Table 1 water quality objectives of the Ocean Plan, effluent limitations are calculated according to the following equation for all pollutants, except for acute toxicity

(see section IV.C.7.b of this Fact Sheet to for effluent limit calculations for whole effluent toxicity).

Ce = Co + Dm (Co – Cs) where,

Ce = the effluent limitation (µg/L)

Co = the water quality objective to be met at the completion of initial dilution (µg/L)

Cs = background seawater concentration

Dm = minimum probable initial dilution expressed as parts seawater per part wastewater

A previously discussed, initial dilution (Dm) has been determined to be 3 to 1 by the San Diego Water Board.

Table 2 of the Ocean Plan establishes background concentrations for some pollutants to be used when determining reasonable potential (represented as "Cs"). In accordance with Table 1 implementing procedures, Cs equals zero for all pollutants not established in Table 2. The background concentrations provided in Table 2 are summarized below:

Table F-2. Ocean Plan Background Concentrations

Pollutant	Background Seawater Concentration
Arsenic	3 µg/L
Copper	2 µg/L
Mercury	0.0005 µg/L
Silver	0.16 µg/L
Zinc	8 µg/L

As an example of how effluent limitations have been calculated, the effluent limitations for total residual chlorine are determined as follows:

Water quality objectives from the Ocean Plan for total residual chlorine are:

Parameter	Units	6-Month Median	Daily Maximum	Instantaneous Maximum
Total Residual Chlorine	µg/L	2	8	60

Using the equation, Ce = Co + Dm (Co – Cs), effluent limitations are calculated as follows.

Total residual chlorine:

Ce = 2 + 3 (2 – 0) = 8 µg/L (6-Month Median)
Ce = 8 + 3 (8 – 0) = 32 µg/L (Daily Maximum)
Ce = 60 + 3 (60 – 0) = 240 µg/L (Instantaneous Maximum)

Section III.C.4.j of the Ocean Plan requires that discharge requirements shall also specify effluent limitations in terms of mass emission rate limits, based on WQBEL (concentration) and flowrate. However, this Order prohibits the discharge of extracted groundwater in excess of the flowrate specified in the NOA on which mass-based effluent limitations would be based. As such, mass-loading is limited by both the concentration-based effluent limitations and the permitted flow rate to the same level that

would otherwise be established pursuant to section III.C.4.j of the Ocean Plan. As such, individual mass-based effluent limitations have not been established in the Order. However, the San Diego Water Board may establish mass-based effluent limitations at its discretion within the NOA based on site-specific information.

6. Antibacksliding

Order Nos. R9-2007-0034 and R9-2008-0002 established effluent limitations for a number of pollutants based on State and federal anti-backsliding regulations, however did not provide the basis for which the effluent limitations were initially established in previous permits. Many of the pollutants carried over appear to be water quality-based effluent limitations established consistent with the NTR, CTR, Basin Plan, or Ocean Plan. As such, reasonable potential to exceed applicable water quality criteria/objectives shall be evaluated as previously discussed, and effluent limitations and monitoring requirements established as necessary. However, a number of these parameters could not be identified as being water quality-based, and have been carried over based solely on State and federal anti-backsliding requirements. These effluent limitations, and corresponding monitoring requirements, shall be applied to discharges that exceed the limit-based triggers established in Appendix C-1, and as described in section II.B of the MRP.

a. Inland surface waters

Order No. R9-2008-0002 established effluent limitations for the following parameters to discharges to inland surface waters based on State and federal anti-backsliding regulations:

- Settleable Solids
- Total Suspended Solids
- Hydrogen Sulfide
- Total Residual Chlorine (only for Dischargers that chlorinate)
- Xylene
- Chlorinated Phenolics
- Remaining Base/Neutral Compounds
- Total Petroleum Hydrocarbons

Extracted groundwater discharged to inland surface waters may contain inconsistent levels of settleable and suspended solids, impacting the ability to accurately evaluate the potential to exceed effluent limitations during the NOI process. Thus, effluent limitations for settleable solids and total suspended solids shall be established independent of sampling results submitted by Dischargers for discharges to inland surface waters.

b. Bays and estuaries

Order No. R9-2008-0002 established effluent limitations for discharges associated with contaminated groundwater to bays and estuaries based on State and federal anti-backsliding regulations. Consistent with State and federal anti-backsliding regulations, these effluent limitations have been carried over.

- Total Suspended Solids
- Settleable Solids
- Hydrogen Sulfide
- Ethylbenzene
- Dichloromethane
- Xylene
- Total Petroleum Hydrocarbons
- Halomethanes
- Toluene
- Benzene

Extracted groundwater discharged to bays and estuaries may contain inconsistent levels of settleable and suspended solids, impacting the ability to accurately evaluate the potential to exceed effluent limitations during the NOI process. Thus, effluent limitations

for settleable solids and total suspended solids shall be established independent of sampling results submitted by Dischargers for discharges to bays and estuaries.

c. Pacific Ocean

Order No. R9-2008-0002 established effluent limitations for xylene, total petroleum hydrocarbons, and dissolved oxygen based on State and federal anti-backsliding regulations. Consistent with State and federal anti-backsliding regulations, effluent limitations for xylene, total petroleum hydrocarbons, and dissolved oxygen have been carried over from Order No. R9-2008-0002.

7. Whole Effluent Toxicity (WET)

Effluent limitations for WET are established for all discharges covered under this Order, independent of the initial pollutant scan required by Appendix C-1 of Attachment C of this Order. Due to uncertainty on toxic effects resulting from the limited initial monitoring data; the potential presence of a variety of pollutants from groundwater contamination sites and plumes in close proximity to groundwater extraction sites, and the potential for toxic synergistic reactions of pollutants in the extracted groundwater discharge, WET effluent limitations and monitoring requirements are necessary for the protection of aquatic life.

Whole effluent toxicity (WET) testing protects receiving waters from the aggregate toxic effect of a mixture of pollutants in the effluent. An acute toxicity test is conducted over a short time period and measures mortality. A chronic toxicity test is conducted over a short or a longer period of time and may measure mortality, reproduction, and growth. A chemical at a low concentration could have chronic effects but no acute effects until the chemical was at a higher concentration. Toxic constituents could be present in the effluent, or could have synergistic or additive effects.

In the past, the State Water Board reviewed the circumstances warranting a numeric chronic toxicity effluent limitation when there is reasonable potential with respect to SWRCB/OCC Files A-1496 & A-1496(a) [Los Coyotes/Long Beach Petitions]. On September 16, 2003, at a public hearing, the State Water Board adopted Order No. 2003-0012 (Los Coyotes Order) deferring the issue of numeric chronic toxicity effluent limitations until a subsequent Phase of the SIP is adopted. In the meantime, the State Water Board replaced the numeric chronic toxicity limit with a narrative effluent limitation and a 1.0 TUc trigger, in the Long Beach and Los Coyotes WRP NPDES permits.

However, many facts have changed since the State Water Board adopted the Los Coyotes Order in 2003. USEPA published two new guidance documents with respect to chronic toxicity testing; the California Regional Water Quality Board, Los Angeles Region adopted NPDES permits for industrial facilities incorporating TST-based effluent limits for chronic toxicity and has adopted numeric chronic toxicity effluent limits for industrial facilities and POTWs with TMDL WLAs of 1 TUc; and the California Regional Water Quality Board, Santa Ana Region adopted an NPDES permit for a POTW incorporating TST-based effluent limits for chronic toxicity. The San Diego Water Board has also adopted TST-based chronic toxicity effluent limitations in permits regulating discharges from boatyards and shipyards. In addition to these and other factual developments, the State Water Board has not adopted a revised policy that addresses chronic toxicity effluent limitations in NPDES permits for inland discharges, as anticipated by the Los Coyotes Order. Because the Los Coyotes Order explicitly “declined to make a determination … regarding the propriety of the final numeric effluent limitations for chronic toxicity…,” (Los Coyotes Order, p. 9) and because of the differing facts before the San Diego Water Board in 2015 as compared to the facts that were the basis for the Los Coyotes Order in 2003, the San Diego Water Board concludes that the

Los Coyotes Order does not require inclusion of narrative rather than numeric effluent limitations for chronic toxicity. Further, the San Diego Water Board finds that due to uncertainty resulting from the limited monitoring data used to evaluate reasonable potential for groundwater extraction discharges to cause or contribute to an exceedance of water quality objectives/criteria, and considering the potential for toxic synergistic reactions of pollutants within discharges, WET effluent limitations and monitoring requirements are necessary for the protection of aquatic life. This Order contains numeric chronic toxicity effluent limitations. Compliance with the chronic toxicity requirement contained in this Order shall be determined in accordance with section IX.K of this Order.

For this Order, chronic toxicity in the discharge is evaluated using a median monthly effluent limitation that utilizes USEPA's 2010 Test of Significant Toxicity (TST) hypothesis testing approach. The chronic toxicity effluent limitations are expressed as "Pass" for the median monthly summary results and as "Pass" or "<50% Effect" for each maximum daily individual results.

In June 2010, USEPA published a guidance document titled, *National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document* (EPA 833-R-10-003, June 2010), in which they recommend the following: "Permitting authorities should consider adding the TST approach to their implementation procedures for analyzing valid WET data for their current NPDES WET Program." The TST approach is another statistical option for analyzing valid WET test data. Use of the TST approach does not result in any changes to USEPA's WET test methods. Section 9.4.1.2 of USEPA's *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms* (EPA/821/R-02/013, 2002), recognizes that, "the statistical methods in this manual are not the only possible methods of statistical analysis." The TST approach can be applied to acute (survival) and chronic (sublethal) endpoints and is appropriate to use for both freshwater and marine EPA WET test methods.

USEPA's WET testing program and acute and chronic WET methods rely on the measurement result for a specific test endpoint, not upon achievement of specified concentration-response patterns to determine toxicity. USEPA's WET methods do not require achievement of specified effluent or ambient concentration-response patterns prior to determining that toxicity is present. Nevertheless, USEPA's acute and chronic WET methods require that effluent and ambient concentration-response patterns generated for multi-concentration acute and chronic toxicity tests be reviewed—as a component of test review following statistical analysis—to ensure that the calculated measurement result for the toxicity test is interpreted appropriately. (EPA-821-R-02-012, section 12.2.6.2; EPA-821-R-02-013, section 10.2.6.2.). In 2000, EPA provided guidance for such reviews to ensure that test endpoints for determining toxicity based on the statistical approaches utilized at the time the guidance was written (NOEC, LC50's, IC25s) were calculated appropriately (EPA 821-B-00-004).

USEPA designed its 2000 guidance as a standardized step-by step review process that investigates the causes for ten commonly observed concentration-response patterns and provides for the proper interpretation of the test endpoints derived from these patterns for NOECs, LC50s, and IC25s, thereby reducing the number of misclassified test results. The guidance provides one of three determinations based on the review steps: that calculated effect concentrations are reliable and should be reported, that calculated effect concentrations are anomalous and should be explained, or that the test was inconclusive and should be repeated with a newly collected sample. The standardized review of the effluent and receiving water concentration-response patterns provided by EPA's 2000 guidance decreased discrepancies in data interpretation for NOEC, LC50, and IC25 test

results, thereby lowering the chance that a truly nontoxic sample would be misclassified and reported as toxic.

Appropriate interpretation of the measurement result from USEPA's TST statistical approach (pass/fail) for effluent and receiving water samples is, by design, independent from the concentration-response patterns of the toxicity tests for those samples. Therefore, when using the TST statistical approach, application of EPA's 2000 guidance on effluent and receiving waters concentration-response patterns will not improve the appropriate interpretation of TST results as long as all Test Acceptability Criteria and other test review procedures—including those related to Quality Assurance for effluent and receiving water toxicity tests, reference toxicity tests, and control performance (mean, standard deviation, and coefficient of variation)—described by the WET test methods manual and TST guidance, are followed. The 2000 guidance may be used to identify reliable, anomalous, or inconclusive concentration-response patterns and associated statistical results to the extent that the guidance recommends review of test procedures and laboratory performance already recommended in the WET test methods manual. The guidance does not apply to single-concentration (IWC) and control statistical t-tests and does not apply to the statistical assumptions on which the TST is based. The San Diego Water Board will not consider a concentration-response pattern as sufficient basis to determine that a TST t- test result for a toxicity test is anything other than valid, absent other evidence. In a toxicity laboratory, unexpected concentration-response patterns should not occur with any regular frequency and consistent reports of anomalous or inconclusive concentration-response patterns or test results that are not valid will require an investigation of laboratory practices.

Any Data Quality Objectives or Standard Operating Procedure used by the toxicity testing laboratory to identify and report valid, invalid, anomalous, or inconclusive effluent or receiving water toxicity test measurement results from the TST statistical approach which include a consideration of concentration-response patterns and/or PMSDs must be submitted for review by the San Diego Water Board, in consultation with USEPA and the State Water Board's Quality Assurance Officer and Environmental Laboratory Accreditation Program (40 CFR 122.44(h)). As described in the bioassay laboratory audit directives to the San Jose Creek Water Quality Laboratory from the State Water Resources Control Board dated August 7, 2014, and from the USEPA dated December 24, 2013, the PMSD criteria only apply to compliance for NOEC and the sublethal endpoints of the NOEC, and therefore are not used to interpret TST results.

a. Inland Surface Waters, Bays and Estuaries

The Basin Plan defines toxicity as the adverse response of organisms to chemicals or physical agents. The Basin Plan establishes a narrative water quality objective for toxicity:

"All waters shall be maintained free of toxic substances in concentrations that are toxic, or that produce detrimental physiological responses in human, plant, animal, or aquatic life."

The implementation of toxicity monitoring requirements and effluent limitations are based on a statistical approach developed by U.S. EPA that assesses the WET measurement of wastewater effects on specific test organisms' ability to survive, grow, and reproduce, called the Test of Significant Toxicity (TST). Guidance documents for the TST include:

i. *Discharge Elimination System Test of Significant Toxicity Implementation Document, An Additional Whole Effluent Toxicity Statistical Approach for Analyzing Acute and Chronic Data (EPA 833-R-10-003), and*

ii. *U.S. EPA's June 2010 guidance document titled National Pollutant Discharge Elimination System Test of Significant Toxicity Technical Document, An Additional Whole Effluent Toxicity Statistical Approach for Analyzing Acute and Chronic Data (EPA 833-R-10-004).*

The TST approach is a statistical method with hypothesis testing techniques based on research and peer-reviewed publications. The approach examines whether an effluent at the critical concentration and a control within a WET test differ by an unacceptable amount (the amount that would have a measured detrimental effect on the ability of aquatic organisms to thrive and survive).Organism response to the effluent and control are unlikely to be exactly the same, even if no toxicity is present. They might differ by such a small amount that even if statistically significant, it would be considered negligible biologically. A more useful approach could be to rephrase the null hypothesis, "Is the mean response in the effluent less than a defined biological amount?" The Food and Drug Administration has successfully used that approach for many years to evaluate drugs, as have many researchers in other biological fields. In that approach, the null hypothesis is stated as the organism response in the effluent is less than or equal to a fixed fraction (b) of the control response (e.g., 0.75 of the control mean response):

Null hypothesis: Treatment mean ≤ *b* * Control mean

To reject the null hypothesis above means the effluent is considered nontoxic. To accept the null hypothesis means the effluent is toxic.

Before the TST null hypothesis expression could be recommended by U.S. EPA, certain Regulatory Management Decisions (RMDs) were needed, including what effect level in the effluent is considered unacceptably toxic and the desired frequency of declaring a truly negligible effect within a test nontoxic.

In the TST approach, the *b* value in the null hypothesis represents the threshold for unacceptable toxicity. For chronic toxicity, the U.S. EPA made the RMD that the b value is set at 0.75, which means that a 25 percent effect (or more) at the in-wastestream concentration (IWC) is considered evidence of unacceptable chronic toxicity.

U.S. EPA's RMDs for the TST method are intended to identify unacceptable toxicity most of the time when it occurs, while also minimizing the probability that the in-stream waste concentration (IWC) is declared toxic when in fact it is truly acceptable. Additional RMDs by U.S. EPA to achieve this objective were made regarding acceptable maximum false positive (13 using a TST approach) and false negative rates (a using a TST approach).

In the TST approach, the RMDs are defined as:

i. Declare a sample toxic between 75 - 95 percent of the time ($0.05 \leq a \leq 0.25$) when there is unacceptable toxicity.

ii. Declare an effluent non-toxic no more than 5 percent of the time ($\beta \leq 0.05$) when the effluent effect at the critical effluent concentration is 10 percent.

U.S. EPA used valid toxicity data from approximately 2,000 WET tests to develop and evaluate the TST approach. The TST approach was tested using nine different whole effluent toxicity test methods comprising twelve biological endpoints and representing most of the different types of whole effluent toxicity test designs in use. More than one million computer simulations were used to select appropriate alpha error rates for each test method that also achieved U.S. EPA's other RMDs for the TST approach.

Effluent limitations are established using the TST "pass" "fail" approach as well as a percent effect. A MDEL for chronic toxicity is established in this Order and is exceeded

when a toxicity test results in a "fail," and the percent effect is greater than or equal to 0.50 for chronic toxicity tests.

Chronic Pass

A test result that rejects the null hypothesis (Ho) below is reported as "Pass" in accordance with the TST approach:

Ho: Mean response (100 percent effluent) ≤ 0.75 x Control mean response

Chronic Fail

A test result that does not reject the null hypothesis (Ho) above is reported as "Fail" in accordance with the TST approach.

The percent effect at the IWC is calculated for each test result using the following equation:

$$\text{\% Effect at IWC} = \frac{\text{Mean Control Reponse-Mean IWC Response}}{\text{Mean Control Response}} \times 100$$

The IWC for these discharges are established at 100% effluent. Allowances for dilution and a different IWC may be made at the discretion of the San Diego Water Board. Because the San Diego Water Board has no documentation to support a different IWC, the IWC is defined as 100 percent effluent (undiluted). This definition of IWC is consistent with other San Diego Water Board's NPDES permitted discharges to San Diego Bay which do not allow dilution.

The San Diego Water Board finds that the application of U.S. EPA's TST method with the 50% effect for chronic toxicity is scientifically defendable and appropriate for the determination of compliance with the Basin Plan's narrative objective for toxicity. As such, toxicity monitoring requirements, analysis, and effluent limitations are established in this Order based on U.S. EPA's TST method and a 50% effect for chronic toxicity.

Using the TST approach with the appropriate percent effect clarifies the requirements for toxicity analyses, provides Dischargers with the positive incentive to generate high quality data, and affords greater protection to aquatic life. Thus, WET effluent limitations established based on the TST method are considered at least as stringent as previous WET limitations established in Order Nos. R9-2007-0034 and R9-2008-0002.

b. Pacific Ocean

Table 1 of the Ocean Plan establishes numeric water quality objectives to acute and chronic toxicity:

Table F-3. Ocean Plan Objectives for Toxicity

Parameter	Water Quality Objective
Acute Toxicity	0.3 TUa
Chronic Toxicity	1 TUc

As previously discussed, because discharges addressed under this Order may discharge to a variety of locations along the Pacific Ocean coast line within the San Diego Region, applying whole effluent toxicity limitations without dilution provides additional protection from potential synergistic effects to aquatic life from the pollutants present in the effluent, and ensures that discharges that occur under unanticipated

receiving water conditions will not negatively impact aquatic life. Consistent with Order No. R9-2008-0002, this Order applies acute and chronic toxicity criteria without dilution.

Based on the procedures specified in section III.C.4 of the Ocean Plan, and discussed in section IV.C.5.b of this fact sheet, the resulting chronic toxicity effluent limitation for discharges to the Pacific Ocean is 1 TUc.

Section III.C.4.b of the Ocean Plan specifies the following equation for the calculation of the acute toxicity effluent limitation:

$$Ce = Ca + (0.1)\ Dm\ (Ca)$$ where,

Ca = the water quality objective to be met at the completion of initial dilution (µg/L)

Dm = minimum probable initial dilution expressed as parts seawater per part wastewater

The resulting acute toxicity effluent limitation for discharges to the Pacific Ocean is 0.3 TUa.

D. Final Effluent Limitations

1. Anti-Backsliding Requirements

Sections 402(o) and 303(d)(4) of the CWA and federal regulations at 40 CFR section 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations may be relaxed. All effluent limitations in this Order are at least as stringent as the effluent limitations in the previous Order except for one technical mistake for chlorinated phenolics referenced on page F-23.

2. Antidegradation Policies

Section 131.12 of 40 CFR requires that State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution 68-16. Resolution 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. Resolution 68-16 requires that existing high water quality be maintained unless degradation is justified based on specific findings. The State Water Board and Regional Water Board's Water Quality Control Plans implement, and incorporate by reference, both the State and federal antidegradation policies. The permitted discharges must be consistent with the antidegradation provision of section 131.12 and State Water Board Resolution 68-16.

Given the nature of a general permit and the broad range of beneficial uses to be protected across the Region, it is not feasible to analyze each surface water body in the Region to determine which water bodies are of high quality for the constituents in the discharges authorized by this Order. The San Diego Water Board finds that, due in part to the often times intermittent and temporary characteristics of these discharges, the impact on existing surface water quality from these discharges will be insignificant. While high-quality surface waters may be temporarily degraded, any such impacts to surface water quality that may occur are consistent with the maximum social and economic benefit of the people of the State, provided that the discharges comply with this Order. The discharges are a necessary consequence of providing an affordable and practical means for managing groundwater to the people of the State. The treatment and BMP standards required under this Order constitute best practical treatment and control of these discharges. Therefore the discharges

permitted under this Order are consistent with the antidegradation provision of 40 CFR section 131.12 and the State Water Board Resolution 68-16.

3. Stringency of Requirements for Individual Pollutants

Both the beneficial uses and the water quality objectives have been approved pursuant to federal law and are the applicable federal water quality standards. All beneficial uses and water quality objectives contained in the Basin Plan were approved under state law and submitted to and approved by U.S. EPA prior to May 30, 2000. Any water quality objectives and beneficial uses submitted to U.S. EPA prior to May 30, 2000, but not approved by U.S. EPA before that date, are nonetheless "applicable water quality standards for purposes of the CWA" pursuant to section 131.21(c)(1). Collectively, this Order's restrictions on individual pollutants are no more stringent than required to implement the requirements of the CWA.

4. Mass-Based Effluent Limitations

All permit limitations, standards, and prohibitions shall also be expressed in terms of mass except for pH, or other pollutants which cannot appropriately be expressed by mass or under certain circumstances including "when applicable standards and limitations are expressed in terms of other units of measurement" (40 CFR section 122.45(f)(1)).

5. Final Effluent Limitations

a. All Inland Freshwater Surface Waters except for Chollas Creek

Freshwater criteria apply where receiving water salinities are 1 part per thousand and below and at locations where this occurs 95% or more of the time. Saltwater criteria apply at receiving water salinities of 10 part per thousand and above and at locations where this occurs 95% of the time. Where receiving water salinities are between 1 and 10 parts per thousand the more stringent of freshwater or saltwater criteria applies. Discharges to inland freshwater surface waters, shall not exceed the effluent limitations specified below:

Table F-4. Hardness Dependent Metal Effluent Limitations for Discharges to Inland Freshwater Surface Waters

Parameter[1]	Units	Hardness (mg/L)						Basis
		Up to 200		200 - 300		300 and above		
		AMEL	MDEL	AMEL	MDEL	AMEL	MDEL	
Cadmium	µg/L	3.5	7.0	4.8	9.6	6.0	12	CTR AL
Copper[2]	µg/L	14	28	20	39	25	50	CTR AL
Lead[2]	µg/L	6.3	13	11	21	15	31	CTR AL
Nickel	µg/L	77	150	110	220	140	280	CTR AL
Silver	µg/L	6.7	13	13	27	22	44	CTR AL
Zinc[2]	µg/L	107	220	150	300	190	390	CTR AL

CTR AL – California Toxics Rule, Aquatic Life Criteria
[1] All metals are expressed as total recoverable.
[2] Discharges to Chollas Creek shall not exceed the effluent limitations established in section IV.A.1.b of this permit

b. Chollas Creek Specific TMDL-based Effluent Limitations

Discharges to Chollas Creek shall not exceed the following effluent limitations for copper, lead, and zinc.

Table F-5. Hardness-Dependent Metal Limits for Discharges to Chollas Creek

Parameter[1]	Units	Hardness (mg/L)						Basis
		Up to 200		200 - 300		300 and above		
		AMEL	MDEL	AMEL	MDEL	AMEL	MDEL	
Copper	µg/L	11.6	23.2	16.8	33.8	21.5	43.2	TMDL
Lead	µg/L	3.9	7.8	5.6	12.0	8.1	16.1	TMDL
Zinc	µg/L	94.4	189.4	133.1	267.0	169.9	340.8	TMDL

TMDL – Total Maximum Daily Load (Resolution No. R9-2007-0043)
[1] All metals are expressed as total recoverable.

c. Municipal Freshwater Receiving Waters. Discharges to freshwater receiving waters, with a designated municipal (MUN) beneficial use, shall not exceed the effluent limitations specified below:

Table F-6. Effluent Limits for Discharges to Inland Freshwaters with MUN Beneficial Use

Parameters	Units	Effluent Limitations			Basis
		AMEL	MDEL	Instantaneous Maximum	
Applicable to All Dischargers					
Settleable Solids	ml/L	0.1	--	0.2	Previous Order
Total Suspended Solids	mg/L	30	--	50	Previous Order
Turbidity	NTU	--	--	20[1]	Basin Plan
Chronic Toxicity	Pass/Fail	--	Pass[2]	--	Basin Plan
pH	standard units	--	--	6.5 – 8.5[3]	Basin Plan
Based on Results of Reasonable Potential Analysis					
Hydrogen Sulfide	µg/L	2.0	4.0	10	Previous Order
Xylene	µg/L	--	--	5	Previous Order
Chlorinated Phenolics	µg/L	--	--	1	Previous Order
Remaining Base/Neutral Compounds	µg/L	--	--	10	Previous Order
Total Petroleum Hydrocarbons	mg/L	--	--	0.5	Previous Order
Percent Sodium	%	--	--	60	Basin Plan
Total Nitrogen	mg/L	1.0	--	2.0	Basin Plan
Total Phosphorus	mg/L	0.1	--	0.2	Basin Plan
Methylene Blue Active Substances (MBAS)	mg/L	--	--	0.5	Basin Plan
Fluoride	mg/L	--	--	1.0	Basin Plan
Total Residual Chlorine	µg/L	2.0	8.0	10	Previous Order
Dissolved Oxygen	mg/L	--	--	5.0/6.0[4]	Basin Plan
Iron, Total Recoverable	mg/L	--	--	0.3	Basin

Parameters	Units	Effluent Limitations			Basis
		AMEL	MDEL	Instantaneous Maximum	
					Plan/MCL
Manganese, Total Recoverable	mg/L	--	--	0.05	Basin Plan/MCL
Total Coliform	MPN/100 mL	--	--	1,000	Previous Order
Fecal Coliform	MPN/100 mL	--	--	200	Previous Order
Dibromochloropropane	µg/L	--	--	0.2	Basin Plan/MCL
Ethylene Dibromide	µg/L	--	--	0.02	Basin Plan/MCL
Methyl-Tert-Butyl Ether (MTBE)	µg/L	--	--	5.0	Basin Plan/MCL
Antimony, Total Recoverable	ug/L	14	28	--	CTR HH
Arsenic, Total Recoverable	ug/L	120	250	--	CTR AL
Chromium (III) , Total Recoverable	ug/L	530	1,100	--	CTR AL
Chromium (VI) , Total Recoverable	ug/L	8.0	16.0	--	CTR AL
Mercury, Total Recoverable	ug/L	0.05	0.1	--	CTR HH
Selenium, Total Recoverable	ug/L	4.1	8.2	--	CTR AL
Thallium, Total Recoverable	ug/L	1.7	3.4	--	CTR HH
Cyanide, Total	ug/L	4.3	8.5	--	CTR AL
2,3,7,8 TCDD	ug/L	1.3E-08	2.6E-08	--	CTR HH
TCDD Equivalents	ug/L	1.3E-08	2.6E-08	--	CTR HH
Acrolein	ug/L	320	640	--	CTR HH
Acrylonitrile	ug/L	0.06	0.12	--	CTR HH
Benzene	ug/L	1.2	2.4	--	CTR AL
Bromoform	ug/L	4.3	8.6	--	CTR HH
Carbon Tetrachloride	ug/L	0.25	0.50	--	CTR HH
Chlorobenzene	ug/L	680	1,400	--	CTR HH
Chlorodibromomethane	ug/L	0.40	0.80	--	CTR HH
Dichlorobromomethane	ug/L	0.56	1.1	--	CTR HH
1,2-Dichloroethane	ug/L	0.38	0.76	--	CTR HH
1,1-Dichloroethylene	ug/L	0.1	0.1	--	CTR HH
1,2-Dichloropropane	ug/L	0.52	1.0	--	CTR HH
1,3-Dichloropropylene	ug/L	10	20	--	CTR HH
Ethylbenzene	ug/L	3,100	6,200	--	CTR HH
Methyl Bromide	ug/L	48	96	--	CTR HH
Methylene Chloride	ug/L	4.7	9.4	--	CTR HH
1,1,2,2-Tetrachloroethane	ug/L	0.17	0.34	--	CTR HH
Tetrachloroethylene	ug/L	0.8	1.6	--	CTR HH
Toluene	ug/L	6,800	14,000	--	CTR HH
1,2-Trans-Dichloroethylene	ug/L	700	1,400	--	CTR HH
1,1,2-Trichloroethane	ug/L	0.60	1.2	--	CTR HH

Parameters	Units	Effluent Limitations			Basis
		AMEL	MDEL	Instantaneous Maximum	
Trichloroethylene	ug/L	2.7	5.4	--	CTR HH
Vinyl Chloride	ug/L	2.0	4.0	--	CTR HH
2-Chlorophenol	ug/L	120	240	--	CTR HH
2,4-Dichlorophenol	ug/L	93	190	--	CTR HH
2,4-Dimethylphenol	ug/L	540	1,100	--	CTR HH
4,6-dinitro-o-resol	ug/L	13	27	--	CTR HH
2,4-Dinitrophenol	ug/L	70	140	--	CTR HH
Pentachlorophenol	ug/L	0.28	0.56	--	CTR HH
Phenol	ug/L	21,000	42,000	--	CTR HH
2,4,6-Trichlorophenol	ug/L	2.1	4.2	--	CTR HH
Acenaphthene	ug/L	1,200	2,400	--	CTR HH
Anthracene	ug/L	9,600	19,000	--	CTR HH
Benzidine	ug/L	0.00012	0.00024	--	CTR HH
Benzo(a)Anthracene	ug/L	0.0044	0.0088	--	CTR HH
Benzo(a)Pyrene	ug/L	0.0044	0.0088	--	CTR HH
Benzo(b)Fluoranthene	ug/L	0.0044	0.0088	--	CTR HH
Benzo(k)Fluoranthene	ug/L	0.0044	0.0088	--	CTR HH
Bis(2-Chloroethyl)Ether	ug/L	0.031	0.062	--	CTR HH
Bis(2-Chloroisopropyl)Ether	ug/L	1,400	2,800	--	CTR HH
Bis(2-Ethylhexyl)Phthalate	ug/L	1.8	3.6	--	CTR HH
Butylbenzyl Phthalate	ug/L	3,000	6,000	--	CTR HH
2-Chloronaphthalene	ug/L	1,700	3,400	--	CTR HH
Chrysene	ug/L	0.0044	0.0088	--	CTR HH
Dibenzo(a,h)Anthracene	ug/L	0.0044	0.0088	--	CTR HH
1,2-Dichlorobenzene	ug/L	2,700	5,400	--	CTR HH
1,3-Dichlorobenzene	ug/L	400	802	--	CTR HH
1,4-Dichlorobenzene	ug/L	400	802	--	CTR HH
3,3 Dichlorobenzidine	ug/L	0.04	0.080	--	CTR HH
Diethyl Phthalate	ug/L	23,000	46,000	--	CTR HH
Dimethyl Phthalate	ug/L	310,000	630,000	--	CTR HH
Di-n-Butyl Phthalate	ug/L	2,700	5,400	--	CTR HH
2,4-Dinitrotoluene	ug/L	0.11	0.22	--	CTR HH
1,2-Diphenylhydrazine	ug/L	0.04	0.080	--	CTR HH
Fluoranthene	ug/L	300	600	--	CTR HH
Fluorene	ug/L	1,300	2,600	--	CTR HH
Hexachlorobenzene	ug/L	0.00075	0.0015	--	CTR HH
Hexachlorobutadiene	ug/L	0.44	0.88	--	CTR HH
Hexachlorocyclopentadiene	ug/L	240	480	--	CTR HH
Hexachloroethane	ug/L	1.9	3.80	--	CTR HH
Indeno(1,2,3-cd)Pyrene	ug/L	0.0044	0.0088	--	CTR HH
Isophorone	ug/L	8.4	17	--	CTR HH
Nitrobenzene	ug/L	17	34	--	CTR HH
N-Nitrosodimethylamine	ug/L	0.0007	0.0014	--	CTR HH
N-Nitrosodi-n-Propylamine	ug/L	0.005	0.010	--	CTR HH
N-Nitrosodiphenylamine	ug/L	5.0	10.0	--	CTR HH

Parameters	Units	Effluent Limitations			Basis
		AMEL	MDEL	Instantaneous Maximum	
Pyrene	ug/L	960	1,900	--	CTR HH
Aldrin	ug/L	0.00013	0.00026	--	CTR HH
alpha-BHC	ug/L	0.0039	0.0078	--	CTR HH
beta-BHC	ug/L	0.014	0.028	--	CTR HH
gamma-BHC	ug/L	0.019	0.038	--	CTR HH
Chlordane	ug/L	0.00057	0.0011	--	CTR HH
4,4'-DDT	ug/L	0.00059	0.0012	--	CTR HH
4,4'-DDE	ug/L	0.00059	0.0012	--	CTR HH
4,4'-DDD	ug/L	0.00083	0.0017	--	CTR HH
Dieldrin	ug/L	0.00014	0.00028	--	CTR HH
alpha-Endosulfan	ug/L	0.046	0.092	--	CTR HH
beta-Endosulfan	ug/L	0.046	0.092	--	CTR HH
Endosulfan Sulfate	ug/L	110	220	--	CTR HH
Endrin	ug/L	0.029	0.059	--	CTR AL
Endrin Aldehyde	ug/L	0.76	1.5	--	CTR HH
Heptachlor	ug/L	0.00021	0.00042	--	CTR HH
Heptachlor Epoxide	ug/L	0.00010	0.00020	--	CTR HH
PCBs sum	ug/L	0.00017	0.00034	--	CTR HH
Toxaphene	ug/L	0.00016	0.00033	--	CTR AL

MCL – Maximum Contaminant Levels
CTR HH – California Toxics Rule, Human Health Criteria
CTR AL – California Toxics Rule, Aquatic Life Criteria
[1] In addition to an instantaneous maximum of 20 NTU, the discharge shall not exceed the ambient turbidity of the surface water at any time.
[2] As specified in section IV of the MRP, Attachment E of this permit.
[3] Within the limits of 6.5 and 8.5 s.u. at all times.
[4] Shall not be less than 5.0 at any time in waters with designated warm fresh-water habitat beneficial use or less than 6.0 in waters with cold fresh-water habitat beneficial use.

d. **Non-Municipal Beneficial Use Freshwater Receiving Waters, including Buena Vista Lagoon.** Discharges to freshwater receiving waters, without a designated municipal (MUN) beneficial use, shall not exceed the effluent limitations specified below:

Table F-7. Effluent Limits for Discharges to Inland Freshwaters without MUN Beneficial Use, including Buena Vista Lagoon

Parameter	Unit	Effluent Limitations			Basis
		AMEL	MDEL	Instantaeous Maximum	
Applicable to All Dischargers					
Settleable Solids	ml/L	0.1	--	0.2	Previous Order
Total Suspended Solids	mg/L	30	--	50	Previous Order
Turbidity	NTU	--	--	20[1]	Basin Plan
Chronic Toxicity	Pass/Fail	--	Pass[2]	--	Basin Plan
pH	standard units	--	--	6.5 – 8.5[3]	Basin Plan
Based on Results of Reasonable Potential Analysis					

Parameter	Unit	Effluent Limitations			Basis
		AMEL	MDEL	Instantaeous Maximum	
Hydrogen Sulfide	µg/L	2.0	4.0	10	Previous Order
Xylene	µg/L	--	--	5	Previous Order
Chlorinated Phenolics	µg/L	--	--	10	Previous Order
Remaining Base/Neutral Compounds	µg/L	--	--	10	Previous Order
Total Petroleum Hydrocarbons	mg/L	--	--	0.5	Previous Order
Percent Sodium	%	--	--	60	Basin Plan
Total Nitrogen	mg/L	1.0	--	2.0	Basin Plan
Total Phosphorus	mg/L	0.1	--	0.2	Basin Plan
Methylene Blue Active Substances (MBAS)	mg/L	--	--	0.5	Basin Plan
Fluoride	mg/L	--	--	1.0	Basin Plan
Total Residual Chlorine	µg/L	2.0	8.0	10	Previous Order
Dissolved Oxygen	mg/L	--	--	5.0/6.0[4]	Basin Plan
Iron, Total Recoverable	mg/L	--	--	0.3	Previous Order/MCL
Manganese, Total Recoverable	mg/L	--	--	0.05	Previous Order/MCL
Total Coliform	MPN/100 mL	--	--	1,000	Previous Order
Fecal Coliform	MPN/100 mL	--	--	200	Previous Order
Dibromochloropropane	µg/L	--	--	0.2	Previous Order/MCL
Ethylene Dibromide	µg/L	--	--	0.02	Previous Order/MCL
Antimony, Total Recoverable	ug/L	4,300	8,600	--	CTR HH
Arsenic, Total Recoverable	ug/L	120	250	--	CTR AL
Chromium (III) , Total Recoverable	ug/L	340	670	--	CTR AL
Chromium (VI) , Total Recoverable	ug/L	8.0	16	--	CTR AL
Mercury, Total Recoverable	ug/L	0.051	0.10	--	CTR HH
Selenium, Total Recoverable	ug/L	4.1	8.2	--	CTR AL
Thallium, Total Recoverable	ug/L	6.3	13	--	CTR HH
Cyanide, Total	ug/L	4.3	8.5	--	CTR AL
2,3,7,8 TCDD	ug/L	1.40E-08	2.81E-08	--	CTR HH
TCDD Equivalents	ug/L	1.40E-08	2.81E-08	--	CTR HH
Acrolein	ug/L	780	1,600	--	CTR HH
Acrylonitrile	ug/L	0.66	1.3	--	CTR HH
Benzene	ug/L	71	140	--	CTR HH
Bromoform	ug/L	360	720	--	CTR HH
Carbon Tetrachloride	ug/L	4.4	8.8	--	CTR HH

Parameter	Unit	Effluent Limitations			Basis
		AMEL	MDEL	Instantaeous Maximum	
Chlorobenzene	ug/L	21,000	42,000	--	CTR HH
Chlorodibromomethane	ug/L	34	68	--	CTR HH
Dichlorobromomethane	ug/L	46	92	--	CTR HH
1,2-Dichloroethane	ug/L	99	200	--	CTR HH
1,1-Dichloroethylene	ug/L	3.2	6.4	--	CTR HH
1,2-Dichloropropane	ug/L	39	78	--	CTR HH
1,3-Dichloropropylene	ug/L	1,700	3,400	--	CTR HH
Ethylbenzene	ug/L	29,000.00	58,000	--	CTR HH
Methyl Bromide	ug/L	4,000	8,000	--	CTR HH
Methylene Chloride	ug/L	1,600	3,200	--	CTR HH
1,1,2,2-Tetrachloroethane	ug/L	11	22	--	CTR HH
Tetrachloroethylene	ug/L	8.9	18	--	CTR HH
Toluene	ug/L	200,000	400,000	--	CTR HH
1,2-Trans-Dichloroethylene	ug/L	140,000	280,000	--	CTR HH
1,1,2-Trichloroethane	ug/L	42	84	--	CTR HH
Trichloroethylene	ug/L	81	160	--	CTR HH
Vinyl Chloride	ug/L	530	1,100	--	CTR HH
2-Chlorophenol	ug/L	400	800	--	CTR HH
2,4-Dichlorophenol	ug/L	790	1,600	--	CTR HH
2,4-Dimethylphenol	ug/L	2,300	4,600	--	CTR HH
4,6-dinitro-o-resol (aka2-methyl-4,6-Dinitrophenol)	ug/L	765	1,500	--	CTR HH
2,4-Dinitrophenol	ug/L	14,000	28,000	--	CTR HH
Pentachlorophenol	ug/L	4.3	8.7	--	CTR HH
Phenol	ug/L	4,600,000	9,000,000	--	CTR HH
2,4,6-Trichlorophenol	ug/L	6.5	13	--	CTR HH
Acenaphthene	ug/L	2,700	5,400	--	CTR HH
Anthracene	ug/L	110,000	220,000	--	CTR HH
Benzidine	ug/L	0.00054	0.0011	--	CTR HH
Benzo(a)Anthracene	ug/L	0.049	0.098	--	CTR HH
Benzo(a)Pyrene	ug/L	0.049	0.098	--	CTR HH
Benzo(b)Fluoranthene	ug/L	0.049	0.098	--	CTR HH
Benzo(k)Fluoranthene	ug/L	0.049	0.098	--	CTR HH
Bis(2-Chloroethyl)Ether	ug/L	1.4	2.8	--	CTR HH
Bis(2-Chloroisopropyl)Ether	ug/L	170,000	340,000	--	CTR HH
Bis(2-Ethylhexyl)Phthalate	ug/L	5.9	12	--	CTR HH
Butylbenzyl Phthalate	ug/L	5,200	10,000	--	CTR HH
2-Chloronaphthalene	ug/L	4,300	8,600	--	CTR HH
Chrysene	ug/L	0.049	0.098	--	CTR HH
Dibenzo(a,h)Anthracene	ug/L	0.049	0.098	--	CTR HH
1,2-Dichlorobenzene	ug/L	17,000	34,000	--	CTR HH
1,3-Dichlorobenzene	ug/L	2,600	5,200	--	CTR HH
1,4-Dichlorobenzene	ug/L	2,600	52,00	--	CTR HH
3,3 Dichlorobenzidine	ug/L	0.077	0.15	--	CTR HH
Diethyl Phthalate	ug/L	120,000	240,000	--	CTR HH

Parameter	Unit	Effluent Limitations			Basis
		AMEL	MDEL	Instantaeous Maximum	
Dimethyl Phthalate	ug/L	2,900,000	5,800,000	--	CTR HH
Di-n-Butyl Phthalate	ug/L	12,000	24,000	--	CTR HH
2,4-Dinitrotoluene	ug/L	9.1	18	--	CTR HH
1,2-Diphenylhydrazine	ug/L	0.54	1.1	--	CTR HH
Fluoranthene	ug/L	370	740	--	CTR HH
Fluorene	ug/L	14,000	28,000	--	CTR HH
Hexachlorobenzene	ug/L	0.00077	0.0015	--	CTR HH
Hexachlorobutadiene	ug/L	50	100	--	CTR HH
Hexachlorocyclopentadiene	ug/L	17,000	34,000	--	CTR HH
Hexachloroethane	ug/L	8.9	18	--	CTR HH
Indeno(1,2,3-cd)Pyrene	ug/L	0.049	0.098	--	CTR HH
Isophorone	ug/L	600	1,200	--	CTR HH
Nitrobenzene	ug/L	1,900	3,800	--	CTR HH
N-Nitrosodimethylamine	ug/L	8.1	16	--	CTR HH
N-Nitrosodi-n-Propylamine	ug/L	1.4	2.8	--	CTR HH
Pyrene	ug/L	11,000	22,000	--	CTR HH
Aldrin	ug/L	0.00014	0.00028	--	CTR HH
alpha-BHC	ug/L	0.013	0.026	--	CTR HH
beta-BHC	ug/L	0.046	0.092	--	CTR HH
gamma-BHC	ug/L	0.063	0.13	--	CTR HH
Chlordane	ug/L	0.00059	0.0012	--	CTR HH
4,4'-DDT	ug/L	0.00059	0.0012	--	CTR HH
4,4'-DDE (linked to DDT)	ug/L	0.00059	0.0012	--	CTR HH
4,4'-DDD	ug/L	0.00084	0.0017	--	CTR HH
Dieldrin	ug/L	0.00014	0.00028	--	CTR HH
alpha-Endosulfan	ug/L	0.046	0.091	--	CTR HH
beta-Endosulfan	ug/L	0.046	0.091	--	CTR HH
Endosulfan Sulfate	ug/L	240	481	--	CTR HH
Endrin	ug/L	0.029	0.059	--	CTR AL
Endrin Aldehyde	ug/L	0.81	1.6	--	CTR HH
Heptachlor	ug/L	0.0002	0.0004	--	CTR HH
Heptachlor Epoxide	ug/L	0.00011	0.00022	--	CTR HH
PCBs sum	ug/L	0.00017	0.00034	--	CTR HH
Toxaphene	ug/L	0.00016	0.00033	--	CTR AL

MCL – Maximum Contaminant Levels
CTR HH – California Toxics Rule, Human Health Criteria
CTR AL – California Toxics Rule, Aquatic Life Criteria

[1] In addition to an instantaneous maximum of 20 NTU, the discharge shall not exceed the ambient turbidity of the surface water at any time.

[2] As specified in section IV of the MRP, Attachment E of this permit.

[3] Within the limits of 6.5 and 8.5 s.u. at all times.

[4] Shall not be less than 5.0 at any time in waters with designated warm fresh-water habitat beneficial use or less than 6.0 in waters with cold fresh-water habitat beneficial use.

e. Effluent Limitations – Saltwater Inland Surface Waters, Not Including Bays and Estuaries

Freshwater criteria apply where receiving water salinities are 1 part per thousand and below and at locations where this occurs 95% or more of the time. Saltwater criteria apply at receiving water salinities of 10 part per thousand and above and at locations where this occurs 95% of the time. Where receiving water salinities are between 1 and 10 parts per thousand the more stringent of freshwater or saltwater criteria applies. Discharges to inland saltwater receiving waters, but not including bays and estuaries, shall not exceed the effluent limitations specified below.

Table F-8. Effluent Limits for Discharges to Saltwater Inland Surface Waters, not Including Bays and Estuaries

Parameters	Units	Effluent Limitations			Basis
		AMEL	MDEL	Insantaneous. Maximum	
Applicable to All Dischargers					
Settleable Solids	ml/L	0.1	--	0.2	Previous Order
Total Suspended Solids	mg/L	30	--	50	Previous Order
Turbidity	NTU	--	--	20[1]	Basin Plan
Chronic Toxicity	Pass/Fail	--	Pass[2]	--	Basin Plan
pH	s.u.	--	--	6.5 – 8.5[3]	Basin Plan
Based on Results of Reasonable Potential Analysis					
Hydrogen Sulfide	µg/L	2.0	4.0	10	Previous Order
Xylene	µg/L	--	--	5.0	Previous Order
Chlorinated Phenolics	µg/L	--	--	10	Previous Order
Remaining Base/Neutral Compounds	µg/L	--	--	10	Previous Order
Total Petroleum Hydrocarbons	mg/L	--	--	0.5	Previous Order
Percent Sodium	%	--	--	60	Basin Plan
Total Nitrogen	mg/L	1.0	--	2.0	Basin Plan
Total Phosphorus	mg/L	0.1	--	0.2	Basin Plan
Methylene Blue Active Substances (MBAS)	mg/L	--	--	0.5	Basin Plan
Fluoride	mg/L	--	--	1.0	Basin Plan
Total Residual Chlorine	µg/L	2.0	8.0	10	Previous Order
Dissolved Oxygen	mg/L	--	--	5.0/6.0[4]	Basin Plan
Iron, Total Recoverable	mg/L			0.3	Previous Order/MCL
Manganese, Total Recoverable	mg/L			0.05	Previous Order/MCL
Total Coliform	MPN/100 mL	--	--	1,000	Previous Order
Fecal Coliform	MPN/100 mL	--	--	200	Previous Order
Dibromochloropropane	µg/L	--	--	0.2	Previous

Parameters	Units	Effluent Limitations			Basis
		AMEL	MDEL	Insantaneous. Maximum	
					Order/MCL
Ethylene Dibromide	µg/L	--	--	0.02	Previous Order/MCL
Antimony, Total Recoverable	ug/L	4,300	8,600	--	CTR HH
Arsenic, Total Recoverable	ug/L	30	59	--	CTR AL
Cadmium, Total Recoverable	ug/L	7.7	1.5	--	CTR AL
Chromium (VI) , Total Recoverable	ug/L	41	83	--	CTR AL
Copper, Total Recoverable	ug/L	2.9	5.8	--	CTR AL
Lead, Total Recoverable	ug/L	7.0	14	--	CTR AL
Mercury, Total Recoverable	ug/L	0.051	0.01	--	CTR HH
Nickel, Total Recoverable	ug/L	6.8	14	--	CTR AL
Selenium, Total Recoverable	ug/L	58	117	--	CTR AL
Silver, Total Recoverable	ug/L	1.1	2.2	--	CTR AL
Thallium, Total Recoverable	ug/L	6.3	13	--	CTR HH
Zinc, Total Recoverable	ug/L	47	95	--	CTR AL
Cyanide, Total	ug/L	0.50	1	--	CTR AL
2,3,7,8 TCDD	ug/L	1.4E-08	2.8E-08	--	CTR HH
TCDD Equivalents	ug/L	1.4E-08	2.8E-08	--	CTR HH
Acrolein	ug/L	780	1,600	--	CTR HH
Acrylonitrile	ug/L	0.66	1.3	--	CTR HH
Benzene	ug/L	71	140	--	CTR HH
Bromoform	ug/L	360	720	--	CTR HH
Carbon Tetrachloride	ug/L	4.4	8.8	--	CTR HH
Chlorobenzene	ug/L	21,000	42,000	--	CTR HH
Chlorodibromomethane	ug/L	34	68	--	CTR HH
Dichlorobromomethane	ug/L	46	92	--	CTR HH
1,2-Dichloroethane	ug/L	99	200	--	CTR HH
1,1-Dichloroethylene	ug/L	3.2	6.4	--	CTR HH
1,2-Dichloropropane	ug/L	39	78	--	CTR HH
1,3-Dichloropropylene	ug/L	1,700	3,400	--	CTR HH
Ethylbenzene	ug/L	29,000	58,000	--	CTR HH
Methyl Bromide	ug/L	4,000	8,000	--	CTR HH
Methylene Chloride	ug/L	1,600	3,200	--	CTR HH
1,1,2,2-Tetrachloroethane	ug/L	11	22	--	CTR HH
Tetrachloroethylene	ug/L	8.9	18	--	CTR HH
Toluene	ug/L	200,000	400,000	--	CTR HH
1,2-Trans-Dichloroethylene	ug/L	140,000	280,000	--	CTR HH
1,1,2-Trichloroethane	ug/L	42	84	--	CTR HH
Trichloroethylene	ug/L	81	160	--	CTR HH
Vinyl Chloride	ug/L	530	1,000	--	CTR HH
2-Chlorophenol	ug/L	400	800	--	CTR HH
2,4-Dichlorophenol	ug/L	790	1,600	--	CTR HH

Parameters	Units	Effluent Limitations			Basis
		AMEL	MDEL	Insantaneous. Maximum	
2,4-Dimethylphenol	ug/L	2,300	4,600	--	CTR HH
4,6-dinitro-o-resol (aka2-methyl-4,6-Dinitrophenol)	ug/L	770	1,500	--	CTR HH
2,4-Dinitrophenol	ug/L	14,000	28,000	--	CTR HH
Pentachlorophenol	ug/L	6.5	13	--	CTR AL
Phenol	ug/L	4,600,000	9,000,000	--	CTR HH
2,4,6-Trichlorophenol	ug/L	6.5	13	--	CTR HH
Acenaphthene	ug/L	2,700	5,400	--	CTR HH
Anthracene	ug/L	110,000	220,000	--	CTR HH
Benzidine	ug/L	0.00054	0.0011	--	CTR HH
Benzo(a)Anthracene	ug/L	0.049	0.098	--	CTR HH
Benzo(a)Pyrene	ug/L	0.049	0.098	--	CTR HH
Benzo(b)Fluoranthene	ug/L	0.049	0.098	--	CTR HH
Benzo(k)Fluoranthene	ug/L	0.049	0.098	--	CTR HH
Bis(2-Chloroethyl)Ether	ug/L	1.4	2.8	--	CTR HH
Bis(2-Chloroisopropyl)Ether	ug/L	170,000	340,000	--	CTR HH
Bis(2-Ethylhexyl)Phthalate	ug/L	5.9	12	--	CTR HH
Butylbenzyl Phthalate	ug/L	5,200	10,000	--	CTR HH
2-Chloronaphthalene	ug/L	4,300	8,600	--	CTR HH
Chrysene	ug/L	0.049	0.098	--	CTR HH
Dibenzo(a,h)Anthracene	ug/L	0.049	0.098	--	CTR HH
1,2-Dichlorobenzene	ug/L	17,000	34,000	--	CTR HH
1,3-Dichlorobenzene	ug/L	2,600	5,200	--	CTR HH
1,4-Dichlorobenzene	ug/L	2,600	5,200	--	CTR HH
3,3 Dichlorobenzidine	ug/L	0.077	0.15	--	CTR HH
Diethyl Phthalate	ug/L	120,000	240,000	--	CTR HH
Dimethyl Phthalate	ug/L	2,900,000	5,800,000	--	CTR HH
Di-n-Butyl Phthalate	ug/L	12,000	24,000	--	CTR HH
2,4-Dinitrotoluene	ug/L	9.1	18	--	CTR HH
1,2-Diphenylhydrazine	ug/L	0.54	1.1	--	CTR HH
Fluoranthene	ug/L	370	740	--	CTR HH
Fluorene	ug/L	14,000	28,000	--	CTR HH
Hexachlorobenzene	ug/L	0.00077	0.0015	--	CTR HH
Hexachlorobutadiene	ug/L	50	100	--	CTR HH
Hexachlorocyclopentadiene	ug/L	17,000	34,000	--	CTR HH
Hexachloroethane	ug/L	8.9	18	--	CTR HH
Indeno(1,2,3-cd)Pyrene	ug/L	0.049	0.098	--	CTR HH
Isophorone	ug/L	600	1,200	--	CTR HH
Nitrobenzene	ug/L	1,900	3,800	--	CTR HH
N-Nitrosodimethylamine	ug/L	8.1	16	--	CTR HH
N-Nitrosodi-n-Propylamine	ug/L	1.4	2.8	--	CTR HH
N-Nitrosodiphenylamine	ug/L	16	32	--	CTR HH
Pyrene	ug/L	11,000	22,000	--	CTR HH

Parameters	Units	Effluent Limitations			Basis
		AMEL	MDEL	Insantaneous. Maximum	
Aldrin	ug/L	0.00014	0.00028	--	CTR HH
alpha-BHC	ug/L	0.013	0.026	--	CTR HH
beta-BHC	ug/L	0.046	0.092	--	CTR HH
gamma-BHC	ug/L	0.063	0.13	--	CTR HH
Chlordane	ug/L	0.00059	0.0012	--	CTR HH
4,4'-DDT	ug/L	0.00059	0.0012	--	CTR HH
4,4'-DDE (linked to DDT)	ug/L	0.00059	0.0012	--	CTR HH
4,4'-DDD	ug/L	0.00084	0.0017	--	CTR HH
Dieldrin	ug/L	0.00014	0.00028	--	CTR HH
alpha-Endosulfan	ug/L	0.0071	0.014	--	CTR AL
beta-Endosulfan	ug/L	0.0071	0.014	--	CTR AL
Endosulfan Sulfate	ug/L	240	480	--	CTR HH
Endrin	ug/L	0.0018	0.0038	--	CTR AL
Endrin Aldehyde	ug/L	0.81	1.6	--	CTR HH
Heptachlor	ug/L	0.00021	0.00042	--	CTR HH
Heptachlor Epoxide	ug/L	0.00011	0.00022	--	CTR HH
PCBs sum	ug/L	0.00017	0.00034	--	CTR HH
Toxaphene	ug/L	0.00016	0.00032	--	CTR AL

MCL – Maximum Contaminant Levels
CTR HH – California Toxics Rule, Human Health Criteria
CTR AL – California Toxics Rule, Aquatic Life Criteria
[1] In addition to an instantaneous maximum of 20 NTU, the discharge shall not exceed the ambient turbidity of the surface water at any time.
[2] As specified in section IV of the MRP, Attachment E of this permit.
[3] Within the limits of 6.5 and 8.5 s.u. at all times.
[4] Shall not be less than 5.0 at any time in waters with designated warm fresh-water habitat beneficial use or less than 6.0 in waters with cold fresh-water habitat beneficial use.

f. Effluent Limitations - Bays and Estuaries, not including Buena Vista Lagoon

i. Discharges to bays and estuaries, not including Buena Vista Lagoon, shall not exceed the effluent limitations specified below.

Table F-9. Effluent Limits for Discharges to Bays and Estuaries, not Including Buena Vista Lagoon

Parameters	Units	Effluent Limitations					Basis
		AMEL	AWEL	MDEL	Inst. Max[1]	6-Month Median	
Applicable to All Dischargers							
Settleable Solids	ml/L	1.0	1.5	--	3.0	--	Previous Order/Ocean Plan
Total Suspended Solids	mg/L	30	--	--	50	--	Previous Order
Turbidity	NTU	75	100	--	225	--	Ocean Plan
Chronic Toxicity	Pass/Fail	--	--	Pass[2]	--	--	Basin Plan
pH	s.u.	--	--	--	6.0 – 9.0[3] 7.0 – 8.5	--	Basin Plan
Based on Results of Reasonable Potential Analysis							
Hydrogen Sulfide	µg/L	2.0	--	4.0	10	--	Previous Order
Xylene	µg/L	--	--	--	5.0	--	Previous Order
Chlorinated Phenolics	µg/L	--	--	4.0	10	1.0	Ocean Plan
Base/Neutral Compounds[4]	µg/L	--	--	--	10	--	Previous Order
Total Petroleum Hydrocarbons	µg/L	--	--	--	500	--	Previous Order
Total Residual Chlorine	µg/L	--		8.0	60	2.0	Ocean Plan
Ammonia, Total	µg/L	--	--	2,400	6,000	600	Ocean Plan
Total Nitrogen	mg/L	--	--	--	2.0	1.0	Basin Plan
Total Phosphorus	mg/L	--	--	--	0.2	0.1	Basin Plan
Dissolved Oxygen	mg/L	--	--	--	5.0[5]	--	Basin Plan
Methyl-tert-butyl Ether	µg/L	--	--	--	5.0	--	Previous Order/MCL
Antimony, Total Recoverable	ug/L	4,300	--	8,600	--	--	CTR HH
Arsenic, Total Recoverable	ug/L	30	--	59	--	--	CTR AL
Cadmium , Total Recoverable	ug/L	7.7	--	15	--	--	CTR AL
Chromium (VI), Total Recoverable	ug/L	41	--	83	--	--	CTR AL
Copper, Total Recoverable	ug/L	2.9	--	5.8	--	--	CTR AL
Lead, Total Recoverable	ug/L	7.0	--	14	--	--	CTR AL
Mercury, Total Recoverable	ug/L	0.051	--	0.1	--	--	CTR HH
Nickel, Total Recoverable	ug/L	6.8	--	14	--	--	CTR AL
Selenium, Total Recoverable	ug/L	58	--	120	--	--	CTR AL
Silver, Total Recoverable	ug/L	1.1	--	2.2	--	--	CTR AL
Thallium, Total Recoverable	ug/L	6.3	--	13	--	--	CTR HH
Tributyltin	µg/L	0.0014	--	--	--	--	Ocean Plan
Zinc, Total Recoverable	ug/L	47	--	95	--	--	CTR AL

Parameters	Units	Effluent Limitations					Basis
		AMEL	AWEL	MDEL	Inst. Max[1]	6-Month Median	
Cyanide, total	ug/L	0.50	--	1.00	--	--	CTR AL
TCDD Equivalents[6]	ug/L	3.90E-09	--	--	--	--	Ocean Plan
Acrolein	ug/L	780	--	1,600	--	--	CTR HH
Acrylonitrile	ug/L	0.66	--	1.3	--	--	CTR HH
Benzene	ug/L	--	--	--	5.0	--	Previous Order
Carbon Tetrachloride	ug/L	0.9	--	--	--	--	Ocean Plan
Chlorobenzene	ug/L	2,100	--	42,000	--	--	CTR HH
Chlorodibromomethane	ug/L	34	--	68	--	--	CTR HH
Dichlorobromomethane	ug/L	46	--	92	--	--	CTR HH
Dichloromethane	µg/L	450[OP]	--	--	5.0[AB]	--	Previous Order/Ocean Plan
1,2-Dichloroethane	ug/L	28	--	--	--	--	Ocean Plan
1,1-Dichloroethylene	ug/L	3.2	--	6.4	--	--	CTR HH
1,2-Dichloropropane	ug/L	39	--	78	--	--	CTR HH
1,3-Dichloropropylene	ug/L	1,700	--	3,400	--	--	CTR HH
Ethylbenzene	ug/L	--	--	--	5.0	--	Previous Order
Phenolic Compounds (non-chlorinated)	µg/L	--	--	1202	300	30	Ocean Plan
1,1,2,2-Tetrachloroethane	ug/L	2.3	--	--	--	--	Ocean Plan
Tetrachloroethylene	ug/L	2.0	--	--	--	--	Ocean Plan
Toluene	ug/L	--	--	--	5.0	--	Previous Order
1,2-Trans-Dichloroethylene	ug/L	140,000	--	280,000	--	--	CTR HH
1,1,1-trichloroethane	µg/L	540,000	--	--	--	--	Ocean Plan
1,1,2-Trichloroethane	ug/L	9.4	--	--	--	--	Ocean Plan
Trichloroethylene	ug/L	27	--	--	--	--	Ocean Plan
Vinyl Chloride	ug/L	36	--	--	--	--	Ocean Plan
Chlorophenol	ug/L	400	--	800	--	--	CTR HH
2,4-Dichlorophenol	ug/L	790	--	1,600	--	--	CTR HH
2,4-Dimethylphenol	ug/L	2,300	--	4,600	--	--	CTR HH
4,6-dinitro-o-resol (aka2-methyl-4,6-Dinitrophenol)	ug/L	770	--	1,500	--	--	CTR HH
2,4-Dinitrophenol	ug/L	14,000	--	28,000	--	--	CTR HH
Pentachlorophenol	ug/L	6.5	--	13	--	--	CTR HH
Phenol	ug/L	4,600,00	--	9,200,000	--	--	CTR HH
2,4,6-Trichlorophenol	ug/L	6.5	--	13	--	--	CTR HH
Acenaphthene	ug/L	2,700	--	5,400	--	--	CTR HH
Anthracene	ug/L	110,000	--	220,000	--	--	CTR HH
Benzidine	ug/L	0.00054	--	0.0011	--	--	CTR HH
Benzo(a)Anthracene	ug/L	0.049	--	0.098	--	--	CTR HH
Benzo(a)Pyrene	ug/L	0.049	--	0.098	--	--	CTR HH
Benzo(b)Fluoranthene	ug/L	0.049	--	0.098	--	--	CTR HH

Parameters	Units	Effluent Limitations					Basis
		AMEL	AWEL	MDEL	Inst. Max[1]	6-Month Median	
Benzo(k)Fluoranthene	ug/L	0.049	--	0.098	--	--	CTR HH
Bis(2-Chloroethyl)Ether	ug/L	1.4	--	2.8	--	--	CTR HH
Bis(2-Chloroisopropyl)Ether	ug/L	170,000	--	340,000	--	--	CTR HH
Bis(2-Ethylhexyl)Phthalate	ug/L	5.9	--	12	--	--	CTR HH
Butylbenzyl Phthalate	ug/L	5,200	--	10,000	--	--	CTR HH
2-Chloronaphthalene	ug/L	4,300	--	8,600	--	--	CTR HH
Chrysene	ug/L	0.049	--	0.098	--	--	CTR HH
Dibenzo(a,h)Anthracene	ug/L	0.049	--	0.098	--	--	CTR HH
1,2-Dichlorobenzene	ug/L	17,000	--	34,000	--	--	CTR HH
1,3-Dichlorobenzene	ug/L	2,600	--	5,200	--	--	CTR HH
1,4-Dichlorobenzene	ug/L	2,600	--	5,200	--	--	CTR HH
3,3 Dichlorobenzidine	ug/L	0.077	--	0.15	--	--	CTR HH
Diethyl Phthalate	ug/L	120,000	--	240,000	--	--	CTR HH
Dimethyl Phthalate	ug/L	2,900,000	--	5,800,000	--	--	CTR HH
Di-n-Butyl Phthalate	ug/L	12,000	--	24,000	--	--	CTR HH
2,4-Dinitrotoluene	ug/L	9.1	--	18	--	--	CTR HH
1,2-Diphenylhydrazine	ug/L	0.51	--	1.1	--	--	CTR HH
Fluoranthene	ug/L	370	--	740	--	--	CTR HH
Fluorene	ug/L	14,000	--	28,000	--	--	CTR HH
Hexachlorobenzene	ug/L	0.00077	--	0.0015	--	--	CTR HH
Hexachlorobutadiene	ug/L	50	--	100	--	--	CTR HH
Hexachlorocyclopentadiene	ug/L	17,000	--	3,400	--	--	CTR HH
Hexachloroethane	ug/L	8.9	--	18	--	--	CTR HH
Indeno(1,2,3-cd)Pyrene	ug/L	0.049	--	0.098	--	--	CTR HH
Isophorone	ug/L	600	--	1,200	--	--	CTR HH
Nitrobenzene	ug/L	1,900	--	3,800	--	--	CTR HH
N-Nitrosodimethylamine	ug/L	8.1	--	16	--	--	CTR HH
N-Nitrosodi-n-Propylamine	ug/L	1.4	--	2.8	--	--	CTR HH
N-Nitrosodiphenylamine	ug/L	16	--	32	--	--	CTR HH
Polynuclear Aromatic Hydrocarbons (PAHs) [7]	µg/L	0.088	--	--	--	--	Ocean Plan
Pyrene	ug/L	11,000	--	22,000	--	--	CTR HH
Aldrin	ug/L	0.00014	--	0.00028	--	--	CTR HH
Chlordane[8]	ug/L	0.00059	--	0.0012	--	--	CTR HH
4,4'-DDT	ug/L	0.00059	--	0.0012	--	--	CTR HH
4,4'-DDE (linked to DDT)	ug/L	0.00059	--	0.0012	--	--	CTR HH
4,4'-DDD	ug/L	0.00084	--	00.0017	--	--	CTR HH
Dieldrin	ug/L	0.00014	--	0.00028	--	--	CTR HH
Endosulfan	ug/L	--	--	0.018	0.027	0.009	Ocean Plan
Endrin	ug/L	0.0023	--	0.0038	--	--	CTR HH
Endrin Aldehyde	ug/L	0.81	--	1.63	--	--	CTR HH
Halomethanes[9]	µg/L	--	--	--	5.0	--	Previous Order
Heptachlor	ug/L	0.00021	--	0.00042	--	--	CTR HH

Parameters	Units	Effluent Limitations					Basis
		AMEL	AWEL	MDEL	Inst. Max[1]	6-Month Median	
Heptachlor Epoxide	ug/L	0.00011	--	0.00022	--	--	CTR HH
Hexachlorocyclohexane (HCH)[10]	µg/L	--	--	0.008	0.012	0.004	Ocean Plan
PCBs sum[11]	ug/L	0.00017	--	0.00034	--	--	CTR HH
Toxaphene	ug/L	0.00020	--	0.00033	--	--	CTR AL

MCL – Maximum Contaminant Levels
CTR HH – California Toxics Rule, Human Health Criteria
CTR AL – California Toxics Rule, Aquatic Life Criteria

[1] Instantaneous Maximum Effluent Limitation.
[2] As specified in section IV of the MRP, Attachment E of this Order.
[3] All bays and harbors shall be within 6.0 and 9.0 standard units at all times. All saline lagoons (all lagoons with the exception of Buena Vista Lagoon) and estuaries of the region shall be within 7.0 and 8.5 standard units at all times.
[4] As defined using Method 6410.
[5] Applied as an instantaneous minimum effluent limitation.
[6] TCDD equivalents shall mean the sum of the concentrations of chlorinated dibenzodioxins (2,3,7,8-CDDs) and chlorinated dibenzofurans (2,3,7,8-CDFs) multiplied by their respective toxicity factors, as shown in the table below:

Isomer Group	Toxicity Equivalence Factor
2,3,7,8-tetra CDD	1.0
2,3,7,8-penta CDD	0.5
2,3,7,8-hexa CDDs	0.1
2,3,7,8-hepta CDD	0.01
Octa CDD	0.001
2,3,7,8- tetra CDF	0.1
1,2,3,7,8-penta CDF	0.05
2,3,4,7,8-penta CDF	0.5
2,3,7,8-hexa CDFs	0.1
2,3,7,8-hepta CDFs	0.01
Octa CDF	0.001

[7] Polynuclear Aromatic Hydrocarbons (PAHs) shall meanthe sum of acenaphthylene, anthracene, 1,2-benzanthracene, 3,4-benzofluoranthene, benzo[k]fluoranthene, 1,12-benzoperylene, benzo[a]pyrene, chrysene, dibenzo[ah]anthracene, fluorene, indeno[1,2,3-cd]pyrene, phenanthrene, and pyrene.
[8] Chlordane shall maen the sum of chlordane-alpha, chlordane-gamma, nonachlor-alpha, nonachlor-gamma, and oxychlordane.
[9] Halomethanes shall mean the sum of bromoform, bromethane, and chloromethane.
[10] Hexachlorocyclohexane (HCH) shall mean the sum of the alpha, beta, gamma, and delta isomers of hexachlorocyclohexane.
[11] PCBs sum shall mean the sum of chlorinated biphenyls whose analytical characteristics resemble those of aroclor-1221, aroclor-1232, aroclor-1242, aroclor-1248, aroclor-1254, and aroclor-1260.

ii. Discharges to bays and estuaries, not including Buena Vista Lagoon, shall not exceed the effluent limitations for bacteria specified below:

1) 30-day geometric mean limitations:

(a) Total coliform - 1,000/100 mL
(b) Fecal coliform - 200/100 mL
(c) Enterococcus - 35/100 mL

2) Single sample maximum limitations:

(a) Total coliform – 10,000/100 mL
(b) Fecal coliform – 400/100 mL
(c) Enterococcus – 104/100 mL

g. Effluent Limitations – Surf Zone of the Pacific Ocean

i. Discharges to the surf zone of the Pacific Ocean shall not exceed the effluent limitations specified below.

Table F-10. Effluent Limits for Discharges to the Surf Zone of the Pacific Ocean

Parameter	Units	Effluent Limitations					Basis
		AMEL	AWEL	6-month median	Daily max	Inst. Max.[1]	
Applicable to All Dischargers							
Grease and Oil	mg/L	25	40	--	--	75	Ocean Plan
Suspended Solids	mg/L	60[3]	--	--	--	--	Ocean Plan
Settleable Solids	mL/L	1.0	1.5	--	--	3.0	Ocean Plan
Turbidity	NTU	75	100	--	--	225	Ocean Plan
pH	s.u.	--	--	--	--	6.0 – 9.0	Ocean Plan
Based on Results of Reasonable Potential Analysis							
Dissolved Oxygen	mg/L	--	--	--	--	5.0[2]	Previous Order
Arsenic, Total Recoverable	ug/l	--	--	23	120	310	Ocean Plan
Cadmium, Total Recoverable	ug/l	--	--	4	16	40	Ocean Plan
Chromium VI, Total Recoverable	ug/l	--	--	8	32	80	Ocean Plan
Copper, Total Recoverable	ug/l	--	--	6	42	110	Ocean Plan
Lead, Total Recoverable	ug/l	--	--	8	32	80	Ocean Plan
Mercury, Total Recoverable	ug/l	--	--	0.16	0.64	1.6	Ocean Plan
Nickel, Total Recoverable	ug/l	--	--	20	80	200	Ocean Plan
Selenium, Total Recoverable	ug/l	--	--	60	240	600	Ocean Plan
Silver, Total Recoverable	ug/l	--	--	2.3	11	28	Ocean Plan
Zinc, Total Recoverable	ug/l	--	--	56	300	780	Ocean Plan
Cyanide, Total	ug/l	--	--	4	16	40	Ocean Plan
Total Chlorine Residual	ug/l	--	--	8	32	240	Ocean Plan
Ammonia (expressed as nitrogen)	ug/l	--	--	2,400	9,600	24,000	Ocean Plan
Acute Toxicity[10]	TUa	--	--	NA	0.3	NA	Ocean Plan
Chronic Toxicity[10]	TUc	--	--	NA	1	NA	Ocean Plan
Phenolic Compounds (non-chlorinated)	ug/l	--	--	120	480	1,200	Ocean Plan
Chlorinated Phenolics	ug/l	--	--	4	16	40	Ocean Plan

Parameter	Units	Effluent Limitations					Basis
		AMEL	AWEL	6-month median	Daily max	Inst. Max.[1]	
Endosulfan	ug/l	--	--	0.036	0.072	0.108	Ocean Plan
Endrin	ug/l	--	--	0.008	0.016	0.024	Ocean Plan
Hexachlorocyclohexane (HCH)[4]	ug/l	--	--	0.016	0.032	0.048	Ocean Plan
Acrolein	ug/l	880	--	--	--	--	Ocean Plan
Antimony	ug/l	4,800	--	--	--	--	Ocean Plan
Bis(2-chloroethoxy) Methane	ug/l	18	--	--	--	--	Ocean Plan
Bis(2-chloroisopropyl) ether	ug/l	4,800	--	--	--	--	Ocean Plan
Chlorobenzene	ug/l	2,300	--	--	--	--	Ocean Plan
Chromium (III)	ug/l	760,000	--	--	--	--	Ocean Plan
Di-n-butyl Phthalate	ug/l	14,000	--	--	--	--	Ocean Plan
Dichlorobenzenes	ug/l	20,000	--	--	--	--	Ocean Plan
Diethyl Phthalate	ug/l	130,000	--	--	--	--	Ocean Plan
Dimethyl Phthalate	ug/l	3,300,000	--	--	--	--	Ocean Plan
4,6-dinitro-2-methylphenol	ug/l	880	--	--	--	--	Ocean Plan
2,4-dinitrophenol	ug/l	16	--	--	--	--	Ocean Plan
Ethylbenzene	ug/l	16,000	--	--	--	--	Ocean Plan
Fluoranthene	ug/l	60	--	--	--	--	Ocean Plan
Hexachlorocyclopentadiene	ug/l	230	--	--	--	--	Ocean Plan
Nitrobenzene	ug/l	20	--	--	--	--	Ocean Plan
Thallium	ug/l	8	--	--	--	--	Ocean Plan
Toluene	ug/l	340,000	--	--	--	--	Ocean Plan
Total Petroleum Hydrocarbons	µg/L	--	--	--	--	500	Ocean Plan
Tributyltin	ug/l	0.0056	--	--	--	--	Ocean Plan
1,1,1-trichloroethane	ug/l	2,200,000	--	--	--	--	Ocean Plan
Xylene	µg/	--	--	--	--	5.0	Ocean Plan
Acrylonitrile	ug/l	0.4	--	--	--	--	Ocean Plan
Aldrin	ug/l	0.000088	--	--	--	--	Ocean Plan
Benzene	ug/l	24	--	--	--	--	Ocean Plan
Benzidine	ug/l	0.00028	--	--	--	--	Ocean Plan
Beryllium	ug/l	0.13	--	--	--	--	Ocean Plan
Bis(2-chloroethyl) Ether	ug/l	0.18	--	--	--	--	Ocean Plan
Bis(2-ethlyhexyl) Phthalate	ug/l	14	--	--	--	--	Ocean Plan
Carbon Tetrachloride	ug/l	3.6	--	--	--	--	Ocean Plan
Chlordane[5]	ug/l	0.000092	--	--	--	--	Ocean Plan
Chlorodibromethane	ug/l	34	--	--	--	--	Ocean Plan
Chloroform	ug/l	520	--	--	--	--	Ocean Plan
DDT[6]	ug/l	0.00068	--	--	--	--	Ocean Plan
1,4-dichlorobenzene	ug/l	72	--	--	--	--	Ocean Plan
3,3'-dichlorobenzidine	ug/l	0.032	--	--	--	--	Ocean Plan
1,2-dichloroethane	ug/l	110	--	--	--	--	Ocean Plan
1,1-dichloroethylene	ug/l	3.6	--	--	--	--	Ocean Plan

Parameter	Units	Effluent Limitations					Basis
		AMEL	AWEL	6-month median	Daily max	Inst. Max.[1]	
Dichlorobromomethane	ug/l	25	--	--	--	--	Ocean Plan
Dichloromethane	ug/l	1,800	--	--	--	--	Ocean Plan
1,3-dichloropropene	ug/l	36	--	--	--	--	Ocean Plan
Dieldrin	ug/l	0.00016	--	--	--	--	Ocean Plan
2,4-dinitrotoluene	ug/l	10	--	--	--	--	Ocean Plan
1,2-diphenylhydrazine	ug/l	0.64	--	--	--	--	Ocean Plan
Halomethanes[7]	ug/l	520	--	--	--	--	Ocean Plan
Heptachlor	ug/l	0.0002	--	--	--	--	Ocean Plan
Heptachlor Epoxide	ug/l	0.00008	--	--	--	--	Ocean Plan
Hexachlorobenzene	ug/l	0.00084	--	--	--	--	Ocean Plan
Hexachlorobutadiene	ug/l	56	--	--	--	--	Ocean Plan
Hexachloroethane	ug/l	10	--	--	--	--	Ocean Plan
Isophorone	ug/l	2,900	--	--	--	--	Ocean Plan
N-nitrosodimethylamine	ug/l	29	--	--	--	--	Ocean Plan
N-nitrosodi-N-propylamine	ug/l	1.5	--	--	--	--	Ocean Plan
N-nitrosodiphenylamine	ug/l	10	--	--	--	--	Ocean Plan
Polynuclear Aromatic Hydrocarbons (PAHs)[8]	ug/l	0.035	--	--	--	--	Ocean Plan
PCBs[9]	ug/l	0.000076	--	--	--	--	Ocean Plan
TCDD equivalents[11]	ug/l	1.6E-08	--	--	--	--	Ocean Plan
1,1,2,2-tetrachloroethane	ug/l	9.2	--	--	--	--	Ocean Plan
Tetrachloroethylene	ug/l	8	--	--	--	--	Ocean Plan
Toxaphene	ug/l	0.00084	--	--	--	--	Ocean Plan
Trichloroethylene	ug/l	110	--	--	--	--	Ocean Plan
1,1,2-trichloroethane	ug/l	38	--	--	--	--	Ocean Plan
2,4,6-trichlorophenol	ug/l	1.2	--	--	--	--	Ocean Plan
Vinyl Chloride	ug/l	140	--	--	--	--	Ocean Plan

[1] Instantaneous maximum effluent limitation.
[2] Applied as an instantaneous minimum.
[3] The Discharger shall remove 75 percent of the suspended solids as a monthly average unless the average monthly influent is 80 mg/L or less, then the effluent limit shall be 60 mg/L.
[4] Hexachlorocyclohexane HCH shall mean the sum of the alpha, beta, gamma, and delta isomers of hexachlorocyclohexane.
[5] Chlordane shall mean the sum of chlordane-alpha, chlordane-gamma, chlordane-alpha, chlordane-gamma, nonachlor-alpha, nonachlor-gamma, and oxychlordane.
[6] DDT shall mean the sum of 4,4-DDT; 2,4-DDT; 4,4-DDE; 2,4-DDE; 4,4-DDD; and 2,4-DDD.
[7] Halomethanes shall mean the sum of bromoform, bromomethane and chloromethane.
[8] Polynuclear Aromatic Hydrocarbons (PAHs)hall mean the sum of acenaphthylene, anthracene, 1,2-benzanthracene, 3,4-benzofluoranthene, benzo[k]fluoranthene, 1,12-benzoperylene, benzo[a]pyrene, chrysene, dibenzo[ah]anthracene, fluorene, indeno[1,2,3-cd]pyrene, phenanthrene and pyrene.
[9] PCBs shall mean the sum of chlorinated biphenyls whose analytical characteristics resemble those of acroclor-1221, aroclor-1232, arochlor-1242, aroclor-1248, aroclor-1254, and aroclor-1260.
[10] As specified in section IV of the MRP, Attachment E of this Order.
[11] TCDD equivalents shall mean the sum of the concentrations of chlorinated dibenzodioxins (2,3,7,8-CDDs) and chlorinated dibenzofurans (2,3,7,8-CDFs) multiplied by their respective toxicity factors, as shown in the table below:

Isomer Group	Toxicity Equivalence Factor
2,3,7,8-tetra CDD	1.0
2,3,7,8-penta CDD	0.5
2,3,7,8-hexa CDDs	0.1
2,3,7,8-hepta CDD	0.01
Octa CDD	0.001
2,3,7,8- tetra CDF	0.1
1,2,3,7,8-penta CDF	0.05
2,3,4,7,8-penta CDF	0.5
2,3,7,8-hexa CDFs	0.1
2,3,7,8-hepta CDFs	0.01
Octa CDF	0.001

ii. Discharges to bays and estuaries, not including Buena Vista Lagoon, shall not exceed the effluent limitations for bacteria specified below:

1) 30-day geometric mean limitations:

(a) Total coliform - 1,000/100 mL
(b) Fecal coliform - 200/100 mL
(c) Enterococcus - 35/100 mL

2) Single sample maximum limitations:

(a) Total coliform – 10,000/100 mL
(b) Fecal coliform – 400/100 mL
(c) Enterococcus – 104/100 mL

3) At all areas where shellfish may be harvested for human consumption, as determined by the San Diego Water Board, the monthly median total coliform density shall not exceed 70/100 mL, and not more than 10 percent of the samples shall exceed 230/100 mL.

V. RATIONALE FOR RECEIVING WATER LIMITATIONS

States are required to adopt numeric criteria where they are necessary to protect designated uses. (CWA sectionsection 303(a) – 303(c)). The San Diego Water Board adopted numeric criteria in the Basin Plan. Likewise, the State Water Board adopted numeric critera in the Ocean Plan. The Basin Plan and Ocean Plan are regulatory references for meeting the State and Federal requirements for water quality control (40 CFR section 131.20). State Water Board Resolution No. 68-16, the Antidegradation Policy, does not allow changes in water quality less than that prescribed in Water Quality Control Plans (Basin Plans). The Basin Plan states that; “The numerical and narrative water quality objectives define the least stringent standards that the San Diego Water Board will apply to regional waters in order to protect the beneficial uses.”

Receiving water limitations of this Order are derived from the water quality objectives established in the Basin Plan and Ocean Plan.

VI. RATIONALE FOR MONITORING AND REPORTING REQUIREMENTS

40 CFR section 122.48 requires that all NPDES permits specify requirements for recording and reporting monitoring results. CWC sections 13267 and 13383 authorize the San Diego Water Board to require technical and monitoring reports. The MRP (Attachment E) of this Order

establishes monitoring and reporting requirements to implement federal and State requirements. The rationale for the monitoring and reporting requirements contained in the MRP for this Order is as follows.

A. Effluent Monitoring

Dischargers are required monitor the discharges covered under this Order to determine compliance with permit conditions. Specific monitoring requirements are in the MRP. The monitoring provisions require compliance with the MRP which is based on 40 CFR sections 122.44(i), 122.62, 122.63 and 124.5. A MRP is a standard requirement in all NPDES permits (including this Order issued by the San Diego Water Board). In addition to containing definitions of terms, the MRP specifies general sampling/analytical protocols and reporting requirements for reporting of spills, violations, and routine monitoring data in accordance with NPDES regulations, the CWC, and San Diego Water Board policies.

Orders Nos. R9-2007-0034 and R9-2008-0002 established monitoring requirements based on categories of discharges (i.e., groundwater remediation for petroleum, urban discharges, short-term, etc.), flowrate, and if treatment was necessary to comply with effluent limitations.

Effluent monitoring requirements have been revised from Orders Nos. R9-2007-0034 and R9-2008-0002. As discussed elsewhere in this Fact Sheet, this Order requires an initial pollutant screening prior to a Discharger submitting an NOI and does not rely on discharge categories that may not correctly identify the pollutants of concern present in each discharge. This screening allows the San Diego Water Board to evaluate the necessity to establish effluent limitations and associated monitoring requirements for the individual parameters, and reduce or increase monitoring requirements as necessary to evaluate compliance with applicable effluent limitations based on water quality criteria/objectives.

Monitoring frequencies are based on discharge flow volume and compliance with applicable effluent limitations. Dischargers with flows greater than 100,000 GPD pose an increased risk to receiving waters as compared to lower flow discharges. As such, discharges greater than 100,000 GPD shall be monitored more frequently than lower volume discharges. However, after a period of demonstrated compliance, monitoring frequencies for most parameters may be reduced. Incorporating compliance history into the established monitoring frequencies ensures that groundwater treatment systems will be sufficiently monitored to identify non-compliance with applicable effluent limitations, and provides economic relief for Dischargers that have demonstrated the adequacy of their treatment systems by achieving consistent compliance with effluent limitations.

B. Receiving Water Monitoring

This Order establishes effluent limitations for hardness dependent metals. As such, receiving water monitoring requirements for hardness are established in this Order for discharges to freshwater receiving waters.

This Order incorporates the requirements of the Basin Plan for the Chollas Creek TMDL for copper, lead, and zinc (Resolution No. R9-2007-0043). Consistent with the requirements of the Basin Plan, this Order establishes receiving water monitoring for discharges to Chollas Creek for hardness, lead, and zinc.

Consistent with receiving water monitoring requirements established in Order Nos. R9-2007-0034 and R9-2008-0002, this Order requires receiving water monitoring for turbidity to evaluate compliance with applicable water quality objectives and the potential impacts to the receiving water at the point of discharge.

VII. PUBLIC PARTICIPATION

The San Diego Water Board considered the issuance of waste discharge requirements that will serve as a General NPDES permit for groundwater extraction discharges throughout the San Diego Region. In the adoption process for this Order, the San Diego Water Board staff developed tentative waste discharge requirements and encouraged public participation in the adoption process.

A. Notification of Interested Parties

The San Diego Water Board notified existing Dischargers and interested agencies and persons of its intent to prescribe WDRs for the discharge of extracted groundwater and provided an opportunity to submit written comments and recommendations. Notification was provided through the following: Published in the San Diego Union Tribune, posted on the San Diego Water Board website, and sent by e-mail on April 20, 2015.

The public had access to the agenda and any changes in dates and locations through the San Diego Water Board's website at:
http://www.waterboards.ca.gov/sandiego/

B. Written Comments

Interested persons were invited to submit written comments concerning the tentative WDRs. Comments were due, either delivered in person or by mail, to the Executive Office at the San Diego Water Board at the address above on the cover page of this Order.

To be fully responded to by staff and considered by the San Diego Water Board, written comments were due at the San Diego Water Board offices by 5:00 p.m. on May 20, 2015.

C. Public Hearing

The San Diego Water Board held a public hearing on the tentative WDRs during its regular board meeting on the following date and time and at the following location:

Date:	June 24, 2015
Time:	9:00 AM
Location:	San Diego Water Board Office Regional Board Meeting Room 2375 Northside Drive, Suite 100 San Diego, CA 92108

Interested persons were invited to attend. At the public hearing, the San Diego Water Board heard testimony pertinent to the discharge, WDRs, and permit. For accuracy of the record, important testimony was requested in writing.

D. Waste Discharge Requirements Petitions

Any person aggrieved by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with CWC section 13320 and CCR, title 23, sections 2050 et seq. The State Water Board must receive the petition by 5:00 p.m., 30 calendar days after the adoption of this Order. Copies of the law and regulations applicable to filing petitions may be found on the Internet at:
http://www.waterboards.ca.gov/public_notices/petitions/water_quality
or will be provided upon request.

E. Information and Copying

The Report of Waste Discharge (ROWD), related documents, tentative effluent limitations and special provisions, comments received, and other information are on file and may be inspected

at the address below at any time between 8:00 a.m. and 5:00 p.m., Monday through Friday. Copying of documents may be arranged through the San Diego Water Board by calling (619) 516-1990 or by mailing requests to:

California Regional Water Quality Control Board
San Diego Region
Attention: File Review Request
2375 Northside Drive, Suite 100
San Diego, CA 92108

The office is closed on weekends and on all state Holidays.

Before making a request to view public records at the San Diego Water Board office interested persons may wish to determine if the information is already available on the San Diego Water Board's website at http://www.waterboards.ca.gov/sandiego or the State Water Board's website at http://www.waterboards.ca.gov. For example the San Diego Water Board's website alphabetical index and the State Water Board's Website alphabetical index provide links to many volumes of key documents on the State and Regional Water Board's water quality programs.

The following is a partial list of the documents available:

- Board Meeting Agendas
- Board Meeting Minutes
- Adopted Orders
- Tentative Orders
- Basin Plan
- Ocean Plan.

New and updated information is frequently added to the aforementioned websites.

F. Register of Interested Persons

Any person interested in being placed on the mailing list for information regarding this Order should contact the San Diego Water Board, reference this Order, and provide a name, address, and phone number.

G. Additional Information

Requests for additional information or questions regarding this Order should be directed to the San Diego Water Board at (619) 516-1990.

ATTACHMENT G – DISCHARGE PROHIBITIONS CONTAINED IN THE OCEAN PLAN AND BASIN PLAN

I. Ocean Plan Discharge Prohibitions

A. The Discharge of any radiological chemical, or biological warfare agent or high-level radioactive waste into the ocean is prohibited.

B. Waste shall not be discharged to designated Areas of Special Biological Significance (ASBS) except as provided in Chapter III.E. of the Ocean Plan.

C. Pipeline discharge of sludge to the ocean is prohibited by federal law; the discharge of municipal and industrial waste sludge directly to the ocean, or into a waste stream that discharges to the ocean, is prohibited. The discharge of sludge digester supernatant directly to the ocean, or to a waste stream that discharges to the ocean without further treatment, is prohibited.

D. The by-passing of untreated wastes containing concentrations of pollutants in excess of those of Table 1 or Table 2 [of the Ocean Plan] is prohibited.

II. Basin Plan Discharge Prohibitions

A. The discharge of waste to waters of the State in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in California Water Code (CWC) section 13050, is prohibited.

B. The discharge of waste to land, except as authorized by waste discharge requirements (WDRs) of the terms described in CWC section 13264 is prohibited.

C. The discharge of pollutants or dredged or fill material to waters of the U.S. except as authorized by an National Pollutant Discharge Elimination System (NPDES) permit or a dredged or fill material permit (subject to the exemption described in CWC section 13376) is prohibited.

D. Discharges of recycled water to lakes or reservoirs used for municipal water supply or to inland surface water tributaries thereto are prohibited, unless this San Diego Water Board issues an NPDES permit authorizing such a discharge; the proposed discharge has been approved by the State Water Board's Division of Drinking Water and the operating agency of the impacted reservoir; and the Discharger has an approved fail-safe long-term disposal alternative.

E. The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the San Diego Water Board. Consideration would include stream flow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if stream flow provided 100:1 dilution capability.

F. The discharge of waste in a manner causing flow, ponding, or surfacing on lands not owned or under the control of the Discharger is prohibited, unless the discharge is authorized by the San Diego Water Board.

G. The dumping, deposition, or discharge of waste directly into waters of the State, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the San Diego Water Board.

H. Any discharge to a storm water conveyance system that is not composed entirely of stormwater is prohibited unless authorized by the San Diego Water Board. [The federal regulations, 40

CFR section 122.26(b)(13), define storm water as storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR section 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to an NPDES permit and discharges resulting from fire fighting activities.] [Section 122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

I. The unauthorized discharge of treated or untreated sewage to waters of the State or to a storm water conveyance system is prohibited.

J. The discharge of industrial wastes to conventional septic tank/ subsurface disposal systems, except as authorized by the terms described in CWC section 13264, is prohibited.

K. The discharge of radioactive wastes amenable to alternative methods of disposal into the waters of the State is prohibited.

L. The discharge of any radiological, chemical, or biological warfare agent into waters of the State is prohibited.

M. The discharge of waste into a natural or excavated site below historic water levels is prohibited unless the discharge is authorized by the San Diego Water Board.

N. The discharge of sand, silt, clay, or other earthen materials from any activity, including land grading and construction, in quantities which cause deleterious bottom deposits, turbidity or discoloration in waters of the State or which unreasonably affect, or threaten to affect, beneficial uses of such waters is prohibited.

O. The discharge of treated or untreated sewage from vessels to Mission Bay, Oceanside Harbor, Dana Point Harbor, or other small boat harbors is prohibited.

P. The discharge of untreated sewage from vessels to San Diego Bay is prohibited.

Q. The discharge of treated sewage from vessels to portions of San Diego Bay that are less than 30 feet deep at MLLW is prohibited.

R. The discharge of treated sewage from vessels, which do not have a properly functioning U.S. Coast Guard certified Type 1 or Type II marine sanitation device, to portions of San Diego Bay that are greater than 30 feet deep at mean lower low water is prohibited.

COUNTYWIDE MODEL SUSMP

Standard Urban Stormwater Mitigation Plan
Requirements for Development Applications

January 2, 2009
Visit www.projectcleanwater.org for updates.

STATEMENT OF CERTIFICATION

Updated Model Standard Urban Stormwater Management Plan

I certify, under penalty of law, that this **Updated Model Standard Urban Stormwater Management Plan** and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

This document was reviewed and approved by the Copermittees of Order No. R9-2007-0001, NPDES No. CAS0108758, on January 15, 2009.

Chandra Wallar

CHANDRA L. WALLAR
Deputy Chief Administrative Officer
County of San Diego

1-21-09
Date

Countywide Model SUSMP

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JANUARY 2, 2009

Updated Countywide Model Standard Urban Stormwater Mitigation Plan (SUSMP)

SUMMARY

In January 2007, the California Regional Water Quality Control Board for the San Diego Region (Regional Water Board) reissued a municipal stormwater NPDES permit to San Diego area municipal Copermittees. The reissued permit updates and expands stormwater requirements for new developments and redevelopments. Stormwater treatment requirements have been made more widely applicable and more stringent; minimum standards for Low Impact Development (LID) have been added, and the Copermittees are required to develop and implement criteria for the control of runoff peaks and durations from development sites.

Low Impact Development is an integrated site design methodology that uses small-scale detention and retention to minimize pollutants conveyed by runoff and to mimic pre-project site hydrological conditions.

As required by the reissued permit, the Copermittees have prepared an updated Countywide Model SUSMP to replace the current countywide model SUSMP, which has been in effect since 2002. Each municipality will update its local SUSMP to implement the requirements. To assist the land development community, to streamline project reviews, and to maximize cost-effective environmental benefits, the updated Countywide Model SUSMP incorporates a unified LID design procedure. This design procedure integrates site planning and design measures with engineered, small-scale Integrated Management Practices (IMPs) such as bioretention. By following the procedure, applicants can develop a single integrated design which complies with the complex and overlapping NPDES permit LID requirements, stormwater treatment requirements, and runoff peak-and-duration-control (hydromodification management) requirements.

Along with the detailed design procedure, the updated Countywide Model SUSMP includes design information and criteria for dispersal of runoff to landscaped areas and for pervious pavements, bioretention facilities, flow-through planters, dry wells, infiltration basins, and cisterns. Where feasible and where allowed, water in cisterns may be directed to nonpotable uses, augmenting water supplies. Bioretention facilities and planter boxes can be designed with an impermeable barrier so that runoff does not saturate native soils; instead, runoff is filtered through an engineered soil mix before being captured in an underdrain and conveyed to off-site storm drains. This configuration may be needed where groundwater is high, is contaminated, or where increasing soil moisture may present a hazard to foundations or slope stability.

Applicants for development project approvals may choose not to use the unified LID design procedure; however, they will still need to demonstrate compliance with the applicable LID criteria, stormwater treatment criteria, and hydromodification management criteria. The updated Countywide Model SUSMP requires that runoff be infiltrated or else treated by bioretention facilities, planter boxes, filters, settling ponds, or constructed wetlands. In some special circumstances—retrofit of existing drainage systems, some pedestrian-oriented developments, and roadway widening projects—where it can also be demonstrated it is not be feasible to construct any of these facilities, higher-rate surface biofilters or higher-rate vault-based filtration units may be used.

Applicants for approval of Priority Development Projects must demonstrate compliance with the hydromodification management criteria in the NPDES permit. The updated Countywide Model SUSMP includes guidance for demonstrating compliance. Submittals for projects smaller than 50 acres may demonstrate compliance by using the integrated LID design procedure. For larger projects, the applicant may use a continuous simulation hydrologic computer model to

simulate pre-project and post-project runoff, including the effect of LID facilities, detention basins, or other stormwater management facilities, or may identify an exemption applicable to the site.

Applicants must also incorporate into their project design features to control pollutants from specified on-site sources, such as refuse areas, outdoor storage areas, and vehicle washing and repair facilities. The Copermittees have developed a table listing the types of sources to be controlled and for each, the corresponding source control measures required.

The updated Countywide Model SUSMP provides the applicant with step-by-step instructions for preparing a Project Submittal for review by the municipal staff. The recommended steps are:

1. Assemble needed information.
2. Identify site opportunities and constraints.
3. Follow the LID Design Guidance to analyze the project for LID and to develop and document the drainage design.
4. Specify source controls using the sources/source control checklist in the appendix.
5. Plan for ongoing maintenance of treatment and flow-control facilities.
6. Complete the Project Submittal.

The step-by-step instructions are augmented by an example checklist which municipal staff may use as a guide when reviewing the Project Submittal. The SUSMP also includes an example project submittal outline and contents. As stated in the SUSMP, municipalities may adapt these submittal requirements to their own needs and procedures.

As required by the reissued NPDES permit, each Copermittee implements a program to verify that approved stormwater treatment facilities are operating effectively. To facilitate implementation of these programs, the updated Countywide Model SUSMP includes instructions for applicants to prepare detailed maintenance plans.

The updated Countywide Model SUSMP is available for download in .pdf format at www.projectcleanwater.org. The 126-page document is formatted for 2-sided printing, and may also be navigated online. Hyperlinks throughout the document provide ready access to references and additional information resources.

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Glossary

Best Management Practice (BMP)	Any procedure or device designed to minimize the quantity of pollutants that enter the storm drain system.
California Association of Stormwater Quality Agencies (CASQA)	Publisher of the California Stormwater Best Management Practices Handbooks, available at www.cabmphandbooks.com. Successor to the Storm Water Quality Task Force (SWQTF).
California BMP Method	A method for determining the required volume of stormwater treatment facilities. Described in Section 5.5.1 of the California Stormwater Best Management Practice Manual (New Development) (CASQA, 2003).
Conditions of Approval (COAs)	Requirements a municipality may adopt for a project in connection with a discretionary action (e.g., adoption of an EIR or negative declaration or issuance of a use permit). COAs may include features to be incorporated into the final plans for the project and may also specify uses, activities, and operational measures that must be observed over the life of the project.
Continuous Simulation Modeling	A method of hydrological analysis in which a set of rainfall data (typically hourly for 30 years or more) is used as input, and runoff rates are calculated on the same time step. The output is then analyzed statistically for the purposes of comparing runoff patterns under different conditions (for example, pre- and post-development-project).
Copermittees	See **Dischargers**.
Detention	The practice of holding stormwater runoff in ponds, vaults, within berms, or in depressed areas and letting it discharge slowly to the storm drain system. See definitions of **infiltration** and **retention**.
Directly Connected Impervious Area	Any impervious surface which drains into a catch basin, area drain, or other conveyance structure without first allowing flow across pervious areas (e.g. lawns).
Direct Infiltration	Infiltration via methods or devices, such as dry wells or infiltration trenches, designed to bypass unsaturated surface soils and transmit runoff directly to groundwater.
Dischargers	The agencies named in the **stormwater NPDES permit** (see definition): the County of San Diego; the Cities of Carlsbad, El Cajon, La Mesa, Poway, Solana Beach, Chula Vista, Encinitas, Lemon Grove, San Diego, Vista, Coronado, Escondido, National City, San Marcos, Del Mar, Impervial Beach, Oceanside, and Santee; the San Diego Unified Port District, and the San Diego County Regional Airport Authority.

Drainage Management Areas	Areas delineated on a map of the development site showing how drainage is detained, dispersed, or directed to **Integrated Management Practices**. There are four types of Drainage Management Areas, and specific criteria apply to each type of area. See Chapter 4.
Drawdown time	The time required for a stormwater detention or infiltration facility to drain and return to the dry-weather condition. For detention facilities, drawdown time is a function of basin volume and outlet orifice size. For infiltration facilities, drawdown time is a function of basin volume and infiltration rate.
Environmentally Sensitive Areas	Areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Resources Control Board (Water Quality Control Plan for the San Diego Basin (1994) and amendments); water bodies designated with the RARE beneficial use by the State Water Resources Control Board (Water Quality Control Plan for the San Diego Basin (1994) and amendments); areas designated as preserves or their equivalent under the Multi Species Conservation Program within the Cities and County of San Diego; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.
Flow Control	Control of runoff rates and durations as required by the Hydromodification Management Plan.
Head	In hydraulics, energy represented as a difference in elevation. In slow-flowing open systems, the difference in water surface elevation, e.g., between an inlet and outlet.
Higher-Rate Biofilter	A biofilter with a design surface loading rate higher than the 5 inches per hour rate specified in this document for bioretention facilities and planter boxes.
Hydrograph	Runoff flow rate plotted as a function of time.
Hydromodification Management Plan (HMP)	A Plan implemented by the **dischargers** so that post-project runoff shall not exceed estimated pre-project rates and/or durations, where increased runoff would result in increased potential for erosion or other adverse impacts to beneficial uses. Also see definition for **flow control.**
Hydrologic Soil Group	Classification of soils by the Natural Resources Conservation Service (NRCS) into A, B, C, and D groups according to infiltration capacity.
Impervious surface	Any material that prevents or substantially reduces infiltration of water into the soil. See discussion of imperviousness in Chapter Two.

Infeasible As applied to best management practices, impossible to implement because of technical constraints specific to the site.

Infiltration Seepage of runoff into soils underlying the site. See definition of **retention.**

Infiltration Device Any structure, such as a dry well, that is designed to infiltrate stormwater into the subsurface and, as designed, bypasses the natural groundwater protection afforded by surface or near-surface soil. See definition for **direct infiltration**.

Integrated Management Practice (IMP) A facility **(BMP)** that provides small-scale treatment, retention, and/or detention and is integrated into site layout, landscaping and drainage design. See **Low Impact Development.**

Integrated Pest Management (IPM) An approach to pest management that relies on information about the life cycles of pests and their interaction with the environment. Pest control methods are applied with the most economical means and with the least possible hazard to people, property, and the environment.

Interim Hydromodification Criteria Pursuant to NPDES permit Provision D.1.d.g.(6), the Copermittees prepared Interim Hydromodification Management criteria, which apply to projects disturbing 50 acres or more. The criteria are described in Chapter 2 and in memoranda on the Project Clean Water website.

Jurisdictional Urban Runoff Management Plan (JURMP) A written description of the specific jurisdictional urban runoff management measures and programs that each Copermittee implements to comply with the **stormwater NPDES permit** and ensure pollutant discharges are reduced to the MEP and do not cause or contribute to a violation of water quality standards. See **Stormwater Pollution Prevention Program.**

Lead Agency The public agency that has the principal responsibility for carrying out or approving a project. (CEQA Guidelines §15367).

Low Impact Development An integrated site design methodology that uses small-scale detention and retention (Integrated Management Practices, or **IMPs**) to mimic pre-existing site hydrological conditions.

Maximum Extent Practicable (MEP) Standard, established by the 1987 amendments to the Clean Water Act, for the implementation of municipal **stormwater pollution prevention programs** (see definition). According to the Act, municipal stormwater NPDES permits "shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants."

National Pollutant Discharge Elimination System (NPDES)	As part of the 1972 Clean Water Act, Congress established the NPDES permitting system to regulate the discharge of pollutants from municipal sanitary sewers and industries. The NPDES was expanded in 1987 to incorporate permits for stormwater discharges as well.
Numeric Criteria	Sizing requirements for stormwater treatment facilities established in Provision D.1.d.(6)(c) of the San Diego RWQCB's stormwater NPDES permit.
Operation and Maintenance (O&M)	Refers to requirements in the **Stormwater NPDES Permit** to inspect treatment BMPs and implement preventative and corrective maintenance in perpetuity. See Chapter Five.
Parking Lot	A land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce.
Permeable Pavements	Pavements for roadways, sidewalks, or plazas that are designed to infiltrate a portion of rainfall, including pervious concrete, pervious asphalt, unit-pavers-on-sand, and crushed gravel.
Priority Development Project	A project subject to SUSMP requirements. Defined in **Stormwater NPDES Permit** Provision D.1.d.(1). See Chapter One.
Project Area	The entire project area comprises all areas to be altered or developed by the project, plus any additional areas that drain on to areas to be altered or developed.
Project Submittal	Documents submitted to a municipality in connection with an application for development approval and demonstrating compliance with Stormwater NPDES Permit requirements for the project. Specific requirements vary from municipality to municipality.
Proprietary	A proprietary device is one marketed under legal right of the manufacturer.
Redevelopment	The creation, addition, and or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include trenching and resurfacing associated with utility work; resurfacing and reconfiguring surface parking lots and existing roadways; new sidewalk construction, pedestrian ramps, or bikelane on existing roads; and routine replacement of damaged pavement, such as pothole repair.

Rational Method	A method of calculating runoff flows based on rainfall intensity, tributary area, and a factor representing the proportion of rainfall that runs off.
Regional (or Watershed) Stormwater Treatment Facility	A facility that treats runoff from more than one project or parcel.
Regional Water Quality Control Board (Regional Water Board or RWQCB)	California RWQCBs are responsible for implementing pollution control provisions of the Clean Water Act and California Water Code within their jurisdiction. There are nine California RWQCBs.
Retention	The practice of holding stormwater in ponds or basins, or within berms or depressed areas, and allowing it to slowly infiltrate into underlying soils. Some portion will evaporate. See definitions for **infiltration** and **detention**.
Self-retaining area	An area designed to retain runoff. Self-retaining areas may include graded depressions with landscaping or pervious pavements and may also include tributary impervious areas up to a 2:1 impervious-to-pervious ratio.
Self-treating area	A natural, landscaped, or turf area drains directly off site or to the public storm drain system.
Source Control	Land use or site planning practices, or structural or nonstructural measures that aim to prevent urban runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between pollutants and urban runoff.
Standard Industrial Classification (SIC)	A Federal government system for classifying industries by 4-digit code. It is being supplanted by the North American Industrial Classification System but SIC codes are still referenced by the Regional Water Board in identifying development sites subject to regulation under the NPDES permit. Information and an SIC search function are available at http://www.bls.gov/bls/NAICS.htm
Stormwater NPDES Permit	A permit issued by a **Regional Water Quality Control Board** (see definition) to local government agencies (**Dischargers**) placing provisions on allowable discharges of municipal stormwater to waters of the state.
Storm Water Pollution Prevention Plan (SWPPP)	A plan providing for temporary measures to control sediment and other pollutants during construction as required by the statewide stormwater NPDES permit for construction activities.

Stormwater Pollution Prevention Program	A comprehensive program of activities designed to minimize the quantity of pollutants entering storm drains. See **Jurisdictional Urban Runoff Management Plan.**
Standard Urban Stormwater Mitigation Plan (SUSMP)	Refers to various documents prepared in connection with implementation of the stormwater **NPDES permit** mandate to control pollutants from new development and redevelopment. Each **discharger** will adapt this **model countywide SUSMP** to create a **local SUSMP** for their respective jurisdiction. Applicants for development project approvals will use the local SUSMP to prepare a submittal for each **Priority Development Project** they propose.
Treatment	Removal of pollutants from runoff, typically by filtration or settling.
Water Board	See **Regional Water Quality Control Board.**
Water Quality Volume (WQV)	For stormwater treatment facilities that depend on detention to work, the volume of water that must be detained to achieve maximum extent practicable pollutant removal. This volume of water must be detained for a specified **drawdown time**.

How to Use the SUSMP

Review Chapters 1 and 2 to get a general understanding of the requirements. Then follow step-by-step instructions in Chapter 3 to prepare your Project Submittal.

THIS *Standard Urban Stormwater Mitigation Plan (SUSMP)* will help you ensure your project complies with the California Regional Water Quality Control Boards' requirements. Most applicants will require the assistance of a qualified civil engineer, architect, and/or landscape architect. Because every project is different, you should begin by checking specific requirements with municipal staff.

ICON KEY
☞ Helpful Tip
Submittal Requirement
Terms to Look Up
References & Resources

To use the *SUSMP,* start by reviewing **Chapter One** to find out whether and how stormwater quality requirements apply to your project. Chapter One also provides an overview of the process of planning, design, construction, operation, and maintenance leading to compliance.

If there are terms and issues you find puzzling, try finding answers in the glossary or in **Chapter T wo**. Chapter Two provides background on key stormwater concepts and water quality regulations, including design criteria.

Then proceed to **Chapter Three** and follow the step-by-step guidance to prepare a Project Submittal for your site.

Chapter Four, the Low Impact Development Design Guide, includes design procedures, calculation procedures, and instructions for presenting your design and calculations in your Project Submittal.

In **Chapter Fiv e** you'll find a detailed description of the process for ensuring operation and maintenance of your stormwater facilities over the life of the

project. The chapter includes step-by-step instructions for preparing a Stormwater Facilities Operation and Maintenance Plan.

Local Requirements
Cities or the County may have requirements that differ from, or are in addition to, this county-wide model SUSMP.

Throughout each Chapter, you'll find references and resources to help you understand the regulations, complete your Project Submittal, and design stormwater control measures for your project.

The most recent, updated version of the *Model SUSMP,* including updates and errata between editions, is on the Project Clean Water website. The on-line *Model SUSMP* is in Adobe Acrobat format. If you are reading the Acrobat version on a computer with an internet connection, you can use hyperlinks to navigate the document and to access various references. The hyperlinks are throughout the text, as well as in "References and Resources" sections (marked by the 🕮 icon) and in the **Bibliography**. Some of these links (URLs) may be outdated. In that case, try entering portions of the title or other keywords into a web search engine.

Construction-Phase Controls
Your Project Submittal for SUSMP compliance is a separate document from the Storm Water Pollution Prevention Plan (SWPPP). A SWPPP provides for temporary measures to control sediment and other pollutants during construction at sites that disturb one acre or more. See the Construction Handbook at www.cabmphandbooks.org for more information on SWPPPs.

► PLAN AHEAD TO AVOID THE THREE MOST COMMON MISTAKES

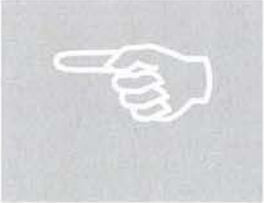

The most common (and costly) errors made by applicants for development approvals with respect to stormwater quality compliance are:

1. Not planning for compliance early enough. You should think about your strategy for stormwater quality compliance before completing a conceptual site design or sketching a layout of subdivision lots (Chapter 3).

2. Assuming proprietary stormwater treatment facilities will be adequate for compliance. Most aren't (Chapter 2).

3. Not planning for periodic inspections and maintenance of treatment and flow-control facilities. Consider who will own and who will maintain the facilities in perpetuity and how they will obtain access, and identify which arrangements are acceptable to your municipality (Chapter 5).

Chapter 1

Policies and Procedures

Determine if your development project must comply with stormwater quality requirements, and review the steps to compliance.

A Low Impact Development Design Procedure

The San Diego Regional Water Board reissued a municipal stormwater NPDES permit to the municipal **Copermittees** in January 2007. The permit updates and expands stormwater requirements for new developments and redevelopments. Stormwater treatment requirements have been made more stringent, minimum standards for **Low I mpact D evelopment** (LID) have been added, and the Copermittees are required to develop and implement criteria for the control of runoff peaks and durations from development sites.

To assist the land development community, streamline project reviews, and maximize cost-effective environmental benefits, the Copermittees have developed a unified LID design procedure. This design procedure integrates site planning and design measures with engineered, small-scale **Integrated Management Practices** (IMPs) such as bioretention. By following the procedure, applicants can develop a single integrated design which complies with the complex and overlapping NPDES permit LID requirements, stormwater treatment requirements, and flow-control (**hydromodification management**) requirements.

ICON KEY
Helpful Tip
Submittal Requirement
Terms to Look Up
References & Resources

The design approach is detailed in Chapter 4. General instructions for preparing a complete Project Submittal are in Chapter 3, and specific local submittal requirements are available from municipal staff.

Applicants may choose not to use this design procedure, in which case they will need to demonstrate, in their submittal, compliance with applicable LID criteria,

stormwater treatment criteria, and flow-control criteria. These criteria are described in Chapter 2 and in the NPDES permit.

Requirements for All Development Projects

All development projects must include control measures to reduce the discharge of stormwater pollutants to the maximum extent practicable.

In general, for projects that are not "Priority Development Projects," this will include:

- Implementation of source control BMPs as listed in the Appendix.
- Inclusion of some LID features that conserve natural features, set back development from natural water bodies, minimize imperviousness, maximize infiltration, and retain and slow runoff.
- Compliance with requirements for construction-phase controls on sediment and other pollutants.

Municipal staff may also require additional controls appropriate to the project, which may include stormwater treatment controls. LID treatment controls such as infiltration or bioretention are preferred. See "Selection of Treatment Facilities" on page 21. If treatment facilities are included, provisions must be made to ensure their long-term maintenance.

Local Requirements
Project Submittal requirements vary from project to project. Check with municipal staff.

Priority Development Projects

The NPDES permit requires more specific criteria be applied to Priority Development Projects.

► NEW DEVELOPMENT

Projects on previously undeveloped land are Priority Development Projects if they are in one or more of the categories listed in Table 1-1.

TABLE 1-1. Priority Development Projects.

Is the project in any of these categories?

Yes ❑	No ❑	**A**	**Housing subdivisions of 10 or more dwelling units.** Examples: single-family homes, multi-family homes, condominiums, and apartments.
Yes ❑	No ❑	**B**	**Commercial—greater than one acre.** Any development other than heavy industry or residential. Examples: hospitals; laboratories and other medical facilities; educational institutions; recreational facilities; municipal facilities; commercial nurseries; multi-apartment buildings; car wash facilities; mini-malls and other business complexes; shopping malls; hotels; office buildings; public warehouses; automotive dealerships; airfields; and other light industrial facilities.
Yes ❑	No ❑	**C**	**Heavy industry—greater than one acre.** Examples: manufacturing plants, food processing plants, metal working facilities, printing plants, and fleet storage areas (bus, truck, etc.).
Yes ❑	No ❑	**D**	**Automotive repair shops.** A facility categorized in any one of Standard Industrial Classification (SIC) codes 5013, 5014, 5541, 7532-7534, or 7536-7539.
Yes ❑	No ❑	**E**	**Restaurants.** Any facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812), where the land area for development is greater than 5,000 square feet. Restaurants where land development is less than 5,000 square feet shall meet all SUSMP requirements except for structural treatment BMP and numeric sizing criteria requirements and hydromodification requirements.
Yes ❑	No ❑	**F**	**Hillside development greater than 5,000 square feet.** Any development that creates 5,000 square feet of impervious surface and is located in an area with known erosive soil conditions, where the development will grade on any natural slope that is twenty-five percent or greater.
Yes ❑	No ❑	**G**	**Environmentally Sensitive Areas (ESAs).** All development located within or directly adjacent to or discharging directly to an ESA (where discharges from the development or redevelopment will enter receiving waters within the ESA), which either creates 2,500 square feet of impervious surface on a proposed project site or increases the area of imperviousness of a proposed project site to 10% or more of its naturally occurring condition. "Directly adjacent" means situated within 200 feet of the ESA. "Discharging directly to" means outflow from a drainage conveyance system that is composed entirely of flows from the subject development or redevelopment site, and not commingled with flows from adjacent lands.
Yes ❑	No ❑	**H**	**Parking lots 5,000 square feet or more** or with 15 or more parking spaces and potentially exposed to urban runoff.
Yes ❑	No ❑	**I**	**Street, roads, highways, and freeways.** Any paved surface that is 5,000 square feet or greater used for the transportation of automobiles, trucks, motorcycles, and other vehicles.
Yes ❑	No ❑	**J**	**Retail Gasoline Outlets (RGOs)** that are: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

To use the table, review each definition A through J. If any of the definitions match, the project is a **Priority Development Project**. Note some thresholds are defined by square footage of impervious area created; others by the total area of the development.

► PREVIOUSLY DEVELOPED SITES

Projects on previously developed sites ("**redevelopment** projects") are Priority Development Projects if they create, add, or replace 5,000 square feet or more of impervious surface and also are in one of the categories listed in Table 1-1.

Local municipal staff may choose to designate projects not within the categories in Table 1-1 as Priority Development Projects, based on potential impacts to stormwater quality.

► THE "50% RULE" FOR PREVIOUSLY DEVELOPED PROJECTS

Projects on previously developed sites may also need to retrofit drainage of **all** impervious areas of the **entire** site. For sites creating or replacing more than 5,000 square feet of impervious area:

- If the new project results in an increase of, or replacement of, 50% or more of the previously existing impervious surface, and the existing development was not subject to SUSMP requirements, then the entire project must be included in the treatment measure design.
- If less than 50% of the previously impervious surface is to be affected, only that portion must be included in the treatment measure design.

If a new Development Project feature such as a parking lot falls into a Priority Development Project category, then the entire project footprint is subject to SUSMP requirements.

Projects limited to interior remodels, routine maintenance or repair, roof or exterior surface replacement, resurfacing and reconfiguring surface parking lots and existing roadways, new sidewalk construction, pedestrian ramps, or bike lanes on existing roads, and routine replacement of damaged pavement such as pothole repair are not subject to treatment requirements. However, other requirements, including incorporation of appropriate source controls, still apply.

Compliance Process at a Glance

For the applicant for development project approval, stormwater compliance follows these general steps:

1. Discuss requirements during a pre-application meeting with municipal staff.

2. Review the instructions in this *SUSMP* before you prepare your tentative map, preliminary site plan, drainage plan, and landscaping plan.

3. Prepare your **Project Submittal**, which is typically made with your application for development approvals (entitlements).

4. Create your detailed project design, incorporating the features described in your Project Submittal.

5. In a table on your construction plans, list each stormwater compliance feature and facility and the plan sheet where it appears.

6. Prepare a draft Stormwater Facility Operation and Maintenance Plan and submit it as required by your local jurisdiction.

7. Maintain stormwater facilities during construction and following construction in accordance with required warranties.

8. Following construction, formally transfer responsibility for maintenance to the owner.

9. The owner must periodically verify stormwater facilities are properly maintained.

Preparation of a complete and detailed Project Submittal is the key to cost-effective stormwater compliance and expeditious review of your project. Instructions for preparing your Project Submittal are in Chapter 3.

Phased Projects

When determining whether SUSMP requirements apply, a "project" should be defined consistent with California Environmental Quality Act (CEQA) definitions of "project." That is, the "project" is the whole of an action which has the potential for adding or replacing or resulting in the addition or replacement of roofs, pavement, or other impervious surfaces and thereby resulting in increased flows and stormwater pollutants. "Whole of an action" means the project may not be segmented or piecemealed into small parts if the effect is to reduce the quantity of impervious area for any part to below the SUSMP thresholds.

Local Requirements

Cities or the County may have requirements that differ from, or are in addition to, this countywide model SUSMP. Check with local planning and community development staff.

Municipal staff may require, as part of an application for approval of a phased development project, a conceptual or master Project Submittal which describes and illustrates, in broad outline, how the drainage for the project will comply with the SUSMP requirements. The level of detail in the conceptual or master Project Submittal should be consistent with the scope and level of detail of the development approval being considered. The conceptual or master Project Submittal should specify that a more detailed Project Submittal for each later phase or portion of the project will be submitted with subsequent applications for discretionary approvals.

CEQA

Preparers of CEQA documents may wish to visit the Project Clean Water website for guidance on how to document stormwater impacts and mitigations in Initial Studies and Environmental Impact Reports.

Note these minimum standards for SUSMP applicability are for the purpose of ensuring a consistent minimum level or "floor" for countywide implementation consistent with the requirements of the NPDES permit. Individual municipalities may choose a more expansive interpretation of the NPDES permit's applicability and may also choose to apply source control, treatment, and flow-control requirements to projects that would be exempt under these minimum standards.

New Subdivisions

If a tentative map approval would potentially entitle future owners to construct new or replaced impervious area which, in aggregate, could exceed one of the SUSMP thresholds (Table 1-1), then the applicant must take steps to ensure SUSMP requirements can and will be implemented as the subdivision is built out.

If the tentative map application does not include plans for site improvements, the applicant should nevertheless identify the type, size, location, and final ownership of stormwater treatment and flow-control facilities adequate to serve common private roadways and any other common areas, and to also manage runoff from an expected reasonable estimate of the square footage of future roofs, driveways, and other impervious surfaces on each individual lot. The municipality may condition approval of the map on implementation of stormwater treatment and other SUSMP measures when construction occurs on the individual lots. At the municipality's discretion, this condition may be enforced by a grant deed of development rights or by a development agreement.

If a municipality deems it necessary, the future impervious area of one or more lots may be limited by a deed restriction. This might be necessary when a project is exempted from one or all SUSMP provisions because the total impervious area is below a threshold, or to ensure runoff from impervious areas added after the project is approved does not overload a stormwater treatment and flow-control facility.

Municipalities may require subdivision maps to dedicate an "open space easement, as defined by Government Code Section 51075," to suitably restrict the future building of structures at each stormwater facility location if necessary.

In general, in new subdivisions **stormwater treatment, infiltration, or flow-control facilities should not be located on individual single-family residential lots**, particularly when those facilities manage runoff from other lots, from streets, or from common areas. A better alternative is to locate stormwater facilities on one or more separate, jointly owned parcels.

After consulting with local planning staff, applicants for subdivision approvals will propose one of the following four options, depending on project characteristics and local policies:

1. Show the number of parcels and the total impervious area to be created on all parcels could not, in the future, exceed any of the thresholds in Table 1-1.

2. Show that, for each and every lot, the intended use can be achieved with a design which disperses runoff from roofs, driveways, streets, and other impervious areas to self-retaining pervious areas, using the criteria in Chapter 4.

3. Prepare improvement plans showing drainage to treatment and/or flow-control facilities designed in accordance with this *SUSMP,* and commit to constructing the facilities prior to transferring the lots.

4. Prepare improvement plans showing drainage to treatment and/or flow-control facilities designed in accordance with this *SUSMP*, and provide appropriate legal instruments to ensure the proposed facilities will be constructed and maintained by subsequent owners.

For the option selected, municipal staff will determine the appropriate conditions of approval, easements, deed restrictions, or other legal instruments necessary to assure future compliance.

Compliance with Flow-Control Requirements

Priority Development Projects (Table 1-1) must be designed so that runoff rates and durations are controlled to maintain or reduce downstream erosion conditions and protect stream habitat.

For projects disturbing areas smaller than 50 acres, this can be accomplished by implementing **Low Impact Development** (LID) design using the design criteria and procedures in Chapter 4. The criteria will be updated following RWQCB approval of the Copermittees' **Hydromodification Management Plan** (see Option 2 below).

Priority Development Projects disturbing 50 acres or more must meet the following **interim hydromodification standard**:

> "...post-project runoff flow rates and durations shall not exceed pre-project runoff flow rates and durations ... where the increased discharge flow rates and durations will result in increased potential for erosion or other significant adverse impacts to beneficial uses, attributable to increased flow rates and durations."

Project Clean Water is developing a Hydromodification Management Plan (HMP) in compliance with Provision D.1.g of the NPDES Permit. As required, the Program has adopted interim hydromodification criteria which will be superseded after the HMP is accepted by the Regional Water Board.

Compliance with the interim hydromodification criteria can be achieved by one of the following options:

1. Use a continuous simulation hydrologic computer model such as USEPA's Hydrograph Simulation Program—Fortran (HSPF) to simulate pre-project and post-project runoff, including the effect of proposed IMPs, detention basins, or other stormwater management facilities, and demonstrate the standard is achieved.

2. Use Low Impact Development Integrated Management Practices to manage hydrograph modification impacts, using design procedures, criteria, and sizing factors (ratios of LID IMP volume or area to tributary area) specified by the Co-permittees.

3. Identify an exemption applicable to the site.

► OPTION 1: CONTINUOUS SIMULATION

Prepare an analysis of pre-project and post-project runoff following the instructions in the memoranda "Using Continuous Simulation to Size Stormwater Control Facilities" (May 9, 2008) and "Development of Interim Hydromodification Criteria" (October 30, 2007). Both memoranda are available on the Project Clean Water website.

Before preparing the analysis, discuss with municipal staff the required documentation for your Project Submittal, which will include assumptions and modeling parameters used in the analysis and a graphical presentation demonstrating compliance with the following:

1. For flow rates from 20% of the pre-project 5-year runoff event (0.2Q5) to the pre-project 10-year runoff event (Q10), the post-project discharge rates and durations shall not deviate above the pre-project rates and durations by more than 10% over and more than 10% of the length of the flow duration curve.

2. For flow rates from 0.2Q5 to Q5, the post-project peak flows shall not exceed pre-project peak flows. For flow rates from Q5 to Q10, post-project peak flows may exceed pre-project flows by up to 10% for a 1-year frequency interval. For example, post-project flows could exceed pre-project flows by up to 10% for the interval from Q9 to Q10 or from Q5.5 to Q6.5, but not from Q8 to Q10. (Note that the 0.2Q5 end of the range may be modified).

► OPTION 2: LID INTEGRATED MANAGEMENT PRACTICES

Low Impact Development Integrated Management Practices, such as bioretention facilities, planter boxes, and dry wells, can achieve the hydromodification standard. However, the Copermittees have not yet prepared design criteria and sizing factors for these facilities applicable to projects 50 acres or more. Project proponents for projects 50 acres or more may use Option 1 to demonstrate their IMPs meet the interim criteria.

► OPTION 3: EXEMPTION FROM HYDROMODIFICATION MANAGEMENT

Exemption from the IHC is allowed for development projects when any of the following conditions are met. (However, plans to restore a channel reach may re-introduce the applicability of hydromodification management.)

1. The project would discharge into channels that are concrete-lined or significantly hardened (e.g., with rip-rap, sackcrete, etc.) downstream to their outfall in bays or the ocean;

2. The project would discharge into underground storm drains discharging directly to bays or the ocean;

3. The project would discharge to a channel where the sub-watershed areas below the project's discharge points are highly impervious (e.g. >70%) and the potential for single-project and/or cumulative impacts is minimal; or

4. The applicant conducts an assessment incorporating sediment transport modeling across the range of geomorphically-significant flows that demonstrates project flows and sediment reductions will not detrimentally affect the receiving water. A May 15, 2008 memorandum, "Geomorphic Analysis for Interim Hydrograph Modification Plan" is available on the Project Clean Water website.

Grandfathering. Projects with prior lawful approval (such as a development agreement, vested tentative map, or a building or grading permit) that have started construction before March 25, 2008, may not have to meet the interim hydromodification management requirements. Verify with municipal staff.

Note these are interim requirements and will be superseded following approval of the HMP by the Regional Water Board sometime after mid-2009. Updated hydromodification criteria for all Priority Development Projects will be incorporated into local SUSMP requirements sometime in 2010 or later.

Waivers from Numeric Sizing Criteria

The NPDES permit allows for a project to be waived from numeric sizing criteria for stormwater treatment **only** if all available treatment facilities have been considered and found **infeasible**. Municipal staff must inform the Water Board within 5 days of granting a waiver. Other SUSMP requirements—including site designs to minimize imperviousness and source control BMPs—will still apply.

Experience has shown implementation of LID facilities, as described in Chapter 4, is feasible on nearly all development sites. However, the use of LID to retrofit existing drainage systems, to manage runoff from sites smaller than one acre in pedestrian-oriented developments, or to manage runoff from widened portions of roadways, sometimes presents special challenges. In these special situations, applicants should see the discussion of "Selection of Stormwater Treatment Facilities" in Chapter 2 and evaluate the options described on page 23 in order (depending on the specific characteristics of the project and as determined by local development review staff). All the options listed meet the numeric sizing criteria in the NPDES permit.

If infeasibility of all these options can be established, local development review staff may determine eligibility of the project for a waiver.

References and Resources:

- RWQCB Order R9-2007-0001 (Stormwater NPDES Permit)
- Project Clean Water web page

Chapter 2

Concepts and Criteria

Technical background and explanations of policies and design requirements

The Regional Water Board reissued a municipal stormwater NPDES permit to San Diego County, its 18 cities, the San Diego Unified Port District, and the San Diego Regional Airport Authority in January 2007. The permit mandates a comprehensive program to prevent stormwater pollution. That program now includes street sweeping, maintenance of storm drains, business inspections, public outreach, construction site inspections, monitoring and studies of stream and ocean health, and control of runoff pollutants from new developments and redevelopments.

Permit Provision D.1.d. requires Copèrmittees to regulate projects in specific categories (Table 1-1) to:

1. Reduce discharges of pollutants to the maximum extent practicable.

2. Prevent runoff discharges from causing or contributing to a violation of water quality standards.

The Copermittees have created a Low Impact Development (LID) design procedure (Chapter 4) that ensures consistent and thorough implementation of the Regional Water Board's requirements. This chapter explains the technical background of the LID approach and how it was derived.

The previous permit, issued in 2001, included a requirement to control the post-development peak storm water runoff rates and velocities to maintain or reduce pre-development downstream erosion and protect stream habitat. The 2007 permit includes, in addition to this ongoing requirement, a new requirement to develop a hydromodification management plan (HMP) to identify and define a methodology and performance criteria to ensure flow rates and durations do not

exceed pre-project runoff where increased runoff could cause erosion or other significant adverse impacts to beneficial uses.

As required by the NPDES permit, the Copermittees have adopted interim hydromodification criteria. See Chapter One.

Water-Quality Regulations

Provision D.1 requires the Copermittees to condition development approvals on incorporation of specified stormwater controls.

Provision D.1 requires applicable new developments and redevelopments:

- Design the site to conserve natural areas, existing trees and vegetation and soils, to maintain natural drainage patterns, to minimize imperviousness, to detain runoff, and to infiltrate runoff where feasible
- Cover or control sources of stormwater pollutants
- Treat runoff prior to discharge. Provision E.10 states: "Urban runoff treatment and/or mitigation must occur prior to the discharge of urban runoff into a receiving water. Federal regulations at 40 CFR 131.10(a) state that in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S."
- Ensure runoff does not exceed pre-project peaks and durations where increases could affect downstream habitat or other beneficial uses
- Maintain treatment and flow-control facilities

The municipalities each maintain a database to track approved installations of treatment facilities and to verify facilities are maintained. The Copermittees' annual report to the Regional Water Board includes a list of development projects subject to SUSMP conditions and descriptions of those projects that:

- Received a waiver from SUSMP criteria;
- Used hydrologic controls used to meet HMP requirements, including a description of the controls;

- Have an area of 50 acres or greater, thus subject to **Interim Hydromodification Criteria**; and

The Copermittees must also report the number of violations and enforcement actions taken upon development projects. The Copermittees' programs are subject to audit by the Regional Water Board.

The municipalities—not the Regional Water Board or its staff—are charged with ensuring development projects comply with the D.1 requirements. Regional Water Board staff sometimes review stormwater controls and hydromodification impacts in connection with applications for Clean Water Act Section 401 water-quality certification, which is required for projects that involve work, such as dredging or placement of fill, within streams, creeks, or other waters of the US.

► MAXIMUM EXTENT PRACTICABLE

Clean Water Act Section 402(p)(3)(iii) sets the standard for stormwater controls as "maximum extent practicable," but doesn't define that term. As implemented, "maximum extent practicable" is ever-changing and varies with conditions.

Many stormwater controls, including LID facilities, have proven to be practicable in most site development projects. To achieve fair and effective implementation, criteria and guidance, requirements for controls must be detailed and specific—while also offering the right amount of flexibility or exceptions for special cases. The NPDES permit includes various standards, including hydrologic criteria, which have been found to comprise "maximum extent practicable." This model SUSMP is to be continuously improved and refined based on the experience of municipal planners and engineers, with input from land developers and development professionals. By following the model SUSMP, applicants can ensure their project design meets "maximum extent practicable."

► BEST MANAGEMENT PRACTICES

Clean Water Act Section 402(p) and USEPA regulations (40 CFR 122.26) specify a municipal program of "management practices" to control stormwater pollutants. **Best Management Practice (BMP)** refers to any kind of procedure, activity or device designed to minimize the quantity of pollutants that enter the storm drain system. BMPs are typically used in place of assigning numeric effluent limits. The criteria for source control BMPs and treatment and flow-control facilities are crafted to fulfill "maximum extent practicable."

To minimize confusion, this guidebook refers to "facilities," "features," or "controls" to be incorporated into development projects. All of these are BMPs.

Pollutants of Concern

NPDES Permit Provision D.1.d.(3) requires each Copermittee to develop and implement a procedure for pollutants of concern to be identified for each Priority Development Project. The Copermittees have considered this requirement jointly and have determined the LID design procedures in Chapters 3 and 4 of this model SUSMP fully address the need to identify pollutants of concern insofar as that identification may affect the selection of source control BMPs and treatment facilities.

Documentation of the approach to identifying pollutants of concern and selecting BMPs and facilities follows.

► GROUPING OF POTENTIAL POLLUTANTS OF CONCERN

Urban runoff from a developed site has the potential to contribute pollutants, including oil and grease, suspended solids, metals, gasoline, pesticides, and pathogens to the storm water conveyance system and receiving waters. For the purposes of identifying pollutants of concern and associated storm water BMPs, pollutants are grouped in nine general categories as follows:

- **Sediments** are soils or other surficial materials eroded and then transported or deposited by the action of wind, water, ice, or gravity. Sediments can increase turbidity, clog fish gills, reduce spawning habitat, lower young aquatic organisms survival rates, smother bottom dwelling organisms, and suppress aquatic vegetation growth.

- **Nutrients** are inorganic substances, such as nitrogen and phosphorus. They commonly exist in the form of mineral salts that are either dissolved or suspended in water. Primary sources of nutrients in urban runoff are fertilizers and eroded soils. Excessive discharge of nutrients to water bodies and streams can cause excessive aquatic algae and plant growth. Such excessive production, referred to as cultural eutrophication, may lead to excessive decay of organic matter in the water body, loss of oxygen in the water, release of toxins in sediment, and the eventual death of aquatic organisms.

- **Metals** are raw material components in non-metal products such as fuels, adhesives, paints, and other coatings. Primary sources of metal pollution in storm water are typically commercially available metals and metal products. Metals of concern include cadmium, chromium, copper, lead, mercury, and zinc. Lead and chromium have been used as corrosion inhibitors in primer coatings and cooling tower systems. At low concentrations naturally occurring in soil, metals are not toxic. However, at higher concentrations, certain metals can be toxic to aquatic life. Humans can be impacted from contaminated groundwater

resources, and bioaccumulation of metals in fish and shellfish. Environmental concerns, regarding the potential for release of metals to the environment, have already led to restricted metal usage in certain applications.

- **Organic compounds** are carbon-based. Commercially available or naturally occurring organic compounds are found in pesticides, solvents, and hydrocarbons. Organic compounds can, at certain concentrations, indirectly or directly constitute a hazard to life or health. When rinsing off objects, toxic levels of solvents and cleaning compounds can be discharged to storm drains. Dirt, grease, and grime retained in the cleaning fluid or rinse water may also adsorb levels of organic compounds that are harmful or hazardous to aquatic life.

- **Trash** (such as paper, plastic, polystyrene packing foam, and aluminum materials) and biodegradable organic matter (such as leaves, grass cuttings, and food waste) are general waste products on the landscape. The presence of trash & debris may have a significant impact on the recreational value of a water body and aquatic habitat. Excess organic matter can create a high biochemical oxygen demand in a stream and thereby lower its water quality. Also, in areas where stagnant water exists, the presence of excess organic matter can promote septic conditions resulting in the growth of undesirable organisms and the release of odorous and hazardous compounds such as hydrogen sulfide.

- **Oxygen-Demanding Substances** includes biodegradable organic material as well as chemicals that react with dissolved oxygen in water to form other compounds. Proteins, carbohydrates, and fats are examples of biodegradable organic compounds. Compounds such as ammonia and hydrogen sulfide are examples of oxygen-demanding compounds. The oxygen demand of a substance can lead to depletion of dissolved oxygen in a water body and possibly the development of septic conditions.

- Primary sources of **oil and grease** are petroleum hydrocarbon products, motor products from leaking vehicles, esters, oils, fats, waxes, and high molecular-weight fatty acids. Introduction of these pollutants to the water bodies are very possible due to the wide uses and applications of some of these products in municipal, residential, commercial, industrial, and construction areas. Elevated oil and grease content can decrease the aesthetic value of the water body, as well as the water quality.

- **Bacteria and Viruses** are ubiquitous microorganisms that thrive under certain environmental conditions. Their proliferation is typically caused by the transport of animal or human fecal wastes from the watershed. Water, containing excessive bacteria and viruses can alter the aquatic habitat and create a harmful environment for humans and aquatic life. Also, the decomposition of excess organic waste causes increased growth of undesirable organisms in the water.

- **Pesticides** (including herbicides) are chemical compounds commonly used to control nuisance growth or prevalence of organisms. Excessive application of a pesticide may result in runoff containing toxic levels of its active component.

► IDENTIFYING POLLUTANTS OF CONCERN BASED ON LAND USES

Table 2-1 associates pollutants with the categories of Priority Development Projects. Pollutants associated with any hazardous material sites that have been remediated or are not threatened by the proposed project are not considered a pollutant of concern.

► WATERSHEDS WITH SPECIAL POLLUTANT CONCERNS

Local receiving water conditions may require specialized attention. The three local conditions to consider include:

- Ocean waters designated as an "Area of Special Biological Significance" (ASBS)

- 303(d) listed waters; and

- Waters with established TMDLs.

TABLE 2-1. ANTICIPATED AND POTENTIAL Pollutants Generated by Land Use Type.

	General Pollutant Categories								
Priority Project Categories	Sediment	Nutrients	Heavy Metals	Organic Compounds	Trash & Debris	Oxygen Demanding Substances	Oil & Grease	Bacteria & Viruses	Pesticides
Detached Residential Development	X	X			X	X	X	X	X
Attached Residential Development	X	X			X	P(1)	P(2)	P	X
Commercial Development >one acre	P(1)	P(1)	X	P(2)	X	P(5)	X	P(3)	P(5)
Heavy Industry	X		X	X	X	X	X		
Automotive Repair Shops			X	X(4)(5)	X		X		
Restaurants					X	X	X	X	P(1)
Hillside Development >5,000 ft2	X	X			X	X	X		X
Parking Lots	P(1)	P(1)	X		X	P(1)	X		P(1)
Retail Gasoline Outlets			X	X	X	X	X		
Streets, Highways & Freeways	X	P(1)	X	X(4)	X	P(5)	X	X	P(1)

X = anticipated
P = potential
(1) A potential pollutant if landscaping exists on-site.
(2) A potential pollutant if the project includes uncovered parking areas.
(3) A potential pollutant if land use involves food or animal waste products.
(4) Including petroleum hydrocarbons.
(5) Including solvents.

The State Water Resources Control Board's California Ocean Plan identifies thirty-four locations along the California coast as **Areas of Special Biological Significance (ASBS)**. The Ocean Plan prohibits the discharge of wastes into these locations, thus barring discharges associated with industrial activities,

publicly owned treatment works, and other traditional point discharges. In 2004 the SWRCB informed affected municipal stormwater programs throughout the state that urban runoff contained a waste and was subject to the prohibition. In March 2008, the SWRCB released a draft *Special Protections for Selected Storm Water and Nonpoint Source Discharges into Areas of Special Biological Significance* that defines design criteria for treating stormwater discharges and elimination of dry-weather discharges associated with non-stormwater sources. San Diego County contains two ASBS locations, the La Jolla ASBS and the San Diego-Scripps ASBS. These locations are adjacent and extend from the northern bluffs of La Jolla through the UC San Diego campus of the Scripps Institute of Oceanography. Proposed development in the watershed of an ASBS may be prohibited; however, the project proponent should immediately contact the municipality for further guidance in contending with ASBS prohibitions.

The NPDES Permit identifies several receiving waters as impaired for constituents or water quality effects pursuant to **Section 30 3(d)** of the Clean Water Act. Placement of a water onto the list requires the Regional Board to make further analysis of the impairment and development of total maximum daily loads (TMDLs) for addressing the impairment. The 303(d) listing in itself does not demand that a project proponent select BMPs on the basis of the impairment; however, the project proponent should be cognizant of the impairment and the future implications a TMDL might have upon the proposed land use.

Once a TMDL is established it may impose conditions on development either through an implementation plan and schedule for the listed water, or through special conditions required of the municipality affected by the numeric criteria of the TMDL. At this time, several 303(d) listings in San Diego County are at various stages of TMDL development with only four TMDLs having been adopted by the Regional Board. However, there are approximately 190 pending TMDLs in the county.

The **adopted TMDLs** in the San Diego area include:

- Diazinon for Chollas Creek;
- Nitrogen and phosphorous for Rainbow Creek;
- Dissolved copper for Shelter Island Yacht Basin;
- Copper, lead, and zinc for Chollas Creek, and
- Indicator bacteria for beaches and creeks in the San Diego Region.

The applicant should meet with municipal staff to determine if any project characteristics or watershed characteristics affect selection and design of BMPs. Except in rare circumstances, the use of the LID Design Guide (Chapter 4) and

the Stormwater Pollutant Sources/Source Control Checklist (Appendix) will ensure your project complies with all stormwater requirements.

Selection of Permanent Source Control BMPs

Based on identification of potential pollutants of concern associated with various types of facilities, the Co-permittees have developed a Stormwater Pollutant Sources/Source Control Checklist (Appendix) of "maximum extent practicable" source controls associated with each facility type. This approach ensures appropriate BMPs are applied to potential sources of each pollutant of concern.

Selection of Stormwater Treatment Facilities

The model SUSMP updated in early 2008 groups pollutants of concern by how easily they are removed by various treatment processes (Table 2-2).

The same document also includes a general comparison of how various types of treatment facilities perform for each group of pollutants (Table 2-3).

TABLE 2-2. GROUPING OF POTENTIAL POLLUTANTS of Concern by fate during stormwater treatment

Pollutant	Coarse Sediment and Trash	Pollutants that tend to associate with fine particles during treatment	Pollutants that tend to be dissolved following treatment
Sediment	X	X	
Nutrients		X	X
Heavy Metals		X	
Organic Compounds		X	
Trash & Debris	X		
Oxygen Demanding		X	
Bacteria		X	
Oil & Grease		X	
Pesticides		X	

TABLE 2-3. GROUPS OF POLLUTANTS and relative effectiveness of treatment facilities

Pollutants of Concern	Bioretention Facilities (LID)	Settling Basins (Dry Ponds)	Wet Ponds and Constructed Wetlands	Infiltration Facilities or Practices (LID)	Media Filters	Higher-rate biofilters*	Higher-rate media filters*	Trash Racks & Hydro -dynamic Devices
Coarse Sediment and Trash	High	High	High	High	High	High	High	High
Pollutants that tend to associate with fine particles during treatment	High	High	High	High	High	Medium	Medium	Low
Pollutants that tend to be dissolved following treatment	Medium	Low	Medium	High	Low	Low	Low	Low

*See page 23 for a discussion of selection of treatment facilities in special situations.

Based on this analysis, the Copermittees have determined that the following types of facilities are appropriate for treatment of runoff potentially containing most pollutants of concern. These types of facilities can be used for stormwater treatment for all land uses in all watersheds, except where site-specific constraints make them infeasible.

- Infiltration facilities or practices, including dry wells, infiltration trenches, infiltration basins, and other facilities that infiltrate runoff to native soils (sized to detain and infiltrate a volume equivalent to the 85th percentile 24-hour event).

- Bioretention facilities and media filters that detain stormwater and filter it slowly through soil or sand (sized with a surface area at least 0.04 times the effectively impervious tributary area).

- Extended detention basins, wet ponds, and wetlands or other facilities using settling (sized to detain a volume equivalent to runoff from the tributary area generated by the 85th percentile 24-hour event).

The recommended design procedure in Chapter 4 integrates LID practices—optimizing the site design, using pervious surfaces, and dispersing of runoff to adjacent pervious areas—with the use of infiltration facilities and practices and bioretention facilities to meet NPDES permit LID requirements, treatment requirements, and flow-control requirements in a cost-effective, unified design.

Oil/water separators ("water quality inlets"), storm drain inlet filters, and hydrodynamic separators, including vortex separators and continuous deflection separators ("CDS units"), are less effective means of stormwater treatment, although they may be used in series with more effective facilities.

Underground vaults typically lack the detention time required for settling of fine particles associated with stormwater pollutants. They also require frequent maintenance and may retain stagnant water, potentially providing harborage for mosquitoes. Because vaults may be "out of sight, out of mind," experience shows that the required maintenance may not occur.

Lack of space, in itself, is not a suitable justification for using a less-effective treatment on a development site, because the uses of the site and the site design can be altered as needed to accommodate bioretention facilities or planter boxes. In most cases, these effective facilities can be fit into required landscaping setbacks, easements, or other unbuildable areas.

Where possible, drainage to inlets, and drainage away from overflows and underdrains, should be by gravity. Where site topography makes it infeasible to accommodate gravity-fed facilities in the project design, the design flow may be captured in a vault or sump and pumped via force main to an effective facility.

The following situations sometimes present special challenges:

- Portions of sites which are not being developed or redeveloped, but which must be retrofit to meet treatment requirements in accordance with Provision D.1.d.(1)(a) which states in part: "Where redevelopment results in an increase of, or replacement of, more than fifty percent of the impervious surface of a previously existing development, the numeric sizing criteria applies to the entire development."

- Sites smaller than one acre approved for development or redevelopment as part of a municipality's stated objective to preserve or enhance a pedestrian-oriented "smart-growth" type of urban design. Municipalities are encouraged to identify areas where this objective applies, based on General Plans or zoning.

- Roadway widening projects.

In these special situations, the following types of facilities should each be evaluated in priority order (depending on the specific characteristics of the site and as determined by the municipal stormwater coordinator) until a feasible design is found.

1. Bioretention areas or planter boxes fed by gravity.

2. Capture of the design flow in a vault or sump and pumping to bioretention areas or planter boxes.

3. A subsurface sand or media filter with a maximum design surface loading rate of 5 inches per hour and a minimum media depth of 18

inches. The sand surface must be made accessible for periodic inspection and maintenance (for example, via a removable grating).

4. A higher-rate surface biofilter, such as a tree-pit-style unit. The grading and drainage design should minimize the area draining to each unit and maximize the number of discrete drainage areas and units.

5. A higher-rate vault-based filtration unit (for example, vaults with replaceable cartridge filters filled with inorganic media).

Many proprietary stormwater treatment devices are currently marketed, and new brands will be introduced. Applicants and applicants' engineers and design professionals should review with municipal staff any proposals for using proprietary devices for stormwater treatment before they commence work on preliminary site layout, drainage plans, grading plans, or landscape plans.

Proprietary Devices

Many currently available proprietary devices do not meet municipalities' requirements when used alone for stormwater treatment. Consult with municipal staff before proposing these devices.

Hydrology for NPDES Compliance

► IMPERVIOUSNESS

Schueler (1995) proposed **imperviousness** as a "unifying theme" for the efforts of planners, engineers, landscape architects, scientists, and local officials concerned with urban watershed protection. Schueler argued (1) that imperviousness is a useful indicator linking urban land development to the degradation of aquatic ecosystems, and (2) imperviousness can be quantified, managed, and controlled during land development.

Imperviousness has long been understood as the key variable in urban hydrology. Peak runoff flow and total runoff volume from small urban catchments is usually calculated as a function of the ratio of impervious area to total area **(rational method)**. The ratio correlates to the runoff factor, usually designated "C". Increased flows resulting from urban development tend to increase the frequency of small-scale flooding downstream.

Imperviousness links urban land development to degradation of aquatic ecosystems in two ways.

First, the combination of paved surfaces and piped runoff efficiently collects urban pollutants and transports them, in suspended or dissolved form, to surface waters. These pollutants may originate as airborne dust, be washed from the atmosphere during rains, or may be generated by automobiles and outdoor work activities.

Second, increased peak flows and runoff durations typically cause erosion of stream banks and beds, transport of fine sediments, and disruption of aquatic habitat. Measures taken to control stream erosion, such as hardening banks with riprap or concrete, may permanently eliminate habitat. By reducing infiltration to groundwater, imperviousness may also reduce dry-weather stream flows.

Imperviousness has two major components: rooftops and transportation (including streets, highways, and parking areas). The transportation component is usually larger and is more likely to be **directly connected** to the storm drain system.

The effects of imperviousness can be mitigated by disconnecting impervious areas from the drainage system and by encouraging detention and retention of runoff near the point where it is generated. Detention and retention reduce peak flows and volumes and allow pollutants to settle out or adhere to soils before they can be transported downstream.

► LOW IMPACT DEVELOPMENT REQUIREMENTS

The NPDES permit requires LID be used on all projects to minimize directly connected impervious area and promote infiltration. For Priority Development Projects, the minimum standards are:

- Drain a portion of impervious areas into pervious areas, if any.
- Design and construct pervious areas, if any, to effectively receive and infiltrate runoff from impervious areas, taking into account soil conditions, slope, and other pertinent factors.
- Construct a portion of paved areas with low traffic and appropriate soil conditions with permeable surfaces.

The LID design procedure in Chapter 4 incorporates these requirements into an integrated design which also meets sizing requirements for stormwater treatment facilities and flow-control (hydromodification management) requirements.

► SIZING REQUIREMENTS FOR STORMWATER TREATMENT FACILITIES

The guidance in Chapter 4 was crafted to ensure LID facilities comply with the NPDES permit's hydraulic sizing requirements for stormwater treatment facilities and flow-control facilities. The technical background follows.

Most runoff is produced by frequent storms of small or moderate intensity and duration. Treatment facilities are designed to treat smaller storms and the first flush of larger storms—approximately 80% of average annual runoff.

The NPDES permit identifies two types of treatment facilities—volume-based and flow-based.

Volume-based facilities must be designed to infiltrate, filter, or treat the volume of runoff produced from a 24-hour 85th percentile storm event as determined from the County of San Diego's 85th Percentile Precipitation Isopluvial Map. As shown on the map, rainfall depths vary from about 0.55" to 1.55".

For **flow-based** facilities, the NPDES permit specifies the rational method be used to determine flow. The rational method uses the equation

$Q = CiA$, where

Q = flow

C = weighted runoff factor between 0 and 1

i = rainfall intensity

A = area

The permit identifies two alternatives for calculating rainfall intensity:

1. the 85th percentile rainfall intensity times two, or
2. 0.2 inches per hour.

It is typically found that both methods yield similar results. The 0.2 inches per hour rainfall intensity should be used for sizing flow-based treatment facilities within the Copermittees' jurisdiction.

The 0.2 inches per hour criterion is the basis for a **consistent countywide sizing factor** for bioretention facilities when used for stormwater treatment only (i.e., not for flow control). The factor is based on maintaining a minimum percolation rate of 5 inches per hour through the engineered soil mix. The sizing factor is the ratio of the design intensity of rainfall on tributary impervious surfaces (0.2 inches/hour) to the design percolation rate in the facility (5 inches/hour), or **0.04** (dimensionless).

► FLOW-CONTROL (HYDROMODIFICATION MANAGEMENT)

The NPDES permit specifies for applicable projects:

> … post-project runoff flow rates and durations shall not exceed pre-project runoff flow rates and durations where the increased discharge

flow rates and durations will result in increased potential for erosion or other significant adverse impacts to beneficial uses, attributable to changes in flow rates and durations.

Under current Interim Hydromodification Criteria, the requirement applies to projects disturbing 50 acres or more, and applicants may select among **three options** for compliance: Use a continuous simulation model to compare pre-project and post-project runoff, use LID facilities with sizing factors and design criteria developed by the Co-permittees, or identify a specified exemption. See Chapter One.

The technical background for the Interim Hydromodification Criteria is in the memorandum "Development of Interim Hydromodification Criteria" (October 30, 2007) and other technical documents available on the Project Clean Water website.

Criteria for Infiltration Devices

The NPDES permit restricts the design and location of "infiltration devices" that, as designed, may bypass filtration through surface soils before reaching groundwater. These devices include:

- Infiltration basins.
- Infiltration trenches (includes french drains).
- Unlined retention basins (i.e., basins with no outlets).
- Unlined or open-bottomed vaults or boxes installed below grade (dry wells).

Infiltration devices may not be used in:

- Areas of industrial or light industrial activity; areas subject to high vehicular traffic (25,000 or greater average daily traffic on main roadway or 15,000 or more average daily traffic on any intersecting roadway);
- Automotive repair shops;
- Car washes;
- Fleet storage areas (bus, truck, etc.);

- Nurseries;
- Other areas with pollutant sources that could pose a threat to groundwater, as designated by each Permittee.

The vertical distance from the base of any infiltration device to the seasonal high groundwater mark shall be at least 10 feet. Infiltration devices shall be located a minimum of 100 feet horizontally from any known water supply wells.

In addition, infiltration devices are not recommended where:

- The infiltration device would receive drainage from areas where chemicals are used or stored, where vehicles or equipment are washed, or where refuse or wastes are handled.
- Surface soils or groundwater are polluted.
- The facility could receive sediment-laden runoff from disturbed areas or unstable slopes.
- Increased soil moisture could affect the stability of slopes of foundations.
- Soils are insufficiently permeable to allow the device to drain within 72 hours.

► MOST LID FEATURES AND FACILITIES ARE NOT INFILTRATION DEVICES

Self-treating and self-retaining areas, pervious pavements, bioretention facilities, and planter boxes are not considered to be infiltration devices.

Bioretention facilities work by percolating runoff through 18 inches or more of engineered soil. This removes most pollutants before the runoff is allowed to seep into native soils below. Further pollutant removal typically occurs in the unsaturated (vadose) zone before moisture reaches groundwater.

Where there is concern about the effects of increased soil moisture on slopes or foundations, an impermeable barrier may be added so the facility is "flow through" and all treated runoff is underdrained away from the facility. See the design sheets for Bioretention Facilities and Flow-Through Planters in Chapter 4.

Environmental and Economic Benefit Perspective

The San Diego Region has varied topography consisting of coastal plain, central mountain-valley, and eastern mountain valley areas. Elevations range from sea level at the Pacific Ocean to approximately 6,000 feet at the summit of Palomar

Mountain. Temperature averages about 65 degrees Fahrenheit and average annual precipitation is between 10 and 13 inches.

San Diego County comprises 10 major stream systems: San Onofre Creek, Santa Margarita River, San Luis Rey River, San Marcos Creek, Escondido Creek, San Dieguito River, San Diego River, Sweetwater River, Otay River, and the Tijuana River. Almost all stream systems in the San Diego region have both perennial and ephemeral reaches. In addition, most of these streams have been impacted by impoundments and/or channelization. There are few undisturbed stream reaches left in San Diego County.

San Diego County is approximately 2.7 million acres and roughly 1.8 million acres (66 percent) is developed or in use. Much of the remaining land is preserved from future development.

Impervious surfaces now cover much of the land, and storm drains pipe runoff from urban areas directly into streams. As in many of California's urban areas, growth and development have caused changes in the timing and intensity of stream flows. These changes can then lead to more frequent flooding, destabilized stream banks, armoring of streambanks with riprap and concrete, loss of streamside trees and vegetation, and the destruction of stream habitat.

The remaining habitat in the region is composed of sensitive coastal sage scrub, chaparral, woodlands, and grasslands. Human encroachment and habitat loss threaten close to 300 species of plants and animals in California. Many of those reside in southern California and range from native grasslands to the Fairy Shrimp.

Once altered, natural streams and their ecosystems cannot be fully restored. However, **it is possible to stop, and partially reverse, the trend of declining habitat** and preserve some ecosystem values for the benefit of future generations.

This is an enormous, long-term effort. Managing runoff from a single development site may seem inconsequential, but by changing the way most sites are developed (and redeveloped), we may be able to preserve and enhance existing stream ecosystems in urban and urbanizing areas.

References and Resources:

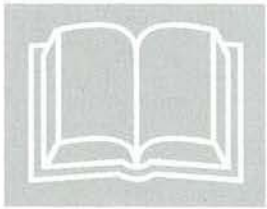

- RWQCB Order R9-2007-0001 (Stormwater NPDES Permit)
- *County of San Diego Low Impact Development Handbook*
- Clean Water Act Section 402(p)
- 40 CFR 122.26
- San Diego Regional Water Quality Control Board—TMDLs
- State Water Resources Control Board—Ocean Standards
- *Site Planning for Urban Stream Protection* (Scheuler, 1995).
- "Application of Water-Quality Engineering Fundamentals to the Assessment of Stormwater Treatment Devices" (Salvia, 2000).

Chapter 3

Preparing Your Project Submittal

Step-by-step assistance to demonstrate compliance.

Your Project Submittal will demonstrate your project complies with all applicable requirements in the stormwater NPDES permit—to minimize imperviousness, retain or detain stormwater, slow runoff rates, incorporate required source controls, treat stormwater prior to discharge, control runoff rates and durations, and provide for operation and maintenance of treatment and flow-control facilities.

ICON KEY

- Helpful Tip
- Submittal Requirement
- Terms to Look Up
- References & Resources

Submittal requirements vary from jurisdiction to jurisdiction. Obtain the specific requirements from local staff.

Typically, your Project Submittal must be coordinated with your application for discretionary approvals and must have sufficient detail to ensure the stormwater design, site plan, and landscaping plan are congruent.

A complete and thorough Project Submittal will facilitate quicker review and fewer cycles of review. Every municipality in San Diego County requires a submittal for every applicable project.

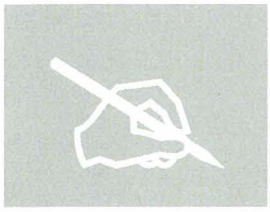

Be sure to obtain specific submittal requirements from the jurisdiction in which your project is located. Your Project Submittal may consist of a report and an exhibit. **Municipal staff may use a checklist** such as the following example to evaluate your Project Submittal:

EXAMPLE PROJECT SUBMITTAL CHECKLIST

CONTENTS OF EXHIBIT

Show all of the following on drawings:

- ❒ Existing natural hydrologic features (depressions, watercourses, floodplains, relatively undisturbed areas) and significant natural resources. (Step 1 in the following step-by-step instructions)
- ❒ Soil types and depth to groundwater. (Step 1)
- ❒ Existing and proposed site drainage network and connections to drainage off-site. (Step 3)
- ❒ Proposed design features and surface treatments used to minimize imperviousness. (Step 3)
- ❒ Entire site divided into separate drainage areas, with each area identified as self-treating, self-retaining (zero-discharge), draining to a self-retaining area, or draining to an IMP. (Step 3)
- ❒ For each drainage area, types of impervious area proposed (roof, plaza/sidewalk, and streets/parking) and area of each. (Step 3)
- ❒ Proposed locations and sizes of treatment or flow-control facilities. (Step 3)
- ❒ Potential pollutant source areas, including refuse areas, outdoor work and storage areas, etc. listed in the Appendix and corresponding required source controls. (Step 4)

CONTENTS OF REPORT

Include all of the following in a report:

- ❒ Narrative analysis or description of site features and conditions that constrain, or provide opportunities for, stormwater control. (Step 2)
- ❒ Narrative description of site design characteristics that protect natural resources. (Step 3)
- ❒ Narrative description and/or tabulation of site design characteristics, building features, and pavement selections that reduce imperviousness of the site. (Step 3)
- ❒ Tabulation of proposed pervious and impervious area, showing self-treating areas, self-retaining areas, and areas tributary to each treatment or flow-control facility. (Step 3)
- ❒ Preliminary designs, including calculations, for each infiltration, treatment, or flow-control facility. Elevations should show sufficient hydraulic head for each. (Step 3)
- ❒ A table of identified pollutant sources and for each source, the source control measure(s) used to reduce pollutants to the maximum extent practicable. See worksheet in the Appendix. (Step 4)
- ❒ General maintenance requirements for infiltration, treatment, and flow-control facilities (Step 5)
- ❒ Means by which facility maintenance will be financed and implemented in perpetuity. (Step 5)
- ❒ Statement accepting responsibility for interim operation & maintenance of facilities (Step 5).
- ❒ Identification of any conflicts with codes or requirements or other anticipated obstacles to implementing the proposed facilities in the submittal (Step 6).
- ❒ Construction Plan SUSMP Checklist (Step 6).
- ❒ Certification by a civil engineer, architect, and landscape architect (Step 6).

Step by Step

Suggested coordination with site and landscape design

Plan and design your stormwater controls integrally with the site planning and landscaping for your project. It's best to start with general project requirements and preliminary site design concepts; then prepare the detailed site design, landscape design, and stormwater control design simultaneously. **This will help ensure that your site plan, landscape plan, and Project Submittal are congruent.**

The following step-by-step procedure should optimize your design by identifying the best opportunities for stormwater controls **early in the design process.**

The recommended steps are:

Begin with general project requirements and program.

1. Assemble needed information.

Sketch conceptual site layout, building locations, and circulation.

2. Identify site opportunities and constraints.
3. Follow the LID design guidance in Chapter 4 to analyze your project for LID and to develop and document your drainage design.

Revise site layout, building locations, and circulation to accommodate LID design. Develop landscaping plan.

4. Specify source controls using the sources/source control checklist in the Appendix.
5. Plan for ongoing maintenance of treatment and flow-control facilities.
6. Complete the Project Submittal.

Submit Site Plan, Landscape Plan, and SUSMP Submittal

Municipal staff may recommend you prepare and submit a preliminary site design prior to formally applying for planning and zoning approvals. Your preliminary site design should incorporate a conceptual plan for site drainage, including self-treating and self-retaining areas and the location and approximate sizes of any treatment facilities. This additional up-front design effort will save time and avoid potential delays later in the review process.

Step 1: Assemble Needed Information

To select types and locations of treatment facilities, the designer needs to know the following site characteristics:

- **Existing natural hydrologic features** and natural resources, including any contiguous natural areas, wetlands, watercourses, seeps, or springs.

- **Existing site topography**, including contours of any slopes of 4% or steeper, general direction of surface drainage, local high or low points or depressions, any outcrops or other significant geologic features.

- **Zoning**, including requirements for **setbacks** and **open space**.

- **Public Works Standards** or other local codes governing minimum street widths, sidewalk construction, allowable pavement types, and drainage. These codes may conflict with Low Impact Development objectives to minimize imperviousness and to maintain or restore natural site hydrology. Municipalities are encouraged to review and revise codes to resolve these conflicts where it is possible to do so.

- Soil types (including **hydrologic soil groups**) and depth to groundwater, which may determine whether infiltration is a feasible option for managing site runoff. Depending on site location and characteristics, and on the selection of treatment and flow-control facilities, site-specific information (e.g. from boring logs or geotechnical studies) may be required.

- **Existing site drainage.** For undeveloped sites, this should be obtained by inspecting the site and examining topographic maps and survey data. For previously developed sites, site drainage and connection to the municipal storm drain system can be located from site inspection, municipal storm drain maps, and plans for previous development.

- Existing **vegetative cover** and **impervious areas**, if any.

References and Resources

- *Site Planning for Urban Stream Protection* (Scheuler 1995).
- *Start at the Source* (BASMAA 1999), p. 36

Step 2: Identify Constraints & Opportunities

Review the information collected in Step 1. Identify the principal constraints on site design and selection of treatment and flow-control facilities as well as opportunities to reduce imperviousness and incorporate facilities into the site and landscape design. For example, **constraints** might include impermeable soils, high groundwater, groundwater pollution or contaminated soils, steep slopes, geotechnical instability, high-intensity land use, heavy pedestrian or vehicular traffic, restricted right-of-way, or safety concerns. **Opportunities** might include existing natural areas, low areas, oddly configured or otherwise unbuildable parcels, easements and landscape amenities including open space and buffers (which can double as locations for bioretention facilities), and differences in

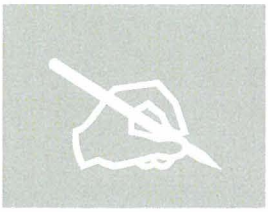

elevation (which can provide hydraulic head). Note stormwater treatment facilities should not be located within protected riparian areas.

If required by your municipality, prepare a brief **narrative** describing site opportunities and constraints. This narrative will help you as you proceed with LID design and explain your design decisions to others.

Step 3: Prepare and Document Your LID Design

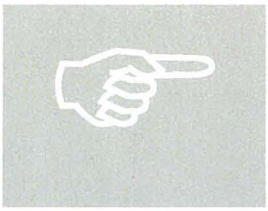

Use the Low Impact Development Design Guide (Chapter 4) to analyze your project for LID, design and document drainage, and specify preliminary design details for integrated management practices. **Follow the detailed instructions in Chapter 4 to ensure your project complies with NPDES permit LID requirements (Provision D.1.d.(4)) as well as stormwater treatment requirements in Provision D.1.d.(6)).** In future editions of this model SUSMP, the LID Design Guide will be updated so that additional hydromodification management requirements are also met via this unified design procedure. Chapter 4 includes calculation procedures and formats for presenting your calculations.

As shown in the example checklist (page 32), your Project Submittal may need to include a drawing showing:

- The entire site divided into separate drainage management areas (DMAs), with each area identified as one of the following: self-treating, self-retaining, draining to a self-retaining area, or draining to an IMP. Each area should be clearly marked with a unique identifier.

Compliance
The design criteria for DMAs in Chapter 4 ensure the required volume of flow from all developed portions of the project, including landscaped areas, is infiltrated, filtered, or treated (Provision D.1.d.(6)(a).

- For each drainage area, the types of impervious area proposed, and the area of each.
- Proposed locations and sizes of treatment facilities. Each facility should be clearly marked with a unique identifier.

Your Project Submittal may need to include:

- Tabulation of proposed self-treating areas, self-retaining areas, areas draining to self-retaining areas, and areas draining to IMPs, and the corresponding IMPs identified on the Exhibit.
- Calculations, in the format shown in Chapter 4, showing the minimum square footage required and proposed square footage for each IMP.

- Preliminary designs for each IMP. The design sheets and accompanying drawings in Chapter 4 may be used or adapted for this purpose.

The following may also be required, or may be advisable to assist the reviewer to understand your design:

- A narrative overview of your design and how your design decisions optimize the site layout, use pervious surfaces, disperse runoff from impervious surfaces, and drain impervious surfaces to engineered IMPs. See Chapter 4.

- A narrative briefly describing each **drainage management area** (DMA), its drainage, and where drainage will be directed.

- A narrative briefly describing each IMP. Include any special characteristics or features distinct from the design sheets in Chapter 4.

References and Resources

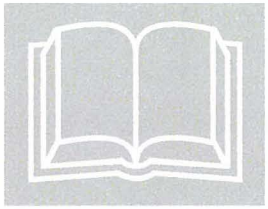

- Chapter 4
- *County of San Diego Low Impact Development Handbook*
- Your municipality's *General Plan*
- Your municipality's Zoning Ordinance and Development Codes
- *Low Impact Development Manual* (Prince George's County, Maryland, 1999).
- *Bioretention Manual* (Prince George's County, Maryland, rev. 2002)
- *Site Planning for Urban Stream Protection* (Schueler, 1995b).
  Low Impact Development Technical Guidance Manual for Puget Sound (Puget Sound Action Team, 2005)
- *LID for Big Box Retailers* (Low Impact Development Center, 2006)

Step 4. Specify Source Control BMPs

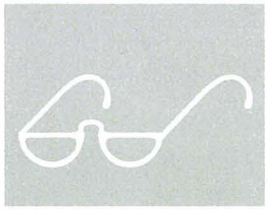

Some everyday activities – such as trash recycling/disposal and washing vehicles and equipment – generate pollutants that tend to find their way into storm drains. These pollutants can be minimized by applying **source control BMPs**.

Source control BMPs include **permanent**, structural features that must be incorporated into your project plans and **operational** BMPs, such as regular sweeping and "housekeeping," that must be implemented by the site's occupant or user. The maximum extent practicable standard typically requires both types of BMPs. In general, operational BMPs cannot be substituted for a feasible and effective permanent BMP.

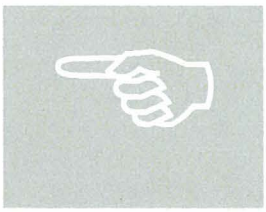

Use the following procedure to specify source control BMPs for your site:

► IDENTIFY POLLUTANT SOURCES

Review the first column in the **Pollutant Sources/Source Control Checklist** (Appendix). Check off the potential sources of pollutants that apply to your site.

► NOTE LOCATIONS ON SUBMITTAL DRAWING

Note the corresponding requirements listed in Column 2 of the Pollutant Sources/Source Control Checklist (Appendix). Show the location of each pollutant source and each permanent source control BMP in your submittal drawing.

► PREPARE A TABLE AND NARRATIVE

Check off the corresponding requirements listed in Column 3 in the Pollutant Sources/Source Control Checklist (Appendix). Now, create a table using the format in Table 3-1. In the left column, list each potential source on your site (from Appendix, Column 1). In the middle column, list the corresponding **permanent, structural BMPs** (from Columns 2 and 3, Appendix) used to prevent pollutants from entering runoff. Accompany this table with a narrative that explains any special features, materials, or methods of construction that will be used to implement these permanent, structural BMPs.

TABLE 3-1. Format for table of permanent and operational source control measures.

Potential source of runoff pollutants	*Permanent source control BMPs*	*Operational source control BMPs*

► IDENTIFY OPERATIONAL SOURCE CONTROL BMPS

To complete your table, refer once again to the Pollutant Sources/Source Control Checklist (Appendix, Column 4). List in the right column of your table the operational BMPs that should be implemented as long as the anticipated activities continue at the site. The same BMPs may also be required as a condition of a use permit or other revocable discretionary approval for use of the site.

References and Resources

- Appendix: Stormwater Pollutant Sources/Source Control Checklist
- RWQCB Order R9-2007-0001, Provision D.1.d.(5)
- *Start at the Source*, Section 6.7: Details, Outdoor Work Areas
- *California Stormwater Industrial/Commercial Best Management Practice Handbook*
- *Urban Runoff Quality Management* (WEF/ASCE, 1998) Chapter 4: Source Controls

Step 5: Stormwater Facility Maintenance

As required by NPDES Permit Provision D.1.c.(5), your local municipality will require submittal of proof of a mechanism under which ongoing long-term maintenance of stormwater treatment and flow-control facilities will be conducted. Your municipality may require one of more of the following items be included in your Project Submittal:

1. A means to finance and implement facility maintenance in perpetuity.
2. Acceptance of responsibility for maintenance from the time the facilities are constructed until responsibility for operation and maintenance is legally transferred. A warranty covering a period following construction may also be required.
3. An outline of general maintenance requirements for the treatment and flow-control facilities you have selected.

Your local municipality may also require that you prepare and submit a detailed plan that sets forth a maintenance schedule for each of the treatment and flow-control facilities built on your site.

Details of these requirements, and instructions for preparing a detailed operation and maintenance plan, are in Chapter 5.

References and Resources

- *Chapter 5*
- Operation, Maintenance, and Management of Stormwater Management Systems (Watershed Management Institute, 1997)

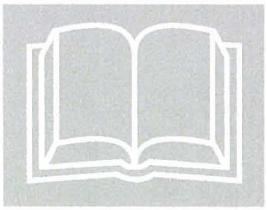

Step 6: Complete Your Project Submittal

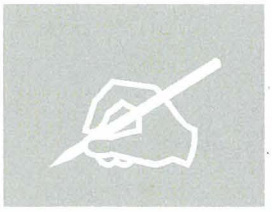

Local municipal staff will provide specific instructions for the content and format of your Project Submittal. Your Project Submittal should document the information gathered and decisions made in Steps 1-5. A clear, complete, well-organized Project Submittal will make it possible to confirm your design meets the minimum requirements of the NPDES permit, the municipal stormwater pollution prevention ordinance, and this *SUSMP*.

► COORDINATION WITH SITE, ARCHITECTURAL, AND LANDSCAPING PLANS

Before completing your Project Submittal, ensure your stormwater control design is fully coordinated with the site plan, grading plan, and landscaping plan being proposed for the site.

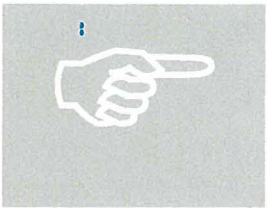

Information submitted and presentations to design review committees, planning commissions, and other decision-making bodies must incorporate relevant aspects of the stormwater design. In particular, ensure:

- Curb elevations, elevations, grade breaks, and other features of the drainage design are consistent with the delineation of DMAs.
- The top edge (overflow) of each bioretention facility is level all around its perimeter—this is particularly important in parking lot medians.
- The resulting grading and drainage design is consistent with the design for parking and circulation.
- Bioretention facilities and other IMPs do not create conflicts with pedestrian access between parking and building entrances.
- Vaults and utility boxes can be accommodated outside bioretention facilities and will not be placed within bioretention facilities.
- The visual impact of stormwater facilities, including planter boxes at building foundations and any terracing or retaining walls required for the stormwater control design, is shown in renderings and other architectural drawings.
- Landscaping plans, including planting plans, show locations of bioretention facilities, and the plant requirements are consistent with the engineered soils and conditions in the bioretention facilities.
- Renderings and representation of street views incorporate any stormwater facilities located in street-side buffers and setbacks.

► CONSTRUCTION PLAN SUSMP CHECKLIST

When you submit construction plans for City review and approval, the reviewer will compare that submittal with your earlier Project Submittal. By creating a Construction Plan SUSMP Checklist for your project, you can facilitate the reviewer's comparison and speed review of your project.

TABLE 3-2. Format for Construction Plan SUSMP Checklist.

SUSMP Page #	*BMP Description*	*See Plan Sheet #s*

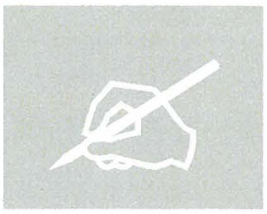

Here's how:

1. Create a table similar to Table 3-2. Number and list each measure or BMP you have specified in your Project Submittal in Columns 1 and 2 of the table. Leave Column 3 blank. Incorporate the table into your Project Submittal.

2. When you submit construction plans, **duplicate t he t able** (by photocopy or electronically). Now fill in Column 3, identifying the plan sheets where the BMPs are shown. List all plan sheets on which the BMP appears. Submit the updated table with your construction plans.

Note that the updated table—or Construction Plan SUSMP Checklist—is **only a reference tool** to facilitate comparison of the construction plans to your Project Submittal. Planning Department staff can advise you regarding the process required to propose changes to your approved Project Submittal.

► CERTIFICATION

Your local municipality may require that your Project Submittal be certified by an architect, landscape architect, or civil engineer.

The certification should state: "The selection, sizing, and preliminary design of stormwater treatment and other control measures in this plan meet the requirements of Regional Water Quality Control Board Order R9-2007-0001 and subsequent amendments."

► EXAMPLE PROJECT SUBMITTAL OUTLINE AND CONTENTS

Check with local municipal staff for requirements specific to your project.

I. Project Setting

- A. Project Name, Location, Description
- B. Existing site features and conditions
- C. Opportunities and constraints for stormwater control

II. Low Impact Development Design Strategies

- A. Optimization of site layout
  - (1) Limitation of development envelope
  - (2) Preservation of natural drainage features
  - (3) Setbacks from creeks, wetlands, and riparian habitats
  - (4) Minimization of imperviousness
  - (5) Using drainage as a design element
- B. Use of permeable pavements
- C. Dispersal of runoff to pervious areas
- D. Use of Integrated Management Practices

III. Documentation of Drainage Design

- A. Drainage Management Areas
  - (1) Tabulation
  - (2) Descriptions
- B. Integrated Management Practices
  - (1) Tabulation and Sizing Calculations
  - (2) Descriptions

IV. Source Control Measures

A. Description of site activities and potential sources of pollutants

B. Table showing sources, permanent source controls, and operational source controls

V. Facility Maintenance Requirements

A. Ownership and responsibility for maintenance in perpetuity.

(1) Commitment to execute any necessary agreements.

(2) Statement accepting responsibility for operation and maintenance of facilities until that responsibility is formally transferred.

B. Summary of maintenance requirements for each stormwater facility.

VI. Construction Plan SUSMP Checklist

VII. Certifications

Attachment: SUSMP Exhibit

► EXAMPLE PROJECT SUBMITTALS

Example Project Submittals may be available from staff at your municipality. Your submittal will reflect the unique character of your own project and should meet the requirements identified in this *SUSMP*. Municipal staff can assist you to determine how specific requirements apply to your project.

Chapter 4

Low Impact Development Design Guide

Guidance for designing and documenting your LID site drainage, stormwater treatment facilities, and flow-control facilities

Follow the Low Impact Development (LID) design in this SUSMP to achieve compliance with the stormwater treatment requirements as well as the LID requirements in the stormwater NPDES permit.

This will require careful documentation of:

- Pervious and impervious areas in the planned project.
- Drainage from each of these areas.
- Locations, sizes, and types of proposed treatment facilities.

Your Project Submittal must include calculations showing the site drainage and proposed LID treatment facilities meet the criteria in this *SUSMP*.

This Low Impact Development Design Guide will help you:

- **Analyze your project** and identify and select options for implementing LID techniques to meet runoff treatment requirements—and flow-control requirements, if they apply.
- **Design and document drainage** for the whole site and document how that design meets this *SUSMP's* stormwater treatment criteria.
- **Specify preliminary design details** and integrate your LID drainage design with your paving and landscaping design.

Alternatives to LID design are discussed in the final section of this chapter.

Analyze Your Project for LID

Conceptually, there are four LID strategies for managing runoff from buildings and paving:

1. **Optimize the site layout** by preserving natural drainage features and designing buildings and circulation to minimize the amount of roofs and paving.

2. **Use pervious surfaces** such as turf, gravel, or pervious pavement—or use surfaces that retain rainfall, such as vegetated roofs. All drainage from these surfaces is considered to be "self-retained" (a detailed definition corresponding to this concept is on page 51). No further management of runoff is necessary. An emergency overflow should be provided for extreme events.

3. **Disperse r unoff** from impervious surfaces on to adjacent pervious surfaces (e.g., direct a roof downspout to disperse runoff onto a lawn).

4. Drain impervious surfaces to engineered **Integrated M anagement Practices** (IMPs), such as bioretention facilities, planter boxes, cisterns, or dry wells. IMPs infiltrate runoff to groundwater and/or percolate runoff through engineered soil and allow it to drain away slowly. Depending on site conditions and local regulations, it may be possible to harvest and reuse rainwater in conjunction with IMPs.

A combination of two or more strategies may work best for your project. With forethought in design, the four strategies can provide multiple, complementary benefits to your development. Pervious surfaces reduce heat island effects and temperature extremes. Landscaping improves air quality, creates a better place to live or work, and upgrades value for rental or sale. Retaining natural hydrology helps preserve and enhance the natural character of the area. LID drainage design can also conserve water and reduce the need for drainage infrastructure.

Table 4-1 includes ideas for applying LID strategies to site conditions and types of development.

TABLE 4-1. Ideas for Runoff Management

Site Features and Design Objectives	*Vegetated Roof*	*Self-retaining Areas*	*Pervious Pavement*	*Bioretention Facility*	*Flow-through Planter*	*Dry Well*	*Cistern with bioretention*
Clayey native soils	✓			✓	✓		✓
Permeable native soils	✓		✓	✓	✓	✓	
Very steep slopes	✓				✓		
Shallow groundwater	✓				✓		
Avoid saturating subsurface soils	✓		✓		✓		
Connect to roof downspouts		✓		✓	✓	✓	✓
Parking lots/islands and medians			✓	✓		✓	
Sites with extensive landscaping		✓	✓	✓			
Densely developed sites with limited space/landscape	✓		✓		✓	✓	✓
Fit IMPs into landscape and setback areas				✓			✓
Make drainage a design feature		✓		✓			✓
Convey as well as treat stormwater				✓			

► OPTIMIZE THE SITE LAYOUT

To minimize stormwater-related impacts, apply the following design principles to the layout of newly developed and redeveloped sites.

Conserve nat ural ar eas, s oils, and v egetation. Define the development envelope and protected areas, identifying areas that are most suitable for development and areas that should be left undisturbed. Use the following guideline to determine the least sensitive areas of the site, in order of increasing sensitivity:

1. Areas devoid of vegetation, including previously graded areas and agricultural fields.
2. Areas of non-native vegetation, disturbed habitats and eucalyptus woodlands where receiving waters are not present.
3. Areas of chamise or mixed chaparral, and non-native grasslands.
4. Areas containing coastal scrub communities.
5. All other upland communities.
6. Occupied habitat of sensitive species and all wetlands (as both are defined by the local jurisdiction).

Within each of the previous categories, hillside areas should be considered more sensitive than flatter areas.

Where possible, conform the site layout along natural landforms, avoid excessive grading and disturbance of vegetation and soils, and replicate the site's natural drainage patterns. Set back development from creeks, wetlands, and riparian habitats. Preserve significant trees, especially native trees and shrubs, and identify locations for planting additional native or drought tolerant trees and large shrubs. Concentrate development on portions of the site with less permeable soils, and preserve areas that can promote infiltration.

Coordination
Chapter One includes a presentation of how review of your project's site design and landscape design is coordinated with review for compliance with stormwater NPDES requirements.

For all types of development, **limit overall coverage** of paving and roofs. Where allowed by local zoning and design standards—and provided public safety and a walkable environment are not compromised—this can be accomplished by designing compact, taller structures, narrower and shorter streets and sidewalks, smaller parking lots (fewer stalls, smaller stalls, and more efficient lanes), and indoor or underground parking. Examine site layout and circulation patterns and identify areas where landscaping can be substituted for pavement.

Detain and retain runoff throughout the site. On flatter sites, it typically works best to intersperse landscaped areas and IMPs among the buildings and paving. On hillside sites, drainage from upper areas may be collected in conventional catch basins and piped to landscaped areas and IMPs in lower areas.

Use drainage as a design element. Use depressed landscape areas, vegetated buffers, and bioretention areas as amenities and focal points within the site and landscape design. Bioretention areas can be almost any shape and should be located at low points. Bioretention areas shaped as swales can detain and treat low runoff flows and also convey higher flows.

► USE PERVIOUS SURFACES

Consider a vegetated roof. Although not yet widely used in California, vegetated or "green" roofs are growing in popularity. Potential benefits include longer roof life, lower heating and cooling costs, and better sound insulation, in addition to air quality and water quality benefits. For SUSMP compliance purposes, vegetated roofs are considered not to produce increased runoff or runoff pollutants (i.e., any runoff from a vegetated roof requires no further treatment or detention). For more information on vegetated roofs, see www.greenroofs.org.

Consider permeable pavements and surface treatments. Inventory paved areas on your preliminary site plan. Identify where permeable pavements, such as crushed aggregate, turf block, unit pavers, pervious concrete, or pervious asphalt could be substituted for impervious concrete or asphalt paving.

► DISPERSE RUNOFF TO ADJACENT PERVIOUS AREAS

Look for opportunities to direct runoff from impervious areas to adjacent landscaping. The design, including slopes and soils, must reflect a reasonable expectation that an inch of rainfall will soak into the soil and produce no runoff. For example, a lawn or garden depressed 3-4" below surrounding walkways or driveways provides a simple but functional landscape design element.

For sites subject to stormwater treatment requirements only, a 2:1 maximum ratio of impervious to pervious area is acceptable. Be sure soils will drain adequately.

Under some circumstances, it may be allowable to direct runoff from impervious areas to pervious pavement (for example, from roof downspouts to a parking lot paved with crushed aggregate or turf block). The pore volume of pavement and base course must be sufficient to retain an inch of rainfall, including runoff from the tributary area. The slopes and soils must be compatible with infiltrating that volume without producing runoff.

► DIRECT RUNOFF TO INTEGRATED MANAGEMENT PRACTICES

Project Clean Water has developed design criteria for the following IMPs:

- **Bioretention facilities**, which can be configured as swales, free-form areas, or planters to integrate with your landscape design.

- **Flow-through planters**, which can be used near building foundations and other locations where infiltration to native soils is not desired.

- **Dry wells** and other infiltration facilities, which can be used only where soils are permeable.

- **Cisterns**, in combination with a bioretention facility.

See the design sheets at the end of this chapter.

It may be possible to create a site-specific design that uses cisterns to achieve stormwater flow control, stormwater treatment, and rainwater reuse for irrigation or indoor uses (**water h arvesting**). Such a design could expand the multiple benefits of LID to include water conservation. Keep in mind:

- Facilities must meet criteria for capturing and treating the volume specified by Equation 4-8 below. This volume must be allowed to empty within 24 hours so runoff from additional storms, which may follow, is also captured and treated. Additional volume may be required if the system also stores runoff for longer periods for reuse.

- Storage of water for longer than 48 hours creates the potential for mosquito harborage. Cisterns must be designed to prevent entry by mosquitoes.

- Indoor uses of non-potable water may be restricted or prohibited. Check with municipal staff.

Some references and resources for water harvesting appear at the end of this chapter.

Finding the right location for treatment facilities on your site involves a careful and creative integration of several factors:

- To make the most efficient use of the site and to maximize aesthetic value, **integrate IMPs with site landscaping**. Many local zoning codes may require landscape setbacks or buffers, or may specify that a minimum portion of the site be landscaped. It may be possible to locate some or all of your site's treatment and flow-control facilities within this same area, or within utility easements or other non-buildable areas.

- Planter boxes and bioretention areas must be **level or nearly level** all the way around. Bioretention areas configured as swales may be gently

sloped in the linear direction, but opposite sides must be at the same elevation.

- For effective, low-maintenance operation, **locate facilities so drainage into and out of the device is by gravity flow.** Pumped systems are feasible, but are expensive, require more maintenance, are prone to untimely failure, and can cause mosquito control problems. Most IMPs require 3 feet or more of head.

- If the property is being subdivided now or in the future, the facility should be in a **common, accessible area.** In particular, avoid locating facilities on private residential lots. Even if the facility will serve only one site owner or operator, make sure the facility is located for ready access by inspectors from the local municipality and local mosquito control agency.

- The facility must be accessible to equipment needed for its maintenance. **Access requirements for maintenance** will vary with the type of facility selected. Planter boxes and bioretention areas will typically need access for the same types of equipment used for landscape maintenance.

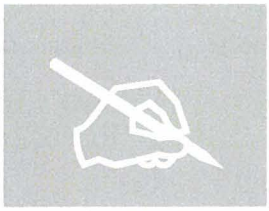

To complete your analysis, if required by your municipality include in your Project Submittal a brief **narrative** documenting the site layout and site design decisions you made. This will provide background and context for how your design meets the quantitative LID design criteria.

Develop and Document Your Drainage Design

The **design document ation procedure** begins with careful delineation of pervious areas and impervious areas (including roofs) throughout the site. The procedure accounts for how runoff from each delineated area is managed. For areas draining to IMPs, the procedure ensures each IMP is appropriately sized.

The procedure results in a space-efficient, cost-efficient LID design for meeting SUSMP requirements on most residential and commercial/industrial developments. The procedure arranges documentation of drainage design and IMP sizing in a consistent format for presentation and review.

This procedure is intended to facilitate, not substitute for, creative interplay among site design, landscape design, and drainage design. **Several iterations may be needed** to optimize your drainage design as well as aesthetics, circulation, and use of available area for your site.

You should be able to complete the needed calculations using only the project's site development plan.

► STEP 1: DELINEATE DRAINAGE MANAGEMENT AREAS

This is the key first step. You must divide the **entire project area** into individual, discrete Drainage Management Areas (DMAs). Typically, lines delineating DMAs follow grade breaks and roof ridge lines. The Exhibit, tables, text, and calculations in your Project Submittal will illustrate, describe, and account for runoff from each of these areas.

Use separate DMAs for each surface type (e.g., landscaping, pervious paving, or roofs). Each DMA must be assigned a single hydrologic soil group. Assign each DMA an identification number and determine its size in square feet.

► STEP 2: CLASSIFY DMAS AND DETERMINE RUNOFF FACTORS

Next, determine how drainage from each DMA will be handled. Each DMA will be one of the following four types:

1. Self-treating areas.
2. Self-retaining areas (also called "zero-discharge" areas).
3. Areas that drain to self-retaining areas.
4. Areas that drain to IMPs.

Self-treating areas are landscaped or turf areas that do not drain to IMPs, but rather drain directly off site or to the storm drain system. Examples include upslope undeveloped areas which are ditched and drained around a development and grassed slopes which drain off-site to a street or storm drain. In general, self-treating areas include no impervious areas, unless the impervious area is very small (5% or less) in relationship to the receiving pervious area and slopes are gentle enough to ensure runoff will be absorbed into the vegetation and soil. Criteria for self-treating areas are in the design sheet "Self Treating and Self-Retaining Areas" at the end of this chapter.

Rationale

Pollutants in rainfall and windblown dust will tend to become entrained in the vegetation and soils of landscaped areas, so no additional treatment is needed. It is assumed the self-treating landscaped areas will produce runoff less than or equal to the pre-project site condition.

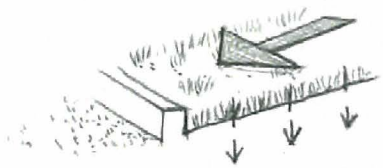

FIGURE 4-1. Self-treating areas are entirely pervious and drain directly off-site or to the storm drain system.

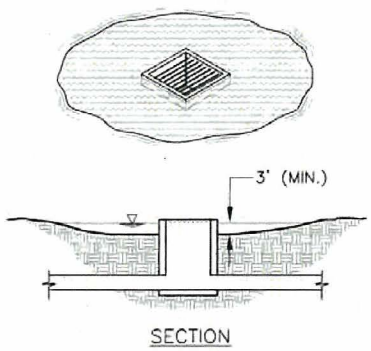

FIGURE 4-2. Self-retaining areas. Berm or depress the grade to retain at least an inch of rainfall and set inlets of any area drains at least 3 inches above low point to allow ponding.

Self-retaining areas are designed to retain the first one inch of rainfall without producing any runoff. The technique works best on flat, heavily landscaped sites. It may be used on mild slopes if there is a reasonable expectation that a one-inch rainfall event would produce no runoff.

To create self-retaining turf and landscape areas in flat areas or on terraced slopes, berm the area or depress the grade into a concave cross-section so that these areas will retain the first inch of rainfall. Specify slopes, if any, toward the center of the pervious area. Inlets of area drains, if any, should be set 3 inches above the low point to allow ponding.

Criteria for self-retaining areas are in the design sheet "Self Treating and Self-Retaining Areas" following this chapter.

Areas draining to self-retaining areas. Runoff from impervious or partially pervious areas can be managed by routing it to self-retaining pervious areas. For example, roof downspouts can be directed to lawns, and driveways can be sloped toward landscaped areas. The maximum ratio is 2 parts impervious area for every 1 part pervious area.

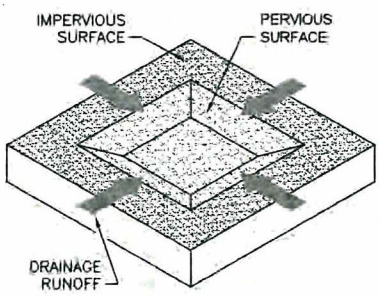

FIGURE 4-3. Relationship of impervious to pervious area for self-retaining areas. Ratio: ***pervious ≥ ½ impervious***

The drainage from the impervious area must be directed to and dispersed within the pervious area, and the entire area must be designed to retain an inch of rainfall without flowing off-site. For example, if the maximum ratio of 2 parts impervious area into 1 part pervious area is used, then the pervious area must absorb 3 inches of water over its surface before overflowing to an off-site drain.

A partially pervious area may be drained to a self-retaining area. For example, a driveway composed of unit pavers may drain to an adjacent lawn. In this case, the maximum ratios are:

(Runoff factor) x (tributary area) ≤ 2 x (self-retaining area) *Equation 4-1*

Use the runoff factors in Table 4-2.

Prolonged ponding is a potential problem at higher impervious/pervious ratios. In your design, ensure that the pervious area soils can handle the additional run-on and are sufficiently well-drained.

Under some circumstances, pervious pavement (e.g., crushed stone, pervious asphalt, or pervious concrete) can be self-retaining. Adjacent roofs or impervious pavement may drain on to the pervious pavement in the same maximum ratios as described above.

To design a pervious pavement to be a self-treating area, ensure:

- The gravel base course is a minimum of four or more inches deep.
- The base course is not be underdrained.
- A qualified engineer has been consulted regarding infiltration rates, pavement stability, and suitability for the intended traffic.

Runoff from self-treating and self-retaining areas does not require any further treatment or flow control.

TABLE 4-2. Runoff factors for surfaces draining to IMPs.

Surface	Factor
Roofs	1.0
Concrete	1.0
Pervious Concrete	0.1
Porous Asphalt	0.1
Grouted Unit Pavers	1.0
Solid Unit Pavers on granular base, min. 3/16 inch joint space	0.2
Crushed Aggregate	0.1
Turfblock	0.1
Amended, mulched soil	0.1
Landscape	0.1

Areas draining to IMPs are multiplied by a sizing factor to calculate the required size of the IMP. On most densely developed sites—such as commercial and mixed-use developments and small-lot residential subdivisions—most DMAs will drain to IMPs.

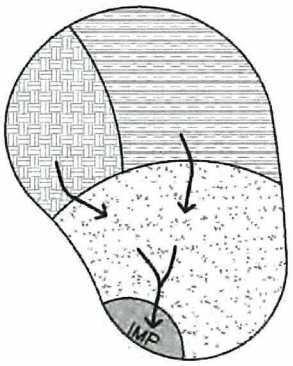

FIGURE 4-4. MORE THAN ONE
Drainage Management Area can drain to a single IMP.

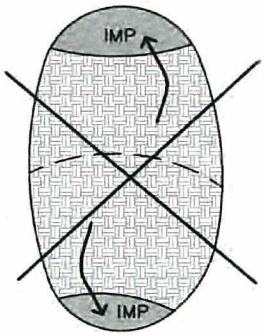

FIGURE 4-5. ONE DRAINAGE
Management Area cannot drain to more than one IMP. Use a grade break to divide the DMA.

More than one drainage area can drain to the same IMP. However, because the minimum IMP sizes are determined by ratio to drainage area size, a drainage area may not drain to more than one IMP. See Figures 4-4 and 4-5.

Where possible, design site drainage so **only impervious roofs and pavement** drain to IMPs. This yields a simpler, more efficient design and also helps protect IMPs from becoming clogged by sediment.

If it is necessary to include turf, landscaping, or pervious pavements within the area draining to an IMP, list each surface as a separate DMA. A runoff factor (similar to a "C" factor used in the rational method) is applied to account for the reduction in the quantity of runoff. For example, when a turf or landscaped drainage management area drains to an IMP, the resulting increment in IMP size is:

Δ(Area) = (pervious area) × (runoff factor) × (sizing factor).

Use the runoff factors in Table 4-2.

► STEP 3: TABULATE DRAINAGE MANAGEMENT AREAS

- Tabulate self-treating areas in the format shown in Table 4-3.
- Tabulate self-retaining areas in the format shown in Table 4-4.
- Tabulate areas draining to self-retaining areas in the format shown in Table 4-5. Check to be sure the total product of (square feet of tributary area × runoff factor) for all DMAs draining to a receiving self-retaining area is no greater than a 2:1 ratio to the square footage of the receiving self-retaining area itself.
- Compile a list of DMAs draining to IMPs. Proceed to Step 4 to check the sizing of the IMPs.

- TABLE 4-3. Format for Tabulating Self-Treating Areas

DMA Name	*Area (square feet)*

TABLE 4-4. Format for Tabulating Self-Retaining Areas

DMA Name	*Area (square feet)*

TABLE 4-5. Format for Tabulating Areas Draining to Self-Retaining Areas

DMA Name	*Area (square feet)*	*Post-project surface type*	*Runoff factor*	*Receiving self-retaining DMA*	*Receiving self-retaining DMA Area (square feet)*

► STEP 4: SELECT AND LAY OUT IMPS ON SITE PLAN

Select from the list of IMPs in Table 4-6. Illustrations, designs, and design criteria for the IMPs are in the "IMP Design Details and Criteria" at the end of this chapter.

Once you have laid out the IMPs, calculate the square footage you have set aside on your site plan for each IMP.

► STEP 5: REVIEW SIZING FOR EACH IMP

For each of the IMPs, use the appropriate sizing from Table 4-6.

TABLE 4-6. IMP Sizing

Bioretention Facilities	Sizing Factor for Area = 0.04
Flow-through Planters	Sizing Factor for Area = 0.04
Dry Well or Infiltration Basin	See Step 6 to Calculate Min. Volume
Cistern with Bioretention	See Step 6 to Calculate Min. Volume of Cistern; then use 0.04 to calculate minimum size of bioretention area

► STEP 6: CALCULATE MINIMUM AREA AND VOLUME OF EACH IMP

The minimum area of bioretention facilities and flow-through planters is found by summing up the contributions of each tributary DMA and multiplying by the adjusted sizing factor for the IMP.

Equation 4-7

$$Min.\,IMP\,Area = \sum \begin{pmatrix} DMA & DMA \\ Square & \times Runoff \\ Footage & Factor \end{pmatrix} \times \begin{pmatrix} IMP \\ Sizing \\ Factor \end{pmatrix}$$

Use the format of Table 4-7 to present the calculations of the required minimum area and volumes for **bioretention areas** and **planter boxes**:

TABLE 4-7. Format for presenting calculations of minimum IMP Areas for bioretention areas and planter boxes.

DMA Name	*DMA Area (square feet)*	*Post-project surface type*	*DMA Runoff factor*	*DMA Area × runoff factor*	*Soil Type:*	*IMP Name*			
					IMP Sizing factor		*Minimum Area*	*Proposed Area*	
			Total		***0.04***				***IMP Area***

To size **dry wells**, **infiltration basins**, or **infiltration trenches**, use the following procedure:

1. Use the County of San Diego's 85th Percentile Isopluvial Map to determine the minimum unit volume.

2. Determine the weighted runoff factor ("C" factor) for the area tributary to the facility. The factors in Table 4-2 may be used.

3. Multiply the weighted runoff factor times the tributary area times the minimum unit volume.

   Equation 4-8

   $$Volume = [Tributary\ Area] \times [weighted\ runoff\ factor] \times [unit\ volume]$$

4. Select a facility depth.

5. Determine the required facility area. Dry wells may be designed as an open vault or with rock fill. If rock fill is used, assume a porosity of 40%.

6. Ensure the facility can infiltrate the entire volume within 72 hours.

To size a **cistern in series with a bioretention facility**:

1. Use Equation 4-8 to calculate the required cistern volume.

2. Design a discharge orifice for a drawdown time of 24 hours.

3. Determine the maximum discharge from the orifice.

4. The minimum area of the bioretention facility must treat this flow based on a percolation rate of 5" per hour through the engineered soil.

► STEP 7: DETERMINE IF AVAILABLE SPACE FOR IMP IS ADEQUATE

Sizing and configuring IMPs may be an iterative process. After computing the minimum IMP area using Steps 1 – 6, review the site plan to determine if the reserved IMP area is sufficient. If so, the planned IMPs will meet the SUSMP sizing requirements. If not, revise the plan accordingly. Revisions may include:

- Reducing the overall imperviousness of the project site.

- Changing the grading and drainage to redirect some runoff toward other IMPs which may have excess capacity.
- Making tributary landscaped DMAs self-treating or self-retaining.
- Expanding IMP surface area.

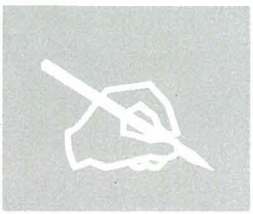

► STEP 8: COMPLETE YOUR SUMMARY REPORT

Present your IMP sizing calculations in tabular form. Adapt the following format as appropriate to your project. Coordinate your presentation of DMAs and calculation of minimum IMP sizes with the Project Submittal drawing (labeled to show delineation of DMAs and locations of IMPs). It is also helpful to incorporate a brief description of each DMA and each IMP.

Sum the total area of all DMAs and IMPs listed and show it is equal to the total project area. This step may include adjusting the square footage of some DMAs to account for area used for IMPs.

Format:

Project Name:

Project Location:

APN or Subdivision Number:

Total Project Area (square feet):

Mean Annual Precipitation at Project Site:

I. Self-treating areas:

DMA Name	*Area (square feet)*

II. Self-retaining areas:

DMA Name	*Area (square feet)*

III. Areas draining to self-retaining areas:

DMA Name	*Post-project surface type*	*Runoff factor*	*Area (square feet)*	*Receiving self-retaining DMA*	*Receiving self-retaining DMA Area (square feet)*

IV. Areas draining to IMPs (repeat for each IMP):

DMA Name	*DMA Area (square feet)*	*Post-project surface type*	*DMA Runoff factor*	*DMA Area × runoff factor*	*Soil Type:*	*IMP Name*			
					IMP Sizing factor		*Minimum Area or Volume*	*Proposed Area or Volume*	
			Total						***IMP Area***

Specify Preliminary Design Details

In your Project Submittal, describe your IMPs in sufficient detail to demonstrate the area, volume, and other criteria of each can be met within the constraints of the site.

Ensure these details are consistent with preliminary site plans, landscaping plans, and architectural plans submitted with your application for planning and zoning approvals.

Following are design sheets for:

- Self-treating and self-retaining areas
- Pervious pavements
- Bioretention facilities
- Flow-through planter
- Dry wells and infiltration basins
- Cistern with bioretention facility

These design sheets include recommended configurations and details, and example applications, for these IMPs. **The information in these design sheets must be adapted and applied to the conditions specific to the development project such as unstable slopes or the lack of available head. Designated municipal staff have final review and approval authority over the project design.**

Keep in mind that proper and functional design of the IMP is the responsibility of the applicant. Effective operation of the IMP throughout the project's lifetime will be the responsibility of the property owner.

Alternatives to Integrated LID Design

If you believe design of features and facilities as described above is infeasible for your development site, consult with municipal staff before preparing an alternative design for stormwater treatment, flow control, and LID compliance.

For all alternative designs, the applicant must prepare a complete Project Submittal, including a drawing showing the entire site divided into discrete Drainage Management Areas, text and tables showing how drainage is routed from each DMA to a treatment facility, and calculations demonstrating the design achieves the applicable design criteria for each stormwater treatment facility. Alternative treatment facilities are limited to the circumstances and selection criteria identified beginning on page 21. The Project Submittal must also show how the project meets the minimum LID criteria (page 25) and ensures runoff rates, durations, and velocities are controlled to maintain or reduce downstream erosion conditions and protect stream habitat (NPDES Permit Provision D.1.d.(10)).

Local Requirements

Cities or the County may have requirements that differ from, or are in addition to, this countywide model SUSMP. Check with local planning and community development staff.

► DESIGN OF ALTERNATIVE TREATMENT FACILITIES

Here are criteria and design considerations for some alternative treatment facilities:

Sand Filters. To ensure effectiveness is not compromised by compacting or clogging of the filter surface, sand filters must be maintained frequently.

The following criteria apply to sand filters:

- Calculate the design flow using the rational method with an intensity of 0.2"/hour and the "C" factors for "treatment only" from Table 4-2.
- To determine the required filter surface area, divide the design flow by an allowable design surface loading rate of 5"/hour.
- The minimum depth of filter media is 18". The media should be washed sand, with gradation similar to that specified for fine aggregate in ASTM C-33.
- The entire filter area must be accessible for easy maintenance without the need to enter a confined space.

A typical filter design includes a gravel drain layer and a perforated pipe underdrain. Filter fabric may be used to prevent the filter media from entering the gravel layer.

The design should not include any permanent pool or other standing water. Instead of including a pretreatment basin, consider the following features in the area tributary to the filter to reduce the potential for filter clogging:

- Limit the size of the Drainage Management Area.

- Include only impervious areas in the DMA.
- Stabilize slopes and eliminate sources of sediment in the DMA.
- Provide screens for trash and leaves at storm drain inlets (if allowed by municipality).

For additional design considerations and details, see *Design of Stormwater Filtering Systems* by Richard A. Claytor and Thomas R. Schueler, The Center for Watershed Protection, 1996, and *California Stormwater BMP Handbooks* Fact Sheet TC-40, Media Filter.

Extended ("Dry") Detention Basins. The required detention volume is based on the 85th percentile 24-hour storm depth. The steps to calculate the required detention volume are:

1. Use the County of San Diego's 85th Percentile Isopluvial Map to determine the unit basin volume.
2. Determine the weighted runoff factor ("C" factor) for the area tributary to the basin. The factors in Table 4-2 may be used.
3. Multiply the weighted runoff factor times the tributary area times the unit basin volume.

For maximum effectiveness the basin should not be sized substantially larger than this volume.

For design considerations and details, see the *California Stormwater Best Management Practice Handbooks*, Fact Sheet TC-22, "Extended Detention Basins." The basin outlet should be designed for a 24-hour drawdown time.

As noted in Fact Sheet TC-22, "dry" detention basins may not be practicable for drainage areas less than 5 acres. The potential for mosquito harborage is a concern. In the design, do not create any areas that will hold standing water for 72 hours or more.

"Wet" Detention Ponds and Constructed Wetlands. The required detention volume is determined as with a "dry" detention basin. Before proceeding with design, contact the local mosquito control agency to coordinate the design and plan ongoing inspection and maintenance of the facility for mosquito control. For design considerations and details, see the *California Stormwater Best Management Practices Handbooks*, Fact Sheet TC-20, "Wet Ponds," and Fact Sheet TC-21, "Constructed Wetlands."

Vegetated Swales. Design recommendations for conventional vegetated swales are in the *California Stormwater Best Management Practices Handbooks*. The conventional swale design uses available on-site soils and does not include an underdrain system. Where soils are clayey, there is little infiltration. Treatment occurs as runoff flows through grass or other vegetation before exiting at the downstream end. Recommended detention times are on the order of 10 minutes. Linear-shaped bioretention areas should be used in place of conventional vegetated swales because:

- Conventional swale design has resulted in standing water and associated nuisances.
- Conventional swales often don't obtain even the design residence time because of the length required and because proper design requires runoff enter the swale at the upstream end rather than at various locations along its length, and
- Bioretention areas provide a more flexible drainage design, more effective practicable treatment, and more effective flow control within the same footprint.

► TREATMENT FACILITIES FOR SPECIAL CIRCUMSTANCES

Higher-rate surface filters and vault-based proprietary filters can only be used in the circumstances described beginning on page 21 and when sand filters, extended "dry" detention basins, and "wet" detention ponds or constructed wetlands have been found infeasible.

For surface filters, the grading and drainage design should minimize the area draining to each unit and maximize the number of discrete drainage areas and units. Proprietary facilities should be installed consistent with the manufacturer's instructions.

References and Resources:

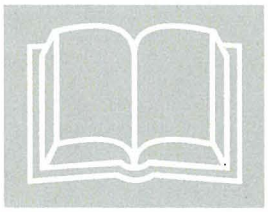

- RWQCB Order R9-2007-0001 (Stormwater NPDES Permit)
- Low Impact Development Center
- *County of San Diego Low Impact Development Handbook*
- *California Best Management Practices Handbooks*
- *Design of Stormwater Filtering Systems* (Claytor and Scheuler, 1996)
- American Rainwater Catchment Systems Association
- Water Conservation Alliance of Southern Arizona
- *Rainwater Harvesting for Drylands and Beyond*
- *The Texas Manual on Rainwater Harvesting*
- *Managing Wet Weather With Green Infrastructure: Municipal Handbook, Rainwater Harvesting Policies* (Low Impact Development Center, 2008)

Self-Treating and Self-Retaining Areas

▶ **CRITERIA**

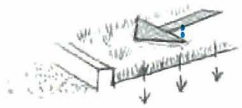

Rainfall on self-treating areas infiltrates or—during intense storms— drains directly off-site or to the storm drain system.

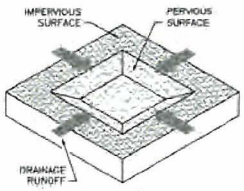

Self-retaining areas are designed to retain the first one inch of rainfall without producing any runoff. During intense storms, runoff may drain off-site, to the storm drain system, or to IMPs.

LID design seeks to manage runoff from roofs and paving so effects on water quality and hydrology are minimized. Runoff from landscaping, however, does not need to be managed the same way.

Runoff from landscaping can be managed by creating self-treating and self-retaining areas.

Self-treating areas are natural, landscaped, or turf areas that drain directly off site or to the storm drain system. Examples include upslope undeveloped areas that are ditched and drained around a development and grassed slopes that drain offsite to a street or storm drain. Self-treating areas may not drain on to adjacent paved areas.

Where a landscaped area is upslope from or surrounded by paved areas, a **self-retaining area** (also called a zero-discharge area) may be created. Self-retaining areas are designed to retain the first one inch of rainfall without producing any runoff. The technique works best on flat, heavily landscaped sites. It may be used on mild slopes if there is a reasonable expectation that the first inch of rainfall would produce no runoff.

To create self-retaining turf and landscape areas in flat areas or on terraced slopes, berm the area or depress the grade into a concave cross-section so that these areas will retain the first inch of rainfall. Inlets of area drains, if any, should be set 3 inches above the low point to allow ponding.

Best Uses

- Heavily landscaped sites

Advantages

- No maintenance verification requirement
- Complements site landscaping

Limitations

- Requires substantial square footage
- Grading requirements must be coordinated with landscape design

Areas draining to self retaining areas. Drainage from roofs and paving can be directed to self-retaining areas and allowed to infiltrate into the soil. The maximum allowable ratio is 2 parts impervious: 1 part pervious.

The self-retaining area must be bermed or depressed to retain an inch of rainfall including the flow from the tributary impervious area.

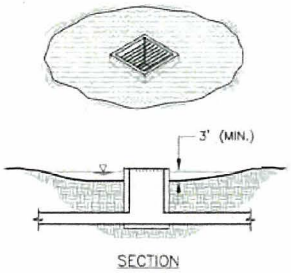

Set overflows and area drain inlets high enough to ensure ponding (3" deep) over the surface of the self-retaining area.

► DETAILS

Drainage from self-treating areas must flow to off-site streets or storm drains without flowing on to paved areas.

Pavement within a self-treating area cannot exceed 5% of the total area.

In self-retaining areas, overflows and area drain inlets should be set high enough to ensure ponding over the entire surface of the self-retaining area.

Self–retaining areas should be designed to promote even distribution of ponded runoff over the area.

Leave enough reveal (from pavement down to landscaped surface) to accommodate buildup of turf or mulch.

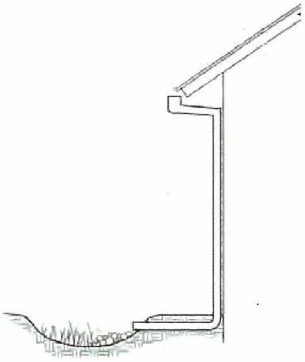

Connecting a roof leader to a self-retaining area. The head from the eave height makes it possible to route roof drainage some distance away from the building.

► APPLICATIONS

Lawn or landscaped areas adjacent to streets can be considered self-treating areas.

Self-retaining areas can be created by depressing lawn and landscape below surrounding sidewalks and plazas.

Runoff from walkways or driveways in parks and park-like areas can sheet-flow to self-retaining areas.

Roof leaders can be connected to self-retaining areas by piping beneath plazas and walkways. If necessary, a "bubble-up" can be used.

Self-retaining areas can be created by terracing mild slopes. The elevation difference promotes subsurface drainage.

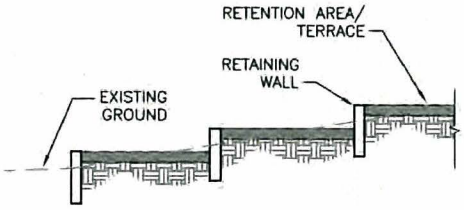

Mild slopes can be terraced to create self-retaining areas.

► DESIGN CHECKLIST FOR SELF-TREATING AREAS

- ❒ The self-treating area is at least 95% lawn or landscaping (not more than 5% impervious).
- ❒ Re-graded or re-landscaped areas have amended soils, vegetation, and irrigation as may be required to maintain soil stability and permeability.
- ❒ Runoff from the self-treating area does not enter an IMP or another drainage management area, but goes directly to the storm drain system.

► DESIGN CHECKLIST FOR SELF-RETAINING AREAS

- ❒ Area is bermed all the way around or graded concave.
- ❒ Slopes do not exceed 4%.
- ❒ Entire area is lawn, landscaping, or pervious pavement (see criteria in Chapter 4).
- ❒ Area has amended soils, vegetation, and irrigation as may be required to maintain soil stability and permeability.
- ❒ Any area drain inlets are at least 3 inches above surrounding grade.

► DESIGN CHECKLIST FOR AREAS DRAINING TO SELF-RETAINING AREAS

- ❒ Ratio of tributary impervious area to self-retaining area is not greater than 2:1.
- ❒ Roof leaders collect runoff and route it to the self-retaining area.
- ❒ Paved areas are sloped so drainage is routed to the self-retaining area.
- ❒ Inlets are designed to protect against erosion and distribute runoff across the area.

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Pervious Pavements

▶ CRITERIA

Impervious roadways, driveways, and parking lots account for much of the hydrologic impact of land development. In contrast, pervious pavements allow rainfall to collect in a gravel or sand base course and infiltrate into native soil.

Pervious pavements are designed to transmit rainfall through the surface to storage in a base course. For example, a 4-inch-deep base course provides approximately 1.6 inches of storage. Runoff stored in the base course infiltrates to native soils over time. Except in the case of solid pavers, the surface course provides additional storage.

Areas with the following pervious pavements may be regarded as "self-treating" and require no additional treatment or flow control if they drain off-site (not to an IMP).

- Pervious concrete
- Porous asphalt
- Crushed aggregate (gravel)
- Open pavers with grass or plantings
- Open pavers with gravel
- Artificial turf

Areas with these pervious pavements can also be **self-retaining areas** and may receive runoff from impervious areas if they are bermed or depressed to retain the first one inch of rainfall, including runoff from the tributary impervious area.

Solid unit pavers—such as bricks, stone blocks, or precast concrete shapes—are considered to reduce runoff compared to impervious pavement, when the unit pavers are set in sand or gravel with d" gaps between the pavers. Joints must be filled with an open-graded aggregate free of fines.

Best Uses

- Areas with permeable native soils
- Low-traffic areas
- Where aesthetic quality can justify higher cost

Advantages

- No maintenance verification requirement
- Variety of surface treatments can complement landscape design

Limitations

- Initial cost
- Placement requires specially trained crews
- Geotechnical concerns, especially in clay soils
- Concerns about pavement strength and surface integrity
- Some municipalities do not allow in public right of way

When draining pervious pavements to an IMP, use the runoff factors in Table 4-2.

Use the following runoff factors for solid unit pavers:

▶ **DETAILS**

Permeable pavements can be used in clay soils; however, special design considerations, including an increased depth of base course, typically apply and will increase the cost of this option. Geotechnical fabric between the base course and underlying clay soil is recommended.

Pavement strength and durability typically determines the required depth of base course. If underdrains are used, the outlet elevation must be a minimum of 3 inches above the bottom elevation of the base course.

Pervious concrete and porous asphalt must be installed by crews with special training and tools. Industry associations maintain lists of qualified contractors.

Parking lots with crushed aggregate or unit pavers may require signs or bollards to organize parking.

▶ DESIGN CHECKLIST FOR PERVIOUS PAVEMENTS

- ❒ No erodible areas drain on to pavement.
- ❒ Subgrade is uniform. Compaction is minimal.
- ❒ Reservoir base course is of open-graded crushed stone. Base depth is adequate to retain rainfall and support design loads.
- ❒ If a subdrain is provided, outlet elevation is a minimum of 3 inches above bottom of base course.
- ❒ Subgrade is uniform and slopes are not so steep that subgrade is prone to erosion.
- ❒ Rigid edge is provided to retain granular pavements and unit pavers.
- ❒ Solid unit pavers are installed with open gaps filled with open-graded aggregate free of fines.
- ❒ Permeable pavements are installed by industry-certified professionals according to vendor's recommendations.
- ❒ Selection and location of pavements incorporates Americans with Disabilities Act requirements, site aesthetics, and uses.

▶ RESOURCES

Southern California Concrete Producers
www.concreteresources.net.

California Asphalt Pavement Association
http://www.californiapavements.org/stormwater.html

Interlocking Concrete Pavement Institute
http://www.icpi.org/

Start at the Source Design Manual for Water Quality Protection, pp. 47-53. www.basmaa.org

Porous Pavements, by Bruce K. Ferguson. 2005. ISBN 0-8493-2670-2.

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Bioretention Facilities

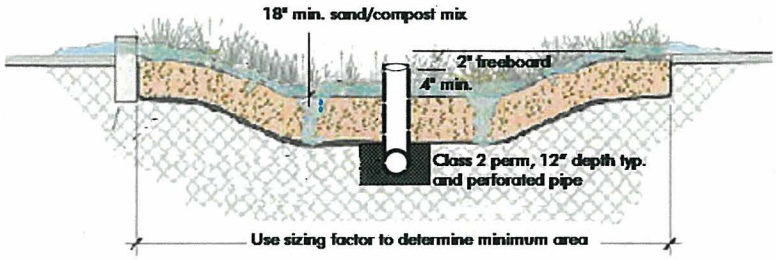

Bioretention facility configured for treatment-only requirements. Bioretention facilities can rectangular, linear, or nearly any shape.

Bioretention detains runoff in a surface reservoir, filters it through plant roots and a biologically active soil mix, and then infiltrates it into the ground. Where native soils are less permeable, an underdrain conveys treated runoff to storm drain or surface drainage.

Bioretention facilities can be configured in nearly any shape. When configured as linear **swales**, they can convey high flows while percolating and treating lower flows.

Bioretention facilities can be configured as in-ground or above-ground planter boxes, with the bottom open to allow infiltration to native soils underneath. If infiltration cannot be allowed, use the sizing factors and criteria for the Flow-Through Planter.

► CRITERIA

For development projects subject only to runoff treatment requirements, the following criteria apply:

Parameter	Criterion
Soil mix depth	18 inches minimum
Soil mix minimum percolation rate	5 inches per hour minimum sustained (10 inches per hour initial rate recommended)
Soil mix surface area	0.04 times tributary impervious area (or equivalent)

Best Uses

- Commercial areas
- Residential subdivisions
- Industrial developments
- Roadways
- Parking lots
- Fit in setbacks, medians, and other landscaped areas

Advantages

- Can be any shape
- Low maintenance
- Can be landscaped

Limitations

- Require 4% of tributary impervious square footage
- Typically requires 3-4 feet of head
- Irrigation typically required

Parameter	Criterion
Surface reservoir depth	6 inches minimum; may be sloped to 4 inches where adjoining walkways.
Underdrain	Required in Group "C" and "D" soils. Perforated pipe embedded in gravel ("Class 2 permeable" recommended), connected to storm drain or other accepted discharge point.

▶ DETAILS

Plan. On the surface, a bioretention facility should be one level, shallow basin—or a series of basins. As runoff enters each basin, it should flood and fill throughout before runoff overflows to the outlet or to the next downstream basin. This will help prevent movement of surface mulch and soil mix.

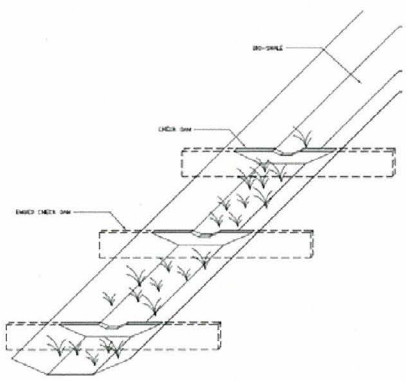

Use check dams for linear bioretention facilities (swales) on a slope.

In a linear swale, check dams should be placed so that the lip of each dam is at least as high as the toe of the next upstream dam. A similar principle applies to bioretention facilities built as terraced roadway shoulders.

Inlets. Paved areas draining to the facility should be graded, and inlets should be placed, so that runoff remains as sheet flow or as dispersed as possible. Curb cuts should be wide (12" is recommended) to avoid clogging with leaves or debris. Allow for a minimum reveal of 4"-6"

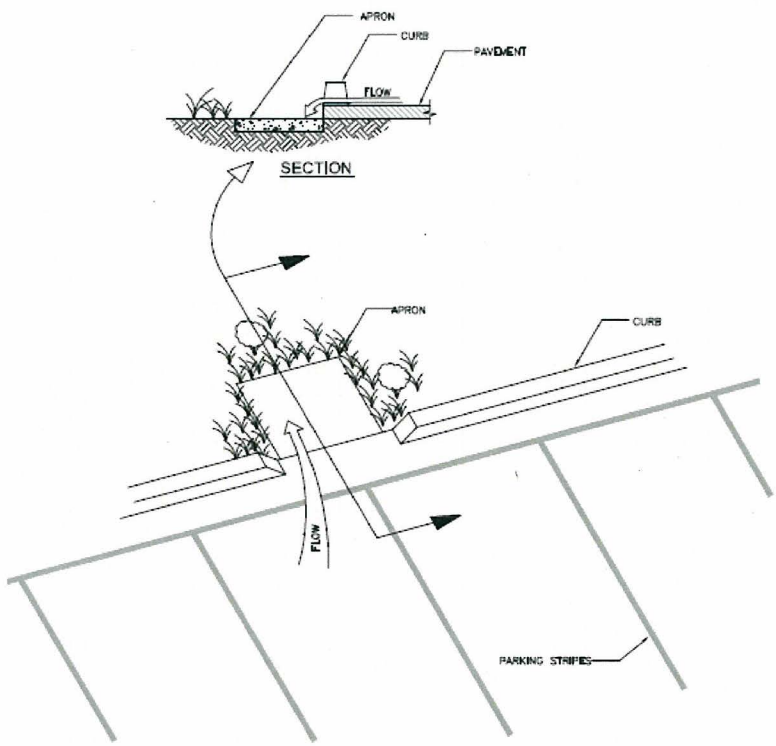

Recommended design details for bioretention facility inlets (see text).

between the inlet and soil mix elevations to ensure turf or mulch buildup does not block the inlet. In addition, place an apron of stone or concrete, a foot square or larger, inside each inlet to prevent vegetation from growing up and blocking the inlet.

Where runoff is collected in pipes or gutters and conveyed to the facility, protect the landscaping from high-velocity flows with energy-dissipating rocks. In larger installations, provide cobble-lined channels to better distribute flows throughout the facility.

Upturned pipe outlets can be used to dissipate energy when runoff is piped from roofs and upgradient paved areas.

Soil mix. The required soil mix is similar to a loamy sand. It must maintain a minimum percolation rate of 5" per hour throughout the life of the facility, and it must be suitable for maintaining plant life. Typically, on-site soils will not be suitable due to clay content.

Storage and drainage layer. "Class 2 permeable," Caltrans specification 68-1.025, is recommended. Open-graded crushed rock, washed, may be used, but requires 4"-6" washed pea gravel be substituted at the top of the crushed rock gravel layers. **Do not use filter fabric** to separate the soil mix from the gravel drainage layer or the gravel drainage layer from the native soil.

Underdrains. No underdrain is required where native soils beneath the facility are Hydrologic Soil Group A or B. For treatment-only facilities where native soils are Group C or D, a perforated pipe must be bedded in the gravel layer and must terminate at a storm drain or other approved discharge point.

Outlets. In treatment-only facilities, outlets must be set high enough to ensure the surface reservoir fills and the entire surface area of soil mix is flooded before the outlet elevation is reached. In swales, this can be achieved with appropriately placed check dams.

The outlet should be designed to exclude floating mulch and debris.

Vaults, utility boxes and light standards. It is best to locate utilities outside the bioretention facility—in adjacent walkways or in a separate area set aside for this purpose. If utility structures are to be placed within the facility, the locations should be anticipated and adjustments made to ensure the minimum bioretention surface area and volumes are achieved. Leaving the final locations to each individual

utility can produce a haphazard, unaesthetic appearance and make the bioretention facility more difficult to maintain.

Emergency overflow. The site grading plan should anticipate extreme events and potential clogging of the overflow and route emergency overflows safely.

Trees. Bioretention areas can accommodate small or large trees. There is no need to subtract the area taken up by roots from the effective area of the facility. Extensive tree roots maintain soil permeability and help retain runoff. Normal maintenance of a bioretention facility should not affect tree lifespan.

The bioretention facility can be integrated with a tree pit of the required depth and filled with structural soil. If a root barrier is used, it can be located to allow tree roots to spread throughout the bioretention facility while protecting adjacent pavement. Locations and planting elevations should be selected to avoid blocking the facility's inlets and outlets.

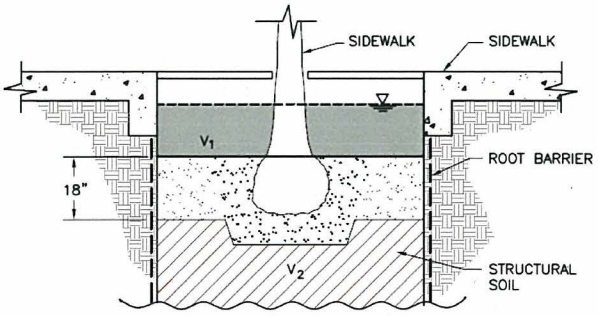

Bioretention facility configured as a tree well. The root barrier is optional.

► APPLICATIONS

Multi-purpose l andscaped ar eas. Biore–tention facilities are easily adapted to serve multiple purposes. The loamy sand soil mix will support turf or a plant palette suitable to the location and a well-drained soil.

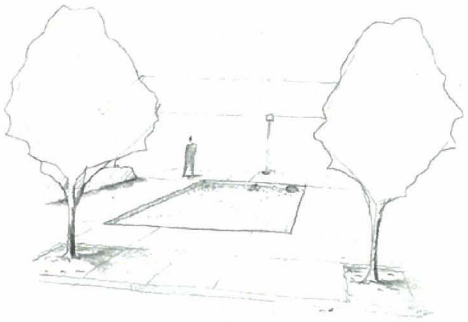

Bioretention facility configured as a recessed decorative lawn with hardscaped edge.

Example landscape treatments:

- Lawn with sloped transition to adjacent landscaping.
- Swale in setback area
- Swale in parking median
- Lawn with hardscaped edge treatment
- Decorative garden with formal or informal plantings
- Traffic island with low-maintenance landscaping

Bioretention facility configured and planted as a lawn/ play area.

- Raised planter with seating
- Bioretention on a terraced slope

Residential subdivisions. Some subdivisions are designed to drain roofs and driveways to the streets (in the conventional manner) and then drain the streets to bioretention areas, with one bioretention area for each 1 to 6 lots, depending on subdivision layout and topography.

If allowed by the local jurisdiction, bioretention areas can be placed on a separate, dedicated parcel with joint ownership.

Sloped sites. Bioretention facilities must be constructed as a basin, or series of basins, with the circumference of each basin set level. It may be necessary to add curbs or low retaining walls.

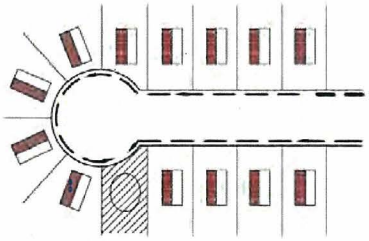

Bioretention facility receiving drainage from individual lots and the street in a residential subdivision.

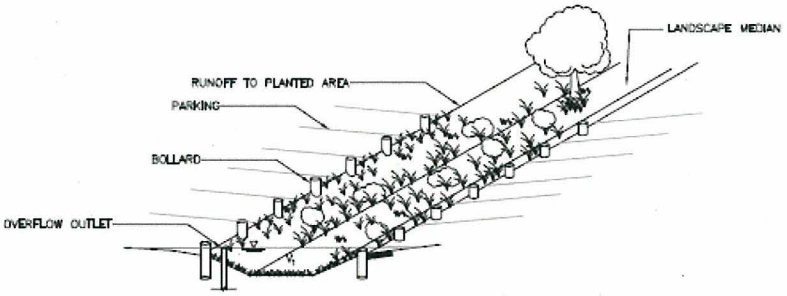

Bioretention facility configured as a parking median.
Note use of bollards in place of curbs, eliminating the need for curb cuts.

Design Checklist for Bioretention

- ❒ Volume or depth of surface reservoir meets or exceeds minimum.
- ❒ 18" depth "loamy sand" soil mix with minimum long-term percolation rate of 5"/hour.
- ❒ Area of soil mix meets or exceeds minimum.
- ❒ Perforated pipe underdrain bedded in "Class 2 perm" with connection and sufficient head to storm drain or discharge point (except in "A" or "B" soils).
- ❒ No filter fabric.
- ❒ Underdrain has a clean-out port consisting of a vertical, rigid, non-perforated PVC pipe, with a minimum diameter of 6 inches and a watertight cap.
- ❒ Location and footprint of facility are shown on site plan and landscaping plan.
- ❒ Bioretention area is designed as a basin (level edges) or a series of basins, and grading plan is consistent with these elevations. If facility is designed as a swale, check dams are set so the lip of each dam is at least as high as the toe of the next upstream dam.
- ❒ Inlets are 12" wide, have 4"-6" reveal and an apron or other provision to prevent blockage when vegetation grows in, and energy dissipation as needed.
- ❒ Overflow connected to a downstream storm drain or approved discharge point.
- ❒ Emergency spillage will be safely conveyed overland.
- ❒ Plantings are suitable to the climate and a well-drained soil.
- ❒ Irrigation system with connection to water supply.
- ❒ Vaults, utility boxes, and light standards are located outside the minimum soil mix surface area.
- ❒ When excavating, avoid smearing of the soils on bottom and side slopes. Minimize compaction of native soils and "rip" soils if clayey and/or compacted. Protect the area from construction site runoff.

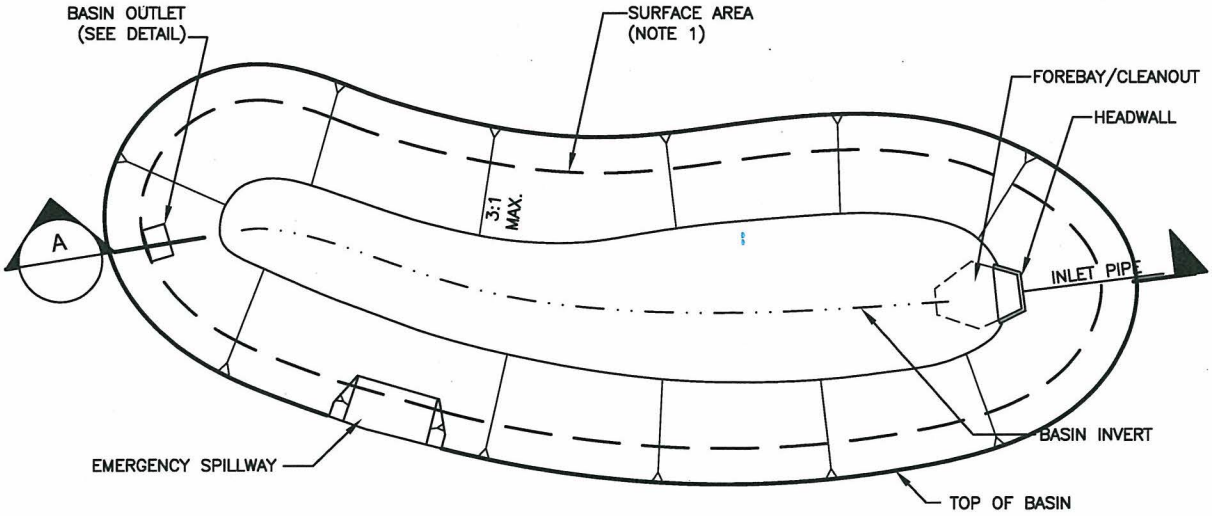

PLAN VIEW
NOT TO SCALE

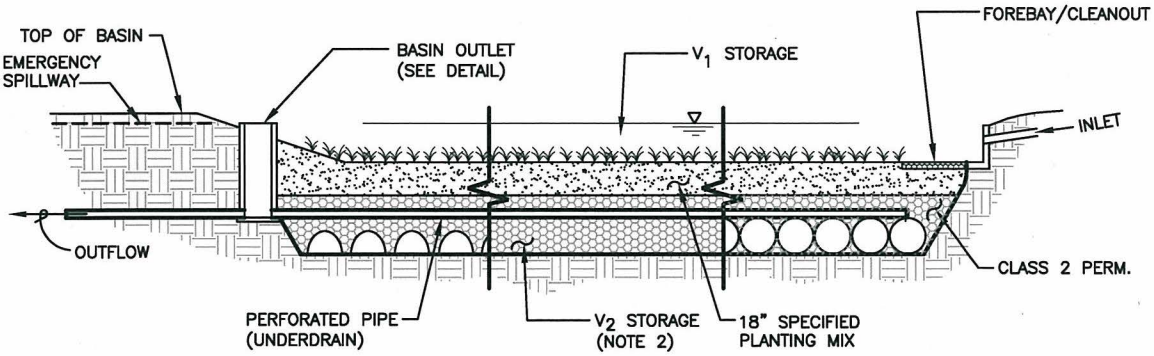

A SECTION
NOT TO SCALE

NOTE

1. SURFACE AREA LIMIT DETERMINED BY EXTENT OF SPECIFIED PLANTING MIX, WHICH IS GOVERNED BY THE OUTLET SPILL ELEVATION. FOR REQUIRED SURFACE AREA REFER TO THE FACTORS AND EQUATIONS IN THE STORMWATER C.3 GUIDEBOOK.
2. V_2 STORAGE ACCOMPLISHED WITH INFILTRATION ARCHES, PERFORATED PIPES, CLASS 2 PERM OR OTHER AT THE DESIGNERS DISCRETION.

Bioretention Facility

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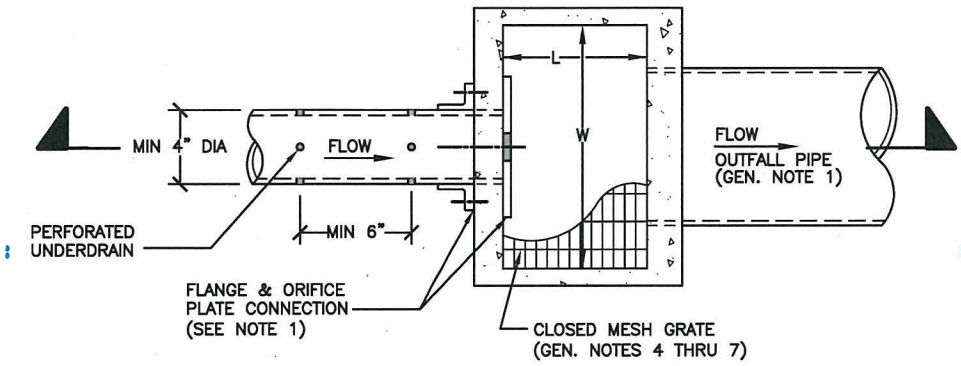

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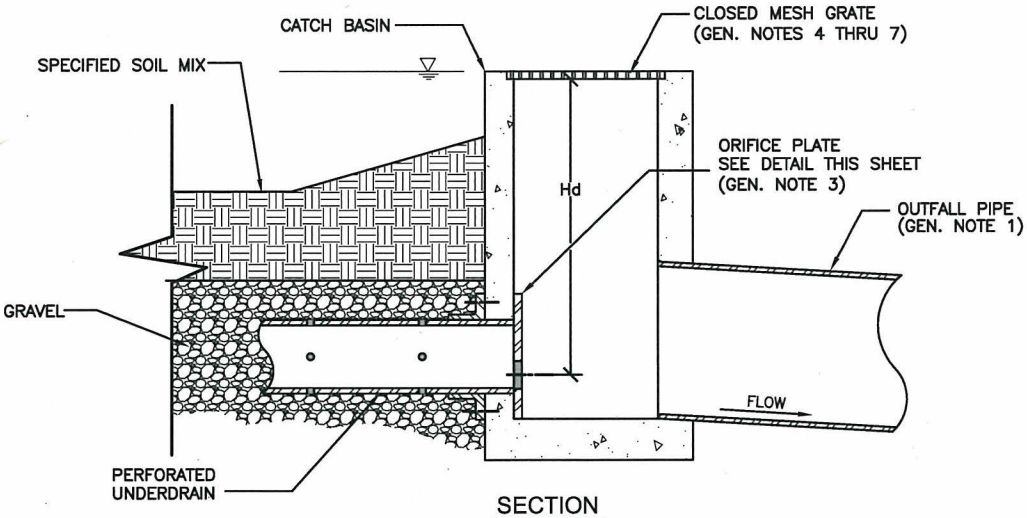

SECTION
N.T.S.

ORIFICE PLATE: MIN SQUARE DIMENSIONS 1.0 FT GREATER THAN PIPE DIA. HOT-DIP GALVANIZED PLATE AFTER HOLES HAVE BEEN DRILLED

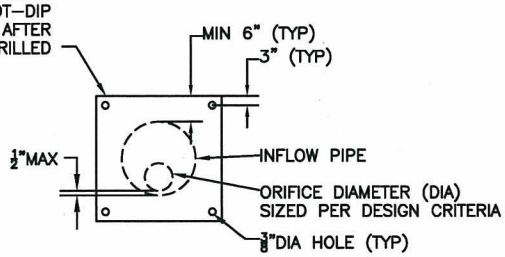

FLOW CONTROL ORIFICE PLATE

NOTE

1. ORIFICE PLATE & FLANGE CONNECTION TO CONCRETE SHALL BE FITTED WITH 30 DUROMETER NEOPRENE RING.

Bioretention Facility Outlet Detail - A

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Flow-through Planter

Portland 2004 Stormwater Manual

Flow-through planters treat and detain runoff without allowing seepage into the underlying soil. They can be used next to buildings and on slopes where stability might be affected by adding soil moisture.

Flow-through planters typically receive runoff via downspouts leading from the roofs of adjacent buildings. However, they can also be set in-ground and receive sheet flow from adjacent paved areas.

Pollutants are removed as runoff passes through the soil layer and is collected in an underlying layer of gravel or drain rock. A perforated-pipe underdrain is typically connected to a storm drain or other discharge point. An overflow inlet conveys flows which exceed the capacity of the planter.

► CRITERIA

Treatment only. For development projects subject only to runoff treatment requirements, the following criteria apply:

Best Uses

- Management of roof runoff
- Next to buildings
- Dense urban areas
- Where infiltration is not desired

Advantages

- Can be used next to structures
- Versatile
- Can be any shape
- Low maintenance

Limitations

- Can be used for flow-control only on sites with "C" and "D" soils
- Requires underdrain
- Requires 3-4 feet of head

Parameter	Criterion
Soil mix depth	18 inches minimum
Soil mix minimum percolation rate	5 inches per hour minimum sustained (10 inches per hour initial rate recommended)
Soil mix surface area	0.04 times tributary impervious area (or equivalent)
Surface reservoir depth	6" minimum; may be sloped to 4" where adjoining walkways.
Underdrain	Typically used. Perforated pipe embedded in gravel ("Class 2 permeable" recommended), connected to storm drain or other accepted discharge point.

► DETAILS

Configuration. The planter must be level. To avoid standing water in the subsurface layer, set the perforated pipe underdrain and orifice as nearly flush with the planter bottom as possible.

Inlets. Protect plantings from high-velocity flows by adding rocks or other energy-dissipating structures at downspouts and other inlets.

Soil mix. The required soil mix is similar to a loamy sand. It must maintain a minimum percolation rate of 5" per hour throughout the life of the facility, and it must be suitable for maintaining plant life. Typically, on-site soils will not be suitable due to clay content.

Gravel storage and drainage lay er. "Class 2 permeable," Caltrans specification 68-1.025, is recommended. Open-graded crushed rock, washed, may be used, but requires 4"-6" of washed pea gravel be substituted at the top of the crushed rock layer. **Do not use filter fabric** to separate the soil mix from the gravel drainage layer.

Emergency ov erflow. The planter design and installation should anticipate extreme events and potential clogging of the overflow and route emergency overflows safely.

► APPLICATIONS

Adjacent to buildings. Flow-through planters may be located adjacent to buildings, where the planter vegetation can soften the visual effect of the building wall. A setback with a raised planter box may be appropriate even in some neo-traditional pedestrian-oriented urban streetscapes.

At plaza level. Flow-through planters have been successfully incorporated into podium-style developments, with the planters placed on the plaza level and receiving runoff from the tower roofs above. Runoff from the plaza level is typically managed separately by additional flow-through planters or bioretention facilities located at street level.

Steep s lopes. Flow-through planters provide a means to detain and treat runoff on slopes that cannot accept infiltration from a bioretention facility. The planter can be built into the slope similar to a retaining wall. The design should consider the need to access the planter for periodic maintenance. Flows from the planter underdrain and overflow must be directed in accordance with local requirements. It is sometimes possible to disperse these flows to the downgradient hillside.

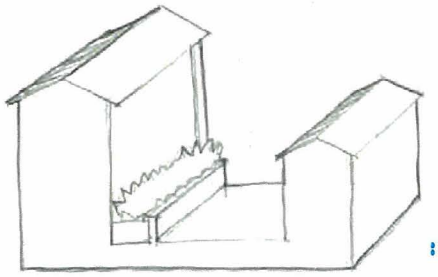

Flow-through planter on the plaza level of a podium-style development.

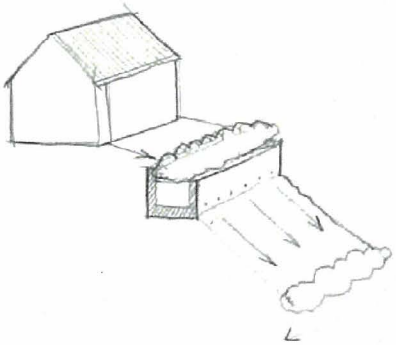

Flow-through planter built into a hillside. Flows from the underdrain and overflow must be directed in accordance with local requirements.

Design Checklist for Flow-through Planter

- ❒ Reservoir depth is 4-6" minimum.
- ❒ 18" depth "loamy sand" soil mix with minimum long-term infiltration rate of 5"/hour.
- ❒ Area of soil mix meets or exceeds minimum.
- ❒ "Class 2 perm" drainage layer.
- ❒ No filter fabric.
- ❒ Perforated pipe underdrain with outlet located flush or nearly flush with planter bottom. Connection with sufficient head to storm drain or discharge point.
- ❒ Underdrain has a clean-out port consisting of a vertical, rigid, non-perforated PVC pipe, with a minimum diameter of 6 inches and a watertight cap.
- ❒ Overflow connected to a downstream storm drain or approved discharge point.
- ❒ Location and footprint of facility are shown on site plan and landscaping plan.
- ❒ Planter is set level.
- ❒ Emergency spillage will be safely conveyed overland.
- ❒ Plantings are suitable to the climate and a well-drained soil.
- ❒ Irrigation system with connection to water supply.

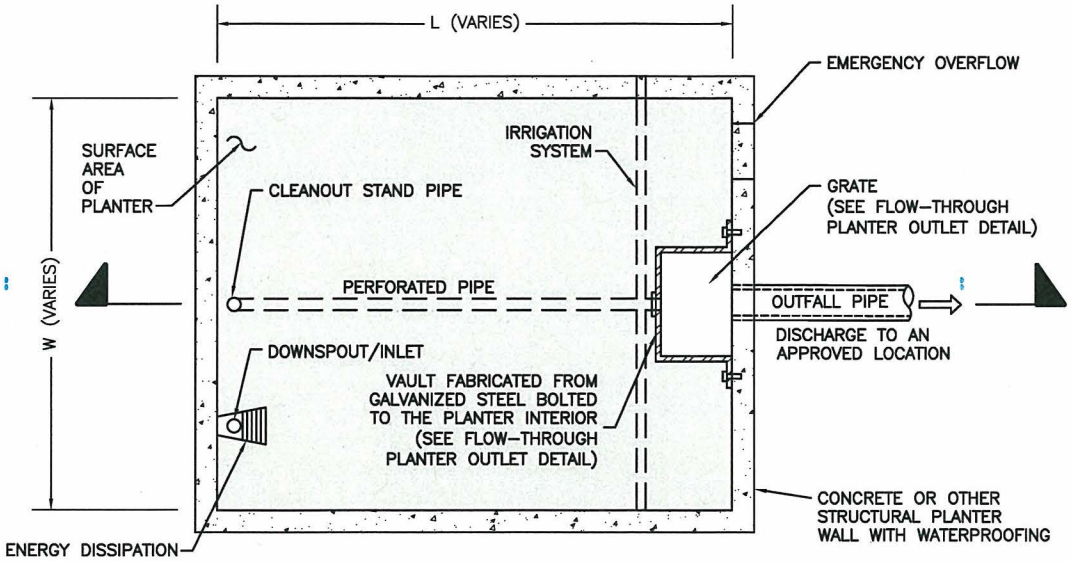

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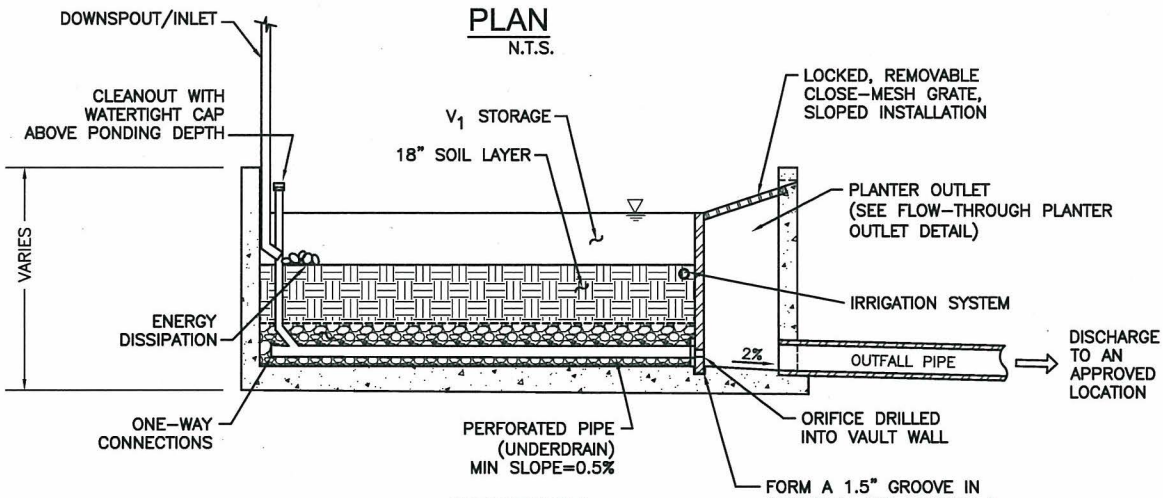

SECTION
N.T.S.

NOTES:

1. FLOW-THROUGH PLANTER SHALL BE SIZED TO MEET CCCWP CRITERIA FOR TREATMENT AND/OR FLOW CONTROL.
2. MINIMUM SURFACE AREA OF PLANTER IS 4% OF TRIBUTARY IMPERVIOUS AREA FOR TREATMENT ONLY DESIGN. FOR FLOW CONTROL AND TREATMENT, REFER TO CCCWP SIZING TOOL CRITERIA.
3. SHAPE OF PLANTER CAN VARY TO MEET PROJECT DESIGN REQUIREMENTS AND LOCATION.
4. CLASS 2 PERMEABLE MATERIAL
5. DOWNSPOUTS/INLET PIPES REQUIRE ENERGY DISSIPATION.
6. USE COUNTY APPROVED ADDITIVE MIXTURE FOR WATERPROOFING CONCRETE.
7. PLANTINGS: SEE CCCWP RECOMMENDED PLANT LIST AND GUIDELINES.
8. PLANTER DESIGN MAY REQUIRE STRUCTURAL ENGINEERING DESIGN.
9. AREA = W x L (ABOVE). EXCLUDES AREA OF VAULT

Flow-Through Planter Detail

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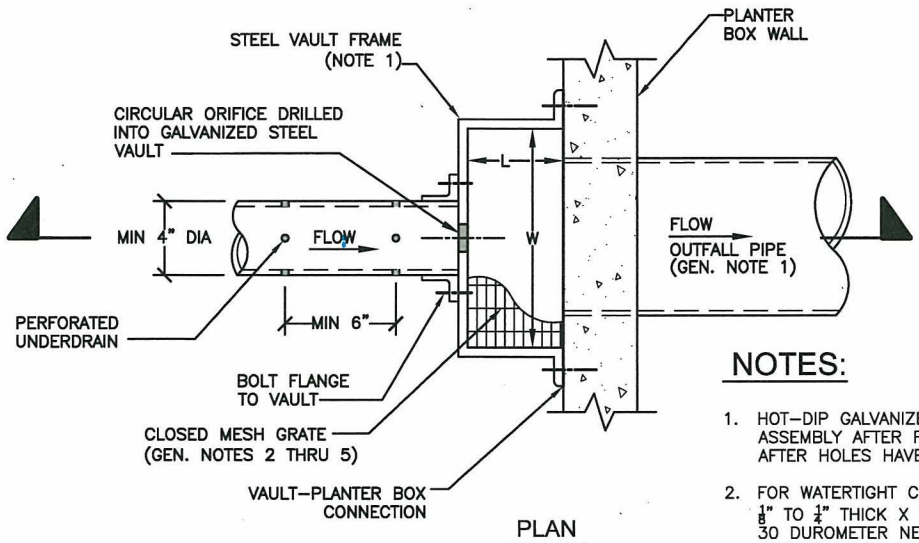

PLAN
N.T.S.

NOTES:

1. HOT–DIP GALVANIZE ENTIRE FRAME ASSEMBLY AFTER FABRICATION AND AFTER HOLES HAVE BEEN DRILLED.
2. FOR WATERTIGHT CONNECTION, INSTALL $\frac{1}{8}$" TO $\frac{1}{4}$" THICK X 2" WIDE CONTINUOUS 30 DUROMETER NEOPRENE GASKET, ALL AROUND VAULT FRAME.

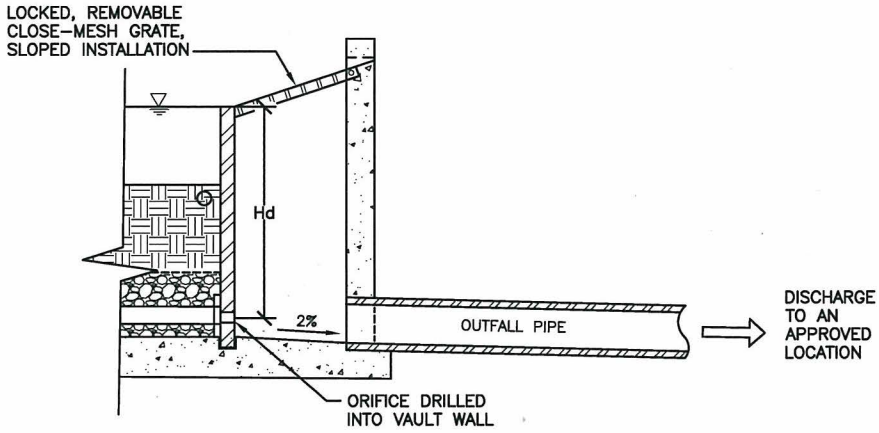

SECTION
N.T.S.

GENERAL OUTLET DETAIL NOTES:

1. OUTFALL PIPE SHALL BE SIZED TO CONVEY DESIGN STORM PER CCCWP DESIGN CRITERIA.
2. GRATE SHALL BE MOUNTED USING STAINLESS STEEL HARDWARE AND PROVIDED WITH HINGED AND LOCKABLE OR BOLTABLE ACCESS PANELS.
3. GRATE SHALL BE STAINLESS STEEL, ALUMINUM OR STEEL. STEEL GRATES SHALL BE HOT DIP GALVANIZED AND MAY BE HOT POWDER PAINTED AFTER GALVANIZING.
4. GRATE SHALL BE DESIGNED SUCH THAT THE DIAGONAL DIMENSION OF EACH OPENING IS SMALLER THAN THE DIAMETER OF THE OUTLET PIPE.
5. STRUCTURAL DESIGN OF GRATE SHALL BE BASED ON FULL HYDROSTATIC HEAD WITH ZERO HEAD DOWNSTREAM OF GRATE.

Flow-Through Planter Outlet Detail

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Dry Wells and Infiltration Basins

The typical dry well is a prefabricated structure, such as an open-bottomed vault or box, placed in an excavation or boring. The vault may be empty, which provides maximum space efficiency, or may be filled in rock.

An infiltration basin has the same functional components—a volume to store runoff and sufficient area to infiltrate that volume into the native soil—but is open rather than covered.

▶ CRITERIA

Dry wells and infiltration basins must be designed with the minimum volume calculated by Equation 4-8 using a unit volume based on the County of San Diego's 85th Percentile Isopluvial Map.

Consult with the local jurisdiction engineer regarding the need to verify soil permeability and other site conditions are suitable for dry wells and infiltration basins. Some proposed criteria are on Page 5-12 of Caltrans' 2004 *BMP Retrofit Pilot Study Final Report* (CTSW-RT-01-050).

The infiltration rate and infiltrative area must be sufficient to drain a full facility within 72 hours.

▶ DETAILS

Dry wells should be sited to allow for the potential future need for removal and replacement.

In locations where native soils are coarser than a medium sand, the area directly beneath the facility should be over-excavated by two feet and backfilled with sand as a groundwater protection measure.

Best Uses

- Alternative to bioretention in areas with permeable soils

Advantages

- Compact footprint
- Can be installed in paved areas

Limitations

- Can be used only on sites with "A" and "B" soils
- Requires minimum of 10' from bottom of facility to seasonal high groundwater
- Not suitable for drainage from some industrial areas or arterial roads
- Must be maintained to prevent clogging.

Design Checklist for Dry Well

- ❒ Volume and infiltrative area meet or exceed minimum.
- ❒ Overflow connected to a downstream storm drain or approved discharge point.
- ❒ Emergency spillage will be safely conveyed overland.
- ❒ Depth from bottom of the facility to seasonally high groundwater elevation is ≥10'.
- ❒ Areas tributary to the facility do not include automotive repair shops; car washes; fleet storage areas (Bus, truck, etc.); nurseries, or other uses that may present an exceptional threat to groundwater quality.
- ❒ Underlying soils are in Hydrologic Soil Group A or B. Infiltration rate is sufficient to ensure a full basin will drain completely within 72 hours. Soil infiltration rate has been confirmed.
- ❒ Set back from structures 10' or as recommended by structural or geotechnical engineer

Cistern with Bioretention Facility

A cistern in series with a bioretention facility can meet treatment requirements where space is limited. In this configuration, the cistern is equipped with a flow-control orifice and the bioretention facility is sized to treat a trickle outflow from the cistern.

► CRITERIA

Cistern. The cistern must detain the volume calculated by Equation 4-8 and must include an orifice or other device designed for a 24-hour drawdown time.

Bioretention facility. See the design sheet for bioretention facilities. The area of the bioretention facility must be sized to treat the maximum discharge flow, assuming a percolation rate of 5" per hour through the engineered soil.

Use with sand filter. A cistern in series with a sand filter can meet treatment requirements. See the discussion of treatment facility selection in Chapter 2 and the design guidance for sand filters in Chapter 4.

► DETAILS

Flow-control orifice. The cistern must be equipped with an orifice plate or other device to limit flow to the bioretention area.

Preventing mosquito harborage. Cisterns should be designed to drain completely, leaving no standing water. Drains should be located flush with the bottom of the cistern. Alternatively—or in addition—all entry and exit points, should be provided with traps or sealed or screened to prevent mosquito entry. Note mosquitoes can enter through openings 1/16" or larger and will fly for many feet through pipes as small as 1/4".

Exclude debris. Provide leaf guards and/or screens to prevent debris from accumulating in the cistern.

Ensure access for maintenance. Design the cistern to allow for cleanout. Avoid creating the need for maintenance workers to enter a confined space. Ensure the outlet orifice can be easily accessed for cleaning and maintenance.

Best Uses

- In series with a bioretention facility to meet treatment requirement in limited space.
- Management of roof runoff
- Dense urban areas

Advantages

- Storage volume can be in any configuration

Limitations

- Somewhat complex to design, build, and operate
- Requires head for both cistern and bioretention facility

► APPLICATIONS

Shallow ponding on a flat roof. The "cistern" storage volume can be designed in any configuration, including simply storing rainfall on the roof where it falls and draining it away slowly. See the County of San Diego's 85th percentile isopluvial diagrams for required average depths.

Cistern attached to a building and draining to a planter. This arrangement allows a planter box to be constructed with a smaller area.

Vault with pumped discharge to bioretention facility. In this arrangement, runoff from a parking lot and/or building roofs can be captured and detained underground and then pumped to a bioretention facility on the surface. Alternatively, treatment can be accomplished with a sand filter. See the discussion of selection of stormwater treatment facilities in Chapter 2.

Water harvesting or graywater reuse. It may be possible to create a site-specific design that uses cisterns to achieve stormwater flow control, stormwater treatment, and rainwater reuse for irrigation or indoor uses (**water harvesting**). Facilities must meet criteria for capturing and treating the volume specified by Equation 4-8. This volume must be allowed to empty within 24 hours so runoff from additional storms, which may follow, is also captured and treated. Additional volume may be required if the system also stores runoff for longer periods for reuse. Indoor uses of non-potable water may be restricted or prohibited. Check with municipal staff.

Design Checklist for Cistern

- ❒ Volume meets or exceeds minimum.
- ❒ Outlet with orifice or other flow-control device restricts flow and is designed to provide a 24-hour drawdown time.
- ❒ Outlet is piped to a bioretention facility designed to treat the maximum discharge from the cistern orifice.
- ❒ Cistern is designed to drain completely and/or sealed to prevent mosquito harborage.
- ❒ Design provides for exclusion of debris and accessibility for maintenance.
- ❒ Overflow connected to a downstream storm drain or approved discharge point.
- ❒ Emergency spillage will be safely conveyed overland.

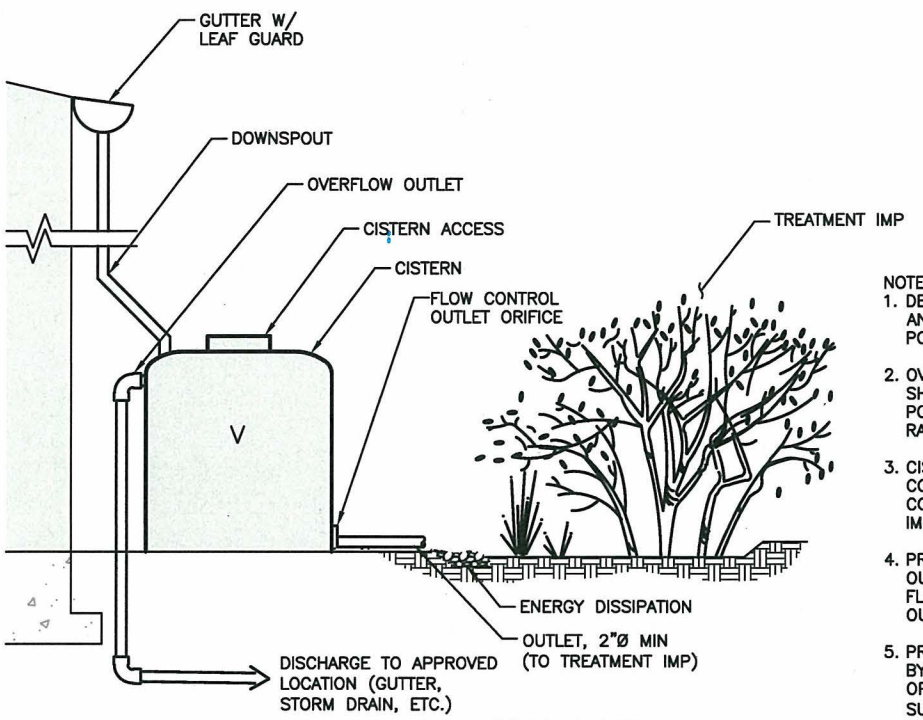

NOTES:
1. DESIGNER SHALL ACCOUNT FOR AND ACCOMODATE FOR POSSIBLE OVERFLOW.
2. OVERFLOW OUTLET CAPACITY SHALL EQUAL OR EXCEED POTENTIAL RUNOFF VOLUME AND RATE.
3. CISTERN PROVIDES FLOW CONTROL ONLY. USE IN COMBINATION WITH TREATMENT IMP.
4. PROVIDE ACCESS FOR CLEAN OUT OF OUTLET ORIFICE. SEE FLOW-THROUGH PLANTER OUTLET DETAIL.
5. PREVENT MOSQUITO BREEDING BY SEALING OR SCREENING ALL OPENINGS TO THE WATER SURFACE AND/OR ENSURE COMPLETE DRAINAGE.

CISTERN

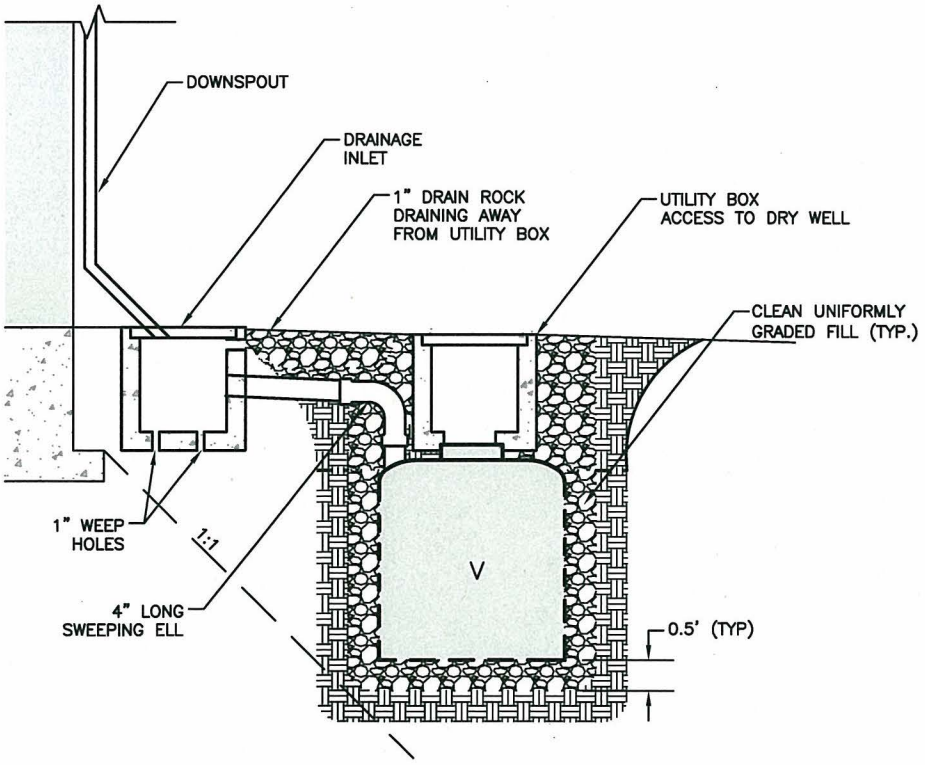

DRY WELL

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Chapter 5

Operation & Maintenance of Stormwater Facilities

How to prepare a customized Stormwater Maintenance Plan for the treatment BMPs on your site.

The stormwater NPDES Permit requires each Copermittee to verify all treatment and flow-control facilities are adequately maintained. Facilities you install as part of your project will be verified for effectiveness and proper performance. Some municipalities also verify the ongoing function of stormwater management features that are not treatment or flow control facilities, such as permeable pavements and limitations on impervious area.

Operation and maintenance of stormwater facilities is a six-stage process:

1. Determine **who will own** the facility and be responsible for the maintenance of treatment facilities. Identify the means by which ongoing maintenance will be assured (for example, a maintenance agreement that runs with the land).

2. Identify typical maintenance requirements, and allow for these requirements in your project planning and preliminary design.

3. Prepare a **maintenance plan** for the site incorporating detailed requirements for **each treatment and flow-control facility**.

4. **Maintain** the facilities from the time they are constructed until ownership and maintenance responsibility is formally transferred.

5. **Formally transfer** operation and maintenance **responsibility** to the site owner or occupant. A warranty, secured by a bond, or other financial instrument, may be required to secure against lack of performance due to flaws in design or construction.

6. Maintain the facilities in perpetuity and comply with your municipality's self-inspection, reporting, and verification requirements.

See the schedule for these stages in Table 5-1.

Stage 1: Ownership and Responsibility

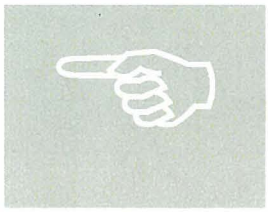

You must specify a means to **ensure maintenance** of treatment and flow-control facilities **in perpetuity.**

Depending on the intended use of your site and the policies of your municipality, this may require one or more of the following:

- Execution of a maintenance agreement that "runs with the land."
- Creation of a homeowners association (HOA) and execution of an agreement by the HOA to maintain the facilities as well as an annual inspection fee.
- Formation of a new community facilities district or other special district, or addition of the properties to an existing special district.
- Dedication of fee title or easement transferring ownership of the facility (and the land under it) to the municipality.

Ownership and maintenance responsibility for treatment and flow-control facilities should be discussed at the **beginning of project planning**, typically at the pre-application meeting for planning and zoning review. Experience has shown provisions to finance and implement maintenance of treatment and flow-control facilities can be a major stumbling block to project approval, particularly for **small residential subdivisions**. (See "New Subdivisions" in Chapter 1.)

► PRIVATE OWNERSHIP AND MAINTENANCE

The municipality may require—as a condition of project approval—that a maintenance agreement be executed.

TABLE 5-1. SCHEDULE for planning operation and maintenance of stormwater treatment BMPs

Stage	*Description*	*Schedule*
1	Determine facility ownership and maintenance responsibility	Discuss with planning staff at pre-application meeting
2	Identify typical maintenance requirements	In initial submittal, coordinate with planning & zoning application
3	Develop detailed operation and maintenance plan	As required by municipality
4	Interim operation and maintenance of facilities	During and following construction including warranty period
5	Formal transfer of operation & maintenance responsibility	On sale and transfer of property or permanent occupancy
6	Ongoing maintenance and compliance with inspection & reporting requirements	In perpetuity

Typically, these agreements provide that your municipality may collect a management and/or inspection fee established by a standard fee schedule. In addition, the agreement may provide that, if the property owner fails to maintain the stormwater facility, the municipality may enter the property, restore the stormwater facility to good working order and obtain reimbursement, including administrative costs, from the property owner. To augment and enforce these requirements, some municipalities have established Community Facilities Districts (Mello-Roos) to cover the costs of inspections and, if necessary, maintenance and repair of individual facilities.

Local Requirements

Cities or the County may have requirements that differ from, or are in addition to, this countywide model SUSMP. Check with local planning and community development staff.

ICON KEY

- Helpful Tip
- Submittal Requirement
- Terms to Look Up
- References & Resources

► TRANSFER TO PUBLIC OWNERSHIP

Municipalities may sometimes choose to have a treatment and flow-control facility deeded to the public in fee or as an easement and maintain the facility as part of the municipal storm drain system. The municipality may recoup the costs of maintenance through a special tax, assessment district, or similar mechanism.

Locating an IMP in a public right-of-way or easement creates an additional design constraint—along with hydraulic grade, aesthetics, landscaping, and circulation.

However, because sites typically drain to the street, it may be possible to locate a bioretention swale parallel with the edge of the parcel. The facility may complement, or substitute for, an underground storm drain system.

Even if the facility is to be conveyed to the municipality after construction is complete, it is still the responsibility of the builder to identify general operation and maintenance requirements, prepare a detailed operation and maintenance plan, and to maintain the facility until that responsibility is formally transferred.

Local Requirements

Cities or the County may have requirements that differ from, or are in addition to, this countywide model SUSMP. Check with local planning and community development staff.

Stage 2: General Maintenance Requirements

Include in your Project Submittal a general description of anticipated facility maintenance requirements. This will help ensure that:

- Ongoing costs of maintenance have been considered in your facility selection and design.
- Site and landscaping plans provide for access for inspections and by maintenance equipment.
- Landscaping plans incorporate irrigation requirements for facility plantings.
- Initial maintenance and replacement of facility plantings is incorporated into landscaping contracts and guarantees.

Fact sheets available on the Project Clean Water web page describe general maintenance requirements for the types of stormwater facilities featured in the LID Design Guide (Chapter 4). You can use this information to specify general maintenance requirements in your Project Submittal.

Maintenance fact sheets for conventional stormwater facilities are available in the California Stormwater BMP Handbooks.

Stage 3: Detailed Maintenance Plan

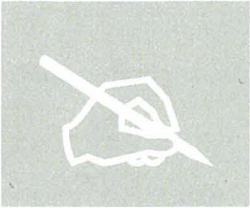

Prepare a detailed maintenance plan and submit it as required by your municipality. Some municipalities may require a detailed maintenance plan be included with the initial Project Submittal; others may wish that the detailed maintenance plan incorporate solutions to any problems or changes that occurred during project construction.

Your detailed maintenance plan should be kept on-site for use by maintenance personnel and during site inspections. It is also recommended that a copy of your initial Project Submittal be kept onsite as a reference.

► YOUR DETAILED MAINTENANCE PLAN: STEP BY STEP

The following step-by-step guidance will help you prepare your detailed maintenance plan.

Preparation of the plan will require familiarity with your stormwater facilities as they have been or will be constructed and a fair amount of "thinking through" plans for their operation and maintenance.

► STEP 1: DESIGNATE RESPONSIBLE INDIVIDUALS

To begin creating your detailed maintenance plan, designate and identify:

- The individual who will have direct responsibility for the maintenance of stormwater controls. This individual should be the designated contact with municipal inspectors and should sign self-inspection reports and any correspondence with the municipality regarding verification inspections.

- Employees or contractors who will report to the designated contact and are responsible for carrying out BMP operation and maintenance.

- The corporate officer authorized to negotiate and execute any contracts that might be necessary for future changes to operation and maintenance or to implement remedial measures if problems occur.

- Your designated respondent to problems, such as clogged drains or broken irrigation mains, that would require immediate response should they occur during off-hours.

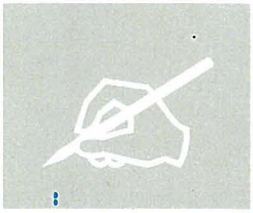

Updated contact information must be provided to the municipality immediately w henever a pr operty is s old and w henever designated individuals or contractors change.

Draw or sketch an **organization chart** to show the relationships of authority and responsibility between the individuals responsible for maintenance. This need not be elaborate, particularly for smaller organizations.

Describe how **funding for BMP operation and maintenance** will be assured, including sources of funds, budget category for expenditures, process for establishing the annual maintenance budget, and process for obtaining authority should unexpected expenditures for major corrective maintenance be required.

Describe how your organization will accommodate initial **training** of staff or contractors regarding the purpose, mode of operation, and maintenance requirements for the stormwater facilities on your site. Also, describe how your organization will ensure ongoing training as needed and in response to staff changes.

► STEP 2: SUMMARIZE DRAINAGE AND BMPS

Incorporate the following information from your Project Submittal into your maintenance plan:

- Figures delineating and designating pervious and impervious areas.
- Figures showing locations of stormwater facilities on the site.
- Tables of pervious and impervious areas served by each facility.

Review the Project Submittal narrative, if any, that describes each facility and its tributary drainage area and update the text to incorporate any changes that may have occurred during planning and zoning review, building permit review, or construction. Incorporate the updated text into your maintenance plan.

► STEP 3: DOCUMENT FACILITIES "AS BUILT"

Include the following information from final construction drawings:

- Plans, elevations, and details of all facilities. Annotate if necessary with designations used in the initial Project Submittal.
- Design information or calculations submitted in the detailed design phase (i.e., not included in the initial Project Submittal.)
- Specifications of construction for facilities, including sand or soil, compaction, pipe materials and bedding.

In the maintenance plan, note field changes to design drawings, including changes to any of the following:

- Location and layouts of inflow piping, flow splitter boxes, and piping to off-site discharge
- Depths and layering of soil, sand, or gravel
- Placement of filter fabric or geotextiles
- Changes or substitutions in soil or other materials.
- Natural soils encountered (e.g. sand or clay lenses)

► STEP 4: PREPARE MAINTENANCE PLANS FOR EACH FACILITY

Prepare a maintenance plan, schedule, and inspection checklists (routine, annual, and after major storms) for each facility. Plans and schedules for two or more similar facilities on the same site may be combined.

Use the following resources to prepare your customized maintenance plan, schedule, and checklists.

- Specific information noted in Steps 2 and 3, above.
- Other input from the facility designer, municipal staff, or other sources.
- Operation and Maintenance Fact Sheets (available on the Project Clean Water website).

Note any particular characteristics or circumstances that could require attention in the future, and include any troubleshooting advice.

Also include manufacturer's data, operating manuals, and maintenance requirements for any:

- Pumps or other mechanical equipment.
- Proprietary devices used as BMPs.

Manufacturers' publications should be referenced in the text (including models and serial numbers where available). Copies of the manufacturers' publications should be included as an attachment in the back of your maintenance plan or as a separate document.

► STEP 5: COMPILE MAINTENANCE PLAN

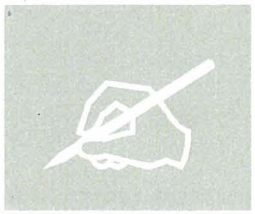

The following general outline is provided as an example. Check with your municipality for specific requirements.

I. Inspection and Maintenance Log

II. Updates, Revisions and Errata

III. Introduction

A. Narrative overview describing the site; drainage areas, routing, and discharge points; and treatment facilities.

IV. Responsibility for Maintenance

A. General

(1) Name and contact information for responsible individual(s).

(2) Organization chart or charts showing organization of the maintenance function and location within the overall organization.

(3) Reference to Operation and Maintenance Agreement (if any). A copy of the agreement should be attached.

(4) Maintenance Funding

(1) Sources of funds for maintenance

(2) Budget category or line item

(3) Description of procedure and process for ensuring adequate funding for maintenance

B. Staff Training Program

C. Records

D. Safety

V. Summary of Drainage Areas and Stormwater Facilities

A. Drainage Areas

(1) Drawings showing pervious and impervious areas (copied or adapted from initial Project Submittal).

(2) Designation and description of each drainage area and how flow is routed to the corresponding facility.

B. Treatment and Flow-Control Facilities

(1) Drawings showing location and type of each facility

(2) General description of each facility (Consider a table if more than two facilities)

(1) Area drained and routing of discharge.

(2) Facility type and size

VI. Facility Documentation

A. "As-built" drawings of each facility (design drawings in the draft Plan)

B. Manufacturer's data, manuals, and maintenance requirements for pumps, mechanical or electrical equipment, and proprietary facilities (include a "placeholder" in the draft plan for information not yet available).

C. Specific operation and maintenance concerns and troubleshooting

VII. Maintenance Schedule or Matrix

A. Maintenance Schedule for each facility with specific requirements for:

(1) Routine inspection and maintenance

(2) Annual inspection and maintenance

(3) Inspection and maintenance after major storms

B. Service Agreement Information

Assemble and make copies of your maintenance plan. One copy must be submitted to the municipality, and at least one copy kept on-site. Here are some suggestions for formatting the maintenance plan:

- Format plans to 8½" x 11" to facilitate duplication, filing, and handling.
- Include the revision date in the footer on each page.

- Scan graphics and incorporate with text into a single electronic file. Keep the electronic file backed-up so that copies of the maintenance plan can be made if the hard copy is lost or damaged.

► STEP 6: UPDATES

Your maintenance plan will be **a living document**.

Operation and maintenance personnel may change; mechanical equipment may be replaced, and additional maintenance procedures may be needed. Throughout these changes, the maintenance plan must be kept up-to-date.

Updates may be transmitted to the local municipality at any time. However, at a minimum, updates to the maintenance plan must accompany the annual inspection report.

Stage 4: Interim Maintenance

Applicants will typically be required to warranty stormwater facilities against lack of performance due to flaws in design or construction. The warranty may need to be secured by a bond or other financial instrument.

Stage 5: Transfer Responsibility

As part of the detailed maintenance plan, note the expected date when responsibility for operation and maintenance will be transferred. Notify the municipality when this transfer of responsibility takes place.

Stage 6: Operation & Maintenance Verification

Each municipality implements an operation and maintenance verification program, including periodic site inspections.

Contact municipal staff to determine the frequency of inspections, whether self-inspections are allowed, and applicable fees, if any.

References and Resources

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- *Stormwater Management Manual* (Portland, 2004). Chapter 3.
- *California Storm Water Best Management Practice Handbooks* (CASQA, 2003).
- *Best Management Practices Guide* (Public Telecommunications Center for Hampton Roads, 2002).
- Operation, Maintenance, and Management of Stormwater Management Systems (Watershed Management Institute, 1997)

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APPENDIX—STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

How to use this worksheet (also see instructions on pages ____ of the *Countywide Model SUSMP*):

1. Review Column 1 and identify which of these potential sources of stormwater pollutants apply to your site. Check each box that applies.
2. Review Column 2 and incorporate all of the corresponding applicable BMPs in your Project-Specific SUSMP drawings.
3. Review Columns 3 and 4 and incorporate all of the corresponding applicable permanent controls and operational BMPs in a table in your Project-Specific SUSMP. Use the format shown in Table 3-1 on page __ of the *Countywide Model SUSMP*. Describe your specific BMPs in an accompanying narrative, and explain any special conditions or situations that required omitting BMPs or substituting alternatives.

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	**... THEN YOUR STORMWATER CONTROL PLAN SHOULD INCLUDE THESE SOURCE CONTROL BMPs**		
1 **Potential Sources of Runoff Pollutants**	**2** **Permanent Controls—Show on SUSMP Drawings**	**3** **Permanent Controls—List in SUSMP Table and Narrative**	**4** **Operational BMPs—Include in SUSMP Table and Narrative**
❑ **A.** On-site storm drain inlets	❑ Locations of inlets.	❑ Mark all inlets with the words "No Dumping! Flows to Bay" or similar.	❑ Maintain and periodically repaint or replace inlet markings. ❑ Provide stormwater pollution prevention information to new site owners, lessees, or operators. ❑ See applicable operational BMPs in Fact Sheet SC-44, "Drainage System Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com ❑ Include the following in lease agreements: "Tenant shall not allow anyone to discharge anything to storm drains or to store or deposit materials so as to create a potential discharge to storm drains."
❑ **B.** Interior floor drains and elevator shaft sump pumps		❑ State that interior floor drains and elevator shaft sump pumps will be plumbed to sanitary sewer.	❑ Inspect and maintain drains to prevent blockages and overflow.

APPENDIX—STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR STORMWATER CONTROL PLAN SHOULD INCLUDE THESE SOURCE CONTROL BMPs		
1 **Potential Sources of Runoff Pollutants**	**2** **Permanent Controls—Show on SUSMP Drawings**	**3** **Permanent Controls—List in SUSMP Table and Narrative**	**4** **Operational BMPs—Include in SUSMP Table and Narrative**
❑ **C.** Interior parking garages		❑ State that parking garage floor drains will be plumbed to the sanitary sewer.	❑ Inspect and maintain drains to prevent blockages and overflow.
❑ **D1.** Need for future indoor & structural pest control		❑ Note building design features that discourage entry of pests.	❑ Provide Integrated Pest Management information to owners, lessees, and operators.
❑ **D2.** Landscape/ Outdoor Pesticide Use	❑ Show locations of native trees or areas of shrubs and ground cover to be undisturbed and retained. ❑ Show self-retaining landscape areas, if any. ❑ Show stormwater treatment facilities.	State that final landscape plans will accomplish all of the following. ❑ Preserve existing native trees, shrubs, and ground cover to the maximum extent possible. ❑ Design landscaping to minimize irrigation and runoff, to promote surface infiltration where appropriate, and to minimize the use of fertilizers and pesticides that can contribute to stormwater pollution. ❑ Where landscaped areas are used to retain or detain stormwater, specify plants that are tolerant of saturated soil conditions. ❑ Consider using pest-resistant plants, especially adjacent to hardscape. ❑ To insure successful establishment, select plants appropriate to site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant interactions.	❑ Maintain landscaping using minimum or no pesticides. ❑ See applicable operational BMPs in Fact Sheet SC-41, "Building and Grounds Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com ❑ Provide IPM information to new owners, lessees and operators.

APPENDIX—STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR STORMWATER CONTROL PLAN SHOULD INCLUDE THESE SOURCE CONTROL BMPs		
1 **Potential Sources of Runoff Pollutants**	**2** **Permanent Controls—Show on SUSMP Drawings**	**3** **Permanent Controls—List in SUSMP Table and Narrative**	**4** **Operational BMPs—Include in SUSMP Table and Narrative**
❑ **E.** Pools, spas, ponds, decorative fountains, and other water features.	❑ Show location of water feature and a sanitary sewer cleanout in an accessible area within 10 feet.	❑ If the local municipality requires pools to be plumbed to the sanitary sewer, place a note on the plans and state in the narrative that this connection will be made according to local requirements.	❑ See applicable operational BMPs in Fact Sheet SC-72, "Fountain and Pool Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com
❑ **F.** Food service	❑ For restaurants, grocery stores, and other food service operations, show location (indoors or in a covered area outdoors) of a floor sink or other area for cleaning floor mats, containers, and equipment. ❑ On the drawing, show a note that this drain will be connected to a grease interceptor before discharging to the sanitary sewer.	❑ Describe the location and features of the designated cleaning area. ❑ Describe the items to be cleaned in this facility and how it has been sized to insure that the largest items can be accommodated.	❑

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❑ **G.** Refuse areas	❑ Show where site refuse and recycled materials will be handled and stored for pickup. See local municipal requirements for sizes and other details of refuse areas. ❑ If dumpsters or other receptacles are outdoors, show how the designated area will be covered, graded, and paved to prevent run-on and show locations of berms to prevent runoff from the area. ❑ Any drains from dumpsters, compactors, and tallow bin areas shall be connected to a grease removal device before discharge to sanitary sewer.	❑ State how site refuse will be handled and provide supporting detail to what is shown on plans. ❑ State that signs will be posted on or near dumpsters with the words "Do not dump hazardous materials here" or similar.	❑ State how the following will be implemented: Provide adequate number of receptacles. Inspect receptacles regularly; repair or replace leaky receptacles. Keep receptacles covered. Prohibit/prevent dumping of liquid or hazardous wastes. Post "no hazardous materials" signs. Inspect and pick up litter daily and clean up spills immediately. Keep spill control materials available on-site. See Fact Sheet SC-34, "Waste Handling and Disposal" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com
❑ **H.** Industrial processes.	❑ Show process area.	❑ If industrial processes are to be located on site, state: "All process activities to be performed indoors. No processes to drain to exterior or to storm drain system."	❑ See Fact Sheet SC-10, "Non-Stormwater Discharges" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com

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❑ **I.** Outdoor storage of equipment or materials. (See rows J and K for source control measures for vehicle cleaning, repair, and maintenance.)	❑ Show any outdoor storage areas, including how materials will be covered. Show how areas will be graded and bermed to prevent run-on or run-off from area. ❑ Storage of non-hazardous liquids shall be covered by a roof and/or drain to the sanitary sewer system, and be contained by berms, dikes, liners, or vaults. ❑ Storage of hazardous materials and wastes must be in compliance with the local hazardous materials ordinance and a Hazardous Materials Management Plan for the site.	❑ Include a detailed description of materials to be stored, storage areas, and structural features to prevent pollutants from entering storm drains. Where appropriate, reference documentation of compliance with the requirements of local Hazardous Materials Programs for: ▪ Hazardous Waste Generation ▪ Hazardous Materials Release Response and Inventory ▪ California Accidental Release (CalARP) ▪ Aboveground Storage Tank ▪ Uniform Fire Code Article 80 Section 103(b) & (c) 1991 ▪ Underground Storage Tank	❑ See the Fact Sheets SC-31, "Outdoor Liquid Container Storage" and SC-33, "Outdoor Storage of Raw Materials " in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com

APPENDIX—STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

❑ **J.** Vehicle and Equipment Cleaning	❑ Show on drawings as appropriate: (1) Commercial/industrial facilities having vehicle /equipment cleaning needs shall either provide a covered, bermed area for washing activities or discourage vehicle/equipment washing by removing hose bibs and installing signs prohibiting such uses. (2) Multi-dwelling complexes shall have a paved, bermed, and covered car wash area (unless car washing is prohibited on-site and hoses are provided with an automatic shut-off to discourage such use). (3) Washing areas for cars, vehicles, and equipment shall be paved, designed to prevent run-on to or runoff from the area, and plumbed to drain to the sanitary sewer. (4) Commercial car wash facilities shall be designed such that no runoff from the facility is discharged to the storm drain system. Wastewater from the facility shall discharge to the sanitary sewer, or a wastewater reclamation system shall be installed.	❑ If a car wash area is not provided, describe measures taken to discourage on-site car washing and explain how these will be enforced.	Describe operational measures to implement the following (if applicable): ❑ Washwater from vehicle and equipment washing operations shall not be discharged to the storm drain system. ❑ Car dealerships and similar may rinse cars with water only. ❑ See Fact Sheet SC-21, "Vehicle and Equipment Cleaning," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com

APPENDIX—STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

❑ **K.** Vehicle/Equipment Repair and Maintenance	❑ Accommodate all vehicle equipment repair and maintenance indoors. Or designate an outdoor work area and design the area to prevent run-on and runoff of stormwater. ❑ Show secondary containment for exterior work areas where motor oil, brake fluid, gasoline, diesel fuel, radiator fluid, acid-containing batteries or other hazardous materials or hazardous wastes are used or stored. Drains shall not be installed within the secondary containment areas. ❑ Add a note on the plans that states either (1) there are no floor drains, or (2) floor drains are connected to wastewater pretreatment systems prior to discharge to the sanitary sewer and an industrial waste discharge permit will be obtained.	❑ State that no vehicle repair or maintenance will be done outdoors, or else describe the required features of the outdoor work area. ❑ State that there are no floor drains or if there are floor drains, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements. ❑ State that there are no tanks, containers or sinks to be used for parts cleaning or rinsing or, if there are, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements.	In the SUSMP report, note that all of the following restrictions apply to use the site: ❑ No person shall dispose of, nor permit the disposal, directly or indirectly of vehicle fluids, hazardous materials, or rinsewater from parts cleaning into storm drains. ❑ No vehicle fluid removal shall be performed outside a building, nor on asphalt or ground surfaces, whether inside or outside a building, except in such a manner as to ensure that any spilled fluid will be in an area of secondary containment. Leaking vehicle fluids shall be contained or drained from the vehicle immediately. ❑ No person shall leave unattended drip parts or other open containers containing vehicle fluid, unless such containers are in use or in an area of secondary containment.

APPENDIX—STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

❑ **L.** Fuel Dispensing Areas	❑ Fueling areas[1] shall have impermeable floors (i.e., portland cement concrete or equivalent smooth impervious surface) that are: a) graded at the minimum slope necessary to prevent ponding; and b) separated from the rest of the site by a grade break that prevents run-on of stormwater to the maximum extent practicable. ❑ Fueling areas shall be covered by a canopy that extends a minimum of ten feet in each direction from each pump. [Alternative: The fueling area must be covered and the cover's minimum dimensions must be equal to or greater than the area within the grade break or fuel dispensing area[1].] The canopy [or cover] shall not drain onto the fueling area.		❑ The property owner shall dry sweep the fueling area routinely. ❑ See the Business Guide Sheet, "Automotive Service—Service Stations" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com

[1] The fueling area shall be defined as the area extending a minimum of 6.5 feet from the corner of each fuel dispenser or the length at which the hose and nozzle assembly may be operated plus a minimum of one foot, whichever is greater.

APPENDIX—STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

❑ **M.** Loading Docks	❑ Show a preliminary design for the loading dock area, including roofing and drainage. Loading docks shall be covered and/or graded to minimize run-on to and runoff from the loading area. Roof downspouts shall be positioned to direct stormwater away from the loading area. Water from loading dock areas should be drained to the sanitary sewer where feasible. Direct connections to storm drains from depressed loading docks are prohibited. ❑ Loading dock areas draining directly to the sanitary sewer shall be equipped with a spill control valve or equivalent device, which shall be kept closed during periods of operation. ❑ Provide a roof overhang over the loading area or install door skirts (cowling) at each bay that enclose the end of the trailer.		❑ Move loaded and unloaded items indoors as soon as possible. ❑ See Fact Sheet SC-30, "Outdoor Loading and Unloading," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com
❑ **N.** Fire Sprinkler Test Water		❑ Provide a means to drain fire sprinkler test water to the sanitary sewer.	❑ See the note in Fact Sheet SC-41, "Building and Grounds Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com

APPENDIX—STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

O. Miscellaneous Drain or Wash Water ❑ Boiler drain lines ❑ Condensate drain lines ❑ Rooftop equipment ❑ Drainage sumps ❑ Roofing, gutters, and trim.		❑ Boiler drain lines shall be directly or indirectly connected to the sanitary sewer system and may not discharge to the storm drain system. ❑ Condensate drain lines may discharge to landscaped areas if the flow is small enough that runoff will not occur. Condensate drain lines may not discharge to the storm drain system. ❑ Rooftop mounted equipment with potential to produce pollutants shall be roofed and/or have secondary containment. ❑ Any drainage sumps on-site shall feature a sediment sump to reduce the quantity of sediment in pumped water. ❑ Avoid roofing, gutters, and trim made of copper or other unprotected metals that may leach into runoff.	
❑ **P.** Plazas, sidewalks, and parking lots.			❑ Plazas, sidewalks, and parking lots shall be swept regularly to prevent the accumulation of litter and debris. Debris from pressure washing shall be collected to prevent entry into the storm drain system. Washwater containing any cleaning agent or degreaser shall be collected and discharged to the sanitary sewer and not discharged to a storm drain.

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Comments Submitted by NRDC/Coastkeeper	
I. Alternative Treatment Facilities	
The Model SUSMP on page 62 mentions that alternative treatment facilities are limited to certain circumstances and selection criteria, but this is an inadequate statement because there is no such discussion on the cross-referenced page 30, and the rest of the document does not identify any particular circumstances necessitating – or criteria for – alternative treatment options. It is critical that the Model SUSMP set forth specific and appropriate requirements for alternative compliance because this currently vague exception could become a massive loophole and defeat meaningful implementation of LID. Any alternative compliance options allowed by the Model SUSMP should ensure equivalent results in stormwater pollution reduction, and the process for determining the applicability of alternative compliance provisions should be clearly outlined.	The page reference in the Model SUSMP is in error. It should have been page 23, not page 30. See the section "Selection of Stormwater Treatment Facilities." *Corrected.*
The Model SUSMP should also be revised to include restrictive criteria for ensuring that alternative compliance is allowed only in situations of true infeasibility.	Decisions about the infeasibility of using LID facilities are made project-by-project by the individual Co-permittees. The Model SUSMP provides detailed guidance identifying project types that present special challenges to implementing LID (see p. 25) and a process for evaluating alternatives. *Section on waivers in Chapter 1 has been revised per follow-up discussion with NRDC/Coastkeeper.*
II. Water Harvesting and Reuse	
Throughout the Model SUSMP, water harvesting and reuse techniques receive scant attention and are inadequately described. Their potential for reducing stormwater runoff and pollutant loading, however, especially in areas with high impervious cover and/or significant concentrations of non-infiltrative soils, is enormous and should be highlighted. Overall, the Model SUSMP	Water harvesting and reuse goes beyond the mandate of the NPDES permit, and it may not be possible to incorporate development of standards, drawings, criteria, and specifications for water harvesting and reuse within the SUSMP. General ideas, examples, and references regarding water

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should mention such techniques much more frequently and emphasize their many beneficial applications in San Diego County.	harvesting and reuse can be added to the SUSMP. *Added to Chapter Four.*
Besides the Model SUSMP's general failure to promote water harvesting and reuse practices, the Model SUSMP's existing treatment of water harvesting is insufficient in two principal respects. First, the document provides specifications and drawings for relatively small-scale cisterns, neglecting the applicability of larger-scale water storage structures for larger buildings and developments. (See, e.g., Model SUSMP at 89-91). Examples like the King Street Center and Santa Monica Public Library, described below, demonstrate how stormwater runoff can be reduced very effectively through the use of water harvesting at sizeable sites. The Model SUSMP's criteria do not preclude the large-scale application of water harvesting, but the Model SUSMP does not indicate that such application is possible. This deficiency could be remedied by describing and providing drawings for (or at least examples of) larger cistern systems.	The cistern drawing on page 91 shows no scale. The required minimum cistern size is determined by the calculation specified in Equation 4-8, which is applicable to small and large systems.
Second, the document entirely neglects the possibility of designing water harvesting systems to reuse stormwater onsite and thereby significantly recue or even eliminate stormwater pollutant loading and offsite runoff. Many developers have installed rainwater recycling systems of this sort at various building scales. Santa Monica Public Library's main branch, for example, contains an underground reservoir that collects rainwater and can store 200,000 gallons for later reuse on the Library's landscaped areas. The King Street Center in downtown Seattle uses water captured from roof runoff to supply over 60 percent of the building's landscape irrigation and toilet flushing needs, saving approximately 1.4 million gallons of potable water per year. On a much smaller scale, NRDC's Southern California office drains roof runoff into two 1500-gallon cisterns that help us reduce our building's water	The NPDES permit does not mention water harvesting and reuse as an option for compliance. Also, and unfortunately, the stringent NPDES permit requirements for treatment and flow control severely constrain options for creating multiple-use facilities. The commenter may be underestimating the complexity and expense of designing, building, and operating reliable systems that will meet the stringent NPDES criteria for treatment and flow control and also provide water harvesting. The model SUSMP can incorporate mention the potential for water harvesting and reuse and refer the user to municipal staff for further information on local requirements. *Mention added to Chapter Four and Cistern Design Sheet.*

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consumption by about 60 percent through a graywater recycling system. The Carkeek Environmental Learning Center in Seattle similarly drains roof runoff into a 3500-gallon cistern for toilets. Even single-family homes can recycle graywater or, for far less cost, connect rain barrels to garden watering systems.	
The Model SUSMP's failure to describe water reuse opportunities is most apparent in the Design Sheets portion of Chapter 4, where the Model SUSMP provides detailed specifications for LID designs, including a "Cistern with Bioretention Facility," but does not mention the possibility of combining a cistern with a graywater recycling and/or landscape irrigation system. Instead, the design specifications state that "[a] cistern in series with a bioretention facility can meet treatment requirements where space is limited," and the Model SUSMP implies that this combination is the only suitable method for reducing polluted runoff (Model SUSMP at 89). However, for two reasons, a cistern linked to a graywater recycling system can function better in the dense urban areas for which the cistern-with-bioretention combination is apparently intended: (1) graywater recycling systems do not require the same landscaped areas as other LID practices and can be contained within structures, thus making them especially amenable to high-density/vertical developments and locations with high groundwater tables where other LID practices may be difficult to implement; and (2) cisterns linked to graywater recycling systems remove potential runoff from contact with any surface that could conceivably drain to receiving waters without adequate treatment.	The Model SUSMP could include mention of graywater recycling systems as a potential adjunct to the use of cisterns-plus-bioretention facilities for treatment and flow control. Implementation of graywater recycling would be subject to local requirements for approval, construction, operation, and maintenance of graywater facilities. *Included in concept in Chapter Four but avoided the use of the term "graywater" because it is easily confused with recycling of washwaters.*
For the preceding reasons, the Model SUSMP should be revised to place more emphasis on combining rainwater storage devices with onsite reuse systems. This requires adding specifications (or at least descriptions) for connecting cisterns to water reuse systems and not only to bioretention facilities. To this end, the Design Sheet on pages 89 to 91 should detail both such uses of harvested	Onsite reuse is a potential enhancement to facilities designed primarily for treatment and runoff control. However, implementation of onsite reuse systems goes beyond the mandate of the NPDES permit. General ideas, examples, and references regarding water harvesting and reuse can be added to the SUSMP. *Added to Chapter Four.*

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rainwater, and all references to this Design Sheet should indicate that water reuse is a viable option, in addition to bioretention. The Model SUSMP should also mention specifically that in areas with high concentrations of non-infiltrative soils, adopting stormwater capture and reuse designs enables developments to reduce or even eliminate polluted stormwater runoff. Such references could be inserted, for example, on page 36 (the description of soil types should mention that onsite water reuse is an option where soils are not amenable to infiltration), page 46 (stormwater capture and reuse should be listed within one of the "four LID strategies" for managing runoff), page 47 (Table 4.1 should describe a "stormwater capture and reuse system"), pages 48 to 51 (stormwater capture and reuse systems should be included in the analysis of optimizing site layout), and pages 51 to 60 (Capture and reuse systems should be described and accounted for in the section on developing and documenting drainage design).	
Table 2-1	
Based on our research and experience, virtually all urban runoff contains elevated levels of heavy metals, bacteria, and viruses, regardless of its source. We feel it is particularly unjustifiable to omit heavy metals from commercial land use and bacteria and viruses from streets, highways, and freeways. Additionally, runoff from landscaping generally contains pesticides, and restaurants and roadways often include landscaping. The table is missing an explanation of what the numerals 1 to 5 and letters "P" and "X" mean.	The footnotes were inadvertently left off the table. "X"s can be added where suggested. As noted on page 23, except in rare circumstances, the use of the LID Design Guide and Pollutant Sources/Source Control Checklist will ensure specific projects comply with all stormwater requirements. *Added as noted.*
Table 2-3	
We believe that dry ponds should not be rated "high" in any category of pollutant removal and that media filters should not be rated "high" for fine particles. Bioretention units can be "high" for removing dissolved pollutants if they infiltrate or evapotranspirate all or the vast majority of runoff. We are not sure what the table	Settling basins (dry ponds) are generally regarded as effective in removing fine sediments if they are properly designed. Available data on performance of facilities tends to back this view. Although bioretention facilities can sometimes infiltrate or evapotranspirate most runoff, their overall application in San

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means by "high-rate" biofilter or media filter, and these should be more concretely defined in order to distinguish them from standard biofilters and media filters.	Diego County will be in clay soils with limited surface area, in which case underdrain flows will carry some dissolved pollutants. Table 2-3 can include a cross-reference to the list on page 26 and make it more clear that "higher rate" (rather than "high-rate") filters and biofilters are those with a surface loading rate much greater than the 5 inches per hour design criterion. *Cross reference added.*
Proprietary Devices	
The Model SUSMP leaves the status of proprietary devices too loose and ill-defined. On page 26, the Model SUSMP simply directs developers to "[c]onsult with municipal staff before proposing these devices." Rather than providing such vague guidance, the Model SUSMP could list proprietary devices that have been shown – by rigorous, independent testing – to meet the objectives of municipally approved practices, if any such devices exist. This exercise would involve some research and coordination and would likely not lead to much benefit, so recommend instead that the Model SUSMP limit the use of proprietary devices to pretreatment alone, unless a proponent submits complete documentation proving that a selected device can meet the objectives of the Permit and Model SUSMP.	The section on the "Selection of Stormwater Treatment Facilities," beginning on page 23, includes criteria to ensure the use of the most effective treatment facilities practicable on a given project. The mention of proprietary devices on page 26 is intended to direct applicants to check with municipal staff and not rely on the representation of company sales representatives regarding the acceptability of their product to meet NPDES and local requirements.
Rational Method	
On page 27, the Model SUSMP describes the rational method as the means of calculating peak runoff flow and total runoff volume. However, the rational method is a very poor basis for the design of flow-through systems. Although computerized continuous simulation hydrologic modeling may not be financially feasible everywhere, there are better methods (e.g., the Santa Barbara Urban Hydrograph).	The rational method is mentioned on page 27 only to illustrate the relationship between imperviousness and peak runoff flow. The NPDES permit specifies the rainfall intensity to be used in calculating runoff flows for flow-based treatment controls.
Limitations on Infiltration	
The Model SUSMP (pages 30 to 31) perpetuates limitations on infiltration that hydrologists have questioned for years, specifically	The section "Criteria for Infiltration Devices" reflects the restrictions of the NPDES Permit section "Infiltration and

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the notions that certain land uses should not be allowed to infiltrate stormwater and that there must be a 10-foot minimum spacing to seasonal high groundwater. Such blanket statements take no account of site-specific hydrogeologic factors. The key factors are the depth and characteristics of the soil medium before it reaches groundwater. Regarding land uses, a recent study of six sites in Southern California has shown that, in most cases, all land uses – even polluted industrial facilities – can safely infiltrate stormwater without polluting local groundwater supplies. Regarding the issue of spacing, the infiltration facility is safe if there are reliable, site-specific data demonstrating that the seasonal high water table approaches no closer than four feet. Ultimately, these limitations matter much less in this context than they have in other contexts because the Model SUSMP defines many LID designs as non-infiltration-based and therefore not subject to the land use and spacing restrictions, but we believe that the Model SUSMP should, nevertheless, reflect the current understanding of limitations on infiltration.	Groundwater Protection."
Soils and Hydrogeological Information	
Chapter 3, particularly Steps 1 and 2 (pages 35 to 37), fails to place enough emphasis on obtaining thorough, site-specific soils and hydrogeological information as a basis for selecting and designing LID features. The City of Santa Barbara's *Post-Construction Stormwater Best Management Practices (BMP) Manual*, Chapter 3, provides an excellent reference for soil and infiltration assessment, as well as for other stormwater management issues.	The referenced material includes typical procedures, which can also be found elsewhere, for measuring infiltration rates of soils. The Model SUSMP guides applicants to lay out the site to: "Concentrate development on portions of the site with less permeable soils, and preserve areas that can promote infiltration," as well as minimizing grading, preserving vegetation, and setting back development from creeks, wetlands, and riparian habitats. In practice, most small development and redevelopment sites have been previously graded and compacted, or are to be graded and compacted in connection with the project. The Model SUSMP emphasizes the use of underdrained bioretention facilities and planter boxes. These facilities work by allowing infiltration to occur, but also

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	ensuring remaining runoff is detained and treated prior to outflow via the underdrain. This approach ensures compliance with NPDES treatment and flow-control requirements using conservative assumptions about how much infiltration will actually occur.
"Self-Retaining" and "Self-Treating" Areas	
The Model SUSMP characterizes turf, gravel, and vegetated roofs as "self-retaining," which is defined as retaining the first one inch of rainfall without producing any runoff (Model SUSMP at page 53). We agree that under such conditions, turf and vegetated roofs could be "self-retaining." However, the "Analyze Your Project for LID" section on page 46 should cross-reference the definition of "self-retaining" so that its meaning is clear in this context. Additionally, turf and vegetated roofs must be properly designed, constructed, operated, and maintained in order to be and to remain self-retaining. The Model SUSMP needs tighter specifications in this respect – although Chapter 5 discusses operation and maintenance requirements, it includes no detail regarding specific LID features. Gravel, on the other hand, tends to become highly compacted with any substantial weight loading, and thus no gravel area with vehicle traffic would remain self-retaining unless it were excavated an replaced periodically, which would likely not be economically feasible for many property owners.	A note can be added on page 46 to cross-reference the explanation of "self-retaining" on page 53. *Added.* Maintenance fact sheets have yet to be prepared and added to the Project Clean Water web site. For green roofs, maintenance recommendations will defer to the manufacturer's or installer's instructions. If properly designed and installed, gravel (crushed aggregate) retains its permeability when compacted. In general, a gravel section properly designed to withstand vehicle loading will be more than 2.5 inches deep and will retain more than an inch of rainfall. Among the Copermittees, current policies vary regarding verification of operation and maintenance of stormwater management features that are not treatment facilities (for example, reducing runoff by limiting paved area and using permeable pavements, as opposed to treatment facilities such as bioretention areas and sand filters). This variation in policy will be noted in the forthcoming model SUSMP, and Copermittees will discuss whether it is possible to develop more consistent policies to be incorporated in a future revision to the SUSMP. *Variation in policy noted in the introductory paragraph in Chapter Five.*
The "self-treating" concept (page 52) is more problematic than the	Criteria for self-treating areas are provided on pages 65-66. A

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"self-retaining" concept because the Model SUSMP provides no criteria for ensuring that "self-treating" areas will result in pollution reduction equivalent to retaining the first one inch of rainfall, as required for "self-retaining" areas. In fact, the description of "self-treating" areas includes no specification at all, and thus there is nothing to guide developers in deciding what qualifies as a self-treating area and how well that area must perform in mitigating stormwater pollution and runoff. To ensure the desired (and legally required) benefits of LID implementation, the Model SUSMP should include design criteria for self-treating areas akin to the design criteria for self-retaining areas.	cross-reference can be added to page 52. *Cross-reference added.* The concept of self-treating area is important to LID design and implementation. Drainage from roofed and paved areas needs to be routed through treatment and flow-control facilities such as bioretention, but drainage from pervious landscaped areas does not need to be so managed if it is kept separate.
Runoff Factors	
In Table 4-2, it does not make sense that amended, mulched soil and landscaping should both have runoff factors of 0.1. Landscaping can be on poor, highly compacted soil and thus generate significantly more runoff than properly amended, mulched soil. These factors probably result from the rational method and incorporate its over-simplicity.	The runoff factors are specific for surfaces draining to treatment facilities. These facilities are designed to handle runoff from small storms, in which case the 0.1 runoff factor is appropriate for landscape generally. When the SUSMP is updated to incorporate flow-control (HMP) requirements, which address larger storms as well as small storms, it may be necessary to develop separate runoff factors for different types of soils.
Underdrains	
Although the Model SUSMP would require underdrains on Group "C" soils (page 74), Group "C" soils do not always necessitate underdrains for two reasons: 1) site-specific soils are frequently very different from the soils shown on soil classification maps; and 2) bioretention systems with properly constructed, amended soils have performed well on ostensibly C soils. This problem highlights the lack of appropriate soil and hydrogeological information-gathering requirements identified above.	Underdrains are recommended for facilities built on "C" soils to ensure against standing water, which could result in boggy conditions and mosquito harborage. If infiltration to native soils turns out to be at a higher rate, the underdrains will simply flow less often.
Comments Submitted by the San Diego Regional Water Quality Control Board	
1. The Draft does not emphasize avoidance of receiving waters,	The language in Section E.10 of the NPDES Permit can be

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nor does it explicitly prohibit the use of receiving waters for urban runoff treatment. Section E.10 of the MS4 permit provides that "[u]rban runoff treatment and/or mitigation must occur prior to the discharge of urban runoff into a receiving water." The draft should be modified accordingly, to reflect this requirement.	added to the SUSMP. *Added.*
2. Maintenance of treatment control BMPs is not specified in the Draft. Sections D.1.d(6)(d) and D.1.e(2)(d) of the MS4 permit require the Copermittees to ensure approved treatment control BMPs are effectively operated and maintained by a responsible party. The Draft should be modified to incorporate these requirements.	See Chapter 5, beginning on page 93 of the SUSMP.
3. The Copermittees use the word "may" throughout the Draft when a requirement is needed for compliance with the MS4 permit. For example, on page 40, the "municipality may require that the applicant submit financial assurances, acceptance of responsibility, and an outline of general maintenance or a detailed maintenance plan and schedule." In this instance the Regional Board considers assurances and plans as necessary to evaluate compliance with the MS4 permit. The Draft should clearly identify that actions mandated for MS4 permit compliance are required actions that "must" be done.	The section on page 40 will be edited to clarify what is required by the permit, what options the Copermittees may use to meet those requirements, and the options regarding the form and timing of submittal requirements different Copermittees may choose to employ. The draft will be reviewed for other instances where these distinctions can be clarified. *Section edited as described.*
4. The Priority Development Projects listed on Table 1-1 of the Draft need to be modified to include pollutant generating projects that result in the disturbance of one acre or more of land (within three years of the adoption of the MS4 permit), as required by Section D.1.d.(1)(b) of the MS4 permit.	As the permit section cited notes, the Copermittees may collectively identify a different threshold. This can be addressed in an update to the model SUSMP or a revised SUSMP to be published by January 2010.
5. Additionally, Table 1-1, Section I, should be clarified to include driveways in addition to "streets, roads, highways, and freeways."	Table 1-1 reflects the language in the NPDES permit.
6. The text on page 4 states, "See Selection of Treatment Facilities on page 30." However, page 30 does not include the reference title or related information. It appears that reference is incorrect and should refer the reader to page 23, "Selection of Stormwater	The reference will be corrected. *Corrected.*

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Treatment Facilities."	
7. The hydromodification management exemption conditions on page 12 are taken from Section D.1.g.(3) of the MS4 permit. In number 3, modify "watershed" to "sub-watersheds" and include the language "and the potential for single project and/or cumulative impacts is minimal." Modifying the text in this manner will make the Draft consistent with the MS4 permit, and will help clarify which locations apply.	This language can be added. *Added.*
8. The hydromodification management exemption conditions should also include the final sentence of Section D.1.g.(3) of the MS4 permit, which states "[h]owever, plans to restore a channel reach may re-introduce the applicability of HMP controls, and would need to be addressed in the HMP." The inclusion of this language will clarify when the exemption applies, and prompt the applicant and the Copermittees to investigate channel restoration activities that are planned or in progress, to apply HMP controls accordingly.	This language can be added. *Added.*
9. Table 2-1, on page 21 does not define the variables used inside the table. Definition of the variables P, X, P(1), P(2), P(3), P(5), X(4), and X(4)(5) is needed to understand the table.	The footnotes were inadvertently omitted and can be restored. As noted on page 23, except in rare circumstances, the use of the LID Design Guide and Pollutant Sources/Source Control Checklist will ensure specific projects comply with all stormwater requirements. *Corrected as noted.*
10. Also in Table 2-1, the Copermittees should consider inclusion of heavy metals from commercial land uses; bacteria and viruses from streets, highways and freeways; and pesticides from restaurant landscaping. The rationale and selection process should be evident to ensure that all anticipated and potential pollutants by land use are being addressed.	"X"s can be added where suggested. *Added, except noted the potential for pesticides is related to whether or not landscaping is part of the project.*
11. Page 45 instructs the reader to analyze their project and select options for implementing LID techniques to "meet runoff treatment	At present flow-control requirements apply only to projects 50 acres and larger. SUSMP references to flow control

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requirements-and flow control requirements; if they apply." Modification of the language from "if they apply" to "unless exempted", and referencing the page where the exemptions and criteria are located (e.g. page 12) will emphasize that LID techniques always apply unless the specific criteria for exemption are met.	requirements will be updated following approval of the HMP by the Regional Water Board.
12. The numbered list on page 48 indicates the order of impacting and conserving natural areas. This list does not take into account that nun1ber 2 can occur in areas that may be delineated as wetlands and may also be the habitat of sensitive species. For clarification, number 2 should be modified to include "where receiving waters are not present."	The language can be added. *Added.*
13. The last bullet on page 50 states: "Planter boxes and bioretention areas must be level or nearly level all the way around." Modification of the language to remove "or nearly level" will add consistency to the level requirement found on page 41 for the top edge of bioretention facilities.	As a practical matter, the top edge needs only be nearly level. There needs to be some flexibility in design criteria. As noted, swales may be gently sloped in the linear direction. Bioretention areas may also be gently sloped in the direction of flow.
14. The title of Step 7 in Chapter 4, page 59 states: "Determine If Available Space For IMP Is Adequate." Modification of the language to change "If" to "Where" will add emphasis that space cannot be a limiting factor in determining the type of treatment facilities to be utilized. As stated on page 25, "lack of space, in itself, is not a suitable justification for using a less-effective treatment on a development site... "	The design process involves developing a site plan with IMPs, checking to see if the IMP area is sufficient, and iterating until an acceptable plan is achieved. This is detailed in the text.
15. Page 12 contains Option 3: Exemption From Hydromodification Management. Clarification is needed to further define what is covered under a channel that is concrete lined or significantly hardened. It is not clear whether this exemption includes channels that are over 90 percent concrete lined or hardened, but contain earthen banks and/or bottoms in one or more portions. It is also unclear whether this exemption includes channels that have hardened banks in their entirety, but have	As noted in the earlier comment, the language here is taken from permit section D.1.g.(3).

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earthen bottoms in their entirety. As mentioned previously, channels and creeks that have restoration plans will reintroduce the applicability of HMP controls.	
16. Clarification as to what is meant by "wetlands" in column four of Table 2-3 and the third bullet of page 24 is needed. It is anticipated that these wetlands are artificial and/or constructed. Clarification in the table and in the bullet item provides another opportunity to emphasize that receiving waters cannot be used as treatment facilities and that runoff entering those waters must first be treated. Also note that in the title of Table 2-3, the font size of the last four words does not match the all caps format.	The heading can be changed to read "constructed wetlands." *Changed as noted.*
17. A reference for the determination of the effectiveness of the treatment facilities in Table 2-3 on page 24 is needed to understand how each facility received its rating.	See Salvia, Samantha (2000), referenced and hyperlinked in the Bibliography. This reference can be included in a "References and Resources" section that could be added to Chapter 2. *Added*
18. Page 36/37, Step 2: Identify Constraints and Opportunities needs clarification on what is meant by "open space and buffers (which can double as locations for bioretention facilities)." Natural buffers are essential to the health of wetlands and stream corridors and should be avoided as locations for concentrated pollution assimilation. The Draft should either remove reference to buffers altogether, or prioritize opportunities in a manner that would deter applicants from using natural buffers where other opportunities are present.	The text states: "…easements and landscape amenities including open space and buffers (which can double as locations for bioretention facilities)…" The text can be revised to note explicitly that this does not included protected riparian areas. In some cases, setbacks from riparian areas are appropriate locations for bioretention facilities. *Revised as noted.*
19. The adopted TMDL list on page 22 does not include the recently adopted Bacteria TMDL for Beaches and Creeks. The inclusion of this TMDL will provide a more accurate and up to date list of adopted TMDLs in the San Diego area.	The recently adopted TMDL can be added to the list. *Added.*
20. In consideration of San Diego's climate and water shortage, the Draft should promote the use of water harvesting, even when not required, for reuse by providing additional information about existing collection alternatives; both large, and small-scale. Chapter 4 provides an opportunity to expand on these techniques.	The NPDES permit does not mention water harvesting and reuse as an option for compliance. Also, and unfortunately, the stringent NPDES permit requirements for treatment and flow control severely constrain options for creating multiple-use facilities. The model SUSMP could incorporate mention the

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	potential for water harvesting and reuse while noting the difficulties involved and referring the user to municipal staff for further information on local requirements. *Done – Chapter Four and Cistern Fact Sheet.*
21. A definition of high-rate biofilters, referenced in Table 2-3, is not provided in the Draft or the Glossary. Providing a definition of this type of treatment BMP will provide clarity as to what constitutes a high-rate biofilter.	This can be added. As may be clear from the prioritized list on page 26, this refers to a filter with a surface loading rate greater than the criteria provided for bioretention areas and sand or media filters. *Added.*
22. The concept of self-treating areas should be defined in the Glossary.	Self-treating areas are natural, landscaped, or turf areas that drain directly off site or to the public storm drain system. This definition can be added to the glossary. *Added.*
23. The definition of "entire project area", which is bolded and emphasized on page 52, should be included in the Glossary.	The entire project area comprises all areas to be altered or developed by the project, plus any additional areas that drain on to areas to be altered or developed. This definition can be added to the glossary. *Added.*
24. "Proprietary storm water treatment facilities" are not defined in the Glossary or the Draft. A definition of this term would provide clarity.	A proprietary device is one marketed under legal right of the manufacturer. "Proprietary" can be defined in the glossary. *Added.*
25. The Glossary is lacking the definitions of multiple terms used throughout the Draft. Including the aforementioned examples, the Glossary should contain the definitions of all terms in the Draft that are bolded, emphasized, or used frequently in the document in order to provide consistency throughout the document.	In many cases, commonly used terms are bolded for emphasis. If there are additional terms the reviewer believes require further definition, these can be added to the glossary.
Comments Submitted by Vaikko Allen, Contech Stormwater Solutions	
Glossary - Impracticable. Either remove this definition or disclose the "set criteria" referenced. This definition mentions "set criteria" to determine if an onsite treatment facility is infeasible. These criteria are not established in the manual. They should either be established with adequate justification or this phrase should be	Did not find the term "impracticable" in a search of the document.

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removed.	
Glossary - Indirect Infiltration. Remove this term. This is a misleading term. Passage of water through a soil medium and subsequent collection and discharge of that water is more accurately termed filtration. To emphasize the biological component it could also be called biofiltration. The term infiltration is conventionally reserved for water entering soil that is dispersed in the interstitial pore spaces of that soil, and is thereby removed from the storm runoff volume.	Did not find the term "indirect infiltration" in a search of the document.
Glossary – Infiltration Device. Change to " Any BMP that is designed to infiltrate stormwater into the subsurface such that the volume of infiltrated water is prevented from entering a downstream conveyance system or groundwater table prior to travel through at least 10' of soil. Self retaining areas with a drainage area less than 2x the infiltrating area are not considered infiltration devices." The definition given makes a distinction between the "natural groundwater protection" afforded by surface or near-surface soils and subsurface soils. There is no basis given for this distinction. On the contrary, it has been demonstrated that percolation of stormwater through subsurface soil is cleansing and generally results in satisfactory water quality. The final report of the Water Augmentation Study initiated by the Los Angeles and San Gabriel Watershed Council is a good reference on the subject. http://www.lasgrwc.org/WAS/Documents/WAS%20Phase%20II%20Final%20Report%20Summary.pdf	The proposed revised definition seems inconsistent with the requirements in Provision D.1.d.(12) of the permit.
Glossary – Retention. Add "within berms or depressed areas" to the definition after "basins". By the existing definition, bioretention would not be retention. The proposed definition is more consistent with the definition of "Detention."	This language can be added to the definition. *Added.*
Glossary – general. Clarify the role of conventional water quality swale as described in most BMP manuals and the CASQA Handbook for New Development and Redevelopment. The term	A brief discussion of conventional vs. bioretention swales can be added to Chapter 4. Bioretention swales have generally supplanted conventional swales because (1) conventional swale

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swale appears several times in this manual, yet it is not defined. As conventionally designed to convey flow at a depth slightly lower than the vegetation length and with a residence time of 7+ minutes, it appears to have no role. It would not be considered a self treating or self retaining area. It seems that its role would be limited to conveying water to bioretention areas or flow through planters. This should be clarified.	design has resulted in standing water and associated nuisances, (2) conventional swales often don't obtain the required residence time and length because runoff must enter the swale at the upstream end, and (3) a bioretention swale provides more flexible drainage design and more effective treatment within the same footprint. *Discussion added to Chapter Four.*
Page 2, Bullet 2. Change to "Assuming exclusive use of BMPs providing no runoff reduction will be adequate for compliance." To suggest that a BMP is inadequate simply because it is proprietary ignores more relevant factors like its runoff reduction and quality improvement capabilities. Permeable pavements, green roofs and other LID IMPs could be considered to be proprietary and would seem to be discouraged. I assume that the intent here is to get designers to focus on runoff reduction rather than the exclusive use of treatment controls.	The existing language is needed to counter inaccurate information delivered to developers by purveyors of proprietary stormwater treatment facilities. The language is intended to convey to applicants that they should check the salesperson's claims with municipal staff rather than assuming those claims are correct.
Page 7, bold text. Change to "stormwater treatment, detention and infiltration facilities…" I assume that the intent here is to put controls that need maintenance in an area where they can be accessed and are not prone to disruption (regrading, removal, fertilization etc.) by land owners. If so, the same logic should apply to all IMPs and BMPs.	The reviewer may be commenting on a draft previous to the 24 July 2008 submittal. Could not find the referenced language on page 7. The bolded language on p. 9 can be changed to "stormwater treatment, infiltration, and flow-control facilities should not be located on individual single-family residential lots."
Page 11 - Waiver section. Either remove entire paragraph starting "Experience has shown…" or change to "Chapter 4, or other on site BMPs are feasible…" LID BMPs listed in chapter 4 are not the only means of treating stormwater to the MEP. Where LID options are not feasible, alternative treatment controls may be used that provide sufficient treatment to avoid the requirement of a waiver.	(Page 13). The countywide SUSMP reflects the policy that LID facilities are to be used for stormwater treatment wherever feasible. The section "Selection of Stormwater Treatment Facilities," which is referenced here, provides instructions for evaluating the use of other options in specified circumstances where it may be infeasible to implement LID facilities.
Page 14 - Water Quality Regulations section. Check grammar on the fourth bulleted item.	(Page 16). Grammar seems OK, but we are open to suggestions.
Page 15 – Maximum Extent Practicable section. Add "including	This change can be made. *Done.*

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LID facilities, have proven…" This addition is needed to distinguish between structural LID elements and non-structural planning and design elements.	
Page 15 – Maximum Extent Practicable section. This section states: "The NPDES permit includes various standards, including hydrologic criteria, which have been found to comprise maximum extent practicable". Please list these criteria. No performance criteria are given in this section. Instead, manual users are directed to follow the SUSMP design procedures in chapter 4 which include only select LID facilities. This approach does not promote innovation and unnecessarily constricts design options. This section should clarify what runoff reduction and water quality goals must be met for a site to meet the MEP standard. This manual seems to interpret MEP based on whether or not the specific LID framework presented in chapter 4 is followed. This framework may be preferred by the writers of this manual, but there are other methods of controlling runoff volumes and improving water quality that may be preferable to design engineers. This section should make it clear that any option that meets specific performance criteria are acceptable. Such performance criteria may include meeting interim and final hydromodification criteria and providing medium to high reduction in loads of pollutants of concern.	The quoted statement reflects a legal opinion provided to the State Water Board which states the hydraulic sizing criteria for treatment facilities in the NPDES permit constitute "maximum extent practicable."
Page 21 - Table 2-2. This table should be removed and replaced with a unit process based BMP matrix. At least, tables 2-2 and 2-3 should be replaced by table 4.3 from the former SUSMP. This table is far too general. For example, treatment may mean screening, filtration, gravitoidal separation, chemical treatment or biological treatment. This table doesn't distinguish between those unit processes which all have different effects on different pollutants. It also does not differentiate between forms of pollutants. For example, particulate metals and particulate organic	The comment seems to state that particulate pollutants associate with small particles and dissolved pollutants do not. This is self-evident. More to the point is that some stormwater pollutants tend to associate with small particles during treatment. The ability of a process to remove small particles is a good predictor of whether that same process will be effective in removing those pollutants. This is what is conveyed in Table 2-2. As stated elsewhere, the need for this simple analysis is obviated

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matter may be adequately removed by sedimentation or filtration. The dissolved forms of these pollutants may persistent after treatment by those means, but may be removed through chemical and/or biological means. A thorough discussion of a unit process based design approach which would be consistent with the San Diego permit requirements can be found in the 2005 WERF publication "Critical Assessment of Stormwater Treatment and Control Issues" by Strecker et al.	by the requirement to use LID facilities where feasible and by the requirement to implement the source controls in the Appendix. Presentation of a more thorough analysis does not seem warranted.
Page 22 - Table 2-3. This table should be removed and replaced with a matrix that includes various BMPs and their unit process. Or, alternately it can table 2-2 should be removed and replaced by table 4.3 from the previous SUSMP. There are several problems with this table. The treatment facility types are undefined. High, Medium and low performance levels are not defined and there is no documentation of BMPs ability to meet these goals. The last column groups trash racks and hydrodynamic devices (HDS) together which are two fundamentally different processes. HDS units may be sized to have a significant impact on sediment as fine as about 50 microns and associated pollutants. They can also be designed to remove oil and grease with high efficiency. A trash rack has neither of these capabilities.	Tables 2-2 and 2-3 are taken from the updated model SUSMP submitted in January 2008 in accordance with Provisions D.1.d.(7) and (8) of the NPDES permit. Although simple in concept, the tables provide sufficient rationale for the Copermittee's determination regarding the selection of stormwater treatment facilities.
Page 22 - Research and regulatory paragraph. Remove this section. The determination of MEP is to be made on a case by case basis. If there is a performance threshold that has been determined to be less than MEP, it should be noted. It is conceivable that some hydrodynamic separators (HDS) may be suitable where coarse sediment, trash, debris and oil and grease are the only primary pollutants of concern. Effectiveness for these units is primarily a function of sizing, which should be scrutinized. It would be appropriate to say that HDS systems are not suitable for the removal of fine sediment, dissolved pollutants, bacteria, organic compounds etc., however the information in tables 2-2 and 2-3	Again, the reviewer may be referring to an earlier draft of the model SUSMP. It may be conceivable, but seems rather unlikely, that it would be appropriate to discharge urban runoff to receiving waters without consideration of the need to reduce, to the maximum extent practicable, heavy metals and bioaccumulative pollutants.

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should make this point obvious. Especially if these tables are revised to relate unit processes to the various pollutants, it will be clear that HDS units are not adequate stand alone treatment on nearly all sites. Catch basin inserts are a different type of technology from HDS systems that should be treated separately. Some include filters and can be effective at very low loading rates and with very low pollutant loads. However they are rarely sized to operate in this effective range and present an onerous maintenance burden that is rarely met. Based on repeated observations of performance and operational failures, and lack of adequate mainentance, it is more appropriate to categorically reject these BMPs for stand alone use. I am not aware of similar endemic performance and operational failures for HDS units.	
Page 22 - "Underground Vault" paragraph. Remove the sentence: "Because vaults may be "out of sight, out of mind".... This problem is not unique to underground vaults. A lack of maintenance across all BMP types is observed throughout California and is noted in the 2006 blue ribbon panel report on the feasibility of numeric limits as a primary cause of persistent water quality degradation. New tracking and Reporting criteria in the NPDES permit are designed to address this issue.	The sentence reflects reported experience in Denver, CO, Prince Georges County, MD, and elsewhere. Although the maintenance verification program required by the permit will no doubt reduce the incidence of unmaintained facilities overall, there will still be substantial maintenance verification advantage to having facilities on the surface and visible.
Page 24 – Proprietary Devices note. Change to read "...proprietary treatment devices do not meet..." The recommendation that design engineers consult with municipal staff is not practical since most staff will not review the use of a product without seeing how it will be used on a site. As written, this paragraph would also encourage design engineers to consult with staff where any proprietary device will be used. Some instances where that is not necessary include but are not limited to the use of proprietary infiltration BMPs, alternative paving materials and HDS units as pretreatment for	The existing language is needed to counter inaccurate information delivered to developers by purveyors of proprietary stormwater treatment facilities. The language is intended to convey to applicants that they should check the salesperson's claims with municipal staff rather than assuming those claims are correct.

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landscape based IMPs.	
Page 26 - "The 0.2 inches" paragraph. Details regarding verification of the 5"/hr infiltration rate are needed. Whose responsibility is it to verify that the 5"/hr infiltration rate is met? Is it enough to call for "engineered soil with 5"/hr infiltration capacity" on a set of plans or does that rate have to be measured prior to the completion of the construction phase? Is there a soil infiltration rate inspection protocol that can be referenced? Without requiring some quality control check at some point, a contractor is likely to import soil with unknown chemical and physical properties and compact it to a point where it loses its permittivity. Since the effectiveness of both IMPs currently listed in this manual hinge on this property, it must be verified. Ability to control construction material quality, compaction and proper design should be required where these BMPs are specified.	The reference here is to a maximum design surface loading rate, not an infiltration rate. The commenter is correct that the quality of the soil mix supplied must be subject to verification during construction.
Additional Comments and Responses Developed in a 4 December 2008 Conference Call with NRDC and Coastkeeper including discussion and resolution of comments in the NRDC/Coastkeeper 7 November 2008 letter and attachments.	
On page 13, under the heading "Waivers from Treatment Requirements," change "stormwater treatment requirements" to "numeric sizing requirements" to be consistent with the NPDES permit.	*Change made.*
On page 13, bring forward some of the discussion from Chapter 2 regarding selection of stormwater treatment facilities.	*Discussion on page 13 revised to clarify that applicants should first consider LID, then, in the specified special situations, consider the options listed in Chapter 2.*
Add within the SUSMP a recommendation that municipalities review their codes for possible revisions that would remove barriers to implementing LID.	*Bullet added in Chapter 3, Step 1.*

FINAL

HYDROMODIFICATION MANAGEMENT PLAN

Prepared for
County of San Diego, California
March 2011

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LIST OF ACRONYMS

ACCCMP	Alameda Countywide Clean Water Program
BAHM	Bay Area Hydrology Model
BEHI	Bank Erosion Hazard Index
BMP	Best Management Practice
CASQA	California Stormwater Quality Association
CCCWP	Contra Costa Clean Water Program
CEM	Channel Evolution Model
CEQA	California Environmental Quality Act
D50	Median grain size diameter
Ep	Erosion potential index
ET	Evapotranspiration
FSURMP	Fairfield-Suisun Urban Runoff Management Program
GIS	Geographical Information System
HEC-HMS	Hydrologic Modeling System; distributed by the US Army Corps of Engineers Hydrologic Engineering Center
HMP	Hydromodification Management Plan
HR	Hydraulic Radius
HSPF	Hydrologic Simulation Program FORTRAN, distributed by USEPA
IMP	Integrated Management Practices
LID	Low Impact Development
LSPC	Loading Simulation Program in C++
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resource Conservation Service
PLS	Pervious Land Surface
PWA	Philip Williams & Associates
Q	Flow
Qcrit	Critical flow
RWQCB	Regional Water Quality Control Board
SCCWRP	Southern California Coastal Water Research Project
SCVURPPP	Santa Clara Valley Urban Runoff Pollution Prevention Program
STOPPP	San Mateo County Stormwater Pollution Prevention Program
SUSMP	Standard Urban Stormwater Mitigation Plan
SWM	Stanford Watershed Model
SWMM	Storm Water Management Model; distributed by USEPA
SWMP	Storm Water Management Plan
SWWM	Storm Water Management Model
TAC	Technical Advisory Committee
TMDL	Total Maximum Daily Load
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey

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HYDROMODIFICATION MANAGEMENT PLAN

EXECUTIVE SUMMARY

Background

The need to address hydromodification and its influence on water quality is included in the San Diego Regional Water Board Order R9-2007-001, Provision D.1.g of California Regional Water Quality Control Board San Diego Region Order R9-2007-0001, which requires the San Diego Stormwater Copermittees to implement a Hydromodification Management Plan (HMP) "…to manage increases in runoff discharge rates and durations from all Priority Development Projects, where such increased rates and durations are likely to cause increased erosion of channel beds and banks, sediment pollutant generation, or other impacts to beneficial uses and stream habitat due to increased erosive force."

To address this permit condition, the Copermittees, represented by the County of San Diego, hired a consultant team and proceeded with developing an HMP that meets the intent of the Permit Order. The permit requires the Copermittees to develop an HMP for all Priority Development Projects (PDP), with certain exemptions. The HMP must develop standards to control flows within the geomorphically-significant flow range. Supporting analyses must be based on continuous hydrologic simulation modeling.

As required by Permit Order No. R9-2007-0001, each Copermittee shall incorporate the approved HMP into its local Standard Urban Storm Water Mitigation Plan (SUSMP) and implement the HMP for all applicable PDPs by January 14, 2011.

HMP Development Process

All 21 Copermittees participated in the development of the HMP, both financially and through their participation in the Copermittees Hydromodification/SUSMP Workgroup. The Workgroup was convened 14 times over the course of the project at times that corresponded with key decision points in developing the HMP and the update to the SUSMP. The Workgroup reviewed and commented on all drafts of the HMP and SUSMP, as well as reviewed all of the public comments received on these documents and responses to comments.

A key element of the San Diego HMP was the creation and involvement of a Technical Advisory Committee (TAC). The TAC members consisted of respected individuals from academia, technical resource agencies, the development community, consulting engineers, and environmental organizations. The TAC was tasked with providing technical input to the scientific approach and interpretation of results integral to the establishment of numerical flow control standards for the HMP, and met 11 times since October 2007.

Literature Review

Pursuant to Permit Section D.1.g(1)(e), the consultant team conducted a literature review as a basis for the initial development of the HMP. The review focused on several key technical areas, including an analysis of the flow control approaches used in past hydromodification management efforts. Concepts of effective work, critical flow, and erosion potential were reviewed along with noted stream classification strategies. Finally, hydromodification management strategies were reviewed, including LID, flow duration control basins, and in-stream mitigation. The literature review also focused on continuous simulation modeling

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approaches, rainfall data management, determination of rainfall losses due to infiltration, and determination of rainfall losses due to evaporation.

To assess the effectiveness of storm water devices to meet hydromodification criteria, peak flow frequency, and duration statistics were required to be developed. A literature review examining these statistical methods indicated that the use of a partial-duration series is preferred for climates similar to San Diego County. The need for partial-duration statistics is more pronounced for control standards based on more frequent return intervals (such as the 2-year design storm), since the peak annual series statistics do not perform as well in the estimation of such events. This phenomenon is especially pronounced in the San Diego region's semi-arid climate. Partial-duration series frequency calculations consider multiple storm events in a given year while the peak annual series considers just the peak storm event. The Hydrologic Research Center (HRC), which is located in San Diego, recommended use of the partial duration series method to most accurately estimate flow frequency response in the San Diego climate.

Methodology and Technical Approach

Per the Permit Order, a range of runoff flow rates was required to be determined to identify the range for which Priority Development Project post-project runoff flows and durations shall not exceed pre-project runoff flows and durations. The Order further required a continuous hydrologic simulation of the entire rainfall record be generated. In January 2008, Interim HMP standards were developed in order to meet the Regional Board Order. These requirements pertained only to projects disturbing 50 acres or more.

Per final hydromodification management criteria developed for San Diego County, which will be applicable to all Priority Development Projects, results of a hydromodification management analysis must adhere to the following criteria:

- For flow rates between the pre-project lower flow threshold (see below) and the pre-project 10-year runoff event, the post-project discharge rates, and durations may not deviate above the pre-project discharge rates and durations by more than 10 percent over more than 10 percent of the length of the flow duration curve.
- Lower flow thresholds may be determined using the HMP Decision Matrix (located in Chapter 6) along with a critical flow calculator and channel screening tools developed by the Southern California Coastal Water Research Project (SCCWRP), detailed in Chapter 5. These methods identify lower flow thresholds for a range of channel conditions. The critical flow calculator recommends a lower flow value of $0.1Q_2$, $0.3Q_2$, or $0.5Q_2$ dependent on the receiving channel material and dimensions. This value will be compared to the channel susceptibility rating (High, Medium, or Low) as determined from the SCCWRP screening tools located in Appendix B to determine the final lower flow threshold.
- The lower flow threshold may alternately be determined as 10 percent of the pre-project 2-year runoff event, or $0.1Q_2$. This approach, which is outlined in the HMP Decision Matrix, is available if the project applicant chooses not to complete the channel screening analysis.

Information regarding the analysis and categorization of streams from a geomorphic context has been prepared in a concurrent grant-funded hydromodification study by the Southern California Coastal Water Research Project (SCCWRP) and the County of San Diego. Screening tools developed by SCCWRP identify channel susceptibility to hydromodification impacts. These include tools to classify receiving streams as having either a High, Medium, or Low susceptibility to channel erosion impacts. Where receiving stream channels are already unstable, the standard is to avoid acceleration of the existing erosion problems. Where receiving channels are in a state of dynamic equilibrium, hydromodification management may prevent the onset of erosion or other problems.

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Requirements/Standards for Projects

Priority Development Projects are required to implement hydromodification mitigation measures so that post-project runoff flow rates and durations do not exceed pre-project flow rates and durations where such increases would result in an increased potential for erosion or significant impacts to beneficial uses. Hydromodification mitigation can provide:

- Demonstration of no post-project increase in impervious area and resultant peak flow rates as compared to pre-project conditions;
- Installation of LID BMPs, such as bioretention facilities, to control runoff flows and durations from new impervious areas;
- Mitigation of flow and durations through implementation of extended detention flow duration control basins;
- Preparation of continuous simulation hydrologic models and comparison of the pre-project and mitigated post-project runoff peaks and durations (with hydromodification flow controls) until compliance is achieved; and
- Implementation of in-stream rehabilitation controls to demonstrate that projected increases in runoff peaks and/or durations would not accelerate erosion to the rehabilitated receiving stream reach.

The HMP Decision Matrix, which leads project applicants through the HMP compliance options, is located in Chapter 6.

Exemptions

The HMP Decision Matrix outlines potential exemptions from hydromodification management criteria. These potential exemptions include discharges to exempt receiving waters such as the Pacific Ocean, to hardened conveyance systems that extend to exempt systems, as well as discharges to highly urbanized watersheds (greater than 70 percent imperviousness).

Selection and Implementation of BMPs

The project proponent may use Low-Impact Development (LID) integrated management practices to mitigate hydromodification impacts, using design procedures, criteria and sizing factors developed by the consultant team with input from the TAC and Copermittees. The sizing factor development protocol, which includes the use of a continuous simulation of runoff from the long-term rainfall record, is detailed in Chapter 7.

LID facilities must be designed to be practically built and maintained within the urban environment. Since the HMP will be implemented through the municipal development review process, design criteria have been specified and will be incorporated into conditions of approval. This HMP advocates the use of LID design approaches to provide both treatment of the 85th percentile water quality event as well as flow control to meet hydromodification criteria. To assure compliance with hydromodification flow control requirements, design criteria, specifications, and long-term operations and maintenance requirements have been provided in the Model SUSMP for a variety of LID-based flow control methods including bioretention basins, flow-through planter boxes, and bioretention systems in combination with cisterns and vaults. Provisions will also be provided for the design of larger extended detention flow duration control scenarios subsequent to approval of the HMP by the Regional Board and subsequent approval of local SUSMPs.

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Details regarding rainwater harvesting, the collection of storm water for future reuse and a potentially effective storm water quality mitigation approach, are discussed in the San Diego Model SUSMP document. Because the release of the collected water is not standardized and since a full collection facility at the onset of rainfall would provide no flow control benefit, rainwater harvesting methods are not discussed in this HMP.

Proof of a long-term, ongoing maintenance responsibility and mechanism will be required for all post-construction BMP and flow control facilities. If not properly designed or maintained, hydromodification flow control devices may create a habitat for vectors such as mosquitoes or rodents. Maintenance activities for flow control and LID devices will be specified in the proposed Project Submittal.

Monitoring and BMP Evaluation

Chapter 8 of this HMP includes an outline for a monitoring program to assess the effectiveness of hydromodification management facilities. Monitoring activities will include inflow and outflow monitoring from BMPs, baseline cross section monitoring, and flow-based sediment monitoring. These monitoring efforts will coordinate with ongoing hydromodification monitoring work conducted by SCCWRP.

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1. INTRODUCTION

Hydromodification refers to changes in the magnitude and frequency of stream flows as a result of urbanization and the resulting impacts on receiving channels in terms of erosion, sedimentation, and degradation of in-stream habitat. The degree to which a channel will erode is a function of the increase in driving force (shear stress), the resistance of the channel (critical shear stress), the change in sediment delivery, and the geomorphic condition of the channel. Critical shear stress is the stress threshold above which erosion occurs. Not all flows cause erosion -- only those that generate shear stress in excess of the critical shear stress of the bank and bed materials. Urbanization increases the shear stress exerted on the channel by stream flows and can trigger erosion in the form of incision (channel downcutting), widening (bank erosion), or both. Increases in flow below critical shear stress levels have little or no effect on the channel.

Provision D.1.g of the San Diego Regional Water Quality Control Board (RWQCB) Permit Order R9-2007-0001 requires the Copermittees to implement a HMP "…to manage increases in runoff discharge rates and durations from all Priority Development Projects, where such increased rates and durations are likely to cause increased erosion of channel beds and banks, sediment pollutant generation, or other impacts to beneficial uses and stream habitat due to increased erosive force." Where receiving stream channels are already unstable, hydromodification management can be thought of as a method to avoid accelerating or exacerbating existing problems. Where receiving stream channels are in a state of dynamic equilibrium, hydromodification management may prevent the onset of erosion or other problems.

To address the permit condition, the San Diego Storm Water Copermittees, represented by the County of San Diego, hired a consultant team and proceeded with developing an HMP that meets the intent of the Order. Permit Order R9-2007-0001 contains certain requirements that strongly influence the methodology chosen in development of the HMP. The Permit requires the Copermittees to develop an HMP for all Priority Development Projects (with certain exemptions) and develop standards to control flows within the geomorphically-significant flow range. Supporting analyses must be based on continuous hydrologic simulation modeling.

The Copermittees will incorporate HMP requirements into the local approval processes via incorporation of HMP criteria into local SUSMPs. The San Diego region's updated Model SUSMP will incorporate the Final HMP criteria. HMP criteria will be incorporated into the local SUSMP and municipal ordinances no later than 180 days following RWQCB adoption of the HMP.

It should be noted that the San Diego RWQCB jurisdiction area covers the majority of San Diego County. A portion of eastern San Diego County, all of which is part of the unincorporated County of San Diego, is under the jurisdiction of the Colorado River RWQCB and is not subject to the provisions of this HMP.

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2. COPERMITTEE HMP DEVELOPMENT PROCESS

Although the County of San Diego serves as the lead agency for development of the HMP, all 20 of the other Copermittees have participated in its development, both financially and through participation in the Copermittees' Hydromodification/SUSMP Workgroup, which is a subcommittee of the Copermittees' Land Development Workgroup. The Hydromodification/SUSMP Workgroup was convened periodically over the course of the project at times corresponding with key decision points in developing the HMP and the update to the Model SUSMP.

This workgroup was tasked with providing regional standards and consistency in the development, implementation, assessment, and reporting of urban runoff activities and programs related to hydromodification management. As required by Permit Section D.1.g, the Workgroup assisted in the development of the regional HMP.

It should be noted that Copermittees' Regional Land Development Workgroup will continue to meet to discuss and resolve any issues that may arise during the HMP implementation phase. The Workgroup will also assist in the refinement and reinforcement of methodologies, criteria, and standards established in the HMP. This Workgroup has provided training regionally to municipal staffs as well as the local engineering community on LID and hydromodification management concepts, as well as requirements in the updated Model SUSMP and HMP.

The Copermittee HMP Workgroup met 14 times since July 2007. The table below summarizes meeting dates, locations, and agenda items. In addition to the formal meetings, the Copermittee HMP Workgroup coordinated via email on countless occasions to review and discuss technical documents, deliberate regarding specific HMP-related topics and reach consensus to provide direction for the consultant team.

Table 2-1. Copermittee Workgroup Meetings Summary

Date	Location	Agenda
July 26, 2007	County of San Diego 9325 Hazard Way San Diego, CA	• Formation of a Technical Advisory Committee • Discussion of HMP requirements in other permits • Consultant contract for HMP
August 23, 2007	City of San Diego 2392 Kincaid Road San Diego, CA	• Formation of a Technical Advisory Committee • Consultant contract for HMP
October 18, 2007	County of San Diego 9325 Hazard Way San Diego, CA	• Development of interim hydromodification criteria • Technical Advisory Committee
November 5, 2007	County of San Diego 5201 Ruffin Road San Diego, CA	• Development of interim hydromodification criteria
December 13, 2007	County of San Diego 5201 Ruffin Road San Diego, CA	• Development of interim hydromodification criteria

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Table 2-1. Copermittee Workgroup Meetings Summary

Date	Location	Agenda
May 12, 2008	County of San Diego 5201 Ruffin Road San Diego, CA	• Development of interim hydromodification criteria
June 19, 2008	County of San Diego 5201 Ruffin Road San Diego, CA	• HMP progress report
October 21, 2008	County of San Diego 5201 Ruffin Road San Diego, CA	• HMP submittal to the Regional Board
December 16, 2008	County of San Diego 5201 Ruffin Road San Diego, CA	• HMP submittals to the Regional Board • Rain gauge data for HMP continuous simulation modeling
January 15, 2009	City of Chula Vista 1800 Maxwell Road Chula Vista, CA	• Approval of Draft HMP for submittal to RWQCB • Approval of Model SUSMP for submittal to RWQCB
July 20, 2009	County of San Diego 5201 Ruffin Road San Diego, CA	• HMP Decision Matrix • Discussion of potential exemptions
October 28, 2009	City of Chula Vista 1800 Maxwell Road Chula Vista, CA	• Discussion of Draft Final HMP document • Discussion of HMP implementation • HMP Design Standards
June 22, 2010	County of San Diego 5201 Ruffin Road San Diego, CA	• HMP Monitoring Plan
September 22, 2010	City of Santee 10601 Magnolia Avenue Santee, CA	• HMP Monitoring Plan • QAPP Development Process

The Copermittees will incorporate HMP requirements into the local approval processes via incorporation of HMP criteria into their local SUSMPs and municipal ordinances no later than 180 days following RWQCB adoption of the HMP. The San Diego region's updated Model SUSMP will also incorporate the Final HMP criteria.

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3. TECHNICAL ADVISORY COMMITTEE

A key element of the San Diego HMP was the creation and involvement of a TAC. The TAC members consist of respected individuals from academia, technical resource agencies, the development community, consulting engineers, and environmental organizations. Dennis Bowling of the San Diego American Public Works Association (APWA), Chair of the Water Resources Committee, chairs the TAC. A list of all TAC members and attendees to the meetings is included at the end of this section. The TAC, which has been convened on t11 occasions that correlated with key decision-making points in the development of the HMP, was tasked with providing technical input to the HMP's scientific approach and interpretation of results integral to the establishment of numerical flow control standards as well as to the Copermittees for their policy determinations. At each TAC meeting, the consultant team presented a PowerPoint presentation describing the technical approach, and solicited feedback and buy-in from TAC members. While the TAC did not always achieve consensus on recommendations to the Copermittee workgroup, its discussions and alternate views were presented to the Copermittees for their consideration. An example involves comments provided by the Natural Resources Defense Council (NRDC) and Coastkeeper. While some of their comments, such as their opinion that storm events up to the 100-year event should be considered for hydromodification mitigation, differed from the majority consensus of the TAC, their comments were considered and specifically addressed. A comment response document to Coastkeeper comments is included in Appendix C.

Some of the key input received from the TAC included agreement with the Consultant Team's approach to using a synthetic watershed modeling approach to develop flow control standards (due to time constraints and a lack of published information on local geomorphology); agreement with the selection of 20 representative rain gauges and methodology to address data gaps (to provide the historical rainfall record for the required continuous simulation hydrologic modeling); agreement on the use of scaled Lindbergh Field data to conduct the initial modeling efforts (since available local rain gauge data sets were not in a format suitable for use with continuous simulation software at the time they were required); input on development of the HMP decision matrix; lower flow threshold calculator; and SCCWRP channel screening tools/domain of analysis.

The table below summarizes meeting dates, locations, and agenda items for all TAC meetings.

Table 3-1. Technical Advisory Group Meeting Summary

Date	Location	Agenda
February 20, 2008	City of San Diego Metro Biosolids Conference Rm. San Diego, CA	• Formation of a Technical Advisory Committee • Introduction of Consultant Team • Proposed approach to developing HMP and Model SUSMP Update (presentations by Dan Cloak, Dan Cloak Environmental Consulting and Andy Collison, PWA) • Input on how much channel erosion is tolerable • Input on how aggrading channels should be addressed

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Table 3-1. Technical Advisory Group Meeting Summary

Date	Location	Agenda
May 29, 2008	City of San Diego Metro Biosolids Conference Rm. San Diego, CA	• Recap of Interim HMP Standard • Input on/agreement with approach on synthetic watershed modeling approach (presentation by Andy Collison, PWA) • Input on/agreement with approach to conducting geomorphic assessment • Discussion of approach to conducting continuous hydrologic simulation modeling
August 5, 2008	City of San Diego Metro Biosolids Conference Rm. San Diego, CA	• Input on/agreement with approach to selection of representative gauges and management of rainfall data (Presentation by Eric Mosolgo, Brown and Caldwell) • Overview of approach to conducting continuous hydrologic simulation modeling (Presentation by Eric Mosolgo, Brown and Caldwell) • Overview of BMP Sizing Tool Development (Presentation by Eric Mosolgo) • Initial results of synthetic watershed modeling based on 2 watersheds in San Diego County (Presentation by Andy Collison, PWA)
October 14, 2008	City of San Diego Stormwater Dept. Conference Rm. 9370 Chesapeake Drive San Diego, CA	• Recap of meeting with Regional Board to discuss HMP and Model SUSMP Update submittals • Input on/agreement with approach to supplementing rain gauge data sets and selection of proper rain gauge(s) for a project (Presentation by Eric Mosolgo, Brown and Caldwell) • Additional discussion of continuous hydrologic simulation modeling, including use of partial duration series data (Presentation by Eric Mosolgo and Tony Dubin, Brown and Caldwell) • Discussion of findings of synthetic watershed modeling (Presentation by Andy Collison and Christie Beeman, PWA)
February 12, 2009	City of San Diego Stormwater Dept. Conference Rm. 9370 Chesapeake Drive San Diego, CA	• Review of Draft HMP submittal to RWQCB, review of concurrent SCCWRP modeling, summary of flow threshold modeling efforts (Presentation by Eric Mosolgo, Brown and Caldwell) • Presentation of flow threshold analysis and lower threshold alternatives including watershed position and channel characteristics (Presentation by Andy Collison and Christie Beeman, PWA)
April 21, 2009	City of San Diego Stormwater Dept. Conference Rm. 9370 Chesapeake Drive San Diego, CA	• Review of comments prepared by Dr. Richard Horner, prepared on behalf of Coastkeeper, pertaining to the Draft HMP submitted to the RWQCB; review of SCCWRP work for San Diego HMP; requirements for partial duration rainfall series analysis; watershed position affects on lower flow threshold; and development of the HMP implementation decision matrix (Presentation by Eric Mosolgo, Brown and Caldwell) • Development of lower flow threshold nomograph and determination of alternate minimum flow rate (Presentation by Christie Beeman, PWA)
June 17, 2009	City of San Diego Stormwater Dept. Conference Rm. 9370 Chesapeake Drive San Diego, CA	• Summary and review of SCCWRP progress on developing the Channel Susceptibility Analysis and Domain of Analysis (Presentation by Eric Stein, SCCWRP, via telephone) • Review and discussion of lower flow threshold nomograph (Presentation by Andy Collison, PWA, via telephone) • Review of minimum flow rate and cumulative impacts (Eric Mosolgo, Brown and Caldwell) • Response to Coastkeeper comments on Draft HMP (Eric Mosolgo, Brown and Caldwell) • Discussion of BMP Sizing Calculator development (Presentation by Tony Dubin, Brown and Caldwell, via telephone, and Eric Mosolgo) • Discussion of Draft HMP Decision Matrix (Eric Mosolgo, Brown and Caldwell)

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Table 3-1. Technical Advisory Group Meeting Summary		
Date	**Location**	**Agenda**
July 29, 2009	City of San Diego Stormwater Dept. Conference Rm. 9370 Chesapeake Drive San Diego, CA	• Review of SCCWRP progress on developing the channel screening tools (Eric Mosolgo, Brown and Caldwell) • Discussion of Revised Draft HMP Decision Matrix (Eric Mosolgo, Brown and Caldwell) • Responses to RWQCB comments on Draft HMP submittal (Eric Mosolgo, Brown and Caldwell)
September 30, 2009	City of San Diego Stormwater Dept. Conference Rm. 9370 Chesapeake Drive San Diego, CA	• Summary and review of SCCWRP progress on developing the Channel Susceptibility Analysis and Domain of Analysis (Presentation by Eric Stein, SCCWRP) • Discussion of Track 1 and Track 2 flow threshold analysis development (Presentation by Andy Collison, PWA, via telephone and Webcast) • Discussion of Draft HMP Decision Matrix, HMP exemptions, design standards technical memo, and proposed monitoring plan (Eric Mosolgo, Brown and Caldwell)
October 16, 2009	City of San Diego Stormwater Dept. Conference Rm. 9370 Chesapeake Drive San Diego, CA	• Discussion of minimum orifice size (Eric Mosolgo, Brown and Caldwell) • Review of proposed monitoring plan (Eric Mosolgo, Brown and Caldwell) • Review of lower flow threshold analysis and modification to the PWA calculator (Eric Mosolgo, Brown and Caldwell) • Review and discussion of revised HMP Decision Matrix incorporating the SCCWRP Channel Susceptibility tools (Eric Mosolgo, Brown and Caldwell)
June 21, 2010	City of San Diego Stormwater Dept. Conference Rm. 9370 Chesapeake Drive San Diego, CA	• HMP Monitoring Plan

The tables below list TAC members, non-TAC member meeting attendees, and the HMP Consultant Team.

Table 3-2. Technical Advisory Committee (TAC)	
Name and Entity	**Sector Represented**
Sara Agahi, County of San Diego	San Diego Stormwater Copermittees
Edward Beighley, San Diego State University	BMP and Erosion Control Expert
Livia Borak, San Diego Coastkeeper, Natural Resources Defense Council (NRDC)	Environmental Community
Dennis Bowling, Rick Engineering	Chair of TAC
Dr. Howard Chang, San Diego State University	Geomorphology Expert
Rob Hawk, City of San Diego	Geotechnical Expert
Mikhail Ogawa, Mikhail Ogawa Engineering	TAC Coordinator
Eric Reichard, U.S. Geological Survey	Geology Expert
Eric Sattler, Spear & Associates	North County Engineers Council
Gabriel Solmer, San Diego Coastkeeper, Natural Resources Defense Council (NRDC)	Environmental Community
Eric Stein, Southern California Coastal Water Research Project (SCCRWP)	Technical Resource Agency
Garret Tam Sing, CA Department of Water Resources	Technical Resource Agency
Martin Teal, West Consultants	Consulting Engineers
Tory Walker, Tory Walker Engineering	Building Industry Association

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Table 3-3. TAC Meeting Attendees (Non-TAC Members)	
Name	**Entity/Affiliation**
David Hauser	City of Carlsbad
Glen Van Peski	City of Carlsbad
Khosro Aminpour	City of Chula Vista
Silvester Evetovich	City of Chula Vista
Tom Adler	City of Chula Vista
Jaime Campos	City of El Cajon
Masih Maher	City of Encinitas
Erik Steenblock	City of Encinitas
Cheryl Filar	City of Escondido
Homi Namdari	City of Escondido
Mo Lahsaie	City of Oceanside
Alison Witheridge	City of Oceanside
Billy Walker	City of Oceanside
Danis Bechter	City of Poway
Roger Morrison	City of Poway
Sumer Hasenin	City of San Diego
James Nabong	City of San Diego
Sassan Haghgoo	City of San Marcos
Julie Procopio	City of Santee
Greg Mayer	City of Vista
Karen Franz	Coastkeeper
Vaikko Allen	Contech Stormwater Solutions
Chris Crompton	County of Orange
George Edwards	County of Orange
Anthony Barry	County of San Diego
John Quenzer	D-MAX Engineering
Arsalan Dadkhah	D-MAX Engineering/City of National City
Dick Rol	Foothill Engineering
Jeff O'Connor	Home Fed
Dave Hammar	Hunsaker & Associates
Luis Parra	Hunsaker & Associates, Adams Engineering, URS
Eylon Shamir	Hydrologic Research Center
Rosanna Lacarra	PBS&J
Debby Reece	Project Design Consultants
Allison Gutierrez	Port of San Diego
Karen Holman	Port of San Diego
Rich Lucera	RBF
Braeden Macguire	RBF

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Table 3-3. TAC Meeting Attendees (Non-TAC Members)	
Name	**Entity/Affiliation**
Laura Henry	Rick Engineering
Bob Cullen	Riverside County Flood Control & Water Conservation District
Jason Uhley	Riverside County Flood Control & Water Conservation District
Tyler Schemper	Tory Walker Engineering
Matt Moore	URS Corporation/Port of San Diego

Table 3-4. HMP Consultant Team	
Name	**Company**
Christie Beeman	Philip Williams & Associates
Dr. Andrew Collison	Philip Williams & Associates
Dan Cloak	Dan Cloak Environmental Consulting
Tony Dubin	Brown and Caldwell
Nancy Gardiner	Brown and Caldwell
Eric Mosolgo	Brown and Caldwell

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4. LITERATURE REVIEW

Pursuant to Permit Section D.1.g(1)(e), this section provides the results of a literature review conducted as a basis for the initial development of the HMP.

4.1 Flow Control Approach

HMPs that have been developed in the San Francisco Bay Area of California (Contra Costa, Santa Clara, and Alameda Counties) vary with regard to the emphasis placed on lower flow control thresholds as compared to other approaches, such as distributed LID methods. However, there is consensus in that both the frequency and duration of flows must be controlled, requiring the use of continuous simulation hydrologic modeling (as opposed to the more standard design storm approach used for flood control design) for evaluation of potential development impacts. It is also generally accepted that events smaller than the 10-year design flow are the most critical for hydromodification management.

The Santa Clara HMP focused on the use of detention basins for hydromodification management and strongly emphasized the lower flow control limit for site runoff. Extended detention flow control basins can utilize multi-stage outlets to mitigate both the duration and magnitude of flows within a prescribed range. To avoid the erosive effects of extended low flows, the maximum rate at which runoff is discharged is set below the erosive threshold. Per the Santa Clara HMP, the lower flow control limit was defined as the flow rate that generates critical shear stress on the channel bed and banks. Both Santa Clara and Alameda Counties correlated the lower flow control limit to a value equal to 10 percent of the 2-year runoff event.

The Contra Costa HMP strongly emphasized the use of LID methods to meet hydromodification management criteria. LID approaches to hydromodification management rely on site design and distributed LID Best Management Practices (BMPs) to control the frequency and duration of flows and to mitigate hydrograph modification impacts. By minimizing directly connected impervious areas and promoting infiltration, LID approaches mimic natural hydrologic conditions to counteract the hydrologic impacts of development. Because more runoff is retained onsite and in distributed facilities the lower discharge limit is less critical for LID facilities since different facilities discharge to the stream system at different times.

The County of San Diego and Copermittees interviewed three consultant teams as part of the selection process to develop the HMP. The selection panel; which included representatives from the County of San Diego, City of San Diego, City of Chula Vista, and the City of Encinitas, selected the team led by Brown and Caldwell and included Phillip Williams Associates and Dan Cloak Engineering. This team had previously developed the HMP for Contra Costa County and thus, the Contra Costa approach was selected as the base approach for the San Diego HMP.

For the San Diego region's Interim Hydromodification Management Criteria, the range of flows to be managed under the hydrograph curve-matching approach (matching of peak flows and durations within the geomorphically significant range) was expressed as a percentage of the 5-year runoff event, based on the understanding that the 5-year runoff event is considered the dominant channel-forming discharge for Southern California streams. This assumption was based upon the paper titled, "Effect of Increases in Peak Flows and Imperviousness on the Morphology of Southern California Streams," by Coleman, MacRae, and Stein. The following list details the range of flows recommended in the San Diego region's Interim Hydromodification Criteria.

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- For flow rates between 20 percent of the pre-project 5-year runoff event and the pre-project 10-year runoff event, the post-project discharge rates and durations may not deviate above the pre-project discharge rates and durations by more than by more than 10 percent over more than 10 percent of the length of the flow duration curve.
- For flow rates between 20 percent of the pre-project 5-year runoff event and the pre-project 5-year runoff event, the post-project flows shall not exceed pre-project flows. For flow rates between the 5-year and 10-year runoff events, post-project flows may exceed pre-project flows by up to 10 percent for a 1-year frequency interval.
- The project proponent may also use LID integrated management practices to manage hydromodification impacts, using design procedures, criteria, and sizing factors (ratio of the required LID area to the tributary impervious area) specified by the Copermittees.

The Interim Hydromodification Management Criteria listed above were put in place beginning in January 2008 for development projects that disturb 50 acres or more.

Hydromodification in the context of this project refers to changes in the magnitude and frequency of stream flows as a result of urbanization and the resulting impacts on the receiving channels in terms of erosion, sedimentation, and degradation of instream habitat. The processes involved in this degradation are complex, but involve an alteration of the hydrologic regime of a watershed due to increases in impervious surfaces, more efficient and dense storm drain networks, and a change in historic sediment sources. The study of hydromodification is an evolving field, and regulations to manage the impacts of hydromodification must take into account the latest science available.

HMPs seek ways to mitigate erosion impacts by establishing requirements for controlling runoff from new development. In order to establish appropriate regulations, it is important to understand 1) how land use changes alter storm water runoff; and 2) how these changes can impact stream channels. This literature review focuses on how these issues have been addressed in HMPs adopted within the state of California as well as relevant journal articles, books, and other reports. This report builds upon previous literature reviews developed for other HMPs, and attempts to not repeat information that can be found in those reports. Instead this report is a synthesis of information that can be found in those studies and is augmented with either more recent studies or information relevant to Southern California.

4.1.1 Previous Studies

Previous hydromodification literature reviews were conducted by Geosyntec Consultants (Mangarella and Palhegyi, 2002) for the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP) and by the Contra Costa Clean Water Program (CCCWP 2004). Mangarella and Palhegyi provide a detailed overview of the geomorphic and hydrologic processes involved in hydromodification and the reader is directed there for more detailed information on the mechanics of stream erosion. Channel Assessment methods described in Section 2 of this report rely heavily on those reviewed by Bledsoe et al. (2008) for SCCWRP.

As of the date of this report, five approved HMPs have been published. These include HMPs for SCVURPPP (2005), the CCCWP (2005), the Fairfield-Suisun Urban Runoff Management Program FSURMP (2005), the Alameda Countywide Clean Water Program (ACCCMP 2005), and the San Mateo County Stormwater Pollution Prevention Program (STOPPP 2005). In addition, a number of HMPs were implemented while agencies developed their final plans. Interim HMPs are not detailed in this report due to the fact that these plans have adopted findings from the above listed HMPs.

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4.1.2 Hydrograph Modification Processes

The effects of urbanization on channel response have been the focus of many studies (see Paul and Meyer, 2001 for a review), and the widely accepted consensus is that increases in impervious surfaces associated with urbanizing land uses can cause irreversible channel degradation. Urbanization generally leads to a change in the amount and timing of runoff in a watershed, which leads to increases in erosive forces on bank and bed material. This can cause large-scale channel enlargement, stream bank failure, loss of aquatic habitat and degradation of water quality.

Channel erosion, like most physical processes, is a complex system based on a variety of influences. Channel erosion is non-linear (Philips 2003) meaning the response of streams is not directly proportional to changes in land use and flow regimes. Small changes or temporary disturbances in a watershed may lead to unrecoverable channel instability (Kirkby 1995). These disturbances may give rise to feedback systems whereby small instabilities can be propagated into larger and larger instabilities (Thomas 2001).

A variety of factors have been documented to contribute to instability in streams. These include historic land use practices such as grazing (Trimble and Mendel 1995), logging (Jana et al. 1975), wildfire patterns, (Benda et al., 2003), geologic uplift (Colin and Burbank 2007), climatic changes (Leeder 1998), or removal of flora or fauna from the watershed (Ripple et al. 2001).

Although these parameters are varied, urban runoff control programs focus on managing the effect that new impervious surfaces have on stream channels. Stream channels show some form of temporal stability, whereby they resist change until a threshold of system parameters are exceeded (Thomas 2001). A number of studies have sought to correlate the amount of urbanization in a watershed and stream instability (Bledsoe 2001; Booth 1990, 1991; Both and Jackson 1997; MacRae 1992; 1993; 1996; Coleman et al. 2005). Evidence from these studies suggests that streams resist instability until a watershed urbanization threshold is crossed. This threshold appears to be around seven to ten percent watershed urbanization for perennial streams (Schueler 1998 and Booth 1997), but may be much lower for intermittent streams such as those found in Southern California. Studies done in Santa Fe, New Mexico (Leopold and Dunne 1978) suggest that dramatic changes occur at four percent impervious area of the watershed. Initial studies by Coleman et al. (2005) suggest that this urbanization threshold may be as low as two to three percent for intermittent streams in Southern California. It is important to understand that use of impermeable cover alone is a poor predictor of channel erosion due to regional differences and differences in storm water detention and infiltration within regions.

Though it is well established that watershed urbanization causes channel degradation, a detailed understanding of how development alters runoff and how this altered runoff in turn causes erosion is still being developed. This section briefly describes these processes and summarizes methods used to quantify hydromodification impacts.

4.1.2.1 Effective Work

The ability of a stream to transport sediment is proportional to the amount of flow in the stream: as flow increases, the amount of sediment moved within a channel also increases. The ability of a stream channel to transport sediment is termed stream power, which integrated over time is work. Leopold (1964) introduced the concept of effective work, whereby the flow-frequency relationship of a channel is multiplied by sediment transport rate. This gives a mass-frequency relationship for erosion rates in a channel. Flows on the lower end of the relationship (e.g., two-year flows) may transport less material, but occur more frequently than higher flows, thereby having a greater overall effect on the work within the channel. Conversely, higher magnitude events, while transporting more material, occur infrequently so as to have less effective work. Leopold found that the maximum point on the effective work curve occurred around the 1- to 2-year frequency range. This maximum point is commonly referred to as the dominant discharge and corresponds

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roughly to a bankfull event (a flow that fills the actively scoured portion of the channel up to a well defined break in the bank slope).

Urbanization tends to have the greatest relative impact on flows that are frequent and small, and which tend to generate less-than-bankfull flows. Change is greatest in these events because prior to urbanization infiltration would have absorbed much or all of the potential runoff, but following urbanization a high percent of the rainfall runs off. Thus, events that might have generated little or no flow in a non-urbanized watershed can contribute flow in urban settings. These smaller less-than-bankfull events have been found to do a significant proportion of the work in urban streams (MaCrae 1993) due to their high frequency, and can lead to channel instability. Less frequent, larger magnitude flows (e.g., flows greater than Q10) are less strongly affected by urbanization because during such large storm events the ground rapidly becomes saturated and acts in a similar manner as impervious surfaces.

4.1.2.2 Erosion Potential

As part of the SCVURPPP's HMP process, GeoSyntec Consultants (2004) studied the Lower-Silver-Thompson Creek subwatershed in Santa Clara County to characterize the pre-development effective work and compare it to modeled post-development effective work. Stability was assessed by comparing these effective work curves via an erosion potential index (Ep). This value is the ratio of the effective work of a pre-development stream to that of a post-development stream. A developed stream with an Ep of 1.0 has the same ability to transport sediment as an undeveloped stable stream. Managing the Ep of a stream can focus on managing the hydrologic regime of a watershed or on managing the stream itself. Both of these methods are discussed in Section 4.1.4.

Ep was adopted as a hydromodification metric for the SCVURPPP's hydromodification management program, and was later incorporated into four of the five approved HMPs. In addition, its use is being promoted by several research and regulatory bodies.

4.1.2.3 Estimating Critical Q_c

Due to the increase in impervious surfaces and fewer opportunities for infiltration of storm water, urbanization creates more runoff volume than an un-urbanized watershed. Opportunities for infiltration of excess storm water exist in some areas, but many times are infeasible due to cost or land use constraints. Therefore, some of the excess storm water must be discharged to a receiving stream. In order to achieve a comparable Ep to a pre-developed condition, this excess runoff volume must be discharged at a rate at which no additional stream work is done.

Bed load sediment moves through transmission of shear stress from the flow of water to the bed load material. An increase in velocity of water corresponds to an increase in shear stress. In order to initiate movement of bed material, however, a shear stress threshold must be exceeded. This is commonly referred to as critical shear stress, and is dependent on sediment and channel characteristics. For a given point on a channel where the cross-section is known, the critical shear can be related to a stream flow. The flow that corresponds to the critical shear is known as the critical flow, or Qc. For a given cross-section, flows that are below the value for Qc do not initiate bed movement, while flows above this value do.

The SCVURPPP expressed Qc as a percentage of the two-year flow in order to develop a common metric across watersheds of different size, and allow for easy application of HMP requirements For the two watersheds studied, a similar relationship was found where Qc corresponded to 10 percent of the two-year flow. This became the basis for the lower range of geomorphically significant flows under the SCVURPPP HMP and is referred to as Qcp to indicate that it is a percentage of flow. That program also adopted the 10-year flow as the upper end of the range of flows to control with the justification that increases in stream work above the 10-year flow were small for urbanized areas.

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A similar study was conducted for the FSURMP on two watersheds in Fairfield, California following a geomorphic assessment. That study found Qcp to be 20 percent of the pre-development two-year flow. The differences in the two values may be attributable to differences in watershed characteristics in Santa Clara County and Fairfield. Channels in Fairfield were found to have a more densely vegetated riparian corridor and may have a higher resistance to increases in shear stresses (FSURMP). Values for Qcp appear to be similar among neighboring watersheds, but there appears to be no evidence for a 'universal' Qcp, and the characteristics of individual biomes (climatically and geographically defined areas of ecologically similar climatic conditions such as communities of plants, animals, and soil organisms, and are often referred to as ecosystems) should be taken into account when developing a Qcp. For example, Western Washington State, which has more densely vegetated riparian zones than either Fairfield or Santa Clara County, has adopted a Qcp of 50 percent of the 2-year flow.

A summary of flow control standards adopted in each of these HMPs is given in Table 4-1.

Table 4-1. Flow Control Standards Adopted by Selected Agencies for Hydromodification Management.

Permitting Agency	Qcp	Largest Managed Flow
Santa Clara County	10 percent of the 2-year flow (0.1Q2)	10-year flow (Q10)
Alameda County	10 percent of the 2-year flow (0.1Q2)	10-year flow (Q10)
San Mateo County	10 percent of the 2-year flow (0.1Q2)	10-year flow (Q10)
Contra Costa County	10 percent of the 2-year flow (0.1Q2)	10-year flow (Q10)
Fairfield-Suisun Urban Runoff Management Program	20 percent of the 2-year flow (0.2Q2)	10-year flow (Q10)
Western Washington State	50 percent of the 2-year flow (0.5Q2)	50-year flow (Q50)

4.1.3 Stream Channel Stability

Numerous stream channel stability assessment methods have been proposed to help identify which channels are most at risk from hydrograph modification impacts and/or define where HMP requirements should apply. Assessment strategies range from purely empirical approaches to channel evolution models to energy-based models (see Simon et al., 2007 for a critical evaluation).

4.1.3.1 Stream Classification Systems

A recent study by Bledsoe et al. (2008) for SCCWRP describes nine types of classification and mapping systems with an emphasis on assessing stream channel susceptibility in Southern California. The summary below is taken from that study. Bledsoe also provides a summary of the implications of these classification and mapping systems to the development of hydromodification tools for Southern California. The article provides a detailed breakdown of guidelines for developing hydromodification tools given the advantages and disadvantages of each system previously assessed.

Planform Classifications and Predictors

Alluvial channels form a continuum of channel types whose lateral variability is primarily governed by three factors: flow strength, bank erodibility, and relative sediment supply. Though many natural channels conform to a gradual continuum between straight and intermediate, meandering, and braided patterns, abrupt transitions in lateral variability imply the existence of geomorphic thresholds where sudden change can occur. The conceptual framework for geomorphic thresholds has proven integral to the study of the effects of disturbance on river and stream patterns. Many empirical and theoretical thresholds have been proposed relating stream power, sediment supply and channel gradient to the transition between braiding and meandering channels. Accounting for the effects of bed material size has been shown to provide a vital

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modification to the traditional approach of defining a discharge-slope combination as the threshold between meandering and braided channel patterns. The many braided planforms in Southern California indicate the need to refine and calibrate established thresholds to river networks of interest. However, at this time there is not a well accepted model to predict how hydromodification affects channel planform.

Energy-Based Classifications

The link between channel degradation and urbanization has been exhaustively studied; however, impervious area is not the solitary factor influencing channel response. Studies have shown that the ratio between specific stream power and median bed material size D50b, where b is approximately 0.4 to 0.5 for both sand- and gravel-bed channels, can be used as a valuable predictor of channel form. Stream power, which is related to the square root of total discharge, is the most comprehensive descriptor of hydraulic conditions and sedimentation processes in stream channels. Several studies have been performed relating channel stability to a combination of parameters such as discharge, median bed-material size, and bed slope, as an analog for stream power.

General Stability Assessment Procedures

By assessing an array of qualitative and quantitative parameters of stream channels and floodplains, several investigators have developed qualitative assessment systems for stream and river networks. These assessment methods have been incorporated into models used to analyze channel evolution and stability. Many parameters used to establish methodologies such as the Rosgen approach are extendable to a qualitative assessment of channel response in Californian river networks. Field investigations in Southern California have shown that grade control can be the most important factor in assessing the severity of channel response to hydromodification. Qualitative methodologies have proven extendable to many regions and utilize many parameters that may provide valuable information for similar assessments in California.

Sand vs. Gravel Behavior / Threshold vs. Live-Bed Contrasts

It is well recognized that the fluvial-geomorphic behavior varies greatly between sand and gravel/cobble systems. Live bed channels (of which sand channels are good examples) are systems where sediment moves at low flows, and where sediment is frequently in motion. Threshold channels such as gravel streams, by contrast, require considerable flow to initiate bedload movement. Live bed channels are more sensitive both to increases in flow and decreases in sediment supply than threshold channels. Scientific consensus shows that sand bed streams lacking vertical control show greater sensitivity to changes in flow and sediment transport regimes than do their gravel/cobble counterparts. Factors such as slope which affect discharge and sedimentation regimes are known to have greater impact on sand-bed streams. This can be an important issue for storm water systems that receive runoff from watersheds composed primarily of streams with sandy substrate. The transition between sand and gravel bed behavior can be rapid which may make it possible to utilize geographic mapping methods to identify channel segments according to their susceptibility to the effects of hydromodification.

Channel Evolution Models of Incising Channels

The Channel Evolution Model (CEM) developed by Schumm et al. (1984) posits five stages of incised channel instability organized by increasing degrees of instability severity, followed by a final stage of quasi-equilibrium. Work has been done to quantify channel parameters such as sediment load and specific stream power through each phase of the CEM. A dimensionless stability diagram was developed by Watson et al. (2002) to represent thresholds in hydraulic and bank stability. This conceptual diagram can be useful for engineering planning and design purposes in stream restoration projects requiring an understanding of the potential for shifts in bank stability.

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Channel Evolution models Combining Vertical and Lateral Adjustment Trajectories

Originally, CEMs focused primarily on incised channels with geotechnically, rather than fluvially, driven bank failure. Several CEMs have been proposed that incorporate channel responses to erosion and sediment transport into the original framework for channel instability. In these new systems, an emphasis is placed on geomorphic adjustments and stability phases that consider both fluvial and geomorphic factors. The state of Vermont has developed a system of stability classification that suggests channel susceptibility is primarily a function of the existing Rosgen stream type and the current stream condition referenced to a range of variability. This system places more weight on entrenchment (vertical erosion of a channel that occurs faster than the channel can widen, so that the resulting channel is more confined than the original channel) and slope than differentiation between bed types.

Equilibrium Models of Supply vs. Transport-capacity / Qualitative Response

The qualitative response model builds on an understanding of the dynamic relationship between the erosive forces of flow and slope relative to the resistive forces of grain size and sediment supply to describe channel responses to adjustments in these parameters. In this system qualitative schematics provide predictions for channel response to positive or negative fluctuations in physical channel characteristics and bed material. Refinements to such frameworks have been made to account for channel susceptibility relative to existing capacity and riparian vegetation among other influential characteristics.

Bank Instability Classifications

Early investigations provided the groundwork for bank instability classifications by analyzing shear, beam, and tensile failure mechanisms. The dimensionless stability approach developed by Watson characterized bank stability as a function of hydraulic and geotechnical stability. Rosgen (1996) proposed the widely applied Bank Erosion Hazard Index (BEHI) as a qualitative approach based on the general stability assessment procedures outlined above. Other classification systems, like the CEM, identify bank instability according to channel characteristics that control hydrogeomorphic behavior.

Hierarchical Approaches to Mapping Using Aerial Photographs / GIS

It has become increasingly common practice to characterize stream networks as hierarchical systems. This practice has presented the value in collecting channel and floodplain attributes on a regional scale. Multiple studies have exploited geographical information systems (GIS) to assess hydrogeomorphic behavior at a basin scale. Important valley scale indices such as valley slope, confinement, entrenchment, riparian vegetation influences, and overbank deposits can provide indispensable information for river networks in California. Many agencies are developing protocol for geomorphic assessment using GIS and other database associated mapping methodologies.

4.1.4 Managing Hydromodification

Most HMPs provide guidance on how Copermittees can meet the goals of their program. There are many different approaches and most HMPs provide multiple options for achieving and documenting compliance. In general, hydrograph management approaches focus on managing runoff from a developed area so as to not increase instability in a channel, and in-stream solutions focus on managing the receiving channel to accept an altered flow regime without becoming unstable. This chapter briefly summarizes various approaches for HMP compliance.

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4.1.4.1 Hydrograph Management Solutions

Facilities that detain or infiltrate runoff to mitigate development impacts are the focus of most HMP implementation guidance. They work either by reducing the volume of runoff (infiltration facilities) or by holding water and releasing it below Qc (retention facilities). These facilities, sometimes referred to as BMPs, can range from regional detention basins designed solely for flow control, to bioretention facilities that serve a number of functions. A number of BMPs including swales, bioretention, flow-through planters, and extended detention basins have been developed to manage storm water quality, and there are several resources that describe the design of storm water quality BMPs (CASQA 2003; Richman et al. 2004). In many cases these facilities can be designed to also meet hydromodification management requirements.

Many HMPs also provide guidance for applying LID approaches to site design and land use planning to preserve the hydrologic cycle of a watershed and mitigate hydromodification impacts. These plans typically include decentralized storm water management systems and protection of natural drainage features, such as wetlands and stream corridors. Runoff is typically directed toward infiltration-based storm water BMPs that slow and treat runoff.

The following sections summarize implementation guidance for designing hydromodification management BMPs that have been developed for existing HMPs.

Sizing Hydromodification BMPS

Hydromodification BMPs differ slightly from those BMPs used to meet water quality objectives in that they focus more on matching undeveloped flow-regimes than on filtering storm runoff, although these two functions can be combined into one facility. Various methods exist for sizing Hydromodification BMPs.

Hydrograph Matching. This is an approach whereby the outflow hydrograph for a particular site matches closely with the pre-project hydrograph for a design storm. This method is most traditionally used to design flood-detention facilities to mitigate for a particular storm recurrence interval (e.g., the 100-year storm). Although hydrograph matching can be employed for multiple storms, this method generally does not take into account the smaller, more frequent storms where a majority of the erosive work in stream channel is done and is therefore not widely accepted for HMP compliance.

Volume Control. This is a method for matching the pre-project and post-construction runoff volume for a project site. Any increase in runoff volume is either infiltrated on site, or discharged to another location where streams will not be impacted. The magnitude of peak flows is not controlled, and therefore this method, while ensuring that there is no increase in total volume of runoff, can result in higher erosive forces during storms.

Flow Duration Control. Refers to matching both the duration and magnitude of a specified range of storms. The entire hydrologic record is taken into account and pre-project and post-construction runoff magnitudes and volumes are matched as closely as possible. Excess runoff is either infiltrated on site, or is discharged below Qcp.

The SCVUPPP HMP reviewed each of these design approaches and concluded that a Flow Duration Control design approach was the most effective in controlling erosive flows. Two examples were evaluated using this approach, one on the Thompson Creek subwatershed in Santa Clara Valley and one on the Gobernadora Creek watershed in Orange County. The evaluation approach used continuous simulation modeling to generate flow-duration curves, and then designed a test hydromodification management facility to match pre-project durations and flows.

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In addition to the SCVURPP, the flow duration control design approach has been applied by ACCWP, STOPPP, FSURMP, and CCCWP. Among these agencies, different approaches have emerged as to how to demonstrate that proposed BMPs meet flow-duration control guidelines. Both methods employ continuous simulation to match flow-durations, but differences exist in how continuous simulation is used (site-specific simulation vs. unit area simulation). Differences also exist in the focus of the two approaches (regional detention facilities vs. on-site LID facilities). Both approaches were evaluated by the RWQCB, and deemed to be valid approaches (Butcher 2007).

BAHM Approach

The Bay Area Hydrology Model (BAHM) is a continuous simulation rainfall-runoff hydrology model developed for ACCWP, STOPPP, and SCVURPP . It was developed from the Western Washington Hydrology Model, which focuses primarily on meeting hydromodification management requirements using storm water detention ponds alone or combined with LID facilities (Butcher 2007). The Western Washington Hydrology model is based on the Hydrologic Simulation Program FORTRAN (HSPF) modeling platform, developed by the USEPA, and uses HSPF parameters in modeling watersheds.

BAHM is a standalone modeling package that is available free of charge to the public. Project proponents who want to size a hydromodification BMP select the location of their project site from a map of the county and BAHM correlates the project location to the nearest rainfall gauge and applies an adjustment factor. The adjustment factor is applied to the hourly rainfall for the nearest gauge, to produce a weighted hourly rainfall at the project site. The user then enters parameters for the proposed project site that describe soil types, slope, and land uses. BAHM then runs the continuous rainfall-runoff simulation for both the pre-project and the post-construction conditions of the project site. Output is provided in the form of flow-duration curves that compare the magnitude and timing of storms between the pre-project and the post-construction modeling runs.

If an increase in flow durations is predicted, the user can select and size mitigation BMPs from a list of modeling elements. An automatic sizing subroutine is available for sizing detention basins and outlet orifices that matches the flow duration curves between the pre-project scenario and a post-construction mitigation scenario. Manual sizing is necessary for other BMPs included in the program, such as storage vaults, bioretention areas, and gravel trenches. The program is designed so that once a BMP is selected and sized, the modeling run can be transferred to the local agency for approval. The model reviewer at the local agency can open the program and verify modeling parameters and sizing techniques.

CCCWP Approach

The CCCWP developed their own protocol for selecting and sizing hydromodification BMPs, which are referred to as Integrated Management Practices (IMPs) in their guidebook. Instead of a project proponent running a site-specific continuous simulation to size hydromodification control facilities, the CCCWP provides sizing factors for designing IMPs. Sizing factors are based on the soil type of the project site and are adjusted for Mean Annual Precipitation. Sizing factors are provided for Bioretention Facilities, Flow-Through Planters, Dry Wells and a combination Cistern and bioretention facility.

Sizing factors were developed through continuous-simulation HSPF modeling runs for a variety of development scenarios. Flow-durations were developed for a range of soil types, vegetation and land use types, and rainfall patterns for development areas in Contra Costa County. Then, based on a unit area (one acre) of impervious surface, flow-durations were modeled using several IMP designs. These IMPs were then sized to achieve flow control for the range of storms required, (from 10 percent of the 2-year storm up to the 10-year storm). These sizing factors were then transferred to a spreadsheet form for use by project proponents.

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The primary difference between the CCCWP approach and the BAHM approach is the focus on type of BMP used. Whereas the CCCWP approach focuses on meeting hydromodification management goals using lot-scale LID facilities, the BAHM approach is geared toward employing detention basins. Although the CCCWP approach is based on utilizing sizing factors for specific BMPs, the program does allow for application of site-specific continuous simulation modeling, such as HSPF, if the relevant sizing factor has not been developed, such as storm water detention basins or constructed wetlands. This approach can be used for larger developments where regional hydromodification facilities will be used.

4.1.4.2 In-Stream Stabilization Solutions

In-stream solutions focus on managing the stream corridor to protect stability and, if necessary, modify stream channels to accept an altered flow regime. In cases where development is proposed in an already degraded watershed it may be beneficial to focus on rehabilitating the stream channel with an altered flow regime in mind rather than retrofitting the watershed or only controlling a percentage of the runoff. In addition, in some cases where a master-planned watershed development plan is being implemented it may be more feasible to design a new channel to be stable under the proposed watershed land use rather than to construct distributed on-site facilities.

Newhall Ranch Natural River Management Plan

An example where in-stream solutions are being designed at the Master Plan level can be found in the Newhall Ranch Natural River Management Plan. The proposed Newhall Ranch development near Valencia, California is employing a combination of distributed storm water quality facilities to manage storm water pollutants and in-stream management actions to manage an altered flow regime. The management plan began with an analysis of post-development flow conditions, then found slopes and channel cross-sections that would be stable under these altered conditions. Biotechnical bank stabilization and stable step-pools were included to allow the new channel to resist higher shear forces. The plan has been approved by Los Angeles County Department of Public Works.

The key objectives for the in-stream channel design employed for the Newhall Ranch development were:

- Accommodate runoff flows from existing and future development;
- Stabilize the channel bed and banks so that they do not degrade;
- Preserve the waterway and canyon characteristics and environment, where applicable;
- Minimize riparian and bank disturbance during construction, where applicable;
- Implement improvements that are the most compatible with the environment and character of the region, yet sustainable on a long-term basis and
- Minimize channel maintenance requirements.

Other Methods

A number of methods exist for managing channels to accept altered flow regimes and higher shear forces. These have been covered in detail in a number of sources available to watershed groups and public agencies. (A few helpful sources include Riley 1998, Watson and Annable 2003, and FISRWG 1998.)

4.2 Continuous Simulation Modeling

As part of the HMP development, Brown and Caldwell is preparing flow control sizing tools to assess the effectiveness of hydromodification controls. A beta version of the HMP Sizing Calculator will be available by early 2010 and will be reviewed by the HMP TAC. Since those sizing tools are not yet available, Brown and Caldwell has identified specific evaluation criteria for the design and analysis of hydromodification controls

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using continuous simulation hydrologic modeling. Evaluation criteria discussed herein focuses on the following items:

- Continuous Simulation Hydrologic Modeling
- Continuous Simulation Modeling Software
- Long-Term Hourly Precipitation Gauge Data
- Parameter Validation for Rainfall Losses
- Hydromodification Control Processes
- Peak Flow and Flow Duration Statistics

Pursuant to criteria set forth by the San Diego RWQCB and by the San Diego County Copermittees in the Hydromodification Criteria, the use of continuous simulation hydrologic modeling is required to size storm water facilities to mitigate hydromodification effects. Continuous simulation modeling uses an extended time series of recorded precipitation data as input and generates hydrologic output, such as surface runoff, groundwater recharge, and evapotranspiration, for each model time step.

Continuous hydrologic models are typically run using either 1-hour or 15-minute time steps. Based on a review of available rainfall records in San Diego County, we are recommending the use of a 1-hour time step (15-minute time series rainfall data are very limited). Continuous models generate model output for each time step. In this case, hydrologic output would be generated for each hour of the continuous model. A continuous simulation model with 35 years of hourly precipitation data will generate 35 years of hourly runoff estimates, which corresponds to runoff estimates for 306,600 time steps over the 35-year simulation period.

Use of the continuous modeling approach allows for the estimation of the frequency and duration by which flows will exceed a particular threshold. The limitations to increases of the frequency and duration of flows within that geomorphically significant flow range is the key component to San Diego County's approach to hydromodification management.

For a more detailed review of continuous simulation modeling, refer to a memo prepared by Brown and Caldwell titled *Using Continuous Simulation to Size Storm Water Control Facilities* (May 2008). This memo is attached as Appendix E.

4.2.1 Continuous Simulation Modeling Software

The following public domain software models may be used to assess hydromodification controls for storm water facilities to meet the Hydromodification Criteria:

- HSPF - Hydrologic Simulation Program-FORTRAN, distributed by United States Environmental Protection Agency (USEPA)
- HEC-HMS – Hydrologic Modeling System; distributed by the US Army Corps of Engineers Hydrologic Engineering Center
- SWMM – Storm Water Management Model; distributed by USEPA

Third-party and proprietary software can be used to meet the Hydromodification Criteria provided that the software incorporates minimum design parameters summarized below:

- Input and output data from the software can interface with public domain software such as HSPF HEC-HMS, or SWMM. In other words, input files from the third-party software should have sufficient functionality to allow export to public domain software for independent validation.
- Rainfall data are selected according to an existing rainfall gauge location that is geographically and meteorologically similar to the project site location.

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- Rainfall loss parameters used in the software can be substantiated and fully referenced.
- The software's hydromodification control processes, detailed later in this memo, are substantiated and fully referenced.

All third-party and proprietary software will be subject to more rigorous review upon the adoption of the Final HMP. This review would include further testing of various development and treatment scenarios as well as an in-depth analysis of software functionality and processes.

As stated previously, Brown and Caldwell is currently preparing flow control sizing tools to assess the effectiveness of hydromodification controls. These tools will be available in association with implementation of the final HMP.

4.2.2 Parameter Validation for Rainfall Losses

In preparing computer models to assess storm water controls and meet Hydromodification Criteria, rainfall loss parameters describing soil characteristics, land cover descriptions, and evapotranspiration data should be validated to prove consistency with the local environment and climatic conditions. The validation process should include documentation of the source of evapotranspiration data and commentary of the effects of varying evapotranspiration patterns between the subject site and parameter data source. A full review of local pan evaporation and potential evapotranspiration data will be included as part of development of the final hydromodification flow control sizing tool.

To meet Hydromodification Criteria, soil and land cover parameter validation can be based on the following:

- Calibration to local stream flow data, where applicable. Examples of local calibration studies include, but are not limited to, total maximum daily load (TMDL) modeling efforts prepared for the San Diego RWQCB (*TMDL for Indicator Bacteria Project I – Beaches and Creeks in the San Diego Region*, Tetra Tech, December 2007).
- Published parameter values consistent with previous studies for San Diego County and Southern California, such as HSPF-related regional calibration studies, research projects, regional soil surveys, etc.
- Specific data prepared as part of a site-specific geotechnical investigation
- If parameters are transposed or modified from calibration efforts outside of Southern California, the source should be identified and justification should be provided stating why such data are applicable for San Diego County. Details should be provided justifying how parameters from such studies were adjusted to be applicable to San Diego conditions.
- Recommended parameter value ranges from *BASINS Technical Notice 6, Estimating Hydrology, and Hydraulic Parameters for HSPF*, USEPA, July 2000.

Storm water flow control devices designed to meet Hydromodification Criteria should be analyzed pursuant to the following criteria:

- Infiltration processes should be modeled with sufficient complexity to properly quantify the flow control benefit to the receiving streams. These infiltration processes should be transparent and fully documented.
- Infiltration quantification should include provisions for water head and pore suction effects for multiple layers of varying materials (i.e., ponding areas, amended soil layer, gravel layer, etc.), or provide justification why such complex processes are not included.
- Storage processes associated with each layer of the storm water device should be fully explained and quantified.
- Device outflow curves should consider controls associated with device underdrains. The methodology by which such stage-discharge relationships are developed should be fully documented.

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4.2.3 Peak Flow and Flow Duration Statistics

To assess the effectiveness of storm water flow control devices in mitigating hydromodification effects to meet Hydromodification Criteria, peak flow frequency statistics should be developed. Peak flow frequency statistics estimate how often flow rates will exceed a given threshold. In this case, the key peak flow frequency values would be the lower and upper bounds of the geomorphically significant flow range. Peak flow frequency statistics should be developed using either a partial-duration or peak annual series. Partial-duration series frequency calculations consider multiple storm events in a given year while the peak annual series considers just the peak annual storm event.

Flow duration statistics must also be summarized to determine how often a particular flow rate is exceeded. To determine if a storm water facility meets hydromodification criteria, peak flow frequency and flow duration curves must be generated for pre-project and post-project conditions. Both pre-project and post-project simulation runs should extend for the entire length of the rainfall record.

For a more detailed review of peak flow frequency and flow duration curves, refer to the aforementioned Brown and Caldwell memo titled *Using Continuous Simulation to Size Storm Water Control Facilities* (May 2008).

The need for partial-duration statistics is more pronounced for control standards based on more frequent return intervals (such as the 2-year runoff event), since the peak annual series does not perform as well in the estimation of such events. This phenomenon is especially pronounced in the San Diego County region's semi-arid climate. Per the advice of the Hydrologic Research Center, with whom the project team has consulted throughout the project, and a review of supporting literature, the use of a partial-duration series is recommended for semi-arid climates similar to San Diego County, where prolonged dry periods can skew peak flow frequency results determined by a peak annual series for more frequent runoff events.

For the statistical analysis of the rainfall record, partial duration series events have been separated into discrete rainfall events assuming the following criteria.

- To determine a discrete rainfall event, a lower flow limit was set to a very small value, equal to 0.002 cfs per acres of contributing drainage area.
- A new discrete event is designated when the flow falls below 0.002 cfs per acre for a time period of 24 hours.

4.3 Rainfall Data

Standards developed as part of this HMP to control runoff peak flows and durations are based on a continuous simulation of runoff using local rainfall data. To provide for clear climatic designation between coastal, foothill and mountain areas of the County, and to distinguish between the major watershed units, historical records for a series of 20 rainfall data stations located throughout San Diego County were compiled, formatted and quality controlled for analysis.

Long-term hourly rainfall records have been prepared for the 20 rainfall stations. These rainfall record files are located on the *Project Clean Water* web site for public use (www.projectcleanwater.org). Sources of the rainfall data include ALERT data from the County of San Diego (which extend back to 1982), the California Climatic Data Archive, National Oceanic and Atmospheric Administration (NOAA), the National Climatic Data Center, and the Western Regional Climate Center. In all cases, the length of the overall rainfall station record is 35 years or the overall length of the rainfall record, whichever is longer.

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Gauge selection was further governed by minimum continuous simulation modeling requirements including the following:

- The selected precipitation gauge data set should be located near the project site to ensure that long-term rainfall records are similar to the anticipated rainfall patterns for the site. Thus, gauges were selected in proximity to areas planned for future development and redevelopment.
- Recording frequency for the gauge data set should be hourly (or more frequent).
- The gauge rainfall record should extend for the entire length of the record. Where the gauge record length is less than 35 years, then adjacent gauge records were used to extend the rainfall record to at least 35 years.
- Use of the most applicable long-term rainfall gauge data, as opposed to the scaling of rainfall patterns from Lindbergh Field, is required to account for the diverse rainfall patterns across San Diego County.

Precipitation gauges identified by Brown and Caldwell, summarized in Table 4-2 below, all have recording frequencies of one hour and recording data ranges of at least 35 years.

Table 4-2. Rainfall Station Summary

Station	Elevation	Watershed
Bonita	120	Sweetwater River
Encinitas	242	San Elijo Lagoon and Batiquitos Lagoon and ocean outlets
Escondido	645	Escondido Creek
Fallbrook	675	San Luis Rey River (near ridge with Santa Margarita River watershed)
Fashion Valley	20	Lower San Diego River
Flinn Springs	880	San Diego River
Kearny Mesa	425	San Diego River (near ridge with San Clemente Canyon watershed)
Lake Cuyamaca	4,590	Upper San Diego River
Lake Heneshaw	2,990	Upper San Luis Rey River
Lake Wohlford	1,490	Upper Escondido Creek
Lindbergh Field	Near Sea Level	Coastal – San Diego Bay
Lower Otay Reservoir	491	Otay River
Morena Dam	3,075	Upper Tijuana River
Oceanside	30	San Luis Rey River
Poway	440	Los Penasquitos Canyon
Ramona	1,450	Upper San Dieguito River
San Onofre	162	North County Coastal – Pacific Ocean
San Vicente Reservoir	663	San Diego River
Santee	300	San Diego River

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For a given project location, the following factors should be considered in the selection of the appropriate rainfall data set.

- In most cases, the rainfall data set in closest proximity to the project site will be the appropriate choice. A rainfall station map has been posted to the *Project Clean Water* web site for public use.
- In some cases, the rainfall data set in closest proximity to the project site may not be the most applicable data set. Such a scenario could involve a data set with an elevation significantly different from the project site. In addition to a simple elevation comparison, the project proponent may also consult with the San Diego County's average annual precipitation isopluvial map, which is provided in the San Diego County Hydrology Manual (2003). Review of this map could provide an initial estimate as to whether the project site is in a similar rainfall zone as compared to the rainfall stations. Generally, precipitation totals in San Diego County increase with increasing elevation.
- Where possible, rainfall data sets should be chosen so that the data set and the project location are both located in the same topographic zone (coastal, foothill, mountain) and major watershed unit (Upper San Luis Rey, Lower San Luis Rey, Upper San Diego River, Lower San Diego River, etc.).

Upon implementation of final hydromodification criteria, the hydromodification flow control sizing calculator being developed by Brown and Caldwell will automate the rainfall gauge selection process.

4.4 Rainfall Losses - Infiltration Parameters

Standards developed as part of this HMP to control runoff peak flows and durations are based on a continuous simulation of runoff using locally derived parameters for initial infiltration. A review was conducted of available continuous hydrologic simulation modeling reports in Southern California. These included TMDL models developed for the San Diego RWQCB (RWQCB), regional continuous models developed by the Southern California Coastal Water Research Project (SCCWRP), and watershed-level continuous models developed for river and large creek systems in Ventura County. In conducting this review, particular interest was focused on determining how local and regional continuous hydrologic models simulated the pervious land surface[1] for various combinations of soils and land use types, because this component of hydrologic modeling is typically the most variable and difficult to describe.

The HSPF software package is the industry standard for continuous simulation hydrologic modeling, though HEC-HMS and SWMM also provide public domain continuous modeling alternatives. The Final HMP provides the option to use HEC-HMS for a project submittal but only provides infiltration data review for HSPF modeling approaches. Therefore, if a project applicant chooses to use HEC-HMS, prior authorization should be provided by the governing municipality.

[1] Characterized by PERLND/PWATER parameters in the EPA's public domain Hydrologic Simulation Program – FORTRAN, HSPF.

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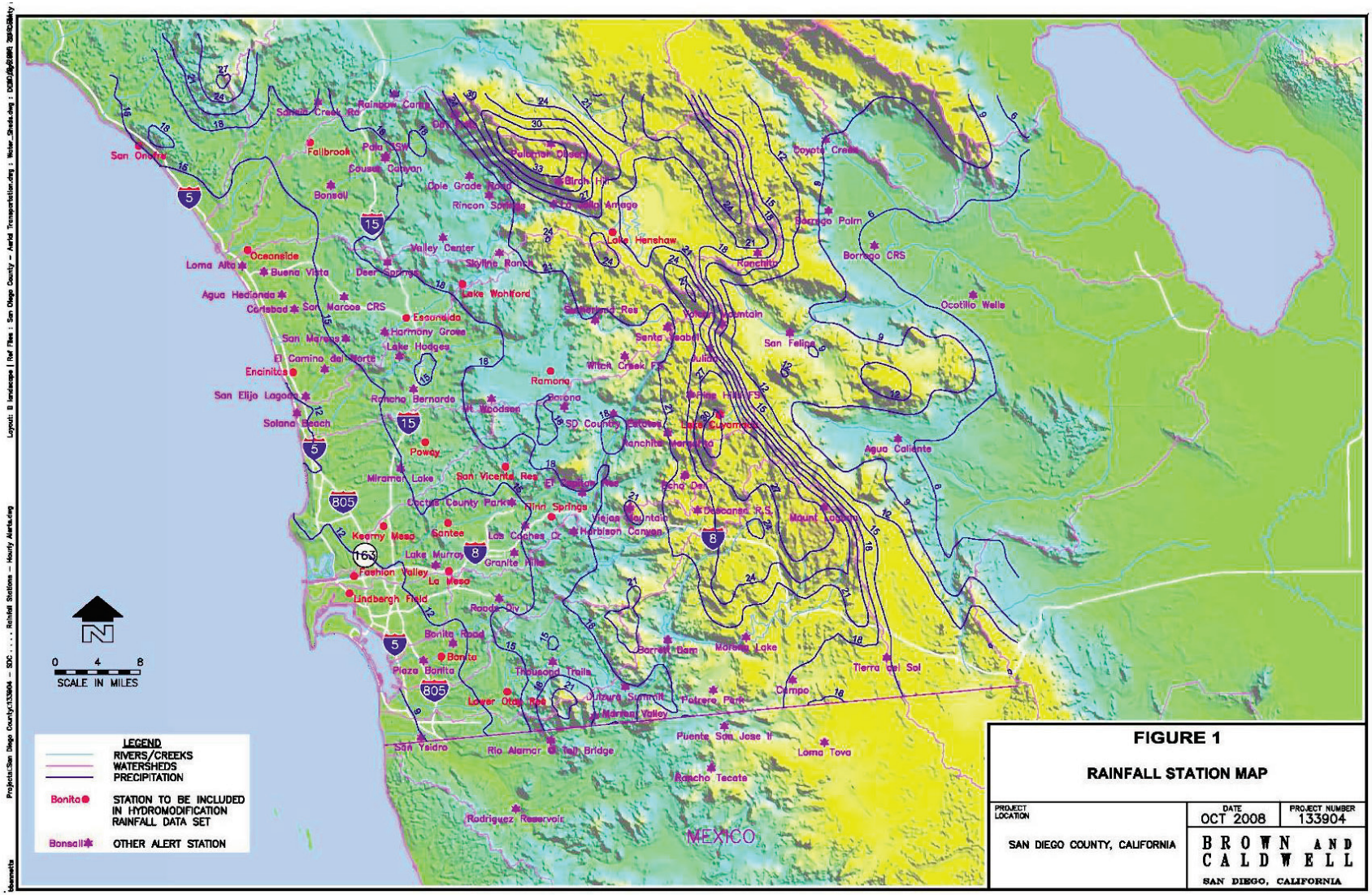

Figure 4-1. Rainfall Station Map

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In preparing computer models to assess storm water controls and meet Hydromodification Criteria, rainfall loss parameters describing soil characteristics, land cover descriptions, and slope should be validated to prove consistency with the local environment and climatic conditions. The goal, with regard to the San Diego HMP, is to develop a set of appropriate parameter ranges to account for variations of these key parameters. The final selection of rainfall loss parameters and evaporation data is part of the Sizing Calculator development process as part of HMP implementation in winter 2010.

In addition to the reports listed below, other TMDL reports from San Diego County and elsewhere in Southern California were reviewed in Table 4-3. However, only those reports with a substantial description of modeling activities were summarized in the table.

Table 4-3. Summary of HSPF Modeling Reports for Southern California

No.	Title	Authors	Date	Summary/Comments
1	TMDL to Reduce Bacterial Indicator Densities at Santa Monica Bay Beaches During Wet Weather (Preliminary Draft)	Los Angeles RWQCB / Tetra Tech	June 21, 2002	Combination of hydrologic and water quality modeling to estimate bacterial loadings to Santa Monica Bay HSPF/Loading Simulation Program in C++ (LSPC) model was calibrated and validated using stream flow data collected on Malibu Creek and Ballona Creek. (LSPC is a recoded C++ version of HSPF) No HSPF model parameters included in report
2	Technical Report – TMDLs for Indicator Bacteria in Baby Beach and Shelter Island Shoreline Park	San Diego RWQCB / Tetra Tech	June 11, 2008	Combination of hydrologic and water quality modeling HSPF/LSPC model was calibrated to flow data collected in Aliso Creek and Rose Creek. Calibrated infiltration rates were reported for Natural Resources Conservation Survey (NRCS) Group A, B, C, and D soils (in Appendix F). However, it is unclear if these rates correspond to specific HSPF model parameters. This issue of how to apply the calibrated infiltration rates should be addressed through correspondence with study authors.
3	Evaluating HSPF in an Arid, Urbanized Watershed (in Journal of the American Water Resources Association, 2005, p477-486	Drew Ackerman, Kenneth Schiff, Stephen Weisburg (SCCWRP)	February 2005	HSPF was used to simulate hydrologic processes in arid region, e.g., precipitation on dry soils, effect of irrigation. Model was calibrated to gauge data collected in lower reaches of Malibu Creek. The calibration set aggregated the soil and land cover variations in the watershed (i.e., spatially "lumped" parameters). Pervious land surface (PWATER) parameters were included in the paper.
4	TMDL for Indicator Bacteria Project I – Beaches and Creeks in the San Diego Region	San Diego RWQCB / Tetra Tech	December 12, 2007	HSPF/LSPC model parameters were selected from regional calibration. Calibration efforts used daily average stream flows as the baseline calibration condition. Appendices describe the regional calibration process. The modeling files have been provided by the San Diego RWQCB
5	Lake Elsinore and Canyon Lake Nutrient Source Assessment (Final Report) for Santa Ana Watershed Project Authority	Tetra Tech, Inc.	January 2003	HSPF/LSPC model was calibrated and validated using United States Geological Survey (USGS) gauging site data in the San Jacinto watershed Model simulated pollutant loading to Lake Elsinore and Canyon Lake Pervious land surface (PWATER) parameters were not published in the report.

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The technical reports listed in Table 4-3 demonstrate that a variety of detailed HSPF modeling studies have been conducted in the past 10 years in Southern California. However, adapting these modeling efforts for use on the San Diego HMP project would require additional work. This is because the reports listed above did not publish their HSPF parameter sets, with the exception of the Ackerman study (see No. 3 above), which published a set of generalized parameters that aggregate or "spatially lump" the contributions of different soil/land use combinations in the upper watershed.

The HSPF model described in the Ackerman paper simulates all soil and land use combinations using a single composite parameter set. In a follow-on conversation in May 2008, Drew Ackerman explained that the "Arid, Urbanized" HSPF model was calibrated only to gauge data in the lower Santa Monica Bay watershed, because the model's purpose was to estimate pollutant loadings to area beaches and water bodies. His study was understandably less focused on characterizing the variation in runoff rates and volumes among the different land uses in the upper portions of the watershed. Additionally, the effect of upstream surface water impoundments would have made the development of an accurate, detailed calibration at the sub-catchment scale very difficult to achieve. Unfortunately, this "spatially lumped" parameter set is of limited usefulness for the purpose of the HMP project, given the need to develop parameter sets that describe a variety of common soil and land use combinations.

Continuous simulation modeling files associated with the report titled *Bacteria Project I – Beaches and Creeks in the San Diego Region* (February 2009) include infiltration parameter calibrations based upon 15-20 years of average daily flows. Per discussions with Tetra Tech in November 2008 and January 2009, ongoing work related to TMDL development for San Diego County lagoons may also prove to be beneficial to the future San Diego HMP model parameter estimation effort.

The consultant team will continue to review additional HSPF studies in preparation for development of a hydromodification flow control sizing tool for San Diego County (to be completed in Winter 2010). The consultant team has had discussions with Tony Donigian of Aquaterra, who has prepared numerous HSPF models and serves as an EPA-sponsored trainer for HSPF modeling.

Aquaterra's HSPF modeling efforts in Southern California have focused on Ventura County. Aquaterra has requested permission from Ventura County to allow the San Diego HMP consultant team to review modeling results and input data sets for the Ventura County HSPF modeling efforts.

To better utilize the existing HPSF models for use in the San Diego HMP project and development of the San Diego HMP Sizing Calculator, the consultant team will be conducting the following activities:

- Contact the authors of the studies listed in Table 4-3 (and others provided by Tetra Tech, Aquaterra and SCCWRP) to obtain copies of the HSPF pervious land surface (PERLND/PWATER) parameter sets. .
- Relate the HSPF parameters to NRCS soil groups and common land use types. Develop a range of recommended HSPF input parameters that could be used to characterize the range of soil and land use types common to San Diego County.

The following model parameters were published in the Drew Ackerman et al. paper described in Figure 4-2. The specific values were selected by calibrating an HSPF model to flow monitoring data in the Santa Monica Bay watershed, specifically on Malibu Creek. The values represent a composite of the various upstream soils and land uses.

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Table 2. Model parameters utilized for modeling of Santa Monica Bay.

Pervious Parameters		Value	Units
Fraction of Remaining E-T from Active Groundwater Storage	AGEWTP	0.05	None
Basic Groundwater Recession Rate	AGWRC	0.92	1/d
Fraction of Remaining E-T from Baseflow	BASETP	0.05	None
Interception Storage Capacity	CEPSC	0.25	cm
Fraction of Groundwater to Deep Aquifer	DEEPFR	0.40	None
Forest Fraction	FOREST	0.0	%
Infiltration Equation Exponent	INFEXP	2.0	None
Ratio between the Maximum and Mean Infiltration Capacities	INFILD	2.0	None
Infiltration Capacity	INFILT	0.10	cm/hr
Interflow Inflow Parameter	INTFW	1.50	None
Interflow Recession Parameter	IRC	0.70	1/d
Groundwater Recession Flow Coefficient	KVARY	7.6	1/cm
Overland Flow Length	LSUR	61	m
Lower Zone E-T Parameter	LZETP	0.70	None
Lower Zone Nominal Storage	LZSN	25	cm
Manning's n for Overland Flow	NSUR	0.20	Complex
Temperature Maximum for Evapotranspiration (E-T)	PETMAX	1.7	°C
Temperature that E-T is Zero	PETMIN	-1.1	°C
Overland Flow Slope	SLSUR	0.03	None
Upper Zone Nominal Storage	UZSN	3.0	cm

Figure 4-2. Model Parameters Utilized by SCCWRP for Modeling of Santa Monica Bay

Additional reference material can be located in the document titled, *BASINS Technical Notice 6, Estimating Hydrology and Hydraulic Parameters for HSPF,* prepared by the U.S. EPA (July 2000). This document provides details regarding pervious and impervious land hydrology parameters along with flow routing parameters. Parameter and value range summary tables are included in the document.

4.4.1 Pervious Land Hydrology (PWATER) Parameters

The HSPF hydrology parameters of PWATER are divided into four sections, titled PARM1-4. PARM1 is a series of checks to outline any monthly variability versus constant parameter values within the simulated algorithm; whereas, PARM2 and 3 are a series of climate, geology, topography, and vegetation parameters that require numerical values to be inputted.

PARM2 involves the basic geometry of the overland flow, the impact of groundwater recession, potential snow impact due to forest cover and the expected infiltration and soil moisture storage. The main parameters of groundwater recession are KVARY and AGWRC. The infiltration and soil moisture storage parameters are INFILT and LZSN.

PARM3 involves the impact of climate temperature during active snow conditions, a wide range of evaporation parameters due to the variability of the onsite soil and existing vegetation and subsurface losses due to groundwater recharge or the existing geology. The main evaporation parameters are INFEXP, INFILD, BASETP, and AGWETP. The parameter for subsurface loss is DEEPFR which accounts for one of only three major losses from the PWATER water balance (i.e., in addition to evaporation, and lateral and stream outflows).

PARM4 involves the flow and hydrograph characteristics, the expectation of rain interception due to the inherent moisture storage capacity from existing vegetation, land use and/or near surface soil conditions and evaporation due to the root zone of the soil profile. The main interception parameters are CEPSC and UZSN. The parameter for evaporation as a primary function of vegetation is LZETP.

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PARM2

KVARY. Groundwater recession flow parameter used to describe non-linear groundwater recession rate *(/inches) (initialize with reported values, then calibrate as needed*).

KVARY is usually one of the last PWATER parameters to be adjusted; it is used when the observed groundwater recession demonstrates a seasonal variability with a faster recession (i.e., higher slope and lower AGWRC values) during wet periods, and the opposite during dry periods. Value ranges are shown in Figure 4-3. Users should start with a value of 0.0 for KVARY, and then adjust (i.e., increase) if seasonal variations are evident. Plotting daily flows with a logarithmic scale helps to elucidate the slope of the flow recession.

AGWRC. Groundwater recession rate, or ratio of current groundwater discharge to that from 24 hours earlier (when KVARY is zero) *(/day) (estimate, then calibrate).*

The overall watershed recession rate is a complex function of watershed conditions, including climate, topography, soils, and land use. Hydrograph separation techniques can be used to estimate the recession rate from observed daily flow data (such as plotting on a logarithmic scale). Value ranges are shown in Figure 4-3.

INFILT. Index to mean soil infiltration rate *(in/hr); (estimate, then calibrate).*

In HSPF, INFILT is the parameter that effectively controls the overall division of the available moisture from precipitation (after interception) into surface runoff. Since INFILT is not a maximum rate nor an infiltration capacity term, it's values are normally much less than published infiltration rates, percolation rates (from soil percolation tests), or permeability rates from the literature. In any case, initial values are adjusted in the calibration process.

INFILT is primarily a function of soil characteristics, and value ranges have been related to SCS hydrologic soil groups (Donigian and Davis, 1978, p.61, variable INFIL) as follows:

Table 4-4. INFILT Parameters

SCS Hydrologic Soil Group	INFILT Estimate		Runoff Potential
	(in/hr)	(mm/hr)	
A	0.4 - 1.0	10.0 - 25.0	Low
B	0.1 - 0.4	2.5 - 10.0	Moderate
C	0.05 - 0.1	1.25 - 2.5	Moderate to High
D	0.01 - 0.05	0.25 - 1.25	High

An alternate estimation method that has not been validated is derived from the premise that the combination of infiltration and interflow in HSPF represents the infiltration commonly modeled in the literature (e.g., Viessman et al., 1989, Chapter 4). With this assumption, the value of 2.0*INFILT*INTFW should approximate the average measured soil infiltration rate at saturation, or mean permeability.

LZSN. Lower zone nominal soil moisture storage *(inches), (estimate, then calibrate).*

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LZSN is related to both precipitation patterns and soil characteristics in the region. Viessman, et al, 1989, provide initial estimates for LZSN in the Stanford Watershed Model (SWM-IV, predecessor model to HSPF) as one-quarter of the mean annual rainfall plus four inches for arid and semiarid regions, or one-eighth annual mean rainfall plus 4 inches for coastal, humid, or subhumid climates. These formulae tend to give values somewhat higher than are typically seen as final calibrated values; since LZSN will be adjusted through calibration, initial estimates obtained through these formulae may be reasonable starting values.

PARM3

INFEXP. Exponent that determines how much a deviation from nominal lower zone storage affects the infiltration rate (HSPF Manual, p. 60) *(initialize with reported values, then calibrate).*

Variations of the Stanford approach have used a POWER variable for this parameter; various values of POWER are included in Donigian and Davis (1978, p. 58). However, the vast majority of HSPF applications have used the default value of 2.0 for this exponent. Use the default value of 2.0, and adjust only if supported by local data and conditions.

INFILD. Ratio of maximum and mean soil infiltration capacities *(initialize with reported value).*

In the Stanford approach, this parameter has always been set to 2.0, so that the maximum infiltration rate is twice the mean (i.e., input) value; when HSPF was developed, the INFILD parameter was included to allow investigation of this assumption. However, there has been very little research to support using a value other than 2.0. Use the default value of 2.0, and adjust only if supported by local data and conditions.

DEEPFR. The fraction of infiltrating water which is lost to deep aquifers (i.e., inactive groundwater), with the remaining fraction (i.e., 1-DEEPFR) assigned to active groundwater storage that contributes baseflow to the stream *(estimate, then calibrate).*

It is also used to represent any other losses that may not be measured at the flow gauge used for calibration, such as flow around or under the gauge site. Watershed areas at high elevations, or in the upland portion of the watershed, are likely to lose more water to deep groundwater (i.e., groundwater that does not discharge within the area of the watershed), than areas at lower elevations or closer to the gauge. DEEPFR should be set to 0.0 initially or estimated based on groundwater studies, and then calibrated, in conjunction with adjustments to evapotranspiration (ET) parameters.

BASETP. ET by riparian vegetation as active groundwater enters streambed; specified as a fraction of potential ET, which is fulfilled only as outflow exists *(estimate, then calibrate).*

Typical and possible value ranges are shown in Figure 4-3. If significant riparian vegetation is present in the watershed then non-zero values of BASETP should be used. If riparian vegetation is significant, start with a BASETP value of 0.03 and adjust to obtain a reasonable low-flow simulation in conjunction with a satisfactory annual water balance.

AGWETP. Fraction of model segment (i.e., pervious land segment) that is subject to direct evaporation from groundwater storage, e.g., wetlands or marsh areas, where the groundwater surface is at or near the land surface, or in areas with phreatophytic vegetation drawing directly from groundwater. This is represented in the model as the fraction of remaining potential ET (i.e., after base ET, interception ET, and upper zone ET are satisfied), that can be met from active groundwater storage *(estimate, then calibrate).*

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If wetlands are represented as a separate pervious land segment (PLS), then AGWETP should be 0.0 for all other land uses, and a high value (0.3 to 0.7) should be used for the wetlands PLS. If wetlands are not separated out as a PLS, identify the fraction of the model segment that meets the conditions of wetlands/marshes or phreatophytic vegetation and use that fraction for an initial value of AGWETP. Like BASETP, adjustments to AGWETP will be visible in changes in the low-flow simulation, and will affect the annual water balance. Follow above guidance for an initial value of AGWETP, and then adjust to obtain a reasonable low-flow simulation in conjunction with a satisfactory annual water balance.

PARM4

CEPSC. Amount of rainfall, in inches, which is retained by vegetation, that never reaches the land surface, and is eventually evaporated (*estimate, then calibrate*). Typical guidance for CEPSC for selected land surfaces is provided in Donigian and Davis (1978, p. 54, variable EPXM) as follows:

Table 4-5. Interception Parameters

Land Cover	Maximum Interception (in)
Grassland	0.10
Cropland	0.10 – 0.25
Forest Cover, light	0.15
Forest Cover, heavy	0.20

LZETP. Index to lower zone evapotranspiration (unitless) (*estimate, then calibrate*).

LZETP is a coefficient to define the ET opportunity; it affects evapotranspiration from the lower zone which represents the primary soil moisture storage and root zone of the soil profile. LZETP behaves much like a 'crop coefficient' with values mostly in the range of 0.2 to 0.7; as such it is primarily a function of vegetation. Typical and possible value ranges are shown in Figure 4-3, and the following ranges for different vegetation are expected for the 'maximum' value during the year:

Table 4-6. LZETP Coefficients

Land Cover	Input Coefficient
Forest	0.6 - 0.8
Grassland	0.4 - 0.6
Row Crops	0.5 - 0.7
Barren	0.1 - 0.4
Wetlands	0.6 - 0.9

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HSPF HYDROLOGY PARAMETERS AND VALUE RANGES

			RANGE OF VALUES					
NAME	DEFINITION	UNITS	TYPICAL		POSSIBLE		FUNCTION OF ...	COMMENT
			MIN	MAX	MIN	MAX		
PWAT - PARM2								
FOREST	Fraction forest cover	none	0.0	0.50	0.0	0.95	Forest cover	Only impact when SNOW is active
LZSN	Lower Zone Nominal Soil Moisture Storage	inches	3.0	8.0	2.0	15.0	Soils, climate	**Calibration**
INFILT	Index to Infiltration Capacity	in/hr	0.01	0.25	0.001	0.50	Soils, land use	**Calibration**, divides surface and subsurface flow
LSUR	Length of overland flow	feet	200	500	100	700	Topography	Estimate from high resolution topo maps or GIS
SLSUR	Slope of overland flow plane	ft/ft	0.01	0.15	0.001	0.30	Topography	Estimate from high resolution topo maps or GIS
KVARY	Variable groundwater recession	1/inches	0.0	3.0	0.0	5.0	Baseflow recession variation	Used when recession rate varies with GW levels
AGWRC	Base groundwater recession	none	0.92	0.99	0.85	0.999	Baseflow recession	**Calibration**
PWAT - PARM3								
PETMAX	Temp below which ET is reduced	deg. F	35.0	45.0	32.0	48.0	Climate, vegetation	Reduces ET near freezing, when SNOW is active
PETMIN	Temp below which ET is set to zero	deg. F	30.0	35.0	30.0	40.0	Climate, vegetation	Reduces ET near freezing, when SNOW is active
INFEXP	Exponent in infiltration equation	none	2.0	2.0	1.0	3.0	Soils variability	Usually default to 2.0
INFILD	Ratio of max/mean infiltration capacities	none	2.0	2.0	1.0	3.0	Soils variability	Usually default to 2.0
DEEPFR	Fraction of GW inflow to deep recharge	none	0.0	0.20	0.0	0.50	Geology, GW recharge	Accounts for subsurface losses
BASETP	Fraction of remaining ET from baseflow	none	0.0	0.05	0.0	0.20	Riparian vegetation	Direct ET from riparian vegetation
AGWETP	Fraction of remaining ET from active GW	none	0.0	0.05	0.0	0.20	Marsh/wetlands extent	Direct ET from shallow GW
PWAT - PARM4								
CEPSC	Interception storage capacity	inches	0.03	0.20	0.01	0.40	Vegetation type/density, land use	Monthly values usually used
UZSN	Upper zone nominal soil moisture storage	inches	0.10	1.0	0.05	2.0	Surface soil conditions, land use	Accounts for near surface retention
NSUR	Manning's n (roughness) for overland flow	none	0.15	0.35	0.05	0.50	Surface conditions, residue, etc.	Monthly values often used for croplands
INTFW	Interflow inflow parameter	none	1.0	3.0	1.0	10.0	Soils, topography, land use	**Calibration**, based on hydrograph separation
IRC	Interflow recession parameter	none	0.5	0.7	0.3	0.85	Soils, topography, land use	Often start with a value of 0.7, and then adjust
LZETP	Lower zone ET parameter	none	0.2	0.7	0.1	0.9	Vegetation type/density, root depth	**Calibration**

Figure 4-3. HSPF Hydrology Parameters and Value Ranges

Source: USEPA BASINS Technical Note 6

Model assumptions for stream reach infiltration rates were derived through calibration based on data collected within the reaches of Aliso Creek (11 stations) and Rose Creek (6 stations). In the model, infiltration rates vary by soil type. Stream infiltration was calibrated by adjusting a single infiltration value, which was varied for each soil type by factors established from literature ranges (USEPA 2000) of infiltration rates specific to each soil type. The final resulting infiltration rates were 1.368 in/hr (Soil Group A), 0.698 in/hr (Soil Group B), 0.209 in/hr (Soil Group C) and 0.084 in/hr (Soil Group D). The infiltration rates for Soil Groups B, C, and D are within the infiltration range given in literature (Wanielisata et al. 1997). The result for Soil Group A is below the range given in Wanielisata et al. (1997); however, this result only represented one watershed in this TMDL study.

The technical reports reviewed demonstrate that a variety of detailed HSPF modeling studies have been conducted in the past 10 years in Southern California. However, adapting these modeling efforts for use on the San Diego HMP project will require additional work, which will be completed in association with development of the implementation Sizing Calculator. That effort includes meetings with report authors, including representatives from the SCCWRP, as well as meetings with HSPF modeling experts from Aquaterra to ascertain appropriate values for initial infiltration parameters.

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4.5 Rainfall Losses - Evapotranspiration Parameters

Standards developed as part of this HMP to control runoff peak flows and durations are based on a continuous simulation of rainfall runoff using locally derived parameters for evaporation and evapotranspiration.

Known data sources for evaporation and evapotranspiration data in San Diego County are listed below.

- California Irrigation Management and Information System web site – evapotranspiration stations include San Diego, Oceanside, Escondido, Ramona, Otay Lakes, Miramar, Torrey Pines, and Borrego Springs.
- Historical Reservoir Level and Evaporation Data for Lake Heneshaw.
- Historical Evaporation Data from City of San Diego Reservoirs.
- Historical Evaporation Data from Helix Water District for Lake Cuyamaca.

The evaporation / evapotranspiration parameter validation process includes documentation of the source of data and analysis of the effects of varying patterns between the subject site and parameter data source. A full review of local pan evaporation and potential evapotranspiration data is being conducted as part of the development of the final hydromodification flow control sizing tool.

Table 4-6 below summarizes available evaporation and evapotranspiration data sources in San Diego County. Most of the available evaporation data are located close to reservoirs in the inland valley and mountain areas of the County. Monthly evaporation records are available for multiple reservoirs within the County. Evapotranspiration sensing data are generally collected in agricultural zones.

The California Irrigation Management Information Systems web site (wwwcimis.water.ca.gov/cimis/data.jsp) provides access to real-time and summarized evapotranspiration data (ETo) throughout California. For the San Diego region, average evapotranspiration values are summarized for the coastal and foothill zones of San Diego County.

Table 4-7. Summary of Evaporation and Evapotranspiration Data for San Diego County

Station Name ID	Data Type	Data Source	Recording Frequency	Start Date	End Date
Barratt Lake	Pan Evaporation	City of San Diego Water Department	Monthly	1950	2008
Borrego Springs	Evapotranspiration	CIMIS	Monthly	2008	2008
Chula Vista	Pan Evaporation	Western Regional Climate Center	Monthly Averages	1948	2005
El Capitain Reservoir	Pan Evaporation	City of San Diego Water Department	Monthly	1950	2008
Escondido / 74	Evapotranspiration	CIMIS	Monthly	1988	1998
Escondido / 153	Evapotranspiration	CIMIS	Monthly	1999	2008
Lake Cuyamaca	Pan Evaporation	Helix Water District	Monthly	1985	2006
Lake Heneshaw	Pan Evaporation	County of San Diego	Daily	1999	2005
Lake Heneshaw	Pan Evaporation	County of San Diego	Monthly	1957	2008
Lake Hodges	Pan Evaporation	City of San Diego Water Department	Monthly	1950	2008
Lake Jennings	Pan Evaporation	Helix Water District	Monthly	1985	2006
Lake Murray	Pan Evaporation	City of San Diego	Monthly	1950	2008

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Table 4-7. Summary of Evaporation and Evapotranspiration Data for San Diego County

Station Name ID	Data Type	Data Source	Recording Frequency	Start Date	End Date
		Water Department			
Lake Sutherland	Pan Evaporation	City of San Diego Water Department	Monthly	1954	2008
Lower Otay Reservoir	Pan Evaporation	City of San Diego Water Department	Monthly	1950	2008
Lower Otay / 147	Evapotranspiration	CIMIS	Monthly	1999	2008
Miramar Lake	Pan Evaporation	City of San Diego Water Department	Monthly	1960	2008
Miramar Lake / 150	Evapotranspiration	CIMIS	Monthly	1999	2008
Morena Lake	Pan Evaporation	City of San Diego Water Department	Monthly	1950	2008
Oceanside / 49	Evapotranspiration	CIMIS	Monthly	1986	2003
Ramona / 98	Evapotranspiration	CIMIS	Monthly	1991	1998
San Diego / 45	Evapotranspiration	CIMIS	Monthly	1985	1989
San Diego / 66	Evapotranspiration	CIMIS	Monthly	1989	2001
San Diego II / 184	Evapotranspiration	CIMIS	Monthly	2002	2008
San Vicente Reservoir	Pan Evaporation	City of San Diego Water Department	Monthly	1950	2008
Torrey Pines / 173	Evapotranspiration	CIMIS	Monthly	2000	2008

Long-term evaporation / evapotranspiration data sets are being generated to correspond with long-term rainfall records. The final selection of rainfall loss parameters and evaporation data is part of the Sizing Calculator development process.

In summary, the published literature reviewed as part of this study support the methods and approach taken in developing the San Diego Hydromodification Management Plan.

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5. METHODOLOGY AND TECHNICAL APPROACH TO REGIONAL HYDROMODIFICATION DEVELOPMENT

As outlined in Permit Section D.1, the San Diego Copermittees shall implement a program to manage increases in runoff discharge rates and durations from Priority Development Projects that are likely to cause increases to erosion of channel beds or banks, silt pollutant generation, or other impacts to beneficial uses and stream habitat due to increased erosive force. This section provides a detailed description of the methodology and approach used in the development of the HMP (Permit Section D.1.g(1)). Section 5.1 specifically focuses on the approach taken to identify the geomorphically significant flow range, Section 5.2 focuses on channel screening tools developed in association with this HMP, and Section 5.3 discusses cumulative watershed impacts.

5.1 Flow Control Limit Determination

5.1.1 Background

The purpose of the HMP is to identify guidelines for managing 'geomorphically-significant' flows that, if not controlled, would cause increased erosion in receiving water channels. Specifically, the HMP must identify low and high flow thresholds between which flows should be controlled so that the post-project flow rates and durations do not exceed pre-project levels between these two flow magnitudes. Specifically, the Board Order requires that the HMP shall:

> Utilize continuous simulation of the entire rainfall record to identify a range of runoff flow[1] for which Priority Development Project post-project runoff flow rates and durations shall not exceed pre-project runoff flow rates and durations, where the increased flow rates and durations will result in increased potential for erosion or other significant adverse impacts to beneficial uses, attributable to changes in the flow rates and durations. The lower boundary of the range of runoff flows identify shall correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks. The identified range of runoff flows may be different for specific watersheds, channels or channel reaches.

For the purposes of this project, 'hydrograph modification' or 'hydromodification' is understood to mean changes to the frequency, duration and magnitude of surface runoff that, when unmitigated, cause an increase in erosion of the receiving water body. Hydromodification occurs when urbanization replaces areas of vegetated, uncompacted soil with impermeable surfaces such as buildings, roads, and compacted fill. The reduction in permeability results in increased volumes of runoff, and faster and more concentrated delivery of this water to receiving waters. These changes have the potential to cause creeks to erode faster than before development. Although the focus of hydromodification management plans has been on increased erosion, it should be noted that in rivers that are depositional, hydromodification can cause creeks to regain some

[1] The identified range of runoff flows to be controlled should be expressed in terms of peak flow rates of rainfall events, such as "10% of the pre-project 2-year peak flow up to the pre-project 10-year peak flow."

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transport equilibrium. This phenomenon is the basis for providing exemptions for river reaches which are aggrading (depositional).

Stream flows are often expressed in terms of the frequency with which a particular flow occurs. For example, Q_2 refers to the flow rate that occurs once every two years, on average over the long term runoff record. Flow frequencies are a function of rainfall and watershed characteristics, and are unique to each stream channel (and location along the channel). The effects of urbanization tend to increase the magnitude of the flow associated with a given frequency (e.g., post-development Q_2. is higher than pre-development Q_2.). Similarly, urbanization tends to increase the frequency with which any given flow rate occurs. The purpose of the HMP is to control runoff from new developments so that flow magnitudes and frequencies match pre-development conditions within a critical range of flows.

Not all runoff causes erosion. Runoff in receiving channels below a critical discharge (Qcrit) does not exert sufficient force to overcome the erosion resistance of the channel banks and bed materials. Flows greater than Qcrit cause erosion, with larger flows causing proportionally greater erosion. It has been determined through calculations and field measurements that most erosion in natural creeks is caused by flows between some fraction of Q_2 and Q_{10}. Flows in this range are referred to as 'geomorphically-significant' because they cause the majority of erosion and sediment transport in a channel system.

Flows greater than Q_{10}, though highly erosive *per event*, occur too infrequently to do as much work as smaller but more frequent flows. Hydromodification also has less impact on flows greater than Q_{10} since at such high rainfall intensities, the soil becomes saturated and the infiltration capacity of undeveloped landscapes is rapidly exceeded. When the soil is saturated, runoff rates become more similar to those from impervious surfaces. For these reasons, HMPs have focused on identifying a low flow threshold that is close to Qcrit for most receiving channels, and controlling flows between that value and Q_{10} (see Literature Review in Chapter 4 for review of HMPs completed in Santa Clara, Contra Costa, Alameda, and San Mateo Counties). By requiring mitigation (storage and either infiltration or detention) of excess runoff within the control range, and by limiting the release of excess water to Qcrit or less, HMPs seek to prevent additional erosion in receiving water channels.

5.1.2 Identifying a Low Flow Threshold

Erosion occurs when the shear stress exerted on the channel by flowing water (*boundary shear stress*) exceeds the resistance of the channel (*critical shear stress*). Critical shear stress varies by several orders of magnitude for different channel materials (Figure 5-1). *Critical flow* (Qcrit) is the channel flow which produces boundary shear stress equal to the critical shear stress for a given channel. In other words, critical flow is the flow rate that can initiate erosion in a channel. Qcrit is a function not only of the critical shear stress of the channel materials, but also channel size and channel geometry. A particular flow rate (expressed as a number of cubic feet per second) in a small, steep, confined channel will create more shear stress than the identical flow rate in a large, flat, wide open channel. Thus, Qcrit can be extremely variable depending on channel and watershed characteristics and will be different in each channel, and in each watershed.

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Boundary Category	Boundary Type	Permissible Shear Stress (lb/sq ft)
Soils	Fine colloidal sand	0.02 - 0.03
	Sandy loam (noncolloidal)	0.03 - 0.04
	Alluvial silt (noncolloidal)	0.045 - 0.05
	Silty loam (noncolloidal)	0.045 - 0.05
	Firm loam	0.075
	Fine gravels	0.075
	Stiff clay	0.26
	Alluvial silt (colloidal)	0.26
	Graded loam to cobbles	0.38
	Graded silts to cobbles	0.43
	Shales and hardpan	0.67
Gravel/Cobble	1-in.	0.33
	2-in.	0.67
	6-in.	2.0
	12-in.	4.0
Vegetation	Class A turf	3.7
	Class B turf	2.1
	Class C turf	1.0
	Long native grasses	1.2 – 1.7
	Short native and bunch grass	0.7 - 0.95
	Reed plantings	0.1-0.6
	Hardwood tree plantings	0.41-2.5
Temporary Degradable RECPs	Jute net	0.45
	Straw with net	1.5 – 1.65
	Coconut fiber with net	2.25
	Fiberglass roving	2.00
Non-Degradable RECPs	Unvegetated	3.00
	Partially established	4.0-6.0
	Fully vegetated	8.00
Riprap	6 – in. d_{50}	2.5
	9 – in. d_{50}	3.8
	12 – in. d_{50}	5.1
	18 – in. d_{50}	7.6
	24 – in. d_{50}	10.1
Soil Bioengineering	Wattles	0.2 – 1.0
	Reed fascine	0.6-1.25
	Coir roll	3 - 5
	Vegetated coir mat	4 - 8
	Live brush mattress (initial)	0.4 – 4.1
	Live brush mattress (grown)	3.90-8.2
	Brush layering (initial/grown)	0.4 – 6.25
	Live fascine	1.25-3.10
	Live willow stakes	2.10-3.10
Hard Surfacing	Gabions	10
	Concrete	12.5

[1] Ranges of values generally reflect multiple sources of data or different t

A. Chang, H.H. (1988).
B. Florineth. (1982)
C. Gerstgraser, C. (1998).
D. Goff, K. (1999).
E. Gray, D.H., and Sotir, R.B. (1996).
F. Julien, P.Y. (1995).
G. Kouwen, N.; Li, R. M.; and Simons, D.B., (1980).
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I. Schiechtl, H. M. and R. Stern. (1996).
J. Schoklitsch, A. (1937).

Figure 5-1. Range of Critical Shear Stresses (τ_{cr}) for Different Materials (from Fischenich)

It was the original intent of the HMP consulting team to identify a single low flow threshold for the entire County (per previous HMPs). However, an extensive assessment of channel and runoff conditions led the team to conclude that there was a very wide range in critical flows, based largely on channel material but also on channel dimensions, rainfall, and watershed area. Adopting a single standard that is conservative for the most vulnerable channels would result in controls that were excessively conservative for more resilient channels, while adopting an 'average' value would leave some channels unprotected.

Because of this natural variability, the team pursued an analytical approach for estimating Qcrit as a function of parameters such as channel materials, channel dimensions, and watershed area. Because the low flow standard is required to correspond to Qcrit (Order No. R9-2007-0001), this approach allows the low flow standard to be customized for local conditions. The following sections describe an analysis of Qcrit as a fraction of Q_2 for the range of channel conditions in San Diego County. This is followed by a description of a calculator tool that may be used to calculate Qcrit for a specific channel based on parameters that may be readily measured in the field. The analyses described in this report provide background for the selection of low flow thresholds identified in the HMP.

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5.1.3 Critical Flow Analysis

The low flow thresholds were calculated by conducting a sensitivity analysis in which a wide range of channel sizes and geometries, rainfalls, watershed areas and channel materials were modeled in a flow-erosion model to identify Qcrit as a function of Q_2. In all, 170 combinations of channel, rainfall, and watershed conditions were assessed. Based on the results of this sensitivity analysis, a series of low flow thresholds was identified.

The steps used to conduct the sensitivity analysis and determine the recommended flow thresholds were as follows:

1. Identify the typical range of rainfall conditions for the HMP area (western San Diego County).
2. Identify the range of typical watershed areas likely to be developed.
3. Identify a range of typical receiving channel dimensions for each watershed area.
4. Identify a range of typical channel materials for receiving channels.
5. Simulate a range of flows and develop rating curves (relationships between discharge and boundary shear stress).
6. Identify the flow rate at which boundary shear stress exceeds critical shear stress for the channel and material.
7. Express this flow rate as a function of Q_2.
8. Group critical flow rates by channel materials and identify appropriate low flow thresholds for each channel material type.

Steps 1 through 4 were used to define the range of parameters to use in the sensitivity testing. The intent was to identify a typical range of conditions likely to occur in the HMP area (western San Diego county), rather than provide an exhaustive description of possible watershed and channel conditions. Sensitivity testing on many combinations of parameters within this typical range allows identification of the range of channel responses and appropriate flow thresholds.

Each step in the critical flow analysis is explained in detail in the following sections.

Identify the Typical Range Of Rainfall Conditions for the HMP Area (West San Diego County)

Mean annual rainfall was used to estimate receiving channel size, Q_2, Q_5 and Q_{10} (methods described in subsequent sections). Figure 5-2 shows mean annual rainfall for San Diego County. Based on the map, three mean annual rainfalls were selected to represent the range of rainfall conditions for the simulations: 10-inch, 20-inch, and 30-inch.

Identify the Range of Typical Watershed Areas Likely to be Developed

Based on discussions with the TAC, a range of representative watershed areas for development projects was identified. These were: 0.1 sq mi, 0.5 sq mi, 1 sq mi, and 2 sq mi. The consultant team assumed that in project watersheds larger than 2 sq mi the development would either require site specific continuous simulation modeling, or would be broken into multiple smaller sub watersheds with individual points of compliance.

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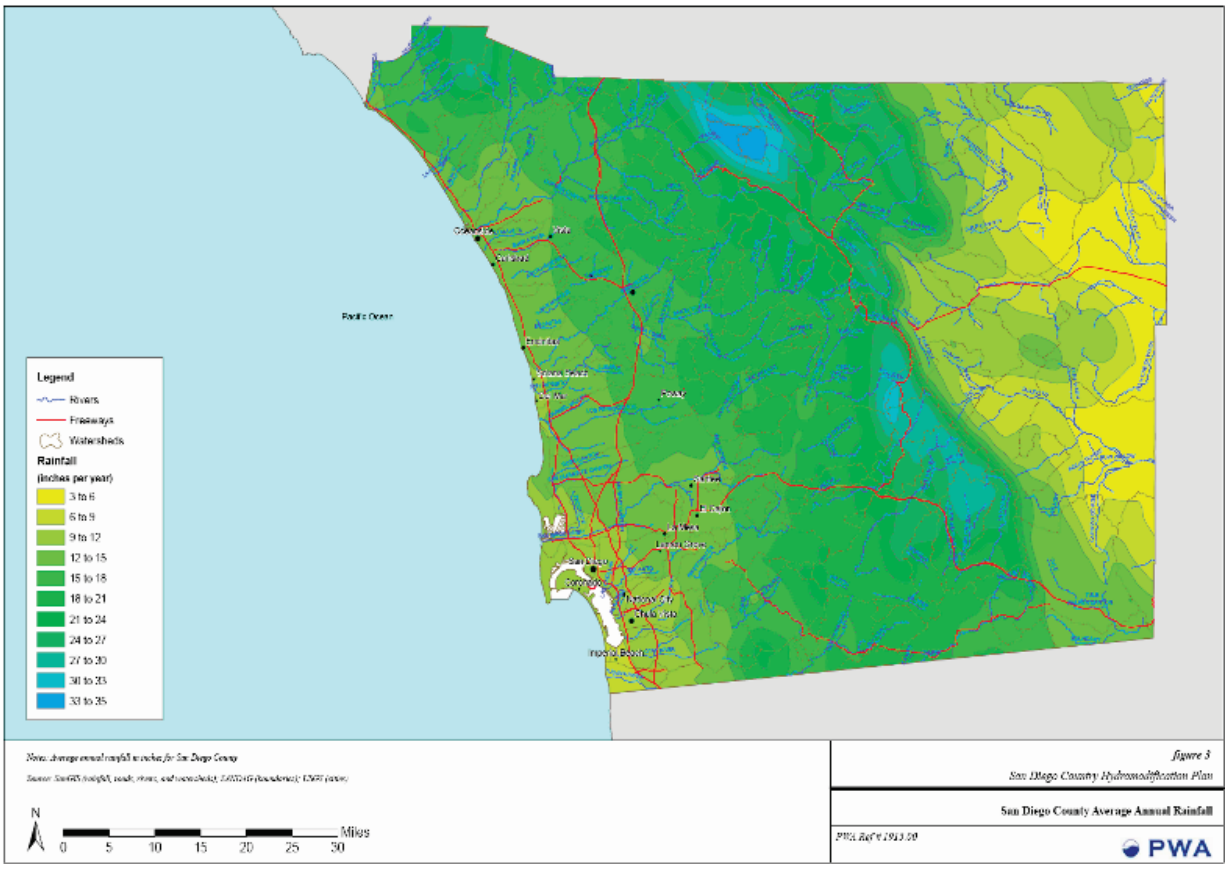

Figure 5-2. Rainfall Distribution in San Diego County

Identify a Range of Typical Receiving Channel Dimensions for Each Watershed Area

Empirical relationships have been developed to express channel dimensions (width, depth and, to a lesser extent, gradient) as a function of dominant discharge. Dominant discharge for a creek channel is the flow rate that transports the majority of sediment and creates/maintains the characteristic size and shape of the channel over time. Dominant discharge may also be referred to as bankfull flow. For undeveloped channels in semi arid parts of the US, dominant discharge is approximately equivalent to Q_5. For example, Coleman et al. (2005) found dominant discharge for streams in Southern California to average $Q_{3.5}$ (range = $Q_{2.1}$ – $Q_{6.7}$). Goodwin (1998) found dominant discharge to vary from Q_2 to Q_{10} for semi arid regions.

To capture natural variability in channel geometry, three different empirical channel geometry relationships were used to estimate receiving channel dimensions for the range of watershed areas and rainfall characteristics used in this study. The relationships were:

Coleman et al. 2005 (modified by Stein – personal communication) – derived from undeveloped channels in Southern California, tends to predict narrow, deep, steep dimensions.

$$\text{Width (ft)} = 0.6012 * Q_{bf}^{0.6875}$$
$$\text{Depth (ft)} = 0.3854 * Q_{bf}^{0.3652}$$

Where Q_{bf} is in cfs.

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Parker et al. 2007 – suitable for gravel channels, tends to predict wide, shallow, flat braided dimensions.

$$\text{Width (m)} = 4.63 * (Q_{bf}^{2/5}) / (9.81^{1/5}) * (Q_{bf} / \text{Sqrt}(9.81 * d_{50}) * d_{50}^{2}))^{0.0667}$$
$$\text{Depth (m)} = 0.382*((Q_{bf}^{2/5})/(9.81^{1/5})))$$

Where Q_{bf} is bankfull discharge in m^3/sec and d_{50} (diameter of median channel material) is in m.

The Parker equation was only used to assess gravel and cobble channel conditions.

Hey and Thorne 1986 tends to predict medium width, depth, and gradient channels.

$$\text{Width (m)} = 2.73*Q_{bf}^{0.5}$$

$$\text{Depth (m)} = 0.22 * \text{Width}^{0.37} * d_{50}^{-0.11}$$

Where Q_{bf} is in m^3/sec and d_{50} is in m.

(Note that original combinations of English and metric units described in the source papers were used rather than standardized these equations in one set of measurements.)

The three equations cover a wide range of likely field conditions, from deeply incised channels (Coleman et al. 2005) to wide, braided conditions (Parker 2007). Note that for the sensitivity analysis we set d50 in the Parker et al equation to the d_{50} of the channel material being tested, and did not use the equation for channels where the material was sand or silt.

The equations produce estimations of width and depth. To estimate a slope for each combination of channel dimensions, the velocity associated with each cross section was calculated (by dividing discharge by width multiplied by depth) and then the slope was calculated that corresponded with that velocity using Manning's equation.

$$\text{Velocity (ft/sec)} = 1.486 \frac{HR^{0.67} * s^{0.5}}{n}$$

Where HR is channel hydraulic radius, s is slope, and n is Manning's roughness coefficient (see definitions).

For the purposes of the sensitivity analysis, a value of n of 0.035 was assumed, corresponding to a non vegetated, straight channel with no riffles and pools. This is a reflection of the small, ephemeral receiving channels which are most prevalent in Southern California developments. A relatively low value was used at the request of the San Diego RWQCB so that the values erred on the conservative side. Some members of the TAC considered the value of n to be too conservative.

These equations all require a value for bankfull discharge. Bankfull discharge (assumed to be approximately Q_5) was estimated using the USGS regional regression for undeveloped watersheds in the South Coast region (Waananen and Crippen 1977). This equation calculates Q_5 as a function of watershed area and mean annual precipitation, based on empirical observations of USGS gauges. The relationship is:

$$Q5 \text{ (cfs)} = 0.4 * \text{Watershed Area}^{0.77} * \text{Mean Annual Precipitation}^{1.69}$$

Where watershed area is in square miles and precipitation is in inches.

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For each combination of typical watershed area and mean annual rainfall, Q_5 was calculated using the USGS regression equation, then three sets of channel dimensions were calculated based on the three channel equations. This provided the range of channel conditions to simulate for the critical flow analysis. The total number of channel conditions was as follows:

3 rainfalls (10, 20, 30 inches per year)
4 watershed areas (0.1, 0.5, 1, 2 square miles)
3 channel width, depth, and slope combinations (narrow/deep, medium, wide/shallow)
= 36 combinations of receiving channel geometry

Identify a Range of Typical Channel Materials for Receiving Channels

The consultant team identified a range of typical channel materials based on feedback from the TAC and experience gained working in San Diego County. The identified materials are not intended as a comprehensive list of possible channel materials, but to cover the range of critical shear stresses likely to be encountered in typical western San Diego County channels. The identified range is as follows:

Table 5-1. Critical Shear Stress Range in San Diego County Channels

Material	Critical Shear Stress (lb/sq ft)
Coarse Unconsolidated Sand	0.01
Alluvial Silt (Non Colloidal)	0.045
Medium gravel	0.12
Alluvial silt/clay	0.26
2.5 inch cobble	1.1

Combining the five channel material types (coarse unconsolidated sand, alluvial silt, medium gravel, alluvial silt/clay, and 2.5 inch cobble) with the 36 combinations of channel geometry produces 180 potential combinations of receiving channel characteristics. Ten sets of combinations were omitted from the analysis because they produced physically unrealistic conditions, such as slopes that were too steep to be developed. Exclusion of these results did not significantly affect the overall results.

Develop Shear Stress Rating Curves

Rating curves for the 36 different combinations of receiving channel characteristics were developed using the same Excel worksheet that forms the basis for the Qcrit calculator developed for Track 2 (described in later sections). Using channel cross section, roughness, and gradient input by the user, the tool calculates the average boundary shear stress associated with a range of different flow depths to construct a rating curve (discharge on the x axis versus shear stress on the y axis). It then identifies the flow rate where average boundary shear stress equals critical shear stress for the channel materials. This is the critical flow (Qcrit). By dividing this number by Q_2, we identify the low flow threshold for each simulation as a function of Q_2. (e.g., $0.1Q_2$ where the critical flow is one tenth of the Q_2 flow).

The tool calculates a shear stress rating curve for a range of flows between 1 and 100 percent of the bankfull flow depth. Bankfull flow depth is defined as the flow depth that corresponds to the dominant discharge for a given channel. The range 1 to 100 percent of bankfull is used because critical flow rarely falls outside these values. The tool then calculates a power function between the points to allow for interpolation. For each of the depths, the tool calculates discharge and average boundary shear stress exerted on the bed, as described below.

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Calculating Average Boundary Shear Stress

Average boundary shear stress is the force that flowing water exerts on channel materials. For a given channel cross-section, it is calculated as follows:

$$\tau_b = \gamma * HR * s$$

where τ_b = average boundary shear stress (lb/ft^2)

γ = unit weight water (62.4 lb/ft^3)

HR = Hydraulic radius (cross section area / wetted perimeter)

s = channel slope (ft/ft)

For each depth increment between 1 and 100 percent of bankfull, cross section area, wetted perimeter, HR and τ_b are calculated. Slope is a constant for the cross section. These calculations produce a rating curve for boundary shear as a function of flow depth.

Calculating Discharge

This step converts flow depth to flow rate (Q) so that the rating curve may be expressed as a function of Q. For each depth increment between 1 and 100 percent of bankfull, the flow rate is calculated using Manning's equation:

$$\text{Velocity (ft/sec)} = 1.486 \frac{HR^{0.67} * s^{0.5}}{n}$$

where V = velocity (ft/sec)

n = Manning's roughness coefficient

HR = hydraulic radius (ft)

For the sensitivity analysis, Manning's n was assumed to be 0.035, which is typical for a non-vegetated ephemeral channel. This assumption was made because most developments covered by the HMP would discharge to receiving channels relatively high in the watershed and with little summer flow. Interim sensitivity analysis found that relative to other factors such as critical shear stress, the range of roughness factors found in receiving channels had little effect on the estimated critical shear flow rate.

Discharge is calculated as velocity multiplied by cross section area (calculated for each cross section). The result of these calculations is a rating curve showing boundary shear stress for the receiving channel as a function of discharge, with the highest point representing bankfull depth (see Figure 5-3 below). Rating curves were created for each of the 36 combinations of channel characteristics.

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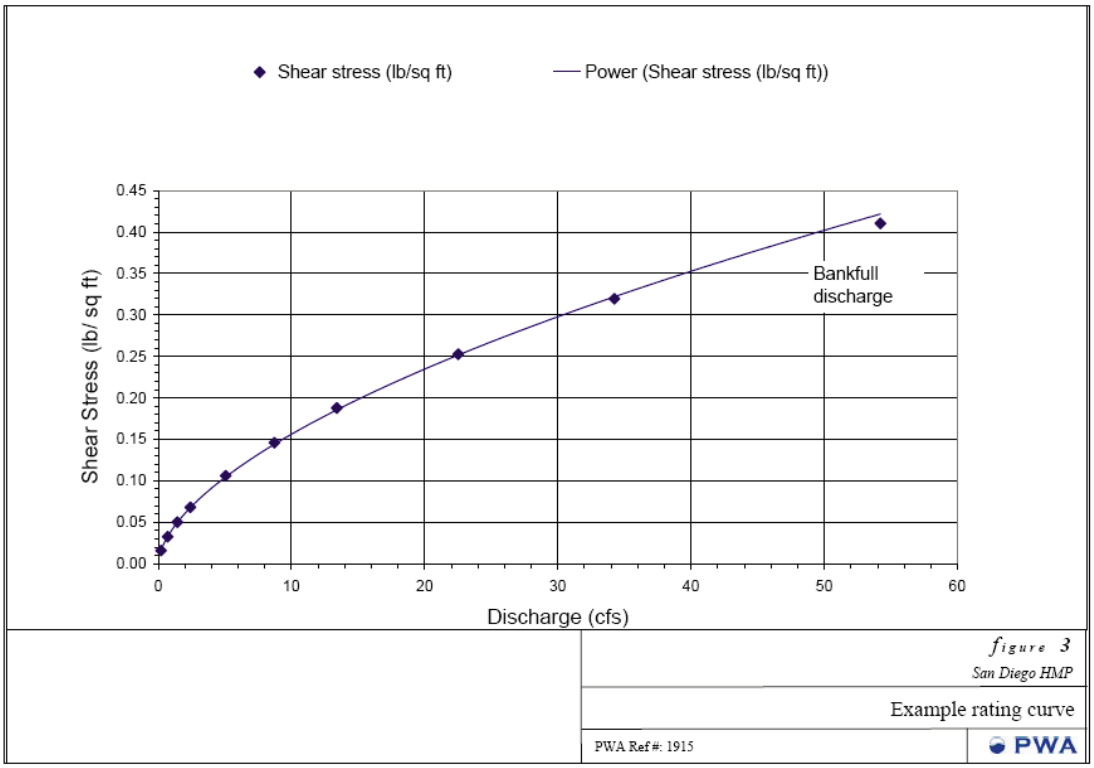

Figure 5-3. Shear Stress Rating Curve for an Example Channel (0.6%, 14 Feet Wide, 1.3 Feet Deep).

These curves were created for 36 different combinations of channel characteristics.

Identify Critical Flow for the Channel and Material

Qcrit is the flow rate at which boundary shear stress equals critical shear stress. A power function interpolates the discharge versus boundary shear stress rating curve, to allow calculation of an intercept between the rating curve and critical shear stress. The critical shear stress for each channel material was plotted horizontally from the Y axis until it intercepted the rating curve. The intercept point was extended vertically to the X axis, showing the Qcrit (Figure 5-4). In this way, Qcrit was calculated for each of the five channel materials using each of the 36 rating curves representing different channel dimensions. As mentioned above, 10 combinations unlikely to occur in nature were eliminated, resulting in a total of 170 Qcrit calculations.

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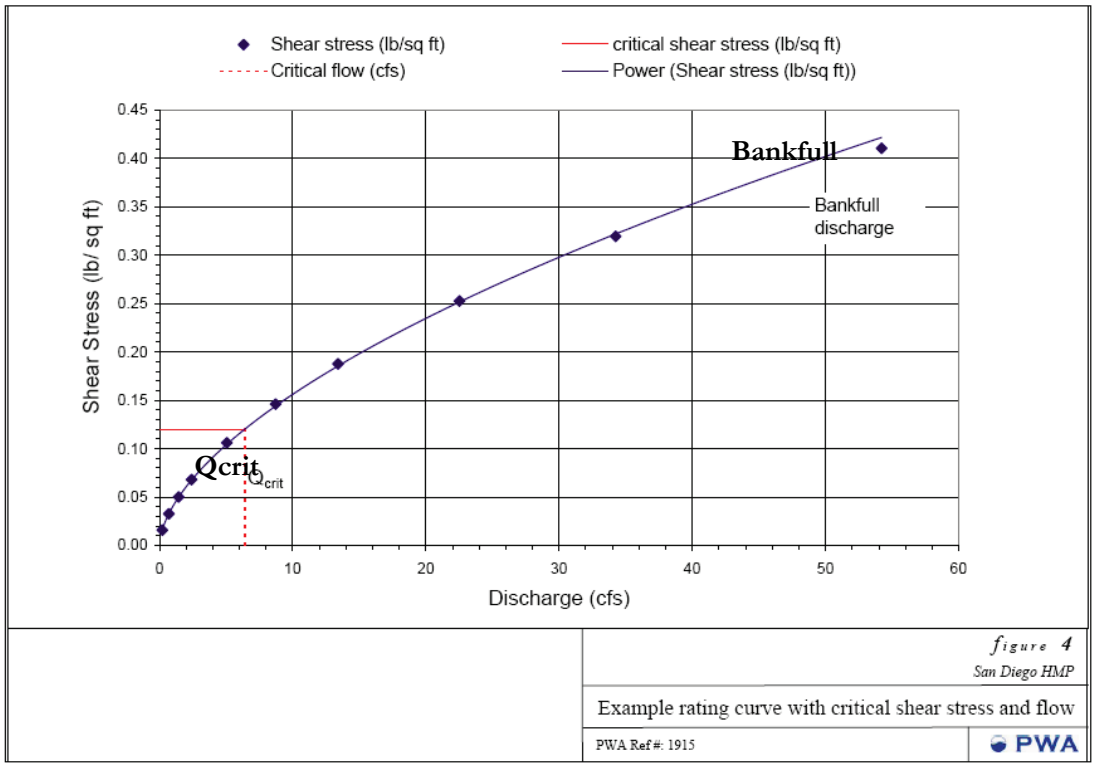

Figure 5-4. Example of a Rating Curve with Critical Shear Stress for Medium Sized Gravel.

In this example critical shear stress = 0.12 lb/sq ft and critical flow Qcrit = 6.4 cfs.

Express Critical Flow as a Function of Q_2

As described above, each rating curve represents a particular combination of watershed area and channel dimensions. Q_2 was calculated for each combination using the USGS regional regression for Q_2 as described above. By dividing the calculated Qcrit by the appropriate Q_2, Qcrit as a proportion of Q_2 was calculated for the 170 scenarios. These Qcrits were then plotted by material type, showing mean and one standard deviation either side of the mean. Note that although Q_5 is assumed as bankfull discharge, critical flow is expressed as a function of Q_2 as has become standard for HMPs.

The results show the high degree of variability in Qcrit based on different channel materials. It is important to note that in field conditions many of the most extreme cases (examples with very high or very low thresholds) would tend to evolve to conditions that yielded critical flows closer to the bankfull discharge because channels have a tendency to self equilibrate. For example, channels with materials that have very low critical flows such as unconsolidated sand tend to erode and either flatten (lowering shear stress, and so increasing critical flow rate) or armor (increasing flow resistance, and increasing critical flow rate). Likewise, channels with materials that have very high thresholds tend to either become steeper due to deposition (increasing shear stress and lowering critical flow rate) or fill in with finer material (reducing resistance and lowering critical flow rate).

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As the results of this analysis demonstrate, critical flow is extremely variable among channel materials and, for a given channel material, can vary significantly with channel configuration (slope, width/depth ratio etc.). Unconsolidated fine sediments can be mobilized by extremely low flows in the absence of clays or other consolidating elements with the structure of the channel. This result is based on literature values for critical shear stress for unconsolidated materials and may not be realistic for natural channels. Therefore in setting flow thresholds this result should be balanced with the recognition that natural channels are likely to include some consolidating fraction within their structure, as well as practical considerations associated with controlling trickle flows that represent the smaller fractions of Q_2 analyzed in this study.

5.1.4 Tool for Calculating Site-Specific Critical Flow

Background

The consultant team developed a tool for calculating a site-specific low flow threshold based on local conditions. The low flow threshold is based on Qcrit for the receiving channel, which is calculated based on channel geometry (width, depth, and gradient), channel materials, and watershed area.

The approach taken was to develop an Excel spreadsheet model to calculate the boundary shear stress associated with a range of flows up to Q_5 for a given channel width, depth and slope, then plot the critical shear stress for the channel material on this rating curve over to identify the flow where boundary shear stress equals critical shear stress.

The development steps were as follows:

1. Develop simplified channel cross section and gradient inputs
2. Calculate a shear stress rating curve
3. Characterize channel materials in terms of critical shear stress
4. Plot critical shear stress of the receiving channel on the rating curve to determine Qcrit
5. Divide the critical low flow by the project area as a proportion of the receiving water watershed area to determine the allowable flow at the point of compliance

Simplified Channel Cross Section and Gradient Inputs

The tool generates a flow rating curve based on user inputs describing the receiving channel dimensions (cross section) and gradient. The first step in developing the tool was to create a template for inputting the required channel parameters. The template assumes a simple trapezoidal cross section, with the following elements:

1. Channel width at a well defined break point corresponding to top of bank (a)
2. Channel width at the toe of the bank (b)
3. Channel depth (elevation difference between bank top and channel bed) (c)

Assumptions:

1. Receiving channels can be reasonably represented by a simple trapezoidal cross section
2. The top of bank corresponds reasonably to the level inundated by the dominant discharge (approximately equal to Q_5)

If top of bank is much higher than the dominant discharge flow depth (e.g. in an incised channel) the applicant should adjust the cross section to represent the lower part of the channel so that depth (c) corresponds approximately to the Q_5 depth.

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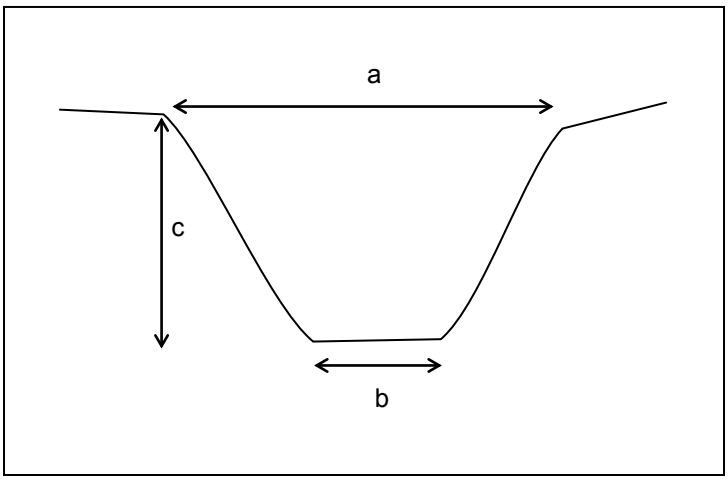

Figure 5-5. Bankfull Cross Section

Develop a Shear Stress Rating Curve

The tool creates a shear stress rating curve for a range of flows between 1 percent of the bankfull flow depth and bankfull depth [flow at depth (c)]. The range 1 to 100 percent of bankfull is used because critical flow rarely lies outside these values. The tool then calculates average boundary shear stress and discharge as previously described in section 5.1.3.

Characterize Receiving Channel Materials in Terms of Critical Shear Stress

The critical shear stress of the channel materials is estimated using a look-up table based on values published by the U.S. Army Corps of Engineers (Fischenich). The tool provides values of critical shear stress for a wide range of channel materials in a drop down box so the user can select from the list. The calculator also allows the user to input a vegetated channel material when this is appropriate (when the channel is completely lined in vegetation).

Calculating Critical Flow for the Receiving Water

Critical flow is the discharge at which boundary shear stress equals critical shear stress. The tool uses a power function to interpolate the discharge versus boundary shear stress rating curve. The critical shear stress for the weaker of the bed or banks is plotted horizontally from the Y axis until it intercepts the rating curve. The intercept point is extended vertically to the X axis, showing the critical flow (see Figure 5-4). This represents the low flow threshold for the receiving water. This value is compared to the 2-year flow in the channel to determine the allowable release rate from BMP facilities, expressed as a fraction of the 2-year flow (0.1, 0.3, or $0.5Q_2$).

Calculating Critical Flow for the Point of Compliance

The tool calculates critical flow based on the characteristics of the receiving water. Where the project watershed does not make up the entire watershed area for the receiving water, the low flow threshold can be prorated based on the percentage of the watershed that is occupied by the project site[2]. For example, if a project occupies one tenth of the receiving water's watershed at the point of compliance and the critical flow

[2]. It is not necessary to adjust the "off-the-shelf" thresholds developed for Track 1 for point of compliance, since they are expressed as a fraction of Q2 for the relevant project area.

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level is 50 cfs, the project's 'share' of the non-erosive flow is 5 cfs (50 x 1/10). This prevents the cumulative impact of future developments from exceeding critical flow in the receiving water, since the critical flow is apportioned according to watershed area.

$$\text{Critical flow at Point of Compliance} = \text{Critical Flow at Receiving Water} \times \frac{\text{Project Area}}{\text{Watershed Area}}$$

The critical flow at the point of compliance is the low flow threshold for the project draining to this point.

Conversion of Critical Flow to Flow Class

To avoid having an infinite range of flow control standards, the calculator assigns the discharge into one of three classes based on its value as a function of the estimated Q_2. These classes are: $0.1Q_2$, $0.3Q_2$, $0.5Q_2$. For example, a channel where the critical flow is $0.15Q_2$ would be assigned a flow threshold of $0.1Q_2$. Channels with critical flows less than $0.1Q_2$ are assigned to the $0.1Q_2$ class. The class flow rate is calculated (i.e. the critical flow corresponding to the assigned fraction of Q_2) and expressed as the final output of the tool.

5.1.5 Third Party Review

West Consultants conducted an in-depth, independent third-party review of the preliminary flow threshold analysis in December 2008. The following list presents a summary of the third-party review.

- Concern was noted regarding the lower flow control limit suggested by the modeling results (10 percent of the 2-year runoff event), especially with regard to implementation practicality and its derivation based solely on sediment movement.
- The review noted that literature suggests standard hydrologic design practices may be inadequate for characterizing cumulative effects of urbanization for flow events more frequent than the 2-year runoff event – specifically with regard to sediment transport and channel disturbance potential.
- The review questioned the use of a specific frequency discharge as an indicator of shear stress to move particles given the variability of other site-specific parameters such as grain size, slope, roughness, and channel shape.
- The review suggested that hydraulic and sediment transport results should be supplemented with actual field data (slope, sediment properties, roughness, and channel shape) to set thresholds (flows, shear stresses, or velocities).
- Concern was noted regarding the use of a single and conservative uniform size for sediment grain sizes. The use of a distribution of sediment grain sizes was recommended.

PWA agreed with the recommendation that additional field data (channel dimensions and slope, and sediment size distribution) is desirable both to verify receiving channel conditions and to make direct measurements of critical shear stress. Efforts were made to pursue the former data, but it was not possible to obtain field permission in time to meet the project deadlines. As the third-party review notes, any revised lower flow threshold calculated using field data is as likely to decrease as increase.

Subsequent to the preliminary flow threshold analysis, PWA ran sediment transport models using a distribution of grain sizes (rather than a single uniform size) for two channel configurations. The results of this limited sensitivity test (see discussion below titled "Summary of Sensitivity Analysis") did not show a consistent trend toward more or less erosion.

For more detailed information regarding West Consultants' independent third-party review, refer to the memo titled *Review of Hydromodification Work by Phillip Williams and Associates (PWA),* prepared by West Consultants and dated December 19, 2008 (Appendix D).

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5.1.6 Summary of Sensitivity Analysis

Subsequent to the preliminary flow threshold analysis, the Copermittees requested that a sensitivity analysis be conducted based on historical rainfall records in the vicinity of the test watershed sites. The purpose of the sensitivity analysis based on the revised rainfall input data is described below. There were two potential concerns associated with the use of the hydrologic analysis developed in the preliminary flow threshold analysis.

- First, the analysis used a single rainfall time series (Lindbergh Field) for all simulations. Rainfall records for other areas were synthesized by taking the difference in mean annual rainfall between a nearby rain gauge and developing a linear adjustment for the Lindbergh series (e.g., if the test site's mean annual rainfall is 15 percent greater than the mean annual rainfall at Lindbergh, then 15 percent is added to all hourly rainfalls). The preliminary flow threshold analysis used this scaled data approach since other data were not available at the time of the initial analysis. Long-term rainfall data for 20 gauges throughout San Diego County have subsequently been prepared and are thus more relevant to the test simulations performed for this study. A test hydrologic analysis showed significant hydrologic response differences between the historical rainfall record for Lower Otay Reservoir and the scaled data from Lindbergh Field.
- Second, the preliminary flow threshold analysis used an "annual peak" method to calculate the rainfall recurrence interval, rather than a partial duration series method. The two methods result in significantly different predictions of the two year runoff event (Q_2.). From discussions with rainfall statistical experts at the Hydrologic Research Center, it has been determined that the partial duration series is a more applicable rainfall series for the semi-arid climate in San Diego County. Partial duration flow statistics have been prepared and the test hydrologic analysis showed significant hydrologic response differences between the partial duration series and annual peak series methods.

There is significant variability in the HEC-RAS modeling results for the different channel and sediment scenarios, as reflected in the results of the preliminary flow threshold analyses. Therefore, it is important to focus on the general trends reflected in the sensitivity analysis results rather than the specific numerical results. As such, the sensitivity analysis modeling results confirm that the selection of rainfall data, flow frequency methodology, and sediment size distribution do affect the results of the flow control analysis. However, the cumulative effect of these changes did not affect the consultant's preliminary conclusion that a singular countywide lower flow threshold limit would converge on 10 percent of the 2-year runoff event.

For more detailed information regarding the PWA sensitivity analysis based on revised rainfall data, refer to the memo titled *Sensitivity of Changing Rainfall Series and Analysis on Erosion Threshold*, prepared by PWA and dated December 29, 2009 (Appendix A).

5.2 Categorization of Streams

Information for this section was prepared in association with a concurrent hydromodification study by the SCCWRP. As discussed with the San Diego RWQCB staff, results of the SCCWRP study have been included in the San Diego HMP to comply with the following Permit Order requirement.

- Identification of geomorphic standards for channel segments receiving storm water discharges from Priority Projects (Permit Section D.1.g.(1)(a) and (m)). The purpose of these standards is to maintain or improve channel stability.

The SCCWRP study, which is being conducted for the entire Southern California region between Ventura and San Diego Counties, was originally funded by a Prop 50 grant. Because of funding issues that required a work stoppage in late 2008, the County of San Diego has provided funding to SCCWRP to continue its work and meet deadlines required for the San Diego HMP submittal timeline. The overall SCCWRP study

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approach is summarized in the document titled, "*Stream Channel Mapping and Classification Systems: Implications for Assessing Susceptibility to Hydromodification Effects in Southern California," SCCWRP Technical Report 562, April 2008*.

Screening tools, prepared by SCCWRP to identify channel susceptibility to hydromodification impacts, are now available in 2009 on a testing basis. Such tools include the following:

- A tiered, hierarchical approach for channel erosion susceptibility evaluation of multiple channel types. This approach includes determination of a vertical channel stability analysis (including transportability of channel bed material) and a lateral channel stability analysis (including potential erodibility of channel banks and subsequent channel migration). These rapid assessment tools provide a preliminary rating of stream susceptibility to erosion (Very High, High, Medium, or Low) and are provided for a variety of geomorphic scenarios including alluvial fans, broad valley bottoms, incised headwater channels, etc.

Eventually, SCCWRP tools will be expanded to help quantify the effect of a proposed project on the receiving stream's susceptibility to erosion, based upon factors such as size of the project, impervious footprint, location of the project within the watershed, and stability of the receiving water body.

Development of HMPs in most Southern California counties is correlated to the ultimate findings of the SCCWRP study, which was originally scheduled for release in March 2010. Though individual regions and municipalities would not be tied to acceptance of the SCCWRP results, it is generally acknowledged that SCCWRP's formulation of regional standards for hydromodification management will serve as a solid baseline for development of HMPs for specific regions in Southern California.

For implementation with the San Diego HMP, the SCCWRP screening tools will be used in association with the decision matrix to determine the appropriate level of mitigation required for a particular project. Where receiving streams have a high susceptibility to erosion, then more restrictive mitigation solutions will be required as compared to receiving streams with a low susceptibility to erosion.

The full lateral and vertical susceptibility decision matrices are included on Pages 4 and 5 of the overall HMP Decision Matrix, located in Chapter 6 of this HMP. Page 3 of the HMP Decision Matrix includes recommendations regarding the appropriate lower flow threshold, based upon the SCCWRP susceptibility analysis as well as the critical flow calculator result.

Channel screening tools will assess the domain of analysis from a proposed project. The domain of analysis is defined as the reach lengths upstream and downstream from a project for which hydromodification assessment is required. The domain of analysis determination includes an assessment of the incremental flow accumulations downstream of the site, identification of hard points in the downstream conveyance system, and quantification of downstream tributary influences.

The effects of hydromodification may propagate for significant distances downstream (and sometimes upstream) from a point of impact such as a stormwater outfall. Accordingly, it may be necessary to conduct geomorphic screening reconnaissance across a domain spanning multiple channel types/settings and property owners.

For purposes of this HMP, the extents of the domain of analysis are defined as follows:

- Proceed downstream until reaching one of the following:
  - At least one reach downstream of the first grade-control point (preferably second downstream grade control location)
  - Tidal backwater/lentic (still water) waterbody
  - Equal order tributary (Strahler 1952)

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- Accumulation of 50 percent drainage area for stream systems (note that SCCWRP is still determining specific flow accumulation percentage)
- Accumulation of 100 percent drainage area for urban conveyance systems (storm drains, hardened channels, etc.)

OR demonstrate sufficient flow attenuation through existing hydrologic modeling.

- Proceed upstream for 20 channel top widths OR to the first grade control point, whichever comes first. Identify hard points that can check headward migration and evidence of active headcutting.

If the screening analysis is conducted on a project-specific basis, there may be instances in which a high susceptibility rating is obtained at the first point of field observation. In these cases, it may be sufficient to limit the analysis to the point/property of impact.

The SCCWRP screening tools, as well as details to determine the domain of analysis, are provided in Appendix B.

5.3 Cumulative Watershed Impacts

California Environmental Quality Act (CEQA) Guidelines §15065 mandate a finding that a project has a significant effect on the environment when it has:

> "…possible environmental effects that are individually limited but cumulatively considerable. 'Cumulatively considerable' means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probably future projects."

Such assessments are inherently difficult and rarely quantifiable. However, it is often possible to incorporate within a project measures that limit or offset potential impacts to such a degree that reasonable minds can agree the net incremental impact of the project is insignificant regardless of the connections to, or multiplying effects of, other projects. To this end, a river reach sensitivity analysis was performed for the San Diego River. The intent of this analysis was to determine the level of cumulative watershed impacts that would result in a significant alteration to the San Diego River's flow duration curve. Data from this analysis are being used to determine exemption criteria for similar-sized river systems in San Diego County, since detailed long-term hourly streamflow data is not available for most of those rivers. The results of the sensitivity analysis are discussed in detail in Section 6.1.

5.3.1 Hydromodification Management

The purpose of the HMP is to address the cumulative effect of many individual development projects on stream erosion. In the HMP, the watershed-scale effect is addressed through conditions placed on individual development projects.

Also, the HMP implements a regulatory standard. A project's compliance with regulatory standards may be used to help determine whether the project may have a significant impact on the environment, either individually or cumulatively.

Two questions have been raised with regard to how the HMP addresses cumulative impacts:

1. Are the low-flow thresholds (the maximum rate at which on-site detention facilities can be drained) low enough to prevent stream erosion, when viewed in connection with the effects of other projects?

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2. With regard to the specific exemption proposed for discharges where downstream sub-watershed imperviousness is at least 70 percent and the potential for cumulative impacts is "minimal," how will that potential be assessed?

Low Flow Thresholds

How does the low flow threshold for a receiving stream relate to the flow that must be controlled at a project site?

A low flow threshold for a receiving stream can be articulated as a particular runoff event (e.g., 0.1 Q_2., or one-tenth the 2-year peak runoff flow). Runoff to the stream is modeled based on the watershed area tributary to the stream, and the model is then calibrated to stream gauge data. In some cases, the low-flow runoff threshold developed from watershed-scale stream analysis has then been applied to each project area within the watershed. Implicitly, this standard is set so that if the entire watershed was made impervious, and runoff from the entire watershed was controlled through the facilities built to this standard, no increase in stream erosion would result.

This is an exceedingly conservative assumption, because:

- Not all areas of the watershed will be developed.
- Very low flows trickling from individual detention facilities will have losses before reaching streams.
- If bioretention facilities are used, the losses to infiltration and evapotranspiration are likely to be underestimated.

In addition to this general conservative bias, additional conservatism is built in when a project is located downstream from headwaters. To use an extreme example, a discharge from a development project near the mouth of a stream draining a large watershed would have an insignificant impact throughout the range of runoff flow rates encountered in the stream.

The degree to which these factors contribute to a conservative bias in the hydromodification standard can only be estimated; however, reasonable judgments can be made. These judgments should be subject to revision based on further insights gained in the first years of implementation.

Proposed Exemptions

How would the potential for cumulative impacts from many exempted projects be assessed? There are too many possible scenarios of development proposal and watershed condition to establish firm standards or guidelines. In this context, the concept of "minimal potential" for cumulative impacts means a judgment that—based on knowledge of the specific land use patterns and policies in the watershed—it is unlikely the total of all future newly developed projects discharging at the selected low-flow threshold would be significant when compared to the current (pre-project) total flow from the watershed. The requirements that Priority Development Projects on previously developed sites implement LID and use LID facilities such as bioretention for storm water treatment further ensure runoff rates and durations in highly developed watersheds will decrease rather than increase over time.

A similar approach applies to other proposed exemptions and in-lieu mitigation projects within the HMP. For example, the HMP states "the project proponent may consider implementation of planning measures such as buffers and restoration activities.… in lieu of implementation of storm water flow controls." In this case, cumulative impacts are addressed by the proviso that this option is available "in situations where the benefits of a proposed stream restoration project would *substantially outweigh the potential impacts* of additional runoff from a proposed project…" (emphasis added). The requirement that benefits "substantially outweigh" potential impacts for each individual project addresses the potential for cumulative impacts by

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ensuring that, even if many such scenarios were implemented in a watershed, the cumulative benefits would outweigh the cumulative impacts.

5.3.2 Summary

As with other cumulative impacts, the cumulative impacts on stream erosion of individual land development projects within a watershed can only be estimated. Judgments on the significance of potential cumulative impacts are based on a weight of evidence approach. Despite the lack of quantification and certainty, it is possible for stakeholders to agree that, in a given set of conditions, the potential for cumulative impacts is highly unlikely.

The HMP supports assessment of cumulative impacts through hydrologic modeling of entire watersheds. Translating the results of watershed modeling to standards applicable to individual development sites is a matter of estimation and judgment.

In the HMP, the potential for cumulative impacts is addressed through a built-in conservative bias in quantitative estimates of impacts and the effectiveness of flow-control measures needed to address those impacts, and through a conservative approach and individual review of proposed exemptions and in-lieu projects.

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6. REQUIREMENTS AND STANDARDS FOR PROJECTS

Priority Development Projects are required to implement hydrologic control measures so that post-project runoff flow rates and durations do not exceed pre-project flow rates and durations where they would result in an increased potential for erosion or significant impacts to beneficial uses or violate the channel standard (Permit Section D.1.g(1)(c)). The purpose of this chapter is to detail HMP applicability requirements, present hydromodification mitigation criteria and implementation options, and provide a framework for in-stream rehabilitation options.

6.1 HMP Applicability Requirements

To determine if a proposed project must implement hydromodification controls, refer to the HMP Decision Matrix in Figure 6-1 on the following page.

The HMP Decision Matrix can be used for all projects. For redevelopment projects, flow controls would only be required if the redevelopment project increases impervious area or peak flow rates as compared to pre-project conditions.

It should be noted that all Priority Development Projects will be subject to the Permit's LID and water quality treatment requirements even if hydromodification flow controls are not required.

As noted in Figure 6-1, projects may be exempt from HMP criteria under the following conditions.

- If the project is not a Priority Development Project
- If the proposed project does not increase the impervious area or peak flows to any discharge location.
- If the proposed project discharges runoff directly to an exempt receiving water such as the Pacific Ocean, San Diego Bay, an exempt river reach, an exempt reservoir, or a tidally-influenced area.
- If the proposed project discharges to a stabilized conveyance system that extends to the Pacific Ocean, San Diego Bay, a tidally-influenced area, an exempt river reach or reservoir.
- If the contributing watershed area to which the project discharges has an impervious area percentage greater than 70 percent
- If an urban infill project discharges to an existing hardened or rehabilitated conveyance system that extends beyond the "domain of analysis," the potential for cumulative impacts in the watershed are low, and the ultimate receiving channel has a Low susceptibility to erosion as defined in the SCCWRP channel assessment tool.

If the proposed project decreases the pre-project impervious area and peak flows to each discharge location, then a flow-duration analysis is implicitly not required. If continuous simulation flow-frequency and flow duration curves were developed for such a scenario, the unmitigated post-project flows and durations would be less as compared to pre-project curves.

Proposed exemptions for projects discharging runoff directly to the Pacific Ocean, San Diego Bay or to hardened conveyance systems which transport runoff directly to the Pacific Ocean or San Diego Bay are referred to the 2007 Municipal Permit. Per the Permit, hardened conveyance systems can include existing concrete channels, storm drain systems, etc.

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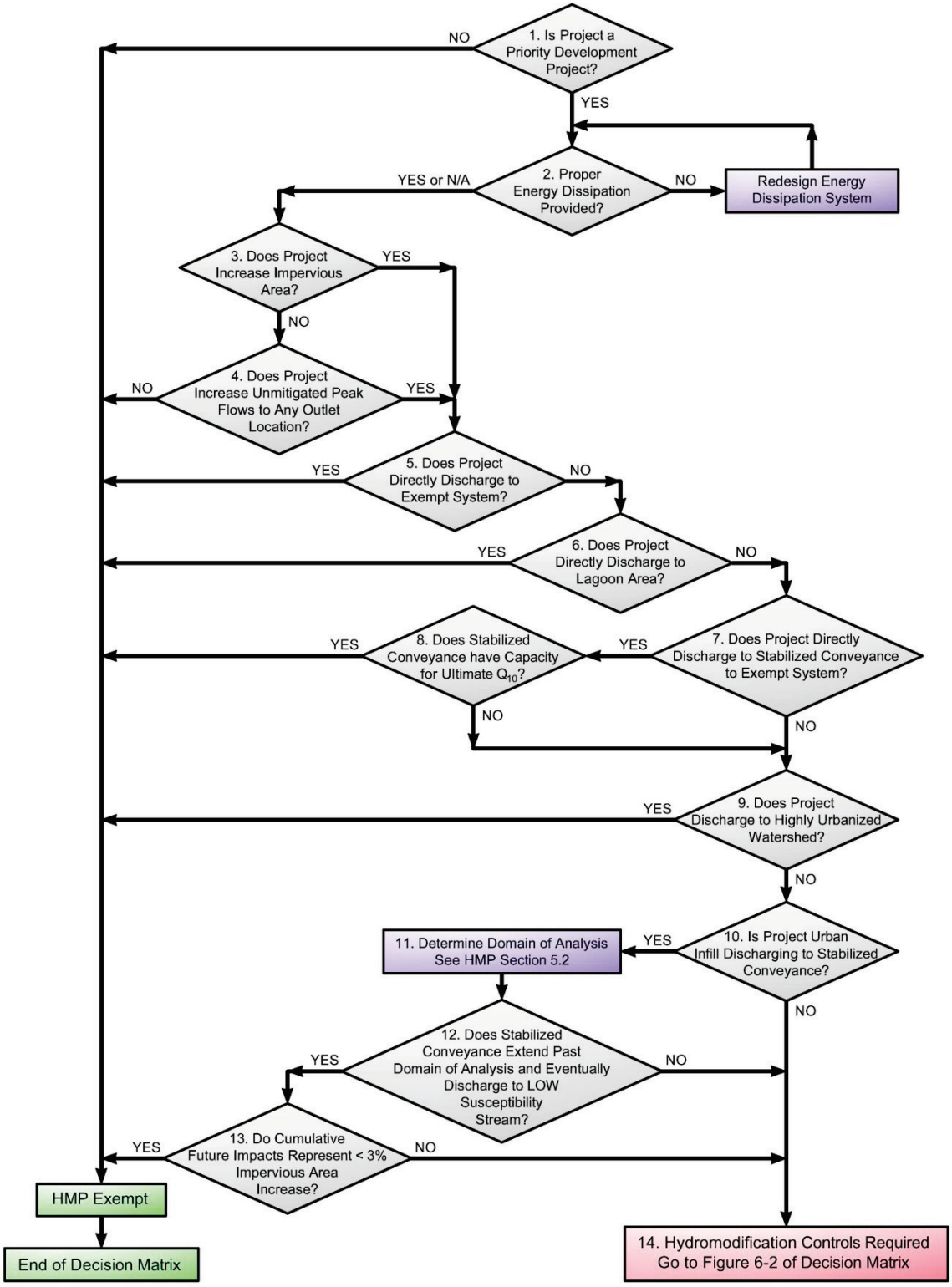

Figure 6-1. HMP Applicability Determination

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The Municipal Permit also contains language to support exemptions for projects located in highly urbanized areas where the impervious percentage exceeds 70 percent (as calculated for the sub-watershed between the project outfall downstream to the exempt receiving water).

- Figure 6-1, Node 1 – Hydromodification mitigation measures are only required if the proposed project is a Priority Development Project.
- Figure 6-1, Node 2 – Properly designed energy dissipation systems are required for all project outfalls to unlined channels. Such systems should be designed in accordance with the County of San Diego's Drainage Design Manual to ensure downstream channel protection from concentrated outfalls.
- Figure 6-1, Nodes 3 and 4 – Projects may be exempt from hydromodification criteria if the proposed project reduces the pre-project impervious area and if unmitigated post-project outflows (outflows without detention routing) to each outlet location are less as compared to the pre-project condition. The pre and post-project hydrologic analysis should be conducted for the 2 and 10-year design storms and follow single-event methodology set forth in the San Diego Hydrology Manual. This scenario may apply to redevelopment projects in particular.
- Figure 6-1, Node 5 – Potential exemptions may be granted for projects discharging runoff directly to an exempt receiving water, such as the Pacific Ocean, San Diego Bay, an exempt river system (detailed in Table 6-1), or an exempt reservoir system (detailed in Table 6-2).
- Figure 6-1, Node 6 – For projects discharging runoff directly to a tidally-influenced lagoon, potential exemptions may also be granted. Exemptions related to runoff discharging directly to tidally-influenced areas were drafted based upon precedent set in the Santa Clara HMP. Regarding the potential exemption, additional analysis would be required to assess the effects of the freshwater / saltwater balance and the resultant effects on lagoon-system biology. This assessment, which would be required by other permitting processes such as the Army Corps of Engineers, California Department of Fish and Game, etc., must be provided by a certified biologist or other specialist as approved by the governing municipality. Such discharges would include an energy dissipation system (riprap, etc.) designed to mitigate 100-year outlet velocities based upon a free outfall condition. Such a design would be protective of the channel bed and bank from an erosion standpoint.
- Figure 6-1, Nodes 7 and 8 – For projects discharging runoff directly to a hardened conveyance or rehabilitated stream system that extends to exempt receiving waters detailed in Node 5, potential exemptions from hydromodification criteria may be granted. Such hardened or rehabilitated systems could include existing storm drain systems, existing concrete channels, or stable engineered unlined channels. To qualify for this exemption, the existing hardened or rehabilitated conveyance system must continue uninterrupted to the exempt system. In other words, the hardened or rehabilitated conveyance system cannot discharge to an unlined, non-engineered channel segment prior to discharge to the exempt system. Additionally, the project proponent must demonstrate that the hardened or rehabilitated conveyance system has capacity to convey the 10-year ultimate condition flow through the conveyance system. The 10-year flow should be calculated based upon single-event hydrologic criteria as detailed in the San Diego County Hydrology Manual.
- Figure 6-1, Node 9 – As allowed per the Municipal Permit, projects discharging runoff to a highly urbanized watershed (defined as an existing, pre-project impervious percentage greater than 70 percent) may be eligible for an exemption from hydromodification criteria.

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Watershed impervious area calculations for this potential exemption will be measured between the project site discharge location and the connection to a downstream exempt receiving conveyance system, such as the Pacific Ocean, San Diego Bay, or an exempt river system. If a tributary area connects with the main line drainage path between the project site and the exempt system, then the entire watershed area contributing to the tributary shall be included in the calculation. Initial review of County land use indicates that this exemption will likely only apply in a limited number of urbanized coastal areas.

Percent imperviousness will be calculated based on an area-weighted average of impervious areas associated with commercial, industrial, single-family residential, multi-family residential, open space, and other miscellaneous areas (schools, churches, etc.) representative for the watershed. Representative percent imperviousness values for each land use type may correspond to values recommended in Table 3-1 of the County of San Diego's Hydrology Manual and detailed below or by more specific representative percent impervious calculations (using GIS, etc.), which are often required to represent impervious area percentages for park, school and church sites.

- Figure 6-1, Nodes 10 through 13 – For urban infill projects discharging runoff to an existing hardened or rehabilitated conveyance system, potential limited exemptions from hydromodification criteria may apply where the existing impervious area percentage in the watershed exceeds 40 percent. For the potential exemption application, the domain of analysis must be determined and the existing hardened or rehabilitated conveyance system must extend beyond the downstream terminus of the domain of analysis. The hardened or rehabilitated conveyance system must discharge to a receiving channel with a Low potential for channel susceptibility for this exemption to be granted (channel susceptibility determined using SCCWRP tool). Finally, continuous simulation sensitivity analysis shows that an exemption could only be granted if the potential future development impacts in the watershed would increase the watershed's impervious area percentage by less than 3 percent (as compared to the existing condition in the year 2010). If the potential future cumulative impacts in the watershed could increase the impervious area percentage by more than 3 percent (as compared to existing condition), then no exemption could be granted based on this item. Watershed impervious area calculations for this potential exemption, in which a project discharges to a watershed with an existing impervious areas greater than 40 percent, will be measured upstream from the outfall of the urban conveyance system (to a non-concrete, non-riprap-lined or non-engineered channel) to the contributing watershed boundary (the entire watershed contributing to the discharge outfall).

  Percent imperviousness will be calculated based on an area-weighted average of impervious areas associated with commercial, industrial, single-family residential, multi-family residential, open space, and other miscellaneous areas (schools, churches, etc.) representative for the watershed. Representative percent imperviousness values for each land use type may correspond to values recommended in Table 3-1 of the County of San Diego's Hydrology Manual and detailed below or by more specific representative percent impervious calculations (using GIS, etc.), which are often required to represent impervious area percentages for park, school and church sites.

Exemptions related to runoff discharging directly to certain river reaches were initially based upon the majority TAC opinion that such river reaches were depositional (aggrading) and that the effects of cumulative watershed impacts to these reaches is minimal. Subsequent justifications for the river reach exemptions were the result of a flow duration curve analysis for the San Diego River.

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Potential river reaches that would be exempt from hydromodification criteria include only those reaches for which the contributing drainage area exceeds 100 square miles and which have a 100-year design flow in excess of 20,000 cfs. For reference, proposed Caltrans HMP criteria allows for river/creek exemptions for drainage areas of only 10 square miles.

Per recommendations from members of the TAC, San Diego river systems meeting the drainage area and peak flow criteria are typically aggrading (depositional) and have very wide floodplain areas when in the natural condition. In all cases, river reaches meeting the drainage area and peak flow criteria are located downstream of large reservoir systems which effectively block outflows for most storm events. In addition, the river systems meeting these criteria typically have very low gradients. The combination of low gradients, significant peak flow attenuation, and wide floodplain areas translate to a low potential for channel erosion at the upper limit of the proposed geomorphic flow range (10-year flow event).

The intent of the San Diego River flow duration analysis was to determine the level of cumulative watershed impacts that would result in a significant alteration to the San Diego River's flow duration curve. Both the Fashion Valley and Mast Boulevard USGS stream gauge stations were used to develop long-term flow duration curves for the San Diego River. Data from this analysis will be used to determine exemption criteria for similar-sized river systems in San Diego County, since detailed long-term hourly streamflow data is not available for most of those rivers. Since the findings of the sensitivity analysis are planned to be extrapolated to other large river systems, implementation of additional gauging stations along other major river systems is recommended to analyze the differences in watershed response between the major watershed systems.

Assumptions related to the San Diego River sensitivity analysis are provided below:

- The flow duration charts show the San Diego River flow durations, plus simulated river flows durations for additional development scenarios.
- HSPF models were built to simulate converting existing undeveloped areas in the watershed into development with no stormwater flow controls.
- Increasing drainage area increments were modeled.
- To produce the 'simulated development' flow duration curves, the difference between developed and undeveloped flow duration curves was calculated for proposed hypothetical development .sites of varying sizes Then, the "difference hydrograph" was added to the San Diego River flow duration curve. This approach was used to avoid the potential problem of double-counting areas.

Tasks Related to Development of Flow Duration Analysis of San Diego River:

- Acquired 15-minute stream flow data from USGS (available from 1988 to present)
- Aggregated to 1-hour historical record
- Computed flow duration statistics for both records and determined if there is any substantial difference between the records (this is a QA step that allowed for removal any high flow 'outliers' in the record that could affect the results).
- Prepared a simple, characteristic HSPF model for the lower watershed for "existing conditions in an undeveloped area" – assumed Group D soils with sparse vegetation.
- Prepared a simple, parallel HSPF model for "developed conditions"

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- Ran both models and examined the difference between the resulting hydrographs (the hydromodification). A couple of different pre- and post-development models were generated to analyze the differences on a per unit area basis.
- Using the "difference hydrograph" created from the model simulations, progressively added development and recomputed the flow duration statistics.
- Examined the modified flow duration statistics and determined at what level of increased development the statistics became noticeably altered.

Results showed that increasing levels of development, in excess of 1,000 acres assumed to occur at the same location as the stream gauge station, would produce a very minor influence on the river's flow duration curve. These results demonstrated that certain portions of the San Diego River could be exempt from hydromodification requirements. Such HMP exemptions would only be granted for projects discharging runoff directly to the exempt river reach. Each municipality must define "direct discharge" based on the project site conditions. To qualify for the potential exemption, the outlet elevation must be between the river bottom elevation and the 100-year floodplain elevation and properly designed energy dissipation must be provided The supporting HSPF continuous modeling analysis results are summarized in a Technical Memo in Appendix F.

All exempt river reaches, which are presented in Table 6-1, have drainage areas in excess of 100 square miles and 100-year flow rates in excess of 20,000 cfs. In addition, all proposed river reaches are subject to significant upstream reservoir flow regulation, have wide floodplain or stabilized channel areas, and low gradients. This combination of factors, in association with field observations and years of historical perspective from the TAC members, justifies exemptions for direct discharges to the exempt river reaches provided that properly sized energy dissipation is provided at the outfall location.

Table 6-1. Summary of Exempt River Reaches in San Diego County

River	Downstream Limit	Upstream Limit
Otay River	Outfall to San Diego Bay	Lower Otay Reservoir Dam
San Diego River	Outfall to Pacific Ocean	Confluence with San Vicente Creek
San Dieguito River	Outfall to Pacific Ocean	Lake Hodges Dam
San Luis Rey River	Outfall to Pacific Ocean	Upstream river limit of Basin Plan subwatershed 903.1 upstream of Bonsall and near Interstate 15
Sweetwater River	Outfall to San Diego Bay	Sweetwater Reservoir Dam

Table 6-2 provides a summary of exempt reservoirs in San Diego County. Large reservoirs can be exempt systems from a hydromodification standpoint since reservoir storm water inflow velocities are naturally mitigated by the significant tailwater condition in the reservoir. HMP exemptions would only be granted for projects discharging runoff directly to the exempt reservoirs. Each municipality must define "direct discharge" based on the project site conditions. To qualify for the potential exemption, the outlet elevation of the conveyance system must be within (or below) the normal operating water surface elevations of the reservoir and properly designed energy dissipation must be provided.

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Table 6-2. Summary of Exempt Reservoirs in San Diego County	
Reservoir	**Watershed**
Barrett Lake	Tijuana River
El Capitain Reservoir	San Diego River
Lake Dixon	Escondido Creek
Lake Heneshaw	San Luis Rey River
Lake Hodges	San Dieguito River
Lake Jennings	San Diego River
Lake Murray	San Diego River
Lake Poway	San Dieguito River
Lake San Marcos	San Marcos Creek
Lake Wohlford	Escondido Creek
Loveland Reservoir	Sweetwater River
Lower Otay Reservoir	Otay River
Miramar Lake	Los Penasquitos Creek
San Vicente Reservoir	San Diego River
Sweetwater Reservoir	Sweetwater River
Upper Otay Reservoir	Otay River

The final exemption category focuses on small urban infill projects where the potential for future cumulative watershed impacts is minimal. Continuous simulation models have been prepared for subwatershed areas containing between 40 and 70 percent existing imperviousness (as measured from the project site downstream to existing storm drain outfall) with the following assumptions.

Sensitivity Analysis for Urban Watersheds:

- Prepared HSPF models for 10-, 100-, and 500-acre watersheds with 40, 50, 60 percent imperviousness. Ran simulations and computed flow duration statistics for each of the urban watershed scenarios.
- Progressively increased the level of imperviousness to simulate infill development for the 10-, 100-, 500-acre watersheds.
- Ran infill scenario simulations and computed flow duration statistics
- Examined the infill flow duration statistics and determined at what level of increased development the statistics became noticeably altered.

Per results of the continuous simulation modeling and analysis of the resultant flow duration curves, urban infill projects have a relatively minor effect on the overall watershed's flow duration curve if the future cumulative additional impacts have the potential to increase the existing watershed impervious area by less than 3 percent. Potential urban infill project exemptions are only considered if the existing impervious area percentage of the sub-watershed is at least 40 percent. For sub-watersheds containing less than 40 percent existing impervious area, continuous simulation models indicated a more pronounced response to the flow duration curve with small urban infill developments.

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Urban infill projects may be exempt from HMP criteria if:

1. The potential future development impacts within the sub-watershed, as measured from the entire sub-watershed area draining to the existing conveyance system outfall, would not increase the composite impervious area percentage of the sub-watershed by more than 3 percent
2. The project discharges runoff to an existing hardened or rehabilitated conveyance system (storm drain, concrete channel, or engineered vegetated channel) that extends beyond the Domain of Analysis determined for the project site, and
3. The stabilized conveyance system eventually discharges to a channel with a Low susceptibility to erosion, as designed by the SCCWRP channel assessment tool.

The supporting HSPF continuous modeling analysis results, which analyzed existing sub-watershed scenarios of 40, 50, and 60 percent impervious area, are summarized in a Technical Memo in Appendix F.

As mentioned in Section 5.2, the Domain of Analysis is defined to extend downstream of a proposed project site to a location in a natural stream section to where a 50 percent flow accumulation is added to the stream system. For existing storm drain systems or hardened conveyance systems, the Domain of Analysis shall extend downstream to a location where a 100 percent flow accumulation is added to the storm drain or hardened conveyance system. These definitions may be revised in the future subsequent to ongoing work being conducted by the SCCWRP.

6.2 Flow Control Performance Criteria

Figures 6-2 and 6-3, which are part of the HMP Decision Matrix and are presented on the following pages, detail how lower flow thresholds would be determined for a project site. Figures 6-4 and 6-5, which detail the SCCWRP lateral and vertical channel susceptibility requirements, complete the HMP Decision Matrix.

The project applicant must first determine whether field investigations will be conducted pursuant to the SCCWRP channel screening tools. If the screening tools are not completed for a proposed project, then the site must mitigate peak flows and durations based on a pre-project condition lower flow threshold of $0.1Q_2$. While a project applicant would be held to the $0.1Q_2$ standard if channel screening tools and assessments are not conducted, less restrictive standards are possible for more erosion-resistant receiving channel sections if the screening tools are completed and the SCCWRP method indicates either a Medium or Low susceptibility to channel erosion.

In such a scenario, the project applicant would also use the critical shear stress calculator to assist in determination of the predicted lower flow threshold. The SCCWRP screening tools and critical shear stress calculator work in concert to determine the lower flow threshold for a given site. Lower flow limits determined by the calculator have been grouped into one of three thresholds – $0.1Q_2$, $0.3Q_2$ or $0.5Q_2$. "Low" susceptibilities from the SCCWRP tool generally correspond to the $0.5Q_2$ threshold, "Medium" susceptibilities generally correspond to the $0.3Q_2$ threshold, and "High" susceptibilities generally correspond to the $0.1Q_2$ threshold. The SCCWRP channel screening tools are required to identify channel conditions not considered by the critical shear stress calculator, which focuses on channel material and cross section. Conversely, the SCCWRP channel screening tools considers other channel conditions including channel braiding, mass wasting, and proximity to the erosion threshold. In cases where the critical shear stress calculator and the SCCWRP screening tools return divergent values, then the most conservative value shall be used as the lower flow threshold for the analysis.

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Low-Impact Development (LID) and extended detention facilities are required to meet peak flow and duration controls as follows:

1. For flow rates ranging from 10 percent, 30 percent or 50 percent of the pre-project 2-year runoff event ($0.1Q_2$, $0.3Q_2$, or $0.5Q_2$) to the pre-project 10-year runoff event (Q_{10}), the post-project discharge rates and durations shall not deviate above the pre-project rates and durations by more than 10 percent over and more than 10 percent of the length of the flow duration curve. The specific lower flow threshold will depend on results from the SCCWRP channel screening study and the critical flow calculator.
2. For flow rates ranging from the lower flow threshold to Q_5, the post-project peak flows shall not exceed pre-project peak flows. For flow rates from Q_5 to Q_{10}, post-project peak flows may exceed pre-project flows by up to 10 percent for a 1-year frequency interval. For example, post-project flows could exceed pre-project flows by up to 10 percent for the interval from Q9 to Q10 or from Q5.5 to Q6.5, but not from Q8 to Q10.

This HMP recommends the use of LID facilities to satisfy both 85th percentile water quality treatment as well as HMP flow control criteria. The Copermittees and the consultant team have developed detailed standards for LID implementation. These standards are provided in the San Diego County Model SUSMP.

The following methods may be used to meet mitigation requirements.

- Install BMPs that meet design requirements to control runoff from new impervious areas. BMPs including bioretention basins, vegetated swales, planter boxes, extended detention basins, etc. shall be designed pursuant to standard sizing and specification criteria detailed in the Model SUSMP and the HMP/LID Sizing Calculator to ensure compliance with hydromodification criteria.
- Use of the automated sizing calculator (San Diego Sizing Calculator) that will allow project applicants to select and size LID treatment devices or flow control basins. The tool, akin to the sizing calculator developed for compliance with the Contra Costa HMP, uses pre-calculated sizing factors to determine required footprint sizes for flow control BMPs. Continuous simulation hydrologic analyses are currently being developed to determine the sizing factors for various flow control options and development scenarios. The Sizing Calculator also includes an automated pond sizing tool to assist in the design of extended detention facilities for mitigation of hydromodification effects. Because of the Sizing Calculator's ease of implementation, and since hydromodification BMPs can also serve as treatment BMPs, it is anticipated that most project applicants will choose this option instead of seeking compliance through site-specific continuous simulation model preparation. The HMP/LID Sizing Calculator is an implementation tool, which is currently under development by the consultant team and will be completed by the time final HMP criteria go into effect.
- Prepare continuous simulation hydrologic models and compare the pre-project and mitigated post-project runoff peaks and durations (with hydromodification flow controls) until compliance to flow control standards can be demonstrated. The project applicant will be required to quantify the long-term pre- and post-project runoff response from the site and establish runoff routing and stage-storage-discharge relationships for the planned flow control devices. Public domain software such as HSPF, HEC-HMS and SWMM can be used for preparation of a continuous simulation hydrologic analysis.
- Points of compliance must be selected to conduct the comparisons of pre-project and post-project flows and durations. Generally, points of compliance are selected at locations along the project boundary where concentrated flows discharge from the project site. If a point of compliance is selected downstream of the project boundary, then the governing municipality should be consulted in advance of the hydromodification analysis. For projects which convey offsite runoff through the site, it is assumed that the offsite runoff would be separated from site runoff. If this is not the case, then the governing municipality should be consulted to further refine the points of compliance for the site (an interior project site point of compliance could be required in such a scenario).

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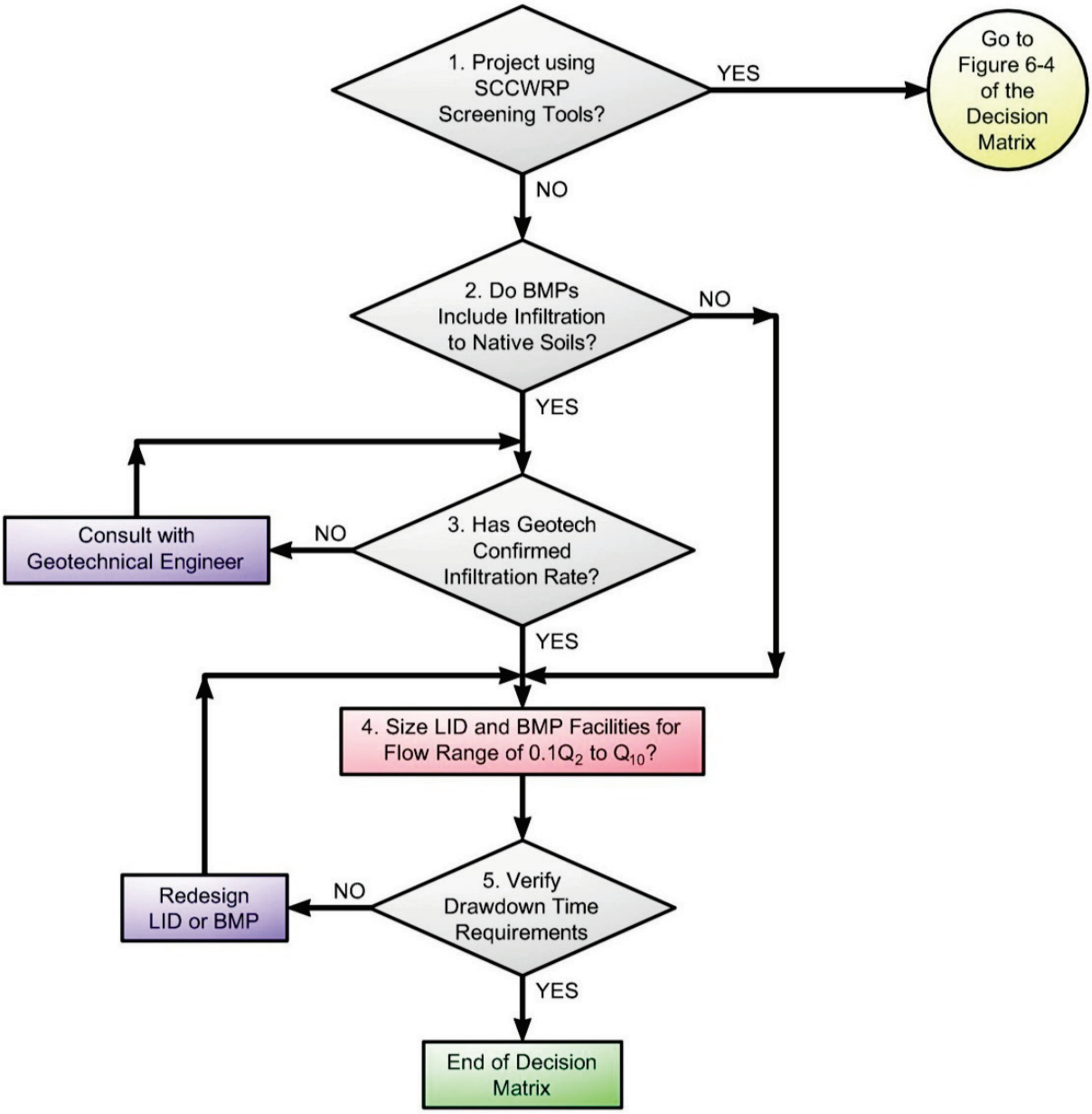

Figure 6-2. Mitigation Criteria and Implementation

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- Figure 6-2, Node 1 – If the project applicant chooses to complete SCCWRP channel screening tools, then the applicant moves to Figures 6-4 and 6-5 to assess the vertical and lateral susceptibility of the receiving channel systems. Depending on the results of the SCCWRP screening tools and critical flow calculator, it is possible that lower flow thresholds in excess of $0.1Q_2$ may be used. If the project applicant chooses not to complete the SCCWRP channel assessment, then the applicant proceeds with Figure 6-2 of the Decision Matrix.
- Figure 6-2, Node 2 – If the project's LID or BMP approach accounts for the infiltration of runoff to native surrounding soils (below amended soil layers), then consultation with a geotechnical engineer is required (Box 3). If the project mitigation approach does not account for infiltration of runoff, then the applicant would proceed to Box 4.
- Figure 6-2, Node 3 – A geotechnical engineer should determine the allowable infiltration rates to be used for the design of each LID or BMP facility. The geotechnical assessment should also identify potential portions of the project which are feasible for infiltration of runoff.
- Figure 6-2, Node 4 – In this scenario, the SCCWRP channel assessment was not conducted. Therefore, the project applicant would be held to the $0.1Q_2$ lower flow threshold. LID and extended detention facilities must be sized so that the mitigated post project flows and durations do not exceed pre-project flows and durations for the geomorphically-significant flow range of $0.1Q_2$ to Q_{10}.
- Figure 6-2, Node 5 - The Decision Matrix includes language regarding a drawdown time requirements so that standards set forth by the County's Department of Environmental Health are met. As a side note, the County's Department of Environmental Health has stated that the drawdown requirement would be applied to underground vaults in addition to extended detention basins and the surface ponding areas of LID facilities. Proper maintenance of hydromodification mitigation facilities is essential to guard against potential vector issues as well potential safety issues resulting from long-term standing water. If mitigation facility outlets clog, then runoff will bypass the system and potentially result in additional erosion problems downstream of a site.

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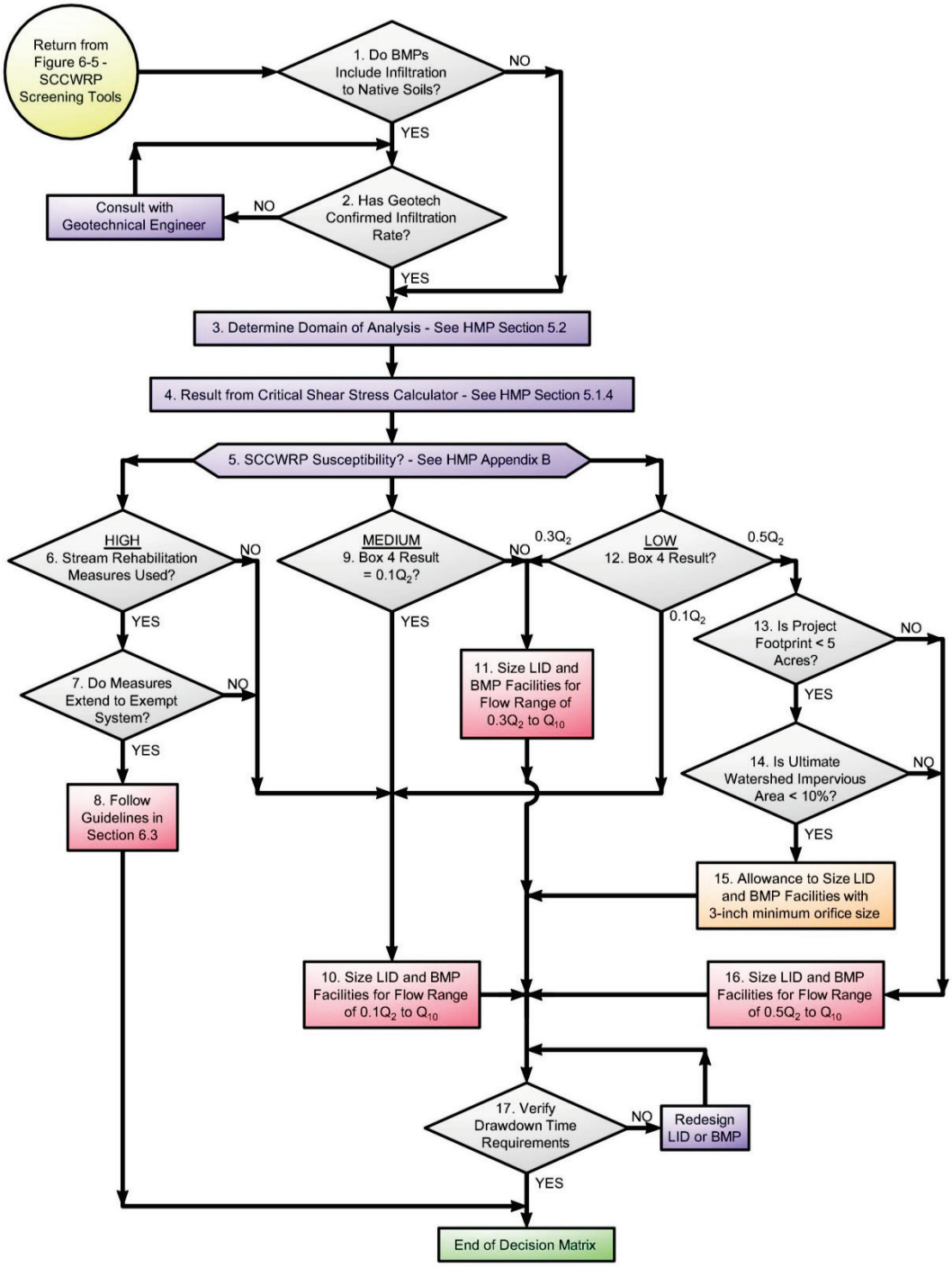

Figure 6-3. Mitigation Criteria and Implementation

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- Figure 6-3, Node 1 – Use of Figure 6-3 assumes that the project applicant conducted the SCCWRP channel assessment. Box 1 would begin following completion of both the lateral and vertical susceptibility flow charts depicted in Figures 6-4 and 6-5. Box 1 is a decision box asking if the project's LID or BMP approach accounts for the infiltration of runoff to native surrounding soils (below amended soil layers). If the answer is Yes, then consultation with a geotechnical engineer is required (Box 2). If the project mitigation approach does not account for infiltration of runoff, then the applicant would proceed to Box 3.
- Figure 6-3, Node 2 – A geotechnical engineer should determine the allowable infiltration rates to be used for the design of each LID or BMP facility. The geotechnical assessment should also identify potential portions of the project which are feasible for infiltration of runoff.
- Figure 6-3, Node 3 – Pursuant to criteria detailed in HMP Section 5.2, the Domain of Analysis is determined downstream and upstream of the project site. This determination is used to ascertain the required reach length for data collection (channel bed and bank material, channel cross section data, etc.) required for the critical flow calculator (see Box 4),
- Figure 6-3, Node 4 – Pursuant to criteria detailed in HMP Section 5.1.4, the project applicant would run the critical shear stress calculator to determine if the recommended critical flow threshold should be $0.1Q_2$, $0.3Q_2$, or $0.5Q_2$. This result will be compared to the result from the SCCWRP screening analysis (Box 5) to determine the final lower flow threshold for the project.
- Figure 6-3, Node 5 – Pursuant to criteria detailed in HMP Appendix B, the project applicant would determine both the lateral and vertical channel susceptibility rating per guidelines set forth by SCCWRP. If the lateral and vertical tools returned divergent results, then the more conservative result would be used. SCCWRP susceptibility ratings include "High", "Medium" and "Low."
- Figure 6-3, Node 6 – A project applicant would arrive at Box 6 if the SCCWRP channel susceptibility rating was determined to be "High." This decision box inquires as to whether stream rehabilitation measures such as grade control and channel widening will be used as a mitigation measure instead of flow control. It should be noted that stream rehabilitation options are only allowed if the existing receiving channel susceptibility is considered to be "High."
- Figure 6-3, Node 7 – Stream rehabilitation measures are only allowed if the proposed mitigation project extends to a downstream exempt system (such as an exempt river system). If the mitigation measure did not extend to an exempt system, then the potential for cumulative watershed impacts would be more pronounced.
- Figure 6-3, Node 8 – If stream rehabilitation measures are allowed, then guidelines outlined in Section 6.3 of the HMP should be followed to design the in-stream mitigation approach.
- Figure 6-3, Node 9 - A project applicant would arrive at Box 9 if the SCCWRP channel susceptibility rating was determined to be "Medium." If the result from the critical shear stress calculator is also "Medium" (or $0.3Q_2$), then the lower flow threshold would be $0.3Q_2$ (Box 11). If the result from the critical shear stress calculator is "High" (or $0.1Q_2$), then the more conservative value would be used and the lower flow threshold would be $0.1Q_2$ (Box 10).
- Figure 6-3, Node 10 – For stream reaches determined by either the critical flow calculator or the SCCWRP screening tools to have a "High" susceptibility to erosion, LID and extended detention flow control facilities should be sized so that the mitigated post project flows and durations do not exceed pre-project flows and durations for the geomorphically-significant flow range of $0.1Q_2$ to Q_{10}.

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- Figure 6-3, Node 11 - For stream reaches determined by either the critical flow calculator or the SCCWRP screening tools to have a "Medium" susceptibility to erosion, LID and extended detention flow control facilities should be sized so that the mitigated post project flows and durations do not exceed pre-project flows and durations for the geomorphically-significant flow range of $0.3Q_2$ to Q_{10}.
- Figure 6-3, Node 12 - A project applicant would arrive at Box 12 if the SCCWRP channel susceptibility rating was determined to be "Low." If the result from the critical shear stress calculator is also "Low" (or $0.5Q_2$), then the lower flow threshold would be $0.5Q_2$ (Box 16 – note potential waiver in Box 13). If the result from the critical shear stress calculator is "High" (or $0.1Q_2$), then the more conservative value would be used and the lower flow threshold would be $0.1Q_2$ (Box 10). If the result from the critical flow calculator is "Medium" (or $0.3Q_2$), then the more conservative value would be used and the lower flow threshold would be $0.3Q_2$ (Box 11).
- Figure 6-3, Node 13 – In some limited situations, namely small developments in rural or lightly developed areas, an allowance for a minimum outlet orifice size may be granted when the receiving channel susceptibility is "Low." This criteria may potentially be used for project footprints less than 5 acres. If the project footprint is greater than 5 acres, then the allowance may not be granted and the applicant would proceed to Box 16.
- Figure 6-3, Node 14 – The potential allowance discussed in Box 13 could only be granted if the ultimate potential impervious area in the sub-watershed is less than 10 percent. If there is potential for the sub-watershed impervious area to exceed 10 percent, then the minimum orifice size criteria may not be granted.
- Figure 6-3, Node 15 – If Boxes 12, 13, and 14 are satisfied, then mitigation facilities may be designed using a 3-inch minimum outlet orifice size.
- Figure 6-3, Node 16 - For stream reaches determined by either the critical flow calculator or the SCCWRP screening tools to have a "Low" susceptibility to erosion – and for projects where the minimum outlet orifice criteria does not apply - LID and extended detention flow control facilities should be sized so that the mitigated post project flows and durations do not exceed pre-project flows and durations for the geomorphically-significant flow range of $0.5Q_2$ to Q_{10}.
- Figure 6-3, Node 17 – For all hydromodification mitigation designs, the Decision Matrix includes language regarding drawdown time requirements so that standards set forth by the County's Department of Environmental Health are met. As a side note, the County's Department of Environmental Health has stated that the drawdown requirement would be applied to underground vaults in addition to extended detention basins and the surface ponding areas of LID facilities. Proper maintenance of hydromodification mitigation facilities is essential to guard against potential vector issues as well potential safety issues resulting from long-term standing water. If mitigation facility outlets clog, then runoff will bypass the system and potentially result in additional erosion problems downstream of a site.

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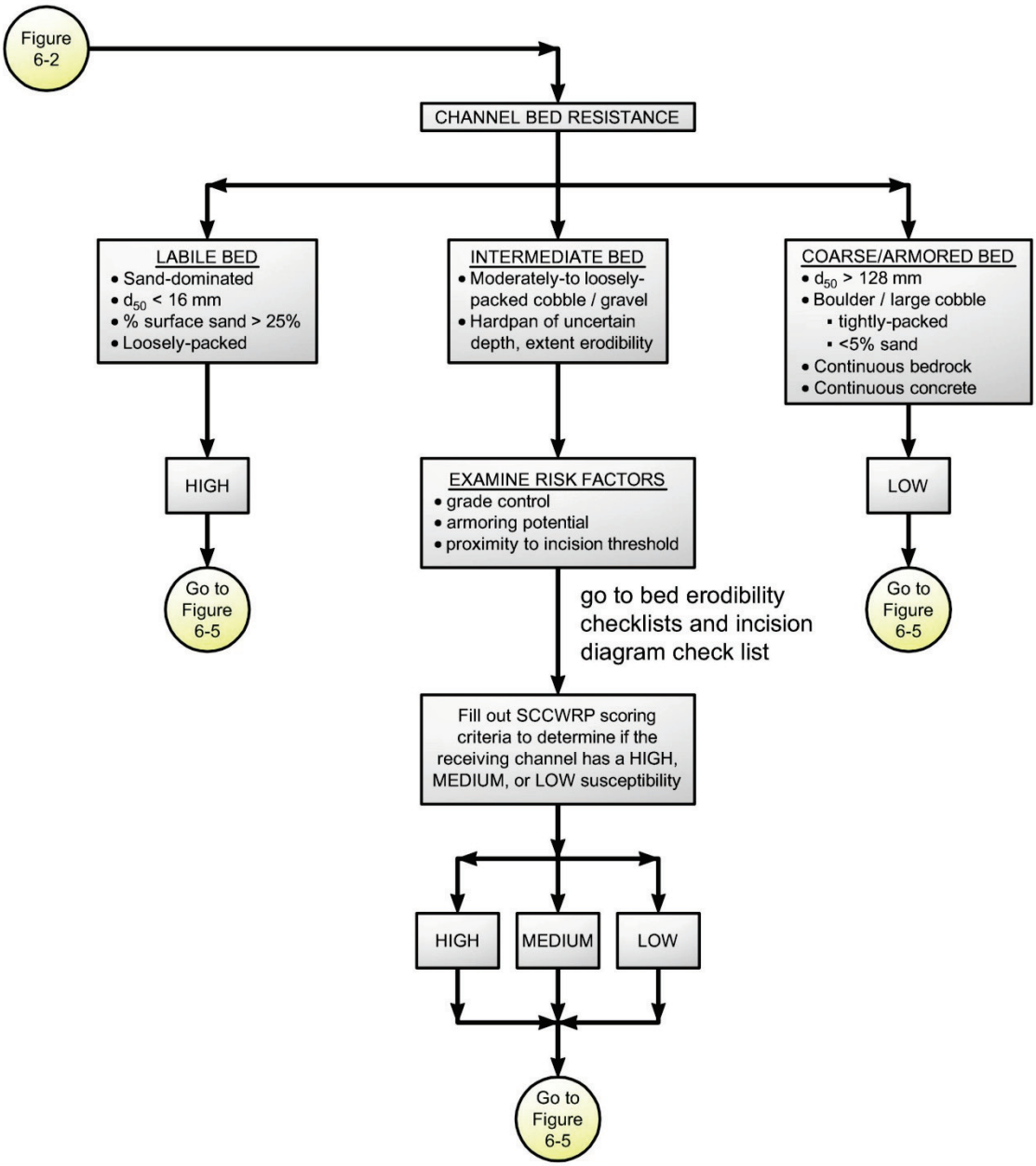

Figure 6-4. SCCWRP Vertical Susceptibility

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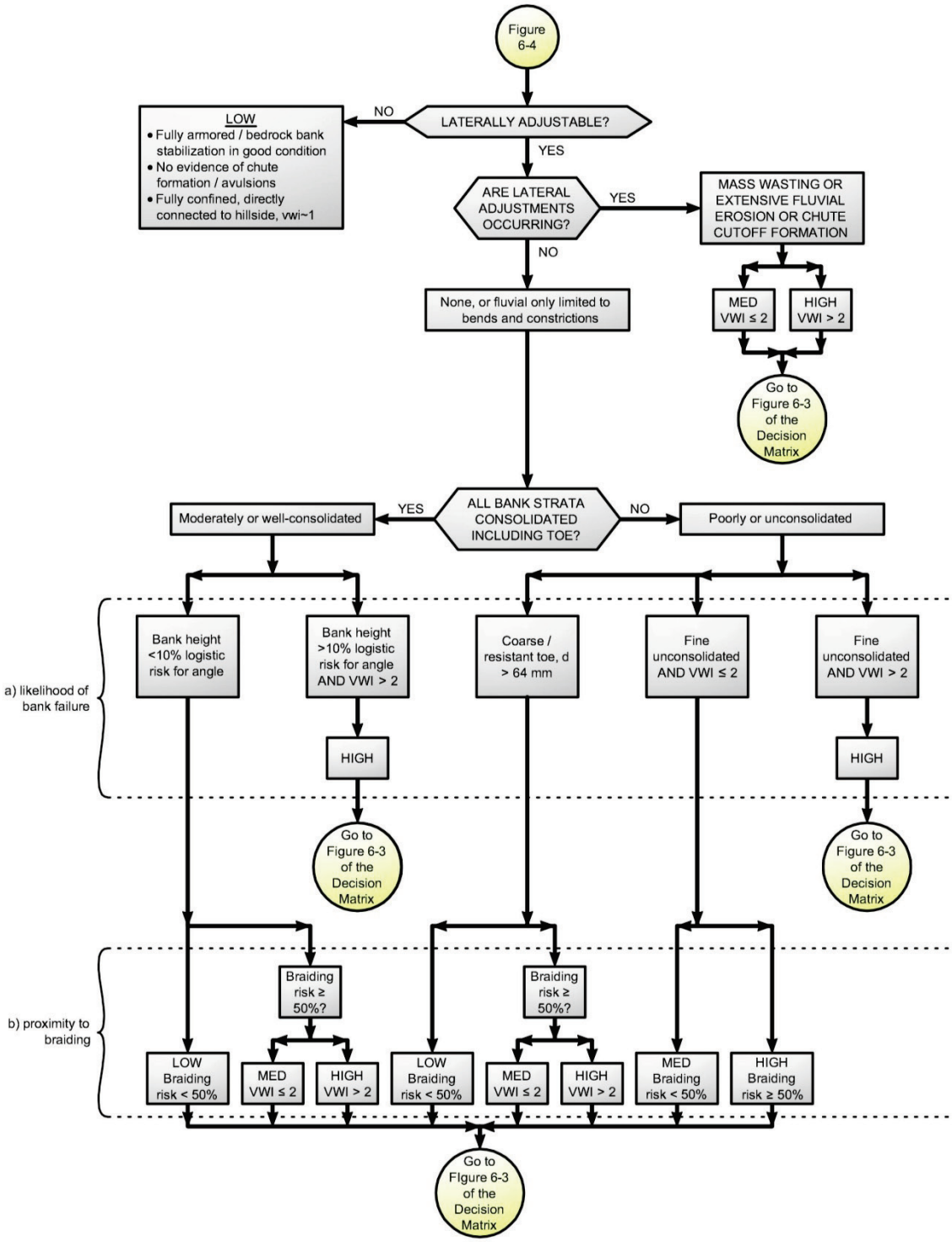

Figure 6-5. Lateral Channel Susceptibility

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A continuous simulation analysis was conducted to identify situations where a 3-inch minimum orifice size standard could be applied. For small sites where orifices less than 3-inches would be required to achieve HMP mitigation, LID implementation is recommended in lieu of extended detention facilities.

The continuous simulation analysis was based on the following assumptions:

Sensitivity Analysis for Minimum Orifice Diameter:

- Prepared HSPF models for 100 and 500 acre undeveloped watersheds – assumed Group D soils with sparse vegetation.
- Prepared simple, parallel HSPF models for 1 and 5 acre developments.
- Added detention ponds to the development models, matching the flow duration curve as much as possible using a 3-inch minimum diameter. For the pond configuration, assumed the ponds are 4 feet deep and contained two outflow control structures (low orifice = 3 inches; high weir to prevent overtopping).
- Ran the undeveloped scenario model simulations and computed the flow duration statistics
- Ran the development scenario model simulations (various levels of development) and computed flow duration statistics.
- Determined the increased level of development that would produce a noticeable difference in the flow duration statistics

The sensitivity analysis showed that cumulative basin outflows from multiple 3-inch outlet orifices from 1- and 5-acre developments would have less than significant cumulative impacts to the watershed's flow duration curve provided the impervious areas in the watershed is less than 10 percent. The supporting HSPF continuous modeling analysis results are summarized in a Technical Memo in Appendix F.

For project sites 1 acre or less in size:

1. HMP mitigation must be attained through the use of LID facilities (because a 3-inch outlet orifice would provide no significant mitigation). If LID facilities cannot fully mitigate flows to meet hydromodification criteria, then small detention facilities can be used in combination with the LID facilities.

For project sites greater than 1 acre and less than 5 acres in size:

1. HMP mitigation should be attained through the use of LID facilities to the maximum extent practicable.
2. A 3-inch minimum outlet orifice size may be used provided that the potential cumulative impacts in the subwatershed area, as measured for the entire sub-watershed (containing the project site) downstream to a natural creek confluence, would not increase the ultimate-condition composite impervious area in the subwatershed to more than 10 percent.

If the potential cumulative impacts in the subwatershed areas would result in an impervious area percentage greater than 10 percent, then the 3-inch minimum orifice size waiver would not be granted.

6.3 Stream Rehabilitation Performance Criteria

If the SCCWRP channel screening tools indicate the existing downstream channel condition has a High susceptibility to erosion, then stream rehabilitation options may be considered. Such mitigation measures must extend downstream to an exempt receiving conveyance system. If such options are chosen as hydromodification mitigation for the project site, then the following criteria must be analyzed.

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- Show that projected increases in runoff peaks and/or durations, along with sediment reductions associated with development, would not accelerate degradation or erosion of rehabilitated receiving stream reaches.
- A proposed stream rehabilitation mitigation measure can accommodate additional runoff from a proposed project, the project proponent may consider implementation of planning measures such as buffers and restoration activities, revegetation, and use of less-impacting facilities at the point of discharge in lieu of implementation of storm water flow controls.
- Such scenarios include the modification of the channel gradient, cross section, or boundary materials to achieve stable conditions in the altered flow regime. Implementation of such measures would require a geomorphic analysis to show that the proposed changes to the stream channel cross sections, vegetation, discharge rates, velocities, and durations would not have adverse impact to the receiving channel's beneficial uses.
- Such measures could not include concrete.
- Such measures must be designed considering the ultimate condition 100-year flows (as well as lower return frequency events) to the rehabilitated channel segment.

The San Diego HMP has a provision for in-channel mitigation as an alternative, or supplement, to flow volume and duration control. In-stream mitigation involves the modification of the receiving channel (primarily by altering its width, depth, slope and channel materials) to accommodate the increased flow following development. The purpose of this section is to outline for applicants and permitees what components should go into designing and implementing an in-channel mitigation program. It is not intended as an exhaustive 'cookery book' approach to designing an instream approach, but to present the principles that should be used to develop a plan. Most projects will require detailed site-specific analyses and approaches and due to differences in scale, channel type and historic condition there is not necessarily a single approach that will be applicable in all sites.

6.3.1 Goal of In-Channel Hydromod Mitigation

The goal of in-channel hydromod mitigation is to modify a receiving channel such that it supports the beneficial uses and physical and ecological functions of the channel to the same extent or greater than it did prior to the proposed development. More specifically it should:

- Be in geomorphic dynamic equilibrium (it is desirable that is should have small amounts of local scour and deposition to support biological processes, but it should not experience significant net erosion or deposition of sediment over the entire reach over a sustained period of several years).
- Provide the appropriate physical processes and forms to sustainably support the flora and fauna that existed prior to development.

A key step in any project will be to define these goals more clearly. In particular, applicants and permitees will need to agree upon whether the goal is to maintain the creek at pre-project conditions or to restore it to a previous, higher level of function. For example, if the existing condition is an incised channel with little ecological value due to historic impacts, there is little value in stabilizing the creek in this condition to accommodate higher future flows, and an alternate goal will be required such as restoring to a previous condition that is more stable.

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6.3.2 Design Principals

Understand Pre-Project Conditions and Potential Project Impacts

All proposed projects must display a clear understanding of the existing physical and ecological condition of the receiving water prior to project implementation. In particular, applicants must identify the ecological functions and values of the existing channel corridor, the physical processes that control or influence them, and the impact of the proposed project on those factors. Table 6-3 provides a hypothetical example but is not intended to be exhaustive.

Identifying the ecological conditions will require the services of a trained riparian and aquatic biologist, while identifying the physical conditions will require a trained geomorphologist or hydrologist. Methods may include field surveys and use of historical documents (maps, aerial photos).

It is important to draw a distinction between 'stability' and 'stasis', and to understand that many ecological functions require a degree of channel disturbance. For example, willow and mulefat assemblages (a common ecotype for many San Diego creeks) require somewhat depositional conditions to form, with alternating periods of sand deposition to create low terraces and subsequent scour and reformation. Many constructed and armored channels are static and do not support the geomorphic functions that underpin these ecological functions.

Table 6-3. Creek Assessment and Mitigation Approaches

Creek Function or Attribute	Current Controlling / Influencing Factors	Project Impacts on Controlling Factors	Potential Mitigation Approach
Vertical channel stability (bed erosion or deposition)	e.g. balance between coarse sediment and water supply, nature of bed materials.	e.g. runoff likely to increase, coarse sediment supply likely to decrease.	Reduce bed gradient using step-pool structures.
Lateral channel stability (e.g. widening, lateral migration)	e.g. vertical stability, riparian vegetation.	e.g. runoff likely to increase, coarse sediment supply likely to decrease.	Widen channel to appropriate geometry and stabilize with biotechnical approaches.
Mulefat assemblage	e.g. requires braided channel with low terraces subject to periodic scour and deposition.	e.g. excess sediment transport capacity over supply will erase terraces and prevent deposition.	Widen channel to lower sediment transport capacity, allow braiding and support terrace formation. Lower gradient to achieve same.
Willow assemblage	e.g. proximity of floodplain to water table.	e.g. incision will lower water table and prevent regeneration.	Prevent incision by grade control, gradient flattening, or channel widening.
Ephemeral vegetation assemblage	e.g. absence of summer nuisance flows.	e.g. presence of summer nuisance flows will allow perennial vegetation to colonize.	Elimination of nuisance flows.
Fish spawning	e.g. presence of gravel, relative absence of fine sediment, relatively low shear stresses during winter/spring flows.	e.g. fine sediment will bury spawning gravel.	Promote sediment sorting and reduce bank erosion or other fine sediment sources.
Fish rearing	e.g. channel complexity, riparian shade cover, relative rarity of high velocity flows.	e.g. excess shear stress will erode and simplify channel features, wash out fish.	Widen and flatten channel to reduce shear stresses.

Design Criteria

In-stream mitigation projects must meet the following design criteria:

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1. The proposed channel and riparian corridor must provide the same acreage of habitat as the pre-project channel and riparian corridor, and should support geomorphic processes that can reasonably be considered to sustain those acreages.
2. The cumulative sediment transport capacity of the proposed channel under the post project flow regime must not exceed that of the pre-project channel under the pre-project flow regime. Sediment transport capacity should be assessed at cross sections along the channel at least every 500 feet (minimum of three cross-sections for channels shorter than 500 feet), with the net proposed sediment transport capacity being equal or less than pre-project net sediment transport capacity, and no individual cross section having a sediment transport capacity more than 10 percent greater than under pre-project conditions.

Proposed plans for in-stream HMP mitigation must demonstrate that these criteria will be met by proving a biological report and maps showing the acreage of habitat in pre-and post project conditions, and by providing hydraulic and sediment transport analyses that show the following:

1. For projects larger than 50 acres the analysis should be based on continuous rainfall-runoff modeling, and continuous sediment transport capacity modeling. The analysis should demonstrate that the cumulative sediment transport capacity in the proposed channel based on the channel dimensions and watershed runoff under post-project conditions is the same or less than the cumulative sediment transport capacity for the existing channel based on the channel dimensions and watershed runoff under pre-project conditions. The period of analysis should be the approved rainfall record for the closest appropriate rain gauge as found on the www.projectcleanwater.org web site.
2. For projects smaller than 50 acres the analysis may be based on sediment transport capacity for a series of designated runoff events. The analysis should demonstrate that the sediment transport capacity in the proposed channel based on the channel dimensions and watershed runoff under post-project conditions is the same or less than the sediment transport capacity for the existing channel based on the channel dimensions and watershed runoff under pre-project conditions for the following events: 0.1Q2, Q2 and Q10.

Methods for performing this analysis are described below.

Matching Pre- and Post-Project Cumulative Sediment Transport Capacity

A key component of any in-channel project will be to quantify and balance the pre- and post-project sediment transport regime in channel that are stable under pre-development conditions, and to lower sediment transport capacity for channels that are unstable under existing conditions. This method is sometimes referred to as the Erosion Potential method. There are several potential tools to assess this and design the channel to meet these goals, but certain principals must be incorporated in whatever approach is used.

For developments larger than 50 acres the analysis must be based on continuous rainfall-runoff modeling, rather than event-based modeling. This is because research has shown that in most urbanized watersheds significant amounts of sediment transport occur during low magnitude, high frequency events (smaller than the two-year flow). Quantification of sediment transport capacity will not capture these processes unless continuous rainfall-runoff simulation is used. Potential models to achieve this include HEC-HMS in continuous mode, SWMM, HSPF, and the San Diego Hydrology Model. Modeling should include at least 40 years of rainfall data from a nearby rain gauge. Modeling should include pre- and post-project conditions. Output (a time series of flow) should be used to quantify pre- and post-project cumulative sediment transport capacity. This can be achieved in several ways, varying from a simple spreadsheet-based sediment transport model to a full one-dimensional hydraulic and sediment transport model such as HEC-RAS (sediment transport module), HEC-6, Fluvial-12, or MIKE-11. The model should simulate the existing and proposed channel morphology in sufficient detail to allow analysis of potential modifications to cross sections and gradient. A hypothetical example is described below.

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A hypothetical analysis might include modeling the existing watershed land use in HEC-HMS and generating a 40-year time series of flow at hourly intervals. This time series would be the input for a HEC-RAS hydraulic and sediment transport model of the existing receiving channel. The time series would be run using a sediment transport equation appropriate to the channel materials, and the cumulative sediment transport capacity over 40 years calculated. The proposed development would then be simulated in HEC-HMS and the 40-year flow output run through a HEC-RAS model of the proposed in-channel mitigation (for example with a lower gradient, in-channel step-pool structures and wider cross section). Cumulative sediment transport capacity would again be calculated. If the proposed channel-with-project cumulative sediment transport capacity was equal to or less than the existing pre-project channel cumulative sediment transport capacity then the channel would have met the sediment transport goals. If the cumulative sediment transport capacity was higher the channel design would have to be refined to lower transport rates or some flow control would be required in the watershed, until the transport capacities either matched or were lower than pre-project condition.

For developments smaller than 50 acres event based analysis may be used. The applicant must calculate the flows for $0.1Q_2$, Q_2 and Q_{10} using continuous rainfall-runoff modeling, and determine the sediment transport capacity using either a sediment transport model or spreadsheet model. If the proposed channel has an equal or lower sediment transport capacity at all three flows it would meet the sediment transport criteria. If it did not the applicant would need to iteratively vary the channel dimensions or manage runoff until the criteria were met.

Methods of Reducing Sediment Transport Capacity

It is highly likely that in a watershed experiencing hydromod without significant flow control the sediment transport capacity will be greatly increased (commonly by a factor of 5 or more for highly developed watersheds) while sediment supply will be reduced. This will likely require a significant modification in channel geometry to bring sediment transport capacity back to pre-project levels. This can be achieved in several ways:

Slope Reduction by Construction of Step-Pools or Roughened Channels

Step-pools are vertical or near vertical sections in a channel profile (step) with a flat section that dissipates the energy of the step (pool). A natural feature of upland creeks, step-pools are sometimes built into creek rehabilitation projects to concentrate bed elevation loss in a small number of hardened areas where erosion is unlikely to occur and allow the remainder of the bed to be designed at a lower gradient that reduces sediment transport capacity. Step-pools can be constructed from uncemented boulders of appropriate size (designed to be stable during design flood events such as the 100-year flow), or from soil cement or other hard materials. The gradient between steps can be designed to match the EP for the pre-project condition without the need for armor, with the difference between the channel's existing and post-project gradient being taken up in vertical steps. Steps should be designed to meet any relevant fish passage and animal migration requirements (e.g., for fish bearing streams steps should be no higher than 3 feet).

Roughened channels are a similar approach where the elevation loss occurs at armored rock reaches typically with a gradient of 10 percent over a few tens of feet (e.g., 3 feet of drop over 30 feet of roughened channel). As with step-pools these are employed between longer reaches of un-armored stable channel at a lower gradient.

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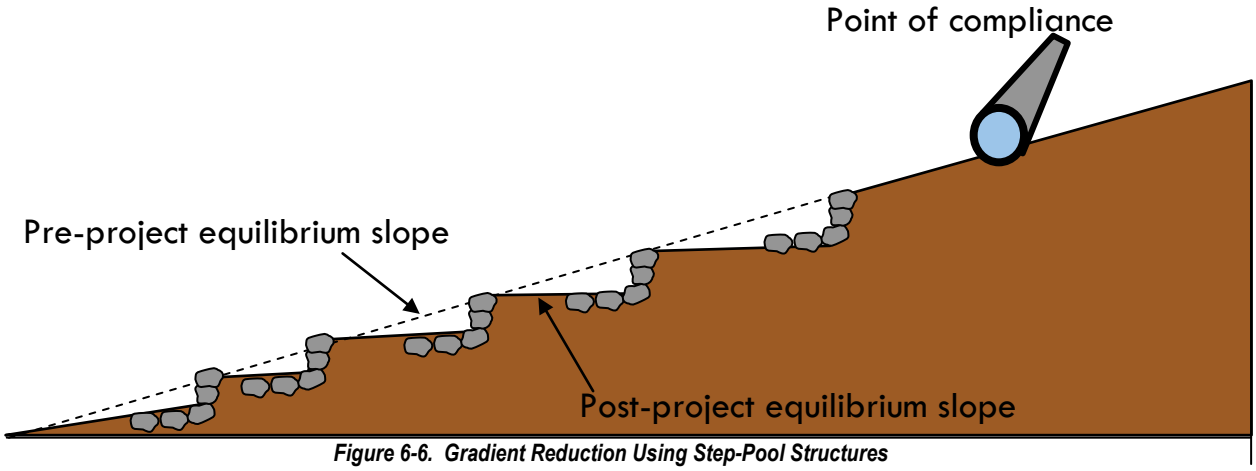

Figure 6-6. Gradient Reduction Using Step-Pool Structures

Slope Reduction by Sinuosity Increase

In some cases small reductions in slope can be achieved by increasing sinuosity (ratio of channel distance between two points to straight line distance). For example, a 30 percent reduction in slope can be achieved by converting a straight receiving channel into a channel with a sinuosity of 1.3 (typical for a meandering channel). However, it is important to understand that channel sinuosity is a dependent variable that is influenced by the valley gradient and the sediment and water regime of the watershed. As a general rule Forcing a channel to a sinuosity that is inappropriately high is likely to lead to subsequent channel avulsion to a straighter course. Channel sinuosity needs to be supported by a geomorphic basis of design that shows the proposed form and gradient to be appropriate for the valley slope and sediment and water regime. This may take the form of reference reaches in similar watersheds that have support the proposed morphology over a significant period of time, or comparison between the proposed form and typical literature values.

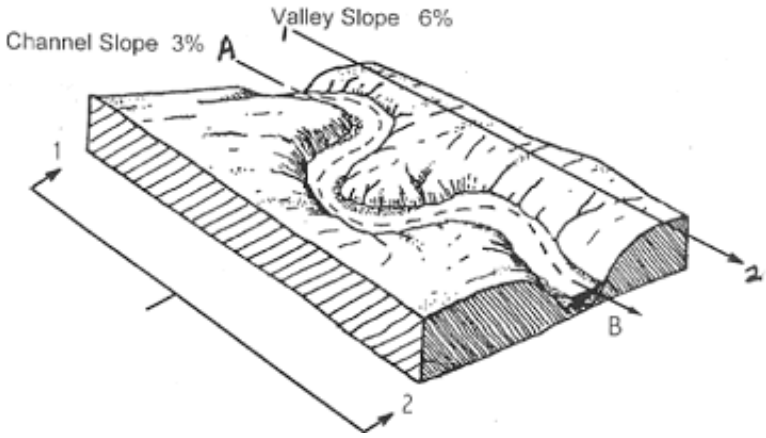

Figure 6-7. Gradient Reduction by Increasing Sinuosity

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Increased Width:Depth Ratio

Sediment transport capacity can be reduced by increasing width:depth ratio for the channel (both low flow channel and floodplain). By spreading flows out over a wider cross section with lower depths, shear stress is reduced for any given flow rate. This approach can be a useful mitigation strategy in incised creeks to bring them back to equilibrium conditions once vertical incision has ceased. However, as with sinuosity, it is important to develop a robust geomorphic basis of design that shows the increase in width:depth ratio to be sustainable. For example, for sand bed channels in watersheds where the coarse sediment supply is greatly reduced by urbanization, low flows may cut into the bed of an over-widened channel, leading to a positive feedback loop of incision and flow concentration. Proposed designs will need to show (using stable analogous reference reaches or analytical methods such as sediment transport analysis) that width:depth ratios are sustainable.

6.3.3 Size Channel for Changed Dominant Discharge

A mitigated channel is likely to consist of a low flow channel that provides the aquatic functions of the pre-project channel, and a floodplain corridor that supports the pre-project riparian functions. The low flow channel should be sized to meet the new dominant discharge of the post-project watershed. In most cases this will be a more frequent event than under pre-development conditions. For example, a low flow channel may accommodate the five year flow under pre-development conditions but be sized for the one-two year flow under developed conditions. For large developments, the EP analysis used to determine cumulative sediment transport capacity will provide the dominant discharge. If EP is plotted as a histogram of sediment transport capacity binned into flow ranges the flow range that produces the highest sediment transport capacity will be the dominant discharge. The floodplain area of the riparian corridor should be designed so as to match the inundation frequencies, areas, and elevations of the pre-project channel.

6.3.4 Upstream and Downstream Limits of In-Channel Mitigation Projects

It is likely that in-channel mitigation projects will have to be negotiated with permitting agencies on a case by case basis due to different site conditions. However, for guideline purposes we recommend the following approach to identifying the limits of in-channel mitigation projects.

The upstream limit of an in-channel mitigation project will typically be the point of compliance (PoC ; point at which stormwater is discharged into the receiving water). However, as a precaution against potential unplanned erosion following a project it is recommended that either the project extend upstream to the next grade control, or that grade control be added immediately upstream of the point of compliance.

The downstream limit of an in-channel project would be the connection to an exempt system (such as the confluence with an exempt river system).

6.3.5 Relationship Between In-Channel HMP Mitigation and Existing Permit Requirements

The HMP does not replace existing permit requirements for in-channel projects. In addition to meeting the HMP requirements, applicants proposing an in-channel mitigation project will likely require the following permits:

- A CEQA/NEPA review and document
- California Department of Fish and Game – 1602 Streambed Alteration Agreement
- US Fish and Wildlife Service – Authorization Under the Endangered Species Act

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- US Army Corps of Engineers – Nationwide 404 Permit
- Regional Water Quality Control Board – 401 Water Quality Certification
- County of San Diego – Grading Permit

These permits have their own requirements that may involve additional studies beyond those described above.

6.4 HMP Design Standards

6.4.1 Introduction

This Technical Memorandum details criteria for the analysis and methodology used to assess mitigation of hydromodification effects. As mandated by Regional Water Quality Control Board (RWQCB) Order R9-2007-0001, San Diego Copermittees must develop criteria for the mitigation of development-related increases to peak flows and flow durations within the geomorphically significant flow range. The purpose of the hydromodification management criteria is to prevent development-related changes in storm water runoff from causing, or further accelerating, stream channel erosion or other adverse impacts to beneficial stream uses.

Three specific areas are discussed in this memorandum.

- Partial Duration Series Calculations
- Drawdown Calculations
- Offsite Area Restrictions

Information contained in this memorandum will be incorporated into a Final Technical Reference Document in support of the final HMP document.

6.4.2 Partial Duration Series Calculations

Preliminary review of continuous simulation hydrologic analyses prepared for multiple project sites throughout the County of San Diego indicates the need for partial duration series calculations to determine estimated return flow frequencies. Because of San Diego's semi-arid climate, in which long periods of time can elapse between significant rainfall events, use of the peak annual series tends to unrealistically underestimate flow return event values (since only the peak event in any given year is considered in the analysis). This effect is particularly pronounced for more frequent return events such as the 2-year flow and the 5-year flow (note: the 2-year flow is the runoff rate which statistically has a 50 percent chance of occurrence in any given year). The partial duration series calculations consider all significant rainfall events in the long-term rainfall record (which for the San Diego area corresponds to a minimum historical record of hourly rainfall totals for 35 years).

This partial duration series data provided below were prepared based on a sample project in south San Diego County. Using the Lower Otay Reservoir rainfall gauge as the historical rainfall record, the subsequent commentary shows how a partial duration series analysis should be conducted to estimate peak runoff rates for frequencies of 2-, 5-, and 10-year recurrence given hydrologic modeling results for hypothetical Basins A, B, C and D.

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6.4.3 Data

Four modeling files, corresponding to Basins A, B, C and D from a proposed development project, were prepared using the HSPF hydrologic modeling software. Relevant time series were output to WDM files, which were named for the modeled basin (e.g., *Basin A.wdm*). Two land use conditions were generated:

- Pre-developed flow in cubic feet per second (cfs)
- Post-developed (unmitigated) flow in cfs

Given two flow scenarios (above) and four basins, a total of 8 sets of time series data were identified for flow frequency analysis. Plots of these flow data are included later in this document.

6.4.4 Analysis

Each of the 8 time series data files described in the previous section were exported from the WDM file using *WDM Util*. The exported files were then imported into MatLAB and a previously developed script was used to convert the complete duration-time series to a partial duration time series using the criteria shown in Table 6-4 below.

The previously developed partial duration script was developed in association with development of the Contra Costa HMP / LID Sizing Tool, which was approved by the San Francisco Regional Water Quality Control Board for review of project-specific hydromodification plans (*Contra Costa Hydromodification Management Plan* - May 15, 2005). Similar methodology is included in the San Diego HMP / LID Sizing Calculator.

Table 6-4. Partial Duration Series Criteria

Basin and Scenario		Separation Event (hours)	Flow Floor (cfs)	Number of Events
Basin A	Pre-developed	24	0.1	357
	Post-developed (unmitigated)	24	0.1	620
Basin B	Pre-developed	24	0.01	63
	Post-developed (unmitigated)	24	0.1	540
Basin C	Pre-developed	24	0.01	73
	Post-developed (unmitigated)	24	0.1	535
Basin D	Pre-developed	24	0.1	104
	Post-developed (unmitigated)	24	0.1	558

The columns listed in Table 6-4 describe criteria detailed below.

- A separation event, defined as time period in which runoff does not exceed a prescribed threshold, is required to parse the long-term flow records into discrete runoff events. The separation event corresponds to the required number of consecutive time intervals (hours in this case because the long-term rainfall records were prepared in hourly time steps) with a flow value less than Flow Floor 1 (which is calculated as an artificially low flow value based on a fraction of the contributing watershed areas – for instance, the flow floor could correspond to ratios in the range of 0.002 cfs/acre to 0.005 cfs/acre).
- Flow Floor 1 is the maximum value for the inter-event time period (allows for separation of events). In other words, if no flow value exceeds the Flow Floor 1 value for a time equal to or greater than the Separation Event, then the preceding runoff event is viewed as a discrete runoff event. Flow Floor 1 is typically set as an artificially low flow value based on a fraction of the contributing watershed area.

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- Flow Floor 1 is also the minimum value for the rainfall event. In other words, if no flow value in the event exceeds Flow Floor 1, then the minor runoff is not considered a discrete runoff event.
- Number of events corresponds to the total number of discrete runoff events generated for the long-term rainfall record. As noted in Table 6-4 and graphically depicted in the figures at the end of this section, impervious area addition associated with development dramatically increases the number of discrete runoff events for the sample basins.

The partial duration series data were ranked and the plotted using the Cunnane equation for plotting return frequency. The Cunnane equation documentation can be referenced in the "Handbook of Hydrology" by David R. Maidment, published in 1994 (Table 18.3.1).

6.4.5 Results

Flow frequency plots are included later in this document. Flow frequency estimates were obtained from these plots for the 2-, 5-, and 10-year recurrence intervals. The results are summarized in Table 6-5.

Table 6-5. Flow Frequency by Partial Duration Series Analysis

Basin and Scenario		Peak Runoff (cfs) by Recurrence Interval		
		2-year	5-year	10-year
Basin A	Pre-developed	1.2	3.1	6.3
	Post-developed (Unmitigated)	4.8	6.9	8.8
Basin B	Pre-developed	0.2	0.6	1.2
	Post-developed (Unmitigated)	1.2	2.0	2.4
Basin C	Pre-developed	0.2	0.9	1.8
	Post-developed (Unmitigated)	1.5	2.5	3.0
Basin D	Pre-developed	0.5	1.2	2.5
	Post-developed (Unmitigated)	1.4	2.0	2.5

As shown in Figures 6-8 and 6-9, impervious area increases associated with proposed development dramatically increases the frequency and intensity of flows throughout the rainfall record. While the scenario modeled above depicts a worst-case scenario where undeveloped land is converted to highly impervious industrial land, similar but less pronounced increases to flow frequency and peak flows would be expected for other development types. The degree of change is dependent on the degree of impervious areas and landform modification.

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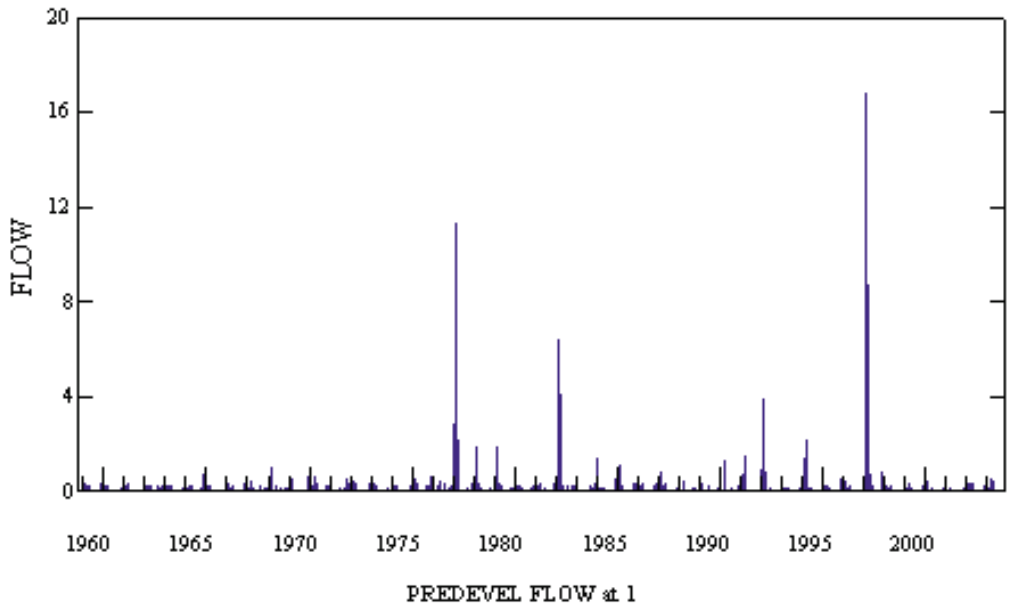

Figure 6-8. Pre-Developed Flow Time Series for Basin A

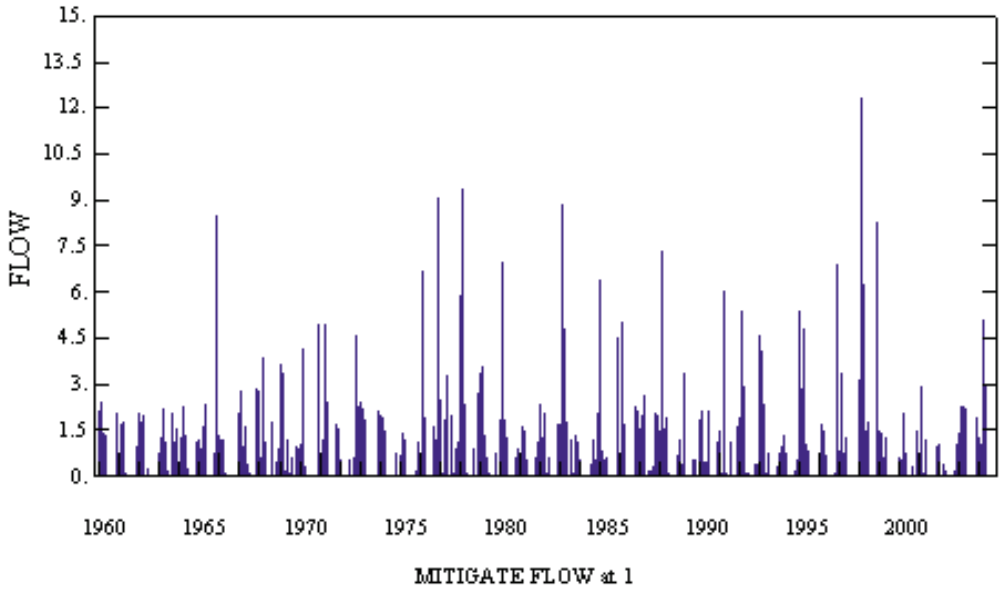

Figure 6-9. Post-Developed (unmitigated) Flow Time Series for Basin A

As shown in Figures 6-10 and 6-11, increases in impervious areas associated with development create a significant flow regime change for the full range of flows. These changes are most pronounced for frequent flow events. As detailed on the figures, development would increase the 1-year pre-project flow of 0.5 cfs to a 1-year post-project flow of 3.0 cfs. At the 5-year event, the pre-project flow is 3 cfs while the post-project flow increases to 7 cfs. At the 10-year event, the pre-project is 6.5 cfs while the post-project flow is 9 cfs.

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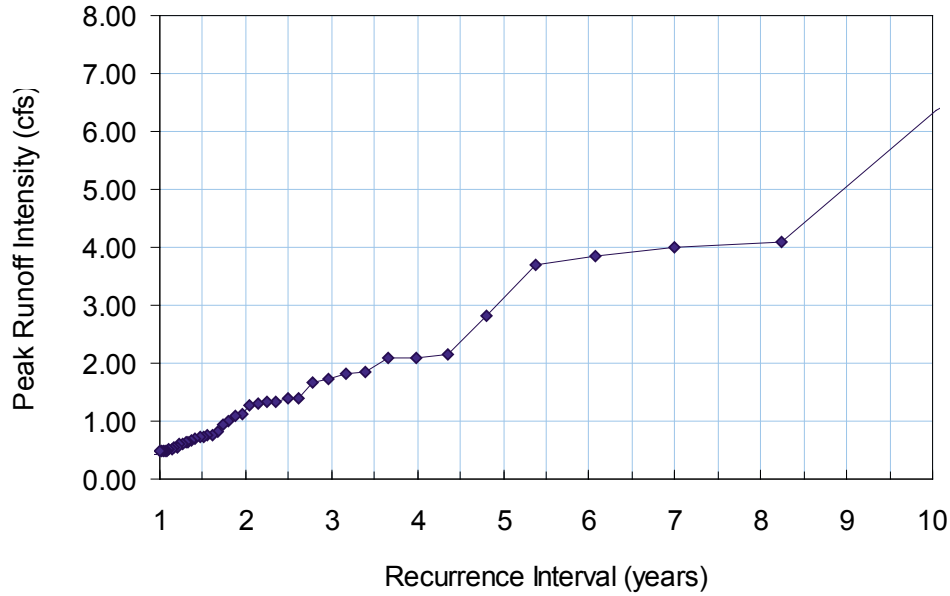

Figure 6-10. Pre-Developed Flow Frequency Basin A

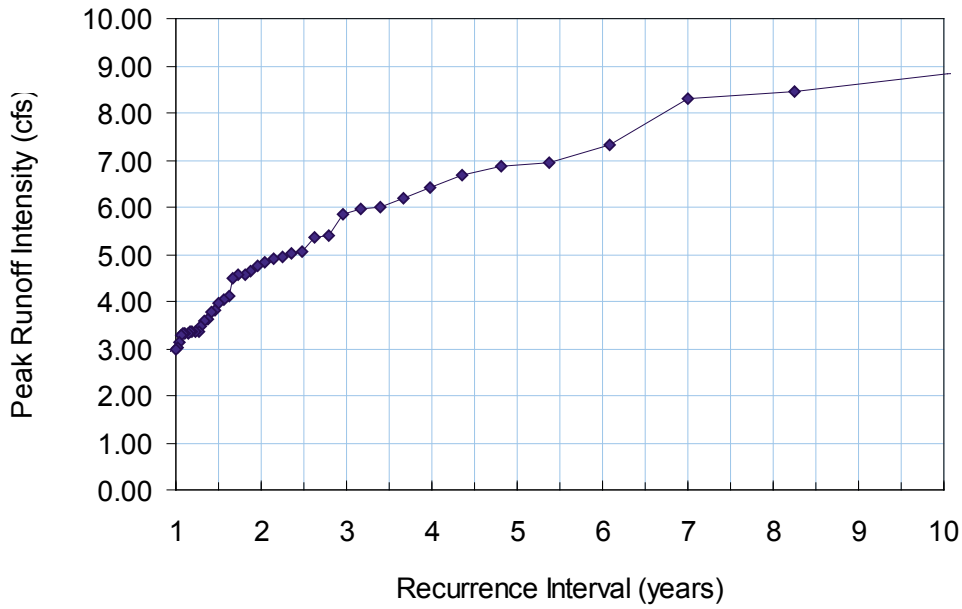

Figure 6-11. Post-Developed (Unmitigated) Flow Frequency Basin A

6.4.6 Drawdown Calculations

Per instruction from the County of San Diego's Department of Environmental Health (DEH), the drawdown time in hydromodification flow control facilities, as well as other flow control facilities such as peak flow attenuation detention basins and water quality extended detention basins, shall be limited to 96 hours. This restriction was implemented as mitigation to potential vector breeding issues and the subsequent risk to human health. The standard applies to, but is not limited to, the following flow control facilities:

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- Detention basins (extended detention and peak flow attenuation)
- Underground storage vaults
- Above-ground storage area in LID facilities

As is the case for peak flow attenuation detention basins and water quality extended detention basins, the drawdown time for hydromodification flow control facilities can be calculated by assuming a starting water surface elevation coincident with the peak operating level in the facility (such as the elevation at the riser overflow or emergency spillway overflow).

Using a hydrologic computer program such HEC-HMS or other public domain software, the basin's dewatering time can be determined given the basin's stage-storage and stage-discharge information. Provided that the basin has completely dewatered after 96 hours, the basin is considered to meet the drawdown criteria.

If an applicant cannot achieve the 96-hour drawdown requirement, a vector management plan may be an acceptable alternative if approved by the governing municipality.

For extended detention flow control facilities, protective fencing may be required to address safety concerns associated with the extended duration of ponded water. Specifications regarding protective fencing requirements will be determined by each individual Copermittee. If a riser is installed in the basin, it is assumed that flows would exit the basin via a small orifice or a series of orifices cut into the side of the riser. To prevent clogging, debris capture devices should be designed to protect the principal outflow orifice. Failure to prevent clogging could actually make downstream erosion problems worse, since basin inflows would simply overtop the riser and flow unattenuated downstream.

6.4.7 Offsite Area Restrictions

Runoff from offsite areas should be routed around hydromodification flow control facilities. This is required because of the following:

- Offsite areas containing sediment should be allowed to pass to the receiving channel to maintain the natural sediment balance in the receiving conveyance system. This is especially true when the offsite area contains significant loads of coarse sediment. Capture and removal of natural sediment from the downstream watercourse can create "hungry water" conditions and the increased potential for downstream erosion. The "hungry water" phenomenon occurs when the natural sediment load decreases and the erosive force of the runoff increases as a natural counterbalance, as described by Lane's Equation.
- The addition of runoff from offsite areas to a hydromodification flow control facility increases the total runoff volume to the basin, which increases the required water quality treatment volume as well as the hydromodification and peak flow attenuation design peak inflows to the basin.

If geometric constraints prohibit the rerouting of flows around a hydromodification flow control facility, then a detailed description of the constraints should be submitted to the governing municipality. Methods to route flows around flow control facilities include the addition of parallel storm drain systems and by simply designing the site to avoid natural drainage courses. It is assumed that off-site runoff would be separated from site runoff. If this is not the case, then the governing municipality should be consulted to further refine the points of compliance for the site (an interior project site point of compliance could be required in such a scenario).

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7. SELECTION AND IMPLEMENTATION OF BMPS

7.1 BMP Selection Criteria

As detailed in Permit Section D.1.d(4), LID BMPs should be implemented where feasible. Selection of the appropriate flow control treatment device will depend on the susceptibility of the receiving channel, geologic conditions in the area surrounding the proposed mitigation facility, impacts of the proposed development, and water quality sensitivity of the receiving streams.

Use of LID BMPs minimizes the impacts of urban runoff discharges to receiving waters by collectively minimizing directly connected impervious areas. By directing urban runoff to landscaped areas, LID BMPs help restore the pre-development condition hydrologic cycle of the site, allowing for filtration and infiltration of urban runoff which can significantly reduce post-development peak runoff rates, velocities, volumes, and pollutant loadings in urban runoff.

The San Diego HMP encourages the use of LID facilities for the dual treatment of the 85th percentile water quality event as well as hydromodification mitigation flow control. When LID facilities are used for both functions, they are known as Integrated Management Practices.

Unless specifically deemed infeasible, LID practices are encouraged to be implemented on the vast majority of proposed development sites to meet hydromodification criteria. Defining the infiltration potential of a site is recommended to provide for sound engineering design. In some cases, infiltration to native soils may not be feasible. These situations include the following:

- Underlying native soils with very low infiltration rates (clay soils, etc.)
- Lenses beneath soil layers that cause lateral migration of flows
- Potential for structural foundation or roadway damage from infiltrated runoff
- High groundwater table

Even if infiltration is shown to be infeasible, LID facilities can be designed as filtration-type or evaporation-type facilities instead of infiltration-based facilities. Filtration type facilities, such as bioretention basins, can be implemented through the use of amended soils. In some cases, LID approaches may need to be implemented in series or in combination with an extended detention type approach to satisfy vector control and hydromodification criteria.

To assure compliance with hydromodification flow control requirements, design criteria and specifications have been provided in the San Diego Model SUSMP for a variety of LID-based flow control methods including the following:

- Bioretention basins
- Flow-through planter boxes
- Infiltration facilities
- Bioretention in series with a cistern
- Bioretention in series with an underground vault
- Self-retaining areas.

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Sizing factors have been developed by the consultant team through the use of continuous simulation hydrologic modeling and these factors will be built into the San Diego LID/HMP Sizing Calculator to assist with HMP implementation. Sizing factors are ratios of the required mitigation size (in area or volume) as compared to the contributing developed area. The same concepts used to develop sizing factors in Contra Costa County are being used to develop sizing factors based on conditions in the San Diego area. Tables 7-1 through 7-5 detail sizing factors which have been determined to ensure compliance with peak flow and flow duration criteria as outlined in this HMP.

Table 7-1. Sizing Factors for Bioretention Facilities

Lower Flow Threshold	Soil Group	Slope	Rain Gauge	A	V_1	V_2
$0.5Q_2$	A	Flat	Lindbergh	0.060	0.0500	N/A
$0.5Q_2$	A	Moderate	Lindbergh	0.055	0.0458	N/A
$0.5Q_2$	A	Steep	Lindbergh	0.045	0.0375	N/A
$0.5Q_2$	B	Flat	Lindbergh	0.093	0.0771	N/A
$0.5Q_2$	B	Moderate	Lindbergh	0.085	0.0708	N/A
$0.5Q_2$	B	Steep	Lindbergh	0.065	0.0542	N/A
$0.5Q_2$	C	Flat	Lindbergh	0.100	0.0833	0.0600
$0.5Q_2$	C	Moderate	Lindbergh	0.100	0.0833	0.0600
$0.5Q_2$	C	Steep	Lindbergh	0.075	0.0625	0.0450
$0.5Q_2$	D	Flat	Lindbergh	0.080	0.0667	0.0480
$0.5Q_2$	D	Moderate	Lindbergh	0.080	0.0667	0.0480
$0.5Q_2$	D	Steep	Lindbergh	0.060	0.0500	0.0360
$0.5Q_2$	A	Flat	Oceanside	0.070	0.0583	N/A
$0.5Q_2$	A	Moderate	Oceanside	0.065	0.0542	N/A
$0.5Q_2$	A	Steep	Oceanside	0.060	0.0500	N/A
$0.5Q_2$	B	Flat	Oceanside	0.098	0.0813	N/A
$0.5Q_2$	B	Moderate	Oceanside	0.090	0.0750	N/A
$0.5Q_2$	B	Steep	Oceanside	0.075	0.0625	N/A
$0.5Q_2$	C	Flat	Oceanside	0.075	0.0625	0.0450
$0.5Q_2$	C	Moderate	Oceanside	0.075	0.0625	0.0450
$0.5Q_2$	C	Steep	Oceanside	0.060	0.0500	0.0360
$0.5Q_2$	D	Flat	Oceanside	0.065	0.0542	0.0390
$0.5Q_2$	D	Moderate	Oceanside	0.065	0.0542	0.0390
$0.5Q_2$	D	Steep	Oceanside	0.050	0.0417	0.0300
$0.5Q_2$	A	Flat	L Wohlford	0.050	0.0417	N/A
$0.5Q_2$	A	Moderate	L Wohlford	0.045	0.0375	N/A
$0.5Q_2$	A	Steep	L Wohlford	0.040	0.0333	N/A
$0.5Q_2$	B	Flat	L Wohlford	0.048	0.0396	N/A
$0.5Q_2$	B	Moderate	L Wohlford	0.045	0.0375	N/A
$0.5Q_2$	B	Steep	L Wohlford	0.040	0.0333	N/A

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Table 7-1. Sizing Factors for Bioretention Facilities						
Lower Flow Threshold	Soil Group	Slope	Rain Gauge	A	V_1	V_2
$0.5Q_2$	C	Flat	L Wohlford	0.065	0.0542	0.0390
$0.5Q_2$	C	Moderate	L Wohlford	0.065	0.0542	0.0390
$0.5Q_2$	C	Steep	L Wohlford	0.050	0.0417	0.0300
$0.5Q_2$	D	Flat	L Wohlford	0.055	0.0458	0.0330
$0.5Q_2$	D	Moderate	L Wohlford	0.055	0.0458	0.0330
$0.5Q_2$	D	Steep	L Wohlford	0.045	0.0375	0.0270
$0.3Q_2$	A	Flat	Lindbergh	0.060	0.0500	N/A
$0.3Q_2$	A	Moderate	Lindbergh	0.055	0.0458	N/A
$0.3Q_2$	A	Steep	Lindbergh	0.045	0.0375	N/A
$0.3Q_2$	B	Flat	Lindbergh	0.098	0.0813	N/A
$0.3Q_2$	B	Moderate	Lindbergh	0.090	0.0750	N/A
$0.3Q_2$	B	Steep	Lindbergh	0.070	0.0583	N/A
$0.3Q_2$	C	Flat	Lindbergh	0.110	0.0917	0.0660
$0.3Q_2$	C	Moderate	Lindbergh	0.110	0.0917	0.0660
$0.3Q_2$	C	Steep	Lindbergh	0.085	0.0708	0.0510
$0.3Q_2$	D	Flat	Lindbergh	0.100	0.0833	0.0600
$0.3Q_2$	D	Moderate	Lindbergh	0.100	0.0833	0.0600
$0.3Q_2$	D	Steep	Lindbergh	0.070	0.0583	0.0420
$0.3Q_2$	A	Flat	Oceanside	0.070	0.0583	N/A
$0.3Q_2$	A	Moderate	Oceanside	0.065	0.0542	N/A
$0.3Q_2$	A	Steep	Oceanside	0.060	0.0500	N/A
$0.3Q_2$	B	Flat	Oceanside	0.098	0.0813	N/A
$0.3Q_2$	B	Moderate	Oceanside	0.090	0.0750	N/A
$0.3Q_2$	B	Steep	Oceanside	0.075	0.0625	N/A
$0.3Q_2$	C	Flat	Oceanside	0.100	0.0833	0.0600
$0.3Q_2$	C	Moderate	Oceanside	0.100	0.0833	0.0600
$0.3Q_2$	C	Steep	Oceanside	0.080	0.0667	0.0480
$0.3Q_2$	D	Flat	Oceanside	0.085	0.0708	0.0510
$0.3Q_2$	D	Moderate	Oceanside	0.085	0.0708	0.0510
$0.3Q_2$	D	Steep	Oceanside	0.065	0.0542	0.0390
$0.3Q_2$	A	Flat	L Wohlford	0.050	0.0417	N/A
$0.3Q_2$	A	Moderate	L Wohlford	0.045	0.0375	N/A
$0.3Q_2$	A	Steep	L Wohlford	0.040	0.0333	N/A
$0.3Q_2$	B	Flat	L Wohlford	0.060	0.0500	N/A
$0.3Q_2$	B	Moderate	L Wohlford	0.055	0.0458	N/A
$0.3Q_2$	B	Steep	L Wohlford	0.045	0.0375	N/A
$0.3Q_2$	C	Flat	L Wohlford	0.075	0.0625	0.0450

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Table 7-1. Sizing Factors for Bioretention Facilities						
Lower Flow Threshold	Soil Group	Slope	Rain Gauge	A	V_1	V_2
$0.3Q_2$	C	Moderate	L Wohlford	0.075	0.0625	0.0450
$0.3Q_2$	C	Steep	L Wohlford	0.060	0.0500	0.0360
$0.3Q_2$	D	Flat	L Wohlford	0.065	0.0542	0.0390
$0.3Q_2$	D	Moderate	L Wohlford	0.065	0.0542	0.0390
$0.3Q_2$	D	Steep	L Wohlford	0.050	0.0417	0.0300
$0.1Q_2$	A	Flat	Lindbergh	0.060	0.0500	N/A
$0.1Q_2$	A	Moderate	Lindbergh	0.055	0.0458	N/A
$0.1Q_2$	A	Steep	Lindbergh	0.045	0.0375	N/A
$0.1Q_2$	B	Flat	Lindbergh	0.100	0.0833	N/A
$0.1Q_2$	B	Moderate	Lindbergh	0.095	0.0792	N/A
$0.1Q_2$	B	Steep	Lindbergh	0.080	0.0667	N/A
$0.1Q_2$	C	Flat	Lindbergh	0.145	0.1208	0.0870
$0.1Q_2$	C	Moderate	Lindbergh	0.145	0.1208	0.0870
$0.1Q_2$	C	Steep	Lindbergh	0.120	0.1000	0.0720
$0.1Q_2$	D	Flat	Lindbergh	0.160	0.1333	0.0960
$0.1Q_2$	D	Moderate	Lindbergh	0.160	0.1333	0.0960
$0.1Q_2$	D	Steep	Lindbergh	0.115	0.0958	0.0690
$0.1Q_2$	A	Flat	Oceanside	0.070	0.0583	N/A
$0.1Q_2$	A	Moderate	Oceanside	0.065	0.0542	N/A
$0.1Q_2$	A	Steep	Oceanside	0.060	0.0500	N/A
$0.1Q_2$	B	Flat	Oceanside	0.103	0.0854	N/A
$0.1Q_2$	B	Moderate	Oceanside	0.090	0.0750	N/A
$0.1Q_2$	B	Steep	Oceanside	0.075	0.0625	N/A
$0.1Q_2$	C	Flat	Oceanside	0.130	0.1083	0.0780
$0.1Q_2$	C	Moderate	Oceanside	0.130	0.1083	0.0780
$0.1Q_2$	C	Steep	Oceanside	0.110	0.0917	0.0660
$0.1Q_2$	D	Flat	Oceanside	0.130	0.1083	0.0780
$0.1Q_2$	D	Moderate	Oceanside	0.130	0.1083	0.0780
$0.1Q_2$	D	Steep	Oceanside	0.065	0.0542	0.0390
$0.1Q_2$	A	Flat	L Wohlford	0.050	0.0417	N/A
$0.1Q_2$	A	Moderate	L Wohlford	0.045	0.0375	N/A
$0.1Q_2$	A	Steep	L Wohlford	0.040	0.0333	N/A
$0.1Q_2$	B	Flat	L Wohlford	0.090	0.0750	N/A
$0.1Q_2$	B	Moderate	L Wohlford	0.085	0.0708	N/A
$0.1Q_2$	B	Steep	L Wohlford	0.065	0.0542	N/A
$0.1Q_2$	C	Flat	L Wohlford	0.110	0.0917	0.0660
$0.1Q_2$	C	Moderate	L Wohlford	0.110	0.0917	0.0660

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Table 7-1. Sizing Factors for Bioretention Facilities						
Lower Flow Threshold	Soil Group	Slope	Rain Gauge	A	V_1	V_2
$0.1Q_2$	C	Steep	L Wohlford	0.090	0.0750	0.0540
$0.1Q_2$	D	Flat	L Wohlford	0.100	0.0833	0.0600
$0.1Q_2$	D	Moderate	L Wohlford	0.100	0.0833	0.0600
$0.1Q_2$	D	Steep	L Wohlford	0.075	0.0625	0.0450

Q_2 = 2-year pre-project flow rate based upon partial duration analysis of long-term hourly rainfall records
Q_{10} = 10-year pre-project flow rate based upon partial duration analysis of long-term hourly rainfall records
A = Surface area sizing factor
V_1 = Surface volume sizing factor
V_2 = Subsurface volume sizing factor

Table 7-2. Sizing Factors for Bioretention Plus Cistern Facilities						
Lower Flow Threshold	Soil Group	Slope	Rain Gauge	A	V_1	V_2
$0.5Q_2$	A	Flat	Lindbergh	0.020	0.1200	N/A
$0.5Q_2$	A	Moderate	Lindbergh	0.020	0.1000	N/A
$0.5Q_2$	A	Steep	Lindbergh	0.020	0.1000	N/A
$0.5Q_2$	B	Flat	Lindbergh	0.020	0.3900	N/A
$0.5Q_2$	B	Moderate	Lindbergh	0.020	0.2000	N/A
$0.5Q_2$	B	Steep	Lindbergh	0.020	0.1200	N/A
$0.5Q_2$	C	Flat	Lindbergh	0.020	0.1200	N/A
$0.5Q_2$	C	Moderate	Lindbergh	0.020	0.1200	N/A
$0.5Q_2$	C	Steep	Lindbergh	0.020	0.1000	N/A
$0.5Q_2$	D	Flat	Lindbergh	0.020	0.1000	N/A
$0.5Q_2$	D	Moderate	Lindbergh	0.020	0.1000	N/A
$0.5Q_2$	D	Steep	Lindbergh	0.030	0.0800	N/A
$0.5Q_2$	A	Flat	Oceanside	0.020	0.1600	N/A
$0.5Q_2$	A	Moderate	Oceanside	0.020	0.1400	N/A
$0.5Q_2$	A	Steep	Oceanside	0.030	0.1200	N/A
$0.5Q_2$	B	Flat	Oceanside	0.020	0.1900	N/A
$0.5Q_2$	B	Moderate	Oceanside	0.025	0.1600	N/A
$0.5Q_2$	B	Steep	Oceanside	0.035	0.1400	N/A
$0.5Q_2$	C	Flat	Oceanside	0.030	0.1400	N/A
$0.5Q_2$	C	Moderate	Oceanside	0.035	0.1400	N/A
$0.5Q_2$	C	Steep	Oceanside	0.040	0.1200	N/A
$0.5Q_2$	D	Flat	Oceanside	0.035	0.1200	N/A
$0.5Q_2$	D	Moderate	Oceanside	0.040	0.1200	N/A
$0.5Q_2$	D	Steep	Oceanside	0.040	0.1000	N/A
$0.5Q_2$	A	Flat	L Wohlford	0.025	0.1800	N/A
$0.5Q_2$	A	Moderate	L Wohlford	0.040	0.1400	N/A

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Table 7-2. Sizing Factors for Bioretention Plus Cistern Facilities						
Lower Flow Threshold	Soil Group	Slope	Rain Gauge	A	V_1	V_2
$0.5Q_2$	A	Steep	L Wohlford	0.040	0.0800	N/A
$0.5Q_2$	B	Flat	L Wohlford	0.040	0.2100	N/A
$0.5Q_2$	B	Moderate	L Wohlford	0.040	0.2000	N/A
$0.5Q_2$	B	Steep	L Wohlford	0.040	0.1400	N/A
$0.5Q_2$	C	Flat	L Wohlford	0.040	0.1400	N/A
$0.5Q_2$	C	Moderate	L Wohlford	0.040	0.1400	N/A
$0.5Q_2$	C	Steep	L Wohlford	0.040	0.1000	N/A
$0.5Q_2$	D	Flat	L Wohlford	0.040	0.1000	N/A
$0.5Q_2$	D	Moderate	L Wohlford	0.040	0.1000	N/A
$0.5Q_2$	D	Steep	L Wohlford	0.040	0.0800	N/A
$0.3Q_2$	A	Flat	Lindbergh	0.020	0.1200	N/A
$0.3Q_2$	A	Moderate	Lindbergh	0.020	0.1000	N/A
$0.3Q_2$	A	Steep	Lindbergh	0.020	0.1000	N/A
$0.3Q_2$	B	Flat	Lindbergh	0.020	0.5900	N/A
$0.3Q_2$	B	Moderate	Lindbergh	0.020	0.3600	N/A
$0.3Q_2$	B	Steep	Lindbergh	0.020	0.1800	N/A
$0.3Q_2$	C	Flat	Lindbergh	0.020	0.1800	N/A
$0.3Q_2$	C	Moderate	Lindbergh	0.020	0.1800	N/A
$0.3Q_2$	C	Steep	Lindbergh	0.020	0.1400	N/A
$0.3Q_2$	D	Flat	Lindbergh	0.020	0.1400	N/A
$0.3Q_2$	D	Moderate	Lindbergh	0.020	0.1400	N/A
$0.3Q_2$	D	Steep	Lindbergh	0.020	0.0800	N/A
$0.3Q_2$	A	Flat	Oceanside	0.020	0.1600	N/A
$0.3Q_2$	A	Moderate	Oceanside	0.020	0.1400	N/A
$0.3Q_2$	A	Steep	Oceanside	0.020	0.1200	N/A
$0.3Q_2$	B	Flat	Oceanside	0.020	0.2200	N/A
$0.3Q_2$	B	Moderate	Oceanside	0.020	0.1800	N/A
$0.3Q_2$	B	Steep	Oceanside	0.020	0.1600	N/A
$0.3Q_2$	C	Flat	Oceanside	0.020	0.1600	N/A
$0.3Q_2$	C	Moderate	Oceanside	0.020	0.1600	N/A
$0.3Q_2$	C	Steep	Oceanside	0.025	0.1400	N/A
$0.3Q_2$	D	Flat	Oceanside	0.020	0.1400	N/A
$0.3Q_2$	D	Moderate	Oceanside	0.025	0.1400	N/A
$0.3Q_2$	D	Steep	Oceanside	0.030	0.1200	N/A
$0.3Q_2$	A	Flat	L Wohlford	0.020	0.1800	N/A
$0.3Q_2$	A	Moderate	L Wohlford	0.025	0.1400	N/A
$0.3Q_2$	A	Steep	L Wohlford	0.030	0.0800	N/A

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Table 7-2. Sizing Factors for Bioretention Plus Cistern Facilities						
Lower Flow Threshold	Soil Group	Slope	Rain Gauge	A	V_1	V_2
$0.3Q_2$	B	Flat	L Wohlford	0.025	0.2600	N/A
$0.3Q_2$	B	Moderate	L Wohlford	0.025	0.2400	N/A
$0.3Q_2$	B	Steep	L Wohlford	0.030	0.1800	N/A
$0.3Q_2$	C	Flat	L Wohlford	0.030	0.1800	N/A
$0.3Q_2$	C	Moderate	L Wohlford	0.030	0.1800	N/A
$0.3Q_2$	C	Steep	L Wohlford	0.035	0.1400	N/A
$0.3Q_2$	D	Flat	L Wohlford	0.030	0.1400	N/A
$0.3Q_2$	D	Moderate	L Wohlford	0.035	0.1400	N/A
$0.3Q_2$	D	Steep	L Wohlford	0.040	0.1000	N/A
$0.1Q_2$	A	Flat	Lindbergh	0.020	0.1200	N/A
$0.1Q_2$	A	Moderate	Lindbergh	0.020	0.1000	N/A
$0.1Q_2$	A	Steep	Lindbergh	0.020	0.1000	N/A
$0.1Q_2$	B	Flat	Lindbergh	0.020	0.5400	N/A
$0.1Q_2$	B	Moderate	Lindbergh	0.020	0.7800	N/A
$0.1Q_2$	B	Steep	Lindbergh	0.020	0.3400	N/A
$0.1Q_2$	C	Flat	Lindbergh	0.020	0.3600	N/A
$0.1Q_2$	C	Moderate	Lindbergh	0.020	0.3600	N/A
$0.1Q_2$	C	Steep	Lindbergh	0.020	0.2400	N/A
$0.1Q_2$	D	Flat	Lindbergh	0.020	0.2600	N/A
$0.1Q_2$	D	Moderate	Lindbergh	0.020	0.2600	N/A
$0.1Q_2$	D	Steep	Lindbergh	0.020	0.1600	N/A
$0.1Q_2$	A	Flat	Oceanside	0.020	0.1600	N/A
$0.1Q_2$	A	Moderate	Oceanside	0.020	0.1400	N/A
$0.1Q_2$	A	Steep	Oceanside	0.020	0.1200	N/A
$0.1Q_2$	B	Flat	Oceanside	0.020	0.5100	N/A
$0.1Q_2$	B	Moderate	Oceanside	0.020	0.3400	N/A
$0.1Q_2$	B	Steep	Oceanside	0.020	0.2400	N/A
$0.1Q_2$	C	Flat	Oceanside	0.020	0.2600	N/A
$0.1Q_2$	C	Moderate	Oceanside	0.020	0.2600	N/A
$0.1Q_2$	C	Steep	Oceanside	0.020	0.2000	N/A
$0.1Q_2$	D	Flat	Oceanside	0.020	0.2000	N/A
$0.1Q_2$	D	Moderate	Oceanside	0.020	0.2000	N/A
$0.1Q_2$	D	Steep	Oceanside	0.020	0.1800	N/A
$0.1Q_2$	A	Flat	L Wohlford	0.020	0.1800	N/A
$0.1Q_2$	A	Moderate	L Wohlford	0.020	0.1400	N/A
$0.1Q_2$	A	Steep	L Wohlford	0.020	0.0800	N/A
$0.1Q_2$	B	Flat	L Wohlford	0.020	0.4400	N/A

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Table 7-2. Sizing Factors for Bioretention Plus Cistern Facilities						
Lower Flow Threshold	Soil Group	Slope	Rain Gauge	A	V_1	V_2
$0.1Q_2$	B	Moderate	L Wohlford	0.020	0.4000	N/A
$0.1Q_2$	B	Steep	L Wohlford	0.020	0.3200	N/A
$0.1Q_2$	C	Flat	L Wohlford	0.020	0.3200	N/A
$0.1Q_2$	C	Moderate	L Wohlford	0.020	0.3200	N/A
$0.1Q_2$	C	Steep	L Wohlford	0.020	0.2200	N/A
$0.1Q_2$	D	Flat	L Wohlford	0.020	0.2400	N/A
$0.1Q_2$	D	Moderate	L Wohlford	0.020	0.2400	N/A
$0.1Q_2$	D	Steep	L Wohlford	0.020	0.1800	N/A

Q_2 = 2-year pre-project flow rate based upon partial duration analysis of long-term hourly rainfall records
Q_{10} = 10-year pre-project flow rate based upon partial duration analysis of long-term hourly rainfall records
A = Bioretention surface area sizing factor
V_1 = Cistern volume sizing factor

Table 7-3. Sizing Factors for Bioretention Plus Vault Facilities						
Lower Flow Threshold	Soil Group	Slope	Rain Gauge	A	V_1	V_2
$0.5Q_2$	A	Flat	Lindbergh	N/A	N/A	N/A
$0.5Q_2$	A	Moderate	Lindbergh	N/A	N/A	N/A
$0.5Q_2$	A	Steep	Lindbergh	N/A	N/A	N/A
$0.5Q_2$	B	Flat	Lindbergh	0.040	0.3600	N/A
$0.5Q_2$	B	Moderate	Lindbergh	0.040	0.2400	N/A
$0.5Q_2$	B	Steep	Lindbergh	0.040	0.1400	N/A
$0.5Q_2$	C	Flat	Lindbergh	0.040	0.1600	N/A
$0.5Q_2$	C	Moderate	Lindbergh	0.040	0.1600	N/A
$0.5Q_2$	C	Steep	Lindbergh	0.040	0.1200	N/A
$0.5Q_2$	D	Flat	Lindbergh	0.040	0.1400	N/A
$0.5Q_2$	D	Moderate	Lindbergh	0.040	0.1400	N/A
$0.5Q_2$	D	Steep	Lindbergh	0.040	0.1000	N/A
$0.5Q_2$	A	Flat	Oceanside	N/A	N/A	N/A
$0.5Q_2$	A	Moderate	Oceanside	N/A	N/A	N/A
$0.5Q_2$	A	Steep	Oceanside	N/A	N/A	N/A
$0.5Q_2$	B	Flat	Oceanside	0.040	0.2100	N/A
$0.5Q_2$	B	Moderate	Oceanside	0.040	0.1800	N/A
$0.5Q_2$	B	Steep	Oceanside	0.040	0.1400	N/A
$0.5Q_2$	C	Flat	Oceanside	0.040	0.1400	N/A
$0.5Q_2$	C	Moderate	Oceanside	0.040	0.1400	N/A
$0.5Q_2$	C	Steep	Oceanside	0.040	0.1200	N/A
$0.5Q_2$	D	Flat	Oceanside	0.040	0.1400	N/A

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Table 7-3. Sizing Factors for Bioretention Plus Vault Facilities						
Lower Flow Threshold	Soil Group	Slope	Rain Gauge	A	V_1	V_2
$0.5Q_2$	D	Moderate	Oceanside	0.040	0.1400	N/A
$0.5Q_2$	D	Steep	Oceanside	0.040	0.1200	N/A
$0.5Q_2$	A	Flat	L Wohlford	N/A	N/A	N/A
$0.5Q_2$	A	Moderate	L Wohlford	N/A	N/A	N/A
$0.5Q_2$	A	Steep	L Wohlford	N/A	N/A	N/A
$0.5Q_2$	B	Flat	L Wohlford	0.040	0.2600	N/A
$0.5Q_2$	B	Moderate	L Wohlford	0.040	0.2200	N/A
$0.5Q_2$	B	Steep	L Wohlford	0.040	0.1200	N/A
$0.5Q_2$	C	Flat	L Wohlford	0.040	0.1400	N/A
$0.5Q_2$	C	Moderate	L Wohlford	0.040	0.1400	N/A
$0.5Q_2$	C	Steep	L Wohlford	0.040	0.1000	N/A
$0.5Q_2$	D	Flat	L Wohlford	0.040	0.1200	N/A
$0.5Q_2$	D	Moderate	L Wohlford	0.040	0.1200	N/A
$0.5Q_2$	D	Steep	L Wohlford	0.040	0.0800	N/A
$0.3Q_2$	A	Flat	Lindbergh	N/A	N/A	N/A
$0.3Q_2$	A	Moderate	Lindbergh	N/A	N/A	N/A
$0.3Q_2$	A	Steep	Lindbergh	N/A	N/A	N/A
$0.3Q_2$	B	Flat	Lindbergh	0.040	0.4500	N/A
$0.3Q_2$	B	Moderate	Lindbergh	0.040	0.3200	N/A
$0.3Q_2$	B	Steep	Lindbergh	0.040	0.1800	N/A
$0.3Q_2$	C	Flat	Lindbergh	0.040	0.1800	N/A
$0.3Q_2$	C	Moderate	Lindbergh	0.040	0.1800	N/A
$0.3Q_2$	C	Steep	Lindbergh	0.040	0.1400	N/A
$0.3Q_2$	D	Flat	Lindbergh	0.040	0.1600	N/A
$0.3Q_2$	D	Moderate	Lindbergh	0.040	0.1600	N/A
$0.3Q_2$	D	Steep	Lindbergh	0.040	0.1200	N/A
$0.3Q_2$	A	Flat	Oceanside	N/A	N/A	N/A
$0.3Q_2$	A	Moderate	Oceanside	N/A	N/A	N/A
$0.3Q_2$	A	Steep	Oceanside	N/A	N/A	N/A
$0.3Q_2$	B	Flat	Oceanside	0.040	0.2500	N/A
$0.3Q_2$	B	Moderate	Oceanside	0.040	0.2000	N/A
$0.3Q_2$	B	Steep	Oceanside	0.040	0.1600	N/A
$0.3Q_2$	C	Flat	Oceanside	0.040	0.1600	N/A
$0.3Q_2$	C	Moderate	Oceanside	0.040	0.1600	N/A
$0.3Q_2$	C	Steep	Oceanside	0.040	0.1400	N/A
$0.3Q_2$	D	Flat	Oceanside	0.040	0.1400	N/A
$0.3Q_2$	D	Moderate	Oceanside	0.040	0.1400	N/A

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Table 7-3. Sizing Factors for Bioretention Plus Vault Facilities						
Lower Flow Threshold	Soil Group	Slope	Rain Gauge	A	V_1	V_2
$0.3Q_2$	D	Steep	Oceanside	0.040	0.1200	N/A
$0.3Q_2$	A	Flat	L Wohlford	N/A	N/A	N/A
$0.3Q_2$	A	Moderate	L Wohlford	N/A	N/A	N/A
$0.3Q_2$	A	Steep	L Wohlford	N/A	N/A	N/A
$0.3Q_2$	B	Flat	L Wohlford	0.040	0.2900	N/A
$0.3Q_2$	B	Moderate	L Wohlford	0.040	0.2600	N/A
$0.3Q_2$	B	Steep	L Wohlford	0.040	0.1600	N/A
$0.3Q_2$	C	Flat	L Wohlford	0.040	0.1600	N/A
$0.3Q_2$	C	Moderate	L Wohlford	0.040	0.1600	N/A
$0.3Q_2$	C	Steep	L Wohlford	0.040	0.1200	N/A
$0.3Q_2$	D	Flat	L Wohlford	0.040	0.1200	N/A
$0.3Q_2$	D	Moderate	L Wohlford	0.040	0.1200	N/A
$0.3Q_2$	D	Steep	L Wohlford	0.040	0.0800	N/A
$0.1Q_2$	A	Flat	Lindbergh	N/A	N/A	N/A
$0.1Q_2$	A	Moderate	Lindbergh	N/A	N/A	N/A
$0.1Q_2$	A	Steep	Lindbergh	N/A	N/A	N/A
$0.1Q_2$	B	Flat	Lindbergh	0.040	0.5900	N/A
$0.1Q_2$	B	Moderate	Lindbergh	0.040	0.5000	N/A
$0.1Q_2$	B	Steep	Lindbergh	0.040	0.3200	N/A
$0.1Q_2$	C	Flat	Lindbergh	0.040	0.3400	N/A
$0.1Q_2$	C	Moderate	Lindbergh	0.040	0.3400	N/A
$0.1Q_2$	C	Steep	Lindbergh	0.040	0.2400	N/A
$0.1Q_2$	D	Flat	Lindbergh	0.040	0.2600	N/A
$0.1Q_2$	D	Moderate	Lindbergh	0.040	0.2600	N/A
$0.1Q_2$	D	Steep	Lindbergh	0.040	0.1800	N/A
$0.1Q_2$	A	Flat	Oceanside	N/A	N/A	N/A
$0.1Q_2$	A	Moderate	Oceanside	N/A	N/A	N/A
$0.1Q_2$	A	Steep	Oceanside	N/A	N/A	N/A
$0.1Q_2$	B	Flat	Oceanside	0.040	0.4300	N/A
$0.1Q_2$	B	Moderate	Oceanside	0.040	0.3400	N/A
$0.1Q_2$	B	Steep	Oceanside	0.040	0.2400	N/A
$0.1Q_2$	C	Flat	Oceanside	0.040	0.2600	N/A
$0.1Q_2$	C	Moderate	Oceanside	0.040	0.2600	N/A
$0.1Q_2$	C	Steep	Oceanside	0.040	0.2000	N/A
$0.1Q_2$	D	Flat	Oceanside	0.040	0.2200	N/A
$0.1Q_2$	D	Moderate	Oceanside	0.040	0.2200	N/A
$0.1Q_2$	D	Steep	Oceanside	0.040	0.1600	N/A

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Table 7-3. Sizing Factors for Bioretention Plus Vault Facilities						
Lower Flow Threshold	Soil Group	Slope	Rain Gauge	A	V_1	V_2
$0.1Q_2$	A	Flat	L Wohlford	N/A	N/A	N/A
$0.1Q_2$	A	Moderate	L Wohlford	N/A	N/A	N/A
$0.1Q_2$	A	Steep	L Wohlford	N/A	N/A	N/A
$0.1Q_2$	B	Flat	L Wohlford	0.040	0.4300	N/A
$0.1Q_2$	B	Moderate	L Wohlford	0.040	0.3800	N/A
$0.1Q_2$	B	Steep	L Wohlford	0.040	0.2800	N/A
$0.1Q_2$	C	Flat	L Wohlford	0.040	0.2800	N/A
$0.1Q_2$	C	Moderate	L Wohlford	0.040	0.2800	N/A
$0.1Q_2$	C	Steep	L Wohlford	0.040	0.2000	N/A
$0.1Q_2$	D	Flat	L Wohlford	0.040	0.2200	N/A
$0.1Q_2$	D	Moderate	L Wohlford	0.040	0.2200	N/A
$0.1Q_2$	D	Steep	L Wohlford	0.040	0.1400	N/A

Q_2 = 2-year pre-project flow rate based upon partial duration analysis of long-term hourly rainfall records
Q_{10} = 10-year pre-project flow rate based upon partial duration analysis of long-term hourly rainfall records
A = Bioretention surface area sizing factor
V_1 = Cistern volume sizing factor

Table 7-4. Sizing Factors for Flow-Through Planters						
Lower Flow Threshold	Soil Group	Slope	Rain Gauge	A	V_1	V_2
0.5Q2	A	Flat	Lindbergh	N/A	N/A	N/A
0.5Q2	A	Moderate	Lindbergh	N/A	N/A	N/A
0.5Q2	A	Steep	Lindbergh	N/A	N/A	N/A
0.5Q2	B	Flat	Lindbergh	N/A	N/A	N/A
0.5Q2	B	Moderate	Lindbergh	N/A	N/A	N/A
0.5Q2	B	Steep	Lindbergh	N/A	N/A	N/A
0.5Q2	C	Flat	Lindbergh	0.115	0.0958	0.0690
0.5Q2	C	Moderate	Lindbergh	0.115	0.0958	0.0690
0.5Q2	C	Steep	Lindbergh	0.080	0.0667	0.0480
0.5Q2	D	Flat	Lindbergh	0.085	0.0708	0.0510
0.5Q2	D	Moderate	Lindbergh	0.085	0.0708	0.0510
0.5Q2	D	Steep	Lindbergh	0.065	0.0542	0.0390
0.5Q2	A	Flat	Oceanside	N/A	N/A	N/A
0.5Q2	A	Moderate	Oceanside	N/A	N/A	N/A
0.5Q2	A	Steep	Oceanside	N/A	N/A	N/A
0.5Q2	B	Flat	Oceanside	N/A	N/A	N/A
0.5Q2	B	Moderate	Oceanside	N/A	N/A	N/A
0.5Q2	B	Steep	Oceanside	N/A	N/A	N/A
0.5Q2	C	Flat	Oceanside	0.075	0.0625	0.0450

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Table 7-4. Sizing Factors for Flow-Through Planters						
Lower Flow Threshold	Soil Group	Slope	Rain Gauge	A	V_1	V_2
0.5Q2	C	Moderate	Oceanside	0.075	0.0625	0.0450
0.5Q2	C	Steep	Oceanside	0.065	0.0542	0.0390
0.5Q2	D	Flat	Oceanside	0.070	0.0583	0.0420
0.5Q2	D	Moderate	Oceanside	0.070	0.0583	0.0420
0.5Q2	D	Steep	Oceanside	0.050	0.0417	0.0300
0.5Q2	A	Flat	L Wohlford	N/A	N/A	N/A
0.5Q2	A	Moderate	L Wohlford	N/A	N/A	N/A
0.5Q2	A	Steep	L Wohlford	N/A	N/A	N/A
0.5Q2	B	Flat	L Wohlford	N/A	N/A	N/A
0.5Q2	B	Moderate	L Wohlford	N/A	N/A	N/A
0.5Q2	B	Steep	L Wohlford	N/A	N/A	N/A
0.5Q2	C	Flat	L Wohlford	0.070	0.0583	0.0420
0.5Q2	C	Moderate	L Wohlford	0.070	0.0583	0.0420
0.5Q2	C	Steep	L Wohlford	0.050	0.0417	0.0300
0.5Q2	D	Flat	L Wohlford	0.055	0.0458	0.0330
0.5Q2	D	Moderate	L Wohlford	0.055	0.0458	0.0330
0.5Q2	D	Steep	L Wohlford	0.045	0.0375	0.0270
0.3Q2	A	Flat	Lindbergh	N/A	N/A	N/A
0.3Q2	A	Moderate	Lindbergh	N/A	N/A	N/A
0.3Q2	A	Steep	Lindbergh	N/A	N/A	N/A
0.3Q2	B	Flat	Lindbergh	N/A	N/A	N/A
0.3Q2	B	Moderate	Lindbergh	N/A	N/A	N/A
0.3Q2	B	Steep	Lindbergh	N/A	N/A	N/A
0.3Q2	C	Flat	Lindbergh	0.130	0.1083	0.0780
0.3Q2	C	Moderate	Lindbergh	0.130	0.1083	0.0780
0.3Q2	C	Steep	Lindbergh	0.100	0.0833	0.0600
0.3Q2	D	Flat	Lindbergh	0.105	0.0875	0.0630
0.3Q2	D	Moderate	Lindbergh	0.105	0.0875	0.0630
0.3Q2	D	Steep	Lindbergh	0.075	0.0625	0.0450
0.3Q2	A	Flat	Oceanside	N/A	N/A	N/A
0.3Q2	A	Moderate	Oceanside	N/A	N/A	N/A
0.3Q2	A	Steep	Oceanside	N/A	N/A	N/A
0.3Q2	B	Flat	Oceanside	N/A	N/A	N/A
0.3Q2	B	Moderate	Oceanside	N/A	N/A	N/A
0.3Q2	B	Steep	Oceanside	N/A	N/A	N/A
0.3Q2	C	Flat	Oceanside	0.105	0.0875	0.0630
0.3Q2	C	Moderate	Oceanside	0.105	0.0875	0.0630
0.3Q2	C	Steep	Oceanside	0.085	0.0708	0.0510
0.3Q2	D	Flat	Oceanside	0.090	0.0750	0.0540

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Table 7-4. Sizing Factors for Flow-Through Planters						
Lower Flow Threshold	Soil Group	Slope	Rain Gauge	A	V_1	V_2
0.3Q2	D	Moderate	Oceanside	0.090	0.0750	0.0540
0.3Q2	D	Steep	Oceanside	0.070	0.0583	0.0420
0.3Q2	A	Flat	L Wohlford	N/A	N/A	N/A
0.3Q2	A	Moderate	L Wohlford	N/A	N/A	N/A
0.3Q2	A	Steep	L Wohlford	N/A	N/A	N/A
0.3Q2	B	Flat	L Wohlford	N/A	N/A	N/A
0.3Q2	B	Moderate	L Wohlford	N/A	N/A	N/A
0.3Q2	B	Steep	L Wohlford	N/A	N/A	N/A
0.3Q2	C	Flat	L Wohlford	0.085	0.0708	0.0510
0.3Q2	C	Moderate	L Wohlford	0.085	0.0708	0.0510
0.3Q2	C	Steep	L Wohlford	0.060	0.0500	0.0360
0.3Q2	D	Flat	L Wohlford	0.065	0.0542	0.0390
0.3Q2	D	Moderate	L Wohlford	0.065	0.0542	0.0390
0.3Q2	D	Steep	L Wohlford	0.050	0.0417	0.0300
0.1Q2	A	Flat	Lindbergh	N/A	N/A	N/A
0.1Q2	A	Moderate	Lindbergh	N/A	N/A	N/A
0.1Q2	A	Steep	Lindbergh	N/A	N/A	N/A
0.1Q2	B	Flat	Lindbergh	N/A	N/A	N/A
0.1Q2	B	Moderate	Lindbergh	N/A	N/A	N/A
0.1Q2	B	Steep	Lindbergh	N/A	N/A	N/A
0.1Q2	C	Flat	Lindbergh	0.250	0.2083	0.1500
0.1Q2	C	Moderate	Lindbergh	0.250	0.2083	0.1500
0.1Q2	C	Steep	Lindbergh	0.185	0.1542	0.1110
0.1Q2	D	Flat	Lindbergh	0.200	0.1667	0.1200
0.1Q2	D	Moderate	Lindbergh	0.200	0.1667	0.1200
0.1Q2	D	Steep	Lindbergh	0.130	0.1083	0.0780
0.1Q2	A	Flat	Oceanside	N/A	N/A	N/A
0.1Q2	A	Moderate	Oceanside	N/A	N/A	N/A
0.1Q2	A	Steep	Oceanside	N/A	N/A	N/A
0.1Q2	B	Flat	Oceanside	N/A	N/A	N/A
0.1Q2	B	Moderate	Oceanside	N/A	N/A	N/A
0.1Q2	B	Steep	Oceanside	N/A	N/A	N/A
0.1Q2	C	Flat	Oceanside	0.190	0.1583	0.1140
0.1Q2	C	Moderate	Oceanside	0.190	0.1583	0.1140
0.1Q2	C	Steep	Oceanside	0.140	0.1167	0.0840
0.1Q2	D	Flat	Oceanside	0.160	0.1333	0.0960
0.1Q2	D	Moderate	Oceanside	0.160	0.1333	0.0960
0.1Q2	D	Steep	Oceanside	0.105	0.0875	0.0630
0.1Q2	A	Flat	L Wohlford	N/A	N/A	N/A

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Table 7-4. Sizing Factors for Flow-Through Planters						
Lower Flow Threshold	Soil Group	Slope	Rain Gauge	A	V_1	V_2
0.1Q2	A	Moderate	L Wohlford	N/A	N/A	N/A
0.1Q2	A	Steep	L Wohlford	N/A	N/A	N/A
0.1Q2	B	Flat	L Wohlford	N/A	N/A	N/A
0.1Q2	B	Moderate	L Wohlford	N/A	N/A	N/A
0.1Q2	B	Steep	L Wohlford	N/A	N/A	N/A
0.1Q2	C	Flat	L Wohlford	0.135	0.1125	0.0810
0.1Q2	C	Moderate	L Wohlford	0.135	0.1125	0.0810
0.1Q2	C	Steep	L Wohlford	0.105	0.0875	0.0630
0.1Q2	D	Flat	L Wohlford	0.110	0.0917	0.0660
0.1Q2	D	Moderate	L Wohlford	0.110	0.0917	0.0660
0.1Q2	D	Steep	L Wohlford	0.080	0.0667	0.0480

Q_2 = 2-year pre-project flow rate based upon partial duration analysis of long-term hourly rainfall records
Q_{10} = 10-year pre-project flow rate based upon partial duration analysis of long-term hourly rainfall records
A = Surface area sizing factor
V_1 = Surface volume sizing factor
V_2 = Subsurface volume sizing factor

Table 7-5. Sizing Factors for Infiltration Facilities						
Lower Flow Threshold	Soil Group	Slope	Rain Gauge	A	V_1	V_2
0.5Q2	A	Flat	Lindbergh	0.040	0.1040	N/A
0.5Q2	A	Moderate	Lindbergh	0.040	0.1040	N/A
0.5Q2	A	Steep	Lindbergh	0.035	0.0910	N/A
0.5Q2	B	Flat	Lindbergh	0.058	0.1495	N/A
0.5Q2	B	Moderate	Lindbergh	0.055	0.1430	N/A
0.5Q2	B	Steep	Lindbergh	0.050	0.1300	N/A
0.5Q2	C	Flat	Lindbergh	N/A	N/A	N/A
0.5Q2	C	Moderate	Lindbergh	N/A	N/A	N/A
0.5Q2	C	Steep	Lindbergh	N/A	N/A	N/A
0.5Q2	D	Flat	Lindbergh	N/A	N/A	N/A
0.5Q2	D	Moderate	Lindbergh	N/A	N/A	N/A
0.5Q2	D	Steep	Lindbergh	N/A	N/A	N/A
0.5Q2	A	Flat	Oceanside	0.045	0.1170	N/A
0.5Q2	A	Moderate	Oceanside	0.045	0.1170	N/A
0.5Q2	A	Steep	Oceanside	0.040	0.1040	N/A
0.5Q2	B	Flat	Oceanside	0.065	0.1690	N/A
0.5Q2	B	Moderate	Oceanside	0.065	0.1690	N/A
0.5Q2	B	Steep	Oceanside	0.060	0.1560	N/A
0.5Q2	C	Flat	Oceanside	N/A	N/A	N/A
0.5Q2	C	Moderate	Oceanside	N/A	N/A	N/A

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Table 7-5. Sizing Factors for Infiltration Facilities						
Lower Flow Threshold	Soil Group	Slope	Rain Gauge	A	V_1	V_2
0.5Q2	C	Steep	Oceanside	N/A	N/A	N/A
0.5Q2	D	Flat	Oceanside	N/A	N/A	N/A
0.5Q2	D	Moderate	Oceanside	N/A	N/A	N/A
0.5Q2	D	Steep	Oceanside	N/A	N/A	N/A
0.5Q2	A	Flat	L Wohlford	0.050	0.1300	N/A
0.5Q2	A	Moderate	L Wohlford	0.050	0.1300	N/A
0.5Q2	A	Steep	L Wohlford	0.040	0.1040	N/A
0.5Q2	B	Flat	L Wohlford	0.078	0.2015	N/A
0.5Q2	B	Moderate	L Wohlford	0.075	0.1950	N/A
0.5Q2	B	Steep	L Wohlford	0.065	0.1690	N/A
0.5Q2	C	Flat	L Wohlford	N/A	N/A	N/A
0.5Q2	C	Moderate	L Wohlford	N/A	N/A	N/A
0.5Q2	C	Steep	L Wohlford	N/A	N/A	N/A
0.5Q2	D	Flat	L Wohlford	N/A	N/A	N/A
0.5Q2	D	Moderate	L Wohlford	N/A	N/A	N/A
0.5Q2	D	Steep	L Wohlford	N/A	N/A	N/A
0.3Q2	A	Flat	Lindbergh	0.040	0.1040	N/A
0.3Q2	A	Moderate	Lindbergh	0.040	0.1040	N/A
0.3Q2	A	Steep	Lindbergh	0.035	0.0910	N/A
0.3Q2	B	Flat	Lindbergh	0.058	0.1495	N/A
0.3Q2	B	Moderate	Lindbergh	0.055	0.1430	N/A
0.3Q2	B	Steep	Lindbergh	0.050	0.1300	N/A
0.3Q2	C	Flat	Lindbergh	N/A	N/A	N/A
0.3Q2	C	Moderate	Lindbergh	N/A	N/A	N/A
0.3Q2	C	Steep	Lindbergh	N/A	N/A	N/A
0.3Q2	D	Flat	Lindbergh	N/A	N/A	N/A
0.3Q2	D	Moderate	Lindbergh	N/A	N/A	N/A
0.3Q2	D	Steep	Lindbergh	N/A	N/A	N/A
0.3Q2	A	Flat	Oceanside	0.045	0.1170	N/A
0.3Q2	A	Moderate	Oceanside	0.045	0.1170	N/A
0.3Q2	A	Steep	Oceanside	0.040	0.1040	N/A
0.3Q2	B	Flat	Oceanside	0.065	0.1690	N/A
0.3Q2	B	Moderate	Oceanside	0.065	0.1690	N/A
0.3Q2	B	Steep	Oceanside	0.060	0.1560	N/A
0.3Q2	C	Flat	Oceanside	N/A	N/A	N/A
0.3Q2	C	Moderate	Oceanside	N/A	N/A	N/A
0.3Q2	C	Steep	Oceanside	N/A	N/A	N/A
0.3Q2	D	Flat	Oceanside	N/A	N/A	N/A
0.3Q2	D	Moderate	Oceanside	N/A	N/A	N/A

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Table 7-5. Sizing Factors for Infiltration Facilities

Lower Flow Threshold	Soil Group	Slope	Rain Gauge	A	V_1	V_2
0.3Q2	D	Steep	Oceanside	N/A	N/A	N/A
0.3Q2	A	Flat	L Wohlford	0.050	0.1300	N/A
0.3Q2	A	Moderate	L Wohlford	0.050	0.1300	N/A
0.3Q2	A	Steep	L Wohlford	0.040	0.1040	N/A
0.3Q2	B	Flat	L Wohlford	0.078	0.2015	N/A
0.3Q2	B	Moderate	L Wohlford	0.075	0.1950	N/A
0.3Q2	B	Steep	L Wohlford	0.065	0.1690	N/A
0.3Q2	C	Flat	L Wohlford	N/A	N/A	N/A
0.3Q2	C	Moderate	L Wohlford	N/A	N/A	N/A
0.3Q2	C	Steep	L Wohlford	N/A	N/A	N/A
0.3Q2	D	Flat	L Wohlford	N/A	N/A	N/A
0.3Q2	D	Moderate	L Wohlford	N/A	N/A	N/A
0.3Q2	D	Steep	L Wohlford	N/A	N/A	N/A
0.1Q2	A	Flat	Lindbergh	0.040	0.1040	N/A
0.1Q2	A	Moderate	Lindbergh	0.040	0.1040	N/A
0.1Q2	A	Steep	Lindbergh	0.035	0.0910	N/A
0.1Q2	B	Flat	Lindbergh	0.058	0.1495	N/A
0.1Q2	B	Moderate	Lindbergh	0.055	0.1430	N/A
0.1Q2	B	Steep	Lindbergh	0.050	0.1300	N/A
0.1Q2	C	Flat	Lindbergh	N/A	N/A	N/A
0.1Q2	C	Moderate	Lindbergh	N/A	N/A	N/A
0.1Q2	C	Steep	Lindbergh	N/A	N/A	N/A
0.1Q2	D	Flat	Lindbergh	N/A	N/A	N/A
0.1Q2	D	Moderate	Lindbergh	N/A	N/A	N/A
0.1Q2	D	Steep	Lindbergh	N/A	N/A	N/A
0.1Q2	A	Flat	Oceanside	0.045	0.1170	N/A
0.1Q2	A	Moderate	Oceanside	0.045	0.1170	N/A
0.1Q2	A	Steep	Oceanside	0.040	0.1040	N/A
0.1Q2	B	Flat	Oceanside	0.065	0.1690	N/A
0.1Q2	B	Moderate	Oceanside	0.065	0.1690	N/A
0.1Q2	B	Steep	Oceanside	0.060	0.1560	N/A
0.1Q2	C	Flat	Oceanside	N/A	N/A	N/A
0.1Q2	C	Moderate	Oceanside	N/A	N/A	N/A
0.1Q2	C	Steep	Oceanside	N/A	N/A	N/A
0.1Q2	D	Flat	Oceanside	N/A	N/A	N/A
0.1Q2	D	Moderate	Oceanside	N/A	N/A	N/A
0.1Q2	D	Steep	Oceanside	N/A	N/A	N/A
0.1Q2	A	Flat	L Wohlford	0.050	0.1300	N/A
0.1Q2	A	Moderate	L Wohlford	0.050	0.1300	N/A

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Table 7-5. Sizing Factors for Infiltration Facilities

Lower Flow Threshold	Soil Group	Slope	Rain Gauge	A	V_1	V_2
0.1Q2	A	Steep	L Wohlford	0.040	0.1040	N/A
0.1Q2	B	Flat	L Wohlford	0.078	0.2015	N/A
0.1Q2	B	Moderate	L Wohlford	0.075	0.1950	N/A
0.1Q2	B	Steep	L Wohlford	0.065	0.1690	N/A
0.1Q2	C	Flat	L Wohlford	N/A	N/A	N/A
0.1Q2	C	Moderate	L Wohlford	N/A	N/A	N/A
0.1Q2	C	Steep	L Wohlford	N/A	N/A	N/A
0.1Q2	D	Flat	L Wohlford	N/A	N/A	N/A
0.1Q2	D	Moderate	L Wohlford	N/A	N/A	N/A
0.1Q2	D	Steep	L Wohlford	N/A	N/A	N/A

Q_2 = 2-year pre-project flow rate based upon partial duration analysis of long-term hourly rainfall records
Q_{10} = 10-year pre-project flow rate based upon partial duration analysis of long-term hourly rainfall records
A = Surface area sizing factor
V_1 = Infiltration volume sizing factor

Rainfall basin boundaries were determined based upon mean annual precipitation values as determined by the County of San Diego and specific precipitation totals at the three base rainfall stations (Lindbergh Field, Oceanside and Lake Wohlford). The final rainfall basin map is provided in the San Diego BMP Sizing Calculator.

Per the County's chief hydrologist Rand Allan, the 3 base rainfall stations have the following mean annual precipitation values for the time period of 1971-2001 (period of time depicted on the mean annual precipitation map created by the County of San Diego).

Lindbergh Field = 10.2 inches
Oceanside = 13.3 inches
Lake Wohlford = 20.0 inches

To determine the east-west boundary between Oceanside and Lake Wohlford, the average of the mean annual precipitation values between Oceanside and Lake Wohlford was determined:

(13.3 inches + 20.0 inches) / 2 = 16.7 inches

The 17 inch isopluvial line was used as the boundary – anything east of the 17 inch isopluvial line would be part of the Lake Wohlford basin.

To determine the east-west boundary between Oceanside and Lindbergh, the average of the mean annual precipitation values between Oceanside and Lindbergh was determined:

(13.3 inches + 10.2 inches) = 11.8 inches

The 12 inch isopluvial line was used as the boundary – anything west of the 12 inch isopluvial line would be part of the Lindbergh basin.

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To determine the east-west boundary between Lindbergh and Lake Wohlford (used only for extreme south county areas), the average of the mean annual precipitation values between Lindbergh and Lake Wohlford was determined:

(10.2 inches + 20.0 inches) / 2 = 15.1 inches

The 15 inch isopluvial line was used as the boundary – anything east of the 15-inch isopluvial line would be part of the Lake Wohlford basin.

Areas located between the 12 inch and 17 inch isopluvial lines and also located north of Sweetwater Reservoir/San Miguel Mountain were designated as part of the Oceanside basin.

Additional notes:

1. The southern extent of the Oceanside basin was limited to the area near Sweetwater Reservoir and San Miguel Mountain. At that location, the previously discussed 15 inch and 17 inch isopluvial lines are in close proximity.
2. There is a short reach of 12 inch isopluvial line near the coastline between Encinitas and Los Penasquitos lagoon. Even though this area has a mean annual precipitation less than 12 inches, it is included in the Oceanside basin pursuant to Rand Allan's determination that a north-south divide between the Lindbergh and Oceanside basins occurs north of La Jolla.

For situations where LID implementation cannot fully achieve the required hydromodification flow mitigation, the project applicant will have the option to implement extended detention facilities in combination with LID facilities. The San Diego HMP / LID sizing calculator will have a basin sizing component to assist with the design of extended detention flow duration control facilities as well as LID facilities.

Facilities must be designed, built, and maintained to practically function within the urban environment. Soil compaction associated with grading activities affects infiltration rates and should be considered. Underdrains are typically required for urban projects where the anticipated infiltration rate is low or where infiltrated runoff could pose an adjacent stability risk.

Since the HMP will be implemented through the municipal development review process, design criteria must be specified and be incorporated into conditions of approval.

Development of sizing factors and the San Diego HMP / LID sizing calculator is currently being conducted and includes the following tasks.

- Develop and document the major assumptions and model parameters that will be used in subsequent HSPF simulations to size Low-Impact Design (LID) facilities, detention ponds, and non-structural stormwater controls. This task includes three steps.
  1. Document LID facility configurations included in the Sizing Calculator
  2. Select the range of input parameters to use in the HSPF model simulations
  3. Develop and document the approach to computing BMP sizing factors
- Develop configurations of each of the LID BMPs included in the Model SUSMP, including the dimensions of the ponding layers, growing medium, storage layer, and outlet piping. The following LID BMPs will be modeled for flow control and water quality treatment:
  1. Bioretention
  2. Cistern with bioretention
  3. Bioretention with flow control vault
  4. Flow-through planter

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5. Dry well
6. Vegetated bioswale (for water quality treatment only)

- Select a recommended set of HSPF input parameters for simulating hydrologic processes on pervious surfaces, known in HSPF as PERLNDs. Parameters will be selected that represent specific combinations of the following:
  - Soils
  - Land Cover
  - Slope
- Develop LID sizing factors for NRCS Group A, B, C, and D soils. LID facilities built in Group C and D soils will include an underdrain and a flow control orifice. LID facilities built in Group A and B soils will have no underdrain, requiring infiltration to surrounding soils.
- Develop sizing for traditional stormwater BMPs using an automated approach to size stormwater detention ponds. The automated pond sizing algorithm is incorporated into the BMP Sizing Calculator.
  - Select specific allowable range of pond configuration parameters, such as side slopes and the number of outlets
  - Develop an algorithm that will read in long-term model simulation results and iteratively vary pond volume and outlet dimensions until the flow control requirements are met
- Develop BMP Sizing Calculator. The BMP Sizing Calculator will help streamline the process of sizing the BMPs listed in the County's Model SUSMP. The software will have the following features:
  - Sizing of BMPs for "flow control + water quality treatment" and "water quality treatment-only" permit requirements
  - Include all LID BMPs listed in the County's SUSMP, including stormwater detention ponds
  - Include sizing criteria for self-retaining areas and self-treating areas, as described in the Model SUSMP

7.2 Inspection and Maintenance Schedule

If not properly designed or maintained, hydromodification flow control devices may create a habitat for vectors such as mosquitoes or rodents as well as potential safety hazards due to standing water. Vector habitat creation can be avoided through collaboration with municipalities and both local vector control agencies and the State Department of Health Services during the development and implementation of Project Submittals (Storm Water Management Plans or Water Quality Technical Reports).

Proof of long-term ongoing maintenance responsibility and mechanism are required for all post-construction BMPs, including hydromodification mitigation facilities. Maintenance activities for flow control and LID devices will be specified in the proposed Project Submittal (Storm Water Management Plan or Water Quality Technical Report).

A blockage in the storm drain system can cause water to back up into the treatment facilities and cause damage. For this reason, inspection and maintenance of the storm drain system is considered part of the inspection and maintenance of the treatment facilities. Normal functioning of the facilities may involve retention of water for up to 72 hours following significant storm events.

As required by Permit Provision D.1.c.(5), local municipalities require submittal of proof of a mechanism under which ongoing long-term maintenance of stormwater treatment and flow-control facilities will be conducted. Municipalities may require one of more of the following items be included in the Project Submittal:

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1. A means to finance and implement facility maintenance in perpetuity.
2. Acceptance of responsibility for maintenance from the time the facilities are constructed until responsibility for operation and maintenance is legally transferred. A warranty covering a period following construction may also be required.
3. An outline of general maintenance requirements for the selected treatment and flow-control facilities.

Local municipalities may also require preparation and submittal of a detailed plan that sets forth a maintenance schedule for each of the treatment and flow-control facilities built on the project site and names the responsible parties for this action.

Before completing the Project Submittal, the applicant should ensure the stormwater control design is fully coordinated with the site plan, grading plan, and landscaping plan being proposed for the site.

Information submitted and presentations to design review committees, planning commissions, and other decision-making bodies must incorporate relevant aspects of the stormwater design. In particular, ensure:

- Curb elevations, elevations, grade breaks, and other features of the drainage design are consistent with the delineation of Drainage Management Areas (DMAs).
- The top edge (overflow) of each bioretention facility is level all around its perimeter—this is particularly important in parking lot medians.
- The resulting grading and drainage design is consistent with the design for parking and circulation.
- Bioretention facilities and other IMPs do not create conflicts with pedestrian access between parking and building entrances.
- Vaults and utility boxes can be accommodated outside bioretention facilities and will not be placed within bioretention facilities.
- The visual impact of stormwater facilities, including planter boxes at building foundations and any terracing or retaining walls required for the stormwater control design, is shown in renderings and other architectural drawings.
- Landscaping plans, including planting plans, show locations of bioretention facilities, and the plant requirements are consistent with the engineered soils and conditions in the bioretention facilities.
- Renderings and representation of street views incorporate any stormwater facilities located in street-side buffers and setbacks

Other design considerations to assist with long-term maintenance include:

- For effective, low-maintenance operation, locate facilities so drainage into and out of the device is by gravity flow. Pumped systems are feasible, but are expensive, require more maintenance, are prone to untimely failure, and can cause mosquito control problems. Most IMPs require 3 feet or more of head.
- If the property is being subdivided now or in the future, the facility should be in a common, accessible area. In particular, avoid locating facilities on private residential lots. Even if the facility will serve only one site owner or operator, make sure the facility is located for ready access by inspectors from the local municipality and local mosquito control agency.
- The facility must be accessible to equipment needed for its maintenance. Access requirements for maintenance will vary with the type of facility selected. Planter boxes and bioretention areas will typically need access for the same types of equipment used for landscape maintenance.

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8. MONITORING AND BMP EVALUATION

8.1 Introduction

This section presents a summary of the San Diego HMP's revised Monitoring Plan. The summary explains technical concepts and proposes approaches to monitor the effectiveness of the HMP as required by provision D.1.g of Regional Board Order No. R9-2007-0001.

Part 1(k) of provision D.1.g requires that the HMP shall "include a description of pre- and post-project monitoring and other program evaluations to be conducted to assess the effectiveness of implementation of the HMP." For the purposes of developing an HMP monitoring approach, an effective HMP is defined as a program that ensures compliance with HMP design criteria and results in no significant stream degradation due to increased erosive force caused by new development.

The proposed monitoring approach provides for the optimum 5-year effectiveness assessment within currently available funding resources. Monitoring Plan activities were selected to achieve statistical data collection requirements while balancing regional financial constraints and highly variable scientific, regulatory, and physical elements. Monitoring plan activities presented herein have been developed to answer the following questions regarding HMP program effectiveness assessment:

- **Do field observations confirm that the HMP appropriately defines the flow rate (expressed as a function of the 2-year runoff event) that initiates movement of channel bed or bank materials?** Since most of the sediment transport modeling prepared as part of the HMP development relied on laboratory flume data, it is important to supplement the sediment transport data set with field observations. This data may be used in the next permit cycle to determine whether critical shear stress is the appropriate parameter for selecting the lower flow threshold of the geomorphically significant flow range.
- **Are mitigation facilities adequately meeting flow duration design criteria outlined in the HMP?** Observed HMP mitigation facility outflow data can be analyzed to determine if mitigation facilities are reducing the mitigated post-project peak flow frequency and flow duration curves to the pre-project curves (within tolerances set forth in the HMP). This data can also be used to analyze the precision of LID sizing factors, extended detention facility design criteria, and to potentially recommend changes to more closely match the mitigated post-project curves to pre-project condition peak flow frequency and flow duration curves.
- **What is the effect of development on downstream cross section incision and widening?** Since the mitigation of accelerated channel degradation as a result of development is the central purpose of the HMP, analysis of channel cross sections downstream of development projects is a component of the monitoring plan. However, uncertainties involved with this comparison tool (namely the determination of pre-project condition trends regarding channel incision and channel widening rates) make policy determinations less likely within the time frame of the 5-year monitoring plan (as compared to sediment transport modeling and flow duration modeling detailed in the previous two questions).

Such a question-driven plan is consistent with the draft hydromodification monitoring framework prepared by the Southern California Coastal Water Research Project (SCCWRP – report dated December 9, 2009).

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In an effort to effectively address the wide variability of potential monitoring scenarios and competing needs outlined above, the Copermittees and Brown and Caldwell have consulted with technical experts in a variety of critical disciplines including Dr. Eric Stein of SCCWRP (geomorphology expert), San Diego Regional Water Quality Control Board staff, Dr. Andy Collison of Phillip Williams Associates (geomorphology expert), Dr. Khalil Abusaba (formerly of the San Francisco Regional Water Quality Control Board and currently with Brown and Caldwell – expert in statistical analysis of water quality data), and members of the San Diego HMP Technical Advisory Committee.

8.2 Technical Concepts

8.2.1 Hydromodification Concepts

As required in the Permit, the evaluation of increased erosive force is limited to the geomorphically significant flow range, which is defined between the flow associated with critical shear stress and the ten-year return flow (Q10). The value of the lower flow threshold indicates the flow at which sediment erosion from the stream bed or banks begins to occur. The HMP uses two calculation tools (the low flow calculator and the SCCWRP channel assessment tool) to determine the low flow threshold based upon substrate type, channel slope, roughness, channel cross section, and other stream assessment conditions. The resulting lower flow threshold will be expressed as a multiple of the two-year return flow (Q2):

- $0.1Q_2$ for streams with HIGH susceptibility to channel erosion
- $0.3Q_2$ for streams with MEDIUM susceptibility to channel erosion
- $0.5Q_2$ for streams with LOW susceptibility to channel erosion

8.2.2 HMP Effectiveness Validation Measures

Sediment Transport Studies. This approach monitors sediment concentration (SSC) throughout a storm event and can be used to directly evaluate the validity of a lower flow threshold for a particular stream segment. Measuring the continuous SSC to flow relationship over a range of flows allows HMP effectiveness to be evaluated based on whether or not significant post-project increases in SSC (as compared to pre-project conditions) are observed at a given flow rate. This approach is the most costly, because it involves measuring flow and SSC. The SSC measurements will involve continuous turbidity monitoring, which would include calibration of turbidity meters using stream cross-sectional sediment sampling to correlate SSC to turbidity, or an approved equivalent metric. SSC values can also be determined through a laboratory analysis using United States Geological Survey (USGS) procedures. The final analysis method, along with data collection specifications, will be determined following future discussions with the Copermittees and members of the Technical Advisory Committee. These approaches are most likely to produce information on HMP effectiveness on a relatively short time frame, provided that a sufficient range of storm event sizes can be sampled in a given year.

Flow Duration Curves. Another measure of HMP effectiveness is determining if, within the geomorphically significant flow range, the post-project flow-duration curve is comparable to or below the pre-project flow duration curve. Flow-duration curves are monitored by installing continuous flow monitoring devices downstream of a planned project prior to development to establish pre-project conditions. If the flow monitoring facilities used for the sediment transport studies (detailed above) are located just downstream of a proposed development, then data from the sediment transport studies can be used for the pre-project flow duration data. This approach is consistent with the draft SCCWRP monitoring framework, which recommends stream flow monitoring to be provided just downstream of a hydromodification mitigation management device. Post-development mitigated flow duration monitoring data is analyzed to evaluate whether significant changes in the flow-duration curve have occurred. This monitoring approach can also be

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used to validate sizing factors for LID and extended detention BMPs. Depending on the range of rainfall events encountered in a particular year, monitoring of flow-duration curves can help develop pre-project conditions and evaluate post-project effectiveness on a relatively short time scale (i.e., 2 to 3 years each).

Channel Incision and Widening. The most obvious measure of stream degradation is to physically measure the pre-project and post-project cross sections, and determine if the channel is incising and / or widening. This is accomplished by conducting geomorphic assessments and channel surveys downstream of a planned development before and after construction. In addition to physical measurements, comparison of current and historical photos, aerial photography, and site inspection for signs of channel degradation can provide important supporting evidence. The labor for conducting such an assessment at a single location is lower compared to the effort needed to conduct sediment transport studies. Costs are driven by the number of sites assessed, as well as the need for establishing pre-project trends (e.g., rate of pre-project channel incision per year). Although this monitoring approach is the most direct measure of whether stream degradation is occurring, it is difficult to use the method to differentiate between existing geomorphic effects and post-project geomorphic effects. To do so would require a long-term baseline of pre-project channel incision and widening rates along with post-project monitoring. To capture the range of annual rainfall conditions encountered in Southern California, decades of information are generally recommended to quantify pre-project baseline trends. Therefore, while baseline data will be collected and be useful for future comparison analyses, this monitoring plan focuses on validation measures likely to provide meaningful data within 2 to 5 years. It is possible that tentative conclusions may be reached regarding channel incision and widening at the conclusion of the 5-year monitoring plan. Finally, it should be noted that the Copermittees will centralize stream assessment information collected as part of project development processes. This information may be used for future channel condition assessments and will be utilized by the Copermittees to the extent practicable. While such stream assessment information will not be required for all Priority Development Projects, it would be required for all projects proposing the use of stream rehabilitation mitigation measures (e.g., constructed channel widening, drop structures) and for projects using lower flow thresholds in excess of 0.1Q2. The Copermittees are currently considering other requirements for pre-project stream assessments, including project size, contributing impervious area cover, and receiving channel material.

8.2.3 Temporal and Spatial Variability of Monitoring Locations

Temporal Variability. As noted above, the single most important factor affecting the temporal variability inherent to measuring stream degradation is variable inter-annual rainfall frequency and intensity. Droughts in California can last years, with little to no rainfall occurring in Southern California. During El Nino years, anomalously high storm frequencies and intensities can result in sudden geomorphic changes. Rainfall intensity also varies intra-annually. However, if a sufficient range of storm intensities is encountered in a particular year, then short duration monitoring approaches, such as flow-duration curves and sediment transport studies can provide some information on HMP effectiveness on shorter timescales.

Spatial Variability. Sampling an adequate variety of channel susceptibility types, along with a reasonable number of replicates within for each susceptibility type, is important to capture the range of watershed conditions present in the permit coverage area. Other important factors that affect stream responses to hydromodification include channel grade, watershed area, vegetated cover, and stream sinuosity. In addition to channel and watershed features, location within the watershed is an important consideration. Monitoring stations should be located in the watershed headwaters just downstream of a development project of sufficient size, so that hydromodification effects from the proposed development can be isolated for comparison purposes to the maximum extent practicable. Upper watershed sites provide more definitive measures of HMP effectiveness because they can more directly correlate effects to specific development projects. Middle watershed and lower watershed sites would be influenced by confounding variables such as mass wasting and impacts from natural tributary confluences and other existing development projects, including phased developments over many years, in the watershed. Therefore, middle and lower watershed

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monitoring sites would require much more time to assess overall program effectiveness. However, the Copermittees will attempt to utilize data from concurrent water quality monitoring programs to develop a database of middle/lower watershed flow data. Specifically, monitoring station located in middle to lower watershed locations will be identified for the two proposed channel susceptibility types. While the San Diego HMP has been written to require onsite hydromodification flow controls at each applicable new development and redevelopment site, thus minimizing the potential for cumulative watershed impacts as a result of new development and redevelopment, monitoring station locations will be selected, where possible, to include the effects of multiple upstream developments. The concept of providing hydromodification effectiveness measurements in the watershed headwaters is supported by SCCWRP. Research by SCCWRP has shown that hydromodification effects of a development project become muted with increasing distance from the development site (defined by SCCWRP as the Domain of Effect). To the extent practicable, monitoring locations detailed in the Monitoring Plan will be distributed throughout the Permit coverage area Hydrologic Units to provide for geographic and climatic variability across San Diego County.

8.3 Recommended Approaches to Assess Effectiveness

Selection of HMP effectiveness assessment monitoring techniques is subject to two primary constraints. The schedule constraint involves the RWQCB's desire to have information on HMP effectiveness prior to re-issuance of the Municipal Separate Storm Sewer System (MS4) Permit for San Diego County, currently scheduled for 2012. This schedule constraint creates an added "practicality" issue, since it is unlikely that meaningful data can be acquired in such an abbreviated timeline. While the monitoring plan detailed in this memorandum extends for five years, interim data may be provided to the Regional Board to assist with development of the next Permit.

The budget constraint involves the San Diego County Copermittees' limited resources for monitoring. Given the fact that the Copermittees are currently committed to a $2,500,000 annual regional water quality monitoring plan effort, and given the current economic climate in which multiple local municipalities have been forced to reduce both budget and staff, expansion of existing monitoring mandates requires significant financial consideration and analysis. Thus, the Copermittees are compelled to evaluate how to develop the best possible monitoring approach to evaluate HMP effectiveness within the available budget.

Details of the monitoring plan are above and beyond details of the existing regional water quality monitoring effort. Wherever possible, the Copermittees will seek opportunities to utilize relevant data from the existing water quality monitoring efforts to achieve an economy of scale. The Copermittees will also ensure there is no duplication of effort between the two monitoring programs.

This monitoring plan focuses on using continuous monitoring data to obtain the maximum amount of data regarding sediment transport and flow duration monitoring. It is the opinion of the Copermittees that acquisition of continuous data at a statistically justified number of monitoring locations is more valuable (from a data analysis standpoint) as compared to obtaining a finite number of isolated runoff events from more monitoring locations.

Considering the constraints and technical approach detailed above, the following approaches are recommended for the revised HMP Monitoring Plan.

- **Monitor effectiveness using Sediment Transport and Flow Duration Studies.** As noted above, continuous sediment transport and flow duration studies can provide direct measures of HMP effectiveness on a relatively short timescale. These studies are important to verify HMP assumptions about the lower flow thresholds and to verify flow duration design criteria is being achieved. Development of the sediment transport studies would also provide stream cross section data, as well as photographic evidence, that could serve as a baseline for future stream morphology comparisons.

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- **Monitor the Upper Watershed.** Upper watershed monitoring is recommended to eliminate confounding lower watershed variables that would skew the analysis and minimize the potential for reaching meaningful conclusions.
- **Monitor Replicates of Two Channel Susceptibility Types.** In the development of the San Diego County HMP, receiving streams will be classified into one of three channel types, pursuant to a State Board-funded study conducted by SCCWRP. The stream classification system is consistent with the analysis, findings, and tools developed in the SCCWRP study and classifies streams into the following stream susceptibility categories:
  - HIGH susceptibility
  - MEDIUM susceptibility
  - LOW susceptibility

  Monitoring locations should be selected from HIGH and MEDIUM susceptibility channel segments.
- **Monitor three replicates and one reference station for each susceptibility type.** Providing three replicates of each channel susceptibility type would begin the characterization of the range of conditions present in San Diego County. The reference monitoring station associated with each channel susceptibility type would be located in a watershed for which no upstream development (existing or future) is anticipated. Data from the reference stations can be used to supplement pre-project condition data obtained at the replicate sites, since the amount of pre-project condition data that can be obtained at such sites is dependent on the land development process. Providing three replicate stations balances the need to characterize spatial variability against the cost of monitoring and provides the data needed to estimate the median and range of the lower flow threshold for a given susceptibility type, or to estimate the standard deviation of an average value.
- **Monitor the Middle Watershed.** Middle watershed monitoring will be provided at two monitoring locations, both of which will be located downstream of existing urbanized areas with watershed impervious areas greater than 40 percent.

8.4 Summary and Conclusions

The revised Monitoring Plan, scheduled for implementation over a 5-year period, will recommend the following specific activities:

Baseline Monitoring Plan Requirements:

- Development of QAPP
- Rainfall gauge analysis and installation
- Rainfall gauge, stream gauge, and HMP facility outflow station inspection and maintenance (Fiscal Year 2012 through 2016)
- Annual data analysis (2012 – 2016)
- Reevaluation of the Monitoring Plan after review of findings from Statewide HMP Monitoring Technical Advisory Group and review of final SCCWRP Hydromodification Monitoring Report (2013)
- Report preparation (final report to be prepared in 2016)

Channel Assessments:

- Initial geomorphic assessment at each monitoring location (to determine stream susceptibility type – 2011-2012)
- Baseline cross section surveys at each monitoring location (2011-2012)

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- Annual geomorphic assessments at each monitoring location (to assess channel condition and response - 2012 – 2016)
- Cross section surveys (after 5 years) at each monitoring location (2016)

Sediment Transport Analysis:

- Flow and sediment monitoring station installation
- Continuous pre-project, post-project and reference station flow, sediment and rainfall data collection (2012 – 2016)

Flow Duration Analysis:

- HMP facility outflow monitoring station installation
- Continuous post-project HMP facility outflow data collection (2013 – 2016)

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9. CONCLUSIONS

Implementation of this HMP satisfies Provision D.1.g of Board Order R9-2007-0001. Adherence to guidelines outlined in the HMP is required "to manage increases in runoff discharge rates and durations for all Priority Development Projects, where such increased rates and durations are likely to cause increased erosion of channel beds or banks, sediment pollutant generation, or other impacts to beneficial uses and stream habitat due to increased erosive force."

Order R9-2007-0001 contains requirements that strongly influence the methodology contained in this HMP. As recommended in the HMP, post-project flows must match pre-project flows within the prescribed geomorphically significant flow range.

Flow control options to meet the criteria include LID facilities, which promote infiltration and filtration to attain the required flow mitigation, and extended flow duration control detention basins. Continuous hydrologic modeling is required to prove conformance with the standards presented in this HMP.

Specific permit requirements, detailed below, have been addressed by this HMP.

- Provide performance criteria for Priority Development Projects (Chapter 6)
- Include a protocol to evaluate potential hydrograph change impacts to downstream watercourses from PDPs (Chapter 6).
- Provide a description of how the Copermittees will incorporate the HMP requirements into their local approval processes (Chapter 1).
- Include a description of pre- and post-project monitoring and other program evaluations to be conducted to assess the effectiveness of implementation of the HMP (Chapter 8).
- Include mechanisms for addressing cumulative impacts within a watershed on channel morphology (Chapter 5).
- Utilize a continuous rainfall record to identify the geomorphically significant flow range (Chapter 5).
- Include a pertinent literature review (Chapter 4)
- Include criteria on management practices designed to mitigate increases to peak flows and durations (Chapter 7)
- Include information on the evaluation of channel form and condition (Chapter 5)

The Copermittees will incorporate HMP requirements into the local approval processes via incorporation of HMP criteria into their local SUSMPs. The San Diego region's updated Model SUSMP will incorporate the Final HMP criteria. HMP criteria will be incorporated into the local SUSMP and municipal ordinances no later than 180 days following RWQCB adoption of the HMP.

Information presented in the HMP has been prepared in association with the County of San Diego, San Diego Storm Water Copermittees, the Technical Advisory Committee, and the consultant team.

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10. LIMITATIONS

Report Limitations

This document was prepared solely for the County of San Diego in accordance with professional standards at the time the services were performed and in accordance with the contract between the County of San Diego and Brown and Caldwell dated September 6, 2007. This document is governed by the specific scope of work authorized by the County of San Diego; it is not intended to be relied upon by any other party except for regulatory authorities contemplated by the scope of work. We have relied on rainfall data provided by the County of San Diego and other parties and have made no independent investigation as to the validity or accuracy of such data.

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APPENDIX A

Flow Threshold Report

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Flow Control Threshold Analysis
for the
San Diego Hydrograph Modification Management Plan

Prepared for

San Diego County and Copermittees

Prepared by

Philip Williams & Associates, Ltd.

December 23rd 2009

PWA REF. # 1915

Services provided pursuant to this Agreement are intended solely for the use and benefit of San Diego County and the Hydromodification Management Plan Copermitees. No other person or entity shall be entitled to rely on the services, opinions, recommendations, plans or specifications provided pursuant to this agreement without the express written consent of Philip Williams & Associates, Ltd., 550 Kearny Street, Suite 900, San Francisco, CA 94108.

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1. INTRODUCTION AND BACKGROUND

1.1 PURPOSE OF THE REPORT

San Diego County and its copermittees are required to develop a Hydromodification Management Plan (HMP) under their National Pollutant Discharge Elimination System (NPDES) MS4 permit. The purpose and requirements of the HMP are described in a 2007 Regional Water Quality Control Board (RWQCB) order renewing the NPDES permit (Order No. R9-2007-0001). The purpose of the HMP is to identify guidelines for managing 'geomorphically-significant' flows that, if not controlled, would cause increased erosion of receiving waters. Specifically, the HMP must identify a low and high flow threshold between which flows should be controlled so that the post-project flow rates and durations do not exceed pre-project levels between these two flow magnitudes. The lower flow threshold is required to correspond to critical flow producing critical shear stress in the channel. The flow control language in the Board Order is as follows:

> Utilize continuous simulation of the entire rainfall record to identify a range of runoff flows[8] for which Priority Development Project post-project runoff flow rates and durations shall not exceed pre-project runoff flow rates and durations, where the increased flow rates and durations will result in increased potential for erosion or other significant adverse impacts to beneficial uses, attributable to changes in the flow rates and durations. The lower boundary of the range of runoff flows identify shall correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks. The identified range of runoff flows may be different for specific watersheds, channels or channel reaches.

[8] The identified range of runoff flows to be controlled should be expressed in terms of peak flow rates of rainfall events, such as "10% of the pre-project 2-year peak flow up to the pre-project 10-year peak flow."

1.2 CONCEPTS BEHIND 'GEOMORPHICALLY-SIGNIFICANT FLOWS', CRITICAL FLOWS AND FLOW CONTROL

For the purposes of this project 'hydrograph modification' or 'hydromodification' is understood to mean changes to the frequency, duration and magnitude of surface runoff that, when untreated, cause an increase in erosion of the receiving water body. Hydromodification occurs when urbanization replaces areas of vegetated, uncompacted soil with impermeable surfaces such as buildings, roads and compacted fill. The reduction in permeability results in increased volumes of runoff, and faster and more concentrated delivery of this water to receiving waters. These changes have the potential to cause creeks to erode faster than before development.[1]

[1] Although the focus of hydromodification management plans has been on increased erosion it should be noted that in rivers that are depositional hydromodification can cause creeks to regain some transport equilibrium.

Stream flows are often expressed in terms of the frequency with which a particular flow occurs. For example, Q_2 refers to the flow rate that occurs once every two years, on average over the long term. Flow frequencies are a function of rainfall and watershed characteristics, and are unique to each stream channel (and location along the channel). The effects of urbanization tend to increase the magnitude of the flow associated with a given frequency (e.g. post-development Q_2 higher than pre-development Q_2). Similarly, urbanization tends to increase the frequency with which any given flow rate occurs. The purpose of the HMP is to control runoff from new developments so that flow magnitudes and frequencies match pre-development conditions within a critical range of flows.

Not all runoff causes erosion: runoff in receiving channels below a critical discharge (Q_{crit}) does not exert sufficient force to overcome the erosion resistance of the channel banks and bed materials. Flows greater than Q_{crit} cause erosion, with larger flows causing proportionally greater erosion. It has been determined by calculations and field measurements that most erosion in most natural creeks is caused by flows between some fraction of Q_2 and Q_{10} (see for example Leopold, 1964). Flows in this range are referred to as 'geomorphically-significant' because they cause the majority of erosion and sediment transport in a channel system.

Flows greater than Q_{10}, though highly erosive *per event*, occur too infrequently to do as much work as smaller but more frequent flows (see Figure 1). Hydromodification also has less impact on flows greater than Q_{10} since at such high rainfall intensities the soil becomes saturated and the infiltration capacity of undeveloped landscapes is rapidly exceeded. When the soil is saturated, runoff rates become more similar to those from impervious surfaces. For these reasons, HMPs have focused on identifying a low flow threshold that is close to Q_{crit} for most receiving channels, and controlling flows between that value and Q_{10} (see for example the HMPs completed in Santa Clara, Contra Costa, Alameda and San Mateo Counties). By requiring treatment (storage and either infiltration or detention) of excess runoff within the control range, and by limiting the release of excess water to Q_{crit} or less, HMPs seek to prevent additional erosion in receiving channels.

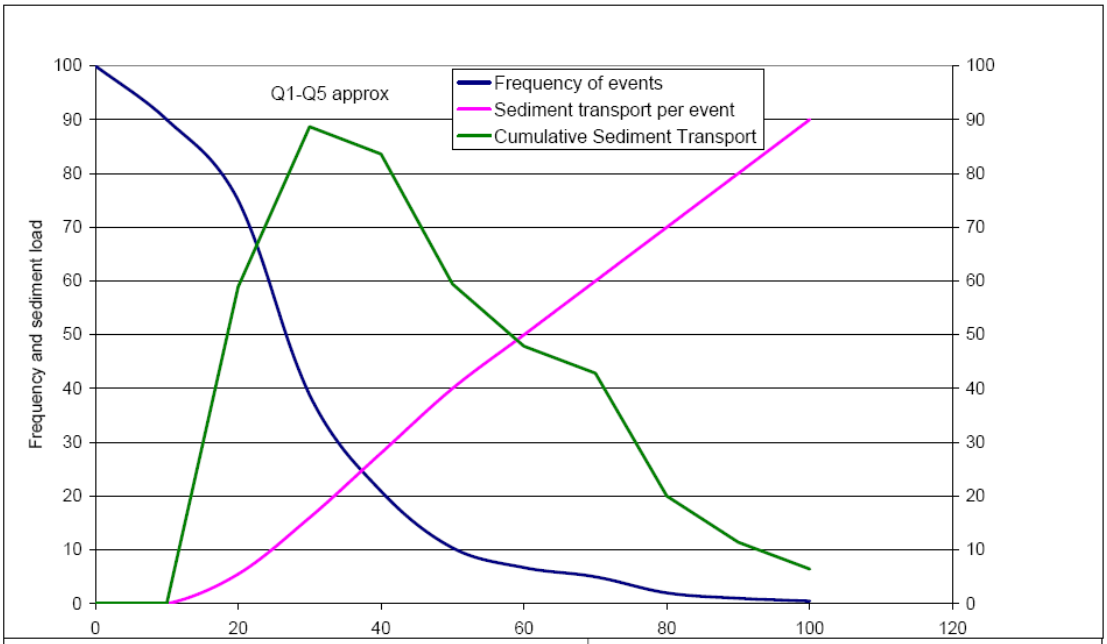

figure 1
San Diego HMP

Hypothetical cumulative work curve

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2. IDENTIFYING A HIGH FLOW THRESHOLD

Previous HMPs have focused considerable attention on the low flow threshold, but little on the high flow threshold. The use of an upper flow threshold is based on two assumptions:

1. Flows above this level cause relatively little cumulative erosion in receiving waters due to their low recurrence
2. Flows above this level are relatively unaffected by hydromodification because at such high rainfall intensities and durations the pre-development ground cover become saturated and most rain runs off, similar to in a post development condition.

The five HMPs developed to date in California have all adopted a value of Q_{10} as the upper threshold. We propose adopting the same value for the San Diego HMP.

3. IDENTIFYING A LOW FLOW THRESHOLD

Erosion occurs when the shear stress exerted on the channel by flowing water (*boundary shear stress*) exceeds the resistance of the channel (*critical shear stress*). Critical shear stress varies by several orders of magnitude for different channel materials (Table 1). *Critical flow* (Q_{crit}) is the channel flow which produces boundary shear stress equal to the critical shear stress for a given channel. That is, the flow rate that can initiate erosion in a channel. Q_{crit} is a function not only of the critical shear stress of the channel materials, but also channel size, and channel geometry. A particular flow rate (expressed as a number of cubic feet per second) in a small, steep, confined channel will create more shear stress than the identical flow rate in a large, flat, wide open channel. Thus Q_{crit} can be extremely variable depending on channel and watershed characteristics and will be different in each channel, and in each watershed.

Boundary Category	Boundary Type	Permissible Shear Stress (lb/sq ft)
Soils	Fine colloidal sand	0.02 - 0.03
	Sandy loam (noncolloidal)	0.03 - 0.04
	Alluvial silt (noncolloidal)	0.045 - 0.05
	Silty loam (noncolloidal)	0.045 - 0.05
	Firm loam	0.075
	Fine gravels	0.075
	Stiff clay	0.26
	Alluvial silt (colloidal)	0.26
	Graded loam to cobbles	0.38
	Graded silts to cobbles	0.43
	Shales and hardpan	0.67
Gravel/Cobble	1-in.	0.33
	2-in.	0.67
	6-in.	2.0
	12-in.	4.0
Vegetation	Class A turf	3.7
	Class B turf	2.1
	Class C turf	1.0
	Long native grasses	1.2 – 1.7
	Short native and bunch grass	0.7 - 0.95
	Reed plantings	0.1-0.6
	Hardwood tree plantings	0.41-2.5
Temporary Degradable RECPs	Jute net	0.45
	Straw with net	1.5 – 1.65
	Coconut fiber with net	2.25
	Fiberglass roving	2.00
Non-Degradable RECPs	Unvegetated	3.00
	Partially established	4.0-6.0
	Fully vegetated	8.00
Riprap	6 – in. d_{50}	2.5
	9 – in. d_{50}	3.8
	12 – in. d_{50}	5.1
	18 – in. d_{50}	7.6
	24 – in. d_{50}	10.1
Soil Bioengineering	Wattles	0.2 – 1.0
	Reed fascine	0.6-1.25
	Coir roll	3 - 5
	Vegetated coir mat	4 - 8
	Live brush mattress (initial)	0.4 – 4.1
	Live brush mattress (grown)	3.90-8.2
	Brush layering (initial/grown)	0.4 – 6.25
	Live fascine	1.25-3.10
	Live willow stakes	2.10-3.10
Hard Surfacing	Gabions	10
	Concrete	12.5

[1] Ranges of values generally reflect multiple sources of data or different t

A. Chang, H.H. (1988).
B. Florineth. (1982)
C. Gerstgraser, C. (1998).
D. Goff, K. (1999).
E. Gray, D.H., and Sotir, R.B. (1996).
F. Julien, P.Y. (1995).
G. Kouwen, N.; Li, R. M.; and Simons, D.B., (1980).
H. Norman, J. N. (1975).
I. Schiechtl, H. M. and R. Stern. (1996).
J. Schoklitsch, A. (1937).

Table 1. Range of critical shear stresses (τ_{cr}) for different materials. From Fischenich, 2001.

It was the original intent of the HMP project team to identify a single low flow threshold for the entire county (per previous HMPs). However, an extensive assessment of channel and runoff conditions led the team to conclude that there was a very wide range in critical flows, based largely on channel material but also on channel dimensions, rainfall, and watershed area[2]. Adopting a single standard that is conservative for the most vulnerable channels would result in controls that were excessively conservative for more resilient channels, while adopting an 'average' value would leave some channels unprotected. As the ongoing SCCWRP Hydromod project is showing, individual creeks have different risk categories and respond in different ways to the same level of hydromodification. Because of this natural variability, we pursued an analytical approach for estimating Q_{crit} as a function of parameters such as channel materials, channel dimensions and watershed area. The following sections of this report describe an analysis of Q_{crit} as a fraction of Q_2 for the range of channel conditions in San Diego County. This is followed by a description of a calculator tool developed by PWA that may be used to calculate Q_{crit} for a specific channel based on parameters that may be readily measured in the field. The analyses described in this report provide background for the selection of low flow thresholds identified in the HMP.

[2] These early analyses are summarized in Appendix D of the Final Hydromodification Management Plan.

4. CRITICAL FLOW ANALYSIS

4.1 BACKGROUND

PWA conducted a sensitivity analysis in which a wide range of channel sizes and geometries, rainfalls, watershed areas and channel materials were modeled in a flow-erosion model to identify Q_{crit} as a function of Q_2. In all, 170 combinations of channel, rainfall and watershed conditions were assessed (described below). Based on the results of this sensitivity analysis, a range of Q_{crits} were identified for several categories of channel materials.

The steps used to conduct the sensitivity analysis:

1. Identify the typical range of rainfall conditions for the HMP area (west San Diego County)
2. Identify the range of typical watershed areas likely to be developed
3. Identify a range of typical receiving channel dimensions for each watershed area
4. Identify a range of typical channel materials for receiving channels
5. Simulate a range of flows and develop rating curves (relationships between discharge and boundary shear stress)
6. Identify the flow rate at which boundary shear stress exceeds critical shear stress for the channel and material
7. Express this flow rate as a function of Q_2
8. Group critical flow rates by channel materials.

Steps 1 through 4 were used to define the range of parameters to use in the sensitivity testing. The intent was to identify a typical range of conditions likely to occur in the HMP area (west San Diego County), rather than provide an exhaustive description of possible watershed and channel conditions. Sensitivity testing on many combinations of parameters within this typical range allows identification of the range of channel responses and critical flows.

Each step in the critical flow analysis is explained in detail in the following sections.

4.2 IDENTIFY THE TYPICAL RANGE OF RAINFALL CONDITIONS FOR THE HMP AREA (WEST SAN DIEGO COUNTY)

Mean annual rainfall was used to estimate receiving channel size, Q_2, Q_5 and Q_{10} (methods described in subsequent sections). Figure 2 shows mean annual rainfall for San Diego County. Based on the map, three mean annual rainfalls were selected to represent the range of rainfall conditions for the simulations: 10”, 20” and 30”.

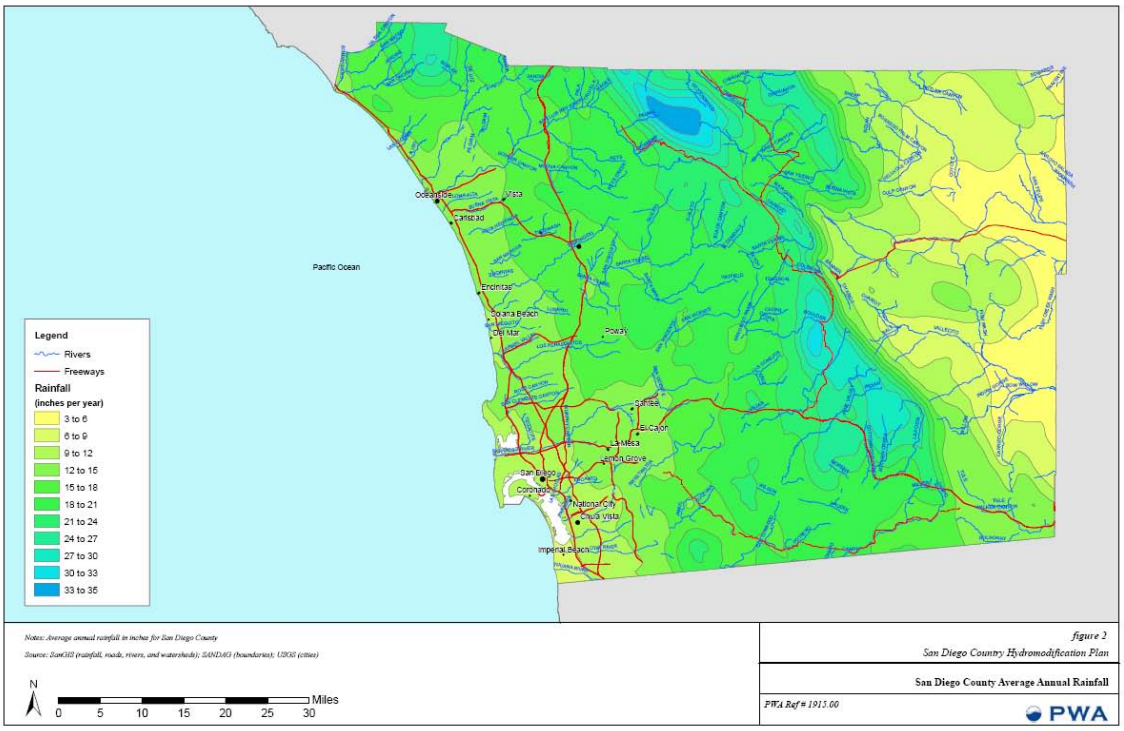

Figure 2. Rainfall distribution in San Diego County

4.3 IDENTIFY THE RANGE OF TYPICAL WATERSHED AREAS LIKELY TO BE DEVELOPED

Based on discussions with the Technical Advisory Committee, a range of representative watershed areas for development projects was identified. These were: 0.1 sq mi, 0.5 sq mi, 1 sq mi, 2 sq mi. We assumed that in project watersheds larger than 2 sq mi the development would either require site specific continuous simulation modeling, or be broken into multiple smaller sub watersheds with individual points of compliance.

4.4 IDENTIFY A RANGE OF TYPICAL RECEIVING CHANNEL DIMENSIONS FOR EACH WATERSHED AREA

Empirical relationships have been developed to express channel dimensions (width, depth and, to a lesser extent, gradient) as a function of dominant discharge. Dominant discharge for a creek channel is the flow rate that transports the majority of sediment and creates/maintains the characteristic size and shape of the channel over time. Dominant discharge may also be referred to as bankfull flow. For undeveloped channels in semi arid parts of the US, dominant discharge is approximately equivalent to Q_5. For example, Coleman et. al. (2005) found dominant discharge for streams in Southern California to average $Q_{3.5}$ (range = $Q_{2.1}$ – $Q_{6.7}$.) Goodwin (1998) found dominant discharge to vary from Q_2 to Q_{10} for semi arid regions.

To capture natural variability in channel geometry, we used three different empirical channel geometry relationships to estimate receiving channel dimensions for the range of watershed areas and rainfall characteristics used in this study. The relationships were:

Coleman et. al. 2005 (modified by Stein – personal communication) – derived from undeveloped channels in Southern California, tends to predict narrow, deep, steep dimensions.

$$\text{Width (ft)} = 0.6012 * Q_{bf}^{0.6875}$$

$$\text{Depth (ft)} = 0.3854 * Q_{bf}^{0.3652}$$

Where Q_{bf} is in cfs.

Parker et al. 2007 – suitable for gravel channels, tends to predict wide, shallow, flat braided dimensions.

$$\text{Width (m)} = 4.63 * (Q_{bf}^{2/5}) / (9.81^{1/5}) * (Q_{bf} / \texttt{Sqrt}\ (9.81 * d50) * d50^2))^{0.0667}$$

$$\text{Depth (m)} = 0.382*((Qbf^{2/5})/(9.81^{1/5})))$$

Where Q_{bf} is bankfull discharge in m^3/sec and d50 (diameter of median channel material) is in m.

The Parker equation was only used to assess gravel and cobble channel conditions.

Hey and Thorne 1986 tends to predict medium width, depth, and gradient channels.

$$\text{Width (m)} = 2.73*Q_{bf}^{0.5}$$

$$\text{Depth (m)} = 0.22 * \text{Width}^{0.37} * d50^{-0.11}$$

Where Q_{bf} is in m^3/sec and d50 is in m.

(Note that we have used the original combinations of English and metric units described in the source papers rather than standardized these equations in one set of measurements.)

The three equations cover a wide range of likely field conditions, from deeply incised channels (Coleman et al, 2005) to wide, braided conditions (Parker, 2007). Note that for the sensitivity analysis we set d50 in the Parker et al. equation to the d50 of the channel material being tested, and did not use the equation for channels where the material was sand or silt.

The equations produce estimations of width and depth. To estimate a slope for each combination of channel dimensions we calculated the velocity associated with each cross section (by dividing

discharge by width multiplied by depth) and calculated the slope that corresponded with that velocity using Manning's equation.

$$\text{Velocity (ft/sec)} = 1.486 \frac{HR^{0.66} * s^{0.5}}{n}$$

Where HR is channel hydraulic radius, s is slope, and n is Manning's roughness coefficient (see definitions). For the purposes of the sensitivity analysis a value of n 0.035 was assumed, corresponding to a non vegetated, straight channel with no riffles and pools. This is a reflection of the small, ephemeral receiving channels which are most prevalent in Southern California developments. A relatively low value was used at the request of the San Diego RWQCB so that the values erred on the conservative side.

These equations all require a value for bankfull discharge. Bankfull discharge (assumed to be approximately Q_5) was estimated using the USGS regional regression for undeveloped watersheds in the South Coast region (Waananen and Crippen, 1977). This equation calculates Q_5 as a function of watershed area and mean annual precipitation, based on empirical observations of USGS gages. The relationship is:

$$Q_5 \text{ (cfs)} = 0.4 * \text{Watershed Area}^{0.77} * \text{Mean Annual Precipitation}^{1.69}$$

Where watershed area is in square miles and precipitation is in inches.

For each combination of typical watershed area (Section 2.2) and mean annual rainfall (Section 2.3) we calculated Q_5 using the USGS regression, then calculated three sets of channel dimensions based on the three channel equations. This provided the range of channel conditions to simulate for the critical flow analysis. The total number of channel conditions was as follows:

3 rainfalls (10, 20, 30 inches per year)
4 watershed areas (0.1, 0.5, 1, 2 square miles)
3 channel width, depth and slope combinations (narrow/deep, medium, wide/shallow)
= 36 combinations of receiving channel geometry

4.5 IDENTIFY A RANGE OF TYPICAL CHANNEL MATERIALS FOR RECEIVING CHANNELS

We identified a range of typical channel materials based on feedback from the TAC and experience gained working in San Diego County. The identified materials are not intended as a comprehensive list of possible channel materials, but to cover the range of critical shear stresses likely to be encountered in typical western San Diego County channels. The identified range is as follows:

Material	Critical shear stress (lb/sq ft)
Coarse unconsolidated sand	0.025
alluvial silt (non coloidal)	0.045
medium gravel	0.12
alluvial silt/clay	0.26
2.5 inch cobble	1.1

Combining the 5 channel material types with the 36 combinations of channel geometry produces 180 potential combinations of receiving channel characteristics. Ten sets of combinations were omitted from the analysis because they produced physically unrealistic conditions, such as slopes that were too steep to be developed. Exclusion of these results did not significantly affect the overall results.

4.6 DEVELOP SHEAR STRESS RATING CURVES

Rating curves for the 36 different combinations of receiving channel characteristics were developed using the same Excel worksheet that forms the basis for the Qcrit calculator developed for Track 2 (described in later sections). Using channel cross section, roughness and gradient input by the user, the tool calculates the average boundary shear stress associated with a range of different flow depths to construct a rating curve (discharge on the x axis versus shear stress on the y axis). It then identifies the flow rate where average boundary shear stress equals critical shear stress for the channel materials. This is the critical flow (Q_{crit}). By dividing this number by Q_2 we identify the critical flow for each simulation as a function of Q_2 (e.g. $0.1Q_2$ where the critical flow is one tenth of the Q_2 flow).

The tool calculates a shear stress rating curve for a range of flows between 1% and 100% of the bankfull flow depth. Bankfull flow depth is defined as the flow depth that corresponds to the dominant discharge for a given channel. The range 1% to 100% of bankfull is used because critical flow rarely falls outside these values. The tool then calculates an equation that allows for interpolation between the points. For each of the depths, the tool calculates discharge and average boundary shear stress exerted on the bed, as described below.

4.6.1 Calculating Average Boundary Shear Stress

Average boundary shear stress is the force that flowing water exerts on channel materials. For a given channel cross-section, it is calculated as follows:

$$\tau_b = \gamma * HR * s$$

where τ_b = average boundary shear stress (lb/ft^2)
γ = unit weight water (62.4 lb/ft^3)
HR = Hydraulic radius (cross section area / wetted perimeter)
S = channel slope (ft/ft)

For each depth increment between 1% and 100% of bankfull, cross section area, wetted perimeter, HR and τ_b are calculated. Slope is a constant for the cross section. These calculations produce a rating curve for boundary shear as a function of flow depth.

4.6.2 Calculating Flow Rate

This step converts flow depth to flow rate (Q) so that the rating curve may be expressed as a function of Q. For each depth increment between 1% and 100% of bankfull, the flow rate is calculated using Manning's equation:

$$\text{Velocity (ft/sec)} = 1.486 \frac{HR^{0.66} * s^{0.5}}{n}$$

where V = velocity (ft/sec)
n = Manning's roughness coefficient

For the sensitivity analysis Manning's n was assumed to be 0.035, which is typical for a non-vegetated ephemeral channel. We assumed that for most developments covered by the HMP the receiving channels would be relatively high in the watershed and would have received little summer flow. In interim sensitivity analysis found that relative to other factors such as critical shear stress, the range of roughness factors found in receiving channels had little effect on the estimated critical shear flow rate.

Discharge is calculated as velocity multiplied by cross section area (calculated for each cross section, above). The result of these calculations is a rating curve showing boundary shear stress for the receiving channel as a function of discharge, with the highest point representing bankfull depth (see Figure 3 below). Rating curves were created for each of the 36 combinations of channel characteristics.

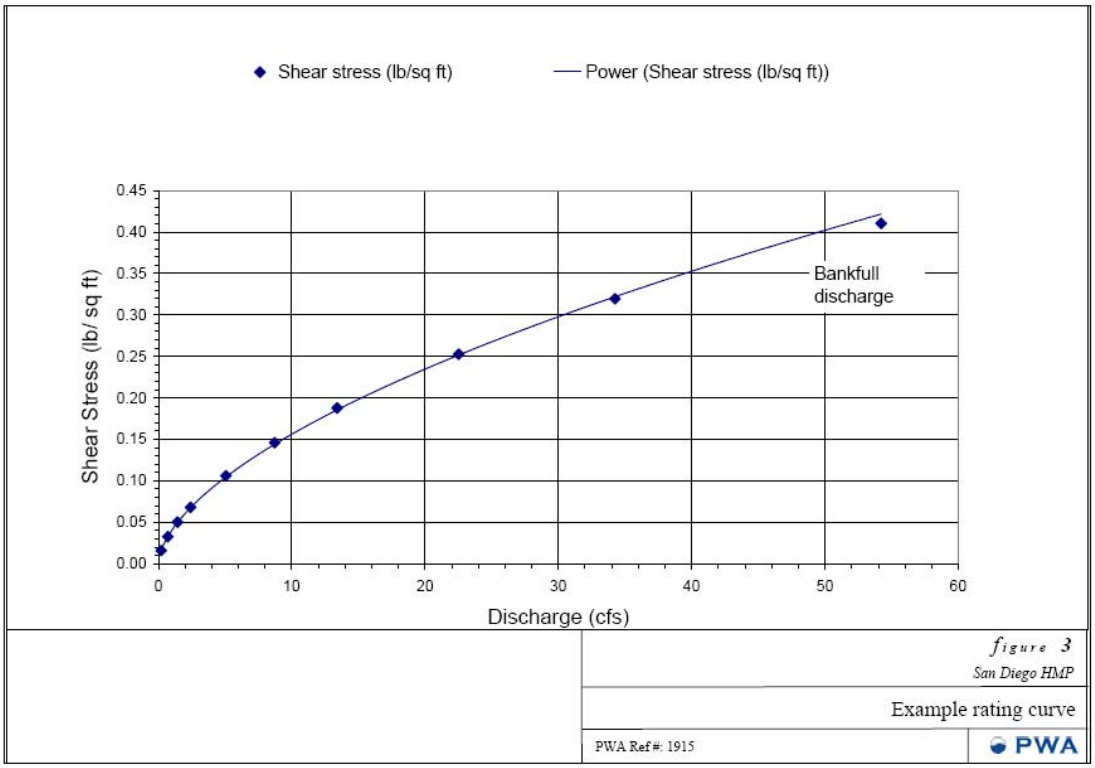

Figure 3. Shear stress rating curve for an example channel (0.5%, 10 feet wide, 2 feet deep). These curves were created for 36 different combinations of channel characteristics.

4.7 IDENTIFY CRITICAL FLOW FOR THE CHANNEL AND MATERIAL

Q_{crit} is the flow rate at which boundary shear stress equals critical shear stress. The tool uses a power function to interpolate the discharge versus boundary shear stress rating curve, to allow calculation of an intercept between the rating curve and critical shear stress. The critical shear stress for each channel material was plotted horizontally from the Y axis until it intercepted the rating curve. The intercept point was extended vertically to the X axis, showing the Q_{crit} (see Figure 4 below). In this way, Q_{crit} was calculated for each of the five channel materials using each of the 36 rating curves representing different channel dimensions. As mentioned above, 10 combinations unlikely to occur in nature were eliminated, resulting in a total of 170 Q_{crit} calculations.

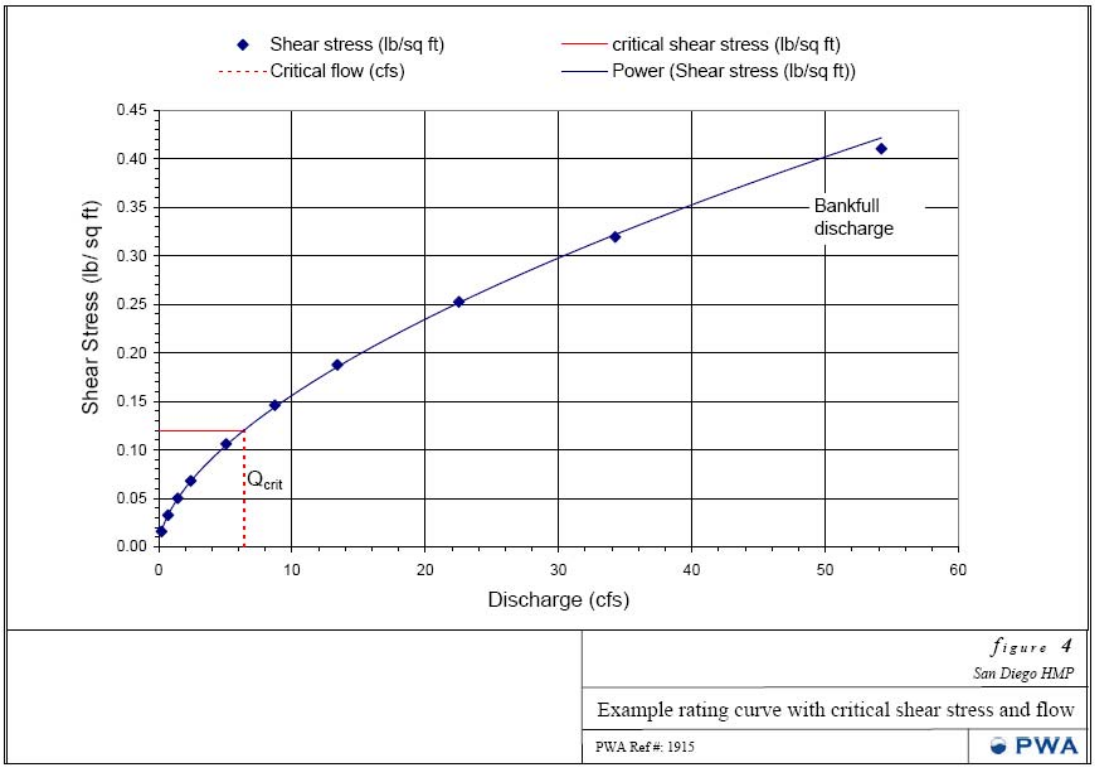

Figure 4. Example of a rating curve with critical shear stress for medium sized gravel. In this example critical shear stress = 0.12 lb/sq ft and critical flow Q_{crit} = 6.4 cfs.

4.8 EXPRESS CRITICAL FLOW AS A FUNCTION OF Q_2

As described above, each rating curve represents a particular combination of watershed area and channel dimensions. Q_2 was calculated for each combination using the USGS regional regression for Q_2 as described in section 4.4. By dividing the calculated Q_{crit} by the appropriate Q_2, Q_{crit} as a proportion of Q_2 was calculated for the 170 scenarios. These Q_{crits} were then plotted by material type, showing mean and one standard deviation either side of the mean. Note that although we assume that Q_5 is bankfull discharge, we express the critical flow as a function of Q_2 as has become standard for HMPs.

4.9 CRITICAL FLOW ANALYSIS RESULTS

The results show the high degree of variability in Q_{crit} based on different channel materials. It is important to note that in field conditions many of the most extreme cases shown in the figure (examples with very high or very low thresholds) would tend to evolve to conditions that yielded critical flows closer to the bankfull discharge because channels have a tendency to self equilibrate. For example, channels with materials that have very low critical flows such as

unconsolidated sand tend to erode and either flatten (lowering shear stress, and so increasing critical flow rate) or armor (increasing flow resistance, and increasing critical flow rate). Likewise, channels with materials that have very high thresholds tend to either become steeper due to deposition (increasing shear stress and lowering critical flow rate) or fill in with finer material (reducing resistance and lowering critical flow rate).

4.10 DISCUSSION

As the results of this analysis demonstrate, critical flow is extremely variable among channel materials and, for a given channel material, can vary significantly with channel configuration (slope, width/depth ratio etc.). Unconsolidated fine sediments can be mobilized by extremely low flows in the absence of clays or other consolidating elements with the structure of the channel. This result is based on literature values for critical shear stress for unconsolidated materials and may not be realistic for natural channels. Therefore in setting flow thresholds this result should be balanced with the recognition that natural channels are likely to include some consolidating fraction within their structure, as well as practical considerations associated with controlling trickle flows that represent the smaller fractions of Q_2 analyzed in this study.

5. TOOL FOR CALCULATING SITE-SPECIFIC CRITICAL FLOW

5.1 BACKGROUND

PWA developed a tool for calculating a site-specific critical flow (Q_{crit}) based on local conditions. Q_{crit} for the receiving channel is calculated based on channel geometry (width, depth and gradient), channel materials, and watershed area.

The approach taken was to develop an Excel spreadsheet model to calculate the boundary shear stress associated with a range of flows up to Q_5 for a given channel width, depth and slope, then plot the critical shear stress for the channel material on this rating curve over to identify the flow where boundary shear stress equals critical shear stress (see example graph below).

The development steps were as follows:

1. Develop simplified channel cross section and gradient inputs
2. Calculate a shear stress rating curve
3. Characterize channel materials in terms of critical shear stress
4. Plot critical shear stress of the receiving channel on the rating curve to determine Q_{crit}
5. Divide the critical low flow by the project areas as a proportion of the receiving water watershed area to determine the allowable flow at the point of compliance

5.2 SIMPLIFIED CHANNEL CROSS SECTION AND GRADIENT INPUTS

The tool generates a flow rating curve based on user inputs describing the receiving channel dimensions (cross section) and gradient. The first step in developing the tool was to create a template for inputting the required channel parameters. The template assumes a simple trapezoidal cross section, with the following elements:

1. Channel width at a well defined break point corresponding to top of bank (a)
2. Channel width at the toe of the bank (b)
3. Channel depth (elevation difference between bank top and channel bed) (c)

Assumptions:

1. Receiving channels can be reasonably represented by a simple trapezoidal cross section
2. The top of bank corresponds reasonably to the level inundated by the dominant discharge (approximately equal to Q_5)

If top of bank is much higher than the dominant discharge flow depth (e.g. in an incised channel) the applicant should adjust the cross section to represent the lower part of the channel so that depth (c) corresponds approximately to the Q_5 depth.

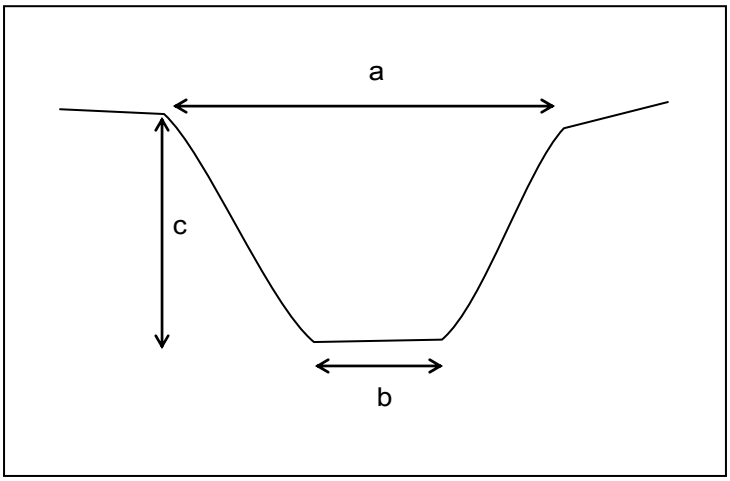

5.3 DEVELOP A SHEAR STRESS RATING CURVE

The tool creates a shear stress rating curve for a range of flows between 1% of the bankfull flow depth and bankfull depth (flow at depth (c).) The range 1% to 100% of bankfull is used because critical flow rarely lies outside these values. The tool then calculates a power function between the points to allow for interpolation. For each of the flows the tool calculates average boundary shear stress exerted on the bed, and discharge, as described below.

5.3.1 Calculating Average Boundary Shear Stress

Average boundary shear stress is the force that erodes channel materials. It is calculated as follows:

$$\tau_{crit} = \gamma * HR * s$$

where τ_{crit} = average boundary shear stress (lb/ft^2)
γ = unit weight water (62.4 lb/ft^3)
HR = Hydraulic radius (cross section area / wetted perimeter)
S = channel slope (ft/ft)

For each depth increment between 1% of bankfull and bankfull, cross section area, wetted perimeter, HR and τ_{crit} are calculated. Slope is assumed to be constant for the cross section; therefore multiple calculations may be required for variable slope conditions. These calculations produce a rating curve for boundary shear stress as a function of flow depth.

5.3.2 Calculating Discharge

For each depth increment between 1% of bankfull and bankfull discharge is calculated using Manning's equation:

$$V = 1.486 \frac{HR^{0.66} * S^{0.5}}{n}$$

where V = velocity (ft/sec)
n = Manning's roughness coefficient

Manning's n is entered by the user from a drop down dialogue box ranging from 0.03 (smooth, straight earth channel with no vegetation) to 0.12 (windy, rough bed channel with dense vegetation).

Discharge is calculated as velocity multiplied by cross section area. The product of these calculations is a rating curve showing boundary shear stress for the receiving channel as a function of discharge, with the highest point representing bankfull flow (see Figure 7 below).

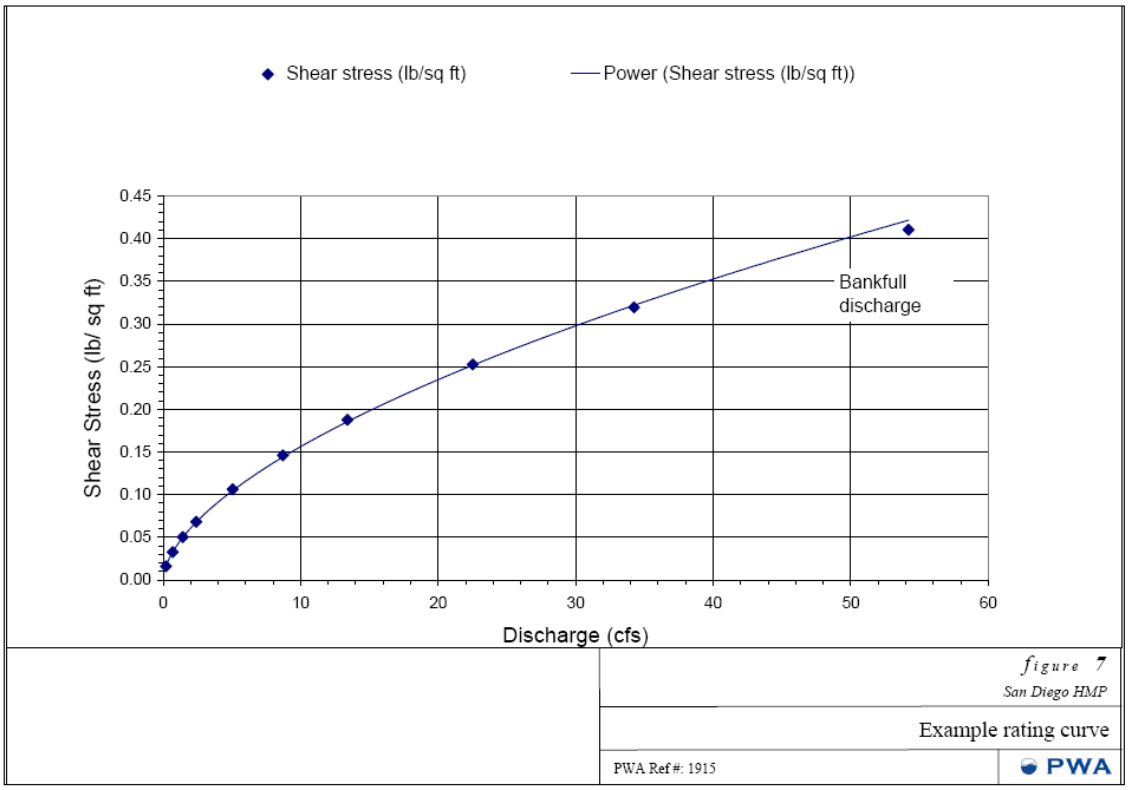

Figure 7. Shear stress rating curve for an example channel (0.5%, 10 feet wide, 2 feet deep)

5.4 CHARACTERIZE RECEIVING CHANNEL MATERIALS IN TERMS OF CRITICAL SHEAR STRESS

The critical shear stress of the channel materials is estimated using a look-up table based on values published by the USACE (Fischenich, 2001). The tool provides values of critical shear stress for a wide range of channel materials in a drop down box so the user can select from the list, or select a median particle size (d50). The values are shown in Table 1. The calculator also allows the user to input a vegetated channel material when this is appropriate (when the channel is completely lined in vegetation). The process for identifying representative materials is covered in the implementation chapter.

5.5 CALCULATING CRITICAL FLOW FOR THE RECEIVING WATER

Critical flow is the discharge at which boundary shear stress equals critical shear stress. The tool uses a power function to interpolate the discharge versus boundary shear stress rating curve. The critical shear stress for the weaker of the bed or banks is plotted horizontally from the Y axis until it intercepts the rating curve. The intercept point is extended vertically to the X axis, showing the critical flow (see Figure 8 below). This represents Q_{crit} for the receiving water. Note that the creation of a site-specific rating curve allows Q_{crit} to be expressed as a specific flow rate (Q) rather than a fraction of Q_2.

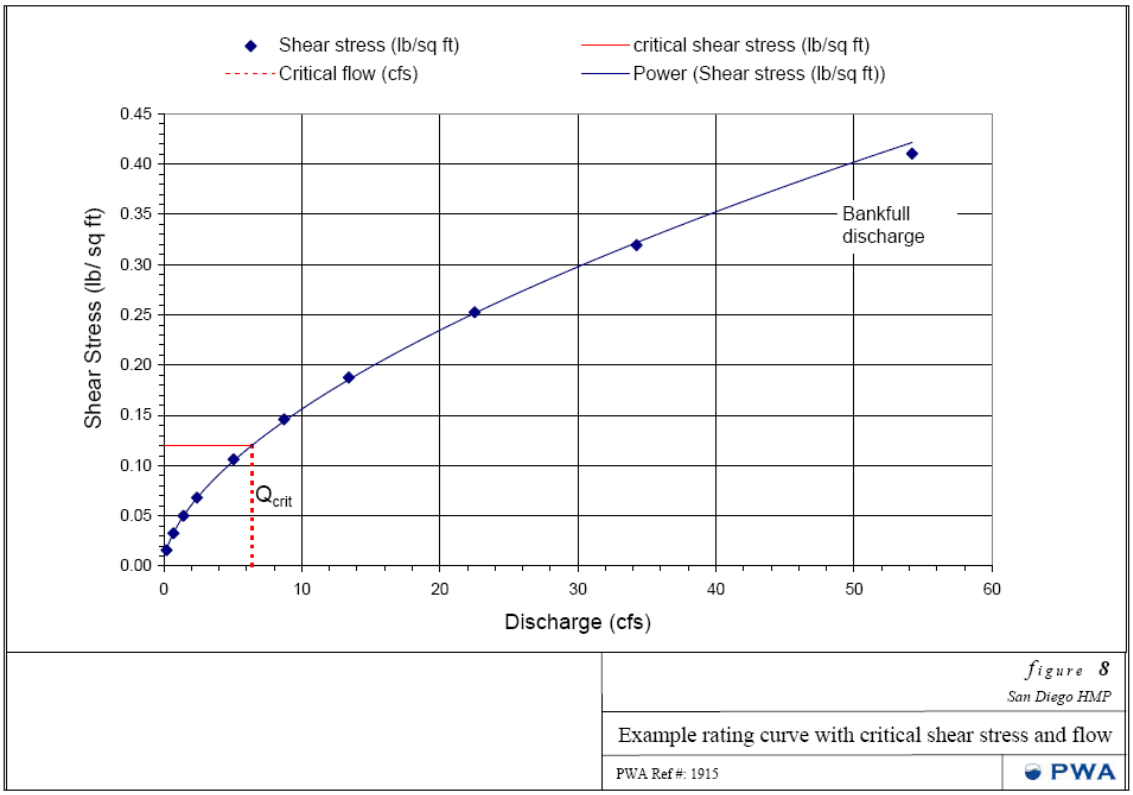

Figure 8. Example of a rating curve with critical shear stress for medium sized gravel. In this example critical shear stress = 0.12 lb/sq ft and critical flow Q_{crit} = 6.4 cfs.

5.6 CALCULATING CRITICAL FLOW AT THE POINT OF COMPLIANCE

The tool calculates critical flow based on the characteristics of the receiving water. Where the project watershed does not make up the entire watershed area for the receiving water, it is necessary to divide the estimated Qcrit based on the percentage of the watershed that is occupied by the project site[3]. For example, if a project occupies one tenth of the receiving water's watershed at the point of compliance and the critical flow level is 50 cfs, the project's 'share' of the non-erosive flow is 5 cfs (50 x 1/10). This prevents the cumulative impact of future developments from exceeding critical flow in the receiving water, since the critical flow is apportioned according to watershed area.

$$\text{Critical flow at Point of Compliance} = \text{Critical flow at receiving water} \times \frac{\text{project area}}{\text{watershed area}}$$

[3]. It is not necessary to adjust the "off-the-shelf" thresholds developed for Track 1 for point of compliance, since they are expressed as a fraction of Q2 for the relevant project area.

5.7 CONVERSION OF CRITICAL FLOW TO FLOW CLASS

To avoid having an infinite range of flow control standards the calculator assigns the discharge into one of three classes based on its value as a function of the estimated Q_2. These classes are: $0.1Q_2$, $0.3Q_2$, $0.5Q_2$. For example, a channel where the critical flow is $0.15Q_2$ would be assigned a flow threshold of $0.1Q_2$. Channels with critical flows less than $0.1Q_2$ are assigned to the $0.1Q_2$ class. The class flow rate is calculated (i.e. the critical flow corresponding to the assigned fraction of Q_2 and expressed as the final output of the tool.

6. GLOSSARY

Bankfull depth
The water depth between the deepest part of the channel and the water surface, during bankfull discharge. Also the vertical distance between the uppermost 'bankfull indicators' and the deepest part of the channel.

Bankfull discharge
The flow rate at which the actively scoured portion of the creek channel is filled with water. In southern California bankfull discharge has typically been found to be between Q2 and Q7, with an average of approximately Q5.

Bankfull indicators
Morphological evidence for the portion of a creek channel that is subject to active scour and sediment transport processes. Typical indicators include scour lines along a bank, the highest vertical level on point bars, base of undercut tree roots.

Bankfull width
The width of the channel at the water surface during bankfull discharge. Also the horizontal distance between 'bankfull indicators' across a channel.

Critical flow
The discharge corresponding to Critical Shear Stress. Varies with channel geometry and materials.

Critical shear stress
The shear stress at which a given channel material is eroded. In non cohesive sediments larger particles have higher critical shear stresses. In cohesive sediments (those smaller than 0.063 mm) sediment has higher critical shear stresses than fine, non cohesive materials

d50
The median sediment particle size in a sample of material taken from a creek bed (diameter of the 50th percentile)

Geomorphically-significant flows
The range of flows that, over a period of several decades, erode and transport the majority of the sediment in a creek system. The mid range of this flow range tends to be similar to "bankfull" discharge, leading people to infer that these flows shape the channel as well as moving most sediment. Calculated by integrating the flow frequency curve with the sediment rating curve.

Point of Compliance
The point at which collected stormwater from a development is delivered from a constructed or modified drainage system into the natural creek receiving water. Note that the HMP applies only to discharge into a natural creek of receiving water, and does not apply to sheet flow or overland flow from a developed site.

Q2
The discharge that recurs on average every 2 years, and that has a 50% probability of occurring in any single year.

Q10
The discharge that recurs on average every 10 years, and that has a 10% probability of occurring in any single year.

Shear stress (also known as boundary shear stress or average boundary shear stress)
The average force exerted by flowing water on the channel boundary. Shear stress is the force responsible for eroding sediment from the channel boundary. It is a function of water surface gradient (related to channel gradient), water depth, and water density.

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APPENDIX B

SCCWRP Channel Screening Report

Use of contents on this sheet is subject to the limitations specified at the end of this document.
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HYDROMODIFICATION SCREENING TOOLS: FIELD MANUAL FOR ASSESSING CHANNEL SUSCEPTIBILITY

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Southern California Coastal Water Research Project

Technical Report 606 - March 2010

044289

Hydromodification Screening Tools: Field Manual for Assessing Channel Susceptibility

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Technical Report 606

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EXECUTIVE SUMMARY

Managing the effects of hydromodification (physical response of streams to changes in catchment runoff and sediment yield) has become a key element of most stormwater programs in California. Although straightforward in intent, hydromodification management is difficult in practice. Shifts in the flow of water and sediment, and the resulting imbalance in sediment supply and capacity can lead to changes in channel planform and cross-section via wide variety of mechanisms. Channel response can vary based on factors such as boundary materials, valley shape and slope, presence of in-stream or streamside vegetation, or catchment properties (e.g., slope, land cover, geology).

Management prescriptions should be flexible and variable to account for the heterogeneity of streams; a given strategy will not be universally well-suited to all circumstances. Management decisions regarding a particular stream reach(s) should be informed by an understanding of susceptibility (based on both channel and catchment properties), resources potentially at risk (e.g., habitat, infrastructure, property), and the desired management endpoint (e.g., type of channel desired, priority functions; see Figure ES1).

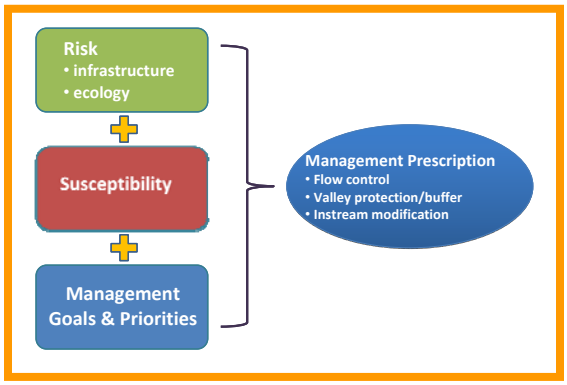

Figure ES1: Decision nodes that influence the management prescription for a particular stream reach.

We have produced a series of documents that outline a process and provide tools aimed at addressing the decision node associated with assessing channel susceptibility. The three corresponding hydromodification screening tool documents are:

1. *GIS-based catchment analyses of potential changes in runoff and sediment discharge* which outlines a process for evaluating potential change to stream channels resulting from watershed-scale changes in runoff and sediment yield.
2. *Field manual for assessing channel susceptibility* which describes an in-the-field assessment procedure that can be used to evaluate the relative susceptibility of channel reaches to deepening and widening.
3. *Technical basis for development of a regionally calibrated probabilistic channel susceptibility assessment* which provides technical details, analysis, and a summary of field data to support the field-based assessment described in the field manual.

The catchment analyses and the field manual are designed to support each other by assessing channel susceptibility at different scales and in different ways. The GIS-based catchment analyses document is a planning tool that describes a process to predict likely effects of hydromodification based on potential change in water and sediment discharge as a consequence of planned or potential landscape alteration (e.g., urbanization). Data on geology, hillslope, and land cover are compiled for each watershed of interest, overlaid onto background maps, grouped into several discrete categories, and classified independently across the watershed in question.

The classifications are used to generate a series of Geomorphic Landscape Units (GLUs) at a resolution defined by the coarsest of the three data sets (usually 10 to 30 m). Three factors: geology, hillslope, and land cover are used because the data are readily available; these factors are important to controlling sediment yield. The factors are combined into categories of High, Medium, or Low relative sediment production. The current science of sediment yield estimation is not sophisticated enough to allow fully remote (desktop) assignment of these categories. Therefore initial ratings must be verified in the field.

Once the levels of relative sediment production (i.e., Low, Medium, and High) are defined across a watershed under its current configuration of land use, those areas subject to future development are identified, and corresponding sediment-production levels are determined by substituting Developed land cover for the original categories and modifying the relative sediment production as necessary (Figure ES2). Conversely, relative sediment production for currently developed watershed areas can be altered to estimate relict sediment production for an undeveloped land use and used to assess the impact of watershed development on pre-development sediment production. The resultant maps can be used to aid in planning decisions by indicating areas where changes in land use will likely have the largest (or smallest) effect on sediment yield to receiving channels.

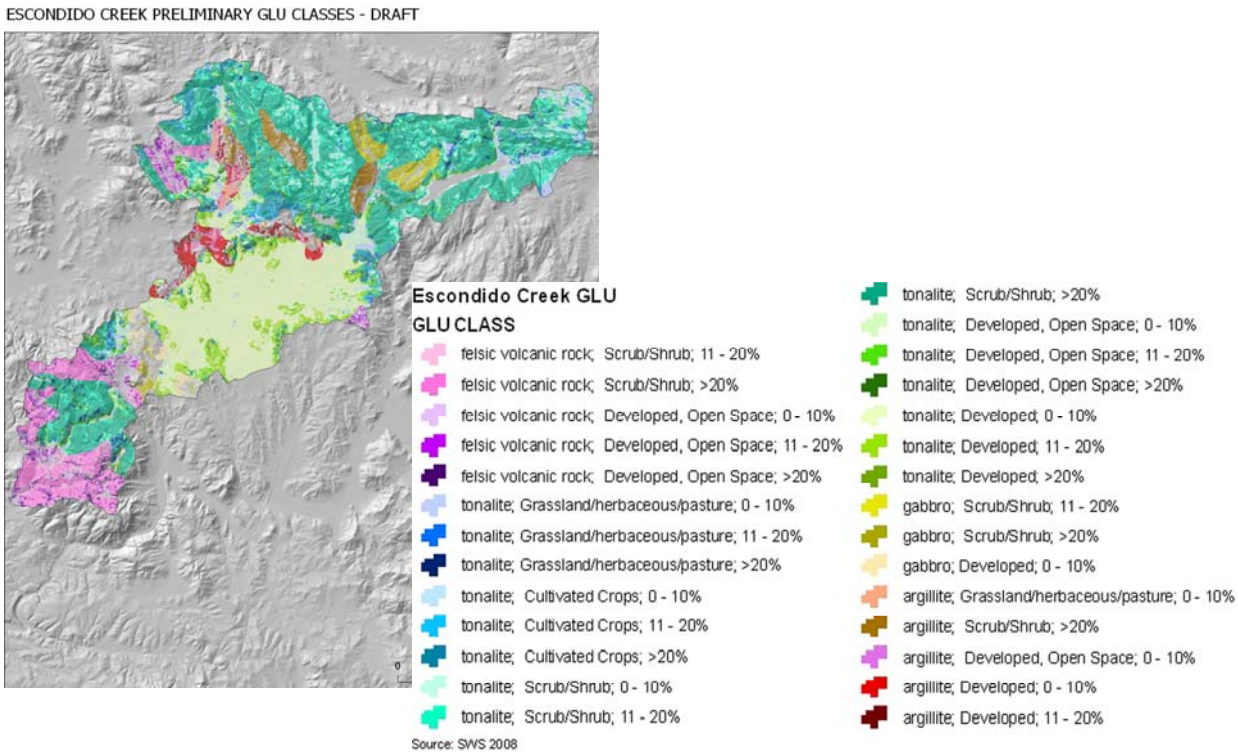

Figure ES2: Example of Geomorphic Landscape Units for the Escondido Creek Watershed.

The field assessment procedure is intended to provide a rapid assessment of the relative susceptibility of a specific stream reach to effects of hydromodification. The intrinsic sensitivity of a channel system to hydromodification as determined by the ratio of disturbing to resisting forces, proximity to thresholds of concern, probable rates of response and recovery, and potential for spatial propagation of impacts. A combination of relatively simple, but quantitative, field indicators are used as input parameters for a set of decision trees. The decision trees follow a logical progression and allow users to assign a classification of Low, Medium, High, or Very High susceptibility rating to the reach being assessed. Ratings based on likely response in the vertical and lateral directions (i.e., channel deepening and widening) are assigned separately. The screening rating foreshadows the level of data collection, modeling, and ultimate mitigation efforts that can be expected for a particular stream-segment type and geomorphic setting. The field assessment is novel in that it incorporates the following combination of features:

- Integrated field and office/desktop components
- Separate ratings for channel susceptibility in vertical and lateral dimensions
- Transparent flow of logic via decision trees
- Critical nodes in the decision trees are represented by a mix of probabilistic diagrams and checklists
- Process-based metrics selected after exhaustive literature review and analysis of large field dataset
- Metrics balance process fidelity, measurement simplicity, and intuitive interpretability
- Explicitly assesses proximity to geomorphic thresholds delineated using field data from small watersheds in southern California
- Avoids bankfull determination, channel cross-section survey, and sieve analysis, but requires pebble count in some instances
- Verified predictive accuracy of simplified logistic diagrams relative to more complex methods, such as dimensionless shear-stress analyses and Osman and Thorne (1988) geotechnical stability procedure
- Assesses bank susceptibility to mass wasting; field-calibrated logistic diagram of geotechnical stability vetted by Colin Thorne (personal communication)
- Regionally-calibrated braiding/incision threshold based on surrogates for stream power and boundary resistance
- Incorporates updated alternatives to the US Geological Survey (USGS; Waananen and Crippen 1977) regional equations for peak flow (Hawley and Bledsoe In Review)
- Does not rely on bank vegetation given uncertainty of assessing the future influence of root reinforcement (e.g., rooting depth/bank height)
- Channel evolution model underpinning the field procedure is based on observed responses in southern California using a modification of Schumm *et al*. (1984) five-stage model to represent alternative trajectories

The probabilistic models of braiding, incision, and bank instability risk embedded in the screening tools were calibrated with local data collected in an extensive field campaign. The models help users directly assess proximity to geomorphic thresholds and offer a framework for gauging susceptibility that goes beyond expert judgment. The screening analysis represents the first step toward determining appropriate management measures and should help inform decisions about subsequent more detailed analysis.

The GIS-based catchment-scale analysis and the field screening procedure are intended to be used as a set of tools to inform management decisions (Figure ES3). The catchment-scale analysis provides an overall assessment of likely changes in runoff and sediment discharge that can be used to support larger-scale land use planning decisions and can be applied prospectively or retrospectively. The field screening procedure provides more precise estimates of likely response of individual stream reaches based on direct observation of indicators. The field assessment procedure also provides a method to evaluate the extent of potential upstream and downstream propagation of effects (i.e., the analysis domain). In concept, the catchment-scale analysis would be completed for a watershed of interest before conducting the field analysis. However, this is not required and the two tools can be used independent of each other. It is not presently possible to describe a mechanistic linkage between the magnitude of the *drivers* of hydromodification (i.e., changes in the delivery of water and sediment to downstream channels), the *resistance* of channels to change, and the net expression on channel form. For this reason, the results of the catchment and field analyses must be conducted independently and the results cannot be combined to produce an overall evaluation of channel susceptibility to morphologic change (Figure ES3).

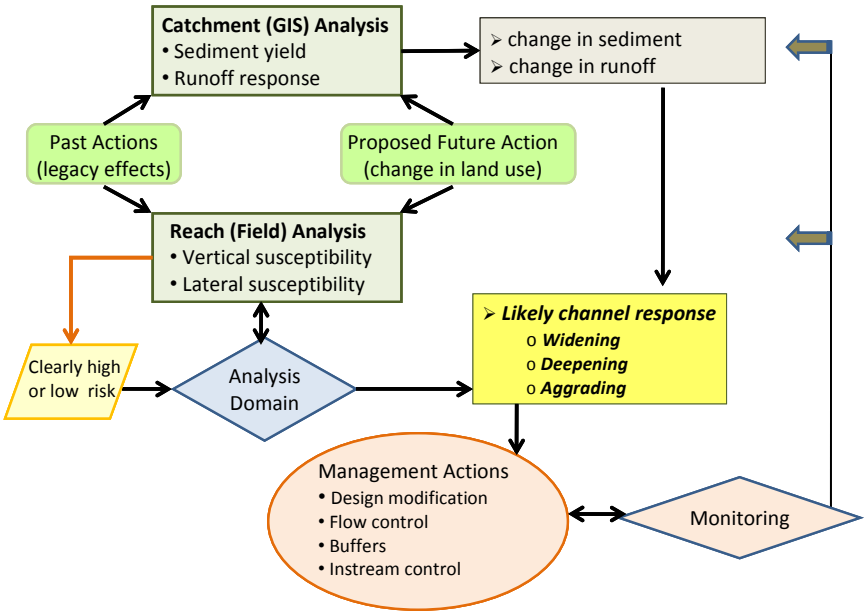

Figure ES3: Relationship of catchment and field screening tools to support decisions regarding susceptibility to effects of hydromodification.

Finally, it is important to note that these tools should be used as part of larger set of considerations in the decision making process (see Figure ES1). For example, the tools do not provide assessments of the ecological or economic affects of hydromodification. Similarly, they do not allow attribution of current conditions to past land use actions. Although the screening tool is designed to have management implications via a decision framework, policy/management decisions must be made by local stakeholders in light of a broader set of considerations.

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INTRODUCTION

Hydromodification, the response of streams to changes in flow and sediment input, is an area of active investigation and emerging regulation. Previous research that led to screening tool development has concluded that 1) urbanization markedly affects the flow regimes of streams in southern California, 2) the corresponding imbalances in sediment-transport capacity result in substantial geomorphic instabilities across most stream settings, 3) channels in southern California may be more sensitive than streams in other regions of the United States (US) for equivalent flows, bed-material sizes, valley slopes, and bank heights/angles, and 4) widely varying degrees of susceptibility to hydromodification are clearly reflected across the field study sites as an interaction between flow energy and the resistance of channel boundaries to lateral and vertical adjustments (Hawley 2009).

Many management schemes currently use a one-size-fits-all approach to managing hydromodification effects, whereby a single criterion is applied to all streams within a given area. However, factors such as dominant bed material, channel planform, grade control, vegetation, and existing infrastructure can influence the rate and manner in which streams respond to changes in flow and sediment. Consideration of these differences in management programs requires a tool to rate stream reaches in terms of their relative susceptibility to hydromodification effects.

This document provides the steps and process to apply a process-based hydromodification susceptibility screening tool. The tool builds on studies conducted in other regions, as summarized by Bledsoe *et al*. (2008), to provide a means to rank stream reaches in terms of their relative likelihood of response to hydromodification. The screening tool consists of two elements: 1) Geographic Information System (GIS) based landscape-scale analyses of relative runoff and sediment yield to stream channels, and 2) field-based assessment of channel condition. Together these two elements can be used to assess susceptibility of a specific stream reach based on both landscape and local influences (**Figure 1**). The GIS based analysis is intended mainly as a planning tool to allow potential changes in runoff and sediment yield to be considered during the siting and design of new developments. This tool is presented in the companion to this document. The field-based tool is intended to provide a rapid assessment of the relative susceptibility of a specific stream reach to effects of hydromodification. This tool is presented in this document.

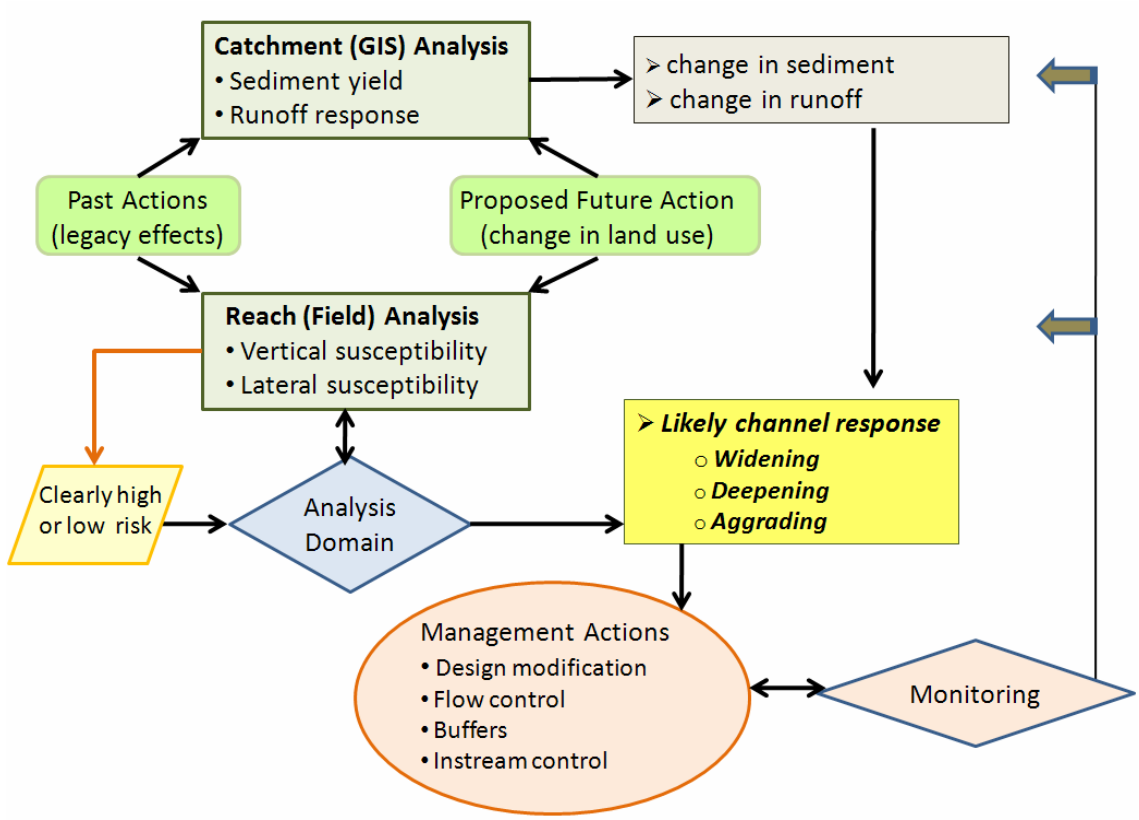

Figure 1. Conceptual application of GIS- and field-based screening tools.

General features of the field screening tool:

- Integrated field and office/desktop components
- Separate ratings for channel susceptibility in vertical and lateral dimensions
- Transparent flow of logic via decision trees
- Critical nodes in the decision trees are represented by a mix of probabilistic diagrams and checklists
- Process-based metrics selected after exhaustive literature review and analysis of large field dataset
- Metrics balance process fidelity, measurement simplicity, and intuitive interpretability
- Explicitly assesses proximity to geomorphic thresholds delineated using field data from small watersheds in southern California
- Avoids bankfull determination, channel cross-section survey, and sieve analysis, but requires pebble count in some instances

- Verified predictive accuracy of simplified logistic diagrams relative to more complex methods, such as dimensionless shear-stress analyses and Osman and Thorne (1988) geotechnical stability procedure
- Assesses bank susceptibility to mass wasting; field-calibrated logistic diagram of geotechnical stability vetted by Colin Thorne (personal communication)
- Regionally-calibrated braiding/incision threshold based on surrogates for stream power and boundary resistance
- Incorporates updated alternatives to the US Geological Survey (USGS; Waananen and Crippen 1977) regional equations for peak flow (Hawley and Bledsoe, In Review)
- Does not rely on bank vegetation given uncertainty of assessing the future influence of root reinforcement (e.g., rooting depth/bank height)
- Channel evolution model (CEM) underpinning the field procedure is based on observed responses in southern California using a modification of Schumm *et al*. (1984) five-stage model to represent alternative trajectories

The Field Screening Tool <u>DOES NOT</u>:

- ⊗ **Make policy/management decisions**: although the screening tool is designed to have management implications via a decision framework, policy/management decisions must be made by local stakeholders
- ⊗ **Incorporate ecological/economic considerations**: the screening tool is exclusively focused on geomorphic stability and does not include ecological/economic aspects that stakeholders may consider
- ⊗ **Assess historical attribution**: the screening tool is designed to assess the current susceptibility of a channel, independent of attributing degraded conditions to historical land users, and policies.

OFFICE AND FIELD COMPONENTS FOR FIELD SCREENING TOOL

Office Components

The screening tool presented in this report is predominantly designed for field-based assessment. The field tool requires some preparatory office work to provide context and familiarity with the site prior to conducting the field evaluation. The following addresses:

- Examination of Overall Setting (using Google Earth or equivalent aerials)
- Quantification of important remotely-sensed parameters (using GIS software)
- Identification of Analysis Domain (tentatively defining upstream and downstream extents of field reconnaissance, locations of likely grade control, and valley transitions)

Overall Setting

Using satellite imagery/aerial photography, gather a baseline understanding of the watershed. Consider aspects such as development extent, fires and vegetation coverage, sediment sources and bottlenecks, ecologically-sensitive areas, etc. Examine the valley setting near the project in greater detail, identifying tributary confluences, potential grade control (e.g., road crossings), and infrastructure (e.g., stormwater outfalls, drainage 'improvements', etc.) *sensu* Chin and Gregory (2005). Specifically consider:

- Geologic setting, basin type, valley context, and tributaries
- Recent watershed history – urbanization and fire
- Obvious grade-control locations, human influences, and existing infrastructure

Printed screen shots of aerials, specifically near the project site, may be helpful in the field. In addition, the results from the GIS-based assessment (if completed) should be reviewed prior to beginning the field assessment.

GIS Metrics

Using publicly available GIS data, measure four readily quantifiable watershed- and valley-scale variables that will be used to compute the simple, but statistically-significant, screening indices (i.e., flow, screening index, and valley width index). Measurement details in Form 1 (**Figure 2**).

- Spatial: contributing drainage area
- Topographic: valley slope at site(s)
- Precipitation: mean annual area-weighted precipitation
- Geomorphic Confinement: valley bottom width at site(s)

These variables are explained in more detail in Form 1 Table 1 (**Figure 2**). A digital data entry form is available as well (Data Entry Form.xls).

Analysis Domain

The effects of hydromodification may propagate for significant distances downstream (and sometimes upstream) from a point of impact such as a stormwater outfall. Accordingly, it may

be necessary to conduct geomorphic screening reconnaissance across a domain spanning multiple channel types/settings and property owners.

The maximum spatial unit for assigning a susceptibility rating is defined as a *ca.* 20 channel width reach not to exceed 200 m. Before conducting the field screening, the analyst should identify the following attributes as part of the office analysis to estimate the maximum extent of the analysis domain for field refinement.

Begin by defining the points or zones along the channel reach(es) where changes in discharge or channel type are likely to occur (e.g., potential locations of outfalls or tributary inputs). Document any observed outfalls for final desktop synthesis and define the upstream and downstream extents of analysis as follows:

- **Downstream** – until reaching the closest of the following:
  - at least one reach downstream of the first grade-control point (but preferably the second downstream grade-control location)
  - tidal backwater/lentic waterbody
  - equal order tributary (Strahler 1952)[1]
  - a 2-fold increase in drainage area[2]

OR demonstrate sufficient flow attenuation through existing hydrologic modeling

- **Upstream** – extend the domain upstream for a distance equal to 20 channel widths OR to grade control in good condition – whichever comes first. Within that reach, identify hard points that could check headward migration, evidence that head cutting is active or could propagate unchecked upstream

Within the analysis domain there may be several reaches that should be assessed independently based on either length or change in physical characteristics. In more urban settings, segments may be logically divided by road crossings (Chin and Gregory 2005), which may offer grade control, cause discontinuities in the conveyance of water or sediment, etc. In more rural settings, changes in valley/channel type, natural hard points, and tributary confluences may be more appropriate for delineating assessment reaches. In general, the following criteria should trigger delineation of a new reach and hence a separate susceptibility assessment:

- 200 m or ca. 20 bankfull widths – it is difficult to integrate over longer distances
- Distinct or abrupt change in grade or slope due to either natural or artificial features
- Distinct or abrupt change in dominant bed material or sediment conveyance
- Distinct or abrupt change in valley setting or confinement
- Distinct or abrupt change in channel type, bed form, or planform

[1] In the absence of proximate downstream grade control or backwater, the confluence of an 'equal order tributary' should correspond to substantial increases in flow and channel capacity that should, in theory, correspond to significant flow attenuation; however, there is no scientific basis to assume that downstream channels of higher stream order are less susceptible than their upstream counterparts. This (practically-driven) guidance should not supersede the consideration of local conditions and sound judgment. Stakeholders may elect to use a more regionally-preferred guidance.

[2] An increase in drainage area greater than or equal to 100% would roughly correspond to the addition of an equal-order tributary

FORM 1: INITIAL DESKTOP ANALYSIS

Complete all shaded sections.

IF required at multiple locations, circle one of the following site types:

Applicant Site / Upstream Extent / Downstream Extent

Location: Latitude: _____ Longitude: _____

Description (river name, crossing streets, etc.): _____

GIS Parameters: The International System of Units (SI) is used throughout the assessment as the field standard and for consistency with the broader scientific community. However, as the singular exception, US Customary units are used for contributing drainage area (A) and mean annual precipitation (P) to apply regional flow equations after the USGS. See SCCWRP Technical Report 607 for example measurements and "Screening Tool Data Entry.xls" for automated calculations.

Form 1 Table 1. Initial desktop analysis in GIS.

	Symbol	Variable	Description and Source	Value
Watershed properties (English units)	A	Area (mi^2)	Contributing drainage area to screening location via published Hydrologic Unit Codes (HUCs) and/or ≤ 30 m National Elevation Data (NED), USGS seamless server	
	P	Mean annual precipitation (in)	Area-weighted annual precipitation via USGS delineated polygons using records from 1900 to 1960 (which was more significant in hydrologic models than polygons delineated from shorter record lengths)	
Site properties (SI units)	S_v	Valley slope (m/m)	Valley slope at site via NED, measured over a relatively homogenous valley segment as dictated by hillslope configuration, tributary confluences, etc., over a distance of up to ~500 m or 10% of the main-channel length from site to drainage divide	
	W_v	Valley width (m)	Valley bottom width at site between natural valley walls as dictated by clear breaks in hillslope on NED raster, irrespective of potential armoring from floodplain encroachment, levees, etc. (imprecise measurements have negligible effect on rating in wide valleys where VWI is >> 2, as defined in lateral decision tree)	

Form 1 Table 2. Simplified peak flow, screening index, and valley width index. Values for this table should be calculated in the sequence shown in this table, using values from Form 1 Table 1.

Symbol	Dependent Variable	Equation	Required Units	Value
Q_{10cfs}	10-yr peak flow (ft^3/s)	$Q_{10cfs} = 18.2 * A^{0.87} * P^{0.77}$	A (mi^2) P (in)	
Q_{10}	10-yr peak flow (m^3/s)	$Q_{10} = 0.0283 * Q_{10cfs}$	Q_{10cfs} (ft^3/s)	
INDEX	10-yr screening index ($m^{1.5}/s^{0.5}$)	$INDEX = S_v * Q_{10}^{0.5}$	Sv (m/m) Q_{10} (m^3/s)	
W_{ref}	Reference width (m)	$W_{ref} = 6.99 * Q_{10}^{0.438}$	Q_{10} (m^3/s)	
VWI	Valley width index (m/m)	$VWI = W_v/W_{ref}$	W_v (m) W_{ref} (m)	

(Sheet 1 of 1)

Figure 2. Form 1: Initial Desktop Analysis. Complete set of assessment forms in Appendix B.

Conceptual Basis for 10-yr Flow Analysis

The geomorphic thresholds presented in the field-screening sections below correspond to the 10-yr peak flow calculated using the regional hydrologic model presented in Form 1 Table 2 (**Figure 2**; Hawley and Bledsoe, In review). This peak flow model is substantially more accurate for small watersheds in southern California than previously published regional regression equations. The 10-yr flow was selected for several reasons. First, it better represents a channel-filling flow than alternative return intervals such as Q_2. Second, it typically requires a 10-yr instantaneous peak flow to create a geomorphically significant *duration* at the 2-yr flow magnitude (i.e., the 10-yr instantaneous peak flow typically corresponds to a daily-mean flow equal to a 2- to 3-yr peak magnitude). Finally, the 10-yr hydrologic models had the best prediction accuracy of all return intervals. Out of 5 peak-flow model forms (Hawley and Bledsoe, In review), the model based on drainage area and precipitation had the best cross-validation performance. With respect to modeling Q_{10}, the standard error as percentage of mean for validation samples was 41% (arithmetic space), with an R^2 during final calibration of 0.81 (geometric space). Because of the relatively-robust model performance and overall simplicity, we selected the model form of Q = f (A, P) for use in this screening tool.

Field Components

After completing the Initial Desktop Analysis (**Figure 2**), the user should have a first-order estimate of an appropriate analysis domain, a baseline understanding of the watershed, and critical indices to use during the field assessment(s). At this juncture it is essential to examine the stream (and its valley setting) in greater detail. Minimally, the following items should be taken to the field, although Form 2: Pebble Count (**Figure 4**) is not needed in every case:

- Assessment forms and/or field book for sketches/notes
- Digital camera for photographic documentation
- Pocket rod and/or tape for some basic measurements and reference/scale in photographs
- Protractor (e.g., gravity-driven) for measuring bank angle (**Figure 3a**)
- Gravelometer (i.e., US SAH-97 half-phi template) for standardized pebble count (**Figure 3b**)

a)

b)

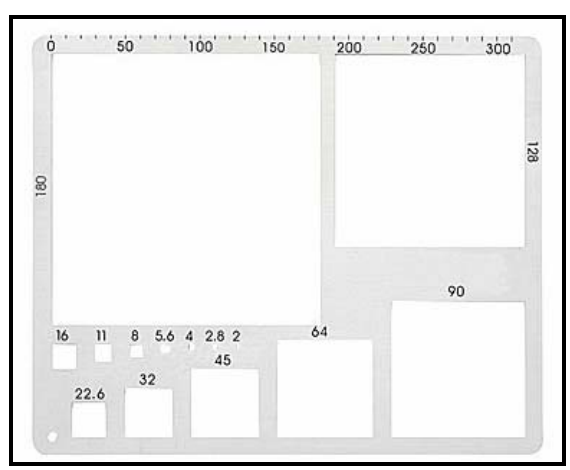

Figure 3. Craftsman magnetic protractor (a) and US SAH-97 half-phi template gravelometer (b).

FORM 2: PEBBLE COUNT

If it is necessary to estimate d_{50}, perform a pebble count, after Bunte and Abt (2001a,b), using a minimum of 100 particles and a standard half-phi template, or by measuring along the intermediate axis of each pebble. Use a grid and tape for equally spaced samples over systematic/complete transects across riffle sections (i.e., if the 100th particle is in the middle of a transect, complete the full transect before stopping the count; if more than 125 particles, record data near the bottom of Sheet 2 of 2). If the source of fines (sand/silt d <2 mm; see Form 2 Table 2 below) is less than ½ inch thick (approximately one finger width) at the sampling point, sample the coarser buried substrate; otherwise record observation of fines. Take photographs to support observations (Detailed instructions in Appendix A.3).

Form 2 Table 1. 100-pebble count tabulation for Vertical Susceptibility. Record station (Sta) and diameter (d) in millimeters.

#	Sta	d (mm)	#	Sta	d (mm)	#	Sta	d (mm)	#	Sta	d (mm)	#	Sta	d (mm)
1			26			51			76			101		
2			27			52			77			102		
3			28			53			78			103		
4			29			54			79			104		
5			30			55			80			105		
6			31			56			81			106		
7			32			57			82			107		
8			33			58			83			108		
9			34			59			84			109		
10			35			60			85			110		
11			36			61			86			111		
12			37			62			87			112		
13			38			63			88			113		
14			39			64			89			114		
15			40			65			90			115		
16			41			66			91			116		
17			42			67			92			117		
18			44			68			93			118		
19			44			69			94			119		
20			45			70			95			120		
21			46			71			96			121		
22			47			72			97			122		
23			48			73			98			123		
24			49			74			99			124		
25			50			75			100			125		

Form 2 Table 2. d_{50} for Screening Index Threshold.

Class Name	Diameter (mm)	Helpful Descriptions for Field Identification
Boulder	> 256	Difficult to lift by hand
Cobble	> 64	Typically able to lift
Gravel	> 2	Fits in one hand
Sand	> 0.0625	Can feel between fingers
Silt	> 0.004	Can feel with tongue
Clay	≤ 0.004	Can not feel individual particle

(Sheet 1 of 2)

Figure 4. Form 2: Pebble Count. Complete set of assessment forms in Appendix B.

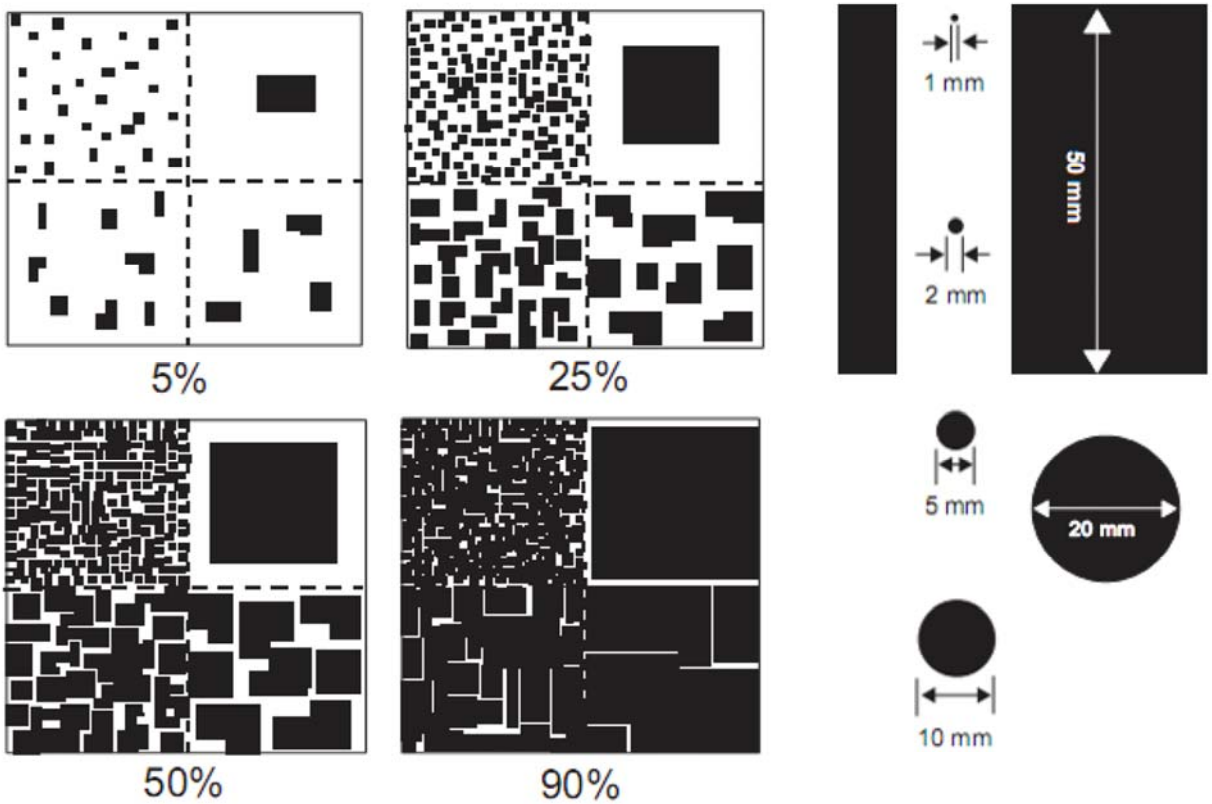

Note: Each quadrant within each box contains the same total area covered using different sized objects.

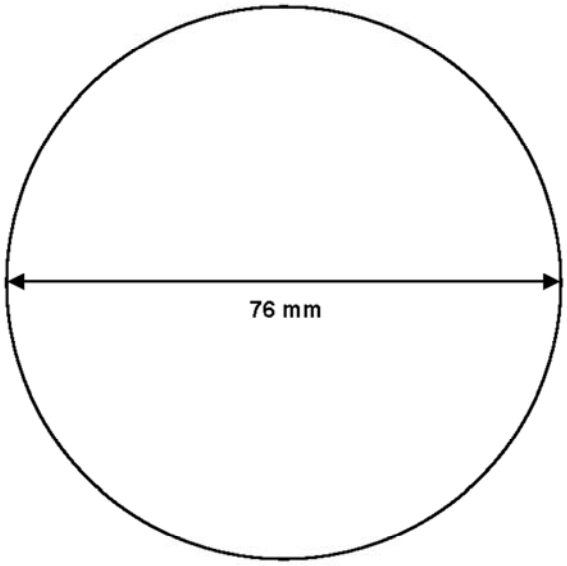

Form 2 Figure 1. Examples of % coverage by volume and substrate sizing adapted from *NRCS Field Book for Describing and Sampling Soils* (Schoeneberger *et al.* 2002) and Julien (1998).

(Sheet 2 of 2)

Figure 4. Continued

Susceptibility Rating Definitions

The field screening tool uses a combination of relatively simple, but quantitative, field indicators as input parameters to a set of decision trees. The decision trees follow a logical progression and allow users to assign a classification of Low, Medium, High, or Very High susceptibility rating (Table 1) to the reach being assessed.

Table 1. Vertical and Lateral Susceptibility rating definitions.

Susceptibility Rating	Definitions of Susceptibility
LOW	• Low ratio of disturbing forces to resisting forces
	• Far from geomorphic thresholds of concern (based on explicit quantification of probability if feasible – < 1% probability of exceedance)
	• Relatively rapid relaxation time
	• Low potential for positive feedbacks, nonlinear response, sensitivity to initial conditions
	• Very limited or no spatial propagation (*ca.* 10 m)
MEDIUM	• Moderate ratio of disturbing forces to resisting forces
	• Not proximate to geomorphic thresholds of concern (based on explicit quantification of probability if feasible – e.g., < 10% probability of exceedance)
	• Moderately rapid relaxation time
	• Low to moderate potential for positive feedbacks, nonlinear response, sensitivity to initial conditions
	• Local spatial propagation, contained within *ca.* 100 m
HIGH	• High ratio of disturbing forces to resisting forces
	• Proximate to geomorphic thresholds of concern (based on explicit quantification of probability if feasible – e.g., > 10 to 50% probability of exceedance)
	• Relaxation time may be relatively long given magnitude and spatial extent of change
	• Moderate to high potential for positive feedbacks, nonlinear response, sensitivity to initial conditions
	• Potential spatial propagation – headcutting/base-level change upstream and downstream but contained within *ca.* 100 to 1,000 m domain of control
VERY HIGH	• High ratio of disturbing forces to resisting forces
	• At geomorphic thresholds of concern (based on explicit quantification of probability if feasible – e.g., $\geq$ 50% probability of exceedance)
	• Relaxation time may be relatively long given magnitude and spatial extent of change
	• High potential for positive feedbacks, nonlinear response, sensitivity to initial conditions
	• Potential widespread spatial propagation – headcutting/base-level change upstream and downstream uncontained within *ca.* 1,000 m domain of control
	• Specifically, the VERY HIGH rating is reserved for the following geomorphic thresholds/states (clear and present danger): o **Vertical** ▪ Currently unstable (Channel Evolution Model (CEM) Type III or IV) with incision past critical bank height for mass wasting and active bank failure ▪ Currently stable (CEM Type I or II) with banks less than critical height, but p $\geq$ 50% for incision or braiding in labile bed (d_{50} <16 mm) with ineffective/absent grade control o **Lateral** ▪ Currently unstable with active braiding/extensive mass wasting/fluvial erosion (> 50% of banks) in a wide valley ▪ Currently stable consolidated bank in wide valley with High Vertical rating combined with p > 10% for mass wasting ▪ Currently stable unconsolidated banks with fine toe material in wide valley with High Vertical rating

Recall that it may be necessary to perform the field assessment at several locations based on an analysis domain that could span multiple stream reaches up and downstream (see Analysis Domain above). At each distinct reach type, the user will follow the guidelines below to separately assess susceptibility in vertical and lateral dimensions. Although vertical and lateral responses are often interdependent, vertical and lateral susceptibility are assessed separately for several reasons. First, vertical and lateral responses are primarily controlled by different types of resistance, which, when assessed separately, may improve ease of use and lead to increased repeatability among users compared to an integrated, cross-dimensional assessment. Second, the mechanistic differences between vertical and lateral responses point to different modeling tools and potentially different management strategies. Having separate screening ratings may better direct users and managers to the most appropriate tools for subsequent analyses.

The field screening tool uses combinations of decision trees, checklists, tables and calculations. We attempt to employ decision trees when a question can be answered fairly definitively and/or quantitatively (e.g., median grain diameter (d_{50}) < 16 mm; see Form 2 (**Figure 4**)). Alternatively, checklists are used in places where answers are relatively qualitative (e.g., grade control).

The tool is designed to first classify the current state of the assessment area. Next, the user identifies the type and number of risk factors that are present; risk factors are then combined with current state to determine a final rating. Users should take photographs to support their assessment. If uncertain about a given decision node, the user should use the more precautionary pathway that results in a higher rating of susceptibility. The field-assessment process is described in detail below:

- Decision Trees
  - Vertical Susceptibility
  - Lateral Susceptibility

- Design/Setup
  - Assess the Analysis Domain (defined above), which may include multiple stream types and settings; conduct separate analyses for reaches distinguished by distance, change in valley type, dominant bed material, and other significant geomorphic considerations
  - Assign susceptibility ratings of Low, Medium, High, and Very High (as defined in Table 1 above) independently to the vertical and lateral conditions of each channel reach

- Consult susceptibility decision trees and photographic supplements for rating guidance; to clearly highlight rating endpoints within the decision trees, non-terminal and terminal nodes in the decision trees have been color coded (**Figure 5**) to prompt users to proceed to another step

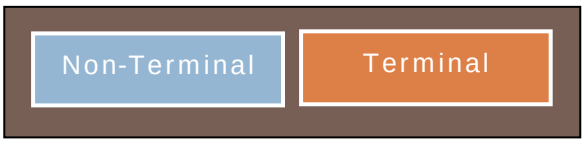

Figure 5. Color scheme for non-terminal and terminal nodes in susceptibility decision trees.

- Overall logic of susceptibility decision trees (**Figure 6**)

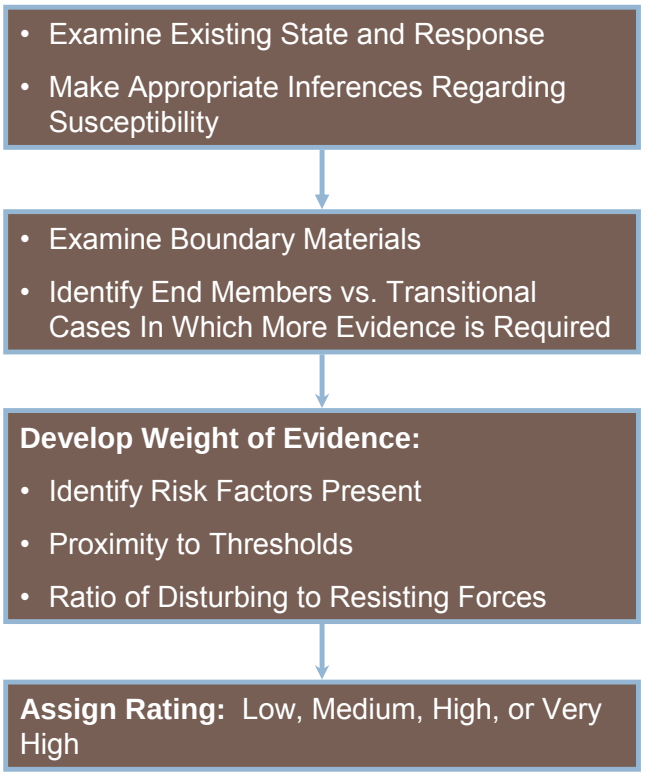

Figure 6. Logical flow of susceptibility decision trees.

CHANNEL SUSCEPTIBILITY DECISION TREES AND FORMS

Vertical Susceptibility

In the Vertical Susceptibility decision tree, there are three potential states of bed material based on broad classes of armoring potential. These states are listed below from most susceptible to least with definitions and photographic examples provided in Form 3 (**Figure 7**):

- Labile Bed – sand-dominated bed, little resistant substrate
- Transitional/Intermediate Bed – bed typically characterized by gravel/small cobble, intermediate level of resistance of the substrate and uncertain potential for armoring
- Threshold Bed (Coarse/Armored Bed) – armored with large cobbles or larger bed material or highly-resistant bed substrate (i.e., bedrock)

Threshold beds composed of boulders and large cobbles and/or highly-resistant bedrock are the region's most resistant channel beds with geologic grade control and a natural capacity to armor (see Form 3 (**Figure 7**)). Consequently, threshold beds correspond to a vertical rating of low. Conversely, labile beds have little to no capacity to self-armor and have a high probability of vertical adjustments in response to hydromodification. Depending on two additional decision tree questions that consider the current state of incision and grade control, labile beds receive a rating of High or Very High. Finally, transitional/intermediate beds are involved in a wide range of potential susceptibility responses and must be assessed in greater detail in order to develop weight of evidence for appropriate screening ratings. Three primary risk factors used to assess vertical susceptibility for channels with transitional/intermediate bed materials:

- Armoring Potential – Form 3 Checklist 1 (**Figure 7**)
- Grade Control – Form 2 Checklist 1 (**Figure 7**)
- Probability of Incision/Braiding based on a Regionally-Calibrated Screening Index – Form 3 Figure 1/Table 1 (**Figure 7**)

These risk factors are assessed using checklists and a diagram, then calculated using the instructions and equation at the bottom of Form 3 Sheet 4 of 4 (**Figure 7**) to provide an overall vertical susceptibility rating for the intermediate/transitional bed-material group.

Vertical Susceptibility Decision Tree

The purpose of the vertical susceptibility decision tree is to assess the state of the channel bed with a particular focus on the risk of incision (i.e., down cutting). Vertical stability is a prerequisite for lateral stability because a stream that incises can increase bank heights to the point of collapse and channel widening. Accordingly, vertical susceptibility is assessed first because it affects the lateral rating in most instances.

Conceptual Basis

Channel bed material is one of the main factors controlling vertical stability. Bed material is assessed using the photographic supplement Form 3 Figure 1 (**Figure 7**), with Form 2 Figure 1 (**Figure 4**) provided as a reference for some particle sizes and to assist with estimating the

percentage of surface sand. Some reaches may require a pebble count, Form 2 (**Figure 4**), for a more definitive assessment of bed material size.

For threshold (coarse/armored) beds, document the channel substrate with photographs, and a supporting pebble count[3] if d_{50} is near 128 mm. For labile beds, use supplemental photographs in Form 3 Figure 1 (**Figure 7**) and the diagram of the five-stage CEM presented in Appendix A, Figure A.3, to assess the current state of channel incision. For intermediate/transitional beds, assess: armoring potential using Form 3 Checklist 1 (**Figure 7**), grade-control condition using Form 3 Checklist 1 (**Figure 7**), and risk of incision/braiding using Form 3 Table 1 (**Figure 7**).

Form 3 Checklist 1 (**Figure 7**): Armoring potential is assessed because it is a primary mechanism in which a channel can self-check channel incision/headcutting. Coarser particles naturally provide greater resistance and, therefore, yield a lower susceptibility rating. Additionally, the tighter the particles are packed, the more resistant the armor layer, which can also influence the rating. Finally, the amount of sand-sized particles can adversely affect the resistance of an armor layer (Wilcock and Kenworthy, 2002; Wilcock and Crowe, 2003).

Form 3 Checklist 2 (**Figure 7**): Grade control is another way in which incision/headcutting can be arrested. When channels adjust their slope, the incision typically hinges around a hard point such as a natural or artificial grade control. Grade control has been clearly demonstrated to be a statistically-significant predictor of channel enlargement in southern California (Hawley 2009). Adjustments may also revolve around channel base-level, which could be set by an estuary, large waterbody (such as a lake or reservoir), or confluence with a larger river.

Form 3 Figure 4 (**Figure 7**): Risk of incising or braiding is based on the potential specific stream power of the valley relative to d_{50}. Beyond armoring potential and grade control, channels with intermediate/transitional beds may also have a relatively-energetic valley setting that creates an inherently higher risk for incision than lower energy settings. The threshold is based on regional data from unconfined, unconstructed valley settings and modeled after similar analyses from various regions (e.g., Chang (1988), van den Berg (1995), and Bledsoe and Watson (2001)).

Hawley (2009) performed separate logistic regression analyses on incising and braiding systems relative to their stable, unconfined counterparts that returned similar thresholds. In developing this revised screening tool, we combined unstable states of braided or incising into one model for parsimony. Well over 100 total model variations were developed that segregated unstable (braided or incising) channels from stable, single-thread, unconfined, unconstructed channels, using different measures of erosive energy (i.e., dimensionless shear stress, specific stream power, and screening index) and different hydrologic models to estimate the 2- and 10-yr instantaneous peak flow events.

In addition, a large body of previous fluvial geomorphic research suggests that the behavior and response potential of coarse versus fine-grained systems is markedly different (e.g., Chang (1988), Montgomery and MacDonald (2002), and Simons and Simons (1987)). We assessed both combined and separated models, based on different grain-size discriminators between sand-

[3] If d_{50} is clearly greater than 128 mm, there is no need to conduct a pebble count, only visual documentation with photographs and general description of substrate type is recommended.

dominated gravels and gravel/cobble armored systems. Out of 108 total models, all but 6 were significant ($p < 0.05$) with the simplified specific stream power and grain-size surrogate(screening index) regularly performing similarly or superior to the more rigorous indices. Indeed, 5 of the 12 models of the screening index for coarse-size fractions offered complete segregation of unstable/stable sites (i.e., 100% correctly classified). Although that clearly delineates a threshold (Form 3 Table 1 (**Figure 7**)) it precludes using the logistic model to represent risk levels in terms of a range of probabilities. This explains why the 90% and 10% lines converge to the 50% risk level for $d_{50} > 16$ mm in Form 3 Figure 4 (**Figure 7**).

Vertical Flow and Forms

Forms 3: Vertical Susceptibility Field Sheet (**Figure 7**) is used to assess vertical susceptibility. The logical flow of this form is summarized through a series of decisions outlined below:

1) Assess the initial 'state': which of the following (a, b, or c) best describes the bed condition/material
    a. If the bed is Coarse/Armored with $d_{50} > 128$ mm or continuous bedrock/concrete, then Vertical Rating = Low; see Form 3 Figure 1 (**Figure 7**)
    b. If the bed is labile with sand dominated gravels and $d_{50} < 16$ mm, then assess level of incision:
        i. If channel is incised past critical bank height for mass wasting (CEM III or IV), Vertical Rating = Very High; see Form 3 Figure 1 (**Figure 7**) and Form 2 (**Figure 4**)
        ii. If channel is not incised past critical bank height (CEM I or II), assess Grade Control using Form 3 Checklist 2 (**Figure 7**) and Probability of Incision/Braiding using Form 3 Table 1 (**Figure 7**)
            1. If CEM I or II with grade control absent, failing, or spaced at intervals larger than 50 m, AND probability of incising/braiding ≥50%, Vertical Rating = Very High; see Form 3 Figure 1 (**Figure 7**)
            2. If CEM I or II with grade control in good condition and spaced at intervals less than 50 m, OR probability of incising/braiding < 50%, Vertical Rating = High; see Form 3 Figure 1 (**Figure 7**)
    c. If the bed is Intermediate with cobbles and gravels and $16 < d_{50} < 128$ mm or hardpan of uncertain strength, proceed to Form 3 Checklist 1 and 2 (**Figure 7**) to assess Armoring Potential and Grade Control, respectively, and Form 3 Figure 4 (**Figure 7**) to estimate Probability of Incising/Braiding.

FORM 3: VERTICAL SUSCEPTIBILITY FIELD SHEET

Circle appropriate nodes/pathway for proposed site.

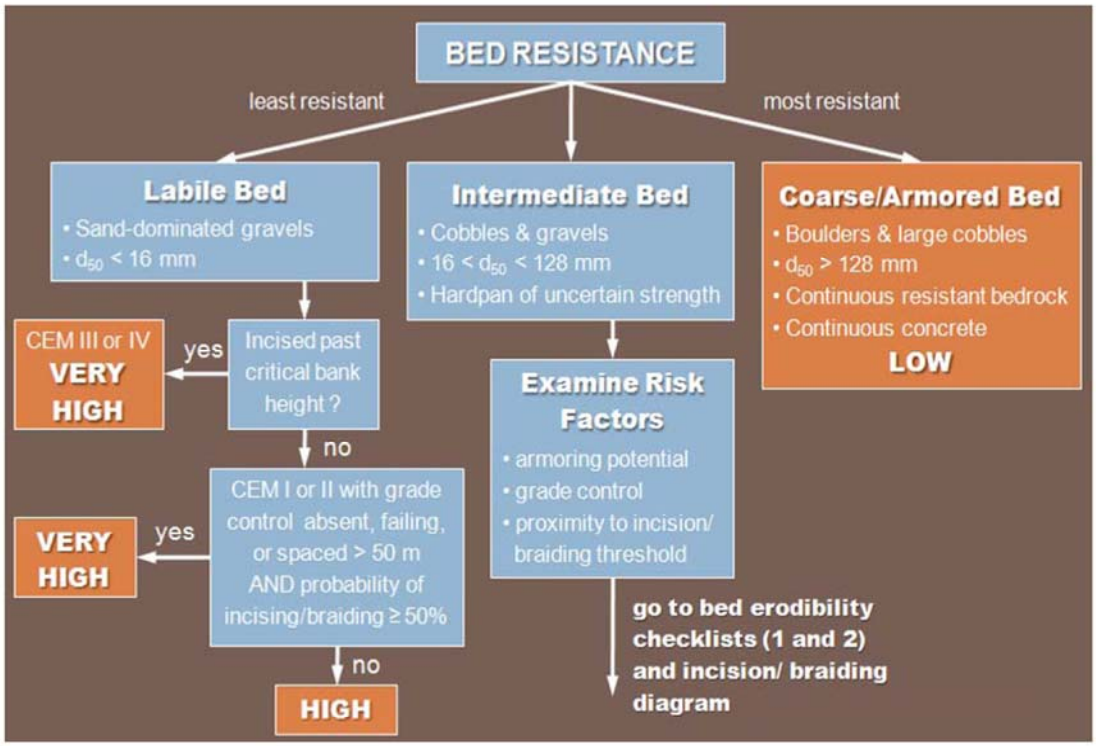

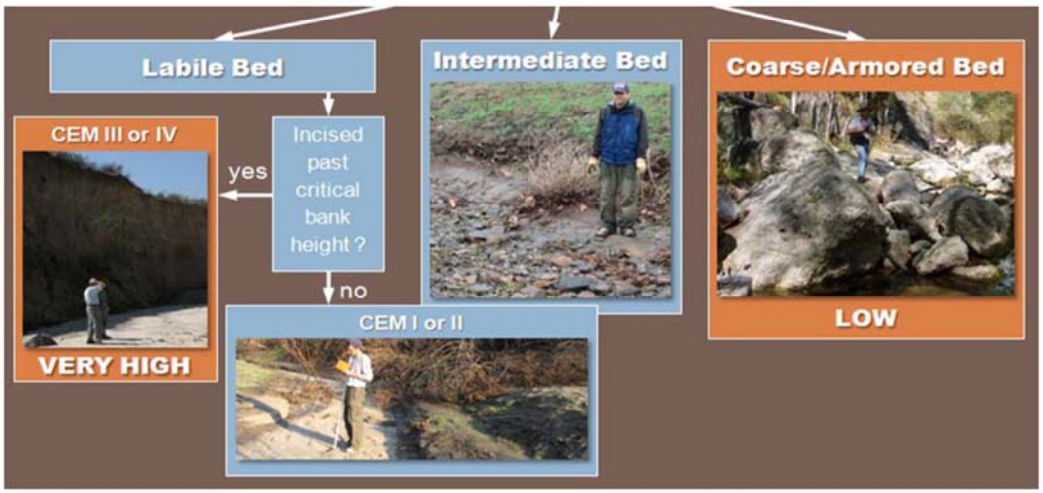

Form 3 Figure 1. Vertical Susceptibility photographic supplement to be used in conjunction with Form 3 Bed Resistance above.

(Sheet 1 of 4)

Figure 7. Form 3: Vertical Susceptibility Field Sheet. Complete set of assessment forms in Appendix B.

Form 3 Support Materials

Form 3 Checklists 1 and 2, along with information recording in Form 3 Table 1, are intended to support the decisions pathways illustrated in Form 3 Overall Vertical Rating for Intermediate/Transitional Bed.

Form 3 Checklist 1: Armoring Potential

☐	A	A mix of coarse gravels and cobbles that are tightly packed with <5% surface material of diameter <2 mm
☐	B	Intermediate to A and C or hardpan of unknown resistance, spatial extent (longitudinal and depth), or unknown armoring potential due to surface veneer covering gravel or coarser layer encountered with probe
☐	C	Gravels/cobbles that are loosely packed or >25% surface material of diameter <2 mm

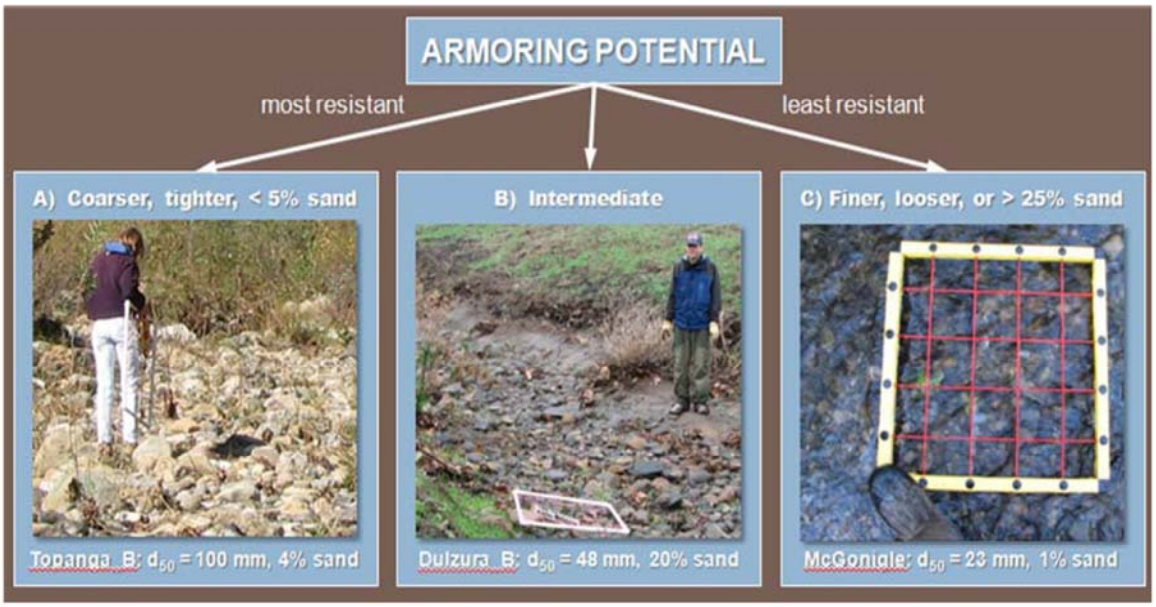

Form 3 Figure 2. Armoring potential photographic supplement for assessing intermediate beds ($16 < d_{50} < 128$ mm) to be used i**n conjunction with Form 3 Checklist 1.**

(Sheet 2 of 4)

Figure 7. Continued

Form 3 Checklist 2: Grade Control

- ☐ A Grade control is present with spacing <50 m or $2/S_v$ m
  - No evidence of failure/ineffectiveness, e.g., no headcutting (>30 cm), no active mass wasting (analyst cannot say grade control sufficient if mass-wasting checklist indicates presence of bank failure), no exposed bridge pilings, no culverts/structures undermined
  - Hard points in serviceable condition at decadal time scale, e.g., no apparent undermining, flanking, failing grout
  - If geologic grade control, rock should be resistant igneous and/or metamorphic; For sedimentary/hardpan to be classified as 'grade control', it should be of demonstrable strength as indicated by field testing such as hammer test/borings and/or inspected by appropriate stakeholder
- ☐ B Intermediate to A and C – artificial or geologic grade control present but spaced 2/Sv m to 4/Sv m or potential evidence of failure or hardpan of uncertain resistance
- ☐ C Grade control absent, spaced >100 m or $>4/S_v$ m, or clear evidence of ineffectiveness

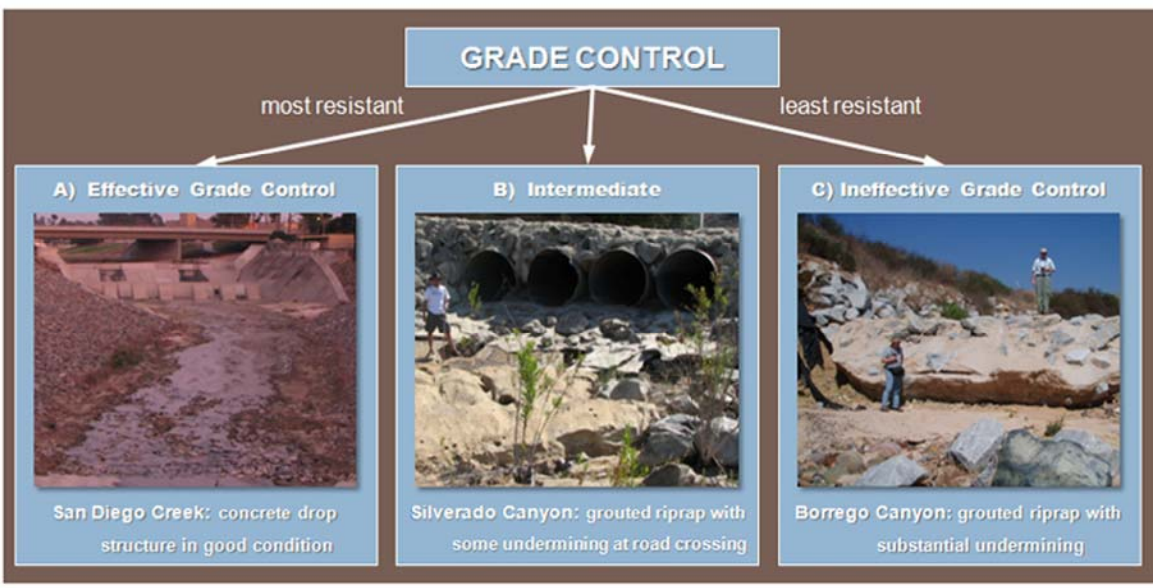

Form 3 Figure 3. Grade-control (condition) photographic supplement for assessing intermediate beds (16 < d_{50} < 128 mm) to be used in conjunction with Form 3 Checklist 2.

(Sheet 3 of 4)

Figure 7. Continued

Regionally-calibrated Screening Index Threshold for Incising/Braiding

For transitional bed channels (d_{50} between 16 and 128 mm) or labile beds (channel not incised past critical bank height), use Form 3 Figure 3 to determine Screening Index Score and complete Form 3 Table 1.

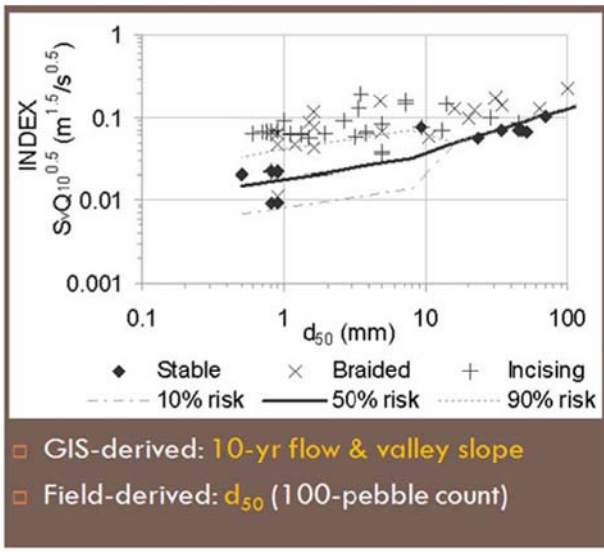

Model Type	d_{50} (mm)	50% Risk $S_vQ_{10}^{0.5}$ ($m^{1.5}/s^{0.5}$)
Logistic Regression $d_{50} \geq 16$ mm	128	0.145
	96	0.125
	80	0.114
	64	0.101
	48	0.087
	32	0.070
	16	0.049
Logistic Reg. $d_{50} < 16$ mm	8	0.031
	4	0.026
	2	0.022
	1	0.018
	0.5	0.015

Form 3 Figure 4. Probability of incising/braiding based on logistic regression of Screening Index and d_{50} to be used in conjunction with Form 3 Table 1.

Form 3 Table 1. Values for Screening Index Threshold (probability of incising/braiding) to be used in conjunction with Form 3 Figure 4 (above) to complete Form 3 Overall Vertical Rating for Intermediate/Transitional Bed (below).. Screening Index Score: A = <50% probability of incision for current Q_{10}, valley slope, and d_{50}; B = Hardpan/d_{50} indeterminate; and C = ≥50% probability of incising/braiding for current Q_{10}, valley slope, and d_{50}.

d_{50} (mm) *From Form 2*	$S_v{*}Q_{10}^{0.5}$ ($m^{1.5}/s^{0.5}$) *From Form 1*	$S_v{*}Q_{10}^{0.5}$ ($m^{1.5}/s^{0.5}$) *50% risk of incising/braiding from table in Form 3 Figure 3 above*	Screening Index Score (A, B, C)

Overall Vertical Rating for Intermediate/Transitional Bed

Calculate the overall Vertical Rating for Transitional Bed channels using the formula below. Numeric values for responses to Form 3 Checklists and Table 1 as follows: A = 3, B = 6, C = 9.

$$Vertical\ Rating = \sqrt{\{(\sqrt{armoring * grade\ control}) * screening\ index\ score\}}$$

Vertical Susceptibility based on Vertical Rating: <4.5 = LOW; 4.5 to 7 = MEDIUM; and >7 = HIGH.

(Sheet 4 of 4)

Figure 7. Continued

Lateral Susceptibility

In terms of lateral stability, there are five primary states of bank characteristics. These states are listed below, roughly in order of most susceptible to least:

- Mass wasting or fluvial erosion/braiding existing and extensive
- Poorly consolidated or unconsolidated with fine/nonresistant toe material
- Poorly consolidated or unconsolidated with coarse/resistant toe material
- Consolidated
- Fully-armored bedrock/engineered reinforcement or fully confined by hillslope

In addition to the present channel state/response and bank materials, there are three primary risk factors used to develop a weight of evidence for lateral susceptibility:

- Valley width index (VWI) from Form 1 (**Figure 2**): a measure of valley bottom width versus reference channel width (calculated in the office) used to assess the potential for lateral movement of the channel; see Forms 4 and 5 (**Figures 12 and 13**, respectively)
- Proximity to a regionally-calibrated bank stability threshold: geotechnical probability diagram based on bank height and angle; see Form 6 (**Figure 14**)
- The Vertical Susceptibility Rating: from Form 3 Sheet 4 of 4 (**Figure 7**)

Lateral Susceptibility Decision Tree

The purpose of the lateral decision tree is to assess the state of the channel banks with a particular focus on the risk of widening. Channels can widen from either bank failure or through fluvial processes such as chute cutoffs, avulsions, and braiding (see Figure A.2 in Appendix A). Widening through fluvial avulsions/active braiding is a relatively straightforward observation. If braiding is not already occurring, the next logical question is to assess the condition of the banks. Banks fail through a variety of mechanisms (see Figures A.4a and A.4b in Appendix A); however, one of the most important distinctions is whether they fail in mass (as many particles) or by fluvial detachment of individual particles. Although much research is dedicated to the combined effects of weakening, fluvial erosion, and mass failure (Beatty 1984, Hooke 1979, Lawler 1992, Thorne 1982), we found it valuable to segregate bank types based on the inference of the dominant failure mechanism (as the management approach may vary based on the dominant failure mechanism).

Conceptual Basis

Cohesive banks have been documented in both flume and field experiments as being much more resistant to fluvial entrainment than non-cohesive banks (Thorne 1982). Despite the fact that most of the banks that observed in southern California had relatively low amounts of cohesion when compared to other US regions, it is generally acknowledged that truly non-cohesive banks are rare in nature given the effective cohesion introduced by pore-water suction even in banks formed in coarse materials (Lawler *et al*. 1997). Furthermore, there was clear evidence of mass wasting at a large number of sites, including the presence of tension cracks and discrete failure surfaces deep within the banks exhibiting corresponding planar, slab, and rotational failures.

Because cohesivity is difficult to assess in the field, Hawley (2009) segregated banks by relative degree of consolidation. Failure in banks composed of recently deposited alluvium with little time to consolidate (i.e., <~10 yrs, unconsolidated) was generally dominated by the resistance of individual particles. Banks composed of much older fluvial deposits with more time to both acquire more cohesive particles and become more consolidated (i.e., well-consolidated) were controlled by mass failure. Intermediate poorly- and moderately-consolidated bank types were generally found to be controlled by mass wasting with the latter and fluvial entrainment with the former; however, the segregation is both subjective and somewhat difficult to determine, especially in stable banks. For the present study, in addition to the current bank condition, we considered key risk factors including 1) the potential for lateral instability triggered by vertical instability, and 2) potential severity of the lateral response based on the available valley width (i.e., how large of a valley bottom is there for the channel to access?).

Lateral Susceptibility Definitions and Forms

- Channel Banks – vertically inclined surfaces that are generally perpendicular to flow and contain approximately the 10-year flow (i.e., the 'walls' of the active channel)

- *Extensive mass wasting* – >50% of banks exhibiting planar, slab, or rotational failures, and/or scalloping, undermining, and/or tension cracks (**Figure 8**)

a) **b)**

Figure 8. Planar/Slab failure with tension cracks, exhibiting cohesive consolidated banks, at San Timetao, San Bernardino County, CA (a) and Acton, Los Angeles County, CA (b).

- *Extensive fluvial erosion* – significant and frequent bank cuts (> 50% of banks) and not limited to bends and constrictions (**Figure 9**)

Figure 9. Bank failure at Hicks Canyon, Orange County, CA, exhibiting combinations of fluvial erosion, shallow slips, and mass failure in weakly cohesive, poorly consolidated banks.

- *Moderately to highly consolidated* – hard when dry with little evidence of crumbling. Bank appears as a composite of tightly-packed particles that are difficult to delineate even with close inspection of the bank; moderately dry block/ped sample (1 in^2) is not crushable between fingers and bank material stratification not prevalent or contributing to failure (**Figure 10**)

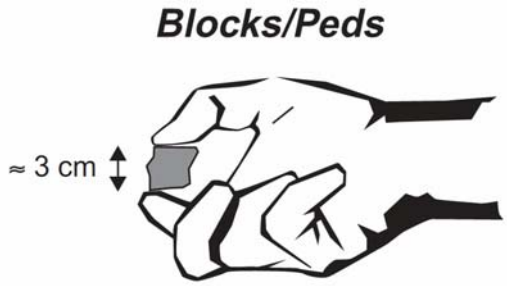

Figure 10. Moderately dry block/ped sample. Figure adapted from Schoeneberger *et al. (*2002); Not to scale.

- *Poorly consolidated to unconsolidated* – relatively weak with evidence of crumbling (**Figure 11**). Bank appears as a loose pile of recently deposited alluvium and block/ped samples (if attainable) can be crushed between fingers

a) b)

Figure 11. Failure of poorly consolidated banks with some cohesivity, but bank stability largely controlled by resistance of the individual particles of the bank toe in Stewart Canyon, Ventura County, CA, (a) and Hasley Canyon, Los Angeles County, CA (b).

In assessing the potential for incision-induced bank failure we selected a vertical rating of high as a key discriminator. This decision was made primarily because such an approach inherently captures braiding risk as channels with high amounts of erosive energy relative to their bed material and >50% risk of incision/braiding using Form 3 Table 1 (**Figure 7**) would most likely result in a vertical rating of high unless exceptionally resistant and well-protected by armoring. We also defined a VWI of 2 as a key discriminator because doing so successfully distinguished between channels with valley bottoms 'confined by bedrock or hillslope' versus unconfined channels in the field data set. Unconfined valley settings were typically well above a VWI of 2.

The Lateral Susceptibility decision tree in Form 4 (**Figure 12**) and the series of questions in Form 5 (**Figure 13**) are provided for use in conducting the lateral susceptibility assessment. Either may be used depending on the user's preference. Definitions and photographic examples above are intended to support the lateral susceptibility assessment.

Additionally, Hawley (2009) performed logistic regression analysis of stable versus mass wasting in moderately- to well-consolidated banks using bank height and angle, consistent with geotechnical stability theory presented by Osman and Thorne (1988). The model was highly significant ($p < 0.0001$) and correctly classified unstable and stable states with ~95% accuracy, as shown in Form 6 (**Figure 14**), using a shape that was analogous to the Culmann relationship. As an alternative, by including the poorly consolidated sites, the model accuracy was ~90% with a lower 50% threshold and a much broader 10 to 90% risk range.

FORM 4: LATERAL SUSCEPTIBILTY FIELD SHEET

Circle appropriate nodes/pathway for proposed site
OR use sequence of questions provided in Form 5.

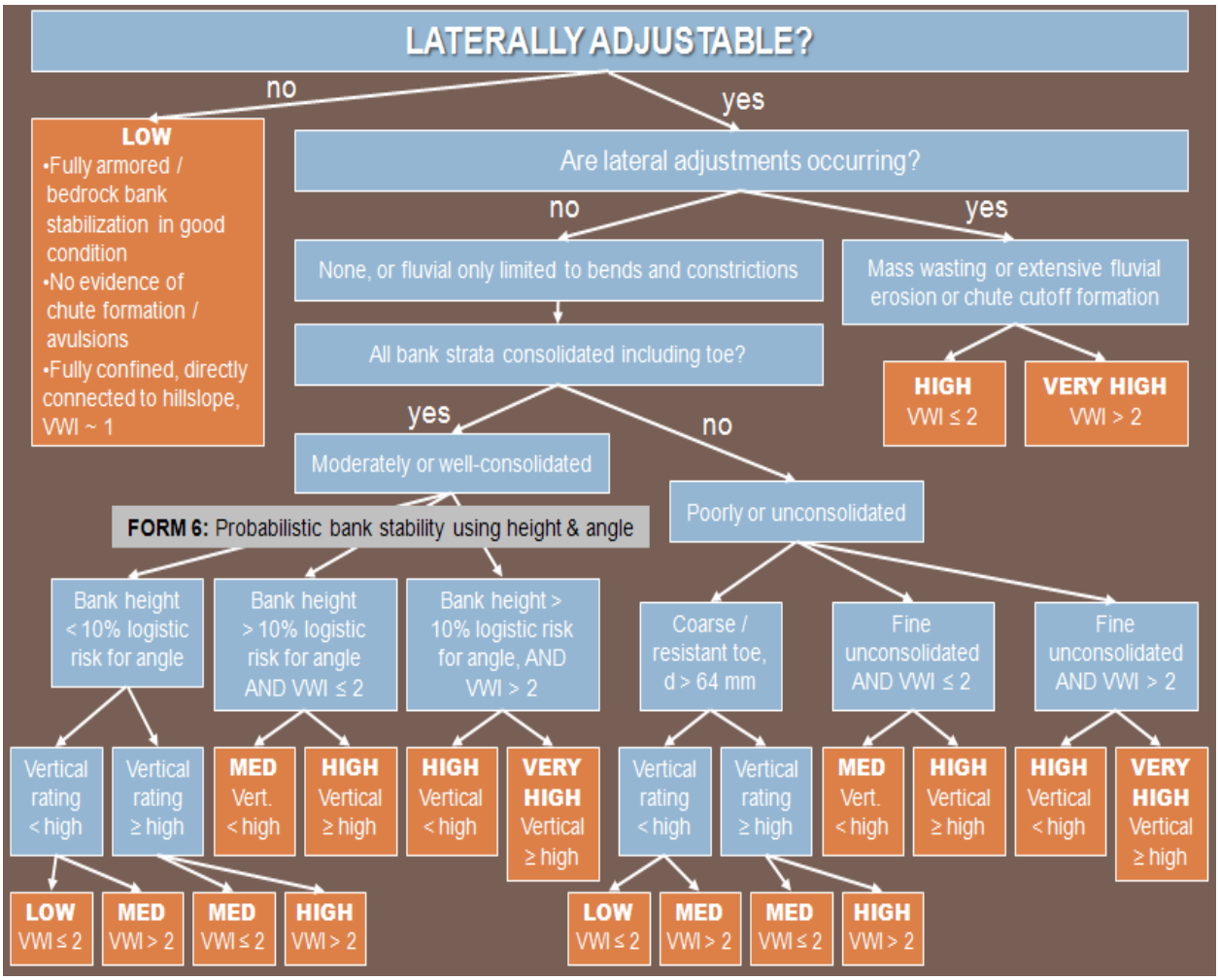

(Sheet 1 of 1)

Figure 12. Form 4: Lateral Susceptibility Field Sheet. Complete set of assessment forms in Appendix B.

FORM 5: SEQUENCE OF LATERAL SUSCEPTIBILITY QUESTIONS OPTION

Enter Lateral Susceptibility (Very High, High, Medium, Low) in shaded column.
Mass wasting and bank instability from Form 6, VWI from Form 4, and Vertical Rating from Form 3.

			Lateral Susceptibility
Channel fully confined with VWI ~1 – connected hillslopes OR fully-armored/engineered bed and banks in good condition?	If YES, then LOW		
If NO, Is there active **mass wasting** or extensive fluvial erosion (> 50% of bank length)?	If YES, VWI ≤ 2 = HIGH, VWI > 2 = VERY HIGH		
If NO, Are both banks consolidated?	If YES, How many risk factors present? **Risk Factors:** o Bank instability p > 10% o VWI > 2 o Vertical rating ≥ High	• All three = VERY HIGH • Two of three = HIGH • One of three = MEDIUM • None = LOW	
If NO, Are banks either consolidated or unconsolidated with coarse toe of d > 64 mm?	If YES, How many risk factors present? **Risk Factors:** o VWI > 2 o Vertical rating ≥ High	• Two = HIGH • One = MEDIUM • None = LOW	
If NO, At least one bank is unconsolidated with toe of d < 64 mm	How many risk factors present? **Risk Factors:** o VWI > 2 o Vertical rating ≥ High	• Two = VERY HIGH • One = HIGH • None = MEDIUM	

(Sheet 1 of 1)

Figure 13. Form 5: Sequence of Lateral Questions Option for lateral susceptibility assessment. Complete set of assessment forms in Appendix B.

FORM 6: PROBABILITY OF MASS WASTING BANK FAILURE

If mass wasting is not currently extensive and the banks are moderately- to well-consolidated, measure bank height and angle at several locations (i.e., at least three locations that capture the range of conditions present in the study reach) to estimate representative values for the reach. Use Form 6 Figure 1 below to determine if risk of bank failure is >10% and complete Form 6 Table 1. Support your results with photographs that include a protractor/rod/tape/person for scale.

	Bank Angle (degrees) *(from Field)*	**Bank Height (m)** *(from Field)*	**Corresponding Bank Height for 10% Risk of Mass Wasting (m)** *(from Form 6 Figure 1 below)*	**Bank Failure Risk** *(<10% Risk)* *(>10% Risk)*
Left Bank				
Right Bank				

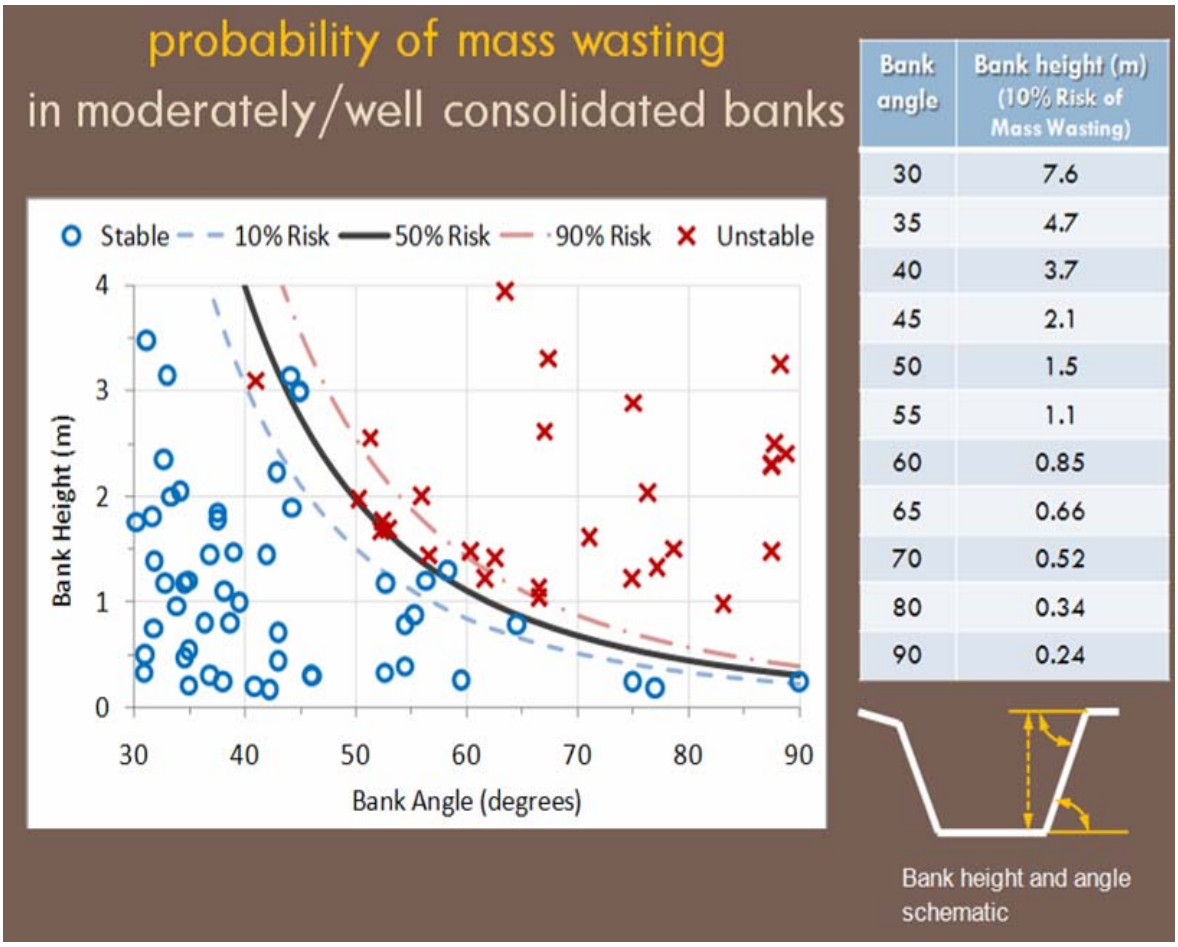

Form 6 Figure 1. Probability Mass Wasting diagram, Bank Angle:Height/% Risk table, and Band Height:Angle schematic.

(Sheet 1 of 1)

Figure 14. Form 6: Probability of Mass Wasting Bank Failure for lateral susceptibility assessment. Complete set of assessment forms in Appendix B.

SUMMARY AND CONCLUSIONS

After completing the initial desktop and field components, the user should return to the office to summarize the reconnaissance information. Some values that were measured in the field may require (or be simplified by) computer assistance (e.g., sorting and ranking the pebble count data to determine the median particle size). A data entry spreadsheet (Data Entry Form.xls) has been provided to automate the necessary calculations from your field data.

At a minimum, we suggest outlining the following aspects from the field reconnaissance:

- Aerial photo of analysis domain with demarcation of reaches assessed and locations of critical features such as hard points, outfalls, changes in valley type, etc.
- A minimum of four photos from each assessed reach
    - Overview/cross-section
    - Representative bed material
    - Representative bank from right and left side of channel
- Applicable Vertical Susceptibility forms and final rating from each assessed reach
- Applicable Lateral Susceptibility forms and final rating from each assessed reach

In depth information describing the development and scientific basis of the field screening tool is provided in SCCWRP Technical Report 607, available at www.sccwrp.org We expect that the field screening tool presented herein will be systematically improved over time through a variety of monitoring and adaptive management activities, as well as through user feedback. Accordingly, comments, questions, and suggestions are welcome and may be submitted to Eric Stein at SCCWRP (**erics@sccwrp.org**) and Brian Bledsoe at CSU (brian.bledsoe@colostate.edu).

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APPENDIX A: GENERAL DEFINITIONS

Click here to open pdf version of Appendix A

APPENDIX A: GENERAL DEFINITIONS

A.1 SUSCEPTIBILITY/SENSITIVITY DEFINITIONS

What is susceptibility?

The *intrinsic* sensitivity of a channel system to hydromodification as determined by the ratio of disturbing to resisting forces, proximity to thresholds of concern, probable rates of response and recovery, and potential for spatial propagation of impacts.

What is sensitivity?

Schumm defined *sensitivity* as:

"One aspect of (landform) singularity that must be treated separately is the sensitivity of landscape components... The reason for such variable response… is the existence of threshold conditions, which when exceeded produce a large change. In contrast, apparently similar landforms may show little or no response to a similar change. Thus, within a landscape composed of singular landforms there will be sensitive and insensitive landforms." Schumm (1985, page 13)

"Sensitivity refers to the propensity of a system to respond to a minor external change. The changes occur at a threshold, which when exceeded produces a significant adjustment. If the system is sensitive and near a threshold it will respond to an external influence; but if it is not sensitive it may not respond." Schumm (1991, page 78)

Downs and Gregory (1995) illustrated *sensitivity* as:

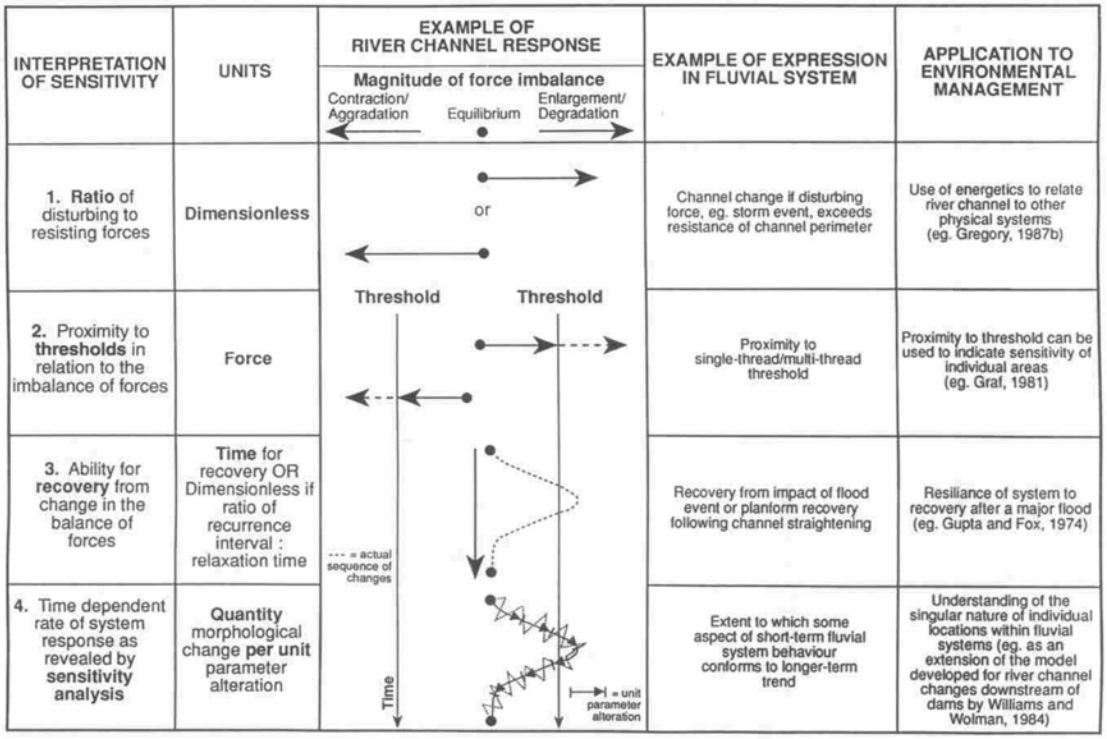

Figure A.1: Interpretation of sensitivity from Downs and Gregory (1995)

We add to this, the potential spatial extent of impacts over a common engineering time scale of *ca*. 50 yrs. That is, some effects may propagate throughout drainage networks relatively quickly and result in headcutting, base-level lowering of tributaries, complex response, etc.

A.2 Braiding Definitions

- Broadest definition: multi-channel patterns (Leopold and Wolman 1957)
- Definition illustrations of sinuosity, braiding, and anabranching (Figure A.2), incision-driven CEM (Figure A.3), bank failure (Figures A.4a and A.4b)
- Flow separated by bars within a defined channel, where bars (Knighton 1998):
  - may be inundated at higher flows, appearing as a single channel at/near 'bankfull'
  - tend to be unvegetated, temporary, with little cohesion
- Characterized by repeated division and joining of channels (i.e., divergence and convergence of flow) resulting in high rates of fluvial activity relative to other rivers (Knighton 1998)

- Non-cohesive floodplains with braid-channel accretion as the main sediment accretion mechanism (Nanson and Croke 1992)

- Informed by the aforementioned definitions, we classify 'braided' channels for the purposes of this screening tool as:

  ➔ ***Multiple flow paths through over 50% of the reach length at low to moderate flows (see 35 – 65% 'degree of braiding', Figure A.2)***

  ➔ ***OR, if stakeholders are not concerned about 'anastomosing'/ 'anabranching' systems, augment above with: where paths are temporary and the result of dynamic, mostly unvegetated/non-cohesive bars***

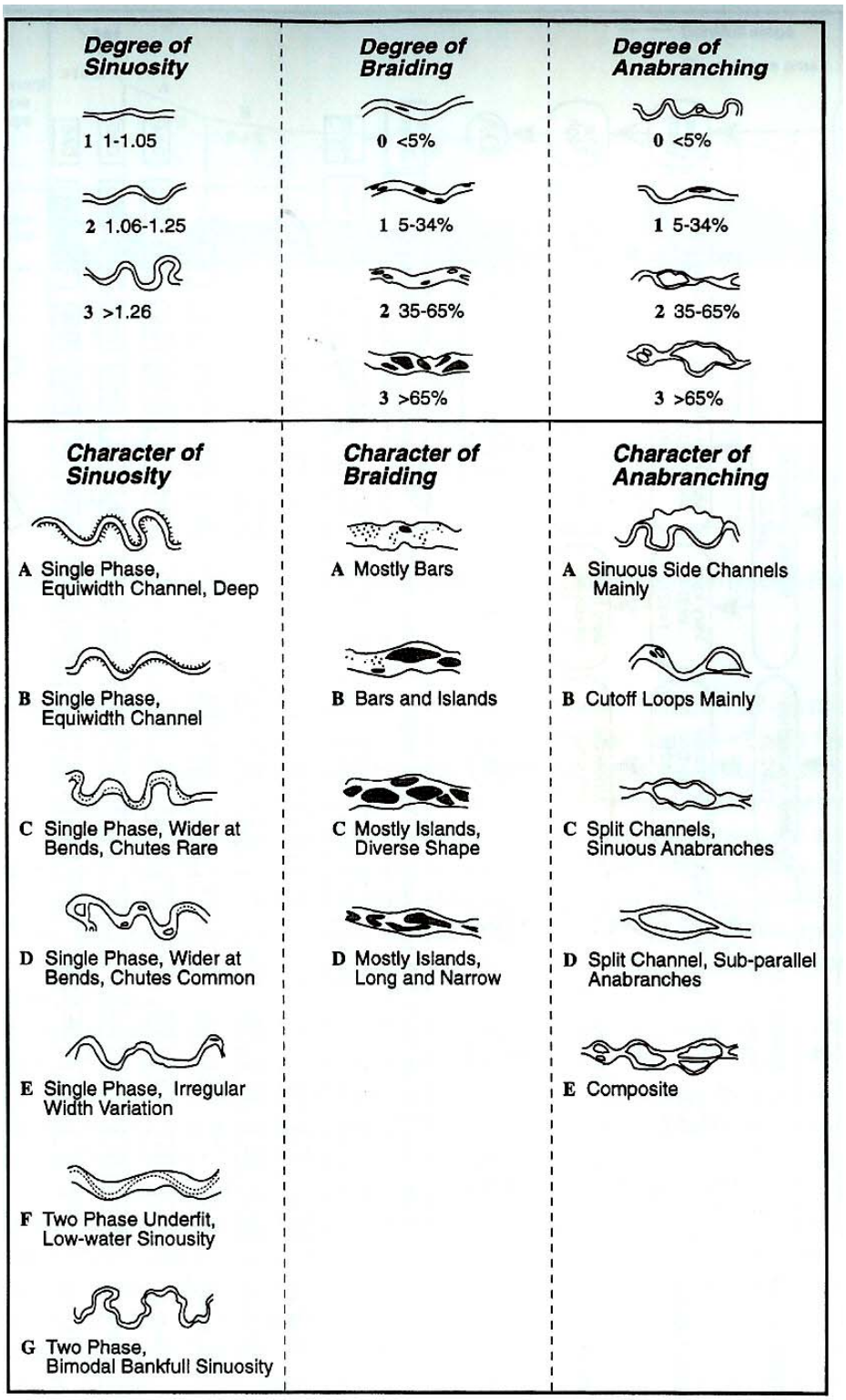

Figure A.2: Illustration of sinuosity, braiding, and anabranching (from Brice (1960, 1964))

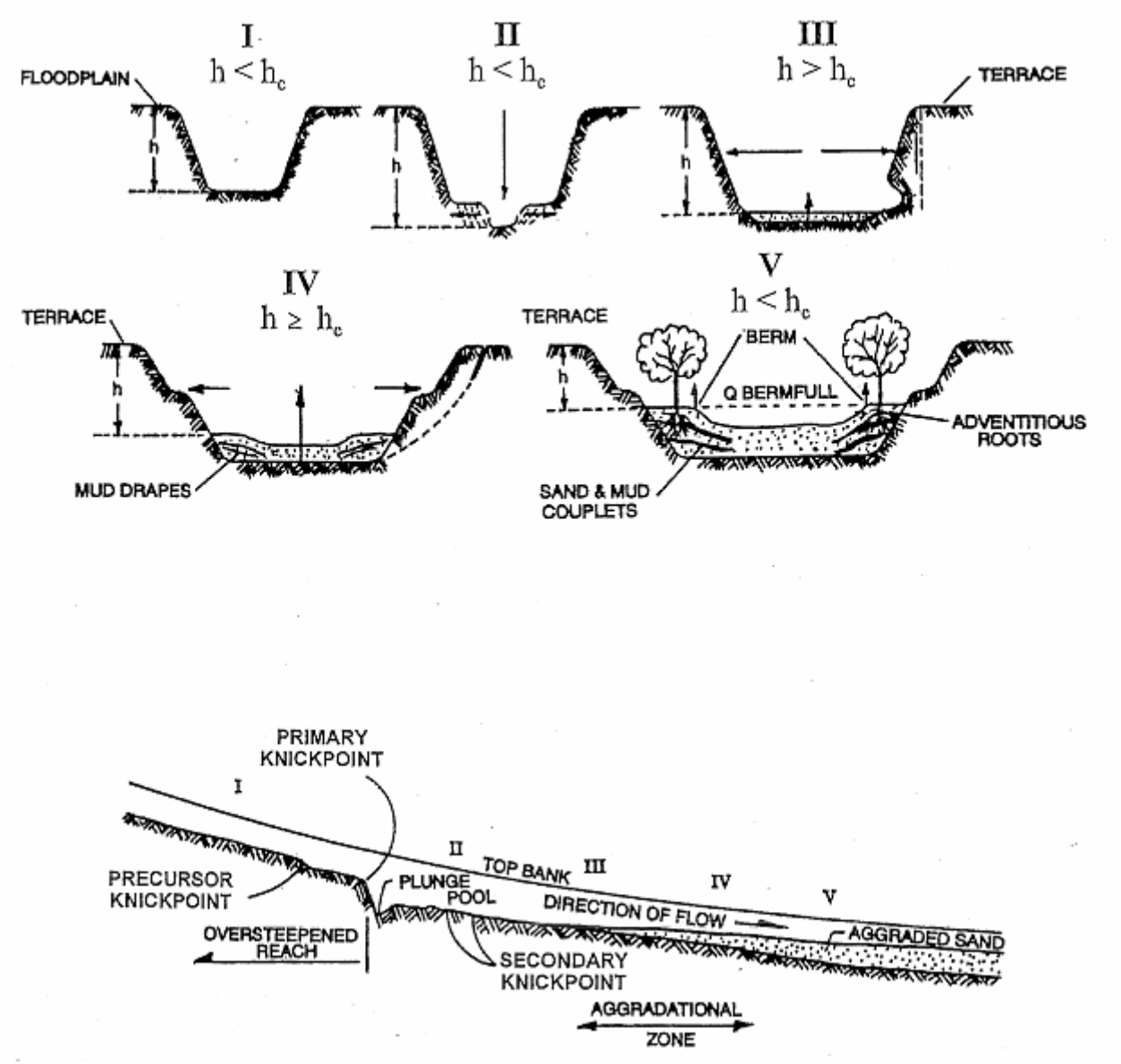

h_c = critical bank height for mass failure

Figure A.3: Incision-driven CEM after Schumm *et al.* (1984); figure adapted from Watson *et al*. (2002)

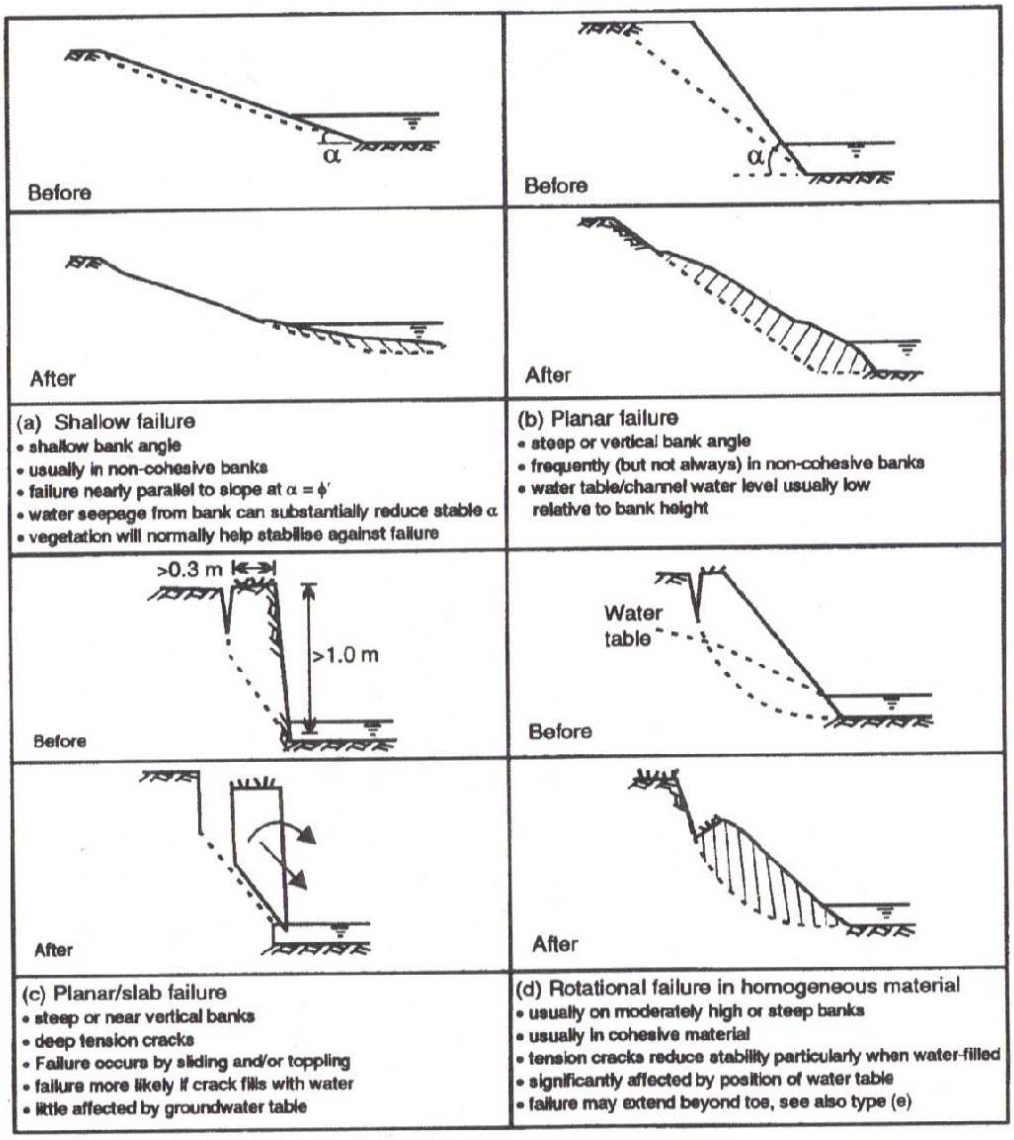

Figure A.4a: Bank-failure illustrations (a through d) after Hey *et al.* (1991); figure adapted from Lawler *et al.* (1997)

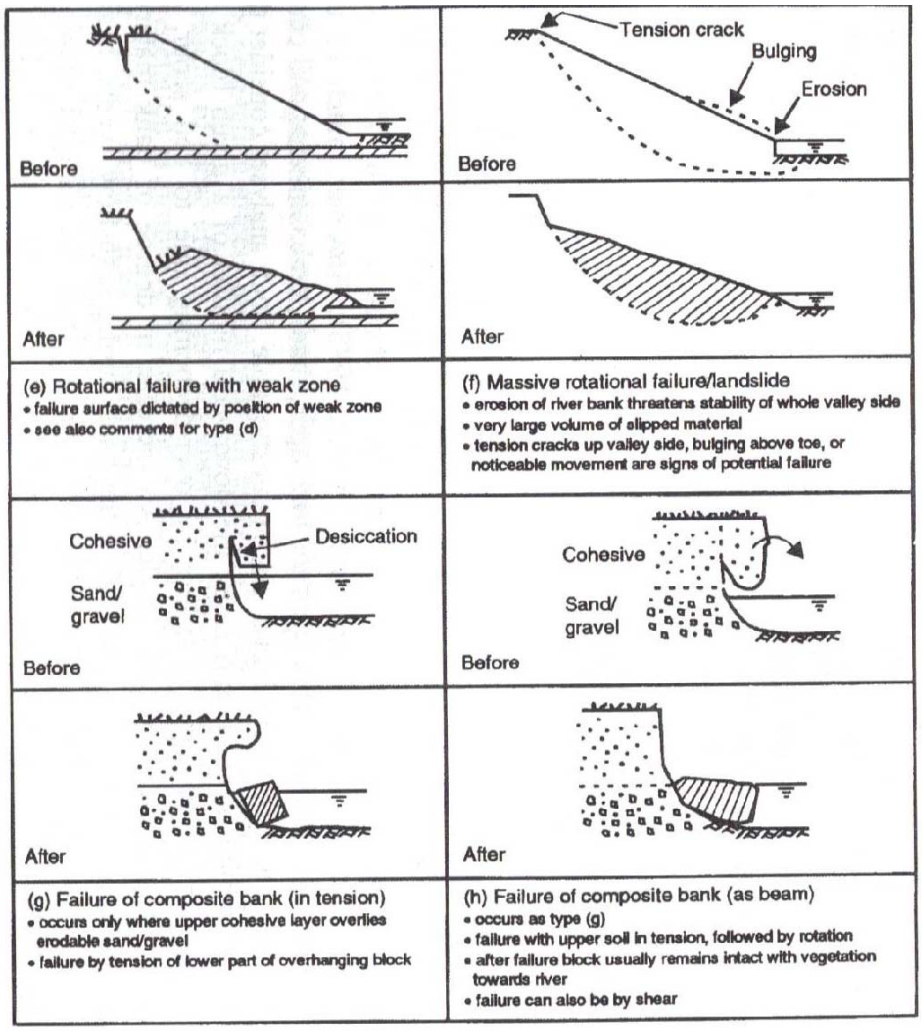

Figure A.4b: Bank-failure illustrations (e through h) after Hey *et al.* (1991); figure adapted from Lawler *et al.* (1997)

A.3 PEBBLE COUNT INSTRUCTIONS

Sampling with a frame – Excerpt from Bunte and Abt, 2001b:

"A tape measure is stretched from bank to bank. The sampling frame is placed onto the stream bottom so that one of the corners aligns with even-spaced marks on the tape, e.g., every three feet or one meter. Grid points derived by the elastic bands are used to visually define the particle to be selected. If the flow is deep and fast, and vision is blurred, looking at the grid intersection can help identify the particle to be included in the sample. If, for example, the grid intersection is between two cobbles, the operator knows that a small interstitial particle should be selected, but neither of the cobbles.

If flow is too deep or too fast to see the particle under the grid intersection, the particle to be included in the sample has to be identified by touch. A pointed index finger is placed in a corner of the grid intersection, and vertically lowered onto the sediment surface. The grid intersection serves as a guide for the position of the finger as it is lowered to the bed surface. Using the grid intersection as a reference point as opposed to the tip of the boot helps the operator select a particle more representatively because the operator works in a more comfortable posture when bending down to the sampling frame as opposed to bending down to the tip of the boot. The elastic bands in the sampling frame do not hinder the removal of a particle from the streambed. Particles are collected from under all four grid points, measured with a template, and placed back approximately into the same position from which they were taken. The frame is then moved to the next position along the tape. For many coarse gravel-bed rivers, a 30-cm grid within a 60 by 60 cm frame placed at 1 m, or 3 feet increments along the tape will be adequate. The sampling frame can be used on both sides of a transect. Individual transects should be 3 - 4 m apart to avoid overlap between sampled areas."

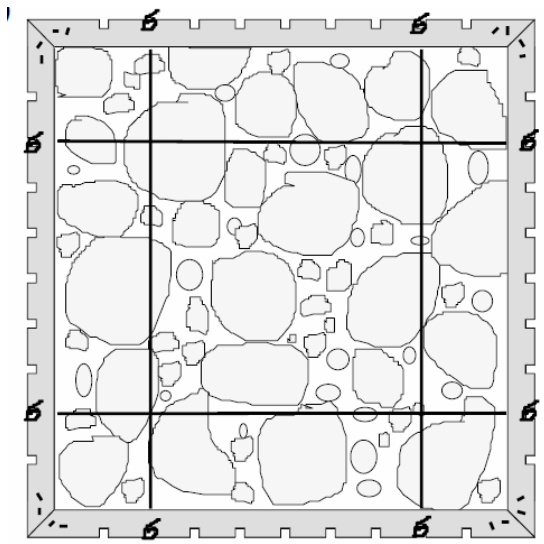

Figure A.5: Pebble Count Sampling Frame and Instructions from Bunte and Abt (2001b)

APPENDIX B: ASSESSMENT FORMS

Click here to open pdf version of Appendix B

APPENDIX B: ASSESSMENT FORMS

Overview

This appendix compiles the field forms necessary to conduct the field susceptibility analysis. The field assessment uses a combination of relatively simple, but quantitative field, indicators as input parameters to a set of decision trees. The decision trees follow a logical progression and allow users to assign a classification of Low, Medium, High, or Very High susceptibility rating to the reach being assessed. Each stream reach is assessed independently in terms of its vertical and lateral susceptibility.

The susceptibility assessment consists of the following steps:

1. Determine the **Analysis Domain**
2. Conduct the initial **Office Assessment**
3. Rate the **Vertical Susceptibility** of the stream reach
4. Rate the **Horizontal Susceptibility** of the stream reach

The following forms and instructions provided to conduct these assessments include:

- Instruction on determining Analysis Domain
- Office Assessment Forms
  - Form 1: Initial Desktop Analysis
  - Form 2: Pebble Count
    - Example coverage and substrate sizing guidance
  - Form 3: Vertical Susceptibility Field Sheet
    - Checklist 1: Armoring Potential
    - Checklist 2: Grade Control
    - Probability of Incising/Braiding Diagram and Screening Index Threshold Calculations
    - Overall Vertical Susceptibility Decision Tree
  - Form 4: Lateral Susceptibility Field Sheet
  - Form 5: Sequence of Lateral Susceptibility Questions Option
  - Form 6: Probability of Mass Wasting Bank Failure

In order to complete the field assessment, the following items should be taken to the field:

- Additional forms and/or field book for sketches/notes
- Digital camera for photographic documentation
- Pocket rod and/or tape for some basic measurements and reference/scale in photographs
- Protractor (e.g., gravity-driven) for measuring bank angle
- Gravelometer (i.e., US SAH-97 half-phi template) for standardized pebble count

Analysis Domain

Prior to initiating the assessment, it is necessary to define the domain of analysis that will be covered. The maximum spatial unit for assigning a susceptibility rating is defined as a *ca.* 20 channel width 'reach' not to exceed 200 m. Before conducting the field screening, the analyst should identify the following attributes as part of the office analysis to estimate the maximum extent of the analysis domain for field refinement.

Begin by defining the points or zones along the channel reach(es) where changes in discharge or channel type are likely to occur (e.g., potential locations of outfalls or tributary inputs). Document any observed outfalls for final desktop synthesis and define the upstream and downstream extents of analysis as follows:

- **Downstream** – until reaching the closest of the following:
  - at least one reach downstream of the first grade-control point (but preferably the second downstream grade-control location)
  - tidal backwater/lentic waterbody
  - equal order tributary (Strahler 1952)[1]
  - a 2-fold increase in drainage area[2]

OR demonstrate sufficient flow attenuation through existing hydrologic modeling

- **Upstream** – extend the domain upstream for a distance equal to 20 channel widths OR to grade control in good condition – whichever comes first. Within that reach, identify hard points that could check headward migration, evidence that head cutting is active or could propagate unchecked upstream

Within the analysis domain there may be several reaches that should be assessed independently based on either length or change in physical characteristics. In more urban settings, segments may be logically divided by road crossings (Chin and Gregory, 2005), which may offer grade control, cause discontinuities in the conveyance of water or sediment, etc. In more rural settings, changes in valley/channel type, natural hard points, and tributary confluences may be more appropriate for delineating assessment reaches. In general, the following criteria should trigger delineation of a new reach and hence a separate susceptibility assessment:

- 200 m or ca. 20 bankfull widths – it is difficult to integrate over longer distances
- Distinct or abrupt change in grade or slope due to either natural or artificial features
- Distinct or abrupt change in dominant bed material or sediment conveyance
- Distinct or abrupt change in valley setting or confinement
- Distinct or abrupt change in channel type, bed form, or planform

Assessment Forms

Assessment Forms 1 - 6, beginning on the next page, have been collected for printing as a group.

[1] In the absence of proximate downstream grade control or backwater, the confluence of an 'equal order tributary' should correspond to substantial increases in flow and channel capacity that should, in theory, correspond to significant flow attenuation; however, there is no scientific basis to assume that downstream channels of higher stream order are less susceptible than their upstream counterparts. This (practically-driven) guidance should not supersede the consideration of local conditions and sound judgment. Stakeholders may elect to use a more regionally-preferred guidance.

[2] An increase in drainage area greater than or equal to 100% would roughly correspond to the addition of an equal-order tributary (see above).

FORM 1: INITIAL DESKTOP ANALYSIS

Complete all shaded sections.

IF required at multiple locations, circle one of the following site types:

Applicant Site / Upstream Extent / Downstream Extent

Location: Latitude: _____ Longitude: _____

Description (river name, crossing streets, etc.): _____

GIS Parameters: The International System of Units (SI) is used throughout the assessment as the field standard and for consistency with the broader scientific community. However, as the singular exception, US Customary units are used for contributing drainage area (A) and mean annual precipitation (P) to apply regional flow equations after the USGS. See SCCWRP Technical Report 607 for example measurements and "Screening Tool Data Entry.xls" for automated calculations.

Form 1 Table 1. Initial desktop analysis in GIS.

	Symbol	Variable	Description and Source	Value
Watershed properties (English units)	**A**	Area (mi^2)	Contributing drainage area to screening location via published Hydrologic Unit Codes (HUCs) and/or ≤ 30 m National Elevation Data (NED), USGS seamless server	
	P	Mean annual precipitation (in)	Area-weighted annual precipitation via USGS delineated polygons using records from 1900 to 1960 (which was more significant in hydrologic models than polygons delineated from shorter record lengths)	
Site properties (SI units)	**S_v**	Valley slope (m/m)	Valley slope at site via NED, measured over a relatively homogenous valley segment as dictated by hillslope configuration, tributary confluences, etc., over a distance of up to ~500 m or 10% of the main-channel length from site to drainage divide	
	W_v	Valley width (m)	Valley bottom width at site between natural valley walls as dictated by clear breaks in hillslope on NED raster, irrespective of potential armoring from floodplain encroachment, levees, etc. (imprecise measurements have negligible effect on rating in wide valleys where VWI is >> 2, as defined in lateral decision tree)	

Form 1 Tabl e 2. Simplif ied peak flo w, screening index, and valley width index. Values for this table should be calculated in the sequence shown in this table, using values from Form 1 Table 1.

Symbol	Dependent Variable	Equation	Required Units	Value
Q_{10cfs}	10-yr peak flow (ft^3/s)	$Q_{10cfs} = 18.2 * A^{0.87} * P^{0.77}$	A (mi^2) P (in)	
Q_{10}	10-yr peak flow (m^3/s)	$Q_{10} = 0.0283 * Q_{10cfs}$	Q_{10cfs} (ft^3/s)	
INDEX	10-yr screening index ($m^{1.5}/s^{0.5}$)	$INDEX = S_v * Q_{10}^{0.5}$	Sv (m/m) Q_{10} (m^3/s)	
W_{ref}	Reference width (m)	$W_{ref} = 6.99 * Q_{10}^{0.438}$	Q_{10} (m^3/s)	
VWI	Valley width index (m/m)	$VWI = W_v/W_{ref}$	W_v (m) W_{ref} (m)	

(Sheet 1 of 1)

FORM 2: PEBBLE COUNT

If it is necessary to estimate d_{50}, perform a pebble count, after Bunte and Abt (2001a,b), using a minimum of 100 particles and a standard half-phi template, or by measuring along the intermediate axis of each pebble. Use a grid and tape for equally spaced samples over systematic/complete transects across riffle sections (i.e., if the 100th particle is in the middle of a transect, complete the full transect before stopping the count; if more than 125 particles, record data near the bottom of Sheet 2 of 2). If the source of fines (sand/silt d <2 mm; see Form 2 Table 2 below) is less than ½ inch thick (approximately one finger width) at the sampling point, sample the coarser buried substrate; otherwise record observation of fines. Take photographs to support observations (Detailed instructions in Appendix A.3).

Form 2 Table 1. 100-pebble count tabulation for Vertical Susceptibility. Record station (Sta) and diameter (d) in millimeters.

#	Sta	d (mm)	#	Sta	d (mm)	#	Sta	d (mm)	#	Sta	d (mm)	#	Sta	d (mm)
1			26			51			76			101		
2			27			52			77			102		
3			28			53			78			103		
4			29			54			79			104		
5			30			55			80			105		
6			31			56			81			106		
7			32			57			82			107		
8			33			58			83			108		
9			34			59			84			109		
10			35			60			85			110		
11			36			61			86			111		
12			37			62			87			112		
13			38			63			88			113		
14			39			64			89			114		
15			40			65			90			115		
16			41			66			91			116		
17			42			67			92			117		
18			44			68			93			118		
19			44			69			94			119		
20			45			70			95			120		
21			46			71			96			121		
22			47			72			97			122		
23			48			73			98			123		
24			49			74			99			124		
25			50			75			100			125		

Form 2 Table 2. d_{50} for Screening Index Threshold.

Class Name	Diameter (mm)	Helpful Descriptions for Field Identification
Boulder	> 256	Difficult to lift by hand
Cobble	> 64	Typically able to lift
Gravel	> 2	Fits in one hand
Sand	> 0.0625	Can feel between fingers
Silt	> 0.004	Can feel with tongue
Clay	≤ 0.004	Can not feel individual particle

(Sheet 1 of 2)

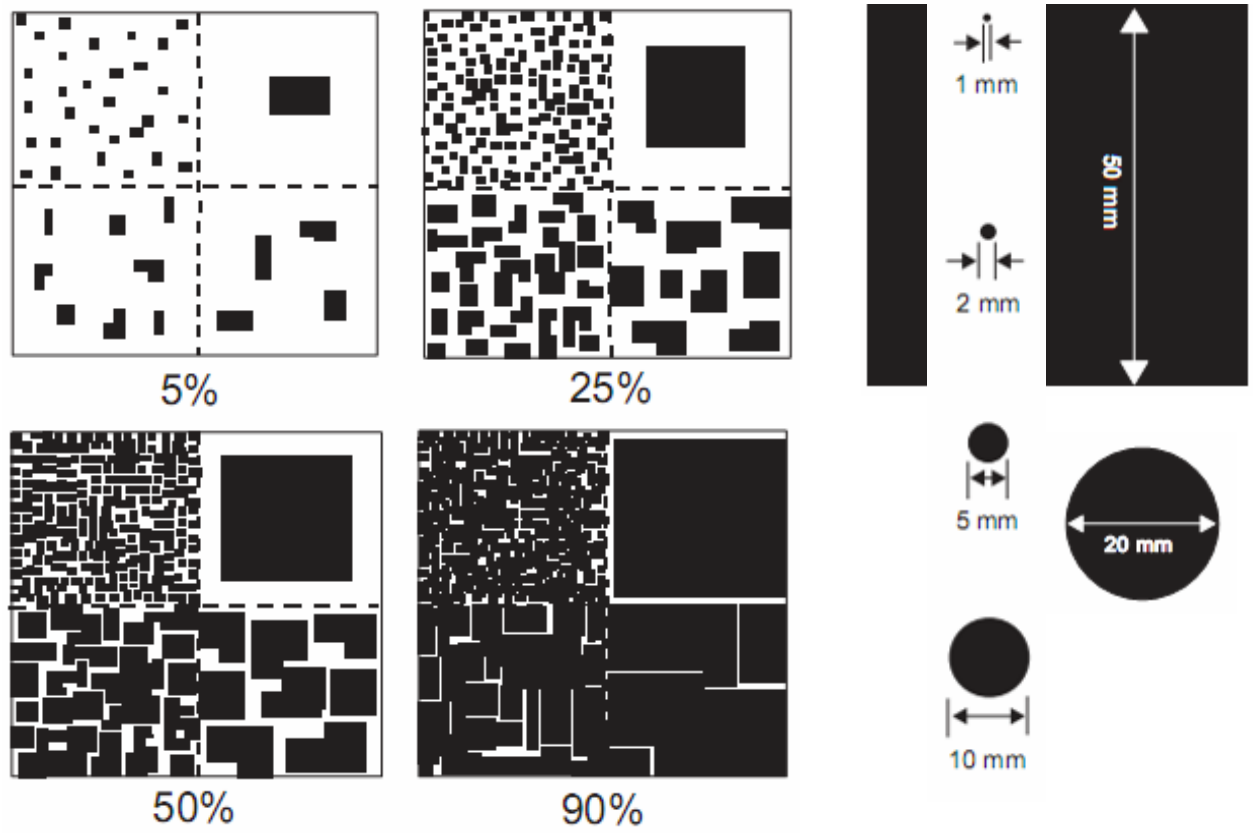

Note: Each quadrant within each box contains the same total area covered using different sized objects.

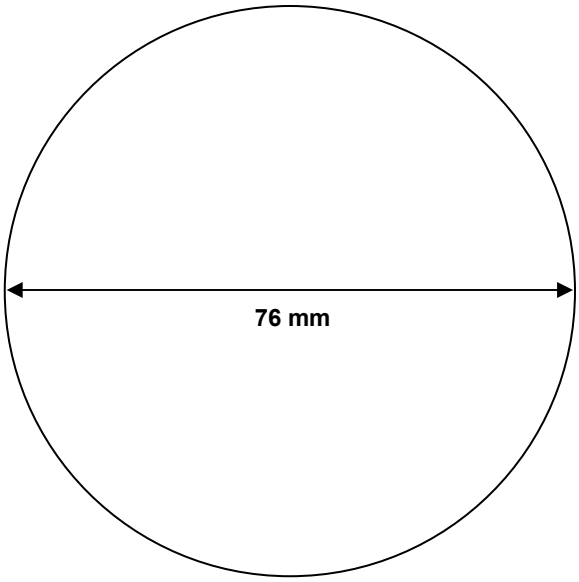

Form 2 Figure 1. Examples of % coverage by volume and substrate sizing adapted from *NRCS Field Book for Describing and Sampling Soils* (Schoeneberger *et al.* 2002) and Julien (1998).

(Sheet 2 of 2)

FORM 3: VERTICAL SUSCEPTIBILITY FIELD SHEET

Circle appropriate nodes/pathway for proposed site.

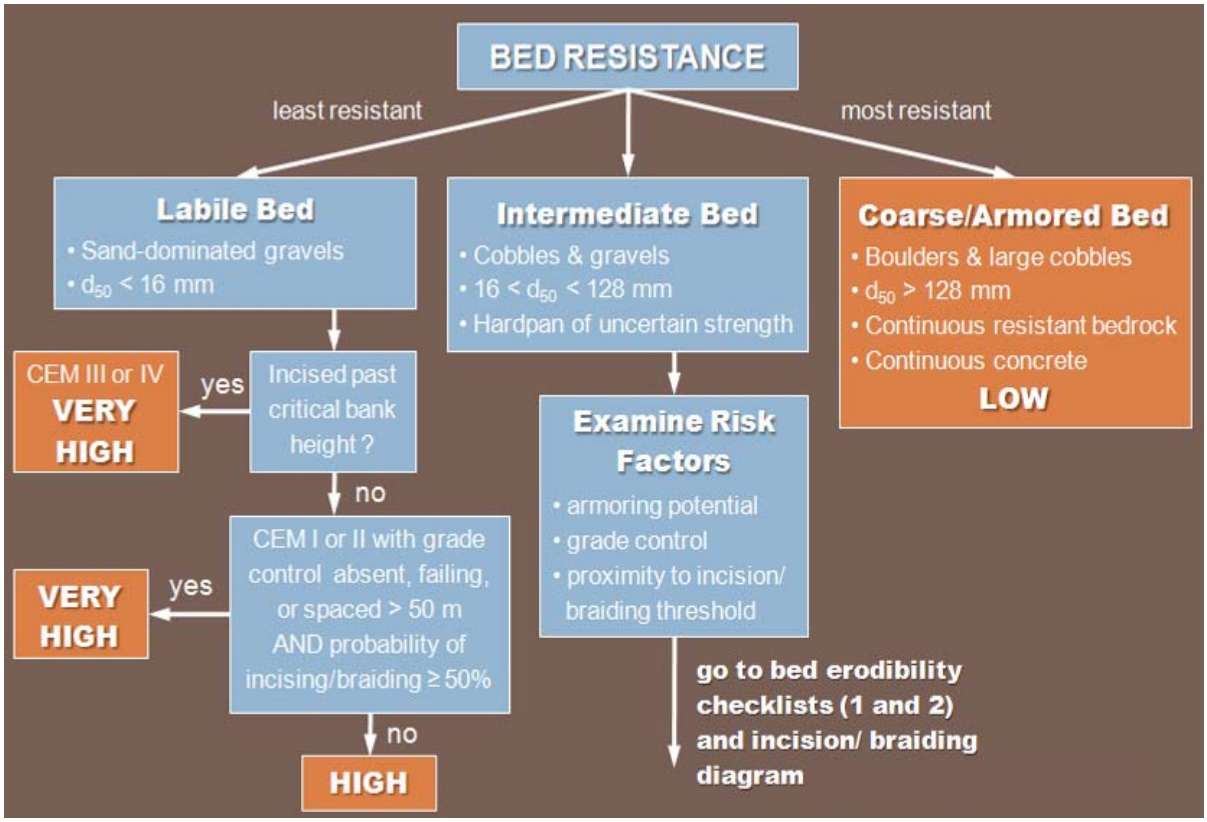

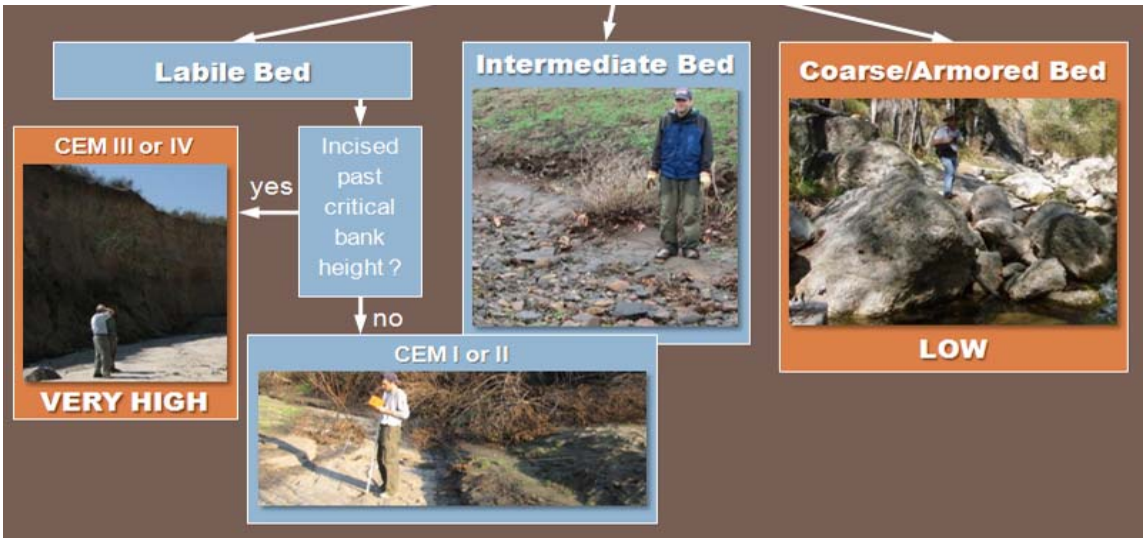

Form 3 Figure 1. Vertical Susceptibility photographic supplement to be used in conjunction with Form 3 Bed Resistance above.

(Sheet 1 of 4)

Form 3 Support Materials

Form 3 Checklists 1 and 2, along with information recording in Form 3 Table 1, are intended to support the decisions pathways illustrated in Form 3 Overall Vertical Rating for Intermediate/Transitional Bed.

Form 3 Checklist 1: Armoring Potential

□	A	A mix of coarse gravels and cobbles that are tightly packed with <5% surface material of diameter <2 mm
□	B	Intermediate to A and C or hardpan of unknown resistance, spatial extent (longitudinal and depth), or unknown armoring potential due to surface veneer covering gravel or coarser layer encountered with probe
□	C	Gravels/cobbles that are loosely packed or >25% surface material of diameter <2 mm

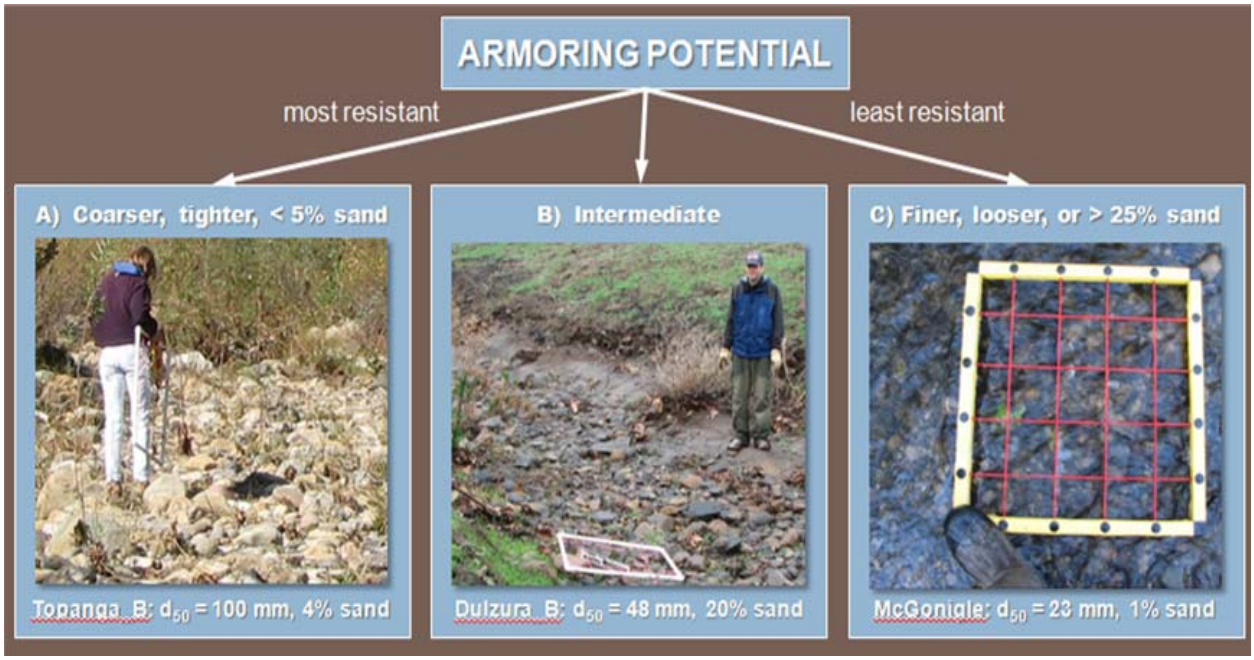

Form 3 Figure 2. Armoring potential photographic supplement for assessing intermediate beds (16 < d_{50} < 128 mm) to be used i**n conjunction with Form 3 Checklist 1.**

(Sheet 2 of 4)

Form 3 Checklist 2: Grade Control

□ A Grade control is present with spacing <50 m or $2/S_v$ m

- No evidence of failure/ineffectiveness, e.g., no headcutting (>30 cm), no active mass wasting (analyst cannot say grade control sufficient if mass-wasting checklist indicates presence of bank failure), no exposed bridge pilings, no culverts/structures undermined
- Hard points in serviceable condition at decadal time scale, e.g., no apparent undermining, flanking, failing grout
- If geologic grade control, rock should be resistant igneous and/or metamorphic; For sedimentary/hardpan to be classified as 'grade control', it should be of demonstrable strength as indicated by field testing such as hammer test/borings and/or inspected by appropriate stakeholder

□ B Intermediate to A and C – artificial or geologic grade control present but spaced 2/Sv m to 4/Sv m or potential evidence of failure or hardpan of uncertain resistance

□ C Grade control absent, spaced >100 m or $>4/S_v$ m, or clear evidence of ineffectiveness

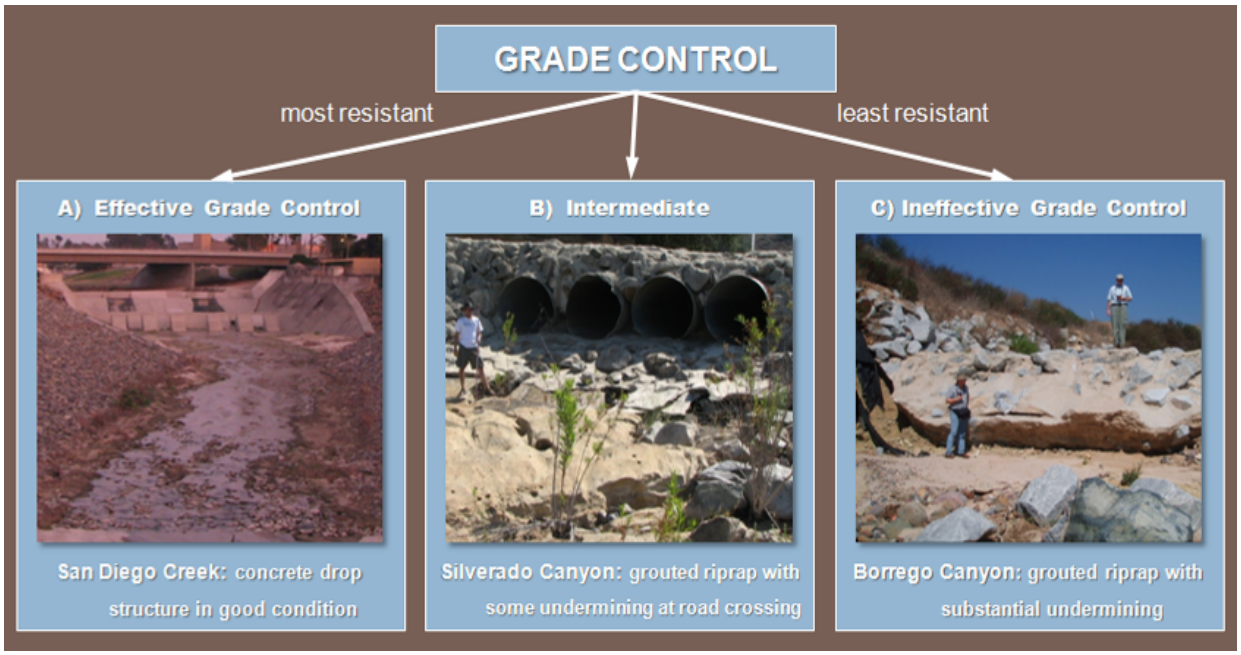

Form 3 Figure 3. Grade-control (condition) photographic supplement for assessing intermediate beds (16 < d_{50} < 128 mm) to be used in conjunction with Form 3 Checklist 2.

(Sheet 3 of 4)

Regionally-Calibrated Screening Index Threshold for Incising/Braiding

For transitional bed channels (d_{50} between 16 and 128 mm) or labile beds (channel not incised past critical bank height), use Form 3 Figure 3 to determine Screening Index Score and complete Form 3 Table 1.

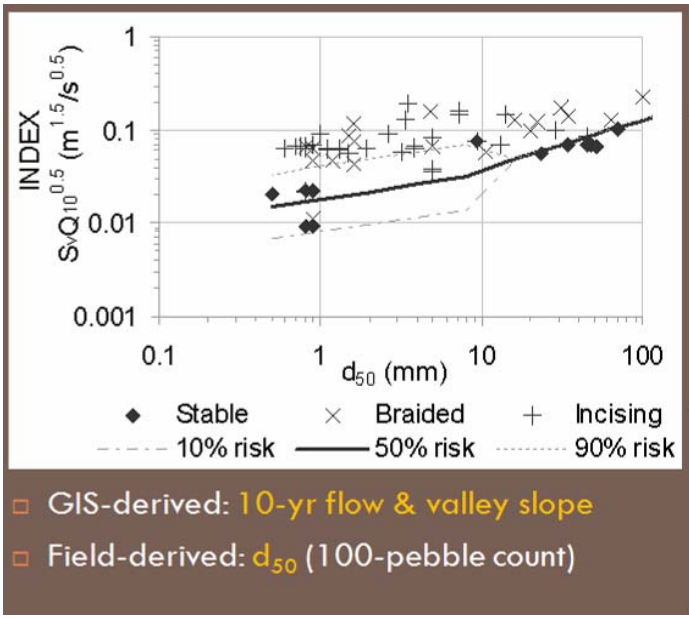

Model Type	d_{50} (mm)	50% Risk $S_vQ_{10}^{0.5}$ ($m^{1.5}/s^{0.5}$)
Logistic Regression $d_{50} \geq 16$ mm	128	0.145
	96	0.125
	80	0.114
	64	0.101
	48	0.087
	32	0.070
	16	0.049
Logistic Reg. $d_{50} < 16$ mm	8	0.031
	4	0.026
	2	0.022
	1	0.018
	0.5	0.015

Form 3 Figure 4. Probability of incising/braiding based on logistic regression of Screening Index and d_{50} to be used in conjunction with Form 3 Table 1.

Form 3 Table 1. Values for Screening Index Threshold (probability of incising/braiding) to be used in conjunction with Form 3 Figure 4 (above) to complete Form 3 Overall Vertical Rating for Intermediate/Transitional Bed (below).. Screening Index Score: A = <50% probability of incision for current Q_{10}, valley slope, and d_{50}; B = Hardpan/d_{50} indeterminate; and C = ≥50% probability of incising/braiding for current Q_{10}, valley slope, and d_{50}.

d_{50} (mm) *From Form 2*	S_v*$Q_{10}^{0.5}$ ($m^{1.5}/s^{0.5}$) *From Form 1*	S_v*$Q_{10}^{0.5}$ ($m^{1.5}/s^{0.5}$) *50% risk of incising/braiding from table in Form 3 Figure 3 above*	Screening Index Score (A, B, C)

Overall Vertical Rating for Intermediate/Transitional Bed

Calculate the overall Vertical Rating for Transitional Bed channels using the formula below. Numeric values for responses to Form 3 Checklists and Table 1 as follows: A = 3, B = 6, C = 9.

$$Vertical\ Rating = \sqrt{\{(\sqrt{armoring * grade\ control}) * screening\ index\ score\}}$$

Vertical Susceptibility based on Vertical Rating: <4.5 = LOW; 4.5 to 7 = MEDIUM; and >7 = HIGH.

(Sheet 4 of 4)

FORM 4: LATERAL SUSCEPTIBILTY FIELD SHEET

Circle appropriate nodes/pathway for proposed site
OR use sequence of questions provided in Form 5.

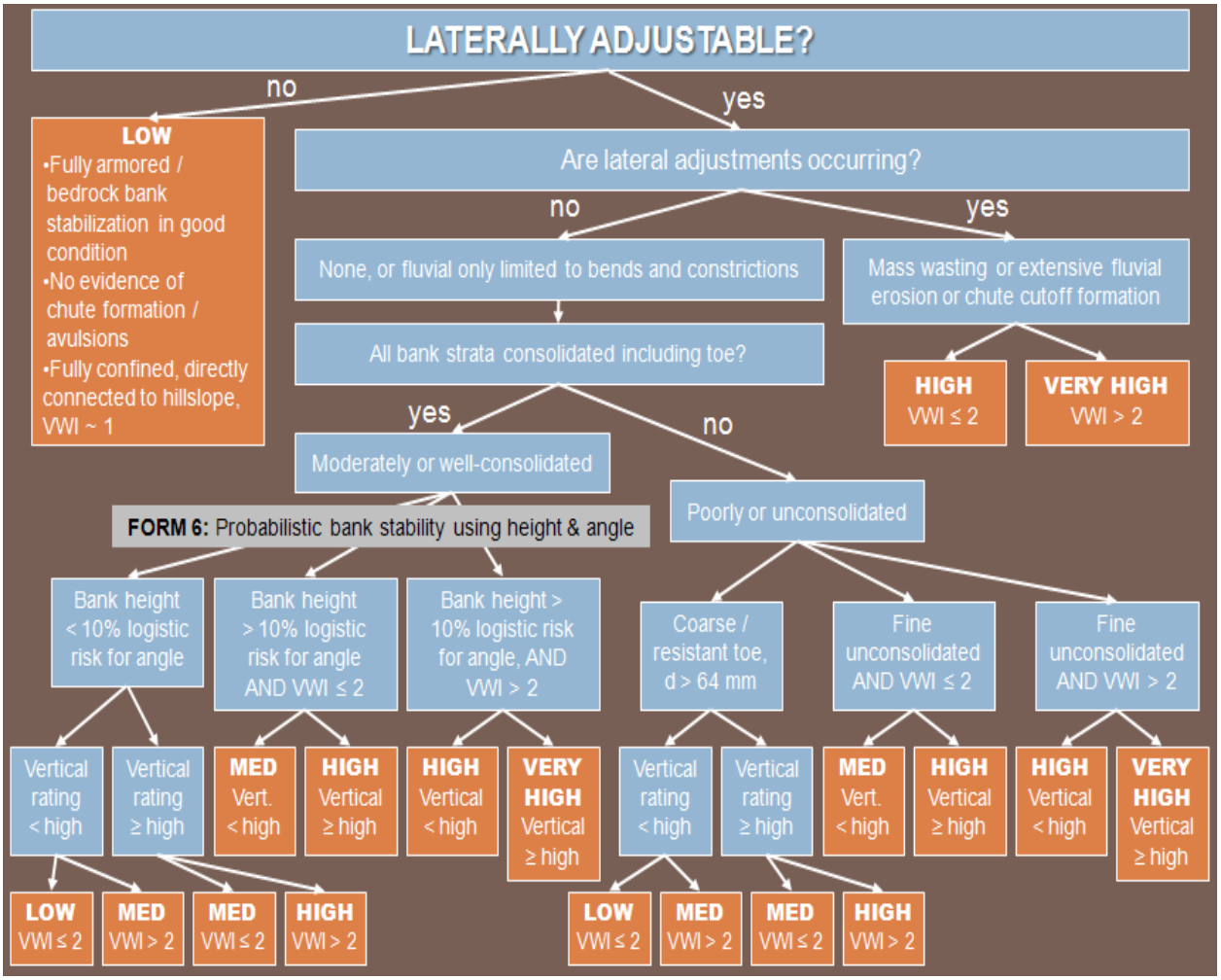

(Sheet 1 of 1)

FORM 5: SEQUENCE OF LATERAL SUSCEPTIBILITY QUESTIONS OPTION

Enter Lateral Susceptibility (Very High, High, Medium, Low) in shaded column.
Mass wasting and bank instability from Form 6, VWI from Form 4, and Vertical Rating from Form 3.

			Lateral Susceptibility
Channel fully confined with VWI ~1 – connected hillslopes OR fully-armored/engineered bed and banks in good condition?	If YES, then LOW		
If NO, Is there active **mass wasting** or extensive fluvial erosion (> 50% of bank length)?	If YES, VWI ≤ 2 = HIGH, VWI > 2 = VERY HIGH		
If NO, Are both banks consolidated?	If YES, How many risk factors present? **Risk Factors:** o Bank instability p > 10% o VWI > 2 o Vertical rating ≥ High	• All three = VERY HIGH • Two of three = HIGH • One of three = MEDIUM • None = LOW	
If NO, Are banks either consolidated or unconsolidated with coarse toe of d > 64 mm?	If YES, How many risk factors present? **Risk Factors:** o VWI > 2 o Vertical rating ≥ High	• Two = HIGH • One = MEDIUM • None = LOW	
If NO, At least one bank is unconsolidated with toe of d < 64 mm	How many risk factors present? **Risk Factors:** o VWI > 2 o Vertical rating ≥ High	• Two = VERY HIGH • One = HIGH • None = MEDIUM	

(Sheet 1 of 1)

FORM 6: PROBABILITY OF MASS WASTING BANK FAILURE

If mass wasting is not currently extensive and the banks are moderately- to well-consolidated, measure bank height and angle at several locations (i.e., at least three locations that capture the range of conditions present in the study reach) to estimate representative values for the reach. Use Form 6 Figure 1 below to determine if risk of bank failure is >10% and complete Form 6 Table 1. Support your results with photographs that include a protractor/rod/tape/person for scale.

	Bank Angle (degrees) *(from Field)*	**Bank Height (m)** *(from Field)*	**Corresponding Bank Height for 10% Risk of Mass Wasting (m)** *(from Form 6 Figure 1 below)*	**Bank Failure Risk** *(<10% Risk)* *(>10% Risk)*
Left Bank				
Right Bank				

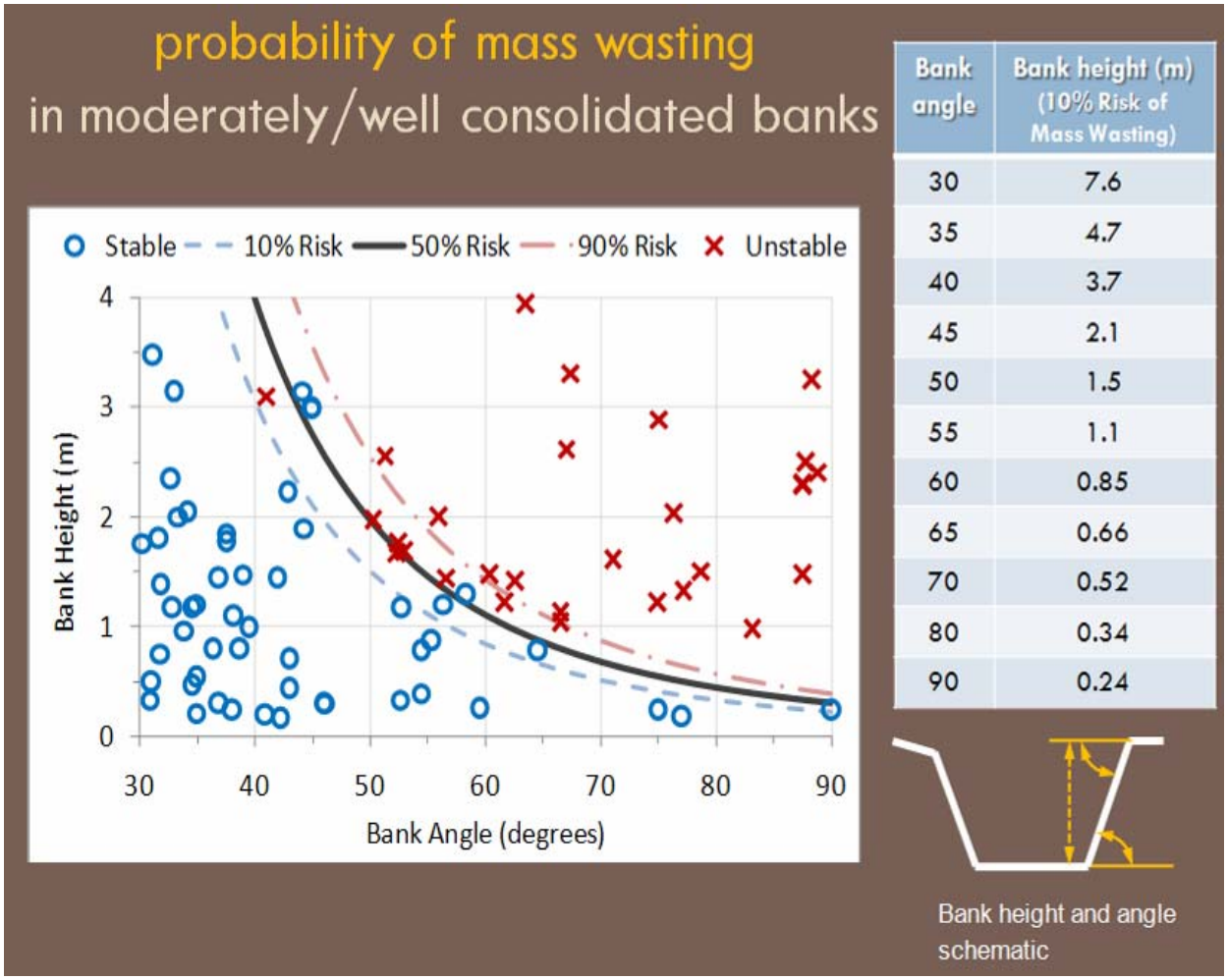

Form 6 Figure 1. Probability Mass Wasting diagram, Bank Angle:Height/% Risk table, and Band Height:Angle schematic.

(Sheet 1 of 1)

APPENDIX C

Response to Coastkeeper Comments

Use of contents on this sheet is subject to the limitations specified at the end of this document.
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BROWN AND CALDWELL

TECHNICAL MEMO

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Project No: 133904

San Diego Hydromodification Management Plan

Subject: Responses to Comments Provided by San Diego Coastkeeper

Date: February 16, 2010

To: Sara Agahi, P.E. – County of San Diego

From: Eric Mosolgo, P.E. – Brown and Caldwell

This draft technical memorandum has been prepared per the request of the County of San Diego to summarize responses to comments made in reference to the San Diego Hydromodification Management Plan (HMP) by San Diego Coastkeeper. These comments were submitted to the County of San Diego in letters dated April 14th, September 29th, and November 30th, 2009.

As mandated by Regional Water Quality Control Board (RWQCB) Order R9-2007-0001 Provision D.1.g, the purpose of hydromodification criteria is to prevent development-related changes in storm water runoff from causing, or further accelerating, stream channel erosion or other adverse impacts to beneficial stream uses.

The responses detailed in this memo have been incorporated into the Final HMP submitted to the San Diego Regional Water Quality Control Board (RWQCB) on December 29, 2009.

Responses to Coastkeeper Comments Dated November 30, 2009

Coastkeeper Comment – The inadequacies in applying LID are the HMP's most serious faults. They start with regarding LID as almost entirely a matter of infiltrating runoff, diminishing or ignoring the mechanisms of evapotranspiration and water harvesting and the practices associated with those mechanisms. Furthermore, the plan recommends basing infiltration assessments on coarse U.S. Department of Agriculture concepts and data instead of site-specific analysis and almost totally ignores the great potential of organic soil amendments to improve infiltration and evapotranspiration and reduce surface runoff quantities. The HMP reveals a poor appreciation of the status, performance, and practice of LID techniques today.

Limitations:
This document was prepared solely for the County of San Diego in accordance with professional standards at the time the services were performed and in accordance with the contract between the County of San Diego and Brown and Caldwell. This document is governed by the specific scope of work authorized by the County of San Diego; it is not intended to be relied upon by any other party except for regulatory authorities contemplated by the scope of work.

Response

- LID options modeled in determination of sizing factors account for both infiltration and evapotranspiration. Continuous simulation models are currently in development to determine the sizing factors for a wide range of development types, rainfall gauges, soil types, and BMP mitigation options. The evapotranspiration (ET) data is a key component of the continuous simulation models, along with the infiltration capacity of the soil, and is more certainly not an ignored mechanism. That said, BMPs studied in this analysis have to meet the County of San Diego's vector control guidelines along with the 85th percentile water quality and hydromodification standards. Thus, storage of runoff in excess of 72 hours will not be allowed.

- While water harvesting and reuse have obvious benefits, these criteria are not addressed or mandated in the Permit. From a hydromodification standpoint, water reuse facilities have some benefit for isolated rainfall events. When back-to-back storms occur, however, the hydromodification benefit is often not sufficient since the storage facilities are filled and provide no attenuation for the multiple concurrent storms. The use of rain water storage as a hydromodification control measure has not been ruled out. Rather, Copermittees can consider developer proposed storage facilities on a case by case basis. Such design strategies must prove compliance with hydromodification design criteria considering the long-term historical rainfall record.

- The Decision Matrix, located in Chapter 6 of the Final HMP, specifically states that site-specific geotechnical investigations be conducted to determine site-specific infiltration rates. Copermittees already require major development projects and many smaller projects to submit geotechnical soils reports which typically include identification of soil types. The referenced USDA information is part of the required Literature Review, which is located in Chapter 4 of the Final HMP. Infiltration parameters for the San Diego Region will be reviewed in details as part of the Sizing Calculator development process and further refined as part of the HMP implementation process.

- The use of amended soils has always been part of the HMP mitigation approach and the text of the Final HMP explicitly encourages the use of amended soils in the design of bioretention facilities. This concept is chronicled in both the HMP and the Model SUSMP. Similar to the approach used in Contra Costa County, several of the proposed BMP facilities will use an amended soil layer with an approximate infiltration rate of 5 inches per hour. Criteria provided in the Model SUSMP and HMP will work in concert. It should be noted that the use of amended soils will not promote deep infiltration for Types C and D soils, which are the dominant soil types in San Diego County. Thus, the use of underdrains may be required in urban environments.

- The Copermittees and the consultant team have developed detailed standards for LID implementation. These standards are provided in the Model SUSMP and are referenced in the Final HMP. The Final HMP recommends the use of LID facilities to satisfy HMP and 85th percentile water quality criteria.

- The intent of the HMP, as well as the Model SUSMP, is to encourage the use of LID facilities to meet hydromodification criteria. The text of Chapters 6 and 7 of the Final HMP were reviewed in detail and revised accordingly to encourage implementation of LID facilities.

- Defining the infiltration potential of a site is recommended to provide for sound engineering design. Even if infiltration is shown to be infeasible, LID facilities can be designed as filtration-type or evaporation-type facilities instead of infiltration-based facilities.
- Chapter 7 of the Final HMP has been revised to allow for evaporation-type facilities. It should be noted that such facilities may require implementation in series with more traditional LID approaches, such as biofiltration basins, in order to satisfy vector control and hydromodification criteria.

Coastkeeper Comment- Concerning the critical flow rate, the HMP presents an alternative to using a single value, a practice adopted elsewhere. The concept of multiple values is theoretically sound, but the plan falls short in specifying how the method it develops should be applied to assure proper use. Unless and until that gap can be filled, the appropriate single value, 10 percent of the 2-year flow event, should be used for the critical flow rate.

Response

- The San Diego HMP's varying lower flow threshold is a major advancement in the field of hydromodification management. This concept has been endorsed by the State Water Resources Control Board and other experts in the field. It is intuitive that erosion-prone streams should be held to a more stringent lower flow threshold as compared to erosion-resistant streams.
- Decision Matrices located in Chapter 6 clearly specify the method for determining the appropriate lower flow threshold. The method uses data from both the Southern California Coastal Water Research Project's (SCCWRP) channel screening tools (discussed in Chapter 5.2 and Appendix B) and the consultant team's critical flow calculator (discussed in Chapter 5.1) to determine the appropriate lower flow threshold.

Coastkeeper Comment – Exemptions put forward by the HMP fall into two categories: those that have been poorly thought through and, as presented in the plan, will continue to allow substantial hydromodification; and those that will forever consign degraded streams to that status. Both must be seriously reconsidered.

Response

- Exemptions proposed in the San Diego HMP have been thoroughly reviewed, discussed and analyzed.
- The exemption regarding projects that decrease both the pre-project impervious area and outlet discharge rates is logical. If the unmitigated post-project condition results in no increase to either impervious surface or resultant outflows as compared to pre-project conditions, then the project has no negative impact on downstream erosion .
- Exemptions regarding direct discharges to existing concrete channels have been thoroughly discussed with both the TAC and the Copermittee Work Group. This potential exemption was referenced in the Permit. A direct discharge to a concrete channel which connects to a

downstream exempt system poses an insignificant hydromodification related issue provided that the concrete channel has capacity to convey the ultimate condition 10-year flow. Note that if the downstream conveyance system passes through a stream segment susceptible to erosion, if the concrete channel does not have capacity to convey the ultimate condition 10-year flow, or if the project does not discharge directly to the existing concrete channel, then the existing concrete channel exemption may not be granted.

- Exemptions regarding direct discharges to large river systems have been analyzed using continuous simulation modeling and review of the resultant flow duration curves. This item has also been discussed in detail with the Copermittee Work Group, the TAC, and the Regional Board. This potential exemption applies only to river reaches with 100-year flows in excess of 20,000 cfs and drainage areas in excess of 100 square miles. The upstream limits of the specific potential exempt reaches, which are detailed in Table 6-1, were set based upon reach-specific review of the floodplain width, degree of upstream reservoir attenuation, etc. A detailed flow duration analysis was conducted to test the variability in flow duration curves based upon hypothetical additions of master development areas. Historical flow duration curves were based upon streamflow data in the San Diego River, as provided by USGS.
- Exemptions regarding urban infill projects in highly urbanized watersheds have been analyzed using continuous simulation modeling and review of the resultant flow duration curves. This item has also been discussed in detail with the Copermittee Work Group, the TAC, and the Regional Board. This potential exemption applies only to projects that discharge runoff directly to a stabilized conveyance system that extends beyond the Domain of Analysis. The exemption is only valid for watersheds with an existing impervious area of 40 percent or greater and with the potential for no more than a 3 percent impervious area increase in ultimate developed conditions (as compared to existing impervious area for the watershed). A detailed flow duration analysis was conducted to test the variability in flow duration curves based upon hypothetical additions of watershed impervious areas. It should be noted that the Permit allows for an exemption when the project discharges to a watershed with an existing impervious area percentage greater than 70 percent. Thus, this particular exemption is focused on highly urbanized watersheds containing an existing impervious area percentage between 40 and 70 percent.

Coastkeeper Comment – The subject of monitoring is only partially developed. At this stage it appears to be missing an in-stream component to determine if indeed the program is meeting its charge to manage channel erosion and impacts to beneficial uses and stream habitat.

Response

- As detailed in Chapter 8 of the Final HMP, in-stream monitoring is required at locations downstream of the monitored project site. Baseline cross section monitoring would be required prior to construction of the project. Subsequent cross section monitoring would then be required at defined intervals following construction of the site to assess effects of hydromodification mitigation controls.
- Chapter 8 of the Final HMP includes requirements for flow-based sediment monitoring. Results of such sediment monitoring can be used to determine the low flows which initiate sediment movement. This data can be used to further refine the low flow thresholds.
- Chapter 8 of the Final HMP also includes requirements for the monitoring of BMP inflows and outflows to assess BMP effectiveness. These protocols are similar to the monitoring requirements for the Contra Costa HMP.

Responses to Coastkeeper Comments Dated September 29, 2009

Coastkeeper Comment – The HMP is disconnected from the purpose and requirements of the MS4 permit. Following the first few meetings, we submitted an email that asked the TAC to take the opportunity to think more holistically and to stem the growing disconnect between the direction of the development of the HMP and the intent of the NPDES permit. We received assurances that the TAC and the consulting team were looking to take this opportunity to create "the most holistic HMP carried out to date in California." Unfortunately, this promise has not been kept. We understand the HMP must address erosion, but it must also address water quality issues. The Copermittee Working Group and TAC's silo approach may have devastating consequences down the line. When one regulatory effort moves forward without consideration of other ongoing efforts, implementation becomes impossible. This is especially true in light of significant movements by various Regional Boards (including San Diego Regional Board) to move toward a more holistic approach to MS4 Permit implementation.

Response

- Throughout the HMP development process, the Copermittees and the consultant team have held regular meetings with the Regional Board to discuss the approach. Through this process, the HMP direction has focused on the purpose and requirements of the MS4 permit.
- The San Diego HMP, Model SUSMP and subsequent implementation sizing tools explicitly recommend integrated facilities that provide for both water quality treatment and hydromodification flow control. The recommended implementation of Integrated Management Practices, such as LID bioretention basins, will provide for both 85th percentile water quality treatment and hydromodification flow control. Water quality issues have been addressed extensively in the Model SUSMP.

Coastkeeper Comment - The HMP inappropriately includes policy and compliance provisions. It appears the Copermittees misunderstand the role of the TAC itself. Throughout the HMP development process,

decisions have been made based not on science, but on "policy" grounds. For example, at the June HMP TAC meeting, a discussion centered on minimum orifice size for BMPs to meet HMP and flow rate requirements. The TAC recognized the conflict between the model and minimum orifice requirements predicted for fine-grained systems. In the end, the decision was labeled a "policy" choice to be made by the Copermittees. However, such decisions must be based on sound science to meet the goals of the Permit. The HMP contains other policy choices made by the TAC and Copermittee working group that are inappropriate for the technical document, and circumvent the Permit. For example, with regard to implementation of the HMP, restoration activities are listed as an alternative to compliance with flow control criteria. The Permit allows for implementation of such activities without adverse impacts to channel beneficial uses. However, the HMP proposes a cost-benefit analysis for implementation of the HMP design requirement. The Permit does not contain such "in-lieu of" language, nor can it be inferred from the Permit. Moreover, injecting such cost-benefit analysis into the Permit creates a loophole in implementation of the HMP. Such subjective analysis should not be part of the HMP in light of the mandate to "manage increases in runoff discharge rates and durations." Additionally, implementation of buffers, revegetation, etc. does not meet the twin roles of the HMP: addressing the "changes in a watershed's runoff characteristics resulting from development, together with associated morphological changes to channels receiving runoff." The in-lieu of planning measures does not address the change in watershed runoff characteristics. The HMP exemption for the lower third of the watershed is also an unsubstantiated policy decision. Impacts to all areas of a watershed need to be addressed. No support has been given for such an exemption, nor is it considered in the Permit. Runoff from impervious surfaces not only causes erosion, but also carries pollutants to receiving waters. As the Permit requires HMP implementation to prevent "significant adverse impacts to beneficial uses, attributable to changes in the discharge rates and durations," wholesale exemptions for portions of a watershed are inappropriate.

Response

- As was the case in both the Santa Clara and Contra Costa HMPs, the San Diego HMP included some policy decisions. These policy decisions, which were ultimately made by the Copermittee Workgroup considering advice provided by the TAC, were based upon scientific investigations and analysis as well as practical considerations. The Hydromodification/SUSMP Workgroup was convened periodically over the course of the project at times corresponding with key decision points in developing the HMP and the update to the Model SUSMP. This workgroup was tasked with providing regional standards and consistency in the development, implementation, assessment, and reporting of urban runoff activities and programs related to hydromodification management. As required by Permit Section D.1.g, the Workgroup assisted in the development of the regional HMP. A key element of the San Diego HMP was the creation and involvement of a Technical Advisory Committee (TAC). The TAC members consist of respected individuals from academia, technical resource agencies, the development community, consulting engineers, and environmental organizations. The TAC, which has been convened on ten occasions that correlated with key decision-making points in the development of the HMP, was tasked with providing technical input to the HMP's scientific approach and interpretation of results integral to the establishment of numerical flow control standards as well as to the Copermittees for their policy determinations.

- Regarding the minimum orifice size issue, detailed analyses were prepared using continuous simulation hydrology to assess the effects of the minimum orifice size criteria. As a result, the minimum orifice size criteria may only be used in very limited scenarios to avoid problems

resulting from clogged orifices and uncontrolled overflows. These scenarios are detailed in Chapter 6.2 of the Final HMP. The policy decisions regarding the minimum orifice size criteria were based on a detailed continuous simulation hydrologic analysis. This detailed analysis was combined with practical considerations regarding facility maintenance (specifically, the clogging of small orifices which would cause riser overflows and the potential for increased erosion downstream) to maximize HMP facility effectiveness.

- Regarding the stream restoration / rehabilitation options, this issue was fully discussed with the Regional Board, the TAC, and the Copermittee Work Group. As worded in the Final HMP, such channel rehabilitation options may be constructed in limited situations. Specifically, such options may only be constructed if the existing channel susceptibility is determined to be "High" (as determined by SCCWRP assessment), if the stream rehabilitation project extends downstream to an HMP exempt system, and if the stream rehabilitation project is constructed assuming ultimate development conditions upstream of the project. Details of the stream rehabilitation protocols are detailed in Chapter 6.3 of the Final HMP. Additionally, permits from resource agencies are necessary in most cases, and improvement to habitat and the environment are expected.
- The Final HMP contains no mention of a cost-benefit analysis regarding stream rehabilitation measures. However, developers will ultimately use cost-benefit analyses when selecting alternative methods for meeting Permit requirements.
- The final HMP contains no mention of the "lower third of the watershed" exemption.

Coastkeeper Comment – TAC consensus has been misrepresented to the Regional Board. Recently, we have become aware of the Copermittees misrepresentation of TAC consensus regarding decisions made in developing the HMP. Our continuing disagreements with the current conclusions of the draft HMP are evident from: our emailed comments submitted by Karen Franz on February 2, 2008; our comment letter from our expert Dr. Horner; submitted on April 14, 2009; and our requests for underlying technical data to support the HMP. Following the receipt of the responses to comments from Dr. Horner, we requested the supporting references and technical papers that were the basis for the development of the design storm formulation for the Santa Clara and Contra Costa HMPs. The request was made at the June 17th meeting, and no communication of the references or technical papers followed the request. Further, the draft HMP was not give to TAC members until after it was first presented to the Regional Board. A TAC meeting was held in October 2008, and another meeting was not held until February 2009. In the interim, the consultants met with the Copermittee working group, obtained approval of the draft HMP, and submitted it to the Regional Board. It was not until February 4, 2009 that TAC members were sent an electronic copy of the HMP. We obtained a physical copy of the draft HMP at the Copermittee meeting in January shortly after it was submitted to the Regional Board and before it was sent to the TAC. TAC consensus and approval are also misrepresented on key issues, such as HMP compliance through "no increase to pre-project impervious area and no increase to pre-project flow." Contrary to the document assertion, this has not been "discussed and approved by the TAC." Coastkeeper has and will continue to insist upon natural, pre-project flows and reduction in overall impervious area.

Response

- In the Final HMP, the phrase "majority TAC approval" was used to indicate the majority opinion of the cumulative TAC members.
- Technical memos detailing the preparation of the Santa Clara and Contra Costa HMPs are public information and located at the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPP) web site and the Contra Costa Clean Water Program (CCCWP) web site.
- The majority of the members of the TAC agreed that HMP requirements should not be imposed on developments that decrease the pre-project impervious cover and decrease the design flows to each outlet location.

Coastkeeper Comment – Coastkeeper's effectiveness has been stymied by a lack of transparency and unavailability of key documents. Coastkeeper concurs in the Regional Board's comments made on June 29, 2009. The lack of detail and transparency highlighted in the letter has been a particular concern for Coastkeeper as well. For instance, the BMP sizing tools and their reporting should be a transparent process. Although the tools go beyond the scope of the HMP development, they are a necessary piece of the process, and as such, the HMP should provide more oversight on their use. Additionally, Coastkeeper's specific comments from our technical expert Dr. Horner remain largely ignored or dismissed out of hand. Even to get an electronic copy of the draft HMP for our expert to review proved challenging. Several attempts were made to request the document by email, without success. We were ultimately forced to scan a paper copy we obtained from a Stormwater Copermittee meeting where the draft HMP was distributed. At a TAC meeting following submission of the comment letter, several TAC meeting attendees and members opined about the radical nature of our comments and marginalized Coastkeeper. This type of discussion is indicative of the limited role Coastkeeper was able to play in participating on the TAC. This process of excluding the TAC from critical decision-making, and information exchange has also hindered the usefulness of the TAC.

Response

- All documents prepared in association with the Final HMP are available for public review. These documents were presented on multiple occasions for review by the TAC, Copermittee Workgroup and the Regional Board. These documents are posted on the Project Clean Water web site.
- The BMP sizing tool development is a transparent and ongoing process. These are implementation tools and were not required as part of the HMP document. Key technical memos and data reviews will be circulated to the TAC, Copermittee Working Group and Regional Board throughout the Sizing Calculator development process.
- Dr. Horner's comments have been addressed in previous comments response document and in this comment response document.

Coastkeeper Comment – A lack of data inhibits progress. In addition to the lack of transparency in information exchange by consultants and Copermittees to TAC members, the delay in production of key

aspects of the HMP prohibits meaningful input from the TAC. For example, the San Diego region has three distinct geomorphic and hence geologic regions. The geologic conditions of a watershed/catchment area are the factors affecting the low flow threshold values. Other critical components that may never be reviewed by the TAC include development of maintenance and long-term monitoring protocols and the required approval process for Priority Development Projects. The incorporation of these tools into the decision matrix and preparation of consultant technical memos are critical steps in the HMP which have yet to be conducted, and may largely take place outside of the TAC.

Response

- The HMP was submitted on time to the Regional Board on December 29, 2009.
- Prior to the final submittal, multiple iterations of the HMP document and supporting memos were distributed to the TAC, Copermittee Work Group and the Regional Board.

Coastkeeper Comment – Exemptions remain ill-conceived and overused. The Draft HMP makes exemptions for hardened channels as arguably allowed by the current Permit, but these exemptions are neither required nor prudent. First, the Permit language gives some discretion to the Copermittees, not requiring exemptions and qualifying such decisions with the requirement not to impact beneficial uses. Moreover, the proposed South Orange County stormwater permit specifically requires hydromodification considerations for restoration of such hardened channels. Also, the Copermittees attempt to create an exemption for projects with "no net increase" in impervious area is also not in line with the Regional Board's interpretation of "pre-project" as highlighted in the proposed South Orange County Permit. Therefore, pre-project conditions in the current Permit should not make exceptions for "no net increase" unless such projects mimic naturally occurring conditions. Further, the "adoption and implementation of this NPDES permit relieves the Copermittee from developing a non-point source plan, for the urban category, under CZARA." CZARA requires implementation of management measures to prevent non-point source pollution from impacting or threatening coastal water quality. Therefore, exemptions for the lower portions of watersheds or large receiving waters are not allowed.

Response

- The exemption regarding projects that decrease both the pre-project impervious area and outlet discharge rates is logical. If there no increase to either impervious surface or resultant outflows as compared to pre-project conditions, then the project has no negative impact on downstream erosion.
- Exemptions regarding direct discharges to existing concrete channels have been thoroughly discussed with both the TAC and the Copermittee Work Group. This potential exemption was referenced in the Permit. A direct discharge to a concrete channel which connects to a downstream exempt system poses an insignificant hydromodification related issue provided that the concrete channel has capacity to convey the ultimate condition 10-year flow. Note that if the downstream conveyance system passes through a stream segment susceptible to erosion, if the concrete channel does not have capacity to convey the ultimate condition 10-year flow, or if the project does not discharge directly to the existing concrete channel, then the existing concrete channel exemption may not be granted.

- Exemptions regarding direct discharges to large river systems have been analyzed using continuous simulation modeling and review of the resultant flow duration curves. This item has also been discussed in detail with the Copermittee Work Group, the TAC, and the Regional Board. This potential exemption applies only to river reaches with 100-year flows in excess of 20,000 cfs and drainage areas in excess of 100 square miles. The upstream limits of the specific potential exempt reaches, which are detailed in Table 6-1, were set based upon reach-specific review of the floodplain width, degree of upstream reservoir attenuation, etc. A detailed flow duration analysis was conducted to test the variability in flow duration curves based upon hypothetical additions of master development areas. Historical flow duration curves were based upon streamflow data in the San Diego River, as provided by USGS.
- Exemptions regarding urban infill projects in highly urbanized watersheds have been analyzed using continuous simulation modeling and review of the resultant flow duration curves. This item has also been discussed in detail with the Copermittee Work Group, the TAC, and the Regional Board. This potential exemption applies only to projects that discharge runoff directly to a stabilized conveyance system that extends beyond the Domain of Analysis. The exemption is only valid for watersheds with an existing impervious area of 40 percent or greater and with the potential for no more than a 3 percent impervious area increase in ultimate developed conditions (as compared to existing impervious area for the watershed). A detailed flow duration analysis was conducted to test the variability in flow duration curves based upon hypothetical additions of watershed impervious areas. It should be noted that the Permit allows for an exemption when the project discharges to a watershed with an existing impervious area percentage greater than 70 percent. Thus, this particular exemption is focused on highly urbanized watersheds containing an existing impervious area percentage between 40 and 70 percent.
- The San Diego HMP complied with permit provision for the San Diego region, not the South Orange County permit.

Coastkeeper Comment – Selection and implementation of BMPs are vague or missing. The Draft HMP does not provide a list possible preferred BMPs, and the explanation of BMPs thus far at TAC meetings have been equally vague. At the outset we find that the BMP specific design criteria will be much more useful and transparent. It is unclear why the TAC has not chosen this route. Additionally, although the age of a BMP system has a great influence on the efficacy of that BMP, no provisions or requirements exist to address this issue. We have also asked to include infiltration and rainwater harvesting in the list of BMPs, but apparently only dry wells have been added so far. San Diego's reliance on imported water and its precipitation patterns create a tremendous regional opportunity for the development of rainwater harvesting systems to not only capture and reuse this resource, but also to reduce flow (and sediment) from Priority Development Projects. The Ventura County permit requires all features constructed to render impervious surfaces "ineffective:" to "infiltrate, store for reuse, or evapotranspire, without any runoff at least the volume of water that results from" the 85th percentile, 24-hour runoff event, annual runoff based on unit basin storage to achieve 80 percent or more volume treatment, or a 0.75 inch storm event. The San Diego HMP should contain greater emphasis on infiltration, reuse and evapotranspiration as well.

Response

- Chapter 7 of the Final HMP and the Model SUSMP include a suite of BMPs that can be used for water quality treatment and hydromodification flow control. The suite of BMPs listed, including bioretention basins, biorentention in series with cisterns, bioretention in series with vaults, extended detention basins, and flow-through planter boxes, corresponds to the BMP selection list that will be provided in the Sizing Calculator.
- While water harvesting and reuse have obvious benefits, these criteria are not addressed or mandated in the Permit. From a hydromodification standpoint, water reuse facilities have some benefit for isolated rainfall events. When back-to-back storms occur, however, the hydromodification benefit is often not sufficient since the storage facilities are filled and provide no attenuation for the multiple storms. The San Diego permit does not require rainwater harvesting for hydromodification mitigation. The use of rain water storage as a hydromodification control measure has not been ruled out. Rather, Copermittees can consider developer proposed storage facilities on a case by case basis. Such design strategies must prove compliance with hydromodification design criteria considering the long-term historical rainfall record.
- The 5 percent EIA requirement from the Ventura permit is not included in the San Diego MS4 permit.

Coastkeeper Comment – The HMP does not consider climate and land use change. Effects of climate and land use changes on low flows and other hydrologic responses have been well documented as to the hydrological effects that will result in our region. When employed singly and in combination, climate and land use changes have significant and varying effects on flow conditions. The draft HMP contemplates only one rate of land-use change. The HMP needs to consider the potential impacts of climate change and the effects that it will have on regional hydrologic conditions through its modeling. Hydrologic data is being generated by the Hydrologic Research Center, a San Diego-based international research center.

Response

- While climate change effects were not considered in this version of the HMP, it is possible that the rainfall data sets prepared in association with the HMP could be updated once predictive rainfall models have been developed. These data sets could be used to refine recommendations of future HMP updates.

Coastkeeper Comment – Implementation of a standard of 3 percent maximum allowable Effective Impervious Area (EIA) in all regulated projects, with a narrowly crafted alternative compliance provision for developments where severe site constraints, such as non-infiltrative soils, render compliance with the 3 percent EIA limitation impossible.

Response

- The Effective Impervious Area (EIA) requirement was not part of the San Diego MS4 permit.

Coastkeeper Comment – As a hydromodification standard, post-development peak flow rates and volumes shall not exceed the modeled peak flow rates and volumes of pre-European-settlement native land cover for all storms from the channel-forming event to the 100-year frequency stream flow. This requirement shall be satisfied to the maximum possible extent by retention of runoff on the development site through infiltration, evapotranspiration, and/or rainwater harvesting. If the requirement cannot be fully met by onsite retention, there shall be a demonstration and convincing justification, according to specific criteria, of why it is not achievable at that site. If such a convincing demonstration and justification can be made, the differential between the required retention and the amount that can be provided onsite shall be offset by performing or contributing to an offsite project, within the same watershed, to retain an equal or greater volume of runoff from such other site.

Response

- The hydromodification standard, as interpreted from the San Diego MS4 permit, requires the control of peak flows and durations within the geomorphically significant flow range to pre-project conditions. No mention of pre-European settlement is included in the San Diego MS4 permit.

Coastkeeper Comment – Monitoring of HMP compliance must be conducted at more than 5 sites in the entire County. At least one site per watershed must be monitored. Additionally, monitoring should begin before development, not after completion. Monitoring site selection should also be made with Regional Board staff input, not solely by Copermittees.

Response

- No HMP monitoring plan in the State of California proposes more than 5 countywide monitoring sites. The recommendations detailed in Chapter 8 exceed the requirements for Contra Costa County as approved by the San Francisco Regional Board.
- As detailed in Chapter 8 of the Final HMP, monitoring will begin before development and extend into the future following development.

Coastkeeper Comment – Individual Priority Development Projects must be required to monitor effectiveness and maintain HMP BMPs and compliance measures. A real, tangible monitoring mechanism and compliance determination must be implemented into the HMP. Without such requirements in the HMP, no assurance of long-term effectiveness will be provided. Such tools would also help Copermittees monitor specific BMP effectiveness in different watersheds.

Response

Monitoring of the 5 sites will be a regional Copermittee effort. Individual Priority Development Projects are required to inspect and maintain their treatment control and HMP facilities through maintenance agreements. Additionally, Copermittees conduct annual inspections of treatment BMPs and HMP facilities as required by the Municipal Permit.

Coastkeeper Comment – Urge the Regional staff to ensure strict compliance with the current Permit and look toward future consistency with other MS4 Permits in southern California, as setting the MEP standard.

Response

- We will defer to the Regional Board for a response to this comment.

Coastkeeper Comment – Future development, implementation, and monitoring of the HMP should be more transparent, including more availability for public input.

Response

- We will continue to provide technical memos and materials available for public review through the TAC, Copermittee Work Group and the Regional Board. These documents can be accessed at the Project Clean Water web site.

Coastkeeper Comment – High, Medium and Low susceptibility ratings should be removed. All watersheds should be treated as susceptible to erosion. Moreover, the classification of streams does not correlate to an appropriate HMP objective. For instance, for already unstable channels the standard is to "avoid acceleration of the existing erosion problems." This is unacceptable, and does not meet the spirit of intent of the Permit.

Response

- Stream classification, as provided for in this HMP by the SCCWRP channel susceptibility analysis, is a requirement of the MS4 permit (Permit Section D.1.g.(1)(a) and (m)). Therefore, this information will not be removed from the HMP. It is a critical component of the HMP for San Diego County and all counties in southern California.

Responses to Coastkeeper Comments Dated April 14, 2009

Coastkeeper Comment - Comparing the stated San Diego County criteria to hydromodification standards elsewhere, the County's criteria are relatively highly protective of runoff receiving waters in the cases of flows of 5- and 10-year frequencies. On the other hand, these criteria do not extend to the larger storms of less frequency. Some hydromodification criteria cover a range of storms up to the 50- and even 100-

year events. In the central city area of San Diego, rainfalls of 24-hour duration for different frequencies are approximately (http://ponce.sdsu.edu/noaa_24hr_sd_2x.html): 5-year—2.4, 10-year—2.8, 50-year—3.5, and 100-year—4.1 inches. Thus, it may be seen that extending the assessment from the 10- to the 100-year frequency enlarges the time period over which resource protection is evaluated by an order of magnitude (1000 percent) with an increase of just 46 percent in the rainfall quantity. The criteria should be extended to these larger storms, or the County should show why doing so is not necessary to protect and recover stream ecosystems.

Response

- Similar to the two previously approved hydromodification management plans in the State of California (Santa Clara County and Contra Costa County), the San Diego Final HMP recommends flow and duration control for a range of flows between a fraction of the 2-year flow event to the 10-year flow event. Neither the approved Santa Clara HMP nor the approved Contra Costa HMP required controls for flow recurrence events in excess of the 10-year design flow.
- The referenced 24-hour rainfall totals in the comment above refer to a single-event design storm approach, which is not applicable with the continuous simulation hydrologic modeling approach mandated in Permit R9-2007-0001. The Permit goes on to say that determination of peak flow frequency values shall be developed from analysis of the full rainfall record. In other words, hourly data from the entire rainfall record (35 to 50+ years) is used in the analysis as opposed to use of a singular rainfall depth as noted in the comment above.
- Finally, it should be noted that various geomorphologists across California and the nation have concurred that controls above the 10-year flow event have a minimal impact on cumulative sediment movement across the historical record. Sediment transport studies based on a continuous flow record, such as the long-term analysis prepared in association with the Santa Clara Hydromodification Management Plan, have shown that roughly 90 percent of the cumulative work exerted on a channel occurs within the relative flow ranges detailed in the Santa Clara, Contra Costa, and San Diego HMPs. Thus, it can be demonstrated that the significant cost associated with controls above the 10-year event would not result in significant additional protection to the stream processes from a hydromodification standpoint.

Coastkeeper Comment - Criteria setting is, "... based on the understanding that the 5-year design flow is considered the dominant channel-forming discharge for Southern California streams." If the basis is merely an "understanding", it is not strong enough. The basis must be rooted in detailed analyses. Such analyses elsewhere in the nation have identified flows having frequencies around 1.5 to 2-year to be the channel-forming discharges.

Response

- Per the Final HMP, lower flow threshold criteria were based upon a fraction of the 2-year design flow. This determination was made using a synthetic modeling approach which used the continuous rainfall record to determine hydrologic response. Sediment transport models were then simulated for the entire historical record for a wide variety of channel conditions.

- The commentary regarding the 5-year design flow in the comment above was provided in reference to determination of interim flow control standards. As a reasonable first step for the setting of the interim standards, initial determinations were made based upon previous research conducted by the Southern California Coastal Water Research Project (SCCWRP) and others. The final flow control standards are based upon detailed hydrologic and sediment transport analyses.

Coastkeeper Comment - The plan contains exemptions from requirements that will foreclose future stream restoration options, or at least substantially increase their difficulty. One such instance is allowance of planning measures as alternatives in lieu of stormwater flow controls. Another is the allowance of a demonstration that projected increases in runoff peaks and/or durations will not accelerate stream channel erosion. The plan further provides a dispensation for controls if a project applicant conducts a sediment transport analysis and shows no adverse impact. Such demonstrations could be convincingly made when a channel is hardened or already cut to bedrock, but each permitted increment of flow further reduces the opportunity to recover a natural stream, and its ecological values. The plan goes on to state specifically that hydromodification management flow controls will not be required for discharges into hardened channels or the downstream sub-watershed imperviousness is at least 70 percent and the potential for cumulative impacts is "minimal". This policy essentially consigns these channels perpetually to their artificial, highly degraded status with almost no ecological function. These exemptions should be removed, at least until a broad assessment of restoration potential can be completed and the most opportune cases prioritized for implementation.

Response

- The exemptions listed in the HMP closely follow recommendations provided in Permit R9-2007-0001, especially with regard to discharges to existing hardened channels, storm drain systems, and into existing highly urbanized watersheds (with a percent imperviousness > 70%).
- Planning measures such as implementation of Low-Impact Development (LID) facilities would still be required to demonstrate that the mitigated condition would meet mandated flow and duration control criteria.
- Planning measures such as the implementation of riparian buffers or non-hardened stream restoration/rehabilitation projects would require mitigation proof in the form of an accompanying hydraulic and/or sediment transport analysis of sufficient technical rigor. The HMP does not allow for the implementation of concrete channel solutions as a method for stream restoration/rehabilitation.

Coastkeeper Comment - The plan is silent on how the potential for cumulative impacts can or should be assessed and what "minimal" is. It should be explicit on these subjects.

Response

- Chapter 5.3 provides a discussion of cumulative watershed impacts.

- Definition of cumulative watershed impacts was quantified in the detailed continuous simulation models prepared in association with the river system exemption, highly urbanized watershed scenario, and minimum orifice size. This discussion is detailed in Appendix F.

Questions related to this comment response document should be directed to Sara Agahi at (858) 694-2665.

APPENDIX D

Flow Threshold Analysis Third Party Review

Use of contents on this sheet is subject to the limitations specified at the end of this document.
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December 19, 2008

Mrs. Sara Agahi, P.E.
County of San Diego.
5201 Ruffin Road, Suite D
San Diego, CA 92123

Subject: Review of Hydromodification Work by Phillip Williams and Associates (PWA)

Dear Mrs. Agahi:

This letter summarizes our findings from review of the subject PWA work as subconsultant to Rick Engineering Company and as authorized under County of San Diego Agreement Number 525773, Task Order Number 5.

According to the County of San Diego (the County) Municipal Separate Storm Sewer System (MS4) permit, the Hydromodification Program (HMP) must use standards to manage increases in runoff discharge rates and durations where these are likely to cause increased erosion of channel bed and banks, sediment pollutant generation, or other impacts to beneficial uses and stream habitat due to increased erosive force. Under the permit's definition of "flow duration" it is noted that flow duration within the range of geomorphically significant flows is important for managing erosion. The permit also requires that the HMP be based on continuous rainfall-runoff modeling. The purpose of the work by PWA is to help establish the flow thresholds for use with the County HMP.

The review consisted of examining the underlying assumptions of the analyses, the methodology followed in the analyses themselves (including the modeling techniques employed), development of results from the analyses, and conclusions reached based on those results. The data, analyses and models submitted for review were contained on a portable hard drive provided by Brown & Caldwell on 11/20/08. A memorandum from PWA to the County of San Diego dated 11/12/08 describing the watershed and channel modeling was also provided by Brown & Caldwell via e-mail on 11/25/08. Other background data was gathered from the periodic reports submitted by Brown & Caldwell and/or PWA to the Technical Advisory Group.

Method

The general methodology employed by PWA was to conduct a large simulation-based sensitivity analysis to cover the range of potential channel and watershed conditions found in western San Diego County. Three sample watersheds within the size to be regulated by the HMP were chosen in areas where development is expected to occur. Specifics of the analyses are commented upon below.

Hydrology

The hydrology for each site was developed using the San Diego Hydrology Model (SDHM) for pre-development, post-development, and post-development with flow mitigation (one, one, and six simulations, respectively). WEST verified the input data contained in the SDHM models for the Otay (Rolling Hills) and Peñasquitos basins. Tables 1 and 2 present a summary of pond sizes, outlet dimensions, and LID parameters (infiltration rate and reduction factors) for each of the scenarios for the two watersheds.

In the Otay input files, the same outlet dimensions (notch width, height, and orifice diameter) were maintained for each flow duration criteria simulation (10% Q_2, 10% Q_5, and 20% Q_5) for both the "non-LID" and "with-LID" cases (see Table 1). The pond size changes slightly, decreasing in the "with-LID" case because flow is lost through infiltration and the pond size can decrease while still meeting the duration criteria. However, WEST found that in the 10% Q_2 scenario, the riser diameter is set to 400 inches, while it is fixed at 48 inches for all other scenarios. The corresponding pond size changes from a square 750 feet on each side for the 10% Q_2 scenario to one 318 feet on each side for the 10% Q_2 with LID scenario. WEST suggests changing the diameter to 48 inches and re-running the simulation.

For the Peñasquitos watershed analyses we observed that while the riser dimensions were the same for all simulations, no consistent choice of notch height, width, and orifice diameter was maintained.

In addition, the SDHM uses only rainfall data from the Lindbergh Field gage in the simulations. Potential pitfalls with this assumption have already been pointed out by Brown & Caldwell elsewhere. All simulations used a 40-year period of record from this gage as input and runoff hydrographs were generated for the eight cases discussed above for each of the sample basins. Eight cases multiplied by three basins resulted in a total of 24 hydrologic simulations.

PWA assumptions for land use (land cover, vegetation, percent impervious) for the test watersheds were not confirmed by measurement in a geographic information system (GIS), but seemed reasonable by inspection.

The assumption that all runoff would be routed into a single runoff control facility is probably not realistic (especially given the resulting single basin sizes compared to the overall watershed area), but is justified for this type of comparative analysis.

Table 1. Otay SDHM Parameters

OTAY	Pond Length (ft)	Pond Width (ft)	Depth (ft)	Riser Height (ft)	Riser Diameter (in)	Notch Height (ft)	Notch Width (ft)	Orifice diameter (in)	Pond Volume at Riser Head (ac-ft)	Infiltration Rate (in/hr)	Reduction Factor	Percent Infiltrated
10% Q_2	750	750	5	4	400	0.0954	4	0.86	54.09	n/a	n/a	n/a
10% Q_5	232	232	5	4	48	0.0878	3.9584	5.543	5.55	n/a	n/a	n/a
20% Q_5	211	211	5	4	48	0.0954	3.94	7.9314	4.624	n/a	n/a	n/a
10% Q_2 with LID	318	318	5	4	48	0.0954	4	0.86	10.154	0.7	0.25	88.74
10% Q_5 with LID	225	225	5	4	48	0.0878	3.9584	5.543	5.241	0.7	0.25	41.65
20% Q_5 with LID	210	210	5	4	48	0.0954	3.94	7.9314	3.5	0.7	0.25	34.47

Table 2. Peñasquitos SDHM Parameters

PEÑASQUITOS	Pond Length (ft)	Pond Width (ft)	Depth (ft)	Riser Height (ft)	Riser Diameter (in)	Notch Height (ft)	Notch Width (ft)	Orifice diameter (in)	Pond Volume at Riser Head (ac-ft)	Infiltration Rate (in/hr)	Reduction Factor	Percent Infiltrated
10% Q_2	307	307	7	6	72	0.14	6.00	2.82	14.73	n/a	n/a	n/a
10% Q_5	172	172	7	6	72	0.2835	5.94	7.7877	5.041	n/a	n/a	n/a
20% Q_5	162	162	7	6	72	0.178	5.94	10.673	4.54	n/a	n/a	n/a
10% Q_2 with LID	251	251	7	6	72	0.178	5.94	2.9834	10.121	0.7	0.25	53.82
10% Q_5 with LID	179	179	7	6	72	0.3185	5.94	8.2677	5.445	0.7	0.25	24.13
20% Q_5 with LID	183	183	7	6	72	0.2626	6	7.5051	5.632	0.7	0.25	25.2

Hydraulics and Sediment Transport

As opposed to the site-specific characteristics employed in the hydrologic analysis, the hydraulic and sediment transport analyses appear to be completely hypothetical in nature. The eight hydrographs produced from the SDHM simulations previously discussed were used as input to the HEC-RAS hydraulic and sediment transport model. Other key input parameters such as cross section geometry, channel slope, roughness, and sediment characteristics were selected to cover a "representative" range corresponding to potential field conditions. Forty-two combinations of basin, grain size, slope and width-to-depth ratio were simulated in HEC-RAS for each of the eight hydrologic scenarios resulting in at least 336 models created and executed (additional models were created for sensitivity analyses). The volume of sediment leaving a "project reach" over the 40-year simulation for each of the post-development analyses were compared with pre-development yield and the results interpreted to select the minimum flow rated that should be regulated in the HMP.

Significant time and effort was obviously spent in preparing, executing and debugging the numerous models. Model instabilities led to using a sediment rating curve approach for computing sediment yield. There are significant issues regarding the modeling and computations which throw the validity of the results and the conclusions drawn from them into question. Specific comments are provided in the following sections.

Cross Section Geometry

The synthetic cross section geometry (width and depth) used for the analyses was generated using empirical relationships developed from various sources. These include equations for gravel-bed rivers in the UK and US, relations for sand-bed streams, and regression equations developed from measurements of Southern California streams (references in PWA memorandum of 11/12/08). Application of some of these equations to San Diego Country streams is problematic, while other similar equations developed from US data (e.g., Lee and Julien[1]) were not employed. In any case, cross sections were developed by imposing a small "bankfull" channel at the bottom of a v-shaped section with 10% side slopes (10 horizontal feet for each 1 vertical foot). Width to depth (W:D) values were computed using the various methods, and a set of width to depth values were chosen, apparently only loosely linked to the specific method results. A trapezoidal channel containing three bottom points was created at the bottom of each cross section. Based on spreadsheets and models provided W:D ratios of 3, 6, and 10 were run for both the Peñasquitos and Otay sites. A W:D ratio of 20 was also used for the Otay site for certain combinations of grain size and slope. Channel depths in HEC-RAS, based on the equation results, were set between 0.25 to 0.5 feet for Peñasquitos and 0.7 feet or less for Otay. Therefore, even though numerous combinations of W:D ratio were used, the absolute dimensions were still very small (for a depth of 0.5 feet the top width would vary from 1.5 feet to 5 feet for W:D ratios of 3 and 10, respectively).

Several of these cross section geometry relationships rely on bankfull or channel-forming discharge as an input parameter. This discharge was estimated by PWA using USGS regression

[1] "Downstream Hydraulic Geometry of Alluvial Channels," Lee and Julien, *Journal of Hydraulic Engineering* Vol. 132, No. 12, December 2006.

equations[2]. Although it is recognized that few methods exist outside of site-specific investigations to estimate this discharge, the USGS equations are known to be very approximate. The equations are based on gauging stations from Santa Barbara to San Diego, from the coast to elevations above 5,000 feet and using data available in 1975. The mean annual precipitation (MAP), also an input to the regression equation, was assumed to be 15 inches for this exercise although it does vary from about 9 inches at the coast to over 25 inches at higher elevations. The MAP at both the Peñasquitos and Otay sites is close to 12 inches. It could be argued that a 5-year return interval would be a more appropriate indicator of bank-full discharge than a 2-year flow, but this is a topic that is still being researched and is far from resolved for semi-arid regions such as San Diego.

Roughness was held constant apparently for all simulations with Manning's coefficients of 0.03 for the channel and 0.05 for the overbanks. This could have an impact on the overall results and conclusions as roughness will usually increase with both increasing grain size and increasing slope (two of the variables in the PWA analysis).

Boundary Conditions

The combination of a short (500 foot) channel length and uncertain boundary conditions casts doubt on the results. Modelers recognize that results near boundaries often reflect inaccuracies in assumptions at those boundaries and will therefore extend their models beyond the immediate area of concern to minimize these boundary effects. The current models incorporate boundary effects at both the upstream and downstream ends. An "equilibrium" inflowing sediment load was developed with the HEC-RAS model such that the upstream most cross section would neither aggrade nor degrade with time. This load was based on uniform sediment size, slope, cross section shape, etc. and is a necessary but fictitious assumption to perform the simulations. At the downstream end, the assumption of normal depth at a fixed energy slope can have similar results. In addition, using a depth rather than an elevation at the downstream end with a movable bed model can prevent the model from ever reaching an equilibrium state. For example, at an aggrading downstream boundary, instead of increased velocity (increased sediment transport potential at a shallower flow depth) the water surface elevation will simply increase to match the bed increase in order to maintain the computed normal depth.

Sediment Grain Sizes

The uniform grain sizes used in the simulations are not representative of field conditions and the model results cannot reflect preferential transport of various size classes nor armoring of the bed ("hiding" of smaller size particles by larger ones on the surface).

Hydrologic Record

Model run times and output were larger than necessary because **all** flows were simulated, even zero flows. Typically in arid regions modeling, zero flows and very low flows estimated not to be able to move particles are excluded from simulations. In the arid Southwest, it is not unusual to have a 50 year period of record with only 10-20 years of actual flow data modeled.

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[2] "Magnitude and Frequency of Floods in California," Waananen and Crippen, USGS *Water Resources Investigations 77-21*, 1977.

Maximum Erosion Depth
The maximum depth of erosion (or "hard bottom") was set to 5 feet for all models. By itself, this is a reasonable value given the very small channel dimensions. However, the fact that the cross sections hit this hard bottom many times, prompting the switch to the analytical (rating curve) approach, *even for existing conditions* (no increased flows) should have been an indicator that other modeling problems were present. An example is given in Figure 1.

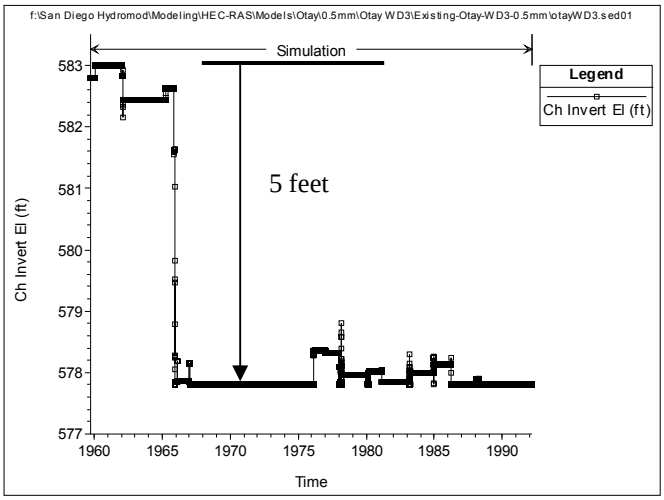

Figure 1. Otay site, existing conditions, bed hits hard bottom December, 1965

Overall, it appears that given all of the assumptions, uncertainty with inputs, and modeling problems, that a stable slope type analysis would have given similar results with much less effort involved.

Conclusions

Based on examination of the materials provided, this reviewer has serious concerns about the results obtained and their application to flow thresholds for hydromodification requirements. All results are related to baseline conditions – good practice in sedimentation modeling – but it is not clear that the baseline results are reasonable. Additionally, as noted by PWA in their memorandum, implementation of a threshold of 0.1Q2 will be a challenge in practical terms as this will encompass a very large range of flows. However, is 0.1Q2 a reasonable threshold based solely on sediment movement? Based on the EPA Nationwide Urban Runoff Program (NURP) results and continuous simulation modeling, Bledsoe and Watson[3] argue that standard hydrologic design practices are inadequate for characterizing the cumulative effects of urbanization on flow events that are *more frequent than Q2* (emphasis added) in terms of sediment transport and channel disturbance potential. That is to say, additional work leading from questions about the methodology and/or results of the PWA study may not result in an increase in a lower flow threshold for the HMP. Because of site-specific values of grain size, slope, roughness, and

[3] "Effects of Urbanization on Channel Instability," Bledsoe and Watson, *Journal of the American Water Resources Association*, Volume 37, No. 2, April 2001.

channel shape, it is not clear that using any specific frequency discharge as an indicator of shear stress that will move particles is a tenable approach.

Recommendations

Clearly the goal of the County must be to meet intent of MS4 permit with a reasonable effort to quantify flow thresholds. PWA's hydraulic and sediment transport results should be supplemented with real data from sites in order to set thresholds (flows, shear stresses, or velocities). With the help of the technical advisory group and others, existing information could be gathered to provide additional base data. Slope, sediment properties, roughness, and channel shape data from other studies could be used to compute shear stresses that would move significant amounts of sediment. If frequency discharges are available for a site, the critical shear could be related to a return period. If enough sites are available, the data could be analyzed to see if there is a consistent value of return period. If such a value is found, this could used for a regulatory threshold. If not, a site specific analysis may be required for each project.

Thank you for the opportunity to perform this review and contribute to stormwater management practice in San Diego County. Please call me at (858) 487-9378 if you have any questions.

Sincerely,

Martin J. Teal, P.E., P.H., D.WRE
Vice President

APPENDIX E

SDHMP Continuous Simulation Modeling Primer

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BROWN AND CALDWELL

Memorandum

9665 Chesapeake Drive, Suite 201
San Diego, CA 92123
Tel: 858-514-8822
Fax: 858-514-8833

Project Title: San Diego County Hydrograph Modification Plan

Project No: 133904

San Diego County Hydrograph Modification Plan

Subject: Using Continuous Simulation to Size Storm water Control Facilities

Date: April 30, 2008

To: Sara Agahi, San Diego County

From: Tony Dubin, Brown and Caldwell
Nancy Gardner, Brown and Caldwell

Brown and Caldwell prepared this memo to help civil engineers through the process of sizing storm water control facilities to meet San Diego County's Interim Hydromodification Criteria (IHC). Since the publication of the IHC this past January, the County has been engaged in outreach activities to explain the new storm water modeling methods required by the IHC and storm water facilities that could meet the IHC performance standard. In response to the outreach efforts, the County has received several questions and comments along a common theme:

1. How do we perform continuous hydrologic modeling analyses to size storm water control facilities?
2. What is the precise meaning of the peak flow and flow duration curve matching standard described in the IHC memo?

This document is not a complete "how-to manual" for conducting continuous hydrologic modeling to meet the County's IHC, but we hope it addresses the major technical concerns of the local engineering community.

Using Continuous Simulation Models to Size Storm Water Facilities

The IHC requires continuous simulation hydrologic modeling to adequately size storm water control facilities. This is a significant break with the common local practice of using event-based modeling to determine whether a storm water pond, swale or other device was properly sized. Event-based modeling computes storm water runoff rates and volumes generated by a synthetic rainfall event with a total depth that matches local records (e.g., rainfall depths shown in County isopluvial maps). By contrast, continuous modeling uses a long time series of actual recorded precipitation data as input a hydrologic model. The model in turn simulates hydrologic fluxes (e.g., surface runoff, groundwater recharge, evapotranspiration) for each model time step.

Continuous hydrologic models are usually run using one-hour or 15-minute time steps, depending on the type of precipitation data available and computational complexity of the model. Continuous models generate outputs for each model time step and most software packages allow the user to output a variety of different hydrologic flux terms. For example, a continuous simulation model setup with 25 years of hourly precipitation data will generate 25 years of hourly runoff estimates, which corresponds to runoff estimates for

each of the 219,000 time steps (each date and hour) of the 25 year simulation period. While creating and running continuous simulation models involves more effort than running event-based models, the clear benefit of the continuous approach is that these models allow an engineer to estimate how often and for how long flows will exceed a particular threshold. Limiting how often and for how long geomorphically significant flows occur is at the heart of San Diego County's approach to hydrograph modification management.

Two common models were presented at a recent APWA workshop on HMP issues: HSPF and HEC-HMS. HSPF refers to the Hydrologic Simulation Program-FORTRAN and is distributed by the USEPA. HEC-HMS refers to the Hydrologic Modeling System (HMS) produced by the US Army Corps of Engineers Hydraulic Engineering Center (HEC). Engineers unfamiliar with these software packages should seek out training opportunities and online guidance. The USEPA conducts training workshops around the US to help teach engineers how to use HSPF. HEC-HMS training is provided through ASCE and third-party vendors.

The following list describes the major elements of developing a hydrologic model and using that model to size storm water facilities that meet the IHC.

1. Select an appropriate historical precipitation dataset for the analysis.
   a. The precipitation station should be located near the project site or at least receive similar rainfall intensities and volumes as the project site.
   b. The station should also have a minimum of 25-years of data recorded at hourly intervals or more frequently.
2. Develop a model to represent the pre-project conditions, including
   a. Land cover types
   b. Soil characteristics
   c. General drainage direction
3. Develop a model to represent the post-project conditions, including
   a. New land cover types – more impervious surfaces
   b. Soil characteristics
   c. Any modifications to the drainage layout
4. Examine the model results to determine how the proposed development affects storm water flows
   a. Compute peak flow recurrence statistics (described below)
   b. Compute flow duration series statistics (described below)
5. Iteratively size storm water control facilities until the post-project peak flows and durations meet the performance standard described below.

Understanding the Peak Flow and Flow Duration Performance Criteria

The IHC is based on a peak flow and flow duration performance standard. To compute the peak flow and flow duration statistics described in the standard, model users must have a method for evaluating long time series outputs (usually longer than the 65,000 rows available in MS Excel 2003 and earlier versions) and computing both peak flow frequency statistics and flow duration statistics.

We recommend computing **peak flow frequency statistics** by constructing a partial-duration series (rather than an "annual maximum" series). This involves examining the entire runoff time series generated by the model, dividing the runoff time series into a set of discrete unrelated events, determining the peak flow for each event, ranking the peak flows for all events and then computing the recurrence interval or plotting position for each storm event. To limit the number of discrete events to a manageable number, we usually only select events that are larger than a 3-month recurrence when generating the partial duration series. We consider flow events to be "separate" when flow rates drop below a threshold value for a period of at least 24 hours.

The exercise described above will generate a table of peak flows and corresponding recurrence intervals (i.e., frequency of occurrence for a particular flow). For continuous modeling and peak flow frequency statistics, it is important to remember that events refer to *flow events* and not precipitation events. Peak flow frequency statistics estimate how often flow rates will exceed a given threshold. For example, the 5-year flow event represents the flow rate that is equaled or exceeded an average of once per 5 years (and the storm generating this flow does not necessarily correspond to the 5-year precipitation event). Ranking the storm events generated by a continuous simulation and computing the recurrence interval of each storm will generate a table similar to Table 1 below.

Readers who are unfamiliar with how to compute the partial-duration series should consult reference books or online resources for additional information. For example, *Hydrology for Engineers*, by Linsley et all, 1982, discusses partial-duration series on pages 373-374 and computing recurrence intervals or plotting positions on page 359. *Handbook of Applied Hydrology*, by Chow, 1964, contains a detailed discussion of flow frequency analysis, including Annual Exceedance, Partial-Duration and Extreme Value series methods, in Chapter 8. The US Geological Survey (USGS) has several hydrologic study reports available online that use partial-duration series statistics (see http://water.usgs.gov/ and http://water.usgs.gov/osw/bulletin17b/AGU_Langbein_1949.pdf).

Table 1. Example Peak Flow Frequency Statistics

Recurrence Interval (years)	Peak Flow (cfs per acre)
58.5	0.73
21.9	0.69
13.5	0.53
9.8	0.53
7.6	0.51
6.3	0.51
5.3	0.50
4.6	0.50
4.1	0.49
3.7	0.48
3.3	0.48
3.0	0.46
2.8	0.45
2.6	0.45
2.4	0.45
2.3	0.45
2.1	0.44
2.0	0.42

Flow duration statistics are more straightforward to compute than peak flow frequency statistics. Flow duration statistics provide a simply summary of how often a particular flow rate is exceeded. To compute the flow duration series, rank the entire runoff time series output and divide the results into discrete bins. Then, compute how often the flow threshold dividing each bin is exceeded. For example, let's assume the results of a 35-year continuous simulation hydrologic model with hourly time steps show that flows leaving a project site exceeded 5 cfs an average of about once per year for 30 hours at a time. This corresponds to a total of

1050 hours of flows exceeding 5 cfs over 35 years. Another way to express this information is to say a flow rate of 5 cfs is exceeded 0.34 percent of the time. Computing the "exceedance percentage" for other flow rates will fill out the flow duration series. Table 2 lists an example flow duration series.

Table 2. Example Flow Duration Statistics

Flow (cfs per acre)	Percent of Time Flow Rate is Exceeded
0.02	0.67%
0.03	0.43%
0.04	0.34%
0.06	0.27%
0.07	0.21%
0.09	0.17%
0.10	0.15%
0.12	0.12%
0.13	0.11%
0.15	0.09%
0.16	0.08%
0.17	0.07%
0.19	0.06%
0.20	0.05%
0.22	0.05%
0.23	0.04%
0.25	0.04%
0.26	0.03%

The intention of the IHC performance standard is to limit the potential for new development to generate accelerated erosion of stream banks and stream bed material in the local watershed by matching the post-project hydrograph to the pre-project hydrograph for the range of flows that are likely to generate significant amounts of erosion within the creek. The IHC memo identified the geomorphically significant flow range as extending from two-tenths of the 5-year flow to the 10-year flow (0.2Q5 to Q10). The performance standard requires the following:

A. For flow rates from 20% of the pre-project 5-year runoff event (0.2Q5) to the pre-project 10-year runoff event (Q10), the post-project discharge rates and durations shall not deviate above the pre-project rates and durations by more than 10% over more than 10% of the length of the flow duration curve.

B. For flow rates from 0.2Q5 to Q5, the post-project peak flows shall not exceed pre-project peak flows. For flow rates from Q5 to Q10, post-project peak flows may exceed pre-project flows by up to 10% for a 1-year frequency interval. For example, post-project flows could exceed pre-project flows by up to 10% for the interval from Q9 to Q10 or from Q5.5 to Q6.5, but not from Q8 to Q10.

Determining When a Storm Water Control Facility Meets the IHC Performance Standard

The previous section discussed how to calculate peak flow frequency and flow duration statistics. By comparing the peak flow frequency and flow duration series for pre-project and post-project conditions, an engineer can determine whether a stormwater control facility would perform adequately or if its size should be increased or decreased. The easiest way to determine if a particular storm water facility meets the IHC performance standard is to plot peak flow frequency curves and flow duration curves for the pre-project and post-project conditions.

Figure 1 shows a **flow duration curve** for a hypothetical development. The three curves show what percentage of the time a range of flow rates are exceeded for three different conditions: pre-project, post-project and post-project with storm water mitigation. Under pre-project conditions the minimum geomorphically significant flow rate (assumed to be 0.2Q5) is 0.10 cfs and flows would equal or exceed this value about 0.14% of the time (about 12 hours per year). For post-project conditions, this flow rate would occur more often – about 0.38% of the time (about 33 hours per year). This increase in the duration of the geomorphically significant flow after development illustrates why duration control is closely linked to protecting creeks from accelerated erosion. Higher flows that last for longer durations provide the energy necessary to increase the amount of erosion in local creeks. The post-project mitigated condition would include stormwater controls designed to limit the duration of geomorphically significant flows. Figure 1 shows that flows exceed 0.10 cfs only 0.08% of the time, which is less than pre-project conditions. This means the stormwater control mitigations would counteract the effects of the increased pavement associated with development projects.

An engineer can easily interpret the flow duration plots to determine whether a stormwater control facility would meet the IHC. Looking at the flow range between 0.2Q5 and Q10, the post-project mitigated curve should plot on or to the left of the pre-project curve. If the post-project curve plots to the left of the pre-project curve, this means a particular flow would occur for shorter durations due to storm water controls. Minor deviations where the post-project durations exceed the pre-project durations are allowed over a short portion of the flow range as described in IHC item A above.

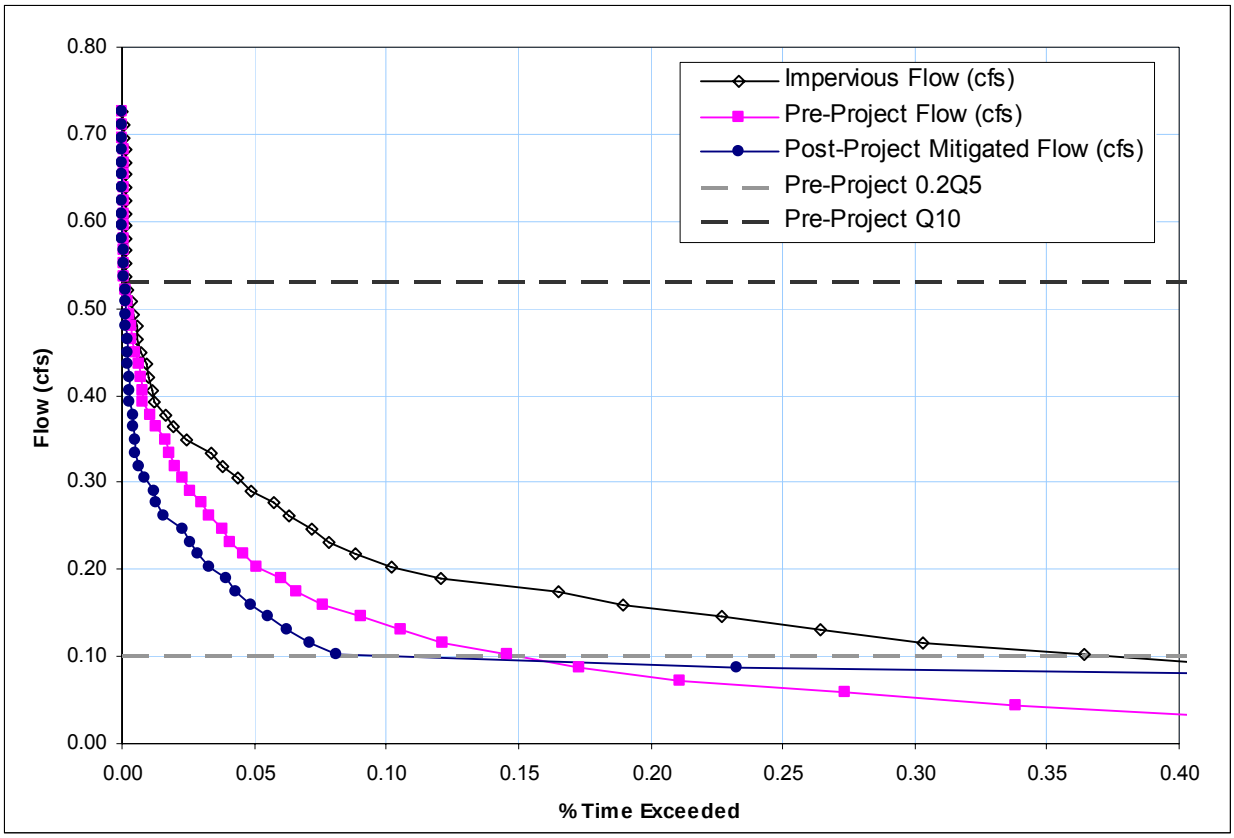

Figure 1. Flow Duration Series Statistics for a Hypothetical Development Scenario

Figure 2 shows a **peak flow frequency curve** for pre-project, post-project and post-project with storm water mitigation scenarios. The curves indicate how often a particular flow rate would be equaled or exceeded. For example, the pre-project 5 year flow rate would be 0.5 cfs per acre. This means under pre-project conditions, a flow rate of 0.5 cfs per acre would be equaled or exceeded an average of once per 5 years. For developed conditions, this 0.5 cfs per acre peak flow rate occur more often – about once per 1.5 years or, expressed another way, more than 3 times as often. The developed 5 year flow rate would increase by 30 percent over the pre-project condition, from 0.5 cfs per acre to about 0.65 cfs per acre.

Storm water control facilities should reduce peak flows from the site to levels less than or equivalent to the pre-project conditions. To determine whether a storm water facility provides sufficient protection, examine the peak flow frequency curves to see if the post-project mitigated peak flows are lower than pre-project peak flows of the same recurrence interval. The post-project mitigated scenario curve should plot below the pre-project curve for recurrence intervals between 0.2Q5 and Q10 to meet the IHC performance standard, with the possible exception of the small, allowable deviations described above in IHC item B.

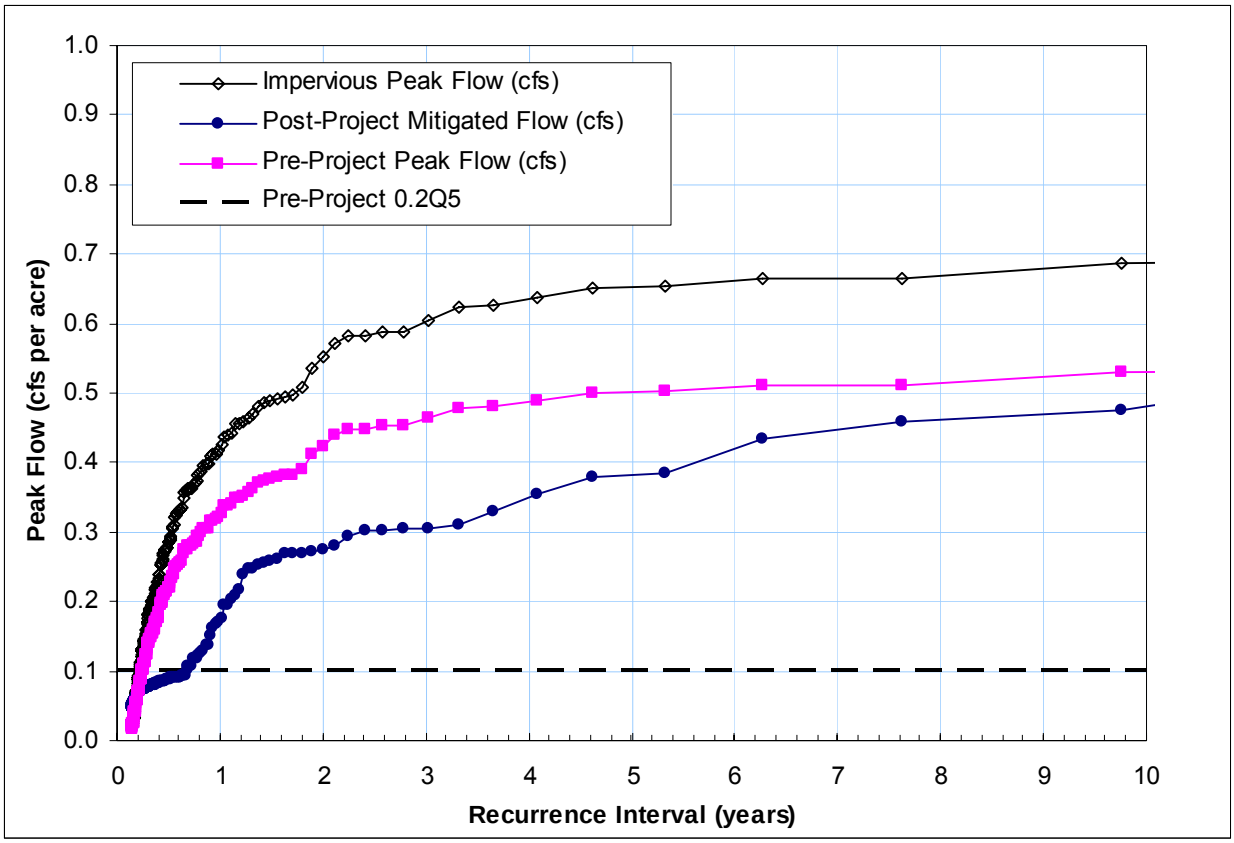

Figure 2. Peak Flow Frequency Statistics for a Hypothetical Development Scenario

References

Linsley, RK Jr.; Koher, MA; Paulhas, JLH; *Hydrology for Engineers,* 1982; McGraw-Hill Inc.

Chow, VT; *Handbook of Applied Hydrology,* 1964; McGraw-Hill Inc.

APPENDIX F

HSPF Modeling Analysis - Technical Memos

Use of contents on this sheet is subject to the limitations specified at the end of this document.
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BROWN AND CALDWELL

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Memorandum

Project Title: San Diego County Hydrograph Modification Plan

Project No: 133904

San Diego County Hydrograph Modification Plan

Subject: HMP Sensitivity Analysis

Date: December 16, 2009

To: Sara Agahi, San Diego County

From: Tony Dubin, Brown and Caldwell
Eric Mosolgo, Brown and Caldwell

This memorandum evaluates three conditions where the HMP requirements could be modified without appreciable impacts on the receiving water body:

1. Development that is directly tributary to a large river
2. Development in highly urbanized watershed
3. Limited small developments within a watershed

The following sections describe the technical analysis that was performed to test the sensitivity of river flow durations to specific modifications in the HMP requirements. The results of the technical analysis can be used to justify and/or discard any planned special conditions that allow the HMP requirements to be modified.

Issue #1: Could Developments Near Large Rivers Be Exempted from Flow Duration Requirements?

To test whether development that is directly tributary to large rivers could potentially be exempted from flow duration control requirements, we examined the historical flow record for the San Diego River and evaluated how much additional development could occur without an appreciable change in the range of flows within the San Diego River channel.

We acquired the historical, hourly stream flow records for the San Diego River at Fashion Valley (USGS 11023000) and San Diego River at Mast Road (USGS 11022480) directly from the US Geological Survey. The data was available from October 1988 through November 2009. Next, we computed flow duration statistics for the river and computed relevant statistics, such as the peak 2-year flow rate.

After summarizing the river flows, we built HSPF models to simulate the conversion of undeveloped land to suburban development, assuming a 10-acre hypothetical development. We then ran the HSPF models and computed flow duration curves for the pre- and post-development conditions. We ran one scenario that used the Fashion Valley rain gauge and another scenario that used the Santee rain gauge. Table 1 lists the NRCS soil groups, land uses, and rain gauges that were used to simulate the different development scenarios.

Table 1. HSPF Model Assumptions for Large River Exemption Simulations							
No.	Scenario Description	Rain Gauge	Basin Acres	Soil and Land Use Combinations (area in acres)			
				Impervious	C/D, Dirt	C/D, Grass	C/D, Shrub
1	Undeveloped conditions in lower watershed	Fashion Valley	10	0	5	0	5
2	Developed (unmitigated) conditions in lower watershed	Fashion Valley	10	4	0	4	2
3	Undeveloped conditions in lower watershed	Santee	10	0	5	0	5
4	Developed (unmitigated) conditions in lower watershed	Santee	10	4	0	4	2

To simulate the incremental effects of development on flow durations, the pre-development flow duration curve was subtracted from the post-development flow duration curve. To represent multiple developments, the flow portion of this *difference flow duration curve* was scaled linearly with area to represent 100, 500, 1000, and 2000-acres of additional development within the San Diego River watershed. The simple scaling of the flow duration curves ignores the curve smoothing that could result from the staggered timing of flows reaching the San Diego River, and as such, this simple scaling of the flow duration curves should provide a conservative approximation of the impacts of multiple developments.

Finally, to gauge the impact of multiple developments on the range of San Diego River flows, the *difference flow duration curves* for 10, 100, 500, 1000, and 2000-acres of additional development were superimposed on the observed San Diego River flow duration curve. Figure 1 and Figure 2 (on the following pages) show the combined effect of multiple developments in the vicinity of the Fashion Valley stream flow gauge. Figure 2 shows the same information, but with the scale that focuses in on the part of the curve where the differences are most noticeable. Figure 3 and Figure 4 show the same results for the Mast Road (near Santee) stream flow gauge.

Recommendations

The post-development flow duration curves show very little difference from existing condition flow duration curves until about 2,000 acres or more of additional development occurs. Even when there are differences in the flow duration curves, the flow rates are sufficiently high that the incremental difference would not appreciably increase the level of sediment movement and river bank erosion. As such, we recommend exemptions for these reaches of the San Diego River and other similar rivers from flow duration control requirements.

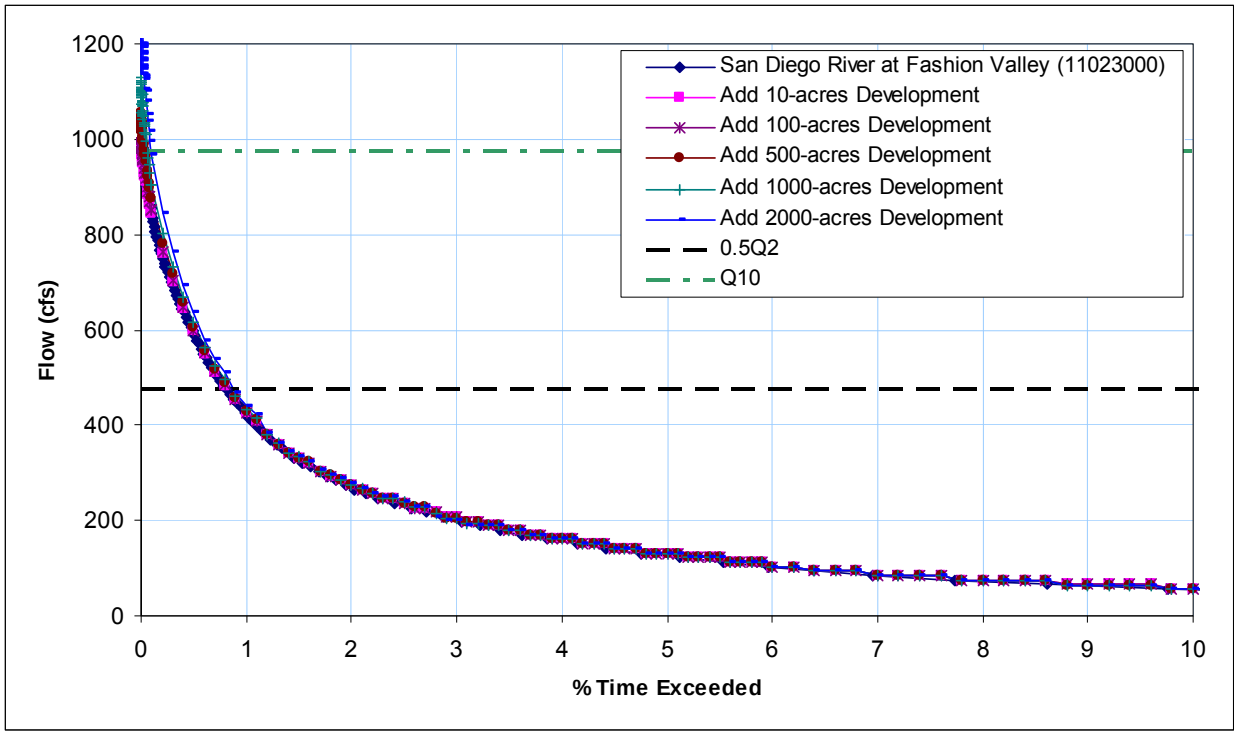

Figure 1. Effects of Additional Development near the San Diego River at Fashion Valley

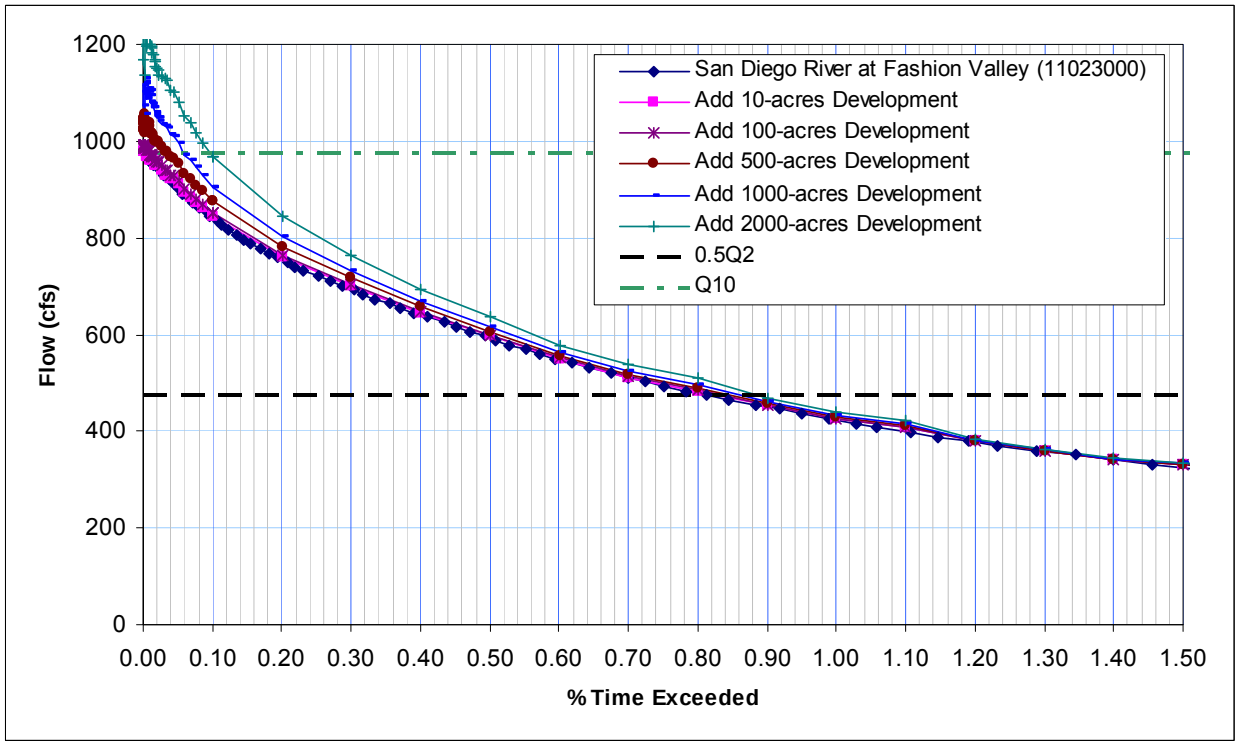

Figure 2. Effects of Additional Development near the San Diego River at Fashion Valley, Zoomed View

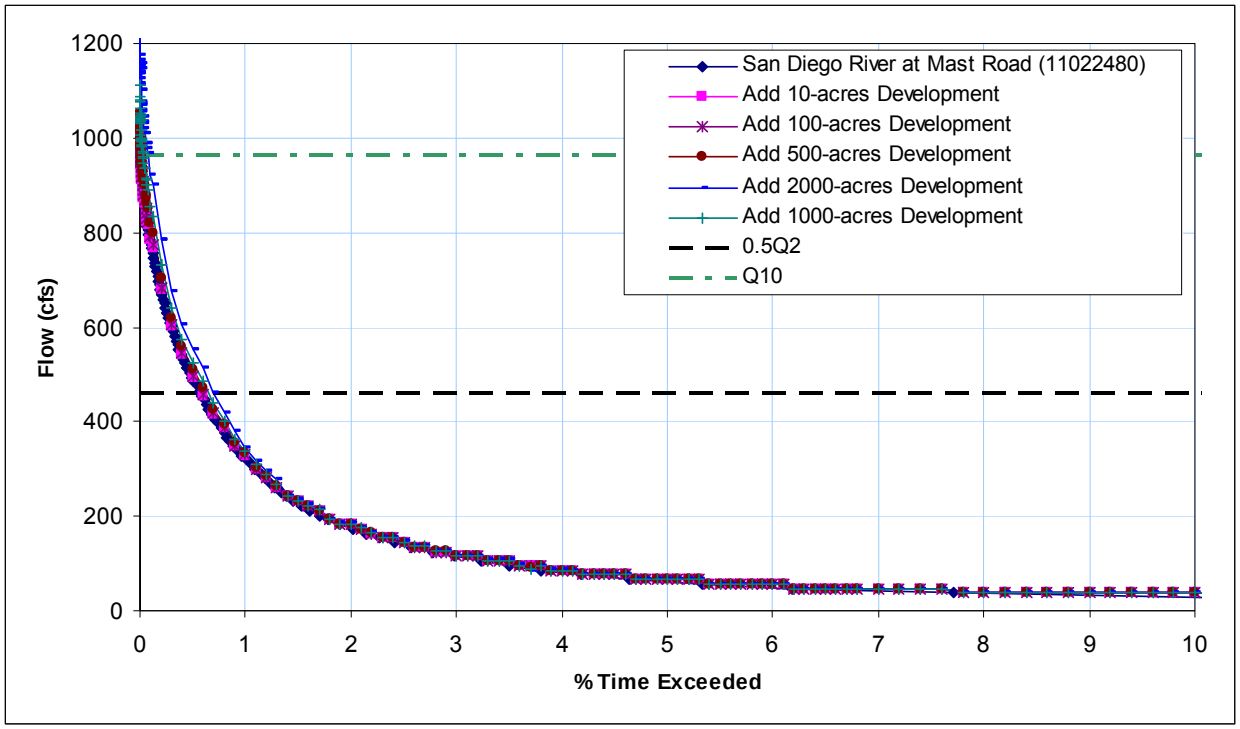

Figure 3. Effects of Additional Development near the San Diego River at Mast Road (near Santee)

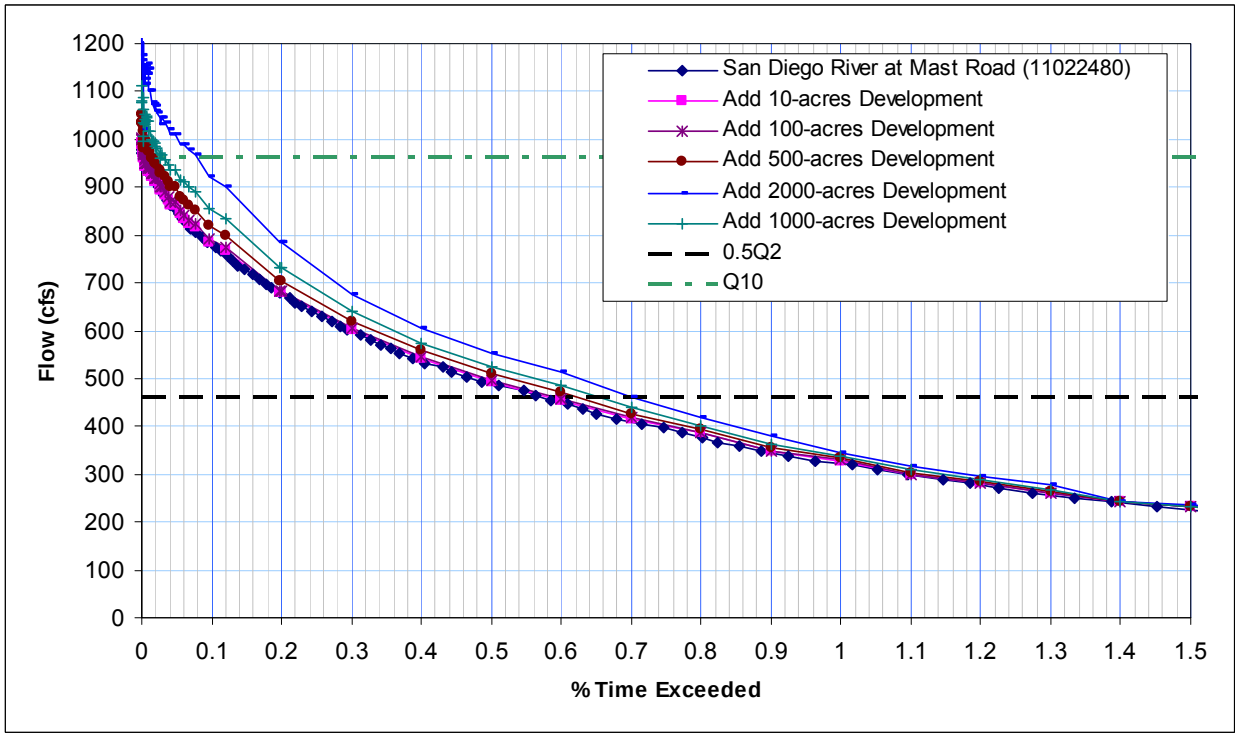

Figure 4. Effects of Additional Development near the San Diego River at Mast Road (near Santee), Zoomed View

Issue #2: Could Limited Infill Development within Highly Urban Watersheds Be Exempted from Flow Duration Control Requirements?

To test whether limited infill development within urbanized watersheds would appreciably impact flow durations in receiving water bodies, we built HSPF models to simulate the stormwater runoff that would occur in 10-acre, 100-acre, and 500-acre urbanized watersheds with 40, 50, and 60-percent total impervious areas. Table 2 lists the soil, land use, and rain gauges that were used to develop the models.

Table 2. HSPF Model Assumptions for Urban Infill Exemption Simulations

No.	Scenario Description	Rain Gauge	Basin Acres	Soil and Land Use Combinations (area in acres)			
				Impervious	C/D, Dirt	C/D, Grass	C/D, Shrub
1	10-acre urban watershed (40% impervious)	Fashion Valley	10	4	0	4	2
2	100-acre urban watershed (40% impervious)	Fashion Valley	100	40	0	40	20
3	500-acre urban watershed (40% impervious)	Fashion Valley	500	200	0	200	100
4	10-acre urban watershed (50% impervious)	Fashion Valley	10	5	0	4	1
5	100-acre urban watershed (50% impervious)	Fashion Valley	100	50	0	40	10
6	500-acre urban watershed (50% impervious)	Fashion Valley	500	250	0	200	50
7	10-acre urban watershed (60% impervious)	Fashion Valley	10	6	0	3	1
8	100-acre urban watershed (60% impervious)	Fashion Valley	100	60	0	30	10
9	500-acre urban watershed (60% impervious)	Fashion Valley	500	300	0	150	50

Figure 5 (on the following page) shows a peak flow frequency curve for the 100-acre, 40, 50, and 60-percent impervious scenarios. Figure 6 shows the flow duration curves for these 100-acre watershed scenarios. Figure 7 focuses on the portion of the flow duration curves where the differences in the simulations are most noticeable. The 10-acre and 500-acre scenarios produced similar results (on a unit area basis).

Recommendations

The extent of the spread among the 40, 50, and 60-percent model scenarios demonstrates that unchecked development within urbanized watershed would have a noticeable effect on the peak flows and flow durations observed within the receiving waters. However, some modest level of urbanized development would produce minor or negligible effects on the peak flows and flow durations. Based on our examination of the peak flow frequency and flow duration curves, we recommend the following allowances in highly urbanized watersheds:

> For subwatershed areas containing between 40 percent and 70 percent existing imperviousness (as measured from the project site downstream to a natural creek confluence), projects may be exempt from HMP criteria if:

1. The potential cumulative impacts within the subwatershed would not increase the composite impervious area percentage by more than 3 percent, and;

2. The project discharges runoff to an existing hardened system (storm drain or concrete channel) that extends beyond the Domain of Analysis determined for the project site.

For subwatershed areas containing existing impervious percentages greater than 70 percent (as measured downstream to the Pacific Ocean, San Diego Bay, a tidally influenced lagoon, or an exempt river system), projects are exempt from HMP criteria. Additionally, for subwatershed areas containing less than 40 percent existing imperviousness, projects are subject to HMP criteria unless they qualify for another exemption (per HMP Decision Matrix).

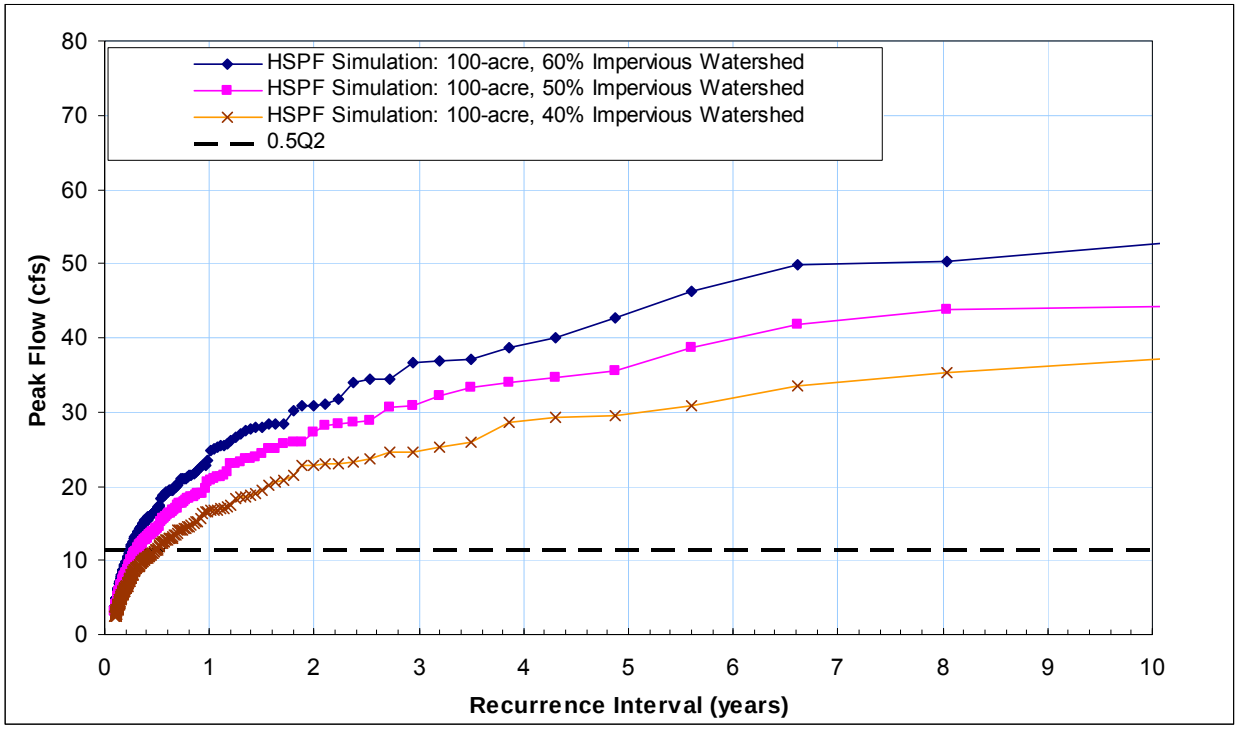

Figure 5. Simulated Peak Flow Frequencies for 100-acre Urbanized Watershed (Fashion Valley rainfall)

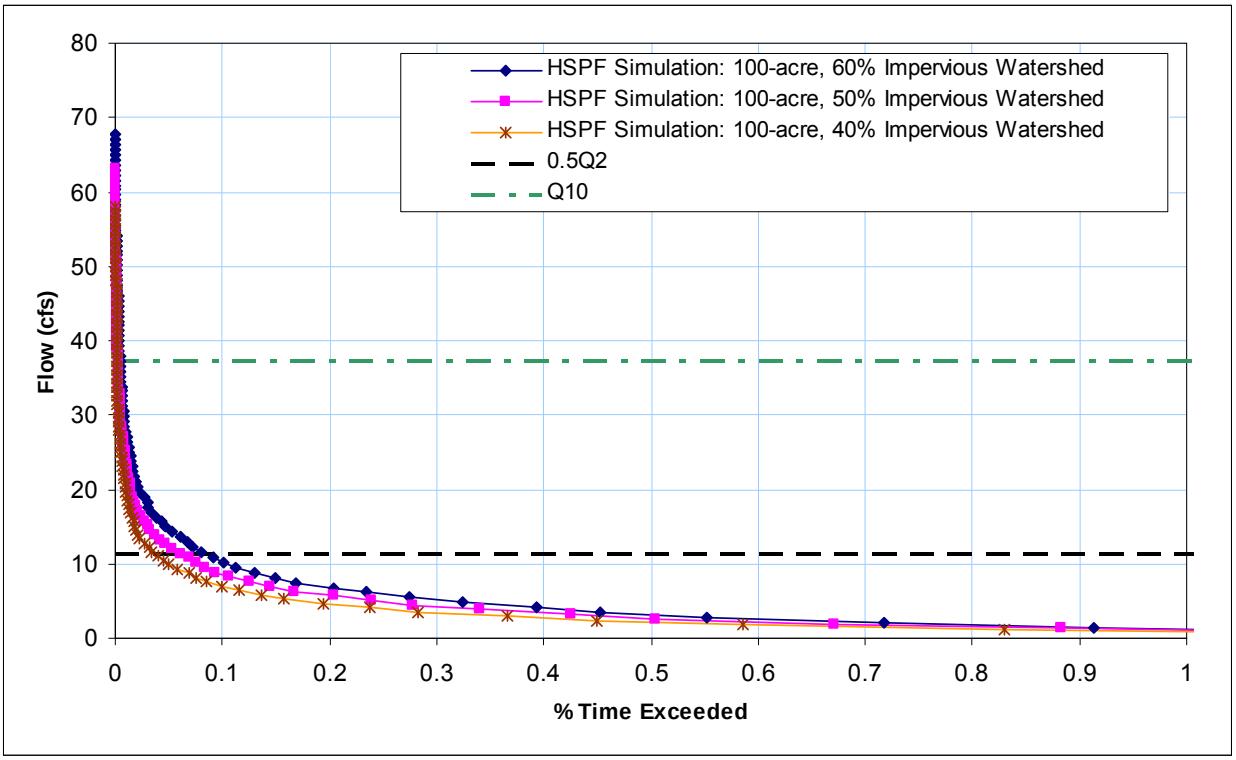

Figure 6. Simulated Flow Durations for 100-acre Urbanized Watershed (Fashion Valley rainfall)

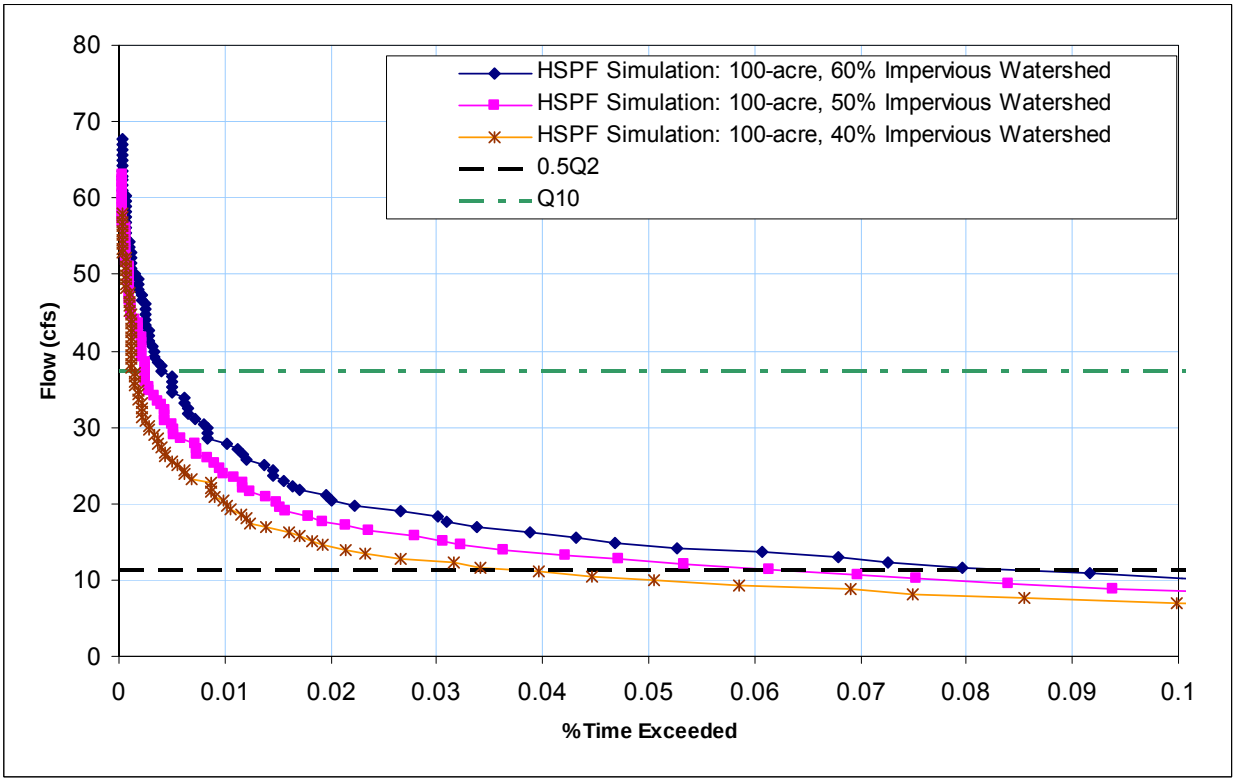

Figure 7. Simulated Flow Durations for 100-acre Urbanized Watershed (Fashion Valley rainfall), Zoomed View

Issue #3: Could Limited Small Developments Specify a Minimum 3-inch Diameter Orifice for Detention Pond Design without Affecting the Receiving Water's Flow Durations?

Due to concerns about clogging, a 3-inch diameter minimum diameter orifice has been proposed for stormwater detention pond design. This size orifice would not provide the required level of flow restriction for small developments, because the 3-inch diameter orifice capacity is greater than the lower flow control range (0.1Q2, 0.3Q2, 0.5Q2) in the Final HMP. As such, we tested whether a limited number of small developments could use a 3-inch minimum orifice diameter without generating appreciable cumulative effects on the receiving water's flow durations.

We built HSPF models to represent undeveloped 100-acre and 500-acre watersheds in the vicinity of the Lower Otay rain gauge. We then built HSPF models to represent undeveloped and developed-mitigated conditions for 5-acre and 10-acre development sites. The developed-mitigated scenarios included detention ponds with 3-inch diameter lower orifice and an upper high flow release.

Similar to the large watershed development scenarios evaluated for Issue #1 above, we computed flow duration curves for the undeveloped and developed-mitigated scenarios, and then subtracted the undeveloped flow duration curve from the developed-mitigated flow duration curve to estimate the difference in conditions. Then, we scaled the difference flow duration curve in increments of 5, 10, 25, and 50-acres and superimposed these curves on the 100-acre and 500-acre undeveloped scenarios to determine when the cumulative impacts would be noticeable. Table 3 lists the soil, land use, and rain gauges that were used for this analysis.

Table 3. HSPF Model Assumptions for 3-inch Minimum Orifice Diameter Simulations

No.	Scenario Description	Rain Gauge	Basin Acres	Soil and Land Use Combinations (area in acres)			
				Impervious	C/D, Dirt	C/D, Grass	C/D, Shrub
1	100 ac undeveloped conditions	Lower Otay	100	0	50	0	50
2	500 ac undeveloped conditions	Lower Otay	500	0	250	0	250
3	1 ac undeveloped conditions	Lower Otay	1	0	0.5	0	0.5
4	5 ac undeveloped conditions	Lower Otay	5	0	2.5	0	2.5
5	10 ac undeveloped conditions	Lower Otay	10	0	5	0	5
6	1 ac mitigated conditions with 3-in diameter outlet	Lower Otay	1	0.4	0	0.4	0.2
7	5 ac mitigated conditions with 3-in diameter outlet	Lower Otay	5	2	0	2	1
8	10 ac mitigated conditions with 3-in diameter outlet	Lower Otay	10	4	0	4	2

Figure 8 shows the flow durations curves for the 100-acre undeveloped scenario, plus developed-mitigated scenarios with increments of 5, 10, 25, and 50-acres of development. For the developments, we are assuming the ponds serve 10 acre increments of development (except for the 5-acre increment scenario) and include a 3-inch diameter lower control orifice.

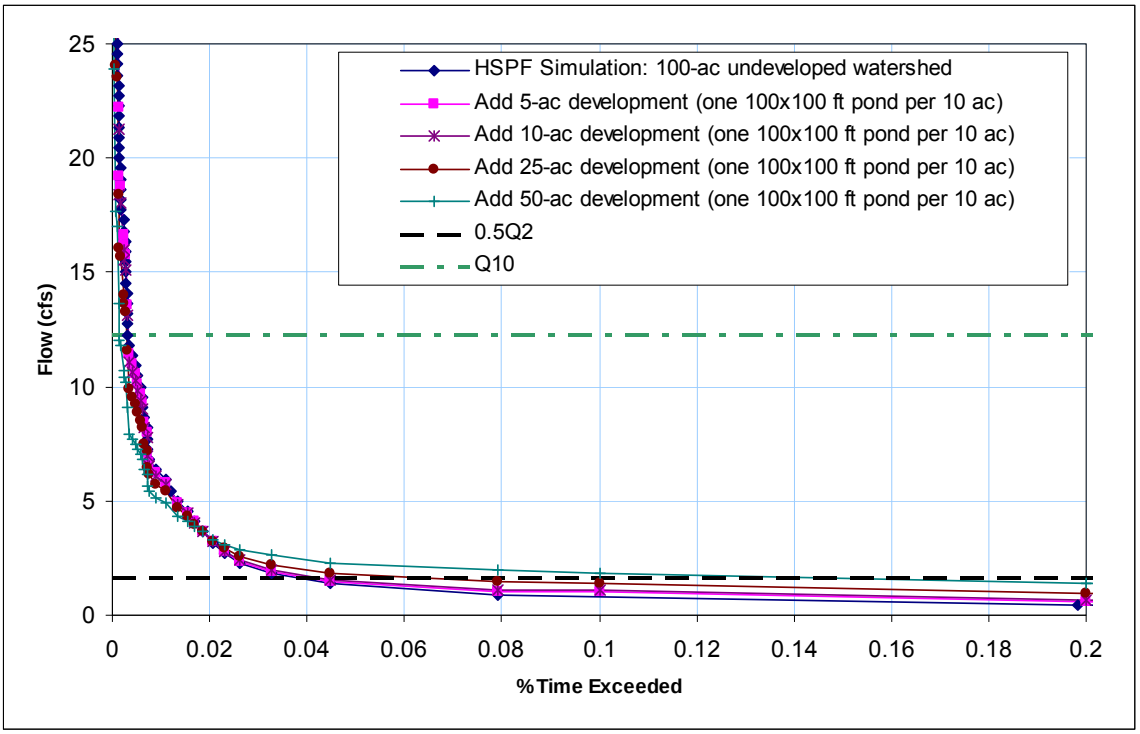

Figure 8. Simulated Flow Durations for Adding Development and Extended Duration Ponds with 3-inch Minimum Diameters to a 100-acre Undeveloped Watershed (Lower Otay rainfall)

The results show that the cumulative development flow duration curve approximately matches the undeveloped flow duration curves when development occurs in 10 percent or less of the watershed. For development levels in excess of 10 percent, the cumulative flow duration curve deviates noticeably from the undeveloped condition. The 500-acre undeveloped watershed simulations indicated a similar threshold sensitivity to development.

Recommendations

The HSPF analysis indicated limited situations where a 3-inch minimum orifice size standard could be applied. However, it should be noted that for small sites where orifices less than 3-inches would be required for HMP mitigation, we recommend an LID requirement in lieu of extended detention facilities.

For project sites 1 acre of less in size:

- HMP mitigation must be attained through the use of LID facilities (because a 3-inch outlet orifice would provide no tangible mitigation)

For project sites greater than 1 acre and less than 5 acres in size:

- HMP mitigation should be attained through the use of LID facilities

If LID implementation is not possible and extended detention basins are used:

- A 3-inch minimum outlet orifice size may be used provided that the potential cumulative impacts in the subwatershed area, as measured from the project site downstream to a natural creek confluence, would not increase the composite impervious area in the subwatershed to more than 10 percent.

If the potential cumulative impacts in the subwatershed areas would result in an impervious area percentage greater than 10 percent, then the 3-inch minimum orifice size waiver would not be granted.

Appendix A: Assumed Water Movement Hydraulics for Modeling BMPs

At minimum, each BMP consists of a reservoir for surface water storage, an overflow outlet and a soil medium. In general, runoff flows into the surface storage reservoir and either infiltrates into the soil or flows through the overflow outlet structure.

Water that does not overflow the surface-storage reservoir infiltrates into the top soil medium and is stored as soil water. Once in the soil, water percolates downward at a rate that is dependent on the soil moisture content, the hydraulic properties of the soil and the boundary conditions of the soil layer.

Many BMPs also include a gravel or aggregate layer below the upper soil layer. Similarly, the rate at which water percolates downward through the gravel/aggregate layer is dependent on the soil moisture content, the hydraulic properties of the soil and the boundary conditions. The lower boundary is often controlled using an underdrain with an orifice outlet.

The following sections describe the theoretical relationships used to develop the FTABLEs for HSPF modeling of the BMPs. The first four sections of this appendix describe the discharge equations used for each of three overflow outlet types and the underdrain orifice:

- Circular Overflow Outlet,
- Straight, Sharp-crested Weir,
- V-notch Weir,
- Underdrain Orifice.

The last three sections describe infiltration, soil water storage and soil water movement.

<u>Circular Overflow Outlet</u>

A circular overflow outlet is basically a vertical pipe with a horizontal opening set to a specific height. This type of outlet is used for bioretention and the flow-through planter BMPs. Hydraulically, this is sufficiently similar to the overflow gate and weir designs shown in the Countywide SUSMP.

Outflow control conditions vary as head over the pipe opening increases. As the water level begins to rise above the opening the pipe acts as a circular weir and flow is crest-controlled. As the head over the opening increases the flow condition transitions to become orifice-controlled and eventually pipe-controlled (the pipe flows full).

Under crest-controlled conditions outflow is calculated using a modified weir equation:

$$Q = C_d \left(\pi R\right) H^{3/2} \qquad \textbf{Equation 1}$$

Where Q = outflow in cfs, C_d = discharge coefficient, R = pipe radius in ft, and H = the head over the crest in ft.

The discharge coefficient for crest-controlled flow is highly variable depending on the head over the crest, the radius of the circular weir, and the ratio of the inlet height to radius. USBR (1987) published a series of curves that are used to determine the appropriate discharge coefficient for each water surface level.

Straight Sharp-crested Weir

A second type of overflow outlet is a straight sharp-crested weir. A sharp-crested weir is used to control overflow in a vegetated/grassy swale. The following weir equation is used to calculate overflow discharge:

$$Q = C_d L H^{3/2} \qquad \textbf{Equation 2}$$

Where Q = outflow in cfs, C_d = discharge coefficient, L = weir length in ft and H = head over the weir crest in ft. The weir coefficient is assumed to be 3.10 for straight sharp-crested weirs.

V-notch Weir

In some cases a v-notch is added to the overflow weir. A v-notch weir is incorporated into the overflow weir of the vegetated bioswale with check dams. The flow through the v-notch is calculated using the following equation.

$$Q = C_d \tan\left(\frac{\phi}{2}\right) H^{5/2} \qquad \textbf{Equation 3}$$

Where Q = outflow in cfs, C_d = discharge coefficient, ϕ = angle of the v-notch, and H = head over the weir crest in ft. The v-notch is assumed to be 90 degrees and the weir coefficient was assumed to be 2.55.

Underdrain Outlet

The perforated pipe of lateral underdrains is assumed to be sufficiently large as to not limit the flow into the drain. Drain outflow is limited by single orifice at the end of the drain pipe. Outflow through this orifice was calculated using the orifice equation:

$$Q = C_d A \sqrt{2gH} \qquad \textbf{Equation 4}$$

Where Q = outflow, C_d = discharge coefficient, A = area of the orifice, g = gravitational constant, H = head over the centerline of the orifice. The discharge coefficient is assumed to be 0.6 in all cases.

Infiltration

Infiltration is the process of water penetrating from the ground surface into the soil (Chow et al. 1988). Many factors influence the rate of infiltration including ground cover, soil hydraulic properties and soil moisture. As water infiltrates into the soil the

soil moisture and hydraulic gradient change. As a result the infiltration rate itself changes over time. This non-linear relation is given by Richard's equation, which is the governing equation for unsteady unsaturated flow in a porous medium. Eagleson (1970) presents Richard's equation in its one-dimensional form:

$$\frac{\partial \theta}{\partial t} = \frac{\partial}{\partial z}\left[D\frac{\partial \theta}{\partial z} + K \right]. \qquad \textbf{Equation 5}$$

Where D = diffusivity, K = hydraulic conductivity, q = soil moisture content, z = elevation and t = time.

Numerous equations have been developed as approximate solutions to Richard's equation. Eagleson (1970) shows that Horton's equation is derived from Richard's equation by assuming D and K are constants independent of soil moisture:

$$f(t) = f_c + (f_0 - f_c)e^{-kt}. \qquad \textbf{Equation 6}$$

Where, f_0 = initial infiltration rate, k = decay constant and f_c = final constant infiltration rate. Using Horton's approximate solution we can see how infiltration rate changes over time.

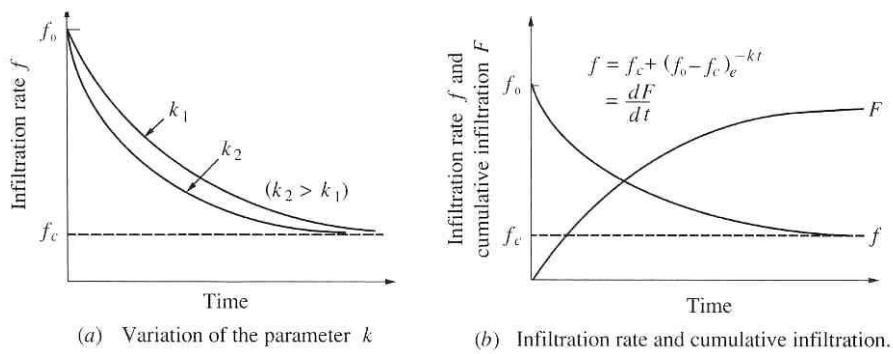

Figure B1– Horton's Equation for Infiltration (graphs from Chow et al. 1988)

We can see from Figure B1 that infiltration begins at a very high rate due to the high matric potential in a dry soil and decreases exponentially as the soil becomes saturated, matric potential becomes insignificant and gravity governs the hydraulic gradient. Thus the infiltration rate approaches a steady-state final rate that approximately corresponds to the saturated hydraulic conductivity of the soil.

After water has been infiltrated into the soil the movement of water through the soil is termed percolation. The rate of percolation can be calculated using Darcy's Law (see Soil Water Movement Section).

Horton's equation showed that the potential infiltration rate of water into the soil always exceeds the saturated hydraulic conductivity of the soil. Conversely, the percolation rate of soil water is limited by the saturated hydraulic conductivity of the soil. Therefore, it is reasonable to assume that the potential infiltration rate is always

greater than the percolation rate, and that the percolation rate will limit the flow rate through the soil layer.

Water Storage

The amount of water stored in soils (soil moisture) is expressed as a dimensionless ratio called the volumetric water content, θ. For any given water content the total volume of water stored in the soil, V_{water}, is equal to the volumetric water content (θ) times the total volume of soil, V_{total}.

$$\theta = \frac{V_{water}}{V_{total}} \qquad \textbf{Equation 7}$$

The total void space within a soil is the porosity, η. Soil is saturated when the volumetric water content is equal to the porosity.

Some voids do not actively store and convey water. The void space within the soil that is hydrodynamically effective is called the effective porosity, θ_e. The difference between the total porosity and the effective porosity is known as the residual water content, θ_r. Maidment (1993) provides typical porosity, effective porosity and residual water content values by soil texture (see Table B1).

Table B1– Soil Porosity, Effective Porosity and Residual Water Content by Soil Texture (Maidment, 1993)

Soil Type	Porosity η	Effective Porosity θ_e	Residual Water Content θ_r
GRAVEL[1]	0.420	0.415	0.005
SAND	0.437	0.417	0.020
LOAMY SAND	0.437	0.401	0.035
SANDY LOAM	0.453	0.412	0.041
LOAM	0.463	0.434	0.027
SILT LOAM	0.501	0.486	0.015
SANDY CLAY LOAM	0.398	0.330	0.068
CLAY LOAM	0.464	0.390	0.075
SILTY CLAY LOAM	0.471	0.432	0.040
SANDY CLAY	0.430	0.321	0.109
SILTY CLAY	0.479	0.423	0.056
CLAY	0.475	0.385	0.090

1 – Values for gravel were obtained from Fayer (1992) as presented in INEEL (2002).

Porosity, effective porosity and residual water content values by hydrologic soil group were obtained for this project by assuming each group corresponds with a specific soil texture.

- Group A → Sand
- Group B → Loam
- Group C → Sandy Clay Loam

- Group D → Clay

These assumptions were based on the hydrologic soil group descriptions provided by NRCS (2001). Table B2 provides the assumed porosity, effective porosity and residual water content values by hydrologic soil group.

Table B2 – Soil Porosity, Effective Porosity and Residual Water Content by Hydrologic Soil Group

Soil Type	Porosity η	Effective Porosity θ_e	Residual Water Content θ_r
HYDROLOGIC SOIL GROUP: A	0.437	0.417	0.020
HYDROLOGIC SOIL GROUP: B	0.463	0.434	0.027
HYDROLOGIC SOIL GROUP: C	0.398	0.330	0.068
HYDROLOGIC SOIL GROUP: D	0.475	0.385	0.090

Soil Water Movement

Darcy's Law is used to calculate the rate of water movement through a porous medium:

$$q = -K \frac{\partial h}{\partial z}$$ **Equation 8**

Where q = Darcy flux, K = hydraulic conductivity of the porous medium, h = total hydraulic head, and z = elevation. The total head, h, is the sum of the matric head, ψ, and the gravity head, z (velocity head is negligible):

$$h = \psi + z \ .$$ **Equation 9**

Assuming flow only in the vertical direction and substituting for h, Equation 1 becomes:

$$q = -K \frac{d(\psi + z)}{dz} \ .$$ **Equation 10**

The matric potential within a soil varies greatly with soil moisture. The relation between matric potential and soil moisture for a specific soil is known as the water-retention characteristic of that soil. Figure B2 shows some examples of typical water-retention curves for soils of various textures.

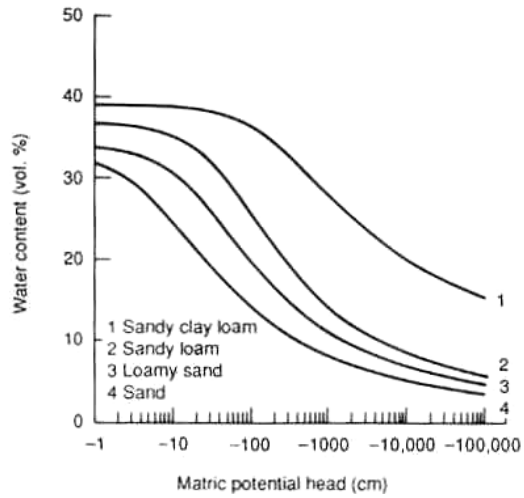

Figure B2 – Typical water retention curves (graph from Maidment, 1993)

Several equations have been developed to approximate water-retention relationships based on the physical characteristics of the soil. One such equation was developed by van Genuchten (1980):

$$\frac{\theta-\theta_r}{\eta-\theta_r}=\left[\frac{1}{1+(\alpha\psi)^n}\right]^m \qquad \textbf{Equation 11}$$

Where the constants α, n and m are given by:

$$\alpha=(h_b)^{-1} \qquad \textbf{Equation 12}$$

$$n=\lambda+1 \qquad \textbf{Equation 13}$$

$$m=\frac{\lambda}{\lambda+1}\ . \qquad \textbf{Equation 14}$$

The bubbling pressure head, h_b, and pore-size index, λ, are soil-specific parameters. Maidment (1993) provides typical bubbling pressures and pore-size index values by soil texture (see

Table B3).

Table B3 – Bubbling Pressure and Pore-size Index by Soil Texture (Maidment, 1993)

Soil Type	Bubbling Pressure (cm) h_b	Pore-size Distribution λ
GRAVEL[1]	0.20	1.190
SAND	7.26	0.694
LOAMY SAND	8.69	0.553
SANDY LOAM	14.66	0.378
LOAM	11.15	0.252
SILT LOAM	20.76	0.234
SANDY CLAY LOAM	28.08	0.319
CLAY LOAM	25.89	0.242
SILTY CLAY LOAM	32.56	0.177
SANDY CLAY	29.17	0.223
SILTY CLAY	34.19	0.150
CLAY	37.30	0.165

1 – Values for gravel were obtained from Fayer (1992) as presented in INEEL (2002).

As discussed previously, soil properties were assigned to hydrologic soil groups based on soil textures. Table B4 provides the bubbling pressure and pore-size index values by hydrologic soil group.

Table B4 – Bubbling Pressure and Pore-size Index by Hydrologic Soil Group

Soil Type	Bubbling Pressure (cm) h_b	Pore-size Distribution λ
HYDROLOGIC SOIL GROUP: A	7.26	0.694
HYDROLOGIC SOIL GROUP: B	11.15	0.252
HYDROLOGIC SOIL GROUP: C	25.89	0.242
HYDROLOGIC SOIL GROUP: D	37.30	0.165

Hydraulic Conductivity, *K*, is also dependent on soil moisture. Van Genuchten (1980) also developed a relationship to approximate the hydraulic conductivity of soils based on soil properties:

$$\frac{K(\theta)}{K_s} = \left(\frac{\theta-\theta_r}{\eta-\theta_r}\right)^{1/2}\left\{1-\left[1-\left(\frac{\theta-\theta_r}{\eta-\theta_r}\right)^{1/m}\right]^m\right\}^2 . \qquad \textbf{Equation 15}$$

Saturated hydraulic conductivity, K_s, is a measure of a saturated soil's ability to transmit water along a hydraulic gradient. This value is highly variable in field conditions; however, Maidment (1993) does provide estimates of saturated hydraulic conductivity by soil texture (see

Table B5).

Table B5 – Saturated Hydraulic Conductivity by Soil Texture (Maidment, 1993)

Soil Type	Saturated Hydraulic Conductivity (cm/hr) K_s
GRAVEL[1]	1260
SAND	23.56
LOAMY SAND	5.98
SANDY LOAM	2.18
LOAM	1.32
SILT LOAM	0.68
SANDY CLAY LOAM	0.3
CLAY LOAM	0.2
SILTY CLAY LOAM	0.2
SANDY CLAY	0.12
SILTY CLAY	0.1
CLAY	0.06

1 – Values for gravel were obtained from Fayer (1992) as presented in INEEL (2002).

As discussed previously, soil properties were assigned to hydrologic soil groups based on soil textures. Table B6 provides the saturated hydraulic conductivity by hydrologic soil group.

Table B6 – Saturated Hydraulic Conductivity by Hydrologic Soil Group

Soil Type	Saturated Hydraulic Conductivity (cm/hr) K_s
HYDROLOGIC SOIL GROUP: A	23.56
HYDROLOGIC SOIL GROUP: B	1.32
HYDROLOGIC SOIL GROUP: C	0.20
HYDROLOGIC SOIL GROUP: D	0.06

Figure B3(a) shows a plot of the van Genuchten relationships using the soil properties assumed for a loamy sand soil. Figure B3(b) is a graph from Chow et al. (1988) that shows the typical variation of matric head and hydraulic conductivity based on experimental data for an example soil.

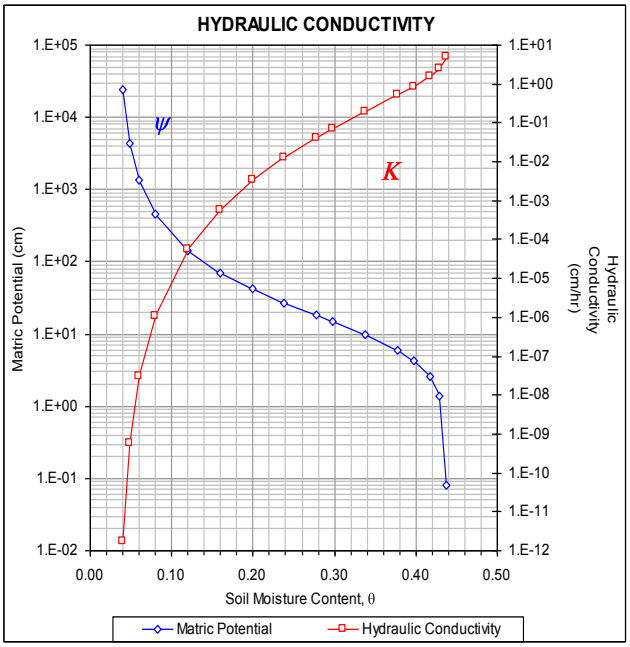

(a)

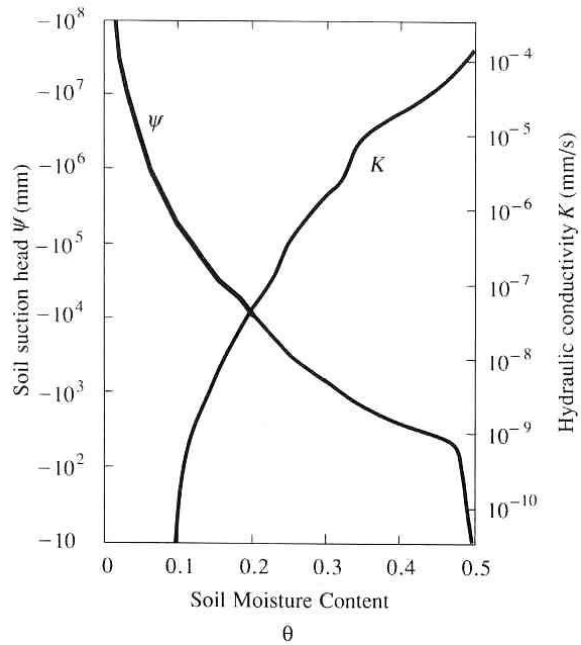

(b)

Figure B3 - (a) variation of matric head and hydraulic conductivity for a loamy sand using van Genuchten relations, (b) example provided in Chow et al. (1988)

The van Genuchten relations were used to calculate the matric head and hydraulic conductivity for a given soil moisture content. These results were then used in the Darcy equation to compute the flow through the soil. Calculated over a range of soil moisture contents, a table can be created relating soil water storage and flow through the soil layer.

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Draft Technical Memorandum

Project Title: San Diego County Hydromodification Management Plan

Project No: 133904

San Diego County Hydromodification Management Plan

Subject: HMP Modeling Approach and BMP Configurations

Date: March 2, 2010

To: Sara Agahi, San Diego County

From: Tony Dubin, Brown and Caldwell
Eric Mosolgo, Brown and Caldwell

This memorandum describes the modeling approach that is being used to size low-impact development dbest management practices (LID BMPs) for the San Diego Hydromodification Management Plan (HMP), including the range of scenarios performed and key assumptions for describing pre-project and post-project conditions, and BMP hydraulics. The memo also describes the type, configurations and dimensions of the LID BMPs that will be modeled in support of the BMP Sizing Tool software. The memo is organized into the following sections:

- **Section 1** provides a brief overview of the HSPF model setup and BMP sizing process.
- **Section 2** describes in greater detail how the HSPF models are setup for the San Diego HMP, including key input data.
- **Section 3** summarizes the general process for computing LID BMP sizing factors.
- **Section 4** describes the physical configurations of the BMPs.

1. Overview of HSPF Modeling and BMP Sizing Approach

The purpose of the runoff simulation for existing and post-development site conditions is to evaluate the effectiveness of BMPs which mitigate the increase in stormwater runoff resulting from the conversion of pervious land surfaces to impervious surfaces. The pre-project runoff regime must be characterized for a variety of baseline soil groups, land cover, slope and rainfall scenarios. Increases in runoff peaks and durations from each of these baseline scenarios establish the impacts to be fully mitigated by a BMP in a particular site development project. This section summarizes the overall steps used in this study to size BMPs.

1.1 Develop Pre-Project and Post-Project Runoff Time Series

San Diego County and its Copermittees' approach to compliance with the stormwater runoff control provision of its NDPES permit is to ensure that post-project runoff at any given development does not exceed pre-project runoff peaks or durations for the range of flows that could potentially have significant

impacts on receiving streams. This approach aims to address the potential impacts of an individual development and the cumulative effects of many developments in the same watershed.

Brown and Caldwell has developed sets of HSPF model parameters to represent a range of pre-project site conditions that may be encountered in San Diego County. The parameter selection process and parameter values are described in a separate technical memorandum entitled, *San Diego HMP HSPF Model Parameter Selections*, dated March 2010. The various possible combinations of these parameters determined the number of "scenarios" that might be required to adequately characterize the pre-project condition for any given development project in the County. Runoff from each scenario was simulated using locally collected rainfall time series data.

Once a continuous runoff time series was generated for the rainfall period of record for each scenario, partial duration frequency and duration analyses were performed on each time series to identify recurrence frequencies and durations for different size runoff events. (This step is needed to characterize the peak flows for various recurrence intervals).

Consistent with the general design guidance in the *Countywide Model SUSMP*, designers are expected to minimize the amount of pervious surface that drains to BMPs. Post-project site runoff was therefore evaluated by simulating runoff from a unit area converted to 100% impervious surface. Comparing the pervious surface model output with the impervious surface model output shows the effects of development prior to adding a BMP.

1.2 Model the Hydraulic Response of BMPs

The project team has constructed representations of each BMP in HSPF. For example, a bioretention basin is represented with separate surface ponding, growing medium, storage layers, an overflow relief outlet, a restricted underdrain outlet (as appropriate), and transmissivity of underlying soils. The configuration of these BMP elements and associated hydraulic characteristics can be varied to determine the configuration that provides the best performance in the least amount of space. The HSPF method for representing storage facilities is called an F-TABLE, and is described further in Section 3.1.1.

1.3 Establish BMP Sizing Factors

To compute sizing factors for each BMP, the impervious runoff time series was routed through the BMP to develop a post-project "mitigated" runoff time series. Each BMP mitigates post-project runoff by providing infiltration and/or reduction of discharge rates to the drainage system. The post-project mitigated time series is then compared to the pre-project runoff time series to assess BMP performance. The BMP size (typically surface area) was varied over the course of multiple model iterations until a size was identified that adequately matched post-project to pre-project runoff. The runoff comparison was performed both for peak rates and durations. The following standard applied to assess BMP performance:

- Flow duration control - For flow rates ranging from 10%, 30% or 50% of the pre-project 2-year runoff event ($0.1Q_2$, $0.3Q_2$, or $0.5Q_2$) to the pre-project 10-year runoff event (Q_{10}), the post-project discharge rates and durations shall not deviate above the pre-project rates and durations by more than 10% over and more than 10% of the length of the flow duration curve. The specific lower flow threshold will depend on results from the SCCWRP channel screening study and the critical flow calculator.
- Peak flow control - For flow rates ranging from the lower flow threshold to Q_5, the post-project peak flows shall not exceed pre-project peak flows. For flow rates from Q_5 to Q_{10}, post-project peak flows may exceed pre-project flows by up to 10% for a 1-year frequency interval. For example, post-project flows could exceed pre-project flows by up to 10% for the interval from Q_9 to Q_{10} or from $Q_{5.5}$ to $Q_{6.5}$, but not from Q_8 to Q_{10}.

1.4 Incorporate Sizing Factors into BMP Sizing Calculator

The sizing factors computed using the above process will be incorporated into a BMP Sizing Calculator that development engineers and municipal plan review staff will use to describe site hydrology, compute pre- and post-project runoff rates, and size BMPs.

During the site design process, the project applicant's engineer will divide a project site into separate drainage management areas that will drain to individual BMPs. Based on the type of BMP selected, the amount of impervious and pervious tributary land, local soil type and site slope, the BMP Sizing Calculator will look up the appropriate value derived from the HSPF modeling analysis. An adjustment will be applied to the BMP sizing factor based on the location of the project in the County to account for the different rainfall characteristics.

The BMP Sizing Calculator will also provide prescriptive guidance on using self-retaining landscaping, soil amendments, and other techniques to limit site runoff, and contains a conservative approach to scale BMPs based on tributary pervious areas (i.e., in addition to the tributary impervious areas). The approaches to be used for scaling the sizing factors according to local rainfall variations will be described in a separate technical memorandum.

2. HSPF Model Development

This section describes in detail how HSPF models are developed to simulate pre-project and post-project runoff for San Diego County.

2.1 HSPF Modeling Overview

An HSPF modeling study of a single watershed typically begins with gathering hydrologic information about the area, such as precipitation data, soil groups, growing medium layer depths, vegetation types, vegetation canopy thickness, etc. This information is used to develop appropriate input parameters to the HSPF model. HSPF parameters fall into three general categories:

1. Prescriptive parameters that set flags and specify algorithms to use.
2. Measured or estimated parameters, such as basin area, that are set by GIS analysis or physical measurement.
3. Calibration parameters that may be estimated by measurement, but must be adjusted during the model calibration process. Examples of calibration parameters are infiltration rates, upper soil depth, and groundwater conductivity.

Together these parameters describe the vertical movement (e.g. interception, depression storage, infiltration, evapotranspiration) and lateral movement (e.g. surface runoff, interflow, groundwater flow) of water in HSPF. For studies of individual watersheds, the values of calibration parameters are adjusted, or tuned, until the model simulations reproduce an observed stream flow record.

The purpose of hydrologic modeling within the HMP is to produce a County-wide assessment tool for sizing BMPs. This requires several modifications to the approach used in evaluating a single watershed. Sets of regional, representative parameters were applied to a theoretical unit area, instead of developing and calibrating a specific watershed model. The representative model parameters were initially selected based on other HSPF studies in the area, such as the Santa Monica Bay HSPF watershed-scale model developed by staff at the Southern California Coastal Water Research Project (SCCWRP). In addition, the range of parameter variations across different soil types and slope values were estimated using other references, including EPA Technical Note 6 and various Brown and Caldwell studies. The HSPF model parameters that are used to characterize the hydrologic response of pervious land surfaces to rainfall area (e.g., PERLND parameters) are described in detail in a separate memo entitled, *San Diego HMP HSPF Model Parameter Selections*, dated March, 2010.

Adapting the compiled HSPF parameters for use in San Diego County required an assessment of the local characteristics that affect surface runoff, such as precipitation data, basic soil groups and vegetation cover. The following subsections briefly summarize the range and variability in rainfall volumes and soil types within the County.

2.1.1 Rainfall Data Evaluation

Evaluating the distribution of rainfall across the County helped determine (1) which precipitation gauges to use as input to HSPF for modeling simulations and (2) the extent of rainfall variation throughout the County. The San Diego Alert Network operates a series of precipitation stations across the County, and the National Oceanographic and Atmospheric Administration (NOAA) operates a station at Lindberg Field in San Diego. Eighteen stations with datasets containing at least 30 years of hourly data were evaluated in detail by Brown and Caldwell. Brown and Caldwell prepared and submitted summary technical memoranda that assessed the data records, identified data gaps, and provided recommendations for filling the data gaps.

Table 1 lists reference information about the gauges and Figure 1 shows the variation in mean annual rainfall depth. Mean annual precipitation values vary from 8.7 inches at Bonita to 30.4 inches at Lake Cuyamaca, with the majority of stations recording annual rainfall amounts between 10 and 15 inches.

Table 1. San Diego County Rain Gauge Station Reference Information									
Station Name	**Watershed**	**Start Date**	**End Date**	**Length of Record**	**Latitude**	**Longitude**	**Elevation (ft)**	**Max Hour Rain (in)**	**Mean Annual Rain (in)**
Bonita	Sweetwater River	11/25/1970	5/25/2008	37 years	32.3922	-117.0203	120	1.10	8.7
Encinitas	North County Coastal	9/4/1963	6/30/2008	45 years	33.0237	-117.1639	242	0.88	10.2
Escondido	Escondido Creek	9/24/1964	5/23/2008	44 years	33.0711	-117.0542	645	0.88	13.7
Fallbrook	San Luis Rey River	7/25/1951	6/30/2008	57 years	33.213	-117.1513	675	1.40	15.1
Fashion Valley	San Diego River	1/2/1968	6/30/2008	40 years	32.4555	-117.1033	20	0.96	10.3
Flinn Springs	San Diego River	8/8/1963	6/30/2008	45 years	325055	-1165129	880	1.05	13.1
Kearny Mesa	San Diego River	9/8/1964	6/30/2008	44 years	32.5003	-117.0744	425	1.40	11.0
Lake Cuyamaca	Upper San Diego River	9/1/1967	6/30/2008	41 years	32.5921	-116.3513	4590	2.30	30.4
Lake Henshaw	Upper San Luis Rey River	1/2/1950	6/30/2008	58 years	331419	-1164542	2990	1.79	22.3
Lake Wohlford	Upper Escondido Creek	10/8/1949	7/7/2008	59 years	33.0959	-117.0016	1490	1.60	16.8
Lindbergh Field	Coastal – San Diego Bay	10/17/1948	6/30/2008	60 years	32.7333	-117.1833	15	1.36	9.8
Lower Otay	Otay River	8/28/1951	6/30/2008	57 years	32.3632	-116.554	491	0.84	10.3
Oceanside	San Luis Rey River	7/1/1951	6/30/2008	57 years	33.1238	-117.2112	30	1.20	11.7
Poway	Los Penasquitos River	10/4/1962	6/30/2008	46 years	32.5658	-117.0346	440	0.80	12.0
Ramona	Upper San Dieguito River	8/8/1963	6/30/2008	45 years	33.0253	-116.5139	1450	1.16	14.2
San Onofre	North County Coastal	11/25/1970	6/30/2008	38 years	33.2105	-117.3155	162	1.60	11.3
San Vicente	San Diego River	1/1/1973	6/10/2008	35 years	32.55	-116.5558	663	1.00	12.7
Santee	San Diego River	1/1/1973	9/26/2008	36 years	32.502	-117.013	300	1.00	13.2

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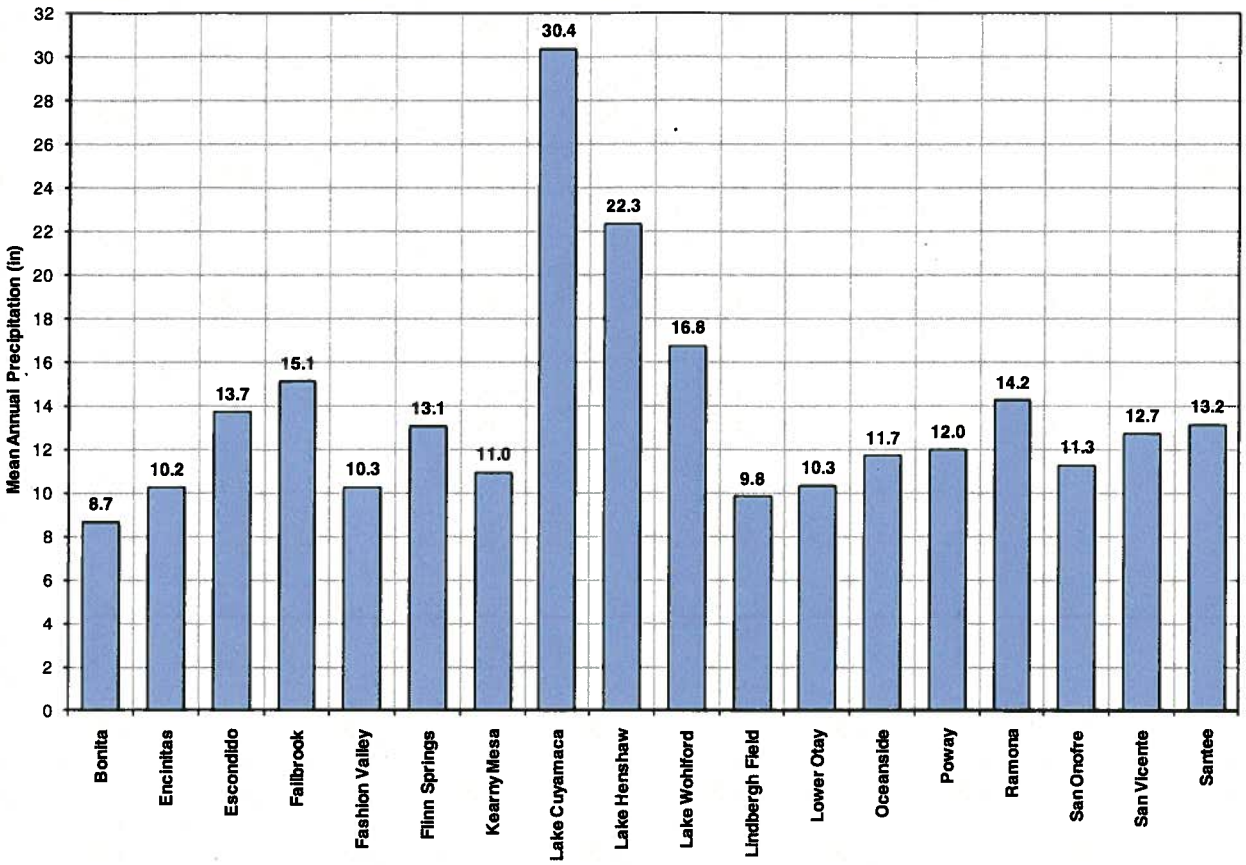

Figure 1. Rainfall Variation in San Diego County

2.1.2 San Diego Soils Map Evaluation

The HSPF model development was based on the commonly occurring and easy-to-identify soil hydrologic groupings used by the National Soils Conservation Service (NRCS). The NRCS uses four groupings called (in decreasing order of hydraulic conductivity) Group A, B, C and D. Group A soils are sandy and exceedingly well drained, while Group D soils are typically poorly drained clays. Group B and Group C soils exhibit hydraulic characteristics between those of Group A and Group D soils.

Figure 2 shows NRCS soil mapping for San Diego County. According NRCS data, about 43 percent of San Diego County is classified as NRCS Group D soils. Approximately one-quarter of the County consists of Group C soils and one-quarter Group B soils. The remaining 7 percent is classified as Group A soils. The well drained Group A and Group B soils occur more commonly in the eastern portions of the County that are not covered under this HMP. The central and western portions of the county consist mainly of the less hydraulically conductive Group C and Group D soils.

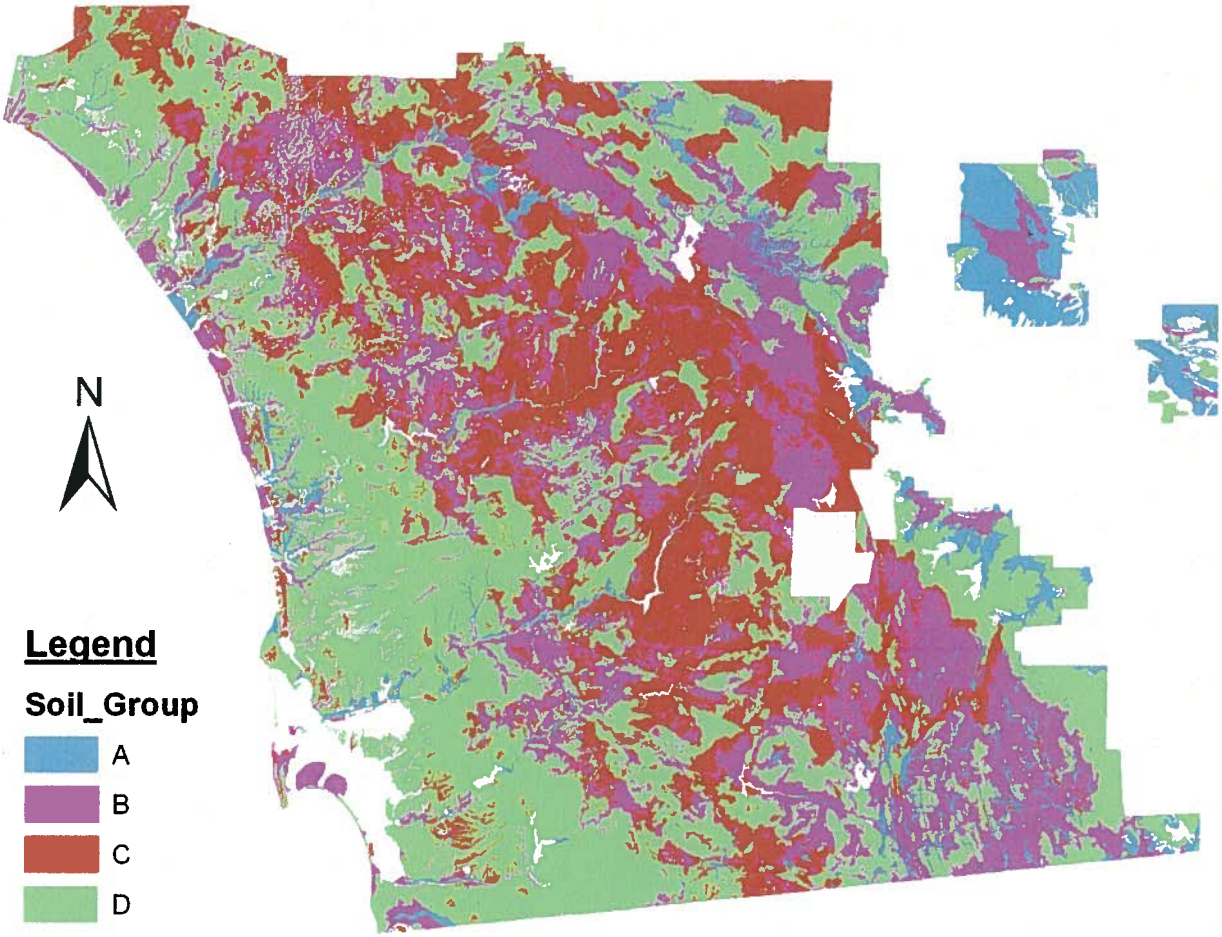

Figure 2. NRCS Soils Mapping of San Diego County

2.2 Scenarios Modeled

HSPF was used to characterize 12 different pre-project runoff scenarios corresponding to 4 soil types and 3 ranges of slopes. The range of land cover and vegetation types is not sufficiently variable among developable lands to require separate scenarios for different pre-project pervious land cover types. Table 2 below summarizes the scenario components. The specific HSPF pervious land surface parameters for these scenarios are described separately in the *San Diego HMP HSPF Model Parameter Selections* technical memo.

Table 2. HSPF Scenarios for Characterizing Pre-Project Conditions

Scenario No.	NRCS Soil Group	Land Cover	Slope
1	A	Scrub, Shrub	Low (<5%)
2	A	Scrub, Shrub	Moderate (10%)
3	A	Scrub, Shrub	Steep (>15%)
4	B	Scrub, Shrub	Low (<5%)
5	B	Scrub, Shrub	Moderate (10%)
6	B	Scrub, Shrub	Steep (>15%)

Table 2. HSPF Scenarios for Characterizing Pre-Project Conditions			
Scenario No.	**NRCS Soil Group**	**Land Cover**	**Slope**
7	C	Scrub, Shrub	Low (<5%)
8	C	Scrub, Shrub	Moderate (10%)
9	C	Scrub, Shrub	Steep (>15%)
10	D	Scrub, Shrub	Low (<5%)
11	D	Scrub, Shrub	Moderate (10%)
12	D	Scrub, Shrub	Steep (>15%)

3. Hydrologic Modeling Approach to Sizing BMPs

This section describes the technical approach used to represent BMPs in the HSPF model. The discussion focuses on the key physical aspects of BMP performance (i.e., how a BMP routes water through its different layers) and how these physical processes are represented in HSPF. This section also describes key hydraulic and modeling assumptions and how these assumptions impact both the modeling process and the accuracy of the results across the full range of flow conditions.

3.1 General BMP Characteristics

The flow control BMP designs selected by San Diego County and its Copermittees all include some combination of detention storage and water quality treatment media. For example, the bioretention BMP includes (in order of vertical routing) a surface ponding layer, a growing medium layer, and a storage layer. Each layer has its configuration, porosity, volume, and hydraulic conditions that influence the rate of flow to the next layer (see Figure 3).

HSPF uses stage-storage-discharge tables to represent the hydraulic behavior of devices that detain and discharge water (e.g., all of the LID BMPs included in the HMP). The *stage* represents depth of water in the facility, the *storage* represents the volume of water stored in the facility for that stage, and the *discharge* is the calculated outflow for that stage. Outflow may be via an orifice, infiltration, evaporation, or any other mechanism for which a relationship to stage or storage can be defined.

The following general hydraulic assumptions were applied to all of the BMPs modeled:

- Inflow is uniformly distributed over the area of the BMP (i.e. level-pool ponding).
- Infiltration and soil water movement is a 1-dimensional flux in the vertical direction (neglecting lateral flows is a conservative assumption).
- Soil moisture within a homogeneous growing medium layer is assumed to be evenly distributed throughout the growing medium layer both vertically and horizontally. This assumes an engineered BMP would be free of macropores.
- Percolation from the growing medium layer to the storage layer is computed based on unsaturated or saturated hydraulic equations, based on the amount of moisture contained in the growing medium during each model time step.
- Water flows out the bottom of the BMP into the surrounding soil at the rate of saturated hydraulic conductivity.
- The sandy loam soil used for the growing medium has an effective porosity of 0.412, based on Table 5.3.2 in the *Handbook of Hydrology* (Maidment, 1994). A sensitivity analyses conducted to determine the

effect of porosity on BMP performance determined that porosity has little influence on the required sizing factor.

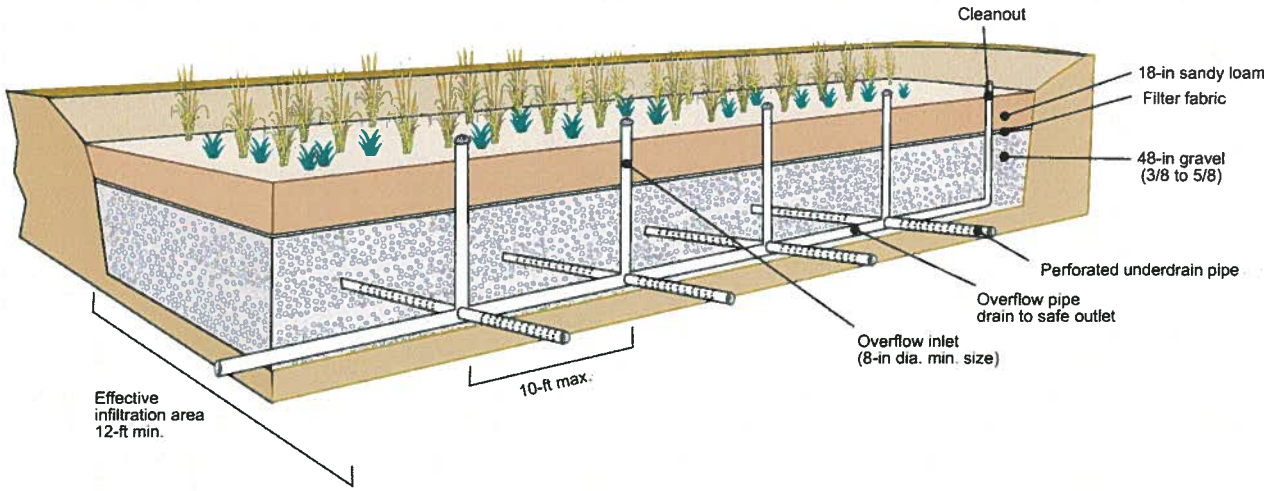

Figure 3. Cross-Section View of Bioretention BMP, Group C/D Soil Configuration

3.1.1 Bioretention BMP HSPF Representation

The bioretention BMP is modeled using two FTABLEs. The first FTABLE represents the surface ponding layer, growing medium layer, and overflow outlet. The second FTABLE represents the storage layer, exfiltration to surrounding soils, and underdrain outflow, if applicable. Percolation from the growing medium to the storage layer is modeled as an outflow from the first FTABLE and inflow to the second FTABLE.

FTABLE 1: Upper Growing medium layer, Ponding Storage and Overflow Outlet

Stormwater routed from impervious surfaces first enters the upper layer of an In-Ground Planter, represented by FTABLE 1 (Figure 4). The HSPF model assumes that all inflow will infiltrate if the layer is not saturated. This is a reasonable assumption based on the anticipated range of inflows (see Appendix A for a complete discussion of soils physics). The growing medium layer is represented by depths from 0 to 1.5 feet. The volume of storage at 1.5 ft is equal to the storage within the growing medium layer at saturation. Above this depth water is stored in the ponding reservoir.

Water contained in the upper growing medium layer is stored as soil moisture. Although there are depths indicated in the first column of the FTABLE, the soil water is considered to be evenly distributed throughout the growing medium layer (e.g. a soil depth of 0.5 feet in FTABLE 1 corresponds to one-third saturated, not water filling the bottom 0.5 feet of the upper growing medium layer). Above 1.5 ft, water ponds on the planter surface, and the FTABLE 1 depth column corresponds to the actual water surface.

The fourth column in FTABLE 1 lists the rate of soil water percolation out the bottom of the upper growing medium layer and into the lower gravel layer. This column is calculated using Darcy's Law and the van Genuchten relations (see Appendix A). Percolation does not occur unless the soil water content exceeds the holding capacity of the soil (i.e. the gravitational head is greater than the suction or *matric head* within the soil pores). The percolation rate calculations assume a free surface at the interface with the lower layer. However, the percolation rate is limited if the lower layer reaches capacity and becomes saturated. In this case the percolation rate through the upper layer is limited to the percolation rate though the lower layer,

which in itself is limited by the total outflow from the lower layer through the underdrain orifice and percolation to the surrounding soil. Thus, the percolation rate through the upper layer is limited to underdrain outflow rate plus a small amount of percolation to the surrounding soil when the planter reaches capacity.

The fifth column in the FTABLE is the outflow through the overflow pipe, which is calculated using a weir equation (see Appendix A). Outflow through the overflow pipe does not occur until the depth of storage in the ponding reservoir is above the pipe inlet.

```
 FTABLE      1
rows cols                                          ***
  31    5
    Depth      Area     Volume     Q Perc     Q Over  ***
     (ft)    (acres)  (acre-ft)    (cfs)      (cfs)   ***
     0.00      0.03     0.0000     0.0000     0.000
     0.10      0.03     0.0012     0.0000     0.000
     0.20      0.03     0.0024     0.0000     0.000

     1.40      0.03     0.0168     0.0132     0.000
     1.50      0.03     0.0180     0.0707     0.000
     1.60      0.03     0.0210     0.0760     0.000

     2.40      0.03     0.0495     0.1957     0.100
     2.50      0.03     0.0525     0.1957     0.312
END FTABLE1
```

Figure 4. Example FTABLE Describing Upper Layer of In-Ground Planter

FTABLE 2: Lower Gravel Layer, Percolation to Surrounding Soils, Underdrain Outlet

The second FTABLE represents the lower gravel layer and the underdrain. Percolation outflow from the first FTABLE is routed as inflow to the second FTABLE (Figure 5). This FTABLE represents the lower gravel layer, which has a depth of 1.5 ft. Water is stored as volumetric water content with a maximum storage limited to saturation of the gravel medium. The percolation rate out the bottom of the lower layer is limited by the hydraulic conductivity of the surrounding soil, which is a conservative assumption (percolation will actually be faster when native soils are unsaturated).

When an underdrain is included in the configuration, the 'Q Outlet' column is included in the FTABLE for the outflow rate. This rate is calculated using the orifice equation (see Appendix A) so that the underdrain flow will match lower flow control rate when the lower gravel layer is fully saturated.

```
 FTABLE       2
rows cols                                                    ***
  16    5
    Depth       Area     Volume     Q Perc   Q Outlet       ***
     (ft)     (acres)  (acre-ft)     (cfs)      (cfs)       ***
     0.00       0.03     0.0000     0.0000      0.000
     0.10       0.03     0.0012     0.0001      0.000
     0.20       0.03     0.0025     0.0007      0.001
     0.30       0.03     0.0037     0.0007      0.005
     0.40       0.03     0.0050     0.0007      0.018
     0.50       0.03     0.0062     0.0007      0.047
     0.60       0.03     0.0075     0.0007      0.104
     0.70       0.03     0.0087     0.0007      0.133
     0.80       0.03     0.0100     0.0007      0.142
     0.90       0.03     0.0112     0.0007      0.151
     1.00       0.03     0.0125     0.0007      0.159
     1.10       0.03     0.0137     0.0007      0.167
     1.20       0.03     0.0149     0.0007      0.174
     1.30       0.03     0.0162     0.0007      0.181
     1.40       0.03     0.0174     0.0007      0.190
     1.50       0.03     0.0187     0.0007      0.195
END FTABLE2
```

Figure 5. Example FTABLE Describing Lower Gravel Layer of In-Ground Planter

3.1.2 Iterative BMP Sizing Steps

Once the geometric characteristics of the BMP were represented in FTABLEs, as described above, the sizing factors were computed using an iterative process involving multiple HSPF simulations and statistical analyses. The process involved varying the surface area until peak flow and flow duration control were achieved.

The ability of the BMP to achieve peak flow and flow duration control was evaluated by generating and comparing partial duration series statistics and flow duration statistics for (a) the pre-project runoff from a pervious land surface and (b) the post-project outflow from the BMP serving an equivalent area that has been converted to an impervious surface. A 24-hour inter-event period (as defined by 24 hours with BMP outflow less than 0.05 cfs/ac) was used to separate storm events in the partial duration series. The footprint of the BMP was included in the calculations to preserve equivalence between the pre-project and post-project analysis (i.e. Pre-project Area = Impervious Area + BMP Area). The HSPF model allowed rainfall directly on the BMP.

BMP surface area was increased incrementally with each iteration until flow and duration control were achieved. Flow and duration control were considered to be achieved when the mitigated post-project peak flows and flow durations were less than or equal to the pre-project flows, as defined by the performance criteria in the Final HMP.

4. Low-Impact Development (LID) BMP Descriptions

This section describes the LID BMPs that are included in the Countywide Model SUSMP, focusing on the elements that are explicitly represented within HSPF. The following LID BMPs will be evaluated for flow control and/or water quality treatment:

1. Bioretention
2. Cistern with bioretention
3. Bioretention with flow control vault
4. Flow-through planter
5. Dry well
6. Vegetated bioswale (for water quality treatment only)

Non-structural strategies for stormwater management, such as pervious pavement, self-retaining areas, and self-treating areas will be described in separate memoranda.

4.1 Bioretention

The bioretention facility consists of a surface ponding layer, a growing medium layer, and a below ground storage layer (Figure 6). The bioretention BMP captures water in the ponding layer, filters it through a growing medium that consists of soil and plant roots, percolates water from the growing medium into a storage layer, and then slowly discharges treated stormwater via exfiltration to surrounding native soils and regulated discharge through an underdrain pipe to the local stormwater drainage system. For applications with well-draining native soils (e.g., NRCS hydrologic group A or B soils), an underdrain pipe would not be included.

For the HMP, we will simulate the bioretention BMP using separate a) ponding layer, b) growing medium, and c) storage layer components. We will assume the following depths for each layer:

- **Ponding layer:** 10-inches active storage, 2-inches of freeboard above overflow relief
- **Growing medium:** 18-inches of soil at 40 percent porosity
- **Storage layer:** 30-inches of gravel at 40 percent porosity

As described above in Section 3.1.2,the plan area of the BMP will be iteratively sized until the BMP controls limit outflows to levels that are less than or equal to pre-project conditions across flow rates ranging from the lower flow control limit ($0.1Q_2$, $0.3Q_2$ or $0.5Q_2$) to the upper flow control limit (Q_{10}). The sizes of the ponding layer and storage layer will be converted into volumes, so that the project designer can flexibly configure the ponding layer and storage layer to meet site constraints. For example, the design engineer could configure the ponding layer with half the depth but twice the plan area called for by the sizing factor if this fits the project site. Additionally, the designer could use commercially-available storage vessels to meet the volume requirements instead of using gravel.

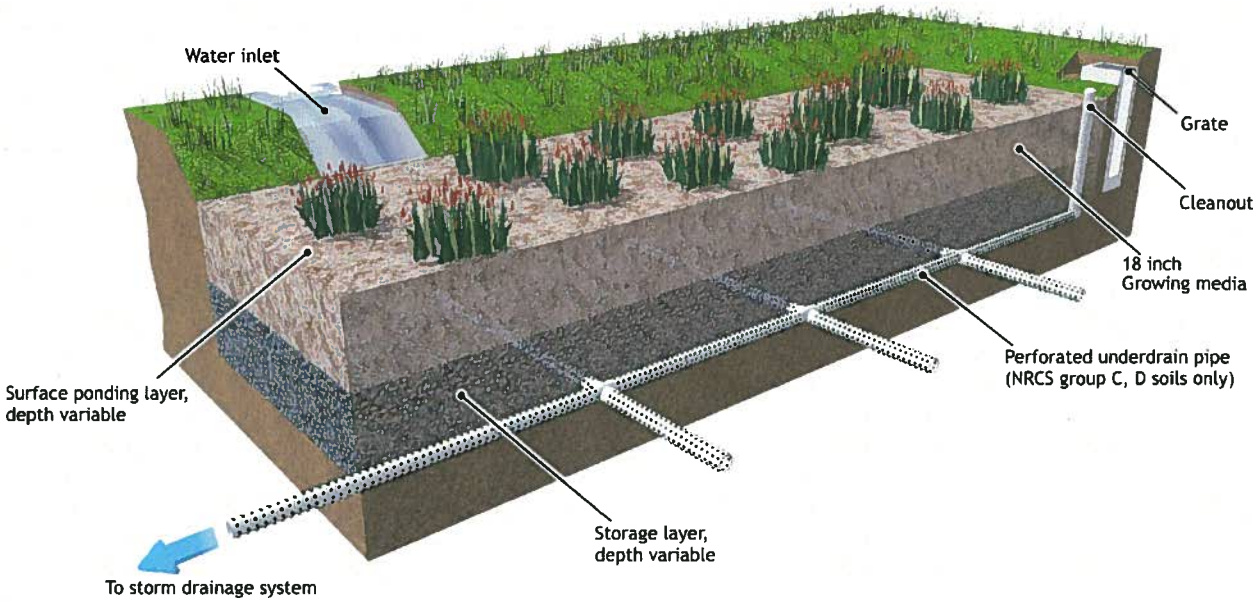

Figure 6. Bioretention BMP Example Illustration

4.2 Cistern with Bioretention

The cistern with bioretention BMP is a flow-control and treatment train BMP. There is no water quality treatment-only option. The cistern component captures and detains site runoff, and then slowly releases the water to a nearby bioretention device that provides water quality treatment by filtering the stormwater through its soil matrix.

The cistern will contain two outlets. A lower orifice will be located at the bottom of the cistern and will be designed to release water at the lower flow control limit ($0.1Q_2$, $0.3Q_2$ or $0.5Q_2$) where it will be routed through the bioretention device. Because the cistern accomplishes the flow control requirement, the bioretention only provides water quality treatment and an underdrain is permissible for all soil groups. However, due to the high infiltration capacity of NRCS hydrologic group A soils, the underdrain should only be used in Group B, C, and D soils. For Group A soils, the bioretention element is not necessary and cistern discharges should be routed into native soils for infiltration and treatment. A small depression should be included in the landscaping to provide sufficient time for infiltration to occur.

For the HMP, we will simulate the performance of the cistern with bioretention BMP using the following key assumptions:

- **Cistern configuration:** The cistern is modeled as a 4-foot tall vessel. However, designers could use other configurations, so long as the lower outlet orifice is sized to properly restrict outflows.
- **Cistern upper outlet:** The upper outlet from the cistern would consist of a weir or other flow control structure set at an elevation of 7/8th of the way to the top of the cistern (see Figure 7). The overflow weir would be sized to pass approximately 1 cfs per acre of tributary impervious area.
- **Bioretention configuration:** The bioretention needs only a small depression/ponding area to settle inflows prior to infiltration. For water quality treatment, the bioretention should be 1.5 feet deep and

contain the soil mixture specified in the *Countywide Model SUSMP* that allows a continuous infiltration rate of 5 inches per hour. The bioretention basin should be sized to pass the cistern outlet flows.

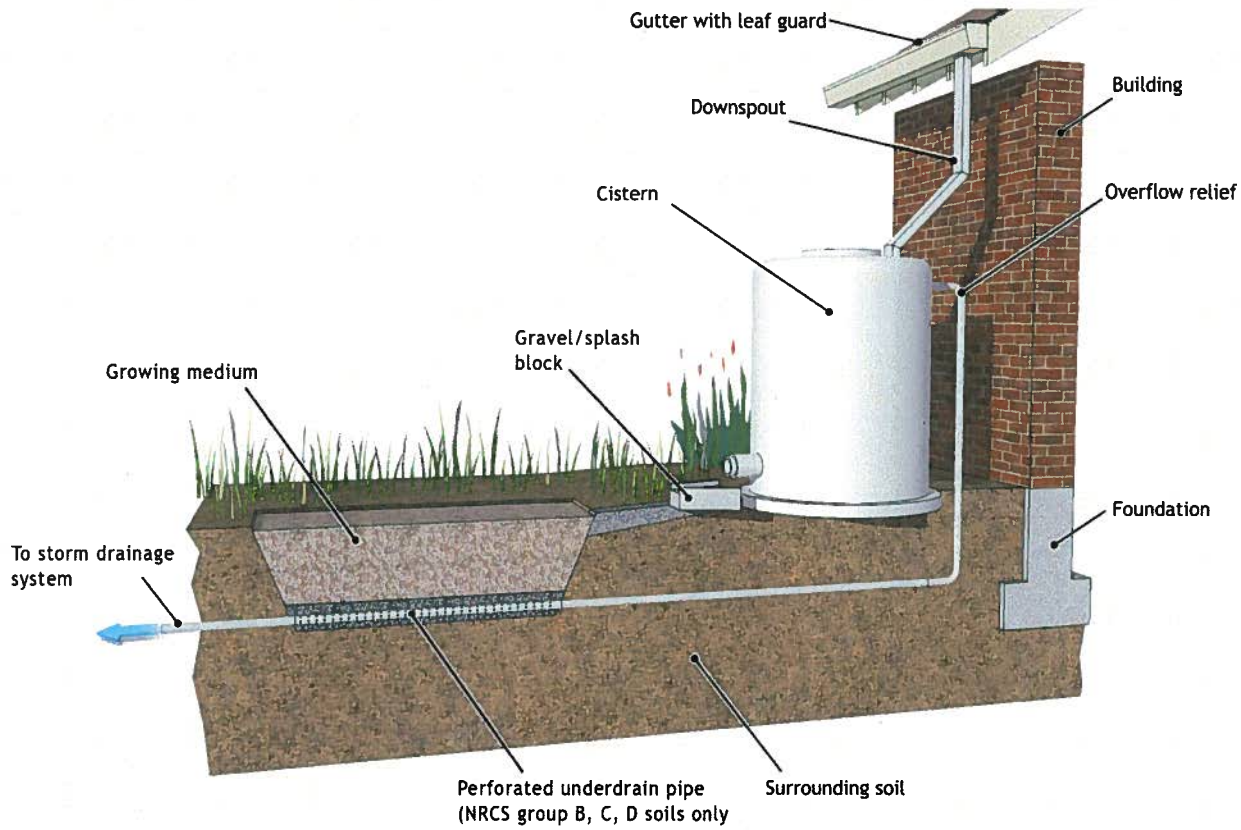

Figure 7. Cistern with Bioretention BMP Example Illustration

4.3 Bioretention with Vault

This BMP configuration would route stormwater through a bioretention basin for water quality treatment, and then discharge water to a nearby vault for detention and release (Figure 8). The vault would contain a lower orifice to restrict outflows to meet the HMP's flow control requirements. The vault portion of the BMP could be located below, adjacent or farther away from the bioretention portion of the BMP. This BMP is particularly effective in commercial applications where distributed water quality treatment outflows could be collected into a single vault for flow control underneath a parking lot. There is not water quality treatment-only option.

For the HMP, we will simulate the performance of the bioretention with vault BMP using the following key assumptions:

- **Bioretention configuration:** The bioretention portion of this BMP would be designed similarly to the bioretention BMP, except that the storage layer would be only deep enough to contain a perforated underdrain pipe that would convey treated runoff to the vault portion of the BMP.
- **Vault configuration:** The vault would contain concrete side wall and top, as well as an access hatch for inspection and maintenance. The bottom of the vault would be open to allow infiltration to the

surrounding soils. The vault was simulated as a 4-foot deep chamber, but the designer could select other configurations that were similar or lesser depths.

- **Vault outlets:** The vault would contain two outlets. The lower outlet would be a flow control orifice that would release water at a maximum rate equal to the lower flow control limit ($0.1Q_2$, $0.3Q_2$, $0.5Q_2$). The upper outlet from the vault would be located at 80 percent of the vault's height and would have a capacity of approximately 1 cfs per acre of tributary impervious area. The overflow relief should be located no lower than the elevation of the vault's inlet pipe.

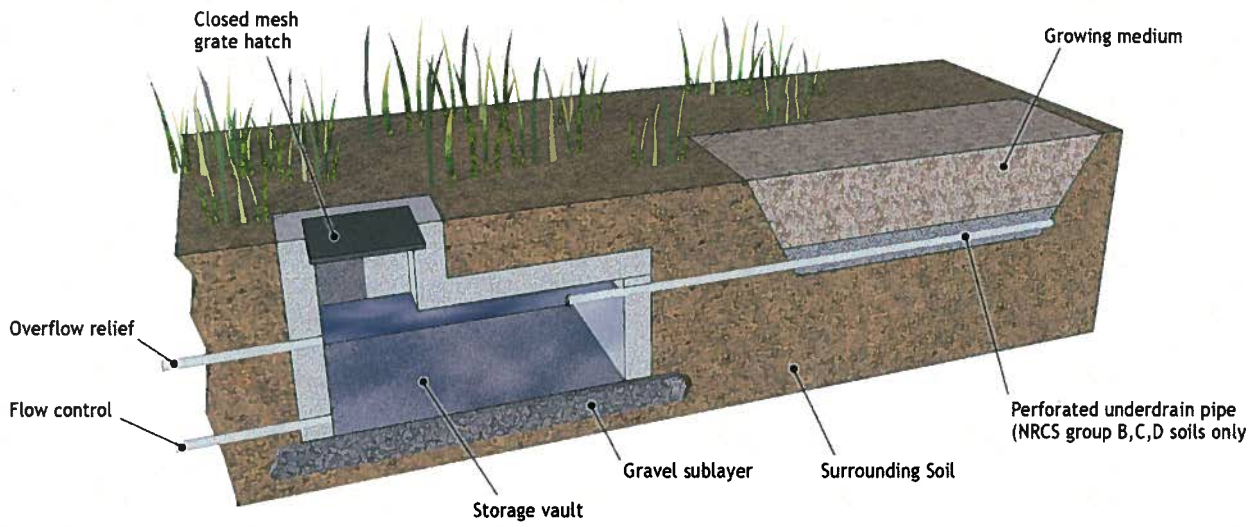

Figure 8. Bioretention with Vault BMP Example Illustration

4.4 Flow Through Planter

Flow-through planters treat and detain runoff without allowing seepage into the underlying soil. Typical applications would be next to buildings or on steep slopes, where the infiltration associated with bioretention facilities could cause problems. Flow-through planters typically receive runoff via downspouts leading from the roofs of adjacent buildings. However, they can also be set in-ground and receive sheet flow from adjacent paved areas.

Pollutants are removed as runoff passes through the growing medium layer and is collected in an underlying storage layer (Figure 9). A perforated-pipe underdrain is typically connected to a storm drain or other discharge point. An overflow inlet conveys flows which exceed the capacity of the planter. The flow through planter BMP should only be used in Group C or D soil applications.

For the HMP, we will simulate the flow through planter BMP using separate a) ponding layers, b) growing medium, and c) storage layer components. We will assume the following depths for each layer:

- **Ponding layer:** 10-inches active storage, 2-inches of freeboard above overflow relief
- **Growing medium:** 18-inches of soil at 40 percent porosity
- **Storage layer:** 30-inches of gravel at 40 percent porosity

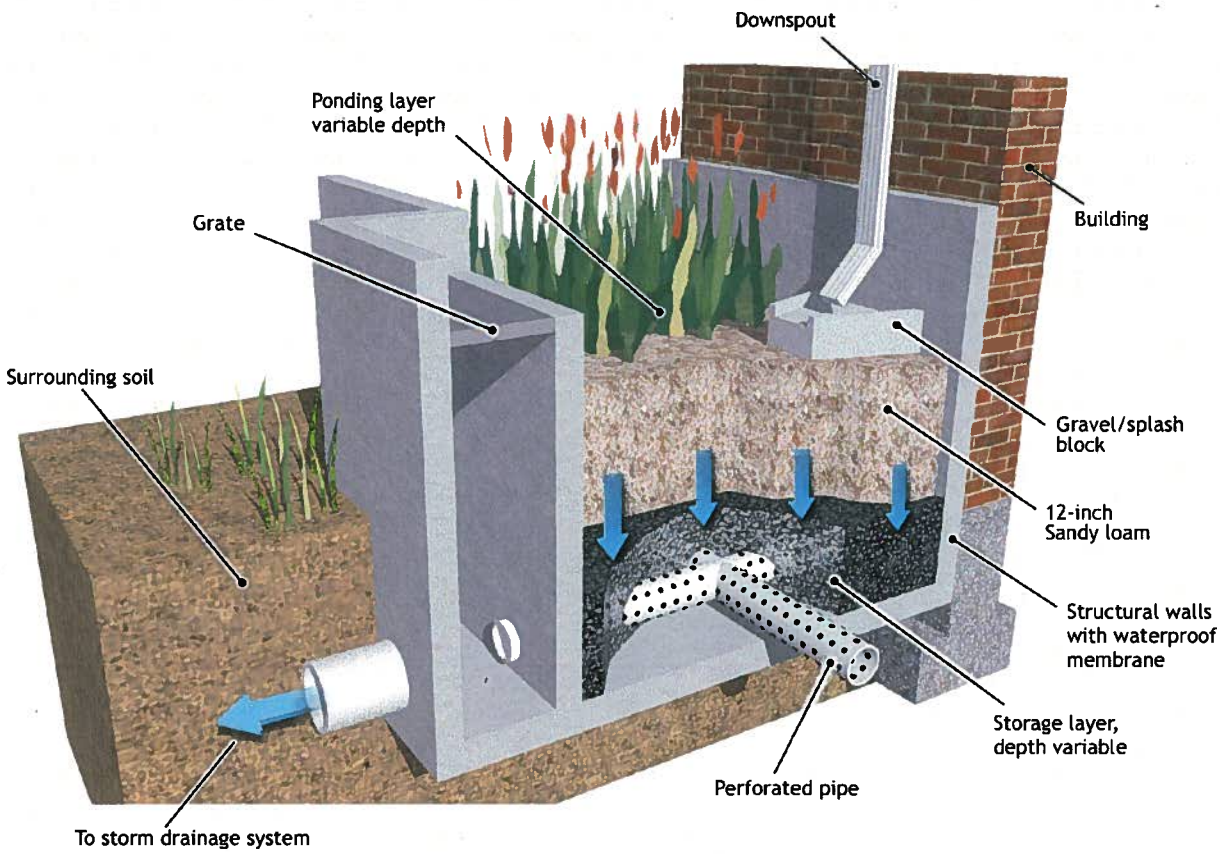

Figure 9. Flow Through BMP Example Illustration

4.5 Drywell

The drywell BMP is a below ground structure that can be used in areas with well-drained soils, such as NRCS Group A or B soils. The drywell consists of an initial soil layer to trap pollutants underlain with gravel, drain rock or some other free draining material (Figure 10). The dry well should have an access hatch to limit access.

For the HMP, we will simulate the drywell BMP using the following key assumptions:

- **Ponding layer:** a nominal 6-inch ponding layer should be included below the access hatch to allow for water spreading and infiltration during intense storms.
- **Soil layer:** 12 inches of soil should be included to remove pollutants
- **Free draining layer:** The drywell is sized assuming a 6-foot deep free draining layer. However, designers could use shallower drywells.

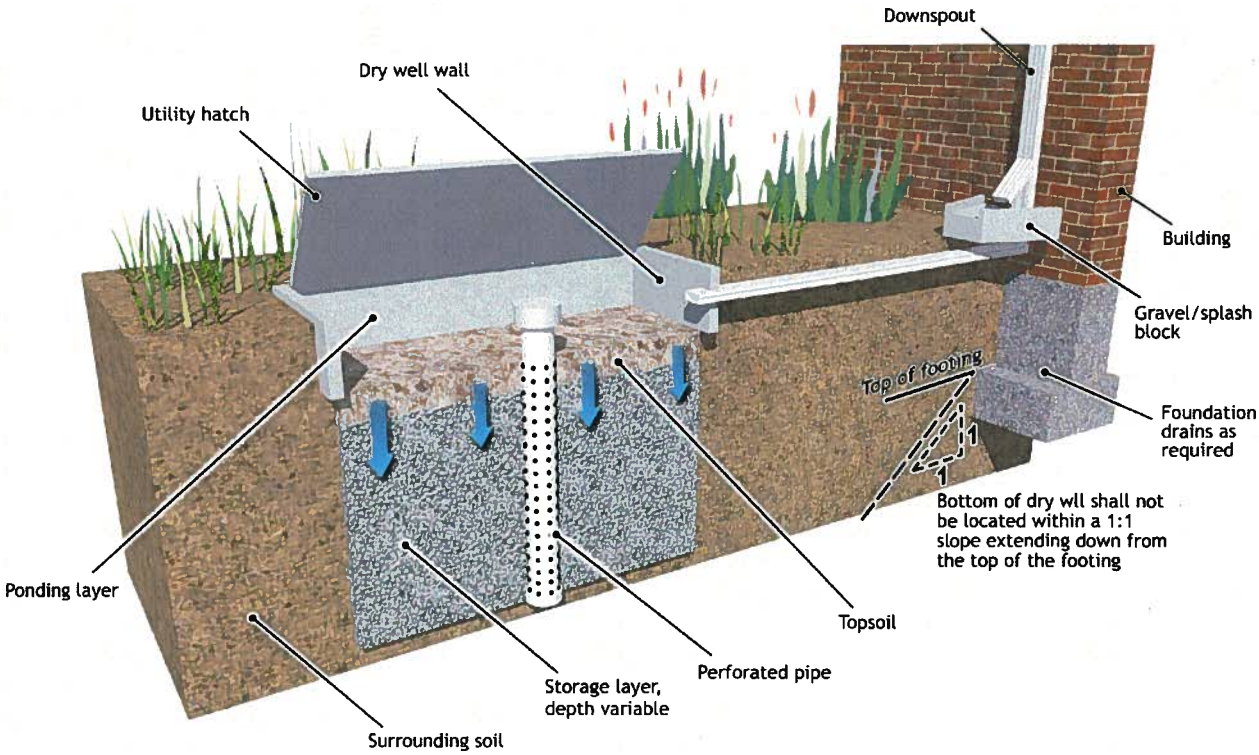

Figure 10. Dry Well BMP Example Illustration

4.6 Vegetated Bioswale

The vegetated bioswale BMP could be used to provide water quality treatment but not to provide stormwater flow control (Figure 11). The conventional swale design uses available on-site soils and does not include an underdrain system. Where soils are clayey, there is little infiltration. Treatment occurs as runoff flows through grass or other vegetation before exiting at the downstream end.

For the simulations, the vegetated bioswale will be sized to meet the minimum detention time specified in the Model SUSMP. If the bioswale is designed to pass stormwater through at a steady rate, its length will be computed based on flow velocities (i.e., slope and dimensions). If the vegetated bioswale is designed with a check dam structure to hold water, its size will be computed based on the volume provided by the swale.

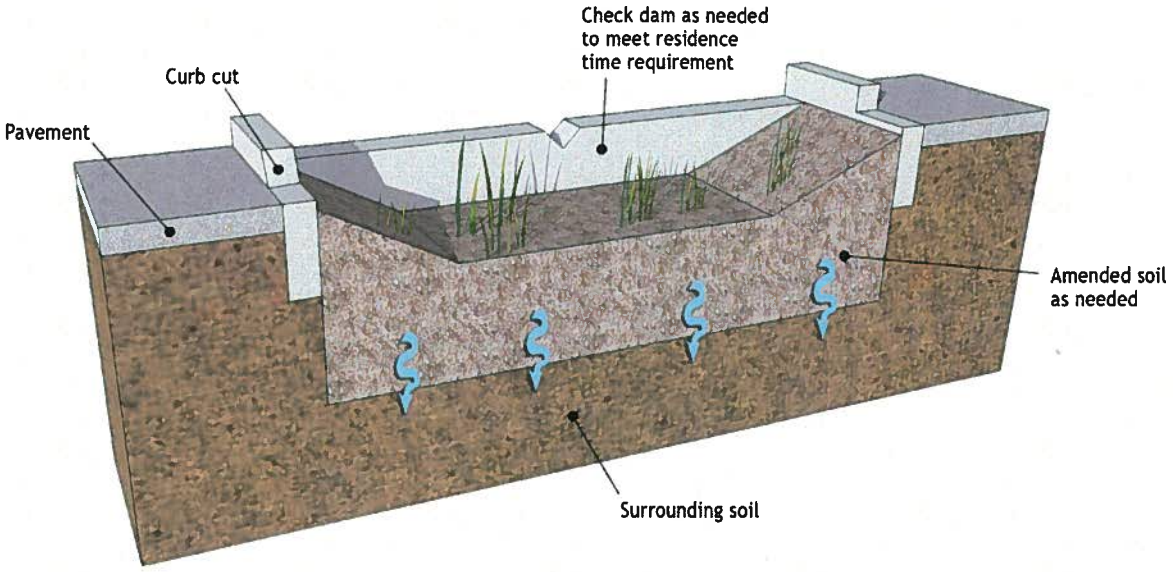

Figure 11. Vegetated Bioswale BMP Example Illustration

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Draft Technical Memorandum

Project Title: San Diego County Hydromodification Management Plan

Project No: 133904

San Diego County Hydromodification Management Plan (HMP)

Subject: Selection of PERLND Parameters for HSPF Modeling

Date: April 23, 2010

To: Sara Agahi, San Diego County

From: Tony Dubin, Brown and Caldwell
Eric Mosolgo, Brown and Caldwell

This memorandum presents the HSPF PERLND parameters recommended for the San Diego HMP's Best Management Practice (BMP) sizing analysis. These parameter values will be used in HSPF to simulate runoff rates and other hydrologic processes across a range of pervious surface conditions. The resulting long-term runoff time series (and key statistical series computed from these time series) will form the pre-project condition baseline that new and redevelopment projects must match by mitigating site runoff rates and durations through the use of BMPs.

This memo is organized as follows:

Section 1 defines a PERLND and describes how HSPF simulates water movement on and through pervious surfaces.

Section 2 describes the published studies using HSPF that were reviewed for this project.

Section 3 summarizes the available PERLND parameter sets that were reviewed.

Section 4 describes how Brown and Caldwell (BC) tested various parameter values to identify sensitive parameters and examined how the selection of specific parameter values would affect the runoff time series.

Section 5 presents conclusions and recommendations.

1. PERLND Description and Schematic

The PERLND block within the HSPF input file contains parameters that affect the vertical and lateral movement of water moisture through a pervious land segment. Figure 1 is a schematic view of the PERLND water budget terms and key HSPF parameters. The schematic illustrates the movement of water among interception storage, upper zone storage, lower zone storage, groundwater storage, and deep/inactive groundwater storage. The schematic also illustrates flux terms, such as overland flow and interflow.

The algorithms that control the movement among these storage layers are described thoroughly in the HSPF User's Manual, which is available from the US EPA as part of the BASINS documentation (http://www.epa.gov/waterscience/basins/bsnsdocs.html). The parameters listed in Figure 1 are described in greater detail in Section 1.1.

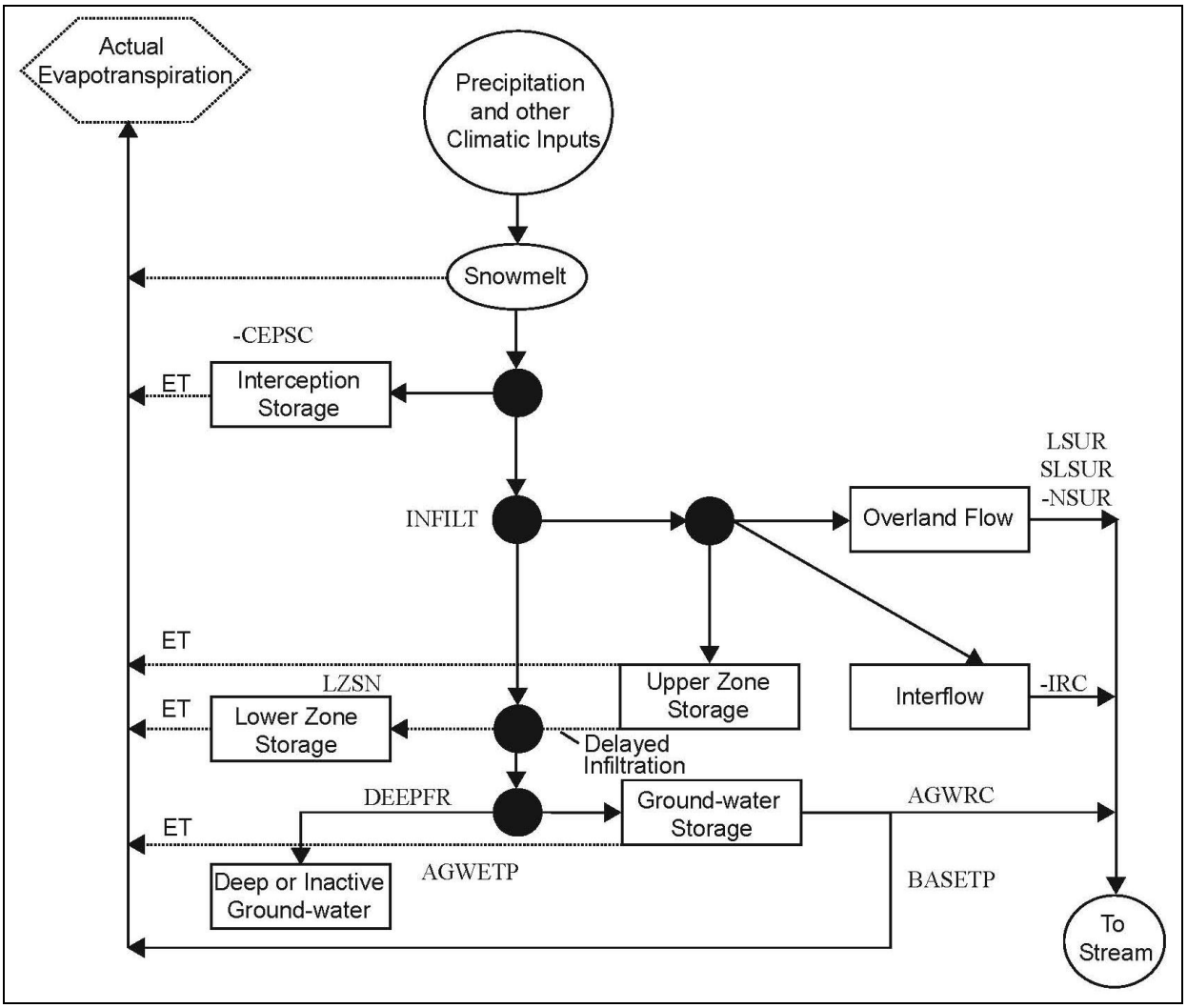

FIGURE 1

HSPF PERLND Water Moisture Schematic (Adapted from HSPF User's Manual)

1.1 PERLND Characteristics

The PERLND parameters shown in Figure 1 are located in the PWATER section of the PERLND block. PWATER, in turn, is divided into four sections, titled PWAT-PARM1, PWAT-PARM2, PWAT-PARM3, and PWAT-PARM4.

- PWAT-PARM1 is a series of flags that specify how various algorithms are to be used to compute hydrologic functions.
- PWAT-PARM2, PWAT-PARM3 and PWAT-PARM4 contain a series of climate, geology,

topography, and vegetation parameters and initial conditions.

Table 1 contains brief descriptions of the HSPF parameters used to characterize pervious land surfaces, along with commonly used ranges of values for these parameters. The parameters that often affect stormwater runoff most (INFILT, LZSN, LZETP) are highlighted in the table below. These highlighted parameters were the focus of our investigation of the range and variation among local HSPF studies and our testing of prospective parameters. The descriptions and parameter ranges in the table were adapted from *EPA BASINS Technical Note 6 – Estimating Hydrologic and Hydraulic Parameters for HSPF (Technical Note 6)*, which is available from the EPA web site, http://www.epa.gov/waterscience/basins/bsnsdocs.html.

TABLE 1
List of PERLND PWATER Parameters, Definitions and Common Range of Values[A]

PWAT-PARM1 – Flags			
Parameter	*Units*	*Description*	*Range of Values*
CSNOFG	None	Flag to use snow simulation data; must be set to if the SNOW simulation algorithms are to be used.	0 or 1
RTOPFG	None	Flag to select overland flow routing method. Set TOPFG=1; This method has been subjected to more widespread application.	1
UZFG	None	Flag to select upper zone inflow computation method Set UZFG=1; This method has been subjected to more widespread application.	1
VCSFG	None	Flag to select constant or monthly-variable interception storage capacity, CEPSC. Monthly value can be varied to represent seasonal changes in foliage cover	0 or 1
VUZFG	None	Flag to select constant or monthly-variable upper zone nominal soil moisture storage, UZSN.	0 or 1
VMNFG	None	Flag to select constant or monthly-variable Manning=s n for overland flow plane, NSUR. .	0 or 1
VIFWFG	None	Flag to select constant or monthly-variable interflow inflow parameter, INTFW. Monthly values are not often used.	0 or 1
VIRCFG	None	Flag to select constant or monthly varied interflow recession parameter, IRC. Monthly values are not often used.	0 or 1
VLEFG	None	Flag to select constant or monthly varied lower zone evapotranspiration (ET) parameter, LZETP.	0 or 1
PWAT-PARM2			
Parameter	*Units*	*Description*	*Range of Values*
FOREST	None	Fraction of land covered by forest that will continue to transpire in winter (i.e. coniferous). This is only relevant if snow is being considered (i.e., CSNOFG=1 in PWATER-PARM1).	0 to 0.95
LZSN	**Inches**	**Lower zone nominal soil moisture storage. This parameter affects the proportion of water going to surface runoff, interflow and active groundwater**	**2 to 15**
INFILT	**in/hr**	**INFILT is the parameter that controls the overall division of the available moisture from precipitation (after interception) into surface runoff. This is NOT equivalent to a field-measured infiltration rate.**	**0.001 to 0.50**
LSUR	Feet	Length of assumed overland flow plane. LSUR approximates the average length of travel for water to reach any drainage path such as streams, swales, ditches, etc.	Estimate from mapping or GIS
SLSUR	ft/ft	Average slope of assumed overland flow path. Average SLSUR values for each land use being simulated can often be estimated directly with GIS capabilities.	Estimate from mapping or GIS
KVARY	1/inches	Groundwater recession flow parameter used to describe non-linear groundwater recession rate	0.0 to 5.0
AGWRC	None	Groundwater recession rate, or ratio of current groundwater discharge to that from 24 hours earlier	0.85 to 0.999
PWAT-PARM3			
Parameter	*Units*	*Description*	*Range of Values*

TABLE 1 List of PERLND PWATER Parameters, Definitions and Common Range of Values[A]			
PETMAX	Deg F	Temperature below which ET will be reduced to 50% of that in the input time series	32 to 48
PETMIN	Deg F	Temperature at and below which ET will be zero. PETMIN represents the temperature threshold where plant transpiration is effectively suspended	30 to 40
INFEXP	None	Exponent that determines how much a deviation from nominal lower zone storage affects the infiltration rate. This parameter is commonly set to a value of 2.	1 to 3
INFILD	None	Ratio of maximum and mean soil infiltration capacities. This parameter is commonly set to a value of 2.	1 to 3
DEEPFR	None	The fraction of infiltrating water that is lost to deep/inactive aquifers with the remaining fraction assigned to active groundwater storage that contributes base flow to the stream.	0.0 to 0.5
BASETP	None	ET by riparian vegetation as active groundwater enters streambed; specified as a fraction of potential ET, which is fulfilled only as outflow exists.	0.0 to 0.2
AGEWTP	None	Fraction of PERLND that is subject to direct evaporation from groundwater storage, e.g. wetlands or marsh areas.	0.0 to 0.2
PWAT-PARM4			
Parameter	*Units*	*Description*	*Range of Values*
CEPSC	inches	Amount of rainfall, in inches, which is retained by vegetation, never reaches the land surface, and is eventually evaporated.	0.01 to 0.40
UZSN	inches	Nominal upper zone soil moisture storage. UZSN is related to land surface characteristics, topography, and LZSN.	0.05 to 2.0
NSUR	None	Manning's friction coefficient, n, for overland flow plane.	0.02 to 0.50
INTFW	None	Coefficient that determines the amount of water that enters the ground from surface detention storage and becomes interflow	1.0 to 10.0
IRC	None	Interflow recession coefficient IRC is the ratio of the current daily interflow discharge to the interflow discharge on the previous day.	0.3 to 0.85
LZETP	**None**	**Index to lower zone evapotranspiration LZETP affects ET from the lower zone, which represents the primary soil moisture storage and root zone of the soil profile.**	**0.1 to 0.9**

A. The parameter descriptions and ranges were obtained from the EPA BASINS Technical Note 6.

2. Available Studies and HSPF Parameter Sources

Brown and Caldwell collected and examined published Southern California studies that used HSPF to perform hydrologic modeling. We previously summarized this effort in the technical memorandum entitled *Summary of HSPF Modeling Reports in Southern California*, dated May 2009. Whenever possible, we also collected the HSPF input files that were used in these studies. We examined studies of the following models and study areas:

- **Santa Monica Bay Watershed** - The Southern California Coastal Water Research Project (SCCWRP) and Tetra Tech created HSPF models to simulate hydrologic processes and pollutant loadings to Santa Monica Bay. The specific parameter values were selected by calibrating an HSPF model to flow monitoring data in the Santa Monica Bay watershed, specifically on Malibu Creek. The values represent a composite of the various upstream soils and land uses.

- **Calleguas Creek** - This project was a pilot study to evaluate the use of HSPF as a management tool for comprehensive watershed assessment within the climatic, physiographic, and topographic conditions of Ventura County. The Calleguas Creek model, developed by Aqua Terra Consultants, simulates watershed hydrology using a combination of six different land use categories, topographic data and soils data.

- **San Diego Hydrology Model (SDHM)** - The San Diego Hydrology Model (SDHM) uses a graphical user interface and pre-selected HSPF parameters to simulate stormwater runoff from development sites and size stormwater control facilities to mitigate the impacts of land use changes. SDHM includes HSPF parameters for common soil and land use combinations. The SDHM user's manual is available in the download section of Clear Creek Solutions' web site, http://www.clearcreeksolutions.com/SearchResults.asp?Cat=17.

We also examined other HSPF input sources for relevant information:

- **EPA BASINS Technical Note 6** - The EPA publication (July 2000) is a very useful guide that describes key HSPF parameters and suggests initial values. This technical note provides BASINS users with guidance in how to estimate the input parameters in the ATEMP, SNOW, PWATER, IWATER, HYDR, and ADCALC portions of the HSPF model.

- **Western Washington Hydrology Model (WWHM)** was developed by Clear Creek Solutions for the Washington Department of Ecology to size stormwater control facilities in western Washington. The model runs HSPF to generate over 40 years of hourly runoff data. The interface and range of input types are generally similar to the SDHM.

- **Calabazas Creek** - In 1997, Aqua Terra Consultants used HSPF to study multipurpose design of detention facilities in Calabazas Creek watershed for the Santa Clara Valley Water District.

3. Range of Available Southern California HSPF Parameters

Brown and Caldwell has compiled and assessed the similarities and variations among the PERLND parameters used for the Santa Monica Bay, Calleguas Creek and SDHM work efforts. For reference, BC also compiled the parameters contained in EPA BASINS Technical Note 6, WWHM version 3, and the Contra Costa HMP. Table 2 lists the minimum, maximum and average values of the PERLND PWATER parameters for each study.

It is difficult to make a direct comparison among the parameters used in previous studies, because these modeling efforts examined entire watersheds with varying levels of development, reservoirs and regulation, and water demands and usages. However, focusing on the general range of specific parameter can be informative. For example, the Santa Monica Bay and Calleguas Creek model files use generally similar values for the key parameters, such as INFILT and LZSN (lower zone storage nominal), while the Santa Monica study used a substantially higher value of LZETP (lower zone evapotranspiration potential). The SDHM, which specifies parameters for ranges of soils, land uses and slopes, has INFILT, LZSN and LZETP parameters that are in the same range as the Santa Monica Bay and Calleguas Creek models.

TABLE 2

Compilation of PERLND Parameters

		Southern California HSPF Research							General HSPF Research										Contra Costa HSPF Research						
		Santa Monica Bay	Calleguas			SDHM			Tech Note 6				WWHM v.3 (moderate slopes)						Calabazas Creek				Contra Costa HMP		
									Typical		Full Range		NRCS Group C			NRCS Group A/B			Developed		Open Space				
		Value	Min	Max	Avg	Min	Max	Avg	Min	Max	Min	Max	Forest	Grass	Pasture	Forest	Grass	Pasture	Min	Max	Min	Max	Min	Max	Avg
PWAT_PARM2	**Units**																								
FOREST	none	0	0	0	0	N/A	N/A	N/A	0	0.5	0	0.95	N/A	N/A	N/A	N/A	N/A	N/A	0	0	0	0	0	0	0
LZSN	inches	9.8	3	12.5	8.7	3.5	5.2	4.5	3	8	2	15	5	5	5	4.5	4.5	4.5	7	7	7	7	7	7	7
INFILT	in/hr	0.04	0.02	0.2	0.11	0.02	0.10	0.05	0.01	0.25	0.001	0.5	2	1.5	0.8	0.08	0.06	0.03	0.03	0.03	0.03	0.03	0.3	0.03	0.1595
LSUR	feet	201	150	400	319	200.0	400.0	312.5	200	500	100	700	400	400	400	400	400	400	200	250	150	200	660	660	660
SLSUR	ft/ft	0.03	0.00	0.30	0.11	0.1	0.3	0.1	0.01	0.15	0.001	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.0065	0.0533	0.068	0.28	0.1	0.1	0.1
KVARY	1/inches	3.0	0.5	1	0.61	0.8	3.0	1.5	0	3	0	5	0.3	0.3	0.3	0.5	0.5	0.5	0	0	0	0	0	0	0
AGWRC	none	0.92	0.80	1.00	0.91	1.0	1.0	1.0	0.92	0.99	0.85	0.999	0.996	0.996	0.996	0.996	0.996	0.996	0.8	0.95	0.8	0.95	0.95	0.95	0.95
PWAT_PARM3																									
PETMAX (F)	F	35	40	40	40	NA	NA	NA	35	45	32	48	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	40	40	40
PETMIN (F)	F	30	35	35	35.0	NA	NA	NA	30	35	30	40	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	35	35	35
INFEXP	none	2	2	2	2	2.0	3.0	2.3	2	2	1	3	2	2	2	2	2	2	2	2	2	2	2	2	2
INFILD	none	2	2	2	2	2.0	2.0	2.0	2	2	1	3	2	2	2	2	2	2	2	2	2	2	2	2	2
DEEPFR	none	0.4	0	0.8	0.67	0.0	0.0	0.0	0	0.2	0	0.5	0	0	0	0	0	0	0.1	0.45	0.1	0.45	0.45	0.1	0.275
BASETP	none	0.05	0	0.26	0.05	0.0	0.0	0.0	0	0.05	0	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0
AGWETP	none	0.05	0	0	0	0.0	0.0	0.0	0	0.05	0	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0
PWAT_PARM4																									
CEPSC	inches	0.10	0.06	0.12	0.08	0.10	0.19	0.13	0.03	0.20	0.01	0.40	0.2	0.15	0.1	0.2	0.15	0.1	0.0	0.0	0.0	0.0	0.1	0.02	0.07
UZSN	inches	1.18	0.50	0.80	0.59	0.20	0.50	0.31	0.1	1	0.05	2	0.5	0.5	0.5	0.43	0.35	0.22	0.4	0.4	0.6	0.6	0.5	0.5	0.5
NSUR	none	0.20	0.15	0.25	0.18	0.20	0.35	0.27	0.15	0.35	0.02	0.5	0.35	0.3	0.25	0.35	0.3	0.25	0.1	0.2	0.4	0.4	0.3	0.3	0.3
INTFW	none	1.50	1.00	1.80	1.35	0.35	1.00	0.81	1	3	1	10	0	0	0	6	6	6	0.4	0.4	0.5	0.5	0.4	0.4	0.4
IRC	none	0.70	0.20	0.60	0.35	0.30	0.80	0.46	0.50	0.70	0.30	0.85	0.70	0.70	0.70	0.43	0.43	0.43	0.30	0.30	0.40	0.40	0.30	0.30	0.30
LZETP	none	0.70	0.40	0.50	0.43	0.20	0.69	0.51	0.20	0.70	0.10	0.90	0.70	0.40	0.25	0.70	0.40	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00

4. Evaluating HSPF Parameter Values

To determine the mix of pre-project conditions to include in the BMP Sizing Calculator, Brown and Caldwell examined the extent of variation among the PERLND parameters among the Santa Monica Bay, Calleguas Creek, and SDHM models.

Figures 2, 3 and 4 show the variation in the INFILT parameter used in the SDHM as function of slope and land cover. The INFILT parameter values clearly vary with slope. However, the INFILT parameter value is the same for the most common pre-project land cover types for new developments in San Diego County – shrub, grass, and dirt. The INFILT parameter value is higher for forest and lower for urban (i.e., compacted soils and irrigated landscapes), but these do not represent pre-project conditions that will be commonly managed by the BMP Sizing Calculator.

- Since the INFILT parameters are identical across the three most common pre-project land cover types, the modeling effort will focus on a single composite land cover type.
- The INFILT values vary significantly for different slopes. As such, parameter sets will be prepared for low, moderate, and steep slope classifications (5, 10 and 15 percent, respectively). In many cases, LID BMPs will not be feasible in areas with slopes that are steeper than this range. Further, because the pre-sizing analysis would potentially under-estimate pre-project runoff rates from very steep sites, any LID facilities designed in such areas using the BMP Sizing Calculator would be conservatively sized.
- An urban parameter set is not needed for the BMP Sizing Calculator. The *Countywide Model SUSMP* encourages developers to manage runoff from landscaped surfaces using grading and soil amendments that emphasize infiltration to reduce site runoff from landscaped areas without implementing LID BMPs. An urban parameter set can be developed for the automated pond sizing tool, because ponds are expected to capture flows from a combination of impervious and urban landscaped surfaces.

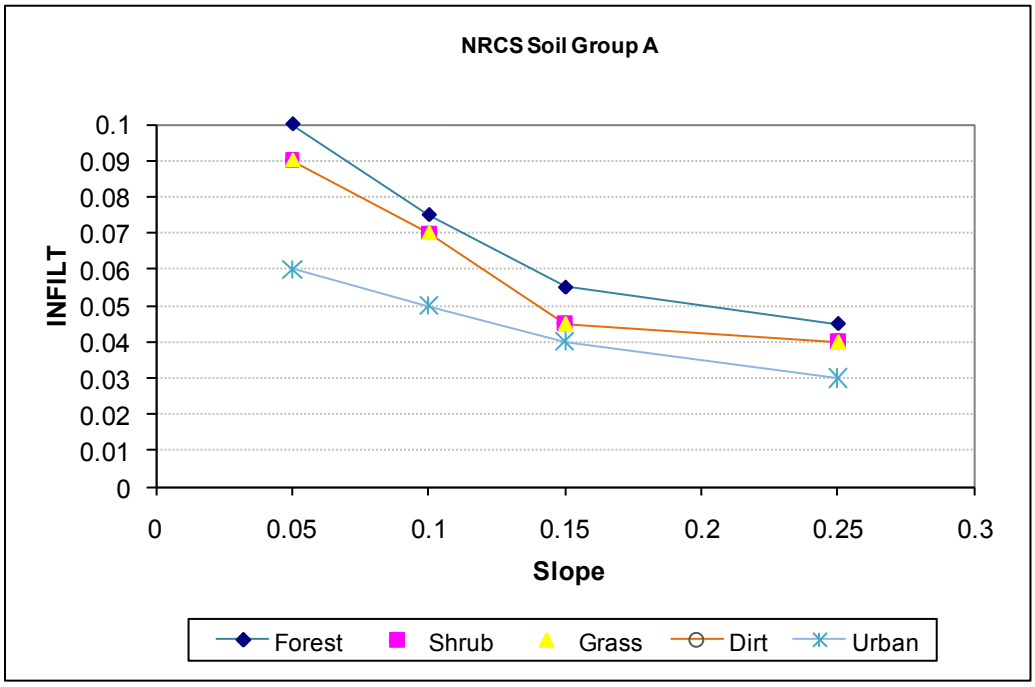

FIGURE 2
SDHM Variation in INFILT Parameter, NRCS Group A Soils

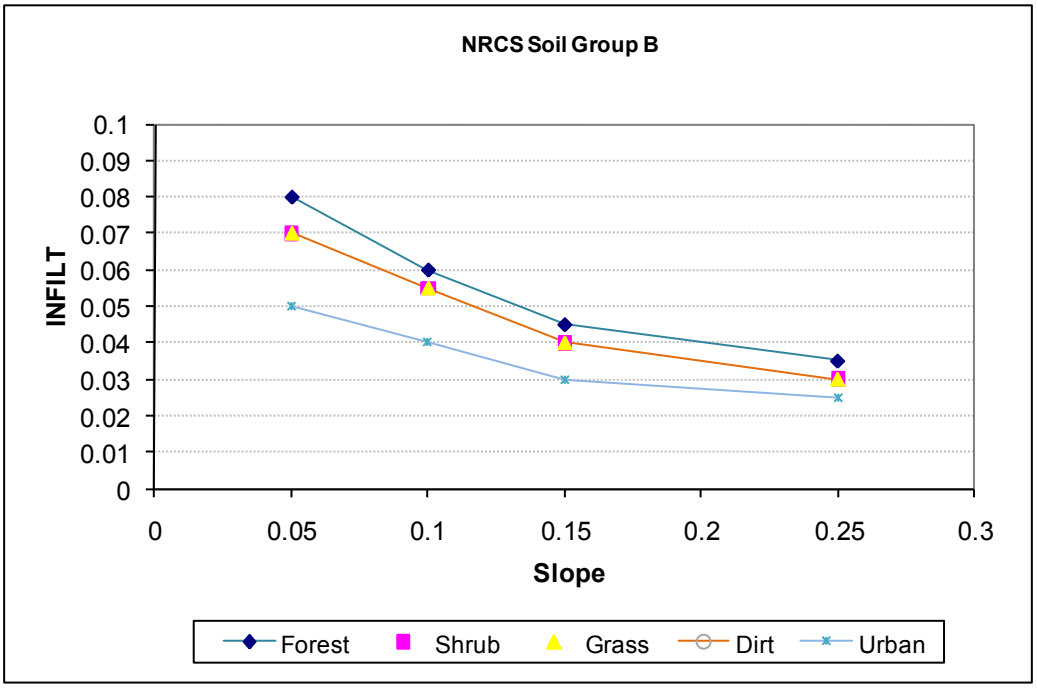

FIGURE 3

SDHM Variation in INFILT Parameter, NRCS Group B Soils

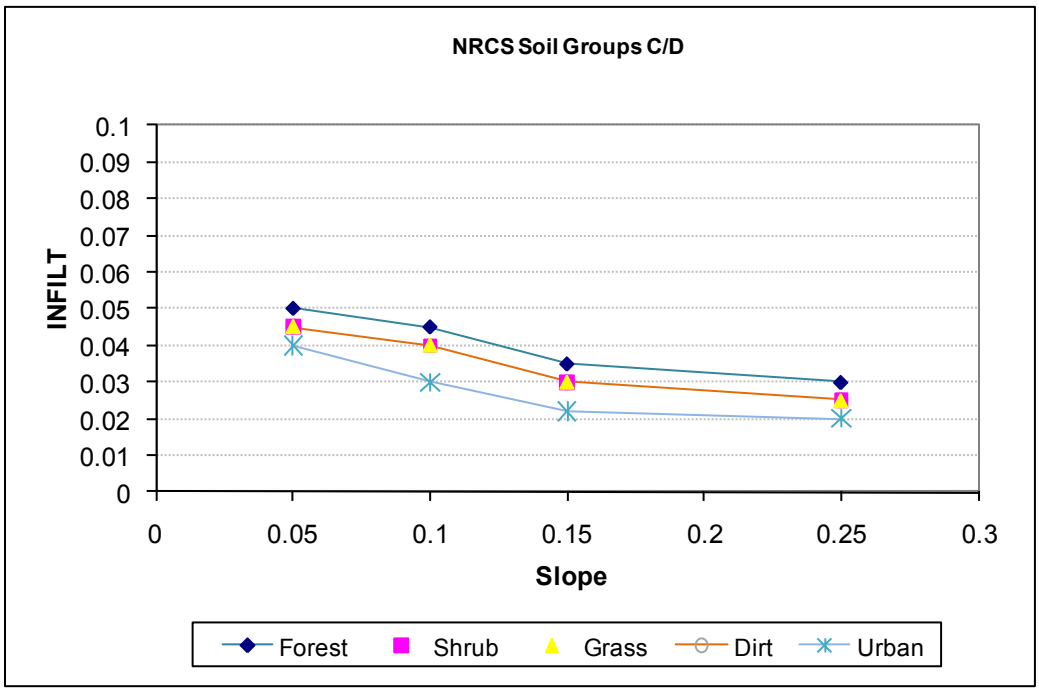

FIGURE 4

SDHM Variation in INFILT Parameter, NRCS Group C/D Soils

Figure 5, 6 and 7 show the SDHM model's assumed variations in the LZSN parameter as a function of slope and land cover type. Similar to the INFILT evaluation above, LZSN values are identical for the most common land cover types that will be incorporated in the BMP Sizing Calculator. These figures further reinforce the intention to focus on a single composite land cover type, while focusing on the differences in runoff generation potential associated with different soils and slopes.

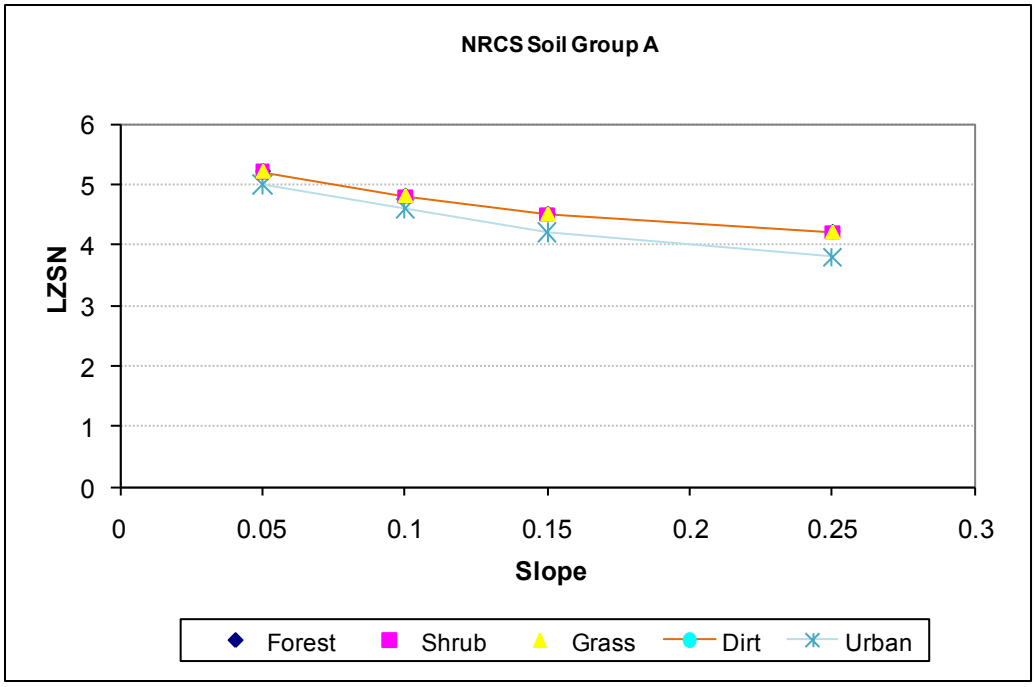

FIGURE 5

SDHM Variation in LZSN Parameter, NRCS Group A Soils

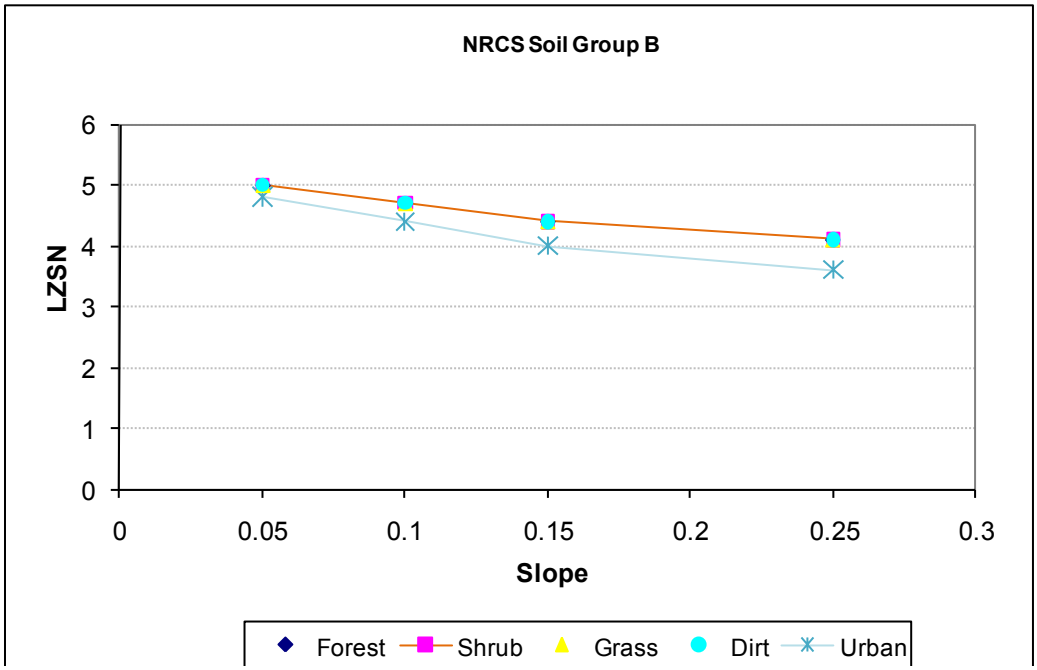

FIGURE 6

SDHM Variation in LZSN Parameter, NRCS Group B Soils

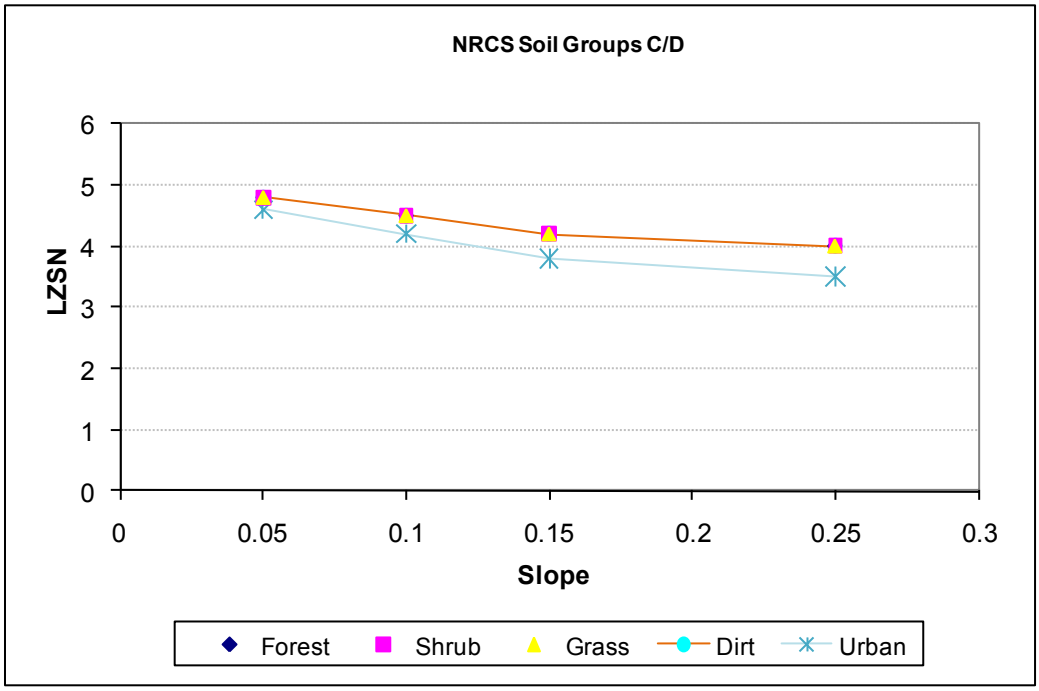

FIGURE 7

SDHM Variation in LZSN Parameter, NRCS Group C/D Soils

5. Recommended HSPF PERLND Parameters

The following recommended HSPF PERLND parameter values have been developed to use for LID pre-sizing factor analysis that will be included in the BMP Sizing Calculator. The 12 parameter sets cover the four NRCS soil groups and three separate slopes. The precise values were obtained by combining the Santa Monica Bay, Calleguas Creek, and SDHM parameter sets.

TABLE 3

Recommended HSPF PERLND Parameters for BMP Modeling

		Group A			Group B			Group C			Group D		
		5%	10%	15%	5%	10%	15%	5%	10%	15%	5%	10%	15%
PWAT_PARM2	**Units**												
FOREST	None	0	0	0	0	0	0	0	0	0	0	0	0
LZSN	inches	5.2	4.8	4.5	5.0	4.7	4.4	4.8	4.5	4.2	4.8	4.5	4.2
INFILT	in/hr	0.090	0.070	0.045	0.070	0.055	0.040	0.050	0.040	0.032	0.040	0.030	0.040
LSUR	Feet	200	200	200	200	200	200	200	200	200	200	200	200
SLSUR	ft/ft	0.05	0.1	0.15	0.05	0.1	0.15	0.05	0.1	0.15	0.05	0.1	0.15
KVARY	1/inches	3	3	3	3	3	3	3	3	3	3	3	3
AGWRC	None	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PWAT_PARM3													
PETMAX (F)	F	35	35	35	35	35	35	35	35	35	35	35	35
PETMIN (F)	F	30	30	30	30	30	30	30	30	30	30	30	30
INFEXP	None	2	2	2	2	2	2	2	2	2	2	2	2
INFILD	None	2	2	2	2	2	2	2	2	2	2	2	2
DEEPFR	None	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
BASETP	None	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
AGEWTP	None	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
PWAT_PARM4													
CEPSC	inches	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
UZSN	inches	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
NSUR	None	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
INTFW	None	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
IRC	None	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
LZETP	None	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5

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Project No: 133904

San Diego Hydromodification Management Plan

Subject: Responses to Comments on HMP Modeling Approach and BMP Configurations

Date: April 23, 2010

To: Sara Agahi, P.E. – County of San Diego

From: Eric Mosolgo, P.E. – Brown and Caldwell
Tony Dubin, P.E. – Brown and Caldwell

This draft technical memorandum summarizes the review comments received regarding the HMP Modeling Approach and BMP Configurations Draft Technical Memorandum (dated March 2, 2010) and Brown and Caldwell's (BC's) responses to these comments.

Review comments were received from the following groups:

- San Diego County Flood Control - Anthony Barry
- Clear Creek Solutions - Doug Beyerlein and Joe Brascher
- West Consultants - Marty Teal
- Hunsaker & Associates - Luis Parra

Table 1 below provides a summary of each comment, the corresponding page location from the originial Draft Technical Memorandum, and Brown and Caldwell's response.

Limitations:
This document was prepared solely for the County of San Diego in accordance with professional standards at the time the services were performed and in accordance with the contract between the County of San Diego and Brown and Caldwell. This document is governed by the specific scope of work authorized by the County of San Diego; it is not intended to be relied upon by any other party except for regulatory authorities contemplated by the scope of work.

No.	Reviewer	Page	Comment	Response
1	Anthony Barry, San Diego County	7	It is mentioned on page 7 that the vegetation types are not "sufficiently variable among developable lands to require separate scenarios". This statement should be further justified in a manner similar to the effects of porosity in the last bullet on page 8.	We made the decision to focus on one land cover type for the following reason: 1) We assume the vast majority of projects regulated by the HMP flow control standard will be in previously undeveloped areas with scrub vegetation. Conversely, many of the areas with "landscape/grass" as a pre-project land cover may not be covered by the flow control requirements, because these projects would be small or located in urban areas that qualify for some type of exemption. 2) We examined the range HSPF PERLND parameter values used in previous Southern CA studies and values included in the SDHM software – in particular the INFILT parameter. The parameter values were less variable for different land cover types than we expected, and this makes it likely that the variation in land cover type would have little impact on the computed LID BMP sizes. 3) The modeling "pre-sizing" analysis used to compute the sizing factors for the Sizing Calculator requires us to constrain or limit the variability of input parameters as much as possible. Because scrub/shrub vegetation will be encountered in most of the development projects, we think this is a good place to start with HSPF simulations and the Sizing Calculator. The County and its Copermittees could add more land cover types, BMPs or other features in V2.0 of the Sizing Calculator.

No.	Reviewer	Page	Comment	Response
2	Anthony Barry, San Diego County	11	Is the BMP area discussed in the second paragraph of Section 3.1.2 considered to be pervious area in the modeling? If so, and alterations to the standard (modeled) design are allowed (as suggested in the last paragraph on page 12), the depth of a BMP could be increased and the plan area decreased. This could allow an increase in the actual impervious area above what was considered in the modeling, without requiring the appropriate increase in required BMP volume. FOLLOW-UP COMMENT: After reviewing the response to my second comment (#2 on Page 3 of the response document) and looking back at the Modeling Approach, I discovered that the BMP area is modeled as being pervious as outlined in the 5th bullet on page 8 (of the document dated March 2, 2010), which states that there is flow out of the bottom of the basin (percolation) equal to the rate of hydraulic conductivity. It seems logical that significant reductions in the BMP area would also significantly reduce the area available for this outflow, and thereby increase the necessary volume. If this were not the case you would have to wonder if the percolation has any effect at all, and if it doesn't, why is it included in the modeling?	The BMPs are modeled using "FTABLEs" in HSPF, which detail stage-area-volume-discharge relationships. The model allows rainfall to occur directly on the BMP (as would happen in real life). The Sizing Calculator contains a "check" to ensure that the total contributing watershed area to the mitigation facility plus the mitigation facility area equates to the total project area. If a development engineer incorporates a narrow/deep ponding layer, the computed drainage management area (DMA) tributary to the BMP must accurately reflect the entire paved area draining to the BMP. We suggest allowing development engineers to vary the configuration of the surface ponding layer to better fit site constraints (e.g., wider/shallower to limit trip hazards; narrower/deeper to limit at-grade footprint). However, the sizing factor is based on the plan area of the growing medium underneath. For the Contra Costa HMP, we tested the sensitivity of BMP sizes to different ponding layer configurations and found that as long as the recommended volume is provided, wide/shallow, deep/narrow surface ponding layer configurations performed similarly enough not to impact BMP sizing factors. RESPONSE TO FOLLOW-UP COMMENT: As discussed by phone, all of the infiltration that occurs beneath the BMP is managed in the FTABLE (see Q Perc column in Figure 5), and not through the hydrologic elements of the HSPF model.
3	Anthony Barry, San Diego County	17	If vegetated bioswales are for water quality only, and do not provide flow control (as mentioned on page 17), why are they being included? Details on how to design a vegetated swale are covered in the CASQA BMP handbook.	This "treatment only" option has been proposed in response to a request from the Copermittees. The Sizing Calculator will allow users to size BMPs to meet either the "water quality treatment only" OR "flow control + treatment" requirement. The vegetated bioswale option will only be available as a selection in the Sizing Calculator if the user chooses "water quality treatment only" as the project design goal.

No.	Reviewer	Page	Comment	Response
4	Doug Beyerlein, Joe Brascher; Clear Creek Solutions	7	Only one land cover vegetation type is offered: scrub, shrub. Different vegetation types change the pre-development runoff. The user should be given more vegetation type options.	See response to comment #1.
5	Doug Beyerlein, Joe Brascher; Clear Creek Solutions	7	The sizing calculator assumes no increase in pervious runoff with development. Runoff from pervious surfaces can and does increase with development due to soil compaction from construction activities, the replacement of native vegetation with urban vegetation, and the addition of irrigation. These effects should be included in the sizing of BMP facilities.	The Countywide Model SUSMP adequately addresses this issue with its requirements for managing runoff from developed/pervious areas. For example, the SUSMP directs project proponents to control pervious runoff as much as possible using grading patterns, soil amendments, etc., so that these areas do not contribute runoff to paved areas and do not increase overall site runoff (relative to pre-project conditions). If a pervious area does drain to a paved area, and then into a BMP, this area must be accounted for within the Sizing Calculator to ensure the BMP is appropriately sized.
6	Doug Beyerlein, Joe Brascher; Clear Creek Solutions	N/A	The HSPF parameter values selected for the BMP sizing calculator are critical in the computation of the existing and development runoff and the sizing of BMP facilities. However, we have had no opportunity to review and comment on these parameter values.	We will issue a separate technical memorandum detailing the selection of HSPF model parameters.
7	Doug Beyerlein, Joe Brascher; Clear Creek Solutions	N/A	We have had no opportunity to review and comment on the HSPF FTABLEs used to represent different BMP facilities nor their associated HSPF UCI files. Nor have we had the opportunity to review and comment on the assumptions used in the construction of the HSPF FTABLEs and UCI files that produce the facility sizing results reported by the BMP sizing calculator.	The soil physics and key assumptions used to route water through the BMPs are described in Appendix A. This will be distributed to the TAC.
8	Marty Teal, West Consultants	2	Will it be obvious which of the various lower control threshold values someone is supposed to use/analyze?	Yes. The critical flow calculator allows a project proponent to determine which lower control threshold will apply to a specific project site. The critical flow calculator will be included in the overall BMP Sizing Calculator.
9	Marty Teal, West Consultants	2	Will the Sizing Calculator automatically determine/report whether a proposed BMP will meet the peak flow and flow duration performance requirement?	Yes. The Sizing Calculator will compute and report a BMP's minimize required size to meet the HMP stormwater control performance requirements.

No.	Reviewer	Page	Comment	Response
10	Marty Teal, West Consultants	8	Page 8 states, "Infiltration and soil water movement is a 1-dimensional flux in the vertical direction (neglecting lateral flows is a conservative assumption)." Why is neglecting lateral flows a conservative assumption?	If we assumed water would move laterally out of the BMP, the BMP would have a higher capacity to capture and mitigate stormwater flows.
11	Luis Parra, Hunsaker	7	The model does not include enough variability of vegetation cover to characterize the expected variation on infiltration. Among the most important vegetation type excluded, grass in fair to good condition comes to mind, as many of the developed areas will occur in this type of existing vegetation.	See response to comment #1.
12	Luis Parra, Hunsaker	9	Figure 3 is wrong and does not correspond with the one presented in page 78 of the Countywide Model SUSMP. The French drain should be placed on top, with only few inches on gravel above the top of the pipe, and the gravel below. This way, water retained below the French drain will be incorporated into the underground media.	Figure 3 was included simply to describe the function of LID BMPs. It could be replaced with Figure 6, which is consistent with the Countywide Model SUSMP.
13	Luis Parra, Hunsaker	9-11	As the hydraulic conductivity of the amended soil is the flow constraining factor (and less than the conductivity of the gravel) the only way that gravel on top makes sense is if an orifice constraining the flow in the French drain is used. This aspect, however, does not exclude the possibility of having some retention below the French drain. For instance, in a soil Type D with a hydraulic saturated conductivity of 0.1 in/hr, the equivalent of 7.2 in of ponding can be placed below the invert elevation of the French drain. With an assumed porosity of 0.4, this corresponds to an additional retention depth of 18" below the French drain. The model should allow retention as a function of the hydraulic conductivity of the bottom soil.	The gravel layer is proposed below the amended soil layer. We will follow up with reviewer to clarify this comment.

No.	Reviewer	Page	Comment	Response
14	Luis Parra, Hunsaker	N/A	Water table constraints should be included in the model. For example, it should be recommended that the water table must be at a given depth below the bottom of the gravel to be sure that the vertical assumption is valid.	The Countywide Model SUSMP describes specific site conditions that affect the feasibility of LID BMPs (e.g., steep slopes, high groundwater). Furthermore, the HMP Decision Matrix requires applicants to complete a geotechnical investigation which would identify such design constraints. A project applicant would first need to determine whether these constraints apply. If not, the project proponent could use the Sizing Calculator to plan BMPs. The Sizing Calculator will not apply in high groundwater conditions.
15	Luis Parra, Hunsaker	9	It is not clear to me if growing medium as a maximum limit of 1.5 ft. The user should be able to increase this depth. As a matter of fact, the Maryland Manual (the one that initiated the bio-retention revolution) suggests using at least 2 ft of amended soil. The user should have the option to increase this depth up to 3-4 ft.	A project proponent could specify a deeper growing medium. However, to pre-size BMPs for the Sizing Calculator we need to limit the number of potential BMP configurations. Other design scenarios can be modeled through the preparation of continuous simulation hydrologic models such as HSPF.
16	Luis Parra, Hunsaker	9	Van Genuchen relations are mentioned in page 9 but never shown.	The Van Genuchten relations are included in Appendix A. This document will be distributed to the reviewers and the TAC.
17	Luis Parra, Hunsaker	9-10	Neglecting lateral percolation and limiting infiltration to the saturated hydraulic conductivity of the existing soil is a reflection of simplicity and building upon conservative assumptions rather than a reality. Also neglecting the influence of the water pressure of the gravel in the infiltration occurring at the bottom soil is another conservative assumption not discussed. I would suggest to allow for adding an increase infiltration dimensionless factor if measurements demonstrate that the discharge is actually much less than what the model predicts.	The conservative assumptions detailed in the HMP Modeling Approach memo serve as a hedge against real-world installation problems, occasional BMP failures, etc., so that the integrated effectiveness of distributed BMP performance is consistent with the requirements of the NPDES permit. The accuracy of the sizing factors will be measured by the Copermittees' monitoring program, which will be conducted over the ensuing 5 years and beyond. If the monitoring results indicate deviations from the sizing factor predictions, then adjustments to the sizing factors will be proposed.

No.	Reviewer	Page	Comment	Response
18	Luis Parra, Hunsaker	12	The user should have flexibility to determine design parameters of the bio-retention: ponding depth (it can be more than 10 inches, no reason why this has to be the limit); growing medium (it can be more than 18" and as a matter of fact many references recommend at least 2 to 3 ft); storage layer: it can be more than 30" and it is associated with the possibility of the Bio-retention to be able to drain in 72 hrs. Also remember the possibility to add gravel below the invert of the French drain for retention purposes and groundwater recharge purposes.	Regarding ponding depth comment: The selection of a maximum ponding depth is a policy decision. Because bioretention is often installed in pedestrian-friendly areas, these systems often have limited ponding depth to eliminate trip hazards. Regarding growing medium and gravel comment: see response to comment #15.
19	Luis Parra, Hunsaker	12	Drawdown considerations for the bio-retention should be included to determine the maximum depth of the combination of ponding, amended soil, and gravel than can drain in 72 hrs.	Vector control is a major benefit of stormwater LID. Conventionally, drawdown considerations only apply to the surface ponding layer of bioretention devices and not the below ground layers. The surface ponding layer will fully drain within a few hours of the end of a storm event. The sizing calculator will include drawdown calculations.
20	Luis Parra, Hunsaker	12	It is not clear in page 12 if the other option of conversion is valid: the example describes a situation where the design engineer can convert the ponding layer with half the depth but twice the area, and actually design engineers are more interested in doing exactly the opposite: half the area and twice the depth. I am assuming that this is also a valid option.	The Countywide Model SUSMP specifies the allowable configurations for bioretention BMPs.
21	Luis Parra, Hunsaker	13	Comments 2 and 3 (#12 and #13 in this table) are also applicable to figure 6 of page 13.	The figures on pages 77 and 78 of the Countywide Model SUSMP should be modified to show the underdrain pipe at or near the bottom of the storage layer (i.e., the gravel layer).
22	Luis Parra, Hunsaker	N/A	There is no opportunity to make comments in hidden parameters or assumptions made by the program, but to trust blindly on the results. Unfortunately the engineer will become more of a technician running a black-box program than an engineer using criteria an experience to come up with a good design.	The Sizing Calculator is a simple-to-use tool that allows engineers to quickly size stormwater BMPs based on detailed "pre-sizing" modeling exercise (performed by Brown and Caldwell). Project proponents could perform their own hydrologic and hydraulic modeling analyses to size modified BMP designs, if desired.

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Draft Technical Memorandum

Project Title: San Diego County Hydromodification Management Plan

Project No: 133904

San Diego County Hydromodification Management Plan (HMP)

Subject: Description of Automated Pond Sizing Procedure

Date: May 6, 2010

To: Sara Agahi, San Diego County

From: Tony Dubin, Brown and Caldwell
Eric Mosolgo, Brown and Caldwell

This memorandum describes the automated pond sizing procedure that Brown and Caldwell (BC) is currently developing to support the implementation of the San Diego HMP. The purpose of the automated pond sizing procedure is to provide both project proponents and municipal review staff with a technically sound yet streamlined method for sizing stormwater ponds that meet the performance requirements of the HMP.

Pond Sizing Procedure

The automated pond sizing procedure will be built into the BMP Sizing Calculator software to allow project proponents to select detention ponds as the method of stormwater runoff control. The general process will work as follows:

1. The project proponent will enter information about the area tributary to the proposed detention pond for the pre-project and post-project conditions. The information will include drainage area, soil types, slopes, and land cover information (e.g., scrub land, landscaping, impervious).

2. The BMP Sizing Calculator software will construct pre-project and post-project (unmitigated) long-term runoff time series data that correspond to the site conditions (i.e., the information described in the item #1 above). The time series will be created through a pre-modeling exercise that involves running HSPF with real, historical rainfall data and developing long-term, unit area hydrographs for each combination of soils, slopes, and land covers.

3. The project proponent will next enter an initial configuration for the detention pond, including area, depth and side slopes. Alternatively, the user could supply a stage-storage-discharge table. The user will also enter preferences for how the automated pond sizing procedure should iteratively adjust the pond configuration if the initial configuration does not meet the HMP's performance requirement for flow duration and peak flow control. The user will not need to supply any information about the outlet control structure, because the automated pond sizing algorithm will use a pre-defined configuration that includes 2 flow control orifices and an overflow weir (sizes of the outflow facilities will be determined by the pond sizing algorithm).

4. The software will route the post-project unmitigated, long-term runoff time series through the detention pond. The reservoir routing routine will compute the following quantities for each hourly time step:
    - stormwater inflow
    - water depth
    - pond exfiltration
    - pond outflow through the outlet control structure

    The pond outflows will form the "post-project mitigated" time series that will be compared to the pre-project conditions.
5. The software will compare the pond outflow **flow durations** and **peak flows** with the pre-project flow durations and peak flows to determine if the pond configuration meets the performance requirements of the HMP.
6. If the current configuration does not meet the HMP performance requirements, the automated pond sizing procedure will apply the user's stated preference for modifying the pond configuration (see item #3 above) and perform the reservoir routing and statistical post-processing calculations again (and again) until the pond is properly sized and meets HMP requirements.

Time Series Data

As described above, the automated pond sizing procedure will prepare pre-project and post-project time series for the area tributary to the proposed pond, and then determine how large the pond must be to mitigate the impacts of development or redevelopment activities. The site-specific time series will be developed by adding together the component time series data that describe the different parts of the project area (e.g., 10-acres impervious *time series* + 5 acres Group D soils and scrub vegetation with moderate slopes *time series* + 12 acres Group D soils with urban/landscaped cover *time series*).

The component runoff time series will be developed by running HSPF simulations for each of the 12 scenario conditions described in the *HMP Modeling Approach and BMP Configurations* technical memo dated March 2, 2010 (see Section 2.2 of the technical memo). Runoff time series will also be developed corresponding to four (4) "urban" landscaped conditions describing landscaped areas with compacted soils that would be typical of urban and suburban-style development.

These landscaped cover types are necessary for the automated pond sizing procedure, because it is not feasible for site developments that include large ponds for stormwater control to segregate runoff from pervious and impervious surfaces (in the way that LID-focused developments typically separate contributions from pervious and impervious sources).

Table 1 below lists the pervious site conditions that will be available for the automated pond sizing procedure.

TABLE 1 HSPF Scenarios for Characterizing Pervious Site Conditions			
Scenario No.	**NRCS Soil Group**	**Land Cover**	**Slope**
1	A	Scrub, Shrub	Low (<5%)
2	A	Scrub, Shrub	Moderate (10%)
3	A	Scrub, Shrub	Steep (>15%)
4	B	Scrub, Shrub	Low (<5%)
5	B	Scrub, Shrub	Moderate (10%)
6	B	Scrub, Shrub	Steep (>15%)
7	C	Scrub, Shrub	Low (<5%)
8	C	Scrub, Shrub	Moderate (10%)
9	C	Scrub, Shrub	Steep (>15%)
10	D	Scrub, Shrub	Low (<5%)
11	D	Scrub, Shrub	Moderate (10%)
12	D	Scrub, Shrub	Steep (>15%)
13	A	Urban/Landscaped	Moderate (10%)
14	B	Urban/Landscaped	Moderate (10%)
15	C	Urban/Landscaped	Moderate (10%)
16	D	Urban/Landscaped	Moderate (10%)

Pond Configuration Preferences

After describing the pre-project and post-project conditions based on local soils, slopes and land covers, the project proponent will describe an initial pond configuration and preferences for modifying the configuration during the automated sizing process.

Since each project site has its unique constraints on pond configurations, the user should be allowed to express preferences with regard to configuration modification. To minimize the pond footprint area, engineers commonly provide the required storage volume by constructing a deeper pond. However, site specific constraints, community concerns, and municipal regulations could require an engineer to set a maximum depth for a pond. Potential concerns associated with pond depths include public safety, drawdown times, vector control, or aesthetics, among others.

Figure 1 below shows how preferences will be incorporated into the iterative pond sizing process. Specifically, the figure illustrates how the automated pond sizing procedure could test an initial configuration, iteratively test increasing pond depths, and finally test increasing pond areas until a solution is found that meets the flow duration and peak flow performance requirements of the HMP.

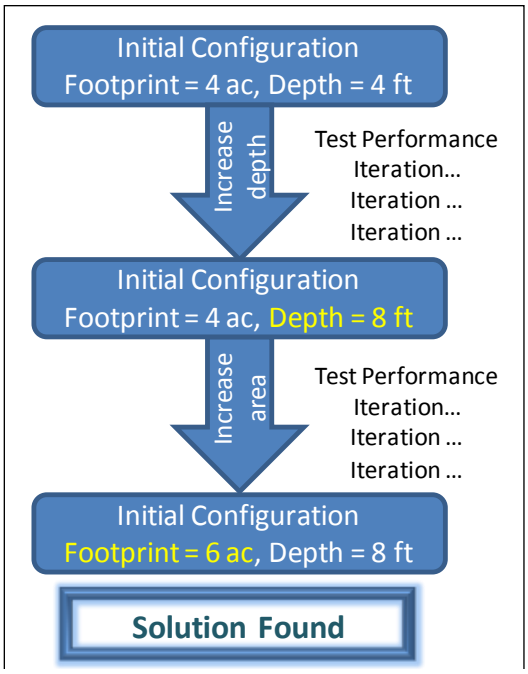

FIGURE 1

Illustration of Pond Configuration Preferences for Automated Iterative Sizing

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Draft Technical Memorandum

Project Title: San Diego County Hydromodification Management Plan

Project No: 133904

San Diego County Hydromodification Management Plan (HMP)

Subject: Rainfall and Evapotranspiration Data for BMP Sizing Calculator

Date: May 20, 2010

To: Sara Agahi, San Diego County

From: Eric Mosolgo, Brown and Caldwell
Tony Dubin, Brown and Caldwell

This memorandum describes the rainfall and evapotranspiration data that Brown and Caldwell (BC) is using to develop BMP sizing factors and pond sizing time series data for incorporation in the San Diego BMP Sizing Calculator. The purpose of the BMP Sizing Calculator is to provide both project proponents and municipal review staff with a technically sound yet streamlined method for sizing stormwater facilities that meet the performance requirements of the HMP.

Rainfall Data

Standards developed as part of this HMP to control runoff peak flows and durations are based on a continuous simulation of runoff using local rainfall data. To provide for clear climatic designation between coastal, foothill and mountain areas of the County, and to distinguish between the major watershed units, historical records for a series of 18 rainfall data stations located throughout San Diego County were compiled and quality controlled for analysis.

Long-term hourly rainfall records have been prepared for the 18 rainfall stations. These rainfall record files are located on the *Project Clean Water* web site for public use (www.projectcleanwater.org). Sources of the rainfall data include ALERT data from the County of San Diego (which extend back to 1982), the California Climatic Data Archive, National Oceanic and Atmospheric Administration (NOAA), the National Climatic Data Center, and the Western Regional Climate Center.

Gauges were selected based on minimum continuous simulation modeling requirements including the following:

1. Since the selected precipitation gauge data set should be located near the project site to ensure that long-term rainfall records are similar to the anticipated rainfall patterns for the site, gauges were selected in proximty to areas planned for future development and redevelopment.
2. Recording frequency for the gauge data set should be hourly (or more frequent).
3. The gauge rainfall record should extend for the entire length of the record. Where the gauge record length is less than 35 years, then adjacent gauge records were used to extend the rainfall record to at least 35 years.

4. Use of the most applicable long-term rainfall gauge data, as opposed to the scaling of rainfall patterns solely from Lindbergh Field, is required to account for the diverse rainfall patterns across San Diego County.

Precipitation gauges summarized in Table 1 below all have recording frequencies of one hour and recording data ranges of at least 35 years.

TABLE 1
Rainfall Station Summary

Station	Elevation	Watershed
Bonita	120	Sweetwater River
Encinitas	242	San Elijo Lagoon and Batiquitos Lagoon and ocean outlets
Escondido	645	Escondido Creek
Fallbrook	675	San Luis Rey River (near ridge with Santa Margarita River watershed)
Fashion Valley	20	Lower San Diego River
Flinn Springs	880	San Diego River
Kearny Mesa	425	San Diego River (near ridge with San Clemente Canyon watershed)
Lake Cuyamaca	4,590	Upper San Diego River
Lake Heneshaw	2,990	Upper San Luis Rey River
Lake Wohlford	1,490	Upper Escondido Creek
Lindbergh Field	Near Sea Level	Coastal – San Diego Bay
Lower Otay Reservoir	491	Otay River
Oceanside	30	San Luis Rey River
Poway	440	Los Penasquitos Canyon
Ramona	1,450	Upper San Dieguito River
San Onofre	162	North County Coastal – Pacific Ocean
San Vicente Reservoir	663	San Diego River
Santee	300	San Diego River

For a given project location, the following factors should be considered in the selection of the appropriate rainfall data set when developing continuous simulation hydrologic models.

1. In most cases, the rainfall data set in closest proximity to the project site will be the appropriate choice. A rainfall station map is included in Figure 1 of this technical memo and has been posted to the *Project Clean Water* web site for public use.
2. In some cases, the rainfall data set in closest proximity to the project site may not be the most applicable data set. Such a scenario could involve a data set with an elevation significantly different from the project site. In addition to a simple elevation comparison, the project proponent may also consult with the San Diego County's average annual precipitation isopluvial map, which is provided in the San Diego County Hydrology Manual (2003). Review of this map could provide an initial estimate as to whether the project site is in a similar rainfall zone as compared to the rainfall station. Generally, average annual precipitation totals in San Diego County increase with increasing elevation.
3. Where possible, rainfall data sets should be chosen so that the data set and the project location are both located in the same topographic zone (coastal, foothill, mountain) and/or major watershed unit (Upper San Luis Rey, Lower San Luis Rey, Upper San Diego River, Lower San Diego River, etc.).

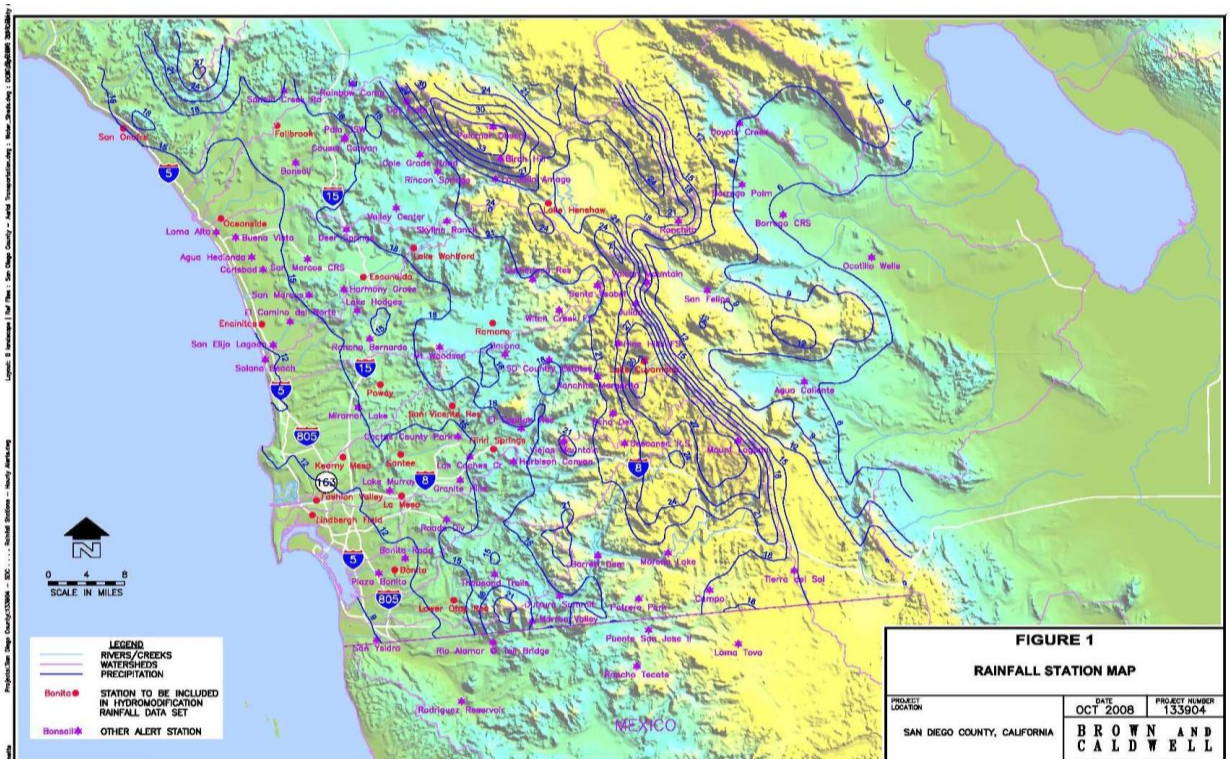

FIGURE 1

Rainfall Station Map

The BMP Sizing Calculator will automate the rainfall gauge selection process considering the factors detailed in this technical memo. For the purposes of the sizing factor modeling development effort, four (4) of the rainfall data sets were considered for analysis. The selected rainfall data sets include:

1. Lindbergh Field (coastal area, San Diego Bay watershed, central San Diego County, elevation near sea level)
2. Oceanside (coastal area, San Luis Rey River watershed, northern San Diego County, elevation = 30 feet)
3. Lower Otay Reservoir (inland valley area, Otay River watershed, southern San Diego County, elevation = 491 feet)
4. Ramona (mountain area, San Dieguito River watershed, eastern San Diego County, elevation = 1,450 feet)

To account for topographic, geographic and climatic variability across San Diego County, scaling factors will be developed for each of the (4) rainfall stations listed above. Projects will be assigned to a "rainfall basin" corresponding to one of the (4) rainfall stations. Then, rainfall data will be scaled based upon either mean annual precipitation of single-event isopluvial data (such as the 2-year, 24-hour or 85th percentile, 24-hour rainfall totals) differences as compared to the selected rainfall station.

Evapotranspiration Data

Known data sources for evaporation and evapotranspiration data in San Diego County are listed below.

1. California Irrigation Management and Information System web site – evapotranspiration stations include San Diego, Oceanside, Escondido, Ramona, Otay Lakes, Miramar, Torrey Pines, and Borrego Springs.
2. Historical Reservoir Level and Evaporation Data for Lake Heneshaw.
3. Historical Evaporation Data from City of San Diego Reservoirs.
4. Historical Evaporation Data from Helix Water District for Lake Cuyamaca.

Table 2 below summarizes available evaporation and evapotranspiration data sources in San Diego County. Most of the available data are located close to reservoirs in the inland valley and mountain areas of the County. Monthly evaporation records are available for multiple reservoirs within the County. Evapotranspiration sensing data are generally collected in agricultural zones.

The California Irrigation Management Information Systems web site (www.cimis.water.ca.gov/cimis/data.jsp) provides access to real-time and summarized evapotranspiration data (ETo) throughout California. For the San Diego region, average evapotranspiration values are summarized for the coastal and foothill zones of San Diego County.

TABLE 2
Summary of Evaporation and Evapotranspiration Data for San Diego County

Station Name ID	Data Type	Data Source	Recording Frequency	Start Date	End Date
Barratt Lake	Pan Evaporation	City of San Diego Water Department	Monthly	1950	2008
Chula Vista	Pan Evaporation	Western Regional Climate Center	Monthly Averages	1948	2005
El Capitain Reservoir	Pan Evaporation	City of San Diego Water Department	Monthly	1950	2008
Escondido / 74	Evapotranspiration	CIMIS	Monthly	1988	1998
Escondido / 153	Evapotranspiration	CIMIS	Monthly	1999	2008
Lake Cuyamaca	Pan Evaporation	Helix Water District	Monthly	1985	2006
Lake Heneshaw	Pan Evaporation	County of San Diego	Daily	1999	2005
Lake Heneshaw	Pan Evaporation	County of San Diego	Monthly	1957	2008
Lake Hodges	Pan Evaporation	City of San Diego Water Department	Monthly	1950	2008
Lake Jennings	Pan Evaporation	Helix Water District	Monthly	1985	2006
Lake Murray	Pan Evaporation	City of San Diego Water Department	Monthly	1950	2008
Lake Sutherland	Pan Evaporation	City of San Diego Water Department	Monthly	1954	2008
Lower Otay Reservoir	Pan Evaporation	City of San Diego Water Department	Monthly	1950	2008
Lower Otay / 147	Evapotranspiration	CIMIS	Monthly	1999	2008
Miramar Lake	Pan Evaporation	City of San Diego Water Department	Monthly	1960	2008
Miramar Lake / 150	Evapotranspiration	CIMIS	Monthly	1999	2008

TABLE 2
Summary of Evaporation and Evapotranspiration Data for San Diego County

Station Name ID	Data Type	Data Source	Recording Frequency	Start Date	End Date
Morena Lake	Pan Evaporation	City of San Diego Water Department	Monthly	1950	2008
Oceanside / 49	Evapotranspiration	CIMIS	Monthly	1986	2003
Ramona / 98	Evapotranspiration	CIMIS	Monthly	1991	1998
San Diego / 45	Evapotranspiration	CIMIS	Monthly	1985	1989
San Diego / 66	Evapotranspiration	CIMIS	Monthly	1989	2001
San Diego II / 184	Evapotranspiration	CIMIS	Monthly	2002	2008
San Vicente Reservoir	Pan Evaporation	City of San Diego Water Department	Monthly	1950	2008
Torrey Pines / 173	Evapotranspiration	CIMIS	Monthly	2000	2008

For the purposes of the sizing factor modeling development effort, the four (4) rainfall data sets were associated with evapotranspiration/evaporation data as detailed below.

1. Lindbergh Field (San Diego/45, San Diego/66, San Diego II/184, Chula Vista, Lake Murray and Torrey Pines/173)
2. Oceanside (Oceanside/49, Lake Hodges, Lake Heneshaw)
3. Lower Otay Reservoir (Lower Otay Reservoir, Lower Otay/147)
4. Ramona (Ramona / 98, Lake Hodges, San Vicente Reservoir)

044450

2011 Long-Term Effectiveness Assessment

San Diego Stormwater Copermittees
Urban Runoff Management Programs

Final Report

Prepared For:

San Diego County Copermittees

June 2011

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Attachment 2 – 2011 Long-Term Effectiveness Assessment on Compact Disc

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Appendix A – Source Profiles
Appendix B – Threat to Water Quality (TTWQ) Examples
Appendix C – Program Management Practice (PMP) Profiles

List of Acronyms

BLTEA	Baseline Long-Term Effectiveness Assessment
BMP	Best Management Practice
BOD	Biological Oxygen Demand
CASQA	California Stormwater Quality Association
CV	Coefficient of Variation
ESA	Environmentally Sensitive Area
FY	Fiscal Year
HMP	Hydromodification Management Plan
IBI	Index of Biological Integrity
ICID	Illegal Connections and Illicit Discharges
JURMP	Jurisdictional Urban Runoff Management Program
LID	Low Impact Development
LTEA	Long-Term Effectiveness Assessment
MBAS	Methylene Blue Active Substances
MLS	Mass Loading Stations
MOU	Memorandum of Understanding
MS4	Municipal Separate Stormwater System
PGA	Pollutant Generating Activities
PMP	Program Management Practice
RURMP	Regional Urban Runoff Management Program
SCCWRP	Southern California Coastal Waters Research Project
SLP	Source Loading Potential
SMC	Southern California Monitoring Coalition
SPS	Source Profile Sheet
SUSMP	Standard Urban Stormwater Mitigation Plan
SWRCB	State Water Resources Control Board
TCBMP	Treatment Control BMP
TDS	Total Dissolved Solids
TMDL	Total Maximum Daily Load
TSS	Total Suspended Solids
TTWQ	Threat to Water Quality
TWAS	Temporary Watershed Assessment Station
URMP	Urban Runoff Management Program
WEA	Watershed Education Activities
WMA	Watershed Management Area
WQ	Water Quality
WQA	Watershed Water Quality Activity
WURMP	Watershed Urban Runoff Management Program

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EXECUTIVE SUMMARY

NPDES Order No. R9-2007-0001, the San Diego Municipal Stormwater Permit (Permit) requires that the Copermittees perform a Long-Term Effectiveness Assessment (LTEA) to evaluate the impacts of program implementation over the Permit cycle. The LTEA serves as a basis for the Copermittees' Report of Waste Discharge (ROWD).

This LTEA represents the Copermittees' second LTEA effort. It was accomplished through an in-depth review of existing pollutant sources and program activities as well as an assessment of water quality monitoring results. Four specific areas of assessment were addressed:

1) Water quality-related assessment,
2) Source-related assessment,
3) Program-related assessment, and
4) Integrated assessment.

Water Quality Assessment includes the analysis of water quality monitoring results on a watershed and sub-watershed basis. The results inform the Copermittees regarding the type and location of water quality issues within the region, as well as the magnitude of any changes in water quality. The Water Quality Assessment is reported in detail in a stand-alone document –*2005-2010 Long-Term Effectiveness Assessment Water Quality Report (***Attachment 1)**.

Source Assessment includes analysis of program data and information to identify the potential impacts of various pollutant-generating sources in the region. The results of this analysis support: 1) identification of sources that may need attention from the programs; and 2) evaluation of whether programs are focused on the "proper" sources, i.e., those identified as having a high potential to discharge pollutants.

Results from the Water Quality and Source Assessments were combined to develop Threat-to-Water Quality (TTWQ) ratings. The TTWQ methodology prioritizes sources that pose significant threats to water quality in watersheds for pollutants that are threatening the specific watershed. Additionally, the TTWQ process may be used as an investigative tool as described in the report.

Assessment of Program Management Practices addresses the implementation of Copermittee programs for the Permit cycle. This analysis looks at how well existing program approaches are addressing priority constituents and sources, as well as their effectiveness in doing so.

Finally, Integrated Assessment looks at the relationship between the Copermittees' program implementation and water quality monitoring results.

Table ES-1 summarizes the conclusions derived from the various areas of assessment presented throughout the LTEA. Specific recommendations for changes to urban runoff management and monitoring programs are contained in the Copermittees' ROWD.

Table ES-1: Effectiveness Assessments and Evaluations

Assessment / Evaluation	Conclusions
Evaluation of Progress in Developing and Implementing Monitoring Programs	Copermittees are implementing the monitoring program consistent with the Permit requirements.
Assessment of Watershed Health and Identification of Water Quality Issues and Concerns	Wet Weather – In general, wet weather receiving water quality priorities are associated with the following issues: mobilization and migration of sediment during storm events as measured by total suspended solids and turbidity; bacterial indicators as reflected by fecal coliform; and the detection of synthetic pyrethroid pesticides. There are also some differences in the priority of these constituents among watersheds as reflected in different land use distributions and pollutant generating activities in the watershed, physical conditions, and flow characteristics. Dry Weather – In general, the receiving water quality priorities under ambient or dry weather conditions, based on two years of data, indicate a countywide issue with bacteria indicators (largely enterococci and also fecal coliforms), nutrients, and total dissolved solids. The level of priority and the specific nutrients vary among watersheds, which is reflective of varying source contributions and the presence of flows.
Assessment of Changes in Discharge Water Quality (Level 5 Outcomes)	At this time, it is not possible to use statistics to assess changes in water quality in outfall discharges because only two of the five years of program data have been collected. Changes in MS4 discharge quality will be reported in the coming years as this program continues to collect data. The temporal resolution of these data sets will improve as well in the coming years. In the LTEA WQ Report (Attachment 1, Sections 2 through 10) discharge loading characteristics are estimated and ranked for wet weather flows. These will help to establish a baseline for future comparisons of changes in the loads. The current assessment presents observed dry weather flow conditions at the MS4 outfalls; these data may also be used as a basis for comparison with future monitoring.
Assessment of Changes in Receiving Water Quality (Level 6 Outcomes)	The results of the trend analysis for the MLS in the receiving water are presented in **Table 6-4** in Section 6. Changes in ambient conditions will be reported in the coming years as the ambient receiving water program continues to collect data.
Evaluation of the need to address additional pollutant sources not already included in Copermittee programs	The analysis performed resulted in no additional sources recommended for inclusion in the Copermittees' programs at this time.
Evaluation of the degree to which existing source management priorities are properly targeted to, and effective in addressing, water quality issues and concerns	The Copermittees have identified potential sources of the pollutants of concern. Copermittee programs would benefit from determining the relative importance of these sources in order to allow for the most efficient allocation of resources.
Assessment of progress in implementing Copermittee programs and activities	Based upon the data and information provided, the Copermittees collectively met their Permit requirements.
Assessment of the effectiveness of Copermittee activities in addressing priority constituents and sources	At this time, there is still not enough supporting data to make direct correlations between program implementation and measureable changes in pollutant loading, MS4 discharge quality, and receiving water quality. Based on the evidence and analysis provided in Sections 6.3 and 6.4 of the report, the Copermittees have made progress towards reducing pollutant loading, improvements to MS4 discharge quality and receiving waters quality.
Assessment of the relationship of program implementation to changes in pollutant loading, discharge quality, and receiving water quality	At this time, there is still not enough supporting data to make direct correlations between program implementation and measureable changes in pollutant loading, MS4 discharge quality, and receiving water quality. Based on the evidence and analysis provided in Sections 6.3 and 6.4 of the report, the Copermittees have made progress towards reducing pollutant loading, improvements to MS4 discharge quality and receiving waters quality.

1 Introduction

1.1 Overview

The San Diego Municipal Stormwater Permit NPDES Order No. R9-2007-0001 (Permit) requires that the Copermittees develop and implement Jurisdictional Urban Runoff Management Programs (JURMPs), Watershed Urban Runoff Management Programs (WURMPs) and a Regional Urban Runoff Management Program (RURMP) and provide annual reports for each.

As a part of these programs, the Copermittees are required to perform a Long-Term Effectiveness Assessment (LTEA) to evaluate the impact of program implementation. The purpose of this LTEA is to provide an evaluation and assessment of Copermittee programs over the Permit cycle. Per the Permit, the LTEA serves as a basis for the Copermittees' Report of Waste Discharge. Specific recommendations for change are contained in the ROWD.

In October 2003, the Copermittees took a significant step toward the development of the methods and approaches needed to conduct long-term effectiveness assessments through the completion of "A Framework for Assessing the Effectiveness of Jurisdictional Urban Runoff Management Programs." This framework describes an iterative process of effectiveness assessment involving program planning, program implementation, and effectiveness assessment and establishes a division of the effectiveness component into short-term, or annual, and long-term components. **Figure 1-1** illustrates these three areas of activity and shows their inter-relationship (County of San Diego, 2003).

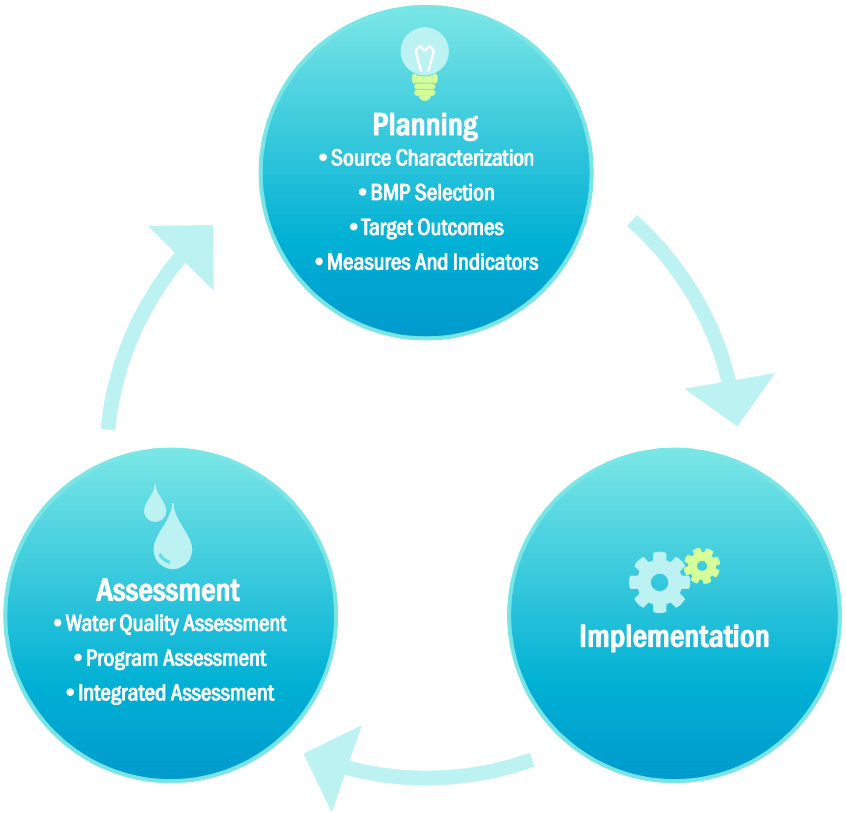

Figure 1-1: Iterative Process for Assessing Jurisdictional Programs (Revised from County of San Diego, October 2003)

In 2005 the Copermittees developed the Baseline Long-Term Effectiveness Assessment (BLTEA) as a first iteration of the long-term portion of the Copermittees' assessment strategy. Its primary purpose was to provide a baseline evaluation of existing water quality and program data, and to establish methods and approaches that could be augmented and refined for use in conducting future assessments.

This report presents the Copermittee' second Long-Term Effectiveness Assessment (LTEA) effort. Similar to the BLTEA, this LTEA continues to further the assessment of the Copermittees JURMPs, WURMPs, and RURMP. As a result of the LTEA, refinement to the prioritization and investigative tools has also progressed. Although, similar principles were used for this assessment, there are some differences from the 2005 BLTEA process. Some of these differences are as follows:

- New water quality assessment methodology and presentation
- Updated source characterizations
- Additional sources evaluated and characterized
- Updated Source Loading Potentials for sources
- Acknowledgement of uncontrollable sources
- TTWQ is now presented as a suggested process with guidelines
- Program Management Practices are evaluated
- Evaluation of the Copermittees' effectiveness of program implementation

This 2011 LTEA consists of the following specific tasks:

- Characterize the water quality conditions of sub-watersheds and watersheds based on available monitoring results
- Characterize sources of pollutants to the region's receiving waters; Provide process and examples of how to develop a Threat to Water Quality (TTWQ) ranking for priority source categories
- Characterize the Program Management Practices (PMPs) that Copermittees implement
- Assess the Copermittees efforts to implement the JURMP, WURMP and RURMP using available data and information

The Copermittees intend to continue collaborating on the development of their LTEAs, and to focus this analysis regionally and by watershed. Future iterations may build on the results of this LTEA through more in-depth evaluations of program implementation and PMP implementation. They will additionally further explore the relationship of program implementation to changes in water quality, a task currently approachable only through very basic and qualitative methods.

Program assessment is addressed through an in-depth review of existing source priorities, PMPs, and water quality assessment. While this analysis is somewhat constrained by existing limitations of data and methodologies, it continues an important process from which future assessments will be further addressed.

The LTEA would ideally evaluate an extended period of program implementation, e.g., five years. However, due to the significant changes in the Municipal Separate Storm Sewer System (MS4) Permit, from Order 2001-01 to Order R9-2007-0001, it was not feasible to perform an assessment of program implementation over a five-year period. This LTEA reflects the Copermittees' efforts to implement the Urban Runoff Management Programs developed in response to the Permit and used as a basis of the assessment, the Annual Reports for Fiscal Years (FY) 2009 and 2010, covering the time periods of July 1, 2008 through June 30, 2010. The FY 2008 Annual Report covering July 1, 2007 through June 30, 2008

covered two permit terms, resulting in different reporting requirements and making an assessment difficult.

1.2 Overview of LTEA Requirements

The Permit has specific requirements for what should be included in the LTEA. Two sections identify LTEA requirements: Section I.5. which references Section I.3.a.(6). Specifically, Section I.5. states:

1) *Each Copermittee shall collaborate with the other Copermittees to develop a Long-Term Effectiveness Assessment (LTEA), which shall build on the results of the Copermittees' August 2005 Baseline LTEA. The LTEA shall be submitted by the Principal Permittee to the Regional Board no later than 210 days in advance of the expiration of this Order.*
2) *The LTEA shall be designed to address each of the objectives listed in section I.3.a.(6) of this Order [see below], and to serve as a basis for the Copermittees' Report of Waste Discharge for the next permit cycle.*
3) *The LTEA shall address outcome levels 1-6, and shall specifically include an evaluation of program implementation to changes in water quality (outcome levels 5 and 6).*
4) *The LTEA shall assess the effectiveness of the Receiving Waters Monitoring Program in meeting its objectives and its ability to answer the five core management questions. This shall include assessment of the frequency of monitoring conducted through the use of power analysis and other pertinent statistical methods. The power analysis shall identify the frequency and intensity of sampling needed to identify a 10% reduction in the concentration of constituents causing the high priority water quality problems within each watershed over the next permit term with 80% confidence.*
5) *The LTEA shall address the jurisdictional, watershed, and regional programs, with an emphasis on watershed assessment.*

Section I.3.a.(6) includes the following objectives:

1) *Assessment of watershed health and identification of water quality issues and concerns.*
2) *Evaluation of the degree to which existing source management priorities are properly targeted to, and effective in addressing, water quality issues and concerns.*
3) *Evaluation of the need to address additional pollutant sources not already included in Copermittee programs.*
4) *Assessment of progress in implementing Copermittee programs and activities.*
5) *Assessment of the effectiveness of Copermittee activities in addressing priority constituents and sources.*
6) *Assessment of changes in discharge and receiving water quality.*
7) *Assessment of the relationship of program implementation to changes in pollutant loading, discharge quality, and receiving water quality.*
8) *Identification of changes necessary to improve Copermittee programs, activities, and effectiveness assessment methods and strategies.*

1.3 Overview of LTEA Approach

Although the primary function of the LTEA is to serve as an assessment of the Copermittees' program effectiveness, the approach can also be used as a tool for program prioritization. The process illustrated below and in more detail throughout the report may be used to prioritize sources and in some cases management actions/decisions. Details of the process are provided in **Section 4**.

The process by which the available data and information were evaluated and how the analysis culminates at the integrated assessment stage is shown in **Figure 1-2**. There are three tracts of analysis that lead to the LTEA assessments. The three tracts are: 1) water quality; 2) sources; and 3) program management practices. The four LTEA assessments that are developed from the analysis are: 1) water quality related assessments; 2) source related assessments; 3) PMP related assessments; and 4) integrated assessments.

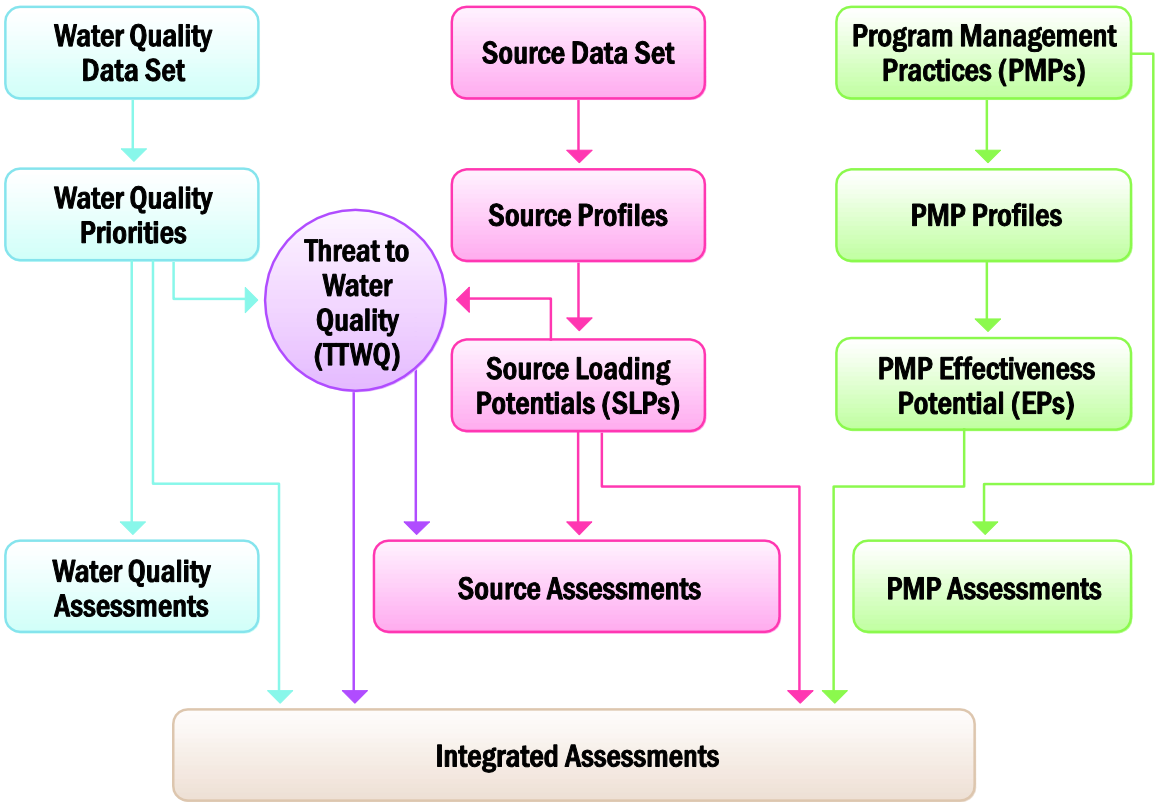

Figure 1-2: LTEA Process

The outcome of the LTEA assessments, (water quality, source, PMP and integrated) are intended to provide data and information into the Copermittees' iterative program process as illustrated in **Figure 1-3** below.

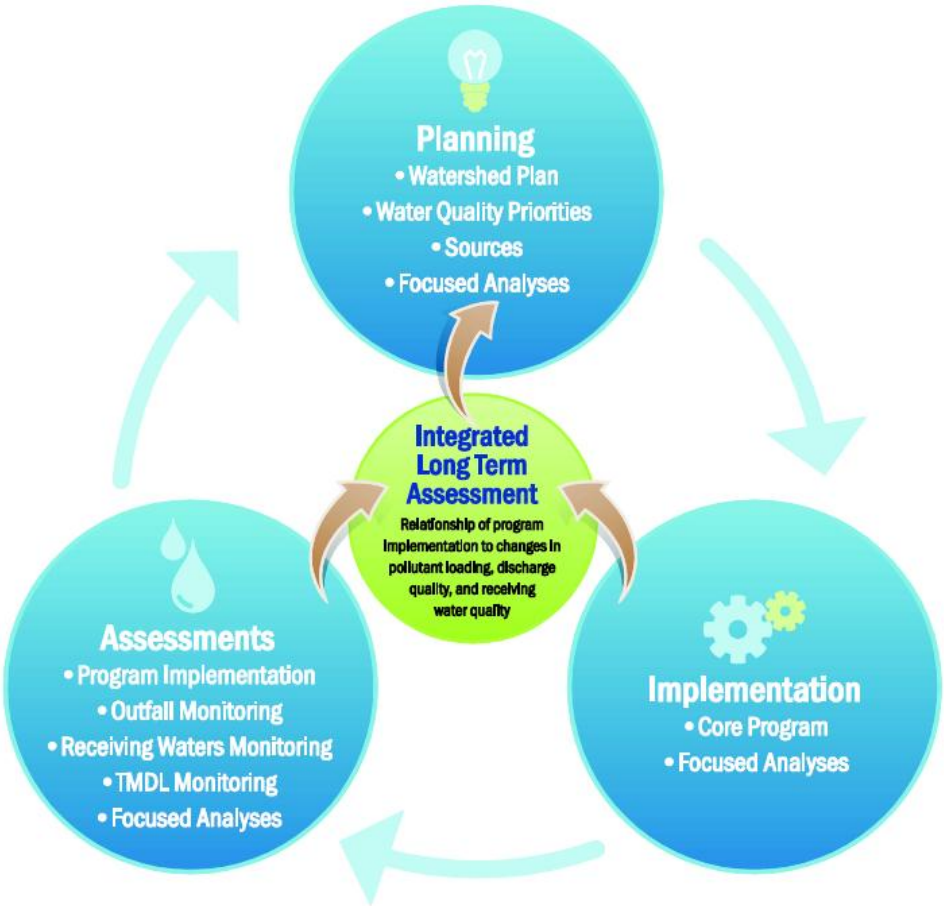

Figure 1-3: Program Iterative Process with Long-Term Effectiveness Assessment

1.4 Report Structure

This report is structured to follow the major steps of the effectiveness assessment process shown in **Figure 1-2**.

Section 2.0 Water Quality Assessment – This section summarizes the water quality priorities for each of nine (9) constituent groups on a hydrologic unit (sub-watershed) level. A separate report was developed specifically for the 2011 LTEA Water Quality Assessment and is included as Attachment 1 to this report.

Section 3.0 Source Characterization – This section prioritizes the source categories. To support this prioritization, source profile fact sheets are included and identified the types of activities/pollutants at the sources and their potential to discharge those pollutants. In this section, the sources are rated as to their potential to discharge particular pollutants.

Section 4.0 Threat to Water Quality – This section describes the process for establishing threat to water quality priority ratings. This process incorporates the Water Quality Assessment of Section 2 and the potential to discharge ratings from the Source Profiles found in Section 3. The concept is to develop a list of priority sources based upon their potential to discharge pollutants in a watershed.

Section 5.0 PMP Characterization – This section describes the various types of Program Management Practices (PMPs) available to address different sources and pollutant types. PMPs are practices and activities that the Copermittees implement or take action with to address water quality issues.

Section 6.0 Program Effectiveness Assessment – Furthering the efforts of the 2005 BLTEA, this section provides an assessment of various program elements using data and information reported in FY 2009 and 2010 Annual Reports and Focused Analyses.

2 Urban Runoff and Receiving Water Assessment

2.1 Section Overview

The Copermittees initiated the LTEA Water Quality Assessment (WQA) as a separate but parallel process to the LTEA development. The complete LTEA WQA is included in this document as Attachment 1. This section summarizes portions of the WQA and discusses the assessment of the water quality data and the required power analysis. This assessment is also further discussed in Section 6.2 of this document.

2.2 Water Quality Assessment

Data Used for Assessment

The specific data sets used for the LTEA Water Quality Assessment includes the core monitoring, urban runoff (MS4 outfall) and regional monitoring elements and are summarized in **Table 2-1**.

Table 2-1: Monitoring Activities and Data Used in the 2005-2010 Long-Term Effectiveness Assessment

Monitoring Program	Monitoring Season				
	'05-'06	'06-'07	'07-'08	'08-'09	'09-'10
Mass loading station monitoring	✓	✓	✓	✓	✓
Temporary watershed assessment station monitoring			✓	✓	✓
Bioassessment monitoring and follow-up analyses and actions (TIEs)	✓	✓	✓	✓	✓
Ambient bay and lagoon monitoring	✓			✓	✓
Coastal storm drain monitoring*	✓	✓	✓	✓	✓
Pyrethroids monitoring			✓	✓	✓
MS4 outfall monitoring 1. Targeted Wet 2. Random Wet 3. Random Dry				✓	✓
Source identification monitoring				✓	✓
Dry weather screening and analytical monitoring	✓	✓	✓	✓	✓
Bight '08 Monitoring Program				✓	
Southern California Regional Watershed Monitoring Coalition				✓	✓
TMDL monitoring for Order No. 2004-0277 (Chollas Creek sub watershed)	✓	✓	✓	✓	✓
Regional harbor monitoring				✓	
Monitoring for Investigation Order No. R9-2006-076 (Lagoon investigation)			✓	✓	

*Not included in Long-term Effectiveness Assessment data evaluation

Water Quality Assessment Methodology

The assessment methodology for the LTEA was revised from the previous BLTEA in order to provide program managers with better resolution and focus for the watershed priorities. An in depth discussion of the assessment methodology may be found in Section 3 of the Assessment Methodology (Weston Solutions, 2010).

The current five-year LTEA assessments were analyzed using the following four-categories:

1) Receiving Waters – Wet Weather
2) Receiving Waters – Dry Weather (ambient)
3) MS4 – Wet Weather
4) MS4 – Dry Weather (ambient).

The assessment processes used to evaluate the receiving water, MS4 urban runoff and sediments is outlined on **Figure 2-1** and includes the following steps:

1) Tables of results were compiled for each monitoring program element using the most recent five years of data (2005-2010)
2) Results were compared to relevant benchmarks
3) Constituent frequency of exceedance was calculated. Magnitude of exceedance ratios and graphs were prepared for relevant constituents
4) Based on the Triad Assessment, assessment scores were developed using 2005-2010 data
5) Results were summarized for inclusions in maps and figures. Trend analyses were conducted using all historical data. Report deliverables were prepared as non-proprietary interactive PDF reader files

Further explanations of specific components of the LTEA assessment methodology are highlighted below.

Triad Assessment

For each watershed, all three elements of the "triad" (chemistry, toxicity, and benthic community) were assessed. Chemistry data provided an indication of the pollutant concentration and load during storm events or ambient conditions. Toxicity data provided a direct measure of the ecological health during specific sampling events in the receiving water and provided the ability to determine if water quality conditions were impacting aquatic organisms. The benthic community data collected during stream bioassessment surveys provided a more direct indication of the ecological health throughout the year of the watershed in terms of insect/benthic community abundance and diversity. The benthic community data provided an assessment representative of long-term (yearly) conditions. The LTEA Water Quality Report separately presents results for indicator bacteria, total dissolved solids (TDS), and nutrients. While these constituent groups represent the condition being assessed on site (e.g., how do nutrient conditions relate to excessive algae growth), these types of benchmark exceedances generally are not responsible for water column toxicity and/or benthic community degradation.

Trends Analyses

Trends analyses were conducted on an annual basis using the historical wet weather data from the MLS. These analyses provide an assessment of data on a watershed wide scale. Trends presented in the LTEA are not limited to the 2005-2010 dataset, and use the entire historical data set at the MLS. Further detail on the methodology for trends analyses is provided in the 2009-2010 Receiving Waters and Urban Runoff Monitoring Report, Appendix A (Weston Solutions, 2011).

Power Analysis

Section I.5.d of the Permit requires use of power analysis to "identify the frequency and intensity of sampling needed to identify a 10% reduction in the concentration of constituents causing the high priority water quality problems within each watershed over the next permit term with 80% confidence."

This provision was interpreted to require determination of the number of samples that would be required to detect a 10% reduction in concentrations of priority constituents over the course of a nominal five-year permit cycle, with 80% statistical power. The evaluation was conducted as required, and the results are presented in Attachment 1, Section 11.

In summary, based on an evaluation of the monitoring data collected so far, the sample size (number of samples) necessary to detect a 10-percent reduction of constituent concentrations over a 5-year Permit cycle is between 33 and 3,339 samples (depending on the constituent and watershed combination)..

The large estimated sample sizes are due to the inherent variability of wet weather monitoring data, reflecting the varying sizes and intensities of storms monitored, as well as sampling and analysis variability. Therefore, it is not likely that a 10-percent reduction can be detected over one Permit cycle because of this inherent variability of the data.

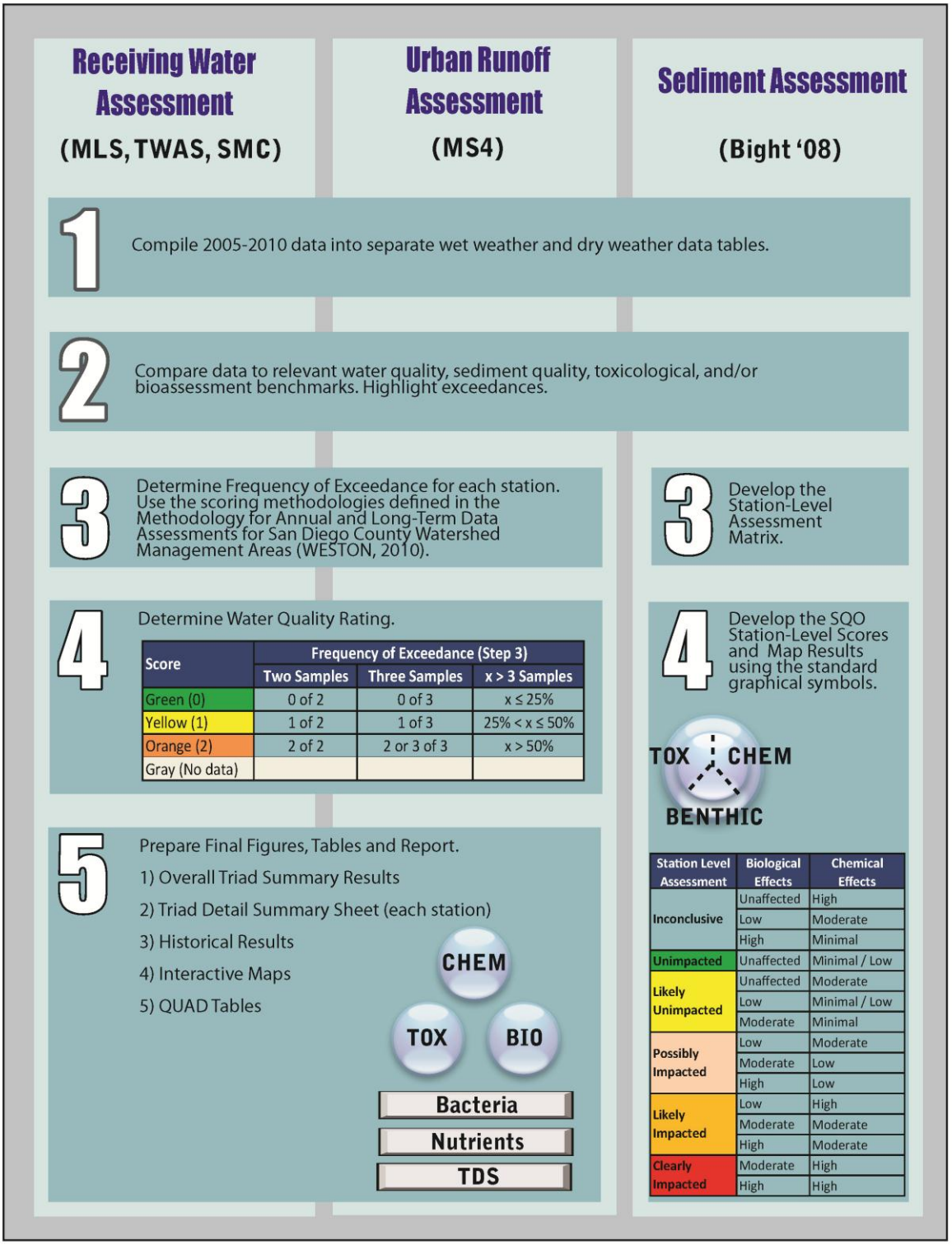

Figure 2-1: Water Quality Assessment Methodology

Interactive Mapping Tools and Spatial Analysis

The results of the LTEA water quality data analyses were displayed graphically by presenting the triad summary results on the drainage area map for each WMA. The maps present results by constituent group (i.e., chemistry, nutrients, bacteria, and total dissolved solids) in pie charts to allow an initial view of overall results at a site for the five-year period according to the scoring. Users are able to interactively view different sets of data within the PDF. Using the interactive mapping tools, the results are spatially analyzed in the MS4 and receiving water under wet weather and dry weather conditions. The interactive mapping tools include land use data and may be updated with current source inventory data in order to further assess potential linkages from dry weather water quality data with land uses and sources. The interactive maps provide a basis for further analysis that is presented in the LTEA Water Quality Report.

Summary of Watershed Management Area Priority Constituents

The priority constituents determined for each WMA through the LTEA water quality analyses are summarized in **Tables 2-2 and 2-3.** The LTEA water quality prioritization methodology is discussed in Attachment 1. **Table 2-2** is a summary of the pollutant priorities by BLTEA pollutant category which is not inclusive of all constituents represented in **Table 2-3**. **Table 2-3** provides overall priorities for the WMAs for wet and dry weather conditions. However, specific differences may occur within individual hydrologic areas and sub-areas. The reader is referred to the specific WMA section for detailed information by drainage area (Attachment 1, Sections 2 through 10). The two tables should be used in tandem to identify high priority pollutant categories and then detailed constituents. The constituents comprising each LTEA pollutant category are listed below:

<u>LTEA Pollutant Categories (Not inclusive of all constituents):</u>

- Metals: Antinomy, Arsenic, Cadmium, Chromium, Copper, Lead, Nickel, Selenium, Zinc
- Oil and Grease: Oil and Grease
- Sediment: Total Suspended Solids (TSS) and Turbidity
- Pesticides: Chlorpyrifos, Diazinon, Malathion, Allethrin, Bifenthrin, Cyfluthrin, Cypermethrin, Danitol, Deltamethrin, Esfenvalerate, Fenvalerate, Fluvalinate, L-Cyhalothrin, Permethrin, Prallethrin
- Nutrients: Dissolved Phosphorous, Total Phosphorous, Total Kjeldahl Nitrogen, Eutrophication, Benthic Algae, Orthosphosphate
- Bacterial Indicators: Enterococcus, Fecal Coliform, Total Coliform
- Dissolved Minerals: Total Dissolved Solids (TDS)

Table 2-2: Watershed Priorities by LTEA Pollutant Categories

WMA	Station	Wet							Dry						
		Metals	Oil and Grease	Sediment	Pesticides	Nutrients	Bacteria/ Pathogens	Dissolved Minerals	Metals	Oil and Grease	Sediment	Pesticides	Nutrients	Bacteria/ Pathogens	Dissolved Minerals
Santa Margarita River	SMR-MLS	-	-	M	-	-	M	-	-	-	-	-	H	-	H
	SMR-MLS-2	-	-	H	H	-	H	-	-	-	-	-	H	-	H
San Luis Rey	SLR-MLS	-	-	M	M	-	H	H	-	-	M	-	H	M	H
	SLR-TWAS-1	-	-	H	H	-	H	H	-	-	-	-	M	H	H
Carlsbad	LA-TWAS-1	-	-	H	M	-	H	-	-	-	-	-	H	M	-
	BVC-TWAS-1	-	-	H	H	-	H	-	-	-	-	-	H	M	H
	AHC-MLS	-	-	H	H	-	H	H	-	-	-	-	H	H	H
	AHC-TWAS-1	-	-	H	H	-	H	M	-	-	-	-	H	M	H
	ESC-MLS	-	-	H	H	-	H	H	-	-	-	-	H	H	H
	ESC-TWAS-1	-	-	H	H	-	H	M	-	-	-	-	H	M	H
San Dieguito Creek	SDC-MLS	-	-	M	M	-	H	H	-	-	H	-	H	M	H
	SDC-TWAS-1	-	-	H	H	-	M	M	-	-	-	-	H	M	H
	SDC-TWAS-2	-	-	H	-	H	H	M	-	-	H	-	H	H	H
Los Peñasquitos Creek	LPC-MLS	-	-	M	M	-	H	H	-	-	-	-	H	H	H
	LPC-TWAS-1	-	-	H	M	-	H	M	-	-	-	-	-	H	H
	LPC-TWAS-2	-	-	H	H	-	H	-	-	-	-	-	H	H	H
Mission Bay / La Jolla	MB-TWAS-1	-	-	H	H	-	H	H	-	-	-	M	M	-	H
	MB-TWAS-2	-	-	H	H	-	H	-	-	-	-	M	H	H	-
	TC-MLS	-	-	H	H	-	H	-	-	-	-	-	H	-	-
San Diego River	SDR-MLS	-	-	H	M	-	H	-	-	-	-	-	H	H	H
	SDR-TWAS-1	-	-	H	H	-	H	M	-	-	-	-	H	H	H
	SDR-TWAS-2	-	-	H	H	-	H	-	-	-	-	-	H	M	H
	SDR-TWAS-3	-	-	H	H	-	H	-	-	-	-	-	M	M	H
San Diego Bay - Pueblo	CC-SD8-1	H	-	H	H	-	H	-	H	M	M	M	H	M	-
San Diego Bay - Sweetwater	SR-MLS	-	-	M	M	-	H	H	-	-	-	-	H	M	H
	SR-TWAS-1	-	-	M	M	-	H	M	-	-	-	-	H	M	H
San Diego Bay - Otay	OR-TWAS-1	M	-	M	H	-	-	M	-	-	-	-	H	-	H
Tijuana River	TJR-MLS	-	-	H	H	H	H	-	-	-	M	-	H	H	-
	TJR-TWAS-1	-	-	-	-	H	M	H	-	-	-	-	-	-	-
	TJR-TWAS-2	-	-	H	-	H	H	-	-	-	-	-	-	-	-

H = High Priority
M = Medium Priority

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Table 2-3: Watershed Priority Constituents Determined by Water Quality Assessment Monitoring Program

WMA	Station	HSA	Priorities	
			Wet	Dry
Santa Margarita River	SMR-MLS*	902.11, 902.12, 902.13, 902.21, 902.22, 902.23, 902.52	*Ceriodaphnia dubia* acute survival, TSS, Turbidity, Fecal Coliform (+)	**Poor IBI, O/E, Total Nitrogen, TDS**
	SMR-MLS-2**	902.22, 902.23, 902.52	**TSS, Turbidity, Bifenthrin, C*eriodaphnia dubia* reproduction, *Hyalella azteca* acute survival, Fecal Coliform**	**Sulfate[1], Total Nitrogen[3], Nitrate as N[2], Total Phosphorus[2], Benthic Algae[1], TDS[3],** Fair IBI[1]
San Luis Rey	SLR-MLS	903.11, 903.12, 903.13, 903.14, 903.15, 903.16, 903.21, 903.22, 903.23	**Fecal Coliform (+), TDS (-)**, Turbidity(+), Bifenthrin	**Poor IBI, O/E, Dissolved Phosphorus, Total Phosphorus, TDS, Chloride[1], Sulfate[1],** Enterococci, Fecal Coliform, Total Nitrogen, Turbidity
	SLR-TWAS-1	903.12, 903.16, 903.21, 903.22, 903.23	**TSS, Turbidity, Bifenthrin, , *Ceriodaphnia dubia* reproduction, Fecal Coliform, TDS**, Chlorpyrifos	**Poor IBI, O/E, Enterococci, TDS, Chloride[1], Sulfate[1],** Total Phosphorus, Total Nitrogen, COD
Carlsbad	LA-TWAS-1	904.1	**TSS, Turbidity, Fecal Coliform,** Bifenthrin	**Poor IBI, O/E, Total Nitrogen, Benthic Algae**, *Ceriodaphnia dubia* reproduction, *Selenastrum* acute, Enterococci[2]
	BVC-TWAS-1	904.21, 904.22	**TSS, Turbidity, Bifenthrin, Fecal Coliform,** Permethrin	**Poor IBI, O/E, Total Nitrogen, Benthic Algae, TDS**, Enterococci
	AHC-MLS	904.31	**TSS (+), Turbidity (+), Bifenthrin, Fecal Coliform, TDS,** Hyalella azteca acute survival,	**Poor IBI, Poor O/E, Enterococci, Fecal Coliform, Nitrate as N[1], Total Phosphorus[1], TDS, Chloride[1], Sulfate[1]**, Total Nitrogen, Benthic Algae[1], *Ceriodaphnia dubia* reproduction, *Selenastrum* acute
	AHC-TWAS-1	904.31	**TSS, Turbidity, Chlorpyrifos, Bifenthrin, Fecal Coliform,** *Hyalella azteca* acute survival, TDS	**Poor IBI, O/E, Dissolved Phosphorus, Nitrate as N[1], TDS, Chloride[1], Sulfate[1],** *Selenastrum* acute, Enterococci , Fecal Coliform, Total Phosphorus, Total Nitrogen, Benthic Algae
	ESC-MLS	904.61, 904.62	**Turbidity, Bifenthrin, Fecal Coliform, TDS**, TSS, Cyfluthrin[4], Cypermethrin[4]	**Very Poor IBI[1], O/E[1], Enterococci, Total Nitrogen, Benthic Algae, TDS, Chloride[1], Sulfate[1],** *Selenastrum* acute, *Ceriodaphnia dubia* reproduction, CRAM[1], Total Phosphorus
	ESC-TWAS-1	904.62	**Turbidity, Bifenthrin, Fecal Coliform**, TSS, Diazinon, TDS	**Poor IBI, O/E, Total Nitrogen, TDS, Chloride[1], Sulfate[1],** COD, CRAM[1], Fecal Coliform, Benthic Algae[1]
San Dieguito Creek	SDC-MLS	905.12	**Fecal Coliform, TDS**, TSS, Turbidity, Bifenthrin, Ceriodaphnia dubia reproduction, Selenastrum acute,	**TSS[1], Poor IBI, O/E, Total Nitrogen, Benthic Algae, TDS, Chloride[1], Sulfate[1],** BOD, *Selenastrum* acute, Enterococci, Fecal Coliform, Total Phosphorus
	SDC-TWAS-1	905.22	**Turbidity, Chlorpyrifos, Bifenthrin,** *Hyalella azteca* acute, TSS, Fecal Coliform, TDS	**Poor IBI, O/E, Total Nitrogen, Benthic Algae, Total Phosphorus, TDS**, *Ceriodaphnia dubia* reproduction, Enterococci, Dissolved Phosphorus
	SDC-TWAS-2	905.32, 905.33, 905.34, 905.35, 905.36, 905.41	**BOD, COD, TSS, Turbidity, Fecal Coliform, Total Phosphorus**, pH, Ammonia as N, Nitrite as N, Surfactants (MBAS), TDS	**BOD, TSS, Turbidity, Enterococci, Total Nitrogen, Total Phosphorus, TDS**, Surfactants (MBAS), Fair IBI
Los Peñasquitos Creek	LPC-MLS	906.1, 906.2	**Fecal Coliform (+), TDS,** Turbidity, Bifenthrin	***Ceriodaphnia dubia* reproduction, Poor IBI, O/E, Enterococci, Total Phosphorus[1], Benthic Algae, TDS, Chloride[1], Sulfate[1],** Total Nitrogen
	LPC-TWAS-1	906.1	**Turbidity, Fecal Coliform**, TSS, Bifenthrin, TDS	**Ceriodaphnia dubia reproduction, Poor IBI, O/E, Enterococci, TDS, Chloride[1], Sulfate[1]**, *Selenastrum* acute
	LPC-TWAS-2	906.2	**TSS, Turbidity, Bifenthrin, Fecal Coliform,** Diazinon, Hyalella azteca acute survival,	**Poor IBI, O/E, Enterococci, Total Phosphorus, Total Nitrogen, TDS,** *Ceriodaphnia dubia* reproduction, Benthic Algae
Mission Bay and La Jolla Shores	MB-TWAS-1	906.4	**Turbidity, Bifenthrin, Fecal Coliform, TDS,** BOD, TSS, Permethrin	***Ceriodaphnia dubia* acute survival, *Ceriodaphnia dubia* chronic survival, *Ceriodaphnia dubia* reproduction, Poor IBI, O/E, TDS, Chloride[1], Sulfate[1]**, Bifenthrin[1], *Selenastrum* acute, CRAM, Total Nitrogen[1], Total Phosphorus[1]
	MB-TWAS-2	906.5	**TSS, Turbidity, Bifenthrin, Fecal Coliform**, BOD, Malathion, Permethrin, *Ceriodaphnia dubia* acute survival, *Ceriodaphnia dubia* chronic survival, *Ceriodaphnia dubia* reproduction	***Selenastrum* acute, *Ceriodaphnia dubia* acute survival, *Ceriodaphnia dubia* reproduction, Poor IBI, O/E, Enterococci, Benthic Algae,** Selenium, *Ceriodaphnia dubia* chronic survival, CRAM, Fecal Coliform
	TC-MLS	906.5	**Turbidity, Bifenthrin, Fecal Coliform**, TSS (-)	***Selenastrum* acute, *Ceriodaphnia dubia* reproduction, Poor IBI, O/E, CRAM, Total Nitrogen[1],** *Ceriodaphnia dubia* chronic survival, Total Phosphorus
San Diego River	SDR-MLS	907.11, 907.12, 907.13, 907.14, 907.15	**Turbidity, Fecal Coliform**, Bifenthrin	**Poor IBI, O/E, Enterococci[2],Dissolved Phosphorus, Total Nitrogen[3], TDS[3], Chloride[1],** CRAM, Fecal coliform[2], Total Phosphorus, Orthophosphate[2]

WMA	Station	HSA	Priorities	
			Wet	Dry
	SDR-TWAS-1	907.11, 907.12, 907.13, 907.14, 907.15	**Turbidity, Bifenthrin, Fecal Coliform**, Surfactants (MBAS), *Ceriodaphnia dubia* reproduction, TDS	**Poor IBI, O/E, Enterococci[2], Total Nitrogen[3], Dissolved Phosphorus, Total Phosphorus, Benthic Algae, TDS[3], Chloride[1],** BOD, CRAM, Fecal Coliform[2], E. Coli[2], Orthophosphate[2]
	SDR-TWAS-2	907.12, 907.13, 907.14, 907.15	**TSS, Turbidity, Bifenthrin, Permethrin, Fecal Coliform**, pH, BOD, *Hyalella azteca* acute	**Poor IBI, O/E, Total Nitrogen, Benthic Algae, Total Phosphorus, TDS, Chloride[1]**, CRAM[1], Enterococci, Fecal coliform[2], E. Coli[2], Orthophosphate[2], Dissolved Phosphorus
	SDR-TWAS-3	907.12, 907.14, 907.14, 907.15	**Turbidity, Bifenthrin, Fecal Coliform**	**Dissolved Oxygen[1], *Selenastrum* acute, Poor IBI, O/E, TDS**, CRAM, Enterococci, Total Nitrogen, Total Phosphorus, Dissolved Phosphorus
San Diego Bay - Pueblo	CC-SD8-1	908.22	**TSS, Turbidity (+), Copper (Dissolved), Bifenthrin, Cyfluthrin[4], Cypermethrin[4], *Hyalella azteca* acute survival (-), Fecal Coliform, Permethrin, Lead (Dissolved), Zinc (Dissolved),** BOD, COD, Surfactants (MBAS), *Ceriodaphnia dubia* reproduction	**Copper (Dissolved), Poor IBI, O/E, Dissolved Phosphorus, Total Phosphorus, Total Nitrogen, Benthic Algae, pH,** Selenium (Total), Turbidity, Surfactants (MBAS), COD, BOD, Ammonia as N, Oil & Grease, *Ceriodaphnia dubia* reproduction, *Ceriodaphnia dubia* acute survival, *Ceriodaphnia dubia* chronic survival, *Hyalella azteca* acute survival, *Selenastrum* acute survival, CRAM, Enterococci, Fecal Coliform
San Diego Bay - Sweetwater	SR-MLS	909.12	**Fecal Coliform, TDS**, Turbidity, Bifenthrin, *Ceriodaphnia dubia* reproduction, *Selenastrum* capricornutum acute	***Ceriodaphnia dubia* reproduction, *Selenastrum* acute, *Ceriodaphnia dubia* acute survival[1], *Ceriodaphnia dubia* chronic survival[1], Poor IBI, O/E, Total Nitrogen[1], TDS, Chloride[1]**, Dissolved Oxygen[1], CRAM, Enterococci, Total Phosphorus, Dissolved Phosphorus
	SR-TWAS-1	909.21, 909.22, 909.23, 909.24, 909.25, 909.26	**Fecal Coliform**, Turbidity, Bifenthrin, *Selenastrum* acute, TDS	***Selenastrum* acute, Poor IBI, O/E, Benthic Algae, TDS**, Enterococci
San Diego Bay - Otay	OR-TWAS-1	910.2	**Bifenthrin**, Cyfluthrin[4], Surfactants (MBAS), TSS, Turbidity, Copper (Dissolved), TDS	***Ceriodaphnia dubia* reproduction, Poor IBI, O/E, Dissolved Phosphorus, Total Phosphorus, TDS**, *Ceriodaphnia dubia* acute survival, *Ceriodaphnia dubia* chronic survival, CRAM, Total Nitrogen
Tijuana River	TJR-MLS	911.11, 911.12, 911.21, 911.23, 911.24, 911.25, 911.82, 911.83, 911.84, 911.85	**BOD, COD, TSS (+), Turbidity (+), Diazinon (-), Bifenthrin, Cypermethrin[4], Permethrin[4], *Ceriodaphnia dubia* acute survival, *Ceriodaphnia dubia* chronic survival, *Ceriodaphnia dubia* reproduction, *Hyalella azteca* acute survival, Fecal Coliform (+), Total phosphorus**, Surfactants (MBAS), Malathion	**Ammonia as N, BOD, Surfactants (MBAS), *Selenastrum* acute, *Ceriodaphnia dubia* reproduction, Very Poor IBI, O/E, Enterococci, Fecal Coliform, Dissolved Phosphorus, Total Phosphorus, Total Nitrogen, Benthic Algae**, COD, Turbidity, *Ceriodaphnia dubia* chronic survival, *Hyalella azteca* acute
	TJR-TWAS-1	911.82, 911.83, 911.84	**Turbidity, TSS, Cyfluthrin[4], Fecal Coliform**, Surfactants (MBAS), Bifenthrin, TDS	**Poor IBI, O/E, Benthic Algae, TDS**, *Selenastrum* acute, Enterococci
	TJR-TWAS-2	911.11, 911.12, 911.21, 911.23, 911.24, 911.25, 911.82, 911.83, 911.84, 911.85	**BOD, TSS, Turbidity, Bifenthrin, Cypermethrin[4], *Ceriodaphnia dubia* acute survival, *Ceriodaphnia dubia* chronic survival, *Ceriodaphnia dubia* reproduction, Fecal Coliform, Total Phosphorus,** Dissolved Phosphorus, Permethrin, Cyfluthrin[4], Oil and Grease, COD, Surfactants (MBAS), *Hyalella azteca* acute	**Ammonia as N, BOD, COD, Surfactants (MBAS), Turbidity, TSS, *Ceriodaphnia dubia* acute survival, *Ceriodaphnia dubia* chronic survival, *Ceriodaphnia dubia* reproduction, Poor IBI, O/E, CRAM, Enterococci, Fecal Coliform, Dissolved Phosphorus, Total Phosphorus, Total Nitrogen, Benthic Algae**, *Selenastrum* acute

High-Priorities are highlighted **BOLD**
Medium-Priorities are not highlighted
* SMR-MLS site discontinued
** No Data for NPDES Dry Weather at SMR-MLS-2
(+) Increasing Trend
(-) Decreasing Trend
[1] Priority Constituent for SMC Program Only
[2] Priority Constituent for Third Party Only (Third Party data is Copermittee Data that is not a part of the Regional Monitoring Program)
[3] Priority Constituent for SMC Program and Third Party Only
[4] Priority Constituent for Synthetic Pyrethroids in Sediment Only

2.3 Monitoring Conclusions

The past five years of monitoring have provided a basis to assess the eight applicable objectives listed in Section I.3.a(6) of the Permit, the Program goals, and the five core management questions that relate to receiving water and urban runoff.

The Program also supports other LTEA objectives (Permit Section I.3.a(6)) related to assessment of specific pollutant sources and management activities. In general, these assessments are conducted at a more focused scale than the current Regional Monitoring Program. The Program has characterized and prioritized water quality issues in receiving waters at the watershed, and in some cases down to the hydrologic area scale, which has resulted in greater focus on these issues in regional, watershed, and jurisdictional management programs. The prioritization of water quality issues facilitates the directing of resources for more effective outcomes by targeting the priority constituents. Greater focus on the MS4 and specific sources may further refine priorities and more clearly respond to the remaining objectives regarding source identification and management action assessments.

One particular insight from the analysis of the receiving water data collected to date is that it will likely be difficult to assess the effectiveness of individual or combined activities using wet weather trend data at the watershed scale due to the variability of the data and the differences in scale of the potential land use and source contributions for most constituents. One exception to this is the observed continuing downward trend of Diazinon concentrations at the MLS in watersheds where this constituent had previously exceeded the benchmark. This situation is due to the USEPA ban of this pesticide, which has resulted in the gradual elimination of its use and detection in storm flows. This “true source control” or essential elimination of this pesticide and ongoing public education has, therefore, been demonstrated to be highly effective. For management actions that address water quality issues through operational source controls, runoff reductions, and other non-structural and structural Best Management Practices (BMPs), additional data are used to assess effectiveness that considers the target audience, the modified behavior, and the most cost-effective method to collect and assess the data.

The Program has met six of the eight Program goals that primarily deal with characterization of water quality and the identification of water quality priorities. The remaining two objectives (goals 5 and 2, see Section 1.2) that the Program has addressed are focused on source identification and measurement and the improvement of the effectiveness of the Copermittees’ urban runoff management programs, respectively. The Program has characterized and prioritized receiving water issues, and while the Program has begun to address source identification and effectiveness assessment, emphasis can now be shifted from receiving waters to the MS4 and sources to better address these objectives. In addition to water quality monitoring assessment, program management assessment includes other methods and data sets for evaluations, including observational data gathering, surveys, modeling, and tracking and reporting of specific management action implementation. These data can also be used as the program evolves to expand the receiving water knowledge base.

Overall, the Program addressed the five core management questions, similar to the LTEA objectives and Permit Regional Monitoring Program goals. The core questions regarding the contribution of the MS4 to those receiving water priorities are being addressed with regard to identification of common priorities through the MS4 targeted and random programs. The MS4 Outfall Program results have shown linkages to several receiving water issues. Generally, the common regional linkages between receiving water quality priorities and MS4 priorities include:

- Wet Weather – Bacteria indicators, predominantly fecal coliform, are common priorities in both MS4 outfall and receiving water storm flows
- Dry Weather – Bacteria indicators (predominantly enterococci), nutrients (predominantly total nitrogen), and TDS are commonly priorities in both MS4 outfall and receiving water dry weather flows

The linkages to receiving water issues can be used as the basis to refine the MS4 program and begin identifying sources of these common priorities. With the progress of the Regional Monitoring Program in addressing the core management questions regarding the health and characterization of the receiving water, there are now opportunities for tradeoffs to focus on source identification.

3 Source Management Priorities

3.1 Section Overview

This Section identifies pollutant sources and pollutant-generating activities and then assesses their potential for discharging pollutants during wet and dry conditions. This information will be used for two purposes: 1) as a factor in prioritizing management decisions and PMP implementation; and, 2) support evaluations and assessment of the Copermittees' programs.

Figure 3-1 below shows the Source Management

3.2 Overview of Priority Sources

The Permit identifies a number of source categories (approximately 63 source categories) subject to programmatic oversight by the Copermittees. In addition, the Permit requires the Copermittees to identify, if appropriate, other high priority sources (see LTEA assessment 3, section 1.2). In the 2005 BLTEA effort, 34 sources were identified for evaluation. In this LTEA some of these sources were removed, or combined, and others were added resulting in a total of 37 source categories assessed in this report. The following efforts were conducted to initially screen the source categories:

1) Compile and summarize existing inventory data for the high priority sources identified in the Permit
2) Review other jurisdictional prioritization efforts (including review of Copermittee JURMPs and Annual Reports) to identify other possible high priority sources not already included in the Permit
3) Reorganize/consolidate list of 63 source categories and select 37 priority source categories for further evaluation
4) Prepare Source Profile Sheets for the 37 selected source categories
5) Compile the Source Profile Sheets to prioritize the sources and Pollutant Generating Activities (PGAs) for their pollutant discharge potential.

The Permit identifies the following source categories as priority sources:

1) Residential areas and activities
2) Development projects
3) Construction sites
4) Municipal facilities and activities
5) Commercial sites and sources
6) Industrial facilities

A complete list of the source categories is provided in **Table 3-1** below.

Table 3-1: Permit Defined Priority Source Categories

Permit Item	Source Category
D.3.c.(1)	***Residential Areas and Activities***
a	Automobile repair, maintenance, washing, and parking
b	Home and garden care activities and product use
c	Disposal of trash, pet waste, green waste, and household hazardous waste
d	Activities Copermittees prioritize
e	Areas tributary to 303(d) impaired waterbody
f	Area adjacent to or directly discharging to a coastal lagoon or ESA
D.1.d.	***Development Projects***
(1)a	Redevelopment projects subject to SUSMPs that create, add, or replace at least 5,000 sq. ft. of impervious area
(2)a	Housing subdivisions of 10 or more dwelling units
(2)b	Commercial development > 1 acre
(2)c	Heavy industrial development > 1 acre
(2)d	Auto repair shops
(2)e	Restaurants
(2)f	Hillside development > 5,000 sq. ft.
(2)g	Development within or directly adjacent to or discharging directly to ESAs
(2)h	Parking lots ≥ 5,000 sq. ft.
(2)i	Streets, roads, highways, and freeways ≥ 5,000 sq. ft.
(2)j	Retail gasoline outlets
D.3.a.(7)(a)	***Municipal Facilities and Activities***
i	Roads, streets, highways, and parking facilities
ii	Flood management projects and flood control devices
iii	Areas and activities tributary to a 303(d) impaired waterbody that generate pollutants for which waterbody is impaired
iii	Areas and activities adjacent or discharging to coastal lagoons or ESAs
Iv[1]	Active or closed municipal landfills
Iv[2]	POTWs (water and wastewater)
Iv[3]	Solid waste transfer facilities
Iv[4]	Land application sites
Iv[5]	Corporate yards (incl. maintenance/storage yards)
iv[6]	Household hazardous waste collection facilities
v	Airfields
vi	Parks and recreational facilities
vii	Special event venues following special events
D.3.a.(7)(a)	***Municipal Facilities and Activities***
viii	Power washing
ix	Municipal areas and activities Copermittees determine significant
D.3.b.(1)	***Commercial Sites and Sources***
(a)i	Auto repair, maintenance, fueling, or cleaning
(a)Ii	Airplane repair, maintenance, fueling, or cleaning
(a)Iii	Boat repair, maintenance, fueling, or cleaning
(a)Iv	Equipment repair, maintenance, fueling, or cleaning
(a)v	Auto or other vehicle body repair and painting
(a)vi	Mobile automobile or vehicle washing
(a)vii	Auto (or other vehicle) parking lots and storage facilities
(a)viii	Retail or wholesale fueling
(a)ix	Pest Control Services
(a)x	Eating or drinking establishments, including food markets
(a)xi	Mobile carpet, drape, or furniture cleaning
(a)xii	Cement mixing or cutting
(a)xiii	Masonry
(a)xiv	Painting and coating
(a)xv	Botanical or zoological gardens and exhibits
(a)xvi	Landscaping
(a)xvii	Nurseries and greenhouses
(a)xviii	Golf courses, parks and other recreational areas/facilities
(a)xix	Cemeteries
(a)xx	Pool and Fountain cleaning
(a)xxi	Marinas
(a)xxii	Portable sanitary services
(a)xxiii	Building material retailers and storage
(a)xxiv	Animal facilities
(a).xxv	Power washing services
D.3.b.(1)	***Industrial Facilities***
(b)i	40 CFR 122.26(b)(14)
(b)ii	Operating and closed landfills
(b)iii	Facilities subject to SARA Title III
(b)iv	Hazardous waste treatment, disposal, storage, and recovery facilities
c	Site/source tributary to a 303(d) listed waterbody where the site/source generate to pollutant for which the waterbody is impaired
c	Sites/source within or directly adjacent to or discharging directly to coastal lagoons or ESAs
d	All other industrial sites/source the Copermittees determine significant

The initial consolidation was based on the 2005 BLTEA effort which conducted the same review of the priority sources in RWQCB Order 2001-01. The current effort meets the Permit requirement which directs the Copermittees to build upon the results of the 2005 BLTEA. However, the Permit identifies additional sources such as power washing and building materials retailers and storage, which the Copermittees have added in this LTEA effort.

2008 JURMPs were reviewed to assess potential sources. Based on the Permit priority sources and this review, the following sources were added to those identified in the 2005 BLTEA effort for evaluation:

- Offices with onsite and outdoor storage facilities (e.g., towing and landscaping businesses)
- Concrete manufacturing
- Stone/Glass manufacturing
- Food manufacturing
- Building materials retailers and storage – New priority source identified in the Permit
- Power washing – New priority source identified in the Permit

The final list of priority sources for evaluation is presented in **Table 3-2** below.

Table 3-2: Priority Sources for which Source Profiles Were Developed

No.	Permit Item	Priority Source Categories/Activities
1	**3.c.(1)(a-f)**	**Residential Areas and Activities**
	1.d.	**Construction projects**
2	(2)(b-c)	Sites > 1 acres
3		Sites < 1 acre
4	(2)(f-g)	Construction Projects - ESA or hillside or sediment TMDL
	1.d.	**New Development and Significant Redevelopment Projects**
5	1)(a)	Development subject to SUSMPs (> 5000 sf impervious area)
	3.a.(7)(a)	**Municipal Facilities and Activities**
6	i	Roads, streets, highways, and parking facilities
7	ix	MS4s – catch basins, drain inlets, conveyance, pump stations
8	iv[5]	Corporate yards (incl. maintenance/storage yards)
9	vi	Park and Recreational facilities - parks, golf courses, cemeteries, entertainment venues.
10	(a)i	Auto mechanical repair, maintenance, fueling, or cleaning
11	(a)iv	Equipment mechanical repair, maintenance, fueling, or cleaning
12	(a)v	Automobile and other vehicle body repair and painting
13	(a)vi	Mobile automobile or vehicle washing
14	(a)xxv	Mobile power washing*
15	(a)vii	Auto parking lots
16	(a)viii	Retail or wholesale fueling
17	(a)ix	Pest Control Services
	3.b.(1)	**Commercial Activities (continued)**
18	(a)x	Eating or drinking establishments
19	(a)xi	Mobile carpet, drape, or furniture cleaning
20	(d)	General contractors for home/commercial improvements
21	(a)xv	Botanical or zoological gardens and nurseries/greenhouses
22	(a)xvi	Mobile Landscaping
23	(a)xx	Pool and Fountain cleaning
24	(a)xxi	Marinas
25	(a)xxiv	Animal kennels, horse stables
26	(d)	Offices with onsite and outdoor storage facilities
27	(a)xxiii	Building materials retailers and storage*
	3.a-b	**Industrial Facilities**
28	3.b.(1)d	Chemical and allied products
29	3.b.(1)d	Fabricated metal
30	3.b.(1)d	Primary metal
31	3.b.(1)d	Recycling, junkyards, scrap metal
32	3.b.(1)d	Airfields
33	3.b.(1) (b)i	Motor Freight
34	3.a.(7)(a)iv[2]	POTWs (water and wastewater)
35	3.b.(1)d	Concrete manufacturing*
36	3.b.(1)d	Stone/Glass manufacturing*
37	3.b.(1)d	Food manufacturing*

*New sources not included in the 2005 BLTEA

In addition to the Permit required sources identified above for evaluation, the Copermittees have identified the following non-controllable sources:

- Air deposition
- Bacteria regrowth
- Groundwater intrusion
- Erosion

Although outside of the purview of MS4 permitting, these sources should be considered by the Copermittees when evaluating their threat to water quality (TTWQ), PMP implementation and management decisions.

Air deposition is a known source of heavy metals in San Diego County. The City of San Diego conducted a three-phase study of air deposition contributions to the storm drain system. Results indicate that deposition is a significant contributor of metals in stormwater and receiving waters in some areas. The primary sources of particulate emissions include transportation related activities, industrial facilities, and general area-wide emissions. The study focused on Chollas Creek where there is a TMDL for dissolved copper, lead, and zinc, with no point sources. Results indicated air deposition accounted for 100%, 29%, and 74% of the annual load of copper, lead, and zinc, respectively in stormwater runoff in Chollas Creek. Emission contributions varied depending on factors that include, but are not limited to, distance to/from the emission sources, wind speed and direction, traffic volume, and humidity. Phase II of the study showed that copper and lead show low solubility in their deposited state, but zinc was relatively soluble (47% to 88% of total in the three events monitored). A recent, related study performed by the Southern California Coastal Water Research Project found that San Diego Bay (at the mouth of Chollas Creek) had the highest copper depositional rate when compared to eight other Southern California coastal embayments, including Los Angeles Harbor (SCCWRP, 2007).

The City of San Diego also conducted a study of bacteria sources in the Chollas Creek Watershed which is 303(d) listed for indicator bacteria in addition to metals. The study focused on the Chollas Creek tidal prism (that area of the watershed influenced by the maximal extent of the tide) during dry weather. The study found that among other sources, bacteria originated from scour ponds where depressions within the streambed can maintain high levels of bacteria. As the tide rises and falls, it maintains a reservoir of brackish water in the scour ponds and carries bacteria from ponds to other areas within the tidal prism. In this way, the scour ponds serve as a point of inoculation for the mouth of Chollas Creek.

Groundwater intrusion has been found to be a source of nutrients in the stormdrain system. Chula Vista conducted a long-term study of groundwater infiltration into its storm drain system and identified several locations where there is a consistent inflow of groundwater. Based on water quality monitoring, it was determined these are not potable water discharges. Similarly, the City of Santee conducted research, investigations and analyses of dry weather monitoring data that resulted in findings of high nitrate-nitrogen in groundwater (City of Santee, 2008). It is believed that nitrogen-rich groundwater is contributing to elevated nitrogen levels observed in the water quality monitoring throughout the region.

Erosion is a naturally occurring process that should be mimicked in the urban environment as it leads to stream bed stabilization and beach sand replenishment. The current effort to develop hydromodication plans and research to characterize stream bed stability address this process and should be considered in the assessment of pollutant loading potential.

3.3 Priority Source and Pollutant Generating Activities

A profile sheet was prepared for each of the 37 priority sources. The Source Profile Sheets contain five different sections:

1) Narrative Description
2) Pollutant Generating Activities and Associated Pollutants
3) Discharge Potential
4) Legal/Regulatory Oversight
5) Source Prevalence and Distribution

Within these sections, regional-, watershed- and sub-watershed-specific information was compiled into seven concise tables to characterize the source and to better evaluate the potential it may have to discharge pollutants into waterways.

3.3.1 Narrative Description

The Narrative Description gives an overview of the source. It defines the activities that constitute the source and lists SIC and NAICS codes that identify the source where applicable.

3.3.2 Pollutant Generating Activities

Activities that have the potential to generate pollutants and the type of pollutants are identified in this section. Associated pollutant types assessed in the 2005 BLTEA effort included heavy metals, organics, oil and grease, sediment, pesticides, nutrients, and bacteria/pathogens. For this effort, gross pollutants were replaced with trash and dissolved minerals were added. Furthermore, the potential of these pollutants being discharged in wet and dry weather conditions is considered. It should be noted that in assessing the potential it was assumed that there were no BMPs in place and rainfall was the mechanism to transport the pollutant (e.g., illegal discharges were not considered). Dry weather potentials are based on the assumption that irrigation and cleaning activities act as transport mechanisms. As with the wet weather assumptions it was assumed that no BMPs were in place.

The following sources were used to compile the Activity Tables:

- Kings County Stormwater Pollution Control Manual (http://dnr.metrokc.gov/wlr/dss/spcm.htm)
- LA County Stormwater Inspection Form
- CASQA Industrial Stormwater BMP Manual (http://www.cabmphandbooks.com/Industrial.asp)
- CASQA BMP Handbooks Portal: Construction
- Orange County Stormwater Inspection Form
- Development Planning for Storm Water Management – A Manual for the Standard Urban Storm Water Mitigation Plan (SUSMP) (http://ladpw.org/wmd/NPDES/SUSMP_MANUAL.pdf)
- Personal communication with Robert Lipetz, Executive Director of the Glass Manufacturing Industry Council

After review of these sources and development of the activity-pollutant tables, best professional judgment was applied to revise some of the entries to include only the most probable activities and associated pollutants.

Table 3-3 and Table 3-4, taken from the automobile and other vehicle repair and painting Source Profile sheet (SPS#10), are included below as an example.

Table 3-3: Summary of Typical Activities and Associated Pollutants during Wet Weather

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	Organics	Oil & Grease	Sediment	Dissolved Minerals	Pesticides	Nutrients	Trash	Bacteria/ Pathogens
Auto Mechanical Repair, Maintenance, Fueling, or Cleaning									
Waste handling and disposal	X	X	X				X	X	
Cleaning facilities	X	X	X	X	X			X	
Cleaning or washing of tools, parts, and equipment	X	X	X	X	X				
Vehicle and equipment cleaning	X	X	X	X	X				
Hazardous waste disposal	X	X	X						
Engine repair/maintenance	X	X	X						
Storage of liquid materials in stationary tanks	X	X	X						
Storage of any liquid materials in portable containers	X	X	X						
Painting, finishing, and coating automobiles	X	X		X					
Vehicle and equipment maintenance and repair	X	X	X					X	
Vehicle and equipment fueling	X	X	X					X	

Table 3-4: Summary of Typical Activities and Associated Pollutants during Dry Weather

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	Organics	Oil & Grease	Sediment	Dissolved Minerals	Pesticides	Nutrients	Trash	Bacteria/ Pathogens
Auto Mechanical Repair, Maintenance, Fueling, or Cleaning									
Cleaning facilities	X	X	X	X	X			X	

3.3.3 Discharge Potential

In this section each source category is evaluated to assess the potential of the source category discharging pollutants. A score of 1 to 5 was assigned based on its discharge potential with 5 being the highest potential and 1 being the lowest. In the 2005 BLTEA a questionnaire was developed and submitted to a limited number of entities[1]. The questionnaire asked, for each of the source category, what information types were available that could assist in assessing the loading potential. The questionnaire respondents were asked to provide a numeric score to each of the information types for each source category.

In addition to the questionnaire information, for this LTEA effort, current monitoring results, Focused Analyses and annual reports were considered in assigning the ranking score. A discharge potential score

[1] The entities included, the County of San Diego; Mikhail Ogawa Engineering which has performed inspection services for the following cities: Del Mar, Vista, San Marcos, and Dana Point; D-Max Engineering who has performed inspections and dry weather monitoring services for the following cities: Carlsbad, Chula Vista, El Cajon, Encinitas, La Mesa, Lemon Grove, National City, Poway, San Diego, San Marcos, Santee, Vista, and the San Diego Unified Port District.

was only provided for wet weather as the original questionnaire only considered wet weather and there was inadequate information/data to rank discharge potential for dry weather.

For each source category, the scores given for each information type were averaged to obtain a source-specific ranking of pollutant discharge potential. The maximum source-specific ranking was then taken as the overall source-specific ranking. These discharge potentials were reviewed and revised as necessary for this report.

Table 3-5, taken from the automobile and other vehicle repair Source Profile sheet (SPS#10), is included below as an example.

Table 3-5: Summary of Available Information Types Related to Assessing Discharge Potential

Auto Mechanical Repair, Maintenance, Fueling or Cleaning		
Information Type	**Information Available**	**Average Ranking***
Dry weather monitoring	Y	4.5
Illicit discharge records	Y	4
Pretreatment compliance records	Y	
Underground storage tank records	Y	
Hazardous waste storage records	Y	
Inspection records	Y	5
Other information? Specify here	Y	4

*Scoring Legend
1 – Low discharge potential
2 – Medium-low discharge potential
3 – Unknown, information does not adequately characterize discharge potential
4 – Medium-high discharge potential
5 – High discharge potential
Overall ranking is the highest "average ranking" received for the various information types. When less than 2 scores were given, due to lack of information, the overall ranking was adjusted to 3 – unknown potential.

Sources added for this LTEA were not included in the original 2005 questionnaires. In lieu of information from the questionnaires, best professional judgment was used to assign a discharge potential for these sources. For construction projects, a ranking of 5 was applied to sub-categories of construction projects based on the questionnaires filled out by the Copermittees in the 2005 LTEA effort for construction sites greater than 1 acre in size. In cases where the permit identified a new source to be included in Copermittee inventories, the source was assigned a discharge potential of 4.

3.3.4 Legal/Regulatory Oversight

This section characterizes existing legal / regulatory oversight (Copermittee programs, Statewide NPDES permits, other permit programs, consent decrees, etc.) that are available for addressing the discharge of pollutants for the source categories. To compile the information for the sections, a template table was created that listed all of the source categories and all of the potential stormwater and non-stormwater related regulatory oversights. A limited number of Copermittees received this table for completion[2] during the 2005 BLTEA effort. Because the initial questionnaire did not address the new source profile sheets developed, as part of the 2011 LTEA, best professional judgment was used to assign presence or absence of regulatory oversight.

[2] The following Copermittees and entity completed the regulatory oversight form: the County of San Diego; the San Diego Unified Port District; Mikhail Ogawa Engineering.

Tables 3-6, taken from the automobile and other vehicle repair Source Profile sheet (SPS#10), is included below as an example.

Table 3-6: Example Summary of the Stormwater-Related and Other Related Regulatory Oversight of Auto Mechanical Repair and Maintenance

Auto Mechanical Repair, Maintenance, Fueling or Cleaning		
Oversight Type	**Regulatory Oversight**	
Stormwater	NPDES Municipal Permit/Local Ordinances	X
	NPDES General Industrial Permit	
	NPDES General Construction Permit	
Other Regulatory Programs	Industrial Pretreatment Program (EPA)	X
	Hazardous Materials/CUPA (County DEH)	X
	CURFFL (County DEH)	
	Local Enforcement Agency – Landfills (County DEH)	
	Air Quality Permits (APCD)	X
	Fire Agencies	
	Pesticide Regulatory Program (County AW&M)	
	Coast Guard	

3.3.5 Source Prevalence and Distribution

In this section the prevalence of each source category was determined. Source prevalence data gathered during the 2005 LTEA effort was used to create inventory tables. The inventory tables provide a list of source prevalence and distribution based on regional, watershed and jurisdictional source inventories. The results of the 2005 regional effort to inventory and geocode the sources are summarized in the first two tables of each Source Profile Sheet. While many of the source categories were effectively included in the inventory process, as noted previously there were some limitations of the inventory used for the Source Profile Sheets. Some of the source types were not included in the inventory process because inventory information was not readily available. Some of the inventories were conducted on only a watershed-basis (not to the sub-watershed level), or a regional-basis. Therefore these sources were not directly comparable with the other sources.

As noted above the 2005 inventory based tables were used for the current LTEA. For planning purposes these tables provide a reasonable starting point since the number of businesses remains relatively constant, although there is likely a reduction in numbers due to the recent slowdown in the economy. The Copermittees are encouraged to standardize their local inventories in a manner that they can be consolidated with geo-spatial information to develop inventories that are current and available at whatever scale is necessary. The Copermittees have completed this standardization process for their inventoried Industrial/Commercial sources.

Table 3-7, taken from the automobile and other vehicle repair Source Profile sheet (SPS#10), is included below as an example.

Table 3-7: Example Summary of Automobile Mechanical Repair, Maintenance, Fueling, or Cleaning Sources within each of San Diego County's sub-watersheds

Watershed Management Area	Hydrologic Unit (HU)	Sources Geo-coded by Sub-watershed Hydrologic Unit									Total Geo-Coded Sources
		90X.10	90X.20	90X.30	90X.40	90X.50	90X.60	90X.70	90X.80	90X.90	
Santa Margarita	902.XX	28	1	0	0	0	0	0	0	0	29
San Luis Rey	903.XX	54	3	0							57
Carlsbad	904.XX	49	94	32	5	110	159				449
San Dieguito	905.XX	13	18	1	33	0					65
Peñasquitos	906.XX	148	53								201
Mission Bay	906.XX			32	57	30					119
San Diego River	907.XX	439	2	8	3						452
San Diego Bay – Pueblo	908.XX	8	319	78							724
San Diego Bay – Sweetwater	909.XX	161	27	2							
San Diego Bay – Otay	910.XX	5	122	2							
Tijuana	911.XX	26	0	1	0	0	1	0	3		31
Total Geo-Coded Sources											**2127**
Total Sources (including non geo-coded)											**2127**

3.4 Source Loading Potential

The next step in the source assessment process is to assign the potential of a source category to contribute a significant loading of pollutants to a receiving water or municipal storm drain. With the information collected and summarized in the Source Profile Sheets (**Appendix A**), each of the 37 sources identified during the initial prioritization process (Section 3.2) could be evaluated for their potential to discharge pollutants into the storm drainage system.

Two sources of information were used to assess the loading potential of a specific source category: the number of pollutant generating activities associated with the source category (Section 3.2) and pollutant discharge potential (Section 3.3.3). A scoring system was established for each source of information and then combined to provide an overall score for loading potential.

3.4.1 Activities

As previously noted, each Source Profile Sheet provides a list of activities commonly associated with each source category. The pollutant(s) associated with each activity is also identified. Using this information the numbers of activities generating a specific pollutant were tabulated for each source category. Scoring was then assigned based on the number of activities, with higher scores reflecting more pollutant generating activities. For scoring purposes, if a source category had no activities associated with a specific pollutant, that pollutant received a score of zero (0). If one to four (1-4) activities were associated with the discharge of a specific pollutant, that pollutant received a score of

one (1). If four or more activities were associated with the discharge of a specific pollutant, that pollutant received a score of two (2).

3.4.2 Field Observations

As noted in Section 3.3.3, a number of entities responded to a questionnaire that assessed the likelihood of a specific source category discharging a pollutant during the 2005 BLTEA effort. This assessment was based on some of the Copermittees' field observations and experience. The compiled information resulted in each source category receiving an initial assessment ranging from one to five (1-5), with one (1) equaling no or an unknown discharge potential, and five (5) equaling a high discharge potential. The assessment was not based on a pollutant specific response but a more generic assessment of whether the source category had the potential to discharge pollutants. The initial assessments were later modified to allow further delineation of the potential, see **Table 3-8**. If the source category received an assessment of zero (0) or one (1), it received a score of zero (0). If the source category received an average assessment of two (2) or three (3), it received a score of three (3). If the source category received an average assessment of four (4), it received a score of six (6). If the source category received an average assessment of five (5), it received a score of nine (9).

3.4.3 Scoring

The scoring process described above was used to determine the overall source loading potential ranging from none to likely. **Table 3-8** summarizes how these rankings were assigned. The scores were summed: for example a discharge potential of zero (0) and pollutant generating activity score of greater than two (2) resulted in a final score of two (2). Finally, qualitative scores of unlikely, likely, etc. were assigned to the potential of the source based on a scoring matrix, shown in **Table 3-9**.

Table 3-8: Final Scoring Matrix Based on Number of Pollutants Generated and Field Observations.

			Number of Pollutant generating activities (See Section 3.3.2)		
			0	1-4	>4
	Initial Assessment	**Score**	**0**	**1**	**2**
Field Observation	0-1	**0**	0	1	2
Discharge potential - 1 = no discharge potential	2-3	**3**	3	4	5
5 = high discharge potential	4	**6**	6	7	8
(see Section 3.3.3)	5	**9**	9	10	11

Note: For each shaded cell, scores from 'Activities' worksheet were added to score from 'Existing Information' worksheet to obtain a final score.

Numeric scores were then converted into qualitative loading potentials of none to likely as shown in **Table 3-9.**

Table 3-9: Final Source Loading Potential Rating Based on Final Scores.

			Number of Pollutant generating activities		
			0	1-4	>4
	Initial Assessment	**Score**	**0**	**1**	**2**
Field Observation	0-1	**0**	N	UK	UK
Discharge potential - 1 = no discharge potential,	2-3	**3**	N	UL	UL
5 = high discharge potential	4	**6**	UL	UL	L
	5	**9**	UL	L	L

Note: Final scores shown in Table 3-9 are converted to obtain a rating of 'N', 'UK', 'UL', or 'L' (N – None; UK – Unknown; UL – Unlikely; L – Likely).

Because discharge potentials were not identified for dry weather activities, source loading potentials were not ranked for dry weather activities.

3.4.4 Results

Once a score for each pollutant in each source category was developed, the final scores were evaluated and revised using best professional judgment to ensure that the final source contribution potentials were appropriate. Final 2011 rankings are slightly different from those developed in the 2005 BLTEA because activities for each source were reevaluated and activities were added, removed, or modified. In some cases, the pollutants associated with an activity were reevaluated. In addition, new pollutant categories for dissolved minerals and trash were added.

The final Source Loading Potential table, presented in **Table 3-10**, designates nine (9) pollutant-specific loading potentials ('N'-none, 'UL'-unlikely, 'UK'-unknown, 'L'-likely) for each of the 37 identified source categories.

3.5 Limitations

The development of the load potential table, although based on a reasonable and logical approach, was limited by the general lack of information used to complete the scoring. Consequently the scoring should be considered preliminary. Attempts were made, however, to utilize the more conservative results (i.e. higher discharge potential) in the final source loading potential determination. Furthermore, as the activities/pollutants table included a subjective identification of potential activities present at each source category, the number of activities utilized in the scoring process is only an estimate based on best professional judgment. Therefore, the final determinations required review and minor revision using best professional judgment to ensure final designations were appropriate and reasonable.

To refine the results of the source assessment the Copermittees may further evaluate field information sources (e.g., dry weather monitoring, inspections, etc.) to provide a more objective evaluation of the potential to discharge pollutants. However, this method requires standardized implementation, data tracking and reporting.

Furthermore, the Source Profile Sheets in Appendix A include source prevalence data from the 2005 BLTEA effort. Based upon need and scale of application, it appears that greater consistency in local Copermittee inventories (inclusion of comparable geo-spatial information, etc.) would facilitate analysis across jurisdictional boundaries. Over time, this would increase the accuracy and utility of tools such as the Source Loading Potentials presented in **Table 3-10.**

Table 3-10: Final Source Loading Potentials

Source Profile #	Activities with Source Loading Potential	Metals	Oil & Grease	Sediment	Pesticides	Nutrients	Bacteria/ Pathogens	Dissolved Minerals	Organics
1	Residential Areas and Activities	L	L	L	L	L	L	L	L
2	Construction Sites > 1 acre	UL	UL	L	UL	UL	UL	L	UL
3	Construction Sites < 1 acre	UL	UL	L	UL	UL	UL	UL	UL
4	Construction Sites: ESA or hillside or sediment TMDL	UL	UL	L	UL	UL	UL	UL	UL
5	Development subject to SUSMPs (> 5,000 sq. ft. impervious area)	UK	UK	UK	UK	UK	UK	UL	UK
6	Roads, streets, highways, and parking facilities	L	L	L	UL	L	L	L	L
7	MS4s - Catch Basins, Drain Inlets, Conveyance, Pump Stations	N	N	L	N	N	UK	UL	N
8	Corporate yards (incl. maintenance/storage yards)	L	L	L	UK	UK	UL	UL	L
9	Parks and Recreational Facilities - parks, golf courses, cemeteries, entertainment venues, etc.	UK	UK	UK	UK	L	UK	UL	UK
10	Auto Mechanical Repair, Maintenance, Fueling, or Cleaning	L	L	UL	UL	UK	UL	L	L
11	Equipment mechanical repair, maintenance, fueling, or cleaning	L	L	UL	UL	UK	UL	UL	L
12	Automobile and Other Vehicle Body Repair and Painting	L	L	UL	UL	UL	UL	L	L
13	Mobile automobile or vehicle washing	L	L	L	UL	UL	UL	UL	L
14	Mobile Power washing*	UK	UK	UK	UK	UK	UK	UK	UK
15	Auto parking lots and storage facilities	L	L	L	UK	UK	UK	UL	L
16	Retail or wholesale fueling	UK	L	UK	N	N	N	N	L
17	Pest Control Services	N	UK	N	L	N	UK	N	UK
18	Eating or drinking establishments	N	L	UL	UK	UK	L	UL	L
19	Mobile carpet, drape, or furniture cleaning	N	UK	UL	N	UK	UL	N	UL
20	General contractors for home/commercial improvements	UL	UL	L	UL	UL	UL	UL	UL
21	Botanical or zoological gardens and nurseries/greenhouses	L	UL	L	L	L	L	UL	UL
22	Mobile Landscaping	N	UL	L	L	L	L	UL	N
23	Pool and Fountain Cleaning	N	N	N	N	UK	N	N	UK
24	Marinas	L	L	N	UK	UK	UK	N	UK
25	Animal Kennels	N	UL	L	UK	L	L	N	L
26	Building Materials Retail and Storage	L	L	L	UL	UL	UL	UL	L
27	Chemical and allied products	UK	UK	UK	UK	UK	UL	N	L
28	Fabricated metal	L	L	UK	UK	UK	UL	UL	L
29	Primary metal	L	UK	UK	UK	UK	UL	N	UK
30	Recycling, Junk Yards, Scrap Metal	L	L	L	UL	UL	UL	L	L
31	Airfields	UK	UK	UK	UK	UK	N	UL	UK
32	Motor Freight	L	L	UK	UK	UK	UK	UL	L
33	POTWs (water and wastewater)	UK	UK	UK	N	UK	L	UL	UK
34	Concrete Manufacturing	L	L	L	UL	UL	UL	UL	L
35	Stone/Glass Manufacturing	L	L	L	UL	UL	UL	UL	L
36	Food Manufacturing	UL	UL	UL	UL	UL	UL	UL	UL

N = None, UK = Unknown, UL = Unlikely, L = Likely

* Power washing activities are not likely to occur during wet weather. To evaluate the source, the dry weather source loading potential is included in this table based on activities that would take place during dry weather

4 Threat to Water Quality

4.1 Section Overview

In Section 2 water quality priorities and associated pollutants were established for the watersheds in the San Diego region, while in Section 3 the sources of these pollutants were identified and the sources potential to discharge the pollutant was assessed. In this section a process that uses the information of Sections 2 and 3 is established to develop a Threat-to-Water-Quality (TTWQ) rating that then can be used to direct and focus the stormwater management program. The purpose of developing TTWQ is to use available information to prioritize sources in selected geographical areas, e.g, watersheds. Each watershed has varying pollutant priorities and sources of pollutants, therefore the TTWQ will vary from watershed to watershed.

For the purposes of this LTEA, *watersheds* are defined as tributary areas that drain towards a common point. Examples of watersheds include, but are not limited to:

- Watershed Management Areas
- Hydrologic Areas
- Hydrologic Sub-Areas
- Smaller Tributary Areas

The results of the process can assist in:

1) Prioritizing sources within watershed areas
2) Assessing if the existing programs implemented in each watershed are focused on the appropriate sources
3) Assisting the development and prioritization of watershed activities and determining locations of appropriate activity implementation
4) Assisting in source identification and investigations based upon downstream water quality results

In the 2005 BLTEA, a process for TTWQ was developed and resulted in source ratings for eight (8) pollutant categories in each of the watershed management areas. Although the process for TTWQ development was sound, it had constraints – primarily the limited factors included in the process. The final inputs into the BLTEA TTWQ process included:

1) Water Quality Ratings – a quantifiable priority of threat, for each pollutant category, to beneficial uses based upon pollutant types found in the analyzed waters
2) Source Loading Potential – a rating, for each pollutant category, of the potential for a source type to discharge pollutants
3) Quantity of Sources – based upon the best available inventory data, the number of facilities in each watershed management area was determined using GIS

As a result of the TTWQ ratings, Copermittees were able to utilize a prioritization process for pollutant-source combinations to assist in guiding program management decisions. However, due to jurisdictional permit constraints, the results primarily benefited Watershed Urban Runoff Management Program activity development and prioritization of commercial/industrial inventories.

Feedback from the Copermittees has influenced the TTWQ process for this Long-Term Effectiveness Assessment effort. Namely, rather than develop actual ratings, this LTEA provides factors to consider and guidelines for including these factors in several examples TTWQ processes. However, the core principle of the TTWQ remains the same: use water quality information in combination with source information to assist in prioritizing sources for Copermittees to apply PMPs.

In addition to the factors identified and used in the BLTEA TTWQ process, additional criteria should be evaluated and considered by Copermittees on a case-by-case basis. The additional considerations that could influence the TTWQ process are grouped by category and follow in no particular order:

Water Quality

1) Existing TMDLs/303(d) listings
2) Robustness of water quality data
3) Number of water quality issues

Sources

1) Sources with multiple priority pollutants
2) Confidence in nexus between pollutants and sources
3) Age of facilities, e.g., outdoor impacts, exposure
4) Relative contribution of the source(s) to the overall watershed area – land use area
5) Transport mechanisms at sources

There are two primary approaches to the TTWQ process: a single-pollutant approach and multi-pollutant approach. Each follows the basic core steps, however, the multi-pollutant approach cycles through the process for each pollutant category and results in prioritizing sources based on multiple pollutants evaluated.

Examples of the TTWQ process are presented in **Appendix B**.

4.2 Establishing Source TTWQ

TTWQ is the result of combining source and water quality information and data that have been developed and analyzed through the processes described in the previous sections. The process for a single-pollutant approach to develop TTWQ is described below. To utilize the multi-pollutant approach, certain steps, as described below, would be cycled through for each pollutant type. Each of the steps in the process is described below and includes applicable guidelines.

Single-Pollutant Approach Description

Several parameters should be evaluated and selected as a part of the TTWQ process. These include selection of:

1) Scale
2) Urban Runoff Flow Conditions
3) Pollutants
4) Sources
5) Source Quantities

Each parameter has considerations that require evaluation by the parties involved in the TTWQ process. Some recommended considerations for the parameters are provided in the green boxes below.

Scale

The first parameter to establish for the TTWQ process is the determination of which scale the TTWQ priorities will be developed. This criterion has a direct effect on the Water Quality and Source factors in the process. Several considerations can influence the scale for analysis, including pollutants, source(s) and PMPs used to address the pollutants and sources. It is assumed that the Copermittees utilizing the TTWQ process will utilize a methodology for developing the scale at which to initiate the TTWQ process.

This method may involve an iterative process of identifying pollutant(s) and/or source(s) that are common throughout the region/watershed that can be feasibly be addressed at those scales. The outcome of the method would be a selection for what scale is used in the TTWQ process.

There are five scales that can be used in the TTWQ process: (1) regional; (2) hydrologic area; (3) hydrologic subarea; (4) other tributary area; and (5) jurisdictional. Based on the TTWQ application (i.e., what the results will be used for) proposed by the Copermittee(s) involved with the process, one of these scales should be selected for the process.

Urban Runoff Flow Conditions

The next parameter is the condition of runoff: wet (e.g., precipitation generated flow) or dry (e.g., irrigation generated discharges, illegal discharges and/or groundwater flow). This criterion also has a direct effect on both the Water Quality and Source factors in the process.

Some considerations the Copermittee(s) should evaluate are as follows:

1) Dry weather flows are generally associated with illicit discharges and illegal connections as well as groundwater intrusion/seepage and permitted discharges
2) Wet weather flows are associated with the accumulation of pollutants on surfaces (grounds, roads, sidewalks, rooftops, etc.) and background loads from undeveloped areas

Pollutant(s)

Selection of the pollutant(s) to focus on is influenced by several key considerations. The primary one is the considering the priorities identified by the results of the LTEA Water Quality Assessment (WQA) – see Section 2.0 and Attachment 1. The LTEA Water Quality priorities are based on water quality data that has been collected and analyzed in a manner that identifies both issues and trends. These priorities were developed for both wet and dry weather conditions and also for both receiving waters and some MS4 outfalls. Having the ability to isolate conditions (wet/dry and receiving water/MS4) allows the development of TTWQ for various scenarios. Some examples of the various scenarios are presented in **Appendix B**.

Where feasible, Copermittees should consider a multi-pollutant approach to the analysis of wet-weather TTWQ because of the inherent commingling of sources and pollutants that occurs during wet weather events as opposed to single point source discharges that are inclined to involve single-pollutant impacts.

In selecting the pollutant(s) to evaluate for the TTWQ, some additional considerations the Copermittee(s) could evaluate are as follows:

1) TMDL(s) existing in the watershed – in general TMDLs would be an important (high ranking) prioritization considerations
2) Non-TMDL 303(d) listings – for 303(d) listings where a TMDL has not been established, the Copermittee(s) may be able to stave off future TMDL development if the pollutant is adequately addressed and removed from the 303(d) list
3) Regulatory Revisions ("offramps") if Applicable for Pollutant, e.g., delisting from 303(d) list, etc.
4) Feasibility in Addressing Pollutant(s), e.g., TDS is a constituent, attributed to uncontrolled groundwater sources and imported water, determined to be relatively infeasible to address from an MS4 program perspective
5) Special studies information regarding pollutants may be considered when selecting pollutant(s)

Sources

After the pollutant(s) have been selected, the Copermittee(s) should select the source(s) they want to evaluate for TTWQ within the area of focus from the list of identified sources likely to be contributing to the water quality priorities. The source factor considers the Source Loading Potentials, for both wet and dry weather conditions that were established using pollutant generating activities and pollutant types found at the source categories. More discussion of the SLPs is found in Section 3.0 of this report.

In selecting the source(s) to evaluate for the TTWQ, some additional considerations the Copermittee(s) could evaluate are as follows:

1) Land use (quantity and activity) should be included and the following considered:
    a. Wet weather TTWQ processes should include an evaluation of the land use areas in the area of focus
    b. Need a surrogate value for residential and open space land areas to compare to inventoried sources
2) Special studies information regarding sources in the focus area
3) Potential sources that are not easily quantifiable including: bacterial regrowth in MS4 systems; erosion in open space areas; accelerated erosion in creeks (hydromodification); and aerial deposition

Source Quantities

Based upon the scale selected, the Copermittees should use the most up to date inventory information available to develop quantities of source categories within their focus area. One factor not well explored in the BLTEA was the quantity of sources that are not easily quantifiable, e.g., residential sources. The Copermittees will need to evaluate methods of assigning quantifiable values to equate to conventional source quantities in the focus areas.

Combining Data

Once the above parameters have been decided upon, and quantities determined, the sources should be tabulated with the appropriate WQ priorities, Source Loading Potentials (SLPs) and quantities included. Sorting of the sources based on SLPs and quantities will provide the highest TTWQ sources in the focus area. The additional considerations identified above (green boxes) should be evaluated for inclusion in this final prioritization process.

The steps for developing TTWQ are listed below and examples of the TTWQ are presented in **Appendix B**.

Steps for Single Pollutant Approach to TTWQ

1) Determine Scale to Develop Threat to Water Quality
    a. Regional
    b. Hydrologic Area
    c. Hydrologic Subarea
    d. Tributary Area
    e. Jurisdictional
2) Determine Wet or Dry Weather Conditions
3) Determine Water Quality Issues (Pollutant(s)) to Evaluate
    a. LTEA Water Quality Priorities (Receiving Water and MS4)
    b. TMDLs
    c. 303(d)

4) Associate Sources[3] to Pollutant
   a. Source SLPs
   b. PGA Associations to Pollutants
5) Incorporate Source Quantities
6) Incorporate Other Criteria as Desired
7) Develop Priority Ranking of Sources

A multi-pollutant approach to TTWQ follows:
1) Perform Steps 1 and 2 above
2) Repeat steps 3-6 above for each pollutant, each time identifying the priority ranking of sources for each pollutant

Evaluate priority rankings of sources for all pollutants, identifying the most prevalent sources that have high TTWQ for most pollutants. An example of the multi-pollutant TTWQ process is provided in **Appendix B**.

4.3 TTWQ as a Tool

In addition to using the TTWQ process for assessment of whether the Copermittees stormwater programs are focused on the proper sources and to prioritize the sources for program implementation, the TTWQ can also be used as an upstream investigative tool. If enough information exists, the Copermittee can use the process to identify potential sources of water quality issues.

The general process for using TTWQ as an investigative tool is described below.
1) Select a monitoring location which establishes the tributary area of focus as well as the group of potential pollutants to focus on
2) Select a water quality pollutant to focus on for the process. It is most likely that this selection will be based on water quality data collected through a monitoring program or discharge identification sampling
3) Using the SLPs table (**Table 3-10** in **Section 3**) identify the sources that have a Likely or Unknown potential to discharge the pollutant of focus
4) Identify the number of known sources from inventory information for the area that is tributary to the monitoring location selected
5) Sorting tabulated source data based on SLP and source quantities results in a list of upstream potential source types for the selected pollutant
6) Utilize detailed source inventory information to perform further site specific inspections or other investigations at the potential pollutant generating sources

An example of this application of the TTWQ process is presented in **Appendix B**.

4.4 Limitations

It is important to understand that the results of the TTWQ process are based on best available information. As described in previous sections, SLPs, identification of sources, and water quality assessments were all derived from various sources of information. Because the TTWQ rankings are a result of combining all of these various sources of information, the TTWQ rankings have an inherent qualification that they are estimates of the threat-to-water-quality from particular sources. Other sources may exist that contribute significant amounts of pollutants to the receiving waters. In addition,

[3] May include land use as a source

there may be other pollutant types that are not analyzed as a part of this process that may be impacting the beneficial uses of the receiving waters.

5 Program Management Practices

5.1 Overview

This section characterizes various types of Program Management Practices (PMPs) and associates them to sources and pollutant types. PMPs are practices and activities that Copermittees and their target audiences implement or take action with to address water quality issues. They include program facilitation activities, BMPs, and other management actions.

> Program Management Practices (PMPs) are activities and BMPs that Copermittees and target audiences implement to address urban runoff pollutants, pollutant generating activities and sources.

PMPs are the counter to pollutant-generating activities (PGAs) and have potential for reducing pollutant loading from PGAs and associated sources. By identifying and associating PMPs with specific source types, the Copermittees can demonstrate connections to effectiveness of their programs. Furthermore, the characterizations may assist Copermittees in prioritizing their management actions for addressing specific sources.

The PMPs, their profiles and effectiveness potentials as presented in this LTEA are meant to be the basis for further refinement by collecting additional data through program implementation and Focused Analyses. It is envisioned that at some point in the future, the information included in the effectiveness potential discussions could be supportive of effectiveness potential ratings for each PMP by which they could be better prioritized for management decisions.

> For the purposes of this LTEA, *Focused Analyses* are defined as those activities which are undertaken to inform Copermittees with data by which to make management decisions. Examples of *Focused Analyses* include, but are not limited to:
> - **WURMP Activities**
> - **Pilot Studies**
> - **Literature Reviews**
> - **Source Characterizations**
> - **Source ID Studies**
> - **Special Investigations**
> - **BMP/PMP Evaluations**
> - **Targeted Monitoring Studies**

Identified PMPs that Copermittees and target audiences implement to address pollutants, PGAs and sources are presented in **Table 5-1** on the following page.

5.2 PMP Profiles

PMP profiles have been developed for PMPs and are included as **Appendix C.** Each PMP profile includes a discussion of the following topics:

- Narrative description of the PMP
- Associated Sources
- Associated Pollutants (from pollutant-generating activities at sources)
- Discussion of PMP Effectiveness Potential including applicable Level Outcomes (Levels 2-4)

The PMP profiles were developed using various sources of information including California Stormwater Quality Association (CASQA) documentation, Focused Analyses, program review, and professional experience.

Table 5-1: Program Management Practices (PMPs)

	Program Management Practices	Target Source						Target Pollutants							Target Audiences							Type			Targeted Outcomes		
		Municipal Fixed Facilities	Industrial and Commercial Facilities	Construction Sites	Residential	Roads, Streets, Highways and Parking Facilities	MS4	Bacteria/Pathogens	Trash	Heavy Metals	Nutrients	Oil and Grease	Sediment	Pesticides	Municipal Staff	Construction	Residential	General Public	Commercial Owners	Industrial Owners	Land Development	Administrative (Level 1a)	Facilitation (Level 1b)	Data Gathering (Level 1c)	Knowledge and Awareness (Level 2)	Behavior (Level 3)	Source Reductions (Level 4)
1	Administrative BMPs[1]	•	•	•	•	•	•								•							•					
2	Activity BMPs[2]	•	•	•	•			•	•	•	•	•	•	•		•	•		•	•	•					•	•
3	MS4 Inspections/ Cleaning						•	•	•	•	•	•	•	•	•												•
4	Street Sweeping					•		•	•	•		•	•		•												•
5	Structural BMPs	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•	•					•	•
6	Education and Outreach	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•
7	Incentives	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•				•	•
8	Employee Training	•				•	•	•	•	•	•	•	•	•	•								•	•	•	•	
9	Inspections	•	•	•		•	•	•	•	•	•	•	•	•	•	•			•	•	•			•	•	•	•
10	Investigations	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•	•			•			•
11	Enforcement (correcting non-compliance)	•	•	•	•			•	•	•	•	•	•	•	•	•	•		•	•	•		•			•	•
12	Regulatory Revisions	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•					
13	True Source Control	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•				•

[1] Examples of Administrative BMPs include: Plan development, program standardization, maintaining and prioritizing inventories, updating education materials, etc.
[2] Activity BMPs are those related to target audience implementation as described in the 2005 BLTEA: Cover, Contain and Control BMPs

6 Effectiveness Assessment of Programs

6.1 Section Overview

This Section provides various program effectiveness assessments for the Permit-driven Copermittee programs. The effectiveness of the monitoring program is included as well as the Copermittees implementation of jurisdictional, watershed and regional programs. The assessment considers the three levels of implementation, regional, watershed and jurisdictional, as well as the Outcome Levels 1-6. **Specific assessments and evaluations are identified in Figure 6-1 below, and in each section below in green text.**

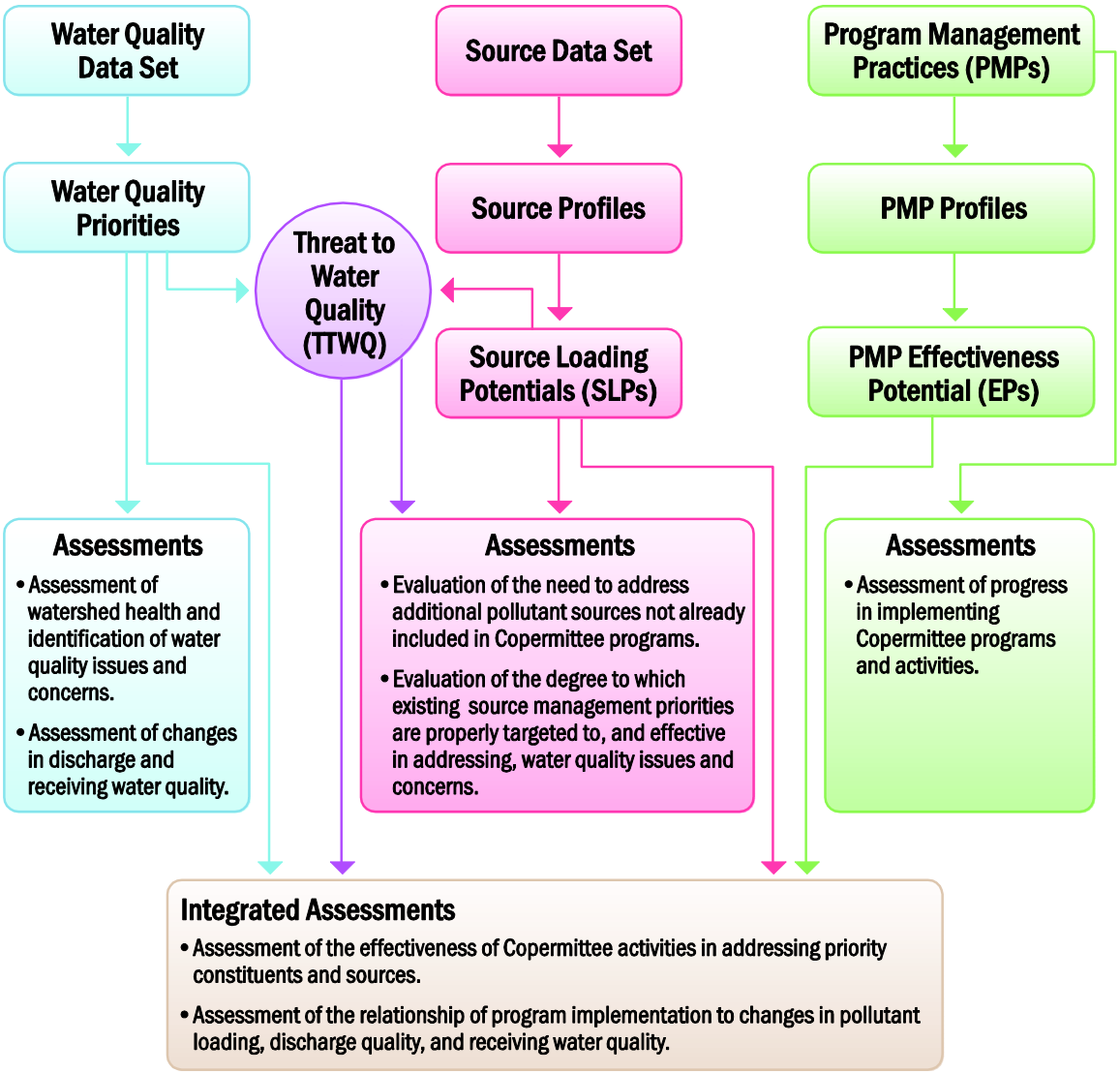

Figure 6-1: LTEA Process – Water Quality Assessment

6.2 Water Quality Effectiveness Assessment

Figure 6-2 shows the Water Quality Assessment portion of the larger LTEA process. The water quality analysis tract of the LTEA process uses water quality data sets collected by the Copermittees and water quality priorities that have been identified by established criteria. The data and information from the

analysis was used to derive the LTEA water quality assessments as illustrated in the figure and described in the narrative below.

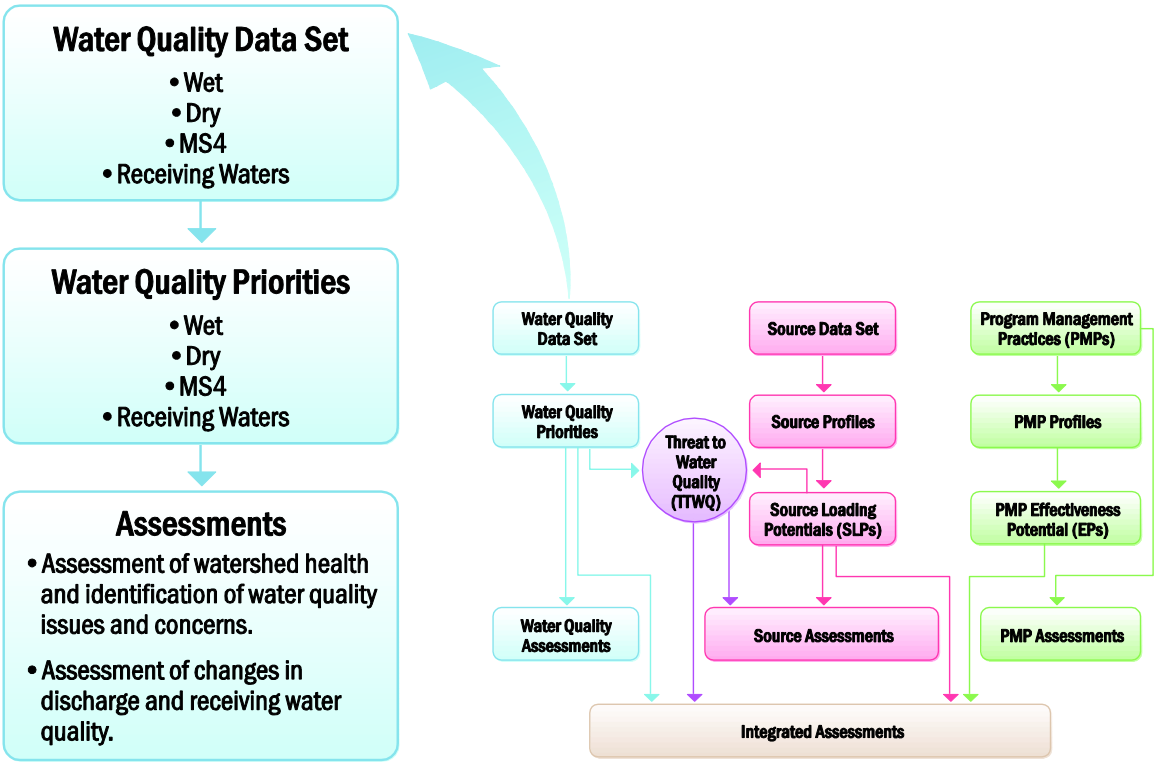

Figure 6-2: LTEA Process – Water Quality Assessment

6.2.1 Monitoring Program Implementation

Evaluation of Progress in Developing and Implementing Monitoring Programs

Regional Monitoring Program

The Permit describes monitoring requirements for implementation by the Copermittees, and this section assesses the Copermittees' implementation of the Regional Monitoring Program (Program).

The Monitoring Program implemented under Order No. R9-2007-0001 is designed to provide the data, analysis, and tools needed to address the program goals and core management questions listed in the Permit. The goals and management questions which the Copermittees have sought to address during the 2007-2012 permit cycle are listed in **Table 6-1**. The following discussion includes a description of the structure of the current Monitoring Program, which includes four key elements.

Table 6-1: Regional Monitoring Program Goals and Five Core Management Questions

Monitoring Program Goals (Permit Section IA)	Core Management Questions (Permit Section IA)
• Assess compliance with the Permit • Measure and improve the effectiveness of the Copermittees' urban runoff management programs • Assess the chemical, physical and biological impacts to receiving waters resulting from urban runoff discharges • Characterize urban runoff discharges • Identify sources of specific pollutants • Prioritize drainage and sub-drainage areas that need management actions • Detect and eliminate illegal connections and illicit discharges (ICID) to the municipal separate stormwater system (MS4) • Assess the overall health of receiving waters	1. Are conditions in receiving waters protective, or likely to be protective, of beneficial uses? 2. What is the extent and magnitude of the current or potential receiving water problems? 3. What is the relative urban runoff contribution to the receiving water problem(s)? 4. What are the sources of urban runoff that contribute to receiving water problem(s)? 5. Are conditions in receiving waters getting better or worse?

The structure of the current Monitoring Program includes the following four key program elements.

Regional Monitoring Programs – These programs provide long-term baseline datasets, encompass a large spatial area (e.g., the San Diego Region and the entire Southern California bight), and look at many elements potentially impacted by stormwater runoff. This type of monitoring takes a long-term view of the ultimate receiving waters; the coastal bays, the lagoons, and the ocean. Regional monitoring is designed to answer questions concerning the ecological health of a large geographic region and encompass numerous components, including but not limited to water and sediment quality, fish, benthos, and birds. The Southern California Coastal Waters Research Project (SCCWRP) Bight Monitoring Program, conducted every five years, and the new Stormwater Monitoring Coalition (SMC) Watershed Monitoring Program are examples of regional monitoring. The Copermittees participated in the Bight '08 Monitoring Program, which was initiated in July 2008. The Copermittees also participated in the SMC Spring 2009 and 2010 Bioassessment and Water Quality Monitoring Surveys. Regional monitoring programs are used to answer management questions 1, 2, and 5 and partially answer questions 3 and 4.

Core Receiving Water Monitoring – Core monitoring is designed to track compliance with regulatory requirements or limits, or to track water quality trends over time. Core monitoring programs typically involve routine sampling at fixed stations located at the lowest, non-tidally influenced point in the watershed. Individual monitoring components are designed to evaluate long-term changes in water quality and mass loading to the receiving waterbody. Assessing concentrations of chemical constituents, toxicity to test organisms and changes to benthic assemblages provides indications of long-term trends and the effects of chemical constituent concentrations within watersheds. The wet and dry weather sampling at the Mass Loading Stations (MLS) located at the base of the watershed are the foundation of the core monitoring program.

In order to provide more spatial information in a cost-effective manner, and without sacrificing the ability to detect trends at the MLS over time, the Copermittees developed a rotating core monitoring program. The core monitoring at the MLS was performed on a rotating schedule in the north and south portions of San Diego County on an annual basis. The exception was during the 2008–2009 monitoring season, which occurred during Bight '08. This rotating program also included increasing the number of monitoring stations in each watershed management area (WMA) by adding temporary watershed assessment stations (TWAS). The TWAS are located upstream of the historical MLS, or in previously

unmonitored hydrologic areas (HAs) where data were needed and allowed for better spatial coverage of each watershed. The TWAS are temporary monitoring stations and therefore are not used for trend analysis, but rather to identify similar or different water quality conditions further up in the watershed compared to the MLS. The core monitoring at the MLS and TWAS locations for each Permit monitoring year is presented in **Figures 6-3 through 6-5**. The TWAS locations during the last two Permit years (i.e., 2010–2011 and 2011–2012) are subject to change based on the findings from each monitoring year. Core monitoring at the MLS and the TWAS monitoring are used to answer management questions 1, 2, and 5.

Urban Runoff (MS4) Monitoring – For the 2007-2008 monitoring season, the Copermittees collaboratively developed the MS4 Outfall Monitoring Program. The purpose of this program element is to characterize pollutant discharges from the MS4 outfalls in each watershed during wet and dry weather as required by Section II.B.1 of the Permit. The program uses a random sample approach for a county-wide evaluation of the MS4 outfalls and a targeted approach at the watershed level. The Regional Monitoring Program conducts the wet and dry random sampling element, as well as the wet targeted element, and the dry targeted sampling is performed by the jurisdictions. The MS4 outfall monitoring is used to answer core questions 3 and 4.

Targeted Monitoring Studies – Targeted monitoring studies supplement both the core monitoring and the regional monitoring. Targeted monitoring studies are focused evaluations designed to answer specific questions. These are typically short-term efforts intended to answer specific questions that may be raised during assessment of core monitoring results. Some examples of targeted monitoring studies include evaluation of the link between water quality criteria exceedances in storm water and atmospheric deposition, conducting molecular/genetic host tracking for bacterial source identification in a watershed, evaluating the effects of bacterial re-growth, and focused monitoring studies used for the development of TMDLs for SWRCB Section 303(d) listed impaired waterbodies. The Copermittees conducted regional source investigation studies during this Permit period focusing on selected residential land uses. Targeted monitoring studies are primarily used to answer management questions 3 and 4 and can partially answer questions 1, 2, and 5.

The current Monitoring Program is summarized in **Table 6-2**. The table also includes the relevant Permit sections and core management questions associated with each monitoring effort. Further detail on each of the program elements listed in **Table 6-2** is provided in the most recent 2009-2010 Regional Monitoring Annual Report Section 2.0 Scope of Work (Weston Solutions, 2011).

Table 6-2: Permit Monitoring Elements and Permit Requirements

Monitoring Program Elements	Monitoring Program Permit Requirement	Permit Section of R9-2007-0001	Core Management Questions Addressed	Comments
Core Receiving Waters Monitoring Program	MLS monitoring	Section II.A.1	Q1, Q2, Q3, and Q5 (Q4 partially)	Conducted in accordance with Permit requirements.
	TWAS monitoring	Section II.A.2	Q1, Q2, Q3, and Q5 (Q4 partially)	Conducted in accordance with Permit requirements.
	Bioassessment monitoring	Section II.A.3	Q1, Q2, Q3, and Q5	Conducted in accordance with Permit requirements.
	Follow-up analyses and actions (TIEs)	Section II.A.4	Q1, Q2, and Q4	Conducted in accordance with Permit requirements.
	Ambient bay and lagoon monitoring	Section II.A.5	Q1, Q2, Q3, and Q5	Conducted in accordance with the 2009 work plan based on Regional Bight '08 lagoon results.
	Coastal storm drain monitoring	Section II.A.6	Q1, Q2, Q3, Q4, and Q5	Conducted by the Coastal Monitoring Sub-Workgroup jurisdictions in accordance with Permit requirements.
	Pyrethroids monitoring	Section II.A.7	Q1, Q2, Q3, and Q5	Conducted in accordance with Permit requirements.
Urban Runoff Monitoring Program	MS4 outfall monitoring	Section II.B.1	Q3 and Q4	Conducted in accordance with the MS4 Outfall Monitoring Program Workplans.
	Source identification monitoring	Section II.B.2	Q3 and Q4	Source characterization of runoff from single-family residential neighborhoods
	Dry weather screening and analytical monitoring	Section II.B.3	Q3 and Q4	Conducted by the individual jurisdictions in accordance with Permit requirements.
Regional Monitoring Program	Bight '08 Monitoring Program	Section II.C.2	Q1, Q2, Q3, and Q5 (Q4 partially)	The Copermittees participated in the Bight '08 Coastal Ecology Program, Coastal Wetlands and Estuaries Program, and the Shoreline Microbiology Program.
	Southern California Regional Watershed Monitoring Coalition (bioassessment workgroup)	Addendum 2, Items 7 and 8	Q1, Q2, Q3, and Q5 (Q4 partially)	The Copermittees participated in the SMC Bioassessment Workgroup Regional Monitoring Program beginning in 2008-2009. Copermittees collected samples from 16 sites annually in San Diego County.
Targeted Monitoring Studies	TMDL monitoring for Order No. R9-2004-0277	Section II.D.1	Q1, Q2, Q3, and Q5 (Q4 partially)	Included annually in appendix to *San Diego Bay WURMP Report* from 2005 to 2010.
	Regional harbor monitoring	Section II.D.2	Q1, Q2, Q3, and Q5 (Q4 partially)	Program conducted by a subset of Copermittees per a 13265 Order.

Figure 6-3: Regional Monitoring Stations during Permit Year 2008–2009 (Bight '08 Monitoring Year)

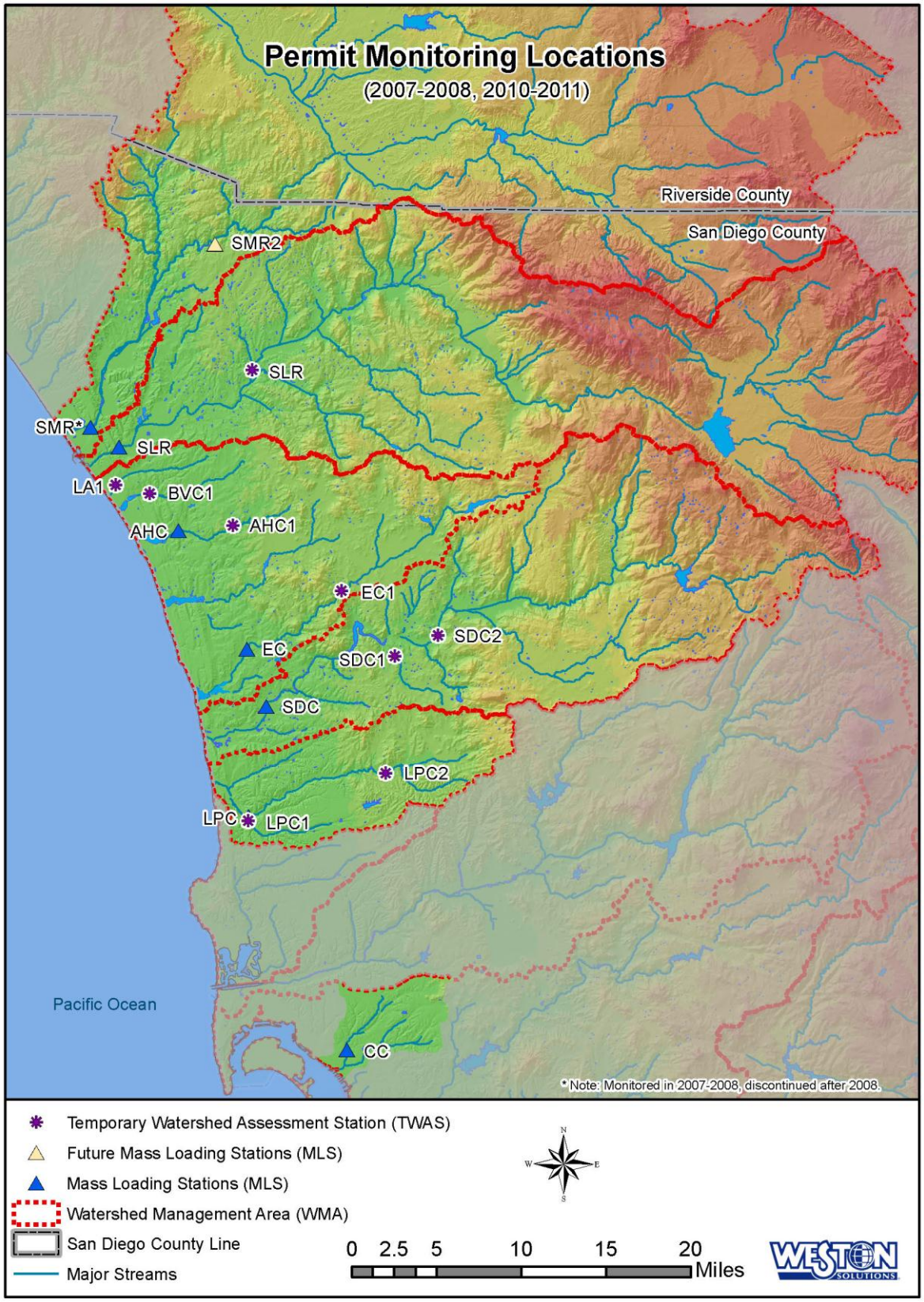

Figure 6-4: Regional Monitoring Stations during Permit Years 2007–2008 and 2010–2011 (North San Diego County Rotation)

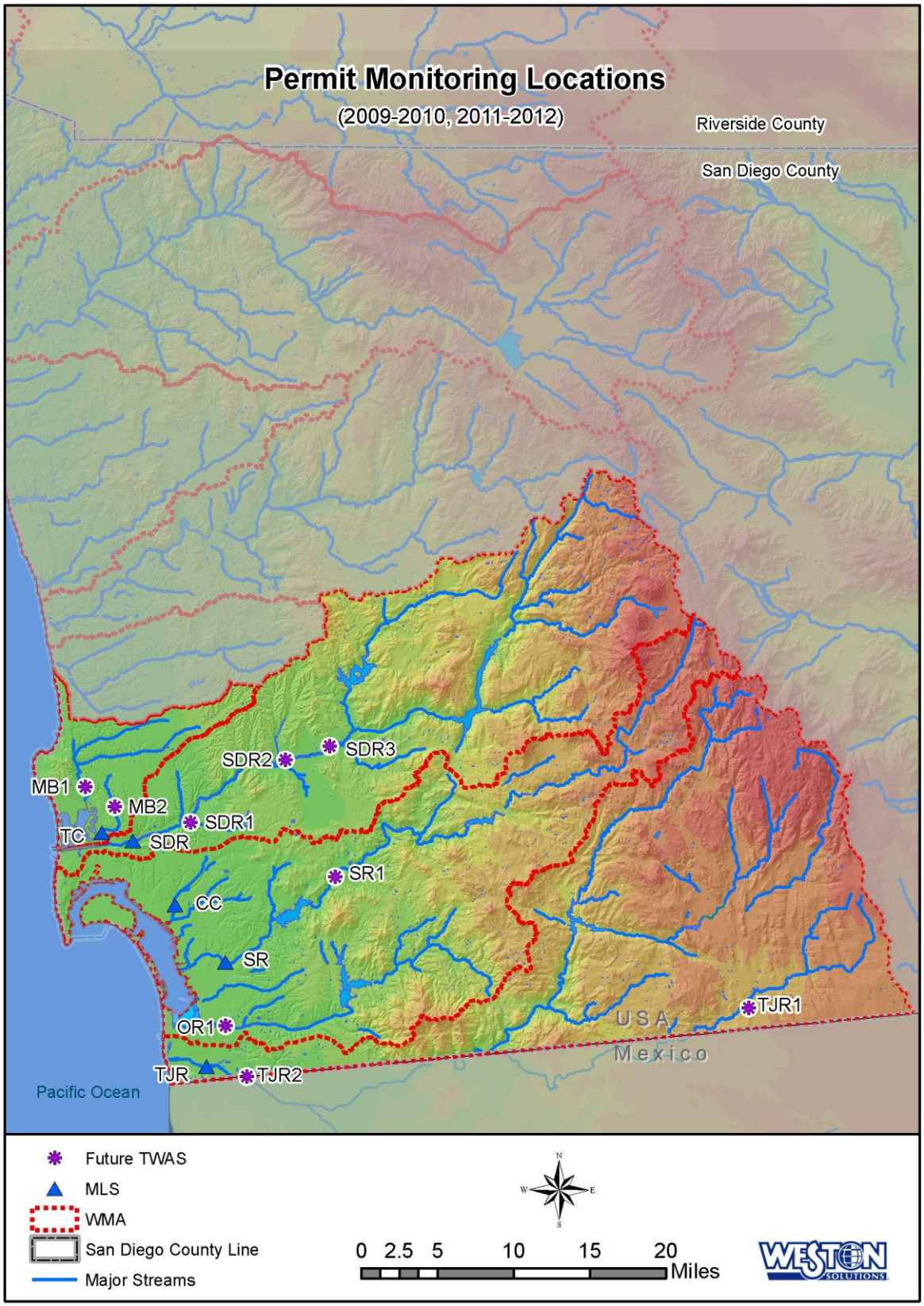

Figure 6-5: Regional Monitoring Stations during Permit Years 2009–2010 and 2011–2012 (South San Diego County Rotation)

The status of the Monitoring Program in meeting these goals is summarized in **Table 6-3**. Overall the Regional Monitoring Program has generally met these Permit goals. **Table 6-3** also references the specific analysis and data presentation in this five-year assessment that supports these goals. A summary of the development of the current five core questions and the current structure of the Regional Monitoring Program is presented in the text box presented following **Table 6-3.**

Table 6-3: Assessment of Monitoring Program in Meeting Its Goals

Monitoring Program Goals	Assessment Summary
Measure and improve the effectiveness of the Copermittees' urban runoff management programs.	The Program provides quantifiable measurements of effectiveness at the watershed scale at the MLS (long-term trend data) and through the MS4 outfall program (wet weather loading) within each watershed management area (WMA). Qualitative measurements are provided by the identification of priority constituents using the new Assessment Methodology. The priority constituents for each WMA are presented in Attachment 1, Sections 2 to 10 for the MLS and TWAS locations. These can be used to spatially assess the extent of priorities, and whether there are changes in these priorities across the watershed. Identification of priority constituents is also strongly correlated to program effectiveness by focusing efforts on these constituents.
Assess the chemical, physical and biological impacts to receiving waters resulting from urban runoff discharges.	The Program provides a triad assessment using chemical, physical, and biological data at the MLS and TWAS in order to assess potential impacts. With the expansion of the Program to include the MS4 outfall assessment, priority constituents identified for urban runoff can be compared to the receiving water priorities to assess their relative contribution.
Characterize urban runoff discharges.	The Program includes both the random and targeted MS4 outfall monitoring program that provides characterization of urban runoff discharges.
Identify sources of specific pollutants.	The Program provides the priority constituents from which source identification studies can be focused at the watershed and jurisdictional levels. This 5-year assessment also provides observations of flow during dry weather at MS4 sites to assess effectiveness of runoff reduction measures that correlate to dry weather sources of urban runoff.
Prioritize drainage and sub-drainage areas that need management actions.	The Program expansion into the watershed with the TWAS and the MS4 outfall program, and the results of the new assessment methodology that identifies priority constituents, support the determination of priority drainage and sub-drainage areas.
Detect and eliminate illegal connections and illicit discharges (ICID) to the municipal separate stormwater system (MS4).	The Dry Weather Monitoring Program is conducted by the jurisdictions and summarized in the Regional Annual Reports, as well as presented in each jurisdiction's annual jurisdictional urban runoff monitoring report. The Dry Weather Field Screening and Analytical Monitoring Program, intended to support IC/ID investigations, is not an efficient use of resources, and has had a very low success rate in identifying ICs and IDs, and is no longer necessary given other more effective measures that are implemented by the Copermittees (i.e., facility inspections, complaint hotline responses, public employee surveillance).
Assess the overall health of receiving waters.	This goal is related to core Question 1, and the Program assessed the overall health of the receiving waters at a large scale based on the MLS sampling. The program has improved spatial resolution through the TWAS.

As a result of implementing the regional monitoring program described above, the Copermittees have accumulated a significant amount of data. **Table 6-4** on the following page identifies the number of sites and events where monitoring occurred during FYs 2009 and 2010.

Table 6-4 Monitoring Stations and Events Sampled

Program	2008-09		2009-10		Total Number of Samples
	#sites	#events	#sites	#events	
MLS/TWAS Monitoring	11	1	15	4	71
Bioassessment Monitoring	-	-	15	1	15
SMC Bioassessment	16	1	16	1	32
TIEs	3	1	-	-	3
Ambient Bay and Lagoon Monitoring	-	-	9	1	9
Bight 08 Lagoon Study	40	1	-	-	40
MS4 Outfall Monitoring-Random Dry*	39	1	54	1	93
MS4 Outfall Monitoring-Random Wet*	40	1	35	1	75
MS4 Outfall Monitoring-Targeted Dry*	191	1	180	1	371
MS4 Outfall Monitoring-Targeted Wet*	-	-	3	1	3
Source ID Monitoring	4	3	2	3	18
Dry Weather*	1106	1	1089	1	2195
CSDM*	784	1	297	1	1081

* Number of events varies by program but is indicated as a single event per site for calculation purposes.

Hydromodification Management Plan Monitoring Program

The Permit requires that the Copermittees develop and implement a pre- and post-project monitoring program to assess the effectiveness of the Hydromodification Management Plan (HMP) implementation. As a result of the Copermittees efforts a Monitoring and BMP Evaluation section was included in the HMP. It is based upon the following HMP effectiveness questions (2011 Brown and Caldwell):

1) Do field observations confirm that the HMP appropriately defines the flow rate (expressed as a function of the 2-year runoff event) that initiates movement of channel bed or bank materials?
2) Are mitigation facilities adequately meeting flow duration design criteria outlined in the HMP?
3) What is the effect of development on downstream cross section incision and widening?

In developing the Monitoring and BMP Evaluation Plan, the Copermittees have satisfied their permit requirements. The implementation and assessment will occur over the next five years.

6.2.1.1 Assessment

As noted above the Copermittees are implementing the monitoring program consistent with the Permit requirements. An assessment of the program is summarized in the sections below.

6.2.2 Watershed Health

Assessment of Watershed Health and Identification of Water Quality Issues and Concerns

The water quality priorities identified on a watershed basis in the BLTEA are supported by the last five years of receiving water monitoring. The results of the current Regional Monitoring Program have also confirmed a few common water quality issues throughout the region. The general overall findings for regional receiving water quality priorities include:

- Wet Weather – In general, wet weather receiving water quality priorities are associated with the following issues: mobilization and migration of sediment during storm events as measured by total suspended solids and turbidity; bacterial indicators as reflected by fecal coliform; and the detection of synthetic pyrethroid pesticides. There are also some differences in the priority of these constituents among watersheds as reflected in different land use distributions and

pollutant generating activities in the watershed, physical conditions, and flow characteristics. Details are presented in the Watershed Assessments in Attachment 1, Sections 2 through 10.

- Dry Weather – In general, the receiving water quality priorities under ambient or dry weather conditions, based on two years of data, indicate a countywide issue with bacteria indicators (largely enterococci and also fecal coliform), nutrients, and total dissolved solids. The level of priority and the specific nutrients vary among watersheds, which is reflective of varying source contributions and the presence of flows. Details are presented in the Watershed Assessments in Attachment 1, Sections 2 through 10.

Additional receiving water quality issues were noted for the Chollas Creek Watershed (Pueblo Hydrologic Unit) and the Tijuana River Watershed, which have distinct source types. Chollas Creek Watershed is a smaller watershed with a high density of industries and transportation corridors that result in specific metals issues. The Tijuana River Watershed receives untreated wastewater from across the international border.

6.2.3 Discharge Water Quality

Assessment of Changes in Discharge Water Quality (Level 5 Outcomes)

At this time it is not possible to identify changes in water quality in outfall discharges because only two of the five years of program data have been collected. Changes in MS4 discharge quality will be reported in the coming years as this program continues to collect data and information. The temporal resolution of these data sets will improve as well in the coming years. In the LTEA WQ Report (Attachment 1, Sections 2 through 10) discharge loading characteristics are estimated and ranked for wet weather flows. These will help to establish a baseline for future comparisons of changes in the loads. The current assessment presents observed dry weather flow conditions at the MS4 outfalls; these data may also be used as a basis for comparison with future monitoring.

6.2.4 Receiving Water Quality

Assessment of Changes in Receiving Water Quality (Level 6 Outcomes)

The results of the trend analysis for the MLS in the receiving water are presented in **Table 6-5** below. The results show a mix of trends, however the statistical information provided demonstrates the relative changes in MLS receiving water quality observed. Changes in ambient conditions will be reported in the coming years as the ambient receiving water program continues to collect data and information. The table below summarizes the detailed trend information provided in Watershed Assessments in Attachment 1, Sections 2 through 10.

Table 6-5: MLS (Receiving Waters) Trends

Watershed	Analyte	p-value	Trend	% ND	Sen's Slope Estimate	Mean Ratio to Benchmarks
2009						
Tecolote Canyon	Ammonia	0.032	Down	14	-0.004	0.03
	Total Hardness	0.0155	Up	0	4.22	NA
	Total Suspended Solids	0.0408	Down	5	-1.78	3.47
	Diazinon	<0.001	Down	43	NA	1.49
San Diego River	Enterococci	0.0138	Up	0	338	NA
	Total Phosphorus	0.0138	Down	0	-0.0063	0.22
	Dissolved Copper	0.027	Down	33	NA	0.11
	Dissolved Organic Carbon	0.044	Up	0	0.21	NA
Chollas Creek	Hyalella (NOEC 96 hr survival)	0.04	Down	42	NA	1.15
	Total Coliform	0.03	Up	0	1,622	NA
	Nitrite	0.011	Up	28	NA	0.07
	Total Kjeldahl Nitrogen	0.022	Up	4	0.026	NA
	Turbidity	0.001	Up	0	0.703	4.38
	Total Copper	0.009	Up	0	0.00036	NA
	Total Zinc	0.0028	Up	0	0.0028	NA
	Malathion	0.024	Down	19	NA	0.47
Sweetwater	Dissoved Phosphorus	0.041	Up	5	0.00276	0.11
	Total Arsenic	0.01	Up	5	0.00008	NA
	Total Lead	0.006	Down	38	NA	NA
Tijuana	Fecal Coliform	0.0023	Up	0	105,757	1214.29
	Total Coliform	<0.001	Up	0	253,333	NA
	Enterococci	0.008	Up	0	52,941	NA
	Conductivity	0.002	Down	0	-31.3	NA
	Nitrate	0.023	Up	0	0.053	0.27
	Total Dissolved Solids	0.004	Down	0	-11.5	0.34
	Total Suspended Solids	<0.001	Up	0	66.3	20.31
	Turbidity	<0.001	Up	0	23.88	40.69
	Diazinon	<0.001	Down	14	-0.014	4.32
	Total Arsenic	0.006	Up	0	0.0002	NA
	Total Copper	0.006	Up	0	0.0015	NA
	Total Lead	0.002	Up	0	0.002	NA
	Total Zinc	<0.001	Up	5	0.010	NA
	Dissolved Nickel	<0.001	Down	0	-0.0004	0.01
	Dissolved Zinc	0.015	Down	38	NA	0.08

Watershed	Analyte	p-value	Trend	% ND	Sen's Slope Estimate	Mean Ratio to Benchmarks
2008						
Santa Margarita	Surfactants MBAS	0.024	Down	44	NA	0.19
San Luis Rey	Dissolved Phosphorus	0.048	Up	14	0.00859	0.14
	Enterococci	0.004	Up	0	137	NA
	Fecal Coliform	0.002	Up	0	76	13.15
	Total Coliform	<0.001	Up	0	719	NA
	Total Dissolved Solids	0.033	Down	0	-13.75	2.67
	Total Hardness	0.048	Down	0	-6.37	NA
	Turbidity	0.017	Up	0	0.485	1.53
Agua Hedionda Creek	Chemical Oxygen Demand	0.029	Up	3	1.64	0.79
	Dissolved Arsenic	0.022	Down	37	NA	0.01
	Diazinon	0.0001	Down	41	NA	1.88
	Fecal Coliform	0.0006	Up	3	414	37.00
	Total Copper	0.03	Up	14	0.000477	NA
	Total Lead	0.017	Up	24	NA	NA
	Total Nickel	0.039	Up	10	0.000125	NA
	Total Coliform	0.013	Up	0	1606	NA
	Total Suspended Solids	0.005	Up	7	20.1	NA
	Turbidity	0.004	Up	0	5.58	7.71
	Total Zinc	0.032	Up	10	0.00176	NA
Escondido Creek	Diazinon	<0.001	Down	43	NA	1.25
	Dissolved Nickel	0.027	Down	19	NA	0.002
	Total Zinc	0.035	Up	14	0.000933	NA
San Dieguito	Conductivity	0.048	Up	0	23.54	NA
	Total Kjeldahl Nitrogen	0.033	Up	0	0.0263	NA
	Total Phosphorus	0.011	Up	0	0.0047	0.10
Los Peñasquitos Creek	Fecal Coliform	0.045	Up	0	41	29.16
	Total Lead	0.014	Down	48	NA	NA

Down = decreasing concentrations
Up = increasing concentrations

6.3 Sources Assessment

This section presents the assessment of the effectiveness of the Copermittees' efforts to address regulated sources. Data and information collected from various sources were reviewed and analyzed, including Copermittee URMP Annual Reports and studies.

Figure 6-6 below shows the Source Assessment portion of the larger LTEA process. The source analysis tract of the LTEA process uses source data sets collected by the Copermittees and evaluations of the sources likelihood of generating pollutants to develop their Source Loading Potentials (SLPs). The data and information from the analysis was used to derive the LTEA source assessments as illustrated in the figure and described in the narrative below.

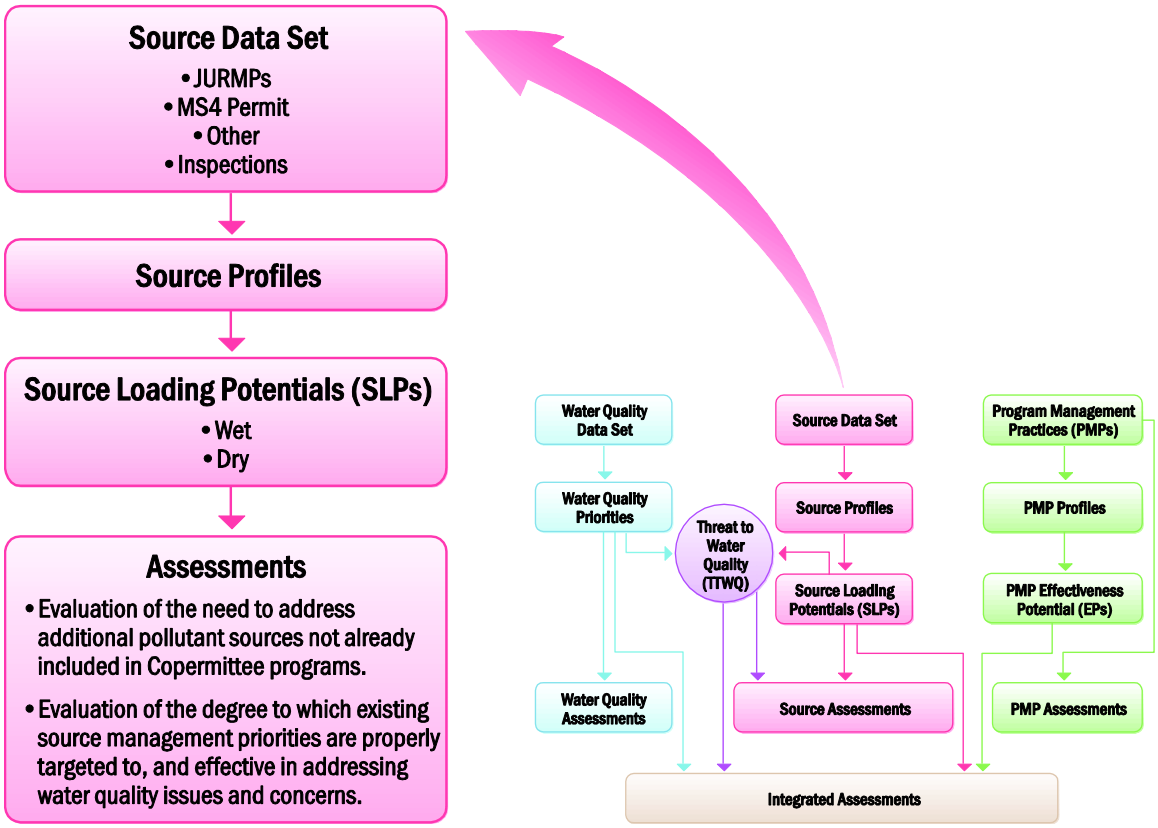

Figure 6-6: LTEA Process – Source Assessment

6.3.1 Additional Sources

Evaluation of the need to address additional pollutant sources not already included in Copermittee programs

6.3.1.1 Background

The Copermittees are required to develop and maintain watershed based inventories for the following program elements: 1) Land Development (i.e., SUSMP projects and Treatment Control BMPs (TCBMPs) as prescribed in the permit); 2) Construction Sites; 3) Municipal Facilities and Activities, including Special Event Venues; 4) Commercial and Industrial Facilities; and, 5) Prioritized Residential Areas. In each case, the Permit prescribes minimum requirements applicable to Copermittee inventories.

6.3.1.2 Analysis

The Copermittees' 2008 JURMPs and FY 2009 and 2010 JURMP Annual Reports were reviewed to determine whether they had identified additional sources not already required to be included in Copermittee programs. Additionally, Focused Analyses that included an expanded evaluation of sources other than those included in the Copermittees programs were reviewed.

A Focused Analysis (via WURMP Activity) performed by the City of San Diego evaluated all businesses including office parks, industrial parks, commercial shopping centers, etc. within geographical areas, regardless of whether they were required to be inventoried or inspected. In evaluating many business types (475 not already included in the inventory), the City did not identify any new business types that posed a threat to water quality.

Several Focused Analyses concentrated on over-irrigation issues, which include misdirected water spray and over-watering landscaped areas to the point where water flows from the landscaped areas into the MS4. Findings from these special projects yielded that over-irrigation is a contributor to pollutants. Over-irrigation itself is not a source; however, it is an activity and a transport mechanism for pollutants and should be considered a PGA at all sources that have irrigated landscaping.

In addition to the above, a review of the remaining program element inventories was performed:

Land Development – Nearly all projects are subject to SUSMP requirements and the remaining projects not subject to SUSMP requirements do not warrant inclusion per the Permit and intended PGAs, e.g., sidewalks, bicycle lanes, and maintenance projects.

Construction – Currently, construction projects and activities considered to present a significant threat to water quality are subject to Copermittees' oversight.

Municipal Facilities – At this time, most municipal facilities and activities are included in the high priority list identified in the Permit. The high priority status distinguishes frequency of inspection (annual). Upon review of the required high priority facilities identified in the Permit, it may be warranted to provide for a mechanism to remove those facilities that are determined not to present significant threat to water quality.

Prioritized Residential Areas – At this time, the Permit requires that Copermittees' identify high threat to water quality residential areas and activities, some of which are identified in the Permit. Based upon the pollutants identified in the WQ Assessment, there are no additional residential areas or activities that need inclusion in the Copermittees' programs.

6.3.1.3 Assessment

The analysis performed resulted in no additional sources recommended for inclusion in the Copermittees' programs at this time. However, eight (8) additional Source Profile Sheets were prepared to augment the 2005 BLTEA effort and are located in Appendix A.

6.3.2 Source Management Priorities

Evaluation of the degree to which existing source management priorities are properly targeted to, and effective in addressing, water quality issues and concerns

6.3.2.1 Background

Assessment of the degree to which the Copermittees are targeting the sources properly considering the need to address water quality issues, gets at the core of watershed-based program planning and implementation. This evaluation required three primary steps: 1) understanding the water quality issues and concerns on a watershed-by-watershed basis; 2) associating specific sources to pollutants causing water quality issues (SLPs in Section 3 above); and 3) evaluating the focus of the Copermittees' programs. Although there are prescriptive requirements for what facilities/activities are included in the

Copermittees' programs, there is some flexibility in how the Copermittees focus their efforts. Furthermore, the evaluation presented below primarily focuses on wet weather conditions – based on historic data analysis driven by wet weather monitoring.

6.3.2.2 Analysis

The Copermittees' 2005 BLTEA, 2008 JURMPs, FY 2009 and 2010 JURMP Annual Reports and FY 2009 and 2010 WURMP Annual Reports were reviewed to determine the degree to which existing source management priorities are properly targeted to water quality issues and concerns. Additionally, special projects that included evaluation of sources other than those included in the Copermittees programs were reviewed.

Water Quality Analysis

The 2005 BLTEA serves as the foundation for prioritization (proper targeting) of sources related to water quality issue and concerns as described in the document and focuses primarily on wet weather conditions. Recognizing the limitations of the supporting data and information for the BLTEA, the Copermittees continued to refine their prioritization process based on best available information as it was developed through annual regional monitoring, Focused Analyses and general program implementation.

The 2005 BLTEA established priority ratings for water quality problems in each watershed through the development of a numerical scoring system. These ratings for each hydrologic area used data available at the time of the analysis, including whether waterbodies in the area were listed as a CWA 303(d) impaired waterbody, the results from various monitoring programs for priority constituents, and sediment toxicology testing.

WURMP documents prepared and submitted in 2008 drew upon the baseline water quality ratings prepared in the BLTEA to determine the High Priority Water Quality Problems (HPWQPs) specific to each watershed. During the time between the BLTEA and the WURMP document submittal, the 2006 CWA 303(d) list of impaired waterbodies had been released, where upon additional impaired waterbodies were recognized by the State. These impaired waterbodies were taken into consideration when determining the HPWQPs designated by the Copermittees for each WURMP document. Additionally, the WURMPs present monitoring data from various sources including the Annual Regional Monitoring Report for comparative purposes to show the frequency of occurrences or exceedances of particular analytes and how they compare to the HPWQPs. Therefore, while the BLTEA and WURMP documents shared many of the same HPWQPs, there were also some significant differences between the two.

High Threat to Water Quality Sources

Based upon the BLTEA priority ratings and WURMP HPWQPs, the Copermittees were able to identify the high TTWQ sources in the 2008 WURMP documents. The BLTEA established a process for determining TTWQ ratings for various source categories based on water quality priority ratings and the potential for the sources to discharge specific pollutants. The BLTEA presented these TTWQ ratings for each of the WMAs and pollutant categories used in the BLTEA (2005 MOE, Weston, LWA). For the most part, the Copermittees used the BLTEA TTWQ ratings in generating their priority sources. Some additional criteria used in the WURMP process included:

1) Updated water quality priority ratings (Weston Solutions, 2007)
2) Updated watershed-specific source inventory data
3) Copermittees' Dry Weather Monitoring data

Additionally, on a jurisdictional level, there are permit requirements and Copermittee selected prioritization processes that used water quality issues, including 303(d) impairments to prioritize sources. Due to the prescriptive nature of the Permit, this criterion was primarily used for prioritizing the Industrial/Commercial inventories.

Program Implementation and Activity Assessment

The next step was to analyze whether the Copermittees PMPs and selected WURMP activities addressed the high TTWQ sources that correlate to the high priority water quality problems. This was done by conducting two comparisons: 1) comparing the PMPs effectiveness potential to high TTWQ sources and water quality issues; and 2) comparing the implemented WURMP activities to high TTWQ sources and water quality issues in each of the watersheds.

PMPs

Findings of Sections 2 and 3 of this LTEA, and Copermittees' annual reports, identified the water quality issues, associated sources and the PMPs implemented within each WMA. Through review and analysis, the WMAs' high TTWQ sources associated with the water quality issues were identified to be the same. Similarly, the PMPs implemented were identified to be the same and addressed high TTWQ sources. With a better understanding of the relative importance of these and other potential sources, the Copermittees would be able to better utilize their resources to focus their PMPs.

WURMP Activities

Two assessments were performed for WURMP activities, one to evaluate addressing water quality issues and the other to evaluate addressing the sources that are potentially generating the pollutants that are contributing to the water quality issues. The BLTEA and WURMP water quality issues (priority ratings and high priority water quality problems respectively) were combined for the analysis. The number of activities identified that address high TTWQ sources and water quality issues are presented in **Table 6-6** below.

It is important to note that of the 283 WURMP Watershed Water Quality and Education Activities that were in active implementation during Fiscal Years 2009 and 2010, only five did not directly address the water quality issues and high TTWQ sources identified for each watershed.

Table 6-6: WURMP Activities Addressing Proper Sources and Water Quality Issues

Watershed	Water Quality Issues (BLTEA and WURMPs)		No. of WURMP Activities Addressing WQ Issues and High TTWQ Sources
Santa Margarita	• Bacteria/ Pathogens • Nutrients	• Sediment	15
San Luis Rey	• Bacteria/ Pathogens • Nutrients	• Sediment	19
Carlsbad	• Bacteria/ Pathogens • Nutrients	• Sediment	18
San Dieguito	• Bacteria/ Pathogens • Nutrients	• Sediment • Gross Pollutants	26
Los Peñasquitos	• Bacteria/ Pathogens • Nutrients	• Sediment	25
Mission Bay	• Bacteria/ Pathogens • Nutrients	• Sediment • Heavy Metals	34
San Diego River	• Bacteria/ Pathogens • Nutrients	• Sediment • Gross Pollutants	65

Watershed	Water Quality Issues (BLTEA and WURMPs)		No. of WURMP Activities Addressing WQ Issues and High TTWQ Sources
San Diego Bay	• Bacteria/ Pathogens • Nutrients • Sediment • Gross Pollutants	• Heavy Metals • Oil and Grease • Organics • Pesticides	55
Tijuana	• Bacteria/ Pathogens • Nutrients • Sediment • Gross Pollutants	• Heavy Metals • Organics • Pesticides	21

Not all HAs in the WMAs identified above have all of the Water Quality Issues and High TTWQ sources identified in the table

6.3.2.3 Assessment

The Copermittees have identified potential sources of the pollutants of concern and are addressing them through program current program implementation. Copermittee programs would benefit from determining the relative importance of these sources in order to allow for the most efficient allocation of resources.

6.4 Program Management Practice (PMP) Assessment

This section assesses the progress the Copermittees have made in implementing PMPs, which includes jurisdictional program activities, watershed activities, Focused Analyses, etc. The assessment was developed using all three scales of program implementation, regional, watershed and jurisdictional, and is presented below by outcome levels:

1) Outcome Level 1 – Program Implementation
2) Outcome Level 2 – Awareness and Knowledge
3) Outcome Level 3 – Behavior
4) Outcome Level 4 – Source Reductions

Figure 6-7 shows the Program Management Practice Assessment portion of the larger LTEA process. The PMP analysis tract of the LTEA process uses PMP data sets (largely from Annual Reports and Focused Analyses) collected by the Copermittees and evaluations of the PMPs effectiveness at reducing pollutants. The data and information from the analysis was used to derive the LTEA PMPs assessments as illustrated in the figure and described in the narrative below.

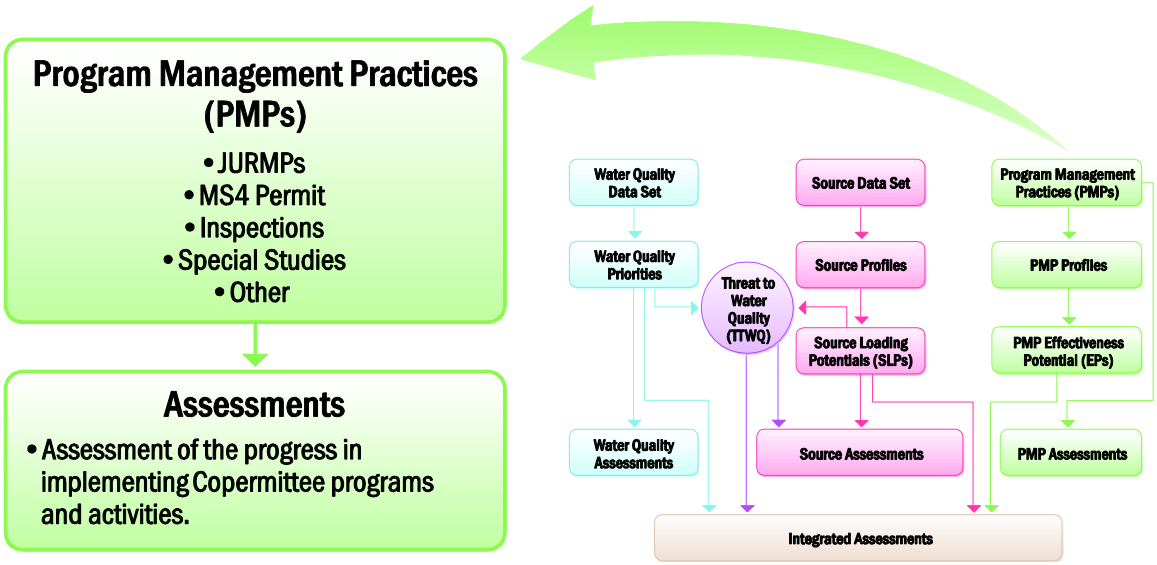

Figure 6-7: LTEA Process – Program Management Practice Assessment

Although, this section focuses on the effectiveness of permit required PMPs, the Copermittees have taken a pro-active approach to regional coordination and program management. There have been several activities self-initiated by the Copermittees in the past several years that support regional/watershed program planning and effectiveness assessment: 1) Regional Memorandum of Understanding; 2) Reporting and Assessment Standards; and 3) Regional Watershed Visioning Process. Each of these efforts is briefly described below including their relationship to effectiveness assessment.

2007 San Diego Regional Stormwater Copermittees Memorandum of Understanding

In addition to establishing roles and responsibilities for the Copermittees, the Memorandum of Understanding (MOU) established regional subject-specific workgroups, e.g., Industrial/Commercial, Municipal, Monitoring, Land Development, Residential Education, and Regional Watersheds. One of the primary purposes of each workgroup is to facilitate consistency, where appropriate, in the ways that programs are implemented, reported and assessed. Each of the twenty-one Copermittees entered into the MOU and all are committed to developing the program consistency. As described in the FY 2009 and 2010 Regional URMP Annual Reports, the workgroups have met consistently throughout the LTEA reporting period and as described below.

San Diego Regional Stormwater Copermittees Data, Reporting, and Assessment Needs

The Copermittees recognize the need to coordinate and develop meaningful program effectiveness assessment at three scales: jurisdictional, watershed, and regional. In mid-2010, they took an important first step in developing consistent reporting and assessment standards for Copermittee urban runoff management programs. The results of the process provide an informational basis and a common framework for reporting and assessment of PMPs performed by Copermittees.

San Diego Regional Stormwater Copermittees Visioning Process

In late 2010, the Copermittees initiated a process to develop a vision to guide watershed management decisions that are effective in improving water quality and efficient in the use of public funds. The outcome of the process was a vision statement and identified goals for the Regional Copermittees to work from as they enter into the potential restructuring of regional program management.

6.4.1 Program Progress

Assessment of progress in implementing Copermittee programs and activities

Presented below are assessments of the implemented PMPs as they relate to Levels 1-4 outcomes.

6.4.2 Program Implementation (Level 1 Outcomes)

6.4.2.1 Background

This section presents the results of an assessment of the implementation of JURMPs, WURMPs and the RURMP based upon annual reporting and a call to Copermittees for additional supporting information. The assessment includes an evaluation of the Copermittees efforts to develop and implement their programs to meet the requirements of the Permit. The LTEA reporting period focuses on the program reporting cycles of FYs 2009 and 2010. These two years represent the first two complete years of program implementation under the current Permit. An attempt to incorporate data and information from the previous years was considered but there were too many inconsistencies in the reporting.

The development, implementation and reporting of jurisdictional stormwater programs varied considerably. Although the Copermittees have initiated standardization measures for program implementation and reporting, there were still varied results. The results below represent the Copermittees' data and information that was consistent enough for consolidation.

6.4.2.2 Analysis

Program Development and Reporting

JURMPs: Each of the Copermittees developed JURMPs that met the requirements of Permit Section J.1.a. and submitted the JURMPs by the revised timeline of March 2008. Subsequently, the Copermittees developed and submitted JURMP Annual Reports for Fiscal Years 2008, 2009 and 2010. Each of these annual reports was submitted to the RWQCB via the Principal Permittee by September 30 of each year as required in the permit.

Table 6-7: JURMP Document Requirements

Requirement	Status
Permit Section J.1.a. 21 JURMPs Submitted by March 24, 2008	Complete
Permit Section J.3.a. 21 JURMP Annual Reports Submitted by September 30 following the reporting period	Complete

WURMPs**:** Each of the Copermittees collaborated to develop WURMPs for the nine watershed management areas. These documents met the requirements of Permit Section J.1.b. and were submitted by the revised timeline of March 2008. Subsequently, the Copermittees developed and submitted JURMP Annual Reports for Fiscal Years 2008, 2009 and 2010. Each of these annual reports was submitted to the RWQCB via the Principal Permittee by January 31 of each following year as required in the permit.

Table 6-8: WURMP Documents Requirements

Requirement	Status
Permit Section J.1.b. 9 WURMPs Submitted by March 24, 2008	Complete
Permit Section J.3.b. 9 WURMP Annual Reports Submitted by January 31 following the reporting period	Complete

RURMP**:** Each of the Copermittees collaborated to develop the RURMP that met the requirements of Permit Section J.1.c. and was submitted by the revised timeline of March 2008. Subsequently, the Copermittees have developed and submitted RURMP Annual Reports for Fiscal Years 2008, 2009 and 2010. Each of these annual reports was submitted to the RWQCB via the Principal Permittee by January 31 of each following year as required in the permit.

Table 6-9: RURMP Documents Requirements

Requirement	Status
Permit Section J.1.c. RURMP Submitted by March 24, 2008	Complete
Permit Section J.3.c. RURMP Annual Reports Submitted by January 31 following the reporting period	Complete

Program Implementation

JURMPs**:** The following table represents some collective results of the Copermittees' JURMP implementation. As stated above, not all of the implemented PMPs could be combined, based on differing reporting formats and types. Therefore**, Table 6-10** is not a comprehensive representation of the Copermittees' overall program efforts. The Copermittees' Annual Reports provide more details of program implementation.

Table 5-1 links the Copermittees' activities, presented in **Table 6-10** below, directly to targeted feasible effectiveness assessment outcomes. While effectiveness levels are attainable through tracking the progress of PMP implementation by utilizing Level 1 methods such as confirmation, tabulation, surveys, inspections, etc., assessment outcomes are difficult to report at this time due to the absence of comprehensive adopted regional data and reporting standards. However, the Copermittees recognize that the PMPs noted in **Table 5-1** produce changes in knowledge and awareness, behavior, and load reductions and are acknowledged. For example, a total of 16,485 construction inspections were conducted by Copermittees in FY 2009 and FY 2010. While the Copermittees did not have a regional standard for tracking the change in behavior to report specific numbers or percentages, it is assumed that as a result of the inspections there were a percent of construction sites with positive behavior changes and source reductions.

Table 6-10: Jurisdictional PMP Results

	PMP Reporting Description	FY 2009 Result	FY 2010 Result	Total (where applicable)
	Development Planning Component			
1	Confirmation that all development projects were required to undergo the Copermittees' urban runoff approval process and meet the applicable project requirements	100% confirmed	90% confirmed*	-
2	Number of the development projects to which SUSMP requirements were applied	318	540	858
3	Confirmation that all applicable SUSMP BMP requirements were applied to all priority development projects	81% confirmed*	90% confirmed*	-
4	Number of treatment control BMPs inspected, including a summary of inspection results and findings *NOTE: These numbers are low as some jurisdictions reported the number of project sites inspected rather than number of TCBMPs*	at least 2,500	at least 2,133	-
5	Number of development projects required to meet HMP requirements	1	5	6

	PMP Reporting Description	FY 2009 Result	FY 2010 Result	Total (where applicable)
6	Number of enforcement actions for development planning issues *NOTE: Enforcement numbers vary greatly, reflecting different approaches to enforcement*	51	333	384
	Construction Component			
7	Confirmation that all construction sites were required to undergo the Copermittees' construction urban runoff approval process and meet the applicable construction requirements	95% confirmed*	95% confirmed*	-
8	Confirmation that the designated BMPs were implemented, or required to be implemented, for all construction sites	100% confirmed	100% confirmed	-
9	Confirmation that a maximum disturbed area for grading was applied to all applicable construction sites	95% confirmed*	86% confirmed*	-
10	Number of construction sites with conditions requiring advanced treatment	1	0	1
11	Total number of construction inspections conducted during the rainy and dry season for all sites	9,620	6,865	16,485
12	Confirmation that the inspections conducted addressed all the required inspection steps to determine full compliance	81% confirmed*	86% confirmed*	-
13	Number of enforcement actions taken for construction sites *NOTE: Enforcement numbers vary greatly, reflecting different approaches to enforcement*	1,103	1,318	2,421
	Municipal Component			
14	Confirmation that the designated BMPs were implemented, or required to be implemented, for municipal areas and activities, as well as special events	95% confirmed*	100% confirmed	-
15	Total number of catch basins and Inlets *NOTE: Variable from year to year based on Copermittees refining inventories*	60,487	81,197	-
16	Total number of catch basins and inlets inspected *NOTE: Some inspected more than once*	77,489	72,891	150,380
17	Total number of catch basins and inlets cleaned *NOTE: Some cleaned more than once*	53,102	37,983	91,085
18	Total miles of MS4 *NOTE: Not all Copermittees reported and MS4 interpreted differently*	8,476 miles	3,883 miles	-
19	Total distance of MS4 cleaned *NOTE: Overall number is skewed: County cleaned nearly twice the length of their MS4 which is a substantial percentage of totals*	7,875 miles	7,524 miles	15,399 miles
20	Total amount of waste and litter (tons) removed from catch basins, inlets, MS4 and open channels *NOTE: More than 55% attributable to open channels*	19,002 tons	38,391 tons	57,393 tons
21	Confirmation that the designated BMPs for pesticides, herbicides, and fertilizers were implemented, or required to be implemented, for municipal areas and activities	100% confirmed	100% confirmed	-
22	Total distance of curb-miles swept	281,628 miles	300,478 miles	582,106 miles
23	Number of parking lots	698	674	-
24	Number of parking lots swept *NOTE: Not all Copermittees reported in FY 2009*	242	663	905
25	Total amount of material (tons) collected from street and parking lot sweeping	29,365 tons	23,534 tons	52,899 tons
26	Number of sites (facilities) requiring inspection	1,527	1,591	-
27	Number of sites (facilities) inspected	1,519	1,602	3,121
28	Confirmation that the inspections conducted addressed all the required inspection steps to determine full compliance	71% confirmed*	90% confirmed*	-

	PMP Reporting Description	FY 2009 Result	FY 2010 Result	Total (where applicable)
29	The number of enforcement actions taken for municipal areas and activities *NOTE: Enforcement numbers vary greatly, reflecting different approaches to enforcement*	302	207	509
	Industrial/Commercial Component			
30	Confirmation that the designated BMPs were implemented, or required to be implemented, for industrial and commercial sites/sources	95% confirmed*	100% confirmed	-
31	Number of industrial/commercial sites/sources	36,273	34,139	-
32	Number of industrial/commercial sites/sources inspected *NOTE: Overall, 33% of inventory inspected: greater than 25% as required*	11,964	12,846	24,810
33	Confirmation that all inspections conducted addressed all the required inspection steps to determine full compliance	81% confirmed*	100% confirmed	-
34	The number of enforcement actions taken for industrial and commercial sites/sources *NOTE: Enforcement numbers vary greatly, reflecting different approaches to enforcement*	1,222	1,291	2,513
	Illicit Discharge Detection and Elimination Component			
35	Number of illicit discharges and connections identified *NOTE: Results vary greatly – reflecting different approaches to categorizing and tracking IC/IDs*	894	2,315	3,209
36	Number of illicit discharges and connections eliminated	779	2,063	2,842
37	Number of times the hotline was called	3,788	3,523	7,311
38	The number of enforcement actions taken for illicit discharges and connections *NOTE: Enforcement numbers vary greatly, reflecting different approaches to enforcement*	3,021	1,857	4,878
	Residential Component			
39	Confirmation that the designated BMPs were implemented, or required to be implemented, for residential areas and activities	95% confirmed*	100% confirmed	-
40	Amounts of household hazardous wastes (tons) collected	2,093	4,680	6,773
41	The number of enforcement actions taken for residential areas and activities *NOTE: Enforcement numbers vary greatly, reflecting different approaches to enforcement*	1,003	738	1,741
	Education Component			
42	A description of education efforts conducted for each target community	100% provided description	100% provided description	-
43	A description of how education efforts targeted underserved target audiences, high-risk behaviors, and "allowable" behaviors and discharges	86% provided description	81% provided description	-
44	A description of education efforts conducted for municipal departments and personnel	100% provided description	100% provided description	-
45	A description of education efforts conducted for the new development and construction communities	100% provided description	100% provided description	-
46	A description of jurisdictional education efforts conducted for residents, the general public, and school children	100% provided description	100% provided description	-

*Confirmations based on Copermittee Annual Reports – less than 100% does not imply non-compliance

WURMPs**:** The Permit requires that each WMA actively implement at least two (2) Watershed Water Quality Activities (WQA) and two Watershed Education Activities (WEA) each Permit year. The following table lists the number of watershed activities in active implementation phases during Fiscal Years 2009 and 2010. A review of **Table 6-11** below demonstrates that the Copermittees have exceeded the required number of activities each year. It is important to note that in addition to the WQAs and WEAs implemented, the Copermittees implemented other activities on a watershed basis. These included monitoring and public participation events that do not fit into the definitions of WQAs and WEAs, but are important activities that do address the high priority water quality problems in the watersheds.

Table 6-11: Watershed Activities in Active Implementation

WMA	FY 2009 Activities in Active Implementation		FY 2010 Activities in Active Implementation	
	WQA	WEA	WQA	WEA
Santa Margarita	9	8	8	5
San Luis Rey	6	2	6	6
Carlsbad	13	6	16	5
San Dieguito	20	8	21	8
Peñasquitos	16	11	19	10
Mission Bay	22	12	24	9
San Diego River	40	12	41	9
San Diego Bay	24	11	32	13
Tijuana	17	9	22	13

RURMP: The Permit requires that the Copermittees collectively develop and implement common activities, facilitate assessment of program effectiveness, develop and implement a regional residential education program, and develop and implement a regional fiscal analysis method. The following table summarizes the Copermittees implementation of the required RURMP elements.

Table 6-12: Regional URMP Activities

RURMP Element	Description	Element Developed?	Implemented
Common Activities	Regional Stormwater Hotline	Previously developed	Yes
Common Activities	Participation in California Stormwater Quality Association	N/A	Yes
Common Activities	Integrated Regional Water Management Planning	N/A	Yes
Common Activities	Regional Stormwater Management Committee	Previously developed	Yes
Common Activities	Regional Program Planning Subcommittee	Yes	Yes
Common Activities	Workgroups: *Fiscal, Reporting and Assessment; Education and Residential Sources; Regional Monitoring; Land Development; Municipal Sources; Industrial and Commercial Sources; Regional WURMP*	Yes	Yes
Regional Effectiveness Assessment	Regional Reporting and Assessment Standards Recommendations	Yes	Yes
Regional Education Program	*County-wide Survey; Mass Media; Underserved Target Audience; Regional Website; Regional Brand; Regional Outreach Events; Materials Development*	Yes	Yes
Fiscal Analysis Method	Standardized Method and Format for Conducting and Reporting Fiscal Analysis	Yes	Yes

6.4.2.3 Assessment

Based upon the data and information provided above, collectively, the Copermittees met their Permit requirements.

6.4.3 Changes in Knowledge and Awareness (Level 2 Outcomes)

6.4.3.1 Background and Analysis

In general, there is a lack of consistent data that supports a collective analysis of Level 2 outcomes. Copermittees reported a variety of methods and results for Level 2 outcomes. This section summarizes some of the findings from the JURMP, WURMP and RURMP Annual Reports as well as special projects, including large-scale surveys.

Local Surveys

In addition to the Regional Telephone Survey (see below) that was conducted, Copermittees implemented local surveys to assess the general public's knowledge and awareness. The surveys contain information and data that is disparate from other Copermittees' data and therefore extracting collective assessment data is not possible. It is important to note that most local surveys provided jurisdictions with information that may be used for refocusing their education and outreach efforts.

Hotline Calls

Some Copermittees utilized hotline calls as a means of measuring Level 2 outcomes. The assumption is that the more knowledgeable the community is regarding stormwater issues, the more apt they are to report issues to the local and regional hotlines. Because there are too many variables that may affect the number of hotline calls, including knowledge and awareness, number of discharges, disgruntled neighbors, etc., the number of hotline calls from year-to-year is not considered as a metric in this LTEA.

Exposure and Impressions

Some Copermittees used exposure and impressions, via website hits and other outreach mechanisms, as a measurement of Level 2 outcomes. Although, exposure and impressions are critical components for changing knowledge and awareness, alone they are not measurements of knowledge and awareness. Coupled with other substantiating evidence, e.g., inspection results, the exposure could be considered a contributor to behavior changes or source reductions – Level 3 and 4 outcomes.

Telephone Surveys

As part of the Regional Residential Education Program, a Regional Residential Education Plan (Plan) was developed and finalized in March 2008. The Plan provides recommended strategies for education and outreach activity implementation. One recommendation was to conduct a baseline regional residential telephone survey with an additional survey conducted late in the permit cycle to assess the changes resulting from program implementation. The Copermittees established targets to achieve through education and outreach efforts: 10% change in knowledge that storm drains are separate from sanitary sewer systems, 10% increase in the awareness that all storm drains are connected to local waterways, and a 15% increase in the number of participants who can identify residential sources of stormwater pollution.

As stated in the FY 2010 RURMP Annual Report:

> "t*he Regional Residential Sources Workgroup developed and implemented a telephone survey of adult residents living in San Diego County. The purpose of the study was to begin to evaluate the effectiveness of the Copermittee's storm water pollution education efforts by measuring baseline*

current levels of polluting practices and awareness of how the storm drain system works. The study was conducted between June 16 and June 26, 2009. A total of 808 telephone interviews were conducted with adult residents randomly identified from across San Diego County."

Regional Calendar

As reported in the FY 2010 RURMP Annual Report:

"*between January and June 2010, Think Blue implemented a two-tiered assessment protocol that was designed to provide both qualitative and quantitative evaluation of the 2010 "Be the Solution to Storm Water Pollution" calendar. The Think Blue San Diego Regional calendar was designed to increase awareness, and educate residents on behaviors that prevent storm water pollution. The goal of the assessment activities was to provide an evaluation of both the clarity and usage of the calendar as well as the impact of the calendar on attitudes and behavior.*

Data were collected through pre- and post-test surveys and in-depth interviews with a subset of calendar recipients. 332 pre-tests were collected at the time of calendar distribution, 59 calendar recipients returned a post-test, and 30 participated in an in-depth telephone interview about the calendar."

Quizzes

Copermittees utilized quizzes as a means of determining the effectiveness of their training programs. The Copermittees used a pre- and post-training/presentation method of measuring the impacts of their training/presentation. In general, the training resulted in increased awareness and knowledge for the various target audiences, e.g., school-aged children and municipal staff.

Inspection Interviews

Copermittees used facility inspections to assess knowledge of general stormwater requirements. This method was used by some, but not all Copermittees and the results are generally not presented in sufficient detail to combine multiple jurisdictions' information across multiple years for comparison purposes.

Anecdotal Evidence

Although not always tracked and measured, there are indicators that point towards positive changes in knowledge and awareness with respect to stormwater issues. Many Copermittees reported that through anecdotal evidence there have been changes to knowledge and awareness in the target audiences. Some of these anecdotal indicators are:

- SUSMP implementation is easier because the development community is aware and knowledgeable of the land development requirements
- Construction community is more aware and knowledgeable of stormwater and BMP requirements and has expectation for impending inspections
- Municipal staff appears to have understanding of the program and an increasing number of urban runoff issues are being identified by field staff
- Industrial/commercial businesses are more aware of requirements and have expectation for impending inspections

6.4.3.2 Assessment

In general, and with the caveat that there is a limited amount of data and information available, the Copermittees have made progress towards changing knowledge and awareness of the general public with respect to stormwater issues.

A regional example of an improvement in knowledge and awareness is demonstrated through the Regional Residential Education calendar distributed. Among calendar recipients, who completed both the pre- and post-test surveys:

- There was a 14% increase in knowledge that storm water is not treated (83% correct at pre-test, 95% correct at post-test).
- After receiving the calendar, people were significantly more likely to be able to mention a specific pollution-prevention behavior. Prior to receiving the calendar 15% of respondents were unable to mention a specific action that they could do to prevent storm water pollution. At post-test, only 2% could not name a specific action.

Think Blue's regional calendar received a positive response in regards to graphics, size, and layout. More importantly, the calendar successfully increased knowledge and awareness, suggesting that it is a viable medium for educating people about storm water pollution and promoting behavior change.

While the Regional telephone survey conducted does not provide a change in knowledge and awareness at this time, it does provide valuable baseline information that can be used to refine outreach programs and be utilized as a comparison for future regional surveys. A summary of the baseline survey results as reported in the FY 2009-2010 RURMP Annual Report applicable to Level 2 is included below.

Level 2 results of the 2009 baseline telephone survey:

- **Knowledge of storm drain system:** 37% of respondents knew that water in storm drains is not treated before it is released into local waterways.
- **Knowledge of pollutants in urban runoff:** 41% of respondents volunteered that litter and trash were common sources of pollution in storm drains, 34% mentioned automobile fluids, 16% mentioned cleaning products, 15% mentioned fertilizers and pesticides, 10% mentioned yard trimmings and dirt, 8% mentioned human and animal wastes, and smaller percentages named other sources; 11% could not name a source of pollution in storm drains.

6.4.4 Behavioral Changes (Level 3 Outcomes)

6.4.4.1 Background and Analysis

In general, there is a lack of consistent data that supports a collective analysis of Level 3 outcomes. Copermittees reported a variety of methods and results for Level 3 outcomes. This section summarizes some of the findings from the JURMP Annual Reports and surveys.

Regional Residential Education Program

Telephone Survey

As noted in Section 6.4.3.1 above, a regional baseline telephone survey was conducted in 2009 and measured both baseline levels of awareness of how the storm drain system works and the levels of polluting practices or behaviors.

Regional Calendar

Also noted in Section 6.4.3.1 above, a Think Blue San Diego Regional calendar was designed to increase awareness, and educate residents on behaviors that prevent storm water pollution. The goal of the assessment activities was to provide an evaluation of both the clarity and usage of the calendar as well as the impact of the calendar on attitudes and behavior.

Community Based Social Marketing (CBSM): Gen-Y Youth Study

The Copermittees conducted a pilot study of littering behavior among youth in four regions throughout the county, which included observations and in-person interviews with youth (under the age of 24 with specific focus on middle school, high school, and college-age youth). The purpose of the study was to identify the sources of litter, establish a baseline littering rate, and identify avenues for outreach and education to reduce and prevent litter. The study was conducted in 2010, and pilot and control sties were chosen across four regions and included: Central County (beaches), East County (transit centers), North County (skate parks), and South County (parks). The study utilized intercept interviews, behavioral observations, and observations of accumulated trash as the methods of assessment.

Results of the study indicate that there were positive changes in knowledge and awareness, behavior, and load reductions at some of the sites as a result of intervention-implementation activities (Action Research, Inc., 2010).

Surveys

Some jurisdictions performed large-scale surveys where the results indicate that there is a general positive trend to change in behaviors related to the following actions/issues:

- Water conservation
- Picking up dog waste
- Picking up litter
- Cleaning gutters

BMP Implementation Rates

Some Copermittees compare BMP implementation rates for several of the regulated communities to determine Level 3 outcomes. However, because of the inconsistencies in the BMPs that are reviewed for compliance and the lack of standardized reporting, collective assessment is not possible at this time. With standards in place, BMPs for the following could be used for comparative analysis to determine Level 3 outcomes with respect to BMP implementation rates:

- Treatment Control BMP (TCBMP) Maintenance
- Construction Sites
- Municipal Areas and Activities
- Industrial/Commercial Facilities and Activities

Furthermore, facility compliance could be used as a determinant for Level 3 outcomes. Based on the complexity of standardization of BMPs and evaluation of BMPs, it may be appropriate to rate levels of compliance (e.g., full, partial, none, or immediate action needed). This can be done for the entire facility or groups of BMPs and assessed for behavior changes over time.

Anecdotal Evidence

Although not always tracked and measured, there are indicators that point towards positive changes in behaviors with respect to stormwater issues. Many Copermittees reported that through anecdotal evidence there have been changes to behaviors. Some of these anecdotal indicators are:

- SUSMP process implementation is easier because the development community is including BMPs in their first (or early in process) submittals as opposed to previous years
- Construction community is implementing BMPs more readily
- Municipal staff is implementing BMPs more readily
- Industrial/commercial businesses are implementing BMPs more readily

6.4.4.2 Assessment

In general, based upon the limited amount of data and information available, the Copermittees have made progress towards changing behavior of the general public, municipal staff, land development community, business owners and operators with respect to stormwater issues.

A regional example of progress toward changing behaviors of the general public is demonstrated through the Regional Residential Education calendar distributed. Among calendar recipients, who completed both the pre- and post-test surveys:

- There was a 69% decrease in the number of participants who reported hosing as clean-up method (16% at pre-test compared to 5% at follow-up).
- Reports of doing nothing for weed and pest control more than doubled. At pre-test 18% reported "none" as their method compared to 39% at post-test.

Telephone interviews with a subset of 30 individuals who remembered receiving the calendar revealed that:

- 73% of participants still had the calendar. Those who no longer had the calendar said that they gave it away to students, friends, or coworkers.
- 59% reported that they looked at the calendar on a daily basis; 39% looked at it weekly, and 5% looked monthly, indicating that the calendar is used regularly.
- Sixty-five percent (65%) of respondents who read the calendar said they made changes to their behavior as a result, validating that the calendar is an effective medium for education and outreach.

As previously mentioned, Think Blue's regional calendar received a positive response in regards to graphics, size, and layout. More importantly, the calendar successfully increased knowledge and awareness, suggesting that it is a viable medium for educating people about storm water pollution and promoting behavior change.

While the Regional telephone survey conducted does not provide a change in behavior at this time, the survey provided substantial information on current levels of polluting practices. These results of the survey can be used to refine outreach programs and utilized as a comparison for future regional or jurisdictional surveys (when the same questions are utilized). A summary of the baseline survey results as reported in the FY 2009-2010 RURMP Annual Report applicable to Level 3 is included below.

Level 3 results of the 2009 baseline telephone survey:

- **Pet waste pick up:** In 76% of households with dogs, the person who walks the dog always or nearly always picks up pet waste; 91% of those who picked up put it in the garbage, 3% hosed it or put it in the street, and 11% left it on the ground.
- **Over-irrigation:** 11% of those with sprinklers said a noticeable amount of water ends up in the street; 76% adjusted the sprinklers to reduce water in the previous year.
- **Reduced use of fertilizer:** 49% of those with yards said they used fertilizer in the previous year; 28% said they used pesticides or chemicals.
- **Sweeping instead of hosing:** 77% of those with driveways said they sweep it, 23% said they hose it down, and 39% blow materials off it.
- **Litter in trash cans:** 14% said they saw litter very frequently on their block; 33% said they always or nearly always pick up litter on their block and dispose of it in a trash container.

6.4.5 Source Reductions (Level 4 Outcomes)

6.4.5.1 Background

Aside from direct measurements of load reductions there is a lack of consistent data that supports Level 4 outcome assessments. There are models that, through gross assumptions, estimate source reductions based on several factors, including PMP implementation. These models do not have the supporting empirical evidence to validate their application on a collective scale; rather, individual Copermittees may use them for relative year-to-year comparisons.

6.4.5.2 Analysis

The Copermittees reported direct measurements as a result of their PMP implementation. The direct measurements that can be summarized collectively are presented below in **Table 6-13**.

Table 6-13: Level 4 Outcomes

	PMP Reporting Description	FY 2009 Result	FY 2010 Result	Total (where applicable)
1	Total amount of waste and litter (tons) removed from catch basins, inlets, MS4 and open channels *NOTE: More than 55% attributable to open channels*	19,002 tons	38,391 tons	57,393 tons
2	Total amount of material (tons) collected from street and parking lot sweeping	29,365 tons	23,534 tons	52,899 tons
3	Number of illicit discharges and connections eliminated.	779	2,063	2,842
4	Amounts of household hazardous wastes (tons) collected	2,093	4,680	6,773

Although not quantifiable, there are pollutant source reductions directly related to the Copermittees requiring the implementation of Treatment Control BMPs (TCBMPs) at development projects. There have been over 3,000 TCBMPs installed throughout the San Diego Region. Currently there are no valid methods of determining source reductions from the implementation of these TCBMPs, however, it is considered significant.

In addition to the pollutant removal described above for TCBMPs, the Copermittees have also required the implementation of Low Impact Development (LID) BMPs throughout the region. As a direct result of the LID BMPs, there is a source reduction in urban runoff flows. Although not quantifiable at this time, the flow source reduction is considered significant.

6.4.5.3 Assessment

In general, based upon the limited amount of data and information available, the Copermittees have made progress towards obtaining source reductions through PMP implementation and land development project implementation of LID and Treatment Control BMPs.

6.5 Integrated Assessment

This section discusses the integrated portion of the LTEA. **Figure 6-8** below, shows the Integrated Assessment portion of the larger LTEA process.

The following are the assessments required by the Permit:

Assessment of the effectiveness of Copermittee activities in addressing priority constituents and sources

Assessment of the relationship of program implementation to changes in pollutant loading, discharge quality, and receiving water quality

These assessments are paraphrased as "How effective are the Copermittees program at reducing pollutant loading, and improving discharge and receiving water quality?"

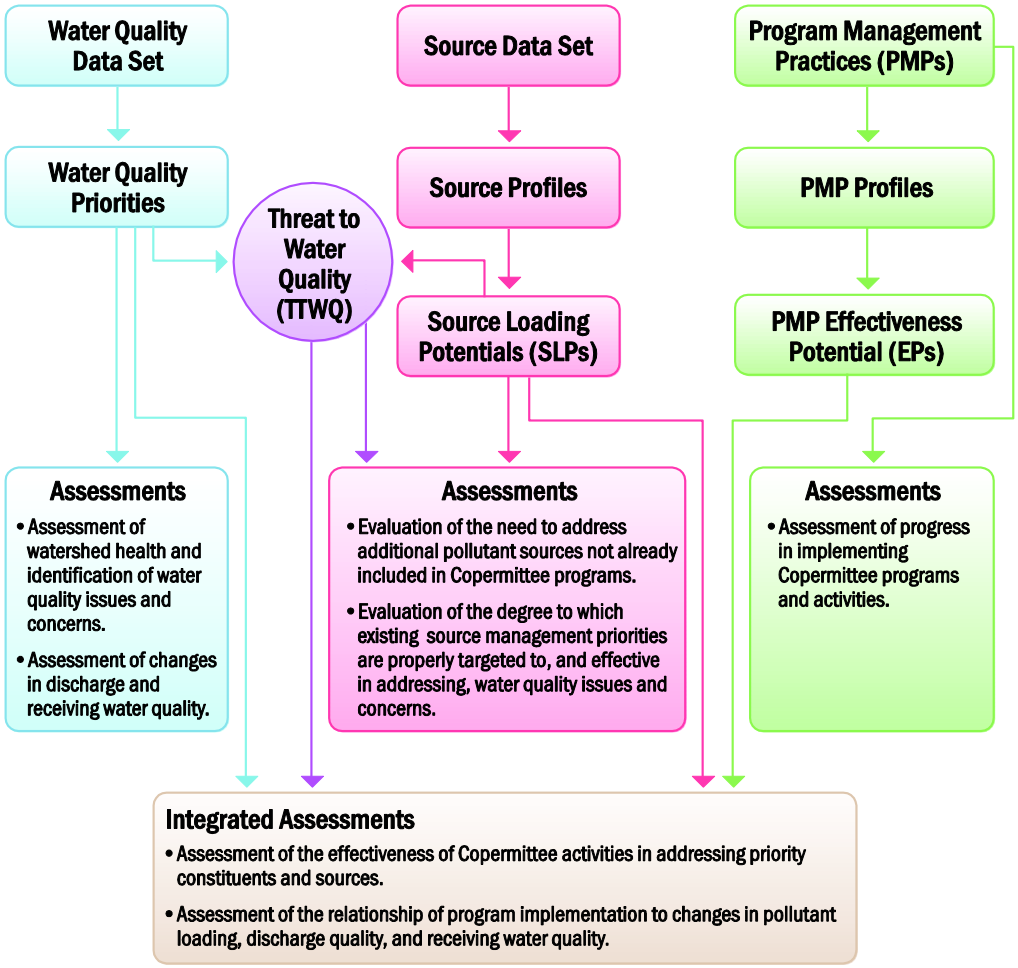

Figure 6-8: LTEA Process – Integrated Assessment

At this time there is not enough supporting data to make direct correlations between program implementation and measureable changes in pollutant loading, MS4 discharge quality and receiving water quality. *Based on the evidence and analysis provided in Sections 6.3 and 6.4 above, the Copermittees have made progress towards reducing pollutant loading, improvements to MS4 discharge quality and receiving waters quality*. However, it is not possible at this time to establish direct relationships between program implementation and the water quality assessment results summarized in Section 6.2 and Attachment 1, 2010-2011 LTEA Water Quality Report.

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7 Conclusions

Based on the analysis provided in Sections 2.0 through 6.0 of this LTEA, a number of conclusions can be drawn regarding the effectiveness of the Copermittees' programs over this Permit cycle. These are summarized in Table 7-1. A more detailed discussion of each can also be found the specific LTEA sections referenced in the Table. As required by Permit Section I.3.a.(6), these conclusions serve as a basis for many of the recommendations provided in the Copermittees' Report of Waste Discharge.

Table 7-1: Summary of Conclusions

Assessment / Evaluation	Conclusions
Evaluation of Progress in Developing and Implementing Monitoring Programs (LTEA Section 6.2.1)	Copermittees are implementing the monitoring program consistent with the Permit requirements
Assessment of Watershed Health and Identification of Water Quality Issues and Concerns (LTEA Section 6.2.2)	Wet Weather – In general, wet weather receiving water quality priorities are associated with the following issues: mobilization and migration of sediment during storm events as measured by total suspended solids and turbidity; bacterial indicators as reflected by fecal coliform; and the detection of synthetic pyrethroid pesticides. There are also some differences in the priority of these constituents among watersheds as reflected in different land use distributions and pollutant-generating activities in the watershed, physical conditions, and flow characteristics. Dry Weather – In general, the receiving water quality priorities under ambient or dry weather conditions, based on two years of data, indicate a countywide issue with bacteria indicators (largely enterococci and also fecal coliform), nutrients, and total dissolved solids. The level of priority and the specific nutrients vary among watersheds, which is reflective of varying source contributions and the presence of flows.
Assessment of Changes in Discharge Water Quality (Level 5 Outcomes) (LTEA Section 6.2.3)	At this time it is not possible to identify changes in water quality in outfall discharges because only two of the five years of program data have been collected. Changes in MS4 discharge quality will be reported in the coming years as this program continues to collect data and information. The temporal resolution of these data sets will improve as well in the coming years. In the LTEA WQ Report (Attachment 1, Sections 2 through 10) discharge loading characteristics are estimated and ranked for wet weather flows. These will help to establish a baseline for future comparisons of changes in the loads. The current assessment presents observed dry weather flow conditions at the MS4 outfalls; these data may also be used as a basis for comparison with future monitoring.
Assessment of Changes in Receiving Water Quality (Level 6 Outcomes) (LTEA Section 6.2.4)	The results of the trend analysis for the MLS in the receiving water are presented in **Table 6-4** in Section 6. Changes in ambient conditions will be reported in the coming years as the ambient receiving water program continues to collect data and information.
Evaluation of the need to address additional pollutant sources not already included in Copermittee programs (LTEA Section 6.3.1)	The analysis performed resulted in no additional sources recommended for inclusion in the Copermittees' programs at this time.
Evaluation of the degree to which existing source management priorities are properly targeted to, and effective in addressing, water quality issues and concerns (LTEA Section 6.3.2)	The Copermittees have identified potential sources of the pollutants of concern. Copermittee programs would benefit from determining the relative importance of these sources in order to allow for the most efficient allocation of resources.
Assessment of progress in implementing Copermittee programs and activities (LTEA Section 6.4.1)	Based upon the data and information provided, collectively, the Copermittees met their Permit requirements.

Assessment / Evaluation	Conclusions
Assessment of the effectiveness of Copermittee activities in addressing priority constituents and sources (LTEA Section 6.5)	At this time there is still not enough supporting data to make direct correlations between program implementation and measureable changes in pollutant loading, MS4 discharge quality and receiving water quality. *Based on the evidence and analysis provided in Sections 6.3 and 6.4 of the report, the Copermittees have made progress towards reducing pollutant loading, improvements to MS4 discharge quality and receiving waters quality*.
Assessment of the relationship of program implementation to changes in pollutant loading, discharge quality, and receiving water quality (LTEA Section 6.5)	At this time there is still not enough supporting data to make direct correlations between program implementation and measureable changes in pollutant loading, MS4 discharge quality and receiving water quality. *Based on the evidence and analysis provided in Sections 6.3 and 6.4 of the report, the Copermittees have made progress towards reducing pollutant loading, improvements to MS4 discharge quality and receiving waters quality*.

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1 Home Automobile Associated Activities, Home and Garden Care, and Waste Disposal

Narrative Description

This Source Profile Sheet primarily covers home automobile associated activities, home and garden care activities, and waste. This includes typical residential outdoor activities, such as landscape maintenance, home maintenance/repair, and vehicle maintenance/repair.

Home automobile associated activities, home and garden care, and waste disposal are not classified under the Standard Industrial Classification (SIC) system or the North American Industry Classification System (NAICS).

Pollutant Generating Activities and Associated Pollutants

The following tables contain a list of activities commonly associated with home automobile associated activities, home and garden care, and waste disposal which may have a source loading potential. Possible pollutants associated with these activities are also presented. Table 1-1 contains a list of activities with a source loading potential in wet weather and Table 1-2 contains a list of activities with source loading potential in dry weather.

The activities below were evaluated for potential pollutant generation during wet weather and dry weather. Wet weather potentials consider runon and runoff during wet weather events. Dry weather potentials are based on the assumption that irrigation and cleaning activities act as transport mechanisms. Furthermore, it is assumed that no BMPs are in place.

Table 1-1. Summary of typical activities and associated pollutants during wet weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacteria/ Pathogens*
Residential Areas and Activities									
Storage of pesticides and fertilizers		X				X	X		
Storage of solid wastes and garden/pet wastes	X	X	X	X		X	X		X
Storage of any liquid materials in portable containers	X	X	X			X	X		
Hazardous waste disposal	X	X	X						
Vehicle and equipment maintenance and repair	X	X	X						
Paint removal and painting	X	X	X					X	
Home repair				X				X	
Landscape maintenance				X	X	X	X	X	
Waste handling and disposal	X	X	X					X	

Table 1-2. Summary of typical activities and associated pollutants during dry weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacteria/ Pathogens*
Residential Areas and Activities									
Landscape maintenance				X	X	X	X	X	

Discharge Potential

As part of the initial 2005 LTEA effort, a questionnaire was completed by various Copermittees to assess the likely potential of a specific source discharging pollutants. Using existing information (e.g. illicit discharge records) and field knowledge the Copermittees ranked the potential of discharging pollutants. These rankings were averaged (when a ranking was given) to obtain average discharge potential rankings for each information type. See Table 1-3 for a summary of the results. An overall ranking was also determined for the source by taking the maximum average ranking from each of the information types. When only one information type received a score, due to lack of information, the average ranking from that one information type was neglected in the overall ranking determination. In these cases the overall ranking was set to 3, meaning

the currently available information does not adequately characterize the discharge potential.

Table 1-3. Ranking of discharge potential using existing information.

home automobile associated activities, home and garden care activities, waste disposal			
Information Types	***Information Available***	***Average Ranking***	***Comments***
Dry Weather Monitoring	Y	5	
Illicit Discharge Records	Y	5	
Pretreatment Compliance Records			
Underground Stoage Tank Records			
Haz Waste Storage Records			
Inspection Records			
Other information? Please specify here		4	
Overall Ranking		**5.0**	

Note: Overall Ranking is the highest 'Average Ranking' received for the various information types. When less than 2 scores were given, due to lack of information, the Overall Ranking was adjusted to 3 - Unknown Potential.

Scoring Legend	
1	- low discharge potential
2	- medium-low discharge potential
3	- Unknown, information does not adequately characterize
4	- medium-high discharge potential
5	- high discharge potential

A review of Table 1-3 shows that while the sources of information are limited, the Copermittees considered home activities having a high potential for discharging pollutants

It should be noted that a blank ranking in Table 1-3 does not necessarily mean that there is no discharge potential but rather the Copermittee chose not to rank the potential. As more information is collected, these blanks will be filled in and a more comprehensive ranking established.

Legal/Regulatory Oversight

Table 1-4 provides a summary of the types of regulatory oversight that pertain to home automobile associated activities, home and garden care, and waste disposal. In some cases, there may be some overlap in the types of regulatory oversight.

Table 1-4. Summary of regulatory oversight of home automobile associated activities, home and garden care, and waste disposal sources.

Home automobile associated activities, home and garden care activities, waste disposal			
Oversight Type	**Regulatory Oversight**		**Comments**
Stormwater	NPDES Municipal Permit / Local Ordinances	X	
	NPDES General Industrial Permit		
	NPDES General Construction Permit		
Other Regulatory Oversight	Industrial Pretreatment Program (EPA)		
	Hazardous Materials / CUPA (County DEH)		
	CURFFL (County DEH)		
	Local Enforcement Agency - Landfills (County DEH)		
	Air Quality Permits (APCD)		
	Fire Agencies		
	Pesticide Regulatory Program (County AW&M)		
	Coast Guard		

Existing regulatory oversight of home activities is limited regarding stormwater issues.

Source Prevalence and Distribution

The 2005 Baseline LTEA effort produced source distribution information, if available, is provided in this section. Numerous resources were relied upon in order to obtain an as accurate as feasible estimate of the number of sources throughout San Diego County. The objective was to locate the sources within watersheds and sub-watersheds. When this was feasible, the sources are termed ‘geo-coded’, meaning there geographic coordinates are known and can be included in a GIS map. In some instances, it was not feasible to geo-code some sources. This is the case with home activities because of the ubiquitous nature of the activities. Instead land use maps are typically used to assess the prevalence of these pollutant generating activities.

2 Construction Sites > 1 Acre

Narrative Description

This Source Profile Sheet covers construction projects greater than one acre in size.

SIC Codes	
23XX	Construction

NAICS Codes	
23XXXX	Construction

Some construction sites were historically classified under the Standard Industrial Classification (SIC) system. This system has been slowly replaced by the North American Industry Classification System (NAICS), which accommodates a larger number of industrial sectors and sub-sectors, and identifies hundreds of new, emerging, and advanced technology industries. As most Copermittees have yet to convert from the SIC system to the NAICS, the applicable codes from both systems are presented here for easy reference.

Pollutant Generating Activities and Associated Pollutants

The following tables contain a list of activities commonly associated with construction sites greater than one acre in size which may have a source loading potential. Possible pollutants associated with these activities are also presented. Table 2-1 contains a list of activities with a source loading potential in wet weather and Table 2-2 contains a list of activities with source loading potential in dry weather.

The activities below were evaluated for potential pollutant generation during wet weather and dry weather. Wet weather potentials consider runon and runoff during wet weather events. Dry weather potentials are based on the assumption that irrigation and cleaning activities act as transport mechanisms. Furthermore, it is assumed that no BMPs are in place.

Table 2-1. Summary of typical activities and associated pollutants during wet weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacteria/ Pathogens*
Sites > 1 acre									
Clearing, grading, and preparation of construction sites		X	X	X	X	X	X		
Demolition of buildings	X	X		X				X	
Building repair, remodeling and construction	X	X	X	X					
Concrete and asphalt preparation, cutting, curing, and finishing	X	X	X	X	X			X	
Paint removal and painting	X	X	X					X	
Loading and unloading	X	X	X	X			X		
Storage of raw materials, products, and containers	X	X	X	X			X	X	
Waste handling and disposal	X	X	X					X	
Operation of outdoor equipment	X	X	X	X					
Vehicle and equipment fueling	X	X	X						
Vehicle and equipment maintenance and repair	X	X	X				X		X
Portable toilets							X		X
Dewatering activities					X		X		

Table 2-2. Summary of typical activities and associated pollutants during dry weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacteria/ Pathogens*
Sites > 1 acre									
Grounds/landscape maintenance				X	X	X	X	X	
Dewatering activities					X		X		

Discharge Potential

As part of the initial 2005 LTEA effort, a questionnaire was completed by various Copermittees to assess the likely potential of a specific source discharging pollutants. Using existing information (e.g. illicit discharge records) and field knowledge the Copermittees ranked the potential of discharging pollutants. These rankings were averaged (when a ranking was given) to obtain average discharge potential rankings for

each information type. See Table 2-3 for a summary of the results. An overall ranking was also determined for the source by taking the maximum average ranking from each of the information types. When only one information type received a score, due to lack of information, the average ranking from that one information type was neglected in the overall ranking determination. In these cases the overall ranking was set to 3, meaning the currently available information does not adequately characterize the discharge potential.

Table 2-3. Ranking of discharge potential using existing information.

Construction Sites > 1 Acre			
Information Types	*Information Available*	*Average Ranking*	*Comments*
Dry Weather Monitoring			
Illicit Discharge Records	Y	5	
Pretreatment Compliance Records			
Underground Storage Tank Records			
Haz Waste Storage Records			
Inspection Records	Y	5	
Other information? Please specify here		4	
Overall Ranking		5.0	

Note: Overall Ranking is the highest 'Average Ranking' received for the various information types. When less than 2 scores were given, due to lack of information, the Overall Ranking was adjusted to 3 - Unknown Potential.

Scoring Legend	
1	- low discharge potential
2	- medium-low discharge potential
3	- Unknown, information does not adequately characterize
4	- medium-high discharge potential
5	- high discharge potential

A review of Table 2-3 shows that there appears to be several sources of information that may be used to assess the discharge potential. As more information is collected and evaluated, the ranking potential will be updated.

It should be noted that a blank ranking in Table 2-3 does not necessarily mean that there is no discharge potential but rather the Copermittee chose not to rank the potential. As more information is collected these blanks will be filled in and a more comprehensive ranking established.

Legal/Regulatory Oversight

Table 2-4 provides a summary of the types of regulatory oversight that pertain to construction sites. In some cases, there may be some overlap in the types of regulatory oversight.

2 Construction Sites > 1 Acre

Table 2-4.Summary of the stormwater-related and non-stormwater related regulatory oversight of construction sites.

Construction sites			
Oversight Type	**Regulatory Oversight**		**Comments**
Stormwater	NPDES Municipal Permit / Local Ordinances	X	
	NPDES General Industrial Permit		
	NPDES General Construction Permit	X	
Other Regulatory Oversight	Industrial Pretreatment Program (EPA)		
	Hazardous Materials / CUPA (County DEH)		
	CURFFL (County DEH)		
	Local Enforcement Agency - Landfills (County DEH)		
	Air Quality Permits (APCD)		
	Fire Agencies		
	Pesticide Regulatory Program (County AW&M)		
	Coast Guard		

Source Prevalence and Distribution

The 2005 Baseline LTEA effort produced source distribution information, if available, is provided in this section. Numerous resources were relied upon in order to obtain an as accurate as feasible estimate of the number of sources throughout San Diego County. The objective was to locate the sources within watersheds and sub-watersheds. When this was feasible, the sources are termed 'geo-coded', meaning there geographic coordinates are known and can be included in a GIS map.

Table 2-5 - Summary of construction sites within each of San Diego County's Watersheds.

Watershed Management Area	Hydrologic Unit (HU)	Construction projects
		Total # of Geo-Coded Sources
Santa Margarita	*902.00*	98
San Luis Rey	*903.00*	918
Carlsbad	*904.00*	919
San Dieguito	*905.00*	925
Penasquitos	*906.10 - 906.20*	92
Mission Bay	*906.30 - 906.50*	0
San Diego	*907.00*	1410
San Diego Bay - Pueblo	*908.00*	1674
San Diego Bay - Sweetwater	*909.00*	
San Diego Bay - Otay	*910.00*	
Tijuana	*911.00*	120
Total Geo-Coded Sources		6156
Total Sources (incl. Non geo-coded)		37212

In some instances, it was not feasible to geo-code some sources. In Table 2-5, the number of geo-coded construction sites >1 acre and active in winter within each watershed is shown, along with the total number of sources (geo-coded and not geo-coded together). In this case, the geographic coordinates for all of the identified sources have not yet been determined.

While the inventory process attempted to ensure there is no overlap between priority sources identified, there may be some overlap of the identified sources with sources identified in other Source Profile Sheets. This may be the case for the construction sources that may also be classified as general contractors (SPS#19).

The source inventory is further broken down in Table 2-6 to show the prevalence of construction sites within each sub-watershed. This information, combined with the concurrent water quality assessment of sub-watersheds throughout San Diego County will ultimately help to assess the threat these facilities pose to water quality by source and constituent. It is recommended that municipalities use updated source information from the County, as available, to develop revised source prevalence and distribution data.

Table 2-6– Summary of construction sites within each of San Diego County's sub-watersheds.

		Construction projects									
Watershed Management Area	Hydrologic Unit (HU)	*Sources Geo-Coded by Sub-watershed Hydrologic Unit*									Total # of Sources
		90X.10	*90X.20*	*90X.30*	*90X.40*	*90X.50*	*90X.60*	*90X.70*	*90X.80*	*90X.90*	
Santa Margarita	*902.XX*	42	49	0	0	0	0	0	0	7	98
San Luis Rey	*903.XX*	750	86	26							918
Carlsbad	*904.XX*	32	51	150	6	123	360				919
San Dieguito	*905.XX*	492	119	47	225	19					925
Penasquitos	*906.XX*	9	83								92
Mission Bay	*906.XX*			0	0	0					0
San Diego	*907.XX*	694	275	205	230						1410
San Diego Bay - Pueblo	*908.XX*	0	2	0							1674
San Diego Bay - Sweetwater	*909.XX*	378	751	91							
San Diego Bay - Otay	*910.XX*	367	1	73							
Tijuana	*911.XX*	2	10	4	17	7	2	1	75		120
							Total Geo-Coded Sources				6156
							Total Sources (incl. Non geo-coded)				37212

3 Construction Sites < 1 Acre

Narrative Description

This Source Profile Sheet covers construction projects less than one acre in size.

SIC Codes	
23XX	Construction

NAICS Codes	
23XXXX	Construction

Some construction sites were historically classified under the Standard Industrial Classification (SIC) system. This system has been slowly replaced by the North American Industry Classification System (NAICS), which accommodates a larger number of industrial sectors and sub-sectors, and identifies hundreds of new, emerging, and advanced technology industries. As most Copermittees have yet to convert from the SIC system to the NAICS, the applicable codes from both systems are presented here for easy reference.

Pollutant Generating Activities and Associated Pollutants

The following tables contain a list of activities commonly associated with construction sites less than one acres in size which may have a source loading potential. Possible pollutants associated with these activities are also presented. Table 3-1 contains a list of activities with a source loading potential in wet weather and Table 3-2 contains a list of activities with source loading potential in dry weather.

The activities below were evaluated for potential pollutant generation during wet weather and dry weather. Wet weather potentials consider runon and runoff during wet weather events. Dry weather potentials are based on the assumption that irrigation and cleaning activities act as transport mechanisms. Furthermore, it is assumed that no BMPs are in place.

Table 3-1. Summary of typical activities and associated pollutants during wet weather

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacteria/ Pathogens*
Sites < 1 acre									
Clearing, grading, and preparation of construction sites		X	X	X	X	X	X		
Demolition of buildings	X	X		X				X	
Building repair, remodeling and construction	X	X	X	X					
Paint removal and painting	X	X	X					X	
Loading and unloading	X	X	X	X			X		
Storage of raw materials, products, and containers	X	X	X	X			X	X	
Waste handling and disposal	X	X	X					X	
Operation of outdoor equipment	X	X	X	X					
Vehicle and equipment fueling	X	X	X						
Vehicle and equipment maintenance and repair	X	X	X				X		X
Portable toilets							X		X
Dewatering activities					X		X		

Table 3-2– Summary of typical activities and associated pollutants during dry weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacteria/ Pathogens*
Sites < 1 acre									
Grounds/landscape maintenance				X	X	X	X	X	
Dewatering activities					X		X		

Discharge Potential

As part of the initial 2005 LTEA effort, a questionnaire was completed by various Copermittees to assess the likely potential of a specific source discharging pollutants. Using existing information (e.g. illicit discharge records) and field knowledge the Copermittees ranked the potential of discharging pollutants. These rankings were averaged (when a ranking was given) to obtain average discharge potential rankings for each information type. The questionnaire was directed at construction sites in general

with no distinction in size. For this reason all construction sites (i.e. <1ac, >1 ac, hillside lots) were rated the same for discharge potential. See Table 3-3 for a summary of the results. An overall ranking was also determined for the source by taking the maximum average ranking from each of the information types. When only one information type received a score, due to lack of information, the average ranking from that one information type was neglected in the overall ranking determination. In these cases the overall ranking was set to 3, meaning the currently available information does not adequately characterize the discharge potential.

Table 3-3 – Ranking of discharge potential using existing information.

Construction Sites < 1 acre			
Information Types	*Information Available*	*Average Ranking*	*Comments*
Dry Weather Monitoring			
Illicit Discharge Records	Y	5	
Pretreatment Compliance Records			
Underground Storage Tank Records			
Haz Waste Storage Records			
Inspection Records	Y	5	
Other information? Please specify here		4	
Overall Ranking		5.0	

Note: Overall Ranking is the highest 'Average Ranking' received for the various information types. When less than 2 scores were given, due to lack of information, the Overall Ranking was adjusted to 3 - Unknown Potential.

Scoring Legend	
1	- low discharge potential
2	- medium-low discharge potential
3	- Unknown, information does not adequately characterize
4	- medium-high discharge potential
5	- high discharge potential

A review of Table 3-3 shows that there appears to be several sources of information that may be used to assess the discharge potential. As more information is collected and evaluated, the ranking potential will be updated.

It should be noted that a blank ranking in Table 3-3 does not necessarily mean that there is no discharge potential but rather the Copermittee chose not to rank the potential. As more information is collected these blanks will be filled in and a more comprehensive ranking established.

Legal/Regulatory Oversight

Table 3-4 provides a summary of the types of regulatory oversight that pertain to construction sites. In some cases, there may be some overlap in the types of regulatory oversight.

Table 3-4. Summary of the stormwater-related and non-stormwater related regulatory oversight of construction sites.

Construction sites			
Oversight Type	Regulatory Oversight		Comments
Stormwater	NPDES Municipal Permit / Local Ordinances	X	
	NPDES General Industrial Permit		
	NPDES General Construction Permit	X	
Other Regulatory Oversight	Industrial Pretreatment Program (EPA)		
	Hazardous Materials / CUPA (County DEH)		
	CURFFL (County DEH)		
	Local Enforcement Agency - Landfills (County DEH)		
	Air Quality Permits (APCD)		
	Fire Agencies		
	Pesticide Regulatory Program (County AW&M)		
	Coast Guard		

Source Prevalence and Distribution

The 2005 Baseline LTEA effort produced source distribution information, if available, for construction projects greater than one acre in size, but not for smaller construction projects. Therefore, it is recommended that new source information be obtained from the County to develop source prevalence and distribution data.

4 Construction Projects – ESA, Hillside, or Sediment TMDL

Narrative Description

This Source Profile Sheet covers construction projects in environmentally sensitive areas (ESA), on hillsides, or in locations where a sediment total maximum daily load (TMDL) has been enacted.

SIC Codes	
23XX	Construction

NAICS Codes	
23XXXX	Construction

Some construction sites were historically classified under the Standard Industrial Classification (SIC) system. This system has been slowly replaced by the North American Industry Classification System (NAICS), which accommodates a larger number of industrial sectors and sub-sectors, and identifies hundreds of new, emerging, and advanced technology industries. As most Copermittees have yet to convert from the SIC system to the NAICS, the applicable codes from both systems are presented here for easy reference.

Pollutant Generating Activities and Associated Pollutants

The following tables contain a list of activities commonly associated with these types of construction sites which may have a source loading potential. Possible pollutants associated with these activities are also presented. Table 4-1contains a list of activities with a source loading potential in wet weather and Table 4-2 contains a list of activities with source loading potential in dry weather.

The activities below were evaluated for potential pollutant generation during wet weather and dry weather. Wet weather potentials consider runon and runoff during wet weather events. Dry weather potentials are based on the assumption that irrigation and cleaning activities act as transport mechanisms. Furthermore, it is assumed that no BMPs are in place.

Table 4-1. Summary of typical activities and associated pollutants during wet weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacteria/ Pathogens*
Construction Sites - ESA or hillside or sediment TMDL									
Cleaning, grading, and preparation of construction sites		X	X	X	X	X	X		
Demolition of buildings	X	X		X				X	
Building repair, remodeling and construction	X	X	X	X					
Paint removal and painting	X	X	X					X	
Loading and unloading	X	X	X	X			X		
Storage of raw materials, products, and containers	X	X	X	X			X	X	
Waste handling and disposal	X	X	X					X	
Operation of outdoor equipment	X	X	X	X					
Vehicle and equipment fueling	X	X	X						
Vehicle and equipment maintenance and repair	X	X	X				X		X
Portable toilets							X		X
Dewatering activities					X		X		

Table 4-2 - Summary of typical activities and associated pollutants during wet weather

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacteria/ Pathogens*
Construction Sites - ESA or hillside or sediment TMDL									
Grounds/landscape maintenance				X	X	X	X	X	
Dewatering activities					X		X		

Discharge Potential

As part of the initial 2005 LTEA effort, a questionnaire was completed by various Copermittees to assess the likely potential of a specific source discharging pollutants. Using existing information (e.g. illicit discharge records) and field knowledge the Copermittees ranked the potential of discharging pollutants. These rankings were averaged (when a ranking was given) to obtain average discharge potential rankings for each information type. The questionnaire was directed at construction sites in general

with no distinction is size. For this reason all construction sites (i.e. <1ac, >1 ac, hillside lots) were rated the same for discharge potential. See Table 4-3 for a summary of the results. An overall ranking was also determined for the source by taking the maximum average ranking from each of the information types. When only one information type received a score, due to lack of information, the average ranking from that one information type was neglected in the overall ranking determination. In these cases the overall ranking was set to 3, meaning the currently available information does not adequately characterize the discharge potential.

Table 4-3 – Ranking of discharge potential using existing information.

Construction Sites – ESA, Hillside, or Sediment TMDL			
Information Types	*Information Available*	*Average Ranking*	*Comments*
Dry Weather Monitoring			
Illicit Discharge Records	Y	5	
Pretreatment Compliance Records			
Underground Storage Tank Records			
Haz Waste Storage Records			
Inspection Records	Y	5	
Other information? Please specify here		4	
Overall Ranking		5.0	

Note: Overall Ranking is the highest 'Average Ranking' received for the various information types. When less than 2 scores were given, due to lack of information, the Overall Ranking was adjusted to 3 - Unknown Potential.

Scoring Legend	
1	- low discharge potential
2	- medium-low discharge potential
3	- Unknown, information does not adequately characterize
4	- medium-high discharge potential
5	- high discharge potential

A review of Table 4-3 shows that there appears to be several sources of information that may be used to assess the discharge potential. As more information is collected and evaluated, the ranking potential will be updated. It should be noted that a blank ranking in Table 4-3 does not necessarily mean that there is no discharge potential but rather the Copermittee chose not to rank the potential. As more information is collected these blanks will be filled in and a more comprehensive ranking established.

Legal/Regulatory Oversight

Table 4-4 provides a summary of the types of regulatory oversight that pertain to construction sites. In some cases, there may be some overlap in the types of regulatory oversight.

Table 4-4. Summary of the stormwater-related and non-stormwater related regulatory oversight of construction sites.

Construction sites			
Oversight Type	**Regulatory Oversight**		**Comments**
Stormwater	NPDES Municipal Permit / Local Ordinances	X	
	NPDES General Industrial Permit		
	NPDES General Construction Permit	X	
Other Regulatory Oversight	Industrial Pretreatment Program (EPA)		
	Hazardous Materials / CUPA (County DEH)		
	CURFFL (County DEH)		
	Local Enforcement Agency - Landfills (County DEH)		
	Air Quality Permits (APCD)		
	Fire Agencies		
	Pesticide Regulatory Program (County AW&M)		
	Coast Guard		

Source Prevalence and Distribution

The 2005 Baseline LTEA effort produced source distribution information for construction projects greater than one acre in size, but not for these specific types of construction projects. It is recommended that municipalities use updated source information.

5 Development Subject to SUSMPs (>5,000sf Impervious Area)

Narrative Description

This Source Profile Sheet primarily covers developments subject to SUSMP requirements.

Developments subject to SUSMPs are not classified under the Standard Industrial Classification (SIC) system or the North American Industry Classification System (NAICS).

Pollutant Generating Activities and Associated Pollutants

The following tables contain a list of activities commonly associated with development subject to SUSMPs which may have a source loading potential. Possible pollutants associated with these activities are also presented. Table 5-1contains a list of activities with a source loading potential in wet weather and Table 5-2 contains a list of activities with source loading potential in dry weather.

The activities below were evaluated for potential pollutant generation during wet weather and dry weather. Wet weather potentials consider runon and runoff during wet weather events. Dry weather potentials are based on the assumption that irrigation and cleaning activities act as transport mechanisms. Furthermore, it is assumed that no BMPs are in place.

Table 5-1. Summary of typical activities and associated pollutants during wet weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacterial/ Pathogens*
Development subject to SUSMPs (>5,000 sq. ft. impervious area)									
Home subdivisions of 100 housing units or more.	X	X	X	X	X	X	X	X	X
Home subdivisions of 10-99 housing units.	X	X	X	X	X	X	X	X	X
Commercial developments greater than 100,000 square feet.	X	X	X	X	X	X	X	X	X
Automotive repair shops.	X	X	X	X			X	X	X
Restaurants (with landscape)	X	X	X	X	X	X	X	X	X
All hillside development greater than 5,000 square feet.	X	X		X	X	X	X	X	
Development near Environmentally Sensitive Areas	X	X		X	X	X	X	X	
Parking lots 5,000 square feet or more or with 15 or more parking spaces and potentially exposed to urban runoff.	X	X	X	X			X	X	X
Street, roads, highways, and freeways.	X	X	X	X	X	X	X	X	
Retail Gasoline Outlets.	X	X	X	X			X		

Table 5-2. Summary of typical activities and associated pollutants during dry weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacterial/ Pathogens*
Development subject to SUSMPs (>5,000 sq. ft. impervious area)									
Development (with landscape)				X	X	X	X	X	

Discharge Potential

As part of the initial 2005 LTEA effort, a questionnaire was completed by various Copermittees to assess the likely potential of a specific source discharging pollutants. Using existing information (e.g. illicit discharge records) and field knowledge the Copermittees ranked the potential of discharging pollutants. These rankings were averaged (when a ranking was given) to obtain average discharge potential rankings for each information type. See Table 5-3 for a summary of the results. An overall ranking

was also determined for the source by taking the maximum average ranking from each of the information types. When only one information type received a score, due to lack of information, the average ranking from that one information type was neglected in the overall ranking determination. In these cases the overall ranking was set to 3, meaning the currently available information does not adequately characterize the discharge potential.

Table 5-3 – Ranking of discharge potential using existing information.

Development subject to SUSMPs			
Information Types	*Information Available*	*Average Ranking*	*Comments*
Dry Weather Monitoring			
Illicit Discharge Records	Y	2	
Pretreatment Compliance Records			
Underground Stoage Tank Records			
Haz Waste Storage Records			
Inspection Records			
Other information? Please specify here		2	
Overall Ranking		**2.0**	

Note: Overall Ranking is the highest 'Average Ranking' received for the various information types. When less than 2 scores were given, due to lack of information, the Overall Ranking was adjusted to 3 - Unknown Potential.

Scoring Legend	
1	- low discharge potential
2	- medium-low discharge potential
3	- Unknown, information does not adequately characterize
4	- medium-high discharge potential
5	- high discharge potential

A review of Table 5-3 shows that there is limited information available to assess discharge potential. Of the information available a more complete evaluation should be conducted to assess discharge potential.

It should be noted that a blank ranking in Table 5-3 does not necessarily mean that there is no discharge potential but rather the Copermittee chose not to rank the potential. As more information is collected these blanks will be filled in and a more comprehensive ranking established.

Legal/Regulatory Oversight

Table 5-4 provides a summary of the types of regulatory oversight that pertain to development subject to SUSMPs. In some cases, there may be some overlap in the types of regulatory oversight.

Table 5-4. Summary of the stormwater-related and non-stormwater related regulatory oversight of development subject to SUSMPs.

Development subject to SUSMPs			
Oversight Type	Regulatory Oversight		Comments
Stormwater	NPDES Municipal Permit / Local Ordinances	X	
	NPDES General Industrial Permit		
	NPDES General Construction Permit		
Other Regulatory Oversight	Industrial Pretreatment Program (EPA)		
	Hazardous Materials / CUPA (County DEH)		
	CURFFL (County DEH)		
	Local Enforcement Agency - Landfills (County DEH)		
	Air Quality Permits (APCD)		
	Fire Agencies		
	Pesticide Regulatory Program (County AW&M)		
	Coast Guard		

Existing regulatory oversight of SUSMP development is limited regarding stormwater issues.

Source Prevalence and Distribution

The 2005 Baseline LTEA effort produced source distribution information, if available, is provided in this section. It is recommended that updated source information is used to develop revised source prevalence and distribution data.

Numerous resources were relied upon in order to obtain an as accurate as feasible estimate of the number of sources throughout San Diego County. The objective was to locate the sources within watersheds and sub-watersheds. When this was feasible, the sources are termed ‘geo-coded’, meaning there geographic coordinates are known and can be included in a GIS map. In some instances, it was not feasible to geo-code some sources. In Table 5-5, the number of geo-coded developments subject to SUSMP sources within each watershed is shown, along with the total number of sources (geo-coded and not geo-coded together). In this case, the geographic coordinates for all of the identified sources have not yet been determined.

While the inventory process attempted to ensure there is no overlap between priority sources identified, there may be some overlap of the identified sources with sources identified in other Source Profile Sheets.

Table 5-5 - Summary of developments subject to SUSMP sources within each of San Diego County's Watersheds.

Watershed Management Area	Hydrologic Unit (HU)	New development and significant redevelopment projects
		Total # of Geo-Coded Sources
Santa Margarita	*902.00*	10
San Luis Rey	*903.00*	115
Carlsbad	*904.00*	298
San Dieguito	*905.00*	87
Penasquitos	*906.10 - 906.20*	17
Mission Bay	*906.30 - 906.50*	0
San Diego	*907.00*	79
San Diego Bay - Pueblo	*908.00*	82
San Diego Bay - Sweetwater	*909.00*	
San Diego Bay - Otay	*910.00*	
Tijuana	*911.00*	10
Total Geo-Coded Sources		698
Total Sources (incl. Non geo-coded)		1176

The source inventory is further broken down in Table 5-6 to show the prevalence of development subject to SUSMPs facilities within each sub-watershed. This information, combined with the concurrent water quality assessment of sub-watersheds throughout San Diego County will ultimately help to assess the threat these facilities pose to water quality by source and constituent.

<u>It is recommended that municipalities use updated source information from the County, as available, to develop revised source prevalence and distribution data.</u>

Table 5-6. Summary of developments subject to SUSMPs within each of San Diego County's sub-watersheds.

		New development and significant redevelopment projects									
Watershed Management Area	Hydrologic Unit (HU)	*Sources Geo-Coded by Sub-watershed Hydrologic Unit*									Total # of Sources
		90X.10	*90X.20*	*90X.30*	*90X.40*	*90X.50*	*90X.60*	*90X.70*	*90X.80*	*90X.90*	
Santa Margarita	*902.XX*	0	0	0	0	0	0	0	0	0	10
San Luis Rey	*903.XX*	0	0	0							115
Carlsbad	*904.XX*	21	13	14	4	48	0				298
San Dieguito	*905.XX*	0	0	0	0	0					87
Penasquitos	*906.XX*	0	17								17
Mission Bay	*906.XX*			0	0	0					0
San Diego	*907.XX*	25	0	0	0						79
San Diego Bay - Pueblo	*908.XX*	0	0	3							82
San Diego Bay - Sweetwater	*909.XX*	0	0	0							
San Diego Bay - Otay	*910.XX*	4	0	0							
Tijuana	*911.XX*	0	0	0	0	0	0	0	0		10
							Total Geo-Coded Sources				698
							Total Sources (incl. Non geo-coded)				1176

6 Roads, Streets, Highways, and Parking Facilities

Narrative Description

This Source Profile Sheet covers the municipal management of roads, streets, highways and parking facilities.

Roads, Streets, Highways, and Parking Facilities are not classified under the Standard Industrial Classification (SIC) system or the North American Industry Classification System (NAICS).

Pollutant Generating Activities and Associated Pollutants

The following tables contain a list of activities commonly associated with home automobile associated activities, home and garden care, and waste disposal which may have a source loading potential. Possible pollutants associated with these activities are also presented. Table 6-1 contains a list of activities with a source loading potential in wet weather and Table 6-2 contains a list of activities with source loading potential in dry weather.

The activities below were evaluated for potential pollutant generation during wet weather and dry weather. Wet weather potentials consider runon and runoff during wet weather events. Dry weather potentials are based on the assumption that irrigation and cleaning activities act as transport mechanisms. Furthermore, it is assumed that no BMPs are in place.

Table 6-1. Summary of typical activities and associated pollutants during wet weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacterial/ Pathogens*
Roads, streets, highways, and parking facilities									
Concrete and asphalt production	X	X	X	X				X	
Concrete cutting				X					
Surface repair work	X	X	X	X					
Clearing, grading, and preparation of road work	X	X	X	X					
Storage of raw materials, products, and containers	X	X	X	X				X	
Storage of pesticides and fertilizers						X	X	X	
Vehicle and equipment maintenance and repair	X	X	X						
Operation of outdoor equipment	X	X	X	X					
Parking and storage area maintenance	X	X	X	X				X	
Landscape maintenance				X	X	X	X	X	

Table 6-2. Summary of typical activities and associated pollutants during dry weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacterial/ Pathogens*
Roads, streets, highways, and parking facilities									
Landscape maintenance				X	X	X	X	X	

Discharge Potential

As part of the initial 2005 LTEA effort, a questionnaire was completed by various Copermittees to assess the likely potential of a specific source discharging pollutants. Using existing information (e.g. illicit discharge records) and field knowledge the Copermittees ranked the potential of discharging pollutants. These rankings were averaged (when a ranking was given) to obtain average discharge potential rankings for each information type. See Table 6-3 for a summary of the results. An overall ranking

was also determined for the source by taking the maximum average ranking from each of the information types. When only one information type received a score, due to lack of information, the average ranking from that one information type was neglected in the overall ranking determination. In these cases the overall ranking was set to 3, meaning the currently available information does not adequately characterize the discharge potential.

Table 6-3. Ranking of discharge potential using existing information.

Roads, streets, highways, and parking facilities			
Information Types	***Information Available***	***Average Ranking***	***Comments***
Dry Weather Monitoring	Y	2	
Illicit Discharge Records	Y	4	
Pretreatment Compliance Records			
Underground Stoage Tank Records			
Haz Waste Storage Records			
Inspection Records	Y	2	
Other information? Please specify here		5	
Overall Ranking		**5.0**	

Note: Overall Ranking is the highest 'Average Ranking' received for the various information types. When less than 2 scores were given, due to lack of information, the Overall Ranking was adjusted to 3 - Unknown Potential.

Scoring Legend	
1	- low discharge potential
2	- medium-low discharge potential
3	- Unknown, information does not adequately characterize
4	- medium-high discharge potential
5	- high discharge potential

A review of Table 6-3 shows that there appears to be considerable information that may be used to assess the discharge potential. As more information is collected and evaluated, the ranking potential will be updated.

It should be noted that a blank ranking in Table 6-3 does not necessarily mean that there is no discharge potential but rather the Copermittee chose not to rank the potential. As more information is collected these blanks will be filled in and a more comprehensive ranking established.

Legal/Regulatory Oversight

Table 6-4 provides a summary of the types of regulatory oversight that pertain to roads, streets, highways, and parking facilities. In some cases, there may be some overlap in the types of regulatory oversight.

Table 6-4. Summary of stormwater-related and non-stormwater-related regulatory oversight of roads, streets, and parking facilities

Roads, streets, highways, and parking facilities			
Oversight Type	Regulatory Oversight		Comments
Stormwater	NPDES Municipal Permit / Local Ordinances	X	
	NPDES General Industrial Permit		
	NPDES General Construction Permit		
Other Regulatory Oversight	Industrial Pretreatment Program (EPA)		
	Hazardous Materials / CUPA (County DEH)		
	CURFFL (County DEH)		
	Local Enforcement Agency - Landfills (County DEH)		
	Air Quality Permits (APCD)		
	Fire Agencies		
	Pesticide Regulatory Program (County AW&M)		
	Coast Guard		

Existing regulatory oversight of roads, streets, highways, and parking facilities is limited regarding stormwater issues.

Source Prevalence and Distribution

The 2005 Baseline LTEA effort produced source distribution information, if available, is provided in this section. It is recommended that updated source information is used to develop revised source prevalence and distribution data.

Numerous resources were relied upon in order to obtain an as accurate as feasible estimate of the number of sources throughout San Diego County. The

Table 6-5. Summary of Roads, Streets, Highways, and Parking Facilities within each of San Diego County's Watersheds.

Watershed Management Area	Hydrologic Unit (HU)	Roads, streets, highways, and parking facilities
		Total # of Geo-Coded Sources
Santa Margarita	*902.00*	0
San Luis Rey	*903.00*	0
Carlsbad	*904.00*	0
San Dieguito	*905.00*	0
Penasquitos	*906.10 - 906.20*	0
Mission Bay	*906.30 - 906.50*	0
San Diego	*907.00*	0
San Diego Bay - Pueblo	*908.00*	0
San Diego Bay - Sweetwater	*909.00*	
San Diego Bay - Otay	*910.00*	
Tijuana	*911.00*	0
Total Geo-Coded Sources		0
Total Sources (incl. Non geo-coded)		0

objective was to locate the sources within watersheds and sub-watersheds. When this was feasible, the sources are termed ‘geo-coded’, meaning there geographic coordinates are known and can be included in a GIS map. In some instances, it was not feasible to geo-code some sources. In this case, roads, streets, highways, and parking facilities were not inventoried. Information regarding the location of roadways is available and can be developed to show the location of these potential sources on a sub-watershed basis. This information was not obtained for this report due to time and resource constraints.

7 MS4s-Catch Basins, Drain Inlets, Conveyance, Pump Stations

Narrative Description

This Source Profile Sheet primarily covers municipal separate storm sewer systems (MS4s).

MS4s are not classified under the Standard Industrial Classification (SIC) system or the North American Industry Classification System (NAICS).

Pollutant Generating Activities and Associated Pollutants

The following tables contain a list of activities commonly associated with MS4s which may have a source loading potential. Possible pollutants associated with these activities are also presented. Table 7-1 contains a list of activities with a source loading potential in wet weather and Table 7-2 contains a list of activities with source loading potential in dry weather.

The activities below were evaluated for potential pollutant generation during wet weather and dry weather. Wet weather potentials consider runon and runoff during wet weather events. Dry weather potentials are based on the assumption that irrigation and cleaning activities act as transport mechanisms. Furthermore, it is assumed that no BMPs are in place.

Table 7-1. Summary of typical activities and associated pollutants during wet weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacteria/ Pathogens*
MS4s - Catch Basins, Drain Inlets, Conveyance, Pump Stations									
Dredging/filling activities	X			X					X
Storage of raw materials, products, and containers	X	X	X	X			X		
Storage of pesticides and fertilizers						X	X		
Grounds maintenance		X		X		X	X	X	
Grading activities				X					
Catch basin cleaning	X	X	X	X			X	X	X
Cleaning facilities/pump stations	X	X		X	X			X	X
Waste handling and disposal	X	X	X					X	X

Table 7-2. Summary of typical activities and associated pollutants during dry weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacteria/ Pathogens*
MS4s - Catch Basins, Drain Inlets, Conveyance, Pump Stations									
Drainage system maintenance	X	X	X	X	X	X	X	X	X
Cleaning facilities/pump stations	X	X	X	X		X	X	X	X

Discharge Potential

As part of the initial 2005 LTEA effort, a questionnaire was completed by various Copermittees to assess the likely potential of a specific source discharging pollutants. Using existing information (e.g. illicit discharge records) and field knowledge the Copermittees ranked the potential of discharging pollutants. These rankings were averaged (when a ranking was given) to obtain average discharge potential rankings for each information type. See Table 7-3 for a summary of the results. An overall ranking was also determined for the source by taking the maximum average ranking from each of the information types. When only one information type received a score, due to lack of information, the average ranking from that one information type was neglected in the overall ranking determination. In these cases the overall ranking was set to 3, meaning the currently available information does not adequately characterize the discharge potential.

Table 7-3.Ranking of discharge potential using existing information.

MS4s			
Information Types	*Information Available*	*Average Ranking*	*Comments*
Dry Weather Monitoring	Y	3	
Illicit Discharge Records	Y	1.5	
Pretreatment Compliance Records			
Underground Stoage Tank Records			
Haz Waste Storage Records			
Inspection Records	Y	3	
Other information? Please specify here			
Overall Ranking		**3.0**	

Note: Overall Ranking is the highest 'Average Ranking' received for the various information types. When less than 2 scores were given, due to lack of information, the Overall Ranking was adjusted to 3 - Unknown Potential.

Scoring Legend	
1	- low discharge potential
2	- medium-low discharge potential
3	- Unknown, information does not adequately characterize
4	- medium-high discharge potential
5	- high discharge potential

A review of Table 7-3 shows that there appears to be several sources of information that may be used to assess the discharge potential. As more information is collected and evaluated, the ranking potential will be updated.

It should be noted that a blank ranking in Table 7-3 does not necessarily mean that there is no discharge potential but rather the Copermittee chose not to rank the potential. As more information is collected these blanks will be filled in and a more comprehensive ranking established.

Legal/Regulatory Oversight

Table 7-4 provides a summary of the types of regulatory oversight that pertain to MS4s. In some cases, there may be some overlap in the types of regulatory oversight.

Table 7-4.Summary of the stormwater-related and non-stormwater related regulatory oversight of MS4s.

MS4s			
Oversight Type	Regulatory Oversight		Comments
Stormwater	NPDES Municipal Permit / Local Ordinances	X	
	NPDES General Industrial Permit		
	NPDES General Construction Permit		
Other Regulatory Oversight	Industrial Pretreatment Program (EPA)		
	Hazardous Materials / CUPA (County DEH)		
	CURFFL (County DEH)		
	Local Enforcement Agency - Landfills (County DEH)		
	Air Quality Permits (APCD)		
	Fire Agencies		
	Pesticide Regulatory Program (County AW&M)		
	Coast Guard		

Existing regulatory oversight of MS4 activities is limited regarding stormwater issues.

Source Prevalence and Distribution

Numerous resources were relied upon in order to obtain an as accurate as feasible estimate of the number of sources throughout San Diego County. The objective was to locate the sources within watersheds and sub-watersheds. When this was feasible, the sources are termed ‘geo-coded’, meaning there geographic coordinates are known and can be included in a GIS map. In this case, MS4 sources have not yet been covered under the source inventory. However, the location of the MS4s is available. This information was not obtained for this report due to time and resource constraints.

8 Corporate Yards (Including Maintenance/Storage Yards)

Narrative Description

This Source Profile Sheet primarily covers corporation yards, including maintenance/ storage yards.

Corporation yards (including maintenance/storage yards) are not classified under the Standard Industrial Classification (SIC) system or the North American Industry Classification System (NAICS).

Pollutant Generating Activities and Associated Pollutants

The following tables contain a list of activities commonly associated with corporation yards (including maintenance/storage yards) which may have a source loading potential. Possible pollutants associated with these activities are also presented. Table 8-1contains a list of activities with a source loading potential in wet weather and Table 8-2 contains a list of activities with source loading potential in dry weather.

The activities below were evaluated for potential pollutant generation during wet weather and dry weather. Wet weather potentials consider runon and runoff during wet weather events. Dry weather potentials are based on the assumption that irrigation and cleaning activities act as transport mechanisms. Furthermore, it is assumed that no BMPs are in place.

Table 8-1. Summary of typical activities and associated pollutants during wet weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacteria/ Pathogens*
Corporate yards (incl. maintenance/storage yards)									
Storage of raw materials, products, and containers	X	X	X	X			X		
Loading and unloading	X	X	X	X			X		
Waste handling and disposal	X	X	X					X	X
Operation of outdoor equipment	X	X	X	X					
Landscape maintenance				X	X	X	X	X	
Cleaning facilities/site	X	X	X	X	X			X	

Table 8-2.Summary of typical activities and associated pollutants during dry weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacteria/ Pathogens*
Corporate yards (incl. maintenance/storage yards)									
Landscape maintenance				X	X	X	X	X	
Cleaning facilities/site	X	X	X	X				X	

Discharge Potential

As part of the initial 2005 LTEA effort, a questionnaire was completed by various Copermittees to assess the likely potential of a specific source discharging pollutants. Using existing information (e.g. illicit discharge records) and field knowledge the Copermittees ranked the potential of discharging pollutants. These rankings were averaged (when a ranking was given) to obtain average discharge potential rankings for each information type. See Table 8-3 for a summary of the results. An overall ranking was also determined for the source by taking the maximum average ranking from each of the information types. When only one information type received a score, due to lack of information, the average ranking from that one information type was neglected in the overall ranking determination. In these cases the overall ranking was set to 3, meaning the currently available information does not adequately characterize the discharge potential.

Table 8-3. Ranking of discharge potential using existing information.

Corporation Yards (Including Maintenance/Storage Yards)			
Information Types	*Information Available*	*Average Ranking*	*Comments*
Dry Weather Monitoring	Y	4	
Illicit Discharge Records	Y	3	
Pretreatment Compliance Records			
Underground Storage Tank Records			
Haz Waste Storage Records			
Inspection Records	Y	4	
Other information? Please specify here		4	
Overall Ranking		4.0	

Note: Overall Ranking is the highest 'Average Ranking' received for the various information types. When less than 2 scores were given, due to lack of information, the Overall Ranking was adjusted to 3 - Unknown Potential.

Scoring Legend	
1	- low discharge potential
2	- medium-low discharge potential
3	- Unknown, information does not adequately characterize
4	- medium-high discharge potential
5	- high discharge potential

A review of Table 8-3 shows that there appears to be considerable information that may be used to assess the discharge potential. As more information is collected and evaluated, the ranking potential will be updated.

It should be noted that a blank ranking in Table 8-3 does not necessarily mean that there is no discharge potential but rather the Copermittee chose not to rank the potential. As more information is collected these blanks will be filled in and a more comprehensive ranking established.

Legal/Regulatory Oversight

Table 8-4 provides a summary of the types of regulatory oversight that pertain to corporation yards (including maintenance/storage yards). In some cases, there may be some overlap in the types of regulatory oversight.

Table 8-4. Summary of the stormwater-related and non-stormwater related regulatory oversight of corporation yard (including maintenance/storage yards) facilities.

Corporate yards (incl. maintenance/storage yards)			
Oversight Type	**Regulatory Oversight**		**Comments**
Stormwater	NPDES Municipal Permit / Local Ordinances	X	
	NPDES General Industrial Permit	X	
	NPDES General Construction Permit		
Other Regulatory Oversight	Industrial Pretreatment Program (EPA)		
	Hazardous Materials / CUPA (County DEH)	X	
	CURFFL (County DEH)		
	Local Enforcement Agency - Landfills (County DEH)		
	Air Quality Permits (APCD)	X	
	Fire Agencies		
	Pesticide Regulatory Program (County AW&M)		
	Coast Guard		

Better coordination may be warranted between the regulatory programs to minimize overlap but still focus on water quality protection.

Source Prevalence and Distribution

Numerous resources were relied upon in order to obtain an as accurate as feasible estimate of the number of sources throughout San Diego County. The objective was to locate the sources within watersheds and sub-watersheds. When this was feasible, the sources are termed 'geo-coded', meaning there geographic coordinates are known and can be included in a GIS map. In some instances, it was not feasible to geo-code some sources. In Table 8-5 the number of geo-coded corporation yard (including maintenance/ storage yards) sources within each watershed is

Table 8-5. Summary of corporation yard (including maintenance storage yards) sources within each of San Diego County's Watersheds.

Watershed Management Area	Hydrologic Unit (HU)	Corporate yards (incl. maintenance/storage yards)
		Total # of Geo-Coded Sources
Santa Margarita	*902.00*	0
San Luis Rey	*903.00*	4
Carlsbad	*904.00*	19
San Dieguito	*905.00*	2
Penasquitos	*906.10 - 906.20*	2
Mission Bay	*906.30 - 906.50*	1
San Diego	*907.00*	5
San Diego Bay - Pueblo	*908.00*	24
San Diego Bay - Sweetwater	*909.00*	
San Diego Bay - Otay	*910.00*	
Tijuana	*911.00*	2
Total Geo-Coded Sources		59
Total Sources (incl. Non geo-coded)		79

shown, along with the total number of sources (geo-coded and not geo-coded together). In this case, the geographic coordinates for all of the identified sources have not yet been determined.

While the inventory process attempted to ensure there is no overlap between priority sources identified, there may be some overlap of the identified sources with sources identified in other Source Profile Sheets.

The source inventory is further broken down in Table 8-6 to show the prevalence of corporation yard (including maintenance/storage yards) facilities within each sub-watershed. This information, combined with the concurrent water quality assessment of sub-watersheds throughout San Diego County will ultimately help to assess the threat these facilities pose to water quality by source and constituent.

<u>It is recommended that municipalities use updated source information from the County, as available, to develop revised source prevalence and distribution data.</u>

Table 8-6. Summary of corporation yard (including maintenance/storage yards) sources within each of San Diego County's sub-watersheds.

		Corporate yards (incl. maintenance/storage yards)									
Watershed Management Area	Hydrologic Unit (HU)	*Sources Geo-Coded by Sub-watershed Hydrologic Unit*									Total # of Sources
		90X.10	*90X.20*	*90X.30*	*90X.40*	*90X.50*	*90X.60*	*90X.70*	*90X.80*	*90X.90*	
Santa Margarita	*902.XX*	0	0	0	0	0	0	0	0	0	0
San Luis Rey	*903.XX*	3	1	0							4
Carlsbad	*904.XX*	1	5	2	1	7	3				19
San Dieguito	*905.XX*	2	0	0	0	0					2
Penasquitos	*906.XX*	0	2								2
Mission Bay	*906.XX*			0	1	0					1
San Diego	*907.XX*	5	0	0	0						5
San Diego Bay - Pueblo	*908.XX*	1	5	1							24
San Diego Bay - Sweetwater	*909.XX*	6	4	2							
San Diego Bay - Otay	*910.XX*	3	2	0							
Tijuana	*911.XX*	0	0	0	0	0	0	0	2		2
							Total Geo-Coded Sources				59
							Total Sources (incl. Non geo-coded)				79

8 Corporate Yards (Including Maintenance/Storage Yards)

Maintenance Yards

9 Parks and Recreational Facilities—Parks, Golf Courses, Cemeteries, Entertainment Venues

Narrative Description

This Source Profile Sheet covers parks and recreational facilities including golf courses, cemeteries, and entertainment venues.

Some recreational facilities were historically classified under the Standard Industrial Classification (SIC) system. This system has been slowly replaced by the North American Industry Classification System (NAICS), which accommodates a larger number of industrial sectors and sub-sectors, and identifies hundreds of new, emerging, and advanced technology industries. As most Copermittees have yet to convert from the SIC system to the NAICS, the applicable codes from both systems are presented here for easy reference.

SIC Codes	
7992	Public Golf Courses
7997	Membership Sports and Recreation Clubs
7999	Amusement and Recreation Services, Not Elsewhere Classified
NAICS Codes	
561730	Cemetery plot care services
7139XX	Golf courses

Pollutant Generating Activities and Associated Pollutants

The following tables contain a list of activities commonly associated with parks and recreational facilities which may have a source loading potential. Possible pollutants associated with these activities are also presented. Table 9-1contains a list of activities with a source loading potential in wet weather and Table 9-2 contains a list of activities with source loading potential in dry weather.

The activities below were evaluated for potential pollutant generation during wet weather and dry weather. Wet weather potentials consider runon and runoff during wet weather events. Dry weather potentials are based on the assumption that irrigation and cleaning activities act as transport mechanisms. Furthermore, it is assumed that no BMPs are in place.

Table 9-1. Summary of typical activities and associated pollutants during wet weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacteria/ Pathogens*
Parks and Recreational Facilities - parks, golf courses, cemeteries, entertainment venues, etc.									
Storage/disposal of solid wastes and garden wastes	X	X	X	X			X		
Storage of any liquid materials in portable containers	X	X	X			X	X	X	
Loading and unloading		X	X	X		X	X	X	
Disposal of solid and food wastes								X	X
Cleaning portable toilets					X			X	X

Table 9-2. Summary of typical activities and associated pollutants during dry weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacteria/ Pathogens*
Parks and Recreational Facilities - parks, golf courses, cemeteries, entertainment venues, etc.									
Grounds/landscape maintenance				X	X	X	X	X	
Cleaning portable toilets					X			X	X

Discharge Potential

As part of the initial 2005 LTEA effort, a questionnaire was completed by various Copermittees to assess the likely potential of a specific source discharging pollutants. Using existing information (e.g. illicit discharge records) and field knowledge the Copermittees ranked the potential of discharging pollutants. These rankings were averaged (when a ranking was given) to obtain average discharge potential rankings for each information type. See Table 9-3 for a summary of the results. An overall ranking was also determined for the source by taking the maximum average ranking from each of the information types. When only one information type received a score, due to lack of information, the average ranking from that one information type was neglected in the overall ranking determination. In these cases the overall ranking was set to 3, meaning the currently available information does not adequately characterize the discharge

potential. The ranking below characterizes the discharge potential of landscaping activities in general.

Table 9-3.Ranking of discharge potential using existing information.

Parks and Recreational Facilities – parks, golf courses, cemeteries, entertainment venues, etc.			
Information Types	*Information Available*	*Average Ranking*	*Comments*
Dry Weather Monitoring			
Illicit Discharge Records	Y	2	
Pretreatment Compliance Records			
Underground Storage Tank Records			
Hazardous Waste Storage Records			
Inspection Records			
Other information? Please specify here			
Overall Ranking		2.0	

Note: Overall Ranking is the highest 'Average Ranking' received for the various information types. When less than 2 scores were given, due to lack of information, the Overall Ranking was adjusted to 3 - Unknown Potential.

Scoring Legend	
1	- low discharge potential
2	- medium-low discharge potential
3	- Unknown, information does not adequately characterize
4	- medium-high discharge potential
5	- high discharge potential

A review of Table 9-3 shows that there is limited information available to assess discharge potential. Of the information available a more complete evaluation should be conducted to assess discharge potential.

It should be noted that a blank ranking in Table 9-3 does not necessarily mean that there is no discharge potential but rather the Copermittee chose not to rank the potential. As more information is collected these blanks will be filled in and a more comprehensive ranking established.

Legal/Regulatory Oversight

Table 9-4 provides a summary of the types of regulatory oversight that pertain to parks and recreational facilities. In some cases, there may be some overlap in the types of regulatory oversight.

Table 9-4. Summary of the stormwater-related and non-stormwater related regulatory oversight of parks and recreational facilities.

Parks and Recreational Facilities – Parks, Golf Course, Cemeteries, Entertainment Venues, etc.			
Oversight Type	**Regulatory Oversight**		**Comments**
Stormwater	NPDES Municipal Permit / Local Ordinances	X	
	NPDES General Industrial Permit		
	NPDES General Construction Permit		
Other Regulatory Oversight	Industrial Pretreatment Program (EPA)		
	Hazardous Materials / CUPA (County DEH)		
	CURFFL (County DEH)		
	Local Enforcement Agency – Landfills (County DEH)		
	Air Quality Permits (APCD)		
	Fire Agencies		
	Pesticide Regulatory Program (County AW&M)		
	Coast Guard		

Existing regulatory oversight of park and recreational facility activities is limited regarding stormwater issues.

Source Prevalence and Distribution

The 2005 Baseline LTEA effort produced source distribution information, if available, is provided in this section. Numerous resources were relied upon in order to obtain an as accurate as feasible estimate of the number of sources throughout San Diego County. The objective was to locate the sources within watersheds and sub-watersheds. When this was feasible, the sources are termed 'geo-coded', meaning there geographic coordinates are known and can be included in a GIS map. In some instances, it was not feasible to geo-code some sources. In Table 9-5, the number of geo-coded landscaping sources within each watershed is shown, along with the total number of sources (geo-coded and not geo-coded together). In this case, the geographic coordinates for golf

Table 9-5. Summary of parks and recreational facilities sources within each of San Diego County's Watersheds.

Watershed Management Area	Hydrologic Unit (HU)	Landscaping - Parks, golf Courses, Cemeteries, etc. Total # of Geo-Coded Sources
Santa Margarita	902.00	1
San Luis Rey	903.00	15
Carlsbad	904.00	23
San Dieguito	905.00	14
Penasquitos	906.10 - 906.20	7
Mission Bay	906.30 - 906.50	7
San Diego	907.00	11
San Diego Bay - Pueblo	908.00	27
San Diego Bay - Sweetwater	909.00	
San Diego Bay - Otay	910.00	
Tijuana	911.00	0
Total Geo-Coded Sources		105
Total Sources (incl. Non geo-coded)		973

courses and cemeteries have been geo-coded. Other sources were not geo-coded for this LTEA effort

The source inventory is further broken down in Table 9-6 to show the prevalence of golf courses and cemeteries within each sub-watershed. Parks and entertainment venues were not accounted for in this LTEA effort.

<u>It is recommended that municipalities use updated source information from the County, as available, to develop revised source prevalence and distribution data.</u>

Table 9-6. Summary of Golf Courses and Cemeteries within each of San Diego County's sub-watersheds

		Golf Courses and Cemeteries									
Watershed Management Area	Hydrologic Unit (HU)	*Sources Geo-Coded by Sub-watershed Hydrologic Unit*									Total # of Sources
		90X.10	*90X.20*	*90X.30*	*90X.40*	*90X.50*	*90X.60*	*90X.70*	*90X.80*	*90X.90*	
Santa Margarita	*902.XX*	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1
San Luis Rey	*903.XX*	14	1	0							15
Carlsbad	*904.XX*	3	3	4	0	8	5				23
San Dieguito	*905.XX*	7	4	1	2	0					14
Penasquitos	*906.XX*	3	4								7
Mission Bay	*906.XX*			3	3	1					7
San Diego	*907.XX*	8	2	1	0						11
San Diego Bay - Pueblo	*908.XX*	2	9	0							27
San Diego Bay - Sweetwater	*909.XX*	7	5	0							
San Diego Bay - Otay	*910.XX*	2	2	0							
Tijuana	*911.XX*	0	0	0	0	0	0	0	0		0
							Total Geo-Coded Sources				105
							Total Sources (incl. Non geo-coded)				973

Golf Courses

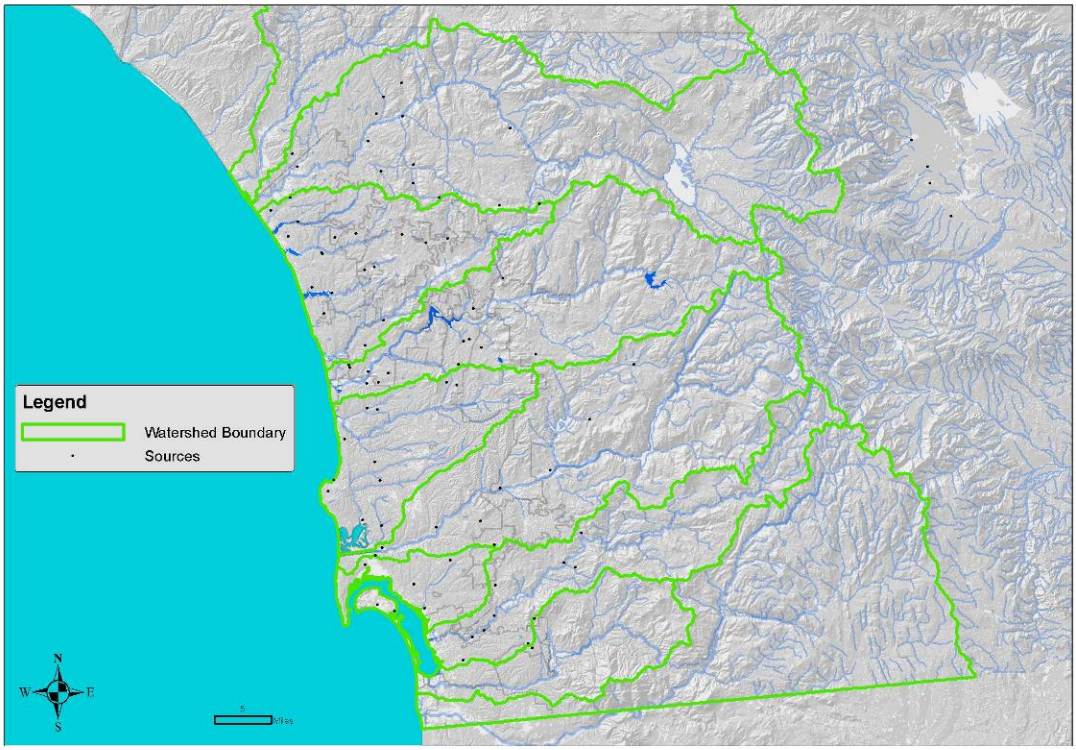

Cemeteries

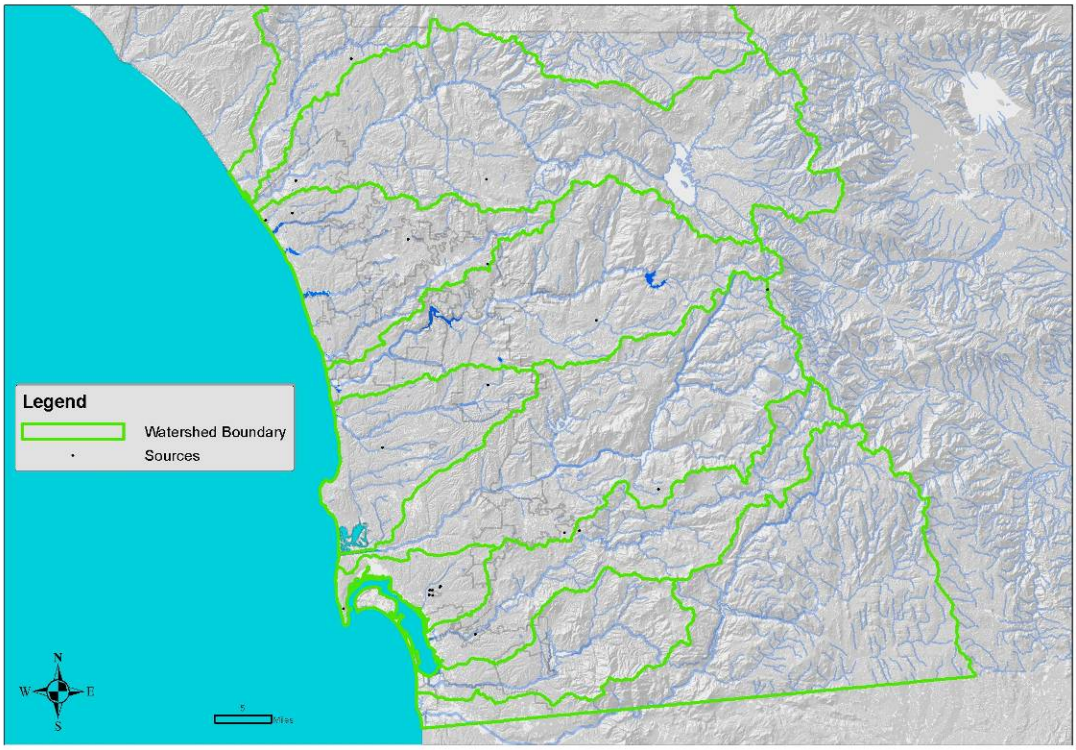

10 Automobile Mechanical Repair, Maintenance, Fueling, or Cleaning

Narrative Description

This Source Profile Sheet covers establishments primarily engaged in the repair and maintenance of automobiles, these establishments may also perform fueling and cleaning functions as well. This includes service stations, auto mechanics, lube and oil service facilities. Not included in this category are auto body shops, boat or airplane repair facilities, mobile auto washing, or retail gasoline outlets. These are all covered in separate Source Profile Sheets.

SIC Codes	
753X	Automotive Repair Shops
7549	Automotive Services, Except Repair and Carwashes
NAICS Codes	
81111X	Automotive Mechanical and Electrical Reair and Maintenance
81119X	Other Automotive repair and Maintenance

Some facilities that conduct automobile mechanical repair, maintenance, fueling, or cleaning were historically classified under the Standard Industrial Classification (SIC) system. This system has been slowly replaced by the North American Industry Classification System (NAICS), which accommodates a larger number of industrial sectors and sub-sectors, and identifies hundreds of new, emerging, and advanced technology industries. As most Copermittees have yet to convert from the SIC system to the NAICS, the applicable codes from both systems are presented here for easy reference.

Pollutant Generating Activities and Associated Pollutants

The following tables contain a list of activities commonly associated with auto mechanical repair, maintenance, fueling, or cleaning which may have a source loading potential. Possible pollutants associated with these activities are also presented. Table 10-1 contains a list of activities with a source loading potential in wet weather and Table 10-2 contains a list of activities with source loading potential in dry weather.

The activities below were evaluated for potential pollutant generation during wet weather and dry weather. Wet weather potentials consider runon and runoff during wet weather events. Dry weather potentials are based on the assumption that irrigation and cleaning activities act as transport mechanisms. Furthermore, it is assumed that no BMPs are in place.

10 Automobile Mechanical Repair, Maintenance, Fueling, or Cleaning

Table 10-1. Summary of typical activities and associated pollutants during wet weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacteria/ Pathogens*
Auto Mechanical Repair, Maintenance, Fueling, or Cleaning									
Waste handling and disposal	X	X	X				X	X	
Cleaning facilities	X	X	X	X	X			X	
Cleaning or washing of tools, parts, and equipment	X	X	X	X	X				
Vehicle and equipment cleaning	X	X	X	X	X				
Hazardous waste disposal	X	X	X						
Engine repair/maintenance	X	X	X						
Storage of liquid materials in stationary tanks	X	X	X						
Storage of any liquid materials in portable containers	X	X	X						
Painting, finishing, and coating automobiles	X	X		X					
Vehicle and equipment maintenance and repair	X	X	X					X	
Vehicle and equipment fueling	X	X	X					X	

Table 10-2. Summary of typical activities and associated pollutants during dry weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacteria/ Pathogens*
Auto Mechanical Repair, Maintenance, Fueling, or Cleaning									
Cleaning facilities	X	X	X	X	X			X	

Discharge Potential

As part of the initial 2005 LTEA effort, a questionnaire was completed by various Copermittees to assess the likely potential of a specific source discharging pollutants. Using existing information (e.g. illicit discharge records) and field knowledge the Copermittees ranked the potential of discharging pollutants. These rankings were averaged (when a ranking was given) to obtain average discharge potential rankings for each information type. See Table 10-3 for a summary of the results. An overall ranking was also determined for the source by taking the maximum average ranking from each of

the information types. When only one information type received a score, due to lack of information, the average ranking from that one information type was neglected in the overall ranking determination. In these cases the overall ranking was set to 3, meaning the currently available information does not adequately characterize the discharge potential.

Table 10-3. Ranking of discharge potential using existing information.

Auto mechanical repair, maintenance, fueling, or cleaning			
Information Types	***Information Available***	***Average Ranking***	***Comments***
Dry Weather Monitoring	Y	4.5	
Illicit Discharge Records	Y	4	
Pretreatment Compliance Records	Y		
Underground Stoage Tank Records	Y		
Haz Waste Storage Records	Y		
Inspection Records	Y	5	
Other information? Please specify here		4	
Overall Ranking		**5.0**	

Note: Overall Ranking is the highest 'Average Ranking' received for the various information types. When less than 2 scores were given, due to lack of information, the Overall Ranking was adjusted to 3 - Unknown Potential.

Scoring Legend	
1	- low discharge potential
2	- medium-low discharge potential
3	- Unknown, information does not adequately characterize discharge potential
4	- medium-high discharge potential
5	- high discharge potential

A review of Table 10-3 shows that there appears to be considerable information that may be used to assess the discharge potential. As more information is collected and evaluated, the ranking potential will be updated.

It should be noted that a blank ranking in Table 10-3 does not necessarily mean that there is no discharge potential but rather the Copermittee chose not to rank the potential. As more information is collected these blanks will be filled in and a more comprehensive ranking established.

Legal/Regulatory Oversight

Table 10-4 provides a summary of the types of regulatory oversight that pertain to auto mechanical repair, maintenance, fueling, or cleaning. In some cases, there may be some overlap in the types of regulatory oversight.

Table 10-4. Summary regulatory oversight of auto mechanical repair, maintenance, fueling, or cleaning facilities.

Auto mechanical repair, maintenance, fueling, or cleaning			
Oversight Type	**Regulatory Oversight**		**Comments**
Stormwater	NPDES Municipal Permit / Local Ordinances	X	
	NPDES General Industrial Permit		
	NPDES General Construction Permit		
Other Regulatory Oversight	Industrial Pretreatment Program (EPA)	X	
	Hazardous Materials / CUPA (County DEH)	X	
	CURFFL (County DEH)		
	Local Enforcement Agency - Landfills (County DEH)		
	Air Quality Permits (APCD)	X	
	Fire Agencies		
	Pesticide Regulatory Program (County AW&M)		
	Coast Guard		

Better coordination may be warranted between the regulatory programs to minimize overlap but still focus on water quality protection.

Source Prevalence and Distribution

The 2005 Baseline LTEA effort produced source distribution information, if available, is provided in this section. It is recommended that updated source information is used to develop revised source prevalence and distribution data.

Numerous resources were relied upon in order to obtain an as accurate as feasible estimate of the number of sources throughout San Diego County. The objective was to locate the sources within watersheds and sub-watersheds. When this was feasible, the sources are termed 'geo-coded', meaning there geographic coordinates are known and can be included in a GIS map. In some instances, it was not feasible to provide a geo-spatial reference for some sources. In Table 10-5, the number of geo-coded automobile mechanical

Table 10-5. Summary of automobile mechanical repair, maintenance, fueling, or cleaning sources within each of San Diego County's watersheds.

Watershed Management Area	Hydrologic Unit (HU)	Auto mechanical repair, maintenance, fueling, or cleaning Total # of Geo-Coded Sources
Santa Margarita	902.00	29
San Luis Rey	903.00	57
Carlsbad	904.00	449
San Dieguito	905.00	65
Penasquitos	906.10 - 906.20	201
Mission Bay	906.30 - 906.50	119
San Diego	907.00	452
San Diego Bay - Pueblo	908.00	724
San Diego Bay - Sweetwater	909.00	
San Diego Bay - Otay	910.00	
Tijuana	911.00	31
Total Geo-Coded Sources		2127
Total Sources (incl. Non geo-coded)		2127

repair, maintenance, fueling, or cleaning sources within each watershed is shown, along with the total number of sources (geo-coded and not geo-coded together). In this case, the geographic coordinates for all of the identified sources were determined.

While the inventory process attempted to ensure there is no overlap between priority sources identified, there may be some overlap of the identified sources with sources identified in other Source Profile Sheets. This may be the case for the auto mechanical repair, maintenance, fueling, or cleaning sources that also perform equipment repair (SPS#10), body repair and painting services (SPS#12), or retail or wholesale fueling (SPS#16).

The source inventory is further broken down in Table 10-6 to show the prevalence of auto mechanical repair, maintenance, fueling, or cleaning facilities within each sub-watershed. This information, combined with the concurrent water quality assessment of sub-watersheds throughout San Diego County will ultimately help to assess the threat these facilities pose to water quality by source and constituent.

It is recommended that municipalities use updated source information from the County, as available, to develop revised source prevalence and distribution data.

Table 10-6. Summary of automobile mechanical repair, maintenance, fueling, or cleaning sources within each of San Diego County's sub-watersheds.

		Auto mechanical repair, maintenance, fueling, or cleaning									
Watershed Management Area	Hydrologic Unit (HU)	*Sources Geo-Coded by Sub-watershed Hydrologic Unit*									Total # of Sources
		90X.10	*90X.20*	*90X.30*	*90X.40*	*90X.50*	*90X.60*	*90X.70*	*90X.80*	*90X.90*	
Santa Margarita	*902.XX*	28	1	0	0	0	0	0	0	0	29
San Luis Rey	*903.XX*	54	3	0							57
Carlsbad	*904.XX*	49	94	32	5	110	159				449
San Dieguito	*905.XX*	13	18	1	33	0					65
Penasquitos	*906.XX*	148	53								201
Mission Bay	*906.XX*			32	57	30					119
San Diego	*907.XX*	439	2	8	3						452
San Diego Bay - Pueblo	*908.XX*	8	319	78							724
San Diego Bay - Sweetwater	*909.XX*	161	27	2							
San Diego Bay - Otay	*910.XX*	5	122	2							
Tijuana	*911.XX*	26	0	1	0	0	1	0	3		31
							Total Geo-Coded Sources				2127
							Total Sources (incl. Non geo-coded)				2127

10 Automobile Mechanical Repair, Maintenance, Fueling, or Cleaning

Fuel Station

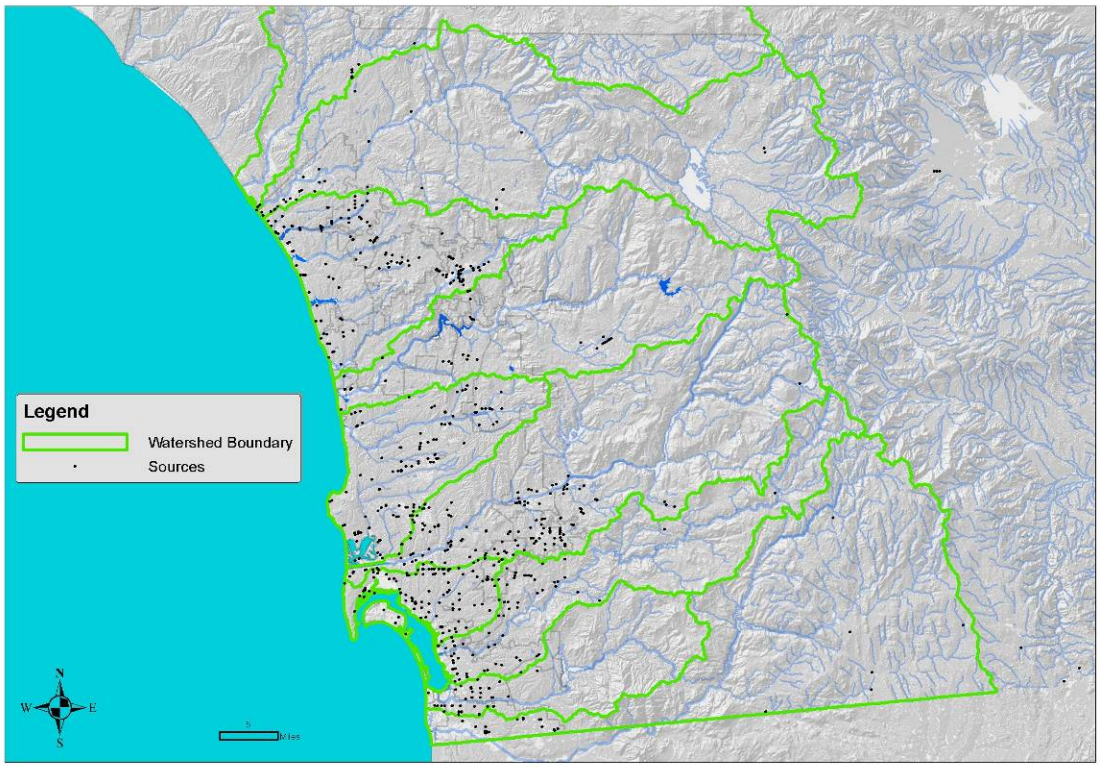

11 Equipment Mechanical Repair, Maintenance, Fueling, or Cleaning

Narrative Description

This Source Profile Sheet covers establishments primarily engaged in the repair and maintenance of equipment, these establishments may also perform fueling and cleaning functions as well.

SIC Codes	
7699	Repair Shops and Related Services, Not Elsewhere Classified

NAICS Codes	
8113	Commercial and Industrial Machinery and Equipment (except Automotive and Electronic) Repair and Maintenance

Some facilities that conduct equipment mechanical repair, maintenance, fueling, or cleaning were historically classified under the Standard Industrial Classification (SIC) system. This system has been slowly replaced by the North American Industry Classification System (NAICS), which accommodates a larger number of industrial sectors and sub-sectors, and identifies hundreds of new, emerging, and advanced technology industries. As most Copermittees have yet to convert from the SIC system to the NAICS, the applicable codes from both systems are presented here for easy reference.

Pollutant Generating Activities and Associated Pollutants

The following tables contain a list of activities commonly associated with equipment mechanical repair, maintenance, fueling, or cleaning which may have a source loading potential. Possible pollutants associated with these activities are also presented. Table 11-1 contains a list of activities with a source loading potential in wet weather and Table 11-2 contains a list of activities with source loading potential in dry weather.

The activities below were evaluated for potential pollutant generation during wet weather and dry weather. Wet weather potentials consider runon and runoff during wet weather events. Dry weather potentials are based on the assumption that irrigation and cleaning activities act as transport mechanisms. Furthermore, it is assumed that no BMPs are in place.

Table 11-1. Summary of typical activities and associated pollutants during wet weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacteria/ Pathogens*
Equipment mechanical repair, maintenance, fueling, or cleaning									
Paint removal	X	X	X					X	
Painting, finishing, and coating equipment	X	X	X						
Waste handling and disposal	X	X	X					X	
Cleaning facilities	X	X	X	X	X			X	
Equipment cleaning	X	X	X	X	X				
Cleaning or washing of tools and equipment	X	X	X	X	X				
Hazardous waste disposal	X	X	X						
Equipment maintenance and repair	X	X	X						

Table 11-2. Summary of typical activities and associated pollutants during dry weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacteria/ Pathogens*
Equipment mechanical repair, maintenance, fueling, or cleaning									
Cleaning facilities	X	X	X	X	X			X	
Equipment cleaning	X	X	X	X					
Cleaning or washing of tools and equipment	X	X	X	X					

Discharge Potential

As part of the initial 2005 LTEA effort, a questionnaire was completed by various Copermittees to assess the likely potential of a specific source discharging pollutants. Using existing information (e.g. illicit discharge records) and field knowledge the Copermittees ranked the potential of discharging pollutants. These rankings were averaged (when a ranking was given) to obtain average discharge potential rankings for each information type. See Table 11-3 for a summary of the results. An overall ranking was also determined for the source by taking the maximum average ranking from each of the information types. When only one information type received a score, due to lack of information, the average ranking from that one information type was neglected in the

overall ranking determination. In these cases the overall ranking was set to 3, meaning the currently available information does not adequately characterize the discharge potential.

Table 11-3. Ranking of discharge potential using existing information.

Equipment mechanical repair, maintenance, fueling, or cleaning			
Information Types	*Information Available*	*Average Ranking*	*Comments*
Dry Weather Monitoring	Y	3	
Illicit Discharge Records	Y		
Pretreatment Compliance Records	Y		
Underground Stoage Tank Records	Y		
Haz Waste Storage Records	Y		
Inspection Records	Y		
Other information? Please specify here			
Overall Ranking		**3.0**	

Note: Overall Ranking is the highest 'Average Ranking' received for the various information types. When less than 2 scores were given, due to lack of information, the Overall Ranking was adjusted to 3 - Unknown Potential.

Scoring Legend	
1	- low discharge potential
2	- medium-low discharge potential
3	- Unknown, information does not adequately characterize
4	- medium-high discharge potential
5	- high discharge potential

A review of Table 11-3 shows that there is limited information available to assess discharge potential. Of the information available a more complete evaluation should be conducted to assess discharge potential.

It should be noted that a black ranking in Table 11-3 does not necessarily mean that there is no discharge potential but rather the Copermittee chose not to rank the potential. As more information is collected these blanks will be filled in and a more comprehensive ranking established.

Legal/Regulatory Oversight

Table 11-4 provides a summary of the types of regulatory oversight that pertain to equipment mechanical repair, maintenance, fueling, or cleaning. In some cases, there may be some overlap in the types of regulatory oversight.

Table 11-4. Summary of the stormwater-related and non-stormwater related regulatory oversight of equipment mechanical repair, maintenance, fueling, or cleaning facilities.

Equipment mechanical repair, maintenance, fueling, or cleaning			
Oversight Type	**Regulatory Oversight**		**Comments**
Stormwater	NPDES Municipal Permit / Local Ordinances	X	
	NPDES General Industrial Permit		
	NPDES General Construction Permit		
Other Regulatory Oversight	Industrial Pretreatment Program (EPA)		
	Hazardous Materials / CUPA (County DEH)	X	
	CURFFL (County DEH)		
	Local Enforcement Agency - Landfills (County DEH)		
	Air Quality Permits (APCD)	X	
	Fire Agencies		
	Pesticide Regulatory Program (County AW&M)		
	Coast Guard		

Better coordination may be warranted between the regulatory programs to minimize overlap but still focus on water quality protection.

Source Prevalence and Distribution

The 2005 Baseline LTEA effort produced source distribution information, if available, is provided in this section. It is recommended that updated source information is used to develop revised source prevalence and distribution data.

Numerous resources were relied upon in order to obtain an as accurate as feasible estimate of the number of sources throughout San Diego County. The objective was to locate the sources within watersheds and sub-watersheds. When this was feasible, the sources are termed ‘geo-coded’, meaning there geographic coordinates are known and can be included in a GIS map. In some instances, it was not feasible to geo-code some sources. In Table 11-5, the number of geo-coded equipment mechanical repair, maintenance, fueling, or cleaning sources within each watershed is shown, along with the total number of sources (geo-coded and not geo-coded together). In this case, the geographic coordinates for all of the identified sources have not yet been determined.

11 Equipment Mechanical Repair, Maintenance, Fueling, or Cleaning

While the inventory process attempted to ensure there is no overlap between priority sources identified, there may be some overlap of the identified sources with sources identified in other Source Profile Sheets. This may be the case for the equipment mechanical repair, maintenance, fueling, or cleaning sources that also perform auto repair (SPS#10).

Table 11-5. Summary of equipment mechanical repair, maintenance, fueling, or cleaning sources within each of San Diego County's Watersheds.

Watershed Management Area	Hydrologic Unit (HU)	Equipment mechanical repair, maintenance, fueling, or cleaning Total # of Geo-Coded Sources
Santa Margarita	*902.00*	0
San Luis Rey	*903.00*	3
Carlsbad	*904.00*	7
San Dieguito	*905.00*	0
Penasquitos	*906.10 - 906.20*	11
Mission Bay	*906.30 - 906.50*	0
San Diego	*907.00*	48
San Diego Bay - Pueblo	*908.00*	57
San Diego Bay - Sweetwater	*909.00*	
San Diego Bay - Otay	*910.00*	
Tijuana	*911.00*	0
Total Geo-Coded Sources		126
Total Sources (incl. Non geo-coded)		214

The source inventory is further broken down in Table 11-6 to show the prevalence of equipment mechanical repair, maintenance, fueling, or cleaning facilities within each sub-watershed. This information, combined with the concurrent water quality assessment of sub-watersheds throughout San Diego County will ultimately help to assess the threat these facilities pose to water quality by source and constituent.

<u>It is recommended that municipalities use updated source information from the County, as available, to develop revised source prevalence and distribution data.</u>

Table 11-6. Summary of equipment mechanical repair, maintenance, fueling, or cleaning sources within each of San Diego County's sub-watersheds.

Watershed Management Area	Hydrologic Unit (HU)	Equipment mechanical repair, maintenance, fueling, or cleaning									
		Sources Geo-Coded by Sub-watershed Hydrologic Unit									Total # of Sources
		90X.10	*90X.20*	*90X.30*	*90X.40*	*90X.50*	*90X.60*	*90X.70*	*90X.80*	*90X.90*	
Santa Margarita	*902.XX*	0	0	0	0	0	0	0	0	0	0
San Luis Rey	*903.XX*	2	1	0							3
Carlsbad	*904.XX*	0	4	2	0	1	0				7
San Dieguito	*905.XX*	0	0	0	0	0					0
Penasquitos	*906.XX*	0	11								11
Mission Bay	*906.XX*			0	0	0					0
San Diego	*907.XX*	48	0	0	0						48
San Diego Bay - Pueblo	*908.XX*	0	3	12							57
San Diego Bay - Sweetwater	*909.XX*	24	0	0							
San Diego Bay - Otay	*910.XX*	0	18	0							
Tijuana	*911.XX*	0	0	0	0	0	0	0	0		0
							Total Geo-Coded Sources				126
							Total Sources (incl. Non geo-coded)				214

12 Auto and Other Vehicle Body Repair and Painting

Narrative Description

This Source Profile Sheet covers establishments primarily engaged in the repair of automotive tops, bodies, and interiors, or automotive painting and refinishing. Also included are establishments primarily engaged in customizing automobiles, trucks, and vans.

SIC Codes	
7532	Automotive Body Shops and Paint Shops
5198	Paints, Varnishes & Supplies

NAICS Codes	
81112	Automotive Body, Paint, Interior, and Glass Repair
811121	Automotive Body, Paint, and Interior Repair and Maintenance

Facilities that conduct automobile and other vehicle body repair and painting were historically classified under the Standard Industrial Classification (SIC) system. This system has been slowly replaced by the North American Industry Classification System (NAICS), which accommodates a larger number of industrial sectors and sub-sectors, and identifies hundreds of new, emerging, and advanced technology industries. As most Copermittees have yet to convert from the SIC system to the NAICS, the applicable codes from both systems are presented here for easy reference.

Pollutant Generating Activities and Associated Pollutants

The following tables contain a list of activities commonly associated with automobile and other vehicle body repair and painting which may have a source loading potential. Possible pollutants associated with these activities are also presented. Table 12-1 contains a list of activities with a source loading potential in wet weather and Table 12-2 contains a list of activities with source loading potential in dry weather.

The activities below were evaluated for potential pollutant generation during wet weather and dry weather. Wet weather potentials consider runon and runoff during wet weather events. Dry weather potentials are based on the assumption that irrigation and cleaning activities act as transport mechanisms. Furthermore, it is assumed that no BMPs are in place.

Table 12-1. Summary of typical activities and associated pollutants during wet weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacteria/ Pathogens*
Automobile and Other Vehicle Body Repair and Painting									
Paint removal	X	X	X					X	
Painting, finishing, and coating vehicles and equipment	X	X	X						
Waste handling and disposal	X	X	X					X	
Cleaning facilities	X	X	X	X	X			X	
Vehicle and equipment cleaning	X	X	X	X	X				
Cleaning or washing of tools and equipment	X	X	X	X	X				
Hazardous waste disposal	X	X	X						
Auto body repair	X	X	X					X	
Vehicle and equipment maintenance and repair	X	X	X						

Table 12-2. Summary of typical activities and associated pollutants during dry weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacteria/ Pathogens*
Automobile and Other Vehicle Body Repair and Painting									
Cleaning facilities	X	X	X	X	X			X	
Vehicle and equipment cleaning	X	X	X	X	X				
Cleaning or washing of tools and equipment	X	X	X	X					

Discharge Potential

As part of the initial 2005 LTEA effort, a questionnaire was completed by various Copermittees to assess the likely potential of a specific source discharging pollutants. Using existing information (e.g. illicit discharge records) and field knowledge the Copermittees ranked the potential of discharging pollutants. These rankings were averaged (when a ranking was given) to obtain average discharge potential rankings for each information type. See Table 12-3 for a summary of the results. An overall ranking

was also determined for the source by taking the maximum average ranking from each of the information types. When only one information type received a score, due to lack of information, the average ranking from that one information type was neglected in the overall ranking determination. In these cases the overall ranking was set to 3, meaning the currently available information does not adequately characterize the discharge potential.

Table 12-3. Ranking of discharge potential using existing information.

Automobile and other vehicle body repair and painting			
Information Types	***Information Available***	***Average Ranking***	***Comments***
Dry Weather Monitoring	Y	4.5	
Illicit Discharge Records	Y	3.5	
Pretreatment Compliance Records	Y		
Underground Stoage Tank Records	Y	2	
Haz Waste Storage Records	Y		
Inspection Records	Y	5	
Other information? Please specify here		4	
Overall Ranking		**5.0**	

Note: Overall Ranking is the highest 'Average Ranking' received for the various information types. When less than 2 scores were given, due to lack of information, the Overall Ranking was adjusted to 3 - Unknown Potential.

Scoring Legend	
1	- low discharge potential
2	- medium-low discharge potential
3	- Unknown, information does not adequately characterize
4	- medium-high discharge potential
5	- high discharge potential

A review of Table 12-3 shows that there appears to be considerable information that may be used to assess the discharge potential. As more information is collected and evaluated, the ranking potential will be updated.

It should be noted that a blank ranking in Table 12-3 does not necessarily mean that there is no discharge potential but rather the Copermittee chose not to rank the potential. As more information is collected these blanks will be filled in and a more comprehensive ranking established.

Legal/Regulatory Oversight

Table 12-4 provides a summary of the types of regulatory oversight that pertain to automobile and other vehicle body repair and painting. In some cases, there may be some overlap in the types of regulatory oversight.

Table 12-4. Summary of the stormwater-related and non-stormwater related regulatory oversight of automobile and other vehicle body repair and painting facilities.

Automobile and other vehicle body repair and painting			
Oversight Type	Regulatory Oversight		Comments
Stormwater	NPDES Municipal Permit / Local Ordinances	X	
	NPDES General Industrial Permit		
	NPDES General Construction Permit		
Other Regulatory Oversight	Industrial Pretreatment Program (EPA)		
	Hazardous Materials / CUPA (County DEH)	X	
	CURFFL (County DEH)		
	Local Enforcement Agency - Landfills (County DEH)		
	Air Quality Permits (APCD)	X	
	Fire Agencies		
	Pesticide Regulatory Program (County AW&M)		
	Coast Guard		

Better coordination may be warranted between the regulatory programs to minimize overlap but still focus on water quality protection.

Source Prevalence and Distribution

The 2005 Baseline LTEA effort produced source distribution information, if available, is provided in this section. It is recommended that updated source information is used to develop revised source prevalence and distribution data.

Numerous resources were relied upon in order to obtain an as accurate as feasible estimate of the number of sources throughout San Diego County. The objective was to locate the sources within watersheds and sub-watersheds. When this was feasible, the sources are termed 'geo-coded', meaning there geographic coordinates are known and can be included in a GIS map.

Table 12-5. Summary of automobile and other vehicle body repair and painting sources within each of San Diego County's Watersheds.

Watershed Management Area	Hydrologic Unit (HU)	Automobile and other vehicle body repair and painting
		Total # of Geo-Coded Sources
Santa Margarita	902.00	2
San Luis Rey	903.00	7
Carlsbad	904.00	62
San Dieguito	905.00	5
Penasquitos	906.10 - 906.20	21
Mission Bay	906.30 - 906.50	12
San Diego	907.00	61
San Diego Bay - Pueblo	908.00	112
San Diego Bay - Sweetwater	909.00	
San Diego Bay - Otay	910.00	
Tijuana	911.00	1
Total Geo-Coded Sources		283
Total Sources (incl. Non geo-coded)		283

In some instances, it was not feasible to geo-code some sources. In Table 12-5, the number of geo-coded automobile and other vehicle body repair and painting sources within each watershed is shown, along with the total number of sources (geo-coded and not geo-coded together). In this case, the geographic coordinates for all of the identified sources were determined.

While the inventory process attempted to ensure there is no overlap between priority sources identified, there may be some overlap of the identified sources with sources identified in other Source Profile Sheets. This may be the case for the automobile and other vehicle body repair & painting sources that also perform auto repair (SPS#10).

The source inventory is further broken down in Table 12-6 to show the prevalence of automobile body repair and paint facilities within each sub-watershed. This information, combined with the concurrent water quality assessment of sub-watersheds throughout San Diego County will ultimately help to assess the threat these facilities pose to water quality by source and constituent.

It is recommended that municipalities use updated source information from the County, as available, to develop revised source prevalence and distribution data.

Table 12-6. Summary of automobile and other vehicle body repair and painting sources within each of San Diego County's sub-watersheds.

		Automobile and other vehicle body repair and painting									
Watershed Management Area	Hydrologic Unit (HU)	*Sources Geo-Coded by Sub-watershed Hydrologic Unit*									Total # of Sources
		90X.10	*90X.20*	*90X.30*	*90X.40*	*90X.50*	*90X.60*	*90X.70*	*90X.80*	*90X.90*	
Santa Margarita	*902.XX*	2	0	0	0	0	0	0	0	0	2
San Luis Rey	*903.XX*	7	0	0							7
Carlsbad	*904.XX*	6	9	4	3	13	27				62
San Dieguito	*905.XX*	1	0	0	4	0					5
Penasquitos	*906.XX*	18	3								21
Mission Bay	*906.XX*			1	7	4					12
San Diego	*907.XX*	61	0	0	0						61
San Diego Bay - Pueblo	*908.XX*	1	52	27							112
San Diego Bay - Sweetwater	*909.XX*	18	1	0							
San Diego Bay - Otay	*910.XX*	1	12	0							
Tijuana	*911.XX*	1	0	0	0	0	0	0	0		1
							Total Geo-Coded Sources				283
							Total Sources (incl. Non geo-coded)				283

12 Auto and Other Vehicle Body Repair and Painting

Automobile Painting

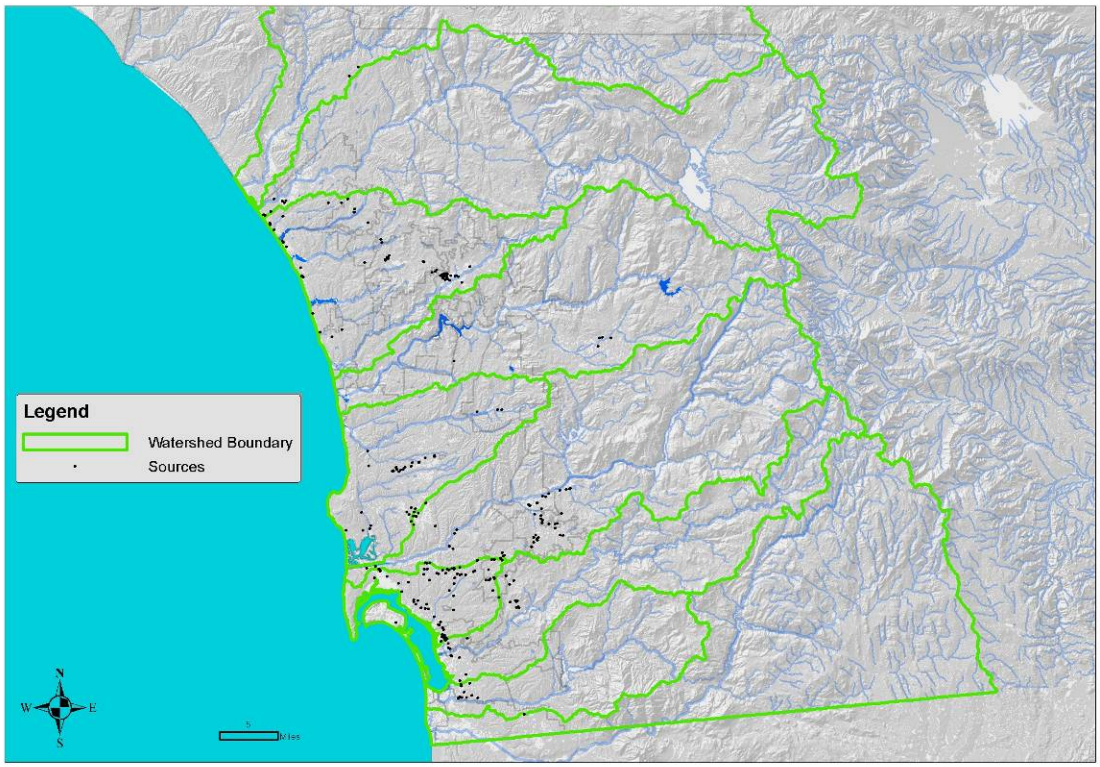

13 Mobile Automobile or Vehicle Washing

Narrative Description

This Source Profile Sheet covers establishments primarily engaged in mobile automobile or vehicle washing.

SIC Codes	
7542	Carwashes

NAICS Codes	
811192	Car Washes

Some businesses that conduct mobile automobile or vehicle washing were historically classified under the Standard Industrial Classification (SIC) system. This system has been slowly replaced by the North American Industry Classification System (NAICS), which accommodates a larger number of industrial sectors and sub-sectors, and identifies hundreds of new, emerging, and advanced technology industries. As most Copermittees have yet to convert from the SIC system to the NAICS, the applicable codes from both systems are presented here for easy reference.

Pollutant Generating Activities and Associated Pollutants

The following table contains a list of activities commonly associated with mobile automobile or vehicle washing which may have a source loading potential. Possible pollutants associated with these activities are also presented. There are no activities with a source loading potential in wet weather. Table 13-1 contains a list of activities with source loading potential in dry weather.

The activities below were evaluated for potential pollutant generation during wet weather and dry weather. Wet weather potentials consider runon and runoff during wet weather events. Dry weather potentials are based on the assumption that irrigation and cleaning activities act as transport mechanisms. Furthermore, it is assumed that no BMPs are in place.

Table 13-1. Summary of typical activities and associated pollutants during dry weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacteria/ Pathogens*
Mobile automobile or vehicle washing									
Vehicle/equipment washing and steam cleaning	X	X	X	X	X				
Mobile interior washing operations				X				X	
Cleaning or washing of tools and equipment	X	X	X	X	X				
Storage of any liquid materials in portable containers	X	X	X						
Waste handling and disposal	X	X	X					X	
Operation of outdoor equipment	X	X	X	X					

Discharge Potential

As part of the initial 2005 LTEA effort, a questionnaire was completed by various Copermittees to assess the likely potential of a specific source discharging pollutants. Using existing information (e.g. illicit discharge records) and field knowledge the Copermittees ranked the potential of discharging pollutants. These rankings were averaged (when a ranking was given) to obtain average discharge potential rankings for each information type. See Table 13-2 for a summary of the results. An overall ranking was also determined for the source by taking the maximum average ranking from each of the information types. When only one information type received a score, due to lack of information, the average ranking from that one information type was neglected in the overall ranking determination. In these cases the overall ranking was set to 3, meaning the currently available information does not adequately characterize the discharge potential.

A review of Table 13-2 shows that there appears to be considerable information that may be used to assess the discharge potential. As more information is collected and evaluated, the ranking potential will be updated.

It should be noted that a blank ranking in Table 13-2 does not necessarily mean that there is no discharge potential but rather the Copermittee chose not to rank the potential. As more information is collected these blanks will be filled in and a more comprehensive ranking established.

Table 13-2. Ranking of discharge potential using existing information.

Mobile automobile or vehicle washing			
Information Types	*Information Available*	*Average Ranking*	*Comments*
Dry Weather Monitoring	Y	4.5	
Illicit Discharge Records	Y	4.5	
Pretreatment Compliance Records	Y		
Underground Stoage Tank Records			
Haz Waste Storage Records			
Inspection Records	Y	5	
Other information? Please specify here		5	
Overall Ranking		**5.0**	

Note: Overall Ranking is the highest 'Average Ranking' received for the various information types. When less than 2 scores were given, due to lack of information, the Overall Ranking was adjusted to 3 - Unknown Potential.

Scoring Legend	
1	- low discharge potential
2	- medium-low discharge potential
3	- Unknown, information does not adequately characterize
4	- medium-high discharge potential
5	- high discharge potential

Legal/Regulatory Oversight

Table 13-3 provides a summary of the types of regulatory oversight that pertain to mobile automobile or vehicle washing. In some cases, there may be some overlap in the types of regulatory oversight.

Table 13-3. Summary of the stormwater-related and non-stormwater related regulatory oversight of mobile automobile or vehicle washing businesses.

Mobile automobile or vehicle washing			
Oversight Type	Regulatory Oversight		Comments
Stormwater	NPDES Municipal Permit / Local Ordinances	X	
	NPDES General Industrial Permit		
	NPDES General Construction Permit		
Non-Stormwater	Industrial Pretreatment Program (EPA)		
	Hazardous Materials / CUPA (County DEH)		
	CUREFL (County DEH)		
	Local Enforcement Agency - Landfills (County DEH)		
	Air Quality Permits (APCD)		
	Fire Agencies		
	Pesticide Regulatory Program (County AW&M)		
	Coast Guard		

13 Mobile Automobile or Vehicle Washing

Existing regulatory oversight of mobile automobile or vehicle washing activities is limited regarding stormwater issues.

Source Prevalence and Distribution

During the 2005 Baseline LTEA effort, numerous resources were relied upon in order to obtain an as accurate as feasible estimate of the number of sources throughout San Diego County. The objective was to locate the sources within watersheds and sub-watersheds. When this was feasible, the sources are termed ‘geo-coded’, meaning there geographic coordinates are known and can be included in a GIS map. For Mobile Automobile and Vehicle washing, it was not feasible to geo-code this source due to the mobile nature of this activity. The number of businesses that conduct these activities is not known at this time as this source has not been inventoried to date.

14 Mobile Power Washing

Narrative Description

This Source Profile Sheet covers establishments primarily engaged in mobile power washing.

SIC Codes	

NAICS Codes	
561790	Power washing

Power washing was not historically classified under the Standard Industrial Classification (SIC) system. The SIC system has been slowly replaced by the North American Industry Classification System (NAICS), which accommodates a larger number of industrial sectors and sub-sectors, and identifies hundreds of new, emerging, and advanced technology industries. Therefore there is a code for power washing in the NAICS system.

Pollutant Generating Activities and Associated Pollutants

The following tables contain a list of activities commonly associated with mobile power washing which may have a source loading potential. Possible pollutants associated with these activities are also presented. Table 14-1 contains a list of activities with a source loading potential in wet weather and Table 14-2 contains a list of activities with source loading potential in dry weather. It is best professional judgment that power washing activities do not take place during wet weather.

The activities below were evaluated for potential pollutant generation during wet weather and dry weather. Wet weather potentials consider runon and runoff during wet weather events. Dry weather potentials are based on the assumption that irrigation and cleaning activities act as transport mechanisms. Furthermore, it is assumed that no BMPs are in place.

Table 14-1. Summary of typical activities and associated pollutants during wet weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacteria/ Pathogens*
Mobile Power Washing									
No Wet Weather									

Table 14-2. Summary of typical activities and associated pollutants during dry weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacteria/ Pathogens*
Mobile Power Washing									
Storage of any liquid materials in portable containers					X				
Pressure cleaning (parking lots, sidewalks, storage areas)	X	X	X	X	X			X	X

Discharge Potential

As part of the initial 2005 LTEA effort, a questionnaire was completed by various Copermittees to assess the likely potential of a specific source discharging pollutants. Using existing information (e.g. illicit discharge records) and field knowledge the Copermittees ranked the potential of discharging pollutants. These rankings were averaged (when a ranking was given) to obtain average discharge potential rankings for each information type. A similar questionnaire was not completed for this source profile sheet. As a result, best professional judgment was used to assign a discharge potential based on sources identified as concerns in the Copermittees' annual reports and permit. In this case, a discharge potential of 4 was assigned because power washing has been identified as a new potential source of pollutants.

Table 14-3. Ranking of discharge potential using existing information.

Mobile Power Washing			
Information Types	*Information Available*	*Average Ranking*	*Comments*
Dry Weather Monitoring			
Illicit Discharge Records			
Pretreatment Compliance Records			
Underground Storage Tank Records			
Haz Waste Storage Records			
Inspection Records			
Other information? Please specify here			
Overall Ranking		4.0	

Note: Overall Ranking is the highest 'Average Ranking' received for the various information types. When less than 2 scores were given, due to lack of information, the Overall Ranking was adjusted to 3 - Unknown Potential.

Scoring Legend	
1	- low discharge potential
2	- medium-low discharge potential
3	- Unknown, information does not adequately characterize
4	- medium-high discharge potential
5	- high discharge potential

Legal/Regulatory Oversight

Table 14-4 provides a summary of the types of regulatory oversight that pertain to mobile power washing. In some cases, there may be some overlap in the types of regulatory oversight.

Table 14-4. Summary of the stormwater-related and non-stormwater related regulatory oversight of mobile power washing businesses.

Mobile automobile or vehicle washing			
Oversight Type	**Regulatory Oversight**		**Comments**
Stormwater	NPDES Municipal Permit / Local Ordinances	X	
	NPDES General Industrial Permit		
	NPDES General Construction Permit		
Non-Stormwater	Industrial Pretreatment Program (EPA)		
	Hazardous Materials / CUPA (County DEH)		
	CURFFL (County DEH)		
	Local Enforcement Agency - Landfills (County DEH)		
	Air Quality Permits (APCD)		
	Fire Agencies		
	Pesticide Regulatory Program (County AW&M)		
	Coast Guard		

14 Mobile Power Washing

Existing regulatory oversight of mobile power washing activities is limited regarding stormwater issues.

Source Prevalence and Distribution

During the 2005 Baseline LTEA effort, numerous resources were relied upon in order to obtain an as accurate as feasible estimate of the number of sources throughout San Diego County. The objective was to locate the sources within watersheds and sub-watersheds. When this was feasible, the sources are termed ‘geo-coded’, meaning there geographic coordinates are known and can be included in a GIS map. For mobile power washing, it was not feasible to geo-code this source due to the mobile nature of this activity. The number of businesses that conduct these activities is not known at this time as this source has not been inventoried to date.

15 Auto Parking Lots

Narrative Description

This Source Profile Sheet covers establishments such as auto parking lots and storage facilities.

SIC Codes	
4225	General Warehousing and Storage
7521	Automobile Parking

NAICS Codes	
493190	Other Warehousing and Storage
812930	Parking Lots and Garages

Some auto parking lots and storage facilities were historically classified under the Standard Industrial Classification (SIC) system. This system has been slowly replaced by the North American Industry Classification System (NAICS), which accommodates a larger number of industrial sectors and sub-sectors, and identifies hundreds of new, emerging, and advanced technology industries. As most Copermittees have yet to convert from the SIC system to the NAICS, the applicable codes from both systems are presented here for easy reference.

Pollutant Generating Activities and Associated Pollutants

The following tables contain activities commonly associated with auto parking lots and storage facilities which may have a source loading potential. Possible pollutants associated with these activities are also presented. Table 15-1 contains a list of activities with a source loading potential in wet weather and Table 15-2 contains a list of activities with source loading potential in dry weather.

The activities below were evaluated for potential pollutant generation during wet weather and dry weather. Wet weather potentials consider runon and runoff during wet weather events. Dry weather potentials are based on the assumption that irrigation and cleaning activities act as transport mechanisms. Furthermore, it is assumed that no BMPs are in place.

Table 15-1. Summary of typical activities and associated pollutants during wet weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacteria/ Pathogens*
Auto parking lots and storage facilities									
Vehicle and equipment parking and storage	X	X	X	X					
Waste handling and disposal	X	X	X						
Storage of raw materials, products, and containers	X	X	X	X					
Loading and unloading	X	X	X	X				X	

Table 15-2. Summary of typical activities and associated pollutants during dry weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacteria/ Pathogens*
Auto parking lots and storage facilities									
Pressure cleaning (parking lots, sidewalks, storage areas)	X	X	X	X	X			X	X

Summary of Existing Information on Discharge Potential

As part of the initial 2005 LTEA effort, a questionnaire was completed by various Copermittees to assess the likely potential of a specific source discharging pollutants. Using existing information (e.g. illicit discharge records) and field knowledge the Copermittees ranked the potential of discharging pollutants. These rankings were averaged (when a ranking was given) to obtain average discharge potential rankings for each information type. See Table 15-3 for a summary of the results. An overall ranking was also determined for the source by taking the maximum average ranking from each of the information types. When only one information type received a score, due to lack of information, the average ranking from that one information type was neglected in the overall ranking determination. In these cases the overall ranking was set to 3, meaning the currently available information does not adequately characterize the discharge potential.

Table 15-3. Ranking of discharge potential using existing information.

Auto parking lots and storage facilities			
Information Types	*Information Available*	*Average Ranking*	*Comments*
Dry Weather Monitoring	Y	2.5	
Illicit Discharge Records	Y	4	
Pretreatment Compliance Records			
Underground Stoage Tank Records			
Haz Waste Storage Records			
Inspection Records	Y	3	
Other information? Please specify here		2	
Overall Ranking		**4.0**	

Note: Overall Ranking is the highest 'Average Ranking' received for the various information types. When less than 2 scores were given, due to lack of information, the Overall Ranking was adjusted to 3 - Unknown Potential.

Scoring Legend	
1	- low discharge potential
2	- medium-low discharge potential
3	- Unknown, information does not adequately characterize
4	- medium-high discharge potential
5	- high discharge potential

A review of Table 15-3 shows that there appears to be considerable information that may be used to assess the discharge potential. As more information is collected and evaluated, the ranking potential will be updated.

It should be noted that a blank ranking in Table 15-3 does not necessarily mean that there is no discharge potential but rather the Copermittee chose not to rank the potential. As more information is collected these blanks will be filled in and a more comprehensive ranking established.

Legal/Regulatory Oversight

Table 15-4 provides a summary of the types of regulatory oversight that pertain to auto parking lots and storage facilities. In some cases, there may be some overlap in the types of regulatory oversight.

Table 15-4. Summary of the stormwater-related and non-stormwater related regulatory oversight of auto parking lots and storage facilities.

Auto parking lots and storage facilities			
Oversight Type	**Regulatory Oversight**		**Comments**
Stormwater	NPDES Municipal Permit / Local Ordinances	X	
	NPDES General Industrial Permit		
	NPDES General Construction Permit		
Other Regulatory Oversight	Industrial Pretreatment Program (EPA)		
	Hazardous Materials / CUPA (County DEH)		
	CURFFL (County DEH)		
	Local Enforcement Agency - Landfills (County DEH)		
	Air Quality Permits (APCD)		
	Fire Agencies		
	Pesticide Regulatory Program (County AW&M)		
	Coast Guard		

Existing regulatory oversight of parking activities is limited regarding stormwater issues

Source Prevalence and Distribution

During the 2005 Baseline LTEA effort, numerous resources were relied upon in order to obtain an as accurate as feasible estimate of the number of sources throughout San Diego County. The objective was to locate the sources within watersheds and sub-watersheds. When this was feasible, the sources are termed ‘geo-coded’, meaning there geographic coordinates are known and can be included in a GIS map. In some instances, it was not feasible to geo-code some sources. Therefore, the number of geo-coded sources and the total number of sources is unknown at this time.

16 Retail or Wholesale Fueling

Narrative Description

This Source Profile Sheet covers establishments primarily engaged in retail or wholesale fueling.

SIC Codes	
5541	Gasoline Service Stations
5172	Petroleum and Petroleum Products Wholesalers, Except Bulk Stations and Terminals

NAICS Codes	
424710	Petroleum Bulk Stations and Terminals
424720	Petroleum and Petroleum Products Merchant Wholesalers (except Bulk Stations and Terminals)
447XXX	Gasoline Stations

Some facilities that conduct retail or wholesale fueling were historically classified under the Standard Industrial Classification (SIC) system. This system has been slowly replaced by the North American Industry Classification System (NAICS), which accommodates a larger number of industrial sectors and sub-sectors, and identifies hundreds of new, emerging, and advanced technology industries. As most Copermittees have yet to convert from the SIC system to the NAICS, the applicable codes from both systems are presented here for easy reference.

Pollutant Generating Activities and Associated Pollutants

The following tables contain a list of activities commonly associated with retail or wholesale fueling which may have a source loading potential. Possible pollutants associated with these activities are also presented. Table 16-1 contains a list of activities with a source loading potential in wet weather and Table 16-2 contains a list of activities with source loading potential in dry weather.

The activities below were evaluated for potential pollutant generation during wet weather and dry weather. Wet weather potentials consider runon and runoff during wet weather events. Dry weather potentials are based on the assumption that irrigation and cleaning activities act as transport mechanisms. Furthermore, it is assumed that no BMPs are in place.

16 Retail or Wholesale Fueling

Table 16-1. Summary of typical activities and associated pollutants during wet weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacteria/ Pathogens*
Retail or wholesale fueling									
Vehicle and equipment fueling	X	X	X						
Storage of liquid materials in stationary tanks	X	X	X						
Loading and unloading	X	X	X	X				X	
Operation of outdoor equipment	X	X	X	X					
Cleaning facilities	X	X	X	X				X	

Table 16-2. Summary of typical activities and associated pollutants during dry weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacteria/ Pathogens*
Retail or wholesale fueling									
Cleaning facilities	X	X	X	X				X	

Discharge Potential

As part of the initial 2005 LTEA effort, a questionnaire was completed by various Copermittees to assess the likely potential of a specific source discharging pollutants. Using existing information (e.g. illicit discharge records) and field knowledge the Copermittees ranked the potential of discharging pollutants. These rankings were averaged (when a ranking was given) to obtain average discharge potential rankings for each information type. See Table 16-3 for a summary of the results. An overall ranking was also determined for the source by taking the maximum average ranking from each of the information types. When only one information type received a score, due to lack of information, the average ranking from that one information type was neglected in the overall ranking determination. In these cases the overall ranking was set to 3, meaning the currently available information does not adequately characterize the discharge potential.

Table 16-3. Ranking of discharge potential using existing information.

Retail or wholesale fueling			
Information Types	***Information Available***	***Average Ranking***	***Comments***
Dry Weather Monitoring	Y	3	
Illicit Discharge Records	Y	2	
Pretreatment Compliance Records			
Underground Stoage Tank Records	Y	2	
Haz Waste Storage Records	Y		
Inspection Records	Y	3	
Other information? Please specify here		2	
Overall Ranking		**3.0**	

Note: Overall Ranking is the highest 'Average Ranking' received for the various information types. When less than 2 scores were given, due to lack of information, the Overall Ranking was adjusted to 3 - Unknown Potential.

Scoring Legend	
1	- low discharge potential
2	- medium-low discharge potential
3	- Unknown, information does not adequately characterize
4	- medium-high discharge potential
5	- high discharge potential

A review of Table 16-3 shows that there appears to be considerable information that may be used to assess the discharge potential. As more information is collected and evaluated, the ranking potential will be updated.

It should be noted that a blank ranking in Table 16-3 does not necessarily mean that there is no discharge potential but rather the Copermittee chose not to rank the potential. As more information is collected these blanks will be filled in and a more comprehensive ranking established.

Legal/Regulatory Oversight

Table 16-4 provides a summary of the types of regulatory oversight that pertain to retail or wholesale fueling. In some cases, there may be some overlap in the types of regulatory oversight.

Table 16-4. Summary of the stormwater-related and non-stormwater related regulatory oversight of retail or wholesale fueling facilities.

Retail or wholesale fueling			
Oversight Type	**Regulatory Oversight**		**Comments**
Stormwater	NPDES Municipal Permit / Local Ordinances	X	
	NPDES General Industrial Permit		
	NPDES General Construction Permit		
Other Regulatory Oversight	Industrial Pretreatment Program (EPA)		
	Hazardous Materials / CUPA (County DEH)	X	
	CURFFL (County DEH)		
	Local Enforcement Agency - Landfills (County DEH)		
	Air Quality Permits (APCD)	X	
	Fire Agencies		
	Pesticide Regulatory Program (County AW&M)		
	Coast Guard		

Better coordination may be warranted between the regulatory programs to minimize overlap but still focus on water quality protection.

Source Prevalence and Distribution

The 2005 Baseline LTEA effort produced source distribution information, if available, is provided in this section.

It is recommended that updated source information is used to develop revised source prevalence and distribution data.

Table 16-5. Summary of retail or wholesale fueling sources within each of San Diego County's Watersheds.

Watershed Management Area	Hydrologic Unit (HU)	Retail or wholesale fueling Total # of Geo-Coded Sources
Santa Margarita	*902.00*	11
San Luis Rey	*903.00*	33
Carlsbad	*904.00*	163
San Dieguito	*905.00*	36
Penasquitos	*906.10 - 906.20*	65
Mission Bay	*906.30 - 906.50*	56
San Diego	*907.00*	160
San Diego Bay - Pueblo	*908.00*	227
San Diego Bay - Sweetwater	*909.00*	
San Diego Bay - Otay	*910.00*	
Tijuana	*911.00*	28
Total Geo-Coded Sources		779
Total Sources (incl. Non geo-coded)		779

Numerous resources were relied upon in order to obtain an as accurate as feasible estimate of the number of sources throughout San Diego County. The objective was to locate the sources within watersheds and sub-watersheds. When this was feasible,

the sources are termed ‘geo-coded’, meaning there geographic coordinates are known and can be included in a GIS map. In some instances, it was not feasible to geo-code some sources. In Table 16-5, the number of geo-coded retail or wholesale fueling sources within each watershed is shown, along with the total number of sources (geo-coded and not geo-coded together). In this case, the geographic coordinates for all of the identified sources were determined.

While the inventory process attempted to ensure there is no overlap between priority sources identified, there may be some overlap of the identified sources with sources identified in other Source Profile Sheets. This may be the case for the retail or wholesale fueling sources that also perform auto repair (SPS#10) and equipment repair (SPS#11).

The source inventory is further broken down in Table 16-6 to show the prevalence of retail or wholesale fueling facilities within each sub-watershed. This information, combined with the concurrent water quality assessment of sub-watersheds throughout San Diego County will ultimately help to assess the threat these facilities pose to water quality by source and constituent.

<u>It is recommended that municipalities use updated source information from the County, as available, to develop revised source prevalence and distribution data.</u>

Table 16-6. Summary of retail or wholesale fueling sources within each of San Diego County’s sub-watersheds.

		Retail or wholesale fueling									
Watershed Management Area	Hydrologic Unit (HU)	*Sources Geo-Coded by Sub-watershed Hydrologic Unit*									Total # of Sources
		90X.10	*90X.20*	*90X.30*	*90X.40*	*90X.50*	*90X.60*	*90X.70*	*90X.80*	*90X.90*	
Santa Margarita	*902.XX*	10	1	0	0	0	0	0	0	0	11
San Luis Rey	*903.XX*	30	1	2							33
Carlsbad	*904.XX*	6	40	18	8	37	54				163
San Dieguito	*905.XX*	11	14	0	11	0					36
Penasquitos	*906.XX*	37	28								65
Mission Bay	*906.XX*			5	27	24					56
San Diego	*907.XX*	153	0	5	2						160
San Diego Bay - Pueblo	*908.XX*	11	86	10							227
San Diego Bay - Sweetwater	*909.XX*	65	11	1							
San Diego Bay - Otay	*910.XX*	5	38	0							
Tijuana	*911.XX*	22	0	0	1	1	0	0	4		28
							Total Geo-Coded Sources				779
							Total Sources (incl. Non geo-coded)				779

16 Retail or Wholesale Fueling

Fuel Station

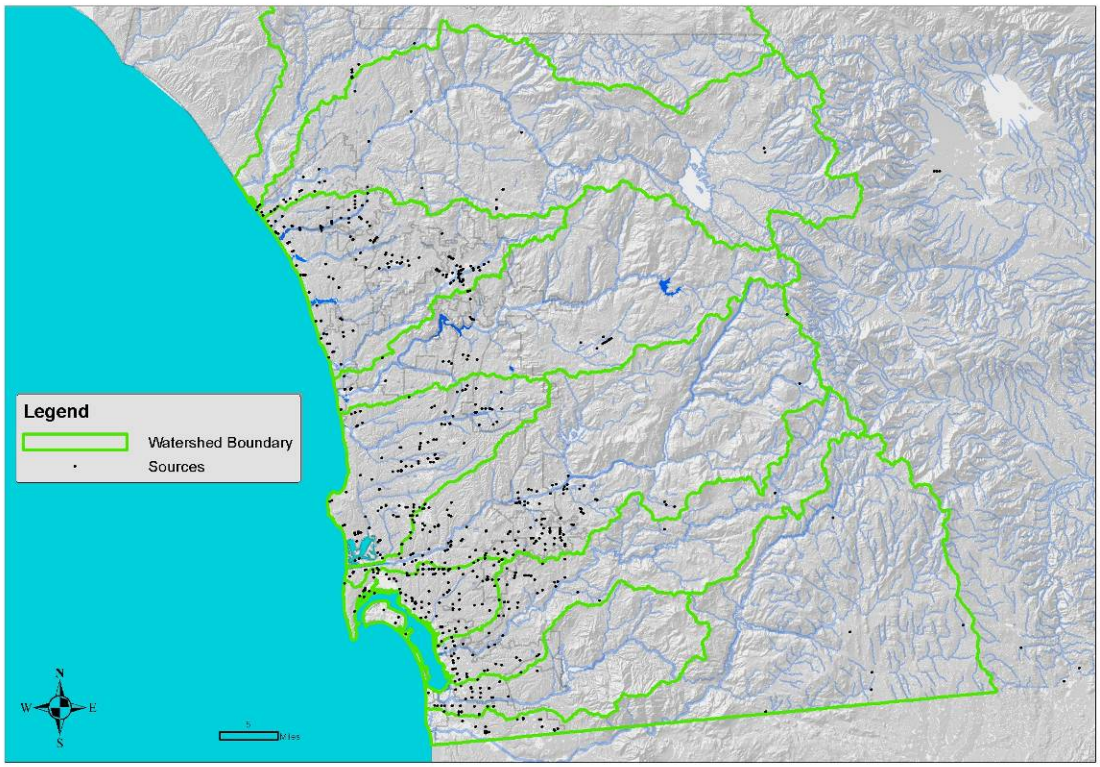

17 Pest Control Services

Narrative Description

This Source Profile Sheet covers establishments primarily engaged in pest control services. This includes yard and structural pest control businesses.

SIC Codes	
7342	Disinfecting and Pest Control Services

NAICS Codes	
115112	Soil Preparation, Planting, and Cultivating
115310	Support Activities for Forestry
561710	Exterminating and Pest Control Services
926140	Regulation of Agricultural Marketing and Commodities

Some businesses that conduct pest control services were historically classified under the Standard Industrial Classification (SIC) system. This system has been slowly replaced by the North American Industry Classification System (NAICS), which accommodates a larger number of industrial sectors and sub-sectors, and identifies hundreds of new, emerging, and advanced technology industries. As most Copermittees have yet to convert from the SIC system to the NAICS, the applicable codes from both systems are presented here for easy reference.

Pollutant Generating Activities and Associated Pollutants

The following tables contain a list of activities commonly associated with pest control services which may have a source loading potential. Possible pollutants associated with these activities are also presented. Table 17-1 contains a list of activities with a source loading potential in wet weather. There are no activities with source loading potential in dry weather.

The activities below were evaluated for potential pollutant generation during wet weather and dry weather. Wet weather potentials consider runon and runoff during wet weather events. Dry weather potentials are based on the assumption that irrigation and cleaning activities act as transport mechanisms. Furthermore, it is assumed that no BMPs are in place.

17 Pest Control Services

Table 17-1. Summary of typical activities and associated pollutants during wet weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacteria/ Pathogens*
Pest Control Services									
Storage of pesticides		X				X			
Waste handling and disposal		X				X		X	X
Loading and unloading		X				X		X	

Discharge Potential

As part of the initial 2005 LTEA effort, a questionnaire was completed by various Copermittees to assess the likely potential of a specific source discharging pollutants. Using existing information (e.g. illicit discharge records) and field knowledge the Copermittees ranked the potential of discharging pollutants. These rankings were averaged (when a ranking was given) to obtain average discharge potential rankings for each information type. See Table 17-2 for a summary of the results. An overall ranking was also determined for the source by taking the maximum average ranking from each of the information types. When only one information type received a score, due to lack of information, the average ranking from that one information type was neglected in the overall ranking determination. In these cases the overall ranking was set to 3, meaning the currently available information does not adequately characterize the discharge potential.

Table 17-2. Ranking of discharge potential using existing information.

Pest Control Services			
Information Types	*Information Available*	*Average Ranking*	*Comments*
Dry Weather Monitoring	Y	2	
Illicit Discharge Records	Y		
Pretreatment Compliance Records			
Underground Stoage Tank Records			
Haz Waste Storage Records			
Inspection Records	Y	3	
Other information? Please specify here			
Overall Ranking		**3.0**	

Note: Overall Ranking is the highest 'Average Ranking' received for the various information types. When less than 2 scores were given, due to lack of information, the Overall Ranking was adjusted to 3 - Unknown Potential.

Scoring Legend	
1	- low discharge potential
2	- medium-low discharge potential
3	- Unknown, information does not adequately characterize
4	- medium-high discharge potential
5	- high discharge potential

A review of Table 17-2 shows that there is limited information available to assess discharge potential. Of the information available a more complete evaluation should be conducted to assess discharge potential.

It should be noted that a blank ranking in Table 17-2 does not necessarily mean that there is no discharge potential but rather the Copermittee chose not to rank the potential. As more information is collected these blanks will be filled in and a more comprehensive ranking established.

Legal/Regulatory Oversight

Table 17-3 provides a summary of the types of regulatory oversight that pertain to pest control services. In some cases, there may be some overlap in the types of regulatory oversight.

Table 17-3. Summary of the stormwater-related and non-stormwater related regulatory oversight of pest control service businesses.

Pest control services			
Oversight Type	Regulatory Oversight		Comments
Stormwater	NPDES Municipal Permit / Local Ordinances	X	
	NPDES General Industrial Permit		
	NPDES General Construction Permit		
Other Regulatory Oversight	Industrial Pretreatment Program (EPA)		
	Hazardous Materials / CUPA (County DEH)	X	
	CURFFL (County DEH)		
	Local Enforcement Agency - Landfills (County DEH)		
	Air Quality Permits (APCD)		
	Fire Agencies		
	Pesticide Regulatory Program (County AW&M)	X	
	Coast Guard		

Better coordination may be warranted between the regulatory programs to minimize overlap but still focus on water quality protection.

Source Prevalence and Distribution

During the 2005 Baseline LTEA effort, numerous resources were relied upon in order to obtain an as accurate as feasible estimate of the number of sources throughout San Diego County. The objective was to locate the businesses within watersheds and sub-watersheds. When this was feasible, the sources are termed ‘geo-coded’, meaning there geographic coordinates are known and can be included in a GIS map. In some instances, it was not feasible to geo-code some sources. In this case, the geographic coordinates for Pest Control Services have not yet been determined.

The use of inventories to locate pest control businesses (and associated pollutants) is somewhat misleading because the business activities creating the pollutants are mobile in nature. Instead the inventory may be used for outreach effort but not necessarily for locating pollutant loads. It is recommended that municipalities use updated source information from the County, as available, to develop revised source prevalence data.

18 Eating and Drinking Establishments

Narrative Description

SIC Codes	
5812	Eating Places

NAICS Codes	
722XXX	Food Services and Drinking Places

This Source Profile Sheet covers primarily eating and drinking establishments.

Some businesses such as eating and drinking establishments were historically classified under the Standard Industrial Classification (SIC) system. This system has been slowly replaced by the North American Industry Classification System (NAICS), which accommodates a larger number of industrial sectors and sub-sectors, and identifies hundreds of new, emerging, and advanced technology industries. As most Copermittees have yet to convert from the SIC system to the NAICS, the applicable codes from both systems are presented here for easy reference.

Pollutant Generating Activities and Associated Pollutants

The following tables contain a list of activities commonly associated with eating and drinking establishments which may have a source loading potential. Possible pollutants associated with these activities are also presented. Table 18-1 contains a list of activities with a source loading potential in wet weather and Table 18-2 contains a list of activities with source loading potential in dry weather.

The activities below were evaluated for potential pollutant generation during wet weather and dry weather. Wet weather potentials consider runon and runoff during wet weather events. Dry weather potentials are based on the assumption that irrigation and cleaning activities act as transport mechanisms. Furthermore, it is assumed that no BMPs are in place.

Table 18-1. Summary of typical activities and associated pollutants during wet weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacteria/ Pathogens*
Eating or drinking establishments									
Storage of solid wastes and food wastes		X	X	X			X		
Pressure washing buildings				X					
Disposal of solid and food wastes							X	X	X
Waste handling and disposal		X	X						X
Vector/Pest control						X			
Sanitary sewer overflows									X

Table 18-2. Summary of typical activities and associated pollutants during dry weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacteria/ Pathogens*
Eating or drinking establishments									
Pressure cleaning (parking lots, sidewalks, storage areas)				X					
Sanitary sewer overflows									X

Discharge Potential

As part of the initial 2005 LTEA effort, a questionnaire was completed by various Copermittees to assess the likely potential of a specific source discharging pollutants. Using existing information (e.g. illicit discharge records) and field knowledge the Copermittees ranked the potential of discharging pollutants. These rankings were averaged (when a ranking was given) to obtain average discharge potential rankings for each information type. See Table 18-3 for a summary of the results. An overall ranking was also determined for the source by taking the maximum average ranking from each of the information types. When only one information type received a score, due to lack of information, the average ranking from that one information type was neglected in the overall ranking determination. In these cases the overall ranking was set to 3, meaning the currently available information does not adequately characterize the discharge potential.

Table 18-3. Ranking of discharge potential using existing information.

Eating or drinking establishments			
Information Types	*Information Available*	*Average Ranking*	*Comments*
Dry Weather Monitoring	Y	4.5	
Illicit Discharge Records	Y	4.5	
Pretreatment Compliance Records			
Underground Stoage Tank Records			
Haz Waste Storage Records			
Inspection Records	Y	5	
Other information? Please specify here		4	
Overall Ranking		**5.0**	

Note: Overall Ranking is the highest 'Average Ranking' received for the various information types. When less than 2 scores were given, due to lack of information, the Overall Ranking was adjusted to 3 - Unknown Potential.

Scoring Legend	
1	- low discharge potential
2	- medium-low discharge potential
3	- Unknown, information does not adequately characterize
4	- medium-high discharge potential
5	- high discharge potential

A review of Table 18-3 shows that there appears to be considerable information that may be used to assess the discharge potential. As more information is collected and evaluated, the ranking potential will be updated.

It should be noted that a blank ranking in Table 18-3 does not necessarily mean that there is no discharge potential but rather the Copermittee chose not to rank the potential. As more information is collected these blanks will be filled in and a more comprehensive ranking established.

Legal/Regulatory Oversight

Table 18-4 provides a summary of the types of regulatory oversight that pertain to eating and drinking establishments. In some cases, there may be some overlap in the types of regulatory oversight.

Table 18-4. Summary of the stormwater-related and non-stormwater related regulatory oversight of eating and drinking establishment businesses.

Eating or drinking establishments			
Oversight Type	**Regulatory Oversight**		**Comments**
Stormwater	NPDES Municipal Permit / Local Ordinances	X	
	NPDES General Industrial Permit		
	NPDES General Construction Permit		
Other Regulatory Oversight	Industrial Pretreatment Program (EPA)	X	
	Hazardous Materials / CUPA (County DEH)		
	CURFFL (County DEH)	X	
	Local Enforcement Agency - Landfills (County DEH)		
	Air Quality Permits (APCD)		
	Fire Agencies		
	Pesticide Regulatory Program (County AW&M)		
	Coast Guard		

Better coordination may be warranted between the regulatory programs to minimize overlap but still focus on water quality protection.

Source Prevalence and Distribution

The 2005 Baseline LTEA effort produced source distribution information, if available, is provided in this section. It is recommended that updated source information is used to develop revised source prevalence and distribution data.

Numerous resources were relied upon in order to obtain an as accurate as feasible estimate of the number of sources throughout San Diego County. The objective was to locate the sources within watersheds and sub-watersheds. When this was feasible, the sources are termed ‘geo-coded’, meaning there geographic coordinates are known and can be included in a GIS map. In some instances, it was not feasible to geo-code some sources. The number of geo-coded eating and drinking establishment sources within each watershed is shown, along with the total number of sources (geo-coded and not geo-coded together). In this case, the geographic coordinates for all of the identified sources have not yet been determined.

While the inventory process attempted to ensure there is no overlap between priority sources identified, there may be some overlap of the identified sources with sources identified in other Source Profile Sheets.

The source inventory is further broken down in Table 18-5 to show the prevalence of eating and drinking establishment businesses within each sub-watershed. This information, combined with the concurrent water quality assessment of sub-watersheds throughout San Diego County will ultimately help to assess the threat these businesses pose to water quality by source and constituent.

It is recommended that municipalities use updated source information from the County, as available, to develop revised source prevalence and distribution data.

Table 18-5. Summary of eating and drinking establishment sources within each of San Diego County's sub-watersheds

		Eating or drinking establishments									
Watershed Management Area	Hydrologic Unit (HU)	*Sources Geo-Coded by Sub-watershed Hydrologic Unit*									Total # of Sources
		90X.10	*90X.20*	*90X.30*	*90X.40*	*90X.50*	*90X.60*	*90X.70*	*90X.80*	*90X.90*	
Santa Margarita	*902.XX*	82	7	0	0	0	0	0	0	0	89
San Luis Rey	*903.XX*	261	9	7							277
Carlsbad	*904.XX*	152	481	217	49	552	510				1961
San Dieguito	*905.XX*	189	182	7	80	7					465
Penasquitos	*906.XX*	512	317								829
Mission Bay	*906.XX*			446	284	252					982
San Diego	*907.XX*	1829	5	42	32						1908
San Diego Bay - Pueblo	*908.XX*	98	1883	339							3574
San Diego Bay - Sweetwater	*909.XX*	613	110	7							
San Diego Bay - Otay	*910.XX*	82	435	7							
Tijuana	*911.XX*	193	6	0	7	3	0	2	12		223
							Total Geo-Coded Sources				10308
							Total Sources (incl. Non geo-coded)				10342

18 Eating and Drinking Establishments

Food Establishment

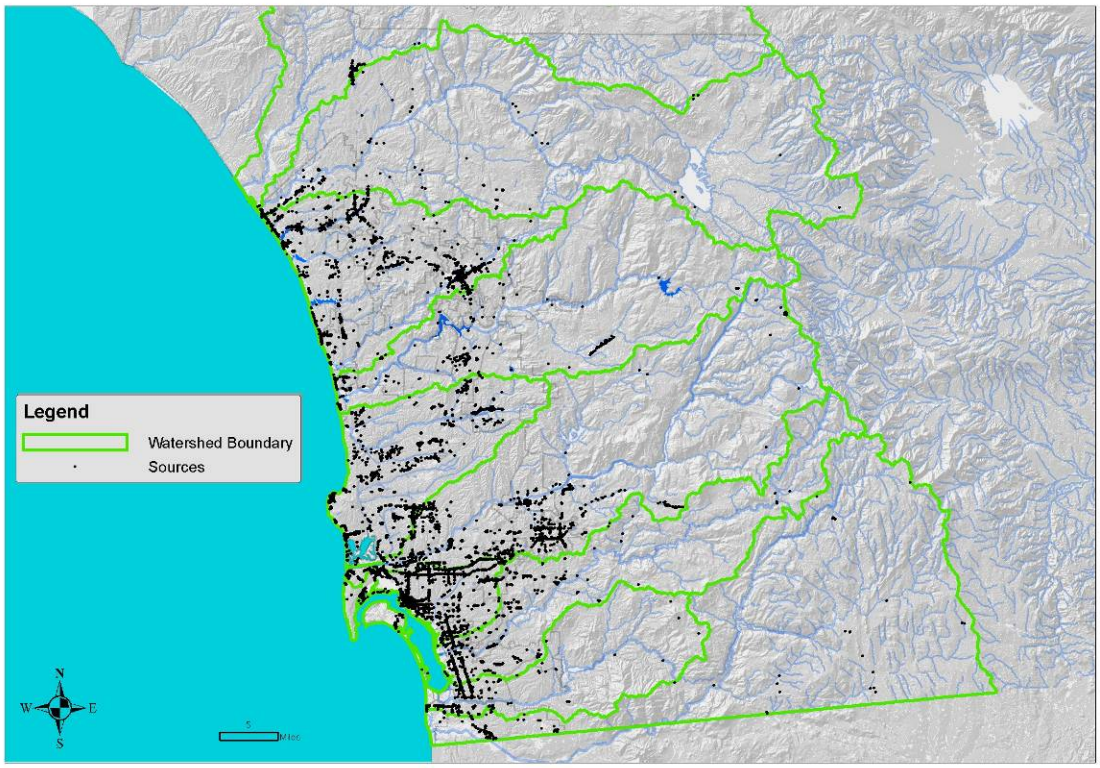

19 Mobile Carpet, Drape, and Furniture Cleaning

Narrative Description

This Source Profile Sheet covers establishments primarily engaged in mobile carpet, drape, and furniture cleaning.

SIC Codes	
7217	Carpet and Upholstery Cleaning
7641	Reupholstery and Furniture Repair

NAICS Codes	
561740	Carpet and Upholstery Cleaning Services
812320	Drycleaning and Laundry Services (except Coin-Operated)

Some businesses that conduct mobile carpet, drape, and furniture cleaning were historically classified under the Standard Industrial Classification (SIC) system. This system has been slowly replaced by the North American Industry Classification System (NAICS), which accommodates a larger number of industrial sectors and sub-sectors, and identifies hundreds of new, emerging, and advanced technology industries. As most Copermittees have yet to convert from the SIC system to the NAICS, the applicable codes from both systems are presented here for easy reference.

Pollutant Generating Activities and Associated Pollutants

The following tables contain a list of activities commonly associated with mobile carpet, drape, and furniture cleaning which may have a source loading potential. Possible pollutants associated with these activities are also presented. Table 19-1contains a list of activities with a source loading potential in wet weather and Table 19-2 contains a list of activities with source loading potential in dry weather.

The activities below were evaluated for potential pollutant generation during wet weather and dry weather. Wet weather potentials consider runon and runoff during wet weather events. Dry weather potentials are based on the assumption that irrigation and cleaning activities act as transport mechanisms. Furthermore, it is assumed that no BMPs are in place.

Table 19-1. Summary of typical activities and associated pollutants during wet weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacteria/ Pathogens*
Mobile carpet, drape, or furniture cleaning									
Storage of any liquid materials in portable containers		X							
Waste handling and disposal		X		X					X
Storage of raw materials, products, and containers		X							
Loading and unloading		X							

Table 19-2. Summary of typical activities and associated pollutants during dry weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacteria/ Pathogens*
Mobile carpet, drape, or furniture cleaning									
No dry weather									

Discharge Potential

As part of the initial 2005 LTEA effort, a questionnaire was completed by various Copermittees to assess the likely potential of a specific source discharging pollutants. Using existing information (e.g. illicit discharge records) and field knowledge the Copermittees ranked the potential of discharging pollutants. These rankings were averaged (when a ranking was given) to obtain average discharge potential rankings for each information type. See Table 19-3 for a summary of the results. An overall ranking was also determined for the source by taking the maximum average ranking from each of the information types. When only one information type received a score, due to lack of information, the average ranking from that one information type was neglected in the overall ranking determination. In these cases the overall ranking was set to 3, meaning the currently available information does not adequately characterize the discharge potential.

A review of Table 19-3 shows that there is limited information available to assess discharge potential. Of the information available a more complete evaluation should be conducted to assess discharge potential.

Table 19-3. Ranking of discharge potential using existing information.

Mobile carpet, drape, or furniture cleaning			
Information Types	***Information Available***	***Average Ranking***	***Comments***
Dry Weather Monitoring			
Illicit Discharge Records	Y	2	
Pretreatment Compliance Records			
Underground Stoage Tank Records			
Haz Waste Storage Records			
Inspection Records			
Other information? Please specify here	Y	2	
Overall Ranking		**2.0**	

Note: Overall Ranking is the highest 'Average Ranking' received for the various information types. When less than 2 scores were given, due to lack of information, the Overall Ranking was adjusted to 3 - Unknown Potential.

Scoring Legend	
1	- low discharge potential
2	- medium-low discharge potential
3	- Unknown, information does not adequately characterize
4	- medium-high discharge potential
5	- high discharge potential

It should be noted that a blank ranking in Table 19-3 does not necessarily mean that there is no discharge potential but rather the Copermittee chose not to rank the potential. As more information is collected these blanks will be filled in and a more comprehensive ranking established.

Legal/Regulatory Oversight

Table 19-4 provides a summary of the types of regulatory oversight that pertain to mobile carpet, drape, and furniture cleaning. In some cases, there may be some overlap in the types of regulatory oversight.

Table 19-4. Summary of the stormwater-related and non-stormwater related regulatory oversight of mobile carpet, drape, and furniture cleaning businesses.

Mobile carpet, drape, or furniture cleaning			
Oversight Type	**Regulatory Oversight**		**Comments**
Stormwater	NPDES Municipal Permit / Local Ordinances	X	
	NPDES General Industrial Permit		
	NPDES General Construction Permit		
Other Regulatory Oversight	Industrial Pretreatment Program (EPA)		
	Hazardous Materials / CUPA (County DEH)		
	CURFFL (County DEH)		
	Local Enforcement Agency - Landfills (County DEH)		
	Air Quality Permits (APCD)		
	Fire Agencies		
	Pesticide Regulatory Program (County AW&M)		
	Coast Guard		

19 Mobile Carpet, Drape, and Furniture Cleaning

Existing regulatory oversight of mobile carpet, drape, or furniture cleaning activities is limited regarding stormwater issues.

Source Prevalence and Distribution

During the 2005 Baseline LTEA effort, numerous resources were relied upon in order to obtain an as accurate as feasible estimate of the number of sources throughout San Diego County. The objective was to locate the sources within watersheds and sub-watersheds. When this was feasible, the sources are termed ‘geo-coded’, meaning there geographic coordinates are known and can be included in a GIS map. In this case, the geographic coordinates for all of inventoried businesses cannot be readily determined because of the mobile nature of these sources.

The use of inventories to locate mobile cleaning businesses (and associated pollutants) is not applicable because the business activities creating the pollutants are mobile in nature. Instead an inventory may be used for outreach effort but not necessarily for locating pollutant loads. It is recommended that municipalities use updated source information from the County, as available, to develop revised source prevalence data.

20 General Contractors for Home/commercial Improvements

Narrative Description

This Source Profile Sheet covers primarily general contractors that engage in home and commercial scale improvements. This includes cement mixing, painting, sandblasting, and masonry. There may be some overlap between this Source Profile Sheet and those for construction projects (SPS#2-SPS#4).

SIC Codes	
17XX	Construction Special Trade Contractors

NAICS Codes	
238XXX	Specialty Trade Contractors

Some general contracting services were historically classified under the Standard Industrial Classification (SIC) system. This system has been slowly replaced by the North American Industry Classification System (NAICS), which accommodates a larger number of industrial sectors and sub-sectors, and identifies hundreds of new, emerging, and advanced technology industries. As most Copermittees have yet to convert from the SIC system to the NAICS, the applicable codes from both systems are presented here for easy reference.

Pollutant Generating Activities and Associated Pollutants

The following tables contain a list of activities commonly associated with general contractors which may have a source loading potential. Possible pollutants associated with these activities are also presented. Table 20-1 contains a list of activities with a source loading potential in wet weather and Table 20-2 contains a list of activities with source loading potential in dry weather.

The activities below were evaluated for potential pollutant generation during wet weather and dry weather. Wet weather potentials consider runon and runoff during wet weather events. Dry weather potentials are based on the assumption that irrigation and cleaning activities act as transport mechanisms. Furthermore, it is assumed that no BMPs are in place.

20 General Contractors for Home/commercial Improvements

Table 20-1. Summary of typical activities and associated pollutants during wet weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacteria/ Pathogens*
General contractors for home/commercial improvements (e.g. cement mixing, masonry, painting, sandblasting, etc.)									
Loading and unloading	X	X	X	X					
Operation of outdoor equipment		X	X	X					
Building repair and construction	X	X	X	X				X	
Cement mixing				X				X	
Masonry				X				X	
Painting	X	X							
Sandblasting				X					

Table 20-2. Summary of typical activities and associated pollutants during dry weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacteria/ Pathogens*
General contractors for home/commercial improvements (e.g. cement mixing, masonry, painting, sandblasting, etc.)									
Cleaning site				X	X			X	

Discharge Potential

As part of the initial 2005 LTEA effort, a questionnaire was completed by various Copermittees to assess the likely potential of a specific source discharging pollutants. Using existing information (e.g. illicit discharge records) and field knowledge the Copermittees ranked the potential of discharging pollutants. These rankings were averaged (when a ranking was given) to obtain average discharge potential rankings for each information type. See Table 20-3 for a summary of the results. An overall ranking was also determined for the source by taking the maximum average ranking from each of the information types. When only one information type received a score, due to lack of information, the average ranking from that one information type was neglected in the overall ranking determination. In these cases the overall ranking was set to 3, meaning the currently available information does not adequately characterize the discharge potential.

Table 20-3. Ranking of discharge potential using existing information.

General Contractors for home/commercial improvements			
Information Types	*Information Available*	*Average Ranking*	*Comments*
Dry Weather Monitoring			
Illicit Discharge Records	Y	5	
Pretreatment Compliance Records			
Underground Stoage Tank Records			
Haz Waste Storage Records			
Inspection Records	Y	4	
Other information? Please specify here	Y	3	
Overall Ranking		**5.0**	

Note: Overall Ranking is the highest 'Average Ranking' received for the various information types. When less than 2 scores were given, due to lack of information, the Overall Ranking was adjusted to 3 - Unknown Potential.

Scoring Legend	
1	- low discharge potential
2	- medium-low discharge potential
3	- Unknown, information does not adequately characterize
4	- medium-high discharge potential
5	- high discharge potential

A review of Table 20-3 shows that there appears to be several sources of information that may be used to assess the discharge potential. As more information is collected and evaluated, the ranking potential will be updated.

It should be noted that a blank ranking in Table 20-3 does not necessarily mean that there is no discharge potential but rather the Copermittee chose not to rank the potential. As more information is collected these blanks will be filled in and a more comprehensive ranking established.

Legal/Regulatory Oversight

Table 20-4 provides a summary of the types of regulatory oversight that pertain to general contractors. In some cases, there may be some overlap in the types of regulatory oversight.

Table 20-4. Summary of the stormwater-related and non-stormwater related regulatory oversight of general contractors.

General contractors for home/commercial improvements (e.g. cement mixing, masonry, painting, etc.)			
Oversight Type	Regulatory Oversight		Comments
Stormwater	NPDES Municipal Permit / Local Ordinances	X	
	NPDES General Industrial Permit		
	NPDES General Construction Permit		
Other Regulatory Oversight	Industrial Pretreatment Program (EPA)		
	Hazardous Materials / CUPA (County DEH)		
	CURFFL (County DEH)		
	Local Enforcement Agency - Landfills (County DEH)		
	Air Quality Permits (APCD)	X	
	Fire Agencies		
	Pesticide Regulatory Program (County AW&M)		
	Coast Guard		

Better coordination may be warranted between the regulatory programs to minimize overlap but still focus on water quality protection.

Source Prevalence and Distribution

During the 2005 Baseline LTEA effort, numerous resources were relied upon in order to obtain an as accurate as feasible estimate of the number of sources throughout San Diego County. The objective was to locate the sources within watersheds and sub-watersheds. When this was feasible, the sources are termed ‘geo-coded’, meaning there geographic coordinates are known and can be included in a GIS map. In this case, the geographic coordinates for all of the inventoried general contractors that engaged in home and commercial scale improvements cannot be readily determined because of the mobile nature and location of these sources.

While the inventory process attempted to ensure there is no overlap between priority sources identified, there may be some overlap of the identified sources with sources identified in other Source Profile Sheets. This may be the case for the general contractor sources that also be classified as construction (SPS#2-SPS#4).

The use of inventories to locate general contractors for home/commercial improvements (and associated pollutants) is somewhat misleading because the business activities creating the pollutants are mobile in nature and the activities at the locations are

temporary. Instead an inventory may be used for outreach effort but not necessarily for locating pollutant loads. It is recommended that municipalities use updated source information from the County, as available, to develop revised source prevalence data.

21 Botanical or Zoological Gardens and Nurseries/Greenhouses

Narrative Description

This Source Profile Sheet covers primarily botanical or zoological gardens, as well as nurseries and greenhouses.

SIC Codes	
0181	Ornamental Floriculture and Nursery Products
0182	Food Crops Grown Under Cover
8422	Arboreta and Botanical or Zoological Gardens
NAICS Codes	
1114XX	Greenhouse, Nursery, and Floriculture Production
712130	Zoos and Botanical Gardens

Some botanical or zoological gardens and nurseries/greenhouses were historically classified under the Standard Industrial Classification (SIC) system. This system has been slowly replaced by the North American Industry Classification System (NAICS), which accommodates a larger number of industrial sectors and sub-sectors, and identifies hundreds of new, emerging, and advanced technology industries. As most Copermittees have yet to convert from the SIC system to the NAICS, the applicable codes from both systems are presented here for easy reference.

Pollutant Generating Activities and Associated Pollutants

The following tables contain a list of activities commonly associated with botanical or zoological gardens and nurseries/greenhouses which may have a source loading potential. Possible pollutants associated with these activities are also presented. Table 21-1 contains a list of activities with a source loading potential in wet weather and Table 21-2 contains a list of activities with source loading potential in dry weather.

The activities below were evaluated for potential pollutant generation during wet weather and dry weather. Wet weather potentials consider runon and runoff during wet weather events. Dry weather potentials are based on the assumption that irrigation and cleaning activities act as transport mechanisms. Furthermore, it is assumed that no BMPs are in place.

Table 21-1. Summary of typical activities and associated pollutants during wet weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacteria/ Pathogens*
Botanical or zoological gardens and nurseries/greenhouses									
Storage of pesticides and fertilizers		X				X	X		X
Storage of any liquid materials in portable containers		X				X	X		
Storage/disposal of solid wastes and garden wastes		X		X			X		
Storage of raw materials, products, and containers		X		X			X		
Landscape maintenance				X		X	X		
Loading and unloading		X					X		

Table 21-2. Summary of typical activities and associated pollutants during dry weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacteria/ Pathogens*
Botanical or zoological gardens and nurseries/greenhouses									
Landscape maintenance				X		X	X	X	

Discharge Potential

As part of the initial 2005 LTEA effort, a questionnaire was completed by various Copermittees to assess the likely potential of a specific source discharging pollutants. Using existing information (e.g. illicit discharge records) and field knowledge the Copermittees ranked the potential of discharging pollutants. These rankings were averaged (when a ranking was given) to obtain average discharge potential rankings for each information type. See Table 21-3 for a summary of the results. An overall ranking was also determined for the source by taking the maximum average ranking from each of the information types. When only one information type received a score, due to lack of information, the average ranking from that one information type was neglected in the overall ranking determination. In these cases the overall ranking was set to 3, meaning the currently available information does not adequately characterize the discharge potential.

Table 21-3. Ranking of discharge potential using existing information.

Botanical or zoological gardens and nurseries/greenhouses			
Information Types	*Information Available*	*Average Ranking*	*Comments*
Dry Weather Monitoring	Y	4	
Illicit Discharge Records	Y	3.5	
Pretreatment Compliance Records			
Underground Stoage Tank Records			
Haz Waste Storage Records			
Inspection Records	Y	5	
Other information? Please specify here		4	
Overall Ranking		**5.0**	

Note: Overall Ranking is the highest 'Average Ranking' received for the various information types. When less than 2 scores were given, due to lack of information, the Overall Ranking was adjusted to 3 - Unknown Potential.

Scoring Legend	
1	- low discharge potential
2	- medium-low discharge potential
3	- Unknown, information does not adequately characterize
4	- medium-high discharge potential
5	- high discharge potential

A review of Table 21-3 shows that there appears to be considerable information that may be used to assess the discharge potential. As more information is collected and evaluated, the ranking potential will be updated.

It should be noted that a blank ranking in Table 21-3 does not necessarily mean that there is no discharge potential but rather the Copermittee chose not to rank the potential. As more information is collected these blanks will be filled in and a more comprehensive ranking established.

Legal/Regulatory Oversight

Table 21-4 provides a summary of the types of regulatory oversight that pertain to botanical or zoological gardens and nurseries/greenhouses. In some cases, there may be some overlap in the types of regulatory oversight.

Table 21-4. Summary of the stormwater-related and non-stormwater related regulatory oversight of botanical or zoological gardens and nurseries/greenhouses.

Botanical or zoological gardens and nurseries/greenhouses			
Oversight Type	**Regulatory Oversight**		**Comments**
Stormwater	NPDES Municipal Permit / Local Ordinances	X	
	NPDES General Industrial Permit		
	NPDES General Construction Permit		
Other Regulatory Oversight	Industrial Pretreatment Program (EPA)		
	Hazardous Materials / CUPA (County DEH)	X	
	CURFFL (County DEH)		
	Local Enforcement Agency - Landfills (County DEH)		
	Air Quality Permits (APCD)		
	Fire Agencies		
	Pesticide Regulatory Program (County AW&M)	X	
	Coast Guard		

Better coordination may be warranted between the regulatory programs to minimize overlap but still focus on water quality protection.

Source Prevalence and Distribution

The 2005 Baseline LTEA effort produced source distribution information, if available, is provided in this section. It is recommended that updated source information is used to develop revised source prevalence and distribution data.

Table 21-5. Summary of botanical or zoological garden and nursery/greenhouse sources within each of San Diego County's Watersheds.

Watershed Management Area	Hydrologic Unit (HU)	Botanical or Zoological Gardens and Nurseries/Greenhouses Total # of Geo-Coded Sources
Santa Margarita	*902.00*	64
San Luis Rey	*903.00*	315
Carlsbad	*904.00*	331
San Dieguito	*905.00*	68
Penasquitos	*906.10 - 906.20*	7
Mission Bay	*906.30 - 906.50*	11
San Diego	*907.00*	45
San Diego Bay - Pueblo	*908.00*	69
San Diego Bay - Sweetwater	*909.00*	
San Diego Bay - Otay	*910.00*	
Tijuana	*911.00*	7
Total Geo-Coded Sources		917
Total Sources (incl. Non geo-coded)		948

Numerous resources were relied upon in order to obtain an as accurate as feasible estimate of the number of sources throughout San Diego County. The objective was to locate the sources within watersheds and sub-watersheds. When this was feasible, the sources are termed 'geo-coded', meaning there geographic coordinates are known and can be included in a GIS map. In some instances, it was not feasible to geo-code some sources. In Table 21-5, the

number of geo-coded botanical or zoological garden and nursery/greenhouse sources within each watershed is shown, along with the total number of sources (geo-coded and not geo-coded together). In this case, the geographic coordinates for all of the identified sources have not yet been determined.

While the inventory process attempted to ensure there is no overlap between priority sources identified, there may be some overlap of the identified sources with sources identified in other Source Profile Sheets.

The source inventory is further broken down in Table 21-6 to show the prevalence of botanical or zoological gardens and nurseries/greenhouses within each sub-watershed. This information, combined with the concurrent water quality assessment of sub-watersheds throughout San Diego County will ultimately help to assess the threat these facilities pose to water quality by source and constituent.

It is recommended that municipalities use updated source information from the County, as available, to develop revised source prevalence and distribution data.

Table 21-6. Summary of botanical or zoological garden and nursery/greenhouse sources within each of San Diego County's sub-watersheds.

		Botanical or Zoological Gardens and Nurseries/Greenhouses									
Watershed Management Area	Hydrologic Unit (HU)	*Sources Geo-Coded by Sub-watershed Hydrologic Unit*									Total # of Sources
		90X.10	*90X.20*	*90X.30*	*90X.40*	*90X.50*	*90X.60*	*90X.70*	*90X.80*	*90X.90*	
Santa Margarita	*902.XX*	7	57	0	0	0	0	0	0	0	64
San Luis Rey	*903.XX*	281	34	0							315
Carlsbad	*904.XX*	2	39	85	10	138	57				331
San Dieguito	*905.XX*	12	17	16	22	1					68
Penasquitos	*906.XX*	4	3								7
Mission Bay	*906.XX*			5	4	2					11
San Diego	*907.XX*	41	2	0	2						45
San Diego Bay - Pueblo	*908.XX*	1	13	4							69
San Diego Bay - Sweetwater	*909.XX*	12	25	1							
San Diego Bay - Otay	*910.XX*	2	7	4							
Tijuana	*911.XX*	6	0	0	0	0	0	0	1		7
							Total Geo-Coded Sources				917
							Total Sources (incl. Non geo-coded)				948

21 Botanical or Zoological Gardens and Nurseries/Greenhouses

Nurseries

22 Mobile Landscaping

Narrative Description

This Source Profile Sheet covers establishments engaged in mobile landscaping activities. Not included in this category are parks, golf courses, and cemeteries. These are all covered in a separate Source Profile Sheet.

SIC Codes	
782	Lawn and Garden Services
783	Ornamental Shrub and Tree Services

NAICS Codes	
561730	Landscaping Services

Some businesses that conduct mobile landscaping were historically classified under the Standard Industrial Classification (SIC) system. This system has been slowly replaced by the North American Industry Classification System (NAICS), which accommodates a larger number of industrial sectors and sub-sectors, and identifies hundreds of new, emerging, and advanced technology industries. As most Copermittees have yet to convert from the SIC system to the NAICS, the applicable codes from both systems are presented here for easy reference.

Pollutant Generating Activities and Associated Pollutants

The following tables contain a list of activities commonly associated with mobile landscaping which may have a source loading potential. Possible pollutants associated with these activities are also presented. Table 22-1 contains a list of activities with a source loading potential in wet weather and Table 22-2 contains a list of activities with source loading potential in dry weather.

The activities below were evaluated for potential pollutant generation during wet weather and dry weather. Wet weather potentials consider runon and runoff during wet weather events. Dry weather potentials are based on the assumption that irrigation and cleaning activities act as transport mechanisms. Furthermore, it is assumed that no BMPs are in place.

Table 22-1. Summary of typical activities and associated pollutants during wet weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacteria/ Pathogens*
Mobile Landscaping									
Storage of pesticides and fertilizers		X				X	X		
Storage/disposal of solid wastes and garden wastes		X		X			X		
Storage of any liquid materials in portable containers		X				X	X		
Landscape maintenance				X		X	X		

Table 22-2. Summary of typical activities and associated pollutants during dry weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacteria/ Pathogens*
Mobile Landscaping									
Landscape maintenance				X		X	X		

Discharge Potential

As part of the initial 2005 LTEA effort, a questionnaire was completed by various Copermittees to assess the likely potential of a specific source discharging pollutants. Using existing information (e.g. illicit discharge records) and field knowledge the Copermittees ranked the potential of discharging pollutants. These rankings were averaged (when a ranking was given) to obtain average discharge potential rankings for each information type. A similar questionnaire was not completed for this source profile sheet. As a result the overall ranking was set to 3, meaning the currently available information does not adequately characterize the discharge potential.

Table 22-3. Ranking of discharge potential using existing information.

Mobile Landscaping			
Information Types	*Information Available*	*Average Ranking*	*Comments*
Dry Weather Monitoring			
Illicit Discharge Records			
Pretreatment Compliance Records			
Underground Storage Tank Records			
Haz Waste Storage Records			
Inspection Records			
Other information? Please specify here			
Overall Ranking		3.0	

A review of Table 22-3 shows that there appears to be considerable information that may be used to assess the discharge potential. As more information is collected and evaluated, the ranking potential will be updated.

It should be noted that a blank ranking in Table 22-3 does not necessarily mean that there is no discharge potential but rather the Copermittee chose not to rank the potential. As more information is collected these blanks will be filled in and a more comprehensive ranking established.

Legal/Regulatory Oversight

Table 22-4 provides a summary of the types of regulatory oversight that pertain to mobile landscaping. In some cases, there may be some overlap in the types of regulatory oversight.

Table 22-4. Summary of the stormwater-related and non-stormwater related regulatory oversight of mobile landscaping businesses.

Landscaping - parks, golf courses, cemeteries, etc.			
Oversight Type	**Regulatory Oversight**		**Comments**
Stormwater	NPDES Municipal Permit / Local Ordinances	X	
	NPDES General Industrial Permit		
	NPDES General Construction Permit		
Other Regulatory Oversight	Industrial Pretreatment Program (EPA)		
	Hazardous Materials / CUPA (County DEH)	X	
	CURFFL (County DEH)		
	Local Enforcement Agency - Landfills (County DEH)		
	Air Quality Permits (APCD)		
	Fire Agencies		
	Pesticide Regulatory Program (County AW&M)	X	
	Coast Guard		

Better coordination may be warranted between the regulatory programs to minimize overlap but still focus on water quality protection.

Source Prevalence and Distribution

Numerous resources were relied upon in order to obtain an as accurate as feasible estimate of the number of sources throughout San Diego County. The objective was to locate the sources within watersheds and sub-watersheds. When this was feasible, the sources are termed ‘geo-coded’, meaning there geographic coordinates are known and can be included in a GIS map. In some instances, it was not feasible to geo-code some sources. Mobile landscaping services were not geo-coded because identification of mobile landscaping office locations does not facilitate determination of regional source loading potentials.

23 Pool and Fountain Cleaning

Narrative Description

This Source Profile Sheet covers establishments primarily engaged in pool and fountain cleaning.

SIC Codes	
7389	Business Services, Not Elsewhere Classified

NAICS Codes	
561790	Other Services to Buildings and Dwellings

Some businesses that conduct pool and fountain cleaning were historically classified under the Standard Industrial Classification (SIC) system. This system has been slowly replaced by the North American Industry Classification System (NAICS), which accommodates a larger number of industrial sectors and sub-sectors, and identifies hundreds of new, emerging, and advanced technology industries. As most Copermittees have yet to convert from the SIC system to the NAICS, the applicable codes from both systems are presented here for easy reference.

Pollutant Generating Activities and Associated Pollutants

The following tables contain a list of activities commonly associated with pool and fountain cleaning which may have a source loading potential. Possible pollutants associated with these activities are also presented. Table 23-1 contains a list of activities with a source loading potential in wet weather and Table 23-2 contains a list of activities with source loading potential in dry weather.

The activities below were evaluated for potential pollutant generation during wet weather and dry weather. Wet weather potentials consider runon and runoff during wet weather events. Dry weather potentials are based on the assumption that irrigation and cleaning activities act as transport mechanisms. Furthermore, it is assumed that no BMPs are in place.

Table 23-1. Summary of typical activities and associated pollutants during wet weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacterial/ Pathogens*
Pool and Fountain Cleaning									
Pool and fountain cleaning		X						X	X
Wastewater handling and disposal		X							
Storage of any liquid materials in portable containers	X	X							

Table 23-2. Summary of typical activities and associated pollutants during dry weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacterial/ Pathogens*
Pool and Fountain Cleaning									
Pool and fountain cleaning		X			X			X	X
Wash waster handling and disposal		X							X

Discharge Potential

As part of the initial 2005 LTEA effort, a questionnaire was completed by various Copermittees to assess the likely potential of a specific source discharging pollutants. Using existing information (e.g. illicit discharge records) and field knowledge the Copermittees ranked the potential of discharging pollutants. These rankings were averaged (when a ranking was given) to obtain average discharge potential rankings for each information type. See Table 23-3 for a summary of the results. An overall ranking was also determined for the source by taking the maximum average ranking from each of the information types. When only one information type received a score, due to lack of information, the average ranking from that one information type was neglected in the overall ranking determination. In these cases the overall ranking was set to 3, meaning the currently available information does not adequately characterize the discharge potential.

Table 23-3. Ranking of discharge potential using existing information.

Pool and fountain cleaning			
Information Types	***Information Available***	***Average Ranking***	***Comments***
Dry Weather Monitoring			
Illicit Discharge Records	Y	3	
Pretreatment Compliance Records			
Underground Stoage Tank Records			
Haz Waste Storage Records			
Inspection Records			
Other information? Please specify here			
Overall Ranking		**3.0**	

Note: Overall Ranking is the highest 'Average Ranking' received for the various information types. When less than 2 scores were given, due to lack of information, the Overall Ranking was adjusted to 3 - Unknown Potential.

Scoring Legend	
1	- low discharge potential
2	- medium-low discharge potential
3	- Unknown, information does not adequately characterize
4	- medium-high discharge potential
5	- high discharge potential

A review of Table 23-3 shows that there is limited information available to assess discharge potential. Of the information available a more complete evaluation should be conducted to assess discharge potential.

It should be noted that a blank ranking in Table 23-3 does not necessarily mean that there is no discharge potential but rather the Copermittee chose not to rank the potential. As more information is collected these blanks will be filled in and a more comprehensive ranking established.

Legal/Regulatory Oversight

Table 23-4 provides a summary of the types of regulatory oversight that pertain to pool and fountain cleaning. In some cases, there may be some overlap in the types of regulatory oversight.

Table 23-4. Summary of the stormwater-related and non-stormwater related regulatory oversight of pool and fountain cleaning businesses.

Pool & fountain cleaning			
Oversight Type	**Regulatory Oversight**		**Comments**
Stormwater	NPDES Municipal Permit / Local Ordinances	X	
	NPDES General Industrial Permit		
	NPDES General Construction Permit		
Other Regulatory Oversight	Industrial Pretreatment Program (EPA)		
	Hazardous Materials / CUPA (County DEH)		
	CURFFL (County DEH)		
	Local Enforcement Agency - Landfills (County DEH)		
	Air Quality Permits (APCD)		
	Fire Agencies		
	Pesticide Regulatory Program (County AW&M)		
	Coast Guard		

Existing regulatory oversight of pool and fountain cleaning activities is limited regarding stormwater issues.

Source Prevalence and Distribution

During the 2005 Baseline LTEA effort, numerous resources were relied upon in order to obtain an as accurate as feasible estimate of the number of sources throughout San Diego County. The objective was to locate the sources within watersheds and sub-watersheds. When this was feasible, the sources are termed ‘geo-coded’, meaning there geographic coordinates are known and can be included in a GIS map. In some instances, it was not feasible to geo-code some sources. In this case, the geographic coordinates for inventoried businesses that provide pool and fountain cleaning cannot be readily determined because of the mobile nature of these sources. Therefore the number of geo-coded sources is zero.

The use of inventories to locate activities covered under pool and fountain cleaning (and associated pollutants) is not applicable because the business activities creating the pollutants are mobile in nature. Instead an inventory may be used for outreach effort but not necessarily for locating pollutant loads.

24 Marinas

Narrative Description

This Source Profile Sheet primarily covers Marinas.

SIC Codes	
4493	Marinas
4499	Water Transportation Services, Not Elsewhere Classified

NAICS Codes	
713930	Marinas

Some marinas were historically classified under the Standard Industrial Classification (SIC) system. This system has been slowly replaced by the North American Industry Classification System (NAICS), which accommodates a larger number of industrial sectors and sub-sectors, and identifies hundreds of new, emerging, and advanced technology industries. As most Copermittees have yet to convert from the SIC system to the NAICS, the applicable codes from both systems are presented here for easy reference.

Pollutant Generating Activities and Associated Pollutants

The following tables contain a list of activities commonly associated with marinas which may have a source loading potential. Possible pollutants associated with these activities are also presented. Table 24-1 contains a list of activities with a source loading potential in wet weather and Table 24-2 contains a list of activities with source loading potential in dry weather.

The activities below were evaluated for potential pollutant generation during wet weather and dry weather. Wet weather potentials consider runon and runoff during wet weather events. Dry weather potentials are based on the assumption that irrigation and cleaning activities act as transport mechanisms. Furthermore, it is assumed that no BMPs are in place.

Table 24-1. Summary of typical activities and associated pollutants during wet weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacterial/ Pathogens*
Marinas									
Boat building, maintenance, and repair	X	X	X	X			X		
Storage of pesticides	X	X	X	X		X	X		X
Storage of any liquid materials in portable containers	X	X	X			X	X		
Storage of liquid materials in stationary tanks	X	X	X			X	X		
Waste handling and disposal	X	X	X						X
Hazardous waste disposal	X	X	X						
Loading and unloading	X	X	X	X			X		
Operation of outdoor equipment	X	X	X	X					

Table 24-2. Summary of typical activities and associated pollutants during dry weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacterial/ Pathogens*
Marinas									
Pressure cleaning (buildings, docks, boats)		X	X	X	X				X
Grounds maintenance	X	X	X	X	X			X	

Discharge Potential

As part of the initial 2005 LTEA effort, a questionnaire was completed by various Copermittees to assess the likely potential of a specific source discharging pollutants. Using existing information (e.g. illicit discharge records) and field knowledge the Copermittees ranked the potential of discharging pollutants. These rankings were averaged (when a ranking was given) to obtain average discharge potential rankings for each information type. See Table 24-3 for a summary of the results. An overall ranking was also determined for the source by taking the maximum average ranking from each of the information types. When only one information type received a score, due to lack of information, the average ranking from that one information type was neglected in the overall ranking determination. In these cases the overall ranking was set to 3, meaning

the currently available information does not adequately characterize the discharge potential.

Table 24-3. Ranking of discharge potential using existing information.

Marinas			
Information Types	***Information Available***	***Average Ranking***	***Comments***
Dry Weather Monitoring		3	
Illicit Discharge Records	Y		
Pretreatment Compliance Records			
Underground Stoage Tank Records	Y		
Haz Waste Storage Records	Y		
Inspection Records	Y		
Other information? Please specify here			
Overall Ranking		**3.0**	

Note: Overall Ranking is the highest 'Average Ranking' received for the various information types. When less than 2 scores were given, due to lack of information, the Overall Ranking was adjusted to 3 - Unknown Potential.

Scoring Legend	
1	- low discharge potential
2	- medium-low discharge potential
3	- Unknown, information does not adequately characterize
4	- medium-high discharge potential
5	- high discharge potential

A review of Table 24-3 shows that there is limited information available to assess discharge potential. Of the information available a more complete evaluation should be conducted to assess discharge potential.

It should be noted that a blank ranking in Table 24-3 does not necessarily mean that there is no discharge potential but rather the Copermittee chose not to rank the potential. As more information is collected these blanks will be filled in and a more comprehensive ranking established.

Legal/Regulatory Oversight

Table 24-4 provides a summary of the types of regulatory oversight that pertain to marinas. In some cases, there may be some overlap in the types of regulatory oversight.

Table 24-4. Summary of the stormwater-related and non-stormwater related regulatory oversight of marinas.

Marinas			
Oversight Type	Regulatory Oversight		Comments
Stormwater	NPDES Municipal Permit / Local Ordinances	X	
	NPDES General Industrial Permit		
	NPDES General Construction Permit		
Other Regulatory Oversight	Industrial Pretreatment Program (EPA)		
	Hazardous Materials / CUPA (County DEH)	X	
	CURFFL (County DEH)		
	Local Enforcement Agency - Landfills (County DEH)		
	Air Quality Permits (APCD)		
	Fire Agencies		
	Pesticide Regulatory Program (County AW&M)		
	Coast Guard		

Better coordination may be warranted between the regulatory programs to minimize overlap but still focus on water quality protection.

Source Prevalence and Distribution

The 2005 Baseline LTEA effort produced source distribution information, if available, is provided in this section. It is recommended that updated source information is used to develop revised source prevalence and distribution data.

Numerous resources were relied upon in order to obtain an as accurate as feasible estimate of the number of sources throughout San Diego County. The

Table 24-5. Summary of marinas sources within each of San Diego County's Watersheds.

Watershed Management Area	Hydrologic Unit (HU)	Marinas
		Total # of Geo-Coded Sources
Santa Margarita	902.00	0
San Luis Rey	903.00	0
Carlsbad	904.00	5
San Dieguito	905.00	0
Penasquitos	906.10 - 906.20	0
Mission Bay	906.30 - 906.50	2
San Diego	907.00	2
San Diego Bay - Pueblo	908.00	26
San Diego Bay - Sweetwater	909.00	
San Diego Bay - Otay	910.00	
Tijuana	911.00	0
Total Geo-Coded Sources		35
Total Sources (incl. Non geo-coded)		39

objective was to locate the sources within watersheds and sub-watersheds. When this was feasible, the sources are termed 'geo-coded', meaning there geographic coordinates are known and can be included in a GIS map. In some instances, it was not feasible to geo-code some sources. In Table 24-5, the number of geo-coded marina sources within each watershed is shown, along with the total number of sources (geo-coded and not geo-coded together). In this case, the geographic coordinates for all of the identified sources have not yet been determined.

The source inventory is further broken down in Table 24-6 to show the prevalence of marinas within each sub-watershed. This information, combined with the concurrent water quality assessment of sub-watersheds throughout San Diego County will ultimately help to assess the threat these facilities pose to water quality by source and constituent.

<u>It is recommended that municipalities use updated source information from the County, as available, to develop revised source prevalence and distribution data.</u>

Table 24-6. Summary of marina sources within each of San Diego County's sub-watersheds.

		Marinas									
Watershed Management Area	Hydrologic Unit (HU)	*Sources Geo-Coded by Sub-watershed Hydrologic Unit*									Total # of Sources
		90X.10	*90X.20*	*90X.30*	*90X.40*	*90X.50*	*90X.60*	*90X.70*	*90X.80*	*90X.90*	
Santa Margarita	*902.XX*	0	0	0	0	0	0	0	0	0	0
San Luis Rey	*903.XX*	0	0	0							0
Carlsbad	*904.XX*	1	1	0	0	0	3				5
San Dieguito	*905.XX*	0	0	0	0	0					0
Penasquitos	*906.XX*	0	0								0
Mission Bay	*906.XX*			0	2	0					2
San Diego	*907.XX*	2	0	0	0						2
San Diego Bay - Pueblo	*908.XX*	19	2	0							26
San Diego Bay - Sweetwater	*909.XX*	4	0	0							
San Diego Bay - Otay	*910.XX*	0	1	0							
Tijuana	*911.XX*	0	0	0	0	0	0	0	0		0
							Total Geo-Coded Sources				35
							Total Sources (incl. Non geo-coded)				39

24 Marinas

Marina

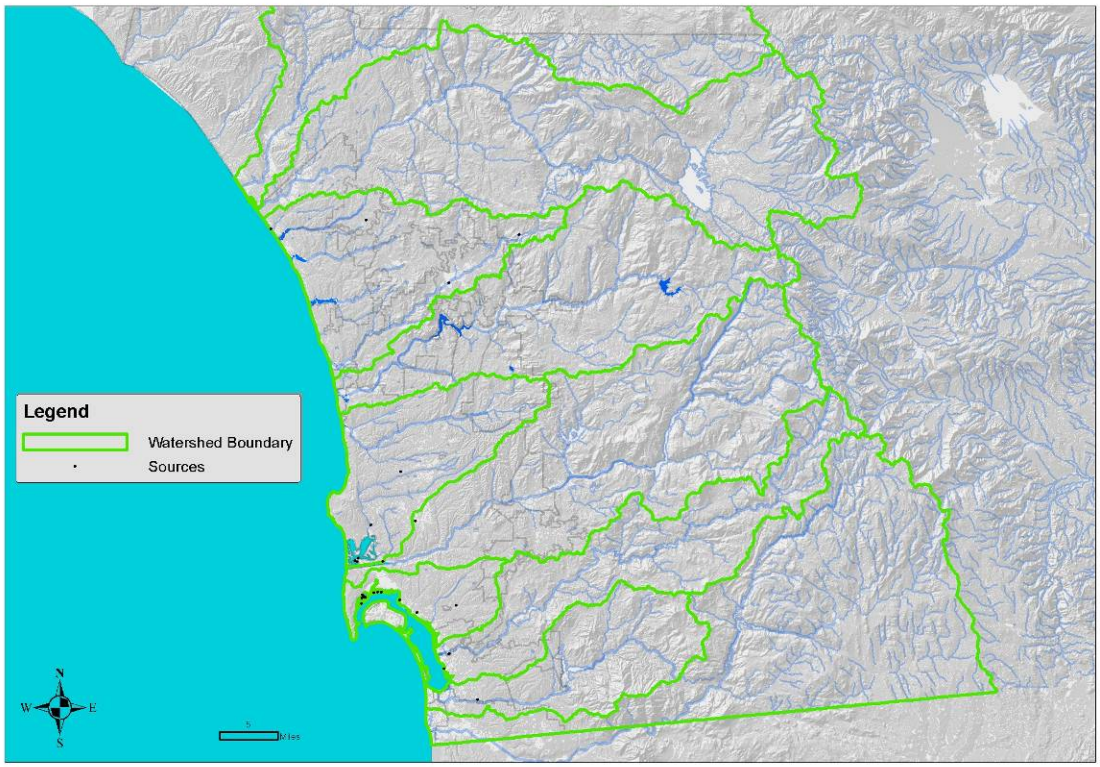

25 Animal Kennels

Narrative Description

This Source Profile Sheet primarily covers animal facilities.

Some animal facilities were historically classified under the Standard Industrial Classification (SIC) system. This system has been slowly replaced by the North American Industry Classification System (NAICS), which accommodates a larger number of industrial sectors and sub-sectors, and identifies hundreds of new, emerging, and advanced technology industries. As most Copermittees have yet to convert from the SIC system to the NAICS, the applicable codes from both systems are presented here for easy reference.

SIC Codes	
0279	Animal Specialties, Not Elsewhere Classified
0291	General Farms, Primarily Livestock and Animal Specialties
0752	Animal Specialty Services, Except Venterinary
NAICS Codes	
112XXX	Animal Production
115210	Support Activities for Animal Production
812910	Pet Care (except Veterinary) Services

Pollutant Generating Activities and Associated Pollutants

The following tables contain a list of activities commonly associated with animal facilities which may have a source loading potential. Possible pollutants associated with these activities are also presented. Table 25-1 contains a list of activities with a source loading potential in wet weather and Table 25-2 contains a list of activities with source loading potential in dry weather.

The activities below were evaluated for potential pollutant generation during wet weather and dry weather. Wet weather potentials consider runon and runoff during wet weather events. Dry weather potentials are based on the assumption that irrigation and cleaning activities act as transport mechanisms. Furthermore, it is assumed that no BMPs are in place.

25 Animal Kennels

Table 25-1. Summary of typical activities and associated pollutants during wet weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacterial/ Pathogens*
Animal Kennels									
Storage of pesticides and fertilizers		X		X		X	X		X
Storage of solid wastes and animal wastes		X		X			X		X
Animal waste disposal				X			X		X
Storage of any liquid materials in portable containers		X				X	X		
Loading and unloading		X		X			X		

Table 25-2. Summary of typical activities and associated pollutants during dry weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacterial/ Pathogens*
Animal Kennels, Horse Stables									
No dry weather									

Discharge Potential

As part of the initial 2005 LTEA effort, a questionnaire was completed by various Copermittees to assess the likely potential of a specific source discharging pollutants. Using existing information (e.g. illicit discharge records) and field knowledge the Copermittees ranked the potential of discharging pollutants. These rankings were averaged (when a ranking was given) to obtain average discharge potential rankings for each information type. See Table 25-3 for a summary of the results. An overall ranking was also determined for the source by taking the maximum average ranking from each of the information types. When only one information type received a score, due to lack of information, the average ranking from that one information type was neglected in the overall ranking determination. In these cases the overall ranking was set to 3, meaning the currently available information does not adequately characterize the discharge potential.

Table 25-3. Ranking of discharge potential using existing information.

Animal facilities			
Information Types	***Information Available***	***Average Ranking***	***Comments***
Dry Weather Monitoring			
Illicit Discharge Records	Y	2	
Pretreatment Compliance Records			
Underground Stoage Tank Records			
Haz Waste Storage Records			
Inspection Records			
Other information? Please specify here			
Overall Ranking		**3.0**	

Note: Overall Ranking is the highest 'Average Ranking' received for the various information types. When less than 2 scores were given, due to lack of information, the Overall Ranking was adjusted to 3 - Unknown Potential.

Scoring Legend	
1	- low discharge potential
2	- medium-low discharge potential
3	- Unknown, information does not adequately characterize
4	- medium-high discharge potential
5	- high discharge potential

A review of Table 25-3 shows that there is limited information available to assess discharge potential. Of the information available a more complete evaluation should be conducted to assess discharge potential.

It should be noted that a blank ranking in Table 25-3 does not necessarily mean that there is no discharge potential but rather the Copermittee chose not to rank the potential. As more information is collected these blanks will be filled in and a more comprehensive ranking established.

Legal/Regulatory Oversight

Table 25-4 provides a summary of the types of regulatory oversight that pertain to animal facilities. In some cases, there may be some overlap in the types of regulatory oversight.

Table 25-4. Summary of the stormwater-related and non-stormwater related regulatory oversight of animal facilities.

Animal facilities			
Oversight Type	**Regulatory Oversight**		**Comments**
Stormwater	NPDES Municipal Permit / Local Ordinances		
	NPDES General Industrial Permit		
	NPDES General Construction Permit		
Other Regulatory Oversight	Industrial Pretreatment Program (EPA)		
	Hazardous Materials / CUPA (County DEH)		
	CURFFL (County DEH)		
	Local Enforcement Agency - Landfills (County DEH)		
	Air Quality Permits (APCD)		
	Fire Agencies		
	Pesticide Regulatory Program (County AW&M)		
	Coast Guard		

25 Animal Kennels

Existing regulatory oversight of animal kennel and horse stable activities is limited regarding stormwater issues.

Source Prevalence and Distribution

The 2005 Baseline LTEA effort produced source distribution information, if available, is provided in this section. Numerous resources were relied upon in order to obtain an as accurate as feasible estimate of the number of sources throughout San Diego County. The objective was to locate the sources within watersheds and sub-watersheds. When this was feasible, the sources are termed 'geo-coded', meaning there geographic coordinates are known and can be included in a GIS map. In some instances, it was not feasible to geo-code some sources. In Table 25-5, the number of geo-coded animal kennel and horse stable sources within each watershed is shown, along with the total number of sources (geo-coded and not geo-coded together). In this case, the geographic coordinates for all of the identified sources have not yet been determined. While the inventory process attempted to ensure there is no overlap between priority sources identified, there may be some overlap of the identified sources with sources identified in other Source Profile Sheets.

The source inventory is further broken down in Table 25-6 to show the prevalence of animal kennel and horse stable facilities within each sub-watershed. This information, combined with the concurrent water quality assessment of sub-watersheds throughout San Diego County will ultimately help to assess the threat these facilities pose to water quality by source and constituent.

<u>It is recommended that municipalities use updated source information from the County, as available, to develop revised source prevalence and distribution data.</u>

Table 25-5. Summary of animal kennel and horse stable sources within each of San Diego County's Watersheds.

Watershed Management Area	Hydrologic Unit (HU)	Animal Facilities
		Total # of Geo-Coded Sources
Santa Margarita	*902.00*	2
San Luis Rey	*903.00*	47
Carlsbad	*904.00*	89
San Dieguito	*905.00*	70
Penasquitos	*906.10 - 906.20*	33
Mission Bay	*906.30 - 906.50*	34
San Diego	*907.00*	60
San Diego Bay - Pueblo	*908.00*	42
San Diego Bay - Sweetwater	*909.00*	
San Diego Bay - Otay	*910.00*	
Tijuana	*911.00*	4
Total Geo-Coded Sources		381
Total Sources (incl. Non geo-coded)		484

Table 25-6. Summary of animal kennel and horse stable sources within each of San Diego County's sub-watersheds.

		Animal Facilities									
Watershed Management Area	Hydrologic Unit (HU)	*Sources Geo-Coded by Sub-watershed Hydrologic Unit*									Total # of Sources
		90X.10	*90X.20*	*90X.30*	*90X.40*	*90X.50*	*90X.60*	*90X.70*	*90X.80*	*90X.90*	
Santa Margarita	*902.XX*	2	0	0	0	0	0	0	0	0	2
San Luis Rey	*903.XX*	45	1	1							47
Carlsbad	*904.XX*	0	6	9	1	40	33				89
San Dieguito	*905.XX*	34	16	2	16	2					70
Penasquitos	*906.XX*	14	19								33
Mission Bay	*906.XX*			11	15	8					34
San Diego	*907.XX*	55	3	2	0						60
San Diego Bay - Pueblo	*908.XX*	0	13	0							42
San Diego Bay - Sweetwater	*909.XX*	10	15	1							
San Diego Bay - Otay	*910.XX*	0	0	3							
Tijuana	*911.XX*	1	0	1	2	0	0	0	0		4
							Total Geo-Coded Sources				381
							Total Sources (incl. Non geo-coded)				484

26 Offices with Onsite and Outdoor Storage Facilities

Narrative Description

This Source Profile Sheet covers establishments with onsite and outdoor storage facilities such as towing and landscaping businesses. These businesses may store machinery, vehicles, or raw materials outside. In some cases there may be an overlap with other business specific source profile sheets.

SIC Codes	
7549	Automotive Services, Except Repair and Carwashes
078X	Landscape and Horticulture Services
NAICS Codes	
488410	Towing
4842XX	Mobile Home Towing
561730	Landscape Services

Some facilities with onsite and outdoor storage facilities were historically classified under the Standard Industrial Classification (SIC) system. This system has been slowly replaced by the North American Industry Classification System (NAICS), which accommodates a larger number of industrial sectors and sub-sectors, and identifies hundreds of new, emerging, and advanced technology industries. As most Copermittees have yet to convert from the SIC system to the NAICS, the applicable codes from both systems are presented here for easy reference.

Pollutant Generating Activities and Associated Pollutants

The following tables contain a list of activities commonly associated with offices with onsite and outdoor storage facilities which may have a source loading potential. Possible pollutants associated with these activities are presented. Table 26-1 contains a list of activities with a source loading potential in wet weather and Table 26-2 contains a list of activities with source loading potential in dry weather.

The activities below were evaluated for potential pollutant generation during wet weather and dry weather. Wet weather potentials consider runon and runoff during wet weather events. Dry weather potentials are based on the assumption that irrigation and cleaning activities act as transport mechanisms. Furthermore, it is assumed that no BMPs are in place.

26 Offices with Onsite and Outdoor Storage Facilities

Table 26-1. Summary of typical activities and associated pollutants during wet weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacteria/ Pathogens*
Offices with Onsite and Storage Facilities									
Loading and unloading	X	X	X	X			X		
Storage of raw materials, products, and containers		X	X	X					
Storage of any liquid materials in portable containers	X	X	X						
Vehicle and equipment maintenance and repair	X	X	X						
Cleaning or washing of tools, parts, and equipment	X	X	X	X	X			X	
Landscape maintenance						X	X	X	
Waste handling and disposal	X	X	X					X	

Table 26-2. Summary of typical activities and associated pollutants during wet weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacteria/ Pathogens*
Offices with Onsite and Storage Facilities									
Vehicle cleaning	X	X	X	X				X	
Cleaning or washing of tools, parts, and equipment	X	X	X	X				X	
Pressure cleaning (parking lots, sidewalks, storage areas)	X	X	X	X				X	

Discharge Potential

As part of the initial 2005 LTEA effort a questionnaire was completed by various Copermittees to assess the likely potential of a specific source discharging pollutants. Using existing information (e.g. illicit discharge records) and field knowledge the Copermittees ranked the potential of discharging pollutants. These rankings were averaged (when a ranking was given) to obtain average discharge potential rankings for each information type. A similar questionnaire was not completed for this source profile sheet. As a result, best professional judgment was used to assign a discharge potential based on sources identified as concerns in the Copermittees' annual reports and permit. In

this case, a discharge potential of 4 was assigned because offices with onsite and outdoor storage facilities have been identified as a new potential source of pollutants.

Table 26-3. Ranking of discharge potential using existing information.

Offices with Onsite and Outdoor Storage			
Information Types	*Information Available*	*Average Ranking*	*Comments*
Dry Weather Monitoring			
Illicit Discharge Records			
Pretreatment Compliance Records			
Underground Storage Tank Records			
Haz Waste Storage Records			
Inspection Records			
Other information? Please specify here			
Overall Ranking		4.0	

Note: Overall Ranking is the highest 'Average Ranking' received for the various information types. When less than 2 scores were given, due to lack of information, the Overall Ranking was adjusted to 3 - Unknown Potential.

Scoring Legend	
1	- low discharge potential
2	- medium-low discharge potential
3	- Unknown, information does not adequately characterize
4	- medium-high discharge potential
5	- high discharge potential

Legal/Regulatory Oversight

Table 26-4 provides a summary of the types of regulatory oversight that pertain to offices with onsite and outdoor storage facilities. In some cases, there may be some overlap in the types of regulatory oversight.

Table 26-4. Summary regulatory oversight for offices with onsite and outdoor storage.

Construction Sites			
Oversight Type	**Regulatory Oversight**		**Comments**
Stormwater	NPDES Municipal Permit / Local Ordinances	X	
	NPDES General Industrial Permit		
	NPDES General Construction Permit		
Other Regulatory Oversight	Industrial Pretreatment Program (EPA)		
	Hazardous Materials / CUPA (County DEH)	X	
	CURFFL (County DEH)		
	Local Enforcement Agency – Landfills (County DEH)		
	Air Quality Permits (APCD)		
	Fire Agencies		
	Pesticide Regulatory Program (County AW&M)	X	
	Coast Guard		

Better coordination may be warranted between the regulatory programs to minimize overlap but still focus on water quality protection.

26 Offices with Onsite and Outdoor Storage Facilities

Source Prevalence and Distribution

The 2005 Baseline LTEA effort did not produce source distribution information for offices with onsite and outdoor storages. It is recommended that new source information be obtained from the County, as available, to develop source prevalence and distribution data.

27 Building Materials Retailers and Storage

Narrative Description

This Source Profile Sheet covers establishments with sell and store building materials. These businesses may include general home improvement centers, and stores specializing in home improvement supplies such as doors, fencing, roofing materials, or masonry. Not included in this category are concrete, stone, and glass manufacturers. These manufacturers are covered in separate Source Profile Sheets.

SIC Codes	
521X	Retail Trade Building Materials, Hardware, and Garden Supply
50XX	Wholesale Trade-durable Goods

NAICS Codes	
444110	Home Centers, Building Materials
444190	Building Materials Supply Dealers

Some building materials retailers and storage facilities were historically classified under the Standard Industrial Classification (SIC) system. This system has been slowly replaced by the North American Industry Classification System (NAICS), which accommodates a larger number of industrial sectors and sub-sectors, and identifies hundreds of new, emerging, and advanced technology industries. As most Copermittees have yet to convert from the SIC system to the NAICS, the applicable codes from both systems are presented here for easy reference.

Pollutant Generating Activities and Associated Pollutants

The following tables contain a list of activities commonly associated with building material retailers and storage which may have a source loading potential. Possible pollutants associated with these activities are also presented. Table 27-1 contains a list of activities with a source loading potential in wet weather and Table 27-2 contains a list of activities with source loading potential in dry weather.

The activities below were evaluated for potential pollutant generation during wet weather and dry weather. Wet weather potentials consider runon and runoff during wet weather events. Dry weather potentials are based on the assumption that irrigation and cleaning activities act as transport mechanisms. Furthermore, it is assumed that no BMPs are in place.

Table 27-1. Summary of typical activities and associated pollutants during wet weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacteria/ Pathogens*
Building Materials Retail and Storage									
Storage of raw materials, products, and containers	X	X	X	X				X	
Loading and unloading	X	X	X	X					
Equipment operations, maintenance, and storage	X	X	X	X					
Cleaning or washing of tools, parts, and equipment	X	X	X	X	X				
Parking and storage area maintenance	X	X	X	X				X	
Waste handling and disposal	X	X	X	X				X	

Table 27-2. Summary of typical activities and associated pollutants during dry weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacteria/ Pathogens*
Building Materials Retail and Storage									
Cleaning or washing of tools, parts, and equipment	X	X	X	X	X				
Cleaning or washing of tools, parts, and equipment	X	X	X	X	X			X	
Pressure cleaning (parking lots, sidewalks, storage areas)	X	X	X	X	X			X	

Discharge Potential

As part of the initial 2005 LTEA effort a questionnaire was completed by various Copermittees to assess the likely potential of a specific source discharging pollutants. Using existing information (e.g. illicit discharge records) and field knowledge the Copermittees ranked the potential of discharging pollutants. These rankings were averaged (when a ranking was given) to obtain average discharge potential rankings for each information type. A similar questionnaire was not completed for this source profile sheet. As a result, best professional judgment was used to assign a discharge potential

based on sources identified as concerns in the Copermittees' annual reports and permit. In this case, a discharge potential of 4 was assigned because building materials retailers and storage have been identified as a new potential source of pollutants.

Table 27-3. Ranking of discharge potential using existing information.

Building Materials Retailers and Storage			
Information Types	*Information Available*	*Average Ranking*	*Comments*
Dry Weather Monitoring			
Illicit Discharge Records			
Pretreatment Compliance Records			
Underground Storage Tank Records			
Haz Waste Storage Records			
Inspection Records			
Other information? Please specify here			
Overall Ranking		4.0	

Note: Overall Ranking is the highest 'Average Ranking' received for the various information types. When less than 2 scores were given, due to lack of information, the Overall Ranking was adjusted to 3 - Unknown Potential.

Scoring Legend	
1	- low discharge potential
2	- medium-low discharge potential
3	- Unknown, information does not adequately characterize
4	- medium-high discharge potential
5	- high discharge potential

Legal/Regulatory Oversight

Table 27-4 provides a summary of the types of regulatory oversight that pertain to offices with onsite and outdoor storage facilities. In some cases, there may be some overlap in the types of regulatory oversight.

Table 27-4. Summary regulatory oversight for building materials retailers and storage.

Construction Sites			
Oversight Type	**Regulatory Oversight**		**Comments**
Stormwater	NPDES Municipal Permit / Local Ordinances	X	
	NPDES General Industrial Permit		
	NPDES General Construction Permit		
Other Regulatory Oversight	Industrial Pretreatment Program (EPA)		
	Hazardous Materials / CUPA (County DEH)	X	
	CURFFL (County DEH)		
	Local Enforcement Agency – Landfills (County DEH)		
	Air Quality Permits (APCD)		
	Fire Agencies		
	Pesticide Regulatory Program (County AW&M)		
	Coast Guard		

Better coordination may be warranted between the regulatory programs to minimize overlap but still focus on water quality protection.

27 Building Materials Retailers and Storage

Source Prevalence and Distribution

The 2005 Baseline LTEA effort did not produce source distribution information for these types of businesses. It is recommended that new source information be obtained from the County, as available, to develop source prevalence and distribution data.

28 Chemical and Allied Products

Narrative Description

This Source Profile Sheet covers establishments primarily engaged in manufacture of chemicals and allied products.

SIC Codes	
5162	Plastics Materials and Basic Forms and Shapes
5169	Chemicals and Allied Products, Not Elsewhere Classified

NAICS Codes	
325XXX	Chemical Manufacturing

Some facilities that manufacture chemical and allied products were historically classified under the Standard Industrial Classification (SIC) system. This system has been slowly replaced by the North American Industry Classification System (NAICS), which accommodates a larger number of industrial sectors and sub-sectors, and identifies hundreds of new, emerging, and advanced technology industries. As most Copermittees have yet to convert from the SIC system to the NAICS, the applicable codes from both systems are presented here for easy reference.

Pollutant Generating Activities and Associated Pollutants

The following tables contain a list of activities commonly associated with chemical and allied product which may have a source loading potential. Possible pollutants associated with these activities are also presented. Table 28-1 contains a list of activities with a source loading potential in wet weather and Table 28-2 contains a list of activities with source loading potential in dry weather.

The activities below were evaluated for potential pollutant generation during wet weather and dry weather. Wet weather potentials consider runon and runoff during wet weather events. Dry weather potentials are based on the assumption that irrigation and cleaning activities act as transport mechanisms. Furthermore, it is assumed that no BMPs are in place.

Table 28-1. Summary of typical activities and associated pollutants during wet weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacteria/ Pathogens*
Chemical and allied products									
Storage of raw materials, products, and containers	X	X	X	X			X		
Process equipment operation and maintenance	X	X	X						
Waste handling and disposal	X	X	X						X
Loading and unloading	X	X	X	X			X		
Site maintenance	X	X	X					X	

Table 28-2. Summary of typical activities and associated pollutants during dry weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacteria/ Pathogens*
Chemical and allied products									
Pressure cleaning (parking lots, sidewalks, storage areas)	X	X	X	X	X			X	X

Discharge Potential

As part of the initial 2005 LTEA effort, a questionnaire was completed by various Copermittees to assess the likely potential of a specific source discharging pollutants. Using existing information (e.g. illicit discharge records) and field knowledge the Copermittees ranked the potential of discharging pollutants. These rankings were averaged (when a ranking was given) to obtain average discharge potential rankings for each information type. See Table 28-3 for a summary of the results. An overall ranking was also determined for the source by taking the maximum average ranking from each of the information types. When only one information type received a score, due to lack of information, the average ranking from that one information type was neglected in the overall ranking determination. In these cases the overall ranking was set to 3, meaning the currently available information does not adequately characterize the discharge potential.

Table 28-3. Ranking of discharge potential using existing information.

Chemical and allied products			
Information Types	***Information Available***	***Average Ranking***	***Comments***
Dry Weather Monitoring	Y	2	
Illicit Discharge Records	Y	2	
Pretreatment Compliance Records			
Underground Stoage Tank Records	Y	2	
Haz Waste Storage Records	Y		
Inspection Records	Y	3	
Other information? Please specify here			
Overall Ranking		**3.0**	

Note: Overall Ranking is the highest 'Average Ranking' received for the various information types. When less than 2 scores were given, due to lack of information, the Overall Ranking was adjusted to 3 - Unknown Potential.

Scoring Legend	
1	- low discharge potential
2	- medium-low discharge potential
3	- Unknown, information does not adequately characterize
4	- medium-high discharge potential
5	- high discharge potential

A review of Table 28-3 shows that there appears to be considerable information that may be used to assess the discharge potential. As more information is collected and evaluated, the ranking potential will be updated.

It should be noted that a blank ranking in Table 28-3 does not necessarily mean that there is no discharge potential but rather the Copermittee chose not to rank the potential. As more information is collected these blanks will be filled in and a more comprehensive ranking established.

Legal/Regulatory Oversight

Table 28-4 provides a summary of the types of regulatory oversight that pertain to chemical and allied products. In some cases, there may be some overlap in the types of regulatory oversight.

Table 28-4. Summary of the stormwater-related and non-stormwater related regulatory oversight of chemical and allied product facilities.

Chemical and allied products			
Oversight Type	**Regulatory Oversight**		**Comments**
Stormwater	NPDES Municipal Permit / Local Ordinances	X	
	NPDES General Industrial Permit	X	
	NPDES General Construction Permit		
Other Regulatory Oversight	Industrial Pretreatment Program (EPA)	X	
	Hazardous Materials / CUPA (County DEH)	X	
	CURFFL (County DEH)		
	Local Enforcement Agency - Landfills (County DEH)		
	Air Quality Permits (APCD)	X	
	Fire Agencies		
	Pesticide Regulatory Program (County AW&M)		
	Coast Guard		

Better coordination may be warranted between the regulatory programs to minimize overlap but still focus on water quality protection.

Source Prevalence and Distribution

The 2005 Baseline LTEA effort produced source distribution information, if available, is provided in this section. Numerous resources were relied upon in order to obtain an as accurate as feasible estimate of the number of sources throughout San Diego County. The objective was to locate the sources within watersheds and sub-watersheds.

Table 28-5. Summary of chemical and allied product sources within each of San Diego County's Watersheds.

Watershed Management Area	Hydrologic Unit (HU)	Chemical Manufacturing
		Total # of Geo-Coded Sources
Santa Margarita	*902.00*	0
San Luis Rey	*903.00*	2
Carlsbad	*904.00*	26
San Dieguito	*905.00*	3
Penasquitos	*906.10 - 906.20*	30
Mission Bay	*906.30 - 906.50*	6
San Diego	*907.00*	12
San Diego Bay - Pueblo	*908.00*	5
San Diego Bay - Sweetwater	*909.00*	
San Diego Bay - Otay	*910.00*	
Tijuana	*911.00*	1
Total Geo-Coded Sources		85
Total Sources (incl. Non geo-coded)		97

When this was feasible, the sources are termed 'geo-coded', meaning there geographic coordinates are known and can be included in a GIS

map. In some instances, it was not feasible to geo-code some sources. In Table 28-5, the number of geo-coded chemical and allied product sources within each watershed is shown, along with the total number of sources (geo-coded and not geo-coded together). In this case, the geographic coordinates for all of the identified sources have not yet been determined.

While the inventory process attempted to ensure there is no overlap between priority sources identified, there may be some overlap of the identified sources with sources identified in other Source Profile Sheets.

The source inventory is further broken down in Table 28-6 to show the prevalence of chemical and allied product facilities within each sub-watershed. This information, combined with the concurrent water quality assessment of sub-watersheds throughout San Diego County will ultimately help to assess the threat these facilities pose to water quality by source and constituent.

It is recommended that municipalities use updated source information from the County, as available, to develop revised source prevalence and distribution data.

Table 28-6. Summary of chemical and allied product sources within each of San Diego County's sub-watersheds.

		Chemical Manufacturing									
Watershed Management Area	Hydrologic Unit (HU)	*Sources Geo-Coded by Sub-watershed Hydrologic Unit*									Total # of Sources
		90X.10	*90X.20*	*90X.30*	*90X.40*	*90X.50*	*90X.60*	*90X.70*	*90X.80*	*90X.90*	
Santa Margarita	*902.XX*	0	0	0	0	0	0	0	0	0	0
San Luis Rey	*903.XX*	1	0	1							2
Carlsbad	*904.XX*	2	2	11	7	4	0				26
San Dieguito	*905.XX*	2	0	0	1	0					3
Penasquitos	*906.XX*	25	5								30
Mission Bay	*906.XX*			2	4	0					6
San Diego	*907.XX*	12	0	0	0						12
San Diego Bay - Pueblo	*908.XX*	0	0	1							5
San Diego Bay - Sweetwater	*909.XX*	3	1	0							
San Diego Bay - Otay	*910.XX*	0	0	0							
Tijuana	*911.XX*	1	0	0	0	0	0	0	0		1
							Total Geo-Coded Sources				85
							Total Sources (incl. Non geo-coded)				97

29 Fabricated Metal

Narrative Description

This Source Profile Sheet covers establishments primarily engaged in the manufacture of fabricated metal.

SIC Codes	
34XX	Fabricated Metal Products, Except Machinery And Transportation Equipment

NAICS Codes	
332XXX	Fabricated Metal Product Manufacturing

Some facilities that conduct fabricated metal were historically classified under the Standard Industrial Classification (SIC) system. This system has been slowly replaced by the North American Industry Classification System (NAICS), which accommodates a larger number of industrial sectors and sub-sectors, and identifies hundreds of new, emerging, and advanced technology industries. As most Copermittees have yet to convert from the SIC system to the NAICS, the applicable codes from both systems are presented here for easy reference.

Pollutant Generating Activities and Associated Pollutants

The following tables contain a list of activities commonly associated with fabricated metal which may have a source loading potential. Possible pollutants associated with these activities are also presented. Table 29-1 contains a list of activities with a source loading potential in wet weather and Table 29-2 contains a list of activities with source loading potential in dry weather.

The activities below were evaluated for potential pollutant generation during wet weather and dry weather. Wet weather potentials consider runon and runoff during wet weather events. Dry weather potentials are based on the assumption that irrigation and cleaning activities act as transport mechanisms. Furthermore, it is assumed that no BMPs are in place.

Table 29-1. Summary of typical activities and associated pollutants during wet weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacteria/ Pathogens*
Fabricated metal									
Manufacturing and post-processing of metal products	X	X	X	X				X	
Storage of liquid materials in stationary tanks	X	X	X			X	X		
Storage of any liquid materials in portable containers	X	X	X			X	X		
Storage of raw materials, products, and containers	X	X	X	X			X		
Process equipment operation and maintenance	X	X	X						
Waste handling and disposal	X	X	X						X
Loading and unloading	X	X	X	X			X		
Site maintenance	X	X	X	X				X	

Table 29-2. Summary of typical activities and associated pollutants during dry weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacteria/ Pathogens*
Fabricated metal									
Pressure cleaning (parking lots, sidewalks, storage areas)	X	X	X	X	X			X	X

Discharge Potential

As part of the initial 2005 LTEA effort, a questionnaire was completed by various Copermittees to assess the likely potential of a specific source discharging pollutants. Using existing information (e.g. illicit discharge records) and field knowledge the Copermittees ranked the potential of discharging pollutants. These rankings were averaged (when a ranking was given) to obtain average discharge potential rankings for each information type. See Table 29-3 for a summary of the results. An overall ranking was also determined for the source by taking the maximum average ranking from each of the information types. When only one information type received a score, due to lack of information, the average ranking from that one information type was neglected in the overall ranking determination. In these cases the overall ranking was set to 3, meaning

the currently available information does not adequately characterize the discharge potential.

Table 29-3. Ranking of discharge potential using existing information.

Fabricated metal			
Information Types	*Information Available*	*Average Ranking*	*Comments*
Dry Weather Monitoring	Y	2.5	
Illicit Discharge Records	Y	2	
Pretreatment Compliance Records			
Underground Stoage Tank Records			
Haz Waste Storage Records	Y		
Inspection Records	Y	4	
Other information? Please specify here			
Overall Ranking		**4.0**	

Note: Overall Ranking is the highest 'Average Ranking' received for the various information types. When less than 2 scores were given, due to lack of information, the Overall Ranking was adjusted to 3 - Unknown Potential.

Scoring Legend	
1	- low discharge potential
2	- medium-low discharge potential
3	- Unknown, information does not adequately characterize
4	- medium-high discharge potential
5	- high discharge potential

A review of Table 29-3 shows that there appears to be several sources of information that may be used to assess the discharge potential. As more information is collected and evaluated, the ranking potential will be updated.

It should be noted that a blank ranking in Table 29-3 does not necessarily mean that there is no discharge potential but rather the Copermittee chose not to rank the potential. As more information is collected these blanks will be filled in and a more comprehensive ranking established.

Legal/Regulatory Oversight

Table 29-4 provides a summary of the types of regulatory oversight that pertain to fabricated metal. In some cases, there may be some overlap in the types of regulatory oversight.

Table 29-4. Summary of the stormwater-related and non-stormwater related regulatory oversight of fabricated metal facilities.

Fabricated metal			
Oversight Type	**Regulatory Oversight**		**Comments**
Stormwater	NPDES Municipal Permit / Local Ordinances	X	
	NPDES General Industrial Permit	X	
	NPDES General Construction Permit		
Other Regulatory Oversight	Industrial Pretreatment Program (EPA)	X	
	Hazardous Materials / CUPA (County DEH)	X	
	CURFFL (County DEH)		
	Local Enforcement Agency - Landfills (County DEH)		
	Air Quality Permits (APCD)	X	
	Fire Agencies		
	Pesticide Regulatory Program (County AW&M)		
	Coast Guard		

Better coordination may be warranted between the regulatory programs to minimize overlap but still focus on water quality protection.

Source Prevalence and Distribution

The 2005 Baseline LTEA effort produced source distribution information, if available, is provided in this section. Numerous resources were relied upon in order to obtain an as accurate as feasible estimate of the number of sources throughout San Diego County. The objective was to locate the sources within watersheds and sub-watersheds. When this was feasible, the sources are termed 'geo-coded', meaning there geographic coordinates are known and can be included in a GIS map. In some instances, it was not feasible to geo-code some sources. In Table 29-5, the

Table 29-5. Summary of fabricated metal sources within each of San Diego County's Watersheds.

Watershed Management Area	Hydrologic Unit (HU)	Fabricated Metal Product Manufacturing
		Total # of Geo-Coded Sources
Santa Margarita	*902.00*	5
San Luis Rey	*903.00*	4
Carlsbad	*904.00*	53
San Dieguito	*905.00*	4
Penasquitos	*906.10 - 906.20*	50
Mission Bay	*906.30 - 906.50*	10
San Diego	*907.00*	64
San Diego Bay - Pueblo	*908.00*	51
San Diego Bay - Sweetwater	*909.00*	
San Diego Bay - Otay	*910.00*	
Tijuana	*911.00*	5
Total Geo-Coded Sources		246
Total Sources (incl. Non geo-coded)		288

number of geo-coded fabricated metal sources within each watershed is shown, along with the total number of sources (geo-coded and not geo-coded together). In this case, the geographic coordinates for all of the identified sources have not yet been determined.

While the inventory process attempted to ensure there is no overlap between priority sources identified, there may be some overlap of the identified sources with sources identified in other Source Profile Sheets. This may be the case for the fabricated metal sources that may also be classified as primary metal sources (SPS#30)

The source inventory is further broken down in Table 29-6 to show the prevalence of fabricated metal facilities within each sub-watershed. This information, combined with the concurrent water quality assessment of sub-watersheds throughout San Diego County will ultimately help to assess the threat these facilities pose to water quality by source and constituent.

<u>It is recommended that municipalities use updated source information from the County, as available, to develop revised source prevalence and distribution data.</u>

Table 29-6. Summary of fabricated metal sources within each of San Diego County's sub-watersheds.

		Fabricated Metal Product Manufacturing									
Watershed Management Area	Hydrologic Unit (HU)	*Sources Geo-Coded by Sub-watershed Hydrologic Unit*									Total # of Sources
		90X.10	*90X.20*	*90X.30*	*90X.40*	*90X.50*	*90X.60*	*90X.70*	*90X.80*	*90X.90*	
Santa Margarita	*902.XX*	5	0	0	0	0	0	0	0	0	5
San Luis Rey	*903.XX*	4	0	0							4
Carlsbad	*904.XX*	8	1	26	1	8	9				53
San Dieguito	*905.XX*	4	0	0	0	0					4
Penasquitos	*906.XX*	38	12								50
Mission Bay	*906.XX*			1	7	2					10
San Diego	*907.XX*	64	0	0	0						64
San Diego Bay - Pueblo	*908.XX*	4	23	13							51
San Diego Bay - Sweetwater	*909.XX*	10	1	0							
San Diego Bay - Otay	*910.XX*	0	0	0							
Tijuana	*911.XX*	5	0	0	0	0	0	0	0		5
							Total Geo-Coded Sources				246
							Total Sources (incl. Non geo-coded)				288

30 Primary Metal

Narrative Description

This Source Profile Sheet covers establishments primarily engaged in the manufacture of primary metal products.

SIC Codes	
33XX	Primary Metal Industries

NAICS Codes	
331XXX	Primary Metal Manufacturing

Some facilities that manufacture primary metal were historically classified under the Standard Industrial Classification (SIC) system. This system has been slowly replaced by the North American Industry Classification System (NAICS), which accommodates a larger number of industrial sectors and sub-sectors, and identifies hundreds of new, emerging, and advanced technology industries. As most Copermittees have yet to convert from the SIC system to the NAICS, the applicable codes from both systems are presented here for easy reference.

Pollutant Generating Activities and Associated Pollutants

The following tables contain a list of activities commonly associated with primary metal which may have a source loading potential. Possible pollutants associated with these activities are also presented. Table 30-1 contains a list of activities with a source loading potential in wet weather and Table 31-2 contains a list of activities with source loading potential in dry weather.

The activities below were evaluated for potential pollutant generation during wet weather and dry weather. Wet weather potentials consider runon and runoff during wet weather events. Dry weather potentials are based on the assumption that irrigation and cleaning activities act as transport mechanisms. Furthermore, it is assumed that no BMPs are in place.

Table 30-1. Summary of typical activities and associated pollutants during wet weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacteria/ Pathogens*
Primary metal									
Manufacturing and post-processing of metal products	X	X	X	X				X	
Storage of liquid materials in stationary tanks	X	X	X			X	X		
Storage of raw materials, products, and containers	X	X	X	X			X		
Process equipment operation and maintenance	X	X	X						
Waste handling and disposal	X	X	X						X
Loading and unloading	X	X	X	X			X		
Site maintenance	X	X	X					X	

Table 30-2. Summary of typical activities and associated pollutants during dry weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacteria/ Pathogens*
Primary metal									
Pressure cleaning (parking lots, sidewalks, storage areas)	X	X	X	X	X			X	X

Discharge Potential

As part of the initial 2005 LTEA effort, a questionnaire was completed by various Copermittees to assess the likely potential of a specific source discharging pollutants. Using existing information (e.g. illicit discharge records) and field knowledge the Copermittees ranked the potential of discharging pollutants. These rankings were averaged (when a ranking was given) to obtain average discharge potential rankings for each information type. See Table 30-3 for a summary of the results. An overall ranking was also determined for the source by taking the maximum average ranking from each of the information types. When only one information type received a score, due to lack of information, the average ranking from that one information type was neglected in the overall ranking determination. In these cases the overall ranking was set to 3, meaning the currently available information does not adequately characterize the discharge potential.

Table 30-3. Ranking of discharge potential using existing information.

Primary metal			
Information Types	***Information Available***	***Average Ranking***	***Comments***
Dry Weather Monitoring	Y	2.5	
Illicit Discharge Records	Y	2	
Pretreatment Compliance Records			
Underground Stoage Tank Records			
Haz Waste Storage Records	Y		
Inspection Records	Y	3	
Other information? Please specify here			
Overall Ranking		**3.0**	

Note: Overall Ranking is the highest 'Average Ranking' received for the various information types. When less than 2 scores were given, due to lack of information, the Overall Ranking was adjusted to 3 - Unknown Potential.

Scoring Legend	
1	- low discharge potential
2	- medium-low discharge potential
3	- Unknown, information does not adequately characterize
4	- medium-high discharge potential
5	- high discharge potential

A review of Table 30-3 shows that there appears to be several sources of information that may be used to assess the discharge potential. As more information is collected and evaluated, the ranking potential will be updated.

It should be noted that a blank ranking in Table 30-3 does not necessarily mean that there is no discharge potential but rather the Copermittee chose not to rank the potential. As more information is collected these blanks will be filled in and a more comprehensive ranking established.

Legal/Regulatory Oversight

Table 30-4 provides a summary of the types of regulatory oversight that pertain to primary metal. In some cases, there may be some overlap in the types of regulatory oversight.

Table 30-4. Summary of the stormwater-related and non-stormwater related regulatory oversight of primary metal facilities.

Primary metal			
Oversight Type	**Regulatory Oversight**		**Comments**
Stormwater	NPDES Municipal Permit / Local Ordinances	X	
	NPDES General Industrial Permit	X	
	NPDES General Construction Permit		
Other Regulatory Oversight	Industrial Pretreatment Program (EPA)	X	
	Hazardous Materials / CUPA (County DEH)	X	
	CURFFL (County DEH)		
	Local Enforcement Agency - Landfills (County DEH)		
	Air Quality Permits (APCD)	X	
	Fire Agencies		
	Pesticide Regulatory Program (County AW&M)		
	Coast Guard		

Better coordination may be warranted between the regulatory programs to minimize overlap but still focus on water quality protection.

Source Prevalence and Distribution

The 2005 Baseline LTEA effort produced source distribution information, if available, is provided in this section. Numerous resources were relied upon in order to obtain an as accurate as feasible estimate of the number of sources throughout San Diego County. The objective was to locate the sources within watersheds and sub-watersheds. When this was feasible, the sources are termed 'geo-coded', meaning there geographic coordinates are known and can be included in a GIS map. In some instances, it was not feasible to geo-code some sources. In Table 30-5, the number of geo-coded primary metal sources within each watershed is shown, along with the total number of sources (geo-coded and not geo-coded together).

Table 30-5. Summary of primary metal sources within each of San Diego County's Watersheds.

Watershed Management Area	Hydrologic Unit (HU)	Primary Metal Manufacturing
		Total # of Geo-Coded Sources
Santa Margarita	*902.00*	0
San Luis Rey	*903.00*	1
Carlsbad	*904.00*	4
San Dieguito	*905.00*	2
Penasquitos	*906.10 - 906.20*	5
Mission Bay	*906.30 - 906.50*	2
San Diego	*907.00*	8
San Diego Bay - Pueblo	*908.00*	14
San Diego Bay - Sweetwater	*909.00*	
San Diego Bay - Otay	*910.00*	
Tijuana	*911.00*	3
Total Geo-Coded Sources		39
Total Sources (incl. Non geo-coded)		42

In this case, the geographic coordinates for all of the identified sources have not yet been determined.

While the inventory process attempted to ensure there is no overlap between priority sources identified, there may be some overlap of the identified sources with sources identified in other Source Profile Sheets. This may be the case for the primary metal sources that may also be classified as fabricated metal sources (SPS#29).

The source inventory is further broken down in Table 30-6 to show the prevalence of primary metal facilities within each sub-watershed. This information, combined with the concurrent water quality assessment of sub-watersheds throughout San Diego County will ultimately help to assess the threat these facilities pose to water quality by source and constituent.

<u>It is recommended that municipalities use updated source information from the County, as available, to develop revised source prevalence and distribution data.</u>

Table 30-6. Summary of primary metal sources within each of San Diego County's sub-watersheds.

		Primary Metal Manufacturing									
Watershed Management Area	Hydrologic Unit (HU)	*Sources Geo-Coded by Sub-watershed Hydrologic Unit*									Total # of Sources
		90X.10	*90X.20*	*90X.30*	*90X.40*	*90X.50*	*90X.60*	*90X.70*	*90X.80*	*90X.90*	
Santa Margarita	*902.XX*	0	0	0	0	0	0	0	0	0	0
San Luis Rey	*903.XX*	1	0	0							1
Carlsbad	*904.XX*	3	0	0	0	1	0				4
San Dieguito	*905.XX*	1	1	0	0	0					2
Penasquitos	*906.XX*	5	0								5
Mission Bay	*906.XX*			0	1	1					2
San Diego	*907.XX*	8	0	0	0						8
San Diego Bay - Pueblo	*908.XX*	0	11	2							14
San Diego Bay - Sweetwater	*909.XX*	1	0	0							
San Diego Bay - Otay	*910.XX*	0	0	0							
Tijuana	*911.XX*	3	0	0	0	0	0	0	0		3
							Total Geo-Coded Sources				39
							Total Sources (incl. Non geo-coded)				42

31 Recycling, Junkyards, Scrap Metal

Narrative Description

This Source Profile Sheet primarily covers recycling, junk yard, and scrap metal facilities.

Some facilities that conduct recycling, junk yards, and scrap metal were historically classified under the Standard Industrial Classification (SIC) system. This system has been slowly replaced by the North American Industry Classification System (NAICS), which accommodates a larger number of industrial sectors and sub-sectors, and identifies hundreds of new, emerging, and advanced technology industries. As most Copermittees have yet to convert from the SIC system to the NAICS, the applicable codes from both systems are presented here for easy reference.

SIC Codes

5012	Automobiles and Other Motor Vehicles
5093	Scrap and Waste Materials

NAICS Codes

423110	Automobile and Other Motor Vehicle Merchant Wholesalers
423930	Recyclable Material Merchant Wholesalers
425120	Wholesale Trade Agents and Brokers
562920	Materials Recovery Facilities

Pollutant Generating Activities and Associated Pollutants

The following tables contain a list of activities commonly associated with recycling, junk yards, and scrap metal facilities which may have a source loading potential. Possible pollutants associated with these activities are also presented. Table 31-1 contains a list of activities with a source loading potential in wet weather and Table 31-2 contains a list of activities with source loading potential in dry weather.

The activities below were evaluated for potential pollutant generation during wet weather and dry weather. Wet weather potentials consider runon and runoff during wet weather events. Dry weather potentials are based on the assumption that irrigation and cleaning activities act as transport mechanisms. Furthermore, it is assumed that no BMPs are in place.

Table 31-1. Summary of typical activities and associated pollutants during wet weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacteria/ Pathogens*
Recycling, Junk Yards, Scrap Metal									
Vehicle and equipment parking and storage	X	X	X	X					
Storage of raw materials, products, and containers	X	X	X	X					
Parking and storage area maintenance	X	X	X	X				X	
Equipment maintenance and repair	X	X	X						

Table 31-2. Summary of typical activities and associated pollutants during dry weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacteria/ Pathogens*
Recycling, Junk Yards, Scrap Metal									
Vehicle washing and steam cleaning	X	X	X	X	x				
Cleaning or washing of tools and equipment	X	X	X	X	X				

Legal/Regulatory Oversight

Table 31-3 provides a summary of the types of regulatory oversight that pertain to recycling, junk yards, and scrap metal. In some cases, there may be some overlap in the types of regulatory oversight.

Table 31-3. Summary of the stormwater-related and non-stormwater related regulatory oversight of recycling, junk yards, and scrap metal facilities.

Recycling, junk yards, scrap metal			
Oversight Type	**Regulatory Oversight**		**Comments**
Stormwater	NPDES Municipal Permit / Local Ordinances	X	
	NPDES General Industrial Permit	X	
	NPDES General Construction Permit		
Other Regulatory Oversight	Industrial Pretreatment Program (EPA)		
	Hazardous Materials / CUPA (County DEH)	X	
	CURFFL (County DEH)		
	Local Enforcement Agency - Landfills (County DEH)		
	Air Quality Permits (APCD)		
	Fire Agencies		
	Pesticide Regulatory Program (County AW&M)		
	Coast Guard		

Better coordination may be warranted between the regulatory programs to minimize overlap but still focus on water quality protection.

Source Prevalence and Distribution

The 2005 Baseline LTEA effort produced source distribution information, if available, is provided in this section. Numerous resources were relied upon in order to obtain an as accurate as feasible estimate of the number of sources throughout San Diego County. The objective was to locate the sources within watersheds and sub-watersheds. When this was feasible, the sources are termed 'geo-coded', meaning there geographic coordinates are known and can be included in a GIS map. In some instances, it was not feasible to geo-code some sources. In Table 31-4, the number of geo-coded recycling, junk yards, and scrap metal sources within each watershed is shown, along with the total number of sources (geo-coded and not geo-coded together). In this case, the geographic coordinates for all of the identified sources were determined.

Table 31-4. Summary of recycling, junk yards, and scrap metal sources within each of San Diego County's Watersheds.

Watershed Management Area	Hydrologic Unit (HU)	Recycling , Junk Yards, Scrap Metal
		Total # of Geo-Coded Sources
Santa Margarita	*902.00*	0
San Luis Rey	*903.00*	5
Carlsbad	*904.00*	3
San Dieguito	*905.00*	1
Penasquitos	*906.10 - 906.20*	0
Mission Bay	*906.30 - 906.50*	1
San Diego	*907.00*	5
San Diego Bay - Pueblo	*908.00*	78
San Diego Bay - Sweetwater	*909.00*	
San Diego Bay - Otay	*910.00*	
Tijuana	*911.00*	1
Total Geo-Coded Sources		94
Total Sources (incl. Non geo-coded)		94

While the inventory process attempted to ensure there is no overlap between priority sources identified, there may be some overlap of the identified sources with sources identified in other Source Profile Sheets.

The source inventory is further broken down in Table 31-5 to show the prevalence of recycling, junk yards, and scrap metal facilities within each sub-watershed. This information, combined with the concurrent water quality assessment of sub-watersheds throughout San Diego County will ultimately help to assess the threat these facilities pose to water quality by source and constituent.

It is recommended that municipalities use updated source information from the County, as available, to develop revised source prevalence and distribution data.

Table 31-5. Summary of recycling, junk yards, and scrap metal sources within each of San Diego County's sub-watersheds.

		Recycling , Junk Yards, Scrap Metal									
Watershed Management Area	Hydrologic Unit (HU)	*Sources Geo-Coded by Sub-watershed Hydrologic Unit*									Total # of Sources
		90X.10	*90X.20*	*90X.30*	*90X.40*	*90X.50*	*90X.60*	*90X.70*	*90X.80*	*90X.90*	
Santa Margarita	*902.XX*	0	0	0	0	0	0	0	0	0	0
San Luis Rey	*903.XX*	5	0	0							5
Carlsbad	*904.XX*	1	0	0	0	1	1				3
San Dieguito	*905.XX*	0	0	0	1	0					1
Penasquitos	*906.XX*	0	0								0
Mission Bay	*906.XX*			0	1	0					1
San Diego	*907.XX*	5	0	0	0						5
San Diego Bay - Pueblo	*908.XX*	0	3	2							78
San Diego Bay - Sweetwater	*909.XX*	0	0	0							
San Diego Bay - Otay	*910.XX*	0	73	0							
Tijuana	*911.XX*	1	0	0	0	0	0	0	0		1
							Total Geo-Coded Sources				94
							Total Sources (incl. Non geo-coded)				94

32 Airfields

Narrative Description

This Source Profile Sheet primarily covers airfields.

SIC Codes	
4581	Airports, Flying Fields, and Airport Terminal Services

NAICS Codes	
488119	Other Airport Operations

Some facilities such as airfields were historically classified under the Standard Industrial Classification (SIC) system. This system has been slowly replaced by the North American Industry Classification System (NAICS), which accommodates a larger number of industrial sectors and sub-sectors, and identifies hundreds of new, emerging, and advanced technology industries. As most Copermittees have yet to convert from the SIC system to the NAICS, the applicable codes from both systems are presented here for easy reference.

Pollutant Generating Activities and Associated Pollutants

The following tables contain a list of activities commonly associated with airfields which may have a source loading potential. Possible pollutants associated with these activities are also presented. Table 31-1 contains a list of activities with a source loading potential in wet weather and Table 32-2 contains a list of activities with source loading potential in dry weather.

The activities below were evaluated for potential pollutant generation during wet weather and dry weather. Wet weather potentials consider runon and runoff during wet weather events. Dry weather potentials are based on the assumption that irrigation and cleaning activities act as transport mechanisms. Furthermore, it is assumed that no BMPs are in place.

Table 32-1. Summary of typical activities and associated pollutants during wet weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacteria/ Pathogens*
Airfields									
Storage of raw materials, products, and containers	X	X	X	X				X	
Airplane maintenance and repair	X	X	X					X	
Building maintenance	X	X	X	X				X	
Equipment operations, maintenance, and storage	X	X	X	X					
Fueling operations	X	X	X						
Vehicle and equipment maintenance and repair	X	X	X						
Vehicle and equipment washing and steam cleaning	X	X	X	X	x				
Waste handling and disposal	X	X	X						
Loading and unloading	X	X	X	X					
Operation of outdoor equipment	X	X	X						

Table 32-2. Summary of typical activities and associated pollutants during dry weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacteria/ Pathogens*
Airfields									
Vehicle and equipment washing and steam cleaning	X	X	X	X	X				
Landscape maintenance				X		X	X	X	

Discharge Potential

As part of the initial 2005 LTEA effort, a questionnaire was completed by various Copermittees to assess the likely potential of a specific source discharging pollutants. Using existing information (e.g. illicit discharge records) and field knowledge the Copermittees ranked the potential of discharging pollutants. These rankings were averaged (when a ranking was given) to obtain average discharge potential rankings for each information type. See Table 32-3 for a summary of the results. An overall ranking was also determined for the source by taking the maximum average ranking from each of the information types. When only one information type received a score, due to lack of information, the average ranking from that one information type was neglected in the

overall ranking determination. In these cases the overall ranking was set to 3, meaning the currently available information does not adequately characterize the discharge potential.

Table 32-3. Ranking of discharge potential using existing information.

Airplane mechanical repair, maintenance, fueling, or cleaning			
Information Types	***Information Available***	***Average Ranking***	***Comments***
Dry Weather Monitoring		5	
Illicit Discharge Records	Y		
Pretreatment Compliance Records	Y		
Underground Stoage Tank Records	Y		
Haz Waste Storage Records	Y		
Inspection Records	Y		
Other information? Please specify here			
Overall Ranking		**3.0**	

Note: Overall Ranking is the highest 'Average Ranking' received for the various information types. When less than 2 scores were given, due to lack of information, the Overall Ranking was adjusted to 3 - Unknown Potential.

Scoring Legend	
1	- low discharge potential
2	- medium-low discharge potential
3	- Unknown, information does not adequately characterize
4	- medium-high discharge potential
5	- high discharge potential

A review of Table 32-3 shows that there is limited information available to assess discharge potential. Of the information available a more complete evaluation should be conducted to assess discharge potential.

It should be noted that a blank ranking in Table 32-3 does not necessarily mean that there is no discharge potential but rather the Copermittee chose not to rank the potential. As more information is collected these blanks will be filled in and a more comprehensive ranking established.

The 2005 Baseline LTEA effort produced source distribution information, if available, is provided in this section. Numerous resources were relied upon in order to obtain an as accurate as feasible estimate of the number of sources throughout San Diego County. The objective was to locate the sources within watersheds and sub-watersheds. When this was feasible, the sources are termed ‘geo-coded’, meaning there geographic coordinates are known and can be included in a GIS map. In some instances, it was not feasible to geo-code some sources. In Table 32-4, the number of geo-coded airfield sources within each watershed is shown, along with the total number of sources (geo-coded and not geo-coded together). In this case, the geographic coordinates for all of the identified sources were determined.

The source inventory is further broken down in Table 32-5 to show the prevalence of airfield facilities within each sub-watershed. This information, combined with the concurrent water quality assessment of sub-watersheds throughout San Diego County will ultimately help to assess the threat these facilities pose to water quality by source and constituent.

Table 32-4. Summary of airfields sources within each of San Diego County's Watersheds.

Watershed Management Area	Hydrologic Unit (HU)	Airfields
		Total # of Geo-Coded Sources
Santa Margarita	*902.00*	0
San Luis Rey	*903.00*	2
Carlsbad	*904.00*	1
San Dieguito	*905.00*	1
Penasquitos	*906.10 - 906.20*	0
Mission Bay	*906.30 - 906.50*	0
San Diego	*907.00*	2
San Diego Bay - Pueblo	*908.00*	1
San Diego Bay - Sweetwater	*909.00*	
San Diego Bay - Otay	*910.00*	
Tijuana	*911.00*	1
Total Geo-Coded Sources		8
Total Sources (incl. Non geo-coded)		8

It is recommended that municipalities use updated source information from the County, as available, to develop revised source prevalence and distribution data.

Table 32-5. Summary of airfield sources within each of San Diego County's sub-watersheds.

Watershed Management Area	Hydrologic Unit (HU)	Airfields									
		Sources Geo-Coded by Sub-watershed Hydrologic Unit									Total # of Sources
		90X.10	*90X.20*	*90X.30*	*90X.40*	*90X.50*	*90X.60*	*90X.70*	*90X.80*	*90X.90*	
Santa Margarita	*902.XX*	0	0	0	0	0	0	0	0	0	0
San Luis Rey	*903.XX*	2	0	0							2
Carlsbad	*904.XX*	0	0	0	1	0	0				1
San Dieguito	*905.XX*	0	0	0	1	0					1
Penasquitos	*906.XX*	0	0								0
Mission Bay	*906.XX*			0	0	0					0
San Diego	*907.XX*	2	0	0	0						2
San Diego Bay - Pueblo	*908.XX*	0	1	0							1
San Diego Bay - Sweetwater	*909.XX*	0	0	0							
San Diego Bay - Otay	*910.XX*	0	0	0							
Tijuana	*911.XX*	1	0	0	0	0	0	0	0		1
							Total Geo-Coded Sources				8
							Total Sources (incl. Non geo-coded)				8

32 Airfields

Airfield Sources

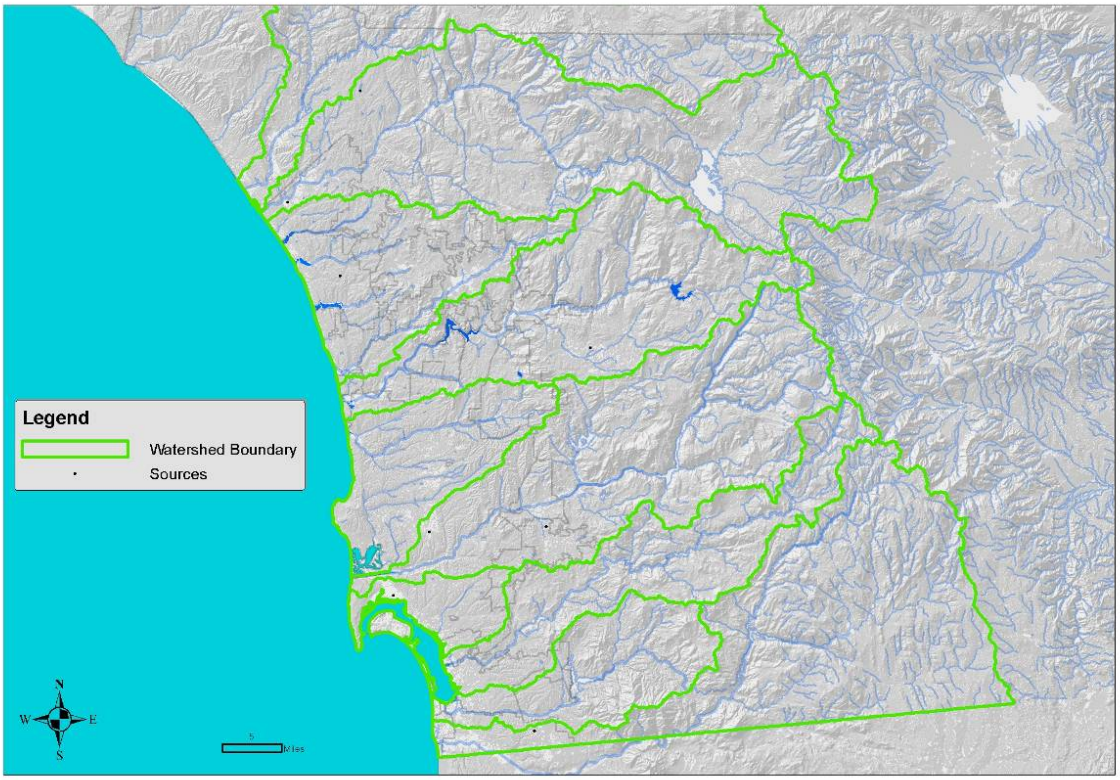

33 Motor Freight

Narrative Description

This Source Profile Sheet covers establishments primarily engaged in motor freight activities.

SIC Codes	
4213	Trucking, Except Local
4231	Terminal and Joint Terminal Maintenance Facilities for Motor Freight Transportation

NAICS Codes	
484220	Specialized Freight (except Used Goods) Trucking, Local
484230	Specialized Freight (except Used Goods) Trucking, Long-Distance

Some facilities that conduct motor freight were historically classified under the Standard Industrial Classification (SIC) system. This system has been slowly replaced by the North American Industry Classification System (NAICS), which accommodates a larger number of industrial sectors and sub-sectors, and identifies hundreds of new, emerging, and advanced technology industries. As most Copermittees have yet to convert from the SIC system to the NAICS, the applicable codes from both systems are presented here for easy reference.

Pollutant Generating Activities and Associated Pollutants

The following tables contain a list of activities commonly associated with motor freight which may have a source loading potential. Possible pollutants associated with these activities are also presented. Table 33-1 contains a list of activities with a source loading potential in wet weather and Table 33-2 contains a list of activities with source loading potential in dry weather.

The activities below were evaluated for potential pollutant generation during wet weather and dry weather. Wet weather potentials consider runon and runoff during wet weather events. Dry weather potentials are based on the assumption that irrigation and cleaning activities act as transport mechanisms. Furthermore, it is assumed that no BMPs are in place.

Table 33-1. Summary of typical activities and associated pollutants during wet weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacteria/ Pathogens*
Motor Freight									
Storage of raw materials, products, and containers	X	X	X	X				X	
Loading and unloading	X	X	X	X				X	
Operation of outdoor equipment	X	X	X						
Vehicle and equipment maintenance and repair	X	X	X						
Vehicle and equipment fueling	X	X	X						
Vehicle and equipment cleaning	X	X	X	X	X			X	
Parking and storage area maintenance	X		X	X				X	

Table 33-2. Summary of typical activities and associated pollutants during dry weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacteria/ Pathogens*
Motor Freight									
Vehicle and equipment cleaning	X	X	X	X	X			X	

Discharge Potential

As part of the initial 2005 LTEA effort, a questionnaire was completed by various Copermittees to assess the likely potential of a specific source discharging pollutants. Using existing information (e.g. illicit discharge records) and field knowledge the Copermittees ranked the potential of discharging pollutants. These rankings were averaged (when a ranking was given) to obtain average discharge potential rankings for each information type. See Table 33-3 for a summary of the results. An overall ranking was also determined for the source by taking the maximum average ranking from each of the information types. When only one information type received a score, due to lack of information, the average ranking from that one information type was neglected in the overall ranking determination. In these cases the overall ranking was set to 3, meaning the currently available information does not adequately characterize the discharge potential.

Table 33-3. Ranking of discharge potential using existing information.

Motor Freight			
Information Types	***Information Available***	***Average Ranking***	***Comments***
Dry Weather Monitoring	Y	3.5	
Illicit Discharge Records	Y	2.5	
Pretreatment Compliance Records			
Underground Stoage Tank Records	Y	4	
Haz Waste Storage Records	Y		
Inspection Records	Y	4	
Other information? Please specify here			
Overall Ranking		**4.0**	

Note: Overall Ranking is the highest 'Average Ranking' received for the various information types. When less than 2 scores were given, due to lack of information, the Overall Ranking was adjusted to 3 - Unknown Potential.

Scoring Legend	
1	- low discharge potential
2	- medium-low discharge potential
3	- Unknown, information does not adequately characterize
4	- medium-high discharge potential
5	- high discharge potential

A review of Table 33-3 shows that there appears to be considerable information that may be used to assess the discharge potential. As more information is collected and evaluated, the ranking potential will be updated.

It should be noted that a blank ranking in Table 33-3 does not necessarily mean that there is no discharge potential but rather the Copermittee chose not to rank the potential. As more information is collected these blanks will be filled in and a more comprehensive ranking established.

Legal/Regulatory Oversight

Table 33-4 provides a summary of the types of regulatory oversight that pertain to motor freight. In some cases, there may be some overlap in the types of regulatory oversight.

Table 33-4. Summary of the stormwater-related and non-stormwater related regulatory oversight of motor freight facilities

Motor freight			
Oversight Type	**Regulatory Oversight**		**Comments**
Stormwater	NPDES Municipal Permit / Local Ordinances		
	NPDES General Industrial Permit	X	
	NPDES General Construction Permit		
Other Regulatory Oversight	Industrial Pretreatment Program (EPA)	X	
	Hazardous Materials / CUPA (County DEH)	X	
	CURFFL (County DEH)		
	Local Enforcement Agency - Landfills (County DEH)		
	Air Quality Permits (APCD)	X	
	Fire Agencies		
	Pesticide Regulatory Program (County AW&M)		
	Coast Guard		

Better coordination may be warranted between the regulatory programs to minimize overlap but still focus on water quality protection.

Source Prevalence and Distribution

The 2005 Baseline LTEA effort produced source distribution information, if available, is provided in this section. Numerous resources were relied upon in order to obtain an as accurate as feasible estimate of the number of sources throughout San Diego County. The objective was to locate the sources within watersheds and sub-watersheds. When this was feasible, the sources are termed 'geo-coded', meaning there geographic coordinates are known and can be included in a GIS map. In some instances, it was not feasible to geo-code some sources. In Table 33-5, the number of geo-coded motor freight sources within each watershed is shown, along with the total number of sources (geo-coded and not geo-coded together). In this case, the geographic coordinates for all of the identified sources have not yet been determined.

Table 33-5. Summary of motor freight sources within each of San Diego County's Watersheds.

Watershed Management Area	Hydrologic Unit (HU)	Transportation & Warehousing
		Total # of Geo-Coded Sources
Santa Margarita	*902.00*	1
San Luis Rey	*903.00*	2
Carlsbad	*904.00*	32
San Dieguito	*905.00*	3
Penasquitos	*906.10 - 906.20*	27
Mission Bay	*906.30 - 906.50*	10
San Diego	*907.00*	37
San Diego Bay - Pueblo	*908.00*	61
San Diego Bay - Sweetwater	*909.00*	
San Diego Bay - Otay	*910.00*	
Tijuana	*911.00*	19
Total Geo-Coded Sources		192
Total Sources (incl. Non geo-coded)		242

While the inventory process attempted to ensure there is no overlap between priority sources identified, there may be some overlap of the identified sources with sources identified in other Source Profile Sheets.

The source inventory is further broken down in Table 33-6 to show the prevalence of motor freight facilities within each sub-watershed. This information, combined with the concurrent water quality assessment of sub-watersheds throughout San Diego County will ultimately help to assess the threat these facilities pose to water quality by source and constituent.

<u>It is recommended that municipalities use updated source information from the County, as available, to develop revised source prevalence and distribution data.</u>

Table 33-6. Summary of motor freight sources within each of San Diego County's sub-watersheds.

		Transportation & Warehousing									
Watershed Management Area	Hydrologic Unit (HU)	*Sources Geo-Coded by Sub-watershed Hydrologic Unit*									Total # of Sources
		90X.10	*90X.20*	*90X.30*	*90X.40*	*90X.50*	*90X.60*	*90X.70*	*90X.80*	*90X.90*	
Santa Margarita	*902.XX*	1	0	0	0	0	0	0	0	0	1
San Luis Rey	*903.XX*	2	0	0							2
Carlsbad	*904.XX*	10	1	1	10	8	2				32
San Dieguito	*905.XX*	2	1	0	0	0					3
Penasquitos	*906.XX*	7	20								27
Mission Bay	*906.XX*			0	5	5					10
San Diego	*907.XX*	37	0	0	0						37
San Diego Bay - Pueblo	*908.XX*	0	19	6							61
San Diego Bay - Sweetwater	*909.XX*	21	0	0							
San Diego Bay - Otay	*910.XX*	0	15	0							
Tijuana	*911.XX*	19	0	0	0	0	0	0	0		19
							Total Geo-Coded Sources				192
							Total Sources (incl. Non geo-coded)				242

34 POTWs (Water and Wastewater)

Narrative Description

This Source Profile Sheet primarily covers publicly owned treatment works (POTWs).

SIC Codes	

NAICS Codes	
221320	Sewage Treatment Facilities

Some facilities such as POTWs (water and wastewater) were not historically classified under the Standard Industrial Classification (SIC) system. This system has been slowly replaced by the North American Industry Classification System (NAICS), which accommodates a larger number of industrial sectors and sub-sectors, and identifies hundreds of new, emerging, and advanced technology industries. As most Copermittees have yet to convert from the SIC system to the NAICS, the applicable codes from both systems are presented here for easy reference.

Pollutant Generating Activities and Associated Pollutants

The following tables contain a list of activities commonly associated with POTWs (water and wastewater) which may have a source loading potential. Possible pollutants associated with these activities are also presented. Table 34-1 contains a list of activities with a source loading potential in wet weather and Table 34-2 contains a list of activities with source loading potential in dry weather.

The activities below were evaluated for potential pollutant generation during wet weather and dry weather. Wet weather potentials consider runon and runoff during wet weather events. Dry weather potentials are based on the assumption that irrigation and cleaning activities act as transport mechanisms. Furthermore, it is assumed that no BMPs are in place.

Table 34-1. Summary of typical activities and associated pollutants during wet weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacteria/ Pathogens*
POTWs (water and wastewater)									
Disposal and treatment of sewage sludge	X			X			X		X
Storage of raw materials, products, and containers	X	X	X	X			X		
Waste handling and disposal	X	X	X						X
Cleaning facilities	X	X		X	X			X	
Storage of liquid materials in stationary tanks	X	X	X						
Storage of any liquid materials in portable containers	X	X	X						
Cleaning or washing of tools, parts, and equipment	X	X	X	X	X				
Loading and unloading	X	X	X	X					
Operation of outdoor equipment	X	X	X						

Table 34-2. Summary of typical activities and associated pollutants during dry weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacteria/ Pathogens*
POTWs (water and wastewater)									
Cleaning facilities	X	X		X	X			X	

Discharge Potential

As part of the initial 2005 LTEA effort, a questionnaire was completed by various Copermittees to assess the likely potential of a specific source discharging pollutants. Using existing information (e.g. illicit discharge records) and field knowledge the Copermittees ranked the potential of discharging pollutants. These rankings were averaged (when a ranking was given) to obtain average discharge potential rankings for each information type. See Table 34-3 for a summary of the results. An overall ranking was also determined for the source by taking the maximum average ranking from each of the information types. When only one information type received a score, due to lack of information, the average ranking from that one information type was neglected in the overall ranking determination. In these cases the overall ranking was set to 3, meaning

the currently available information does not adequately characterize the discharge potential.

Table 34-3. Ranking of discharge potential using existing information.

Airfields			
Information Types	***Information Available***	***Average Ranking***	***Comments***
Dry Weather Monitoring	Y	3	
Illicit Discharge Records	Y		
Pretreatment Compliance Records			
Underground Stoage Tank Records	Y	3	
Haz Waste Storage Records	Y		
Inspection Records	Y		
Other information? Please specify here			
Overall Ranking		**3.0**	

Note: Overall Ranking is the highest 'Average Ranking' received for the various information types. When less than 2 scores were given, due to lack of information, the Overall Ranking was adjusted to 3 - Unknown Potential.

Scoring Legend	
1	- low discharge potential
2	- medium-low discharge potential
3	- Unknown, information does not adequately characterize
4	- medium-high discharge potential
5	- high discharge potential

A review of Table 34-3 shows that there is limited information available to assess discharge potential. Of the information available a more complete evaluation should be conducted to assess discharge potential.

It should be noted that a blank ranking in Table 34-3 does not necessarily mean that there is no discharge potential but rather the Copermittee chose not to rank the potential. As more information is collected these blanks will be filled in and a more comprehensive ranking established.

Legal/Regulatory Oversight

Table 34-4 provides a summary of the types of regulatory oversight that pertain to POTWs. In some cases, there may be some overlap in the types of regulatory oversight.

Table 34-4. Summary regulatory oversight of POTW (water and wastewater) facilities.

POTWs (water and wastewater)			
Oversight Type	**Regulatory Oversight**		**Comments**
Stormwater	NPDES Municipal Permit / Local Ordinances	X	
	NPDES General Industrial Permit	X	
	NPDES General Construction Permit		
Other Regulatory Oversight	Industrial Pretreatment Program (EPA)		
	Hazardous Materials / CUPA (County DEH)	X	
	CURFFL (County DEH)		
	Local Enforcement Agency - Landfills (County DEH)		
	Air Quality Permits (APCD)		
	Fire Agencies		
	Pesticide Regulatory Program (County AW&M)		
	Coast Guard		

Better coordination may be warranted between the regulatory programs to minimize overlap but still focus on water quality protection.

Source Prevalence and Distribution

The 2005 Baseline LTEA effort produced source distribution information, if available, is provided in this section. Numerous resources were relied upon in order to obtain an as accurate as feasible estimate of the number of sources throughout San Diego County. The objective was to locate the sources within watersheds and sub-watersheds. When this was feasible, the sources are termed 'geo-coded', meaning there geographic coordinates are known and can be included in a GIS map. In some instances, it was not feasible to geo-code some sources. In Table 34-5, the number of geo-coded POTW (water and wastewater) sources within each watershed is shown, along with the total number of sources (geo-coded and not geo-coded together). In this case, the geographic coordinates for all of the identified sources have not yet been determined.

Table 34-5. Summary of POTW (water and wastewater) sources within each of San Diego County's Watersheds.

Watershed Management Area	Hydrologic Unit (HU)	POTWs (water and wastewater) Total # of Geo-Coded Sources
Santa Margarita	*902.00*	4
San Luis Rey	*903.00*	17
Carlsbad	*904.00*	28
San Dieguito	*905.00*	14
Penasquitos	*906.10 - 906.20*	4
Mission Bay	*906.30 - 906.50*	1
San Diego	*907.00*	4
San Diego Bay - Pueblo	*908.00*	29
San Diego Bay - Sweetwater	*909.00*	
San Diego Bay - Otay	*910.00*	
Tijuana	*911.00*	1
Total Geo-Coded Sources		102
Total Sources (incl. Non geo-coded)		131

While the inventory process attempted to ensure there is no overlap between priority sources identified, there may be some overlap of the identified sources with sources identified in other Source Profile Sheets. This may be the case for the POTW (water and wastewater) sources that also perform body repair and painting services.

The source inventory is further broken down in Table 34-6 to show the prevalence of POTW (water and wastewater) facilities within each sub-watershed. This information, combined with the concurrent water quality assessment of sub-watersheds throughout San Diego County will ultimately help to assess the threat these facilities pose to water quality by source and constituent.

<u>It is recommended that municipalities use updated source information from the County, as available, to develop revised source prevalence and distribution data.</u>

Table 34-6. Summary of POTW (water and wastewater) sources within each of San Diego County's sub-watersheds.

Watershed Management Area	Hydrologic Unit (HU)	POTWs (water and wastewater)									
		Sources Geo-Coded by Sub-watershed Hydrologic Unit									Total # of Sources
		90X.10	*90X.20*	*90X.30*	*90X.40*	*90X.50*	*90X.60*	*90X.70*	*90X.80*	*90X.90*	
Santa Margarita	*902.XX*	4	0	0	0	0	0	0	0	0	4
San Luis Rey	*903.XX*	17	0	0							17
Carlsbad	*904.XX*	4	7	10	1	2	4				28
San Dieguito	*905.XX*	2	10	2	0	0					14
Penasquitos	*906.XX*	3	1								4
Mission Bay	*906.XX*			0	1	0					1
San Diego	*907.XX*	2	0	1	1						4
San Diego Bay - Pueblo	*908.XX*	1	2	0							29
San Diego Bay - Sweetwater	*909.XX*	0	4	1							
San Diego Bay - Otay	*910.XX*	20	1	0							
Tijuana	*911.XX*	0	0	0	0	0	0	0	1		1
							Total Geo-Coded Sources				102
							Total Sources (incl. Non geo-coded)				131

POTW

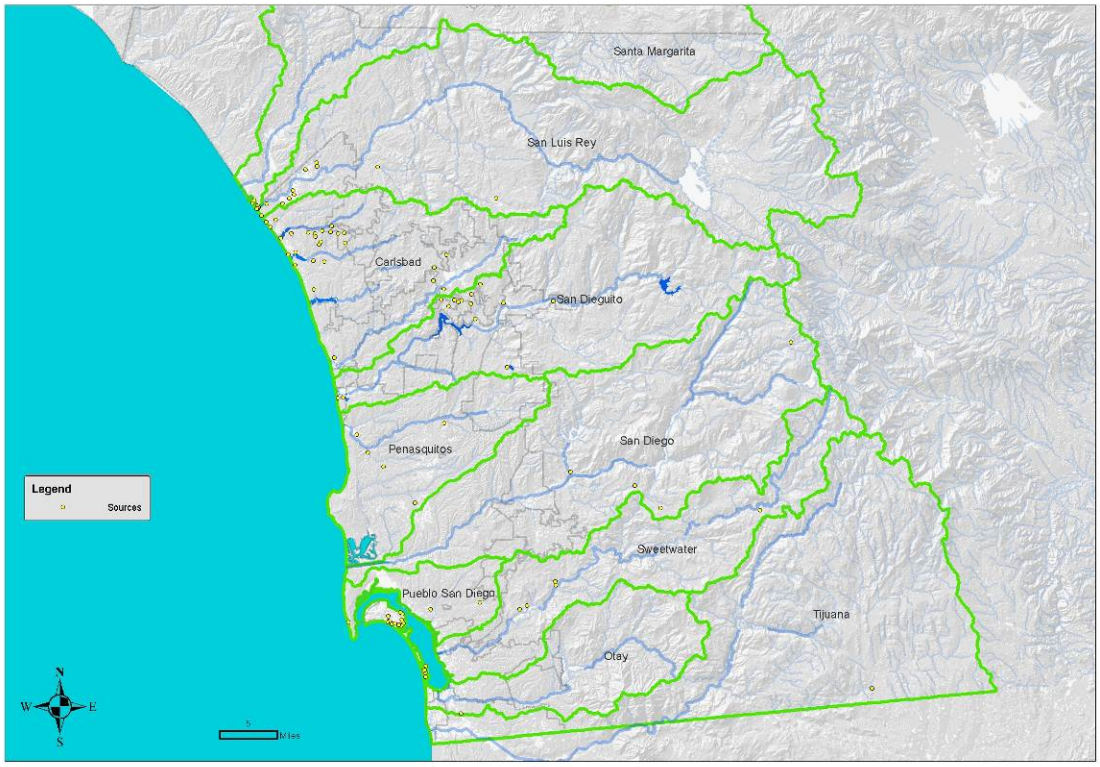

35 Concrete Manufacturing

Narrative Description

This Source Profile Sheet covers concrete manufacturers. Building materials retailers are not included, but instead covered in a separate Source Profile Sheet.

SIC Codes	
32XX	Stone, Clay, Glass, and Concrete Products
NAICS Codes	
3273XX	Concrete manufacturing

Some concrete manufacturers were historically classified under the Standard Industrial Classification (SIC) system. This system has been slowly replaced by the North American Industry Classification System (NAICS), which accommodates a larger number of industrial sectors and sub-sectors, and identifies hundreds of new, emerging, and advanced technology industries. As most Copermittees have yet to convert from the SIC system to the NAICS, the applicable codes from both systems are presented here for easy reference.

Pollutant Generating Activities and Associated Pollutants

The following tables contain a list of activities commonly associated with concrete manufacturing and source loading potential. Possible pollutants associated with these activities are also presented. Table 35-1 contains a list of activities with a source loading potential in wet weather and Table 35-2 contains a list of activities with source loading potential in dry weather.

The activities below were evaluated for potential pollutant generation during wet weather and dry weather. Wet weather potentials consider runon and runoff during wet weather events. Dry weather potentials are based on the assumption that irrigation and cleaning activities act as transport mechanisms. Furthermore, it is assumed that no BMPs are in place.

Table 35-1. Summary of typical activities and associated pollutants during wet weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacteria/ Pathogens*
Concrete									
Parking lot cleaning/sweeping	X	X	X	X				X	
Concrete and asphalt production	X	X	X						
Concrete cutting				X					
Storage of raw materials, products, and containers	X	X	X	X					
Loading and unloading	X			X					
Equipment operations, maintenance, and storage	X	X	X	X					
Cleaning or washing of tools, parts, and equipment	X	X	X	X	X			X	
Parking and storage area maintenance	X	X	X	X				X	
Storage of solid wastes	X	X	X	X				X	
Waste handling and disposal	X	X	X	X				X	

Table 35-2. Summary of typical activities and associated pollutants during dry weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacteria/ Pathogens*
Concrete									
Cleaning or washing of tools, parts, and equipment	X	X	X	X	X			X	

Discharge Potential

As part of the initial 2005 LTEA effort, a questionnaire was completed by various Copermittees to assess the likely potential of a specific source discharging pollutants. Using existing information (e.g. illicit discharge records) and field knowledge the Copermittees ranked the potential of discharging pollutants. These rankings were averaged (when a ranking was given) to obtain average discharge potential rankings for each information type. A similar questionnaire was not completed for this source profile sheet. As a result, best professional judgment was used to assign a discharge potential based on sources identified as concerns in the Copermittees' annual reports and permit. In

this case, a discharge potential of 4 was assigned because concrete manufacturing has been identified as a new potential source of pollutants.

Table 35-3. Ranking of discharge potential using existing information.

Concrete Manufacturing			
Information Types	*Information Available*	*Average Ranking*	*Comments*
Dry Weather Monitoring			
Illicit Discharge Records			
Pretreatment Compliance Records			
Underground Storage Tank Records			
Haz Waste Storage Records			
Inspection Records			
Other information? Please specify here			
Overall Ranking		4.0	

Note: Overall Ranking is the highest 'Average Ranking' received for the various information types. When less than 2 scores were given, due to lack of information, the Overall Ranking was adjusted to 3 - Unknown Potential.

Scoring Legend	
1	- low discharge potential
2	- medium-low discharge potential
3	- Unknown, information does not adequately characterize
4	- medium-high discharge potential
5	- high discharge potential

Legal/Regulatory Oversight

Table 35-4 provides a summary of the types of regulatory oversight that pertain to concrete manufacturers. In some cases, there may be some overlap in the types of regulatory oversight.

Table 35-4. Summary regulatory oversight of building materials retailers.

Concrete Manufacturing			
Oversight Type	Regulatory Oversight		Comments
Stormwater	NPDES Municipal Permit / Local Ordinances	X	
	NPDES General Industrial Permit	X	
	NPDES General Construction Permit		
Other Regulatory Oversight	Industrial Pretreatment Program (EPA)	X	
	Hazardous Materials / CUPA (County DEH)	X	
	CURFFL (County DEH)		
	Local Enforcement Agency – Landfills (County DEH)		
	Air Quality Permits (APCD)		
	Fire Agencies		
	Pesticide Regulatory Program (County AW&M)		
	Coast Guard		

Better coordination may be warranted between the regulatory programs to minimize overlap but still focus on water quality protection.

Source Prevalence and Distribution

The 2005 Baseline LTEA effort did not produce source distribution information for these types of facilities. Therefore, it is recommended that new source information be obtained from the County, as available, to develop source prevalence and distribution data.

36 Glass and Stone Manufacturing

Narrative Description

This Source Profile Sheet covers glass and stone manufacturers. Building materials retailers are not included, but instead covered in a separate Source Profile Sheet.

SIC Codes	
3211	Flat Glass
3281	Cut Stone and Stone Products

NAICS Codes	
327211	Flat Glass Manufacturing
327991	Stone Manufacturing

Some glass and stone manufacturers were historically classified under the Standard Industrial Classification (SIC) system. This system has been slowly replaced by the North American Industry Classification System (NAICS), which accommodates a larger number of industrial sectors and sub-sectors, and identifies hundreds of new, emerging, and advanced technology industries. As most Copermittees have yet to convert from the SIC system to the NAICS, the applicable codes from both systems are presented here for easy reference.

Pollutant Generating Activities and Associated Pollutants

The following tables contain a list of activities commonly associated with concrete manufacturing and source loading potential. Possible pollutants associated with these activities are also presented. Possible pollutants associated with these activities are also presented. Table 36-1 contains a list of activities with a source loading potential in wet weather and Table 36-2 contains a list of activities with source loading potential in dry weather.

The activities below were evaluated for potential pollutant generation during wet weather and dry weather. Wet weather potentials consider runon and runoff during wet weather events. Dry weather potentials are based on the assumption that irrigation and cleaning activities act as transport mechanisms. Furthermore, it is assumed that no BMPs are in place.

Table 36-1. Summary of typical activities and associated pollutants during wet weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacteria/ Pathogens*
Stone/Glass Manufacturing									
Storage of raw materials, products, and containers	X	X	X	X	X				
Stone cutting				X					
Loading and unloading	X			X	X				
Equipment operations, maintenance, and storage	X	X	X	X					
Cleaning or washing of tools, parts, and equipment	X	X	X	X	X			X	
Parking and storage area maintenance	X	X	X	X				X	
Storage of solid wastes	X	X	X	X				X	
Waste handling and disposal	X	X	X	X				X	
Air deposition from stacks				X					

Table 36-2. Summary of typical activities and associated pollutants during dry weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacteria/ Pathogens*
Stone/Glass Manufacturing									
Cleaning facilities	X	X		X	X			X	

Discharge Potential

As part of the initial 2005 LTEA effort a questionnaire was completed by various Copermittees to assess the likely potential of a specific source discharging pollutants. Using existing information (e.g. illicit discharge records) and field knowledge the Copermittees ranked the potential of discharging pollutants. These rankings were averaged (when a ranking was given) to obtain average discharge potential rankings for each information type. A similar questionnaire was not completed for this source profile sheet. As a result, best professional judgment was used to assign a discharge potential based on sources identified as concerns in the Copermittees' annual reports and permit. In this case, a discharge potential of 4 was assigned because stone and glass manufacturing has been identified as a new potential source of pollutants.

Table 36-3. Ranking of discharge potential using existing information.

Glass and Stone Manufacturing			
Information Types	*Information Available*	*Average Ranking*	*Comments*
Dry Weather Monitoring			
Illicit Discharge Records			
Pretreatment Compliance Records			
Underground Storage Tank Records			
Haz Waste Storage Records			
Inspection Records			
Other information? Please specify here			
Overall Ranking		4.0	

Note: Overall Ranking is the highest 'Average Ranking' received for the various information types. When less than 2 scores were given, due to lack of information, the Overall Ranking was adjusted to 3 - Unknown Potential.

Scoring Legend	
1	- low discharge potential
2	- medium-low discharge potential
3	- Unknown, information does not adequately characterize
4	- medium-high discharge potential
5	- high discharge potential

Legal/Regulatory Oversight

Table 36-4 provides a summary of the types of regulatory oversight that pertain to concrete manufacturers. In some cases, there may be some overlap in the types of regulatory oversight.

Table 36-4. Summary regulatory oversight of building materials retailers.

Glass and Stone Manufacturing			
Oversight Type	Regulatory Oversight		Comments
Stormwater	NPDES Municipal Permit / Local Ordinances	X	
	NPDES General Industrial Permit	X	
	NPDES General Construction Permit		
Other Regulatory Oversight	Industrial Pretreatment Program (EPA)	X	
	Hazardous Materials / CUPA (County DEH)	X	
	CURFFL (County DEH)		
	Local Enforcement Agency – Landfills (County DEH)		
	Air Quality Permits (APCD)	X	
	Fire Agencies		
	Pesticide Regulatory Program (County AW&M)		
	Coast Guard		

Better coordination may be warranted between the regulatory programs to minimize overlap but still focus on water quality protection.

Source Prevalence and Distribution

The 2005 Baseline LTEA effort did not produce source distribution information for these types of facilities. Therefore, it is recommended that new source information be obtained from the County, as available, to develop source prevalence and distribution data.

37 Food Manufacturing

Narrative Description

This Source Profile Sheet covers primarily food manufacturing businesses.

SIC Codes	
514X	Groceries and Related Products

NAICS Codes	
311XXX	Food manufacturing

Some businesses such as food manufacturing businesses were historically classified under the Standard Industrial Classification (SIC) system. This system has been slowly replaced by the North American Industry Classification System (NAICS), which accommodates a larger number of industrial sectors and sub-sectors, and identifies hundreds of new, emerging, and advanced technology industries. As most Copermittees have yet to convert from the SIC system to the NAICS, the applicable codes from both systems are presented here for easy reference.

Pollutant Generating Activities and Associated Pollutants

The following tables contain a list of activities commonly associated with food manufacturing which may have a source loading potential. Possible pollutants associated with these activities are also presented. Possible pollutants associated with these activities are also presented. Table 37-1contains a list of activities with a source loading potential in wet weather and Table 37-2contains a list of activities with source loading potential in dry weather.

The activities below were evaluated for potential pollutant generation during wet weather and dry weather. Wet weather potentials consider runon and runoff during wet weather events. Dry weather potentials are based on the assumption that irrigation and cleaning activities act as transport mechanisms. Furthermore, it is assumed that no BMPs are in place.

Table 37-1. Summary of typical activities and associated pollutants during wet weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacteria/ Pathogens*
Food									
Loading and unloading		X	X					X	
Cleaning facilities		X	X	X	X			X	
Equipment maintenance and repair	X	X							
Storage of solid wastes and food wastes		X	X	X			X		
Disposal of solid and food wastes							X	X	X
Vector/Pest control						X			
Sanitary sewer overflows									X

Table 37-2. Summary of typical activities and associated pollutants during dry weather.

Activities with Source Loading Potential	Associated Pollutants								
	Heavy Metals	*Organics*	*Oil & Grease*	*Sediment*	*Dissolved Minerals*	*Pesticides*	*Nutrients*	*Trash*	*Bacteria/ Pathogens*
Food									
Cleaning facilities		X	X	X	X			X	
Sanitary sewer overflows									X

Discharge Potential

As part of the initial 2005 LTEA effort a questionnaire was completed by various Copermittees to assess the likely potential of a specific source discharging pollutants. Using existing information (e.g. illicit discharge records) and field knowledge the Copermittees ranked the potential of discharging pollutants. These rankings were averaged (when a ranking was given) to obtain average discharge potential rankings for each information type. A similar questionnaire was not completed for this source profile sheet. As a result, best professional judgment was used to assign a discharge potential based on sources identified as concerns in the Copermittees' annual reports and permit. In this case, a discharge potential of 4 was assigned food manufacturing has been identified as a new potential source of pollutants.

Table 37-3. Ranking of discharge potential using existing information.

Food Manufacturing			
Information Types	*Information Available*	*Average Ranking*	*Comments*
Dry Weather Monitoring			
Illicit Discharge Records			
Pretreatment Compliance Records			
Underground Storage Tank Records			
Haz Waste Storage Records			
Inspection Records			
Other information? Please specify here			
Overall Ranking		4.0	

Note: Overall Ranking is the highest 'Average Ranking' received for the various information types. When less than 2 scores were given, due to lack of information, the Overall Ranking was adjusted to 3 - Unknown Potential.

Scoring Legend	
1	- low discharge potential
2	- medium-low discharge potential
3	- Unknown, information does not adequately characterize
4	- medium-high discharge potential
5	- high discharge potential

Legal/Regulatory Oversight

Table 37-4 provides a summary of the types of regulatory oversight that pertain to food manufacturing businesses. In some cases, there may be some overlap in the types of regulatory oversight.

Table 37-4. Summary of the stormwater-related and non-stormwater related regulatory oversight of food manufacturing businesses.

Food Manufacturing			
Oversight Type	Regulatory Oversight		Comments
Stormwater	NPDES Municipal Permit / Local Ordinances	X	
	NPDES General Industrial Permit		
	NPDES General Construction Permit		
Other Regulatory Oversight	Industrial Pretreatment Program (EPA)		
	Hazardous Materials / CUPA (County DEH)		
	CURFFL (County DEH)	X	
	Local Enforcement Agency – Landfills (County DEH)		
	Air Quality Permits (APCD)		
	Fire Agencies		
	Pesticide Regulatory Program (County AW&M)		
	Coast Guard		

Better coordination may be warranted between the regulatory programs to minimize overlap but still focus on water quality protection.

Source Prevalence and Distribution

The 2005 Baseline LTEA effort did not produce source distribution information for these types of facilities. Therefore, it is recommended that new source information be obtained from the County, as available, to develop source prevalence and distribution data.

This appendix provides examples of the use of the Threat-to-Water Quality (TTWQ) methodology discussed in the 2011 Long-Term Effectiveness Assessment (LTEA) Section 4. All of the examples presented in this appendix, although may include some real data and information, are fictional in nature and are intended to be for example purposes only.

The tables presented in this appendix are provided in electronic form on the accompanying 2011 LTEA compact disc. The compact disc also contains template (blank) forms for use in conducting the TTWQ methods.

The imagery for the examples are taken from the watershed interactive mapping in the 2011 LTEA Water Quality Report included as Attachment 1 to the 2011 LTEA. The aerial imagery is from Google Earth and includes overlays from City of San Diego storm drain mapping and hydrologic areas – the data and information presented in these images are not necessarily accurate or correct, but are presented as examples only.

The plots and tables in the examples below, illustrate a process in which the TTWQ in a particular watershed is analyzed by using available data and information to prioritize sources. The primary approaches to the TTWQ process are presented for two monitoring locations in the Peñasquitos watershed. Four examples are provided:

1) Single Pollutant Approach on Large Area Scale (MLS/TWAS)
2) Multi-Pollutant Approach on Large Area Scale (MLS/TWAS)
3) Single Pollutant Approach on Small Area Scale (MLS/TWAS)
4) Investigative Method using TTWQ Approach (MS4 Outfall)

As discussed in Section 4 of the LTEA, the methodologies for the single and multi-pollutant approaches are listed below:

Steps for Single Pollutant Approach to TTWQ

1) Determine Scale to Develop Threat to Water Quality
    a. Regional
    b. Hydrologic Area
    c. Hydrologic Subarea
    d. Tributary Area
    e. Jurisdictional
2) Determine Wet or Dry Weather Conditions
3) Determine Water Quality Issues (Pollutant(s)) to Evaluate
    a. LTEA Water Quality Priorities (RW and MS4)
    b. TMDLs
    c. 303(d)
    d. Special Studies
4) Associate Sources[1] to Pollutant
    a. Source SLPs
    b. PGA Associations to Pollutants
    c. Special Studies
5) Incorporate Source Quantities
6) Incorporate Other Criteria as Desired

[1] May include land use as a source

7) Develop Priority Ranking of Sources

A multi-pollutant approach to TTWQ follows:

1) Perform Steps 1 and 2 above
2) Repeat steps 3-6 above for each pollutant, each time identifying the priority ranking of sources for each pollutant.

The first example is for an area that is tributary to a MLS in the Peñasquitos WMA and demonstrates a multi-pollutant approach to TTWQ. The mass loading station, LPC-MLS, is the monitoring location that captures a large tributary area spanning two Hydrologic Areas (HAs) in the watershed.

Multi-Pollutant Large Area Scale TTWQ Approach

1) Determine Scale to Develop Threat to Water Quality

When determining the TTWQ, the first step is to determine the scale and location where a particular monitoring location can characterize the flow from a tributary area. For the example, Figures B-1 and B-2 show the Peñasquitos watershed and the associated monitoring locations, including MLS, TWAS, and MS4 outfalls.

For this example, the ***mass loading station LPC-MLS*** has been chosen because of its large tributary area. Figure B-1 shows the Los Peñasquitos Creek WMA dry weather urban runoff and receiving water base map. To see the tributary area to the LPC-MLS station to be used in the example, Figure B-2 shows the drainage to the MLS throughout the watershed, which is turned on as one of the map layers. The station is encircled in red on the maps in order to callout its location.

2) Determine Wet or Dry Weather Conditions

The flow conditions should be selected at this point. For the example, a ***dry weather*** condition is selected.

3) Determine Water Quality Issues (Pollutant(s)) to Evaluate

Using Table 2-2 of the LTEA, the water quality issues are identified by reviewing the watershed priority constituents presented. This process identifies the pollutants that are deemed a priority based on the water quality monitoring data. This step is conducted by reviewing the priorities table (LTEA Table 2-2) and locating the appropriate row containing information pertaining to the monitoring location. Table B-1 below shows the watershed priority constituents identified for mass loading station LPC-MLS in the Peñasquitos WMA. The high priority constituents have been highlighted to show a corresponding 'high' score represented in the data. The outcome of this step is ***Nutrients and Bacteria/Pathogens*** as Dissolved Minerals (TDS) is not an analyte that is selected for Copermittee action in this example due to its nexus to groundwater and/or imported water issues.

4) Associate Sources to Pollutant

Using the high priority constituents determined in the step above, the next step is to review the final source loading potentials (SLPs) of sources within the LPC-MLS tributary area that are likely sources contributing to the selected pollutant(s). Using the information presented in Section 3 (LTEA Table 3-10), the activities with source loading potential with regards to mass loading station LPC-MLS have been highlighted based on the three high priority constituents (nutrients and bacteria/pathogens) –see Table B-2 below for sources.

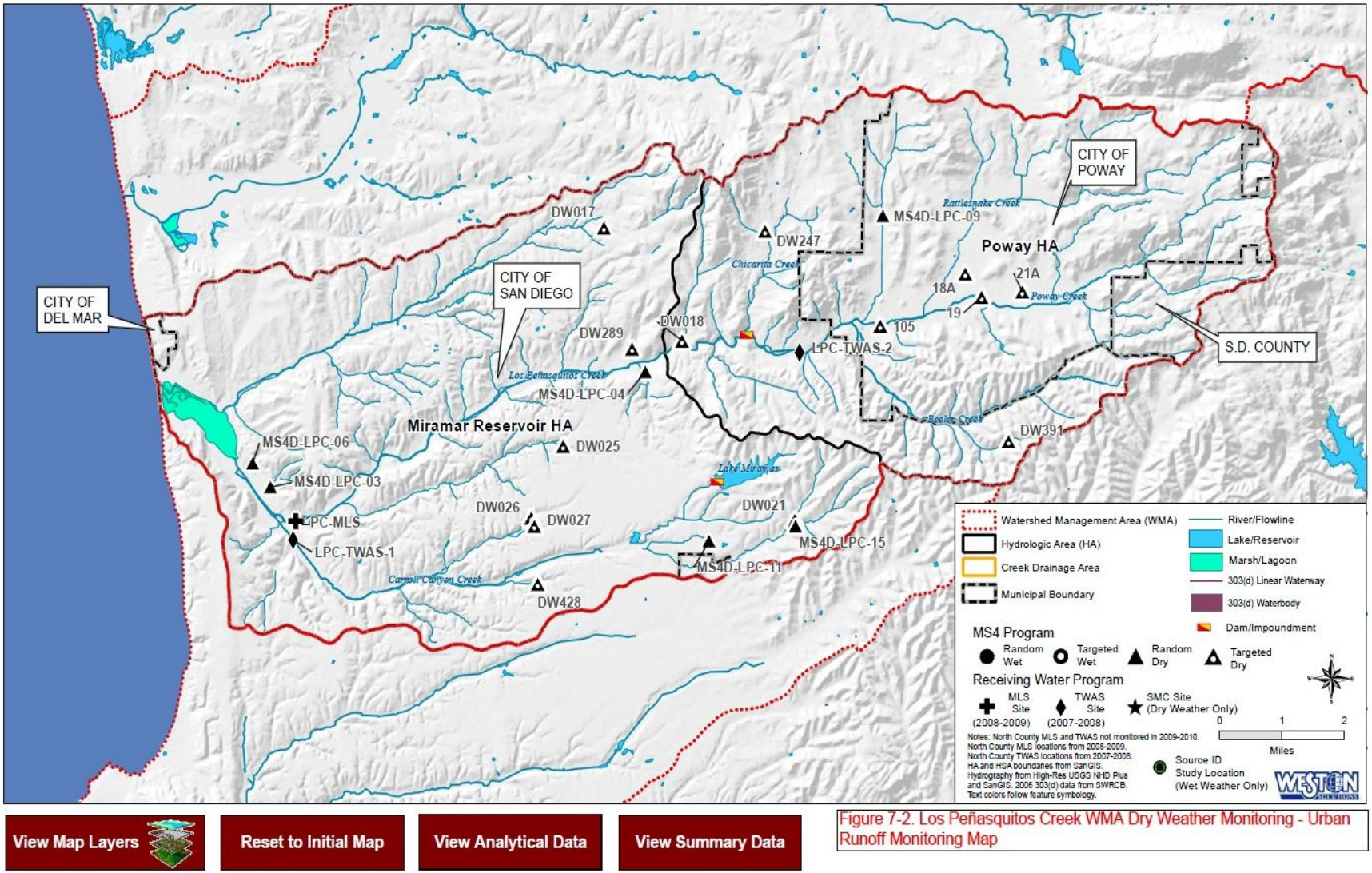

Figure B-1: Los Peñasquitos Creek Monitoring Map

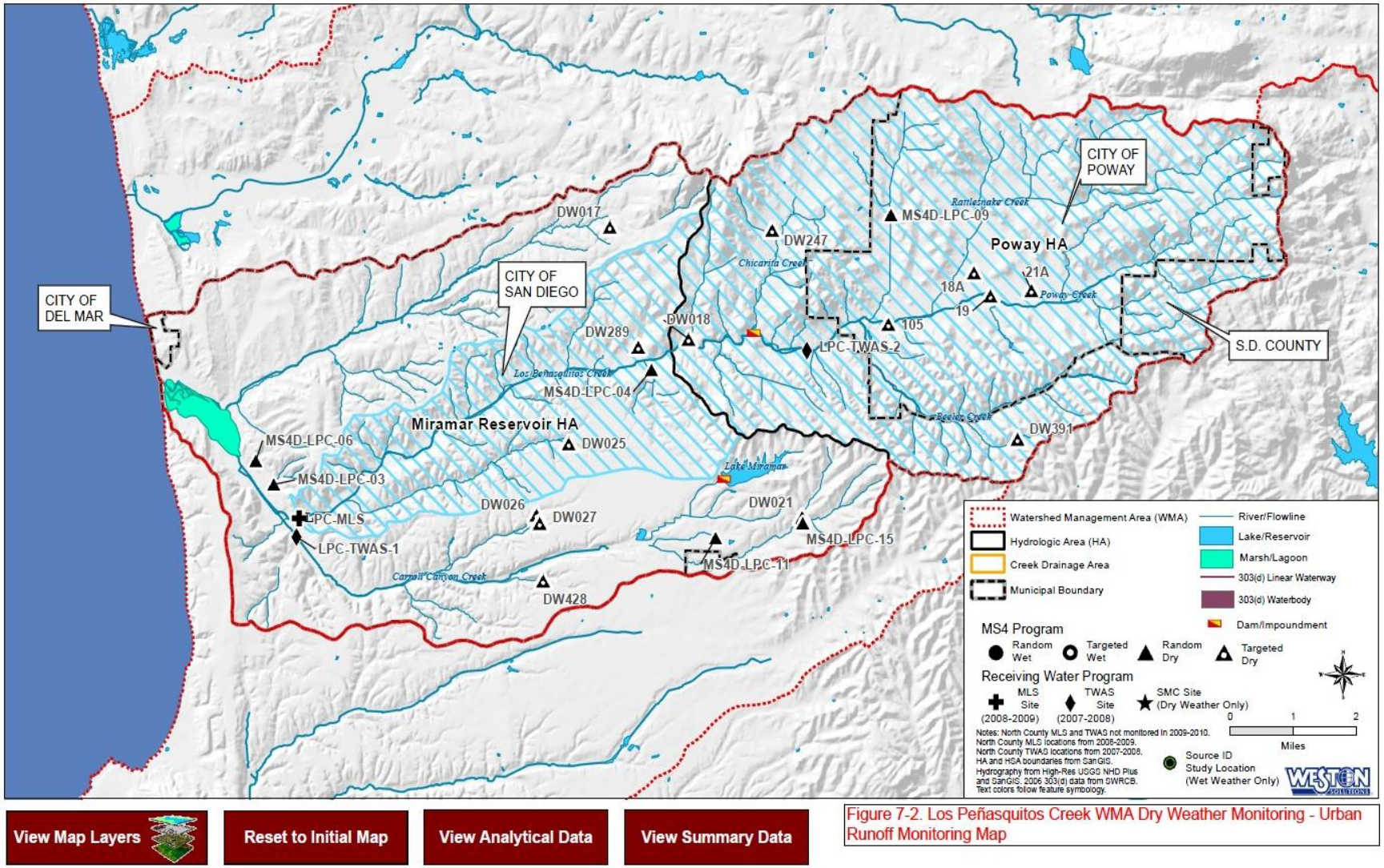

Figure: B-2 Los Peñasquitos Creek Monitoring Map showing tributary drainage to Mass Loading Station LPC-MLS

Table B-1: Watershed Priority Constituents Determined by Water Quality Assessment Monitoring Program at LPC-MLS

WMA	Station	Wet							Dry						
		Metals	Oil and Grease	Sediment	Pesticides	Nutrients	Bacteria/ Pathogens	Dissolved Minerals	Metals	Oil and Grease	Sediment	Pesticides	Nutrients	Bacteria/ Pathogens	Dissolved Minerals
Santa Margarita River	SMR-MLS	-	-	M	-	-	M	-	-	-	-	-	H	-	H
	SMR-MLS-2	-	-	H	H	-	H	-	-	-	-	-	H	-	H
San Luis Rey	SLR-MLS	-	-	M	M	-	H	H	-	-	M	-	H	M	H
	SLR-TWAS-1	-	-	H	H	-	H	H	-	-	-	-	M	H	H
Carlsbad	LA-TWAS-1	-	-	H	M	-	H	-	-	-	-	-	H	M	-
	BVC-TWAS-1	-	-	H	H	-	H	-	-	-	-	-	H	M	H
	AHC-MLS	-	-	H	H	-	H	H	-	-	-	-	H	H	H
	AHC-TWAS-1	-	-	H	H	-	H	M	-	-	-	-	H	M	H
	ESC-MLS	-	-	H	H	-	H	H	-	-	-	-	H	H	H
	ESC-TWAS-1	-	-	H	H	-	H	M	-	-	-	-	H	M	H
San Dieguito Creek	SDC-MLS	-	-	M	M	-	H	H	-	-	H	-	H	M	H
	SDC-TWAS-1	-	-	H	H	-	M	M	-	-	-	-	H	M	H
	SDC-TWAS-2	-	-	H	-	H	H	M	-	-	H	-	H	H	H
Los Peñasquitos Creek	LPC-MLS	-	-	M	M	-	H	H	-	-	-	-	H	H	H
	LPC-TWAS-1	-	-	H	M	-	H	M	-	-	-	-	-	H	H
	LPC-TWAS-2	-	-	H	H	-	H	-	-	-	-	-	H	H	H
Mission Bay / La Jolla	MB-TWAS-1	-	-	H	H	-	H	H	-	-	-	M	M	-	H
	MB-TWAS-2	-	-	H	H	-	H	-	-	-	-	M	H	H	-
	TC-MLS	-	-	H	H	-	H	-	-	-	-	-	H	-	-
San Diego River	SDR-MLS	-	-	H	M	-	H	-	-	-	-	-	H	H	H
	SDR-TWAS-1	-	-	H	H	-	H	M	-	-	-	-	H	H	H
	SDR-TWAS-2	-	-	H	H	-	H	-	-	-	-	-	H	M	H
	SDR-TWAS-3	-	-	H	H	-	H	-	-	-	-	-	M	M	H
San Diego Bay - Pueblo	CC-SD8-1	H	-	H	H	-	H	-	H	M	M	M	H	M	-
San Diego Bay - Sweetwater	SR-MLS	-	-	M	M	-	H	H	-	-	-	-	H	M	H
	SR-TWAS-1	-	-	M	M	-	H	M	-	-	-	-	H	M	H
San Diego Bay - Otay	OR-TWAS-1	M	-	M	H	-	-	M	-	-	-	-	H	-	H
Tijuana River	TJR-MLS	-	-	H	H	H	H	-	-	-	M	-	H	H	-
	TJR-TWAS-1	-	-	-	-	H	M	H	-	-	-	-	-	-	-
	TJR-TWAS-2	-	-	H	-	H	H	-	-	-	-	-	-	-	-

Note: H=High Priority, M=Medium Priority pollutant based on the monitoring station data.
Green cells represent the intersection of the site location and the high priority issues for dry conditions.

Table B-2. Final Source Loading Potentials at LPC-MLS

Source Profile #	Activities with Source Loading Potential	Metals	Oil & Grease	Sediment	Pesticides	Nutrients	Bacteria/ Pathogens	Dissolved Minerals	Organics
1	Residential Areas and Activities	L	L	L	L	L	L	L	L
2	Construction Sites > 1 acre	UL	UL	L	UL	UL	UL	L	UL
3	Construction Sites < 1 acre	UL	UL	L	UL	UL	UL	UL	UL
4	Construction Sites: ESA or hillside or sediment TMDL	UL	UL	L	UL	UL	UL	UL	UL
5	Development subject to SUSMPs (> 5,000 sq. ft. impervious area)	UK	UK	UK	UK	UK	UK	UL	UK
6	Roads, streets, highways, and parking facilities	L	L	L	UL	L	L	L	L
7	MS4s - Catch Basins, Drain Inlets, Conveyance, Pump Stations	N	N	L	N	N	UK	UL	N
8	Corporate yards (incl. maintenance/storage yards)	L	L	L	UK	UK	UL	UL	L
9	Parks and Recreational Facilities - parks, golf courses, cemeteries, entertainment venues, etc.	UK	UK	UK	UK	L	UK	UL	UK
10	Auto Mechanical Repair, Maintenance, Fueling, or Cleaning	L	L	UL	UL	UK	UL	L	L
11	Equipment mechanical repair, maintenance, fueling, or cleaning	L	L	UL	UL	UK	UL	UL	L
12	Automobile and Other Vehicle Body Repair and Painting	L	L	UL	UL	UL	UL	L	L
13	Mobile automobile or vehicle washing	L	L	L	UL	UL	UL	UL	L
14	Mobile Power washing*	UK	UK	UK	UK	UK	UK	UK	UK
15	Auto parking lots and storage facilities	L	L	L	UK	UK	UK	UL	L
16	Retail or wholesale fueling	UK	L	UK	N	N	N	N	L
17	Pest Control Services	N	UK	N	L	N	UK	N	UK
18	Eating or drinking establishments	N	L	UL	UK	UK	L	UL	L
19	Mobile carpet, drape, or furniture cleaning	N	UK	UL	N	UK	UL	N	UL
20	General contractors for home/commercial improvements	UL	UL	L	UL	UL	UL	UL	UL
21	Botanical or zoological gardens and nurseries/greenhouses	L	UL	L	L	L	L	UL	UL
22	Mobile Landscaping	N	UL	L	L	L	L	UL	N
23	Pool and Fountain Cleaning	N	N	N	N	UK	N	N	UK
24	Marinas	L	L	N	UK	UK	UK	N	UK
25	Animal Kennels	N	UL	L	UK	L	L	N	L
26	Building Materials Retail and Storage	L	L	L	UL	UL	UL	UL	L
27	Chemical and allied products	UK	UK	UK	UK	UK	UL	N	L
28	Fabricated metal	L	L	UK	UK	UK	UL	UL	L
29	Primary metal	L	UK	UK	UK	UK	UL	N	UK
30	Recycling, Junk Yards, Scrap Metal	L	L	L	UL	UL	UL	L	L
31	Airfields	UK	UK	UK	UK	UK	N	UL	UK
32	Motor Freight	L	L	UK	UK	UK	UK	UL	L
33	POTWs (water and wastewater)	UK	UK	UK	N	UK	L	UL	UK
34	Concrete Manufacturing	L	L	L	UL	UL	UL	UL	L
35	Stone/Glass Manufacturing	L	L	L	UL	UL	UL	UL	L
36	Food Manufacturing	UL	UL	UL	UL	UL	UL	UL	UL

N = None, UK = Unknown, UL = Unlikely, L = Likely

In addition to using the SLPs, Copermittees can also use PGA associations to pollutants and other special studies to associate sources to pollutant.

5) Incorporate Source Quantities

After determining the high priority pollutant constituents and the source loading potentials, identify the number of sources in the particular tributary/drainage area for the monitoring station. For this exercise, it is recommended that the Copermittees use the most up-to-date inventory information and GIS software, if necessary, to identify an accurate number of sources in the particular drainage area. Additionally, if it is available, the area of residential land use and any other pertinent land use should be calculated. The sources within the example drainage are shown in Figure B-3.

Once these source numbers have been compiled, consolidate the results of the number of sources, residential acreage, and source loading potential into a table for the pollutants of concern. See Tables B-3 through B-5 for the high priority constituents at LPC-MLS. If only using a single-pollutant approach, follow up the single table with the prioritization.

6) Incorporate Other Criteria as Desired

At this point, the Copermittees should look to consider other criteria that may be important in deciding upon which sources are of greatest importance. Taken from the LTEA (Section 4), the following are additional considerations.

In selecting the source(s) to evaluate for the TTWQ, some additional considerations the Copermittee(s) should evaluate are as follows:

1) Land use (quantity and activity) should be included and the following considered:
    a. Wet weather TTWQ processes should include an evaluation of the land use areas in the area of focus
    b. Need a surrogate value for residential and open space land areas to compare to inventoried sources
2) Special studies information regarding sources in the focus area
3) Potential sources that are not easily quantifiable including: bacterial regrowth in MS4 systems; erosion in open space areas; accelerated erosion in creeks (hydromodification); and aerial deposition

For the purposes of this example, the residential land-use is identified as being of great importance. In order to compare the residential land acres to the number of inventoried sources, a conservative assumption is made for this tributary watershed area – average lot size of 0.5 acres, therefore ***each acres of residential land use equates to two (2) residential units***.

7) Develop Priority Ranking of Sources

For the multi-pollutant approach, the process combines the single-pollutant tables (Tables B-3 through B-5) into a single master table where sources can be ranked on the basis of source loading potential and number of sources in the associated tributary watershed area. See Table B-6 for the results of the example process. Using this process, and the consideration that residential areas are of great importance, ***the highest TTWQ source is the residential areas in the tributary watershed area.***

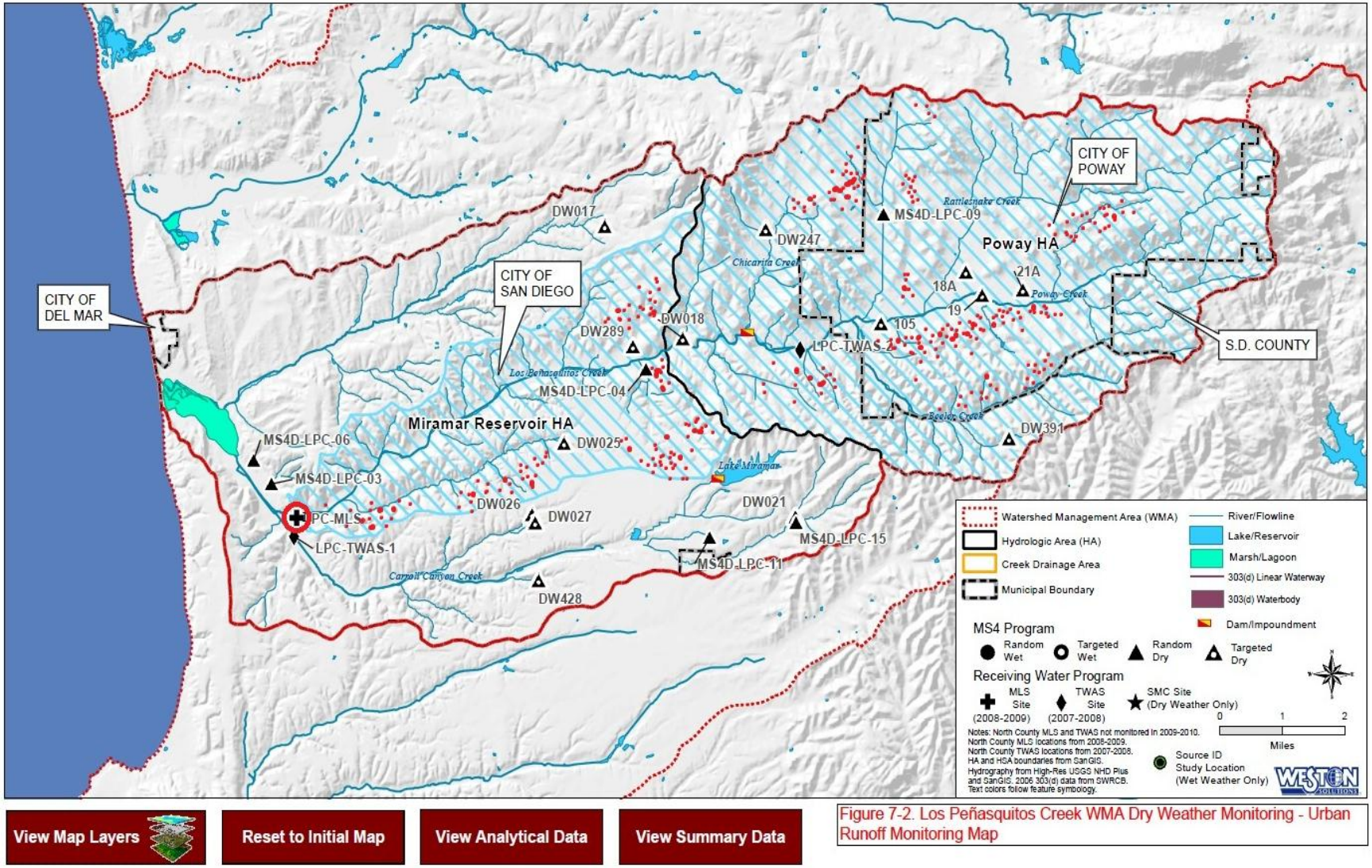

View Map Layers | Reset to Initial Map | View Analytical Data | View Summary Data

Figure 7-2. Los Peñasquitos Creek WMA Dry Weather Monitoring - Urban Runoff Monitoring Map

Figure B-3. Los Peñasquitos Creek Monitoring Map showing tributary drainage and potential sources above Mass Loading Station LPC-MLS.

Table B-3. Source Quantities, Water Quality Priority, and SLPs for Bacteria/Pathogens at LPC-MLS.

LPC-MLS				
Bacteria/Pathogens		# Sources	Water Quality Priority	Source Loading Potential
Source ID	Source			
1	Residential Areas and Activities – 4,468 acres	8,936	H	L
2	Sites > 1 acre	-		L
3	Sites < 1 acre	-		UL
4	ESA or Hillside or Sediment TMDL	-		UL
5	Development Subject to SUSMPs (> 5,000 sq. ft. Impervious Area)	-		UL
6	Roads, Streets, Highways, and Parking Facilities	-		UL
7	MS4s - Catch Basins, Drain Inlets, Conveyance, Pump Stations	-		UL
8	Corporate Yards (incl. Maintenance/Storage Yards)	2		UL
9	Parks and Recreational Facilities - Parks, Golf Courses, Cemeteries, Entertainment Venues, etc.	4		UL
10	Auto Mechanical Repair, Maintenance, Fueling, or Cleaning	59		UL
11	Equipment Mechanical Repair, Maintenance, Fueling, or Cleaning	-		N
12	Automobile and Other Vehicle Body Repair and Painting	3		UL
13	Mobile Automobile or Vehicle Washing	-		UL
14	Mobile Power Washing	-		N
15	Auto Parking Lots and Storage Facilities	-		UL
16	Retail or Wholesale Fueling	35		N
17	Pest Control Services	-		UL
18	Eating or Drinking Establishments	421		L
19	Mobile Carpet, Drape, or Furniture Cleaning	-		UL
20	General Contractors for Home/Commercial Improvements	-		UL
21	Botanical or Zoological Gardens and Nurseries/Greenhouses	3		L
22	Mobile Landscaping	-		UL
23	Pool and Fountain Cleaning	-		UL
24	Marinas	-		UL
25	Animal Kennels, Horse Stables	-		UL
26	Offices with Onsite and Outdoor Storage Facilities	-		N
27	Building Materials Retail and Storage	-		N
28	Chemical and Allied Products	-		UL
29	Fabricated Metal	-		UL
30	Primary Metal	-		UL
31	Recycling, Junk Yards, Scrap Metal	-		UL
32	Airfields	-		N
33	Motor Freight	-		UL
34	POTWs (Water and Wastewater)	1		UL
35	Concrete Manufacturing	-		N
36	Stone/Glass Manufacturing	-		N
37	Food Manufacturing	-		UL

N = None, UK = Unknown, UL = Unlikely, L = Likely

Table B-4. Source Quantities, Water Quality Priority, and SLPs for Nutrients at LPC-MLS.

LPC-MLS				
Nutrients		# Sources	Water Quality Priority	Source Loading Potential
Source ID	Source			
1	Residential Areas and Activities – 4,468 acres	8,936	H	L
2	Sites > 1 acre	-		L
3	Sites < 1 acre	-		UL
4	ESA or Hillside or Sediment TMDL	-		UL
5	Development Subject to SUSMPs (> 5,000 sq. ft. Impervious Area)	-		UL
6	Roads, Streets, Highways, and Parking Facilities	-		L
7	MS4s - Catch Basins, Drain Inlets, Conveyance, Pump Stations	-		UL
8	Corporate Yards (incl. Maintenance/Storage Yards)	2		UL
9	Parks and Recreational Facilities - Parks, Golf Courses, Cemeteries, Entertainment Venues, etc.	4		UL
10	Auto Mechanical Repair, Maintenance, Fueling, or Cleaning	59		L
11	Equipment Mechanical Repair, Maintenance, Fueling, or Cleaning	-		N
12	Automobile and Other Vehicle Body Repair and Painting	3		UL
13	Mobile Automobile or Vehicle Washing	-		UL
14	Mobile Power Washing	-		N
15	Auto Parking Lots and Storage Facilities	-		UL
16	Retail or Wholesale Fueling	35		N
17	Pest Control Services	-		N
18	Eating or Drinking Establishments	421		L
19	Mobile Carpet, Drape, or Furniture Cleaning	-		N
20	General Contractors for Home/Commercial Improvements	-		UL
21	Botanical or Zoological Gardens and Nurseries/Greenhouses	3		L
22	Mobile Landscaping	-		L
23	Pool and Fountain Cleaning	-		N
24	Marinas	-		UL
25	Animal Kennels, Horse Stables	-		UL
26	Offices with Onsite and Outdoor Storage Facilities	-		UL
27	Building Materials Retail and Storage	-		N
28	Chemical and Allied Products	-		UL
29	Fabricated Metal	-		UL
30	Primary Metal	-		UL
31	Recycling, Junk Yards, Scrap Metal	-		UL
32	Airfields	-		N
33	Motor Freight	-		UL
34	POTWs (Water and Wastewater)	1		UL
35	Concrete Manufacturing	-		N
36	Stone/Glass Manufacturing	-		N
37	Food Manufacturing	-		UL

N = None, UK = Unknown, UL = Unlikely, L = Likely

Table B-5. TTWQ Ranking of Multi-Pollutant Approach at LPC-MLS.

LPC-MLS				
Source ID	Source	# Sources	Source Loading	
			Bacteria	Nutrients
1	Residential Areas and Activities – 4,468 acres	8,936	L	L
18	Eating or Drinking Establishments	421	L	L
10	Auto Mechanical Repair, Maintenance, Fueling, or Cleaning	59	UL	L
16	Retail or Wholesale Fueling	35	N	N
21	Botanical or Zoological Gardens and Nurseries/Greenhouses	3	L	L
12	Automobile and Other Vehicle Body Repair and Painting	3	UL	UL
9	Parks and Recreational Facilities - Parks, Golf Courses, Cemeteries, Entertainment Venues, etc.	4	UL	UL
8	Corporate Yards (incl. Maintenance/Storage Yards)	2	UL	UL
34	POTWs (Water and Wastewater)	1	UL	UL
2	Sites > 1 acre	-	L	L
3	Sites < 1 acre	-	UL	UL
4	ESA or Hillside or Sediment TMDL	-	UL	UL
5	Development Subject to SUSMPs (> 5,000 sq. ft. Impervious Area)	-	UL	UL
6	Roads, Streets, Highways, and Parking Facilities	-	UL	L
7	MS4s - Catch Basins, Drain Inlets, Conveyance, Pump Stations	-	UL	UL
11	Equipment Mechanical Repair, Maintenance, Fueling, or Cleaning	-	N	N
13	Mobile Automobile or Vehicle Washing	-	UL	UL
14	Mobile Power Washing	-	N	N
15	Auto Parking Lots and Storage Facilities	-	UL	UL
17	Pest Control Services	-	UL	N
19	Mobile Carpet, Drape, or Furniture Cleaning	-	UL	N
20	General Contractors for Home/Commercial Improvements	-	UL	UL
22	Mobile Landscaping	-	UL	L
23	Pool and Fountain Cleaning	-	UL	N
24	Marinas	-	UL	UL
25	Animal Kennels, Horse Stables	-	UL	UL
26	Offices with Onsite and Outdoor Storage Facilities	-	N	UL
27	Building Materials Retail and Storage	-	N	N
28	Chemical and Allied Products	-	UL	UL
29	Fabricated Metal	-	UL	UL
30	Primary Metal	-	UL	UL
31	Recycling, Junk Yards, Scrap Metal	-	UL	UL
32	Airfields	-	N	N
33	Motor Freight	-	UL	UL
35	Concrete Manufacturing	-	N	N
36	Stone/Glass Manufacturing	-	N	N
37	Food Manufacturing	-	UL	UL

Rankings based on number of sources/residential acreage and Source Loading Potentials
N = None, UK = Unknown, UL = Unlikely, L = Likely

Single-Pollutant Small Area Scale TTWQ Approach

The following example uses a MS4 Outfall Station and its sampling results to illustrate the single-pollutant TTWQ approach on a smaller area scale. This example uses monitoring data from the 2011 LTEA Water Quality Report to identify pollutants exceedances above the water quality benchmarks. These constituents will then be used to determine the pollutant priority categories and ultimately the high TTWQ sources.

1) Determine Scale to Develop Threat to Water Quality

As with the multi-pollutant approach, the first step is to determine the scale and location where a particular monitoring location can characterize the flow from a tributary area. Figure B-4 shows the ***drainage area to the example MS4 outfall in the Peñasquitos watershed***.

2) Determine Wet or Dry Weather Conditions

The flow conditions should be selected at this point. For the example, a ***wet weather*** condition is selected.

3) Determine the Water Quality Issue (Pollutant) to Evaluate

Determine water quality issues by reviewing the MS4 outfall monitoring data for the appropriate watershed. Then identify the pollutants that are high priority as a result of the water quality monitoring data. Open the monitoring data table (included on LTEA compact disc- also derived from 2011 LTEA Water Quality Report) and locate the appropriate row containing info pertaining to the monitoring location. Table B-7 shows the watershed priority constituents determined by the assessment program for MS4 outfall LPC-02 in the Peñasquitos WMA. The monitoring data for the example MS4 outfall and the high priority constituents have been boxed in red to show a corresponding 'high' score represented in the data.

4) Associate Sources to Pollutant

From Table B-7, Total Nitrogen, Total Phosphorous, TDS, and Enterococcus are considered high priority analytes at MS4 monitoring station LPC-02 as monitored during both the wet and dry seasons. These analytes are then grouped into one of the nine priority pollutant categories as seen in Table B-8. The corresponding high priority pollutants are shown in Table B-8.

Using the high priority constituents determined in the step above, the next step is to review the final source loading potentials (SLPs) of sources within the LPC-MLS tributary area that are likely sources contributing to the selected pollutant(s). Using the information presented in Section 3 (LTEA Table 3-10), the activities with source loading potential with regards to mass loading station LPC-MLS have been highlighted based on the three high priority constituents (nutrients and bacteria/pathogens) –see Table B-9 below for sources.

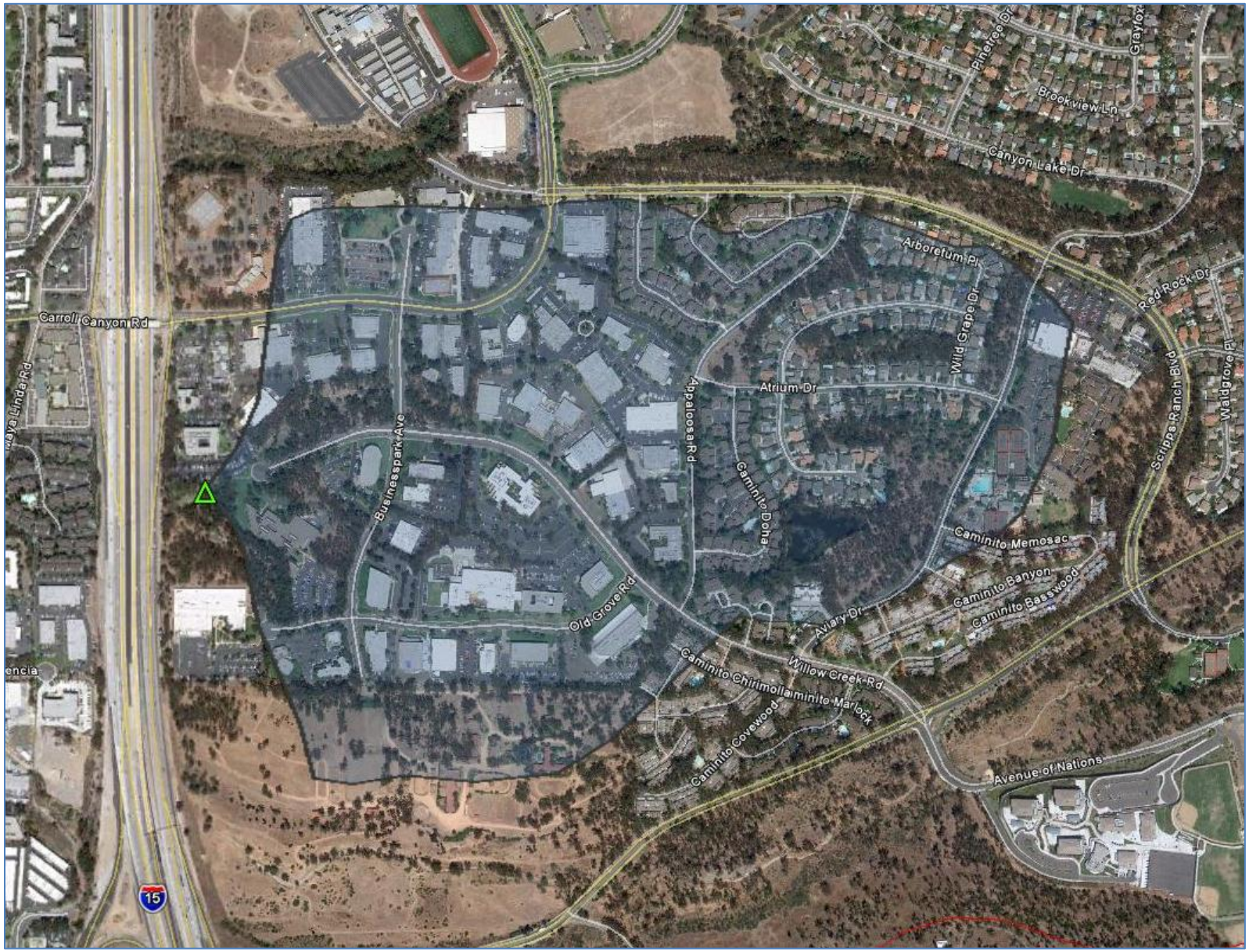

Figure B-4. Map of MS4-LPC-02 Monitoring Station and Drainage Area

Table B-7. Watershed Priority Constituents determined by MS4 monitoring data at LPC-02

Station	Dry and Wet	HSA	Analyte																													
			pH		Nitrate as N		Nitrate/Nitrite as N		Nitrite as N		Total Nitrogen (calculated)		Phosphorus, Total		Total Suspended Solids		Total Dissolved Solids		Fecal Coliform		Enterococcus		Analyte									
																							Ammonia-N		Turbidity		Copper (Cu), Dissolved		Diazinon		MBAS	
			n	% > Criteria	n	% > Criteria	n	% > Criteria	n	% > Criteria	n	% > Criteria	n	% > Criteria	n	% > Criteria	n	% > Criteria	n	% > Criteria	n	% > Criteria	n	% > Criteria	n	% > Criteria	n	% > Criteria	n	% > Criteria	n	% > Criteria
19	Dry	906.20	0	NA	0	NA	2	0%	0	NA	2	50%	2	50%	2	0%	2	100%	2	0%	2	0%	0	NA	0	NA	0	NA	0	NA	0	NA
105	Dry	906.20	0	NA	0	NA	2	0%	0	NA	2	100%	2	100%	2	0%	2	100%	2	100%	2	100%	0	NA	0	NA	0	NA	0	NA	0	NA
80024778	Wet	906.1	2	50%	1	0%	2	0%	1	0%			2	0%	2	0%	2	0%	2	50%												
18A	Dry	906.20	0	NA	0	NA	2	100%	0	NA	2	100%	2	50%	2	0%	2	100%	2	100%	2	100%	0	NA	0	NA	0	NA	0	NA	0	NA
21A	Dry	906.20	0	NA	0	NA	2	0%	0	NA	2	100%	2	100%	2	0%	2	100%	2	100%	2	100%	0	NA	0	NA	0	NA	0	NA	0	NA
DW017	Dry	906.10	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	2	0%	2	100%	2	0%	2	50%	0	NA	0	NA	0	NA	0	NA	0	NA
DW018	Dry	906.20	1	0%	1	0%	0	NA	0	NA	2	50%	2	50%	2	0%	3	100%	3	33%	3	100%	1	0%	1	0%	0	NA	0	NA	1	0%
DW021	Dry	906.10	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	2	0%	2	100%	2	50%	2	100%	0	NA	0	NA	0	NA	2	0%	0	NA
DW025	Dry	906.10	0	NA	0	NA	0	NA	0	NA	2	100%	2	100%	2	0%	2	100%	2	50%	2	100%	0	NA	0	NA	2	0%	0	NA	0	NA
DW026	Dry	906.10	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	2	0%	2	100%	2	0%	2	100%	0	NA	0	NA	2	50%	2	0%	2	0%
DW027	Dry	906.10	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	2	0%	2	100%	2	50%	2	100%	0	NA	0	NA	0	NA	0	NA	0	NA
DW247	Dry	906.20	0	NA	0	NA	0	NA	0	NA	2	100%	2	100%	2	0%	2	100%	2	50%	2	100%	0	NA	0	NA	0	NA	0	NA	0	NA
DW289	Dry	906.10	0	NA	0	NA	0	NA	0	NA	2	100%	2	0%	2	0%	2	100%	2	50%	2	100%	0	NA	0	NA	0	NA	0	NA	0	NA
DW391	Dry	906.20	0	NA	0	NA	0	NA	0	NA	2	100%	2	100%	2	0%	2	100%	2	100%	2	100%	0	NA	0	NA	0	NA	0	NA	0	NA
DW428	Dry	906.10	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	2	50%	2	100%	2	50%	2	100%	0	NA	0	NA	0	NA	0	NA	0	NA
LPC-01-2008	Wet	906.2	1	0%	0	NA	1	0%	0	NA			1	0%	1	0%	1	0%	1	100%												
LPC-02-2009	Wet	906.1	1	0%	1	0%	1	0%	1	0%			1	0%	1	0%	1	0%	1	100%												
LPC-03-2008	Dry	906.10	1	0%	1	0%	1	0%	1	0%	1	100%	1	0%	1	0%	1	100%	1	0%	1	100%	0	NA	0	NA	0	NA	0	NA	0	NA
LPC-03-2008	Wet	906.1	1	0%	1	0%	1	0%	1	0%			1	0%	1	0%	1	100%	1	0%												
LPC-03-2009	Dry	906.10	1	0%	1	0%	1	0%	1	0%	1	100%	1	100%	1	0%	1	100%	1	0%	1	100%	0	NA	0	NA	0	NA	0	NA	0	NA
LPC-04-2008	Dry	906.10	1	0%	1	0%	1	0%	1	0%	1	100%	1	100%	1	100%	1	100%	1	0%	1	100%	0	NA	0	NA	0	NA	0	NA	0	NA
LPC-04-2009	Dry	906.10	1	0%	1	0%	1	0%	1	0%	1	0%	1	100%	1	0%	1	100%	1	0%	1	100%	0	NA	0	NA	0	NA	0	NA	0	NA
LPC-06-2008	Dry	906.10	1	0%	1	0%	1	0%	1	0%	1	0%	1	100%	1	0%	1	100%	1	0%	1	100%	0	NA	0	NA	0	NA	0	NA	0	NA
LPC-06-2009	Dry	906.10	1	0%	1	0%	1	0%	1	0%	1	100%	1	100%	1	0%	1	100%	1	0%	1	100%	0	NA	0	NA	0	NA	0	NA	0	NA
LPC-06-2009	Wet	906.1	1	0%	1	0%	1	0%	1	0%			1	0%	1	0%	1	0%	1	0%												
LPC-09-2008	Dry	906.10	1	0%	1	0%	1	0%	1	0%	1	100%	1	100%	1	0%	1	100%	1	0%	1	100%	0	NA	0	NA	0	NA	0	NA	0	NA
LPC-09-2009	Dry	906.20	1	0%	1	0%	1	0%	1	0%	1	0%	1	0%	1	0%	1	100%	1	100%	1	100%	0	NA	0	NA	0	NA	0	NA	0	NA
LPC-09-2009	Wet	906.2	1	100%	1	0%	1	0%	1	0%			1	0%	1	100%	1	0%	1	100%												
LPC-10-2008	Dry	906.20	1	0%	1	0%	1	0%	1	0%	1	100%	1	100%	1	0%	1	100%	1	100%	1	100%	0	NA	0	NA	0	NA	0	NA	0	NA
LPC-10-2008	Wet	906.2	1	0%	1	0%	1	0%	1	0%			1	0%	1	0%	1	0%	1	100%												
LPC-11-2009	Dry	906.10	1	0%	1	0%	1	0%	1	0%	1	100%	1	100%	1	0%	1	100%	1	0%	1	100%	0	NA	0	NA	0	NA	0	NA	0	NA
LPC-12-2008	Dry	906.10	1	0%	1	0%	1	0%	1	0%	1	100%	1	100%	1	0%	1	100%	1	100%	1	100%	0	NA	0	NA	0	NA	0	NA	0	NA
LPC-12-2008	Wet	906.1	0	NA	1	0%	1	0%	1	0%			1	0%	1	0%	0	NA	1	100%												
LPC-12-2009	Wet	906.1	1	0%	1	0%	1	0%	1	0%			1	0%	1	0%	1	0%	1	0%												
LPC-13-2008	Wet	906.2	0	NA	1	0%	1	0%	1	0%			1	0%	1	0%	0	NA	1	100%												
LPC-15-2009	Dry	906.10	1	0%	1	0%	1	0%	1	0%	1	100%	1	0%	1	0%	1	100%	1	0%	1	100%	0	NA	0	NA	0	NA	0	NA	0	NA
LPC-18-2009	Wet	906.2	1	0%	1	0%	1	0%	1	0%			1	0%	1	0%	1	100%	1	100%												

Note: Orange=High Priority, Yellow=Medium Priority pollutant based on the monitoring station data.

Table B-8: Pollutant Categories

Metals	Oil and Grease	Sediments	Pesticides	Nutrients	Bacteria/ Pathogens	Dissolved Minerals	Organics	Trash	Benthic Alterations	Toxicity	Gross Pollutants	Chemistry
Antimony	Oil and Grease	TSS	Chlorpyrifos	Dissolved Phosphorus	Enterococcus	TDS	Total Organic Carbon	Trash	Poor IBI	Ceriodaphnia survival	BOD	Chloride
Arsenic		Turbidity	Diazinon	Orthophosphate	Fecal Coliforms				O/E	Ceriodaphnia reproduction	COD	Sulfate
Cadmium			Malathion	Total Phosphorus	Total Coliforms				IBI	Hyalellasurvival	MBAS	
Chromium			Allethrin	Total Kjeldahl Nitrogen					CRAM	Selenastrumsurvival	Dissolved Oxygen	
Copper			Bifenthrin	Total Nitrogen							pH	
Lead			Cyfluthrin	Eutrophication							Conductivity	
Nickel			Cypermethrin	Benthic Algae							Nitrate as N	
Selenium			Danitol								Ammonia as N	
Zinc			Deltamethrin									
			Esfenvalerate									
			Fenvalerate									
			Fluvalinate									
			L-Cyhalothrin									
			Permethrin									
			Prallethrin									

Table B-9. Final Source Loading Potentials at LPC-02

Source Profile #	Activities with Source Loading Potential	Metals	Oil & Grease	Sediment	Pesticides	Nutrients	Bacteria/ Pathogens	Dissolved Minerals	Organics
1	Residential Areas and Activities	L	L	L	L	L	L	L	L
2	Construction Sites > 1 acre	UL	UL	L	UL	UL	UL	L	UL
3	Construction Sites < 1 acre	UL	UL	L	UL	UL	UL	UL	UL
4	Construction Sites: ESA or hillside or sediment TMDL	UL	UL	L	UL	UL	UL	UL	UL
5	Development subject to SUSMPs (> 5,000 sq. ft. impervious area)	UK	UK	UK	UK	UK	UK	UL	UK
6	Roads, streets, highways, and parking facilities	L	L	L	UL	L	L	L	L
7	MS4s - Catch Basins, Drain Inlets, Conveyance, Pump Stations	N	N	L	N	N	UK	UL	N
8	Corporate yards (incl. maintenance/storage yards)	L	L	L	UK	UK	UL	UL	L
9	Parks and Recreational Facilities - parks, golf courses, cemeteries, entertainment venues, etc.	UK	UK	UK	UK	L	UK	UL	UK
10	Auto Mechanical Repair, Maintenance, Fueling, or Cleaning	L	L	UL	UL	UK	UL	L	L
11	Equipment mechanical repair, maintenance, fueling, or cleaning	L	L	UL	UL	UK	UL	UL	L
12	Automobile and Other Vehicle Body Repair and Painting	L	L	UL	UL	UL	UL	L	L
13	Mobile automobile or vehicle washing	L	L	L	UL	UL	UL	UL	L
14	Mobile Power washing*	UK	UK	UK	UK	UK	UK	UK	UK
15	Auto parking lots and storage facilities	L	L	L	UK	UK	UK	UL	L
16	Retail or wholesale fueling	UK	L	UK	N	N	N	N	L
17	Pest Control Services	N	UK	N	L	N	UK	N	UK
18	Eating or drinking establishments	N	L	UL	UK	UK	L	UL	L
19	Mobile carpet, drape, or furniture cleaning	N	UK	UL	N	UK	UL	N	UL
20	General contractors for home/commercial improvements	UL	UL	L	UL	UL	UL	UL	UL
21	Botanical or zoological gardens and nurseries/greenhouses	L	UL	L	L	L	L	UL	UL
22	Mobile Landscaping	N	UL	L	L	L	L	UL	N
23	Pool and Fountain Cleaning	N	N	N	N	UK	N	N	UK
24	Marinas	L	L	N	UK	UK	UK	N	UK
25	Animal Kennels	N	UL	L	UK	L	L	N	L
26	Building Materials Retail and Storage	L	L	L	UL	UL	UL	UL	L
27	Chemical and allied products	UK	UK	UK	UK	UK	UL	N	L
28	Fabricated metal	L	L	UK	UK	UK	UL	UL	L
29	Primary metal	L	UK	UK	UK	UK	UL	N	UK
30	Recycling, Junk Yards, Scrap Metal	L	L	L	UL	UL	UL	L	L
31	Airfields	UK	UK	UK	UK	UK	N	UL	UK
32	Motor Freight	L	L	UK	UK	UK	UK	UL	L
33	POTWs (water and wastewater)	UK	UK	UK	N	UK	L	UL	UK
34	Concrete Manufacturing	L	L	L	UL	UL	UL	UL	L
35	Stone/Glass Manufacturing	L	L	L	UL	UL	UL	UL	L
36	Food Manufacturing	UL	UL	UL	UL	UL	UL	UL	UL

N = None, UK = Unknown, UL = Unlikely, L = Likely

In addition to using the SLPs, Copermittees can also use PGA Associations to Pollutants and other special studies to associate sources to pollutant.

5) Incorporate Source Quantities

After determining the high priority pollutant constituents and the source loading potentials, find the number of sources in the particular tributary/drainage area for the monitoring station. For this exercise, it is recommended that the Copermittees use the most up-to-date inventory information and GIS software, if necessary, to pinpoint an accurate number of sources in the particular drainage. Additionally, calculate the area of residential land use in the area, if available. The single source identified within the MS4 outfall drainage is shown in Figure B-5.

Once these numbers have been compiled, bring together the results of the number of sources, residential acreage, and source loading potential into a table for the pollutants of concern. For the sake of the single-pollutant approach example, see Table B-10 for the high priority sources and activities for bacteria/pathogens within the drainage area.

6) Incorporate Other Criteria as Desired

For this example, no additional criteria are considered.

7) Develop Priority Ranking of Sources

The final step is to prioritize the table outlining the source quantities, water quality priority, and SLPs for the priority pollutant (in this case, bacteria/pathogens). The prioritization is based off of the SLP and the number of sources and residential acreage in the drainage area (see Table B-11).

Figure B-5. Map of MS4-LPC-02 Monitoring Station and Drainage Area; note pollutant sources in red.

Table B-10. Source Quantities, Water Quality Priority, and SLPs for Bacteria/Pathogens at LPC-02

LPC-02				
Bacteria		# Sources	Water Quality Priority	Source Loading Potential
Source ID	Source			
1	Residential Areas and Activities – 49.91 acres	100	H	L
2	Sites > 1 acre	-		L
3	Sites < 1 acre	-		L
4	ESA or Hillside or Sediment TMDL	-		L
5	Development Subject to SUSMPs (> 5,000 sq. ft. Impervious Area)	-		UL
6	Roads, Streets, Highways, and Parking Facilities	-		UL
7	MS4s - Catch Basins, Drain Inlets, Conveyance, Pump Stations	-		UL
8	Corporate Yards (incl. Maintenance/Storage Yards)	2		UL
9	Parks and Recreational Facilities - Parks, Golf Courses, Cemeteries, Entertainment Venues, etc.	-		UL
10	Auto Mechanical Repair, Maintenance, Fueling, or Cleaning	-		UL
11	Equipment Mechanical Repair, Maintenance, Fueling, or Cleaning	-		UL
12	Automobile and Other Vehicle Body Repair and Painting	-		UL
13	Mobile Automobile or Vehicle Washing	-		UL
14	Mobile Power Washing	-		UL
15	Auto Parking Lots and Storage Facilities	-		UL
16	Retail or Wholesale Fueling	-		UL
17	Pest Control Services	-		UL
18	Eating or Drinking Establishments	6		UL
19	Mobile Carpet, Drape, or Furniture Cleaning	-		UL
20	General Contractors for Home/Commercial Improvements	-		UL
21	Botanical or Zoological Gardens and Nurseries/Greenhouses	-		UL
22	Mobile Landscaping	-		UL
23	Pool and Fountain Cleaning	-		UL
24	Marinas	-		UL
25	Animal Kennels, Horse Stables	-		UL
26	Offices with Onsite and Outdoor Storage Facilities	3		UL
27	Building Materials Retail and Storage	1		UL
28	Chemical and Allied Products	-		UL
29	Fabricated Metal	-		UL
30	Primary Metal	-		N
31	Recycling, Junk Yards, Scrap Metal	-		N
32	Airfields	-		N
33	Motor Freight	-		N
34	POTWs (Water and Wastewater)	-		N
35	Concrete Manufacturing	2		N
36	Stone/Glass Manufacturing	1		N
37	Food Manufacturing	-		N

N = None, UK = Unknown, UL = Unlikely, L = Likely

Table B-11. Prioritized Source Quantities and SLPs for Bacteria/Pathogens at LPC-02

LPC-02				
Bacteria		# Sources	Water Quality Priority	Source Loading Potential
Source ID	Source			
1	Residential Areas and Activities – 49.91 acres	100	H	L
18	Eating or Drinking Establishments	6		UL
26	Offices with Onsite and Outdoor Storage Facilities	3		UL
8	Corporate Yards (incl. Maintenance/Storage Yards)	2		UL
27	Building Materials Retail and Storage	1		UL
35	Concrete Manufacturing	2		N
36	Stone/Glass Manufacturing	1		N
2	Sites > 1 acre	-		L
3	Sites < 1 acre	-		L
4	ESA or Hillside or Sediment TMDL	-		L
5	Development Subject to SUSMPs (> 5,000 sq. ft. Impervious Area)	-		UL
6	Roads, Streets, Highways, and Parking Facilities	-		UL
7	MS4s - Catch Basins, Drain Inlets, Conveyance, Pump Stations	-		UL
9	Parks and Recreational Facilities - Parks, Golf Courses, Cemeteries, Entertainment Venues, etc.	-		UL
10	Auto Mechanical Repair, Maintenance, Fueling, or Cleaning	-		UL
11	Equipment Mechanical Repair, Maintenance, Fueling, or Cleaning	-		UL
12	Automobile and Other Vehicle Body Repair and Painting	-		UL
13	Mobile Automobile or Vehicle Washing	-		UL
14	Mobile Power Washing	-		UL
15	Auto Parking Lots and Storage Facilities	-		UL
16	Retail or Wholesale Fueling	-		UL
17	Pest Control Services	-		UL
19	Mobile Carpet, Drape, or Furniture Cleaning	-		UL
20	General Contractors for Home/Commercial Improvements	-		UL
21	Botanical or Zoological Gardens and Nurseries/Greenhouses	-		UL
22	Mobile Landscaping	-		UL
23	Pool and Fountain Cleaning	-		UL
24	Marinas	-		UL
25	Animal Kennels, Horse Stables	-		UL
28	Chemical and Allied Products	-		UL
29	Fabricated Metal	-		UL
30	Primary Metal	-		N
31	Recycling, Junk Yards, Scrap Metal	-		N
32	Airfields	-		N
33	Motor Freight	-		N
34	POTWs (Water and Wastewater)	-		N
37	Food Manufacturing	-		N

Rankings based on number of sources/residential acreage and Source Loading Potentials
N = None, UK = Unknown, UL = Unlikely, L = Likely

Investigative TTWQ Approach

The following approach follows the general outline of the previous two examples with one difference – the past monitoring information is not a primary factor in the TTWQ assessment. Instead, the approach can be used to analyze current monitoring data and flows (immediate exceedance response) in an attempt to locate sources using other resources such as storm drain maps and local drainage patterns. This example uses the MS4 Random Monitoring Station identified during the single-pollutant TTWQ approach.

1) Determine Scale to Develop Threat to Water Quality

As with the single and multi-pollutant approach, the first step is to determine the scale and location where a particular monitoring location can characterize the flow from a tributary area. In addition, determine the flow and storm drain network in order to pinpoint the location of flows from the drainage. Figure B-6 shows the drainage area to the example MS4 outfall in the Peñasquitos watershed, including the storm drain map.

3) Determine the Water Quality Issue (Pollutant) to Evaluate

Determine water quality issues by reviewing the current monitoring data at the MS4 outfall. Any exceedances or readings above the water quality objectives should be further investigated using this approach. For any exceedances or readings above the water quality objectives, refer to Table B-8 above in order to determine the priority pollutants.

4) Associate Sources to Pollutant

Using the high priority pollutants, the next step is to review the final source loading potentials at LPC-02 to determine the likeliness of sources contributing to the pollutant. Using the information presented in Section 3 (Table 3-10), determine the activities with source loading potential with regards to the MS4 outfall (see example in Table B-9 above).

In addition to using the SLPs, Copermittees can also use PGA associations to pollutants and other special studies to associate sources to pollutant.

5) Identify Potential Sources of Pollutants

Based upon the resulting pollutant to source associations, one can identify the potential sources within the tributary area that are causing the exceedance at the MS4 outfall. Figure B-7 shows the resulting potential sources for this example.

Figure B-6. Map of MS4-LPC-02 Monitoring Station and Drainage Area, including storm drain network.

Figure B-7. Map of MS4-LPC-02 Monitoring Station and Drainage Area, including storm drain network and pollutant sources (red).

I Program Management Practices Information Sheet

Purpose

The Program Management Practices (PMPs) are activities and BMPs that Copermittees and target audiences implement to address urban runoff pollutants, pollutant generating activities, and sources. The PMP Profile sheets are provided as a step towards generally defining the PMPs, along with associated sources, pollutants, and target audiences, and beginning to look at the effectiveness potential. The Profile sheets provide a limited discussion on PMPs and further development of PMPs and the direct relationship to measurable outcomes is needed.

Effectiveness Assessment Level 1 Variation

The Copermittees have expanded upon the assessment framework initially developed by the Copermittees in 2003 and subsequently modified by the California Stormwater Quality Association in 2007 in regards to Effectiveness Assessment Outcome Level 1 (Storm Water Program Activities). Outcome Level 1 has been broken down further into the following sub-categories and is utilized throughout the PMP Profile sheets:

Level 1a) Program Administration Activities: These are the activities that are needed to administer the program.

Level 1b) Facilitation Activities: These are the activities that are implemented to bring about ("facilitate") Level 2, 3, or 4 changes in target audiences – or in some cases, maintain a targeted outcome.

Level 1c) Data Gathering Activities: These are the activities used to determine whether and to what extent Level 2 through 6 changes in target audience has occurred.

Resources/References

The Program Management Practices (PMPs) are primarily based upon reported information from Copermittee's JURMP, WURMP, and RURMP Annual Reports (2009-2010), the California Stormwater Program Effectiveness Assessment Guidance Document (May 2007), the Baseline Long Term Effectiveness Assessment (2005), and the San Diego Regional Stormwater Copermittees input during watershed data, reporting and assessment needs workshops conducted in 2010. All resources and references are also included in the bibliography of the LTEA. It is important to note that any focused analyses included in a PMP Profile sheet may have limitations and are just provided in summary. It is encouraged that the reader review the noted reports in their entirety.

1 Administrative Best Management Practices

Narrative Description

Program administrative BMPs are essential Program Management Practices for program implementation. Administrative BMP activities include:

1. Review/update source inventories and priorities (TCBMPs, construction, industrial and commercial, municipal, etc.)
2. Review/update BMP requirements
3. Develop/review/update standard operating procedures (SOPs), Storm Water Pollution Prevention Plans (SWPPPs), Storm Water Management Plans (SWMPs), manuals etc.
4. Review/update General Plans,
5. Review/update ordinances, municipal code, etc.
6. Maintain appropriate contracts
7. Review/update educational materials
8. Review/update approval process

These activities are important for establishing the foundation of a storm water program.

Target Source(s)

- Municipal Facilities
- Industrial and Commercial Facilities
- Construction Sites
- Residential
- Roads, streets, highways, and parking facilities
- MS4

Target Pollutant(s)

- Indirect relationship to all pollutants

Target Audience(s)

- Municipal Staff

1 Administrative Best Management Practices

Effectiveness Potential

Program administration is fundamental in achieving effectiveness assessment outcome levels. Administrative BMPs result in a Level 1a (administration) effectiveness assessment which is ultimately confirmation of the activity. Confirmation is often used to track plan implementation. Because administrative BMPs require other PMPs to be implemented, they have the indirect potential to be effective at changing knowledge and awareness (Level 2), behavior (Level 3), and source reduction (Level 4) which ultimately leads to Levels 5 and 6.

2 Activity Best Management Practices

Narrative Description

Activity BMPs are those related to target audience implementation as described in the 2005 BLTEA: cover, contain, prevent, good housekeeping and administrative BMPs. Some examples of activity BMPs include:

1. Cover activity/material
2. Clean floor mats, etc. indoors
3. Wash vehicles and equipment in designated areas
4. Properly manage pesticide/fertilizer use
5. Protect storm drains
6. Clean up regularly with dry methods
7. Develop and implement spill prevention plan

Minimum Activity BMPs may vary between Copermittees due to each jurisdiction's requirements, but each jurisdiction strives to require and enforce all minimum BMPs for the appropriate source.

Target Source(s)

- Municipal Facilities
- Industrial and Commercial Facilities
- Construction Sites
- Residential

Target Pollutant(s)

- Bacteria
- Trash
- Heavy Metals
- Nutrients
- Oil and Grease
- Organics
- Sediment
- Pesticides

Target Audience(s)

- Municipal
- Construction
- Residential
- Commercial Owners
- Industrial Owners
- Land Development

Effectiveness Potential

The requirement and enforcement of Activity BMPs is a facilitation activity that when implemented by the target audience can assist in achieving Level 3 and Level 4 targeted outcomes. Tracking of behavior or monitoring over a few years may be needed to attain measurable results.

3 MS4 Inspections/Cleaning

Narrative Description

Operating and maintaining the MS4 infrastructure which includes storm drain pipes, catch basins, inlets, open channels, etc., encompasses a large variety of activities performed by the Copermittees' municipal or contract staff. Each Copermittee implements a schedule of inspection and maintenance activities for the MS4 and MS4 facilities. The maintenance activities that may be conducted include:

- Inventory and prioritization
- Inspection
- Cleaning and proper disposal of any wastes removed
- Record keeping of maintenance and cleaning including amounts removed.

Additionally, each Copermittee implements controls and measures to prevent and eliminate infiltration of seepage from municipal sanitary sewers to MS4s through thorough, routine preventive maintenance of the MS4.

Target Source(s)

- MS4

Target Pollutant(s)

- Bacteria
- Trash
- Heavy Metals
- Nutrients
- Oil and Grease
- Organics
- Sediment
- Pesticides

Target Audience(s)

- Municipal Staff

Effectiveness Potential

The facilitation of the MS4 inspection and cleaning program can provide a Level 3 effectiveness assessment outcome. Level 3 can be achieved through municipal staff implementing the MS4 inspection and cleaning at the proper frequency and within the

proper cleaning guidelines. MS4 cleaning can achieve source load reductions when the amount of debris removed from the MS4 and MS4 facility cleaning is measured - Level 4 effectiveness assessment.

4 Street Sweeping

Narrative Description

Street Sweeping is conducted to remove debris, trash, or particles from improved (possessing a curb and gutter) municipal roads, streets, highways, and parking facilities. Street sweeping can be effective in removing trash, debris and other constituents of concern, such as metals, from roadways and parking facilities before entering the storm drain system and has the potential to reach receiving waters. In addition street sweeping helps prevent blockages in storm drains caused from trash and debris that can create flooding issues during periods of heavy rainfall.

Target Source(s)

- Roads, streets, highways, and parking facilities

Target Pollutant(s)

- Bacteria
- Trash
- Heavy Metals
- Oil and Grease
- Sediment

Target Audience(s)

- Municipal Staff

Effectiveness Potential

The facilitation of the street sweeping program can provide a Level 3 effectiveness assessment outcome. Level 3 can be achieved through municipal staff implementing sweeping in the correct locations and at the proper frequency. Furthermore, the measurement of the amount of trash, debris, and constituents of concern removed through street sweeping provides information on the source load reduction - Level 4 effectiveness assessment.

The San Diego Regional Copermittees have conducted Focused Analyses that are related to street sweeping. The following are results of these analyses that support the effectiveness potential.

1. City of San Diego Targeted Aggressive Street Sweeping Pilot Study Effectiveness Assessment (June 2010):

4 Street Sweeping

As stated in the Executive Summary of the Report, the Targeted Aggressive Street Sweeping Study was designed to address the following three study questions:

1) Which sweeping machine (i.e. mechanical, regenerative air, or vacuum) is most effective in removing metals and other constituents of concern?
2) Is it more efficient and effective to aggressively sweep at a high frequency (e.g., once a week or twice a week)?
3) Is there a quantifiable link between aggressive street sweeping and the reduction of metals and other constituents of concern in storm water runoff?

The Executive Summary of the report also stated that the results from this study "indicate that street sweeping provides an effective means of reducing concentrations of some constituents in storm water runoff. While machine effectiveness varied by site, the vacuum sweeper was more effective in reducing storm water constituent concentrations than the mechanical and regenerative-air sweepers". Additionally "storm water concentrations of total suspended solids (TSS) and metals (copper, lead, and zinc) during the beginning of a storm event (first flush) in the vacuum-swept streets were significantly less than those in the mechanically-swept and unswept streets".

"Optimal load reductions were achieved by the vacuum machine at an aggressive, twice per week frequency. The mechanical sweeper was most effective at removing debris and contaminants at a less aggressive, once per week frequency. Sweeping frequency did not impact the vacuum sweeper's effectiveness. The vacuum sweeper collected the same amount of debris and metals per broom mile at both the once and twice per week frequencies. The mechanical machine was less effective, in terms of debris removed per broom mile, when sweeping twice per week versus once per week".

As a result of this special study the City of San Diego will be evaluation the following key considerations that should be weighed in combination with other environmental, social/community and economic factors. Below is an excerpt of the key considerations from the Executive Summary of the report:

- *Key route features such as street grade, and the presence/absence of curbs and gutters, eroding hillsides, or low overhanging trees should be considered when developing future targeted aggressive street sweeping programs.*
- *IN the drainages with the greatest potential for the accumulation of metals on street surfaces (e.g., Priority Section #1), using the vacuum sweeper at an aggressive frequency of twice per week should be considered to maximize load reduction potential.*

- *Along Route 3J, and other residential areas in the Chollas Creek Subwatershed, sweeping with the vacuum sweeper once per week should be considered to attain the maximum metals load reduction possible (aggressive sweeping frequency limited by public response to parking restrictions).*
- *The mechanical sweeper was effective in remove debris and metals along the steeper roads of La Jolla Shores (Routes 1C and 103) and should be considered for weekly sweeping to maximize metals removal and protect ASBS.*
- *In both the Chollas Creek and La Jolla Shores Subwatersheds, additional storm water monitoring should be considered to verify the results of the pilot study and assess the effectiveness of street sweeping on a site-specific basis (i.e., incorporate route-specific baseline sampling for the "unswept" condition, target larger drainage areas, etc.).*
- *The data from this study and future studies should be used to develop a more robust model that can incorporate environmental conditions and complexities associated with urban runoff.*

2. Target Aggressive Street Sweeping Pilot Program Phase III Median Sweeping Study, City of San Diego (August 2010):

   As stated in the Executive Summary of the Special Study Report, "the purpose of the Phase III Median Sweeping Study was to evaluate sweeping of roadway medians adjacent to high volume roadways in order to determine the water quality benefits and feasibility of sweeping the median sweeping routes. The areas are not included in the current City street sweeping routes and are not typically swept during routine sweeping activities".

   An excerpt of the results of the study from the Executive Summary of the report is included below.

   The Phase III study results indicate that median sweeping has potential to remove significant amounts of street debris and roadway constituents. Key results include:

   - *The initial median sweeping event collected 3-5 times greater amounts of debris than subsequent 3-week interval sweeping events. This suggests significant buildup of roadway debris occurs adjacent to median areas. Extrapolation of data allowed an estimate of 32,000 pounds of material to be removed by a single annual sweeping event or up to 140,000 pounds of material to be removed annually from sweeping median areas at 3-week intervals.*

- *Metals, nutrients, and hydrocarbon constituents were all detected in median street debris and the hand-swept samples in varying concentrations which may impact downstream water quality. These results suggest that median sweeping may provide a significant benefit for controlling input of constituents with potential water quality impacts to the City MS4.*
- *Operational capacity limitations are likely to limit potential implementation of median sweeping activities to quarterly or even less frequent intervals. Examination of relatively infrequent implementation scenarios using the project data indicated that approximately 3 pounds of copper, 0.75 pounds of lead, and 3.5 pounds of zinc may be removed from City streets by median sweeping. Periodic manual sweeping of raised medians will likely result in additional removal of street debris and associated roadway constituents.*

5 Structural Best Management Practices

Narrative Description

Structural BMPs are engineered facilities that are generally designed and constructed to capture or filter pollutants from urban runoff. Some structural BMPs may mitigate urban runoff volume and velocities rather than reducing urban runoff pollutants. Some examples of structural BMPs include:

1. Infiltration devices
2. Sediment basins
3. Treatment facilities (ozone, UV)
4. Bioretention
5. Detention ponds
6. Pervious pavement
7. Storm water wetlands
8. Filters

Target Source(s)

- Municipal Facilities
- Industrial and Commercial Facilities
- Construction Sites
- Residential
- Roads, streets, highways, and parking facilities
- MS4

Target Pollutant(s)

- Bacteria
- Trash
- Heavy Metals
- Nutrients
- Oil and Grease
- Organics
- Sediment
- Pesticides

Target Audience(s)

- Municipal Staff
- Construction
- Residential
- Commercial Owners
- Industrial Owners
- Land Development

Effectiveness Potential

Installation and the applicable operation and maintenance of structural BMPs can provide information for Level 3 effectiveness assessment and data on source reductions (Level 4). Observing structural BMP implementation or maintenance trends from year to year can provide information regarding Level 3 effectiveness. Source reductions may be achieved through direct monitoring results or pollutant load estimations, as described in the CASQA Effectiveness Assessment Guidance (2007).

6 Education and Outreach

Narrative Description

Education and outreach activities are Program Management Practices (PMPs) conducted to increase the knowledge and awareness of a target community regarding stormwater, change the behavior of the target community, and/or ultimately reduce pollutants and runoff into the MS4 and receiving waters. In general, an education and outreach strategy is developed and the programs typically address high priority pollutants, pollutant-generating activities, and the following target communities, as applicable and appropriate:

- Municipal Departments and Personnel (described in employee training PMP Profile sheet)
- Construction Site Owners and Developers
- Industrial Owners and Operators
- Commercial Owners and Operators
- Residential Community, General Public and School Children

Methods utilized for education and outreach vary and may include mass media, mailers, door hangers, booths at public events, workshops, focus groups, classroom education, field trips, hands-on experiences, clean-up events, websites, etc. Education and outreach can be conducted by a single Copermittee or several Copermittees may combine funds and efforts to conduct activities or develop materials.

Target Source(s)

- Municipal
- Industrial and Commercial Facilities
- Construction Sites
- Residential

Target Pollutant(s)

- Bacteria
- Trash
- Heavy Metals
- Nutrients
- Oil and Grease
- Sediment
- Pesticides

6 Education and Outreach

Target Audience(s)

- Municipal Staff
- Construction
- Residential
- General Public
- Commercial Owners
- Industrial Owners
- Land Development

Effectiveness Potential

Education and outreach activities can be facilitation and/or data gathering activities with targeted outcomes focused primarily on Level 2 and Level 3 effectiveness assessments with occasional Level 4 assessments. Education and outreach effectiveness can be measured and assessed through surveys (i.e. web-based, at events, or on the phone) BMP implementation rates, focus groups, observations, participation in events or workshops, hotline calls, and questionnaires.

The San Diego Regional Copermittees have conducted Focused Analyses that are related to education and outreach. The following are results of these analyses that support the effectiveness potential.

Regional Residential Education Program

Telephone Survey

As part of the Regional Residential Education Program, a Regional Residential Education Plan (Plan) was developed and finalized in March 2008. The Plan provides recommended strategies for education and outreach activity implementation. One recommendation was to conduct a baseline regional residential telephone survey with an additional survey conducted late in the permit cycle to assess the changes resulting from program implementation. The Copermittees established targets to hopefully achieve during the permit cycle: 10% change in knowledge that storm drains are separate from sanitary sewer systems, 10% increase in the awareness that all storm drains are connected to local waterways, and a 15% increase in the number of participants who can identify residential sources of stormwater pollution.

The regional baseline storm water survey was conducted in 2009, but an additional regional telephone survey has not been conducted to compare results. A summary of the baseline survey results as reported in the FY 2009-2010 RURMP Annual Report is included below.

As required under the Municipal Permit Order No. R9-2007-0001 the Regional Residential Sources Workgroup developed and implemented a telephone survey of adult

residents living in San Diego County. The purpose of the study was to begin to evaluate the effectiveness of the co-permittee's storm water pollution education efforts by measuring baseline current levels of polluting practices and awareness of how the storm drain system works. The study was conducted between June 16 and June 26, 2009. A total of 808 telephone interviews were conducted with adult residents randomly identified from across San Diego County. Results of the 2009 baseline telephone survey were as follows:

- ***Knowledge of storm drain system:*** *37% of respondents knew that water in storm drains is not treated before it is released into local waterways.*
- ***Knowledge of pollutants in urban runoff:*** *41% if respondents volunteered that litter and trash were common sources of pollution in storm drains, 34% mentioned automobile fluids, 16% mentioned cleaning products, 15% mentioned fertilizers and pesticides, 10% mentioned yard trimmings and dirt, 8% mentioned human and animal wastes, and smaller percentages named other sources; 11% could not name a source of pollution in storm drains.*
- ***Pet waste pick up:*** *In 76% of households with dogs, the person who walks the dog always or nearly always picks up pet waste; 91% of those who picked up put it in the garbage, 3% hosed it or put it in the street, and 11% left it on the ground.*
- ***Over-irrigation:*** *11% of those with sprinklers said a noticeable amount of water ends up in the street; 76% adjusted the sprinklers to reduce water in the previous year.*
- ***Reduced use of fertilizer:*** *49% of those with yards said they used fertilizer in the previous year; 28% said they used pesticides or chemicals.*
- ***Sweeping instead of hosing:*** *77% of those with driveways said they sweep it, 23% said they hose it down, and 39% blow materials off it.*
- ***Litter in trash cans:*** *14% said they saw litter very frequently on their block; 33% said they always or nearly always pick up litter on their block and dispose of it in a trash container.*

The 2009 Regional Residential Sources survey provided substantial information on baseline levels of awareness about how the storm drain system works and current levels of polluting practices. These results were used to inform existing outreach and will be also used as a basis of comparison from which to evaluate the effectiveness of the co-permittee's outreach efforts.

Regional Calendar

Between January and June 2010, Think Blue implemented a two-tiered assessment protocol that was designed to provide both qualitative and quantitative evaluation of the 2010 "Be the Solution to Storm Water Pollution" calendar. The Think Blue San Diego Regional calendar was designed to increase awareness, and educate residents on behaviors that prevent storm water pollution. The goal of the assessment activities was to provide an evaluation of both the clarity and usage of the calendar as well as the impact of the calendar on attitudes and behavior.

Data were collected through pre- and post-test surveys and in-depth interviews with a subset of calendar recipients. 332 pre-tests were collected at the time of calendar distribution, 59 calendar recipients returned a post-test, and 30 participated in an in-depth telephone interview about the calendar.

Among calendar recipients, who completed both the pre- and post-test surveys:

- There was a 14% increase in knowledge that storm water is not treated (83% correct at pre-test, 95% correct at post-test).
- There was a 69% decrease in the number of participants who reported hosing as clean-up method (16% at pre-test compared to 5% at follow-up).
- Reports of doing nothing for weed and pest control more than doubled. At pre-test 18% reported "none" as their method compared to 39% at post-test.
- After receiving the calendar, people were more significantly more likely to be able to mention a specific pollution-prevention behavior. Prior to receiving the calendar 15% of respondents were unable to mention a specific action that they could do to prevent storm water pollution. At post-test, only 2% could not name a specific action.

Telephone interviews with a subset of 30 individuals who remembered receiving the calendar revealed that:

- 73% of participants still had the calendar. Those who no longer had the calendar said that they gave it away to students, friends, or coworkers.
- 59% reported that they looked at the calendar on a daily basis; 39% looked at it weekly, and 5% looked monthly, indicating that the calendar is used regularly.
- Sixty-five percent (65%) of respondents who read the calendar said they made changes to their behavior as a result, validating that the calendar is an effective medium for education and outreach.

Think Blue's regional calendar received a positive response in regards to graphics, size, and layout. More importantly, the calendar successfully increased knowledge and awareness, suggesting that it is a viable medium for educating people about storm water pollution and promoting behavior change.

<u>Community Based Social Marketing (CBSM): Gen-Y Youth Study</u>

The Copermittees conducted a pilot study of littering behavior among youth in four regions throughout the county, which included observations and in-person interviews with youth (under the age of 24 with specific focus on middle school, high school, and college-age youth). The purpose of the study was to identify the sources of litter, establish a baseline littering rate, and identify avenues for outreach and education to reduce and prevent litter. The study was conducted in 2010, and pilot and control sties were chosen across four regions and included: Central County (beaches), East County (transit centers), North County (skate parks), and South County (parks). The study utilized intercept interviews, behavioral observations, and observations of accumulated trash as the methods of assessment.

The report has not been finalized yet, but initial results indicate that there were positive changes in knowledge and awareness, behavior, and load reductions at some of the sites in the study as a result of intervention-implementation activities.

Individual Copermittee Focused Analyses

In addition to regional efforts, some Copermittees conducted focused analyses to provide assessment information for their jurisdiction. There were four analyses conducted by jurisdictions where education and outreach program effectiveness information was provided in JURMP Annual Reports.

1. City of San Diego – FY 2010 Event Surveys:
   - A total of 10,762 event survey cards were collected
   - 56% of the individuals who completed an event survey had heard of *Think Blue San Diego* prior to attending the event (a 6% increase as compared to FY 2009)
   - 61% of respondents knew that storm water is not treated
   - Nearly 56% of those who filled out a survey card provided some type of contact information

2. City of San Diego – FY 2010 Residential Telephone Survey:
   - 47% of all San Diego residents have heard the *Think Blue* slogan, up from 39% in FY 2009 (a 52% increase since 2001)
   - 52% of residents know that storm water is not treated, which is an increase from 44% in FY 2009 and up from 39% in FY 2008
   - Residents who had heard of *Think Blue* or steps the city has been taking to prevent storm drain pollution were more than twice as likely to make behavior change.

3. City of San Diego – Business Outreach: Focus Groups – FY 2010

Think Blue completed seven focus groups, among business owners and managers who were in either the restaurant industry, the automotive repair industry or in the landscaping industry. Key findings included:

- High awareness of *Think Blue* ads and storm water pollution issues
- Knowledge of Storm Water Regulations, mostly from contact with the City
- English language business owners and managers readily made the connection between water pollution, the economy, and themselves
- Regulations seen as needed, but a sense of unfairness and imbalance could undermine willingness to comply
- Cost, labor, and lack of reliable alternatives were stated as a major barrier to compliance among gardeners and landscapers.

4. City of Chula Vista – Storm Water Quality Public Awareness Survey Analysis:

The City of Chula Vista implemented an 11-question survey in FY 2010 and was able to utilize a similar survey administered in 2005 as a general baseline in order to assess effectiveness. However, some of the questions were re-written or re-worded which

can have an impact on the results. Results from two questions that were able to be compared are provided.

- Car washing on the driveway increased from 3.7% in 2005 to 24.21% in 2009 – this may be more of a result of the downturn of the economy (residents prefer to wash cars at home rather than pay for a car wash), than the education and outreach to residents on car washing.
- The majority of respondents knew the best way to dispose of pet waste in both the 2005 baseline survey and the 2009 survey

7 Incentives

Narrative Description

Incentives are typically established programs utilized to entice and induce an individual, company, or group to do something. An incentive program may be established for industrial or commercial businesses, municipal employees, general public, or construction site owners and operators. Incentives may include programs such as water conservation rebates or storm water fee credits.

Target Source(s)

- Municipal
- Industrial and Commercial Facilities
- Construction Sites
- Residential

Target Pollutant(s)

- Bacteria
- Trash
- Heavy Metals
- Nutrients
- Oil and Grease
- Sediment
- Pesticides

Target Audience(s)

- Municipal Staff
- Construction
- Residential
- General Public
- Commercial Owners
- Industrial Owners
- Land Development

Effectiveness Potential

The development of incentive programs are administrative activities. When incentive programs are utilized by individuals or groups then Level 3 and Level 4 effectiveness assessments may be reached. Typically if an individual, company, or group utilizes an incentive this can indicate a behavior change which may result in a load reduction. For

example, if a jurisdiction offers a smart irrigation incentive program, then a homeowner may decide to upgrade their sprinkler system in order to get a rebate or other form of incentive. The homeowner will then have changed their behavior related to irrigation, and there is a potential load reduction due to the probable decrease in over-irrigation at the homeowner's location.

8 Employee Training

Narrative Description

Municipal employee storm water training is conducted to increase the knowledge of the target audience in regards to laws, regulations, permits and requirements; BMPs; general urban runoff concepts; and any other relevant topics as deemed appropriate. Trainings may be job specific (i.e. MS4 cleaning procedures) or may be more general but ultimately provides a mechanism to communicate JURMP requirements to the appropriate employees. Training methods that may be utilized could be computer based interactive tutorials, classroom style trainings, audiovisual methods (i.e. DVD) or on-the-job training (i.e. training on how to use a street sweeper).

Target Source(s)

- Municipal Facilities
- Roads, streets, highways, and parking facilities
- MS4

Target Pollutant(s)

- Bacteria
- Trash
- Heavy Metals
- Nutrients
- Oil and Grease
- Sediment
- Pesticides

Target Audience(s)

- Municipal Staff

Effectiveness Potential

Municipal employee training can be conducted as facilitation or data gathering activities that can provide Level 2 or Level 3 effectiveness assessments. Municipal employee training can provide important information on whether training conducted is effective at increasing employees general and/or job specific knowledge regarding stormwater. This type of assessment is often measured and assessed utilizing pre-and post-test questionnaires/surveys. Several jurisdictions implemented pre-and post-test questions at trainings conducted to assess whether there was an increase in knowledge of storm water issues among employees. In general, there was typically an increase in the pass rate from

the pre-test to the post-test indicating that the trainings were effective in increasing the municipal staff's knowledge and awareness.

In addition to knowledge and awareness, BMP implementation or changes in behavior may be assessed through employee activity. For example, if training for street sweeper operators was conducted to provide routes, sweeping priorities, and frequency of street sweeping and at the end of the year it was implemented properly, then it can be deduced that the training was successful and the operation and maintenance BMPs were implemented. Additionally, if general storm water training was conducted for municipal staff to provide them the tools to identify potential illegal discharges, and then the program receives an increase in the municipal staff reporting of illegal discharges, then it would indicate that there was a change in behavior based upon the training provided.

9 Inspections

Narrative Description

Inspections are Program Management Practices (PMPs) conducted to examine facilities or sites for storm water requirements and BMP implementation and are often utilized as an opportunity to educate facility operators or owners regarding storm water and BMPs. Typically, inspections consist of two primary components: a visual/observational assessment of the conditions and operations at facility or site; and, verbal interviewing of the facility or site representative. The purpose of the inspections is to identify issues or potential issues and initiate a course of action to correct identified issues. Typical issues include:

1. Active discharges
2. Presence of evidence identifying previous discharges
3. Required BMPs not implemented
4. Lack of required documentation or paperwork
5. Required operation and maintenance not conducted

As part of the inspection program a complete facility inventory is maintained and facilities are prioritized. In general, an inspection frequency is determined based upon priority, and inspection and enforcement information, along with any applicable follow-up, is retained in a database.

When inspections are conducted, either by Municipal staff or contracted staff, the inspector typically has a checklist or inspection form that is utilized to assist in determining compliance. Some of the items inspectors will look for during inspections are included below.

Development Planning:

- Verifying effective operation and maintenance of Treatment Control BMPs (TCBMPs)
- Verifying TCBMPs compliance with all ordinances, permits, codes, etc.
- Prior to occupancy of each Priority Development Project subject to SUSMP requirements, verifying that the constructed LID, source control, and TCBMPs have been constructed in compliance with all specifications, plans, permits, ordinances, etc.

Construction:

- Check for coverage under the General Construction Permit (Notice of Intent (NOI) and/or Waste Discharge Identification No.) during initial inspections;
- Assessment of Compliance with Permittee ordinances and permits related to urban runoff, including the implementation and maintenance of designated minimum BMPs;
- Assessment of BMP effectiveness;
- Visual observations for non-storm water discharges, potential illicit connections, and potential discharge of pollutants in storm water runoff;
- Education and outreach on storm water pollution prevention, as needed; and

- Creation of a written or electronic inspection report.

Industrial and Commercial:

- Review of BMP implementation plans, if the site uses or is required to use such a plan;
- Review of facility monitoring data, if the site monitors its runoff;
- Check for coverage under the General Industrial Permit (Notice of Intent (NOI) and/or Waste Discharge Identification No.), if applicable;
- Assessment of compliance with Copermittee ordinances and permits related to urban runoff;
- Assessment of BMP implementation, maintenance and effectiveness;
- Visual observations for non-storm water discharges, potential illicit connections, and potential discharge of pollutants in storm water runoff; and
- Education and training on storm water pollution prevention, as conditions warrant.

Municipal Areas and Activities

- Review of BMP implementation plans, if the site uses or is required to use such a plan;
- Assessment of compliance with Copermittee ordinances and permits related to urban runoff;
- Assessment of BMP implementation, maintenance and effectiveness;
- Visual observations for non-storm water discharges, potential illicit connections, and potential discharge of pollutants in storm water runoff.

Based upon inspection findings, each Copermittee should implement follow-up actions necessary to comply with the Municipal Permit and any applicable ordinances, permits, etc.

Target Source(s)

- Municipal Facilities
- Industrial and Commercial Facilities
- Construction Sites
- Roads, streets, highways, and parking facilities
- MS4

Target Pollutant(s)

- Bacteria
- Trash
- Heavy Metals
- Nutrients

- Oil and Grease
- Organics
- Sediment
- Pesticides

Target Audience(s)

- Municipal Staff
- Construction
- Commercial Owners
- Industrial Owners
- Land Development

Effectiveness Potential

Inspections are a data gathering PMP that have the potential to provide data for effectiveness levels 2 through 4. Inspections can target land development, construction, industrial, commercial, and municipal audiences in order to gather the necessary data for program evaluations and effectiveness assessments. Additionally, inspections can address single or multiple pollutants such as bacteria, trash, heavy metals, nutrients, oil and grease, organics, sediment, and pesticides, depending upon the facility type being inspected. However, the effectiveness of inspections in reducing runoff pollutants and discharges is highly variable and dependent upon site-specific conditions, including but not limited to: motivation of facility or site representative/owner; level of difficulty in making required corrections; BMP complexity and others. An example of the variability of effectiveness potential is the knowledge assessments and BMP assessments that were conducted by some jurisdictions during industrial and commercial inspections. In reviewing the results from JURMP Annual Reports, the results were variable depending upon the jurisdiction and the reporting period. Furthermore, measurable results may require tracking over a few years or inspection cycles.

The Copermittees have developed and conducted focused analyses in order to improve the understanding between Program Management Practices and effectiveness assessment. Two special studies applicable to inspections are summarized below.

1. City of San Diego Automotive Facility Watershed Inspections (November 2010):

   This special study conducted by the City of San Diego involved the development and implementation of a two-year focused inspection activity in order to answer the following management questions:
   1) Does inspecting more frequently at automotive facilities improve BMP implementation rates?

2) Does type of business ownership change the required inspection frequencies?
3) Based on information collected during inspections, can the inventory of specific source types, in this case automotive facilities, be feasibly prioritized?

As stated in the Executive Summary of the report, the study found that increased inspections over a one-year period of automotive facilities does not increase the implementation rates or reduce the amount of pollutant discharge potential at automotive facilities. It also found that based on the result of the inspections, there is potential for the City to feasibly prioritize its inventory specific to automotive facilities based on their site specific characteristics. There may be underlying reasons that had the potential for affecting the findings of the study and further exploration may be needed. For further information see the City of San Diego's WURMP Activity Report.

2. City of San Diego Geographically Based Watershed Inspections (November 2010):

   The City of San Diego conducted this special study to answer the following questions related to the implementation of commercial/industrial inspection programs:

   1) What activities and locations at businesses should be targeted during inspections based on severity of observed/reported issues?
   2) Can the City increase its commercial/industrial program efficiency by using a tiered inspection process (variable inspection forms and procedures) based on site specific characteristics of the businesses?
   3) Does the City's commercial/industrial inventory need to be reevaluated (additions of business types or modifications to prioritization process)?

   There were two primary findings from the activity as stated in the Executive Summary of the report: (1) in many instances the City can perform inspections and collect valuable information without making contact with owners/manager – potentially increasing the efficiency of the inspection program, and; (2) confirmation that the severity of the issues related to trash areas; onsite storm drains systems and over-irrigation warrant the focus of the inspection program as well as other programs that can support the effort to reduce the impacts of these areas.

10 Investigations

Narrative Description

Investigations are a Program Management Practice that is conducted to try to identify illegal discharges and illicit connections as a result of public reporting (hotline, website, etc.), inspection findings, staff referrals, and/or monitoring results. Investigations may include visual observations, closed circuit television (CCTV) often used for the MS4, or additional monitoring. Investigations can occur in municipal, land development, construction, industrial, commercial, or residential areas. Investigations may also address a wide range of pollutants and pollutant generating activities based upon the type of illegal discharge, illicit connection, or possibly natural source discovered. The purpose of investigations is to identify and eliminate any illegal discharges or illicit connections to the MS4. Typical illegal discharges identified through investigations include:

1. Motor oil or antifreeze from automobiles
2. Sanitary wastewater
3. Runoff from excess irrigation
4. Groundwater
5. Household toxic substances
6. Sediment
7. Trash

Target Source(s)

- Municipal Facilities
- Industrial and Commercial Facilities
- Construction Sites
- Residential
- Roads, streets, highways, and parking facilities
- MS4

Target Pollutant(s)

- Bacteria
- Trash
- Heavy Metals
- Nutrients
- Oil and Grease
- Organics
- Sediment
- Pesticides

10 Investigations

Target Audience(s)

- Municipal Staff
- Construction
- Residential
- Commercial Owners
- Industrial Owners
- Land Development

Effectiveness Potential

Investigations are a common tool used to respond to reports of potential violations, and this data gathering activity can be effective in finding and eliminating illegal discharges and illicit connections. This can result in a Level 4 source reduction. The Copermittees have discovered that most effective means of identifying illegal discharges or illicit connections is through hotline call or complaint referral response and investigation or visual surveys of the stormwater conveyance system during routine maintenance and/or cleaning.

11 Enforcement

Narrative Description

Each Copermittee implements and enforces its ordinances, codes, or other legal authority to prevent illegal discharges and connections to its MS4. Enforcement methods are utilized to affect a return to compliance at either a construction, municipal, industrial, commercial, or residential area. Some enforcement methods utilized include verbal warning, letters, educational materials, citations, notices of violation, stop work orders, or civil penalties. Each Copermittee also implements all follow-up actions necessary to achieve the return to compliance for a particular site.

Target Source(s)

- Municipal Facilities
- Industrial and Commercial Facilities
- Construction Sites
- Residential
- Roads, streets, highways, and parking facilities
- MS4

Target Pollutant(s)

- Bacteria
- Trash
- Heavy Metals
- Nutrients
- Oil and Grease
- Organics
- Sediment
- Pesticides

Target Audience(s)

- Municipal Staff
- Construction
- Residential
- Commercial Owners
- Industrial Owners
- Land Development

11 Enforcement

Effectiveness Potential

Enforcement is a common tool used to not only return violators to compliance but also to educate and promote compliance. Enforcement is a facilitation activity where the tabulation of enforcement data can be associated with a load reduction. If a site or residence where a pollutant is leaving, or has the potential to leave, the site has been stopped or mitigated through enforcement efforts there is an implied load reduction (Level 4). The tabulation of enforcement data may also provide information on assessment Levels 2-3. For example, as noted in the CASQA Effectiveness Assessment Guidance (May 2007), the number of enforcement actions can be compared from year to year to identify trends and to show program progress.

12 Regulatory Revisions

Narrative Description

Regulatory revisions, or "off-ramps", are essential in an adaptive management approach for storm water programs. For example, if valid monitoring data indicate a pollutant should be removed off of the 303(d) list, then it should be removed and may not be a primary focus of storm water program efforts. Additionally, if a jurisdiction determines that conducting inspections in a certain area or a certain facility classification is the most effective, then the jurisdiction should be able to focus efforts accordingly and not necessarily held to a minimum number. Some examples of regulatory revisions are:

1. 303(d) list changes
2. Beneficial Use modifications
3. Water Quality Objective adjustments
4. Program modifications
5. TMDL amendments

Target Source(s)

- Municipal Facilities
- Industrial and Commercial Facilities
- Construction Sites
- Residential
- Roads, streets, highways, and parking facilities
- MS4

Target Pollutant(s)

- Bacteria
- Trash
- Heavy Metals
- Nutrients
- Oil and Grease
- Organics
- Sediment
- Pesticides

12 Regulatory Revisions

Target Audience(s)

- Municipal Staff
- Construction
- Residential
- Commercial Owners
- Industrial Owners
- Land Development

Effectiveness Potential

While regulatory revisions do not have a direct link to an effectiveness assessment level, they do provide an indirect correlation. When regulatory revisions are made typically based upon scientific data, it provides an opportunity to reallocate resources to other issues which can be more efficient and effective.

13 True Source Control

Narrative Description

Eliminating the potential for urban runoff to come in contact with constituents of concern is defined as true source control. True source control reduces or prevents pollution, or pollutants, at their source. For example if Industry A was using pollutant X and pollutant X was having a negative impact on a receiving water, then true source control results in Industry A halting the use of pollutant X or replacing pollutant X with a less harmful alternative.

Target Source(s)

- Municipal Facilities
- Industrial and Commercial Facilities
- Construction Sites
- Residential
- Roads, streets, highways, and parking facilities
- MS4

Target Pollutant(s)

- Bacteria
- Trash
- Heaving Metals
- Nutrients
- Oil and Grease
- Organics
- Sediment
- Pesticides

Target Audience(s)

- Municipal Staff
- Construction
- Residential
- General Public
- Commercial Owners and Operators
- Industrial Owners and Operators
- Land Development

13 True Source Control

Effectiveness Potential

True source control is a facilitation activity aimed at Level 4 effectiveness assessment, and, depending upon the source control, has the potential to target any one or more of the target audiences, sources, and pollutants.

Currently, there are two examples of true source control applicable to the San Diego region as described below.

1. City of San Diego – SB346 – Brake Pad Partnership:
   As reported in the City's FY 2010 WURMP Annual Reports, *the City of San Diego (City) and other MS4 dischargers in the Chollas Creek Watershed are mandated by Total Maximum Daily Load (TMDL) Waste Load Allocations (WLAs) to reduce the amount of dissolved copper, lead, and zinc that are discharged to the creek. Previous City investigations determined that copper from automotive brake pads was a major contributor of dissolved copper to Chollas Creek and other waterbodies within City jurisdiction. Because the regulation of automotive brake pads is beyond the authority of any local government, the City collaborated with other California local governments, through California Stormwater Quality Association, to achieve true source control by reducing copper at its source. It was determined that the best way to achieve this goal was through the development of legislation, mandating reductions and then replacement of copper in automotive brake pads.*

   During FY 2010, the City of San Diego assisted with writing the proposed Senate Bill (SB346: Motor Vehicle Brake Friction Materials, Removal of Copper in Automotive Brake Pads), provided financial resources for technical experts to assist with its development, participated in negotiations with the automobile and brake pad manufacturers, and provided lobbyist assistance to Senator Kehoe to obtain political support for the bill's passage. Due to the automobile manufacturers renewed interest in this bill, negotiations were re-initiated to obtain support from all stakeholders, as required by the governor. The bill was rewritten multiple times and discussed by all parties before it was presented to Assembly subcommittees for review and approval. After the reporting period, SB346 was passed by both houses, signed into legislation by the governor on September 25, 2010, and incorporated into the California Health and Safety Code, Article 13.5, commencing with Section 25250.50.

   SB346 calls for reductions of copper down to 5% by weight by 2021 and 0.05% by 2025. It is anticipated that copper loads from automotive brake pads will decline after the first reduction date in 2021.

2. Diazinon Ban – Nationwide:

   A highly effective example of true source control is the ban on the pesticide, Diazinon. In January 2005, a nationwide ban was placed on the retail sale Diazinon. Since that time, Diazinon concentrations have been steadily declining at the Mass Loading Stations (MLS) throughout the San Diego region.

REPORT OF WASTE DISCHARGE
Application for Renewal of NPDES Municipal Stormwater Permit for San Diego County

Submitted to the San Diego Regional Water Quality Control Board on behalf of the Copermittees to Order No. R9-2007-0001

County of San Diego
City of Carlsbad
City of Chula Vista
City of Coronado
City of Del Mar
City of El Cajon
City of Encinitas
City of Escondido
City of Imperial Beach
City of La Mesa
City of Lemon Grove
City of National City
City of Oceanside
City of Poway
City of San Diego
City of San Marcos
City of Santee
City of Solana Beach
City of Vista
San Diego Unified Port District
San Diego County Regional Airport Authority

June 24, 2011

Prepared with the Assistance of Larry Walker Associates

Executive Summary

Urban runoff from the municipalities in San Diego County is regulated by an NPDES Permit (Regional Board Order No. R9-2007-0001) which is typically renewed every five years. As part of the renewal process the Copermittees must prepare a Report of Waste Discharge (ROWD) that serves as an application for issuance of a new waste discharge permit. The ROWD must include the following:

- Updated Copermittee contact information;
- Proposed changes to the Copermittees' urban runoff management programs (see Sections 2 and 3);
- Proposed changes to the Copermittees' water quality monitoring programs (see Section 2.B and related attachments);
- Justification for proposed changes; and
- Any other information necessary for the reissuance of the Permit.

To support the development of the ROWD the Copermittees conducted numerous meetings to assess and identify changes to their urban runoff management programs. A core set of principles guided the Copermittees' development of the ROWD and recommendations for changes:

- Simplified reporting;
- Streamlined and more meaningful assessment;
- Better coordinated water quality monitoring;
- Enhanced watershed and Total Maximum Daily Load (TMDL) focus; and
- Increased emphasis on strategic planning.

The Copermittees identified a number of specific recommendations for changes to existing management and monitoring requirements. If adopted, these changes would be in effect on adoption of the new Order. They are identified and discussed in detail in ROWD Section 2.

Parallel to the evaluation of the current urban runoff management and monitoring programs, the Copermittees identified the need to develop an iterative, adaptive urban runoff management approach focused on watersheds. This approach would build on the changes to core requirements described in ROWD Section 2. It is introduced in Section 1 and expanded upon in Section 3. The central feature of the Copermittees' recommended Watershed Adaptive Management Strategy is the "Watershed Plan." A single plan for each watershed would help streamline and refocus efforts and make best use of limited resources. The watershed appears to be the appropriate scale at which to integrate the many programs and activities targeting water quality improvement. Furthermore, this scale is consistent with other regulatory programs and policies (e.g. TMDLs and Basin Plans). While it is critical that decision-making remain within the discretion of each jurisdiction, the creation of Watershed Plans would encourage each Copermittee to carefully consider the impact of its management decisions on priority watershed water quality conditions. The suggested content and framework for the Watershed Plan is presented in Section 3.

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ATTACHMENTS

Attachment 1-1: Jurisdictional Illicit Discharge Detection and Elimination Program and Dry Weather Filed Screening and Analytical Monitoring Program Review

Attachment 2-1: Receiving Water Assessment of Mass Loading Stations/Temporary Watershed Assessment Stations

Attachment 2-2: Coastal Storm Drain Outfall Monitoring Program Review

Attachment 2-3: MS4 Outfall Monitoring Program Review

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Section 1 Introduction

1.A REPORT OF WASTE DISCHARGE PURPOSE AND ORGANIZATION

This Report of Waste Discharge (ROWD) serves as a legally required application[1] for issuance of a new waste discharge permit for the Copermittees in San Diego County. The permit will replace the current waste discharge Order No. R9-2007-0001 (2007 Order)[2]. Section J.2.d of the 2007 Order sets out a timeframe and minimum requirements for the development and submittal of a ROWD prior to the scheduled expiration of the 2007 Order. The ROWD must include the following:

1) Names, titles, and mailing addresses of primary Copermittee contacts (**Table 1.2**);
2) Proposed changes to the Copermittees' urban runoff management programs (see Sections 2 and 3);
3) Proposed changes to the Copermittees' water quality monitoring programs (see Section 2.B and related attachments);
4) Justification for proposed changes (see above as applicable); and
5) Any other information necessary for the reissuance of the Permit.

The organization and content of the ROWD are as follows:

Section 1: Introduction – Includes a general description of the Permit coverage area, relevant application information, background to ROWD development, and a brief discussion of general permitting issues, some of which are addressed in more detail in Sections 2 and 3.

[1] Section J.2.d of the 2007 Order mandates that the Copermittees submit this application and address the issues identified in the ROWD. The Copermittees therefore are legally mandated to submit this document and to make the recommended modifications set forth herein. Because the Copermittees are legally compelled to submit this application, nothing in this ROWD should be construed as an invitation to the RWQCB to regulate the Copermittees in any particular way. Please see Section 1.F.v of this ROWD for further discussion of this issue.

[2] California Regional Water Quality Control Board San Diego Region Order No. R9-2007-0001 NPDES No. CAS0108758, Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego County, the San Diego Unified Port District, and the San Diego County Regional Airport Authority.

Section 2: Recommended Modifications[3] to Order R9-2007-001 Management and Monitoring Programs – Provides background and recommendations for establishing updated core program requirements in the new Permit. This information and any new findings that the Copermittees acquire each year will be used to identify program enhancements as part of the Watershed Adaptive Management Strategy, which is discussed in Section 3.

Section 3: Watershed Adaptive Management Strategy – Provides a detailed discussion of an iterative, watershed-based adaptive management strategy for water quality protection. The strategy contains two primary processes for program improvement:

- *Watershed Plan Development*. Establishment of an overall management program for each watershed at the outset of the new Permit, including management objectives, assessment metrics, strategies and actions (i.e., BMPs), based on the recommended improvements to core programs presented in Section 2 and the Copermittees' understanding of pollutant sources in each watershed; and,

- *Adaptive Management*. As needed adjustments to management actions that will enhance effectiveness based on new BMP effectiveness data, source identification findings, monitoring data results, or in response to deficiencies in program assessment results.

1.B REGION AND MS4 DESCRIPTION

Bounded by the Pacific Ocean on the west and Mexico to the south, the San Diego region occupies more than 4,200 square miles in the southwest corner of the continental United States. At the beginning of 2010, the region had an estimated population of 3,224,432[4], an increase of more than 400,000 people (15 percent) from April 2000 Census figures. While the San Diego region is expected to grow at a slower pace in the coming decades, the impacts of increasing population and urbanization will continue to be felt. Within the region, each of the entities below owns or operates a municipal separate storm sewer system (MS4), through which it discharges urban runoff into waters of the United States.

1. County of San Diego (Principal Permittee)
2. City of Carlsbad
3. City of Chula Vista
4. City of Coronado
5. City of Del Mar
12. City of National City
13. City of Oceanside
14. City of Poway
15. City of San Diego
16. City of San Marcos

[3] This ROWD uses terms such as "recommended modifications", "proposed changes", "requests" etc. because the requirements of Section J.2.d of the 2007 Order mandate that the ROWD address such program improvements. The use of these and similar terms in the ROWD must be interpreted in accordance with footnote 1 above and Section 1.F.v of this document.

[4] SANDAG Regional Growth Forecast, 2011.

6. City of El Cajon
7. City of Encinitas
8. City of Escondido
9. City of Imperial Beach
10. City of La Mesa
11. City of Lemon Grove
17. City of Santee
18. City of Solana Beach
19. City of Vista
20. San Diego Unified Port District
21. San Diego County Regional Airport Authority

Municipal urban runoff management programs in the San Diego region were initiated with the July 1990 adoption of Regional Water Quality Control Board (RWQCB) Order No. 90-42, but in many respects started fresh when that Permit was reissued in February 2001. The current Permit was reissued in January 2007. It added a number of new and increasingly prescriptive requirements for jurisdictions to implement, including expanded requirements for low impact development BMPs, treatment control BMPs, and BMP maintenance tracking for new development; hydromodification management plans; specific street sweeping and MS4 maintenance requirements; and expanded water quality monitoring programs among others[5].

Also notable is the 2007 Order's increased emphasis on watershed management principles and practices. Unlike previous permits, it specifically requires the implementation of a minimum number of watershed activities that go above and beyond core management requirements to reduce pollutant discharges causing high priority water quality problems in each of the nine watersheds identified in **Table 1.1**. These activities are developed, implemented, and assessed within the context of Watershed Urban Runoff Management Program (WURMPs), which are required for each watershed. Since urban runoff does not conform to jurisdictional boundaries, watershed-based urban runoff management requirements are intended to help focus programs on the most important water quality problems in each watershed.

Collectively, these and other requirements represented a significant increase in effort over previous permit cycles. Copermittees are now nearing the end of a third Permit cycle, and have conducted in-depth reviews of their management programs with an eye toward continued program improvement. The results of this review are described as applicable throughout the remainder of this ROWD and in the Copermittees' Long-term Effectiveness Assessment (LTEA), which is submitted under separate cover.

[5] As discussed in Section 1.F.v of the ROWD, many of these new and increasingly prescriptive provisions are the subject of a successful Test Claim before the Commission on State Mandates which is currently being challenged in the California courts.

Table 1.1: Watersheds and Responsible Copermittees under Order No. R9-2007-001

Watershed	Area (sq. mi.)	Population (2000)	Responsible Copermittees
1. Santa Margarita	750 total; 197 in San Diego County	27,124 in San Diego County	• County of San Diego
2. San Luis Rey	562	148,515	• City of Oceanside (lead) • City of Vista • County of San Diego
3. Carlsbad	211	496,128	• City of Carlsbad (lead) • City of Encinitas • City of Escondido • City of Oceanside • City of San Marcos • City of Solana Beach • City of Vista • County of San Diego
4. San Dieguito	346	147,626	• City of Escondido (lead) • City of Del Mar • City of Poway • City of San Diego • City of Solana Beach • County of San Diego
5. Los Penasquitos	94	227,599	• City of Poway (lead) • City of Del Mar • City of San Diego • County of San Diego
6. Mission Bay	68	220,803	• City of San Diego
7. San Diego	434	505,032	• City of El Cajon (lead) • City of La Mesa • City of San Diego • City of Santee • County of San Diego
8. San Diego Bay	415	932,845	• San Diego Unified Port District (lead) • City of Chula Vista • City of Coronado • City of Imperial Beach • City of La Mesa • City of Lemon Grove • City of National City • City of San Diego • County of San Diego • San Diego County Regional Airport Authority
9. Tijuana	1,750 total; 467 in U.S.	1.4 million total; 77,344 in San Diego County	• County of San Diego (lead) • City of Imperial Beach • City of San Diego

1.C APPLICANT INFORMATION

The administrative and technical contact information for each Copermittee is provided in **Table 1.2**. The first 20 of these parties were initially named as Copermittees under Order No. 90-42 in July 1990. The San Diego County Regional Airport Authority was added as the 21st Copermittee on August 13, 2003. No additional Copermittees have been added since that time.

Table 1.2: Copermittee Contact Information

Copermittee	Primary Administrative Contact (Official Mailing Contact)	Primary Technical Contact (Day-to-day Contact)
1. County of San Diego (Principal Permittee)	Cid Tesoro LUEG Program Manager 5201 Ruffin Rd., Ste P. San Diego, CA 92123	Jon Van Rhyn Water Quality Program Manager 5201 Ruffin Rd., Ste P. San Diego, CA 92123
2. City of Carlsbad	Elaine Lukey Environmental Manager 1635 Faraday Avenue Carlsbad, CA 92008	Elaine Lukey Environmental Manager 1635 Faraday Avenue Carlsbad, CA 92008
3. City of Chula Vista	Khosro Aminpour Senior Civil Engineer 1800 Maxwell Road Chula Vista, CA 91911	Khosro Aminpour Senior Civil Engineer 1800 Maxwell Road Chula Vista, CA 91911
4. City of Coronado	Scott Huth Director of Public Services 101 B Avenue Coronado, CA 92118	Kimberly Godby Supervisor - Services 101 B Avenue Coronado, CA 92118
5. City of Del Mar	Kathleen Garcia Director, Planning & Community Development 1050 Camino Del Mar Del Mar, CA 92014	Mikhail Ogawa Clean Water Manager 1050 Camino Del Mar Del Mar, CA 92014
6. City of El Cajon	Dennis Davies Deputy Director of Public Works 200 Civic Center Way, 4th Floor El Cajon, CA 92020	Jaime Campos Associate Civil Engineer 200 Civic Center Way, 4th Floor El Cajon, CA 92020
7. City of Encinitas	Erik Steenblock Clean Water Program Manager 505 S. Vulcan Avenue Encinitas, CA 92024	Erik Steenblock Clean Water Program Manager 505 S. Vulcan Avenue Encinitas, CA 92024
8. City of Escondido	Lori Vereker Utilities Director 201 North Broadway Escondido, CA 92025	Cheryl Filar Env. Programs Manager 201 N. Broadway Escondido, CA 92025
9. City of Imperial Beach	Hank Levien Public Works Director 825 Imperial Beach Blvd. Imperial Beach, CA 91932	Chris Helmer Env. Programs Manager 825 Imperial Beach Blvd. Imperial Beach, CA 91932

Copermittee	Primary Administrative Contact (Official Mailing Contact)	Primary Technical Contact (Day-to-day Contact)
10. City of La Mesa	Joe Kuhn Storm Water Program Manager 8130 Allison Avenue La Mesa, CA 91941	Joe Kuhn Storm Water Program Manager 8130 Allison Avenue La Mesa, CA 91941
11. City of Lemon Grove	Cora Long Stormwater Policy Analyst 3232 Main Street Lemon Grove, CA 91945	Cora Long Stormwater Policy Analyst 3232 Main Street Lemon Grove, CA 91945
12. City of National City	Din Daneshfar Principal Civil Engineer 1243 National City Blvd. National City, CA 91950	Barby Tipton Storm-water Inspector 1243 National City Blvd. National City, CA 91950
13. City of Oceanside	Mo Lahsaie Clean Water Prog. Coordinator 300 N. Coast Highway Oceanside, CA 92054	Mo Lahsaie Clean Water Prog. Coordinator 300 N. Coast Highway Oceanside, CA 92054
14. City of Poway	Malik Tamimi Stormwater Program Administrator P.O. Box 789 Poway, CA 92074	Malik Tamimi Stormwater Program Administrator P.O. Box 789 Poway, CA 92074
15. City of San Diego	Kris McFadden Deputy Director City of San Diego Transportation & Stormwater Dept. 9370 Chesapeake Drive, Suite 100, MS 1900 San Diego, CA 92123	Drew Kleis Program Manager City of San Diego Transportation & Stormwater Dept. 9370 Chesapeake Drive, Suite 100, MS 1900 San Diego, CA 92123
16. City of San Marcos	Erica Ryan Stormwater Program Manager 1 Civic Center Drive San Marcos, CA 92069	Reed Thornberry Stormwater Analyst 1 Civic Center Drive San Marcos, CA 92069
17. City of Santee	Pedro Orso-Delgado Deputy City Manager/Development Services Director 10601 Magnolia Avenue Santee, CA 92071	Helen Perry Stormwater Program Manager 10601 Magnolia Avenue Santee, CA 92071
18. City of Solana Beach	Dan Goldberg Principle Civil Engineer 635 South Highway 101 Solana Beach, CA 92075	Taryn Dunbar Assistant Civil Engineer 635 South Highway 101 Solana Beach, CA 92075
19. City of Vista	Paul Hartman Storm Water Program Manager 200 Civic Center Drive Vista, CA 92084	Paul Hartman Storm Water Program Manager 200 Civic Center Drive Vista, CA 92084
20. San Diego Unified Port District	Karen Holman Manager, Environmental Programs P.O. Box 120488 San Diego, CA 92112-0488	Karen Holman Manager, Environmental Programs P.O. Box 120488 San Diego, CA 92112-0488

Copermittee	Primary Administrative Contact (Official Mailing Contact)	Primary Technical Contact (Day-to-day Contact)
21. San Diego County Regional Airport Authority	Paul Manasjan Director, Environmental Affairs P.O. Box 82776 San Diego, CA 92138-2776	Richard Gilb Manager, Environmental Affairs P.O. Box 82776 San Diego, CA 92138-2776

1.D BACKGROUND TO ROWD DEVELOPMENT

Prior to initiating work on the ROWD, the Copermittees recognized a need for dialogue on long-term strategic planning. Considerations included:

- In addition to the 2007 Order, Copermittees are faced with new and more stringent water quality mandates, including total maximum daily loads (TMDLs) and Areas of Special Biological Significance (ASBS). There is an urgent need to integrate and streamline the many programs and activities required by these different regulations so that limited resources can be prioritized and put to their best use.
- There is an increasing need for improved efficiency and effectiveness, and reduced redundancy in programs.
- There is a need to connect Copermittee activities to demonstrated improvements in water quality.
- There is an ever-increasing reality of diminishing resources at the local level.

It is in this context that spurred Copermittees to develop an overarching 20-year vision that would help guide watershed management decision-making that is both effective in improving water quality and efficient in the use of public funds. The results of the Copermittees' visioning process, which took place between September and November of 2010, are summarized in Section 1.E. Results from the visioning provide an important foundation upon which specific recommendations in this ROWD are based. The vision will continue to be used beyond the timeframe of this Permit reissuance.

In addition to visioning, the Copermittees conducted an extensive Permit review process between May 2010 and June 2011 that was wholly or partially dedicated to reissuance topics. Some of the more important forums for discussion are discussed below.

Reporting and Assessment Standards Evaluation Workshops. In February 2010, two Copermittee workgroups (the Regional WURMP Workgroup and the Fiscal, Reporting and Assessment Workgroup) jointly initiated a project to begin developing recommended reporting and assessment standards for Jurisdictional Urban Runoff Management Programs (JURMPs). Between May 25 and July 10, 2010, workshops were held to help promote consistency in how Copermittee programs are reported and assessed. The results of the workshops are reflected in the final recommendations of this ROWD.

Meetings with RWQCB Staff. Critical dialogue between Copermittees and RWQCB staff took place on the following dates:

- Feb. 8, 2011
- April 6, 2011
- April 19, 2011

The first meeting dealt with broad conceptual issues. During the meeting, RWQCB staff informed the Copermittees of its intention to issue a single municipal stormwater permit for the San Diego region. Under this scenario, the upcoming San Diego County reissuance would represent the first leg of a process that would eventually bring in south Orange and south Riverside Counties. RWQCB staff also expressed a desire for more emphasis on using water quality monitoring information to drive management actions under the new Permit, with a corresponding decrease in jurisdictional reporting.

The second meeting included an overview of results from the Copermittees' Watershed Visioning workshops, and how they are likely to inform the ROWD. The remainder of the meeting was dedicated to "brainstorming" ideas for a new permit, with much of the discussion focusing on: (1) an overall adaptive management permit framework, (2) watershed and TMDL integration, (3) the role of reporting and assessment, and (4) permit performance standards.

The third meeting focused solely on water quality monitoring issues and approaches. Copermittees presented preliminary results and recommendations from their ongoing extensive review of monitoring programs. That content, which has since undergone additional refinement, is reflected in this ROWD (Section 2.b. and related attachments) as well as the LTEA.

Permit Reissuance Workgroup Meetings. After the initial meeting with RWQCB staff, the Copermittees established a dedicated workgroup (subordinate to the Regional Program Planning Subcommittee) to oversee the development of the ROWD and LTEA. This workgroup was responsible for generating potential content, overseeing consultant support, interfacing with RWQCB staff, and keeping Copermittees informed and updated.

Regional Monitoring ROWD Sub-workgroup Meetings. A dedicated workgroup (subordinate to the Regional Monitoring Workgroup) was also formed to review existing monitoring approaches, develop recommendations for potential changes to monitoring programs, oversee consultant support related to monitoring content in the LTEA and ROWD, interface with RWQCB staff, and ensure Copermittee participation throughout the review process.

Copermittee Permit Reissuance Workshops. To ensure broad and inclusive input from all 21 Copermittees, four workshops were held to allow discussion among Copermittee representatives regarding reissuance topics and potential content.

- Workshop 1: March 29, 2011

- Workshop 2: April 26, 2011
- Workshop 3: May 31, 2011
- Workshop 4: June 16, 2011

The purpose of these workshops was to brief Copermittees on ongoing content development, to seek their input, and to validate and refine potential recommendations developed by the ROWD workgroups described above. The first two workshops addressed both monitoring and broader ROWD content. The third focused solely on monitoring issues. The last workshop provided an opportunity for Copermittees to comment on and discuss the draft ROWD and LTEA documents.

Additional Input from Regional Workgroups. On April 7, 2011, the County of San Diego requested that all Copermittee workgroups provide subject area input on reissuance. Workgroups were specifically asked to identify anything within their respective subject areas that should be modified in, removed from, or added to, the current Permit. Input provided by these workgroups is reflected as applicable in ROWD Section 2.

The recommendations and discussion presented in this ROWD represent a consensus of Copermittees as developed through this extended dialogue. However, it should also be understood that consensus is not always unanimity. Individual jurisdictions reserve the right to dissent from, or address issues not reflected in, the content of this ROWD during the remainder of the permit reissuance process.

1.E A VISION FOR URBAN RUNOFF MANAGEMENT IN SAN DIEGO

The San Diego region continues to face many challenges associated with protecting its precious and finite water resources. Urban runoff has been identified as impacting the water quality of the region's ocean, bays, streams, and other water bodies. Local jurisdictions have important responsibilities to implement programs to protect and improve the quality of these watersheds and water bodies, but often find that progress is hampered by resource limitations and a lack of knowledge or consensus on how best to move forward. This desire for additional clarity and coordination led the Copermittees to pursue a series of visioning workshops in Fall 2010. Over the course of five workshops, the Copermittees identified a consensus-based strategy for protecting water quality and local watersheds in a long-term, sustainable manner. While this strategy addresses some issues that are beyond the scope of the Copermittees' responsibilities under the2007 Order, it provides a comprehensive, iterative, and adaptive strategy that the Copermittees wish to pursue in the next and future permit terms.

1.E.i Visioning Effort

Five regional Copermittee workshops were held to develop consensus-based vision, goals, and objectives for the future state of urban runoff and surface water protection in the San Diego region:

- Workshop 1: September 2, 2010

- Workshop 2: September 14, 2010
- Workshop 3: October 4, 2010
- Workshop 4: October 14, 2010
- Workshop 5: November 30, 2010

Each workshop was professionally facilitated to ensure that all objectives were completed within the projected scope of the workshops, and that all participants had sufficient opportunity to provide input. Ground rules were agreed upon at the first meeting. All workshops were attended by a majority of Copermittees. A planning workgroup also met extensively between the workshops to review and document results, and to prepare materials for ensuing discussion.

1.E.ii Vision, Goals, Objectives

A vision statement and supporting goals were crafted by the Copermittees (**Table 1.3**) to guide the planning of specific activities and programs over a 20-year horizon.

Table 1.3: Watershed Vision, Goals, and Objectives

Vision	Our vision is for the protection of water quality in our streams, bays, ocean, and other water bodies that benefits wildlife, recreation, the environment, and other community needs as supported by sustainable stormwater management.
Goal 1	Protect and restore appropriate beneficial uses for prioritized water bodies impacted by stormwater. Objectives • Establish source, constituent, and water body priorities for each watershed • Promote beneficial use designation and water quality objectives that are scientifically valid • Reduce flows and pollutant loads from stormwater that adversely impact receiving water integrity • Promote watershed stewardship as a social standard • Support the identification and development of sustainable projects that provide diverse habitats and water quality benefits
Goal 2	Achieve sustainable stormwater management that balances social, economic, and environmental needs. Objectives • Promote public policy that supports sustainable stormwater management • Obtain public support for long-term and reliable funding for stormwater programs • Involve the public in understanding and defining sustainable stormwater management
Goal 3	Focus stormwater management on sources and practices that jurisdictions have the ability to affect or control. Objectives • Identify the pollutant of concern loads that are attributable to stormwater • Work with regulatory agencies and other parties to ensure that pollutant sources are re-assigned to the appropriate regulatory process (air, water, and waste) • Promote public policy that reduces pollutants of concern through source product

	replacement/substitution/application
Goal 4	Support development of a regulatory framework and establish an organizational structure that facilitates implementation of the most effective and efficient stormwater management program. <u>Objectives</u> • Focus assessment on information needed to implement the most effective control strategies and adaptive management • Establish and organizational and workload structure that focuses stormwater program implementation at the watershed or other appropriate scale • Streamline program implementation, reporting, and assessment • Develop TMDL implementation plans that integrate sustainable stormwater management.

Although each goal in the Copermittees' Vision is relevant to the programs and activities required under the 2007 Order, Goal 4 is particularly relevant to the reissuance process*. To achieve Goal 4 – Support development of a regulatory framework and establish an organizational structure that facilitates implementation of the most effective and efficient stormwater management program* – the Copermittees have identified a watershed adaptive management framework that should serve as the basis for the Permit renewal process. The framework is described in detail in Section 3.

1.E.iii Key Concepts from the Copermittees' Vision

The following five key concepts were distilled from the visioning workshops. These concepts establish a set of guiding principles for permit reissuance, and inform the remainder of this ROWD.

- *Simplified reporting* (e.g., JURMP checklist, integrating multiple reports into a single watershed-based report)
- *Streamlined and more meaningful assessment* (e.g., collaborative efforts to assess the efficiency of BMPs and pollutant-generating activities)
- *Better coordinated water quality monitoring* (increased regional / watershed efficiencies)
- *Enhanced TMDL focus* (e.g., better integration of WURMP and TMDL programs)
- *Increased emphasis on strategic planning* (e.g., regionally coordinated efforts on addressing program funding, regulatory changes, and true source control initiatives)

1.F GENERAL PERMITTING ISSUES

This section introduces some of the general issues that should be explored in more depth during the Permit reissuance process. Some of these issues are explored in further detail in ROWD Sections 2 and 3.

1.F.i Adoption of a Region-wide Permit

During the south Orange and south Riverside County Permit hearing processes, and in meetings with San Diego Copermittees to date, RWQCB staff has expressed its intention to adopt a single, region-wide

Permit covering the portions of all three Counties within Region 9 boundaries. Under this scenario, San Diego would be the first in, and the others would follow on their next scheduled reissuances (December 2014 and October 2015, respectively), or sooner.

While a single, region-wide Permit might present some potential process efficiencies, there a number of issues that warrant additional discussion with Copermittees and RWQCB staff. Among the outstanding questions to be addressed are the following:

- How would the Permit be structured?
- What other permitting authorities in the U.S. have considered or adopted region-wide permits? Is staff reviewing those permits and re-issuance processes? If so, what were the key issues and concerns raised, and how were they resolved?
- Would all three regions have identical conditions, or would some requirements be unique to individual regions?
- Could specific conditions in any of the individual Permits be omitted from the region-wide Permit, or would the starting point be the sum of all existing conditions in the three Permits?
- Would the three regions be required to collaborate? If so, how?
- Would there be a single region-wide "principal" Copermittee? If so, what would its responsibilities be?

The ideas and recommendations presented in this ROWD can be addressed either within or outside of a consolidated, region-wide Permit structure. It is, however, critical that the details of a proposed Permit structure be put forth as early as possible. We therefore recommend that a dialogue dedicated solely to Permit structure be initiated with RWQCB staff and representatives of all three Permit regions, and that these discussions initially be held independently of those involving other permitting issues.

1.F.ii Watershed-Based Adaptive Management

The Copermittees feel strongly that a reissued Permit must be predicated on an adaptive management framework. Moreover, the watershed appears to be the appropriate scale at which to integrate the many programs and activities targeting water quality improvement. Watershed-based adaptive management will help ensure that programs and activities are effectively addressing the pollutant-generating sources and activities causing each watershed's priority water quality problems. This is critical to ensuring the best use of limited resources. The Watershed Adaptive Management Strategy described in ROWD Section 3 is also in line with the desire expressed by RWQCB staff to issue a watershed-based Permit that is more strategic and less prescriptive.

1.F.iii Timeline for Establishing and Updating Watershed-Based Programs

Under the reissued Permit, it is inevitable that program modifications will initially be necessary in response to new requirements, and also as part of an ongoing adaptive management process. In both cases, it is critical that consistency and quality of effort be foremost considerations, and that Copermittees be provided the time necessary to carry these changes through. Rather than setting out generic schedules for program updates, the reissued Permit should realistically reflect all of the intermediate steps necessary to fully implement each new or modified mandate, and the time needed to complete it. This is particularly true as we transition from the existing JURMP/WURMP structure to a Watershed Plan approach (see Section 3). Among the process considerations that may be relevant to each are the following:

- Collaborative or individual development and approval of new programs, collaborative standards, or Watershed Plans;
- RWQCB review and/or approval of new or modified core programs, Watershed Plans, annual reports, or other key work products;
- Development of reporting and assessment standards to ensure consistency amongst Copermittees, and to allow watershed and regional consolidation of results;
- Development and adoption of ordinances or other legal authorities;
- Modification of individual Copermittee programs in accordance with new Permit requirements, group standards, program implementation results, monitoring results, or other feedback;
- Adoption of modified budgets to support increased implementation costs; and
- Development of new or modified monitoring programs.

1.F.iv MS4 Action Levels

Action Levels, as applied in the south Orange and south Riverside County permits that were recently adopted by the RWQCB, are triggers used to define specific follow up actions to be undertaken by Copermittees when results of monitoring at MS4 outfalls exceed prescribed limits. Both permits incorporate two forms of Action Levels, non-stormwater dry weather action level (NALs) for dry weather discharges and Stormwater Action Levels (SALs) for wet weather discharges.

The Copermittees recognize the presence of NALs and SALs in the Orange and Riverside permits, and acknowledge the stated intention of RWQCB staff to utilize them in the Region-wide Permit. At the same time, RWQCB staff has expressed a desire to issue a Permit that is more strategic, less prescriptive, watershed-based, and more oriented to the evaluation of changes in MS4 discharge quality. While it is

unclear how RWQCB staff propose to use Action Levels to support this updated approach, it is clear that MS4 outfall monitoring would be a critical component of it. Prior to the adoption of the reissued Permit, Copermittees wish to explore with RWQCB staff an appropriate application of Action Levels that would make best use of limited resources and contribute to actual improvements in water quality. Some of the Copermittees' initial considerations for discussion are summarized below. The following is based on the Copermittees' review of the south Orange and south Riverside County Permits, and is intended to further discussions with RWQCB staff.

Potential Use of Action Levels as Triggers for Immediate Investigations

Comparison of MS4 outfall monitoring results to NALs and SALs is not likely to improve the Copermittees' ability to identify and abate illegal connections and illicit discharges (IC/IDs) to the storm drain system. ROWD Section 2.B and Attachment 1-1 discuss how implementation of a similar IC/ID program under the 2007 Order has had a very low success rate in identifying IC/IDs. Since NALs and SALs are assessed at the "end of pipe", an even lower success rate would be expected since the point of monitoring is further downstream and therefore further removed from potential upstream sources. In addition, samples submitted for laboratory analysis can often take weeks to return results. This further reduces the usefulness of NALs and SALs as tools to abate IC/IDs, particularly for discharges that are transient in nature. As explained in ROWD Section 2.B., the Copermittees suggest that a more appropriate trigger for immediate IC/ID investigations would be observations at the time of a field visit.

Potential Use of Action Levels for Long-Term Program Planning

Though limited in their ability to help Copermittees detect IC/IDs, Action Levels could be more useful in guiding the review, analysis, and refinement of Copermittees' programs over a longer-term period. For example, a statistically valid analysis of change in MS4 results over time could be explored as a determinant of program success. However, if sample sizes or analytical timeframes are too limited, the usefulness and validity of results would be compromised. Given the significant cost of water quality monitoring, consideration may need to be given to pooling and analyzing results over broader geographic scales (e.g., regionally) and longer time frames than those envisioned in the south Orange and south Riverside Permits. Moreover, to remain consistent with a strategic and watershed-based approach, Action Levels should be limited to constituents identified as watershed priorities. Information on MS4 outfall results for non-priority constituents could be utilized at periodic intervals to assess the appropriateness of watershed priorities, but follow-up action in the form of programmatic response to results should be limited to firmly established watershed priorities. Finally, the possibility of relief from some prescriptive Permit requirements based on demonstrated progress toward compliance with NALs and/or SALs should be explored. In instances where a Copermittee can demonstrate that core requirements are unrelated to priority water quality problems in the watershed, NAL and SAL results might be used to support a reduction in, or removal of, certain core requirements. This should be further discussed as part of the development of a watershed adaptive management strategy.

1.F.v Unfunded Mandates

The 2007 Order imposes a number of requirements that the Copermittees allege constitute an unfunded state mandate under Government Code Title 2, Division 4, Part 7 (State-Mandated Local Costs). A test claim was filed by the County of San Diego on June 20, 2008, and 19 other Copermittees were added in August 2008. The State Mandates Commission conducted a hearing on March 26, 2010, and issued a final Statement of Decision on March 30, 2010. In it, the Commission partially approved the Copermittees' test claim, finding that the following activities required under the 2007 Order constitute a reimbursable state-mandated new program or higher level of service:

- Street sweeping / reporting [Permit Sections D.3.a.(5) and J.3.a.(3)(c)(x-xv)]
- MS4 cleaning / reporting [Permit Sections D.3.a.(3) andJ.3.a.(3)(c)(iv)-(viii)]
- Educational component [Permit Sections D.5.a.(1)-(2); D.5.b.(1)(c)-(d); D.5.b.(3)]
- Watershed activities [Permit Sections E.2.f and E.2.g]
- Regional URMP [Permit Sections F.1, F.2, and F.3]
- All Copermittee collaboration [Permit Section L.1.a.(3)-(6)]
- Program effectiveness assessment [Permit Sections I.1 and I.2]
- Long-term effectiveness assessment [Permit Section I.5]

The Commission also found that the Low Impact Development and Hydromodification Plan development requirements were new programs or increased levels of service that exceeded the requirements of federal law, but concluded that the Copermittees had adequate fee authority to fund those two program elements. On July 20, 2010, the Department of Finance filed a Petition for Writ of Administrative Mandamus to overturn the Commission's decision. In August 2010, the Copermittees filed a cross-petition also challenging the Commission's decision with respect to the Copermittees' fee authority for Low Impact Development and Hydromodification Plan development, and the use of SB 310 Fee Authority for developing Watershed Management Plans. It is uncertain when a final judicial resolution of this lawsuit will be obtained, but the Copermittees anticipate that a final decision may be issued in 2012.

Assuming that the Commission's decision is at least partially upheld by the courts, some requirements of the 2007 Order, if carried through to the new Permit, will continue to constitute unfunded mandates. As such, the State legislature would either be required to appropriate funding to reimburse Copermittees for these costs, or the mandates would have to be suspended.

This also has bearing on the content of this ROWD. While the Copermittees have worked in good faith to identify and describe potential improvements to existing programs and Permit approaches, it must be

emphasized that the content of this document has not been evaluated against the requirements of Government Code Title 2, Division 4, Part 7. It is our expectation that in developing specific Permit requirements, RWQCB staff will conduct such analysis as they determine necessary, and that responsibility for doing so is entirely with the RWQCB. This position is supported by the Commission's March 2010 Statement of Decision, wherein they specifically contradicted State Board claims that a ROWD can be considered a "proposal" by dischargers, i.e., that ideas put forth by the Copermittees do not constitute unfunded mandates because they suggested them.

The Copermittees maintain that the specific content and suggestions put forth in this ROWD are intended solely to advance ongoing dialogue with RWQCB staff, and to identify potential options to be explored in a reissued permit. As such, the development and adoption of specific permit provisions remain solely the responsibility of the RWQCB and its staff. In addition, as noted in footnote 1 on page 1 of this ROWD, the Copermittees are legally required to submit this ROWD and to address the program changes as set forth in Section J.2.d of the 2007 Order; thus, the content and suggestions in this ROWD are legally mandated and should not be construed as being voluntary.

Section 2 Recommended Modifications to Order R9-2007-0001 Management and Monitoring Programs

Copermittees are currently implementing comprehensive stormwater management programs consistent with the 2007 Order. As part of the development of this Report of Waste Discharge (ROWD) they have carefully evaluated their current programs to identify opportunities for improvement.

ROWD Section 2.A discusses each of the primary jurisdictional program components ("core programs") contained in sections D, I, and J of the 2007 Order , first by providing an brief overview of the current Permit-defined effort and then providing recommendations for modifying the core program. Modifications to Permit Section E (Watershed Urban Runoff Management Program) are not addressed. The Copermittees' recommendations for watershed-based adaptive management contained in ROWD Section 3 should be considered a recommended alternative to Permit Section E. However, given that the Watershed Plans discussed in ROWD Section 3 represent an iterative process whereby specific strategies would be developed and modified over time, it is likely that Copermittees would require, with justification, additional flexibility to modify core programs within a watershed.

Regional Urban Runoff Management Program (Permit Section F) requirements are not addressed here. As discussed in ROWD Section 3.C, the Copermittees recommend that the reissued Permit not contain prescriptive regional implementation requirements, but that they be allowed to use regional activities and programs as an option for partially or wholly satisfying specific Watershed Plan requirements.

ROWD Section 2.B discusses alternatives to the existing monitoring program. Attachments 2.1-2.3 provide detailed analysis to justify these proposed changes.

2.A MODIFICATIONS TO CORE JURISDICTIONAL STORMWATER MANAGEMENT PROGRAMS

This section describes specific recommended modifications to core jurisdictional programs that, if adopted, would be effective on issuance of the new Order. As described in ROWD Section 3, these core requirements would also be subject to modification as part of the development and updating of Watershed Plans.

The Copermittees recommend that, with justification and RWQCB staff approval, the Order allow the future modification of jurisdictional core requirements during the development and updating of the Watershed Plans described in ROWD Section 3. Under the Watershed Plans, Copermittee efforts would increasingly be directed to the constituents and sources of most importance to each Watershed Management Area. Corresponding modifications to core requirements must be allowed to ensure that Copermittee resources can be used where they're most needed.

The remainder of this section applies only to those core requirements effective upon Permit reissuance. This content should be considered to represent a starting point and informational basis for considering and developing the updated core program requirements that will be identified in the new Permit.

During the development of Watershed Plans after the adoption of the new Permit, each Copermittee would optimize the implementation of the various core programs in order to target watershed priorities and maximize the efficiency of its overall implementation efforts in the watershed. These adjustments would need to meet clearly-defined criteria designed to provide reasonable assurance that the adjustments, when considered cumulatively, would enhance the overall efficiency and effectiveness of a Copermittee's actions in a watershed.

In subsequent years after the Watershed Plan has begun implementation, the Copermittees would continue to consider and implement modifications to core programs as part of an iterative, watershed-based adaptive management process that should also be clearly defined in the new Permit.

2.A.i Development Planning Component (Permit Section D.1)

Existing Core Program

Each Copermittee implements a Development Planning Component to minimize the short- and long-term impacts on receiving water quality from new development and redevelopment. Jurisdictions are currently implementing the following general control measures associated with this Component:

- Assessing and modifying general plans to ensure that land use decisions are adequately guided by water quality and watershed protection principles.
- Revising environmental review processes to include requirements for evaluation of water quality effects and identification of appropriate mitigation measures.
- Educating municipal staff and affected parties to ensure their understanding of applicable water quality laws and requirements and methods for minimizing the impact of development on water quality.
- Implementing a development project approval procedure so that priority projects are required to implement: source control BMPs; site design/landscape characteristics, where feasible; structural treatment control BMPs; and buffer zones for natural water bodies, where feasible.
- Requiring the development a Standard Urban Storm Water Mitigation Plan (SUSMP) for all new development and significant redevelopment projects falling under specified priority project categories.
- Requiring all priority projects to mitigate the water quality storm volume or flow through the use of infiltration, filtration or other treatment control BMPs.
- Developing and implementing a hydromodification management plan (HMP). The HMP requires that post-project runoff flow rates and durations do not exceed pre-project flow rates and durations where the increased flow rates and durations result in increased potential for erosion or other adverse impacts on beneficial uses.
- Developing a monitoring program to assess the impacts of the recently adopted Regional HMP.

Recommendations for Program Modification

Limits on Further Updates to Existing SUSMP and HMP Programs

The Copermittees recommend that existing SUSMP and HMP programs be evaluated over the next 5-10 years, and that future Permit modifications not be considered until results have been observed and monitoring data have been collected to provide a sufficient basis to validate and refine existing approaches. Other than allowing minor modifications needed to improve programs and realize efficiencies, changes to SUSMP and HMP requirements should not be considered until such time, i.e., not sooner than the 2017 Permit reissuance.

The 2007 Order required multiple updates to Copermittee SUSMP and HMP initiatives, each of which required an extensive effort on behalf of the Copermittees, e.g., to take documents through their respective adoption processes, to update technical reference manuals, and to re-train staff and the regional consulting community. Copermittees have spent considerable time and money to develop and update these approaches. SUSMP changes under the 2007 Order were substantive and incorporated a whole new LID approach that requires time to validate. These programs need time to mature and for Copermittees and the development community to gain experience in implementing them. They should not be substantively modified in the new Permit. Instead, results should be collected for a minimum of 5-10 years. Any future modifications to the programs should be based on observations made from implementing the SUSMP and HMP programs rather than incorporation of new or different requirements for which such analysis has not yet been conducted.

Limits on the Applicability of SUSMP and HMP Requirements

The Copermittees recommend that the applicability of all existing SUSMP and HMP requirements be evaluated during the reissuance process. We suggest the following principles inform this review and deliberation:

- *<u>Requirements for all projects (small "mom and pop," road widening, etc.) should reflect relative risk and cost-effectiveness</u>. Small projects often do not present the same threat to water quality as larger developments, but the financial burden of meeting Permit requirements can be proportionally much greater than for large developers. Likewise, significant limitations and constraints exist for incorporating HMP requirements into new linear projects (e.g., road widening). The tiering of requirements should be explored, e.g., based on size (for projects between 5000 square feet and 1 acre versus projects greater than an acre) or location (less risk if project is not near an impaired water body). Lower risk projects might be limited to meeting general source control and/or LID requirements, and HMP and TCBMP requirements introduced only above defined thresholds.*
- *<u>Impracticability provisions should apply to HMP facilities</u>. These provisions in the 2007 Order apply only to treatment control BMPs (TCBMPs). However, the same considerations that could make TCBMP placement impracticable also apply to HMP facilities. The Permit should allow impracticability determinations for HMP facilities. As an example, the San Francisco Municipal*

Regional Permit has an impracticability provision that includes considerations of space limitations and reasonable cost.

The Copermittees also believe that additional focused discussions on the applicability of specific SUSMP and HMP requirements would help to better focus the Permit where it will have the greatest impact and cost-efficiency.

Baseline Requirements for HMP Projects

The Copermittees recommend that the "pre-project" baseline used in the 2007 Order for HMP projects be retained in the reissued Permit.

The 2007 Order requires that Copermittee HMP requirements be implemented through local SUSMPs so that post-project runoff discharge rates and durations do not exceed estimated pre-project discharge rates and durations where the increased discharge rates and durations will result in increased potential for erosion or other significant adverse impacts to beneficial uses. Copermittees have put forth considerable effort and expense in meeting these requirements, which is especially difficult for road improvements and redevelopment projects in particular.

Under the south Orange and south Riverside Orders, HMP requirements must be implemented so that estimated post-project runoff discharge rates and durations do not exceed pre-development discharge rates and durations (i.e., naturally occurring conditions). Copermittees are concerned about the potential imposition of this more restrictive standard for the San Diego Region.

Changing the baseline to "pre-development" will make it impracticable for cities to meet increased traffic capacity demands for existing roads and will greatly hamper plans to densify existing urban areas through redevelopment and infill projects as an alternative to continued urban sprawl. Moreover, there is an existing, unanswered legal question about whether the Copermittees' police power authority would provide them with sufficient legal authority to regulate runoff based upon pre-development, as opposed to pre-project, discharge rates and durations. Until there is sufficient legal clarity on the authority of Copermittees to so regulate, the language in the 2007 Order should be maintained. The Copermittees believe that any substantive modifications to current HMP requirements should be based on analysis of data and implementation experience over the next 5-10 years, as well as a thorough analysis of the legal authority needed to support them.

TCBMP Maintenance Inspection Requirements

The Copermittees recommend that the TCBMP maintenance verification requirements of the 2007 Order be modified to reduce duplication, and to increase flexibility in allocating staffing resources.

The 2007 Order requires annual verification of the effective operation and maintenance of each approved treatment control BMP by responsible parties. Moreover, it requires that Copermittees conduct independent inspections of all high priority TCBMPs, 50% of projects with drainage inserts, and a minimum of 20% of the total number of projects with approved treatment control BMPs.

Under the south Orange and south Riverside Orders, Copermittees are given greater flexibility in the selection of methods to verify effective TCBMP operation. In particular, these Copermittees must verify maintenance and effective operation of TCBMPs through a combination of "inspections, self-certifications, surveys, or other equally effective approaches." While both Permits contain minimum inspection requirements for projects with high priority TCBMPs, they do not independently require that the effective operation and maintenance each inventoried TCBMP be annually certified by the responsible party. Moreover, the south Riverside Permit does not require that at least 50 percent of projects with drainage insert treatment control BMPs be inspected annually, as do the San Diego and south Orange County Permits. Clearly, the conditions of the south Orange and south Riverside Permits are more flexible, and allow a more efficient use of Copermittee resources than does the 2007 Order. Moreover, differences in approaches between the three permits should be more fully explored and better aligned in the future.

2.A.ii Construction Activities Component (Permit Section D.2)

Existing Core Program

Each Copermittee implements a Construction Component to minimize the near-term impacts of construction activities on receiving water quality. Jurisdictions are currently implementing the following general control measures associated with this Component:

- Implementing a plan review processes to incorporate jurisdictional requirements.
- Creating a prioritized watershed-based inventory of all construction sites prior to the rainy season.
- Requiring minimum BMPs for high, medium, and low priority construction sites during all phases of construction.
- Inspecting construction sites at defined frequencies during the wet and dry seasons.
- Obtaining legal authority through the jurisdictional construction ordinances and permits to regulate all construction sites.
- Notifying the RWQCB of non-compliant sites via a reporting system.

Recommendations for Program Modification

The Copermittees recommend that they be given greater flexibility in implementing their Construction Components. At a minimum, this should include greater discretion in determining appropriate construction site inspection frequencies.

The 2007 Order establishes both priorities <u>and</u> mandated minimum inspection frequencies for regulated construction sites. This leaves Copermittees very little room in adjusting site requirements or inspection strategies for individual sites. For example, the current Permit does not allow a Copermittee to reduce inspection frequencies on inactive sites that have been stabilized. Moreover, construction sites disturbing greater than one acre of land area are concurrently subject to oversight and inspection by RWQCB staff under the State Construction General Permit (CGP), which has been reissued since the adoption of the 2007 Order . Copermittees should have the ability to take these and other relevant

considerations into account when establishing specific requirements and oversight strategies for these sites. In contrast, Permit Section D.3.b identifies industrial and commercial source types that must be addressed by the program, but leaves critical details such as site prioritization and inspection priorities up to individual Copermittees. Construction program requirements should be structured in a way that similarly allows Copermittees the discretion to best use the resources available to them.

2.A.iii Municipal (Existing Development; Permit Section D.3.a)

The Existing Development Component of the 2007 Order encompasses several sub-components which are addressed in further detail below.

Existing Core Program

Each Copermittee implements a Municipal sub-component to minimize pollutants in runoff from municipal facilities and activities. Municipal operations encompass a wide variety of activities and facility types (i.e., sources), some of which have the potential to generate pollutant loads in runoff. Jurisdictions are currently implementing the following general control measures associated with this sub-component:

- Developing a prioritized, watershed-based inventory of municipal sources, including at least the following high priority sources and activities:
    - Roads, streets, highways, and parking facilities;
    - Flood management projects and flood control devices;
    - Areas and activities tributary to a CWA Section 303(d) impaired water body segment, where an area or activity generates pollutants for which the water body segment is impaired. Areas and activities within or adjacent to or discharging directly to coastal lagoons or other receiving waters within environmentally sensitive areas;
    - Municipal waste facilities (active or closed landfills; publicly-owned treatment works; solid waste transfer facilities; land application sites; corporate yards; and household hazardous waste collection facilities);
    - Municipal airfields;
    - Parks and recreation facilities;
    - Special event venues following special events;
    - Power washing; and
    - Other sources determined to be significant by the Copermittee.
- Requiring and implementing BMPs at these and other specified sources or facilities (MS4s and structural controls; application, storage, and disposal of pesticides, herbicides and fertilizers at municipal areas and activities; and municipal sanitary sewers).
- Inspecting facilities for compliance, including annual inspections at high priority municipal sources.
- Enforcing stormwater ordinances as necessary.

Recommendations for Program Modification

The Copermittees recommend that the reissued Permit provide a mechanism either to entirely avoid the inclusion in their inventories of facilities and activities not considered to contribute a significant pollutant load to the MS4, or to remove them when determined appropriate. Additionally, the new Permit should not establish minimum inspection frequencies for any source or source type.

The 2007 Order prescribes the types of municipal facilities and activities that must be addressed by Copermittee programs, including those that must be considered high priority (and therefore inspected at least annually). In practice, many factors determine the threat-to-water-quality of an individual activity or site. Copermittees have multiple years of experience and inspection data that would often justify a decrease in priority or inspection frequency of an individual site. However, since the prescriptive language of the 2007 Order does not allow them this flexibility, facilities and activities not posing a significant threat-to-water-quality continue to be inventoried and inspected, often tying up limited resources.

As is already the case with Section D.3.b.(1) of the 2007 Order (industrial and commercial source identification), municipal inventories should include only those activities and facilities "that could contribute a significant pollutant load to the MS4" rather than requiring that all sources be addressed regardless of threat-to-water-quality. These changes would allow limited Copermittee resources to be better aligned with actual priorities and needs.

2.A.iv Industrial and Commercial (Existing Development; Permit Section D.3.b)

Existing Core Program

Each Copermittee implements an Industrial and Commercial sub-component to reduce the discharge of pollutants in runoff from business sites and activities. Commercial and industrial operations encompass a wide variety of activities and facility types (i.e., sources), many of which have the potential to generate pollutant loads in runoff. Jurisdictions are currently implementing the following general control measures associated with this sub-component:

- Compiling and prioritizing a watershed-based inventory of industrial sites and all high priority commercial sites "that could contribute a significant pollutant load to the MS4". At a minimum, this includes the business types listed in **Table 2.1**.
- Requiring businesses to implement minimum BMPs.
- Inspecting 100% of high priority sites annually, and 25% of all inventoried sources annually.
- Enforcing ordinances at non-compliant sites.
- Reporting industrial sites that may require coverage under the General Industrial Permit to the RWQCB.
- Participating in the development and implementation of a program to reduce the discharge of pollutants from mobile businesses.

Recommendations for Program Modification

The Copermittees recommend that they be given more flexibility in implementing their Industrial and Commercial Components, at a minimum to include greater discretion in determining appropriate inspection frequencies.

The Copermittees believe it is important to utilize their limited resources to focus on the highest threat to water quality sources. While the 2007 Order provides the Copermittees some flexibility in prioritizing sites and inspections, it does not encourage an efficient use of inspection resources.

For example, the 2007 Order requires that the Copermittees develop an inventory (with minimum facility types prescribed by the Permit) and within that inventory identify and annually inspect all high priority facilities. It further requires that each Copermittee perform inspections at 25% of all of its inventoried sites. In many cases, Copermittee resources would be better spent by increasing their focus on the facilities they consider the highest threat to water quality. For instance, if a Copermittee chooses to re-inspect a high priority facility, subsequent inspections should count toward their total inspection obligations (currently to inspect 25% of the total inventory). This is, however, not allowed under the 2007Order. To address such inefficiencies, it makes more sense to allow Copermittees greater discretion in setting their inspection priorities.

Table 2.1: Minimum requirements for Commercial and Industrial Source Inventories

Commercial Sources
• Automobile/Airplane/Boat/Equipment mechanical repair, maintenance, fueling, cleaning • Auto or other vehicle parking lots and storage facilities • Auto and other vehicle body repair or painting • Painting and coating • Mobile auto or other vehicle washing • Botanical or zoological gardens and exhibits • Retail or wholesale fueling • Nurseries and greenhouses • Pest control services • Masonry • Eating or drinking establishments • Cemeteries • Mobile carpet, drape or furniture cleaning • Pool and fountain cleaning • Cement mixing or cutting • Marinas • Landscaping • Port-a-potty servicing • Other commercial sites/sources that the Copermittee determines may contribute a significant pollutant load to the MS4 • Golf courses, parks and other recreational areas/facilities • Any commercial site or source tributary to a Clean Water Act section 303(d) impaired water body, where the site or source generates pollutants for which the water body is impaired • Any commercial site or source within or directly adjacent to or discharging directly to a coastal lagoon or other receiving water within an environmentally sensitive area
Industrial Sources
• Facility that contributes a significant pollutant load to the Copermittee's MS4 • Industrial facility is subject to section 313 Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA) • Industrial site is tributary to a 303(d)-listed water body and generates pollutants for which the water body is impaired • Industrial facilities subject to the statewide General Industrial Permit (SIC codes 0211 through 5171 in particular, although full SWRCB list should be considered • Industrial facilities located within or adjacent to (i.e., within 200 feet) of a coastal lagoon or a receiving water body within an environmentally sensitive area (ESA) or discharges directly to a receiving water body.

2.A.v Residential (Existing Development; Permit Section D.3.c)

Existing Core Program

Copermittees implement a Residential Component to prevent and reduce pollutants in runoff from residential land use areas and activities. Jurisdictions are currently implementing the following general control measures associated with this sub-component:

- Identifying high priority sources. The following activities have been identified as high priority sources of pollutants:
    - Automobile repair, maintenance, washing, and parking;
    - Home and garden care activities and product use (pesticides, herbicides, and fertilizers); and
    - Disposal of household hazardous waste, pet waste, and green waste.
- Additional criteria for identifying minimum high priority residential sources include:
    - Residential sources the Copermittee determines may contribute significant pollutant loads to the MS4;
    - Any residence tributary to a 303(d)-impaired water body, where the residence generates pollutants for which the water body is impaired; and
    - Any residence within or directly adjacent to or discharging directly to a coastal lagoon or other receiving waters within an environmentally sensitive area.
- Requiring BMP implementation.
- Educating residents.
- Responding to complaints.
- Enforcing jurisdictional ordinances, as necessary.

Recommendations for Program Modification

Except as indicated under Education below, the Copermittees do not have recommendations for modification of the residential requirements of the 2007 Order at this time.

2.A.vi Illicit Discharge Detection and Elimination Component (Permit Section D.4)

Existing Core Program

Each Copermittee implements an Illicit Discharge Detection and Elimination Component to eliminate illicit connections and illegal discharges into and from the MS4. Jurisdictions are currently implementing the following general control measures associated with this Component:

- Implementing a program to actively seek and eliminate illicit discharges and connections into its MS4.

- Developing and updating MS4 maps.
- Implementing dry weather field screening and analytical monitoring of MS4 outfalls and other portions of its MS4 to detect illicit discharges and connections.
- Investigating and inspecting potential IC/IDs based on monitoring results and other information.
- Eliminating identified IC/IDs.
- Preventing and responding to sewage and other spills.
- Using public hotlines and other methods to facilitate IC/ID reporting.

Recommendations for Program Modification

As described in Section 2.B.v, the Dry Weather Field Screening and Analytical Monitoring Program, intended to support IC/ID investigations, is not an efficient use of resources, is no longer necessary given other more effective measures that are implemented by the Copermittees (e.g., facility inspections, complaint hotline responses, and public employee surveillance). This program should therefore be discontinued in its current form (see analysis, Attachment1-1) The Copermittees do not have additional recommendations for modification of the IDDEC requirements of the 2007 Order at this time.

2.A.vii Education Component (Permit Section D.5)

Existing Core Program

Each Copermittee implements an Education Component to measurably increase the knowledge of target audiences within its jurisdiction regarding MS4s, the impacts of urban runoff on receiving waters, and potential BMPs. The education component also seeks to provide measurable changes in the behavior of these entities so as to reduce pollutant releases to MS4s and the environment.

The Education Component addresses the following six target audiences:

- Municipal Departments and Personnel
- Construction Site Owners and Developers
- Industrial Owners and Operators
- Commercial Owners and Operators
- Residential Community, General Public, and School Children
- Quasi-Governmental Agencies/Districts (i.e., educational institutions, water districts, sanitation districts)

In addition to these individual efforts, Copermittees implement a Regional Residential Education Program under Section F.1 of the 2007 Order, and within each Watershed Management Area (WMA) develop and implement watershed-based education strategies (Permit Section E.2.f.(4)). For each Permit year, no less than two Watershed Water Quality Activities and two Watershed Education Activities must be in an active implementation phase.

Recommendations for Program Modification

The core educational requirements of the 2007 Order Section D.5 should not be substantially modified at this time. However, the Copermittees recommend that the watershed education requirements of Section E.2.f.(4) and the Regional Residential Education Program required under Section F.1 be removed, and that Copermittees instead be allowed to develop and implement educational activities as needed to support the Watershed Plan strategies described in Section 3 of this ROWD. As described, Copermittees should identify and implement the jurisdictional and regional education activities that they determine to be necessary to support established Watershed Plan objectives.

2.A.viiiPublic Participation (Permit Section D.6)

Existing Core Program

Each Copermittee implements a Public Participation Component to incorporate public participation in the development of its JURMP.

Recommendations for Program Modification

The Copermittees do not have recommendations for modification of the public participation requirements of the 2007 Order at this time.

2.A.ix Reporting and Assessment (Permit Sections I and J)

Existing Core Program

Per Sections I and J of the 2007 Order, Copermittees annually report on and assess the progress and effectiveness of their JURMP, WURMP, and RURMP elements. Annual assessments, which are part of the JURMP Annual Report, typically include:

- Assessment of the effectiveness of:
    - Significant jurisdictional activities and BMPs;
    - Implementation of each major JURMP component (Development Planning, Construction, Municipal, Industrial/Commercial, Residential, Illicit Discharge Detection and Elimination, and Education); and
    - Implementation of the Jurisdictional Urban Runoff Management Program as a whole.
- Identification and utilization of measurable targeted outcomes, assessment measures, and assessment methods for each of the above items.
- Utilization of outcome levels 1-6.
- Utilization of monitoring data and analysis from the Receiving Waters Monitoring Program.

Recommendations for Program Modification

The Copermittees recommend that the reporting and assessment requirements of the 2007 Order be significantly streamlined and simplified. Additional dialogue between the Copermittees and RWQCB

staff should be focused on identifying the most efficient and effective reporting and assessment approaches under a reissued Permit.

The Copermittees also recommend that jurisdictional compliance be monitored through the Watershed annual reports (see Section 3.B.iii).

RWQCB staff would have other means such as meetings and audits available to them to further evaluate jurisdictional compliance. With this change in emphasis, it's unlikely that JURMP Annual Reports would be necessary in the future.

JURMP Annual Reports in particular currently consume an inordinate amount of Copermittee resources to complete. Likewise, their sheer volume makes it very difficult for RWQCB staff to complete timely reviews. This is critical since the 2007 Order relies primarily on the jurisdictional reports for evaluating Copermittee progress and compliance. Assuming a significantly greater focus on watershed programs under the reissued Permit, this will likely be unnecessary. RWQCB staff could instead focus on evaluating Copermittee compliance within the context of each applicable Watershed Annual Report. Other aspects of core jurisdictional compliance could be evaluated in other ways (e.g., audits or specific information requests) and on different time scales (e.g., biannually or as-needed).

2.B MODIFICATIONS TO MONITORING PROGRAMS

The existing monitoring program is summarized in the monitoring attachment of the LTEA report, submitted separately. This section of the ROWD describes preliminary modifications to the monitoring program along with a summary of supporting data analysis. Details of the data analysis are presented in Attachments 2.1 to 2.3. Results from the Copermittees' visioning process informed the Copermittees' modifications to monitoring programs as follows:

- Monitoring results should aid Copermittees in establishing watershed priorities and adjusting watershed plans through the adaptive management strategy (see Goal 1)
- Monitoring should be more responsive to the Copermittees' needs within an adaptive management context (see Goal 4)
- Monitoring activities should be coordinated or leveraged with other monitoring programs including the implementation of TMDLs (see "Key Concepts" in ROWD Section 1.E.iii)
- Monitoring reports should be streamlined (see "Key Concepts", in ROWD Section 1.E.iii)
- Monitoring activities should aid watershed managers in developing watershed priorities based on the contribution of MS4s to identified watershed receiving water issues, the potential for beneficial use impacts, and the Copermittees' ability to control and assess compliance with performance standards, as applicable. (see Goals 1 and 4)

The preliminary monitoring approach emphasizes a Question-Driven Process consistent with the approach taken through the current permit term. In alignment with the Copermittees' proposed adaptive management process, the various monitoring efforts described in this section are designed to inform and assess watershed-based management decisions.

2.B.i Conceptual Monitoring Framework

The Copermittees have developed a Conceptual Watershed Monitoring Framework (Conceptual Framework) designed to serve the needs of the Watershed Plans, and to support the overall goal of reducing discharges of pollutants to the MEP. The Conceptual Framework is shown diagrammatically in **Figure 2.1**.

This framework recognizes that the fundamental purpose of the NPDES permit program is protection of receiving water quality, to support viable beneficial uses of the receiving waters. This underlying purpose then provides the basis for the permit requirements and the content of the Watershed Plans.

The Conceptual Framework incorporates monitoring activities involving two time frames:

- Long-term monitoring (typically conducted for more than 5 years) includes ongoing compliance monitoring of receiving waters, MS4 outfalls, and includes HMP and TMDL compliance monitoring, and
- Short-term monitoring (typically conducted for less than 5 years) involving Targeted Studies that are of limited duration and that are watershed-driven, as-needed, and may include monitoring of receiving waters or MS4 Outfalls, HMP and TMDL monitoring, Source Identification and Prioritization studies, and watershed-specific Targeted Studies, including BMP Effectiveness Studies.

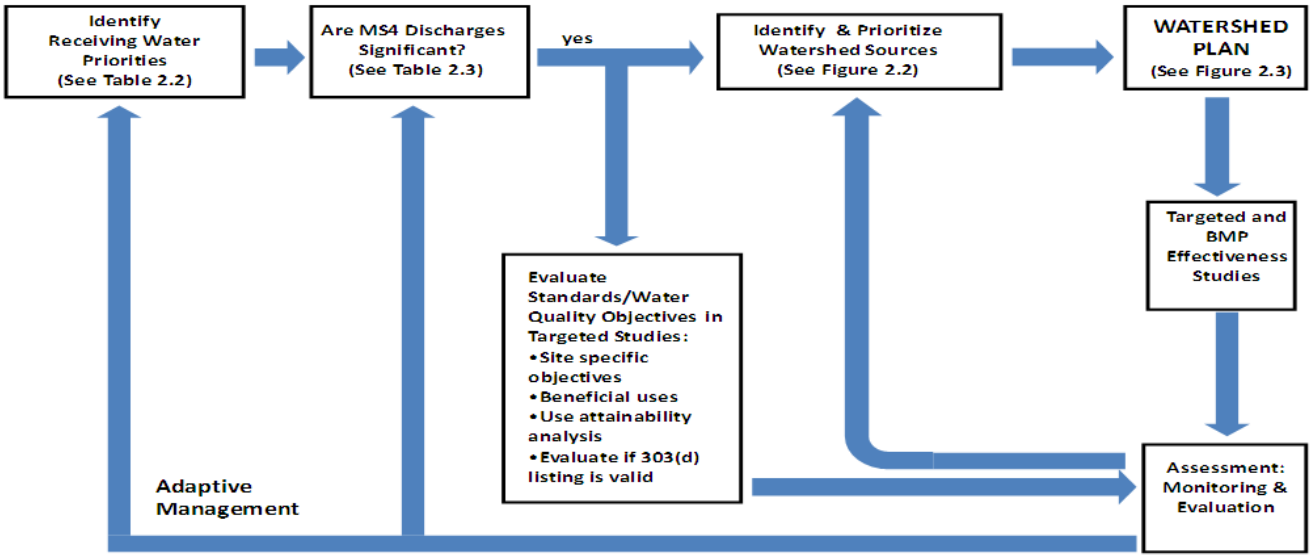

Figure 2.1: Conceptual Framework for Watershed Monitoring

The principal purpose of receiving water monitoring is to assess attainment of designated beneficial uses. Watershed receiving water priorities (Watershed priorities) are well established through prior monitoring of receiving waters in San Diego County (see Attachment 2-1, as well as the LTEA report, submitted separately).

With watershed priorities well established for the next permit cycle, monitoring can be reduced in receiving waters and those efforts refocused to determine to what degree discharges from the MS4s contribute to the identified watershed priorities. Receiving water monitoring may still be necessary to help assess stormwater program effectiveness, as shown in the feedback loop on the Conceptual Framework diagram (Figure 2.1). In this context receiving water priorities also may be revised. The Copermittees' participation in TMDLs also may involve receiving water monitoring to determine the effectiveness of TMDL implementation.

If MS4s are found to contribute significantly to receiving water issues, then follow-up investigation may be implemented within watersheds as indicated in Figure 2-1 (see box under "if yes"). For constituents for which MS4 discharges contribute significantly to confirmed receiving water issues, source identification and prioritization studies may be performed on a constituent-specific basis. Such follow-up investigations may involve monitoring in the form of watershed-driven targeted studies.

The results of the watershed-driven source investigations may then be used in the watershed planning process to develop strategies for reduction of the high priority sources of discharges of the subject constituent.

The Conceptual Framework includes the analysis of appropriate data to evaluate program effectiveness and identify data gaps, if any. This completes the monitoring information cycle to guide the alternate adaptive management approach.

2.B.ii Question-Driven Process

The conceptual framework addresses and clarifies the management questions developed by the Southern California Stormwater Monitoring Coalition (SMC) and listed in the current Permit:

1. Are conditions in receiving waters protective, or likely to be protective, of beneficial uses?
2. What is the extent and magnitude of the current or potential receiving water problems?
3. What is the relative urban runoff contribution to the receiving water problem(s)?
4. What are the sources of urban runoff that contribute to receiving water problem(s)?
5. Are conditions in receiving waters getting better or worse?

For monitoring of receiving waters and MS4 outfalls, including HMP and TMDL monitoring, – a question-driven approach was used to guide the identification of more specific questions or sub-questions, and from those sub-questions were derived the specific activities that may guide monitoring activities for the next permit term. The sub-questions and associated activities are described below for the receiving water and MS4 outfall monitoring categories.

Approaches for source identification, responses to potential action level exceedances, and potential development of watershed-driven targeted studies, as-needed, are outlined below.

2.B.iii Receiving Water Monitoring

In reviewing available receiving water monitoring data, the Copermittees determined the following:

- Watershed priorities are already well-established for the watersheds of San Diego County, based on prior monitoring by the Copermittees and others.
- Existing mass loading stations (MLS) and temporary watershed assessment stations (TWAS) should be consolidated into a smaller number of representative TWAS, with reduced monitoring frequency. Monitoring of 3 to 5 receiving waters stations once every five years should suffice for assessment of long-term trends of constituents per SMC Question 5 (see analysis, Attachment 2-1). In the future, watershed Copermittees will consider the need for focused receiving water studies as initiated through the Watershed Plans.
- Participation in the SMC Regional Monitoring Program is anticipated to be continued, to provide a statistically-sound, representative sampling of receiving water quality in the region's watersheds.
- The Ambient Bay and Lagoon Monitoring program (ABLM) is anticipated to be coordinated with the periodic Bight program monitoring, and integrated with the Copermittees' responsibility to conform to the Statewide Sediment Quality Objectives regulatory program.
- The 2010 HMP Monitoring Plan will continue to be implemented under the next permit.
- Receiving water monitoring conducted in response to adopted TMDLs should replace receiving water monitoring required by the Permit where applicable.
- Where appropriate, the Permit should allow for the trade-off of required monitoring elements in consideration of participation to support the RWQCB's Basin Planning priorities (i.e., evaluating or validating the appropriateness of beneficial use designations and water quality objectives).
- As under the 2007Order, the new Permit should allow a trade-off of required monitoring elements in consideration of participation in the Southern California Bight Regional Monitoring effort. The benefits of participation include regionally consistent data collection, additional in-depth data analysis and the leveraging of San Diego County resources with resources from outside the county.
- The Coastal Storm Drain Monitoring (CSDM) Program (which includes both MS4 outfall and receiving water monitoring) is essentially complete and should be discontinued (see analysis, Attachment 2-2). The CSDM Program has demonstrated that coastal storm drain flows cause few ocean or bay bacterial standard exceedances during dry weather. Less than 2 percent of paired receiving water and coastal storm drain samples collected from 2007-2010 indicate a "linkage", where elevated storm drain concentrations correlate with observed receiving water exceedances of AB 411 bacterial criteria. Of 1,647 individual receiving water bacteria indicator

samples analyzed, only 32 corresponded with elevated bacteria levels in coastal storm drain outfall discharges (3.5 % of paired samples for *Enteroccocus*, 1.5 % of paired samples for Fecal Coliform, and 0.9 % of paired samples for Total Colifoms).

SMC Management questions 1, 2, and 5 address receiving waters. Questions 1 and 2 have been well answered through the receiving water monitoring performed by the Copermittees, as well as work performed by others, including water quality impairments identified per CWA Section 303(d) and Bight Regional Monitoring Studies. Management question 5 addresses the issue of long-term trends; it is assumed that this question will be addressed on a continuing basis over the long term through the Copermittees continued participation in Bight Regional Monitoring Studies.

Preliminary receiving water sub-questions were developed, along with preliminary receiving water monitoring activities to guide the proposed approach in a more targeted manner through the next Permit term, as presented in **Table 2.2**. The management questions shown in Table 2.2 are meant to provide context for the more specific, technical monitoring sub-questions and associated monitoring activities. Monitoring results from any given activity may only partially contribute to answers for the overarching "big picture" management questions.

2.B.iv MS4 Outfall Monitoring

Under an updated approach, the principal role of MS4 Outfall Monitoring in the Conceptual Framework is to provide information on the relative contribution of MS4 discharges of priority constituents to receiving waters. It is recognized that the Permit may include requirements for performance metrics for MS4 discharges, and that outfall monitoring may be required to make the relevant assessments of discharge quality.

In reviewing available MS4 outfall monitoring data collected under the current Permit, the Copermittees determined the following:

- The ongoing MS4 outfall monitoring programs, which include both randomly selected and targeted sites, should be continued, with modifications to the number and distribution of sites as necessary to improve efficiency and value of the data. In particular, outfall monitoring should be evaluated with respect to established watershed priorities and TMDLs, and coordinated so as to provide information on the relative contribution of MS4s to receiving water issues. Outfall monitoring is anticipated to continue during both wet and dry weather conditions where appropriate for safe access and not disturbing critical habitat (Attachment 2-3). Additionally, a focused group of chemical analyses addressing the watershed priorities as is done in the current MS4 Outfall Program should be continued.
- Monitoring of representative outfalls should be considered for TMDL constituents in watersheds where the Copermittees are responsible parties in a TMDL implementation plan and where the outfalls are part of the monitoring plan.
- As described above, the CSDM program (which includes both MS4 outfall and receiving water monitoring) is essentially complete and should be discontinued (see analysis, Attachment 2-2). In addition to the low incidence of correspondence between elevated coastal storm drain outfall bacteria discharge levels and receiving water AB411 exceedances (as described above), the

number of coastal storm drain discharges that reach receiving waters has decreased during the past eight years, from 73 percent to 23 percent. This decrease in discharge flows reaching the receiving waters demonstrates a lower risk of a linkage occurring between coastal storm drains and receiving waters.

- The Dry Weather Field Screening and Analytical Monitoring Program characterizes discharges in the MS4s using a limited list of constituents. This overlaps with the current MS4 Outfall Monitoring Program, which expands the list of constituents and tailors the list to support watershed planning. To avoid this duplication of effort, the MS4 outfall monitoring should be conducted under the MS4 Outfall Monitoring Program instead of the Dry Weather Program (see analysis, Attachment 1-1).

Table 2.2: Preliminary Receiving Water Monitoring Sub-Questions and Activities

Management Question	Preliminary Monitoring Sub-Question	SMC QST No.	Preliminary Monitoring Activity
1. Are the aquatic ecosystems healthy?	What are conditions of benthic fauna in receiving waters?	1,2	Committed to completion of SMC Southern California bioassessment monitoring.
2. How is the health of the streams/rivers affected by urban runoff changing over time?	How are conditions in receiving waters that are affected by urban runoff discharges changing over time?	1,5	Wet Weather: Monitor at 3 to 5 MLS stations (locations to be determined) once per permit term for 3 events during Bight Regional Monitoring Survey. Dry Weather: Monitor at 3 to 5 MLS stations once per permit term (locations to be determined) for 2 events during Bight Regional Monitoring Survey.
3. What are additional receiving water quality problems?	Where data are lacking, what is receiving water quality with respect to watershed priorities and regulatory mandates?	1,2	Focused receiving water monitoring with a minimum of one special study per WMA per permit term coordinated with the Watershed Plans or substitute an equivalent regionally coordinated study (e.g., Bacteria/REC1 Beneficial Use Study) with RWQCB staff approval to evaluate: • Receiving Water Priorities • Triennial Review Priorities • Beneficial Uses and Basin Plan Objectives • 303(d) listings • TMDLs • Impact of MS4 outfalls on receiving waters

Table 2.2: Preliminary Receiving Water Monitoring Sub-Questions and Activities

Management Question	Preliminary Monitoring Sub-Question	SMC QST No.	Preliminary Monitoring Activity
4. How effective are our management actions to meet TMDL requirements?	What is the progress in achieving and complying with adopted TMDLs and WLAs?	1,5, Targeted	Perform compliance monitoring for: • Chollas Creek Diazinon TMDL • Shelter Island Yacht Basin Dissolved Copper TMDL • Chollas Creek Dissolved Copper, Lead and Zinc TMDL • Revised Project 1- Indicator Bacteria TMDLS for Twenty Beaches and Creeks in San Diego Region • Project II – Indicator Bacteria TMDLs in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay
5. Are the bays and estuaries healthy and protective of estuarine beneficial uses?	What is the condition of sediments in enclosed bays and estuaries with respect to the statewide sediment quality objectives?	1,2	Submit a Work Plan to comply with the requirements of State Water Resources Control Board Resolution No. 2008-0070 – Adoption of a Water Quality Control Plan for Enclosed bays and estuaries – Part 1 Sediment Quality

Table 2.2: Preliminary Receiving Water Monitoring Sub-Questions and Activities

Management Question	Preliminary Monitoring Sub-Question	SMC QST No.	Preliminary Monitoring Activity
6. How is the Hydromodification Management Plan being implemented?	a. Do field observations confirm that the HMP appropriately defines the flow rate (expressed as a function of the 2-year runoff event) that initiates movement of channel bed or bank materials? b. Are mitigation facilities adequately meeting flow duration design criteria outlined in the HMP? c. What is the effect of development on downstream cross section incision and widening?	Targeted	a.b.c. Per Revised July 14, 2010 Section 8 of the Hydromodification Management Plan and California Regional Water Quality Control Board, San Diego Region, Resolution No. R9-2010-0066

SMC management question 3 addresses the relative contribution of MS4 discharges to receiving water constituent levels. Preliminary focused MS4 outfall monitoring sub-questions were developed along with preliminary MS4 outfall monitoring activities; see **Table 2.3** below. The management questions shown in Table 2.3 are meant to provide context for the more specific, technical monitoring sub-questions and associated monitoring activities. Monitoring results from any given activity may only partially contribute to answers for the overarching "big picture" management questions.

Table 2.3: Preliminary MS4 Outfall Monitoring Sub-Questions to SMC Question No. 3 and Preliminary Activities

Management Question	Preliminary Monitoring Sub-Question	Preliminary Monitoring Activity
1. Are the MS4s a potential source of priority constituents to receiving waters?	How do representative outfall concentrations compare to concentrations of priority constituents in receiving water?	An analysis of the MS4 outfall monitoring results collected under the 2007 Permit will be conducted when program is completed in 3 years.
2. Is it a system-wide or area-specific water quality issue?	How do MS4 outfall discharge characteristics differ within or between watersheds? (Note: Important for regional issues such as TDS & Bacteria)	An analysis of the MS4 outfall monitoring results collected under the 2007 Permit will be conducted when current program is completed in 3 years.
3. When is the best time to focus management actions and/or BMP implementation?	How do wet weather outfall concentrations compare to dry weather within and among watersheds?	An analysis of the MS4 outfall monitoring results collected under the 2007 Permit will be conducted when current program is completed in 3 years.
4. Which factors influence MS4 outfall discharge water quality?	How do wet season dry weather discharges differ from dry season dry weather discharges? What are the patterns and factors affecting wet weather discharge characteristics?	Perform monitoring to distinguish wet season dry weather from dry season dry weather. Perform appropriate data analysis (e.g., multivariate analysis including land use, geology, drainage acreage, antecedent rainfall conditions, etc.).
5. Are MS4 outfalls water quality improving overtime?	How do representative MS4 outlet discharge concentrations, loads, and flows change over time? (i.e. trends)	Continue to monitor at a sub-set of random MS4 outfall sites to assess long-term trend line

Table 2.3: Preliminary MS4 Outfall Monitoring Sub-Questions to SMC Question No. 3 and Preliminary Activities

Management Question	Preliminary Monitoring Sub-Question	Preliminary Monitoring Activity
6. Are MS4s outfalls meeting Permit Action Levels (if applicable)?	Do discharge concentrations at MS4 Outfall discharges meet permit action levels (if applicable)?	Conduct wet and dry weather monitoring at representative selected sites.
7. What outfalls ("priority outfalls") are contributing most to receiving water?	What outfalls contribute most to loadings for constituents identified as receiving waters priorities? (based on representative outfalls)?	Use monitoring results in numbers 1-3 and 5 and perform data analysis which may include modeling
8. To what extent is watershed plan implementation affecting discharge quality at priority MS4 outfalls?	How do discharge characteristics change over longer term (i.e. trends) at priority outfalls?	Monitor outfalls identified in assessment of number 6

2.B.v Source Identification

The principal role of Source Identification in the Conceptual Framework is to identify and prioritize pollutant generating activities and source categories. Identification of high-priority sources is an important step in support of the watershed planning process, to help inform the development of effective pollutant reduction strategies for particular priority constituents in particular watersheds.

In reviewing available source identification information, the Copermittees determined the following:

- The Copermittees should consider developing a more comprehensive approach to source identification, on a *constituent-specific basis*. These source identification efforts should focus on constituents identified as watershed priorities, and would likely include prioritization of sources based on magnitude, controllability, and other factors.
- The ongoing residential source identification program, which provides information on water quality of discharges from residential land uses, should be completed as planned and then discontinued.
- As described above, the CSDM Program (which includes both MS4 outfall and receiving water monitoring) is essentially complete and should be discontinued (see analysis, Attachment 2-2).
    - Only 4 of the 227 (1.7 percent) coastal storm drains monitored over the past three years were linked more than once to a nearby AB411 exceedance in the ocean or bay. These four coastal storm drains have ongoing source abatement programs.
    - In addition, upcoming Bacteria TMDL monitoring will overlap with CSDM Program requirements. The TMDL will require an implementation plan to assess and prioritize receiving water exceedances caused by outfall discharges.
- The Dry Weather Field Screening and Analytical Monitoring Program, intended to support IC/ID investigations, is not an efficient use of resources, has had a very low success rate in identifying

ICs and IDs, and is no longer necessary given other more effective measures that are implemented by the Copermittees (i.e., facility inspections, complaint hotline responses, public employee surveillance). This program should therefore be discontinued in its current form (see analysis, Attachment 1-1). IC/ID investigations as conducted under the Dry Weather Program are less efficient in detecting and eliminating IC/IDs than hotline call responses (over 1,600 annually), business inspections (over 6,000 annually), and visual surveys of the stormwater conveyance system performed during routine system maintenance and/or cleaning. Based on the number of samples collected through the Dry Weather Program over the past three years, only 3.7 percent of samples collected resulted in a successful detection and elimination of an illicit discharge (87 successful IC/ID investigations out of 23,635 sample analyses from 2007-2009). Copermittees observed that more IC/IDs were identified through complaint referrals than through the Dry Weather Program. The City of Oceanside reported in 2009-2010 that 86 out of 87 IC/IDs identified through their hotline were eliminated, whereas only one IC/ID was identified and resolved through their Dry Weather Program.

SMC management question 4 addresses the sources of MS4 discharges that contribute to receiving water constituent levels. The Copermittees will consider approaching this question principally through a source identification process for individual priority constituents.

As shown in **Figure 2.2**, the Copermittees' preliminary constituent-specific source identification process includes the following steps:

- Step 1: Compile known information on the priority constituent. This information includes potential sources and movement of a particular constituent within the urban watershed. Data generated by others and literature research on the priority constituent will be compiled and analyzed as appropriate.
- Step 2: Based on the compiled information generated on the priority constituent, identify data gaps, if any. Targeted studies may be performed where appropriate. For example, targeted studies to improve our understanding of the fate of a constituent in the environment might be considered.
- Step 3: Based on the information compiled, develop an inventory of sources and consider how to prioritize them within the watershed for potential follow-up action. Examples of prioritization criteria include relative magnitude and controllability.

Figure 2.2: Schematic of Preliminary Source Identification Process

The process outlined above is directed at improving the understanding of the fate, transport, and sources of priority constituents within urban watersheds. Steps 1 and 2 may be conducted at a regional scale to reduce costs. Step 3 will likely be applied within a watershed for that particular priority constituent.

2.B.vi Preliminary Watershed Responses to MS4 Monitoring Results

In the event that the RWQCB imposes NALs or SALs in the new permit, Copermittees recommend that the Permit include an iterative approach for responses to potential exceedances of those NALs or SALs. The overall goal is to provide for a range of responses that is comprehensive, consistent and appropriate to the measured outfall levels. The preliminary approach is outlined in **Figure 2.3**.

If initial field observations indicate a potential illegal discharge that is characterized by unusual odor, color, or sheen, etc, then an immediate response will be initiated. If warranted, a field investigation will be initiated to follow the observed flow upstream, in an attempt to observe the source, with additional water quality measurements performed as needed.

If there is no evidence of a potential illegal discharge, then the follow-up actions would fall into one of the following three categories:

- The receiving water has an active TMDL Implementation Plan, in which case the exceedance will be addressed through the relevant Watershed Plan.
- The constituent is an established watershed priority, in which case the constituent is addressed through the preliminary source identification process (see description above) and the data are fed into the watershed planning process.
- For constituents not covered under a TMDL implementation plan and which are not priority constituents, additional follow-up monitoring will be performed to verify the persistence of the exceedance. If the exceedance does persist, the measured outfall levels will be compared to receiving water levels for the constituent to provide an assessment of the relative contribution of the discharge to the in-stream levels. If the discharge is substantially contributing to the receiving water exceedance, then the constituent will be included in the watershed planning process. If the exceedance is not persistent, then no further action is required and routine monitoring will continue.

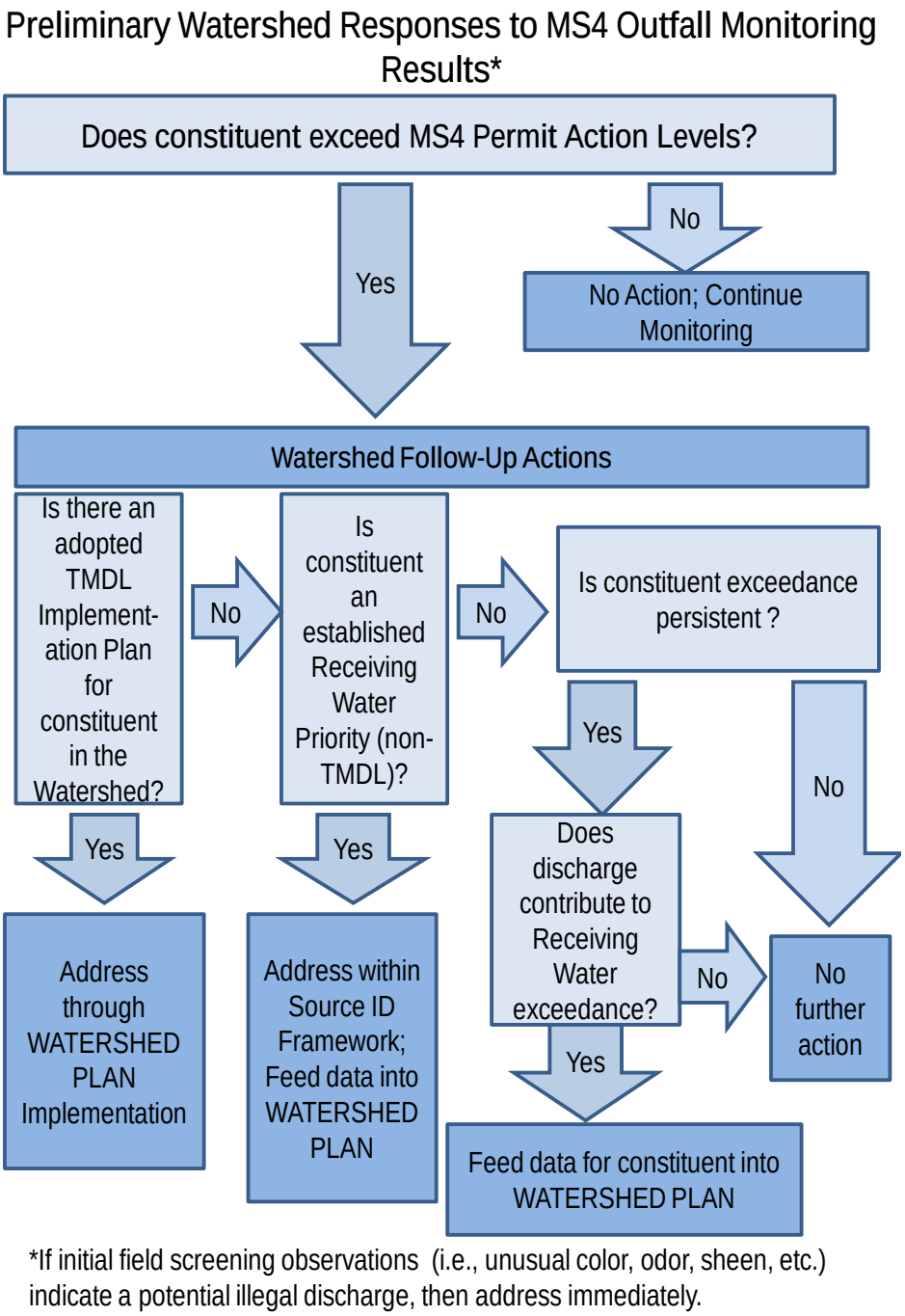

Figure 2.3: Preliminary Strategy for Responses to MS4 Outfall Exceedances

2.B.vii Targeted Studies

Copermittees would periodically evaluate the need for targeted studies to support the watershed adaptive management strategy. Examples of targeted studies include investigation of sources of MS4 contributions to receiving water priorities, participation in Bight Regional Monitoring projects, assessment of TMDL compliance strategies, evaluation of BMP effectiveness, and investigation of the appropriateness of beneficial uses or water quality objectives.

Section 3 Watershed Adaptive Management Strategy

In ROWD Section 1 the concept of watershed adaptive management was presented as the strategy for prioritizing, structuring and directing the Copermittees' stormwater management efforts. The translation of that strategy into an implementation document is represented by the development of a Watershed Plan. The development, implementation, and assessment and iterative updating of these Plans is described below.

3.A WATERSHED ADAPTIVE MANAGEMENT STRATEGY

As noted in Section 1, the Copermittees support a permitting approach that facilitates the implementation of the most effective and efficient stormwater management programs. Consequently, the Permit should be predicated on an adaptive management framework such as the one shown in **Figure 3.1**. As indicated, the Copermittees recognize that the Permit must continue to contain a "core" set of required activities. This is both appropriate and desirable for the purpose of defining what initially constitutes compliance. However, the Permit must also allow for modifications to core requirements when a Copermittee proposes and justifies a more effective or efficient suite of stormwater control measures. Two of the key factors expected to inform adaptive management decisions are watershed water quality priorities and BMP effectiveness data. Over time, core activities – which are typically established as generic preventive measures – should be evaluated with respect to whether they effectively address the pollutant-generating sources and activities causing a watershed's priority water quality problems, and adjusted as determined appropriate by the Copermittee with Regional Board staff approval to enhance efficiency. This is critical to ensuring the best use of limited resources.

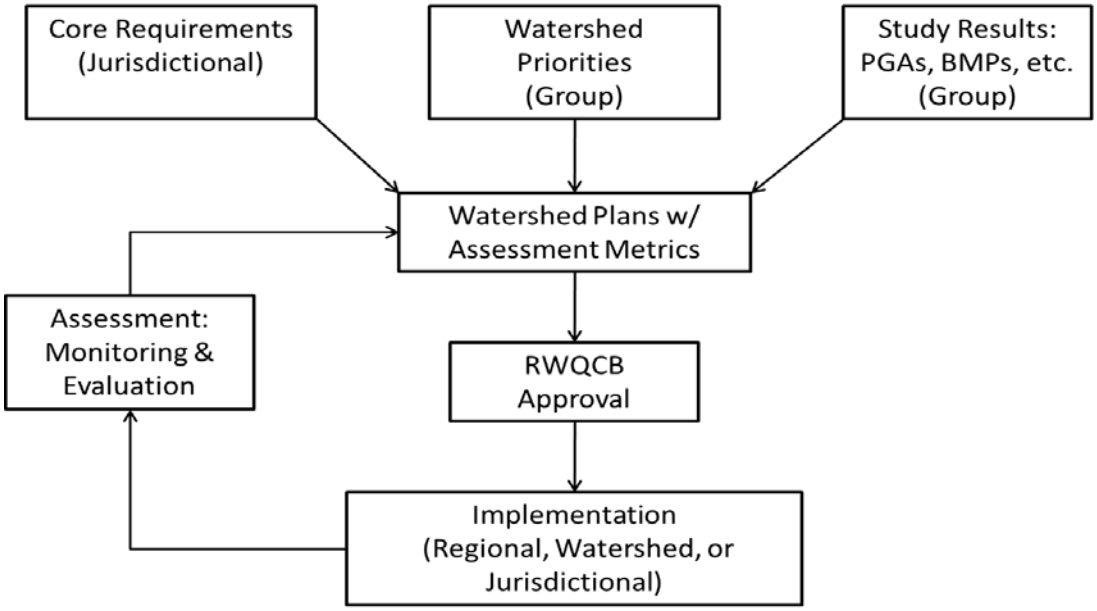

Figure 3.1: Watershed Adaptive Management Strategy

The Copermittees support the development of criteria to govern the adaptive management process so that modifications to core requirements are proposed and justified based on sound and impartial information. These criteria should either be developed during the Permit reissuance process, or as an early deliverable under the new Permit. In either case, to be workable in practice, the Permit's adaptive management provisions must also represent a reasonable balance of specificity and flexibility. Each Copermittee should remain responsible for selecting and proposing the combination of activities and controls that will result in the most effective and efficient stormwater program within its jurisdictional boundaries. A "one-size-fits-all" application of adaptive management requirements is neither effective nor desirable. Similarly, each jurisdiction should be held accountable for the implementation of its jurisdictional program and a determination as to whether it has met the Permit's "maximum extent practicable" performance standard. This is not to say that every jurisdiction should be completely independent in managing its program. For example, Figure 3.1 shows that watershed pollutant and source prioritization, as well as studies to evaluate BMP effectiveness or to characterize pollutant generating activities (PGAs), would be appropriate activities for implementation by groups of Copermittees at the watershed or regional scale. Other activities where economies of scale could be realized through group implementation might include public education and water quality monitoring. In most cases, however, identifying the appropriate scale of implementation is best left to jurisdictional discretion. The establishment of clear assessment metrics will play an important role in determining whether watershed plan implementation is on the right track and achieving desired results.

The Watershed Adaptive Management Strategy would also benefit from a well-defined role for RWQCB staff in reviewing and approving proposed modifications to core requirements. This is necessary not only to evaluate the appropriateness of proposed programs and changes, but to provide Copermittees with a level of certainty with regard to what constitutes compliance.

The central feature of the Copermittees' recommended Watershed Adaptive Management Strategy is the "Watershed Plan" as shown in **Figure 3.1**. A single plan for each watershed (i.e. replacing the URMPs – regional, watershed, and jurisdictional) would help streamline and refocus efforts and make best use of limited resources. The watershed appears to be the appropriate scale at which to integrate the many programs and activities targeting water quality improvement. Furthermore, this scale is consistent with other regulatory programs and policies (e.g. TMDLs and Basin Plans). While it is critical that decision-making remain within the discretion of each jurisdiction, the creation of Watershed Plans would encourage each Copermittee to carefully consider the impact of its management decisions on priority watershed water quality conditions. Enhancing the Permit's watershed focus would also enable Copermittees to better integrate TMDL and ASBS goals into Permit compliance activities. In fact, the Copermittees see the potential for Watershed Plans developed and implemented under the Permit to serve a similar function as the load reduction plans currently required by TMDLs. Better integration of TMDL and Permit programs is consistent with the Copermittees' Vision presented in Section 1 and could provide significant administrative cost savings.

3.B WATERSHED PLAN DEVELOPMENT

The Copermittees support the development of Watershed Plans for the nine major Watershed Management Areas (WMAs) currently identified in the 2007Order. Copermittees might also instead

elect to develop Watershed Plans specific to hydrologic areas within a WMA if determined appropriate (e.g., San Diego Bay and Carlsbad WMAs). Watershed Plans would be developed during the first year and implemented and periodically updated throughout the remainder of the Permit cycle. Watershed leads are summarized in **Table 3.1** below. Watershed Plans will be prepared at the watershed level but specific requirements may be implemented at the regional, watershed, and/or jurisdictional scale.

Table 3.1 Watershed Management Areas (WMAs) and Lead Jurisdictions

WMA	Lead Jurisdiction
Santa Margarita	County of San Diego
San Luis Rey	City of Oceanside
Carlsbad	City of Carlsbad
San Dieguito	City of Escondido
Penasquitos	City of Poway
Mission Bay	City of San Diego
San Diego River	City of El Cajon
San Diego Bay	Port of San Diego
Tijuana	County of San Diego

The Watershed Plans represent a continuation and refinement of the Watershed Urban Runoff Management Programs (WURMPs) developed under the 2007 Order. On the surface the two are very similar. WURMPs were completed for each of the WMAs with the goals of improving Copermittee understanding of water quality issues and concerns, enhancing stakeholder participation, and augmenting jurisdictional programs to more effectively address watershed specific issues. The Watershed Plan would further these goals by strategically focusing jurisdictional, watershed, and regional efforts toward the highest priority constituents and sources in each WMA. By making watersheds the primary foci of Permit programs, Copermittees would also be better able to address other regulatory requirements such as those associated with TMDLs and ASBS programs.

A key feature of Watershed Plans is that they incorporate a combination of planning, implementation, and assessment activities at the most appropriate scales to confer and demonstrate watershed-scale benefits. In essence they provide a unified comprehensive implementation plan for each WMA that identifies the jurisdictional, watershed, and regional activities and control measures that will be pursued. As illustrated in Figure 3.1, the development of the Watershed Plan is described below and includes the following steps:

1. Establishing the watershed priorities(constituents and sources);
2. Modifying jurisdictional core stormwater program implementation strategies to address the highest priority issues and concerns (including the incorporation of BMP effectiveness and source identification findings);
3. Identifying assessment and reporting objectives and metrics; and
4. Obtaining approval by the RWQCB Executive Officer.

3.B.i Establishing Watershed Priorities

In evaluating existing water quality conditions and establishing stormwater management priorities for a watershed, the Copermittees would consider a variety of data and information sources. These include existing water quality data and assessments, WURMPs, WURMP Annual Reports, TMDLs, LTEAs, focused analysis, current monitoring programs, and regulatory requirements. This evaluation will assist in identifying and prioritizing the watershed issues and may support the need to establish different priorities within a watershed. In establishing watershed priorities Copermittees may consider the following: pollutants or issues of concern, watershed characteristics, and a prioritization process to consider multiple issues in determining the watershed priorities. Each is discussed briefly below. Priorities will be established in the beginning of the Permit term and adjusted as needed in subsequent years.

The Copermittees have implemented an extensive monitoring program for many years with the data being used to identify Pollutants and Issues of Concern in previous regulatory documents. Such work provides an excellent foundation for establishing watershed priorities. In addition to pollutants, additional issues of concern may include stream bank erosion or benthic community conditions. In evaluating the previous monitoring programs, consideration will be given to historical trends, land-based pollutant loadings, designated uses, and persistent water quality impacts based on the triad of chemistry, toxicity, and benthic community data. The Copermittees may consider common pollutants/Issues of Concern and choose to prioritize these at the jurisdictional, watershed or regional scale, as defined in the Watershed Plan. In addition consideration may be given to differentiate between wet and dry weather issues.

Key watershed characteristics will vary by watershed but notable characteristics may include sensitive species or ecosystems (i.e., North County Multiple Habitat Conservation Program), 303(d) listed water bodies, ASBS, areas prone to flooding, channel erosion, tidally influenced waterbodies, groundwater recharge areas, presence of septic system, and age of infrastructure. These types of factors will be taken into account when determining the stormwater program activities most effective in each watershed. For example, it may be an effective use of resources to target components of an illicit discharge/illegal connection program in a watershed with aging infrastructure. Additional considerations may also include land use and growth patterns. Understanding the dominant land use within each watershed can help to direct resources on the program components most applicable to each watershed. For example, areas of watersheds predominantly made up of industrial/commercial land uses would benefit from placing emphasis on the industrial/commercial component of their stormwater program over the residential component.

Once the characterization is complete, the Copermittees would consider a number of other factors in prioritizing watershed issues. This prioritization would assist them in identifying the key stormwater program implementation activities that will address the pollutants or issues of concern as discussed above. These factors may include:

- Applicability of regulatory drivers such as 303(d) listing, approved TMDLs, 13267 water quality violations

- Optimizing ongoing implementation efforts (e.g., addressing the PGAs and/or source categories that are the major contributors of the pollutants of concern) to address water quality issues,
- Ability to serve as an "umbrella issue" that encompasses multiple community goals including recreation, habitat enhancement, etc.
- Ability to address primary stakeholder concerns including beach closures, drainage issues, etc.
- Feasibility to address within regulatory and time constraints

3.B.ii Refining Core Stormwater Programs to Address Watershed Priorities

The Copermittees are currently implementing comprehensive, jurisdictional stormwater management programs in a broad-based, preventive manner and consistent with the 2007 Order (see Section 2). In this capacity they've directed their resources to a wide range of activities and pollutants throughout the region. Although the Copermittees will continue to implement the core requirements for each program component, they must remain responsible for selecting and proposing which combination of activities and controls will result in the most effective and efficient stormwater program within their jurisdictional boundaries. Similarly, each Copermittee should also be held accountable for the quality of its jurisdictional program and a determination as to whether it has met the "maximum extent practicable" performance standard established by the Permit. Specific tasks chosen to address the priorities will be identified in each Copermittee's sections of the Watershed Plans. Copermittees should be given the ability to assess and prioritize their current stormwater management programs to identify opportunities for making better use of their resources for the relevant water quality issues in each watershed.

As an example, all Copermittees would be required by the new Permit to have a commercial/industrial program component that includes the following core control measures: maintaining an inventory, prioritizing businesses with the potential to discharge pollutants, inspecting businesses, requiring BMP implementation, and conducting enforcement actions, if necessary. However, depending on the watershed priority, the Copermittees may focus on business categories that have the highest potential to address the watershed priorities. By allowing watershed-based modifications to the core stormwater program, the jurisdictions may optimize their level of effort within one program component or across components (e.g., a jurisdiction may wish to focus on nurseries in a watershed where nutrients are the pollutant of concern and less on automobile repair shops). Likewise the jurisdiction may decide to focus on inspections and less so on outreach material). The intent of the watershed approach is to avoid the creation of additive requirements by focusing core program requirements on the pollutants or issues of concern within a watershed.

Copermittees would also consider previous LTEA findings and any relevant new BMP efficiency findings that may become available after the adoption of the new Permit.

3.B.iii Identifying Assessment and Reporting Metrics

Assessment is a critical component of an iterative adaptive management approach to incrementally improving the measurability of programs. Depending on the specific objectives, assessments and corresponding metrics may reflect different time intervals.

- **Short-term metrics** are typically conducted within intervals less than 5 years in duration.[6] Some assessments (e.g. documenting implementation) might occur annually, with others (e.g., behavior change) requiring more time. In general, short-term metrics would be limited to Outcome Levels 1-4 (implementation of Permit requirements, changes in awareness or behavior, and reduction of pollutant loads).
- **Long-term metrics** would typically be assessed at frequencies ranging from 5 -20 years. They would initially examine changes in urban runoff and receiving water quality. But over time, they could also be used to explore the relationship of program implementation to these "higher" Outcome Levels. In this context, water quality standards represent an ideal for guiding programs in achieving long-term compliance, and for defining the interim measures, actions, and program modifications necessary to achieve that end. As previously discussed, the Copermittees' ability to meaningfully assess long-term changes depends on many critical considerations such as the number and variability of data points and level of changes being measured.

The Copermittees will continue to assess the effectiveness of their Watershed Plans as well as the specific jurisdictional and regional activities implemented in support of them. The establishment of clear assessment metrics will play an important role in determining whether programs are on the right track and achieving desired results. It should be emphasized that reporting and assessment in a group setting (i.e., at the watershed and regional scales) require a higher degree of comparability between results than is currently needed for the jurisdictional analysis of programs and activities. Moreover, even where such comparability exists, the interpretation of common metrics (e.g., summaries of inspection results) can also be compromised if underlying data and information (e.g., classification of violation types, or thresholds for issuing violations) are also dissimilar. Because of this, the Copermittees recognize a need to further explore the development and Copermittee adoption of reporting and assessment standards under the reissued Permit. As such, it is important to remember that the development, adoption, and implementation of standards can take a significant amount of time. In this respect, the new Permit should realistically reflect the work that needs to be completed, and allow sufficient time to do so.

The 2007 Permit also requires the submittal of a number of reports including the JURMP WURMP, and RURMP Annual Reports from the Copermittees. The Watershed Plan will incorporate reporting formats and frequencies developed regionally for use in meeting Permit requirements. In the interest of streamlining this effort, the Copermittees recommend the submittal of one report for each of the nine watersheds (i.e. nine watershed reports). Each report would summarize the Copermittees efforts in the watershed, the assessment of activities and monitoring within the watershed, and, where applicable, activities and other efforts conducted to comply with TMDLs.

3.B.iv Approving Watershed Plans

A well-defined role for RWQCB staff in reviewing and approving any modifications to core requirements is necessary not only to evaluate the appropriateness of proposed programs and changes, but to provide

[6] Municipal Stormwater Program Effectiveness Assessment Guidance, CASQA, May 2007.

Copermittees with a level of certainty with regard to what constitutes compliance. Consequently the Copermittees propose that the Watershed Plans and modifications of such Plans require the approval of the RWQCB Executive Officer. Such approval will also aid in developing budgets and obtaining funds for the Watershed Plan implementation.

3.C WATERSHED PLAN IMPLEMENTATION

Watershed Plans will be prepared at the watershed level but may be implemented at the regional, watershed, and/or jurisdictional scale. This will allow the Copermittees to leverage their resources and provide efficiencies for the stormwater program as appropriate, as well as provide accountability for the Copermittees and RWQCB. This section describes an approach that might be used by the Copermittees in collaboratively addressing regional, watershed, and jurisdictional issues so that there is an effective integration of the programs.

As described, the RWQCB has indicated that they will pursue a region-wide Permit that would encompass the jurisdictions in the urbanized portions of San Diego County, south Orange County and south Riverside County. Once adopted the region-wide Permit would supersede the existing Permit. Notwithstanding the Copermittees comments in Section 1, if a region-wide Permit is developed and adopted, it should support the ability of the Copermittees to develop the Watershed Plans as described within this ROWD.

Regional coordination and collaboration should continue to be encouraged under the new Permit. Under a Region-wide Permit, this might also occur an inter-county basis (between the three counties; San Diego, Orange and Riverside). The emphasis of coordination, however, would likely remain on a countywide basis (between Copermittees within San Diego County). The Copermittees might continue to use the framework that has been established for the Regional Working Bodies, which includes the Regional Management Committee, the Regional Program Planning Subcommittee, and the Regional Workgroups. Some of the program activities that may be the focus of collaboration include:

- Public education;
- Training;
- Monitoring;
- BMP effectiveness assessments;
- Pollutant generating characterization studies; and
- Development of standards, model programs, and guidance documents.

As noted previously, the Watershed Plans will be developed by the Copermittees sharing a watershed. The Copermittees may continue to use the existing framework that has been established for the Watershed Working Bodies or may choose to include other dischargers as part of TMDL programs, or coordinate with other watershed groups and any appropriate regional coordinating groups. Some of the program activities that may be the focus of the watershed collaboration include:

- Establishing watershed priorities;

- TMDL implementation plan strategies and BMPs;
- Monitoring; and
- Pilot projects/studies.

As identified in Section 3.B.ii above, each Watershed Plan would have a jurisdictional (Core Requirements) section that is prepared by the Copermittees to identify how each will implement their stormwater programs to support the Watershed Plans. The jurisdictional section should have clear goals and performance standards so that Copermittees and the RWQCB can assess if the plan has been implemented as intended, whether programs are on the right track and achieving desired results, and to determine if the Copermittee is in compliance.

3.D. WATERSHED PLAN ASSESSMENT AND ACCOUNTABILITY

As noted in Section 3.B.iii the Watershed Plans should include reporting and assessment metrics and include a combination of short-term and long-term metrics that is best suited for demonstrating long-term program success and interim progress toward it. The reporting and effectiveness assessments will be conducted consistent with the California Stormwater Quality Association (CASQA) *Municipal Program Effectiveness Assessment Guidance Manual* (2007, or as amended) and will be focused at the watershed scale to assist the Copermittees and the RWCQB in determining if the goals, targets, waste load allocations (WLAs), or other metrics established by the Copermittees are being achieved or to evaluate progress toward achieving them. One report will be submitted for each Watershed Plan, but jurisdictional results will be included as appropriate.

These effectiveness assessments will allow the Copermittees to determine if the activities identified within the Watershed Plans are achieving the desired outcomes and to assist the Copermittees in allocating their limited resources toward the most effective programs and solutions.

3.E. ADAPTIVE MANAGEMENT

3.E.i Scope of Watershed Plan Modifications

The Watershed Plan modifications may be limited to changes to BMPs or control measures that, when considered in combination, are intended to enhance the overall effectiveness and efficiency of a Copermittee's implementation efforts within a watershed. However, each Copermittee remains responsible for selecting and proposing which combination of activities and controls will result in the most effective and efficient stormwater program within its jurisdictional boundaries and is responsible for the quality of its jurisdictional program. Modifications may include any combination of the following:

- Modifying Core Requirements to increase their effectiveness and efficiency,
- Increasing the implementation rate of more effective and efficient BMPs, or
- Decreasing the implementation rate of less effective and efficient BMPs.

3.E.ii Modifying Watershed Plans

Copermittees will consider and recommend enhancements to core requirements identified in the Watershed Plans when they obtain new BMP effectiveness or source identification findings, or when information is gained from an evaluation of the assessment metrics. Consistent with the initial preparation of the watershed plan there should be a criteria established for identifying and proposing modifications or enhancements that are based on sound and impartial information. Copermittees will identify these enhancements consistent with the time frame established for the assessment metrics (i.e. some enhancement may be identified sooner than others) and as part of the Copermittee's compliance reporting requirements. Ultimately approval by the RWQCB of the modifications in a timely manner will serve all parties well.

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Section 4 Conclusions

Per Section J.2.d of Order No. R9-2007-0001, this Report of Waste Discharge (ROWD) serves as an application for issuance of a new waste discharge permit for the San Diego Municipal Stormwater Copermittees. We are now nearing the end of a third Permit cycle, and have conducted in-depth reviews of our management and monitoring programs with an eye toward continued improvement.

As a whole, the Copermittees have concluded that the next Permit cycle represents an important opportunity for program improvement, but that the way forward is fundamentally different than that embodied in the 2007 Order. This ROWD describes a vision that emphasizes iterative, adaptive urban runoff management approaches, and a predominant focus on watersheds as the focal point of these efforts. This updated approach is largely based on a review of existing programs, but also on an extensive visioning process collaboratively conducted by the Copermittees in Fall 2010, and subsequent discussions with RWQCB staff in early 2011. RWQCB staff has informed the Copermittees of its intention to issue a single Region-wide Order for the San Diego, south Orange, and south Riverside regions, to increasingly emphasize water quality monitoring information as a driver of watershed-based management, and to decrease the current Order's emphasis on detailed jurisdictional reporting.

A core set of principles have guided the Copermittees' development of this ROWD:

- Simplified reporting;
- Streamlined and more meaningful assessment;
- Better coordinated water quality monitoring;
- Enhanced watershed and Total Maximum Daily Load (TMDL) focus; and
- Increased emphasis on strategic planning.

As a starting point for program modification, the Copermittees identified a number of specific recommendations for change to existing management and monitoring requirements. These are identified and discussed in detail in ROWD Section 2. Building on this, ROWD Section 3 further describes a process for modifying program approaches in accordance with established watershed priorities, and as necessary to improve programs over time. In accordance with this approach, the following key principles should guide the development and implementation of Watershed Plans under a reissued Order:

- Watershed Adaptive Management should drive the planning, review, and modification of Copermittee programs;
- Watershed Plans should identify watershed priorities (constituents and sources) and be the vehicle for implementing the Watershed Adaptive Management Strategy;
- Watershed priorities should be the primary driver for determining how individual Copermittees prioritize, develop, and implement stormwater program activities within their jurisdictions;
- Watershed requirements should focus, rather than add to, core jurisdictional program requirements within a watershed;

- Implementation of Watershed Plans should be carried out at the most efficient and effective scale – either jurisdictional, watershed, or regional;
- RWQCB staff should approve the Watershed Plans; and
- With very limited exception, Permit compliance should be assessed at the individual Copermittee level.

Finally, it should be noted that this ROWD represents the results of an extended discussion that can in no way be considered complete. The Copermittees believe that it goes a long way toward describing a workable vision for the future. But, as described throughout, many important details have yet to be discussed (Watershed Plan approvals, mechanisms and standards for program modification, performance metrics, monitoring requirements, etc.). Further discussion of these and other critical details must necessarily precede the finalization or endorsement of any new Permit requirements.

ATTACHMENT 1-1

JURISDICTIONAL ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM AND DRY WEATHER FIELD SCREENING AND ANALYTICAL MONITORING EVALUATION

ATTACHMENT 1-1 JURISDICTIONAL ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM AND DRY WEATHER FIELD SCREENING AND ANALYTICAL MONITORING EVALUATION

The purpose of the Jurisdictional Illicit Discharge Detection and Elimination Program is to detect and eliminate illegal connections and illicit discharges (IC/IDs) to the Municipal Separate Storm Sewer System (MS4). In support of the Illicit Discharge Detection and Elimination Program, a Dry Weather Field Screening and Analytical Monitoring Program (Dry Weather (DWM) Program) is a requirement of the San Diego Regional Water Quality Control Board Municipal Permit (Order No. R9-2007-0001).

An evaluation of the DWM Program was conducted to answer the following question:

Does the DWM Program successfully detect and eliminate illicit dry weather discharges?

Evaluation of the DWM Program found that:

- IC/ID investigations are less efficient in detecting and eliminating IC/IDs than hotline call responses (over 1,600 annually), business inspections (over 6,000 annually), and visual survey of the stormwater conveyance system during routine maintenance and/or cleaning. Based on the number of samples collected through the Dry Weather Program over the past three years, only 3.7 percent of samples collected resulted in a successful detection and elimination of an illicit discharge (87 successful IC/IDs out of 23,635 sample analyses from 2007-2009). Copermittees observed that more IC/IDs were identified through complaint referrals than through the Dry Weather program. The City of Oceanside reported in 2009-2010 that 86 out of 87 IC/IDs identified through their hotline were eliminated whereas only one IC/ID was identified and resolved through their Dry Weather Program.
- In addition to the inefficiency of the DWM Program to detect IC/IDs compared to hotline calls or inspections, the follow-up investigations which are required within two business days are rarely effective. Typically, it takes a week or more for laboratory analytical data to be reported, and if action levels are exceeded, an upstream investigation must be conducted within 2 business days of receipt of the data. With so many transient sources it is unrealistic to expect an upstream investigation conducted over a week after the IC/ID was observed to detect the source of the IC/ID. Requiring that other priorities be shifted to conduct the investigation is not an effective use of resources and does not necessarily result in the elimination of more IC/IDs.
- Identification of an action level exceedance from a storm drain outfall discharge does not necessarily indicate detection of IC/IDs. Exceedances can be caused by other sources, such as ingress of nitrate-bearing groundwater into the storm drain system, resulting in nitrate exceedances. If nitrate reduction subsequently occurs in ponded water, ammonia may also be detected. Exceedances may also be caused by saline intrusion, resulting in high conductivity, or alkalization of the runoff in a concrete channel, resulting in higher pH. Within the current permit, exceedances from these common causes currently still require a prompt upstream investigation by many jurisdictions to confirm that there is no IC/ID upstream, diverting attention away from more effective activities.

- The DWM Program characterizes discharges in the MS4s using a limited number of constituents. This overlaps with the MS4 Outfall Monitoring Program, which expands the list of constituents and tailors the list to support watershed planning. In fact, efficiencies have been gained through incorporating parts of the MS4 Outfall Monitoring Program into the DWM Program. However, the MS4 Outfall Monitoring Program has the advantage of focusing on watershed priority pollutants and not on a standard list of constituents that includes the use of field test kits that may have chemical interferences which can limit their usefulness.
- The MS4 Outfall Monitoring Program could be used to assess discharges from the storm drain system. The detection of IC/IDs could be addressed through those methods proven to be most effective to date: stormwater hotline complaints, facility inspections and public employee surveillance. Additionally, in the modified MS4 Outfall program anticipated in the next Permit, Copermittees propose that if initial field screening observations (i.e., unusual color, odor, sheen, etc.) indicate a potential illegal discharge, then it will be addressed immediately.
- Indicator bacteria are the constituent with the highest frequency above action levels from the period of 2007-2009. IC/ID investigations are typically not successful at identifying sources of bacterial indicators related to anthropogenic activities (e.g. re-growth in storm drains and wildlife scat are common sources as opposed to illicit discharges). The introduction of the Revised Total Maximum Daily Loads for Indicator Bacteria Project I – Twenty Beaches and Creeks in the San Diego Region Total Maximum Daily Load (Bacteria Project – I TMDL) for many watersheds in the region will require additional monitoring, source investigations, and treatment of bacteria. Any IC/ID component incorporating bacteria investigation should simultaneously fulfill other parallel regulatory MS4 requirements to ensure that monitoring efforts are optimized.
- Diazinon and Chlorpyrifos are no longer commercially available. These pesticides have been detected above action levels in no more than 0.3% of samples over the past three years. The analysis of organophosphate compounds is no longer a useful analysis for this program.
- The transient nature of many IC/IDs frequently causes difficulties in identifying the source of an IC/ID, even when a suspected IC/ID is detected. Often, based on exceedances of NPDES dry weather action levels, it can be concluded that an “activity” or group of “activities” have occurred in a sub-drainage area, but the source cannot be pinpointed. The nature of nonpoint source pollution may result in a timing disconnect between the “activity” producing a pollutant (e.g., over fertilizing a lawn) and the transport mechanism of the pollutant into the MS4 system (e.g., runoff from over irrigation hours after the application of the fertilizer). Unless the IC/ID activity is actually occurring and being transported into the MS4 system during the field screening and subsequent upstream investigations, the precise source and location of the IC/ID cannot be identified. In these circumstances the IC/ID is addressed through other means, such as education, and periodic reconnaissance of the area. Additionally, other program elements such as more stringent development standards and inspections of municipal, industrial and commercial facilities are preventive measures to reduce the likelihood of IC/IDs.

Conclusions:

- The conclusion of this evaluation is that the DWM Program should be discontinued in its current form. IC/ID investigations are less efficient in detecting and eliminating IC/IDs than hotline call responses (over 1,600 annually), business inspections (over 6,000 annually), and visual survey of the stormwater conveyance system during routine maintenance activities. During the permit term a comprehensive range of stormwater program elements have been implemented to decrease the likelihood of IC/IDs, and have been shown to be more efficient than the DWM Program. In addition, the MS4 Outfall Monitoring Program also samples outfall discharges. To avoid this duplication of effort, the MS4 outfall monitoring should be conducted under the MS4 Outfall Monitoring Program instead of the DWM Program. Additionally, Copermittees propose that in the MS4 outfall discharge program under the next Permit that if initial field screening observations (i.e., unusual color, odor, sheen, etc.) indicate a potential illegal discharge, then it will be addressed immediately.

Supporting Documentation

Jurisdictions conduct a separate DWM Program as described in each Jurisdictional Urban Runoff Management Program (JURMP) Annual Report. Dry weather samples are collected from the jurisdictions' MS4 to detect and eliminate IC/IDs. Samples are collected from May 1 through September 30 each Permit monitoring year. The results of the 2007, 2008, and 2009 DWM Program are included in the data assessment. The DWM Program primarily answers two core management questions, which address urban runoff discharges in the MS4: 3) What is the relative urban runoff contribution to the receiving water problem(s)? and 4) What are the sources of urban runoff that contribute to receiving water problem(s)?

During the 2007, 2008, and 2009 DWM Program monitoring years, out of 23,635 individual field and analytic samples, 1,258 samples had results measured above the dry weather action levels (Table 1) for an exceedance rate of only 5.3-percent. Table 1 also shows the exceedance rate for each analyte measured under the DWM Program. The analyte with the highest rate of results above the action level for 2007-2009 was total coliforms (25-percent), and Enterococcus was the constituent with the second highest exceedance rate (15-percent). Out of 1,091 dry weather samples collected from the region and analyzed for Diazinon, there was one dry weather action level exceedance. Of 1,089 dry weather samples collected and analyzed for Chlorpyrifos, only one sample (in Point Loma) was reported as an action level exceedance. Among the four dissolved metals for which analyses were conducted (i.e., cadmium, lead, copper, and zinc), the action level exceedance rate was less than 2-percent. Dissolved copper had the greatest number of reported exceedances (21 exceedances in 1,067 samples). Dissolved lead was found to be above the dry weather action level in five of 1,060 samples and dissolved cadmium exceeded the action level in one of 1,065 samples. Six exceedances out of 1,068 samples were reported for dissolved zinc in the region. The dissolved metals action levels are based on the CTR hardness based criteria.

Table 1. 2007, 2008, and 2009 Jurisdictional Dry Weather Program Monitoring Data Summary of Action Level Exceedances

Constituent Group	Constituent	Number of Dry Weather Samples Collected Regionally	Number of Dry Weather Action Level Exceedances	Percentage of Action Level Exceedances (%)
General chemistry	pH	2868	80	3%
	Oil & grease	976	8	1%
	Ammonia (NH_3-N)	2821	164	6%
	Methylene blue active substance (MBAS)	1515	119	8%
Nutrients	Orthophosphate (PO_4-P)	2844	117	4%
	Nitrate (NO_3-N)	2837	156	5%
Metals	Cadmium (dissolved)	1065	1	0%
	Copper (dissolved)	1067	21	2%
	Lead (dissolved)	1060	5	0%
	Zinc (dissolved)	1068	6	1%
Pesticides	Chlorpyrifos	1089	1	0.09%
	Diazinon	1091	1	0.09%
Bacteria	Total coliforms	1111	283	25%
	Fecal coliforms	1112	127	11%
	Enterococci	1111	169	15%
Grand Total		**23,635**	**1.258**	**5.3%**

* For conductivity and turbidity the action levels adopted by the Dry Weather Workgroup are based on best professional judgment and are excluded from this table.

When the Regional Monitoring Program implemented the analysis of organophosphate pesticides in 2001, it was based on the threat of these pesticides entering the region's receiving waters, evidence of persistent exceedances of Diazinon and Chlorpyrifos, and evidence of pesticide-induced acute and chronic toxicity to *Ceriodaphnia dubia*. DWM Program results for Chlorpyrifos and Diazinon over the past seven years are shown in Table 2. The dry weather exceedance rates for Diazinon and Chlorpyrifos have steadily declined over the past six years of monitoring and have been less than 1% in each year over the past five years. With respect to the USEPA ban on the pesticides Diazinon and Chlorpyrifos and the infrequent (or lack of) detections for these analytes in the DWM Program, this analysis could be justifiably removed from the next Permit constituent list..

Table 2. Jurisdictional Dry Weather Monitoring Program Results for Chlorpyrifos and Diazinon for the Period 2003–2009

Monitoring Year	Analyte	Number of Dry Weather Samples Collected Regionally	Number of Dry Weather Action Level Exceedances	Percentage of Action Level Exceedances
2003	Chlorpyrifos	373	117	31.4%
2004	Chlorpyrifos	241	1	0.4%
2005	Chlorpyrifos	285	0	0%
2006	Chlorpyrifos	382	1	0.3%
2007	Chlorpyrifos	333	0	0%
2008	Chlorpyrifos	387	1	0.3%
2009	Chlorpyrifos	369	0	0%
2003	Diazinon	373	129	34.6%
2004	Diazinon	240	6	2.5%
2005	Diazinon	286	2	0.7%
2006	Diazinon	377	2	0.5%
2007	Diazinon	333	0	0%
2008	Diazinon	389	0	0%
2009	Diazinon	369	1	0.3%

During the past three years (2007-2009) an IC/ID was detected for 118 (5-percent) of the action level exceedances. Of the 118 IC/IDs, 87 were resolved (i.e., source was identified and eliminated). Compared to the stormwater hotline and inspection programs, the proportion of IC/IDs that are resolved in the DWM Program is much lower. Methods such as hotline call in programs and inspection programs meet the requirements of non-stormwater discharge elimination to the storm sewers, and Copermittees report the number of IC/IDs eliminated as a result of their hotline call-in program or inspection program in their Annual Jurisdictional Urban Runoff Management Plan Reports.

ATTACHMENT 2-1

RECEIVING WATER ASSESSMENT OF MASS LOADING STATIONS/ TEMPORARY WATERSHED ASSESSMENT STATIONS

ATTACHMENT 2-1: RECEIVING WATER ASSESSMENT OF MASS LOADING STATIONS/ TEMPORARY WATERSHED ASSESSMENT STATIONS

Wet and dry weather samples are collected at mass loading stations (MLS) and temporary watershed assessment stations (TWAS) within nine watershed management areas. Samples are collected per the requirements of Table 1 of the San Diego Regional Water Quality Control Board Order No. R9-2007-001 (Permit). The MLS stations have been consistently sampled for the last 10 to 15 years whereas the TWAS address specific questions beginning with the 2007 Permit and were not designed to be long term monitoring stations.

This monitoring is designed to answer core management questions 1, 2, and 5. The core monitoring management questions per the Permit are as follows:

1. *Are conditions in receiving waters protective, or likely to be protective, of beneficial uses?*
2. *What is the extent and magnitude of the current or potential receiving water problems?*
3. *What is the relative urban runoff contribution to the receiving water problem(s)?*
4. *What are the sources of urban runoff that contribute to receiving water problem(s)?*
5. *Are conditions in receiving waters getting better or worse?*

Analysis of receiving water data was conducted to evaluate progress so far on questions 1, 2 and 5. Additionally, the following sub-questions were analyzed to guide the Copermittees' monitoring recommendations for the next permit:

1. Have priority constituents changed over this current Permit cycle compared to the previous?
2a. How have the TWAS contributed to the understanding of the spatial extent and magnitude of receiving water problems?
2b. How do the monitoring results of the upstream TWAS compare to the downstream MLS?
2c. Can wet weather priority constituents be linked to land uses in the watersheds?
3. What frequency of sampling at the MLS is necessary to maintain the detection of long-term trends of receiving water quality?

Statistical analysis of the water quality data from the MLs and TWAS concluded that:

- Receiving water constituent priorities in 2010 are similar to the previous assessment conducted in 2005 for wet weather. Dry weather ambient monitoring was added in the 2007 Permit to address seasonal variability. With few exceptions, priority constituents are the same in all watersheds. Wet weather priorities, in general, are bacteria and sediment. Dry weather priorities, in general, are bacteria, nutrients and total dissolved solids (TDS). Synthetic pyrethroids, not analyzed under the previous Permit, are an emerging regional issue beginning to be addressed at the state and national levels.
- With few exceptions, the constituent priorities at TWAS and MLS across the region are similar. Constituent concentrations and patterns of occurrence are similar at TWAS and MLS in the same watershed.

- Additional constituent priorities were identified in Chollas Creek Watershed (copper and zinc) and Tijuana River Watershed (e.g., ammonia, surfactants (MBAS), and biological chemical oxygen demand). Both of these watersheds have unique characteristics compared to the rest of the region. Tijuana River is subject to periodic sewage discharges from across the international border and Chollas Creek has a high density of industrial facilities and transportation corridors.
- Statistical analysis of 8 to 18 years of wet weather receiving water data indicate that sampling frequency may be reduced from alternate years to once every five years without increasing the amount of time necessary to detect long term trends. Because wet weather data has a higher variability than dry weather data, it is assumed that a reduced frequency for ambient dry monitoring will also be appropriate.
- Statistical analysis of the wet weather receiving water data also showed that if a significant increasing or decreasing trend is observed, a reduction of sampling frequency from alternate years to every five years will not increase the time necessary to detect a significant trend.

Conclusions

Constituent priorities in receiving water are similar in 2010 to the previous 2005 assessment. Additionally, the upstream TWAS and downstream MLS have similar constituent priorities. Therefore, core monitoring questions 1 and 2 (i.e., impact to beneficial uses and the magnitude and lateral extent of problem) have been successfully addressed by the monitoring of the 2007 Permit. Because the constituent concentrations and patterns are generally similar at the TWAS and MLS, especially within a watershed, there is no added value to continuing TWAS monitoring in its current form. The similarity of priority constituents across the region support reducing the number of receiving water stations from the 2007 Permit. Several stations (3 to 5 across the region) close to the mouth of the watershed will be adequate to monitor receiving water conditions in the region. The region has the wet weather constituent priorities of bacteria and sediment and the dry weather constituent priorities of bacteria, nutrients and TDS. Resources can be reduced from receiving water monitoring and redirected to working on how to fix the problems by increasing emphasis on MS4 outfall monitoring, source identification and source abatement activities.

Wet weather sampling at the MLS may be reduced to once every five years. The statistical simulation results show that decreasing the sampling frequency to every five years will not affect the ability to detect long-term trends. This finding is further supported by the finding that receiving water priority constituents have not changed substantially at individual MLS during the past five years. Therefore, reduced receiving water monitoring will still allow for detection of trends in the long-term, answering management question 5.

Supporting Documentation

A list of watershed management area and mass loading station (MLS) acronyms is presented in Table 1.

Table 1. Watershed Management Area and Watershed Acronym List

Watershed Management Area	Watershed Name	Mass Loading Station
Santa Margarita	Santa Margarita River	SMR-MLS; SMR-MLS2
San Luis Rey River	San Luis Rey River	SLR-MLS
Carlsbad Watershed	Loma Alta Creek	LAC-TWAS-1
	Buena Vista Creek	BVC-TWAS-1
	Agua Hedionda Creek	AHC-MLS; AHC-TWAS-1
	Escondido Creek	ESC-MLS; ESC-TWAS-1
San Dieguito River	San Dieguito Creek	SDC-MLS; SDC-TWAS-1; SDC-TWAS-2
Los Peñasquitos River	Los Peñasquitos	LPC-MLS; LPC-TWAS-1; LPC-TWAS-2
Mission Bay and La Jolla	Tecolote Creek	TC-MLS
	Mission Bay	MB-TWAS-1; MB-TWAS-2
San Diego River	San Diego River	SDR-MLS; SDR-TWAS-1; SDR-TWAS-2; SDR-TWAS-3
San Diego Bay	Chollas Creek	CC-SD8(1)-MLS; CC-NF54
	Sweetwater River	SR-MLS; SR-TWAS-1
	Otay River	OR-TWAS-1
Tijuana River	Tijuana River	TJR-MLS; TJR-TWAS-1; TJR-TWAS-2

Sub-Question #1: *Have priority constituents changed over this current Permit cycle compared to the previous?*

Determination of whether or not receiving water priorities remained similar between the Baseline Long Term Effectiveness Assessment (BLTEA) and the current long term effectiveness assessment (LTEA) was made by comparing the two sets of results at the watershed level. The BLTEA analysis was conducted in 2005 and grouped wet and ambient data from the municipal separate storm sewer system (MS4) and the receiving waters, along with whether or not an constituent was included on the Section (§) 303(d) list. The LTEA analysis was conducted in 2010 and evaluated data from the MS4, receiving water (RW), wet, and ambient separately. In addition, inclusion of a constituent on the §303(d) list did not result in that constituent categorized as high priority. Constituent groups are used for the comparison of the BLTEA and the receiving waters LTEA. Priorities within watersheds were also evaluated. The purpose of this evaluation was to determine if the answer to management question #1 (conditions in receiving waters protective of beneficial uses) is the same in 2010 (LTEA) as the 2005 (BLTEA).

As shown in Table 2, wet weather priorities are similar between the BLTEA and the LTEA, as well as across the region. Cells highlighted orange are high priorities (greater than 50-percent exceedance of water quality benchmark (WQB)) and yellow cells are medium priorities (greater than 25-percent exceedance of WQBs, up to and including 50-percent exceedance of WQBs). A comparison of BLTEA and LTEA priority results at each MLS indicates that priorities remain similar between the two evaluations. Due to the dry weather ambient monitoring element initiated in the 2007 Permit, seasonal differences in priority constituents were identified in receiving water. Nutrients were not found to be a priority constituent during wet weather monitoring, but were a high priority constituent across many watersheds during dry weather conditions. These seasonal variations may in part be attributed to the differences in WQBs between seasons.

Since 2005, Copermittees participation in the Stormwater Monitoring Coalition (SMC) Regional Monitoring Program has provided additional ambient dry weather nutrient data. In general, during dry weather bacteria, nutrients, and TDS are constituent priorities found in watershed management areas across the region. In general, during wet weather, bacteria and sediments (total suspended sediments) are region-wide constituent priorities.

Table 2. Comparison of 2005 Baseline Long Term Effectiveness Assessment and 2010 Long Term Effectiveness Assessment Priority Results

Priority Group	BLTEA or LTEA	SMR-MLS	SLR-MLS	AHC-MLS	ESC-MLS	SDC-MLS	LPC-MLS	TC-MLS	SDR-MLS	CC-SD8(1)	SR-MLS	TJR-MLS
Baseline Long Term Effectiveness Assessment Priorities												
Bacteria	BLTEA											
Gross Pollutants	BLTEA											
Heavy Metals	BLTEA											
Nutrients	BLTEA											
Pesticides	BLTEA											
Sediment	BLTEA											
Total Dissolved Solids	BLTEA											
Toxicity	BLTEA											
Turbidity	BLTEA											
2010 Long Term Effectiveness Assessment Wet Weather Priorities												
Bacteria	LTEA-WET											
Gross Pollutants	LTEA-WET											
Heavy Metals	LTEA-WET											
Nutrients	LTEA-WET											
Pesticides	LTEA-WET											
Sediment	LTEA-WET											
Total Dissolved Solids	LTEA-WET											
Toxicity	LTEA-WET											
Turbidity	LTEA-WET											
2010 Long Term Effectiveness Assessment Dry Weather Priorities												
Bacteria	LTEA-DRY											
Gross Pollutants	LTEA-DRY											
Heavy Metals	LTEA-DRY											
Nutrients	LTEA-DRY											
Pesticides	LTEA-DRY											
Sediment	LTEA-DRY											
Total Dissolved Solids	LTEA-DRY											
Toxicity	LTEA-DRY											
Turbidity	LTEA-DRY											

BLTEA Priorities were based on Section 303(d) listing and combined wet and dry weather data
Orange highlights indicate high priorities (>50% exceedance of WQOs/WQBs), and yellow highlights indicate medium priorities (>25-50% exceedance of WQOs/WQBs)

Sub-Question #2a. How have the TWAS contributed to the understanding of the spatial extent and magnitude of receiving water problems?

and

Sub-Question #2b. How do the monitoring results of the upstream TWAS compare to the downstream MLS?

Priority constituents were also examined within watersheds to determine whether or not Priorities remained consistent throughout a watershed, and to help determine whether or not the TWAS have contributed to the understanding of the spatial extent and magnitude of receiving water quality problems. Three watersheds were examined in detail, and are presented in Table 3. The results demonstrate that Priorities remained consistent within the same watershed. Some differences in upstream and downstream relationships may be due to differences in the Basin Plan objectives in a specific hydrologic subarea (e.g. the TDS results for San Diego River stations).

Table 3. Agua Hedionda Creek, Escondido Creek, and San Diego River Mass Loading Station and Temporary Watershed Assessment Station Wet Weather Priority Constituent Comparison

Station	HSA	No. Samples	Assessment Scores - NPDES Monitoring - Wet Weather					
			Chemistry	Toxicity	IBI	Bacterio-logical	Nutrients	TDS
Agua Hedionda Hydrologic Area								
AHC-MLS	Los Monos (904.31)	9	TSS, Turbidity, Bifenthrin	*Hyalella azteca* acute	Very Poor	Fecal Coliforms		TDS
AHC-TWAS-1	Los Monos (904.31)	2	TSS, Turbidity, Chlorpyrifos, Bifenthrin	*Hyalella azteca* acute	Very Poor	Fecal Coliforms		TDS
Escondido Creek Hydrologic Area								
ESC-MLS	San Elijo (904.61)	9	Turbidity, Bifenthrin, TSS		NA	Fecal Coliforms		TDS
ESC-TWAS-1	Escondido (904.62)	2	Turbidity, Bifenthrin, TSS, Diazinon		Very Poor	Fecal Coliforms		TDS
San Diego River Hydrologic Area								
SDR-MLS	Mission San Diego (907.11)	9	Turbidity Bifenthrin		Very Poor	Fecal Coliforms		
SDR-TWAS-1	Mission San Diego (907.11)	2	Turbidity/Bifenthrin Surfactants (MBAS)	*Ceriodaphnia dubia* reproduction	Very Poor	Fecal Coliforms		TDS

Station	HSA	No. Samples	Assessment Scores - NPDES Monitoring - Wet Weather					
			Chemistry	Toxicity	IBI	Bacterio-logical	Nutrients	TDS
SDR-TWAS-2	Santee (907.12)	2	TSS/Turbidity Bifenthrin/Permethrin pH/BOD	*Hyalella azteca* acute survival	Very Poor	Fecal Coliforms		
SDR-TWAS-3	Santee (907.12)	2	Turbidity Bifenthrin		Very Poor	Fecal Coliforms		

-Orange highlights indicate high priorities (>50% exceedance of WQOs/WQBs), yellow highlights indicate medium priorities (>25-50% exceedance of WQOs/WQBs), blue indicates low priorities (≤25% exceedance of WQOs/WQBs). Only group scores of blue (low priority) are presented in the table.
-NA, not applicable no data collected

Sub-Question #2c.Can wet weather priority constituents be correlated to land uses in the watersheds?

A cluster evaluation was conducted to evaluate whether or not watersheds with similar land use also exhibited similar Priority constituent concentrations during wet conditions. The TWAS data were included to evaluate whether or not Priority constituent similarities between MLS and TWAS were found within watersheds.

Land use proportions upstream of each receiving water catchment (MLS or TWAS) were calculated using Geographic Information System (GIS), and compared using cluster analysis. The results of the analysis are presented in Figure 1. A map of the cluster results is presented in Figure 2. Several distinct land use group patterns were found, three of which are discussed here. Cluster "A" is defined by watersheds that contain relatively large proportions of industrial and agricultural land uses, and includes Agua Hedionda Creek (AHC-MLS and AHC-TWAS-1), San Dieguito Creek (SDC-MLS), Loma Alta Creek (LAC-TWAS-1), and Otay River (OR-TWAS-1). Cluster "C1" is defined by the highly urbanized watersheds, and includes relatively high proportions of public facilities, residential, transportation, and commercial land uses. This group includes Buena Vista Creek (BVC-TWAS-1), Sweetwater River (SR-MLS), Chollas Creek (CC-SD8(1)-MLS and CC-NF54-MLS), and portions of San Dieguito (SDC-TWAS-1). Finally, the most rural watersheds are characterized by Clusters "D1, D2, and E", which include relatively large proportions of vacant and undeveloped land, agriculture, and spaced rural residential land uses. Watersheds included in the cluster are portions of San Dieguito (SDC-TWAS-2), San Luis Rey (SLR-MLS and SLR-TWAS-1), Sweetwater River (SR-TWAS-1), Tijuana River (TJR-MLS, TJR-TWAS-1, TJR-TWAS-2), and Santa Margarita River (SMR-MLS and SMR-MLS2).

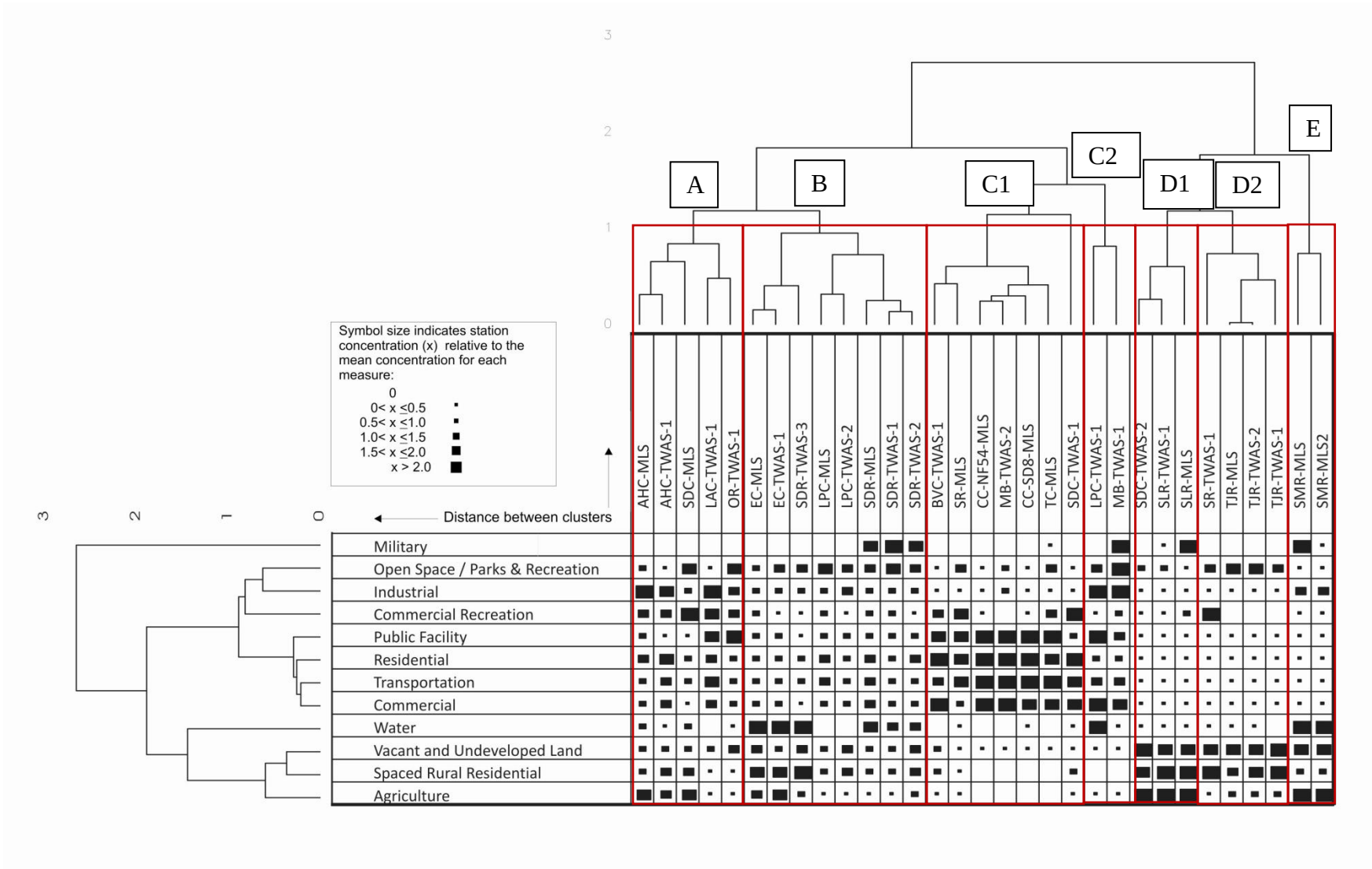

Figure 1. Land Use Cluster Analysis of the Mass Loading Station and Temporary Watershed Assessment Stations

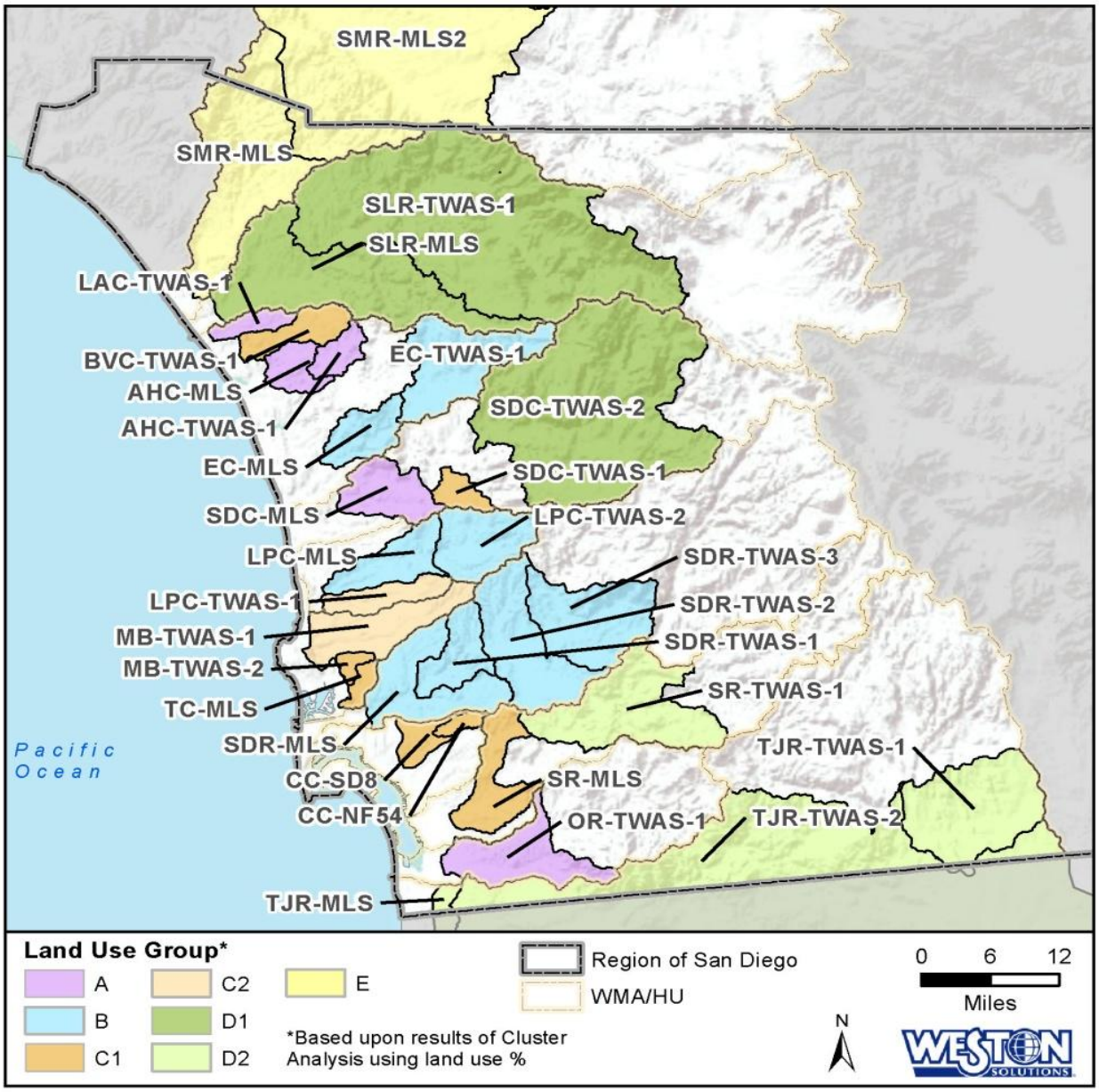

Figure 2. Land Use Cluster Analysis Results

The patterns of constituent concentrations at each MLS and TWAS were also evaluated using cluster analysis. The five-year LTEA dataset was used, and included wet weather data only, as receiving water constituent concentrations are expected to be more related to wash-off during wet events than during ambient conditions.

Results of the analysis are presented in Figure 3. In general, MLS and TWAS samples clustered together over time and a distinct sewage pattern was observed for Tijuana River (TJR-MLS and TJR-TWAS-2, highlighted blue) along with higher toxicity (highlighted orange). Chollas Creek (CC-SD8(1)-MLS) samples exhibited relatively higher concentrations of metals than other MLS and TWAS stations (highlighted purple). However, the groupings based on the water quality data do not directly correspond to the land use cluster analysis results. Therefore, based on constituent

concentrations, there does not appear to be a strong correlation between land use and constituent concentrations (i.e., individual land uses do not relate directly to stormwater concentrations). The exceptions are Tijuana River and Chollas Creek, which have unique activities. Tijuana River is subject to sewage discharge and Chollas Creek has a high density of industrial facilities and transportation corridors. The SDC-TWAS-2 grouping with the Tijuana River (TJR-MLS) sites was due to the post-fire stormwater monitoring results which were highly impacted by the 2007 San Diego Wildfires.

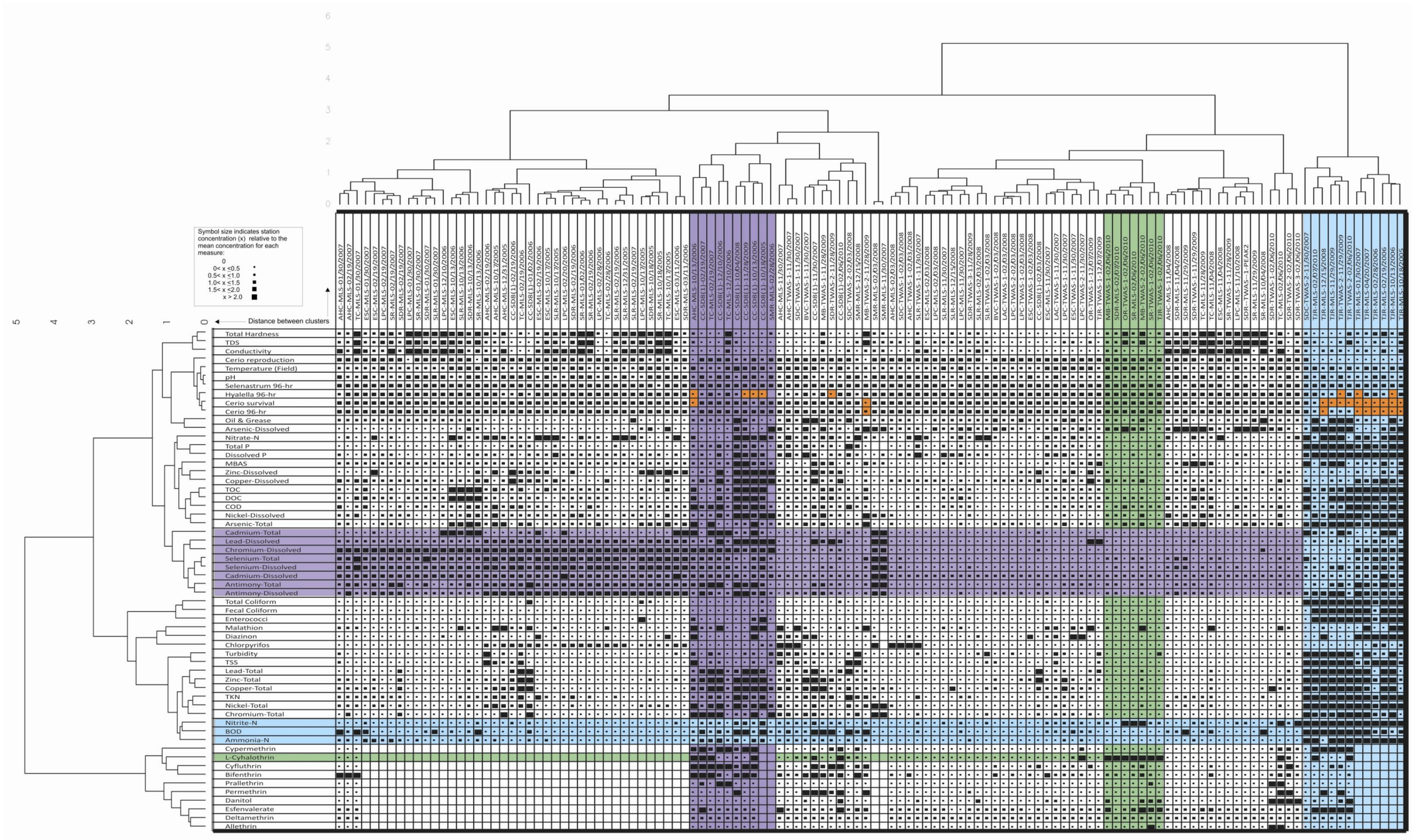

Figure 3. Cluster Analysis Results for Wet Weather Concentrations at Mass Loading Station and Temporary Watershed Assessment Stations during 2005-2010

Sub-Question #3: What frequency of sampling at the MLS is necessary to maintain the detection of long-term trends of receiving water quality?

A statistical analysis was conducted to determine whether or not a reduction in sample frequency from two wet weather events every other year to three wet weather events every five years at the MLS would decrease the Copermittees' ability to detect long-term receiving water trends. In particular, the question of whether a change in sampling frequency would affect Copermittees' ability to detect when the constituent concentrations fall below the WQB (or, for increasing trends, above the WQB) was evaluated.

The statistical analysis utilized the data from the existing program, between 8 and 18 years of data and 113 constituents at 10 MLS. The MLS and constituent combinations included all high priority constituents at each MLS, as well as constituents with greater than 50-percent detection frequency (more than half of the results were greater than the reporting limit). In addition, each MLS and constituent combination was tested for normality and log-normality (results in Attachment 1a). Only constituents that were found to be normal or log-normally distributed were included in the final statistical analysis dataset, because of the statistical method requirements. The final statistical analysis dataset included 66 analytes at 10 MLS. A full explanation of statistical tools utilized to assess the recommended monitoring program compared with the existing program is presented in Attachment 1a.

The existing data were used to evaluate trends (increasing, decreasing, or no trend), and the slope of the line was utilized to project future sampling results. Of the constituents included in the analysis, 2 were found to be significantly decreasing, 11 were found to be significantly increasing, and 53 did not exhibit a significant trend.

The statistical analysis included two scenarios, 1) the current program of two samples every other year and, 2) three samples every five years. The scenarios were compared to determine whether or not a reduction in monitoring frequency will increase the number of years it will take before the measured constituent of concern is observed below the WQO or WQB. Constituents that exhibited significant or non-significant decreasing or increasing trends were included in the analysis.

Comparison of the two scenarios found that, given the continuation of the existing trend line, decreasing the sampling frequency from two storm events every two years (n=5 per permit cycle) to three storm events every five years will not increase the amount of time necessary to detect when a decreasing or increasing trend crosses the WQO with 95-percent confidence. For MLS and constituent combinations that currently exhibit a significant increasing or decreasing trend, decreasing the sampling frequency will not decrease the ability to detect trends. For constituent and MLS combinations that do not exhibit significant trends, there is no difference between the two scenarios to detect when annual average concentrations first fall below or above the WQB or WQO with 95-percent confidence.

TSS was selected to illustrate the simulation results because it is often correlated to other constituents during storm events, including total phosphorus, bacteria, and total metals. Regionally, bacteria and TSS are Priority constituents during wet weather events. Therefore, evaluation to detect when these Priorities fall below WQOs is highlighted in the analysis. Results of the correlation analysis used to justify examination of TSS as a surrogate for other

constituents is included in Attachment 1b. Statistically significant correlations are highlighted yellow in the table (alpha=0.10).

Significantly Decreasing Trends

Only two of the 66 constituent and MLS combinations included in the statistical analysis exhibited statistical decreasing trends. These included total suspended solids (TSS) at Tecolote Creek Mass Loading Station (TC-MLS) and TDS at SLR-MLS. Figure 4 below illustrates the statistical assessment results for TC-MLS. The upper and lower 95-percent confidence interval is shown as a green and light blue line, respectively. Currently, there is a significantly decreasing trend for TSS at this MLS. Observed data are shown as black diamonds, and simulated data are shown as light blue diamonds. The existing program of two wet weather events every other year is compared to three events every five years at TC-MLS. Given the steep decreasing trend at TC-MLS (Figure 4), changes to the frequency of monitoring will not increase the amount of time required to detect when the 95-percent confidence interval falls below the wet weather water quality benchmark of 100 mg/L for TSS (shown in red on the graphs). As shown in Figure 4, the anticipated date to detect TSS concentrations below the WQO is during 2010 for both scenarios (shown as a vertical fuchsia line).

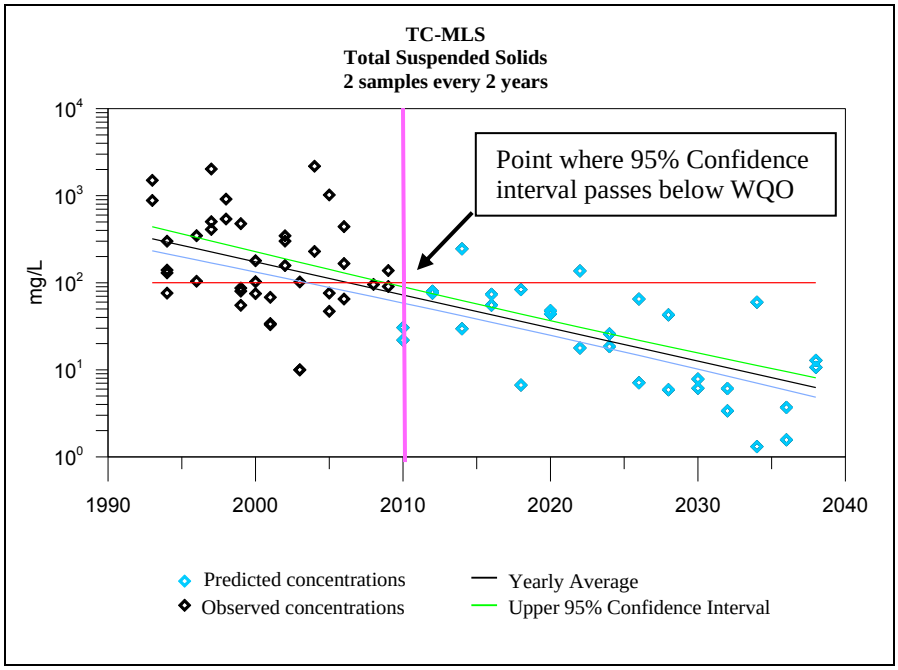

Figure 4. Statistical Analysis Results

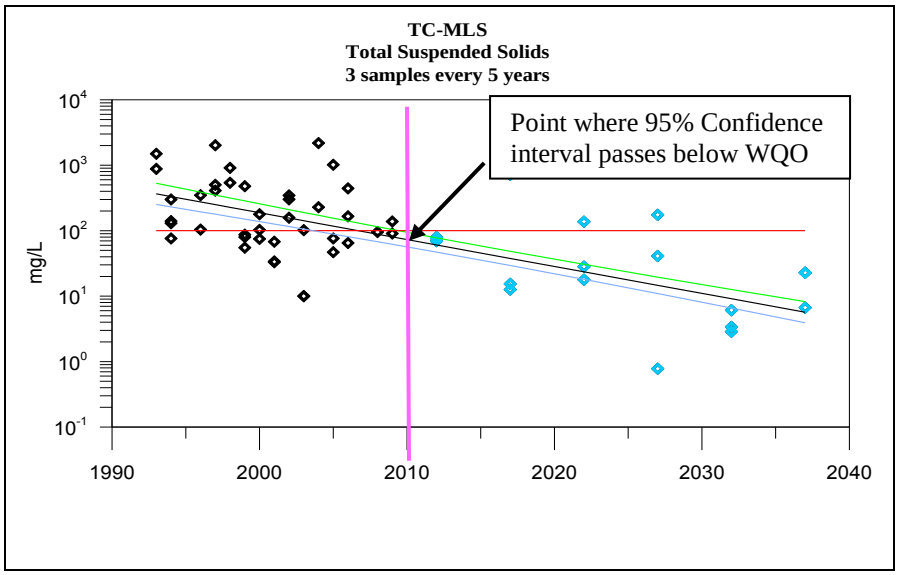

Comparison for Mass Loading Station with Significantly Decreasing Trend, Tecolote Creek Simulated Total Suspended Solids concentrations with Trend Line and 95-percent confidence interval bound

Significantly Increasing Trends

Eleven of the 66 constituent and MLS combinations included in the statistical analysis were found to be statistically increasing over time. Of these 11, four were turbidity, three were Total coliform, two were Fecal coliform, one was for TSS, and one was for total phosphorus.

The increasing trend shown in Figure 5 of TSS at Tijuana River MLS (TJR-MLS) (shown as the black line) illustrates the finding that if a significant increasing trend is observed, a reduction in sampling frequency will not affect the Copermittees' ability to detect it. Additional examples are provided in Attachment 1c that supports this conclusion.

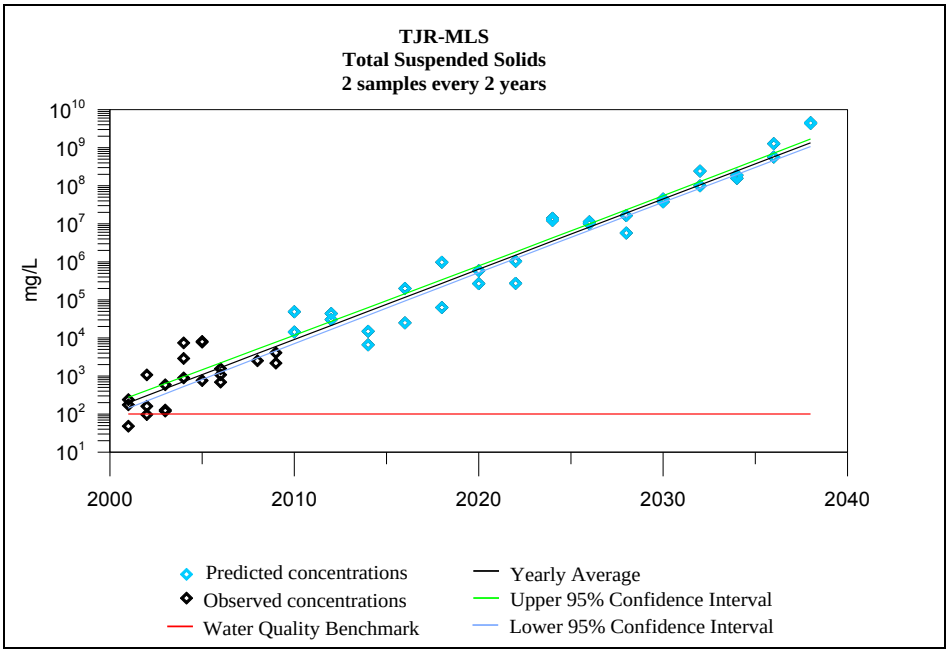

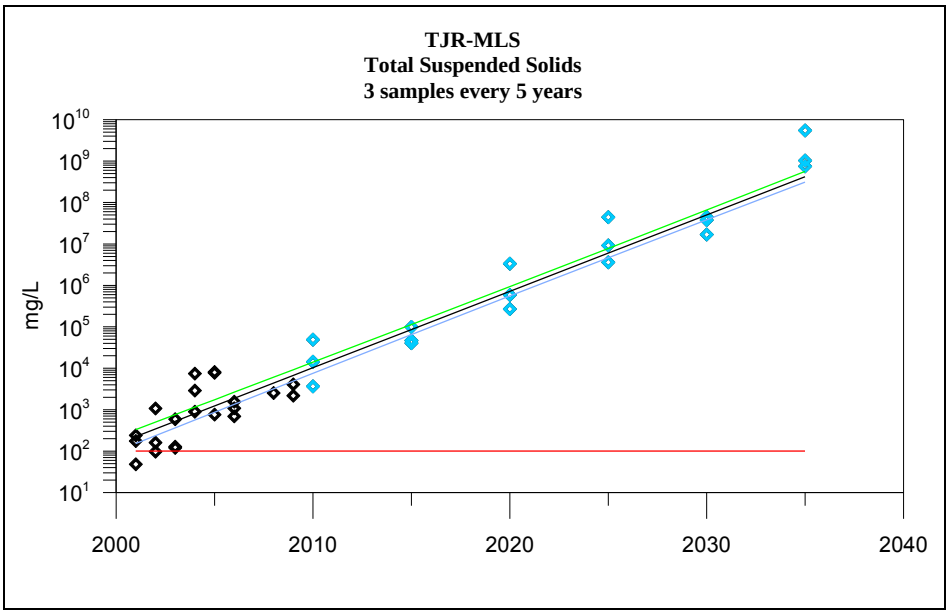

Figure 5. Statistical Analysis Results Comparison for Mass Loading Station with Significantly Increasing Trend, Tijuana River Simulated Total Suspended Solids concentrations with Trend Line and 95-percent confidence interval bound

No Significant Trends

Constituent and MLS combinations for which no significant increasing or decreasing trend has been observed present the worst case scenario for sample frequency reduction (53 of the 66 constituent and MLS pairs analyzed). The two scenarios are compared for TSS at Chollas Creek Mass Loading Station (CC-SD8(1)-MLS) and TSS at San Dieguito River (SDC-MLS) in Figure 6. The trend is generally decreasing at CC-SD8(1) and generally increasing at SDC-MLS.

In the CC-SD8(1) example, because a significant trend is not currently observed, the existing trend line will take a considerable amount of time before the upper 95-percent confident interval passes the WQB. As noted in Figure 6, although the average result is expected to cross the WQB in 2054 at the two year sampling frequency, and 2047 for the five year frequency, the 95-percent confidence interval is not predicted to fall below the WQB before the next 50 years. This finding is based on the variability of the data. Because the data are highly variable, sampling every two years actually makes it more difficult to predict when the average annual TSS concentrations will fall below the WQB. Therefore, decreasing the sample frequency from every other year to every five years will not decrease the Copermittees' ability to detect a decreasing trend. If the existing slope of the line changes to decrease faster, this scenario would result in less time to detect a trend in either instance.

At SDC-MLS a generally increasing TSS trend is observed. This example is included here to illustrate that although the current TSS levels are below the WQB, it is possible to predict when TSS concentrations will meet or exceed the WQB using either the current monitoring program or the reduced sampling frequency to every five years. In this instance, the average annual TSS concentrations are not expected to exceed the WQB within the next 50 years. The lower 95-percent confidence interval does not pass the WQB in this example.

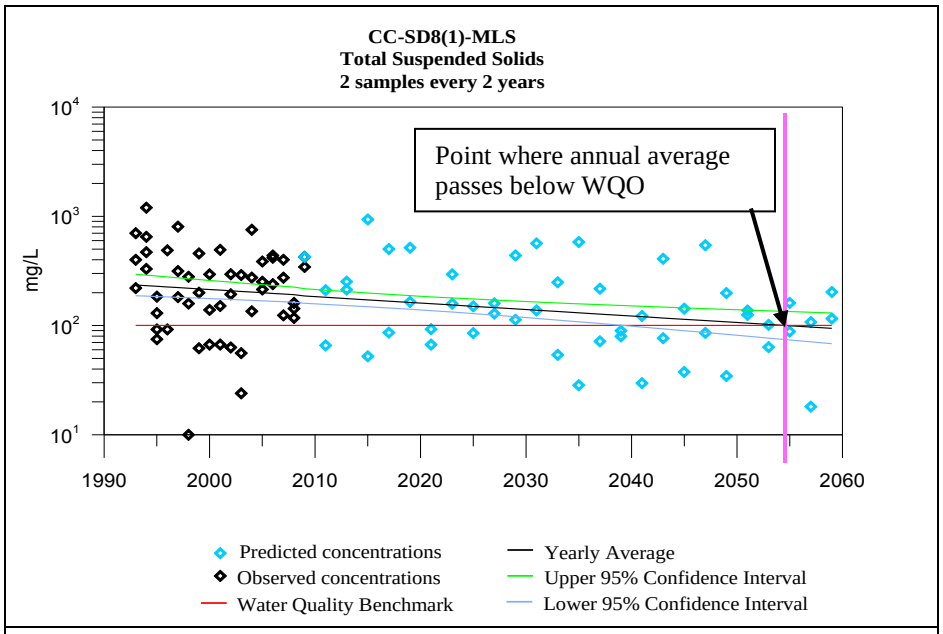
CC-SD8(1)-MLS
Total Suspended Solids
2 samples every 2 years
Point where annual average passes below WQO
mg/L
10^4
10^3
10^2
10^1
1990
2000
2010
2020
2030
2040
2050
2060
Predicted concentrations
Observed concentrations
Water Quality Benchmark
Yearly Average
Upper 95% Confidence Interval
Lower 95% Confidence Interval

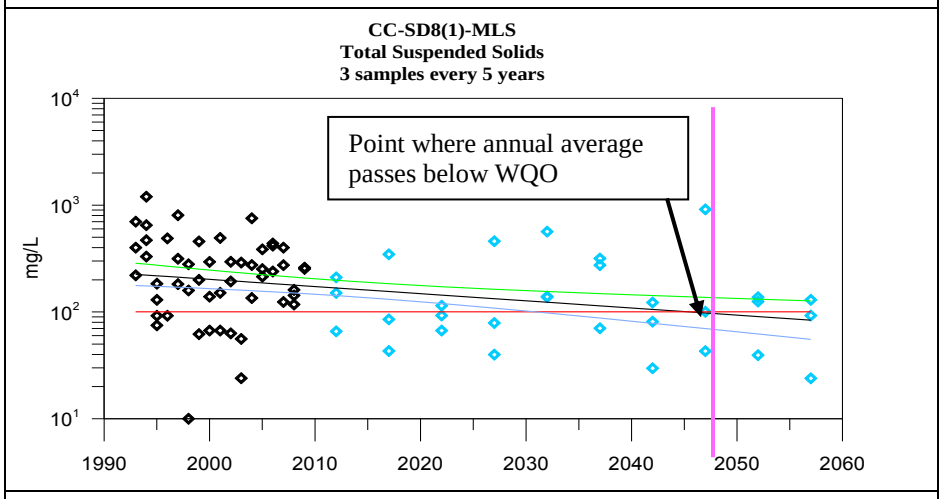
CC-SD8(1)-MLS
Total Suspended Solids
3 samples every 5 years
Point where annual average passes below WQO
mg/L
10^4
10^3
10^2
10^1
1990
2000
2010
2020
2030
2040
2050
2060

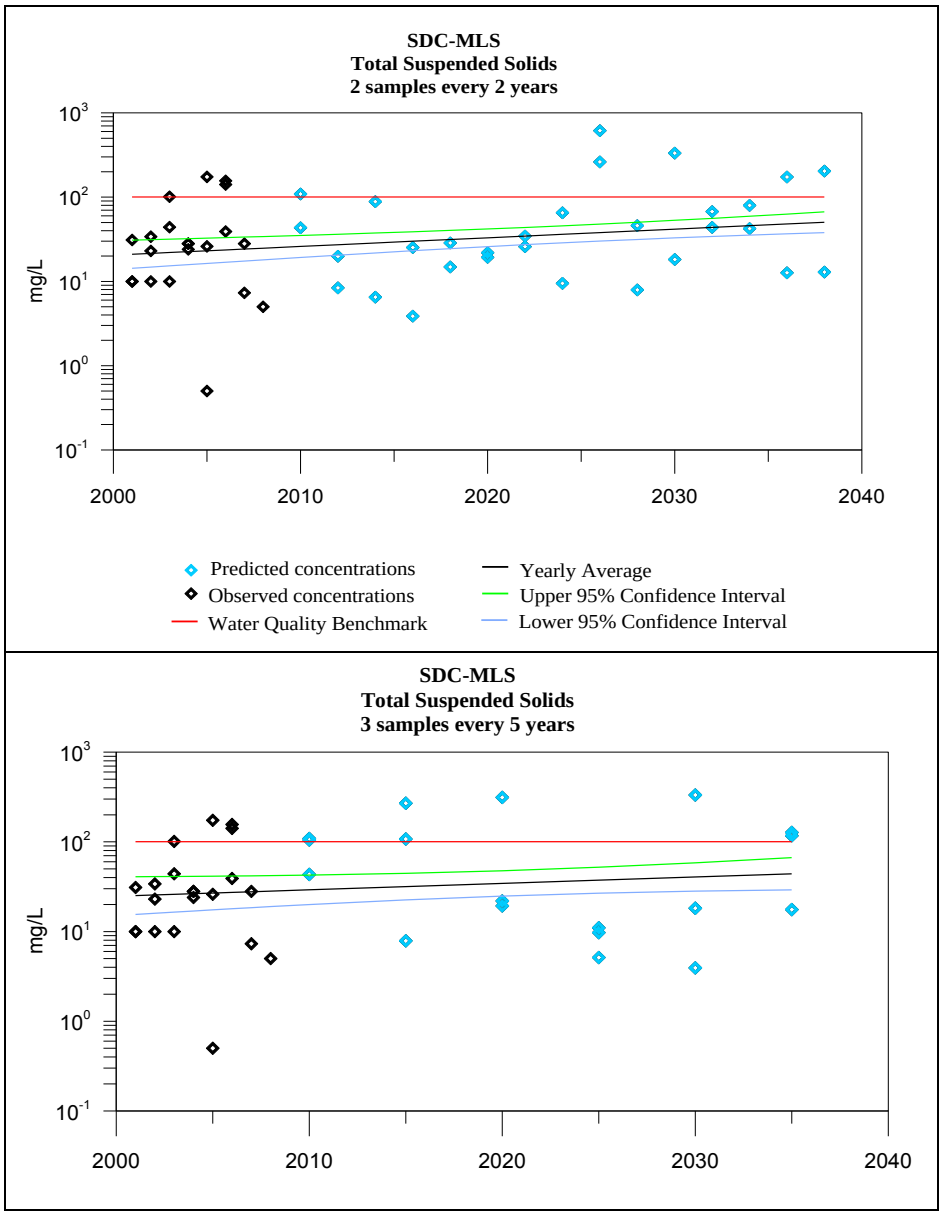

Figure 6. Tecolote Creek and Chollas Creek Simulated Total Suspended Solids concentrations with Trend Line and 95-percent confidence interval bound

ATTACHMENT 2-2

COASTAL STORM DRAIN MONITORING PROGRAM REVIEW

ATTACHMENT 2-2: COASTAL STORM DRAIN MONITORING PROGRAM REVIEW

The Coastal Storm Drain Monitoring Program met the overall monitoring program goals by complying with San Diego Regional Water Quality Control Board Order No. R9-2007-0001 (Permit), characterizing urban runoff discharges, identifying sources of bacteria, and helping to detect and eliminate illegal discharges. The Coastal Storm Drain Monitoring Program provided information that is intended to primarily answer the core management questions addressing urban runoff discharges, particularly core management question 3 and question 4 from the Permit, which are as follows:

3. What is the relative urban runoff contribution to the receiving water problem(s)?
4. What are the sources of urban runoff that contribute to receiving water problem(s)?

The Permit requires monitoring of indicator bacteria levels in urban runoff from coastal storm drain outfalls. Through a paired sampling design of the flowing coastal storm drain that reaches the ocean or bay and the nearby AB411 ocean or bay station, this program evaluates the relationship between coastal storm drain discharges and exceedances of bacteriological water quality standards in the coastal receiving waters.

An evaluation of the CSDM Program was conducted to answer the following question:

What is the impact of dry weather discharges from the coastal storm drains on the REC-1 beneficial use the adjacent coastal beach?

Evaluation of the results of the CSDM Program found that:

- The CSDM Program has demonstrated that coastal storm drain flows cause few ocean or bay bacterial exceedances during dry weather. Less than 2 percent of paired receiving water and coastal storm drain samples collected from 2007-2010 indicate a “linkage”, where elevated storm drain concentrations correlate with observed receiving water exceedance of AB 411 bacterial criteria. Of 1,647 individual receiving water bacteria indicator samples analyzed, only 32 corresponded with coastal storm drain outfall discharges (0.9% of Total coliform, 1.5% of Fecal coliform, and 3.4% of *Enterococcus* paired samples). In addition to the low incidence of linked coastal storm drain outfall discharge and receiving water AB411 exceedances, the number of coastal storm drain discharges that reach receiving waters has decreased during the past eight years from 73 percent to 23 percent. The decrease in discharge reaching the receiving waters demonstrates a lower risk of a linkage occurring between coastal storm drains and receiving waters.
- Results of the CSDM Program indicate that few storm drains contribute discharges that are linked to the AB411 exceedances in receiving waters. Only 4 of the 227 (1.7 percent) coastal storm drains monitored over the past three years corresponded more than once to a nearby AB411 exceedance in the ocean or bay. These four coastal storm drains have ongoing source abatement programs. An additional six coastal storm drains over the past three years each corresponded only once with an elevated coastal storm drain discharge to a nearby AB 411 exceedance in the ocean or bay.

- Of the ten coastal storm drain outfalls over the past three years linked to AB411 exceedances in the ocean or bay, five will be included in the implementation plans for the Revised Total Maximum Daily Loads for Indicator Bacteria Project – I Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek Bacteria TMDL). The Bacteria TMDL will cover the following hydrologic areas: San Luis Rey River HU 903.00, San Marcos HA 904.50, San Dieguito HU 905.00, Miramar Reservoir HA 906.10, Scripps HA 906.30, Tecolote HA 906.50, San Diego River HU 907.00, and Chollas HSA 908.22. These areas cover much of the coastline and will result in a duplication of effort between the CSDM Program and the Bacteria TMDL monitoring program.

Conclusions

The conclusion of this evaluation is that the CSDM Program should be discontinued, as it has shown that the correspondence between elevated coastal storm drain outfall discharges and AB411 exceedances in the receiving water is minimal (1.9 percent). In addition, upcoming Bacteria TMDL monitoring will overlap with CSDM Program requirements. The TMDL will require an implementation plan to assess and prioritize receiving water exceedances caused by outfall discharges. The very few stations that exhibit a link to AB411 indicator bacterial exceedances in the bay or ocean are addressed by special programs at those stations.

Supporting Documentation

Background

The CSDM Program has been implemented since 2001, and includes the cities of Oceanside, Carlsbad, Encinitas, Solana Beach, Del Mar, San Diego, and the San Diego Unified Port District. The cities of Coronado and Imperial Beach do not currently participate in the program because Coronado participates in a weekly bacteria beach monitoring program, and Imperial Beach coastal storm drains do not flow during dry weather.

Order 2007-0001 require the Copermittees to identify all coastal storm drains and sample those that are flowing on a monthly basis. Current active sites for each jurisdiction were selected based on the following considerations:

- Accessibility
- Safety for samplers
- Outfall conveys urban runoff from the Copermittees' MS4.

Samples were collected from all locations meeting the site selection criteria above, in the manner described below:

1. Samples will be collected at all flowing storm drain outlets, even if the discharge does not come into direct contact with the receiving water.
2. Storm drain outlet samples will be collected if the storm drain discharge infiltrates into the sand before reaching the receiving water.
3. Storm drain outlet samples will be collected if the flowing storm drain results in ponding between the drain and the receiving water.

4. Paired samples (both storm drain sample and receiving water sample) will be collected when storm drain flows are observed to reach the receiving water.

Monthly samples are collected at all flowing coastal storm drain outfalls, and paired samples are collected in the receiving water if the coastal storm drain discharge reaches the receiving water. A total of 471 unpaired samples were collected at coastal storm drain outfalls from 2007-2010, and a total of 549 paired samples were collected during the same timeframe (2007-2008, 2008-2009, and 2009-2010 Coastal Storm Drain Monitoring Program Annual Reports). In total, 1,569 samples were analyzed for *Enterococcus*, Fecal Coliform, and Total Coliform (4,707 analyses total).

Summary of receiving water samples collected from 2007-2010

The geometric mean and range of receiving water results from 2007-2010 are presented in Figure 1 through Figure 3. Except for *Enterococcus*, the geometric mean for all stations and bacteria indicators is below the AB411 benchmark. Coast 36 and CSD010 are the only two stations with geometric means above the AB411 criteria for *Enterococcus* (although there are some single sample exceedances). Fecal coliform has a few single samples that are above the AB411 standard, but no geometric means. Total coliform also has no stations with geometric means above the benchmark, just a few single samples.

These results corroborate the findings of the receiving water and outfall discharge linkage analysis, which demonstrate that 19 Enterococcus, 8 Fecal Coliform, and 5 Total Coliform receiving water exceedances were likely caused by storm drain discharges. In those instances where receiving water results indicated higher concentrations of indicator bacteria than observed in storm drain runoff discharges, there was not a causal relationship demonstrated between storm drain discharge and the receiving water exceedance (see Table 1). Overall, there were more receiving water samples above the AB411 standard than presented in Table 1 because in some samples the receiving water result was much higher than the storm drain discharge concentration. For example, Station CSD021 exceeded the receiving water standard for *Enterococcus* and Fecal coliform on 12/1/2008 (804 MPN/100mL, and 460 MPN/100mL, respectively), but the storm drain concentrations were much lower than the receiving water results (280 MPN/100mL, and 9 MPN/100mL, respectively).

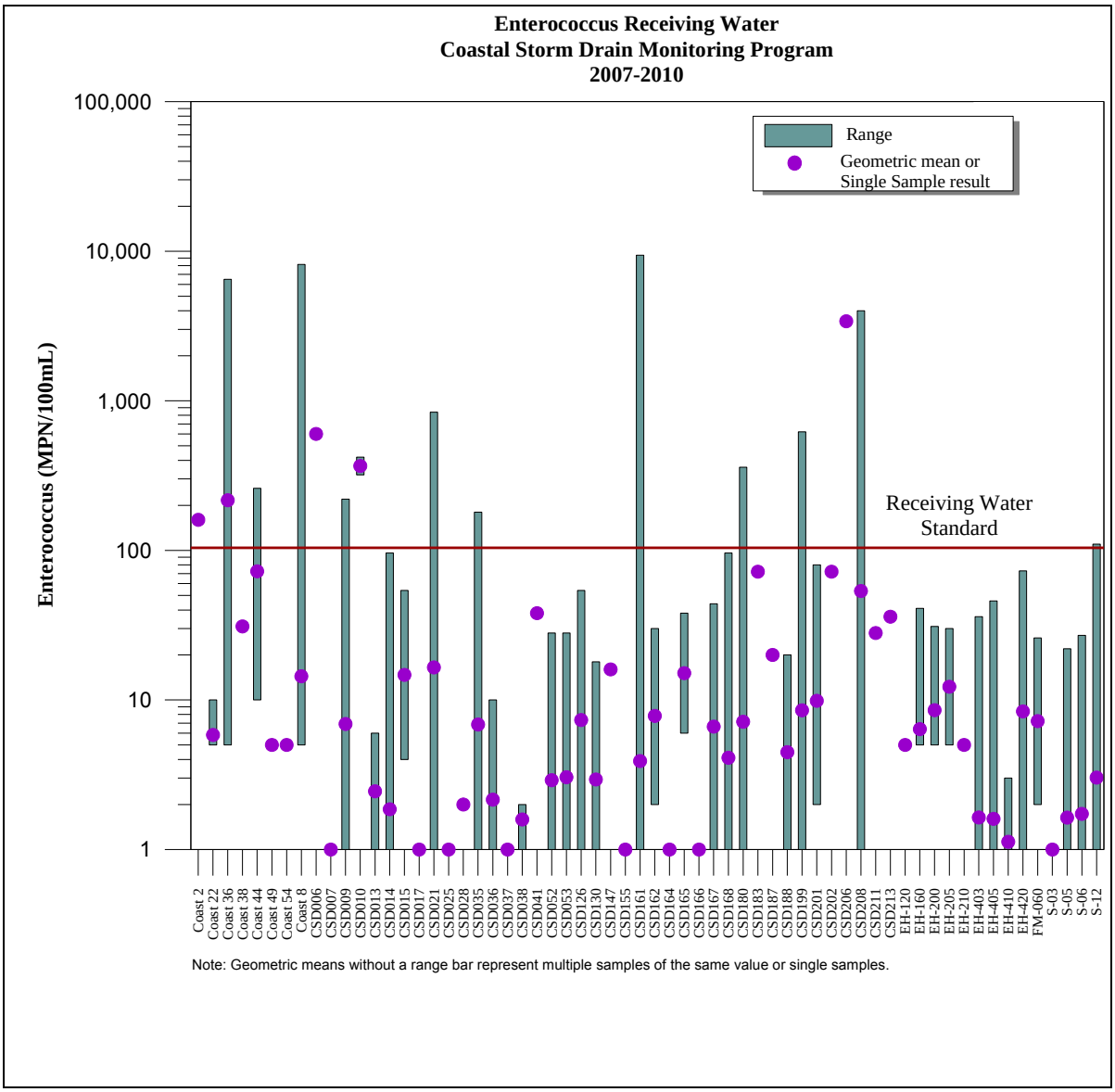

Figure 1. Summary of Coastal Storm Drain Monitoring Program Enterococcus Receiving Water Results 2007-2010

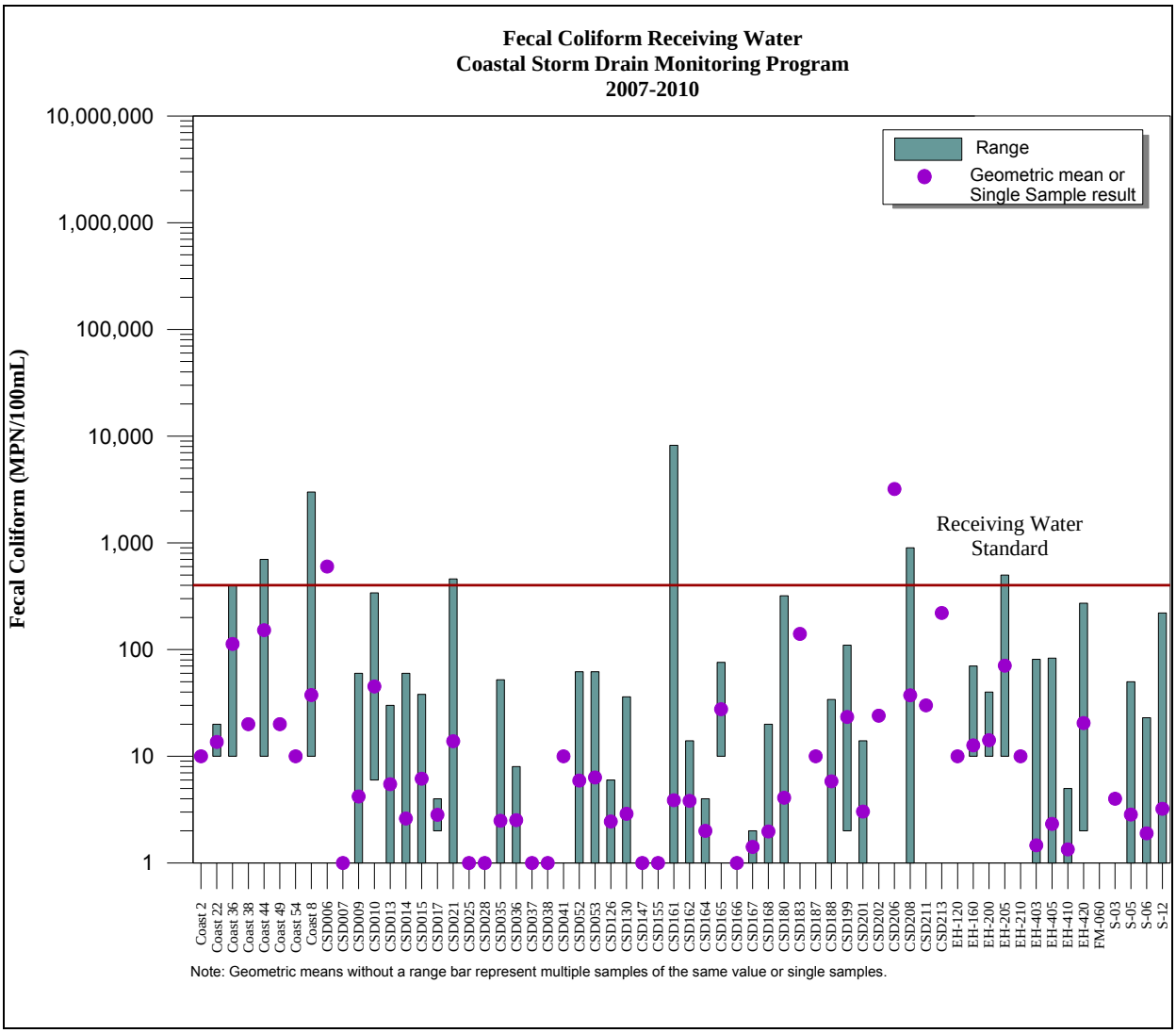

Figure 2. Summary of Coastal Storm Drain Monitoring Program Enterococcus Receiving Water Results 2007-2010

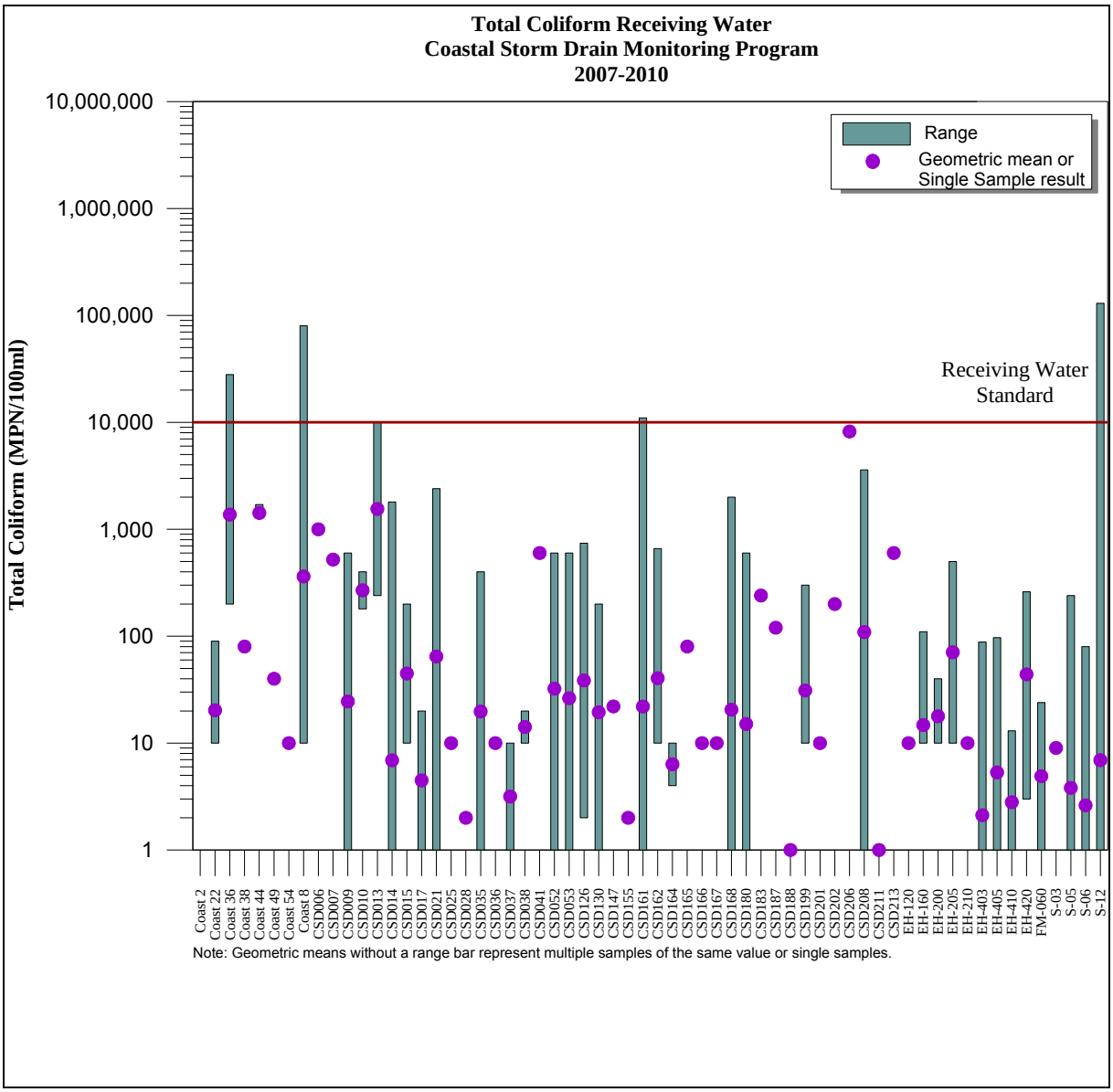

Figure 3. Summary of Coastal Storm Drain Monitoring Program Enterococcus Receiving Water Results 2007-2010

Coastal Storm Drain Outfall Discharge and Receiving Water Linkage Analysis

Sampling of the receiving water occurs when coastal storm drain outfall discharges reach the receiving waters. During the past three years of monitoring (2007-2010) 549 paired samples were collected. A paired sample consisted of one sample from the coastal storm drain outfall discharge and one from the receiving water. Of the 549 paired samples, 1.9 percent showed a link between storm drain outfalls and the receiving water (Table 1).

Table 1. Summary of Coastal Storm Drain Outfall and Receiving Water Linkages

Analyte	Number of Linked Samples	Total Number of Paired Samples	Percent Storm Drain Caused Receiving Water Exceedance
Enterococcus	19	549	3.5%
Fecal Coliform	8	549	1.5%
Total Coliform	5	549	0.9%
Total	**32**	**1,647**	**1.9%**

To further illustrate the relationships between receiving water and storm drain bacteria levels, and receiving water and storm drain action levels, a series of scatter plots referred to as adaptive monitoring diagrams were developed. The adaptive monitoring diagrams stratified the paired sampling data into categories, or quadrants and are essential tools in the implementation of understanding how storm drain flows can impact receiving waters. Figure 4 through Figure 6 summarize the results of Total Coliform, Fecal Coliform, and *Enterococcus* paired samples for 2007-2010.

The scatter plots are divided into five quadrants that are formed by superimposing a line of slope = 1 and two perpendicular lines that delineate the AB411 standard for the indicator of interest. For example, the five quadrants in Figure 1 through Figure 3 are formed by the 1:1 slope line and two lines delineating the AB411 standard line for Total Coliform (10,000 MPN/ 100mL). Receiving water bacteria levels in samples falling within quadrants above the 1:1 slope line (Quadrants II and III, and the upper part of Quadrant I) are higher in bacteria than the corresponding storm drain sample and are therefore, likely influenced by sources in addition to the storm drain discharge. Possible sources include birds, other marine wildlife, discharges from watercraft, and ocean bathers. Quadrant IV of the scatter plots includes the paired samples where elevated storm drain bacteria are likely to have caused or contributed significantly to the AB411 exceedance. Quadrant V includes the elevated storm drain samples that did not result in an AB411 exceedance. Table 2 describes the relationships associated with paired sample data falling into each quadrant.

Table 2. Adaptive Monitoring Description, Recreated from Coastal Storm Drain Monitoring Program 2009-2010 Annual Report

Quadrant	Area	Relationship/Possible Action
Lower Left	I	Storm drain and receiving water levels are below receiving water standards. The receiving waters support beneficial uses
Lower Right	I-A	Storm drain concentration is above receiving water criteria but below 95th percentile action level, receiving water is below receiving water criteria. No action necessary
	V	Storm drain concentration is above 95th percentile action level while receiving water concentration is below receiving water criteria. Highly elevated storm drain concentration does not cause receiving water exceedance, however, the magnitude of the exceedance warrants follow-up and possible investigation.
Upper Left	II	Storm drain less than receiving water standards, while criteria are exceeded in receiving water sample. It does not appear that storm drain flow is responsible for the receiving water exceedance.

Quadrant	Area	Relationship/Possible Action
Upper Right	III	Storm drain and receiving water samples are above receiving water criteria, and storm drain concentration is less than receiving water concentration. Storm drain contamination may contribute to receiving water exceedance, but other sources are also likely.
	IV	Storm drain and receiving water samples are above receiving water criteria, and storm drain concentration is greater than the receiving water concentration. Elevated storm drain concentration likely to have caused receiving water exceedance.

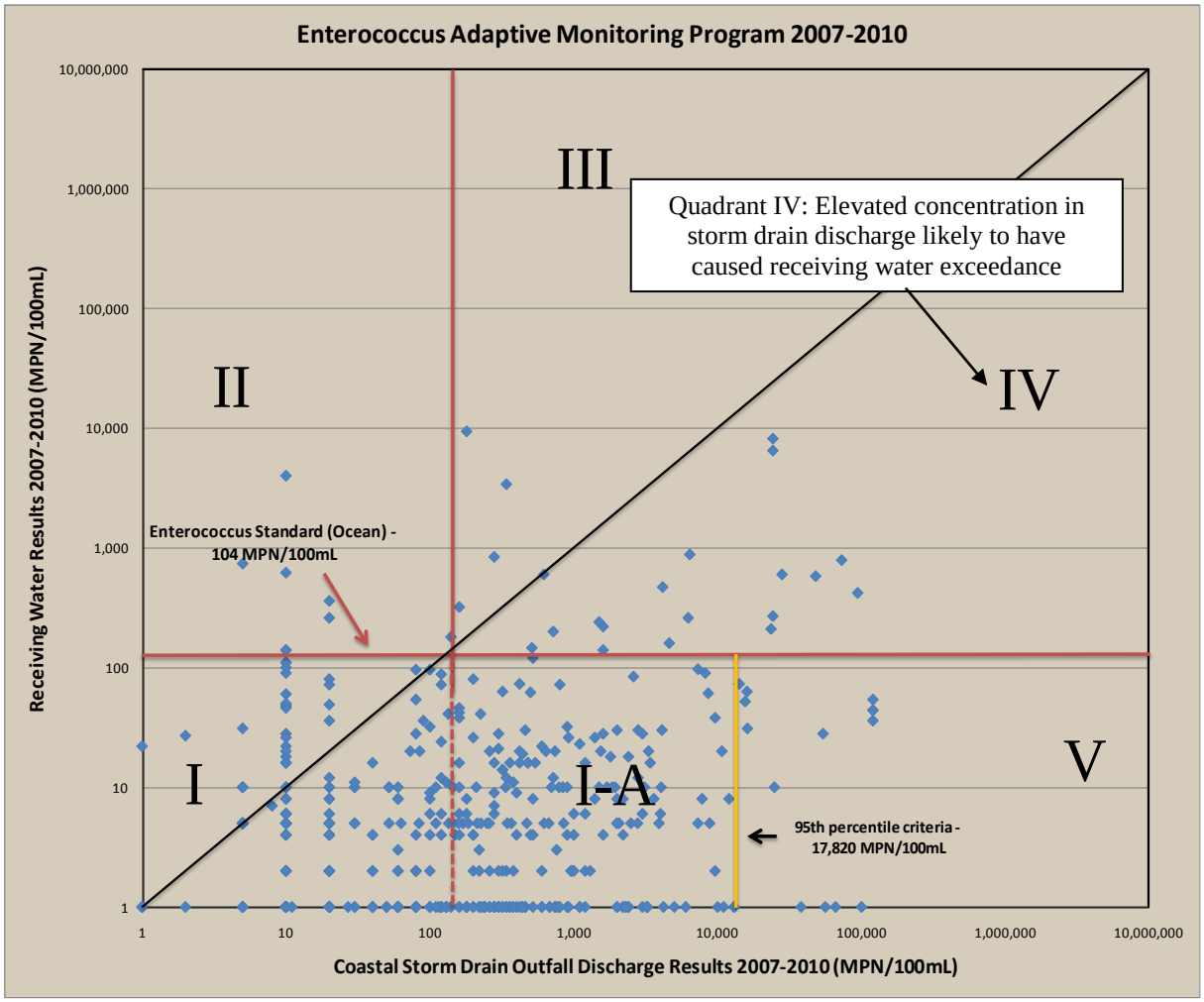

Figure 4. *Enterococcus* Adaptive Monitoring Results 2007-2010

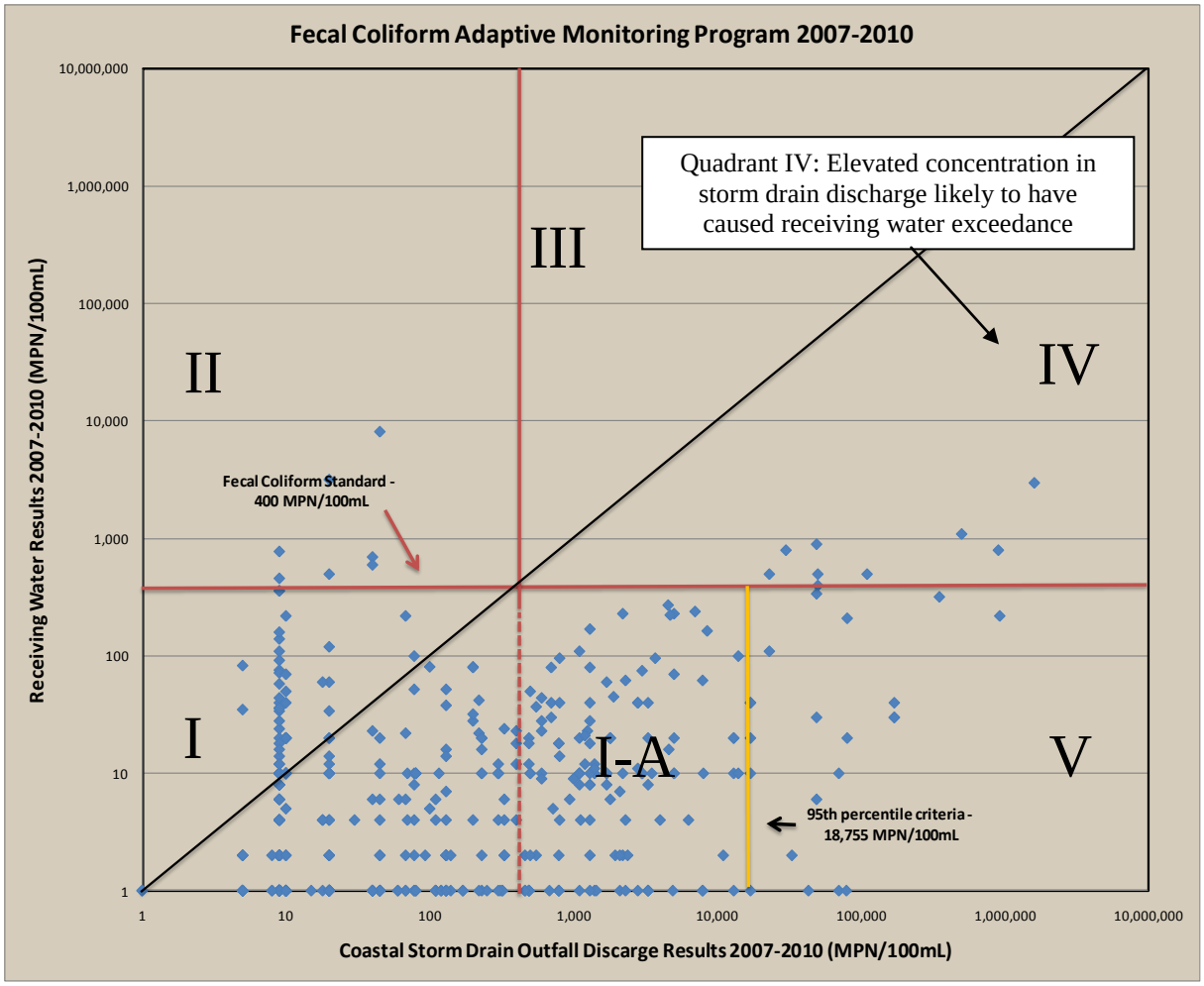

Figure 5. Fecal Coliform Adaptive Monitoring Results 2007-2010

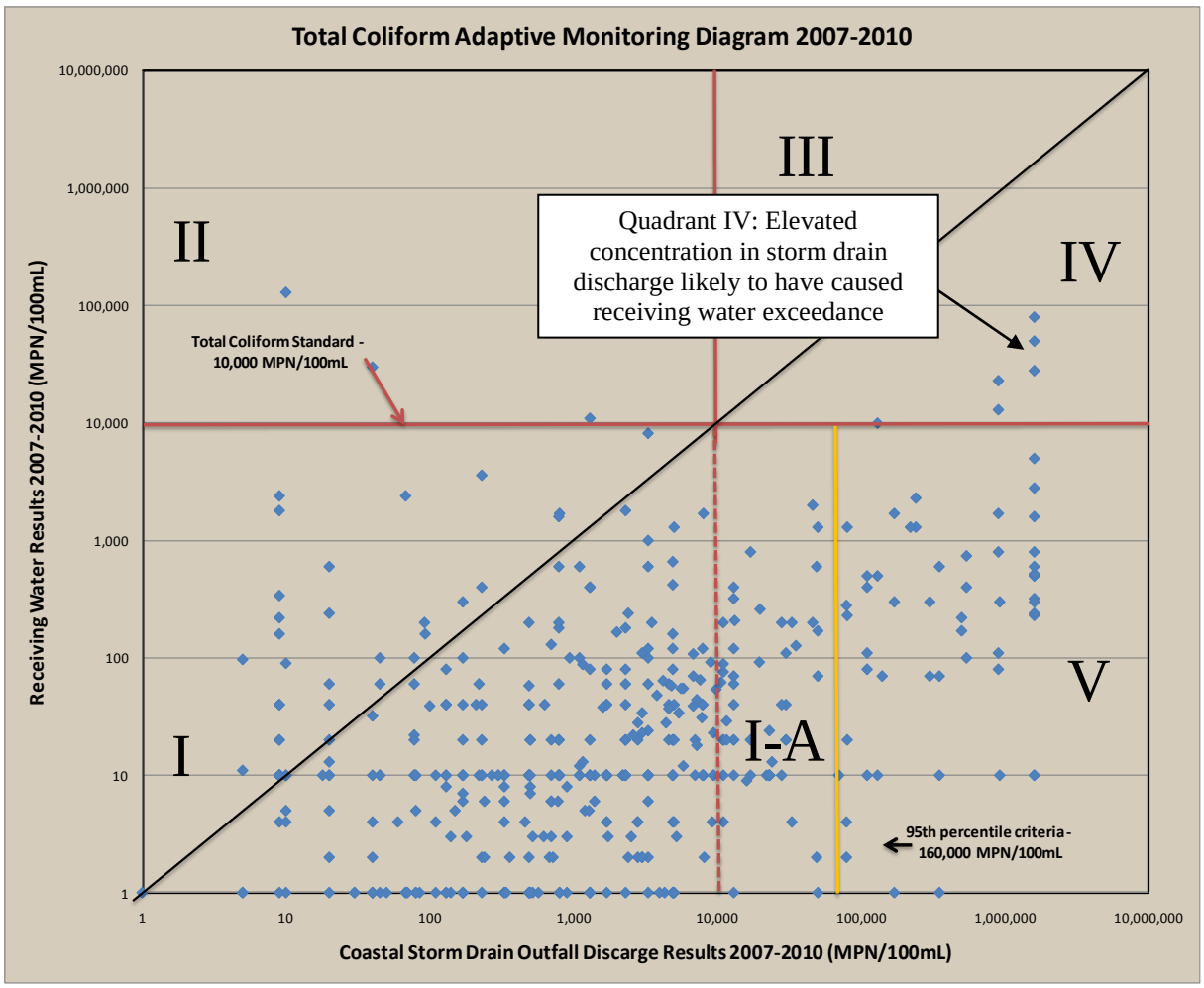

Figure 6. Total Coliform Adaptive Monitoring Results 2007-2010

The samples that fall into Quadrant IV in Figure 4 through Figure 6 are summarized in Table 5, which presents a seasonal breakdown of the coastal storm drain discharge and receiving water results where linkages are present. The majority of linked samples occurred during the winter months (11 of 19 *Enterococcus* samples, 4 of 7 Fecal Coliform, and 4 of 5 Total Coliform).

Table 3. Seasonal Summary of Coastal Storm Drain Discharge and Linked Receiving Water Samples

Month	*Enterococcus*	Fecal Coliform	Total Coliform	Season
May	1	0	0	Dry Season
June	1	1	0	
July	0	1	0	
August	3	1	0	
September	3	0	1	
Summer Total	**8**	**3**	**1**	
October	1	2	1	Wet Season
November	2	0	0	
December	1	0	0	
Jan	4	2	3	
Feb	2	0	0	
March	1	0	0	
April	0	0	0	
Winter Total	**11**	**4**	**4**	

Stations for which a linkage between coastal storm drain discharge and receiving water results has been observed are presented in Table 4. Of 227 stations included in the program, only four of the ten stations with a suspected linkage exhibit a chronic pattern of paired sample exceedances. These four stations represent 1.7 percent of the stations monitored within the CSDM Program. At two of these four stations, additional measures have already been taken to ensure the linkage between coastal storm drain discharges and receiving waters is eliminated. Effectiveness assessment of BMP implementation (Coast 8) is currently underway, and for CSD208 special monitoring is currently underway to understand and eliminate the source of bacteria. The sources of indicator bacteria exceedances at Coast 36 and Coast 44 have been identified. The outfall at Coast 36 is from Camp Pendleton and results have been forwarded to them for action. The two exceedances at Coast 44 were from commercial fishing activity and Oceanside Harbor Maintenance and Oceanside Code Enforcement have worked with the fisherman and the fish distributors to implement appropriate BMPs. The other six stations have exhibited a linkage between storm drain discharge and receiving water bacteria indicator results only once during the past three years. Four of the six stations will be monitored under the upcoming Bacteria TMDL. Therefore, additional special monitoring at these locations is not necessary.

Table 4. Summary of Coastal Storm Drain Outfall Monitoring Stations with Linkages to Receiving Water AB411 Exceedances

Station	Season Linkage Observed	Years Linkage Observed	HU	Water Body	Latitude	Longitude	Ongoing Actions
Coast 2	Winter (2008-2009)	1	902*	Oceanside Harbor	33.21303	-117.39474	Not an ongoing receiving water and storm drain outfall discharge linkage. No further action necessary.
Coast 36	Summer/Winter (2008-2010)	2	902*	Oceanside Harbor	33.21253	-117.39426	Source of flow identified. Results, photos, and details sent to Camp Pendleton for abatement.
Coast 44	Winter (2008-2010)	2	902*	Oceanside Harbor	33.20642	-117.38961	Source of flow identified. Oceanside Harbor Maintenance and Code Enforcement have implemented structural and administrative BMPs for the commercial fisherman and seafood transport and distribution companies.
Coast 8	Summer/Winter (2007-2010)	3	902*	Oceanside Harbor	33.20564	-117.3932	Effectiveness Assessment of BMP implementation ongoing
CSD006	Winter (2008-2009)	1	906	Vallecitos	32.85562	-117.25819	Included in Bacteria TMDL; Not an ongoing receiving water and storm drain outfall discharge linkage. No further action necessary.
CSD009	Winter (2008-2009)	1	906	Roseland Dr	32.852138	-117.26111	Included in Bacteria TMDL; Not an ongoing receiving water and storm drain outfall discharge linkage. No further action necessary.
CSD010	Summer (2008-2009)	1	906	Coast Blvd	32.850346	-117.27297	Included in Bacteria TMDL; Not an ongoing receiving water and storm drain outfall discharge linkage. No further action necessary.
CSD035	Winter (2007-2008)	1	906	Cortez Place	32.818586	-117.27428	Included in Bacteria TMDL; Not an ongoing receiving water and storm drain outfall discharge linkage. No further action necessary.
CSD208	Summer/Winter (2007-2010)	3	906	Cudahy	32.78679	-117.20791	Included in Bacteria TMDL, Special Monitoring through City of San Diego
EH-205	Summer (2008-2009)	1	908	Bessemer St	32.71803	-117.23344	Not an ongoing receiving water and storm drain outfall discharge linkage. No further action necessary.

* Hydrologic Unit designated as 902* is representative of stations in Oceanside Harbor. The harbor is listed as a coastal water body in Table 2-3 of the Water Quality Control Plan for the San Diego Basin (9). A Hydrologic Unit Basin Number has not been assigned to the harbor. According to SanGIS data, the stations fall into the 902 Hydrologic Unit, Santa Margarita.

The sample results shown in Quadrant IV of Figure 4 through Figure 6 are presented in Table 5.

Table 5. Coastal Storm Drain Discharge and Receiving Water Linkage Analysis Individual Results

Station	Date	Analyte	Months	Coastal Outfall Concentration (MPN/100 ml)	Coastal Receiving Water Concentration (MPN/100 ml)
Coast 2	2/4/2009	Enterococcus	Feb	4,611	160
Coast 36	9/2/2008	Enterococcus	Sept	24,196	6,488
Coast 36	6/1/2009	Enterococcus	June	4,150	470
Coast 36	11/9/2009	Enterococcus	Nov	23,500	210
Coast 36	9/1/2010	Enterococcus	Sept	72,700	790
Coast 44	3/10/2008	Enterococcus	March	512	146
Coast 44	1/11/2010	Enterococcus	Jan	6,240	260
Coast 8	1/17/2008	Enterococcus	Jan	24,196	8,164
Coast 8	5/12/2008	Enterococcus	May	24,196	269
CSD006	12/1/2008	Enterococcus	Dec	620	600
CSD009	11/10/2008	Enterococcus	Nov	1,600	220
CSD010	8/4/2008	Enterococcus	Aug	94,000	420
CSD035	1/14/2008	Enterococcus	Jan	1,600	140
CSD208	8/11/2008	Enterococcus	Aug	1,500	240
CSD208	8/5/2009	Enterococcus	Aug	28,000	600
CSD208	10/14/2009	Enterococcus	Oct	48,000	580
CSD208	1/13/2010	Enterococcus	Jan	6,400	880
CSD208	2/1/2010	Enterococcus	February	720	200
CSD208	9/7/2010	Enterococcus	Sept	520	120
Enterococcus: 19 Receiving Water Samples Likely Linked to Storm Drain Discharge					
Coast 44	1/11/2010	Fecal Coliform	Jan	50,000	500
Coast 8	10/8/2007	Fecal Coliform	Oct	500,000	1,100
Coast 8	1/17/2008	Fecal Coliform	Jan	30,000	800
Coast 8	6/2/2008	Fecal Coliform	June	110,000	500
Coast 8	10/21/2009	Fecal Coliform	Oct	1,600,000	3,000
Coast 8	2/15/2010	Fecal Coliform	February	900,000	800
CSD208	8/5/2009	Fecal Coliform	Aug	49,000	900
EH-205	7/23/2009	Fecal Coliform	July	23,000	500
Fecal Coliform: 8 Receiving Water Samples Likely Linked to Storm Drain Discharge					
Coast 36	9/2/2008	Total Coliform	Sept	1,600,000	23,000
Coast 8	1/17/2008	Total Coliform	Jan	1,600,000	50,000
Coast 8	1/31/2008	Total Coliform	Jan	90,000	23,000

Table 5. Coastal Storm Drain Discharge and Receiving Water Linkage Analysis Individual Results

Station	Date	Analyte	Months	Coastal Outfall Concentration (MPN/100 ml)	Coastal Receiving Water Concentration (MPN/100 ml)
Coast 8	1/12/2009	Total Coliform	Jan	90,000	13,000
Coast 8	10/21/2009	Total Coliform	Oct	1,600,000	80,000
Total Coliform: 5 Receiving Water Samples Likely Linked to Storm Drain Discharge					
In Total: 1.9 Percent (32 of 1,647) Receiving Water Samples Likely Linked to Storm Drain Discharge					

Coastal Storm Drain Discharge Frequency

During the time period of 2007-2010, coastal storm drain outfall discharges that reach the receiving water have decreased. Figure 7 illustrates the reduction of coastal storm drain outfall discharges, from approximately 73 percent of coastal storm drains discharging in 2002-2003 down to 23 percent discharging in 2009-2010. The reduced incidence of discharging outfalls translates to a reduced risk of beneficial use impairment in the coastal receiving waters.

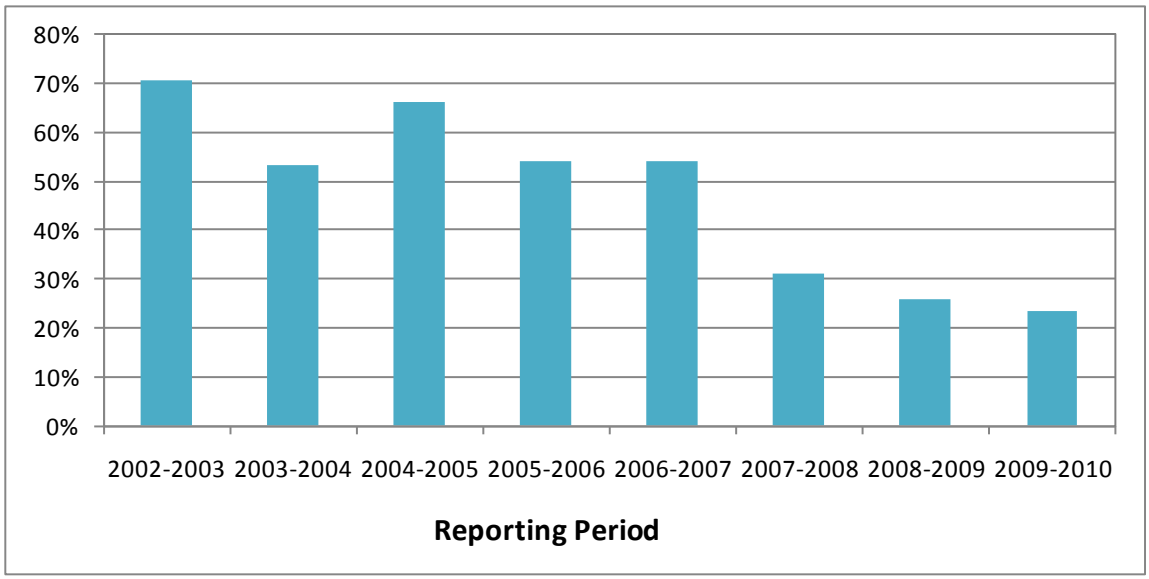

Figure 7. Proportion of Flowing Coastal Storm Drains, Reproduced from Figure 4-10 of Coastal Storm Drain Monitoring Program 2009-2010 Annual Report

ATTACHMENT 2-3

MS4 OUTFALL MONITORING PROGRAM REVIEW

ATTACHMENT 2-3: MS4 OUTFALL MONITORING PROGRAM REVIEW

The 2007 Permit required a municipal separate storm sewer system program (MS4 Program) to characterize constituent discharges from MS4 outfalls and to assess whether these discharges contribute to the water quality problems in the receiving waters. The MS4 Program addresses core management question #3 of the Permit (what is the relative urban runoff contribution to the receiving water problem(s)?). The MS4 Outfall Work Plan (Attachment to Copermittees Scope of Work for 2010-2011, 2010) consists of a random and targeted sampling design during dry weather and wet weather periods (Table 0-1).

Table 0-1: Summary of the MS4 Outfall Monitoring Design

Season	Design Type	Outfall Diameter	Number of Samples
Dry	Random	≥36 inches	54 per year
	Targeted	Any	200 per year
Wet	Random	≥36 inches	54 per year
	Targeted	Any	9 per Permit cycle

The following monitoring questions guide the different components of the MS4 Outfall monitoring program.

Random Program-

1. *What are the characteristics of discharges from MS4 outfalls in regard to high priority pollutants?*
2. *Are constituent loadings changing over time?*

Targeted Program-

3. *Which of the targeted MS4 outfalls have the greatest constituent loading?*
4. *Are the pollutants loading decreasing over time?*

A preliminary assessment of the MS4 Program was conducted to answer those questions that could be addressed with the data collected thus far which include questions 1 and 3. Table 0-2 shows the number of samples collected each year in each element of the five-year program. Except for the targeted wet weather element, which has only one year of data thus far, there were two years of monitoring data for evaluation.

Table 0-2: Summary of MS4 Program Monitoring Data Collection (2007-2010)

Program Year	Random Sites		Targeted Sites	
	Wet Weather	*Dry Weather*	*Wet Weather*	*Dry Weather**
2007-2008	0	0	0	9
2008-2009	39	40	0	178
2009-2010	50	35	3	172

*For targeted dry, number of sites differs by analyte and includes all sites sampled. An additional 28-29 sites visited were dry (~14%) and could not be sampled.

Key Findings

- On a regional basis, dry weather priority constituents from MS4 outfalls included: bacteria, nutrients, and TDS. Wet weather priority constituents included bacteria and TSS.
- In general, these regional MS4 outfall priorities match the priorities in receiving waters.
- MS4 targeted outfalls with the greatest pollutant loading differ somewhat by constituent and year. However, upon further data collection, priority MS4 outfalls will be identified.

Conclusions

The on-going MS4 Program will provide a sound basis for updating the design under the next Permit. In general, priority constituents in dry and wet weather conditions match the receiving water priorities. Preliminary results have indicated that high priority MS4 outfalls will be identified with a more robust data set at the completion of the current MS4 program in three years. When an adequate number of samples are collected, this program will allow for Copermittees to focus on key drainages to identify and abate sources, as warranted.

Supporting Documentation

The analysis of all data collected from the MS4 outfalls throughout the region was used to answer the following question:

> *Question 1: What are the characteristics of discharges from MS4 outfalls in regard to high priority pollutants?*

Storm drain discharge data were compared to receiving water benchmarks to determine if storm drain runoff has the potential to contribute to the receiving water problems.

Dry Weather – Of the ten constituents analyzed in the MS4 random program, dry weather priority constituents for MS4 outfall discharges included: total nitrogen, total phosphorus, TDS, fecal coliform and enterococcus for the region. Note that discharge results were compared to WQOs for receiving waters (RW) to determine priority rating, where greater than 50-percent detections were above WQO was considered high priority and greater than 25-percent frequency and less than or equal to 50-percent was considered medium priority (shown as percent above the receiving water –water quality objective (% above RW-WQB) in the following tables). The high priority and the medium priority constituents were evaluated using all of the data collected in the random and targeted monitoring elements of the MS4 Program. The results of the random program regionally represent the ten constituents sampled at randomly-selected outfalls in each watershed. The results of the targeted program support the regional results for these constituents, and also identify two additional constituents, chloride and sulfate (constituents of TDS), as priorities in some watersheds.

Table 0-3: Summarized Results of MS4 Random Outfalls Dry Weather Sampling

MS4 Random Dry		
Constituent	n	% Above RW-WQB
pH	75	3%
Nitrate as N	75	7%
Nitrate/Nitrite as N	75	7%
Nitrite as N	75	0%
Total Phosphorus	75	79%
Total Nitrogen	75	91%
Total Suspended Solids*	75	17%
Total Dissolved Solids	67	93%
Enterococcus	75	92%
Fecal Coliform	75	43%

Notes:
Discharge results compared to receiving water quality benchmarks.
*TSS-WQO is a narrative standard, the objective is a benchmark based on the overall median values and EMCs from the NSDQ, Version 1.0 (2004).
n= number of samples
High priority constituents shown in orange and medium priority constituents in yellow.

Table 0-4: Summarized Results of MS4 Targeted Outfalls Dry Weather Sampling

MS4 Targeted Dry		
Constituent	n	% Above RW-WQB
pH	95	5%
Nitrate as N	125	14%
Nitrate/Nitrite as N	56	7%
Nitrite as N	96	0%
Total Phosphorus	257	69%
Total Nitrogen	259	88%
Total Suspended Solids	228	4%
Total Dissolved Solids	260	90%
Enterococcus	355	80%
Fecal Coliform	352	42%
Chloride	41	68%
Sulfate	44	98%
Cadmium (Dissolved)	106	0%
Copper (Dissolved)	110	5%
Lead (Dissolved)	106	0%
Nickel (Dissolved)	6	0%
Zinc (Dissolved)	105	1%
Selenium, Total	33	15%
Ammonia as N	51	4%
Dissolved Oxygen	99	12%
Turbidity	52	12%
MBAS	32	22%
Chlorpyrifos	69	1%
Diazinon	73	0%
Malathion	45	0%
Oil & Grease	32	0%

Notes:
Discharge results compared to receiving water quality benchmarks.
Based on 202 different sites; 149 sites sampled in both 2008-2009 and 2009-2010.n= number of samples
High priority constituents shown in orange and medium priority constituents in yellow.

Preliminary dry weather priority ratings for monitored constituents by MLS drainage area are provided in Table 0-5 and Table 0-6 for the random and targeted MS4 outfall discharge results, respectively. These tables identify the number of MS4 samples within each MLS drainage area, and the priority identified based on these data. The ambient receiving water priorities based on the MLS monitoring results are also shown for comparison. In general, the priorities for the MS4 outfall discharges were largely consistent with the priorities identified in the corresponding receiving water.

Table 0-5: MS4 Random Dry Weather Results compared to Receiving Water Priorities by Watershed (MLS Drainage Area)

Constituent	AHC		CC-SD8(1)		EC		LPC		SDC		SDR		SLR		SMR		SR		TC		TJR	
	n	% Above RW-WQB	n	% Above RW-WQB	n	% Above RW-WQB	n	% Above RW-WQB	n	% Above RW-WQB	n	% Above RW-WQB	n	% Above RW-WQB	n	% Above RW-WQB	n	% Above RW-WQB	n	% Above RW-WQB	n	% Above RW-WQB
pH	2	0%	0	NA	1	0%	5	0%	2	0%	4	0%	8	0%	12	0%	4	0%	2	50%	2	50%
Nitrate as N	2	0%	0	NA	1	0%	5	0%	2	0%	4	0%	8	25%	12	25%	4	0%	2	0%	2	0%
Nitrate/Nitrite as N	2	0%	0	NA	1	0%	5	0%	2	0%	4	0%	8	25%	12	25%	4	0%	2	0%	2	0%
Nitrite as N	2	0%	0	NA	1	0%	5	0%	2	0%	4	0%	8	0%	12	0%	4	0%	2	0%	2	0%
Total Phosphorus	2	100%	0	NA	1	100%	5	60%	2	100%	4	75%	8	63%	12	75%	4	75%	2	100%	2	50%
Total Nitrogen	2	100%	0	NA	1	100%	5	60%	2	50%	4	100%	8	88%	12	92%	4	100%	2	100%	2	100%
Total Suspended Solids	2	0%	0	NA	1	0%	5	20%	2	0%	4	0%	8	25%	12	8%	4	0%	2	0%	2	50%
Total Dissolved Solids	2	100%	0	NA	1	100%	5	100%	2	100%	4	100%	8	100%	12	100%	4	100%	0	NA	2	0%
Enterococcus	2	50%	0	NA	1	100%	5	100%	2	100%	4	100%	8	88%	12	92%	4	100%	2	100%	2	100%
Fecal Coliform	2	0%	0	NA	1	0%	5	40%	2	0%	4	50%	8	50%	12	67%	4	50%	2	50%	2	0%
Ambient RW Priorities		Total Nitrogen (medium), TDS, Enterococcus, Fecal coliform, Toxicity (medium)		pH, Dissolved Phosphorus, Total Phosphorus, Total Nitrogen, Ammonia as N (medium), Bacteria (medium), Dissolved Cu, Total Selenium (medium); Toxicity (medium); and Turbidity, MBAS, COD, BOC, Oil and Grease (all medium)		Total Nitrogen, TDS, Enterococcus, Toxicity (medium)		Total Nitrogen (medium), Total Phosphorus, TDS, Enterococcus , Toxicity		Total Phosphorus (medium), Total Nitrogen, TDS, Enterococcus (medium) Fecal coliform (medium), BOD (medium), Toxicity (medium)		Dissolved Phosphorus, Total Phosphorus (medium),		Dissolved Phosphorus, Total Phosphorus, Total Nitrogen (medium), TDS, Enterococci (Med), Fecal Coliforms (Med)		Total Nitrogen, TDS, Chlorpyrifos		Total Phosphorus (medium), Total Nitrogen (medium) TDS, Enterococci (medium), Toxicity		Total Phosphorus (medium), Toxicity		Dissolved Phosphorus, Total Phosphorus, Total Nitrogen, Ammonia as N, Enterococcus, Fecal coliform, BOD, MBAS, Turbidity (medium), COD (medium), Toxicity

Discharge results compared to receiving water quality benchmarks. Ambient RW Priorities based NPDES Regional Program and does not include results from SMC or Third Party data.
NA – Either no data were collected upstream of the mass loading station, or stations were dry and no data collected

Table 0-6: MS4 Targeted Dry Weather Results compared to Receiving Water Priorities by Watershed (MLS Drainage Area)

Constituent	AHC		CC-SD8(1)		EC		LPC		SDC		SDR		SLR		SMR		SR		TC		TJR	
	n	% Above RW-WQB	n	% Above RW-WQB	n	% Above RW-WQB	n	% Above RW-WQB	n	% Above RW-WQB	n	% Above RW-WQB	n	% Above RW-WQB	n	% Above RW-WQB	n	% Above RW-WQB	n	% Above RW-WQB	n	% Above RW-WQB
pH	0	NA	1	0%	12	8%	1	0%	0	NA	25	4%	4	0%	0	NA	0	NA	0	NA	1	0%
Nitrate as N	5	60%	0	NA	16	13%	1	0%	0	NA	15	27%	25	20%	10	0%	5	0%	0	NA	0	NA
Nitrate/Nitrite as N	4	0%	0	NA	0	NA	8	25%	0	NA	20	5%	0	NA	0	NA	0	NA	0	NA	0	NA
Nitrite as N	5	0%	0	NA	6	0%	0	NA	0	NA	15	0%	25	0%	10	0%	5	0%	0	NA	0	NA
Total Phosphorus	9	67%	1	100%	18	50%	18	72%	0	NA	54	63%	28	71%	10	50%	5	60%	8	88%	7	100%
Total Nitrogen	9	78%	1	100%	18	78%	18	89%	0	NA	54	94%	28	96%	10	70%	5	100%	8	75%	7	86%
Total Suspended Solids	11	0%	8	0%	18	6%	18	0%	11	0%	54	6%	3	0%	9	0%	0	NA	8	0%	7	0%
Enterococcus	11	91%	8	88%	18	83%	19	89%	11	64%	54	74%	28	68%	10	60%	17	82%	8	100%	8	75%
Fecal Coliform	11	73%	8	0%	18	67%	19	63%	11	18%	54	35%	28	39%	10	20%	16	13%	8	50%	8	0%
Total Dissolved Solids	11	100%	0	NA	18	100%	19	100%	11	100%	54	81%	28	100%	10	80%	17	88%	0	NA	0	NA
Chloride	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	28	64%	1	0%	0	NA	0	NA	0	NA
Sulfate	11	100%	0	NA	17	100%	0	NA	0	NA	0	NA	0	NA	3	67%	0	NA	0	NA	0	NA
Cadmium (Dissolved)	0	NA	8	0%	10	0%	0	NA	0	NA	0	NA	0	NA	0	NA	16	0%	6	0%	7	0%
Copper (Dissolved)	0	NA	8	0%	10	0%	2	0%	0	NA	0	NA	0	NA	0	NA	16	0%	6	0%	7	0%
Lead (Dissolved)	0	NA	8	0%	10	0%	0	NA	0	NA	0	NA	0	NA	0	NA	16	0%	6	0%	7	0%
Nickel (Dissolved)	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	6	0%
Zinc (Dissolved)	0	NA	8	0%	10	0%	0	NA	0	NA	0	NA	0	NA	0	NA	16	0%	6	0%	7	0%
Selenium, Total	9	33%	0	NA	18	11%	0	NA	0	NA	0	NA	3	0%	0	NA	0	NA	0	NA	0	NA
Ammonia as N	0	NA	0	NA	10	10%	1	0%	0	NA	8	0%	1	0%	0	NA	0	NA	0	NA	0	NA
Dissolved Oxygen	0	NA	0	NA	10	0%	0	NA	0	NA	46	7%	4	0%	0	NA	0	NA	0	NA	7	86%
Turbidity	0	NA	0	NA	12	0%	1	0%	0	NA	0	NA	4	0%	0	NA	0	NA	0	NA	0	NA
MBAS	0	NA	0	NA	10	0%	1	0%	0	NA	1	0%	0	NA	0	NA	0	NA	0	NA	0	NA
Chlorpyrifos	5	20%	8	0%	10	0%	0	NA	0	NA	2	0%	0	NA	2	0%	0	NA	0	NA	7	0%
Diazinon	5	0%	8	0%	10	0%	0	NA	0	NA	2	0%	0	NA	2	0%	0	NA	0	NA	7	0%
Malathion	5	0%	8	0%	0	NA	0	NA	0	NA	2	0%	0	NA	2	0%	0	NA	0	NA	0	NA
Oil & Grease	0	NA	0	NA	10	0%	0	NA	0	NA	2	0%	3	0%	0	NA	0	NA	0	NA	0	NA
Ambient RW Priorities		Total Nitrogen (medium), TDS, Enterococcus, Fecal coliform, Toxicity (medium)		pH, Dissolved Phosphorus, Total Phosphorus, Total Nitrogen, Ammonia as N (medium), Bacteria (medium), Dissolved Cu, Total Selenium (medium); Toxicity (medium); and Turbidity, MBAS, COD, BOC, Oil and Grease (all medium)		Total Nitrogen, TDS, Enterococcus, Toxicity (medium)		Total Nitrogen (medium), Total Phosphorus, TDS, Enterococcus , Toxicity		Total Phosphorus (medium), Total Nitrogen, TDS, Enterococcus (medium) Fecal coliform (medium), BOD (medium), Toxicity (medium)		Dissolved Phosphorus, Total Phosphorus (medium),		Dissolved Phosphorus, Total Phosphorus, Total Nitrogen (medium), TDS, Enterococci (Med), Fecal Coliforms (Med)		Total Nitrogen, TDS, Chlorpyrifos		Total Phosphorus (medium), Total Nitrogen (medium) TDS, Enterococci (medium), Toxicity		Total Phosphorus (medium), Toxicity		Dissolved Phosphorus, Total Phosphorus, Total Nitrogen, Ammonia as N, Enterococcus, Fecal coliform, BOD, MBAS, Turbidity (medium), COD (medium), Toxicity

Discharge results compared to receiving water quality benchmarks. Ambient RW Priorities based NPDES Regional Program and does not include results from SMC or Third Party data.
NA – Either no data were collected upstream of the mass loading station, or stations were dry and no data collected

Overall, the five primary dry weather regional priority constituents in the MS4 outfall discharges are the same priorities identified in the receiving water as shown in Table 0-7. This table displays a check mark if the constituent was a priority in both the MS4 and receiving water.

Table 0-7: General Comparison of Dry Weather Regional MS4 Outfall Priority Constituents and Receiving Water Priorities by Watershed Management Area

Dry Weather Regional MS4 Priority Constituents	Receiving Waters by WMA*								
	SMR	SLR	CAR	SDC	LPC	MB	SDR	SDB	TJR
Total Nitrogen	✓	✓	✓	✓	✓	✓	✓	✓	✓
Total Phosphorus	*MS4*	✓	✓	✓	✓	✓	✓	✓	✓
TDS	✓	✓	✓	✓	✓	✓	✓	✓	✓
Enterococci	*MS4*	✓	✓	✓	✓	✓	✓	✓	✓
Fecal Coliform	*MS4*	✓	✓	✓	*MS4*	✓	*MS4*	✓	*RW*

✓=Both RW and MS4; MS4 indicates priority identified for MS4 only; RW indicates priority identified for RW only.

Wet Weather – Analysis of the constituents collected in the MS4 random wet weather program indicated priority constituents of fecal coliform and TSS (Table 0-8). The limited results of the targeted wet weather program (Table 0-9) supported the random regional results, with fecal coliform (high) and TSS (medium) identified as priority constituents. Turbidity was also a priority constituent in two of three sites.

Table 0-8: Summarized Results of MS4 Random Outfalls Wet Weather Sampling

MS4 Random Wet		
Constituent	n	% Above RW-WQB
pH	86	13%
Nitrate as N	73	4%
Nitrate/Nitrite as N	88	3%
Nitrite as N	73	0%
Total Phosphorus	89	0%
Total Dissolved Solids	76	21%
Total Suspended Solids	89	25%
Fecal Coliform	89	75%

No wet weather benchmark for Total Nitrogen or Enterococci
Based on n= 89 sites; analytes not collected at all sites.
Discharge results compared to receiving water quality benchmarks (RW-WQBs).

Table 0-9: Summarized Results of MS4 Targeted Outfalls Wet Weather Sampling

MS4 Targeted Wet		
Constituent	**n**	**% Above RW-WQB**
pH	3	0%
Nitrate as N	3	0%
Nitrite as N	3	0%
Total Phosphorus	3	0%
Dissolved Phosphate	3	0%
Total Suspended Solids	3	33%
Total Dissolved Solids	2	0%
Fecal Coliform	3	100%
Chloride	2	0%
Sulfate	2	0%
As (Dissolved)	3	0%
Cd (Dissolved)	3	0%
Cr (Dissolved)	3	0%
Cu (Dissolved)	3	33%
Ni (Dissolved)	3	0%
Pb (Dissolved)	3	0%
Sb (Dissolved)	3	0%
Zn (Dissolved)	3	0%
Selenium, Total	3	0%
Turbidity	3	67%
MBAS	3	33%
Ammonia as N	3	0%
Chemical Oxygen Demand	3	0%
Dissolved Oxygen	3	0%
Chlorpyrifos	3	0%
Diazinon	3	0%
Malathion	3	0%
Oil & Grease	3	0%

No wet weather benchmark for Total Nitrogen or Enterococci
Discharge results compared to wet weather receiving water quality benchmarks (RW-WQBs).

Overall, the two wet weather priority constituents in the MS4 outfall discharges match the priorities identified in the receiving water as shown in Table 0-10. Table 0-10

Table 0-10. General Comparison of Wet Weather Regional MS4 Outfall Priority Constituents and Receiving Water Priorities by Watershed Management Area

Wet Weather Regional MS4 Priority Constituents	Receiving Waters by WMA*								
	SMR	SLR	CAR	SDC	LPC	MB	SDR	SDB	TJR
Fecal Coliform	✓	✓	✓	✓	✓	✓	✓	✓	✓
TSS	✓	✓	RW	✓	RW	✓	RW	RW	✓

✓=Both RW and MS4; MS4 indicates priority identified for MS4 only; RW indicates priority identified for RW only.

Question 3: Which are the Targeted MS4 outfalls with the greatest constituent loading?

The instantaneous loads of the targeted MS4 outfalls from the dry program will be analyzed by constituent when additional data from the 200 monitored outfalls are collected. The MS4 outfall program is beginning year 3 of the 5-year program. Future analyses will consider not only load, but load/unit area to identify priority MS4 outfalls.

Additional questions answered in the MS4 Analysis:

1. *Is it likely that differences can be detected between seasons for analyte concentrations within watersheds, and among watersheds (both within and between seasons) at the end of the 2007 Permit MS4 monitoring program?*

To address this question, the average concentration, as well as the standard error, of an analyte measured in the MS4 program was calculated by season for each watershed management area. In Figure 0-1, these means with standard errors are plotted as side-by-side wet and dry result bars by watershed for the regional priority constituents. The graph demonstrates typically higher concentrations of bacteria and TSS in the wet weather samples. Conversely, total nitrogen and TDS concentrations tend to be higher in dry weather. Total phosphorus is less consistent, with some watersheds being higher in wet while others are higher in dry weather. Given the size of the error bars, however, these differences may not be significant. In general, these results indicate that detection of differences within and among watersheds (both within and between seasons), may be possible for some constituents (total phosphorus, enterococcus, some fecal, TDS, some TSS).

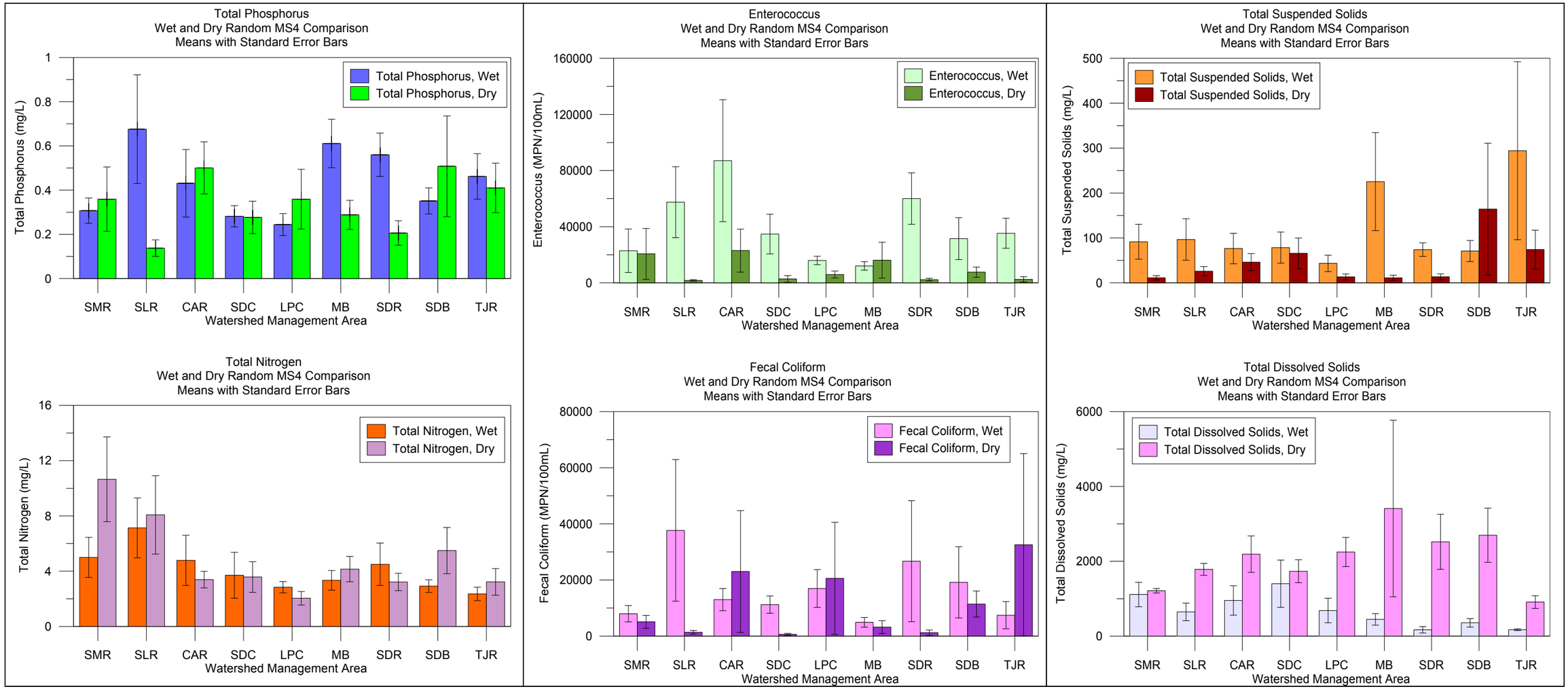

Figure 0-1. Mean Concentration with Standard Error by Analyte and Season for each WM

SOUTH ORANGE COUNTY HYDROMODIFICATION MANAGEMENT PLAN (HMP)

October 25, 2012

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ACRONYMS

ACCCMP	Alameda Countywide Clean Water Program
BAHM	Bay Area Hydrology Model
BEHI	Bank Erosion Hazard Index
BMI	Benthic Macroinvertebrates Index
BMP	Best Management Practice
CASQA	California Stormwater Quality Association
CCCWP	Contra Costa Clean Water Program
CEM	Channel Evolution Model
CEQA	California Environmental Quality Act
D_{50}	Median grain size diameter
Ep	Erosion potential index
ET	Evapotranspiration
FSURMP	Fairfield-Suisun Urban Runoff Management Program
GIS	Geographical Information System
HEC-HMS	Hydrologic Modeling System; distributed by the US Army Corps of Engineers Hydrologic Engineering Center
HMP	Hydromodification Management Plan
HR	Hydraulic Radius
HSPF	Hydrologic Simulation Program FORTRAN, distributed by USEPA
IMP	Integrated Management Practices
LEED	Leadership in Energy and Environmental Design
LID	Low Impact Development
LSPC	Loading Simulation Program in C++
MHHW	Mean Higher High Water
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resource Conservation Service
OCHM	Orange County Hydrology Manual
PDP	Priority Development Project
PLS	Pervious Land Surface
PWA	Philip Williams & Associates
S	Slope in Lane's equation
Q or Qw	Flow
Qcrit - Qc	Critical flow
Qcp	Geomorphically critical flow – 10 percent of the 2-year flow
Qs	Sediment discharge in Lane's equation
RWQCB	Regional Water Quality Control Board
SCCWRP	Southern California Coastal Water Research Project
SCVURPPP	Santa Clara Valley Urban Runoff Pollution Prevention Program
SMCWPPP	San Mateo Countywide Water Pollution Prevention Program
STOPPP	San Mateo County Stormwater Pollution Prevention Program
SSMP	Standard Stormwater Mitigation Plan
SUSMP	Standard Urban Stormwater Mitigation Plan
SWM SWMM	Stanford Watershed Model Storm Water Management Model; distributed by USEPA
SWMP	Storm Water Management Plan
SWWM	Storm Water Management Model
TMDL	Total Maximum Daily Load
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey

1.0 Introduction

Hydromodification refers to changes in the magnitude and frequency of stream flows and its associated sediment load due to urbanization or other changes in the watershed land use and hydrology and the resulting impacts on receiving channels, such as erosion, sedimentation, and potentially degradation of in-stream habitat. The degree to which a channel will erode or aggrade is a function of the increase or decrease in work (shear stress), the resistance of the channel bed and bank materials – including vegetation (critical shear stress), the change in sediment delivery, and the geomorphic condition (soil lithology) of the channel. Critical shear stress is the shear stress threshold above which motion of bed material load is initiated. Not all flows cause significant movement of bed material—only those that generate shear stress in excess of the critical shear stress of the bank and bed materials. Urbanization increases the discharge rate, amount and timing of runoff, and associated shear stress exerted on the channel by stream flows and can trigger erosion in the form of incision (channel downcutting), widening (bank erosion), or both. Depths that generate shear below critical shear stress levels have no effect on the channel stability.

Program Provision F.1.h of the San Diego California Regional Water Quality Control Board (SDRWQCB) Permit Order R9-2009-0002 (Permit) requires "…the Permittees to develop and implement a Hydromodification Management Plan (HMP) to manage increases in runoff discharge rates and durations from all Priority Development Projects." Where receiving stream channels are already unstable, hydromodification management can be thought of as a method to avoid accelerating or exacerbating existing problems. Where receiving stream channels are in a state of dynamic equilibrium, hydromodification management may prevent the onset of erosion, sedimentation, lateral bank migration, or impacts to in-stream vegetation.
The Permit contains certain requirements that strongly influence the methodology chosen in development of the HMP. The Permit requires the Permittees to develop an HMP for all Priority Development Projects (with certain exemptions) and develop a performance standard including a geomorphically-significant flow range that ensures the geomorphic stability within the channel. Supporting analyses must be based on continuous hydrologic simulation modeling. Similarly, the loss of sediment supply due to the development must be considered.

The SDRWQCB jurisdiction area covers the southern portion of Orange County. The northern portion of Orange County is under the jurisdiction of the Santa Ana Regional Water Quality Control Board (SARWQCB) and is not subject to this HMP. MS4 Permittees or dischargers directly or indirectly discharging runoff into waters of the United States within the San Diego Region include the Cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Lake Forest, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano, as well as the County of Orange and the Orange County Flood Control District.

2.0 Permittee HMP Development Process

Although the County of Orange serves as the lead agency for development of the HMP, all 13 Permittees have participated in its development, both financially and through participation in HMP workshops scheduled over the course of the project at times corresponding with key decision points in developing the HMP. Participants in the HMP Workshops created a Permittee HMP Workgroup to provide input on the development of the HMP.

The Permittees will continue to meet to discuss and resolve any issues that may arise during the HMP implementation phase. The Permittee HMP Workgroup will also assist in refining and reinforcing methodologies, criteria, and standards established in the HMP.

The Permittee HMP Workgroup has met four times since August 2011. **Table 2-1** shows meeting dates, locations, and agenda items. In addition to the formal meetings, the Permittee HMP Workgroup coordinated via email to review and discuss technical documents, deliberate on specific HMP-related topics and concur on issues.

Table 2-1: HMP Workgroup Meetings

Date	Location	Agenda
August 8, 2011	Laguna Hills City Hall	Kickoff Workshop Discussion of the proposed South Orange County HMP (SOCHMP) Approach and Methodology
October 12, 2011	RBF Consulting Irvine/Webcast	Presentation of the San Diego Hydrology Model Tool by Clear Creek Solution (Doug Beyerlein) Presentation of the HMP Framework by RBF Consulting (Scott Taylor & Daniel Apt)
November 17, 2011	RBF Consulting Irvine	Draft HMP Document Review
February 21, 2012	RBF Consulting Irvine	South Orange County Hydrology Model Workshop – Presentation of the model tool by Clear Creek Solution (Doug Beyerlein)

A Draft South Orange County HMP was submitted to the San Diego Regional Water Quality on December 16, 2012. In response to the draft HMP, the San Diego Water Board sent a comment letter dated April 25, 2012 to the South Orange County Permittees to support the general approach taken by the document. The letter includes several comments to be addressed in the Final South Orange County HMP, which shall be submitted by October 25, 2012.

As required by Permit item F.1.h(4), the draft document was posted on the Orange County Watersheds website (http://www.ocwatersheds.com/) for public review. Public comments were provided by Torry Walker Engineering and are considered in Revised South Orange County HMP.

No later than 90 days after receiving a finding of adequacy from the San Diego Regional Water Quality Control Board Executive Officer, the Final South Orange County HMP requirements will be incorporated into the Model Water Quality Management Plan (Model WQMP). The Permittees will use the revised Model WQMP to incorporate the HMP requirements into the local approval processes through their local WQMPs and municipal ordinances. This will also be completed within 90 days after receiving a finding of adequacy from the San Diego Regional Water Quality Control Board Executive Officer.

It should be noted that this HMP has in large part been based on the San Diego HMP, which was developed by the County of San Diego and the Permittees for San Diego County. The San Diego HMP was approved by the San Diego Regional Board and served as the starting point for development of the South OC HMP.

3.0 Literature Review

Pursuant to Permit Section F.1.h(1)(e), this section provides the results of a literature review conducted as a basis for the development of the HMP.

Hydromodification in the context of this Plan refers to changes in the magnitude and frequency of stream flows due to urbanization and the resulting impacts on the receiving channels in terms of erosion, sedimentation, and degradation of in-stream habitat. The processes involved in aggradation and degradation are complex, but are caused by an alteration of the hydrologic regime of a watershed due to increases in impervious surfaces, more efficient storm drain networks, and a change in historic sediment supply sources, among other factors. The study of hydromodification is an evolving field, and regulations to manage the impacts of hydromodification must be grounded in the latest science available.

HMPs seek ways to mitigate erosion impacts by establishing requirements for controlling runoff from new development. In order to establish appropriate regulations, it is important to understand 1) how land use changes alter storm water runoff; and 2) how these changes can impact stream channels. These and other issues central to HMPs adopted in California have been addressed in numerous journal articles, books, and reports. This report builds upon previous literature reviews developed for the San Diego County HMP, including recent studies or information relevant to Southern California.

3.1 Managing Hydromodification

There are many different approaches to managing hydromodification impacts from urbanization and most HMPs provide multiple options for achieving and documenting compliance with National Pollutant Discharge Elimination System (NPDES) permit requirements. In general, hydrograph management approaches focus on managing runoff from a developed area to not increase instability in a channel, and in-stream solutions focus on managing the receiving channel to accept an altered flow regime without becoming unstable. This section briefly summarizes various approaches for HMP compliance.

Hydrograph Management Solutions

Facilities that detain or infiltrate runoff to mitigate development impacts are the focus of most HMP implementation guidance. They work by either reducing the volume of runoff (infiltration facilities) or holding water and releasing it below Q_c (detention facilities). These facilities, also referred to as BMPs, can range from regional detention basins designed solely for flow control, to bioretention facilities that serve a number of functions. A number of BMPs, including swales, bioretention, flow-through planters, and extended detention basins have been developed to manage storm water quality, and several resources describe the design of storm water quality BMPs (CASQA 2003; Richman et al. 2004). In many cases, these facilities can be designed to also meet hydromodification management requirements.

Many HMPs also provide guidance for applying LID approaches to site design and land use planning to preserve the hydrologic cycle of a watershed and mitigate hydromodification impacts. These plans typically include decentralized storm water management systems and

protection of natural drainage features, such as wetlands and stream corridors. Runoff is typically directed toward infiltration-based storm water BMPs that slow and treat runoff. The following sections summarize how hydromodification management BMPs developed for existing HMPs have been designed and implemented.

Sizing Hydromodification BMPs

Hydromodification BMPs differ from those used to meet water quality objectives in that they focus more on generating a flow-duration curve that matches or reduces the undeveloped flow duration curve than on removing potential pollutants, although these two functions can be combined into one facility. Various methods exist for sizing hydromodification BMPs.

- **Hydrograph Matching** uses an outflow hydrograph for a particular site that matches closely with the pre-project hydrograph for a design storm. This method is most traditionally used to design flood-detention facilities to mitigate for a particular storm recurrence interval (e.g., the 100-year storm). Although hydrograph matching can be employed for multiple storm recurrence intervals, this method generally does not take into account the smaller, more frequent storms that are identified by the actual state of the science as performing a majority of the erosive work in stream channel and is therefore not widely accepted for HMP compliance nor recommended for use as a part of this plan.
- **Volume Control** matches the pre-project and post-construction runoff volume for a project site. Any increase in runoff volume is either infiltrated on site, or discharged to another location where streams will not be impacted. The magnitude of peak flows and time of concentration is not controlled, so while this method ensures there is no increase in total volume of runoff, it can result in higher erosive forces during storms.
- **Flow Duration Control** matches or reduces both the duration and magnitude of a specified range of storms. The entire hydrologic record is taken into account, and pre-project and post-construction runoff magnitudes and volumes are matched as closely as possible. Excess runoff is either infiltrated onsite or discharged below Q_{cp} (Geomorphically critical flow – 10 percent of the 2-year flow).

The Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVUPPP) HMP reviewed each of these methods and concluded that a Flow Duration Control approach was the most effective in controlling erosive flows. Two examples were evaluated using this approach, one on the Thompson Creek subwatershed in Santa Clara Valley and one on the Gobernadora Creek watershed in Orange County. The evaluation approach used continuous simulation modeling to generate flow-duration curves, and then designed a test hydromodification management facility to match pre-project durations and flows.

In addition to the SCVURPP HMP, the flow duration control approach has been applied by the Alameda Countywide Clean Water Program (ACCWP), SMCWPPP, the Fairfield-Suisun Urban Runoff Management Program (FSURMP), Contra Costa Clean Water Program (CCCWP), and San Diego County. Among these agencies, different approaches have emerged on how to demonstrate that proposed BMPs meet flow-duration control guidelines. Both methods employ continuous simulation to match or reduce flow-durations, but differences exist in how continuous simulation is used (site-specific simulation vs. unit area simulation). Differences also

exist in the focus of the two approaches (regional detention facilities vs. on-site LID facilities). Both approaches were evaluated by the different RWQCBs and deemed valid (Butcher 2007).

BAHM Approach

The Bay Area Hydrology Model (BAHM) is a continuous simulation rainfall-runoff hydrology model developed for ACCWP, SMCWPPP, and SCVURPP. It was developed from the Western Washington Hydrology Model, which focuses primarily on meeting hydromodification management requirements using storm water detention ponds alone or combined with LID facilities (Butcher 2007). The Western Washington Hydrology model is based on the Hydrologic Simulation Program – FORTRAN (HSPF) modeling platform, developed by the United States Environmental Protection Agency (U.S. EPA), and uses HSPF parameters in modeling watersheds.

Project proponents who want to size a hydromodification BMP select the location of their project site from a map of the county and BAHM correlates the project location to the nearest rainfall gauge and applies an adjustment factor to the hourly rainfall for the nearest gauge, to produce a weighted hourly rainfall at the project site. The user then enters parameters for the proposed project site describing soil types, slope, and land uses. BAHM then runs the continuous rainfall-runoff simulation for both the pre-project and the post-construction conditions of the project site. Output is provided in the form of flow-duration curves that compare the magnitude and timing of storms between the pre-project and the post-construction modeling runs.

If an increase in flow durations is predicted, the user can select and size mitigation BMPs from a list of modeling elements. An automatic sizing subroutine is available for sizing detention basins and outlet orifices that matches the flow duration curves between the pre-project scenario and a post-construction mitigation scenario. Manual sizing is necessary for other BMPs included in the program, such as storage vaults, bioretention areas, and infiltration trenches. The program is designed so that, once a BMP is selected and sized, the modeling run can be transferred to the local agency for approval. The model reviewer at the local agency can launch the program and verify modeling parameters and sizing techniques.

A HMP tool was also developed to support developers and applicants with the San Diego County HMP. The San Diego Hydrology Model (SDHM) derives from the BAHM, and integrates parameters that are specific to the San Diego region.

A similar approach will be used for the South Orange County HMP. The Western Washington Continuous Simulation Hydrology Model (WWHM) has been modified to include local rainfall and loss rate information, in addition to preferred local BMP selection to provide project proponents a user-friendly tool to develop a hydromodification mitigation strategy. The South Orange County Hydrology Model (SOCHM) allows the user to match or reduce the flow duration curve for the selected range of flows using locally preferred BMPs.

Contra Costa Clean Water Program (CCCWP) Approach

The CCCWP developed a protocol for selecting and sizing hydromodification BMPs, which are referred to as Integrated Management Practices (IMPs) in their guidebook. Instead of a project proponent running a site-specific continuous simulation to size hydromodification control facilities, the CCCWP provides sizing factors for designing site level IMPs. Sizing factors are based on the soil type of the project site and are adjusted for Mean Annual Precipitation. Sizing factors are provided for bioretention facilities, flow-through planters, dry wells and a combination cistern and bioretention facility.

Sizing factors were developed through continuous-simulation HSPF modeling runs for a variety of development scenarios. Flow-durations were developed for a range of soil types, vegetation and land use types, and rainfall patterns for development areas in Contra Costa County. Then, based on a unit area (one acre) of impervious surface, flow-durations were modeled using several IMP designs. These IMPs were then sized to achieve flow control for the range of storms required, (from 10 percent of the 2-year storm up to the 10-year storm). These sizing factors were then transferred to a spreadsheet form for use by project proponents.

The primary difference between the CCCWP approach and the BAHM approach is the level of modeling required. The CCCWP approach is simplified for the project proponent in that both hydromodification and water quality mitigation are incorporated into the IMP sizing factors. The BAHM allows for more flexibility in that regional BMPs may be used for hydromodification, and if desired, water quality, in addition to site level approaches. The South Orange County NPDES Permit allows for regional mitigation of hydromodification impacts. Therefore, an approach that uses continuous simulation to assess regional or neighborhood level BMP implementation is preferred for this Plan.

Sediment Management Solutions

Sediment discharge is one of the fundamental independent variables impacting stream stability. Lane (1955) described alluvial channel stability in the relation:

$$Q_s \times D_{50} \propto Q_w \times S$$

Where:

Q_s = Sediment discharge
D_{50} = Median sediment size
Q_w = Flow
S = Channel Slope

As seen by Lane's relationship, if any of the four variables are altered, one or more of the remaining variables must change. In the case of urbanization, runoff usually is increased, causing a reduction in channel slope (S) through downcutting or increased channel meander. Urbanization may also result in a change in sediment discharge (Q_s). Streambed material is derived from the channel bed and banks. If channels are altered by development in such a way as to reduce or increase sediment discharge, instability may occur.

Only a portion of the total sediment load in a channel is important for stream stability. Total channel sediment load may be classified by size or transport mechanism. The wash load commonly refers to the portion of the total sediment load that remains continuously in suspension (based on particle size). The wash load has a nominal impact on channel stability. Bed material load refers to the material that moves along the channel bed via saltation, and is continuously in contact or exchange with the channel bed. Bed material load is the critical portion of total sediment discharge for channel stability.

Urbanization can reduce the mass of bed material transported through the elimination of alluvial channel sections. This occurs in site development when first order and particularly larger streams are lined or placed into underground conduits. There are two general approaches for managing the bed material load relative to urbanization and channel stability. The first approach attempts to correct for the change in bed material load by increasing or decreasing the discharge rate as appropriate to generally maintain the balance between hydrologic and geomorphic processes as conceptualized in Lane's interrelationship. While theoretically a sound approach, this option requires a significant amount of detailed information that is difficult to obtain and requires good calibration of sediment models. Sediment transport models are non-linear and relatively sensitive to the rate of sediment supply and particle size distribution. This HMP does not recommend any specific sediment transport equation or model as the selection of such a model should be based on stream and watershed specific information, and the amount and quality of available data. Examples of sediment transport equations the designer may consider include: Duboys Formula, Meyer-Peter Formula, Einstein Bed Load Function, Modified Einstein Procedure, Colby's Method, Engelund and Hansen Method, Ackers and White Method. There are several models that use these transport formulas to predict long-term sediment transport. General guidance for site specific analysis is provided in **Appendix D**.

The second approach to maintaining sediment supply is physically based, relying on a field assessment of site locations that may supply bed material load to the receiving channel, and protecting those sources during the site planning and development process. With this approach, the project proponent need only provide engineered solutions for flow mitigation. Protection of site bed material sources is the preferred approach since it is physically based and potentially less prone to error. Guidelines for field assessment of bed material sources are provided with the Sediment Supply Management approach, which is described in **Section 5.1**.

In-Stream Stabilization Solutions

In-stream solutions focus on managing the stream corridor to provide stability, modifying the stream channel to accept an altered flow regime. In cases where development is proposed in a watershed with an impacted stream it may be beneficial to focus on rehabilitating the stream channel to match the new independent variables of channel cross section, sediment discharge, flow discharge and channel slope rather than retrofitting the watershed or only controlling a percentage of the runoff with on-site controls. This type of approach can restore stream functions, beneficial uses, and values at a much more rapid pace, especially in locations that cannot physically be returned to their natural state due to changes in stream channel alignment and restrictions on the channel cross section due to adjacent development. In addition, in some cases where a master-planned watershed development plan is being implemented it may be

more feasible to design a new channel to be stable under the proposed watershed land use rather than to construct distributed on-site facilities.

In-stream stabilization and restoration solutions are available as alternative compliance as a part of the South OC HMP. In-stream restoration projects are available if on-site controls are not feasible and it has been determined that the receiving water that the project discharges to has impacts due to hydromodification. Tiered benefits (benthic communities, morphology) of such in-stream restoration projects must offset the hydrologic and sediment changes induced by the associated PDP(s).

Other Methods

A number of methods exist for managing channels to accept altered flow regimes and higher shear forces. These have been covered in detail in a number of sources available to watershed groups and public agencies. (A few helpful sources include Riley 1998, Watson and Annable 2003, and FISRWG 1998.)

Stream Susceptibility - Domain of Analysis

Southern California Coastal Water Research Project (SCCWRP) has developed a series of screening tools that evaluate the susceptibility of a stream to hydromodification impacts (SCCWRP, 2010). These screening tools allow a project proponent to rate the susceptibility of the evaluated stream to erosion for a variety of geomorphic scenarios including alluvial fans, broad valley bottoms, incised headwaters, etc.

The development of HMPs in most Southern California counties is correlated to the ultimate findings of SCCWRP studies on hydromodification (SCCWRP, 2008 through 2011). It is generally acknowledged that SCCWRP's formulation of regional standards for hydromodification management may serve as a baseline for development of HMPs for specific regions in Southern California.

When evaluating the stream susceptibility though the SCCWRP screening tools, a domain of analysis is defined. This domain of analysis corresponds to the reach lengths upstream and downstream from a project from which hydromodification assessment is required. The domain of analysis determination includes an assessment of the incremental flow accumulations downstream of the site, identification of grade control points in the downstream conveyance system, and quantification of downstream tributary influences. The south Orange County program elected not to perform the extensive susceptibility mapping required to correlate channel reaches with variable low-flow discharge thresholds, since the return on investment for this type of analysis appears to be very low.

The effects of hydromodification may propagate for significant distances downstream (and sometimes upstream) from a point of impact such as a stormwater outfall. Accordingly, the domain of analysis serves as a representative buffer domain across which the susceptibility of a stream should be evaluated. This representative domain spans multiple channel types/settings, and is defined as follows in this HMP (SCCWRP, 2010):

- Proceed downstream until reaching the closest of the following:
    - at least one reach downstream of the first grade-control point (but preferably the second downstream grade-control location)
    - tidal backwater/lentic waterbody
    - equal order tributary (Strahler 1952)
    - a 2-fold increase in drainage area

OR demonstrate sufficient flow attenuation through existing hydrologic modeling.

- Proceed upstream to extend the domain:
    - upstream for a distance equal to 20 channel widths OR to grade control in good condition – whichever comes first. Within that reach, identify hard points that could check headward migration, evidence that head cutting is active or could propagate unchecked upstream

Within the analysis domain there may be several reaches that should be assessed independently based on either length or change in physical characteristics. In more urban settings, segments may be logically divided by road crossings (Chin and Gregory 2005), which may offer grade control, cause discontinuities in the conveyance of water or sediment, etc.

The domain of analysis is discussed here since it may be relevant for use in site-specific analysis as discussed in **Appendix D**. It is not used in this HMP as a discriminator for HMP applicability to a specific project except in the case of urban infill projects.

3.2 Flow Control Approach

HMPs that have been developed in the San Francisco Bay Area, Northern California (Contra Costa, Santa Clara, and Alameda Counties and the Sacramento area), and San Diego County vary with regard to the emphasis placed on lower flow control thresholds as compared to other approaches, such as distributed low impact development (LID) methods. The South Orange County HMP was developed using the lower flow control threshold approach. There is consensus in that both the frequency and duration of flows must be controlled using continuous simulation hydrologic modeling (rather than the standard design storm approach used for flood control design) to mitigate for potential development impacts. At this point, it is generally accepted that events more frequent than the 10-year flow are the most critical for hydromodification management, since flows within this range of return period (up to the 10-year event) have been documented to perform the most work on the channel bed and banks. However, the range of analysis could potentially change in the future if new studies provide sufficient evidence warranting a modification.

The Santa Clara HMP focused on using detention basins for hydromodification management and emphasized the lower flow control limit for site runoff. Extended detention flow control basins can be constructed with multi-stage outlets to mitigate both the duration and magnitude of flows within a prescribed range. To avoid the erosive effects of extended low flows, the maximum rate (depth) at which runoff is discharged is set below the erosive threshold. Per the Santa Clara HMP, the lower flow control limit was defined as the flow rate that generates critical shear stress on the channel bed and banks. Both Santa Clara and Alameda Counties correlated the lower flow control limit to a value equal to 10 percent of the 2-year runoff event.

The Contra Costa HMP emphasized the importance of using LID methods to meet hydromodification management criteria. LID approaches to hydromodification management rely on site design and distributed LID Best Management Practices (BMPs) to control the frequency and duration of flows and to mitigate hydrograph modification impacts. By minimizing directly connected impervious areas and promoting infiltration, LID approaches mimic natural hydrologic conditions to counteract the hydrologic impacts of development. LID systems are sized to achieve flow control for the range of storms required (from 10 percent of the 2-year storm up to the 10-year storm).

The County of San Diego HMP defined an adaptive lower flow threshold based on the channel susceptibility rating (High, Medium, or Low). Receiving streams in San Diego County were individually classified by their susceptibility to channel erosion impacts using a critical flow calculator and a channel screening tool developed by Southern California Coastal Water Research Project (SCCWRP). This classification produced three lower flow thresholds which are 0.1Q2, 0.3Q2, and 0.5Q2. The upper range of the mitigation flow was considered the pre-project 10-year storm event.

Rates of sediment production from southern California rivers depend upon bedrock geology, rates of tectonic uplift, land use, and precipitation (Warrick et al., 2003). The California Geological Survey agency identifies 13 unique geomorphic zones based on geology, faults, topographic relief, and climate (California Department of Conservation, 2002). South Orange County is located within the Peninsular Ranges geomorphic zone, whose geology is characterized by the granitic rocks intruding the older metamorphic rocks. San Diego County is also located within the same geomorphic zone, thus exhibits similar macro-scale geomorphic trends to those in South Orange County.

The approach developed for the San Diego County HMP was approved by the SDRWQCB and selected as the base approach for the South Orange County HMP. However, the South Orange County program elected not to perform the extensive susceptibility mapping required to correlate channel reaches with variable low-flow discharge thresholds. The implementation of HMPs in Northern California and in San Diego has shown that numerically larger low flow thresholds generally have very limited applicability in practice. Accordingly, a base low flow threshold ($0.1Q_2$) was selected for this HMP. The selection of the low flow threshold ($0.1Q_2$) was based on other approved HMPs in California with similar hydrologic and geologic conditions. The low flow threshold ($0.1Q_2$) is the most conservative of the potential range identified in the San Diego HMP. Nonetheless, the applicant may compute a site-specific low flow threshold at their option, following a methodology developed by the applicant. An example of such a procedure is described in the San Diego County HMP document.

If the applicant opts for developing a site-specific criterion, the selected lower flow threshold shall correspond to the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks. For a channel segment that is lined but not exempt by this HMP, the low flow threshold must be computed assuming the lining has been removed.

3.2.i Previous Studies

Previous hydromodification literature reviews were conducted by Geosyntec Consultants (Mangarella and Palhegyi, 2002) for the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP) and by the Contra Costa Clean Water Program (CCCWP 2004). Mangarella and Palhegyi provide a detailed overview of the geomorphic and hydrologic processes involved in hydromodification (see **Section 3.2.iii**) for additional details on the mechanics of stream erosion). Channel assessment methods described in Section 6 of this HMP rely heavily on those reviewed by Bledsoe et al. (2008) for SCCWRP.

To date, six approved HMPs have been published. These include HMPs for SCVURPPP (2005), the CCCWP (2005), the Fairfield-Suisun Urban Runoff Management Program FSURMP (2005), the Alameda Countywide Clean Water Program (ACCCMP 2005), the San Mateo Countywide Stormwater Pollution Prevention Program (SMCWPPP [formerly STOPPP] 2005), and the San Diego County Hydromodification Plan (2009). In addition, a number of HMPs were implemented while agencies developed their final plans. Interim HMPs are not detailed in this report because these plans have adopted findings from the above listed HMPs.

3.2.ii Hydrograph Modification Processes

The effects of urbanization on channel response have been the focus of many studies (see Paul and Meyer, 2001 for a review), and the widely accepted consensus is that increases in impervious surfaces associated with urbanizing land uses can cause channel degradation. Urbanization generally leads to a change in the amount and timing of runoff in a watershed, which increases erosive forces on channel bank and bed material and can cause large-scale channel enlargement, general scour, stream bank failure, loss of aquatic habitat and degradation of water quality.

Channel erosion, like most physical processes, is a complex system based on a variety of influences. Channel erosion is non-linear (Philips 2003), meaning the response of streams is not directly proportional to changes in land use and flow regimes. Small changes or temporary disturbances in a watershed may lead to unrecoverable channel instability (Kirkby 1995). These disturbances may give rise to feedback systems whereby small instabilities can be propagated into larger and larger instabilities (Thomas 2001).

A number of studies have sought to correlate the amount of urbanization in a watershed and stream instability (Bledsoe 2001; Booth 1990, 1991; Both and Jackson 1997; MacRae 1992; 1993; 1996; Coleman et al. 2005). Evidence from these studies suggests that below a certain threshold of watershed imperviousness, streams maintain stability. This threshold or imperviousness transition zone appears to be around seven to ten percent watershed urbanization for perennial streams (Schueler 1998 and Booth 1997), but may begin at a lower level for intermittent streams such as those found in Southern California. Studies done in Santa Fe, New Mexico (Leopold and Dunne 1978) suggest that changes occur at four percent impervious area of the watershed. Initial studies by Coleman et al. (2005) suggest that a response in the stream channel may begin to occur at two to three percent watershed imperviousness for intermittent streams in Southern California. It is important to understand that use of impermeable cover alone is a poor predictor of channel erosion due to differences in storm water detention and infiltration within regions.

In highly urbanized watersheds returning a stream to a natural condition is infeasible due to existing development in the watershed. In these scenarios the focus should be on in-stream restoration to restore the beneficial uses of the receiving water.

Though it is well established that watershed urbanization causes channel degradation, a detailed understanding of how development alters runoff and how this altered runoff in turn causes erosion is still being developed. This section briefly describes these processes and summarizes methods used to quantify hydromodification impacts.

Effective Work

The ability of a stream to transport sediment is proportional to the amount of flow in the stream: as flow increases, the amount of sediment moved within a channel also increases. The ability of a stream channel to transport sediment is termed stream power, which integrated over time is work. Leopold (1964) introduced the concept of effective work, whereby the flow-frequency relationship of a channel is multiplied by sediment transport rate. This gives a mass-frequency relationship for erosion rates in a channel. Flows on the lower end of the relationship (e.g., two-year flows) may transport less material, but occur more frequently than higher flows, thereby having a greater overall effect on the work within the channel. Conversely, higher magnitude events, while transporting more material, occur infrequently so cause less effective work. Leopold found that the maximum point on the effective work curve occurred around the 1-to 2-year frequency range. This maximum point is commonly referred to as the dominant discharge. It corresponds roughly to a bankfull event (a flow that fills the active portion of the channel up to a well-defined break in the bank slope).

Urbanization tends to have the greatest relative impact on flows that are frequent and small, and which tend to generate less-than-bankfull flows. Change is greatest in these events because prior to urbanization, infiltration would have absorbed much or all of the potential runoff, but following urbanization, a high percent of the rainfall runs off. Thus, events that might have generated little or no flow in a non-urbanized watershed can contribute flow in urban settings. These smaller less-than-bankfull events have been found to cause a significant proportion of the work in urban streams (MacRae 1993) due to their high frequency, and can lead to channel instability. Less frequent, larger magnitude flows (e.g., flows greater than Q_{10}) are less strongly affected by urbanization because during such infrequent storm events, the ground rapidly becomes saturated, and acts (for purposes of runoff generation) in a similar manner as impervious surfaces.

Estimating Critical Q_c

Due to the increase in impervious surfaces and fewer opportunities for infiltration of storm water, urbanization creates a higher runoff rate and more runoff volume than an un-urbanized watershed. Opportunities for infiltration of excess storm water exist in urbanized areas, but many times are infeasible due to cost, technical barriers or land use constraints. Therefore, some of the excess storm water must be discharged to a receiving stream. In order to achieve a comparable E_p to a pre-developed condition, this excess runoff volume must be discharged at a rate at which insignificant effective stream work is done.

Bed load sediment moves through transmission of shear stress from the flow of water on the channel bed. An increase in the hydraulic radius (measure of channel flow efficiency through a ratio of the channel's cross sectional area of the flow to its wetted perimeter) corresponds to an increase in shear stress. In order to initiate movement of bed material, however, a shear stress threshold must be exceeded. This is commonly referred to as critical shear stress, and is dependent on sediment and channel characteristics. For a given point on a channel where the bed composition and cross-section is known, the critical shear can be related to a stream flow. The flow that corresponds to the critical shear is known as the critical flow, or Q_c. For a given cross-section, flows that are below the value for Q_c do not initiate bed movement, while flows above this value do initiate bed movement.

SCVURPPP expressed Q_c as a percentage of the two-year flow in order to develop a common metric across watersheds of different size, and allow for easy application of HMP requirements. For the two watersheds studied in detail in the SCVURPPP study, a similar relationship was found where Q_c corresponded to 10 percent of the two-year flow. Several methodologies were used to determine both the two-year flows and the ten-year flows across the evaluated watersheds. The two-year flow was computed based on either the rational method, as described in the Santa Clara Valley Hydrology Procedures, or the Cunnane ranking schema applied to "all event frequency" curves. The ten-year flow was computed based on the Log Pearson type III distribution applied to annual flow frequency curves. This became the basis for the lower range of geomorphically significant flows under the SCVURPPP HMP and is referred to as Q_{cp} to indicate that it is a percentage of flow. That program also adopted the 10-year flow as the upper end of the range of flows to control with the justification that increases in stream work above the 10-year flow were small for urbanized areas.

A similar study was conducted for the FSURMP on two watersheds in Fairfield, California following a geomorphic assessment. That study found Q_{cp} to be 20 percent of the pre-development two-year flow. The differences in the two values may be attributable to differences in watershed characteristics in Santa Clara County and Fairfield, the number of streams studied, the methodology used to compute the two-year flow, and the precision of the modeling tools. Channels in Fairfield were found to have a more densely vegetated riparian corridor and may have a higher resistance to increases in shear stresses (FSURMP). Values for Q_{cp} appear to be similar among neighboring watersheds, but there appears to be a range of appropriate Q_{cp} values. The characteristics of individual biomes (climatically and geographically defined areas of ecologically similar climatic conditions, such as communities of plants, animals, and soil organisms, often referred to as ecosystems) should be taken into account when developing a Q_{cp}. For example, Western Washington State, which has more densely vegetated riparian zones than either Fairfield or Santa Clara County, has adopted a Q_{cp} of 50 percent of the 2-year flow.

A summary of flow control standards adopted in each of the approved HMPs in California and western Washington is given in **Table 3-1**.

Table 3-1: Summary of Flow Control Standards – Approved HMPs

Permitting Agency	Q_{cp}	Largest Managed Flow
Alameda County	10 percent of the 2-year flow (0.1Q2)	10-year flow (Q10)
Contra Costa County	10 percent of the 2-year flow (0.1Q2)	10-year flow (Q10)
Fairfield-Suisun Urban Runoff Management Program	20 percent of the 2-year flow (0.2Q2)	10-year flow (Q10)
San Diego County	10, 30, or 50 percent of the 2-year flow (0.1Q2, 0.3Q2, or 0.5Q2)	10-year flow (Q10)
San Mateo County	10 percent of the 2-year flow (0.1Q2)	10-year flow (Q10)
Santa Clara County	10 percent of the 2-year flow (0.1Q2)	10-year flow (Q10)
Western Washington State	50 percent of the 2-year flow (0.5Q2)	50-year flow (Q50)

As noted previously the South Orange County HMP has selected a low flow threshold ($0.1Q_2$) as a default value. The determination of the two-year flow should be based on the guidance provided in Section 3.3. The project proponent may put forth other low flow thresholds for individual projects, but other low flow thresholds will require site-specific justification using modeling or field tests to support the unique threshold value.

3.2.iii Stream Channel Stability

Numerous stream channel stability assessment methods have been proposed to help distinguish which channels are most at risk from hydrograph modification impacts and/or define where HMP requirements should apply. Assessment strategies range from purely empirical approaches to channel evolution models to energy-based models (see Simon et al., 2007 for a critical evaluation). Stream channel stability assessment methods are useful in assessing the impact of urbanization, or control programs over time. Their value lies in showing trends as changes in a watershed occur, rather than classifying the reach of a discrete channel section at a given point in time.

Stream Classification Systems

A recent study by Bledsoe et al. (2008) for SCCWRP describes nine types of classification and mapping systems with an emphasis on assessing stream channel susceptibility in Southern California. The summary below is taken from that study. Bledsoe also provides a summary of the implications of these classification and mapping systems to the development of hydromodification tools for Southern California. The article provides a detailed breakdown of guidelines for developing hydromodification tools given the advantages and disadvantages of each system previously assessed.

Planform Classifications and Predictors

Alluvial channels form a continuum of channel types whose lateral variability is primarily governed by three factors: flow magnitude, bank erodibility, and relative sediment supply. Though many natural channels conform to a gradual continuum between straight and intermediate, meandering, and braided patterns, abrupt transitions in lateral variability imply the existence of geomorphic thresholds where sudden change can occur. The conceptual framework for geomorphic thresholds has proven integral to the study of the effects of disturbance on river and stream patterns. Many empirical and theoretical thresholds have been

proposed relating stream power, sediment supply and channel gradient to the transition between braiding and meandering channels. Accounting for the effects of bed material size has been shown to provide a vital modification to the traditional approach of defining a discharge-slope combination as the threshold between meandering and braided channel patterns. The many braided planforms in Southern California indicate the need to refine and calibrate established thresholds to river networks of interest. However, at this time there is not a well-accepted model to predict how hydromodification affects channel planform.

Energy-Based Classifications

The link between channel degradation and urbanization has been studied; however, impervious area is not the solitary factor influencing channel response. Studies have shown that the ratio between specific stream power and median bed material size D50b, where b is approximately 0.4 to 0.5 for both sand-and gravel-bed channels, can be used as a valuable predictor of channel form. Stream power, which is linearly related to the total discharge, is the most comprehensive descriptor of hydraulic conditions and sedimentation processes in stream channels. Several studies have been performed relating channel stability to a combination of parameters such as discharge, median bed-material size, and bed slope, as an analog for stream power.

General Stability Assessment Procedures

By assessing an array of qualitative and quantitative parameters of stream channels and floodplains, several investigators have developed qualitative assessment systems for stream and river networks. These assessment methods have been incorporated into models used to analyze channel evolution and stability. Many parameters used to establish methodologies such as the Rosgen approach are extendable to a qualitative assessment of channel response in Californian river networks. Field investigations in Southern California have shown that grade control can be the most important factor in assessing the severity of channel response to hydromodification. Qualitative methodologies have proven extendable to many regions, and they use many parameters that may provide valuable information for similar assessments in California.

Sand vs. Gravel Behavior / Threshold vs. Live-Bed Contrasts

It is well recognized that the fluvial-geomorphic behavior varies greatly between sand and gravel/cobble systems. Live bed channels (of which sand channels are good examples) are systems where sediment moves at low flows, and where sediment is frequently in motion. Threshold channels, such as gravel streams, by contrast, require considerable flow to initiate bedload movement. Live bed channels are more sensitive to increases in flow and decreases in sediment supply than threshold channels. Scientific consensus shows that sand bed streams lacking vertical control show greater sensitivity to changes in flow and sediment transport regimes than do their gravel/cobble counterparts. Factors such as slope, and sedimentation regimes are known to have greater impact on sand-bed streams. This can be an important issue for storm water systems receiving runoff from watersheds composed primarily of streams with sandy substrate. The transition between sand and gravel bed behavior can be rapid, enabling the use of geographic mapping methods to prioritize channel segments according to their susceptibility to the effects of hydromodification.

Channel Evolution Models of Incising Channels

The Channel Evolution Model (CEM) developed by Schumm et al. (1984) posits five stages of incised channel instability organized by increasing degrees of instability severity, followed by a final stage of quasi-equilibrium. Work has been done to quantify channel parameters, such as sediment load and specific stream power, through each phase of the CEM. A dimensionless stability diagram was developed by Watson et al. (2002) to represent thresholds in hydraulic and bank stability. This conceptual diagram can be useful for engineering planning and design purposes in stream restoration projects requiring an understanding of the potential for shifts in bank stability.

Figure 3-1: Five Stages of the Channel Evolution Model (CEM)

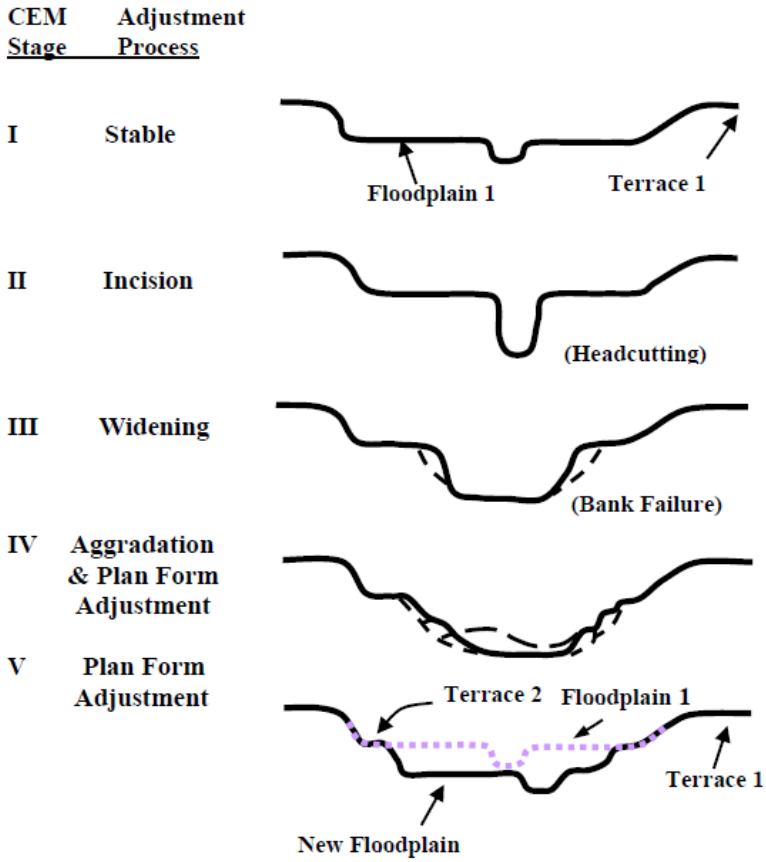

(Schumm et al. 1984)

Channel Evolution models Combining Vertical and Lateral Adjustment Trajectories

Originally, CEMs focused primarily on incised channels with geotechnically, rather than fluvially, driven bank failure. Several CEMs have been proposed that incorporate channel responses to erosion and sediment transport into the original framework for channel instability. In these new systems, an emphasis is placed on geomorphic adjustments and stability phases that consider both fluvial and geomorphic factors. The state of Vermont has developed a system

of stability classification that suggests channel susceptibility is primarily a function of the existing Rosgen stream type and the current stream condition referenced to a range of variability. This system places more weight on entrenchment (vertical erosion of a channel that occurs faster than the channel can widen, resulting in a more confined channel) and slope than differentiation between bed types.

Equilibrium Models of Supply vs. Transport-capacity / Qualitative Response

The qualitative response model builds on an understanding of the dynamic relationship between the erosive forces of flow and slope relative to the resistive forces of grain size and sediment supply to describe channel responses to adjustments in these parameters. In this system, qualitative schematics provide predictions for channel response to positive or negative fluctuations in physical channel characteristics and bed material. Refinements to such frameworks have been made to account for channel susceptibility relative to existing capacity and riparian vegetation among other influential characteristics.

Bank Instability Classifications

Early investigations provided the groundwork for bank instability classifications by analyzing shear, beam, and tensile failure mechanisms. The dimensionless stability approach developed by Watson characterized bank stability as a function of hydraulic and geotechnical stability. Rosgen (1996) proposed the widely applied Bank Erosion Hazard Index (BEHI) as a qualitative approach based on the general stability assessment procedures outlined above. Other classification systems, like the CEM, determine bank instability according to channel characteristics that control hydrogeomorphic behavior.

Hierarchical Approaches to Mapping Using Aerial Photographs / GIS

It has become increasingly common practice to characterize stream networks as hierarchical systems. This practice has presented the value in collecting channel and floodplain attributes on a regional scale. Multiple studies have exploited geographical information systems (GIS) to assess hydrogeomorphic behavior at a basin scale. Important valley scale indices such as valley slope, confinement, entrenchment, riparian vegetation influences, and overbank deposits can provide information for river networks in California. Many agencies are developing protocols for geomorphic assessment using GIS and other database associated mapping methodologies. These tools may be useful as they are further developed in a monitoring program, but are not viable at a scale useful for reach-by-reach channel analysis.

The approach taken by this HMP to monitor its effectiveness is embedded in a derivative of the channel classification approach defined by Rosgen (1996). The author distinguishes three different levels of stream classification including (1) level I that generally describes stream relief, landform, and valley morphology; (2) level II that describes the morphology of stream and associates the later to a stream type based on channel form and bed composition. Field measurements of entrenchment, width-to-depth ratio, sinuosity, slope, and representative sampling of channel material may be suitable ; (3) level III that assesses stream condition and departure. A stream that is geomorphically stable per Rosgen's definition is characterized by two elements: dimension, pattern, and profile of a stream are maintained over time; the

transport capacity of a watershed's flows and detritus is maintained. As such, physical and biological functions of a geomorphologically stable stream remain at an optimum.

3.3 Continuous Simulation Modeling

As part of the HMP development, an integrated flow control sizing tool has been prepared. The tool offers the same interface as that of the San Diego Hydrology Model, which has been approved by the SDRWQCB. The SOCHM has been developed to help applicants comply with hydromodification requirements. This modeling approach is different from Orange County's calibrated rainfall-runoff procedures and criteria for flood control design and mitigation purposes. HMP requirements from the Regional Board are separate from Orange County's requirement for mitigation within the drainage system of development effects on runoff per the Orange County Hydrology Manual (OCHM). Specific evaluation criteria were developed for the design and analysis of hydromodification controls using continuous simulation hydrologic modeling. Evaluation criteria discussed herein focuses on the following items:

- Continuous Simulation Hydrologic Modeling
- Continuous Simulation Modeling Software
- Long-Term Hourly Precipitation Gauge Data
- Parameter Validation for Rainfall Losses
- Hydromodification Control Processes
- Peak Flow and Flow Duration Statistics

Pursuant to criteria set forth by the SDRWQCB and by the South Orange County Permittees in the hydromodification criteria, the use of continuous simulation hydrologic modeling is required to size storm water facilities to mitigate hydromodification effects. Continuous simulation modeling uses an extended time series of recorded precipitation data as input and generates hydrologic output, such as surface runoff, infiltration, and evapotranspiration, for each model time step.

Continuous hydrologic models are typically run using either 1-hour or 15-minute time steps. Based on a review of available rainfall records in Orange County, the SOCHM will use a 1-hour time step (15-minute time series rainfall data are very limited). Continuous models generate model output for each time step. In this case, hydrologic output is generated for each hour of the continuous model. A continuous simulation model with 35 years of hourly precipitation data will generate 35 years of hourly runoff estimates, which corresponds to runoff estimates for 306,600 time steps over the 35-year simulation period.

Use of the continuous modeling approach allows for the estimation of the frequency and duration by which flows exceed the lower flow threshold (adopted as 10 percent of the 2-year flow for this Plan). The limitations to increases of the frequency and duration of flows within that geomorphically significant flow range represent the key component to the South Orange County approach to hydromodification management.

3.3.i Continuous Simulation Modeling Software

The following public domain software models may be used to assess hydromodification controls for storm water facilities to meet the hydromodification criteria:

- Hydrologic Simulation Program – FORTRAN (HSPF), distributed by U.S. EPA
- Hydrologic Engineering Center – Hydrologic Modeling System (HEC-HMS), distributed by the U.S. Army Corps of Engineers Hydrologic Engineering Center
- Storm Water Management Model (SWMM); distributed by U.S. EPA

3.3.ii Parameter Validation for Rainfall Losses

In preparing computer models to assess storm water controls and meet the hydromodification criteria, rainfall loss parameters describing soil characteristics, land cover descriptions, and evapotranspiration data have been validated to prove consistency with the local environment and climatic conditions. The validation process should include documentation of the source of evapotranspiration data and commentary of the effects of varying evapotranspiration patterns between the subject site and parameter data source. To meet the hydromodification criteria, soil and land cover parameter validation are based on the following:

- Calibration to local stream flow data, where applicable. Examples of local calibration studies include, but are not limited to, modeling efforts prepared for the Orange County Retrofit Study. Two watersheds were modeled, including the Anaheim Bay-Huntington Harbor watershed and the Aliso Creek watershed.
- Published parameter values consistent with previous studies for Orange County and Southern California, such as HSPF-related regional calibration studies, research projects, regional soil surveys, etc.
- Recommended parameter value ranges from BASINS (Better Assessment Science Integrating point and Nonpoint Sources) Technical Notice 6, Estimating Hydrology, and Hydraulic Parameters for HSPF, U.S. EPA, July 2000.

Where parameters have been transposed or modified from calibration efforts outside of Southern California, the source was determined and justification provided stating why such data are applicable for Orange County. Details have been provided justifying how parameters from such studies were adjusted to be applicable to Orange County conditions. Storm water flow control devices designed to meet the hydromodification criteria have been analyzed pursuant to the following criteria:

- Infiltration processes have been modeled with sufficient complexity to properly quantify the flow control benefit to the receiving streams.
- Infiltration quantification includes provisions for water head and pore suction effects for multiple layers of varying materials (i.e., ponding areas, amended soil layer, gravel layer, etc.)
- Storage processes associated with each layer of the storm water device are quantified.
- Device outflow curves are considered controls associated with device underdrains.

3.3.iii Peak Flow and Flow Duration Statistics

To assess the effectiveness of storm water flow control devices in mitigating hydromodification effects to meet the hydromodification criteria, peak flow frequency statistics are required. Peak flow frequency statistics estimate how often flow rates exceed a given threshold. In this case, the key peak flow frequency values are the lower and upper bounds of the geomorphically significant flow range. Peak flow frequency statistics can be developed using either a partial-duration or peak annual series. Partial-duration series frequency calculations consider multiple storm events in a given year while the peak annual series considers just the peak annual storm event.

Flow duration statistics are also summarized to determine how often a particular flow rate is exceeded. To determine if a storm water facility meets the hydromodification criteria, peak flow frequency and flow duration curves are generated for the pre-development condition, or naturally occurring condition, and the post-project condition. Both pre-development and post-project simulation runs are extended for the entire length of the rainfall record.

The need for partial-duration statistics is more pronounced for control standards based on more frequent return intervals (such as the 2-year runoff event), since the peak annual series does not perform as well in the estimation of such events. This phenomenon is especially pronounced in the South Orange County region's semi-arid climate. After a review of supporting literature, the use of a partial-duration series is recommended for semi-arid climates similar to Orange County, where prolonged dry periods can skew peak flow frequency results determined by a peak annual series for more frequent runoff events.

For the statistical analysis of the rainfall record, partial duration series events have been separated into discrete unrelated rainfall events assuming the following criteria.

1. A minimum interval of 24 hours between peaks is applied to capture those peaks generated from back-to-back storms.
2. The Weibull plotting method is used to rank the selected peaks as the method was specifically developed for California-based streams, where wet-weather and dry-weather years produce two populations of flood events.

3.4 Rainfall Data

The SOCHM integrates local rainfall data to design storm water flow control devices. To provide for clear climatic designation between coastal, foothill and mountain areas of the southern part of Orange County, historical records for a series of two rainfall data stations located throughout South Orange County were compiled, formatted and quality controlled for analysis.

Long-term rainfall records of 15-minute intervals have been prepared for these two rainfall stations. Sources of the rainfall data include Orange County Automated Local Evaluation in Real Time (ALERT) telemetry system rain gauges (extending back to 1991), the California Climatic Data Archive, National Oceanic and Atmospheric Administration (NOAA), the National Climatic Data Center, and the Western Regional Climate Center. In all cases, the length of the overall rainfall station record is a minimum of 49 years.

Gauge selection was further governed by minimum continuous simulation modeling requirements, including the following:

- The selected precipitation gauge data set should be located near the project site to ensure that long-term rainfall records are similar to the anticipated rainfall patterns for the site. Thus, gauges were selected near areas planned for future development and redevelopment.
- Recording frequency for the gauge data set should be at least hourly
- The recorded rainfall data should be disaggregated to at least a 15-minute interval. It is expected that the time of concentration for most projects will be below 15 minutes.
- The gauge rainfall data set should extend for the entire length of the record. Where the gauge record length is less than 49 years, then adjacent gauge data sets were used to extend the rainfall record to at least 49 years.
- Use of the most applicable long-term rainfall gauge data, as opposed to the scaling of rainfall patterns from Laguna Beach, is required to account for the diverse rainfall patterns across South Orange County.

As part of developing SOCHM, hourly time series were disaggregated into time series of 15-minute intervals and incorporated into the model to optimize the estimation of peak flows and ultimately the sizing of LID BMPs. The disaggregation was based on the rainfall disaggregation model for continuous hydrologic modeling as developed by Ormsbee (1989). The stochastic algorithm determines, for each independent storm event, a synthetic peak depth based on an initial observed peak depth and a total rainfall for the event.

The County operates the Orange County Automated Local Evaluation in Real Time (ALERT) telemetry system rain gauges, which includes the Sulphur Creek raingage station located in the Aliso Creek watershed. Complete real-time information from this station, including the timing of the peak, the peak rainfall depth, and the total rainfall depth, is available for 167 recorded storm events between October 1991 and December 2006. In addition, the difference in rainfall depths between the Sulphur Creek ALERT station and the Laguna Beach NOAA station (ID# CA044647) are not statistically different (-3% cumulative difference in mean rainfall depth). Thus, the records from the Sulphur Creek station were used to calibrate statistically the disaggregation scheme: a spiking factor of 0.33 coupled with a stochastic pulse depth of 0.01 inch returned the highest statistical results.

Data gathered from precipitation gauges are summarized in **Table 3-2** below. Disaggregated time series all have computed frequencies of 15-minute intervals and recording data ranges of at least 49 years.

Table 3-2: Summary of Precipitation Gauges

Station	Elevation (feet)	Watershed	Hourly data span
Laguna Beach (CA044647)	35	Laguna Coastal Streams	December 1948 – December 2006
Trabuco Canyon (CA048992)	970	San Juan	August 1957 – March 2006

For a given project location, the following factors have been considered in the selection of the appropriate rainfall data set.

In most cases, the rainfall data set nearest the project site is the appropriate choice. A rainfall station map associated with this HMP is presented in **Figure 3-2** for public use.

In some cases, the rainfall data set nearest the project site was a less applicable data set. Such a scenario involved a data set, for instance, with an elevation significantly different from the project site. In addition to a simple elevation comparison, the project proponent may also consult with the Orange County's average annual precipitation isopluvial map, which is provided in the Orange County Technical Guidance Manual, Appendix XVI (2011). Review of this map could provide an initial estimate as to whether the project site is in a similar rainfall zone as compared to the rainfall stations. Generally, precipitation totals in South Orange County increase with increasing elevation.

Where possible, rainfall data sets located in the same topographic zone (coastal and foothill, or mountain) as the project should be selected.

3.5 Rainfall Losses – Infiltration Parameters

Standards developed as part of this HMP to control runoff peak flows and durations are based on a continuous simulation of runoff using locally derived parameters for initial infiltration. A review was conducted of available continuous hydrologic simulation modeling reports in Southern California. These included water quality HSPF models developed for the County of Orange, regional continuous models developed by SCCWRP, and watershed-level continuous models developed for river and large creek systems in San Diego and Los Angeles Counties. Of particular interest and focus in this review was how local and regional continuous hydrologic models simulated the pervious land surface for various combinations of soils and land use types, because this component of hydrologic modeling is typically the most variable and difficult to describe.

The HSPF software package is an industry standard for continuous simulation hydrologic modeling. However, HEC-HMS and SWMM also provide adequate public domain continuous modeling alternatives. The HMP allows the option to use HEC-HMS for a project submittal but only provides infiltration data review for HSPF modeling approaches. Therefore, applicants choosing HEC-HMS should seek prior authorization by the governing municipality.

In preparing computer models to assess storm water controls and meet hydromodification criteria, rainfall loss parameters describing soil characteristics, land cover descriptions, and slope should be validated to prove consistency with the local environment and climatic conditions. The goal, with regard to the South Orange County HMP, is to develop a set of appropriate parameter ranges to account for variations.

Figure 3-2: Rainfall Data – Available Stations and Starting Date

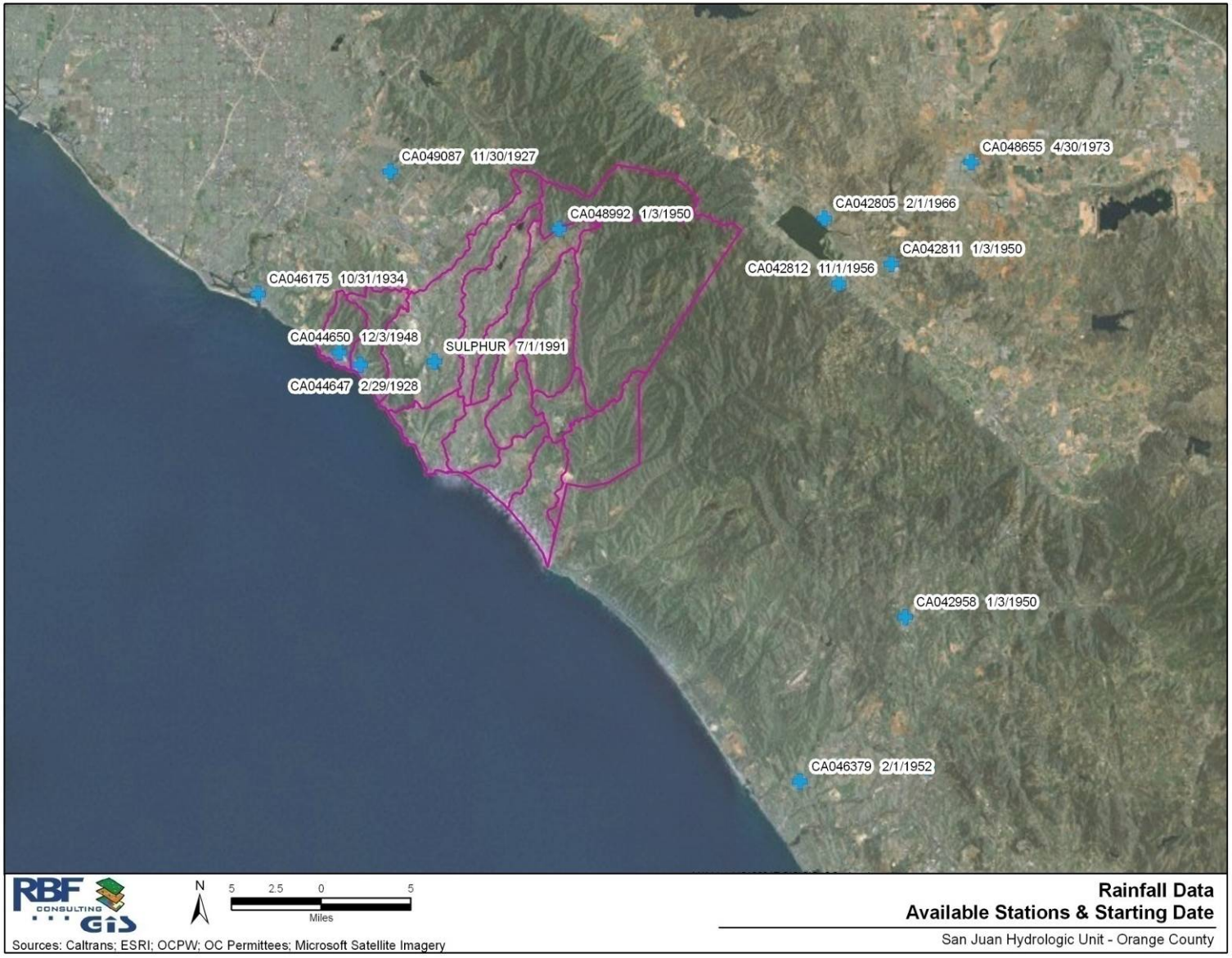

In addition to the reports listed in **Table 3-3**, other TMDL reports in Southern California were reviewed. However, only those reports with a substantial description of modeling activities were summarized in the table.

Table 3-3: TMDL Technical Reports

No.	Title	Authors	Date	Summary/Comments
1	Orange County Stormwater Program – Identification of Retrofitting Opportunities – Watershed HSPF Model Development	County of Orange / RBF Consulting	September 12, 2009	Combination of hydrologic and water quality modeling to estimate both pollutant loadings and pollutant removal from retrofitting opportunities. Two watersheds were modeled: Anaheim Bay-Huntington Harbor and Aliso Creek HSPF calibration parameters are specific to each local watershed.
2	TMDL to Reduce Bacterial Indicator Densities at Santa Monica Bay Beaches During Wet Weather (Preliminary Draft)	Los Angeles RWQCB / Tetra Tech	June 21, 2002	Combination of hydrologic and water quality modeling to estimate bacterial loadings to Santa Monica Bay. The HSPF/LSPC model was calibrated and validated using stream flow data collected on Malibu Creek and Ballona Creek. (LSPC stands for Loading Simulation Program in C++, a recoded C++ version of HSPF.) No HSPF model parameters are included.
3	Technical Report – TMDLs for Indicator Bacteria in Baby Beach and Shelter Island Shoreline Park	San Diego RWQCB / Tetra Tech	June 11, 2008	HSPF/LSPC model was calibrated to flow data collected in Aliso Creek and Rose Creek. Calibrated infiltration rates were reported for Natural Resources Conservation Survey (NRCS) Group A, B, C, and D soils. However, it is unclear if these rates correspond to specific HSPF model parameters. The issue of how to apply the calibrated infiltration rates should be addressed through correspondence with study authors.
4	Evaluating HSPF in an Arid, Urbanized Watershed (in Journal of the American Water Resources Association, 2005, p477-486)	Drew Ackerman, Kenneth Schiff, Stephen Weisburg (SCCWRP)	February 2005	HSPF was used to simulate hydrologic processes in arid region, e.g., precipitation on dry soils, effect of irrigation. The model was calibrated to gauge data collected in the lower reaches of Malibu Creek. The calibration set aggregated the soil and land cover variations in the watershed (i.e., spatially "lumped" parameters). Pervious land surface (PWATER) parameters were included.
5	TMDL for Indicator Bacteria Project I – Twenty Beaches and Creeks in the San Diego Region	San Diego RWQCB / Tetra Tech	December 12, 2007	HSPF/LSPC model parameters were selected from regional calibration. Calibration efforts used daily average stream flows as the baseline calibration condition. The Appendices describe the regional calibration process. The modeling files are provided by the San Diego RWQCB.
6	Lake Elsinore and Canyon Lake Nutrient Source Assessment (Final Report) for Santa Ana Watershed Project Authority	Tetra Tech, Inc.	January 2003	The HSPF/LSPC model was calibrated and validated using United States Geological Survey (USGS) gauging site data in the San Jacinto watershed. Model simulated pollutant loading to Lake Elsinore and Canyon Lake. Pervious land surface (PWATER) parameters were not published in the report.

The technical reports listed in **Table 3-3** demonstrate that a variety of detailed HSPF modeling studies have been conducted in the past 10 years in Southern California. The modeling efforts conducted in Orange County, particularly the HSPF model for Aliso Creek watershed, have been adapted for use in the South Orange County HMP (see No. 1 above). The parameters developed for this watershed model were specifically calibrated and validated by using stream flow and water quality data from the Aliso Creek watershed. In addition, the Ackerman study (**Table 3-3**, item No. 4) published a set of generalized parameters that aggregates or "spatially lumps" the contributions of different soil/land use combinations in the lower watershed.

The HSPF model described in the Ackerman paper (**Table 3-3**, item No. 4) simulates all soil and land use combinations using a single composite parameter set. The purpose of the model was to estimate pollutant loadings to area beaches and water bodies. Therefore, the HSPF model was calibrated only to gauge data in the lower Santa Monica Bay watershed. Additionally, the effect of upstream surface water impoundments would have made the development of an accurate, detailed calibration at the sub-catchment scale very difficult to achieve. Unfortunately, this "spatially lumped" parameter set is of limited usefulness for the purpose of the HMP project, given the need to develop parameter sets that describe a variety of common soil and land use combinations.

The following model parameters were incorporated into the Aliso Creek HSPF model. Specific values were associated to each type of land use such that several values are possible for each pervious parameter.

Table 3-4: Model Parameters

Pervious Parameters	Acronym	Value	Unit
Fraction of Remaining Evapotranspiration (E-T) from Active Groundwater Storage	AGEWTP	0.05	-
Basic Groundwater Recession Rate	AGWRC	0.8/0.99	1/day
Fraction of Remaining E-T from baseflow	BASETP	0.2	-
Interception Storage Capacity	CEPSC	0.2	inch
Fraction of Groundwater to Deep Aquifer	DEEPFR	0.05/0.15	-
Forest Fraction	FOREST	0 or 1	-
Infiltration Equation Exponent	INFEXP	2	-
Ratio between the Maximum and Mean Infiltration Capacities	INFILD	2	-
Infiltration Capacity	INFILT	0.1/2	inch/hour
Interflow Inflow Parameter	INTFW	0.2	-
Interflow Recession Parameter	IRC	0.5	1/day
Groundwater Recession Flow Coefficient	KVARY	5/8	1/inch
Overland Flow Length	LSUR	75 to 190	feet
Lower Zone E-T Parameter	LZETP	0.9	-
Lower Zone Nominal Storage	LZSN	0.8/2.4/3.2	in
Manning's n for Overland Flow	NSUR	0.15/0.25/0.35	Complex
Temperature Maximum for E-T	PETMAX	35	deg F
Temperature that E-T is Zero	PETMIN	30	deg F

Pervious Parameters	Acronym	Value	Unit
Overland Flow Slope	SLSUR	0.2	foot/feet
Upper Zone Nominal Storage	UZSN	0.05/0.07	inch

Additional reference material is contained in the BASINS Technical Notice 6, Estimating Hydrology and Hydraulic Parameters for HSPF, prepared by U.S. EPA (July 2000). This document provides details regarding pervious and impervious land hydrology parameters along with flow routing parameters. Parameter and value range summary tables are included in the document.

3.6 Rainfall Losses - Evapotranspiration Parameters

Standards developed as part of this HMP to control runoff peak flows and durations are based on a continuous simulation of rainfall runoff using locally derived parameters for evaporation and evapotranspiration. Known data sources for potential evapotranspiration data in South Orange County are listed below.
Historical potential evapotranspiration at Laguna Beach station (CA044647) is considered to best represent the coastal evapotranspiration conditions of the San Juan hydrologic unit. Historical potential evapotranspiration at Vista station (CA049378) was found to best correspond to the foothills and mountainous conditions. It is located in San Diego County but remains in the San Juan hydrologic unit.

Other gauging stations that record potential evapotranspiration were not selected because the elevation and land use were not representative of the specific foothill and mountainous conditions present in South Orange County. The potential evapotranspiration will be coupled with historical records of temperature to determine the actual daily evapotranspiration. **Table 3-5** summarizes available sources for potential evapotranspiration in South Orange County.

Table 3-5: Available Evapotranspiration Sources

Station Name ID	Data Type	Data Source	Recording Frequency	Hourly data span
Laguna Beach (CA044647)	Potential Evapotranspiration	BASIN	Daily	December 1948 – December 2006
Vista (CA049378)	Potential Evapotranspiration	BASIN	Daily	August 1957 – December 2006

Long-term evaporation / evapotranspiration data sets are being generated to correspond with long-term rainfall records. The final selection of rainfall loss parameters and evaporation data is part of the SOCHM development process.

In summary, the published literature reviewed as part of this study support the methods and approach taken in developing the South Orange County HMP.

Figure 3-3: Potential Evapotranspiration Data – Available Stations and Starting Date

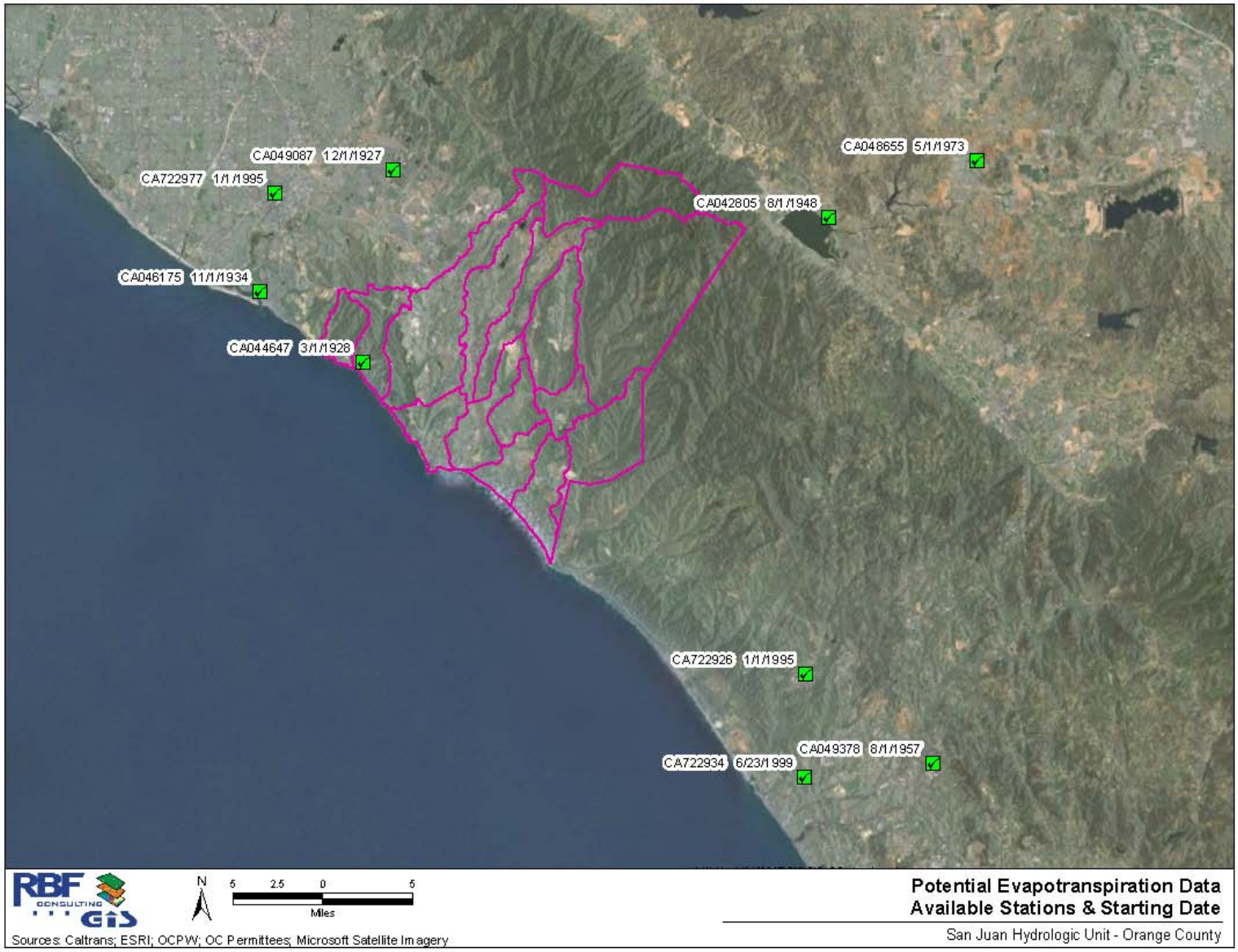

3.7 Identification of naturally-occurring conditions

Permit language of Section F.1.h requires that estimated post-project runoff discharge rates and durations shall not exceed pre-development (naturally occurring) discharge rates and durations. Compliance with the Permit requirement should be based on the results of continuous simulation and the use of the South Orange County Hydrology Model or equivalent model. As part of developing the supporting hydrology model for a development or re-development project, a project proponent shall identify and document, using professional knowledge, pre-development (naturally occurring) conditions in terms of geology, topography, soils, and vegetation, Several publicly-available information sources may help the developer characterize pre-development conditions, including:

- Soil database #678 from the Natural Resources Conservation Service (NRCS). Among the parameters of interest, the database identifies the type, the original range of observed topographic slopes, the soil erosion factor K, and, if available, plant community information for the native or pre-development soil. The database is accessible through the Web Soil Survey page (http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm).
- Vegetation and eco-regional GIS information listed by the US Forest Services. Eco-Region information locates South Orange County in the Southern California Coast and Mountain Ecoregion and references the climate of humid and temperate Mediterranean type. Overall, two vegetation regions are observed, including the California Coastal Chaparral Forest and Scrub (California Sagebrush) on the coastal and inner lands of the County, as well as California Coastal range Open Woodland-Scrub-Coniferous Forest-Meadow (Scrub and Oak Trees) in the upper mountainous parts of South Orange County. In addition, a historical CALVEG GIS vegetation layer is available for the year 1977 (USFS, 2000). Figure 3-4 delineates the distribution of vegetation types in the South Orange County portion of the San Juan Hydrologic Unit. GIS-based layers are available on the USFS website (http://www.fs.usda.gov/detail/r5/landmanagement/gis/).
- Other historical USGS topographic maps and aerials of South Orange County are publicly available from the USGS website.

Figure 3-4: South Orange County Vegetation and Eco-Regions

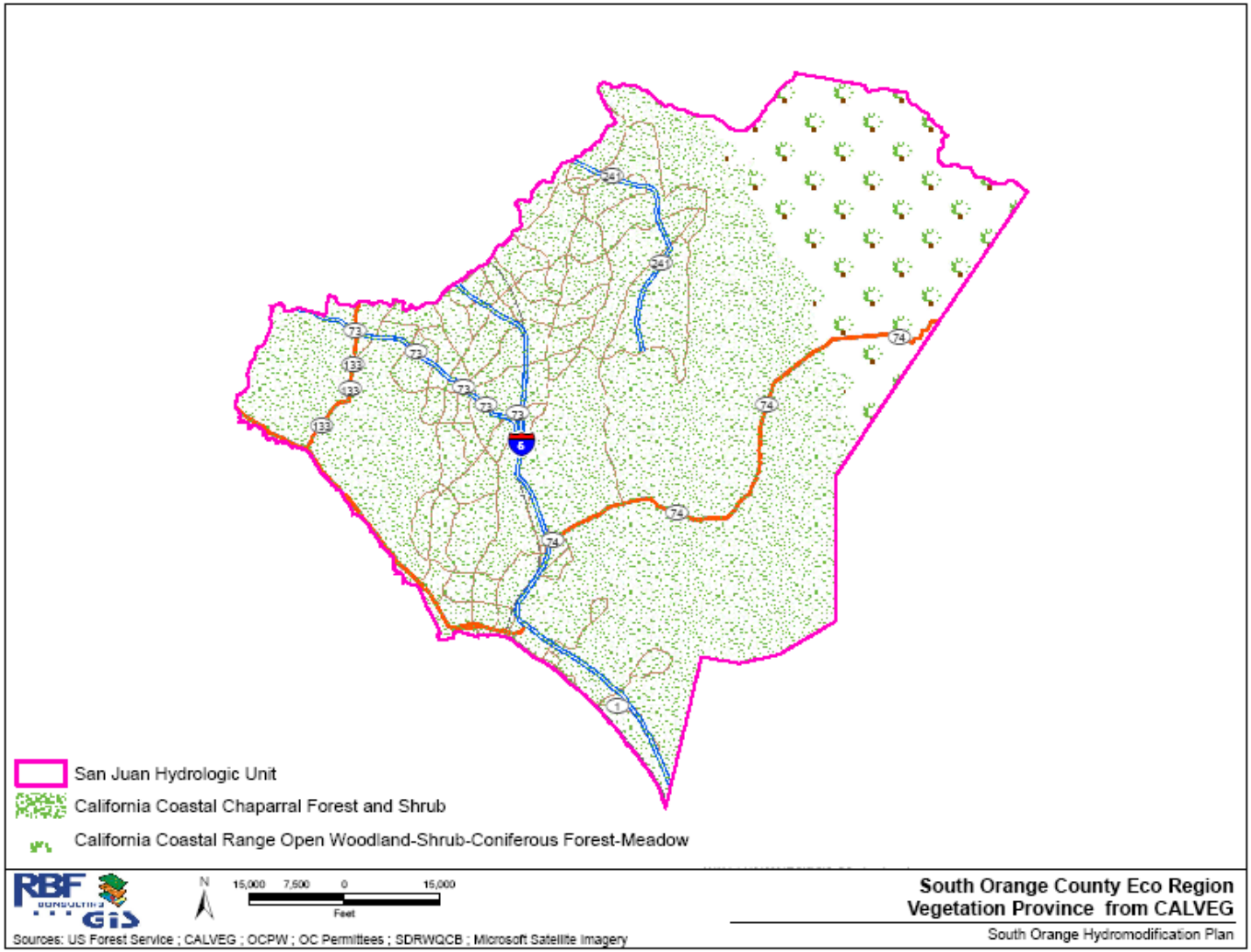

4.0 Requirements and Standards for Projects

Priority Development Projects are required to implement hydrologic control measures and on-site management controls so that post-project runoff flow rates and durations do not exceed pre-development, i.e. naturally occurring conditions, flow rates and durations where they would result in an increased potential for erosion or significant impacts to beneficial uses (Permit Section F.1.h.). The purpose of this chapter is to identify the HMP criteria, detail the HMP applicability requirements, and provide a framework for alternative compliance.

4.1 HMP Criteria and Performance Standard

The HMP criteria are designed to manage increases in runoff discharge rates and durations from all Priority Development Projects (PDPs) and they apply to all PDPs. The HMP criteria include the following:

- All PDPs must use continuous simulation to ensure that post-project runoff flow rates and durations for the PDP shall not exceed pre-development, naturally occurring, runoff flow rates and durations by more than 10% of the time, from 10% of the 2-year runoff event up to the 10-year runoff event.

This HMP includes a tool to provide continuous simulation of peak flow rates, from 10% of the 2-year runoff event up to the 10-year runoff event for PDPs. The tool is the South Orange County Hydrology Model, which is an HSPF model based on the San Diego Hydrology Model and allows PDPs to meet the HMP criteria through interactive graphic user interface. Details about how to use the model are provided in **Appendix C**.

Demonstration of flow-duration matching for the range of geomorphically-significant flows constitutes conformance with the hydrologic element of the performance standard of this HMP. The second element of the HMP performance standard, sediment bed material sources, is the maintenance of pre-project sediment bed material supply. The general approach that a project proponent shall follow to demonstrate compliance with the sediment source performance standard is described in Section 5.

All priority project proponents shall demonstrate compliance with the hydrologic performance standard and the sediment supply performance standard. Compliance with these standards constitutes compliance with the overall performance standard for the HMP.

The lower flow threshold ($0.1Q_2$) satisfies Section F.1.h.(1)(b) in that it corresponds with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks of a soft-bottomed channel. For those PDPs that chose to perform a site-specific analysis, the selected lower flow threshold must also ensure that it meets the requirements of Section F.1.h.(1)(b) of the permit.

The HMP performance standard is also applicable to those priority projects that are unable to implement flow-duration controls onsite but seek compliance through offsite mitigation projects. The mitigation project must be capable of matching or reducing the equivalent flow-duration curves from the project development.

This HMP offers an alternate hydrologic performance standard to those priority projects that are unable to implement flow-duration matching onsite and offsite, only if the unfeasibility is demonstrated and documented to the governing Copermittee. The alternative performance standard consists of implementing restoration projects that will ensure the channel stability and restore the beneficial uses. The performance equivalency of a restoration project shall be demonstrated to the governing Copermittee.

Priority Development Projects that fail to meet the dual performance standard or do not qualify for the alternate performance standard are required to redesign the project.

4.2 HMP Applicability Requirements

To determine if a proposed project must implement hydromodification controls, refer to the HMP Decision Matrix in **Figure 4-3**.

The HMP Decision Matrix can be used for all projects. Project tiers are based on the size and type of development or re-development, are identified in **Figure 4-3**, and their associated requirements are defined in **Section 4.5**.

It should be noted that all PDPs are subject to the Permit's LID and water quality treatment requirements even if hydromodification flow controls are not required.

As noted in **Figure 4-3**, projects may be exempt from HMP criteria under the following conditions.

- If the project is not a PDP; or
- If the proposed project discharges storm water runoff directly into underground storm drains discharging directly to bays or the ocean; or
- If the proposed project discharges runoff directly to an exempt receiving water as defined in **Section 4.3.i**; or
- If the project is an in-stream flood control or restoration project and the use of natural material has been evaluated (See **Section 4.3.ii**), or,
- If the project discharges to a large river per the definition provided in **Section 4.3.iii**

Figure 4-1 through **Figure 4-2** provide an overview of the inventoried south Orange County storm drains, and identify potentially exempt areas per the requirements of the permit and non-exempt areas. **Figure 4-1** through **Figure 4-2** are classified per watershed and geographical localization within the San Juan Hydrologic Unit.

Figure 4-1: South Orange County Storm Drain Inventory 2010

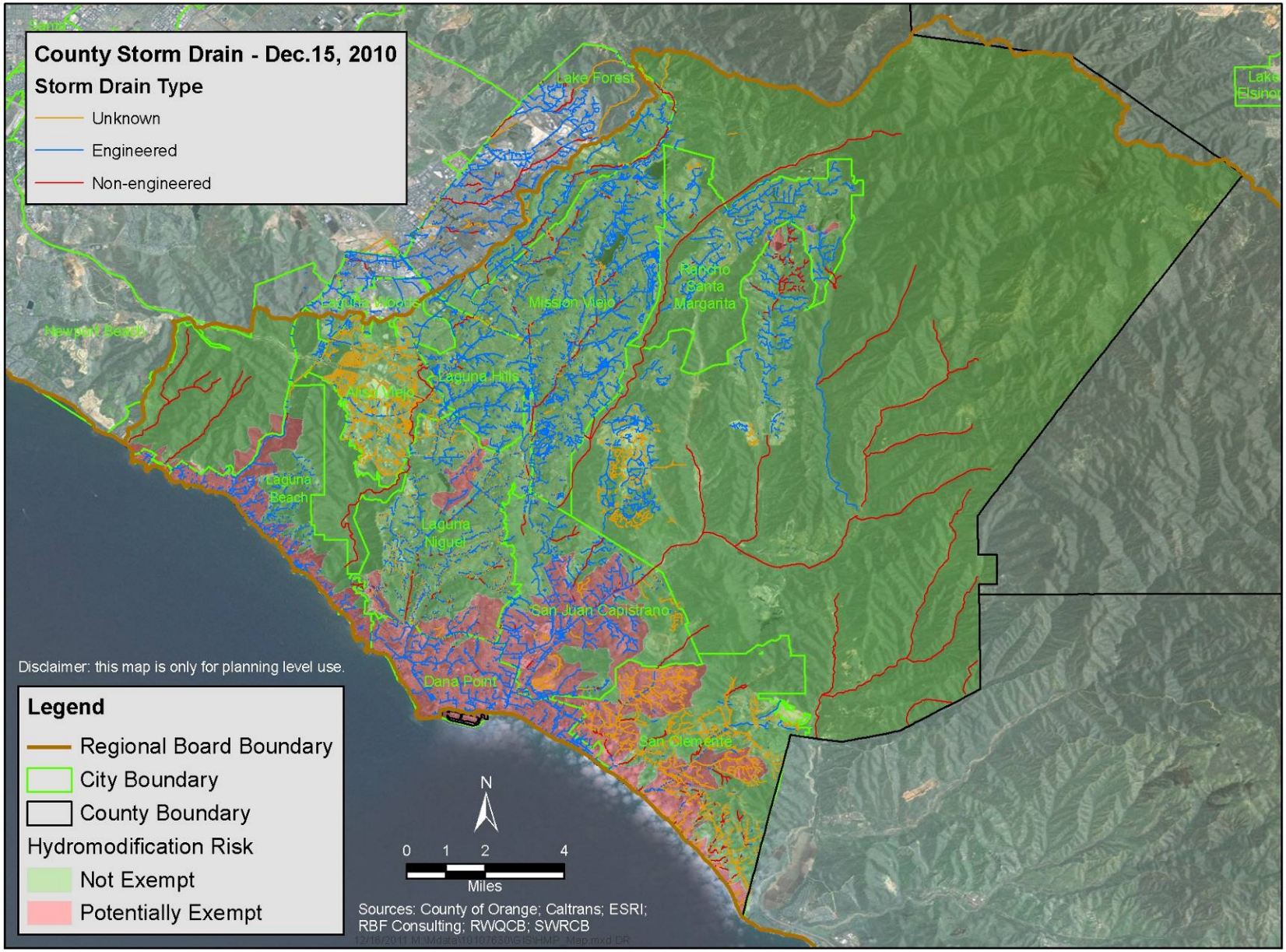

Figure 4-2: Southern Portion South Orange County Storm Drain Inventory 2010

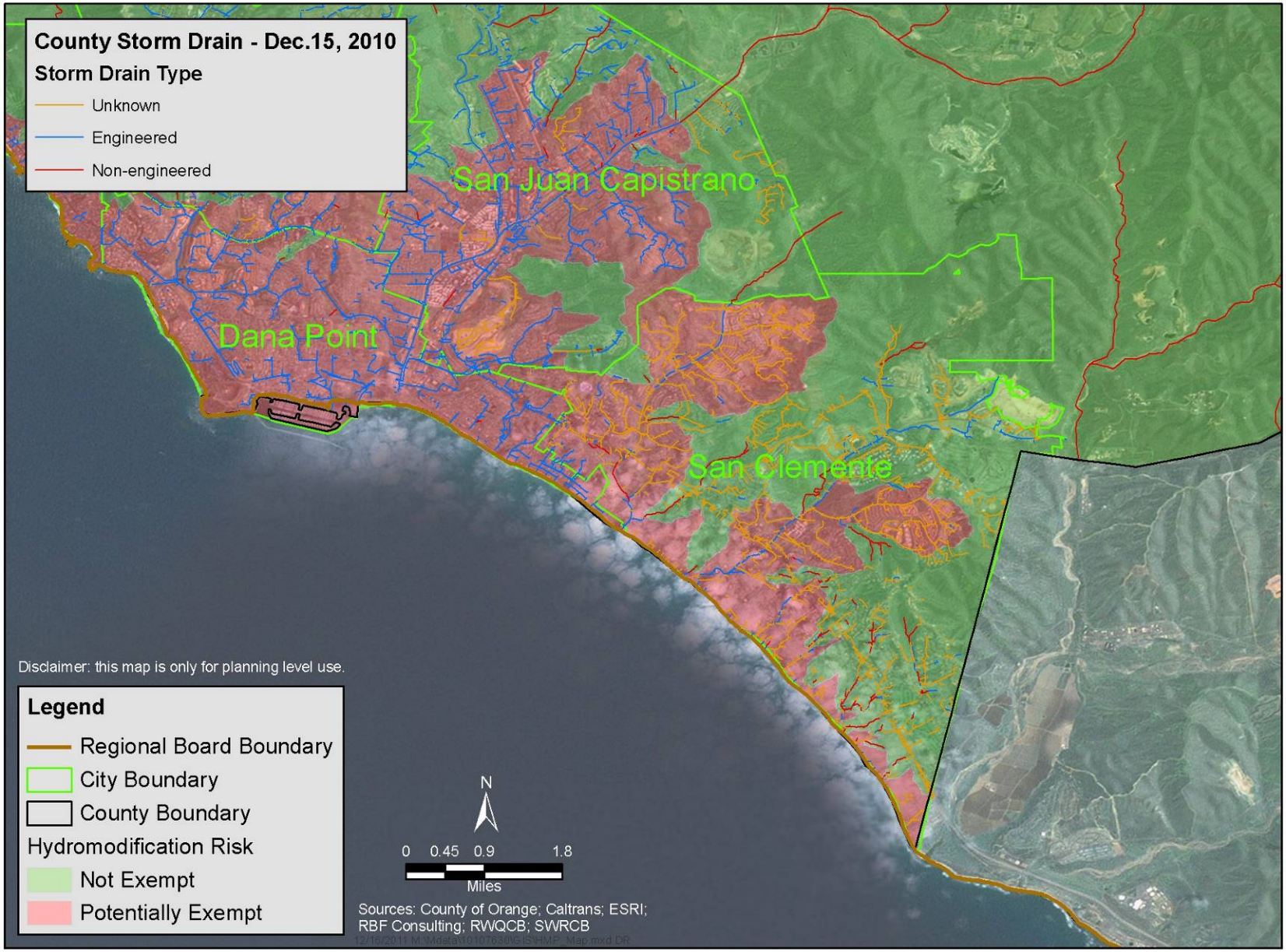

Figure 4-3: HMP Decision Matrix

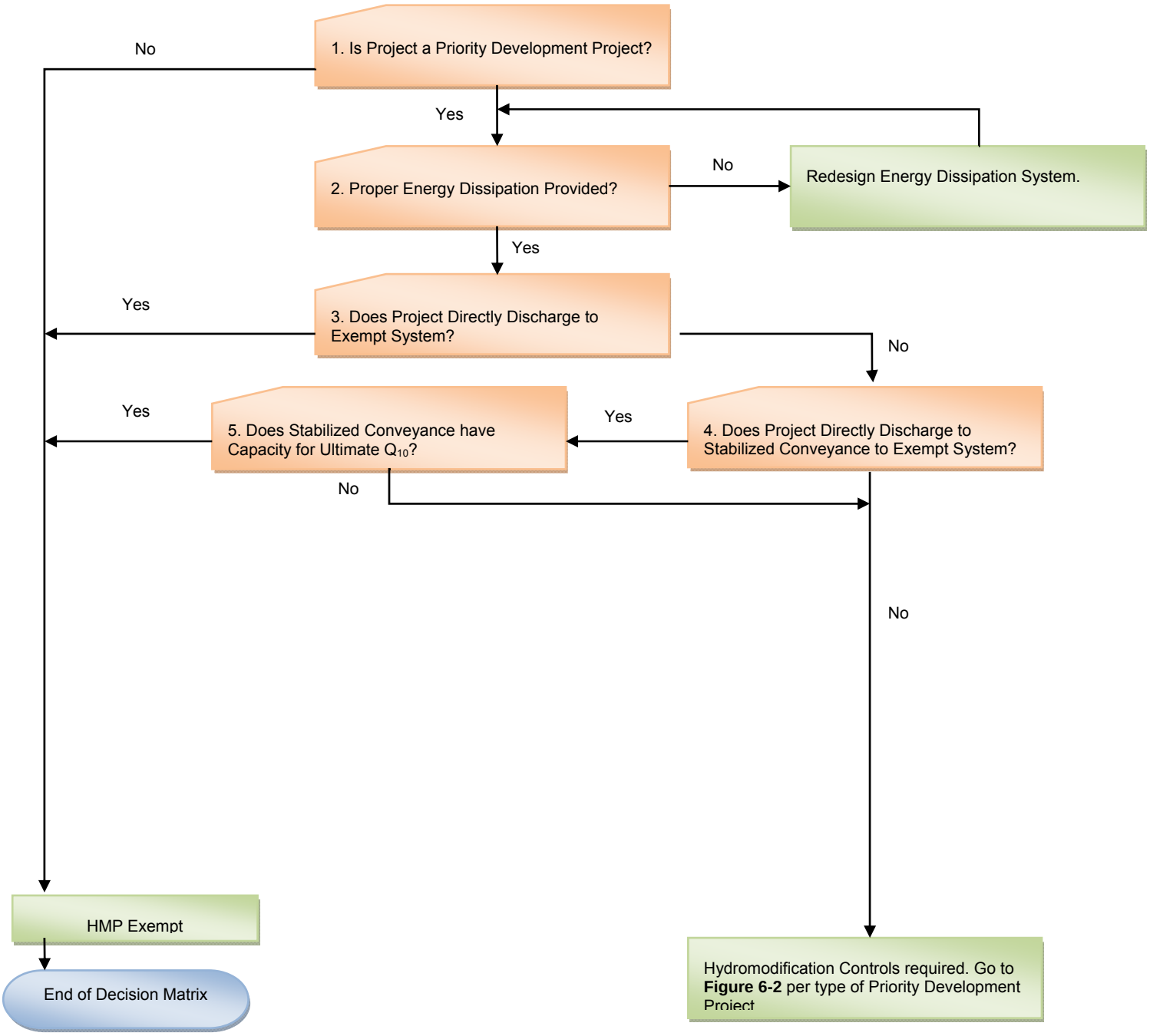

- **Figure 4-3**, Node 1 – Hydromodification mitigation measures are only required if the proposed project is a PDP, as defined per Permit Item F.1.d.
- **Figure 4-3**, Node 2 – Properly designed energy dissipation systems are required for all project outfalls to unlined channels. Such systems should be designed in accordance with the Orange County Local Drainage Manual to ensure downstream channel protection from concentrated outfalls.
- **Figure 4-3**, Node 3 – Potential exemptions may be granted for projects discharging runoff directly to an exempt receiving water, such as the Pacific Ocean, an exempt river system (identified in **Table 4-1**), an exempt reservoir system (identified in **Table 4-2**), a large river stream (identified in **Section 4.3.iii**), but also for in-stream flood control projects for which the use of natural material has been evaluated (identified in **Section 4.3.ii**).
- **Figure 4-3**, Nodes 4 and 5 – For projects discharging runoff directly to an engineered conveyance system that extends to exempt receiving waters detailed in Node 3, potential exemptions from hydromodification criteria may be granted. Such engineered systems could include existing storm drain systems, existing hardened conveyance channels, or stable engineered unlined conveyance channels that are part of the MS4 but that are not receiving waters. To qualify for this exemption, the existing hardened or rehabilitated conveyance system must continue uninterrupted to the exempt system. The engineered conveyance system cannot discharge to an unlined, non-engineered channel segment prior to discharge to the exempt system. Additionally, the project proponent must demonstrate that the engineered conveyance system has the capacity to convey the 10-year ultimate condition flow through the conveyance system. The 10-year flow should be calculated based upon single-event hydrologic criteria as detailed in the Orange County Hydrology Manual.

4.3 HMP Exemptions

PDPs may be exempt from HMP criteria based on specific channel conditions. These exemptions are detailed in this section.

4.3.i Engineered Channel Exempt Areas

The channel exempt areas include those areas that discharge to engineered channels sections that have the capacity to convey the 10-year ultimate condition discharge. This includes, as identified in Section F.1.h.3. of the permit,

- PDPs that discharge runoff directly into underground storm drains discharging directly to bays or the ocean; or
- PDPs that discharge runoff into conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to Ocean waters, enclosed bays, estuaries, or water storage reservoirs and lakes.

Only engineered sections are exempt from the hydromodification requirements. To confirm the exemption, the succession of existing engineered conveyance sections must be continuous from the upstream point to the Pacific Ocean, or to an exempt receiving water, such as a reservoir.

The South Orange County Permit area was screened for identification of exempt channels. The screening analysis was conducted using the 2010 Orange County Countywide Storm Drain Inventory. The storm drain inventory defines the type of material and size composing each section of a channel or storm drain. Major storm drains that are exempt from hydromodification requirements are presented in **Table 4-1** for reference only. The PDP may use the exemption map for planning purposes and must determine if the development or redevelopment project discharges runoff into a continuous succession of existing engineered conveyance sections all the way to the Pacific Ocean or other exempt water body. The table contains the name of the storm drain, as well as the associated downstream and upstream limits. The upstream limit being reported corresponds to the nearest cross street. The resulting map from this effort is presented in **Figure 4-4**. The map shows drainage areas that are exempt from HM criteria.

Table 4-1: Channels Exempt from Hydromodification Requirements in Orange County

Channel	Downstream Limit	Upstream Limit
Laguna Canyon Channel	Pacific Ocean	Philips Street
Sleepy Hollow Storm Drain	Pacific Ocean	Park Avenue
Bluebird Storm Drain	Pacific Ocean	Glenneyre Street
Aliso Creek Channel	Pacific Ocean	Pacific Coast Highway
Salt Creek Channel	Pacific Ocean	300 ft north of Pacific Coast Highway
San Juan Creek Channel	Pacific Ocean	Paseo Michelle
Prima Deshecha Canada Channel	Pacific Ocean	Avenida Vaquero
North Creek	Pacific Ocean	Doheny Park Road
Cacadita Canyon Storm Channel	Prima Deshecha Canada Channel	Via Cascadita
Segunda Deshecha Canada Channel	Pacific Ocean	Calle Frontera
Marquita Storm Channel	Pacific Ocean	Encino Lane
Trafalgar Storm Drain	Pacific Ocean	South Ola Vista

Table 4-2 provides a summary of exempt reservoirs in South Orange County. Large reservoirs or lakes can be exempt systems from a hydromodification standpoint since reservoir and lake storm water inflow velocities are naturally mitigated by the significant tailwater condition in the reservoir. HMP exemptions would only be granted for projects discharging runoff directly to the exempt reservoirs or into engineered conveyance systems designed convey the 10-year ultimate condition discharging into a lake or reservoir. To qualify for the potential exemption, the outlet elevation of the conveyance system must be within (or below) the normal operating water surface elevations of the reservoir and properly designed energy dissipation must be provided.

Table 4-2: Reservoirs in Orange County

Reservoir	Watershed
Sulphur Creek Reservoir	Sulphur Creek
El Toro Reservoir	Oso
Rancho Santa Margarita Lake	Middle Trabuco
Dove Canyon Lake	Upper San Juan

Figure 4-4 below displays the areas of exemption for the entire South Orange County permit area based on the criteria outlined above, where the areas in pink are potentially exempt as they discharge to engineered conveyances all the way to exempt receiving waters (ocean waters, enclosed bays, estuaries, water storage reservoirs, lakes). **Figure 4-5** and **Figure 4-6** show more

detailed maps for the exempt areas in the northern coastal part of South Orange County and the southern coastal part of south Orange County, respectively.

4.3.ii Exemption for In-stream Flood Control and Restoration projects

In-stream flood control projects protect citizens and property from injury and damage by flooding. In-stream restoration projects restore beneficial uses of streams and channels, which ultimately provide benefit to benthic communities. Public health and safety, transportation corridors, economic activities, and in-stream aquatic health all benefit from in-stream flood control and restoration projects.

The Permittee will evaluate the feasibility of using natural materials for stabilization and rehabilitation projects on a case-by-case basis. If the use of natural materials is determined to be infeasible by the Permittee, the use of non-naturally occurring materials will be allowed.

4.3.iii Exemption for Large River Reaches

Effects of cumulative watershed impacts are minimal in stream reaches of large depositional rivers. These large rivers typically have very wide floodplain areas when in the natural condition or are stabilized when in the engineered condition, and are of low gradient. The results of a flow duration curve analysis that was performed for the San Diego River are presented in the San Diego County HMP.

This analysis demonstrated that the effects of cumulative watershed impacts are minimal in those reaches for which the contributing drainage area exceeds 100 square miles and with a 100-year design flow in excess of 20,000 cfs. Development and re-development projects that discharge either directly or via an engineered conveyance system designed to convey the 10-year ultimate condition into such large river streams are hence exempt from the South Orange County HMP requirements, provided that properly sized energy dissipation is implemented at the outfall location. All exempt river reaches, which are presented in **Table 4-3** have a drainage area larger than 100 square miles and a 100-year design flow higher than 20,000 cfs (SDRWQCB, 2002). **Table 4-3** also provides the corresponding upstream and downstream limits to define the exempted reach.

Table 4-3: Exempt River Reaches in South Orange County

River	Downstream Limit	Upstream Limit
San Juan Creek	Outfall to Pacific Ocean	Caper Park Road
San Mateo Creek	Outfall to Pacific Ocean	Nickel & Tenaja Canyons

Figure 4-4: Exemption Map

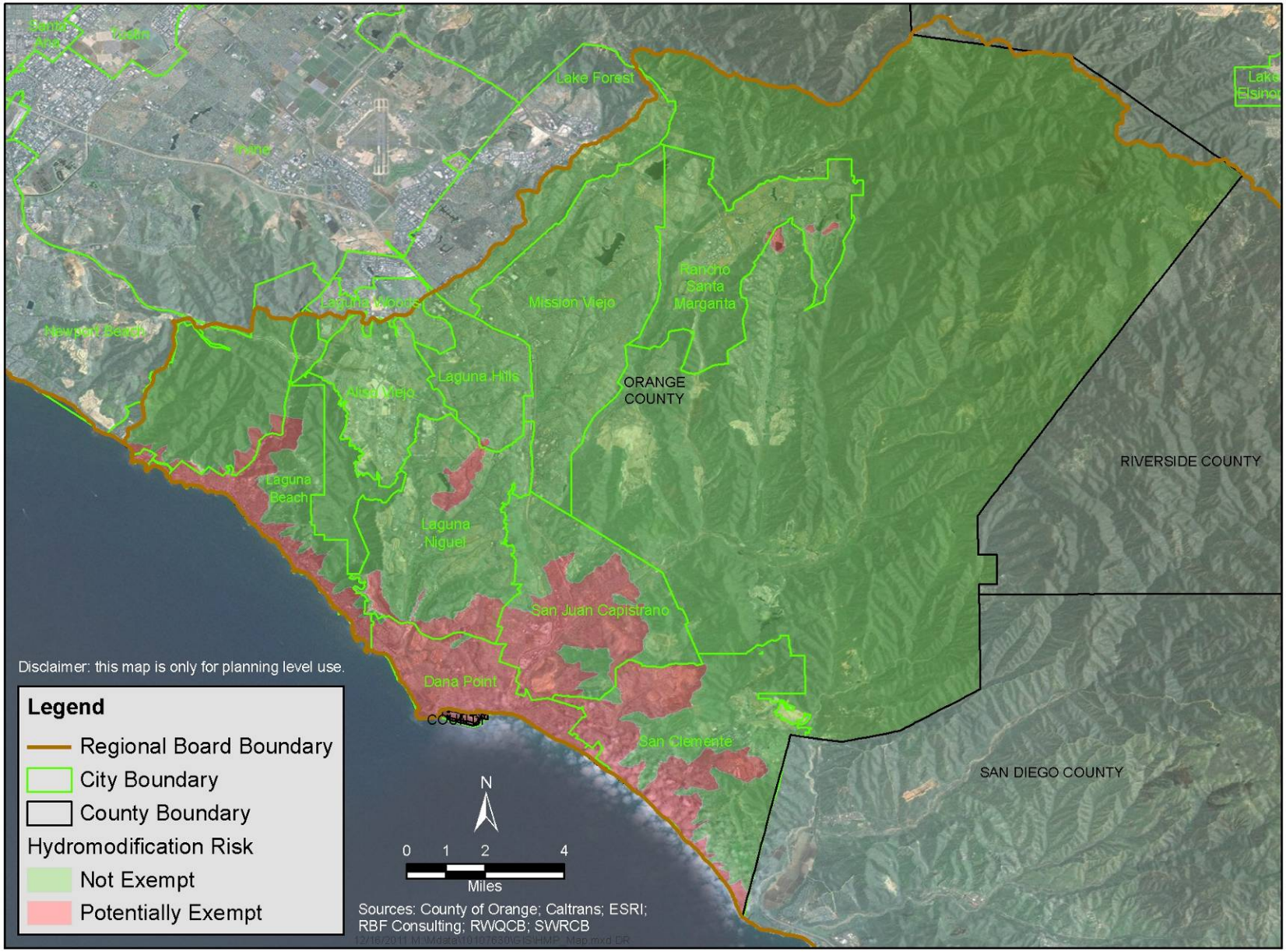

Figure 4-5: Exemption Map Coastal Areas Northern South Orange County

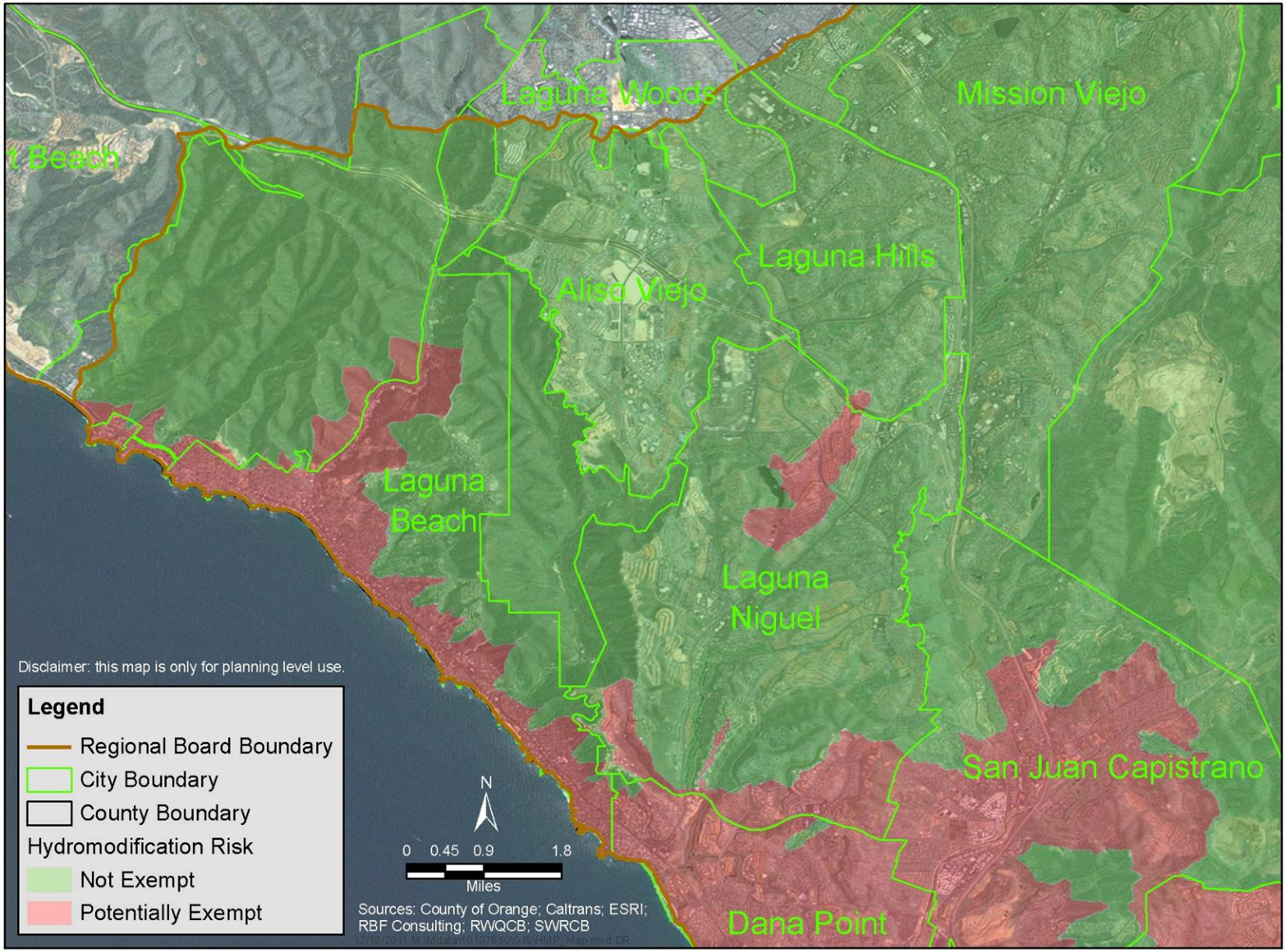

Figure 4-6: Exemption Map Coastal Areas Southern South Orange County

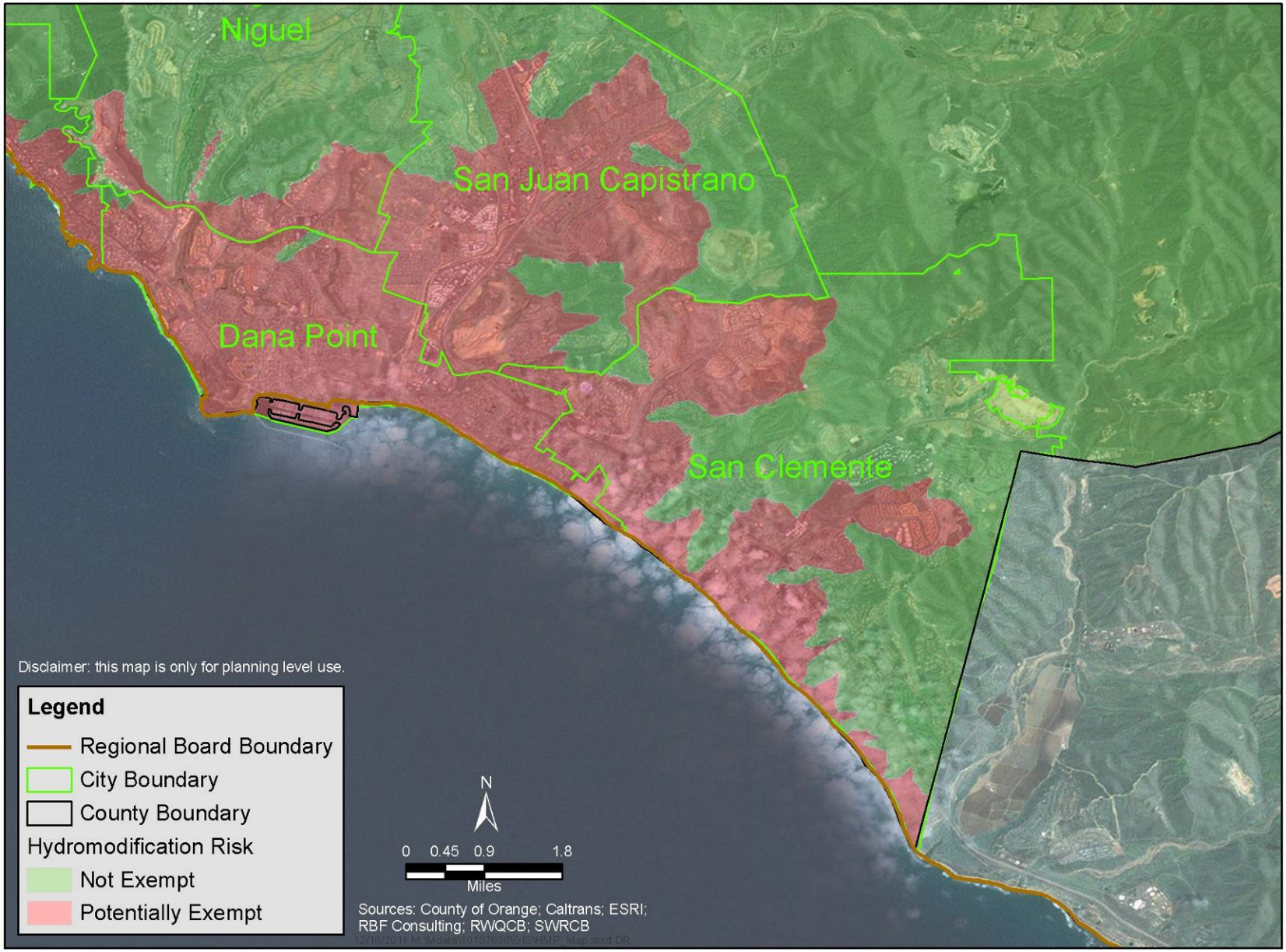

4.4 HMP Alternative Compliance

For some PDPs, implementation of onsite hydromodification controls consistent with the HMP may not be feasible due to site constraints. These projects require alternatives to onsite hydromodification controls. The LID requirements of the permit require the implementation of LID techniques that effectively result in hydrologic processes that mimic the desired natural watershed conditions. There are two alternative compliance options for PDPs that cannot implement onsite hydromodification controls. One option is for a PDP proponent to identify and construct off-site mitigation to offset the inability to meet the HMP criteria onsite. The other option is for the PDP proponent to pay into an HMP mitigation bank, if an HMP mitigation bank is available to the PDP. The details of these options are provided below.

4.4.i HMP Alternative Compliance Option 1: Off-site Mitigation

A progression through a defined process is required to document eligibility then implementation of alternative compliance for the HMP. Off-site mitigation is based on a progression of steps to meet compliance that is consistent with Section F.1.h.2 of the MS4 Permit. These steps include the following:

1. Technical feasibility study of onsite hydromodification controls; and
2. Off-site mitigation project within the same hydrologic unit as the PDP or in-stream restoration of the receiving water of the PDP.

Step A: Conduct a technical feasibility study for onsite hydromodification controls

A technical feasibility study is required to identify why onsite hydromodification controls cannot be incorporated into the project. The technical feasibility study must include the project constraints and provide detailed technical justification as to why the project constraints prevent implementation of onsite controls. The technical feasibility study will be submitted to the jurisdiction of the location of the PDP for review as part of the Preliminary WQMP. The jurisdiction must approve the technical feasibility before the PDP moves on to Step B.

Model WQMP Integration

Guidance on the hydromodification technical feasibility study will be incorporated into the Model WQMP and Technical Guidance. The hydromodification technical feasibility study will be integrated with the LID feasibility analysis as part of the Model WQMP; however, it should be noted that the criteria for hydromodification and LID requirements are different. The feasibility analysis for both hydromodification and LID will be integrated into one feasibility study for the project and submitted with the Preliminary WQMP.

Step B: Implement off-site mitigation within the same hydrologic unit as the PDP or in-stream restoration of the PDP receiving water

For those PDPs where the technical feasibility study for onsite controls has been approved by the jurisdiction, step B for the PDP is to either (1) implement an off-site mitigation project within the same hydrologic unit as the PDP, or (2) implement an in-stream restoration project for the receiving water of the PDP. The process for these options under Step B is detailed below:

B(1) Implement off-site mitigation within the same hydrologic unit as the PDP

In choosing this option, the PDP must investigate potential locations for implementation of an off-site mitigation project within the same hydrologic unit as the PDP. The off-site mitigation project must be sized to mitigate the equivalent runoff volume as implementing onsite hydromodification controls for the PDP. The PDP will evaluate and identify potential sites in the same hydrologic unit for implementation of an off-site hydromodification project that has the capacity to mitigate the PDP's hydromodification requirements. If an adequate site is identified by the PDP in the same hydrologic unit, the PDP will submit a report detailing:

- that the off-site mitigation project will be sized to mitigate the equivalent volume as implementing onsite hydromodification controls for the PDP; and
- conceptual plans for the off-site mitigation project as part of an amended WQMP for review and approval.

If no potential off-site mitigation project sites are identified in the same hydrologic unit as the PDP, the PDP must implement Option 2(b), an in-stream restoration project of the PDP receiving water.

B(2) Implement in-stream restoration of the PDP receiving water

In choosing this option, the PDP investigates the potential for implementation of an in-stream restoration project for the receiving water of the project. It must be determined that the receiving water for the project has hydromodification impacts. The in-stream restoration project must be located in the receiving water of the PDP. The PDP must submit a report detailing the condition of the receiving water due to hydromodification, as well as conceptual plans for the in-stream restoration project to the PDP's jurisdiction for review. The Permittee is responsible for ensuring that the level of restoration is adequate given the impacts of the PDP. Permittees will establish individual processes consistent with their ministerial approval procedures to ensure that the applicants obligations under the HMP alternative compliance process are completed prior to project approval.

Once the project conceptual plans have been approved by the PDP's jurisdiction, the PDP must submit the appropriate permit applications to the appropriate regulatory agencies (e.g., Regional Board, California Department of Fish and Game, U.S. Army Corps of Engineers) for review and approval. If the PDP identifies no opportunities for in-stream restoration in the receiving water that the PDP discharges to, then the PDP must implement Option 2(a), an off-site mitigation project within the same hydrologic unit as the PDP.

4.4.ii HMP Alternative Compliance Option 2: HMP Mitigation Bank

(Note: Option 2 is available only if an HMP mitigation bank has been developed and is available to the PDP.)

The County and the Permittees have the option to develop an HMP mitigation bank or multiple HMP mitigation banks. A mitigation bank will develop regional HMP mitigation projects where PDPs can buy HMP mitigation credits if it is determined that implementing onsite hydromodification controls is infeasible. The development and operation of an HMP mitigation

bank will include the identification of potential regional HMP mitigation projects; the planning, design, permitting, construction, and maintenance of regional HMP mitigation projects; the development of a fee structure for PDPs participating in the mitigation bank; and managing the HMP mitigation bank fund. Regional HMP mitigation projects can also serve as projects for an LID waiver program if site conditions allow for implementation of LID-type projects.

If PDPs are unable to meet the HMP criteria by incorporating onsite hydromodification controls, and a HMP mitigation bank is available, the PDP can apply to participate in the bank. The application must include a technical feasibility study to identify why onsite hydromodification controls cannot be incorporated into the project. The technical feasibility study must include the project constraints and detailed technical justification as to why the project constraints prevent implementation of onsite controls. The technical feasibility study will be submitted to the jurisdiction where the PDP is located for review as part of the Preliminary WQMP. The jurisdiction must approve the technical feasibility study for the PDP to participate in a HMP mitigation bank.

4.4.iii Review Mechanism of Alternative Compliance Projects

A review mechanism for alternative compliance projects should be developed and implemented by the County and the Permittees. The governing Permittee(s) will ultimately be responsible for ensuring that the offsite mitigation project or the restoration project will meet the performance standard of the HMP, or adequate restoration for beneficial uses and stream stabilization. In addition, the Permittee having jurisdiction over the project shall ensure that the timing and financing of the project are secured to guarantee that construction will be completed and maintenance performed over the long term.

It is expected that the implementation of offsite mitigation or restoration projects will be sought by project proponents with limited onsite available space. In a first case, the project proponent or a joint group of project proponents may pursue and manage an offsite mitigation or restoration project on its or their own, with or without the support of the local public agency. The second case considers those offsite mitigation or restoration projects being jointly pursued through the HMP Mitigation Bank.

Project proponents are required to submit a project-specific Water Quality Management Plan to the Permittee having jurisdiction over the project. As part of the submittal, the elements demonstrating that the offsite mitigation project or the restoration project is technically viable, financially secured, and guaranteeing long-term maintenance, should be provided. An in-stream restoration project will trigger Section 401/404 permitting requirements of the Clean Water Act, which will involve the San Diego Water Board in the review process.

The project proponent, or person, financially responsible for the construction and the long-term operation and maintenance of the offsite mitigation or restoration project must demonstrate the viability of the established funding mechanism. A security bond program may be required by the local jurisdiction to guarantee completion of the construction. A funding schema for long-term operation and maintenance must be established and presented along with the BMP Operation and Maintenance Plan.

Similar to project-specific WQMPs, a mitigation or restoration project Operation and Maintenance (O&M) Plan must be prepared and submitted as part of the project submittal. Long-term maintenance and operation of the regional facility must be covered by an O&M mechanism under the direction of a local jurisdiction or a project proponent. Such an agreement must be reached and approved prior to the issuance of any construction permits. The agreement shall include legal agreements, maintenance agreements, conditional use permits and funding arrangements. The O&M Plan shall describe the designated responsible party to manage the offsite mitigation or restoration project, employee's training program and duties, operating schedule, maintenance frequency, routine service schedule, specific maintenance activities, copies of resource agency permits, and any other necessary activities.

Construction of the priority project shall not commence prior to approval of the final WQMP and the security of the overall funding mechanism.

4.5 Tiered Requirements

A proposed PDP that is not located in an exemption zone (see **Figures 4-4, 4-5, and 4-6**) must meet the HMP requirements defined in **Section 4.4**. **Figures 4-4, 4-5, and 4-6** are provided for planning purposes; however, the project proponent shall verify the eligibility to exemption criteria as defined in **Section 4.3**. The PDP must be classified by an applicable tier and meet all the requirements outlined for that tier. The project proponent may associate the size and type of the PDP to one of the following four tiers:

- Tier 1 – Large development projects exceeding 100 acres or development projects that are part of a common initial or phased development plan that exceeds 100 acres
- Tier 2 – Medium-sized development projects between one and 100 acres or re-development projects over one acre
- Tier 3 – Small-sized projects less than one acre yet defined as a PDP
- Tier 4 – Roadway-specific projects

Proposed development or re-development projects face different levels of spatial, environmental, financial, technical, and permitting constraints based on their size and type. As such, the permit language was translated into HMP requirements that are specific and adapted to each tier configuration. The definition of the four tiers was principally derived from the elements of the permit, as well as from a review of the other HMPs (Santa Clara, Alameda, Sacramento, and San Diego). The proposed tiers were defined based on the size and type of proposed projects, and include all PDPs as defined in Permit Item F.1.d.(11). Most individual single-family residential projects will be exempt from the HMP requirements.

Figure 4-7 illustrates the four tiers. The following subsections detail the HMP criteria specific to each tier.

Figure 4-7: Hydromodification Controls: PDP Tiers

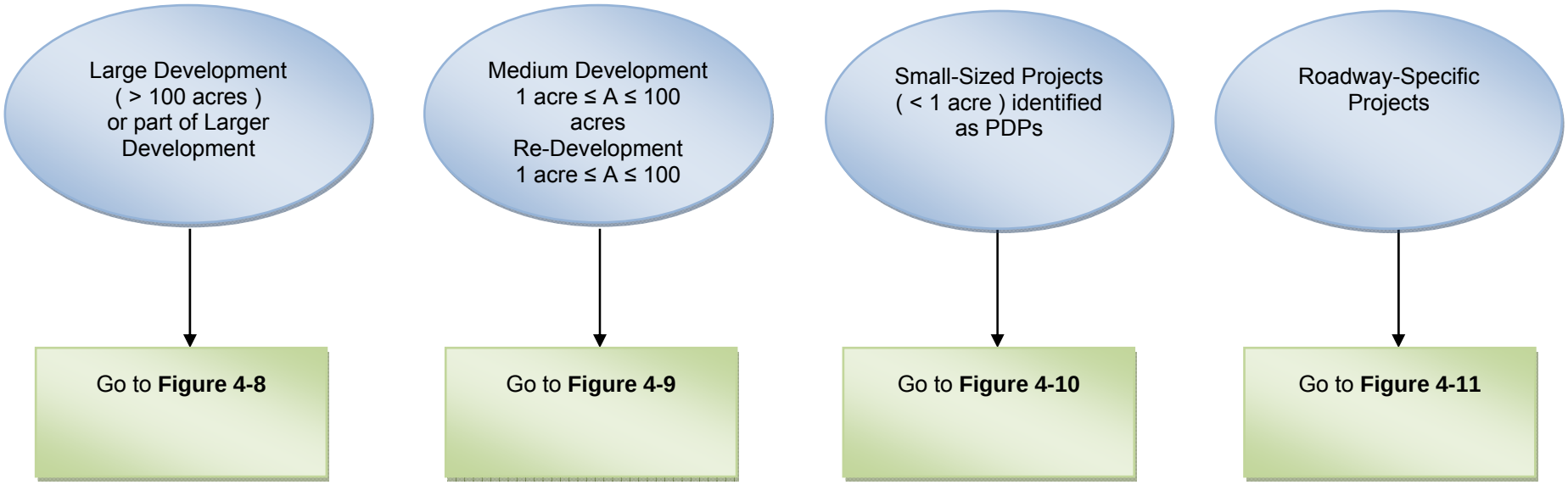

4.5.i Tier 1 - Large developments (higher than one hundred acres)

Tier 1 includes large development projects greater than 100 acres or development projects in a common development plan that exceeds 100 acres. These developments typically offer a enough space for on-site implementation of flow and sediment management controls. Pursuant to permit item F.1.d.(11), implementation of regional control systems for hydromodification may also be considered. Overall, either of the following approaches may be pursued by the applicant:

- Meet the HMP Criteria identified in **Section 4.1** by mitigating flow and duration through on-site hydrologic control measures and addressing sediment loss through on-site management controls.
- Implement regional control systems in lieu of on-site management controls, consistent with the language in permit item F.1.d.(11). A technical feasibility study must be performed to define regional control systems that fulfill water quality, hydrologic, and fluvial geomorphologic requirements consistent with a study framework. Permit item F.1.d.(11) includes also a clause that allows applicants to implement conventional treatment BMPs, as well as participate in the LID waiver program when the regional LID implementation has been shown to be technically infeasible. This clause would not be translated for hydromodification requirements if such technical infeasibility were demonstrated. The technical feasibility study is Step A in **Section 4.4.1**. If a HMP mitigation bank is available, the PDP can pursue this option. The PDP can also pursue the in-stream restoration option (B2) identified in **Section 4.4.1**.

Figure 4-8 shows the two different approaches in a graphical form.

Figure 4-8: Hydromodification Controls: Large Development

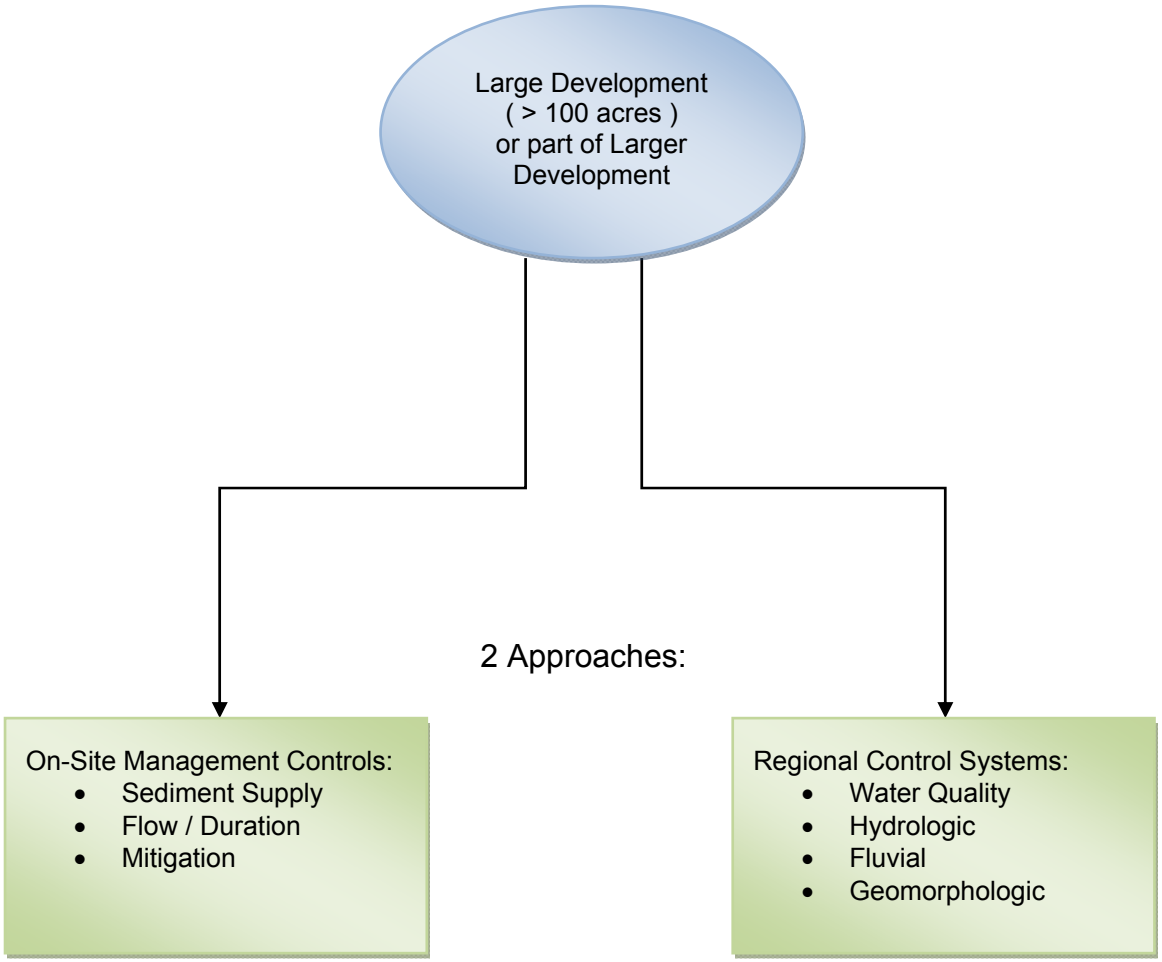

4.5.ii Tier 2 – Medium sized projects (between one acre and one hundred acres)

Tier 2 includes medium size development projects of area comprised between one acre and 100 acres, as well as re-development projects of one acre or more. The two boundaries define Tier 2. Tier 2 development or re-development projects will be subject to a large panel of spatial, environmental, financial, technical, and permitting constraints.

Hydrologic control measures and on-site management controls to ensure compliance with the HMP criteria are described in **Section 4.1**. Using this approach, mitigation of both flow and duration is achieved through on-site hydrologic control measures, and sediment loss is addressed through on-site management controls.

Alternatively, if on-site hydrologic control measures and management controls are not technically feasible due to site constraints, a technical study will be developed to demonstrate the infeasibility, per Step A in **Section 4.4.1**. Step B involves implementation of either an off-site mitigation project in the same hydrologic unit as the PDP or implementation of an in-stream restoration project in the receiving water that the PDP discharges to. Details of Step B are provided in **Section 4.4.1**. PDPs can pursue the HMP mitigation bank option, if available.

A flow chart indicating which HM criteria should be pursued and implemented for a Tier 2 project is shown in **Figure 4-9**.

Figure 4-9: Hydromodification Controls: Medium Development

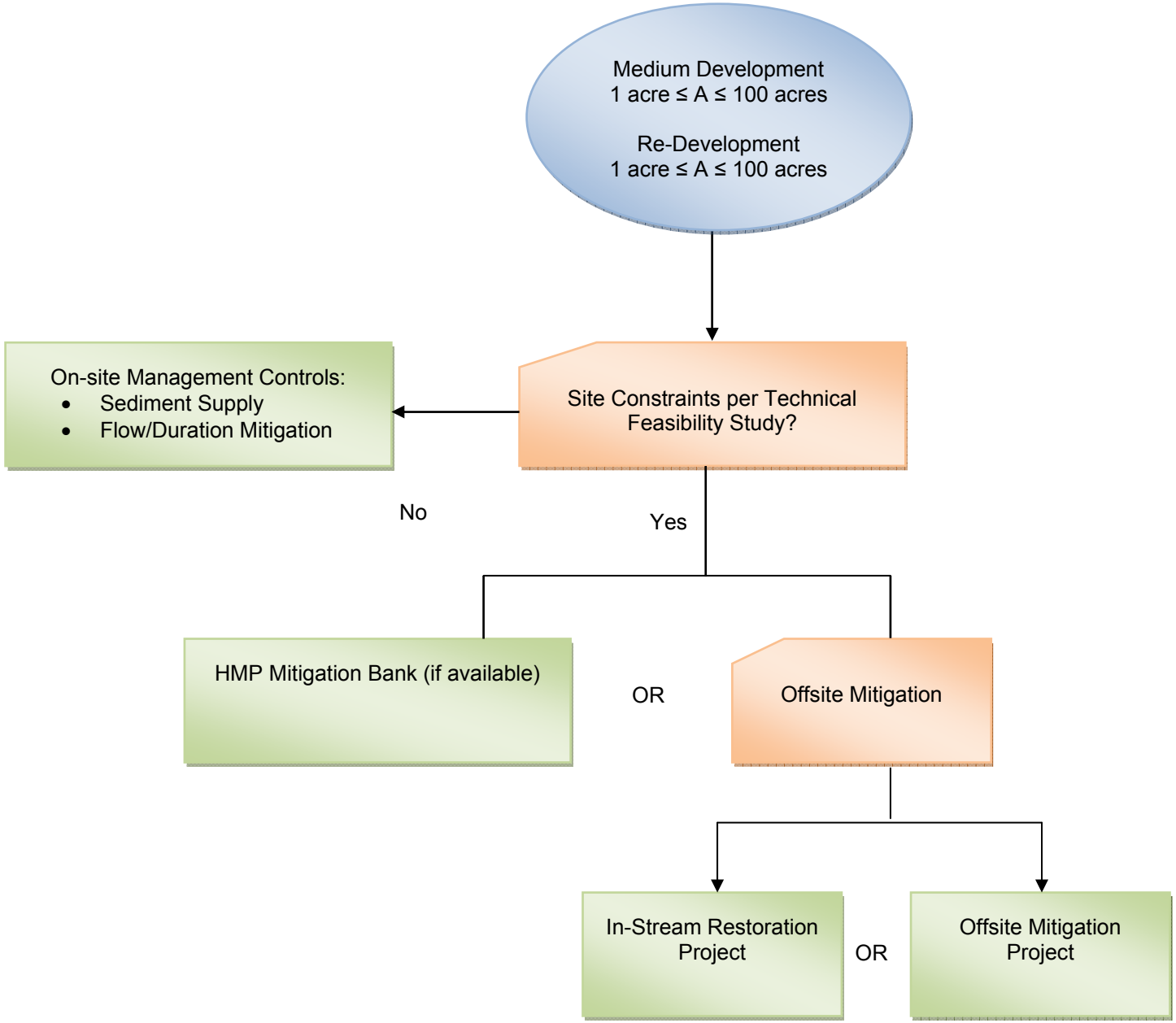

4.5.iii Tier 3 – Smaller-sized projects (less than one acre)

Tier 3 encompasses small-sized projects less than one acre but defined as a PDP. The tier may include the following projects, as characterized by permit Item F.1.d.(1) and Permit item F.1.d.(2):

- New development projects that are smaller than one acre that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site) including commercial, industrial, residential, mixed-use, and public projects. This category includes development projects on public or private land which fall under the planning and building authority of the Permittees.
- Projects on automotive repair shops that are smaller than one acre,. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.
- Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812), where the land area for development is greater than 5,000 square feet but lesser than one acre.
- All hillside development greater than 5,000 square feet but lesser than one acre. This category is defined as any development which creates 5,000 square feet of impervious surface which is located in an area with known erosive soil conditions, where the development will grade on any natural slope that is twenty-five percent or greater.
- All development lesser than one acre that are located within or directly adjacent to or discharging directly to an ESA (where discharges from the development or redevelopment will enter receiving waters within the ESA), which either creates 2,500 square feet of impervious surface on a proposed project site or increases the area of imperviousness of a proposed project site to 10 percent or more of its naturally occurring condition. "Directly adjacent" means situated within 200 feet of the ESA. "Discharging directly to" means outflow from a drainage conveyance system that is composed entirely of flows from the subject development or redevelopment site, and not commingled with flows from adjacent lands.
- Parking lots 5,000 square feet or more or with 15 or more parking spaces and potentially exposed to runoff. Only parking lots that are lesser than one acres are included into Tier 3. Parking lot is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce.
- Retail Gasoline Outlets (RGOs) This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day. RGO projects that are lesser than one acre are included into Tier 3.
- Those redevelopment projects lesser than one acre that create, add, or replace at least 5,000 square feet of impervious surfaces on an already developed site and the existing development and/or the redevelopment project falls under the project categories or locations listed in permit section F.1.d.(2). Where redevelopment results in an increase of less than fifty percent of the impervious surfaces of a previously existing development, and the existing development was not subject to Standard Stormwater Mitigation Plan (SSMP) requirements, the numeric sizing criteria discussed in permit section F.1.d.(6) applies only to the addition or replacement, and not to the entire development. Where

redevelopment results in an increase of more than fifty percent of the impervious surfaces of a previously existing development, the numeric sizing criteria applies to the entire development.

The majority of Tier 3 projects are completed within a very limited amount of space, making it unlikely the applicant will be able to implement on-site management controls. Two approaches are available.

- Implementing hydrologic control measures and on-site management controls within the project boundaries to ensure compliance with the HMP Criteria identified in **Section 4.1**. Using this approach, mitigation of both flow and duration is achieved through on-site hydrologic control measures, and sediment loss is addressed through on-site management controls.
- If on-site hydrologic control measures and management controls are not technically feasible due to site constraints, a simplified technical feasibility study shall be developed to explain why the HMP criteria cannot be met onsite. The simplified technical feasibility study must include:
    - the soil conditions of the PDP site;
    - a demonstration of the lack of available space for onsite controls; and
    - an explanation of prohibitive costs to implement onsite controls.
    - a written opinion from a California Registered Geotechnical Engineer, who will identify the infeasibility due to geotechnical concerns.
- Once the simplified technical feasibility study is accepted by the jurisdiction of the PDP, the PDP can pursue payment into the HMP mitigation bank, if one exists and is available to the PDP. If not, the PDP must pursue either an off-site mitigation project or an in-stream restoration project detailed in Step B in **Section 4.4.1**.

A flow chart indicating which HMP criteria should be considered for a Tier 3 project is shown in **Figure 4-10**.

Figure 4-10: Hydromodification Controls: Small-Size Projects

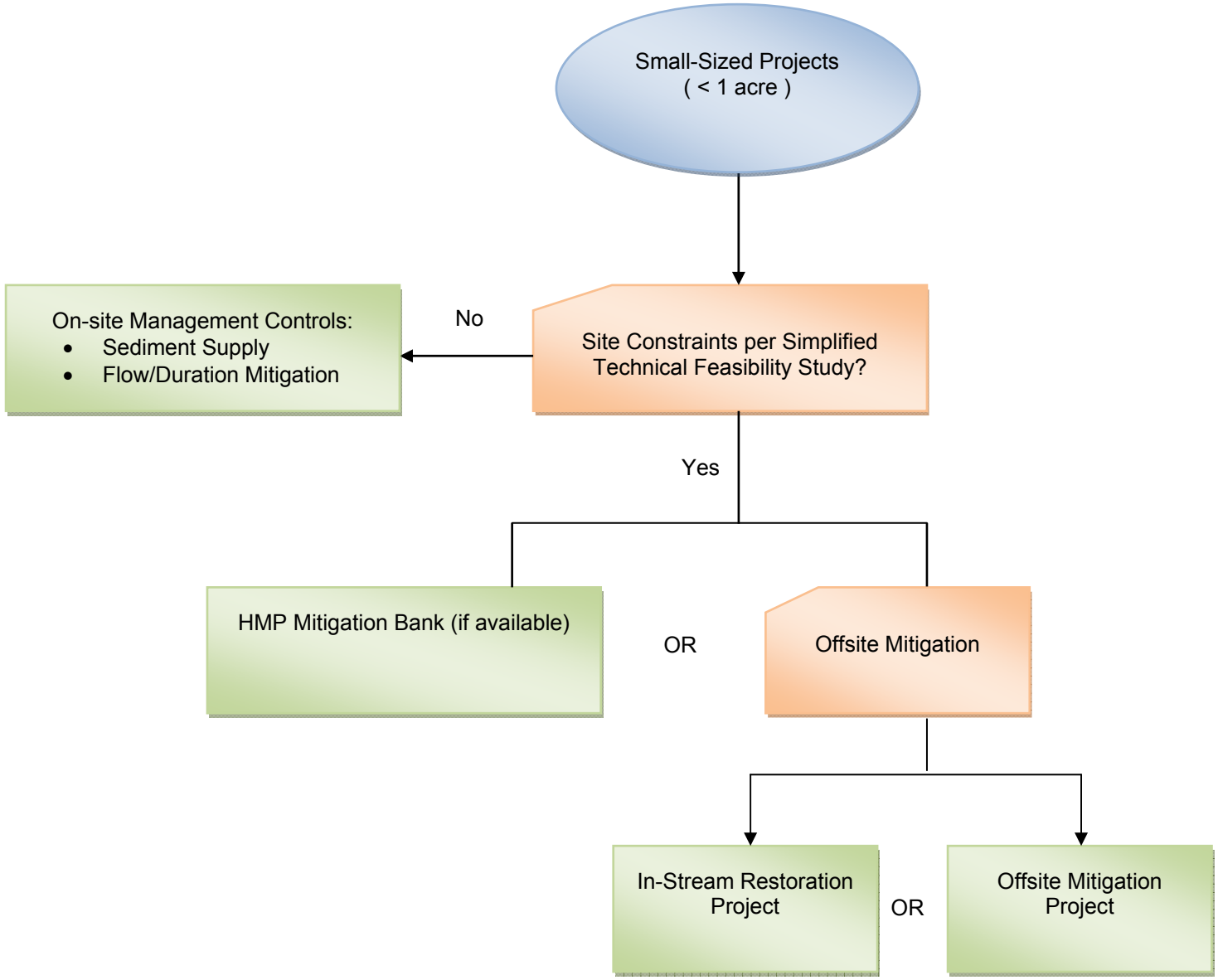

4.5.iv Tier 4 – Municipal Roadway Projects

Municipal roadway projects constitute a standalone tier based on their unique characteristics. Roadway projects are linear development or re-development projects to be completed within a limited right-of-way. Tier 4 includes the following roadway projects, as defined per Permit Items F.1.d.(1) and F.1.d.(2):

- Streets, roads, highways, and freeways. This category includes any paved surface that is 5,000 square feet or greater used for the transportation of automobiles, trucks, motorcycles, and other vehicles.
- Roadway redevelopment projects that create, add, or replace at least 5,000 square feet of impervious surfaces. Where a roadway redevelopment project results in an increase of less than 50% of the impervious surface within the limits of the project, and the existing development was not subject to SSMP requirements, the numeric sizing criteria discussed in permit section F.1.d.(6) applies only to the addition or replacement, and not to the entire development. Where the roadway redevelopment project results in an increase of more than 50% of the impervious surface within the limits of the project, the numeric sizing criteria applies to the entire project.

Routine roadway maintenance projects that maintain the original line and grade, hydraulic capacity, original purpose of the facility, or emergency roadway maintenance activities that are required to protect public health and safety are exempt from HMP requirements. The exemption is consistent with the requirements of the 2011 Model WQMP.
Roadway projects have the option to implement a green street approach to meet compliance with the HMP. The opportunity to develop a green street project will depend upon several factors, including but not limited to the ownership of the land adjacent to the right-of-way, the location of existing utilities, the course of the existing storm drain, and potential access opportunities. The PDP will take the following course of action for meeting the HMP Criteria for municipal roadway projects:

- The PDP will evaluate, to the maximum extent practicable (MEP), implementation of a "green streets" approach consistent with the 2008 U.S. EPA Green Streets Manual. If it is determined that due to site constraints implementation of a "green streets" approach for the municipal roadway project is infeasible, the PDP will complete a checklist identifying the constraints of why a "green streets" approach cannot be implemented. If a "green streets" approach is infeasible for the municipal roadway project, the PDP shall implement a "green street" project elsewhere in the same hydrologic unit. This alternative "green street" project shall mitigate an equivalent or greater tributary area than that of the proposed municipal roadway project.
- Alternatively, the PDP may pursue either an off-site mitigation project or an in-stream restoration project detailed in Step B in **Section 4.4.1**.
- The flow chart in **Figure 4-11** shows the four scenarios that shall apply to each proposed roadway project.

Figure 4-11: Hydromodification Controls: Roadway-Specific Projects

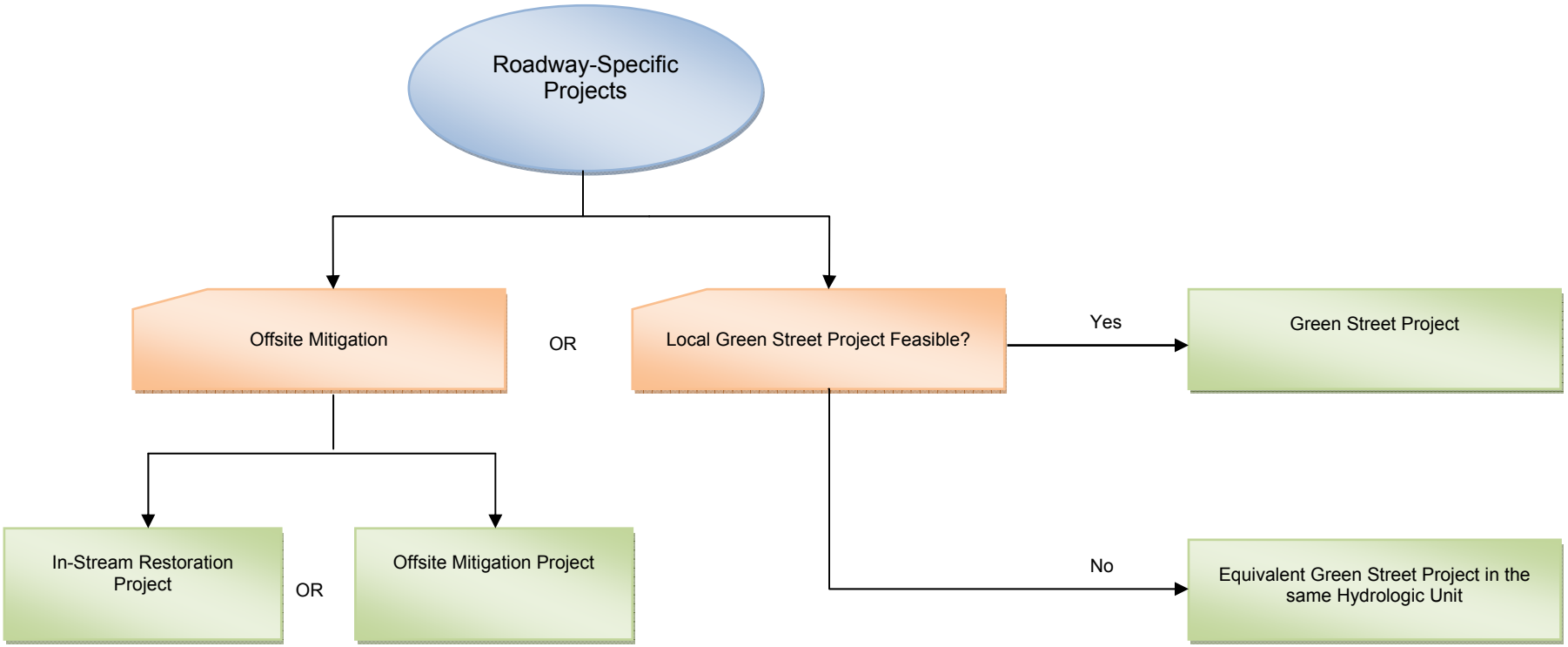

4.6 Hydrologic Management Measures

PDPs are encouraged to use the full suite of hydrologic management measures available to meet the HMP criteria identified in **Section 4.1**. The intent of the HMP is not to specify the types of hydrologic control measures that can be used but rather identify the criteria that must be met allowing flexibility for PDPs to use the full suite of management measures to meet the HMP criteria. Section 5 of the Technical Guidance Document provides information on hydromodification control design. Section 5.5 includes Hydromodification Control BMPs, which specifies the type of BMPs that can be used to meet hydromodification standards. The South Orange County Hydrology Model includes BMPs that can be used to meet the HMP criteria and has been developed as the primary tool to select and size the appropriate hydrologic site design and BMP controls to meet the HMP criteria. The model also incorporates buffer zones as a management measure for those PDPs adjacent to stream channels.

4.6.i Selection and Design of Hydrologic Management Measures

Selection and design of hydrologic management measures is an iterative process that can be facilitated using the South Orange County Hydrology Model (SOCHM). The SOCHM has a comprehensive menu of hydrologic site design measures and hydrologic management measures that can be selected for implementation for PDPs. The design parameters for these hydrologic measures have been incorporated into the model and can be modified to an extent based on site constraints.

4.6.ii Inspection and Maintenance of Hydrologic Management Measures

Maintenance for hydrologic control measures is critical to ensure there optimal operation. PDPs are conditioned to provide verification of inspections and maintenance operations as defined in Section 7.II-4.0 of the approved 2011 Model WQMP. The list of such inspections and maintenance operations shall be included in the WQMP submitted by the applicant. Maintenance activities shall ensure that the systems are properly controlling flow rates and durations to ensure the HMP criteria is being met and inspections shall document the maintenance activities performed and that the hydrologic control measure is functioning properly

5.0 Hydromodification Sediment and Bioassessment Standards

5.1 Sediment Supply Management

Sediment supply plays a role in the stability of alluvial stream channels. A change in coarse (bed material) sediment supply will cause instability in the channel manifested through general scour or aggradation. Lateral bank migration may also result from changes in sediment supply as the channel slope increases or decreases.

The delivery of bed material during construction may increase as land surface is cleared and the potential for erosion is increased. Once the land surface is urbanized, runoff may be discharged through closed conduits and lined channels. The potential for bed material transport may be reduced as compared to the pre-development condition. The purpose of this portion of the HMP is to maintain the pre-development delivery of bed material to receiving streams following urbanization. Bed material is defined as the sediment that comprises the bed and banks of the receiving stream. Bed material load is the material transported by the stream during runoff events. It is comprised partly of the bed load (material that moves along the bed by sliding or saltating) and partly of the suspended load, including particle size fractions in the channel bed sediments. Bed material load is a primary variable controlling stream channel morphology. Wash load is the portion of the total sediment load carried continuously in suspension by the flow, and generally consists of the finest particles. Changes in wash load are not likely to significantly affect the channel stability, and reductions in wash load are generally assumed to improve habitat function.

The resiliency of receiving channels to forestall changes in the watershed due to urbanization varies with the magnitude of the change and characteristics of the channel (bed and bank material, vegetation, channel cross section and slope). It is difficult to quantitatively predict the response in a receiving channel to changes in the fundamental variables described by Lane (1955) of discharge, bed material grain size, channel slope and sediment supply. Accordingly, the most effective approach to ensuring channel stability may be to avoid changes in the fundamental variables (Lane's relationship) during urbanization through the implementation of stream channel management guidelines. In the case of bed material sediment supply, this will be accomplished by avoiding development in areas that are a significant contributor of bed material load to the receiving channel.

The general approach to ensure maintenance of the pre-project sediment supply is a three-step process:

1. Determine whether the site is a significant source of bed material to the receiving stream.
2. Avoid significant bed material supply areas in the site design.
3. Replace significant bed material supply areas that are eliminated through urbanization.

In the event of a projected reduction in sediment supply, the project proponent shall investigate the feasibility of sediment management measures, including rerouting drainage pathways through coarse bed sediments onsite, otherwise maintaining pre-project bed material discharge from the site, or providing additional mitigation in site runoff. Specific guidance on sediment management measures will be provided in the Model WQMP for South Orange County.

An alternative compliance option allows the project applicant to model the site conditions and the receiving stream and provide additional mitigation in site runoff to compensate for the reduction (or addition) of bed material. An erosion potential management objective must comply with the HMP performance standard as defined in Section 4.1. This option may only be used if the general approach outlined above is deemed infeasible by the permitting authority, or if the project site design requires significant alteration of on-site streams.

5.1.i Methodology

The project applicant must determine the location of the downstream alluvial receiving water that may be impacted by the project. Only the first downstream conveyance that is unlined (invert, side slopes or both) will be considered and will serve as the "assessment" or "receiving" stream for the project. The following methodology will be used to ensure that the project does not adversely impact bed material load to the assessment stream.

Step 1

A triad approach will be completed to determine whether the site is a significant source of bed material to the receiving stream and includes the following components:

1. Site soil assessment, including an analysis and comparison of the bed material in the receiving stream and the onsite streams;
2. Determination of the capability of the onsite streams to deliver the site bed material (if present) to the receiving stream; and
3. Present and potential future condition of the receiving stream.

A geotechnical and sieve analysis is the first piece of information to be used in a triad approach to determine if the site is a significant source of bed material load to the assessment stream. An investigation shall be completed of the assessment stream to complete a sieve analysis of the bed material. Two samples shall be taken of the assessment stream using the "reach" approach (TS13A, 2007). Samples in each of the two locations should be taken using the surface and subsurface bulk sample technique (TS13A, 2007) for a total of four samples.

A similar sampling assessment should be conducted on the project site. First-order and greater streams that will be impacted by the project (drainage area changed, stabilized, lined or replaced with underground conduits) will be analyzed in each subwatershed. One stream per subwatershed that will be impacted on the site must be assessed. A subwatershed is defined as tributary to a single discharge point at the project property boundary.

The sieve analysis should report the coarsest 90 percent (by weight) of the material for comparison between the site and the assessment stream. The Professional Engineer shall render an opinion if the material found on the site is of similar gradation to the material found in the receiving stream. The opinion will be based on the following information:

- Sieve analysis results
- Soil erodibility (K) factor
- Topographic relief of the project area
- Lithology of the soils on the project site

The Professional Engineer shall rate the site as having either a high, medium or low probability of supplying bed material load to the receiving stream. This site soil assessment serves as the first piece of information for the triad approach.

The second piece of information is to qualitatively assess the sediment delivery potential of the site streams to deliver the bed material load to the receiving stream, or the bed material sediment delivery potential or ratio. There is no documented procedure to estimate the sediment delivery ratio; it is affected by a number of factors, including the sediment source, proximity to the receiving stream, on-site channel density, project watershed area, slope, length, land use and land cover, and rainfall intensity. The Engineer will qualitatively assess the bed material sediment delivery potential and rate the potential as high, medium or low potential.
The final piece of information is the present and potential future condition of the receiving stream. The Engineer shall assess the receiving stream for the following:

- Bank stability. Receiving streams with unstable banks may be more sensitive to changes in bed material load.
- Degree of incision. Receiving streams with moderate to high incision may be more sensitive to changes in bed material load.
- Bed material gradation. Receiving streams with more coarse bed material (such as gravel) are better able to buffer change in bed material load as compared to beds with finer gradation of bed material (sand).
- Transport vs. supply limited streams. Receiving streams that are transport limited may be better able to buffer changes in bed material load as compared to streams that are supply limited.

The Engineer will qualitatively assess the receiving stream using the gathered observations and rate the potential for adverse response based on a change in bed material load as high, medium or low.
The Engineer shall use a triad assessment approach, weighting each of the components based on professional judgment to determine if the project site provides a significant source of bed material load to the receiving stream, and the impact the project would have on the receiving stream. The final assessment and recommendation shall be documented in the HMP portion of the WQTR.

The recommendation may be any of the following:

- Site a significant source of sediment bed material – all on-site streams must be preserved.
- Site a source of sediment bed material – some of the on-site streams must be preserved (with identified streams noted).
- Site is not a significant source of sediment bed material.

The final recommendation will be guided by the triad assessment. Projects with predominantly "high" values for each of the three assessment areas would indicate preservation of on-site streams. Sites with predominantly "medium" values may warrant preservation of some of the on-site streams, and sites with generally "low" values would not require site design considerations for bed material.

The Engineer shall also assess if the receiving stream has been altered either for alignment, cross section, or longitudinal grade, or has degraded to the extent that an in-stream restoration project would be required to restore the functions and values of the stream bed. In such cases, the Engineer should discuss options for participating in an in-stream project in lieu of on-site design features to preserve bed material load.

Provision for waiver of sediment assessment. If any of the following are present, the site shall not be required to consider sediment component as a part of the HMP mitigation.

1. The site was previously developed and is being redeveloped.
2. There was no stormwater discharge from the site to a receiving water for the range of flows associated with the HMP.
3. The site discharges directly to a bay, estuary, reservoir, lake or the ocean, or through engineered channels to any of these receiving waters.

Step 2

If the analysis in Step 1 indicates that some or all of the site stream courses must be preserved as a contributor of bed material load to the receiving stream, the site plan shall be developed to avoid impacting the identified streams. The Engineer will designate streams onsite that should be avoided to preserve the discharge of bed material load from the site. The Engineer may consider the factors discussed above when determining whether a specific on-site stream course is a significant contributor of bed material load and should be preserved.

Step 3

If it is infeasible to avoid on-site streams that contribute significant bed material load in the design of the site plan, the drainage(s) may be moved and replicated elsewhere on the site, provided the Engineer will certify that the relocated drainage course has a similar potential to generate bed material load. The Professional Engineer will also certify that the revised drainage location is in substantially similar material as the natural stream location.

5.1.ii Alternative Compliance Methodology

The alternative compliance program may only be pursued if the significant replacement of bed material supply is deemed infeasible by the permitting authority, or if the project site design requires significant alteration of on-site streams. The infeasibility of the different sediment management measures stated in the general approach may only be demonstrated and documented by a Professional Engineer. The Professional Engineer may also demonstrate the expected feasibility of the alternative compliance methodology.

In such an eventuality, applicants may propose an alternative compliance methodology for bed material load mitigation from a project based on numerical modeling. The Engineer may propose adjusting the flow duration curve to maintain pre-project conditions in the receiving channel with the expected change in bed material load discharge from the site. This option may not be practical when the changes in bed material supply from the project are relatively small, due to limitations in the accuracy of modeling. The Engineer shall determine, using best professional judgment, if the alternative modeling approach is applicable.

The alternative modeling approach shall include the following:

1. Continuous hydrologic simulation for the project baseline condition and proposed condition over the range of flow values up to the pre-project 10-year event.
2. Sediment transport model of the receiving stream for the project baseline condition and proposed condition.
3. Analysis of the change in sediment bed material from the project baseline condition to the proposed condition
4. Explanation of method used to control the discharge from the project to account for changes in the delivered sediment bed material.
5. Summary report

An erosion potential (Ep) management objective will serve as the alternative performance standard for this option. As described in the modeling approach, hydromodification management measures will be selected and designed to maintain the Ep ratio within 10 percent of the target value in the receiving waters. The target Ep will be adjusted to account for changes in bed sediment supply. Studies have demonstrated that achieving an optimum capacity-supply ratio within 10 percent of the unity should ensure the dynamic stability of a stream while allowing the river to recover of some of the morphological detail that cannot be designed a-priori (USACE, 2001).

Site specific modeling is discussed further in **Appendix D**.

5.2 Bioassessment

5.2.i Historical hydromodification impacts and IBI scoring

Permit Section F.1.h.(1)(f) requires the identification of areas within the San Juan hydrologic unit where historical hydromodification has resulted in negative impacts to benthic macroinvertebrate communities. This section of the HMP was developed to address permit Section F.1.h.(1)(f). The upper part of the San Juan hydrologic unit (HU 901) is located in Orange County. A Surface Water Ambient Monitoring Program (SWAMP) was prepared in July 2007 for this portion of the hydrologic unit by the Southern California Coastal Water Research Project (SCCWRP, 2007). Findings of the 2007 SWAMP report indirectly identify such areas that are associated with the negative impact to benthic macroinvertebrate and benthic periphyton. These areas are characterized by low (poor) or very low (very poor) Index of Biotic Integrity (IBI) scores. This reporting effort was completed under the supervision of the SDRWQCB. SWAMP monitoring efforts are conducted every five years.

The bioassessment analysis included monitoring data from the following historical monitoring programs:

- California Department of Fish and Game (1998-2000)
- Orange County NPDES (2002-2006)
- Camp Pendleton (2004-2005)

The Southern California IBI is computed as a composite of seven metrics summed and scaled from 0 to 100, as follows:

- 0–19 (very poor condition)
- 20–39 (poor condition)
- 40–59 (fair condition)
- 60–79 (good condition)
- 80–100 (very good condition)

Seventeen monitoring stations are located within the Orange County boundaries. **Figure 5-1** shows the location of these stations, as well as their associated IBI scoring category. Associated IBI scores were derived from the statistical analysis of monitoring data that was collected over several seasons (winter, spring, summer, and fall) and different hydrologic conditions.

The SWAMP study considers three monitoring locations as unimpacted by anthropogenic development in the hydrologic unit. They are characterized as reference monitoring locations. The three reference stations and their associated IBI scores are

- Bell Creek (64)
- Cold Spring Creek (34)
- Arroyo Trabuco Creek (68)

Figure 5-1: IBI Scoring within the San Juan Hydrologic Unit

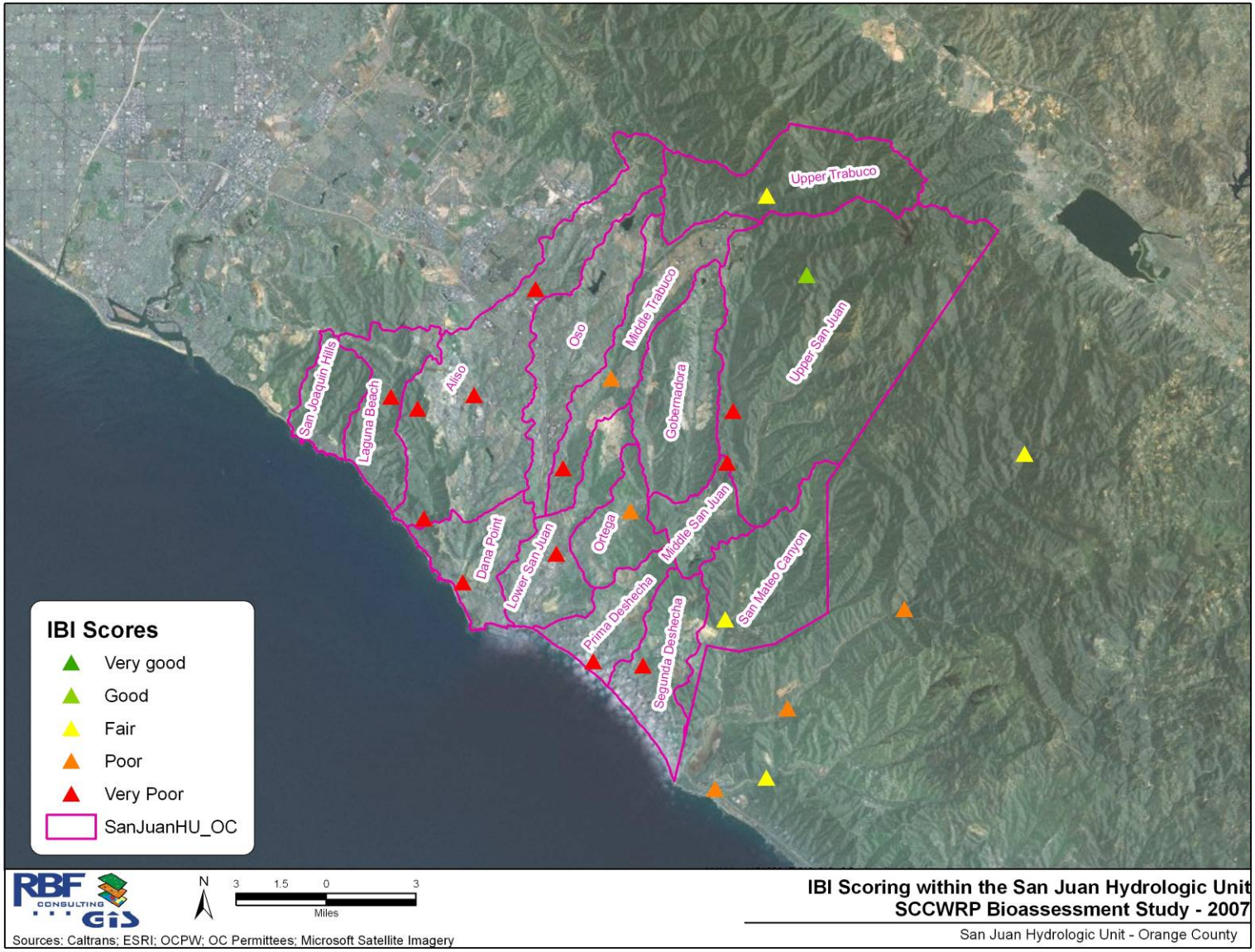

Overall, benthic macroinvertebrate communities may have been impacted by hydromodification in several coastal and foothill subwatersheds that exhibit very poor IBI scores. These include the following subwatersheds: Laguna Beach, Aliso Creek, Dana Point, Lower San Juan, Prima Deshecha, Segunda Deshecha, Middle San Juan subwatersheds, as well as the lower portion of the Middle Trabuco subwatershed. Similarly, benthic macroinvertebrate communities may have been impacted to a lesser level in the Middle Trabuco and Ortega subwatersheds. One of the reference monitoring stations, Cold Creek, exhibits poor IBI scores. Conversely, benthic macroinvertebrate communities of the following subwatersheds may have been not impacted by hydromodification: San Mateo Canyon, Upper Trabuco, and Upper San Juan. Developments in these subwatersheds are limited.

No monitoring stations are available in the Gobernadora, Oso, and San Joaquin Hills subwatersheds. Impacts of hydromodification on IBI scores were not extrapolated to these subwatersheds because of the geographic variability of environmental conditions.

5.2.ii Assessment of watercourses

Hydromodification impacts from development projects and/or maintenance activities may have led to the impairment of state and federal waters and wetlands. U.S. EPA reports three major types of hydromodification activities: channelization and channel modification, dams, and streambank and shoreline erosion (U.S. EPA, 2007). Studies suggest a link between the value of physical habitat/structure and IBI values. Waterbodies that are impacted by hydromodification may have lower IBI scores due to direct and indirect impacts of upstream development.

Accelerated impacts occur to natural or earthen drainages from projects that increase in runoff flow rates and duration. Such impacts to aquatic species may include changes in flow, increased sedimentation, higher water temperatures, lower dissolved oxygen, degradation of biotic structure and decreased water quality (U.S. EPA 2007). Once these environmental stressors are present, subsequent direct and indirect impacts occur, especially to aquatic life. For example, increased sediment loading can decrease fish spawning and reduce macro-invertebrate communities. Hydromodification generally increases the transport of sediment and associated constituents (nitrates, sulfates, metals, turbidity), which impacts water quality to the point where aquatic life thresholds may be exceeded (SCCWRP 2007). Studies suggest a link between the value of physical habitat/structure and IBI values. Waterbodies that are impacted by hydromodification would be expected to have lower IBI scores from direct and indirect impacts of upstream development. It should be noted, however, that low IBI scores may be caused by natural variability.

The second aspect to consider is the reduction of wash load, which is generally viewed as favorable to benthic health. “Natural” discharge of course material (bed material) is beneficial, but colloidal material, clay, and silt are unfavorable. Stabilization of the watershed, particularly of areas generating turbidity in runoff, is the goal. The reduction of wash load during construction activities may be accomplished with the implementation of the requirements of the Construction General Permit.

The impacts of potential hydrograph changes will be assessed through the SWAMP monitoring program, as presented in **Section 6**. In addition, records of channel morphology will be taken at selected monitoring locations.

6.0 HMP and Bioassessment Monitoring & Effectiveness

The following section defines the monitoring approach and the performance protocol that will be implemented to verify the effectiveness of the South Orange County HMP. The section presents technical concepts and defines approaches to monitor the effectiveness of the HMP as required by provisions F.1.h. (1)(g) and F.1.h. (1)(l) of Regional Board Order No. R9-2009-0002. Section F.1.h.(1)(g) requires the definition of a protocol to evaluate the potential hydrograph change impacts to downstream watercourses from PDPs. The protocol must include the use of IBI scores. Section F.1.h.(1)(l) also requires a description of pre- and post- project monitoring and other program evaluation, including IBI score, to assess the effectiveness of the HMP. The defined performance protocol addresses the requirements of provisions F.1.h.(1)(k), including a description of inspections and maintenance of hydrologic controls and sediment supply management measures, as well as a protocol to address potential hydromodification impacts.

The hydrologic and sediment performance standards established by this HMP are based on the most recent state of the hydromodification management science (SCCWRP, 2012). The level of uncertainty associated with the variables influencing the geomorphology and the biological integrity of receiving streams may only be reduced through monitoring. The implementation of the hydromodification monitoring approach along with the performance protocol will operate on the basis of adaptive management principles. The frequency and geographical distribution of the proposed monitoring actions is optimally selected upon identification of the scientifically-observed seasonal and geographical patterns of hydromodification and in-stream biological activity. The findings of the monitoring plan will trigger refinements improving the hydrologic and sediment performance standards, to ensure that the geomorphology and the biological integrity of receiving streams are protected or enhanced.

6.1 Technical Concepts

6.1.i HMP Monitoring Measures

Stream Benthic Community

A stream benthic community is a metric for assessing the condition of a stream. Biological communities represent the health of a portion of the benthic stream community. This is explained by the fact that biological organisms, especially benthic macroinvertebrate and periphyton communities, integrate exposure over time and respond to cumulative stressors (SCCWRP, 2011). The IBI integrates several populations of organisms, and as such the combination of organisms offers a differential sensitivity to stressors, allowing for early detection of potential degradation (SCCWRP, 2011). Bioassessment may only be conducted from May to July and only if water is present; however, samples that are collected late spring may provide the most representative results, as vegetation cover and flow conditions are usually optimal. This is particularly true for non-perennial streams of the San Juan Hydrologic Unit. Seasonal variability in benthic communities is typical for non-perennial streams; however, the current IBI has almost exclusively been calibrated for perennial streams (SCCWRP, 2011). SCCWRP is in the process of developing a Benthic Macroinvertebrate Index (BMI) that would account for the typical seasonal variability of non-perennial streams.

Channel incision and widening

The most obvious way to assess changes due to scour or deposition is to physically measure the pre-project and post-project cross sections, and determine if the channel is incising and/or widening over time. This is accomplished by conducting geomorphic assessments and channel surveys downstream of a planned development before and after construction. In addition to physical measurements, comparison of current and historical photos, aerial photography, and site inspection for signs of channel degradation can provide important supporting evidence.

6.1.ii Temporal and Spatial Variability of Monitoring Locations

Temporal variability

The single most important factor affecting the temporal variability inherent to measuring stream degradation is variable inter-annual rainfall frequency and intensity. Droughts in California can last years, with little to no rainfall occurring in Southern California. During El Niño years, anomalously high storm frequencies and intensities can result in sudden geomorphic changes. Rainfall intensity also varies intra-annually. Accordingly, the value of the monitoring program will be derived only over the long-term. Significant trends will likely require many years to identify. IBI scores may be a correlating variable to geomorphic changes in streams.. However, the method used to compute the index is specifically for perennial streams, and does not account for the typical seasonal variability associated with non-perennial streams, as it exists in the San Juan Hydrologic Unit.

Spatial variability

Sampling a representative set of streams is important to capture the range of watershed conditions and biological organisms present in the permit coverage area. Other important factors that affect stream responses to hydromodification include channel grade, watershed area, vegetated cover, and stream sinuosity. In addition to channel and watershed features, location within the watershed is an important consideration. Monitoring stations should be located in the watershed headwaters just downstream of a development project of sufficient size, so that hydromodification effects from the proposed development can be isolated for comparison purposes to the maximum extent practicable. Upper watershed sites provide more definitive measures of HMP effectiveness because they can more directly correlate effects to specific development projects.

Middle watershed and lower watershed sites would be influenced by confounding variables (such as mass wasting and impacts from natural tributary confluences and other existing development projects), including phased developments over many years, in the watershed. Therefore, middle and lower watershed monitoring sites would require much more time to assess overall program effectiveness, if achievable.
The concept of providing hydromodification effectiveness measurements in the watershed headwaters is supported by SCCWRP. Research by SCCWRP has shown that hydromodification effects of a development project become muted with increasing distance from the development site (defined by SCCWRP as the Domain of Effect). To the extent practicable, monitoring locations detailed in this plan will be distributed throughout the San

Juan Hydrologic Unit to provide for geographic and climatic variability across south Orange County.

6.2 Approaches Selected to Assess HMP Effectiveness

The HMP Effectiveness Plan extends for a period of five years. However, interim data may be provided to the Regional Board on an annual basis. A period of five years is necessary to implement the monitoring stations, analyze the data, and account for spatial and temporal variability of the conditions in South Orange County.
An examination of benthic macroinvertebrate organisms will be conducted to assess both biological and geomorphologic health of the streams. Additionally, channel assessment cross sections at selected locations, coincident with the IBI sampling locations, will be selected. South Orange County Permittees seek cost-effective methods to implement the HMP Effectiveness Plan. Stream bioassessment for the purpose of HMP effectiveness should be coupled with the Urban Stream Bioassessment and be reported annually in the Orange County Unified Program Effectiveness Assessment (PEA) (OCDP, 2010). Several bioassessment monitoring sites already exist for both the SWAMP, which is developed on a five-year cycle, and the annual PEA. At each of these existing sites, historical bioassessment data is readily available for the establishment of pre-project conditions. Several reference monitoring sites are also readily available including, but not limited to, three urban bioassessment sites. The ultimate selection of bioassessment sites should consider integrating one or several of these existing sites if consistent with the objectives of the HMP Effectiveness Plan.

Considering the constraints and technical approach detailed above, the following approaches are recommended for HMP monitoring.

Evaluate the HMP effectiveness by monitoring benthic macroinvertebrate communities. Biological organisms provide essential information to the overall health of a stream. The evolution of benthic macroinvertebrate communities may be the precursor to an impacted or improved stream. Benthic communities should be monitored once a year, preferably in late spring, at defined monitoring stations. Bioassessment should be done by computing the IBI score and comparing it to historical levels in the same stream. Ultimately, the Benthic Macroinvertebrate Index (BMI) could be used once it has been developed by SCCWRP, however at this time there is no estimated date as far as completion.

Complete a stream channel survey at each of the selected channel sections on an annual basis. The stream channel survey consists of collecting topographic and bathymetric measurements along each cross-section to characterize morphology and longitudinal slope of the stream segment. Four parameters will be surveyed: the floodprone width, the bankfull width, the bankfull depth, and the longitudinal slope. Each surveyed stream segment will be subsequently classified per the simplified Rosgen system of channel classification (Rosgen, 1996). **Figure 4-13** shows the different types of channels per Rosgen channel classification (Rosgen, 1996).

Figure 6-1: Simplified Rosgen Channel Classification

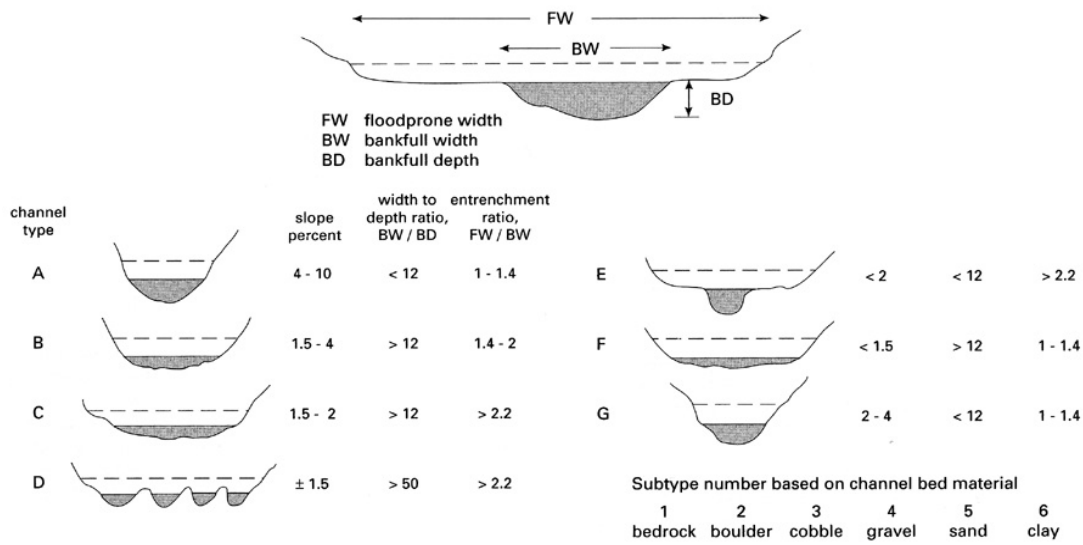

Figure 1.12 The Rosgen system of channel classification.

(Rosgen, 1996)

The temporal evolution in geomorphology, if any, of the surveyed stream segment will be compared to the six-stage Channel Evolution Model defined by Simon, as well as the previous year cross section data, to correlate any potential impacts of urbanization to this change of stream channel geomorphology (Simon et al., 1992). The geomorphologic evolution of a stream segment, if any, will also be compared to the annual bioassessment to determine if the observed aggradation or degradation is associated with changes in the benthic macroinvertebrate communities. **Figure 6-2** illustrates the six-stage sequence of incised channel evolution (Simon et al., 1992). A stream segment will be considered stable over time if features of the stream segment (such as dimension, pattern, and profile) are maintained, and the stream system neither aggrades nor degrades. The channel classification procedure is described in more detail in **Appendix B**.

Figure 6-2: Six-Stage Channel Evolution Model

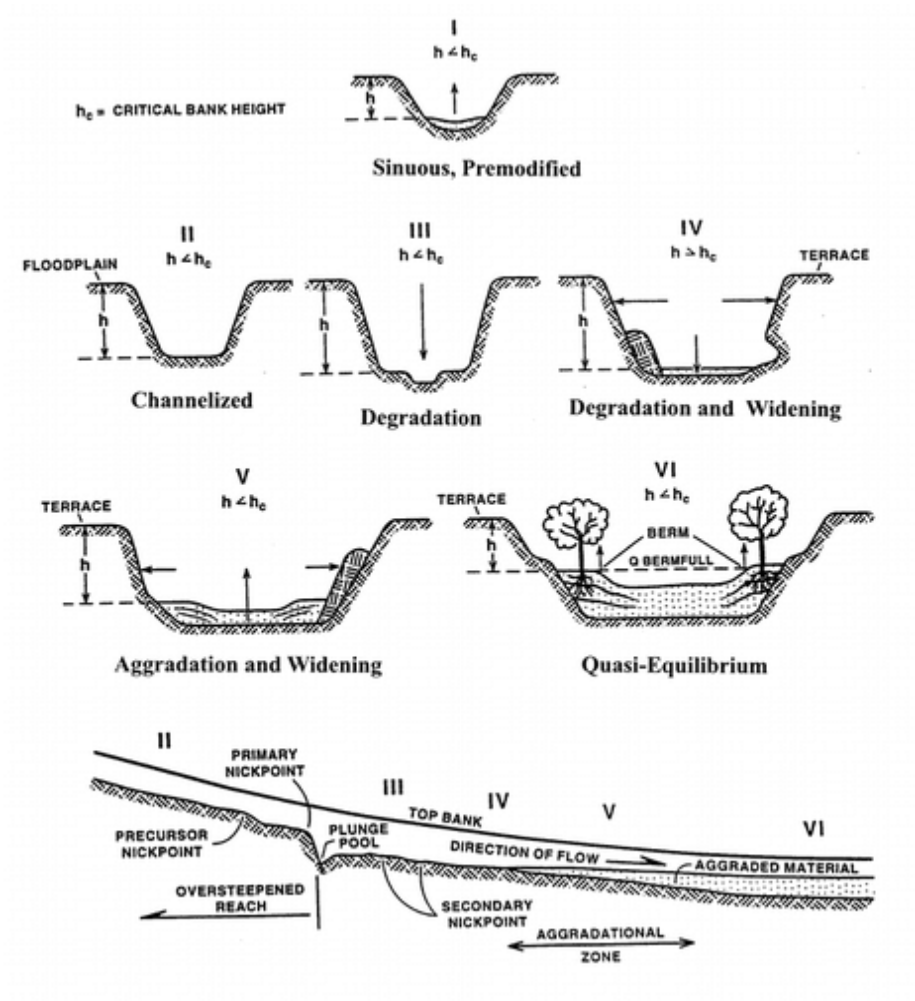

(Simon et al, 1992)

Monitoring in the upper watershed

Upper watershed monitoring (channel surveys) is recommended to eliminate confounding lower watershed variables that would skew the analysis and minimize the potential for reaching meaningful conclusions.

Monitor three representative locations and one reference station

Providing three geographically representative stations would be sufficient to account for spatial and temporal variability of the conditions present in South Orange County. The reference monitoring station would be located in a watershed for which no upstream development (existing or future) is anticipated, preferably where historical bioassessment has been carried out. Data from the reference stations can be used to supplement pre-project condition data obtained at the representative monitoring sites, since the amount of pre-project condition data that can be obtained at such sites is dependent on the land development process. Providing

three representative stations balances the need to characterize spatial variability against the cost of monitoring.

6.3 HMP Effectiveness Evaluation

The effectiveness of the HMP is to be evaluated into two main axes:

- BMP inspections and maintenance
- Performance protocol

6.3.i BMP Inspections and Maintenance

One key component of the implementation of the HMP is to ensure hydrologic controls and sediment supply management measures perform effectively. PDPs are conditioned to verify inspections and maintenance operations as defined in Section 7.II-4.0 of the approved 2011 Model WQMP. The list of such inspections and maintenance operations shall be included in the WQMP submitted by the applicant. Maintenance activities shall ensure that the systems are properly controlling flow rates and durations to meet the requirements defined in the permit Item F.1.h.(1)(k).

6.3.ii Performance Protocol

As defined in **Section 6.2**, channel section surveys and IBI scores are to be monitored on a regular basis at representative locations in the San Juan Hydrologic Unit. If a significant degradation of a stream segment has been detected, a hydrologic analysis shall be performed. A significant degradation of the stream segment will be subjectively interpreted by the analyst as a sudden decline in the IBI, or a rapid change of the morphology of the channel (cross-section). A drastic change in IBI scores may indicate that flow conditions have consequently changed. A significant improvement of the IBI scores may validate the approach taken in this HMP.

The hydrologic analysis, if required, shall determine if the significant degradation of the stream segment is associated to geomorphically significant flows (10% of the 2-year storm event to the 10-year storm event). A significant difference between the expected and the observed flow duration curves for the identified flow range would automatically trigger a performance protocol. The objective of the performance protocol is to correct any performance deficiencies in the existing hydrologic controls and sediment supply management measures. If the stream degradation was caused by flows outside the critical range (a relatively rare storm event), the extensive hydrologic analysis may terminate and no further investigation is needed.

The performance protocol consists of investigating the tributary area of the impacted stream segment to identify the potential source(s). Hydrologic controls and sediment supply management measures of one or several PDPs will be examined to determine if they are under-performing due to a lack of maintenance or poor design. In this case, the lack of performance may appear to be directly responsible for the drastic change in stream conditions (IBI score, morphology). Rehabilitation of the stream segment may be required. It is expected that initial conclusions regarding the effectiveness of the HMP will be drawn after a minimum of five years of observations.

6.4 Summary and Conclusions

The HMP Effectiveness Plan, scheduled for initial implementation over a five-year period, will include the following specific activities:

Baseline Monitoring Plan Requirements:

- Development of QAPP (to be provided to Regional Board staff for review and comment)
- Bioassessment monitoring station analysis and installation
- Annual data analysis (2013–2017)
- Mid-term evaluation of the HMP Effectiveness after review of initial findings (interim report to be submitted in 2015)
- Report preparation (final report to be prepared in 2017)

Monitoring stations:

- Four monitoring locations – three representative stations monitoring exclusively areas in development located in the upper part of the San Juan Hydrologic Unit, and one reference station.
- Bioassessment conducted once a year

Bioassessment

- Annual sampling, preferably during spring season – similar to annual PEA and SWAMP (2012–2017)

Channel Assessments:

- Initial geomorphic assessment at each monitoring location (2012-2013)
- Baseline cross section surveys at each monitoring location (2012-2013)
- Annual geomorphic assessments and cross-section survey at each monitoring location to assess channel condition and response (2013–2017)

Cross-section surveys consist of recording, on an annual basis, the vertical elevations of all significant geomorphic features (bankfull, bank top, bank toe, bar tops, edge of water, thalweg, bank failure, and others) and of all changes in slope breaks at the monumented cross-sections. Annual geomorphic assessments consist of characterizing, on an annual basis, the rate of change, if any, of bed material encountered, vegetation, and bed and bank lateral and longitudinal profiles that are derived from cross-section surveys. The geomorphic survey will also be coupled with monitoring data from the bioassessment stations to ensure that the HMP is effective in protecting the geomorphic and biological integrity of receiving streams.

7.0 HMP and Model WQMP Integration

Within 90 days after a finding of adequacy from the San Diego Regional Water Quality Control Board Executive Officer the Final South Orange County HMP requirements will be incorporated into the Model Water Quality Management Plan (Model WQMP) and the Technical Guidance Document (TGD). The HMP requirements including the HMP criteria, alternative compliance options and steps, tiered requirements, and the sediment supply management methodology and steps will be incorporated into the Section 7II-2.4.2.2 Determine Hydromodification Performance Criteria under the South County Requirements. The HMP alternative compliance and the alternative compliance for sediment supply management will also be integrated into the Section 7.II-3.0 Alternative Compliance Approaches.

Guidance regarding the hydromodification technical feasibility study will be integrated with the LID feasibility analysis as part of the TGD. This guidance will identify that the criteria for hydromodification and LID requirements are different, however the feasibility analysis for both hydromodification and LID are to be integrated into one feasibility study for the project and submitted with the Preliminary WQMP. Section 5.4, "System Design to Address HCOCs" in South Orange County of the TGD will be updated to include the requirements of the HMP. The Permittees will use the revised Model WQMP and TGD with the HMP requirements to incorporate requirements into the local approval processes via their local WQMPs and municipal ordinances. This will also be completed within 90 days after receiving a finding of adequacy from the San Diego Regional Water Quality Control Board Executive Officer.

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APPENDIX A
HSPF Pervious Land Parameters

Pervious Land Hydrology (PWATER) Parameters

The HSPF hydrology parameters of PWATER are divided into four sections, titled PARM1-4. PARM1 is a series of checks to outline any monthly variability versus constant parameter values within the simulated algorithm; whereas, PARM2 and 3 are a series of climate, geology, topography, and vegetation parameters that require numerical values to be input.

PARM2 involves the basic geometry of the overland flow, the impact of groundwater recession, potential snow impact due to forest cover and the expected infiltration and soil moisture storage. The main parameters of groundwater recession are KVARY and AGWRC. The infiltration and soil moisture storage parameters are INFILT and LZSN.

PARM3 involves the impact of climate temperature during active snow conditions, a wide range of evaporation parameters due to the variability of the onsite soil and existing vegetation and subsurface losses due to groundwater recharge or the existing geology. The main evaporation parameters are INFEXP, INFILD, BASETP, and AGWETP. The parameter for subsurface loss is DEEPFR, which accounts for one of only three major losses from the PWATER water balance (i.e., in addition to evaporation, and lateral and stream outflows).

PARM4 involves the flow and hydrograph characteristics, the expectation of rain interception due to the inherent moisture storage capacity from existing vegetation, land use and/or near surface soil conditions and evaporation due to the root zone of the soil profile. The main interception parameters are CEPSC and UZSN. The parameter for evaporation as a primary function of vegetation is LZETP.

PARM2

KVARY. Groundwater recession flow parameter used to describe non-linear groundwater recession rate (/inches) (initialize with reported values, then calibrate as needed).
KVARY is usually one of the last PWATER parameters to be adjusted; it is used when the observed groundwater recession demonstrates a seasonal variability with a faster recession (i.e., higher slope and lower AGWRC values) during wet periods, and the opposite during dry periods. Value ranges are shown in Table A-4. Values that are representative of the conditions in south Orange County have been selected for the SOCHM. Plotting daily flows with a logarithmic scale helps to elucidate the slope of the flow recession.

AGWRC. Groundwater recession rate, or ratio of current groundwater discharge to that from 24 hours earlier (when KVARY is zero) (/day) (estimate, then calibrate).

The overall watershed recession rate is a complex function of watershed conditions, including climate, topography, soils, and land use. Hydrograph separation techniques can be used to estimate the recession rate from observed daily flow data (such as plotting on a logarithmic scale).

INFILT. Index to mean soil infiltration rate (in/hr); (estimate, then calibrate).
In HSPF, INFILT is the parameter that effectively controls the overall division of the available moisture from precipitation (after interception) into surface runoff. Since INFILT is not a maximum rate nor an infiltration capacity term, its values are normally much less than published infiltration rates, percolation rates (from soil percolation tests), or permeability rates from the literature.

INFILT is primarily a function of soil characteristics, and value ranges have been related to SCS hydrologic soil groups (Donigian and Davis, 1978, p.61, variable INFIL) as follows (Table A-1):

Table A-1: SCS Hydrologic Soil Group Characteristics

SCS Hydrologic Soil Group	INFILT Estimate		Runoff Potential
	(in/hr)	(mm/hr)	
A	0.4 – 1.0	10.0 – 25.0	Low
B	0.1 – 0.4	2.5 – 10.0	Moderate
C	0.05 – 0.1	1.25 – 2.5	Moderate to High
D	0.01 – 0.05	0.25 – 1.25	High

An alternate estimation method that has not been validated is derived from the premise that the combination of infiltration and interflow in HSPF represents the infiltration commonly modeled in the literature (e.g., Viessman et al., 1989, Chapter 4). With this assumption, the value of 2.0*INFILT*INTFW should approximate the average measured soil infiltration rate at saturation, or mean permeability.

LZSN. Lower zone nominal soil moisture storage (inches).

LZSN is related to both precipitation patterns and soil characteristics in the region. Viessman, et al, 1989, provide initial estimates for LZSN in the Stanford Watershed Model (SWM-IV, predecessor model to HSPF) as one-quarter of the mean annual rainfall plus four inches for arid and semiarid regions, or one-eighth annual mean rainfall plus 4 inches for coastal, humid, or subhumid climates.

PARM3

INFEXP. Exponent that determines how much a deviation from nominal lower zone storage affects the infiltration rate (HSPF Manual, p. 60).

Variations of the Stanford approach have used a POWER variable for this parameter; various values of POWER are included in Donigian and Davis (1978, p. 58). However, the vast majority of HSPF applications have used the default value of 2.0 for this exponent.

INFILD. Ratio of maximum and mean soil infiltration capacities.

In the Stanford approach, this parameter has always been set to 2.0, so that the maximum infiltration rate is twice the mean (i.e., input) value; when HSPF was developed, the INFILD parameter was included to allow investigation of this assumption. However, there has been very little research to support using a value other than 2.0.

DEEPFR. The fraction of infiltrating water which is lost to deep aquifers (i.e., inactive groundwater), with the remaining fraction (i.e., 1-DEEPFR) assigned to active groundwater storage that contributes baseflow to the stream.

It is also used to represent any other losses that may not be measured at the flow gauge used for calibration, such as flow around or under the gauge site. Watershed areas at high elevations, or in the upland portion of the watershed, are likely to lose more water to deep groundwater (i.e., groundwater that does not discharge within the area of the watershed), than areas at lower elevations or closer to the gauge.

BASETP. ET by riparian vegetation as active groundwater enters streambed; specified as a fraction of potential ET, which is fulfilled only as outflow exists.

If significant riparian vegetation is present in the watershed then non-zero values of BASETP are typically applied. If riparian vegetation is significant, a generic BASETP value of 0.2 is typically representative of the evapotranspiration conditions in the San Juan Hydrologic Unit. This value was established in conjunction with a satisfactory annual water balance.
AGWETP. Fraction of model segment (i.e., pervious land segment) that is subject to direct evaporation from groundwater storage, e.g., wetlands or marsh areas, where the groundwater surface is at or near the land surface, or in areas with phreatophytic vegetation drawing directly from groundwater. This is represented in the model as the fraction of remaining potential ET (i.e., after base ET, interception ET, and upper zone ET are satisfied), that can be met from active groundwater storage.

A value of 0.05 has been selected for inclusion into the SOCHM. This value was adjusted and calibrated in the Aliso Creek watershed HSPF model based on adjustment of the low-flow simulation, and ultimately the annual water balance.

PARM4

CEPSC. Amount of rainfall, in inches, which is retained by vegetation, that never reaches the land surface, and is eventually evaporated (estimate, then calibrate). Typical guidance for CEPSC for selected land surfaces is provided in Donigian and Davis (1978, p. 54, variable EPXM) (**Table A-2**).

Table A-2: CEPSC for Selected Land Surfaces

Land Cover	Maximum Interception (in)
Grassland	0.10
Cropland	0.10 – 0.25
Forest Cover, light	0.15
Forest Cover, heavy	0.20

LZETP. Index to lower zone evapotranspiration (unitless).

LZETP is a coefficient to define the ET opportunity; it affects evapotranspiration from the lower zone, which represents the primary soil moisture storage and root zone of the soil profile. LZETP behaves much like a “crop coefficient” with values mostly in the range of 0.2 to 0.7; as

such, it is primarily a function of vegetation. Typical and possible value ranges are shown in **Figure 4-3**, and the following ranges for different vegetation are expected for the "maximum" value during the year (**Table A-3**):

Table A-3: LZETP Value Ranges

Land Cover Type	Input Coefficient
Forest	0.6 – 0.8
Grassland 0.4	0.4 - 0.6
Row Crops 0.5	0.5 – 0.7
Barren 0.1	0.1 – 0.4
Wetlands 0.6	0.6 – 0.9

Table A-4: Typical permanent channel cross-section with benchmark locations and points of measurement – Rosgen (1996)

HSPF HYDROLOGY PARAMETERS AND VALUE RANGES

			RANGE OF VALUES					
NAME	DEFINITION	UNITS	TYPICAL		POSSIBLE		FUNCTION OF ...	COMMENT
			MIN	MAX	MIN	MAX		
PWAT - PARM2								
FOREST	Fraction forest cover	none	0.0	0.50	0.0	0.95	Forest cover	Only impact when SNOW is active
LZSN	Lower Zone Nominal Soil Moisture Storage	inches	3.0	8.0	2.0	15.0	Soils, climate	**Calibration**
INFILT	Index to Infiltration Capacity	in/hr	0.01	0.25	0.001	0.50	Soils, land use	**Calibration**, divides surface and subsurface flow
LSUR	Length of overland flow	feet	200	500	100	700	Topography	Estimate from high resolution topo maps or GIS
SLSUR	Slope of overland flow plane	ft/ft	0.01	0.15	0.001	0.30	Topography	Estimate from high resolution topo maps or GIS
KVARY	Variable groundwater recession	1/inches	0.0	3.0	0.0	5.0	Baseflow recession variation	Used when recession rate varies with GW levels
AGWRC	Base groundwater recession	none	0.92	0.99	0.85	0.999	Baseflow recession	**Calibration**
PWAT - PARM3								
PETMAX	Temp below which ET is reduced	deg. F	35.0	45.0	32.0	48.0	Climate, vegetation	Reduces ET near freezing, when SNOW is active
PETMIN	Temp below which ET is set to zero	deg. F	30.0	35.0	30.0	40.0	Climate, vegetation	Reduces ET near freezing, when SNOW is active
INFEXP	Exponent in infiltration equation	none	2.0	2.0	1.0	3.0	Soils variability	Usually default to 2.0
INFILD	Ratio of max/mean infiltration capacities	none	2.0	2.0	1.0	3.0	Soils variability	Usually default to 2.0
DEEPFR	Fraction of GW inflow to deep recharge	none	0.0	0.20	0.0	0.50	Geology, GW recharge	Accounts for subsurface losses
BASETP	Fraction of remaining ET from baseflow	none	0.0	0.05	0.0	0.20	Riparian vegetation	Direct ET from riparian vegetation
AGWETP	Fraction of remaining ET from active GW	none	0.0	0.05	0.0	0.20	Marsh/wetlands extent	Direct ET from shallow GW
PWAT - PARM4								
CEPSC	Interception storage capacity	inches	0.03	0.20	0.01	0.40	Vegetation type/density, land use	Monthly values usually used
UZSN	Upper zone nominal soil moisture storage	inches	0.10	1.0	0.05	2.0	Surface soil conditions, land use	Accounts for near surface retention
NSUR	Manning's n (roughness) for overland flow	none	0.15	0.35	0.05	0.50	Surface conditions, residue, etc.	Monthly values often used for croplands
INTFW	Interflow inflow parameter	none	1.0	3.0	1.0	10.0	Soils, topography, land use	**Calibration**, based on hydrograph separation
IRC	Interflow recession parameter	none	0.5	0.7	0.3	0.85	Soils, topography, land use	Often start with a value of 0.7, and then adjust
LZETP	Lower zone ET parameter	none	0.2	0.7	0.1	0.9	Vegetation type/density, root depth	**Calibration**

Source: U.S. EPA BASINS Technical Note 6

Model assumptions for stream reach infiltration rates were derived through calibration based on data collected within the reaches of Aliso Creek (11 stations) and Rose Creek (6 stations). In the model, infiltration rates vary by soil type. Stream infiltration was calibrated by adjusting a single infiltration value, which was varied for each soil type by factors established from literature ranges (U.S. EPA 2000) of infiltration rates specific to each soil type. The final resulting infiltration rates were 1.368 in/hr (Soil Group A), 0.698 in/hr (Soil Group B), 0.209 in/hr (Soil Group C) and 0.084 in/hr (Soil Group D). The infiltration rates for Soil Groups B, C, and D are within the infiltration range given in literature (Wanielisata et al. 1997). The result for Soil Group A is below the range given in Wanielisata et al. (1997); however, this result only represented one watershed in this TMDL study.

APPENDIX B
Stream Classification Procedure

The procedure derives from the "Stream Stability Validation" approach that is described by Rosgen (1996). Stream stability over time may be assessed by monitoring the stream channel for five factors: (1) aggradation (2) degradation (3) shifting of particle sizes of stream bed materials (4) changing the rate of lateral extension through accelerated bank erosion (5) morphological changes following the CEM (Simon et al., 1992). If any hydrological changes or disturbance occurs in the watershed, the five elements defined above are critical to analyze the channel response to the implementation of HMP mitigation measures.

One reference stream station will be used for comparison purposes and should coincide with the station selected for the bioassessment. The reference station should be located in a stream that shows the same lithology, sediment regime, and morphometric parameters as the study stream stations. Annual comparisons of channel stability will be carried out at the same time of the year, at the end of the spring season, thus maximizing the chances to monitor similar weather patterns.

Channel stability will be evaluated, on an annual basis, at selected cross-sections in the San Juan hydrologic unit. Evaluation of the vertical or bed stability will serve as the reference method to understand the geomorphological changes of a channel stream over time. Vertical or bed stability will be evaluated at each of the identified cross-sections: this field method will identify a potential aggradation or degradation, if any, of the stream. Rate, magnitude, and direction of vertical change, if any, will be quantified.

Vertical or bed stability:

Rosgen (1996) has documented a couple methods including one, known as the "Monumented cross-sections method". At each selected site, the method consists of setting permanently monumented cross-sections that are located on a riffle and pool segment (or step/pool segment), i.e., two monumented cross-sections per site. Annual measurements at the two monumented cross-sections per site will be compared to the reference elevations taken during the initial survey.

Initially, one permanent bench mark should be installed on each bank of the stream: a left temporary bench mark and a right temporary bench mark. These should be made permanent by digging a hole in which a 10-inch stove bolt will be set up by a pad of concrete. The intent is to avoid vandalism damage. These two bench marks will be located at the cross-section on a stable site above and away from the bankfull channel. Additionally, an elevation cross-section is often needed if the left or right side of the cross-section is located on an unstable slope. An elevation bench mark is established and often does not represent a true representation, but rather a relative elevation set at 100 feet.

During each cross-section survey, a leveled tape line is set above the stream channel. Measurements originate from the intercept of the rod with the leveled tape line (**Figure A-1**).

Figure A-1: Typical permanent channel cross-section with benchmark locations and points of measurement – Rosgen (1996)

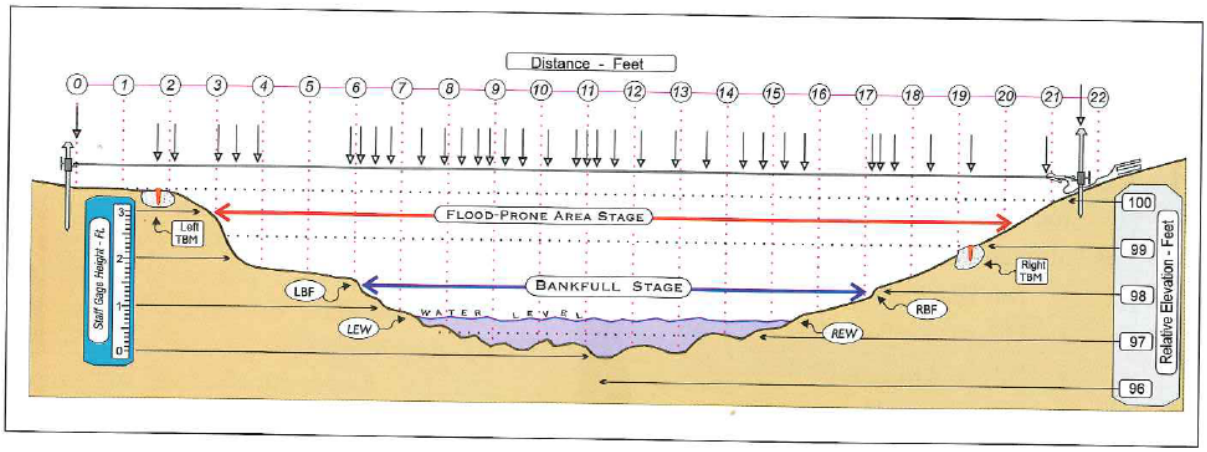

Simple measurements are made with the measuring tape and elevation rod method as described by Rosgen (1996):

- Locate the permanent bench mark on both sides of the stream (or, if on one side, a bearing for the transect is needed)
- Stretch the tape very tight with spring clamp and tape level
- Locate tape at same elevation as reference bolt on bench mark
- Read distance and elevation reading of rod intercept with tape
- Measure major features, such as:
    - Left bench mark (LBM)
    - Left terrace/floodplain (LT, LFP)
    - Left bankfull (LBF)
    - Left bank (LB)
    - Left edge of water (LEW)
    - Various bed features, bars, etc.
    - Thalweg (TW)
    - Inner berm features (IB)
    - Right edge of water (REW)
    - Right bank (RB)
    - Right bankfull (RBF)
    - Right terrace/floodplain (RT, RFP)
    - Right benchmark (RBM)

Measurements must include the floodplain, terraces, and stream adjacent slopes. Other surveying procedures such as auto or laser levels and total station surveys may be adapted from the described "measuring tape and elevation rod" method. If technically feasible, any exceptional event associated with level higher than the bankfull level needs to be marked and indicated on the cross-section. The cross-section needs to be plotted for each measurement and compared to previous cross-sections to evaluate bed stability.

Finally, the longitudinal slope will be assessed based on measurements taken at two consecutive cross-sections. Rosgen (1996) also recommends developing a vicinity map and detailed site map indicating the locations of monumented cross-sections, as well as upstream and downstream photographs for site documentation. Channel dimensions for stream classification need to be correlated in order to document morphological comparisons for extrapolation.

Each stream segment being surveyed will be classified on an annual basis per the simplified Rosgen system of channel classification (Rosgen, 1996). Classification will be possible upon identification of the following parameters: floodprone width, bankfull width, bankfull depth, and longitudinal slope. **Figure A-2** shows the different types of channels per Rosgen channel classification (Rosgen, 1996).

Figure A-2: Simplified Rosgen Channel Classification (Rosgen, 1996)

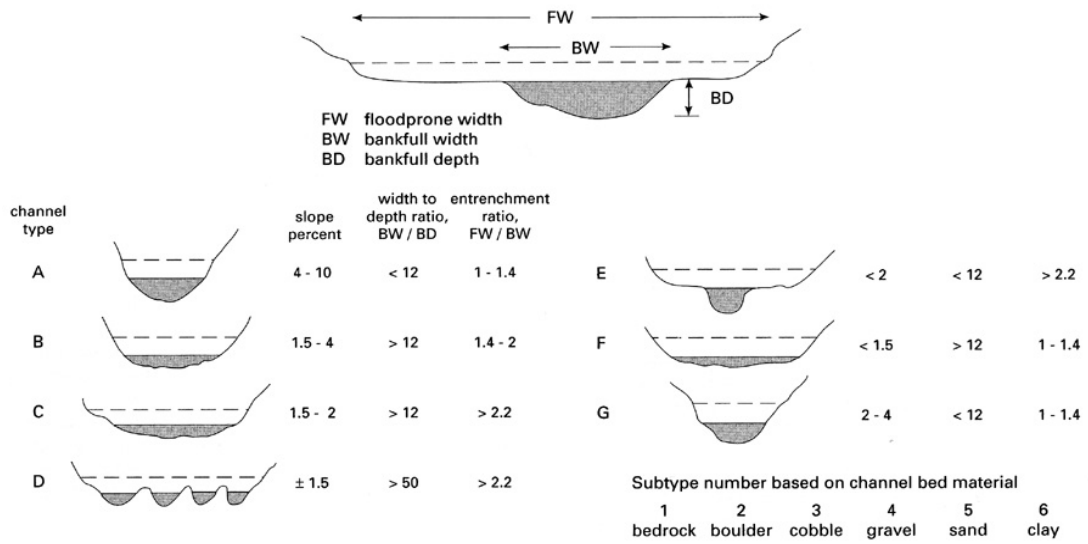

Figure 1.12 The Rosgen system of channel classification.

APPENDIX C
South Orange County Hydrology Model Instructions

To be developed upon completion of the model.

APPENDIX D
Conducting a Site-Specific Hydromodification Analysis

A project proponent may choose to develop a site specific hydromodification mitigation analysis in lieu of using the continuous simulation tool provided by the south Orange County Hydromodification Management Plan (HMP). The site specific analysis must be developed to demonstrate that the project will not adversely impact the receiving stream through either changes in the receiving stream hydrograph, or changes in bed material load supply to the stream.

The following items are not intended to be an approach to complete the analysis, rather, they are provided for information as suggestions for the engineering analysis. Each project will have unique conditions and will require a customized approach for analysis. A site specific analysis may or may not be ultimately approved by the reviewing agency. It is the responsibility of the engineer to assess the potential for an analysis to successfully demonstrate that the project is consistent with the guidelines of this HMP.

1. It is recommended that the applicant develop a study approach and outline, and review it with the local agency prior to beginning the full study.
2. The study must demonstrate that the project is consistent with the requirements of the south Orange County NPDES Permit and this HMP.
3. Site specific information to characterize bed sediment gradation, flow and rainfall data, and watershed hydrologic parameters will be required. Continuous simulation is required.
4. An objective of the study may be to determine if the loss of bed material load from the project site to the receiving stream can be partially or fully mitigated by additional mitigation of the runoff discharge from the project site.
5. Sediment transport modeling has inherent uncertainty. The agency may not approve a site specific analysis if it is apparent that the change in conditions that will be modeled are about the same magnitude as the model uncertainty.

The selected lower flow threshold shall correspond to the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks of a comparable soft-bottom channel.

The method of analysis, including the specific modeling program, the sediment transport function, the reach of the receiving water to be modeled, the method of determining bed material discharge in the receiving stream, the method of determining bed material discharge from the project site, the period of record for continuous simulation and other parameters are left to the discretion of the engineer. The study report should document and justify the approach, selected models and methods, data requirements, analysis method and results for review.

APPENDIX E
Practitioner Quick Start Sheet

The quick start summary lists the chronological steps that a practitioner should follow for their development project or re-development project to meet the requirements of this South Orange County Hydromodification Plan. The chronological steps are, as follows:

1. The first step consists of verifying if the project is exempt from hydromodification requirements. Exemption occurs:
   - If the project is not classified as Priority Development Project per permit item F.1.d., or,
   - If the proposed project discharges runoff directly to an exempt receiving water such as the Pacific Ocean, an exempt river reach, an exempt reservoir, or a tidally-influenced area. Or, if the proposed project discharges to an engineered conveyance system with the capacity to convey the 10-year ultimate condition that extends to the Pacific Ocean, a tidally-influenced area, an exempt river reach or reservoir (See **Section 4.3.1**), or,
   - If the project classifies as an infill development projects per the definition provided **in Section 4.3.2**, or,
   - If the project is an in-stream flood control or restoration project (See **Section 4.3.3**), or,
   - If the project discharges to a large river per the definition provided in **Section 4.3.4**

2. If the project is non-exempt, the practitioner should identify the tier requirements that apply to the proposed project. For specific tier requirements, the practitioner may refer to **Section 4.5**. These include hydrologic management controls and sediment supply management:
   a. Hydrologic management controls

The following table summarizes the different options that a practitioner may pursue to achieve hydrologic management controls. Prioritization of hydrologic controls, as well as the applicability of each type of hydrologic control are defined in this table. Onsite hydrologic controls are to be designed based on the South Orange County Hydrology Model. Alternatively, the practitioner may develop its own numerical criteria but should support his findings with continuous simulation models. Technical infeasibility of a type of hydrologic control should be documented. Specifics are provided in **Section 4.5**.

Type of hydrologic control	Onsite	Regional	Offsite (mitigation or instream restoration)	Mitigation bank (if available)	Green Street Project or equivalent
Large (>100 ac)	Yes	Yes	n/a	n/a	n/a
Medium (1 ac ≤A≤100 ac)	Yes - #1	n/a	Yes - #2a	Yes - #2b	n/a
Small (<1 ac)	Yes - #1	n/a	Yes - #2a	Yes - #2b	n/a

Type of hydrologic control	Onsite	Regional	Offsite (mitigation or instream restoration)	Mitigation bank (if available)	Green Street Project or equivalent
Public roadway	n/a	n/a	Yes	n/a	Yes

b. Sediment supply management

The practitioner may follow a three-step process to ensure maintenance of the pre-project sediment supply to the stream:

1. Determine whether the site is a significant source of bed material to the receiving stream.
2. Avoid significant bed material supply areas in the site design.
3. Replace significant bed material supply areas that are eliminated through urbanization.

If the three-step process is deemed infeasible, an alternative compliance option allows the project applicant to model the site conditions and the receiving stream and provide additional mitigation in site runoff to compensate for the reduction (or addition) of bed material. Specifics are detailed in **Section 5.1**.

3. The practitioner shall integrate hydrologic management controls and sediment supply management into the project site design, and define the design specifics in the preliminary WQMP that should be submitted to the jurisdiction. The jurisdiction may approve the proposed design upon identification of compliance with the requirements of this HMP.

EXHIBIT 7.II

MODEL WATER QUALITY MANAGEMENT PLAN (MODEL WQMP) FOR SOUTH ORANGE COUNTY

December 20, 2013

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(all page numbers refer to pages within Exhibit 7.II)

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Note: Hydromodification requirements were in flux at the time of publication of this document. Appendix C includes a summary of current requirements at the time of publication and references to the associated technical resource(s) for implementing these requirements. Appendix C is subject to change as the applicability of requirements changes. Please refer to http://ocwatersheds.com/documents/wqmp/ to determine whether a newer version of Appendix C is in effect.

7.II Model Water Quality Management Plan (WQMP)

7.II–1.0 Introduction

This Model Water Quality Management Plan (Model WQMP) has been developed to aid the County of Orange, the Orange County Flood Control District, and the cities in South Orange County (Permittees) and project proponents with addressing post-construction urban runoff and stormwater pollution from new development and significant redevelopment projects that qualify as Priority Development Projects. New development Priority Development Projects create new impervious surface on a previously undeveloped site. The amount of new impervious surface that qualifies a project as a Priority Development Project depends upon the project type. Significant redevelopment projects add or replace 5,000 or more square feet of impervious surface on an already-developed site. These terms are further defined for specific project types in **Section 7.II-1.2**. This Model WQMP has been developed specifically for South Orange County, which is defined in **Figure 7.II-1** and **Table 7.II-1**.

LID BMP – a BMP that provides retention or biofiltration as part of an LID strategy – these may include hydrologic source controls (HSCs), retention, and biofiltration BMPs

The purpose of this Model WQMP is to describe the process that Permittees will employ for developing a Project WQMP for priority new development and redevelopment projects, which, when implemented, will minimize the effects of urbanization on site hydrology, runoff flow rates, and pollutant loads. Following approval of the final Project WQMP and construction of the project, the Project WQMP will serve to maintain the terms, conditions, and requirements with the project proponent and their successors and assigns. The effects of urbanization will be minimized through implementation of practicable and enforceable project-based controls or stormwater Best Management Practices (BMPs), or through a combination of project-based and regional BMPs. For most projects, the process will first involve preparing a Conceptual or Preliminary WQMP to incorporate Low Impact Development (LID) and hydromodification control BMPs where necessary at the earliest conceptual planning stages of a project for early review. All Priority Development Projects will require a final Project WQMP be prepared, regardless of whether a Conceptual or Preliminary WQMP was prepared first. The process for preparing Conceptual or Preliminary WQMPs and/or final Project WQMPs is described in **Section 7.II-5.0,** with supplemental information provided in the Technical Guidance Document (TGD).

By initiating runoff management planning for early in the development process, the Preliminary/Conceptual WQMP can be used as the principal mechanism for describing how impacts of a project will be reduced to less than significant when developing documentation for the project to comply with the California Environmental Quality Act (CEQA). Further discussion of the CEQA process in the context of New Development and Redevelopment Planning process and the role of the Preliminary/ Conceptual Model WQMP can be found in the Orange County Drainage Area Management Plan (**DAMP**) **Section 7**.

This Model WQMP identifies controls, referred to as low impact development (LID) BMPs and hydromodification BMPs as well as other BMPs and alternative compliance programs, for new development and redevelopment projects that are subject to WQMP requirements pursuant to **DAMP Section 7**.

The Permittees require that certain new development and redevelopment projects develop and implement a Conceptual or Preliminary WQMP, and/or final Project WQMP that includes LID BMPs and/or other BMPs. Depending upon the project size and characteristics, BMPs may include:

- Site design measures
- Implementing LID BMPs on-site
- Implementing hydromodification control BMPs on-site
- Utilizing alternative programs or treatment control BMPs
- Employing applicable source control BMPs

Explanation, definitions, and examples of the above site design measures and BMP types as well as alternative programs are provided later within this document.

7.II–1.1 Regulatory Basis

The development of this Model WQMP is required by the National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) permit held jointly by the Permittees in South Orange County (Order No. R9-2009-0002). As authorized by the Federal Clean Water Act (CWA), the NPDES permit program controls water pollution by regulating sources that discharge pollutants into waters of the United States. South Orange County is defined as the area under the jurisdiction of the San Diego Regional Water Quality Control Board (SDRWQCB). **Figure 7.II-1** shows the division of the County between North and South County areas. **Table 7.11-1** shows which cities are situated within each permit area. The County unincorporated area and three cities overlay both permit areas. This Model WQMP does not contain criteria for the North Orange County Permit area.

Figure 7.II-1: Division of Permit Areas

Table 7.II-1: Division of Permit Areas

Jurisdictions Wholly within San Diego Region (SOC)	Jurisdictions within both the NOC and SOC Regions
City of Aliso Viejo City of Dana Point City of Laguna Beach City of Laguna Niguel City of Mission Viejo City of Rancho Santa Margarita City of San Clemente City of San Juan Capistrano	County of Orange Orange County Flood Control District City of Laguna Hills City of Laguna Woods City of Lake Forest

A draft version of this Model WQMP for South Orange County was submitted to the SDRWQCB on December 16, 2011. The SDRWQCB reviewed the Draft Model WQMP for compliance with the Fourth Term MS4 Permit for South Orange County (South County Permit, Order R9-2009-0002) and issued a conditional finding of adequacy (Memorandum dated June 20, 2013: Conditional Finding of Adequacy for the December 16, 2011 Model Water Quality Management Plan (Model WQMP) for South Orange County MS4 Permit Order No. R9-2009-0002, NPDES No. CAS108740). By December 20, 2013, South Orange County (SOC) Area Permittees are required to adopt their own local Jurisdictional Runoff Management Program (JRMP) and Local Standard Stormwater Mitigation Plan (Local SSMP, also known as Local Implementation Plan, LIP) incorporating all requirements of this Model WQMP (see **DAMP, Appendix A-7**). Using the Local SSMP (or LIP) as a guide, each SOC Area Permittee will review and approve Project WQMPs as part of the development plan and entitlement approval process or the ministerial permit approval process for priority new development and redevelopment projects as defined in **DAMP Section 7.6** and **Table 7.II-2**.

Section F.1.d(9) of the South Orange County MS4 Permit (Order No. R9-2009-0002) requires that each Local SSMP (or LIP) adopted by SOC Permittees describe a process that will be implemented to verify compliance with Model WQMP requirements. The process must identify at what point in the planning process priority new development and redevelopment projects will be required to meet Model WQMP requirements and, at a minimum, that these priority development projects implement the required post-construction BMPs prior to occupancy and/or the intended use of any portion of the project. The process must also include identification of the roles and responsibilities of various municipal departments in implementing the Model WQMP requirements, as well as any other measures necessary for the implementation of Model WQMP requirements.

7.II–1.2 Priority Development Project Categories

This Model WQMP describes the process for preparing Conceptual or Preliminary WQMPs and final Project WQMPs for certain new development and redevelopment projects called "Priority Development Projects." A project is considered a Priority Development Project if it meets any one of the criteria listed in **Table 7.II-2**.

Table 7.II-2: Priority Development Projects Categories for South County Permit Area

1. New development projects that create or add 10,000 square feet or more of impervious surface. This category includes commercial, industrial, residential housing subdivisions, mixed-use, and public projects on private or public property that falls under the planning and building authority of the Permittees.
2. Automotive repair shops. This applies to facilities that are categorized in any one of the following Standard Industrial Classification (SIC) codes 5013, 5014, 5541, 7532-7534, and 7536-7539.
3. Restaurants where the land area of development is 5,000 square feet or more including parking area. This category is defined as facilities that sell prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812), where the land area for development is greater than 5,000 square feet. Restaurants where land development is less than 5,000 square feet shall meet all WQMP requirements except for LID BMP, treatment control BMP, and hydromodification/HCOC requirements.
4. Hillside development greater than 5,000 square feet. Hillside development is defined as any development which is located in an area with known erosive soil conditions or where the natural slope is 25 percent or greater.
5. All development located within or directly adjacent to or discharging directly to an ESA (where discharges from the development or redevelopment will enter receiving waters within the ESA), which either creates 2,500 square feet of impervious surface on a proposed project site or increases the area of imperviousness of a proposed project site to 10 percent or more of its naturally occurring condition. "Directly adjacent" means situated within 200 feet of the ESA. "Discharging directly to" means outflow from a drainage conveyance system that is composed entirely of flows from the subject development or redevelopment site, and not commingled with flows from adjacent lands.
6. Parking lots 5,000 square feet or more, or parking lots with 15 parking spaces or more, including associated drive aisle, and potentially exposed to urban stormwater runoff. A parking lot is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce.
7. Streets, roads, highways, and freeways. This category includes any public or private paved surface that is 5,000 square feet or greater used for the transportation of automobiles, trucks, motorcycles, and other vehicles. (See discussion under (**Section 7.II-1.5** relative to public projects).

8. Those redevelopment projects that create, add, or replace at least 5,000 square feet of impervious surface on an already developed site and the existing development or redevelopment project falls under another Priority Development Project Category. Where redevelopment results in the addition or replacement of less than 50 percent of the impervious surfaces of a previously existing development site, and the existing development was not subject to WQMP requirements, the numeric sizing criteria discuss below only applies to the addition or replacement, and not the entire development. Where redevelopment results in an addition or replacement of more than 50 percent of the impervious surfaces, the Project WQMP requirements apply to the entire development.
9. Retail Gasoline Outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more, or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.
10. Effective December 16, 2012, all pollutant generating development or redevelopment projects that result in the disturbance of one acre or more of land are considered a Priority Development Project. This category of Priority Development Projects is <u>in addition</u> to those categories described above in this table.

7.II–1.3 Non-Priority Development Projects

The provisions of this Model WQMP do not apply to projects if they do not meet the criteria to be considered a Priority Development Project.

7.II–1.4 Use of the Model WQMP, TGD, and WQMP Templates

Three documents have been developed to support the Priority Development Project requirements: a Model WQMP, a TGD, and a WQMP Template. This Model WQMP describes the requirements for preparing a Project WQMP. The TGD contains supporting technical guidance on how to perform the technical analyses necessary to prepare a Project WQMP. The WQMP Template should be used to prepare a Project WQMP. Additionally, **Appendix C** to this Model WQMP describes the criteria currently in place for hydromodification control (subject to change) and directs the user to the appropriate reference(s) to find guidance for implementing hydromodification control requirements.

The TGD has been prepared as a companion to this Model WQMP (**DAMP Section 7.III)**. The TGD contains more detailed information and explains how to complete the requirements and the technical analyses necessary for preparing a Conceptual or Preliminary WQMP or Project WQMP. Throughout this document, references to the TGD will be made, including the section of the TGD where the corresponding information is located.

The WQMP Template is to be used by project proponents as a tool for the preparation and submittal of Project WQMPs. The WQMP Template contains the overall structure for developing a Conceptual or Preliminary WQMP or final Project WQMP, including fields for entering general information and space for sizing calculations and other analyses necessary for WQMP completion. It is expected that project proponents will adapt the WQMP template as needed, to provide the required information in a manner that demonstrates conformance to applicable criteria.

This Model WQMP includes the following sections:

- **Section 7.II–1.0** provides an introduction to the overall regulatory basis and purpose of the Model WQMP, an overview on the use of the Model WQMP, the TGD and the WQMP Template, an overview of applicable priority development projects, and the general process steps for developing a Conceptual or Preliminary WQMP, or Project WQMP.
- **Section 7.II–2.0** describes the Project WQMP requirements, and guides the reader through the parts of the Project WQMP.
- **Section 7.II–3.0** describes alternative compliance approaches.
- **Section 7.II–4.0** contains BMP funding and maintenance requirements.
- **Section 7.II–5.0** describes the process for Project WQMP preparation, submittal, and approval.
- **Section 7.II–6.0** provides additional project WQMP related resources and the references used for producing this Model WQMP.

The intended users of the Model WQMP are summarized in the following table.

Document	Intended users	Role of Document
Model Water Quality Management Plan	• Permittee planning, permitting and NPDES program staff • Project applicants and planning and design consultants	• Provides regulatory requirements and direction for preparing and submitting a Conceptual or Preliminary WQMP and/or Final Project WQMP
Technical Guidance Document	• Permitting and NPDES program staff • Project applicants and planning and design consultants	• Provides Technical Guidance and details for site planning and selection and of BMPs to meet the performance criteria • Provides technical basis for documenting feasibility of LID BMPs
WQMP Template	• Project applicants and planning and design consultants • City and county planning and permitting staff	• Provides a template and instructions for preparing a site-specific Preliminary/Conceptual and Final Project WQMP
DAMP Section 7	• Permittee NPDES program staff and planning staff	• Provides program direction to Permittee staff for all aspects of New Development/Significant Redevelopment Program

Both the TGD and WQMP Template are located at the Permittee websites or www.ocwatersheds.com.

7.II–1.5 Public Agency Projects

New development/redevelopment requirements apply to public agency projects that meet the definitions in the Priority Development Project categories described above. In general, the same Project WQMP overall development steps described herein apply to public agency projects as well as private development projects. However, there are unique issues associated with certain public agency projects that are either specifically recognized in the MS4 Permit, or for which particular approaches can be considered.

Public agency street, road, highway, and freeway Priority Development Projects are subject to the standard hierarchy of LID and hydromodification requirements applicable to other categories of Priority Development Projects as described in Section 7.II-2.4.2.2 and 7.II-2.4.3 of this Model WQMP. Priority Development Projects may employ a "green street" design approach that incorporates United States Environmental Protection Agency (USEPA) guidance, "Managing Wet Weather with Green Infrastructure: Green Streets" in a manner consistent with the maximum extent practicable (MEP) standard. A copy of the guidance is included in **Appendix B**. However, these projects must demonstrate that they meet the LID and hydromodification standards applicable to other categories of Priority Development Projects as described in Section 7.II-2.4.2.2 and 7.II-2.4.3 of this Model WQMP.

Above ground linear lined drainage projects typically consist of lined vertical or trapezoidal channels. These projects may result in the creation of more than 10,000 square feet of impervious surface or the addition of more than 5,000 sq-ft to an existing developed site, which would result in a categorization as a Priority Development Project. These types of projects are permitted to use the "Green Infrastructure" guidance as described in **Appendix B** and **Section 2.7 of the TGD.**

Individual Permittees may elect to develop a separate "Master Project WQMP" for anticipated future projects with similar characteristics based upon the requirements outlined in this document. A Master Project WQMP document would need to list the public agency projects that are anticipated to occur within the Permittee's jurisdiction over a given time period and the proposed methods of compliance with this Model WQMP.

Below ground linear drainage and utility construction projects, such as storm drains, sewers and water lines, may result in the replacement of more than 5,000 square feet of impervious surface within a developed public street, road or highway. However, such projects would not qualify as a Priority Development Project if they maintain original line and grade, hydraulic capacity, original purpose of the facility, or occur in response to an emergency to protect public health and safety. Consequently, these projects would not require the preparation of a Project WQMP.

7.II–1.6 WQMP Development Process

Several steps are involved in completing an approvable Conceptual or Preliminary WQMP, or final Project WQMP for new development or significant redevelopment projects. **Figure7.II-2** displays an overview WQMP flowchart and the major implementation and decision steps that must be followed to successfully complete a Project WQMP for the SOC Permit Area. Each of the steps identified in the flow chart

are described in later sections of the Model WQMP. The relevant sections which detail each step are referenced in the overall WQMP flow chart.

Figure 7.II-3 provides a more detailed overview of the steps in the process. Each of these steps is described in more detail in **Section 7.II-2.0**.

Figure 7.II-2: Overall WQMP Development Process Flow Chart

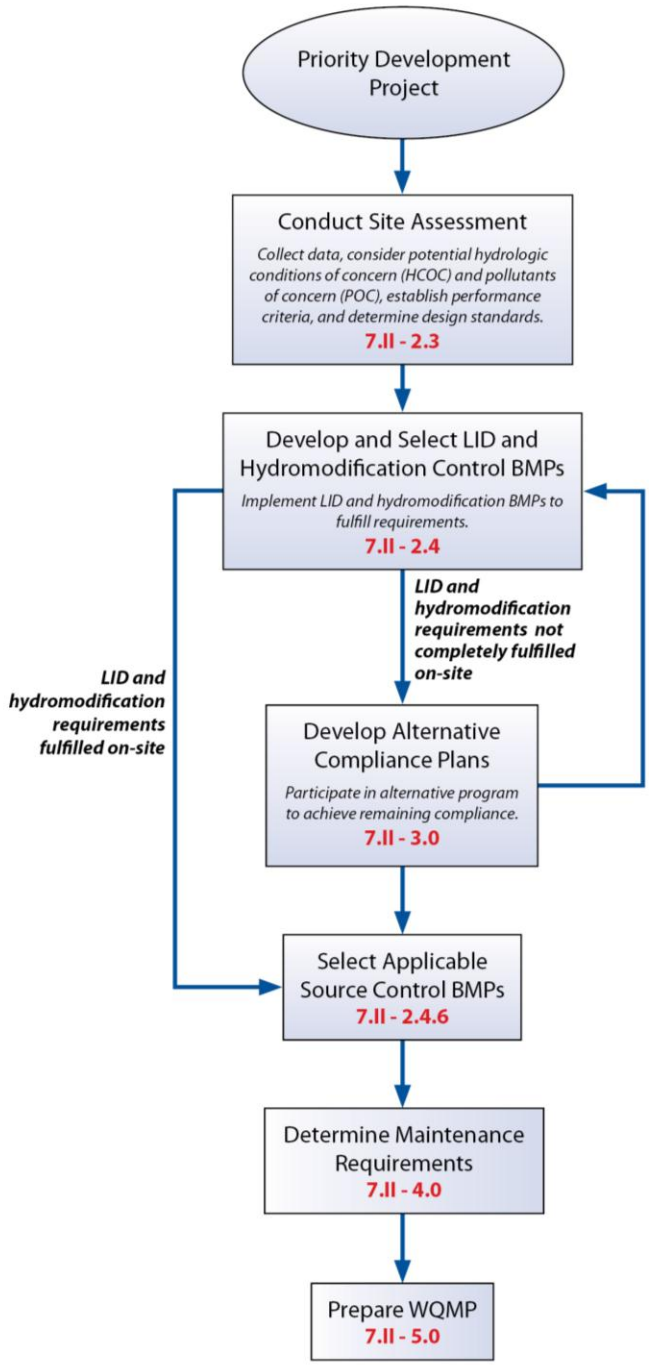

Note: Model WQMP sections shown in red

Figure 7.II-3: WQMP Development Process Flow Chart

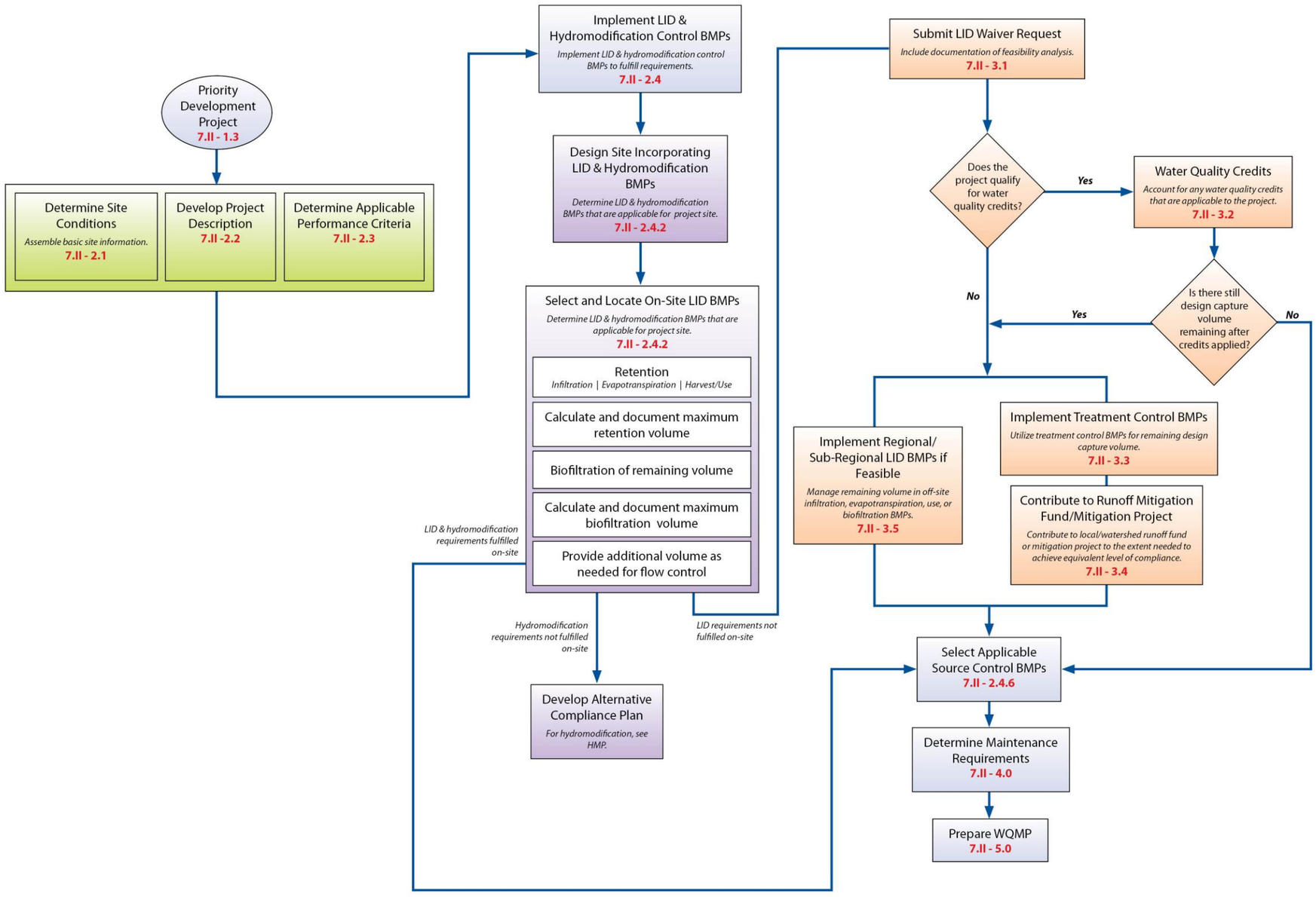

Note: Model WQMP sections shown in red

7.II–2.0 Project WQMP Requirements

The purpose of the Project WQMP is to define project features and BMPs that will mitigate the project's impacts on receiving water quality and hydromodification. In order to complete a Project WQMP, the following steps will need to be performed:

1. Determine discretionary permits and water quality conditions that may apply – **Section 7.II-2.1**
2. Describe the project – **Section 7.II-2.2**
3. Assess the site – **Section 7.II-2.3**
4. Develop and select BMPs, including LID BMPs, site design BMPs, hydromodification control BMPs, and source control BMPs – **Section 7.II-2.4**
5. Determine any applicable alternative compliance approaches – **Section 7.II-3.0**
6. Identify parties responsible for BMP maintenance and funding sources – **Section 7.II-4.0**

The first four steps are discussed in the following subsections. Additional information with technical guidance and supporting information can be found in the **TGD**.

7.II–2.1 Discretionary Permit(s) and Water Quality Conditions

This Model WQMP provides a framework for addressing General Plan, discretionary permit conditions, water quality conditions, and complying with CEQA. Compliance with the requirements set forth in this document can provide the basis for evaluating the surface water impacts and any mitigation measures and can be sufficiently specific to satisfy the requirements of CEQA with regards to projects. See **TGD Section 2.1** for additional details regarding discretionary permits and water quality conditions.

7.II–2.2 Project Description

The Project WQMP shall contain an overall description of the project including permit applicability, whether the project is in NOC and/or SOC Permit Areas, if it is in an environmentally sensitive area (ESA), whether it may be eligible for water credits (as discussed in **Section 7.II-3.2**), and whether the project contains specific features, such as above ground linear facilities that would require specific BMP approaches (as discussed in **Section 7.II-2.4.2**). See **TGD Section 2.2** for additional details regarding project descriptions.

7.II–2.3 Site Assessment

7.II–2.3.1 Introduction

Site assessment involves the following steps:

1. Gather site information.
2. Determine if hydrologic conditions of concern are applicable.
3. Determine potential pollutants of concern (POCs).

Using this information, the applicable performance criteria that apply to the remaining steps in the overall process can be determined.

Each of these steps is described in more detail in the following subsections. A flow chart of the key steps and decisions required for site assessment is shown in **Figure 7.II-6.** See **TGD Section 2.3** for the technical basis for developing site descriptions.

7.II–2.3.2 Gather Site Information

Basic information for the site must be compiled. Specific details for compiling this information can be found in the **TGD Section 2.3**. The information that must be compiled is listed below:

- Community Name or Planning Area (if located in planned community): Provide exhibit of the boundary of the project site and surroundings in sufficient detail to allow project location to be shown on a base map.
- Site specifics: Provide general and specific location, site address, parcel number, and size (acreage to the nearest 1/10 acre).
- Watershed name: Provide the name of the receiving water and information on how runoff would enter the receiving water (i.e., through a storm drain, an unnamed tributary, or direct discharge through an outfall into the water body).
- Site characteristics: Include a description of site drainage (including ownership) and how it ties with the drainage from the surrounding property. Refer to the Project WQMP's Plot Plan showing drainage flow arrows and how drainage ties to drainage of surrounding property.
- Additional information: Provide additional information as described in **TGD Section 2.3**, as necessary to support evaluation of LID feasibility, selection, and design, potentially regarding the following subject areas:
    - Topography
    - Soil Type and Geology
    - Coarse Sediment Supply Areas (see Appendix C for further information)
    - Groundwater and Soil Contamination
        - Groundwater Levels
        - Groundwater/Soil Contamination
        - Protection of Groundwater Quality
        - Groundwater Recharge
        - Groundwater/Surface Water Interactions
    - Geotechnical Considerations
        - Collapsible Soils
        - Expansive Soils
        - Slopes
        - Liquefaction

- Managing Off-Site Drainage
- Existing Utilities
- ESAs

Figure 7.II-4: Assessment for Priority Development Projects

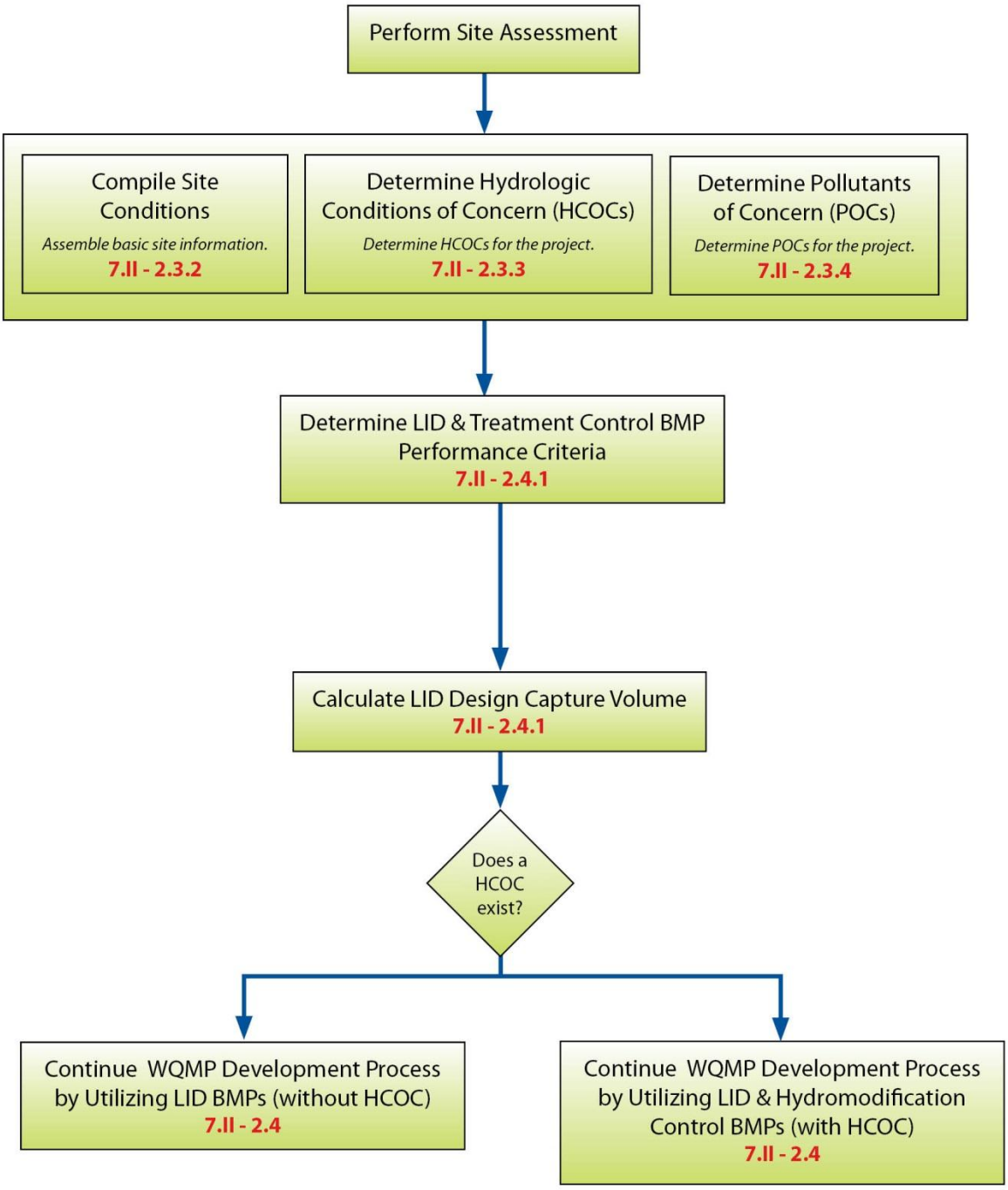

Note: Model WQMP sections shown in red

Site assessment must involve collecting relevant information to address two primary issues:

- Determine Hydrologic Conditions of Concern (HCOCs)
- Determine POCs

Technical details regarding how to determine if there is a HCOC in downstream receiving waters from the project site and how to select and size BMPs to provide for hydromodification control (hydromodification control BMPs) if HCOCs exist is provided in **Appendix C** of this Model WQMP (or by reference from **Appendix C**). Additional information regarding how to identify POCs, and related priority POCs, and how to select a combination of source control, LID, and treatment control BMPs that are effective at removing those pollutants from stormwater runoff from the project site is provided in **TGD Section 2.2.2**.

7.II–2.3.3 Determine Hydrologic Conditions of Concern

An HCOC exists when a site's hydrologic regime is altered and there are significant impacts on downstream channels and aquatic habitats, alone or in conjunction with impacts of other projects.

Hydromodification is the alteration of natural flow characteristics and sediment supply in streams and channels due to urbanization, which can result from new development and significant redevelopment projects without appropriate preventative controls. Hydromodification controls are implemented in order to prevent hydromodification from happening. Urbanization commonly results in increased runoff volume and velocity; reduced infiltration; increased flow frequency, duration, and peaks; and faster time to reach peak flow. Under certain circumstances, urbanization could also result in the reduction in the amount of sediment supplied to the channel for transport. If the sediment supplied to the channel is reduced such that in-stream flows are transporting sediment faster than it can be replenished, then erosion of the channel's bed and bank may occur. These changes have the potential to permanently impact downstream channels and habitat integrity. A change to a Priority Project site's hydrologic characteristics would be considered a condition of concern if the change would have a significant impact on downstream natural channels and habitat integrity.

Priority Development Project proponents shall use the approaches identified in **Appendix C** (or by reference from **Appendix C**) to determine if the Project has an HCOC. In South Orange County, all projects are considered to have a potential HCOC unless they are tributary to an exempt receiving water as defined in **Appendix C** (or by reference from **Appendix C**).

7.II–2.3.4 Determine Pollutants of Concern

Stormwater runoff from new development and significant redevelopment project sites has the potential to contribute pollutants, including suspended solids/sediment, nutrients, metals, microbial pathogens, oil and grease, toxic organic compounds, and trash and debris from the municipal storm drain system to tributary receiving waters. Knowing the POCs is necessary to select the most effective BMPs, since some BMPs are more effective for some pollutants than others. POCs are identified based on the

pollutants that are anticipated to be generated by a project based on the type of development project that is proposed. Primary POCs are any pollutants anticipated to be generated by the project that also have approved TMDLs or which are causing an impairment for which a TMDL has not yet been approved. Other POCs are those pollutants anticipated to be generated by the project that have not been identified as causing impairment nor have an adopted TMDL for the project's receiving waters. **TGD Section 2.3.3** provides technical details regarding identifying POCs.

Further information on POCs may also be available from the environmental impact assessment for the project (e.g., project-specific pollutant evaluations in CEQA Environmental Impact Reports). This site-specific information should be used to supplement, or in some cases supersede, the POCs identified through the methods described in this section. Any site-specific information used to identify additional POCs or remove a pollutant from being a presumed POC must be based on substantial evidence and justified in either the project's CEQA document and/or the project WQMP. Watershed planning documents previously developed by Orange County should also be reviewed for identification of specific implementation requirements that address POCs, where applicable.

7.II–2.4 Select Low Impact Development Best Management Practices

7.II–2.4.1 Introduction

BMPs are programs and policies, including structural controls that are implemented to control the discharge of pollutants. This Model WQMP describes LID BMPs, site design BMPs, hydromodification control BMPs, source control BMPs and treatment control BMPs.

Using the information compiled above, the following steps must be taken to determine what performance criteria apply to the project: 1) LID, 2) treatment control, and 3) hydromodification control. These performance criteria are evaluated individually although they can be interrelated. It is possible to meet one and not meet the others. This is synonymous with "performance standard" as used by other guidance documents, but only "performance criteria" is used in this document.

Several steps must be followed in order to determine what performance criteria will apply to a project. These steps include:

1. Determining if the project is an above ground linear lined drainage facility. If the project is an above ground linear lined drainage facility, then follow alternative compliance requirements, by incorporating US EPA guidance "Managing Wet Weather with Green Infrastructure: Green Streets." Refer to **Appendix B** of this document for the EPA guidance and **TGD Section 2.4.1** for additional technical information.
2. Determining site design and LID performance criteria.
3. Determining treatment control BMP performance criteria.
4. Calculating the LID design storm capture volume.
5. Determining hydromodification control performance criteria.

6. Completing the LID BMP selection process.

Once the performance criteria have been established, the next step is to develop and select site design practices and on-site LID BMPs and hydromodification control BMPs based on these project-specific criteria.

7.II–2.4.2 Determine Performance Criteria

7.II-2.4.2.1 Determine if the Project is an Above Ground Linear Lined Drainage Facility

If the proposed project is a public agency project that is an above ground linear lined drainage facility, the project shall incorporate USEPA guidance, "Managing Wet Weather with Green Infrastructure: Green Streets"(see **Appendix B**) in a manner consistent with the MEP standard. Separate compliance requirements for these projects are discussed in **TGD Section 2.7**.

Public agency street projects that meet criteria to be considered a Priority Development Project may employ a "green street "design approach, however, these projects must demonstrate that they meet the full LID and hydromodification standards applicable to the remaining categories of Priority Development Projects as described in Section 2.4.2.2 and 2.4.3 of this Model WQMP.

7.II–2.4.2.2 Determine Hydromodification Performance Criteria

Hydromodification criteria are applicable to all Priority Development Projects, except those that discharge to an exempt receiving water. **Appendix C** identifies the hydromodification control criteria that are currently applicable in South Orange County, and includes technical guidance for addressing these criteria (within **Appendix C** and/or by reference from **Appendix C**).

7.II-2.4.3 Determine LID and Treatment Control BMP Performance Criteria

The following performance criteria for LID implementation are stated in the South Orange County MS4 Permit:

- Priority Development Projects must infiltrate, harvest and use, evapotranspire, or biofilter, the 85th percentile, 24-hour storm event (Design Capture Volume).
- A properly designed biofiltration system may only be considered if infiltration, harvest and use, and evapotranspiration (ET) cannot be feasibly implemented for the full design capture volume. In this case, infiltration, harvest and use, and ET practices must be implemented to the greatest extent feasible and biofiltration may be provided for the remaining design capture volume.

A diversity of controls must be provided, where feasible, to achieve the greatest feasible retention of the Design Capture Volume, then if necessary, biofiltration of the remaining design capture volume.

The Design Capture Storm Depth is the 85th percentile, 24-hr storm depth that, when applied to the project site, results in runoff equal to the Design Capture Volume (DCV). The design capture storm depth varies across the County and is shown in **TGD Exhibit XVI-1**. The TGD provides information for determining the applicable "design capture

storm depth" to apply to a project to calculate design capture volume as well as guidance for recommended hydrologic methods.

Equivalent LID performance criteria have been synthesized from the permit requirements with consideration of the MEP standard and analysis of local precipitation and ET patterns. The following performance criteria result in capture and retention and/or biofiltration of 80 percent of average annual stormwater runoff volume. The performance criteria for LID are stated as follows:

- LID BMPs must be designed to retain (infiltrate, harvest and use, or evapotranspire), on-site, stormwater runoff up to 80 percent average annual capture efficiency.
- LID BMPs must be designed to:
  - Retain (infiltrate, harvest and use, or evapotranspire), on-site, stormwater runoff as feasible up to the Design Capture Volume; and
  - Recover (i.e., draw down) the storage volume as soon as possible after a storm event (see criteria for maximizing drawdown rate in the **TGD Appendix XI**); and, if necessary,
  - Biofilter, on-site, additional runoff, as feasible, up to 80 percent average annual capture efficiency (cumulative, retention plus biofiltration); and, if necessary
  - Fulfill alternative compliance obligations for runoff volume not retained or biofiltered up to 80 percent average annual capture efficiency using treatment controls or other alternative approaches as described in Section 7.II-3.

Where a project can retain the DCV and drain this volume in less than or equal to 48 hours following the end rainfall, the system is considered to achieve 80 percent capture, as described in the **TGD, Appendix III**.

When biofiltration is used, the volume provided in the pre-filter detention volume (surface storage) and pores of biofiltration BMPs may not be less than 75 percent of the remaining DCV, regardless of the average annual capture efficiency achieved. The pre-filter volume criterion is not applicable to infiltration systems. Further discussion on determining the pre-filter detention volume and calculating BMP sizing to meet these criteria are provided in the **TGD** and the **TGD Appendix II and III**.

7.II–2.4.3.1 Selecting LID BMPs

The South County Permit stresses the importance of project planning and design utilizing the principles of LID. The use of LID BMPs is intended to reduce the discharge of pollutants and the effects of changes to runoff patterns caused by land use modifications. Permit requirements for Priority Development Projects must be met through the use of structural and non-structural BMPs, with foremost consideration given to LID BMPs.

The primary goal of using LID BMPs is to preserve a site's predevelopment hydrology in order to preserve the integrity of receiving water bodies. The adverse effects of changes to runoff patterns and pollutant loading on receiving water bodies caused by

land use modifications can be reduced through the use of structural and non-structural techniques that store, infiltrate, evaporate, and detain runoff. Predevelopment is defined as the naturally occurring (pre-human disturbance) conditions.

The South County Permit contains requirements to implement LID practices in order to address the impacts of hydromodification and pollution of stormwater runoff from a Priority Development Project on the physical, chemical, and biological integrity of receiving waters.

A list of LID BMPs is shown in **Table 7.II–3**. Specific details and fact sheets for each BMP are provided in **TGD Sections 4 and TGD Appendix XIV**.

Table 7.II-3: LID BMPs by Category

Infiltration	ET and Evaporation	Harvest and Use	Biofiltration[1]
➢ Infiltration Trenches ➢ Infiltration Basins ➢ Bioretention Without Underdrains ➢ Bioinfiltration ➢ Drywells ➢ Permeable Pavement ➢ Proprietary Infiltration	➢Green Roofs ➢Brown Roofs ➢Blue Roofs	➢Cisterns ➢Underground Detention ➢Irrigation Use ➢Domestic Use	➢Bioretention With Underdrains ➢Stormwater Planter Boxes With Underdrains ➢Proprietary Biofiltration Systems meeting Permit definition of biofilter (see Footnote 1)

The TGD defines an additional category of LID BMPs called "Hydrologic Source Controls (HSCs)" that may be used as part of compliance with LID requirements via quantitative approaches defined in the TGD, including:

- Localized on-lot infiltration,
- Impervious area dispersion (e.g. roof top disconnection),
- Street trees(canopy interception),
- Residential rain barrels (not actively managed),
- Green roofs/ brown roofs,
- Blue roofs, and

[1] When biofiltration is used, the volume provided in the pre-filter detention volume (surface storage) and pores of biofiltration BMPs may not be less than 75 percent of the remaining design capture volume, regardless of the average annual capture efficiency achieved. Further discussion on determining the pre-filter detention volume and calculating BMP sizing to meet these criteria are provided in the TGD and the TGD Appendix II and III.

- Impervious area reduction (permeable pavers, site design).

Additionally, the following treatment control and pre-treatment BMPs may be used, as applicable, however these BMPs do not meet LID requirements:

- Constructed wetlands,
- Vegetated swales,
- Vegetated filter strips,
- Dry extended detention basins,
- Wet extended detention basins,
- Proprietary biotreatment (except when designed to meet pre-filter detention volume criteria defined in Footnote 1),
- Media filters (sand filters), and
- Hydrodynamic separators and catch basin inserts.

While requirements for LID BMPs, treatment control BMPs, and hydromodification control are stated independently in the Permit, and Priority Development Projects must demonstrate compliance with each requirement individually, the requirements overlap significantly and some management practices may fulfill or partially fulfill one or more requirements. The LID and treatment control requirements are especially interrelated because full compliance with LID requirements onsite inherently results in compliance with treatment control requirements. LID and hydromodification control requirements are also interrelated as both are based on reduction of runoff volume as their first priority. However, meeting the performance criteria for either LID BMPs or hydromodification control BMPs does not imply that the performance criteria for the other has category been met. As a result, a project that has HCOCs will need to document that it has met the performance criteria for both categories of BMPs.

The steps involved in selecting LID practices are described in more detail in the following subsections. A flow chart of the key steps and decisions required for selecting LID BMPs is shown in **Figure 7.II-7** for projects where there is no potential for HCOCs and **Figure 7.II-8** for Projects which must consider HCOCs**.** The TGD expands on these steps and provides specific instructions for selecting, designing, and documenting the use of LID practices. Where BMP fact sheets in the TGD specify selection and/or design criteria, the applicable selection and/or design criteria must be used. The **TGD Section 2.4.2** discusses the process of selecting, locating, and sizing LID BMPs and also provides specific LID design criteria and a process that must be followed to determine if it is feasible to incorporate LID BMPs. The feasibility analysis will provide the basis for documenting project and site conditions under which it is not feasible to fully meet the LID BMP performance criteria leading to use of an alternative strategy as discussed further in **Section 7.II-3.0**.

7.II–2.4.3.2 LID Practices Implemented on a Regional or Sub-Regional Basis

While most of the LID practices and LID BMPs described in this Model WQMP are focused at an individual project level, it may be most appropriate to implement LID BMPs beyond the boundaries of the specific development being proposed on a broader

scale: (1) regional (several developments within the same watershed); or (2) sub-regional (multiple adjacent developments within the same watershed) for certain development conditions. There could be multiple benefits and/or constraining factors, including, but not limited to, smart growth goals, water conservation and groundwater recharge benefits soil conditions, groundwater levels, soil and/or groundwater contaminants, space restrictions or redevelopment opportunities and economic considerations.

Where a development project greater than 100 acres in total project size, or smaller than 100 acres in size yet part of a larger common plan of development that is over 100 acres, has been prepared using watershed and/or sub-watershed based water quality, hydrologic, and fluvial geomorphologic planning principles that implement regional LID BMPs in accordance with the sizing and location criteria of the South County Permit and acceptable to the Regional Board, such standards shall govern review of projects and shall be deemed to satisfy the South County Permit's requirements for LID site design, buffer zone, infiltration and groundwater protection standards, source control, treatment control, and hydromodification control standards. Regional BMPs must clearly exhibit that they will not result in a net impact from pollutant loadings over and above the impact caused by capture and retention of the design storm with on-site LID BMPs.

For Priority Development Projects that do not meet the criteria in the previous paragraph, compliance with LID using sub-regional or regional (off-site) BMPs is considered Alternative Compliance and requires that an request for waiver of on-site LID BMPs first be prepared before participating in a sub-regional/regional LID solution. Additional Alternative Compliance information can be found in **Section 7.II-3.0**, and details concerning on-site LID BMP waivers can be found in **Section 7.II-3.1**.

Figure 7.II-5: Design the Site Incorporating LID BMPs – Without HCOCs

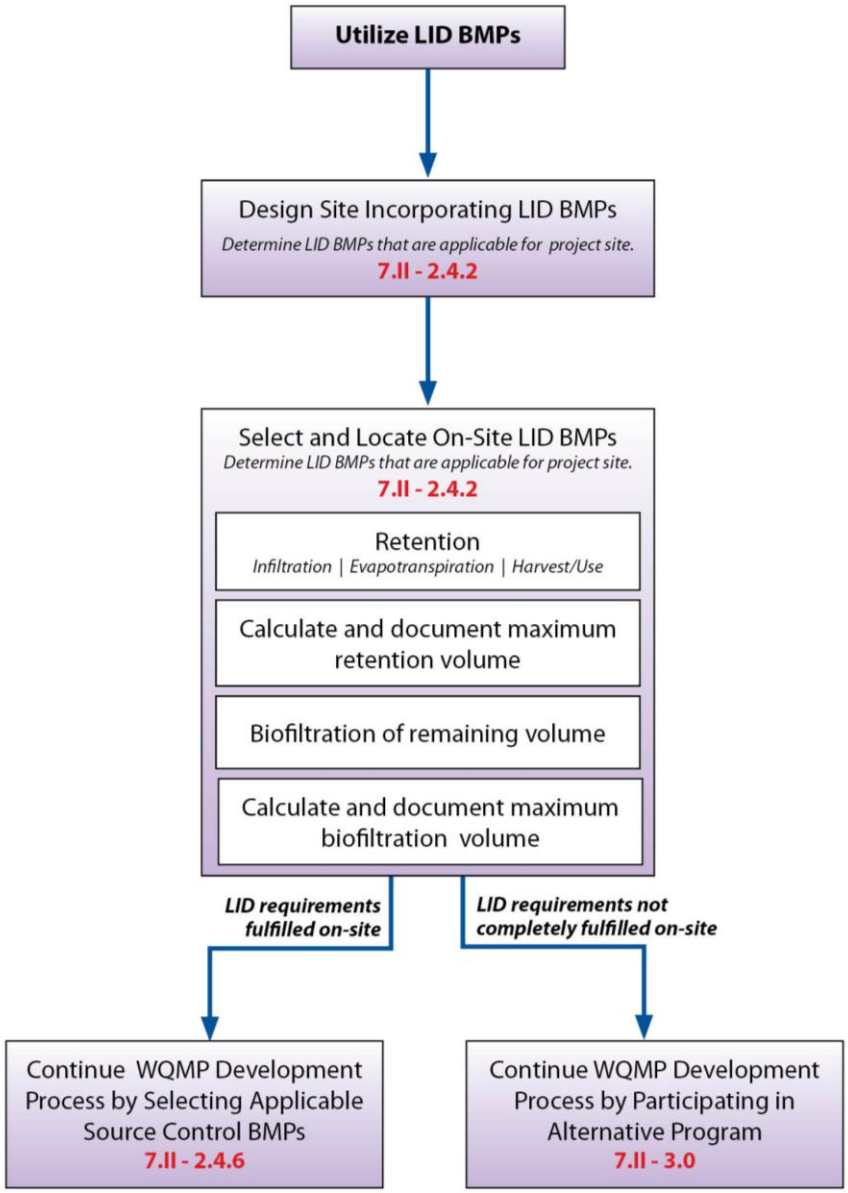

Note: Model WQMP sections shown in red

Figure 7.II-6: Design the Site Incorporating LID BMPs – With Potential HCOCs

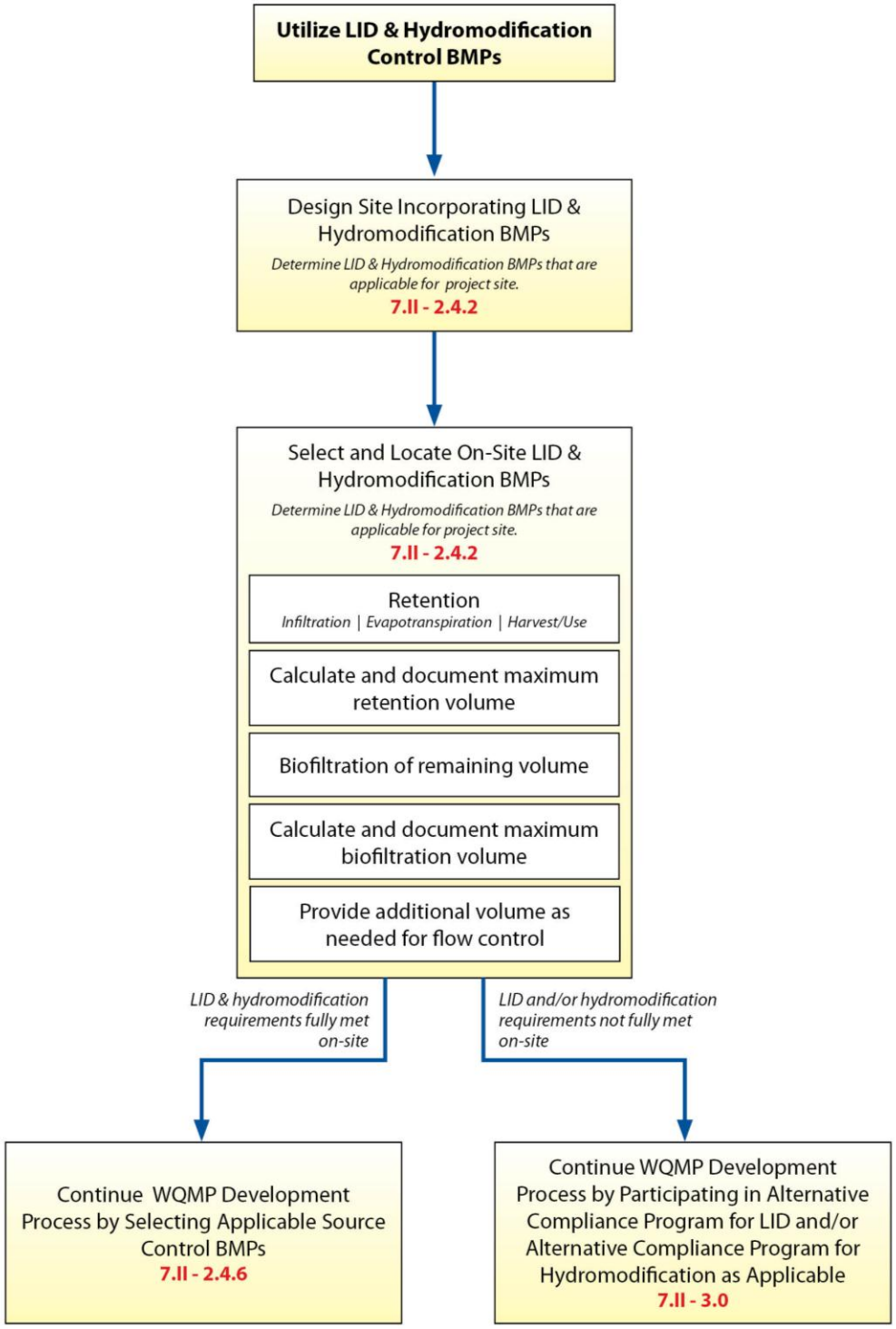

Note: Model WQMP sections shown in red

7.II–2.4.4 Site Design BMPs

LID site design practices include a wide range of potential practices that can be implemented to reduce the volume of stormwater runoff generated on a project site as well as improve the quality of runoff that leaves the site and help avoid downstream hydromodification impacts. LID site design is predominantly "preventative" in nature as it consists of practices that reduce the amount of runoff and other impacts before, or immediately after, they occur. Examples of "preventative" aspects of LID site design include reduction of impervious area, preservation of drainage courses, and restoration of impacted soils. Descriptions of the most common site design practices are provided in **TGD Section 2.4.2**.

There are no numeric performance criteria for site design practices, however, LID site design should be considered as the first priority in the hierarchy of LID implementation, beginning with the earliest phases of a project. The use of effective site design practices can result in a reduction in the volume of stormwater runoff that must be retained, a reduction of the design capture volume, and the related reduction in the size of structural treatment BMPs than if site design practices are not used. Allocating space for BMPs in the site design at the earliest phases of the project planning process can allow projects to more easily satisfy numeric performance criteria.

On-site LID practices that should be considered include, but are not limited to, the following:

- Maximize Natural Infiltration Capacity and Groundwater Recharge (where appropriate),
- Preserve Existing Drainage Patterns and Time of Concentration,
- Protect Existing Vegetation and Sensitive Areas,
- Minimize Impervious Area,
- Disconnect Impervious Areas,
- Minimize Construction Footprint, and
- Re-vegetate Disturbed Areas.

Each of these techniques is described further in the **TGD Section 3**. Certain site design practices are referred to as HSCs, and can be counted toward LID performance criteria. These HSC are described in **TGD Section 4** and **TGD Appendix XIV**.

In addition, where hydromodification criteria apply, site design activities should include identification and preservation of areas of coarse sediment supply. More technical guidance on managing coarse sediment supply can be found in **Appendix C** (or by reference from **Appendix C**).

7.II–2.4.5 Hydromodification Control BMPs

All projects must address hydromodification unless they are identified as exempt under the applicable criteria that apply to the project. Applicable hydromodification control criteria and exempt categories are defined in **Appendix C** (or by reference from **Appendix C**). It may be beneficial to a PDP to use volume retention (i.e. LID BMPs) to

meet the hydromodification requirements, however detention-based BMPs can also be used. LID BMPs may partially or fully satisfy the requirements to address hydromodification. Additional retention and/or flow control volume may be required to fully satisfy hydromodification criteria. This may require adaptation of typical LID or treatment control BMP designs, such as through the addition of detention volume and a flow control outlet structure.

7.II–2.4.6 Source Control BMPs

Source Control BMPs reduce the potential for stormwater runoff and pollutants from coming into contact with one another. Source Control BMPs are defined as any administrative action, design of a structural facility, usage of alternative materials, and operation, maintenance, inspection, and compliance of an area that aims to eliminate or reduce stormwater pollution. This Model WQMP categorizes Source Control BMPs as either Structural or Non-Structural Source Control BMPs.

Source Control BMPs are required within all Priority Development Projects unless they do not apply due to the project characteristics.

The following list of Structural and Non-Structural Source Control BMPs are numbered for purposes of the Orange County Stormwater Program and Model WQMP, followed by a cross-reference for the CASQA BMP Handbook reference number in parenthesis, where applicable, for general guidance for implementing the BMPs that apply to the project. Additional information for each BMP is contained within **TGD Section 6**. Where BMP fact sheets in the TGD specify selection and/or design criteria, the applicable selection and/or design criteria must be used.

7.II–2.4.6.1 Structural Source Control BMPs

- S1 Provide Storm Drain System Stenciling and Signage (CASQA BMP Handbook SD-13)
- S2 Design Outdoor Hazardous Material Storage Areas to Reduce Pollutant Introduction (CASQA BMP Handbook SD-34)
- S3 Design Trash Enclosures to Reduce Pollutant Introduction (CASQA BMP Handbook SD-32)
- S4 Use Efficient Irrigation Systems and Landscape Design (CASQA BMP Handbook SD-12)
- S5 Protect Slopes and Channels
- S6 Loading Dock Areas (CASQA BMP Handbook SD-31)
- S7 Maintenance Bays and Docks (CASQA BMP Handbook SD-31)
- S8 Vehicle Wash Areas (CASQA BMP Handbook SD-33)
- S9 Outdoor Processing Areas (CASQA BMP Handbook SD-36)
- S10 Equipment Wash Areas
- S11 Fueling Areas (CASQA BMP Handbook SD-30)

- S12 Site Design and Landscape Planning (Hillside Landscaping) (CASQA BMP Handbook SD-10)
- S13 Wash Water Controls for Food Preparation Areas
- S14 Community Car Wash Racks

7.II–2.4.6.2 Non- Structural Source Control BMPs

- N1 Education for Property Owners, Tenants and Occupants
- N2 Activity Restrictions
- N3 Common Area Landscape Management (CASQA BMP Handbook SC-73)
- N4 BMP Maintenance
- N5 Title 22 CCR Compliance
- N6 Local Water Quality Permit Compliance
- N7 Spill Contingency Plan (CASQA BMP Handbook SC-11)
- N8 Underground Storage Tank Compliance
- N9 Hazardous Materials Disclosure Compliance
- N10 Uniform Fire Code Implementation
- N11 Common Area Litter Control (CASQA BMP Handbook SC-60)
- N12 Employee Training
- N13 Housekeeping of Loading Docks (CASQA BMP Handbook SD-31)
- N14 Common Area Catch Basin Inspection (CASQA BMP Handbook SC-74)
- N15 Street Sweeping Private Streets and Parking Lots (CASQA BMP Handbook SC-43, SC-70)

7.II–2.4.6.3 Non-Structural Source Control Measures for Public Agency Projects

In addition to the above list of non-structural source control measures that apply to all projects, when Public Agency Priority Development Projects are completed, the source control measures and maintenance measures described in **DAMP Section 5**, Municipal Activities, shall be implemented to maintain the projects.

7.II–3.0 Alternative Compliance Approaches for LID

Note: This section comprises the LID BMP Waiver Program as required per F.1.d.(7) of the South Orange County Permit until it is superseded in whole or part by a separate or supplemental Waiver Program developed by the copermittees, collectively or individually, at a future point in time.

Note: This section does not consider alternative compliance for hydromodification control. For alternative compliance for hydromodification control, if available, refer to ***Appendix C*** *(and any supporting documents referenced from* ***Appendix C****).*

This section describes alternative compliance approaches for LID criteria for proposed projects that are not able to fully capture and infiltrate, harvest and use, or biofilter the design capture volume in one of the following ways:

- Using a combination of site design and on-site LID BMPs.
- Development projects greater than 100 acres in total project size or smaller than 100 acres in size yet part of a larger common plan of development that is over 100 acres, that have been prepared using watershed and/or sub-watershed based water quality, hydrologic, and fluvial geomorphologic planning principles that implement regional LID BMPs consistent with an approved watershed scale approach (See Section 7.II–2.4.3.2).

If it is demonstrated to be technically infeasible meet the LID requirements summarized above, a request for waiver of on-site LID requirements must be submitted by the project proponent. Waivers are discussed in **Section 7-II-3.1.** As part of the waiver program, an alternative compliance plan must be developed to address the remainder of the pollutants borne in the design capture volume that is not treated using LID BMPs either on or off site. The Project WQMP must demonstrate that the alternative compliance plan will not result in a net impact (after consideration of treatment control BMPs, mitigation, and in-lieu payments) from pollutant loadings over and above the impacts caused by projects meeting the LID requirements.

Some projects may qualify for Water Quality Credits that can be applied to reduce or fully satisfy the remaining design capture volume that must be treated before evaluating alternative approaches. Water Quality Credits are discussed in **Section 7.II-3.2**.

After adjusting the remaining obligations to account for water quality credits, if applicable, alternative compliance plans may include one or more of the following elements:

- Implement regional/sub-regional LID solutions, if feasible, following the LID selection hierarchy (i.e., retain then biofilter) for the remaining design capture volume.
- Implement on-site structural treatment controls (treatment control BMPs) for the remaining design capture volume, and implement one or more of the following approaches to mitigate for pollutant loads associated with the remaining DCV not removed via treatment control BMPs:
    - Implement an off-site mitigation project, and/or

- Contribute to a stormwater mitigation fund.

A flow chart illustrating the key steps for developing an alternative compliance plan approach for the SOC Permit Area is shown in **Figure 7.II-7.** The following sections describe the elements of an alternative compliance plan in greater detail, including Waivers, Water Quality Credits, Treatment Control BMPs, Urban Runoff Funds / Mitigation Programs, and Off-Site Mitigation.

Figure 7.II-7: Alternative Program Flow Chart for South Orange County

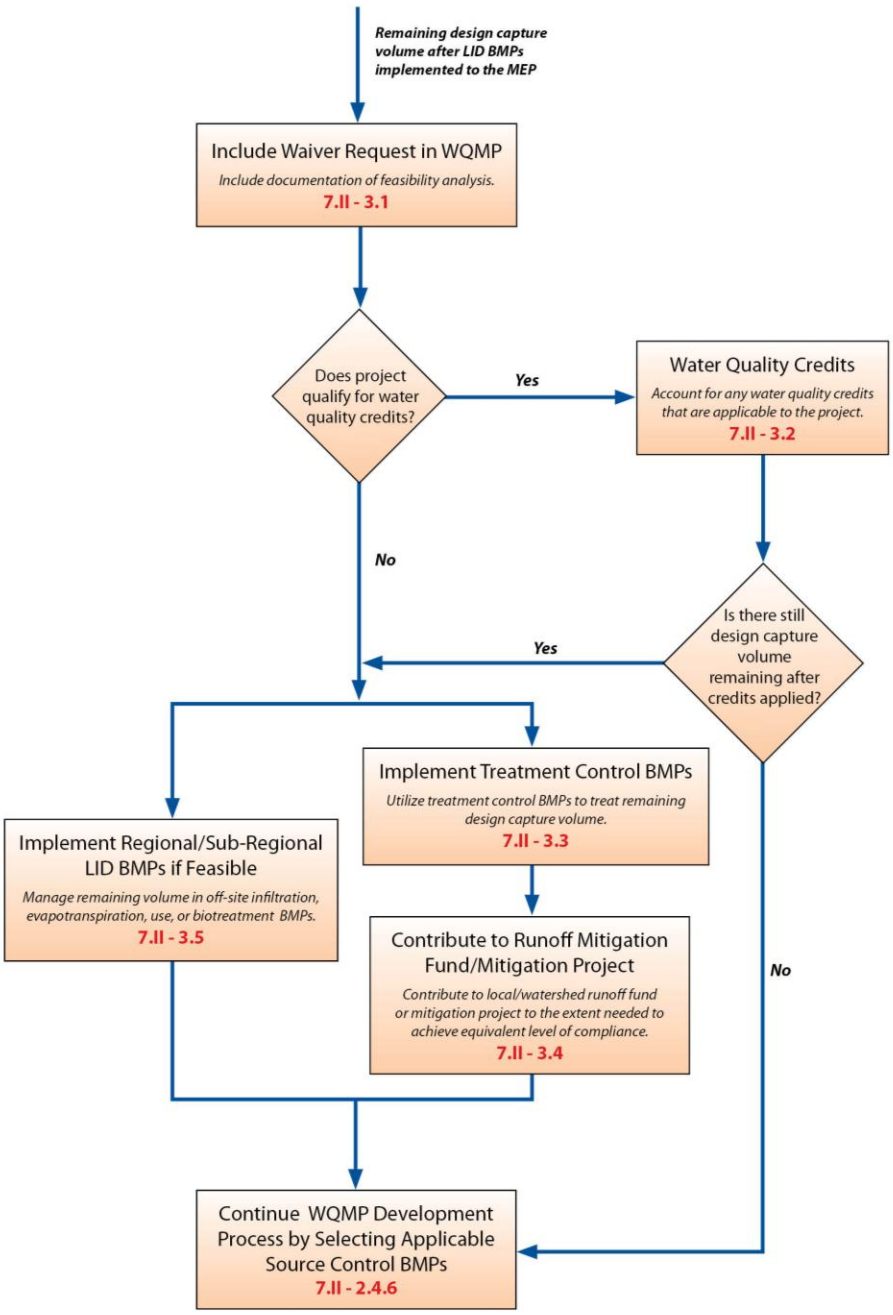

Note: Model WQMP sections shown in red

7.II–3.1 Waivers

For project proponents in the SOC Permit Area, a Waiver Request is required if it is technically infeasible to completely satisfy LID requirements through the implementation of on-site LID BMPs.

Permittees in South Orange County must develop, collectively or individually, a LID Waiver Program for incorporation into local SSMPs meeting the requirements of Section d(7) of the permit. A waiver application for an alternative compliance plan in accordance with the adopted program must be submitted for Permittee approval for each project, which will be reported to the San Diego Regional Water Quality Control Board within the Permittee's annual stormwater program report.

[Note: Section 7.II-3.0 of this Model WQMP comprises the LID BMP Waiver Program as required per F.1.d.(7) of the South Orange County Permit until it is superseded in whole or part by a separate or supplemental Waiver Program developed by the copermittees, collectively or individually, at a future point in time.]

Each local jurisdiction is to use the feasibility criteria described in **TGD Section 2.4.2** to evaluate if Waiver Requests have adequately documented infeasibility. Each jurisdiction will identify in its Local Implementation Plan (LIP) or Jurisdictional Urban Runoff Management Plan the individual(s) or position(s) that is (are) authorized to review and approve Waivers.

Project proponents that have been granted a waiver must comply with requirements for the alternative compliance plan proposed by the Project Proponent and approved by the Permittee for the proposed project to mitigate potential negative impacts on the watershed due to the infeasibility of fully implementing LID BMPs.

7.II–3.2 Water Quality Credits

7.II–3.2.1 Type of Project Potentially Qualifying for Water Quality Credits

For certain types of development projects, LID BMPs may be more difficult to incorporate due to the nature of the development, but the development practices may provide other environmental benefits to communities. For example, infiltration BMPs may not desirable for a Brownfield redevelopment site where infiltrated stormwater could cause an adverse impact to groundwater supply, but redevelopment of the site would be expected to have other environmental benefits such as accelerated site clean-up. Development in city centers, historic districts, or historic preservation areas often follows land-use patterns that existed before the introduction of the automobile and subsequent urban sprawl. New development or redevelopment in these areas is expected to follow those same patterns in order to be compatible with the surrounding area and thereby mimic many LID principles, while potentially reducing the number of vehicle miles traveled and associated water pollution. In addition, redevelopment projects could be implemented in a way that reduces the overall impervious footprint of the project site rather than increasing it.

Local jurisdictions may develop a water quality credit program that applies to certain types of development projects after they first evaluate the feasibility of meeting LID requirements on-site. In order to determine if a project falls into any of the following categories, local jurisdictions will use the descriptions provided below as well as

descriptions or definitions in local planning documents. If any of these descriptions or definitions is inadequate to determine a project's eligibility for credits, local jurisdictions will use published and generally accepted descriptions or definitions.

If it is not feasible to meet the requirements for on-site LID, project proponents for specific project types can apply credits that would reduce project obligations for selecting and sizing other treatment BMPs or participating in other alternative programs. Credits can be applied only as part of the LID Waiver Program.

Projects potentially eligible for consideration for credits include:

- Redevelopment projects that reduce the overall impervious footprint of the project site;
- Brownfield redevelopment, meaning redevelopment, expansion, or reuse of real property which may be complicated by the presence or potential presence of hazardous substances, pollutants or contaminants, and which have the potential to contribute to adverse ground or surface water quality if not redeveloped;
- Higher density development projects which include two distinct categories (credits can only be taken for one category):
  - Those with more than seven units per acre of development (lower credit allowance);
  - Vertical density developments, for example, those with a Floor to Area Ratio (FAR) of 2, or those having more than 18 units per acre (greater credit allowance);
- Mixed use development, such as a combination of residential, commercial, industrial, office, institutional, or other land uses which incorporate design principles that can demonstrate environmental benefits that would not be realized through single use projects (e.g., reduced vehicle trip traffic with the potential to reduce sources of water or air pollution);
- Transit-oriented developments, such as a mixed use residential or commercial area designed to maximize access to public transportation; similar to above criterion, but where the development center is within one half mile of a mass transit center (e.g., bus, rail, light rail or commuter train station). Such projects would not be able to take credit for both categories, but may have greater credit assigned;
- Redevelopment projects in an established historic district, historic preservation area, or similar significant city area including core City Center areas (to be defined through mapping);
- Developments with dedication of undeveloped portions to parks, preservation areas, and other pervious uses;
- Developments in a city center area;
- Developments in historic districts or historic preservation areas;

- Live-work developments, a variety of developments designed to support residential and vocational needs together – similar to criteria to mixed use development; would not be able to take credit for both categories; and
- Infill projects, the conversion of empty lots and other underused spaces into more beneficially used spaces, such as residential or commercial areas.

These categories address other types of alternative opportunities or compliance approaches that are described in other sections of this MWQMP. This provision does not exempt the project proponent from first conducting the investigations to determine if is feasible to fulfill the full LID, treatment control, and hydromodification requirements through a combination of site design practices and LID BMPs consistent with the permit hierarchy. These credits are not applicable to hydromodification requirements.

7.II–3.2.2 Applying Water Quality Credits to LID Performance Criteria

To determine the amount of credit a project would qualify for, the first step is to calculate the volume that would need to be satisfied in the absence of any credits as described in **Section 7.II-3.2**. Any credits would then be taken as a reduction to this remaining volume. The credits would be calculated in one of two ways:

- For redevelopment projects that reduce the overall impervious footprint of the project site compared to current use, the credits would be calculated as follows:
  - Calculate an equivalent "existing" Design Capture Volume for the site (DCV_E) using the LID BMP Performance Criteria defined in **Section 7.II-2.4.3** and current site conditions
  - Calculate the full Design Capture Volume for the site under the proposed development plan (DCV_p)
  - Subtract to obtain a "credit" volume: (DCV_E) - (DCV_p) = Credit Volume
- For all other categories of projects noted above, the remaining volume to be treated or mitigated would be reduced in accordance with the following portions of the original design capture volume :
  - Historic district, historic preservation area, or similar areas – 10 percent
  - Brownfield redevelopment – 25 percent
  - Higher density development
    - 7 units/acre – 5 percent
    - Vertical density – 20 percent
  - Mixed use development, transit oriented development or live-work development – 20 percent
  - Infill development – 10 percent

If more than one category applies to a particular project, the credit percentages would be additive up to a 50 percent reduction (50 percent reduction maximum). Applicable performance criteria depend on the number of LID water quality credits claimed by the

proposed project. The volume credit would be calculated as the original design capture volume of the proposed condition (before accounting for the retention and biofiltration achieved on-site) multiplied by the sum of the percentages claimed above. This credit (expressed as a volume) is subtracted from the proposed project's remaining alternative compliance obligations. If the credit volume exceeds the remaining volume that could not be provided in on-site LID, there are no further alternative compliance obligations.

7.II–3.3 Treatment Control BMPs

This section contains performance criteria for treatment control BMPs. Note that satisfaction of LID performance criteria also fully satisfies treatment control performance criteria, therefore this section is only applicable when the project cannot fully retain or biofilter the design capture volume, and must enter an alternative compliance program.

7.II–3.3.1 Determine Treatment Control BMP Water Quality Performance Criteria

This section contains performance criteria for treatment control BMPs when used as part of an alternative compliance plan.

If LID performance criteria have not been met through retention and biofiltration on-site or in a regional LID BMP (per criteria in Section 7.II-3.5), the Project shall participate in the LID Waiver Program (see **Section 7.II- 3.1**) and treatment control BMPs shall be provided prior to discharge to Waters of the US. Sizing of treatment control BMP(s) shall be based on either:

- The unmet volume as calculated in **TGD Appendix VI**. Treatment control sizing, or
- If no controls have been provided upstream of treatment control BMPs, permit-based sizing criteria may be used:
  - Capture and infiltrate, filter, or treat 80 percent of average annual runoff volume,

    OR
  - Capture and infiltrate, filter, or treat the runoff from the 24-hour, 85th percentile storm event, as determined from the County of Orange's 85th Percentile Precipitation Isopluvial Map and draw down the stored volume in no more than 48 hours following the end of precipitation,

    OR
  - Treat the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity, as determined from the local historical rainfall record, multiplied by a factor of two,

    OR
  - The maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event.

By default, treatment controls BMPs are located prior to discharge of runoff from the project site. However, treatment control BMPs can also be located at a sub-regional or regional scale, provided that they meet the applicable criteria described in Section 7.II-3.5.

7.II–3.3.2 Compute the Remaining Obligation after Applying Treatment Control BMPs

The alternative compliance obligations that must be provided through the LID Waiver Program (see **Section 7.II- 3.1**) shall be based on the difference between the pollutant load reduction achieved by the provided LID BMPs compared to the pollutant load reduction that would result from full implementation of LID BMPs for the design capture volume.

After applying treatment control BMPs, two options may be used to determine the amount of LID obligation that remains: 1) a volume-based like-for-like, equivalency determination, and (2) a quantitative pollutant-load-based equivalency calculation.

In the volume-based like-for-like, equivalency approach, the benefits of treatment control BMPs are not quantified. It is assumed that all remaining LID obligations will be met with an off-site mitigation program or urban runoff fund. The project proponent participates in an off-site mitigation program or urban runoff fund for the remaining volume not addressed by LID BMPs. Participation in these programs is based on treating an equivalent volume of runoff from like land uses with like pollutant loads.

In the quantitative, pollutant load-based equivalency approach, the pollutant load reduction achieved in treatment control BMPs that are provided per the criteria above may constitute all or part of this alternative compliance obligation. The pollutant load reduction that is not met through a combination of LID and treatment control must be provided via an off-site mitigation program or urban runoff fund such that the resulting discharge of pollutant loads is not greater than would have been achieved via full implementation of LID for the design capture volume. Equivalent loading calculations shall be based on the priority pollutant(s) of concern, if present. If no priority POCs exists, equivalent loading calculations shall be based on all POCs and the most stringent POC shall be used. Scientifically defensible information about BMP performance shall be used to calculate pollutant load reduction achieved in treatment control BMPs compared to full implementation of LID BMPs and assumptions and rationales shall be provided in the Project WQMP. Remaining obligations to be met via off-site mitigation projects or urban runoff funds shall be expressed in terms of pollutant loads that must be reduced.

7.II–3.4 Urban Runoff Funds / Mitigation Programs and Off-Site Mitigation Projects

7.II–3.4.1 Urban Runoff Funds / Mitigation Programs

For projects granted a LID BMP Waiver, participation in an urban runoff fund or mitigation program is an option for meeting remaining obligations, in combination with treatment control BMPs, as discussed in **Section 7.II-3.3**. Payment into an urban runoff fund or mitigation program can be used to address the runoff volume or pollutant load that is not addressed through LID BMPs or other alternative compliance options including treatment control BMPs described above. When an approved urban runoff fund or mitigation program is available, participation in the program is allowable as long as the net effectiveness of the alternative program is the same or better than that

which would have been achieved with on-site compliance. The following section describes a general basis and criteria for developing such programs. However, a specific program with established quantitative criteria and cost basis has not been established. It is expected that the Permittees will develop a specific program and submit this to the Executive Officer for future review and approval to allow specific projects to use this approach.

Payment into a runoff fund or mitigation program is an alternative to off-site mitigation, but must include implementing on-site treatment controls.

The amount of the contribution will be based on the unmet difference between the pollutant load reduction that would be achieved through full compliance with on-site LID BMPs and the actual pollutant load reduction that can be achieved through the combination of LID practices and treatment control BMPs that can be incorporated in the project. The basis for determining the "value" of the contribution will be determined by additional future studies by the Permittees.

The urban runoff fund or mitigation fund must be expended for water quality improvement or other related projects. Examples of projects eligible for funding through an urban runoff/mitigation fund include, but are not limited to:

- Green street projects
- Projects which retrofit of existing development areas with LID and other BMPs to reduce existing pollutant loads
- Retrofit incentive programs
- Regional BMPs/Sub-Regional BMPs
- Stream restoration
- Projects which promote groundwater recharge to increase water supplies
- Other mitigation projects proposed by Permittees

7.II–3.4.2 Off-Site Mitigation Projects

For projects granted a LID BMP Waiver, an off-site mitigation project or alternative pollutant-reducing project may be considered to meet remaining obligations after claiming applicable water quality credits and providing treatment control BMPs. The project is not required to be upstream from the off-site mitigation, but the off-site mitigation must be implemented within the same hydrologic subarea as the proposed project. Off-site mitigation projects outside of the hydrologic subarea but within the same hydrologic unit may be developed for Permittee approval provided that the project proponent demonstrates that mitigation projects within the same hydrologic subarea are infeasible and that the mitigation project will address similar beneficial use impacts as expected from the proposed project's pollutant load types and amount. Off-site project BMPs should be located as close as possible to the project site and should generally address a similar mix of land uses to that proposed by the project. The off-site project shall not be located within waters of the US and it shall be demonstrated that equivalent pollutant removal is accomplished prior to discharge to waters of the US. Off-site mitigation projects may demonstrate equivalent pollutant load reduction using a

volume-based approach when treating a like land use, or via a quantitative pollutant load-based equivalency approach when addressing a different land use type, as discussed in **Section 7.II–3.3.2.** Off-site mitigation projects may include, but are not limited to:

- Green streets projects
- Existing development retrofit projects
- Retrofit incentive programs
- Regional BMPs
- Groundwater recharge programs
- Stream restoration

Other off-site mitigation techniques may be proposed to the Permittee for review and approval.

7.II–3.5 Use of Sub-Regional or Regional BMPs as Part of Alternative Compliance

Where it is not feasible to provide LID BMPs for the entire design capture volume on-site and the project has submitted a waiver request, sub-regional or regional LID BMPs can be proposed as an alternative compliance approach for the remaining design capture volume. These types of BMPs are based on the LID principles of stormwater retention or biofiltration, but are located beyond the boundaries of the specific development project, and may address several developments within the same watershed or multiple adjacent developments within the same watershed. A sub-regional LID BMP, selected per the LID selection hierarchy described in Section 7.II-2.4.3 and with capacity allocated for the remaining design capture volume from a project, fully meets alternative compliance obligations for the project.

The potential availability of regional or sub-regional LID BMP opportunities could be identified as part of a planning process undertaken by the appropriate jurisdictions and project proponents. For this approach to be considered, the Project WQMP or an associated planning document must demonstrate that regional LID BMP will meet the following criteria:

- The sub-regional/regional BMP is located such that the project would drain to the BMP prior to discharge to a Waters of the US, the net pollutant removal load within the watershed is equivalent to what would be accomplished on-site, or would not impair the beneficial uses of Waters of the US.
- The sub-regional/regional BMP is sufficiently sized to treat stormwater runoff from its tributary area, to the extent needed to address volume that is not met on-site.
- The sub-regional/regional BMP is sited and designed such that it will provide equal or greater overall pollutant load reduction than would be achieved by LID BMPs on-site as described in **TGD Section 2.4.3**.

- The sub-regional/regional BMP will be adequately maintained for the life of the project and the sub-regional/regional BMP will be constructed and operational to serve the project prior to certification of occupancy for the project.

A sub-regional or regional BMP opportunity that meets all of the above criteria, but is a treatment control BMP rather than an LID BMP, may be constructed to address the treatment control criteria described in Section **7.II-3.3**, but may not fully address the remaining LID obligations, unless demonstrated to be equivalent to the treatment provided in LID BMPs via pollutant load calculations.

7.II–4.0 BMP Maintenance Requirements

A BMP Operation and Maintenance (O&M) Plan must be prepared as part of the Project WQMP (see **DAMP Section 7.6.6**) and a mechanism must be in place that will ensure ongoing long-term maintenance of all structural BMPs. This mechanism may be provided either through the local jurisdiction under a maintenance agreement or other mechanism, or by the project proponent as further described herein. As part of project review, if a project proponent is required to include interim or permanent structural BMPs in project plans, and if the local jurisdiction does not provide a mechanism for BMP maintenance, the local jurisdiction shall require that the applicant describe an approach to implement and maintain all BMPs included in approved Project WQMP through such means as may be appropriate, at the discretion of the local jurisdiction, including, but not limited to covenants, legal agreements, maintenance agreements, conditional use permits and/or funding arrangements.

7.II–4.1 Maintenance Mechanisms

The following are alternative mechanisms that may be used to provide on-going maintenance for the BMPs included in the approved Project WQMP.

- **Public entity maintenance**: The local jurisdiction with the responsibility for WQMP approval may approve a WQMP that identifies a public or acceptable quasi-public entity (e.g., the City, the County, or County Flood Control District, an existing assessment district, an existing utility district, or a conservation conservancy) as assuming responsibility for operation, maintenance, repair and replacement of the BMP. Unless otherwise acceptable to individual local agencies, public entity maintenance agreements shall ensure estimated costs are front-funded or reliably guaranteed, (e.g., through a trust fund, assessment district fees, bond, letter of credit or similar means). In addition, the local jurisdictions may seek protection from liability by appropriate releases and indemnities.

  The Project Proponent must demonstrate that it will transfer the BMP maintenance to another public entity subject to the following provisions. The Project Proponent will negotiate maintenance requirements with the entity that it is proposing to accept maintenance responsibilities within its jurisdiction; and negotiate with the resource agencies responsible for issuing permits for the construction and/or maintenance of the facilities. If necessary, the public entity will also demonstrate through the CEQA review or the public entity's public review process that it can accept the maintenance responsibility. If a public entity is named as the responsible maintenance entity, then the local jurisdiction must include that entity in its CEQA review process as a Responsible Agency where applicable. The local jurisdiction must be identified as a third party beneficiary empowered to enforce any such maintenance agreement within their respective jurisdictions.

- **Project proponent agreement to maintain stormwater BMPs**: The local jurisdiction may enter into a contract with the project proponent obliging the project proponent to maintain, repair and replace the stormwater BMP as

necessary into perpetuity. Security or a funding mechanism with a "no sunset" clause may be required.

- **Assessment districts**: The local jurisdiction may approve an Assessment District or other funding mechanism created by the project proponent to provide funds for stormwater BMP maintenance, repair and replacement on an ongoing basis. Any agreement with such a District shall be subject to the Public Entity Maintenance Provisions above.
- **Lease provisions**: In those cases where the local jurisdiction holds title to the land in question, and the land is being leased to another party for private or public use, the local jurisdiction may assure stormwater BMP maintenance, repair and replacement through conditions in the lease.
- **Conditional use permits**: For discretionary projects only, the local jurisdiction may assure maintenance of stormwater BMPs through the inclusion of maintenance conditions in the conditional use permit. Security may be required. Some jurisdictions include requirements to implement approved WQMPs in their municipal code.
- **Alternative mechanisms**: The local jurisdiction may accept alternative maintenance mechanisms if such mechanisms are as protective as those listed above.

7.II–4.2 Maintenance Requirements

7.II–4.2.1 O&M Plan

An Operation and Maintenance Plan for the BMPs will be prepared and included as Section 5 of the final Project WQMP. The local jurisdiction shall ensure that the O&M plan, prepared by the project proponent satisfactory to the agency, is received prior to permit closeout and the issuance of certificates of use and occupancy. The O&M Plan describes the designated responsible party to manage the stormwater BMP(s), employee's training program and duties, operating schedule, maintenance frequency, routine service schedule, specific maintenance activities, copies of resource agency permits, and any other necessary activities.

The final Project WQMP shall require the project proponent or approved maintenance entity to complete and maintain O&M forms to document all maintenance requirements. Parties responsible for the O&M plan shall retain records for at least 5 years. These documents shall be made available to the local jurisdiction for inspection upon request at any time.

7.II–4.2.2 O&M Commitments

At a minimum, the final Project WQMP shall require the inspection and servicing of all structural BMPs on an annual basis.

As part of the maintenance mechanism selected above, the local jurisdiction shall require the inclusion of a copy of an executed access easement within the final Project WQMP that shall be binding on the land throughout the life of the project, until such time that the stormwater BMP requiring access is replaced, satisfactory to the local agency.

7.II–4.3 Permit Closeout Requirements

For discretionary projects, the method approved by local jurisdiction for stormwater BMP maintenance shall be incorporated into the project's permit, and shall be consistent with permits issued by resource agencies, if any. Just as with all other aspects of a project's approved plans and designs, the local authority will make a determination that all requirements of the Project WQMP have been satisfactorily completed prior to close-out of permits and issuance of certificates of use and occupancy (see **DAMP Section 7.6.6**).

For projects requiring only ministerial permits, the method approved by local jurisdiction for stormwater BMP maintenance shall be shown on the project plans before the issuance of any ministerial permits. Verification will occur similar to discretionary projects.

In all instances, the project proponent shall provide proof of execution of a method approved by local jurisdiction for maintenance, repair, and replacement (O&M Plan – See **DAMP Section 5.3**) before the issuance of construction approvals, permit closeout and issuance of certificates of use and occupancy. For all properties, the verification mechanism includes the project proponent's signed statement, as part of the Project WQMP, accepting responsibility for all structural BMP maintenance, repair and replacement or agreeing to an alternative mechanism that is approved by the local authority regarding maintenance, repair and replacement of the structural BMP. Local authorities implementing public projects that are not required to obtain permits shall be responsible for ensuring that stormwater BMP maintenance, repair and replacement requirements are identified prior to the completion of construction and incorporated into the agency's Municipal Activities Program under the DAMP.

7.II–5.0 WQMP Preparation and Approval

The preceding sections describe the requirements and process for developing site design; selecting the appropriate LID BMPs, other BMPs, and/or identifying other compliance approaches; and identifying the BMP maintenance requirements for Priority Development Projects. This section describes the process for documenting this information in a Conceptual or Preliminary WQMP and/or Project WQMP and for submitting and obtaining approval of the Project WQMP.

Project proponents are strongly encouraged to incorporate LID and hydromodification control BMPs at the earliest conceptual planning stages of a project for early review, to potentially avoid necessary project changes and delays during the subsequent review and approval process. For all projects requiring discretionary or land use entitlement actions, a Conceptual or Preliminary WQMP should be submitted as part of the application for project approval during the environmental review phase (CEQA) and must be submitted prior to relevant project-level approval of entitlements and Planning Commission approval of a project or other public hearing.

The local jurisdiction will assure that a final Project WQMP is submitted for review and approval prior to issuance of grading or building permits. The final Project WQMP must be prepared by or under the direction of a California Registered Civil Engineer and affixed with their stamp unless specifically exempted from this requirement by the Permittee.

7.II–5.1 Conceptual or Preliminary WQMP Preparation

To facilitate early water quality planning and ensure that water quality protection and LID principles are considered in the earliest phases of a project, a the local jurisdiction will suggest that the project proponent prepare a Conceptual or Preliminary WQMP prior to a complete or final Project WQMP for full review and approval. A Conceptual or Preliminary WQMP may be used by the local jurisdiction during the land use entitlement process or as part of a project application for discretionary project approval.

A Conceptual or Preliminary WQMP supports the CEQA process and provides documentation to support a checklist for an Initial Study and Negative Declaration or Mitigated Negative Declaration, or serves as the basis for the water quality section of an EIR. It should also serving as the basis for the Lead Agency and Responsible Agency to conclude that the MEP standard is being met, by serving as the basis that selected BMPs will not have the potential to cause significant effects and/or that the effects have been mitigated, and "are not significant with mitigation". The Conceptual or Preliminary WQMP should to be circulated with the CEQA document or summarized within the circulated CEQA document.

A WQMP Template has been produced to assist project proponents with developing a Conceptual or Preliminary WQMP (available at www.ocwatersheds.com). The level of detail in a Conceptual or Preliminary WQMP can vary somewhat upon the level of detail known at the time discretionary project approval is sought, but must contain at a minimum the following information:

- Local project identifier and description (application number, tentative tract number, review number, etc.)

- Site plan (tentative map, major project features, use exhibit, etc.) showing the following
  - Property or project boundaries
  - Locations of buildings, landscaping, streets, curb and gutter, storm drainage system, and other major project features
  - Direction of surface drainage
  - Existing easements
  - Surface waters
  - Areas of known or potential hazards such as landfills, soil and groundwater contamination, Alquist-Priolo mapped fault zones, etc.
  - Other project features or activities that may generate pollutants such as wash racks, trash enclosures, fuelling areas, loading docks, etc.
- Preliminary site assessment information
  - Most proximate and downstream receiving waters and any impairments
  - Primary and other POCs, and the related conclusions that are to be made from this information
  - Identification of any hydrologic conditions of concern and the supporting rationale
- LID feasibility analysis results and supporting information
- Proposed LID BMP selection rationale and supporting details and calculations (or sub-regional/regional LID BMPs if applicable)
- Proposed hydromodification control BMPs and calculations
- Waiver request, if applicable
- Any proposed project specific credits or alterative compliance methods planned, and associated rationales and calculations
- Preliminary Source Control BMP information
- Proposed parties responsible for the long-term operation and maintenance of proposed BMPs
- Proposed funding mechanisms for the long-term operation and maintenance of the proposed BMPs
- The list of standard WQMP requirements as indicated earlier, including access easement, records to be kept, records retention, inspection frequencies, etc.

Local jurisdiction staff will review and evaluate the Conceptual / Preliminary Project WQMP for general acceptance and conceptual or preliminary approval, and will offer guidance toward plan elements necessary for approval of the full Project WQMP. Additional information and submittals may be necessary for conceptual or preliminary approval. It is the responsibility of the project proponent to provide the additional information for consideration by the local jurisdiction.

7.II–5.2 Final Project WQMP Preparation and Submittal

A completed Final Project WQMP should fully address site design measures, LID BMPs, hydromodification controls, source control BMPs, and treatment control BMPs (where applicable to the project) to address pollutants or hydrologic conditions of concern. If the project is participating in an alternative program such as a contribution to a Runoff Mitigation Fund or Participation in a Mitigation Program, the Project WQMP must describe and document the Project's participation. The Final Project WQMP, when prepared for submittal for approval, must be certified by the owner, and must include elements agreed upon at Conceptual or Preliminary WQMP acceptance and any revisions proposed. A WQMP Template has been produced to assist project proponents with developing a Project WQMP (available at www.ocwatersheds.com).

The Final Project WQMP must be consistent with the Conceptual or Preliminary WQMP. If there are any substantial differences, the local jurisdiction must make a determination that the differences do not diminish the effectiveness of the BMPs to mitigate or address the project's potential impacts to water quality. Furthermore, any changes must not result in any new environmental impacts not previously disclosed in the local jurisdiction's circulated environmental document(s). If the changes diminish the project's ability to mitigate or address its water quality impacts, or result in previously undisclosed environmental impacts, the local jurisdiction should require that the project be subject to further environmental review.

For review and approval, the completed Project WQMP must provide the information described within this Model WQMP, including but not limited to:

- Local project identifier and description (application number, tentative tract number, review number, etc.)
- Site plan (tentative map, major project features, use exhibit, etc.) showing the following
  - Property or project boundaries
  - Locations of buildings, landscaping, streets, curb and gutter, storm drainage system, and other major project features
  - Direction of surface drainage
  - Existing easements
  - Surface waters
  - Areas of known or potential hazards such as landfills, soil and groundwater contamination, Alquist-Priolo fault zones, etc.
  - Other project features or activities that may generate pollutants such as wash racks, trash enclosures, fuelling areas, loading docks, etc.
- Site assessment information
  - Most proximate and downstream receiving waters and any impairments

  - Primary and other POCs and the related conclusions that are to be made from this information
  - Identification of any hydrologic conditions of concern and the supporting rationale
- Completed LID feasibility analysis, with findings, supporting rationales, and references to supporting documents, as applicable
- LID BMP selection rationale and supporting details and calculations (or sub-regional/regional LID BMPs if applicable)
- Hydromodification control BMPs and calculations
- Source Control BMP information
- Identified parties responsible for the long-term operation and maintenance of proposed BMPs
- Identified funding mechanisms for the long-term operation and maintenance of the proposed BMPs
- The list of standard WQMP requirements as indicated earlier, including access easement, records to be kept, records retention, inspection frequencies, etc.
- A waiver request, if applicable
- Any proposed project specific credits or alterative compliance methods utilized, and associated rationales and calculations
- Project specific credits taken to reduce the Design Storm Volume
- If the project is participating in a regional or sub-regional LID project, contributing to a Runoff Mitigation Fund, or participating in a Mitigation Project, documentation and description of the program, and the Project's contribution to the program.

The completed Project WQMP is to be submitted to the local jurisdiction for review and approval. Any changes to WQMP elements agreed upon at the Conceptual or Preliminary WQMP phase should be noted within the Project WQMP submitted for final approval.

Local jurisdiction staff will review the submittal for acceptance and approval. Reviews will be documented by the local jurisdiction. Additional information and submittals may be necessary for final approval. It is the responsibility of the project proponent to provide the additional information for consideration by the local jurisdiction.

Once a project reaches the plan check phase, the project proponent must submit a completed Project WQMP for Priority Development Projects since the construction plans submitted by the project proponent for plan check must incorporate all of the structural BMPs identified in the Project WQMP. Local jurisdictions may encourage (but not necessarily require) project proponents to obtain approval of the project's final Project WQMP prior to submitting construction plans for plan check. Building or grading permits for qualifying Priority will not be issued until the Project WQMP has been submitted and approved.

The Project WQMP will be stored within local jurisdiction files, and will continue with the property after the completion of the construction phase, and a local jurisdiction may require that the terms, conditions and requirements be recorded with the County Recorder's office by the property owner or any successive owner as authorized by the Water Quality Ordinance. In lieu of recordation, a local jurisdiction may require the Project WQMP to include a Notice of Transfer Responsibility Form, which serves to notify the local jurisdiction that a change in ownership has occurred and notify the new owner of its responsibility to continue implementing the Project WQMP.

7.II–5.3 Location Map, Plot Plan, and BMP Details

The Project WQMP should contain a location map showing the project site and surroundings in sufficient detail to allow the project location to be plotted on a base map. Project proponents should submit the plot plan with BMP details in electronic drawing or GIS format. The Project WQMP should also contain a plot plan showing proposed improvements to the property. The plot plan shall include the following project features:

- Each facility and its intended function (if multiple facilities and uses are present onsite)
- Areas of outdoor activities (if applicable)
- Applicable Structural Source Control BMPs and any Treatment Control BMPs
- Drainage flow information
- Storm drain facilities
- Relationship between onsite drainage and offsite drainage

The plot plan must contain the following labels:

- Title Block
  - Drainage Plot Plan
  - Project Name
  - Address
  - Owner
- Legend
- North Arrow
- Scale

The Project WQMP should contain plans and details related to the BMPs that will be included.

7.II–5.4 Educational Materials

The Project WQMP should reference standard educational materials that are applicable to the nature of the project relating to the type of development and practices that may occur on the site. Standard educational materials can be found on the Orange County

Watersheds website at www.ocwatersheds.com and referenced in the Project WQMP. Any materials that are specific to the project and not included in the standard materials must be included in the Project WQMP.

7.II–6.0 Resources and References

Additional information can be obtained within the following references.

Low Impact Development Manual for Southern California: Technical Guidance and Site Planning Strategies	California State Water Resources Control Board and Low Impact Development Center, 2009
Stormwater C.3 Guidebook: Stormwater Quality Requirements for Development Applications, Fourth Edition	Contra Costa Clean Water Program, September 10, 2008
Better Site Design: A Handbook for Changing Development Rules in Your Community (1998) Presents guidance for different model development alternatives.	Center for Watershed Protection 8391 Main Street Ellicott City, MD 21043 410-461-8323 www.cwp.org
Green Streets: A Conceptual Guide to Effective Green Streets Design Solutions	USEPA, 2009
California Association of Stormwater Quality Agencies (CASQA) Low Impact Development Portal	http://www.casqa.org/LID/tabid/240/Default.aspx
California Urban Runoff Best Management Practices Handbooks (1993) for Construction Activity, Municipal, and Industrial/Commercial Presents a description of a large variety of Structural BMPs, Treatment Control, BMPs and Source Control BMPs	Los Angeles County Department of Public Works Cashiers Office 900 S. Fremont Avenue Alhambra, CA 91803 626-458-6959
Caltrans Urban runoff Quality Handbook: Planning and Design Staff Guide (Best Management Practices Handbooks (1998) Presents guidance for design of urban runoff BMPs	California Department of Transportation P.O. Box 942874 Sacramento, CA 94274-0001 916-653-2975
Design and Construction of Urban Stormwater Management Systems, American Society of Civil Engineers (ASCE) Manuals and	ASCE
Effect of urban soil compaction on infiltration rate; Gregory, J.H.; Dukes, M.D.; Jones, P.H.; and G.L. Miller, 2006.	Journal of Soil and Water Conservation 2006 61(3):117-124
Reports on Engineering Practice No. 77/ Water Environment Federation (WEF) Manual of Practice FD-20, 1992.	WEF

Design Manual for Use of Bioretention in Stormwater Management (1993) Presents guidance for designing bioretention facilities.	Prince George's County Watershed Protection Branch 9400 Peppercorn Place, Suite 600 Landover, MD 20785
Design of Stormwater Filtering Systems (1996) by Richard A. Claytor and Thomas R. Schuler Presents detailed engineering guidance on ten different urban runoff-filtering systems.	Center for Watershed Protection 8391 Main Street Ellicott City, MD 21043 410-461-8323
Development Planning for Stormwater Management, A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), (May 2000)	Los Angeles County Department of Public Works http://dpw.co.la.ca.us/epd/ or http://www.888cleanLA.com
Florida Development Manual: A Guide to Sound Land and Water Management (1988) Presents detailed guidance for designing BMPs	Florida Department of the Environment 2600 Blairstone Road, MailStation 3570 Tallahassee, FL 32399 850-921-9472
Guidance Manual for On-Site Stormwater Quality Control Measures, Sacramento Stormwater Management Program.	City of Sacramento Department of Utilities and County of Sacramento Water Resources Division. January 2000.
Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters (1993) Report No. EPA–840-B-92-002. Provides an overview of, planning and design considerations, programmatic and regulatory aspects, maintenance considerations, and costs.	National Technical Information Service US Department of Commerce Springfield, VA 22161 800-553-6847
Guide for BMP Selection in Urban Developed Areas (2001)	ASCE Envir. and Water Res. Inst. 1801 Alexander Bell Dr. Reston, VA 20191-4400 (800) 548-2723
Low-Impact Development Design Strategies - An Integrated Design Approach (June 1999)	Prince George's County, Maryland Department of Environmental Resource Programs and Planning Division 9400 Peppercorn Place Largo, Maryland 20774 http://www.co.pg.md.us/Government/DER/PPD/pgcounty/lidmain.htm
Maryland Stormwater Design Manual (1999) Presents guidance for designing urban runoff BMPs	Maryland Department of the Environment 2500 Broening Highway Baltimore, MD 21224 410-631-3000
Methodology for Analysis of Detention Basins for Control of Urban Runoff Quality, Environmental Protection Agency (EPA-440/5-87-001).	

National Stormwater Best Management Practices (BMP) Database, Version 1.0 Provides data on performance and evaluation of urban runoff BMPs	American Society of Civil Engineers 1801 Alexander Bell Drive Reston, VA 20191 703-296-6000
National Stormwater Best Management Practices Database (2001)	Urban Water Resources Research Council of ASCE Wright Water Engineers, Inc. (303) 480-1700
Operation, Maintenance and Management of Stormwater Management (1997) Provides a thorough look at stormwater practices including, planning and design considerations, programmatic and regulatory aspects, maintenance considerations, and costs.	Watershed Management Institute, Inc. 410 White Oak Drive Crawfordville, FL 32327 850-926-5310
Potential Groundwater Contamination from Intentional and Non-Intentional Stormwater Infiltration	Report No. EPA/600/R-94/051, USEPA (1994).
Preliminary Data Summary of Urban runoff Best Management Practices (August 1999) EPA-821-R-99-012	http://www.epa.gov/ost/stormwater/
Reference Guide for Stormwater Best Management Practices (July 2000)	City of Los Angeles Urban runoff Management Division 650 South Spring Street, 7th Floor Los Angeles, California 90014 http://www.lacity.org/san/swmd/
Second Nature: Adapting LA's Landscape for Sustainable Living (1999) by Tree People Detailed discussion of BMP designs presented to conserve water, improve water quality, and to achieve flood protection.	Tree People 12601 Mullholland Drive Beverly Hills, CA 90210 (818) 623-4848 Fax (818) 753-4625
Site Planning for Urban Stream Protection, Department of Environmental Programs, Metropolitan Washington Council of Governments	
Start at the Source (1999) Detailed discussion of permeable pavements and alternative driveway designs presented.	Bay Area Stormwater Management Agencies Association 2101 Webster Street Suite 500 Oakland, CA 510-286-1255
Stormwater, Grading and Drainage Control Code, Seattle Municipal Code Section 22.800-22.808, and Director's Rules, Volumes 1-4. (Ordinance 119965, effective July 5, 2000)	City of Seattle Department of Design, Construction & Land Use 700 5th Avenue, Suite 1900 Seattle, WA 98104-5070 (206) 684-8880 http://www.ci.seattle.wa.us/dclu/Codes/sgdccode.htm

Stormwater Management in Washington State (1999) Vols. 1-5 Presents detailed guidance on BMP design for new development and construction.	Department of Printing State of Washington Department of Ecology P.O. Box 798 Olympia, WA 98507-0798 360-407-7529
The Stormwater Manager's Resource Center. This is a comprehensive site with information on BMP design and sizing. http://www.stormwatercenter.com	Stormwater Pollution Control, Municipal, Industrial and Construction NPDES Compliance, Second Edition. Roy D. Dodson, P.E., 1999.
Texas Nonpoint Source Book – Online Module (1998)www.txnpsbook.org Presents BMP design and guidance information on-line	Texas Statewide Urban runoff Quality Task Force North Central Texas Council of Governments 616 Six Flags Drive Arlington, TX 76005 817-695-9150
The Practice of Watershed Protection by Thomas R. Schueler and Heather K. Holland	Center for Watershed Protection 8391 Main Street Ellicott City, MD 21043 410-461-8323 www.cwp.org
Urban Runoff Quality Management, American Society of Civil Engineers (ASCE) Manual and Report on Engineering Practice No. 87/Water Environment Federation (WEF) Manual of Practice No.23, 1998.	
Urban Storm Drainage, Criteria Manual – Volume 3, Best Management Practices (1999) Presents guidance for designing BMPs	Urban Drainage and Flood Control District 2480 West 26th Avenue, Suite 156-B Denver, CO 80211 303-455-6277

APPENDIX A
Acronyms and Glossary

A.1 Acronyms

BMP – Best Management Practice

CEQA - California Environmental Quality Act

CWA – Federal Clean Water Act

DAMP – Drainage Area Management Plan

ESA – Environmentally Sensitive Area

ET – Evapotranspiration

HCOC – Hydrologic Condition of Concern

HSC – Hydrologic Source Control

LID – Low Impact Development

LIP – Local Implementation Plan

MEP – Maximum Extent Practicable

NOC – North Orange County (Region 8- SARWQCB Jurisdictional Area)

NPDES – National Pollutant Discharge Elimination System

POC – Pollutant of Concern

RWQCB – Regional Water Quality Control Board

SDRWQCB – San Diego Regional Water Quality Control Board

SOC – South Orange County (Region 9 -SDRWQCB Jurisdictional Area)

SSMP – Standard Stormwater Mitigation Plan

TGD – Technical Guidance Document

WQDV – Water Quality Design Volume

WQMP – Water Quality Management Plan

A.2 Glossary of Key Terms

Alternative compliance program – encompasses the elements used to satisfied remaining performance criteria after on-site LID BMPs have been implemented to the maximum feasible level.

Average annual capture efficiency (a.k.a. capture efficiency) – the estimated percent of long term average annual runoff volume that is managed/controlled by a BMP. Target capture efficiency serves as one element of the performance criteria for LID and treatment control BMPs.

Biofiltration BMP – a class of LID BMPs, biofiltration BMPs are vegetated treat-and-release BMPs that filter stormwater through amended soil media that is biologically active, support plant growth, and also promote infiltration and/or evapotranspiration. The total volume of storage in surface ponding and pores spaces is required to be at least 75% of the remaining DCV that the biofiltration BMP is designed to address. This prevents significant down-sizing of BMPs through routing calculations.

Biofilter volume (see also "pre-filter volume")– the volume of storage in biofilter BMPs, measured from the overflow elevation of the BMP outlet, which would be treated and discharged as the BMP drains; this volume includes surface storage and pore storage but does not include the volume that would be retained in the BMP and discharged to infiltration, ET, or uses.

Conceptual Project WQMP - a Project WQMP prepared at the planning phase of projects subject to discretionary approval; intended to describe, at the earliest possibly phase in the development process, the BMPs that will be implemented and maintained throughout the project (functionally equivalent to a Preliminary Project WQMP; nomenclature varies by local jurisdiction).

Design capture storm depth – the 85th percentile, 24-hr storm depth.

Design Capture Volume – the volume of storm water runoff resulting from the design capture storm depth.

Design criteria – requirements that serve as the basis for designing a BMP to meet performance criteria. Design criteria may encompass BMP sizing and other characteristics of BMP design.

Drainage Area Management Plan (DAMP) – The specific water pollutant control elements of the Orange County Stormwater Program are documented in the Drainage Area Management Plan (DAMP), which is the Permittees' primary policy, planning and implementation document for municipal NPDES Stormwater Permit compliance.

Drawdown – the act of discharging water from a BMP. Drawdown provides storage volume for subsequent storm events.

Drawdown rate – the rate at which water discharges from a BMP, making storage volume available for subsequent storm events.

Environmentally Sensitive Areas – areas such as those designated in the Ocean Plan as Areas of Special Biological Significance or waterbodies listed on the CWA Section 303(d) list of impaired waters.

Evapotranspiration (ET) - the loss of water to the atmosphere by the combined processes of evaporation (from water, soil and plant surfaces) and transpiration (from plant tissues). As used in this TGD, evapotranspiration refers to one or both of these processes.

Evapotranspiration BMP (aka ET BMP) – a class of retention BMPs that discharges stored volume predominantly to evapotranspiration; some infiltration may occur. Evapotranspiration includes both evaporation and transpiration, and ET BMPs may incorporate one or more of these processes.

Final Project WQMP – a Project WQMP submitted at the ministerial approval phase prior to final approval of a grading or building permit; expected to reflect the detail available at the time of project ministerial-level approval.

Harvest and Use – The process of capturing rainwater or stormwater runoff, storing it, and making it available for subsequent use. This process is performed by Harvest and Use BMPs.

Harvest and Use BMP (aka Rainwater Harvesting BMP) – a class of retention BMPs that captures rainwater or stormwater runoff and stores it for subsequent use.

Hydrologic condition of concern – a combination of upland hydrologic conditions and stream biological and physical conditions that presents a condition of concern for physical and/or biological degradation of a stream.

Hydromodification – Changes in runoff and sediment yield caused by land use modifications.

Hydromodification control – Management techniques which reduce the potential for hydromodification impact.

Hydromodification impact – The physical response of stream channels to changes in runoff and sediment yield caused by land use modifications

Infiltration BMP – a class of retention BMPs that discharges stored volume predominantly to deeper percolation/infiltration; some evapotranspiration may also occur.

LID BMP – a BMP that provides retention or biofiltration as part of an LID strategy – these may include hydrologic source controls, retention, and biofiltration BMPs.

LID site design – The component of LID that relates to the way in which a site is laid out to achieve strategic stormwater management and resource management objectives. Site design practices work synergistically with LID BMPs, treatment control, and hydromodification control strategies. Example practices include minimizing impervious areas and locating pervious areas such that impervious areas can drain to pervious areas.

Liquefaction - a seismically-induced geological hazard that can result in damage to structures as a result in reduction in bulk volume of saturated granular soils.

Local Implementation Plan (LIP) - The Local Implementation Plan (LIP) describes how the DAMP is being implemented by individual permittees under the MS4 Permit. The DAMP provides a foundation for the description and detail of how the Orange County

Stormwater Permittees commonly implement model programs designed to prevent pollutants from entering receiving waters to the maximum extent practicable (MEP). The LIP is designed to supplement the DAMP and each city and the County have developed a comprehensive LIP that is specific to their jurisdiction.

Non-Priority Development Project – New development and redevelopment projects that are not Priority Development Projects are considered Non-Priority Development Projects.

On-site LID practices – LID practices that are implemented within the project boundary.

Performance criteria – specific measurable or verifiable requirements against which the performance of a system is compared to assess compliance with a Project WQMP, the Model WQMP, and the Permit. There are three separate types of performance criteria: 1) LID, 2) treatment control, and 3) hydromodification control. These performance criteria are evaluated individually although they can be interrelated. It is possible to meet one and not meet the others. This is synonymous with "performance standard" as used by other guidance documents, but only "performance criteria" is used in this document.

Pre-filter Volume (see also "biofilter volume") – The physical storage provided in a biofiltration BMP including ponded storage and pore space, not counting the volume that is routed through the system during the storm event. The physical pre-filter volume of the BMP must be at least 75% of the remaining DCV after subtracting the portion of the DCV can be reliably retained.

Preliminary Project WQMP – a Project WQMP prepared at the planning phase of projects subject to discretionary approval; intended to describe, at the earliest possibly phase in the development process, the BMPs that will be implemented and maintained throughout the project (functionally equivalent to a Conceptual Project WQMP; nomenclature varies by local jurisdiction).

Priority Development Project – a new development or redevelopment project meeting the thresholds described in **Section 7.II-1.2**.

Retention BMP – a class of LID BMPs including infiltration BMPs, evapotranspiration BMPs, and harvest and use BMPs whose design does not allow the discharge of stormwater runoff to the storm drainage system or surface water up to the DCV ; these BMPs either infiltration, evapotranspire, or allow for use of the retention volume.

Retention volume – the volume of storage in retention and biofiltration BMPs, measured from the overflow elevation of the BMP, which would be retained and discharged to infiltration, ET, or uses as the BMP drains. All storage volume is retention volume in retention BMPs.

Sizing criteria – specific design criteria related to BMP size that serve as a basis for meeting performance criteria.

Standard Stormwater Mitigation Plan (SSMP) – See Project WQMP

Treatment control BMP – a structure designed to treat pollutants in stormwater runoff and release the treated runoff to surface waters or a storm drain system, but is not a biofiltration BMP. Examples include sand filters and cartridge media filters.

Waiver – Process by which project proponents must document and submit a request to implement alternative requirements if it is determined to be infeasible to fulfill the on-site LID performance requirements.

Water quality credit system – the system by which certain project types are granted reduction in the criteria for determining treatment control and/or offsite mitigation requirements for alternative program requirements.

APPENDIX B
EPA Green Streets Manual

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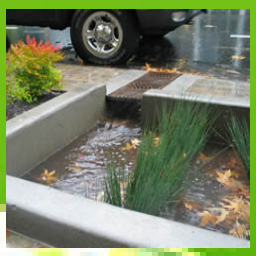

Managing Wet Weather with Green Infrastructure

Municipal Handbook

Green Streets

045037

Managing Wet Weather with Green Infrastructure

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prepared by

Robb Lukes
Christopher Kloss
Low Impact Development Center

The Municipal Handbook is a series of documents
to help local officials implement green infrastructure in their communities.

December 2008

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Front Cover Photos
Top: rain garden; permeable pavers; rain barrel;
planter; tree boxes.
Large photo: green alley in Chicago

Green Streets

Introduction

By design and function, urban areas are covered with impervious surfaces: roofs, roads, sidewalks, and parking lots. Although all contribute to stormwater runoff, the effects and necessary mitigation of the various types of surfaces can vary significantly. Of these, roads and travel surfaces present perhaps the largest urban pollution sources and also one of the greatest opportunities for green infrastructure use.

The Federal Highway Administration (FHA) estimates that more than 20% of U.S. roads are in urban areas.[1] Urban roads, along with sidewalks and parking lots, are estimated to constitute almost two-thirds of the total impervious cover and contribute a similar ratio of runoff.[2] While a significant source of runoff, roads are also a part of the infrastructure system, conveying stormwater along gutters to inlets and the buried pipe network. Effective road drainage, translated as moving stormwater into the conveyance system quickly, has been a design priority while opportunities for enhanced environmental management have been overlooked especially in the urban environment.

Table 1. Examples of Stormwater Pollutants Typical of Roads.[3, 4]

Pollutant	Source	Effects
Trash	---	Physical damage to aquatic animals and fish, release of poisonous substances
Sediment/solids	Construction, unpaved areas	Increased turbidity, increased transport of soil bound pollutants, negative effects on aquatic organisms reproduction and function
Metals • Copper • Zinc • Lead • Arsenic	 • Vehicle brake pads • Vehicle tires, motor oil • Vehicle emissions and engines • Vehicle emissions, brake linings, automotive fluids	Toxic to aquatic organisms and can accumulate in sediments and fish tissues
Organics associated with petroleum (e.g., PAHs)	Vehicle emissions, automotive fluids, gas stations	Toxic to aquatic organisms
Nutrients	Vehicle emissions, atmospheric deposition	Promotes eutrophication and depleted dissolved oxygen concentrations

The altered flow regime from traditional roadways, increased runoff volume, more frequent runoff events, and high runoff peak flows, are damaging to the environment and a risk to property downstream. These erosive flows in receiving streams will cause down cutting and channel shifting in some places and excessive sedimentation in others. The unnatural flow regime destroys stream habitat and disrupts aquatic systems.

Compounding the deliberate rapid conveyance of stormwater, roads also are prime collection sites for pollutants. Because roads are a component of the stormwater conveyance system, are impacted by atmospheric deposition, and exposed to vehicles, they collect a wide suite of pollutants and deliver them into the conveyance system and ultimately receiving streams (See Table 1). The metals, combustion by-products, and automotive fluids from vehicles can present a toxic mix that combines with the ubiquitous nutrients, trash, and suspended solids.

While other impervious surfaces can be replaced, for example using green roofs to decrease the amount of impervious roof surface, for the most part, impervious roads will, for some time to come, constitute a significant percentage of urban imperviousness because of their current widespread existence. Reducing road widths and other strategies to limit the amount of impervious surface are critical, but truly addressing road runoff requires mitigating its effects.

Green Streets achieve multiple benefits, such as improved water quality and more livable communities, through the integration of stormwater treatment techniques which use natural processes and landscaping.

Roads present many opportunities for green infrastructure application. One principle of green infrastructure involves reducing and treating stormwater close to its source. Urban transportation right-of-ways integrated with green techniques are often called "green streets". Green streets provide a source control for a main contributor of stormwater runoff and pollutant load. In addition, green infrastructure approaches complement street facility upgrades, street aesthetic improvements, and urban tree canopy efforts that also make use of the right-of-way and allow it to achieve multiple goals and benefits. Using the right-of-way for treatment also links green with gray infrastructure by making use of the engineered conveyance of roads and providing connections to conveyance systems when needed.

Green streets are beneficial for new road construction and retrofits. They can provide substantial economic benefits when used in transportation applications. Billions of dollars are spent annually on road construction and rehabilitation, with a large percentage focused on rehabilitation especially in urban areas. Coordinating green infrastructure installation with broader transportation improvements can significantly reduce the marginal cost of stormwater management by including it within larger infrastructure improvements. Also, and not unimportantly, right-of-way installations allow for easy public maintenance. A large municipal concern regarding green infrastructure use is maintenance; using roads and right-of-ways as locations for green infrastructure not only addresses a significant pollutant source, but also alleviates access and maintenance concerns by using public space.

In urban areas, roads present many opportunities for coordinated green infrastructure use. Some municipalities are capitalizing on the benefits gained by introducing green infrastructure in transportation applications. This paper will evaluate programs and policies that have been used to successfully integrate green infrastructure into roads and right-of-ways.

Green Street Designs

Green streets can incorporate a wide variety of design elements including street trees, permeable pavements, bioretention, and swales. Although the design and appearance of green streets will vary, the functional goals are the same: provide source control of stormwater, limit its transport and pollutant conveyance to the collection system, restore predevelopment hydrology to the extent possible, and provide environmentally enhanced roads. Successful application of green techniques will encourage soil and vegetation contact and infiltration and retention of stormwater.

Alternative Street Designs (Street Widths)

A green street design begins before any BMPs are considered. When building a new street or streets, the layout and street network must be planned to respect the existing hydrologic functions of the land (preserve wetlands, buffers, high-permeability soils, etc.) and to minimize the impervious area. If retrofitting or redeveloping a street, opportunities to eliminate unnecessary impervious area should be explored.

Implementation Hurdles
Many urban and suburban streets, sized to meet code requirements for emergency service vehicles and provide a free flow of traffic, are oversized for their typical everyday functions. The Uniform Fire Code requires that streets have a *minimum 20 feet of unobstructed width;* a street with parking on both sides would require a width of at least 34 feet. In addition to stormwater concerns, wide streets have many detrimental implications on neighborhood livability, traffic conditions, and pedestrian safety.[5]

Oregon State Code Granting Authority for Street Standards to Local Government

ORS 92.044 - Local governments shall *supersede and prevail over any specifications and standards for roads and streets set forth in a uniform fire code adopted by the State Fire Marshal, a municipal fire department or a county firefighting agency....* Local governments shall consider the needs of the fire department or fire-fighting agency when adopting the final specifications and standards.

The Transportation Growth and Management Program of Oregon, through a Stakeholder Design Team, developed a guide for reducing street widths titled the *Neighborhood Street Design Guidelines.*[6] The document provides a helpful framework for cities to conduct an inclusive review of street design profiles with the goal of reducing widths. Solutions for accommodating emergency vehicles while minimizing street widths are described in the document. They include alternative street parking configurations, vehicle pullout space, connected street networks, prohibiting parking near intersections, and smaller block lengths.

Figure 1. The street-side swale and adjacent porous concrete sidewalk are located in the High Point neighborhood of Seattle, WA
(Source: Abby Hall, US EPA).

In 1997, Oregon, which has adopted the *Uniform Fire Code,* specifically granted local government the authority to establish alternative street design standards but requires them to consult with fire departments before standards are adopted. Table 2 provides examples of alternative street widths allowed in U.S. jurisdictions.[7]

Swales

Swales are vegetated open channels designed to accept sheet flow runoff and convey it in broad shallow flow. The intent of swales is to reduce stormwater volume through infiltration, improve water quality through vegetative and soil filtration, and reduce flow velocity by increasing channel roughness. In the simple roadside grassed form, they have been a common historical component of road design. Additional benefit can be attained through more complex forms of swales, such as those with amended soils, bioretention soils, gravel storage areas, underdrains, weirs, and thick diverse vegetation.

Implementation Hurdles
There is a common misconception of open channel drainage being at the bottom of a street development hierarchy in which curb and gutter are at the top. Seattle's Street Edge Alternative Project and other natural drainage swale pilot projects have demonstrated that urban swales not only mitigate stormwater impacts, but they can also enhance the urban environment.[8]

Table 2. Examples of Alternative Street Widths

Jurisdiction	Street Width	Parking Condition
Phoenix, AZ	28'	parking both sides
Santa Rosa, CA	30' 26'-28' 20' 20'	parking both sides, <1000ADT parking one side no parking neck downs @ intersection
Orlando, FL	28' 22'	parking both sides, res. Lots<55' wide parking both sides, res. Lots>55' wide
Birmingham, MI	26' 20'	parking both sides parking one side
Howard County, MD	24'	parking unregulated
Kirkland, WA	12' 20' 24' 28'	alley parking one side parking both sides – low density only parking both sides
Madison, WI	27' 28'	parking both sides, <3DU/AC parking both sides, 3-10 DU/AC

ADT: Average Daily Traffic DU/AC: dwelling units per acre

Bioretention Curb Extensions and Sidewalk Planters

Bioretention is a versatile green street strategy. Bioretention features can be tree boxes taking runoff from the street, indistinguishable from conventional tree boxes. Bioretention features can also be attractive attention grabbing planter boxes or curb extensions. Many natural processes occur within bioretention cells: infiltration and storage reduces runoff volumes and attenuates peak flows; biological and chemical reactions occur in the mulch, soil matrix, and root zone; and stormwater is filtered through vegetation and soil.

Figure 2. This bioretention area takes runoff from the street through a trench drain in the sidewalk as well as runoff from the sidewalk through curb cuts *(Source: Abby Hall, US EPA).*

Implementation Hurdles

A few municipal DOT programs have instituted green street requirements in roadway projects, but as of yet, specifications for street bioretention have not yet been incorporated into municipal DOT specifications. Many cities do have street bioretention pilot projects; two of the well documented programs are noted in the table. Several concerns and considerations have prevented standard implementation of bioretention by DOTs.

Table 3. Municipalities with Swale Specifications and Standard Details

Municipality	Document	Section Title	Section #
City of Austin[9]	Standard Specifications and Standard Details	Grass-Lined Swale and Grass-Lined Swale with Stone Center	627S
City of Seattle[10]	2008 Standard Specifications for Municipal Construction	Natural Drainage Systems	7-21

Table 4. Municipalities with Bioretention Pilot Projects in the Right-of-Way

Municipality	Bioretention Type	Document
Maplewood, MN	Rain gardens	*Implementing Rainwater in Urban Stormwater Management* [11]
Portland, OR	• Curb extensions • Planters • Rain gardens	*2006 Stormwater Management Facility Monitoring Report* [12]

The diversity of shapes, sizes, and layouts bioretention can take is a significant obstacle to their incorporation with DOT specifications and standards. Street configurations, topography, soil conditions, and space availability are some of the factors that will influence the design of the bioretention facility. These variables make documentation of each new bioretention project all the more important. By building a menu of templates from local bioretention projects, future projects with similar conditions will be easier to implement and cost less to design. The documentation should include copies of the details and specifications for the materials used. A section on construction and operation issues, costs, lessons learned, and recommendations for similar designs should also be included in project documentation. Portland's Bureau of Environmental Services has proven adept at documenting each of its Green Streets projects and making them accessible online.[13]

Utilities are a chief constraint to implementing bioretention as a retrofit in urban areas. The Prince George's County, MD Bioretention Design Specifications and Criteria manual recommends applying the same clearance criteria recommended for storm drainage pipes.[14] Municipal design standards should specify the appropriate clearance from bioretention or allowable traversing.

Prince George's County, MD - 2.12.1.16 Utility Clearance

Utility clearances that apply to storm drainage pipe and structure placement also apply to bioretention. Standard utility clearances for storm drainage pipes have been established at 1' vertical and 5' horizontal. However, bioretention systems are shallow, non-structural IMP's consisting of mostly plant and soil components, (often) with a flexible underdrain discharge pipe. For this reason, other utilities may traverse a bioretention facility without adverse impact. Conduits and other utility lines may cross through the facility but construction and maintenance operations must include safeguard provisions. In some instances, bioretention could be utilized where utility conflicts would make structural BMP applications impractical.

Plants are another common concern of municipal staff, whether it is maintenance, salt tolerance, or plant height with regard to safety and security. Cities actively implementing LID practices in public spaces maintain lists of plants which fit the vegetated stormwater management practice niche. These are plants that flourish in the regional climate conditions, are adapted to periodic flooding, are low maintenance, and, if in cold climates, salt tolerant. Most often these plants are natives, but sometimes an approved non-native will best fit necessary criteria. A municipal plant list should be periodically updated based on maintenance experience, and vegetation health surveys.

Permeable Pavement

Permeable pavement comes in four forms: permeable concrete, permeable asphalt, permeable interlocking concrete pavers, and grid pavers. Permeable concrete and asphalt are similar to their impervious counterparts but are open graded or have reduced fines and typically have a special binder added. Methods for pouring, setting, and curing these permeable pavements also differ from the impervious versions. The concrete and grid pavers are modular systems. Concrete pavers are installed with gaps between them that allow water to pass through to the base. Grid pavers are typically a durable plastic matrix that can be filled with gravel or vegetation. All of the permeable pavement systems have an aggregate base in common which provides structural support, runoff storage, and pollutant removal through filtering and adsorption. Aside from a rougher unfinished surface, permeable concrete and asphalt look very similar to their impervious versions. Permeable concrete and asphalt and certain permeable concrete pavers are ADA compliant.

Implementation Hurdles

Of all the green streets practices, municipal DOTs have been arguably most cautious about implementing permeable pavements, though it should be noted that some DOTs have, for decades, specified open-graded asphalt for low use roadways because of lower cost; to minimize vehicle hydroplaning; and to reduce road noise. The reticence to implement on a large-scale, however, is understandable given the lack of predictability and experience behind impervious pavements. However, improved technology, new and ongoing research, and a growing number of pilot projects are dispelling common myths about permeable pavements.

Figure 3. Pervious pavers used in the roadway of a neighborhood development in Wilsonville, OR *(Source: Abby Hall, US EPA).*

The greatest concern among DOT staff seems to be a perceived lack of long-term performance and maintenance data. Universities and DOTs began experimenting with permeable pavements in parking lots, maintenance yards, and pedestrian areas as early as twenty years ago in the U.S., even earlier in Europe. There is now a wealth of data on permeable pavements successfully used for these purposes in nearly every climate region of the country. In recent years, the cities of Portland, OR, Seattle, WA, and Waterford, CT and several private developments have constructed permeable pavement pilots within the roadway with positive results.

Permeable pavement concerns in the roadway often raise concerns of safety, maintenance, and durability. Municipalities can replace impervious surfaces in other non-critical areas such as sidewalks, alleys, and municipal parking lots. These types of applications help municipalities build experience and a market for the technology.

The two typical maintenance activities are periodic sweeping and vacuuming. The City of Olympia, WA has experimented with several methods of clearing debris from permeable concrete sidewalks. Each of the methods was evaluated on the ease of use, debris removal, and the performance pace. The cost analysis by Olympia, WA found that the maintenance cost for pervious pavement was still lower than the traditional pavement when the cost of stormwater management was considered.

Table 5. Municipalities with Permeable Pavement Specifications and Standard Details

Municipality	Document	Section Title	Section #
Portland	2007 Standard Construction Specifications	Unit Pavers (includes permeable pavers)	00760
Olympia	WSDOT Specification	Pervious Concrete Sidewalks	8-30

Freeze/thaw and snow plows are the major concerns for permeable pavements in cold climate communities. However, these concerns have proven to be generally unwarranted when appropriate design and maintenance practices are employed. A well designed permeable pavement structure will always drain and never freeze solid. The air voids in the pavement allow plenty of space for moisture to freeze and ice crystals to expand. Also, rapid drainage through the pavement eliminates the occurrence of freezing puddles and black ice. Cold climate municipalities will need to make adjustments to snow plowing and deicing programs for permeable pavement areas. Snow plow blades must be raised enough to prevent scraping the surface of permeable pavements, particularly paver systems. Also, sand should not be applied.

Table 6. A Study in Olympia, WA Comparison of the cost of permeable concrete sidewalks to the cost of traditional impervious sidewalks[15]

Traditional Concrete Sidewalk		Permeable Concrete Sidewalk	
Construction Cost	Maintenance Cost	Construction Cost	Maintenance Cost
$5,003,000*	$156,000	$2,615,000*	$147,000
Total = $5,159,000 $101.16 per square yard		Total = $2,762,000 $54.16 per square yard	

*The cost of stormwater management (stormwater pond) for the added impervious surface is factored into the significantly higher cost of constructing the traditional concrete sidewalk. Maintenance of the stormwater pond is also factored into the traditional concrete sidewalk maintenance cost.

Sidewalk trees and tree boxes

From reducing the urban heat island effect and reducing stormwater runoff to improving the urban aesthetic and improving air quality, much is expected of street trees. Street trees are even good for the economy. Customers spend 12% more in shops on streets lined with trees than on those without trees.[16] However, most often street trees are given very little space to grow in often inhospitable environments. The soil around street trees often becomes compacted during the construction of paved surfaces and minimized as underground utilities encroach on root space. If tree roots are surrounded by compacted soils or are deprived of air and water by impervious streets and sidewalks, their growth will be stunted, their health will decline, and their expected life span will be cut short. By providing adequate soil volume and a good soil mixture, the benefits obtained from a street tree multiply. To obtain a healthy soil volume, trees can simply be provided larger tree boxes, or structural soils, root paths, or "silva cells" can be used under sidewalks or other paved areas to expand root zones. These allow tree roots the space they need to grow to full size. This increases the health of the tree and provides the benefits of a mature sized tree, such as shade and air quality benefits, sooner than a tree with confined root space.

Figure 4. Trees planted at the same time but with different soil volumes, Washington DC
(Source: Casey Trees)

Table 7. Healthy Tree Volume and Permeable Pavement Specifications and Standard Details

Jurisdictions	Minimum Soil Volume		Section Title	Section #
Prince William County, VA	Large tree Medium tree Small tree	970 cf 750 cf 500 cf	Design Construction Manual (Sec 800)	Table 8-8
Alexandria, VA		300 cf	Landscape Guidelines	II.B. (2)

Implementation Hurdles

Providing an adequate root volume for trees comes down to a trade off between space in the right-of-way and added construction costs. The least expensive way to obtain the volume needed for roots to grow to full size is providing adequate space unhindered by utilities or other encroachments. However, it is often hard to reserve space dedicated just to street trees in an urban right-of-way with so many other uses competing for the room they need. As a result, some creative solutions, though they cost more to install, have become useful alternatives in crowded subsurface space. Structural soils, root paths, and "silva cells" leave void space for roots and still allow sidewalks to be constructed near trees.

Root Paths can be used to increase tree root volume by connecting a small tree root volume with a larger subsurface volume nearby. A tunnel-like system extends from the tree underneath a sidewalk and connects to an open space on the other side.

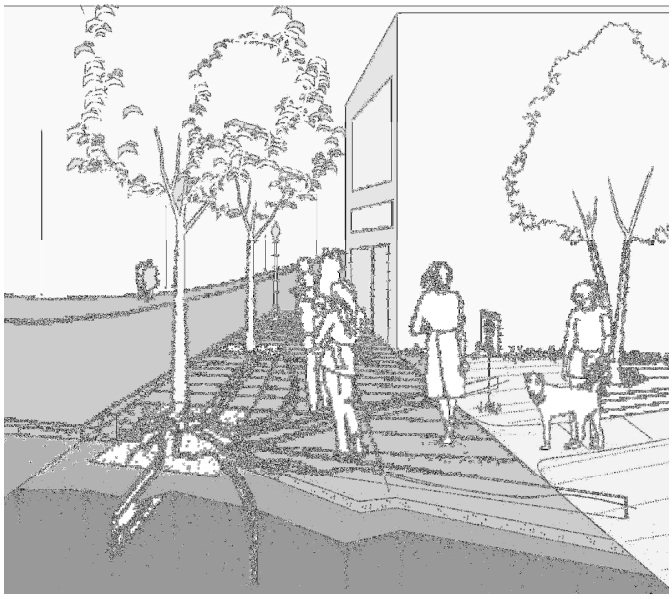

Figure 5. Root Paths direct tree roots under paving and into better soil areas for tree root growth
(Source: Arlington County, VA).

Silva Cells[17] are another option for supporting sidewalks near trees while still providing enough space for roots to grow. These plastic milk crate-like frames fit together and act as a supporting structure for a sidewalk while leaving room for uncompacted soil and roots inside the frame.

Permeable pavement sidewalks are another enhancement to the root space. They provide moisture and air to roots under sidewalks. Soils under permeable pavements can still become compacted. Structural soils[18] are a good companion tree planting practice to permeable pavement. When planting a tree in structural soils an adequate tree root volume is excavated and filled with a mix of stone and soil that still provides void space for healthy roots and allows for sidewalks, plazas or other paved surfaces to be constructed over them.

Case Studies

Portland, OR: Green Street Pilot Projects

Portland, Oregon is a national leader in developing green infrastructure. Portland's innovation in stormwater management was necessitated by the need to satisfy a Combined Sewer Overflow consent decree, Safe Drinking Water Act requirements, impending Total Maximum Daily Load limitations, Superfund cleanup measures and basement flooding. Through the 1990s, over 3 billion gallons of combined sewer overflow discharged to the Willamette River every year.[19] All of these factors plus leadership and local desires to create green solutions and industries compelled the city to implement green infrastructure as a complement to adding capacity to the sewer system with large pipe overflow interceptors. Despite gaps in long-term performance data, Portland took a proactive approach in implementing green infrastructure pilot projects.

Portland's green infrastructure pilot projects have their roots in the city's 2001 Sustainable Infrastructure Committee. The committee, consisting of representatives from Portland's three infrastructure management Bureaus, documented the city's ongoing efforts toward sustainable infrastructure, gathered research on green infrastructure projects from around the country, and identified opportunities for local pilots.[20, 21, 22]

Figure 6. Silva cell structures support the sidewalk while providing root space for street trees
(Source: Deep Root Partners, LP).

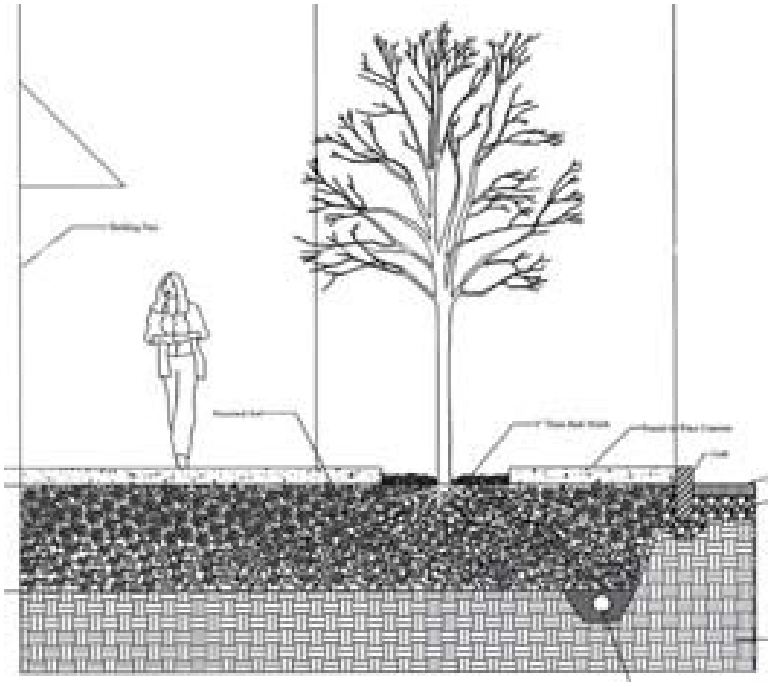

Figure 7. Structural soils provide void space for root growth and load-bearing for sidewalk
(Source: Urban Horticulture Institute, Cornell University).

One of the Bureau of Environmental Services' (BES) earliest green infrastructure retrofit projects within the right-of-way was a set of two stormwater curb extensions on NE Siskiyou Street. Portland had been retrofitting many streets with curb extensions for the purpose of pedestrian safety, but this was the first done for the purpose of treating street runoff. In a simulated 25-year storm event flow test, the curb extensions captured 85% of the runoff volume that would be discharged to the combined sewer system and reduced peak flow by 88%.[23]

Between 2003 and 2007, Portland designed and implemented a variety of Green Street pilots. Funding sources for these projects have come from BES, Portland Department of Transportation, U.S. EPA, and an Innovative Wet Weather Fund. BES combined funds with an EPA grant to create the Innovative Wet Weather Fund. In 2004, nearly $3 million from the Innovative Wet Weather Fund was budgeted for a long list of projects from city green roofs, public-private projects, and a number of pilot projects within the right-of-way.[24] Several pilots have been cost competitive with or less costly than conventional upgrades. The Bureau recognizes that costs will decrease once these projects become more routine. Many of the pilot project costs included one time costs such as the development of outreach materials and standard drawings.

Figure 8: NE Siskiyou Vegetated Curb Extensions
Source: City of Portland – Bureau of Environmental Services

Table 8. Portland, OR - Green Street Pilot Projects

Location	Design	Year Completed	Cost
NE Siskiyou b/w NE 35th Pl. and NE 36th Ave	Stormwater curb extension	2003	$20,000
3 blocks of the Westmoreland Neighborhood	Permeable Pavers in parking lanes and curb to curb	2004	$412,000
SE Ankeny b/w SE 56th and SE 57th Ave.	Stormwater curb extensions	2004	$11,946
NE Fremont b/w NE 131st and 132nd Av	Stormwater curb extension	2005	$20,400
SW 12th Ave b/w SW Montgomery and Mill	Stormwater planters	2005	$34,850
East Holladay Park	Pervious paver parking lot	2005	$165,000
4 blocks of North Gay Avenue b/w N Wygant and N Sumner	Porous concrete in curb lanes and curb to curb; porous asphalt in curb lanes and curb to curb	2005	--
SW Texas	Stormwater wetlands and swales	2007	$2.3 million
Division St. – New Seasons Market	Stormwater planters and swales	--	--
SE Tibbetts and SE 21st Ave.	Stormwater curb extension and planters	--	--

Source: Portland Bureau of Environmental Services, 2008
http://www.portlandonline.com/bes/index.cfm?c=44463&

Each of the pilot projects have been well documented by BES. A consistent format has been used to describe pilot background, features, engineering design, landscaping, project costs, maintenance, monitoring, and, most importantly, lessons learned. These case studies as well as other Green Street documentation can be found on BES's Sustainable Stormwater webpage, http://www.portlandonline.com/BES/index.cfm?c=34598. Due to physical factors (drainage, slope, soil, existing utilities, multiple uses) and development factors (retrofit, redevelopment, and new construction), there will be many variations on Green Streets. As part of the program, a continually updated Green Street Profile Notebook will catalog the successful green street projects. Users can use the Notebook for permitting guidance, to identify green streets facilities appropriate for various factors, but the document is not a technical document with standard details.

The Green Streets Team

The City of Portland, OR is widely acknowledged for long term, forward thinking, and comprehensive transportation and environmental planning. Portland recognized the fact that 66% of the City's total runoff is collected from streets and the right-of-way.[25] The city also saw the potential for transportation corridors to meet multiple objectives, including:

- Comprehensively address numerous City goals for neighborhood livability, sustainable development, increased green spaces, stormwater management, and groundwater protection;
- Integrate infrastructure functions by creating "linear parks" along streets that provide both pedestrian/bike areas and stormwater management;
- Avoid the key impacts of unmanaged stormwater whereby surface waterbodies are degraded, and water quality suffers;
- Manage stormwater with investments citizens can support, participate in, and see;
- Manage stormwater as a resource, rather than a waste;
- Protect pipe infrastructure investments (extend the life of pipe infrastructure, limit the additional demand on the combined sewer system as development occurs);
- Protect wellhead areas by managing stormwater on the surface; and
- Provide increased neighborhood amenities and value.

In a two phased process from 2005 to 2007, the Green Streets Team, a cross agency and interdisciplinary team, developed a comprehensive green streets policy and a way forward for the green streets agenda. Phase 1 identified challenges and issues and began a process for addressing them. Barriers to the public initiation of green street projects included a code and standards that would disallow or discourage green street strategies, long term performance unknowns, and maintenance responsibilities. To address these barriers, the Green Streets Team organized into subgroups focusing on outreach, technical guidance, infrastructure, maintenance, and resources.

Phase 2 of the Green Streets project synthesized the opportunities and solutions identified in Phase 1 into a citywide Green Streets Program. The first priority for this phase was the drafting of a binding citywide policy. The resolution was adopted by the Portland City Council in March 2007.

Prior to the start of the Portland effort, 90% of implemented green street projects were issued by private permits rather than city initiated projects.

Six Approaches to Implementing Green Streets	
Pathway	**Implementation**
City-initiated street improvement projects	City designs, manages, maintains
City-initiated stormwater retrofits	City designs, manages, maintains
Neighborhood-initiated LIDs	
Developer-initiated subdivisions with public streets	Developer designs and builds via City permit and review process, then turns over new right of way to the City after warranty period
Developer-initiated subdivisions with private streets	Developer designs and builds via City permit and review process, and turns over to home-owner association
Developer-related initiated frontage improvements on existing public streets	Developer designs and builds new sidewalks and curbs via City permit and review process, usually because the City required it via a building permit or via a land division

Source: Portland Green Streets, Phase 1

Portland City Council Approved Green Streets Policy

Goal: City of Portland will promote and incorporate the use of green street facilities in public and private development.

City elected officials and staff will:

1. Infrastructure Projects in the Right of Way:

   a. Incorporate green street facilities into all City of Portland funded development, redevelopment or enhancement projects as required by the City's September 2004 (or updated) Stormwater Management Manual. Maintain these facilities according to the May 2006 (or updated) Green Streets Maintenance Policy.

      If a green street facility (infiltrating or flow through) is not incorporated into the Infrastructure Project, or only partial management is achieved, then an off site project or off site management fee will be required.

   b. Any City of Portland funded development, redevelopment or enhancement project, that does not trigger the Stormwater Manual but requires a street opening permit or occurs in the right of way, shall pay into a "% for Green" Street fund. The amount shall be 1% of the construction costs for the project.
      Exceptions: Emergency maintenance and repair projects, repair and replacement of sidewalks and driveways, pedestrian and trail replacement, tree planting, utility pole installation, street light poles, traffic, signal poles, traffic control signs, fire hydrants, where this use of funds would violate contracted or legal restrictions.

2. Project Planning and Design:

   a. Foster communication and coordination among City Bureaus to encourage consideration of watershed health and improved water quality through use of green street facilities as part of planning and design of Bureau projects.
   b. Coordinate Bureau work programs and projects to implement Green Streets as an integrated aspect of City infrastructure.
   c. Plan for large-scale use of Green Streets as a means of better connecting neighborhoods, better use of the right of way, and enhancing neighborhood livability.
   d. Strive to develop new and innovative means to cost-effectively construct new green street facilities.
   e. Develop standards and incentives (such as financial and technical resources, or facilitated permit review) for Green Streets projects that can be permitted and implemented by the private sector. These standards and incentives should be designed to encourage incorporation of green street facilities into private development, redevelopment and enhancement projects.

3. Project and Program Funding:

   a. Seek opportunities to leverage the work and associated funding of projects in the same geographic areas across Bureaus to create Green Street opportunities.
   b. Develop a predictable and sustainable means of funding implementation and maintenance of Green Street projects.

4. Outreach:

   a. Educate citizens, businesses, and the development community/industry about Green Streets and how they can serve as urban greenways to enhance, improve, and connect neighborhoods to encourage their support, demand and funding for these projects.
   b. Establish standard maintenance techniques and monitoring protocols for green street facilities across bureaus, and across groups within bureaus.

5. Project Evaluation:

   a. Conduct ongoing monitoring of green street facilities to evaluate facility effectiveness as well as performance in meeting multiple City objectives for:
      - Gallons managed;
      - Projects distributed geographically by watershed and by neighborhood; and

The second priority for Phase 2 was developing communication and planning procedures for incorporating multi-bureaus plans into the scheduled Portland DOT Capital Improvement Program (CIP). Three timeframes for green street project planning were recommended. In the short term, the CIP Planning Group, backed by the citywide policy directive, will shift to a focus on "identifying and evaluating opportunities to partner." For example, coordinating Water Bureau and BES pipe replacement

projects with DOT maintenance, repair, and improvement projects. The mid-term approach is more proactive and involves forecasting potential green street projects using existing bureau data and GIS tools. As for the long term, green street objectives will be incorporated into the citywide systems plan which guides city bureaus for the next 20 years.

The Green Street Team methodology propelled Portland's early green street pilot projects into a comprehensive, citywide multi-bureau program. The program built on previous efforts by the Sustainable Infrastructure Committee as well as other efforts such as the 2005 Portland Watershed Management Plan, established a City Council mandated policy, and institutionalized green street development. The outcome of this approach is multi-agency buy-in and responsibility for the effort. For instance, because of their knowledge of plant maintenance, Portland Parks and Recreation is responsible for the maintenance of some DOT installations.

Chicago, IL: Green Alleys Program

The City of Chicago, Illinois has an alley system that is perhaps the largest in the world. These 13,000 publicly owned alleys result in 1,900 miles, or 3,500 acres, of impermeable surfaces in addition to the street network. Because the alley system was not originally paved, there are no sewer connections as part of the original design. Over time the alleys were paved and flooding in garages and basements began to occur as a result of unmanaged stormwater runoff. Since the city already spends $50 million each year to clean and upgrade 4,400 miles of sewer lines and 340,000 related structures, the preferred solution to the flooded alleys is one that doesn't put more stress on an already overburdened and expensive sewer system.[26]

In 2003, the Chicago Department of Transportation (CDOT) used permeable pavers and French drain pilot applications to remedy localized flooding problems in alleys in the 48th Ward.[27] These applications proved to be successful and by 2006, CDOT launched its Green Alley Program with the release of the Chicago Green Alley Handbook (Handbook).[28]

The Chicago Green Alley Program is unique because it marries green infrastructure practices in the public right-of-way with green infrastructure efforts on private property. The user-friendly Handbook, which describes both facets of the program including the design techniques and their benefits, is an award winning document. The American Society of Landscape Architects awarded the creators of the Handbook the 2007 Communications Honor Award for the clear graphics and simple, yet effective, message.[29] The Handbook explains to the residents why green infrastructure is important, how to be good stewards of the Green Alley in their neighborhood, and what sorts of "green" practices they can implement on their property to reduce waste, save water, and help manage stormwater wisely.

While the initial impetus behind the Green Alley Program was stormwater management, Chicago decided to use this opportunity to address other environmental concerns as well as reducing the urban heat island effect, recycling, energy conservation, and light pollution.

Green Infrastructure in the Right-of-Way

Chicago's Green Alley Program uses the following five techniques in the public right-of-way to "green" the alley:

1. Changing the grade of the alley to drain to the street rather than pond water in the alley or drain toward garages or private property.
2. Using permeable pavement that allows water to percolate into the ground rather than pond on the surface.
3. Using light colored paving material that reflects sunlight rather than adsorbing it, reducing urban heat island effect.

4. Incorporating recycled materials into the pavement mix to reduce the need for virgin materials and reduce the amount of waste going into the landfill.

5. Using energy efficient light fixtures that focus light downward, reducing light pollution.

Figure 9: Permeable Asphalt Installation Using Ground Tire Rubber.
Source: Chicago Department of Transportation, Sustainable Development Initiatives; Streetscape and Urban Design Program, CDOT Division of Project Development.

Four design approaches were created using these techniques. Based on the local conditions, the most appropriate approach is selected. In areas where soils are well-draining, permeable pavement is used. In areas where buildings come right up to the edge of pavement and infiltrated water could threaten foundations, impermeable pavement strips are used on the outside with a permeable pavement strip down the middle. In areas where soils do not provide much infiltration capacity, the alley is regraded to drain properly and impermeable pavement made with recycled materials is used. Another approach utilizes an infiltration trench down the middle of the alley. Light colored (high albedo) pavement, recycled materials, and energy efficient, glare reducing lights are a part of each design approach.

Green Infrastructure on Private Property
The Handbook also describes actions that property owners can take to "green" their own piece of Chicago. The Handbook describes the costs, benefits, and utility of the following practices:

- Recycling;
- Composting;
- Planting a tree;
- Using native landscape vegetation;
- Constructing a rain garden;
- Installing a rain barrel;
- Using permeable pavement for patios;
- Installing energy efficient lighting; and
- Utilizing natural detention.

By bringing this wide range of "green" practices to the attention of homeowners, the positive impacts of the Green Alley Program spread beyond the boundaries of the right-of-way, increasing awareness and providing practical resources to help community members be a part of the solution.

Chicago Green Alley Cost Considerations
When the program began in 2006, repaving the alleys with impermeable pavement ranged in cost from $120,000 to $150,000, whereas a total Green Alley reconstruction was more along the lines of $200,000 to $250,000.[30] While less expensive conventional rehabilitation options may seem more attractive, they don't provide a solution to the localized flooding issues or the combined sewer system overflow problems. Sewer system connections could be established to solve the localized flooding problem, but it would add to the already overburdened sewer system and increase the cost of the reconstruction to that of the impermeable alley option. Consequently, the higher priced Green Alley option proved to be the best investment as it has multiple benefits in addition to solving localized flooding and reducing flow into the combined sewer system. The additional benefits of the Green Alley Program include not only urban heat

island effect reduction, material recycling, energy conservation, and light pollution reduction, but also the creation of a new market.

In 2006, when the Green Alley Program began, the city paid about $145 per cubic yard of permeable concrete. Just one year later, the cost of permeable concrete had dropped to only $45 per cubic yard. Compared with the cost of ordinary concrete, $50 per cubic yard, permeable concrete may have seemed like an infeasible option in the past to customers wanting to purchase concrete.[31] After the city's initial investment in the local permeable concrete market, the product cost has come down making permeable concrete a more affordable option for other consumers besides the city. This has resulted in an increased application of permeable concrete throughout the region.

Figure 10: Permeable Pavers and Permeable Concrete Chicago Alleys
(Source: Abby Hall, US EPA)

The success of the Chicago Green Alley Program is evident. Not only are the alleys been "greened" as a result of the program, the surrounding properties and even the surrounding neighborhoods are experiencing the positive impacts of the program's implementation.

Conclusions and Recommendations

Incorporating green streets as a feature of urban stormwater management requires matching road function with environmental performance. Enhancing roads with green elements can improve their primary function as a transportation corridor while simultaneously mitigating their negative environmental impacts. In theory and practice many municipalities are not far removed from dedicated green streets programs. Street tree and other greenscaping programs are often identified and promoted along urban transportation corridors. Adapting them to become fully functional green streets requires minor design modifications and an evaluation of how to maximize the benefits of environmental systems.

Portland's green streets program demonstrates how common road and right-of-way elements (e.g., traffic calming curb extensions, tree boxes) can be modified and optimized to provide stormwater management in addition to other benefits. The curb cuts and design variations to allow runoff to enter the vegetated areas are subtle changes with a significant impact and demonstrate how stormwater can be managed successfully at the source. One of the biggest successes of the program was reassessing common design features and realizing that environmental performance can be improved by integrating stormwater management.

Where Portland used vegetation, Chicago's Green Alley Program similarly demonstrates that hardscape elements can be an integral part of a greening program. By incorporating permeable pavements that simulate natural infiltration, Chicago enhances the necessary transportation function of alleys while enhancing infrastructure and environmental management. Portland also contrasts the "soft" and "hard"

elements of green streets by using both permeable pavements and vegetated elements. The green options available demonstrate the flexibility of green infrastructure to satisfy road function and environmental objectives and highlight why transportation corridors are well suited for green infrastructure.

Elements necessary for a successful green streets program:

- **Pilot projects are critical.** The most successful municipal green street programs to date all began with well documented and monitored pilot projects. These projects have often been at least partially grant funded and receive the participation of locally active watershed groups working with the city infrastructure programs. The pilot projects are necessary to demonstrate that green streets can work in the local environment, can be relied upon, and fit with existing infrastructure. Pilot projects will help to dispel myths and resolve concerns.
- **Leadership in sustainability from the top.** The cities with the strongest green streets programs are those with mayors and city councils that have fully bought into sustainable infrastructure. Council passed green policies and mayoral sustainability mandates or mission statements are needed to institutionalize green street approaches and bring it beyond the token green project.
- **Buy-in from all municipal infrastructure departments.** By their nature, green streets cross many municipal programs. Green street practices impact stormwater management, street design, underground utilities, public lighting, green space planning, public work maintenance, and budgeting. When developing green streets, all of the relevant agencies must be represented. Also, coordination between the agencies on project planning is important for keeping green infrastructure construction costs low. Superior green street design at less cost occurs when sewer and water line replacement projects can be done in tandem with street redevelopment. These types of coordination efforts must happen at the long-term planning stage.
- **Documentation.** Green street projects need to be documented on two levels, the design and construction level and on a citywide tracking level. Due to the different street types and siting conditions, green street designs will take on many variations. By documenting the costs, construction, and design, the costs of similar future projects can be minimized and construction or design problems can be avoided or addressed. Tracking green street practices across the city is crucial for managing maintenance and quantifying aggregate benefits.
- **Public outreach.** Traditional pollution prevention outreach goes hand in hand with green street programs. Properly disposing of litter, yard waste, and hazardous chemicals and appropriately applying yard chemicals will help prolong the life of green street practices. An information campaign should also give the public an understanding of how green infrastructure works and the benefits and trade offs. In many cases, remedial maintenance of green street practices will be performed by neighboring property owners; they need to know how to maintain the practices to keep them performing optimally.

As public spaces, roads are prime candidates for green infrastructure improvements. In addition to enabling legislation, and technical guidance, developing a green streets program requires an institutional re-evaluation of how right-of-ways are most effectively managed. This process typically includes:

- Assessing the necessary function of the road and selecting the minimum required street width to reduce impervious cover;
- Enhancing streetscaping elements to manage stormwater and exploring opportunities to integrate stormwater management into roadway design; and
- Integrating transportation and environmental planning to capitalize on economic benefits.

The use of green streets offers the capability of transforming a significant stormwater and pollutant source into an innovative treatment system. Green streets optimize the performance of public space easing maintenance concerns and allowing municipalities to coordinate the progression and implementation of stormwater control efforts. In addition, green streets optimize the performance of both the transportation and water infrastructure. Effectively incorporating green techniques into the transportation network provides significant opportunity to decrease infrastructure demands and pollutant transport.

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APPENDIX C
Applicable Hydromodification Control Requirements in South Orange County as of 12/20/2013

Note: Hydromodification requirements were in flux at the time of publication of this document. Appendix C includes a summary of current requirements in place at the time of publication and the associated technical resource(s) for implementing these requirements. Appendix C is subject to change as the applicability of requirements changes. Please refer to http://ocwatersheds.com/documents/wqmp/ to determine whether a newer version of Appendix C is in effect.

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SOUTH ORANGE COUNTY MODEL WQMP

APPENDIX C

HCOC GUIDANCE MEMORANDUM

To: Richard Boon, OC Watersheds

From: Daniel Apt and Remi Candaele, RBF Consulting

Date: December 3, 2013

Subject: South Orange County Hydrologic Conditions of Concern (HCOC) Guidance

---

Priority Development Projects (PDPs) in South Orange County (San Diego Region) where Hydrologic Conditions of Concern (HCOCs) exist are currently subject to the Interim Hydromodification Criteria identified in Section F.1.h.(5) of the South Orange County Municipal Separate Storm Sewer System (MS4) Permit (Order No. R9-2009-0002). The County of Orange on behalf of the South Orange County Copermittees has submitted the South Orange County Hydromodification Management Plan (SOC HMP) to the San Diego Regional Water Quality Control Board (Regional Board)for approval, however until the SOC HMP is approved by the Regional Board the Interim Hydromodification Criteria apply to PDPs where HCOCs exist. It is the responsibility of PDPs to check the OC Watersheds website located at http://ocwatersheds.com/documents/wqmp/ to identify status of the SOC HMP and if the Interim Hydromodification Criteria still apply.

Hydromodification Management Applicability

HCOCs for South Orange County (San Diego Region) are considered to exist for all PDPs, regardless of the existing condition of the project site, except for those PDPs where the project discharges (1) storm water runoff into underground storm drains discharging directly to bays or the ocean; or (2) storm water runoff into conveyance channels whose bed and bank are concrete lined all the way from the point of discharge to ocean waters, enclosed bays, estuaries, or water storage reservoirs and lakes, per Section F.1.h.(5) of the South Orange County MS4 Permit. **Figures J1-J8** below provide the hydromodification applicability maps for South Orange County based on the exemptions provided in Section F.1.h.(5) of the South Orange County MS4 Permit. These maps identify the inventoried South Orange County storm drains and the potentially exempt areas. These maps are for planning purposes only as it is the responsibility of the PDP to verify if the project actually discharges into the exempt conditions identified above. These maps can also be found at the OC Watersheds website located at http://ocwatersheds.com/documents/wqmp/.

Interim Hydromodification Criteria

Currently PDPs in South Orange County where HCOCs exist are subject to the Interim Hydromodification Criteria identified in Section F.1.h.(5) of the South Orange County MS4 Permit. The Interim Hydromodification Criteria is as follows:

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PDPs must implement the following criteria by comparing the pre-development (naturally occurring) and post-project flow rates and durations using a continuous simulation hydrologic model such as US EPA's Hydrograph Simulation Program-Fortran (HSPF):

(a) For flow rates from 10 percent of the 2-year storm event to the 5 year storm event, the post-project peak flows shall not exceed pre-development (naturally occurring) peak flows.

(b) For flow rates from the 5-year storm event to the 10 year storm event the post-project peak flows may exceed pre-development (naturally occurring) flows by up to 10 percent for a 1-year frequency interval.

Tools for Achieving the Interim Hydromodification Criteria

PDPs have the option to use the South Orange County Hydrology Model (SOCHM), developed by the County of Orange, to meet the Interim Hydromodification Criteria. SOCHM and the SOCHM Guidance Manual are available on the OC Watersheds website located at http://ocwatersheds.com/documents/wqmp/.

It should be noted that the user of SOCHM will need to make sure that all flow durations from 10 percent of the 2-year storm event to the 5 year storm event pass the SOCHM model in addition to passing the entire model simulation to be in compliance with the Interim Hydromodification Criteria. PDPs also may use a different continuous simulation hydrologic model to meet the Interim Hydromodification Criteria but must seek approval from the governing jurisdiction (Copermittee) where the PDP is located prior to using a different model.

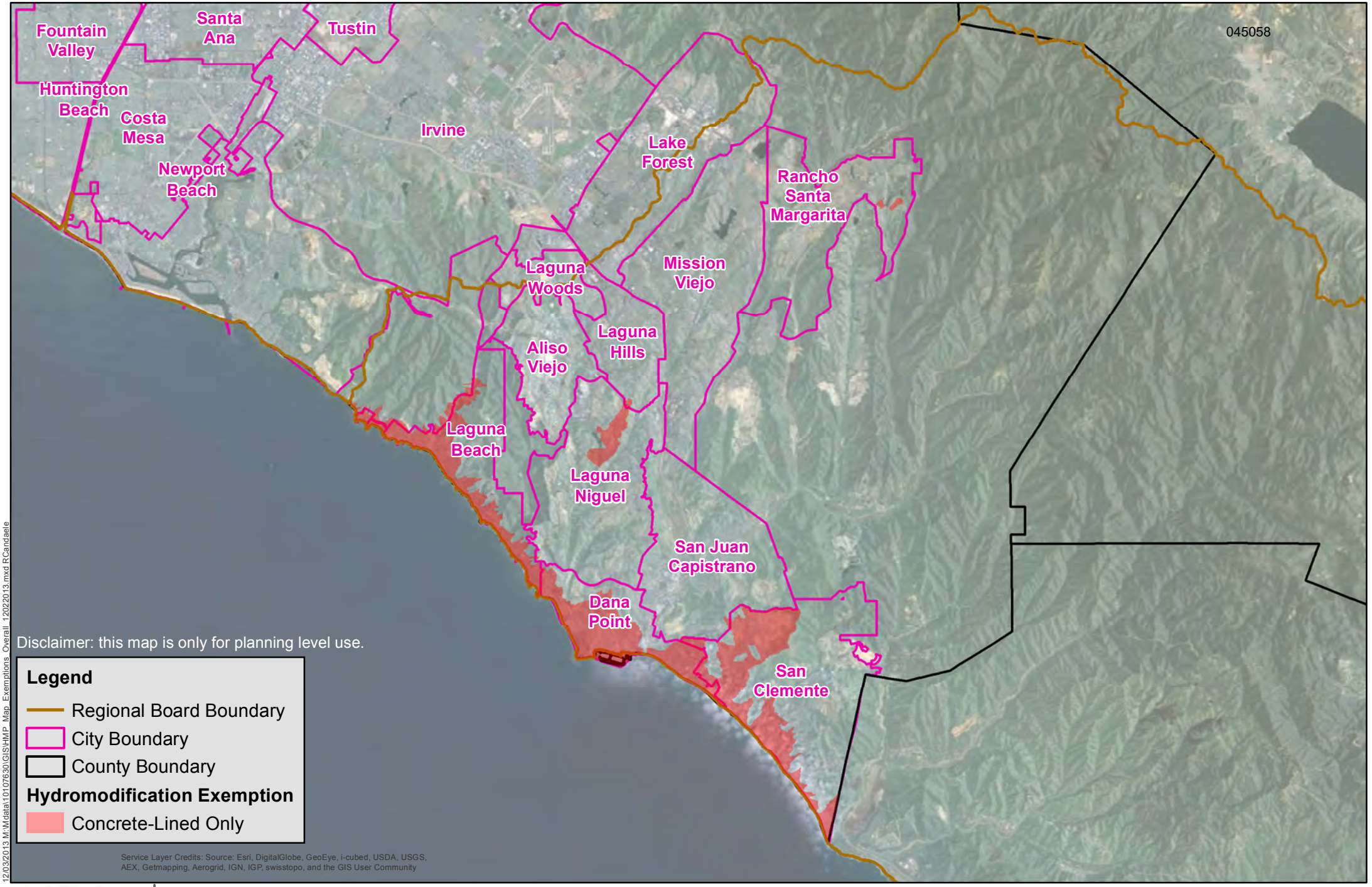

0 5 10 Miles

Sources: County of Orange; Caltrans; ESRI; RBF Consulting; San Diego RWQCB; SWRCB

Hydromodification Exempt Areas – Concrete-Lined Channel Exemption
Figure J-1 - South Orange County Exemption Map

045059

Laguna Beach

Laguna Niguel

San Juan Capistrano

Dana Point

San Clemente

Pacific Ocean

Disclaimer: this map is only for planning level use.

Legend

- Regional Board Boundary
- City Boundary
- County Boundary

Hydromodification Exemption

- Concrete-Lined Only

Service Layer Credits: Sources: Esri, DeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, 2013

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0 0.5 1 Miles

Sources: County of Orange; Caltrans; ESRI; RBF Consulting; San Diego RWQCB; SWRCB

Hydromodification Exempt Areas – Concrete-Lined Channel Exemption
Figure J-2 - Dana Point Exemption Map

South Orange County Hydromodification Management Plan

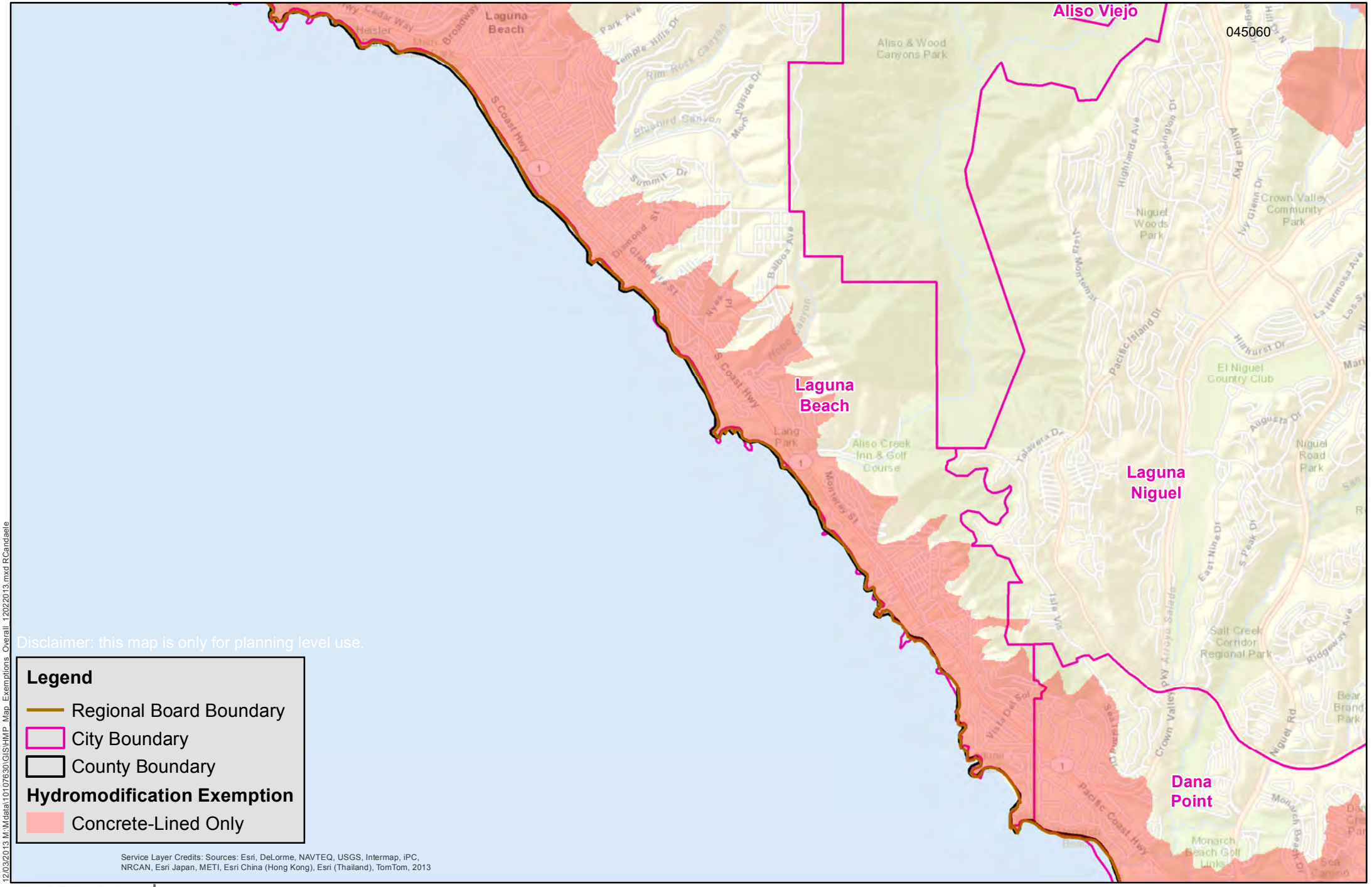

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Sources: County of Orange; Caltrans; ESRI; RBF Consulting; San Diego RWQCB; SWRCB

Hydromodification Exempt Areas – Concrete-Lined Channel Exemption
Figure J-3a - South Laguna Beach Exemption Map

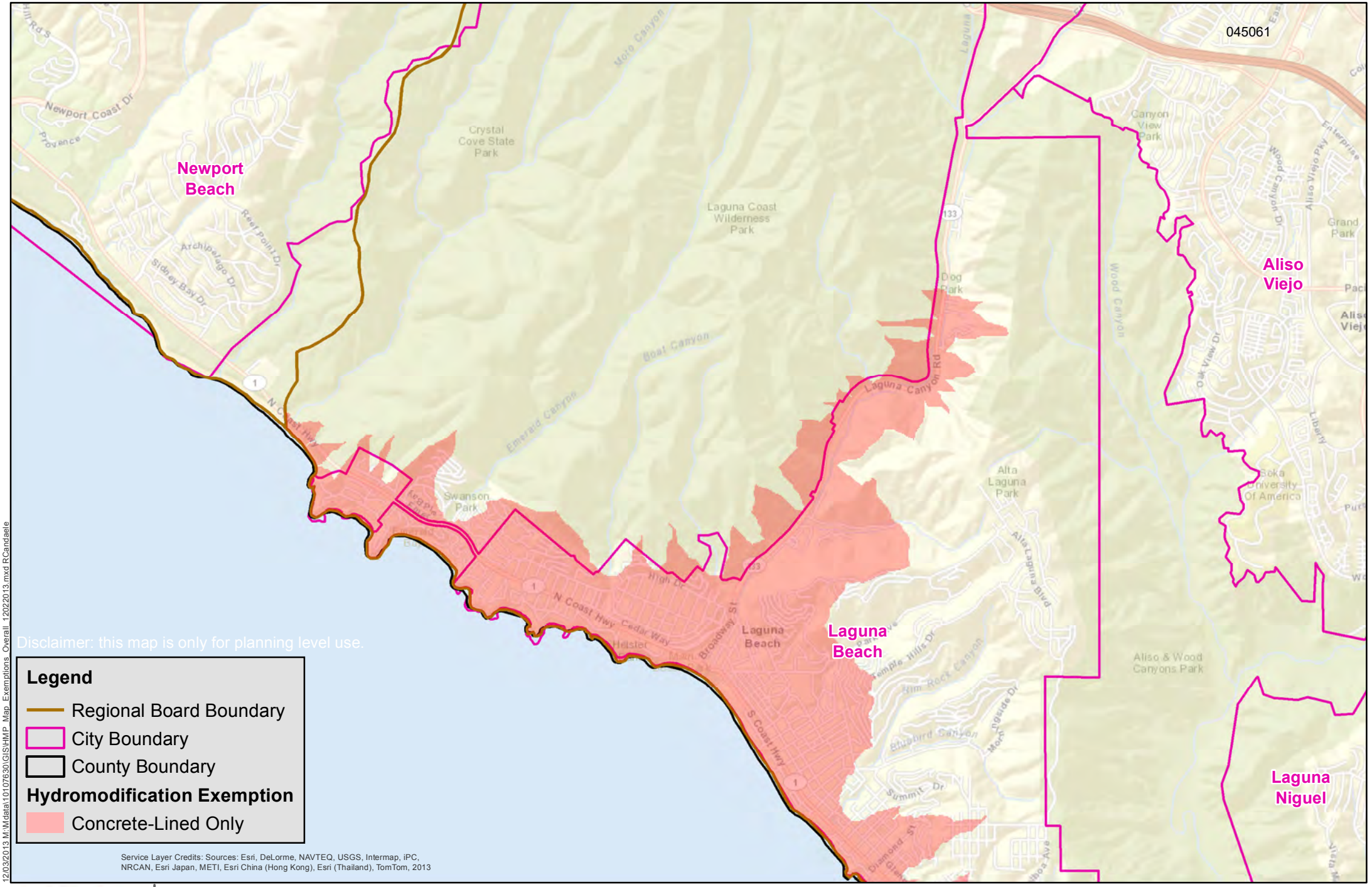

0 0.5 1 Miles

Sources: County of Orange; Caltrans; ESRI; RBF Consulting; San Diego RWQCB; SWRCB

Hydromodification Exempt Areas – Concrete-Lined Channel Exemption
Figure J-3b - North Laguna Beach Exemption Map

South Orange County Hydromodification Management Plan

045062

Irvine

Lake Forest

Laguna Woods

Mission Viejo

Rancho Santa Margarita

Laguna Hills

Aliso Viejo

Laguna Beach

Laguna Niguel

Ladera Ranch

Disclaimer: This map is only for planning level use.

Legend

- Regional Board Boundary
- City Boundary
- County Boundary

Hydromodification Exemption

- Concrete-Lined Only

Service Layer Credits: Sources: Esri, DeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, 2013

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0 0.5 1 Miles

Sources: County of Orange; Caltrans; ESRI; RBF Consulting; San Diego RWQCB; SWRCB

Hydromodification Exempt Areas – Concrete-Lined Channel Exemption

Figure J-4 - Laguna Hills Exemption Map

South Orange County Hydromodification Management Plan

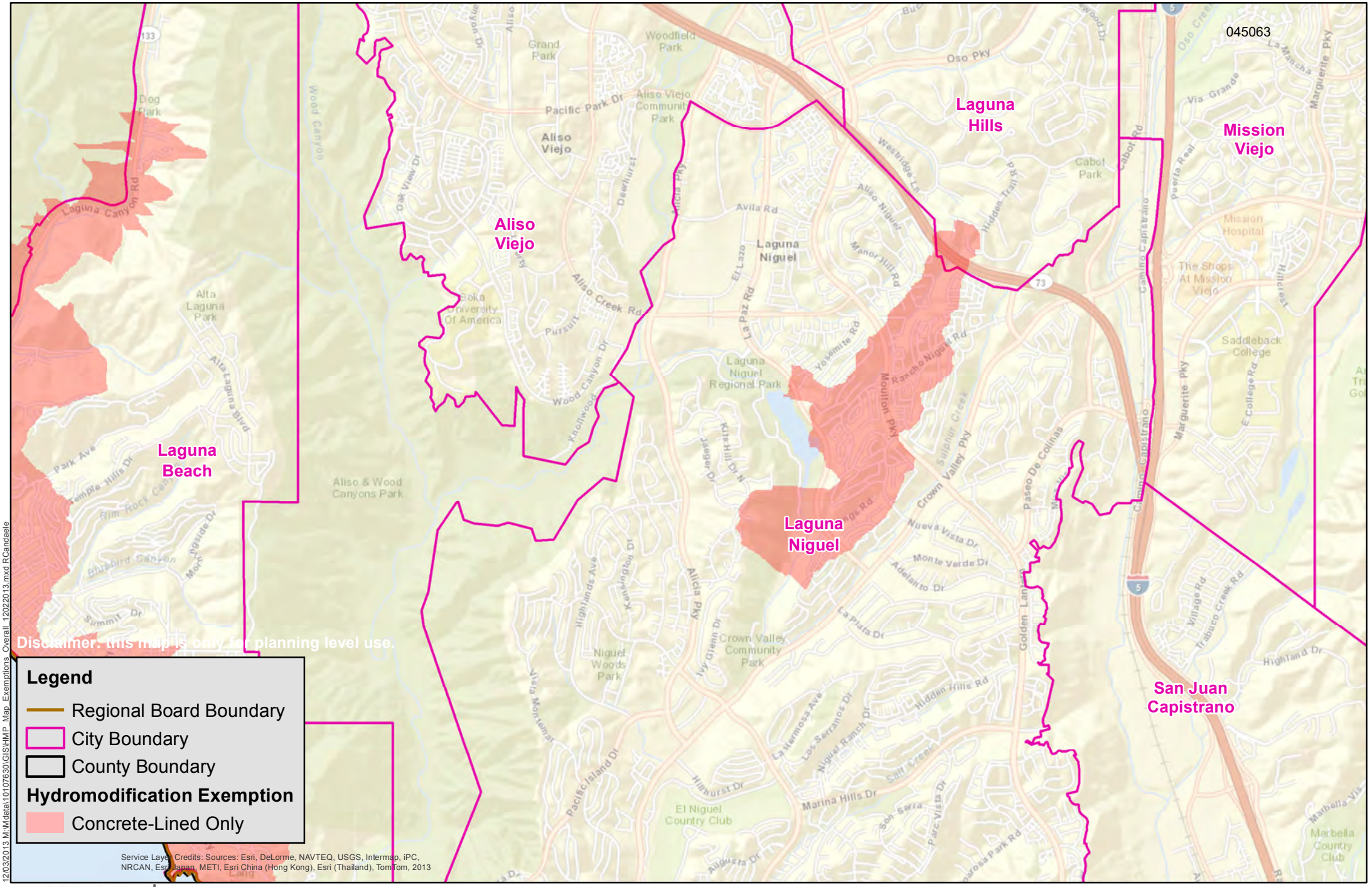

0 0.5 1 Miles

Sources: County of Orange; Caltrans; ESRI; RBF Consulting; San Diego RWQCB; SWRCB

Hydromodification Exempt Areas – Concrete-Lined Channel Exemption
Figure J-5a - North Laguna Niguel Exemption Map

South Orange County Hydromodification Management Plan

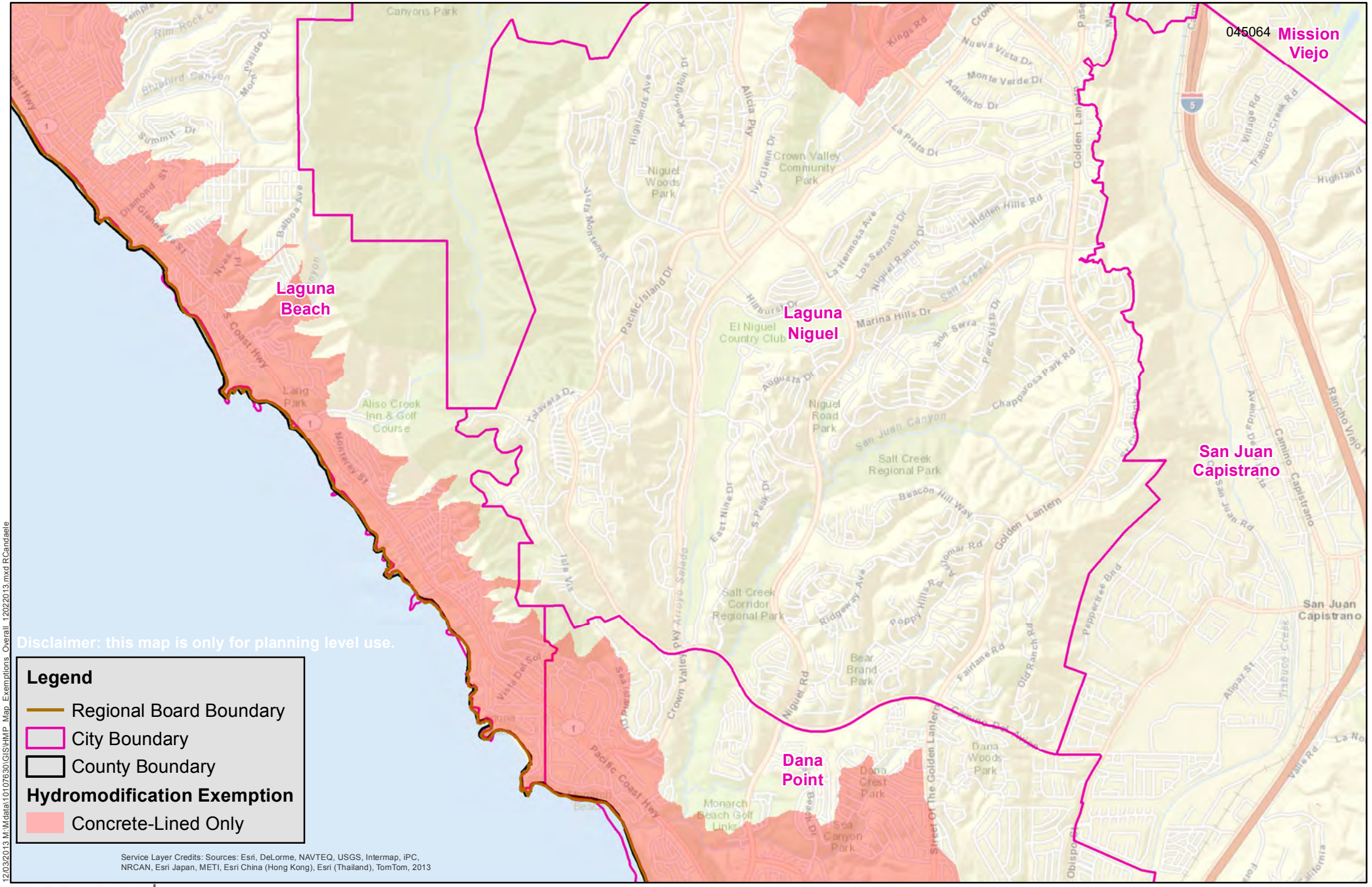

0 0.5 1 Miles

Sources: County of Orange; Caltrans; ESRI; RBF Consulting; San Diego RWQCB; SWRCB

Hydromodification Exempt Areas – Concrete-Lined Channel Exemption
Figure J-5b - South Laguna Niguel Exemption Map

South Orange County Hydromodification Management Plan

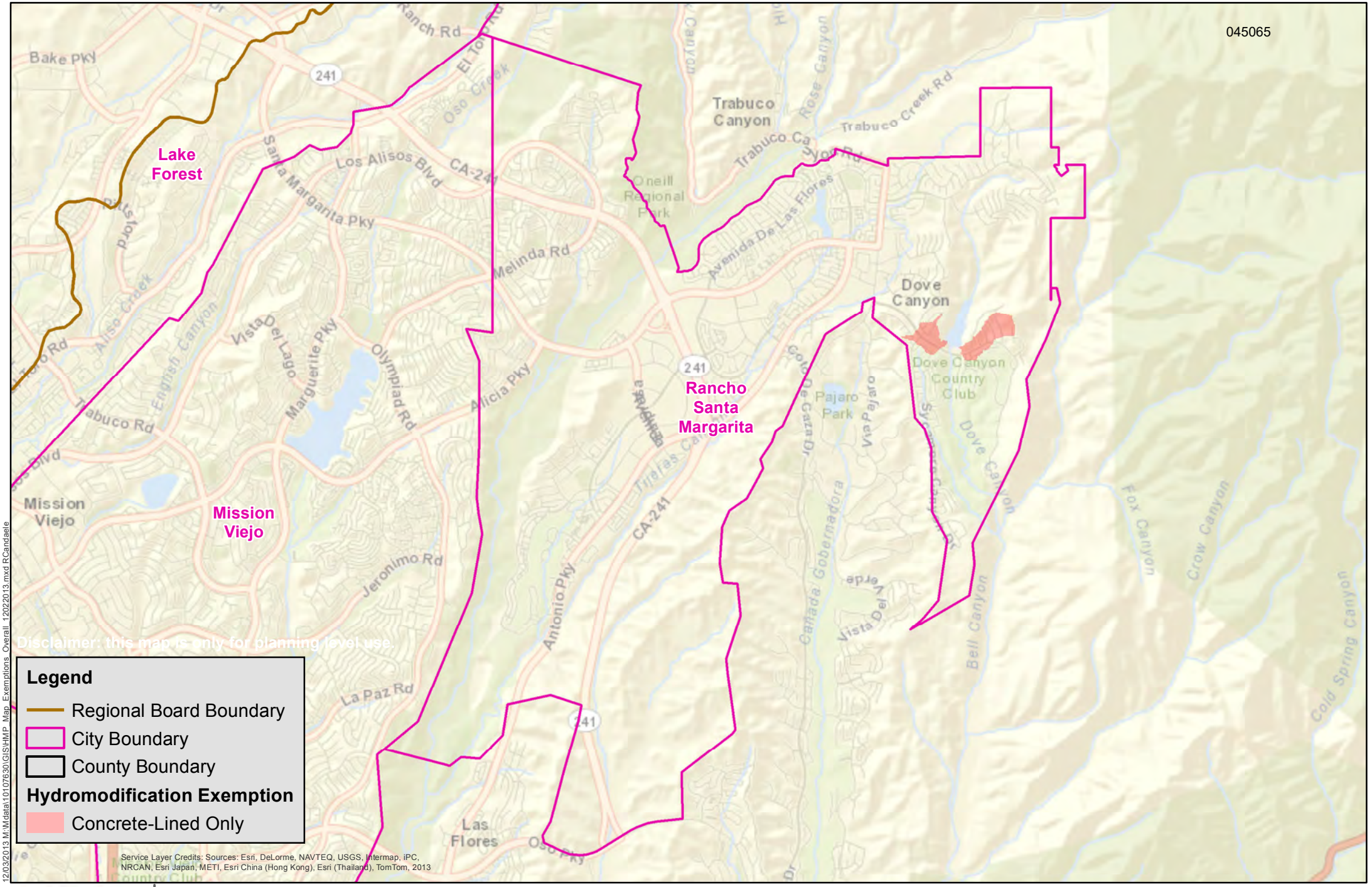

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Sources: County of Orange; Caltrans; ESRI; RBF Consulting; San Diego RWQCB; SWRCB

Hydromodification Exempt Areas – Concrete-Lined Channel Exemption
Figure J-6 - Rancho Santa Margarita Exemption Map

South Orange County Hydromodification Management Plan

045066

San Juan Capistrano

San Clemente

Dana Point

Disclaimer: this map is only for planning level use.

Legend

- Regional Board Boundary
- City Boundary
- County Boundary

Hydromodification Exemption

- Concrete-Lined Only

Service Layer Credits: Sources: Esri, DeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, 2013

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0 0.5 1 Miles

Sources: County of Orange; Caltrans; ESRI; RBF Consulting; San Diego RWQCB; SWRCB

Hydromodification Exempt Areas – Concrete-Lined Channel Exemption
Figure J-7a - North San Clemente Exemption Map

South Orange County Hydromodification Management Plan

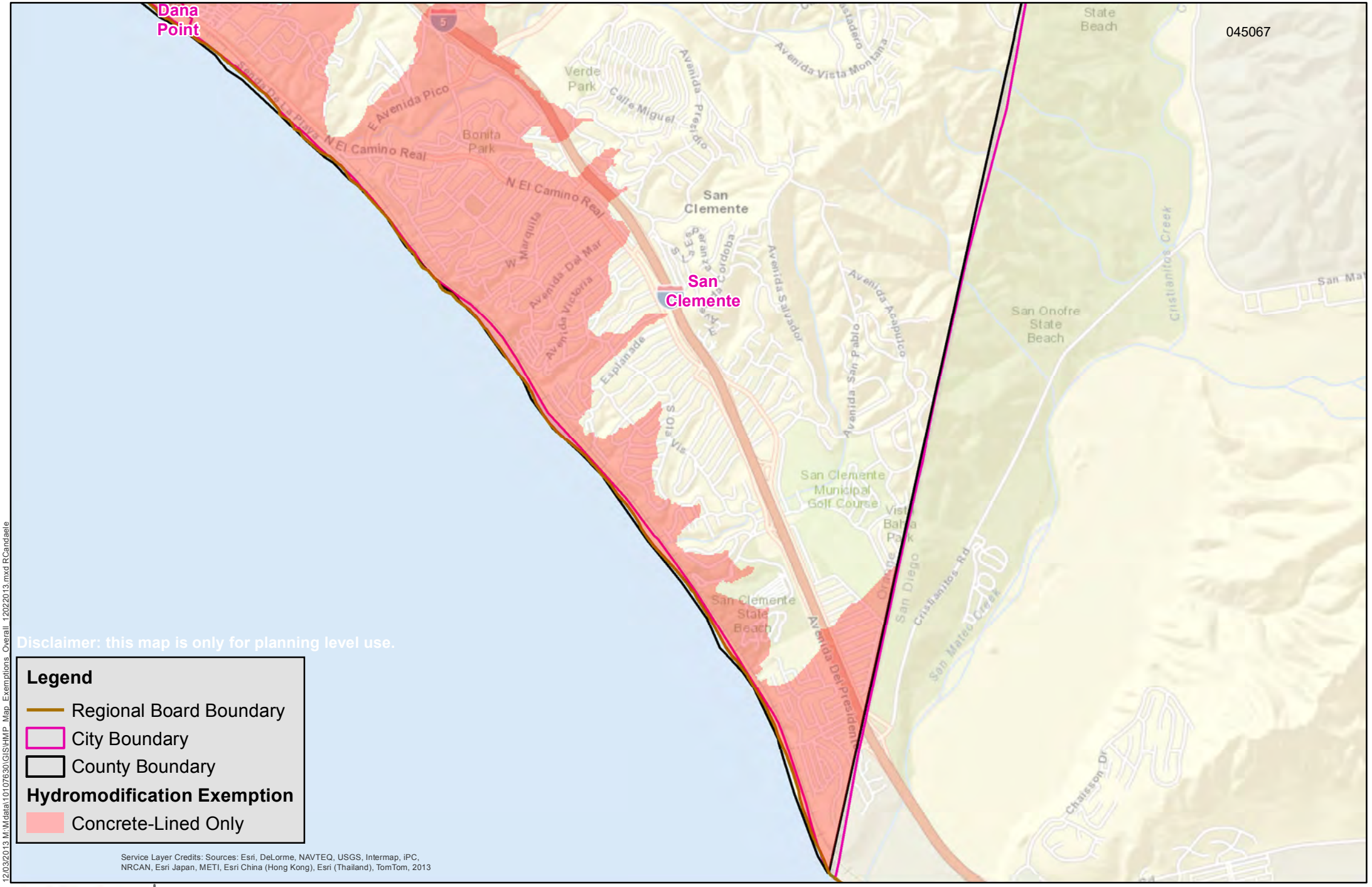

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Sources: County of Orange; Caltrans; ESRI; RBF Consulting; San Diego RWQCB; SWRCB

Hydromodification Exempt Areas – Concrete-Lined Channel Exemption
Figure J-7b - South San Clemente Exemption Map

South Orange County Hydromodification Management Plan

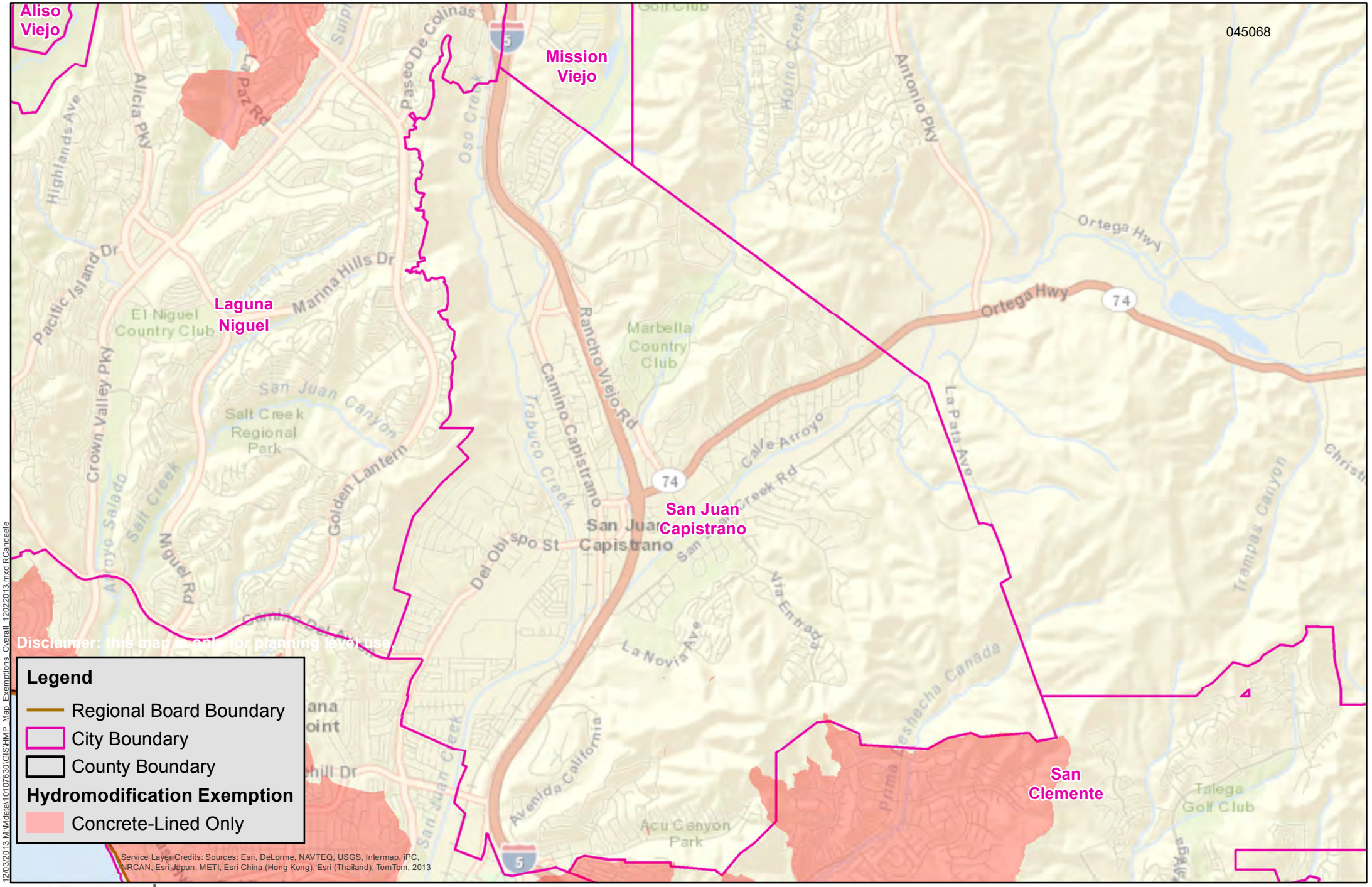

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0 0.5 1 Miles

Sources: County of Orange; Caltrans; ESRI; RBF Consulting; San Diego RWQCB; SWRCB

Hydromodification Exempt Areas – Concrete-Lined Channel Exemption
Figure J-8 - San Juan Capistrano Exemption Map

South Orange County Hydromodification Management Plan

Report of Waste Discharge

Submitted by

The County of Orange, Orange County Flood Control District and Cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Lake Forest, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano

May 20, 2014

Report of Waste Discharge

Prepared for the California Regional Water Quality Control Board

May 20, 2014

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Mary Anne Skorpanich, Deputy Director
OC Public Works

2014 County of Orange Report of Waste Discharge for the San Diego Region

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Executive Summary

The Orange County Stormwater Program (the Program) is a cooperative municipal regulatory compliance initiative focused on the management of urban and stormwater runoff for the protection and enhancement of Orange County's creeks, rivers, streams, and coastal waters. The primary objective of the Program is to fulfill the commitment of the County of Orange, the Orange County Flood Control District and the cities of Orange County (collectively, the "Permittees"), to develop and implement a program that satisfies the requirements of area-wide Municipal Separate Storm Sewer System (MS4) National Pollutant Discharge Elimination System (NPDES) Permits.

The purpose of this document is to comply with the requirement for submittal of a "Report of Waste Discharge" (ROWD). This report discusses the Permittees' Fourth Term MS4 Permit compliance activities and accomplishments over the period June, 2009 to June, 2013. It identifies all of the activities, research and pilot studies the Permittees propose to undertake during the next permit term based upon a consideration of the effectiveness of the Program and need for additional pollutant control initiatives. The report requests coverage under a Fifth Term Permit that is specific to south Orange County.

The Permittees also consider a series of performance metrics to further enable the effectiveness of the Program's elements to be evaluated. This assessment of program effectiveness, comprising consideration of both the state of the aquatic environment and program performance metrics, is the basis for identifying the specific program activities and pilot studies the Permittees propose to undertake during the next permit term. These activities, which are identified as recommendations for program continuation, program enhancements, or program modifications, together with the Fifth Term MS4 Permit compliance milestones, are noted in each section of the report and are summarized in Section 7.0. The deliberate emphasis on program enhancement, rather than policy and programmatic change, is emblematic of a mature municipal stormwater program that is protective of water quality and is achieving meaningful environmental outcomes.

State of the Environment – Key Findings

This report includes an analysis of the state of water quality in Orange County and explores trends for four primary water quality issues on which the Permittees intend to focus during the Fifth Term. Key findings and trends are discussed for bacteria, total dissolved solids, nutrients and toxicity.

Bacteria

- The County's beaches support concentrated recreational activities for both residents and visitors and are important contributors to the local and regional economy.
- Concern about swimming safety is consistently high and epidemiology studies in dry weather show that some illness (for example, gastroenteritis) is associated with full immersion swimming in contaminated water.
- Contamination is very low during dry weather and has dropped steadily over time; beach report card grades are consistently high.

- Sources of contamination have been reduced through targeted actions; remaining issues during dry weather are localized and may have natural components.
- Contamination is more widespread during wet weather; wet weather flows are larger and qualitatively different.
- Health risks associated with wet weather flows are uncertain, but ongoing research and development focuses on improved monitoring tools and wet weather epidemiology studies.
- Progress on managing dry weather contamination demonstrates the efficacy of targeted BMPs appropriate to specific situations that may include natural sources (e.g., birds).

Dissolved Solids

- Persistent and widespread exceedances of total dissolved solids occur in channels and at discharge outfalls.
- Dissolved solids are a challenging to address because a large portion of these elevated levels derive from natural sources in regional groundwater.
- Understanding local geology is key to understanding sources of dissolved solids and the pathways they travel in the watershed.
- While the flood control system provides one pathway for dissolved solids in groundwater to reach the surface, other natural pathways (such as artesian springs) exist and there is evidence of historically elevated dissolved solids levels in surface water in the region.

Nutrients

- Nutrient levels in South Orange County streams and channels are frequently above commonly used thresholds that suggest increased likelihood of nutrient impacts. In contrast, there are much less frequent occurrences of impacts, such as macroalgal overgrowth, due to excessive nutrient levels.
- Nutrient issues are not limited to the urban portion of the County; regional monitoring data show nutrient enrichment and impacts such as increased macroalgal cover and/or lower dissolved oxygen in streams and estuaries in undeveloped regions.
- The major point sources of nutrients have been controlled. Therefore, nonpoint and diffuse sources such as leaching from upland soils and intrusions from shallow groundwater are increasingly important.
- Nutrients can be readily transported in and out of various reservoirs (e.g., sediments, groundwater) and undergo complex biological transformation and cycling. This makes traditional pollutant control strategies less effective for nutrients.

Improved management strategies may contribute to further progress, particularly in streams and channels, by accounting for site-specific conditions, promoting Low Impact Development, and accounting for broader regional sources.

Toxicity

- Toxicity in freshwater channels in all conditions (aquatic, sediment, wet and dry weather) occurs at low levels and is

sporadic, occurring at different locations at different times and varying unpredictably across test species.

- Aquatic toxicity in dry weather occurs in open (undeveloped) areas at levels equivalent to those in urban areas; suggesting that dry weather toxicity is not driven predominantly by urban pollutants.
- There are no apparent trends in toxicity over time.
- Metals, except for some instances of elevated copper, are at low levels and do not appear to contribute to aquatic toxicity in freshwater.
- The primary source of toxicity appears to be pesticides, with evidence that pyrethroids contribute to sediment toxicity.
- Use of organophosphate pesticides has declined virtually to zero but use of pyrethroid pesticides has increased and exceedances of thresholds for pyrethroid pesticides are high.
- Reported pesticide use in the County has declined from just over 2 million pounds a year in 1998 to just under 1 million pounds in 2011, due primarily to reduced use of indoor fumigants.
- There is a large data gap in our knowledge of retail pesticide sales and use.
- Pesticide use (which is regulated directly at the state and federal levels) presents a moving target for management because of the continued introduction of new products; the most effective management strategies are to continue to reduce dry weather runoff/flows and support education and outreach efforts to reduce pesticide use and runoff.

Controlling Pollutant Sources - Countywide/Jurisdictional Programs: Accomplishments

The management of sources of pollution from diffuse urban areas involves the strategic application of Best Management Practices (BMPs) to activities and drainage systems within the urban environment. The purpose of BMPs is to protect water quality by reducing pollutant loads and concentrations and by reducing discharges (volumetric flows and flow rates) causing stream channel erosion. Municipal efforts to prioritize, inspect and manage existing and new development, educate the public to encourage adoption of behaviors protective of water quality and to respond to illegal discharges or illicit connections are discussed in this section.

- The Model Municipal Activities Program ensures that BMPs are implemented and maintained at over 1,700 municipal facilities.

- The Model Integrated Pest Management Program ensures municipal conformance with an Integrated Pest Management Policy developed in partnership with University of California Cooperative Extension. Implementation of the policy is resulting in reductions in municipal fertilizer and pesticide use.

- Public awareness surveys conducted approximately every three years demonstrate increased levels of awareness regarding stormwater concerns and several positive behavior changes regarding car washing, use of landscape management products, and pet waste.

- The Program achieved over 155 million impressions through various forms of paid media, and over 5.5 million impressions at outreach events from 2008 to 2013.

- The Permittees initiated a strategic behavior-specific outreach program in 2012.

- Reductions in outdoor water use, retrofitting the residential environment to reduce outdoor water demand and elimination of runoff from irrigation are the foci of action-based outreach efforts initiated in 2013.

- The Permittees developed a significantly revised Model Water Quality Management Plan (WQMP) and Technical Guidance Document (TGD) to implement new requirements for the implementation of Low Impact Development (LID) BMPs.

- The Permittees implemented the new Model WQMP and TGD for all priority projects in north Orange County starting on August 17, 2011, and in south Orange County starting on December 20, 2013.

- During the permit term (through the FY2012-13 reporting period) 1,369 WQMPs for public and private projects were approved across all of Orange County for a total of 18,749 acres of development now that are now subject to Project WQMPs.

- South Orange County was mapped and a geodatabase was developed that includes conveyance systems, infiltration constraints, land use, and soil types. The County is using the geodatabase to evaluate channel susceptibility to hydromodification, and opportunities and constraints for infiltration and treatment BMP implementation at various scales.

- The Construction Program maintained an inventory of up to 12,060 construction sites, prioritized these sites regarding their threat to water quality, and inspected them at the frequency specified by the permit. Non-compliant sites were educated and required to implement BMPs as required.

- The Industrial/Commercial Program inventoried 14,000 sites and conducted inspections of these sites at frequencies specified by the permit.

- A new Mobile Business Pilot Model Program was developed and implemented.

- Residential sources of pollutants were addressed through the Model Residential Program, which included development of new outreach materials and continued outreach to Common Interest Areas and Homeowner's Associations.

- The Permittees continued to aggressively detect and eliminate Illicit Discharges and Illegal Connections (ID/IC) through discharge monitoring, source investigation, and enforcement.

- A spill reporting hotline (1-877-89-SPILL) provides a resource for public spill and water pollution reporting, and an iPhone reporting application was developed. All reports were responded to and resolved.

- The *Model Investigative Guidance for Orange County Illegal Discharges and Illicit Connections Program* was updated for the Non-stormwater Action Levels (NALs) based monitoring program by inclusion of a new *San Diego Region Dry Weather Numeric Action Level (NAL) Source Identification Guide*.

- Essential elements of the Countywide Area Spill Control Program were completed and implemented.

- The NALs monitoring program was fully implemented.

Controlling Pollutant Sources - Watershed Programs: Accomplishments

In addition to countywide and jurisdictional programs, the Permittees participated in water quality planning on the watershed scale. These efforts have led to multi-jurisdictional solutions to problems that cut across programs and jurisdictional boundaries. While the focus of watershed planning in south Orange County is on specific pollutants of concern associated with urban stormwater, particularly TMDLs, this management approach is also supportive of broader objectives such as watershed habitat restoration, consistent with the Practical Vision, and integrated water resource management.

- Extensive watershed mapping of hydromodification susceptibility, infiltration feasibility and regional BMP opportunity sites for the entire south Orange County area has been completed.

- Watershed Workplans for all six San Diego Region Watersheds were developed and implemented. These workplans describe the Watershed Permittees' collective watershed strategies to assess, prioritize and address water quality challenges within each watershed.

- Comprehensive Load Reduction Plans (CLRPs) were developed for Aliso Creek, San Juan Creek and San Clemente Coastal Streams Watersheds. These watershed CLRPs were developed to address bacteria pollutants and other watershed 303(d) listed constituents.

- Dana Point harbor was delisted for Indictor Bacteria and 17 shoreline stations were delisted for Enterococcus, Fecal Coliform and Total Coliform.

- Baby Beach TMDL dry weather load reductions have been achieved for total coliform and the 50% load reduction milestones for fecal coliform and Enterococcus have also been achieved. Wet weather data also supports the conclusion that TMDL load reductions have been achieved for total coliform and fecal coliform. Further reductions are needed for Enterococcus.

Plan Development

The Permittees have developed a strategic approach to stormwater management that is a cyclical process of measurement, analysis and program improvement.

- The Permittees have been implementing a strategic management approach that includes model programs specified in the permit and the DAMP, and watershed programs focused on specific water bodies and pollutants.

- The Program employs an iterative, adaptive management approach that includes monitoring, evaluation, program revision, BMP implementation adjustment/enhancement, and continued monitoring.

- The Program conducts annual and permit term (i.e. ROWD) using the guidance from CASQA approach.

- The ROWD recommends an evolution to a more holistic watershed management approach to support integrated water resource management and the optimization of watershed ecosystem services.

Program Management and Financing: Accomplishments

Program management includes maintaining a committee structure, participation in regional and statewide groups and tracking costs for compliance.

- The Program continued to operate with the County of Orange as the Principal Permittee during the permit term.

- The Program operated under a four-tier committee structure with participation at all levels by Permittee staff and management.

- An Implementation Agreement establishes responsibilities and provides a funding mechanism for cooperative activities. Funding has been sufficient to complete common program activities.

- The Program benefitted strongly from cooperation and representation among several regional and statewide groups including the California Stormwater Quality Association and the Southern California Coastal Water Research Project.

- Coordination with Orange County Transportation Authority (OCTA) on development of a Structural BMP Prioritization and Analysis Tool (SBPAT) to support disbursement of Measure M2 funding for water quality projects. SBPAT is a GIS-based decision support tool that is being used to identify and prioritize potential structural BMP retrofit projects throughout Orange County. To date Tier 1 funding of $8.6 million has been awarded to 85 projects and Tier 2 funding of $12.7 million has been awarded to 8 projects.

1.0 Introduction

The Story: Introduction

- Established in 1990, the Orange County Stormwater Program (the Program) is a cooperative regulatory partnership among the cities of Orange County, the County of Orange and the Orange County Flood Control District (collectively the Permittees) who operate an interconnected municipal storm drain system. Discharges of stormwater and urban runoff from this system are authorized by National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permits.

- The Program is focused on maintaining regulatory compliance of the Permittees with Clean Water Act mandates and mitigating the water quality impacts to streams, creeks and coastal waters that can arise from the imprint of urban development on the landscape.

- This Report of Waste Discharge (ROWD) constitutes the Permittees' application for a Fifth Term of NPDES Municipal Stormwater Permit that is specific to South Orange County and presents specific recommendations for the continuation and future development of the Program.

1.1 Overview

The Program is a cooperative regulatory partnership among the cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Lake Forest, Mission Viejo, Rancho Santa Margarita, San Clemente, San Juan Capistrano, the County of Orange and the Orange County Flood Control District (collectively the Permittees - See **Attachment 1.1 - Primary Permittee Contacts**) who operate an interconnected municipal storm drain system which discharges stormwater and urban runoff pursuant to National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System Permit (MS4 Permit). Clean Water Act Section 402(p) stipulates that MS4 permits must require the Permittees to:

- Effectively prohibit non-stormwater discharges to the storm drain system, and
- Implement controls to reduce the discharge of pollutants in stormwater to the Maximum Extent Practicable (MEP).

In anticipation of the expiration of the South Orange County MS4 Permit on December 16, 2014, this Report of Waste Discharge (ROWD):

- Describes the regulatory basis and environmental rationale for the Program and requests issuance of a Fifth Term Permit that is specific to south Orange County (see – "Introduction");
- Presents an assessment of the state of the environment for South Orange County with specific reference to swimming safety and aquatic ecosystem health and makes recommendations for the future allocation of monitoring resources (see – "State of the Environment");
- Evaluates jurisdictional pollutant control program effectiveness and makes recommendations for enhancing future program implementation (see – "Controlling Pollutant Sources: Jurisdictional Management Programs");
- Describes watershed-based planning in Orange County and makes recommendations for integrating Total Maximum Daily Load requirements into the Fifth Term Permit (see – "Controlling Pollutant Sources: Watershed Programs");
- Reviews the Program's jurisdictional and watershed planning processes and makes recommendations for a shift toward a "watershed management approach"

supportive of the restorative goals of the Clean Water Act (see – "Plan Development");
- Reviews the Program's management structure and describes current program financing including recommendations for future cost studies (see – "Program Management and Financing"); and
- Summarizes recommendations for the future direction of the Program with recommendations (see – "Summary and Conclusions").

In combination these discussions are intended to fulfill the requirements for the content of the Report of Waste Discharge (see R9-2009-0002 – Section K.2.b), which must include:

- Proposed changes to the Permittees' runoff management programs;
- Proposed changes to monitoring programs;
- Justification for proposed changes;
- Permittee and primary contact information; and
- Any other information for the reissuance of the Order.

1.2 Background

Urban Runoff and Water Quality

The Program is focused on mitigating the adverse impacts to creeks, streams, estuaries and coastal waters that can arise from the imprint of urban development on the landscape. Urbanization creates rooftops, driveways, roads and parking lots (Schueler and Holland, 2000) use the term *imperviousness* as the unifying theme for understanding the adverse hydrologic impacts of urbanization), which (1) increase the flow rate and volume of rainfall runoff (compared to pre-development conditions) and (2) provide a source of pollutants that are flushed or leached by rainfall runoff into surface water systems. These pollutants can include pathogens (disease causing bacteria, viruses and protozoan cysts from fecal sources), nutrients (bio-stimulatory substances such as nitrogen and phosphorus from fertilizers and organic wastes), sediments (sands and silts eroded from construction sites) and toxic organic and inorganic constituents (metals from automotive wear surfaces and pesticides applied to structures and landscapes).

> *There are four interrelated but separable effects of land-use changes on the hydrology of an area: changes in peak flow characteristics, changes in total runoff, changes in quality of water, and changes in the hydrologic amenities*
>
> Luna Leopold, 1968

For streams, creeks and coastal waters, urban runoff can result in:

- Water quality degradation from increased loadings of sediment, nutrients, metals, hydrocarbons, pesticides, and bacteria;
- Stream channel modification and habitat loss due to erosion or channel realignment for flood protection;
- Increased water temperatures resulting from solar energy absorption by urban surfaces and elimination of riparian shading; and
- Loss of groundwater recharge.

Water quality can be defined by both a set of concentrations, speciations, and physical partitions of organic and inorganic substances, and the composition and state of aquatic biota found in a waterbody (Meybeck and Helmer, 1992). Understanding these alternate definitions is highly significant to the ongoing development of the Program, the regulatory framework that impels it and the San Diego RWQCB's "Practical Vision (SDRWQCB 2013)."

Section 2.0 presents a comprehensive assessment of the "state of the environment" for South Orange County based on the results of long-term water quality monitoring and related special studies. However, from a regulatory compliance perspective the 303(d) has particular significance in setting the Program's specific pollutant priorities.

Regulatory History

The Program was initiated in 1990 as a cooperative local government response to a 1987 amendment to the federal Clean Water Act (CWA) that established National Pollutant Discharge System (NPDES) permit requirements for municipal operators of storm drain systems. This amendment was intended to specifically address the adverse water quality impacts of urban runoff. Permit application requirements were promulgated by US Environmental Protection Agency (EPA) in 1990 (40 CFR 122) and form the basis of the current program. There are two fundamental requirements:

- Effectively prohibit non-stormwater discharges to the storm drain system; and
- Implement controls to reduce the discharge of pollutants in stormwater to the Maximum Extent Practicable (MEP).

Orange County's first NPDES Permits were issued in 1990 with renewals in 1996, 2002 and 2009. The Permits require that surface water quality protection be a key consideration in local governments' oversight of construction and development, its regulation of industry and commerce, and in its construction, operation and maintenance of the public urban infrastructure.

There are separate NPDES Permits administered by the Santa Ana and San Diego Regional Water Quality Control Boards (RWQCBs). City and county jurisdictional boundaries rarely coincide with watershed boundaries and in Orange County five jurisdictions within the Program (County of Orange, Orange County Flood Control District and the cities of Lake Forest, Laguna Hills and Laguna Woods) are subject to both permits. For these jurisdictions, the designation provision in Water Code Section 13228 is an option for seeking a single set of permit requirements in instances, such as Orange County, where there is a trend of increasing divergence in permitting approaches between the Regional Boards. The adoption of the Fifth Term Permit will be an opportunity for the two of the split jurisdictions (Cities of Lake Forest and Laguna Hills) who have requested coverage under a single permit to have resolution of this issue.

> "*Maximum extent practicable (MEP) means to the maximum extent possible, taking into account equitable considerations of synergistic, additive, and competing factors, including but not limited to, gravity of the problem, fiscal feasibility, public health risks, societal concern, and social benefits.*"
>
> Elizabeth Miller Jennings, 1993

Management Approach

The management of water pollution arising from landscapes involves the strategic application of Best Management Practices (BMPs). The purpose of BMPs is to protect the beneficial uses of water resources principally through the reduction of pollutant loads and concentrations.

The Program's management approach is a process that involves:

1. Selecting and implementing BMPs to address site specific water quality problems based upon a consideration of

regulatory requirements and technical, institutional and economic feasibility;
2. Conducting comprehensive program effectiveness assessments to ensure that the BMPs are correctly implemented and to determine the effectiveness of BMPs in achieving water quality standards; and
3. Revising and/or enhancing BMPs if water quality standards are not being achieved.

This management approach is applied at two distinct scales: (1) activities conducted by the Permittees implementing jurisdictional programs based on the model programs in the Drainage Area Management Plan (DAMP); and (2) activities conducted by the Permittees and others participating in watershed programs addressing specific waterbody-pollutant combinations including the restorative goals of the Clean Water Act.

Drainage Area Management Plan

The **Drainage Area Management Plan (DAMP)** is the principal policy and program guidance document for the *Program*. The DAMP describes the agreements, structures and programs that:

- Identify urban impacts on receiving waters; produce environmental quality information to direct management activities, including prioritization of pollutants to support the development of specific controls to address these problems; and determine if aquatic resources are being protected;
- Improve existing municipal pollution prevention and removal best management practices (BMPs) to further reduce the amount of pollutants entering the storm drain system;
- Educate the public about the issues of urban stormwater and non-stormwater pollution and obtain their support in implementing pollution prevention BMPs;
- Ensure that all new development and significant redevelopment incorporates appropriate Site Design, Source Control, Treatment Control and LID BMPs to address specific water quality issues;
- Ensure that construction sites implement control practices that address control of construction related pollutants discharges including an effective combination of erosion and sediment controls and on-site hazardous materials and waste management;
- Ensure that existing development addresses discharges from industrial facilities, selected commercial businesses, residential development and common interest areas/homeowner associations.
- Detect and eliminate illegal discharges/illicit connections to the municipal storm drain system;
- Assess constituents of concern and manage urban runoff on a watershed basis with an emphasis on Total Maximum Daily Load (TMDL) obligations and the restorative goals of the Clean Water Act;
- Provide the framework for the program management activities and plan development, and
- Provide the legal authority for prohibiting unpermitted discharges into the storm drain system and for requiring

Best Management Practices

BMPs are defined as "schedules of activities, prohibitions of practices, maintenance procedures, and structural and/or managerial practices, that when used singly or in combination, prevent or reduce the release of pollutants to receiving waters." The types of BMPs are source control, runoff treatment, and flow control.

BMPs in new development and significant redevelopment;

The model programs in the DAMP are implemented individually by each of the Permittees according to jurisdictional DAMP/Local Implementation Plans (LIPs). The ongoing development of the DAMP is informed by annual and five year (i.e. ROWD) program effectiveness assessments.

Orange County – Physical Landscape

Orange County comprises 790 square miles of land area, beginning on a coastal plain and rising to an elevation of over 5,000 feet in the Puente Hills and Santa Ana Mountains to the north and east. The northwestern part of the county lies on the coastal plain of the Los Angeles Basin, while the southeastern end rises into the foothills of the Santa Ana Mountains. The landscape of Orange County presents urbanized watersheds encompassing 34 cities and a total population of 3.1 million people.

Most of Orange County's population resides in one of two shallow coastal valleys either the Santa Ana Valley or the Saddleback Valley. The County has a history of large planned communities, the most notable being the City of Irvine, City of Mission Viejo, City of Aliso Viejo, Coto de Caza, Anaheim Hills, Tustin Ranch, Tustin Legacy, Ladera Ranch, Talega and City of Rancho Santa Margarita. Population growth has slowed as the County has become largely built out (**Figures 1.1 – 1.5**).

Before urbanization, Orange County was drained by ephemeral streams and agricultural drainage ditches which were dry most of the year and carried measurable flow primarily during short duration flash floods and longer duration general winter storms. As urbanization progressed, man-made agricultural drainage ditches were enlarged to flood control channels and the few natural streams such as Santa Ana River, San Diego Creek and San Juan Creek were constrained within levees to provide flood protection (**Figures 1.6 -1.10**). Ephemeral flows in some of the man-made and natural channels have been replaced with continuous low flows created from urban and agricultural irrigation and shallow groundwater.

South Orange County comprises five principal watersheds (Laguna Coastal Streams, Aliso Creek, Dana Point Coastal Streams, San Juan Creek and San Clemente Coastal Streams). In addition, small areas of largely undeveloped land in the City of San Clemente and unincorporated Orange County extend into the San Mateo Creek Watershed. These watersheds are hydrologically separate from North Orange County and physically, hydrologically and jurisdictionally isolated from the adjacent counties of Riverside and San Diego by mountain ranges and/or large swaths of federal land.

Across south Orange County, residential land uses, spread across characteristically modified topography, predominate. Beneath the urbanized landscapes, mostly clay-rich soils overlie marine sediments such as the Monterey and Capistrano Formations. Shallow groundwater from these formations is likely the major determinant of dry weather stream water chemistry and the cause of phosphorus, chloride, sulfates and total dissolved solids (TDS) being identified as the cause of water quality impairments.

Fifth Term Permit

The complexion of the south Orange County landscape is distinct both within Orange County and across the region. For the Program, this landscape presents a number of unique water quality challenges. For example, to enable the Program to effectively prohibit non-stormwater discharges, efforts to

abate dry weather discharges must be allowed to distinguish and prioritize between shallow groundwater influences and genuinely aberrant urban conditions.

In the absence of large areas of industrial and commercial enterprise and little residential redevelopment, addressing pollutant wash-off from impervious surfaces in predominantly residential landscapes requires an emphasis on public infrastructure solutions complemented with education and outreach. This approach ensures that both modifications to drainage infrastructure and public support for the Program will be sustained over the long term.

The history and nature of South Orange County's development also has implications for stormwater regulation and permitting if the broader ecological outcomes contemplated in the Practical Vision and recent imperatives for integrated water resource management are to be achieved. For example, the highly modified stream systems that have been reconstructed to protect historic floodplain development and high land values mean that opportunities for alternate channel configurations will need to be identified through a watershed analysis and cannot be assumed to be presented by every modified channel segment.

For reasons identified above and which are discussed in greater detail in the subsequent sections of this report, this ROWD constitutes the request by the Permittees for a Fifth Term Permit that is unique to South Orange County.

Figure 1.1: Laguna Coastal Streams - Land Use

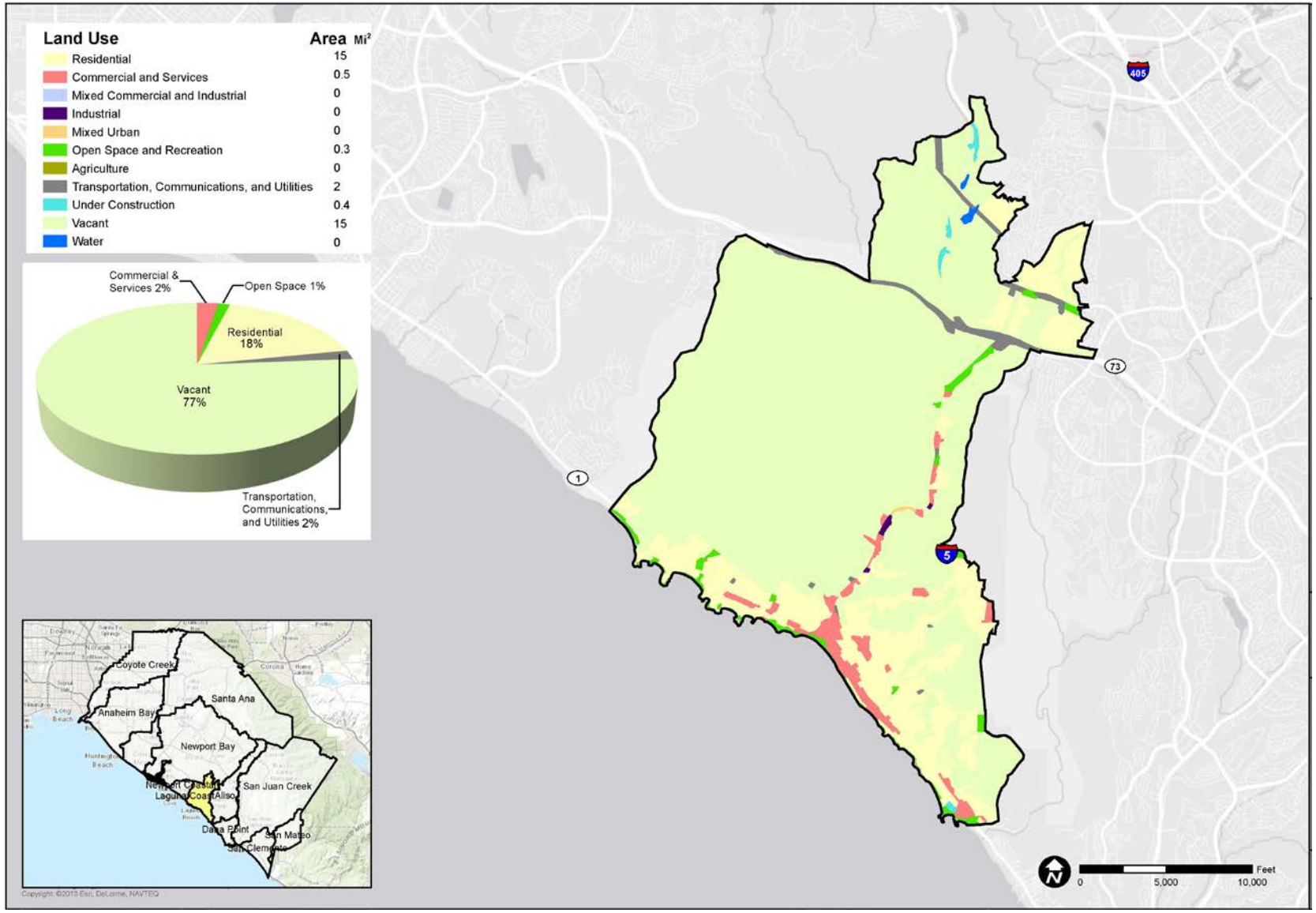

Figure 1.2: Dana Point Coastal Streams - Land Use

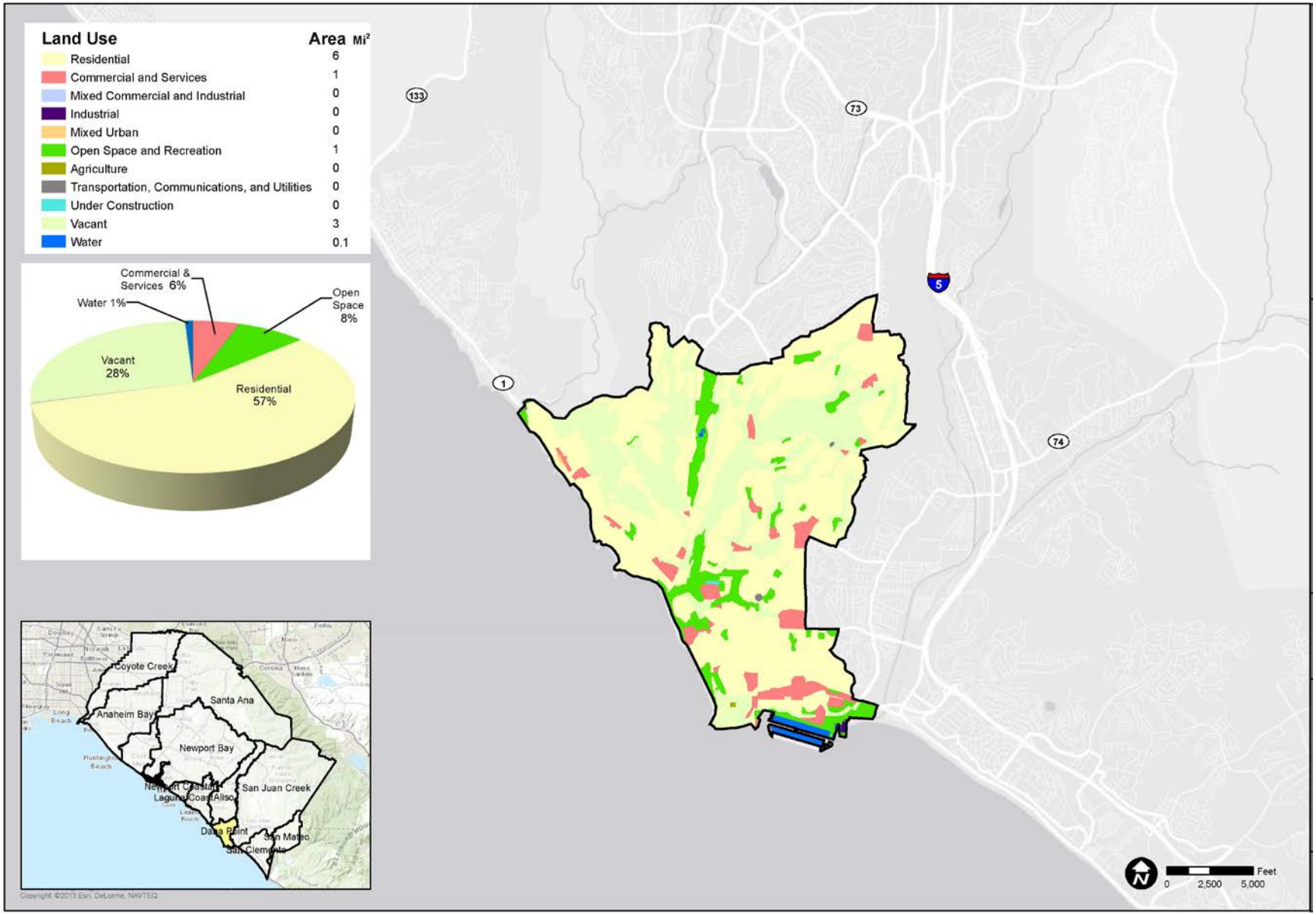

Figure 1.3: Aliso Creek - Land Use

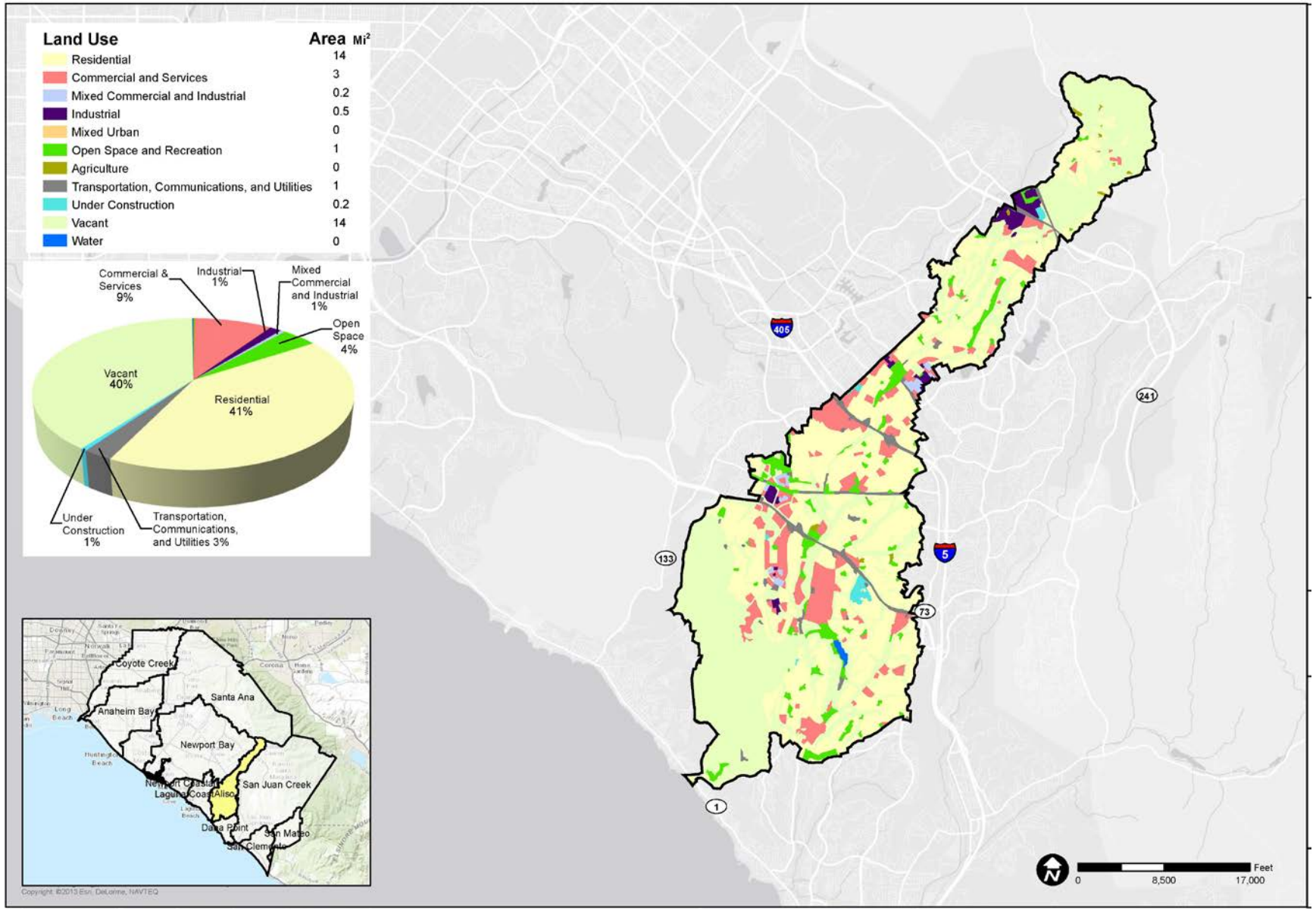

Figure 1.4: San Juan Creek – Land Use

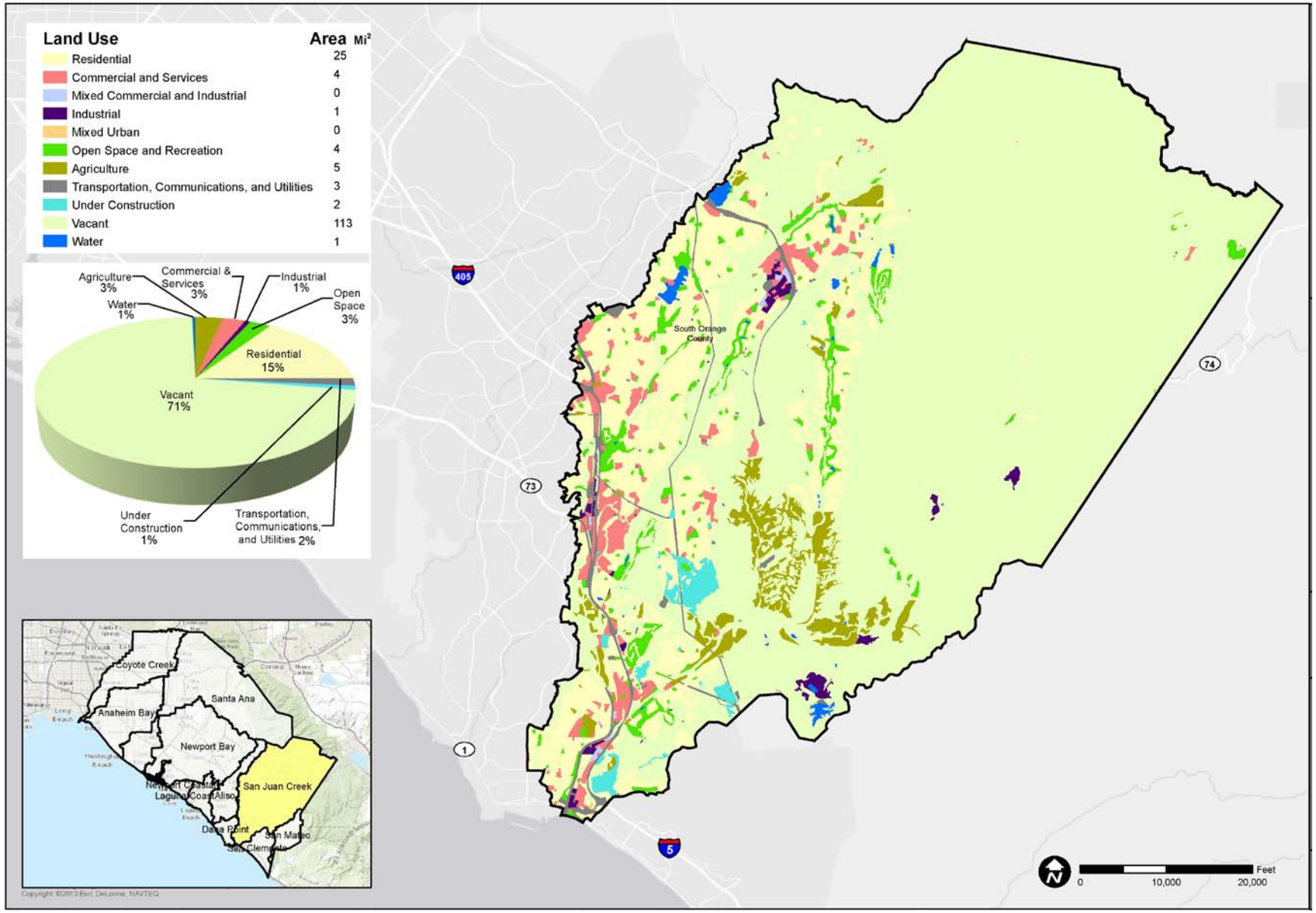

Figure 1.5: San Clemente Coastal Streams – Land Use

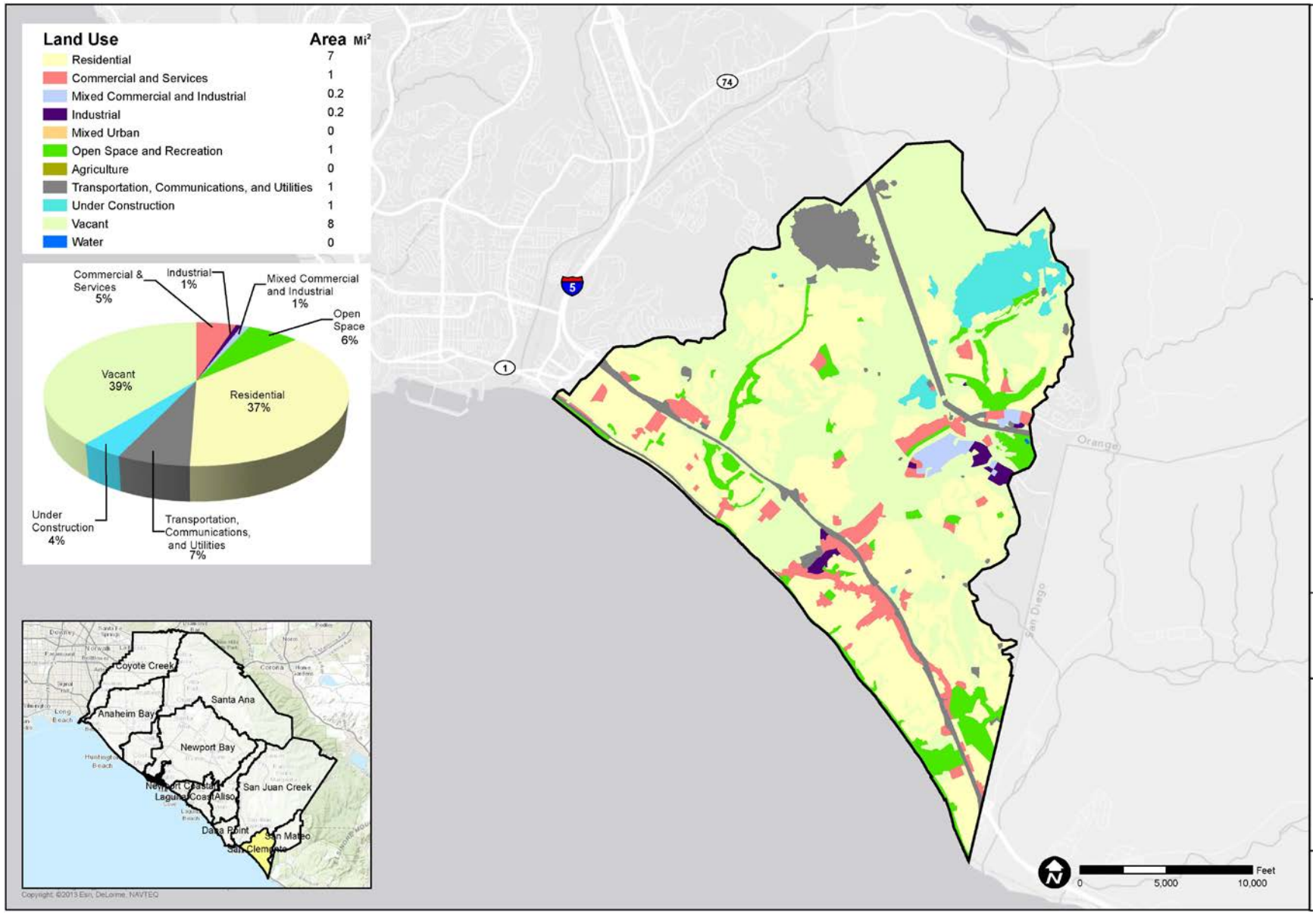

Figure 1.6: San Mateo Creek – Land Use

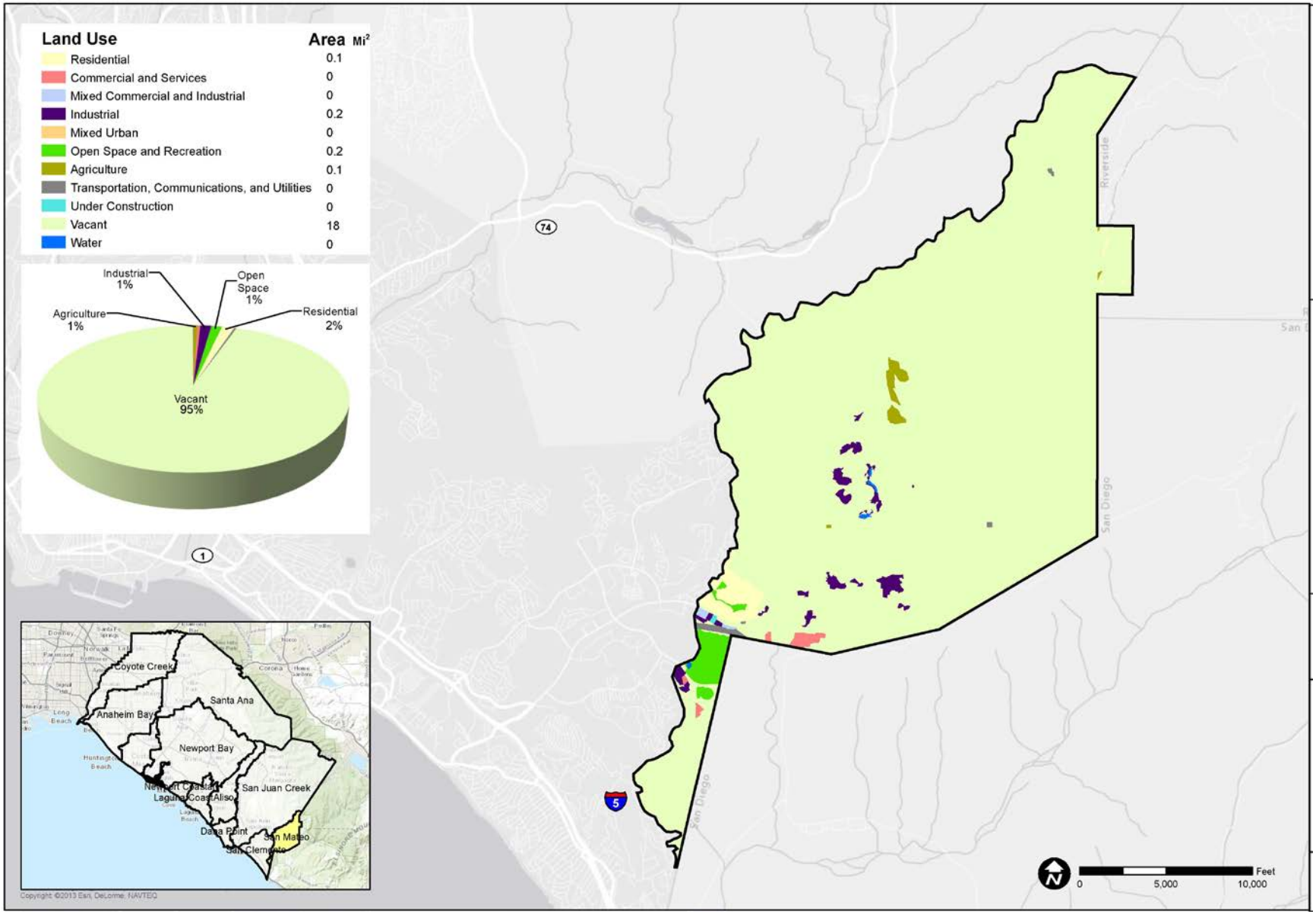

Figure 1.7: Laguna Coastal Streams – Main Stem Channel Type

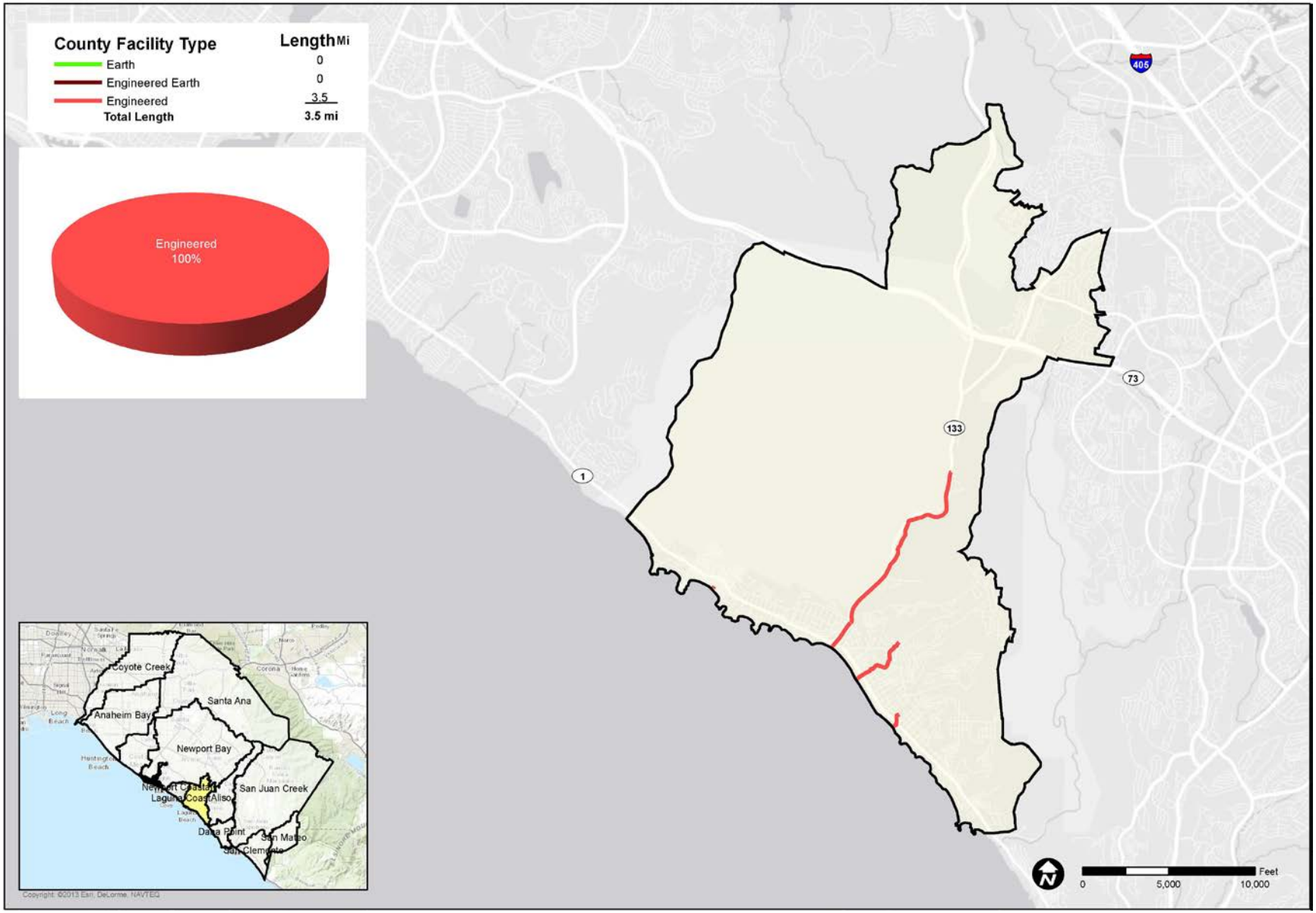

Figure 1.8: Dana Point Coastal Streams - Main Stem Channel Type

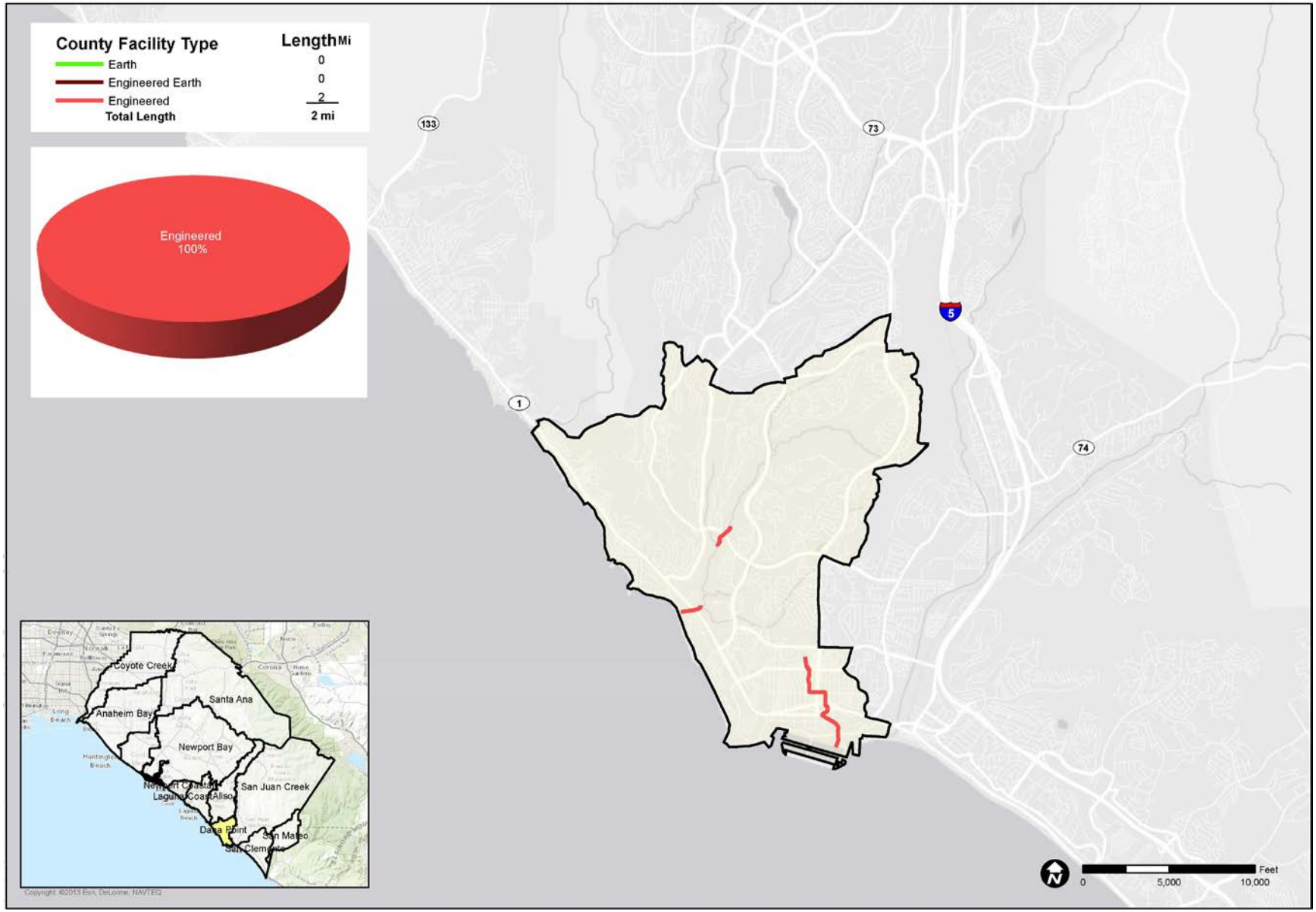

Figure 1.9: Aliso Creek - Main Stem Channel Type

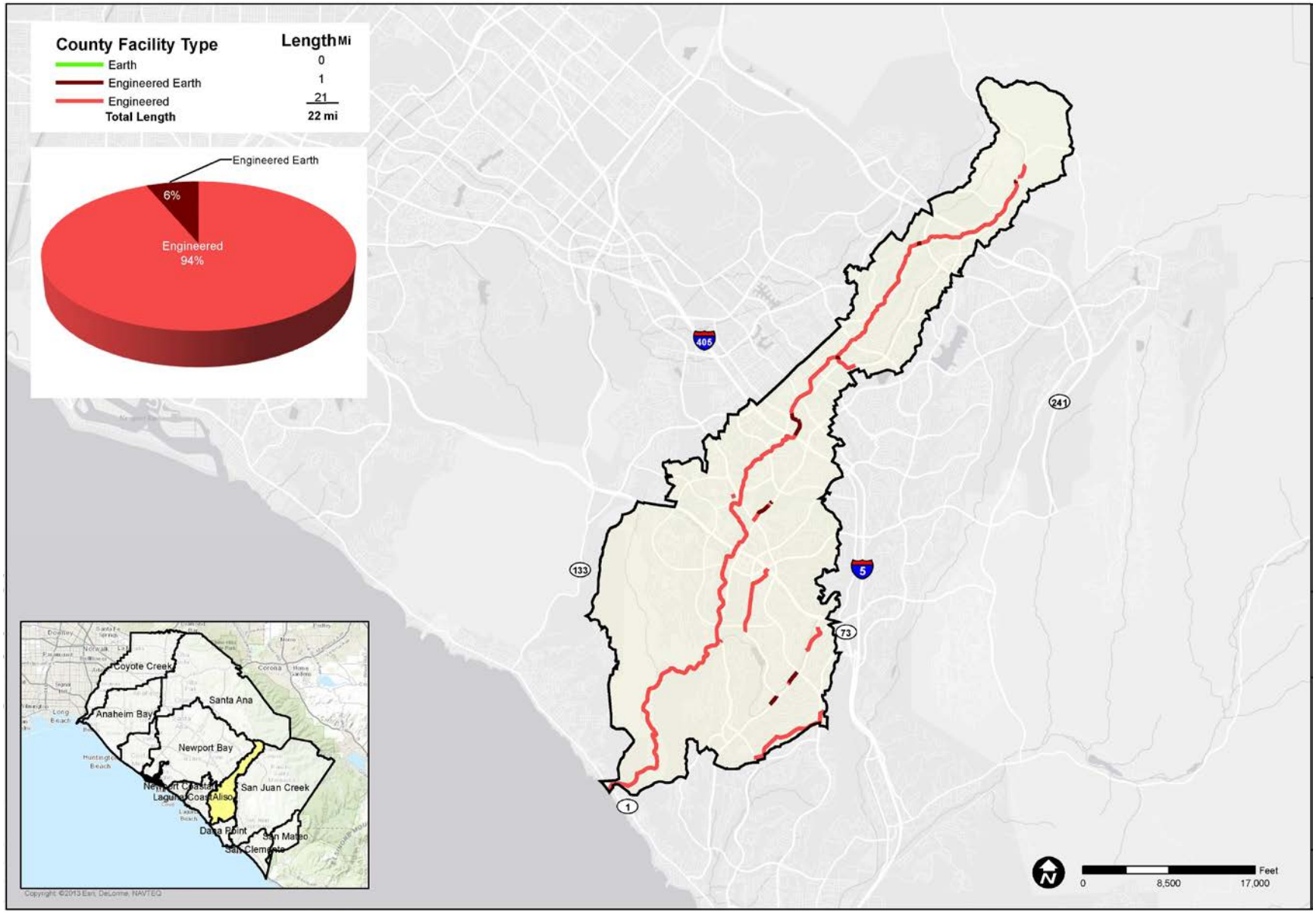

Figure 1.10: San Juan Creek – Main Stem Channel Type

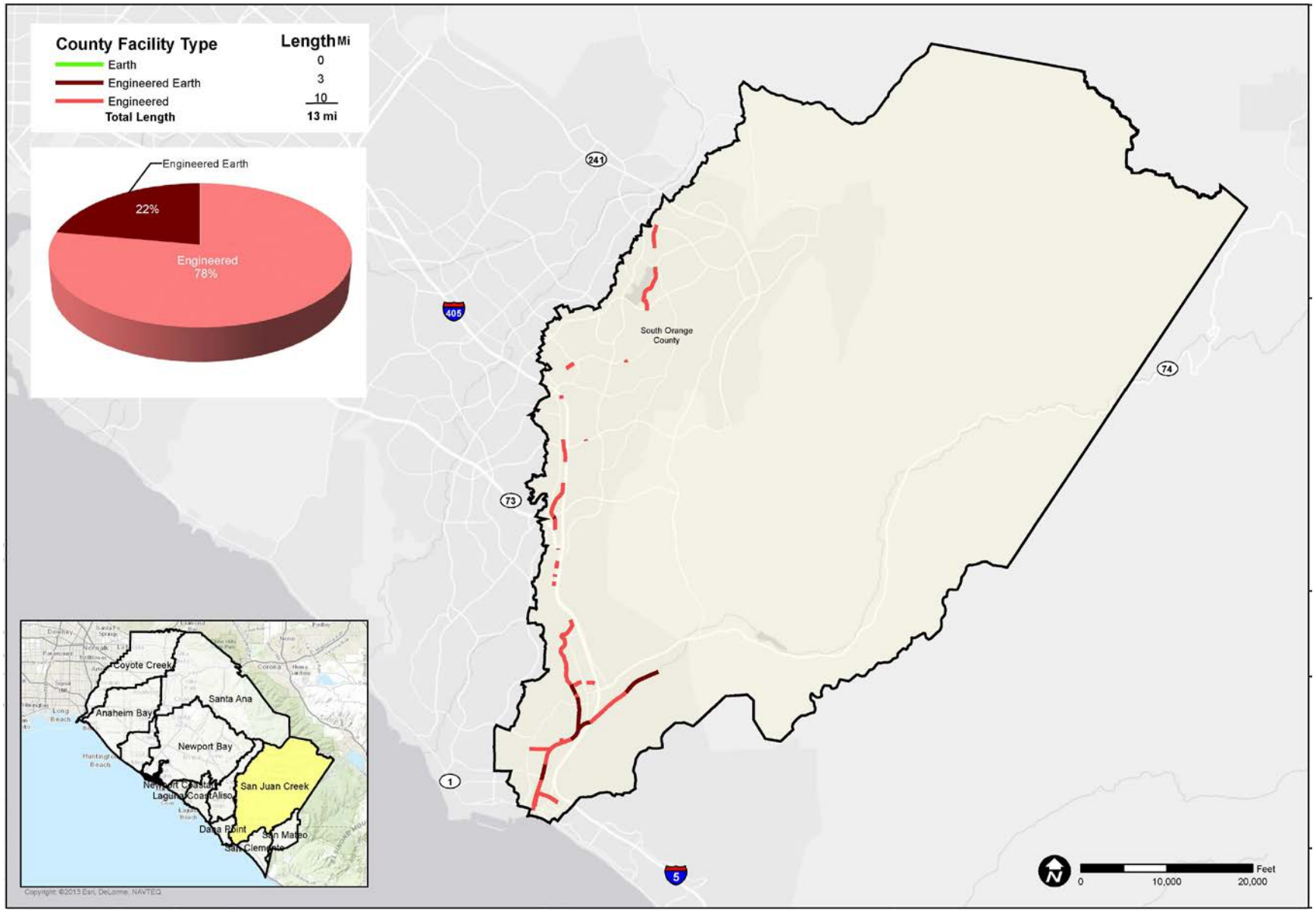

Figure 1.11: San Clemente Coastal Streams – Main Stem Channel Type

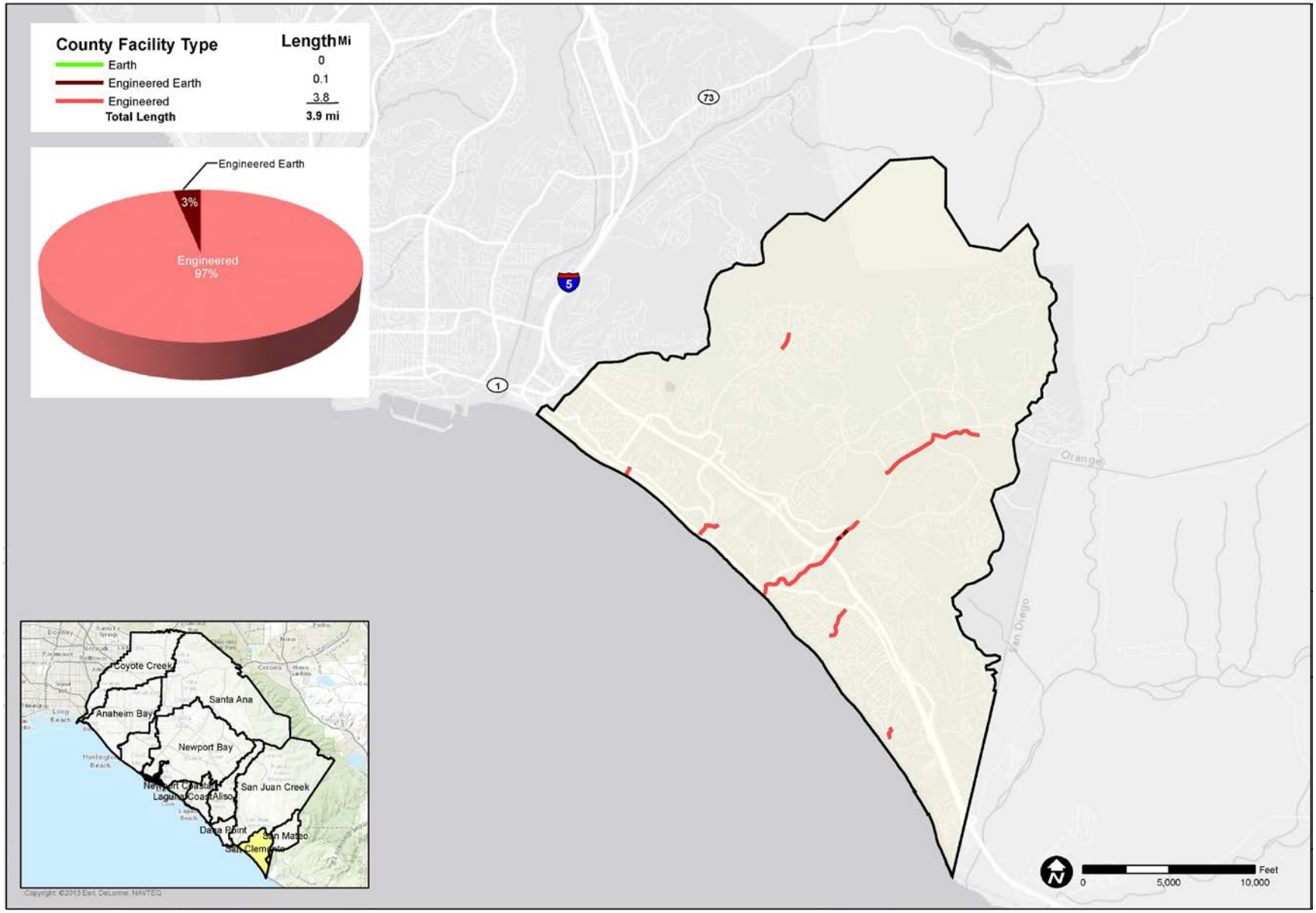

Orange County - Public Interest

A public that is informed and motivated to adopt practices protective of water quality can be a significant form of pollution source control. However, continually increasing public knowledge of and willingness to prevent water pollution at home and work is an ever-evolving process and significant challenge. In spite of this, public opinion surveys conducted in 2003, 2005, 2009 and 2012 indicate that Orange County residents have already become both more knowledgeable of environmental quality and are increasingly engaged in environmentally protective behaviors.

Preservation of the environment out of concern for future generations is the number one environmental concern reported by respondents in the most recent opinion survey. A notable eighty-eight percent of respondents reported being concerned about preserving the environment for their children. As a powerful motivator, the connection to future generations can help communicate *why* a particular issue is important and supplement *how* the individual can personally help prevent pollution. Perhaps not surprisingly, parents of children who brought home water quality information were also substantially more likely to perform a greater number of "stormwater safe" behaviors. Of the seven behaviors measured, parents of informed students were more than three times as likely to perform all seven behaviors (22 percent compared to only seven percent).

Orange County residents are clearly concerned about the environment and can be motivated to adopt practices that protect water quality. The Permittees intend to respond to this interest by supplementing continued investment in mass-media education campaigns with targeted outreach that zeroes in on key pollutants and addresses behaviors that most regularly contribute to that source of pollution. This supplemental approach will use Community Based Social Marketing (CBSM) to encourage target audiences to adopt specific BMPs; the process of CBSM is explained further in **Section 3.3.4**. This two pronged approach provides the Permittees the ability to foster long-term engagement while continuing to provide mass media communication that reaches the entire Orange County population.

1.3 Approach to Preparing Report of Waste Discharge

The ROWD assesses the current Program and identifies revisions to the management program in response to the information learned. Indeed, it is a basic requirement of the Permits' receiving water limitations provisions that the Program continue to adapt and evolve when urban runoff is determined to be causing or contributing to impairments of beneficial uses.

The development of the DAMP is informed by two discrete, yet related water quality planning processes: "countywide/jurisdictional," and "watershed-based" water quality management (see – "Plan Development"). Each process incorporates findings from annual assessments focused on determining whether desired programmatic outcomes are being achieved. Specifically:

- Are program elements being implemented effectively?
- Are environmental improvements being realized?

In this ROWD, the assessment of the Program has produced three types of "Recommendations":

1. **Program Continuation –** Requires no changes in implementation approach, policy or permitting
2. **Program Enhancements –** Requires shift in implementation approach
3. **Program Modifications –** Requires adjustments in policy and permitting

The "Recommendations" are presented throughout the ROWD and are summarized in "Recommendations for Fifth Term Permit."

1.4 References

San Diego Regional Water Quality Control Board (SDRWQCB). *San Diego Regional Water Board Practical Vision: Healthy Waters, Healthy People.* 2000. http://www.swrcb.ca.gov/sandiego/water_issues/Practical_Vision/docs/PV.pdf

Thomas R. Schuler and Heather K. Holland. *The Practice of Watershed Protection: Techniques for protecting our nation's streams, lakes, rivers and estuaries* (Maryland: Center for Watershed Protection, 2000).

2.0 State of the Environment

2.1 Overview

The Program's monitoring, assessment, and environmental research efforts are intended to track progress toward solving existing issues, identify emerging issues that could become issues in the future, and support research and development that improves our understanding of key processes and advances the efficiency and effectiveness of monitoring methods.

Monitoring is most often seen as a response to regulatory requirements, which it is, but it also provides information that guides the use of important resources and answers a set of fundamental questions of keen interest to both managers and the public. The State Water Resources Control Board has articulated the following four questions (based on the intent of the federal Clean Water Act) that provide a broad context for water quality monitoring in the state:

- Is our water safe to drink?
- Is it safe to swim in our waters?
- Is it safe to eat fish and shellfish from our waters?
- Are our aquatic ecosystems healthy?

This current assessment of the state of the environment for south Orange County (**Figure 2.1.1**) summarizes the results of long-term monitoring and related special studies that address the second and fourth of these questions (related to swimming safety and aquatic ecosystem health). These two issues are directly related to stormwater management priorities. The safety of drinking water is addressed by other agencies and programs that produce independent reports on drinking water quality. The safety of consuming local fish and shellfish is directly managed by the California Office of Environmental Health Hazard Assessment (OEHHA), supported by data and assessments conducted by the California Surface Water Ambient Monitoring Program (SWAMP) and others (the Beaches and Creeks TMDL for bacteria did not address the shellfish recreational use standard). In addition, the State Water Resources Control Board is in the process of conducting a statewide assessment of the potential contribution of contaminated sediments in enclosed bays and estuaries to the levels of contaminants in seafood tissue as well as shell beneficial use (SWRCB 2011).

Figure 2.1.1: The portion of South Orange County that is under the jurisdiction of the San Diego Regional Water Quality Control Board and is the focus of this Report. *Blue lines represent watershed boundaries.*

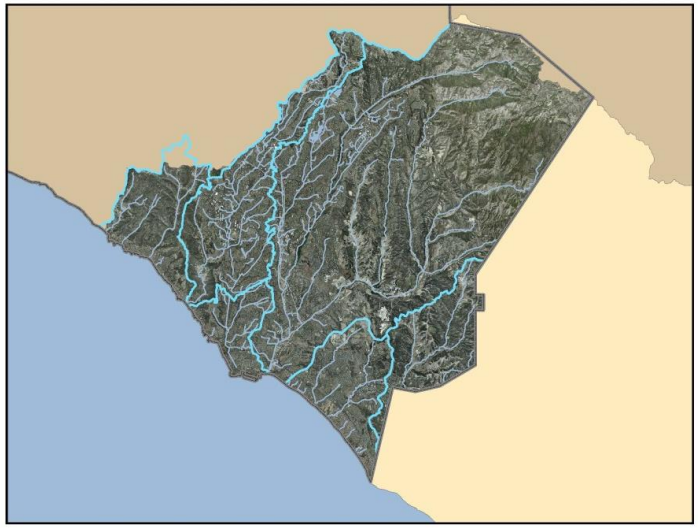

This Report therefore focuses on the two core management questions that are within the Stormwater Program's area of responsibility and that are not currently being assessed by other agencies. For each major question (e.g., Is it safe to swim in our waters?), monitoring and assessment should, over time, answer the following assessment questions:

- Is there a problem?
- If so, what is its magnitude and extent?
- What are the sources of the problem?
- Are conditions getting better or worse?
- Are management actions working as intended?

Monitoring, assessment, and research efforts should be tightly focused on one or more of these questions and be managed to ensure that resources are reallocated when questions are answered and new ones arise (**Figure 2.1.2**). Monitoring, assessment, and research should therefore be managed as a portfolio of resources invested in creating the information needed to meet the Program's goals, with the allocation of resources adjusted as needed. Assessment and research are included as a package with monitoring for two reasons. First, the information produced by ongoing monitoring programs is most useful when it is carefully analyzed, evaluated in the context of other related information, and applied to the basic questions motivating monitoring (i.e., assessed). Second, not all questions can be answered by routine monitoring and targeted special studies (i.e., research) are often needed to fill critical data gaps, develop more effective monitoring tools, and/or lay the groundwork for new management approaches. This approach follows the guidance contained in the Regional Board's recently adopted *Framework for Monitoring and Assessment (RWQCB 2012),* which emphasizes the importance of a sequential, question-driven approach supported by appropriate monitoring and assessment efforts that are adapted over time as knowledge improves and priorities shift.

Figure 2.1.2: Monitoring, assessment, and research provide the data and information required to answer the five key assessment questions. *Attention should shift among questions as information improves and priorities change, and the mix of monitoring, assessment, and research activities should be adjusted to correspond.*

The Program has identified three themes that help structure the assessment of the status and trends of environmental conditions in south Orange County and the accompanying recommendations for restructuring current monitoring programs:

- Theme 1: Focus on priority areas and constituents rather than trying to monitor all constituents, potential issues, and locations.

- Theme 2: Increase the integration of data from a wider range of sources in order to leverage the value and impact of the Program's efforts to address the five assessment questions.
- Theme 3: Continue evolving from a strictly discharge-specific approach to a risk prioritization approach that can highlight problem areas and support more flexible monitoring designs that include data driven adaptive triggers.

These three Report themes inform the following the section of progress toward meeting management goals for the four critical areas of concern (bacteria, dissolved solids, nutrients and toxicity). In these areas, there is a substantial amount of data available to support conclusions about progress, highlight remaining problem areas, and reexamine current monitoring designs to improve efficiency and effectiveness.

This Report begins with an evaluation of available data from the past ten years of monitoring in the region's water bodies in order to identify constituents whose concentrations and impacts have been successfully reduced, as well as those that remain of concern. This initial prioritization is then expanded and examined in greater detail in subsequent sections of this Report.

Subsequent sections examine these constituents in greater depth, the progress made and factors that contribute to continuing issues. Each section ends with recommendations for improving monitoring's effectiveness. A final section evaluates the study designs for the Dry Weather and the Coastal Ambient monitoring efforts, to assess whether their goals could be better met with different approaches.

2.2 Prioritization

The Story: Prioritization

- Prioritization is a valuable tool for the Program to use its resources wisely to focus on the most important issues.
- Initial prioritization is based on the overall frequency and magnitude of exceedances of compliance standards and other measures of problem severity.
- In inland channels, bacteria, dissolved solids, and nutrients are persistent issues over time, particularly in wet weather.
- For coastal discharges, there are no persistent issues in wet weather, while bacteria and nutrients are issues in dry weather.
- Some elevated toxicity is present in inland channels during wet weather, but overall toxicity is not different from that described for background conditions by the Stormwater Monitoring Coalition (SMC).
- There are no persistent issues in the coastal surfzone due to discharges, other than localized bacteria contamination at a handful of problem beaches and localized and moderate nutrient exceedances in wet weather.

The Program has measured a broad suite of contaminants and other measures of condition (i.e., toxicity, bioassessment) and the accumulated data from many years of monitoring provides a valuable opportunity to compare the severity of impacts and adjust their relative priority. In order to provide a consistent basis of comparison across indicators (with the exceptions of toxicity and bioassessment), an overall index of the extent to which indicators meet regulatory standards is used.

The index, developed by the Canadian Council of Ministers of the Environment (CCME) was used in the Report of Waste Discharge (ROWD) for the northern portion of the County and such frequency-based indices are widely used in water quality assessment (e.g., by the Central Coast Regional Water Quality Control Board and the Ventura Countywide Stormwater Quality Management Program). It provides a measure, scored from 0 – 100, of the frequency and magnitude of exceedances that can be tracked over time, with lower scores representing worse conditions and higher scores better conditions. This index which is a more effective means of communicating water quality results accounts for the number of indicators within each category (e.g., bacteria, metals) that exceed standards in each year, the percentage of individual samples that exceed standards, and the average magnitude of any such exceedances (CCME 2001).

Table 2.2.1: Overall summary of results of prioritization analysis. *Red represents persistent and widespread exceedances of regulatory thresholds, yellow occasional exceedances, and green few if any exceedances. Measures of exceedance used in this analysis accounted for both the frequency and the magnitude of exceedance. Note: Bacteria, dissolved solids, and nutrients may be problem constituents in channels, and bioassessment scores in urban areas are generally low.*

	Bacteria	Dissolved solids	Nutrients	Toxicity	Pesticides	Metals	Bioassessment
Channels							
Dry							
Wet							NA
Coastal							
Dry		NA					NA
Wet		NA					NA

2.2.1 Inland Channels

For inland channels, bacteria, dissolved solids, and nutrients are persistent issues over time. Toxicity is somewhat higher in wet than in dry weather, but is not substantially above background conditions described in SMC studies. Biological condition (i.e., bioassessment) is generally poor and is in the lower 50% of the distribution compared to other urban areas in southern California. The following figures present results of the prioritization analysis for these core constituents, beginning with **Figure 2.2.1**'s overall summary ranking of constituents based on monitoring data from receiving waters in inland channels.

Figure 2.2.2 presents a slightly different perspective with data collected from stormwater discharge points into inland channels prior to mixing with receiving water. No constituents in wet weather exceeded Stormwater Action Levels (SALs) (**Figure 2.2.2a**) which are higher than the Water Quality Objectives (WQO) that apply to dry weather discharges (**Figure 2.2.2b**) and receiving waters in channels (**Figure 2.2.1**). Nutrients and bacteria are persistent issues for dry weather discharges.

While toxicity is present in urban channels (**Table 2.2.2**), it is not higher, overall, in dry weather than the toxicity documented in the open (undeveloped) landuse by the SMC's regional monitoring program. Wet weather toxicity in the County's channels is higher in wet than in dryweather, and is somewhat higher in wet weather for *Americamysis bahia* than seen in the northern portion of the County, patterns discussed further in the subsequent section on toxicity.

Figure 2.2.1: Overall exceedance index for core monitoring constituents in inland channels, summarized over the 2003 – 2013 monitoring period. *The bar charts rank constituents based on their respective CCME exceedance indices in both dry and wet weather, with higher values indicating fewer and smaller exceedances. Note: pesticides and metals had considerably lower exceedance rates and magnitudes of exceedance than bacteria, dissolved solids, and nutrients.*

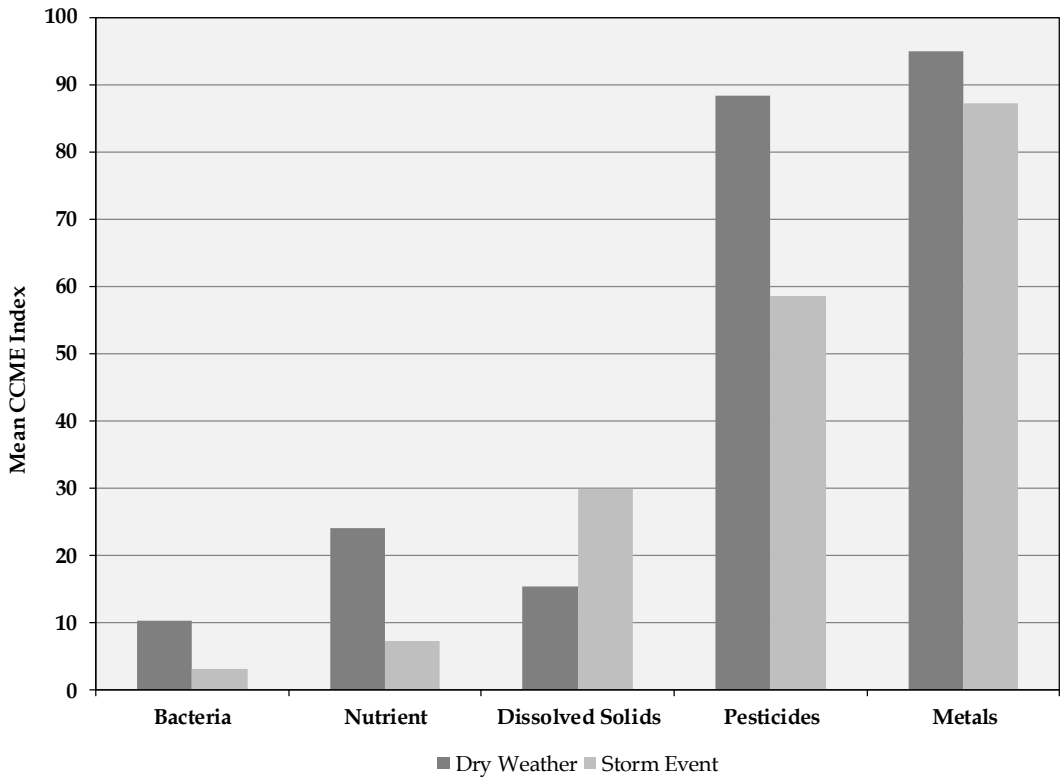

Figure 2.2.2: Comparison of individual constituent concentrations with a) stormwater action levels (SALs) for wet weather and b) water quality objectives (WQOs) for dry weather. *In the box and whiskers plot, the horizontal bar represents the median, with the upper and lower edge of the box the 75th and 25th percentiles of the distribution, respectively, and the whiskers the maximum and minimum values. Note: All constituents are below SALs in wet weather and only nutrients and bacteria are above NALs in dry weather.*

a)

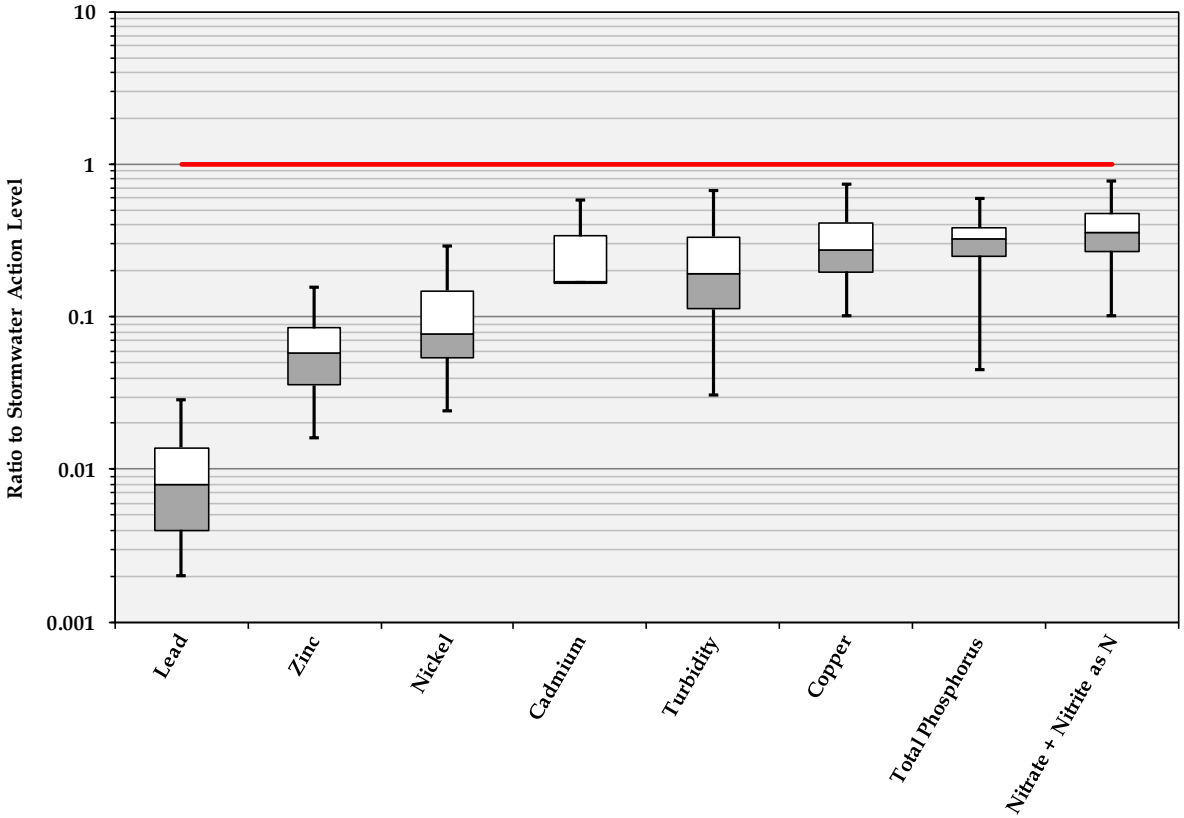

b)

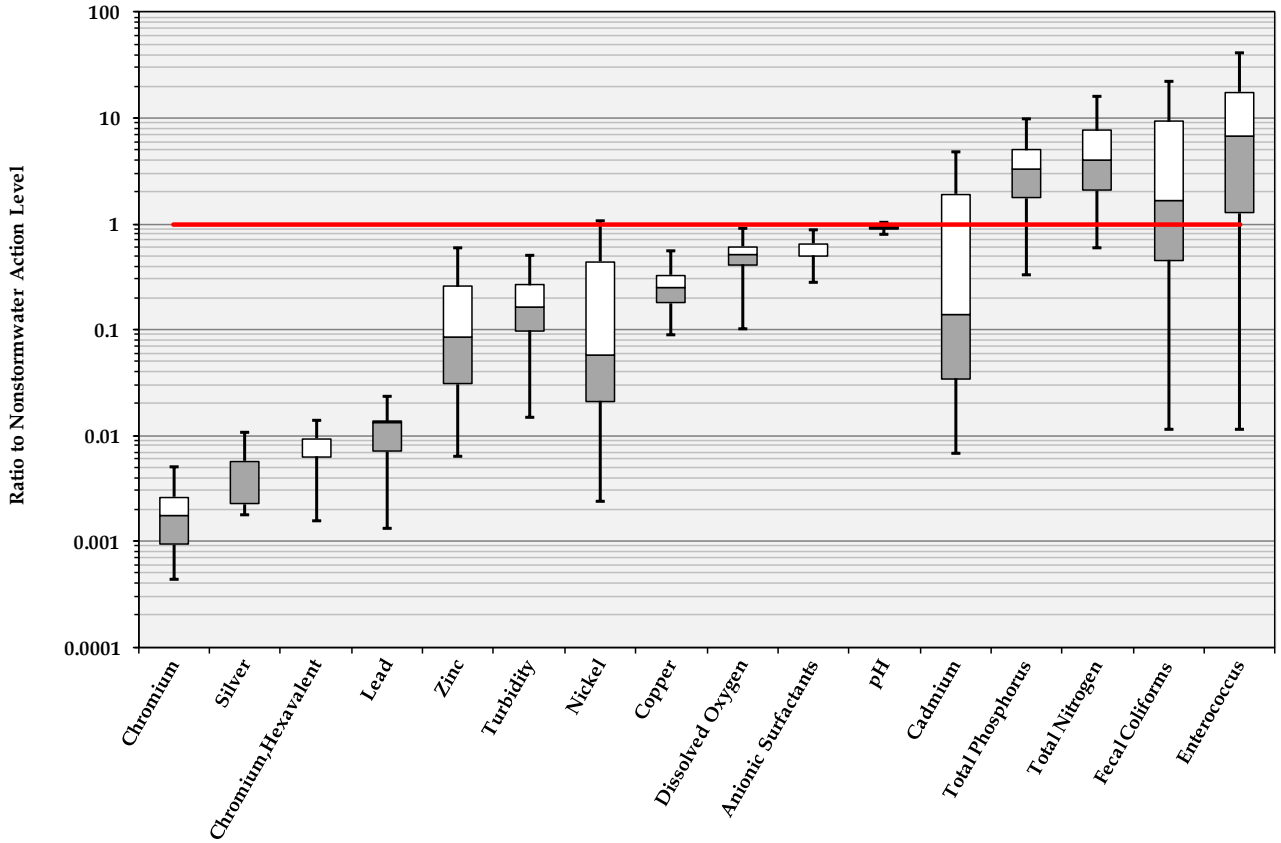
Ratio to Nonstormwater Action Level
100
10
1
0.1
0.01
0.001
0.0001
Chromium
Silver
Chromium,Hexavalent
Lead
Zinc
Turbidity
Nickel
Copper
Dissolved Oxygen
Anionic Surfactants
pH
Cadmium
Total Phosphorus
Total Nitrogen
Fecal Coliforms
Enterococcus

Table 2.2.2: Summary of the Program's toxicity testing in South Orange County from 2003 – 2012, an effort that includes 2548 tests on multiple species from a range of times, locations, and conditions. *Note: Toxicity levels are generally low except for one organism in wet weather that is susceptible to pesticides.*

Test Species	Dry Weather			Wet Weather			Sediment		
	n	Toxic	Nontoxic	n	Toxic	Nontoxic	n	Toxic	Nontoxic
Americamysis bahia	391	34%	66%	573	45%	55%			
Strongylocentrotus purpuratus	179	5%	95%	293	24%	76%			
Ceriodaphnia dubia	569	20%	80%	51	12%	88%			
Pimephales promelas	64	9%	91%	1	0%	100%			
Hyalella azteca	224	11%	89%	17	53%	47%	9	0%	100%
Overall	1593	18%	82%	946	36%	64%	9	0%	100%

Biological condition, as measured by macroinvertebrate bioassessment results, is uniformly poor at targeted monitoring sites in South Orange County channels (**Figure 2.2.3**). Studies conducted as part of the State Water Resources Control Board's effort to develop a statewide Biological Integrity policy indicate that alterations to physical habitat are a major cause of degraded biological conditions. The somewhat elevated toxicity in wet weather (**Table 2.2.3**) might be another contributing factor. Because the Biological Integrity policy, with its new scoring protocol, is still under development, and its technical background studies have not been completed and released, the Program will defer a more detailed consideration of biological condition for now. At that point, however, a causal assessment, using the approach recommended by the State Water Board, would be appropriate and informative.

Table 2.2.3: Summary of aquatic toxicity results from the past five years of Stormwater Monitoring Coalition (SMC) samples from random sites across the southern California region. *Sites were located in both open (i.e., undeveloped) and urban landuse types. The large majority of stream miles were nontoxic for acute toxicity (i.e., survival), with an equivalent amount of sporadic background toxicity, in both open and urban landuses. The majority of stream miles were toxic for chronic toxicity (i.e., reproduction) in the open landuse, a strikingly different pattern than seen in the urban landuse. Note: Toxicity patterns in open undeveloped areas are not substantially from those in urban areas.*

	% Stream Miles	
Ceriodaphnia Survival	**Open**	**Urban**
Toxic	2.1	2.4
Nontoxic	97.9	97.6
Ceriodaphnia Reproduction		
Toxic	63.0	37.4
Nontoxic	37.0	62.6

Figure 2.2.3: Cumulative frequency distribution of SMC bioassessment monitoring results across southern California in three distinct landuses. *The random sites within Orange County sampled as part of the SMC program are indicated on the curves for urban and open landuses. Targeted channel sites are shown along the X axis and Index of Biotic Integrity (IBI) scores for these sites, with one exception, fall in the lower 50% of the distribution compared to all urban landuse sites sampled as part of the SMC regional study. Note: Bioassessment IBI scores in urban areas are in the lower half of scores for urban areas in southern California.*

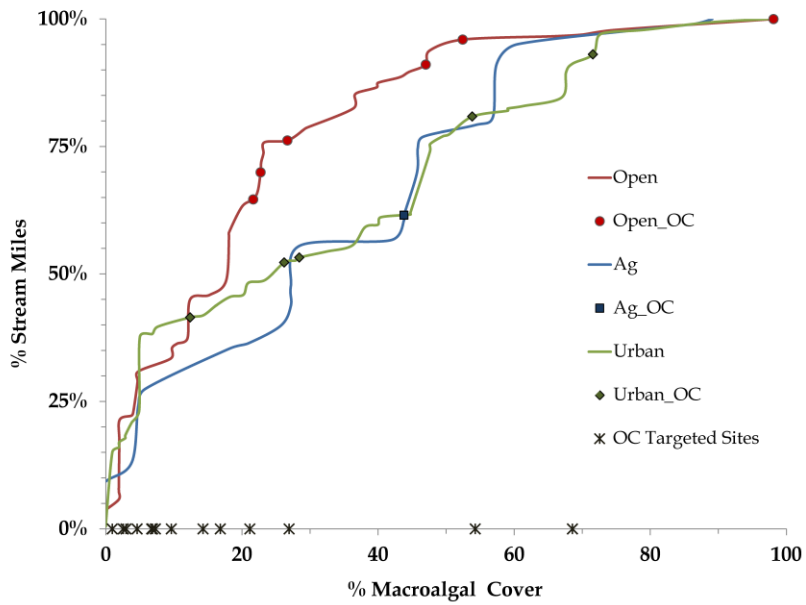

2.2.2 Coastal Surfzone

For the coastal surfzone, nutrients and bacteria are mild to moderate issues in wet weather, with most bacteria issues due to a small number of persistent problem beaches (**Figure 2.2.4**). Elevated nutrient concentrations in wet weather are a concern because they may contribute to regional eutrophication in coastal estuaries and to harmful algal blooms along the coast.

Figure 2.2.4: Overall exceedance index for core monitoring constituents in the coastal surfzone, summarized over the 2003 – 2013 monitoring period. *Note: Constituents measured at coastal discharge points rarely exceed standards, except occasionally for bacteria and nutrients in wet weather.*

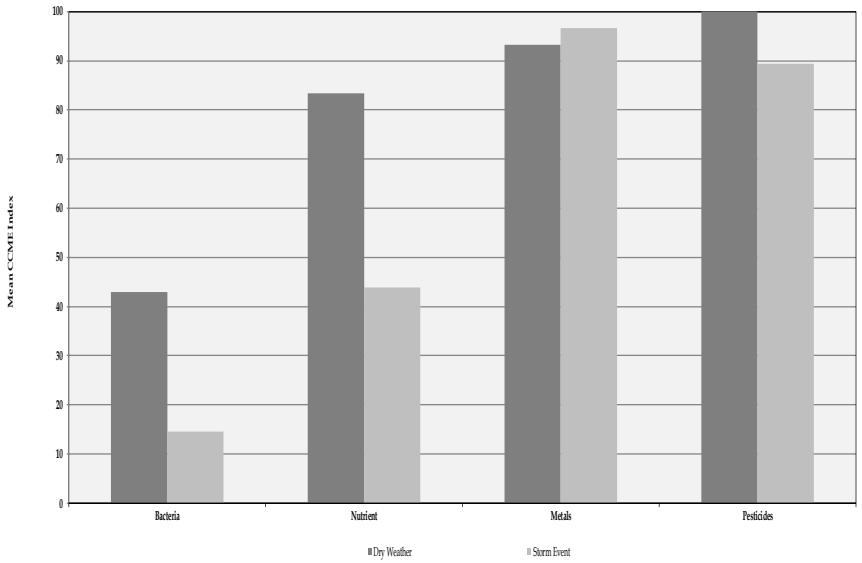

While **Figure 2.2.4** suggests that bacteria contamination is a moderate problem, particularly in wet weather, two other datasets present a different perspective. The data in **Figure 2.2.4** are drawn from the Program's monitoring at large coastal discharges, all of which are more likely to have elevated bacteria levels and thus represent a worst case estimate. In contrast, Heal the Bay beach report grades for a much larger set of South Orange County swimming beaches (**Figure 2.2.5**) show that the large majority of grades are in the A condition, even in wet weather and a more detailed examination of individual beaches (**Figure 2.2.6**) shows that bacteria shows continued improvement at some beaches over the past five years. However, **Figure 2.2.6** does not reflect recent dramatic improvements at these beaches because it summarizes data over the entire 2005 – 2013 period (see **Section 2.3** which reflects on the recent changes and provides a perspective of trends over time). The issues that do exist are localized to a few persistent problem beaches. For example, Heal the Bay has recently removed both Poche and Doheny beaches from its Beach Bummer list of the top 10 problem beaches in southern California. Thus, the data summarized for **Figure 2.2.4** do not provide the entire context for evaluating bacterial contamination at coastal beaches.

Figure 2.2.4 shows that nutrients may be a moderate issue in wet weather. However, unlike bacteria which cause relatively localized issues because they die off in seawater, nutrients can be a more regional concern due to their potential to contribute to plankton blooms and eutrophication both in local estuaries and the larger coastal ocean. A fuller assessment of potential nutrient impacts will depend on the developing state policy on Nutrient Numeric Endpoints (NNE) for coastal estuaries and Bight Program assessments of nutrients' potential contribution to plankton blooms in the coastal ocean.

Figure 2.2.5: Percentage of the time that swimming beaches are in each Heal the Bay report card category, averaged across all monitored beaches. *During dry weather beaches are in the A grade between 80 and 90% of the time. During wet weather the percentage of A grades drops, but has remained at about 80% for the past two years.*

a)

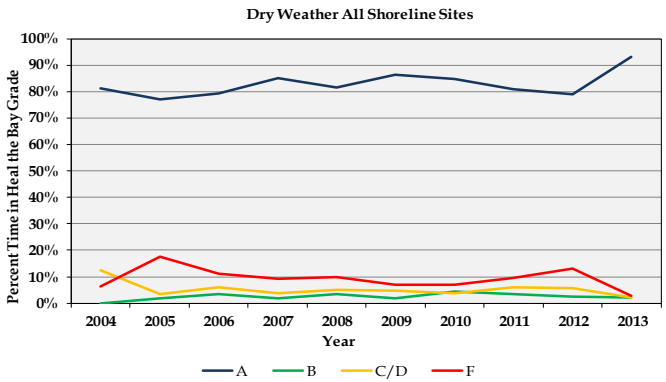

b)

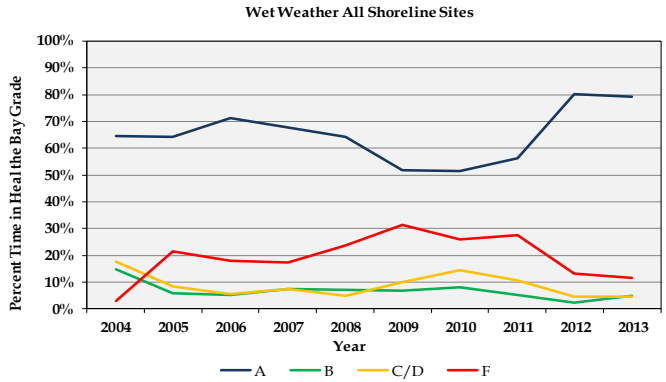

Figure 2.2.6: The overall percent exceedance of the AB411 *Enterococcus* standard over the time period 2005 - 2013. *Poche and Doheny, and to a lesser extent Pico, are the only persistent problem beaches and this summary figure overstates the problem because it does not clearly reflect significant recent improvements. This figure focuses on Enterococcus because it is the only one of the three AB411 indicators with any meaningful level of exceedance. Note: Exceedances of the Enterococcus standard occur at only a few problem beaches, which have improved dramatically in recent years.*

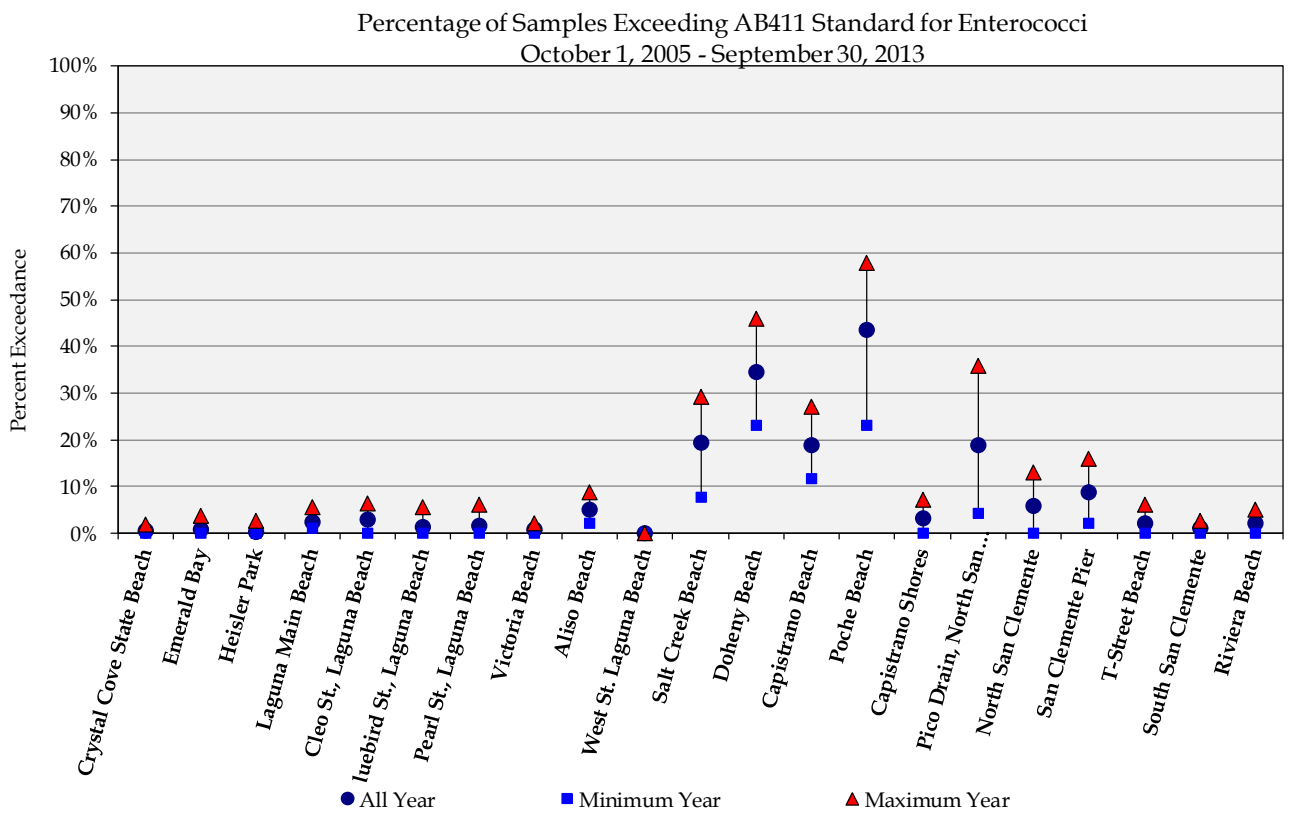

2.3 Bacteria

The Story: Bacteria

- The County's beaches support concentrated recreational activities for both residents and visitors and are important contributors to the local and regional economy.
- Concern about swimming safety is consistently high and epidemiology studies in dry weather show that some illness (for example, gastroenteritis) is associated with full immersion swimming in contaminated water.
- Contamination is very low during dry weather and has dropped steadily over time; beach report card grades are consistently high.
- Sources of contamination have been reduced through targeted actions; remaining issues during dry weather are localized and may have natural components.
- Contamination is more widespread during wet weather; wet weather flows are larger and qualitatively different.
- Health risks associated with wet weather flows are uncertain, but ongoing research and development focuses on improved monitoring tools and wet weather epidemiology studies.
- Progress on managing dry weather contamination demonstrates the efficacy of targeted BMPs appropriate to specific situations that may include natural sources (e.g., birds).

2.3.1 A Valued Resource

South Orange County's beaches (**Figure 2.3.1**) have been used for recreation at least as far back as the early 20th Century, and the local population as well as visitors from outside the region have enjoyed the opportunities they provide for sightseeing, picnicking, sunbathing, swimming, and surfing. The acceleration of urbanization and population growth in the last century increased beach usage at the same time as growing environmental awareness intensified concerns about contamination and its potential health impacts. The nexus of these two trends was illustrated dramatically in 1999 when persistent closures of Huntington State Beach due to contamination resulted in substantial economic impacts, anxiety about potential health effects, and concerted efforts to find and control the sources of contamination. While this event occurred in the north County, it affected perceptions among managers and the public throughout southern California. With over 100 million visits annually to southern California's beaches (nearly 40 million of which occur in Orange County) (Dwight et al. 2007) that contribute billions of dollars to the regional economy, the stakes related to contamination and public health are higher than ever.

The intensity of recreational use at beaches has stimulated a large amount of research, monitoring, and regulation at the federal, state, and local levels. These efforts have identified bacterial, protozoan, and viral pathogens that could be present when contaminated runoff and untreated sewage are released into the ocean (HCA 2012). Epidemiology studies in Santa Monica Bay (1995 & 2007/08) and at Doheny Beach (Colford et al. 2012) documented higher illness rates (e.g., gastroenteritis) among swimmers, especially near flowing stormdrains.

Figure 2.3.1: The beach is a popular recreational destination across the region.

These illnesses are not life threatening. However, the past history of beach contamination due to untreated sewage discharges (prior to passage of the federal Clean Water Act), along with current concerns about sewage spills and untreated storm-drain discharges, has led to constant vigilance and one of the preeminent beach water quality monitoring and improvement programs in the state (**Figure 2.3.2**). A unified monitoring program that improves coordination among monitoring efforts conducted by the Program and the water treatment agencies has been approved by the Regional Water Board and will be implemented shortly.

Figure 2.3.2: A Coordinated beach monitoring program conducted by the County Health Care Agency, the Program, and wastewater treatment agencies regularly monitors a large number of swimming sites. *Heal the Bay prepares weekly beach report card grades (inset figure and expanded* ***Figure*** **2.2.5***) that are made available on their website (www.healthebay.org).*

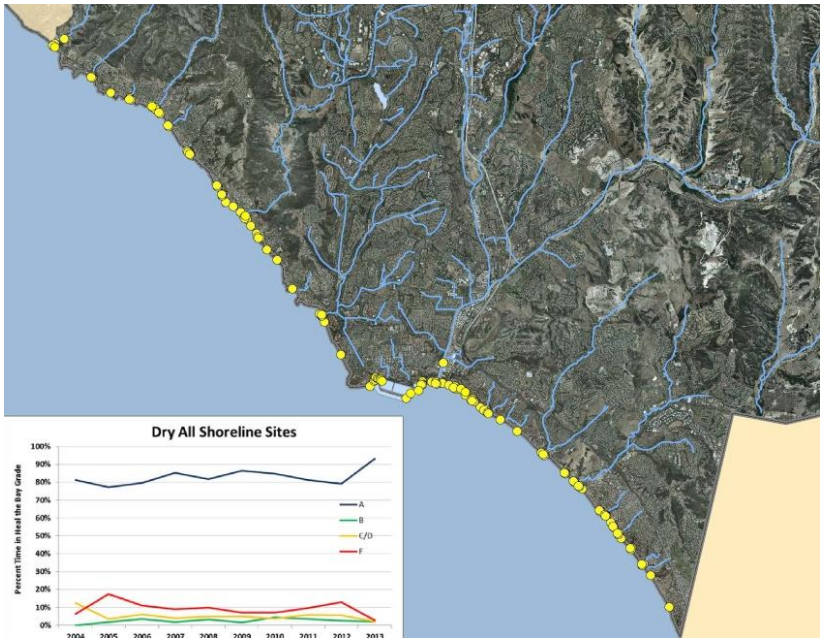

2.3.2 Progress during Dry Weather

Beach use and body contact recreation occur predominantly during the summer and in dry weather, although there is some use, mainly by surfers, during wet weather in the winter storm season. As a result, most regulation and monitoring focuses on dry weather conditions, using three bacterial indicators that indicate the presence of fecal pollution. These indicators are only indirect indicators of illness risk and not themselves pathogens, or disease agents. Thus, they do not provide a direct measure of potential health risk. However, they have been correlated with illness rates in dry weather when sewage contamination is present. They are more easily sampled and analyzed than the larger number of pathogens themselves. Long-term monitoring based on these indicators shows that exceedances of regulatory standards are also low and have been dropping over time and that the percentage of Heal the Bay report card grades of A has been at or above 80% in dry weather since 2004 (**Figure 2.3.2**).

This improvement in conditions during dry weather has been mirrored by a decrease over the past several years in beach closures due to contamination, as measured by Beach Mile Days (**Figure 2.3.3**). This metric is calculated by multiplying the length in days of each closure by the length (in miles) of beach affected and is a more accurate measure of the impact on beach users than the simple number of closures.

The improvement over time in these several measures of beach condition has resulted from a better understanding of contamination sources and targeted efforts to address the most severe of these sources. These efforts (**Figure 2.3.4**) initially focused on wastewater treatment plant improvements and treatment upgrades and have more recently expanded to include a wide range of localized BMPs (**Figure 2.3.5**) that have dramatically reduced the level of contamination at beaches and in the streams that discharges to the coastline. For example, the percent of *Enterococcus* exceedances at Salt Creek in Dana Point and the Pico stormdrain in San Clemente have dropped from 23 to 10% and from 22 to 4%, respectively, since 2005.

Figure 2.3.3: The total number of Beach Mile Days (the product of the length of beach posted times the length of beach posted) posted due to exceedances of standards during the April 1 – October 31 summer swimming season. *Beach Mile Days have declined substantially since 2000 and reached an all-time low in 2013. Adapted from HCA (2012).*

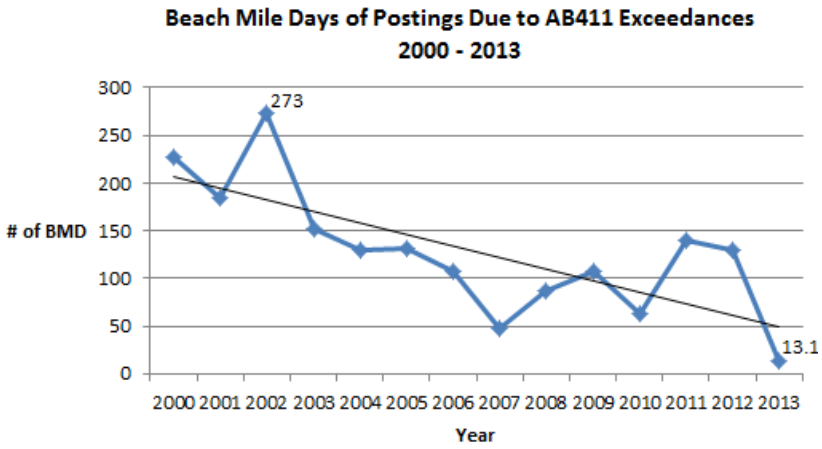

Figure 2.3.4: Timeline of significant actions in several categories that have contributed significantly to improved beach water quality.

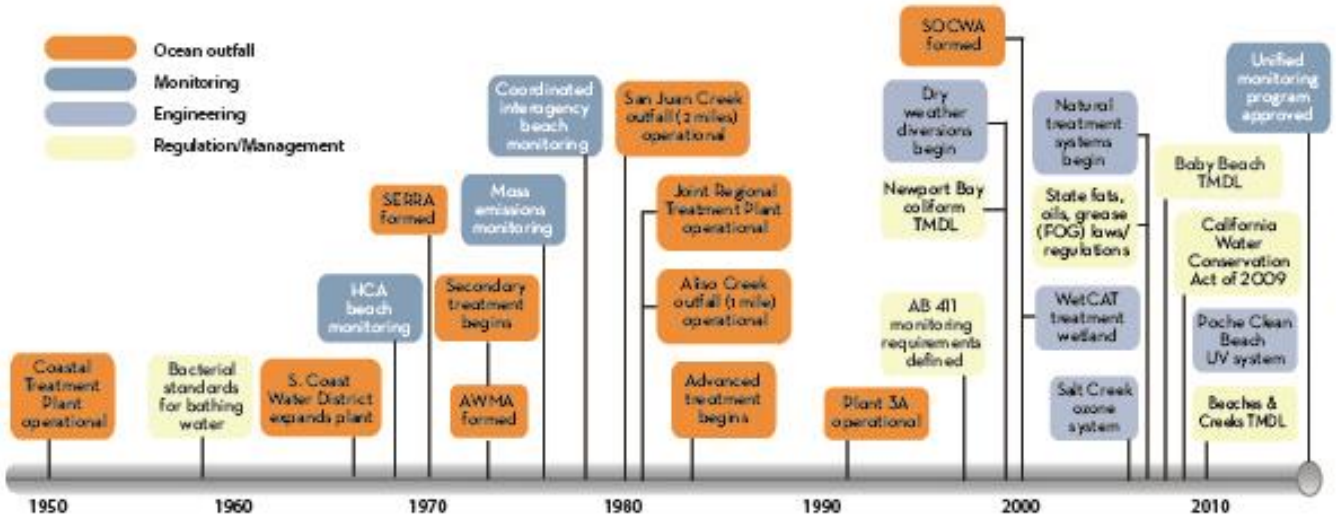

Figure 2.3.5: Coastal flow diversions that reroute dry weather flow to treatment plants that affect flow and/or bacterial loads.

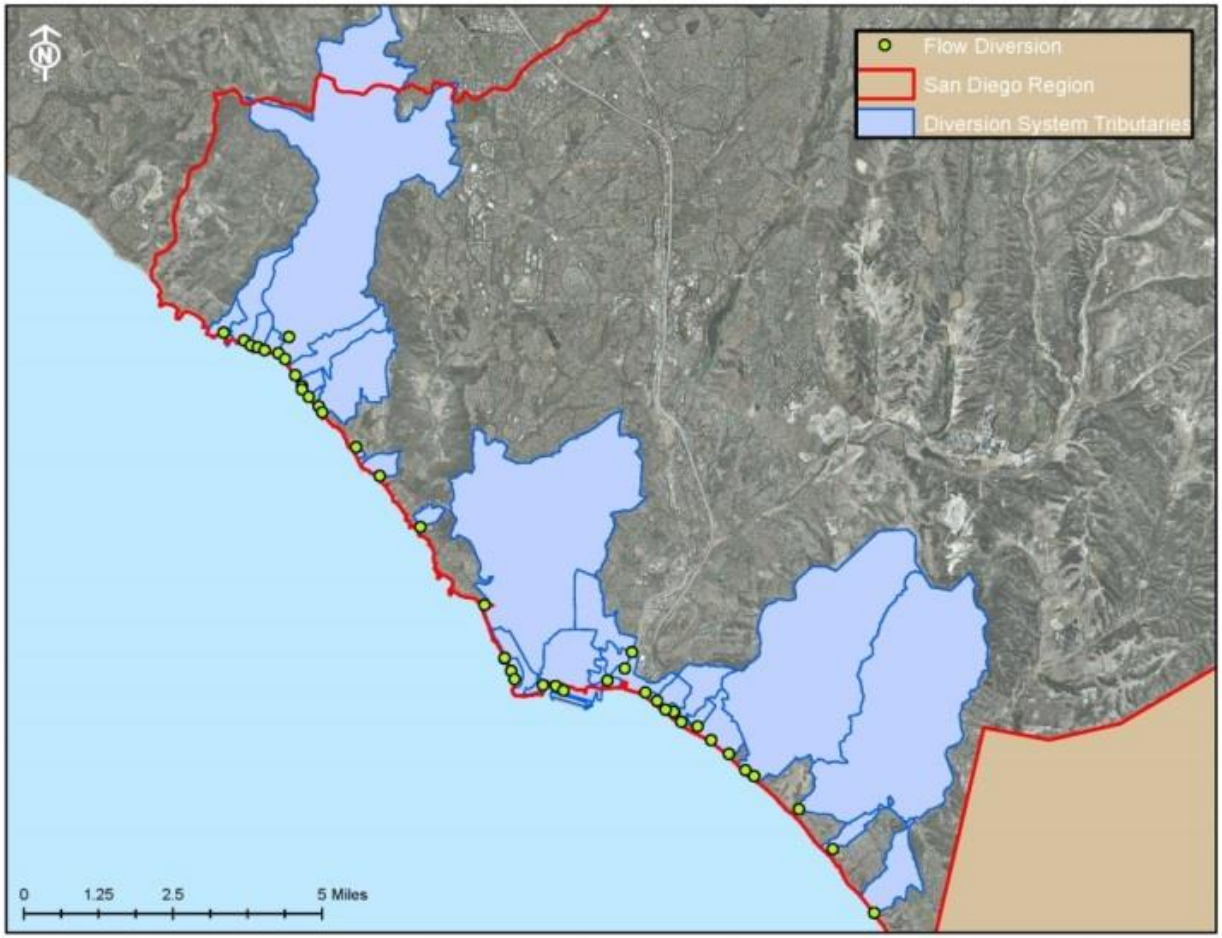

Beginning around 2000, County agencies and individual cities began improving their spill response and prevention capability, supported by a number of state laws and policies targeted at the discharge of FOG (fats, oils and grease, which can clog sewer lines), with the result that the numbers of spills and beach closures due to spills have declined dramatically (**Figure 2.3.6**).

Attention also focused on urban runoff from rivers, creeks, and stormdrains, which can contain high levels of bacterial indicators. A notable regional example is the long-term effort to document and reduce levels of bacterial contamination in Aliso Creek which has been ongoing since the lat 1990s.

a)

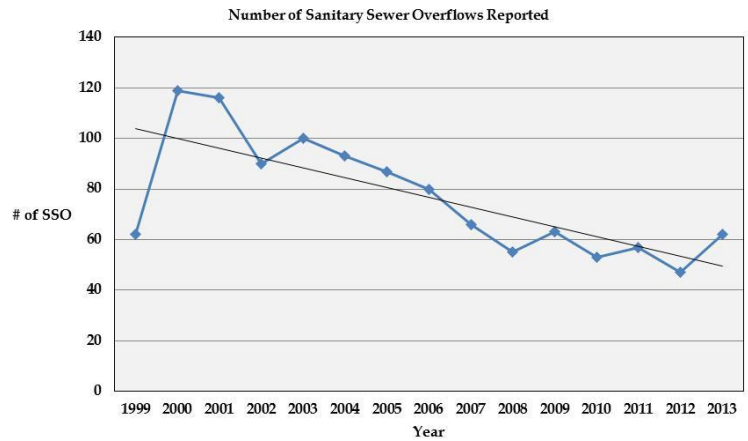

b)

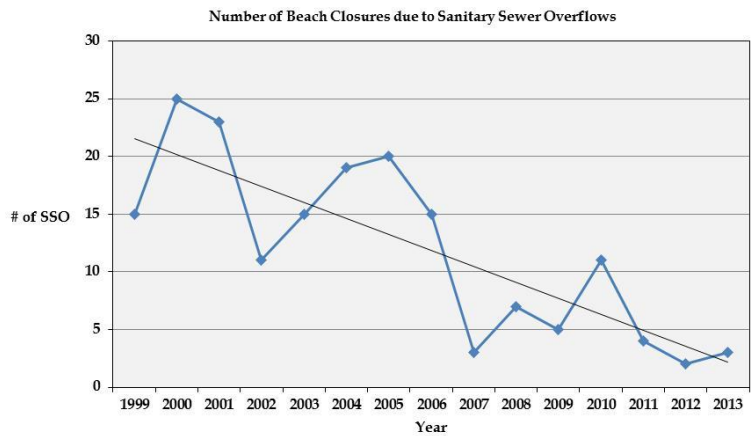

Figure 2.3.6: Two key metrics track the decreasing impact of sewage spills on beach condition in South Orange County over time. a) The number of reported sewage spills from 1999 through 2013. *The number of spills peaked in 2000 and has declined steadily since then (regression significant at p = 0 .001), reflecting increased attention to the causes of spills (primarily line blockages);* **b) the number of beach closures from 1999 through 2011 resulting from sewage spills.** *After peaking in 2000, the number of closures has declined steadily (regression significant at p <0.001), reflecting the reduction in the number of sewage spills and in the percentage of spills reaching the beach. Peaks in 2005 and 2010 are due to an unusual number of larger spills over 1000 gallons. Adapted from HCA (2012).*

2.3.3 Problem Beaches and Creeks

In response to persistent bacterial contamination issues at a number of creeks and beaches in the San Diego region, the San Diego Regional Water Board in 2007 adopted a Total Maximum Daily Loads for Indicator Bacteria, Project I - Beaches and Creeks in the San Diego Region, commonly referred to as the Beaches and Creeks TMDL. In the southern portion of the County, the primary focus of the TMDL was on a handful of persistent problem beaches (**Figure 2.2.6**). The TMDL was preceded by other individual actions, such as the Aliso Creek Directive issued by the Regional Water Board in 2001, also in response to elevated bacteria concentrations in the Aliso Creek watershed. These regulatory actions, combined with increased public and management attention to bacterial contamination (e.g., reduced sewage spills (**Figure 2.3.6**), have resulted in significant improvements to beach water quality. For example, both Poche and Doheny Beaches were recently removed from Heal the Bay's Beach Bummer list of the ten worst beaches in the region.

While actions to reduce bacterial inputs and improve water quality span the region (**Figure 2.3.5**), Aliso Creek and Poche and Doheny Beaches provide representative examples of the diversity of monitoring, assessment, prevention, and treatment efforts that combine to produce improvements over the past several years.

In addition to water conservation efforts that include the entire urbanized portion of the Aliso Creek watershed, four specific types of Best Management Practices (BMPs) have been implemented, including:

- **Treatment systems** such as sand filters, cartridge media filters, disinfection (ozone or Ultraviolet (UV) light, and dry weather diversions that send stormdrain flow to the sanitary sewer for treatment
- **Wetlands/channel restoration** that enhances a stream's natural capacity to absorb pollutant loads and restores riparian habitat
- **Landscape retrofits** such as weather-based irrigation controllers, edgescaping that replaces irrigated lawn area along the edge of a sidewalk, street curb, driveway, etc. with lower impact landscaping and permeable ground covering, and other irrigation improvements to improve water efficiency and reduce runoff
- **Catch basin retrofits** such as debris gates and in line baskets or filters that reduce the potential for bacterial growth by keeping trash out of catch basins

These actions have had noticeable effects, reducing fecal coliform levels below the regulatory standard at a key monitoring station in the lower watershed and reducing *Enterococcus* levels to near the standard (**Figure 2.3.7**).

Figure 2.3.7: Fecal indicator bacteria concentrations at Aliso Creek monitoring site CTPJ01 have significantly declined and now meet recreational water quality objectives (WQOs) for fecal coliform.

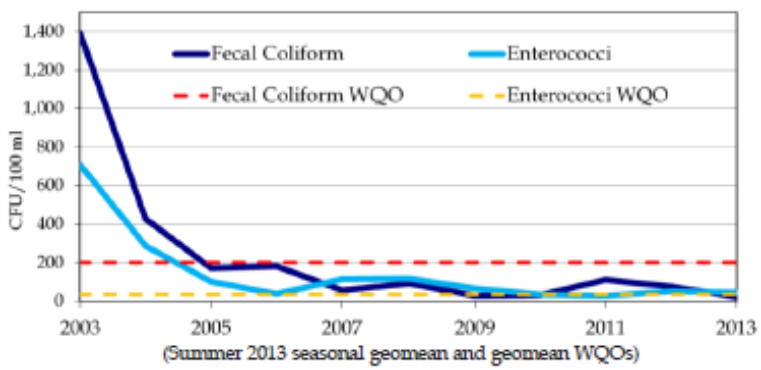

Bacterial indicator levels in the Aliso Creek watershed have declined over the past several years in concert with a decline in the average flowrate from urban discharges to the creek (**Figure 2.3.8**). While correlation of course does not necessarily equal causality, in this instance there is a strong case that the reduced flow of water contaminated with urban pollutants (including bacteria) has contributed to the reduced levels seen in the creek monitoring program.

The story of success at Poche and Doheny Beaches is equally dramatice but involves a different set of studies and BMPs. In concert with the epidemiology study at Doheny Beach in 2008-08, a source identification pilot project (or SIPP) identified leaking sanitary sewer infrastructure as a source of human fecal markers seen in the surfzone. Targeted repair efforts essentially removed this source. A parallel program at Poche Beach, the Poche Clean Beach Project, used state grant funds to construct a filtration and UV treatment system that reduced input of bacterial contamination from the the channel discharging to the beach.

Figure 2.3.8: The fecal coliform seasonal geomean in the Aliso Creek watershed plotted in comparison to the average dry weather flow rate in the creek. *Note: Fecal coliforms have declined in concert with reductions in flow of urban runoff to Aliso Creek.*

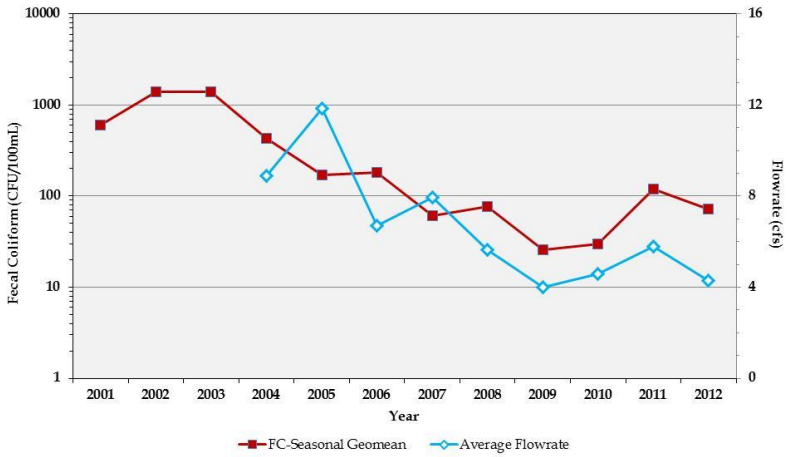

Additional studies identified another source of human fecal makers, this one airborne. Projects that involved genetic characerization as well as behavioral studies of seagulls found that seagulls feeding at the Prima Deshecha landfill in the upper watershed constituted a separate pathway for contamination. Better landfill maintenance, combined with falconry programs at both the landfill and the beach significantly reduce this source of contaminant input (**Figure 2.3.9**). Thus, the combination of modern genetics methods and the ancient practice of falconry provided an effective solution at Poche and Doheny Beaches.

Figure 2.3.9: The presence of an active falconry program to deter seagulls is associated with significant declines in bacterial contamination levels at both Poche (a) and Doheny (b) beaches. *Note: Falconry programs help reduce contaminant inputs from seagulls.*

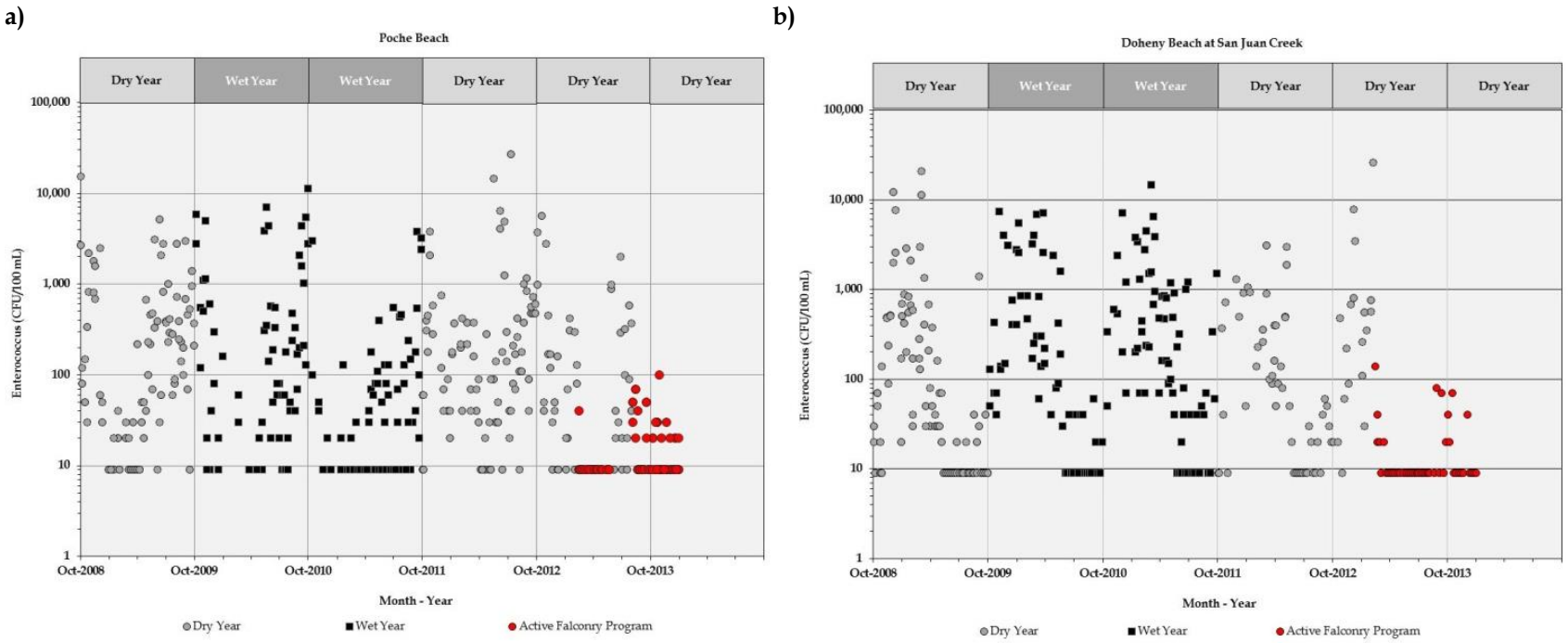

Ongoing efforts by cities and their stormwater programs to improve water conservation and reduce nuisance runoff have begun to ameliorate this problem. While concentrations of indicator bacteria in channels in both wet and dry weather combined continue to be elevated, the diversion of dry weather stormdrain and stream flows to treatment plants and other actions (**Figure 2.3.5**) has significantly reduced the volume of contaminated flows to beaches. Such efforts, along with the targeted identification and removal of specific problem sources, have also helped the County and watershed permittees make substantial progress toward improving conditions at the few problem beaches in the region. As a result of the effectiveness of these complementary actions, Orange County's beaches meet regulatory standards for the large majority of the time in dry weather and the health risks of swimming during dry weather conditions are very low, well understood, and well managed.

2.3.4 Continued Challenges in Wet Weather

In contrast to the progress achieved in maintaining clean beaches during dry weather conditions, significant challenges remain during wet weather. Channel flows during and immediately after wet weather storms are substantially higher than during dry weather (**Figure 2.3.11a vs. 2.3.11b**) which makes it infeasible to apply the management practices (e.g., diversion to treatment plants) that have been so successful in dry weather. In addition, these flows reach the beach more frequently (**Figure 2.3.10c**), which means that their loads of bacteria and other pathogens are delivered directly to the coastal ocean, with the result that beach grades worsen and exceedances of standards increase during wet weather (**Figure 2.3.11**). Nevertheless, the annual percentage of A grades for wet weather on the Heal the Bay report card has reached 70% in recent years (**Figure 2.3.11**). As a result of these characteristics of wet weather flow, the Orange County Health Care Agency issues routine health advisories recommending that the public stay out of the ocean during and for 72 hours after storms in order to avoid contact with potentially contaminated discharge. Despite this, there is significant recreational use during storms (**Figure 2.3.10d**), primarily by surfers taking advantage of the larger surf that often accompanies winter storms.

Figure 2.3.10: Photographs showing examples of the changes in flows during dry and wet weather and the subsequent changes in ocean water quality. *a) Dry weather flows are much smaller than b) wet weather flows; c) wet weather flows from stormdrains and channels typically reach the ocean in wet weather, in contrast to dry weather flows which rarely reach the ocean; d) surfers often take advantage of the large waves caused by winter storms, despite the increased exposure to contamination this may involve.*

Figure 2.3.11: The percentage of poor Heal the Bay report card grades at swimming beaches is much higher in wet weather than in dry weather (see insert in Figure 2.10), although the annual percentage of A grades has increased gradually in recent years to 80% and the percentage of F grades has dropped to 10% in the most recent monitoring year (2013). *Note: Heal the Bay beach grades in wet weather have improved recently and are mostly A.*

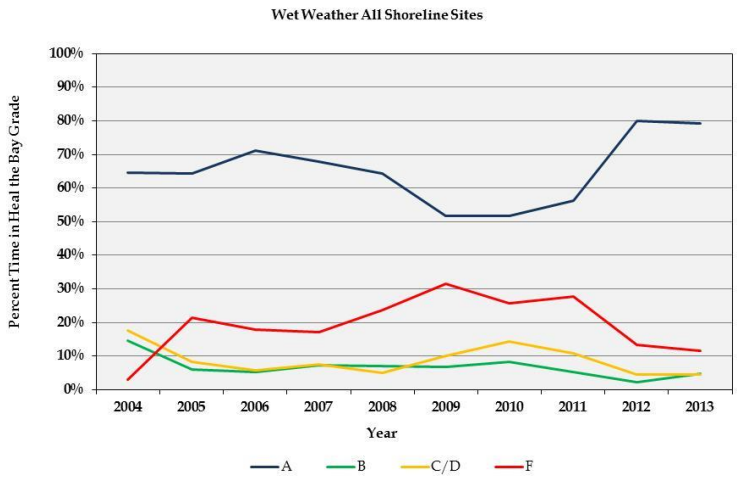

In addition to the higher flows in wet weather, there are two other aspects of this issue that complicate efforts to reduce wet weather contamination and its resultant potential health risks:

- Bacterial contamination in wet weather flows stems from a much wider range of sources than in dry weather
- Limitations in existing monitoring tools make it difficult to know when there is actually human fecal contamination and a resultant health problem

Rainfall and the resulting runoff from land surfaces mobilizes indicator bacteria from a wide range of sources, including humans and animals, soils, vegetation debris, and persistent bacterial films in gutters and stormdrains. These loads stem from sources in both urban and open areas, as documented in a number of studies that have correlated bacterial loading with rainfall and measured loading from both urban and natural landscapes. Controlling this large range of sources and the very large volumes of wet weather flow would present a daunting engineering problem. For example, the long-term (1986 – 2013) mean monthly flow of San Juan Creek in January, February, and March is approximately 6175, 9201, and 5095 acre feet, respectively. Because treating these runoff volumes is infeasible, approaches such as Low Impact Development (which reduces runoff) and amendments to the Basin Plan that include changing bacteria objectives, delisting of some concrete channels, and suspending objectives in highly modified flood control channels during periods of high flow may be called for.

Because of the different nature of wet weather flows and the indirect nature of monitoring indicators, it is impossible to draw firm conclusions about health risk in wet weather. Wet weather flows may actually include a large proportion of true pathogens or they may simply be mobilizing non-pathogenic indicator bacteria from multiple sources across the landscape and diluting a stable pool of human fecal pathogens. Epidemiological studies in dry weather, including in Santa Monica Bay in 1995 and 2007 - 08, and at Doheny Beach (Colford et al. (2012) have established a relationship between levels of indicator bacteria and health risk, as well as documenting that full immersion swimming closer to flowing stormdrains increases risk. In contrast, there are no epidemiological studies in wet weather that can help resolve the fundamental uncertainties that have so far precluded significant management actions.

New studies planned and underway should, over the next few years, provide significant insight into the nature and magnitude of health risks in wet weather as well as more powerful and targeted monitoring tools to support improved regulation and decision making.

2.3.5 Monitoring Methods

Current indicators do not measure pathogens directly and do not separate human vs. animal and other sources. This is problematic, especially in wet weather when higher flows mobilize indicator bacteria from a multitude of sources distributed widely across the landscape. The current bacterial indicators are present in soils, leaf litter, other forms of rotting biomass, biofilms in gutters and stormdrains, as well as in both domesticated animals and wildlife, and often recover and grow in the environment even after disinfection. In contrast, the pathogens responsible for human illness (about 90% of which are viruses) all derive from human fecal contamination. These shortcomings of traditional indicators make it difficult to reliably separate human from nonhuman sources, estimate health risk, and accurately track the sources of actual pathogens.

Recent research has led to new tools that resolve some of these handicaps, although further development remains to be done over the next few years. Ongoing research falls into three categories:

- Development of genetic markers that more reliably identify the presence of human fecal material
- Monitoring methods that directly measure the presence and abundance of pathogens, particularly viruses
- Wet weather epidemiology studies that will improve estimates of health risk from exposure to ocean waters during wet weather conditions

We now have the technology to reliably determine if there is a human fecal component to bacterial contamination, using the HF183 genetic marker from a *Bacteriodes* species that is present in large quantities in humans but not in other species. This marker is not itself a pathogen but does enable relatively accurate estimates of the percentage of time human fecal material is present. At present, it is most useful as a means of confirming / eliminating the presence of human sources, a key first step in microbial source tracking studies. However, it is not yet a suitable basis for revised regulatory standards because its persistence in the environment and its behavior compared to that of actual pathogens is poorly understood. A component of Bight '13 aims to improve our understanding of HF183's utility by measuring it, along with traditional indicators, in a number of coastal drainages across southern California in both wet and dry weather.

New monitoring methods that utilize digital polymerase chain reaction (dPCR) technology enable quantification of pathogenic viruses at very low detection limits. Researchers can now test for the presence of adenoviruses, noroviruses, and rotaviruses in environmental samples, although substantial further development is needed before these methods are available for routine application. Rotaviruses are related predominantly to gastrointestinal illness and some adenoviruses affect a broader range of membranes, including those in the nose and bronchia. Some noroviruses cause intense but shortlived (24 – 48 hour) illnesses that are not life threatening but are extremely unpleasant. With funding from the state of CA, the Southern California Coastal Water

Research Project is working with the Monterey Bay Aquarium Research Institute (MBARI) and researchers at Arizona State University to develop mobile digital PCR equipment that could enable new approaches to beach water quality monitoring, such as in situ sensors that provide a stream of real-time data. There are technical complications related to sample processing but once these are resolved, the digital PCR methods could provide the basis for updated standards.

The third area of research is the investigation of health effects associated with swimming and surfing in the ocean during wet weather conditions. SCCWRP is cooperating with the City and County of San Diego and USEPA this winter on a pilot wet weather epidemiology study that will follow a large sample of surfers to estimate the relationship between illness rates and the levels in ocean water of a number of indicator bacteria and pathogens. Plans are in place for a full epidemiology study at more locations during the winter of 2014/15. The results of these studies, in combination with quantitative risk assessment methods, could show that health risk is either lower or higher than the assumptions built into current regulations. In either case, the epidemiology studies, in combination with new monitoring methods, will provide the basis for improved regulations and more informed management decisions.

2.3.6 Recommendations

Past progress in identifying and controlling sources of contamination, the availability of a long time series of monitoring data, and the development of new monitoring and assessment tools provide the basis for this review of existing bacteria monitoring programs with the goal of improving their utility and efficiency. The following recommendations stem from a data-driven, risk prioritization approach that views monitoring, assessment, research, and management actions as a portfolio of related actions.

- Continue targeted data analyses of monitoring data to prioritize problem areas. Conduct additional source tracking studies as needed, using new monitoring methods based on genetic markers to identify potential sources of these issues such as infiltration into the MS4 from sewage lines. This effort should build on results of the Bight '13 Microbiology Study.
- Continue identifying opportunities to reduce and prevent flows in dry weather, where monitoring and source tracking data suggest the presence of human fecal contamination.
- Conduct statistical power analysis and optimization studies to improve existing monitoring program designs to improve efficiency and take advantage of available information about patterns and trends of contamination. **Figure 2.3.12** illustrates how statistical power analysis can provide information that can reduce and/or better target monitoring resources.
- Shift resources from routine monitoring to targeted source tracking and adaptive response, using new tools such as genetic markers of human fecal contamination as these become available.
- Continue supporting regional and collaborative research into better monitoring and source tracking tools.
- Improve understanding of health risk related to high wet weather flows, for example, through the Bight '13 Microbiology Study; follow results of the pilot wet weather epidemiology study planned for San Diego and consider

supporting the larger, follow-on study planned for 2014/2015.

- Conduct pilot mass balance studies to determine their utility for improving the prioritization of management actions.

Figure 2.3.12: Example analysis run with pesticide data to demonstrate statistical power analysis for a trend monitoring program. *The number of years of data required to detect varying amounts of change with different numbers of samples per year (5, 10, 20, 40) next to respective curves). This figure illustrates that increased sampling intensity often produces diminishing returns and that such analyses can inform tradeoffs among different types of sampling effort and the amount of change managers with to detect and/or the amount of time they can wait to detect a change. The figure also shows that the inherent variability in a system may make it impossible to detect small amounts of change with even large amounts of sampling effort.*

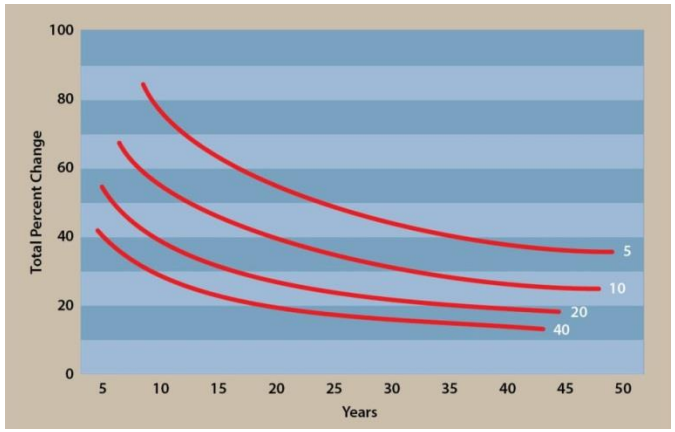

2.4 Dissolved Solids

The Story: Dissolved Solids

- Persistent and widespread exceedances of total dissolved solids occur in channels and at discharge outfalls.
- Dissolved solids are a challenging to address because a large portion of these elevated levels derive from natural sources in regional groundwater.
- Understanding local geology is key to understanding sources of dissolved solids and the pathways they travel in the watershed.
- While the flood control system provides one pathway for dissolved solids in groundwater to reach the surface, other natural pathways (such as artesian springs) exist and there is evidence of historically elevated dissolved solids levels in surface water in the region.

2.4.1 Natural Geology is Key

Dissolved solids refers to the amount of salt in water and can be a difficult water quality problem to address when concentrations are elevated. They can be toxic to fish and plants and require expensive processing in water reclamation systems to make the water drinkable or usable for irrigation. Dissolved solids, as general description of the amount of salt in water, consists of several other constituents including chloride, sulfate, nitrate, phosphate, calcium, magnesium, sodium, potassium, and sometimes a few trace metals such as cadmium, nickel, selenium, and zinc.

Total dissolved solids (TDS) consistently exceed the Basin Plan Objective (**Figure 2.4.1**) and these levels create the potential for detrimental impacts on the aquatic ecosystem; for example, TDS has been suspected as a causal factor in poor benthic macroinvertebrate community condition.

The key issue in deciding whether elevated dissolved solids represent a water quality problem, and thus a priority for management, depends directly on the source of these solids and the appropriate benchmark for comparison (**Figure 2.4.2**). Many creeks in South Orange County have elevated levels of dissolved solids that do not appear to be related to the urban sources. For example, the dissolved solids from common urban potable sources such as imported water from the Colorado River or northern California, or locally generated drinking water from deep groundwater supplies or from recycled water, are often at levels much lower than those measured in South Orange County creeks. Similarly, the shallow groundwater tables that provide most of the water to these streams are often much higher in dissolved solids than water from urban sources.

Figure 2.4.1: An overall exceedance index of the extent to which total dissolved solids meet regulatory standards in both a) wet and b) wet conditions is low (which means poor conditions) and has remained fairly steady since 2004.

a)

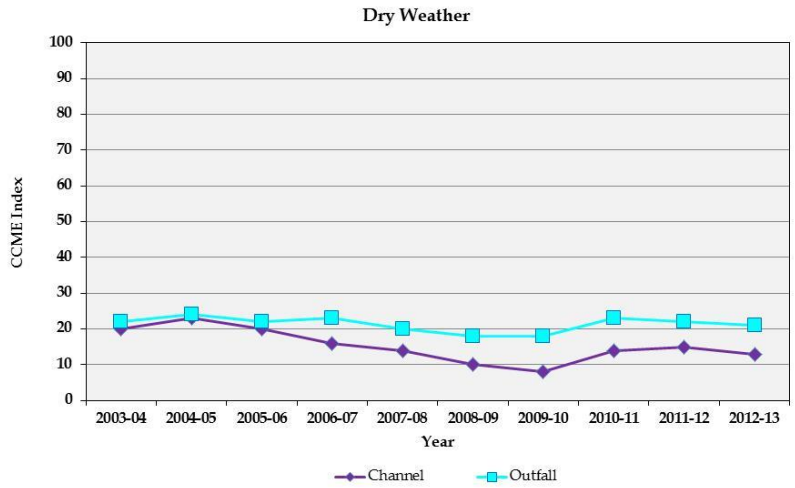

b)

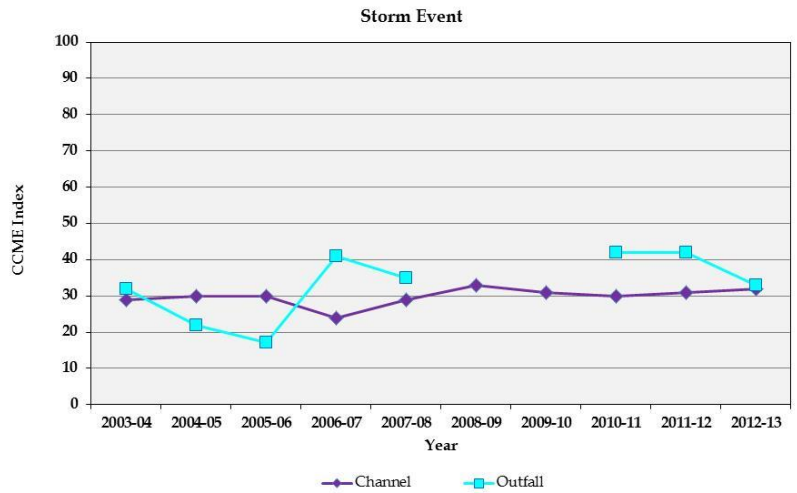

Local geology is the primary reason South Orange County creeks have dissolved solids higher than those in common urban sources of water. The coastal areas of South Orange County have salt-rich native soils, commonly referred to as marine sedimentary geology, with the result that creeks have elevated dissolved solids. Further, the creeks with elevated dissolved solids are not limited only to water bodies within urbanized areas. Natural reference creeks in coastal areas with this type of unique geology and little to no urban influence have levels of dissolved solids substantially above those in urban water sources (**Figure 2.4.2a**).

In contrast, the parts of South Orange County with geology more closely related to bedrock (i.e., igneous geology) and those soils found in the upland higher elevations closer to the Santa Ana mountains are much less related to marine sediments and thus have lower levels of dissolved solids (**Figure 2.4.2b**).

The Program has conducted several special studies to improve understanding of the relationships between natural and urban sources of dissolved solids in creeks. Studies in Oso Creek, which has elevated dissolved solids levels showed that dissolved solids concentrations in this Creek were comparable to those in three reference streams (**Figure 2.4.3a**), although loads of dissolved solids to Oso Creek were higher than those in natural streams (**Figure 2.4.3b**).

The Program has also conducted collaborative studies with researchers in the Geochemistry Group at University of Southern California's Department of Earth Sciences, using specialized testing of stable isotopes of hydrogen and oxygen. Physiographic conditions under which rain falls in the Sierra Nevada or Colorado River watersheds are very different from those in the County's low elevation coastal watersheds. These differences impart unique isotopic signatures that can help to uniquely identify the contribution from various sources. This study compared the isotopic signatures of groundwater emerging from weeps and springs in the urbanized areas of South Orange County to those from a range of potential sources including rain, natural groundwater, and urban sources (e.g., potable or recycled water). The stable isotopic signature for shallow groundwater from weeps and springs in urban areas is more similar to that of local rain water and natural reference streams and much less similar to the imported water that is the primary source of potable water in south Orange County.

Figure 2.4.2: Means and ranges of dissolved solids concentration in a) various water sources including rainwater, local potable, Colorado River potable, recycled, groundwater, and b) streams. *Data from these sources provide context as to which water source(s) most closely resemble surface waters with elevated dissolved solids.*

a)

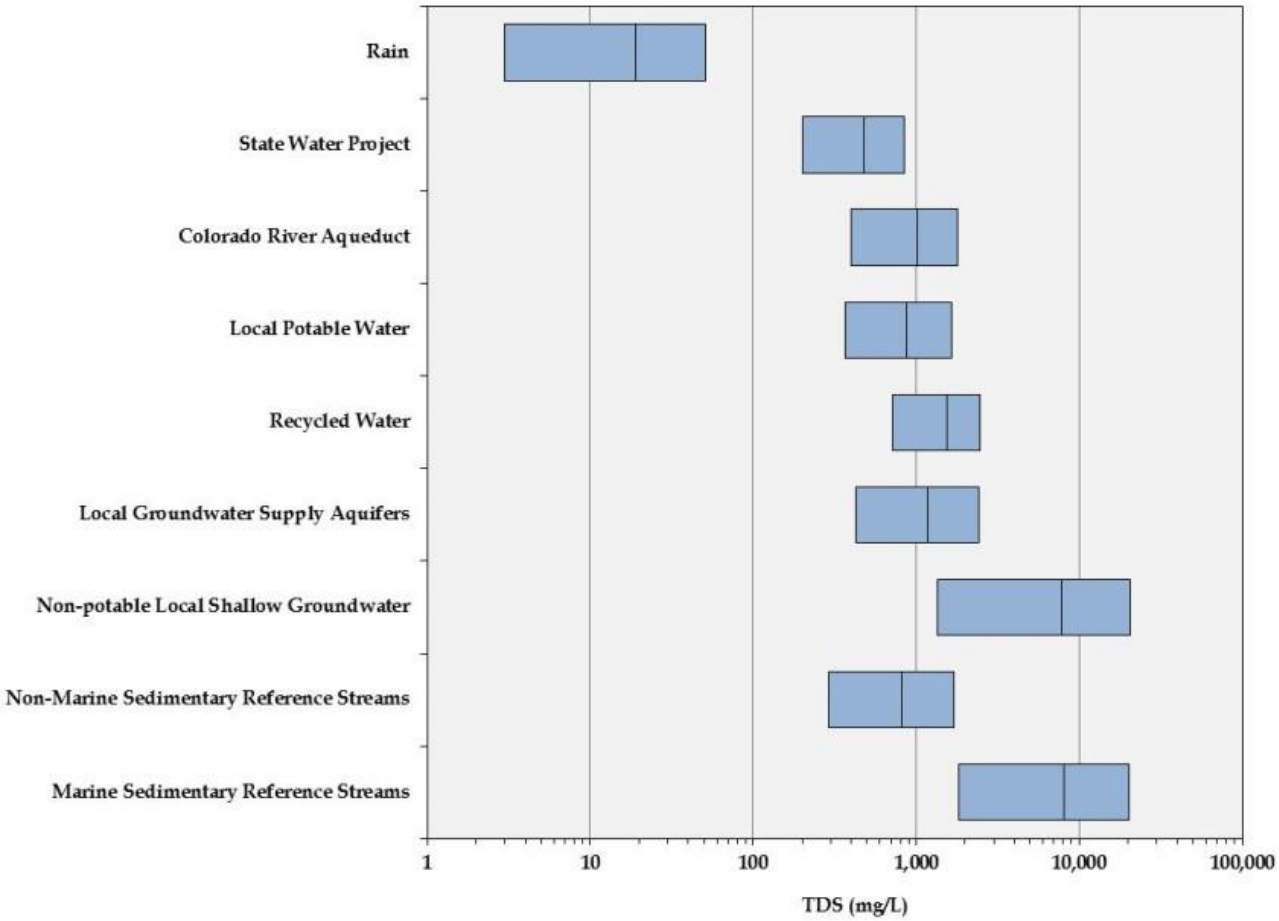

b)

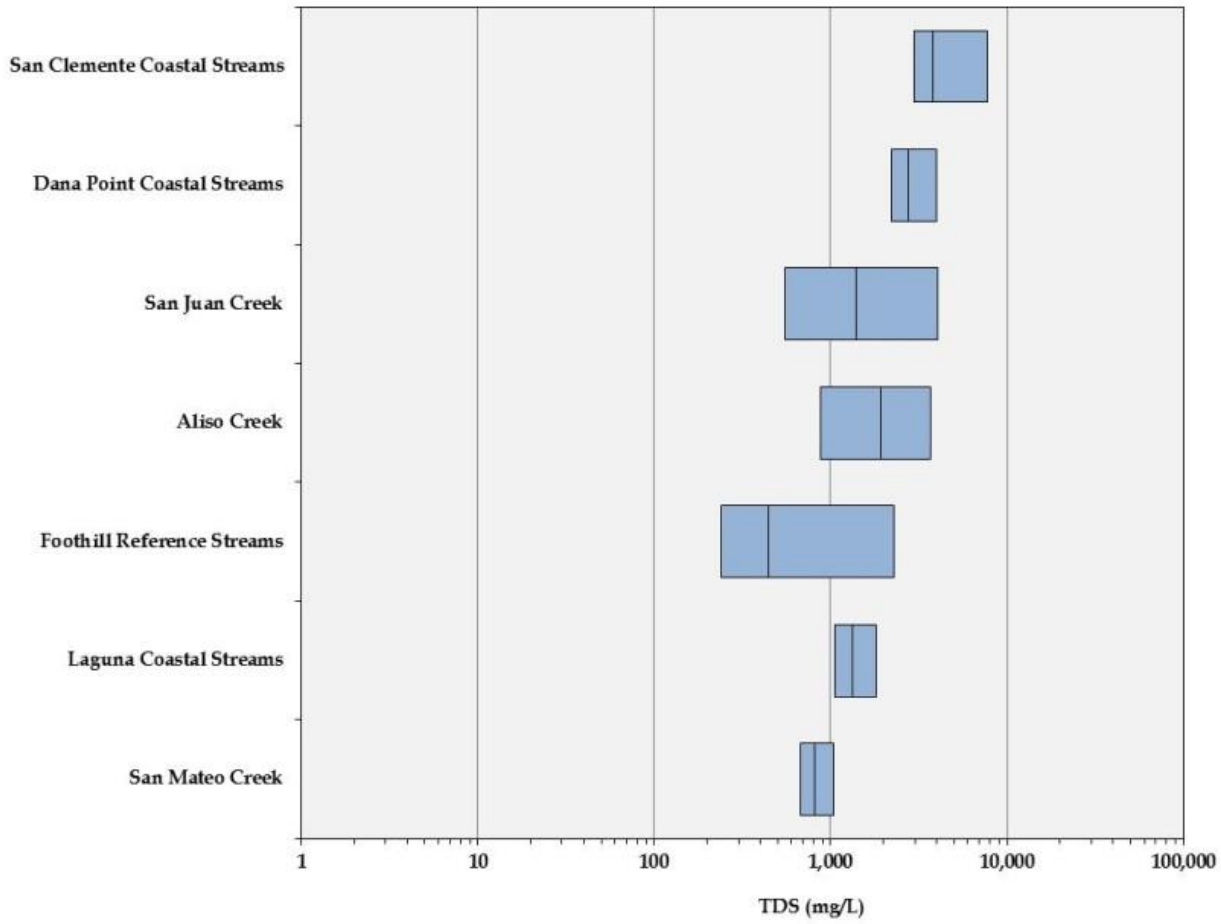
San Clemente Coastal Streams
Dana Point Coastal Streams
San Juan Creek
Aliso Creek
Foothill Reference Streams
Laguna Coastal Streams
San Mateo Creek
1
10
100
1,000
10,000
100,000
TDS (mg/L)

Figure 2.4.3: Ranges of dissolved solid concentrations (a) and loads (b) in Oso Creek in comparison to three reference streams of similar geology.

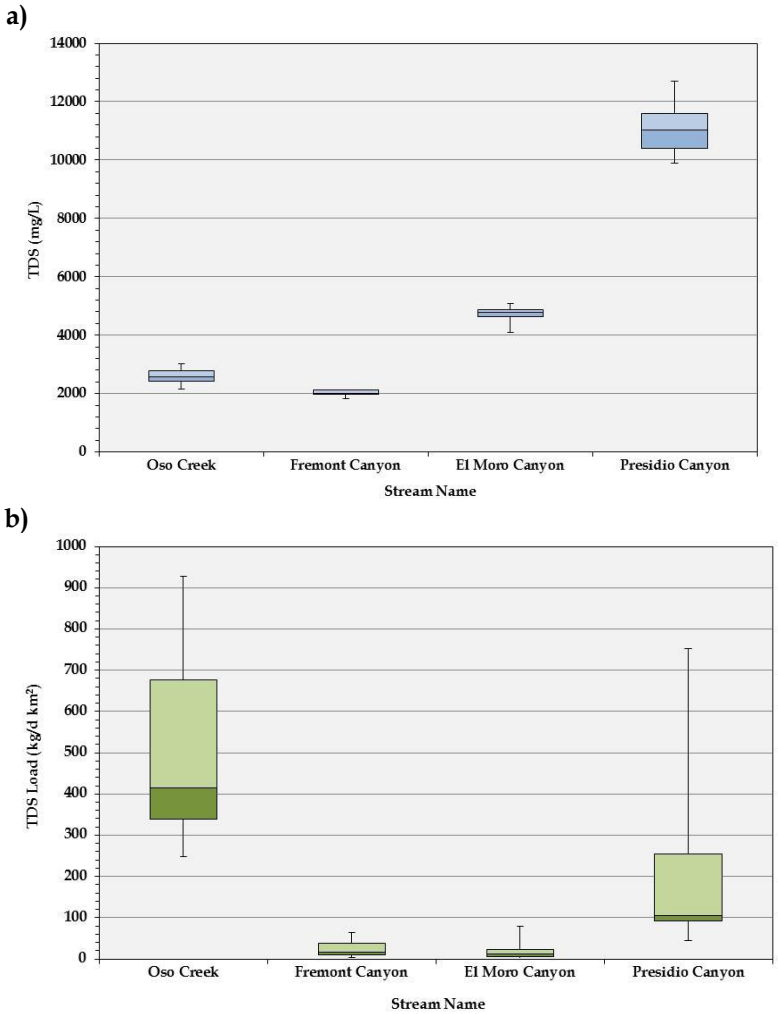

This study also compared shallow groundwater to the global meteoric water line, which describes the mean relationship between hydrogen and oxygen isotopes in water which has not been exposed to evaporation (**Figure 2.4.4**). The shallow groundwater in urban areas reflects conditions more similar to rainwater and reference streams than to an imported source of water.

Figure 2.4.4: Hydrogen and oxygen stable isotope compositions of shallow groundwater in urban creeks across south Orange County in comparison to rain, water from reference streams in undeveloped watersheds, and imported municipal water from Colorado River and the Sierra Nevada mountains.

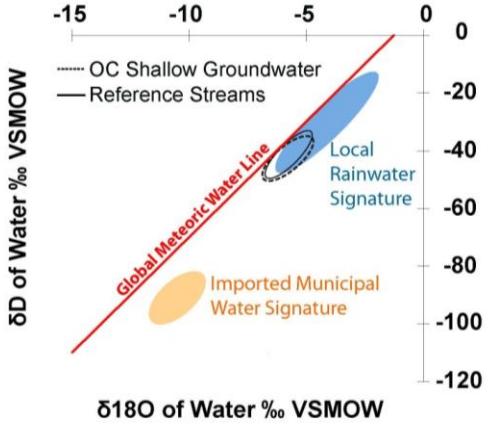

These three pieces of information have important implications for the Program's efforts to identify sources of dry weather flow, understand the underlying natural conditions in streams in the urbanized portions of South Orange County, and to then determine whether elevated dissolved solids in a particular watershed are an important management priority for the future.

2.4.2 Recommendations

- Conduct a mass balance study, even if at a crude level, to determine the extent to which the MS4 contributes to dissolved solid levels in the creeks
- Prepare a summary report on historic and contemporary conditions of dissolved solids across south Orange County
- Invest effort into understanding whether dissolved solids are important stressor on macroinvertebrate communities in the creeks to evaluate the environmental significance of elevated dissolved solid concentrations
- Continue evaluating changes in dissolved solids at key locations such as Oso Creek in concert with water conservation efforts to track changes in dissolved solids over time.

2.5 Nutrients

The Story: Nutrients

- Nutrient levels in South Orange County streams and channels are frequently above commonly used thresholds that suggest increased likelihood of nutrient impacts. In contrast, there are much less frequent occurrences of impacts, such as macroalgal overgrowth, due to excessive nutrient levels.
- Nutrient issues are not limited to the urban portion of the County; regional monitoring data show nutrient enrichment and impacts such as increased macroalgal cover and/or lower dissolved oxygen in streams and estuaries in undeveloped regions.
- The major point sources of nutrients have been controlled. Therefore, nonpoint and diffuse sources such as leaching from upland soils and intrusions from shallow groundwater are increasingly important.
- Nutrients can be readily transported in and out of various reservoirs (e.g., sediments, groundwater) and undergo complex biological transformation and cycling. This makes traditional pollutant control strategies less effective for nutrients.
- Improved management strategies may contribute to further progress, particularly in streams and channels, by accounting for site-specific conditions, promoting Low Impact Development, and accounting for broader regional sources.

2.5.1 A Complex Regional Problem

Elevated levels of nutrients have become an increasing national and regional concern in recent years because of their impacts on lakes, streams and estuaries. Nutrient enrichment leads to the overgrowth of algae in streams, (**Figure 2.5.1**) and estuaries (**Figure 2.5.2**) that can reduce dissolved oxygen, sometimes to the point of causing mortality to fish and other aquatic organisms. Dense algal mats can also cause aesthetic (visual and odor) impacts and impair beneficial uses such as boating and swimming. There is also concern that nutrient runoff has contributed to the observed increased incidence and severity of harmful algal blooms (HABs) in California and their toxic effects in the coastal ocean (**Figure 2.5.3**). For example, the Bight '08 Program found that anthropogenic nutrient inputs are co-located with algal bloom hotspots at subregional and seasonal / daily scales and onging regional studies are further investigating this potential connection. Finally, nutrients are involved in geochemical processes that can amplify ocean acidification impacts in estuaries.

Unlike most other pollutants, nutrients are involved in complex biological transformation and cycling processes (**Figure 2.5.4**) and storage in a variety of reservoirs. This complicates nutrient assessment and management in two important ways. First, nutrient impacts can persist even after inputs have been reduced or ended because nutrients stored in sediments, groundwater, and plants can move in and out of these reservoirs on a range of time scales. For example, studies conducted by the Southern California Coastal Water Research Project and others have shown that nutrients cycle in and out of the sediments in bays and estuaries on a seasonal basis and (Fenn et al. 2010) showed that large portions of several vegetation types in California (e.g., chaparral, oak woodlands,

coastal sage scrub, annual grassland) exceed the "critical load" for nitrogen deposition. Excess loading of nitrogen from aerial deposition can cause shifts in the plant community by, for example, changing conditions to favor invasive grasses and other nutrient sensitive species. Where loadings exceed the amount that can be assimilated by plants, rainfall can more easily wash excess nutrients out of soils and into streams.

Figure 2.5.1: Nutrient enrichment causes overgrowth of algae in streams, particularly in warmer, low flow conditions. a) algal mats in a slow moving stream. *Urban and natural watershed areas can supply excessive nutrients, so algal overgrowth and its secondary impacts (e.g., low dissolved oxygen) occur in both urban channels (b) and streams in undeveloped open space (c).*

a)

b)

c)

Figure 2.5.2: Almost all estuarine segments in the Southern California Bight show some degradation on at least one of the three response indicators of eutrophication: macroalgal cover, phytoplankton, and dissolved oxygen concentration. *Adapted from Bight '08 program data.*

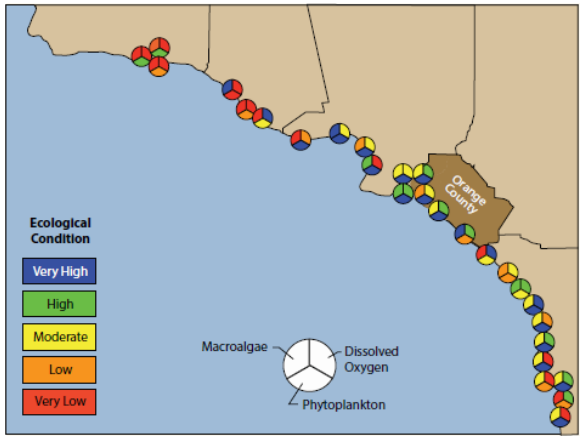

Figure 2.5.3: Bloom of the alga *Lingulodinium polyhedrum* in the coastal ocean off southern California. *This alga can be toxic to marine organisms.*

Figure 2.5.4: A graphical conceptual model of nutrient dynamics in a generalized estuarine system. *Nutrients derive from multiple sources, both natural and anthropogenic, spread across the watershed. Atmospheric deposition can exceed the carrying capacity of upland soils, leading to nutrient loading to streams during storm events. Nutrient loadings are higher in wet weather and they can be stored in and move through sediments, groundwater, and riparian and aquatic plants on different timescales. Because of these reservoirs, nutrients can require a lengthy period to move through the system and their impacts can continue long after inputs have been shut off. Note: Nutrients enter coastal systems through a variety of sources and pathways.*

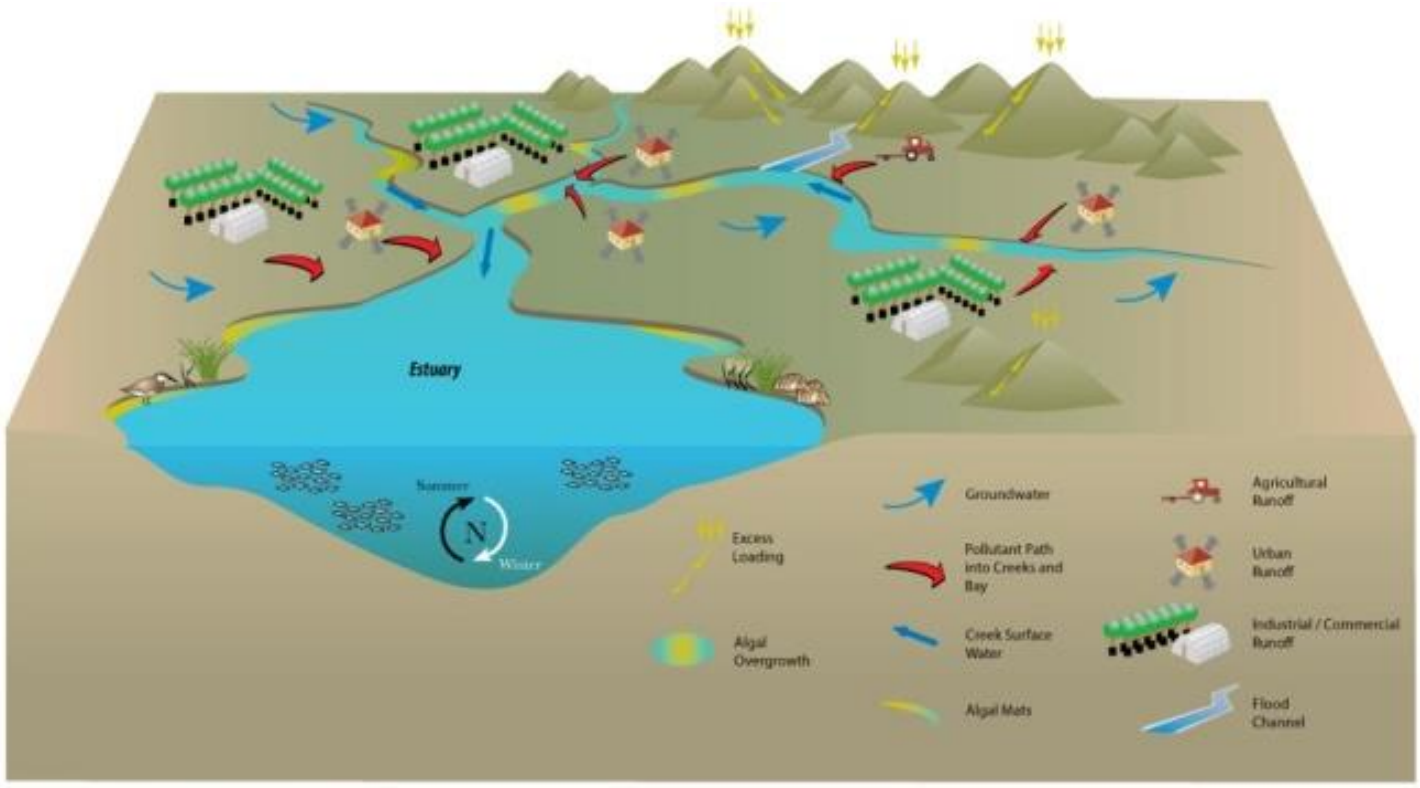

The second way in which nutrients differ from most other pollutants is that complex bio- and geochemical dynamics can cause very different effects at different locations or times in response to the same nutrient concentration or load. As a result, there is no consistent functional relationship between the exceedance of a single, numeric regulatory standard for nitrogen or phosphorus and the presence or severity of impacts from nutrient overenrichment.

2.5.2 Nutrient Patterns in South Orange County

The Program collects three types of data that help document the extent, severity, and changes over time in nutrient issues:

- Concentrations of nutrients and comparison of these data to commonly used thresholds(1 mg/l for total Nitrogen; 0.1 mg/L for total Phosphorus) that indicate likelihood of impacts
- The percent cover of algae, a measure of nutrient impacts on biological conditions in waterbodies
- Mass loads of nutrients at key mass emission stations

Figure 2.5.5a and **2.5.5b** shows that nutrients (total nitrogen and total phosphorus) commonly exceed thresholds in channels and that a frequency-based water quality index widely used in a number of monitoring and assessment programs has improved only slightly since 2000. While conditions are slightly better in dry weather in most years, the index values are consistently low (i.e., poor condition) in all years in both dry and wet weather.
However, this is not strictly an urban problem (see **Figures 2.5.1c and 2.5.6**). The Stormwater Monitoring Coalition (SMC) has for the past five years collected data from sites across southern California in urban, agricultural, and open (undeveloped) natural areas. The locations of SMC sites are selected randomly each year so that they can provide a statistically valid picture of regional conditions, which forms a valuable context for interpreting data from north County. **Figure 2.5.6** shows that targeted monitoring sites in South Orange County channels clustered in the lower end of the distribution (less than about 30% macroalgal cover) for the urban landuse. In other words, about half of the stream miles in southern California in the urban land use had a greater degree of macroalgal cover than did sites in channels in South Orange County. **Figure 2.5.6** also shows about half of the stream miles in southern California in the open (undeveloped) landuse had up to 20% macroalgal cover. Thus, while macroalgal cover is greater in the urban landuse, this problem also occurs in undeveloped streams in the region.

Figure 2.5.5 shows that elevated nutrient levels are pervasive in south County channels but **Figure 2.5.6** documents that the primary nutrient impact monitored in these channels, percent macroalgal cover, is at the lower end of the cumulative frequency distribution for the urban landuse in the region. Thus, nuisance algal growth is not always evident in streams when nutrients are above thresholds, which reflects the lack of a one-to-one correspondence between nutrient levels and impacts such as macroalgal cover and dissolved oxygen. Recognition of this issue is at the heart of the State Water Resources Control Board's attempt to develop a new approach to setting nutrient thresholds (see **Section 2.5.4** *New Management Approaches* below).

Figure 2.5.5: An overall index of the extent to which nutrients (total nitrogen and total phosphorus) meet thresholds in channels and outfalls, in both dry (a) and wet (b) weather is low (which means poor conditions) and has remained low over the monitoring period. *The index integrates the number of indicators and the percentage of samples higher than thresholds in each year, and the average magnitude of such excursions (CCME 2001). It provides a score, scaled from 0 - 100, that can readily be tracked over time. Note: Nutrients regularly exceed standards in channels in both wet and dry weather.*

Figure 2.5.6: The cumulative frequency distribution function of macroalgal cover in the three landuse types sampled by the Stormwater Monitoring Coalition's (SMC) regional program. *Fifty percent of the stream miles in the open landuse had about 20% or less macroalgal cover, while about 50% of the stream miles in the urban landuse had about 30% or less macroalgal cover. The majority of the County's targeted sites (situated along the X axis) had less than 30% macroalgal cover.*

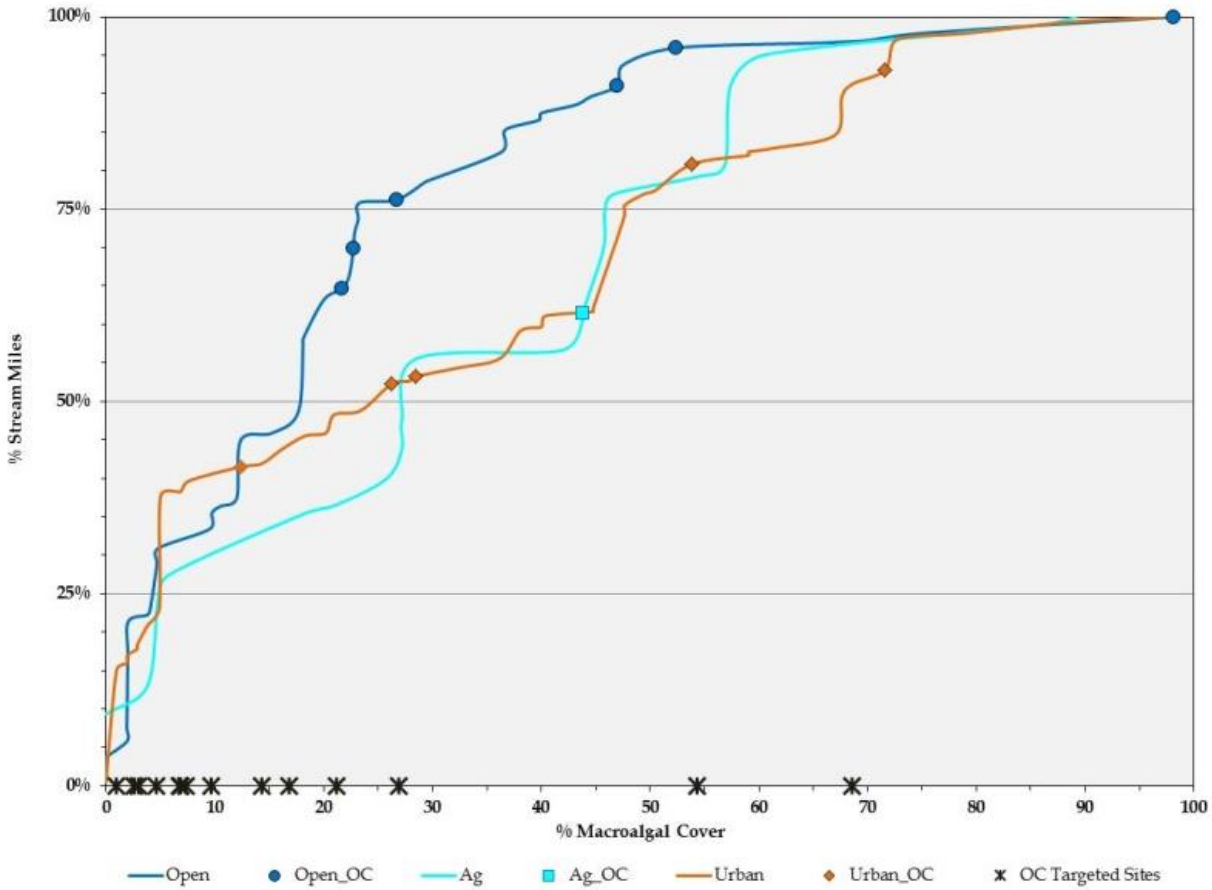

2.5.3 Nutrient Sources

As with many pollutants, the focus on sources of nutrient inputs has gradually shifted from distinct point sources to more widespread and diffuse sources as point sources have been identified, targeted for management action, and removed or reduced. Natural areas such as chaparral, oak woodlands, coastal sage scrub, and annual grassland can also be important sources of nutrient loading, particularly in wet weather. These areas have accumulated excess nutrients from aerial deposition (e.g., nitrogen oxides in smog) which can leach from soils during rain events. **Figure 2.5.7** shows that concentrations of nutrients in wet weather runoff from undeveloped open space are similar to those in runoff from urban sites. As a result, a narrow focus on urban sources of nutrients will miss an important category of inputs.

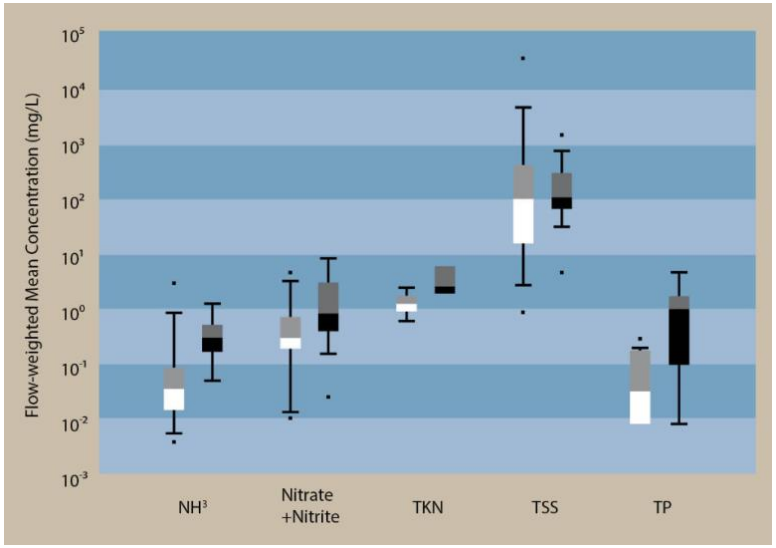

Figure 2.5.7: Wet weather flow-weighted mean concentrations of several forms of nutrients at urban (shaded boxes) and undeveloped open space (clear boxes) sites, as measured in the SCCWRP Natural Loadings Study. *These data document that natural areas are sources of nutrients at concentrations that are similar in some cases to those in runoff from urban sites. Boxes indicate the 25th and 75th percentiles and error bars indicate the 10th and 89th percentiles. From Stein and Yoon (2007).*

2.5.4 New Management Approaches

Improved knowledge about the lack of a tight correlation between nutrient levels and nutrient impacts, and about the importance of diffuse sources in open areas and in groundwater, has prompted the development of new management approaches at both the statewide and regional / local levels that more accurately measure and address the risk of impairment. For example, the State Water Resources Control Board's Nutrient Numeric Endpoint (NNE) project is developing methods (**Figure 2.5.8**) to derive a maximum allowable nutrient concentration in a particular stream reach, reservoir, or estuary based on local factors such as temperature, irradiance, and flow. The NNE's goal is to ensure that the key ecological indicators of macroalgae and dissolved oxygen remain within acceptable bounds.

Figure 2.5.8: The main user interface for the current version of the freshwater Nutrient Numeric Endpoint (NNE) biomass estimation spreadsheet tool. *In this figure, data fields are loaded with example data for illustrative purposes.*

USER INPUTS

Site:	
Analyst:	
Date:	

Nutrient Concentrations (mg/L)

	Average	Minimum	Maximum
Ammonia-N	0.03	0.02	0.05
Nitrite-N	0.001	0.001	0.001
Nitrate-N	0.14	0.05	0.2
Organic N	0.32	0.1	1
Total N (calc)	0.491	0.171	1.251
Inorganic P	0.0062	0.003	0.01
Organic P	0.0036	0.002	0.01
Total P (calc)	0.0098	0.005	0.02

Unshaded Solar Radiation (cal/cm^2/d)

	Average	Minimum	Maximum
Enter manually	614	561	649
Estimate	Latitude	Month Range	
	37.00	May	Aug

Stream Inputs

Stream Depth (m)	1
Stream Velocity (m/s)	0.3
Water Temperature (°C)	20.0
Days of Accrual (optional)	80
Canopy Closure	0% / 20% / 40% / 80%

Method & Target Selection

Select Method:	Revised QUAL2K, benthic chl a
Target Benthic Chl a (mg/m^2)	100
Corresponding Algal Density (g/m^2 AFDW)	40

California Benthic Biomass Tool, v12 (July 2006)

RESULTS

Less than or equal to Target
Greater than Target

Method	Max algal density, ave conditions (g/m^2 AFDW)	Benthic chlorophyll a estimate (mg/m^2)
Standard QUAL2K	53	133
Revised QUAL2K	45	112
Revised QUAL2K with accrual adj	32	79
Dodds '97, mean Chl a	13	32
Dodds '97, max Chl a	36	91
Dodds '02, mean Chl a	7	17
Dodds '02, max Chl a	35	86

Max algal contribution to DO deficit (mg/L)	1.39

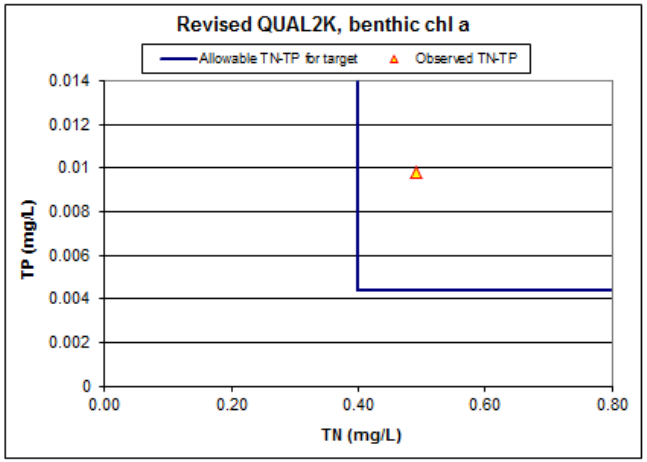

2.5.5 Recommendations

Past progress in identifying and controlling sources of contamination, the availability of a long time series of monitoring data, and the development of new monitoring and assessment tools provide the basis for this review of existing nutrient programs with the goal of improving their utility and efficiency. The following recommendations stem from a data-driven, risk prioritization approach that views monitoring, assessment, research, and management actions as a portfolio of related actions.

- Conduct an assessment of sources and practices that input to the MS4, to assess the significance of each to downstream issues.
- Continue identifying opportunities to reduce and prevent flows in dry weather.
- Pilot a regional mass balance nutrient model, even if elementary, to help prioritize monitoring and management attention; the Newport Bay watershed and SCCWRP coastal ocean nutrient mass balance models provide useful examples.
- Use available time series of data to streamline monitoring to improve its statistical and economic efficiency. Sampling effort could be reduced by identifying stations that essentially mimic each other and/or by reducing the spatial and/or temporal intensity of sampling. Monitoring could shift to a sentinel program with a lower frequency of monitoring intended to ensure conditions do not worsen.

2.6 Toxicity

The Story: Toxicity

- Toxicity in freshwater channels in all conditions (aquatic, sediment, wet and dry weather) occurs at low levels and is sporadic, occurring at different locations at different times and varying unpredictably across test species.
- Aquatic toxicity in dry weather occurs in open (undeveloped) areas at levels equivalent to those in urban areas; suggesting that dry weather toxicity is not driven predominantly by urban pollutants.
- There are no apparent trends in toxicity over time.
- Metals, except for some instances of elevated copper, are at low levels and do not appear to contribute to aquatic toxicity in freshwater.
- The primary source of toxicity appears to be pesticides, with evidence that pyrethroids contribute to sediment toxicity.
- Use of organophosphate pesticides has declined virtually to zero but use of pyrethroid pesticides has increased and exceedances of thresholds for pyrethroid pesticides are high.
- Reported pesticide use in the County has declined from just over 2 million pounds a year in 1998 to just under 1 million pounds in 2011, due primarily to reduced use of indoor fumigants.
- There is a large data gap in our knowledge of retail pesticide sales and use.
- Pesticide use (which is regulated directly at the state and federal levels) presents a moving target for management because of the continued introduction of new products; the most effective management strategies are to continue to reduce dry weather runoff/flows and support education and outreach efforts to reduce pesticide use and runoff.

2.6.1 Low but Puzzling Patterns in Toxicity

Since the publication of Rachel Carson's Silent Spring in 1962, concerns about the potentially destructive impacts of chemicals released into the environment have expanded, supported by an increasingly sophisticated understanding of their impacts and modes of action. Environmental monitoring now provides a range of tools, including sensitive sampling for specific chemicals at very low levels and toxicity tests (**Figure 2.6.1**) that integrate the effects on organisms of multiple chemicals in ambient water and sediments. These tools can indicate the potential for toxic effects before they become major events and provide the means for tracking and managing the distribution and impacts of anthropogenic chemicals.

Figure 2.6.1: The water flea *Ceriodaphnia* which is commonly used as a laboratory test organism in both acute and chronic aquatic toxicity tests

The Program's monitoring efforts to assess aquatic ecosystem health include a range of toxicity tests (**Table 2.2.2**) including aquatic tests in both dry and wet weather as well as toxicity tests on sediment collected from streams and channels. These tests use a variety of test organisms sensitive to different types of chemicals include and assess both acute (i.e., survival / death) and chronic (i.e., reproduction / growth) endpoints to document a range of potential toxic effects. **Table 2.2.2** summarizes the results of 2548 separate toxicity tests performed since 2003. The overall level of toxicity is low but is highest in wet weather. Winter storms wash accumulated contaminants off land surfaces and the first flush of storms is known to have higher levels of contamination. In addition, some contaminants, particularly synthetic pyrethroids, which are an increasingly common pesticide, bind to sediments where, depending on their solubility, they may be a primary cause of aquatic and/or sediment toxicity in urban streams (Holmes et al. 2008). However, the occurrence of toxicity is highly variable, shifting from site to site at different sampling times; a careful examination of the Program's data shows no consistent spatial patterns or trends over time. The relatively low level of toxicity, combined with the fact it appears sporadically, makes it difficult to control.

Table 2.2.2 (Repeated): Summary of the Program's toxicity testing in South Orange County since from 2003 - 2012, an effort that includes 2548 tests on multiple species from a range of times, locations, and conditions. *Note: Toxicity levels are generally low except for one organism in wet weather that is susceptible to pesticides.*

Test Species	Dry Weather		
	n	Toxic	Nontoxic
Americamysis bahia	391	34%	66%
Strongylocentrotus purpuratus	179	5%	95%
Ceriodaphnia dubia	569	20%	80%
Pimephales promelas	64	9%	91%
Hyalella azteca	224	11%	89%
Overall	1593	18%	82%

The Program also has the benefit of comparing data from its sites in South Orange County to a collection of sites from across southern California sampled by the regional Stormwater Monitoring Coalition (SMC). The locations of SMC sites are selected randomly each year so that they can provide a statistically valid picture of regional background conditions, which forms a valuable context for interpreting data from South Orange County.

A summary of the past five years of SMC aquatic toxicity testing data (**Table 2.2.3**, repeated below for convenience) shows puzzling patterns. Acute toxicity (i.e., mortality) occurs in only a small fraction of stream miles in both open and urban landuses. In contrast, chronic toxicity (i.e., reduced reproduction) is more prevalent in the open landuse than the urban landuse. There is chronic toxicity present in the urban landuse, but in a much smaller portion of stream miles than in undeveloped open space. These results suggest that there are sources of toxicity that are more widely spread throughout the region and may not necessarily be directly associated with urban runoff. Speculation has focused on aerial deposition of airborne contaminants or natural factors such as high conductivity or turbidity. For example, a special study conducted by the Program in the Oso Creek watershed found that high levels of dissolved solids (see **Section 2.4** on dissolved solids, above), which can be toxic to aquatic species, derived from natural geologic formations and had increased in recent decades as development patterns caused the

groundwater table to rise. However, no regionwide followup studies on the SMC's findings have to date been planned or conducted.

In addition to the generally low toxicity found in inland channels, the Program's toxicity testing in the surfzone up- and downcoast of stormwater discharge points has found virtually no toxicity in the nearshore marine environment.

Table 2.2.3: Summary of aquatic toxicity results from the past five years of Stormwater Monitoring Coalition (SMC) samples from random sites across the southern California region. *Sites were located in both open (i.e., undeveloped) and urban landuse types. The large majority of stream miles were nontoxic for acute toxicity (i.e., survival) in both landuse categories, with an equivalent amount of sporadic background toxicity in both open and urban landuses. The majority of stream miles were toxic for chronic toxicity (i.e., reproduction) in the open landuse, a strikingly different pattern than seen in the urban landuse.*

	% Stream Miles	
	Open	**Urban**
Ceriodaphnia Survival		
Toxic	2.1	2.4
Nontoxic	97.9	97.6
Ceriodaphnia Reproduction		
Toxic	63.0	37.4
Nontoxic	37.0	62.6

2.6.2 Metals not a Source of Toxicity

Toxicity is a useful indicator of ecological impacts but toxicity test results by themselves do not identify the specific pollutants or other stressors responsible for toxicity. Instead they can indicate the general category of pollutants, such as metals or organic pesticides, contributing to toxicity. The Program therefore combines three complementary lines of evidence to attempt to isolate the cause(s) of toxicity:

- Correlation between toxicity test results and chemical concentrations in the waters and sediments collected for toxicity tests
- Comparison of these chemical concentrations to regulatory standards in the California Toxics Rule (CTR) which are based on laboratory studies of test organisms' sensitivity to specific chemicals
- More detailed analyses of ambient water and sediments, called Toxicity Investigation Evaluations (TIEs), that sequentially remove classes of chemicals to determine whether toxicity drops in concert

Unfortunately, these studies have not succeeded in clearly identifying the sources of toxicity in the County's streams and channels. The sporadic nature of the toxicity signal makes it difficult to follow up on, correlations are inconsistent, and TIE methods have technical limitations that make their results less specific than desired. However, these methods have succeeded in ruling out metals as a source of toxicity and suggesting that the observed persistent toxicity patterns in the test species evaluated in urban streams and channels is due to organic compounds, likely pesticides.

Exceedances of CTR standards for metals are consistently low in both dry and wet weather (**Figure 2.6.2**) and there is no apparent trend over time. While copper and cadmium account for the large majority of these limited exceedances, neither metal is correlated with the occurrence of toxicity in streams and channels and has not been identified as a cause of freshwater toxicity in TIEs. This conclusion matches findings from the SMC's regional program (see **Table 2.2.3**), a regional

Figure 2.6.2: An overall index of the extent to which metals meet regulatory standards in channels and embayments is high (meaning few exceedances) and has remained steady since 2003, in all samples for both dry (a) and wet (b) weather. *This index accounts for the number of metals that exceed standards in each year, the percentage of individual samples that exceed standards, and the average magnitude of any such exceedances (CCME 2001). It provides a score, scaled from 0 - 100, that can readily be tracked over time.*

a)

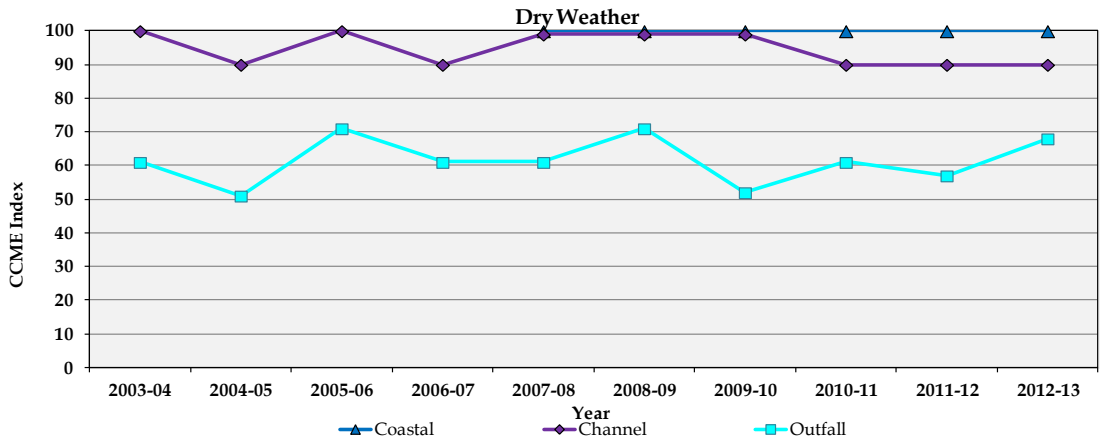

b)

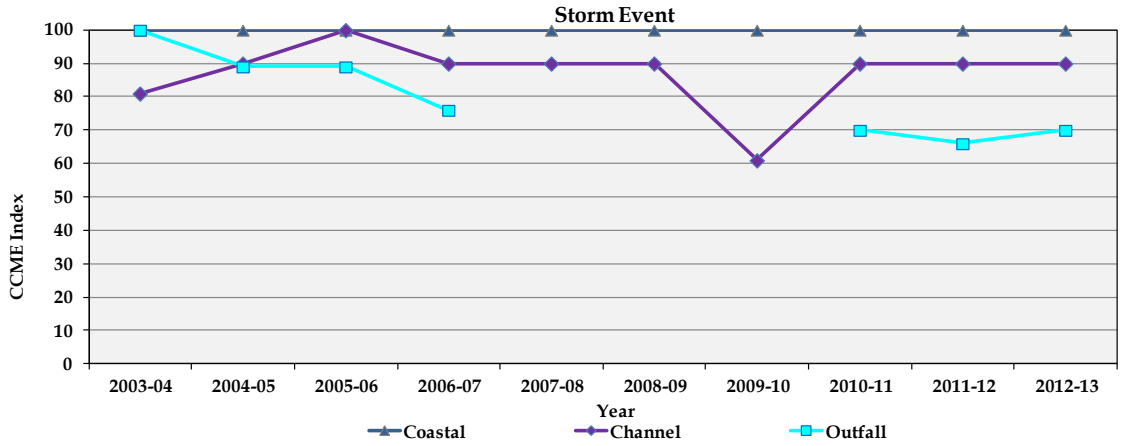

study of loadings from natural areas (**Figure 2.6.3**), as well as from watershed monitoring programs in the San Gabriel River and Los Angeles River watersheds.

While copper is a concern in harbors, the 2002 TMDL for Toxic Pollutants in San Diego Creek and Newport Bay estimated that antifouling paint on boat hulls represents nearly 90% of the loading of copper to the Bay. In addition, a Bight '08 study of discharges to Areas of Special Biological Significance (ASBS) (Schiff et al. 2011) found no significant differences between post storm metals concentration at ASBS discharge sites and at reference drainages. There was some evidence for a slight increase in copper at ASBS discharge sites but this may be due to particular coastal sources such as harbors and coastal developments with copper architectural features.

2.6.3 A Localized Source of Copper

A history of persistent exceedances of regulatory thresholds for copper in the Irvine Cove community triggered a detailed, two-year special study to identify and prioritize sources of copper for future source control efforts. This cooperative effort between the County and the City of Laguna Beach included additional sampling of stormwater runoff at multiple locations along with field reconnaissance to identify potential sources of copper. This information helped focus targeted sampling at specific potential sources to rule them in or out and characterize their contribution to copper levels in runoff. The study showed that copper was concentrated in runoff from Irvine Cove below the Pacific Coast Highway, a spatial pattern that ruled out brake pad dust as a major source. Further reconnaissance focused attention on residential architectural copper uses such as roofs, rain gutters, and flashing (**Figure 2.6.4**). Sampling during a storm event of runoff from homes with and without architectural copper features showed that the average level of copper in runoff from homes with copper features was nearly ten times higher than copper in runoff

Figure 2.6.3: Wet weather flow-weighted mean concentrations of metals at urban (shaded boxes) and undeveloped open space (clear boxes) sites, as measured in the regional study of runoff characteristics from natural drainages. *These data document that natural areas are sources of metals, although concentrations in runoff from natural drainages are somewhat lower than those at urban sites. Boxes indicate the 25th and 75th percentiles and error bars indicate the 10th and 89th percentiles. Dots represent extreme values.*

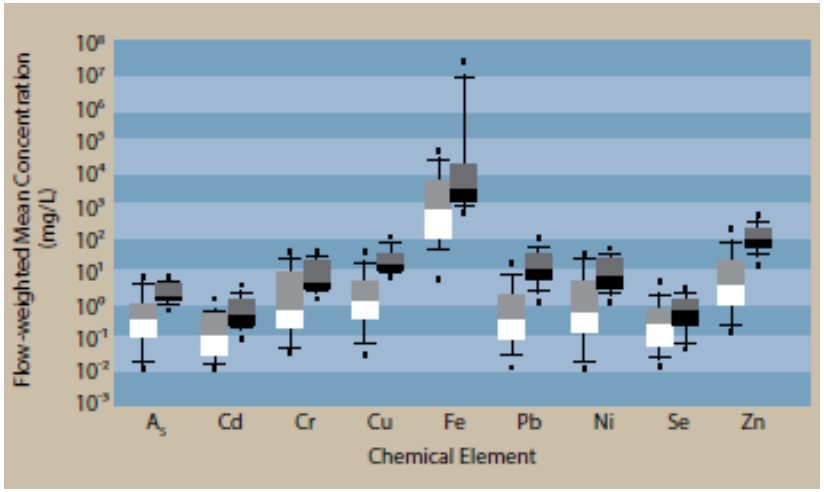

from homes without copper, and nearly six times the regulatory action level. Maximum levels of copper were more than 1000 times higher. This information is useful in ruling out other sources and highlights the difficulty of controlling all sources of contaminants from urbanized watersheds.

Figure 2.6.4: Aerial photograph of a portion of the Irvine Cove drainage area identifying various types of structural architectural copper uses.

2.6.4 Trends in Pesticide Use

While pesticides have been implicated as a cause of both aquatic and sediment toxicity, it has been extremely difficult to confirm their role largely because of technical challenges associated with TIEs. There are hundreds of pesticides in current use, neither certified laboratory methods nor toxic thresholds exist for many of these, and legacy pesticides such as DDT are still present in the environment. In addition, the population of pesticides in use changes continually over time in response to new regulatory requirements and increasing knowledge of their targets' physiology (**Figure 2.6.5**). Organochlorine pesticides (e.g., DDT, chlordane) were banned and replaced by organophosphate pesticides (e.g., diazinon and chlorpyrifos), whose use was tightly restricted and were in turn replaced by the synthetic pyrethroids (e.g., permethrin). Most recently, policies have tightened the use of pyrethroids, opening a door for increased use of fipronil. Newer pesticides are often toxic at much lower levels than older pesticides (e.g., pyrethroids exhibit toxic effects at the parts per trillion level), requiring the development of increasingly sensitive methods with lower detection limits. In addition, new pesticides often change the nature of toxicity and the types of organisms affected. This illustrates a core problem in pesticide monitoring, assessment, and management – the ever-changing cast of characters that pose a constant challenge to monitoring methods and the understanding of toxic processes.

Figure 2.6.5 shows that the use of organophosphate pesticides (chlorpyrifos and diazinon) has declined substantially since the early 1990s, even before their use in residential applications was banned in 2001 and 2004, respectively. Available data from the Program's monitoring efforts shows that, as a result, the exceedance index for organophosphate pesticides has increased (i.e., improved conditions) significantly in dry weather and to a lesser degree in wet weather (**Figure 2.6.6**). The slower rate of improvement in wet weather suggests that there may be reservoirs of these pesticides still present. Because agricultural uses must be reported and the reported use of these pesticides has declined to virtually zero (**Figure 2.6.5**), it is unlikely that still-permitted uses of these two pesticides are the source of the remaining wet weather exceedances. In contrast, the exceedance index for pyrethroid pesticides in wet weather is quite low (i.e., poor conditions), reflecting their increased use.

Figure 2.6.5: Trends in the use of the two most widely used organophosphate pesticides, diazinon and chlorpyrifos, and permethrin, the most widely used of the newer synthetic pyrethroids. *The organophosphates have virtually disappeared from the County after their residential use was banned by the USEPA, in 2001 for chlorpyrifos and 2004 for diazinon. Trends for all three pesticides are significant at the p <0.001 level.*

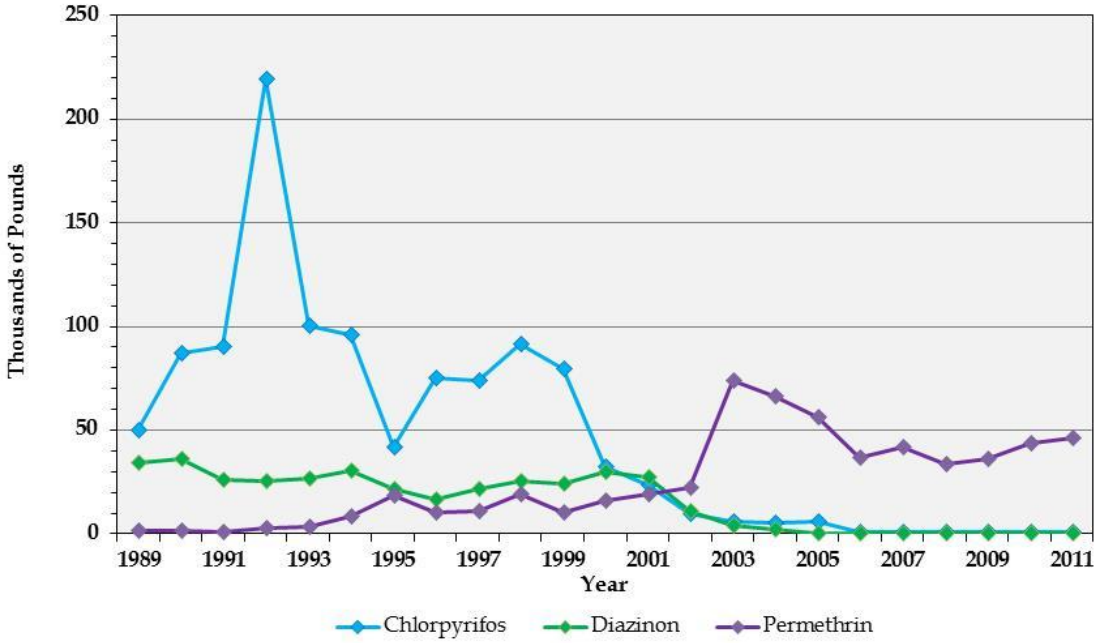

Figure 2.6.6: Trends over time in the exceedance index for a) organophosphate pesticides in dry weather and b) both organophosphate and pyrethroid pesticides in wet weather. *Higher values of the index indicate better conditions. Organophosphate pesticides reach an index value of 100 (no exceedances) in dry weather (a) and remain there, a trend significant at the p <0.001 level; pyrethroid exceedances appear in 2010 and increase quickly. While there are remaining exceedances for organophosphate pesticides in wet weather (b), the overall relationship between trends in the two types of pesticides reflects that in dry weather.*

a)

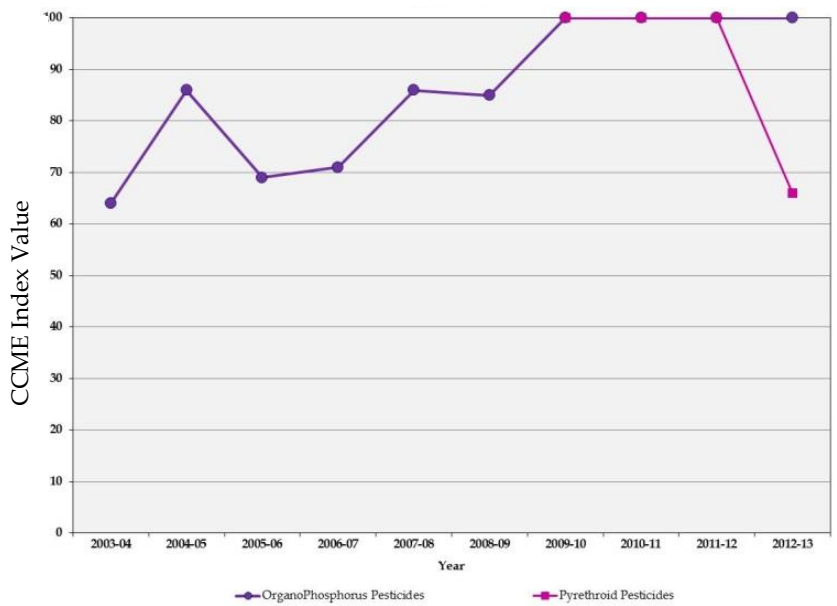

b)

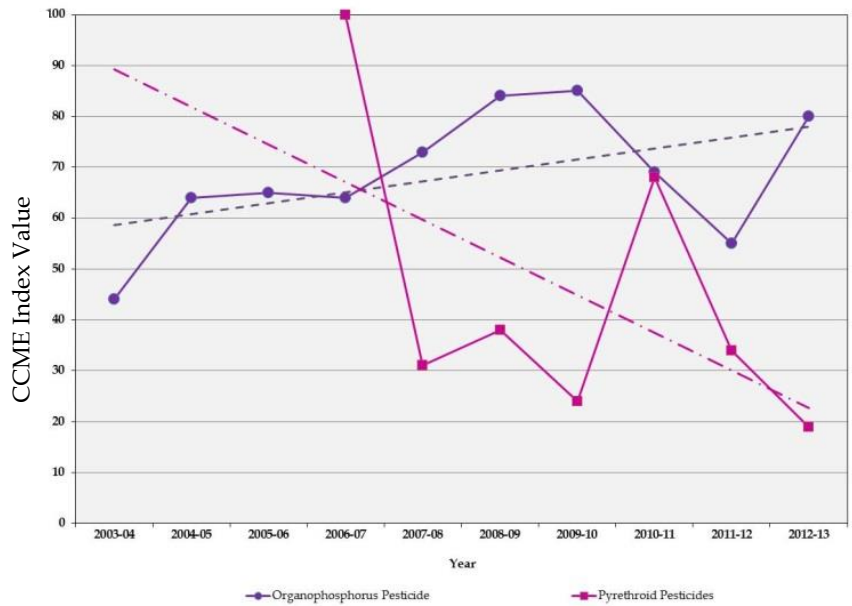

Despite the challenges of assessing pesticides' impacts in waterbodies, we do know that total reported pesticide use in Orange County has declined dramatically since 1998 (**Figure 2.6.7**). Inspection of detailed annual reports on the California Department of Pesticide Regulation's (CDPR) website shows this is due to declines in the use of glyphosate (i.e., Roundup) and a set of indoor fumigants used, for example, in termite treatment of homes and other structures. Glyphosate is an herbicide that is applied in the environment and there are some concerns about its potential water quality impacts. Indoor fumigants, in contrast, are not applied outdoors, degrade relatively quickly, and vent to the atmosphere. Because it has extended over nearly 15 years, this decline is likely due to a combination of causes, including changes in the real estate market (fumigation is required as a condition of sale), growing concern about health effects of toxic compounds, the greater use of spot applications of pesticides, and the increased availability of alternative non-pesticide treatments for indoor and structural pests.

The CDPR data show that large declines in pesticide use are possible, and provide promise that continued education and improved policy can contribute to environmental improvement. However, the chemicals that contributed most to the decline shown in **Figure 2.6.7** are not those (e.g., pyrethroids, fipronil) most often implicated in environmental toxicity. Further examination of the CDPR database would be needed to determine whether the aggregate amount of reported environmentally toxic pesticide applications has also declined in recent years. More importantly, there is a large and significant data gap related to retail purchases at hardware, gardening, and home improvement stores. Sales at these outlets are not reported to the CDPR and methods to reliably

Figure 2.6.7: Total reported pesticide use in Orange County, drawn from the California Department of Pesticide Regulation's website (www.cdpr. ca.gov). *The amount applied annually has declined by over 50% since 1998 (regression significant at p <0.001). Note: Overall pesticide use appears to be declining.*

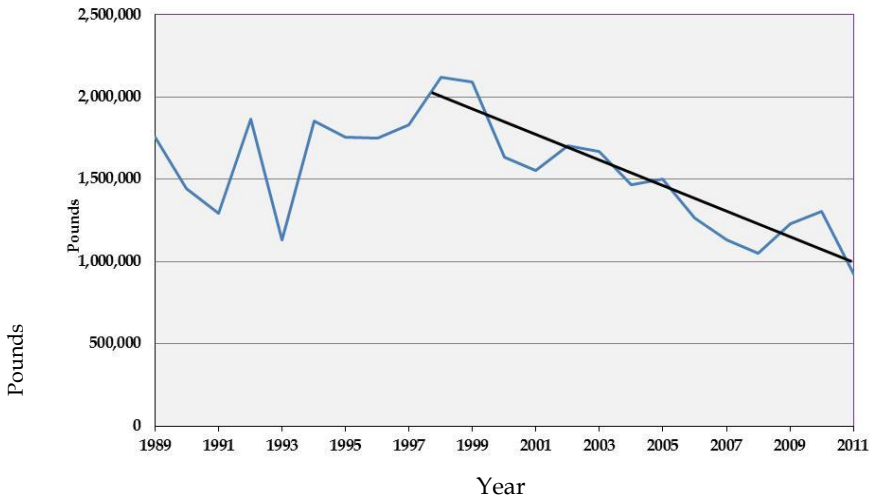

capture these data have not yet been developed.
Continued efforts to expand the scope of pesticide sales / use reporting and to improve education on proper application and the use of effective alternatives (e.g., botanical oils) could reduce the loading of pesticides to the County's water bodies. For example, CDPR has developed new regulations for pyrethroid application that should substantially reduce pyrethroids in urban runoff. Such efforts will be amplified by the continuing focus on water conservation to reduce dry weather runoff (e.g., through Low Impact Development practices) and on reducing overuse to minimize or prevent toxicity in wet weather runoff, which are the two delivery

pathways for moving pesticides from the landscape to water bodies.

2.6.5 Recommendations

Past progress in identifying and controlling sources of contamination, the availability of a long time series of monitoring data, and the development of new monitoring and assessment tools provide the basis for this review of existing toxicity monitoring programs with the goal of improving their utility and efficiency. The following recommendations stem from a data-driven, risk prioritization approach that views monitoring, assessment, research, and management actions as a portfolio of related actions.

- Reassess management concerns and priorities about metals impacts in freshwater channels, bays and estuaries, and the nearshore coastal zone.
- To the extent that metals, particularly copper, remain a concern because of potential impacts in bays and harbors, recognize that inputs from antifouling paint, which are not an urban runoff issue, are likely a more important source than watershed input.
- Improve information on the use of pesticides in the County, particularly by the largest applicators
- Work with other interested parties to fill the data gap related to retail sales of pesticides.
- Examine the CDPR database to develop a more thorough picture of trends in reported pesticide use.
- Use this information to expand and focus cooperate outreach efforts about proper pesticide application and the use of alternatives such as botanical oils that are effective, but nonlethal, insect deterrents.
- Use available data to streamline monitoring and improve its statistical and economic efficiency. Consider reducing the current focus on metals monitoring and targeting pesticide monitoring on less expensive representative constituents or surrogates. Consider reducing the frequency of sampling for sediment associated constituents to the Bight Program's sampling frequency.
- Given the overall low level of observed toxicity, consider increasing the use of adaptive responses (e.g., TIEs and other types of causal assessment) in place of intensive routine monitoring.
- Continue taking advantage of opportunities to reduce dry weather runoff to channels.
- Continue the productive relationship the University of California's South Coast Research and Extension Center and take advantage of opportunities for its Director to communicate the stormwater management perspective to CDPR.

2.7 Reconsideration of Monitoring Program Elements

The Story: Revisiting Program Designs

- The designs of two program elements deserve reconsideration because of increased knowledge, improved monitoring and assessment tools, and shifting management priorities.
- Such reconsideration and adaptation is fully in the spirit of the Regional Board's recently adopted Framework for Monitoring and Assessment.
- The Coastal Ambient Program has served its purpose and documented that coastal stormwater discharges are not causing any meaningful exceedances or impacts in the very nearshore coastal zone.
- The Bight Program's regional assessment of the effects of stormwater discharges on protected areas at larger spatial scales is a more effective approach to answering questions about the potential impacts of stormwater discharges.
- Efforts to reduce dry weather flow, in part through water conservation and reclamation efforts have produced substantial declines in the amount of dry weather stormwater discharge.
- These reductions have resulted in concomitant reductions in the loads of a range of problematic constituents and represent an effective means of controlling pollution from urban runoff.

2.7.1 Coastal Ambient Monitoring has Served Its Purpose

The potential impacts of coastal stormwater discharges on the marine ecosystem have long been a concern because of the pollutants they carry to the ocean. Impacts could occur at the point of initial discharge where they are most concentrated and/or at larger distances as discharge plumes mix into the coastal ocean.

The Program's Coastal Ambient monitoring effort samples directly in front of and at a short distance up- and downcoast of key discharge points. It is designed to determine whether stormwater pollutants are reaching the surfzone in concentrations that exceed water quality objectives and are causing measurable toxicity. However, the prioritization analysis shows that this is not the case, with only minor exceedances and virtually no toxicity detected. The length of time this monitoring has continued and its consistent results in both wet and dry years suggests these findings are robust and reliable.

While the Coastal Ambient monitoring has confirmed that nearfield effects in the immediate vicinity of coastal discharges are not occurring, questions about the possibility of farfield effects, particularly on protected areas (ASBSs and MPAs), have not yet been resolved. This requires a more substantial effort and is being addressed by a Bight Program study that integrated several types of information on a regional scale. The Bight study included three main parts:

- A pollution index of the likely intensity of stormwater pollution at specific protected areas
- A fishing pressure index of the effects of commercial and recreational fishing on key species

- A new assessment tool for measuring the condition of biological communities on rocky reefs

The pollution index was based on a plume dispersion model (**Figure 2.7.1**) (Rogowski et al. 2014) that estimated the probability that stormwater discharge plumes would overlap with specific protected areas. This was combined with a measure of pollutant loads to develop an estimated index of pollution intensity. The regional assessment will then compare the relative effects of fishing pressure (**Figure 2.7.2**) and pollution on the status of biological communities.

Figure 2.7.1: Illustration of the use of coastal discharge flow and coastal current data to produce probability exposure maps for a series of discharges and nearby protected areas in southern California. *The figure is organized by rows for (A) Newport Bay, and (B) Santa Ana River. Additionally, each column represents a different temporal model run including (a) annual, (b) the February 22, 2008 storm event, and (c) the December 15, 2008 storm event. Local ASBS are also displayed in all figures and defined in column (b). The X-axis is longitude and the Y-axis latitude. Colors represent probability of plume exposure as indicated at the bottom of the the figure. These probability exposure maps are then combined with estimates of pollutant loads for each discharge to derive a pollutant index for each protected area. From Figure 3, Rogowski et al. (2014).*

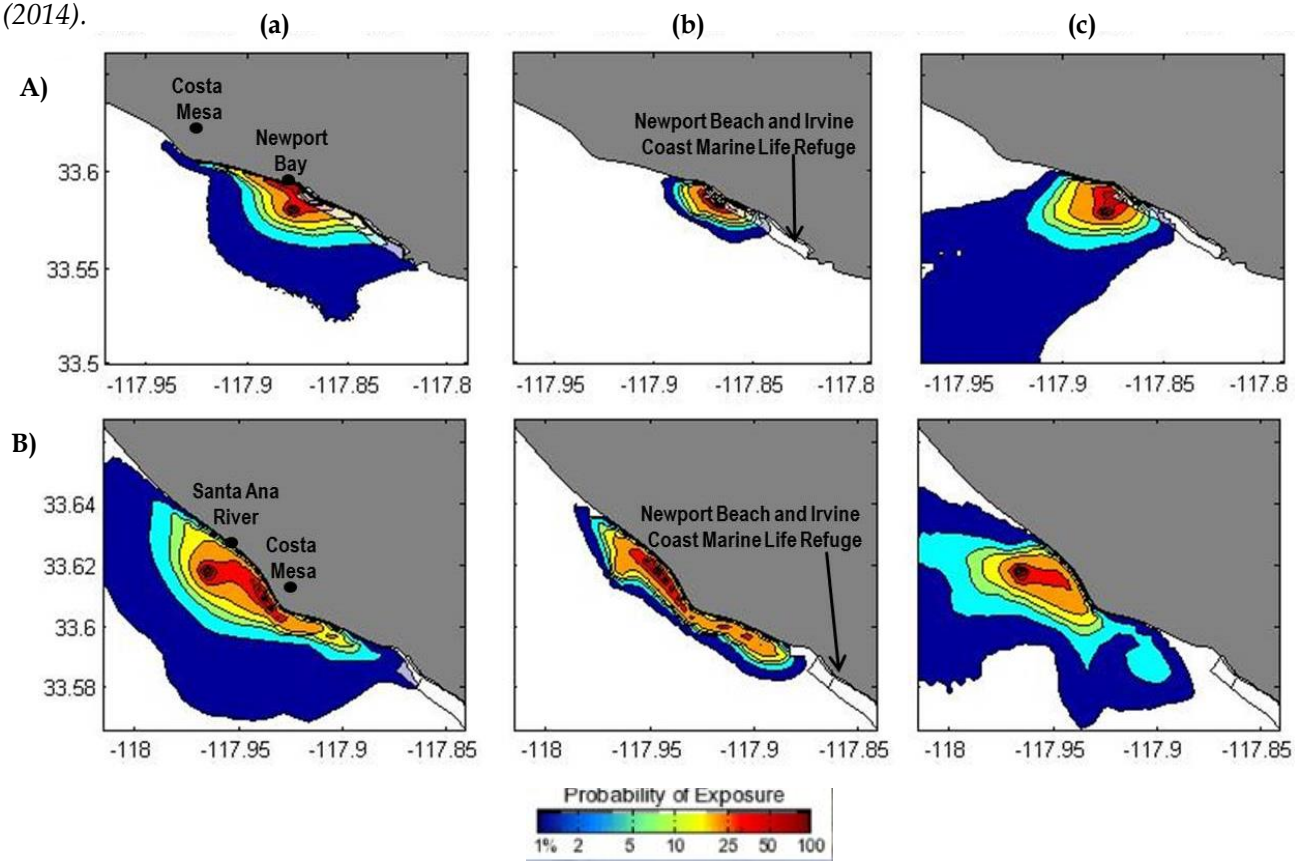

Figure 2.7.2: Schematic of the data integration and synthesis steps involved in producing an index of fishing pressure on protected areas in southern California. *From Update on Fishing Pressure Index presentation by SCCWRP, Ocean Science Trust, and Occidental College Vantuna Research Group, March 2, 2014.*

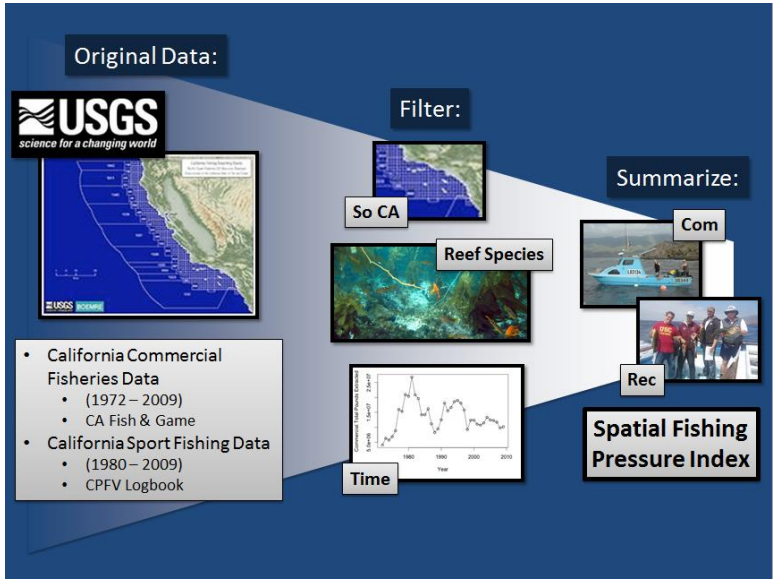

The integrated regional approach includes a more much more powerful and relevant set of questions and methods to address the potential impacts of coastal stormwater discharges on marine ecosystems. The Program's future efforts to assess the potential impacts of coastal discharges should therefore focus on contributing to this regional effort rather than continuing to monitor at extremely local scales in the vicinity of each discharge point.

2.7.2 Runoff Reduction, a Powerful All-Around Tool

Evidence from a number of the Program's monitoring efforts documents the value of water conservation and reduced urban runoff (i.e., discharge flow into streams and channels) in reducing pollutant inputs and their impacts. Water conservation and related efforts to reduce urban runoff therefore represent a potentially powerful all-around tool for addressing impacts of urban runoff. While water conservation efforts motivated by state and local policies provide the underlying impetus, pollutant control could add another important rationale for pursuing such policies as part of a larger, coordinated strategy. The effectiveness of such programs is dramatically illustrated by the declining trend of dry weather discharge flow to channels and streams from urban outfall (**Figure 2.7.3**).

Figure 2.7.3: Discharge of dry weather flow to channels and creeks from urban outfalls has declined dramatically despite an increase in regional population. *The decline spans both wet and dry years and is therefore not simply a result of drought conditions.*

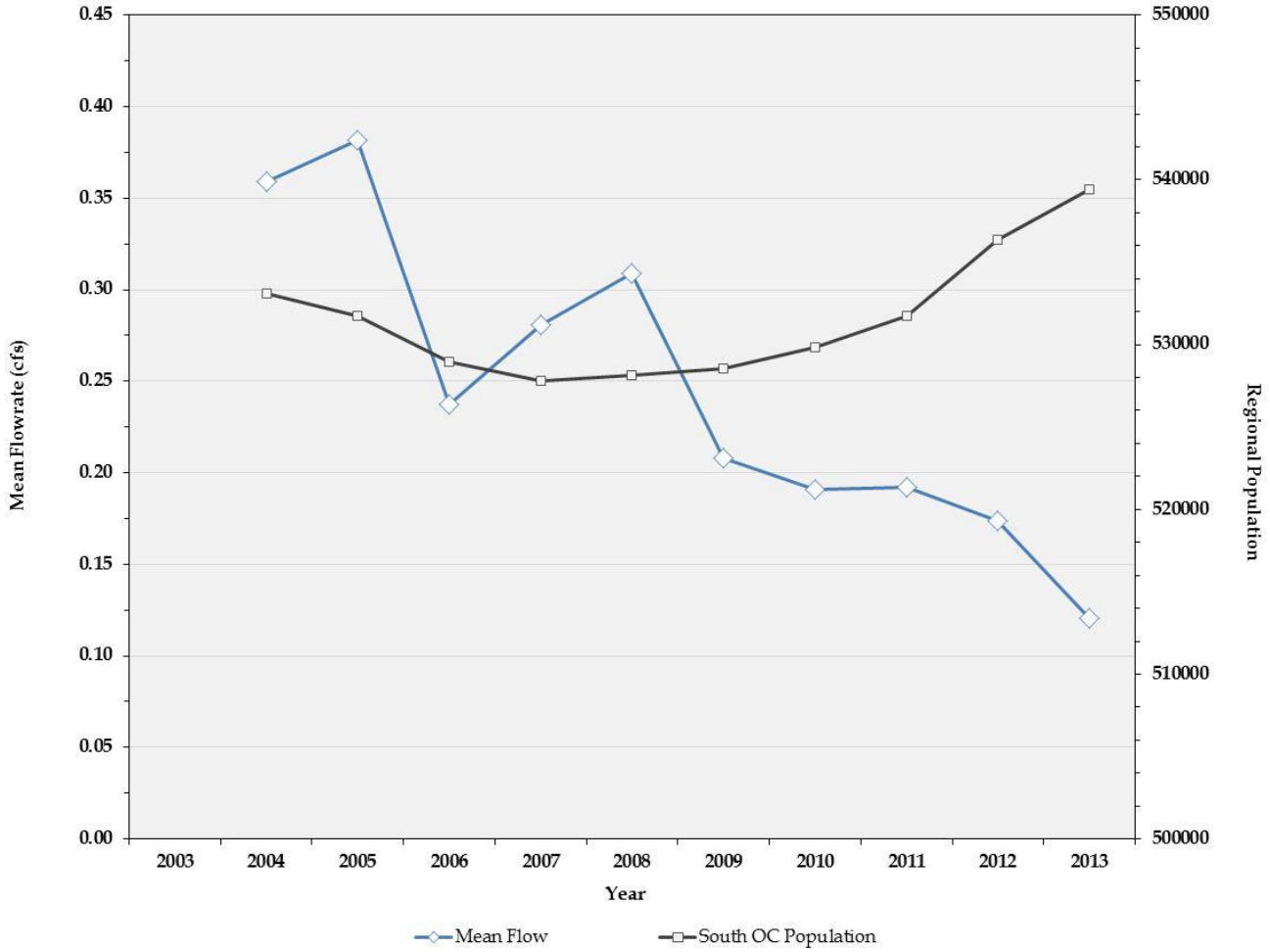

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3.0 Controlling Pollutant Sources: Jurisdictional Programs

3.1 Overview

The management of sources of pollution from diffuse urban areas involves the strategic application of Best Management Practices (BMPs) to activities and drainage systems within the urban environment. The purpose of BMPs is to protect water quality by reducing pollutant loads and concentrations and by reducing discharges (volumetric flows and flow rates) causing stream channel erosion.

The DAMP is the principal policy and program guidance document for the *Program*. At its core is a series of Model Programs that are individually implemented by the Permittees in accordance with DAMP/Local Implementation Plans (LIPs). These Model Programs are intended to enable the Permittees to:

- Improve existing municipal pollution prevention and removal BMPs to further reduce the amount of pollutants entering the storm drain system (**Model Municipal Activities and Model IPM Program**);
- Educate the public about the issues of urban stormwater and non-stormwater pollution and obtain their support in implementing pollution prevention BMPs (**Model Education and Outreach Program)**;
- Ensure that all new development and significant redevelopment incorporates appropriate Site Design, Source Control and Treatment Control BMPs to address specific water quality issues (**Model Land Development Program)**;
- Ensure that construction sites implement an effective combination of erosion and sediment controls and on-site hazardous materials and waste management (**Model Construction Program)**;
- Ensure that existing development addresses discharges from industrial facilities, selected commercial businesses, residential development and common interest areas/homeowner associations (**Model Existing Development**), and
- Detect and eliminate illegal discharges/illicit connections to the municipal storm drain system (**Model ID/IC Program)**.

3.2 Municipal Infrastructure and Integrated Pest Management

The Story: Municipal

- The Model Municipal Activities Program ensures that BMPs are implemented and maintained at over 1,700 municipal facilities.

- Municipal services, including trash and debris removal, solid waste collection, household hazardous waste disposal and street sweeping were established prior to the First Term MS4 Permits but are monitored and contribute to water quality protection.

- The Model Integrated Pest Management Program ensures municipal conformance with an Integrated Pest Management Policy developed in partnership with University of California Cooperative Extension. Implementation of the policy is resulting in reductions in municipal fertilizer and pesticide use.

3.2.1 Overview

The Permittees own and operate facilities and build and maintain much of the transportation, drainage and recreational infrastructure of the urban environment. To ensure that BMPs are incorporated into municipal areas and infrastructure maintenance programs, the Permittees have followed a systematic process of BMP evaluation of municipal areas, activities and drainage facilities since the First Term Permits. The Permittees also implement Integrated Pest Management (IPM) approaches at municipal sites to address sources of toxicity from municipal activities.

3.2.2 Municipal Activities Program Implementation and Assessment

The Model Municipal Activities Program has been implemented since 2002-03. It requires the Permittees to:

- Inventory municipal sites
- Prioritize municipal areas and maintenance activities based upon water quality threat
- Prepare BMP guidance
- Conduct inspections of municipal areas/facilities
- Implement Model Maintenance Procedures
- Conduct training
- Implement an IPM Policy
- Examine retrofit opportunities for municipal facilities

<u>Site Inventories</u>

Annually, the Permittees inspect over 1,700 municipal facilities comprising 27% high priority sites, 11% medium priority sites and 62% low priority sites.

<u>BMP Guidance</u>

The Permittees have produced BMP factsheets for the Model Municipal Program that are available at www.ocwatersheds.com. In addition to training, these BMP factsheets serve as the primary guidance for Permittee municipal maintenance procedures. The Permittees will complete a review of the municipal BMP factsheets in late 2014 or early 2015.

Training

Municipal training materials for "Municipal 101" were available for Permittee use as a "train the trainer" tool covering the minimum required BMPs discussed in the fact sheets. The focus of municipal training during the permit term was on development and implementation of jurisdictional IPM programs **(Table 3.2.1)**.

In the Fifth Term MS4 Permit, the Permittees will examine opportunities to enhance training formats with "flip the classroom" approaches that emphasize in-classroom discussion and hands-on application of concepts.

Table 3.2.1: Municipal Training

Date	Subject Matter/Title	Target Audience	Permittee Staff in Attendance
September 15, 2010	Integrated Pest Management (IPM) Training	Stormwater Program Managers	23
May 17, 2012	Implementing Integrated Pest Management Policy Within Local Jurisdictions: The Impacts of Pesticide Formulations and Exotic Pests	Municipal Training Instructors and Field Staff	52
May 15, 2013	Implementing Integrated Pest Management Policy Within Local Jurisdiction: The Who, What, Where and Why	Stormwater Program Managers and Field Staff	32

Inspection and BMP Implementation

Municipal Facilities

Inspectors implement the Model Municipal Program by ensuring implementation of the Model Maintenance Procedures. For each facility, inspectors categorize the degree of BMP implementation on site as "fully implemented," "partially implemented" or "not implemented."

Since 2008, more than 90% of facilities have consistently implemented all required BMPs. In addition, the number of facilities with no BMP implementation has decreased since 2009 from 2.4% to 0.28% of facilities **(Figure 3.2.1)**.

Figure 3.2.1: Municipal Area Inspections and BMP Implementation from 2008-09 to 2012-13

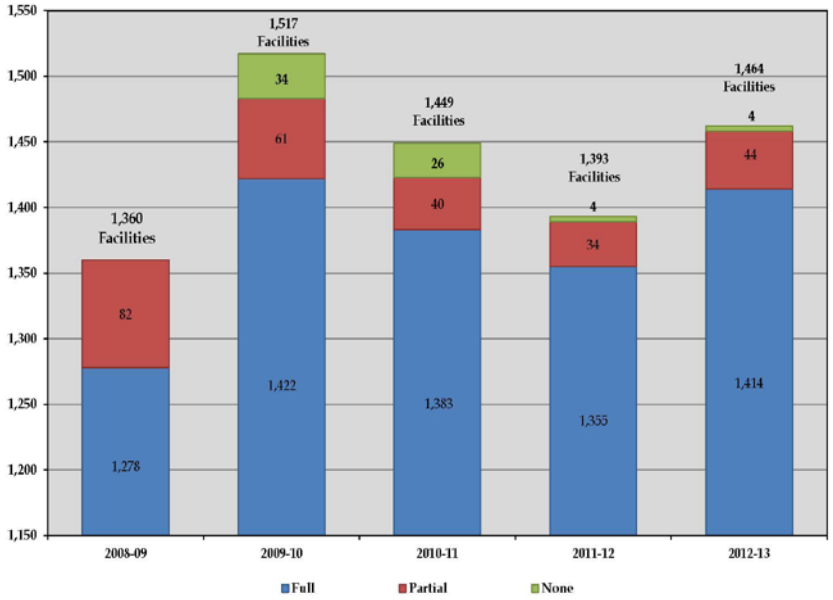

Between 2008 and 2013, a majority of Permittees reported inspecting an average of more than 90% of catch basins on an annual basis and 100% of catch basins on a bi-annual basis **(Figure 3.2.2)**. The percentage of drainage facilities requiring cleaning as a result of inspections has remained approximately 80% **(Figure 3.2.2)**.

Figure 3.2.2: Catch Basin Inspections Performed from 2008-09 to 2012-13

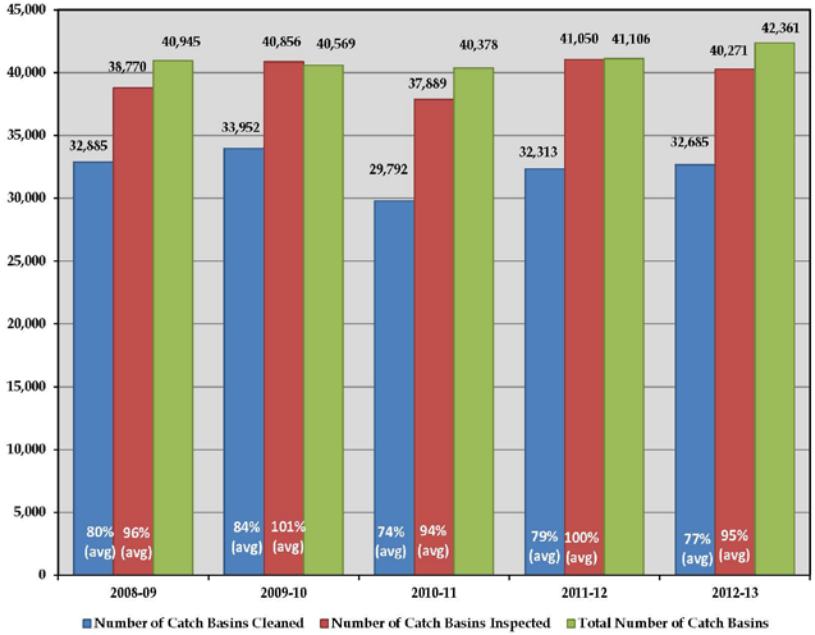

Municipal Services (Baseline BMPs)

Permittees collect data on a number of municipal activities that pre-date the adoption of MS4 permits for Orange County, but nonetheless contribute significantly to water quality protection. These "baseline BMPs" include storm drain cleaning, street sweeping, solid waste and household hazardous waste collection, used oil grant participation and trash and debris control.

Storm Drain Maintenance

The Permittees inspected and cleaned an average of 210 miles of storm drain and removed an average of 6,279 tons of material on an annual basis **(Figure 3.2.3)**.

Figure 3.2.3: Drainage Facility Maintenance and Material Removed from 2008-09 to 2012-13

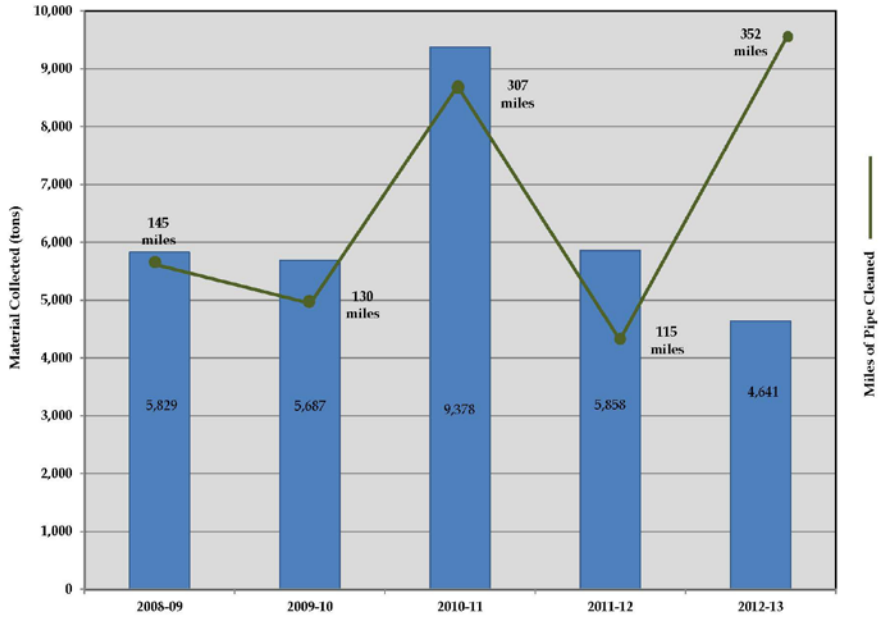

Household Hazardous Waste (HHW) Collection

OC Public Works finalized a memorandum of understanding

with OC Waste and Recycling on June 23, 2010 to ensure that household hazardous waste collection, transfer and disposal practices do not cause or contribute to water quality problems. The County, on behalf of the Permittees has collected an annual average of almost 3,600 tons of household hazardous waste since 2008 **(Figure 3.2.4).**

Figure 3.2.4: Tons of Household Hazardous Waste Collected from 2008-09 to 2012-13

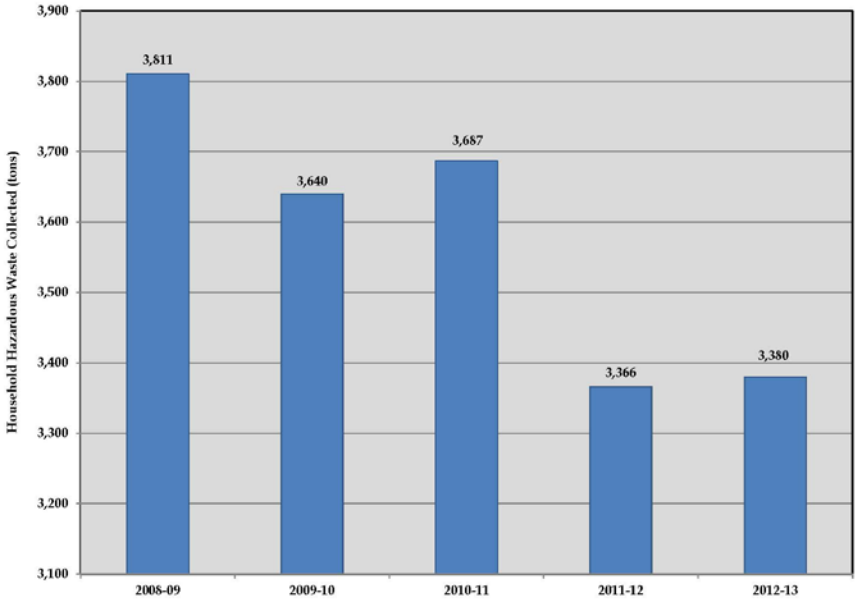

Used Oil Grant Participation

Nearly all of the Permittees and the County's Health Care Agency participated in the Used Oil Grant program during the past five years. Through these programs, hundreds of thousands of gallons of used oil and tens of thousands of used oil filters have been collected and disposed of properly, preventing these contaminants from entering the environment **(Figure 3.2.5)**.

Figure 3.2.5: Used Oil and Filters Collected from 2008-09 to 2012-13

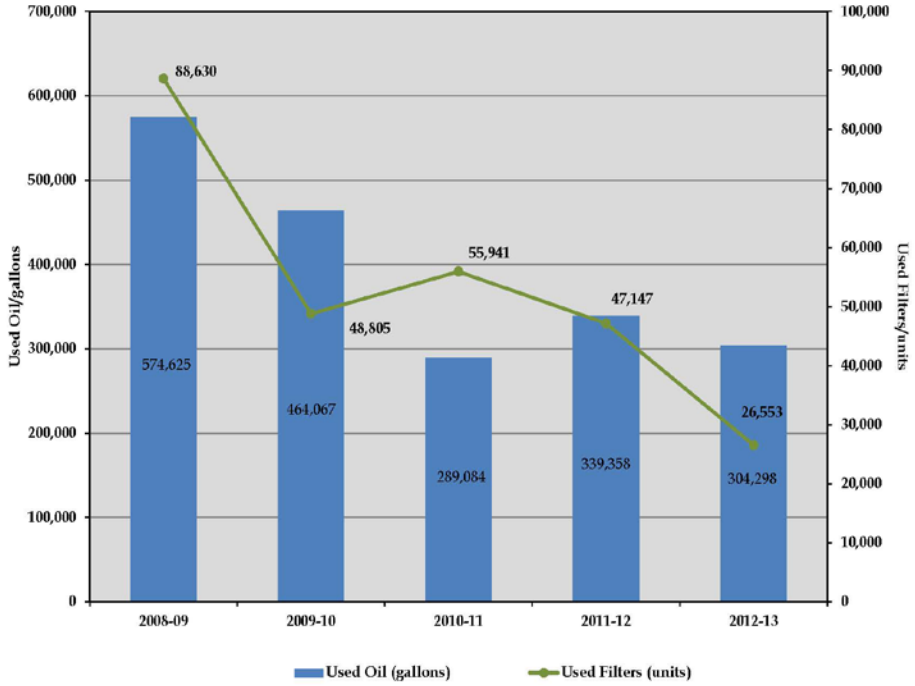

Trash & Debris Control

Trash can degrade surface water quality and negatively impact aquatic habitat. The Permittees utilize a combination of trash and debris controls to address this issue. Controls include structural BMPs such as debris booms, catch basin inserts and continuous deflection separation (CDS) units and source control BMPs such as public education and street sweeping. The Orange County Stormwater Program GIS Cloud layer includes locations of all trash and debris booms

(http://oc.giscloud.com/map/242085/orange-county-stormwater-program-san-diego-region).

The Permittees also engage the public in cleanup events throughout the year when requested and annually every September for Inner-Coastal & Watershed and Coastal Cleanup Day, resulting in the removal of thousands of pounds of trash and debris. The County also initiated a pilot Adopt A Channel program in 2012 whereby Disneyland Resort adopted a 2-mile segment of Anaheim Barber City Channel and a debris boom. Though the pilot adoption was within the Santa Ana Region, the County is in the process of expanding the program county-wide to promote community involvement in keeping trash out of local waterways and to supplement jurisdictional resources.

Additionally, ongoing efforts to characterize the flux of trash and debris through the County's urban watersheds may ultimately produce recommendations for enabling management and maintenance approaches to be more effectively prioritized. These efforts include the Newport Bay Trash Management Plan and South Orange County Trash and Litter Special Study described in Section 3.2.4 of the 2012-13 Unified Annual Report. Also, the Permittees collaborated on the Stormwater Monitoring Coalition's (SMC) Regional Bioassessment Study to incorporate trash and debris data from multiple sampling sites throughout southern California in 2012 and 2013. As a result of ongoing watershed and regional trash monitoring efforts, the Permittees would like to see the opportunity retained for jurisdictions to leverage the information arising from these studies to prioritize control efforts consistent with the MEP standard established by the statute.

Model Integrated Pest Management Program

Since pesticide-related water column toxicity is a priority issue of countywide concern, Integrated Pest Management (IPM) will continue to be a focus of the Program. A key component of an effective Integrated Pest Management (IPM) Program is an emphasis on maintaining plant health through proper fertilizer and pest management. Reducing unnecessary fertilizer and pesticide applications reduces the opportunity for these chemicals to inadvertently enter local waters through irrigation and rain events.

The Permittees formally adopted individual IPM Policies during the 2010-2011 reporting period based on an IPM Policy template developed with assistance from University of California Cooperative Extension (UCCE). The result has been the adoption of a set of basic IPM guidelines implemented by each public agency.

Fertilizer

Fertilizer usage is tracked and reported by total nitrogen, phosphorus and potassium applied per acre. Since 2010, the amount of all three nutrients applied per acre has decreased; nitrogen per acre decreased 49%, phosphorus per acre decreased 60% and potassium decreased by 55% **(Figure 3.2.6)**.

Figure 3.2.6: Fertilizer Applied per Acre 2008-09 to 2012-13

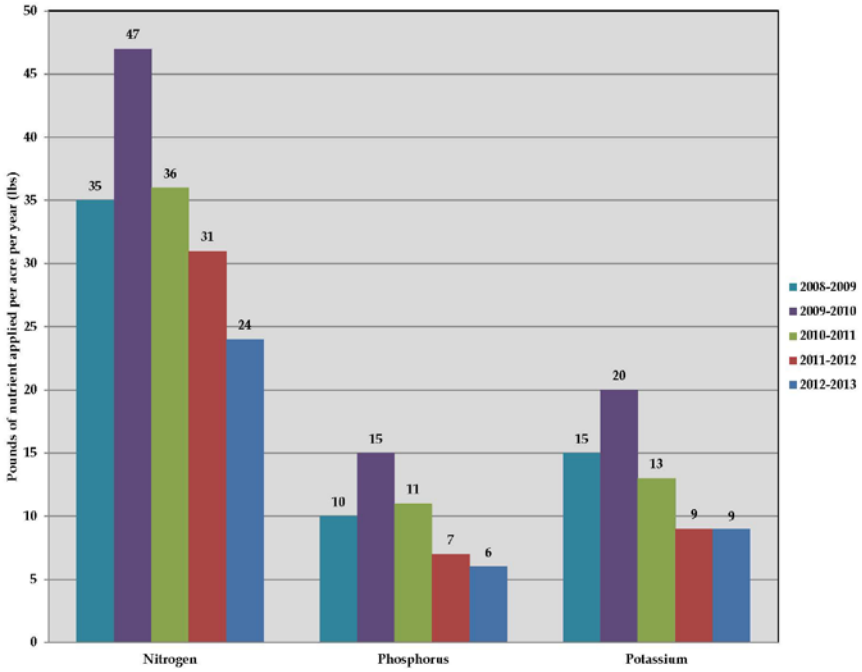

Figure 3.2.7: Active Ingredient Herbicide Applied 2008-09 to 2012-13

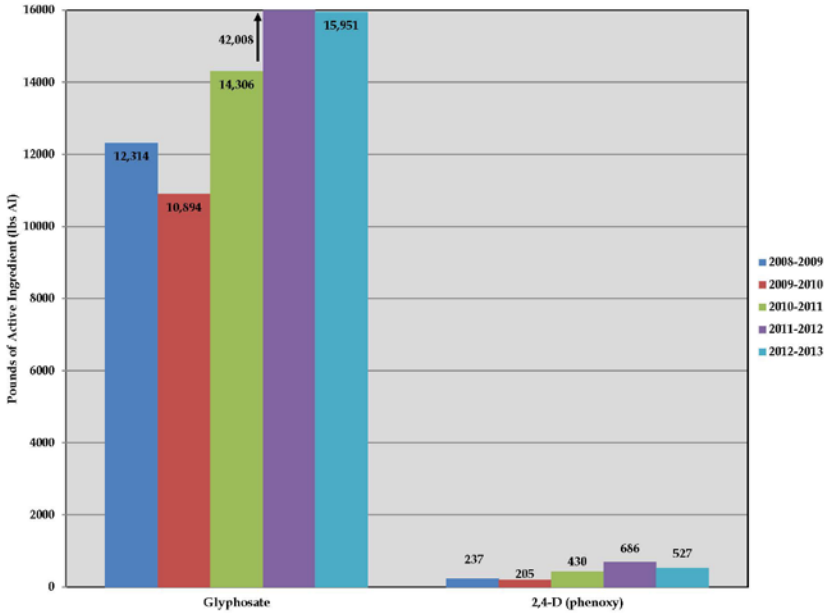

Pesticides

Permittees have utilized fewer pounds of insecticides on an annual basis since 2010, especially those recognized by research as having the greatest potential for causing aquatic toxicity. For the 2012-13 reporting year, Permittees reduced application of the herbicide glyphosate by 62% **(Figure 3.2.7)**. Additionally, Permittees reduced overall application of pyrethroid, organophosphate and phenylpyrazole pesticides by 47% collectively between 2012 and 2013 **(Figure 3.2.8)**.

Figure 3.2.8: Active Ingredient Pesticide Applied 2008-09 to 2012-13

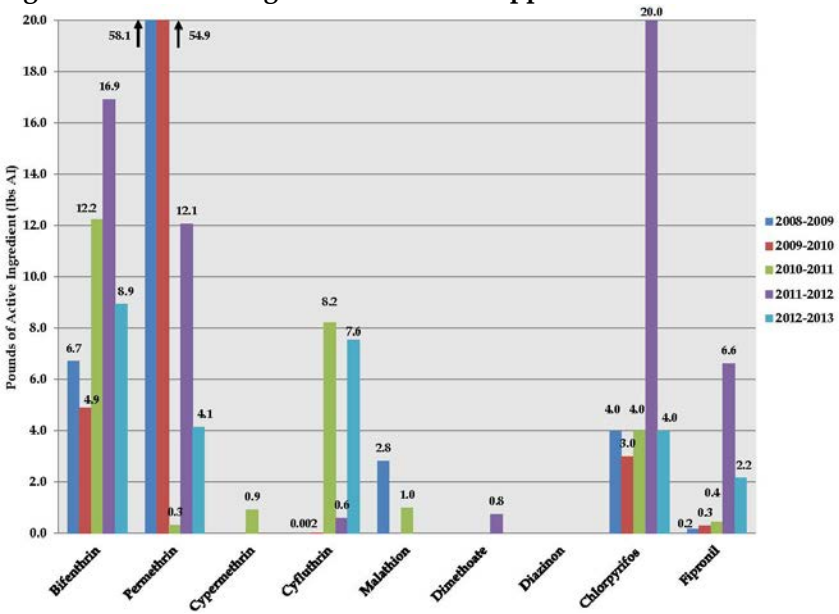

3.2.3 Municipal Retrofit Opportunities & the Practical Vision for Sustainable Water Supply

Municipal Retrofitting

Municipal stormwater retrofits and specifically regional stormwater retrofits are potentially an important tool in the municipal stormwater tool box. Municipal stormwater retrofits provide an opportunity to implement BMPs to provide treatment for existing urban areas, assist with achieving TMDL compliance, serve as offset mitigation for land development and contribute toward integrated water resource management.

Through the Orange County BMP Retrofit Opportunities Study numerous potential stormwater BMP retrofit sites were identified in various municipal right-of-ways. Water quality models have also been developed for some of the watersheds in Orange County that can help identify the water quality benefits of the proposed BMP sites. The Permittees will continue to identify public land suitable for stormwater retrofitting and projects supportive of the "*Practical Vision – A Vision for Achieving a Sustainable Local Water Supply* (SDRWQCB 2013)."

OCTA Environmental Cleanup Grant Program

The Permittees have also implemented trash and debris controls and regional retrofit projects through the Orange County Transportation Authority (OCTA) Measure M Environmental Cleanup Program. The structure of the Environmental Cleanup Program, its management and coordination with the Permittees was discussed in Section C-3.2.6.1 of the 2012-13 Unified Annual Report**. Section 6.0** of this report summarizes the two-tier grant process which provides funding for BMPs, including catchbasin screens and regional multi-jurisdictional projects.

Green Infrastructure

Green infrastructure is also an important tool in the municipal stormwater tool box. Green infrastructure incorporates LID concepts to help achieve stormwater management goals of improving water quality and reducing volume of stormwater runoff while also meeting infrastructure needs of municipalities in a sustainable manner. Opportunities exist for implementation of green infrastructure either as a part of municipal capital improvement projects (CIP) or as part of Green Street retrofit projects. Evaluation of how green

infrastructure can be incorporated into CIP or as part of green street retrofit projects will be undertaken.

3.2.4 Recommendations

Based upon consideration of the water quality priorities of the Program (bacteria, nutrients and pesticide related toxicity) and the evaluation of program implementation, the recommendations are:

1. **Enhance municipal training** to address common issues encountered through municipal related complaints and to utilize innovative education formats to encourage effective discussion-based learning. The four most common issues that occur are: trash/debris, pathogen/bacteria, hydrocarbons and exempt discharges (County of Orange PNIR data, n=205 municipal related complaints, 2008-2012). Training will focus on in-classroom engagement of concepts learned prior to the training session and focus on reducing issues and pollutants of concern through specific actions (e.g. runoff reduction to reduce bacteria loading).

2. **Develop a municipal green infrastructure program** that could include evaluation of opportunities for pilot green street projects of different land use/density configurations and development of a green street guidance manual.

3. **Examine public land retrofit opportunities** for regional BMPs and propose a program to evaluate previously identified regional retrofit opportunities in jurisdictionally owned areas for use in TMDL compliance and LID and/or hydromodification management alternative compliance. This effort will involve the development of watershed models and evaluation of the previously identified potential BMP retrofit sites. Previous reviews (e.g. 2005 RBF retrofit study) will be integrated with current mapping.

4. **Develop and initiate the implementation of individualized IPM Guidelines for each Permittee** with the goal of demonstrating significant and consistent reductions in fertilizer and pesticide applications based on the mission and goals outlined in jurisdictional IPM Policies.

5. **Conduct pilot soil and/or leaf tissue analysis to guide fertilizer use** to ensure nitrogen is not applied at annual rates above those recommended by UCCE research. The Permittees would identify the most fertilizer-intensive area by type (e.g. sports fields) and select one site for analysis. The analysis would assist Permittees in fine-tuning nitrogen application based on the needs of plants at the highest use areas.

6. **Improve methods for documenting usage of fertilizer and active ingredient of pesticide on an annual basis** to allow for more reliable data on the acreage receiving fertilizer applications. In collaboration with the UCCE, a standardized reporting method would be developed, improving reporting accuracy on both the amount of nitrogen and pesticides applied by Permittees on an annual basis. The objective would be to minimize fertilizer applications where annual rates exceed those recommended by UC research (174 -261 lbs. N/acre) while more accurately capturing the acreage to which fertilizer is applied.

7. **Expand training to include peer-reviewed online training**

courses offered by University of California IPM (UC IPM) and UCCE to ensure the IPM and water quality message reaches as many field staff as possible. Possible options include the UC IPM Urban Pesticide Runoff and Mitigation online training series developed by UC academics across the state to provide a more suitable method to reach field staff unable to attend in-person training. The online training consists of a series of courses directly addressing the impacts of pesticides on water quality as well as practices to mitigate these impacts (http://www.ipm.ucdavis.edu/training/upr-mitigation.html).

3.2.5 References

San Diego Regional Water Quality Control Board (SDRWQCB). *San Diego Regional Water Board Practical Vision: Healthy Waters, Healthy People.* 2000. http://www.swrcb.ca.gov/sandiego/water_issues/Practical_Vision/docs/PV.pdf

Implementation Schedule – Municipal Infrastructure & IPM

Proposed Municipal Program Actions	Recommendation[1]	Implementation Schedule[2]				
		2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
Municipal Facility Inventory						
Update and maintain GIS based storm drain conveyance inventory	C					
Inspection and Best Management Practice (BMP) Implementation at Municipal Facilities						
Inspect fixed facilities according to established prioritization	C					
Inspect municipal operations/activities annually	C					
Install, inspect and maintain basin inlet markings as necessary	C					
Implement and Track Baseline BMPs – Operations and Activities						
Conduct and track street sweeping activities	C					
Promote, facilitate, and track proper disposal of solid waste	C					
Promote, facilitate, and track HHW collection activities	C					
Promote, facilitate, and track proper collection and disposal of used oil	C					
Maintain debris booms as necessary	C					
Promote, facilitate, and track clean up events	C					
Municipal Training						
Conduct training for staff	C					

Proposed Municipal Program Actions	Recommendation[1]	Implementation Schedule[2]				
		2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
Develop and update BMP Fact Sheet and other training materials as necessary	C					
Develop an Integrated Pest Management Policy						
Develop and initiate the implementation of individualized IPM Guidelines for each Permittee	N			X		
Conduct pilot soil and/or leaf tissue analysis to guide fertilizer use	N			X		
Improve methods for documenting usage of fertilizer and active ingredient of pesticide on an annual basis	E	X				
Expand training to include peer-reviewed online training courses offered by UC IPM and UCCE	E		X			
Municipal Green Infrastructure Program						
Evaluation of opportunities for the development of pilot green street projects for different land use/density configurations	N	X				
Development of a green street WQMP template	N		X			
Development of green streets standard design specifications	N			X		
Implementation of one green street pilot project in the 5th term permit term.	N					X
Examine Retrofit Opportunities BMPs at Municipal Facilities						
Develop water quality models	N			X		
Integration of the previously identified potential BMP retrofit sites into the models and evaluation of use for TMDL compliance and/or LID and/or hydromodification management offset	E					X

1. C = Continue; E = Enhance; N = New
2. X = Performance Standard will be completed during this fiscal year. Gray shaded cells indicate ongoing implementation.

3.3 Public Outreach

The Story: Public Outreach

- Public awareness surveys conducted approximately every three years demonstrate increased levels of awareness regarding stormwater concerns and several positive behavior changes regarding car washing, use of landscape management products, and pet waste.

- The Program achieved over 155 million impressions through various forms of paid media, and over 5.5 million impressions at outreach events from 2008 to 2013.

- Outreach to school-age children provided water pollution prevention education to over 125,000 students and the Permittees helped support several targeted academic programs throughout the Fourth MS4 Permit term.

- The Permittees initiated a strategic behavior-specific outreach program in 2012.

- The Program enhanced partnerships with the Municipal Water District of Orange County, Chapman University and the University of California Cooperative Extension (UCCE) during the Fourth MS4 Permit term.

- Reductions in outdoor water use, retrofitting the residential environment to reduce outdoor water demand and elimination of runoff from irrigation are the foci of action-based outreach efforts initiated in 2013.

3.3.1 Overview

Ongoing education of the public about environmentally protective behaviors is essential foundational to improving water quality. The goal of the Education Program is to build engagement with residents, encourage and document the adoption of BMPs and increase the overall knowledge of Orange County residents and businesses regarding water quality protection. The Education Program was strategically re-branded from "Project Pollution Prevention" to "H_2OC" in 2012 to stress the importance to Orange County residents of water resource stewardship.

3.3.2 Public Outreach Program Accomplishments and Assessment

For the past decade, H_2OC (previously Project Pollution Prevention) has used public awareness surveys to assess awareness of and behavior change regarding stormwater issues. Survey results indicate small but significant increases in awareness around causes and prevention of stormwater pollution and increased levels of participation in BMPs. Most notably, survey results indicate several positive behavior changes among Orange County residents since 2003 including:

- Willingness to use a commercial car wash facility in lieu of home car washing (five percent increase);
- Proper use of lawn and garden fertilizers and pesticides (five percent increase); and
- Picking up waste and droppings from their pet (nine percent increase).

The Permittees will continue to conduct public awareness surveys to measure and assess awareness of Orange County

residents on water quality issues. These surveys will seek to measure water quality knowledge, current participation in stormwater safe behaviors, and willingness to participate in the same. Additional tracking of specific behavior campaigns, as discussed below, will be measured with pre-initiation and post-completion surveys to better evaluate effectiveness. Finally, the Permittees will continue to measure impressions garnered from the mass media campaigns. Collectively, these measures will help evaluate the success of the various public outreach efforts.

Media Outreach and Impressions

The Permittees have consistently improved the reach of paid advertising since the program began in 2003 and exceeded goals for achievement of impressions through media. The Permittees achieved the following from 2008 through 2013:

- 155 million total paid media impressions including traditional print (e.g. newspaper) ads, bus shelter and bus side posters, billboards, internet banner ads, radio, movie theater and television public service announcements, and gas pump banners; and
- More than 5.5 million grassroots impressions including outreach events like environmental fairs, beach and channel clean-up days, newsletters and workshops.

During the 2012-13 reporting year, the Permittees garnered a total of 40,218,892 impressions through various forms of media (**Figure 3.3.1**).

Earned Media

Earned media includes any unpaid publicity through sources like television (e.g. news reports), newspaper articles, social media (e.g. Facebook, Twitter, or blogs), or other media platform (e.g. podcasts, YouTube, etc). The inclusion of earned media into the total impression count provides a more accurate assessment of the true number of impressions earned, and helps increase public trust in the program overall. The Permittees garnered a total of 18,405,509 impressions from earned media during the 2012-13 reporting year **(Figure 3.3.1)**.

The Permittees will examine methods for increasing program presence on social media in the Fifth Term Permit to encourage residential adoption of specific BMPs associated with *action campaigns*. Development and implementation of these campaigns is described in **Section 3.3.4**.

Figure 3.3.1: Media Impressions by Region 2012-13

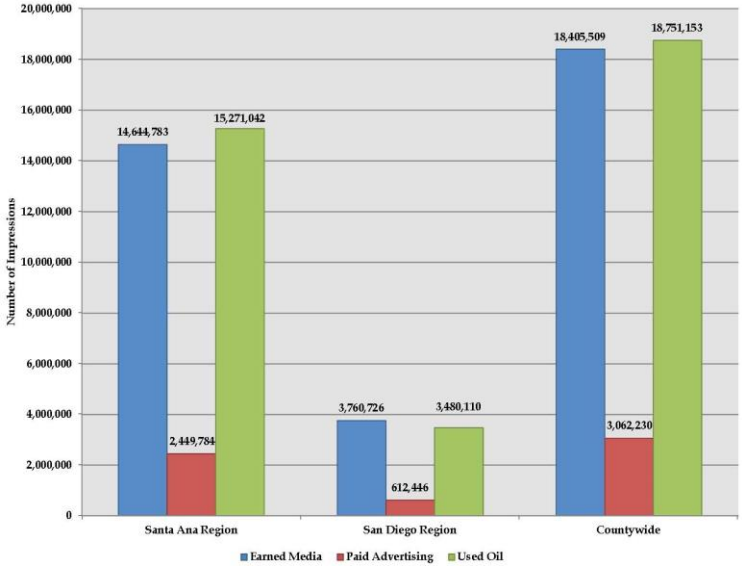

3.3.3 Youth Outreach

Children are crucial to the dissemination of water quality information as key messengers and influencers of parents' behavior. The 2012 Public Awareness Survey indicated that forty-six percent (46%) of adults with school-aged children at home received information about water pollution prevention, an increase of 20% over the 2009 Survey. Additionally, parents of students who brought home information were three times more likely to engage in 7 out of 7 identified "stormwater safe" behaviors (22% to 7%).

The Permittees have maintained and enhanced a robust school outreach program since 2008, including:

- Direct outreach to more than 125,000 students through provision of workbooks, support and assistance designing watershed education programs and funding of programming focused on addressing water quality issues;
- Achieved more than 400,000 total impressions through programs to educate teachers (i.e. Project WET) and the general public at the Discovery Science Center; and
- Development and support of targeted academic programs through partnerships with educational institutions in the community to ensure a consistent message and increase breadth of outreach (e.g. Municipal Water District of Orange County, Chapman University).

3.3.4. Behavior Specific Campaigns

There are a variety of actions an Orange County resident can take to help protect water quality, ranging from picking up after their dog to reporting illegal dumping. However, studies have shown that people can become easily overwhelmed when presented with multiple options, leading to inaction.

Through behavior-specific campaigns the Permittees will target narrow behaviors most likely to have a positive impact on water quality. Target behaviors will be selected by assessing public awareness survey data, water quality monitoring results and the needs of the Permittees.

Behavior-specific campaigns began in 2012; assessment of these efforts will serve as a robust foundation from which future campaigns are determined. Specific achievements include:

- Development of a comprehensive strategic plan in 2012 (2012 Strategic Plan) including extensive analysis of Orange County residents, ongoing biennial surveys, and independent research; and
- Prioritization of target behaviors based on public awareness surveys and water quality monitoring data.

The Permittees intend to employ best practices to implement behavior-specific campaigns using the Community Based Social Marketing (CBSM) model. CBSM steps include:

- Identifying barriers and motivators to an activity;
- Developing a strategy that utilizes tools to leverage those barriers and motivators in order to affect behavior change;
- Pilot the strategy; and
- Evaluate the strategy and refine it for broader implementation.

The Permittees will use these principles in tandem with mass media outreach efforts to continue fostering general public awareness of stormwater issues.

Targeted Outreach Campaigns

The 2012 Strategic Plan concluded that existing outreach efforts should be supplemented by targeted outreach to small, community-based groups in *action campaigns*. Evaluation of each *action campaign* includes setting baseline measures and conducting follow-up assessments using the CBSM model to create long term engagement and to track success.

Each *action campaign* focus is determined by assessing the following variables:

- *Identification of key pollutants* – the Permittees will examine and prioritize key pollutants based on level of harm they pose to the environment and prevalence in water quality data. Once identified, constituents of concern will be further prioritized by likelihood of education impacting the presence of these pollutants;
- *Determine return on investment (ROI)* – the Permittees will assess which behaviors would produce the largest ROI, predicted by assessing the number of people performing that action (i.e. prevalence) and the likelihood that those people would change that action. This step balances ease of performing a behavior and the potential environmental impact; and
- *Consideration of external opportunities and needs* – the final step considers opportunities to leverage campaign messages and tactics with existing programs and/or messaging elsewhere in the Orange County Stormwater Program or by other agencies or groups.

3.3.5 Runoff Reduction and Water Use Efficiency

Runoff reduction stresses onsite retention of runoff by utilizing BMPs to intercept, capture, and infiltrate rainwater to reduce runoff and pollutant loading. The Permittees will continue to build upon partnerships with water purveyors to marry water use efficiency and runoff reduction messaging, increasing message consistency and breadth. Since 2008, the Permittees have nurtured relationships with other agencies and community groups to accomplish the following:

- Collaborated with water utility providers on water use efficiency messaging by participating in stakeholder meetings and providing presentations on key stormwater pollution issues (e.g. Municipal Water District of Orange County).
- Utilized partnerships with the University of California Cooperative Extension (UCCE) to outreach to plant nursery owners and operators and other landscape representatives.

The Permittees will continue to foster these relationships to promote reductions in runoff and overall water use. Investment in coordination of programs and specific action campaigns will continue with campaigns such as the "Overwatering is Out" initiative launched in 2013.

3.3.6 Website Content and Usability

Public awareness surveys indicate that the number of residents seeking information about watersheds and water pollution prevention from the internet continues to increase. In order to ensure water quality data, watershed information and public education materials are available to the public in an easily accessible online format is important to the success of the program.

Building off of the San Diego Regional Water Quality Control Board *Practical Vision for Proactive Public Outreach and Communication* (SDRWQCB 2013), the Principal Permittee will review the ocwatersheds.com website to assess usability and with the goal of increasing access to mapping tools, water quality data and BMPs to prevent water pollution and urban runoff.

3.3.7 Recommendations

The Permittees intend to focus on the following:

1. **Emphasize outreach to school-age children** to continue building upon existing partnerships and increasing knowledge of the Orange County community as a whole through increasing knowledge of youth.

2. **Incorporate current strategic approach of using public awareness survey results to prioritize outreach efforts** based on behaviors of concern in tandem with water quality results to document small-scale behavior change over time.

3. **Coordinate with water supply agencies** to incorporate water use efficiency and runoff reduction messaging to maximize program reach and ensure requested behavior changes align with water use efficiency techniques supported by other agencies. Coordinate to encourage behaviors and develop programs supportive of building a sustainable local water supply as identified in the Practical Vision; including building social norms around water use efficiency and elimination of irrigation runoff.

4. **Develop focused outreach campaigns based on water quality and survey results** utilizing CBSM techniques to document changes in targeted behaviors. The Permittees will develop focused campaigns supportive of a singular message with the goal of reducing competing messaging that may lead to inaction. CBSM tactics will be utilized to target behaviors associated with water quality priorities identified by the Permittees.

5. **Encourage greater public participation in stormwater pollution prevention and elimination of non-stormwater discharges** through the use of CBSM and increased availability to online resources. *Action campaigns* would encourage residents to take an identified action and to share efforts with others.

6. **Social media calendars will synchronize outreach efforts and encourage direct participation in and sharing of program messaging.** Social media forms of earned media will complement *action campaign* elements by encouraging direct residential participation in programs. Activity on social media significantly increases with boosted posts and paid advertising; these unpaid and paid tools will support CBSM programs.

7. **Review website for usability and revise structure as needed to meet goals of increasing public use of web content.** The goal of the review will be to increase access to mapping tools, water quality data and BMPs to prevent water pollution

3.3.8 References

San Diego Regional Water Quality Control Board (SDRWQCB). *San Diego Regional Water Board Practical Vision: Healthy Waters, Healthy People*. 2000. http://www.swrcb.ca.gov/sandiego/water_issues/Practical_Vision/docs/PV.pdf

Implementation Schedule – Public Outreach

Proposed Public Outreach Actions	Recommendation[1]	Implementation Schedule[2]				
		2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
Foundational Program Elements						
Conduct public awareness surveys	C		X			X
Earned and Paid Media						
Develop and place paid media	C					
Develop social media channels	N	X				
Promote programs through social media channels	N					
Outreach to School Age Children						
Support outreach programs for school age children	C					
Website Content and Usability						
Review ocwatersheds.com website for usability	E	X	X			
Explore options for making water quality data more accessible and webpages are user-friendly	E	X	X			
Behavior Specific Campaigns						
Conduct Overwatering Is Out campaign	N					
Assess progress of Overwatering Is Out campaign	N	X	X			
Assess public awareness survey and water quality results	N		X			
Prioritize behaviors for Outreach	N		X			
Develop action campaign #2	N			X		

1. C = Continue; E = Enhance; N = New
2. X = Recommendations will be completed during this fiscal year.

Gray shaded cells indicate ongoing implementation.

3.4 New Development/Significant Redevelopment

The Story: New Development/Significant Redevelopment

- The Permittees developed a significantly revised Model Water Quality Management Plan (WQMP) and Technical Guidance Document (TGD) to implement new requirements for the implementation of Low Impact Development (LID) BMPs.

- The Permittees implemented the new Model WQMP and TGD for all priority projects in north Orange County starting on August 17, 2011, and in south Orange County starting on December 20, 2013.

- The Permittees are implementing region-specific approaches to hydromodification management.

- During the permit term (through the 2012-13 reporting period) 1,369 WQMPs for public and private projects were approved across all of Orange County for a total of 18,749 acres of development now that are now subject to Project WQMPs.

- South Orange County was mapped and a geodatabase was developed that includes conveyance systems, infiltration constraints, land use, and soil types. The County is using the geodatabase to evaluate channel susceptibility to hydromodification, and opportunities and constraints for infiltration and treatment BMP implementation at various scales.

3.4.1 Overview

Development creates rooftops, driveways, roads and parking lots which increase the timing and volume of rainfall runoff (compared to pre-development conditions) and provide a source of pollutants that are flushed or leached by rainfall runoff or dry weather runoff into surface water systems. Since the inception of the Program, it has been recognized that the incorporation of BMPs into a development project in its planning stages offers the most effective opportunity to limit increases in pollutant loads and preserve natural hydrologic processes. Consequently, the Program links new development and significant redevelopment BMP design, construction and site operation to the earliest phases of new development project planning, encompassed by the jurisdictional General Plans, environmental review and development permit approval processes.

The New Development/Significant Redevelopment Program has evolved over successive MS4 Permit terms from a narrow focus on discharge water quality to a broader consideration of the hydrologic impacts of land use change. Routine structural and non-structural BMPs implemented during the first two permit terms aimed to minimize the introduction of pollutants into the drainage system. In the third MS4 Permit term, the Permittees continued to implement routine structural and non-structural BMPs, but they also worked with project proponents to improve site design. The current Fourth Term Permits emphasize use of site design BMPs and bring the concepts of LID and hydromodification control to the forefront.

The Model WQMP describes the process that Permittees employ for developing a Project WQMP for individual new development and significant redevelopment projects, which, minimizes the effects of urbanization on site hydrology, runoff flow rates or velocities and pollutant loads. Following approval of the final project WQMP and construction of the

project, the Project WQMP will also serve to maintain the terms, conditions and requirements with the project proponent and their successors over the entire life of the project. The effects of urbanization will be minimized through implementation of practicable and enforceable project-based controls or stormwater BMPs, or through a combination of project-based and regional BMPs.

3.4.2 New Development/Significant Redevelopment Program Implementation and Assessment

Model Water Quality Management Plan (WQMP)

A new Model WQMP and TGD were developed during an eighteen month stakeholder process. Implementation of the new Model WQMP and TGD commenced on August 17, 2011, in north Orange County and on December 20, 2013, in south Orange County. This Model WQMP identifies appropriate LID practices and BMPs and alternative compliance programs for new development and significant redevelopment projects. LID BMPs must be selected based on a hierarchy of control types and sized to capture the maximum feasible portion of the design capture volume using the highest priority control type (e.g., retention). The next lower priority control type (biotreatment) can only be used for any portion of the design capture volume that cannot be feasibly captured by retention BMPs.

In accordance with the Model WQMP, new development and significant redevelopment projects meeting threshold criteria, are required to develop and implement a Project WQMP that includes LID and hydromodification control BMPs, where necessary, at the earliest conceptual planning stages of a project for early review. Depending upon the project size and characteristics, these may include:

- BMP site design measures;
- Implementing LID BMPs on-site;
- Constructing or participating in sub-regional/regional LID systems;
- Implementing hydromodification control BMPs; and
- Using alternative programs or treatment control BMPs.

In addition, the Model WQMP includes more rigorous requirements regarding assessing and abating hydromodification impacts. The effects of hydromodification can be mitigated with the use of LID strategies, site design and hydrologic source controls.

In south Orange County an interim hydromodification performance standard was applied to development and redevelopment projects starting in December 2010. This performance standard has been superseded by the requirements of the Hydromodification Management Plan (HMP).

Project WQMPs are required for private new development and significant redevelopment projects within Permittees' jurisdictions, and equivalent public agency capital projects undertaken by the Permittees that are either:

- "Priority Projects" meeting one of the criteria identified in the Permit, regardless of project size.

- "Non-Priority Projects" that do not qualify as one of the Priority Project Categories but meet one of the following:

    - Require discretionary action that will include a precise plan of development, except for those

projects exempted by the Water Quality Ordinance (as applicable), or

- Require issuance of a non-residential plumbing permit.

BMP Implementation

Since 2002, a total of 4,152 Project WQMPs have been approved, covering 40,461 acres which represents 9.3% of the area within Orange County subject to subject to the regulatory provisions of the Third and Fourth Term MS4 Permits (681.4 square miles). During the current Fourth Term MS4 permit term 1,369 WQMPs for public and private projects were approved for a total of 18,749 acres of development **(Figure 3.4.2)**.

Figure 3.4.2: Historical WQMPs and Acreage Covered

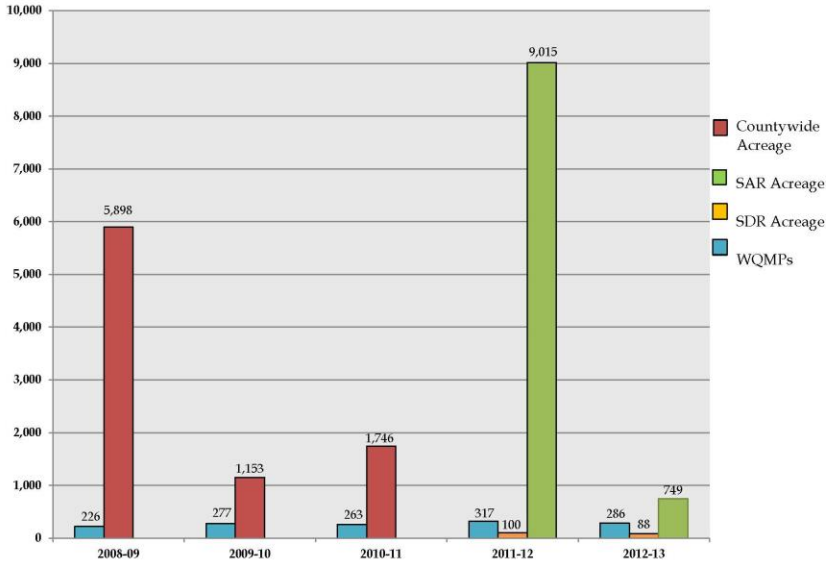

The Project WQMP for a Priority Project must include:

- Routine structural and non-structural Source Control BMPs;
- Site Design BMPs (as appropriate);
- Runoff retention BMPs, also referred to as LID BMPs – requirements may be met through either project specific (on-site) controls or, in cases of on-site infeasibility, regional or watershed management controls that provide equivalent or better treatment performance, subject to certain conditions described in the Model WQMP; and
- The mechanism(s) by which long-term operation and maintenance of all structural BMPs will be provided.

The Project WQMP for a Non-Priority Project must include:

- Routine structural and non-structural Source Control BMPs;
- Site Design BMPs (as appropriate); and
- The mechanism(s) by which long-term operation and maintenance of all structural BMPs will be provided.

Following approval of the Model WQMP in 2011, 9,764 acres of development in north Orange County have incorporated LID BMPs. Progress with implementation of the LID-based Model WQMP in south Orange County will be discussed in the FY2013-14 Annual Report.

Since each site with an approved Project WQMP may incorporate multiple BMPs, there is now in Orange County a growing inventory across the urban landscape of many thousands of BMPs. The emergence of Geographical Information System (GIS)-based software allows (1) strategically managing an inspection program to ensure the continued effectiveness of these BMPs and (2) evaluation of

the impact of constructing features in the urban landscape intended to be protective of water quality.

Training

To provide land developers, project proponents, and associated consultants and organizations with an overview of the new land development requirements, training for NPDES Program Managers, planners, plan checkers and the development community was provided in July and September 2011 for north Orange County and was repeated for south Orange County in October, 2013. The training provided an overview of the level of detail that must be included at each phase of the WQMP preparation process, site and watershed assessment methods, LID BMP selection and prioritization methods, LID BMP design standards and performance criteria, regional LID BMP options, watershed-based plans and LID alternative compliance options. All of the training modules have been posted to the OC Watersheds website (http://www.ocwatersheds.com/WQMP_FAQs.aspx) and YouTube.

General Plan Assessment and Development Standards Review

In October 2009, the Principal Permittee hosted a workshop for the Permittees to provide guidance on assessing their General Plans and development standards review to ensure the following LID principles are considered in their review, and considered for inclusion in some fashion as appropriate, in the General Plan and Local Coastal Plan (if applicable):

- Limit disturbance of natural water bodies and drainage systems; conserve natural areas; minimize soil compaction to landscaped areas; protect slopes and channels; and minimize impacts from stormwater and urban runoff on the biological integrity of natural drainage systems and water bodies;
- Minimize changes in hydrology and pollutant loading; ensure that post-development runoff rates and velocities from a site have no significant adverse impact on downstream erosion and stream habitat;
- Maximize the percentage of permeable surfaces to allow more percolation of storm water into the ground; construct streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided that public safety is not compromised;
- Preserve wetlands, riparian corridors, and buffer zones and establish reasonable limits on the clearing of vegetation from the project site;
- Encourage the use of water quality wetlands, biofiltration swales, watershed-scale retrofits, etc., where such measures are likely to be effective and technically and economically feasible;
- Provide for appropriate permanent measures to reduce storm water pollutant loads in storm water from the development site; and
- Establish development guidelines for areas particularly susceptible to erosion and sediment loss.

Enhancements in Methodologies

The County of Orange as Principal Permittee participates in a number of collaborative studies and initiatives on behalf of the Permittees that are aimed at the further development of

assessment techniques and methodologies to support more informed and consistent decision making across Southern California. Examples of current studies and initiatives affecting New Development/Significant Development include:

SMC – Phase 1 Hydromodification Study

The primary objective of this study was to find relationships between stream channel type and resistance that would allow prediction of channel response under changed conditions associated with increased impervious cover. Ultimately this effort will contribute to the establishment of stormwater management criteria to help minimize the impacts to stream channels from the conversion of undeveloped (or less developed) areas to residential, commercial, or other intensive land uses.

SMC – Low Impact Development Study

SMC developed a manual of practice for LID that provides:

- Details on how to use LID Principles and LID BMPs to reduce the impacts of land development or re-development on water resources at the project level;
- Guidance for municipalities, land use planners, land developers, consultants, design professionals who prepare stormwater engineering plans and specifications, and others in private industry and public service;
- A site planning and design reference that will facilitate the implementation of LID for projects in Southern California. It is designed to complement the Stormwater BMP Manual(s) that have been developed and are maintained by CASQA;
- A tool that can be applied at the site level for the development of integrated water and stormwater management regulatory compliance and resource protection programs; and
- The SMC LID Manual is available online at the California LID Portal (californialid.org).

SMC – Barriers to Low Impact Development Study

The purpose of this study was to dig deeper into potential barriers to LID by investigating the complex web of codes, processes and perceptions surrounding LID implementation.

<u>Hydromodification</u>

Hydrograph modification, or "hydromodification," refers to the changes in the magnitude and frequency of stream flows and its associated sediment load that can be the consequence of watershed urbanization due to increasing landscape imperviousness. In urban watersheds, hydromodification can become evident as channel erosion and sedimentation resulting in degradation of in-stream habitat. Another consequence of hydromodification can be channel realignment and modification which can similarly lead to degraded ecology.

Concern for the significance to stream ecology of the hydrologic impacts of urban runoff was the rationale for the inclusion of hydromodification control requirements in the Fourth Term Permits. These requirements also align with the Practical Vision's intention of focusing the State's regulatory

tools, in the San Diego region, on realizing the restorative goals of the Clean Water Act. The planning required of the Permittees for pollution prevention, pollution control and MS4 permit compliance, is thus evolving into a more holistic approach that integrates flood control, erosion control and water quality management.

In Orange County, BMP planning occurs on both a watershed scale and a site scale. However, the watershed in most cases is the appropriate scale for developing plans that consider both multiple stream system influences and effects and the setting of ecological objectives and restorative goals. In the absence of a holistic evaluation of the watershed, the benefit of unilaterally applying hydromodification control requirements to all development projects is not clear because it is harder to understand the relationship of a specific project to the surrounding landscape. It is also difficult to effectively evaluate the cumulative influences and effects that are involved[1].

The adverse environmental impacts that can arise from land development must, however, be understood for the lawful requirement of mitigation. Based on the takings clause of the U.S. and California constitutions and the Mitigation Fee Act, hydromodification control requirements applied to development projects must bear a reasonable relationship to the impacts of the project. Requiring hydrologic controls on projects draining to receiving waters not susceptible to hydromodification is contrary to these legal requirements. Such requirements may also be beyond the scope of a mandate intended to control the discharge of pollutants from a point source. The need for all hydromodification control requirements to be informed by a holistic and rigorous watershed analysis is considered in greater detail in **Attachment 3.4.1.**

[1] Urban Runoff Quality Management, WEF Manual of Practice No.23/ASCE Manual and Report on Engineering Practice No. 87.

Integrated Water Resource Management and Regional BMPs

The use of "Regional BMPs," in the Model WQMP is required to be a subordinate choice to on-site mitigation. This LID hierarchy is increasingly being viewed as obstructive, as California adapts to increasing uncertainty regarding the resilience of its water supply infrastructure by seeking to better retain stormwater in the landscape for local water supply augmentation. Regional BMPs are seen to be a key part of this adaptive effort (See Southern California Water Committee www.socalwater.org/).

Following two prior years of scant rainfall, calendar year 2013 closed as the driest year in recorded history for many areas of California. Early in 2014, on January 17, Gov. Edmund G. Brown Jr. declared a drought state of emergency and directed state officials to take all necessary actions in response. The policy framework for these actions is the California Water Action Plan (CWAP) (State of California, 2014).

One of the CWAP's key action items is a shift toward Integrated Water Resource Management approaches (IRWM). IWRM has long been practiced in other areas of the world and is now being championed by USEPA and California water leaders as the preferred management approach for solving the challenges of increasingly stringent water quality regulations and the water supply demands of a growing population.

The America Water Resources Association defines IWRM as:

> *The coordinated planning, development, protection, and management of water, land, and related resources in a*

manner that fosters sustainable economic activity, improves or sustains environmental quality, ensures public health and safety, and provides for the sustainability of communities and ecosystems.

IWRM is a management approach that requires collaboration among key water resources areas such as drinking water supply, wastewater treatment, flood management, and water quality protection to leverage resources and create multi-benefit projects. In the field of stormwater management, the term "multi-benefit projects" is often synonymous with the term "Regional BMPs." Such BMPs are typically conceived as constructed basins, under the management of a special distract, where basin design is optimized for local groundwater augmentation, flood control and runoff treatment and where the basin is receiving runoff from sub-watershed areas often in excess of 50 acres.

Since the use of "Regional BMPs," in the Model WQMP is required to be a subordinate choice to on-site mitigation, the CWAP's mandate for a policy shift toward IRWM in California has clear implications for future MS4 permitting. Indeed, in his observations on the future contribution of stormwater management to IRWM, the Executive Officer of the Santa Ana RWQCB observed (CASQA, 2013[2]) that while Regional BMP solutions potentially offered an opportunity to realize multiple benefits, consistent with IRWM, the "LID Hierarchy" of the Fourth Term Permits presents an impediment to constructing Regional BMPs.

These observations cause the recurring debate about the merits of centralized versus de-centralized approaches, or on-site versus regional controls, to creating a stormwater management infrastructure to be re-visited. While the Fourth Term Permits have required on-site BMPs to be constructed unless they can be determined to be infeasible, the Santa Ana Third Term Permit encouraged examination of regional approaches. The regional BMP emphasis was supported by technical guidance (see WEF/ASCE, 1998[3]) that contemplated stormwater quality being managed across the landscape in a drainage system retrofitted with basins and under the direct management of a special district. This guidance had concluded that constructing fewer regional controls would ultimately be both less expensive than a large number of on-site controls and more effective in the longer term since control outlets are larger and therefore easier to design, build, operate and maintain. Moreover, they could additionally capture the street runoff that would be missed by on-site controls and be large enough to offer opportunities for compatible uses such as recreation and ecological habitat. With the new imperative to have IWRM inform approaches to stormwater management, the permitting framework clearly needs to allow for on-site and off-site BMP "equivalency" to enable IRWM and water quality and restorative goals to be realized and optimized at the watershed level.

Mitigation for Restoration Projects

Rehabilitating highly modified streams, to improve ecological, recreational or water supply augmentation amenities, may require the use of impervious materials to the extent that Project WQMP criteria are met. Requiring mitigation for restoration projects in such instances may threaten project viability. Moreover, such projects would already be subject to regulation by the United States Army Corps of Engineers (USACOE) under CWA Section 404, by the State and Regional Boards under CWA Section 401, and by the Federal

[2] CASQA Quarterly Meeting, November, 2013

[3] Urban Runoff Quality Management, WEF Manual of Practice No.23/ASCE Manual and Report on Engineering Practice No. 87.

USFW and California DFG. Any environmental impacts of these projects will be mitigated as required by these agencies and therefore should be explicitly exempted from Project WQMP requirements.

Public Safety Projects

In specific instances, channel re-construction may need to be undertaken on an emergency basis when there is an imminent threat to public safety. Such projects may involve like-for-like replacement of hardened channels and there will be no time for the development, processing and plan check, and revisions of a Project WQMP for these projects. Emergency projects are provided exempt status in many other MS4 permits including the Santa Ana Region Permit (Order No. R8-2009-0030) and the Los Angeles County MS4 Permit (Order R4-2012-0175).

3.4.3 Recommendations:

1. **Implement an approach to hydromodification management that is informed by a watershed analysis and channel-specific protection and restoration goals.** The Permittees understand that, consistent with current published research, a "one-size-fits-all" approach for hydromodification management is not appropriate for highly modified urban stream systems. Pending a comprehensive watershed analysis, land development projects discharging runoff to engineered channels, should not be required to implement hydromodification management controls.

2. **Incorporate an IRWM element into the land planning/land development process.** The Permittees understand that an IRWM approach is needed to optimize attainment of water quality protection, water conservation, flood control, and stream protection goals. The Permittees therefore intend to incorporate an IRWM element into their land planning and land development processes so that as development projects begin entitlement this approach and opportunities to achieve this approach are evaluated. This recommendation will require a modified LID Hierarchy that establishes the equivalency of "On-site BMP" and "Off-Site /Regional BMP" solutions.

3. **Create an exemption from Project WQMP requirements for steam and watershed restoration projects**.

4. **Create an exemption for emergency public safety projects where delay would compromise public safety, public health and/or the environment**.

5. **Develop an internet based regional geodatabase.** To effectively implement an IRWM and watershed management approach, access to information that describes all of the key hydrologic process and landscape characteristics will be critical. The Permittees are developing and starting to use an internet-based regional geodatabase to give developers and municipal staff access to the geotechnical and hydrologic information necessary for evaluating the application of the LID hierarchy to sites.

6. **Pilot the use of technology to better track Project WQMP inspections and follow up actions needed.** To fully utilize the WQMP Submittal Tool and Database WQMP inspections could be performed with tablets or other devices where GIS information and other

information can immediately be uploaded to the database. The Permittees propose piloting the use of tablets or other devices linked to the Database for Project WQMP inspections by a select number of cities.

7. **Enhance the data collected for WQMPs to have a better understanding of water quality benefits on an annual basis.** The Permittees desire to perform a better assessment of the New Development/Significant Redevelopment Program. In order to better understand the effectiveness of the program, the Permittees propose to collect new critical data elements, and enhance data quality by integrating information into the WQMP Submittal Tool and Database. New data would include volumes of water treated, land area treated, and other relevant information needed to evaluate TMDL compliance, to identify developed/redeveloped areas that meet LID and/or hydromodification requirements, and to track BMP maintenance as a measure of effectiveness.

Implementation Schedule – Land Development

Proposed New Development/Significant Redevelopment Program Actions	Recommendation[1]	Implementation Schedule[2]				
		2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
New Development/Significant Redevelopment Program						
Development of Program Guidance	C					
Develop an internet-based regional geodatabase.	E		X			
Water Quality Management Plans (WQMPs)						
Integrate the use of emerging information technologies to better track WQMP inspections and follow up actions needed.	E			X		
Enhance the data collected for WQMPs to have a better understanding of water quality benefits on an annual basis.	E			X		
BMP Implementation						
Implement Model WQMP	C					
Training						
Deliver Model WQMP & TGD Training Modules	C					
"Help Desk"						
Provide "Help Desk" service	C					
General Plan Assessment and Development Standards Review						
Incorporate an integrated water resources approach element into the land planning/land development process.	M			X		

Proposed New Development/Significant Redevelopment Program Actions	Recommendation[1]	Implementation Schedule[2]				
		2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
Enhancements in Assessment Methodologies and Their Role in New Development/Significant Redevelopment						
Development of technical guidance	C					

1. C = Continuation; E = Enhancement; M=Modification (Requires adjustment to Policy/Permitting)
2. X = Recommendation will be completed during this fiscal year. Gray shaded cells indicate ongoing implementation

3.5 Construction

The Story: Construction

- The Construction Program maintained an inventory of up to 12,060 construction sites, prioritized these sites regarding their threat to water quality, and inspected them at the frequency specified by the permit. Non-compliant sites were educated and required to implement BMPs as required.

- BMP Guidance was updated to address the renewed Statewide General Construction Storm Water Permit, and Permittee construction inspection staff were trained accordingly.

- Three Qualified SWPPP Developer (QSD)/Qualified SWPPP Practitioner (QSP) training sessions were offered during the Permit term. Approximately 150 people attended this training.

3.5.1 Overview

The Permittees regulate construction activities and have responsibility for the construction and reconstruction of municipal facilities and infrastructure within their jurisdictions. Construction sites and activities are a significant potential source of sediment and other pollutants and have been a priority for the Program since the First Term MS4 Permits.

The Program requires effective BMP implementation by construction site owners, developers, contractors, and other responsible parties. All construction projects, regardless of size, must implement an effective combination of erosion and sediment controls and waste and materials management BMPs. To ensure that effective BMPs are implemented, each jurisdiction conducts inspections to verify the appropriateness and implementation of BMPs and takes enforcement action as necessary. Training is provided annually to support consistent countywide implementation.

3.5.2 Construction Program Implementation and Assessment

The Model Construction Program has been implemented since 2002-03. It requires the Permittees to:

- Inventory construction sites;
- Prioritize construction sites based upon water quality threat;
- Prepare BMP guidance;
- Conduct inspections of construction sites;
- Undertake enforcement; and
- Conduct training.

<u>Site Inventories</u>

Between 2008 and 2013, the Permittees reported annual construction site inventories ranging from 7,123 (2012-13) to 12,059 (2008-2009). Order R9-2009-002 does not designate construction sites as high, medium or low priority; rather, prioritization is based on site size and proximity to sediment-impaired receiving waters. However, for the ease of differentiation and reporting, sites will be categorized as

"high" "medium" and "low" priority based on the following factors:

HIGH: Any site 30 acres or larger; any site 1 acre or larger and tributary to a CWA section 303(d) water body segment impaired for sediment or within or directly adjacent to, or discharging directly to, the ocean or a receiving water within an ESA; or other sites determined by the Copermittees or the Regional Board as a significant threat to water quality.

MEDIUM: Construction sites with one acre or more of soil disturbance not meeting the criteria specified for 'high' priority sites.

LOW: Construction sites that are less than one acre in size.

The numbers of construction sites and relative proportions of low, medium, and high priority sites for the past five years are shown in **Figure 3.5.1**.

Figure 3.5.1: Construction Site Inspections & Prioritizations, 2008-09 to 2012-13

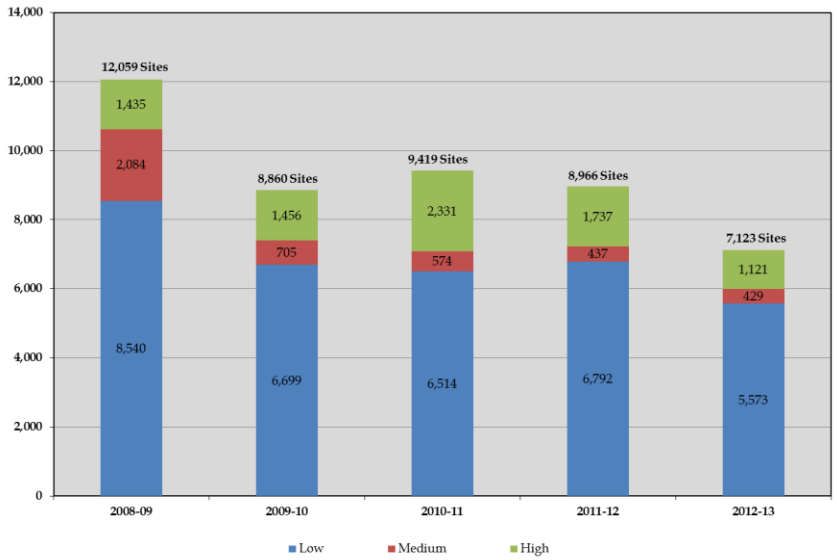

BMP Guidance

The Permittees have produced a *Construction Runoff Guidance Manual* and it is available at http://ocwatersheds.com/documents/bmp/constructionactivities. The manual was updated in late 2012 to ensure consistency with the renewed Construction General Permit (Order 2009-0009-DWQ) (CGP), to incorporate findings from an Erosion Control BMP Field Evaluation, and to provide guidance on dewatering activities and BMPs appropriate for small construction sites. The manual is the basis for the pre-wet season construction training held each September. CASQA updated their California Stormwater BMP Handbook for Construction in November 2009 as on online portal and the updated BMP Factsheets provide additional, up-to-date guidance for the Permittees.

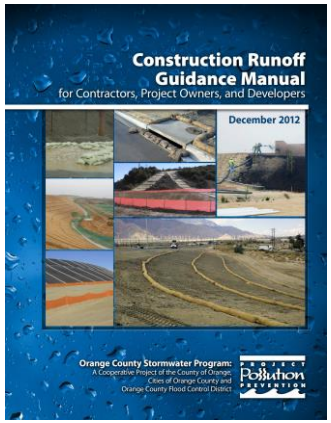

Inspection and Enforcement

Inspectors implement their jurisdictional program, which is based on the Model Construction Program, by enforcing compliance with grading or building permits, sediment and erosion control plans, and the Water Quality Ordinance(s). Enforcement actions taken by inspectors include, but are not limited to, education, verbal warnings and administrative actions under the Water Quality Ordinance (notice of violation, administrative compliance order, etc.), and written actions under Building/Grading Ordinances (corrective action notice, stop work order, etc.).

As a result of the inspections, between 2008-2013 the Permittees reported issuing 2,297 educational letters, 1,454 notices of non-compliance, 186 administrative compliance orders, 19 cease and desist orders, and 9 misdemeanor/infractions for a total of 3,965 enforcement actions (**Figure 3.5.2**).

Figure 3.5.2: Enforcement Actions Taken, 2008-09 to 2012-13

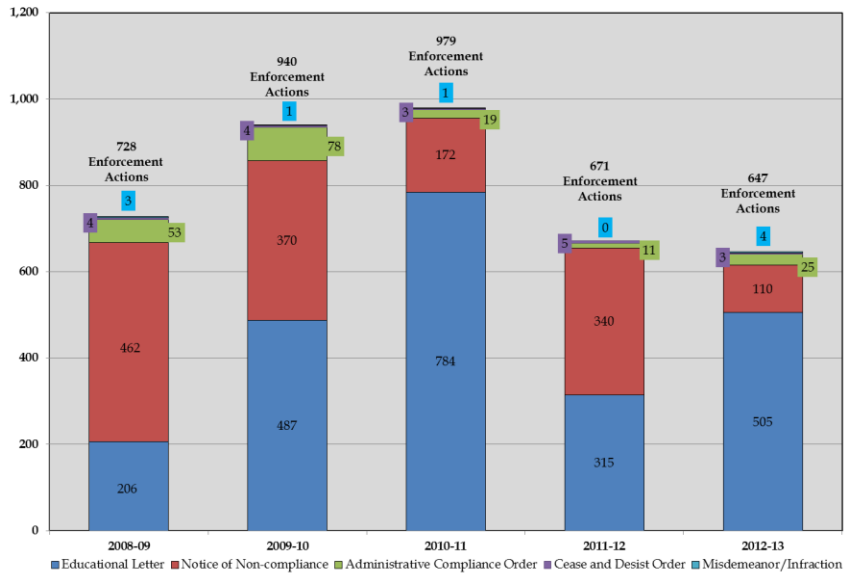

Figure 3.5.3: Construction Sites Out of Compliance, 2008-09 to 2012-13

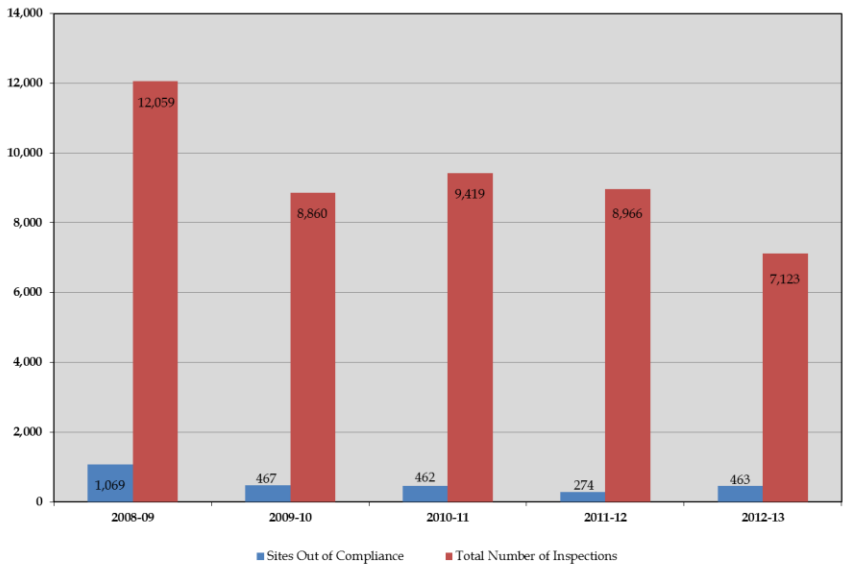

The number and type of enforcement activities vary greatly from year to year; however, the percentage of construction sites out of compliance is consistently under 10% **(Figure 3.5.3)**. This is a consistently high (i.e. >90%) level of compliance from year to year within the regulated community, which may be attributable to the long term impact of inspection programs, new guidance published by CASQA, and the implementation of the new Construction General Permit requirements, including new requirements for a *Qualified Stormwater Pollution Prevention Plan (SWPPP) Developer* to prepare a construction site's SWPPP, and a *Qualified SWPPP Practitioner* to ensure that the SWPPP is being correctly implemented.

The Fourth Term MS4 Permit requires significant inspection resources for both high priority and medium priority construction sites. Based on **Figure 3.5.2** and **Figure 3.5.3**, enforcement actions per capita and the proportion of construction sites out of compliance have decreased over the permit term. Therefore, it is appropriate to consider revising the inspection requirements and inspection frequency for the Fifth-Term MS4 Permit.

<u>Training</u>

Pre-wet season construction inspection training has been provided to inspectors each September during the permit term. A new module for Construction Inspectors, with a focus on interactive exercises for trainees, was developed and provided in September 2012. Qualified SWPPP Developer (QSD) and Qualified SWPPP Practitioner (QSP) training was provided three times in the permit term to NPDES Program staff and construction inspectors. The first QSD/QSP Training was provided on June 9, 13, and 14, 2011. The second QSD/QSP Training was provided on May 24, 29 and June 5, 2012. The third QSD/QSP Training was provided on April 2, 9 and 16, 2014. Approximately 50 staff attended each round of training.

3.5.3 Recommendations

The recommendations are:

1. **Reduce the frequency of inspection for "high" priority sites** from bi-weekly to twice during the wet season and reduce the frequency of inspection for "medium" priority sites from monthly to once during the wet season.

2. **Pilot a GIS and internet-based database to track construction sites**. In order to provide easier tracking of construction sites on a countywide basis, the Permittees will develop a GIS and internet-based database where information regarding each construction site can be entered. The Permittees would examine the benefits of such a database by piloting implementation with a select number of cities.

3. **Conduct pilot field-testing of personal electronic devices to document inspections onsite**. Use of tablets or other electronic devices during inspections will allow inspectors to immediately upload construction site information to the GIS based database. The Permittees would pilot the use of these technologies with a select number of cities.

4. **Conduct QSD/QSP Training.** The QSD/QSP Training developed by the State Board and CASQA provides a detailed understanding of the Construction General Permit. The Permittees propose providing this training to municipal staff every other year to ensure that inspectors and other municipal staff understand the CGP requirements that are to be implemented for construction projects in their jurisdiction. It is anticipated that with potential changes to the CGP being adopted in 2014 that municipal staff should be aware of these changes and any new or modified requirements for CGP compliance.

Implementation Schedule – Construction

Proposed Model Construction Program Actions	Recommendation[1]	Implementation Schedule[2]				
		2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
Inventory Construction Sites						
Maintain inventory of construction sites	C					
Pilot GIS based database system to maintain inventory of construction sites	E		X			
Prioritize Construction Sites based upon Water Quality Threat						
Prioritize as high, medium, low threat to water quality	C					
Prepare BMP Guidance						
Implement BMPs identified in the OC Construction Runoff Guidance Manual	C					
Conduct Inspections of Construction Sites						
Inspectors to pilot use of tablets or other device during inspections to upload information to the GIS based database	N			X		
Perform inspections for high priority sites twice during the wet season	N					
Perform inspections for medium priority sites once during the wet season	N					
Perform inspections for low priority sites once during the wet season	C					
Enforcement						
Enforcing compliance with grading or building permits, sediment and erosion control plans, and the Water Quality Ordinance	C					

Proposed Model Construction Program Actions	Recommendation[1]	Implementation Schedule[2]				
		2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
Training						
Conduct Training of construction inspectors annually prior to the wet season	C					
Conduct QSD/QSP Training	C	X		X		X

1. C = Continue; E = Enhance; N = New
2. X = Performance Standard will be completed during this fiscal year. Gray shaded cells indicate ongoing implementation

3.6 Existing Development

The Story: Industrial/Commercial

- The Industrial/Commercial Program inventoried 14,000 sites and conducted inspections of these sites at frequencies specified by the permit.
- The Program trained Authorized Inspectors and provided education and enforcement to address facilities lacking effective BMPs.
- A new Mobile Business Pilot Model Program was developed and implemented.
- Residential sources of pollutants were addressed through the Model Residential Program, which included development of new outreach materials and continued outreach to Common Interest Areas and Homeowner's Associations.

3.6.1 Overview

Stormwater discharges from commercial and industrial facilities can become contaminated when material management practices allow exposure of pollutant sources to stormwater and/or there is commingling of runoff with wastes. The Existing Development Model Program provides a programmatic framework to guide Permittees in the regulatory oversight of activities in commercial and industrial areas. Through inspections, outreach and requiring compliance with water quality ordinances, the Permittees are able to effect protection of the quality of urban and stormwater runoff from industrial and commercial facilities.

The Model Program also provides a framework, emphasizing education and outreach approaches, for addressing activities in residential and common interest areas that can threaten water quality.

3.6.2 Model Industrial/Commercial Program Implementation and Assessment

The Model Industrial/Commercial Program requires the Permittees to address the following:

- Identify and inventory commercial and industrial facilities;
- Establish model maintenance procedures;
- Develop and implement a program to address mobile businesses;
- Conduct inspections of food service establishments (FSEs);
- Conduct inspections and undertake enforcement
- Conduct training; and
- Conduct education and outreach.

<u>Facility Inventory and Inspection</u>

The Permittees maintain a database of industrial and commercial facilities that have a potential impact to water quality. This database documents all information related to the facility such as outreach, inspection, and any follow up actions required. Industrial and commercial facilities have been identified and inventoried per permit requirements for over ten years.

Following clarification of reporting practices in 2008, the total number of industrial facilities has remained relatively stable.

The significant drop in number of commercial facilities on the inventory between FY 2009-10 and FY 2010-11 is attributable to the removal of the food service establishments (FSEs) from the commercial inventory that year. The gradual decline in the number of both industrial and commercial facilities over the permit term is likely due to the economic downturn.

The Fourth-Term MS4 Permit specifies that a minimum of 20% of the total combined industrial and commercial facility inventories be inspected each year. Since permit adoption in 2009, the annual inspection average for the total combined industrial and commercial inventory has been between 40-46%. **Figure 3.6.1** and **Figure 3.6.2** show the total annual inventory and inspections of industrial and commercial facilities, respectively. This data excludes inspections at Food Service Establishments (FSEs), as these are inspected by the HCA and are tracked separately.

On April 1, 2014, the State Water Resources Control Board adopted a new Industrial General Permit which expands the list of facilities that are required to obtain coverage. The Orange County Stormwater Program will evaluate how this expansion and other changes to the statewide industrial program will impact the Permittees' Existing Development Model Program.

Figure 3.6.1: Industrial Facility Inventory and Inspections from 2008-09 to 2012-13
*

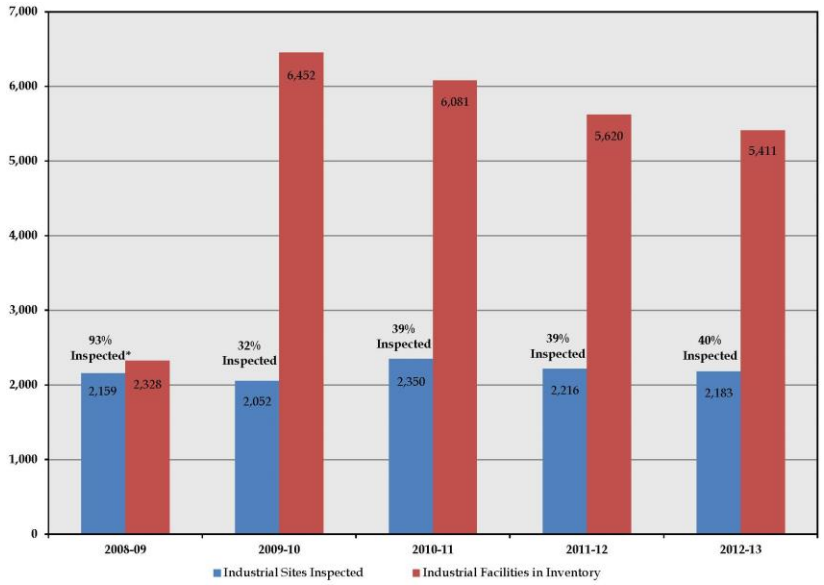

* Low number of industrial facilities in 2008-09 was due to a reporting issue that was subsequently clarified in 2009-10.

Figure 3.6.2: Commercial Facility Inventory and Inspections from 2008-09 to 2012-13

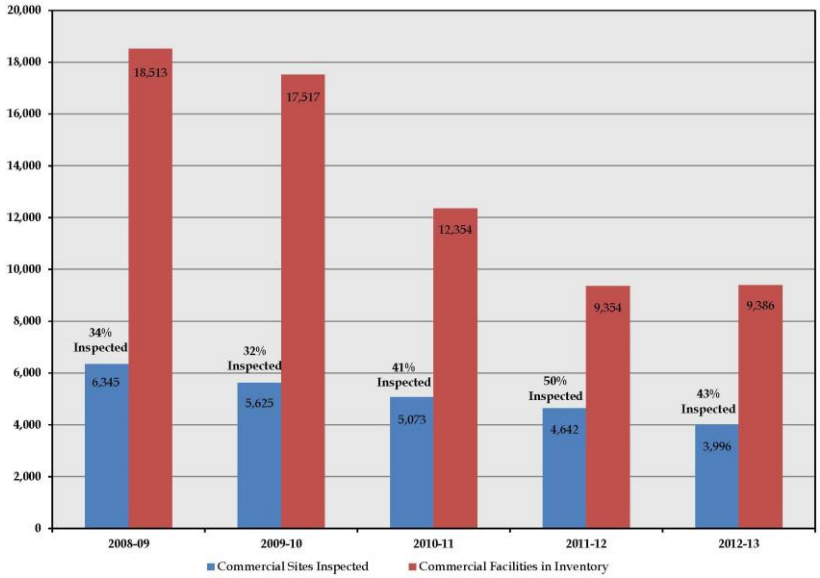

BMP Implementation

Twenty-four (24) model BMP fact sheets have been prepared (available at http://www.ocwatershed.com/IndustrialCommercialBusinessesActivities.aspx) which include a description of specific minimum source control BMPs for common industrial and commercial activities that may discharge pollutants. The California Stormwater Quality Association (CASQA) is currently updating the Industrial BMP Handbook and converting it to a web portal. The Orange County Stormwater Program will be giving consideration to incorporating the updated CASQA BMP fact sheets into the program.

Permittees gauge implementation of the required BMPs through the inspection program. Facilities fall into one of three categories; they have fully implemented, partially implemented, or not implemented any of the required BMPs. As illustrated in **Figure 3.6.3**, the majority (>80%) of industrial and commercial facilities were fully implementing BMPs as required upon inspection.

Figure 3.6.3: Industrial and Commercial Site Compliance Rates (excluding FSEs) from 2008-09 to 2012-13

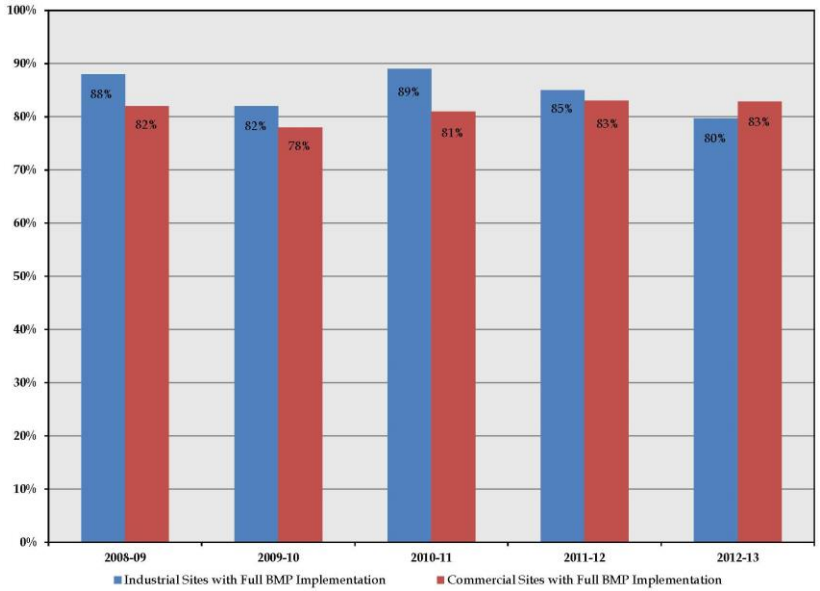

Enforcement Activities

Permittees are required to use a progressive enforcement approach and initiate enforcement actions where commercial and industrial facilities are found to be out of compliance. Enforcement for the industrial and commercial component of the Existing Development Program is the responsibility of

individual Permittees. Each Permittee has several different levels of enforcement to choose from for different types of situations. This includes – from least severe to most severe – issuance of an educational letter, a notice of non-compliance, an administrative compliance order, a cease and desist order, or a misdemeanor/infraction. Over the past five years, the Permittees conducted enforcement as necessary based on the results of the industrial and commercial inspections (**Figure 3.6.4**).

Figure 3.6.4: Industrial and Commercial Enforcement Actions (excluding FSEs) from 2008-09 to 2012-13

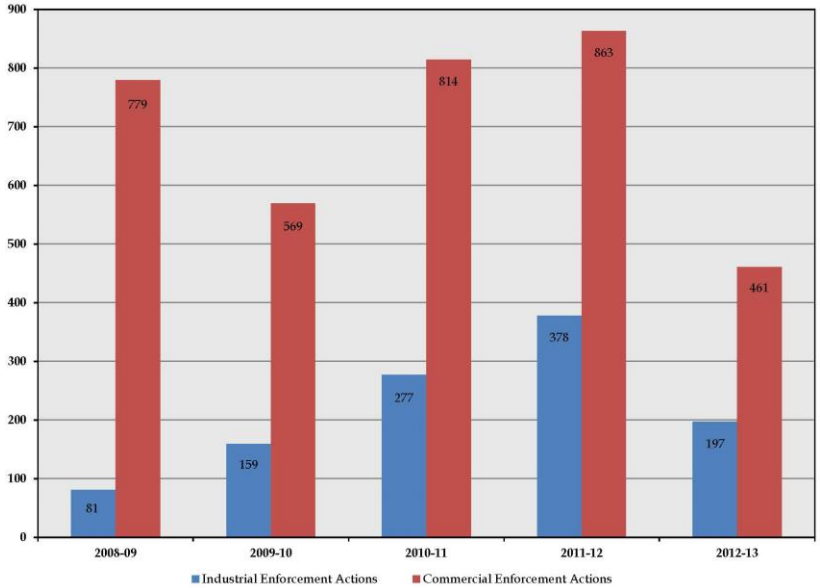

Where non-compliance is evident during inspections, inspection frequency and enforcement actions are increased until compliance is achieved. Increased follow-up and enforcement appear to be resulting in increased rates of compliance. **Figure 3.6.5** illustrates the number and type of enforcement actions taken at industrial and commercial facilities over the past five years. It appears that lower level enforcement actions such as educational letters and notices of non-compliance are typically successful in gaining compliance, although nearly every year, there are over 100 higher level enforcement actions taken against industrial and commercial facilities.

Figure 3.6.5: Industrial and Commercial Enforcement Actions by Enforcement Types (Excluding FSEs) from 2008-09 to 2012-13

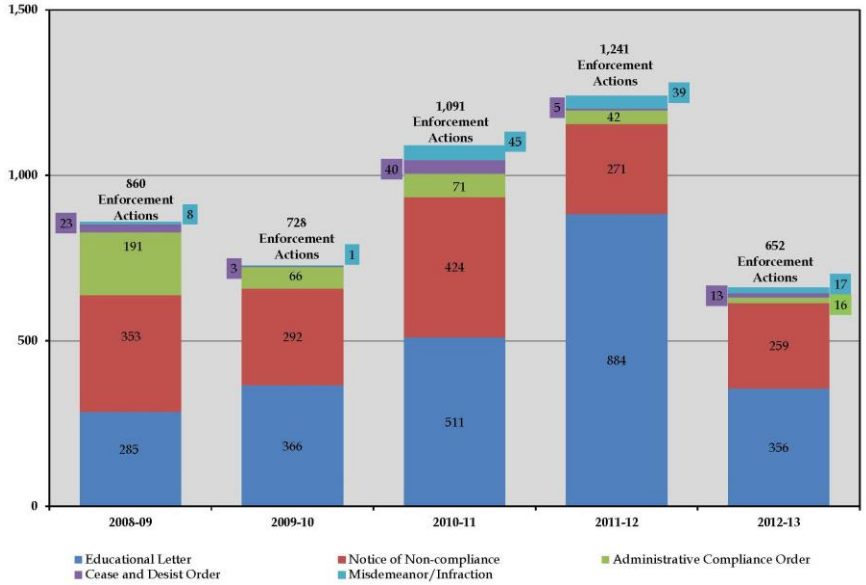

Food Facility Inspection Program

Orange County Health Care Agency (OCHCA) annually conducts up to three inspections of each food service establishment for compliance with the California Uniform Retail Food Facilities Law. The OCHCA inspectors identify NPDES issues during one of these three inspections and they

are forwarded to the respective Permittees for follow up. In **Figure 3.6.6**, a sharp decrease in the number of inspections per year is evident between FY 2008-09 and FY 2009-10, due to a clarification in reporting practices.

Figure 3.6.6: HCA Annual Inspections at Food Service Establishments from 2008-09 to 2012-13

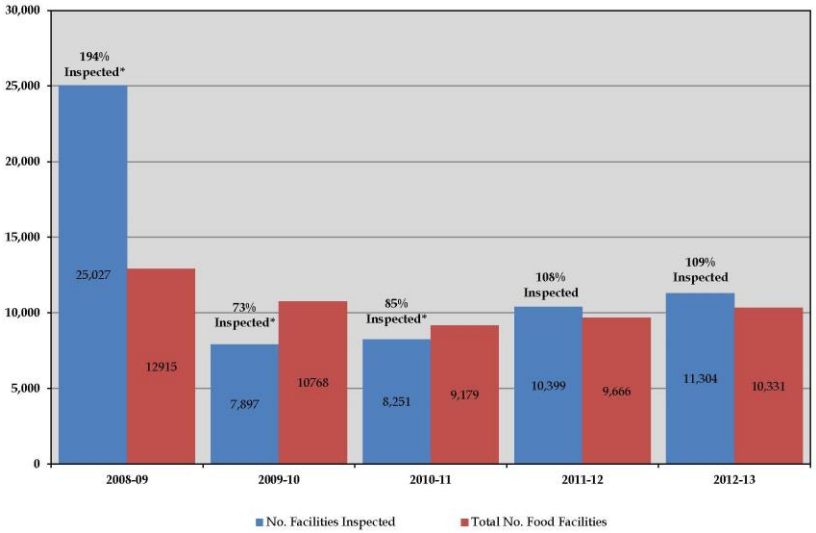

* High number of inspections in 2008-09, and low numbers of inspections in 2009-10 and 2010-11 due to reporting issues that were subsequently clarified in 2009-10 and 2011-12, respectively.

The numbers of inspections resulting in the detection of NPDES issues at FSEs is illustrated in **Figure 3.6.7**. Where these issues were found, Permittees followed up with the necessary enforcement actions. It appears that the numbers of inspections detecting issues has been slowly declining since 2009, from 34% to 24%.

Figure 3.67: NPDES Issues Discovered During Food Service Establishment Inspections Performed by HCA from 2008-09 to 2012-13

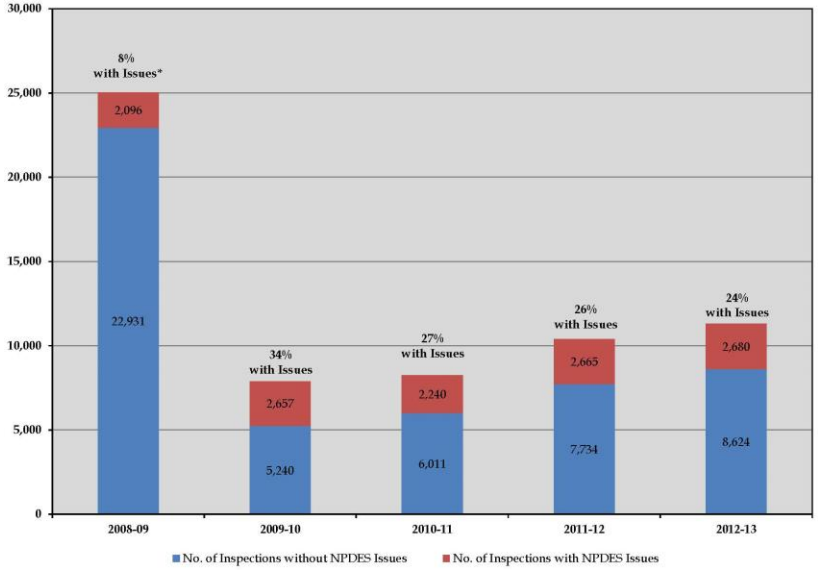

* High number of inspections in 2008-09 due to reporting issues that was subsequently clarified in 2009-10.

Mobile Business Model Pilot Program

Due to their transitory and regional nature, mobile businesses are a challenging component of the Model Existing Development Program. The Mobile Business Model Pilot Program, which was developed in 2009-2010 and commenced in 2010-2011, is a countywide approach to inventorying and regulating mobile businesses. There are five key elements to the Model Program:

1. Develop an inventory of mobile businesses operating within the County;
2. Identify and require implementation of minimum BMPs for mobile businesses;

3. Provide outreach to the mobile businesses;
4. Perform inspections or provide a self-certification process for the businesses; and
5. Conduct enforcement as necessary to ensure compliance.

In 2011, a web-based Mobile Business Database was developed to serve as a countywide inventory and repository for the information for each business pertaining to inspections and/or self-certification, outreach, and enforcement actions. The database allows Permittees to update the inventory with mobile businesses found to operate within their jurisdiction, as well as enter and track enforcement actions in their jurisdiction and countywide. The database tracks over 1,500 mobile businesses and includes information related to the business type, outreach, and enforcement information.

In order to assist surface cleaners in selecting and implementing the appropriate types of BMPs, a Model Surface Cleaner BMP Fact Sheet was developed in 2011. This BMP Fact Sheet provides the minimum control measures required of the mobile businesses.

A mass-mailing notification was distributed in June 2012 to all mobile detailing businesses in the countywide inventory in conjunction with an outreach workshop held on June 27, 2012. The notification included a workshop flier and mobile detailing brochure.

The Permittees implemented appropriate enforcement actions where necessary to ensure that Mobile Businesses were implementing the required BMPs **(Figure 3.6.9)**. The increase in enforcement actions in 2010-11 may be due to improved inventorying countywide after development of the Mobile Business Database (**Figure 3.6.8**).

Figure 3.6.8: Enforcement Actions Issued to Mobile Businesses in Orange County from 2008-09 to 2012-13

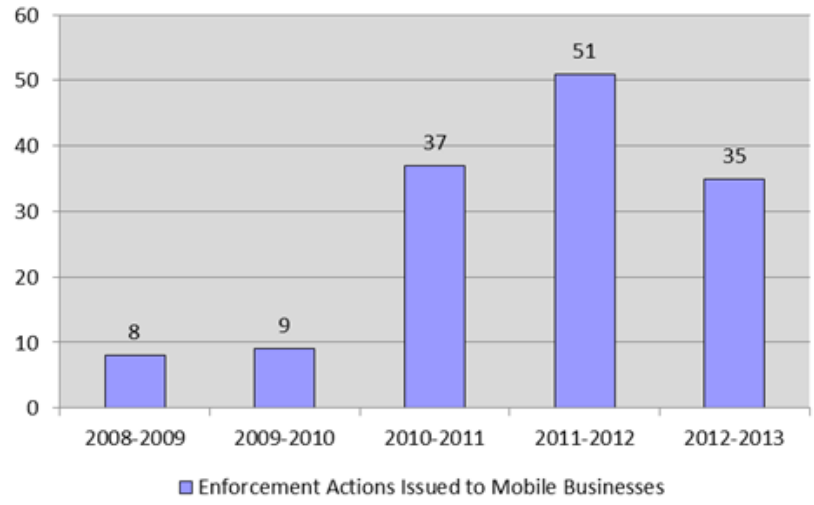

Figure 3.6.9: Types of Enforcement Actions Issued to Mobile Businesses from 2008-09 to 2012-13

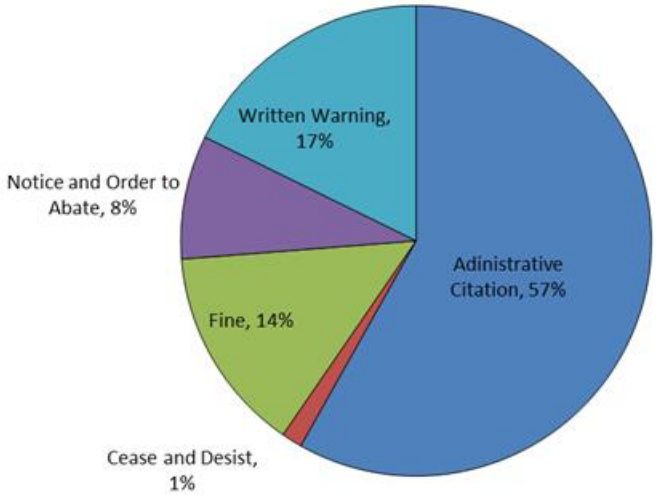

Training

Over the permit term the County developed the *Training Program Framework Core Competencies Document*. The *Training Program Framework Core Competencies* document defines the core competencies (knowledge, level of experience, and skills) necessary to ensure the capabilities of individuals carrying out specialized municipal stormwater program compliance responsibilities. It is expected that an individual or group of individuals who has/have developed these competencies will be able to affect jurisdictional conformance with the DAMP/ LIP and the compliance of their jurisdiction.

The Permittees developed and implemented the training program pursuant to Permit requirements and the DAMP. A region-wide training session was held specific to industrial and commercial inspections on April 7, 2009. The NPDES Inspection Sub-Committee also provided training on various subjects relevant to the Existing Development and ID/IC programs. This sub-committee meets quarterly to provide training to inspectors and others on issues related to spill response, inspection and enforcement.

3.6.3 Model Residential Program Implementation and Assessment

Residential areas comprise a significant portion of the land area of each Permittee's jurisdiction. The Model Residential Program was developed to further reduce pollutants potentially released into the environment from residential activities, including efforts to reduce over-watering. It encourages use of pollution prevention practices as the most effective method to protect receiving water quality and comprises:

- Best Management Practice (BMP) Requirements
- Source identification and prioritization
- Facilitation of hazardous waste collection
- Program Implementation
- Enforcement

During the 2012-13 reporting period, the LIP/PEA Sub-committee updated the eight (8) model BMP fact sheets which include a description of specific pollution-prevention activities for residential areas. The BMP fact sheets are available at http://ocwatersheds.com/documents/bmp/residentialactivities. Each fact sheet contains the following sections: targeted pollutants, required activities, and recommended activities.

BMP factsheets have been prepared for the following activities:

- Automobile Repair & Maintenance
- Automobile Washing
- Automobile Parking
- Home & Garden Care Activities
- Disposal of Pet Waste
- Disposal of Green Waste
- Household Hazardous Wastes
- Water Conservation

Four (4) Household Hazardous Waste Collection Centers, operated by the County of Orange Waste and Recycling Agency, are located at the following sites throughout the county:

- 1071 N. Blue Gum Street, Anaheim, CA 92806
- 17121 Nichols Street – Gate 6, Huntington Beach, CA 92647
- 6411 Oak Canyon, Irvine, CA 92618
- 32250 La Pata Avenue, San Juan Capistrano, CA 92675

The implementation of the residential program relies on education and outreach to notify and urge residents to observe the designated sets of BMPs for each of the high threat activities. Permittees encourage the implementation of the designated BMPs for each residence within its jurisdiction principally through the overall public education element of the Program. The Permittees have also developed a source identification procedure and prioritize residential areas based on proximity to Environmentally Sensitive Areas (ESAs). Over the last five years, the County (as manager of the reporting system) has responded to, or forwarded to Permittees, a total of 260 residential complaints (Figure 3.6.11).

Figure 3.6.10: Residential Complaints, County of Orange, from 2008-09 to 2012-13

Enforcement in residential areas begins with outreach and education and most often compliance is achieved without formal enforcement remedies. However, where necessary, the Permittees have the legal authority to increase the level of enforcement to gain compliance. Where necessary, enforcement actions were taken to achieve compliance. Indeed, between 2008-09 and 2011-12, the County has relied on formal enforcement actions to gain compliance in residential areas in only seven cases. These included two citations, three criminal cases, and two notices of non-compliance. However, many of the residential cases tracked by the County were referred to other agencies for follow-up and enforcement. The analysis of residential enforcement data performed only includes those actions taken by the County.

3.6.4 Common Interest Areas (CIAs) and Homeowner's Associations (HOAs) Program Implementation and Assessment

Orange County is home to over 3,000 CIAs/HOAs and common interest developments account for 80% of all new housing in the County. Within Orange County, approximately 90% of incorporated residential areas lie within 2. the purview of the maintenance associations that govern CIAs/HOAs. Permittees in the San Diego Region have implemented individual CIA/HOA programs since the Third-Term permits.

Nineteen (19) model BMP fact sheets were developed which include a description of specific pollution-prevention activities for CIAs/HOAs. The BMP Fact Sheets are available at http://ocwatersheds.com/documents/bmp/commoninterestactivities.

Enforcement of BMPs in common interest developments relies on the following mechanisms: public reporting hotline, analysis of dry weather/illicit discharge monitoring results, and municipal employee observations. During the permit term, the County responded to, or forwarded to Permittees, 37 complaints related to CIA/HOA issues. When necessary, enforcement may be accomplished in two ways: through enforcement of conditions and restrictions (CC&Rs) enacted by the associations or through the Permittees' enforcement processes.

3.6.5 Recommendations

1. Consider incorporating the updated CASQA BMP fact sheets into the Existing Development Model Program.

Implementation Schedule – Industrial, Commercial, Mobile Program

Industrial, Commercial, and Mobile Program Actions	Recommendation[1]	Implementation Schedule[2]				
		2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
Source Identification and Facility Inventory						
Maintain inventory of required industrial sites	C					
Maintain inventory of required commercial facilities	C					
Maintain inventory of required residential sites	N					
Facility Inspection Activities						
Annually inspect 20%of the industrial and commercial inventory, with 100% of the industrial and commercial inventory inspected over the permit term.	C					
Best Management Practice (BMP) Implementation						
Update BMP Fact Sheets for existing development as necessary	C					
Provide outreach to all industrial commercial facilities during the Permit term	C					
Enforcement Activities						
Conduct follow-up inspections and enforcement as necessary to ensure compliance	C					
Track types of enforcement actions by facility type	E					
Food Facility Inspection Program						
Maintain and update inventory of FSEs	C					

Industrial, Commercial, and Mobile Program Actions	Recommendation[1]	Implementation Schedule[2]				
		2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
Inspect FSEs according to prioritization	C					
Track follow-up and enforcement actions related to FSEs	E					
Mobile Business Model Pilot Program						
Maintain inventory of mobile businesses operating within the County focusing on automobile detailers, carpet cleaners, pet services	E					
Identify and require implementation of minimum BMPs for mobile businesses, focusing on automobile detailers, carpet cleaners, and pet services	E					
Provide outreach to the mobile businesses	C					
Perform inspections or provide a self-certification process for the businesses	C					
Conduct enforcement as necessary to ensure compliance	C					
Training						
Train inspections and field staff as necessary	C					

1. C = Continue; E = Enhance; N = New
2. X = Recommendation will be completed during this fiscal year. Gray shaded cells indicate ongoing implementation.

Implementation Schedule – Residential Program

Residential Program Actions	Recommendation[1]	Implementation Schedule[2]				
		2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
Source Identification and Prioritization						
Update and maintain residential source inventories as necessary	C					
Best Management Practice (BMP) Requirements						
Update BMP Fact Sheets as necessary	C					
Program Implementation						
Respond to notifications of NPDES issues from the public, municipal staff, and other regulatory agencies	C					
Facilitate proper collection and management of used oil and household hazardous waste	C					
Track amounts of used oil and HHW collected	C					
Enforcement						
Enforce ordinances as appropriate	C					
Track enforcement actions	C					

1. C = Continue; E = Enhance; N = New

2. X = Performance Standard will be completed during this fiscal year. Gray shaded cells indicate ongoing implementation.

Implementation Schedule – CIA/HOA Program

CIA/HOA Program Actions	Recommendation[1]	Implementation Schedule[2]				
		2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
Identification of CIA/HOA Areas and Activities of Concern						
Update inventory of CIA/HOAs as necessary	C					
Best Management Practices Implementation						
Update BMP Fact Sheets associated with activities of concern as necessary	C					
Program Implementation Strategy						
Develop guidance for inclusion in CCRs for CIA/HOAs	C					
Require new HOAs to include guidance in CCRs	E					
Perform outreach to CIA/HOAs	C					
Coordinate with UCCE and water districts to enhance approaches to IPM implementation and reducing irrigation runoff	C					
Enforcement						
Enforce ordinances as necessary to ensure BMPs are implemented as required	C					

1. C = Continue; E = Enhance; N = New

2. X = Performance Standard will be completed during this fiscal year. Gray shaded cells indicate ongoing implementation.

Implementation Schedule – CIA/HOA Program

Retrofitting Program Actions	Recommendation[1]	Implementation Schedule[2]				
		2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
Evaluate Opportunities for Retrofit						
Evaluate opportunities for retrofitting existing development to address constituents identified as the highest priorities in the Water Quality Implementation Plan	E					

1. C = Continue; E = Enhance; N = New

2. X = Performance Standard will be completed during this fiscal year. Gray shaded cells indicate ongoing implementation.

3.7 Illegal Discharges/Illicit Connections

The Story: ID/IC

- The requirement to effectively prohibit non-stormwater discharges into the MS4 is one of two fundamental requirements of the Clean Water Act stormwater mandate.

- The Permittees continued to aggressively detect and eliminate Illicit Discharges and Illegal Connections (ID/IC) through discharge monitoring, source investigation, and enforcement.

- A spill reporting hotline (1-877-89-SPILL) provides a resource for public spill and water pollution reporting, and a smartphone reporting application was developed. All reports were responded to and resolved.

- The *Model Investigative Guidance for Orange County Illegal Discharges and Illicit Connections Program* was updated for the Non-stormwater Action Levels (NALs) based monitoring program by inclusion of a new *San Diego Region Dry Weather Numeric Action Level (NAL) Source Identification Guide*.

- Essential elements of the Countywide Area Spill Control Program were completed and implemented.

- The NALs monitoring program was fully implemented.

3.7.1 Overview

It is a specific requirement of the Federal Clean Water Act that non-stormwater discharges, arising from illegal discharges and illicit connections (ID/IC) to the municipal storm drain system, must be effectively prohibited. Since the first term MS4 permit, a programmatic framework for detecting and quickly responding to non-stormwater discharges has been a key integral element of the Program.

3.7.2 Illegal Discharges/Illicit Connections Program Implementation and Assessment

The Model ID/IC Program provides guidance for Permittees when identifying, responding to, and mitigating the effects of non-stormwater discharges**.** The Model Program requires the Permittees to address the following:

- Detect illegal discharges and illicit connections;
- Enable public reporting;
- Investigate illegal discharges and illicit connections;
- Undertake enforcement; and
- Conduct Training.

<u>Detection of Illegal Discharges and Illicit Connections</u>

The Permittees implemented the NALs monitoring program during the Fourth Term MS4 Permit in south Orange County. The NALs monitoring program is outlined in the Fourth Term MS4 Permit and includes numeric action levels derived from Basin Plan objectives that, when exceeded, trigger the need for a source investigation. The NALs monitoring program uses a suite of water quality analyses conducted in the field and through contract laboratories. Field data is entered into the County's CBI MS4 on-line database system to which

Permittees have been provided with login information and have immediate access to all field data once it is entered into the system.

As part of the NALs monitoring program, outfall sites are visited and sampled twice annually; once in the dry season and once in the wet seasons (preceded by an absence of rain for 72 hours). Over the past four years, the Permittees have conducted a total of 175 site visits at 25 sites.

Reporting

The Permittees continue to field complaints stemming from numerous sources, including the water pollution telephone hotlines. Telephone and web-based reporting systems (both countywide and in individual cities) for the general public have been established and are advertised in the Program's public education materials, Orange County "White Pages" telephone directories, and Permittee websites.

The Permittees' field inspectors are trained to detect illegal discharges as part of their daily activities and, indeed, the majority of illegal discharges continue to be detected by Permittee staff. In addition, the Permittees promote hotline numbers, principally 1-877-89-SPILL, to receive water pollution complaints and incident information from the public and use database software to document the reported incidents which assists with the tracking of water pollution complaints by source. The Permittees also developed a smartphone application to provide another tool for the general public to use when reporting water pollution issues

Over the past five years there has been a decrease in the total number of complaints received (**Figure 3.7.1**).

Figure 3.7.1: Source of Complaints from 2008-09 to 2012-13

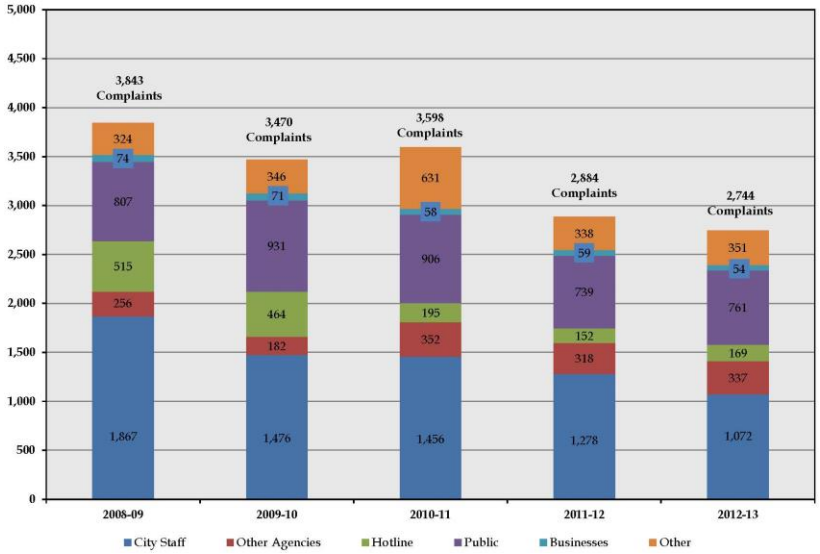

Investigate Illegal Discharges and Illicit Connections

Each Permittee has designated Authorized Inspectors to investigate compliance with, detect violations of, and take actions pursuant to their Water Quality Ordinance. Authorized Inspectors follow specific procedures documented in the *Model Investigative Guidance for Orange County Illegal Discharges and Illicit Connections Program* (*Investigative Guidance Manual*). The *Investigative Guidance Manual* was updated by the Permittees during the permit term. The revision included adding resources and tools as appendices and updating key resources, including an attachment specific to South County Permittees, the *San Diego Region Dry Weather Numeric Action Level (NAL) Source Identification Guide*.

The Permittees maintain records of information from a complaint, notification, or response request. To ensure that the necessary information is collected, the Permittees use pre-established forms to collect information. After the initial entry of the information on the Pollution Notification/Investigation Request (PNIR) or related form, the information is generally entered into a database. The data from the Permittees' databases is analyzed to increase the Permittees' awareness regarding the most problematic waste categories and facility activity types.

Figure 3.7.2 and **Figure 3.7.3** display results from the County-maintained PNIR database covering the 2008-09 to 2011-12 reporting periods. **Figure 3.7.2** provides a breakdown of the waste category under which each ID/IC discharge investigation was classified. The frequency of incident appears to be equally distributed all waste categories. **Figure 3.7.3** displays a breakdown of the facility activity type under which each ID/IC discharge investigation was classified.

Similarly there is no facility type or single land use that is pre-dominantly the subject of investigations.

The data used in the analysis includes information from the mobile business database which is a shared incident reporting database created specifically to ensure effective application of the Enforcement Consistency Guide to businesses operating from mobile premises across multiple jurisdictions. The experience with this database encourages consideration being given to creating a single countywide ID/IC database with the potential to streamline reporting and enable more detailed analyses to better identify priority activities and facility types of concern.

Figure 3.7.2: Waste Categories Encountered during ID/IC or Mobile Business Discharge Investigations

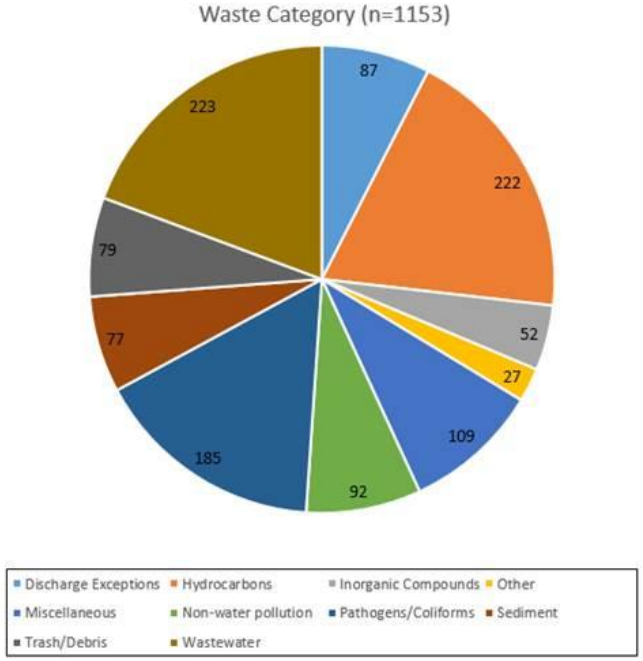

Figure 3.7.3: Facility Activity Types Encountered during ID/IC Discharge Investigations

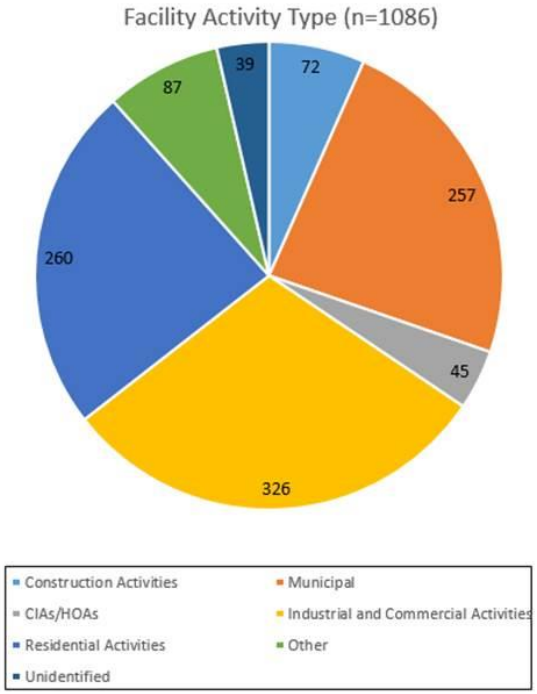

Enforcement

Enforcement actions are undertaken according to the adopted Water Quality Ordinances and accompanying Enforcement Consistency Guide. In instances of noncompliance, the Permittees adopted one of four types of remedies, including educational letters, administrative remedies, criminal remedies, or other civil or criminal remedies, as appropriate. **Figure 3.7.4** displays the number and type of enforcement actions undertaken during the past five reporting periods. The five year trend largely represents a decrease in the total number of enforcement actions. Given the correlating decrease in the total number of complaints received over the same time period, the decrease in the total number of enforcement actions indicates a change in behavior which is causing a decrease in the total number of ID/IC incidents occurring.

Figure 3.7.4: Enforcement Actions 2008-09 to 2012-13

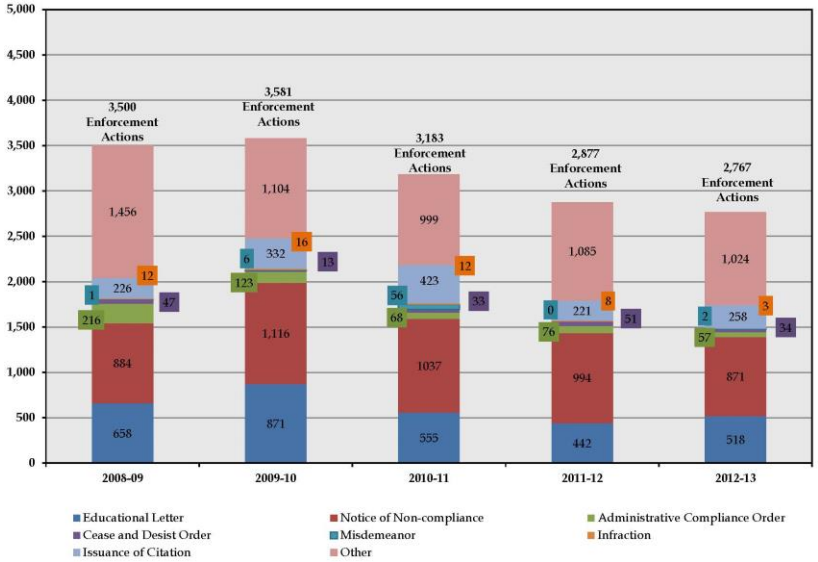

Training

During the permit term, the Permittees developed a training program, including curriculum content. The training program defined expertise and competency for each key area of jurisdictional stormwater program responsibility, including Authorized Inspectors. Illegal Discharges/Illicit Connections (ID/IC) Training Sessions for Authorized Inspectors and spill responders were conducted on May 18, 2010 (66 attendees) and April 16, 2013 (69 attendees). In addition, the NPDES

Inspection Sub-Committee also provided training on various subjects relevant to the ID/IC program. This sub-committee meets quarterly to provide training to Authorized Inspectors and others on issues related to spill response, inspection and enforcement. It also serves as a forum for the coordination and discussion of ongoing difficult or new enforcement, investigation, or enforcement issues and to profile cases or incidents.

Model Sewage Spill Response Procedures

Starting in 2000, the County and OCSD began development and implementation of a coordinated sewage spill prevention and response demonstration project (i.e. the "Countywide Area Spill Control (CASC) Program").

During the permit term, the CASC Program was activated three times in the San Diego Region: (1) March 23, 2010, to respond to a 1.4 million gallon sewage spill; (2) on June 25, 2010, to respond to a 2,400 gallon sewage spill; and, (3) on April 28, 2014, to respond to a 4,600 gallon biosolids spill. The March 23, 2010 incident was the largest CASC response to date, and the response was a major success – a berm was placed in Tijeras Creek to contain the spill and 2.5 million gallons were pumped from the containment and returned from the Santa Margarita Water District sewer system, minimizing both the beach closure area and the total number of beach closure days. For these reasons, the San Diego Regional Board reduced the *Potential Harm for Discharge Violations* score when assessing the Administrative Civil Liability (ACL) for this spill event.

CASC Response on March 23, 2010, Tijeras Creek

Actions Levels

In 2003, the Permittees began implementing the seasonal *Dry Weather Reconnaissance Program* on a countywide basis to monitor storm drain outfalls for the presence of illegal connections and illicit discharges (ID/IC). This Program's hybrid reconnaissance monitoring design combines probabilistic and targeted sampling and the use of formal statistical tools (tolerance intervals and control charts). This design enables the program to systematically prioritize problematic sites, compare conditions to the regional urban background, and track trends over time.

- A *tolerance interval* bound is the upper or lower confidence-interval bound of a quartile of the background data distribution. Tolerance intervals are

derived from the probabilistic site data and are used to quantify the key aspects of the regional background.

- *Control charts* are used to establish an upper or lower bound on a data distribution, based on previous monitoring data. They are created for each site and provide a means of tracking data at individual sites and identifying when new data values deviate substantially (either upward or downward) from previous experience.
- Used together, tolerance intervals and control charts provide a consistent and quantitative means of identifying sites that exhibit clearly aberrant values.

In its Fourth Term Permit for south Orange County the San Diego Regional Board has modified the dry weather reconnaissance-based monitoring to include NALs), based on Basin Plan objectives. Comparison of the approaches shows that the NALs-based program triggers investigative responses at a much higher frequency for many constituents (e.g. enterococci and reactive orthophosphate as P; **Figure 3.7.6** and **Figure 3.7.7** respectively).

Based upon historical data **(Figure 3.7.6)**, for example, the probability that a sample does not exceed the NAL for enterococci is approximately 3%. As a result, 32 out of 33 sampling events would be required to be investigated. In contrast, the probability that a sample does not exceed the enterococci tolerance interval is 90%, which ensures that investigative resources are applied to the most aberrant prioritized discharges.

Figure 3.7.5: Enterococci Exceedance Frequencies Associated with Dry Weather Reconnaissance Tolerance Intervals Compared with Exceedance Frequencies Associated with NALs.

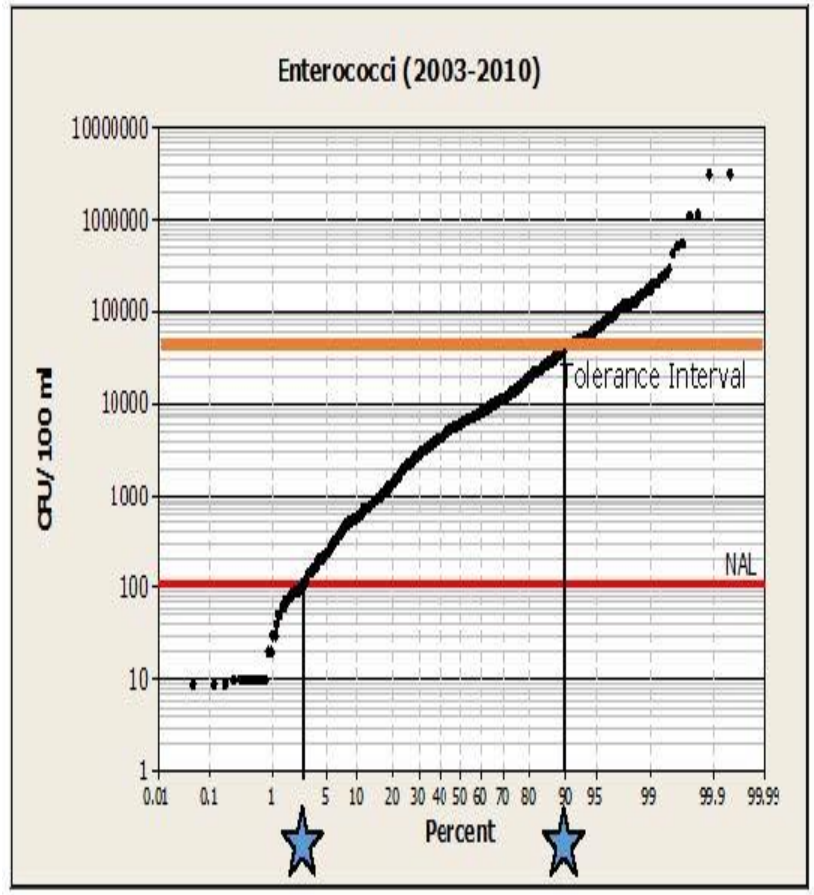

Figure 3.7.6: Reactive Orthophosphate as P Exceedance Frequencies Associated with Dry Weather Reconnaissance Tolerance Intervals Compared with Exceedance Frequencies Associated with NALs

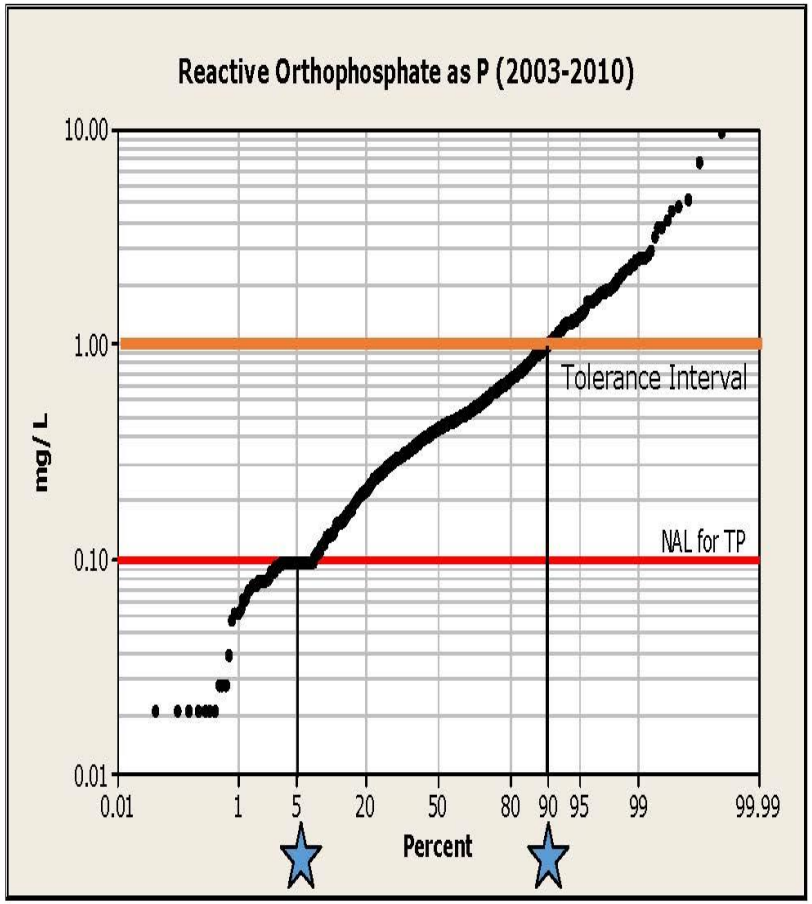

The impact of the switch from "action levels" to "NALs" is demonstrated in **Table 3.7.1**. Under the Dry Weather Reconnaissance Program protocol the Permittees conducted 274 site visits; whereas for the NAL-based program the Permittees conducted 45 site visits. Although the Permittees collected data and information for six times more stations as a part of the Dry Weather Reconnaissance Program, the NALs-based program identified more than six times the number of exceedances, thereby confounding the ability of the Permittees to prioritize investigative efforts.

The South Orange County Permittees have found strong positive linear relationships between phosphorus and metals associated with seepage and exfiltration of shallow groundwater from the Monterey and Capistrano marine sedimentary formations. Both formations are known to be enriched in trace metals and phosphorus and are prevalent across southern Orange County. This evidence suggests that many exceedances are due to non-ID/IC factors (i.e. local geology - Ni, Cd). These findings underscore the concern of the Permittees that the NALs preclude the Permittees from discriminating between instances of ID/IC and non-ID/IC conditions and is therefore inconsistent with a mandate that requires the effective prohibition through ordinance of non-stormwater discharges arising from ID/IC. See additional discussion of this issue in **Attachment 3.7.1.**

Table 3.7.1: Comparison of the 2011-12 NALs Data Collected in the San Diego Region with the Data from the Dry Weather Hybrid Reconnaissance Monitoring Program for the 2009-10 Reporting Period

Constituent	# of NAL Exceedances	% of NAL Exceedances	# of Reconnaissance Action Level Exceeedances	% of Reconnaissance Action Level Exceeedances
	2011-2012		2009-2010	
pH	1	2	0	0
TDS	42	93	0	0
Dissolved Oxygen	2	4	0	0
Turbidity	3	7	3	1
Surfactants	3	7	14	5
Total Coliforms	24	53	0	0
Fecal Coliforms	19	42	0	0
Enterococcus	42	93	0	0
Unionized Ammonia	3	7	8	3
Total Nitrogen	41	91	0	0
Total Phosphate	38	84	11	4
Cadmium	13	28	0	0
Copper	1	2	0	0
Nickel	7	15	0	0
Zinc	1	2	0	0
Total # of Site Visits	**45**		**274**	

3.7.3 Recommendations

The major elements of the program (e.g. the facilitation of public reporting of complaints, and the designation and training of Authorized Inspectors) continue to be vital and successful pieces of the Program. However, the NALs Program has proven to be less effective than the Dry Weather Reconnaissance Program. The recommendation is:

1. **Reinstate an approach, such as the Dry Weather Reconnaissance Program, that allows investigative resources to be directed toward abating priority aberrant discharges.**
2. **Continue implementation of CASC.**
3. **Consider development of a standardized reporting database potentially accessible by all Permittees.**

Implementation Schedule – ID/IC

Proposed ID/IC Program Actions	Recommendation[1]	Implementation Schedule[2]				
		2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
Detect Illegal Discharges and Illicit Connections						
Implement Dry Weather Reconnaissance Program monitoring approach to prioritize investigations on non-stormwater discharges arising from ID/IC.	N					
Facilitate Reporting						
Advertise telephone, web-based, and applications-based reporting systems	C					
Investigate Illegal Discharges and Illicit Connections						
Investigate compliance with, detect violations of, and take actions pursuant to each Permittee's respective Water Quality Ordinance and the *Investigative Guidance Manual*	C					
Maintain records of information from monitoring, a complaint, notification, or response request in an ID/IC database	C					
Evaluate using a standardized ID/IC record-keeping system and/or database amongst all Permittees	N		X			
Enforce upon Illegal Discharges and Illicit Connections						
Take enforcement actions according to each Permittee's respective Water Quality Ordinances and accompanying Enforcement Consistency Guide	C					

Proposed ID/IC Program Actions	Recommendation[1]	Implementation Schedule[2]				
		2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
Track enforcement actions	C					
Conduct Training						
Develop additional training modules as needed	E	X				
Conduct training of Authorized Inspectors	C					
Model Sewage Spill Response Procedures						
Implement CASC Program countywide	C					

1. C = Continue; E = Enhance; N = New
2. X = Recommendation will be completed during this fiscal year. Gray shaded cells indicate ongoing implementation.

4.0 Controlling Pollutant Sources: Watershed Programs

The Story: Watershed Programs

- Extensive watershed mapping of hydromodification susceptibility, infiltration feasibility and regional BMP opportunity sites for the entire south Orange County area has been completed.

- Watershed Workplans for all six San Diego Region Watersheds were developed and implemented. These workplans describe the Watershed Permittees' collective watershed strategies to assess, prioritize and address water quality challenges within each watershed.

- Comprehensive Load Reduction Plans (CLRPs) were developed for Aliso Creek, San Juan Creek and San Clemente Coastal Streams Watersheds. These watershed CLRPs were developed to address bacteria pollutants and other watershed 303(d) listed constituents.

- Dana Point harbor was delisted for Indictor Bacteria and 17 shoreline stations were delisted for *Enterococcus*, Fecal Coliform and Total Coliform.

- Baby Beach TMDL dry weather load reductions have been achieved for total coliform and the 50% load reduction milestones for fecal coliform and Enterococcus have also been achieved. Wet weather data also supports the conclusion that TMDL load reductions have been achieved for total coliform and fecal coliform. Further reductions are needed for Enterococcus.

4.1 Overview

Watershed management is the term used for the approach to water quality planning that places an emphasis on the watershed (the area draining into a river system, ocean or other body of water through a single outlet) as the planning area and looks to multi-jurisdictional solutions to problems that cut across programs and jurisdictional boundaries.

While the focus of watershed planning in south Orange County is on specific pollutants of concern associated with urban stormwater, particularly TMDLs, this management approach is also supportive of broader objectives such as watershed habitat restoration, consistent with the Practical Vision, and integrated water resource management.

There are six distinct watersheds within the San Diego Regional Board area which are identified in **Table 4.1** and shown **in Figure 4.1**

Table 4.1: San Diego Region Watersheds

Watershed Planning Area	Major Watercourses
Laguna Coastal Streams	Laguna Canyon Creek
Aliso Creek	Aliso Creek
Dana Point Coastal Streams	Salt Creek
San Juan Creek	San Juan Creek, Oso Creek, Trabuco Creek, Bell Canyon, Verdugo Canyon
San Clemente Coastal Streams	Prima Deshecha, Segunda Deshecha
San Mateo Creek	San Mateo Creek

Figure 4.1: Orange County Watershed Boundaries

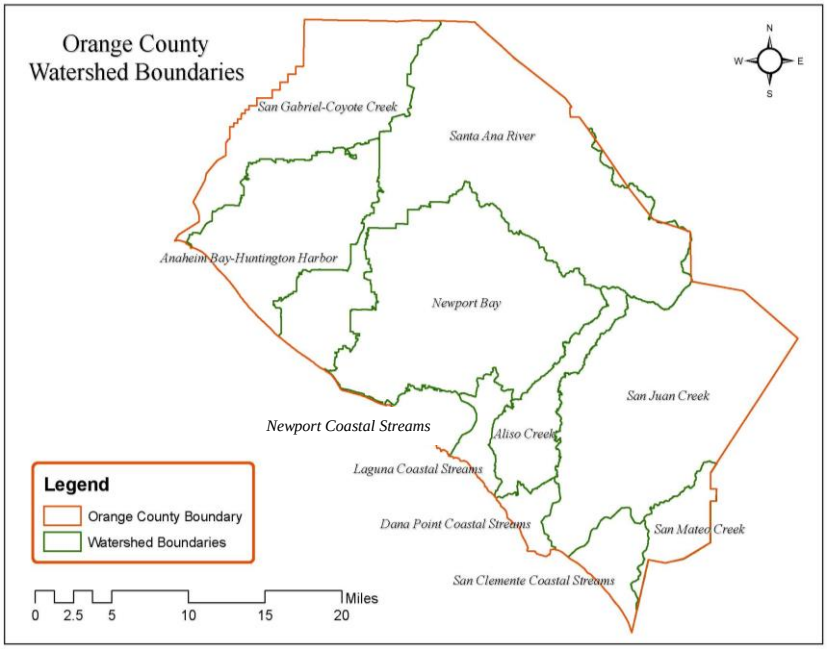

4.2 Non-TMDL Watershed Accomplishments

During the Fourth Term Permit, non-TMDL watershed management efforts—supportive of integrated water resource management—have included mapping of the landscape characteristics that are significant for hydrologic processes, adoption of an Integrated Regional Watershed Management Plan for south Orange County, preparation of Watershed Workplans for each of the six San Diego Region Watersheds, and engaging the public regarding local watershed issues.

Watershed Mapping Tool

A key element of watershed planning is identification of opportunities for regional and subregional stormwater management facilities. These facilities can play a critical role in more quickly realizing water quality, hydromodification, water supply and/or habitat goals compared to approaches that are exclusively reliant upon on-site mitigation.

Initial extensive watershed mapping of hydromodification susceptibility, infiltration feasibility and regional BMP opportunity sites for the entire south Orange County area has been completed and is available through the County's land records web-based portal, known as the Land Records 2.0 mapping tool: http://landrecords.ocpublicworks.com/ocsl/.

Integrated Regional Watershed Management Plan

Although it is not a permit requirement, the preparation of an Integrated Regional Watershed Management Plan (IRWMP) provides for a coordinated approach to resource management and capital improvement planning. This coordinated approach also leverages partnerships with regional stakeholders and existing programs and plans, such as TMDLs, and consolidated grants.

The State of California has been promoting integrated regional water management planning, as a means of achieving more sustainable water use. IRWMPs are a more efficient and effective way to manage water resources. It allows for regional prioritization of important watershed issues and for consensus to be reached on how to address those issues. Whereas watershed planning for stormwater management is focused on enhanced BMP implementation targeting specific

constituents of concern within a watershed, an IRWMP is an integrated plan for all water resources projects, including water supply, wastewater, flood management, stormwater and urban runoff, aquatic habitat, and recreation.

Governance for water quality programs is organized around three geographic sub-areas, or watershed management areas (WMAs)--North Orange County, Central Orange County, and South Orange County. Aliso Creek, San Juan Creek, Laguna Coastal Streams, Dana Point Coastal Streams, San Clemente Coastal Streams and San Mateo Creek (within Orange County) watersheds comprise the South Orange County WMA which falls wholly under the jurisdiction of the San Diego Regional Board.

The County of Orange, cities, and water and wastewater agencies of south Orange County formed the South Orange County Integrated Regional Water Management (IRWM) Group in 2004 and subsequently developed and adopted the South Orange County IRWMP in 2005.

In January 2007, the South Orange County IRWMP was one of seven statewide proposals recommended for funding. In July 2007, the South Orange County IRWM Group executed a Prop 50 IRWM Implementation Grant Agreement with the State Water Resources Control Board to receive grant funds in an amount of $25,000,000 for the seven highest ranking projects included in the IRWMP. One of the completed projects for which the water management strategy was water quality was the City of Laguna Beach's Heisler Park Marine Habitat Protection Project. This project was designed to reduce runoff to the ecological reserve. The park improvements include: a controlled and efficient irrigation system; bluff-top landscape grading; surface drain and pathway improvements; storm drain improvements; installation of three (3) urban runoff diversion automation systems in existing Continuous Deflection Separation (CDS) units; and coastal bluff stabilization.

An IRWMP update was initiated in 2012 to meet Prop 84 State guidelines and included a call for projects. 57 project forms were received. These projects were added to previous projects for a total of 139 projects now included in the IRWMP. Five of the top ten projects on the priority project list directly address water quality.

The updated plan was finalized in 2013 and adopted by the South Orange County WMA Executive Committee. The Final and Approved 2013 IRWMP is available at the following link: http://ocwatersheds.com/programs/ourws/wmaareas/wmasouthoc/soc_wma_irwmp

Watershed Workplans

Pursuant to Directive G of Order No. R9-2009-0002, Watershed Workplans were developed for each of the six watersheds in south Orange County. These Workplans describe the Watershed Permittees' development and implementation of a collective watershed strategy to assess and prioritize the water quality challenges within the watershed's receiving waters, identify and model sources of the highest priority water quality challenges, develop a watershed-wide BMP implementation strategy to abate highest priority water quality challenges, and a monitoring strategy to evaluate BMP effectiveness and changing water quality prioritization in each watershed.

The 2012-13 reporting period marked the tenth year of implementation of Watershed Action Plans/Watershed Workplans. The Watershed Workplans build on the considerable work and studies that have been completed collaboratively over a multi-year period. These include the following initiatives:

- Development and implementation of the *Drainage Area Management Plan (DAMP)/Jurisdictional Runoff Management Plans (JRMPs)*.
- *2005 Draft Identification of Retrofitting Opportunities Study* – this study identifies potential retrofit sites adjacent to or near existing flood control infrastructure under public ownership.
- *South Orange County IRWMP* – integrated regional watershed planning fosters development of holistic solutions to problems; addresses problems at the source; and integrates projects and programs throughout the region that have logical overlaps.
- *Southern California Coastal Water Research Project (SCCWRP) epidemiology and microbial source tracking study* – this study examined several new techniques for measuring traditional fecal indicator bacteria, new species of bacteria, and viruses to determine whether they yield a better relationship to human health outcomes than the indicators presently used in California.
- *Hydromodification controls* – these controls seek ways to mitigate erosion impacts by establishing requirements for controlling runoff from new development and significant redevelopment. These plans typically include decentralized storm water management systems and protection of natural drainage features, such as wetlands and stream corridors. Runoff is typically directed toward infiltration-based storm water BMPs, such as those included in the Watershed Workplans, that slow and treat runoff.

The Watershed Workplans consider the findings of the Receiving Waters and MS4 Discharge Monitoring Program in addition to other characterizations of receiving water quality. This data is used to inform management decisions in each of the watersheds, which includes guiding the type and location of BMPs to employ.

Water quality is assessed through a review of water quality standards and objectives, NPDES wet weather and non-stormwater monitoring data, indicator bacteria data for coastal waters collected from the Orange County Health Care Agency (OCHCA) and South Orange County Wastewater Authority (SOCWA), special studies conducted within the region, watershed management plans, and through informal data exchange and discussions with watershed residents, local conservation agents, and government officials.

Indicator bacteria exceedances (as determined by fecal indicator bacteria) at south county beaches and creeks, and the resulting potential for human health impacts, is currently the most significant concern for the region based upon MS4 permit and bacteria TMDL requirements. Consequently, indicator bacteria has been the primary focus of existing watershed water quality monitoring programs. As new data is collected through the Orange County Stormwater Program's regional monitoring efforts, future watershed specific TMDL monitoring and assessment efforts, and pollution source identification monitoring special studies, the characterization of receiving water quality will be expanded to include additional pollutants as priorities.

Changes in receiving water indicator bacteria levels concentrations have seen some positive improvements over the past few years. In general, the number of beach monitoring sites affected by the more stringent *Enterococcus* standard is showing a decreasing trend in the number of sites affected. These changes are attributed partially to 1) the cumulative effects of increasing attention on water conservation and 2) continued education of the public on the pollution prevention, but substantially to 3) implementation of structural BMPs at problematic sites.

Heal the Bay, a nonprofit environmental organization, reports the results of routine monitoring of beaches conducted by local health agencies and dischargers annually in their Beach Report Card. In the 2013 Beach Report Card, water quality in Orange County was reported as excellent with 93% A or B grades. Beach water quality during the winter dry weather was also very good with 86% A or B grades. Wet weather A and B grades (73%) were up four percent from last year and bested the five-year average by 17%.

Examples of special studies on pollutant source tracking for pollutants of concern in addition to and including indicator bacteria include:

Fecal Indicator Bacteria Special Study at Doheny Beach and Poche Beache

The San Juan Creek and San Clemente Coastal Streams Watershed Permittees have invested in source investigation studies and made long term capital investments in additional control measures to reduce runoff impacts on beach water quality at Doheny Beach and Poche Beach. The efforts undertaken during the Fourth Term Permit include:

- Completing the Prima Deschecha watershed study to identify sources and develop plans for additional BMPs to mitigate indicator bacteria levels at Poche Beach;
- Continuing operation of the Poche Beach ultraviolet treatment system to reduce indicator bacteria levels in watershed runoff;
- Conducting a pilot scale falconry project to discourage gulls from congregating at Poche Beach;
- Providing support for the scientific development of new microbial source tracking host-specific fecal source markers through contributions of in-kind services to the Source; and
- Providing support of scientific advancements to identify beaches affected by potential human sources through contributions of in-kind services to the Southern California Bight-13 Regional Monitoring Program Shoreline Microbiology Study.

The goal of the source investigations at Poche Beach and Doheny Beach, which are ongoing, are intended to develop a prioritization effort to identify and ultimately reduce the most important sources that represent a potential health risk for beach visitors.

Origin of Fecal Indicator Bacteria Impairments at Doheny State Beach

This study was designed to answer questions about the origin of bacteria impairments along Doheny State Beach from San Juan Creek. The study found that the native bird population accounts for the single largest percentage of fecal indicator bacteria variability and mass contribution in dry weather flows to the Pacific Ocean Shoreline at the beach.

Additionally, the main sources of fecal indicator bacteria in San Juan Creek appears to be concentrated at the pond at the mouth of San Juan Creek and not from the lower watershed.

Trace Metals

This is an ongoing study in the region, which includes monitoring for trace metals to better understand the nature of sources in runoff. In recent years, efforts lead by the County to characterize natural sources from ambient geology demonstrated that native soil attributes in specific areas are the primary contributor for many constituents of concern such as cadmium, nickel, chloride, sulfate, and selenium. Understanding the true source of naturally derived pollutants is important from not only a scientific basis but also from a management perspective.

Trash & Debris

This special study is ongoing and relates to trash monitoring in San Diego Region watersheds. The goals of the trash monitoring efforts are to help determine the extent of the issue and improve our understanding of managing trash in the environment using multiple efforts on both regional and local scales.

Oso Creek Dissolved Solids Study

This study was conducted to compile information on the impairments and assessed three aspects of water quality in Oso Creek, a subwatershed to San Juan Creek:

1. An evaluation of the current water quality condition of Oso Creek in comparison with three reference streams of similar geological characteristics;
2. Use of stable isotope measurements to assess whether current sulfate levels may be originating from sulfur based fertilizers; and,
3. A review of historic information to examine critical points in the development of the watershed over time that may have contributed to the impairments and may continue as potential barriers to corrective actions.

Three general and somewhat contrary water quality findings from this study are the key points of consideration for future efforts:

1. The dissolved solids are consistent with the geology and reference streams in terms of the concentrations,
2. The process of urbanization appears to have increased dissolved solid levels over the time period of the developed watershed history by increasing groundwater loadings, and
3. Successful efforts to decrease the domestic water runoff appear to have contributed to increases in dissolved solids concentration.

L01S03 Drainage Area Nitrogen and Phosphorus Source Investigation

Water quality data for the L01S03 drainage system in the San Juan Creek watershed has shown that the drainage area has elevated levels of nitrate-nitrogen and phosphorus. This study was conducted to investigate and identify the source of the elevated nutrients. The results of this drainage area source identification and investigation support that the source of

elevated nitrate-nitrogen and phosphorus source in the L01S03 drainage system originates from natural groundwater seepage in contact with the Capistrano Formation geology.

The watershed Permittees use the water quality monitoring data and findings from the special studies to develop BMP action plans. These action plans contribute to attaining receiving water quality objectives. Copies of the BMP action plans are included with each of the Watershed Workplans, which are available at the following links:

Aliso Creek:
http://ocwatersheds.com/programs/ourws/alisocreek/reportsstudies

Dana Point Coastal Streams:
http://ocwatersheds.com/programs/ourws/dpcoastalstreams/reportsstudies

Laguna Coastal Streams:
http://ocwatersheds.com/programs/ourws/lagunacoastalstreams/reportsstudies

San Clemente Coastal Streams:
http://ocwatersheds.com/programs/ourws/coastalstreams/sanclementecoastalreportsstudies

San Juan Creek:
http://ocwatersheds.com/programs/ourws/sanjuancreek/sjreportsstudies

San Mateo Creek:
http://ocwatersheds.com/programs/ourws/sanmateocreek/reportsstudies

Public Outreach and Participation

The governance structure for the WMAs, which was developed at the request of the Orange County Board of Supervisors, includes a variety of methods to engage the general public. The process provides balanced access and opportunity for participation in the IRWM process. It includes participating in stakeholder workshops, inclusion in the IRWM process, communication via email and information sharing via the County's website www.ocwatersheds.com.

Additionally, directive G of Order No. R9-2009-0002 includes a provision for public participation. The first drafts of the Watershed Workplans were posted on the www.ocwatersheds.com website in November 2010 for public review and comment prior to submittal to the San Diego Regional Water Quality Control Board. No comments specific to the plans were received. The south Orange County Permittees held the inaugural annual public stakeholder meeting the following year in December 2012 to identify issues of concern among residents in the watershed. Attendance for the meeting was low. Given the well-established stakeholder structure of the IRWM process, high level of public stakeholder involvement, and in the interest of a truly integrated approach to water resources, all of the south Orange County watershed permittees elected to integrate the annual public update of the Watershed Workplans into the IRWM stakeholder process. This approach also gives the south Orange County watershed Permittees the ability to reach the same stakeholders, as well as a broader audience, including water and sewer agencies and elected officials.

4.3 TMDL Watershed Accomplishments

Through the Fourth Term Permit term, the Permittees have made significant progress addressing the Beaches and Creeks TMDL and the Baby Beach TMDL. Accomplishments include:

Beaches and Creeks Bacteria TMDL

On February 10, 2010, the San Diego Regional Water Quality Control Board adopted indicator bacteria TMDLs for impaired beaches and creeks in the San Diego Region (Beaches and Creeks TMDLs). This TMDL includes over nine and a half miles of County beaches, the entire length of Aliso Creek and the lower mile of San Juan Creek.

As a first step to TMDL compliance, watershed Comprehensive Load Reduction Plans (CLRPs) were developed outlining the BMPs needed to meet TMDL Waste Load Allocations (WLAs) and special studies to identify sources of indicator bacteria and other listed pollutants in the watershed. In October 2012, Aliso and San Juan Creek Watershed Permittees submitted draft CLRPs to the San Diego Regional Water Quality Control Board for review. Subsequently, a draft CLRP for the San Clemente Coastal Streams Watershed was submitted in December 2012.

The CLRPs describe the approach taken by the Watershed Permittees in response to San Diego Regional Water Quality Control Board Resolution No. R9-2010-0001 (Amending the Water Quality Control Plan for the San Diego Basin [9] to Incorporate Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Beaches and Creeks in the San Diego Region [Including Tecolote Creek]). As described in the resolution, development of a watershed pollutant load reduction plan is a required step in the bacteria TMDL. To fulfill this requirement watershed CLRPs were developed to address bacteria pollutants and other watershed 303(d) listed constituents. Key CLRP elements include: assessing watershed conditions and setting priorities including development of a Watershed Monitoring and Assessment Program; assessing BMP effectiveness and developing a CLRP Implementation Strategy; developing individual Watershed Permittee BMP Action Plans; and, preparing a schedule for loading reductions to be achieved.

The 2010 Clean Water Act Section 303(d) list identifies the following pollutants/stressors for segments in the Aliso Creek Watershed: indicator bacteria, selenium, total nitrogen, total phosphorus, toxicity, Benzo[b]fluoranthene, Dieldrin, and sediment toxicity. San Juan Creek is listed for: indicator bacteria, chloride, sulfates, total dissolved solids, total nitrogen, total phosphorus, toxicity, DDE, Diazinon, and selenium. San Clemente Coastal Streams are listed for: indicator bacteria, phosphorus, turbidity, toxicity, cadmium and nickel. With the exception of indicator bacteria where TMDLs have been developed, current monitoring provides limited data on these other constituents at a watershed scale. Additional monitoring and data analysis is needed to calculate pollutant loads, identify hotspots, better define human health risks, habitat impacts, and in the case of toxicity determine the specific pollutants causing impairment. As a result initial CLRP efforts focus on bacteria TMDLs and a series of additional studies to collect the data necessary to understand the extent of impairment for other watershed pollutants.

The BMP Action Plans contained in the CLRPs detail current and proposed structural and non-structural BMP efforts. Projected watershed bacterial load reductions were calculated

based upon these plans to determine overall progress within the watershed and an expected reduction schedule.

By using an adaptive management approach, it is anticipated that the continual refinement of watershed BMP Action Plans and data gathered through CLRP Monitoring and Assessment Program will result in reductions consistent with bacteria TMDL WLAs and an improved understanding of watershed water quality impairments and the measures needed to address them.

Examples of BMPs in the action plans include two new wetlands constructed during the Fourth Term Permit, the Glenwood Wetland in Aliso Viejo which will treats runoff from 230 acres of golf course, residential and HOA common area and public parks; and the Oso Parkway Southside Wetland in Laguna Hills which treats 30 acres. Wetlands have proven to have high bacteria removal efficiency during dry weather. For example, the Wood Canyon Emergent Wetland at J02P08 in Aliso Viejo has reduced the concentration of indicator bacteria significantly--over 95% or 1 to 2-logs. The level of fecal coliform bacteria dropped to an average of 58 CFU/100 mL, which is lower than REC-1 water quality objective of 200 CFU/100mL. Both the Glenwood Wetland and the Oso Parkway Southside Wetland is expected to achieve similar bacteria removal efficiency.

Another BMP effective at bacterial removal are debris gates. The cities of Laguna Hills, Laguna Niguel and Lake Forest have installed debris gates at a number of catch basins to prevent gross pollutants from entering the MS4. Based on previous projects and studies, the debris gates are anticipated to provide an 85% reduction in debris in basins at pre-wet-season cleanout, and 68% reduction in number of basins containing any pollutant-laden debris that would contaminate influent water during dry weather. During wet weather an average of 85% decrease in debris quantity in catch basins yielding 85% decrease of first-flush pollutant constituents released to MS4 at start of each storm of rainy season has been observed.

The efforts to date to reduce bacteria impairments have proven successful. On October 11, 2011, USEPA issued its final decision regarding the water bodies and pollutants USEPA added to California's 2010 303(d) List, which also included State Water Board staff recommendations for additions, deletions or changes. The following list of segments were recommended for deletion in the 2010 Integrated report and were included in the final approved 2010 303(d) list: Dana Point harbor was delisted for Indictor Bacteria (Note: 0.03 mile was included on the 2010 303(d) list for *Enterococcus* and Total Coliform, and the listing for Total Coliform relates to the SHELL standard and not REC-1); 17 shoreline stations were delisted for *Enterococcus*, Fecal Coliform and Total Coliform; 2 shoreline stations were delisted for *Enterococcus* and Fecal Coliform; 2 shoreline stations were delisted for Fecal Coliform and Total Coliform; and 2 shoreline stations delisted for Fecal Coliform. Note that the 2006 303(d) list included whole segments that were later broken down to stations on the 2010 303(d) list. Several segments/stations were also changed from the all-encompassing Indicator Bacteria on the 2006 303(d) list to Total Coliform, Fecal Coliform, and/or Enterococcus on the 2010 303(d) list.

Baby Beach TMDL

In June 2008, the San Diego Regional Water Quality Control Board adopted indicator bacteria Total Maximum Daily Loads

(TMDLs) for Baby Beach in Dana Point Harbor. The TMDLs require 82.7-96.2% (dependent upon specific indicator bacteria) waste load reductions from the stormdrain system. Total Coliform, Fecal Coliform and *Enterocossus* wet weather reductions have to occur by December 31, 2019. Dry weather reductions for Total Coliform, Fecal Coliform and *Enterococcus* must occur by September 15, 2014.

Through implementation of BMPs to address several suspected bacteria sources, including measures such as manually removing bird feces from the beach, Baby Beach water quality has improved significantly. Data analysis for the 2012-13 reporting period indicates that dry weather TMDL load reductions have been achieved for total coliform and the 50% load reduction milestones for fecal coliform and Enterococcus have also been achieved. Wet weather data also supports the conclusion that TMDL load reductions have been achieved for total coliform and fecal coliform while further reductions are needed for Enterococcus. A recent microbial source tracking special study suggested that a portion of the remaining bacterial exceedances at Baby Beach may be of canine origin, prompting the County to increase enforcement of its policy banning dogs from the beach.

4.4 Recommendations

Aliso Creek Bacteria Investigations

There has been a dramatic reduction in bacteria concentrations in Aliso Creek since 2003 correlating with an increase in watershed Permittee BMP implementation and watershed wide water conservation efforts. This current Aliso Creek Monitoring Program was designed to track Creek bacteria concentrations over a ten year period. 2015 marks the tenth year of implementation of this program, and the following recommendations are made:

1) Reduce current Permittee quarterly progress reporting to an annual basis. Observed watershed bacteria reductions have shifted efforts away from new BMP projects to ongoing BMP maintenance decreasing the benefit of quarterly reporting. This change is consistent with R9-2009-0002 which specifies only an annual assessment of water quality data and municipality programs implemented within high-priority storm drain locations. Permittees will continue to meet quarterly to discuss efforts to reduce bacteria in the Aliso Creek watershed.

2) Continue implementation of monitoring and reporting described in the Revised Aliso Creek Program through December 2015 with 2015 annual reporting to include a reevaluation of the program relative to watershed bacteria TMDLs, the watershed Comprehensive Load Reduction Plan (CLRP), and related NPDES programs. Implementation of the program through 2015 will allow for an evaluation of the data relative to the initial ten year program design and developing fifth term permit NPDES programs.

5.0 Plan Development

5.1 Overview

The Story: Plan Development

- The Permittees have been implementing a strategic management approach that includes model programs specified in the permit and the DAMP, and watershed programs focused on specific water bodies and pollutants.

- The Program employs an iterative, adaptive management approach that includes monitoring, evaluation, program revision, BMP implementation adjustment/enhancement, and continued monitoring.

- The Program conducts annual and permit term (i.e. ROWD) using the guidance from CASQA approach.

- The ROWD recommends an evolution to a more holistic watershed management approach to support integrated water resource management and the optimization of watershed ecosystem services.

The Permittees have developed a strategic approach to stormwater management that is a cyclical process of measurement, analysis and program improvement. This approach is applied at two distinct scales: (1) regionally by the Permittees implementing jurisdictional programs based on the model programs in the DAMP; and (2) in specific watersheds by the Permittees and others participating in watershed programs addressing specific waterbody-pollutant combinations and the restorative goals of the Clean Water Act.

Two basic categories of assessment measure have been used related to (1) the shorter term confirmation of BMP implementation (Implementation or Process Measures, also termed Programmatic Indicators) and (2) the longer term verification of environmental improvement (Validation or Results Measures, including indicators of environmental change). This categorization of measures is intended to reflect two basic assessment questions: (1) are program elements being implemented correctly and effectively? And (2) are environmental improvements being realized?

> *…. Upon determination by either the permittees of the Regional Water Board that discharges are causing or contributing to an exceedance of an applicable Water Quality Standard, the permittees shall promptly notify and thereafter submit a report to the Regional Water Board that describes BMPs that are currently being implemented and additional BMPs that will be implemented to prevent or reduce any pollutants that are causing or contributing to the exceedances of Water Quality Standards. The report may be incorporated in the annual update to the Stormwater Management Plan unless the Regional Water Board directs an earlier submittal. WQO-99-05*

The planning process has been given particular regulatory significance by the approach to MS4 permitting in California. Indeed, the approach was developed as a model for fulfilling the Receiving Water Limitations and Discharges Prohibitions of the Permits. These provisions are based on State Water Resources Control Board Water Quality order 99-05 which creates an iterative management approach as the basis for compliance.

5.2 Plan Development and Effectiveness Assessment

Strategic Management Approach

The Permittees' strategic approach to stormwater management is defined by a cyclical (iterative) process, or *Quality Loop*, of measurement, analysis, and improvement of the program (Figure 5.1). An analogue for this approach is the formal environmental management system for which ISO 14001 establishes standards. It provides a structure that enables the Permittees to *think* about new ways of working, *measure* existing policies and procedures and/or just *implement* existing activities in different ways. The key is the continual search for improvement in the way that regulatory compliance is maintained and the surface water environment protected and enhanced through implementation of BMPs until protection of beneficial uses is achieved.

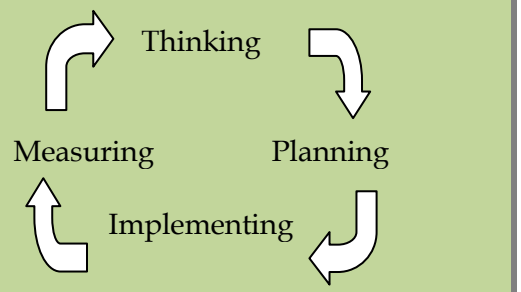

Figure 5.1: The Quality Loop (Gilbert & Gould, 1998)

Due to the episodic and highly variable nature of stormwater, strict compliance with regulatory water quality standards is problematic, especially for wet weather runoff discharges. In recognition of the nature of wet weather discharges, WQO 99-05 requires application of an iterative management process as the basis of compliance with the MS4 permit Receiving Water Limitations provisions. The Permits have required this process be conducted a minimum of once each year. This process is outlined in Figure 5.3.

Plan development occurs at two distinct scales: (1) activities conducted by the Permittees implementing BMPs in their DAMP/LIPs based on the model programs in the DAMP; and (2) activities conducted by the Permittees and others participating in watershed programs addressing specific waterbody-pollutant combinations.

Countywide/Jurisdictional BMPs are specified in the Permits, are applicable on a countywide basis and are proven and cost-effective. They include BMP requirements for municipal maintenance activities, public and business education and outreach, BMP requirements for land development and redevelopment, structural and non-structural BMP requirements for construction projects), BMPs for existing development and identification and elimination of illegal discharges/illicit connections.

For the watershed-based programs, the planning process has been focused principally on specific water quality problems in receiving waters, with impaired waters or TMDLs having a higher priority, and implementation of additional *Watershed BMPs* on an individual and/or collaborative basis. However, watershed-based planning has also led to a number restoration projects.

At both scales the approach uses information obtained from program effectiveness assessment, the countywide baseline water quality monitoring program, and from the additional water quality planning initiatives that have been or are currently being conducted in a number of the watersheds to determine those with beneficial use impairments potentially attributable to urban stormwater. New candidate BMPs can be prevention or removal oriented and can be considered either for updating *Countywide/Jurisdictional BMPs* or for incorporation as *Watershed BMPs*. New BMPs are generally identified from one or more of the following:

- A review of technical literature (such as the ASCE/EPA database);
- A review of existing control programs;
- Demonstration or research projects;
- Input from consulting firms and municipalities already involved in new BMP implementation; or
- Other sources.

New BMPs, chosen for broad implementation, are selected from candidate BMPs that have been field-tested and evaluated as to their pollutant removal efficiency and cost effectiveness. Methodologies for assessing Program and BMP effectiveness include conventional monitoring (such as water quality monitoring) and non-conventional monitoring. Conventional monitoring can provide a more direct indication of actual BMP performance, but is very challenging for a number of reasons. Water quality monitoring is costly, particularly given the highly variable nature of stormwater runoff, and targeted on a limited number of BMPs. Furthermore, not all BMPs are readily evaluated through water quality monitoring. Therefore, an accurate, quantifiable assessment of the cumulative effectiveness of current BMPs is difficult for a variety of reasons, including:

- A number of BMPs predate the Program which means that there is no "baseline" monitoring data representative of "pre-BMP" conditions;
- Since, to date, no watershed has been uniquely subject to a single BMP, the influence of an individual BMP upon the overall surface water quality cannot yet be readily determined;
- The temporal and spatial variability in water quality, particularly in wet weather, complicates any statistical correlation of the data with storm frequency, storm length and intensity, land use, or land management practices. This confounding factor in statistical analyses has been exacerbated by storm seasons in recent years that have varied much in their intensity, duration and volume;
- Many of the BMPs are implemented to address the issues associated with a specific land use. However, since the land uses are extremely varied within the watersheds, it has not proven possible to characterize the effects of those specific BMPs; and
- Factors other than chemical water quality may be more directly responsible for impairment of beneficial uses, yet all these factors combine in their effects and are difficult to separate one from another.

A method for evaluating overall stormwater program effectiveness on both a programmatic and individual BMP level has been documented by the California Stormwater Quality Association **(Figure 5.1)**. The approach presents a hierarchy of potential outcomes that can be evaluated ranging from programmatic permit compliance assessment to demonstrated changes in receiving water quality. Tiers 1-3 are assessment measures that support the shorter term confirmation of BMP implementation (Implementation or Process Measures, also termed Programmatic Indicators). Tiers 4-6 are assessment measures that reflect the longer term verification of environmental improvement (Validation or Results Measures, including indicators of environmental change).

Figure 5.1: CASQA Assessment Pyramid

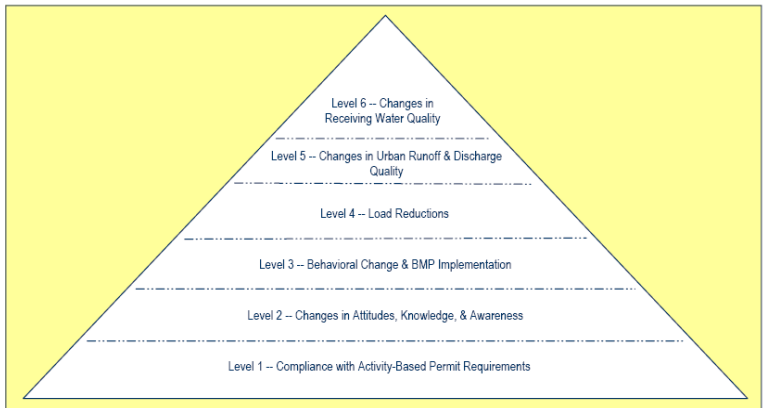

In addition, a number of important initiatives are being supported by the Permittees aimed at the further development of assessment techniques and methodologies to support more informed and consistent decision making across Southern California. Notable amongst these initiatives is the Regional Bioassessment Monitoring Program of the Stormwater Monitoring Coalition.

5.3 Watershed Approach

Managing water quality on a watershed basis, rather than jurisdictional basis (see **Table 5.1** for comparison), is generally recognized as offering a more holistic and thereby more effective basis for ultimately achieving meaningful environmental outcomes. Consequently, the ROWD recommends a watershed-based approach as a fundamental structure for the future of the Program.

Watershed

..that area of land, a bounded hydrologic system, within which all living things are inextricably linked by their common water course and where, as humans settled, simple logic demanded that they become part of a community.

John Wesley Powell, Scientist-Geographer

The development of a Watershed Plan would generally include the following steps:

- Conduct a watershed assessment to identify the watershed issues and establish desired beneficial use and ecosystem service outcomes;
- Establish watershed-specific implementation strategies to address the highest priority issues and concerns; and
- Submit to the Regional Board Executive Officer for review and approval.

A Watershed Plan is consistent with federal regulations regarding the development of NPDES permit conditions, as well as the implementation of storm water management programs, at a watershed scale (40 CFR §§ 122.26(a)(3)(ii), 122.26(a)(3)(v), and 122.26(d)(2)(iv)). This approach is also consistent with USEPA's Watershed-Based NPDES Permitting Policy Statement[1] which explains that, "[t]he utility of this tool relies heavily on a detailed, integrated, and inclusive watershed planning process." USEPA identifies a number of important benefits of watershed permitting, including more environmentally effective results; the ability to emphasize measuring the effectiveness of targeted actions on improvements in water quality; reduced cost of improving the quality of the nation's waters; and more effective implementation of watershed plans, including TMDLs, among others.

The watershed approach requires development and implementation of a comprehensive, collaborative, and prioritized Watershed Plan. A Watershed Plan will allow for the more effective linking of existing stormwater program elements to create an implementation strategy tailored to the needs of the watershed(s). In Orange County, such an approach would also present an opportunity to bring greater cogency to ongoing sub-regional and watershed initiatives, address the current impetus for integrated water resource management, and provide a framework for identifying projects that align with the restorative goals of the Practical Vision.

5.4 Recommendations

The recommendations are:

1. **Continue to implement the Strategic Countywide/Jurisdictional Management approach**.

[1] Memorandum from G. Tracy Meehan, III, Assistant Administrator to Water Division Directors, Regions I-IX, titled "Watershed-Based National Pollutant Discharge Elimination System (NPDES) Permitting Policy Statement," USEPA, December 3, 2002.

2. **Develop a comprehensive Watershed Plan** to evaluate the watershed and to prioritize implementation efforts and associated resource allocation.

3. **Develop pilot program(s) for regional water quality** or groundwater recharge BMPs

4. **Develop model program(s) for water retention credit trading** to facilitate off-site BMP implementation where appropriate and to address existing developed areas.

Implementation Schedule – Plan Development

Proposed Plan Development Actions	Recommendations[1]	Implementation Schedule[2]				
		2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
Strategic Management Approach						
Countywide/Jurisdictional Management approach	C					
Complete model program for a water quality/quantity trading	E		X			
Complete identification of regional runoff retention BMPs opportunity sites	E		X			
Complete model watershed management plan	N		X			

1. C = Continue; E = Enhance; N = New
2. X = Recommendations will be completed during this fiscal year. Gray shaded cells indicate ongoing implementation

Table 5.1 Comparison of Planning Processes		
	Local Implementation Plan	**Watershed Plans**
Area Covered by Plan	Defined by political (city/county) boundaries	Defined by hydrologic boundaries
Planning Process	Focused on reducing discharges of pollutants in urban runoff and stormwater pollution on a uniform countywide basis. Directed by DAMP/LIP in conformance with NPDES permits requirements.	Focused on improving local receiving water quality where it is adversely impacted by urban runoff and stormwater pollution (or other stressors). Directed by NPDES permit requirements and 303(d) list/TMDLs. Should optimize all watershed attributes and functions (water supply, energy, habitat, economic development, housing, trans…)
Framework	Directed by Orange County Stormwater Program committee structure and Regional Board review. Public consultation principally through California Environmental Quality Act (CEQA) process/Regional Board review.	Directed by broad participation among municipal and public agency stakeholders. Characterized by public participation.
Assessment	Based on information from countywide municipal and regional cooperative investigations of stormwater and receiving water quality	Based on information from watershed-specific investigations and are undertaken on an annual basis, or timescale appropriate

Table 5.1 Comparison of Planning Processes		
	and are undertaken on an annual and 5 year basis.	to the process, impact, or management strategy.
Planning	Broad based approach with emphasis on well established pollution prevention and source control measures.	Includes both pollutant specific approach, with emphasis on treatment controls and consideration of innovative regional solutions, and projects addressing restorative goals of the Clean Water Act.
Implementation	Individually by the Permittees.	Individually and collaboratively by Watershed Permittees and other agencies.
Monitoring	Considers pollutant load reduction.	Considers beneficial use attainment.

Figure 5.2: Strategic management flow diagram

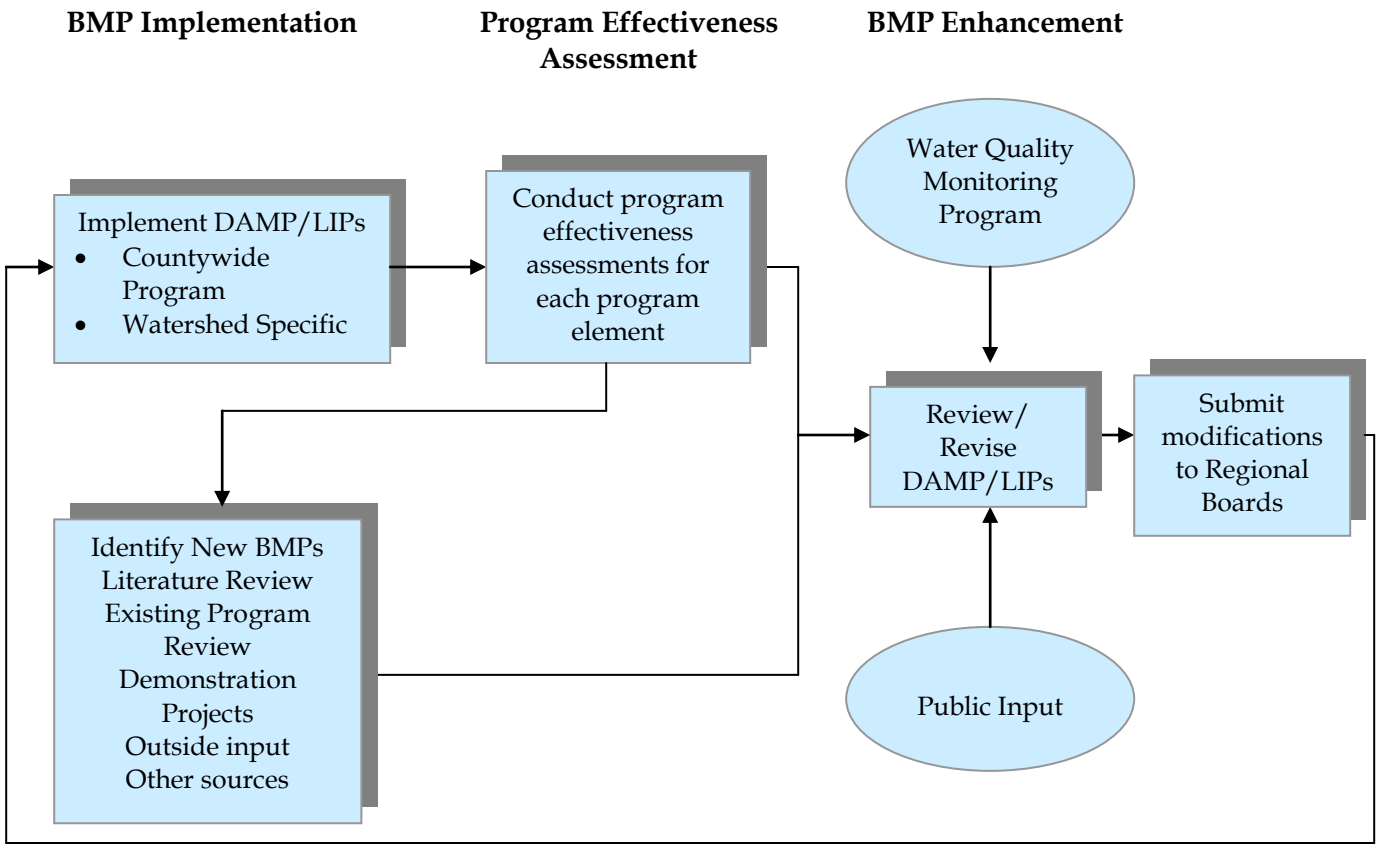

6.0 Program Management and Financing

The Story: Program Management/Financing

- The Program continued to operate with the County of Orange as the Principal Permittee during the permit term.

- The Program operated under a four-tier committee structure with participation at all levels by Permittee staff and management.

- An Implementation Agreement establishes responsibilities and provides a funding mechanism for cooperative activities. Funding has been sufficient to complete common program activities.

- The Program benefitted strongly from cooperation and representation among several regional and statewide groups including the California Stormwater Quality Association and the Southern California Coastal Water Research Project.

- Coordination with Orange County Transportation Authority (OCTA) on development of a Structural BMP Prioritization and Analysis Tool (SBPAT) to support disbursement of Measure M2 funding for water quality projects. SBPAT is a GIS-based decision support tool that is being used to identify and prioritize potential structural BMP retrofit projects throughout Orange County. To date Tier 1 funding of $8.6 million has been awarded to 85 projects and Tier 2 funding of $12.7 million has been awarded to 8 projects.

6.1 Overview

The Program is a cooperative regulatory compliance initiative comprised of 36 separate municipal entities. It addresses Clean Water Act mandates and is focused on the management of urban and stormwater runoff for the protection and enhancement of Orange County's creeks, streams, rivers and coastal waters. The County of Orange is the Principal Permittee and the cities and the Orange County Flood Control District are Co-Permittees on the permits. Principal Permittee and Permittee responsibilities are specified in the permit. Permittee collaboration and cooperation is enabled by an Implementation Agreement. The designation of a Principal Permittee has provided for cost effective management of the overall stormwater program by combining resources to complete those activities which benefit all of the Permittees.

To enable the development and implementation of the Program a program management framework has been established. This management framework comprises a four tier committee structure (Permittees, City Managers' Water Quality Committee, Technical Advisory Committee (TAC)/Planning Advisory Committee (PAC) and Program Committees/Task Forces/Ad Hoc Groups).

6.2 Program Implementation and Assessment

<u>Implementation Agreement</u>

A formal agreement enabling Permittee cooperation is the NPDES Stormwater Permit Implementation Agreement (the "Implementation Agreement") which establishes the responsibilities of the Permittees with respect to compliance with the Permits. The Implementation Agreement also

establishes a funding mechanism for the shared costs of the Program, based on each municipality's area and resident population, and formally recognizes the role of the TAC.

The Implementation Agreement, originally entered into in December of 1990, was amended in October of 1993 to include two additional Permittees (the cities of Laguna Hills and Lake Forest) and formally established the TAC. The Implementation Agreement was amended again, effective June 25, 2002, to include three additional Permittees (the cities of Aliso Viejo, Laguna Woods and Rancho Santa Margarita) and to incorporate modifications to the management structure and cost-sharing formulas.

The structure of the Agreement has accommodated the expansion of the Program and the significant escalation of shared costs with the adoption and implementation of the Third- and Fourth-Term MS4 Permits. It has also served as a model for cost sharing collaboration related to the Newport Bay TMDL compliance effort (including the related Nitrogen Selenium Management Program), Aliso Creek TMDL, San Juan Creek TMDL, Coyote Creek TMDL and Regional Harbor Monitoring Program.

Management Framework

The USEPA defines a management framework as "*a lasting process for partners working together. It's a support structure making it easier to coordinate efforts – a structure made of agreed upon standard operating procedures, timelines and forums for communicating with each other*" (USEPA, 2002). The four tier management framework was established in early 2002 to support the development and implementation of the Program.

The Permittee committees, subcommittees, task forces and ad-hoc working groups are shown in **Figure 6.1**.

Figure 6.1: Orange County Municipal NPDES Management Framework

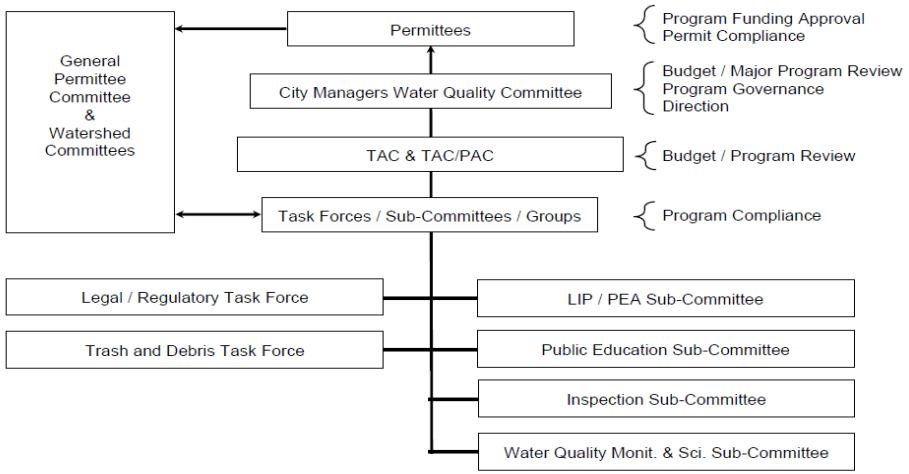

City Manager's Water Quality Committee

The City Manager's Water Quality Committee meets annually and as otherwise needed and provides budget and overall program review and governance direction. The Committee is comprised of several City Managers and is supported by County staff.

City Engineer's Technical Advisory Committee (TAC)/ Planning Advisory Committee (PAC)

The TAC acts in an advisory role to the Permittees and implements policy previously established by the Permittees. The TAC is comprised of one City Engineer, or selected

representative from each of the County Supervisorial Districts and a representative from the County of Orange. The TAC is expanded to the TAC/PAC when matters relating to land development are considered. It meets 4-6 times annually. Meetings of the TAC and the TAC/PAC are subject to the Brown Act.

General Permittee Committee

The General Permittee Committee is the principal forum for disseminating information for program coordinators. The Committee meets monthly (except November). The Committee periodically evaluates the need for creating standing sub-committees and ad hoc committees as needed in order to accomplish the objectives of the Orange County NPDES Stormwater Program.

Sub-Committees/Task Forces

The task forces, sub-committees and ad-hoc working groups provide for the continued development of the Program in specialized areas. The management framework is reviewed annually to ensure it meets program needs. All of the task forces, sub-committees and ad-hoc working groups have brought forward initiatives to meet the requirements of the Fourth Term Permits and to address Program needs under a consensus building process. The frequency (i.e. number of meetings) of meetings is undergoing re-evaluation with respect to the upcoming Fifth Term MS4 Permit as programs attain maturity and require less oversight.

Program Funding

Over the last 10 years the countywide cost of compliance with the permits has almost doubled from approximately $55m in FY2000-01 to $95m in FY2011-12. These costs are anticipated to continue to increase as the Program shifts toward a greater emphasis on watershed management approaches to address burgeoning TMDL requirements.

In FY2011-12, the funding sources used by the Permittees to meet these costs included: General Fund, Utility Tax, Separate Utility, Gas Tax, and Special District Fund, Others (Sanitation Fee, Fleet Maintenance, Community Services District, Water Fund, Sewer & Storm Drain Fee, Grants, and Used Oil Recycling Grants) (See Figure 6.2). While increasingly more stringent regulatory obligations prompt consideration being given to creation of dedicated stormwater funding, there are significant obstacles to overcome.

Figure 6.2: FY2011-12 Funding Sources

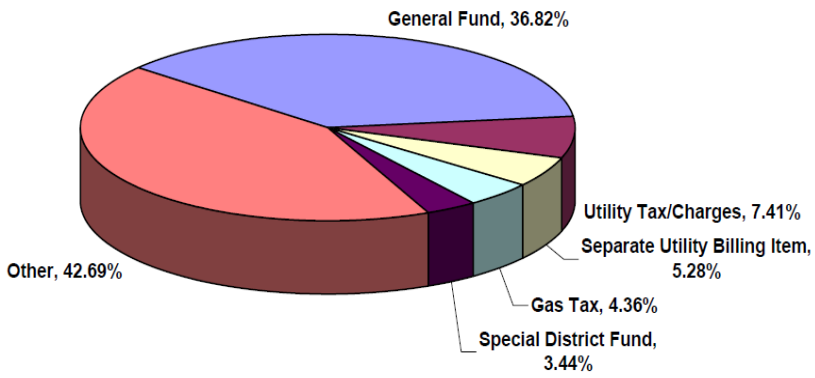

In November 1996, California voters approved Proposition 218 which requires that any new or increased property-related fee be subject to voter approval. Proposition 218 has created a significant hurdle for municipalities seeking to levy charges for storm water management programs that, with successive permits are becoming increasingly complex. The Proposition did create an exemption to the voter approval requirement for water, sewer and trash collection fees, and some municipalities adopted the position that stormwater fees were akin to water or sewer fees, and thus exempt from the voter approval requirement. However, the 2002 court decision in *Howard Jarvis Taxpayers Association v. City of Salinas* established definitively that storm water or storm drainage fees are property-related fees subject to Proposition 218, and are not exempt from voter approval requirements. Based on this ruling, any new or increased stormwater fee must be approved by 66% of voters (Office of the Independent Budget Analyst Report, City of San Diego, 2009).

The uncertainty regarding future compliance costs is a concern to the Permittees. Consequently, a costs study, including a review of funding options, will be completed in the next permit term.

6.3 Program Representation and Coordination with Other Agencies

Orange County Transportation Authority (OCTA)

The Principal Permitteee co-chairs the OCTA's Environmental Cleanup Allocation Committee which oversees the Environmental Cleanup Program (ECP). The ECP is intended to support improvements in overall water quality by providing funding for projects addressing transportation-generated pollution. The Committee has been meeting on a monthly basis since November 2007.

The Tier 1 Grant Program is designed to mitigate the more visible form of pollutants, such as litter and debris that collects on roadways and in storm drains prior to being deposited in waterways and the ocean. Tier 1 consists of funding for equipment purchases and upgrades to existing catch basins and related best management practices (BMPs) such as screens, filters, inserts and other streetscale low-flow diversion projects. A total of up to $19.5 million is available for the Tier 1 program over a seven-year window from 2011-12 through 2017-18.

The first Tier 1 call for projects was issued in February 2011. In August 2011, the Board approved the funding of 34 projects to 23 cities and the County of Orange, totaling more than $2.8 million. In August 2012, the Board approved a second round of funding with a total of $2.8 million awarded to 33 projects from 24 cities and the County.

The Tier 2 Grant Program consists of funding regional, potentially multi-jurisdictional, capital-intensive projects. Examples include constructed wetlands, detention/infiltration basins and bioswales, which mitigate pollutants including litter and debris, but also heavy metals, organic chemicals, sediment and nutrients. The Tier 2 program is funded with bond financing revenues with up to $38 million from the EAP allocated through fiscal year 2015-16. Beyond 2015-16, funding will be based on a pay-as-you-go basis.

To date Tier 1 funding of $8.6 million has been awarded to 85 projects and Tier 2 funding of $12.7 million has been awarded to 8 projects.

California Stormwater Quality Association

Since 1989, CASQA has assisted the State of California, USEPA, municipalities, special districts and businesses in developing and implementing effective water quality management programs in California. CASQA is a leader in helping California comply with the municipal and industrial NPDES stormwater mandates of the federal Clean Water Act. The Principal Permittee is active on the Board of Directors, Executive, Program Committee, Policy and Permitting Sub-Committee and Public Information – Public Participation Sub-Committee.

Stormwater Monitoring Coalition

The SMC was formed in 2001 and revised in 2008 by cooperative agreement of the Phase I municipal stormwater NPDES lead Permittees, Caltrans, the NPDES regulatory agencies in southern California, SCCWRP and USEPA Office of Research. The SMC seeks to improve the effectiveness of existing programs, particularly monitoring, by promoting standardization and coordination, and reducing duplication of effort across individual programs.

Southern California Coastal Water Research Project

The SCCWRP is a joint powers agency research institute focusing on the coastal ecosystems of Southern California from watersheds to the ocean. It was formed in 1969 to enhance the scientific understanding of linkages among human activities, natural events, and the health of the Southern California coastal environment; to communicate this understanding to decision makers and other stakeholders; and to suggest strategies for protecting the coastal environment. Current SCCWRP studies of particular significance to the Program include Bight '13, investigations into toxicity, trash and debris and microbiology, and the effort to better coordinate environmental monitoring in the Newport Bay watershed.

The Principal Permittee participated as a Commissioner on SCCWRP's governing board and as the Program's representative on the Commission Technical Advisory Group (CTAG).

6.4 Recommendations

The recommendations are:

1. **Retain the NPDES Stormwater Permit Implementation Agreement**.

2. **Continue the program management framework, albeit with a reduction in meeting frequencies**.

3. **Complete study of future stormwater compliance costs and funding alternatives**.

4. **Continue collaborative regional studies**.

Implementation Schedule – Program Management and Financing

Proposed Program Management and Financing Actions	Recommendations[1]	Implementation Schedule[2]				
		2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
Implementation Agreement						
Retain agreement	C					
Program Management Framework						
Retain management framework	C					
Program Costs and Funding						
Complete cost and funding options study	N			X		

1. C = Continue; E = Enhance; N = New
2. X = Recommendation will be completed during this fiscal year. Gray shaded cells indicate ongoing implementation

7.0 Recommendations for Fifth Term Permit

7.1 Overview

Established in 1990, the Program is a cooperative regulatory partnership of the Permittees who operate an interconnected municipal storm drain system which discharges stormwater and urban runoff and at the same time provides flood protection to the United States' sixth most populous county. In Orange County, the impact of urbanization on hydrologic systems and the adverse consequences of both changed hydrology and pollutant source creation are evident today in Orange County's principal drainage systems. However, at the same time, there are very significant water quality successes, such as coastal water quality along the entire length of the Orange County coastline and sources of bacteria contamination having been reduced through targeted actions that can unequivocally be attributed to the impact of the Program and the Permittees.

7.2 Future Program Development and Implementation

During the Fourth Term Permit period there has continued to be a significant allocation of resources the integration of LID and hydromodification control practices into local land development regulation. Going forward, this element of the Program will continue to be a major focus of activity as the Permittees look to create off-site and in-lieu fee options for alternative compliance pathways for land development and re-development. This focus also aligns with broader State Board integrated water resource management goals centered on better use of stormwater for local water supply augmentation, increasing interest in "green infrastructure" solutions and realization of the restorative goals of the Clean Water Act.

Development of a watershed-based planning approach is viewed as the most important next step to take in the development of the Program. Such an approach offers the opportunity for more comprehensively identifying the meaningful environmental and recreational amenities that can be realized in each watershed and the management strategies that will most effectively ensure their realization. These plans will also provide an opportunity, through linkage and integration, for cogency to be brought to a number of related restoration projects and sub-regional water management efforts such as the Integrated Regional Water Management Plans.

With respect to specific water quality constituents of concern, there will be additional effort directed toward pollutant control and research into the environmental significance of pesticide related toxicity, bacteria, and nutrients.

<u>Pesticides</u>

Synthetic pyrethroids have been identified as a significant urban runoff water quality issue on a statewide basis. Directly as a consequence of the efforts of CASQA, the Department of Pesticide Regulation enacted regulations that became effective in July, 2012, specifically intended to limit where structural pest control businesses can apply pesticides in an effort to protect water quality in urban areas. The rules restrict the use of 17 pyrethroid insecticides applied by businesses and significantly limit the amount of pesticides that can be applied outdoors, especially to concrete and other hard surfaces more susceptible to runoff. The regulations also prohibit outdoor pest control applicators and maintenance gardeners from

spraying when it rains or to standing water due to rainfall or watering. An evaluation of the regulations by UC Davis suggested that they could affect an 80% reduction in pyrethroid concentrations in runoff. Nonetheless, the Program will continue to seek to make additional progress with IPM policy implementation and general public education and outreach.

Bacteria

There is significant progress to be reported in Orange County regarding trends in bacterial contamination. Indeed, long-term monitoring of bacterial indicators of contamination shows that exceedances of regulatory standards are low and have been dropping over time and that the annual percentage of Heal the Bay report card grades of A has been between 93% and 97% since 2005. This very significant progress with respect to shoreline water quality underscores the impetus for action that comes from broad societal recognition of a problem, an unequivocally favorable cost-benefit analysis and the ability to implement pragmatic cost effective solutions.

In inland surface waters the issue of systemic elevated concentrations of bacteria persists. However, intensive monitoring of the Aliso Creek watershed appears to show that reductions in dry weather flow have produced significant reductions in bacterial concentrations. This finding points to the value of efforts to curtail outdoor water usage. Consequently, collaboration with water districts on water conservation themed education and outreach will continue to be the focus of efforts to engage the general public and sustain the ongoing reductions in bacteria concentrations being observed in inland surface waters.

Nutrients

Eutrophication of estuaries and coastal waters has been linked to anthropogenic changes in watersheds and is of concern because of the potential for harmful algal blooms, hypoxia, and impacts on aquatic food webs. Across Orange County's watersheds nutrients continue to present a regulatory concern although the environmental significance of nutrients and the specific contribution of urban sources is less understood in these other areas. Nutrient thresholds are frequently exceeded in the County's streams and channels. However, there are many less frequent occurrences of impacts, such as macroalgal overgrowth, due to these exceedances. Moreover nutrient problems are not limited to the urban portion of the County; regional monitoring data show nutrient enrichment and impacts such as increased macroalgal cover and/or lower dissolved oxygen in streams and estuaries in undeveloped regions. Pending further research, the Program will continue to effect reductions in municipal fertilizer use through implementation of the Program's IPM policy and encourage water quality-sensitive landscape maintenance practices in the general population through education and outreach.

7.3 Proposed Management Program

Based upon the prior discussion and in response to the findings of the environmental quality monitoring program, the Program proposes the following management program for the period of the Fifth Term MS4 Permit:

State of the Environment: Bacteria

- Continue targeted data analyses of monitoring data to prioritize problem areas. Conduct additional source

tracking studies as needed, using new monitoring methods based on genetic markers to identify potential sources of these problems such as infiltration into the MS4 from sewage lines. This effort should build on results of the Bight '13 Microbiology Study (**see Section 2.3.6**);

- Continue identifying opportunities to reduce and prevent flows in dry weather, where monitoring and source tracking data suggest the presence of human fecal contamination (**see Section 2.3.6**);

- Conduct statistical power analysis and optimization studies to improve existing monitoring program designs to improve efficiency and take advantage of available information about patterns and trends of contamination (**see Section 2.3.6**);

- Shift resources from routine monitoring to targeted source tracking and adaptive response, using new tools such as genetic markers of human fecal contamination as these become available (**see Section 2.3.6**);

- Continue supporting regional and collaborative research into better monitoring and source tracking tools (**see Section 2.3.6**);

- Improve understanding of health risk related to high wet weather flows, for example, through the Bight '13 Microbiology Study; follow results of the pilot wet weather epidemiology study planned for San Diego and consider supporting the larger, follow-on study planned for 2014-15 (**see Section 2.3.6**); and

- Conduct pilot mass balance studies to determine their utility for improving the prioritization of management actions (**see Section 2.3.6**).

State of the Environment: Dissolved Solids

- Conduct a mass balance study, even if at a crude level, to determine the extent to which the MS4 contributes to dissolved solid levels in the creek (see **Section 2.4.2**);

- Prepare a summary report on historic and contemporary conditions of dissolved solids across south Orange County (see **Section 2.4.2**);

- Invest effort into understanding whether dissolved solids are important stressor on macroinvertebrate communities in the creeks to evaluate the environmental significance of elevated dissolved solid concentrations (see **Section 2.4.2**); and

- Continue evaluating changes in dissolved solids at key locations such as Oso Creek in concert with water conservation efforts to track changes in dissolved solids over time (see **Section 2.4.2**).

State of the Environment: Nutrients

- Conduct an assessment of sources and practices that input to the MS4 to assess the significance of each to downstream issues (**see Section 2.5.5**);

- Continue identifying opportunities to reduce and prevent flows in dry weather (**see Section 2.5.5**);

- Pilot a regional mass balance nutrient model, even if elementary, to help prioritize monitoring and management attention; the Newport Bay watershed and SCCWRP coastal ocean nutrient mass balance models provide useful examples (**see Section 2.5.5**); and

- Use available time series of data to streamline monitoring to improve its statistical and economic efficiency. Sampling effort could be reduced by identifying stations that essentially mimic each other and/or by reducing the spatial and/or temporal intensity of sampling. Monitoring could shift to a sentinel program with a lower frequency of monitoring intended to ensure conditions do not worsen (**see Section 2.5.5**).

State of the Environment: Toxicity

- Reassess management concerns and priorities about metals impacts in freshwater channels, bays and estuaries, and the nearshore coastal zone (**see Section 2.6.5**);

- To the extent that metals, particularly copper, remain a concern because of potential impacts in bays and harbors, recognize that inputs from antifouling paint, which are not an urban runoff issue, are likely a more important source than watershed input (**see Section 2.6.5**);

- Improve information on the use of pesticides in the County, particularly by the largest applicators (**see Section 2.6.5**);

- Work with other interested parties to fill the data gap related to retail sales of pesticides (**see Section 2.6.5**);

- Examine the CDPR database to develop a more thorough picture of trends in reported pesticide use (**see Section 2.6.5**);

- Use this information to expand and focus cooperative outreach efforts about proper pesticide application and the use of alternatives such as botanical oils that are effective, but nonlethal, insect deterrents (**see Section 2.6.5**);

- Use available data to streamline monitoring and improve its statistical and economic efficiency. Consider reducing the current focus on metals monitoring and targeting pesticide monitoring on less expensive representative constituents or surrogates. Consider reducing the frequency of sampling for sediment associated constituents to the Bight Program's sampling frequency (**see Section 2.6.5**);

- Given the overall low level of observed toxicity, consider increasing the use of adaptive responses (e.g., TIEs and other types of causal assessment) in place of intensive routine monitoring (**see Section 2.6.5**);

- Continue taking advantage of opportunities to reduce dry weather runoff to channels (**see Section 2.6.5**); and

- Continue the productive relationship the University of California's South Coast Research and Extension

Center and take advantage of opportunities for its Director to communicate the stormwater management perspective to CDPR (**see Section 2.6.5**).

Controlling Pollutant Sources: Watershed Programs – Aliso Creek

- Reduce current Permittee quarterly progress reporting to an annual basis. Observed watershed bacteria reductions have shifted efforts away from new BMP projects to ongoing BMP maintenance decreasing the benefit of quarterly reporting. (**see Section 4.4**); and

- Continue implementation of monitoring and reporting described in the Revised Aliso Creek Program through December 2015 with 2015 annual reporting to include a reevaluation of the program relative to watershed bacteria TMDLs, the watershed Comprehensive Load Reduction Plan (CLRP), and related NPDES programs. (**see Section 4.4**).

Municipal Infrastructure and Integrated Pest Management

Continue current model programs and*:*

- Enhance municipal training to address common issues encountered through municipal related complaints and to utilize innovative education formats to encourage effective discussion-based learning. The four most common issues that occur are: trash/debris, pathogen/bacteria, hydrocarbons and exempt discharges. Training will focus on in-classroom engagement of concepts learned prior to the training session and focus on reducing issues and pollutants of concern through specific actions (e.g. runoff reduction to reduce bacteria loading) (**see Section 3.2.3**);

- Develop a municipal green infrastructure program that could include evaluation of opportunities for pilot green street projects of different land use/density configurations and development of a green street guidance manual (**see Section 3.2.3**);

- Examine public land retrofit opportunities for regional BMPs and propose a program to evaluate previously identified regional retrofit opportunities in jurisdictionally owned areas for use in TMDL compliance and LID and/or hydromodification management alternative compliance. This effort will involve the development of watershed models and evaluation of the previously identified potential BMP retrofit sites. Previous reviews (e.g. 2005 RBF retrofit study) will be integrated with current mapping (**see Section 3.2.3**);

- Develop and initiate the implementation of individualized IPM Guidelines for each Permittee with the goal of demonstrating significant and consistent reductions in fertilizer and pesticide applications based on the mission and goals outlined in jurisdictional IPM Policies (**see Section 3.2.3**);

- Conduct pilot soil and/or leaf tissue analysis to guide fertilizer use to ensure nitrogen is not applied at annual rates above those recommended by UCCE research. The Permittees would identify the most fertilizer-intensive area by type (e.g. sports fields) and select one site for analysis. The analysis would assist Permittees in fine-tuning nitrogen application based on

the needs of plants at the highest use areas (**see Section 3.2.3**)

- Improve methods for documenting usage of fertilizer and active ingredient of pesticide on an annual basis to allow for more reliable data on the acreage receiving fertilizer applications. In collaboration with the UCCE, a standardized reporting method would be developed, improving reporting accuracy on both the amount of nitrogen and pesticides applied by Permittees on an annual basis. The objective would be to minimize fertilizer applications where annual rates exceed those recommended by UC research (174 -261 lbs. N/acre) while more accurately capturing the acreage to which fertilizer is applied (**see Section 3.2.3**); and

- Expand training to include peer-reviewed online training courses offered by University of California IPM (UC IPM) and UCCE to ensure the IPM and water quality message reaches as many field staff as possible. Possible options include the UC IPM Urban Pesticide Runoff and Mitigation online training series developed by UC academics across the state to provide a more suitable method to reach field staff unable to attend in-person training. The online training consists of a series of courses directly addressing the impacts of pesticides on water quality as well as practices to mitigate these impacts (http://www.ipm.ucdavis.edu/training/upr-mitigation.html) (**see Section 3.2.3**).

Public Outreach

Continue current model program and:

- Emphasize outreach to school-age children to continue building upon existing partnerships and increasing knowledge of the Orange County community as a whole through increasing knowledge of youth (**see Section 3.3.7**);

- Incorporate current strategic approach of using public awareness survey results to prioritize outreach efforts based on behaviors of concern in tandem with water quality results to document small-scale behavior change over time (**see Section 3.3.7**);

- Coordinate with water supply agencies to incorporate water use efficiency and runoff reduction messaging to maximize program reach and ensure requested behavior changes align with water use efficiency techniques supported by other agencies. Coordinate to encourage behaviors and develop programs supportive of building a sustainable local water supply as identified in the Water Quality Implementation Plan; including building social norms around water use efficiency and elimination of irrigation runoff (**see Section 3.3.7**);

- Develop focused outreach campaigns based on water quality and survey results utilizing CBSM techniques to document changes in targeted behaviors. The Permittees will develop focused campaigns supportive of a singular message with the goal of reducing competing messaging that may lead to inaction. CBSM tactics will be utilized to target behaviors associated with water quality priorities identified in the Water Quality Implementation Plan (**see Section 3.3.7**);

- Encourage greater public participation in stormwater pollution prevention and elimination of non-stormwater discharges through the use of CBSM and increased availability to online resources. Action campaigns would encourage residents to take an identified action and to share efforts with others (**see Section 3.3.7**);

- Social media calendars will synchronize outreach efforts and encourage direct participation in and sharing of program messaging. Social media forms of earned media will complement action campaign elements by encouraging direct residential participation in programs. Activity on social media significantly increases with boosted posts and paid advertising; these unpaid and paid tools will support CBSM programs (**see Section 3.3.7**); and

- Review website for usability and revise structure as needed to meet goals of increasing public use of web content. The goal of the review will be to increase access to mapping tools, water quality data and BMPs to prevent water pollution (**see Section 3.3.7**).

New Development / Significant Redevelopment

- Implement an approach to hydromodification management that is informed by a watershed analysis and channel-specific protection and restoration goals. The Permittees understand that, consistent with current published research, a "one-size-fits-all" for hydromodification management is not appropriate for highly modified urban stream systems. Pending a watershed analysis, land development projects discharging runoff to engineered channels, should not be required to implement hydromodification management controls (see **Section 3.4.3**);

- Incorporate an IRWM element into the land planning/land development process. The Permittees understand that an integrated water resources management approach is needed to optimize attainment of water quality protection, water conservation, flood control, and stream protection goals. The Permittees therefore intend to incorporate an integrated water resources management element into their land planning and land development processes so that as development projects begin entitlement this approach and opportunities to achieve this approach are evaluated. This recommendation will require a modified LID Hierarchy that establishes the equivalency of "On-site BMP" and "Off-Site /Regional BMP" solutions (see **Section 3.4.3**);

- Create an exemption from Project WQMP requirements for steam and watershed restoration projects (see **Section 3.4.3**);

- Create an exemption for emergency public safety projects where delay would compromise public safety, public health and/or the environment (see **Section 3.4.3**);

- Develop an internet based regional geodatabase. To effectively implement an IRWM and watershed management approach, access to information that describes all of the key hydrologic process and landscape characteristics will be critical. The

Permittees are developing and starting to use an internet-based regional geodatabase to give developers and municipal staff access to the geotechnical and hydrologic information necessary for evaluating the application of the LID hierarchy to sites (see **Section 3.4.3**);

- Develop an internet based Project WQMP Submittal Tool and Database potentially in collaboration with Riverside and San Bernardino. The Permittees spend a significant amount of time plan checking and tracking Project WQMPs and so the permittees propose development of an internet based Project WQMP review tool to streamline the submittal and review of WQMPs, allow for enhanced tracking of WQMPs and WQMP inspections, and help with effectiveness assessments and annual reporting (see **Section 3.4.3**);

- Pilot the use of technology to better track Project WQMP inspections and follow up actions needed. To fully utilize the WQMP Submittal Tool and Database WQMP inspections could be performed with tablets or other devices where GIS information and other information can immediately be uploaded to the database. The Permittees propose piloting the use of tablets or other devices linked to the Database for Project WQMP inspections by a select number of cities (see **Section 3.4.3**); and

- Enhance the data collected for WQMPs to have a better understanding of water quality benefits on an annual basis. The Permittees desire to perform a better assessment of the New Development/Significant Redevelopment Program. In order to better understand the effectiveness of the program, the Permittees propose to collect new critical data elements, and enhance data quality by integrating information into the WQMP Submittal Tool and Database. New data would include volumes of water treated, land area treated, and other relevant information needed to evaluate TMDL compliance, to identify developed/redeveloped areas that meet LID and/or hydromodification requirements, and to track BMP maintenance as a measure of effectiveness (see **Section 3.4.3**).

Construction

Continue current model program and

- Reduce the frequency of inspection for "high" priority sites from bi-weekly to twice during the wet season and reduce the frequency of inspection for "medium" priority sites from monthly to once during the wet season (see **Section 3.5.3**);

- Pilot a GIS and internet-based database to track construction sites. In order to provide easier tracking of construction sites on a countywide basis, the Permittees will develop a GIS and internet-based database where information regarding each construction site can be entered. The Permittees would examine the benefits of such a database by piloting implementation with a select number of cities (see **Section 3.5.3**);

- Conduct pilot field-testing of personal electronic devices to document inspections onsite. Use of tablets

or other electronic devices during inspections will allow inspectors to immediately upload construction site information to the GIS based database. The Permittees would pilot the use of these technologies with a select number of cities (see **Section 3.5.3**); and

- Conduct QSD/QSP Training. The QSD/QSP Training developed by the State Board and CASQA provides a detailed understanding of the Construction General Permit. The Permittees propose providing this training to municipal staff every other year to ensure that inspectors and other municipal staff understand the CGP requirements that are to be implemented for construction projects in their jurisdiction. It is anticipated that with potential changes to the CGP being adopted in 2014 that municipal staff should be aware of these changes and any new or modified requirements for CGP compliance (**see Section 3.5.3**).

Existing Development

Continue current model program and

- Consider incorporating the updated CASQA BMP fact sheets into the Existing Development Model Program (see **Section 3.6.6**).

Illegal Discharges/Illicit Connections

- The major elements of the program (e.g. the facilitation of public reporting of complaints, and the designation and training of Authorized Inspectors) continue to be vital and successful pieces of the Program. However, the NALs Program has proven to be less effective than the Dry Weather Reconnaissance Program. The recommendation is (see **Section 3.7.3**):
    - Reinstate an approach, such as the Dry Weather Reconnaissance Program, that allows investigative resources to be directed toward abating priority aberrant discharges;
    - Continue implementation of CASC; and
    - Consider development of a standardized reporting database potentially accessible by all Permittees.

Plan Development

- Continue to implement the Strategic Countywide/Jurisdictional Management approach (**see Section 5.4**);
- Develop a comprehensive Watershed Plan to evaluate the watershed and to prioritize implementation efforts and associated resource allocation (**see Section 5.4**);
- Develop pilot program(s) for regional water quality or groundwater recharge BMPs (**see Section 5.4**); and
- Develop model program(s) for water retention credit trading to facilitate off-site BMP implementation where appropriate and to address existing developed areas (**see Section 5.4**).

Program Management and Financing

- Retain the NPDES Stormwater Permit Implementation Agreement (**see Section 6.4**);

- Continue the program management framework, albeit with a reduction in meeting frequencies (**see Section 6.4**);

- Complete study of future stormwater compliance costs and funding alternatives (**see Section 6.4**); and

- Continue collaborative regional studies (**see Section 6.4**).

Attachment 1.1: Permittee Contact List

NPDES Permittee Contact List
San Diego Region

	Aliso Viejo	Dana Point	Laguna Beach	Laguna Hills	Laguna Niguel	Laguna Woods	Lake Forest
Name	**Moy Yahya**	**Lisa Zawaski**	**Tracy Ingebrigtsen**	**Ken Rosenfield**	**Nancy Palmer**	**Chris Macon**	**Devin Slaven**
Title	Environmental Programs Manager	Senior Water Quality Engineer	Senior Water Quality Analyst	Director of Public Works	Senior Watershed Manager	Special Projects Manager	Water Quality Specialist
Address	12 Journey, Suite 100	33282 Golden Lantern	505 Forest Ave.	24035 El Toro Rd.	30111 Crown Valley Parkway	24264 El Toro Road	25550 Commercentre Dr. Ste.100
City,CA Zip	Aliso Viejo, CA 92656	Dana Point, CA 92629	Laguna Beach, CA 92651	Laguna Hills, CA 92653	Laguna Niguel, CA 92677	Laguna Woods, CA 92637	Lake Forest, CA 92630
Alternate Name	**Shaun Pelletier**	**Brad Fowler**	**Mike Phillips**	**Humza Javed**	**JC Herrera**	**Moy Yahya**	**Angel Fuertes**
Title	Director of Public Works/City Engineer	Director of Public Works	Environmental Specialist	Associate Civil Engineer	Civil Engineer Tech/WQ Analyst	Code Enforcement & Water Quality Mgr	Assistant City Engineer
Address	12 Journey, Suite 100	33282 Golden Lantern	505 Forest Ave.	24035 El Toro Rd.	30111 Crown Valley Parkway	24264 El Toro Road	25550 Commercentre Dr. Ste 100
City,CA Zip	Aliso Viejo, CA 92656	Dana Point, CA 92629	Laguna Beach, CA 92651	Laguna Hills, CA 92653	Laguna Niguel, CA 92677	Laguna Woods, CA 92637	Lake Forest, CA 92630

	Mission Viejo	Rancho Santa Margarita	San Clemente	San Juan Capistrano	Countywide Program	County of Orange	OC Flood Control District	Regional Water Quality Control Board
Name	**Joe Ames**	**Rae Beimer**	**Tom Bonigut**	**Ziad Mazboudi**	**Richard Boon**	**Chris Crompton**	**Greg Yi**	**James (Jimmy) Smith**
Title	Assistant City Engineer	Stormwater Program Manager	Assistant City Engineer	Senior Civil Engineer/NPDES Coord.	Stormwater Program Manager	Manager, Environmental Resources	Project Manager	Assistant Executive Officer
Address	200 Civic Center Drive	22112 El Paseo	910 Calle Negocio, Suite 100	32400 Paseo Adelanto	2301 N. Glassell Street	2301 N. Glassell Street	300 N. Flower Street, Suite 716	9174 Sky Park Court, Ste. 100
City,CA Zip	Mission Viejo, California 92691	Rancho Santa Margarita, CA 92688	San Clemente, CA 92673	San Juan Capistrano, CA 92675	Orange, CA 92865	Orange, CA 92865	Santa Ana, CA 92703	San Diego, CA 92123-4340
Alternate Name	**Richard Schlesinger**	**E. (Max) Maximous**	**Mary Vondrak**	**Keith Van Der Maaten**	**Chris Crompton**	**Tony Olmos**	**Vincent Gin**	**Tony Felix**
Title	City Engineer	City Engineer	Management Analyst II	Utilities Director	Manager, Environmental Resources	Assistant Director of OC Engineering	Admin Manager II	Water Resource Control Engineer
Address	200 Civic Center Drive	22112 El Paseo	910 Calle Negocio, Suite 100	32400 Paseo Adelanto	2301 N. Glassell Street	300 N. Flower	300 N. Flower Street, Suite 315	9174 Sky Park Court, Ste. 100
City,CA Zip	Mission Viejo, CA 92691	Rancho Santa Margarita, CA 92688	San Clemente, CA 92673	San Juan Capistrano, CA 92675	Orange, CA 92865	Santa Ana, CA 92702-4048	Santa Ana, CA 92703	San Diego, CA 92123-4340

Attachment 3.4.1: Recommendations for Fifth term Permit - Hydromodification

Recommendations for Fifth term Permit: Hydromodification

The Fifth Term Permit should include an initial or time limited exemption for conveyance channels that are engineered and regularly maintained for the capacity to convey peak flows from the 10-year or greater storm for ultimate build out condition from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean. The proposed exemption is necessary to provide adequate time to develop a prioritized approach informed by a holistic watershed analysis

Discussion

The Program has expended significant resources to map and characterize the County's drainage systems and create a geodatabase that includes significant information regarding channel attributes. The geodatabase identifies the susceptibility of channel and stream systems to hydromodification from increased flow rates and durations. These efforts have categorized three basic channel conditions;

1. Natural condition or minimally modified;
2. Large river channels that are highly engineered and modified; and
3. Channels with substantial modification for flood control, most of which are engineered and maintained.

The Program proposes to prioritize the hydromodification management approach to identify and fully protect near-natural condition channels. Engineered channels with substantial modification and flood control function will have a lower priority for hydromodification management. A holistic watershed analysis will evaluate and prioritize channel reaches or basins regarding their potential for rehabilitation or potentially improving their ecological functions. An initial limited time exemption will provide the time to determine which modified channels have potential for rehabilitation to a more natural state, as well as channels with more constraints that reduces their potential for rehabilitation. Highly modified channels require further evaluation for several reasons:

- Engineered channels were installed for the purpose of flood control and protection of public safety and property. Alterations to these channels may conflict with their primary function in the built environment. Additionally, engineered flood control channels generally have limited options for modification as they must provide their mandated service of flood control within a right-of-way constrained by adjacent development. In virtually all cases, it is likely to be cost prohibitive to purchase additional right of way so that flood control channels could modified to approximate a natural state.
- Studies[1] have shown that hydromodification is caused by storms up to the 10 year event. Engineered channels designed to convey the 10-year ultimate build out condition will therefore not experience hydromodification impacts. and if impacts or damage does occur, the Flood Control District is legally obligated to repair the channel and restore the design function.
- The pre-development stream channel pathways were dynamic and changed through time. These natural washes were modified to provide flood protection for developed areas, fundamentally changing the slope and composition of the bed material. This modification is evident in south Orange County as identified for both Prima Deshecha identified in **Figure**

1 and Segunda Deshecha identified in **Figure 2** below. In both cases the historic paths of these streams were straightened, and development in the area was built as close to the modified channel right-of-way as possible. There are few opportunities to change the condition of these streams as most changes would require additional right-of-way acquired through condemning existing development.

The adverse hydrologic impacts to stream systems that can arise from land development must, be understood as a basis for the lawful requirement of mitigation. Based on the takings clause of the U.S. and California constitutions and the Mitigation Fee Act, hydromodification control requirements applied to development projects must bear a reasonable relationship to the impacts of the project. Requiring hydrologic controls on projects draining to receiving waters not susceptible to hydromodification is contrary to these legal requirements. An initial exemption for engineered channels is consistent with this mitigation concept of relationship and nexus to impacts.

In addition to legal concerns regarding the overly broad application of hydromodification management controls, significant fiscal constraints confront restorative goals. The Prima Deshecha and Segunda Deshecha watersheds (**Figures 1 & 2**), for example, demonstrate the quite profound changes to these channel systems that have attended development of the landscape. Moreover, it is evident in **Figures 1** and **2** that a re-configuration of these channels toward more natural channel alignments will require more land. Because of the costs identified in **Table 1** it will be fiscally infeasible to restore in many instances. The watershed analysis is needed to identify modified channels that genuinely present opportunities for restoration or rehabilitation in south Orange County and which will benefit from hydromodification management.

Table 1 Average Property Costs in Orange County

Property Type	Cost (per square foot)	Cost (per acre)
Retail	$355.52	$15,486,451.20
Office	$249.47	$10,866,913.20
Industrial	$179.39	$7,814,228.40

Source: Loopnet.com

A final consideration is another aspect of state law. The Orange County Flood Control District has been delegated authority by the Legislature to construct channels and infrastructure for flood control purposes. These engineered channels are intended for the protection of public safety and property and are mandated by the Orange County Flood Control Act of 1927. Engineered channels serve the public health and safety through flood control protection. A significant portion of Orange County lies in a flood plain and the public needs the benefits of these flood control channels for protection of public safety and property.

Based on the above information a time limited (i.e. pending completion of a watershed analysis) exemption for engineered channels is warranted and should be provided in the Fifth Term Permit for all engineered channels in South Orange County. Provided below are **Figures 3-14** that identify the engineered channels and associated drainage areas in South Orange County, including specific jurisdictions, that would be exempt for discharges to an engineered channel conveyance system with the capacity to convey the 10-year ultimate condition that extends from the point of discharge to water

storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean.

The approach to hydromodification management should be to protect the highest quality streams from future impacts of increased volume and velocity of runoff that will cause hydromodification impacts. A secondary goal of hydromodification management can be restoration or rehabilitation of stream channels where it is feasible, however the watershed analysis needs to be completed first, to identify which streams restoration or rehabilitation is practical.

Figure 1: Prima Deshecha Watershed – 1947 vs. 2012 Alignment

Figure 2: Segunda Deshecha Watershed – 1947 vs. 2012 Alignment

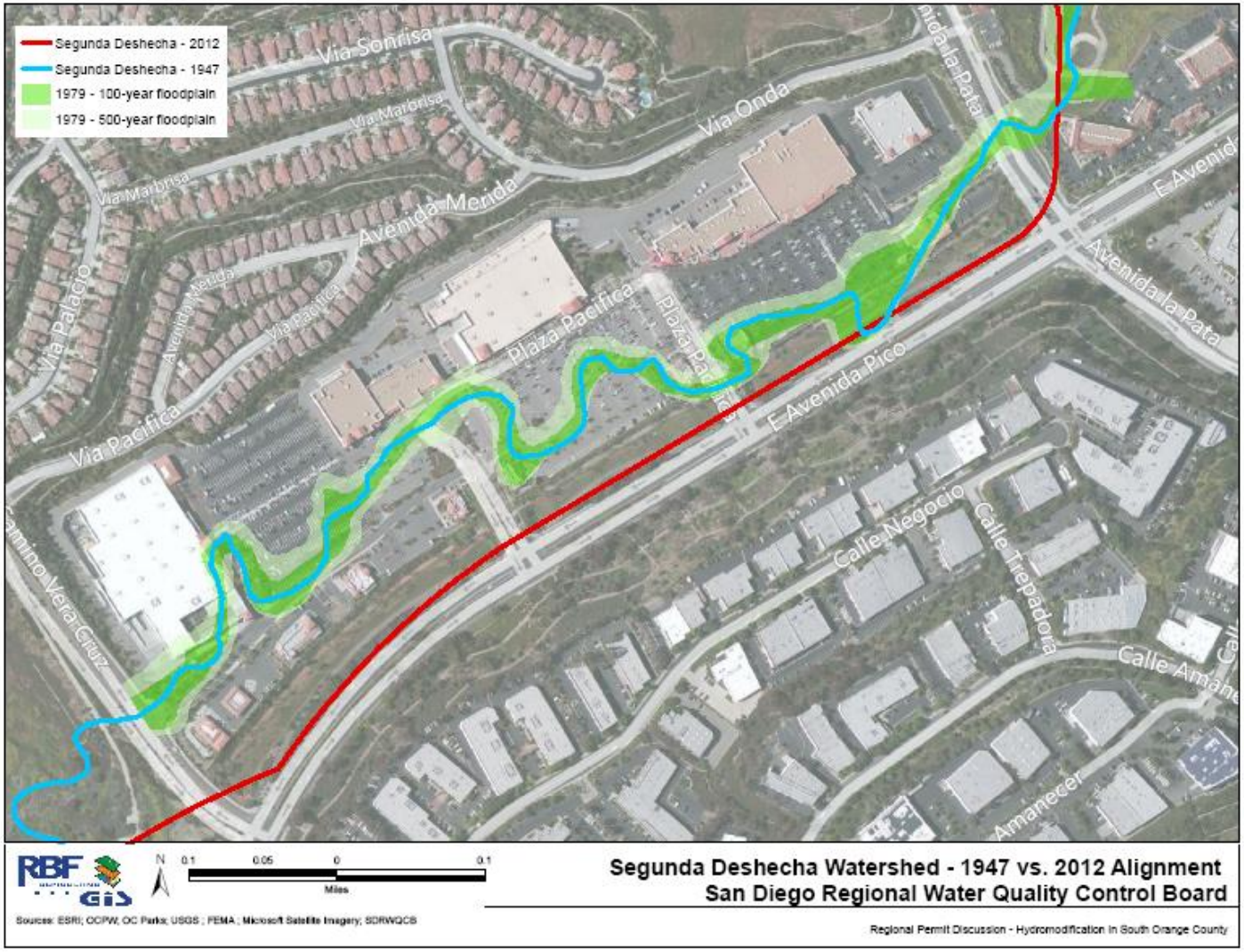

Figure 3: South Orange County Engineered Channels Exemption Areas

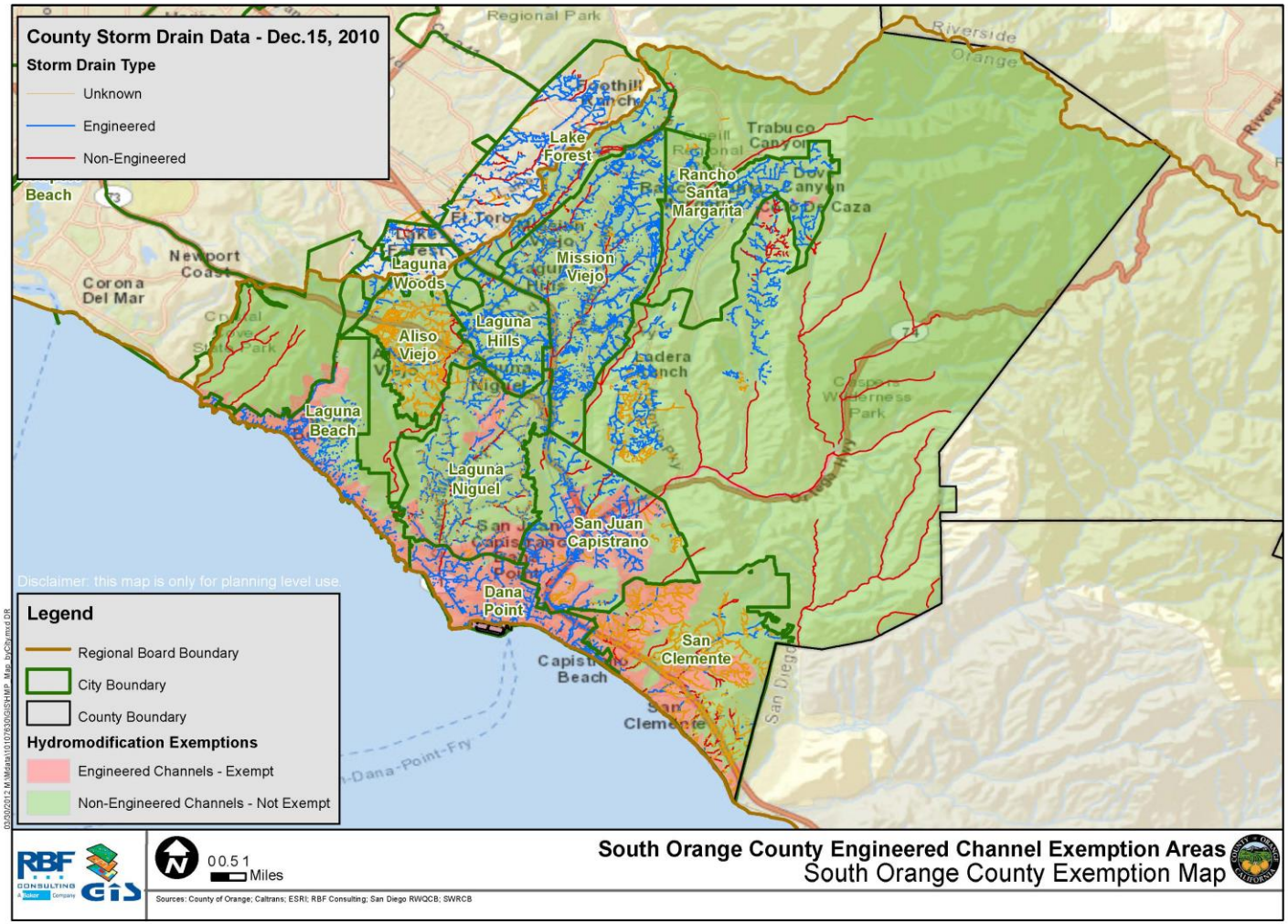

Figure 4: Lake Forest - South Orange County Engineered Channels Exemption Areas

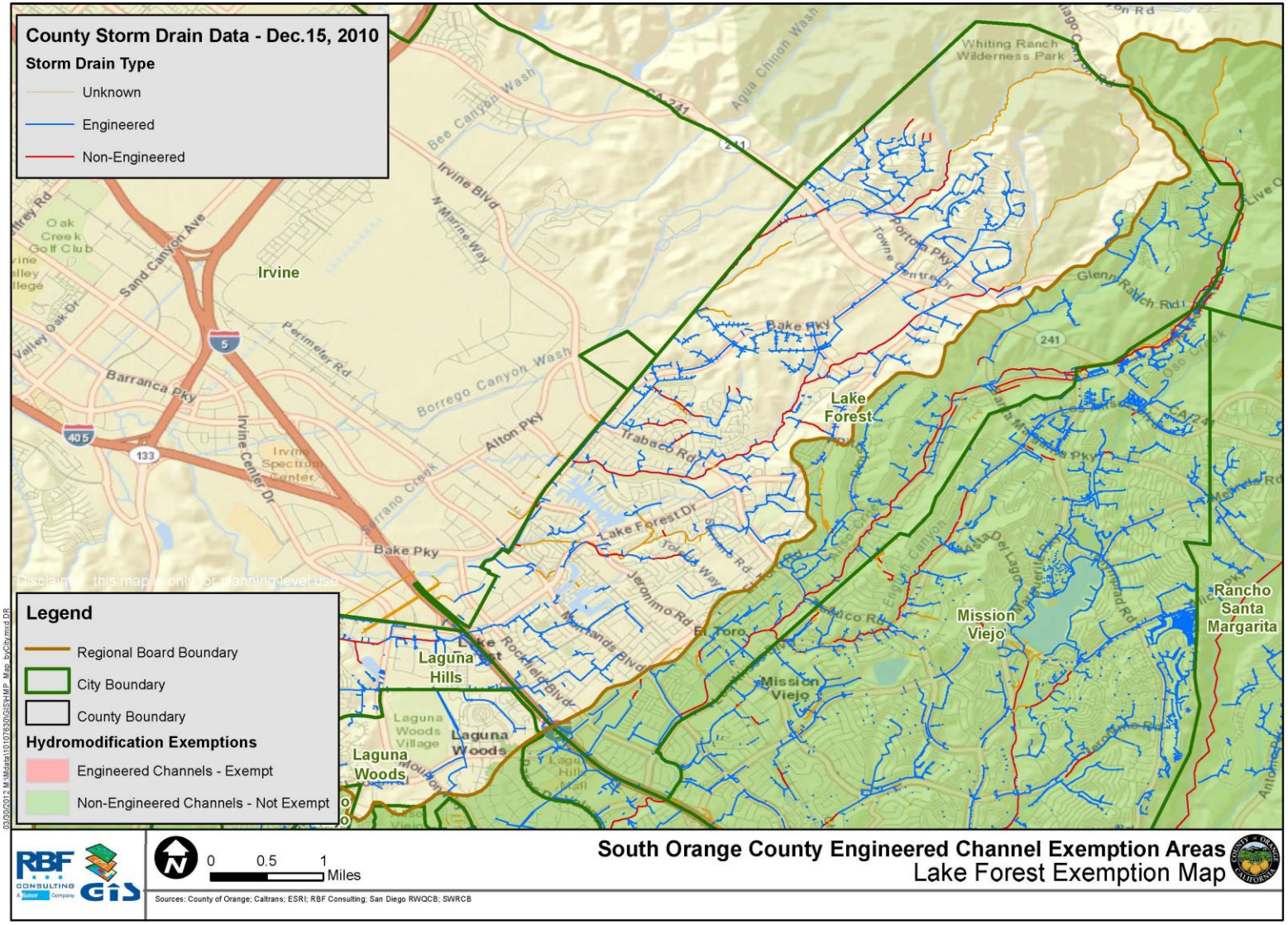

Figure 5: Laguna Woods - South Orange County Engineered Channels Exemption Areas

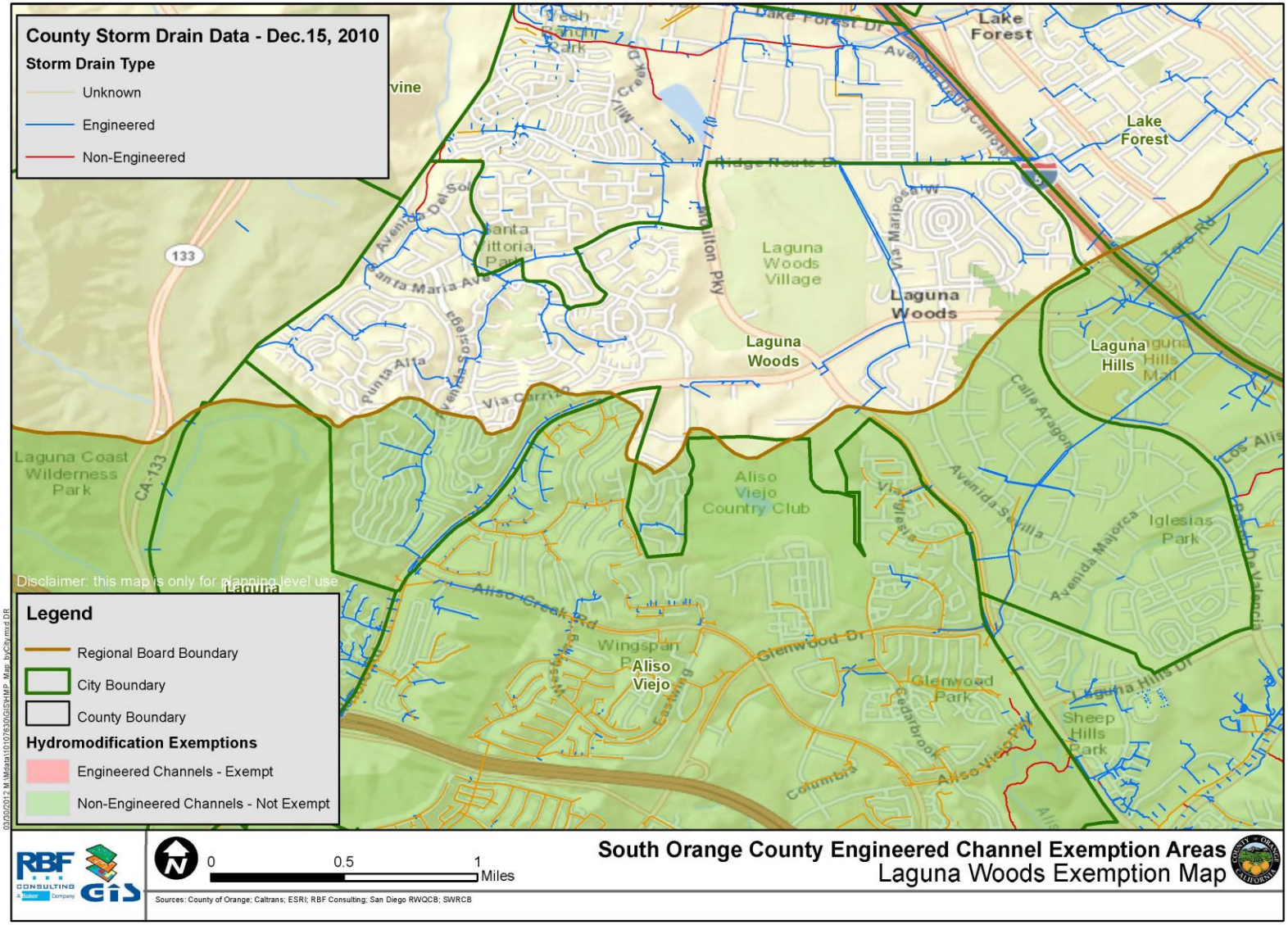

Figure 6: Rancho Santa Margarita - South Orange County Engineered Channels Exemption Areas

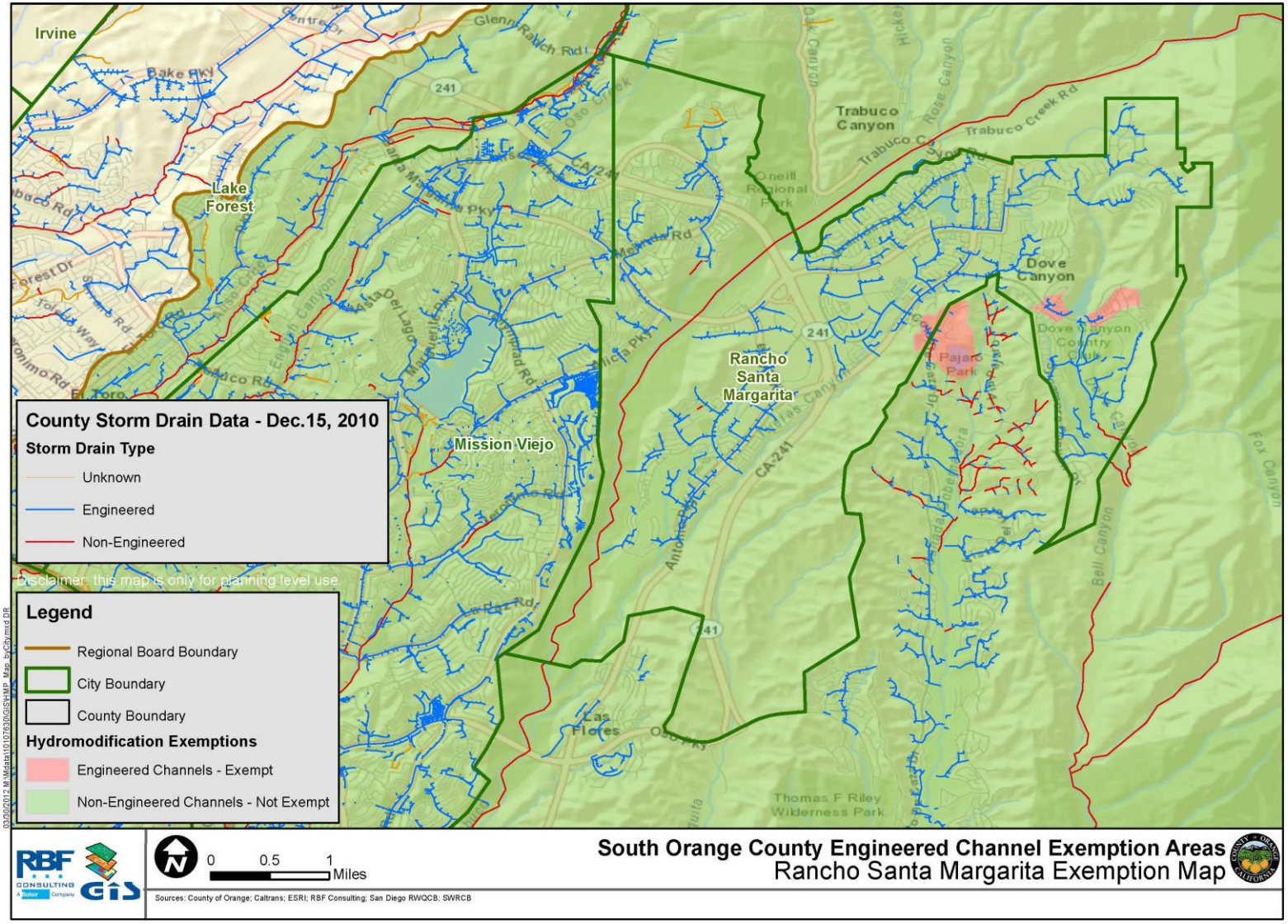

Figure 7: Mission Viejo - South Orange County Engineered Channels Exemption Areas

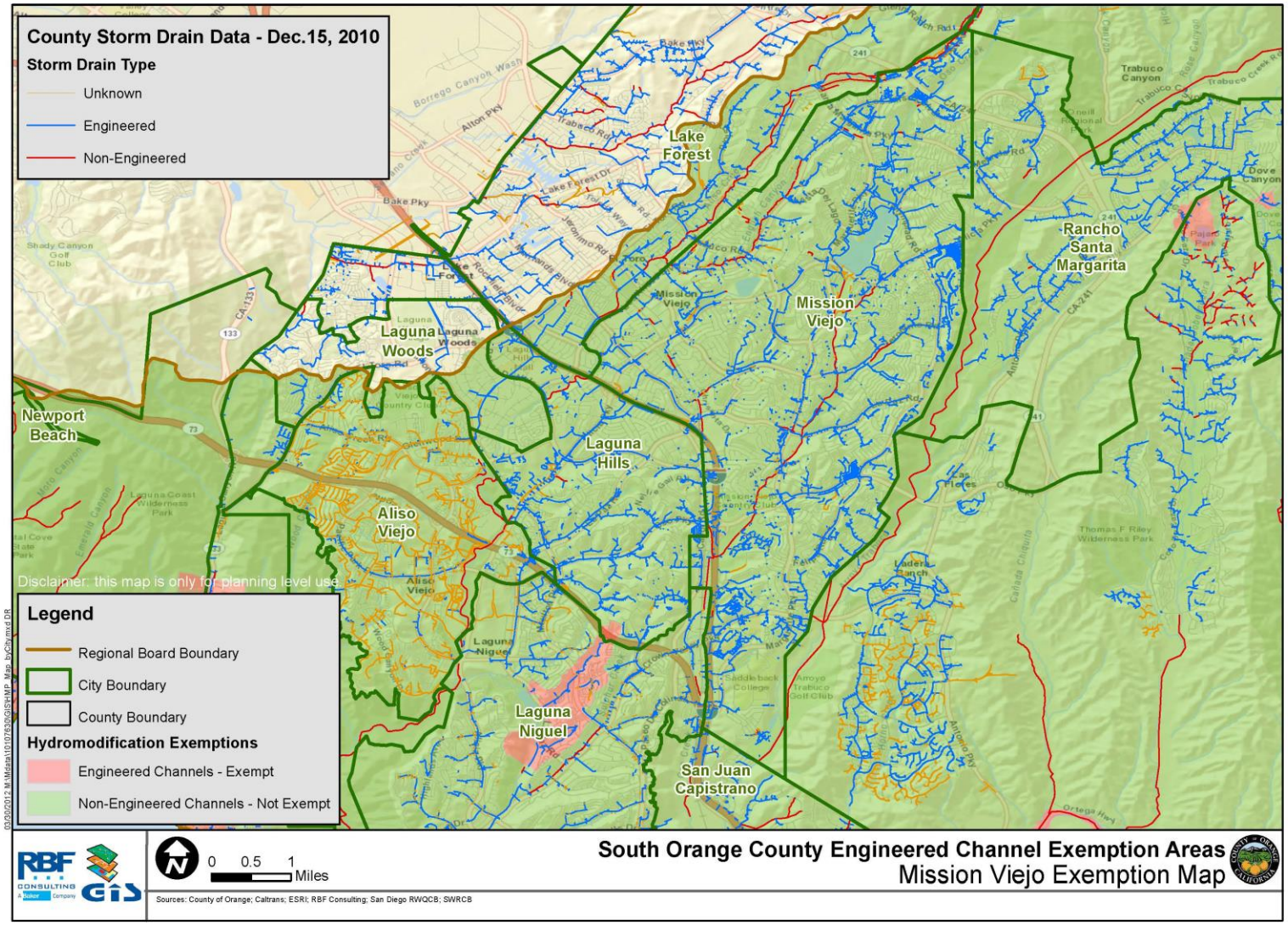

Figure 8: Laguna Hills - South Orange County Engineered Channels Exemption Areas

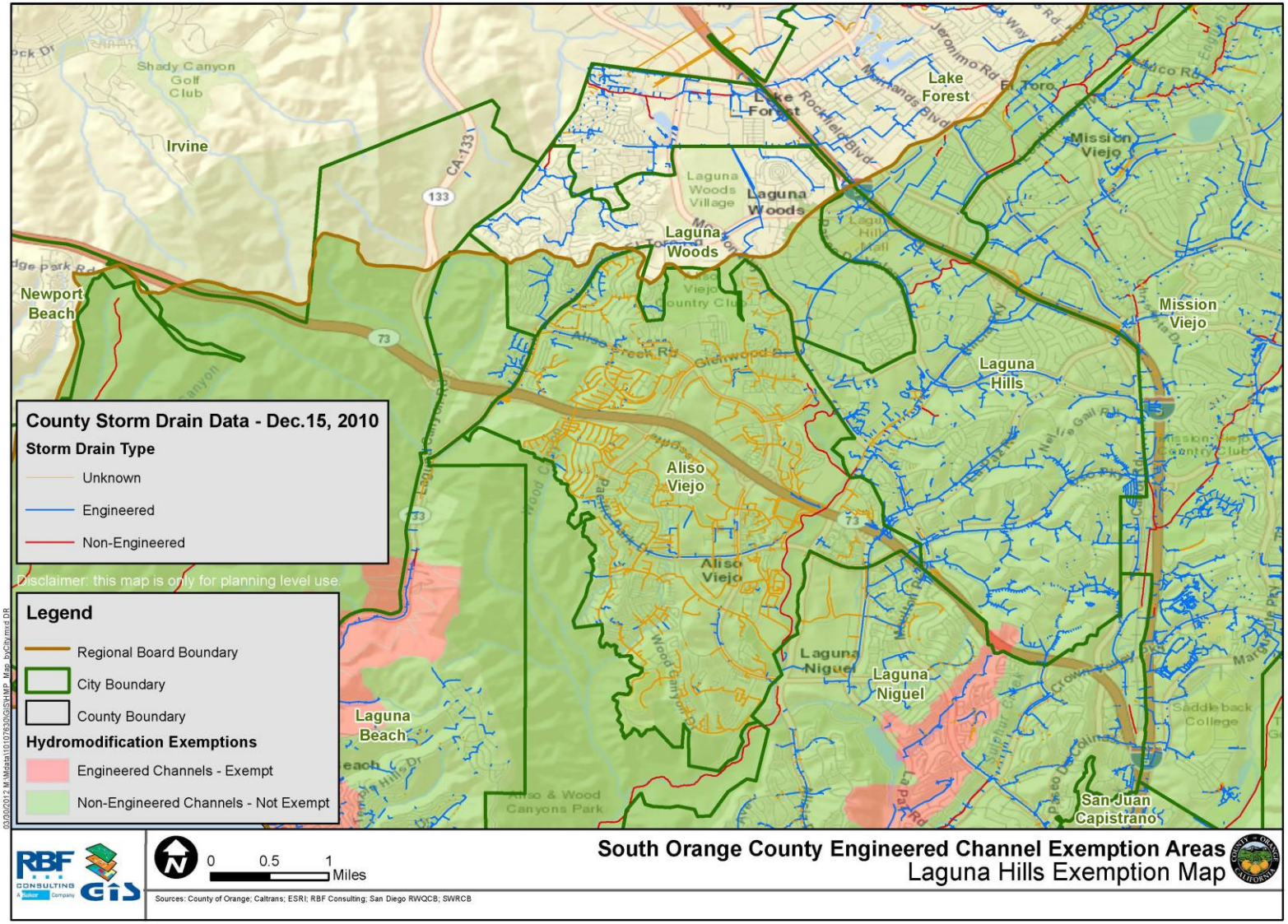

Figure 9: Aliso Viejo - South Orange County Engineered Channels Exemption Areas

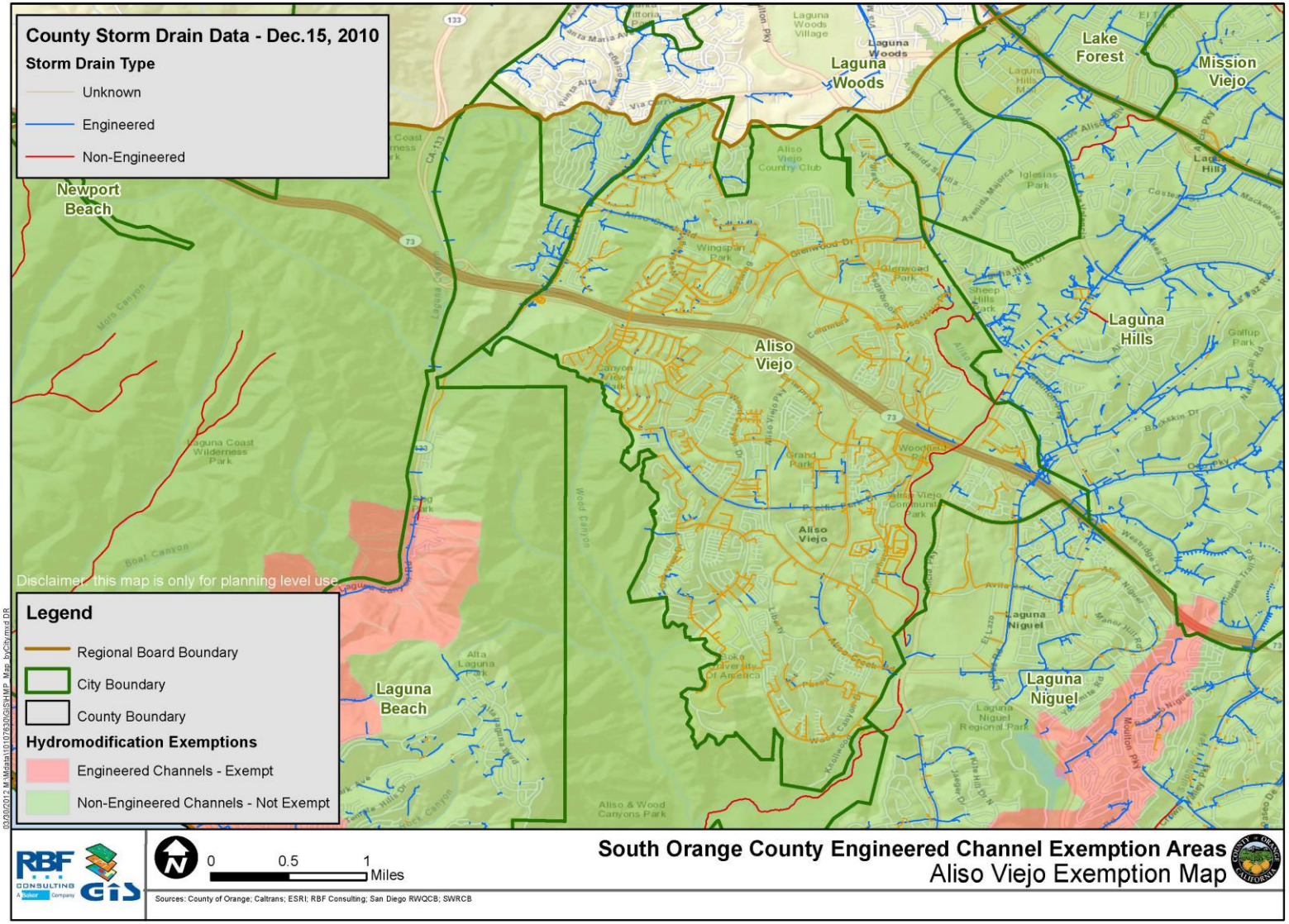

Figure 10: Laguna Beach - South Orange County Engineered Channels Exemption Areas

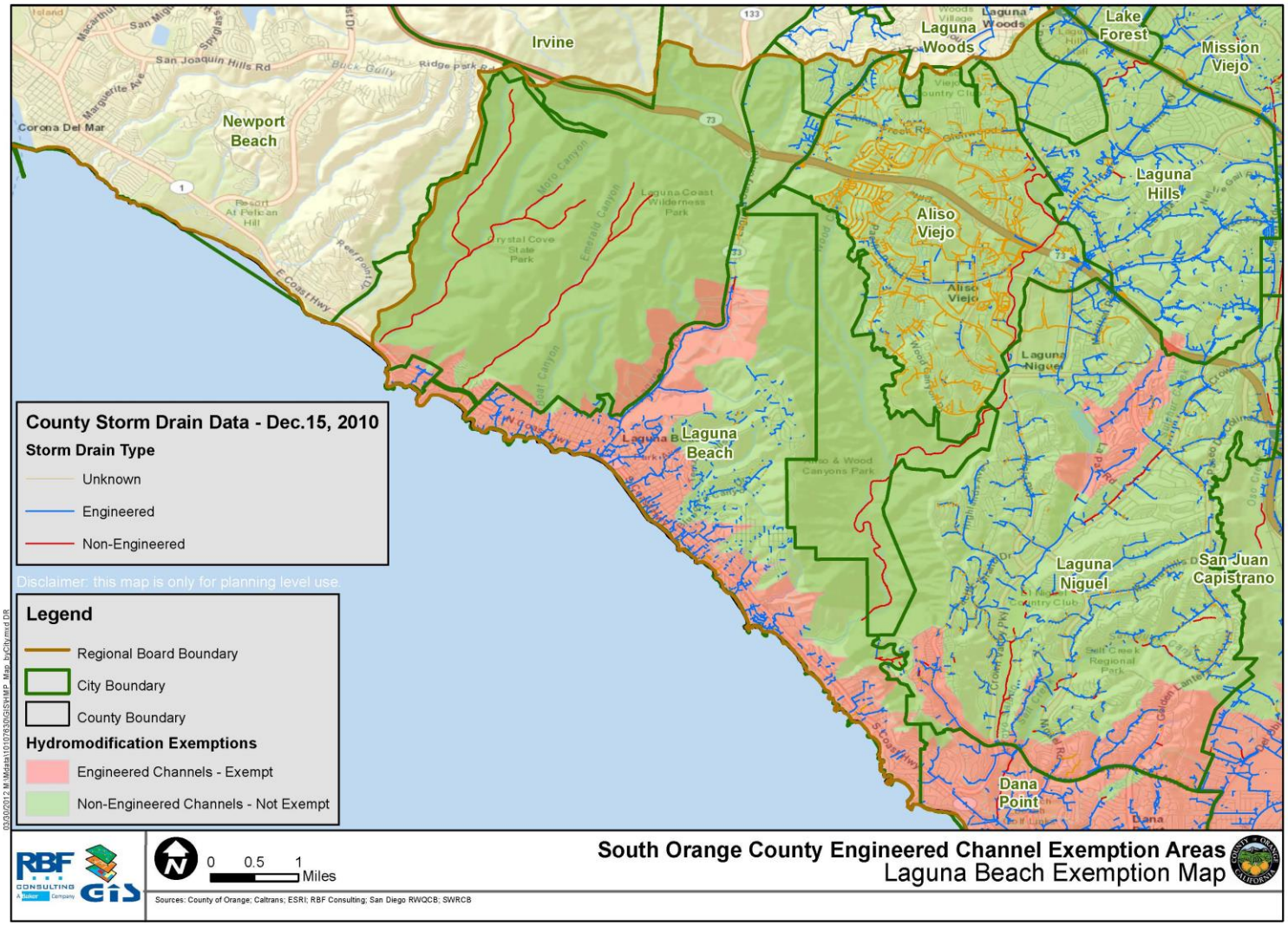

Figure 11: Ladera Ranch & Unincorporated County - South Orange County Engineered Channels Exemption Areas

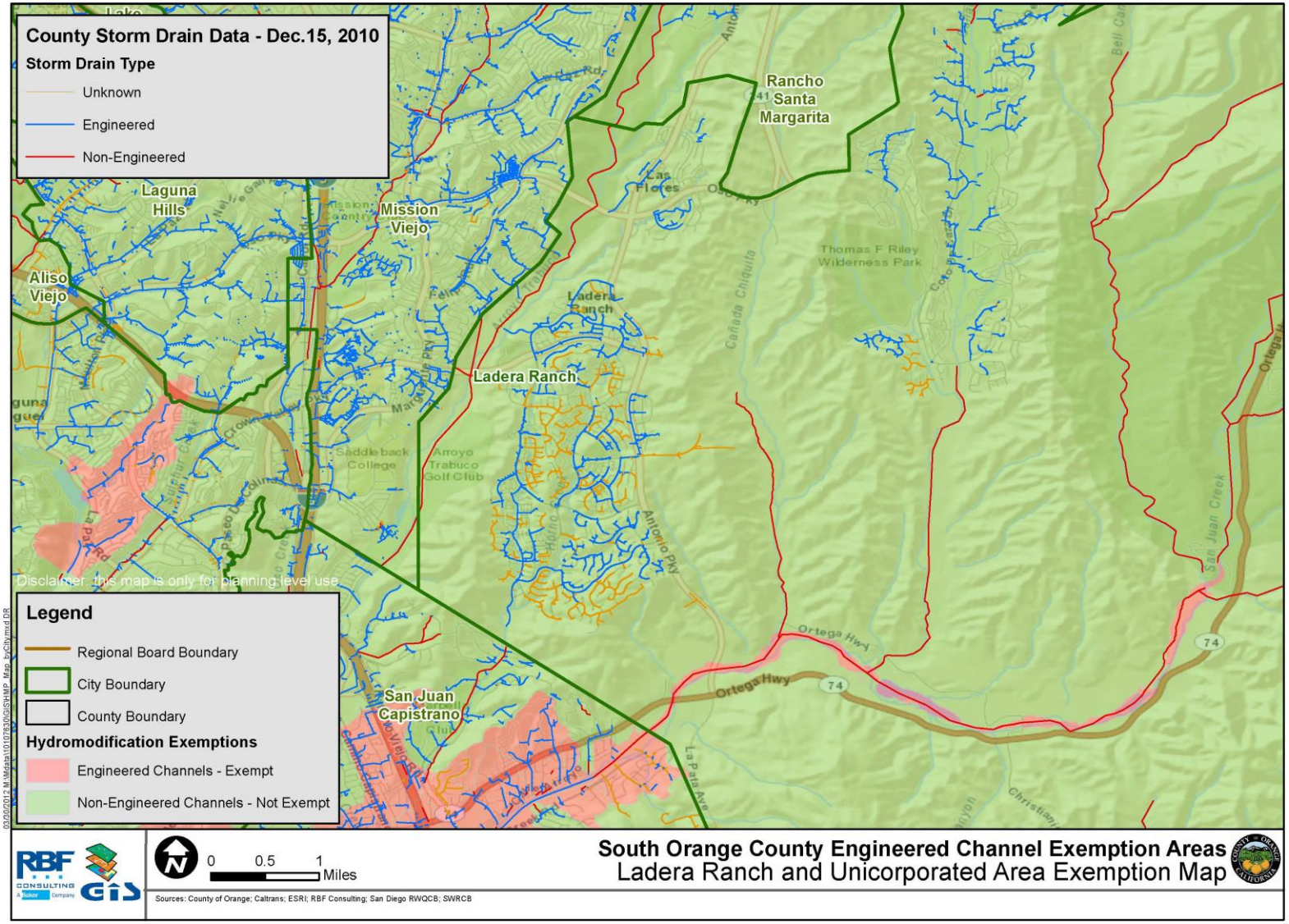

Figure 12: Laguna Niguel - South Orange County Engineered Channels Exemption Areas

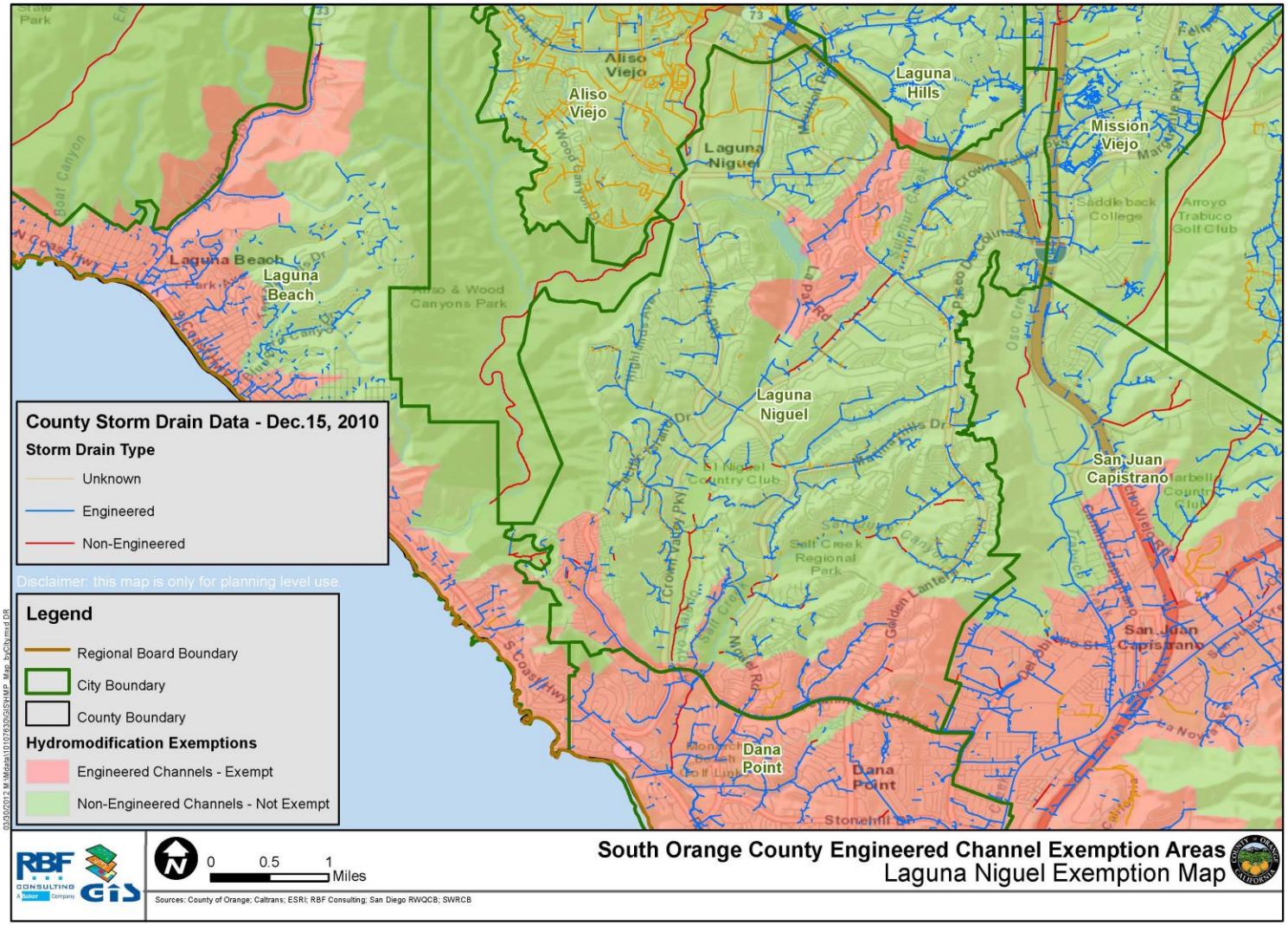

Figure 13: San Juan Capistrano - South Orange County Engineered Channels Exemption Areas

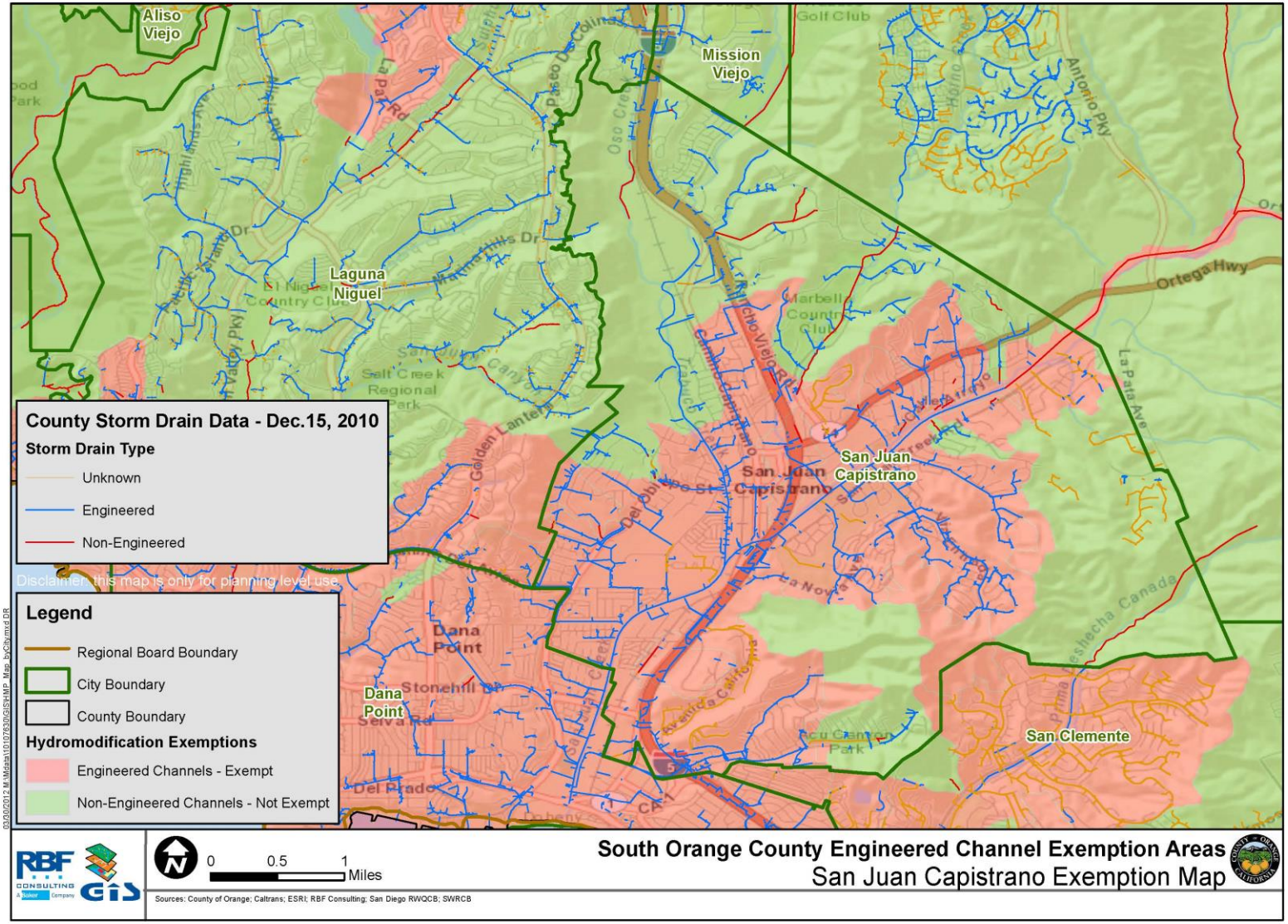

Figure 14: Dana Point - South Orange County Engineered Channels Exemption Areas

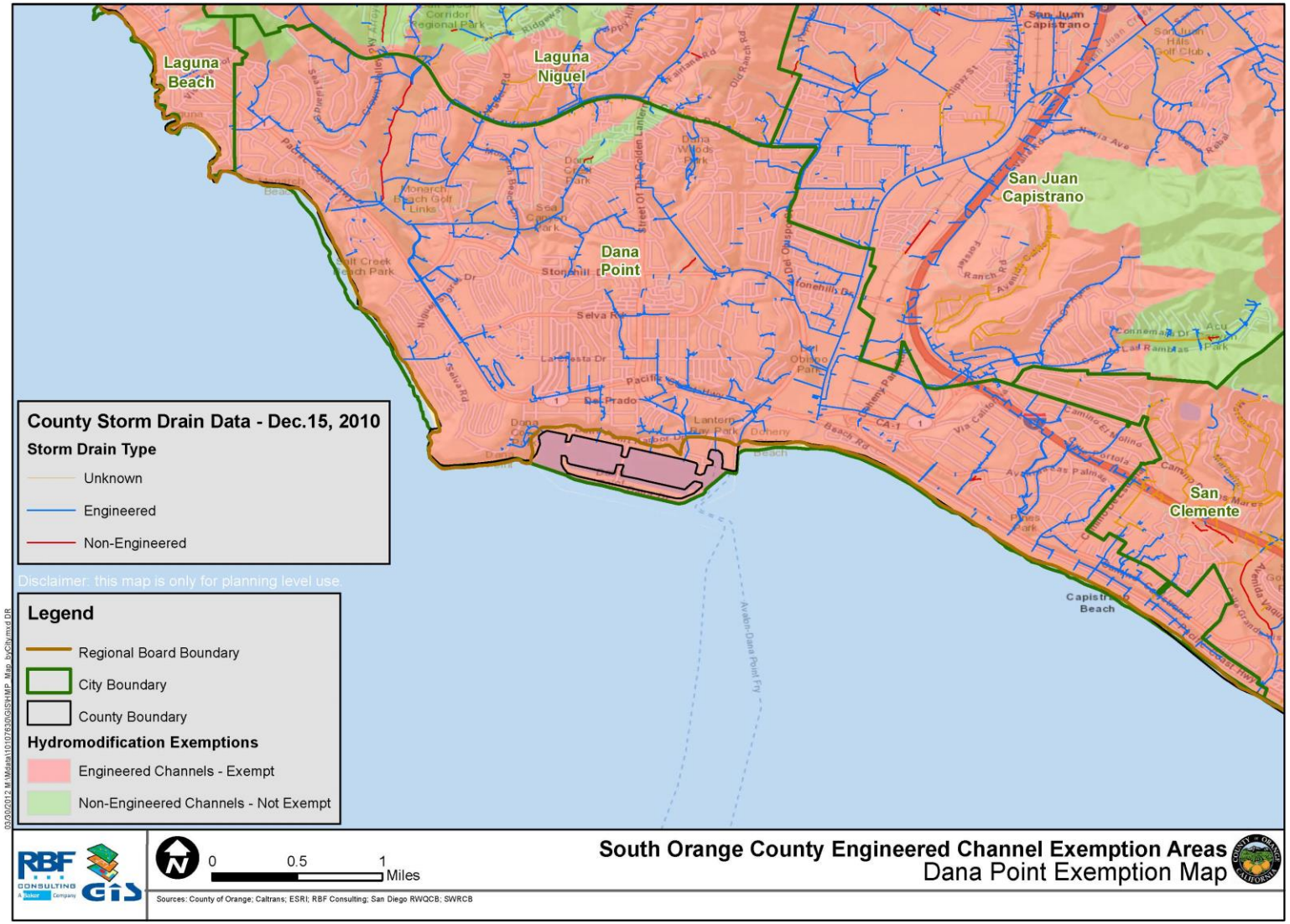

Figure 15: San Clemente - South Orange County Engineered Channels Exemption Areas

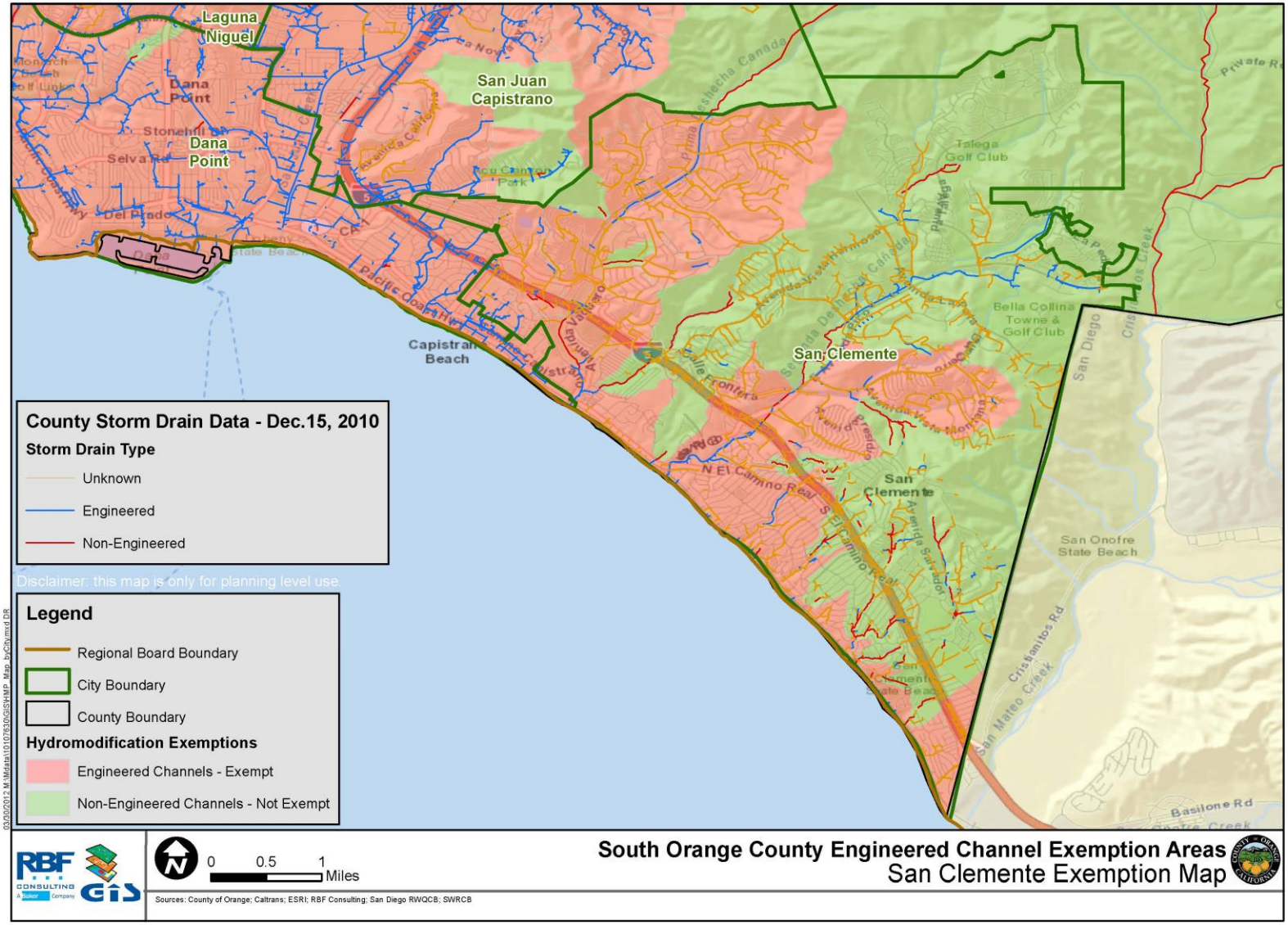

Attachment 3.7.1: Dry Weather Monitoring Rationale and Recommendations

The Fifth Term Permit must recognize that all discharges of pollutants from the MS4 are subject to the MEP standard.

Clean Water Act Sections 402(p)(3)(B)(ii) and (iii) require the Copermittees implement controls to effectively prohibit non-stormwater discharges into the MS4 and that such controls reduce pollutants to the maximum extent practicable (MEP). While federal law regulates "non-stormwater discharges" into the MS4, Section 402(p)(3)(B)(iii) expressly states that the "discharge of pollutants" shall be reduced to MEP. In drafting this section of the CWA, Congress expressly intended all discharges from MS4s to be subject to MEP as it used the term "pollutant" and did not differentiate between stormwater and non-stormwater, as the current Permit attempts to do. Therefore, the duty of the Copermittees to reduce the discharge of pollutants from the MS4 to MEP applies to both stormwater and non-stormwater pollutants.
Furthermore, the focus of the CWA and federal regulations is on a management program that includes a comprehensive planning process to reduce the discharge of pollutants to MEP.[1] One of the elements of the management program is the illicit discharge prevention program.[2] The control and limitation of illicit discharges into the MS4 is intended to achieve the overall MEP standard for discharges from the MS4. This is confirmed by the preamble to EPA regulations that discuss the required elements of the management program.

According to EPA:

> [Copermittees are required] to develop management programs for four types of pollutant sources which discharge to large and medium municipal storm sewer systems. Discharges from large and medium municipal storm sewer systems are usually expected to be composed primarily of: (1) Runoff from commercial and residential areas; (2) storm water runoff from industrial areas; (3) runoff from construction sites; and **(4) non-storm water discharges**. Part 2 of the permit application has been designed to allow [Copermittees] the opportunity to propose **MEP control measures for each of these components of the discharge**. 55 Fed Reg at 48052 (emphasis added).
> *See also* 55 Fed Reg at 48045 (stating "Part 2 of the proposed permit application [which includes the illicit discharge prevention requirement] is designed to . . . provide municipalities with the opportunity of proposing a comprehensive program of structural and non-structural control measures that will **control the discharge of pollutants, to the maximum extent practicable, from municipal storm sewers**.") (Emphasis added).

EPA's position is consistent with existing State Water Resources Control Board policy which states that discharges into the MS4 are to be controlled through an iterative, BMP based approach.[3] The State Board held:

> An NPDES permit is properly issued for "discharge of a pollutant" to waters of the United States. (Clean Water Act § 402(a).) The Clean Water Act defines "discharge of a pollutant" as an "addition" of a pollutant to waters of the United States from a point

[1] 40 CFR 122.26(d)(2)(iv).
[2] 40 CFR 122.26(d)(2)(iv)(B)(1).

[3] Specifically in State Board in Order No. WQ-2001-15, *In the Matter of the Petitions of Building Industry Assoc. of San Diego County and Western States Petroleum Assoc*. (2001).

> source. (Clean Water Act section 502(12). Section 402(p)(3)(B) authorizes the issuance of permits for discharges "from municipal storm sewers."
> We find that the permit language is overly broad because it applies the MEP standard not only to discharges "from" MS4s, but also to discharges "into" MS4s. . . [T]he specific language in this prohibition too broadly restricts all discharges "into" an MS4, and does not allow flexibility to use regional solutions, where they could be applied in a manner that fully protects receiving waters. It is important to emphasize that dischargers into MS4s continue to be required to implement a full range of BMPs, including source control. In particular, dischargers subject to industrial and construction permits must comply with all conditions in those permits prior to discharging storm water into MS4s.[4]

The State Board's decision in the Building Industry Association (BIA) matter makes clear that the CWA does not include a blanket prohibition on discharges of non-stormwater into the MS4. Fifth Term PermitFifth Term Permit
It is also technically infeasible in some cases to differentiate between non-stormwater or stormwater pollutants discharged from the MS4. Thus, just as the discharge of non-stormwater into the MS4 is subject to the effective prohibition standard, the discharge of pollutants in non-stormwater from the MS4 is subject to the MEP standard. Fifth Term Permit

The Fifth Term Permit must not seek to include language that creates an overly broad use of the term "prohibit."

The Fifth Term Permit should require the Permittees to "effectively prohibit non-stormwater discharges" but may exempt certain discharges that are not significant sources of pollutants from the prohibition. Section 402(p) does not require a full prohibition but rather an effective prohibition. The operative word is "effective", which recognizes the constraints of owning and operating a stormwater drainage system, which includes hundreds of miles of open channel. In addition, discharges that are not significant sources of pollutants are exempted from the prohibition. In a practical sense, the use of word "effective" also provides flexibility to assess the impacts of relatively benign discharges such as air condition condensate, individual car washing, and non-emergency fire-fighting flows or non-anthropogenic sources before instituting a prohibition.

The Fifth Term Permit should enable the Permittees to develop program specific action levels that meets the objectives of the IDDE program.

Future NALs for the IDDE program should not be based on water quality objectives at the 'end of pipe' . Instead, these values should be based on 'upset' values that reflect an abnormality for typical urban runoff. The State's own Blue Ribbon Panel, which was convened specifically to examine the feasibility of incorporating numeric effluent limits in stormwater permits, ultimately concluded that numeric limits were generally infeasible across all three stormwater activities,

[4] Id., at 9-10.

with few exceptions[5]. However, the Panel did agree that "upset values" or "action levels" could be established to assist Copermittees in identifying "bad actor" catchments which are clearly above the normal observed variability.

The rationale for this is provided in additional detail below.

Dry Weather Reconnaissance Program Approach

As a part of the IDDE program, the Copermittees had developed and implemented an innovative Dry Weather Reconnaissance Program, based upon statistically derived benchmarks to identify illegal discharges and illicit connections during the typically dry summer months of May through September using a suite of water quality analyses conducted in the field at designated random and targeted drains. A brief summary of that program is provided below.

- The Dry Weather Reconnaissance Program collected significant amounts of data and utilized a hybrid monitoring design that combined probabilistic sampling, targeted sampling, and formal statistical tools (tolerance intervals and control charts). This design enabled the program to systematically prioritize problematic sites, compare conditions to regional urban background, and track trends over time.
    - A *tolerance interval* bound is the upper or lower confidence-interval bound of a quantile of the background data distribution. Tolerance intervals are derived from the probabilistic site data and are used to quantify the key aspects of the regional background.
    - *Control charts* are used to establish an upper or lower bound on a data distribution, based on previous monitoring data. They are created for each site and provide a means of tracking data at individual sites and identifying when new data values deviate substantially from previous experience. The tolerance intervals are supplemented with control charts that track specific historical data, providing a second till to detect results that are out of the ordinary for the specific site.
    - Used together, tolerance intervals and control charts provide a consistent and quantitative means of identifying sites that exhibit excursions in pollutant values.
    - Tolerance intervals and control charts provide the means to discern between typical site conditions and illicit discharges.

The 2010-11 reporting period marked the ninth season of dry weather monitoring in the San Diego Region. Monitoring in the San Diego Region under the Dry Weather Reconnaissance Program was replaced in August 2011 with the NALs Monitoring Program (pursuant to Order No. R9-2009-0002). In order to demonstrate the effectiveness of the Dry Weather Reconnaissance Program, a comparison of this program and the NALs-based program is provided below.

Comparison of the Dry Weather Reconnaissance Program Approach and the NALs-based Approach

[5] *The Feasibility of Numeric Effluent Limits Applicable to Discharges of Stormwater Associated with Municipal, Industrial and Construction Activities, June 19, 2006*

First, a comparison of the probability of an exceedance using the tolerance interval-based approach compared to the NAL-based approach shows that the NALs-based approach requires increased resources since investigations are triggered at a much higher frequency for many constituents (e.g., enterococci and reactive orthophosphate as P – **Figures 1** and **2** below, respectively).

- The Dry Weather Reconnaissance Program is designed to detect "abnormal" results that are indicative of illicit discharges, typically short term, transient, non-stormwater discharges. The Permittees perform many more site visits but initiate fewer investigations, as they are able to discern between discharges that are most likely to be illicit and those that are not. These focused investigations are based on statistically valid data assessments, historical data for the site, and are most likely to be associated with illicit discharges.
- In contrast, the NAL-based program is designed to compare urban runoff from an outfall to a water quality objective that has been established for a receiving water. As demonstrated in the ROWD, chemistry results trigger exceedances of the NALs the majority of the time, which does <u>not</u> allow the Permittees to differentiate between typical site conditions and illicit discharges.
- For example, based on historical data, the probability that a sample does not exceed the NAL for enterococci or orthophosphate is ~ 3-5%. As a result, roughly 31 out of 33 sampling events would be required to be investigated for one or both constituents.
- In contrast, the probability that a sample does not exceed the enterococci or orthophosphate tolerance interval is 90%, which results in only 1 out of 10 sampling events requiring an investigation.
- Thus, the tolerance intervals allow for a true prioritization of the investigations whereas the NALs result in almost all events requiring investigations.

Figure 1: Enterococci Exceedance Frequencies Associated with Dry Weather Reconnaissance Tolerance Intervals Compared with Exceedance Frequencies Associated with NALs.

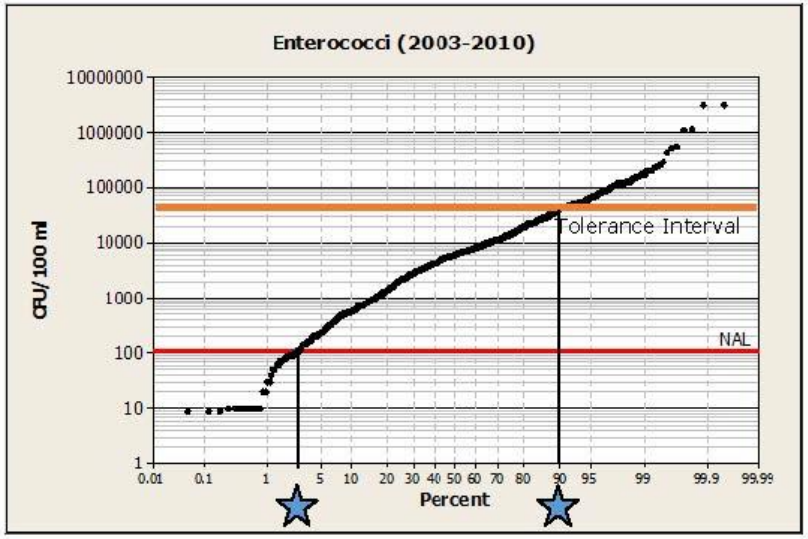

Figure 2: Reactive Orthophosphate as P Exceedance Frequencies Associated with Dry Weather Reconnaissance Tolerance Intervals Compared with Exceedance Frequencies Associated with NALs.

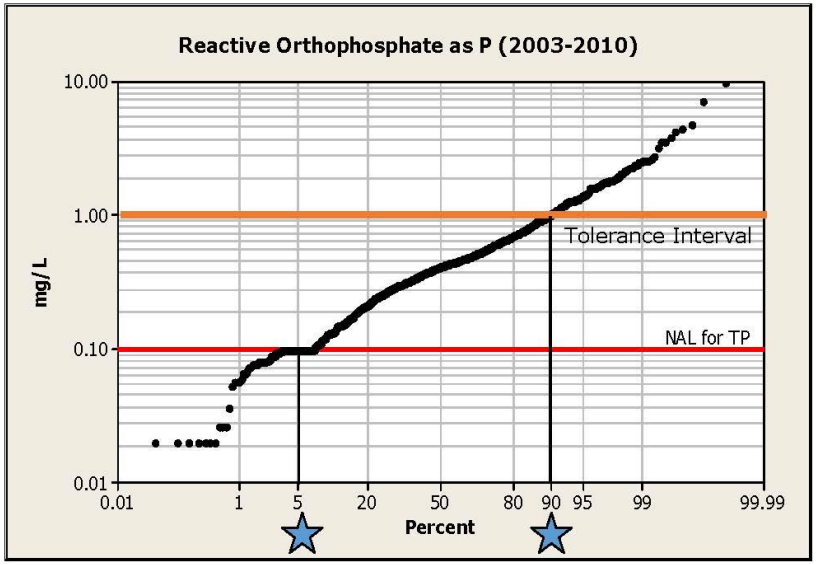

Second, efforts lead by the County to characterize natural sources from ambient geology have demonstrated that natural sources in specific areas are the primary contributor for many constituents of concern such as cadmium, nickel, total dissolved solids, chloride, and sulfate.

Monitoring and special studies show that many of the creeks in south Orange County have elevated levels of several constituents that do not appear to be related to the urban landscape. These constituents correlate poorly with urban attributes such as residential, industrial, and commercial land uses.

The Orange County Stormwater Program has monitored water quality for several years and found that naturally derived pollutants in surface waters can often exceed water quality criteria both in undeveloped catchments as well as in developed watersheds. In recent years, efforts led by the Program to characterize natural sources related to ambient geology have demonstrated that natural sources in specific areas are the primary contributor for many constituents of concern. The concentration ranges measured from the natural sources are shown in the table below.

Constituent	Concentration Range	Water Quality Criterion
Arsenic	<1 - 53 ppb	36 ppb[2]
Cadmium	<1 - 200 ppb	7.3 ppb[2]
Copper	1.2 - 23 ppb	18 ppb[2]
Nickel	6.4 - 1300 ppb	169 ppb[2]
Selenium	<1 - 220 ppb	5.0 ppb[2]
Zinc	<1 - 1800 ppb	379 ppb[2]
Chloride	470 - 2400 ppm	250 ppb[1]
Sulfate	1200 - 11000 ppm	250 ppb[1]
Total Dissolved Solids	3700 - 22000 ppm	500 ppb[1]
Total Nitrogen as N	<0.1 - 38 ppm	1.0 ppb[1]

Notes:
1) Basin Plan Water Quality Objective
2) California Toxics Rule, Criterion Continuous Concentration at hardness of 400 mg/L

Additionally, the Program is currently collaborating with the University of Southern California (USC) to develop a modeling approach that could "fingerprint" water sources based on their patterns of constituent concentrations. Such a

fingerprint, or chemical signature, for groundwater provides information about its source(s) and potential conveyance mechanism for constituents of concern. Physiographic conditions under which rain falls in Sierra Nevada or Colorado River watersheds are very different from those in Orange County's low elevation coastal watersheds. As a result, these differences impart unique isotopic fractionation on the water - a signature that acts as a fingerprint for various sources.

The Program's efforts, in collaboration with USC, recently have focused on sampling these new water quality tests for fingerprinting sources that provides a better approach for assessing natural contributions from anthropogenic, or human based activities. This work focused on collecting samples from natural streams, groundwater springs, domestic water sources, and urban channels to compare and contrast differences between the various water body types. Together with the information on constituent levels from ambient geology and source fingerprinting , this approach will provide a much better understanding about natural and anthropogenic sources of both water and contaminants to streams in south Orange County.

This effort is providing a more robust approach to interpret measured pollutant concentrations against in the context of natural background levels as well as to determine relative loading contributions from natural and anthropogenic inputs. This work is still underway, but will provide important information and assist in understanding the origin of non-stormwater discharges within the stormdrain system.
Until this work is completed, the Program will be unable to discriminate between instances of illicit discharges and conditions that are essentially artifacts of a constructed storm drain system and/or the local geology. The Program has found strong positive linear relationships between levels of metals associated with runoff and groundwater seepage from the Monterey and Capistrano marine sedimentary formations. Both formations are known to be enriched in trace metals and are common across southern Orange County. This evidence suggest that many exceedances of water quality criteria are due to non-illicit discharge factors (i.e., local geology).

Third, after the implementation of the NAL-based program for over a year, some clear differences between the previously established Dry Weather Reconnaissance Program and the NAL-based program have been evident (see **Table 1** below). Comparison of the 2011-2012 NALs data collected in the San Diego Region with the data from the Dry Weather Reconnaissance Monitoring program for the 2009-2010 reporting period shows how the ability to prioritize the IDDE investigations has been diminished.

Table 1: Comparison of 2011-2012 NALs Data Collected in the San Diego Region with the Data from the Dry Weather Reconnaissance Monitoring Program for the 2009-2010 Reporting Period

	NAL Exceedances 2011-2012		DW Pgm Action Level Exceedances 2009-2010	
Constituent	**Number**	**%**	**Number**	**%**
pH	1	2	0	0
TDS	42	93	0	0
Dissolved Oxygen	2	4	0	0
Turbidity	3	7	3	1
Surfactants	3	7	14	5
Total Coliform	24	53	0	0
Fecal Coliform	19	42	0	0
Enterococcus	42	93	0	0
Unionized Ammonia	3	7	8	3
Total N / Nitrate	41	91	0	0
Total P / Ortho PO4	38	84	11	4
Cadmium	13	28	0	0
Copper	1	2	0	0
Nickel	7	15	0	0
Zinc	1	2	0	0
Total # of Site Visits	**45**		**274**	

For the Dry Weather Reconnaissance Program, the Permittees conducted 274 site visits, whereas for the NAL-based program, the Permittees conducted 45 site visits.

- Although the Permittees collected data and information for six times more stations as a part of the Dry Weather Reconnaissance Program, the NALs-based program identified more than six times the number of exceedances.
    - Dry Weather Reconnissance Program – 274 site visits/36 exceedances (13%)
    - NALs-based Program – 45 site visits/240 exceedances (5x the number of visits)
- The Dry Weather Reconnaissance Program provides better spatial and temporal coverage than a NAL-based program. The number of sites visited during implementation of the current program was six times greater than the number of sites visited during implementation of the NAL-based program.

- The Dry Weather Reconnaissance program identified exceedances for four (4) constituents: turbidity, surfactants, unionized ammonia, and total phosphate
- The NALs-based program identified exceedances for all fifteen (15) constituents, with the top three associated with TDS, enterococcus, and total nitrogen
- For the NALs-based program, there was no ability to prioritize discharges for follow up investigation since many of the constituents exceeded the NALs 20-40% of the time.

The conclusions from the implementation of the Orange County NAL-based program to date are:

- The NAL program replaced an previously existing and effective program (the Dry Weather Reconnaissance program);
- The Dry Weather Reconnaissance Program resulted in focused source investigations for key constituents indicative of illicit discharges;
- The NAL program has required increased resources and has resulted in everything being a priority (thus, nothing is a priority). In addition, the NAL-based triggers have, in many cases been the result of constituents attributable to natural sources within the watersheds;
- There have been many exceedances that have been due to non-IDDE factors such as local geology (especially for nickel and cadmium);
- It has been very difficult to determine the endpoints, the sources, of the various non-stormwater discharges since the discharges are so co-mingled; and
- There is a strong need for a regionally-based prioritization so that there is not a mis-direction of limited resources.

Recommendations

The Regional Water Board staff review the results of the Orange County program to date and consider the revisions as proposed in order to assist with the prioritization of resources and water quality issues. If the Copermittees are required to continue to use the NAL-based program, they will lose the ability to prioritize the water quality issues and discriminate between true instances of IDDE and ambient urban conditions in a storm drain systems draining landscapes underlain by marine sedimentary formations containing phosphorous and a number of metals. The Copermittees fundamentally recommend that they be able to reinstate the Dry Weather Reconnaissance Program.

2014 WATER QUALITY MANAGEMENT PLAN

for the Santa Margarita Region of Riverside County

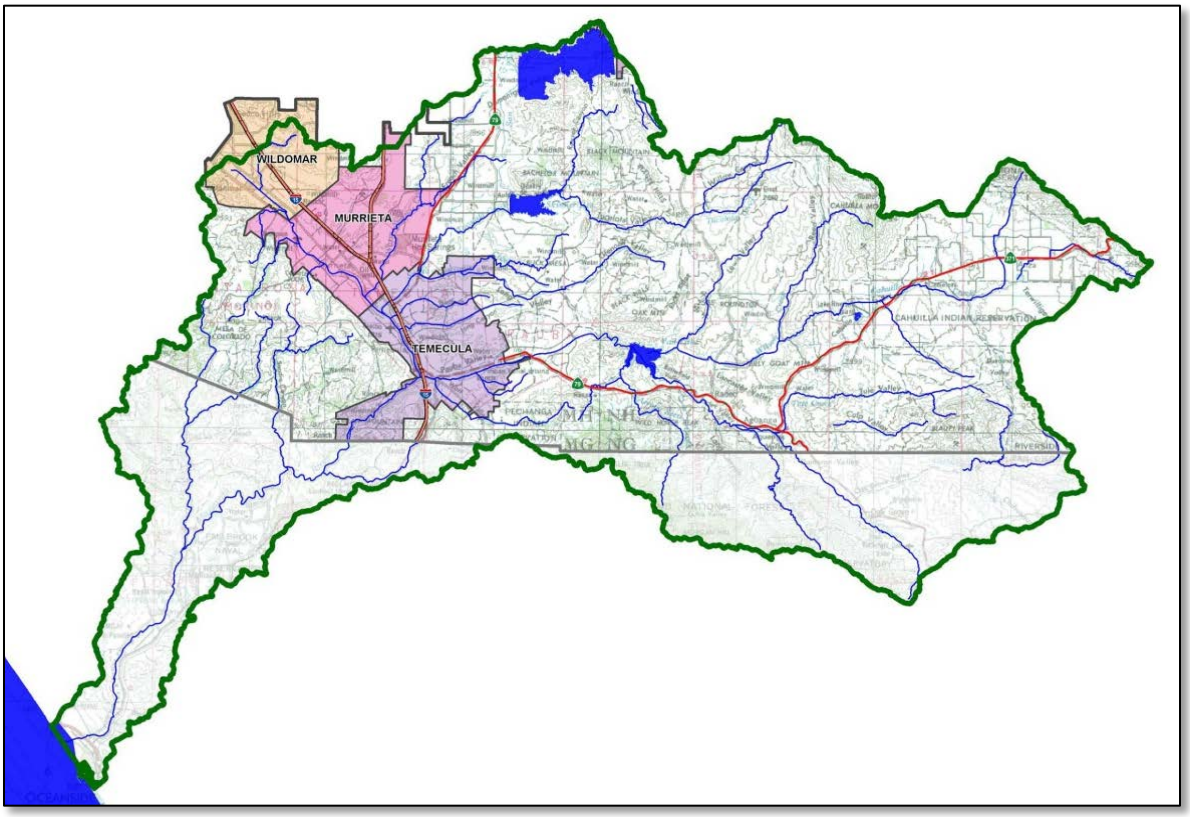

Water Quality Management Plan

for the Santa Margarita Region *of Riverside County*

In compliance with Order No. R9-2010-0016, this WQMP has been developed and will be implemented by the Copermittees in the Santa Margarita Region:

Copermittees:

County of Riverside
All Project applications:
www.countyofriverside.us/

For WQMP questions in unincorporated County areas:
www.rctlma.org
(951) 955-3185

Riverside County Flood Control and Water Conservation District
http://www.rcflood.org/

Murrieta
http://www.murrieta.org/

Temecula
http://www.cityoftemecula.org/

Wildomar
http://www.cityofwildomar.org/

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EXHIBIT C: LID BMP Design Handbook

EXHIBIT D: WQMP Applicability Checklist

EXHIBIT E: Project-Specific WQMP Review Checklist

EXHIBIT F: Santa Margarita Region Hydromodification Management Plan

EXHIBIT G: Glossary

Start

INTRODUCTION

This Water Quality Management Plan (WQMP) is a guidance document to assist in the design of projects in compliance with San Diego Regional Water Quality Control Board (San Diego Regional Board) requirements for Priority Development Projects (PDPs). These requirements are specified in the National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) permit issued to the Riverside County Flood Control and Water Conservation District (District), County of Riverside (County), and Cities of Murrieta, Temecula, and Wildomar (Copermittees) in November 2010 (2010 SMR MS4 Permit). The area covered by this MS4 Permit is referred to as the Santa Margarita Region (SMR).

This WQMP is only applicable to projects in the cities of:

- Murrieta
- Temecula
- Wildomar

and

- Portions of unincorporated County of Riverside that are within the SMR.

Because every project is unique, development of a Project-Specific WQMP should begin by scheduling a pre-application meeting with the applicable staff of the Copermittee with jurisdiction over the project site to understand the specific submittal requirements.

Be sure to use the most recent version of this WQMP for each and every project, including updates and errata. The most recent version is available at www.rcflood.org/NPDES/Developers.aspx. This WQMP may be updated periodically based on the Copermittees' experience with implementation of this document. Any non-substantive updates to the WQMP will be provided in the Copermittee's Jurisdictional Runoff Management Plan (JRMP) Annual Report to the San Diego Regional Board. Substantive updates will be submitted to San Diego Regional Board staff for review and approval prior to implementation. If reading the WQMP on a computer, hyperlinks within this document can be used to navigate from section to section Internet references can be accessed directly via the internet. The hyperlinks are

throughout the text, as well as in "References and Resources" sections (marked by the 🕮 icon).

To use the *WQMP* to guide development of a Project-Specific WQMP, start by reviewing Chapter 1 to find out whether and how the requirements apply to your PDP. Chapter 1 also provides an overview of the entire process of planning, design, construction, operation, and maintenance leading to compliance.

Terms and issues used in the *WQMP* are defined in the Glossary or in Chapter 2. Chapter 2 provides background on key stormwater concepts and water quality regulations, including technical criteria for the design and selection of Best Management Practices (BMPs). Defined terms that are included in the glossary are also capitalized in the text.

Then proceed to Chapter 3 and follow the step-by-step guidance to prepare a Project-Specific WQMP for your site. Note that the steps in Chapter 3 reference additional detail in Chapters 4 and 5. A preliminary Project-Specific WQMP is commonly required to be submitted with applications for entitlements and development approvals and must be approved by the Copermittee with jurisdiction over the project site before any approvals or entitlements will be granted. A final Project-Specific WQMP will be required to be submitted and approved prior to issuance of grading and building permits.

Construction Phase Controls
Your Project-Specific WQMP is a separate document from the Stormwater Pollution Prevention Plan (SWPPP). A SWPPP provides for temporary measures to control discharges of sediment and other Pollutants during construction at sites that disturb one acre or more, whereas a WQMP is required to address discharges from the post-construction use of the site.

Chapter 4 describes key ways to coordinate development of the Project-Specific WQMP with other site plans such as landscaping, grading and erosion control plans, and overseeing construction of BMPs.

Chapter 5 provides a description of the process for ensuring operation and maintenance of BMPs over the life of the PDP. The chapter includes step-by-step instructions for preparing a Project-Specific WQMP Operation and Maintenance Plan.

Throughout each chapter, you will find references and resources to help you understand the regulations, complete the Project-Specific WQMP, and design the PDP to be protective of water quality to the Maximum Extent Practicable (MEP).

PLAN AHEAD TO AVOID THE THREE MOST COMMON MISTAKES

The most common (and costly) errors made by Users for development approvals with respect to stormwater compliance are:

1. Not planning for compliance early enough. The strategy for compliance with WQMP requirements should be developed before completing a conceptual site design or sketching a layout of subdivision lots. It is highly recommended that the project team (civil engineers, planners, architects, landscape architects, etc.) meet and confer at project inception, and then regularly throughout the design, to discuss design strategies that meet the WQMP requirements. Section 4.0 discusses some of the elements of the Project-Specific WQMP that will need to be coordinated among the site plans that these professionals may develop.

2. Assuming proprietary Stormwater BMPs or Conventional Treatment BMPs will be adequate for compliance. Low Impact Development (LID) BMPs that maximize infiltration, harvest and use, evapotranspiration and/or bio-treatment, are now required for nearly all projects. In addition, Hydrologic Control BMPs and Sediment Control BMPs are required for all projects that are not exempt from the requirements set forth in the SMR HMP. See Chapter 2 for criteria affecting what Stormwater BMPs can be used on a project.

3. Not planning for long-term maintenance of the PDP BMPs, and inspections/verifications by the Copermittee. Consider who will own and who will maintain the BMPs in perpetuity and how they will obtain access, and identify which arrangements are acceptable to the Copermittee with jurisdiction over the project site (Chapter 5).

COMPLIANCE PROCESS AT A GLANCE

Users should follow these general steps to comply with the requirements of the 2010 SMR MS4 Permit:

1. Discuss WQMP requirements during a pre-application meeting with Copermittee staff, if possible. This can help you to confirm any requirements specific to the Copermittee with jurisdiction over the project site. Note that the Copermittee will require the User to certify that the project does or does not qualify as a PDP. The Copermittee with jurisdiction over the project site will nevertheless have the ultimate discretion as to whether a Project-Specific WQMP will be required for any particular project.

2. If the project is required to prepare a Project-Specific WQMP, review the instructions in this WQMP BEFORE the tentative map, preliminary site plan, drainage plan, and improvement plans are prepared. The requirements in this WQMP will affect each of these items. Neglecting to appropriately consider and address the requirements of this WQMP at all stages of project planning and design, will likely result in costly re-design being required.

3. When required by the Copermittee with jurisdiction over the project site, prepare a preliminary Project-Specific WQMP and submit it with applications for Discretionary Approvals (entitlements).

4. Following receipt of any Discretionary Approvals, the final Project-Specific WQMP can be developed as part of the plan to complete the detailed project design, incorporating the BMPs committed to in the preliminary Project-Specific WQMP.

5. Prepare a draft Project-Specific WQMP Operation and Maintenance Plan and submit both, together with the grading and improvement plans as part of the application for grading and/or building permits. Execute legal documents assigning responsibility for operation and maintenance of BMPs. Protect proposed Post-Construction BMPs (and underlying infiltration soils) during construction, and maintain them following construction.

6. Following construction, submit 'as-built' plans and a final Project-Specific WQMP Operation and Maintenance Plan and formally transfer responsibility for maintenance to the owner or permanent occupant. Typically the Copermittees will require the final Project-Specific WQMP Operation and Maintenance Plan prior to issuance of Certificate of Occupancy.

7. Following occupancy, the occupant or owner (as defined in the Project-Specific WQMP Operation and Maintenance Plan) must maintain records that all necessary maintenance of Post-Construction BMP facilities has been performed and allow periodic inspections of Structural BMPs by the Copermittee with jurisdiction over the project site. Where Copermittees allow or require self-certifications of Structural BMPs, the occupant or owner must certify that the Structural BMPs are properly maintained and submit reports, prepared and certified by a Professional Engineer, to the Copermittee staff upon their request.

8. Preparation of a complete and detailed Project-Specific WQMP is the key to cost-effective compliance and expeditious review of your project. Instructions for preparing a Project-Specific WQMP are in Chapter 3.

Consistent with Section F of the 2010 SMR MS4 Permit, each Copermittee has implemented a JRMP that identifies an implementation process to verify compliance

with the SMR WQMP requirements. In each JRMP, the implementation process identifies roles and responsibilities of the Copermittee departments in the method to track post-construction BMPs, to ensure that appropriate easements and ownerships are properly recorded in public records and that the information is conveyed to all applicable parties when there is a change in project or site ownership. Figure 1-1 identifies the typical implementation process for Project-Specific WQMP approval adopted by the Copermittees. The User may refer to the JRMP of the Copermittee with jurisdiction over the project site to determine specific roles and responsibilities.

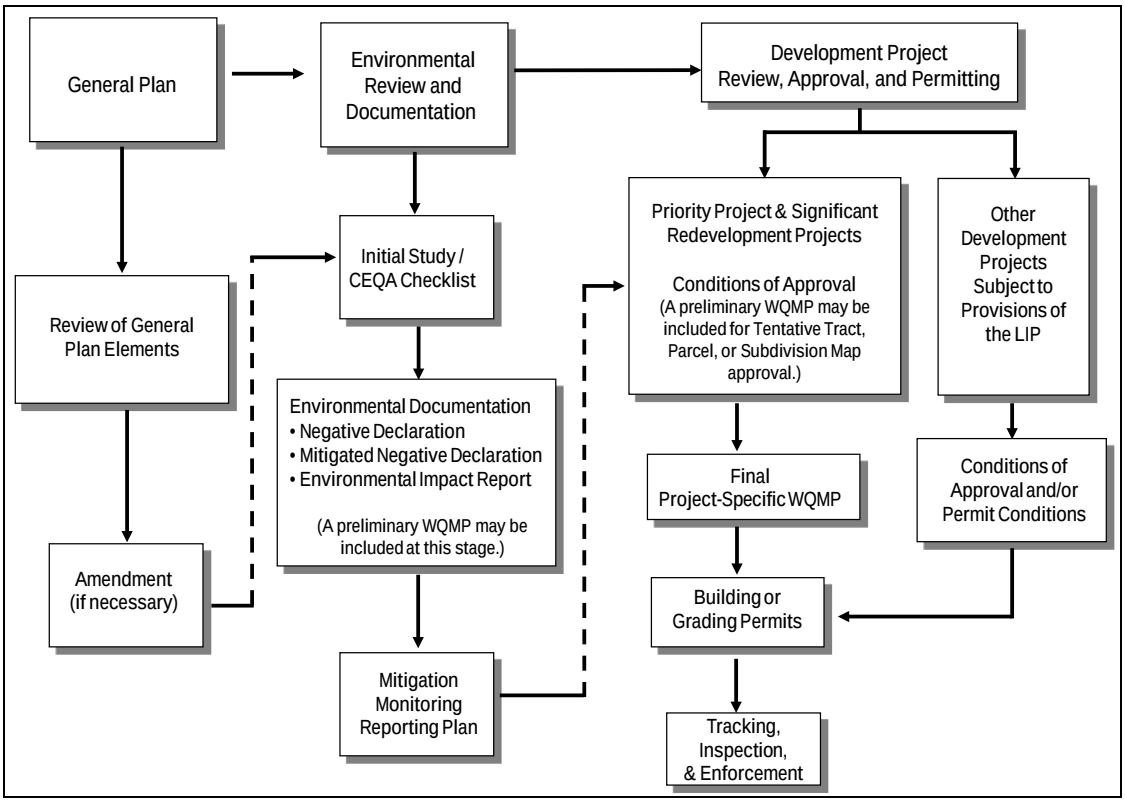

FIGURE 1-1: Development Process Flow Chart

Chapter

1

1.0 POLICIES AND PROCEDURES

Determine if your project requires a Project-Specific WQMP, and review the steps to compliance.

1.1. PROJECTS REQUIRING A PROJECT-SPECIFIC WQMP

This Document is specific to projects in the Santa Margarita Region of Riverside County.

> ☞*Before continuing use of this document, it is highly encouraged that the 'Locate your Watershed' tool available at www.rcflood.org/npdes, or SWCT2 (Stormwater & Water Conservation Tracking Tool - http://rivco.permitrack.com/)is used to verify that your project is within the Santa Margarita Region of Riverside County; which includes the incorporated Cities of Murrieta, Temecula and Wildomar, as well as the Unincorporated County of Riverside within the Santa Margarita Region.*

ICON KEY

- ☞ Helpful Tip
- Submittal Requirement
- Terms to Look Up
- References & Resources

The 2010 SMR MS4 Permit (see Section 2.1.1) requires that a Project-Specific WQMP be prepared for all development projects within the SMR that meet the 'Priority Development Project' categories and thresholds listed in Table 1-1 (Section 1.1.1 below), and Redevelopment projects that meet the criteria in Section 1.1.2 below.

Additionally, the Project-Specific WQMP Applicability Checklist provided in Exhibit D, which is incorporated into each Copermittee's project application requirements, can be used as a means to document a conclusion that a project does or does not meet the criteria as a PDP. Note some thresholds are defined by square footage of impervious area; others by land area of development; others by total area disturbed. Exhibit E includes a Project-Specific WQMP Review Checklist that can be used to ensure that your Project-Specific WQMP submittal includes all required elements.

If the project is not a PDP, a Project-Specific WQMP is generally not required. Such projects, referred to as 'Other Development Projects' are still required to incorporate appropriate minimum Site Design, Source Control and LID BMPs which may or may not

include Structural LID or Conventional Treatment Control BMPs. If your project is an Other Development Project, consult the Copermittee with jurisdiction over the project site to determine applicable requirements.

However, Copermittee staff may choose to require a Project-Specific WQMP for Other Development Projects, based on their assessment of the potential for the proposed project to impact stormwater quality.

When determining whether WQMP requirements apply, a "project" should be defined consistent with California Environmental Quality Act (CEQA) definitions of "project". That is, the "project" is the whole of an action which has the potential for adding or replacing or resulting in the addition or replacement of roofs, pavement, or other impervious surfaces. "Whole of an action" means the project may not be segmented or piecemealed into small parts if the effect is to reduce the quantity of impervious area for any part to below the applicable threshold.

1.1.1. New Priority Development Projects

New Development Projects are defined by the 2010 MS4 permit as a PDP if the project, or a component of the project, meets the categories and thresholds described in Table 1-1 below.

TABLE 1-1. Priority Development Project Categories

Category	Threshold	Development Project Description
New Development Projects	10,000 SF new Impervious surface	Development Projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site) including commercial, industrial, residential, mixed-use, and public development projects. This category includes Development Projects on public or private land which fall under the planning and building authority of the Copermittees.
Automotive Repair Shops	Dependent on SIC Code	Development Projects that include automotive repair shops that are categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.
Restaurants	5,000 SF	Development Projects that will sell prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812), where the land area for development is greater than 5,000 square feet. Restaurants where land development is less than 5,000 square feet must meet all WQMP requirements except for the conventional treatment control BMP requirements of WQMP Section 3.5, and the Hydromodification requirements of WQMP Section 3.6.
Hillside Developments	5,000 SF	Hillside Development Projects greater than 5,000 square feet. This category is defined as any development project which creates 5,000 square feet of impervious surface and which is located in an area with known erosive soil conditions, where the development project will grade on any natural slope that is 25% or greater.

Category	Threshold	Development Project Description
Environmentally Sensitive Areas	2,500 SF Impervious surface	Development Projects located within, directly adjacent to or discharging directly to an Environmentally Sensitive Area (ESA) (where discharges from the Development Project site will enter Receiving Waters within the ESA), which either creates 2,500 square feet of impervious surface on a proposed project site or increases the area of imperviousness of a proposed Development Project site to 10% or more of its naturally occurring condition. "Directly adjacent" means situated within 200 feet of the ESA. "Discharging directly to" means outflow from a drainage conveyance system that is composed entirely of flows from the subject Development Project site, and not commingled with flows from adjacent or upstream lands.
Parking Lots	5,000 SF Impervious surface	Development Projects with impervious parking lots 5,000 square feet or more and potentially exposed to runoff. Parking lot is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business or for commerce.
Streets, Roads, Highways and Freeways	5,000 SF Impervious surface	Private Development Projects that include any paved impervious surface that is 5,000 square feet or greater used for the transportation of automobiles, trucks, motorcycles and other vehicles.
Retail Gasoline Outlets	5,000 SF or ADT >100	Retail Gasoline Outlets that meet either of the following criteria: (a) 5,000 square feet or more; or (b) a projected Average Daily Traffic of 100 or more vehicles per day.
Pollutant Generating projects disturbing over 1 acre	1 acre disturbed area	Development Projects that disturb over one acre of land, where the post-construction use of the site generate pollutants at levels greater than natural background levels.

1.1.1.a) Entire Project

Where a New Development Project feature, such as a parking lot, falls into a PDP Category as described in Table 1-1 above, the entire project footprint is subject to WQMP requirements.

1.1.2. Redevelopment Projects

Redevelopment projects are considered a PDP if:

- The project creates, adds, or replaces at least 5,000 square feet of impervious surfaces on an already developed site: AND
- The existing development AND/OR the proposed redevelopment project meets the criteria in Table 1-1 above.

1.1.2.a) The "50% Rule" for Redevelopment Projects

Redevelopment PDPs may not only be required to develop a Project-Specific WQMP for the new 'project' footprint, but may also be required to retrofit the existing portions of the site for compliance with this WQMP as well (including runoff from existing areas not otherwise being modified as part of the current project).

- Where a Redevelopment Project results in an increase of less than 50% of the impervious surfaces compared to the previously existing development, and the existing development was not subject to WQMP requirements, the Project-Specific WQMP applies only to the addition or replacement, and not to the entire development.
- Where a Redevelopment Project results in an increase of more than 50% of the impervious surfaces compared to the previously existing development, the Project-Specific WQMP applies to the entire development, including portions of the site not otherwise being modified or improved as part of the current project.

Copermittee staff will require submittal of sufficient information about the existing developed site and proposed additions/modifications, and to assess whether or not the proposed Redevelopment Project increases the collective impervious surfaces beyond the 50% threshold. Compliance with the Hydrologic Performance Standard (See Chapter 2.2.3) will be determined based on the naturally occurring condition, i.e. the native condition of the project site prior to any existing development.

1.2. WQMP REQUIREMENTS FOR PROJECTS IN PROGRESS

Requirements for preparing Project-Specific WQMPs have been in place for all applicable projects submitted to the Copermittee after July 13, 2005. The 2010 SMR MS4 Permit, however, includes new/additional requirements for Project-Specific WQMPs that are reflected in this revised WQMP. The following describes how these new requirements are to be applied to PDPs that have begun the process for securing approvals from the Copermittee.

The Project-Specific WQMP and HMP requirements described in this WQMP address the provisions of the 2010 SMR MS4 Permit and apply to all PDPs or phases of PDPs except those where:

- The project or phase has begun grading or construction activities at the time the updated WQMP and/or Hydromodification requirements go into effect*, or

- The Copermittee determines that lawful prior approval rights for a Development Project or project phase exist, whereby application of the updated requirements to the project is illegal.

If it appears that the project may meet either of these criteria, verify with the Copermittee with jurisdiction over the project site. Each Copermittee individually determines how and when a project will be allowed to be grandfathered.

1.3. Project-Specific WQMP Requirements for Phased Projects

Before occupancy will be granted for any phase of a multi-phase PDP, all requirements of the Project-Specific WQMP must be met for the current phase.

If any Structural BMPs necessary for the current phase of the PDP would be located in a future phase, occupancy for the current phase will not be granted until such 'offsite' BMPs have been constructed and are fully operational. In addition, the Operation and Maintenance requirements described in Section 5.0 must be fully met for all such 'offsite' BMPs.

1.4. Types of Project-Specific WQMPs

1.4.1. Preliminary Project-Specific WQMPs

If a Discretionary Approval would entitle construction of new or replaced improvements which, individually or in aggregate, would qualify as a PDP, then the User must prepare a preliminary Project-Specific WQMP. The level of detail in a preliminary Project-Specific WQMP will depend upon the level of detail known about the overall project design at the time project approval is sought.

> **Local Requirements**
> A Copermittee may have requirements that differ from, or are in addition to, this WQMP. Check with the Copermittee with jurisdiction over your project site.

For example, if approval of a tentative tract map application would entitle site improvements on individual lots that individually or in aggregate would exceed the thresholds for PDPs in Table 1-1, the User should prepare a preliminary Project-

* If your project site has been partially graded under an expired grading permit, consult the Copermittee with jurisdiction over your project site to determine whether the requirements in this document apply.

Specific WQMP. If particular plans for individual lots have not been identified, the preliminary Project-Specific WQMP may nevertheless be required to identify the type, size, location, and final ownership of Structural BMPs adequate to serve new roadways and any common areas, and to also manage runoff from an expected reasonable estimate of the square footage of future roofs, driveways, and other impervious surfaces on each individual lot. The Copermittee with jurisdiction over the project site will then condition approval of the map on implementation of a final Project-Specific WQMP that is in substantial conformance with the approved preliminary Project-Specific WQMP prior to issuance of grading / building permits.

If a Copermittee deems it necessary, the future improvements on one or more lots may be required to be limited by a deed restriction or dedication of an appropriate easement, to suitably restrict the future building of structures at each Structural BMP location.

In general, it is recommended Structural BMPs not be located on individual single-family residential lots to facilitate long-term maintenance, particularly when those BMPs manage runoff from streets or from common areas. However, local requirements may vary. Most often, it is better to locate Structural BMPs on one or more separate, jointly owned parcels such as a parcel owned by a homeowners association).

1.4.2. Final Project-Specific WQMPs

All PDPs are required to prepare a final Project-Specific WQMP, which the Copermittees require to be submitted together with associated grading and improvement plans, and approved prior to the issuance of any building or grading permits. The final Project-Specific WQMP must be in substantial conformance with any preliminary Project-Specific WQMP submitted and approved by the Copermittee with jurisdiction over the project site during the land use entitlement process.

Chapter 2

2.0 CONCEPTS AND CRITERIA

Technical background and explanations of policies and general design requirements.

2.1. REGULATORY REQUIREMENTS

2.1.1. 2010 SMR MS4 Permit

The San Diego Regional Board first issued a MS4 Permit to the Copermittees in the Santa Margarita Region in 1990. That permit has been reissued four times since then, with the most recent permit being issued in 2010. These permits have required the Copermittees to develop and implement a comprehensive program to prevent Stormwater Pollution to the MEP.

The 2010 SMR MS4 Permit mandates the LID approach described in this WQMP for management of the discharge of storm water pollutants from PDPs to the MEP. The 2010 SMR MS4 Permit also requires implementation of the SMR HMP to manage runoff discharge rates and durations from PDPs to avoid increased erosion of stream beds and banks in receiving waters.

This section (Section 2) explains the technical background of the Copermittees' approach to implementing both LID requirements and the SMR HMP requirements; and Chapter 3 describes how to prepare a Project-Specific WQMP (referred to as a SSMP in the 2010 MS4 Permit) that is in compliance with these requirements.

2.1.2. Maximum Extent Practicable

The Clean Water Act (CWA) Section 402(p)(3)(iii) sets the standard for control of Stormwater Pollutants as MEP, but the CWA does not quantitatively define this term. As implemented, MEP is varies with conditions. In general, to achieve the MEP

standard, Copermittees must require deployment of whatever BMPs are technically feasible (that is, are likely to be effective) and are not cost prohibitive.[1]

Many stormwater controls, including LID, have proven to be practicable in most Development Projects. To achieve fair and effective implementation, criteria and guidance for those controls must be detailed and specific—while also offering the right amount of flexibility or exceptions for special cases. The 2010 SMR MS4 Permit includes various standards, reflected in this WQMP, which the San Diego Regional Board has found to provide "MEP" control.

2.1.3. Best Management Practices

CWA Section 402(p) and United States Environmental Protection Agency (USEPA) regulations (40 CFR 122.26) require the Copermittees to implement a program of "management practices" to control Stormwater Pollutants to the MEP. BMPs are schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. This document defines several categories of BMPs. The glossary includes definitions for each category of BMP.

2.1.4. TMDL

A TMDL, or 'Total Maximum Daily Load', is the maximum amount of a Pollutant that the Regional Board has established can be discharged into a waterbody from all sources (point and non-point) and still maintain Water Quality Standards. Under CWA Section 303(d), TMDLs must be developed for all waterbodies that do not meet Water Quality Standards after application of technology-based controls.

At this time, there are no adopted TMDLs in the SMR. As TMDLs are developed and adopted in the SMR, this WQMP will be updated as necessary.

2.2. Potential Impacts of Development

This section describes the potential impacts that Development Projects can have on streams, rivers and other water bodies.

[1] "Definition of Maximum Extent Practicable", memo by Elizabeth Jennings, Senior Staff Counsel, State Water Resources Control Board, February 11, 1993.

2.2.1. Imperviousness

Schueler (1995) proposed imperviousness as a "unifying theme" for the efforts of planners, engineers, landscape architects, scientists, and local officials concerned with urban watershed protection. Schueler argued (1) that imperviousness is a useful indicator linking urban land development to the degradation of aquatic ecosystems, and (2) imperviousness can be quantified, managed, and controlled during land development.

Imperviousness has long been understood as the key variable in urban hydrology. Peak runoff flow and total runoff volume from small urban catchments are usually calculated as a function of the ratio of impervious area to total area. The ratio correlates to the composite runoff factor, usually designated "C". Increased flows resulting from urban development tend to increase the frequency of small-scale flooding downstream.

Imperviousness has three major components: rooftops, transportation (including streets, highways, and parking areas) and other hardscape. The transportation component is most likely to be directly connected to the MS4.

The effects of imperviousness can be managed by disconnecting impervious areas from the MS4 and by making drainage conveyances *less* efficient—that is, by encouraging retention and detention of runoff near the point where it is generated, more closely mimicking pre-development runoff flows and durations and time of concentration.

2.2.2. Potential Water Quality Impacts Associated with Developments

Runoff from a developed site has the potential to contribute Pollutants to the MS4 and Receiving Waters. These Pollutants may originate as airborne dust, be washed from the atmosphere during rains or may be generated locally by automobiles and activities present at the site. Pollutants can be grouped in nine general categories as follows:

- Sediments are soils or other surficial materials that are eroded and then transported or deposited by the action of wind, water, ice, or gravity. Excessive discharge of sediments to waterbodies and streams can potentially increase turbidity, clog fish gills, reduce spawning habitat, lower young aquatic organism survival rates, smother bottom dwelling organisms, and/or suppress aquatic vegetation growth.

- Nutrients are inorganic substances, such as nitrogen and phosphorus. They commonly exist in the form of mineral salts that are either dissolved or suspended in water. Primary potential sources of nutrients in runoff are fertilizers and eroded soils. Excessive discharge of nutrients to waterbodies and streams may cause excessive aquatic algae and plant growth. Such excessive production, referred to as cultural eutrophication, may lead to excessive decay of organic matter in the waterbody, loss of oxygen in the water, release of toxins in bed sediment, and/or the eventual death of aquatic organisms and fish kills.

- Metals are raw material components in both metal and non-metal products. Primary potential sources of metal pollution in stormwater are typically commercially-available metals and non-metal products such as fuels, adhesives, paints, and other coatings. Metal Pollutants may include cadmium, chromium, copper, lead, mercury, and zinc. Lead and chromium have been used as corrosion inhibitors in primer coatings and cooling tower systems. Metals that naturally occur in soil are typically not toxic at low concentrations. However, at higher concentrations, certain metals can be toxic to aquatic life. Humans can be impacted from contaminated groundwater resources, and bioaccumulation of metals in fish and shellfish. Environmental concerns, regarding the potential for release of metals to the environment, have already led to restricted metal usage in certain applications.

- Toxic Organic Compounds are natural or synthetic carbon-based molecules that may be found in pesticides, solvents, and hydrocarbons. Organic compounds can, at certain concentrations, indirectly or directly constitute a hazard to life or health. When rinsing off objects, toxic levels of solvents and cleaning compounds can inadvertently be discharged to MS4 facilities. Dirt, grease, and grime retained in the cleaning fluid or rinse water may also adsorb levels of organic compounds that are harmful or hazardous to aquatic life.

- Trash (such as paper, plastic, polystyrene packing foam, and aluminum materials) and biodegradable organic matter (such as leaves, grass cuttings, and food waste) may impact the recreational value or other Beneficial Uses of a waterbody and/or aquatic habitat. Excess organic matter that may have been introduced as trash can create a high biochemical oxygen demand in a stream and thereby lower its water quality.

- Primary sources of oil and grease are petroleum hydrocarbon products, motor products from leaking vehicles, esters, oils, fats, waxes, and high molecular-weight fatty acids. Introduction of these Pollutants to the waterbodies can occur due to the wide uses and applications of some of these products in municipal, residential, commercial, industrial, and construction areas. Elevated oil and grease content can decrease the aesthetic value of the waterbody, as well as the water quality.

- Bacteria and Viruses are environmentally-ubiquitous microorganisms that thrive under certain ecological conditions. Their proliferation is often from natural or uncontrollable sources but can also be caused by the transport of animal or human fecal wastes from a watershed. Water containing excessive bacteria and viruses, can alter the aquatic habitat and create a harmful environment for humans and aquatic life.

- Pesticides (including herbicides) are chemical compounds commonly used to control nuisance growth or prevalence of organisms. Excessive or inappropriate application of a pesticide may result in runoff that may be toxic to aquatic life.

The 2010 MS4 Permit requires the Copermittees to require proposed PDPs to incorporate LID principles and LID BMPs, Conventional Treatment Control BMPs (where LID BMPs are technically infeasible), and Hydrologic Control BMPs that address potential water quality impacts.

2.2.3. Hydromodification Impacts

The 2010 SMR MS4 Permit defines Hydromodification as:

> *The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, interflow and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered Hydromodification, due to their disruption of natural watershed hydrologic processes.*

Once altered, natural streams and their ecosystems may have diminished beneficial uses. However, the stream may reach a new geomorphic equilibrium if proper management measures are implemented, and beneficial uses may be partially or fully recovered. Managing runoff from a single development site may seem inconsequential, but by changing the way most sites are developed (and

redeveloped), it may be possible to protect existing stream ecosystems downstream of urban and urbanizing areas.

2.2.4. Priority Pollutants of Concern

'Priority Pollutants of Concern' are those Pollutants that the proposed PDP has the potential to generate, and are also known to be impairing the downstream Receiving Waters. Identifying Priority Pollutants of Concern involves the following steps:

1. Identify Receiving Waters – Use the most recent version of the Water Quality Control Plan for the in the San Diego Region Basin to determine the PDPs proximate Receiving Waters. This information can be accessed from the following site: (http://www.waterboards.ca.gov/sandiego/water_issues/programs/basin_plan/)

2. Identify Impairments in those Receiving Waters by Reviewing:

the 303(d) listings for all downstream Receiving Waters:

http://waterboards.ca.gov/santaana/water_issues/programs/tmdl/303d.shtml

and any Pollutants being addressed by an adopted TMDL:

http://waterboards.ca.gov/santaana/water_issues/programs/tmdl/

3. Identify Pollutants associated with your site/project - This includes legacy Pollutants that may be present on the project site, as well as Pollutants that are listed for the category of development on Table 2-1 below. That table may be updated by the Copermittees periodically based on updated studies and information. Updates will be reported in the JRMP Annual Report to the San Diego Regional Board submitted by the Copermittee with Jurisdiction over the project site, and reflected in an update to this WQMP.

Table 2-1: Potential Pollutants by Land Use Type

Priority Development Project Categories and/or Project Features	General Pollutant Categories							
	Bacterial Indicators	Metals	Nutrients	Pesticides	Toxic Organic Compounds	Sediments	Trash & Debris	Oil & Grease
Detached Residential Development	P	N	P	P	N	P	P	P
Attached Residential Development	P	N	P	P	N	P	P	P(2)
Commercial/Industrial Development	P(3)	P	P(1)	P(1)	P(5)	P(1)	P	P
Automotive Repair Shops	N	P	N	N	P(4, 5)	N	P	P
Restaurants (>5,000 ft^2)	P	N	N	N	N	N	P	P
Hillside Development (>5,000 ft^2)	P	N	P	P	N	P	P	P
Parking Lots (>5,000 ft^2)	P(6)	P	P(1)	P(1)	P(4)	P(1)	P	P
Retail Gasoline Outlets	N	P	N	N	P	N	P	P

P = Potential
N = Not Potential
(1) A potential Pollutant if non-native landscaping exists or is proposed onsite; otherwise not expected.
(2) A potential Pollutant if the project includes uncovered parking areas; otherwise not expected
(3) A potential Pollutant is land use involving animal waste
(4) Specifically petroleum hydrocarbons
(5) Specifically solvents
(6) Bacterial Indicators are routinely detected in pavement runoff

2.3. LOW IMPACT DEVELOPMENT (LID)

The 2010 SMR MS4 Permit defines LID as follows:

> A stormwater management and land development strategy that emphasizes conservation and the use of onsite natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions.

The Low Impact Development Manual for Southern California (SMC, 2010) further describes that there are two types of LID:

- LID Principles which are site design concepts that prevent or minimize the causes (or drivers) of post-construction impacts, and help mimic the pre-development hydrologic regime. LID Principles should be implemented to the MEP on all sites.

- LID BMPs which are Structural BMPs that help manage otherwise unavoidable post-construction impact; i.e., where implementation of LID Principles cannot fully address the Design Capture Volume for a particular portion of a site, LID

BMPs must be implemented. The User may also investigate the feasibility of using LID BMPs as Hydrologic Control BMPs to manage the increases in runoff discharge rates and durations that may cause Hydromodification impacts.

2.3.1. Benefits of LID

There are many potential benefits associated with the use of LID. Foremost, LID BMPs tend to retain runoff, thus reducing the amount of potentially Polluted runoff that can be transported to Receiving Waters. Additionally, LID BMPs have the advantage of supplementing the physical processes of interstitial settling and adsorption—common to all media filters—with additional complexation and adsorption to the biofilms that are developed, and for those that include vegetation, additional Pollutant removal through uptake through the plant roots. In addition, LID BMPs that integrate engineered/amended soils and/or vegetation benefit from the biological activity of bacteria, insects, and worms, which helps renew and maintain the media, increasing reliability and eliminating the need for frequent maintenance or re-setting of the filtration layers. LID BMPs also act as "sponges", absorbing the amount of Runoff from small storm events and some of the Runoff from larger events and retaining it so as to maximize infiltration and Evapotranspiration. This, in turn helps the post-development site's hydrologic regime mimic the pre-development hydrology and can be useful in achieving compliance with the HMP Performance Standards.

In addition to Stormwater management, LID implementation can result in environmental, economic, and community benefits:

Potential Environmental Benefits:

- Improved water quality
- Maintenance of predevelopment Runoff volume and discharge
- Groundwater recharge
- Terrestrial and aquatic habitat preservation
- Reduced potable water demand
- Recycling and beneficial reuse

- Reduction in urban heat island effect

Potential Economic Benefits:

- Reduced construction and maintenance costs
- Improved marketability
- Energy cost reduction and water conservation

Potential Community Benefits:

- Improved aesthetic value
- Provides "green job" opportunities
- Educational opportunities

LID BMPs have been shown in studies throughout the country to be effective and reliable at treating a wide range of Pollutants that can be found in Runoff, including those listed in Section 2.2.2 above. As such, the LID BMPs required in this WQMP are expected to treat discharges of urban-sourced Pollutants from PDPs with a high level of effectiveness, such that the runoff discharges from the PDP should not cause or contribute to an exceedance of Receiving Water Quality Objectives.

2.3.2. LID BMP Types and Prioritization

LID BMPs are a type of Structural BMP that provide many of the benefits described above. For the purposes of this WQMP, LID BMPs are categorized and prioritized as follows:

- Priority 1: LID Retention BMPs
    - LID Infiltration BMPs are designed to infiltrate captured runoff into the underlying native soils. As such, these LID Infiltration BMPs can be used only where soils are highly permeable. Review the assessment of constraints and opportunities in Step 2 to determine the applicability of LID Infiltration BMPs to the PDP. Typical LID Infiltration BMPs include infiltration basins, infiltration trenches and pervious pavements.
        - Pervious Pavements include pervious pavers, asphalt or concrete surfaces, or permeable modular block. Unlike traditional pavements that are impermeable, porous pavements reduce the volume and peak of Stormwater Runoff as well as manage

Pollutants from Stormwater Runoff by allowing precipitation to infiltrate into underlying soils. Permeable pavements can be designed as LID Infiltration BMPs, or as an LID Principle[1].

- Harvest and Use BMPs are used to facilitate capturing Stormwater Runoff for later use. Review the assessment of constraints and opportunities in Step 2 to determine the applicability of this LID BMP to the Development Project.

- Bioretention BMPs are engineered vegetated areas that are designed to receive runoff. These areas can be configured as free-form areas or planters to integrate with the landscape design. Bioretention BMPs are feasible on all soil types and distinguished from Biotreatment BMPs (below) by the fact that they capture and absorb the Design Capture Volume (DCV) entirely into a biologically active soil media. Water retained in this soil media is then evapotranspired by plants in the BMP, or slowly allowed to infiltrate into the underlying soils. This BMP inherently maximizes both infiltration and evapotranspiration of runoff based on the actual limitations of the soil and environment. In sufficiently drained soils, even when constructed with a subdrain, Bioretention BMPs will retain long term volumes of runoff. See the additional discussion of Retention vs. Bioretention in Section 2.3.3.

- Priority 2: Other LID BMPs

  - Bioretention BMPs while designed to be a LID Retention BMP, Bioretention BMPs can also be used in areas where infiltration characteristics of the soils will not allow full retention of the DCV. Bioretention BMPs may also be implemented to partially, if not fully, manage increases in runoff discharge rates and duration to meet the Hydrologic Performance Standard (Section 3.6.3). In this case, infiltration and evapotranspiration of Runoff will still be maximized based on the actual limitations of the soil and environment.

[1] When pervious pavement is designed primarily as a site design feature (i.e., it doesn't receive Runoff from more than 2 parts tributary impervious area to 1 part pervious pavement), the pervious pavement is considered a self-retaining area as described in Section 3.3.3. If additional area is drained onto the pervious pavement beyond the 2:1 ratio, the pervious pavement will be required to be constructed in accordance with a Copermittee approved Stormwater BMP design that allows for greater ratios, (such as the LID BMP Design Handbook). In this case, pervious pavement is considered a LID Infiltration BMP.

- Biotreatment BMPs are naturally-based LID BMPs, which can be used where soils are relatively impermeable. These BMPs are distinguished from LID Bioretention BMPs in that they are not designed to retain the DCV in an engineered soil media, however, they still provide similar functions and benefits to LID Bioretention BMPs by incorporation of features that provide for natural biological processes while still maximizing opportunities for infiltration and evapotranspiration. Biotreatment BMPs may also be implemented to partially, if not fully, manage increases in runoff discharge rates and duration to meet the Hydrologic Performance Standard (Section 3.6.3). Examples of Biotreatment Control BMPs include extended detention basins, bioswales, and constructed wetlands. Consult with the Copermittee with jurisdiction over the project site to determine approved LID Biotreatment BMPs.

Descriptions, illustrations, designs, and design criteria for the LID BMPs described herein can be found in the LID BMP Design Handbook (Exhibit C). A Copermittee may have its own designs for these same BMPs, or may specify other LID BMPs that Users may use.

2.3.2.a) LID Prioritization

Consistent with Provision F.1.d.(4) of the 2010 SMR MS4 Permit, each PDP must implement LID Retention BMPs that capture and retain onsite the DCV for each of the project's Drainage Management Areas (DMAs). If it has been shown to be technically infeasible to implement such LID Retention BMPs for some or all of DMAs on the site, other LID BMPs can be used to address the runoff from those DMAs.

2.3.3. LID Retention vs Bioretention

The 2010 SMR MS4 Permit requires that the DCV be retained onsite unless it is technically infeasible. The intent behind these prioritization requirements is to reduce the volume of runoff and Pollutant loads entering Receiving Waters. In cases where such retention practices are feasible, they may provide a significant benefit to runoff quality, and help the project mimic the pre-development hydrologic regime. Of particular interest is the contribution of LID BMPs towards managing potential increases in runoff discharge rates and durations caused by PDPs.

BMPs solely reliant on retention practices (infiltration, harvesting and use, or evapotranspiration) however, require a high level of confidence in the long-term

reliability of water demand, the infiltration characteristics of the underlying soils, and of evapotranspiration rates, to ensure timely drawdown of the storage volume.

LID Bioretention BMPs, when properly designed such as shown in the LID BMP Design Handbook, also inherently meet the goal of capturing the required volume of runoff, and infiltrating and evapotranspiring that volume to the extent feasible given site soils and other conditions. In highly permeable soils, infiltration will meet or exceed the required DCV; in less permeable soils the proportion infiltrated will be smaller and the remaining proportion will either be evapotranspired or receive full biotreatment. Such LID Biotreatment BMPs will achieve the *maximum* feasible level of infiltration and evapotranspiration and achieve the *minimum* feasible (but highly biotreated) discharge.

> LID Bioretention BMPs provide the benefits of LID Retention BMPs, while providing a higher level of confidence that the captured volume will be drained within an acceptable timeframe to avoid nuisance conditions and ensure that subsequent storms will not bypass the BMP untreated.

A recent analysis of the monitored inflow and outflow data contained in the International Stormwater BMP Database showed an average long-term volume reduction on the order of 40% for biofilters, 30% for extended detention basins, and 60% for Bioretention BMPs. These performance figures are for installations on a variety of underlying soil types. The higher the infiltrative capacity of the underlying soils, the higher percentage of long term captured volume will be retained.

This means that a designer could substitute a LID Bioretention BMP designed to capture 100% of the DCV, instead of an identically sized LID Harvest and Use BMP that has insufficient demand - without impairing the long term retention of stormwater runoff of the PDP's system of BMPs. This is because, if the Harvest and Use BMP would, based on the demands present on the site, retain less than 40% of the *long term volume of runoff*, the LID Biotreatment BMP would end up retaining more than the Harvest and Use BMP.

☞ *To further validate the volume reduction resulting from LID BMPs in the semi-arid environment of western Riverside County, the District has constructed several categories of LID BMPs, including Bioretention BMPs, at their headquarters in Riverside, CA and is directly measuring the actual long term volume reductions.*

2.3.4. LID Infiltration Feasibility Criteria

In many areas of Riverside County, soils will support LID Infiltration BMPs. However, there are several factors that affect their feasibility that must be considered before

utilizing such BMPs. Some of the factors will require a licensed Geotechnical Engineer to verify, as identified in the sub-sections below.

2.3.4.a) Downstream Impacts

If it is demonstrated that infiltrating the DCV would negatively impact downstream water rights or other Beneficial Uses, LID Infiltration BMPs are not required. Such a condition must be substantiated by sufficient modeling to demonstrate such an impact. Such an exemption would have to be approved by the Copermittee with jurisdiction over the project site and the San Diego Regional Board.

2.3.4.b) Groundwater Protection

The following restrictions on the use of centralized Infiltration BMPs are identified to ensure that the BMP does not cause or contribute to an exceedance of groundwater quality objectives. These restrictions do not apply to small infiltration systems dispersed throughout a PDP.

- LID Infiltration BMPs must not be used for areas of industrial or light industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee unless first treated or filtered to remove Pollutants prior to infiltration.
- The seasonal high groundwater mark must be at least 10 feet below the invert of the LID Infiltration BMP.
- Infiltration BMPs must be located a minimum of 100 feet horizontally from any water supply wells.
- No part of a LID Infiltration BMP should be within a 2:1 (horizontal: vertical) influence line extending from any septic leach line.
- LID Infiltration BMPs must not be located in soils that, according to a licensed Geotechnical Engineer, do not have adequate physical and chemical characteristics (such as appropriate cation exchange capacity, organic content, clay content and infiltration rate) for the protection of groundwater.

2.3.4.c) Public Safety and Offsite Impacts:

LID Infiltration BMPs must not be used in locations or in soils that may create a public safety or structural concern, such as but not limited to slope or structural instability, landslides, mudslides, liquefaction, seeps, adjacent to building

foundations, or other geotechnical concerns. Such a determination must be in accordance with the recommendations of a licensed Geotechnical Engineer.

2.3.4.d) Infiltration Characteristics

BMPs entirely reliant on infiltration (such as infiltration basins or infiltration trenches) require a high level of confidence in the long-term reliability of the infiltration characteristics of the underlying soils. Adequate long-term infiltration capacity is the determining factor as to whether a LID Infiltration BMP will be effective for the protection of Receiving Water quality.

'In-Situ' tested infiltration rates (i.e., the Saturated Hydraulic Conductivity) can vary widely both spatially and temporally within a project site. It is not uncommon to find that the tested infiltration rates at one location can be an order of magnitude different from another test conducted a matter of feet away – even within the same BMP footprint. Additionally it is known that the infiltration rate is typically reduced after construction of the project (compared to exploratory/feasibility testing performed before construction) due to grading, cut and fill conditions; and that the infiltration rate continues to further degrade over time due to unavoidable/inadvertent clogging of the native soils.

If the actual long-term infiltration rates within the BMP are too low, excessive ponding may occur, which may result in two negative effects:

1) Mosquitoes and other vectors may begin breeding; and

2) Runoff from subsequent rainfall events may bypass the BMP, resulting in untreated runoff being discharged from the site and potential impacts to receiving waterbodies.

To avoid creation of these conditions, a maximum Drawdown Time of 72 hours has been established. To ensure that over the life of the BMP the actual Drawdown Time does not exceed 72 hours, and based on the typical infiltration basin depth of five (5) feet, the minimum long-term post-development infiltration rate must be at least 0.83 inch per hour (5ft * 12/72 hours = 0.83 inch/hour).

As discussed above, however, the long-term post-development infiltration rates can be much lower than the initial (pre development) infiltration rates that are measured for feasibility testing. As such, infiltration testing requirements have incorporated a minimum factor of safety of two for Infiltration BMPs. Incorporating the established minimum factor of safety, the tested pre-development infiltration

rates must be greater than 1.6 inches per hour to be assured that over the life of the BMP, the actual infiltration rate will not degrade to a level that nuisance or vector conditions could be created. This will also ensure that the BMP will be adequately drained for back-to-back storms.[1]

Accordingly, the following feasibility criteria have been developed to ensure that the most effective and reliable BMPs are deployed:

- If the 'in-situ' tested infiltration rate for the site is less than 1.6 inches per hour, due to the uncertainty in infiltration rates as discussed above LID Infiltration BMPs (infiltration basins, infiltration trenches, etc.) must not be used. Infiltration testing must be performed using methodologies such as identified in the LID BMP Design Handbook, or Copermittee-approved alternative methods. If Harvest and Use is also not feasible, Bioretention BMPs can instead be used. Bioretention BMPs provide infiltration and evapotranspiration to the MEP as described in Section 2.3.3, while ensuring that the BMP drains appropriately and capacity is restored for subsequent storms.

While soil amendment practices can affect evapotranspiration rates, they do not have a substantial effect on infiltration rates to the surrounding native soils or overall retention in a LID Infiltration BMP, and as such are not appropriate to prevent vector concerns or ensure adequate drainage for subsequent storms. Amended soils may be appropriate for self-retaining areas (micro-infiltration areas) described in section 3.3.2, when sited on Group C or D soils.

If the project meets the following criteria:

Table 2-2: Small Project Criteria

Residential	Commercial, Institutional	Industrial
Less than 10 acres and less than 30 DU	Less than 5 acres and less than 50,000 SF Impervious	Less than 2 acres and less than 20,000 SF Impervious

Then the project is considered a small project. If the small project is underlain with Hydrologic Soils Group (HSG) "D" soils according to available regional soils maps, and

[1] The analysis used to determine the threshold infiltration rates was based on factors of safety used in the adopted Orange County WQMP/Technical Guidance Document (Appendix VII), standard engineering practices, experience with BMPs that rely solely upon infiltration in Contra Costa County, and best professional judgment.

no available data for the site is conflicting with such a designation, 'in-situ' testing of infiltration rates may not be required, at the discretion of the Copermittee. In this case, LID Infiltration BMPs cannot be used.

2.3.4.e) Cut / Fill Conditions

The soil beneath LID Infiltration BMPs must be thoroughly evaluated in a geotechnical report since such BMPs are reliant solely on the infiltration rates of the underlying soils for their long term performance. Because of this, the project proponent must be able to perform tests on the actual soils that will exist at the infiltration surface. It is impossible to test the infiltration rate of an engineered fill that does not yet exist. As such, LID Infiltration BMPs would be prohibited if the planned fill was so deep that the bottom of the BMP could not extend down through the fill and into the native soils. A similar situation exists for those areas that will be significantly excavated as part of the site grading process, and the testing cannot be performed at the future cut elevation. If there is no practicable way to verify infiltration rates at the final BMP infiltration surface, LID Infiltration BMPs may not be used. LID Infiltration BMPs may still be applicable for DMAs in other parts of a project site in which infiltration testing is feasible. Each DMA on a project site will be assessed accordingly.

2.3.4.f) Other Site Specific Factors

If the geotechnical investigation performed by a licensed engineer discovers other site-specific factors that would preclude effective and/or safe infiltration, such as, but not limited to, clay lenses, restrictive layers, or soils prone to liquefaction, LID Infiltration BMPs are not required in those areas.

2.3.5. LID Harvest and Use Feasibility Criteria

LID Harvest and Use BMPs may be employed on any site where it can be shown there is sufficient reliable and timely demand for non-potable water, subject to the following criteria:

2.3.5.a) Downstream Impacts

If harvesting and using Stormwater Runoff would demonstrably negatively impact downstream water rights or other Beneficial Uses, LID Harvest and Use BMPs are not required. Such a condition must be substantiated by sufficient modeling to demonstrate such an impact. Such an exemption would have to be approved by the Copermittee with jurisdiction over the project site and the San Diego Regional Board.

2.3.5.b) Reclaimed Water Use

Utilizing reclaimed water where available inherently reduces the amount of treated municipal effluent discharged to waterbodies. Further, utilizing the capacity of the reclaimed water system, where available, has a significantly larger benefit for offsetting potable water supply than LID Harvest and Use BMPs. If reclaimed water is available to the site, the use of reclaimed water will take precedence over the harvest and use of Stormwater Runoff.

If reclaimed water will be used on the project, there is no need to further evaluate the feasibility of LID Harvest and Use BMPs. Use of reclaimed water should be documented in the Project-Specific WQMP.[1]

2.3.5.c) Code Compliance

If a particular use of captured stormwater, and/or available methods for storage of captured stormwater would be contrary to building codes in effect at the time of approval of the preliminary Project-Specific WQMP, then an evaluation of harvesting and use for that use would not be required.

2.3.5.d) Minimum Demands

The evaluation of the feasibility of LID Harvest and Use BMPs is performed for three potential categories of use: toilet flushing, irrigation and other onsite non-potable uses as described in the following tables. Data presented in the tables were generated based upon a continuous simulation analysis and demand factors consistent with similar analyses prepared for the 2011 Orange County WQMP and Technical Guidance Document. Riverside County specific rainfall and evapotranspiration data was used to generate the analysis.

For evaluation of toilet flushing, flush volumes and use rates from the literature have been combined with a long-term continuous simulation to develop a minimum unit demand, referred to as the Toilet Users to Impervious Area ratio that would be required to achieve the minimum 40% long-term retention of Runoff. See Table 2-3 below, as well as the discussion of Retention vs. Bioretention BMPs above. If the proposed project does not meet or exceed this minimum demand, implementing this LID Harvest and Use BMP would be less

[1] Non-agricultural irrigation using recycled water must comply with the statewide permit for Landscape Irrigation Using Recycled Water and the State Department Health guidelines.

effective than a Bioretention BMP, and as such, this LID Harvest and Use BMP would not be required for the project.

Table 2-3: Harvest and Use Data for Toilet Use

Project type	Residential	Retail / Office Commercial	Industrial	Schools
Basis of Use Type	*Resident*	*Employee (non-visitor)*	*Employee (non-visitor)*	*Employee (non-student)*
Design Capture Storm depth, in	**Minimum Demand (toilet users per tributary impervious acre)**			
0.50	87	116	160	26
0.55	94	125	170	28
0.60	102	133	179	30
0.65	109	142	189	31
0.70	116	150	198	33
0.75	123	159	208	35
0.80	130	167	217	36
0.85	137	176	227	38
0.90	145	184	236	40
0.95	152	193	246	41
1.00	159	201	255	43
1.05	166	210	265	45
1.10	173	218	274	46
1.15	180	227	284	48
1.20	188	235	293	50

[A]*Unit demands used in analysis:* *Residential = 9.3 gal/resident/day*
Retail/office = 7 gal/employee/day
Industrial = 5.5 gal/employee/day
Schools = 33 gal/employee/day

[B]*Design storm capture = 0.7 in. with Lake Elsinore rainfall; 1.0 in. with Temecula rainfall. Other values were linearly interpolated/extrapolated*

For evaluation of irrigation, typical evapotranspiration and water demands have been combined with a long-term continuous simulation to develop a minimum ratio of Effective Impervious Area to Irrigated Area that would be required to achieve the minimum 40% long-term retention of Runoff. See Table 2-4 below, as well as the discussion of Retention vs. Bioretention BMPs above. If the proposed project cannot meet or exceed this ratio, implementing this LID Harvest and Use

BMP would be less effective than a LID Bioretention BMP, and as such this LID Harvest and Use BMP would not be required for the project.

Table 2-4: Harvest and Use Data for Irrigation Use[A]

General landscape type	Conservation Design: K_L^B=0.35	Active Turf Areas: K_L^B=0.70
Design Capture Storm Depth[C], in	**Minimum required irrigated area per tributary impervious acre for partial capture (ac/ac)**	
0.50	0.36	0.22
0.55	0.72	0.35
0.60	1.08	0.47
0.65	1.45	0.60
0.70	1.81	0.91
0.75	2.17	1.16
0.80	2.53	1.41
0.85	2.90	1.66
0.90	3.26	1.91
0.95	3.62	2.16
1.00	3.98	2.41
1.05	4.35	2.66
1.10	4.71	2.91
1.15	5.07	3.16
1.20	5.43	3.41

[A]ET data from the CIMIS station at Temecula used for this analysis

[B] (KL) incorporates plant species, microclimate and water management/irrigation practices, as described in the 2011 Orange County WQMP and Technical Guidance Document.

[C]Design storm capture = 0.7 in. was calculated using Lake Elsinore rainfall; 1.0 in. with Temecula rainfall. Other values were linearly interpolated/extrapolated

For evaluation of other non-potable uses such as industrial uses, a long-term continuous simulation of precipitation intensity and frequency has been performed to develop a table of minimum demands that would be required to achieve the minimum 40% long-term retention of runoff. See Table 2-5 below, as well as the discussion of Retention vs. Biotreatment above. If the proposed project cannot meet or exceed these minimum demands, implementing this LID Harvest and Use BMP would be less effective than a LID Bioretention BMP, and as such this LID Harvest and Use BMP would not be required for the PDP.

Table 2-5: Harvest and Use Data for other non-potable uses*

Design Capture Storm depth, in	Wet season demand required for minimum partial capture, gpd per impervious acre
0.50	880
0.55	932
0.60	985
0.65	1,037
0.70	1,089
0.75	1,141
0.80	1,194
0.85	1,246
0.90	1,298
0.95	1,350
1.00	1,403
1.05	1,455
1.10	1,507
1.15	1,559
1.20	1,612

**Design storm capture = 0.7 in. was calculated using Lake Elsinore rainfall; 1.0 in. with Temecula rainfall. Other values were linearly interpolated/extrapolated*

2.3.6. Feasibility of Other LID BMPs

Experience has shown implementation of other types of LID BMPs, such as Bioretention and/or Biotreatment is feasible on nearly all PDP sites with sufficient advance planning. Projects where LID Bioretention and/or Biotreatment BMPs may not always be feasible generally fall into one of the following two categories:

- Portions of sites which are not being developed or redeveloped, but which must be retrofitted in accordance with the "50% rule". For example if site-specific conditions preclude draining existing impervious surfaces on the newly developed portion of the site – and if the existing impervious surfaces cannot be otherwise retrofitted with other LID BMPs.
- Sites smaller than one acre approved for lot-line to lot-line development or redevelopment as part of a Copermittee's effort to preserve or enhance a pedestrian-oriented "smart-growth" type of urban design. For many scenarios, LID Biotreatment BMP options such as planters will be feasible.

If you believe specific conditions on your site preclude the use of LID BMPs, you must submit, in the Project-Specific WQMP, a detailed site-specific examination and demonstration that implementation of other LID BMPs is technically infeasible.

2.3.7. BMP Area Considerations

Most LID BMPs can be fit within planned landscaped areas of a project with proper planning and site and grading/drainage optimization.

Table 2-6 provides the recommended percentage of a PDP site that is required to be made available for LID BMPs. The PDP may provide more area for LID BMPs if desired. Table 2-6 is intended to be used as follows:

- If the percentage of the PDP site that would have to be made available for BMPs to meet the requirements in this WQMP exceeds the project-type specific minimum criteria shown in Table 2-6 below, then the remaining volume (beyond that which fits within the shown minimum criteria) must be addressed with other Conventional Treatment Control BMPs, Credits, Runoff Fund contributions, or waivers.
- If the percentage of the site provided for BMPs is lower than the value shown in Table 2-6 <u>and the BMP requirements have not fully been met</u>, a reviewer can request that additional area be made available for BMPs until either the percentage of the site in Table 2-6 is provided or the BMP requirements are met, whichever is less.

Table 2-6: Recommended Effective Area[1] Required to be made Available for LID BMPs (% of site)[2]

Priority Development Project Type	New Development	Redevelopment
SF/MF Residential < 7 du/ac	10%	5%
SF/MF Residential 7 – 18 du/ac	7%	3.5%
SF/MF Residential > 18 du/ac	5%	2.5%
Mixed Use, Commercial/Industrial w/ FAR < 1.0	10%	5%
Mixed Use, Commercial/Industrial w/ FAR 1.0 – 2.0	7%	3.5%
Mixed Use, Commercial/Industrial w/ FAR > 2.0	5%	2.5%
Podium (parking under > 75% of project)	3%	1.5%
Zoning allowing development to property lines	2%	1%
Transit Oriented Development[3]	5%	2.5%
Parking	5%	2.5%

[1] "Effective area" is defined as area which 1) is suitable for a BMP (for example, if infiltration is potentially feasible for the site based on infeasibility criteria, infiltration must be allowed over this area) and 2) receives runoff from impervious areas.

[2] Adapted from the San Bernardino County Stormwater Program Technical Guidance Document for Water Quality Management Plans.

[3] Transit oriented development is defined as a development with development center within one half mile of a mass transit center.

Key: du/ac = dwelling units per acre, FAR = Floor Area Ratio = ratio of gross floor area of building to gross lot area, MF = Multi Family, SF = Single Family

2.4. HYDROMODIFICATION

As land converts from natural land covers to developed land covers, runoff discharge rates and durations, and the delivery of Bed Sediment Supply from PDPs to the Receiving Waters may be altered. The alteration of both hydrology and sediment transport regimes may cause erosion or aggradation to channels. Where this occurs, this phenomenon is referred to as Hydromodification.

The 2010 SMR MS4 Permit specifies additional BMP requirements to help prevent Hydromodification impacts. Formerly referred to as 'Hydrologic Conditions of Concern', Hydromodification management approaches have evolved over time, with efforts first focused on managing peak flow rates, and have now shifted to matching or reducing the flow duration curves from post-development to pre-development, in some cases naturally occurring, conditions using continuous simulation approaches, and preserving the delivery of Bed Sediment Supply to the Receiving Waters. This can be accomplished through the use of Structural BMPs, or Hydrologic Control BMPs, and Site Design Principles, or Sediment Supply BMPs. Hydrologic Control BMPs are designed to control the post-construction Runoff hydrograph from the PDP site. Sediment Supply BMPs are implemented to preserve the delivery of Bed Sediment Load to the Receiving Waters.

Hydromodification requirements are separate from, but overlap, the LID requirements of the 2010 SMR MS4 Permit. The LID Design process described in this document will help to avoid potential Hydromodification impacts from a PDP, however may not lead to full compliance with the HMP Performance Standards.

2.5. HYDROLOGY FOR NPDES COMPLIANCE

2.5.1. Water Quality Hydrology

Most runoff, and therefore, most of the potential for conveyance of Pollutants, is produced by frequent storms of small or moderate intensity and duration. Accordingly, Structural BMPs are designed to treat smaller storms and the first flush of larger storms.

2.5.1.a) Design Storm

Methods that have historically been used to determine an MEP-based and cost effective volume of treatment involve continuous simulation of long term rainfall and corresponding runoff from a hypothetical one-acre area entering a basin designed to draw down in a specified amount of time. The simulation is iterated with varying unit basin sizes, and the results are graphed to find the point of diminishing returns (i.e., the 'knee' of the curve) where incrementally larger BMPs result in incrementally smaller benefits to treatment of runoff.

It has been found that the knee of the curve typically occurs with a basin designed for the 85th percentile 24-hour storm event. It has also been found that a basin of this size ends up treating about 80% of the total long-term volume of runoff that occurs during the simulation period.

To simplify design calculations (that is, to avoid the need to perform continuous simulation for design of all BMPs), 2010 SMR MS4 Permit has established the 85th percentile, 24-hour storm event as the "Design Storm", which is the standard used in this WQMP.

An updated Isohyetal map showing the 85th percentile 24-hour storm depth at different locations throughout western Riverside County, based on long-term rainfall data, is provided in Exhibit A.

2.5.1.b) Composite Runoff Factor

The sizing of both Volume-Based BMPs and Flow-Based BMPs is based on determination of a composite runoff factor, which varies depending on the land use covers tributary to the BMP. This composite runoff factor, C, is determined using the following equation

$$C = 0.858 \cdot {I_f}^3 - 0.78 \cdot {I_f}^2 + 0.774 * I_f + 0.04$$

where the Impervious Fraction, I_f is obtained from Table 2-7 below.

Table 2-7: Impervious Fraction Based on Various Land Use Covers

Surface Type	Effective Impervious Fraction, I_f
Roofs	1.00
Concrete or Asphalt	1.00
Grouted or Gapless Paving Blocks	1.00
Compacted Soil (e.g. unpaved parking)	0.40
Decomposed Granite	0.40
Permeable Paving Blocks w/ Sand Filled Gap	0.25
Class 2 Base	0.30
Gravel or Class 2 Permeable Base	0.10
Pervious Concrete / Porous Asphalt	0.10
Open and Porous Pavers	0.10
Turf block	0.10
Ornamental Landscaping	0.10
Natural (A Soil)	0.03
Natural (B Soil)	0.15
Natural (C Soil)	0.30
Natural (D Soil)	0.40

Where multiple surface types are present, a Composite Impervious Fraction, and therefore a Composite Runoff Factor can be calculated using the following equation:

$$I_{f_{composite}} = \frac{\left[(I_f)_1 \cdot A_1\right] + \left[(I_f)_2 \cdot A_2\right] + [\ldots]}{A_T}$$

2.5.1.c) Design Capture Volume (DCV or V_{BMP})

The 2010 SMR MS4 Permit requires that all LID Retention BMPs, Other LID BMPs and Volume-Based Conventional Treatment BMPs be sized to address the volume of runoff from the Design Storm, referred to as

NOTE
The LID BMP Design Handbook (Exhibit C) includes calculation sheets that can be used to calculate and document the '**Design Capture Volume**,' and the **Design Flow Rate**. These should be documented as described in Section 3 herein.

the 'Design Capture Volume', or V_{BMP}. Use the LID BMP Design Handbook to calculate the DCV. For reference, the following equations are used by the LID BMP Design Handbook:

$$DCV = D_{85} \cdot C \cdot A_{TRIB}$$

Where:

DCV = Design Capture Volume (ft^3)

D_{85} = Design Storm depth (from Exhibit A)

C = Composite Runoff Factor (unitless, per 2.5.1.b)

A_{TRIB} = Area tributary to the BMP (acres, see Section 3.3)

2.5.1.d) Design Flow Rate (Q_{BMP})

For flow-based Conventional Treatment Control BMPs, use the LID BMP Design Handbook to calculate the design flow rate. For reference, the LID BMP Design Handbook is based on the rational method and uses the following equation:

$$Q_{BMP} = C \cdot i \cdot A_{TRIB}$$

Where:

Q_{BMP} = Design Flow Rate (cfs)

i = rainfall intensity (0.2 inches/hour)

C = Composite Runoff Factor (unitless, per 2.5.1.b))

A_{TRIB} = area tributary to the BMP (acres, see Section 3.3)

2.5.2. Hydromodification Hydrology

In addition to incorporating applicable LID BMPs to ensure water quality treatment of runoff, Users may be required to provide additional LID Principles, LID BMPs, or other Structural BMPs to manage Hydromodification.

2.5.2.a) Santa Margarita Region Hydrology Model

The 2010 SMR MS4 Permit states:

> *All PDPs must use continuous simulation to ensure that post-project runoff flow rates and durations for the PDP shall not exceed pre-development, naturally occurring, runoff flow rates and durations by more than 10% over more than 10% the length of the flow duration curve, from 10% of the 2-year runoff event up to the 10-year runoff event.*

To comply with this provision, the Copermittees require Users to use the Santa Margarita Region Hydrology Model (SMRHM) to demonstrate compliance with the Hydrologic Performance Standard of the SMR HMP. The SMRHM is an integrated flow control sizing tool that performs continuous hydrologic simulations over the entire available rainfall record. The tool allows the User to size LID BMPs and match or reduce the flow duration curve of post-development to that of pre-existing, naturally occurring, conditions. Geomorphically significant flows that are embedded in SMRHM range from 10% of the 2-year runoff event up to the 10-year runoff event. The SMRHM is made available to Users at no cost.

Alternatively, the User may opt to develop its own model using publicly-available software, which performs continuous hydrologic simulation over the available period of rainfall record, consistent with the conditions set forth in Section 2.2.i of the SMR HMP. The use of a different model than SMRHM must receive prior approval from the Copermittee having jurisdiction over the PDP. User may also put forth other low-flow thresholds for individual PDPs, which will require site-specific justification, at the User's expense. General guidelines on how to develop a site-specific low-flow threshold are provided in Appendix I of the SMR HMP.

Compliance with the Hydrologic Performance Standard of the SMR HMP does not constitute full compliance with the HMP Performance Standards. The Copermittees also require Users to demonstrate compliance with the Sediment Supply Performance Standard defined in Section 3.6 to fulfill the requirements.

2.6. References and Resources

- *The Importance of Imperviousness* (Tom Scheuler, 1995)
  Site Planning for Urban Stream Protection, available from the Center for Watershed Protection)
- California Stormwater BMP Handbooks
  - Southern California LID Manual
  - *Urban Runoff Quality Management,* Water Environment Federation and American Society of Civil Engineers, 1998. ISBN 1-57278-039-8 ISBN 0-7844-0174-8.
  - *Stormwater Infiltration,* Bruce K. Ferguson, 1994. ISBN 0-87371-987-5

- Clean Water Act Section 402(p)
- 40 CFR 122.26(d)(2)(iv)(A)(2) – Stormwater Regulations for New Development
- *Restoring Streams in Cities* (Riley, 1998)
- *Stream Restoration: Principles, Processes, and Practices* (Federal Interagency Stream Restoration Working Group, 1998, revised 2001)
- *Municipal Handbook, Rainwater Harvesting Policies* (USEPA, 2008)
- *Green Roofs for Stormwater Runoff Control* (USEPA, 2009a)
- *Porous Pavements* (Ferguson, 2005)
- *Orange County WQMP and TGD, with errata, 2011*
- *CASQA LID Guidance Manual for Southern California*
- *RWQCB Water Quality Control Plan for the San Diego Basin (Basin Plan)*
- *Design Hansbook for Low Impact Development Best Management Practices,* Riverside County Flood Control and Water Conservation District, 2011.

Chapter

3

3.0 PREPARING PROJECT-SPECIFIC WQMPS

Step-by-step assistance to document compliance.

A Project-Specific WQMP is a document to demonstrate that a PDP complies with applicable requirements of the 2010 SMR MS4 Permit — to implement LID Principles and BMPs, manage Hydromodification, incorporate required Source Control BMPs, and provide for operation and maintenance of Structural BMPs.

ICON KEY
Helpful Tip
Submittal Requirement
1. Terms to Look Up
References & Resources

The Copermittees require a 'Project-Specific' WQMP for every PDP as described in Section 1.1. The Project-Specific WQMP must be submitted with the application for Discretionary Approvals (entitlements) and must have sufficient detail to ensure the stormwater design, site plan, and landscaping plan are congruent and will comply with the applicable LID and HCOC standards in the 2010 SMR MS4 Permit. Submitting a complete and thorough Project-Specific WQMP will facilitate quicker review and fewer cycles of review.

The procedure in this section is intended to facilitate, not substitute for, creative interplay among site design, landscape design, and drainage design. Several iterations may be needed to optimize your drainage design as well as aesthetics, circulation, and use of available area for the PDP site.

Structural BMPs should be planned and designed integrally with the site planning and landscaping for the PDP. It's best to start with general project requirements and preliminary site design concepts; then prepare the detailed site design, landscape design, and Project-Specific WQMP simultaneously. This will facilitate the development of a congruent site plan, landscape plan, grading plan and Project-Specific WQMP.

3.1. Assemble Project and Site Information

To perform the LID design, the designer needs to identify pertinent site and PDP characteristics, including information such as (but not limited to):

- Existing natural hydrologic features and natural resources, including any contiguous natural areas, wetlands, watercourses, seeps, or springs.
- Existing site topography, including contours of any slopes of 4% or steeper, general direction of surface drainage, local high or low points or depressions, and any outcrops or other significant geologic features.
- Zoning, including requirements for setbacks and open space.
- Soil types (including Hydrologic Soil Groups) and depth to groundwater, which may determine whether infiltration is a feasible option for managing site Runoff. Depending on site location and characteristics, and on the selection of Structural BMPs, site-specific information (e.g., from boring logs or geotechnical studies) may be required.
- Existing site drainage. For undeveloped sites, this should be obtained by inspecting the site and examining topographic maps and survey data. For previously developed sites, site drainage and connection to the MS4 can be located from site inspection, MS4 maps, and plans for previous development.
- Onsite Significant Sources of Bed Sediment and first order, or higher, channels, as defined in Section 2.3.i of the SMR HMP.
- Existing vegetative cover and impervious areas, if any.
- Project Design Features, including impervious surfaces, landscaped surfaces, parking lots, land uses, etc.

3.2. Optimize Site utilization (LID Principles)

Review the information collected in Section 3.1. Identify the principal constraints on site design as well as opportunities to reduce imperviousness and incorporate LID Principles into the PDP site and landscape design. For example, constraints might include impermeable soils, high groundwater, groundwater pollution or contaminated soils, steep slopes, geotechnical instability, high-intensity land use, heavy pedestrian or vehicular traffic, utility locations, or safety concerns. Opportunities might include existing natural areas, low areas, oddly configured or otherwise unbuildable parcels,

easements and landscape amenities including open space and buffers (which may be able to double as locations for LID Bioretention BMPs), and differences in elevation (which may provide hydraulic head).

Apply the following LID Principles to the layout of the PDP. Putting thought upfront about how best to organize the various elements of PDP site can help to significantly reduce the PDP's potential impact on the environment and reduce the number of Structural LID and/or Conventional Treatment BMPs that must be implemented. Analyze the preliminary PDP site layout concepts, and look for opportunities to accommodate the following LID Principles within the PDP site layout. Performing this analysis and optimizing the layout for LID will come in handy during the remaining steps.

3.2.1. Preserve Existing Drainage Patterns

Integrating existing drainage patterns into the site plan may facilitate maintaining the PDPs predevelopment hydrologic function. Preserving existing drainage paths and depressions will not only help maintain the time of concentration and infiltration rates of Runoff, decreasing peak flows, but may also help preserve the contribution of Bed Sediment Supply from the PDP to the Receiving Water. The best way to define existing drainage patterns may be to visit the site of the PDP during a rain event and to directly observe runoff flowing over the site. If this is not possible, drainage patterns may be inferred from topographic data, though it should be noted that depression micro-storage features are often not accurately mapped in topographic surveys. Analysis of the existing site drainage patterns during the site assessment phase of the PDP can help to identify the best locations for buildings, roadways, and Structural BMPs.

Minimize unnecessary site grading that eliminates small depressions, which may provide storage of small volumes of runoff. Where appropriate, add additional depression "micro" storage throughout the site's landscaping. This is referred to in Section 3.3 as 'self-retaining areas'. Mild gradients may be used to extend the time of concentration, which reduces peak flows and increases the potential for additional infiltration. While risk of serious flooding must be limited, the persistence of temporary "puddles" during storms may be beneficial to infiltration.

- Where possible, conform the PDP site layout along natural landforms, avoid excessive grading and disturbance of vegetation and soils, and preserve or replicate the site's natural drainage features and patterns.
- Set back PDP improvements from creeks, wetlands, and riparian habitats.

- Use both existing and proposed site drainage patterns as a natural design element, rather than using expensive impervious conveyance systems. Use depressed landscape areas, vegetated buffers, and bioretention areas as amenities and focal points within the site and landscape design.

3.2.2. Protect Existing Vegetation and Sensitive Areas

Identify any areas of the PDP containing dense native vegetation or well-established trees, and try to avoid disturbing these areas. Soils with thick, undisturbed vegetation have a much higher capacity to store and infiltrate Runoff than do disturbed soils. Reestablishment of a mature vegetative community may take decades. Sensitive areas, such as streams and floodplains should also be avoided.

- Define the development envelope and protected areas, identifying areas that are most suitable for development and areas that should be left undisturbed.
- Establish setbacks and buffer zones surrounding sensitive areas.
- Preserve significant trees and other natural vegetation where possible.

3.2.3. Preserve Natural Infiltration Capacity

A key component of LID is taking advantage of a site's natural infiltration and storage capacity. A site survey and geotechnical investigation can help define areas with high potential for infiltration and surface storage. Identify opportunities to locate LID Principles and Structural BMPs in highly pervious areas. Doing so will maximize infiltration and limit the amount of runoff generated. Concentrate development on portions of the site with less permeable soils, and preserve areas that can promote infiltration.

3.2.4. Minimize Impervious Area

As discussed in Chapter 2, creation of impervious cover can be tied to potential environmental impacts due to runoff. Look for opportunities to limit impervious cover through identification of the smallest possible land area that can be practically impacted or disturbed during site development.

- Limit overall coverage of paving and roofs. This can be accomplished by designing compact, taller structures, narrower and shorter streets and sidewalks, clustering buildings and sharing driveways, smaller parking lots

(fewer stalls, smaller stalls, and more efficient lanes), and indoor or underground parking.

- Examine site layout and circulation patterns and identify areas where landscaping can be substituted for pavement, such as for overflow parking.
- Inventory planned impervious areas on your preliminary site plan. Identify where permeable pavements, such as crushed aggregate, turf block, permeable modular blocks, pervious concrete or pervious asphalt could be substituted for impervious concrete or asphalt paving. This will help reduce the amount of Runoff that may need to be addressed through Structural BMPs.
- Consider green roofs. Green roofs are roofing systems that provide a layer of soil/vegetative cover over a waterproofing membrane. A green roof mimics pre-development conditions by filtering, absorbing, and evapotranspiring precipitation to help manage the effects of an otherwise impervious rooftop. Green roofs with growing media four inches or deeper are considered 'self-retaining areas' as defined in Step 3, and do not produce increased Runoff or Runoff Pollutants (i.e., any Runoff from a green roof requires no further LID or Hydrologic Control BMPs).

3.2.5. Disperse Runoff to Adjacent Pervious Areas

Look for opportunities to direct Runoff from impervious areas to adjacent landscaping or other pervious areas. This is sometimes referred to as reducing Directly Connected Impervious Areas.

- Direct roof runoff into landscaped areas such as medians, parking islands, planter boxes, etc., and/or areas of pervious paving. Instead of having landscaped areas raised above the surrounding impervious areas, design them as depressed areas that can receive Runoff from adjacent impervious pavement. For example, a lawn or garden depressed 3"-4" below surrounding walkways or driveways provides a simple but quite functional landscape design element. This is referred to as 'areas draining to self-retaining areas' in Section 3.3.
- Detain and retain Runoff throughout the site. On flatter sites, smaller Structural BMPs may be interspersed in landscaped areas among the buildings and paving.

- On hillside sites, drainage from upper areas may be collected in conventional catch basins and piped to landscaped areas and LID BMPs and/or Hydrologic Control BMPs in lower areas. Low retaining walls may also be used to create terraces that can accommodate LID BMPs. Wherever possible, direct drainage from landscaped slopes offsite and not to impervious surfaces like parking lots.
- Reduce curb maintenance and provide for allowances for curb cuts.

3.3. DELINEATE DRAINAGE MANAGEMENT AREAS

The delineation of DMAs is key to successfully implementing your LID design. The procedure begins with:

1. Careful delineation of pervious areas and impervious areas (including roofs) throughout the site, and then;
2. Dividing the entire PDP site into individual, discrete DMAs.

Typically, lines delineating DMAs follow grade breaks and roof ridge lines. The exhibits, tables, text, and calculations in the Project-Specific WQMP will illustrate, describe, and account for runoff from each of the areas of the PDP.

Where possible, establish separate DMAs for each surface type (e.g., landscaping, pervious paving, or roofs). Assign each DMA a unique code and determine its size in *square feet*. The total area of your site should total the sum of all of your DMAs.

Next, determine how drainage from each DMA will be handled. Each DMA will be classified as one of the following four types:

A. Self-treating areas.

B. Self-retaining areas (also called "zero-discharge" areas).

C. Areas that drain to self-retaining areas.

D. Areas that drain to BMPs.

The first three types of DMAs: Self-Treating, Self-Retaining, and draining to Self-Retaining, are ways to account for successful implementation of the LID Principles discussed in Step 1. Areas addressed by LID Principles are self-managing and do not require any further management measures. Further, these areas will not require specialized Operation and Maintenance procedures, and can typically be maintained with normal landscape and site maintenance.

The fourth type of DMA is a way to document the specific areas within the site layout that require additional mitigation measures through LID BMPs.

> As more LID Principles are implemented, more of the site will mimic natural processes and become self-managing, resulting in less area that must be managed through structural LID BMPs.

3.3.1. Type 'A': Self-Treating areas

Self-Treating Areas are those that meet the following criteria:

- Are either undisturbed from their natural condition, or restored with Native and/or California Friendly vegetative covers, AND
- Are irrigated, if at all, with appropriate low water use irrigation systems to prevent irrigation runoff.

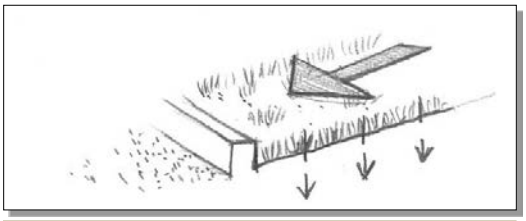

Figure 3-1: Self-Treating Areas

- Runoff from the area will not comingle with runoff from the developed portion of the site, or across other landscaped areas that do not meet the above criteria.

Examples include up-sloped undeveloped areas which are ditched and drained around a development, and landscaped areas (as described above) that drain offsite. Areas that do not meet the above criteria do not qualify as a Self-Treating Area. In general, Self-Treating Areas include no impervious areas, unless the impervious area is very small (e.g., 5% or less of the Self-Treating Area) and slopes are gentle enough to ensure Runoff from impervious areas will be absorbed into the vegetation and soil.

Table 3-1: Table for Documenting Self-Treating Areas (Type 'A' DMA)

DMA Name or ID	Area (Sq. Ft.)	Stabilization Type	Irrigation Type (if any)
A/1	*4,460*	*Undisturbed Natural*	*None*
A/2	*1,026*	*Native Low Water Use*	*Drip Irrigation*

Note: Example Data shown

3.3.2. Type 'B': Self-retaining Areas

Self-Retaining Areas are shallowly depressed 'micro infiltration' areas designed to retain the Design Storm rainfall that reaches the area, without producing any Runoff. The technique works best on flat, landscaped sites. It may be used on mild slopes if there is a reasonable expectation that design of the area will result in the Design Storm rainfall event producing no Runoff.

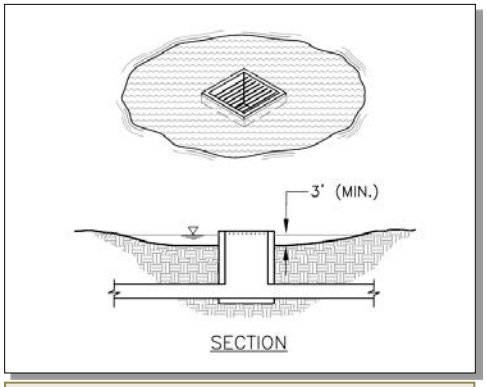

Figure 3-2 Self-Retaining Areas

To create Self-Retaining Areas in flat areas or on terraced slopes, either berm the area or depress the grade into a concave cross section so that there is a reasonable expectation that these areas will retain the Design Storm rainfall. Grade slopes, if any, toward the center of the pervious area.

Soils: Self-Retaining Areas are not recommended for soils that are not expected to be freely draining, so as not to create vector or nuisance conditions. Self-retaining areas within C or D soils must be constructed with appropriately amended soils to increase the shallow storage capacity of the soils such that surficial ponded water will not occur due to the design storm rainfall. All Self-Retaining Areas (regardless of soil type) should be protected during construction such that compaction is minimized or avoided entirely where possible. If compaction within a Self-Retaining area nevertheless occurs, the compacted surface must be re-tilled to a depth of at least six inches and amended as necessary to restore the infiltrative and storage capacity of the soil.

Inlet elevations of area/overflow drains, if any, should be clearly specified to be three inches or more above the low point to promote ponding. In setting elevations, account for mulch or other landscaping cover that could reduce available ponding depth. Construction documents must clearly specify the required elevation(s) of any overflow drain inlets.

Pervious pavements (e.g., crushed stone, porous asphalt, pervious concrete, or permeable pavers) can be self-retaining when constructed with a gravel base course four or more inches deep. This will ensure an adequate proportion of rainfall is infiltrated into native soils (including clay soils) rather than producing Runoff. Consult with a qualified (geotechnical) engineer regarding infiltration rates, pavement stability, and suitability for the intended traffic.

Drainage from green roofs is considered to be self-retained, however, an emergency overflow should be provided for extreme events. Drainage from green roofs should be routed to landscaping rather than being tied directly into MS4 facilities.

Table 3-2: Table for Documenting Self-Retaining Areas (Type 'B' DMAs)

Self-Retaining Area				Type 'C' DMAs that are draining to the Self-Retaining Area		
DMA Name/ ID	Post-project surface type	Area (square feet) [A]	Storm Depth (inches) [B]	DMA Name / ID	[C] from table 3-3 = [C]	Required Retention Depth (inches) [D]
B/1	*Planter*	*604*	*0.8*	*C/1, C/2*	*1100+80 =1180*	*2.4*
B/2	*Pervious patio*	*2,149*	*0.8*	*C/3*	*1946*	*1.5*
B/3	*Planter*	*1677*	*0.8*	*N/A*	*N/A*	*0.8*

Note: Example Data shown

$$[D] = [B] + \frac{[B] \cdot [C]}{[A]}$$

3.3.3. Type 'C': Areas Draining to Self-Retaining Areas

Runoff from impervious or partially pervious areas can be managed by routing it to Self-Retaining Areas consistent with the LID Principle discussed in Section 3.2.5 for 'Dispersing Runoff to Adjacent Pervious Areas'. For example, roof downspouts can be directed to lawns, and parking areas can be drained to landscaped areas.

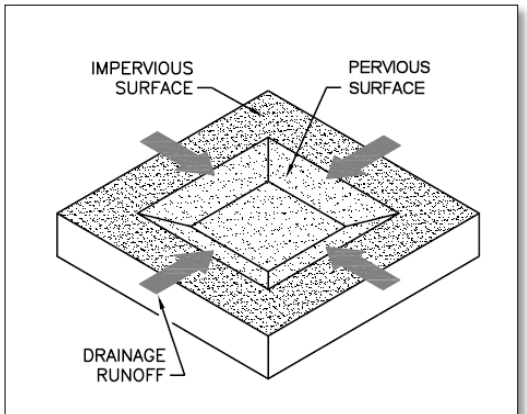

Figure 3-3: Areas draining to Self-Retaining Areas

For *impervious* areas such as pavements that drain to a nearby Self-Retaining Area, the maximum ratio, based upon past modeling efforts in California, is 2 parts impervious area for every 1 part pervious area.

For *partially* pervious areas draining to a Self-Retaining area the maximum ratio is:

$$\left(\frac{\mathbf{2}}{\boldsymbol{Impervious\ Fraction}}\right) : \mathbf{1}$$

(Tributary Area **:** Self-Retaining Area)

> **Special Case**
> If your self-retaining area is a **Permeable Pavement**, higher ratios than 2:1 can be used **IF** the pervious pavement is designed in accordance with the LID BMP Design Handbook or other standard approved by the Copermittee with jurisdiction over the project site. In this case, the area draining to the pavement will be considered a **Type D DMA** (area draining to a BMP).

Where the Impervious Fraction is obtained from Section 2.5.1.b).

The drainage from the tributary area must be directed to and dispersed within the Self-Retaining Area, and the area must be designed to retain the entire Design Storm runoff without flowing offsite. For example, if the ratio of 2 parts impervious area into 1 part pervious area is used, and the Design Storm is one inch, then the pervious area must absorb three inches of water over its surface before overflowing to an offsite drain (one inch of rainfall for the Self-Retaining Area itself, plus one inch for each of the 2 parts of tributary impervious area).

Prolonged ponding is a potential problem at higher impervious/pervious ratios. In your design, ensure that the pervious area soils can handle the additional run-on and are sufficiently well-drained, and/or amended as described in Section 3.3.2.

Table 3-3: Table for Documenting Areas Draining to Self-Retaining Areas (Type 'C' DMAs)

DMA					Receiving Self-Retaining DMA		
DMA Name/ ID	Area (square feet) [A]	Post-project surface type	Runoff factor [B]	Product [C] = [A] x [B]	DMA name /ID	Area (square feet) [D]	Ratio [C]/[D]
C/1	*1100*	*Roof*	*1*	*1100*			
C/2	*800*	*Pervious Walkway*	*0.1*	*80*			
				1180	*B/1*	*604*	*1.95 < 2*
C/3	*1946*	*Driveway*	*1*	*1946*	*B/2*	*2,149*	*0.91 < 2*

Note: Example Data shown

3.3.4. Type 'D': Areas Draining to BMPs

Areas draining to BMPs are those that could not be fully managed through LID Principles (DMA Types A through C) and will instead drain to a LID BMP and/or a Conventional Treatment BMP designed to manage water quality impacts from that area, and Hydromodification where necessary.

More than one DMA can drain to a single LID BMP, however, one DMA may not drain to more than one LID BMP. See Figures 3-4.

Where possible, design site drainage so only impervious roofs and pavement drain to LID BMPs. This yields a simpler, more efficient design, with minimized LID BMP requirements, and also helps protect LID BMPs from becoming clogged by sediment.

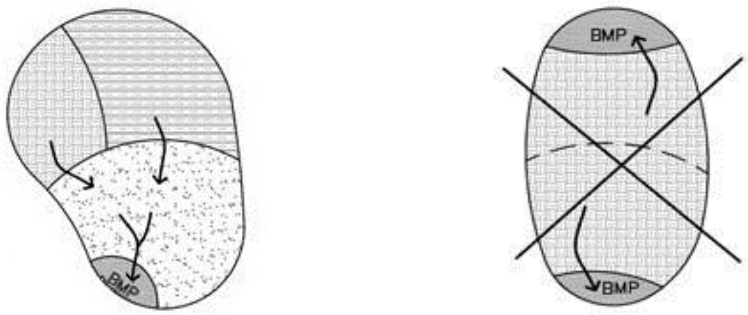

More than one DMA can drain to a single BMP.

One DMA cannot drain to multiple BMPs

Figure 3-4: Drainage from Multiple DMAs

Table 3-5, Example Format for Determining the Required DCV for BMPs, is discussed in Section 3.4.3.

3.4. IMPLEMENT LID BMPS

Type 'D' DMAs draining to BMPs, as defined in Section 2.3.4, must be addressed using LID BMPs according to the prioritization discussed in Section 2.3.2.

Special Note

The User may distinguish the four types of DMAs ('A', 'B', 'C', and 'D'), which identifies the type and magnitude of LID principles incorporated into the site drainage, from the Hydrologic Soil Group Types (A,B,C, and D), which designate the minimum rate of infiltration obtained for bare soil after prolonged wetting.

3.4.1. LID BMP Selection

3.4.1.a) LID Infiltration BMP Assessment

An assessment of the feasibility of utilizing LID Infiltration BMPs is required for all Development Projects, except where it can be shown that Harvest and Use BMPs can and will be implemented to address the DCV (see the Harvest and Use assessment below).

A site-specific evaluation of the feasibility of LID Infiltration BMPs must at minimum incorporate consideration of the criteria identified in Section 2.3.4. If one or more of the infiltration criteria indicate that LID Infiltration BMPs are not feasible for the PDP site, the other remaining infiltration criteria do not need to be assessed.

3.4.1.b) LID Harvest and Use BMP Assessment

An assessment of the feasibility of implementing harvesting and use BMPs is required for all PDPs, *except:*

- Where reclaimed water will be used for the non-potable water demands for the PDP, or where downstream water rights may be impacted by Harvest and Use (see Harvest and Use discussion in Chapter 2).
- Where it can be shown that the LID design can reliably provide for infiltration or evapotranspiration of the DCV (see the infiltration assessment below). In such a case, Harvest and Use BMPs can still be implemented for the DCV if desired, but it would not be required if the DCV will be infiltrated or evapotranspired.

If neither of the above criteria applies, follow the steps below to assess the feasibility of:

- Irrigation use
- Toilet use
- Other non-potable uses (i.e., industrial use)

> ☞ NOTE: It is important to note that harvested water demand calculations differ in purpose and methods from water demand calculations done for water supply planning. When designing harvest and use systems for stormwater management, a reliable method of quickly regenerating storage capacity (i.e., using water) must exist to provide storage capacity for subsequent storms. Therefore, demand calculations for LID Harvest and Use BMPs should attempt to estimate the actual demand that is reliably present to drain stormwater cisterns during the wet season, additionally considering that during a short time frame (a week to a couple of weeks) a series of storms may occur. This objective is fundamentally different from the objectives of water demand forecasting calculations done for water supply planning, which may err toward higher estimates of demand to provide conservatism to account for uncertainty. Harvested water demand calculations used to determine the feasibility of LID Harvest and Use BMPs must be based on estimates of actual expected demand that are reliably present to drain the cistern/vault during the wet season.

To assess the feasibility of implementing Harvest and Use BMPs, complete the following steps:

1. Document the following potential demands for the site, as applicable:

   a. ***The total area of irrigated landscape.*** It will be necessary to determine the type of landscaping that will be implemented on the site. For the purposes of this assessment, landscaping will either be a 'Conservation Design' (low water use, native species, etc.), or 'Active Turf areas' (higher water use, ornamental species such as conventional sod). Determine the irrigated landscape area in acres.

   b. ***The expected number of toilet users.*** This should be based on the average number of daily toilet users (building occupants) during the Wet Season and should account for any periodic shut downs/lapses in occupancy (e.g., for vacations, maintenance, or other reasons). This requires close coordination with the project architect to accurately reflect the number of daily users.

c. ***Other non-potable water demands.*** Identify any other onsite non-potable demand (in gallons per day) that is anticipated on an *average daily basis* during the Wet Season. Sources of demand should only be included if they are reliably and consistently present during the Wet Season.

2. Identify the planned ***total of all impervious areas*** on the proposed Development Project from which Runoff might be feasibly captured and stored. Depending on the configuration of buildings and other impervious areas on the PDP site, you may consider the site as a whole, or parts of the site, to evaluate reasonable scenarios for capturing and storing Runoff and directing the stored Runoff from the potential use(s) identified in Step 1 above. Identify the total impervious area in acres.

3. Enter the Design Storm depth for the PDP site (see Exhibit A) into the left column of Tables 2-1 through 2-3 in Section 2.3.5 to determine, respectively: a) the minimum number of toilet users per tributary impervious acre, b) the minimum square footage of effective irrigated area per tributary impervious acre, and c) the minimum demand for other non-potable uses per tributary impervious acre.

4. Multiply the unit values obtained from Step 3 by the total of impervious areas from Step 2, to develop the minimum demand that would be required for the various forms of LID Harvest and Use BMPs to be feasible on the PDP. Then compare minimum demand values to the anticipated demands identified in Step 1.

   ☞ If any of the anticipated demands exceed the applicable minimum values, LID Harvest and Use BMPs are feasible for that demand type.

   ☞ If all of the anticipated demands are less than the applicable minimum values, LID Harvest and Use BMPs are not required, however, other LID Retention BMPs, such as infiltration must be assessed and where applicable used – before LID Biotreatment BMPs can be used.

3.4.1.c) LID BMP Selection Matrix

Once the above assessments for LID Infiltration and Harvest and Use BMPs have been completed, the following table can be used to determine the applicable LID BMPs for the PDP site. Refer to Table 3-4 below for determining LID BMPs that may be applicable to the PDP.

Table 3-4: LID BMP Selection Matrix

LID BMP Type	Are LID Retention BMPs Feasible?		
		No, but 'Other LID BMPs' are feasible, and	
	Yes	0.3"/hr. < K_{SAT} < 1.6"/hr.	K_{SAT} < 0.3"/hr.
Harvest and Use	✓(A)		
Infiltration	✓(B)		
Permeable Pavement	✓(C)		
Bioretention	✓(D)	✓(E)	✓
Biotreatment			✓

Notes for Table 4-5:

(A): LID Harvest and Use BMPs may be used where it can be shown that there is sufficient demand for harvested water. See Sections **LID Harvest and Use Feasibility Criteria** and **LID Harvest and Use BMP Assessment 3.4.1.b)..**

(B): LID Infiltration BMPs may be used in locations where the tested infiltration rate of underlying soils is at least 1.6 in. per hour and no restrictions on infiltration apply to these locations. See Sections **LID Infiltration Feasibility Criteria and LID Infiltration BMP Assessment 3.4.1.a)**.

(C) Permeable Pavement is a form of LID Infiltration BMP. However, when designed with a 2:1 ratio of impervious area to pervious pavement areas, or less, permeable pavement is considered a self-retaining area, and is not considered a LID BMP for the purposes of this table. This table focuses on the 'special case' included in the Section **3.3.3**, where a project proponent can choose to design the pervious pavement as a LID BMP in accordance with an approved design, such as the LID BMP Design Handbook, and perform any necessary infiltration testing; and in return drain additional impervious area onto the pervious pavement beyond the 2:1 ratio.

(D) As discussed in Section 2.3.3., in well drained soils, water captured in LID Bioretention BMPs can be fully retained via infiltration and evapotranspiration.

(E) In this range of infiltration rates, LID Bioretention BMPs will be more reliable than LID Infiltration BMPs, but will still infiltrate and evapotranspire captured runoff to the maximum extent feasible based on in-situ actual characteristics.

3.4.2. Laying out LID BMPs on the PDP site

Finding the right location for LID BMPs on the PDP site involves a careful and creative integration of several factors:

- To make the most efficient use of the site and to maximize aesthetic value, integrate LID BMPs with site landscaping. Many local zoning codes may require landscape setbacks or buffers, or may specify that a minimum portion of the site be landscaped. It may be possible to locate some or all LID BMPs within this same area, or within utility easements or other non-buildable areas.

- Use permeable pavements wherever possible. These pavement systems are not only aesthetically pleasing but they also minimize the amount of runoff that needs to be treated.

- LID Bioretention BMPs must be level or nearly level all the way around. When configured in a linear fashion (similar to swales) LID Bioretention BMPs may be gently sloped end to end, but opposite sides must be at the same elevation. BMPs on steeper slopes must be terraced or provided with check dams.

- For effective, low-maintenance operation, locate LID BMPs so drainage into and out of the device is by gravity flow. Many LID BMPs require three feet or more of hydraulic head.

- LID BMPs require excavations three or more feet deep, which can conflict with underground utilities.

- If the property is being subdivided now or in the future, the BMP should be in a common, accessible area. In particular, avoid locating LID BMPs on private residential lots. Even if the LID BMP will serve only one site owner or operator, make sure the BMP is located for ready access for inspection by the Copermittee with jurisdiction over the project site and the local mosquito and vector control agency. The goal is to ensure that LID BMPs are maintained and functional, to assure a properly functioning maintenance mechanism since the ability of individual homeowners to provide maintenance is variable, and to avoid residential property rights issues for inspections and verifications. While the specific maintenance mechanism will be provided on a project by project basis, many Copermittees are pursuing methods to allow residential LID BMPs to be maintained by a public entity. Maintenance via a public maintenance mechanism will require BMPs to be located in common areas and not in individual lots.

- The LID BMP must be accessible to equipment needed for its maintenance. Access requirements for maintenance will vary with the type of BMP selected. LID Bioretention BMPs will typically need access for the same types of equipment used for landscape maintenance.

Document site layout and site design decisions in the Project-Specific WQMP. This will provide background and context for how the design meets the quantitative LID

BMP design criteria. Once the LID BMPs have been laid out, calculate the square footage set aside on the site plan for each BMP.

3.4.3. Calculate Minimum LID BMP Sizes

LID BMPs must at minimum be sized to address the DCV. LID BMPs can be additionally sized and configured to meet Hydromodification Criteria described in Section 3.6, if applicable.

3.4.3.a) Design Capture Volume

Appendix F of the LID BMP Design Handbook contains worksheets that can be used for calculating the required DCV (aka V_{BMP}) for LID BMPs. The User may also compute V_{BMP} and Q_{BMP} using the LID BMP interface of SMRHM. Refer to the SMRHM Guidance Document (Appendix G of SMR HMP) for complementary information).

If neither the worksheet nor the LID BMP interface of SMRHM are used, your calculations should be in tables using the following format:

Table 3-5: Example Format for Determining the Required DCV for BMPs

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Enter BMP Name / Identifier Here*		
	[A]		[B]	[C]	[A] x [C]	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
	$A_T = \Sigma[A]$				$\Sigma = [D]$	[E]	$[F] = \frac{[D]x[E]}{12}$	[G]

[B], [C] are obtained as described in Section 2.5.1.b)
[E] is obtained from Exhibit A
[G] is obtained from a design procedure sheet, such as in LID BMP Design Handbook. Maintain a completed design procedure sheet for each LID BMP.

3.4.3.b) Hydromodification

The User should consider the full suite of Hydrologic Control BMPs to manage runoff from the post-development condition and meet the Hydrologic Performance Standard identified in Section 3.6. The User may consider the following in identifying the Hydrologic Control BMPs for incorporation in the design of the PDP:

- LID principles as defined in Section 3.2;
- Structural LID BMPs that may be modified or enlarged, if necessary, beyond the DCV;
- Structural Hydrologic Control BMPs are distinct from the LID BMPs. The LID BMP Design Handbook provides information not only on Hydrologic Control BMP design, but also on BMP design to meet the combined LID and Hydromodification requirements. The Handbook specifies the type of BMPs that can be used to meet the Hydrologic Performance Standard.

LID principles, structural LID BMPs, and structural Hydrologic Control BMPs can each be modeled in the SMRHM.

Refer to Section 3.6 to determine if the PDP is subject to the HMP Performance Standards, and Section 2.5.2 for acceptable methodologies to demonstrate compliance with the Hydrologic Performance Standard.

3.4.4. Specify Design Details

Preliminary design details sufficient to demonstrate that the area, volume, and other criteria of each can be met within the constraints of the PDP site are required in the preliminary Project-Specific WQMP.

The final Project-Specific WQMP and the construction and grading plans will need to include final design details consistent with your approved preliminary Project-Specific WQMP. These final details must demonstrate that the required DCV, potential HMP Performance Standards, and any other requirements specified by the Copermittee with jurisdiction over the project site, have been met. Ensure these details are consistent with preliminary site plans, landscaping plans, and architectural plans submitted with your application for planning and zoning approvals.

The User may elect to use SMRHM to select and design LID BMPs and Hydrologic Control BMPs, where required, selection and design of Hydrologic Control BMPs is an iterative process that can be facilitated using the SMRHM. The SMRHM has a comprehensive menu of site design LID BMPs and Hydrologic Control BMPs that can be selected for PDPs. The design standards for these Hydrologic Control BMPs have been pre-incorporated into SMRHM and can be modified to an extent based on site constraints. The User must verify that the design details of LID BMPs and Hydrologic Control BMPs defined in SMRHM are consistent with the BMP standards set forth in the LID BMP Design Handbook.

The LID BMP Design Handbook includes standard configurations, details and sizing calculator worksheets that are available for the LID BMPs referenced in this WQMP. Check with the Copermittee with jurisdiction over the project site to determine if this or alternative standards should be used for your PDP. The information in the LID BMP Design Handbook is designed to address the DCV and includes alternative designs and sizes for managing Hydromodification.

The planning, building, and public works officials of the Copermittee with jurisdiction over the project site have final review and approval authority over the project design.

3.4.5. Determine if BMP Area and Volume are Adequate

Sizing and configuring BMPs is typically an iterative process. After specifying the preliminary design details as described in Section 3.4.4, review the site plan to determine if the reserved BMP locations are sufficient for each of the LID BMPs.

If so, the planned BMPs will meet the WQMP sizing requirements for water quality.

If not, revise the plan accordingly. Revisions may include:

- Reducing the overall imperviousness of the PDP site. For example, consider incorporating additional permeable pavements to reduce the imperviousness of the site.
- Changing the grading and drainage to redirect some Runoff toward other BMPs which may have excess capacity.

- Making tributary landscaped DMAs self-treating or self-retaining (may require changes to grading).
- Expanding BMP surface area.
- Revision to the square footage of a BMP typically requires a corresponding revision to the square footage of the surrounding or adjacent DMA.
- The Hydromodification Performance Standards described in Section 3.6 are separate and additional standards that must be met by applicable PDPs. Even if the PDP has demonstrated compliance with the DCV standard, such Development Projects may need to implement additional and/or larger BMPs to meet the Hydromodification Performance Standards.

Section 3.5 describes alternative compliance measures that can be implemented if it has been demonstrated that it is technically infeasible to address all required Type 'D' DMAs with LID BMPs.

3.4.6. Unpaved Roads

If the PDP includes unpaved roads, ensure that appropriate erosion and sediment control BMPs are incorporated to manage runoff and erosion during the post-construction life of the unpaved roads. At a minimum, the BMPs must include the following or alternative BMPs that are equally effective:

- Practices to minimize road related erosion and sediment transport;
- Grading of unpaved roads to slope outward where consistent with road engineering safety standards;
- Installation of water bars as appropriate; and
- Unpaved roads and culvert designs that do not impact creek functions and where applicable, that maintain migratory fish passage.

3.5. Document any Alternative Compliance Measures (LID Waiver Program)

As discussed in Section 2.3.6, LID BMPs are expected to be feasible on virtually all PDPs. Where LID BMPs have been demonstrated to be infeasible, a LID waiver must be granted by the Copermittee with jurisdiction over the project site, and the minimum

alternative compliance measures described in this section must be implemented for the remaining Type D DMAs not addressed with LID BMPs.

3.5.1. LID Waiver

If you believe specific conditions on your site preclude the use of LID, you must submit, in the Project-Specific WQMP, a detailed site-specific examination and demonstration that implementation of other LID BMPs (as discussed in Sections 2.3.2 and 2.3.6) is infeasible. A site-specific determinations must be approved by the Copermittee with jurisdiction over the PDP site. Some Copermittees may require that the determination be performed by a Professional Civil Engineer registered in the State of California

- If a site-specific infeasibility determination for Other LID BMPs will be submitted, it is highly recommended to discuss this with the Copermittee with jurisdiction over the project site early on, as such site-specific determinations are expected to be highly scrutinized and LID Waivers are only granted in truly extenuating circumstances.
- If a Copermittee grants a LID Waiver from implementation of LID BMPs for particular DMAs:
    - LID BMPs are required to be used for all other DMAs where LID is feasible.
    - Other Conventional Treatment Control BMPs approved by the Copermittee with jurisdiction over the project site must be implemented, and the pollutant loads expected to be discharged due to not implementing LID Retention BMPs must be fully managed, as described in Sections 3.5.2 through 3.5.5.

3.5.2. Identify Priority Pollutants of Concern

The first step to identifying adequate alternative compliance measures is to identify the specific pollutants generated by the PDP that are also impairing the downstream receiving waters, referred to as 'Priority Pollutants of Concern'. Follow the process identified in Section 2.2.4 to identify the Priority Pollutants of Concern for your project.

3.5.3. Required Pollutant Load Mitigation

All projects participating in the Alternative Compliance Program must fully manage the Pollutant loads for the Priority Pollutants of Concern that are expected to be discharged due to not implementing LID Retention BMPs. Table 3-6 below provides estimated Pollutant concentrations that may be associated with various land use types, and has been compiled based on a study performed by the Southern California Coastal Water Research Project (SCCWRP) in the Los Angeles area watersheds (SCCWRP, TR510), assessments performed by the County of Los Angeles, and the National Stormwater Quality Database. However, there is currently insufficient data to accurately model land use wash-off rates for all potential Priority Pollutants of Concern that may potentially be discharged from development land uses in Southern California. Accordingly, Total Suspended Solids (TSS) should be used as a surrogate for any Priority Pollutants of Concern that are not identified in Table 3-6.

Table 3-6: Potential Untreated Median Concentration of Stormwater Runoff from Various Land Use Categories

Constituent	Residential	Commercial	Industrial	Transportation	Open Space
Sediments					
TSS (mg/L)	100	18	74	50	134
Pathogens					
Fecal Coliform (mpn/100 mL)	55426	22291	39595	2500	25565
Nutrients					
NH3 (mg/L)	0.25	0.25	0.26	0.14	0.05
N02+NO3 (mg/L)	0.51	0.50	0.58	0.45	0.99
Phos., total (mg/L)	0.32	0.28	0.30	0.32	0.05
Metals					
Cadmium, total (µg/L)	Non-detect	0.50	Non-detect	0.50	Non-detect
Chromium, total (µg/L)	Non-detect	2.5	2.5	2.5	Non-detect
Copper, total (µg/L)	18	17	33	39	8.0
Iron, total (µg/L)	546	587	600	512	233
Lead, total (µg/L)	8.0	4.0	19	2.5	1.0
Manganese, total (µg/L)	Non-detect	Non-detect	Non-detect	Non-detect	50
Zinc, total (µg/L)	103	156	550	218	23

Notes: TSS, fecal coliform, copper, lead, zinc data from Stein et al (2007), except for Transportation category data. Other data from County of L.A. monitoring data (http://dpw.lacounty.gov/wmd/NPDES/IntTC.cfm), except for Transportation fecal coliform which is from the National Stormwater Quality Database (Pitt and Maestre, 2005).

As discussed in Section 2.3.3, LID Retention BMPs sized to capture the runoff from the 85th percentile 24-hour storm, retain, on average, 80% of the long term runoff volume.

Therefore, to provide equivalent Pollutant load reduction as LID Retention BMPs, management measures must reduce 80% of the Pollutant loads identified in Table 3-6 above for TSS (at minimum), and additionally any other Pollutant that is identified as a Priority Pollutant of Concern for which data is available.

3.5.4. Stormwater Credits

Certain types of development practices may provide broad scale environmental benefits to communities, which will reduce overall Pollutant loadings into Receiving Waters. For example, a PDP that will redevelop a brownfield site could reduce discharges of legacy Pollutants into Receiving Waters and/or groundwater. Section 101 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (42 U.S.C. 9601) defines “brownfield site” as real property, the expansion,

redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Alternatively, a transit-oriented development would reduce car trips, which also reduces Pollutant loadings.

3.5.4.a) Applying Water Quality Credits

The following water quality credits have been established for particular smart growth project categories. To determine the amount of credit a project would qualify for, the first step is to calculate the Pollutant loads that would need to be managed as described in Section 3.5.3. Any credits shown in Table 3-7 below would then be taken as a reduction to this required mitigation.

Table 3-7: Water Quality Credits for Applicable PDP Categories

PDP Category	Water Quality Credit
Redevelopment Projects that reduce the overall impervious footprint of the existing project site	*Percentage of site imperviousness reduced*
Historic district, historic preservation area, or similar areas	*10%*
Brownfield redevelopment	*25%*
Higher density development, 7 units/acre or more	*5%*
Higher density development, vertical density	*20%*
Mixed use development, transit oriented development or live-work development	*20%*
In-fill development	*10%*
[1] *Maximum total of water quality credits for a project is 50%*	

If more than one category applies to a particular PDP, the credit percentages would be additive. Applicable performance criteria depend on the number of LID water quality credits claimed by the proposed PDP. Water quality credits can be additive up to a 50% reduction (50% reduction maximum) from a proposed PDP's obligation for sizing Conventional Treatment Control BMPs, contributing to an urban runoff/mitigation fund, or offsite mitigation projects. The volume credit would be calculated as the DCV of the proposed condition multiplied by the sum of the percentages claimed above.

3.5.5. Conventional Treatment Control BMPs

Conventional Treatment Control BMPs are typically proprietary devices that provide treatment mechanisms for Pollutants in runoff, but do not reduce the volume of runoff.

3.5.5.a) Selection and Sizing of Conventional Treatment Control BMPs

Conventional Treatment Control BMPs must be implemented and sized to meet the following criteria:

- At minimum, all Conventional Treatment Control BMPs must be sized to address the DCV or the Design Flow Rate, as applicable to the BMP type, as described in Section 2.5.1. Document minimum size of the Conventional Treatment Control BMPs in the Project-Specific WQMP using the table below.

Table 3-8: Example Format for Conventional Treatment Control BMPs

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Enter BMP Name / Identifier Here*		
	[A]		[B]	[C]	[A] x [C]			
						Design Storm Depth (in)	*DCV or Design Flow Rate (cubic feet or cfs)*	*Minimum DCV, adjusted for any Water Quality Credits (cubic feet or cfs)*
	$A_T = \Sigma[A]$				$\Sigma = [D]$	[E]	$[F] = \frac{[D]x[E]}{[G]}$	[H]

[B], [C] are obtained as described in Section 2.5.1.b)
[E] is obtained from Exhibit A
[G] for Flow-Based Treatment BMPs [G] = 43,560, for Volume-Based Treatment BMPs, [G] = 12.
[H] = [F], reduced by the project's total water quality credit percentage.

- Additionally, the onsite or offsite BMPs must fully manage the required pollutant loads as calculated from Sections 3.5.3 and 3.5.4. Meeting this standard may require additional or larger Conventional Treatment Control BMPs to be incorporated into the design, or the construction of / participation in an offsite mitigation project, if available.

- Pollutant load removal efficiencies of any selected Conventional Treatment Control BMP must be substantiated by independent third-party 'in-situ' testing of the specific Conventional Treatment Control BMPs being considered, such as provided on the references included in the BMP Performance Report Library, located at:

  http://rcflood.org/NPDES/BMPPerformance.aspx

Document that all Type D DMAs that have not been addressed using LID BMPs have been fully managed with Conventional Treatment Control BMPs and any additional onsite or offsite mitigation in the Project-Specific WQMP as described above.

3.6. ADDRESS HYDROMODIFICATION

Section 3.6 identifies the critical questions and steps that the User must fulfill to meet the HMP requirements, defined as HMP Performance Standards in the SMR HMP. The SMR HMP serves as the supporting document to the outlined methodology; the User may refer to the SMR HMP for complementary information to that described in this section. The major steps to be fulfilled include:

- Identify if the project is subject to the HMP Performance Standards;
- Understand the HMP Performance Standards;
- Incorporate Hydrologic Control BMPs and Sediment Supply BMPs, where required

3.6.1. Projects Subject to HMP Performance Standards

If the User determines that a Project-Specific WQMP based on the conditions described in Section 1.1, the User may use the Decision Matrix (Figure 3-5) to determine if the PDP is subject to HMP Performance Standards. Non-Priority Projects, as identified in Section 1.1, are exempt from HMP requirements. Other exemptions may be granted under each of the following conditions:

- If the project is not classified as PDP per Section 1.1;
- If the PDP discharges runoff directly to an exempt river reach, or an exempt reservoir (Vail Lake, Skinner Lake). Or if the PDP discharges to a concrete-lined or artificially hardened channel that exetends to an exempt river reach or reservoir, as defined in Section 3.2.i of the SMR HMP;
- If the PDP discharges to a large river large river as defined in Section 3.2.ii of the SMR HMP.

It should be noted that all PDPs are subject to the 2010 SMR MS4 Permit's LID and water quality treatment requirements even if Hydrologic Control BMPs and Sediment Supply BMPs are not required.

In addition, the User should note that properly designed energy dissipation systems are required for all project outfalls to unlined channels (See Section 3.6.6). The User should refer to the HMP Decision Matrix in Figure 3-6 to identify if the project is subject to the requirements of the HMP.

Figure 3-5: HMP Decision Matrix

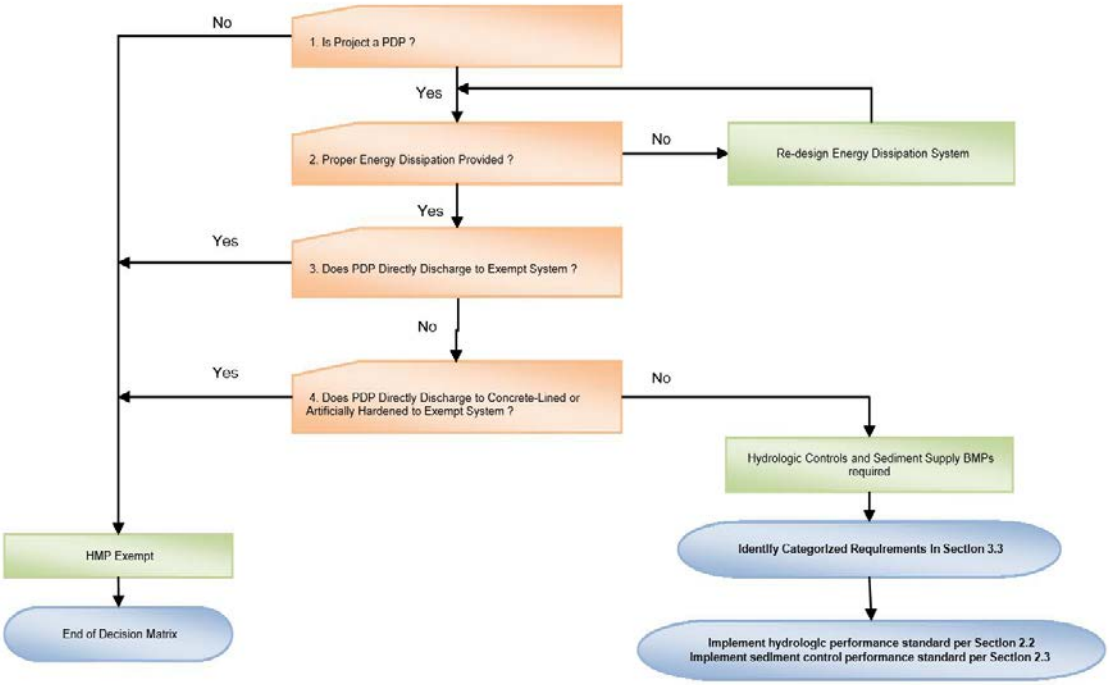

3.6.2. HMP Performance Standards

PDPs that are subject to HMP requirements must demonstrate compliance with the HMP Performance Standards, consisting of the Hydrologic Performance Standard and the Sediment Supply Performance Standard.

The Hydrologic Performance Standard consists of matching or reducing the flow duration curve of post-development conditions to that of pre-existing, naturally occurring conditions, for the range of geomorphically significant flows (10% of the 2-year runoff event up to the 10-year runoff event). The Sediment Supply Performance Standard consists of maintaining the pre-project Bed Sediment supply to the channel receiving runoff from the project site (Receiving Channel).

HMP Performance Standards are also applicable to those PDPs that are unable to implement flow duration controls onsite or via a regional or sub-regional BMP that

accepts discharges from the project, but is located outside of the project boundaries, but seek compliance through offsite Hydrologic Control BMP projects. The offsite Hydrologic Control BMP project must be capable of matching or reducing the equivalent flow duration curves from the PDP.

In addition, the HMP offers an alternate Hydrologic Performance Standard to those PDPs that are unable to implement flow duration matching onsite and offsite, only if the infeasibility is demonstrated and documented to the Copermittee with jurisdiction over the project site. The alternative Hydrologic Performance Standard consists of implementing projects to restore or rehabilitate channels with historic Hydromodification that are tributary to documented low or very low Index of Biotic Integrity scores. The performance equivalency of a restoration project must be demonstrated to the Copermittee.

To obtain approval from the Copermittee with jurisdiction over the project site, PDPs must either meet both the Hydrologic Performance Standard and the Sediment Supply Performance Standard OR qualify for the alternate performance standard.

3.6.3. Hydrologic Performance Standard Compliance *F.1.h.(1)*

The User must design and implement onsite Hydrologic Control BMPs to meet the Hydrologic Performance Standard. Hydrologic Control BMPs must be sized to mitigate flow rates and durations from the post-development condition to the Permit standards. As identified in Section 2.5.2, the User is required to use the SMRHM tool, which is an HSPF model overlaid with an interactive and user-friendly interface, to demonstrate compliance with the Hydrologic Performance Standard. A manual to this tool, the SMRHM Guidance Document (Appendix G of the SMR HMP), describes the specifics and functionality of the SMRHM and is available to all Users at no cost.

The User should consider the full suite of Hydrologic Control BMPs to manage runoff from the post-development condition and meet the Hydrologic Performance Standard identified in this section. The intent of this WQMP is not to specify the types of Hydrologic Control BMPs that can be used but rather identify the criteria that must be met, allowing flexibility for PDPs to use the full suite of BMPs to meet the Hydrologic Performance Standard. The User may consider the following in identifying the Hydrologic Control BMPs for incorporation in the design of the PDP:

- LID principles as defined in Section 3.2;

- Structural LID BMPs that may be modified or enlarged, if necessary, beyond the DCV;

- Structural Hydrologic Control BMPs are distinct from the LID BMPs. The LID BMP Design Handbook provides information not only on Hydrologic Control BMP design, but also on BMP design to meet the combined LID requirement and Hydrologic Performance Standard. The Handbook specifies the type of BMPs that can be used to meet the Hydrologic Performance Standard.

LID principles, structural LID BMPs, and structural Hydrologic Control BMPs can be modeled in the SMRHM. SMRHM can be employed by the User not only to meet the Hydrologic Performance Standard, but also to meet the LID requirements. SMRHM incorporates additional BMPs that may be investigated by the User. For example, buffer zones for those PDPs adjacent to channels can be modeled and sized the meet the Hydrologic Performance Standard.

3.6.3.a) HMP Waiver Program F.1.h.(3)

For some PDPs, the implementation of onsite Hydrologic Control BMPs may not be feasible due to site constraints. A technical feasibility study is required to provide technical justification as to why onsite Hydrologic Control BMPs cannot be incorporated into the PDP. The technical feasibility study will be submitted to the Copermittee with jurisdiction over the project site for review as part of the Preliminary Project-Specific WQMP. The feasibility analysis for both Hydrologic Control BMPs and LID BMPs will be integrated into one technical feasibility study for the PDP and submitted with the Preliminary Project-Specific WQMP.

The technical feasibility study should:

- Provide a narrative regarding the applicability of LID principles onsite as described in Section 3.2;

- Evaluate the feasibility of infiltration to capture partially or in its entirety the DCV based on the presence of either low infiltrating soils or high groundwater level, proximity to a water well or a contaminated plume, or a geotechnical report precluding effective and safe infiltration, consistent with the conditions set forth in Section 2.2.3;

- Evaluate the feasibility of harvest-and-use BMPs based on local water demands, consistent with the conditions set forth in Section 2.2.4;

- Evaluate the feasibility of implementing detention or retention BMPs onsite based on critical geotechnical considerations such as collapsible soil, expansive soil, slopes, liquefaction and other factors identified by a registered Geotechnical Engineer that may prohibit the detention of large volumes of runoff. The feasibility to implement Hydrologic Control BMPs and meet the Hydrologic Performance Standard onsite may be principally dictated by the geotechnical considerations.

There are two alternative compliance options for PDPs that cannot implement onsite Hydromodification Control BMPs. The User may identify and construct off-site Hydrologic Control BMPs within the same channel system as the PDP; or implement an in-channel restoration project for the Receiving Channel.

The SMR HMP includes the additional option of participating into a HMP Management Bank that will develop regional HMP BMP projects where PDPs can buy HMP management credits. The User may only pursue this option if an HMP Management Bank is available to the PDP. The User should consult with the Copermittee with jurisdiction over the project site to determine an HMP Management Bank is available.

The decision matrix that Users should follow to meet the Hydrologic Performance Standard is presented in Figure 3-7.

Figure 3-6: Hydrologic Performance Standard – Decision Matrix

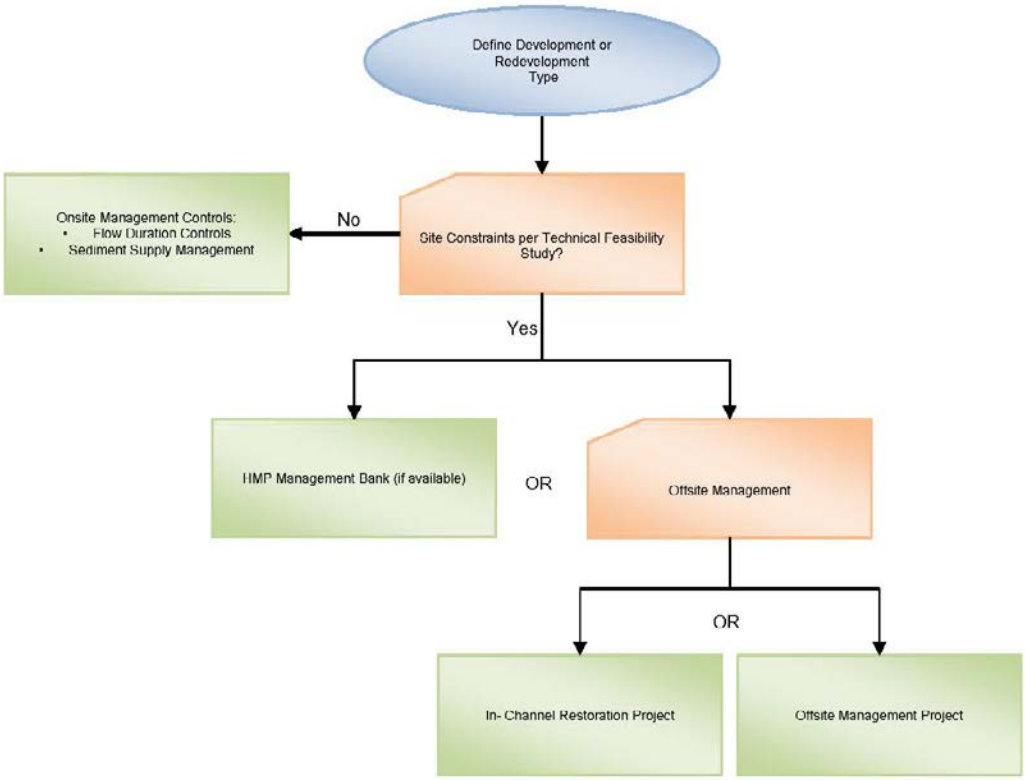

3.6.3.b) Off-Site Mitigation

For those PDPs where the technical feasibility study demonstrating the infeasibility of onsite Hydrologic Control BMPs has been approved by the Copermittee with jurisdiction over the project site, Users have the option to either (a) implement an offsite Hydrologic Control BMP project within the Receiving Channel, or (b) implement an in-channel restoration project for the Receiving Channel. The process for these two options is detailed hereafter.

Option a(1) - Implement offsite Hydrologic Control BMP projects within the Receiving Channel

In choosing this option, the PDP must investigate potential locations for implementation of an offsite Hydrologic Control BMP project within the Receiving Channel. If the User demonstrates that an offsite Hydrologic Control BMP project is not feasible in the Receiving Channel, then an offsite Hydrologic Control project in the same Hydrologic Unit as the PDP may be approved. The offsite Hydrologic Control BMP project must manage the incremental impact from not achieving the pre-development (naturally occurring) runoff flow rates and durations for the project site. Sizing of offsite Hydrologic Control BMP projects may be accomplished using the SMRHM. The User will evaluate and identify potential sites in the Receiving Channel, and if not feasible, then evaluate projects in the same Hydrologic Unit for implementation of an offsite Hydrologic

Control BMP project that has the supplemental capacity to manage the PDPs Hydrologic Performance Standard. If an adequate site is identified in the Receiving Channel, the User will submit a report detailing:

- That the offsite Hydrologic Control BMP project manages the incremental impact from the pre-development (naturally occurring) runoff flow rates and durations for the project site;
- Conceptual plans for the offsite Hydrologic Control BMP project as part of an amended Project-Specific WQMP for review and approval;
- If the PDP is a redevelopment project, that the post-project runoff flow rates and durations do not exceed pre-project runoff flow rates and durations; and
- If no potential offsite Hydrologic Control BMP project sites are identified in the Receiving Channel, that there is an offsite Hydrologic Control BMP project in the same Hydrologic Unit.

If no potential offsite Hydrologic Control BMP project sites are identified in the same Hydrologic Unit as the PDP, the PDP must implement Option a(2), a restoration or rehabilitation project in the Receiving Channel with historic Hydromodification.

Option a(2) – Implement In-Channel Restoration or Rehabilitation of the Receiving Channel

In choosing this option, the PDP investigates the potential for implementation of an in-channel restoration or rehabilitation project for the Receiving Channel. It must be determined that the Receiving Channel has experienced historic Hydromodification. The in-channel restoration or rehabilitation project must be located in the Receiving Channel. The PDP must submit a report detailing the historic Hydromodification, as well as conceptual plans for the in-channel restoration or rehabilitation project to the Copermittee with jurisdiction over the project site for review. The Copermittee is responsible for verifying that the level of restoration or rehabilitation is adequate given the potential Hydromodification impacts of the PDP. Copermittees maintain individual processes consistent with their approval procedures to ensure that the User's obligations under the HMP alternative compliance process are completed prior to approval of the PDP.

Once the project conceptual plans have been approved by the Copermittee with jurisdiction over the project site, it is the responsibility of the User to obtain required permits from the appropriate regulatory agencies (e.g., SDRWQCB, California Department of Fish and Wildlife, USACE). If the PDP identifies no opportunities for in-channel restoration or rehabilitation in the Receiving Channel, then the PDP must implement Option a(1), an offsite Hydrologic Control BMP project within the same Hydrologic Unit as the PDP.

3.6.4. Meet the Sediment Supply Performance Standard

Bed Sediment Supply to a Receiving Channel during construction may increase as land surface is cleared and the potential for erosion is increased. Once the land surface is urbanized, the potential for Bed Sediment Supply may be reduced as compared to the pre-development condition. The purpose of the Sediment Supply Performance Standard is to maintain the pre-development supply of Bed Sediment to the Receiving Channel following urban development.

The User must perform a stepwise assessment to ensure the maintenance of the pre-project Bed Sediment Supply:

- Determine whether the site or a portion of the site is a Significant Source of Bed Sediment Load to the Receiving Channel;
- Avoid areas identified as Significant Sources of Bed Sediment Supply in the PDP design;
- Site specific alternative compliance measures.

The stepwise assessment that Users should follow to meet the Sediment Supply Performance Standard is conceptualized in Figure 3-7.

Figure 3-7: Sediment Supply Performance Standard - Stepwise Approach

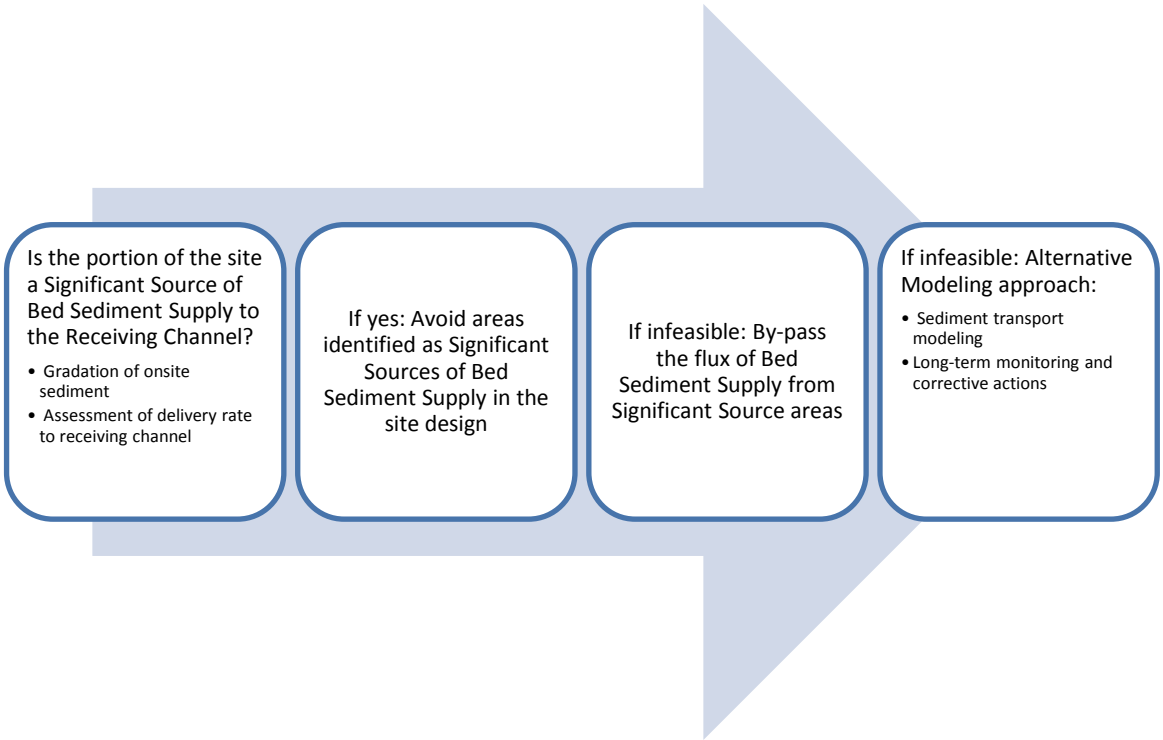

The User must determine the location of the downstream alluvial Receiving Channel that may be impacted by the PDP. The first downstream conveyance that is unlined (invert, side slopes or both) will serve as the Receiving" Channel for the PDP. The stepwise assessment will be used to ensure that the PDP does not adversely impact the delivery of Bed Sediment Supply to the Receiving Channel. The User may refer to Section 2.3.i of the SMR HMP for additional information on the stepwise assessment.

The analyses from the stepwise assessment must be documented and submitted to the Copermittee with jurisdiction over the project site along with the Preliminary Project-Specific WQMP for approval.

STEP 1:

A triad approach must be completed to determine whether the site is a Significant Source of Bed Sediment Supply to the Receiving Channel and include the following components:

A. Site soil assessment, including an analysis and comparison of Bed Sediment in the Receiving Channel and the onsite channel, if any;
B. Determination of the capability of the channels, if any, on the project site to deliver the site Bed Sediment (if present) to the receiving channel;
C. Present and potential future condition of the Receiving Channel.

STEP 2:
If the analysis in Step 1 indicates that some or all of the channels on the project site must be preserved as a source of Bed Sediment Supply to the Receiving Channel, the site plan must be developed to avoid impacting the identified channels. The User will designate channels on the project site that should be avoided to preserve the discharge of Bed Sediment Supply from the site.

STEP 3:
If it is infeasible to avoid channels on the project site that are Significant Sources of Bed Sediment Supply in the design of the site plan, the drainage(s) may be by-passed to maintain the Bed Sediment Supply to the Receiving Channel. The Engineer will need to prepare specific designs to achieve this objective.

ALTERNATIVE STEP:
The alternative compliance program can only be pursued if the replacement of Bed Sediment Supply to the Receiving Channel is deemed infeasible by the Copermittee with jurisdiction over the project site, or if the project site design requires significant alteration of onsite channels. The infeasibility of the different Sediment Supply BMPs stated in the general approach can only be demonstrated and documented by the User in the preliminary Project-Specific WQMP for approval. The User must also demonstrate the expected feasibility of the alternative compliance methodology.

The alternative compliance option allows the User to model numerically the site conditions and the Receiving Channel and provide additional mitigation in site runoff to compensate for the estimated reduction (or addition) of Bed Sediment Load in the Receiving Channel. The alternative compliance option will generally trigger the necessity to implement a long-term monitoring program, with potential corrective measures to be identified and implemented as needed in response to findings from the monitoring program. The User may refer to Section 2.3.ii of the SMR HMP for additional guidelines on the alternative compliance approach.

Fulfilling the objectives of the stepwise assessment constitutes compliance with the Sediment Supply Performance Standard.

3.6.5. Specific Requirements for PDPs Smaller Than One Acre and Copermittee Roadway Projects *Permit Reference?*

PDPs that are smaller than one acre and Copermittee Roadway Projects are typically completed within a limited right-of-way, making it unlikely for the User to implement onsite Hydrologic Control BMPs. Those projects are allowed to submit, if necessary, a simplified Technical Feasibility Study to the Copermittee having jurisdiction over the PDP. The simplified Technical Feasibility Study must be developed to explain why the HMP Performance Standards cannot be met onsite and must include:

- The soil conditions of the PDP site;
- A demonstration of the lack of available space for onsite controls; and
- An explanation of prohibitive costs to implement onsite controls.
- A written opinion from a California Registered Geotechnical Engineer, who will identify the infeasibility due to geotechnical concerns.

Once the simplified technical feasibility study is accepted by the jurisdiction of the PDP, the User may pursue either an off-site mitigation project or an in-stream restoration project as detailed in Section 3.6.3.a) and Section 3.6.3.b). The off-site mitigation project or in-stream restoration project must meet the HMP Performance Standards.

3.7. SPECIFY SOURCE CONTROL BMPS

Some everyday activities–such as trash recycling/disposal and washing vehicles and equipment–may generate Pollutants that tend to find their way into the MS4. These Pollutants can be minimized by applying Source Control BMPs.

Source Control BMPs include Permanent, structural features (Source Control BMPs) that may be required in your Development Project plans—such as roofs over and berms around trash and recycling areas—and Operational BMPs, such as regular sweeping and "housekeeping", that must be implemented by the site's occupant or user. The MEP standard typically requires both types of BMPs. In general, Operational Source Control BMPs cannot be substituted for a feasible and effective Source Control BMP.

Use the following procedure to specify Source Control BMPs for the PDP site:

1. Identify Pollutant Sources. Review the PDP site plan to identify potential Pollutant sources such as, but not limited to:

   - Storm Drain Inlets
   - Floor Drains

- Sump Pumps
- Pets Control/Herbicide Application
- Pools, Spas, Fountains and other water features
- Food Service Areas
- Trash Storage Areas
- Industrial Processes
- Outdoor storage areas
- Vehicle and Equipment Cleaning and Maintenance/Repair Areas
- Fueling areas
- Loading Docks
- Fire Sprinkler Test/Maintenance water
- Plazas, Sidewalks and Parking Lots

2. Identify in the Project-Specific WQMP the permanent Source Control BMPs, as applicable, for each identified source.

3. Using Table 3-9 as a model, identify in the Project-Specific WQMP the Operational Source Control BMPs, for each source, which should be implemented as long as the anticipated activities continue at the site. Copermittee Stormwater Ordinances require that applicable Source Control BMPs be implemented; the same BMPs may also be required as a condition of a use permit or other revocable Discretionary Approval for use of the site.

Table 3-9: Format for Table of Structural and Operational Source Control BMPs

Potential source of Runoff Pollutants	*Structural Source Control BMPs*	*Operational Source Control BMPs*

3.8. Coordinate your Project-Specific WQMP Design with Other Site Plans

Follow the guidance in Section 4.0 to verify that the Project-Specific WQMP, including all LID Principles, LID BMPs, Alternative Compliance measures, Hydrologic Control BMPs, and Source Control BMPs are properly identified on and coordinated with all other site plans, such as Architectural Plans, Improvement Plans, Construction Plans, and Landscaping Plans.

3.9. Develop an Operation and Maintenance Plan

All Structural Control BMPs must be maintained and functional throughout the life of the project to ensure their ongoing effectiveness for protecting runoff quality and quantity. As required by the 2010 SMR MS4 Permit, the Copermittee with jurisdiction over the project site will periodically verify that Structural Control BMPs on your site are maintained and continue to operate as designed.

To make this possible, the Copermittee with jurisdiction over the project site will also require preparation and submittal of a Project-Specific WQMP Operation and Maintenance Plan.

Details of these requirements, and instructions for preparing a Project-Specific WQMP Operation and Maintenance Plan are provided in Section 5.0.

Chapter

4

4.0 COORDINATION WITH OTHER SITE PLANS

Guidance for coordinating the Project-Specific WQMP with other site plans, including Architectural Plans, Grading Plans, Construction SWPPPs, and Landscaping Plans.

The Project-Specific WQMP must contain enough detail to demonstrate the planned LID Principles, LID BMPs, Alternative Compliance measures, Hydrologic Control BMPs, and Source Control BMPs are feasible and are coordinated with the project construction plan, architectural renderings, grading plan, landscape design, and other information submitted with your application for development approvals.

4.1. PREPARE A PROJECT-SPECIFIC WQMP SITE PLAN

To help ensure that the PDP design has fully met the WQMP requirements and is coordinated with your other project plans, Users are required to prepare and submit a Project-Specific WQMP Site Plan with the Project-Specific WQMP. At a minimum, the Project-Specific WQMP Site Plan should include the following:

- Vicinity and location maps
- Drainage Management Areas
- Proposed Structural BMPs
- Drainage paths
- Drainage infrastructure, inlets, overflows
- Source Control BMPs
- Buildings, roof lines, downspouts
- Impervious surfaces
- Standard labeling

Use discretion on whether or not you may need to show additional information and/or to create multiple sheets to appropriately accommodate these features. Keep in mind that the Copermittee plan reviewer must be able to easily analyze your Project-Specific WQMP and Site plan, and compare those to your other plans and maps as described below.

4.2. Coordination with Architectural Plans

If the User is required by the Copermittee(s) having jurisdiction over the project site to submit information and presentations to design review committees, planning commissions, and other decision-making bodies, the User may be required to incorporate relevant aspects of the BMP design. In particular:

- The visual impact of Structural BMPs adjacent to building foundations and any terracing or retaining walls required for the BMP design should be shown in renderings and other architectural drawings.
- Renderings and representation of street views should incorporate Structural Control BMPs located in street-side buffers and setbacks.
- Potential conflicts with local development standards should be identified and resolved.
- Verify that the selected BMPs do not create conflicts with pedestrian access between parking and building entrances.
- Verify that potential conflicts with local development standards have been identified and resolved.

4.3. Coordination with Improvement Plans

Details of how the project BMPs are constructed can be critical to proper operation. A misplaced inlet, an overflow at the wrong elevation, or the wrong soil mix used in an LID BMP may delay project approvals and incur additional expenses.

Additional details identified in this section must be shown on plans submitted with applications for building and grading permits. During construction and at completion, Copermittee inspectors will verify the installation of BMPs against the approved plans.

LID principles and LID BMPs have been routinely incorporated into PDPs for only a few years. Land development professionals and Copermittee staff continue to compile and analyze "lessons learned" from their experiences. The following guidance is based on those lessons.

4.3.1. What to Show on Improvement Plans

With few exceptions, the plan set should include separate sheets specifically incorporating the BMPs described in the Project-Specific WQMP. The information on these sheets should be carefully coordinated and made consistent with grading

plans, utility plans, landscaping plans, and (in many cases) architectural plans. Consider including the grading plan (screened) as background for the BMP sheets. It may also be appropriate to show portions of the roofing plan wherever roof ridges define DMAs. Additionally, utilizing different colors with associated legends will help the Copermittee reviewers differentiate the details shown on the construction plans with respect to grading and runoff management.

In particular, verify that relevant aspects of the BMP design are properly incorporated into your construction documents, including:

4.3.1.a) BMP Reference Table

The Copermittee plan checker will compare the Building and Grading plans with the Project-Specific WQMP. To facilitate the plan checker's comparison and speed review of your project, a WQMP Checklist should be prepared for your PDP.

Table 4-1: Format for BMP Reference Table

Project-Specific WQMP Page #	*BMP Identifier and Description*	*See Plan Sheet #s*

Here's how:

1) Create a table similar to Table 4-1. Number and list each measure or BMP specified in the Project-Specific WQMP in Columns 1 and 2 of the table. Leave Column 3 blank. <u>Incorporate the table into the Project-Specific WQMP.</u>

2) When you submit construction plans, duplicate the table (by photocopy or electronically). Now fill in Column 3, identifying the plan sheets where the BMPs are shown. List all plan sheets on which the BMP appears. Submit the updated table with your construction plans so that the plan checker can quickly locate the Structural Control BMPs that were committed to in the Project-Specific WQMP.

Note that the updated table—or Construction Plan WQMP Checklist—is only a reference tool to facilitate comparison of the construction plans to the Project-Specific WQMP. The Copermittee plan checker can advise regarding the process required to propose changes, if any, to the approved Project-Specific WQMP.

4.3.1.b) Grading is Key

Copermittee plan checkers typically require grading plans to show each BMP in addition to the delineation of DMAs. Elevations, including the following, should be called out:

- Curbs, inlets, grade breaks and other features of the drainage design consistent with the delineation of the DMAs.
- Top of paving at curb cut inlets, top of curb and top of the bioretention soil layer.
- Grate elevation at overflow grates and the adjacent top of soil elevation.
- Piped inlets.

Show how DMAs follow grade breaks, consistent with the grading plan and the Project-Specific WQMP.

4.3.1.c) Show How Runoff Moves

As needed for clarity, show the direction of Runoff flow across roofs and pavement and into BMPs. For runoff conveyed via pipes or channels, show locations, slopes, and elevations at the beginning and end of each run.

For roof drainage, show the routing of roof downspouts, use drawings or notes to make clear how drainage from leaders is routed under walkways, across pavement, through drainage pipes, or by other means to reach the BMP.

Show pipes or channels connecting the BMP underdrain and overflow to the site drainage system, MS4, or other approved discharge point. Call out slopes and key elevations.

4.3.1.d) Landscaping and Utility Plans

- The 2010 SMR MS4 Permit *(Order No. R9-2010-0016 NPDES No. CAS0108766)* requires the Copermittees to prohibit irrigation runoff. Any instance of irrigation water reaching the MS4 or Receiving Water is a violation of the Copermittees' ordinances. Ensure that irrigation systems are designed to avoid the potential for irrigation runoff. For example, drip irrigation may be an appropriate technology to meet this objective.

- Vaults and utility boxes should be accommodated outside BMPs and not placed within Structural BMPs in a manner that may interfere with their performance and/or operation and maintenance.

- Landscaping plans, including planting plans, should identify locations of Structural BMPs and the plant requirements must be consistent with the engineered soils and conditions in the BMPs. For more information on plant species appropriate for LID Bioretention BMPs, see Appendix A of the LID Manual for Southern California:

https://www.casqa.org/resources/lid/socal-lid-manual

4.3.1.e) Show LID Principles and Structural BMPs in Cross-Section

Use one or more cross section drawings to illustrate details and key BMP elevations, including bottom of excavation, top of gravel layer, top of soil layer, edge treatments, inlet elevations, overflow grate elevations, rim elevations, locations of rock for energy dissipation, moisture barriers, and other information. If structural BMPs include gravel and soil mix, call out specifications or refer to specifications elsewhere for gravel and soil mix.

- Any area drains within Type B Self-Retaining areas should be identified with elevations of the inlet into the drain, such that the required retention depth will be provided.

- The top edge (overflow) of each BMP provides for the required ponding depth.

4.4. Coordination with Construction Activities

Successful construction of BMPs requires attention to detail during every stage of the construction process, from initial layout to rough grading, installation of utilities, construction of buildings, paving, landscaping, and final clean-up and inspection.

Construction project managers need to understand the purpose and function of BMPs and know how to avoid common missteps that can occur during construction. For LID BMPs, the following operating principles should be noted at a pre-construction meeting.

- Runoff flow from the intended tributary DMA must flow into the BMP.
- The surface reservoir must fill to its intended volume during high inflows.
- Runoff must filter rapidly through the filtration/soil layer.
- Filtered Runoff must infiltrate into the native soil to the extent feasible (or allowable).
- Remaining Runoff must be captured and drained to a storm drain or other approved location.

4.4.1. Coordination with Erosion and Sediment Control Plan/SWPPP

BMPs may not perform as designed if the BMP and the BMP location are not protected during site construction. It is important to specify that appropriate measures be taken by construction staff to protect these areas and BMPs. Be sure that all construction site staff is aware of these requirements, because historical construction habits may take time to change.

- Avoid intentional or unintentional compaction of planned landscaped areas, particularly areas that have been designated for infiltration such as Self-Retaining Areas, LID Infiltration and LID Bioretention BMPs. If these areas are compacted, or even just used as an access path for heavy equipment during site grading, then the soil structure and infiltration characteristics will be destroyed, and the BMP will not perform as designed. If this occurs, require re-tilling and/or soil amendments as necessary to restore the infiltrative capacity of the underlying soils.
- Once any BMP is constructed, surround the BMP with Sediment Control BMPs, and maintain them until site occupancy is granted. Even small amounts of construction sediment can significantly affect the performance of the Sediment Control BMPs.

- Construct pervious pavements as the last order of work, if possible, to minimize the risk of clogging the constructed pervious pavement by sediment and debris generated from additional construction activities.

4.4.2. Items to Be Inspected During Construction

Verify that the project contract documents are sufficiently detailed to provide for the proper construction of the elements of the BMPs specified in the Project-Specific WQMP. See the example construction checklist on the following pages for ideas of items that may need to be verified in the contract documents and during construction.

EXAMPLE BMP CONSTRUCTION CHECKLIST

Staking

- ❒ Square footage of BMPs meets or exceeds minimum shown in Project-Specific WQMP
- ❒ Site grading and grade breaks are staked consistent with and sufficient to define the boundaries of the tributary Drainage Management Area(s) (DMAs) shown in the Project-Specific WQMP
- ❒ Inlet elevation of the BMP is low enough to receive drainage from the entire tributary DMA
- ❒ Locations and elevations of overland flow or piping, including roof leaders, from impervious areas to the BMP have been laid out and any conflicts resolved
- ❒ Rim elevation of the BMP is staked consistent with plans
- ❒ Locations for vaults, utility boxes, and light standards have been identified so that they will not conflict with BMPs

EXCAVATION (to be confirmed prior to backfilling or pipe installation)

- ❒ Excavation conducted with materials and techniques to minimize compaction of soils within the BMP area
- ❒ Excavation is to accurate area and depth
- ❒ Slopes or side walls protected from sloughing of native soils into the BMP
- ❒ Moisture barrier, if specified, has been added to protect adjacent pavement or structures
- ❒ Native soils at bottom of excavation are ripped or loosened to promote infiltration

OVERFLOW OR SURFACE CONNECTION TO MS4
(to be confirmed prior to backfilling with any materials)

- ❒ Overflow is at specified elevation (typically no lower than two inches below BMP rim)
- ❒ No knockouts or side inlets are in overflow riser
- ❒ Overflow location selected to minimize surface flow velocity (near, but offset from, inlet recommended)
- ❒ Grating excludes mulch and litter (beehive or atrium-style grates with ¼" openings recommended)
- ❒ Overflow structures are located away from inlets to the BMP
- ❒ Overflow is connected to storm drain or other specified outlet via appropriately sized piping

UNDERGROUND CONNECTION TO MS4 /OUTLET ORIFICE
(to be confirmed prior to backfilling BMP with any materials)

- ❒ Perforated pipe underdrain is installed with holes facing down
- ❒ Perforated pipe is connected to the specified discharge point
- ❒ Underdrain pipe is at elevation shown on plans. In facilities allowing infiltration, preferred elevation is above native soil but low enough to still be covered by the underdrain rock; in bioretention facilities that are sealed or with liners, preferred elevation is as near bottom as possible
- ❒ Cleanouts are in accessible locations and connected via sweeps
- ❒ Structures (arches or large diameter pipes) for additional surface storage are installed as shown in plans and specifications and have the specified volume

(continued)

Figure 4-1: Example BMP Construction Checklist

EXAMPLE BMP CONSTRUCTION CHECKLIST (CONTINUED)

DRAIN ROCK/SUBDRAIN (to be confirmed prior to installation of soil mix)

- ❒ Rock is installed as specified.
- ❒ Rock is smoothed to a consistent top elevation. Depth and top elevation are as shown in plans
- ❒ Slopes or side walls protected from sloughing of native soils into the BMP
- ❒ No filter fabric is placed between the subdrain and soil mix layers

SOIL MIX (FOR BIORETENTION)

- ❒ Soil mix is as specified. Quality of mix is confirmed by delivery ticket or onsite testing as appropriate to the size and complexity of the BMP
- ❒ Mix is not compacted during installation but may be thoroughly wetted to encourage consolidation
- ❒ Mix is smoothed to a consistent top elevation. Depth of mix and top elevation are as shown in plans, accounting for depth of mulch to follow and required reservoir depth

IRRIGATION

- ❒ Irrigation system is installed so it can be controlled separately from other landscaped areas. Smart irrigation controllers and drip emitters are recommended
- ❒ Spray heads, if any, are positioned to avoid direct spray into outlet structures

PLANTING

- ❒ Plants are installed consistent with approved planting plan
- ❒ Any trees and large shrubs are staked securely
- ❒ No clayey material, including inappropriate native soils are used in the BMP
- ❒ 1"-2" mulch may be applied following planting; mulch selected to avoid floating
- ❒ Final elevation of soil mix, including mulch, is maintained following planting
- ❒ Curb openings are free of obstructions

FINAL ENGINEERING INSPECTION

- ❒ Drainage Management Area(s) are free of construction sediment and landscaped areas are stabilized
- ❒ Inlets are installed to provide smooth entry of Runoff from adjoining pavement, have sufficient reveal (drop from the adjoining pavement to the top of the mulch or soil mix, and are not blocked
- ❒ Inflows from roof leaders and pipes are connected and operable
- ❒ Temporary flow diversions are removed
- ❒ Rock or other energy dissipation at piped or surface inlets is adequate
- ❒ Overflow outlets are configured to allow the BMP to flood and fill to near rim before overflow
- ❒ Plantings are healthy and becoming established
- ❒ Irrigation is operable
- ❒ If rains have occurred: BMP drains rapidly; no surface ponding is evident
- ❒ Any accumulated construction debris, trash, or sediment is removed from BMP
- ❒ Certification Statement from design professional that all BMPs have been constructed and/or installed in accordance with the approved plans and specs.

Chapter

5

5.0 PROJECT-SPECIFIC WQMP OPERATION & MAINTENANCE

How to prepare a customized Project-Specific WQMP Operation & Maintenance Plan for the BMPs on your PDP site.

Provision F.1.f(2)(b) of the 2010 SMR MS4 Permit requires that each Copermittee must verify that Structural BMPs are adequately maintained. Copermittees must report the results of these verifications to the San Diego Regional Board annually.

Structural BMPs installed as part of the PDP will be incorporated into the Copermittee's verification program. This is a five-stage process:

1) Determine who will own the Structural BMPs and be responsible for its maintenance in perpetuity and document this in the Project-Specific WQMP. The Project-Specific WQMP must also identify the means by which ongoing maintenance will be assured (for example, a maintenance agreement that runs with the land).

2) Identify project-specific maintenance requirements, allow for these requirements in your project planning and preliminary design, and document the typical maintenance requirements in the Project-Specific WQMP.

3) Prepare a Project-Specific WQMP Operation and Maintenance Plan (WQMP O&M Plan) for the site incorporating detailed requirements for each LID, Conventional Treatment and Hydrologic Control BMP. Other types of LID Principles, such as self-retaining areas may also require operation and maintenance to ensure that they continue to function as designed. Typically, a draft Project-Specific WQMP Operation and Maintenance Plan must be submitted with the Final Project-Specific WQMP, and a final Project-Specific WQMP Operation and Maintenance Plan must be submitted to and approved by the Copermittee with jurisdiction over the project site prior to issuance of a

certificate of occupancy. Local requirements vary as to schedule. Check with Copermittee staff.

4) Maintain the Structural BMPs from the time they are constructed until ownership and maintenance responsibility is formally transferred to the site owner/operator.

5) **Maintain** the BMPs in perpetuity and comply with the Copermittee's self-inspection, reporting, and verification requirements.

Table 5-1: Schedule for Planning the Project-Specific WQMP Operation and Maintenance Plan

Stage	*Description*	*Where documented*	*Schedule*
1	Determine BMP ownership and maintenance responsibility	Preliminary Project-Specific WQMP	Discuss with project owner at initial project planning phase
2	Identify Project-Specific maintenance requirements	Preliminary Project-Specific WQMP	Submit with planning & zoning application
3	Develop detailed operation and maintenance plan	Final Project-Specific WQMP	Submit draft with Building Permit application; final due before building permit final and applying for a Certificate of Occupancy
4	Interim operation and maintenance of BMPs	As required by Copermittee O&M verification program	During and following construction including warranty period
5	Ongoing maintenance and compliance with inspection & reporting requirements	As required by Copermittee O&M verification program	In perpetuity

5.1. STAGE 1: OWNERSHIP AND MAINTENANCE RESPONSIBILITY

Ownership & maintenance responsibility for Structural BMPs should be discussed as early as due diligence and definitely at the beginning of project planning. Experience has shown that provisions to implement and finance maintenance of Structural BMPs can be a major stumbling block to project approval, particularly for small residential subdivisions.

Your Project-Specific WQMP must specify:

1) Who will be responsible for maintaining the site in conformance with the WQMP Operation & Maintenance Plan.

2) The means for financing the maintenance of Structural BMPs in perpetuity once the BMP is implemented and the Development Project is complete. This should include the mechanisms for the eventual replacement of the BMP or elements of the BMP.

3) How the maintenance obligations will carry over to subsequent owners, as further described in Sections 5.1.1 through 5.1.3 below.

5.1.1. Private Ownership and Maintenance

The Copermittee may require—as a condition of project approval—that a maintenance agreement be executed and recorded against the title of the property. Consult with the Copermittee with jurisdiction over the project site for a copy of any required maintenance agreement.

The agreement will thereby "run with the land", so the maintenance agreement executed by a developer is binding on the owners of the subdivided lots and subsequent owners. The agreement must be recorded prior to conveyance of the subdivided property.

5.1.2. Transfer to Public Ownership

Some Copermittees may have developed a process by which a Structural BMP can be deeded to the public in fee or as an easement, for public maintenance. The Copermittee may recoup the costs of maintenance through a special tax, assessment district, or similar mechanism.

☞ Check with the Copermittee with jurisdiction over the project site to determine if any such 'public maintenance' mechanisms are in place, and for any associated requirements.

Transferring a LID BMP to Public Ownership may create additional design constraints, however, it removes the burden from the site owner/operator from having to maintain the BMP in perpetuity. Because PDP sites typically drain to the street, it may be possible to locate a BMP parallel to the street and within road right of way, or on a common, publically accessible lot.

Even if the Structural BMP is to be deeded or transferred to the Copermittee after construction is complete, it is still the responsibility of the User, to maintain the BMP in accordance with the Project-Specific WQMP O&M Plan until that responsibility is formally transferred to the subsequent owner.

5.1.3. Copermittee Projects

Public projects (such as Public Works/Capital Improvement Projects) implemented by a Copermittee will be maintained by the Copermittee in accordance with a Facility Pollution Prevention Plan as described in the Copermittees' JRMP.

5.2. STAGE 2: IDENTIFY MAINTENANCE REQUIREMENTS

Include in the Project-Specific WQMP a description of the maintenance requirements for each Structural BMP, including for any self-retaining and/or landscaped self-treating areas. This will help ensure that:

- Ongoing costs of Structural BMP maintenance have been considered in BMP selection and design.
- Site and landscaping plans provide for access for inspections and by maintenance equipment.
- Landscaping plans incorporate irrigation requirements for Structural BMP plantings as appropriate.
- Initial maintenance and replacement of Structural BMP plantings is incorporated into landscaping contracts and guarantees.

Fact sheets in the LID BMP Design Handbook describe typical maintenance requirements for many of the Structural BMPs described in this WQMP. Use this information, or other requirements specified by the Copermittee to specify the maintenance requirements for each of the Structural BMPs, including LID BMPs, Conventional Treatment Control BMPs, Hydrologic Control BMPs, and Source Control BMPs identified in the Project-Specific WQMP. In addition, identify any necessary maintenance requirements for any other LID Principles that were incorporated into the project, such as buffer areas, etc.

5.3. STAGE 3: DEVELOP PROJECT-SPECIFIC WQMP OPERATIONS &MAINTENANCE PLAN

Submit a draft Project-Specific WQMP O&M Plan with your final Project-Specific WQMP included with the application for permits to begin grading or construction on the site. A final Project-Specific WQMP O&M Plan (updated as necessary) will be required to be submitted with the 'as-built' plans and approved before occupancy is granted.

The final Project-Specific WQMP O&M Plan should incorporate solutions to any problems noted or changes that occurred during construction.

The Final Project-Specific WQMP O&M Plan and 'as-built' plans must be submitted to and approved by the Copermittee with jurisdiction over the project site before a building permit can be made final and a certificate of occupancy issued.

The Project-Specific WQMP and WQMP O&M Plan must be kept onsite for use by maintenance personnel and during site inspections.

The following step-by-step guidance will help you prepare each required section of your WQMP O&M Plan. Preparation of the Plan will require familiarity with the Structural BMPs as they have been designed/constructed and a fair amount of "thinking through" plans for their operation and maintenance. The text and forms provided here will assist you, but are no substitute for thoughtful planning.

5.3.1. Step 1: Designate Responsible Individuals

To begin creating the Project-Specific WQMP O&M Plan, the User must designate and identify:

- The individual who will have direct responsibility for the maintenance of the BMPs identified in the Project-Specific WQMP O&M Plan. This individual should be the designated contact with Copermittee inspectors and should sign self-inspection reports and any correspondence with the Copermittee regarding verification inspections. The Copermittee may accept self-certification or third-party certification by a California licensed Professional Engineer.
- Employees or contractors who will report to the designated contact and are responsible for conducting all required operation and maintenance.
- The corporate officer authorized to negotiate and execute contracts that might be necessary for future changes to operation and maintenance of the BMPs identified in the Project-Specific WQMP O&M Plan or to implement remedial measures if problems occur.
- The designated respondent to problems with the BMPs, such as clogged drains or broken irrigation mains, that would require immediate response should they occur during off-hours.

Include an organization chart to show the relationships of authority and responsibility between the individuals responsible for Project-Specific WQMP operation and maintenance. This need not be elaborate, particularly for smaller organizations.

Describe how funding for operation and maintenance will be assured, including sources of funds, budget category for expenditures, process for establishing the annual maintenance budget, and process for obtaining authority should unexpected expenditures for major corrective maintenance be required.

Describe how training of staff or contractors regarding the purpose, mode of operation, and maintenance requirements for the BMPs Identified in the Project-Specific WQMP O&M Plan will be provided. Also, describe how ongoing training will be provided as needed and in response to staff changes.

5.3.2. Step 2: Summarize Drainage and BMPs

Incorporate the following information from the Project-Specific WQMP into the Project-Specific WQMP O&M Plan:

- Figures delineating and designating DMAs
- Figures showing locations of BMPs on the site
- Tables of the DMAs served by each Structural BMP

Verify that these figures incorporate changes that may have occurred during planning and zoning review, building permit review, or construction.

5.3.3. Step 3: Document BMPs 'As-Built'

Once each Structural BMP is constructed, plans for the BMP must be 'as-built' by a licensed civil/geotechnical engineer registered in the State of California and submitted to the Copermittee, and also included as part of the Project-Specific WQMP O&M Plan. The information contained on the 'as-built' plans must be consistent with standard engineering practice. Following is a list of types of information that should be documented on 'as-built' plans as applicable and appropriate:

- Plans, elevations, and details of all Structural BMPs. Annotate if necessary with designations used in the Project-Specific WQMP.
- Design information or calculations submitted in the detailed design phase (i.e., not included in the Project-Specific WQMP).
- Specifications of construction of the Structural BMPs, including sand or soil, compaction, pipe materials, and bedding.

In the final Project-Specific WQMP O&M Plan, incorporate field changes to design drawings, including changes to any of the following:

- Location and layouts of inflow piping, flow splitter boxes, and piping to offsite discharge.

- Depths and layering of soil, sand, or gravel.
- Placement of filter fabric or geotextiles.
- Changes or substitutions in soil or other materials.
- Natural soils encountered (e.g., sand or clay lenses).
- Vegetation type within or around the BMP.
- Changes in tree types.
- Fencing around the BMP.
- Etc.

5.3.4. Step 4: Prepare Customized Maintenance Plans

Prepare a maintenance plan, schedule, and inspection checklists (e.g. routine, annual, and after major storms) for each Structural BMP including for any self-retaining and/or landscaped self-treating areas. Plans and schedules for two or more similar BMPs on the same site may be combined.

Use the following resources to prepare the customized maintenance plan, schedule, and checklists.

- Specific information noted in Steps 2 and 3, above.
- Other input from the Structural BMP designer, Copermittee staff, or other sources.
- BMP Fact Sheets in the LID BMP Design Handbook, as applicable.

Note any particular characteristics or circumstances that may require attention in the future, and include any troubleshooting advice.

Also include in an appendix any manufacturer's data, operating manuals, and maintenance requirements for any:

- Pumps or other mechanical equipment.
- Proprietary devices used as or in conjunction with BMPs.

Manufacturers' publications should be referenced in the text (including models and serial numbers where available). Copies of the manufacturers' publications

should be included as an attachment in the back of the Project-Specific WQMP O&M Plan or as a separate document.

5.3.5. Step 5: Compile O&M Plan

The Project-Specific WQMP O&M Plan should follow the general outline below.

> **Note** that for Copermittee Projects, the WQMP O&M Plan requirements will be incorporated into a new or existing, Facility Pollution Prevention Plans (FPPP).

I. Inspection and Maintenance Log

II. Updates, Revisions and Errata

III. Introduction

Narrative overview describing the site; drainage areas, routing, and discharge points; and Structural BMPs

IV. Responsibility for Maintenance

A. General

1) Name and contact information for responsible individual(s).

2) Organization chart or charts of the maintenance function and location within the overall organization.

3) Reference to Operation and Maintenance Agreement (if any). A copy of the agreement should be attached.

4) Maintenance Funding

a. Sources of funds for maintenance

b. Budget category or line item

c. Description of procedure and process for ensuring adequate funding for maintenance

B. Staff Training Program

C. Records

D. Safety

V. Summary of DMAs and BMPs

A. DMAs

1) Drawings showing pervious and impervious areas (copied or adapted from Project-Specific WQMP)

2) Designation and description of each DMA and how flow is routed to the corresponding BMP

B. Structural BMPs

1) Drawings showing location and type of each Structural Post-Construction BMP

2) General description of each BMP (consider a table if more than two BMPs)

(b) DMA and routing of discharge

(c) BMP type and size

VI. BMP Design Documentation

A. 'As-built' drawings of each Structural BMP (design drawings in the draft Plan).

B. Manufacturer's data (as applicable) including manuals, and maintenance requirements for pumps, mechanical or electrical equipment, and proprietary facilities (include a "placeholder" in the draft Project-Specific WQMP Operations and Maintenance Plan for information not yet available at the draft phase).

C. Specific operation and maintenance concerns and troubleshooting.

VII. Maintenance Schedule or Matrix

A. Maintenance Schedule for each Structural BMP with specific requirements for:

(1) Routine inspection and maintenance

(2) Annual inspection and maintenance

(3) Inspection and maintenance after major storms

B. Service Agreement Information

Assemble and make copies of the Project-Specific WQMP O&M Plan. One or more copies must be submitted to the Copermittee, including one electronic

copy. At least one copy must be kept onsite. Following are some suggestions for formatting the Project-Specific WQMP O&M Plan:

- Format plans to 8½" x 11" to facilitate duplication, filing, and handling
- Include the revision date in the footer on each page
    - Scan graphics and incorporate with text into a single electronic file. Keep the electronic file backed up so that copies of the Project-Specific WQMP O&M Plan can be made if the hard copy is lost or damaged.

5.3.6. Step 6: Updates

The Stormwater Control Operation and Maintenance Plan (or Facility Pollution Prevention Plan for Copermittee projects) will be a living document and, thus, will require periodic updates by the Facility/Activity Manager at least annually. There are two types of updates, each with their own implications as noted below. Note that these are examples of minimum thresholds that should be verified with the Copermittee with jurisdiction over the PDP site for specific direction and advisement.

- Minor Updates – Turnover of named maintenance personnel, mechanical equipment, addition of maintenance procedures, etc.
- Major Updates – Relocation of BMPs, modification of maintenance schedule(s) of BMPs, change in legal ownership and/or party responsible for maintaining the BMPs in perpetuity, major site re-grading or re-paving that can affect DMAs, changing one BMP for an alternative BMP, etc.

Updates may be transmitted to the Copermittee with jurisdiction over the project site at any time. However, at a minimum, updates to the O&M Plan must be maintained, implemented, and available to Copermittee inspectors. These updates should reference the sections of the O&M Plan being changed. In addition, major updates may necessitate a revision to the Project-Specific WQMP and as such may cause the need for the document to be re-recorded. Consult with the Copermittee with jurisdiction over the project site before performing any major updates to the approved and implemented Project-Specific WQMP. Conversely, updates may not require re-recordation if they are consistent with the original, executed agreement.

Failure to maintain an up-to-date copy of the O&M Plan may be a violation of Copermittee requirements subject to fines and/or other penalties.

5.4. Stage 4: Interim Operation & Maintenance

The User is responsible for interim operation and maintenance of Stormwater BMPs until such time as this responsibility is formally transferred to a subsequent property owner. Users may be required to warranty Stormwater BMPs against lack of performance due to flaws in design or construction for a minimum of two rainy seasons following completion of construction. The warranty may need to be secured by a bond or other financial instrument if required by the Copermittee.

5.5. Stage 5: Operation & Maintenance Verification

Each Copermittee implements a program to ensure that the Structural BMPs are operating and are maintained properly and all BMPs are working effectively to remove Pollutants in Runoff from the site. This may include periodic site inspections, or requirements for self-certifications by a licensed professional engineer. This program will be described by each Copermittee in their respective JRMP.

5.6. References and Resources

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- Operation, Maintenance, and Management of Stormwater Management Systems (Watershed Management Institute, 1997)

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EXHIBIT A:

Isohyetal Map for the 85th Percentile 24-hour Storm Event

EXHIBIT B:

Project-Specific WQMP Template

EXHIBIT C:

LID BMP Design Handbook

Please Visit

www.rcflood.org/npdes/developers

to access the current Handbook.

EXHIBIT D:

WQMP Applicability Checklist

EXHIBIT E:

WQMP Review Checklist

EXHIBIT F:

Santa Margarita Region Hydromodification Management Plan

EXHIBIT G:

Glossary

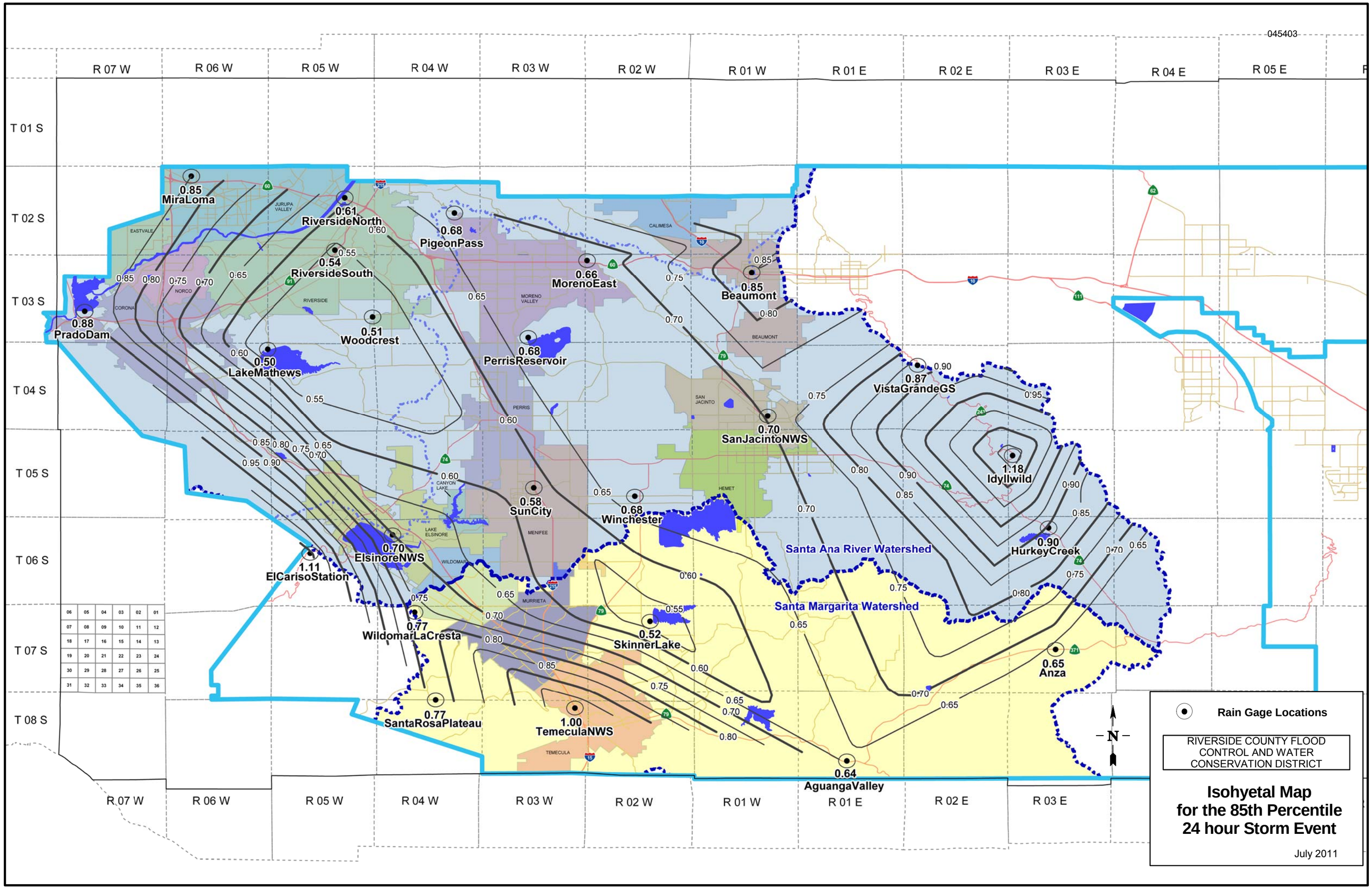
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0.68 PigeonPass
0.54 RiversideSouth
0.66 MorenoEast
0.85 Beaumont
0.88 PradoDam
0.51 Woodcrest
0.50 LakeMathews
0.68 PerrisReservoir
0.87 VistaGrandeGS
0.70 SanJacintoNWS
1.18 Idyllwild
0.58 SunCity
0.68 Winchester
0.90 HurkeyCreek
0.70 ElsinoreNWS
1.11 ElCarisoStation
0.77 WildomarLaCresta
0.52 SkinnerLake
0.65 Anza
0.77 SantaRosaPlateau
1.00 TemeculaNWS
0.64 AguangaValley
Santa Ana River Watershed
Santa Margarita Watershed
EASTVALE
JURUPA VALLEY
CORONA
NORCO
RIVERSIDE
CALIMESA
MORENO VALLEY
BEAUMONT
PERRIS
SAN JACINTO
HEMET
CANYON LAKE
LAKE ELSINORE
WILDOMAR
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MURRIETA
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Rain Gage Locations
RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
Isohyetal Map for the 85th Percentile 24 hour Storm Event
July 2011

Project Specific Water Quality Management Plan

*A Template for preparing Project Specific WQMPs for Priority Development Projects located within the **Santa Margarita Region** of Riverside County*

Project Title: Insert text here

Development No: Insert text here

Design Review/Case No: Insert text here

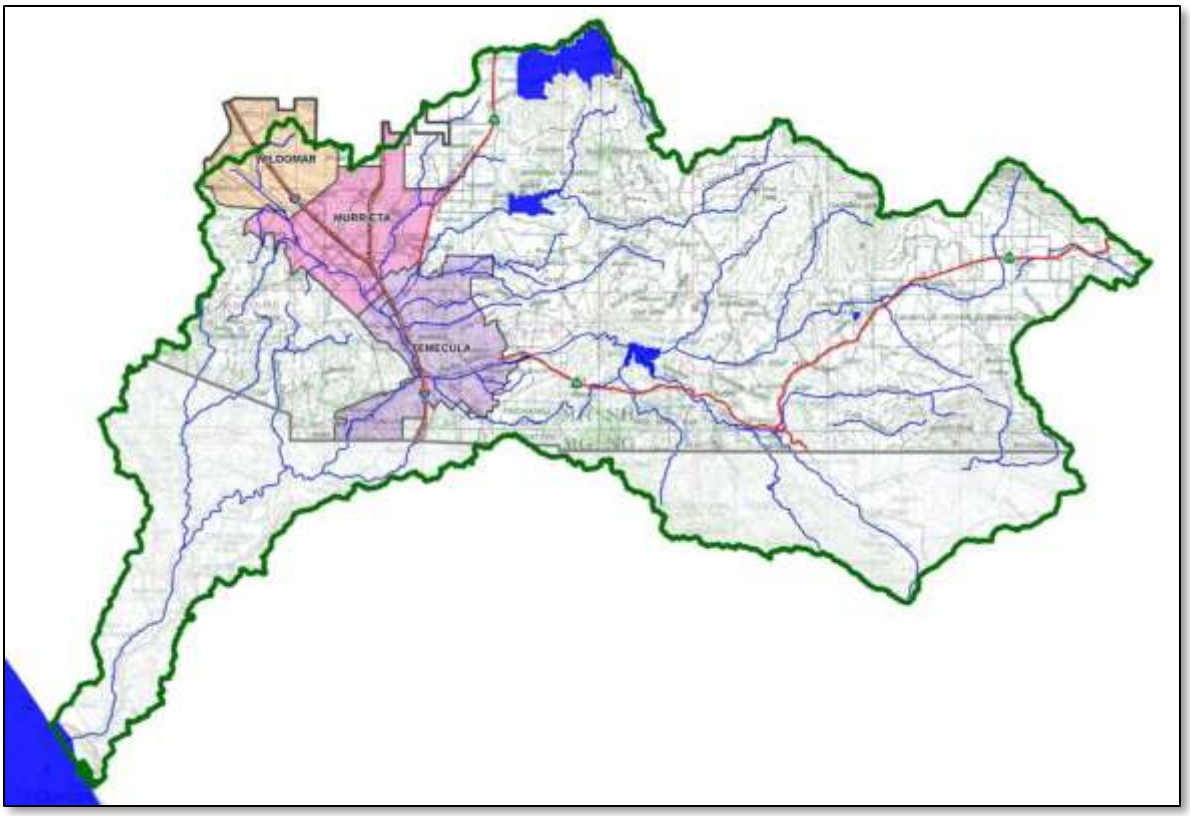

☐ **Preliminary**
☐ **Final**

Original Date Prepared: Insert text here

Revision Date(s): Insert text here

Prepared for Compliance with
Regional Board Order No. **R9-2010-0016**

Contact Information:

Prepared for: Insert Developer Name, Address, and Phone Number

Prepared by: Insert Name and Title of Preparer, address, and Phone Number

A Brief Introduction

The Municipal Separate Stormwater Sewer System (MS4) Permit[1] for the **Santa Margarita Region** (SMR) requires preparation of a Project-Specific Water Quality Management Plan (WQMP) for all Development Projects as defined in section F.1.d.(1) of the Permit. This Project-Specific WQMP Template for Development Projects in the **Santa Margarita Region** has been prepared to help document compliance and prepare a WQMP submittal. Below is a flowchart for the layout of this Template that will provide the steps required to document compliance.

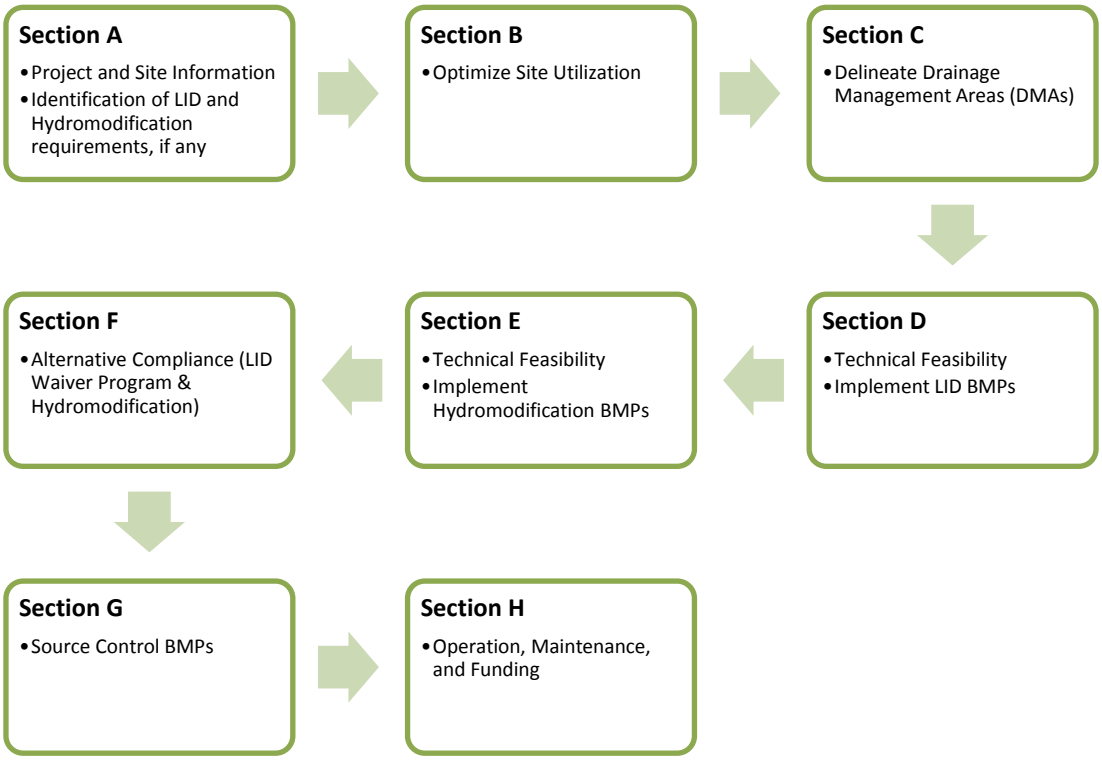

[1] Order No. R9-2010-0016, NPDES No. CAS0108766, Waste Discharge Requirements for Discharges from the MS4 Draining the County of Riverside, the Incorporated Cities of Riverside County, and the Riverside County Flood Control and Water Conservation District within the San Diego Region, California Regional Water Quality Control Board, November 10, 2010.

OWNER'S CERTIFICATION

This Project-Specific WQMP has been prepared for <Owner's Name> by <Preparer's Name> for the <Project Name> project.

This WQMP is intended to comply with the requirements of <Insert City or County Name> for <Insert Ordinance No.> which includes the requirement for the preparation and implementation of a Project-Specific WQMP.

The undersigned, while owning the property/project described in the preceding paragraph, shall be responsible for the implementation and funding of this WQMP and will ensure that this WQMP is amended as appropriate to reflect up-to-date conditions on the site. In addition, the property owner accepts responsibility for interim operation and maintenance of Stormwater Best Management Practices until such time as this responsibility is formally transferred to a subsequent owner. This WQMP will be reviewed with the facility operator, facility supervisors, employees, tenants, maintenance and service contractors, or any other party (or parties) having responsibility for implementing portions of this WQMP. At least one copy of this WQMP will be maintained at the project site or project office in perpetuity. The undersigned is authorized to certify and to approve implementation of this WQMP. The undersigned is aware that implementation of this WQMP is enforceable under <Insert City or County Name> Water Quality Ordinance (Municipal Code Section).

"I, the undersigned, certify under penalty of law that the provisions of this WQMP have been reviewed and accepted and that the WQMP will be transferred to future successors in interest."

Owner's Signature	Date
Owner's Printed Name	Owner's Title/Position

PREPARER'S CERTIFICATION

"The selection, sizing and design of stormwater treatment and other stormwater quality and quantity control Best Management Practices in this plan meet the requirements of Regional Water Quality Control Board Order No. **R9-2010-0016** and any subsequent amendments thereto."

Preparer's Signature	Date
Preparer's Printed Name	Preparer's Title/Position

Preparer's Licensure:

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Section A: Project and Site Information

PROJECT INFORMATION	
Type of Project:	Insert text here (e.g., commercial, residential, etc.)
Planning Area:	Insert text here
Community Name:	Insert text here
Development Name:	Insert Planning Area / Community Name/ Development Name, if known
PROJECT LOCATION	
Latitude & Longitude (DMS): Insert coordinates here	
Project Watershed and Sub-Watershed: Insert text here	
APN(s): Insert text here	
Map Book and Page No.: Insert text here	
PROJECT CHARACTERISTICS	
Proposed or potential land use(s)	Insert text here
Proposed or Potential SIC Code(s)	Insert text here
Area of Impervious Project Footprint (SF)	Insert text here
Total area of proposed Impervious Surfaces within the Project Limits (SF)/or Replacement	Insert text here
Total Project Area (ac)	Insert text here
Does the project consist of offsite road improvements?	☐ Y ☐ N
Does the project propose to construct unpaved roads?	☐ Y ☐ N
Is the project part of a larger common plan of development (phased project)?	☐ Y ☐ N
Is the project exempt from HMP Performance Standards?	☐ Y ☐ N
EXISTING SITE CHARACTERISTICS	
Total area of existing Impervious Surfaces within the project limits (SF)	Insert text here.
Is the project located within any Multi-Species Habitat Conservation Plan (MSHCP Criteria Cell?	☐ Y ☐ N
If so, identify the Cell number:	Insert text here.
Are there any natural hydrologic features on the project site?	☐ Y ☐ N
Is a Geotechnical Report attached?	☐ Y ☐ N
If no Geotech. Report, list the Natural Resources Conservation Service (NRCS) soils type(s) present on the site (A, B, C and/or D)	Insert text here.
What is the Water Quality Design Storm Depth for the project?	Insert text here.

A.1 Maps and Site Plans

When completing your Project-Specific WQMP, include a map of the Project vicinity and existing site. In addition, include all grading, drainage, landscape/plant palette and other pertinent construction plans in Appendix 2. At a **minimum**, your WQMP Site Plan should include the following:

- Drainage Management Areas (DMAs)
- Proposed Structural Best Management Practices (BMPs)
- Drainage Path
- Source Control BMPs
- Buildings, Roof Lines, Downspouts
- Impervious Surfaces
- Standard Labeling

- Drainage infrastructure, inlets, overflows

Use your discretion on whether or not you may need to create multiple sheets or can appropriately accommodate these features on one or two sheets. Keep in mind that the Copermittee plan reviewer must be able to easily analyze your Project utilizing this template and its associated site plans and maps.

A.2 Identify Receiving Waters

Using Table A.1 below, list in order of upstream to downstream, the Receiving Waters that the Project site is tributary to. Continue to fill each row with the Receiving Water's 303(d) listed impairments (if any), designated Beneficial Uses, and proximity, if any, to a RARE Beneficial Use. Include a map of the Receiving Waters in Appendix 1. *(http://www.waterboards.ca.gov/sandiego/water_issues/programs/basin_plan/)*

Table A.1 Identification of Receiving Waters

Receiving Waters	USEPA Approved 303(d) List Impairments	Designated Beneficial Uses	Proximity to RARE Beneficial Use
Insert name of 1st receiving water	List any 303(d) impairments of 1st receiving water, including Approved TMDL pollutant limitations	Insert designated beneficial use of 1st receiving water	Insert distance of project to RARE-designated waters (indicate whether feet, yards, or miles)
insert name of 2nd receiving water	List any 303(d) impairments of 2nd receiving water, including Approved TMDL pollutant limitations	Insert designated beneficial use of 2nd receiving water	Insert distance of project to RARE-designated waters (indicate whether feet, yards, or miles)
Insert name of 3rd receiving water	List any 303(d) impairments of 3rd receiving water, including Approved TMDL pollutant limitations	Insert designated beneficial use of 3rd receiving water	Insert distance of project to RARE-designated waters (indicate whether feet, yards, or miles)

A.3 Drainage System Susceptibility to Hydromodification

Using Table A.2 below, list in order of the point of discharge at the project site down to the Santa Margarita River, each drainage system or receiving water that the project site is tributary to. Continue to fill each row with the material of the drainage system, the storm drain susceptibility using the SWCT2 (Stormwater & Water Conservation Tracking Tool - http://rivco.permitrack.com/) or Map 2 of the Hydromodification Susceptibility Documentation Report and Mapping: Santa Margarita Region (Appendix D of the SMR HMP), and the condition for exempting the drainage system, if applicable. If the exemption includes receiving waters that were not evaluated in Appendix D, provide supporting documentation in Appendix 7 to demonstrate that they classify as Engineered, Fully Hardened and Maintained (EFHM) channels, consistent with the definition provided in Appendix D. Include a map exhibiting each drainage system and the associated susceptibility in Appendix 1.

Table A.2 Identification of Susceptibility to Hydromodification

Drainage System	Drainage System Material	Susceptibility of Drainage System	Hydromodification Exemption
Insert name and length (in miles) of 1st drainage system	Identify either (1) the type of material of bed and bank for open channels; or (2) the material of storm drain pipes and conduits	Identify the susceptibility to hydromodication of 1st drainage system	Insert exemptions the 1st receiving water may qualify for. If none, insert NONE.
Insert name and length (in miles) of 2nd drainage system	Identify either (1) the type of material of bed and bank for open channels; or (2) the material of storm drain pipes and conduits	Identify the susceptibility to hydromodication of 2nd drainage system	Insert exemptions the 2nd receiving water may qualify for. If none, insert NONE.

Drainage System	Drainage System Material	Susceptibility of Drainage System	Hydromodification Exemption
Insert name and length (in miles) of 3rd drainage system	Identify either (1) the type of material of bed and bank for open channels; or (2) the material of storm drain pipes and conduits	Identify the susceptibility to hydromodication of 3rd drainage system	Insert exemptions the 3rd receiving water may qualify for. If none, insert NONE.

A.4 Additional Permits/Approvals required for the Project:

Table A.3 Other Applicable Permits

Agency	Permit Required	
State Department of Fish and Game, 1602 Streambed Alteration Agreement	☐ Y	☐ N
State Water Resources Control Board, Clean Water Act Section 401 Water Quality Certification	☐ Y	☐ N
US Army Corps of Engineers, Clean Water Act Section 404 Permit	☐ Y	☐ N
US Fish and Wildlife, Endangered Species Act Section 7 Biological Opinion	☐ Y	☐ N
Statewide Construction General Permit Coverage	☐ Y	☐ N
Statewide Industrial General Permit Coverage	☐ Y	☐ N
Western Riverside MSHCP Consistency Approval (e.g., JPR, DBESP)	☐ Y	☐ N
Other *(please list in the space below as required)*	☐ Y	☐ N

If yes is answered to any of the questions above, the Copermittee may require proof of approval/coverage from those agencies as applicable including documentation of any associated requirements that may affect this Project-Specific WQMP.

Section B: Optimize Site Utilization (LID Principles)

Review of the information collected in Section 'A' will aid in identifying the principal constraints on site design and selection of LID BMPs as well as opportunities to reduce imperviousness and incorporate LID Principles into the site and landscape design. For example, **constraints** might include impermeable soils, high groundwater, groundwater pollution or contaminated soils, steep slopes, geotechnical instability, high-intensity land use, heavy pedestrian or vehicular traffic, utility locations or safety concerns. **Opportunities** might include existing natural areas, low areas, oddly configured or otherwise unbuildable parcels, easements and landscape amenities including open space and buffers (which can double as locations for LID Bioretention BMPs), and differences in elevation (which can provide hydraulic head). Prepare a brief narrative for each of the site optimization strategies described below. This narrative will help you as you proceed with your Low Impact Development (LID) design and explain your design decisions to others.

The 2010 SMR MS4 Permit further requires that LID Retention BMPs (Infiltration Only or Harvest and Use) be used unless it can be shown that those BMPs are infeasible. Therefore, it is important that your narrative identify and justify if there are any constraints that would prevent the use of those categories of LID BMPs. Similarly, you should also note opportunities that exist which will be utilized during project design. Upon completion of identifying Constraints and Opportunities, include these on your WQMP Site plan in Appendix 1.

Site Optimization

The following questions are based upon Section 3.2 of the WQMP Guidance Document. Review of the WQMP Guidance Document will help you determine how best to optimize your site and subsequently identify opportunities and/or constraints, and document compliance.

Did you identify and preserve existing drainage patterns? If so, how? If not, why?

Insert narrative here

Did you identify and protect existing vegetation? If so, how? If not, why?

Insert narrative here

Did you identify and preserve natural infiltration capacity? If so, how? If not, why?

Insert narrative here

Did you identify and minimize impervious area? If so, how? If not, why?

Insert narrative here

Did you identify and disperse runoff to adjacent pervious areas? If so, how? If not, why?

Insert narrative here

Section C: Delineate Drainage Management Areas (DMAs)

Utilizing the procedure in Section 3.3 of the WQMP Guidance Document which discusses the methods of delineating and mapping your project site into individual DMAs, complete Table C.1 below to appropriately categorize the types of classification (e.g., Type A, Type B, etc.) per DMA for your Project site. Upon completion of this table, this information will then be used to populate and tabulate the corresponding tables for their respective DMA classifications.

Table C.1 DMA Classifications

DMA Name or Identification	Surface Type(s)[1]	Area (Sq. Ft.)	DMA Type

[1]*Reference Table 2-1 in the WQMP Guidance Document to populate this column*

Table C.2 Type 'A', Self-Treating Areas

DMA Name or Identification	Area (Sq. Ft.)	Stabilization Type	Irrigation Type (if any)

Table C.3 Type 'B', Self-Retaining Areas

Self-Retaining Area				Type 'C' DMAs that are draining to the Self-Retaining Area		
DMA Name/ ID	Post-project surface type	Area (square feet) [A]	Storm Depth (inches) [B]	DMA Name / ID	[C] from Table C.4 = [C]	Required Retention Depth (inches) [D]

$$[D] = [B] + \frac{[B] \cdot [C]}{[A]}$$

Table C.4 Type 'C', Areas that Drain to Self-Retaining Areas

DMA					Receiving Self-Retaining DMA		
DMA Name/ ID	Area (square feet)	Post-project surface type	Runoff factor	Product	DMA name /ID	Area (square feet)	Ratio
	[A]		[B]	[C] = [A] x [B]		[D]	[C]/[D]

Note: (See Section 3.3 of WQMP Guidance Document) Ensure that partially pervious areas draining to a Self-Retaining area do not exceed the following ratio:

$$\left(\frac{\mathbf{2}}{\boldsymbol{Impervious\ Fraction}}\right) : \mathbf{1}$$

(Tributary Area**:** Self-Retaining Area)

Table C.5 Type 'D', Areas Draining to BMPs

DMA Name or ID	BMP Name or ID

Note: More than one DMA may drain to a single LID BMP; however, one DMA may not drain to more than one BMP.

Section D: Implement LID BMPs

D.1 Infiltration Applicability

An assessment of the feasibility of utilizing Infiltration BMPs is required for all projects, *except in the following case:*

- ☐ Harvest and Use BMPs will be implemented to address the Design Capture Volume (see the Harvest and Use Assessment below) for all Drainage Management Areas AND the project is exempt from HMP Performance Standards (*Proceed to Section D.2 and Section E*).

If the above box remains unchecked, perform a site-specific evaluation of the feasibility of Infiltration BMPs using each of the applicable criteria identified in Chapter 3.4.1 of the WQMP Guidance Document and complete the remainder of Section D.1.

Is there an infiltration concern (see discussion in Chapter 2.3.4 of the WQMP Guidance Document for further details)? ☐ Y ☐ N

If yes has been checked, both Infiltration BMPs and Hydrologic Control BMPs that include an infiltration functionalities may not be feasible for the site. It is recommended that you contact your Copermittee to verify whether or not infiltration within the Project is infeasible.

Geotechnical Report

A Geotechnical Report or Phase I Environmental Site Assessment may be required by the Copermittee to confirm present and past site characteristics that may affect the use of Infiltration BMPs. In addition, the Copermittee, at their discretion, may not require a geotechnical report for small projects as described in Chapter 2 of the WQMP Guidance Document. If a geotechnical report has been prepared, include it in Appendix 3. In addition, if a Phase I Environmental Site Assessment has been prepared, include it in Appendix 4.

Is this project classified as a small project consistent with the requirements of Chapter 2 of the WQMP Guidance Document? ☐ Y ☐ N

Infiltration Feasibility

Table D.1 below is meant to provide a simple means of assessing which DMAs on your site support Infiltration BMPs and is discussed in the WQMP Guidance Document in Chapter 2.3.4. Check the appropriate box for each question and then list affected DMAs as applicable. If additional space is needed, add a row below the corresponding answer.

Table D.1 Infiltration Feasibility

Does the project site…	YES	NO
…have any DMAs with a seasonal high groundwater mark shallower than 10 feet?		
If Yes, list affected DMAs:		
…have any DMAs located within 100 feet of a water supply well?		
If Yes, list affected DMAs:		
…have any areas identified by the geotechnical report as posing a public safety risk where infiltration of stormwater could have a negative impact?		
If Yes, list affected DMAs:		
…have measured in-situ infiltration rates of less than 1.6 inches / hour?		
If Yes, list affected DMAs:		

…have significant cut and/or fill conditions that would preclude in-situ testing of infiltration rates at the final infiltration surface?		
If Yes, list affected DMAs:		
…have any contaminated groundwater plume in the vicinity of the site?		
If Yes, list affected DMAs:		
…geotechnical report identifies other site-specific factors that would preclude effective and safe infiltration?		
Describe here:		

If you answered "Yes" to any of the questions above for any DMA, Infiltration BMPs should not be used for those DMAs and you should proceed to the assessment for Harvest and Use below.

D.2 Harvest and Use Assessment

Please check what applies*:*

☐ Reclaimed water will be used for the non-potable water demands for the Project.

☐Downstream water rights may be impacted by Harvest and Use as approved by the Regional Board (verify with the Copermittee).

☐The Design Capture Volume (DCV) will be addressed using Infiltration Only BMPs. In such a case, Harvest and Use BMPs are still encouraged, but it would not be required if the DCV will be infiltrated or evapotranspired.

If any of the above boxes have been checked, Harvest and Use BMPs need not be assessed for the site. If neither of the above criteria applies, follow the steps below to assess the feasibility of irrigation use, toilet use and other non-potable uses (e.g., industrial use).

Irrigation Use Feasibility

Complete the following steps to determine the feasibility of harvesting stormwater runoff for Irrigation Use BMPs on your site:

Step 1: Identify the total area of irrigated landscape on the site, and the type of landscaping used.

Total Area of Irrigated Landscape: Insert Area (Acres)

Type of Landscaping (Conservation Design or Active Turf): List Landscaping Type

Step 2: Identify the planned total of all impervious areas on the proposed project from which runoff might be feasibly captured and stored for irrigation use. Depending on the configuration of buildings and other impervious areas on the site, you may consider the site as a whole, or parts of the site, to evaluate reasonable scenarios for capturing and storing runoff and directing the stored runoff to the potential use(s) identified in Step 1 above.

Total Area of Impervious Surfaces: Insert Area (Acres)

Step 3: Cross reference the Design Storm depth for the project site (see Exhibit A of the WQMP Guidance Document) with the left column of Table 2-4 in Chapter 2 to determine the minimum area of Effective Irrigated Area per Tributary Impervious Area (EIATIA).

Enter your EIATIA factor: EIATIA Factor

Step 4: Multiply the unit value obtained from Step 3 by the total of impervious areas from Step 2 to develop the minimum irrigated area that would be required.

Minimum required irrigated area: Insert Area (Acres)

Step 5: Determine if harvesting stormwater runoff for irrigation use is feasible for the project by comparing the total area of irrigated landscape (Step 1) to the minimum required irrigated area (Step 4).

Minimum required irrigated area (Step 4)	Available Irrigated Landscape (Step 1)
Insert Area (Acres)	Insert Area (Acres)

Toilet Use Feasibility

Complete the following steps to determine the feasibility of harvesting stormwater runoff for toilet flushing uses on your site:

Step 1: Identify the projected total number of daily toilet users during the wet season, and account for any periodic shut downs or other lapses in occupancy:

Projected Number of Daily Toilet Users: Number of daily Toilet Users

Project Type: Enter 'Residential', 'Commercial', 'Industrial' or 'Schools'

Step 2: Identify the planned total of all impervious areas on the proposed Project from which runoff might be feasibly captured and stored for toilet use. Depending on the configuration of buildings and other impervious areas on the site, you may consider the Project site as a whole, or parts of the site, to evaluate reasonable scenarios for capturing and storing runoff and directing the stored runoff to the potential use(s) identified in Step 1 above.

Total Area of Impervious Surfaces: Insert Area (Acres)

Step 3: Enter the Design Storm depth for the project site (see Exhibit A) into the left column of Table 2-3 in Chapter 2 to determine the minimum number or toilet users per tributary impervious acre (TUTIA).

Enter your TUTIA factor: TUTIA Factor

Step 4: Multiply the unit value obtained from Step 3 by the total of impervious areas from Step 2 to develop the minimum number of toilet users that would be required.

Minimum number of toilet users: Required number of toilet users

Step 5: Determine if harvesting stormwater runoff for toilet flushing use is feasible for the Project by comparing the Number of Daily Toilet Users (Step 1) to the minimum required number of toilet users (Step 4).

Minimum required Toilet Users (Step 4)	Projected number of toilet users (Step 1)
Insert Area (Acres)	Insert Area (Acres)

Other Non-Potable Use Feasibility

Are there other non-potable uses for stormwater runoff on the site (e.g. industrial use)? See Chapter 2 of the Guidance for further information. If yes, describe below. If no, write N/A.

Insert narrative description here.

Step 1: Identify the projected average daily non-potable demand, in gallons per day, during the Wet Season and accounting for any periodic shut downs or other lapses in occupancy or operation.

Average Daily Demand: Projected Average Daily Use (gpd)

Step 2: Identify the planned total of all impervious areas on the proposed Project from which runoff might be feasibly captured and stored for the identified non-potable use. Depending on the configuration of buildings and other impervious areas on the site, you may consider the

Project site as a whole, or parts of the site, to evaluate reasonable scenarios for capturing and storing runoff and directing the stored runoff to the potential use(s) identified in Step 1 above.

Total Area of Impervious Surfaces: Insert Area (Acres)

Step 3: Enter the Design Storm Depth for the Project site (see Exhibit A) into the left column of Table 2-5 in Chapter 2 to determine the minimum demand for non-potable uses of stormwater runoff per tributary impervious acre.

Enter the factor from Table 2-3: Enter Value

Step 4: Multiply the unit value obtained from Step 4 by the total of impervious areas from Step 3 to develop the minimum gpd of non-potable use that would be required.

Minimum required use: Minimum use required (gpd)

Step 5: Determine if harvesting stormwater runoff for other non-potable use is feasible for the Project by comparing the Number of Daily Toilet Users (Step 1) to the minimum required number of toilet users (Step 4).

Minimum required non-potable use (Step 4)	**Projected average daily use (Step 1)**
Minimum use required (gpd)	Projected Average Daily Use (gpd)

If Irrigation, Toilet and Other Use feasibility anticipated demands are less than the applicable minimum values, Harvest and Use BMPs are not required and you should proceed to utilize LID Bioretention and Biotreatment BMPs, unless a site-specific analysis has been completed that demonstrates technical infeasibility as noted in D.3 below.

D.3 Bioretention and Biotreatment Assessment

Other LID Bioretention and Biotreatment BMPs as described in Chapter 2.3 of the WQMP Guidance Document are feasible on nearly all development sites with sufficient advance planning.

Select one of the following:

☐ LID Bioretention/Biotreatment BMPs will be used for some or all DMAs of the Project as noted below in Section D.4

☐ A site-specific analysis demonstrating the technical infeasibility of all LID BMPs has been performed and is included in Appendix 5. If you plan to submit an analysis demonstrating the technical infeasibility of LID BMPs, request a pre-submittal meeting with the Copermittee with jurisdiction over the Project site to discuss this option. Proceed to Section E to document your alternative compliance measures.

D.4 Other Limiting Geotechnical Conditions

Onsite retention may not be feasible due to specific geotechnical concerns identified in the Geotechnical Report. If any, describe below. If no, write N/A:

Insert narrative description here.

Table D.2 Geotechnical Concerns for Onsite Retention Table

Type of Geotechnical Concern	DMAs Feasible (By Name or ID)	DMAs Infeasible (By Name or ID)
Collapsible Soil		
Expansive Soil		
Slopes		
Liquefaction		
Other		

D.5 Feasibility Assessment Summaries

From the Infiltration, Harvest and Use, Bioretention and Biotreatment Sections above, complete Table D.3 below to summarize which LID BMPs are technically feasible, and which are not, based upon the established hierarchy.

Table D.3 LID Prioritization Summary Matrix

DMA Name/ID	LID BMP Hierarchy				No LID (Alternative Compliance)
	1. Infiltration	2. Harvest and use	3. Bioretention	4. Biotreatment	
	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐

For those DMAs where LID BMPs are not feasible, provide a brief narrative below summarizing why they are not feasible, include your technical infeasibility criteria in Appendix 5, and proceed to Section E below to document Alternative Compliance measures for those DMAs. Recall that each proposed DMA must pass through the LID BMP hierarchy before alternative compliance measures may be considered.

Insert narrative description here.

D.6 LID BMP Sizing

Each LID BMP must be designed to ensure that the DCV will be addressed by the selected BMPs. First, calculate the DCV for each LID BMP using the V_{BMP} worksheet in Appendix F of the LID BMP Design Handbook. Second, design the LID BMP to meet the required V_{BMP} using a method approved by the Copermittee with jurisdiction over the Project site. Utilize the worksheets found in the LID BMP Design Handbook or consult with the Copermittee to assist you in correctly sizing your LID BMPs. Complete Table D.4 below to document the DCV and the Proposed Volume for each LID BMP. Provide the completed design procedure sheets for each LID BMP in Appendix 6. You may add additional rows to the table below as needed.

Table D.4 DCV Calculations for LID BMPs

DMA Type/ID	DMA (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Enter BMP Name / Identifier Here*		
	[A]		[B]	[C]	[A] x [C]			
						Design Storm Depth (in)	*DCV, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
	$A_T = \Sigma[A]$				$\Sigma = [D]$	[E]	$[F] = \frac{[D]x[E]}{12}$	[G]

[B], [C] is obtained as described in Section 2.5 of the WQMP Guidance Document
[E] is obtained from Exhibit A in the WQMP Guidance Document
[G] is obtained from a design procedure sheet, such as in LID BMP Design Handbook and placed in Appendix 6

Each LID BMP must be designed to ensure that the Design Capture Volume (DCV) will be addressed by the selected BMPs. First, calculate the Design Capture Volume for each LID BMP using the 'V_{BMP}' worksheet in Appendix F of the LID BMP Design Handbook. Second, design the LID BMP to meet the required V_{BMP} using a method approved by the Copermittee. Utilize the worksheets found in the LID BMP Design Handbook or consult with your Copermittee. Complete Table D.5 below to document the Design Capture Volume and the Proposed Volume for each LID BMP. You can add rows to the table as needed. Alternatively, the Santa Margarita Hydrology Model (SMRHM) can be used to size LID BMPs to address the DCV and, if applicable, to size Hydrologic Control BMPs to meet the Hydrologic Performance Standard of the SMR HMP, as identified in Section E.

Table D.5 LID BMP Sizing

BMP Name / ID	DMA No.	BMP Type / Description	Design Capture Volume (ft^3)	Proposed Volume (ft^3)

Section E: Implement Hydrologic Control BMPs and Sediment Supply BMPs

If a completed Table A.2 demonstrates that the project is exempt from HMP Performance Standards, specify N/A of proceed to Section F, if applicable, and Section G.

E.1 Onsite Feasibility of Hydrologic Control BMPs

An assessment of the feasibility of implementing onsite Hydrologic Control BMPs is required for all projects.

Select one of the following:

- ☐ Yes – The implementation of Hydrologic Control BMPs is feasible onsite. *(Proceed to Step E.3 and Step E.4)*

- *Or* -

- ☐ No – The project site is larger than one acre and the implementation of Hydrologic Control BMPs is not feasible onsite. *(Proceed to Step E.5 and Step F for Alternative Compliance upon approval of the Technical Feasibility Assessment by the Copermittee)*
- ☐ No – The project site is smaller than one acre and the implementation of Hydrologic Control BMPs is not feasible onsite. *(Proceed to Step E.2)*

If the reasons for infeasibility are different from those listed in Section D.1, describe the technical or spatial reasons that preclude the implementation of onsite Hydrologic Control BMPs. If none, write N/A:

Insert narrative description here.

Approval of the condition for infeasibility, if any, is required by the Copermittee. Has the condition for infeasibility been approved by the Copermittee?

☐ Y ☐ N ☐ N/A

E.2 Meeting the HMP Performance Standard for Small Project Sites

Select one of the following:

- ☐ Yes – The project site is equal to or larger than one acre. *(Proceed to Step E.3, Step E.4, and Step E.5)*

- *Or* -

- ☐ No – The project site is less than one acre. *(Follow the remainder of Step E.2)*

Only a Simplified Technical Feasibility Study is required from the applicant. Complete the Simplified Technical Feasibility Study in Appendix 7, which must include, at a minimum, the soil conditions at the PDP, a demonstration of the lack of available space for onsite Hydrologic Control BMPs, an explanation of prohibitive costs to implement Hydrologic Control BMPs, and a written opinion from a Registered Geotechnical Engineer identifying the infeasibility due to geotechnical concerns.

Select one of the following:

☐ Yes – Onsite Hydrologic Control BMPs are feasible. *(Proceed to Step E., Step E.4, and Step E.5)*

- *Or* -

☐ No – Onsite Hydrologic Control BMPs are not feasible per the Simplified Technical Feasibility Study. *(Proceed to Section E.5 for Sediment Supply Performance Standard and Section F for Alternative Compliance)*

E.3 Hydrologic Control BMP Selection

Capture of the DCV and achievement of the Hydrologic Performance Standard may be met by combined and/or separate structural BMPs. Similarly, compliance with the two identified requirements may be fully or partially achieved onsite.

For each DMA, identify in Table E.1 if the DCV is fully or partially captured onsite, if the Hydrologic Performance Standard is fully or partially met onsite (by using the SMRHM identified in Step E.4), and if structural BMPs for compliance with the LID requirement and the Hydrologic Performance Standard are combined.

Table E.1 LID & Hydromodification BMP Location

DMA	LID BMP	Hydrologic Control BMP	Combined BMP	BMP type and ID
	☐ Onsite ☐ Partially Onsite ☐ Offsite ☐ None Required	☐ Onsite ☐ Partially Onsite ☐ Offsite ☐ None Required	☐ Yes ☐ No	Identify the ID and type of Hydrologic Control BMP to mitigate 1st DMA
	☐ Onsite ☐ Partially Onsite ☐ Offsite ☐ None Required	☐ Onsite ☐ Partially Onsite ☐ Offsite ☐ None Required	☐ Yes ☐ No	Identify the ID and type of Hydrologic Control BMP to mitigate 2nd DMA
	☐ Onsite ☐ Partially Onsite ☐ Offsite ☐ None Required	☐ Onsite ☐ Partially Onsite ☐ Offsite ☐ None Required	☐ Yes ☐ No	Identify the ID and type of Hydrologic Control BMP to mitigate 3rd DMA

For each DMA provide a narrative describing if the DCV and the Hydrologic Performance Standard are to be fully managed onsite. If not, the narrative should detail how and where offsite structural BMPs will achieve management of the DCV and the Hydrologic Performance Standard.

DMA #1 - Insert narrative description here

DMA #2 - Insert narrative description here

DMA #3 - Insert narrative description here

E.4 Hydrologic Control BMP Sizing

Each Hydrologic Control BMP must be designed to ensure that the flow duration curve of the post-development DMA will not exceed that of the pre-existing, naturally occurring, DMA by more than ten percent over a one-year period. Using SMRHM, the applicant shall demonstrate that the performance of each designed Hydrologic Control BMP complies with the Hydrologic Performance Standard. Complete Table E.2 below and identify, for each DMA, the type of Hydrologic Control BMP, if the SMRHM model confirmed the management (Identified as "passed" in SMRHM), the total volume capacity of the Hydrologic Control BMP, the Hydrologic Control BMP footprint at top floor elevation, and the drawdown time of the Hydrologic Control BMP. SMRHM summary reports should be documented in Appendix 7. Refer to the SMRHM Guidance Document for additional information on SMRHM. You can add rows to the table as needed.

Table E.2 Hydrologic Control BMP Sizing

BMP Name / ID	DMA No.	BMP Type / Description	SMRHM Passed	BMP Volume (ac-ft)	BMP Footprint (ac)	Drawdown time (hr)
			☐			
			☐			
			☐			
			☐			

E.5 Implement Sediment Supply BMPs

The applicant may refer to Section 2.3 of the SMR HMP for a comprehensive description of the methodology to meet the Sediment Supply Performance Standard. Complete the following steps to determine compliance with the Sediment Supply Performance Standard:

Step 1: Identify if the site is a Significant Source of Bed Sediment Supply to the receiving channel

☐ Step 1.A – Is the Bed Sediment of onsite streams similar to that of receiving streams?

Rate the similarity: ☐ High
☐ Medium
☐ Low

Results from the geotechnical and sieve analysis to be performed both onsite and in the receiving channel should be documented in Appendix 7. Of particular interest, the results of the sieve

analysis, the soil erodibility factor, a description of the topographic relief of the project area, and the lithology of onsite soils should be reported in Appendix 7.

☐ Step 1.B – Are onsite streams capable of delivering Bed Sediment Supply from the site, if any, to the receiving channel?

Rate the potential:

☐ High

☐ Medium

☐ Low

Results from the analyses of the sediment delivery potential to the receiving channel should be documented in Appendix 7 and identify, at a minimum, the Sediment Source, the distance to the receiving channel, the onsite channel density, the project watershed area, the slope, length, land use, and rainfall intensity.

☐ Step 1.C – Will the receiving channel adversely respond to a change in Bed Sediment Load?

Rate the need for bed sediment supply:

☐ High

☐ Medium

☐ Low

Results from the in-stream analysis to be performed both onsite should be documented in Appendix 7. The analysis should, at a minimum, quantify the bank stability and the degree of incision, provide a gradation of the Bed Sediment within the receiving channel, and identify if the channel is sediment supply-limited.

☐ Step 1.D – Summary of Step 1

Summarize in Table E.3 the findings of Step 1 and associate a score (in parenthesis) to each step. The sum of the three individual scores determines if a stream is a significant contributor to the receiving stream.

- Sum is equal to or greater than eight - Site is a significant source of sediment bed material – all on-site streams must be preserved or by-passed within the site plan. The applicant shall proceed to Step 2 for all onsite streams.
- Sum is greater than five but lower than eight. Site is a source of sediment bed material – some of the on-site streams must be preserved (with identified streams noted). The applicant shall proceed to Step 2 for the identified streams only.
- Sum is equal to or lower than five. Site is not a significant source of sediment bed material. The applicant may advance to Section F.

Table E.3 Triad Assessment Summary

Step	Rating			Total Score
1.A	☐ High (3)	☐ Medium (2)	☐ Low (1)	
1.B	☐ High (3)	☐ Medium (2)	☐ Low (1)	
1.C	☐ High (3)	☐ Medium (2)	☐ Low (1)	
Significant Source Rating of Bed Sediment to the receiving channel(s)				

Step 2: Preservation of Identified Onsite Channels

Onsite streams identified as a Significant Source of Bed Sediment should be avoided in the site design.

Check one of the following:

☐ The site design does avoid all onsite channels identified as a Significant Source of Bed Sediment *(The applicant may disregard subsequent steps of Section E.5 and directly advance directly to Section F.*)

- *Or* -

☐ The site design **does NOT avoid** all onsite channels identified as a Significant Source of Bed Sediment *(The applicant may proceed with the subsequent steps of Section E.5).*

Provide in Appendix 7 a site map that identifies all onsite channels and highlights those onsite channels that were identified as a Significant Source of Bed Sediment. The site map shall demonstrate, if feasible, that the site design avoids those onsite channels identified as a Significant Source of Bed Sediment. In addition, the applicant shall describe the characteristics of each onsite channel identified as a Significant Source of Bed Sediment. If the design plan cannot avoid the onsite channels, please provide a rationale for each channel individually.

Identified Channel #1 - Insert narrative description here

Identified Channel #2 - Insert narrative description here

Identified Channel #3 - Insert narrative description here

Step 3: By-Pass of Upstream Drainage(s) to Preserve the discharge of Bed Sediment Supply to the receiving channel(s)

Onsite channels identified as a Significant Source of Bed Sediment Supply should be by-passed the discharge of Bed Sediment Supply to the receiving channel(s).

Check one of the following:

☐ The site design does avoid and/or bypass all onsite channels identified as a source of Bed Sediment Supply *(The applicant may directly advance to Section F.*)

- *Or* -

☐ The site design **does NOT avoid or by-pass** all onsite channels identified as a source of Bed Sediment Supply *(The applicant may proceed to an Alternative Approach, as defined in Section F).*

Provide in Appendix 7 a site map that identifies all onsite channels and highlights those onsite channels that were identified as a Significant Source of Bed Sediment Supply. The site map shall demonstrate, if feasible, that the site design avoids or by-passes those onsite channels of significant Bed Sediment Supply to the receiving channel(s). In addition, the applicant shall describe the characteristics of each onsite channel identified as a Significant Source of Bed Sediment Supply. If the design plan cannot avoid or by-pass the onsite channels, please provide a rationale for each channel individually.

Identified Channel #1 - Insert narrative description here

Identified Channel #2 - Insert narrative description here

Identified Channel #3 - Insert narrative description here

Section F: Alternative Compliance

LID BMPs and Hydrologic Control BMPs are expected to be feasible on virtually all projects. Where LID BMPs and/or Hydrologic Control BMPs have been demonstrated to be infeasible as documented in Section D and/or Section E, respectively, other Treatment Control BMPs or alternative compliance approaches must be used (subject LID waiver and/or HMP alternative compliance approval by the Copermittee).

In addition, if supporting documentation demonstrates the infeasibility to implement Sediment Supply BMPs onsite (See Section E.5), the applicant may refer to Section F.5.

Check one of the following boxes:

- ☐ LID Principles, LID BMPs, Hydrologic Control BMPs, and Sediment Supply BMPs have been incorporated into the site design to fully address all Drainage Management Areas. No alternative compliance measures are required for this project and thus this Section is not required to be completed.

- *Or* -

- ☐ LID Principles and LID BMPs have NOT been incorporated into the site design to fully address the LID requirements for all Drainage Management Areas AND HMP Performance Standards are not fully addressed in the following Drainage Management Areas.
    - The following Drainage Management Areas are unable to be addressed using LID BMPs. A site specific analysis demonstrating technical infeasibility of LID BMPs has been approved by the Copermittee and included in Appendix 5. The following alternative compliance measures on the following pages are being implemented to ensure that any pollutant loads expected to be discharged by not incorporating LID BMPs, are fully mitigated. The applicant should complete Section F.1, Section F.2, and Section F.3, as applicable.
    - A site specific analysis demonstrating technical infeasibility of Hydrologic Control BMPs and Sediment Supply BMPs has been approved by the Copermittee and included in Appendix 7. Projects less than one acre have completed the Simplified Technical Feasibility Study. The applicant should complete Section F.5 and/or Section F.6, as applicable.

List DMAs Here.

- *Or* -

- ☐ LID Principles and LID BMPs have been incorporated into the site design to fully address the DCV for all Drainage Management Areas. However, HMP Performance Standards are not fully addressed in the following Drainage Management Areas. A site specific analysis demonstrating technical infeasibility of Hydrologic Control BMPs and Sediment Supply BMPs has been approved by the Copermittee and included in Appendix 7. Projects less than one acre have

completed the Simplified Technical Feasibility. The applicant should complete Section F.5 and/or Section F.6, as applicable.

List DMAs Here.

F.1 Identify Pollutants of Concern

Utilizing Table A.1 from Section A above which noted your project's Receiving Waters and their associated USEPA approved 303(d) listed impairments, cross reference this information with that of your selected Priority Development Project Category in Table F.1 below. If the identified General Pollutant Categories are the same as those listed for your Receiving Waters, then these will be your Pollutants of Concern and the appropriate box or boxes will be checked on the last row. The purpose of this is to document compliance and to help you appropriately plan for mitigating your Pollutants of Concern in lieu of implementing LID BMPs.

Table F.1 Potential Pollutants by Land Use Type

Priority Development Project Categories and/or Project Features (check those that apply)	General Pollutant Categories							
	Bacterial Indicators	Metals	Nutrients	Pesticides	Toxic Organic Compounds	Sediments	Trash & Debris	Oil & Grease
☐ Detached Residential Development	P	N	P	P	N	P	P	P
☐ Attached Residential Development	P	N	P	P	N	P	P	P(2)
☐ Commercial/Industrial Development	P(3)	P	P(1)	P(1)	P(5)	P(1)	P	P
☐ Automotive Repair Shops	N	P	N	N	P(4, 5)	N	P	P
☐ Restaurants (>5,000 ft^2)	P	N	N	N	N	N	P	P
☐ Hillside Development (>5,000 ft^2)	P	N	P	P	N	P	P	P
☐ Parking Lots (>5,000 ft^2)	P(6)	P	P(1)	P(1)	P(4)	P(1)	P	P
☐ Retail Gasoline Outlets	N	P	N	N	P	N	P	P
Project Priority Pollutant(s) of Concern	☐	☐	☐	☐	☐	☐	☐	☐

P = Potential
N = Not Potential
(1) A potential Pollutant if non-native landscaping exists or is proposed onsite; otherwise not expected
(2) A potential Pollutant if the project includes uncovered parking areas; otherwise not expected
(3) A potential Pollutant is land use involving animal waste
(4) Specifically petroleum hydrocarbons
(5) Specifically solvents
(6) Bacterial indicators are routinely detected in pavement runoff

F.2 Stormwater Credits

Projects that cannot implement LID BMPs but nevertheless implement Smart Growth Principles are potentially eligible for Stormwater Credits. Utilize Table 3-7 within the WQMP Guidance Document to identify your Project Category and its associated Water Quality Credit. If not applicable, write N/A.

Table F.2 Stormwater Credits

Qualifying Project Categories	Credit Percentage[2]
Total Credit Percentage[1]	

[1]*Cannot Exceed 50%*
[2]*Obtain corresponding data from Table 3-7 in the WQMP Guidance Document*

F.3 Sizing Criteria

After you appropriately considered Stormwater Credits for your Project, utilize Table F.3 below to appropriately size them to the DCV, or Design Flow Rate, as applicable. Please reference Chapter 3.5.5 of the WQMP Guidance Document for further information.

Table F.3 Treatment Control BMP Sizing

DMA Type/ID	**DMA (square feet)**	**Post-Project Surface Type**	**Effective Impervious Fraction, I_f**	**DMA Runoff Factor**	**DMA x Runoff Factor**		***Enter BMP Name / Identifier Here***		
	[A]		[B]	[C]	[A] x [C]				
						Design Storm Depth (in)	*Minimum DCV or Design Flow Rate (cubic feet or cfs)*	*Total Storm Water Credit % Reduction*	*Proposed Volume or Flow on Plans (cubic feet or cfs)*
	A_T = Σ[A]				Σ= [D]	[E]	$[F] = \frac{[D]x[E]}{[G]}$	[F] X (1-[H])	[I]

[B], [C] is obtained as described in Section 2.5 from the WQMP Guidance Document
[E] is obtained from Exhibit A in the WQMP Guidance Document
[G] is for Flow-Based Treatment Control BMPs [G] = 43,560, for Volume-Based Control Treatment BMPs, [G] = 12
[H] is from the Total Stormwater Credit Percentage as Calculated from Table E.2 above
[I] as obtained from a design procedure sheet from the BMP manufacturer and should be included in Appendix 6

F.4 Treatment Control BMP Selection

Treatment Control BMPs typically provide proprietary treatment mechanisms to treat potential Pollutants in runoff, but do not sustain significant biological processes. Treatment Control BMPs must have a removal efficiency of a medium or high effectiveness as quantified below:

- **High**: equal to or greater than 80% removal efficiency
- **Medium**: between 40% and 80% removal efficiency

Such removal efficiency documentation (e.g., studies, reports, etc.) as further discussed in Chapter 3.5.2 of the WQMP Guidance Document, must be included in Appendix 6. In addition, ensure that proposed Treatment Control BMPs are properly identified on the WQMP Site Plan in Appendix 1.

Table F.4 Treatment Control BMP Selection

Selected Treatment Control BMP Name or ID[1]	Priority Pollutant(s) of Concern to Mitigate[2]	Removal Efficiency Percentage[3]

[1] *Treatment Control BMPs must not be constructed within Receiving Waters. In addition, a proposed Treatment Control BMP may be listed more than once if they possess more than one qualifying pollutant removal efficiency.*
[2] *Cross Reference Table E.1 above to populate this column.*
[3] *As documented in a Copermittee Approved Study and provided in Appendix 6.*

F.5 Hydrologic Performance Standard – Alternative Compliance Approach

Alternative compliance options are only available if the governing Copermittee has acknowledged the infeasibility of onsite Hydrologic Control BMPs and approved an alternative compliance approach. Attach to Appendix 7 the Technical Feasibility Study (Projects equal or greater than one acre) or Simplified Technical Feasibility Study (Projects less than one acre) along with a written approval from the Copermittee. The applicant may refer to Section 2.2.iv of the SMR HMP for extensive guidelines on the alternative compliance approach.

Select the pursued alternative and describe the specifics of the alternative:

☐ Offsite Hydrologic Control Management within the same channel system

Insert narrative description here

☐ In-Stream Restoration Project

Insert narrative description here

<u>For Offsite Hydrologic Control BMP Option</u>

Each Hydrologic Control BMP must be designed to ensure that the flow duration curve of the post-development DMA will not exceed that of the pre-existing, naturally occurring, DMA by more than ten percent over a one-year period. Using SMRHM, the applicant shall demonstrate that the performance of

each designed Hydrologic Control BMP is equivalent with the Hydrologic Performance Standard for onsite conditions. Complete Table F.4 below and identify, for each Hydrologic Control BMP, the equivalent DMA the Hydrologic Control BMP mitigates, that the SMRHM model passed, the total volume capacity of the BMP, the BMP footprint at top floor elevation, and the drawdown time of the BMP. SMRHM summary reports for the alternative approach should be documented in Appendix 7. Refer to the SMRHM Guidance Document for additional information on SMRHM. You can add rows to the table as needed.

Table F.5 Offsite Hydrologic Control BMP Sizing

BMP Name / Type	Equivalent DMA (ac)	SMRHM Passed	BMP Volume (ac-ft)	BMP Footprint (ac)	Drawdown time (hr)
		☐			
		☐			
		☐			
		☐			

For Instream Restoration Option

Attach to Appendix 7 the technical report detailing the condition of the receiving channel subject to the proposed hydrologic and sediment regimes. Provide the full design plans for the in-stream restoration project that have been approved by the Copermittee.

F.6 Sediment Supply Performance Standard - Alternative Compliance

The alternative compliance option to the Sediment Supply Performance Standard is only available if the governing Copermittee has approved the investigation of alternative Bed Sediment Supply options. Attach to Appendix 7 the Technical Feasibility Study, along with the modeling analysis, the long-term monitoring program, and the potential corrective actions, that demonstrate the performance of the overall alternative compliance program. The applicant may refer to Section 2.3.ii of the SMR HMP for extensive guidelines on the alternative compliance approach.

Provide a narrative describing the alternative Bed Sediment Supply approach, including the long-term monitoring program and the findings of the numerical modeling.

Insert narrative description here

Section G: Source Control BMPs

Source Control BMPs include permanent, structural features that may be required in your Project plans — such as roofs over and berms around trash and recycling areas — and Operational BMPs, such as regular sweeping and "housekeeping", that must be implemented by the site's occupant or user. The Maximum Extent Practicable (MEP) standard typically requires both types of BMPs. In general, Operational BMPs cannot be substituted for a feasible and effective structural BMP. Using the Pollutant Sources/Source Control Checklist in Appendix 8, review the following procedure to specify Source Control BMPs for your site:

1. ***Identify Pollutant Sources***: Review Column 1 in the Pollutant Sources/Source Control Checklist. Check off the potential sources of Pollutants that apply to your site.

2. ***Note Locations on Project-Specific WQMP Exhibit***: Note the corresponding requirements listed in Column 2 of the Pollutant Sources/Source Control Checklist. Show the location of each Pollutant source and each permanent Source Control BMP in your Project-Specific WQMP Exhibit located in Appendix 1.

3. ***Prepare a Table and Narrative***: Check off the corresponding requirements listed in Column 3 in the Pollutant Sources/Source Control Checklist. In the left column of Table G.1 below, list each potential source of Pollutants on your site (from those that you checked in the Pollutant Sources/Source Control Checklist). In the middle column, list the corresponding permanent, Structural Source Control BMPs (from Columns 2 and 3 of the Pollutant Sources/Source Control Checklist) used to prevent Pollutants from entering runoff. **Add additional narrative** in this column that explains any special features, materials or methods of construction that will be used to implement these permanent, Structural Source Control BMPs.

4. ***Identify Operational Source Control BMPs:*** To complete your table, refer once again to the Pollutant Sources/Source Control Checklist. List in the right column of your table the Operational BMPs that should be implemented as long as the anticipated activities continue at the site. Copermittee stormwater ordinances require that applicable Source Control BMPs be implemented; the same BMPs may also be required as a condition of a use permit or other revocable Discretionary Approval for use of the site.

Table G.1 Structural and Operational Source Control BMP

Potential Sources of Runoff Pollutants	Structural Source Control BMPs	Operational Source Control BMPs

Section H: Construction Plan Checklist

Populate Table H.1 below to assist the plan checker in an expeditious review of your project. The first two columns will contain information that was prepared in previous steps, while the last column will be populated with the corresponding plan sheets. This table is to be completed with the submittal of your final Project-Specific WQMP.

Table H.1 Construction Plan Cross-reference

BMP No. or ID	BMP Identifier and Description	Corresponding Plan Sheet(s)

Note that the updated table — or Construction Plan WQMP Checklist — is **only a reference tool** to facilitate an easy comparison of the construction plans to your Project-Specific WQMP. The Copermittee with jurisdiction over the Project site can advise you regarding the process required to propose changes to the approved Project-Specific WQMP.

Section I: Operation, Maintenance and Funding

The Copermittee with jurisdiction over the Project site will periodically verify that BMPs on your Project are maintained and continue to operate as designed. To make this possible, the Copermittee will require that you include in Appendix 9 of this Project-Specific WQMP:

1. A means to finance and implement maintenance of BMPs in perpetuity, including replacement cost.
2. Acceptance of responsibility for maintenance from the time the BMPs are constructed until responsibility for operation and maintenance is legally transferred. A warranty covering a period following construction may also be required.
3. An outline of general maintenance requirements for the Stormwater BMPs you have selected.
4. Figures delineating and designating pervious and impervious areas, location, and type of Stormwater BMP, and tables of pervious and impervious areas served by each facility. Geo-locating the BMPs using a coordinate system of latitude and longitude is recommended to help facilitate a future statewide database system.
5. A separate list and location of self-retaining areas or areas addressed by LID Principles that do not require specialized Operations and Maintenance or inspections but will require typical landscape maintenance as noted in Chapter 5, in the WQMP Guidance. Include a brief description of typical landscape maintenance for these areas.

The Copermittee with jurisdiction over the Project site will also require that you prepare and submit a detailed BMP Operation and Maintenance Plan that sets forth a maintenance schedule for each of the BMPs built on your site. An agreement assigning responsibility for maintenance and providing for inspections and certification may also be required.

Details of these requirements and instructions for preparing a BMP Operation and Maintenance Plan are in Chapter 5 of the WQMP Guidance Document.

Maintenance Mechanism: Insert text here.

Will the proposed BMPs be maintained by a Homeowners' Association (HOA) or Property Owners Association (POA)?

☐ Y ☐ N

Include your Operation and Maintenance Plan and Maintenance Mechanism in Appendix 9. Additionally, include all pertinent forms of educational materials for those personnel that will be maintaining the proposed BMPs within this Project-Specific WQMP in Appendix 10.

Acronyms, Abbreviations and Definitions

2010 SMR MS4 Permit	Order No. R9-2010-0016, an NPDES Permit issued by the San Diego Regional Water Quality Control Board.
Applicant	Public or private entity seeking the discretionary approval of new or replaced improvements from the Copermittee with jurisdiction over the project site. The Applicant has overall responsibility for the implementation and the approval of a Priority Development Project. The WQMP uses consistently the term "user" to refer to the applicant such as developer or project proponent. The WQMP employs also the designation "user" to identify the Registered Professional Civil Engineer responsible for submitting the Project-Specific WQMP, and designing the required BMPs.
Best Management Practice (BMP)	Defined in 40 CFR 122.2 as schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. In the case of municipal storm water permits, BMPs are typically used in place of numeric effluent limits.
BMP Fact Sheets	BMP Fact Sheets are available in the LID BMP Design Handbook. Individual BMP Fact Sheets include sitting considerations, and design and sizing guidelines for seven types of structural BMPs (infiltration basin, infiltration trench, permeable pavement, harvest-and-use, bioretention, extended detention basin, and sand filter).
California Stormwater Quality Association (CASQA)	Publisher of the California Stormwater Best Management Practices Handbooks, available at www.cabmphandbooks.com.
Conventional Treatment Control BMP	A type of BMP that provides treatment of stormwater runoff. Conventional treatment control BMPs, while designed to treat particular Pollutants, typically do not provide the same level of volume reduction as LID BMPs, and commonly require more specialized maintenance than LID BMPs. As such, the 2010 SMR MS4 Permit and this WQMP require the use of LID BMPs wherever feasible, before Conventional Treatment BMPs can be considered or implemented.
Copermittees	The 2010 SMR MS4 Permit identifies the Cities of Murrieta, Temecula, and Wildomar, the County, and the District, as Copermittees for the SMR.
County	The abbreviation refers to the County of Riverside in this document.
CEQA	California Environmental Quality Act - a statute that requires state and local agencies to identify the significant environmental impacts of their actions and to avoid or mitigate those impacts, if feasible.

CIMIS	California Irrigation Management Information System - an integrated network of 118 automated active weather stations all over California managed by the California Department of Water Resources.
CWA	Clean Water Act - is the primary federal law governing water pollution. Passed in 1972, the CWA established the goals of eliminating releases of high amounts of toxic substances into water, eliminating additional water pollution by 1985, and ensuring that surface waters would meet standards necessary for human sports and recreation by 1983. CWA Section 402(p) is the federal statute requiring NPDES permits for discharges from MS4s.
CWA Section 303(d) Waterbody	Impaired water in which water quality does not meet applicable water quality standards and/or is not expected to meet water quality standards, even after the application of technology based pollution controls required by the CWA. The discharge of urban runoff to these water bodies by the Copermittees is significant because these discharges can cause or contribute to violations of applicable water quality standards.
Design Storm	The 2010 SMR MS4 Permit has established the 85th percentile, 24-hour storm event as the "Design Storm". The applicant may refer to Exhibit A to identify the applicable Design Storm Depth (D85) to the project.
DCV	Design Capture Volume (DCV) is the volume of runoff produced from the Design Storm to be mitigated through LID Retention BMPs, Other LID BMPs and Volume Based Conventional Treatment BMPs, as appropriate.
Design Flow Rate	The design flow rate represents the minimum flow rate capacity that flow-based conventional treatment control BMPs should treat to the MEP, when considered.
DCIA	Directly Connected Impervious Areas - those impervious areas that are hydraulically connected to the MS4 (i.e. street curbs, catch basins, storm drains, etc.) and thence to the structural BMP without flowing over pervious areas.
Discretionary Approval	A decision in which a Copermittee uses its judgment in deciding whether and how to carry out or approve a project.
District	Riverside County Flood Control and Water Conservation District.
DMA	A Drainage Management Area - a delineated portion of a project site that is hydraulically connected to a common structural BMP or conveyance point. The Applicant may refer to Section 3.3 for further guidelines on how to delineate DMAs.

Drawdown Time	Refers to the amount of time the design volume takes to pass through the BMP. The specified or incorporated drawdown times are to ensure that adequate contact or detention time has occurred for treatment, while not creating vector or other nuisance issues. It is important to abide by the drawdown time requirements stated in the fact sheet for each specific BMP.
Effective Area	Area which 1) is suitable for a BMP (for example, if infiltration is potentially feasible for the site based on infeasibility criteria, infiltration must be allowed over this area) and 2) receives runoff from impervious areas.
ESA	An Environmental Sensitive Area (ESA) designates an area "in which plants or animals life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which would be easily disturbed or degraded by human activities and developments". (Reference: California Public Resources Code § 30107.5).
ET	Evapotranspiration (ET) is the loss of water to the atmosphere by the combined processes of evaporation (from soil and plant surfaces) and transpiration (from plant tissues). It is also an indicator of how much water crops, lawn, garden, and trees need for healthy growth and productivity
FAR	The Floor Area Ratio (FAR) is the total square feet of a building divided by the total square feet of the lot the building is located on.
Flow-Based BMP	Flow-based BMPs are conventional treatment control BMPs that are sized to treat the design flow rate.
FPPP	Facility Pollution Prevention Plan
HCOC	Hydrologic Condition of Concern - Exists when the alteration of a site's hydrologic regime caused by development would cause significant impacts on downstream channels and aquatic habitats, alone or in conjunction with impacts of other projects.
HMP	Hydromodification Management Plan – Plan defining Performance Standards for PDPs to manage increases in runoff discharge rates and durations.
Hydrologic Control BMP	BMP to mitigate the increases in runoff discharge rates and durations and meet the Performance Standards set forth in the HMP.
HSG	Hydrologic Soil Groups – soil classification to indicate the minimum rate of infiltration obtained for bare soil after prolonged wetting. The HSGs are A (very low runoff potential/high infiltration rate), B, C, and D (high runoff potential/very low infiltration rate)
Hydromodification	The 2010 SMR MS4 Permit identifies that increased volume, velocity, frequency and discharge duration of storm water runoff from developed areas has the potential to greatly accelerate downstream erosion, impair stream habitat in natural drainages, and negatively impact beneficial uses.

JRMP	A separate Jurisdictional Runoff Management Plan (JRMP) has been developed by each Copermittee and identifies the local programs and activities that the Copermittee is implementing to meet the 2010 SMR MS4 Permit requirements.
LID	Low Impact Development (LID) is a site design strategy with a goal of maintaining or replicating the pre-development hydrologic regime through the use of design techniques. LID site design BMPs help preserve and restore the natural hydrologic cycle of the site, allowing for filtration and infiltration which can greatly reduce the volume, peak flow rate, velocity, and pollutant loads of storm water runoff.
LID BMP	A type of stormwater BMP that is based upon Low Impact Development concepts. LID BMPs not only provide highly effective treatment of stormwater runoff, but also yield potentially significant reductions in runoff volume – helping to mimic the pre-project hydrologic regime, and also require less ongoing maintenance than Treatment Control BMPs. The applicant may refer to Chapter 2.
LID BMP Design Handbook	The LID BMP Design Handbook was developed by the Copermittees to provide guidance for the planning, design and maintenance of LID BMPs which may be used to mitigate the water quality impacts of PDPs within the County.
LID Bioretention BMP	LID Bioretention BMPs are bioretention areas are vegetated (i.e., landscaped) shallow depressions that provide storage, infiltration, and evapotranspiration, and provide for pollutant removal (e.g., filtration, adsorption, nutrient uptake) by filtering stormwater through the vegetation and soils. In bioretention areas, pore spaces and organic material in the soils help to retain water in the form of soil moisture and to promote the adsorption of pollutants (e.g., dissolved metals and petroleum hydrocarbons) into the soil matrix. Plants use soil moisture and promote the drying of the soil through transpiration. The 2010 SMR MS4 Permit defines "retain" as to keep or hold in a particular place, condition, or position without discharge to surface waters.
LID Biotreatment BMP	BMPs that reduce stormwater pollutant discharges by intercepting rainfall on vegetative canopy, and through incidental infiltration and/or evapotranspiration, and filtration, and other biological and chemical processes. As stormwater passes down through the planting soil, pollutants are filtered, adsorbed, biodegraded, and sequestered by the soil and plants, and collected through an underdrain.
LID Harvest and Reuse BMP	BMPs used to facilitate capturing Stormwater Runoff for later use without negatively impacting downstream water rights or other Beneficial Uses.

LID Infiltration BMP	BMPs to reduce stormwater runoff by capturing and infiltrating the runoff into in-situ soils or amended onsite soils. Typical LID Infiltration BMPs include infiltration basins, infiltration trenches and pervious pavements.
LID Retention BMP	BMPs to ensure full onsite retention without runoff of the DCV such as infiltration basins, bioretention, chambers, trenches, permeable pavement and pavers, harvest and reuse.
LID Principles	Site design concepts that prevent or minimize the causes (or drivers) of post-construction impacts, and help mimic the pre-development hydrologic regime.
MEP	Maximum Extent Practicable - standard established by the 1987 amendments to the CWA for the reduction of Pollutant discharges from MS4s. Refer to Attachment C of the 2010 SMR MS4 Permit for a complete definition of MEP.
MF	Multi-family – zoning classification for parcels having 2 or more living residential units.
MS4	Municipal Separate Storm Sewer System (MS4) is a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designated or used for collecting or conveying storm water; (iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.26.
New Development Project	Defined by the 2010 MS4 permit as 'Priority Development Projects' if the project, or a component of the project meets the categories and thresholds described in Section 1.1.1.
NPDES	National Pollution Discharge Elimination System - Federal program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the CWA.
NRCS	Natural Resources Conservation Service
PDP	Priority Development Project - Includes New Development and Redevelopment project categories listed in Section F.1.d(2) of Order No. R9-2009-0002.

Priority Pollutants of Concern	Pollutants expected to be present on the project site and for which a downstream water body is also listed as Impaired under the CWA Section 303(d) list or by a TMDL.
Project-Specific WQMP	A plan specifying and documenting permanent LID Principles and Stormwater BMPs to control post-construction Pollutants and stormwater runoff for the life of the PDP, and the plans for operation and maintenance of those BMPs for the life of the project.
Receiving Waters	Waters of the United States.
Redevelopment Project	The creation, addition, and or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include trenching and resurfacing associated with utility work; resurfacing existing roadways; new sidewalk construction, pedestrian ramps, or bike lane on existing roads; and routine replacement of damaged pavement, such as pothole repair. Project that meets the criteria described in Section 1.
Runoff Fund	Runoff Funds have not been established by the Copermittees and are not available to the Applicant. If established, a Runoff Fund will develop regional mitigation projects where PDPs will be able to buy mitigation credits if it is determined that implementing onsite controls is infeasible.
San Diego Regional Board	San Diego Regional Water Quality Control Board - The term "Regional Board", as defined in Water Code section 13050(b), is intended to refer to the California Regional Water Quality Control Board for the San Diego Region as specified in Water Code Section 13200. State agency responsible for managing and regulating water quality in the SMR.
SCCWRP	Southern California Coastal Water Research Project
Site Design BMP	Site design BMPs prevent or minimize the causes (or drivers) of post-construction impacts, and help mimic the pre-development hydrologic regime.
SF	Parcels with a zoning classification for a single residential unit.
SMC	Southern California Stormwater Monitoring Coalition
SMR	The Santa Margarita Region (SMR) represents the portion of the Santa Margarita Watershed that is included within the County of Riverside.

Source Control BMP	Source Control BMPs land use or site planning practices, or structural or nonstructural measures that aim to prevent runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between Pollutants and runoff.
Stormwater Credit	Stormwater Credit can be claimed by an Applicant if certain development practices that provide broad-scale environmental benefits to communities are incorporated into the project design. Refer to Section 3.5.4 for additional information on Stormwater Credits.
Structural BMP	Structures designed to remove pollutants from stormwater runoff and mitigate hydromodification impacts.
SWPPP	Storm Water Pollution Prevention Plan
Tentative Tract Map	Tentative Tract Maps are required for all subdivision creating five (5) or more parcels, five (5) or more condominiums as defined in Section 783 of the California Civil Code, a community apartment project containing five (5) or more parcels, or for the conversion of a dwelling to a stock cooperative containing five (5) or more dwelling units.
TMDL	Total Maximum Daily Load - the maximum amount of a Pollutant that can be discharged into a waterbody from all sources (point and non-point) and still maintain Water Quality Standards. Under CWA Section 303(d), TMDLs must be developed for all waterbodies that do not meet Water Quality Standards after application of technology-based controls.
USEPA	United States Environmental Protection Agency
Volume-Based BMP	Volume-Based BMPs applies to BMPs where the primary mode of pollutant removal depends upon the volumetric capacity such as detention, retention, and infiltration systems.
WQMP	Water Quality Management Plan
Wet Season	The 2010 SMR MS4 Permit defines the wet season from October 1 through April 30.

Appendix 1: Maps and Site Plans

Location Map, WQMP Site Plan and Receiving Waters Map

Appendix 2: Construction Plans

Grading and Drainage Plans

Appendix 3: Soils Information

Geotechnical Study and Other Infiltration Testing Data

Appendix 4: Historical Site Conditions

Phase I Environmental Site Assessment or Other Information on Past Site Use

Appendix 5: LID Infeasibility

LID Technical Infeasibility Analysis

Appendix 6: BMP Design Details

BMP Sizing, Design Details and other Supporting Documentation

Appendix 7: Hydromodification

Supporting Detail Relating to compliance with the HMP Performance Standards

Appendix 8: Source Control

Pollutant Sources/Source Control Checklist

Appendix 9: O&M

Operation and Maintenance Plan and Documentation of Finance, Maintenance and Recording Mechanisms

Appendix 10: Educational Materials

BMP Fact Sheets, Maintenance Guidelines and Other End-User BMP Information

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

How to use this worksheet (also see instructions in Section G of the 2014 SMR WQMP Template):

1. Review Column 1 and identify which of these potential sources of stormwater pollutants apply to your site. Check each box that applies.
2. Review Column 2 and incorporate all of the corresponding applicable BMPs in your WQMP Exhibit.
3. Review Columns 3 and 4 and incorporate all of the corresponding applicable permanent controls and operational BMPs in your WQMP. Use the format shown in Table G.1on page 31 of this WQMP Template. Describe your specific BMPs in an accompanying narrative, and explain any special conditions or situations that required omitting BMPs or substituting alternative BMPs for those shown here.

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
❑ A. **On-site storm drain inlets**	❑ **Locations of inlets.**	❑ **Mark all inlets with the words "Only Rain Down the Storm Drain" or similar. Catch Basin Markers may be available from the Riverside County Flood Control and Water Conservation District, call 951.955.1200 to verify.**	❑ **Maintain and periodically repaint or replace inlet markings.** ❑ **Provide stormwater pollution prevention information to new site owners, lessees, or operators.** ❑ **See applicable operational BMPs in Fact Sheet SC-44, "Drainage System Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com** ❑ **Include the following in lease agreements: "Tenant shall not allow anyone to discharge anything to storm drains or to store or deposit materials so as to create a potential discharge to storm drains."**
❑ B. **Interior floor drains and elevator shaft sump pumps**		❑ **State that interior floor drains and elevator shaft sump pumps will be plumbed to sanitary sewer.**	❑ **Inspect and maintain drains to prevent blockages and overflow.**
❑ C. **Interior parking garages**		❑ **State that parking garage floor drains will be plumbed to the sanitary sewer.**	❑ **Inspect and maintain drains to prevent blockages and overflow.**

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
❑ D1. **Need for future indoor & structural pest control**		❑ **Note building design features that discourage entry of pests.**	❑ **Provide Integrated Pest Management information to owners, lessees, and operators.**
❑ D2. **Landscape/ Outdoor Pesticide Use**	❑ **Show locations of native trees or areas of shrubs and ground cover to be undisturbed and retained.** ❑ **Show self-retaining landscape areas, if any.** ❑ **Show stormwater treatment and hydrograph modification management BMPs. (See instructions in Chapter 3, Step 5 and guidance in Chapter 5.)**	**State that final landscape plans will accomplish all of the following.** ❑ **Preserve existing native trees, shrubs, and ground cover to the maximum extent possible.** ❑ **Design landscaping to minimize irrigation and runoff, to promote surface infiltration where appropriate, and to minimize the use of fertilizers and pesticides that can contribute to stormwater pollution.** ❑ **Where landscaped areas are used to retain or detain stormwater, specify plants that are tolerant of saturated soil conditions.** ❑ **Consider using pest-resistant plants, especially adjacent to hardscape. To insure successful establishment, select plants appropriate to site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant interactions.**	❑ **Maintain landscaping using minimum or no pesticides.** ❑ **See applicable operational BMPs in "What you should know for…..Landscape and Gardening"** at **http://www.rcflood.org/stormwater/Downloads/LandscapeGardenBrochure.pdf** ❑ **Provide IPM information to new owners, lessees and operators.**

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE …	… THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
❑ E. **Pools, spas, ponds, decorative fountains, and other water features.**	❑ **Show location of water feature and a sanitary sewer cleanout in an accessible area within 10 feet. (Exception: Public pools must be plumbed according to County Department of Environmental Health Guidelines.)**	**If the Co-Permittee requires pools to be plumbed to the sanitary sewer, place a note on the plans and state in the narrative that this connection will be made according to local requirements.**	❑ **See applicable operational BMPs in "Guidelines for Maintaining Your Swimming Pool, Jacuzzi and Garden Fountain" at** http://www.rcflood.org/stormwater/Downloads/poolsandspas.pdf
❑ F. **Food service**	❑ **For restaurants, grocery stores, and other food service operations, show location (indoors or in a covered area outdoors) of a floor sink or other area for cleaning floor mats, containers, and equipment.** ❑ **On the drawing, show a note that this drain will be connected to a grease interceptor before discharging to the sanitary sewer.**	❑ **Describe the location and features of the designated cleaning area.** ❑ **Describe the items to be cleaned in this facility and how it has been sized to insure that the largest items can be accommodated.**	❑ **See the brochure, "The Food Service Industry Best Management Practices for: Restaurants, Grocery Stores, Delicatessens and Bakeries" at** http://www.rcflood.org/stormwater/downloads/FoodServ.pdf **Provide this brochure to new site owners, lessees, and operators.**
❑ G. **Refuse areas**	❑ **Show where site refuse and recycled materials will be handled and stored for pickup. See local municipal requirements for sizes and other details of refuse areas.** ❑ **If dumpsters or other receptacles are outdoors, show how the designated area will be covered, graded, and paved to prevent run-on and show locations of berms to prevent runoff from the area.** ❑ **Any drains from dumpsters, compactors, and tallow bin areas shall be connected to a grease removal device before discharge to sanitary sewer.**	❑ **State how site refuse will be handled and provide supporting detail to what is shown on plans.** ❑ **State that signs will be posted on or near dumpsters with the words "Do not dump hazardous materials here" or similar.**	❑ **State how the following will be implemented:** **Provide adequate number of receptacles. Inspect receptacles regularly; repair or replace leaky receptacles. Keep receptacles covered. Prohibit/prevent dumping of liquid or hazardous wastes. Post "no hazardous materials" signs. Inspect and pick up litter daily and clean up spills immediately. Keep spill control materials available on-site. See Fact Sheet SC-34, "Waste Handling and Disposal" in the CASQA Stormwater Quality Handbooks at** www.cabmphandbooks.com

IF THESE SOURCES WILL BE ON THE PROJECT SITE …	… THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
❑ H. **Industrial processes.**	❑ **Show process area.**	❑ **If industrial processes are to be located on site, state: "All process activities to be performed indoors. No processes to drain to exterior or to storm drain system."**	❑ **See Fact Sheet SC-10, "Non-Stormwater Discharges" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com** See the brochure "Industrial & Commercial Facilities Best Management Practices for: Industrial, Commercial Facilities" at http://www.rcflood.org/stormwater/Downloads/IndustrialCommercialFacilities.pdf
❑ I. **Outdoor storage of equipment or materials. (See rows J and K for source control measures for vehicle cleaning, repair, and maintenance.)**	❑ **Show any outdoor storage areas, including how materials will be covered. Show how areas will be graded and bermed to prevent run-on or run-off from area.** ❑ **Storage of non-hazardous liquids shall be covered by a roof and/or drain to the sanitary sewer system, and be contained by berms, dikes, liners, or vaults.** ❑ **Storage of hazardous materials and wastes must be in compliance with the local hazardous materials ordinance and a Hazardous Materials Management Plan for the site.**	❑ **Include a detailed description of materials to be stored, storage areas, and structural features to prevent pollutants from entering storm drains.** **Where appropriate, reference documentation of compliance with the requirements of Hazardous Materials Programs for:** ▪ **Hazardous Waste Generation** ▪ **Hazardous Materials Release Response and Inventory** ▪ **California Accidental Release (CalARP)** ▪ **Aboveground Storage Tank** ▪ **Uniform Fire Code Article 80 Section 103(b) & (c) 1991** ▪ **Underground Storage Tank** www.cchealth.org/groups/hazmat/	❑ **See the Fact Sheets SC-31, "Outdoor Liquid Container Storage" and SC-33, "Outdoor Storage of Raw Materials " in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com**

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
❑ J. **Vehicle and Equipment Cleaning**	❑ **Show on drawings as appropriate:** **(1) Commercial/industrial facilities having vehicle/equipment cleaning needs shall either provide a covered, bermed area for washing activities or discourage vehicle/equipment washing by removing hose bibs and installing signs prohibiting such uses.** **(2) Multi-dwelling complexes shall have a paved, bermed, and covered car wash area (unless car washing is prohibited on-site and hoses are provided with an automatic shut-off to discourage such use).** **(3) Washing areas for cars, vehicles, and equipment shall be paved, designed to prevent run-on to or runoff from the area, and plumbed to drain to the sanitary sewer.** **(4) Commercial car wash facilities shall be designed such that no runoff from the facility is discharged to the storm drain system. Wastewater from the facility shall discharge to the sanitary sewer, or a wastewater reclamation system shall be installed.**	❑ **If a car wash area is not provided, describe any measures taken to discourage on-site car washing and explain how these will be enforced.**	**Describe operational measures to implement the following (if applicable):** ❑ **Washwater from vehicle and equipment washing operations shall not be discharged to the storm drain system. Refer to "Outdoor Cleaning Activities and Professional Mobile Service Providers" for many of the Potential Sources of Runoff Pollutants categories below. Brochure can be found at** http://www.rcflood.org/stormwater/downloads/OutdoorCleaningActivities.pdf ❑ **Car dealerships and similar may rinse cars with water only.**

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

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1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
❑ K. **Vehicle/Equipment Repair and Maintenance**	❑ **Accommodate all vehicle equipment repair and maintenance indoors. Or designate an outdoor work area and design the area to prevent run-on and runoff of stormwater.** ❑ **Show secondary containment for exterior work areas where motor oil, brake fluid, gasoline, diesel fuel, radiator fluid, acid-containing batteries or other hazardous materials or hazardous wastes are used or stored. Drains shall not be installed within the secondary containment areas.** ❑ **Add a note on the plans that states either (1) there are no floor drains, or (2) floor drains are connected to wastewater pretreatment systems prior to discharge to the sanitary sewer and an industrial waste discharge permit will be obtained.**	❑ **State that no vehicle repair or maintenance will be done outdoors, or else describe the required features of the outdoor work area.** ❑ **State that there are no floor drains or if there are floor drains, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements.** ❑ **State that there are no tanks, containers or sinks to be used for parts cleaning or rinsing or, if there are, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements.**	**In the Stormwater Control Plan, note that all of the following restrictions apply to use the site:** ❑ **No person shall dispose of, nor permit the disposal, directly or indirectly of vehicle fluids, hazardous materials, or rinsewater from parts cleaning into storm drains.** ❑ **No vehicle fluid removal shall be performed outside a building, nor on asphalt or ground surfaces, whether inside or outside a building, except in such a manner as to ensure that any spilled fluid will be in an area of secondary containment. Leaking vehicle fluids shall be contained or drained from the vehicle immediately.** ❑ **No person shall leave unattended drip parts or other open containers containing vehicle fluid, unless such containers are in use or in an area of secondary containment.** **Refer to "Automotive Maintenance & Car Care Best Management Practices for Auto Body Shops, Auto Repair Shops, Car Dealerships, Gas Stations and Fleet Service Operations". Brochure can be found at** http://rcflood.org/stormwater/ **Refer to Outdoor Cleaning Activities and Professional Mobile Service Providers for many of the Potential Sources of Runoff Pollutants categories below. Brochure can be found at** http://rcflood.org/stormwater/

IF THESE SOURCES WILL BE ON THE PROJECT SITE …	… THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
❑ L. **Fuel Dispensing Areas**	❑ **Fueling areas[6] shall have impermeable floors (i.e., portland cement concrete or equivalent smooth impervious surface) that are: a) graded at the minimum slope necessary to prevent ponding; and b) separated from the rest of the site by a grade break that prevents run-on of stormwater to the maximum extent practicable.** ❑ **Fueling areas shall be covered by a canopy that extends a minimum of ten feet in each direction from each pump. [Alternative: The fueling area must be covered and the cover's minimum dimensions must be equal to or greater than the area within the grade break or fuel dispensing area[1].] The canopy [or cover] shall not drain onto the fueling area.**		❑ **The property owner shall dry sweep the fueling area routinely.** ❑ **See the Fact Sheet SD-30 , "Fueling Areas" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com**

[6] **The fueling area shall be defined as the area extending a minimum of 6.5 feet from the corner of each fuel dispenser or the length at which the hose and nozzle assembly may be operated plus a minimum of one foot, whichever is greater.**

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

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❑ M. **Loading Docks**	❑ **Show a preliminary design for the loading dock area, including roofing and drainage. Loading docks shall be covered and/or graded to minimize run-on to and runoff from the loading area. Roof downspouts shall be positioned to direct stormwater away from the loading area. Water from loading dock areas shall be drained to the sanitary sewer, or diverted and collected for ultimate discharge to the sanitary sewer.** ❑ **Loading dock areas draining directly to the sanitary sewer shall be equipped with a spill control valve or equivalent device, which shall be kept closed during periods of operation.** ❑ **Provide a roof overhang over the loading area or install door skirts (cowling) at each bay that enclose the end of the trailer.**		❑ **Move loaded and unloaded items indoors as soon as possible.** ❑ **See Fact Sheet SC-30, "Outdoor Loading and Unloading," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com**

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❑ N. **Fire Sprinkler Test Water**		❑ **Provide a means to drain fire sprinkler test water to the sanitary sewer.**	❑ **See the note in Fact Sheet SC-41, "Building and Grounds Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com**
O. **Miscellaneous Drain or Wash Water or Other Sources** ❑ **Boiler drain lines** ❑ **Condensate drain lines** ❑ **Rooftop equipment** ❑ **Drainage sumps** ❑ **Roofing, gutters, and trim.** ❑ **Other sources**		❑ **Boiler drain lines shall be directly or indirectly connected to the sanitary sewer system and may not discharge to the storm drain system.** ❑ **Condensate drain lines may discharge to landscaped areas if the flow is small enough that runoff will not occur. Condensate drain lines may not discharge to the storm drain system.** ❑ **Rooftop equipment with potential to produce pollutants shall be roofed and/or have secondary containment.** ❑ **Any drainage sumps on-site shall feature a sediment sump to reduce the quantity of sediment in pumped water.** ❑ **Avoid roofing, gutters, and trim made of copper or other unprotected metals that may leach into runoff.** ❑ **Include controls for other sources as specified by local reviewer.**	

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

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1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
❑ P. **Plazas, sidewalks, and parking lots.**			❑ **Sweep plazas, sidewalks, and parking lots regularly to prevent accumulation of litter and debris. Collect debris from pressure washing to prevent entry into the storm drain system. Collect washwater containing any cleaning agent or degreaser and discharge to the sanitary sewer not to a storm drain.**

Design Handbook

for

Low Impact Development Best Management Practices

Prepared by:

9/2011

Riverside County Flood Control and Water Conservation District
1995 Market Street
Riverside, CA 92501

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Riverside County Design Handbook for

Low Impact Development Best Management Practices

1.0 Introduction

What is Low Impact Development?

According to the State Water Resources Control Board, Low Impact Development (LID) is:

> *… a sustainable practice that benefits water supply and contributes to water quality protection. Unlike traditional storm water management, which collects and conveys storm water runoff through storm drains, pipes, or other conveyances to a centralized storm water facility, LID takes a different approach by using site design and storm water management to maintain the site's pre-development runoff rates and volumes. The goal of LID is to mimic a site's predevelopment hydrology by using design techniques that infiltrate, filter, store, evaporate, and detain runoff close to the source of rainfall.*[1]

When implemented correctly on a site, LID provides two primary benefits: 1) The post-construction site hydrology will more closely mimic the pre-development hydrology, thus reducing the downstream erosion that may occur due to increased runoff from impervious surfaces; and 2) Pollutants in runoff from the site will be significantly reduced.

Additionally, the California Stormwater Quality Association (CASQA) LID Manual[2] identifies that a properly and effectively designed site will incorporate two forms of LID: LID Principles and LID BMPs. Whereas LID Principles focus on planning and designing a site in a manner that minimizes the causes, or drivers, of project impacts (sometimes referred to as site design), this Handbook discusses LID BMPs which are implemented to help mitigate any impacts that are otherwise unavoidable.

[1] State Water Resources Control Board, *Low Impact Development – Sustainable Storm Water Management*, 2010; http://www.waterboards.ca.gov/water_issues/programs/low_impact_development/index.shtml

[2] California Stormwater Quality Association, *Low Impact Development Manual for Southern California: Technical Guidance and Site Planning Strategies*, April 2010

About this Handbook

This Handbook supplements the Riverside County Water Quality Management Plan (WQMP) by providing guidance for the planning, design and maintenance of Low Impact Development (LID) BMPs which may be used to mitigate the water quality impacts of developments within Riverside County.

This Handbook is the culmination of over five years of research, wherein manuals, studies, and experts from across the country were consulted to identify the most effective LID BMPs and designs. Although there are many types of BMPs that can be considered LID, this research found that the BMPs that are likely to be the most effective for the life of the project are those that are integrated into the design of the site and passively remove pollutants from runoff (without human intervention) through natural processes such as infiltration, biofiltration, and evapotranspiration. Further, it was found that BMPs are only effective as a function of how well they are maintained. Proprietary BMPs, underground BMPs or BMPs that require complicated maintenance equipment and procedures are all much less likely to be appropriately maintained, therefore, less reliable for the protection of water quality.

Based on that research, this Handbook contains detailed information and designs for seven (7) LID BMPs that are designed to encourage replication of the site's natural hydrologic processes. This includes maximizing direct or incidental infiltration and evapotranspiration, and using vegetation and other biological processes to filter and absorb pollutants. For each BMP, pertinent information is provided such as the maximum tributary drainage area, siting considerations, design procedures, and maintenance requirements. This Handbook also includes detailed guidance for infiltration testing, and basin considerations. By following these standardized designs and procedures, the citizens of Riverside County can be assured that water quality will be protected to the maximum extent practicable.

Selecting appropriate LID BMPs

LID BMPs are a highly effective and naturally-based form of Treatment Control BMPs. Before selecting any particular BMPs for a site, refer to the WQMP applicable to the project (based on the watershed the project is located in). The WQMP may specify particular types of LID or Treatment Control BMPs that can or must be considered for use on the project. Such considerations may include whether or not the LID BMP will maximize on-site retention of runoff, or be based on the types of pollutants that the site may generate, types of pollutants that are impairing the downstream receiving waters, and which BMPs are effective at addressing those pollutants. Generally infiltration BMPs have advantages over other types of BMPs, including reduction of the volume and rate of runoff, as well as full treatment of all potential pollutants potentially contained in the stormwater runoff. It is recognized however that infiltration may not be feasible on sites, such as those with high groundwater, low infiltration rates, or located on compacted engineered fill. In those situations, harvest and use, bioretention and/or biotreatment based BMPs that provide opportunity for evapotranspiration and incidental infiltration may be a more feasible option. The WQMP may specify criteria that can be used to determine when particular BMPs are considered feasible.

Who should be involved in the selection, siting and design of LID BMPs?

Everyone involved with the project site development, including owners, architects, engineers, and geologists, should be informed about the proposed/required BMPs as early as possible in the planning of a project. This reduces the chance of costly redesign, the need for additional testing and produces a better and more integrated site overall. For most basins and all infiltration BMPs, it is important that the responsible engineer/geologist be made aware of the location of BMPs, so they can make design recommendations including setbacks and perform the appropriate infiltration testing, if required. Landscape architects will need to know the locations and types of proposed BMPs as these might change the types of plants that can be used. Owners must be made aware of the long term maintenance and total cost of ownership for the BMPs in order to make informed decisions during the BMP selection process.

Many of the BMP fact sheets reference the 'Engineering Authority' (EA). Who is the EA for my project?

The engineering authority for a project is the public agency responsible for reviewing and approving the proposed project. Usually the EA is the City/County wherein the project is located.

Do I need to do additional studies?

Most infiltration BMPs and basins will require a geotechnical report prepared by either a licensed geotechnical engineer, civil engineer or certified engineering geologist. The report must provide characterization of site specific soil conditions, recommendations of any required testing, and site specific recommendations for setbacks as well as commentary on slope stability and potential offsite impacts. See Infiltration Testing Requirements and Basin Guidelines in Appendices A and C, respectively, for more information.

Designing the BMPs

The BMPs in this Handbook are designed based on volume. Volume based BMPs are designed to capture a particular volume of stormwater runoff (referred to as V_{BMP}), and either infiltrate that volume, re-use the water, or slowly and naturally filter pollutants from that stormwater, and discharge the volume within a specified drawdown time.

This Handbook contains worksheets to assist the designer in determining the required V_{BMP} based on the location of the site. While there are likely significant direct or indirect volume reduction benefits associated with each of the included LID BMPs, these sizing worksheets are not intended to meet the requirements listed in the Hydraulic Conditions of Concern (HCOC) section of the WQMP.

Can I make my BMP smaller?

The worksheets in this Handbook calculate the minimum required size for each LID BMP based on the amount of runoff reaching the BMP. However, early and aggressive implementation of LID Principles (site design) during the planning stages of a project will translate directly to less runoff, and in turn will help minimize the required size of the BMPs. To further reduce the required size, consider looking for additional ways to increase the percentage of landscaped areas and porous surfaces on the site, and opportunities to drain impervious areas into pervious areas.

Can I place my BMP underground?

Under most circumstances, in areas of new development or significant redevelopment, the use of underground treatment control BMPs in lieu of the LID BMPs in this Handbook is not justifiable.

What are Drawdown Times?

Volume based BMPs are usually associated with a required drawdown time. The drawdown time refers to the amount of time the design volume takes to pass through the BMP. The specified or incorporated drawdown times are to ensure that adequate contact or detention time has occurred for treatment, while not creating vector or other nuisance issues. It is important to abide by the drawdown time requirements stated in the fact sheet for each specific BMP.

What is the tributary drainage area?

The tributary drainage area is the entire area that drains to the proposed onsite BMP. While small sites could be tributary to a single BMP, usually the site is broken up into several drainage management areas (DMAs), each draining to a discrete BMP. Although it is usually desirable to address offsite flows separately, if flows from offsite areas commingle with onsite flows they shall also be included in the sizing calculation. At the beginning of each fact sheet, the maximum (or minimum) tributary drainage area for each BMP is listed. The tributary areas for each BMP will be required to be clearly shown on one or more drainage exhibits. Such exhibits shall be clearly labeled to show which areas drain to which BMP.

What are pervious and impervious areas?

Project sites are made up of both pervious and impervious surfaces. The pervious portion of a site is where stormwater has the opportunity to infiltrate into the ground, such as but not limited to landscaped or natural areas. Impervious areas are where water has no opportunity to infiltrate and immediately becomes surface runoff. When a site is developed, the percentage of impervious area typically increases from the natural state. This higher impervious percentage increases the volume and flow rate of stormwater runoff.

2.0 Sizing Calculations

The following section includes sizing calculations for three regions: Santa Ana, Santa Margarita and Whitewater. These calculations are based on approved methodologies within the currently active Municipal Separate Storm Sewer System (MS4) permits for each of these three watershed regions of Riverside County. In this manual, all BMP designs are sized based on the design capture volume, V_{BMP}. However, there may be circumstances when flow based Treatment Control BMPs are utilized and therefore this section also includes guidelines for calculating the design flow rate, Q_{BMP}.

2.1 Calculating V_{BMP}

Volume based BMPs, including all of the BMPs in this manual, are sized to capture and treat the design capture volume, V_{BMP}. As the method for calculating and documenting the design capture volume varies by watershed, the designer must first know which watershed the proposed project is within, and then follow the corresponding guidelines below.
The watershed a particular project is within can be determined from the 'Locate my Watershed' tool available at:

www.rcflood.org/npdes/

2.1.1 Santa Ana Watershed (including the San Jacinto sub-watershed)

In order to meet Regional Water Quality Control Board (RWQCB) requirements, in the Santa Ana Watershed the design capture volume (V_{BMP}) is based on capturing the volume of runoff generated from an 85th percentile, 24-hour storm event. Follow the steps below to calculate V_{BMP} in the Santa Ana Watershed. For convenience, these steps have also been integrated into an excel worksheet that has been provided in Appendix F of this Handbook.

1) Delineate Drainage Management Areas (DMAs) draining to the BMP as described in the WQMP. Wherever possible, use separate DMAs for each surface type (e.g., landscaping, pervious paving, or roofs). Assign each DMA a unique ID code and determine its area in square feet. Multiple DMAs can be combined to individual downstream BMPs.

2) Compile a list of DMAs draining to each volume based BMP using the V_{BMP} calculation worksheet provided in Appendix F to this Handbook. An example of the table from that worksheet is provided below. Account for all areas that will contribute runoff to the proposed BMP, including runoff from off-site areas that commingle with on-site runoff. Enter the unique DMA ID, area, and post-project surface type for each DMA, into the first three columns of the table. The remaining steps describe the process for filling in the remaining parts of the table.

DMA Type/ ID	*DMA Area (square feet)*	*Post-Project Surface Type*	*Effective Imper-vious Fraction, I_F*	*DMA Runoff Factor, C*	*DMA Area × Runoff Factor*	*LID BMP Name/Identifier*		
						Design Storm Depth (in)	*Design Capture Volume (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
	$\Sigma = A_T$		***Total***		**Σ= [A]**	**[B]**	***[C]***	

3) Determine the effective impervious fraction (I_f) for each DMA, and fill in the fourth column of the table described in Step 2.

For DMAs comprised of a single post-project surface type (as described in the WQMP, most DMAs should be designed in this manner), the effective Impervious Fraction should be derived from the following table:

Surface Type	Effective Impervious Fraction, I_f
Roofs	1.00
Concrete or Asphalt	1.00
Grouted or Gapless Paving Blocks	1.00
Compacted Soil (e.g. unpaved parking)	0.40
Decomposed Granite	0.40
Permeable Paving Blocks w/ Sand Filled Gap	0.25
Class 2 Base	0.30
Gravel or Class 2 Permeable Base	0.10
Pervious Concrete / Porous Asphalt	0.10
Open and Porous Pavers	0.10
Turf block	0.10
Ornamental Landscaping	0.10
Natural (A Soil)	0.03
Natural (B Soil)	0.15
Natural (C Soil)	0.30
Natural (D Soil)	0.40

If a single DMA contains mixed post-project surface types, a composite or area-weighted average effective impervious fraction should be used. The following equation can be used for determining an area-weighted average:

$$\frac{\left[(I_f)_1 \cdot A_1\right] + \left[(I_f)_2 \cdot A_2\right] + [\ldots]}{A_T}$$

4) Calculate a runoff factor, 'C', using the following equation, and enter this value into the fifth column of the table described in Step 2:

$$C = 0.858 \cdot {I_f}^3 - 0.78 \cdot {I_f}^2 + 0.774 * I_f + 0.04$$

5) For each tabulated DMA, multiply the area by the runoff factor, and enter the resulting value in the sixth column of the table described in Step 2. Enter the sum of the sixth column in the field identified with "[A]" in the table.

6) Determine the Design Storm Depth (D_{85}) by locating the project site on the full sized Isohyetal Map for the 85th Percentile 24-hour Storm Event, contained in Appendix D of this Handbook. These values were determined throughout Riverside County using rain gauges with the greatest periods of record. Use township, range and section information to locate the project site, and interpolate the closest value for the site. Enter this value (inches) in the field identified with "[B]" in the table from Step 2.

Tip: Make a clear acetate copy of the township, range and section grid to use as an overlay on other sections of the map.

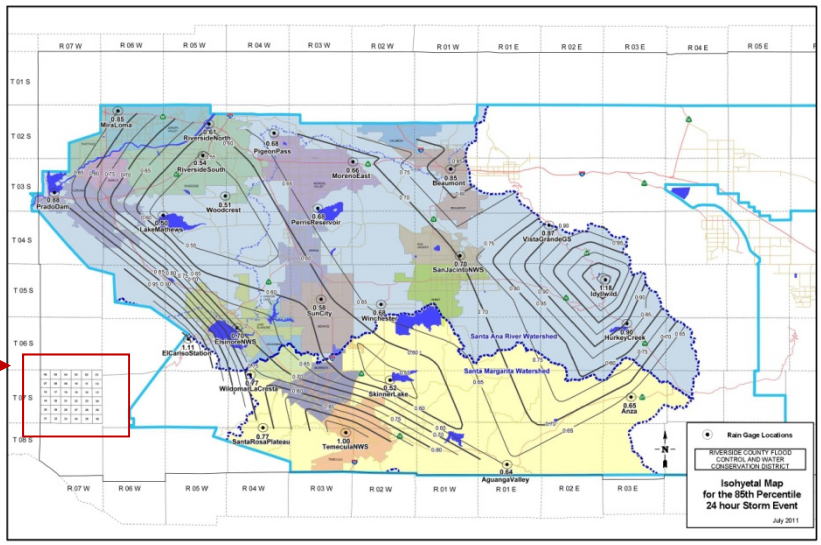

7) Determine the Design Capture Volume or 'VBMP' using the equation below:

$$V_{BMP}(ft^3) = \frac{[A] \times [B]}{12\ (in/ft)}$$

Enter this value in the field identified with "[C]" in the table from Step 2. This is the volume to be used in the design of BMPs presented in this Handbook.

2.1.2 Santa Margarita Watershed

In order to meet RWQCB requirements, in the Santa Margarita Watershed, the design capture volume (V_{BMP}) is based on capturing the volume of runoff generated from an 85th percentile, 24-hour storm event. Follow the steps below to calculate V_{BMP} in the Santa Margarita Watershed. For convenience, these steps have also been integrated into an excel worksheet that has been provided in Appendix F of this Handbook.

1) Determine the tributary drainage area to the BMP, A_T. This includes all areas that will contribute runoff to the proposed BMP, including pervious areas, and runoff from off-site areas that commingle with on-site runoff. Calculate this area in acres.

2) Locate the project site on the full sized Isohyetal Map for the 85th Percentile 24-hour Storm Event contained in Appendix D of this Handbook. These values were determined throughout Riverside County using rain gauges with the greatest periods of record. Use township, range and section information to locate the project site, and interpolate the closest value, D85, for the site.

   NOTE: *The use of the Isohyetal Map in Appendix D of this Handbook requires the use of BMPs identified in this LID BMP Design Handbook. This Isohyetal Map cannot be used with older BMP designs.*

Tip: Make a clear acetate copy of the township, range and section grid to use as an overlay on other sections of the map.

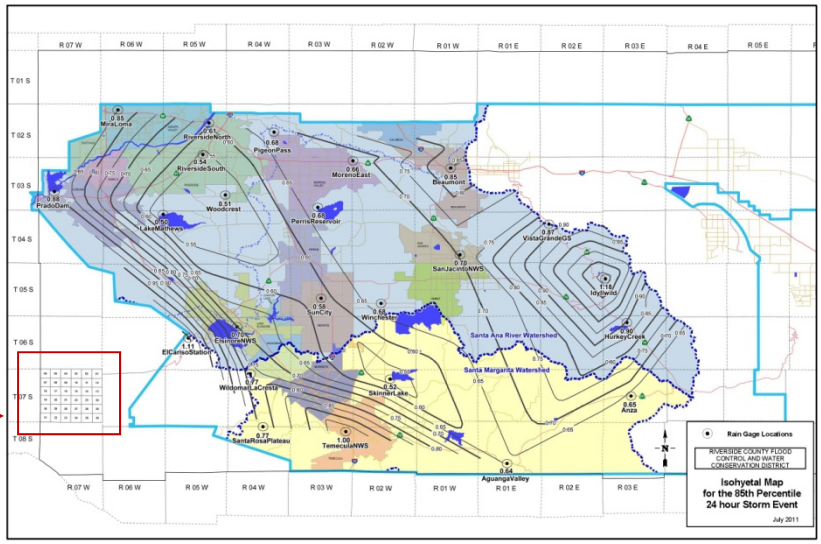

3) Determine the effective impervious fraction (I_f) for the area tributary to the BMP, using the following table:

Surface Type	Effective Impervious Fraction, I_f
Roofs	1.00
Concrete or Asphalt	1.00
Grouted or Gapless Paving Blocks	1.00
Compacted Soil (e.g. unpaved parking)	0.40
Decomposed Granite	0.40
Permeable Paving Blocks w/ Sand Filled Gap	0.25
Class 2 Base	0.30
Gravel or Class 2 Permeable Base	0.10
Pervious Concrete / Porous Asphalt	0.10
Open and Porous Pavers	0.10
Turf block	0.10
Ornamental Landscaping	0.10
Natural (A Soil)	0.03
Natural (B Soil)	0.15
Natural (C Soil)	0.30
Natural (D Soil)	0.40

If the area tributary to the BMP contains mixed post-project surface types, a composite or area-weighted average effective impervious fraction should be used. The following equation can be used for determining an area-weighted average:

$$\frac{\left[(I_f)_1 \cdot A_1\right] + \left[(I_f)_2 \cdot A_2\right] + [\ldots]}{A_T}$$

4) Calculate a runoff factor, 'C', using the following equation:

$$C = 0.858 \cdot {I_f}^3 - 0.78 \cdot {I_f}^2 + 0.774 * I_f + 0.04$$

5) Determine unit storage volume, V_U. This is found by multiplying the Design Storm Depth found in Step 2 by the runoff coefficient found in Step 4.

$$\mathrm{V_U} = \mathrm{D_{85}} \times \mathrm{C}$$

6) Determine V_{BMP} using the equation below or the worksheet provided in Appendix F of this Handbook. This is the volume to be used in the design of selected BMPs presented in this Handbook. Multiply the BMP tributary drainage area, A_T, by the unit storage volume, V_U, to give the BMP design storage volume.

$$\mathrm{V_{BMP}(ft^3)} = \frac{\mathrm{V_U(in-ac/ac)} \times \mathrm{A_T(ac)} \times 43{,}560(\mathrm{ft^2/ac})}{12\ (\mathrm{in/ft})}$$

2.1.3 Whitewater Watershed

In order to meet RWQCB requirements, in the Whitewater Watershed the design capture volume (V_{BMP}) is based on the CASQA methodology referenced in Section F.1.c.v.4.a.ii of the MS4 permit. The Palms Springs Thermal Airport rain gauge was used as the reference gauge. Follow the steps below to calculate V_{BMP} in the Whitewater Watershed. For convenience, these steps have also been integrated into an excel worksheet that has been provided in Appendix F of this Handbook.

7) Determine the tributary drainage area, A_T. This includes all areas that will contribute runoff to the proposed BMP, including pervious areas, and runoff from offsite areas that commingle with site runoff. Calculate this area in acres.

8) Determine the effective impervious fraction (I_f) for the area tributary to the BMP, using the following table:

Surface Type	Effective Impervious Fraction, I_f
Roofs	1.00
Concrete or Asphalt	1.00
Grouted or Gapless Paving Blocks	1.00
Compacted Soil (e.g. unpaved parking)	0.40
Decomposed Granite	0.40
Permeable Paving Blocks w/ Sand Filled Gap	0.25
Class 2 Base	0.30
Gravel or Class 2 Permeable Base	0.10
Pervious Concrete / Porous Asphalt	0.10
Open and Porous Pavers	0.10
Turf block	0.10
Ornamental Landscaping	0.10
Natural (A Soil)	0.03
Natural (B Soil)	0.15
Natural (C Soil)	0.30
Natural (D Soil)	0.40

If the area tributary to the BMP contains mixed post-project surface types, a composite or area-weighted average effective impervious fraction should be used. The following equation can be used for determining an area-weighted average:

$$\frac{\left[(I_f)_1 \cdot A_1\right] + \left[(I_f)_2 \cdot A_2\right] + [\ldots]}{A_T}$$

9) Calculate a runoff factor, 'C', using the following equation:

$$C = 0.858 \cdot {I_f}^3 - 0.78 \cdot {I_f}^2 + 0.774 * I_f + 0.04$$

10) Determine 85th percentile unit storage volume, V_U. This is found by multiplying the runoff coefficient found in Step 3 by 0.40.

$$V_U = 0.4 \times C$$

11) Determine the design capture volume, V_{BMP} using the equation below or the worksheet provided in Appendix F of this Handbook. This is the volume to be used in the design of selected BMPs presented in this Handbook.

$$V_{BMP}(ft^3) = \frac{V_U(in - ac/ac) \times A_T(ac) \times 43{,}560(ft^2/ac)}{12\ (in/ft)}$$

2.2 Calculating Q_{BMP}

While the BMPs in this Handbook are designed based on V_{BMP} as discussed in 2.1 above, in some circumstances flow based BMPs may be used. Flow-based BMPs are sized to treat the design flow rate. As the method for calculating and documenting the design flow rate varies by watershed, the designer must first know which watershed the proposed project is within, and then follow the corresponding guidelines below.

The watershed a particular project is within can be determined from the 'Locate my Watershed' tool available at:

www.rcflood.org/npdes/

2.2.1 Santa Ana Watershed (including the San Jacinto sub-watershed)

In the Santa Ana Watershed, Q_{BMP} is the runoff flow rate resulting from a design rainfall intensity of 0.2 inches per hour. Follow the steps below to calculate and document Q_{BMP} in the Santa Ana Watershed. For convenience, these steps have also been integrated into a worksheet that has been provided in Appendix F of this Handbook.

1) Delineate Drainage Management Areas (DMAs) draining to the BMP, as described in the WQMP. Wherever possible, use separate DMAs for each surface type (e.g., landscaping, pervious paving, or roofs). Assign each DMA a unique code and determine its size in square feet. Multiple DMAs can be combined to individual downstream BMPs.

2) Compile a list of DMAs draining to each flow based BMP using the Q_{BMP} calculation worksheet provided in Appendix F to this Handbook. An example of the table from that worksheet is provided below. Account for all areas that will contribute runoff to the proposed BMP, including runoff from off-site areas that commingle with on-site runoff. Enter the unique DMA ID, area, and post-project surface type for each DMA, into the first three columns of the table. The remaining steps describe the process for filling in the remaining parts of the table.

DMA Type /ID	*DMA Area (square feet)*	*Post-Project Surface Type*	*Effective Imper-vious Fraction, I_F*	*DMA Runoff Factor, C*	*DMA Area × Runoff Factor*	*LID BMP Name/Identifier*		
						Design Rainfall Intensity	*Minimum Flow (cfs)*	*Proposed Flow (cfs)*
	Σ= A_T		***Total***		***Σ= [A]***	**0.2**	***[B]***	

3) Determine the effective impervious fraction (I_f) for each DMA, and fill in the fourth column of the table described in Step 2.

For DMAs comprised of a single post-project surface type (as described in the WQMP, most DMAs should be designed in this manner), the effective Impervious Fraction should be derived from the following table:

Surface Type	Effective Impervious Fraction, I_f
Roofs	1.00
Concrete or Asphalt	1.00
Grouted or Gapless Paving Blocks	1.00
Compacted Soil (e.g. unpaved parking)	0.40
Decomposed Granite	0.40
Permeable Paving Blocks w/ Sand Filled Gap	0.25
Class 2 Base	0.30
Gravel or Class 2 Permeable Base	0.10
Pervious Concrete / Porous Asphalt	0.10
Open and Porous Pavers	0.10
Turf block	0.10
Ornamental Landscaping	0.10
Natural (A Soil)	0.03
Natural (B Soil)	0.15
Natural (C Soil)	0.30
Natural (D Soil)	0.40

If a single DMA contains mixed post-project surface types, a composite or area-weighted average effective impervious fraction should be used. The following equation can be used for determining an area-weighted average:

$$\frac{\left[(I_f)_1 \cdot A_1\right] + \left[(I_f)_2 \cdot A_2\right] + [\ldots]}{A_T}$$

4) Calculate a runoff factor, 'C', using the following equation, and enter this value into the fifth column of the table described in step 2:

$$C = 0.858 \cdot {I_f}^3 - 0.78 \cdot {I_f}^2 + 0.774 * I_f + 0.04$$

5) For each tabulated DMA, multiply the area by the runoff factor. Enter the resulting value in the sixth column of the table described in Step 2. Enter the sum of the sixth column in the field identified with "[A]" in the table.

6) Determine the BMP Design Flow Rate (Q_{BMP}) using the equation:

$$\text{QBMP} = \frac{(0.2\ x\ \text{“}[A]\text{”})}{43{,}560}$$

Enter Q_{BMP} in the field identified with "[B]" in the table.

2.2.2 Santa Margarita and Whitewater Watersheds

In the Santa Margarita and Whitewater Watershed regions of Riverside County, Q_{BMP} is the runoff flow rate resulting from a design rainfall intensity of 0.2 inches per hour. Follow the steps below to calculate Q_{BMP} for both the Santa Margarita and Whitewater watersheds.

1) Determine the tributary drainage area, A_T, that drains to the proposed BMP. This includes all areas that will contribute runoff to the proposed BMP, including pervious areas, impervious areas, and runoff from offsite areas that commingle with site runoff, whether or not they are directly or indirectly connected to the BMP. Calculate this area in units of acres.

2) Determine the effective impervious fraction (I_f) for the area tributary to the BMP, using the following table:

Surface Type	Effective Impervious Fraction, I_f
Roofs	1.00
Concrete or Asphalt	1.00
Grouted or Gapless Paving Blocks	1.00
Compacted Soil (e.g. unpaved parking)	0.40
Decomposed Granite	0.40
Permeable Paving Blocks w/ Sand Filled Gap	0.25
Class 2 Base	0.30
Gravel or Class 2 Permeable Base	0.10
Pervious Concrete / Porous Asphalt	0.10
Open and Porous Pavers	0.10
Turf block	0.10
Ornamental Landscaping	0.10
Natural (A Soil)	0.03
Natural (B Soil)	0.15
Natural (C Soil)	0.30
Natural (D Soil)	0.40

If the area tributary to the BMP contains mixed post-project surface types, a composite or area-weighted average effective impervious fraction should be used. The following equation can be used for determining an area-weighted average:

$$\frac{\left[(I_f)_1 \cdot A_1\right] + \left[(I_f)_2 \cdot A_2\right] + [\ldots]}{A_T}$$

3) Calculate a runoff factor, 'C', using the following equation:

$$C = 0.858 \cdot {I_f}^3 - 0.78 \cdot {I_f}^2 + 0.774 * I_f + 0.04$$

4) Determine the BMP Design Flow Rate using the equation:

$$Q_{BMP} = C \times I \times A_T$$

Where,

A_T = Tributary Area to the BMP, in acres

I = Design Rainfall Intensity, 0.2 inch/hour is used for this Handbook

C = Runoff Factor, found in Step 3

3.0 BMP Fact Sheets

This section provides fact sheets for the following seven types of BMPs:

3.1 - Infiltration Basins

3.2 - Infiltration Trenches

3.3 - Permeable Pavement

3.4 - Harvest and Use

3.5 - Bioretention Facilities

3.6 - Extended Detention Basins

3.7 - Sand Filter Basins

►For portability, the fact sheets for each BMP, as well as Calculation worksheets for sizing and documenting the design of these BMPs, are provided as separate downloadable files on the LID Handbook page at www.rcflood.org/NPDES/developers.aspx

BEFORE selecting any particular BMP for use on your project, review the requirements of the applicable WQMP, and the discussions in sections 1 and 2 of this Handbook. These provide important context and instructions that may dictate that particular BMPs be used.

3.1 INFILTRATION BASIN

Type of BMP	LID - Infiltration
Treatment Mechanisms	Infiltration, Evapotranspiration (when vegetated), Evaporation, and Sedimentation
Maximum Treatment Area	50 acres
Other Names	Bioinfiltration Basin

Description

An Infiltration Basin is a flat earthen basin designed to capture the design capture volume, V_{BMP}. The stormwater infiltrates through the bottom of the basin into the underlying soil over a 72 hour drawdown period. Flows exceeding V_{BMP} must discharge to a downstream conveyance system. Trash and sediment accumulate within the forebay as stormwater passes into the basin. Infiltration basins are highly effective in removing all targeted pollutants from stormwater runoff.

Figure 1 – Infiltration Basin

See Appendix A, and Appendix C, Section 1 of *Basin Guidelines*, for additional requirements.

Siting Considerations

The use of infiltration basins may be restricted by concerns over ground water contamination, soil permeability, and clogging at the site. See the applicable WQMP for any specific feasibility considerations for using infiltration BMPs. Where this BMP is being used, the soil beneath the basin must be thoroughly evaluated in a geotechnical report since the underlying soils are critical to the basin's long term performance. To protect the basin from erosion, the sides and bottom of the basin must be vegetated, preferably with native or low water use plant species.

In addition, these basins may not be appropriate for the following site conditions:

- Industrial sites or locations where spills of toxic materials may occur
- Sites with very low soil infiltration rates
- Sites with high groundwater tables or excessively high soil infiltration rates, where pollutants can affect ground water quality
- Sites with unstabilized soil or construction activity upstream
- On steeply sloping terrain
- Infiltration basins located in a fill condition should refer to Appendix A of this Handbook for details on special requirements/restrictions

Setbacks

Always consult your geotechnical engineer for site specific recommendations regarding setbacks for infiltration trenches. Recommended setbacks are needed to protect buildings, existing trees, walls, onsite or nearby wells, streams, and tanks. Setbacks should be considered early in the design process since they can affect where infiltration facilities may be placed and how deep they are allowed to be. For instance, depth setbacks can dictate fairly shallow facilities that will have a larger footprint and, in some cases, may make an infiltration basin infeasible. In that instance, another BMP must be selected.

Infiltration basins typically must be set back:

- 10 feet from the historic high groundwater (measured vertically from the bottom of the basin, as shown in Figure 2)
- 5 feet from bedrock or impermeable surface layer (measured vertically from the bottom of the basin, as shown in Figure 2)
- From all existing mature tree drip lines as indicated in Figure 2 (to protect their root structure)
- 100 feet horizontally from wells, tanks or springs

Setbacks to walls and foundations must be included as part of the Geotechnical Report. All other setbacks shall be in accordance with applicable standards of the District's *Basin Guidelines* (Appendix C).

Figure 2 – Setback Requirements

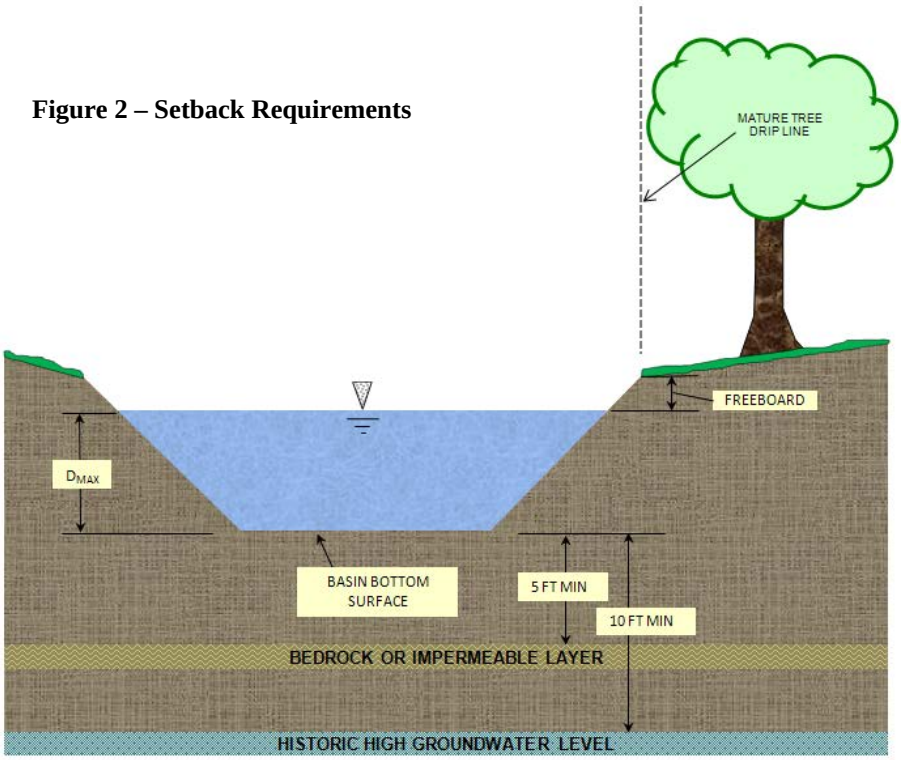

Forebay

A concrete forebay shall be provided to reduce sediment clogging and to reduce erosion. The forebay shall have a design volume of at least 0.5% V_{BMP} and a minimum 1 foot high concrete splashwall / berm. Full height notch-type weir(s), offset from the line of flow from the basin inlet to prevent short circuiting, shall be used to outlet the forebay. It is recommended that two weirs be used and that they be located on opposite sides of the forebay (see Figure 2).

Overflow

Flows exceeding V_{BMP} must discharge to an acceptable downstream conveyance system. Where an adequate outlet is present, an overflow structure may be used. Where an embankment is present, an emergency spillway may be used instead. Overflows must be placed just above the design water surface for V_{BMP} and be near the outlet of the system. The overflow structure shall be similar to the District's Standard Drawing CB 110. Additional details may be found in the District's *Basin Guidelines* (Appendix C).

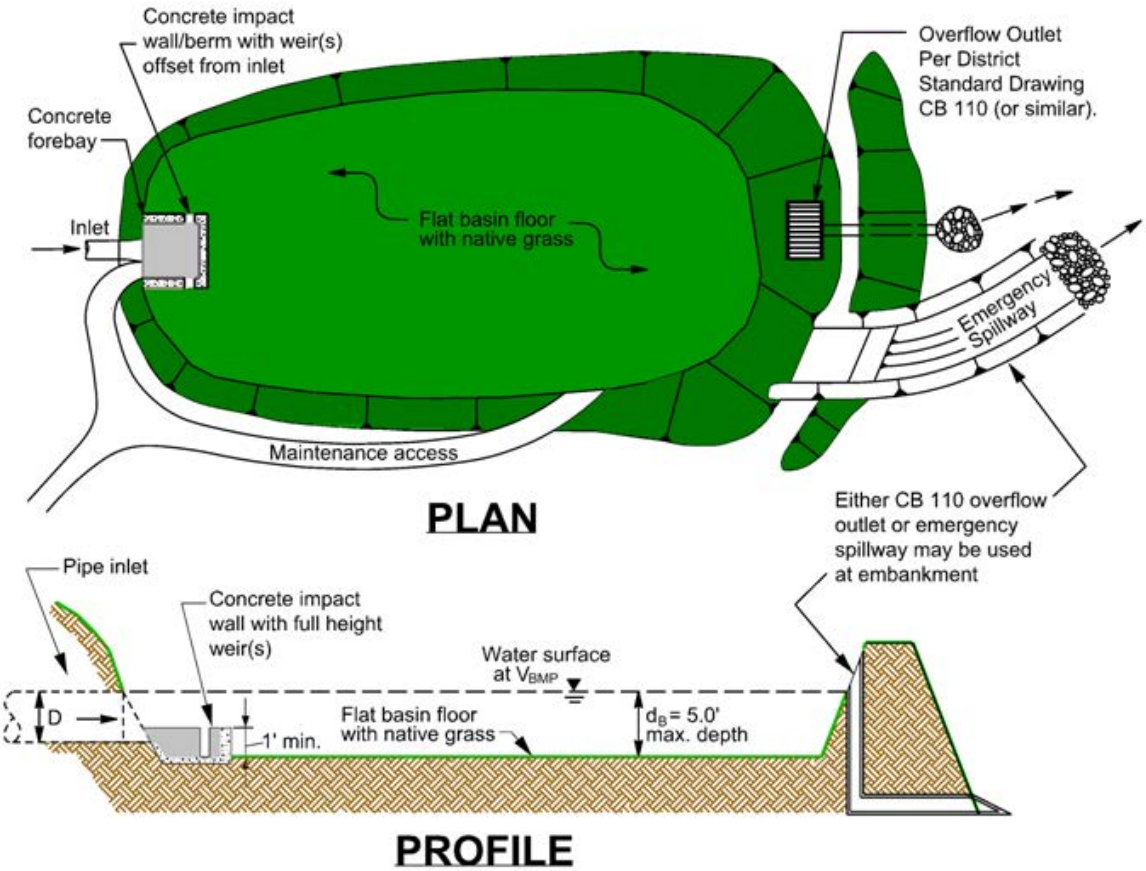

Figure 3 – Infiltration Basin

Landscaping Requirements

Basin vegetation provides erosion protection, improves sediment removal and assists in allowing infiltration to occur. The basin surface and side slopes shall be planted with native grasses. Proper landscape management is also required to ensure that the vegetation does not contribute to water pollution through pesticides, herbicides, or fertilizers. Landscaping shall be in accordance with County of Riverside Ordinance 859 and the District's *Basin Guidelines* (Appendix C), or other guidelines issued by the Engineering Authority.

Maintenance

Normal maintenance of an infiltration basin includes the maintenance of landscaping, debris and trash removal from the surface of the basin, and tending to problems associated with standing water (vectors, odors, etc.). Significant ponding, especially more than 72 hours after an event, may indicate that the basin surface is no longer providing sufficient infiltration and requires aeration. See the District's *Basin Guidelines* (Appendix C) for additional requirements (i.e., fencing, maintenance access, etc.).

Table 1 - Inspection and Maintenance

Schedule	Inspection and Maintenance Activity
Ongoing including just before annual storm seasons and following rainfall events.	• Maintain vegetation as needed. Use of fertilizers, pesticides and herbicides should be strenuously avoided to ensure they don't contribute to water pollution. If appropriate native plant selections and other IPM methods are used, such products shouldn't be needed. If such projects are used, o Products shall be applied in accordance with their labeling, especially in relation to application to water, and in areas subjected to flooding. o Fertilizers should not be applied within 15 days before, after, or during the rain season. • Remove debris and litter from the entire basin to minimize clogging and improve aesthetics. • Check for obvious problems and repair as needed. Address odor, insects, and overgrowth issues associated with stagnant or standing water in the basin bottom. There should be no long-term ponding water. • Check for erosion and sediment laden areas in the basin. Repair as needed. Clean forebay if needed. • Revegetate side slopes where needed.
Annually. If possible, schedule these inspections within 72 hours after a significant rainfall.	• Inspection of hydraulic and structural facilities. Examine the inlet for blockage, the embankment and spillway integrity, as well as damage to any structural element. • Check for erosion, slumping and overgrowth. Repair as needed. • Check basin depth for sediment build up and reduced total capacity. Scrape bottom as needed and remove sediment. Restore to original cross-section and infiltration rate. Replant basin vegetation. • Verify the basin bottom is allowing acceptable infiltration. Use a disc or other method to aerate basin bottom only if there is actual significant loss of infiltrative capacity, rather than on a routine basis[1]. • No water should be present 72 hours after an event. No long term standing water should be present at all. No algae formation should be visible. Correct problem as needed.

1. CA Stormwater BMP Handbook for New Development and Significant Redevelopment

Table 2 - Design and Sizing Criteria for Infiltration Basins

Design Parameter	Infiltration Basin
Design Volume	V_{BMP}
Forebay Volume	0.5% V_{BMP}
Drawdown time (maximum)	72 hours
Maximum tributary area	50 acres [2]
Minimum infiltration rate	Must be sufficient to drain the basin within the required Drawdown time over the life of the BMP. The WQMP may include specific requirements for minimum tested infiltration rates.
Maximum Depth	5 feet
Spillway erosion control	Energy dissipators to reduce velocities[1]
Basin Slope	0%
Freeboard (minimum)	1 foot [1]
Historic High Groundwater Setback (max)	10 feet
Bedrock/impermeable layer setback (max)	5 feet
Tree setbacks	Mature tree drip line must not overhang the basin
Set back from wells, tanks or springs	100 feet
Set back from foundations	As recommended in Geotechnical Report

1. **Ventura County's Technical Guidance Manual for Stormwater Quality Control Measures**
2. **CA Stormwater BMP Handbook for New Development and Significant Redevelopment**

Note: The information contained in this BMP Factsheet is intended to be a summary of design considerations and requirements. Additional information which applies to all detention basins may be found in the District's Basin Guidelines (Appendix C). In addition, information herein may be superseded by other guidelines issued by the co-permittee.

INFILTRATION BASIN SIZING PROCEDURE

1. Find the Design Volume, V_{BMP}.
   a) Enter the Tributary Area, A_T.
   b) Enter the Design Volume, V_{BMP}, determined from Section 2.1 of this Handbook.
2. Determine the Maximum Depth.
   a) Enter the infiltration rate. The infiltration rate shall be established as described in Appendix A: "Infiltration Testing".
   b) Enter the design Factor of Safety from Table 1 in Appendix A: "Infiltration Testing".
   c) The spreadsheet will determine D_1, the maximum allowable depth of the basin based on the infiltration rate along with the maximum drawdown time (72 hours) and the Factor of Safety.

$$D_1 = [(t) \times (I)] / 12s$$

Where I = site infiltration rate (in/hr)
s = safety factor
t = drawdown time (maximum 72 hours)

d) Enter the depth of freeboard.

e) Enter the depth to the historic high groundwater level measured from the top of the basin.

f) Enter the depth to the top of bedrock or other impermeable layer measured from the finished grade.

g) The spreadsheet will determine D_2, the total basin depth (including freeboard, if used) of the basin, based on restrictions to the depth by groundwater and an impermeable layer.

D_2 = Depth to groundwater – (10 + freeboard) (ft);

or

D_2 = Depth to impermeable layer – (5 + freeboard) (ft)

Whichever is least.

h) The spreadsheet will determine the maximum allowable effective depth of basin, D_{MAX}, based on the smallest value between D_1 and D_2. D_{MAX} is the maximum depth of water only and does not include freeboard. D_{MAX} shall not exceed 5 feet.

3. Basin Geometry

a) Enter the basin side slopes, z (no steeper than 4:1).

b) Enter the proposed basin depth, d_B excluding freeboard.

c) The spreadsheet will determine the minimum required surface area of the basin:

$$A_s = V_{BMP} / d_B$$

Where A_s = minimum area required (ft^2)
V_{BMP} = volume of the infiltration basin (ft^3)
d_B= proposed depth not to exceed maximum allowable depth, D_{MAX} (ft)

d) Enter the proposed bottom surface area. This area shall not be less than the minimum required surface area.

4. Forebay

A concrete forebay with a design volume of at least 0.5% V_{BMP} and a minimum 1 foot high concrete splashwall shall be provided. Full-height rectangular weir(s) shall be used to outlet the forebay. The weir(s) must be offset from the line of flow from the basin inlet. It is recommended that two weirs be used and that they be located on opposite sides of the forebay (see Figure 2).

a) The spreadsheet will determine the minimum required forebay volume based on 0.5% V_{BMP}.

b) Enter the proposed depth of the forebay berm/splashwall (1foot minimum).

c) The spreadsheet will determine the minimum required forebay surface area.

d) Enter the width of rectangular weir to be used (minimum 1.5 inches). Weir width should be established based on a 5 minute drawdown time.

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Infiltration Basin - Design Procedure (Rev. 03-2012)	BMP ID	Legend:	Required Entries / Calculated Cells

Company Name: _____ Date: _____

Designed by: _____ County/City Case No.: _____

Design Volume

a) Tributary area (BMP subarea) A_T = _____ acres

b) Enter V_{BMP} determined from Section 2.1 of this Handbook V_{BMP}= _____ ft^3

Maximum Depth

a) Infiltration rate I = _____ in/hr

b) Factor of Safety (See Table 1, Appendix A: "Infiltration Testing" from this BMP Handbook) FS = _____

c) Calculate D_1 $D_1 = \frac{I\ (in/hr) \times 72\ hrs}{12\ (in/ft) \times FS}$ D_1 = _____ ft

d) Enter the depth of freeboard (at least 1 ft) _____ ft

e) Enter depth to historic high ground water (measured from **top** of basin) _____ ft

f) Enter depth to top of bedrock or impermeable layer (measured from **top** of basin) _____ ft

g) D_2 is the smaller of:

Depth to groundwater - (10 ft + freeboard) and
Depth to impermeable layer - (5 ft + freeboard)

D_2 = _____ ft

h) D_{MAX} is the smaller value of D_1 and D_2 but shall not exceed 5 feet D_{MAX} = _____ ft

Basin Geometry

a) Basin side slopes (no steeper than 4:1) z = _____ :1

b) Proposed basin depth (excluding freeboard) d_B = _____ ft

c) Minimum bottom surface area of basin ($A_S = V_{BMP}/d_B$) A_S = _____ ft^2

d) Proposed Design Surface Area A_D = _____ ft^2

Forebay

a) Forebay volume (minimum 0.5% V_{BMP}) Volume = _____ ft^3

b) Forebay depth (height of berm/splashwall. 1 foot min.) Depth = _____ ft

c) Forebay surface area (minimum) Area = _____ ft^2

d) Full height notch-type weir Width (W) = _____ in

Notes: _____

3.2 INFILTRATION TRENCH

Type of BMP	LID - Infiltration
Treatment Mechanisms	Infiltration, Evapotranspiration (when vegetated), Evaporation
Maximum Drainage Area	10-acres
Other Names	None

Description

Infiltration trenches are shallow excavated areas that are filled with rock material to create a subsurface reservoir layer. The trench is sized to store the design capture volume, V_{BMP}, in the void space between the rocks. Over a period of 72 hours, the stormwater infiltrates through the bottom of the trench into the surrounding soil. Infiltration basins are highly effective in removing all targeted pollutants from stormwater runoff.

Figure 1 shows the components of an infiltration trench. The section shows the reservoir layer and observation well, which is used to monitor water depth. An overflow pipe that is used to bypass flows once the trench fills with stormwater is also shown.

Site Considerations

Location

The use of infiltration trenches may be restricted by concerns over groundwater contamination, soil permeability, and clogging at the site. See the applicable WQMP for any specific feasibility considerations for using infiltration BMPs. Where this BMP is being used, the soil beneath the basin must be thoroughly evaluated in a geotechnical report since the underlying soils are critical to the basin's long term performance. These basins may not be appropriate for the following site conditions:

- Industrial sites or locations where spills of toxic materials may occur.
- Sites with very low soil infiltration rates.
- Sites with high groundwater tables or excessively high soil infiltration rates, where pollutants can affect groundwater quality.
- Sites with unstabilized soil or construction activity upstream.
- On steeply sloping terrain.
- Infiltration trenches located in a fill condition should refer to Appendix A of this Handbook for details on special requirements/restrictions.

This BMP has a flat surface area, so it may be challenging to incorporate into steeply sloping terrain.

Setbacks

Always consult your geotechnical engineer for site specific recommendations regarding setbacks for infiltration trenches. Recommended setbacks are needed to protect buildings, walls, onsite or nearby wells, streams, and tanks. Setbacks should be considered early in the design process as they affect where infiltration facilities may be placed and how deep they are allowed to be. For instance, depth setbacks can dictate fairly shallow facilities that will have a larger footprint and, in some cases, may make an infiltration trench infeasible. In that instance, another BMP must be selected.

In addition to setbacks recommended by the geotechnical engineer, infiltration trenches must be set back:

- 10 feet from the historic high groundwater mark (measured vertically from the bottom of the trench, as shown in Figure 1)
- 5 feet from bedrock or impermeable surface layer (measured vertically from the bottom of the trench, as shown in Figure 1)
- From all mature tree drip lines as indicated in Figure 1
- 100 feet horizontally from wells, tanks or springs

Setbacks to walls and foundations must be included as part of the Geotechnical Report.

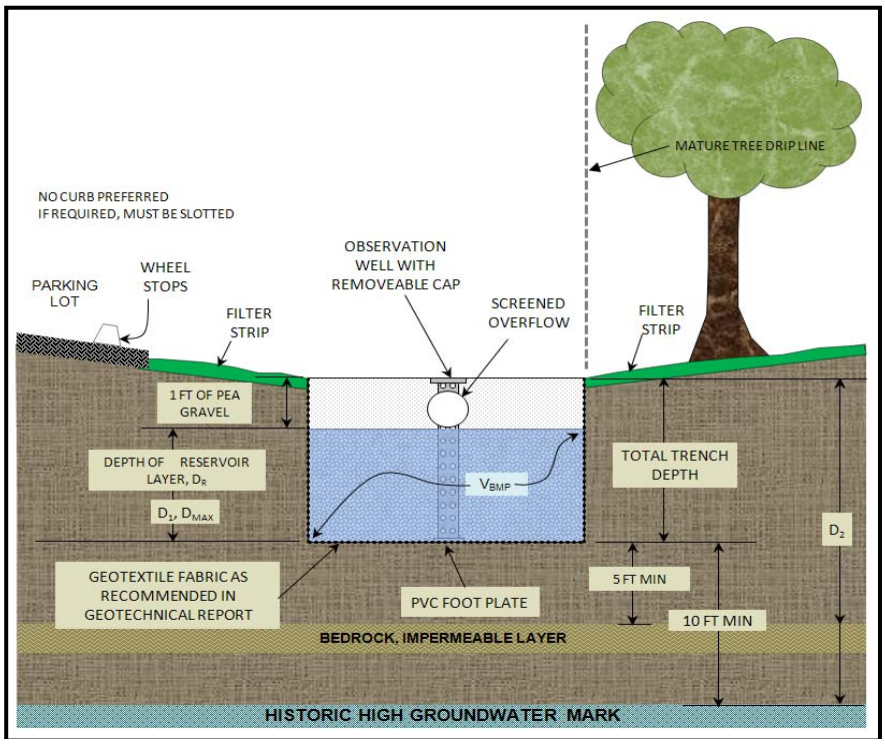

Figure 1 Section View of an Infiltration Trench

Sediment Control

Infiltration BMPs have the risk of becoming plugged over time. To prevent this, sediment must be removed before stormwater enters the trench. Both sheet and concentrated flow types have requirements that should be considered in the design of an infiltration trench.

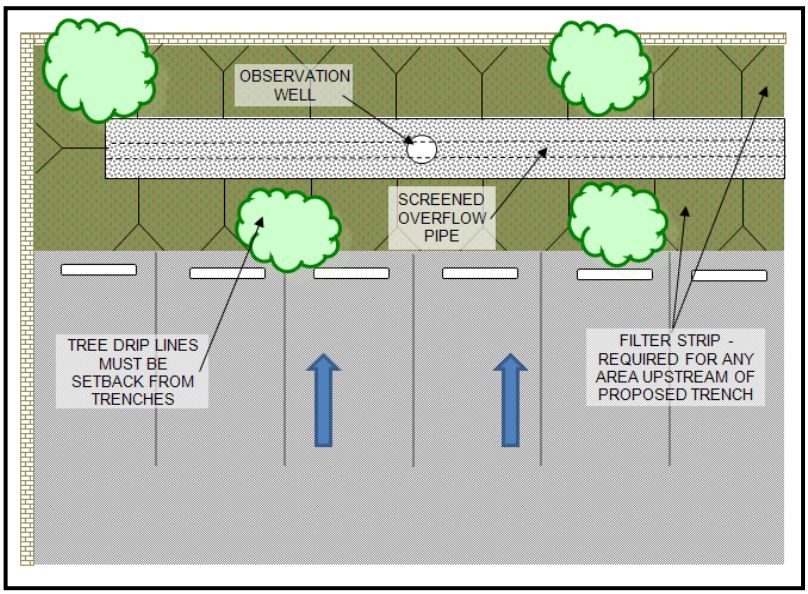

Figure 2 Plan View, Sheet Type Flows

When sheet type flows approach the trench along its length (as illustrated in Figure 2), a vegetated filter strip should be placed between the trench and the upstream drainage area. The filter strip must be a minimum of 5 feet wide and planted with grasses (preferably native) or covered with mulch.

Concentrated flows require a different approach. A 2004 Caltrans BMP Retrofit Report found that flow spreaders recommended in many water quality manuals are ineffective in distributing concentrated flows. As such, concentrated flows should either be directed toward a traditional vegetated swale (as shown on the right side of Figure 3) or to catch basin filters that can remove litter and sediment. Catch basins must discharge runoff as surface flow above the trench; they cannot outlet directly into the reservoir layer of the infiltration trench. If catch basins are used, the short and long term costs of the catch basin filters should be considered.

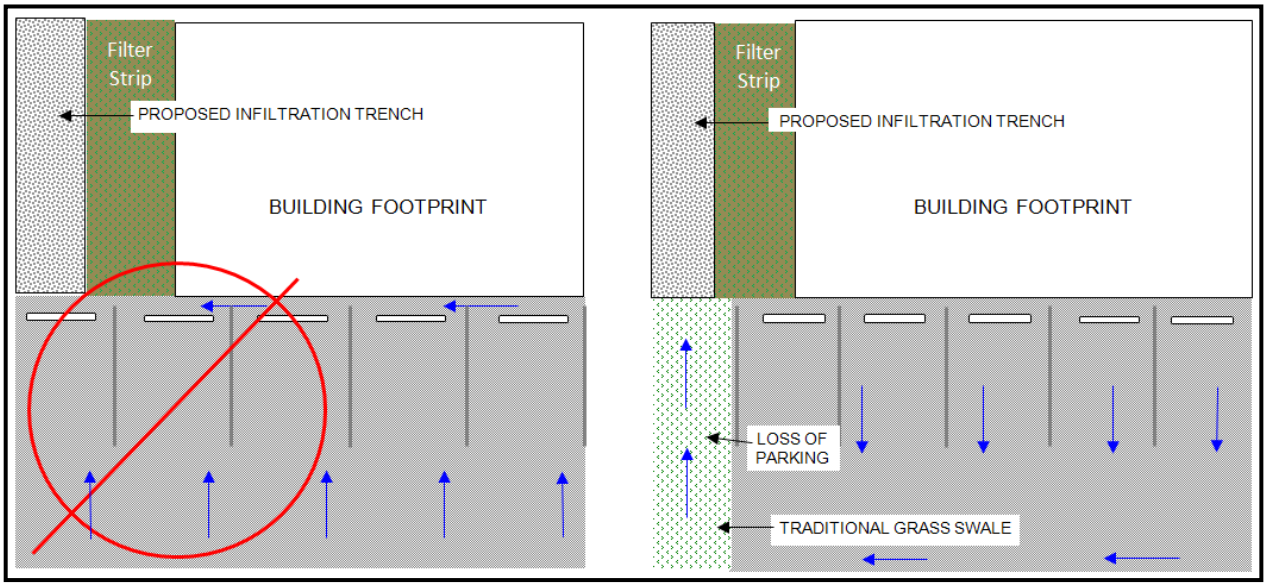

Figure 3 Plan View, Concentrated Flows

Additional Considerations

Class V Status

In certain circumstances, for example, if an infiltration trench is "deeper than its widest surface dimension," or includes an assemblage of perforated pipes, drain tiles, or other similar mechanisms intended to distribute fluids below the surface of the ground, it would probably be considered by the EPA to be a Class V injection well. Class V injection wells are subject to regulations and reporting requirements via the Underground Injection Control (UIC) Program. To ensure that infiltration trenches are not considered Class V wells, the design procedure in this manual requires that the trench not be deeper than it is wide.

Geotechnical Report

A geotechnical report must be included for all infiltration trenches. Appendix A of this Handbook entitled "Infiltration Testing Guidelines", details which types of infiltration tests are acceptable and how many tests or boring logs must be performed. A Geotechnical Report must be submitted in support of all infiltration trenches. Setbacks to walls and foundations must be included in the Geotechnical Report.

Observation Wells

One or more observation wells should be provided. The observation well consists of a vertical section of perforated pipe, 4 to 6 inches in diameter, installed flush with top of trench on a foot plate and have a locking, removable cap.

Overflow

An overflow route is needed to bypass storm flows larger than the V_{BMP} or in the event of clogging. Overflow systems must connect to an acceptable discharge point such as a downstream conveyance system.

Maintenance Access

Normal maintenance of an infiltration trench includes maintenance of the filter strip as well as debris and trash removal from the surface of the trench and filter strip. More substantial maintenance requiring vehicle access may be required every 5 to 10 years. Vehicular access along the length of the swale should be provided to all infiltration trenches. It is preferred that trenches be placed longitudinally along a street or adjacent to a parking lot area. These conditions have high visibility which makes it more likely that the trench will be maintained on a regular basis.

Inspection and Maintenance

Schedule	Inspection and Maintenance Activity
Every two weeks, or as often as necessary to maintain a pleasant appearance	- Maintain adjacent landscaped areas. Remove clippings from landscape maintenance activities. - Remove trash & debris
3 days after Major Storm Events	- Check for surface ponding. If ponding is only above the trench, remove, wash and replace pea gravel. May be needed every 5-10 years. - Check observation well for ponding. If the trench becomes plugged, remove rock materials. Provide a fresh infiltration surface by excavating an additional 2-4 inches of soil. Replace the rock materials.

Design and Sizing Criteria

Design Parameter	Design Criteria
Design Volume	V_{BMP}
Design Drawdown time	72 hrs
Maximum Tributary Drainage Area	10 acres
Maximum Trench Depth	8.0 ft
Width to Depth Ratio	Width must be greater than depth
Reservoir Rock Material	AASHTO #3 or 57 material or a clean, washed aggregate 1 to 3-in diameter equivalent
Filter Strip Width	Minimum of 5 feet in the direction of flow for all areas draining to trench
Filter Strip Slope	Max slope = 1%
Filter Strip Materials	Mulch or grasses (non-mowed variety preferred)
Historic High Groundwater Mark	10 ft or more below bottom of trench
Bedrock/Impermeable Layer Setback	5 ft or more below bottom of trench
Tree Setbacks	Mature tree drip line must not overhang the trench
Trench Lining Material	As recommended in Geotechnical Report

Infiltration Trench Design Procedure

1. Enter the area tributary to the trench, maximum drainage area is 10 acres.

2. Enter the Design Volume, $V_{BMP,}$ determined from Section 2.1 of this Handbook.

3. Enter the site infiltration rate, found in the geotechnical report.

4. Enter the factor of safety from Table 1 of Appendix A, Infiltration Testing.

5. Determine the maximum reservoir layer depth, $D_{MAX.}$ The value is obtained by taking the smaller of two depth equations but may never exceed 8 feet. The first depth, D_1 is related to the infiltration rate of the soil. The second depth, $D_{2,}$ is related to required setbacks to groundwater, bedrock/impermeable layer. These parameters are shown in Figure 1.

   Calculate D_1.

$$D_1 = \frac{I\left({}^{in}/_{hr}\right) \times 72\ (hrs)}{12\left({}^{in}/_{ft}\right) \times {}^{n}/_{100} \times FS}$$

   Where:

   I = site infiltration rate (in/hr), found in the geotechnical report
   FS = factor of safety, refer to Appendix A - Infiltration Testing
   n = porosity of the trench material, 40%

   Calculate D_2. Enter the depth to the seasonal high groundwater and bedrock/impermeable layer measured from the finished grade. The spreadsheet checks the minimum setbacks shown in Figure 1 and selects the smallest value. The equations are listed below for those doing hand calculations.

   Minimum Setbacks (includes 1 foot for pea gravel):
   = Depth to historic high groundwater mark - 11 feet
   = Depth to impermeable layer - 6 feet

   D_2 is the smaller of the two values.

   D_{MAX} is the smaller value of D_1 and $D_{2,}$ and must be less than or equal to 8 feet.

6. Enter the proposed reservoir layer depth, D_R. The value must be no greater than D_{MAX}.

7. Find the required surface area of the trench, A_S. Once D_R is entered, the spreadsheet will calculate the corresponding depth of water and the minimum surface area of the trench.

$$Design\ d_W = D_R \times \left({}^{n}/_{100}\right) \qquad A_S = \frac{V_{BMP}}{Design\ d_W}$$

Where:

A_S = minimum area required (ft^2)
V_{BMP} = BMP storage volume (ft^3)
Design d_W = Depth of water in reservoir layer (ft)

8. Enter the proposed design surface area; it must be greater than the minimum surface area.

9. Calculate the minimum trench width. This is to ensure that EPA's Class V Injection well status is not triggered. The total trench depth (shown in Figure 1) includes the upper foot where the overflow pipe is located. The minimum surface dimension is D_R + 1 foot.

Additional Items

The following items detailed in the preceding sections should also be addressed in the design.

- Sediment Control
- Geotechnical Report
- Observation well(s)
- Overflow

Reference Material

California Stormwater Quality Association. California Stormwater BMP Handbook New Development and Redevelopment. 2003.

County of Los Angeles Department of Public Works. Stormwater BMP Best Management Practice Design and Maintenance Manual for Publicly Maintained Storm Drain Systems. Los Angeles, CA, 2009.

LandSaver Stormwater Management System. Tech Sheet - Porosity of Structural Backfill. 2006.

United States Environmental Protection Agency. Office of Water, Washington D.C. Storm Water Technology Fact Sheet Vegetated Swales. 1999.

United States Environmental Protection Agency. Office of Water. Memorandum on Clarification on Which Stormwater Infiltration Practices/technologies Have the Potential to Be Regulated as "Class V" Wells by Underground Injection Control Program. By Linda Boornazian and Steve Heare. Washington D.C., 2008.

Ventura Countywide Stormwater Quality Management Program. Land Development Guidelines Biofilter Fact Sheet. Ventura, CA, 2001.

Ventura Countywide Stormwater Quality Management Program. Technical Guidance Manual for Stormwater Quality Control Measures. Ventura, CA, 2002.

Infiltration Trench - Design Procedure	BMP ID	Legend:	Required Entries
			Calculated Cells

Company Name:		Date:	
Designed by:		County/City Case No.:	

Design Volume

Enter the area tributary to this feature, Max = 10 acres — A_t= _____ acres

Enter V_{BMP} determined from Section 2.1 of this Handbook — V_{BMP}= _____ ft^3

Calculate Maximium Depth of the Reservoir Layer

Enter Infiltration rate — I = _____ in/hr

Enter Factor of Safety, FS (unitless) — FS = _____

Obtain from Table 1, Appendix A: "Infiltration Testing" of this BMP Handbook

n = 40 %

Calculate D_1.

$$D_1 = \frac{I\ (in/hr) \times 72\ hrs}{12\ (in/ft) \times (n/100) \times FS}$$

D_1 = _____ ft

Enter depth to historic high groundwater mark (measured from finished grade) _____ ft

Enter depth to top of bedrock or impermeable layer (measured from finished grade) _____ ft

D_2 is the smaller of:

Depth to groundwater - 11 ft; & Depth to impermeable layer - 6 ft — D_2 = _____ ft

D_{MAX} is the smaller value of D_1 and D_2, must be less than or equal to 8 feet. — D_{MAX} = _____ ft

Trench Sizing

Enter proposed reservoir layer depth D_R, must be $\leq D_{MAX}$ — D_R = _____ ft

Calculate the design depth of water, d_W

Design $d_W = (D_R) \times (n/100)$ — Design d_W= _____ ft

Minimum Surface Area, A_S

$$A_S = \frac{V_{BMP}}{d_W}$$

A_S = _____ ft^2

Proposed Design Surface Area — A_D = _____ ft^2

Minimum Width = D_R + 1 foot pea gravel _____ ft

Sediment Control Provided? (Use pulldown) _____

Geotechnical report attached? (Use pulldown) _____

If the trench has been designed correctly, there should be no error messages on the spreadsheet.

3.3 Permeable Pavement

Type of BMP	LID - Infiltration
Treatment Mechanisms	Infiltration, Evaporation
Maximum Drainage Area	10 acres
Other Names	porous pavement, pervious concrete, pervious asphalt, pervious gravel pavement, cobblestone block, modular block, modular pavement

Description

Permeable pavements can be either pervious asphalt and concrete surfaces, or permeable modular block. Unlike traditional pavements that are impermeable, permeable pavements reduce the volume and peak of stormwater runoff as well as mitigate pollutants from stormwater runoff, provided that the underlying soils can accept infiltration. Permeable pavement surfaces work best when they are designed to be flat or with gentle slopes. This factsheet discusses criteria that apply to infiltration designs.

The permeable surface is placed on top of a reservoir layer that holds the water quality stormwater volume, $V_{BMP.}$ The water infiltrates from the reservoir layer into the native subsoil. Tests must be performed according to the Infiltration Testing Section in Appendix A to be able to use this design procedure.

In some circumstances, permeable pavement may be implemented on a project as a source control feature. Where implemented as a source control feature (sometimes referred to as a 'self-retaining' area), the pavement is not considered a 'BMP' that would be required to be designed and sized per this manual. Where permeable pavement receives runoff from adjacent tributary areas, the permeable pavement *may* be considered a BMP that must be sized according to this manual. Consult the Engineering Authority and the WQMP for any applicable requirements for designing and sizing permeable pavement installations.

Siting Considerations

The WQMP applicable to the project location should be consulted, as it may include criteria for determining the applicability of this and other Infiltration-based BMPs to the project.

Permeable pavements can be used in the same manner as concrete or asphalt in low traffic parking lots, playgrounds, walkways, bike trails, and sports courts. Most types of permeable pavement can be designed to meet Americans with Disabilities Act (ADA) requirements. Permeable pavements **should not** be used in the following conditions:

- Downstream of erodible areas
- Downstream of areas with a high likelihood of pollutant spills
- Industrial or high vehicular traffic areas (25,000 or greater average daily traffic)
- Areas where geotechnical concerns, such as soils with low infiltration rates, would preclude the use of this BMP.

Sites with Impermeable Fire Lanes

Oftentimes, Fire Departments do not allow alternative pavement types including permeable pavement. They require traditional impermeable surfaces for fire lanes. In this situation, it is acceptable to use an impermeable surface for the fire lane drive aisles and permeable pavement for the remainder of the parking lot.

Where impermeable fire lanes are used in the design, the impermeable surface must slope towards the permeable pavement, and the base layers shall remain continuous underneath the two pavement types, as shown in Figure 1. This continuous reservoir layer helps to maintain infiltration throughout the pervious pavement site, and can still be considered as part of the total required storage area.

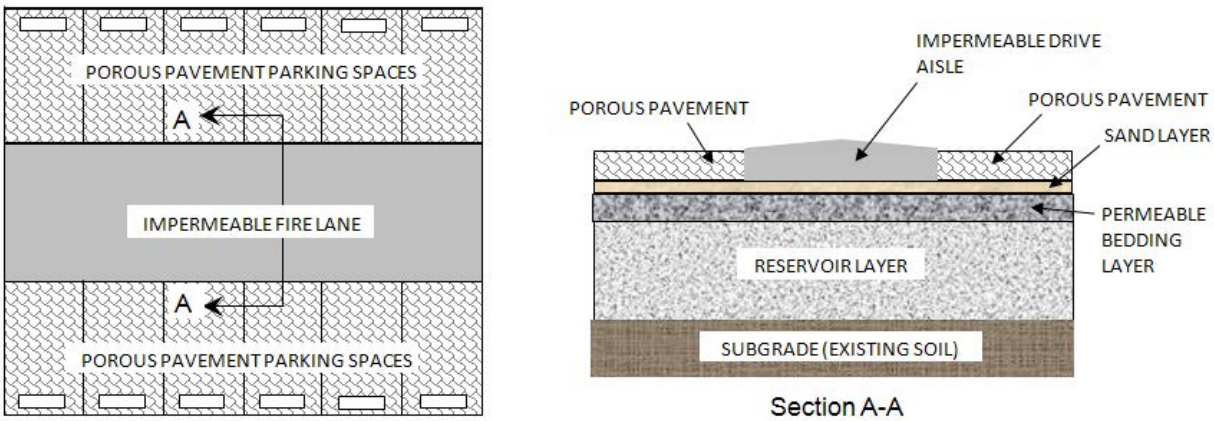

Figure 1: Impermeable Fire Lanes

Also, while a seal coat treatment may be used on the impermeable fire land, traditional seal coat treatments **shall not** be used on permeable pavement.

Setbacks

Always consult your geotechnical engineer for site specific recommendations regarding setbacks for permeable pavement. Recommended setbacks are needed to protect buildings, walls, onsite wells, streams and tanks.

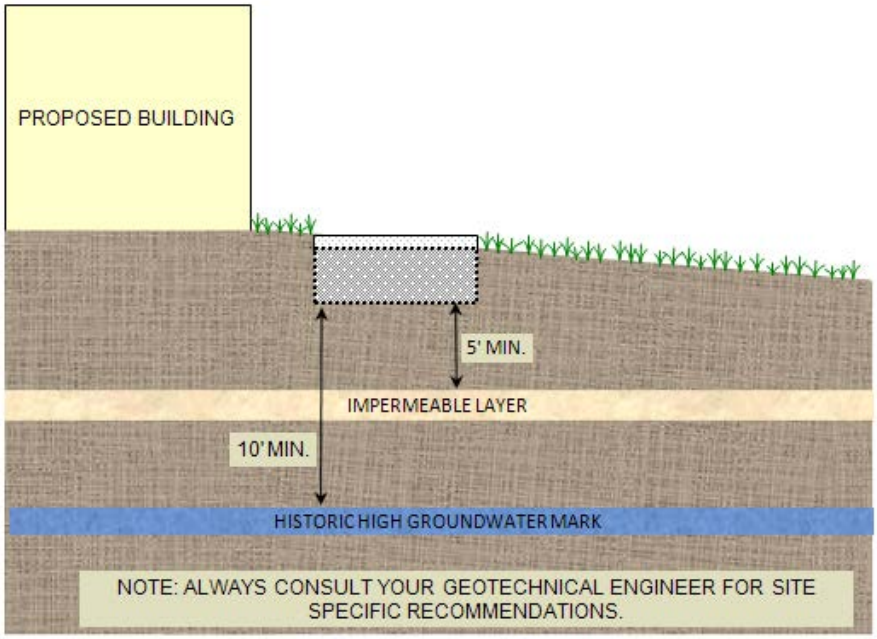

Figure 2: Permeable Pavement Setback Requirements

A minimum vertical separation of 10 feet is required from the bottom of the reservoir layer to the historic high groundwater mark, see Figure 2. A minimum vertical separation of 5 feet is required from the bottom of the reservoir layer to any impermeable layer in the soil. If the historic high groundwater mark is less than 10 feet below the reservoir layer section, or less than 5 feet from an impermeable layer, the infiltration design is not feasible.

Design and Sizing Criteria

To ensure that the pavement structural section is not compromised, a 24-hour drawdown time is utilized for this BMP instead of the longer drawdown time used for most volume based BMPs.

Reservoir Layer Considerations

Even with proper maintenance, sediment will begin to clog the soil below the permeable pavement. Since the soil cannot be scarified or replaced, this will result in slower infiltration rates over the life of the permeable pavement. Therefore, the reservoir layer is limited to a maximum of 12 inches in depth to ensure that over the life of the BMP, the reservoir layer will drain in an adequate time.

***Note**: All permeable pavement BMP installations (not including Permeable Pavement as a source control BMP i.e. a self-retaining area) must be tested by the geotechnical engineer to ensure that the soils drain at a minimum allowable rate to ensure drainage.. See the Infiltration Testing Section of this manual for specific details for the required testing and applied factors of safety.*

Sloping Permeable Pavement

Ideally permeable pavement would be level, however most sites will have a mild slope. If the tributary drainage area is too steep, the water may be flowing too fast when it approaches the permeable pavement, which may cause water to pass over the pavement instead of percolating and entering the reservoir layer. If the maximum slopes shown in Table 1 are complied with, it should address these concerns.

Table 1: Design Parameters for Permeable Pavement

Design Parameter	Permeable Pavement
Maximum slope of permeable pavement	3%
Maximum contributing area slope	5%

Regardless of the slope of the pavement surface design, the bottom of the reservoir layers **shall be flat and level** as shown in Figure 3. The design shown ensures that the water quality volume will be contained in the reservoir layer. A terraced design utilizing non-permeable check dams may be a useful option when the depth of gravel becomes too great as shown in Figure 3.

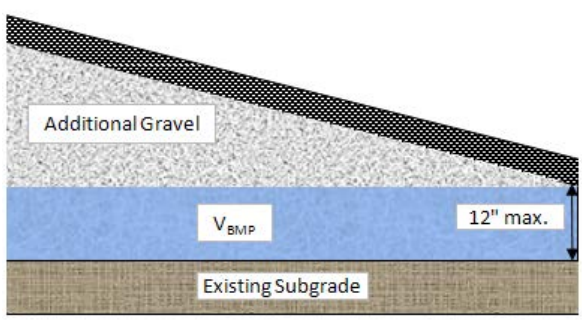

Figure 3: Sloped Cross Sections for Permeable Pavement

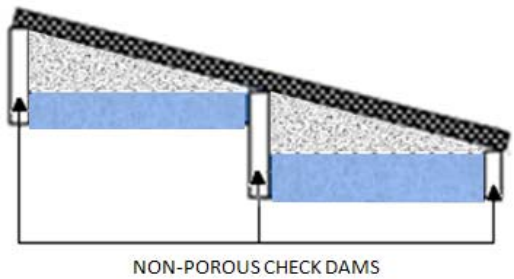

Figure 4: Permeable Pavement with Non-permeable Check Dams

In Figure 4, the bottom of the gravel reservoir layer is incorrectly sloped parallel to the pavement surface. Water would only be allowed to pond up to the lowest point of the BMP. Additional flows would simply discharge from the pavement. Since only a portion of the gravel layer can store water, this design would result in insufficient capacity. This is not acceptable.

Figure 5: Incorrect Sloping of Permeable Pavement

To assure that the subgrade will empty within the 24 hour drawdown time, it is important that the maximum depth of 12 inches for the reservoir layer discussed in the design procedure is not exceeded. The value should be measured from the lowest elevation of the slope (Figure 4).

Minimum Surface Area

The minimum surface area required, A_S, is calculated by dividing the water quality volume, V_{BMP}, by the depth of water stored in the reservoir layer. The depth of water is found by multiplying the void ratio of the reservoir aggregate by the depth of the layer, b_{TH}. The void ratio of the reservoir aggregate is typically 40%; the maximum reservoir layer depth is 12".

Sediment Control

A pretreatment BMP should be used for sediment control. This pretreatment BMP will reduce the amount of sediment that enters the system and reduce clogging. The pretreatment BMP will also help to spread runoff flows, which allows the system to infiltrate more evenly. The pretreatment BMP must discharge to the surface of the pavement and not the subgrade. Grass swales may also be used as part of a treatment train with permeable pavements.

Liners and Filter Fabric

Always consult your geotechnical engineer for site specific recommendations regarding liners and filter fabrics. Filter fabric may be used around the edges of the permeable pavement; this will help keep fine sediments from entering the system. Unless recommended for the site, impermeable liners are not to be used below the subdrain gravel layer.

Overflow

An overflow route is needed in the permeable pavement design to bypass storm flows larger than the V_{BMP} or in the event of clogging. Overflow systems must connect to an acceptable discharge point such as a downstream conveyance system.

Roof Runoff

Permeable pavement can be used to treat roof runoff. However, the runoff cannot be discharged beneath the surface of the pavement directly into the subgrade, as shown in Figure 6. Instead the pipe should empty on the surface of the permeable pavement as shown in Figure 7. A filter on the drainpipe should be used to help reduce the amount of sediment that enters the permeable pavement.

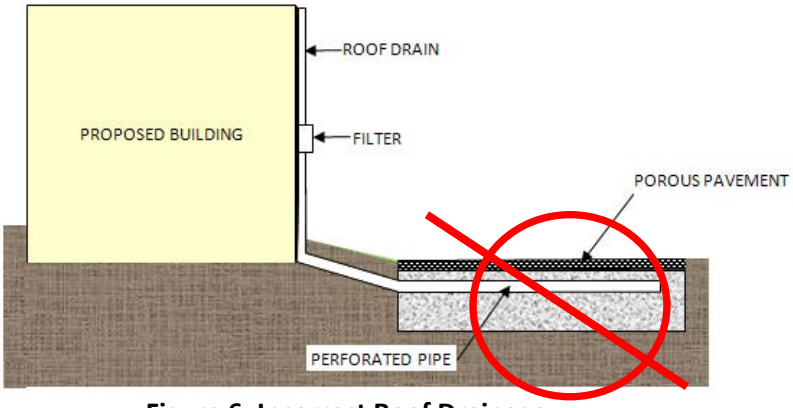

Figure 6: Incorrect Roof Drainage

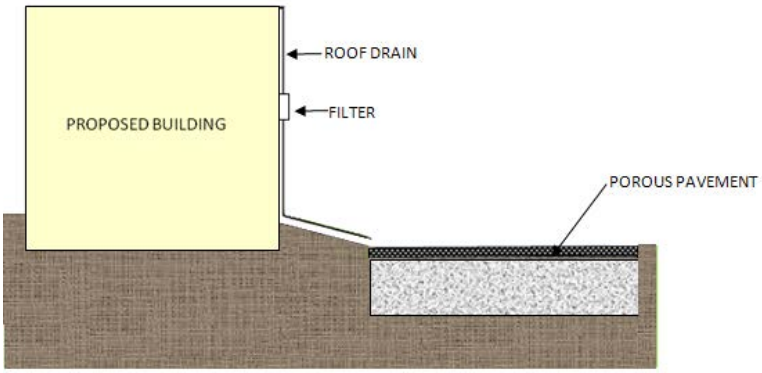

Figure 7: Correct Roof Runoff Drainage

Infiltration

Refer to the Infiltration Testing Section (Appendix A) in this manual for recommendations on testing for this BMP.

Pavement Section

The cross section necessary for infiltration design of permeable pavement includes:

- The thickness of the layers of permeable pavement, sand and bedding layers depends on whether it is permeable modular block or pervious pavement. A licensed geotechnical or civil engineer is required to determine the thickness of these upper layers appropriate for the pavement type and expected traffic loads.
- A 12" maximum reservoir layer consisting of AASHTO #57 gravel vibrated in place or equivalent with a minimum of 40% void ratio.

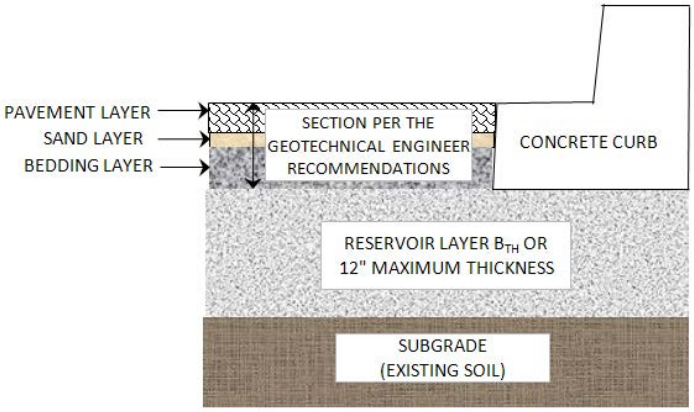

Figure 8: Infiltration Cross Section

Inspection and Maintenance Schedule –Modular Block

Schedule	Activity
Ongoing	• Keep adjacent landscape areas maintained. Remove clippings from landscape maintenance activities. • Remove trash and debris
Utility Trenching and other pavement repairs	• Remove and reset modular blocks, structural section and reservoir layer as needed. Replace damaged blocks in-kind. • Do not pave repaired areas with impermeable surfaces.
After storm events	• Inspect areas for ponding
2-3 times per year	• Sweep to reduce the chance of clogging
As needed	• Sand between pavers may need to be replaced if infiltration capacity is lost

Inspection and Maintenance Schedule –Pervious Concrete/Asphalt

Schedule	Activity
Ongoing	• Keep adjacent landscape areas maintained. Remove clippings from landscape maintenance activities. • Remove trash and debris
Utility Trenching other pavement repairs	• Replace structural section and reservoir layer in kind. • Re-pave using pervious concrete/asphalt. Do not pave repaired areas with impermeable surfaces.
After storm events	• Inspect areas for ponding
2-3 times per year	• Vacuum the permeable pavement to reduce the chance of clogging
As needed	• Remove and replace damaged or destroyed permeable pavement

Design Procedure Permeable Pavement

1. Enter the Tributary Area, A_T.

2. Enter the Design Volume, V_{BMP}, determined from Section 2.1 of this Handbook.

3. Enter the reservoir layer depth, b_{TH} for the proposed permeable pavement. The reservoir layer maximum depth is 12 inches.

4. Calculate the Minimum Surface Area, A_S, required.

$$A_S(\text{ft}) = \frac{V_{BMP}\ (\text{ft}^3)}{(0.4\ \times\ b_{TH}\ (\text{in}))/12(\text{in/ft})}$$

   Where, the porosity of the gravel in the reservoir layer is assumed to be 40%.

5. Enter the proposed surface area and ensure that this is equal to or greater than the minimum surface area required.

6. Enter the dimensions, per the geotechnical engineer's recommendations, for the pavement cross section. The cross section includes a pavement layer, usually a sand layer and a permeable bedding layer. Then add this to the maximum thickness of the reservoir layer to find the total thickness of the BMP.

7. Enter the slope of the top of the permeable pavement. The maximum slope is 3%.

8. Enter whether sediment control was provided.

9. Enter whether the geotechnical approach is attached.

10. Describe the surfaces surrounding the permeable pavement. It is preferred that a vegetation buffer is used around the permeable pavement.
11. Check to ensure that vertical setbacks are met. There should be a minimum of 10 feet between the bottom of the BMP and the top of the high groundwater table, and a minimum of 5 feet between the reservoir layer the top of the impermeable layer.

Reference Materials Used to Develop this Fact Sheet:

Adams, Michelle C. "Porous Asphalt Pavement with Recharge Beds: 20 Years and Still Working." Stormwater Magazine May-June 2003.

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Bean, E. Z., et al. "Study on the Surface Infiltration Rate of Permeable Pavements." Water and Environment Specialty Conference of the Canadian Society for Civil Engineering. Saskatoon, 2004. 1-10.

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Camp Dresser and McKee Inc.; Larry Walker Associates. California Stormwater Best Management Practice Handbook for New Development and Redevelopment. California Stormwater Quality Association (CASQA), 2004.

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Sacramento Stormwater Quality Partnership and the City of Roseville. Stormwater Quality Design Manual for the Sacramento and South Placer Regions. County of Sacramento, 2007.

Taylor, Chuck. "Advanced Pavement Technology." Riverside, 2008.

Tennis, Paul D., Michael L. Leming and David J. Akers. Pervious Concrete Pavements. Silver Spring: Portland Cement Association and National Ready Mixed Concrete Association, 2004.

Urban Drainage and Flood Control District. Urban Storm Drainage Criteria Manual Volume 3 - Best Management Practices. Vol. 3. Denver, 2008. 3 vols.

Urbonas, Ben R. Stormwater Sand Filter Sizing and Design: A Unit Operations Approach. Denver: Urban Drainage and Flood Control District, 2002.

Permeable Pavement - Design Procedure	BMP ID	Legend:	Required Entries
			Calculated Cells

Company Name: _____ Date: _____

Designed by: _____ County/City Case No.: _____

Design Volume

Enter the area tributary to this feature A_T= _____ acres

Enter V_{BMP} determines from Section 2.1 of this Handbook V_{BMP}= _____ ft^3

Permeable Pavement Surface Area

Reservoir Layer Depth, b_{TH} b_{TH}= _____ inches

Minimum Surface Area Required, A_S

$$A_{S\,(ft)} = \frac{V_{BMP}\,(ft^3)}{(0.4 \times b_{TH}\,(in))\,/\,12(in/ft)}$$

A_S= _____ ft^2

Proposed Surface Area = _____ ft^2

Permeable Pavement Cross Section

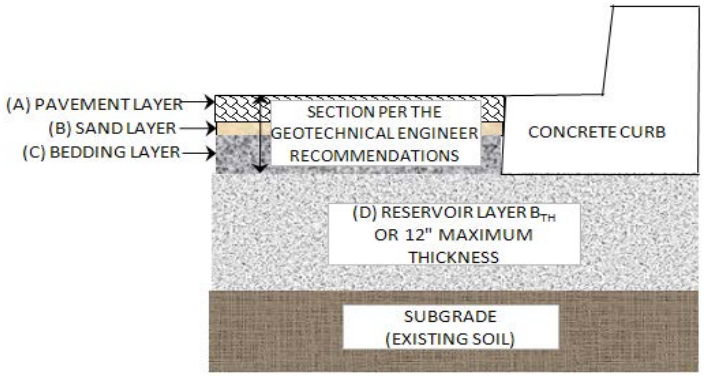

Per the Geotechnical Engineer's Recommendations	(A)	_____	in
	(B)	_____	in
	(C)	_____	in
Reservoir Layer	(D)	_____	in
Total Permeable Pavement Section		_____	in
Slope of Permeable Pavement		_____	%

Sediment Control Provided? (Use pulldown) _____

Geotechnical report attached? (Use pulldown) _____

Describe Surrounding Vegetation: _____

Notes: _____

If the permeable pavement has been designed correctly, there should be no error messages on the spreadsheet.

3.4 Harvest and Use BMPs

Type of BMP	LID – Harvest and Use
Treatment Mechanisms	Volume Reduction
Minimum Tributary Drainage Area	This BMP is generally limited by the cistern / detention storage size.
Other Names	Cistern, Above-Ground Cistern, Underground Detention

Description

Harvest and use BMPs include both above-ground and underground cisterns / vaults. Such BMPs collect and temporarily store runoff for later non-potable uses including the following:

- Irrigation
- Toilet flushing
- Other non-potable uses, such as industrial processes

Above-ground cisterns collect and temporarily store runoff from rooftops or other above-ground impervious surfaces. Underground cisterns include subsurface tanks, vaults and oversized pipes that temporarily store runoff for later use. These systems can include pipes that divert runoff to the cistern, an overflow system for when the cistern is full, a pump, and a distribution system to supply the intended uses.

Siting Considerations

- The primary feasibility consideration for harvest and use BMPs is the presence of a consistent and reliable demand that is sufficient to drain the BMPs between storms. When designing harvest and use systems for stormwater management, a reliable method of quickly regenerating storage capacity (through the use of the captured stormwater) must exist to ensure that there will be adequate storage capacity for subsequent storms in the wet season.
- Other feasibility considerations include potential conflicts with health and plumbing codes. Applicable health codes focus mainly on the potential impacts of long-term standing water in the BMP facility.
- For above-ground cisterns, the facilities should be installed on a level surface, either on consolidated and stable native soil, or on a concrete pad. A geotechnical analysis is required to ensure stability.
- For underground detention facilities, **pretreatment** must be provided where necessary or as directed by the Engineering Authority, to prevent accumulation of sediments within the BMP. These facilities should be installed on consolidated and stable native soil. A geotechnical analysis is required to ensure stability.

Key Design Elements

- All cisterns must:
  - Have provisions for mosquito prevention and abatement.
  - Have mechanisms to keep debris and animals from entering the cistern, and have a mechanism to easily clean any/all screens.
  - Have provisions for safe overflow of runoff when the cistern is full. Overflow shall be directed to an appropriate area as approved by the Engineering Authority. Dispersion within vegetated areas is preferred.
  - Have adequate access to maintain and/or replace the cistern and all associated equipment such as pumps. For underground cisterns / vaults, this includes access adequate to remove any/all accumulated sediment.
  - Be designed in a manner that allows for supplemental potable water to be used when there is insufficient harvested water to fully meet required demands.
  - Include measures acceptable to the local water supplier to prevent harvested storm water from being introduced into the potable water supply.

See the following figures for *examples* of common elements of above-ground and underground cisterns. The proposed design elements and configurations must be approved by the Engineering Authority.

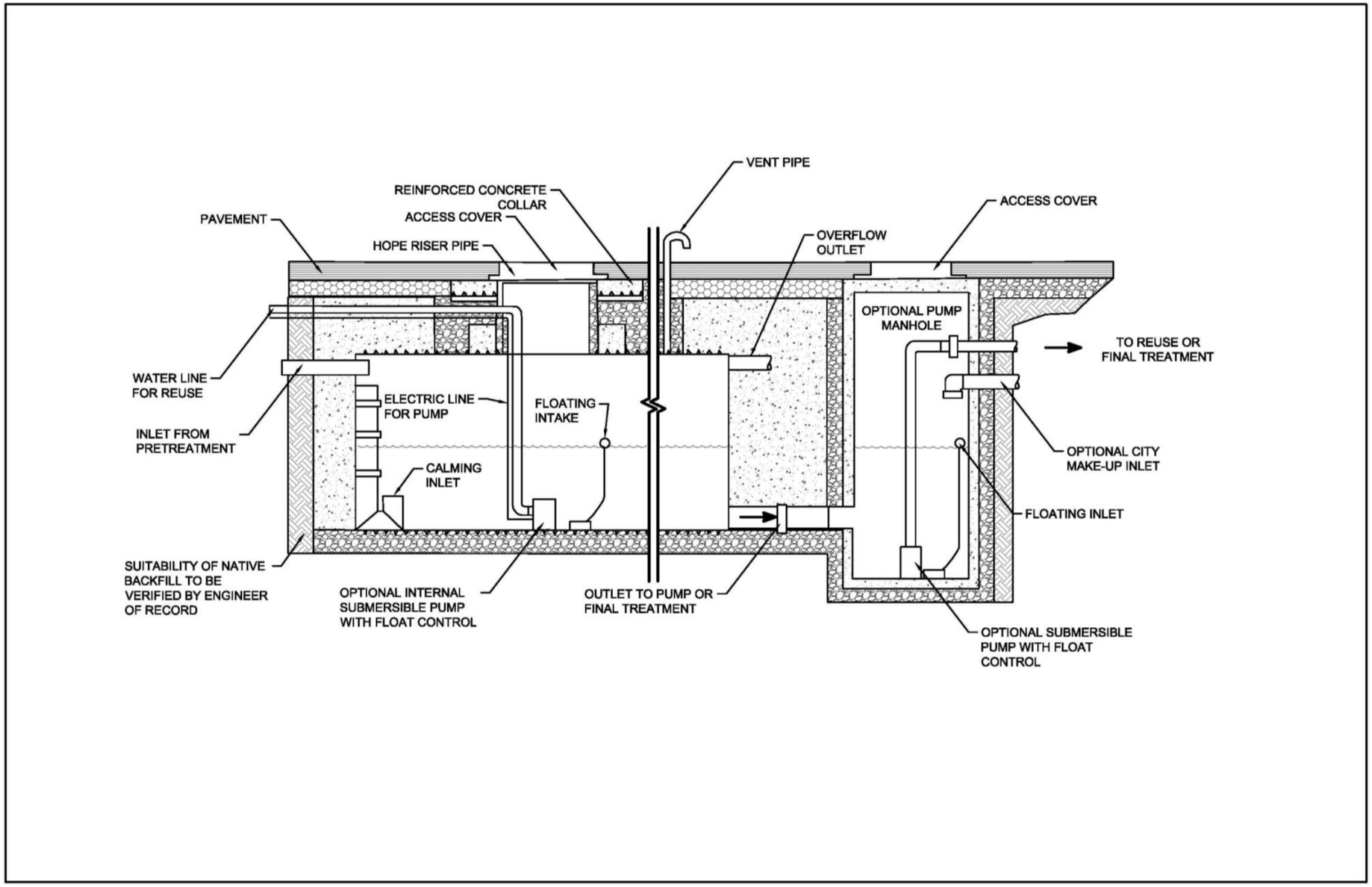

Figure 1 – Common Design Elements of Underground Cistern

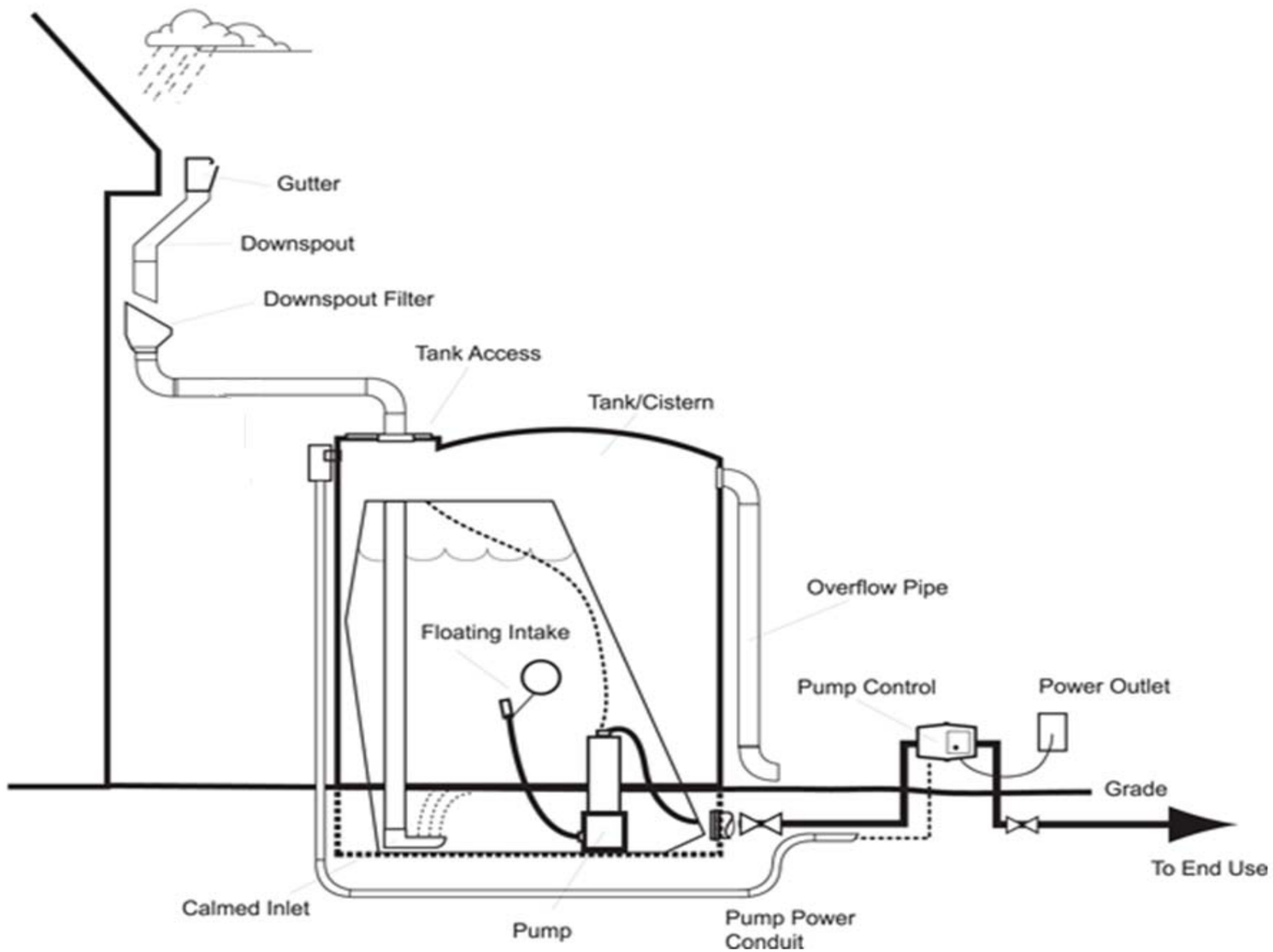

Figure 2 – Common Design Elements of Above-ground Cistern
Graphic courtesy of BRAE

Design and Sizing Criteria

1. Assess whether there is sufficient and reliable (year-round) demand for non-potable use of the runoff from the area tributary to the BMP. Consider seasonal variations in demand for harvested water, such as irrigation needs during the wet season, periodic facility closures (such as for schools), etc. Verify with the Engineering Authority (EA) and the applicable WQMP for applicability requirements / restrictions for this BMP. The following potential on-site uses for harvested rainwater are typically assessed:

    a. Irrigation use
    b. Toilet use
    c. Other non-potable uses (i.e. industrial use)

2. If there is a sufficient on-site demand for harvested rainwater acceptable to the Engineering Authority, determine the Design Capture Volume, V_{BMP}, determined from Section 2.1 of this Handbook.

3. Size the cistern to hold and allow for the use of the Design Capture Volume, in accordance with any manufacturer specifications.

Inspection and Maintenance Schedule

Schedule	Activity
Annually before the wet season	• Check for debris and sediment on screens and overflow facilities and remove where observed. • Verify proper operation of all pumps. • Check integrity of downspout connections to harvest and use BMPs • Check locking mechanisms on facility entry covers • Check integrity of mosquito screens
After storm events	• Check for long-term standing water in the facility. If standing water is observed more than 72 hours after the last storm event, monitor water levels, and verify that the water is being drawn down through the intended use of the water. If water is not properly being drawn down ensure that all pumps distribution systems are functioning correctly. Under no circumstances shall water retained within a cistern be pumped or otherwise drained in a manner that could allow a discharge to a street or storm drain. • Remove debris and sediment from screens and overflow facilities

3.5 Bioretention Facility

Type of BMP	LID – Bioretention
Treatment Mechanisms	Infiltration, Evapotranspiration, Evaporation, Biofiltration
Maximum Drainage Area	This BMP is intended to be integrated into a project's landscaped area in a distributed manner. Typically, contributing drainage areas to Bioretention Facilities range from less than 1 acre to a maximum of around 10 acres.
Other Names	Rain Garden, Bioretention Cell, Bioretention Basin, Biofiltration Basin, Landscaped Filter Basin, Porous Landscape Detention

Description

Bioretention Facilities are shallow, vegetated basins underlain by an engineered soil media. Healthy plant and biological activity in the root zone maintain and renew the macro-pore space in the soil and maximize plant uptake of pollutants and runoff. This keeps the Best Management Practice (BMP) from becoming clogged and allows more of the soil column to function as both a sponge (retaining water) and a highly effective and self-maintaining biofilter. In most cases, the bottom of a Bioretention Facility is unlined, which also provides an opportunity for infiltration to the extent the underlying onsite soil can accommodate. When the infiltration rate of the underlying soil is exceeded, fully biotreated flows are discharged via underdrains. Bioretention Facilities therefore will inherently achieve the maximum feasible level of infiltration and evapotranspiration and achieve the minimum feasible (but highly biotreated) discharge to the storm drain system.

Siting Considerations

These facilities work best when they are designed in a relatively level area. Unlike other BMPs, Bioretention Facilities can be used in smaller landscaped spaces on the site, such as:

- ✓ Parking islands
- ✓ Medians
- ✓ Site entrances

Landscaped areas on the site (such as may otherwise be required through minimum landscaping ordinances), can often be designed as Bioretention Facilities. This can be accomplished by:

- *Depressing* landscaped areas below adjacent impervious surfaces, rather than elevating those areas
- Grading the site to direct runoff from those impervious surfaces *into* the Bioretention Facility, rather than away from the landscaping
- Sizing and designing the depressed landscaped area as a Bioretention Facility as described in this Fact Sheet

Bioretention Facilities should however not be used downstream of areas where large amounts of sediment can clog the system. Placing a Bioretention Facility at the toe of a steep slope should also be avoided due to the potential for clogging the engineered soil media with erosion from the slope, as well as the potential for damaging the vegetation.

Design and Sizing Criteria

The recommended cross section necessary for a Bioretention Facility includes:

- Vegetated area
- 18' minimum depth of engineered soil media
- 12' minimum gravel layer depth with 6' perforated pipes (added flow control features such as orifice plates may be required to mitigate for HCOC conditions)

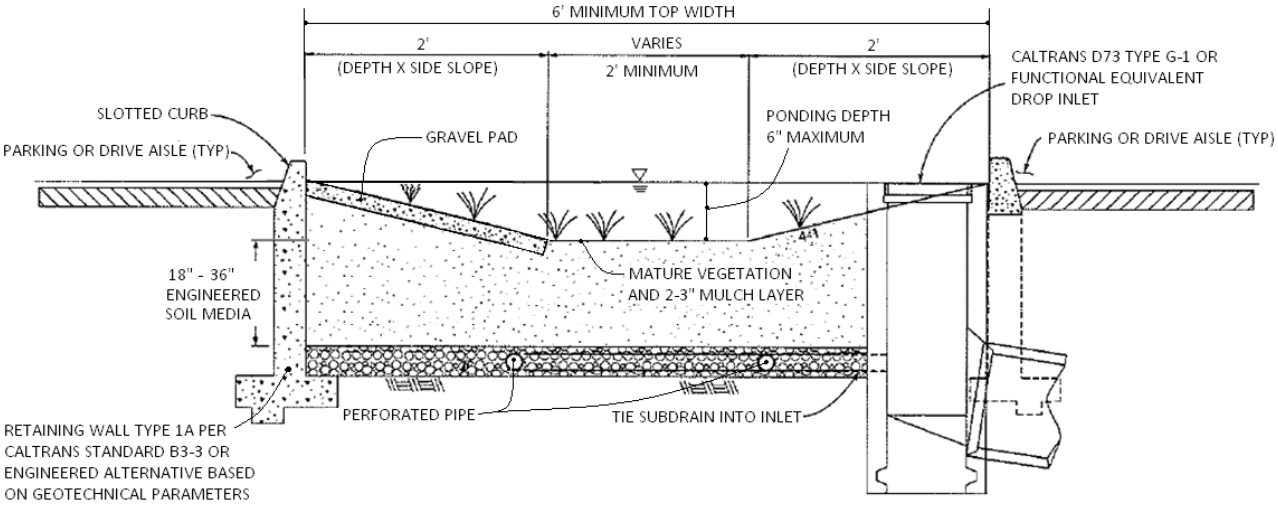

While the 18-inch minimum engineered soil media depth can be used in some cases, it is recommended to use 24 inches or a preferred 36 inches to provide an adequate root zone for the chosen plant palate. Such a design also provides for improved removal effectiveness for nutrients. The recommended ponding depth inside of a Bioretention Facility is 6 inches; measured from the flat bottom surface to the top of the water surface as shown in Figure 1.

Because this BMP is filled with an engineered soil media, pore space in the soil and gravel layer is assumed to provide storage volume. However, several considerations must be noted:

- Surcharge storage above the soil surface (6 inches) is important to assure that design flows do not bypass the BMP when runoff exceeds the soil's absorption rate.
- In cases where the Bioretention Facility contains engineered soil media deeper than 36 inches, the pore space within the engineered soil media can only be counted to the 36-inch depth.
- A maximum of 30 percent pore space can be used for the soil media whereas a maximum of 40 percent pore space can be use for the gravel layer.

Figure 1: Standard Layout for a Bioretention Facility

Engineered Soil Media Requirements

The engineered soil media shall be comprised of 85 percent mineral component and 15 percent organic component, by volume, drum mixed prior to placement. The mineral component shall be a Class A sandy loam topsoil that meets the range specified in Table 1 below. The organic component shall be nitrogen stabilized compost[1], such that nitrogen does not leach from the media.

Table 1: Mineral Component Range Requirements

Percent Range	Component
70-80	Sand
15-20	Silt
5-10	Clay

The trip ticket, or certificate of compliance, shall be made available to the inspector to prove the engineered mix meets this specification.

Vegetation Requirements

Vegetative cover is important to minimize erosion and ensure that treatment occurs in the Bioretention Facility. The area should be designed for at least 70 percent mature coverage throughout the Bioretention Facility. To prevent the BMP from being used as walkways, Bioretention Facilities shall be planted with a combination of small trees, densely planted shrubs, and natural grasses. Grasses shall be native or ornamental; preferably ones that do not need to be mowed. The application of fertilizers and pesticides should be minimal. To maintain oxygen levels for the vegetation and promote biodegradation, it is important that vegetation not be completely submerged for any extended period of time. Therefore, a maximum of 6 inches of ponded water shall be used in the design to ensure that plants within the Bioretention Facility remain healthy.

A 2 to 3-inch layer of standard shredded aged hardwood mulch shall be placed as the top layer inside the Bioretention Facility. The 6-inch ponding depth shown in Figure 1 above shall be measured from the top surface of the 2 to 3-inch mulch layer.

Curb Cuts

To allow water to flow into the Bioretention Facility, 1-foot-wide (minimum) curb cuts should be placed approximately every 10 feet around the perimeter of the Bioretention Facility. Figure 2 shows a curb cut in a Bioretention Facility. Curb cut flow lines must be at or above the V_{BMP} water surface level.

[1] For more information on compost, visit the US Composting Council website at: http://compostingcouncil.org/

Figure 2: Curb Cut located in a Bioretention Facility

To reduce erosion, a gravel pad shall be placed at each inlet point to the Bioretention Facility. The gravel should be 1- to 1.5-inch diameter in size. The gravel should overlap the curb cut opening a minimum of 6 inches. The gravel pad inside the Bioretention Facility should be flush with the finished surface at the curb cut and extend to the bottom of the slope.

In addition, place an apron of stone or concrete, a foot square or larger, inside each inlet to prevent vegetation from growing up and blocking the inlet. See Figure 3.

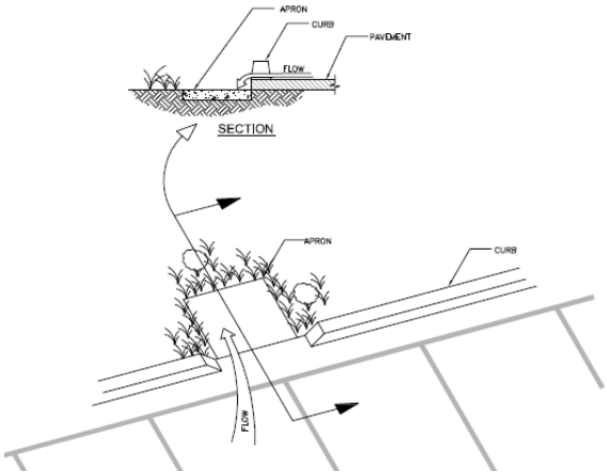

Figure 3: Apron located in a Bioretention Facility

Terracing the Landscaped Filter Basin

It is recommended that Bioretention Facilities be level. In the event the facility site slopes and lacks proper design, water would fill the lowest point of the BMP and then discharge from the basin without being treated. To ensure that the water will be held within the Bioretention Facility on sloped sites, the BMP must be terraced with nonporous check dams to provide the required storage and treatment capacity.

The terraced version of this BMP shall be used on non-flat sites with no more than a 3 percent slope. The surcharge depth cannot exceed 0.5 feet, and side slopes shall not exceed 4:1. Table 2 below shows the spacing of the check dams, and slopes shall be rounded up (i.e., 2.5 percent slope shall use 10' spacing for check dams).

Table 2: Check Dam Spacing

6” Check Dam Spacing	
Slope	**Spacing**
1%	*25'*
2%	*15'*
3%	*10'*

Roof Runoff

Roof downspouts may be directed towards Bioretention Facilities. However, the downspouts must discharge onto a concrete splash block to protect the Bioretention Facility from erosion.

Retaining Walls

It is recommended that Retaining Wall Type 1A, per Caltrans Standard B3-3 or equivalent, be constructed around the entire perimeter of the Bioretention Facility. This practice will protect the sides of the Bioretention Facility from collapsing during construction and maintenance or from high service loads adjacent to the BMP. Where such service loads would not exist adjacent to the BMP, an engineered alternative may be used if signed by a licensed civil engineer.

Side Slope Requirements

Bioretention Facilities Requiring Side Slopes

The design should assure that the Bioretention Facility does not present a tripping hazard. Bioretention Facilities proposed near pedestrian areas, such as areas parallel to parking spaces or along a walkway, must have a gentle slope to the bottom of the facility. Side slopes inside of a Bioretention Facility shall be 4:1. A typical cross section for the Bioretention Facility is shown in Figure 1.

Bioretention Facilities Not Requiring Side Slopes

Where cars park perpendicular to the Bioretention Facility, side slopes are not required. A 6-inch maximum drop may be used, and the Bioretention Facility must be planted with trees and shrubs to prevent pedestrian access. In this case, a curb is not placed around the Bioretention Facility,

but wheel stops shall be used to prevent vehicles from entering the Bioretention Facility, as shown in Figure 4.

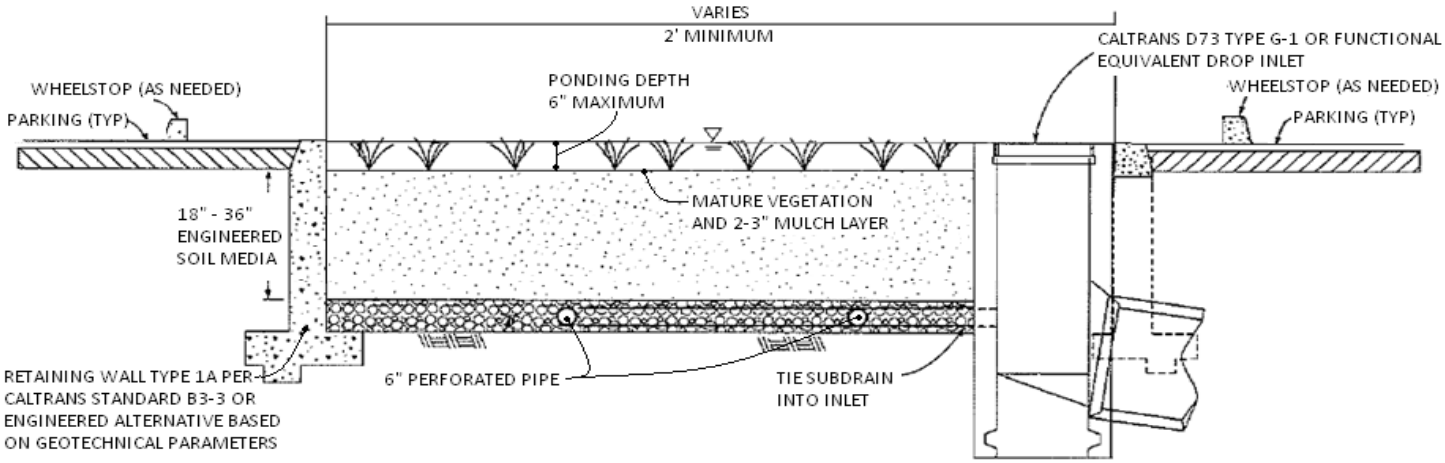

Planter Boxes

Bioretention Facilities can also be placed above ground as planter boxes. Planter boxes must have a minimum width of 2 feet, a maximum surcharge depth of 6 inches, and no side slopes are necessary. Planter boxes must be constructed so as to ensure that the top surface of the engineered soil media will remain level. This option may be constructed of concrete, brick, stone or other stable materials that will not warp or bend. Chemically treated wood or galvanized steel, which has the ability to contaminate stormwater, should not be used. Planter boxes must be lined with an impermeable liner on all sides, including the bottom. Due to the impermeable liner, the inside bottom of the planter box shall be designed and constructed with a cross fall, directing treated flows within the subdrain layer toward the point where subdrain exits the planter box, and subdrains shall be oriented with drain holes oriented down. These provisions will help avoid excessive stagnant water within the gravel underdrain layer. Similar to the in-ground Bioretention Facility versions, this BMP benefits from healthy plants and biological activity in the root zone. Planter boxes should be planted with appropriately selected vegetation.

Figure 5: Planter Box
Source: LA Team Effort

Overflow

An overflow route is needed in the Bioretention Facility design to bypass stored runoff from storm events larger than V_{BMP} or in the event of facility or subdrain clogging. Overflow systems must connect to an acceptable discharge point, such as a downstream conveyance system as shown in Figure 1 and Figure 4. The inlet to the overflow structure shall be elevated inside the Bioretention Facility to be flush with the ponding surface for the design capture volume (V_{BMP}) as shown in Figure 4. This will allow the design capture volume to be fully treated by the Bioretention Facility, and for larger events to safely be conveyed to downstream systems. The overflow inlet shall **not** be located in the entrance of a Bioretention Facility, as shown in Figure 6.

Underdrain Gravel and Pipes

An underdrain gravel layer and pipes shall be provided in accordance with Appendix B – Underdrains.

Figure 6: Incorrect Placement of an Overflow Inlet.

Inspection and Maintenance Schedule

The Bioretention Facility area shall be inspected for erosion, dead vegetation, soggy soils, or standing water. The use of fertilizers and pesticides on the plants inside the Bioretention Facility should be minimized.

Schedule	Activity
Ongoing	• Keep adjacent landscape areas maintained. Remove clippings from landscape maintenance activities. • Remove trash and debris • Replace damaged grass and/or plants • Replace surface mulch layer as needed to maintain a 2-3 inch soil cover.
After storm events	• Inspect areas for ponding
Annually	• Inspect/clean inlets and outlets

Bioretention Facility Design Procedure

1) Enter the area tributary, A_T, to the Bioretention Facility.

2) Enter the Design Volume, V_{BMP}, determined from Section 2.1 of this Handbook.

3) Select the type of design used. There are two types of Bioretention Facility designs: the standard design used for most project sites that include side slopes, and the modified design used when the BMP is located perpendicular to the parking spaces or with planter boxes that do not use side slopes.

4) Enter the depth of the engineered soil media, d_S. The minimum depth for the engineered soil media can be 18' in limited cases, but it is recommended to use 24' or a preferred 36' to provide an adequate root zone for the chosen plant palette. Engineered soil media deeper than 36' will only get credit for the pore space in the first 36'.

5) Enter the top width of the Bioretention Facility.

6) Calculate the total effective depth, d_E, within the Bioretention Facility. The maximum allowable pore space of the soil media is 30% while the maximum allowable pore space for the gravel layer is 40%. Gravel layer deeper than 12' will only get credit for the pore space in the first 12'.

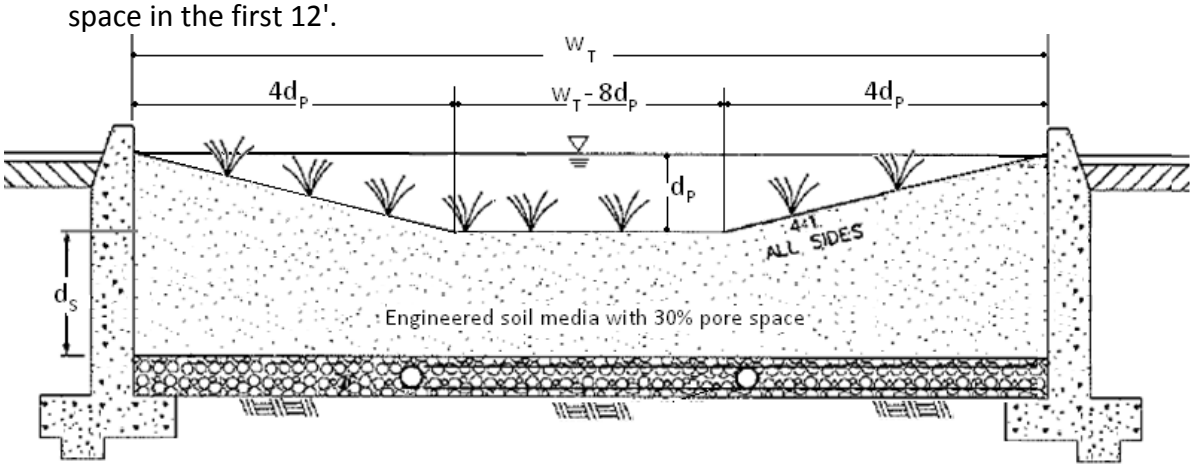

a. For the design with side slopes the following equation shall be used to determine the total effective depth. Where, d_P is the depth of ponding within the basin.

$$d_E(\text{ft}) = \frac{0.3 \times \left[\left(w_T(\text{ft}) \times d_S(\text{ft})\right) + 4\left(d_P(\text{ft})\right)^2\right] + 0.4 \times 1(\text{ft}) + d_P(\text{ft})\left[4d_P(\text{ft}) + \left(w_T(\text{ft}) - 8d_P(\text{ft})\right)\right]}{w_T(\text{ft})}$$

This above equation can be simplified if the maximum ponding depth of 0.5' is used. The equation below is used on the worksheet to find the minimum area required for the Bioretention Facility:

$$d_E(\text{ft}) = (0.3 \times d_S(\text{ft}) + 0.4 \text{ x } 1(\text{ft})) - \left(\frac{0.7\ (\text{ft}^2)}{w_T(\text{ft})}\right) + 0.5(\text{ft})$$

b. For the design without side slopes the following equation shall be used to determine the total effective depth:

$$d_E(\text{ft}) = d_P(\text{ft}) + [(0.3) \times d_S(\text{ft}) + (0.4) \times 1(\text{ft})]$$

The equation below, using the maximum ponding depth of 0.5', is used on the worksheet to find the minimum area required for the Bioretention Facility:

$$d_E(\text{ft}) = 0.5\ (\text{ft}) + [(0.3) \times d_S(\text{ft}) + (0.4) \times 1(\text{ft})]$$

7) Calculate the minimum surface area, A_M, required for the Bioretention Facility. This does not include the curb surrounding the Bioretention Facility or side slopes.

$$A_M(\text{ft}^2) = \frac{V_{BMP}(\text{ft}^3)}{d_E\ (\text{ft})}$$

8) Enter the proposed surface area. This area shall not be less than the minimum required surface area.

9) Verify that side slopes are no steeper than 4:1 in the standard design, and are not required in the modified design.

10) Provide the diameter, minimum 6 inches, of the perforated underdrain used in the Bioretention Facility. See Appendix B for specific information regarding perforated pipes.

11) Provide the slope of the site around the Bioretention Facility, if used. The maximum slope is 3 percent for a standard design.

12) Provide the check dam spacing, if the site around the Bioretention Facility is sloped.

13) Describe the vegetation used within the Bioretention Facility.

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Urbonas, Ben R. Stormwater Sand Filter Sizing and Design: A Unit Operations Approach. Denver: Urban Drainage and Flood Control District, 2002.

Bioretention Facility - Design Procedure	BMP ID	Legend:	Required Entries
			Calculated Cells

Company Name:		Date:	
Designed by:		County/City Case No.:	

Design Volume

Enter the area tributary to this feature A_T= _____ acres

Enter V_{BMP} determined from Section 2.1 of this Handbook V_{BMP}= _____ ft^3

Type of Bioretention Facility Design

- (●) Side slopes required (parallel to parking spaces or adjacent to walkways)
- ( ) No side slopes required (perpendicular to parking space or Planter Boxes)

Bioretention Facility Surface Area

Depth of Soil Filter Media Layer d_S = _____ ft

Top Width of Bioretention Facility, excluding curb w_T = _____ ft

Total Effective Depth, d_E

$d_E = (0.3) \times d_S + (0.4) \times 1 - (0.7/w_T) + 0.5$ d_E = _____ ft

Minimum Surface Area, A_m

$$A_M\ (ft^2) = \frac{V_{BMP}\ (ft^3)}{d_E\ (ft)}$$

A_M = _____ ft^2

Proposed Surface Area A= _____ ft^2

Bioretention Facility Properties

Side Slopes in Bioretention Facility z = _____ :1

Diameter of Underdrain _____ inches

Longitudinal Slope of Site (3% maximum) _____ %

6" Check Dam Spacing _____ feet

Describe Vegetation: _____

Notes: _____

3.6 Extended Detention Basin

Type of BMP	LID - Biotreatment
Treatment Mechanisms	Sedimentation, Infiltration, Biofiltration, Evapotranspiration, and Evaporation
Minimum Tributary Drainage Area	5 acres
Other Names	Enhanced Water Quality Basin

Overview

The Extended Detention Basin (EDB) is designed to detain the design volume of stormwater, V_{BMP}, and maximize opportunities for volume losses through infiltration, evaporation, evapotranspiration and surface wetting. Additional pollutant removal is provided through sedimentation, in which pollutants can attach to sediment accumulated in the basin through the process of settling. Stormwater enters the EDB through a *forebay* where any trash, debris, and sediment accumulate for easy removal. Flows from the forebay enter the basin which is vegetated with native grasses that enhance infiltration and evapotranspiration, and which is interspersed with gravel-filled trenches that help further enhance infiltration. Water that does not get infiltrated or evapotranspired is conveyed to the *bottom stage* of the basin. At the bottom stage of the basin, low or incidental dry weather flows will be treated through a sand filter and collected in a subdrain structure. Any additional flows will be detained in the basin for an extended period by incorporating an outlet structure that is more restrictive than a traditional detention basin outlet. The restrictive outlet structure extends the drawdown time of the basin which further allows particles and associated pollutants to settle out before exiting the basin, while maximizing opportunities for additional incidental volume losses.

EXTENDED DETENTION BASIN BMP FACT SHEET

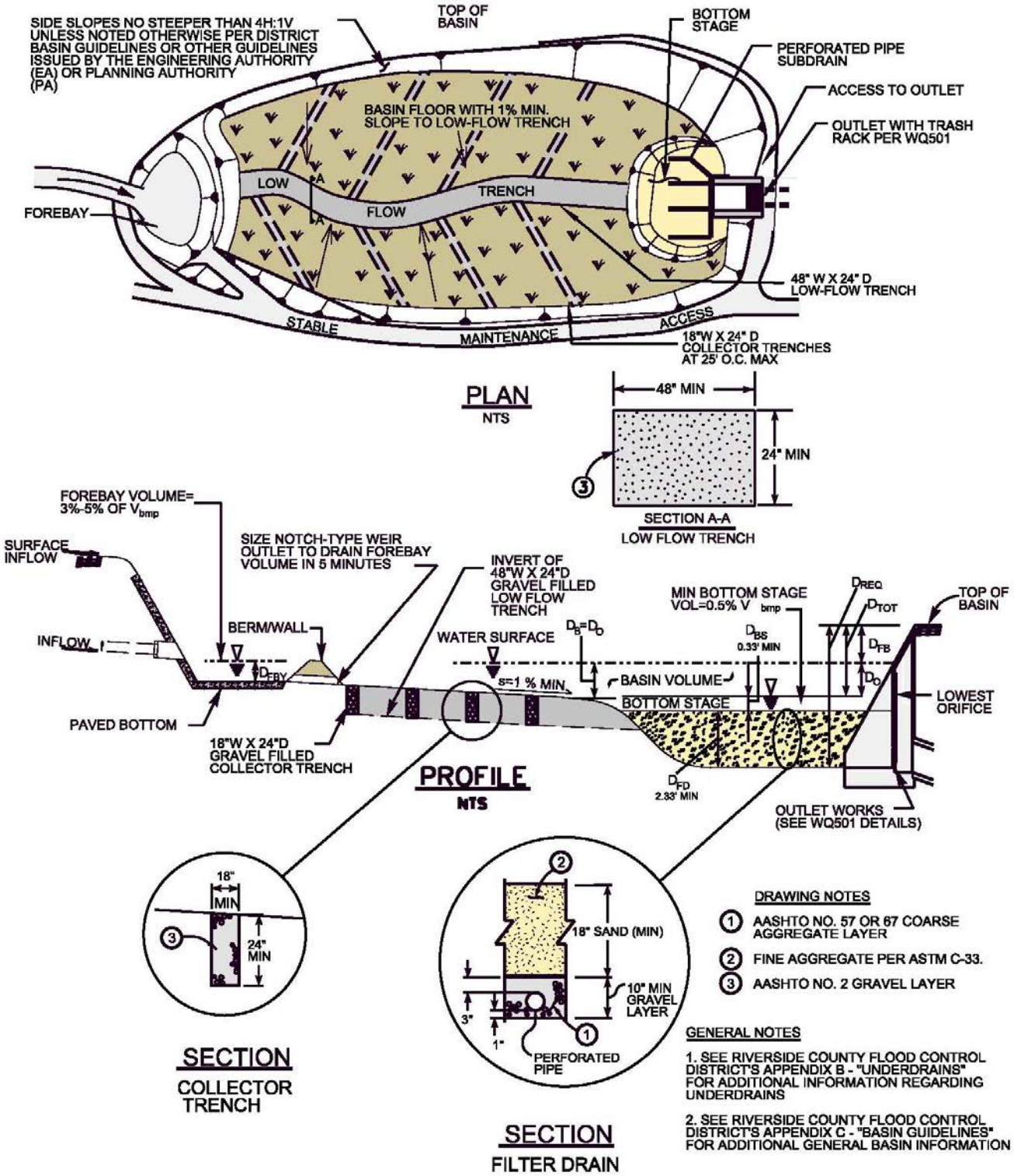

Figure 1 – Extended Detention Basin

Siting Considerations

Soils: EDBs can be used with almost all soils and geology. However, pollutant removal effectiveness is greatly improved when the underlying soil permits at least some infiltration.

Tributary Area: EDBs should only be used where the tributary drainage area is at least 5 acres, since meeting the draw-down requirements (discussed below) for smaller areas would result in very small outlet orifice diameters which would be prone to clogging.

Proximity to Receiving Waters: All site runoff must be treated to the MEP with appropriate BMPs *before* being discharged into Receiving Waters; as such the EDB cannot be constructed in-line within Receiving Waters.

Setbacks: Due to the infiltration characteristics incorporated into the EDB design, the lowest pervious point (beneath the filter drain) of the extended detention facility should be a minimum of 10' above the seasonal high groundwater table. All other setbacks shall be in accordance with applicable standards of the "Basin Guidelines" (Appendix C) or other guidelines issued by the Engineering Authority (EA).

Basin Guidelines: See Section 1 of the "Basin Guidelines" (Appendix C) for additional requirements (i.e., fencing, maintenance access, etc.) that may be required by the Engineering Authority (EA).

Landscaping Requirements

Basin vegetation provides erosion protection, enhances evapotranspiration and infiltration, and improves pollutant removal. The upper stage basin surface, berms and side slopes shall be planted with native grasses. Proper landscape management is also required to ensure that the vegetation does not contribute to water pollution through the use of pesticides, herbicides, or fertilizers. Landscaping shall be in accordance with applicable standards of the "Basin Guidelines" (Appendix C) or other guidelines issued by the EA.

EXTENDED DETENTION BASIN BMP FACT SHEET

Maintenance Guidelines

Schedule	Inspection and Maintenance Activity
During every scheduled maintenance check (per below), and *as needed* at other times	• Maintain vegetation as needed. Use of fertilizers, pesticides and herbicides should be strongly avoided to ensure they don't contribute to water pollution. If appropriate native plant selections and other IPM methods are used, such products shouldn't be needed. If such projects are used: o Care should be taken to avoid contact with the low-flow or other trenches, and the media filter in the bottom stage. o Products shall be applied in accordance with their labeling, especially in relation to application to water, and in areas subjected to flooding. o Fertilizers should not be applied within 15 days before, after, or during the rainy season. • No ponded water should be present for more than 72 hours to avoid nuisance or vector problems. No algae formation should be visible. Correct problems as needed.
Annually. If possible, schedule these inspections before the beginning of the rain season to allow for any repairs to occur before rains occur.	• Remove debris and litter from the entire basin • Inspect hydraulic and structural facilities. Examine the outlet for clogging, the embankment and spillway integrity, as well as damage to any structural element. • Check for erosion, slumping and overgrowth. Repair as needed. • Inspect sand media at the filter drain to verify it is allowing acceptable infiltration. **Scarify top 3 inches by raking the filter drain's sand surface annually.** • Check the media filter underdrains (via the cleanout) for damage or clogging. Repair as needed. • Remove accumulated sediment and debris from the forebay, and ensure that the notch weir is clear and will allow proper drainage. • Check gravel filled low flow and collector trenches for sediment buildup and repair as needed.
Every 5 years or sooner (depending on whether observed drain times to empty the basin are less than 72 hours).	• Remove the top 3 inches of sand from the filter drain and backfill with 3 inches of new sand to return the sand layer to its original depth. When scarification or removal of the top 3 inches of sand is no longer effective, remove and replace sand filter layer.
Whenever substantial sediment accumulation has occurred.	• Remove accumulated sediment from the bottom of the basin. Removal should extend to original basin depth.

EXTENDED DETENTION BASIN BMP FACT SHEET

Design Summary

Design Parameter	Extended Detention Basin
Drawdown time (total)	72 hours [2,3]
Minimum drawdown time for 50% V_{BMP}	24 hours [2]
Minimum tributary area	5 acres [2]
Outlet erosion control	Energy dissipaters to reduce velocities[1]
Forebay volume	3 to 5 % of V_{BMP}[3]
Basin Invert Longitudinal Slope (min.)	1%
Basin Invert Transverse (cross) Slope (min)	1%
Low-flow trench width (min.)	48 inches
Low-flow trench depth (min.)	24 inches
Slope of low-flow trench along bottom excavated Surface (max.)	1%
Slope of gravel collector trenches along bottom excavated surface (max.)	1 %
Length to width ratio (min.)	1.5:1
Basin depth (min.)	1 foot [3]
Bottom stage volume	0.5 % of V_{BMP} [3]
Bottom stage depth (min)	0.33 feet [3]
Filter drain depth (min)	2.33 feet [3]

1. **Ventura County's Technical Guidance Manual for Stormwater Quality Control Measures**
2. **CA Stormwater BMP Handbook for New Development and Significant Redevelopment**
3. **Denver, Colorado's UDFCD Drainage Criteria Manual, Volume 3**

Note: The information contained in this BMP Factsheet is intended to be a summary of design considerations and requirements. Additional information which applies to all detention basins may be found in the "Basin Guidelines" (Appendix C). In addition, information herein may be superseded by other guidelines issued by the Engineering Authority.

Design Procedure

These steps correspond to and provide a description of the information required in the EDB Design Worksheet.

1. Find the Design Volume, V_{BMP}.

a) Enter the tributary area, A_T to the BMP. The minimum tributary area is 5 acres.

b) Enter the Design Volume, V_{BMP}, determined from Section 2.1 of this Handbook.

2. Basin Footprint

a) Enter the length and width of the EDB. The length shall be measured between the inlet to the basin and the outlet structure; and the width shall be measured at the widest point of the basin invert. The length to width ratio should be 1.5:1 or longer to prevent short-circuiting and increase the overall effectiveness of the BMP.

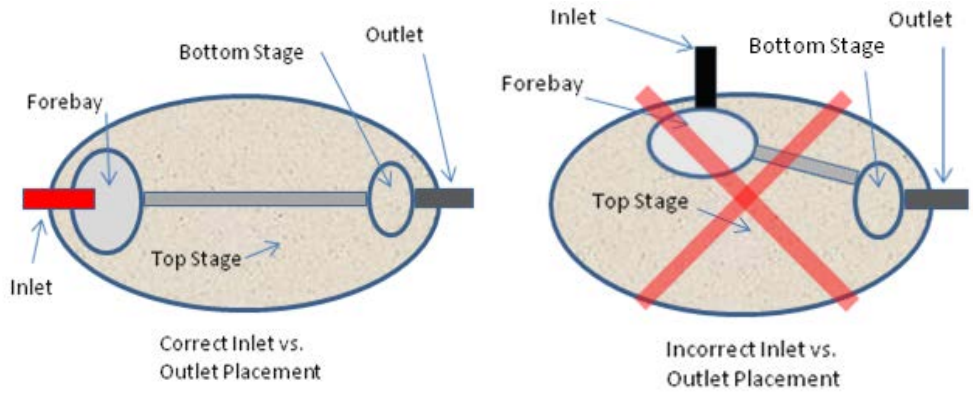

b) Enter the internal basin side slopes. See the "Basin Guidelines" (Appendix C) for side slope requirements. If variable internal side-slopes are used, enter the steepest slope that will be used.

c) Using Figure 1 as a guide, enter the proposed basin depth, D_B, and the freeboard depth, D_{FB}. Based on the information provided, the spreadsheet will calculate the minimum total depth required, D_{REQ}, for this BMP. D_{REQ} is the depth from the bottom of the underdrain layer in the bottom stage (see step 5c), to the top of the freeboard. This calculated minimum required depth can be used to determine if enough elevation difference is available within the design topography to allow for use of this BMP.

d) Additionally, the basin depth D_B is equal to $D_{O,}$ which is the depth from the design pond water surface elevation to the lowest orifice in the outlet structure. D_O is confirmed by the spreadsheet and is used in the Basin Outlet Design described in step 6 below. It should be noted that this lowest orifice is a critical elevation in the design of this BMP. The Volume of the Basin V_{Basin} described in step 3d) is the volume of water above this lowest orifice. This lowest-orifice also represents the dry weather ponded water surface discussed in step 5c below. Below this elevation there must be a minimum of a 4-inch drop down to the surface of the Sand Filter in the bottom stage.

3. Basin Design

a) The Total Basin Depth, D_{TOT}, is calculated automatically, and is the sum of the basin depth D_B plus the freeboard depth D_{FB}.

b) Enter the longitudinal slope of the basin invert. This slope must be at least 1% and is measured along the low flow trench between the forebay and the bottom stage. Note that the surface of the sand layer in the bottom stage must be level (see Figure 1).

c) Enter the transverse slope of the basin invert. This transverse (cross sectional) slope must be at least 1% sloped toward the low flow trench.

d) Enter the Volume of the Basin, V_{Basin}. This volume must be the actual volume of water held within the basin as substantiated by modeling or appropriate volumetric calculations, and must be equal to or greater than V_{BMP}. This volume must be held above the lowest orifice in the Basin Outlet Design described in step 6 below.

4. Forebay Design

All flows must enter the basin through the forebay. The forebay provides a location for the settlement and collection of larger particles, and any other trash or debris. A relatively smooth and level concrete bottom surface should be provided to facilitate mechanical removal of any accumulated sediment, trash and debris.

Figure 2: Forebay filled with storm water

a) Enter the Forebay Volume VFB. This volume must be from 3 to 5 percent of V_{BMP}.

b) A rock or concrete berm must be constructed to detain water before it drains into the basin. The top of the berm shall be set no higher than the invert of the inlet conveyance. Enter the Forebay Depth, D_{FBY}.

c) The spreadsheet will calculate the minimum surface area of the forebay, A_{FB}, based on the provided Forebay Volume and Depth. Ensure that the plans provide for a forbay area at least this large.

d) Although the forebay will be well submerged in the design event, a full height rectangular notch-type weir shall be constructed through the berm to prevent permanent ponding in the forebay, and allow water to slowly and fully drain to the main body of the basin. This notch should be offset from the inflow streamline to prevent low-flows from short circuiting. Enter the width, W, of this rectangular notch weir. The width shall not be less than 1.5 inches to prevent clogging. Additionally,

immediately outside the notch construct a minimum 1-foot by 1-foot gravel pad to prevent vegetative growth within the basin invert from blocking the notch.

5. Dry Weather and Low-Flow Management

The basin shall have both a low-flow gravel trench and a network of gravel collector trenches across the invert of the basin, as well as a bottom stage sand filter to treat low flows and dry weather flows (see Figure 1).

a) Low Flow Trench: The low-flow gravel trench conveys flow from the forebay to the bottom stage, while allowing for maximum incidental infiltration and volume loss. The trench shall be a minimum of 48 inches wide by 24 inches deep. This trench shall be unlined and backfilled with AASHTO No. 2 gravel (or similar) to the finished surface of the basin invert, and shall not use underdrains. The bottom excavated surface of the low-flow trench shall be 1 percent or flatter to promote infiltration.

Figure 3: Gravel filled low-flow trench

b) Collector Trenches: Gravel collector trenches beneath the top stage shall be arranged as illustrated in Figure 1 of Appendix C with minimal slope (1% maximum) along their bottom excavated surface to promote infiltration, and must extend from the low-flow trench to the toe of the basin side slopes. They shall be a minimum of 18-inches wide by 24-inches deep, unlined and backfilled with AASHTO No. 2 gravel (or similar) to the finished basin invert surface. The gravel collector trenches shall not use underdrains and shall be constructed with a maximum spacing of 25 feet, center to center. See Figure 1 of Appendix C.

c) Bottom Stage: A depressed sand filter drain area, referred to as the bottom stage, must be constructed adjacent to the outlet structure to treat any dry weather flows. To ensure that dry weather flows are treated through the sand filter and not discharged through the orifice plate, the top surface of the sand filter must be depressed at least 4 inches below the lowest orifice in the outlet structure. This depressed area will create a micro pool of water that is then filtered down through the sand filter and out through underdrains. Based on the minimum dimensions described below, the minimum depth of excavation below the lowest orifice in the outlet structure is 2.33 feet.

i. Enter the Depth of the bottom stage, D_{BS}. As mentioned above, this depth must be at least 4 inches, and extend down below the lowest orifice in the outlet structure.

ii. Enter the area of the bottom stage, A_{BS}.

iii. Based on the D_{BS} and A_{BS} entered, the spreadsheet will calculate V_{BS}. This volume is the volume of ponded water that will be held below the lowest orifice in the outlet structure, and above the surface of the sand filter. This volume must be at least 0.5% of V_{BMP}.

iv. Enter the thickness of the ASTM C-33 sand layer that will be provided, D_S. A minimum thickness of 18 inches is required.

v. Below the sand layer, a minimum 10-inch thick layer of gravel shall be installed with underdrains to drain the water that has been treated through the sand filter. The underdrains shall connect into the outlet structure. See Appendix B for standard underdrain construction. Enter the diameter of the underdrain pipe (minimum 6" dia.), and the spacing of the underdrains. The maximum spacing of the underdrains is 20 feet on center, however where the area of the bottom stage is particularly small (less than 500 square feet), the underdrain pipes shall be placed at no more than a 10-foot separation on center.

6. Basin Outlet Design

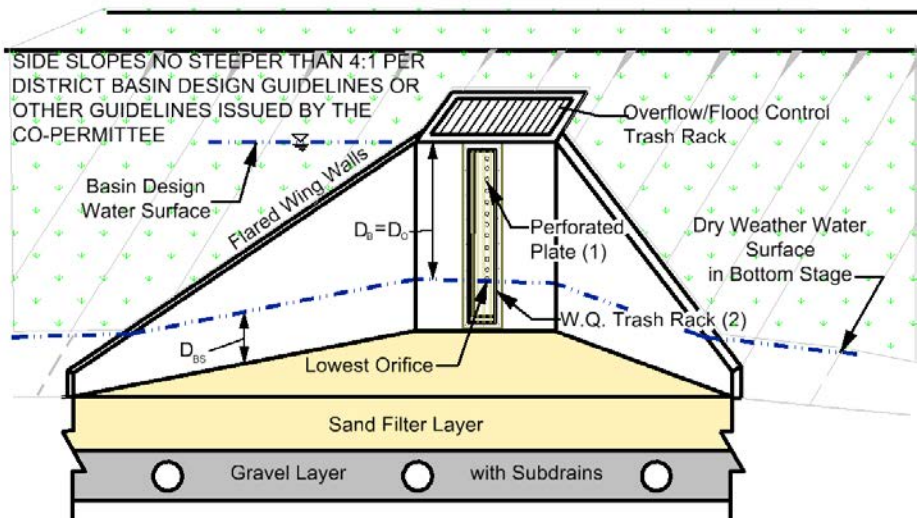

Figure 4: Basin Outlet Structure with Bottom Stage Shown

Outlet structures for publicly maintained basins shall conform to District Standard Drawings WQ501 unless approved in advance by the local Engineering Authority (EA). This standardization is to provide for efficient maintenance. The basin outlet should be sized to release the design volume, VBMP, within a 72-hour period but 50 percent of VBMP within 24 hours. This is an iterative design process where an appropriate control orifice can be selected using the following steps:

a. Develop a Stage vs. Discharge Curve for the Outlet Structure

Estimate the orifice size and outlet plate configuration (number per row, etc.). Based on D_O provided in the Basin Footprint section, the spreadsheet will automatically generate the stage vs. discharge relationship for this outlet:

$$Q = C*A*[2*g*(H-H_o)]^{0.5}$$

Where:

Q = discharge (ft^3/s)

C = orifice coefficient

A = area of the orifice (ft)

g = gravitational constant (32.2 ft2/s)

H = water surface elevation (ft)

H_o = orifice elevation (ft)

The lowest orifice shall be located with its centerline at the top of the bottom stage; at least 4 inches above the surface of the sand filter drain. To help avoid clogging, the minimum orifice diameter is limited to 3/8 inch. Since the 1/4 inch thickness of the orifice plate will be less than the orifice diameter, a value for C of 0.66 may be used. If another value for C is used, justification may be required.

b. Develop a Discharge/Volume vs. Stage Table for the Basin

Based on the shape and size of the basin, develop a relationship between the stage and the volume of water in the basin. Since the orifice spacing is 4 inches on center for the standard orifice plate, the stage intervals must also be 4 inches. Enter the basin volume at each interval starting at the centerline of the lowest orifice.

c. Route the Design Volume through the Basin

The spreadsheet assumes that the Design Volume, $V_{BMP,}$ enters the basin instantaneously and as such, no inflow/outflow hydrograph is necessary. The drawdown time for each stage becomes:

$$\Delta t = V_i/Q$$

Where:

Δt = drawdown time for each stage

V_i = the volume at each stage

Q = the flow rate corresponding to the headwater elevation at each stage.

The spreadsheet automatically determines the drawdown time from the sum of the Δt values for each stage. If the orifice size and plate configuration estimate meets the

hydraulic retention time requirements (50% of the volume empties in not less than 24 hours, 100% of the volume empties in no more than 72 hours), the outlet is correctly sized. If these requirements are not met, select a new orifice size or configuration and repeat the process starting at Step 6a.

7. Outlet Protection

To prevent the orifices from clogging, trash racks are required where perforated vertical outlet control plates are used. This allows for easier access to outlet orifices for inspection and cleaning. Trash racks shall be sized to prevent clogging of the primary water quality outlet without restricting the hydraulic capacity of the outlet control orifices. The orifice plate shall be protected with a trash rack conforming to Standard Drawing WQ501 (at end of this section) with at least six square feet of open surface area or 25 times the total orifice area, whichever is greater. The rack shall be adequately secured to prevent it from being removed or opened when maintenance is not occurring.

Overflow Structure Similar to Standard Drawing Number WQ 501
(Photo courtesy of Colorado Association of Stormwater Floodplain Managers)

Trash rack with screen

8. Overflow Outlet

Overflow outlets for publicly maintained basins shall conform to Standard Drawing WQ501 (at end of this section) unless approved in advance by the Engineering Authority (EA).

9. Embankment

Embankments shall be designed in accordance with applicable standards of Riverside County Flood Control District's "Basin Guidelines" (Appendix C) or other guidelines issued by the Engineering Authority (EA). Where applicable, embankment designs must additionally conform to the requirements of the State of California Division of Safety of Dams.

10. Spillway and Overflow Structures

Spillway and overflow structures should be designed in accordance with applicable standards of the "Basin Guidelines" (Appendix C) or other guidelines issued by the Engineering Authority (EA).

EXTENDED DETENTION BASIN BMP FACT SHEET

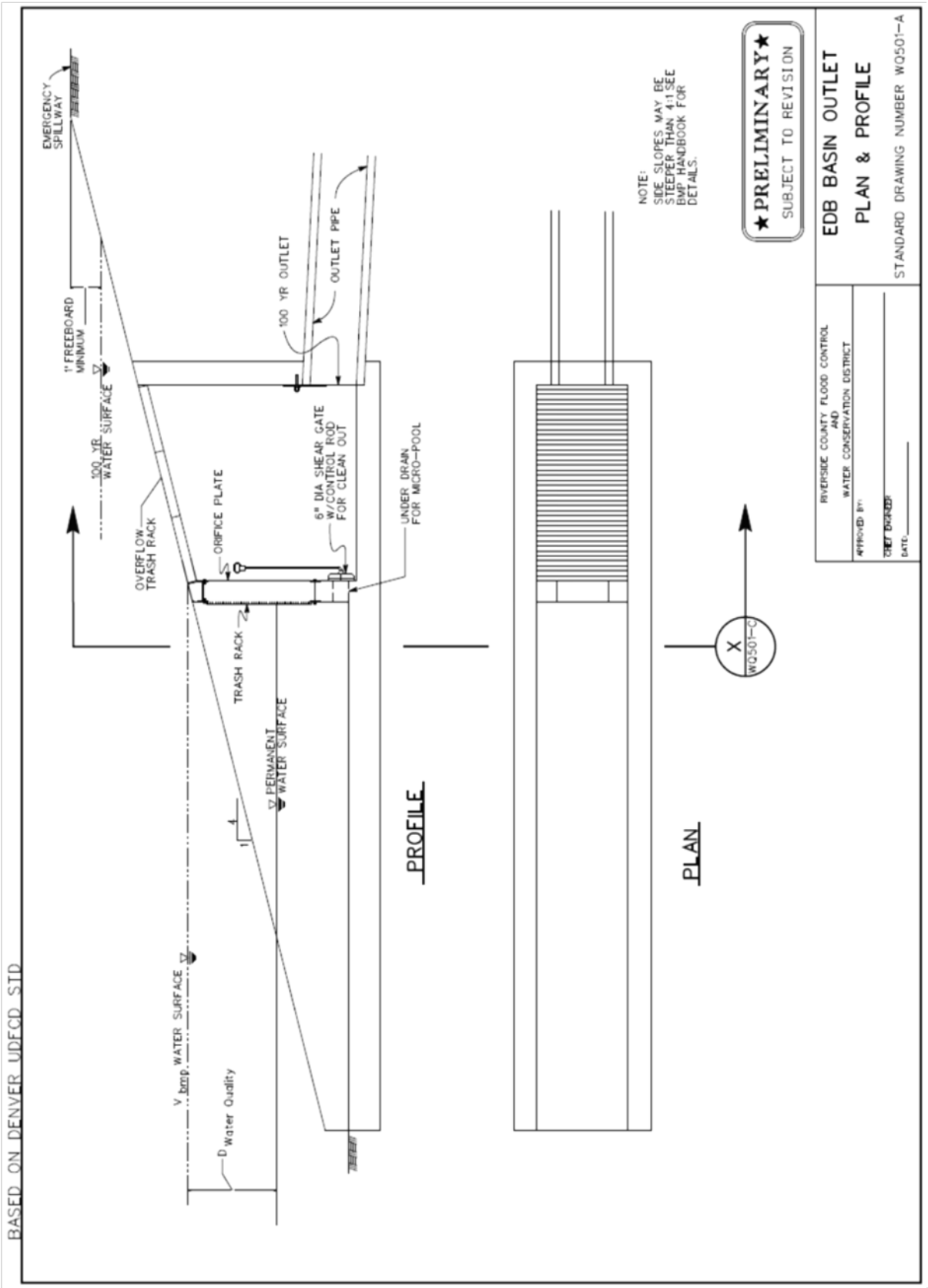

EXTENDED DETENTION BASIN BMP FACT SHEET

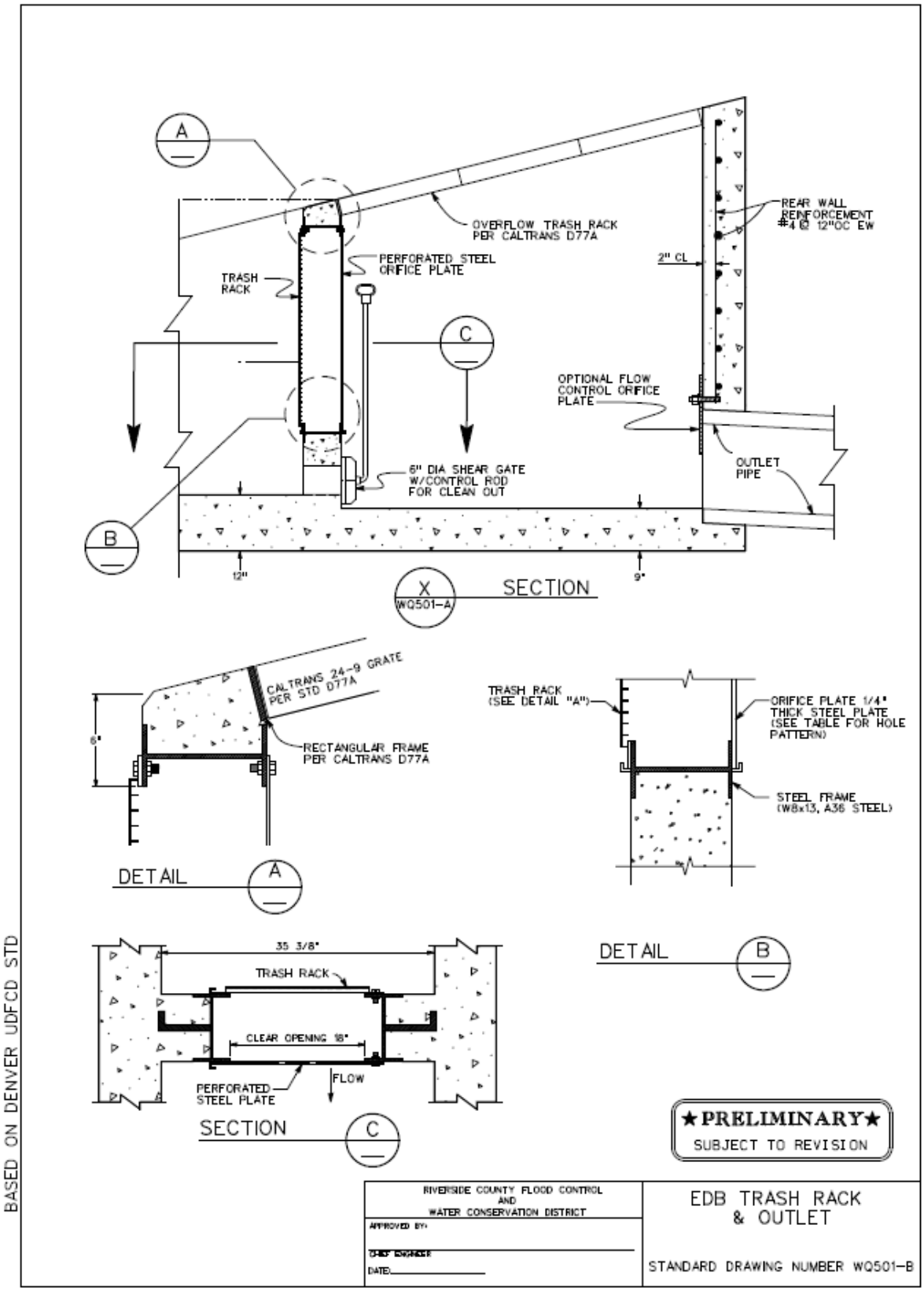

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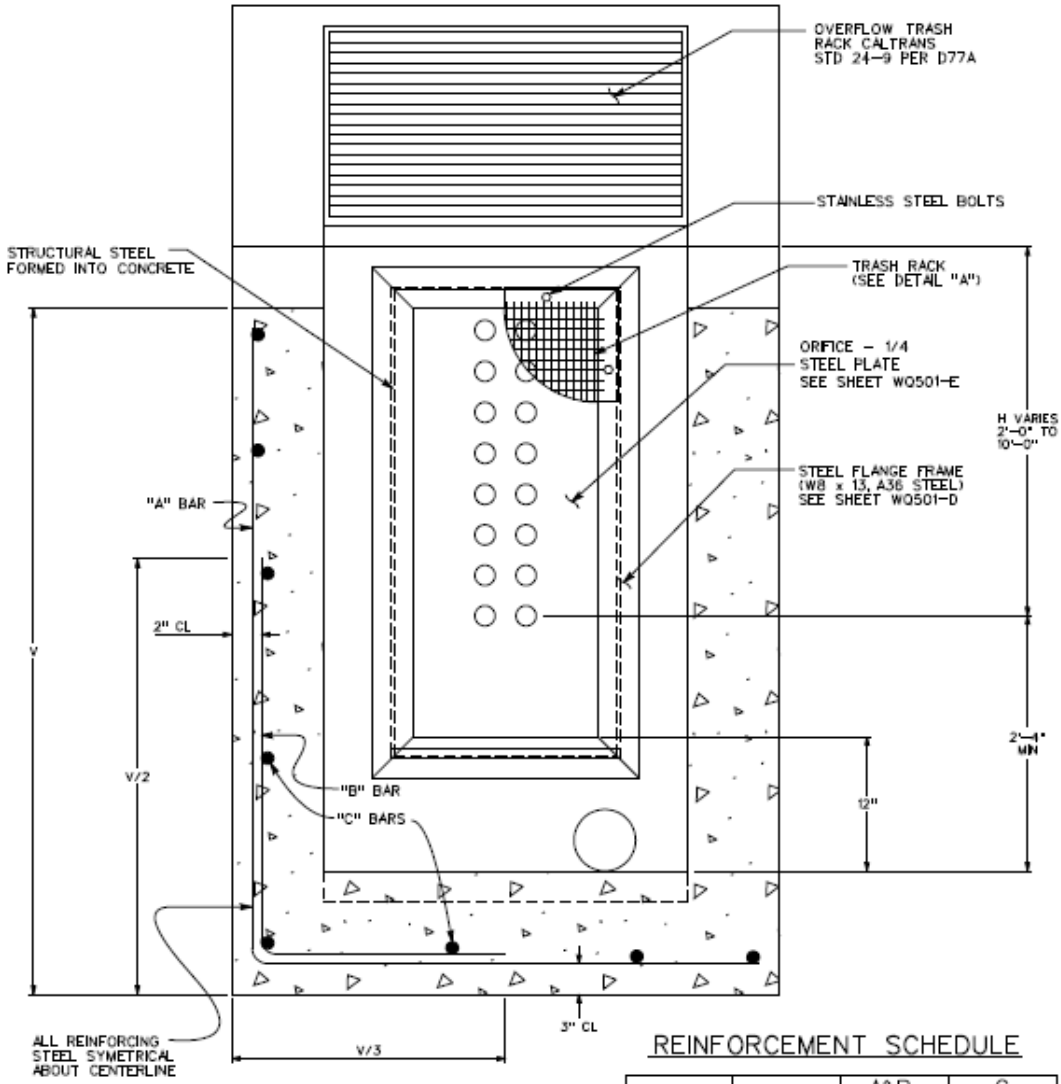

REINFORCEMENT SCHEDULE

MAX V	T WALL	A&B BARS	C BARS
6'	9"	#4 @ 18"	#4 @ 18"
10'	10"	#4 @ 12"	#4 @ 18"
12'	10"	#5 @ 12"	#4 @ 18"
REAR WALL REINFORCEMENT #4 @12" OC EW SEE DWG WQ501-B			

ELEVATION X WQ501-A

★PRELIMINARY★
SUBJECT TO REVISION

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
APPROVED BY:
CHIEF ENGINEER
DATE:

EDB BASIN OUTLET

STANDARD DRAWING NUMBER WQ501-C

BASED ON DENVER UDFCD STD

EXTENDED DETENTION BASIN BMP FACT SHEET

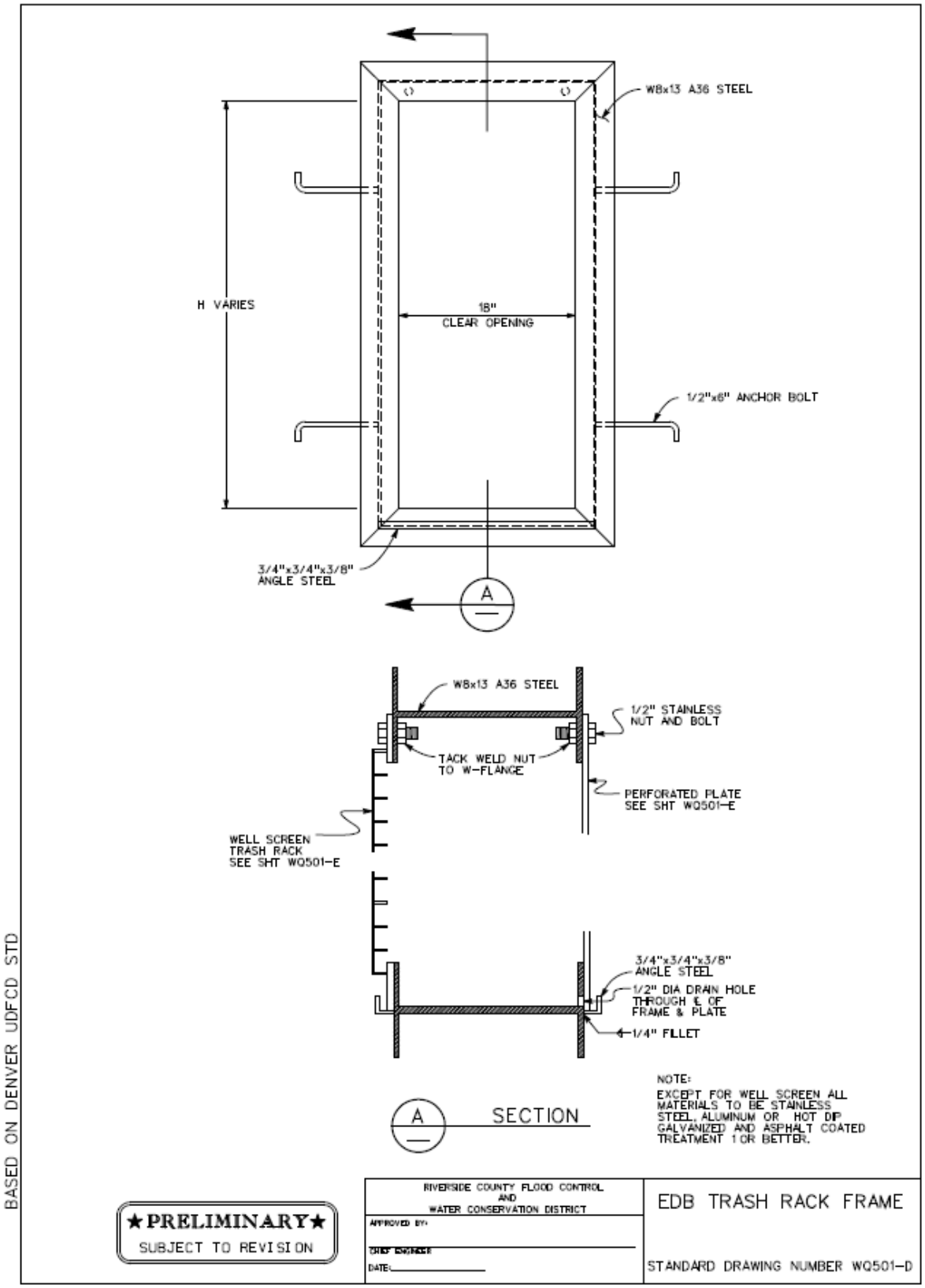

EXTENDED DETENTION BASIN BMP FACT SHEET

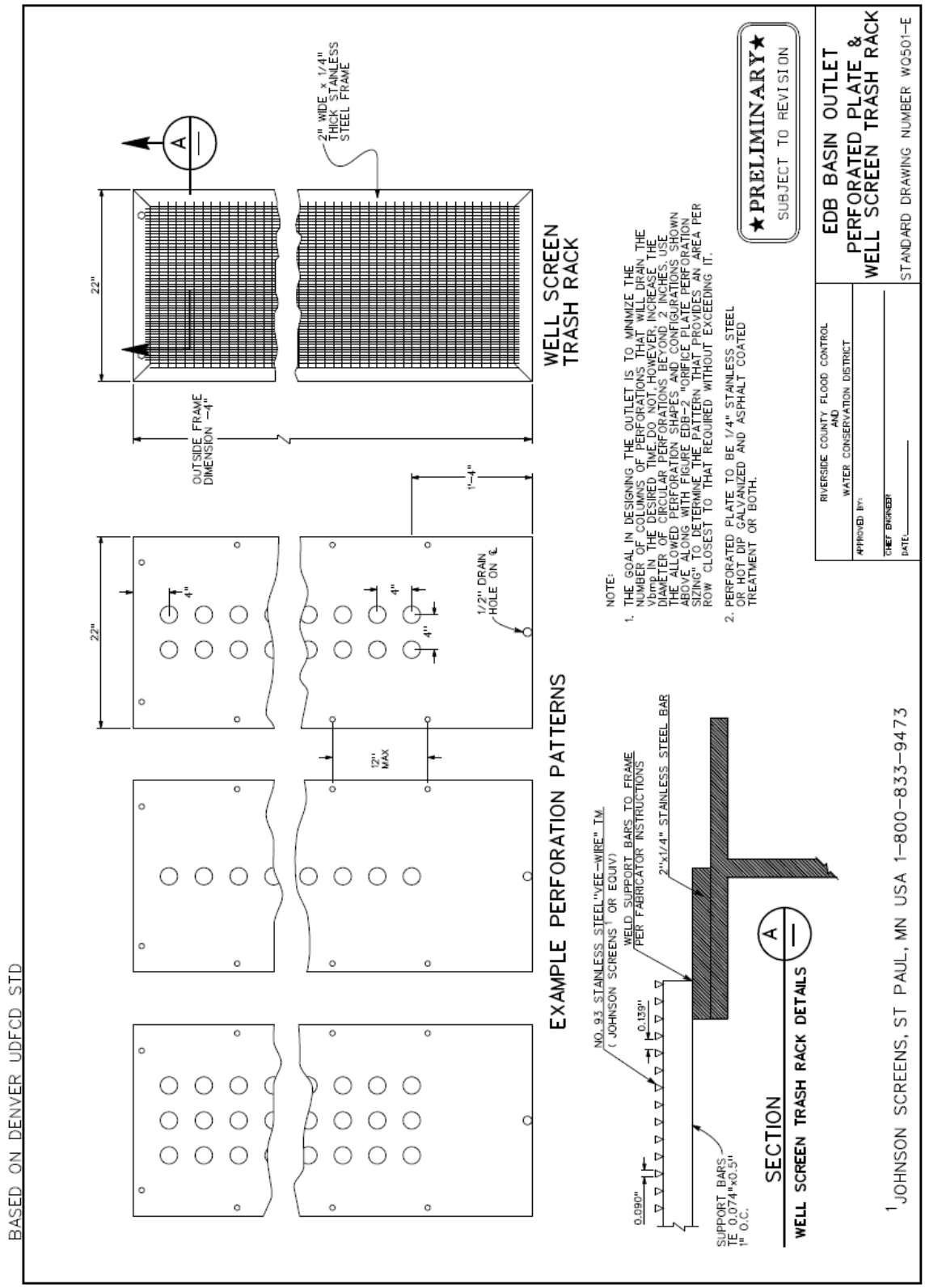

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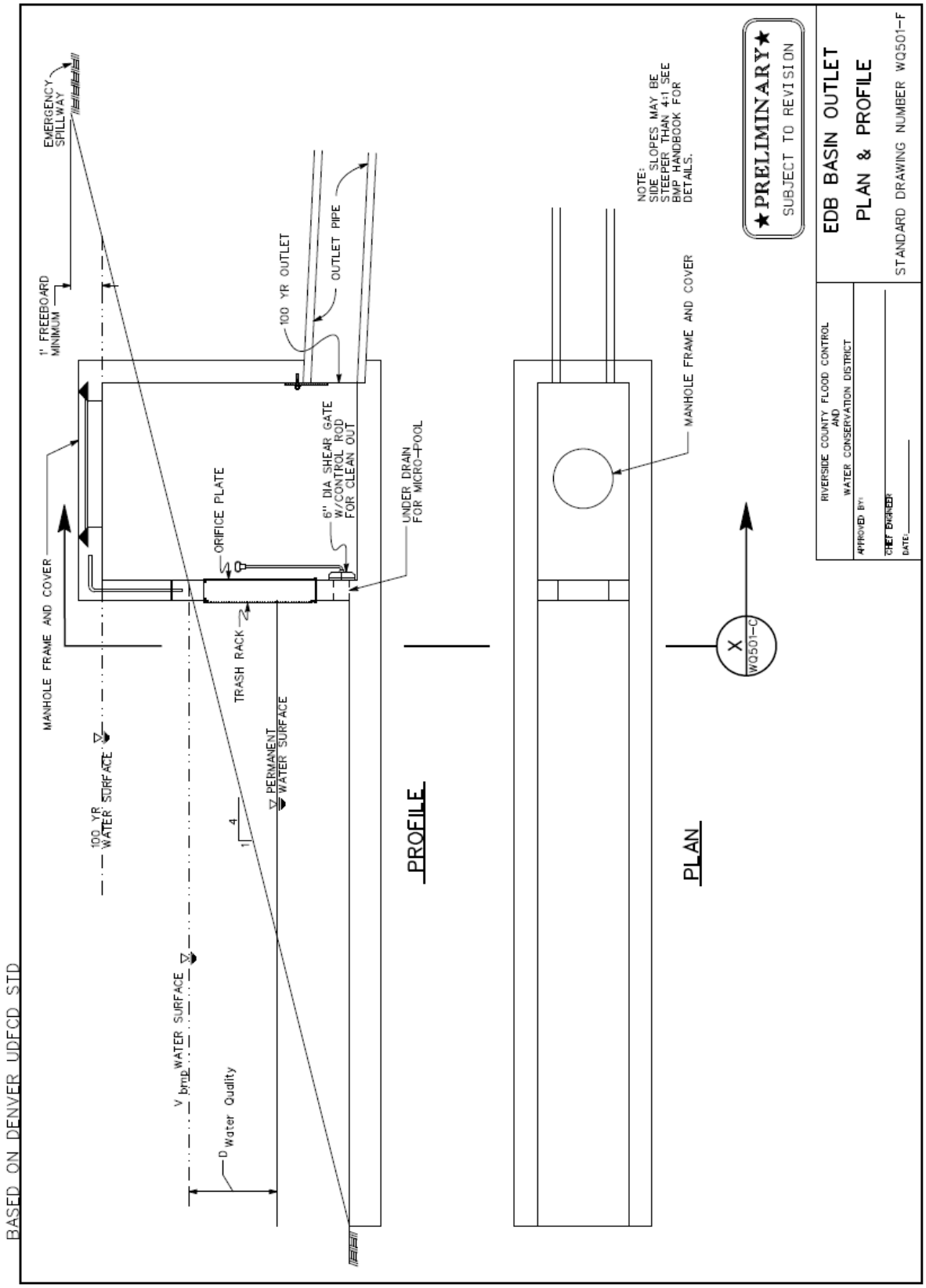

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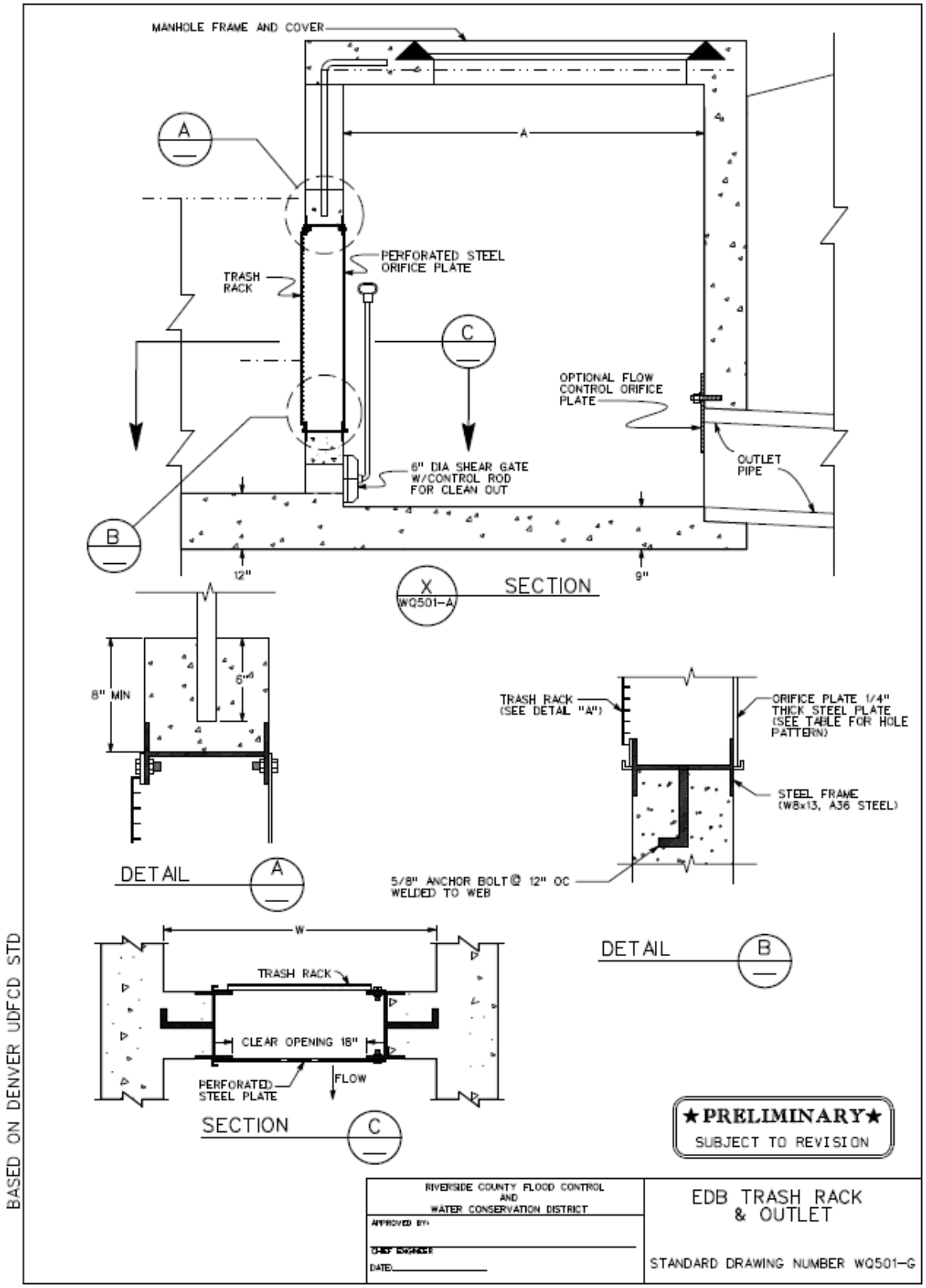

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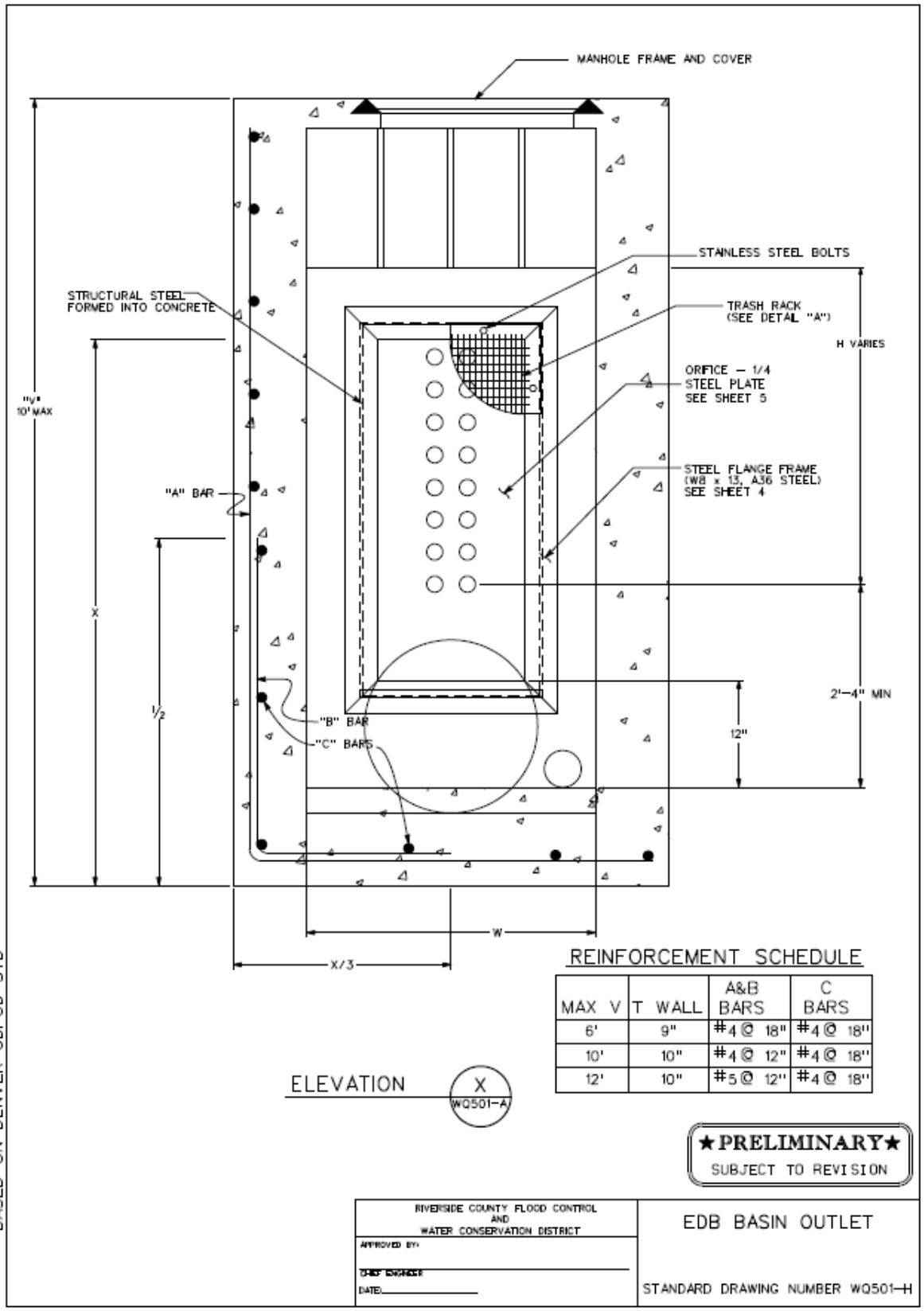

REINFORCEMENT SCHEDULE

MAX V	T WALL	A&B BARS	C BARS
6'	9"	#4 @ 18"	#4 @ 18"
10'	10"	#4 @ 12"	#4 @ 18"
12'	10"	#5 @ 12"	#4 @ 18"

045545

Extended Detention Basin Design Procedure	BMP Subarea No.	Legend:	Required Entries
			Calculated Cells

Company Name: Date:

Designed by: County/City Case No.:

Design Volume

Tributary Area (BMP Subarea) A_T = acres

Enter $V_{BMP,}$ determined from Section 2.1 of this Handbook V_{BMP}= ft^3

Basin Footprint

Overall Geometry

Length at Basin Bottom Surface Length = ft

Width at Basin Bottom Surface Width = ft

Meets 1.5 : 1 requirement?

Side Slopes per "Basin Guidelines", Sect. 1.2 z = :1

Proposed Basin Depth (with no freeboard) D_B = ft

Depth of freeboard (if used) D_{FB} = ft

Minimum Required Allowance for Total Depth (including proposed basin depth, freeboard, minimum depth of bottom stage (D_{BS}=0.33') and minimum filter depth (D_{FD}=2.33')) D_{REQ} = ft

Depth from design water surface elevation to lowest orifice D_O = ft

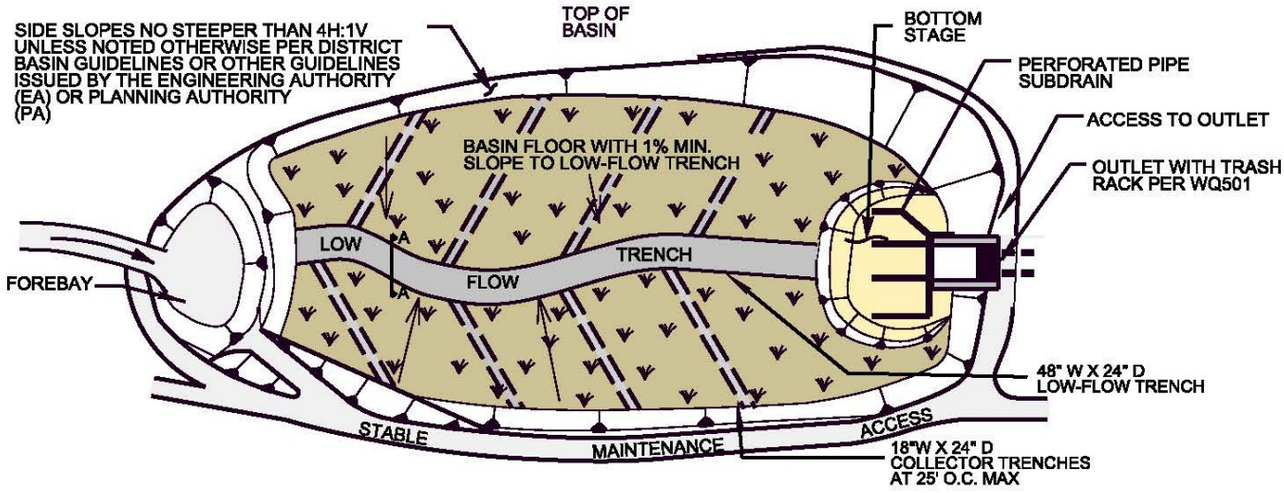

Basin Design

Basin Design

Proposed Total Basin Depth (proposed depth plus freeboard)	D_{TOT} =	ft
Basin Invert Longitudinal Slope	Slope =	%
Basin Invert Transverse Slope (1% min)	Slope =	%
Basin Volume	V_{Basin} =	ft^3

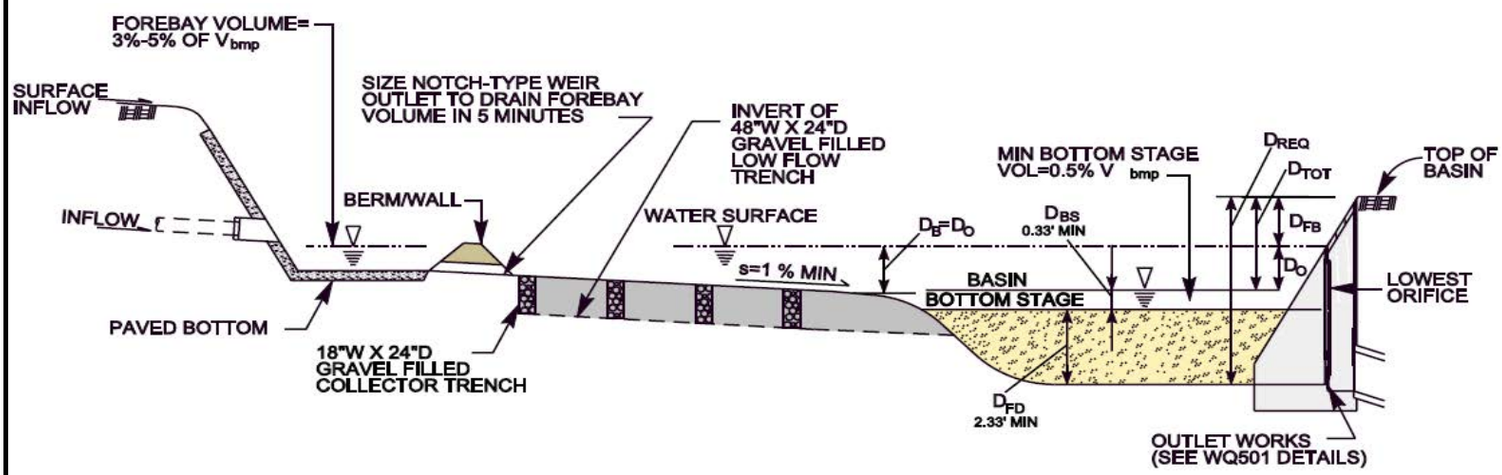

Forebay Design

Forebay Volume (3 - 5% V_{BMP})	V_{FB} =	ft^3
Forebay Depth (height of berm)	D_{FBY} =	ft
Minimum Forebay Surface Area	A_{FB} =	ft^2
Rectangular weir (notch)	W =	in

Dry Weather and Low-Flow Management

Low-Flow Trench (see graphic below)

Depth (24 inches minimum, gravel filled) — Depth = _____ inches

Width (48 inches minimum) — Width = _____ inches

Trench Invert Longitudinal Slope — Slope = _____ %

Collector Trenches (see graphic below)

Depth (24 inches minimum) — Depth = _____ inches

Width (18 inches minimum) — Width = _____ inches

Trench Invert Longitudinal Slope — Slope = _____ %

Spacing (25 feet on center maximum) — S = _____ feet

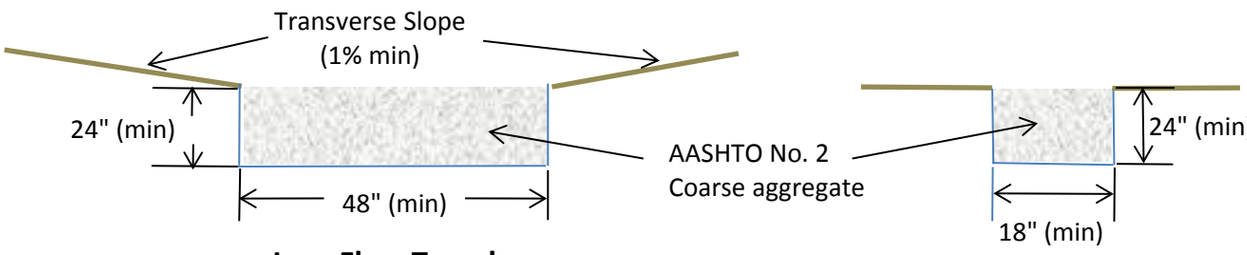

Low-Flow Trench **Collector Trench**

Bottom Stage (Sand Filter) Design

Depth of the Bottom Stage (4" minimum ponding) — D_{BS} = _____ in

Surface Area of Bottom Stage — A_{BS} = _____ ft^2

Dry Weather Ponded Volume (above sand layer) — V_{BS} = _____ ft^3

Is V_{BS} no less than 0.5% V_{BMP}? Enter Depth and Surface Area

Depth of ASTM-C33 sand (18 inch minimum)

Ds = _____ inches

Diameter of Subdrains — ϕ = _____ in

Subdrain Spacing — s = _____ ft. on center

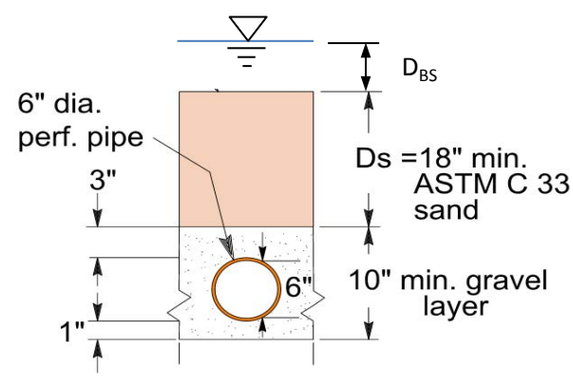

Basin Outlet Design

Outlet Design

Assume an orifice area. Based on the information provided above, the spreadsheet provides discharge vs. stage data. Enter the volume vs. stage data for each interval. This information is used to route the volume through the basin. The size of the orifice is acceptable when the data shows that less than 50% of V_{BMP} has drained in 24 hours, and that 100% drawdown occurs within 72 hours.

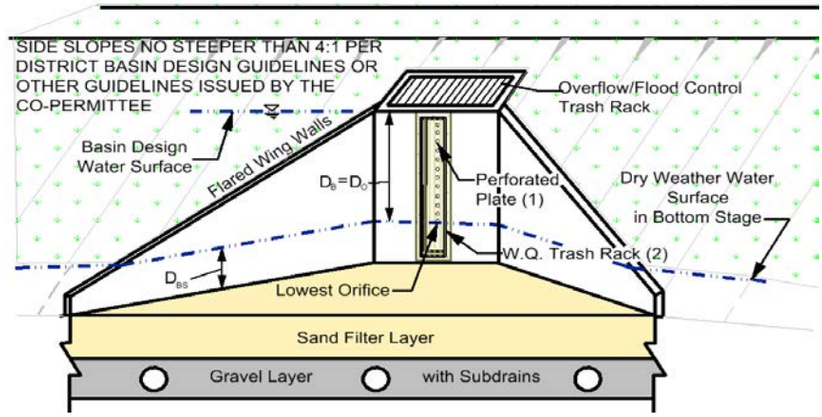

All values on this worksheet must be filled out to use this calculator

Flow Rate, Q (cfs)

$$Q=CA[2g(H-H_o)]^{0.5}$$

Discharge Coefficient,

Default, C = 0.66

Other, C =

Orifice Area (ft^2)

Orifice Diameter, d; number of orifices per row, n; and number of orifice rows, N (from the bottom up).

d = inches

n = per row

N = rows

Aeff = 0.000 ft^2 per row

or

Aeff = 0.000 in^2 per row

From outflow hydrograph, the time where 50% of V_{BMP} has drained from the basin (24 hour minimum):

Time (50%) = **Error *** hrs

From outflow hydrograph, the time where 100% V_{BMP} has drained from the basin(within 72 hours):

Time (100 %) = **Error *** hrs

Headwater Elev. / Stage (ft)	Discharge (cfs)	Volume (acre-ft)	Δt (hrs.)
0	0.0000	0.0000	
0.33			
0.67			
1.00			
1.33			
1.67			
2.00			
2.33			
2.67			
3.00			
3.33			
3.67			
4.00			
4.33			
4.67			
5.00			
5.33			
5.67			
6.00			
6.33			
6.67			
7.00			
7.33			
7.67			
8.00			
8.33			
8.67			
9.00			
9.33			
9.67			
10.00			
		∑ =	0.00

Notes:

3.7 Sand Filter Basin

Type of BMP	Treatment
Treatment Mechanisms	Filtration, Biofiltration
Maximum Tributary Area	25 acres
Other Names	Sand Filter, Media Filter, Pocket Filter

Description

The Sand Filter Basin (SFB) is a basin where the entire invert is constructed as a stormwater filter, using a sand bed above an underdrain system. Stormwater enters the SFB at its forebay where trash and sediment accumulate or through overland sheet flow. Overland sheet flow into the Sand Filter Basin is biofiltered through the vegetated side slopes or other pre-treatment. Flows pass into the sand filter surcharge zone and are gradually filtered through the underlying sand bed. The underdrain gradually dewaters the sand bed and discharges the filtered runoff to a nearby channel, swale, or storm drain.

The primary advantage of the SFB is its effectiveness in removing pollutants where infiltration into the underlying soil is not practical, and where site conditions preclude the use of a Bioretention Facility . The primary disadvantage is a potential for clogging if silts and clays are allowed to flow into the SFB. In addition, this BMP's performance relies heavily on its being regularly and properly maintained.

While this BMP is not currently considered an LID BMP, when designed in accordance with this manual, a Sand Filter Basin is considered to be a highly effective Treatment Control BMP.

Siting Considerations

SFBs should be avoided where onsite configurations include a base flow and/or where this BMP would be put into operation while construction, grading or major landscaping activities are taking place in the tributary catchment. **This BMP has a flat surface area**, so it may be challenging to incorporate into steeply sloping terrain. SFBs should be set away from areas that could discharge fine sediments into the basin such as at the bottom of a slope. **See Section 1 of Riverside County Flood Control and Water Conservation District's "Basin Guidelines" (Appendix C) for additional requirements** (i.e., fencing, maintenance access, etc.) or other guidelines issued by the Engineering Authority (EA)[1].

[1] The Engineering Authority (EA) may choose to alter these guidelines and may have different/additional requirements. These entities, along with the District, will be referred to as the EA.

Setbacks

The bottom of the sand filter should remain above the seasonal high groundwater level. Always consult your geotechnical engineer for additional site specific recommendations.

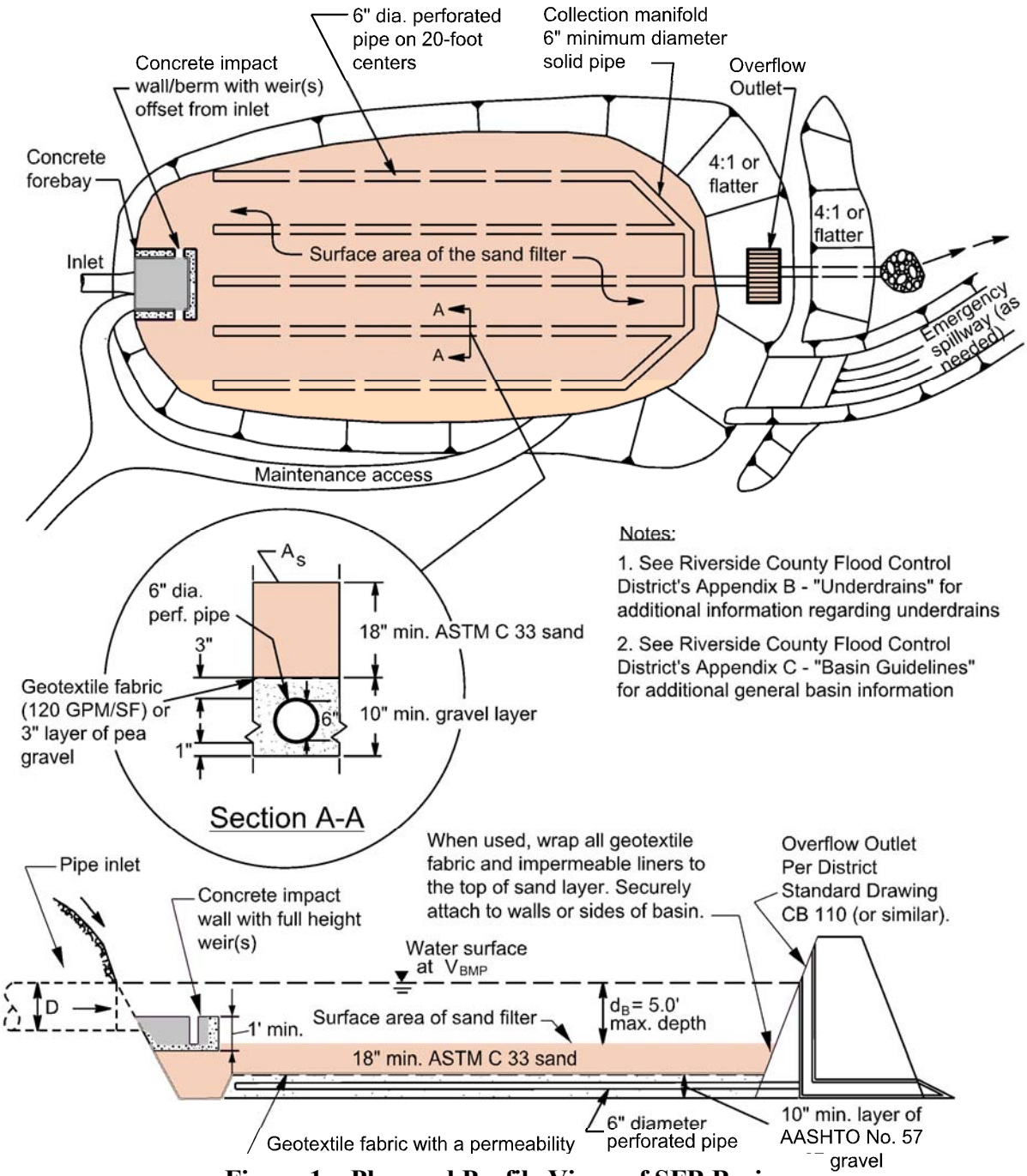

Figure 1 – Plan and Profile Views of SFB Basin

Forebay

A concrete forebay shall be provided to reduce sediment clogging and to reduce erosion. The forebay shall have a design volume of at least 0.5% V_{BMP} and a minimum 1 foot high concrete splashwall. Full height notch-type weir(s), offset from the line of flow from the basin inlet to prevent short circuiting shall be used to outlet the forebay. It is recommended that two weirs be used and that they be located on opposite sides of the forebay (see Figure 1).

Underdrains

Underdrain piping shall consist of a manifold (collector) pipe with perforated lateral branching. The lateral branching conveys the filtered water to the manifold where it is discharged into the outlet structure. See Appendix B for additional information.

Overflow Structure

An overflow must be provided to drain volume in excess of V_{BMP} or to help drain the system if clogging were to occur. Overflows shall flow to an acceptable discharge point such as a downstream conveyance system. Overflows must be placed above the water quality capture volume and near the outlet of the system. The overflow structure shall be similar to the District's Standard Drawing CB 110.

Recommended Maintenance

Table 1 - Recommended Inspection and Maintenance Activities for SFBs

Schedule	Inspection and Maintenance Activity
Semi-monthly including just before the annual storm season and following rainfall events.	• Routine maintenance and inspection. • Remove debris and litter from the entire basin to minimize filter clogging and to improve aesthetics. • Check for obvious problems especially filter clogging and signs of long term ponding. Repair as needed. Address odor, insects, and overgrowth issues associated with stagnant or standing water in the basin bottom. There should be no long-term ponding water. • Check for erosion and sediment laden areas in the basin. Repair as needed. Clean forebay if needed. • Revegetate side slopes where needed.
Annually. If possible, schedule these inspections within 72 hours after a significant rainfall.	• Inspection of hydraulic and structural facilities. Examine the overflow outlet for clogging, the embankment and spillway integrity, and damage to any structural element. • Check side slopes and embankments for erosion, slumping and overgrowth. • Inspect the sand media at the filter drain to verify it is allowing acceptable infiltration. **Scarify the top 3 inches by raking the filter drain's sand surface annually.** • Check the filter drain underdrains for damage or clogging. Repair as needed. • Repair basin inlets, outlets, forebays, and energy dissipaters whenever damage is discovered. • No water should be present 72 hours after an event. No long term standing water should be present at all. No algae formation should be visible. Correct problem as needed.
Every 5 years or sooner depending on the observed drain times (no more than 72 hours to empty the basin).	• Remove the top 3 inches of sand from the filter drain and backfill with 3 inches of new sand to return the sand layer to its original depth. When scarification or removal of the top 3 inches of sand is no longer effective, remove and replace sand filter layer.

Table 2 - Design and Sizing Criteria for SFBs

Design Parameter	Extended Detention Basin
Maximum tributary area	25 acres [2]
Basin design volume	100% of V_{BMP}
Maximum basin depth	5 feet
Forebay volume	0.5 % of V_{BMP}
Longitudinal Slope	0%
Transverse Slope (min.)	0%
Outlet erosion control	Energy dissipaters to reduce velocities[1]

1. **Ventura County's Technical Guidance Manual for Stormwater Quality Control Measures**
2. **CA Stormwater BMP Handbook for New Development and Significant Redevelopment**

Note: The information contained in this BMP Factsheet is intended to be a summary of design considerations and requirements. Additional information which applies to all detention basins may be found in the District's "Basin Guidelines" (Appendix C). In addition, information herein may be superseded by other guidelines issued by the EA.

Design Procedure

1. Enter the Tributary Area, A_{TRIB}
2. Enter the Design Capture Volume, V_{BMP}, determined from Section 2.1 of this Handbook
3. SFB Geometry

   Determine the minimum sand filter area required. The filtration bed surface shall be flat with the maximum depth for the reservoir design volume no greater than 5 feet*. The reservoir design volume does not include the volume of the sand filter. No credit is given for voids in the sand layer toward the reservoir volume since the sand is part of the water quality filter and not a reservoir layer. The design storage volume shall equal 100 percent of V_{BMP}. The minimum sand filter area (As) of the basin's bottom shall be determined using the equation:

$$A_s = (V_{BMP} / d_B)$$

   Where:

   V_{BMP} = Design Volume, ft^3
   d_B = proposed basin depth (5 feet maximum), ft

   Once the basin side slopes, proposed basin depth and depth of freeboard are entered, the spreadsheet will calculate the minimum total depth required to use this BMP. This is the depth from the top of the basin (including freeboard) down to the bottom of the underdrain gravel layer. This depth can be used to determine if enough vertical separation is available between the BMP and its outlet destination.

*Note: The 5 foot maximum depth equates to a minimum filter media infiltration rate of 0.83 inches per hour with a 72 hour drawdown time. Studies have shown that while initially most filter media will infiltrate at a much higher rate, it is not uncommon for that rate to decrease significantly over a very short period of time. (Urbonas, 1996)

4. Enter the proposed surface area of the basin.

5. Forebay

Provide a concrete forebay. Its volume shall be at least 0.5% V_{BMP} with a minimum 1 foot high concrete splashwall. Full-height notch-type weir(s) shall be used to outlet the forebay. The weir(s) must be offset from the line of flow from the basin inlet. It is recommended that two weirs be used and that they be located on opposite sides of the forebay (see Figure 1). Notches shall not be less than 1.5 inches in width.

Figure 1

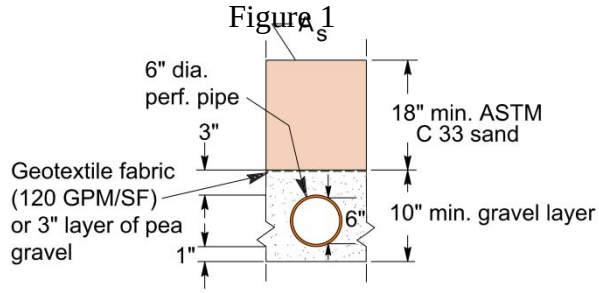

6. Filter Media

Provide, as a minimum, an 18-inch layer of filter media (ASTM C-33 sand). Other filter media may be considered with sufficient supporting documentation. Where a medium level of removal efficiency is desired for nutrients, the depth of the sand layer must be increased to 36 inches.

5. Underdrains

Underdrains shall be provided per the guidelines outlined in Appendix B.

045555

Sand Filter Basin (SFB) - Design Procedure	BMP ID	Legend:	Required Entries
			Calculated Cells

Company Name: _____ Date: _____

Designed by: _____ County/City Case No.: _____

Design Volume

Total Tributary area	A_{TRIB} = _____	ac
Enter V_{BMP} determined from Section 2.1 of this Handbook	V_{BMP}= _____	ft^3

Basin Geometry

Basin side slopes (no steeper than 4:1)	z = _____	:1
Proposed basin depth (see Figure 1)	d_B = _____	ft
Depth of freeboard (if used)	d_{fb} = _____	ft
Minimum bottom surface area of basin (As = V_{BMP}/d_B)	A_s = _____	ft^2
Minimum total depth required (includes freeboard, filter media and subdrains)	d_{req} = _____	ft
Proposed Surface Area	_____	ft^2

Forebay

Forebay volume (minimum 0.5% V_{BMP})	Volume = _____	ft^3
Forebay depth (height of berm/splashwall. 1 foot min.)	Depth = _____	ft
Forebay surface area (minimum)	Area = _____	ft^2
Full height notch-type weir	Width (W) = _____	in

Filter Media

Description of filter media

_____ Sand (ASTM C-33)

_____ Other (Clarify in "Notes" below)

Media depth, df = _____ inches

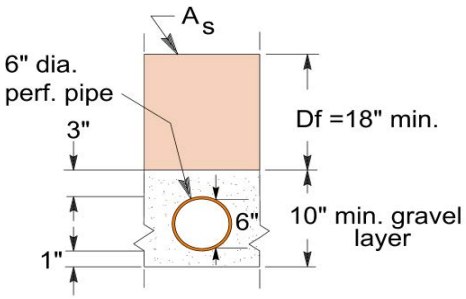

Underdrains

Diameter of perforated underdrain	_____	in
Spacing of underdrains (maximum 20 feet on center) OK	_____	ft

Notes: _____

APPENDIX A

Infiltration Testing

APPENDIX A - INFILTRATION TESTING

Infiltration BMPs use the interaction of chemical, physical, and biological processes between soil and water to filter out sediments and constituents from stormwater. Infiltration BMPs require a maximum drawdown time to avoid nuisance issues. Since drawdown time is contingent on the infiltration rate of the underlying soil, tests are used to help establish the vertical infiltration rate of the soil below a proposed infiltration facility. The tests attempt to simulate the physical process that will occur when the facility is in operation.

Section 1 - General Requirements

1.1 - Summary of Requirements

The following is a brief summary of the requirements for all infiltration test reports submitted to the Engineering Authority (EA)[1] for the purpose of water quality BMP design. A checklist form is included at the end of this document.

1. Where infiltration testing is to be performed (as directed by the EA or in the WQMP), the measured infiltration rate of the underlying soil must be determined using either the single ring infiltrometer test (as described in ASTM D 5126, Section 4.1.2.1), the double ring infiltrometer test (ASTM D 3385), the well permeameter method (USBR 7300-89), or a percolation test per County of Riverside Department of Environmental Health (RCDEH) test procedures. A general explanation of these test methods can be found in Section 2 of this appendix. The minimum number of tests required can be found in Table 1 and is dependent upon the type of infiltration test performed.

2. Test pits and borings (ASTM D 1452) may be used to determine the USCS series and textural class (SM, CL, etc.) of the soil horizons, the thickness of soil and rock strata, and to estimate the historical high groundwater mark[2]. Test pits or boring logs must be of sufficient depth to establish that a minimum of 5 feet of permeable soil exists below the infiltration facility and that there is a minimum of 10 feet between the bottom of the infiltration facility and the historical high groundwater mark (Sections 1.7 and 2.5). The required number of test pits or borings are listed in Table 1.

3. A final report, prepared by a registered civil engineer, geotechnical engineer, certified engineering geologist or certified hydrogeologist shall be provided to the EA which demonstrates through infiltration testing and/or soil logs that the proposed facility location is suitable for the proposed infiltration facility and an infiltration rate shall be recommended. In addition, any requirements associated with impacts to a landslide, erosion or steep slope hazard area should also be addressed in the final report. (Section 1.7)

[1]*County Transportation, Coachella Valley Water District and the City Engineer for incorporated cities within the County may choose to alter these guidelines and may have different/additional requirements. These entities, along with the District, will be referred to as the Engineering Authority (EA).*

[2]*The "historical high groundwater mark" is defined as the groundwater elevation expected due to a normal wet season and shall be obtained by boring logs or test pits.*

4. Tests may be performed only by individuals trained and educated to perform, understand and evaluate the field conditions. The individual(s) supervising the field work must be named in the final report as described in Item 3. (Section 1.7)

5. Preliminary site grading plans shall be provided to the EA showing the proposed BMP locations along with section views through each BMP clearly identifying the extents of cut/fill relative to native soil. (See Section 1.1)

6. For sites where infiltration BMPs have been determined to be feasible and will be used, infiltration tests shall be performed within the boundaries of the proposed infiltration BMP and at the bottom elevation (infiltration surface) of the proposed infiltration BMP to confirm the suitability of infiltration. (See Photo 5)

A Note on "Infiltration Rate" vs. "Percolation Rate"

A common misunderstanding exists that the "percolation rate" obtained from a percolation test is equivalent to the "infiltration rate" obtained from a single or double ring infiltrometer test. While the percolation rate is related to the infiltration rate, percolation rates tend to overestimate infiltration rates and can be off by a factor of ten or more. However, as is discussed in Section 2.3, the percolation rate can be converted to a reasonable estimate of the infiltration rate using the Porchet Method.

1.2 Applicability of Infiltration BMPs

The WQMP guidance applicable to a project (based on the watershed location of the project), may include specific criteria for evaluating whether infiltration BMPs are feasible for a particular project. Where the WQMP requires that infiltration testing be performed as part of an infiltration feasibility evaluation, a testing method approved by the EA shall be used. The District requires the use of the methods described in Section 2 herein. The remainder of Section 1 herein describes requirements that must be implemented whenever an infiltration BMP is to be implemented.

1.3 - Grading Plans

Many projects require a significant amount of grading prior to their construction. It is important to determine if the BMP will be placed in cut or fill since this may affect the performance of the BMP or even the soil. As such, preliminary site grading plans showing the proposed BMP locations are required along with section views through each BMP clearly identifying the extents of cut or fill. In addition, since it is imperative that any testing be performed at the proper elevations and locations, it is highly recommended that the preliminary site grading plans be provided to the engineer/geologist prior to any tests being performed.

1.4 - Cut Condition

Where the proposed infiltration BMP is to be located in a cut condition, the infiltration surface level at the bottom of the BMP might be far below the existing grade. For example, if the infiltration surface of a proposed BMP is to be located at an elevation that is currently beneath 15 feet of cut, how can the proposed infiltration surface be tested?

In order to determine an infiltration rate where the proposed infiltration surface is in a cut condition, the following procedures may be used:

1. The USBR 7300-89, "Procedure for Performing Field Permeability Testing by the Well Permeameter Method" (Section 2.4). Note: the result must be converted to an infiltration rate.
2. The Percolation Test per RCDEH (Section 2.3) may be used. Note: the result must be converted to an infiltration rate.

Refer also to the WQMP guidance document applicable to the project, which may identify applicability criteria for infiltration BMPs in cut conditions.

1.5 - Fill Condition

If the bottom of a BMP (infiltration surface) is in a fill location, the infiltration surface may not exist prior to grading. How then can the infiltration rate be determined? For example, if a proposed infiltration BMP is to be located in 12 feet of fill, how could one reasonably establish an infiltration rate prior to the fill being placed?

Unfortunately, no reliable assumptions can be made about the in-situ properties of fill soil. As such, the bottom, or rather the infiltration surface of the BMP, must extend into natural soil. The natural soil shall be tested at the design elevation prior to the fill being placed.

In some cases, the extension of the BMP down to natural soil may prove infeasible. In that case, another BMP must be selected.

1.6 - Factors of Safety

Long term monitoring has shown that the performance of working full-scale infiltration facilities may be far lower than the rate measured by small-scale testing. There are several reasons for this:

- Over time, the surface of infiltration facilities can become plugged as sedimentary particles accumulate at the infiltration surface.
- Post-grading compaction of the site can destroy soil structure and seriously impact the facility's performance.

- Soils and soil strata are rarely homogenous, and variations across a site, and sometimes even within a BMP footprint, can cause tested infiltration rates to vary widely.
- Testing procedures in general are subject to natural variations and errors which can skew the results.

As such, to obtain an appropriate level of confidence in the final design infiltration rate, factors of safety shall be applied to the tested infiltration rate, I_t, in order to determine the design infiltration rate, I_d. These factors are based on such considerations as the type of tests used, the number of tests performed and whether testing is performed at all. Table 1 provides a complete matrix of testing requirements versus factors of safety.

1.7 - Infiltration Testing Requirements

Table 1 is a list of infiltration BMPs with test regime options and their corresponding design factors of safety. The options are summarized below:

Option 1- This test regime includes ring infiltrometer type tests, test pit or boring logs and a final report. The minimum required number of tests is as described in Table 1. The minimum required factor of safety for this option is FS=3.

Option 2- This test regime includes percolation type tests, test pit or boring logs and a final report. The minimum required number of tests is as described in Table 1. The minimum required factor of safety for this option is FS=3.

Option 3- This test regime includes test pit or boring logs only and a final report. The minimum required number of tests is as described in Table 1. An expected infiltration rate shall be included in the final report based on the specifics of the borings or test pits. The minimum required factor of safety for this option is FS=6. This option may be used for projects with a maximum tributary area of 5 acres only.

Option 4- This test regime includes a single test pit or boring log at any representative location on the project site. Plates E-6.1 and E-6.2 of the Riverside County Flood Control and Water Conservation District's (RCFCD) Hydrology Manual shall then be used to establish an approximate infiltration rate based on the appropriate Runoff Index and the Antecedent Moisture Content (AMC) as defined on page C-3 of the Hydrology Manual. The minimum required factor of safety for this option is FS=10.

Table 1 - Infiltration Testing Requirements							
Infiltration BMP	Testing Options	Ring Infiltrometer Tests[1]	Percolation Test[2]	Test Pits or Boring Logs[3]	Final Report[4]	Hydrology Manual[5]	Factor of Safety
Infiltration Trench	Option 1▶	2 tests min. with at least 1 per trench	not used	1 boring or test pit per trench	Required	not used	FS = 3
	Option 2▶	not used	4 tests min. with at least two per trench	1 boring or test pit per trench	Required	not used	FS = 3
	Option 3[7]▶	not used	not used	1 boring or test pit per trench	Required	not used	FS = 6
	Option 4▶	not used	not used	1 boring or test pit per site	not used	only	FS = 10
Infiltration Basin	Option 1▶	2 tests min. with at least 1 per basin[6]	not used	1 boring or test pit per basin	Required	not used	FS = 3
	Option 2▶	not used	4 tests min. with at least 2 per basin[6]	1 boring or test pit per trench	Required	not used	FS = 3
	Option 3[7]▶	not used	not used	1 boring or test pit per basin	Required	not used	FS = 6
	Option 4▶	not used	not used	1 boring or test pit per site	not used	only	FS = 10
Permeable Pavement	Option 1▶	2 tests min. with at least 1 every 10,000 ft^2	not used	1 boring or test pit every 10,000 ft^2	Required	not used	FS = 3
	Option 2▶	not used	4 tests min. with at least 2 every 10,000 ft^2	1 boring or test pit every 10,000 ft^2	Required	not used	FS = 3

Table Footnotes:

(1) Ring Infiltrometer tests per Section 2.2

(2) Percolation tests per Section 2.3 and Well Permeameter Test per Section 2.4

(3) Test pits or boring logs per Section 2.5

(4) Final Report per Section 1.7

(5) See Plate E-6.2 of the District's Hydrology Manual

(6) For basins in excess of 10,000 ft^2, provide one (1) ring infiltrometer test or two (2) percolation tests for each additional 10,000 ft^2

(7) This option may be used for projects with a maximum tributary area of 5 acres only.

1.8 - Final Report

Where a final report is required, a civil engineer, geotechnical engineer, certified engineering geologist or certified hydrogeologist shall establish whether the location is suitable for the proposed infiltration facility. At least 5 feet of permeable soil must be present below the infiltration facility and a minimum of 10 feet between the bottom of the infiltration facility and the historical high groundwater mark[1] is required. The signed/stamped report shall include discussion and records of the infiltration testing as well as boring log findings. Based on the results of these tests, the report shall provide an estimate of the infiltration rate found at the location of each proposed infiltration BMP in units of inches per hour. The factor of safety specified in Table 1 will be applied to the interpreted test results to determine the design infiltration rate for each infiltration BMP. Any requirements associated with impacts to an erosion hazard area, steep slope hazard area, or landslide hazard area should also be addressed in the report. In addition, the report shall include complete field records with the following information:

- Location of the test site.
- Dates of test, start and finish.
- Weather conditions, start to finish.
- Names(s) of technician(s).
- Description of test site, including assessment of boring profile and USCS soil classification.
- Depth to the water table and a description of the soils to a depth of at least 10 feet below proposed infiltration surface.
- Type of equipment used to construct the boreholes or test holes (such as backhoe, hollow stem auger, etc.)
- Areas of the rings (if used) or test hole diameter.
- Volume constants for graduated cylinder or Mariotte tube (if used).
- Complete field results in tabular format. Sample test data forms, as well as examples, have been provided following the description of each test in Section 2.
- A plot of the infiltration rate versus total elapsed time. An example is provided following the description of each test in Section 2.
- A labeled keymap showing test and boring locations.
- Confirmation that the soil was pre-saturated in accordance with the testing methods described herein.

Section 2 - Accepted Testing Methods

There is a wide range of different methods for measuring the infiltration rate of a given soil with varying degrees of accuracy and reliability. However, the District will accept only the following test methods:

1. Single Ring Infiltrometer (Per ASTM D 5126), Section 2.1.1
2. Double Ring Infiltrometer (Per ASTM D 3385), Section 2.1.2
3. Well Permeameter Method (USBR 7300-89), Section 2.4
4. Percolation Test (per County of Riverside Department of Environmental Health procedure), Section 2.3

[1]The "historical high groundwater mark" is defined as the groundwater elevation expected due to a normal wet season and shall be obtained by boring logs or test pits.

The following pages of this document provide an overview of these tests. It is recommended that the original Standards be referenced.

2.1 - Constant Head vs. Falling Head Method

There are two operational techniques used with all four of the testing techniques herein: the *constant head method* and the *falling head method*. With the *constant head method*, water is consistently added to both the outer and inner rings (ring infiltrometers) or to the test hole (pecolation test and well permeameter) to maintain a constant level throughout the testing. The volume of water needed to maintain the fixed level of the inner ring is measured. Conversely, in the *falling head method*, the water level is allowed to fall and the time that the water level takes to decrease is measured.

2.2 - Overview of Ring Infiltrometer Test Methods

Ring infiltrometers measure the rate of infiltration at the soil surface. Infiltration is influenced by both saturated hydraulic conductivity as well as capillary effects. The term *capillary effects* refers to the ability of dry soil to pull, or wick away, water from a zone of saturation faster than would occur if the soil were uniformly saturated. The magnitude of the capillary effect is determined by initial moisture content at the time of testing, the pore size, soil properties (texture, structure) and a number of other factors. The effects of capillarity are short lived and can greatly skew test results. As such, it is critical to obtain steady-state infiltration so that capillary effects are minimized. (ASTM 5126)

The ***single ring infiltrometer*** and ***double ring infiltrometer*** methods both employ the use of metal cylinders driven to shallow depths into the test soil. The rings are filled with water and the rate at which the water moves into the soil is measured. This rate becomes constant when the saturated hydraulic conductivity for the particular soil has been reached. This is reflected by the flattening out of the curve generated by sample test data as shown in Figure 2, "Plot of Infiltration Rate vs. Time". While we note that infiltration rate is not exactly the same as saturated hydraulic conductivity, for the purposes of this guidance document they are synonymous.

2.2.1 - Single Ring Infiltrometers

Single ring infiltrometer tests using a ring 40 inches or larger in diameter have been shown to closely match full-scale facility performance (Figures 1 and 2, Photo 1). The cylindrical ring is driven approximately 12 inches into the soil. Water is ponded within the ring above the soil surface. The upper surface of the ring is often covered to prevent evaporation. Using the constant head method, the volumetric rate of water added to the ring, sufficient to maintain a constant head within the ring is measured. The test is complete and the tested infiltration rate, I_t, is determined after the flow rate has stabilized. (ASTM D 5126)

Photo 1 – Simple Single Ring Infiltrometer

To help maintain a constant head, a variety of devices may be used. A hook gauge, steel tape or rule, length of steel, or plastic rod pointed on one end can be used for measuring and controlling the depth of liquid (head) in the infiltrometer ring. If available, a graduated Mariotte tube or automatic flow control system may also be used. Care should be taken when driving the ring into the ground as there can be a poor connection between the ring wall and the soil. This poor connection can cause a leakage of water along the ring wall and an overestimation of the infiltration rate.

The volume of liquid used during each measured time interval may be converted into an incremental infiltration velocity (infiltration rate) using the following equation:

$$I_t = \Delta V/(A*\Delta t)$$

Where:

I_t = tested infiltration rate, in/hr

ΔV = volume of liquid used during time interval to maintain constant head in the ring, in^3

A = internal area of ring, in^2

Δt = time interval, hr.

Final Report - Ultimately, as discussed in Section 1.7, a final report shall be provided and, based on the test results, an infiltration rate shall be recommended.

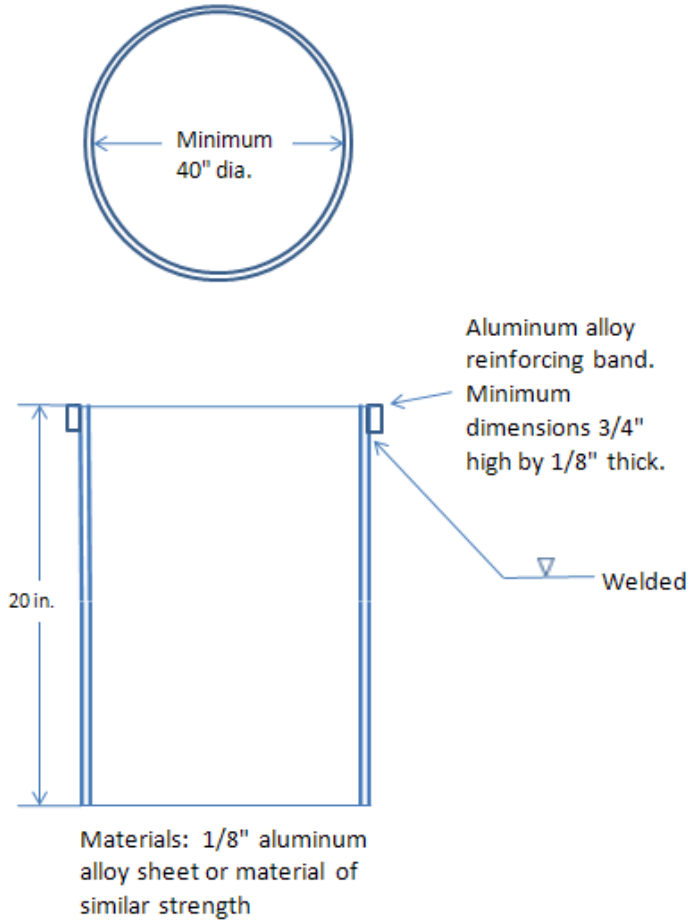

Figure 1- Single Ring Infiltrometer Construction

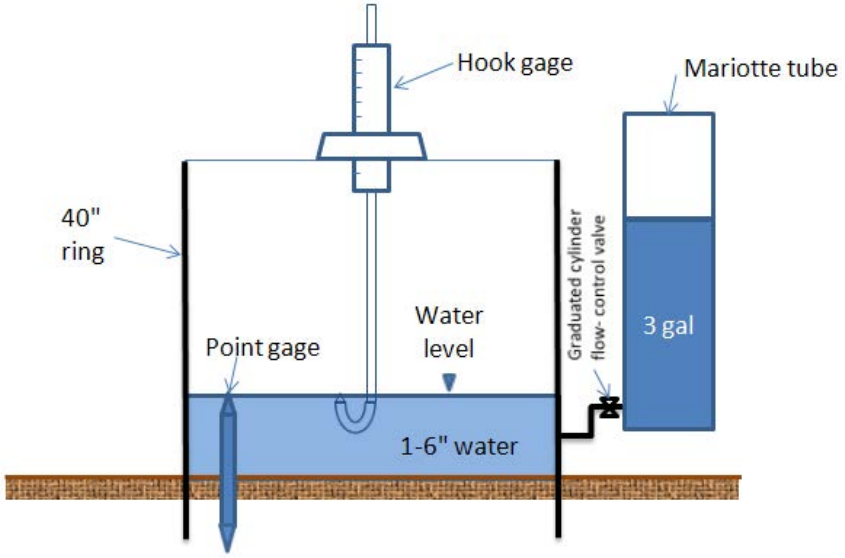

Figure 2- SIngle Ring Setup with Mariotte Tube

SINGLE RING INFILTROMETER TEST DATA

Project Name and Test Location:	Constants-	Ring Data		Liquid Containers
		Ring Area, A_r (in^2)	Depth of Liquid (in)	Reservoir Container Volume, V_r (in^3/in)

Test By:		USCS Class:		Penetration of Ring into Soil (in.):			
Liquid Used:		pH:		Ground Temp (°F):		at Depth:	
Date of Test:		Depth to Water Table:					
Liquid Level Maintained by using:	( ) Flow Valve ( ) Float Valve ( ) Marriotte Tube ( ) Other:						
Additional Comments:							

Time interval	Time (hr:min)	Dt (min) & Total	Flow Readings		Liquid Temp (°F)	Infiltratn Rate , I**(in/hr)	Remarks
			Elev., H (In)	ΔH (in) & Q_f* (in^3)			
1 - Start							
End							
2 - Start							
End							
3 - Start							
End							
4 - Start							
End							
5 - Start							
End							
6 - Start							
End							
7 - Start							
End							
8 - Start							
End							
9 - Start							
End							
10 - Start							
End							
11 - Start							
End							
12 - Start							
End							
13 - Start							
End							
14 - Start							
End							
15 - Start							
End							

*Flow, $Q_f = \Delta H \times V_r$ **Infiltration Rate, $I = (Q_f/A_r)/$

Table 2 – Sample Test Data Form for Single Ring Infiltrometer Test

SINGLE RING INFILTROMETER TEST DATA

Project Name and Test Location:	Constants-	Ring		Liquid Containers
		Ring Area, A_r (in^2)	Depth of Liquid (in)	Reservoir Container Volume, V_r (in^3/in)
ACME IND. SITE 24166 ELM, RIVERDALE *WESTERN CORNER OF SITE (NEAR WAREHOUSE)		1256	4.0	78.54

Test By:	CMD	USCS Class:	SM	Penetration of Ring into Soil (in.):	3.0		
Liquid Used:	TAP WATER	pH:	8.0	Ground Temp (°F):	57	at Depth:	16"
Date of Test:	3-21-09	Depth to Water Table:	40 FEET				
Liquid Level Maintained by using:	( ) Flow Valve ( ) Float Valve (X) Marriotte Tube ( ) Other:						
Additional Comments:	DRY GROUND						

Time interval	Time (hr:min)	Dt (min) & Total	Flow Readings: Elev., H (In)	Flow Readings: ΔH (in) & Q_f* (in^3)	Liquid Temp (°F)	Infiltratn Rate, I**(in/hr)	Remarks
1 - Start	10:00	15	3.0	1.45	59	0.36	CLOUDY, SLIGHT WIND
End	10:15	(15)	4.45	114	59		
2 - Start	10:15	15	4.45	2.7	59	0.68	
End	10:30	(30)	7.15	212	59		
3 - Start	10:30	15	7.15	3.35	59	0.84	
End	10:45	(45)	10.5	263	59		
4 - Start	10:45	15	10.5	3.9	59	0.97	
End	11:00	(60)	14.4	306	60		
5 - Start	11:00	30	14.4	9.65	60	1.2	
End	11:30	(90)	24.05	758	61		
6 - Start	11:30	30	24.05	10.8	61	1.4	
End	12:00	(120)	34.85	848	62		
7 - Start	12:10	60	3.5	24.7	62	1.5	REFILLED TUBES
End	13:10	(180)	28.25	1944	63		
8 - Start	13:20	60	2.4	23.9	64	1.5	)(
End	14:20	(240)	26.3	1877	64		
9 - Start	14:30	60	4.3	21.6	64	1.4	)(
End	15:30	(300)	25.9	1696	64		
10 - Start	15:40	60	2.2	20.2	64	1.3	)(
End	16:40	(360)	22.4	1586	64		CLOUDY, SLIGHT WIND
11 - Start							
End							
12 - Start							
End							
13 - Start							
End							
14 - Start							
End							
15 - Start							
End							

*Flow, $Q_f = \Delta H \times V_r$ **Infiltration Rate, $I = (Q_f/A_r)/\Delta t$

FIGURE 3 – Sample Test Data

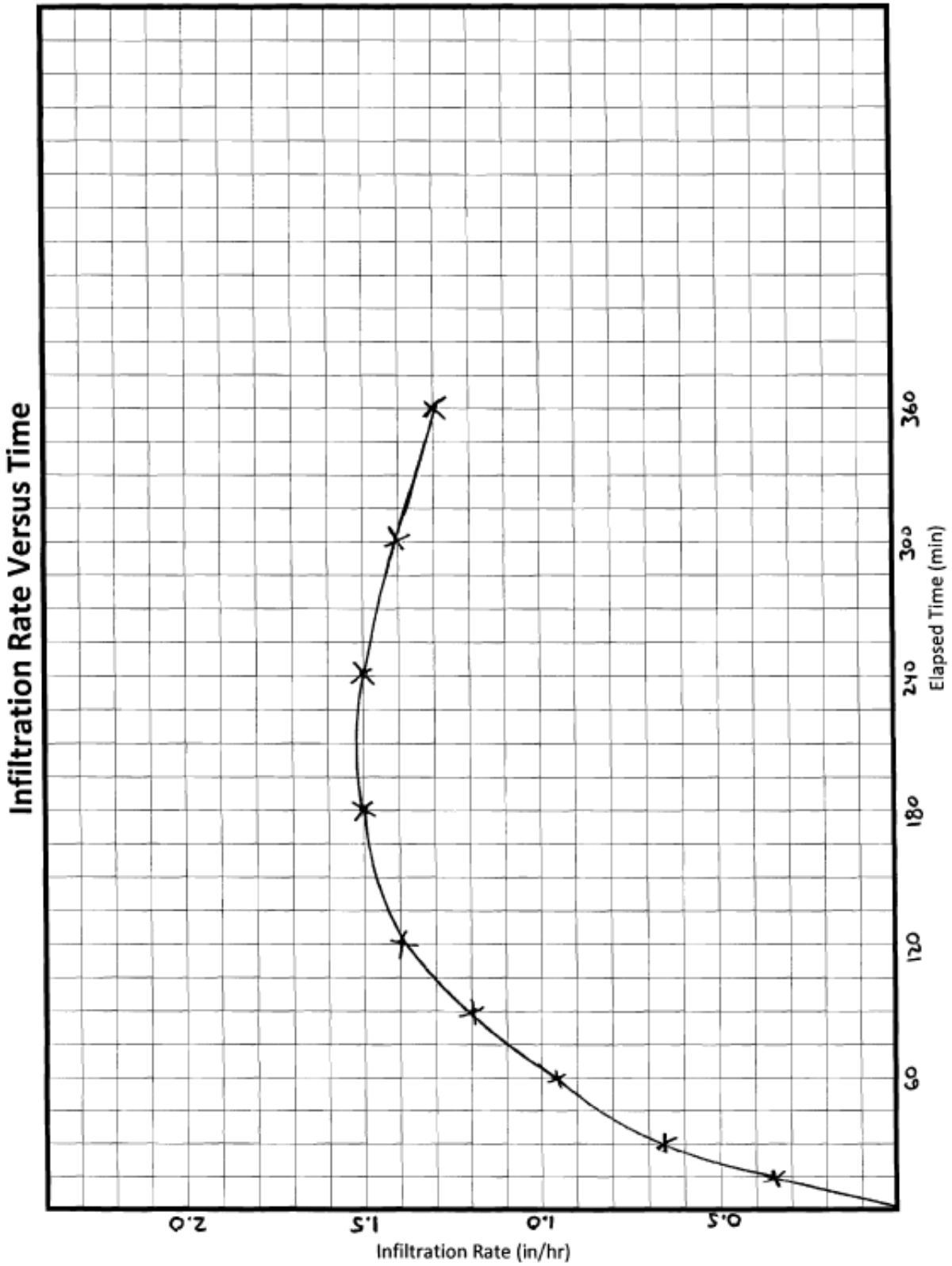

FIGURE 4 – Plot of Sample Test Data for Single Ring Infiltrometer Test

2.2.2 - Double Ring Infiltrometers

The ***double ring infiltrometer*** test (ASTM D 3385) is a well recognized and documented technique for directly measuring the soil infiltration rate of a site (see Figure 5, 6 and 7; Photos 2, 3, 4 and 5). Double ring infiltrometers were developed in response to the fact that smaller (less than 40 inch diameter) single ring infiltrometers tend to overestimate vertical infiltration rates. This has been attributed to the fact that the flow of water beneath the cylinder is not purely vertical and diverges laterally. Double ring infiltrometers minimize the error associated with the single-ring method because the water level in the outer ring forces vertical infiltration of water in the inner ring. Care should be taken when driving the rings into the ground as there can be a poor connection between the ring wall and the soil. This poor connection can cause a leakage of water along the ring wall and an overestimation of the infiltration rate. Another potential source of error is attributed to the size of the cylinders. As such, the use of cylinder sizes less than those prescribed in ASTM D 3385 is not recommended.

A typical double ring infiltrometer would consist of a 12 inch inner ring and a 24 inch outer ring. While there are two operational techniques used with the double-ring infiltrometer, the constant head method and the falling head method, ASTM D3385 mandates the use of the constant head method. With the constant head method, water is consistently added to both the outer and inner rings to maintain a constant level throughout the testing. The volume of water needed to maintain the fixed level of the inner ring is measured. To help maintain a constant head, a variety of devices may be used. A hook gauge, steel tape or rule, or length of steel or plastic rod pointed on one end, can be used for measuring and controlling the depth of liquid (head) in the infiltrometer ring. If available, a graduated Mariotte tube or automatic flow control system may also be used.

The volume of liquid used during each measured time interval may be converted into an incremental infiltration velocity (infiltration rate) using the following equation:

$$I_t = \Delta V/(A*\Delta t)$$

Where:

I_t = tested infiltration rate, in/hr

ΔV = volume of liquid used during time interval to maintain constant head in the inner ring, in^3

A = area of inner ring, in^2

Δt = time interval, hr.

Final Report - Ultimately, as discussed in Section 1.7, a final report shall be provided and, based on the test results, an infiltration rate shall be recommended.

Photo 2 – Simple Double Ring Infiltrometer

Photo 3 – Pre-fabricated Double Ring Infiltrometer
(Photo courtesy of Turf-Tec International)

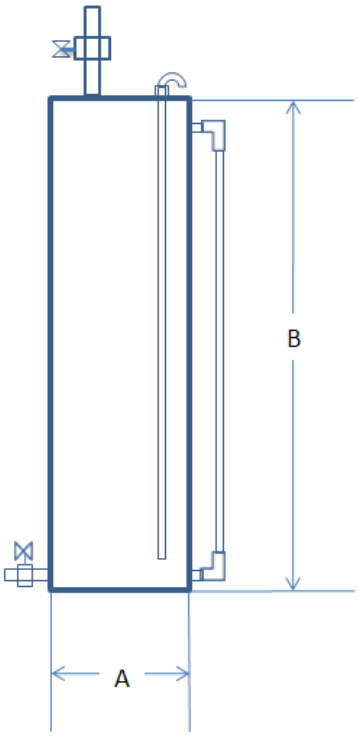

Mariotte Tube
Useful Capacity

	1 gal	3 gal
A =	3 in.	6 in.
B =	18 in.	24 in.

Figure 5 - Mariotte Tube

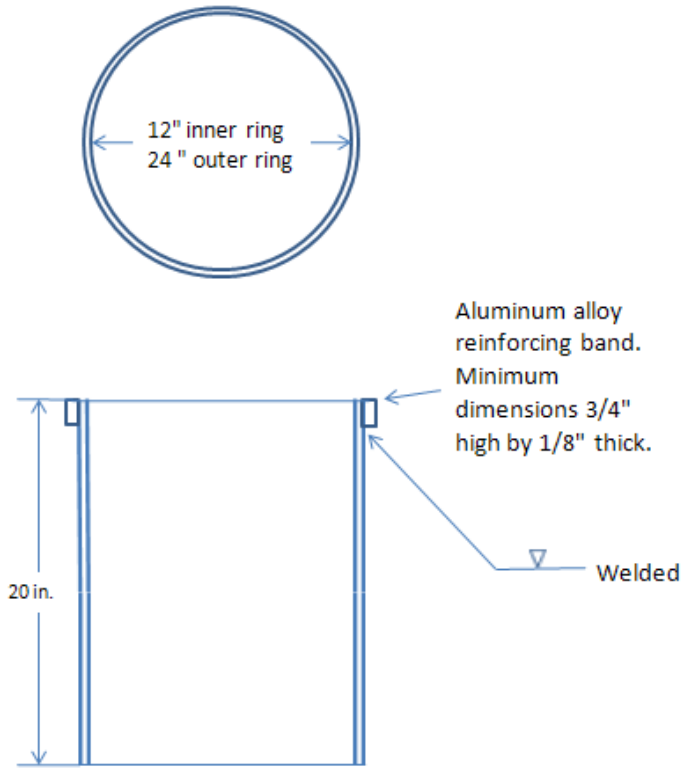

Materials: 1/8" aluminum alloy sheet or material of similar strength

Figure 6- Double Ring Infiltrometer Construction

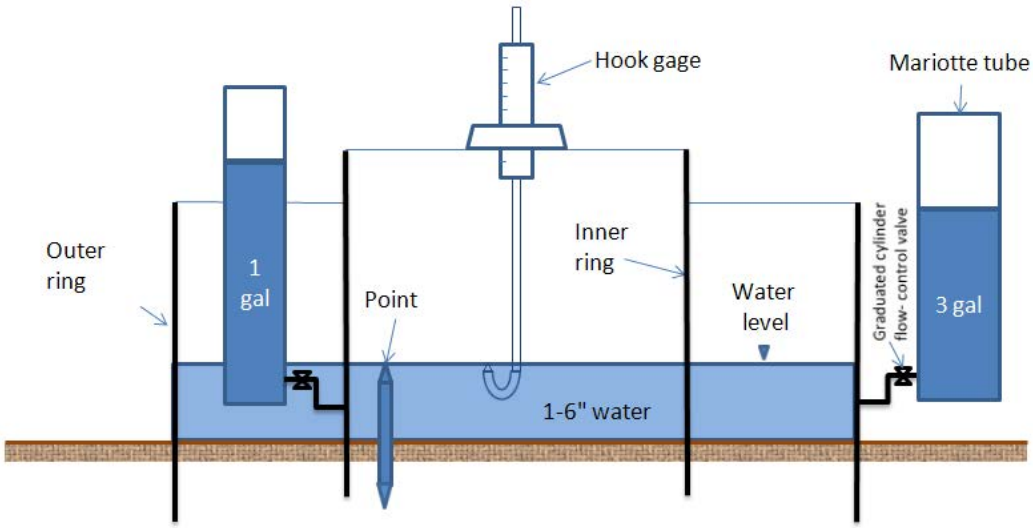

Figure 7- Double Ring Setup with Mariotte Tubes

Photo 4- Double Ring Infiltrometer Set-up with Mariotte Tubes
(Photo courtesy of Turf-Tec International)

Photo 5 – Double Ring Infiltrometer Set-up for Test at Basin Surface Elevation
(Photo courtesy of Turf-Tec International)

DOUBLE RING INFILTROMETER TEST DATA

Project Name and Test Location:				Constants-	Ring Data		Liquid Containers	
					Area, A_r (in^2)	Depth of Liquid (in)	No.	Vol., V_r (in3/in)
				Inner Ring:				
Test By:		USCS Class:		Annular Space:				

Water Table Depth:		Penetration of Rings into Soil (in.):		Inner:		Outer:	
Date of Test:		Liquid Used:		pH:		Ground Temp (°F):		at Depth:	

Liquid Level Maintained by using: ( ) Flow Valve ( ) Float Valve ( ) Marriotte Tube ( ) Other:

Additional Comments:

Time interval	Time (hr:min)	Dt (min) & Total	Inner Ring		Annular Ring		Liquid Temp °F	Infiltration Rate, I**		Remarks
			Elev., H (In)	ΔH (in) &	Elev., H (In)	ΔH (in) &		Inner in/hr	Outer in/hr	
1 - Start										
End										
2 - Start										
End										
3 - Start										
End										
4 - Start										
End										
5 - Start										
End										
6 - Start										
End										
7 - Start										
End										
8 - Start										
End										
9 - Start										
End										
10 - Start										
End										
11 - Start										
End										
12 - Start										
End										
13 - Start										
End										
14 - Start										
End										
15 - Start										
End										

***Flow, Qf = ΔH x Vr **Infiltration Rate, I = (Qf/Ar)/Δt**

Table 3 – Sample Test Data Form for Double Ring Infiltrometer Test

DOUBLE RING INFILTROMETER TEST DATA

Project Name and Test Location:				Constants-	Ring Data		Liquid Containers	
ACME Industrial Site 24166 Elm, Riverdale (Western corner of site, near warehouse)					Area, A_r (in^2)	Depth of Liquid (in)	No.	Vol., V_r (in3/in)
				Inner Ring:	113	4	1	78.54
Test By:	CMD	USCS Class:	SM	Annular Space:	339	4.1	2	176.7
Water Table Depth:	40 ft.	Penetration of Rings into Soil (in.):			Inner:	3.0	Outer:	7.0
Date of Test:	3/22/09	Liquid Used:	tap water	pH: 8.0	Ground Temp (°F):	57.2	at Depth:	16 in.
Liquid Level Maintained by using:	( ) Flow Valve ( ) Float Valve (X) Marriotte Tube ( ) Other:							
Additional Comments:	Dry Gound							

Time interval	Time (hr:min)	Dt (min) & Total	Inner Ring Elev., H (In)	Inner Ring ΔH (in) &	Annular Ring Elev., H (In)	Annular Ring ΔH (in) &	Liquid Temp °F	Infiltration Rate, I** Inner in/hr	Infiltration Rate, I** Outer in/hr	Remarks
1 - Start	9:00	15	3	0.2	3	0.4	59	0.6	0.8	Cloudy, slight wind
End	9:15	15	3.2	15.71	3.4	70.68	59			
2 - Start	9:15	15	3.2	0.35	3.4	0.6	59	1.0	1.3	
End	9:30	30	3.55	27.49	4	106	59			
3 - Start	9:30	15	3.55	0.5	4	0.9	59	1.4	1.9	
End	9:45	45	4.05	39.27	4.9	159	59			
4 - Start	9:45	15	4.05	0.65	4.9	1.2	59	1.8	2.5	
End	10:00	60	4.7	51.05	6.1	212	60			
5 - Start	10:00	30	4.7	1.5	6.1	2.65	60	2.1	2.8	
End	10:30	90	6.2	117.8	8.75	468.3	61			
6 - Start	10:30	30	6.2	1.7	8.75	2.75	61	2.4	2.9	
End	11:00	120	7.9	133.5	11.5	485.9	62			
7 - Start	11:10	60	3.25	3.75	2.5	5.9	62	2.6	3.1	
End	12:10	180	7	294.5	8.4	1043	63			Refilled tubes
8 - Start	12:20	60	3.5	3.9	3	5.7	64	2.7	3.0	
End	13:20	240	7.4	306.3	8.7	1007	64			Refilled tubes
9 - Start	13:30	60	3	3.6	3.1	5.5	64	2.5	2.9	
End	14:30	300	6.6	282.7	8.6	971.9	64			Refilled tubes
10 - Start	14:40	60	3.25	3.45	3	5.4	64	2.4	2.8	
End	15:40	360	6.7	271	8.4	954.2	64			Refilled tubes
11 - Start	15:50	60	3.3	3.4	2.9	5	64	2.4	2.6	
End	16:50	420	6.7	267	7.9	883.5	64			Refilled tubes
12 - Start	18:00	60	3	3.5	3.1	4.9	64	2.4	2.6	Refilled tubes
End	19:00	480	6.5	274.9	8	865.8	64			Cloudy, no wind
13 - Start										
End										
14 - Start										
End										
15 - Start										
End										

***Flow, Qf = ΔH x Vr** ****Infiltration Rate, I = (Qf/Ar)/Δt**

Table 4 – Sample Test Data Form for Double Ring Infiltrometer Test

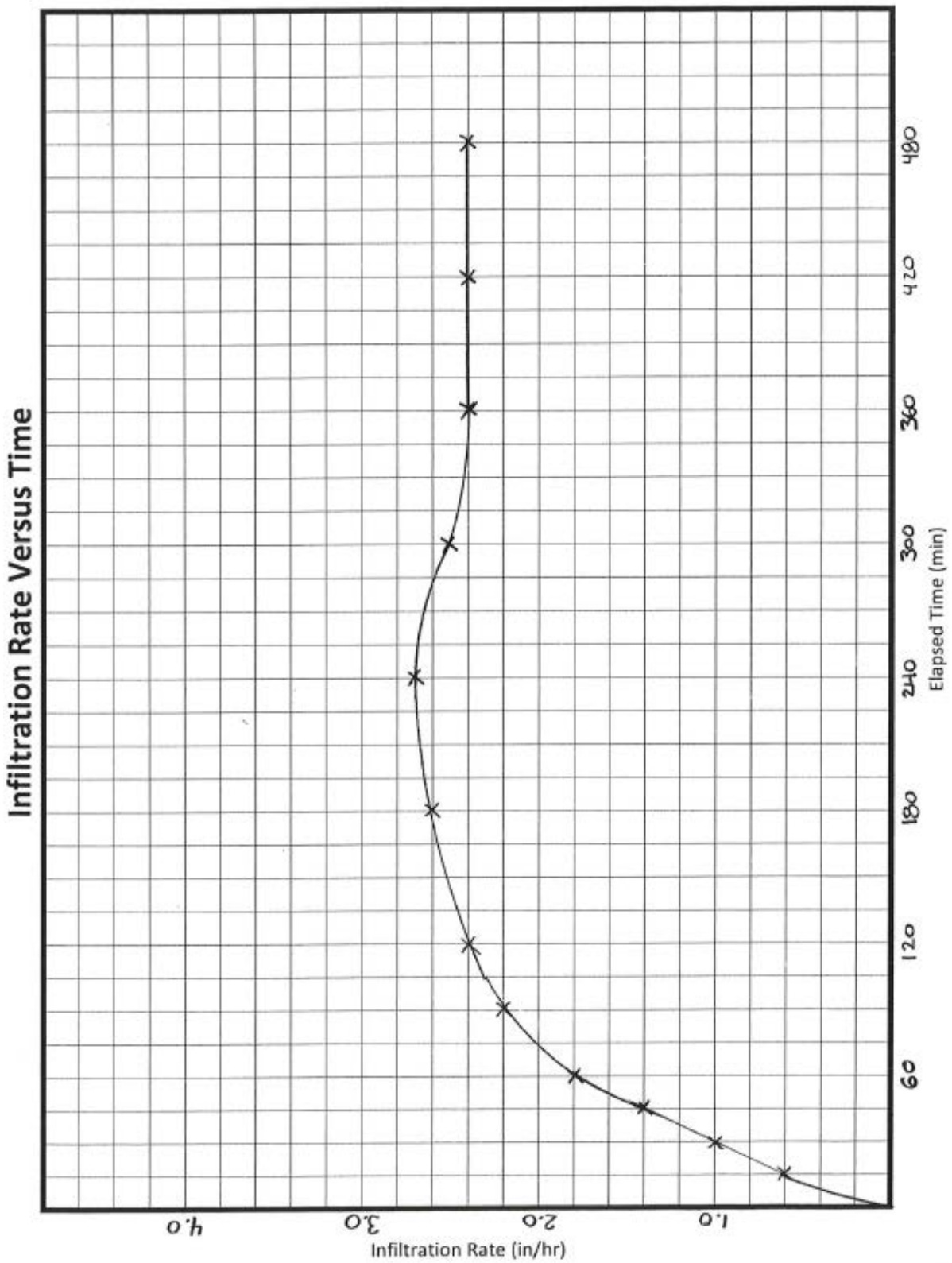

FIGURE 8 – Plot of Sample Test Data for Double Ring Infiltrometer Test

2.3 - Percolation Tests

The ***percolation test*** is widely used for assessing the suitability of a soil for onsite wastewater disposal. Depending on the required depth of testing, there are two versions of the percolation test. For shallow depth testing (less than 10 feet), the procedure would be as shown in Figure 8 (Photo 6). For deep testing (10 feet to 40 feet), the procedure is as shown in Figure 9. For deep testing, special care must be taken to ensure that caving of the sidewalls does not occur.

This test measures the length of time required for a quantity of water to infiltrate into the soil and is often called a "percolation rate". It should be noted that the percolation rate is related to, but not equal to, the infiltration rate. While an infiltration rate is a measure of the speed at which water progresses downward into the soil, the percolation rate measures not only the downward progression but the lateral progression through the soil as well. This reflects the fact that the surface area for infiltration testing would include only the horizontal surface while the percolation test includes both the bottom surface area and the sidewalls of the test hole. However, there is a relationship between the values obtained by a percolation test and infiltration rate. Based on the [1]"Porchet Method", the following equation may be used to convert percolation rates to the tested infiltration rate, I_t:

$$I_t = \frac{\Delta H\, \pi r^2\, 60}{\Delta t(\pi r^2 + 2\pi r H_{avg})} = \frac{\Delta H\, 60\, r}{\Delta t(r + 2H_{avg})}$$

Where:

I_t = tested infiltration rate, inches/hour
ΔH = change in head over the time interval, inches
Δt = time interval, minutes
$^*r$ = effective radius of test hole
H_{avg} = average head over the time interval, inches

An example of this procedure is provided on Page 26 based data form Table 5, *Sample Percolation Test Data*. Figure 11 provides a plot of the converted percolation test data.

*Where a rectangular test hole is used, an equivalent radius should be determined based on the actual area of the rectangular test hole. (i.e., $r = (A/\pi)^{0.5}$)

Note to the designer: The values obtained using this method may vary from those obtained from methods considered to be more accurate. The designer is encouraged to explore the derivation of these equations (Ritzema; Smedema)

Final Report - Ultimately, as discussed in Section 1.7, a final report shall be provided and, based on the test results, an infiltration rate shall be recommended.

[1]H.P. Ritzema, "Drainage Principles and Applications," International Institute for Land Reclamation and Improvement (ILRI), Publication 16, 2nd revised edition, 1994, Wageningen, The Netherlands.

Percolation Test Procedure

Only those individuals trained and educated to perform, understand and evaluate the field conditions and tests may perform these tests. This would include those who hold one of the following State of California credentials and registrations: Professional Civil and Geotechnical Engineers, Certified Engineering Geologist and Certified Hyrdrogeologist. The District will only approve the percolation test method described in this Chapter.

When the percolation testing has been completed, a 3 foot long surveyor's stake (lath) shall be flagged with highly visible banner tape and placed in the location of the test indicating date, test hole number as shown on the field data sheet, and firm performing the test. Field data shall be included in the Final Report as described in Section 1.7.

Shallow Percolation Test (less than 10 feet)

Test Preparation

1.) The test hole opening shall be between 8 and 12 inches in diameter or between 7 and 11 inches on each side if square.

2.) The bottom elevation of the test hole shall correspond to the bottom elevation of the proposed basin (infiltration surface). Keep in mind that this procedure will require the test hole to be filled with water to a depth of at least 5 times the hole's radius.

3.) The bottom of the test hole shall be covered with 2 inches of gravel.

4.) The sides of the hole shall remain undisturbed (not smeared) after drilling and any cobbles encountered left in place.

5.) **Pre-soaking** shall be used with this procedure. Invert a full 5 gallon bottle (more if necessary) of clear water supported over the hole so that the water flow into the hole holds constant at a level at least 5 times the hole's radius above the gravel at the bottom of the hole. Testing may commence after all of the water has percolated through the test hole or after 15 hours has elapsed since initiating the pre-soak. However, to assure saturated conditions, testing must commence no later than 26 hours after all pre-soak water has percolated through the test hole. The use of the "continuous pre-soak procedure" is no longer accepted. When sandy soils (as described below) are present, the test shall be run immediately.

Test Procedure

Test hole shall be carefully filled with water to a depth equal to at least 5 times the hole's radius ($H/r>5$) above the gravel at the bottom of the test hole prior to each test interval.

- In **sandy soils**, when 2 consecutive measurements show that 6 inches of water seeps away in less than 25 minutes, the test shall be run for an additional hour with measurements taken every 10 minutes. Measurements shall be taken with a precision of 0.25 inches or better. The drop that occurs during the final 10 minutes is used to calculate the percolation rate. Field data must show the two 25 minute readings and the six 10 minute readings.

- In **non-sandy soils**, obtain at least twelve measurements per hole over at least six hours with a precision of 0.25 inches or better. From a fixed reference point, measure the drop in water level over a 30 minute period for at least 6 hours, refilling after every 30 minute reading. The total depth of the hole must be measured at every reading to verify that collapse of the borehole has not occurred. The drop that occurs during the final reading is used to calculate the percolation rate.

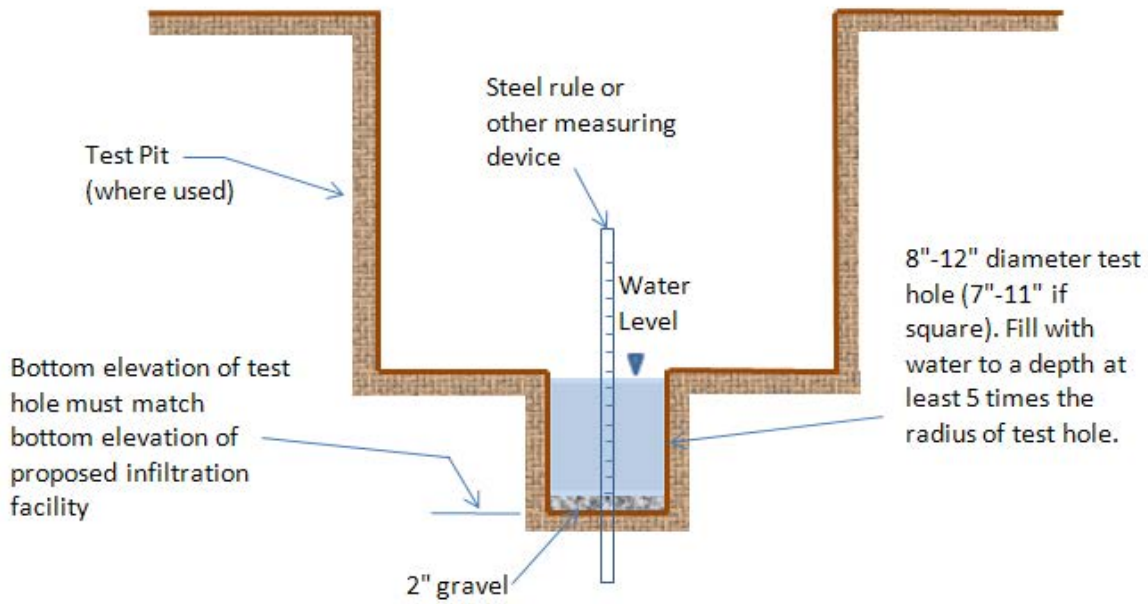

Figure 9- Test Pit for Shallow Percolation Test

Deep Percolation Test (Depths 10-40 feet)

Test Preparation

1.) Borehole diameter shall be either 6 inch or 8 inch only. No other diameter test holes will be accepted.

2.) The bottom elevation of the test hole shall correspond to the bottom elevation of the proposed basin (infiltration surface). Keep in mind that this procedure will require the test hole to be filled with water to a depth of at least 5 times the hole's radius.

3.) The bottom of the test hole shall be covered with 2 inches of gravel.

4.) The sides of the hole shall remain undisturbed (not smeared) after drilling and any cobbles encountered left in place. Special care should be taken to avoid cave-in.

5.) **Pre-soaking** shall be used with this procedure. Invert a full 5 gallon bottle of clear water supported over the hole so that the water flow into the hole holds constant at a maximum depth of 4 feet below the surface of the ground or if grading cuts are anticipated, to the approximate elevation of the **top** of the basin but at least 5 times the hole's radius (H/r>5). Pre-soaking shall be performed for 24 hours unless the site consists of sandy soils containing little or no clay. If sandy soils exist as described below, the tests may then be run after a 2 hour pre-soak. However, to assure saturated conditions, testing must commence no later than

26 hours after all pre-soak water has percolated through the test hole. The use of the "continuous pre-soak procedure" is no longer accepted. When sandy soils (as described below) are present, the test shall be run immediately.

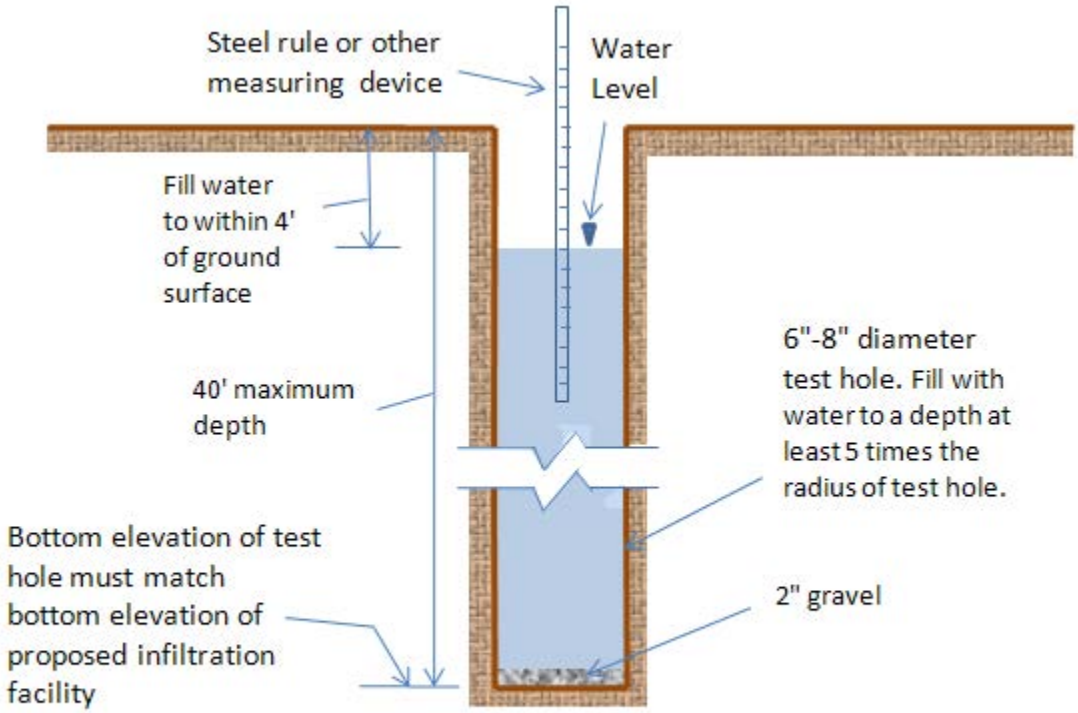

Figure 10- Test Pit for Deep Percolation Test

Test Procedure

Carefully fill the hole with clear water to a maximum depth of 4 feet below the surface of the ground or, if grading cuts are anticipated, to the approximate elevation of the **top** of the basin. However, at a minimum, the bore hole shall be filled with water to a depth equal to 5 times the hole's radius (H/r>5).

- In **sandy soils**, when 2 consecutive measurements show that 6 inches of water seeps away in less than 25 minutes, the test shall be run for an additional hour with measurements taken every 10 minutes. Measurements shall be taken with a precision of 0.25 inches or better. The drop that occurs during the final 10 minutes is used to calculate the percolation rate. Field data must show the two 25 minute readings and the six 10 minute readings.

- In **non-sandy soils**, the percolation rate measurement shall be made on the day following initiation of the pre-soak as described in Item #5 above. From a fixed reference point, measure the drop in water level over a 30 minute period for at least 6 hours, refilling after every 30 minute reading. Measurements shall be taken with a precision of 0.25 inches or better. The total depth of hole must be measured at every reading to verify that collapse of the borehole has not occurred. The drop that occurs during the final reading is used to calculate the percolation rate.

Photo 6 – Percolation Test Pit. Use of perforated PVC pipe is a variation.

Percolation Test Data Sheet

Project:			Project No:			Date:	
Test Hole No:			Tested By:				
Depth of Test Hole, D_T:			USCS Soil Classification:				
Test Hole Dimensions (inches)					Length	Width	
Diameter (if round)=			Sides (if rectangular)=				
Sandy Soil Criteria Test*							
Trial No.	Start Time	Stop Time	Time Interval, (min.)	Initial Depth to Water (in.)	Final Depth to Water (in.)	Change in Water Level (in.)	Greater than or Equal to 6"? (y/n)
1							
2							
*If two consecutive measurements show that six inches of water seeps away in less than 25 minutes, the test shall be run for an additional hour with measurements taken every 10 minutes. Other wise, pre-soak (fill) overnight. Obtain at least twelve measurements per hole over at least six hours (approximately 30 minute intervals) with a precision of at least 0.25".							
Trial No.	Start Time	Stop Time	Δt Time Interval (min.)	D_o Initial Depth to Water (in.)	D_f Final Depth to Water (in.)	ΔD Change in Water Level (in.)	Percolation Rate (min./in.)
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
COMMENTS:							

Table 5 – Sample Test Data Form for Percolation Test

Percolation Rate Conversion

Example:

The bottom of a proposed infiltration basin would be at 5.0 feet below natural grade. Percolation tests are performed within the boundaries of the proposed basin location with the depth of the test hole set at the infiltration surface level (bottom of the basin). The Percolation Test Data Sheet (Table 5) is prepared as the test is being performed. After the minimum required number of testing intervals, the test is complete. [1]**The data collected at the final interval is as follows:**

Time interval, Δt = 10 minutes
Initial Depth to Water, D_0 = 12.25 inches
Final Depth to Water, D_f = 13.75 inches
Total Depth of Test Hole, D_T = 60 inches
[2]Test Hole Radius, r = 4 inches

The conversion equation is used:

$$I_t = \frac{\Delta H\ 60\ r}{\Delta t(r+2H_{avg})}$$

"H_o" is the initial height of water at the selected time interval.

$H_o = D_T - D_0 = 60 - 12.25 =$ **47.75 inches**

"H_f" is the final height of water at the selected time interval.

$H_f = D_T - D_0 = 60 - 13.75 =$ **46.25 inches**

"ΔH" is the change in height over the time interval.

$\Delta H = \Delta D = H_o - H_f = 47.75 - 46.25 =$ **1.5 inches**

"H_{avg}" is the average head height over the time interval.

$H_{avg} = (H_o - H_f)/2 = (47.75 - 46.25)/2 =$ **47.0 inches**

"I_t" is the tested infiltration rate.

$$I_t = \frac{\Delta H\ 60\ r}{\Delta t(r+2H_{avg})} = \frac{(1.5\text{ in})(60\text{ min/hr})(4\text{ in})}{(10\text{ min})((4\text{ in}) + 2(47\text{ in}))} = \mathbf{0.37\ in/hr.}$$

Percolation Test Data Sheet

Project:	ACME SITE	Project No:	1106 B	Date:	2-18-09
Test Hole No:	3	Tested By:	CMD		
Depth of Test Hole, D_T:	60 IN.	USCS Soil Classification:	SM		
Test Hole Dimensions (inches)			Length	Width	
Diameter (if round)=	8	Sides (if rectangular)=			

Sandy Soil Criteria Test*

Trial No.	Start Time	Stop Time	Time Interval, (min.)	Initial Depth to Water (in.)	Final Depth to Water (in.)	Change in Water Level (in.)	Greater than or Equal to 6"? (y/n)
1	8:00	8:25	25	12.0	19.5	7.5	Y
2	8:30	8:55	25	12.0	18.75	6.75	Y

*If two consecutive measurements show that six inches of water seeps away in less than 25 minutes, the test shall be run for an additional hour with measurements taken every 10 minutes. Other wise, pre-soak (fill) overnight. Obtain at least twelve measurements per hole over at least six hours (approximately 30 minute intervals) with a precision of at least 0.25".

Trial No.	Start Time	Stop Time	Δt Time Interval (min.)	D_o Initial Depth to Water (in.)	D_f Final Depth to Water (in.)	ΔD Change in Water Level (in.)	Percolation Rate (min./in.)
1	9:00	9:10	10	12.0	14.25	2.25	4.4
2	9:10	9:20	10	11.5	13.5	2.0	5.0
3	9:20	9:30	10	12.0	14.0	2.0	5.0
4	9:30	9:40	10	11.75	13.5	1.75	5.7
5	9:40	9:50	10	12.0	13.5	1.5	6.7
6	9:50	10:00	10	12.25	13.75	1.5	6.7
7							
8							
9							
10							
11							
12							
13							
14							
15							

Data used for conversion to Infiltration rate.

COMMENTS: OVERCAST (62°F). GROUND DRY. FIRST (2) MEASUREMENTS MET SANDY SOIL CRITERIA.

Table 6 – Sample Percolation Test Data

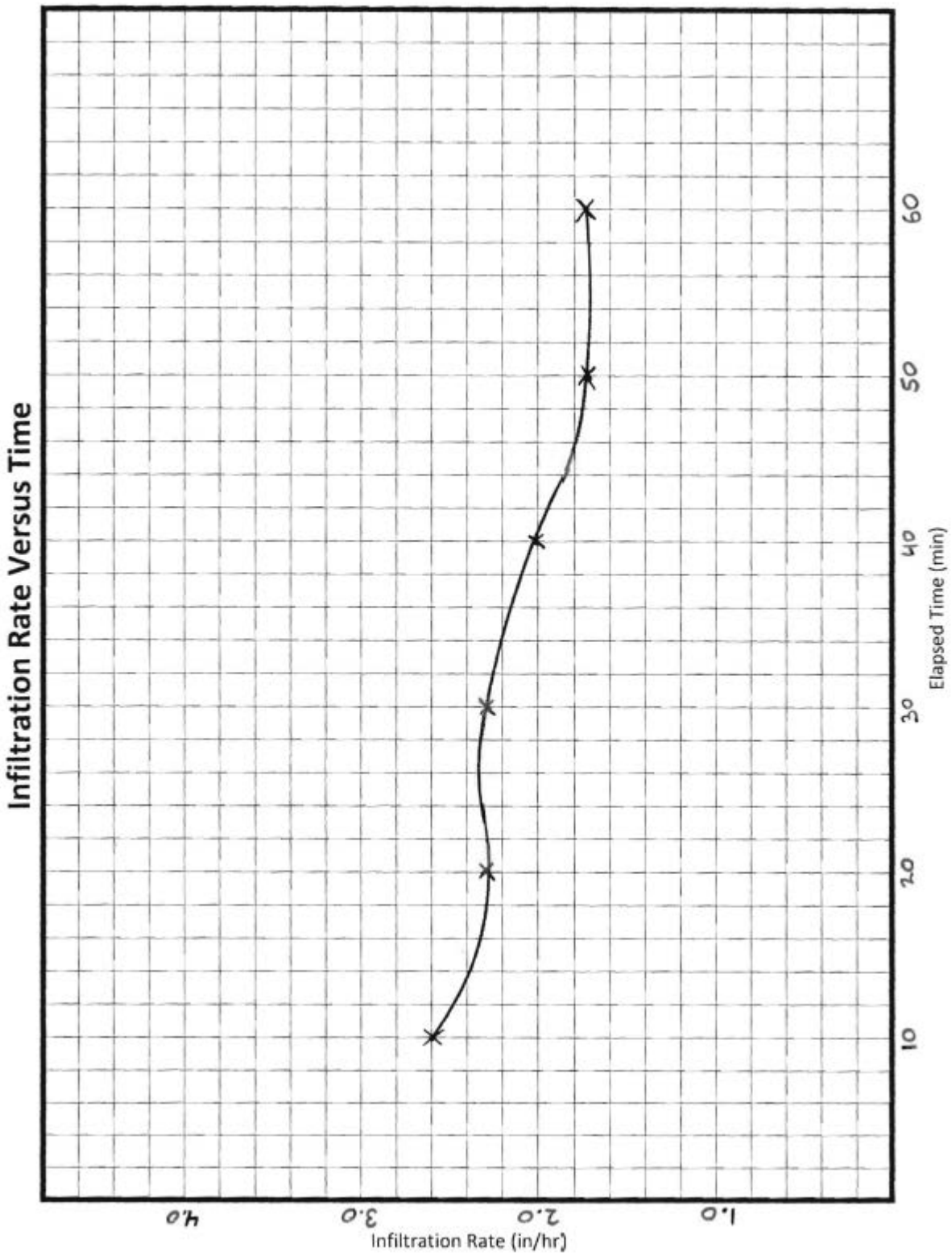

FIGURE 11 – PLOT OF CONVERTED PERCOLATION TEST DATA

2.4 - Field Permeability Test (Well Permeameter Method USBR 7300-89)

Similar to a constant-head version of the percolation test used for seepage pit design is the Well Permeameter Method of the United States Bureau of Reclamation. [1]USBR 7300-89 is an in-hole hydraulic conductivity test performed by drilling test wells with a 6-8 inch diameter auger to the desired depth. This test measures the rate at which water flows into the soil under constant-head flow conditions and is used to determine field-saturated hydraulic conductivity. As with the percolation test, the rate determined with this test is a "percolation rate" and is related, but not equal, to the infiltration rate. Infiltration rate is a measure of the speed at which water progresses downward into the soil. A percolation rate measures not only the downward progression but the lateral progression through the soil. However, this procedure uses the following equation(s) to establish an infiltration rate:

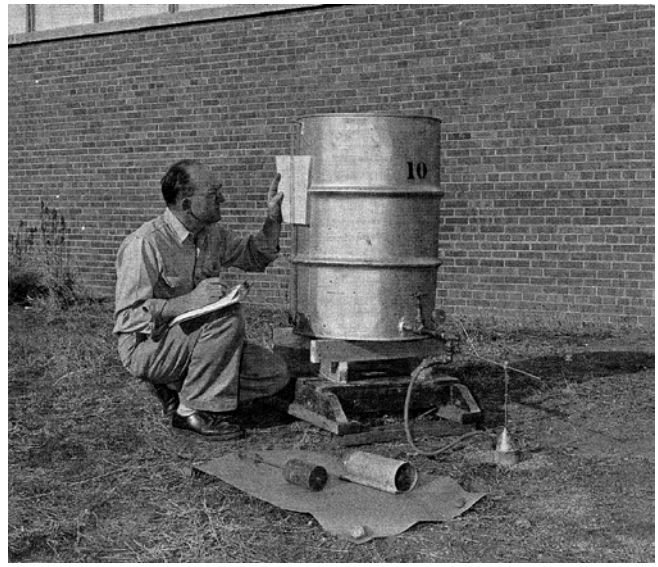

Photo 7 - Typical Well Permeamater Test Installation

Condition I: Typical condition (See Figure 12). The distance between the historical high water mark[2] and the water surface in the well is at least three (3) times the height of water in the well. In addition, there must be at least 10 feet from the bottom of the well to the historical high water table and at least 5 feet to impervious strata.

$$K_s = \frac{Q(\mu_T/\mu_{20})}{2\pi H^2}\left[\ln\left[\frac{H}{r} + \sqrt{\left(\frac{H}{r}\right)^2 + 1}\right] - \frac{\sqrt{1+\left(\frac{H}{r}\right)^2}}{\frac{H}{r}} + \frac{r}{H}\right]$$

Where:

K_s = saturated hydraulic conductivity (infiltration rate, inches/hour)
H = height of water in well (inches)
Q = percolation flow rate from selected time interval (cubic inches/hour)
r = effective radius of well (inches)
μ_T = viscosity of water at test temperature, T
μ_{20} = viscosity of water at 20°C

[1]A detailed description of this procedure along with a complete example using the associated equations can be found in the United States Bureau of Mines and Reclamation (USBR) document 7300-89.

[2]The "historical high groundwater mark" is defined as the groundwater elevation expected due to a normal wet season and shall be obtained by boring logs or test pits.

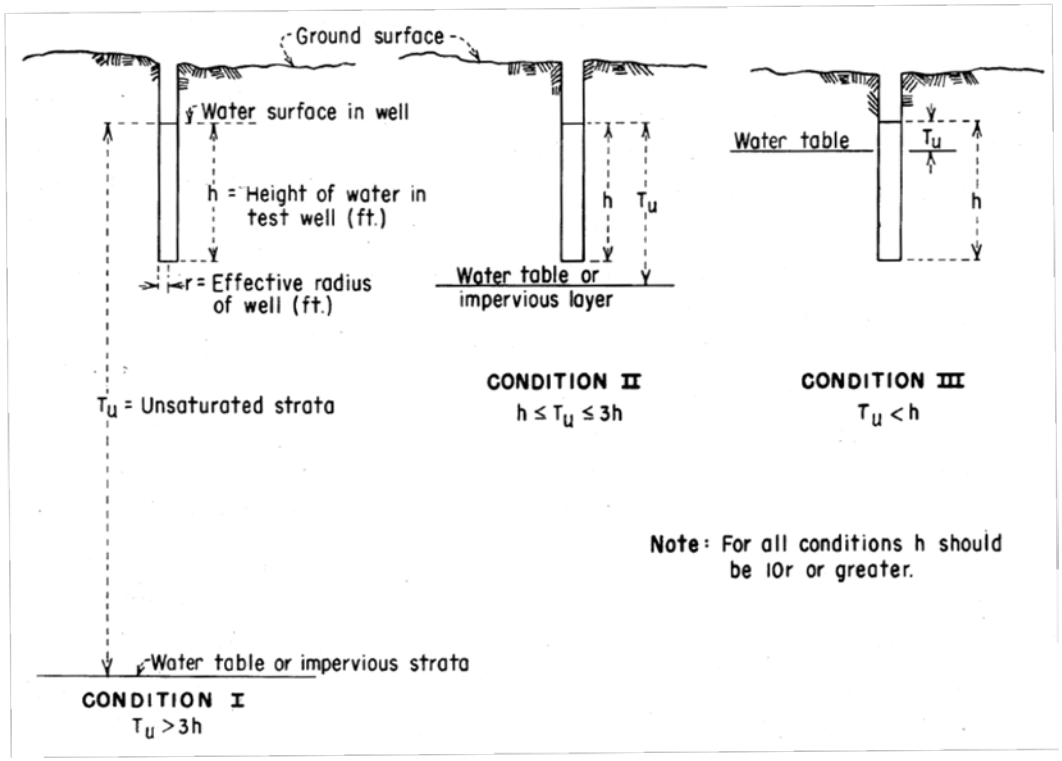

Figure 12 – Site Conditions Govern Procedure to be Used

Condition II: The distance between the historical high groundwater mark[1] and the water surface in the well is less than three (3) times, but at least equal to, the height of water in the well. In addition, there must be at least 10 feet from the bottom of the well to the historical high water mark[1] and at least 5 feet to impervious strata.

$$K_s = \frac{Q(\mu_{20}/\mu_T)}{2\pi H^2}\left[\frac{\ln\left(\frac{H}{r}\right)}{\frac{1}{6}+\frac{1}{3}\left(\frac{H}{T_u}\right)^{-1}}\right]$$

Where:

K_s = saturated hydraulic conductivity (infiltration rate, inches/hour)
H = height of water in well (inches)
Q = percolation flow rate from selected time interval (cubic inches/hour)
r = effective radius of well (inches)
μ_T = viscosity of water at water temperature, T
μ_{20} = viscosity of water at 20° C
T_u = unsaturated distance between the water surface and the water table or impervious strata

Condition III: Unacceptable location. The distance between the historical high groundwater mark and the water surface in the well is less than the height of water in well. As such, the base of the BMP would not be 10 feet above the historical high water mark or 5 feet from impervious strata.

Final Report - Ultimately, as discussed in Section 1.7, a final report shall be provided and, based on the test results, an infiltration rate shall be recommended.

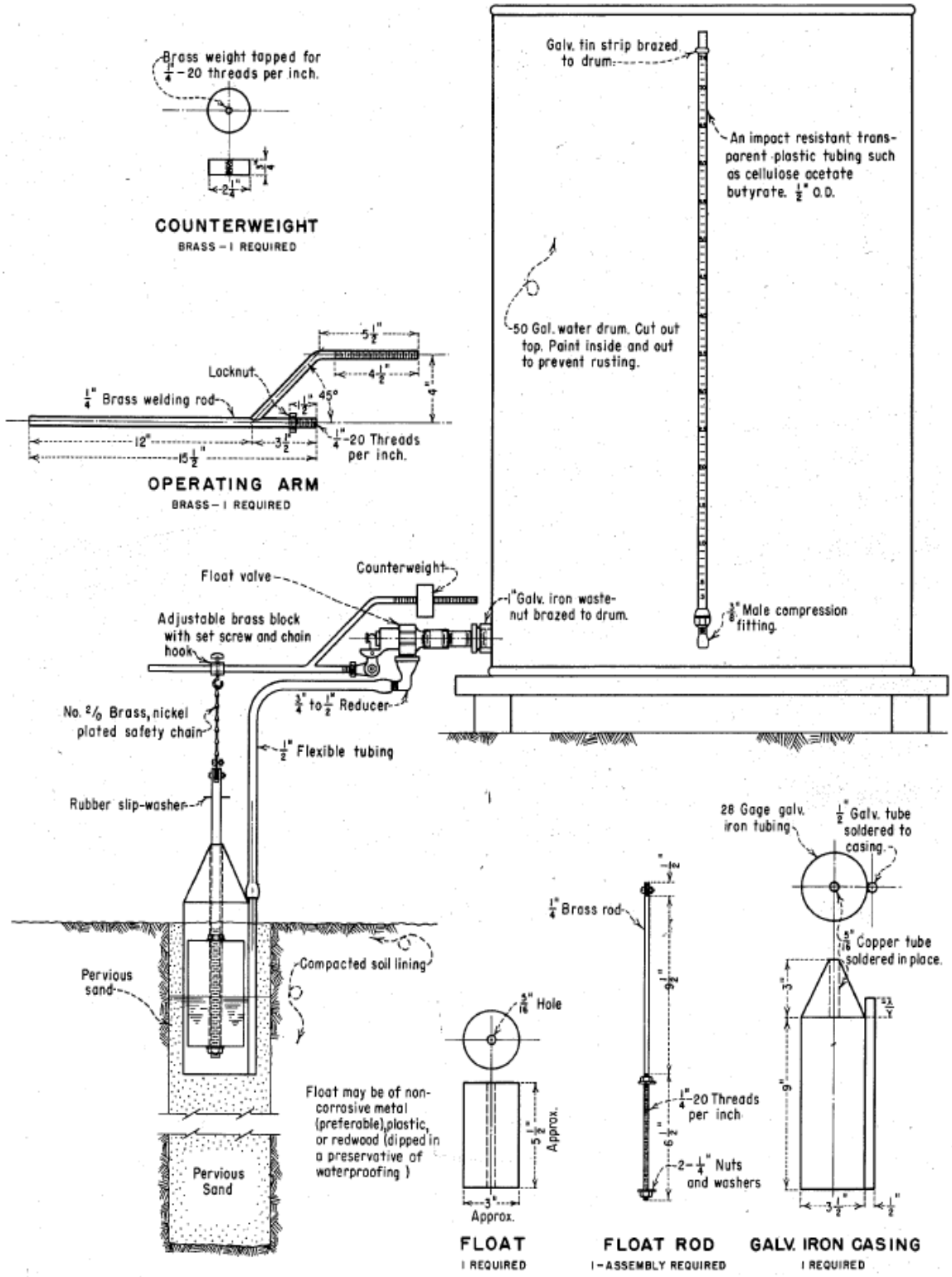

Figure 11 – Well Permeameter Test Equipment

2.5 - Borings and Test Pits

Borings and test pits are used to determine the thickness of soil and rock strata, estimate the depth to groundwater, obtain soil or rock specimens and perform field tests such as standard penetration tests (SPTs) or cone penetration tests (CPTs).

Test pits and trenches may be used to evaluate near-surface conditions up to about 15 feet deep but are often used for performing subsurface exploration at shallower depths. Test pits are often square in plan view and may be dug with shovels in less accessible areas. Trenches are long and narrow excavations usually made by a backhoe or bulldozer.

Borings (ASTM D 1452) are generally used to investigate deeper subsurface conditions. A cylindrical hole is drilled into the ground for the purpose of investigating subsurface conditions, performing field tests, and obtaining soil, rock, or underground specimens for testing. Borings can be excavated by hand (e.g., hand auger), although the usual procedure is to use mechanical equipment to excavate the borings.

Whatever method is used, testing shall be sufficient to establish USCS series and textural class (SM, CL, etc) of the soil beneath the infiltration surface of the BMP and of sufficient depth to establish that a minimum of 5 feet of permeable soil exists below the infiltration facility and that there is a minimum of 10 feet between the bottom of the infiltration facility and the historical high groundwater mark[1].

Photo 8- Auger Boring Rig

Photo 9 – Test Pit Excavation

[1]The "historical high groundwater mark" is defined as the groundwater elevation expected due to a normal wet season and shall be obtained by boring logs or test pits.

Infiltration Test Requirement Checklist

___ Where infiltration testing is to be performed, the measured infiltration rate of the underlying soil must be determined using either the single ring infiltrometer test (as described in ASTM D 5126, Section 4.1.2.1), the double ring infiltrometer test (ASTM D 3385), the well permeameter method (USBR 7300-89), or a percolation test per County of Riverside Department of Environmental Health (RCDEH) test procedures. A general explanation of these test methods can be found in Section 2 of this appendix. The minimum number of tests required can be found in Table 1 and is dependent upon the type of infiltration test performed.

___ Test pits and borings (ASTM D 1452) may be used to determine the USCS series and textural class (SM, CL, etc.) of the soil horizons throughout the depth of boring log or pit, the thickness of soil and rock strata, and estimate the historical groundwater depth. Test pits or boring logs must be of sufficient depth to establish that a minimum of 5 feet of permeable soil exists below the infiltration facility and that there is a minimum of 10 feet between the bottom of the infiltration facility and the historical high groundwater mark[1] (Section 1.7 and 2.5). The required number of test pits or borings is listed in Table 1.

___ A final report, prepared by a registered civil engineer, geotechnical engineer, certified engineering geologist or certified hydrogeologist shall be provided to the District or other EA which demonstrates through infiltration testing and/or soil logs that the proposed facility location is suitable for the proposed infiltration facility and an infiltration rate shall be recommended. In addition, any requirements associated with impacts to a landslide, erosion or steep slope hazard area should also be addressed in the final report. (Section 1.7)

___ Tests may be performed only by individuals trained and educated to perform, understand and evaluate the field conditions. The individual(s) supervising this field work must be named along with their education or training background in the final report as described in Item 3. (Section 1.7)

___ Preliminary site grading plans shall be provided to the District or other EA showing the proposed BMP locations along with section views through each BMP clearly identifying the extents of cut/fill.

___ All infiltration tests shall be performed within the boundaries of the proposed infiltration BMP and at the bottom elevation (infiltration surface) of the proposed infiltration facility. (See Photo 5)

[1]The "historical high groundwater mark" is defined as the groundwater elevation expected due to a normal wet season and shall be obtained by boring logs or test pits.

APPENDIX B

Underdrains

APPENDIX B – UNDERDRAINS

Where underdrains are specified, the following information provides guidance for underdrain requirements.

Underdrain Material Types
Underdrain pipe shall be 6-inch diameter ABS pipe or PVC pipe. ABS pipe shall meet the requirements of ASTM Designation D-2751, SDR 23.5, and PVC pipe shall meet the requirements of ASTM Designation D-2665. Perforations shall be as described in ASTM Designation C-700. It should be noted that placing the pipe such that the perforations are oriented upward may help to maximize infiltration in unlined BMP's with underdrains. If the BMP is constructed with an impermeable liner, the perforations should be angled downward to maximize the volume of water that will be drained from the BMP.

Underdrain Connections
Pipe joints and storm drain structure connections must be adequately sealed to avoid piping conditions (water seeping through pipe or structure joints). Pipe sections shall be coupled using suitable connection rings and flanges. Field connections to storm drain structures and pipes shall be sealed with polymer grout material that is capable of adhering to surfaces. Underdrain pipe shall be capped (at structure) until completion of site construction. Underdrains connected directly to a storm drainage structure shall be non-perforated for an appropriate distance from the structure interface to avoid possible piping problems.

Underdrain Slope
Underdrains must "daylight" or connect to an existing drainage system to achieve positive flow. All underdrains must be placed with a minimum slope of 0.5% (s = 0.005 ft/ft).

Underdrains Layout and Spacing
Typically, there are two main layouts for underdrains. One is a non-perforated central collector pipe with perforated lateral feeder pipes, the other is simply a series of longitudinal perforated pipes. Both layouts connect to a non-perforated outlet pipe before "daylighting" or connecting to an existing drainage system. The minimum spacing is shown below.

BMP Type	Underdrains Center to Center Spacing
Sand Filter Basin	20'
Extended Detention Basins (Bottom stage 500 sq ft. or greater)	20'
Extended Detention Basins (Bottom stage < 500 sq ft.)	10'
Bioretention Facility	5'

Underdrain Gravel

Gravel bed materials should be used to protect an underdrain pipe and to reduce clogging potential. Placement of gravel over the underdrain must be done with care. Avoid dropping the gravel from excessive heights from a backhoe or front-end loader bucket. Spill directly over underdrain and spread manually.

Recommended construction specifications for gravel used to protect underdrains are as follows:

- AASHTO #57 stone preferred
- Geotextile fabrics should be avoided because tearing and/or plugging can dramatically affect performance. If the designer is concerned about the engineered soil media migrating into the underdrain, a 3-inch thick layer of "pea gravel" may be added to create a “choker” course.

Maintenance

Access for cleaning underdrains is required for each system. Clean-outs, with diameters equal to the underdrain, should extend 6 inches above the media and have a lockable screw cap for easy access. Cleanouts should be located for every 50 feet of lateral, at the collector drain line connection, and at any bends.

Underdrain Orifice Plate

When designing a BMP to meet Hydraulic Conditions of Concern (HCOC) criteria in addition to water quality criteria, it is sometimes necessary to install an orifice plate near the downstream end of the underdrain system. The orifice plate restricts the opening of the underdrain to mitigate flows to a specific lower flow threshold. Proper maintenance access should be provided to the orifice plate location to facilitate maintenance activities, specifically the removal of accumulated sediment and debris upstream of the orifice plate.

APPENDIX C

Basin Guidelines

APPENDIX C – BASIN GUIDELINES

This appendix is broken up into two sections. Section 1 presents guidelines and standards for the design and maintenance of water quality and increased runoff basins used within Riverside County. Applicable water quality basins include infiltration, sand filter and extended detention basins but do not include Bioretention BMPs. Section 2 is devoted to guidelines and standards for debris basins. Regional Basins are only loosely governed by this document and are largely considered on a case-by-case basis.

These guidelines are *intended* to be used on both private and public facilities throughout Riverside County and *shall* be adhered to for all facilities to be maintained by the Riverside County Flood Control and Water Conservation District (District). It is anticipated that County Transportation, Coachella Valley Water District and the City Engineer for incorporated cities within the County may choose to alter these guidelines and may have different/additional requirements. These entities, along with the District, will be referred to as the Engineering Authority (EA). Similarly, County or City Planning Departments, Parks Departments and Parks Districts may also have different/additional requirements. These entities will be referred to as the Planning Authority (PA). Both the EA and PA should be consulted regarding their specific requirements.

Section 1- Detention and Water Quality Basins

1.1 General Criteria

Off-line versus In-stream Mitigation – All water quality mitigation basins must be flow-through. In-stream mitigation is extremely difficult to accomplish unless the basin is designed to accommodate all upstream tributary area and to mitigate for all impacts due to upstream development. Therefore most EAs will not allow in-stream water quality mitigation basins. It shall be noted that while flow mitigation BMPs may be allowed to be constructed within "jurisdictional waters", water quality mitigation BMPs will not be permitted.

Dam Safety Compliance – Basin designs that would be considered "jurisdictional" and fall under the Division of Safety of Dams (DSoD) review are not recommended.

Standard Details - Most EAs would prefer standardization of elements of outlet structures that are likely to wear (e.g., trash racks). Outflow control structures shall be designed in accordance with the EA's standards unless site-specific conditions preclude it. The District requires the use of Standard Drawing WQ501 for most basins. However a modified District CB110 overflow outlet is recommended for infiltration and sand filter basins. Minor modifications to provide supplemental hydraulic routing characteristics above the water quality storage volume are acceptable.

General Sizing Criteria – These guidelines relate to the basic features to be included in the various types of basins and the general geometrics of the basins design criteria. This

appendix does not include the volumetric sizing of facilities. Follow the appropriate increased runoff guidelines or BMP fact sheet sizing.

Geotechnical Reports – A geotechnical report prepared by either a licensed geotechnical engineer, civil engineer or certified engineering geologist is required for all basins. The minimum content of the Geotechnical report shall include the following:

- Slope stability - Discussion shall include the affect the basin may have on the stability of adjacent slopes as a result of the basin's proposed location.

- Compaction, cut and fill - Issues due to soil compaction and/or cut and fill conditions with regards to the safety and effectives of the basin shall be discussed.

- Setbacks from buildings, slopes, wells - The report shall include recommendations for the minimum setback required from buildings, onsite walls, and slopes. In addition, the report shall determine the location of any pre-existing wells (onsite or offsite) and clarify that the minimum 100 foot horizontal setback has been maintained.

- Embankment design - For embankments over 5 feet in height, the geotechnical report shall include recommendations as to its construction and clarify that the embankment meets the requirements herein.

- Boring logs - Boring logs shall be provided within the report and a discussion of their findings included. Any subsurface conditions which may be pertinent to the safety and effectiveness of the basin shall be discussed.

- High Groundwater Level - The historic high groundwater level shall be determined. It shall be clarified that a minimum 10 foot vertical separation from the bottom of the basin to the top of the historic high groundwater level will be maintained.

In addition, where infiltration basins are to be utilized on the site the following topics shall be discussed:

- Existing Conditions (i.e., legacy pollutants) - Where existing soil contains unusually high levels of pollutants, the report shall clarify the extent of the pollution, mitigation efforts and the viability of using an infiltration BMP effectively as a result.

- Infiltration Testing - The use of infiltration BMPs may require an infiltration rate be established as described in Appendix A, "Infiltration Testing Guidelines". An infiltration testing report may be required and documented as described therein

Parking Lot Detention - Parking lots <u>shall not</u> be used to provide additional surface (above ground) storage for either water quality BMPs or to address HCOCs.

Seeps and Springs- Intermittent seeps along cut slopes are typically fed by a shallow groundwater source (interflow) flowing along a relatively impermeable soil stratum. These flows are precipitation driven and should discontinue after a few weeks of dry weather. No special provisions are needed when directing these flows through the basin. However, more continuous seeps and springs, which extend through longer dry periods, are likely from a deeper groundwater source. When continuous flows are intercepted and directed through basins, adjustments to the approved facility design may be required to account for the additional base flow (unless already considered in design).

Privately Owned Basins - All of the criteria herein apply to privately maintained basins except that retaining walls may be used for a portion of interior slopes. Privately owned basins are only acceptable for commercial projects, multi-family residential projects and single family residential communities with a viable maintenance mechanism. Retaining walls may not be used to support water impounding embankments. Retaining walls shall not exceed one third of the outside perimeter of the basin. Detailed structural design calculations must be submitted with every retaining wall proposal. A fence shall be provided along the top of the wall. **The use of retaining walls in a basin requires approval prior to tentative project approval.** The EA or PA may reject the proposed use of retaining walls due to aesthetic and maintenance concerns relating to nuisance and graffiti abatement.

1.2 - Basin Grading Parameters

Basins must meet the following requirements for side slopes, fencing, and embankments:

Interior Side Slopes - At least 50 percent of the facility perimeter shall have interior sides no steeper than 4H:1V and in no case steeper than 2H:1V (even if fenced) to minimize safety risks. Side slopes shall be no steeper than 4H:1V whenever adjacent to down-gradient external property lines, roadways, sidewalks and trails.

Embankments - Embankment fill slopes (external and internal) may be no steeper than 4:1 with no exceptions. Basin embankment height will be based on the vertical distance from the design overflow water surface (typically the spillway invert elevation) to the lowest downstream toe of embankment fill. Basin embankments higher than 5 feet shall require design by a geotechnical engineer and shall have a top width not less than 20 feet. For embankments 5 feet or less in height, the minimum top width shall be 6 feet. Embankments for water quality basins may not exceed 3 feet in height.

Setbacks - All basin grading impacts shall be set back a minimum of 6 feet from down-gradient external property lines. This requirement applies to both the top of a cut-slope and the toe of any exterior slope embankment, along with rip-rap energy dissipaters relative to the property line (excluding road right of way). The cut-slope setback requirement is intended to avoid situations where future offsite grading/cut-slopes could turn an incised

basin into an embankment-impounded reservoir. For all cases, depending on the amount of discharge and site characteristics, additional setback may be required unless appropriate easements are secured from the affected property owner(s).

There shall be a minimum 6 foot setback between a basin and an adjacent slope 4:1 or steeper measured horizontally from the basin hinge to the toe of the slope.

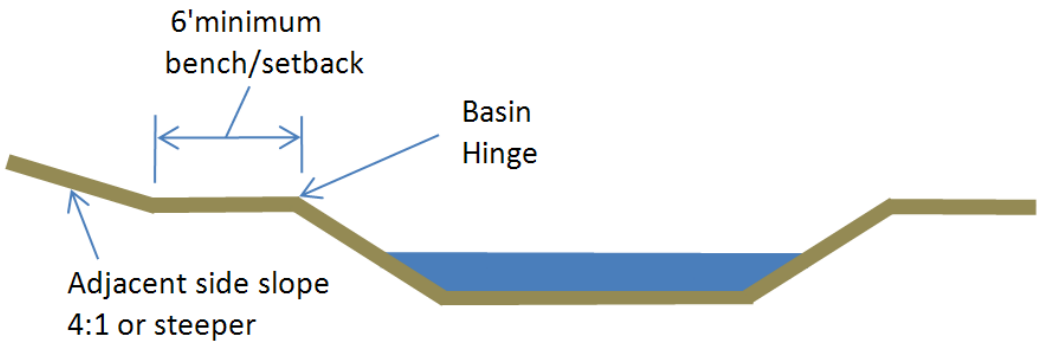

Forebay - A forebay shall be placed at each inlet to the basin to allow for the settlement and collection of larger particles. A relatively smooth concrete bottom surface should be provided to facilitate mechanical removal of accumulated sediment, trash and debris. A rock or concrete berm separates the forebay from the remainder of the basin. The forebay's design volume must be from 3 to 5% of the design volume, with the exception of infiltration and sand filter basins whose forebays should be 0.5% of the design volume. A full height notch-type weir shall be made through the berm to convey water to the main body of the basin. This notch shall be offset from the inflow streamline to prevent low-flows from short circuiting.

Basin Floor Slopes - Surface slopes should be kept at a minimum to allow for as much infiltration/groundwater recharge as is possible while still meeting vector concerns. All detention and extended detention basins shall have transverse and longitudinal bottom surface slopes of 1% minimum. For infiltration and sand filter basins, the basin floor should be level.

Gravel filled low-flow trench

Dry Weather Flow Management – All increased runoff or extended detention basins (**excluding** infiltration or sand filter basins) shall be designed to accommodate dry weather flows without impairing wet weather function or creating potential nuisance or maintenance issues. The basin shall have a network of gravel filled low-flow and collector trenches covering the entire basin floor area along with a sand filter drain adjacent to the outlet structure. See Figure 1 on following page.

A 48-inch wide by 24-inch deep low-flow trench conveys flow from the forebay to the filter drain. With a mild longitudinal slope of at least 1% to promote infiltration, the unlined low-flow trench shall be filled with 2" gravel (ASTM No. 2 or similar) to the finished surface and shall not use perforated subdrains.

Collector trenches beneath the top stage shall be arranged in accordance with Figure 1 with a maximum slope of 0.5% to promote infiltration and must extend from the low-flow channel to the toe of the basin side slopes. They shall be 18-inches wide by 24-inches deep and filled with 2" gravel (ASTM No. 2 or similar) to the finished surface. The collector trenches shall not have perforated subdrains and shall be constructed with a maximum spacing of 25 feet on center. See Figure 1 on following page.

A sand filter drain shall be constructed at the low point (or bottom-stage) of the basin adjacent to the outlet structure. To avoid clogging at the lowest orifice of the outlet structure, the top of the filter drain is offset below the lowest orifice of the outlet structure by 0.33 feet (4 inches). The sand filter drain shall include an 18 inch layer of sand (fine aggregate per

ASTM C-33) over a 10-inch gravel subdrain system and shall line the entire bottom stage. The total depth of the sand filter drain, $D_{FD,}$ shall therefore not be less than 2.33 feet. See Appendix B for standard subdrain construction. The filter drain's design volume must be a minimum of 0.5% of V_{BMP} and the minimum bottom stage area is $A_{BS}= V_{BMP}/ D_{BS}$.

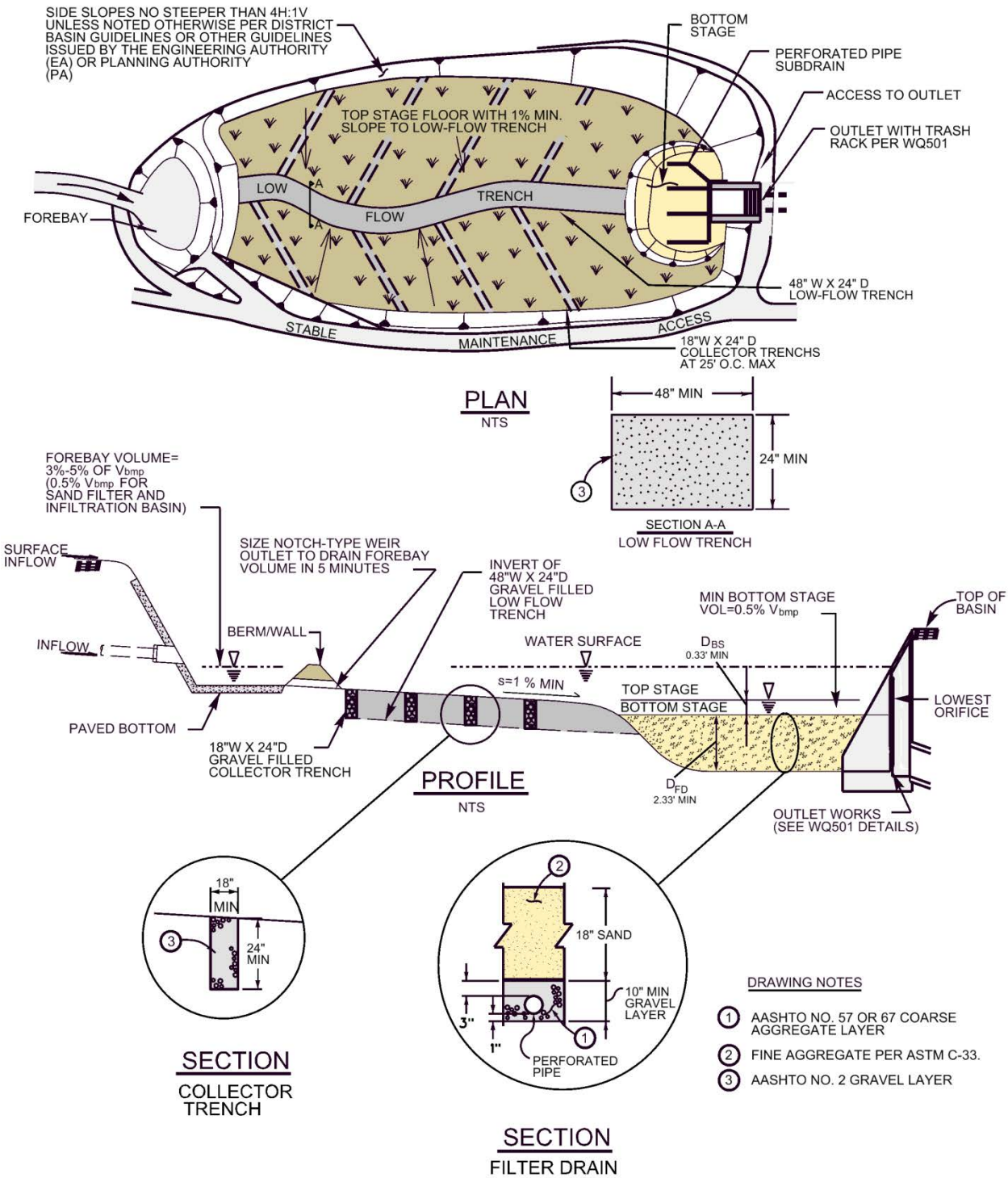

Figure 1 –Dry Weather Management Features

Outlet Structure and Spillway - Outlet structures shall conform to District Standard Drawing WQ501 unless approved in advance by the EA. This standardization is important in order to provide for efficient maintenance.

a. **Water Quality Outlet Trash Rack/Screen** - The outlet's orifice plate shall be protected with a conforming trash rack with at least six square feet of open surface area or 25 times the total orifice area, whichever is greater. The rack shall be adequately secured to prevent it from being removed or opened when maintenance is not occurring.

b. **Overflow Outlet** - In all basins, a primary overflow (usually integrated into the control structure) must be provided to pass flows greater than the design volume up to the 100-year event. The design must provide controlled discharge directly into the downstream conveyance system or an acceptable discharge point.

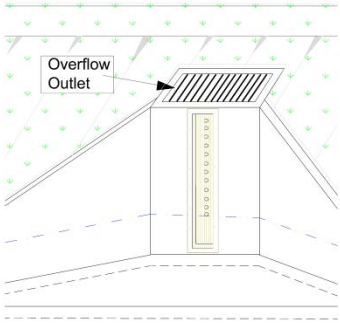

c. **Emergency Overflow** - In addition to the above overflow requirements, basins must have an emergency overflow escape path sized to safely pass the 100-year tributary developed peak flow in the event of total control structure failure (e.g., blockage of the control structure outlet pipe) or extreme inflows. Emergency overflow pathways are intended to control the location of basin overtopping and direct overflows back into the downstream conveyance system or other acceptable discharge point.

d. **Emergency Overflow Spillway -** Basins with constructed embankment over 3 feet in height and for BMP embankments of any height, or located on grades in excess of 5% must provide an emergency overflow spillway structure. The emergency overflow spillway must be designed to pass the 100-year developed peak flow, with a minimum 12 inches of freeboard, directly to the downstream conveyance system or an acceptable discharge point. The emergency overflow spillway shall be armored full width, beginning at a point midway across the berm embankment and extending downstream to an adequate outlet point. Design of emergency overflow spillways generally requires the analysis of a broad-crested trapezoidal weir.

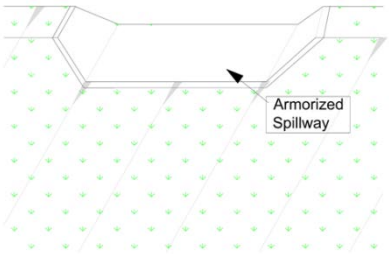

Access Roads and Ramps - Maintenance access road(s) shall be provided to the top of the control structure and other drainage structures associated with the basin (e.g., inlet/forebay, emergency overflow or bypass structures). All basins shall have unobstructed access from a public street (see Section 1.4, "Right-of-Way") with commercial size curb cut-outs and driveway approaches. Flood control basins designed to attenuate the 100 year flood event shall have an access road around the entire basin. Manhole and catch basin lids should be within or at the edge of the access road and shall be at least three feet from a property line. Rims shall be set at the access road grade.

On large, deep basins (at least 1500 square feet bottom area, measured without the ramp, and over 4 feet deep), an access ramp must extend to the basin bottom at the forebay for removal of sediment with a trackhoe and truck. This is necessary so truck loading can be done in the basin bottom.

However, on small deep basins (less than 1500 square feet, but over 4 feet deep), the truck can remain on the ramp for loading. As such, the ramp may end at an elevation up to 4 feet above the basin bottom provided the basin side slopes are 4:1 or flatter.

On small shallow basins (less than 1500 square feet bottom area, and 4 feet deep or less), a ramp to the bottom is not required if the trackhoe can load a truck parked at the basin edge (trackhoes can negotiate mild interior basin side slopes).

No ramp is required for <u>any</u> basin 4-feet or less in depth if vehicular access is provided to the top of slope at the forebay and the side slopes are 4:1 or flatter. (Depth trigger for ramp is measured from top of slope adjacent to forebay invert.)

Design of access roads and ramps shall meet the following design criteria:

a. Maximum grade (measured along ramp centerline) shall be 15% for asphalt or concrete paving and 10% for soft surface or modular grid paving.
b. Inside turning radius shall be 35 feet, minimum.
c. Fence gates shall be located only on straight sections of road.
d. Access roads shall be constructed with an asphalt, concrete, 3-inch layer of compacted Class 2 aggregate road base material, decomposed granite or modular grid pavement.
e. Access roads and ramps shall be 15 feet in width on curves, 12 feet on straight sections. A paved apron shall be provided where access roads connect to paved public roadways.

1.3 - Landscaping

Landscaping will likely be required by the Planning Authority. Landscaping requirements shall be in accordance with Riverside County Ordinance 859 or equivalent agency ordinance. Care must be taken to ensure that landscaping does not hinder maintenance operations.

a. Facilities shall be designed so that they do not require mowing. Where mowing cannot be avoided, facilities shall be designed to require mowing no more than once or twice annually. A 6-foot minimum width must be provided to allow a mower to pass (see Figure 2).

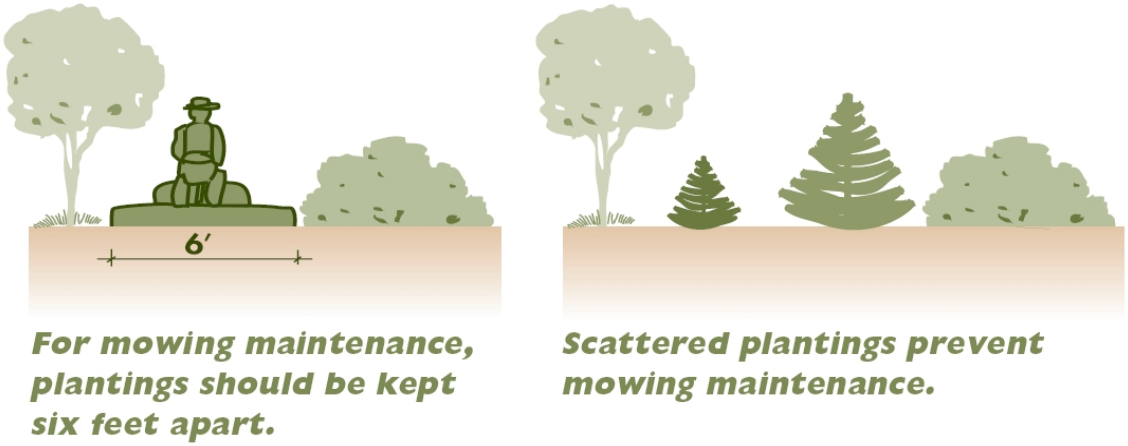

Figure 2- Landscaping setbacks (Source: King County WLR)

b. Turf and lawn areas are not allowed for publicly maintained basins unless an appropriate landscape maintenance entity is identified.

c. Planting is restricted on embankments that impound water either permanently or temporarily during storms (see figure 3). This reduces the likelihood of blown down trees, or the possibility of channeling or piping of water through the root system, which may contribute to dam failure on embankments that retain water.

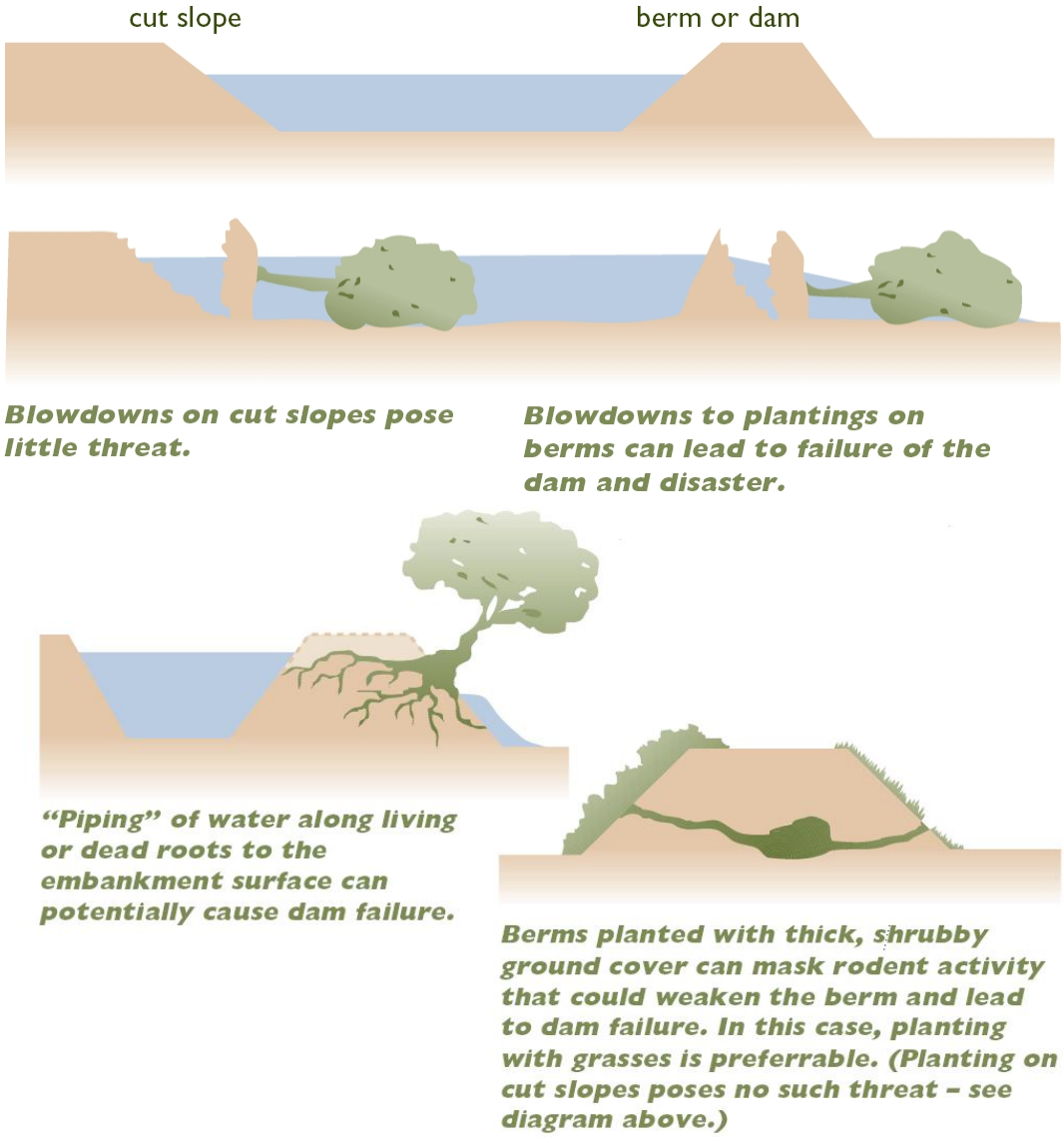

Figure 3 - Hazardous Landscaping Practices (Source: King County WLR)

Note: *This restriction does not apply to cut slopes that form basin banks, only to embankments.*

d. No trees or shrubs may be planted within 10 feet of inlet or outlet pipes or from manmade drainage structures such as spillways or flow spreaders.

e. Trees with roots that seek water, such as willow or poplar, should be avoided within 50 feet of pipes or manmade structures.

f. Evergreen trees and others that produce relatively little leaf-fall (such as locust) are preferred in areas draining to the basin. Trees should be set back so branches do not extend over the outlet structure area of the basin (to help prevent clogging). Drought tolerant species are recommended.

g. Trees or shrubs may not be planted on portions of water-impounding embankments taller than four feet high. Only grasses may be planted on embankments taller than four feet.

1.4 - Additional Requirements

Fencing Criteria - The requirements for slopes and fencing are intended to discourage access to portions of a basin where steep side slopes (steeper than 4:1) increase the potential for slipping into the basin, and to allow easy egress for those who have fallen with slopes that are mild enough (flatter than 4:1 and unfenced) to allow for easy escape. If the basin will hold water deeper than 2 feet, a physical barrier as demarcation of the basin limits is required:

a. Where interior slopes are steeper than 4:1, the barrier shall be a fence 6 feet in height (see District Standard Drawing M-801 for chain link fence details). In joint use ventures where a special district or agency has agreed to maintain landscape facilities, tubular steel fencing such as that meeting Valley Wide Recreation and Parks District landscape standard LC-10 is also acceptable. Functionally equivalent designs may be acceptable on a case by case basis.

b. Where interior slopes are 4:1 or milder, the physical demarcation shall be (3-foot minimum height) vinyl or PVC rail fence, post-and-cable, masonry wall, or densely planted hedges. Functionally equivalent designs may be acceptable on a case by case basis.

c. If the side slopes undulate, and segments of the slope are steeper than 4:1, the barrier standard from "b." above may be used in place of the 6-foot fence for the short lengths of slope as specified here: The barriers described in "b." may be used for sections of 2:1 slope not to exceed 20 lineal feet and sections of 3:1 slope not exceeding 50 lineal feet.

d. If required, fencing shall be placed at or above the overflow water surface. Side slope and attendant fencing requirements are not applicable to slopes above the overflow water surface.

Gates - Vehicular access shall be limited by a double-posted gate if a fence is required, or by bollards. Access road gates shall be 14 feet in width consisting of two swinging sections 7 feet in width (see the District's Standard Drawing M-801 for details). Alternately, two fixed bollards on each side of the access road and two removable bollards equally located between the fixed bollards may be used. Additional vehicular access gates may be required as needed to facilitate maintenance access. Pedestrian access gates (if needed) shall be 4 feet in width.

Signage - All basins to be maintained by the District shall have a sign placed for maximum visibility from adjacent streets, sidewalks, and paths. The sign shall meet the design and installation requirements illustrated in Figure 4.

Right-of-Way - Basins shall not be located in a dedicated public road right-of-way. Publicly maintained basins shall be in a lot dedicated to the public. Any lot not abutting the public right-

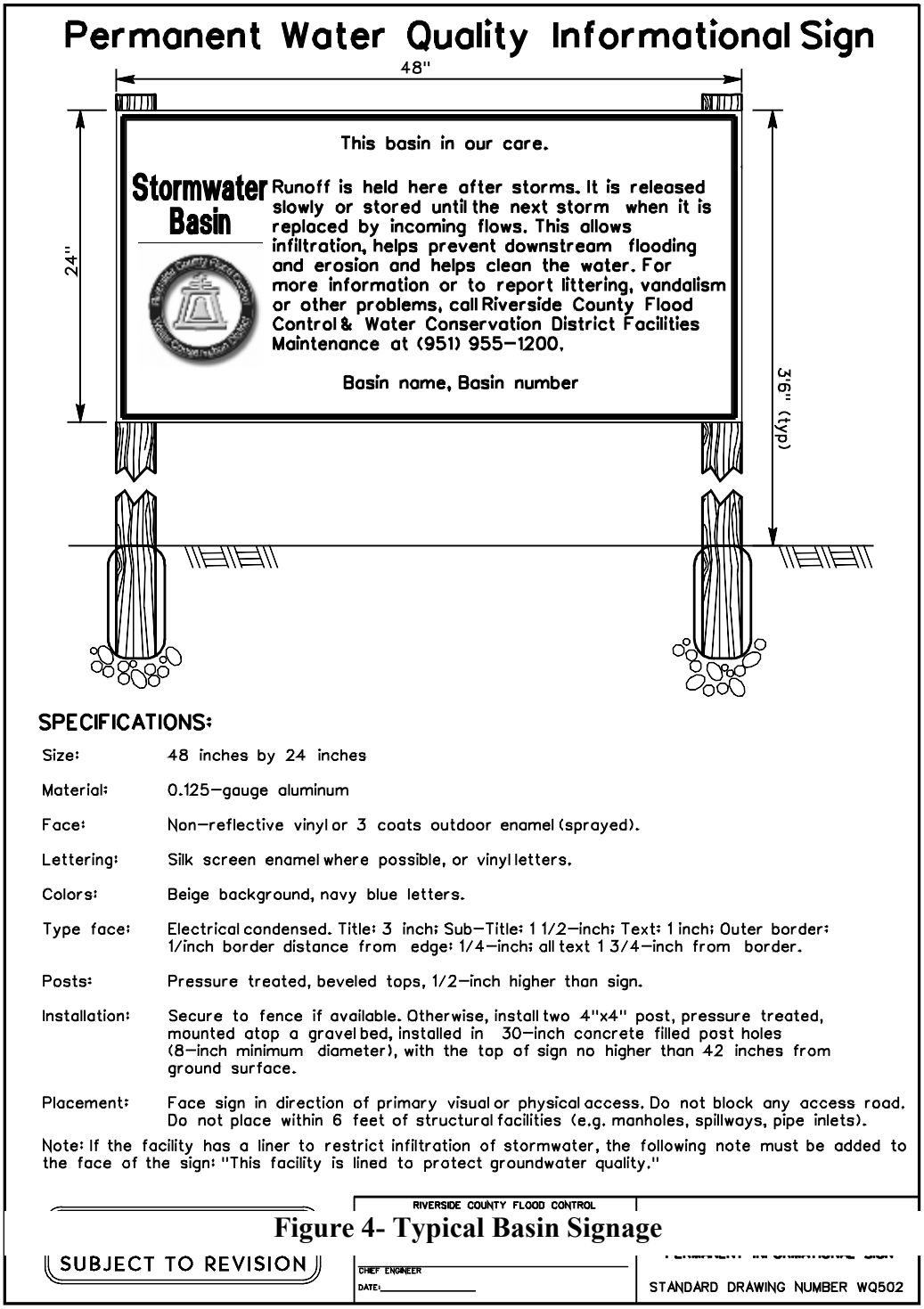

Figure 4- Typical Basin Signage

of-way will require a 16.5-foot wide extension of the lot to an acceptable access location.

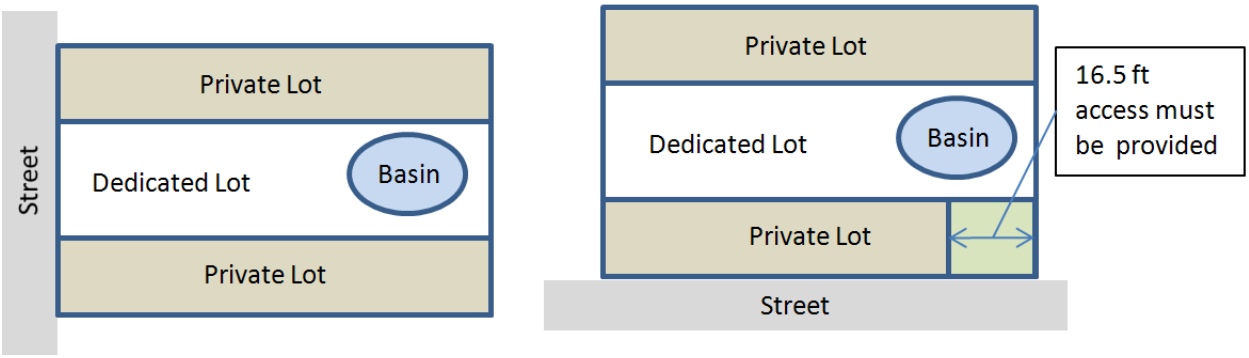

Case 1 - Access available to public road right-of-way.

Case 2 - Access must be acquired through adjacent lot to public road right-of-way.

1.5 - Basins in Recreational Spaces

Any basin site with a bottom surface area larger than one acre will likely be required to incorporate active use area and shall be designed only after consultation with the PA to establish site-specific guidance which may increase the total facility footprint.

If multiple uses are being contemplated, consider the following:

- Place the active use areas such as ballparks, playing fields, and picnic areas above the water quality design volume (V_{BMP}) ponding limit.
- Use a multiple-stage detention basin to limit inundation of passive recreational areas to one or two occurrences a year.
- Side slopes shall not exceed 25% (4:1) unless they are existing, natural, and covered with vegetation.
- Locate the basin in a separate lot.
- Incorporate a bypass system or emergency overflow pathway that does not present a safety hazard or discharge into active recreation areas.
- The basin shall be landscaped in a manner to enhance passive recreational opportunities such as trails and aesthetic viewing. Inquire with the PA whether the basin can be compatible with the open space value and functions.

If the criteria above are met, projects may be able to receive some reduction in required onsite recreational space if approved in advance of tentative project approval by the PA.

Section 2 - Debris Basins

Debris basins differ from stormwater detention and water quality basins in that they are not intended to detain flows or to mitigate pollutants (other than debris). They are simply utilized to collect large debris from storm flows for later removal. The guidelines in this section apply to debris basins only.

Site access – Debris basins shall have unobstructed access from a public street (see Section 1.4, "Right-of-Way") with commercial size curb cut-outs and driveway approaches.

Fencing – The entire facility shall be enclosed with 6-foot high chain link fencing and 14-foot high double drive gates. Where the perimeter fencing crosses a streambed, cable or barbed wire fencing across streambed will be provided.

Maintenance access - Maintenance access shall extend around the entire perimeter of the facility. Roads shall be a minimum of 15 feet wide (20 feet wide if on an embankment of 3 feet or higher). The minimum design turning radius shall be 35 feet. Ramps shall be a minimum of 15 feet wide with a maximum longitudinal slope of 10%. Both roads and ramps shall be surfaced (full width) with 3" of compacted Class 2 base material.

Basin Cut/Fill slopes – All basin slopes shall not be steeper than 3:1.

Stockpile/Staging Area – Shall be situated immediately adjacent to the basin. The minimum acreage shall be sufficient to temporarily store 20% of volume of debris accumulated in the 100-yr-frequency design event. Surface acreage shall be calculated assuming a stockpile of 10 feet high with 2:1 fill slopes. A minimum 15-foot wide access road with a 35-foot wide turning radius shall be provided to accommodate equipment access. In addition, a 70-foot long by 15-foot wide strip is required for equipment loading and unloading within an area of sufficient size to maneuver heavy construction equipment.

Minimum Basin Floor Surface Area – Basin floors 1,400 square or greater must be provided with a minimum width of 30 feet.

Outlet Structure – A tower-type outlet is not permitted. Use outlet structure design similar to that used in designs for Tahquitz Creek and Oak Street Debris Basins (slotted/slanted grate). All structures and ramps to structures shall include safety rails/belly bars at all stairways and wherever appropriate. A minimum of two (2) visible depth (paddle) gauges shall be provided.

APPENDIX D

Isohyetal Map for the 85th Percentile 24-hour Storm Event

For the Santa Ana and Santa Margarita Watersheds

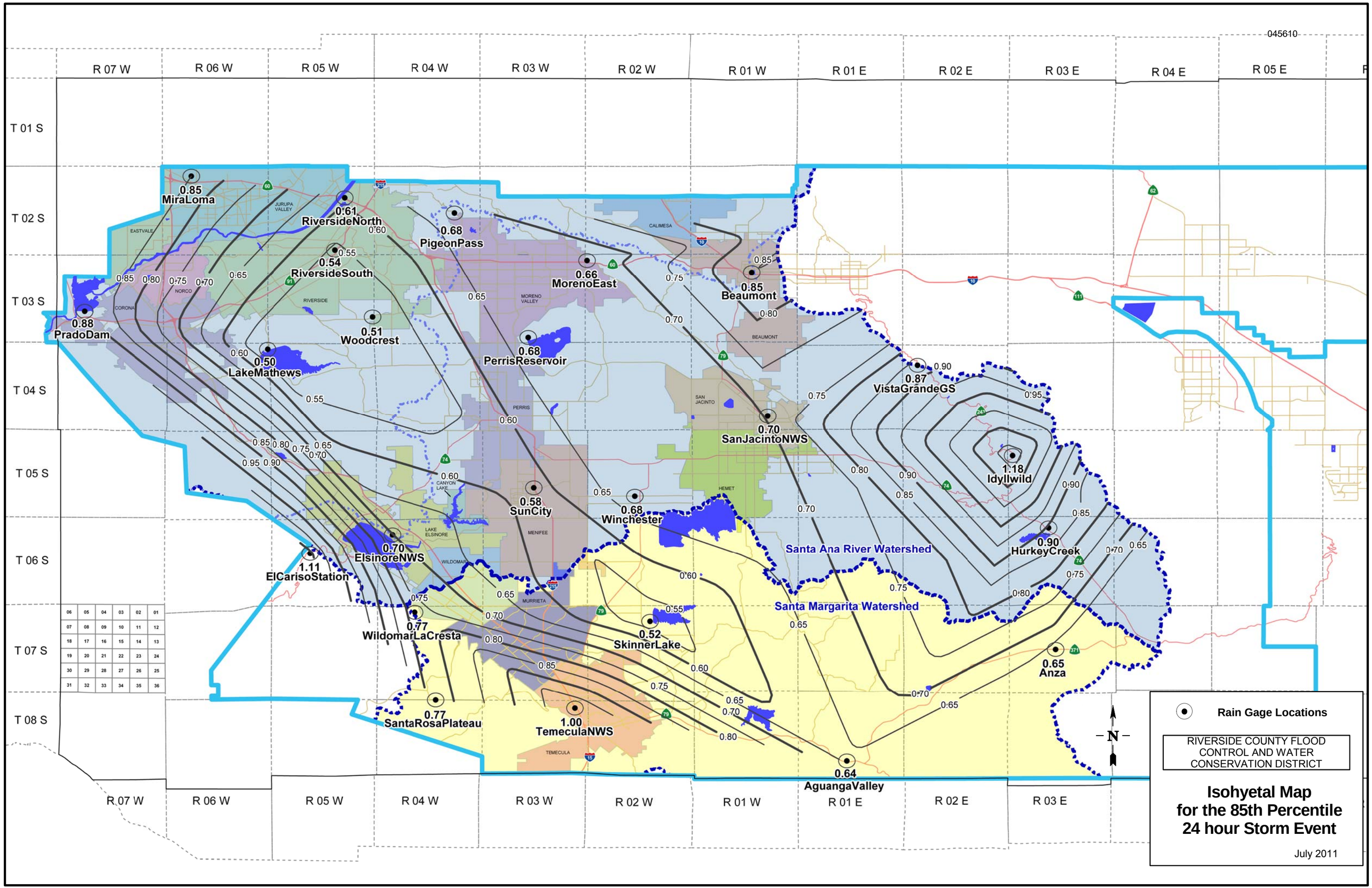
045610
R 07 W
R 06 W
R 05 W
R 04 W
R 03 W
R 02 W
R 01 W
R 01 E
R 02 E
R 03 E
R 04 E
R 05 E
T 01 S
T 02 S
T 03 S
T 04 S
T 05 S
T 06 S
T 07 S
T 08 S
0.85 MiraLoma
0.61 RiversideNorth
0.68 PigeonPass
0.54 RiversideSouth
0.66 MorenoEast
0.85 Beaumont
0.88 PradoDam
0.51 Woodcrest
0.50 LakeMathews
0.68 PerrisReservoir
0.87 VistaGrandeGS
0.70 SanJacintoNWS
1.18 Idyllwild
0.58 SunCity
0.68 Winchester
0.90 HurkeyCreek
0.70 ElsinoreNWS
1.11 ElCarisoStation
0.77 WildomarLaCresta
0.52 SkinnerLake
0.65 Anza
0.77 SantaRosaPlateau
1.00 TemeculaNWS
0.64 AguangaValley
Santa Ana River Watershed
Santa Margarita Watershed
EASTVALE
JURUPA VALLEY
CORONA
NORCO
RIVERSIDE
CALIMESA
MORENO VALLEY
BEAUMONT
PERRIS
SAN JACINTO
HEMET
CANYON LAKE
LAKE ELSINORE
WILDOMAR
MENIFEE
MURRIETA
TEMECULA
N
Rain Gage Locations
RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
Isohyetal Map for the 85th Percentile 24 hour Storm Event
July 2011

APPENDIX E

BMP Pollutant Removal Effectiveness

APPENDIX E
BMP POLLUTANT REMOVAL EFFECTIVENESS

BMP Pollutant Removal Effectiveness (1)

Pollutant of Concern	Harvest and Use (8)	Infiltration BMPs (3)	Bioretention	Extended Detention Basins (2)	Sand Filter Basin (7)
Sediment	H	H	H	M	H
Nutrient	H	H	(5)	M (4)	L (6)
Trash	H	H	H	H	H
Metal	H	H	H	M	M
Bacteria	H	H	H	M	M
Oil & Grease	H	H	H	M	H
Organic Compounds	H	H	H	M	H
Pesticides	H	H	H	U	U

Abbreviations:

L: Low removal efficiency M: Medium removal efficiency H: High removal efficiency U: Unknown

Notes:

(1) Periodic performance assessment and updating of this table may be performed based on updated information from studies from the District, CASQA, Caltrans or others. These effectiveness ratings are based on the specific BMP designs incorporated into this manual.

(2) Effectiveness based upon total 72-hour drawdown time.

(3) Includes infiltration basins, infiltration trenches, and permeable pavements.

(4) Medium for soil types A & B only. Low for soil types C & D.

(5) Removal rating is dependent on the soil media depth. L=Min. 18” deep, M= Min. 24” deep, H=Max. 30"-36" deep.

(6) Medium where sand filter layer is increased to 36”.

(7) Considered to be a Treatment Control BMP. See the WQMP to determine if this BMP can be used.

(8) Cisterns, when associated with an adequate and reliable (year-round) demand for non-potable use of captured storm water (see the applicable WQMP for any specific requirements), have a High effectiveness at removing all pollutants from stormwater runoff. If there is inadequate demand to reliably drain the cistern through a non-potable use throughout the year, pollutant removal effectiveness will be Low.

APPENDIX F

Worksheets for calculating V_{BMP} and Q_{BMP}

Santa Ana Watershed

V_{BMP} and Q_{BMP} worksheets

These worksheets are to be used to determine the required

Design Capture Volume (V_{BMP})
or the
Design Flow Rate (Q_{BMP})

for BMPs in the Santa Ana Watershed

To verify which watershed your project is located within, visit

www.rcflood.org/npdes

and use the 'Locate my Watershed' tool

If your project is not located in the Santa Ana Watershed,

Do not use these worksheets! Instead visit

www.rcflood.org/npdes/developers.aspx

To access worksheets applicable to your watershed

Use the tabs across the bottom
to access the worksheets for the Santa Ana Watershed

Santa Ana Watershed - BMP Design Volume, V_{BMP}

(Rev. 10-2011)

Legend: Required Entries / Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name _____ Date _____

Designed by _____ Case No _____

Company Project Number/Name _____

BMP Identification

BMP NAME / ID _____

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth,
from the Isohyetal Map in Handbook Appendix E

D_{85}= _____ inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*

045616

Santa Ana Watershed - BMP Design Flow Rate, Q_{BMP}

(Rev. 10-2011)

Legend: Required Entries / Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name _____ Date _____

Designed by _____ Case No _____

Company Project Number/Name _____

BMP Identification

BMP NAME / ID _____

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

Design Rainfall Intensity I = 0.20 in/hr

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

	DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type (use pull-down menu)	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Rainfall Intensity (in/hr)*	*Design Flow Rate (cfs)*	*Proposed Flow Rate (cfs)*
DMAs									

Effective Impervious Fraction

Developed Cover Types	Effective Impervious Fraction
Roofs	1.00
Concrete or Asphalt	1.00
Grouted or Gapless Paving Blocks	1.00
Compacted Soil (e.g. unpaved parking)	0.40
Decomposed Granite	0.40
Permeable Paving Blocks w/ Sand Filled Gap	0.25
Class 2 Base	0.30
Gravel or Class 2 Permeable Base	0.10
Pervious Concrete / Porous Asphalt	0.10
Open and Porous Pavers	0.10
Turf block	0.10
Ornamental Landscaping	0.10
Natural (A Soil)	0.03
Natural (B Soil)	0.15
Natural (C Soil)	0.30
Natural (D Soil)	0.40

Mixed Surface Types

Use this table to determine the effective impervious fraction for the V_{BMP} and Q_{BMP} calculation sheets

Santa Margarita Watershed

V_{BMP} and Q_{BMP} worksheets

These worksheets are to be used to determine the required

Design Capture Volume (V_{BMP})
or the
Design Flow Rate (Q_{BMP})

for BMPs in the Santa Margarita Watershed

To verify which watershed your project is located within, visit

www.rcflood.org/npdes

and use the 'Locate my Watershed' tool

If your project is not located in the Santa Margarita Watershed,

Do not use these worksheets! Instead visit

www.rcflood.org/npdes/developers.aspx

To access worksheets applicable to your watershed

Use the tabs across the bottom
to access the worksheets for the Santa Margarita Watershed

Santa Margarita Watershed

BMP Design Volume, V_{BMP} (Rev. 03-2012)

Legend: Required Entries / Calculated Cells

(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)

Company Name		Date	
Designed by		County/City Case No	
Company Project Number/Name			
Drainage Area Number/Name			

Enter the Area Tributary to this Feature A_T = _____ acres

85th Percentile, 24-hour Rainfall Depth, from the Isohyetal Map in Handbook Appendix E

Site Location

Township _____

Range _____

Section _____

Enter the 85th Percentile, 24-hour Rainfall Depth D_{85} = _____

Determine the Effective Impervious Fraction

Type of post-development surface cover (use pull down menu): Roofs

Effective Impervious Fraction I_f = _____

Calculate the composite Runoff Coefficient, C for the BMP Tributary Area

Use the following equation based on the WEF/ASCE Method

$C = 0.858I_f^3 - 0.78I_f^2 + 0.774I_f + 0.04$ C = _____

Determine Design Storage Volume, V_{BMP}

Calculate V_U, the 85% Unit Storage Volume $V_U = D_{85} \times C$ V_u = _____ (in*ac)/ac

Calculate the design storage volume of the BMP, V_{BMP}.

$$V_{BMP}\ (ft^3) = \frac{V_U\ (in\text{-}ac/ac) \times A_T\ (ac) \times 43{,}560\ (ft^2/ac)}{12\ (in/ft)}$$

V_{BMP} = _____ ft^3

Notes:

Santa Margarita Watershed

BMP Design Flow Rate, Q_{BMP} (Rev. 03-2012)

Legend: Required Entries / Calculated Cells

Company Name		Date	
Designed by		County/City Case No	
Company Project Number/Name			
Drainage Area Number/Name			

Enter the Area Tributary to this Feature A_T = _____ acres

Determine the Effective Impervious Fraction

Type of post-development surface cover (use pull down menu): Roofs

Effective Impervious Fraction I_f = _____

Calculate the composite Runoff Coefficient, C for the BMP Tributary Area

Use the following equation based on the WEF/ASCE Method

$C = 0.858I_f^3 - 0.78I_f^2 + 0.774I_f + 0.04$

C = _____

BMP Design Flow Rate

$Q_{BMP} = C \times I \times A_T$

Q_{BMP} = _____ ft^3/s

Notes:

Effective Impervious Fraction

Developed Cover Types	Effective Impervious Fraction
Roofs	1.00
Concrete or Asphalt	1.00
Grouted or Gapless Paving Blocks	1.00
Compacted Soil (e.g. unpaved parking)	0.40
Decomposed Granite	0.40
Permeable Paving Blocks w/ Sand Filled Gap	0.25
Class 2 Base	0.30
Gravel or Class 2 Permeable Base	0.10
Pervious Concrete / Porous Asphalt	0.10
Open and Porous Pavers	0.10
Turf block	0.10
Ornamental Landscaping	0.10
Natural (A Soil)	0.03
Natural (B Soil)	0.15
Natural (C Soil)	0.30
Natural (D Soil)	0.40
Mixed Surface Types	

Use this table to determine the effective impervious fraction for the V_{BMP} and Q_{BMP} calculation sheets

Whitewater Watershed

V_{BMP} and Q_{BMP} worksheets

These worksheets are to be used to determine the required

Design Capture Volume (V_{BMP})
or the
Design Flow Rate (Q_{BMP})

for BMPs in the Whitewater Watershed

To verify which watershed your project is located within, visit

www.rcflood.org/npdes

and use the 'Locate my Watershed' tool

If your project is not located in the Whitewater Watershed,

Do not use these worksheets! Instead visit

www.rcflood.org/npdes/developers.aspx

To access worksheets applicable to your watershed

Use the tabs across the bottom
to access the worksheets for the Whitewater Watershed

Whitewater Watershed

BMP Design Volume, V_{BMP} (Rev. 03-2012)

Legend: Required Entries / Calculated Cells

Company Name		Date	
Designed by		County/City Case No	
Company Project Number/Name			
Drainage Area Number/Name			

Enter the Area Tributary to this Feature A_T = _____ acres

Determine the Effective Impervious Fraction

Type of post-development surface cover (use pull down menu): Roofs

Effective Impervious Fraction I_f = _____

Calculate the composite Runoff Coefficient, C for the BMP Tributary Area

Use the following equation based on the WEF/ASCE Method

$C = 0.858I_f^3 - 0.78I_f^2 + 0.774I_f + 0.04$ C = _____

Determine Design Storage Volume, V_{BMP}

Calculate V_U, the 85% Unit Storage Volume $V_U = 0.40 \times C$ V_u = _____ (in*ac)/ac

Calculate the design storage volume of the BMP, V_{BMP}.

$$V_{BMP}\ (ft^3) = \frac{V_U\ (in\text{-}ac/ac) \times A_T\ (ac) \times 43{,}560\ (ft^2/ac)}{12\ (in/ft)}$$

V_{BMP} = _____ ft^3

Notes:

Whitewater Watershed

BMP Design Flow Rate, Q_{BMP} (Rev. 03-2012)

Legend: Required Entries / Calculated Cells

Company Name _____ Date _____

Designed by _____ County/City Case No _____

Company Project Number/Name _____

Drainage Area Number/Name _____

Enter the Area Tributary to this Feature A_T = _____ acres

Determine the Effective Impervious Fraction

Type of post-development surface cover (use pull down menu): Roofs

Effective Impervious Fraction I_f = _____

Calculate the composite Runoff Coefficient, C for the BMP Tributary Area

Use the following equation based on the WEF/ASCE Method

$C = 0.858I_f^3 - 0.78I_f^2 + 0.774I_f + 0.04$ C = _____

BMP Design Flow Rate

$Q_{BMP} = C \times I \times A_T$ Q_{BMP} = _____ ft^3/s

Notes:

Effective Impervious Fraction

Developed Cover Types	Effective Impervious Fraction
Roofs	1.00
Concrete or Asphalt	1.00
Grouted or Gapless Paving Blocks	1.00
Compacted Soil (e.g. unpaved parking)	0.40
Decomposed Granite	0.40
Permeable Paving Blocks w/ Sand Filled Gap	0.25
Class 2 Base	0.30
Gravel or Class 2 Permeable Base	0.10
Pervious Concrete / Porous Asphalt	0.10
Open and Porous Pavers	0.10
Turf block	0.10
Ornamental Landscaping	0.10
Natural (A Soil)	0.03
Natural (B Soil)	0.15
Natural (C Soil)	0.30
Natural (D Soil)	0.40

Mixed Surface Types

Use this table to determine the effective impervious fraction for the V_{BMP} and Q_{BMP} calculation sheets

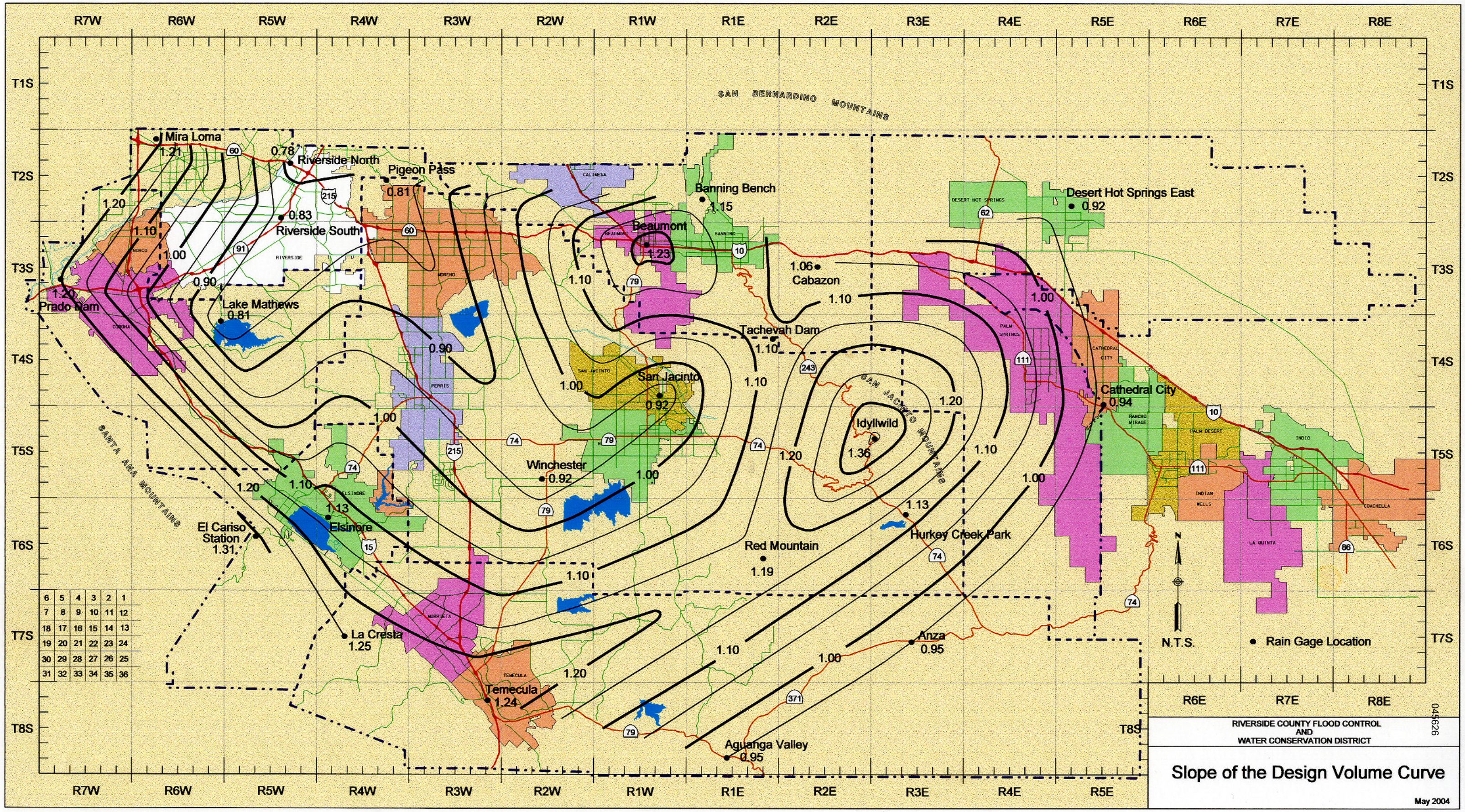
R7W
R6W
R5W
R4W
R3W
R2W
R1W
R1E
R2E
R3E
R4E
R5E
R6E
R7E
R8E
T1S
T2S
T3S
T4S
T5S
T6S
T7S
T8S
SAN BERNARDINO MOUNTAINS
SAN JACINTO MOUNTAINS
SANTA ANA MOUNTAINS
Mira Loma
1.21
0.78
Riverside North
Pigeon Pass
0.81
0.83
Riverside South
1.20
1.10
1.00
0.90
Prado Dam
Lake Mathews
0.81
Banning Bench
1.15
Beaumont
1.23
1.06
Cabazon
Desert Hot Springs East
0.92
Tachevah Dam
1.10
San Jacinto
0.92
Idyllwild
1.36
Cathedral City
0.94
Winchester
0.92
1.13
Elsinore
El Cariso Station
1.31
Hurkey Creek Park
Red Mountain
1.19
La Cresta
1.25
Anza
0.95
Temecula
1.24
Aguanga Valley
0.95
N.T.S.
Rain Gage Location
6 5 4 3 2 1
7 8 9 10 11 12
18 17 16 15 14 13
19 20 21 22 23 24
30 29 28 27 26 25
31 32 33 34 35 36
RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
045626
Slope of the Design Volume Curve
May 2004

Appendix B
Stormwater Quality Best Management Practice
Design Handbook

Grass Swale Example

045628

TENTATIVE TRACT MAP

BEING A BOUNDARY MAP OF THE SOUTHWEST QUARTER OF SECTION 11, TOWNSHIP 6 SOUTH, RANGE 3 WEST, SAN BERNARDINO MERIDIAN, IN THE COUNTY OF RIVERSIDE.

OWNER/DEVELOPER:

ENGINEER:

ASSESSORS PARCEL NO.:

TOTAL ACREAGE:

TOTAL ACREAGE (GROSS) ——— 95 AC.
MIN. LOT SIZE ——— 7,200 S.F.
TOTAL NO. OF LOTS ——— 180

UTILITIES:

ELECTRIC ——— SO. CAL. EDISON CO.
GAS ——— SO. CAL. GAS CO.
WATER ——— CUTLERIN MUNICIPAL WATER DISTRICT
SEWER ——— CUTLERIN MUNICIPAL WATER DISTRICT
TELEPHONE ——— GENERAL TELEPHONE
HEMET UNION SCHOOL DISTRICT (ELEMENTARY)
HEMET UNION HIGH SCHOOL DISTRICT

TARGET DENSITY:

PLANNING AREA ——— 3 – 5 DU/AC

ZONING AND LAND USE:

EXIST. ZONING ——— A
PROP. ZONING ——— R-1
EXIST. LAND USE ——— VACANT
PROP. LAND USE ——— RESIDENTIAL
GENERAL PLAN DESIGNATION ——— RESIDENTIAL
PROP. MAP PHASING # ———
PROP. NO. OF FINAL MAP = 1

FLOOD ZONE:

FLOOD ZONE = C

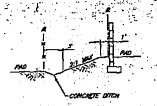

SECTION "A–A"
N.T.S.

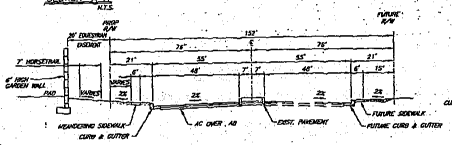

TYP. STREET SECTION
N.T.S.

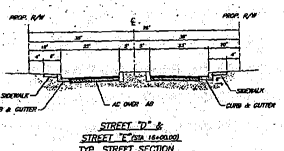

STREET "D" &
STREET "E" (SEE 18+00 (D))
TYP. STREET SECTION
(AT PROJECT ENTRANCES)
N.T.S.

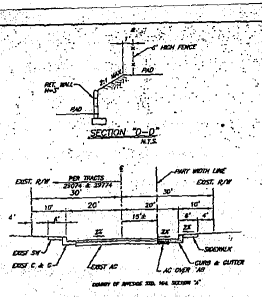

TYP. STREET SECTION
N.T.S.

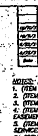

SECTION "D–D"
N.T.S.

10/96	10	1	REVISED ACREAGE BEL. R/W & CHANGE DIMENSIONS
10/96	10	2	CHANGED 20' TO 30' GRADING SEC. UNIT 137-139
10/96	10	3	REVISED PARK SITE SIZE
10/97	10	4	REVISED STREETS
DATE	BY		REVISIONS

NOTES:
1. (ITEM #10) PROPOSED IMPROVEMENT SCHEDULE = "A"
2. (ITEM #22) THIS TOWNSHIP MAP IS A CONTINUOUS OWNERSHIP.
3. (ITEM #23) THIS PROJECT IS NOT WITHIN A SPECIFIC PLAN.
4. (ITEM #30) THIS PROPERTY HAS NO RECEIVED OF EXISTING EASEMENTS.
5. (ITEM #32) THIS PROPERTY IS NOT WITHIN A COMMUNITY SERVICES DISTRICT.
6. (ITEM #37) THERE ARE NO KNOWN WELLS ON OR WITHIN 200 FEET OF THE PROPERTY BOUNDARY.
7. (ITEMS #38 & #39) NOT REQUIRED.
8. (ITEM #42) THIS PROPERTY HAS NO LIQUEFACTION POTENTIAL, NOT IN A FAULT AREA AND NOT IN SPECIAL FLOOD AREA.
9. (ITEM #43) THIS PROPERTY IS NOT SUBJECT TO OVERFLOW, INUNDATION, OR FLOOD HAZARD.
10. (ITEM #46) THERE ARE NO NEW CHANNELS.
11. (ITEMS #54, #54, #55 & #56)THIS PLAN IS FOR SUBDIVISION OF PROPERTY ONLY. THERE ARE NO PROPOSED OR EXISTING STRUCTURES.

DIAGRAM GUIDE:
2001 EDITION –.

NOTE:
IN ORDER TO ENSURE COMPLIANCE WITH SUPPLEMENT "A", DEVELOPER SHALL ADHERE TO BEST MANAGEMENT PRACTICES DURING ALL CONSTRUCTION OPERATIONS CONCERNING THE CONSTRUCTION OF THIS PROJECT

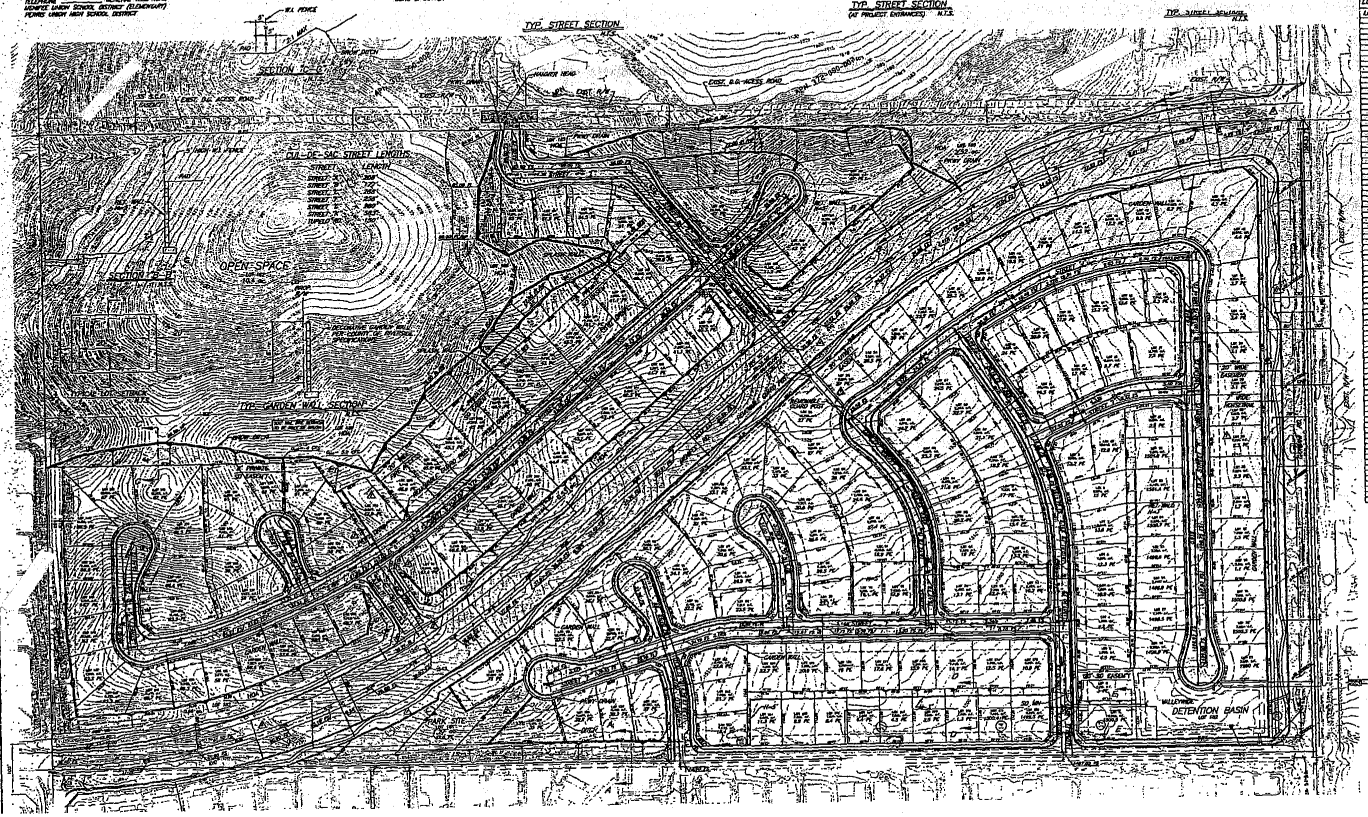

LOT SUMMARY	
LOT NO.	AREA (s.f.)
1	7,200
2	7,200
3	7,200
4	7,200
5	7,200
6	7,200
7	7,200
8	7,200
9	7,200
10	7,200
11	7,200
12	7,200
13	7,200
14	7,200
15	7,200
16	7,200
17	7,200
18	7,200
19	7,200
20	7,200
21	7,200
22	7,200
23	7,200
24	7,200
25	7,200
26	7,200
27	7,200
28	7,200
29	7,200
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LOT SUMMARY	
LOT NO.	AREA (s.f.)
1	8,000
2	8,000
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180	8,000

SOUND BARRIER SECTION
N.T.S.

SOUND BARRIER HEIGHTS		
LOT NO.	STAFFT	HEIGHT
1		5'
2, 3, 4, 14–17, 86–101, 106–110, 148–150		6'
5, 13, 18–21		7'
22–24		8'
25–27, 29, 32, 33		9'
28–31, 34, 35, 37		10'
36–38		12'

Datasheet

Site Conditions:

A_{total} = 80 acres (from worksheet 2)
Q_{BMP} = 9.27 cfs (from worksheet 2)

Design Assumptions:

Swale Geometry:
Initially, some of the swale design parameters must be chosen within the ranges listed for the design criteria. Site constraints may influence some of these values. In this example the following assumptions were made:

Side slope z = 3:1 (maximum)
Channel slope s = 1% (2% maximum, 0.2% minimum)
Depth of flow D = 5" (5" maximum)

These values can be used in the Manning Equation to solve for the required channel width:

$$Q_{BMP} = (1.49/n)\ AR^{2/3}\ s^{1/2}$$

where A = cross sectional area (ft^2)
R = hydraulic radius (ft) = A/P
P = wetted perimeter (ft)
n = manning n value = 0.15 (standard)

Using Manning's Equation:

Swale bottom width b = 55 ft
Design flow velocity v = 0.4 fps

Design Length:
The design length is based on the following equation for a 7 minute minimum contact time:

L = (7 minutes) x (v) x (60 sec/min)
= 168 feet minimum

Vegetation:
Turf grass chosen as appropriate for the site.

Outflow Collection:
Grated inlet chosen as appropriate for the site.

Table 4. Runoff Coefficients for an Intensity = 0.2 $^{in}/_{hr}$ for Urban Soil Types*

Impervious %	A Soil RI =32	B Soil RI =56	C Soil RI =69	D Soil RI =75
0 (Natural)	0.06	0.15	0.24	0.31
5	0.10	0.18	0.28	0.35
10	0.15	0.23	0.33	0.40
15	0.19	0.27	0.37	0.44
20 (1-Acre)	0.24	0.29	0.38	0.41
25	0.27	0.35	0.43	0.49
30	0.32	0.38	0.46	0.51
35	0.35	0.41	0.47	0.51
40 (1/2-Acre)	0.40	0.45	0.50	0.53
45	0.44	0.48	0.52	0.55
50 (1/4-Acre)	0.49	0.53	0.55	0.59
55	0.53	0.57	0.58	0.62
60	0.57	0.61	0.62	0.66
65 (Condominiums)	0.61	0.65	0.65	0.77
70	0.65	0.69	0.70	0.76
75 (Mobilehomes)	0.69	0.71	0.73	0.75
80 (Apartments)	0.74	0.75	0.77	0.78
85	0.77	0.78	0.79	0.81
90 (Commercial)	0.82	0.83	0.83	0.84
95	0.86	0.86	0.87	0.88
100	0.90	0.90	0.90	0.90

*Complete District's standards can be found in the Riverside County Flood Control Hydrology Manual

Worksheet 2

Design Procedure Form for Design Flow

Uniform Intensity Design Flow

Designer:	**Benjie Cho**
Company:	**Riverside County Flood Control and Water Conservation District**
Date:	**3/1/04**
Project:	**BMP Example**
Location:	

1. Determine Impervious Percentage				
a. Determine total tributary area	A_{total} =	**80**	acres	*(1)*
b. Determine Impervious %	i =	**50**	%	*(2)*
2. Determine Runoff Coefficient Values Use **Table 4** and impervious % found in step 1				
a. A Soil Runoff Coefficient	C_a =	**.49**		*(3)*
b. B Soil Runoff Coefficient	C_b =	**.53**		*(4)*
c. C Soil Runoff Coefficient	C_c =	**.55**		*(5)*
d. D Soil Runoff Coefficient	C_d =	**.59**		*(6)*
3. Determine the Area decimal fraction of each soil type in tributary area				
a. Area of A Soil / ***(1)*** =	A_a =	**-**		*(7)*
b. Area of B Soil / ***(1)*** =	A_b =	**-**		*(8)*
c. Area of C Soil / ***(1)*** =	A_c =	**.27**		*(9)*
d. Area of D Soil / ***(1)*** =	A_d =	**.73**		*(10)*
4. Determine Runoff Coefficient				
a. C = ***(3)***x***(7)*** + ***(4)***x***(8)*** + ***(5)***x***(9)*** + ***(6)***x***(10)*** =	C =	**.579**		*(11)*
5. Determine BMP Design flow				
a. Q_{BMP} = C x I x A = ***(11)*** x 0.2 x ***(1)***	Q_{BMP} =	**9.27**	$\frac{ft^3}{s}$	*(12)*

Worksheet 9

Design Procedure Form for Grassed Swale

Designer: **Benjie Cho**
Company: **Riverside County Flood Control and Water Conservation District**
Date: **3/1/04**
Project: **BMP Example**
Location:

1. Determine Design Flow (Use Worksheet 2)	Q_{BMP} = **9.27** cfs
2. Swale Geometry a. Swale bottom width (b) b. Side slope (z) c. Flow direction slope (s)	 b = **55** ft z = **3:1** s = **1** %
3. Design flow velocity (Manning n = 0.2)	v = **0.4** ft/s
4. Depth of flow (D)	D = **0.42 (5")** ft
5. Design Length (L) L = (7 min) x (flow velocity, ft/sec) x 60	L = **168** ft
6. Vegetation (describe)	Turf Grass
1. Outflow Collection (check type used or describe "other")	**X** Grated Inlet' ___ Infiltration Trench ___ Underdrain ___ Other___

Notes:
Assuming a depth of 1 foot, this swale will require 0.222 acres of area.

Appendix B
Stormwater Quality Best Management Practice
Design Handbook

Extended Detention Basin Example

045634

TENTATIVE TRACT MAP

BEING A BOUNDARY MAP OF THE SOUTHWEST QUARTER OF SECTION 11, TOWNSHIP 6 SOUTH, RANGE 3 WEST, SAN BERNARDINO MERIDIAN, IN THE COUNTY OF RIVERSIDE.

OWNER/DEVELOPER:

ENGINEER:

ASSESSORS PARCEL NO.:

TOTAL ACREAGE:

UTILITIES:

TARGET DENSITY:

ZONING AND LAND USE:

FLOOD ZONE:

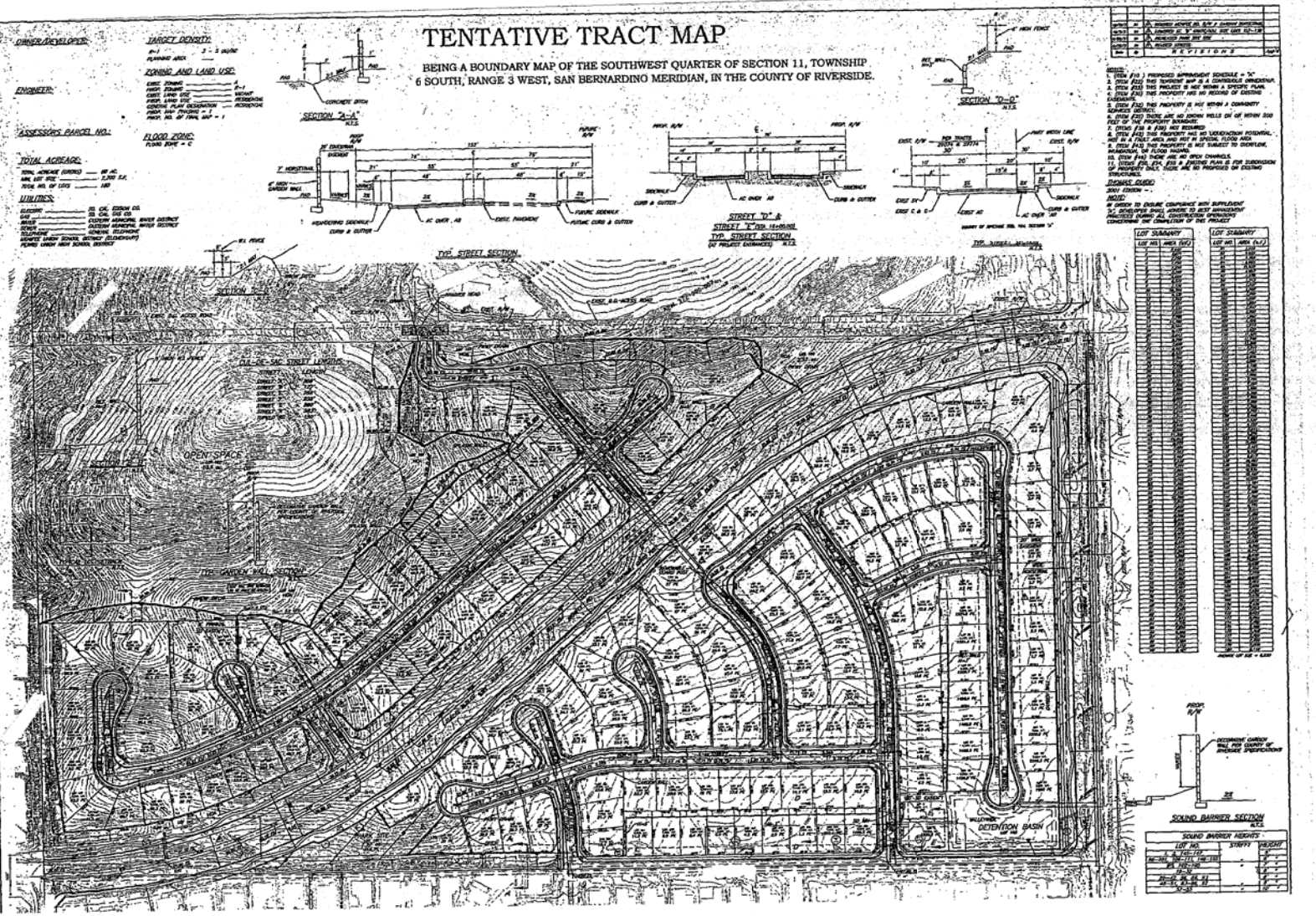

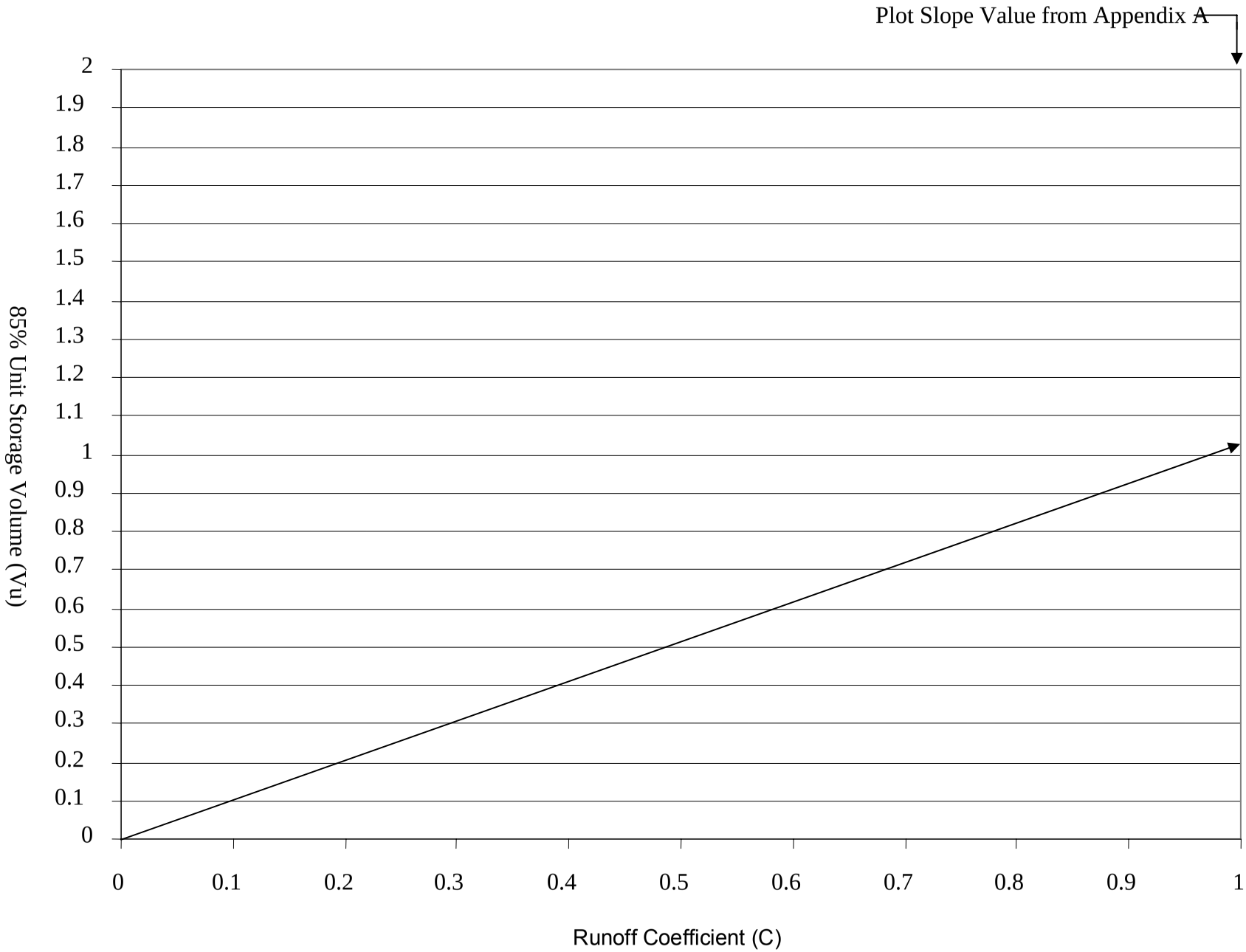

Figure 2 Unit Storage Volume Graph

045635

Datasheet

Site Conditions:

A_{total} = 40 acres	(from worksheet 1)
V_{BMP} = 50820 ft^3	(from worksheet 1)
L:W Ratio = 2:1	(min 2:1, consider site constraints)
Basin depth = 4’	(min 3.5’, consider site constraints)

Design Assumptions:

In this example a rectangular basin shape was assumed for simplification. Actual volumes and dimensions will differ based on the configuration of the basin.

Two Stage Design (see Figure 3):
Based on the total depth (outlet to spillway) of 4’, set depth of each stage:

Upper Stage Depth = 2’	(2’ min)
Bottom Stage Depth = 2’	(1.5’ min)

Upper Stage:
The total basin volume must be greater than or equal to the design volume. The bottom stage will hold between 10 and 25 percent of the design volume. The top stage must therefore hold between 75 and 90 percent of the design volume. In this example, the top stage is designed to hold 90 percent of the design volume.

$L = 2 * W$
$0.9V_{BMP} = Depth * (2W^2)$
$45738 = 4*W^2$

W = 106.9’ → round to 110’
L = 220’
$Volume_{US} = 48400\ ft^2$

Bottom Stage:
The bottom stage must hold between 10 and 25 percent of the design volume.

At 10% → $0.1V_{BMP} = D_{Bottom} * W * L_{Bottom}$
$0.1(50820) = (2')*(110')* L_{Bottom}$
$L_{Bottom} = 23.1'$

At 25% → $0.25V_{BMP} = D_{Bottom} * W * L_{Bottom}$
$0.25(50820) = (2')*(110')* L_{Bottom}$
$L_{Bottom} = 57.8'$

Set L_{Bottom} = 30'
$Volume_{BS}$ = 6600 ft^3 (13% of V_{BMP})

Total Basin Volume check:
$Volume_{Basin} = V_{BS} + V_{US}$ = 55000 ft^3 (108% V_{BMP}) $\geq$ V_{BMP} ok

Forebay Design:

In this example a cylindrical forebay shape was assumed for simplification.

Set forebay volume between 5 and 10 percent of the design volume:
$V_F = 0.1V_{BMP}$ = 5082 ft^3
Forebay should drain into low-flow channel in approximately 45 minutes or less. Standing water is not allowable.
$Depth_F$ = 0.8 ft (assumed)
$Area_F$ = (5082)/ depth = 6352.5 ft^2
$Diameter_F$ = SQRT((4* $Area_F$)/ π) = 89.9 → use 90'
For a 45 minute drain time:
Forebay Q_{out} = (5082 ft^3) / (45 min * 60 sec/min) = 1.9 ft^3/s
Size outlet accordingly

Low-flow Channel:

This example assumes a low flow channel depth. The capacity is based on a v-ditch channel at a 2% slope, with side slopes of 2:1. The capacity should be at least twice the forebay outlet rate.

Depth = 0.9 ft (min. 0.75 ft)
Flow capacity = 4.5 ft/s > (2 * Forebay Q_{OUT}) → ok

Basin Outlet:

The stage versus storage graph shows the volume of the proposed basin at various depths:

stage (ft)	storage (ft^3)	storage (acre-ft)
0	0	0.0000
0.5	1650	0.0379
1	3300	0.0758
1.5	4950	0.1136
2	6600	0.1515
2.5	18700	0.4293
3	30800	0.7071
3.5	42900	0.9848
4	55000	1.2626

In this example CivilD was used to route the design volume through the basin for various orifice sizes. After several iterations an appropriate orifice size was chosen of a 2.1-inch diameter. The CivilD program determined the outflow rate at each depth. Please see the attached printout for the routing.

stage (ft)	storage (ft^3)	storage (acre-ft)	Q_{OUT} (cfs)
0	0	0.0000	0.00
0.5	1650	0.0379	0.11
1	3300	0.0758	0.15
1.5	4950	0.1136	0.18
2	6600	0.1515	0.21
2.5	18700	0.4293	0.23
3	30800	0.7071	0.25
3.5	42900	0.9848	0.27
4	55000	1.2626	0.29

For this size orifice:

50% of the V_{BMP} has drained from the basin in 27 hours $\geq$ 24 hours → ok

After 27 hours
Volume Remaining = 0.581 acre-ft
WS Elevation = 2.77 ft

100% of the V_{BMP} has drained from the basin in 60 hours $\geq$ 48 hours
< 72 hours → ok

After 60 hours
Volume Remaining = 0.03 acre-ft
WS Elevation = 0.45 ft

Vegetation:
Native grass chosen as appropriate for the site.

Embankment:
Maximum interior slope of 4:1 and maximum exterior slope of 3:1 chosen.

Access:
Maximum 10% slope and minimum 16' access roads chosen.

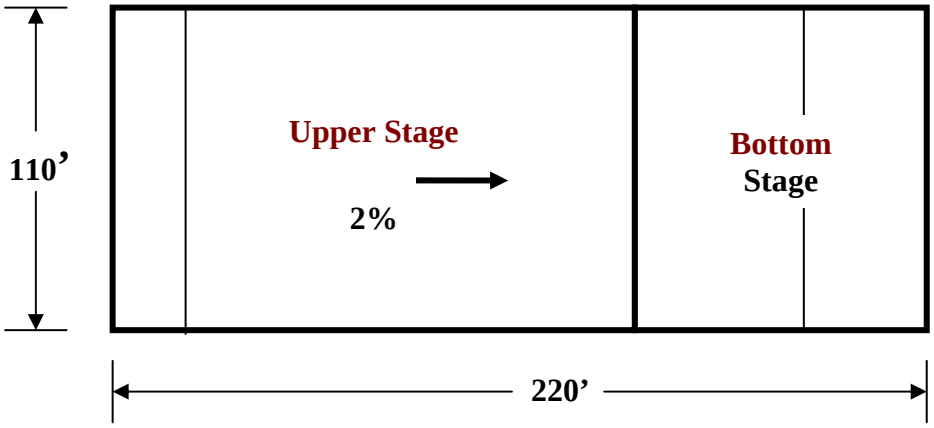

PLAN VIEW
N.T.S.

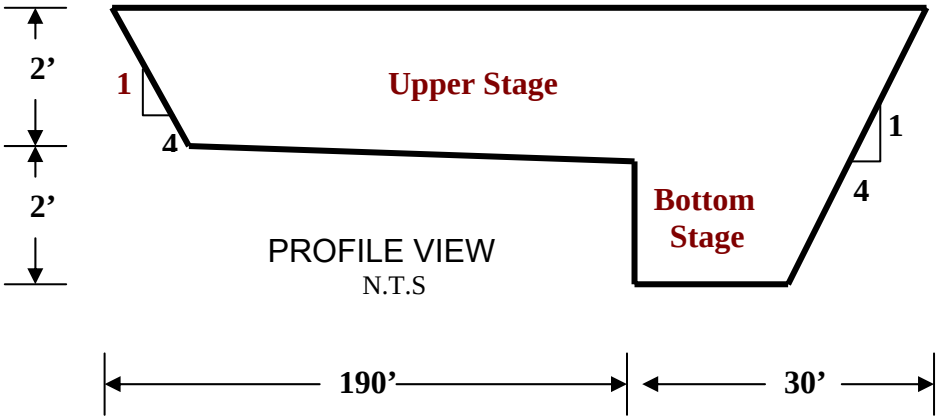

PROFILE VIEW
N.T.S

Worksheet 1

Design Procedure for BMP Design Volume

85th percentile runoff event

Designer:	**Benjie Cho**
Company:	**Riverside County Flood Control and Water Conservation District**
Date:	**3/1/04**
Project:	**BMP Example**
Location:	

1. Create Unit Storage Volume Graph a. Site location (Township, Range and Section) b. Slope value from the Design Volume Curve in **Appendix A**. c. Plot this value on the Unit Storage Volume Graph shown on **Figure 2**. d. Draw a straight line form this point to the origin, to create the graph	T **6** &R **3** Section **11**	*(1)*
	Slope = **1.03**	*(2)*
	Is this graph attached? Yes ☒ No ☐	
2. Determine Runoff Coefficient a. Determine total impervious area	$A_{impervious}$ = **20** acres	*(5)*
b. Determine total tributary area	A_{total} = **40** acres	*(6)*
c. Determine Impervious fraction i = ***(5)*** / ***(6)***	i = **.50**	*(7)*
d. Use ***(7)*** in **Figure 1** to find Runoff OR $C = .858i^3 - .78i^2 + .774i + .04$	C = **.34**	*(8)*
3. Determine 85% Unit Storage Volume a. Use ***(8)*** in **Figure 1** Draw a Vertical line from ***(8)*** to the graph, then a Horizontal line to the desired V_u value.	V_u = **.35** in-acre / acre	*(9)*
4. Determine Design Storage Volume a. V_{BMP} = ***(9)*** x ***(6)*** [in- acres]	V_{BMP} = **14** in-acre	*(10)*
b. V_{BMP} = ***(10)*** / 12 [ft- acres]	V_{BMP} = **1.17** ft-acre	*(11)*
c. V_{BMP} = ***(11)*** x 43560 [ft^3]	V_{BMP} = **50820** ft^3	*(12)*

Notes:

Worksheet 3

Design Procedure Form for Extended Detention Basin

Designer: Jennifer Otterson
Company: Riverside County Flood Control and Water Conservation District
Date: 3/2/04
Project: BMP Example
Location: Winchester/Antelope Valley Area

1. Determine Design Volume (Use Worksheet 1) a. Total Tributary Area (minimum 5 ac.) b. Design Volume, V_{BMP}	A_{total} = 40 acres V_{BMP} = 50820 ft^3
2. Basin Length to Width Ratio (2:1 min.)	Ratio = 2:1 L:W
3. Two-Stage Design a. Overall Design 1) Depth (3.5' min.) 2) Width (30' min.) 3) Length (60' min.) 4) Volume (must be $\geq V_{BMP}$) b. Upper Stage 1) Depth (2' min.) 2) Bottom Slope (2% to low flow channel recommended) c. Bottom Stage 1) Depth (1.5' to 3') 2) Length 3) Volume (10 to 25% of V_{BMP})	 Depth = 4 ft Width = 110 ft Length = 220 ft Volume = 55000 ft^3 Depth = 2 ft Slope = 2 % Depth = 2 ft Length = 30 ft Volume = 6600 (13%) ft^3
4. Forebay Design a. Forebay Volume (5 to 10% of V_{BMP}) b. Outlet pipe drainage time ($\cong$ 45 min)	Volume = 5082 (10%) ft^3 Drain time = 45 minutes
5. Low-flow Channel a. Depth (9" minimum) b. Flow Capacity (2 * Forebay Q_{OUT})	Depth = 0.9 ft $Q_{Low\ Flow}$ = 4.5 cfs
6. Trash Rack or Gravel Pack (check one)	Trash Rack X Gravel Pack _____

7. Basin Outlet a. Outlet type (check one)	Single orifice __X__ Multi-orifice plate _____ Perforated Pipe _____ Other _____
b. Orifice Area c. Orifice Type d. Maximum Depth of water above bottom orifice e. Length of time for 50% V_{BMP} drainage (24 hour minimum) f. Length of time for 100% V_{BMP} drainage (between 48 and 72 hours) g. Attached Documents (all required) 1) Stage vs. Discharge 2) Stage vs. Volume 3) Inflow Hydrograph 4) Basin Routing	Area = 0.024 (2.1" Diameter) ft^2 Type _Pipe_____ Depth = _3.8_____ ft Time 50% = __27_____ hrs Time 100% = __60_____ hrs Attached Documents (check) 1) __X_____ 2) __X_____ 3) __X_____ 4) __X_____
8. Increased Runoff (optional) Is this basin also mitigating increased runoff? Attached Documents (all required) for 2, 5, & 10-year storms: 1) Stage vs. Discharge 2) Stage vs. Volume/Storage 3) Inflow Hydrograph 4) Basin Routing	Yes _____ No _X____ (if No, skip to #9) Attached Documents (check) 1) _____ 2) _____ 3) _____ 4) _____
9. Vegetation (check type)	_X__ Native Grasses ____ Irrigated Turf ____ Other _____
10. Embankment a. Interior slope (4:1 max.) b. Exterior slope (3:1 max.)	Interior Slope = ___4:1___ Exterior Slope = ___3:1___
11. Maintenance Access a. Slope (10% max.) b. Width (16 feet min.)	Slope = ___10____ % Width = ___16____ ft

FLOOD HYDROGRAPH ROUTING PROGRAM
Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2001
Study date: 04/15/04

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********** HYDROGRAPH INFORMATION **********

From study/file name: BMPexampl.rte
********** Hydrograph Information **********
From manual input hydrograph

**********HYDROGRAPH DATA**********
Number of intervals = 2
Time interval = 5.0 (Min.)
Maximum/Peak flow rate = 84.700 (CFS)
Total volume = 1.167 (Ac.Ft)

Status of hydrographs being held in storage

	Stream 1	Stream 2	Stream 3	Stream 4	Stream 5
Peak (CFS)	0.000	0.000	0.000	0.000	0.000
Vol (Ac.Ft)	0.000	0.000	0.000	0.000	0.000

****

++
Process from Point/Station 1.000 to Point/Station 2.000
**** RETARDING BASIN ROUTING ****
_____

Program computation of outflow v. depth

CALCULATED OUTFLOW DATA AT DEPTH = 0.50(Ft.))
Pipe length = 1.00(Ft.) Elevation difference = 0.10(Ft.)
Manning's N = 0.013 No. of pipes = 1
Given pipe size = 2.10(In.)
NOTE: Assuming free outlet flow.
NOTE: Normal flow is pressure flow.
The total friction loss through the pipe is 0.600(Ft.)
Pipe friction loss = 0.105(Ft.)
Minor friction loss = 0.495(Ft.) K-factor = 1.50
Calculated flow rate through pipe(s) = 0.111(CFS)

Total outflow at this depth = 0.11(CFS)

CALCULATED OUTFLOW DATA AT DEPTH = 1.00(Ft.))
Pipe length = 1.00(Ft.) Elevation difference = 0.10(Ft.)

Manning's N = 0.013 No. of pipes = 1
Given pipe size = 2.10(In.)
 NOTE: Assuming free outlet flow.
NOTE: Normal flow is pressure flow.
The total friction loss through the pipe is 1.100(Ft.)
Pipe friction loss = 0.193(Ft.)
Minor friction loss = 0.907(Ft.) K-factor = 1.50
Calculated flow rate through pipe(s) = 0.150(CFS)

Total outflow at this depth = 0.15(CFS)

CALCULATED OUTFLOW DATA AT DEPTH = 1.50(Ft.))
Pipe length = 1.00(Ft.) Elevation difference = 0.10(Ft.)
Manning's N = 0.013 No. of pipes = 1
Given pipe size = 2.10(In.)
 NOTE: Assuming free outlet flow.
NOTE: Normal flow is pressure flow.
The total friction loss through the pipe is 1.600(Ft.)
Pipe friction loss = 0.281(Ft.)
Minor friction loss = 1.320(Ft.) K-factor = 1.50
Calculated flow rate through pipe(s) = 0.181(CFS)

Total outflow at this depth = 0.18(CFS)

CALCULATED OUTFLOW DATA AT DEPTH = 2.00(Ft.))
Pipe length = 1.00(Ft.) Elevation difference = 0.10(Ft.)
Manning's N = 0.013 No. of pipes = 1
Given pipe size = 2.10(In.)
 NOTE: Assuming free outlet flow.
NOTE: Normal flow is pressure flow.
The total friction loss through the pipe is 2.100(Ft.)
Pipe friction loss = 0.369(Ft.)
Minor friction loss = 1.732(Ft.) K-factor = 1.50
Calculated flow rate through pipe(s) = 0.207(CFS)

Total outflow at this depth = 0.21(CFS)

CALCULATED OUTFLOW DATA AT DEPTH = 2.50(Ft.))
Pipe length = 1.00(Ft.) Elevation difference = 0.10(Ft.)
Manning's N = 0.013 No. of pipes = 1
Given pipe size = 2.10(In.)
 NOTE: Assuming free outlet flow.
NOTE: Normal flow is pressure flow.
The total friction loss through the pipe is 2.600(Ft.)
Pipe friction loss = 0.457(Ft.)
Minor friction loss = 2.144(Ft.) K-factor = 1.50
Calculated flow rate through pipe(s) = 0.231(CFS)

Total outflow at this depth = 0.23(CFS)

CALCULATED OUTFLOW DATA AT DEPTH = 3.00(Ft.))
Pipe length = 1.00(Ft.) Elevation difference = 0.10(Ft.)

Manning's N = 0.013 No. of pipes = 1
Given pipe size = 2.10(In.)
 NOTE: Assuming free outlet flow.
NOTE: Normal flow is pressure flow.
The total friction loss through the pipe is 3.100(Ft.)
Pipe friction loss = 0.545(Ft.)
Minor friction loss = 2.557(Ft.) K-factor = 1.50
Calculated flow rate through pipe(s) = 0.252(CFS)

Total outflow at this depth = 0.25(CFS)

CALCULATED OUTFLOW DATA AT DEPTH = 3.50(Ft.))
Pipe length = 1.00(Ft.) Elevation difference = 0.10(Ft.)
Manning's N = 0.013 No. of pipes = 1
Given pipe size = 2.10(In.)
 NOTE: Assuming free outlet flow.
NOTE: Normal flow is pressure flow.
The total friction loss through the pipe is 3.600(Ft.)
Pipe friction loss = 0.633(Ft.)
Minor friction loss = 2.969(Ft.) K-factor = 1.50
Calculated flow rate through pipe(s) = 0.272(CFS)

Total outflow at this depth = 0.27(CFS)

CALCULATED OUTFLOW DATA AT DEPTH = 4.00(Ft.))
Pipe length = 1.00(Ft.) Elevation difference = 0.10(Ft.)
Manning's N = 0.013 No. of pipes = 1
Given pipe size = 2.10(In.)
 NOTE: Assuming free outlet flow.
NOTE: Normal flow is pressure flow.
The total friction loss through the pipe is 4.100(Ft.)
Pipe friction loss = 0.721(Ft.)
Minor friction loss = 3.381(Ft.) K-factor = 1.50
Calculated flow rate through pipe(s) = 0.290(CFS)

Total outflow at this depth = 0.29(CFS)

Total number of inflow hydrograph intervals = 2
Hydrograph time unit = 5.000 (Min.)
Initial depth in storage basin = 0.00(Ft.)

Initial basin depth = 0.00 (Ft.)
Initial basin storage = 0.00 (Ac.Ft)
Initial basin outflow = 0.00 (CFS)

Depth vs. Storage and Depth vs. Discharge data:

Basin Depth (Ft.)	Storage (Ac.Ft)	Outflow (CFS)	(S-O*dt/2) (Ac.Ft)	(S+O*dt/2) (Ac.Ft)
0.000	0.000	0.000	0.000	0.000
0.500	0.038	0.111	0.038	0.038

1.000	0.076	0.150	0.075	0.077
1.500	0.114	0.181	0.113	0.115
2.000	0.152	0.207	0.151	0.153
2.500	0.429	0.231	0.428	0.430
3.000	0.707	0.252	0.706	0.708
3.500	0.985	0.272	0.984	0.986
4.000	1.263	0.290	1.262	1.264

Hydrograph Detention Basin Routing

Graph values: 'I'= unit inflow; 'O'=outflow at time shown

Time (Hours)	Inflow (CFS)	Outflow (CFS)	Storage (Ac.Ft)	.0	21.2	42.35	63.53	84.70	Depth (Ft.)
0.083	84.70	0.22	0.291	O	|	|	|	I	2.25
0.167	84.70	0.26	0.873	O	|	|	|	I	3.30
0.250	0.00	0.28	1.162	O	|	|	|	|	3.82
0.333	0.00	0.28	1.160	O	|	|	|	|	3.82
0.417	0.00	0.28	1.158	O	|	|	|	|	3.81
0.500	0.00	0.28	1.157	O	|	|	|	|	3.81
0.583	0.00	0.28	1.155	O	|	|	|	|	3.80
0.667	0.00	0.28	1.153	O	|	|	|	|	3.80
0.750	0.00	0.28	1.151	O	|	|	|	|	3.80
0.833	0.00	0.28	1.149	O	|	|	|	|	3.79
0.917	0.00	0.28	1.147	O	|	|	|	|	3.79
1.000	0.00	0.28	1.145	O	|	|	|	|	3.79
1.083	0.00	0.28	1.143	O	|	|	|	|	3.78
1.167	0.00	0.28	1.141	O	|	|	|	|	3.78
1.250	0.00	0.28	1.139	O	|	|	|	|	3.78
1.333	0.00	0.28	1.137	O	|	|	|	|	3.77
1.417	0.00	0.28	1.135	O	|	|	|	|	3.77
1.500	0.00	0.28	1.133	O	|	|	|	|	3.77
1.583	0.00	0.28	1.131	O	|	|	|	|	3.76
1.667	0.00	0.28	1.129	O	|	|	|	|	3.76
1.750	0.00	0.28	1.127	O	|	|	|	|	3.76
1.833	0.00	0.28	1.125	O	|	|	|	|	3.75
1.917	0.00	0.28	1.124	O	|	|	|	|	3.75
2.000	0.00	0.28	1.122	O	|	|	|	|	3.75
2.083	0.00	0.28	1.120	O	|	|	|	|	3.74
2.167	0.00	0.28	1.118	O	|	|	|	|	3.74
2.250	0.00	0.28	1.116	O	|	|	|	|	3.74
2.333	0.00	0.28	1.114	O	|	|	|	|	3.73
2.417	0.00	0.28	1.112	O	|	|	|	|	3.73
2.500	0.00	0.28	1.110	O	|	|	|	|	3.72
2.583	0.00	0.28	1.108	O	|	|	|	|	3.72
2.667	0.00	0.28	1.106	O	|	|	|	|	3.72
2.750	0.00	0.28	1.104	O	|	|	|	|	3.71
2.833	0.00	0.28	1.102	O	|	|	|	|	3.71
2.917	0.00	0.28	1.100	O	|	|	|	|	3.71
3.000	0.00	0.28	1.098	O	|	|	|	|	3.70
3.083	0.00	0.28	1.097	O	|	|	|	|	3.70
3.167	0.00	0.28	1.095	O	|	|	|	|	3.70
3.250	0.00	0.28	1.093	O	|	|	|	|	3.69
3.333	0.00	0.28	1.091	O	|	|	|	|	3.69
3.417	0.00	0.28	1.089	O	|	|	|	|	3.69

3.500	0.00	0.28	1.087	O	|	|	|	|	3.68
3.583	0.00	0.28	1.085	O	|	|	|	|	3.68
3.667	0.00	0.28	1.083	O	|	|	|	|	3.68
3.750	0.00	0.28	1.081	O	|	|	|	|	3.67
3.833	0.00	0.28	1.079	O	|	|	|	|	3.67
3.917	0.00	0.28	1.077	O	|	|	|	|	3.67
4.000	0.00	0.28	1.075	O	|	|	|	|	3.66
4.083	0.00	0.28	1.074	O	|	|	|	|	3.66
4.167	0.00	0.28	1.072	O	|	|	|	|	3.66
4.250	0.00	0.28	1.070	O	|	|	|	|	3.65
4.333	0.00	0.28	1.068	O	|	|	|	|	3.65
4.417	0.00	0.28	1.066	O	|	|	|	|	3.65
4.500	0.00	0.28	1.064	O	|	|	|	|	3.64
4.583	0.00	0.28	1.062	O	|	|	|	|	3.64
4.667	0.00	0.28	1.060	O	|	|	|	|	3.64
4.750	0.00	0.28	1.058	O	|	|	|	|	3.63
4.833	0.00	0.28	1.056	O	|	|	|	|	3.63
4.917	0.00	0.28	1.055	O	|	|	|	|	3.63
5.000	0.00	0.28	1.053	O	|	|	|	|	3.62
5.083	0.00	0.28	1.051	O	|	|	|	|	3.62
5.167	0.00	0.28	1.049	O	|	|	|	|	3.61
5.250	0.00	0.28	1.047	O	|	|	|	|	3.61
5.333	0.00	0.28	1.045	O	|	|	|	|	3.61
5.417	0.00	0.28	1.043	O	|	|	|	|	3.60
5.500	0.00	0.28	1.041	O	|	|	|	|	3.60
5.583	0.00	0.28	1.039	O	|	|	|	|	3.60
5.667	0.00	0.28	1.037	O	|	|	|	|	3.59
5.750	0.00	0.27	1.036	O	|	|	|	|	3.59
5.833	0.00	0.27	1.034	O	|	|	|	|	3.59
5.917	0.00	0.27	1.032	O	|	|	|	|	3.58
6.000	0.00	0.27	1.030	O	|	|	|	|	3.58
6.083	0.00	0.27	1.028	O	|	|	|	|	3.58
6.167	0.00	0.27	1.026	O	|	|	|	|	3.57
6.250	0.00	0.27	1.024	O	|	|	|	|	3.57
6.333	0.00	0.27	1.022	O	|	|	|	|	3.57
6.417	0.00	0.27	1.020	O	|	|	|	|	3.56
6.500	0.00	0.27	1.019	O	|	|	|	|	3.56
6.583	0.00	0.27	1.017	O	|	|	|	|	3.56
6.667	0.00	0.27	1.015	O	|	|	|	|	3.55
6.750	0.00	0.27	1.013	O	|	|	|	|	3.55
6.833	0.00	0.27	1.011	O	|	|	|	|	3.55
6.917	0.00	0.27	1.009	O	|	|	|	|	3.54
7.000	0.00	0.27	1.007	O	|	|	|	|	3.54
7.083	0.00	0.27	1.005	O	|	|	|	|	3.54
7.167	0.00	0.27	1.003	O	|	|	|	|	3.53
7.250	0.00	0.27	1.002	O	|	|	|	|	3.53
7.333	0.00	0.27	1.000	O	|	|	|	|	3.53
7.417	0.00	0.27	0.998	O	|	|	|	|	3.52
7.500	0.00	0.27	0.996	O	|	|	|	|	3.52
7.583	0.00	0.27	0.994	O	|	|	|	|	3.52
7.667	0.00	0.27	0.992	O	|	|	|	|	3.51
7.750	0.00	0.27	0.990	O	|	|	|	|	3.51
7.833	0.00	0.27	0.988	O	|	|	|	|	3.51
7.917	0.00	0.27	0.987	O	|	|	|	|	3.50
8.000	0.00	0.27	0.985	O	|	|	|	|	3.50
8.083	0.00	0.27	0.983	O	|	|	|	|	3.50

8.167	0.00	0.27	0.981	O	|	|	|	|	3.49
8.250	0.00	0.27	0.979	O	|	|	|	|	3.49
8.333	0.00	0.27	0.977	O	|	|	|	|	3.49
8.417	0.00	0.27	0.975	O	|	|	|	|	3.48
8.500	0.00	0.27	0.974	O	|	|	|	|	3.48
8.583	0.00	0.27	0.972	O	|	|	|	|	3.48
8.667	0.00	0.27	0.970	O	|	|	|	|	3.47
8.750	0.00	0.27	0.968	O	|	|	|	|	3.47
8.833	0.00	0.27	0.966	O	|	|	|	|	3.47
8.917	0.00	0.27	0.964	O	|	|	|	|	3.46
9.000	0.00	0.27	0.962	O	|	|	|	|	3.46
9.083	0.00	0.27	0.961	O	|	|	|	|	3.46
9.167	0.00	0.27	0.959	O	|	|	|	|	3.45
9.250	0.00	0.27	0.957	O	|	|	|	|	3.45
9.333	0.00	0.27	0.955	O	|	|	|	|	3.45
9.417	0.00	0.27	0.953	O	|	|	|	|	3.44
9.500	0.00	0.27	0.951	O	|	|	|	|	3.44
9.583	0.00	0.27	0.949	O	|	|	|	|	3.44
9.667	0.00	0.27	0.948	O	|	|	|	|	3.43
9.750	0.00	0.27	0.946	O	|	|	|	|	3.43
9.833	0.00	0.27	0.944	O	|	|	|	|	3.43
9.917	0.00	0.27	0.942	O	|	|	|	|	3.42
10.000	0.00	0.27	0.940	O	|	|	|	|	3.42
10.083	0.00	0.27	0.938	O	|	|	|	|	3.42
10.167	0.00	0.27	0.936	O	|	|	|	|	3.41
10.250	0.00	0.27	0.935	O	|	|	|	|	3.41
10.333	0.00	0.27	0.933	O	|	|	|	|	3.41
10.417	0.00	0.27	0.931	O	|	|	|	|	3.40
10.500	0.00	0.27	0.929	O	|	|	|	|	3.40
10.583	0.00	0.27	0.927	O	|	|	|	|	3.40
10.667	0.00	0.27	0.925	O	|	|	|	|	3.39
10.750	0.00	0.27	0.924	O	|	|	|	|	3.39
10.833	0.00	0.27	0.922	O	|	|	|	|	3.39
10.917	0.00	0.27	0.920	O	|	|	|	|	3.38
11.000	0.00	0.27	0.918	O	|	|	|	|	3.38
11.083	0.00	0.27	0.916	O	|	|	|	|	3.38
11.167	0.00	0.27	0.914	O	|	|	|	|	3.37
11.250	0.00	0.27	0.912	O	|	|	|	|	3.37
11.333	0.00	0.27	0.911	O	|	|	|	|	3.37
11.417	0.00	0.27	0.909	O	|	|	|	|	3.36
11.500	0.00	0.27	0.907	O	|	|	|	|	3.36
11.583	0.00	0.27	0.905	O	|	|	|	|	3.36
11.667	0.00	0.27	0.903	O	|	|	|	|	3.35
11.750	0.00	0.27	0.901	O	|	|	|	|	3.35
11.833	0.00	0.27	0.900	O	|	|	|	|	3.35
11.917	0.00	0.27	0.898	O	|	|	|	|	3.34
12.000	0.00	0.27	0.896	O	|	|	|	|	3.34
12.083	0.00	0.27	0.894	O	|	|	|	|	3.34
12.167	0.00	0.27	0.892	O	|	|	|	|	3.33
12.250	0.00	0.26	0.891	O	|	|	|	|	3.33
12.333	0.00	0.26	0.889	O	|	|	|	|	3.33
12.417	0.00	0.26	0.887	O	|	|	|	|	3.32
12.500	0.00	0.26	0.885	O	|	|	|	|	3.32
12.583	0.00	0.26	0.883	O	|	|	|	|	3.32
12.667	0.00	0.26	0.881	O	|	|	|	|	3.31
12.750	0.00	0.26	0.880	O	|	|	|	|	3.31

12.833	0.00	0.26	0.878	O	|	|	|	|	3.31
12.917	0.00	0.26	0.876	O	|	|	|	|	3.30
13.000	0.00	0.26	0.874	O	|	|	|	|	3.30
13.083	0.00	0.26	0.872	O	|	|	|	|	3.30
13.167	0.00	0.26	0.871	O	|	|	|	|	3.29
13.250	0.00	0.26	0.869	O	|	|	|	|	3.29
13.333	0.00	0.26	0.867	O	|	|	|	|	3.29
13.417	0.00	0.26	0.865	O	|	|	|	|	3.28
13.500	0.00	0.26	0.863	O	|	|	|	|	3.28
13.583	0.00	0.26	0.861	O	|	|	|	|	3.28
13.667	0.00	0.26	0.860	O	|	|	|	|	3.27
13.750	0.00	0.26	0.858	O	|	|	|	|	3.27
13.833	0.00	0.26	0.856	O	|	|	|	|	3.27
13.917	0.00	0.26	0.854	O	|	|	|	|	3.26
14.000	0.00	0.26	0.852	O	|	|	|	|	3.26
14.083	0.00	0.26	0.851	O	|	|	|	|	3.26
14.167	0.00	0.26	0.849	O	|	|	|	|	3.26
14.250	0.00	0.26	0.847	O	|	|	|	|	3.25
14.333	0.00	0.26	0.845	O	|	|	|	|	3.25
14.417	0.00	0.26	0.843	O	|	|	|	|	3.25
14.500	0.00	0.26	0.842	O	|	|	|	|	3.24
14.583	0.00	0.26	0.840	O	|	|	|	|	3.24
14.667	0.00	0.26	0.838	O	|	|	|	|	3.24
14.750	0.00	0.26	0.836	O	|	|	|	|	3.23
14.833	0.00	0.26	0.834	O	|	|	|	|	3.23
14.917	0.00	0.26	0.833	O	|	|	|	|	3.23
15.000	0.00	0.26	0.831	O	|	|	|	|	3.22
15.083	0.00	0.26	0.829	O	|	|	|	|	3.22
15.167	0.00	0.26	0.827	O	|	|	|	|	3.22
15.250	0.00	0.26	0.825	O	|	|	|	|	3.21
15.333	0.00	0.26	0.824	O	|	|	|	|	3.21
15.417	0.00	0.26	0.822	O	|	|	|	|	3.21
15.500	0.00	0.26	0.820	O	|	|	|	|	3.20
15.583	0.00	0.26	0.818	O	|	|	|	|	3.20
15.667	0.00	0.26	0.816	O	|	|	|	|	3.20
15.750	0.00	0.26	0.815	O	|	|	|	|	3.19
15.833	0.00	0.26	0.813	O	|	|	|	|	3.19
15.917	0.00	0.26	0.811	O	|	|	|	|	3.19
16.000	0.00	0.26	0.809	O	|	|	|	|	3.18
16.083	0.00	0.26	0.808	O	|	|	|	|	3.18
16.167	0.00	0.26	0.806	O	|	|	|	|	3.18
16.250	0.00	0.26	0.804	O	|	|	|	|	3.17
16.333	0.00	0.26	0.802	O	|	|	|	|	3.17
16.417	0.00	0.26	0.800	O	|	|	|	|	3.17
16.500	0.00	0.26	0.799	O	|	|	|	|	3.16
16.583	0.00	0.26	0.797	O	|	|	|	|	3.16
16.667	0.00	0.26	0.795	O	|	|	|	|	3.16
16.750	0.00	0.26	0.793	O	|	|	|	|	3.16
16.833	0.00	0.26	0.792	O	|	|	|	|	3.15
16.917	0.00	0.26	0.790	O	|	|	|	|	3.15
17.000	0.00	0.26	0.788	O	|	|	|	|	3.15
17.083	0.00	0.26	0.786	O	|	|	|	|	3.14
17.167	0.00	0.26	0.784	O	|	|	|	|	3.14
17.250	0.00	0.26	0.783	O	|	|	|	|	3.14
17.333	0.00	0.26	0.781	O	|	|	|	|	3.13
17.417	0.00	0.26	0.779	O	|	|	|	|	3.13

17.500	0.00	0.26	0.777	O	|	|	|	|	3.13
17.583	0.00	0.26	0.776	O	|	|	|	|	3.12
17.667	0.00	0.26	0.774	O	|	|	|	|	3.12
17.750	0.00	0.26	0.772	O	|	|	|	|	3.12
17.833	0.00	0.26	0.770	O	|	|	|	|	3.11
17.917	0.00	0.26	0.768	O	|	|	|	|	3.11
18.000	0.00	0.26	0.767	O	|	|	|	|	3.11
18.083	0.00	0.26	0.765	O	|	|	|	|	3.10
18.167	0.00	0.26	0.763	O	|	|	|	|	3.10
18.250	0.00	0.26	0.761	O	|	|	|	|	3.10
18.333	0.00	0.26	0.760	O	|	|	|	|	3.09
18.417	0.00	0.26	0.758	O	|	|	|	|	3.09
18.500	0.00	0.26	0.756	O	|	|	|	|	3.09
18.583	0.00	0.26	0.754	O	|	|	|	|	3.09
18.667	0.00	0.26	0.753	O	|	|	|	|	3.08
18.750	0.00	0.26	0.751	O	|	|	|	|	3.08
18.833	0.00	0.25	0.749	O	|	|	|	|	3.08
18.917	0.00	0.25	0.747	O	|	|	|	|	3.07
19.000	0.00	0.25	0.746	O	|	|	|	|	3.07
19.083	0.00	0.25	0.744	O	|	|	|	|	3.07
19.167	0.00	0.25	0.742	O	|	|	|	|	3.06
19.250	0.00	0.25	0.740	O	|	|	|	|	3.06
19.333	0.00	0.25	0.739	O	|	|	|	|	3.06
19.417	0.00	0.25	0.737	O	|	|	|	|	3.05
19.500	0.00	0.25	0.735	O	|	|	|	|	3.05
19.583	0.00	0.25	0.733	O	|	|	|	|	3.05
19.667	0.00	0.25	0.732	O	|	|	|	|	3.04
19.750	0.00	0.25	0.730	O	|	|	|	|	3.04
19.833	0.00	0.25	0.728	O	|	|	|	|	3.04
19.917	0.00	0.25	0.726	O	|	|	|	|	3.03
20.000	0.00	0.25	0.725	O	|	|	|	|	3.03
20.083	0.00	0.25	0.723	O	|	|	|	|	3.03
20.167	0.00	0.25	0.721	O	|	|	|	|	3.03
20.250	0.00	0.25	0.719	O	|	|	|	|	3.02
20.333	0.00	0.25	0.718	O	|	|	|	|	3.02
20.417	0.00	0.25	0.716	O	|	|	|	|	3.02
20.500	0.00	0.25	0.714	O	|	|	|	|	3.01
20.583	0.00	0.25	0.712	O	|	|	|	|	3.01
20.667	0.00	0.25	0.711	O	|	|	|	|	3.01
20.750	0.00	0.25	0.709	O	|	|	|	|	3.00
20.833	0.00	0.25	0.707	O	|	|	|	|	3.00
20.917	0.00	0.25	0.705	O	|	|	|	|	3.00
21.000	0.00	0.25	0.704	O	|	|	|	|	2.99
21.083	0.00	0.25	0.702	O	|	|	|	|	2.99
21.167	0.00	0.25	0.700	O	|	|	|	|	2.99
21.250	0.00	0.25	0.699	O	|	|	|	|	2.98
21.333	0.00	0.25	0.697	O	|	|	|	|	2.98
21.417	0.00	0.25	0.695	O	|	|	|	|	2.98
21.500	0.00	0.25	0.693	O	|	|	|	|	2.98
21.583	0.00	0.25	0.692	O	|	|	|	|	2.97
21.667	0.00	0.25	0.690	O	|	|	|	|	2.97
21.750	0.00	0.25	0.688	O	|	|	|	|	2.97
21.833	0.00	0.25	0.686	O	|	|	|	|	2.96
21.917	0.00	0.25	0.685	O	|	|	|	|	2.96
22.000	0.00	0.25	0.683	O	|	|	|	|	2.96
22.083	0.00	0.25	0.681	O	|	|	|	|	2.95

22.167	0.00	0.25	0.680	O	|	|	|	|	2.95
22.250	0.00	0.25	0.678	O	|	|	|	|	2.95
22.333	0.00	0.25	0.676	O	|	|	|	|	2.94
22.417	0.00	0.25	0.674	O	|	|	|	|	2.94
22.500	0.00	0.25	0.673	O	|	|	|	|	2.94
22.583	0.00	0.25	0.671	O	|	|	|	|	2.94
22.667	0.00	0.25	0.669	O	|	|	|	|	2.93
22.750	0.00	0.25	0.668	O	|	|	|	|	2.93
22.833	0.00	0.25	0.666	O	|	|	|	|	2.93
22.917	0.00	0.25	0.664	O	|	|	|	|	2.92
23.000	0.00	0.25	0.662	O	|	|	|	|	2.92
23.083	0.00	0.25	0.661	O	|	|	|	|	2.92
23.167	0.00	0.25	0.659	O	|	|	|	|	2.91
23.250	0.00	0.25	0.657	O	|	|	|	|	2.91
23.333	0.00	0.25	0.656	O	|	|	|	|	2.91
23.417	0.00	0.25	0.654	O	|	|	|	|	2.90
23.500	0.00	0.25	0.652	O	|	|	|	|	2.90
23.583	0.00	0.25	0.650	O	|	|	|	|	2.90
23.667	0.00	0.25	0.649	O	|	|	|	|	2.90
23.750	0.00	0.25	0.647	O	|	|	|	|	2.89
23.833	0.00	0.25	0.645	O	|	|	|	|	2.89
23.917	0.00	0.25	0.644	O	|	|	|	|	2.89
24.000	0.00	0.25	0.642	O	|	|	|	|	2.88
24.083	0.00	0.25	0.640	O	|	|	|	|	2.88
24.167	0.00	0.25	0.639	O	|	|	|	|	2.88
24.250	0.00	0.25	0.637	O	|	|	|	|	2.87
24.333	0.00	0.25	0.635	O	|	|	|	|	2.87
24.417	0.00	0.25	0.633	O	|	|	|	|	2.87
24.500	0.00	0.25	0.632	O	|	|	|	|	2.86
24.583	0.00	0.25	0.630	O	|	|	|	|	2.86
24.667	0.00	0.25	0.628	O	|	|	|	|	2.86
24.750	0.00	0.25	0.627	O	|	|	|	|	2.86
24.833	0.00	0.25	0.625	O	|	|	|	|	2.85
24.917	0.00	0.25	0.623	O	|	|	|	|	2.85
25.000	0.00	0.25	0.622	O	|	|	|	|	2.85
25.083	0.00	0.25	0.620	O	|	|	|	|	2.84
25.167	0.00	0.25	0.618	O	|	|	|	|	2.84
25.250	0.00	0.25	0.617	O	|	|	|	|	2.84
25.333	0.00	0.24	0.615	O	|	|	|	|	2.83
25.417	0.00	0.24	0.613	O	|	|	|	|	2.83
25.500	0.00	0.24	0.611	O	|	|	|	|	2.83
25.583	0.00	0.24	0.610	O	|	|	|	|	2.83
25.667	0.00	0.24	0.608	O	|	|	|	|	2.82
25.750	0.00	0.24	0.606	O	|	|	|	|	2.82
25.833	0.00	0.24	0.605	O	|	|	|	|	2.82
25.917	0.00	0.24	0.603	O	|	|	|	|	2.81
26.000	0.00	0.24	0.601	O	|	|	|	|	2.81
26.083	0.00	0.24	0.600	O	|	|	|	|	2.81
26.167	0.00	0.24	0.598	O	|	|	|	|	2.80
26.250	0.00	0.24	0.596	O	|	|	|	|	2.80
26.333	0.00	0.24	0.595	O	|	|	|	|	2.80
26.417	0.00	0.24	0.593	O	|	|	|	|	2.79
26.500	0.00	0.24	0.591	O	|	|	|	|	2.79
26.583	0.00	0.24	0.590	O	|	|	|	|	2.79
26.667	0.00	0.24	0.588	O	|	|	|	|	2.79
26.750	0.00	0.24	0.586	O	|	|	|	|	2.78

26.833	0.00	0.24	0.585	O	|	|	|	|	2.78
26.917	0.00	0.24	0.583	O	|	|	|	|	2.78
27.000	0.00	0.24	0.581	O	|	|	|	|	2.77
27.083	0.00	0.24	0.580	O	|	|	|	|	2.77
27.167	0.00	0.24	0.578	O	|	|	|	|	2.77
27.250	0.00	0.24	0.576	O	|	|	|	|	2.76
27.333	0.00	0.24	0.575	O	|	|	|	|	2.76
27.417	0.00	0.24	0.573	O	|	|	|	|	2.76
27.500	0.00	0.24	0.571	O	|	|	|	|	2.76
27.583	0.00	0.24	0.570	O	|	|	|	|	2.75
27.667	0.00	0.24	0.568	O	|	|	|	|	2.75
27.750	0.00	0.24	0.566	O	|	|	|	|	2.75
27.833	0.00	0.24	0.565	O	|	|	|	|	2.74
27.917	0.00	0.24	0.563	O	|	|	|	|	2.74
28.000	0.00	0.24	0.561	O	|	|	|	|	2.74
28.083	0.00	0.24	0.560	O	|	|	|	|	2.73
28.167	0.00	0.24	0.558	O	|	|	|	|	2.73
28.250	0.00	0.24	0.556	O	|	|	|	|	2.73
28.333	0.00	0.24	0.555	O	|	|	|	|	2.73
28.417	0.00	0.24	0.553	O	|	|	|	|	2.72
28.500	0.00	0.24	0.551	O	|	|	|	|	2.72
28.583	0.00	0.24	0.550	O	|	|	|	|	2.72
28.667	0.00	0.24	0.548	O	|	|	|	|	2.71
28.750	0.00	0.24	0.546	O	|	|	|	|	2.71
28.833	0.00	0.24	0.545	O	|	|	|	|	2.71
28.917	0.00	0.24	0.543	O	|	|	|	|	2.71
29.000	0.00	0.24	0.541	O	|	|	|	|	2.70
29.083	0.00	0.24	0.540	O	|	|	|	|	2.70
29.167	0.00	0.24	0.538	O	|	|	|	|	2.70
29.250	0.00	0.24	0.536	O	|	|	|	|	2.69
29.333	0.00	0.24	0.535	O	|	|	|	|	2.69
29.417	0.00	0.24	0.533	O	|	|	|	|	2.69
29.500	0.00	0.24	0.532	O	|	|	|	|	2.68
29.583	0.00	0.24	0.530	O	|	|	|	|	2.68
29.667	0.00	0.24	0.528	O	|	|	|	|	2.68
29.750	0.00	0.24	0.527	O	|	|	|	|	2.68
29.833	0.00	0.24	0.525	O	|	|	|	|	2.67
29.917	0.00	0.24	0.523	O	|	|	|	|	2.67
30.000	0.00	0.24	0.522	O	|	|	|	|	2.67
30.083	0.00	0.24	0.520	O	|	|	|	|	2.66
30.167	0.00	0.24	0.518	O	|	|	|	|	2.66
30.250	0.00	0.24	0.517	O	|	|	|	|	2.66
30.333	0.00	0.24	0.515	O	|	|	|	|	2.65
30.417	0.00	0.24	0.514	O	|	|	|	|	2.65
30.500	0.00	0.24	0.512	O	|	|	|	|	2.65
30.583	0.00	0.24	0.510	O	|	|	|	|	2.65
30.667	0.00	0.24	0.509	O	|	|	|	|	2.64
30.750	0.00	0.24	0.507	O	|	|	|	|	2.64
30.833	0.00	0.24	0.505	O	|	|	|	|	2.64
30.917	0.00	0.24	0.504	O	|	|	|	|	2.63
31.000	0.00	0.24	0.502	O	|	|	|	|	2.63
31.083	0.00	0.24	0.500	O	|	|	|	|	2.63
31.167	0.00	0.24	0.499	O	|	|	|	|	2.63
31.250	0.00	0.24	0.497	O	|	|	|	|	2.62
31.333	0.00	0.24	0.496	O	|	|	|	|	2.62
31.417	0.00	0.24	0.494	O	|	|	|	|	2.62

31.500	0.00	0.24	0.492	O	|	|	|	|	2.61
31.583	0.00	0.24	0.491	O	|	|	|	|	2.61
31.667	0.00	0.24	0.489	O	|	|	|	|	2.61
31.750	0.00	0.24	0.488	O	|	|	|	|	2.61
31.833	0.00	0.24	0.486	O	|	|	|	|	2.60
31.917	0.00	0.23	0.484	O	|	|	|	|	2.60
32.000	0.00	0.23	0.483	O	|	|	|	|	2.60
32.083	0.00	0.23	0.481	O	|	|	|	|	2.59
32.167	0.00	0.23	0.479	O	|	|	|	|	2.59
32.250	0.00	0.23	0.478	O	|	|	|	|	2.59
32.333	0.00	0.23	0.476	O	|	|	|	|	2.58
32.417	0.00	0.23	0.475	O	|	|	|	|	2.58
32.500	0.00	0.23	0.473	O	|	|	|	|	2.58
32.583	0.00	0.23	0.471	O	|	|	|	|	2.58
32.667	0.00	0.23	0.470	O	|	|	|	|	2.57
32.750	0.00	0.23	0.468	O	|	|	|	|	2.57
32.833	0.00	0.23	0.467	O	|	|	|	|	2.57
32.917	0.00	0.23	0.465	O	|	|	|	|	2.56
33.000	0.00	0.23	0.463	O	|	|	|	|	2.56
33.083	0.00	0.23	0.462	O	|	|	|	|	2.56
33.167	0.00	0.23	0.460	O	|	|	|	|	2.56
33.250	0.00	0.23	0.458	O	|	|	|	|	2.55
33.333	0.00	0.23	0.457	O	|	|	|	|	2.55
33.417	0.00	0.23	0.455	O	|	|	|	|	2.55
33.500	0.00	0.23	0.454	O	|	|	|	|	2.54
33.583	0.00	0.23	0.452	O	|	|	|	|	2.54
33.667	0.00	0.23	0.450	O	|	|	|	|	2.54
33.750	0.00	0.23	0.449	O	|	|	|	|	2.54
33.833	0.00	0.23	0.447	O	|	|	|	|	2.53
33.917	0.00	0.23	0.446	O	|	|	|	|	2.53
34.000	0.00	0.23	0.444	O	|	|	|	|	2.53
34.083	0.00	0.23	0.442	O	|	|	|	|	2.52
34.167	0.00	0.23	0.441	O	|	|	|	|	2.52
34.250	0.00	0.23	0.439	O	|	|	|	|	2.52
34.333	0.00	0.23	0.438	O	|	|	|	|	2.52
34.417	0.00	0.23	0.436	O	|	|	|	|	2.51
34.500	0.00	0.23	0.435	O	|	|	|	|	2.51
34.583	0.00	0.23	0.433	O	|	|	|	|	2.51
34.667	0.00	0.23	0.431	O	|	|	|	|	2.50
34.750	0.00	0.23	0.430	O	|	|	|	|	2.50
34.833	0.00	0.23	0.428	O	|	|	|	|	2.50
34.917	0.00	0.23	0.427	O	|	|	|	|	2.50
35.000	0.00	0.23	0.425	O	|	|	|	|	2.49
35.083	0.00	0.23	0.423	O	|	|	|	|	2.49
35.167	0.00	0.23	0.422	O	|	|	|	|	2.49
35.250	0.00	0.23	0.420	O	|	|	|	|	2.48
35.333	0.00	0.23	0.419	O	|	|	|	|	2.48
35.417	0.00	0.23	0.417	O	|	|	|	|	2.48
35.500	0.00	0.23	0.415	O	|	|	|	|	2.48
35.583	0.00	0.23	0.414	O	|	|	|	|	2.47
35.667	0.00	0.23	0.412	O	|	|	|	|	2.47
35.750	0.00	0.23	0.411	O	|	|	|	|	2.47
35.833	0.00	0.23	0.409	O	|	|	|	|	2.46
35.917	0.00	0.23	0.408	O	|	|	|	|	2.46
36.000	0.00	0.23	0.406	O	|	|	|	|	2.46
36.083	0.00	0.23	0.404	O	|	|	|	|	2.46

36.167	0.00	0.23	0.403	O	|	|	|	|	2.45
36.250	0.00	0.23	0.401	O	|	|	|	|	2.45
36.333	0.00	0.23	0.400	O	|	|	|	|	2.45
36.417	0.00	0.23	0.398	O	|	|	|	|	2.44
36.500	0.00	0.23	0.397	O	|	|	|	|	2.44
36.583	0.00	0.23	0.395	O	|	|	|	|	2.44
36.667	0.00	0.23	0.393	O	|	|	|	|	2.44
36.750	0.00	0.23	0.392	O	|	|	|	|	2.43
36.833	0.00	0.23	0.390	O	|	|	|	|	2.43
36.917	0.00	0.23	0.389	O	|	|	|	|	2.43
37.000	0.00	0.23	0.387	O	|	|	|	|	2.42
37.083	0.00	0.23	0.386	O	|	|	|	|	2.42
37.167	0.00	0.23	0.384	O	|	|	|	|	2.42
37.250	0.00	0.23	0.382	O	|	|	|	|	2.42
37.333	0.00	0.23	0.381	O	|	|	|	|	2.41
37.417	0.00	0.23	0.379	O	|	|	|	|	2.41
37.500	0.00	0.23	0.378	O	|	|	|	|	2.41
37.583	0.00	0.23	0.376	O	|	|	|	|	2.40
37.667	0.00	0.23	0.375	O	|	|	|	|	2.40
37.750	0.00	0.23	0.373	O	|	|	|	|	2.40
37.833	0.00	0.23	0.372	O	|	|	|	|	2.40
37.917	0.00	0.23	0.370	O	|	|	|	|	2.39
38.000	0.00	0.23	0.368	O	|	|	|	|	2.39
38.083	0.00	0.23	0.367	O	|	|	|	|	2.39
38.167	0.00	0.23	0.365	O	|	|	|	|	2.39
38.250	0.00	0.23	0.364	O	|	|	|	|	2.38
38.333	0.00	0.23	0.362	O	|	|	|	|	2.38
38.417	0.00	0.23	0.361	O	|	|	|	|	2.38
38.500	0.00	0.22	0.359	O	|	|	|	|	2.37
38.583	0.00	0.22	0.358	O	|	|	|	|	2.37
38.667	0.00	0.22	0.356	O	|	|	|	|	2.37
38.750	0.00	0.22	0.354	O	|	|	|	|	2.37
38.833	0.00	0.22	0.353	O	|	|	|	|	2.36
38.917	0.00	0.22	0.351	O	|	|	|	|	2.36
39.000	0.00	0.22	0.350	O	|	|	|	|	2.36
39.083	0.00	0.22	0.348	O	|	|	|	|	2.35
39.167	0.00	0.22	0.347	O	|	|	|	|	2.35
39.250	0.00	0.22	0.345	O	|	|	|	|	2.35
39.333	0.00	0.22	0.344	O	|	|	|	|	2.35
39.417	0.00	0.22	0.342	O	|	|	|	|	2.34
39.500	0.00	0.22	0.341	O	|	|	|	|	2.34
39.583	0.00	0.22	0.339	O	|	|	|	|	2.34
39.667	0.00	0.22	0.338	O	|	|	|	|	2.33
39.750	0.00	0.22	0.336	O	|	|	|	|	2.33
39.833	0.00	0.22	0.334	O	|	|	|	|	2.33
39.917	0.00	0.22	0.333	O	|	|	|	|	2.33
40.000	0.00	0.22	0.331	O	|	|	|	|	2.32
40.083	0.00	0.22	0.330	O	|	|	|	|	2.32
40.167	0.00	0.22	0.328	O	|	|	|	|	2.32
40.250	0.00	0.22	0.327	O	|	|	|	|	2.32
40.333	0.00	0.22	0.325	O	|	|	|	|	2.31
40.417	0.00	0.22	0.324	O	|	|	|	|	2.31
40.500	0.00	0.22	0.322	O	|	|	|	|	2.31
40.583	0.00	0.22	0.321	O	|	|	|	|	2.30
40.667	0.00	0.22	0.319	O	|	|	|	|	2.30
40.750	0.00	0.22	0.318	O	|	|	|	|	2.30

40.833	0.00	0.22	0.316	O	|	|	|	|	2.30
40.917	0.00	0.22	0.315	O	|	|	|	|	2.29
41.000	0.00	0.22	0.313	O	|	|	|	|	2.29
41.083	0.00	0.22	0.312	O	|	|	|	|	2.29
41.167	0.00	0.22	0.310	O	|	|	|	|	2.29
41.250	0.00	0.22	0.308	O	|	|	|	|	2.28
41.333	0.00	0.22	0.307	O	|	|	|	|	2.28
41.417	0.00	0.22	0.305	O	|	|	|	|	2.28
41.500	0.00	0.22	0.304	O	|	|	|	|	2.27
41.583	0.00	0.22	0.302	O	|	|	|	|	2.27
41.667	0.00	0.22	0.301	O	|	|	|	|	2.27
41.750	0.00	0.22	0.299	O	|	|	|	|	2.27
41.833	0.00	0.22	0.298	O	|	|	|	|	2.26
41.917	0.00	0.22	0.296	O	|	|	|	|	2.26
42.000	0.00	0.22	0.295	O	|	|	|	|	2.26
42.083	0.00	0.22	0.293	O	|	|	|	|	2.26
42.167	0.00	0.22	0.292	O	|	|	|	|	2.25
42.250	0.00	0.22	0.290	O	|	|	|	|	2.25
42.333	0.00	0.22	0.289	O	|	|	|	|	2.25
42.417	0.00	0.22	0.287	O	|	|	|	|	2.24
42.500	0.00	0.22	0.286	O	|	|	|	|	2.24
42.583	0.00	0.22	0.284	O	|	|	|	|	2.24
42.667	0.00	0.22	0.283	O	|	|	|	|	2.24
42.750	0.00	0.22	0.281	O	|	|	|	|	2.23
42.833	0.00	0.22	0.280	O	|	|	|	|	2.23
42.917	0.00	0.22	0.278	O	|	|	|	|	2.23
43.000	0.00	0.22	0.277	O	|	|	|	|	2.23
43.083	0.00	0.22	0.275	O	|	|	|	|	2.22
43.167	0.00	0.22	0.274	O	|	|	|	|	2.22
43.250	0.00	0.22	0.272	O	|	|	|	|	2.22
43.333	0.00	0.22	0.271	O	|	|	|	|	2.21
43.417	0.00	0.22	0.269	O	|	|	|	|	2.21
43.500	0.00	0.22	0.268	O	|	|	|	|	2.21
43.583	0.00	0.22	0.266	O	|	|	|	|	2.21
43.667	0.00	0.22	0.265	O	|	|	|	|	2.20
43.750	0.00	0.22	0.263	O	|	|	|	|	2.20
43.833	0.00	0.22	0.262	O	|	|	|	|	2.20
43.917	0.00	0.22	0.260	O	|	|	|	|	2.20
44.000	0.00	0.22	0.259	O	|	|	|	|	2.19
44.083	0.00	0.22	0.257	O	|	|	|	|	2.19
44.167	0.00	0.22	0.256	O	|	|	|	|	2.19
44.250	0.00	0.22	0.254	O	|	|	|	|	2.18
44.333	0.00	0.22	0.253	O	|	|	|	|	2.18
44.417	0.00	0.22	0.251	O	|	|	|	|	2.18
44.500	0.00	0.22	0.250	O	|	|	|	|	2.18
44.583	0.00	0.22	0.248	O	|	|	|	|	2.17
44.667	0.00	0.22	0.247	O	|	|	|	|	2.17
44.750	0.00	0.22	0.245	O	|	|	|	|	2.17
44.833	0.00	0.22	0.244	O	|	|	|	|	2.17
44.917	0.00	0.22	0.242	O	|	|	|	|	2.16
45.000	0.00	0.21	0.241	O	|	|	|	|	2.16
45.083	0.00	0.21	0.240	O	|	|	|	|	2.16
45.167	0.00	0.21	0.238	O	|	|	|	|	2.16
45.250	0.00	0.21	0.237	O	|	|	|	|	2.15
45.333	0.00	0.21	0.235	O	|	|	|	|	2.15
45.417	0.00	0.21	0.234	O	|	|	|	|	2.15

45.500	0.00	0.21	0.232	O	|	|	|	|	2.14
45.583	0.00	0.21	0.231	O	|	|	|	|	2.14
45.667	0.00	0.21	0.229	O	|	|	|	|	2.14
45.750	0.00	0.21	0.228	O	|	|	|	|	2.14
45.833	0.00	0.21	0.226	O	|	|	|	|	2.13
45.917	0.00	0.21	0.225	O	|	|	|	|	2.13
46.000	0.00	0.21	0.223	O	|	|	|	|	2.13
46.083	0.00	0.21	0.222	O	|	|	|	|	2.13
46.167	0.00	0.21	0.220	O	|	|	|	|	2.12
46.250	0.00	0.21	0.219	O	|	|	|	|	2.12
46.333	0.00	0.21	0.217	O	|	|	|	|	2.12
46.417	0.00	0.21	0.216	O	|	|	|	|	2.12
46.500	0.00	0.21	0.215	O	|	|	|	|	2.11
46.583	0.00	0.21	0.213	O	|	|	|	|	2.11
46.667	0.00	0.21	0.212	O	|	|	|	|	2.11
46.750	0.00	0.21	0.210	O	|	|	|	|	2.10
46.833	0.00	0.21	0.209	O	|	|	|	|	2.10
46.917	0.00	0.21	0.207	O	|	|	|	|	2.10
47.000	0.00	0.21	0.206	O	|	|	|	|	2.10
47.083	0.00	0.21	0.204	O	|	|	|	|	2.09
47.167	0.00	0.21	0.203	O	|	|	|	|	2.09
47.250	0.00	0.21	0.201	O	|	|	|	|	2.09
47.333	0.00	0.21	0.200	O	|	|	|	|	2.09
47.417	0.00	0.21	0.198	O	|	|	|	|	2.08
47.500	0.00	0.21	0.197	O	|	|	|	|	2.08
47.583	0.00	0.21	0.196	O	|	|	|	|	2.08
47.667	0.00	0.21	0.194	O	|	|	|	|	2.08
47.750	0.00	0.21	0.193	O	|	|	|	|	2.07
47.833	0.00	0.21	0.191	O	|	|	|	|	2.07
47.917	0.00	0.21	0.190	O	|	|	|	|	2.07
48.000	0.00	0.21	0.188	O	|	|	|	|	2.07
48.083	0.00	0.21	0.187	O	|	|	|	|	2.06
48.167	0.00	0.21	0.185	O	|	|	|	|	2.06
48.250	0.00	0.21	0.184	O	|	|	|	|	2.06
48.333	0.00	0.21	0.182	O	|	|	|	|	2.06
48.417	0.00	0.21	0.181	O	|	|	|	|	2.05
48.500	0.00	0.21	0.180	O	|	|	|	|	2.05
48.583	0.00	0.21	0.178	O	|	|	|	|	2.05
48.667	0.00	0.21	0.177	O	|	|	|	|	2.04
48.750	0.00	0.21	0.175	O	|	|	|	|	2.04
48.833	0.00	0.21	0.174	O	|	|	|	|	2.04
48.917	0.00	0.21	0.172	O	|	|	|	|	2.04
49.000	0.00	0.21	0.171	O	|	|	|	|	2.03
49.083	0.00	0.21	0.170	O	|	|	|	|	2.03
49.167	0.00	0.21	0.168	O	|	|	|	|	2.03
49.250	0.00	0.21	0.167	O	|	|	|	|	2.03
49.333	0.00	0.21	0.165	O	|	|	|	|	2.02
49.417	0.00	0.21	0.164	O	|	|	|	|	2.02
49.500	0.00	0.21	0.162	O	|	|	|	|	2.02
49.583	0.00	0.21	0.161	O	|	|	|	|	2.02
49.667	0.00	0.21	0.159	O	|	|	|	|	2.01
49.750	0.00	0.21	0.158	O	|	|	|	|	2.01
49.833	0.00	0.21	0.157	O	|	|	|	|	2.01
49.917	0.00	0.21	0.155	O	|	|	|	|	2.01
50.000	0.00	0.21	0.154	O	|	|	|	|	2.00
50.083	0.00	0.21	0.152	O	|	|	|	|	2.00

50.167	0.00	0.21	0.151	O	|	|	|	|	1.99
50.250	0.00	0.21	0.149	O	|	|	|	|	1.97
50.333	0.00	0.20	0.148	O	|	|	|	|	1.95
50.417	0.00	0.20	0.147	O	|	|	|	|	1.93
50.500	0.00	0.20	0.145	O	|	|	|	|	1.91
50.583	0.00	0.20	0.144	O	|	|	|	|	1.89
50.667	0.00	0.20	0.142	O	|	|	|	|	1.87
50.750	0.00	0.20	0.141	O	|	|	|	|	1.86
50.833	0.00	0.20	0.140	O	|	|	|	|	1.84
50.917	0.00	0.20	0.138	O	|	|	|	|	1.82
51.000	0.00	0.20	0.137	O	|	|	|	|	1.80
51.083	0.00	0.20	0.136	O	|	|	|	|	1.78
51.167	0.00	0.20	0.134	O	|	|	|	|	1.77
51.250	0.00	0.19	0.133	O	|	|	|	|	1.75
51.333	0.00	0.19	0.132	O	|	|	|	|	1.73
51.417	0.00	0.19	0.130	O	|	|	|	|	1.71
51.500	0.00	0.19	0.129	O	|	|	|	|	1.70
51.583	0.00	0.19	0.128	O	|	|	|	|	1.68
51.667	0.00	0.19	0.126	O	|	|	|	|	1.66
51.750	0.00	0.19	0.125	O	|	|	|	|	1.65
51.833	0.00	0.19	0.124	O	|	|	|	|	1.63
51.917	0.00	0.19	0.122	O	|	|	|	|	1.61
52.000	0.00	0.19	0.121	O	|	|	|	|	1.59
52.083	0.00	0.19	0.120	O	|	|	|	|	1.58
52.167	0.00	0.18	0.119	O	|	|	|	|	1.56
52.250	0.00	0.18	0.117	O	|	|	|	|	1.54
52.333	0.00	0.18	0.116	O	|	|	|	|	1.53
52.417	0.00	0.18	0.115	O	|	|	|	|	1.51
52.500	0.00	0.18	0.114	O	|	|	|	|	1.49
52.583	0.00	0.18	0.112	O	|	|	|	|	1.48
52.667	0.00	0.18	0.111	O	|	|	|	|	1.46
52.750	0.00	0.18	0.110	O	|	|	|	|	1.45
52.833	0.00	0.18	0.109	O	|	|	|	|	1.43
52.917	0.00	0.18	0.107	O	|	|	|	|	1.41
53.000	0.00	0.17	0.106	O	|	|	|	|	1.40
53.083	0.00	0.17	0.105	O	|	|	|	|	1.38
53.167	0.00	0.17	0.104	O	|	|	|	|	1.37
53.250	0.00	0.17	0.103	O	|	|	|	|	1.35
53.333	0.00	0.17	0.101	O	|	|	|	|	1.34
53.417	0.00	0.17	0.100	O	|	|	|	|	1.32
53.500	0.00	0.17	0.099	O	|	|	|	|	1.30
53.583	0.00	0.17	0.098	O	|	|	|	|	1.29
53.667	0.00	0.17	0.097	O	|	|	|	|	1.27
53.750	0.00	0.17	0.096	O	|	|	|	|	1.26
53.833	0.00	0.17	0.095	O	|	|	|	|	1.24
53.917	0.00	0.16	0.093	O	|	|	|	|	1.23
54.000	0.00	0.16	0.092	O	|	|	|	|	1.21
54.083	0.00	0.16	0.091	O	|	|	|	|	1.20
54.167	0.00	0.16	0.090	O	|	|	|	|	1.18
54.250	0.00	0.16	0.089	O	|	|	|	|	1.17
54.333	0.00	0.16	0.088	O	|	|	|	|	1.16
54.417	0.00	0.16	0.087	O	|	|	|	|	1.14
54.500	0.00	0.16	0.086	O	|	|	|	|	1.13
54.583	0.00	0.16	0.085	O	|	|	|	|	1.11
54.667	0.00	0.16	0.083	O	|	|	|	|	1.10
54.750	0.00	0.16	0.082	O	|	|	|	|	1.08

54.833	0.00	0.15	0.081	O	|	|	|	|	1.07
54.917	0.00	0.15	0.080	O	|	|	|	|	1.06
55.000	0.00	0.15	0.079	O	|	|	|	|	1.04
55.083	0.00	0.15	0.078	O	|	|	|	|	1.03
55.167	0.00	0.15	0.077	O	|	|	|	|	1.01
55.250	0.00	0.15	0.076	O	|	|	|	|	1.00
55.333	0.00	0.15	0.075	O	|	|	|	|	0.99
55.417	0.00	0.15	0.074	O	|	|	|	|	0.97
55.500	0.00	0.15	0.073	O	|	|	|	|	0.96
55.583	0.00	0.15	0.072	O	|	|	|	|	0.95
55.667	0.00	0.14	0.071	O	|	|	|	|	0.93
55.750	0.00	0.14	0.070	O	|	|	|	|	0.92
55.833	0.00	0.14	0.069	O	|	|	|	|	0.91
55.917	0.00	0.14	0.068	O	|	|	|	|	0.90
56.000	0.00	0.14	0.067	O	|	|	|	|	0.88
56.083	0.00	0.14	0.066	O	|	|	|	|	0.87
56.167	0.00	0.14	0.065	O	|	|	|	|	0.86
56.250	0.00	0.14	0.064	O	|	|	|	|	0.84
56.333	0.00	0.14	0.063	O	|	|	|	|	0.83
56.417	0.00	0.14	0.062	O	|	|	|	|	0.82
56.500	0.00	0.14	0.061	O	|	|	|	|	0.81
56.583	0.00	0.13	0.060	O	|	|	|	|	0.80
56.667	0.00	0.13	0.060	O	|	|	|	|	0.78
56.750	0.00	0.13	0.059	O	|	|	|	|	0.77
56.833	0.00	0.13	0.058	O	|	|	|	|	0.76
56.917	0.00	0.13	0.057	O	|	|	|	|	0.75
57.000	0.00	0.13	0.056	O	|	|	|	|	0.74
57.083	0.00	0.13	0.055	O	|	|	|	|	0.72
57.167	0.00	0.13	0.054	O	|	|	|	|	0.71
57.250	0.00	0.13	0.053	O	|	|	|	|	0.70
57.333	0.00	0.13	0.052	O	|	|	|	|	0.69
57.417	0.00	0.12	0.052	O	|	|	|	|	0.68
57.500	0.00	0.12	0.051	O	|	|	|	|	0.67
57.583	0.00	0.12	0.050	O	|	|	|	|	0.66
57.667	0.00	0.12	0.049	O	|	|	|	|	0.64
57.750	0.00	0.12	0.048	O	|	|	|	|	0.63
57.833	0.00	0.12	0.047	O	|	|	|	|	0.62
57.917	0.00	0.12	0.046	O	|	|	|	|	0.61
58.000	0.00	0.12	0.046	O	|	|	|	|	0.60
58.083	0.00	0.12	0.045	O	|	|	|	|	0.59
58.167	0.00	0.12	0.044	O	|	|	|	|	0.58
58.250	0.00	0.12	0.043	O	|	|	|	|	0.57
58.333	0.00	0.12	0.042	O	|	|	|	|	0.56
58.417	0.00	0.11	0.042	O	|	|	|	|	0.55
58.500	0.00	0.11	0.041	O	|	|	|	|	0.54
58.583	0.00	0.11	0.040	O	|	|	|	|	0.53
58.667	0.00	0.11	0.039	O	|	|	|	|	0.52
58.750	0.00	0.11	0.039	O	|	|	|	|	0.51
58.833	0.00	0.11	0.038	O	|	|	|	|	0.50
58.917	0.00	0.11	0.037	O	|	|	|	|	0.49
59.000	0.00	0.11	0.036	O	|	|	|	|	0.48
59.083	0.00	0.10	0.036	O	|	|	|	|	0.47
59.167	0.00	0.10	0.035	O	|	|	|	|	0.46
59.250	0.00	0.10	0.034	O	|	|	|	|	0.45

Remaining water in basin = 0.03 (Ac.Ft)

```
****************************HYDROGRAPH DATA****************************
                    Number of intervals =   711
                    Time interval =    5.0 (Min.)
                    Maximum/Peak flow rate =       0.283 (CFS)
                    Total volume =       1.133 (Ac.Ft)
          Status of hydrographs being held in storage
                   Stream 1  Stream 2  Stream 3  Stream 4  Stream 5
          Peak (CFS)      0.000     0.000     0.000     0.000     0.000
          Vol (Ac.Ft)     0.000     0.000     0.000     0.000     0.000
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Appendix B
Stormwater Quality Best Management Practice
Design Handbook

Filter Strip Example

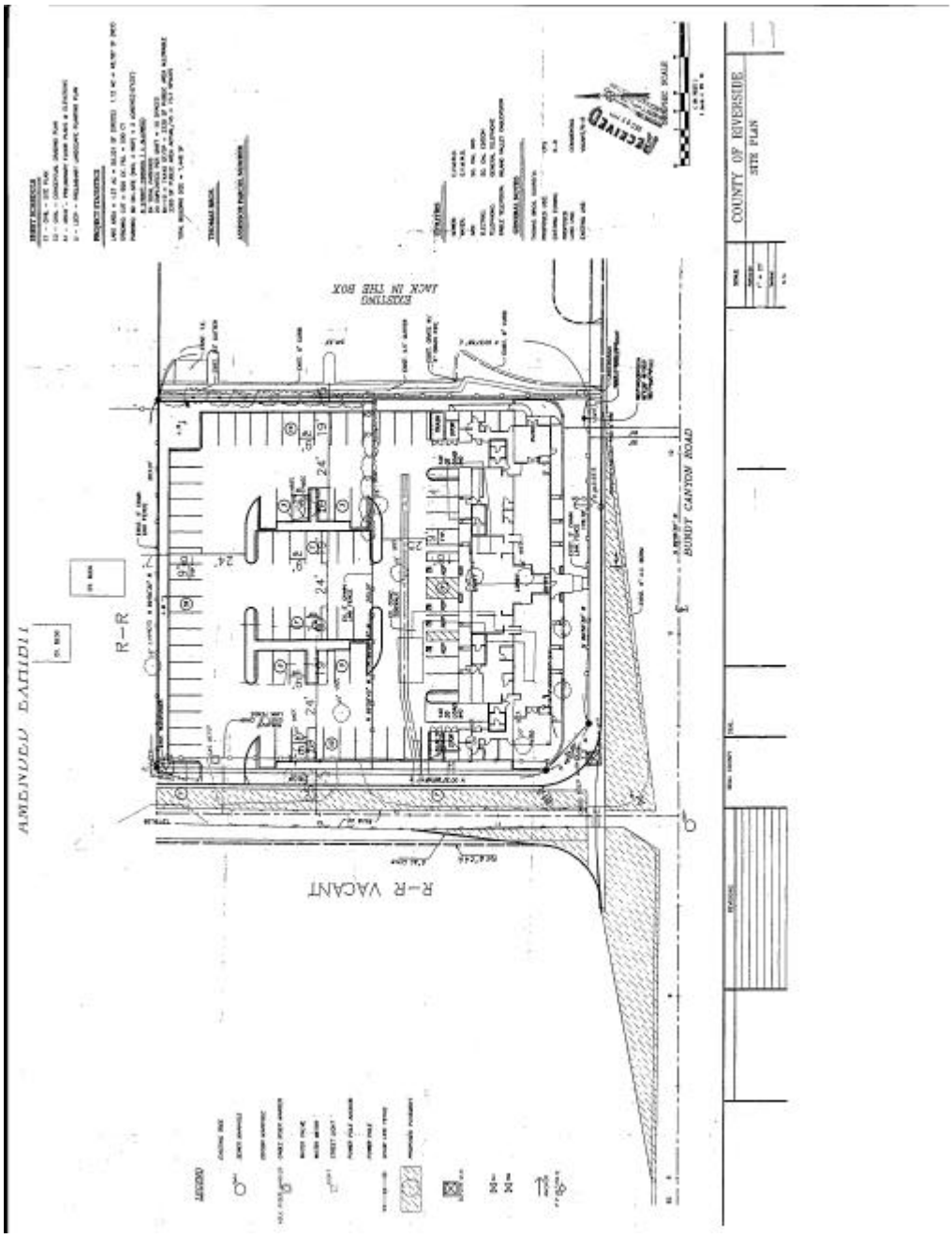
AMBUNDU BAHDIH
R-R
R-R VACANT
BUNDY CANYON ROAD
EXISTING
LACK IN THE BOX
RECEIVED
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Table 4. Runoff Coefficients for an Intensity = 0.2 $^{in}/_{hr}$ for Urban Soil Types*

Impervious %	A Soil RI =32	B Soil RI =56	C Soil RI =69	D Soil RI =75
0 (Natural)	0.06	0.15	0.24	0.31
5	0.10	0.18	0.28	0.35
10	0.15	0.23	0.33	0.40
15	0.19	0.27	0.37	0.44
20 (1-Acre)	0.24	0.29	0.38	0.41
25	0.27	0.35	0.43	0.49
30	0.32	0.38	0.46	0.51
35	0.35	0.41	0.47	0.51
40 (1/2-Acre)	0.40	0.45	0.50	0.53
45	0.44	0.48	0.52	0.55
50 (1/4-Acre)	0.49	0.53	0.55	0.59
55	0.53	0.57	0.58	0.62
60	0.57	0.61	0.62	0.66
65 (Condominiums)	0.61	0.65	0.65	0.77
70	0.65	0.69	0.70	0.76
75 (Mobilehomes)	0.69	0.71	0.73	0.75
80 (Apartments)	0.74	0.75	0.77	0.78
85	0.77	0.78	0.79	0.81
90 (Commercial)	0.82	0.83	0.83	0.84
95	0.86	0.86	0.87	0.88
100	0.90	0.90	0.90	0.90

*Complete District's standards can be found in the Riverside County Flood Control Hydrology Manual

Worksheet 2

Design Procedure Form for Design Flow

Uniform Intensity Design Flow

Designer:	**Benjie Cho**
Company:	**Riverside County Flood Control and Water Conservation District**
Date:	**5/24/04**
Project:	**BMP Example**
Location:	

1. Determine Impervious Percentage				
a. Determine total tributary area	A_{total} =	**1.27**	acres	*(1)*
b. Determine Impervious %	i =	**90**	%	*(2)*
2. Determine Runoff Coefficient Values Use **Table 2** and impervious % found in step 1				
a. A Soil Runoff Coefficient	C_a =	**.82**		*(3)*
b. B Soil Runoff Coefficient	C_b =	**.83**		*(4)*
c. C Soil Runoff Coefficient	C_c =			*(5)*
d. D Soil Runoff Coefficient	C_d =			*(6)*
3. Determine the Area decimal fraction of each soil type in tributary area				
a. Area of A Soil / *(1)* =	A_a =	**0.5**		*(7)*
b. Area of B Soil / *(1)* =	A_b =	**0.5**		*(8)*
c. Area of C Soil / *(1)* =	A_c =			*(9)*
d. Area of D Soil / *(1)* =	A_d =			*(10)*
4. Determine Runoff Coefficient				
a. C = *(3)*x*(7)* + *(4)*x*(8)* + *(5)*x*(9)* + *(6)*x*(10)* =	C =	**.83**		*(11)*
5. Determine BMP Design flow				
a. Q_{BMP} = C x I x A = *(11)* x 0.2 x *(1)*	Q_{BMP} =	**0.21**	$\frac{ft^3}{s}$	*(12)*

Datasheet

Site Conditions:

A_{total} = 1.27 acres (from worksheet 2)
Q_{BMP} = 0.21 cfs (from worksheet 2)

Design Assumptions:

1. **Design Flow**
   Q_{BMP} = 0.211 cfs

2. **Minimum Width**
   Calculate minimum width of the grass strip filter (W_m) normal to flow direction:
   $W_m = (Q_{BMP})/0.005$ cfs/ft (minimum) = 42.2 ft

3. **Minimum Length**
   Length of the grass strip filter (Lm) in the direction of flow shall not be less than 15 feet.
   L_m = 15 feet (minimum)

4. **Slope Requirement**
   Slope = 4%

5. **Flow Distribution**
   Level spreader of similar concept.

6. **Vegetation**
   3” Grass

7. **Outflow Collection**
   Street gutter

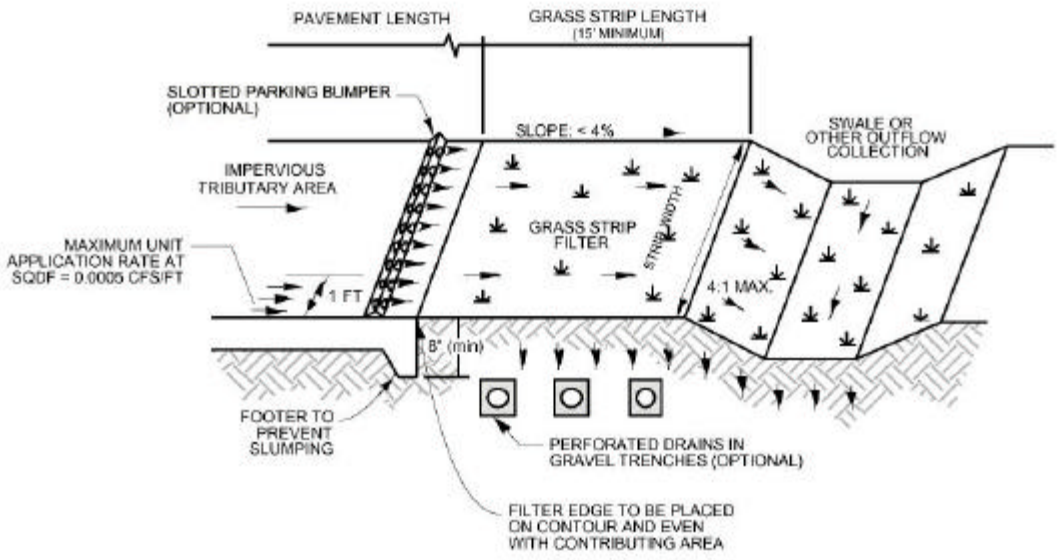

SHEET FLOW CONTROL

NOT TO SCALE

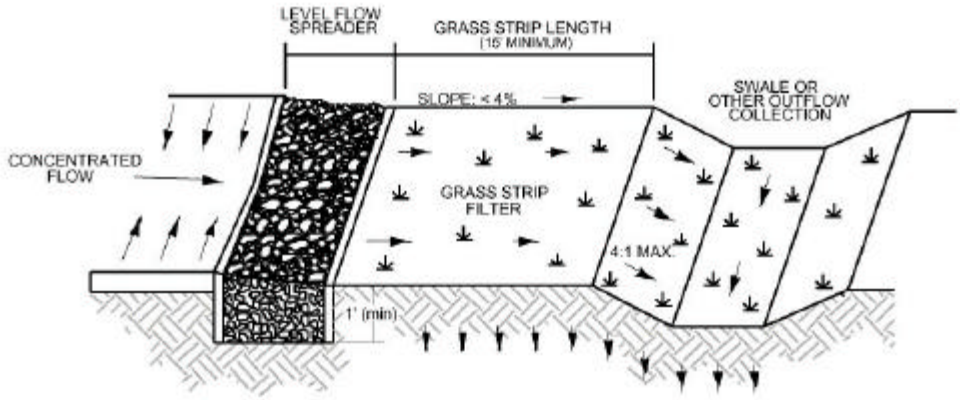

CONCENTRATED FLOW CONTROL

NOT TO SCALE

Figure 12: Grass Filter Strip

Source: Ventura County Guidance Manual

Worksheet 10

Design Procedure Form for Filter Strip

Designer: Benjie Cho
Company: Riverside County Flood Control
Date: 5/20/04
Project: BMP Example
Location: Township 6 South & Range 4 West Section 22

1. Determine Design Flow (Use Worksheet 2)	Q_{BMP} = **.211** cfs
2. Design Width $W_m = (Q_{BMP})/0.005$ cfs/ft	W_m = **42.2** ft
3. Design Length (15 ft minimum)	L_m = 15 ft
4. Design Slope (4 % maximum)	S_D = 4 %
5. Flow Distribution (check type used or describe "other")	___ slotted curbing ___ Modular Block Porous Pavement _X_ Level Spreader ___other_____
6. Vegetation (describe)	3" grass
5. Outflow Collection (check type used or describe "other")	___ Grass Swale _X_ Street Gutter ___ Storm Drain ___ Underdrain ___ Other_____

Notes:

Appendix B
Stormwater Quality Best Management Practice
Design Handbook

Infiltration Basin Example

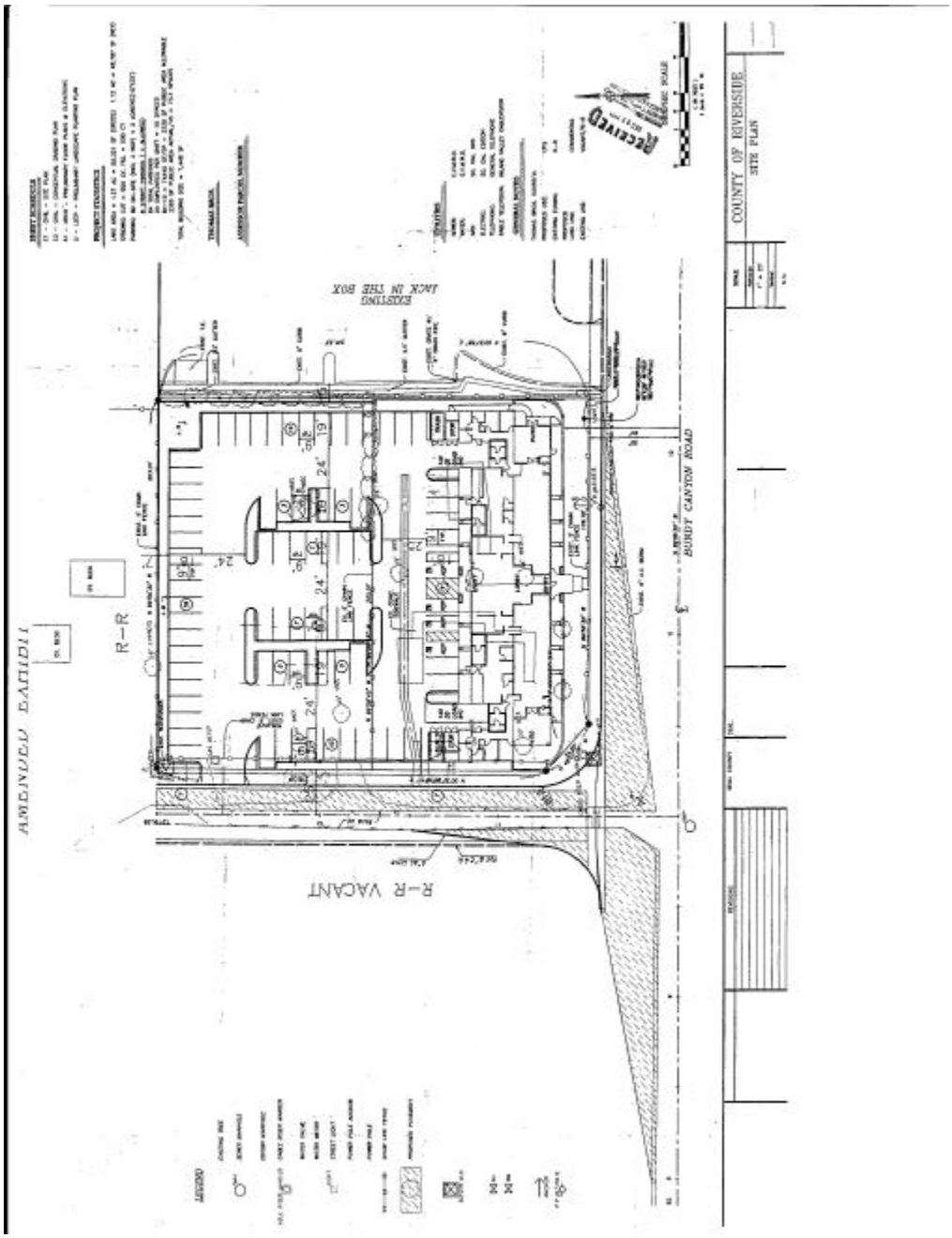
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Worksheet 1

Design Procedure for BMP Design Volume

85th percentile runoff event

Designer:	**Benjie Cho**
Company:	**Riverside County Flood Control and Water Conservation District**
Date:	**3/1/04**
Project:	**BMP Example**
Location:	**Township 6 South & Range 4 West Section 22**

1. Create Unit Storage Volume Graph a. Site location (Township, Range and Section) b. Slope value from the Design Volume Curve in **Appendix A**. c. Plot this value on the Unit Storage Volume Graph shown on **Figure 2**. d. Draw a straight line form this point to the origin, to create the graph	T **6S** &R **4W** Section **22**	*(1)*
	Slope = **1.148**	*(2)*
	Is this graph attached? Yes ☒ No ☐	
2. Determine Runoff Coefficient a. Determine total impervious area	$A_{impervious}$ = **1.143** acres	*(5)*
b. Determine total tributary area	A_{total} = **1.27** acres	*(6)*
c. Determine Impervious fraction i = ***(5)*** / ***(6)***	i = **.90**	*(7)*
d. Use ***(7)*** in **Figure 1** to find Runoff OR $C = .858i^3 - .78i^2 + .774i + .04$	C = **.73**	*(8)*
3. Determine 85% Unit Storage Volume a. Use ***(8)*** in **Figure 1** Draw a Vertical line from ***(8)*** to the graph, then a Horizontal line to the desired V_u value.	V_u = **0.88** in-acre / acre	*(9)*
4. Determine Design Storage Volume a. V_{BMP} = ***(9)*** x ***(6)*** [in- acres]	V_{BMP} = **1.13** in-acre	*(10)*
b. V_{BMP} = ***(10)*** / 12 [ft- acres]	V_{BMP} = **0.0942** ft-acre	*(11)*
c. V_{BMP} = ***(11)*** x 43560 [ft^3]	V_{BMP} = **4103** ft^3	*(12)*

Notes:

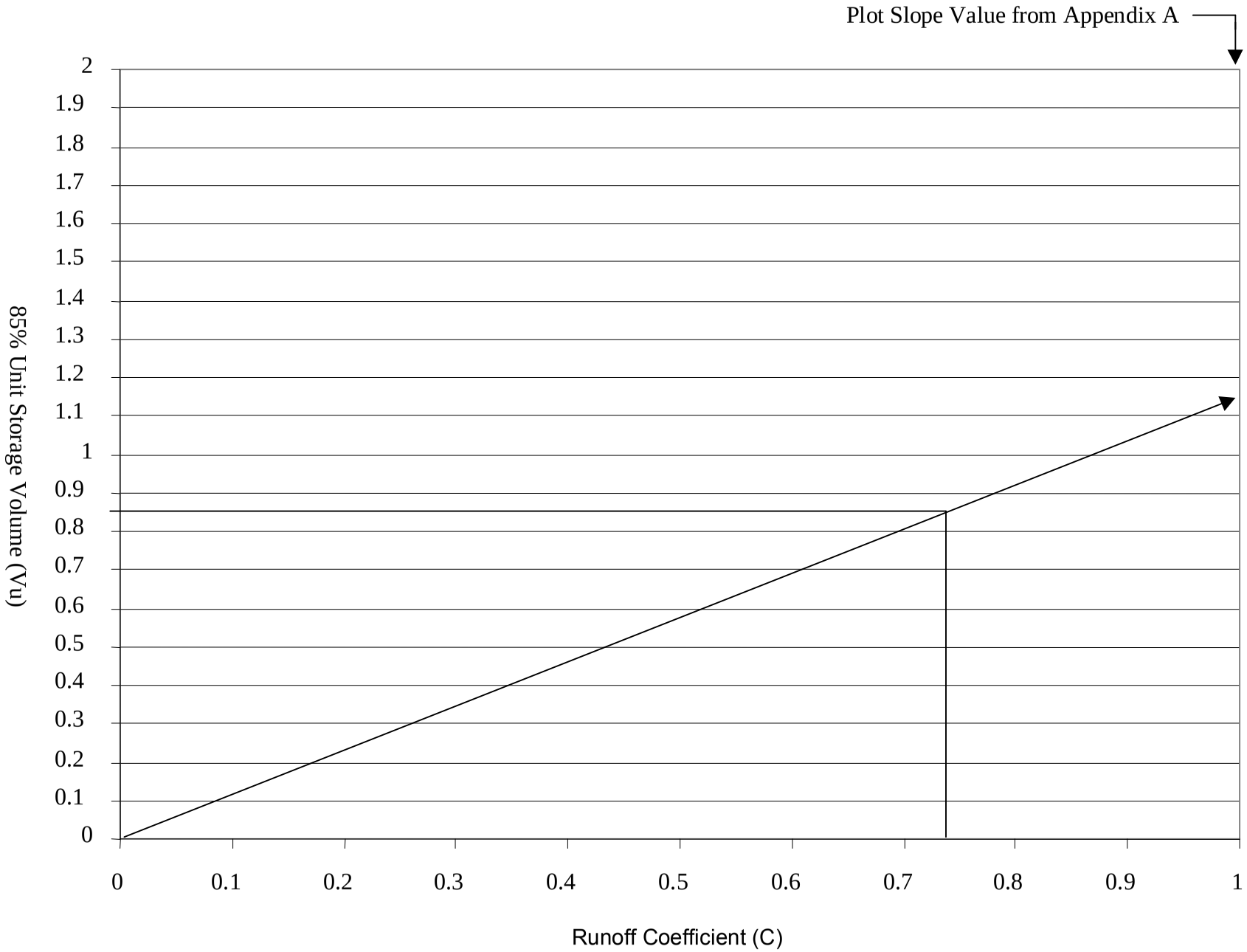

Figure 2 Unit Storage Volume Graph

045670

Datasheet

Site Conditions

A_{total} = 1.27 acres
Land Use = Commercial
Impervious Cover = 90%

Design Assumptions

1. Design Storage Volume

V_{BMP} = 4103 ft^3 (from worksheet 1)

2. Trench Water Depth

Maximum depth should not exceed 8 feet
Calculate the maximum allowable depth of water in the trench, Dm, in feet using the following equation:

$$D_m = [(t) \times (I)] / 12s$$

Where I = site infiltration rate (in/hr)
s = safety factor
t = minimum draw down time (48 hours)

Step#1: For urban cover with B type soil the District uses a RI value of 56
Step#2: Using Plate E-6.2, Fp (infiltration rate) = 0.517 in/hr (for an AMC II)
Step#3: Assuming a safety factor of 3, **D_m = 0.689 feet**

3. Trench Surface Area

Calculate the minimum surface area of the trench bottom will the following equation:

$$A_m = V_{BMP} / D_m$$

A_m = 5952 feet = 0.1366 Acres

Where A_m = minimum area required (ft^2)
V_{BMP} = volume of the infiltration basin (ft^3)
D_m = maximum allowable depth (ft)

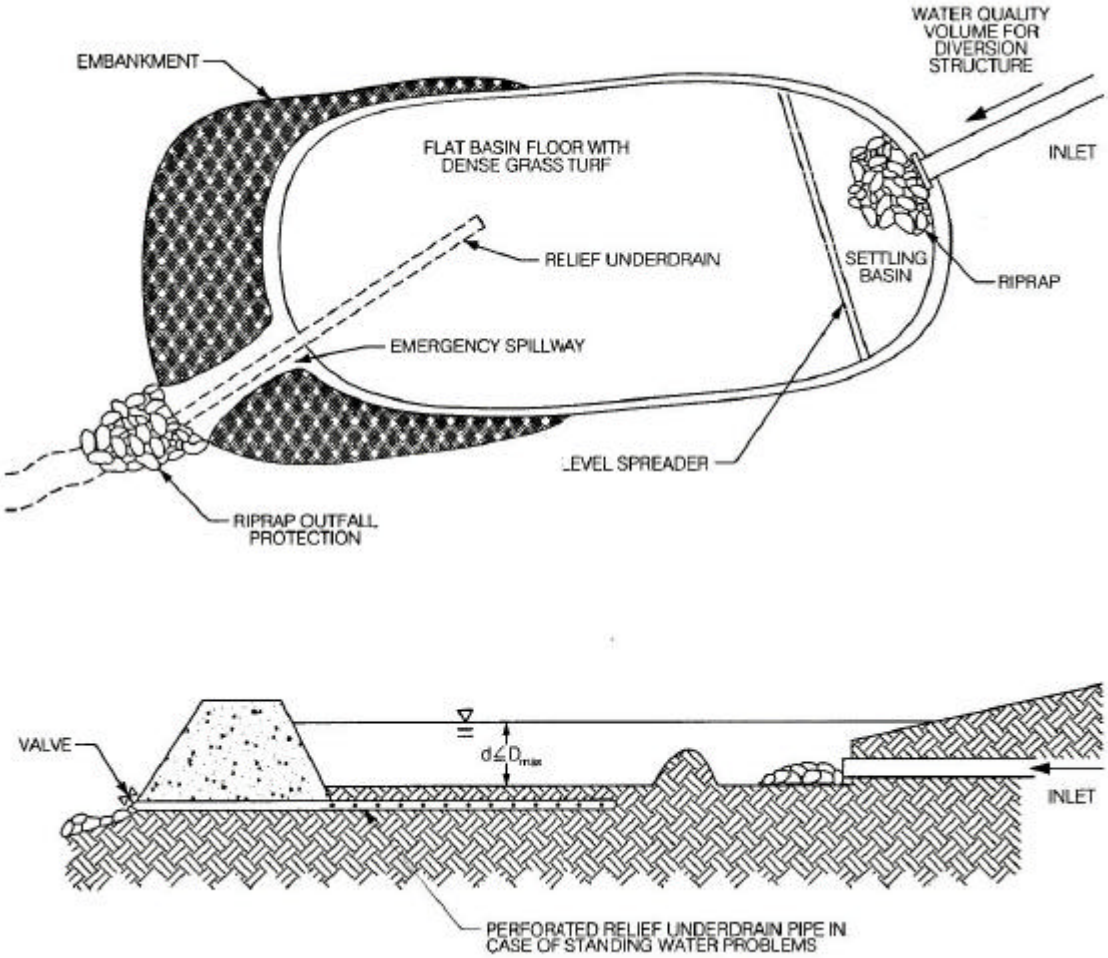

Figure 6: INFILTRATION BASIN

Source: City of Modesto Guidance Manual

Worksheet 4

Design Procedure Form for Infiltration Basin

Designer: Benjie Cho
Company: Riverside County Flood Control
Date: 5/24/04
Project: Example
Location: Township 6 South & Range 4 West Section 22

1. Determine Design Storage Volume (Use Worksheet 1) a. Total Tributary Area (maximum 50) b. Design Storage Volume, V_{BMP}	A_{total} = 1.27 acres V_{BMP} = 4103 ft^3
2. Maximum Allowable Depth (D_m) a. Site infiltration rate (I) b. Minimum drawdown time (48 hrs) c. Safety factor (s) d. D_m = [(t) x (I)]/[12s]	I = 0.517 in/hr t = 48 hrs s = 3 D_m = 0.689 ft
3. Basin Surface Area $A_m = V_{BMP} / D_m$	A_m = 5952 ft^2
4. Vegetation (check type used or describe "other")	____ Native Grasses _X_ Irrigated Turf Grass ____ Other _____ _____

Notes:

Exhibit D

SMR WQMP Applicability Checklist

2014 Santa Margarita Region WQMP – Exhibit D

Checklist for Identifying Projects Requiring a Project-Specific WQMP within the Santa Margarita Region

Project File No.:	
Project Name:	
Project Location:	
Project Description:	

Proposed Project Consists of or Includes:	Yes	No
New Development. The creation of 10,000 square feet or more of impervious surfaces (collectively over the entire project site) including commercial, industrial, residential, mixed-use, and public projects.		
Redevelopment. The creation, addition or replacement of at least 5,000 square feet of impervious surfaces on an already developed site and the existing development and/or the redevelopment project falls under the project categories or locations listed below in this table. Where redevelopment results in an increase of less than 50% of the impervious surfaces of previously existing development, and the existing development was not subject to WQMP requirements, the numeric sizing criteria [MS4 Permit requirement F.1.d. (6)] applies only to the addition or replacement, and not to the entire development. [Note: Where redevelopment results in an increase of more than 50% of the impervious surfaces of a previously existing development, the numeric sizing criteria applies to the entire development.]		
Automotive repair shops. A facility that is categorized in any one of the following Standard Industrial Classification (SIC) Codes 5013–Motor vehicle supplies or parts, 5014–Tires & Tubes, 5541–Gasoline Service Stations, 7532–Top, Body & Upholstery Repair Shops and Paint Shops, 7533–Automotive Exhaust System Repair Shops, 7534–Tire Retreading and Repair Shops, 7536–Automotive Glass Replacement Shops, 7537–Automotive Transmission Repair Shops, 7538–General Automotive Repair Shops, 7539–Automotive Repair Shops, not elsewhere classified)		
Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812), where the land area for development is greater than 5,000 square feet. Restaurants where land development is less than 5,000 square feet must meet all WQMP requirements except for structural treatment BMP and numeric sizing criteria requirement F.1.d.(6) and hydromodification requirement F.1.h.		
All Hillside development greater than 5,000 square feet. Any development that creates greater than 5,000 square feet of impervious surface which is located in an area with known erosive soil conditions, where the development will include grading on any natural slope that is 25% or greater.		
Environmentally Sensitive Areas (ESAs)[1]. All development located within or directly adjacent to or discharging directly to an ESA (where discharges from the development or redevelopment will enter receiving waters within the ESA), which either creates 2,500 square feet of impervious surface on a proposed project site or increases the area of imperviousness of a proposed project site to 10% or more of its naturally occurring condition. "Directly adjacent" means situated within 200 feet of the ESA. "Discharging directly to" means outflow from a drainage conveyance system that is composed entirely of flows from the subject development or redevelopment site, and not commingled with flows from adjacent lands.		
Parking lot. Impervious parking lots 5,000 sq. ft. or more and potentially exposed to runoff. Parking lot is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally for business or commerce.		
Streets, roads, highways, and freeways. Includes any paved impervious surface that is 5,000 square feet or greater used for the transportation of automobiles, trucks, motorcycles, and other vehicles.		
Retail Gasoline Outlets (RGOs). Includes RGOs that meet the following criteria: (a) 5,000 square feet or more, or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.		
Pollutant Generating projects disturbing over 1 acre. Development projects that disturb over one acre of land, where the post-construction use of the site generate pollutants at levels greater than natural background levels.		

1 Land area is based on acreage disturbed
2 Descriptions of SIC codes can be found at http://www.osha.gov/pls/imis/sicsearch.html.

DETERMININATION: Circle appropriate determination

Any questions answered "YES" → Project requires a project-specific WQMP.
All questions are answered "NO" → Project requires incorporation of Site Design and Source Control BMPs imposed through Conditions of Approval or permit conditions.

Exhibit E

Project Specific SMR WQMP Review Checklist

Water Quality Management Plan Review Checklist

The purpose of this checklist is to provide a format for uniform, comprehensive, and well-documented reviews of the Water Quality Management Plans (WQMPs) submitted by project applicants. The completed checklist should be transmitted to the project applicant with the project WQMP. A copy of the completed checklist should be retained with the project planning/permitting file.

Planning Project/Design Review Number: _____

Project Name: _____

Project Address: _____

_____

First Review

WQMP Received on: _____

Review Completed on: _____

Second Review

WQMP Received on: _____

Review Completed on: _____

Third Review

WQMP Received on: _____

Review Completed on: _____

Signature of Reviewer: _____ Date: _____

WQMP REQUIREMENT	Requirement Satisfied?		
	Yes	No	N/A
Title Page			
The Title Page includes the following:			
Project Title			
Development No. (Tract, Parcel, or Use number)			
Design Review/Case number			
Prepared for: (Owner/Developer name and contact information)			
Prepared by: (Consulting/Engineering firm that prepared WQMP with contact person, title and information)			
Date WQMP was prepared and appropriate revision date(s)			
Preliminary or Final box checked			
Owner's Certification			
Includes a fully completed and signed certification statement, in which the project owner acknowledges and accepts the provisions of the WQMP, follows the title page. *Note: Original signature and notarization certification for the project owner will be required for each approval document(s).*			
Includes a fully completed and signed certification statement, in which the preparer acknowledges that the WQMP meets the requirements of Regional Water Quality Control Board Order No. R9-2010-0016, follows the title page.			
Table of Contents			
Includes a fully completed Table of Contents, list of figures, and appendices, as applicable.			
SECTION A: PROJECT AND SITE INSPECTION			
Includes an accurate description of project information, project location, project characteristics, and existing site characteristics.			
Section A.1: Maps and Site Plans			
Includes a WQMP site plan • Refer to Appendix 1 for specific WQMP site plan information to be provided.			
Section A.2: Identify Receiving Waters			
Includes fully completed Table A.1: Identification of Receiving Waters - All receiving waters that the project site is tributary to, are listed in order of upstream to downstream.			
Section A.3: Drainage System Susceptibility to Hydromodification			
Includes fully completed Table A.3: Identification of Susceptibility to Hydromodification			
Section A.4: Additional Permits/Approvals required for the Project:			
Includes fully completed Table A.2: Other Applicable Permits - Identifies additional permits/approvals required for the project: • State Department of Fish and Wildlife, 1602 Streambed Alteration Agreement. • State Water Resources Control Board, Clean Water Act (CWA) section 401 Water Quality Certification. • US Army Corps of Engineers, CWA section 404 permit. • US Fish and Wildlife, Endangered Species Act section 7 biological opinion. • Statewide Construction General Permit Coverage. • Statewide Industrial General Permit Coverage. • Western Riverside MSHCP Consistency Approval (e.g. JPR, DBESP). • Other.			

WQMP REQUIREMENT	Requirement Satisfied?		
	Yes	No	N/A
SECTION B: OPTIMIZE SITE UTILIZATION (LID PRINCIPLES)			
Includes narrative describing approach to identifying and preserving existing drainage patterns.			
Includes narrative describing approach to identifying and protecting existing vegetation.			
Includes narrative describing approach to identifying and preserving natural infiltration capacity.			
Includes narrative describing approach to identifying and minimizing impervious area.			
Includes narrative describing approach to identifying and dispersing runoff to adjacent pervious areas.			
SECTION C: DELINEATE DRAINAGE MANAGEMENT AREAS (DMA'S)			
Includes fully completed Table C.1: DMA Classifications. • Drainage Management Areas (DMAs) and surface type (e.g. landscaping, pervious paving, or roofs). • The total project site area should total the sum of all DMAs, plus the area of any stormwater BMPs.			
Includes fully completed Table C.2: Type 'A' Self-Treating Areas.			
Includes fully completed Table C.3: Type 'B' Self-Retaining Areas.			
Includes fully completed Table C.4: Type 'C' Areas that Drain to Self-Retaining Areas.			
Includes fully completed Table C.5: Type 'D' Areas draining to BMPs. • Where possible, site drainage should be designed so that only impervious roofs and pavement drain to LID BMPs. This yields a simpler, more efficient design and minimizes the potential for clogging by sediment.			
SECTION D: IMPLEMENT LID BMPS			
Section D.1: Infiltration Applicability			
Indicates if Harvest and Use BMPs will be implemented to address the DCV for all DMA or if there is an approved downstream 'Highest and Best Use' for stormwater runoff. • If Yes, Infiltration BMPs shall not be used for the site, and the Highest and Best Use is documented in the WQMP. • If No, a project site-specific evaluation of the feasibility of Infiltration BMPs shall be performed and is included with the WQMP. • Existence of an approved 'Highest and Best Use' should be verified with Copermittee.			
Indicates if the project meets criteria for classification as a 'small project' consistent with the requirements of Chapter 2 of the WQMP Guidance Document by providing supporting evidence that the project meets the following criteria: • Project must not be larger than size criteria listed on Page 27 of the 2014 WQMP Guidance Document. • Project must be underlain with hydrologic soils group (HSG) "D" soils only, according to available regional soils maps. • No data should be available that conflicts with the above HSG "D" designation.			
Includes fully completed Table D.1 Infiltration Feasibility, listing any affected DMAs.			
Section D.2: Harvest and Use Assessment			
Indicates if reclaimed water will be used for the non-potable water demands for the project.			
Indicates if downstream water rights may be impacted by Harvest and Use, as approved by the Regional Board.			
Indicates if the Design Capture Volume (DCV) will be addressed using Infiltration Only BMPs.			
Irrigation Use Feasibility			
Step 1: Identifies the total area of irrigated landscape (Acres).			
Step 1: Identifies the type of landscaping – Conservation Design or Active Turf.			
Step 2: Identifies total area of impervious surfaces (Acres).			
Step 3: Identifies the minimum area of *Effective Irrigated Area per Tributary Impervious Area* (EIATIA factor).			
Step 4: Identifies minimum required irrigated area (Acres).			
Step 5: Determines if harvesting stormwater runoff for irrigation use is feasible.			

WQMP REQUIREMENT	Requirement Satisfied?		
	Yes	No	N/A
Toilet Use Feasibility			
Step 1: Identifies the total number of daily toilet users and the project type (Residential, Commercial, Industrial or School).			
Step 2: Identifies total area of impervious surfaces (Acres).			
Step 3: Identifies minimum number of *toilet users per tributary impervious acre* (TUTIA) Factor.			
Step 4: Identifies minimum number of toilet users.			
Step 5: Determines if harvesting stormwater runoff for toilet use is feasible.			
Other Non-Potable Use Feasibility			
Provided narrative description of other non-potable uses for stormwater runoff.			
Step 1: Identifies average daily demand: Projected average daily use in (GPD).			
Step 2: Identifies total area of impervious surfaces (Acres).			
Step 3: Identifies minimum demand for non-potable uses per tributary impervious acre (see Table 2-5 of the WQMP Guidance Document).			
Step 4: Identifies minimum number of gallons per day of non-potable use that would be required.			
Step 5: Determines if harvesting stormwater runoff for other non-potable use is feasible.			
Section D.3: Bioretention and Biotreatment Assessment			
Lists LID Bioretention/Biotreatment BMPs that will be used for some or all DMAs of the Project.			
If LID BMPs are infeasible throughout the site, a site-specific technical infeasibility analysis is included in Appendix 5.			
Section D.4: Other Limiting Geotechnical Conditions			
Indicates if onsite retention is not feasible due to specific geotechnical concerns identified in Geotechnical Report			
Provides brief narrative describing why onsite retention is not feasible.			
Section D.5: Feasibility Assessment Summaries			
Includes fully completed Table D.3 Feasibility Assessment Summary Table			
Provides brief narrative describing all DMAs where LID BMPs are not feasible for implementation.			
Section D.6: LID BMP Sizing			
Provides a completed Table D.4: DCV Calculations for LID BMPs			
Provides a completed Table D.5: LID BMP Sizing			
Indicates if LID BMPs will be used.			
SECTION E: IMPLEMENT HYDROLOGIC CONTROL BMPs AND SEDIMENT SUPPLY BMPs			
Section E.1: Onsite Feasibility of Hydrologic Control BMPs			
Indicates Yes or No that onsite Hydrologic Control BMPs are feasible or infeasible.			
Indicates that infeasibility has been approved by Copermittee.			
Section E.2: Meeting the HMP Performance Standard for Small Project Sites			
Indicates that the project is either greater or less than 1 acre.			
Provides a Simplified Technical Feasibility Study in Appendix 7.			
Indicates if onsite Hydrologic Control BMPs are feasible or not feasible .			
Section E.3: Hydrologic Control BMP Selection			
Includes fully completed Table E.1: LID & Hydromodification BMP Location.			
Section E.4: Hydrologic Control BMP Sizing			

WQMP REQUIREMENT	Requirement Satisfied?		
	Yes	No	N/A
Includes fully completed Table E.2: Hydrologic Control BMP Sizing			
Section E.5: Implement Sediment Supply BMPs			
Completed Step 1: Identify if site is a Significant Source of Bed Sediment Supply			
• Step 1.A: Identifies bed sediment similarity as…High, Medium or Low. • Results from geotechnical report attached in Appendix 7			
• Step 1.B: Identifies onsite streams capable of delivering bed sediment to receiving channel as…High, Medium or Low. • Results from analysis attached in Appendix 7			
• Step 1.C: Identifies if receiving channel will adversely respond to change in Bed Sediment Load as…High, Medium or Low. • Results from in-stream analysis provided in Appendix 7			
• Step 1.D: Provides summary of Step 1 in Table E.3: Triad Assessment Summary			
Completed Step 2: Preservation of identified onsite channels			
- Indicates whether site design will or will not avoid onsite channels that are identified as Significant Source of Bed Sediment…Yes or No.			
- Provides map identifying all onsite channels that are Significant Source of Bed Sediment in Appendix 7			
Completed Step 3: By-Pass of Upstream Drainage(s)			
- Indicates if site design avoids or doesn't avoid all onsite channels			
- Provides a site map identifying all upstream channels that are Significant Source of Bed Sediment in Appendix 7			
SECTION F: ALTERNATIVE COMPLIANCE			
Indicates if LID Principles and LID BMPs have been incorporated into the site design to fully address all DMAs. If checked, no alternative compliance measures are required for this project and thus, Section F is not required to be completed. Preparer may skip to Section E.			
Indicates that some project DMAs are unable to be addressed using LID & Hydrologic Control BMPs. • Includes site-specific infeasibility analysis, approved by the Copermittee, in Appendix 5. • Indicates that no downstream regional and/or sub-regional LID & Hydrologic Control BMPs exist or are available for use by the project. • Includes list of DMAs that are unable to be addressed using LID & Hydrologic Control BMPs.			
Section F.1: Identify Pollutants of Concern			
Includes fully completed Table E.1: Potential Pollutants by Land Use Type. • Indicates all applicable project categories. • Identifies the project's Pollutants of Concern by comparing general pollutant categories to those listed as impairments in the project's receiving waters.			
Section F.2: Stormwater Credits			
Includes fully completed Table E.2: Water Quality Credits – Provides credit reduction percentage of DCV.			
Section F.3: Sizing Criteria			
Includes fully completed Table E.3: Treatment Control BMP Sizing – Includes appropriate V_{BMP} or Q_{BMP} calculations and are analyzed using method described in Section 2.3.1 of the Guidance Document.			
Section F.4: Treatment Control BMP Selection			

WQMP REQUIREMENT	Requirement Satisfied?		
	Yes	No	N/A
Includes fully completed Table F.4: Treatment Control BMP Selection. • Lists proposed treatment control BMP. • List project's priority pollutants of concern. • List removal efficiency percentage, as documented in Copermittee approved study. Include study in Appendix 6.			
Section F.5: Hydrologic Performance Standard – Alternative Compliance Approach			
Provides an Technical Feasibility Study or Simplified Technical Feasibility Study in Appendix 7 • Written approval from Copermittee has been given prior to development of study			
Indicates if offsite hydrologic control management within the same channel system will be pursued.			
Provides a completed Table F.5: Offsite Hydrologic Control BMP Sizing			
Indicates if in-stream restoration project is being pursued			
Provides a technical report detailing in-stream restoration option in Appendix 7			
Section F.6: Sediment Supply Performance Standard – Alternative Compliance			
Copermittee has given approval to investigate alternative Bed Sediment Supply options and the approval document is provided in the WQMP			
Provides narrative of alternative Bed Sediment Supply approach in Appendix 7 • Includes long-term monitoring program • Includes findings of the numerical modeling			
SECTION G: SOURCE CONTROL BMPS			
Includes completed Table G.1: Structural and Operational Source Control BMP – Table is consistent with Stormwater Pollutant Sources/Source Control Checklist located in Appendix 8 for the following: • Potential sources of runoff pollutants. • Structural source control BMPs. • Operational source control BMPs.			
SECTION H: CONSTRUCTION PLAN CHECKLIST			
Includes completed Table H.1: Construction Plan Cross-reference: • For Final WQMP only. • Reference tool to be used for easy reference of related construction plans.			
SECTION I. OPERATION, MAINTENANCE AND FUNDING			
Describes Maintenance Mechanism that is included in Appendix 9.			
Indicates if proposed BMPs will be maintained by a Home Owners' Association (HOA) or Property Owners Association (POA)			
APPENDICES			
Appendix 1: Maps and Site Plans			
Includes an accurate project location Map.			
Includes a fully complete and labeled map of all project identified receiving waters.			

WQMP REQUIREMENT	Requirement Satisfied?		
	Yes	No	N/A
Includes WQMP Site Plan that provides the following: • DMAs and drainage paths. • Proposed structural LID BMPs and design details. • Drainage infrastructure, inlets, and overflows. • Source Control BMPs consistent with those specified in Appendix 8. • Buildings, roof lines, and downspouts. • Impervious, pervious and total project site areas. • Area made available for LID BMPs (Effective Area) – include floor area ratio in calculation as described in Table 2-6 of the WQMP Guidance Document. • Standard drawing labeling.			
Appendix 2: Construction Plans			
Includes grading, drainage, landscape/plant palette and other pertinent construction plans.			
Appendix 3: Soil Information			
Includes Geotechnical Study.			
Includes infiltration testing data.			
Appendix 4: Historical Site Conditions			
Includes Phase 1 Environmental Site Assessment and/or other information on past site use.			
Appendix 5: LID infeasibility			
Includes LID Technical Infeasibility Analysis. • Analysis should be approved by Copermittee.			
Appendix 6: BMP Design Details			
Includes Design procedure sheets for LID BMPs. • Includes separate calculations for each DMAs draining to an LID BMP. • Includes calculations of V_{BMP} for each DMA using worksheets from Appendix F of the *LID BMP Design Handbook*. • Sizing of the LID BMP is performed using worksheets found in the *LID BMP Design Handbook* or other approved method by the Copermittee, and all worksheets are included. • Calculation values are consistent with those provided in Table D.3.			
Appendix 7: Hydromodification			
Includes supporting documentation for exemption of receiving waters that were not evaluated in the SMR HMP			
Includes Simplified Technical Feasibility Study			
Includes SMRHM summary reports			
Includes sieve analysis from Geotechnical Report, including soil erodibility factor.			
Includes analysis of sediment delivery potential to receiving channel			
Includes in-stream analysis			
Includes a site map identifying all onsite/upstream channels that are a significant source of bed sediment supply			
Includes site specific Technical Infeasibility Study of Hydrologic Control and Sediment Supply BMPs, including, but not limited to: • Modeling analysis • Long-term monitoring program • Potential corrective actions • SMRHM summary reports for alternative approach BMPs			
Includes supporting documentation for alternative compliance option for offsite/in-stream restoration			

WQMP REQUIREMENT	Requirement Satisfied?		
	Yes	No	N/A
Includes analysis of sediment delivery potential to receiving channel.			
Includes full design plans for in-stream restoration project that has been approved by Copermittee.			
Appendix 8: Source Control			
Includes Pollutant Sources/Source Control Checklist. • Checklist is consistent with Table G.1: Structural and Operational Source Control BMP • Checklist is consistent with the WQMP Site Plan.			
Appendix 9: O&M			
Includes a mean to finance and implement facility maintenance in perpetuity, including replacement cost.			
Includes acceptance of responsibility for maintenance from the time the BMPs are constructed until the responsibility for operation and maintenance is legally transferred.			
Includes an outline of general maintenance requirements for the Stormwater BMPs selected.			
Includes figures delineating and designating pervious and impervious areas, location, and type of Stormwater BMP, and tables of pervious and impervious areas served by each facility. Geo-locating the BMPs using a coordinate system of latitude and longitude is recommended to help facilitate a future statewide database system.			
Includes a separate list and location of self-retaining areas, or areas addressed by LID Principles, that do not require specialized O&M or inspections, but will require typical landscape maintenance as noted in Chapter 5, in the WQMP Guidance. Includes a brief description of typical landscape maintenance for these areas.			
Includes Maintenance and Recording Mechanisms			
Appendix 10: Educational Materials			
Includes BMP Fact Sheets			
Includes Maintenance Guidelines			
Includes Other End-User BMP Information			

WQMP REVIEW COMMENTS

The following is a summary of major comments and/or questions relative to this project-specific WQMP:

2010 SMR MS4 Permit	Order No. R9-2010-0016, an NPDES Permit issued by the San Diego Regional Water Quality Control Board.
Applicant	Public or private entity seeking the discretionary approval of new or replaced improvements from the Copermittee with jurisdiction over the project site. The Applicant has overall responsibility for the implementation and the approval of a Priority Development Project. The WQMP uses consistently the term "user" to refer to the applicant such as developer or project proponent. The WQMP employs also the designation "user" to identify the Registered Professional Civil Engineer responsible for submitting the Project-Specific WQMP, and designing the required BMPs.
Bed Sediment	Term to define the coarse-grained portion of the sediment load
Bed Sediment Load	The Bed Sediment (material that moves along the bed by sliding or saltating) and part of the suspended sediment load including particle size fractions in the channel Bed Sediments.
Best Management Practice (BMP)	Defined in 40 CFR 122.2 as schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. In the case of municipal storm water permits, BMPs are typically used in place of numeric effluent limits.
BMP Fact Sheets	BMP Fact Sheets are available in the LID BMP Design Handbook. Individual BMP Fact Sheets include sitting considerations, and design and sizing guidelines for seven types of structural BMPs (infiltration basin, infiltration trench, permeable pavement, harvest-and-use, bioretention, extended detention basin, and sand filter).
California Stormwater Quality Association (CASQA)	Publisher of the California Stormwater Best Management Practices Handbooks, available at: www.cabmphandbooks.com.
CEQA	California Environmental Quality Act - a statute that requires state and local agencies to identify the significant environmental impacts of their actions and to avoid or mitigate those impacts, if feasible.
CIMIS	California Irrigation Management Information System - an integrated network of 118 automated active weather stations all over California managed by the California Department of Water Resources.

Comprehensive Regional BMP	Regional runoff management systems that address water quality, hydrologic, and fluvial geomorphologic requirements for PDPs larger than 100 acres.
Conventional Treatment Control BMP	A type of BMP that provides treatment of stormwater runoff. Conventional treatment control BMPs, while designed to treat particular Pollutants, typically do not provide the same level of volume reduction as LID BMPs, and commonly require more specialized maintenance than LID BMPs. As such, the 2010 SMR MS4 Permit and this WQMP require the use of LID BMPs wherever feasible, before Conventional Treatment BMPs can be considered or implemented.
Copermittees	The 2010 SMR MS4 Permit identifies the Cities of Murrieta, Temecula, and Wildomar, the County, and the District, as Copermittees for the SMR.
County	The abbreviation refers to the County of Riverside in this document.
Critical Shear Stress	Threshold above which motion of bed sediment is initiated.
CWA	Clean Water Act - is the primary federal law governing water pollution. Passed in 1972, the CWA established the goals of eliminating releases of high amounts of toxic substances into water, eliminating additional water pollution by 1985, and ensuring that surface waters would meet standards necessary for human sports and recreation by 1983. CWA Section 402(p) is the federal statute requiring NPDES permits for discharges from MS4s.
CWA Section 303(d) Waterbody	Impaired water in which water quality does not meet applicable water quality standards and/or is not expected to meet water quality standards, even after the application of technology based pollution controls required by the CWA. The discharge of urban runoff to these water bodies by the Copermittees is significant because these discharges can cause or contribute to violations of applicable water quality standards.
DCIA	Directly Connected Impervious Areas - those impervious areas that are hydraulically connected to the MS4 (i.e. street curbs, catch basins, storm drains, etc.) and thence to the structural BMP without flowing over pervious areas.
DCV	Design Capture Volume (DCV) is the volume of runoff produced from the Design Storm to be mitigated through LID Retention BMPs, Other LID BMPs and Volume Based Conventional Treatment BMPs, as appropriate.
Design Flow Rate	The design flow rate represents the minimum flow rate capacity that flow-based conventional treatment control BMPs should treat to the MEP, when considered.

Design Storm	The 2010 SMR MS4 Permit has established the 85th percentile, 24-hour storm event as the "Design Storm". The applicant may refer to Exhibit A to identify the applicable Design Storm Depth (D85) to the project.
Discretionary Approval	A decision in which a Copermittee uses its judgment in deciding whether and how to carry out or approve a project.
District	Riverside County Flood Control and Water Conservation District.
DMA	A Drainage Management Area - a delineated portion of a project site that is hydraulically connected to a common structural BMP or conveyance point. The Applicant may refer to Section 3.3 for further guidelines on how to delineate DMAs.
Drawdown Time	Refers to the amount of time the design volume takes to pass through the BMP. The specified or incorporated drawdown times are to ensure that adequate contact or detention time has occurred for treatment, while not creating vector or other nuisance issues. It is important to abide by the drawdown time requirements stated in the fact sheet for each specific BMP.
Effective Area	Area which 1) is suitable for a BMP (for example, if infiltration is potentially feasible for the site based on infeasibility criteria, infiltration must be allowed over this area) and 2) receives runoff from impervious areas.
Ep	stream erosion potential
Erosion	The process by which soil and rock are removed from the Earth's surface by exogenic processes such as wind or water flow, and then transported and deposited in other locations
ESA	An Environmental Sensitive Area (ESA) designates an area "in which plants or animals life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which would be easily disturbed or degraded by human activities and developments". (Reference: California Public Resources Code § 30107.5).
ET	Evapotranspiration (ET) is the loss of water to the atmosphere by the combined processes of evaporation (from soil and plant surfaces) and transpiration (from plant tissues). It is also an indicator of how much water crops, lawn, garden, and trees need for healthy growth and productivity
FAR	The Floor Area Ratio (FAR) is the total square feet of a building divided by the total square feet of the lot the building is located on.
Flow-Based BMP	Flow-based BMPs are conventional treatment control BMPs that are sized to treat the design flow rate.

FPPP	Facility Pollution Prevention Plan
GIS	Geographical Information System
HCOC	Hydrologic Condition of Concern - Exists when the alteration of a site's hydrologic regime caused by development would cause significant impacts on downstream channels and aquatic habitats, alone or in conjunction with impacts of other projects.
HMP	Hydromodification Management Plan – Plan defining Performance Standards for PDPs to manage increases in runoff discharge rates and durations.
HMP Performance Standard	The Hydrologic Performance and Sediment Supply Performance Standards
HRU/GLU Analysis	Hydrologic Response Units/Geomorphic Landscape Units
HSG	Hydrologic Soil Groups – soil classification to indicate the minimum rate of infiltration obtained for bare soil after prolonged wetting. The HSGs are A (very low runoff potential/high infiltration rate), B, C, and D (high runoff potential/very low infiltration rate)
HSPF	Hydrologic Simulation Program FORTRAN, distributed by USEPA
Hydrologic Control BMPs	A technique, measure or structural control that is used for a given set of conditions to manage the quantity and improve the quality of stormwater runoff
Hydrologic Performance Standard	The Hydrologic Performance Standard, or HMP Performance Standard consists of matching or reducing the flow duration curve of post-development conditions to that of pre-existing, naturally occurring conditions, for the range of geomorphically significant flows (10% of the 2-year runoff event up to the 10-year runoff event).
Hydromodification	The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, interflow and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered Hydromodification, due to their disruption of natural watershed hydrologic processes.
IMP	Integrated Management Practices

JRMP	A separate Jurisdictional Runoff Management Plan (JRMP) has been developed by each Copermittee and identifies the local programs and activities that the Copermittee is implementing to meet the 2010 SMR MS4 Permit requirements.
K	Soil erosion factor
LEED	Leadership in Energy and Environmental Design
LID	Low Impact Development (LID) is a site design strategy with a goal of maintaining or replicating the pre-development hydrologic regime through the use of design techniques. LID site design BMPs help preserve and restore the natural hydrologic cycle of the site, allowing for filtration and infiltration which can greatly reduce the volume, peak flow rate, velocity, and pollutant loads of storm water runoff.
LID Bioretention BMP	LID Bioretention BMPs are bioretention areas are vegetated (i.e., landscaped) shallow depressions that provide storage, infiltration, and evapotranspiration, and provide for pollutant removal (e.g., filtration, adsorption, nutrient uptake) by filtering stormwater through the vegetation and soils. In bioretention areas, pore spaces and organic material in the soils help to retain water in the form of soil moisture and to promote the adsorption of pollutants (e.g., dissolved metals and petroleum hydrocarbons) into the soil matrix. Plants use soil moisture and promote the drying of the soil through transpiration. The 2010 SMR MS4 Permit defines "retain" as to keep or hold in a particular place, condition, or position without discharge to surface waters.
LID Biotreatment BMP	BMPs that reduce stormwater pollutant discharges by intercepting rainfall on vegetative canopy, and through incidental infiltration and/or evapotranspiration, and filtration, and other biological and chemical processes. As stormwater passes down through the planting soil, pollutants are filtered, adsorbed, biodegraded, and sequestered by the soil and plants, and collected through an underdrain.
LID BMP	A type of stormwater BMP that is based upon Low Impact Development concepts. LID BMPs not only provide highly effective treatment of stormwater runoff, but also yield potentially significant reductions in runoff volume – helping to mimic the pre-project hydrologic regime, and also require less ongoing maintenance than Treatment Control BMPs. The applicant may refer to Chapter 2.

LID BMP Design Handbook	The LID BMP Design Handbook was developed by the Copermitees to provide guidance for the planning, design and maintenance of LID BMPs which may be used to mitigate the water quality impacts of PDPs within the County.
LID Harvest and Reuse BMP	BMPs used to facilitate capturing Stormwater Runoff for later use without negatively impacting downstream water rights or other Beneficial Uses.
LID Infiltration BMP	BMPs to reduce stormwater runoff by capturing and infiltrating the runoff into in-situ soils or amended onsite soils. Typical LID Infiltration BMPs include infiltration basins, infiltration trenches and pervious pavements.
LID Principles	Site design concepts that prevent or minimize the causes (or drivers) of post-construction impacts, and help mimic the pre-development hydrologic regime.
LID Retention BMP	BMPs to ensure full onsite retention without runoff of the DCV such as infiltration basins, bioretention, chambers, trenches, permeable pavement and pavers, harvest and reuse.
Management Bank	A Bank consisting of regional HMP management projects where PDPs can buy HMP management credits if it is determined that implementing onsite Hydrologic Control BMPs is infeasible.
MEP	Maximum Extent Practicable - standard established by the 1987 amendments to the CWA for the reduction of Pollutant discharges from MS4s. Refer to Attachment C of the 2010 SMR MS4 Permit for a complete definition of MEP.
MF	Multi-family – zoning classification for parcels having 2 or more living residential units.
MS4	Municipal Separate Storm Sewer System (MS4) is a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designated or used for collecting or conveying storm water; (iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.26.

MSHCP	Western Riverside County Multi-Species Habitat Conservation Plan
MUSLE	Modified Universal Soil Loss Equation. A mathematical model that describes soil erosion processes
New Development Project	Defined by the 2010 MS4 permit as 'Priority Development Projects' if the project, or a component of the project meets the categories and thresholds described in Section 1.1.1.
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollution Discharge Elimination System - Federal program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the CWA.
NRCS	Natural Resource Conservation Service
PDP	Priority Development Project - Includes New Development and Redevelopment project categories listed in Section F.1.d(2) of Order No. R9-2009-0002.
Priority Pollutants of Concern	Pollutants expected to be present on the project site and for which a downstream water body is also listed as Impaired under the CWA Section 303(d) list or by a TMDL.
Project-Specific WQMP	A plan specifying and documenting permanent LID Principles and Stormwater BMPs to control post-construction Pollutants and stormwater runoff for the life of the PDP, and the plans for operation and maintenance of those BMPs for the life of the project.
Q or Qw	Flow
Qcp	Geomorphically critical flow – 10% of the 2-year flow
Qcrit - Qc	Critical flow
Receiving Waters	Waters of the United States.
Redevelopment Project	The creation, addition, and or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include trenching and resurfacing associated with utility work; resurfacing existing roadways; new sidewalk construction, pedestrian ramps, or bikelane on existing roads; and routine replacement of damaged pavement, such as pothole repair. Project that meets the criteria described in Section 1.

RGO	Retail Gasoline Outlets: A category 2 PDP less than one acre that uses BMPs to reduce or eliminate pollution
Runoff Fund	Runoff Funds have not been established by the Copermittees and are not available to the Applicant. If established, a Runoff Fund will develop regional mitigation projects where PDPs will be able to buy mitigation credits if it is determined that implementing onsite controls is infeasible.
RWQCB	Regional Water Quality Control Board
San Diego Regional Board	San Diego Regional Water Quality Control Board - The term "Regional Board", as defined in Water Code section 13050(b), is intended to refer to the California Regional Water Quality Control Board for the San Diego Region as specified in Water Code Section 13200. State agency responsible for managing and regulating water quality in the SMR.
SCCWRP	Southern California Coastal Water Research Project
SDRWQCB	San Diego California Regional Water Quality Control Board
Sediment Supply BMP	Site design principles to preserve onsite first-order or higher order streams that have been identified as significant contributors of bed sediment load.
Sediment Supply Performance Standard	Consists of maintaining the pre-project bed sediment supply to the downstream channel reach.
SF	Parcels with a zoning classification for a single residential unit.
Site Design BMP	Site design BMPs prevent or minimize the causes (or drivers) of post-construction impacts, and help mimic the pre-development hydrologic regime.
SMC	Southern California Stormwater Monitoring Coalition
SMR	The Santa Margarita Region (SMR) represents the portion of the Santa Margarita Watershed that is included within the County of Riverside.
SMR	Santa Margarita Region
SMRHM	Santa Margarita Region Hydrology Model
SOHM	South Orange Hydrology Model
Source Control BMP	Source Control BMPs land use or site planning practices, or structural or nonstructural measures that aim to prevent runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between Pollutants and runoff.

Stormwater Credit	Stormwater Credit can be claimed by an Applicant if certain development practices that provide broad-scale environmental benefits to communities are incorporated into the project design. Refer to Section 3.5.4 for additional information on Stormwater Credits.
Structural BMP	Structures designed to remove pollutants from stormwater runoff and mitigate hydromodification impacts.
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
Tentative Tract Map	Tentative Tract Maps are required for all subdivision creating five (5) or more parcels, five (5) or more condominiums as defined in Section 783 of the California Civil Code, a community apartment project containing five (5) or more parcels, or for the conversion of a dwelling to a stock cooperative containing five (5) or more dwelling units.
TMDL	Total Maximum Daily Load - the maximum amount of a Pollutant that can be discharged into a waterbody from all sources (point and non-point) and still maintain Water Quality Standards. Under CWA Section 303(d), TMDLs must be developed for all waterbodies that do not meet Water Quality Standards after application of technology-based controls.
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
USEPA	United States Environmental Protection Agency
User	The person using this guidance document to prepare analyze a projects and preparea WQMP
USGS	United States Geological Survey
Volume-Based BMP	Volume-Based BMPs applies to BMPs where the primary mode of pollutant removal depends upon the volumetric capacity such as detention, retention, and infiltration systems.
Wash Load	The portion of the total sediment load carried continuously in suspension by the flow, and generally consists of the finest particles.
Wet Season	The 2010 SMR MS4 Permit defines the wet season from October 1 through April 30.
WQMP	Water Quality Management Plan

May 2014

045695

Santa Margarita Region Hydromodification Management Plan

In compliance with Order No. R9-2010-0016, this HMP has been developed by the Riverside County Copermittees

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ACRONYMS, ABBREVIATIONS AND DEFINITIONS

2010 SMR MS4 Permit	The SMR MS4 Permit requires the Copermittees to develop and implement a stormwater management program to reduce the contamination of stormwater runoff and prohibit illicit discharges
ACCWP	Alameda Countywide Clean Water Program
Adequate Sump	
ALERT	Automated Local Evaluation in Real Time: a local flood warning system for a local agency such as a county or a city
Alternative Compliance Option	
Alternative Performance Standard	
BAHM	Bay Area Hydrology Model
Bed Sediment	Term to define the coarse-grained portion of the sediment load
Bed Sediment Load	The Bed Sediment (material that moves along the bed by sliding or saltating) and part of the suspended sediment load including particle size fractions in the channel Bed Sediments.
BMP	Best Management Practice
CALVEG	A California statewide system for describing vegetation types in mapping their general distributions
CCCWP	Contra Costa Clean Water Program
CEM	Channel Evolution Model
Channel Stability Performance Standard	Requires that geomorphic stability within a channel will not be compromised as a result of receiving runoff from a PDP
Comprehensive Regional BMP	Regional runoff management systems that address water quality, hydrologic, and fluvial geomorphologic requirements for PDPs larger than 100 acres.
Copermittees	County, District, and Cities of Murrieta, Temecula and Wildomar
Critical Shear Stress	Threshold above which motion of bed sediment is initiated.
D_{50}	Median grain size diameter
DAMP	Drainage Area Management Plan
DCV	Design Capture Volume
Ep	stream erosion potential
Erosion	The process by which soil and rock are removed from the Earth's surface by exogenic processes such as wind or water flow, and then transported and deposited in other locations
ESA	Environmentally Sensitive Areas
FSURMP	Fairfield-Suisun Urban Runoff Management Program
GIS	Geographical Information System
HEC-HMS	Hydrologic Engineering Center – Hydrologic Modeling System
HMP	Hydromodification Management Plan

HMP Criteria	All PDPs must use continuous simulation to ensure that post-project runoff flow rates and durations for the PDP shall not exceed pre-development, naturally occurring, runoff flow rates and durations by more than 10% over more than 10% the length of the flow duration curve, from 10% of the 2-year runoff event up to the 10-year runoff event.
HMP Management Bank	
HMP Performance Standard	The Hydrologic Performance and Sediment Supply Performance Standards
HR	Hydraulic Radius
HRU/GLU Analysis	Hydrologic Response Units/Geomorphic Landscape Units
HSPF	Hydrologic Simulation Program FORTRAN, distributed by USEPA
Hydrologic Control BMPs	A technique, measure or structural control that is used for a given set of conditions to manage the quantity and improve the quality of stormwater runoff
Hydrologic Performance Standard	Consists of matching or reducing the flow duration curve of post-development conditions to that of pre-existing, naturally occurring conditions, for the range of geomorphically significant flows (10% of the 2-year runoff event up to the 10-year runoff event).
Hydromodification	The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, interflow and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered Hydromodification, due to their disruption of natural watershed hydrologic processes.
IMP	Integrated Management Practices
K	Soil erosion factor
LEED	Leadership in Energy and Environmental Design
LID	Low Impact Development
LSPC	Loading Simulation Program in C++
Management Bank	A Bank consisting of regional HMP management projects where PDPs can buy HMP management credits if it is determined that implementing onsite Hydrologic Control BMPs is infeasible.
MHHW	Mean Higher High Water
MS4	Municipal Separate Storm Sewer System
MSHCP	Western Riverside County Multi-Species Habitat Conservation Plan
MUSLE	Modified Universal Soil Loss Equation. A mathematical model that describes soil erosion processes
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resource Conservation Service
PDP	Priority Development Project
Project Specific WQMP	Project Specific Water Quality Management Plan
Q or Qw	Flow
Qcrit - Qc	Critical flow
Qcp	Geomorphically critical flow – 10% of the 2-year flow
District	Riverside County Flood Control and Water Conservation District
Receiving Water	Water of the United States

RGO	Retail Gasoline Outlets: A category 2 PDP less than one acre that uses BMPs to reduce or eliminate pollution
RWQCB	Regional Water Quality Control Board
Saltation	
SCCWRP	Southern California Coastal Water Research Project
SCS	Soil Conservation Service
SCVURPPP	Santa Clara Valley Urban Runoff Pollution Prevention Program
SDRWQCB	San Diego California Regional Water Quality Control Board
SDHM	San Diego Hydromodification Model
Sediment Supply BMP	Site design principles to preserve onsite first-order or higher order streams that have been identified as significant contributors of bed sediment load.
Sediment Supply Performance Standard	Consists of maintaining the pre-project bed sediment supply to the downstream channel reach.
SMCWPPP	San Mateo Countywide Water Pollution Prevention Program
SMR	Santa Margarita Region
SMRHM	Santa Margarita Region Hydrology Model
SOHM	South Orange Hydrology Model
SSMP	Standard Stormwater Mitigation Plan, also known as WQMP (Water Quality Management Plan)
STOPPP	San Mateo County Stormwater Pollution Prevention Program
SUSMP	Standard Urban Stormwater Mitigation Plan
SWM SWMM	Stanford Watershed Model Stormwater Management Model; distributed by USEPA
SWMP	Stormwater Management Plan
SWRCB	State Water Resources Control Board
SWWM	Stormwater Management Model
TMDL	Total Maximum Daily Load
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
User	The person using this guidance document to prepare analyze a projects and preparea WQMP
USGS	United States Geological Survey
Wash Load	The portion of the total sediment load carried continuously in suspension by the flow, and generally consists of the finest particles.
WQMP	Water Quality Management Plan
WWHM	Western Washington Continuous Simulation Hydrology Model

Note to the User:

The Santa Margarita Region Hydromodification Management Plan (SMR HMP) uses the term "User" to refer to any public or private entities seeking the discretionary approval of new development or significant redevelop projects (Priority Development Projects [PDP]) by the Copermittee with jurisdiction over the project site. The SMR HMP employs the term "User" to identify the person responsible for submitting the Water Quality Management Plan (WQMP) that meets the performance standards set forth in the SMR HMP.

Simplified HMP Roadmap for User

The Copermittees continue to reduce Hydromodification and flood risk through master planning and evaluating specific development projects to manage stormwater runoff. Additionally, the Santa Margarita Region Hydromodification Management Plan (SMR HMP) was developed by the Copermittees in response to Provision F.1.h of the 2010 SMR Municipal Separate Storm Sewer System (MS4) Permit (Order R9-2010-0016) to manage increases in runoff discharge rates and durations from Priority Development Projects (PDPs). The 2010 SMR MS4 Permit contains requirements specifying the methodology to be employed in the development of the HMP, including the development of hydrologic and sediment supply performance standards that will support maintenance of geomorphic stability in channels receiving runoff from PDPs.

The simplified HMP roadmap guides the User through the steps and the sections of the SMR HMP to be followed to:

1. Identify if the development project is subject to the requirements of the HMP; and
2. When required, guide the User in meeting the HMP requirements.

A User, who must meet Low Impact Development (LID) and Hydromodification requirements simultaneously, may refer to the SMR WQMP.

How to identify if my project is subject to the requirements of this HMP?

The User may refer to the HMP Decision Matrix presented in **Figure 1** to identify if the PDP is exempt from the requirements of the SMR HMP.

Conditions for exemption of development projects from HMP requirements must be documented by the User and may only be considered by the Copermittee with jurisdiction over the project site if:

- The project is not classified as PDP per Permit Provision F.1.d.;
- The proposed project discharges runoff directly to an exempt channel such as an exempt river reach, or an exempt reservoir. Or, if the proposed project discharges to an concrete-lined or artificially hardened channel, that extends to an exempt river reach or reservoir (See **Section 3.2.i**);
- The project discharges to a large river per the definition provided in Section 3.2.ii;

If the project is not exempt, the User should identify the categorized requirements that apply. For specific categorized requirements, the User may refer to **Section 3.3**. These requirements direct the User to implement, when required, Hydrologic Control BMPs and Sediment Supply BMPs following the approach listed in **Section 2.0**.

Figure 1. HMP Decision Matrix

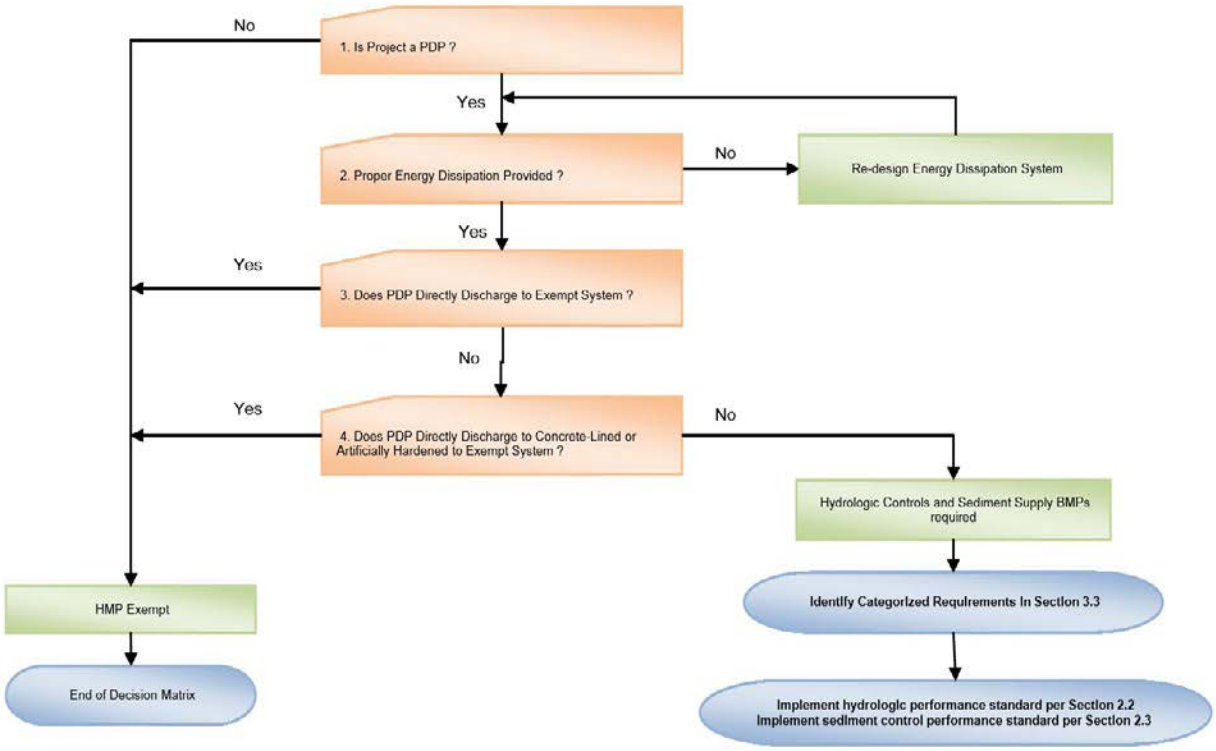

What are the HMP Performance Standards that PDPs must meet?

Users must demonstrate compliance with the overall HMP Performance Standard, thus demonstrate compliance with the ***Hydrologic Performance Standard*** and the ***Sediment Supply Performance Standard,*** respectively.

The Hydrologic Performance Standard consists of matching or reducing the flow duration curve of post-development conditions to that of pre-existing, naturally occurring conditions, for the range of geomorphically significant flows (10% of the 2-year runoff event up to the 10-year runoff event). The Sediment Supply Performance Standard consists of maintaining the pre-project Bed Sediment supply to the channel receiving runoff from the project site.

PDPs are categorized based on their size and type. Specific requirements are associated with each of the two categories. The User should refer to **Section 3.3** to identify the specific categorized requirements.

How to meet the Hydrologic Performance Standard?

This HMP includes a tool to provide continuous simulation of peak flow rates, from 10% of the 2-year runoff event up to the 10-year runoff event for PDPs. The tool is the Santa Margarita Region Hydrology Model (SMRHM), which is a Hydrologic Simulation Program FORTRAN

(HSPF) model based on the South Orange County Hydrology Model. This model allows Users to demonstrate compliance with the HMP Performance Standards through interactive graphic user interface. Details about how to use the model are provided in the 2013 SMRHM Guidance Document (see APPENDIX F).

In some situations, onsite Hydrologic Control BMPs may not be feasible due to identified constraints. In this case the User must investigate the feasibility of alternative options and must implement offsite Hydrologic Control BMPs or in-channel restoration or rehabilitation projects. The User should refer to **Section 2.2** for additional information.

How to meet the Sediment Supply Performance Standard?

The User may follow a three-step process, as identified in **Section 2.3,** to attain maintenance of the pre-project sediment supply to the channel receiving runoff from the project:

1. Determine whether the project site is a significant source of Bed Sediment load to the receiving channel.
2. Avoid significant Bed Sediment supply areas in the site design.
3. Replace significant Bed Sediment supply areas that are eliminated through development of the PDP.

If the three-step process is deemed infeasible, an alternative compliance option allows the User to model the site conditions and the receiving channel and provide additional management in site runoff to compensate for the reduction (or addition) of Bed Sediment Load. Specifics are detailed in **Section 2.3.ii**.

How to initiate compliance with the requirements of this HMP?

The User must integrate Hydrologic Control and Sediment Supply BMPs into the PDP design, and define the design specifics in the preliminary WQMP that should be submitted to the Copermittee with jurisdiction over the project site. The Copermittee with jurisdiction over the project site may approve the proposed design upon identification of compliance with the requirements of this HMP.

The User may refer to the SMR WQMP for complete guidelines on how to develop a WQMP for the PDP.

1.0 Introduction

1.1 SMR HMP Context

The SDRWQCB jurisdiction covers the portion of Riverside County that is located within the Santa Margarita Watershed referred to as the SMR. The Copermittees regulated under the 2010 SMR MS4 Permit are the Cities of Murrieta, Temecula, and Wildomar, as well as the County of Riverside and the Riverside County Flood Control and Water Conservation District (District).

The 2010 SMR MS4 Permit defines Hydromodification as:

> *The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, interflow and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered Hydromodification, due to their disruption of natural watershed hydrologic processes.*

In addition to urban development activities, anthropogenic activities that may result in Hydromodification may include agriculture, forestry, mining, water withdrawal, climate change, and flow regulation by upstream reservoirs. Hydromodification can result in impacts on receiving channels, such as erosion, sedimentation, and potentially degradation of in-channel habitat. The degree to which a channel will erode or aggrade is a function of the increase or decrease in work (shear stress), the resistance of the channel bed and bank sediments – including vegetation (critical shear stress), the change in sediment delivery, and the geomorphic condition (soil lithology) of the channel.

Not all flows cause significant movement of Bed Sediment—only those which exceed the Critical Shear Stress of the sediments found in the channel bank and bed. Critical Shear Stress is the threshold above which motion of Bed Sediment is initiated. Urban development may increase the discharge rate, amount and timing of runoff, and associated shear stress exerted on the receiving channel by channel flows, may reduce sediment delivered to the channel, and can trigger erosion in the form of incision (channel downcutting), aggradation (deposition of sediment), widening (bank erosion), or both. Flow velocities that generate shear below Critical Shear Stress levels will not result in the channel's degradation and may result in aggradation.

The Copermittees continue to reduce factors that may lead to Hydromodification and reduce flood risk through master planning and evaluating specific development projects to manage stormwater runoff. Additionally, program Provision F.1.h of the Santa Margarita Region (SMR) Municipal Separate Storm Sewer System (MS4) Permit (Order R9-2010-0016) (2010 SMR MS4 Permit) issued by the San Diego California Regional Water Quality Control Board (SDRWQCB) requires that "Each Copermitee shall collaborate with the other Copermittees to develop and implement a Hydromodification Management Plan (HMP) to manage increases in runoff discharge rates and durations from all Priority Development Projects (PDPs)." Where receiving channels are already unstable due to natural or anthropogenic processes, Hydromodification

management may be thought of as a method to avoid accelerating or exacerbating existing Hydromodification. Where receiving channels are in a state of dynamic equilibrium, Hydromodification management may prevent the onset of accelerated erosion, sedimentation, lateral bank migration, aggradation, or impacts to in-channel vegetation.

The 2010 SMR MS4 Permit contains requirements specifying the methodology to be employed in development of the HMP. The 2010 SMR MS4 Permit requires the Copermittees to develop an HMP to address all PDPs (with certain exemptions) and to develop a HMP Performance Standard including a geomorphically-significant flow range that ensures the geomorphic stability within the channel. Supporting analyses must be based on continuous hydrologic simulation modeling. The loss of sediment supply due to the PDP must also be considered.

The SMR HMP addresses the impacts of Hydromodification on the channels receiving stormwater runoff from a PDP. As identified in **Section 1.2**, other anthropogenic stressors to the channels in the SMR are outside of the jurisdictional purview of the Copermittees.

The SMR HMP will serve as the technical documentation for Hydromodification aspects to support the LID BMP Design Handbook and the SMR WQMP. The LID BMP Design Handbook will be updated with Hydrologic Control and Sediment Supply BMPs. For BMP sizing and site planning purposes, Users and plan checkers may refer directly to the LID BMP Design Handbook and the SMR WQMP. The methodology for meeting LID and Hydromodification requirements, or LID requirements alone, will be identified in these documents.

1.2 SMR History and Historic Hydromodification Impacts

The Southern California Coastal Water Research Project (SCCWRP) characterizes the Santa Margarita River as one of the largest rivers in southern California whose course has remained unobstructed by dams and other artificial infrastructure from its confluence of Temecula Creek and Murrieta Creek to the Pacific Ocean (SCCWRP, 2007). The Santa Margarita River begins at the confluence of Temecula Creek and Murrieta Creek, in Southern Riverside County, and flows southwest successively through Temecula Canyon, a large floodplain in Camp Pendleton Marine Corps Base, and ultimately discharges into the Pacific Ocean. The Santa Margarita River Watershed drains a tributary area of 746-square miles and is physiologically split into a mountainous highland and broad, flat topped sea terrace. The boundary between the upper drainage basin and the coastal drainage basin transitions at the border between Riverside County and San Diego County. The construction of Vail Dam and Skinner Reservoir and historical urbanization within the SMR have progressively and significantly altered the hydrology and sediment transport regimes in the downstream channels. The intent of this section is not to quantify these impacts, but rather to describe the existence of these historic modifications.

1.2.i Water Reservoirs

Runoff from approximately 65% of the SMR has been controlled by the construction of Vail Dam and Skinner Reservoir. In 1974, the 44,200 acre-feet Lake Skinner was formed by

construction of a dam on Tucalota Creek. Skinner Lake creates a sump for surface flows and Bed Sediment that has been transported from the upper reaches of Tucalota Creek. Vail Lake is a 49,370 acre-feet reservoir located at the confluence of Temecula Creek, Wilson Creek, and Kolb Creek. The reservoir was built in 1949 by Vail Ranch to develop an irrigation system for expanding their agricultural activities. Since 1978, the reservoir has been operated by the Rancho California Water District to help replenish local groundwater.

Vail Lake and Skinner Lake are operated based on water supply and groundwater recharge considerations, and not for flood control purposes. Virtually all runoff received in these reservoirs is conserved for municipal, industrial, and agricultural use. Nonetheless, the storage capacity of each reservoir induces a management of peak flow rates and durations during storm events. The potential increases in flood flows resulting from urban development in the SMR are offset by the storage effect of the reservoirs (PWA, 2004).

1.2.ii Existing Surface Water and Groundwater Conditions

In 2013 the District conducted field reconnaissance to identify perennial channel segments within the SMR. These investigations identified that 97.3% of the stream segments in the SMR are ephemeral. Sources of dry-weather runoff, if any, were identified as predominantly from urban and agricultural irrigation runoff. The channel segments exhibiting dry weather flow were observed to be short and discontinuous, with the minor flows evaporating and/or infiltrating. There was no continuity of flow from the MS4 to the confluence of Murrieta and Temecula Creeks. Dry weather flows in the Santa Margarita River consist of deliveries of imported water by the Rancho California Water District to Camp Pendleton augmented with minor amounts of rising groundwater that occur in the vicinity of the confluence of Murrieta and Temecula Creeks.

Surface runoff from the SMR does not augment the dry weather flows in the Santa Margarita River. Dry-weather runoff in the SMR evaporates and infiltrates prior to the confluence of Murrieta and Temecula Creeks. The creeks in the urbanized areas of the watershed, located primarily in the valley, are ephemeral and flows are observed only during and immediately after significant storm events. During major storms, after initial wetting, periods of intense rainfall result in rapid increases in channel flow in steep foothill and mountain areas. Runoff in channels in the watershed is derived primarily from rainfall, and as a result, channel flow exhibits monthly and seasonal variations similar to those shown by the precipitation records. There is a rapid decrease in channel flow at the conclusion of the winter precipitation season. Following severe storms, discharge in the larger channels often increases in a few hours from no flow, to a rate of thousands of cubic feet per second. Channel flows vary greatly from month to month and from season to season.

1.2.iii Historical Urbanization in the SMR

The Riverside County Drainage Area Management Plan (2007 DAMP) assumes that 92% of the SMR remained undeveloped as of 2010. Much of the remaining SMR lands will ultimately be

incorporated into the Western Riverside County Multi-Species Habitat Conservation Plan (MSHCP), which requires the ongoing conservation of 500,000 acres within the County. For the average annual event, it is estimated that approximately 89% of the volume of runoff in the SMR is due to non-urban land uses not regulated under the federal stormwater program (2007 DAMP).

1.3 SMR HMP Organization

The HMP is organized in two major sections, supported with technical appendices. The first major section identifies the HMP Performance Standards and identifies the applicable tools and measures to meet these standards. The second major section establishes specific categorized requirements for a User, based on a classification of the PDP and the susceptibility to Hydromodification of the channels receiving stormwater runoff from the PDP. The technical appendices reference the HMP development process and reporting requirements per 2010 SMR MS4 Permit Provision F.1.h.(5), provide a literature review of the state of the Hydromodification science per 2010 SMR MS4 Permit Provisions F.1.h.(1)(g) and F.1.h(1)(k), and incorporate the findings of HMP studies performed to classify channel segments per susceptibility category. The HMP also is required to identify areas with historic Hydromodification of Receiving Waters and that are tributary to documented low or very low Index of Biotic Integrity scores for potential opportunities for channel restoration or rehabilitation per Permit provisions F.1.h(1)(a) and F.1.h(1)(h), respectively.

It should be noted that this HMP has in large part been based on the San Diego HMP, which was developed by the San Diego Copermittees and the South Orange County HMP developed by the Copermittees of South Orange County. The San Diego HMP was approved by the SDRWQCB and served as the starting point for development of the SMR HMP.

2.0 SMR HMP Criteria and Performance Standards

The objective of this section is to identify the specific HMP criteria and Performance Standards for Hydromodification to be implemented. PDPs are required to implement Hydrologic Control BMPs so that post-project runoff flow rates and durations are similar to those found in pre-development conditions, i.e. naturally occurring conditions, flow rates and durations where they would result in an increased or decreased potential for erosion or significant impacts to Beneficial Uses (Permit Section F.1.h.). The purpose of this chapter is to identify the HMP criteria, detail the HMP applicability requirements, and provide a framework for alternative compliance.

2.1 HMP Criteria and Performance Standards

The HMP Criteria is designed to manage changes in runoff discharge rates and durations from PDPs:

> All PDPs must use continuous simulation to ensure that post-project runoff flow rates and durations for the PDP must not exceed pre-development, naturally occurring, runoff flow rates and durations by more than 10% over more than 10% the length of the flow duration curve, from 10% of the 2-year runoff event up to the 10-year runoff event.

Section F.1.h.(1)(d) of the 2010 SMR MS4 Permit identifies that PDPs are required to implement Hydrologic Control and Sediment Supply BMPs to meet the following Performance Standards such that that geomorphic stability within a channel will not be compromised as a result of receiving runoff from a PDP:

1. The Hydrologic Performance Standard, which consists of demonstrating flow duration matching for the range of geomorphically-significant flows. This HMP includes a tool to provide continuous simulation of peak flow rates, from 10% of the 2-year runoff event up to the 10-year runoff event for PDPs. The tool is the SMR Hydrology Model (SMRHM), which is a Hydrologic Simulation Program FORTRAN (HSPF) model based on the South Orange County Hydrology Model. This model allows Users to demonstrate compliance with the Hydrologic Performance Standard defined below through interactive graphic user interface. Details about how to use the model are provided in the 2013 SMRHM Guidance Manual (See APPENDIX G).

2. The Sediment Supply Performance Standard, which consists of the approximate maintenance of pre-project Bed Sediment supply. The general approach that a User must follow to demonstrate compliance with the Sediment Supply Performance Standard is described in **Section 2.3**.

Users managing a PDP must demonstrate compliance with the Hydrologic Performance Standard and the Sediment Supply Performance Standard. Compliance with these standards constitutes compliance with the overall HMP criteria.

As demonstrated in APPENDIX C , the lower flow threshold ($0.1Q_2$) satisfies Section F.1.h.(1)(b) in that it corresponds with the critical channel flow that produces the Critical Shear Stress that initiates channel Bed Sediment movement or that erodes the toe of channel banks of a soft-bottomed channel.

In addition, the Copermittees have selected the lower flow threshold ($0.1Q_2$) based on the results from the Flow Control Threshold Analysis performed for the San Diego HMP. The analysis evaluated the geomorphic stability of a channel under 170 scenarios that are representative of the typical watershed sizes, receiving channel dimensions, channel Bed Sediment, and rainfall conditions in San Diego County. As identified in Appendix C, the SMR is located within the Peninsular Ranges geomorphic zone; hence the results from the San Diego HMP Flow Control Threshold Analysis are applicable to the SMR. A copy of the Flow Control Threshold Analysis is available in APPENDIX J .

Alternatively, the User may put forth other low flow thresholds for individual PDPs, but other low flow thresholds will require site-specific justification, at the User's expense, using modeling or field tests to support the unique threshold value. For those PDPs that chose to perform a site-specific analysis, the selected lower flow threshold must also ensure that it meets the requirements of Section F.1.h.(1)(b) of the 2010 SMR MS4 Permit, i.e. the selected lower flow threshold must correspond to the critical channel flow that produces the critical shear stress that initiates channel Bed Sediment movement or that erodes the toe of channel banks. For a channel segment that is lined but not exempt by this HMP, the low flow threshold must be computed based on a comparable natural channel. The User may consult APPENDIX I to identify a site-specific low-flow threshold, as follows:

- A simplified approach, which consists of a critical flow sensitivity assessment, which provides the User with a general indication that a site-specific low flow threshold may be appropriate, but is not sufficient to quantify the threshold. The approach is consistent with the Flow Control Threshold Analysis, also referenced in APPENDIX J .

- Guidelines for performing a full-scale geomorphic assessment of the stability of the channel receiving runoff from a PDP that may be considered by the Copermittee with jurisdiction over the project site.

The HMP Performance Standard is also applicable to those PDPs that are unable to implement flow duration controls onsite or via a regional or sub-regional BMP that accepts discharges from the project, but is located outside of the project boundaries, but seek compliance through offsite Hydrologic Control BMP projects. The offsite Hydrologic Control BMP project must be capable of matching or reducing the equivalent flow duration curves from the PDP.

This HMP offers an alternate Hydrologic Performance Standard to those PDPs that are unable to implement flow duration matching onsite and offsite, only if the infeasibility is demonstrated and documented to the Copermittee with jurisdiction over the project site. The alternative Hydrologic Performance Standard consists of implementing projects to restore or rehabilitate channels with historic Hydromodification that are tributary to documented low or very low

Index of Biotic Integrity scores. The performance equivalency of a restoration or rehabilitation project must be demonstrated to the Copermittee.

PDPs that either fail to meet both the Hydrologic Performance Standard and the Sediment Supply Performance Standard OR that do not qualify for the Alternate Performance Standard are required to redesign the project.

2.2 Meeting the Hydrologic Performance Standard

The User should consider the full suite of Hydrologic Control BMPs to manage runoff from the post-development condition and meet the Hydrologic Performance Standard identified in this section. The intent of the HMP is not to specify the types of Hydrologic Control BMPs that can be used but rather identify the criteria that must be met, allowing flexibility for PDPs to use the full suite of BMPs to meet the Hydrologic Performance Standard. The User may consider the following in identifying the Hydrologic Control BMPs for incorporation in the design of the PDP:

- LID principles as defined in Section 3.2. of the SMR WQMP;
- Structural LID BMPs that may be modified or enlarged, if necessary, beyond the Design Capture Volume (DCV)
- Structural Hydrologic Control BMPs are distinct from the LID BMPs. The LID BMP Design Handbook provides information not only on Hydrologic Control BMP design, but also on BMP design to meet the combined LID and Hydromodification requirements. The handbook specifies the type of BMPs that can be used to meet the Hydrologic Performance Standard.

LID principles, structural LID BMPs, and structural Hydrologic Control BMPs can each be modeled in the SMRHM. SMRHM has been developed as the primary tool to assist the User in selecting and sizing Hydrologic Control BMPs. SMRHM can be used by the User not only to meet the Hydrologic Performance Standard, but also to meet the LID requirements. SMRHM incorporates additional BMPs that may be investigated by the User. For example, buffer zones for those PDPs adjacent to channels can be modeled and sized the meet the Hydrologic Performance Standard. The User may refer to the SMRHM User Guidance Manual in APPENDIX G for further details on the BMPs available to meet the Hydrologic Performance Standard.

For some PDPs, implementation of onsite Hydrologic Control BMPs consistent with the HMP may not be feasible due to site constraints. There are two Alternative Compliance Options for PDPs that cannot implement onsite Hydrologic Control BMPs:

- Identify and construct offsite Hydrologic Control BMPs; and
- Pay into an HMP management bank, if an HMP management bank is available to the PDP.

The decision matrix that Users should follow to meet the Hydrologic Performance Standard is summarized in **Figure 2**.

Figure 2. Hydrologic Performance Standard – Decision Matrix

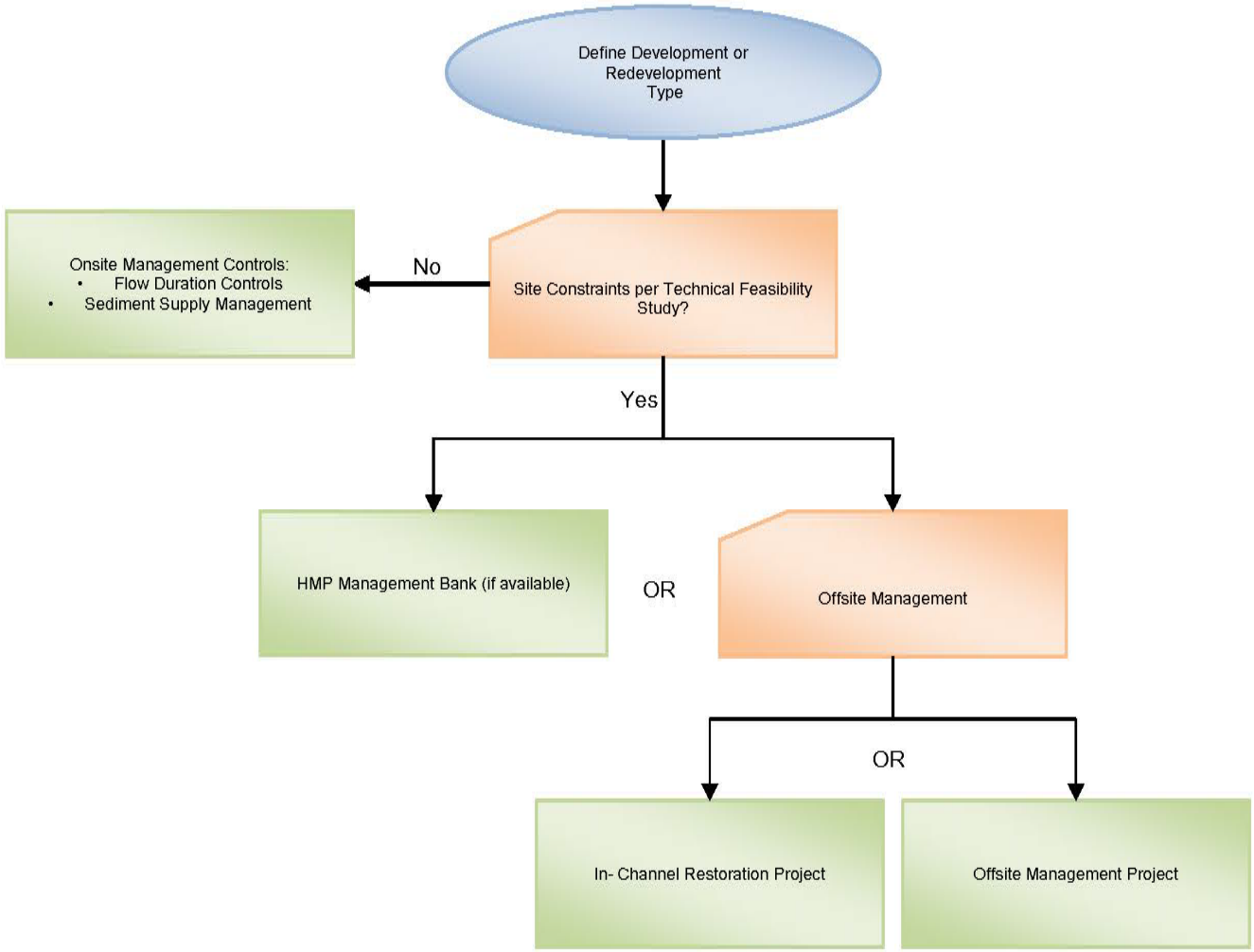

2.2.i Continuous Simulation Modeling

Introduction to the SMR Hydrology Model

Permit Provision F.1.h.(1)(b) identifies that the Hydrologic Performance Standard should be demonstrated based on continuous hydrologic simulation over the entire available rainfall record. As part of the HMP development, an integrated Hydrologic Control BMP sizing tool, SMRHM, has been prepared. The SMRHM has been developed to help Users comply with Hydromodification requirements. This modeling approach is different from the District's calibrated rainfall-runoff procedures and criteria for drainage design, flood control design, and hydrologic management purposes. HMP requirements specified in the 2010 SMR MS4 Permit are separate from the requirements for hydrologic management within the SMR for development effects of runoff per the District's Hydrology Manual. Specific evaluation criteria were developed for the design and analysis of Hydrologic Control BMPs using continuous simulation hydrologic modeling.

Continuous simulation modeling uses an extended time series of recorded precipitation data as input and generates hydrologic output, such as surface runoff, infiltration, and evapotranspiration, for each model time step. Continuous hydrologic models are typically run using either 1-hour or 15-minute time steps. Based on a review of available rainfall records in the SMR, the SMRHM uses 15-minute time series of rainfall data. Continuous models generate model output for each time step. In this case, hydrologic output is generated at each time step (15 minutes) of the continuous model.

Use of the continuous modeling approach allows for the estimation of the frequency and duration by which flows exceed the significant flow range (with a lower flow threshold adopted as 10% of the 2-year flow for this plan, and an upper flow valued adopted as 100% of the 10-year flow for this plan, which is considered the significant flow range). The limitations to increases of the frequency and duration of flows within that geomorphically significant flow range represent the key component to the SMR approach to Hydromodification management.

The SMRHM, along with a SMRHM Guidance Document explaining how to operate the model, is made available to all Users at no cost. The SMRHM is the only software that is approved by the Copermittees. However, the User may opt to develop its own model using publicly-available software, which performs continuous hydrologic simulations over the available period of rainfall record (over 30 years). The use of a different model than the SMRHM is subject to prior approval by the Copermittee with jurisdiction over the project site. The following public domain software models may be used:

- Hydrologic Simulation Program – FORTRAN (HSPF), distributed by the United States Environmental Protection Agency (USEPA)
- Hydrologic Engineering Center – Hydrologic Modeling System (HEC-HMS), distributed by the USACE Hydrologic Engineering Center
- Stormwater Management Model (SWMM); distributed by USEPA

Peak Flow and Duration Statistics

To assess the effectiveness of Hydrologic Control BMPs to meet the Hydrologic Performance Standard, peak flow frequency statistics are required. Peak flow frequency statistics estimate how often flow rates exceed a given threshold. In this case, the key peak flow frequency values are the lower and upper bounds of the geomorphically significant flow range. Peak flow frequency statistics can be developed using either a partial-duration or peak annual series. Partial-duration series frequency calculations consider multiple storm events in a given year while the peak annual series considers just the peak annual storm event.

Flow duration statistics are also summarized to determine how often a particular flow rate is exceeded. To determine if a Hydrologic Control BMP meets the Hydrologic Performance Standard, peak flow frequency and flow duration curves are generated for the pre-development (naturally occurring) condition and the post-project condition. Both pre-development and post-project simulation runs are extended for the entire length of the rainfall record.

The need for partial-duration statistics is more pronounced for Hydrologic Performance Standards based on more frequent return intervals (such as the 2-year runoff event), since the peak annual series does not perform as well in the estimation of such events due to the bimodal nature of the precipitation in Southern California (few wet years with many events, many dry years with few events). This problem is especially pronounced in the SMRs semi-arid climate. After a review of supporting literature, the use of a partial-duration series is recommended for semi-arid climates similar to the climate in the SMR, where prolonged dry periods can skew peak flow frequency results determined by a peak annual series for more frequent runoff events.

For the statistical analysis of the rainfall record, partial duration series events have been separated into discrete unrelated rainfall events assuming the following criteria.

1. A minimum interval of 24 hours between peaks is applied to capture those peaks generated from back-to-back storms.
2. The Weibull plotting method is used to rank the selected peaks by the partial duration method as this method is the most adequate for statistical analysis of Southern California channels, in which wet-weather and dry-weather years produce two populations of flood events.

Rainfall Data

The SMRHM integrates local rainfall data to design Hydrologic Control BMPs. To provide for clear climatic distinction between the Temecula Valley, the western plateau, the northern valley, and the eastern slopes of the SMR, historical records for a series of three rainfall data stations located within or in close proximity to the SMR were compiled, formatted, modulated, and quality controlled for analysis.

Long-term rainfall records of 15-minute intervals have been prepared and made available by the District for these three rainfall stations. The District operates and maintains several rainfall

stations, which feed into the Riverside County Automated Local Evaluation in Real Time (ALERT) telemetry system rain gauges, the California Climatic Data Archive, National Oceanic and Atmospheric Administration (NOAA), the National Climatic Data Center, and the Western Regional Climate Center. For the selected three stations, the length of the overall rainfall station record is a minimum of 37 years.

Gauge selection was further governed by minimum continuous simulation modeling requirements, including the following:

- The selected precipitation gauge data set should exhibit similar meteorological and rainfall trends, especially in terms of intensity and total precipitation depth, to ensure that long-term rainfall records are similar to the anticipated rainfall patterns for the project site. When available, gauges were selected near areas planned for future development and redevelopment.
- Reporting frequency for the gauge data set should be at least hourly, if not at a 15-minute interval. Most of the rainfall stations operated by the District report precipitation in real-time.
- The gauge rainfall data set should extend for the entire length of the record, with a minimum of 37 years.
- Use of the most applicable long-term rainfall gauge data, along with regional scaling of rainfall patterns from a reference station, is required to account for the diverse rainfall patterns across the SMR.

Four meteorological zones were identified and delineated from the rainfall patterns observed from NOAA Atlas 14 precipitation-frequency maps, isohyetal maps from the District's Hydrology Manual (1978), and the professional knowledge of the District's Hydrologic Data Collection Section. Only three precipitation stations were identified as viable for the purpose of continuous simulation because of the available length of precipitation records. Out of the three stations, only one station (Temecula, ID#217) is located within the SMR; the two other stations, Elsinore (ID#067) and San Jacinto (ID#186), are located in close proximity to the SMR. The four meteorological zones are: the Western Plateau covering the Santa Rosa Plateau area, the Temecula Valley, the Wildomar/North Murrieta area, and the Eastern Slopes covering the eastern part of the SMR. For each meteorological zone, a correction factor, which accounts for the variations in depths and intensity observed on the isohyetal maps, is applied independently to the associated precipitation records. The location of the three selected raingage stations and the delineation of the four meteorological zones are shown in **Figure 3**.

Table 1 lists the meteorological zones and the associated rainfall stations. In addition, the period of available record is presented.

Table 1 - SMR Meteorological Zones & Associated Rainfall Stations

Meteorological Zone	Station	15-minute data span
Western Plateau	Temecula (ID#217)	January 1974 – July 2012
Wildomar/North Murrieta	Elsinore (ID#067)	January 1940 – July 2012
Temecula Valley	Temecula (ID#217)	January 1974 – July 2012
Eastern Slopes	San Jacinto (ID#186)	January 1940 – July 2012

All the presented factors have been considered in the selection of the appropriate rainfall data set before inclusion into the SMRHM. For a given project location, the User should refer to the rainfall station map shown in **Figure** and identify the meteorological zone where the proposed project is located. The meteorological zones are integrated in the SMRHM and the appropriate raingage station will be automatically selected by the model upon pinpointing the location on the model's map.

If desirable, the User is allowed to design a project-specific continuous simulation model and must comply with the factors and precipitation zones presented in this section when selecting the associated raingage station.

A rainfall station map associated with this HMP is presented in **Figure 3** for public use. Where possible, rainfall data sets located in the same meteorological zone as the project should be selected.

Figure 3 - Precipitation Zones and Rainfall Stations for the Santa Margarita Region

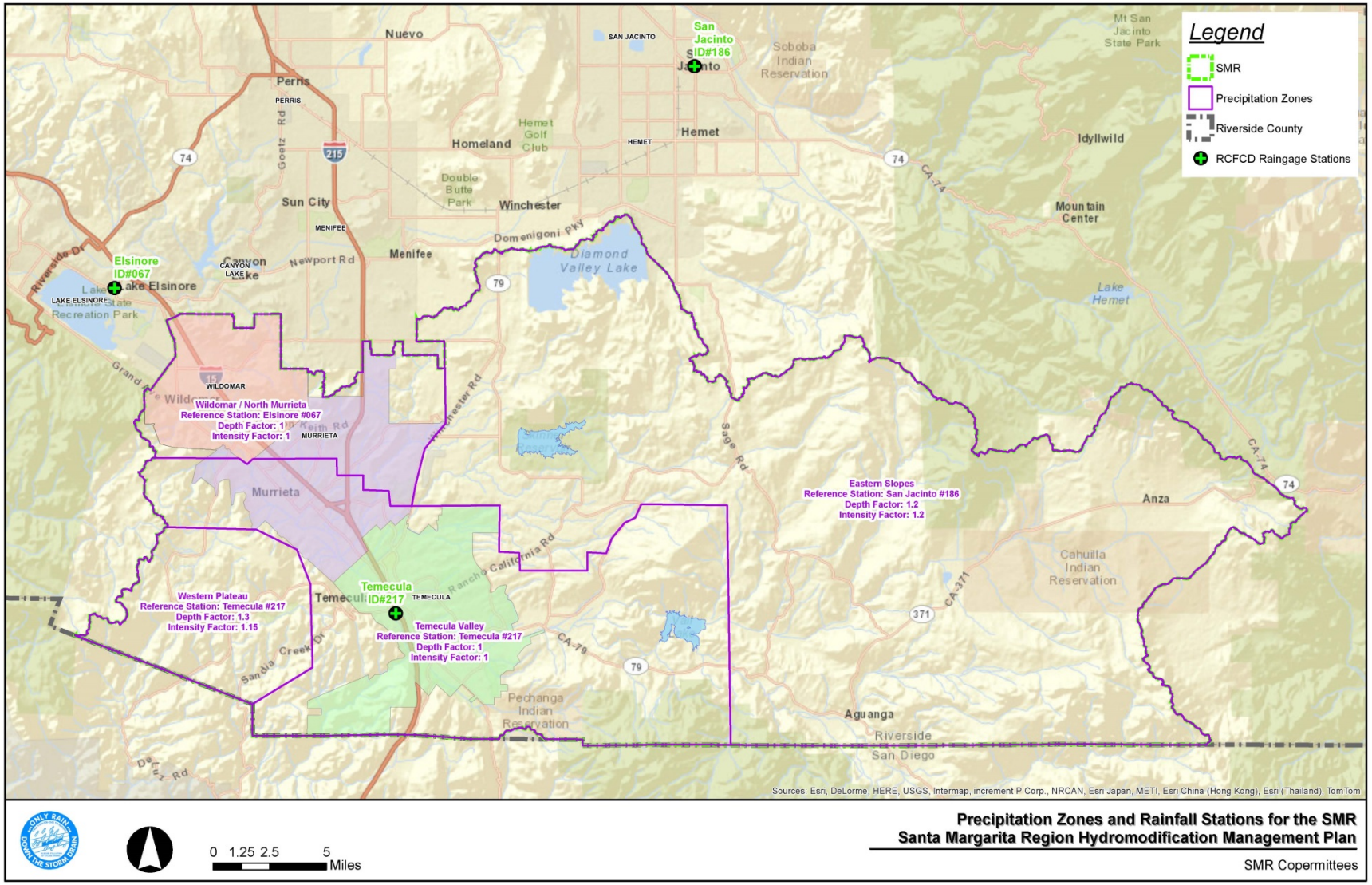

Evapotranspiration Parameters

Hydrologic Performance Standards developed as part of this HMP to control runoff peak flows and durations are based on a continuous simulation of rainfall runoff using locally derived parameters for evaporation and evapotranspiration. Known data sources for potential evapotranspiration data in proximity to the SMR are listed below.

Historical potential evapotranspiration at Elsinore station (CA042805) is considered to best represent the evapotranspiration conditions within the SMR.

Other gauging stations that record potential evapotranspiration were not selected because the period of record did not match with that of the precipitation station, or the local meteorological patterns are not representative of those observed in the SMR. The potential evapotranspiration will be coupled with historical records of temperature to determine the actual daily evapotranspiration. **Table 2** summarizes available sources for potential evapotranspiration in the SMR.

Table 2 - Available Evapotranspiration Sources

Station Name ID	Data Type	Data Source	Recording Frequency	Hourly data span
Elsinore (CA042805)	Potential Evapotranspiration	BASIN	Hourly	August 1948 – November 2005

Long-term evaporation / evapotranspiration data sets are being generated to correspond with long-term rainfall records. The final selection of rainfall loss parameters and evaporation data is part of the SMRHM development process.

In summary, the published literature reviewed as part of this study support the methods and approach taken in developing the SMR HMP.

2.2.ii Identification of naturally-occurring conditions

Section F.1.h.(d) of the 2010 SMR MS4 Permit requires that estimated post-project runoff discharge rates and durations shall not exceed pre-development (naturally occurring) discharge rates and durations. Compliance with this Permit requirement should be based on the results of continuous simulation and the use of the SMRHM or an approved equivalent model. As part of developing the supporting hydrology model for a PDP, a User must identify and document, using professional knowledge, pre-development (naturally occurring) conditions in terms of geology, topography, soils, and vegetation.

Several publicly-available information sources may help the User characterize pre-development conditions, including:

- Soil database (#678, #679, and #680) from the Natural Resources Conservation Service (NRCS). Among the parameters of interest, the database identifies the type, the original range of observed topographic slopes, the soil erosion factor K, and, if available, plant

community information for the native or pre-development soil. The database is accessible through the Web Soil Survey page (http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm).

- Vegetation and ecoregional GIS information listed by the U.S. Forest Services. The USEPA Ecoregion database information locates the SMR in the Southern California Mountains and Valleys Ecoregion and references the climate of humid and temperate Mediterranean type. The USEPA Ecoregion database identifies also the vegetation province of the SMR within the California Coastal Range Open Woodland-Shrub-Coniferous Forest-Meadow province. A historical CALVEG GIS vegetation layer is available for the year 1977 (USFS, 2000). The historical vegetation layer reveals a majority of evergreen chaparral shrub and scrub oak within the watershed. For those areas located within the Urban Land and Agriculture vegetation area, the User may select the shrub vegetation for pre-development, naturally occurring, conditions. **Figure 4.** Historical Vegetation and Ecoregions in the Santa Margarita Region delineates the distribution of historical vegetation types in the SMR. GIS-based layers are available on the USFS website: (http://www.fs.usda.gov/detail/r5/landmanagement/gis/). Consistent with historical aerials, the User should select Shrub as the native vegetation, if the PDP is located in an urban/agricultural area on the 1977 CALVEG GIS layer.
- Other historical USGS topographic maps and aerial photos of Riverside County, specifically of the SMR area, are publicly available from the USGS website.

Figure 4. Historical Vegetation and Ecoregions in the Santa Margarita Region

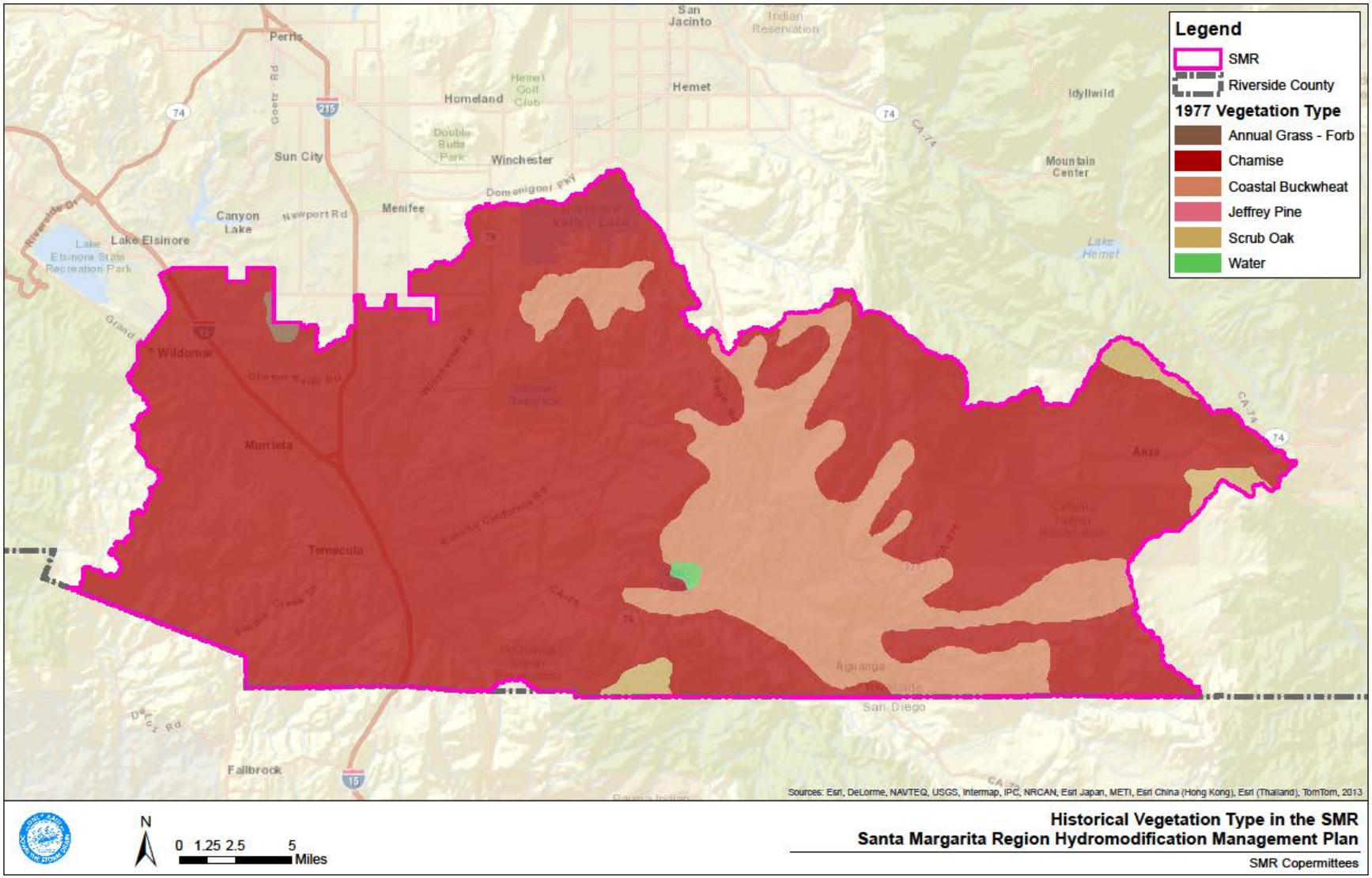

2.2.iii Hydrologic Control BMPs

As identified in **Section 2.2.i**. PDPs are encouraged to use the full suite of Hydrologic Control BMPs available to meet the Hydrologic Performance Standards. The intent of the HMP is not to specify the types of Hydrologic Control BMPs that can be used but rather identify the criteria that must be met.

Selection and design of Hydrologic Control BMPs is an iterative process that can be facilitated using the SMRHM. The SMRHM has a comprehensive menu of site design LID BMPs and Hydrologic Control BMPs that can be selected for PDPs. The design parameters for these Hydrologic Control BMPs have been incorporated into the model and can be modified to an extent based on site constraints. The User is invited to refer to the SMRHM Guidance Document that is referenced in APPENDIX G for SMRHM specific questions.

Hydrologic Control BMPs must be maintained for optimal operation. PDPs are conditioned to provide verification of inspections and maintenance operations as defined in Section H of the SMR WQMP Template that must be completed in its entirety prior to the issuance of a grading permit. The list of such inspections and maintenance operations must be included in the WQMP for the PDP submitted by the User. Maintenance activities must ensure that the Hydrologic Control BMPs are functioning as designed.

2.2.iv Alternative Compliance Options

The use of Alternative Compliance Options will require coordination with the Copermittee with jurisdiction over the project site and may also require coordination with other Copermittee(s) with jurisdiction over an offsite location where a Hydrologic Control BMP may be proposed. For some PDPs, implementation of onsite Hydrologic Control BMPs consistent with the HMP may not be feasible due to site constraints. These projects require alternatives to onsite Hydrologic Control BMPs. There are two Alternative Compliance Options for PDPs that cannot implement onsite Hydrologic Control BMPs. One option is for the User to identify and construct offsite Hydrologic Control BMPs. The other option is for the PDP to pay into an HMP Management Bank, if an HMP Management Bank option is available.

HMP Alternative Compliance Option 1: Offsite Hydrologic Control Management

A progression through a defined process is required to document eligibility then implementation of alternative HMP compliance. Offsite Hydrologic Control management is based on completing a series of steps to meet compliance that is consistent with Section F.1.h.(3) of the 2010 SMR MS4 Permit. These steps include the following:

1. Technical feasibility study of onsite Hydrologic Control BMPs; and
2. Offsite Hydrologic Control BMP project within the same hydrologic unit as the PDP or in-channel restoration of a channel receiving runoff from the PDP.

Step 1: Conduct a technical feasibility study for onsite Hydrologic Control BMPs

A technical feasibility study is required to identify why onsite Hydrologic Control BMPs cannot be incorporated into the PDP. The technical feasibility study must include the project constraints and provide detailed technical justification as to why the project constraints prevent implementation of onsite Hydrologic Control BMPs. The technical feasibility study will be submitted to the Copermittee with jurisdiction over the project site for review as part of the Preliminary WQMP. The Copermittee must approve the findings of the technical feasibility study before the PDP moves on to Step 2.

The Hydrologic Control BMP technical feasibility study will be incorporated into the SMR WQMP Template and integrated with the LID feasibility analysis; however, it should be noted that the criteria for Hydrologic Control BMP and LID requirements are different. The feasibility analysis for both Hydrologic Control BMPs and LID will be integrated into one feasibility study for the PDP and submitted with the Preliminary WQMP.

The technical feasibility study should:

- Provide a narrative regarding the applicability of LID principles onsite as required by the SMR WQMP;
- Evaluate the feasibility of infiltration to capture partially or in its entirety the DCV based on the presence of either low infiltrating soils or high groundwater level, proximity to a water well or a contaminated plume, or a geotechnical report precluding effective and safe infiltration;
- Evaluate the feasibility of harvest-and-use BMPs based on local water demands;
- Evaluate the feasibility of implementing detention or retention BMPs onsite based on critical geotechnical considerations such as collapsible soil, expansive soil, slopes, liquefaction and other factors identified by a registered Geotechnical Engineer. The feasibility to implement Hydrologic Control BMPs and meet the Hydrologic Performance Standard onsite may be principally dictated by the geotechnical considerations.

Step 2: Implement offsite Hydrologic Control BMP projects within the same channel system as the PDP (2a) or implement in-channel restoration or rehabilitation of the PDP receiving water (2b)

For those PDPs where the Hydrologic Control BMP technical feasibility study for onsite controls has been approved by the Copermittee with jurisdiction over the project site, step 2 is to either (a) implement an offsite Hydrologic Control BMP project within the same channel system as the PDP, or (b) implement an in-channel restoration project for the channel receiving runoff from the PDP. The process for these options under Step 2 is detailed below:

HMP Alternative Compliance Option 1 – Step 2a: Implement Offsite Hydrologic Control Project within the Channel System receiving runoff from the PDP

In choosing this option, the PDP must investigate potential locations for implementation of an offsite Hydrologic Control project within the channel system receiving runoff from the PDP. If the User demonstrates that an offsite Hydrologic Control project is not feasible in the channel system receiving runoff from the PDP, then an offsite Hydrologic Control project in the same hydrologic unit as the PDP may be approved. The offsite Hydrologic Control project must manage the incremental impact from not achieving the pre-development (naturally occurring) runoff flow rates and durations for the project site. Sizing of offsite Hydrologic Control projects may be accomplished using the SMRHM. The User will evaluate and identify potential sites in the channel system receiving runoff from the PDP, and if not feasible, then evaluate projects in the same hydrologic unit for implementation of an offsite Hydrologic Control project that has the capacity to provide the PDPs Hydrologic Performance Standard requirements. If an Adequate Sump is identified in the channel system receiving runoff from the PDP, the User will submit a report detailing:

- That the offsite Hydrologic Control project manages the incremental impact from the pre-development (naturally occurring) runoff flow rates and durations for the project site;
- Conceptual plans for the offsite Hydrologic Control project as part of an amended WQMP for review and approval;
- If the PDP is a redevelopment project, that the post-project runoff flow rates and durations do not exceed pre-project runoff flow rates and durations; and
- If no potential offsite Hydrologic Control project sites are identified in the channel system receiving runoff from the PDP, that there is an offsite Hydrologic Control project in the same hydrologic unit.

If no potential offsite Hydrologic Control project sites are identified in the same hydrologic unit as the PDP, the PDP must implement Option 2(b), a restoration or rehabilitation project in the channel system with historic Hydromodification and receiving runoff from the PDP.

HMP Alternative Compliance Option 1 – Step 2b: Implement In-Channel Restoration or Rehabilitation of the Channel Receiving Runoff from the PDP

In choosing this option, the PDP investigates the potential for implementation of an in-channel restoration or rehabilitation project for the channel receiving runoff from the PDP. It must be determined that the channel receiving runoff from the PDP has experienced historic Hydromodification. The in-channel restoration or rehabilitation project must be located in the channel receiving runoff from the PDP. The PDP must submit a report detailing the historic Hydromodification, as well as conceptual plans for the in-channel restoration or rehabilitation project to the Copermittee with jurisdiction over the project site for review. The Copermittee is responsible for ensuring that the level of restoration or rehabilitation is adequate given the potential Hydromodification impacts of the PDP. Copermittees maintain individual processes

consistent with their approval procedures to ensure that the User's obligations under the HMP alternative compliance process are completed prior to approval of the PDP.

Once the project conceptual plans have been approved by the Copermittee with jurisdiction over the project site, the User must submit required permit applications to the appropriate regulatory agencies (e.g., SDRWQCB, California Department of Fish and Wildlife, USACE) for review and approval. If the PDP identifies no opportunities for in-channel restoration or rehabilitation in the channel receiving runoff from the PDP, then the PDP must implement Option 2(a), an offsite Hydrologic Control project within the same hydrologic unit as the PDP.

HMP Alternative Compliance Option 2: HMP Management Bank Alternative Compliance Option

(Note: Option 2 is available only if an HMP management bank has been developed and is available to the PDP.)

The Copermittees have the option to develop an HMP Management Bank or multiple HMP Management Banks. A HMP Management Bank will develop regional HMP management projects where PDPs can buy HMP management credits if it is determined that implementing onsite Hydrologic Control BMPs is infeasible. The development and operation of an HMP Management Bank will include the identification of potential regional Hydrologic Control projects; the planning, design, permitting, construction, and maintenance of regional Hydrologic Control projects; the development of a fee structure for PDPs participating in the HMP Management Bank; and managing the HMP Management Bank fund. Regional Hydrologic Control projects can also serve as projects for an LID waiver program if site conditions allow for implementation of LID-type projects.

If PDPs are unable to meet the Hydrologic Performance Standard by incorporating onsite Hydrologic Control BMPs, and a HMP Management Bank is available, the PDP can apply to participate in the Bank. The application must include a technical feasibility study to identify why onsite Hydrologic Control BMPs cannot be incorporated into the PDP. The technical feasibility study must include the project constraints and detailed technical justification as to why the project constraints prevent implementation of onsite Hydrologic Control BMPs. The technical feasibility study will be submitted to the Copermittee with jurisdiction over the project site for review as part of the Preliminary WQMP. The Copermittee must approve the Hydrologic Control BMP technical feasibility study for the PDP to participate in a HMP Management Bank.

2.3 Meeting the Sediment Supply Performance Standard

Bed Sediment Supply from PDPs plays a role in the stability of alluvial channels. As identified in APPENDIX C , a change in Bed Sediment Load may cause instability in the receiving channel manifested through general scour or aggradation. Lateral bank migration may also result from changes in Bed Sediment Load as the channel slope increases or decreases.

Bed Sediment typically includes coarse sand (1-2 mm) and thicker sediment sizes. The User may refer to the classification table (Table 14 of APPENDIX I) for a full listing of sediment sizes and associated critical shear stresses.

Bed Sediment Supply to a receiving channel during construction may increase as land surface is cleared and the potential for erosion is increased. Once the land surface is urbanized, the potential for Bed Sediment Supply may be reduced as compared to the pre-development condition. The purpose of this portion of the HMP is to maintain the pre-development supply of Bed Sediment to receiving channels following urban development. Total Sediment Load consists of the Bed Sediment Load that includes both material moving along the bed by rolling, sliding or Saltation) and coarse sand (1-2 mm) that is transported in near-suspension by the velocity of flow, and the Wash Load that includes clays, silts and fine sand (under 1 mm). Bed Sediment Load is a primary variable controlling channel morphology. Wash Load is the portion of the total sediment load carried continuously in suspension by the flow. Changes in Wash Load are not likely to significantly affect the channel stability, and reductions in Wash Load are generally assumed to improve habitat function.

The resiliency of channels to forestall changes due to urban development varies with the magnitude of the change and characteristics of the channel (bed and bank sediment, vegetation, channel cross-section and slope). It is difficult to quantitatively predict the response in a channel receiving runoff from urban development to changes in the fundamental variables described by Lane (1955) of discharge, Bed Sediment grain size, channel slope and Bed Sediment Load. Accordingly, the most effective approach to ensuring channel stability may be to avoid changes in the fundamental variables (Lane's interrelationship) during urban development through the implementation of channel management guidelines. In the case of Bed Sediment Load, this will be accomplished by avoiding development in areas that are a Significant Source of Bed Sediment Supply to a channel. The User must identify the areas on the project site that are a Significant Source of Bed Sediment Supply. The determination will be performed following the three-step process, as described in **Section 2.3.i**.

The general approach to ensure maintenance of the pre-project Bed Sediment Supply is a three-step process:

1. Determine whether the portion of the site is a Significant Source of Bed Sediment Load to the channel receiving runoff from the PDP.
2. Avoid areas identified as Significant Sources of Bed Sediment Supply in the PDP design.
3. Site-specific alternative compliance measures.

In the event of a projected reduction in Bed Sediment Supply, the User must investigate the feasibility of Sediment Supply BMPs, including bypassing the flux of Bed Sediment Supply from Significant Source areas onsite, otherwise maintaining pre-project Bed Sediment Supply from the site, or providing additional management of site runoff to accommodate the reduced Bed Sediment Supply. Specific guidance on sediment management measures will be provided in the SMR WQMP Template. Specifically, the SMR WQMP Template includes a Section for performing a Bed Sediment Supply assessment, which:

- Identifies the conditions for exemption from the Sediment Supply Performance Standard, if any;
- Summarizes the results of the three-step approach and identifies, for each step, the documentation required for approval of the evaluation by the Copermittee with jurisdiction over the project site. Documentation may include:
    - Results from the geotechnical and sieve analysis, the soil erodibility factor, a description of the topographic relief of the project area, and the lithology of onsite soils;
    - Results from the analyses of the sediment delivery potential to the channel receiving runoff from the project site, including the sediment source, the distance to the receiving channel, the onsite channel density, the PDP watershed area, the slope, length, land use, and rainfall intensity;
    - Quantification of the bank stability investigation, including the degree of incision, a gradation of the Bed Sediment, and identification if the receiving channel is sediment supply-limited.
- Provides a site map that identifies all onsite channels and highlights those that were identified as a Significant Source of Bed Sediment Supply. The site map must demonstrate if feasible, that the site design avoids those project site channels that may be a Significant Source of Bed Sediment Supply. In addition, the User must describe the characteristics of each channel on the project site identified as a Significant Source of Bed Sediment Supply. If the design plan cannot avoid the channels on the project site, the User should provide a rationale for each channel individually.

An Alternative Compliance Option allows the User to model the site conditions and the channel receiving runoff from the project site and provide additional management of site runoff to compensate for the reduction (or addition) of Bed Sediment Load. This option may only be used if the general approach outlined above is deemed infeasible by the Copermittee with jurisdiction over the project site, or if the project site design requires significant alteration of channel(s) on the project site. Step 1 of the three-step approach describes how channels on the project site should be identified and characterized by the User.

The stepwise approach that Users should follow to meet the Sediment Supply Performance Standard is summarized in **Figure 5**.

Figure 5 - Sediment Supply Performance Standard – Stepwise Approach

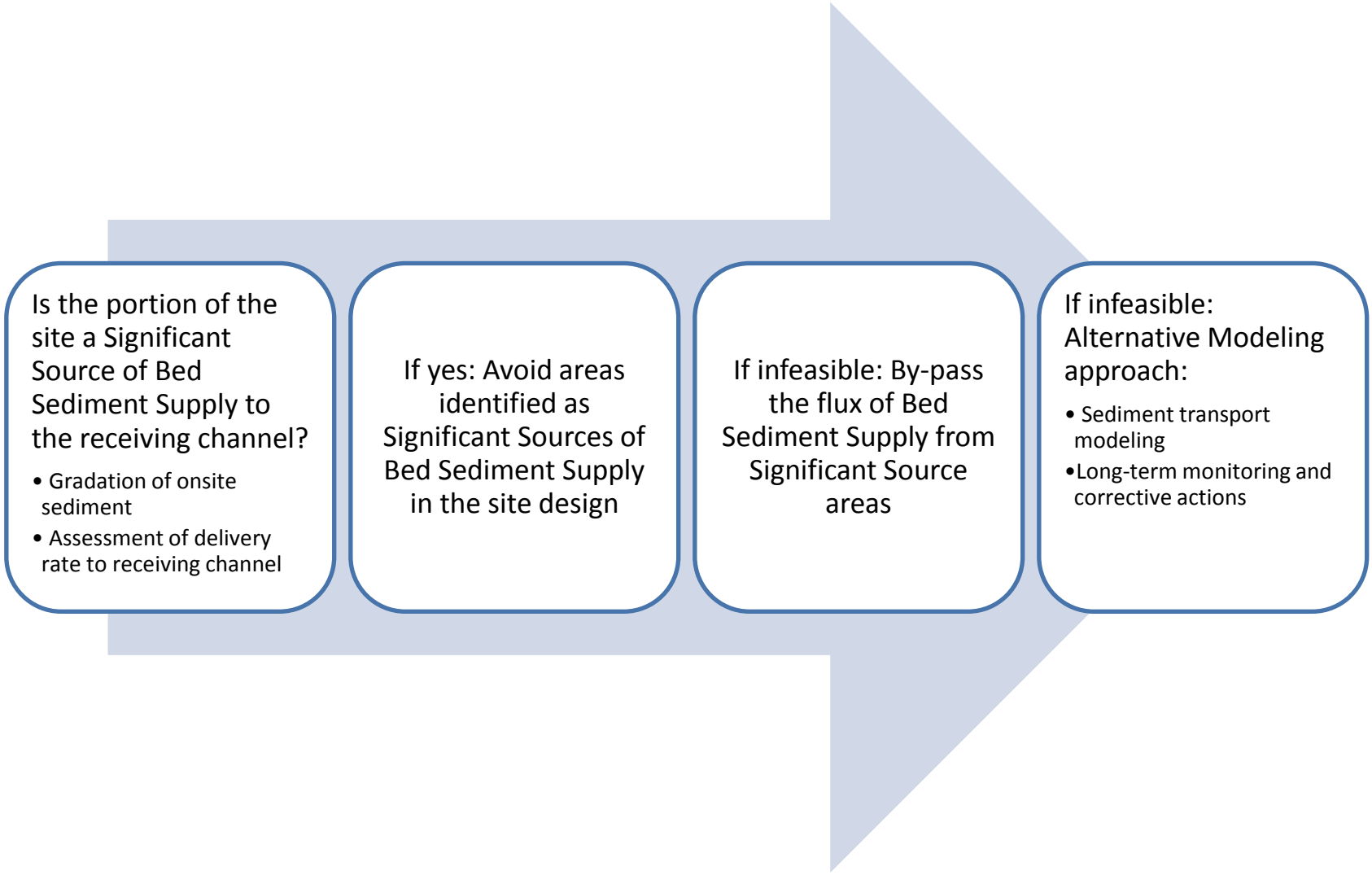

2.3.i Three-Step Process

The User must determine the location of the alluvial channel receiving runoff from the project site. The first such channel that is unlined (invert, side slopes or both) will serve as the "assessment" or "receiving" channel for the PDP. The following methodology will be used to ensure that the PDP does not adversely impact the delivery of Bed Sediment Supply to the assessment channel.

Step 1: Determine whether the Portion of the Project Site is a Significant Source of Bed Sediment Supply to the Channel Receiving Runoff

A triad approach will be completed to determine whether the project site is a Significant Source of Bed Sediment Supply to the channel receiving runoff and includes the following components:

A. Site soil assessment, including an analysis and comparison of the Bed Sediment in the receiving channel and the onsite channel;

B. Determination of the capability of the channels on the project site to deliver the site Bed Sediment (if present) to the receiving channel; and

C. Present and potential future condition of the receiving channel.

Prior to performing a site-specific triad assessment, the User should refer to the macro-scale findings of the HRU/GLU Analysis performed as part of the SMR Hydromodification Susceptibility Study (APPENDIX D). The HRU/GLU Analysis will provide the designer with critical geomorphic information for the subwatershed where the PDP is located, including the impacts of existing imperviousness on the hydrologic cycle and the potential for sediment production.

A. Site soil assessment, including an analysis and comparison of the Bed Sediment in the channel receiving runoff and the onsite channels

A geotechnical and sieve analysis is the first piece of information to be used in a triad approach to determine if the project site is a Significant Source of Bed Sediment Supply to the assessment channel. An investigation must be completed of the assessment channel to complete a sieve analysis of the Bed Sediment. Two samples will be taken of the assessment channel using the "reach" approach (TS13A, 2007). Samples in each of the two locations should be taken using the surface and subsurface bulk sample technique (TS13A, 2007) for a total of four samples. Pebble counts may be required for some channels.

A similar sampling assessment should be conducted on the project site. First-order and greater channels that may be impacted by the PDP (drainage area changed, stabilized, lined or replaced with underground conduits) will be analyzed in each subwatershed. First-order channels are identified as the unbranched channels that drain from headwater areas and develop in the uppermost topographic depressions, where two or more contour crenulations (notches or

indentations) align and point upslope (NEH, 2007). First-order channels may, in fact, be field ditches, gullies, or ephemeral gullies (NEH, 2007). One channel per subwatershed that may be impacted on the project site must be assessed. A subwatershed is defined as tributary to a single discharge point at the project site boundary.

The sieve analysis should report the coarsest 90% (by weight) of the sediment for comparison between the site and the assessment channel. The User should render an opinion if the Bed Sediment found on the site is of similar gradation to the Bed Sediment found in the receiving channel. The opinion will be based on the following information:

- Sieve analysis results
- Soil erodibility (K) factor
- Topographic relief of the project area
- Lithology of the soils on the project site

The User should rate the similarity of onsite Bed Sediment and Bed Sediment collected in the receiving channel as high, medium, or low. The rating should be consistent with Figures 4 through 6 of the Hydromodification Susceptibility Report and Mapping: SMR (See APPENDIX D). This site soil assessment serves as the first piece of information for the triad approach.

B. Determination of the capability of the onsite channels to deliver Bed Sediment Supply (if present) to the channel receiving runoff from the project site.

The second piece of information is to qualitatively assess the sediment delivery potential of the channels on the project site to deliver the Bed Sediment Supply to the channel receiving runoff from the project site, or the Bed Sediment delivery potential or ratio. There are few documented procedures to estimate the Bed Sediment delivery ratio (see: Williams, J. R., 1977: Sediment delivery ratios determined with sediment and runoff models. IAHS Publication (122): 168-179, as an example); it is affected by a number of factors, including the sediment source, proximity to the receiving channel, onsite channel density, project sub-watershed area, slope, length, land use and land cover, and rainfall intensity. The User will qualitatively assess the Bed Sediment delivery potential and rate the potential as high, medium, or low.

C. Present and potential future condition of the channel receiving runoff from the project site.

The final piece of information is the present and potential future condition of the channel receiving runoff from the project site. The User should assess the receiving channel for the following:

- Bank stability - Receiving channels with unstable banks may be more sensitive to changes in Bed Sediment Load.

- Degree of incision - Receiving channels with moderate to high incision may be more sensitive to changes in Bed Sediment Load.
- Bed Sediment gradation - Receiving channels with more coarse Bed Sediment (such as gravel) are better able to buffer change in Bed Sediment Load as compared to beds with finer gradation of Bed Sediment (sand).
- Transport vs. supply limited channels. Receiving channels that are transport limited may be better able to buffer changes in Bed Sediment Load as compared to channels that are supply limited.

The User will qualitatively assess the channel receiving runoff from the project site using the gathered observations and rate the potential for adverse response based on a change in Bed Sediment Load as high, medium, or low.

In addition to the findings of the macro-scale HRU/GLU Analysis, the User should use the triad assessment approach, weighting each of the components based on professional judgment to determine if the project site provides a Significant Source of Bed Sediment Supply to the receiving channel, and the impact the PDP would have on the receiving channel. The final assessment and recommendation must be documented in the HMP portion of the WQMP.

The recommendation may be any of the following:

- Site is a Significant Source of Bed Sediment Supply – all channels on the project site must be preserved or by-passed within the site plan.
- Site is a source of Bed Sediment Supply – some of the channels on the project site must be preserved (with identified channels noted).
- Site is not a Significant Source of Bed Sediment Supply.

The final recommendation will be guided by the triad assessment. Projects with predominantly "high" values for each of the three assessment areas would indicate preservation of channels on the project site. Sites with predominantly "medium" values may warrant preservation of some of the channels on the project site, and sites with generally "low" values would not require site design considerations for Bed Sediment Load.

The User should also assess if the receiving channel has been altered either for alignment, cross section, or longitudinal grade, or has degraded to the extent that an in-channel restoration or rehabilitation project would be required to restore the functions and values of the channel bed. In such cases, the User should discuss options for participating in an in-channel project in lieu of onsite design features to preserve the Bed Sediment Supply.

Step 2: Avoid Areas Identified As Significant Sources of Bed Sediment Supply in the Site Design

If the analysis in Step 1 indicates that some or all of the channels on the project site must be preserved as a source of Bed Sediment Supply to the receiving channel, the site plan should be

developed to avoid impacting the identified channels. The User will designate channels on the project site that should be avoided to preserve the discharge of Bed Sediment Supply from the site. The User may consider the factors discussed above when determining whether a specific channel on the project site is a Significant Source of Bed Sediment Supply and should be preserved.

Step 3: Site-Specific Alternative Compliance Measures

If it is infeasible to avoid channels on the project site that are Significant Sources of Bed Sediment Supply in the design of the site plan, the drainage(s) may be by-passed to maintain the Bed Sediment Supply to the receiving channel. The User will need to prepare specific designs to achieve this objective.

2.3.ii Alternative Compliance Option

An Alternative Compliance Option may only be pursued if the replacement of Bed Sediment Supply is deemed infeasible by the Copermittee with jurisdiction over the project site, or if the project site design requires significant alteration of onsite channels. The infeasibility of the different Sediment Supply BMPs stated in the general approach may only be demonstrated and documented by the User. The User may also demonstrate the expected feasibility of the Alternative Compliance Option.

In such an eventuality, Users may propose an Alternative Compliance Option for Bed Sediment management from a PDP based on numerical modeling. This option would generally include a long-term monitoring program, with potential corrective measures to be identified and implemented as needed in response to findings from the monitoring program. The use of an Alternative Compliance Option derives from Lane's interrelationship that conceptualizes the balance between hydrologic and geomorphic processes for alluvial channels.

For example, the User may recommend an annual replenishment of Bed Sediment Load downstream of the project site based on an estimation of the amount of reduction of Bed Sediment Supply from the project site as a result of development.

The general steps to estimate the average annual replacement of Bed Sediment Load are:

1. Identify the sources of Total Sediment Supply based on a geotechnical review of the site. Areas that are not a Significant Source of Bed Sediment Supply may be omitted from the analysis.
2. Estimate the base erosion rate of areas identified as sources of Total Sediment Supply. This estimate should be completed using the Modified Universal Soil Loss Equation (MUSLE) and a 2-year runoff return period.
3. Approximate the sediment delivery ratio of sources. This can be done using published values for the area or estimated values based on best professional judgment.
4. Evaluate the Bed Sediment proportion of sources and calculate the yield rate. The Bed Sediment proportion of the sources should be determined by comparing the sieve

analysis in the channel with that in the identified supply areas on the project site. The yield is computed by multiplying the total yield, by the Bed Sediment proportion and the sediment delivery ratio.

5. Identity sources of Bed Sediment Supply to be eliminated after development. This is performed based on a review of the site plan.
6. Calculate and compare the total pre- and post-development Bed Sediment Supply yield to estimate the average annual amount of Bed Sediment that should be replenished to the channel.

Alternatively, the User may propose adjusting the flow duration curve to maintain pre-project conditions in the receiving channel with the expected change in Bed Sediment Supply discharge from the project site. The erosion potential (total sediment transported in the proposed condition vs. the baseline) should be modeled and used to adjust the flow duration curve to ensure a condition that does not vary more than 10% from the natural condition. Bledsoe (2002) introduced the index of stream erosion potential (Ep), which compares the erosive power of pre- and post-development streamflows. This index allows comparison of sediment-transport relationships to ensure that an erosion potential that is comparable to pre-development conditions is achieved. Changes in Total Sediment Supply after development are accounted for by changing the target Ep from 1.0 (proposed is the same as pre-project) in proportion to the change in Bed Sediment Supply (post-development/pre-development), calculated using the six steps above. This option may not be practical when changes in Bed Sediment Supply are relatively large (greater than 50%). The User should determine, using best professional judgment, if the alternative modeling approach is applicable.

The alternative modeling approach must include the following:

1. Continuous hydrologic simulation for the project baseline condition and proposed condition over the range of flow values up to the pre-project 10-year event;
2. Sediment transport model of the receiving channel for the PDP baseline condition and proposed condition;
3. Analysis of the change in Bed Sediment Supply from the PDP baseline condition to the proposed condition;
4. Explanation of method used to control the discharge from the PDP to account for changes in the delivered Bed Sediment Supply; and
5. Summary report.

Channel systems and fluvial processes react to changes in the watershed as to progressively evolve to a dynamic equilibrium. However, the SMR is geomorphically highly dynamic due to natural conditions including topography, vegetative cover and soils, and may only achieve dynamic equilibrium in geologic time (i.e., many thousands of years). The alternative Hydrologic Performance Standard for this option consists of evaluating the changes in both Bed Sediment Supply and hydrologic changes caused by a PDP. The User must demonstrate through a channel stability impact assessment that the changes to both the amount of Bed Sediment Load being transported and the amount of sediment supplied to the receiving channel

will maintain the general trends of aggradation and degradation in the different impacted channel reaches, which are representative of the pre-development geormorphologic state of a channel. Typical channel sediment continuity analysis procedures may be performed using moveable bed fluvial models such as HEC-6t or equivalent.

Receiving channel monitoring may be required for the project site to verify that the PDP does not result in long-term changes to the receiving channel. The User should make a recommendation if long-term monitoring is required, for concurrence by the Copermittee with jurisdiction over the project site. Some of the considerations in assessing the need for a long-term monitoring program are:

1. Total area of the watershed at the PDP discharge point vs. the PDP area;
2. Condition and type of receiving channel;
3. Magnitude of change in Bed Sediment Supply to the receiving channel;
4. Relief of the land on the project site;
5. Number of channels (density) potentially delivering Bed Sediment Supply to the receiving channel, and the delivery ratio; and
6. Soil characteristics on the project site.

Site-specific modeling is discussed further in APPENDIX H .

2.4 Mechanisms to Assess and Address Cumulative Impacts

The Copermittees have developed the SMR HMP Evaluation Program, which defines both a Hydromodification monitoring approach and a performance protocol as required by provisions F.1.h. (1)(e) and F.1.h. (1)(m) of the 2010 SMR MS4 Permit. Section F.1.h.(1)(e) requires the definition of a protocol to evaluate the potential hydrograph change impacts to downstream channels from PDPs to meet the range of runoff flows identified under section F.1.h.(1)(b).

The HMP Evaluation Program includes a description of inspections and maintenance of Hydrologic Control and Sediment Supply BMPs, as well as a protocol to address cumulative impacts of PDPs within a watershed on channel morphology. The protocol includes the evaluation of changes to physical features of the receiving channels and biological conditions of the receiving channels downstream of the areas where PDPs are developed. The Evaluation Program will assess the cumulative impacts of PDPs through the performance protocol.

A mechanism has been defined in the Evaluation Program to identify the causes of further geomorphologic changes to the channels and address the cumulative impacts of PDPs, if any. The findings of the initial monitoring efforts may trigger refinements improving the Hydrologic and Sediment Supply Performance Standards, to manage the impacts of PDPs on the geomorphology and the biological integrity of receiving channels.

3.0 HMP Requirements for Projects

Per 2010 SMR MS4 Permit Provision F.1.h(1)(d), this chapter identifies where in the SMR and under what circumstances do the HMP Performance Standards apply to PDPs. The HMP identifies the coverage areas that are exempted from Hydromodification requirements based on Permit Provisions, the state of the Hydromodification science, the practicality of implementation of Hydrologic Control BMPs, environmental benefits of the implementation of Hydrologic Control BMPs, and approved Hydromodification exemptions for other jurisdictions in California.

Users may refer to the HMP Decision Matrix presented in **Section 3.1** to determine if Hydrologic Control and/or Sediment Supply BMPs are required. When required, the HMP Decision Matrix will direct the User to the adequate sections of this HMP describing the Hydrologic Control and Sediment Supply BMPs to be implemented based on the project type and size.

3.1 HMP Applicability Requirements

3.1.i HMP Decision Matrix

To determine if a proposed project must implement Hydrologic Control BMPs, refer to the HMP Decision Matrix in **Figure 6.**

The HMP Decision Matrix can be used for all projects. PDP categories are based on the size and type. Their associated requirements are defined in **Section 3.3**.

It should be noted that all PDPs are subject to the 2010 SMR MS4 Permit's LID and water quality treatment requirements even if Hydrologic Control BMPs are not required.

Figure 6 - SMR HMP Decision Matrix

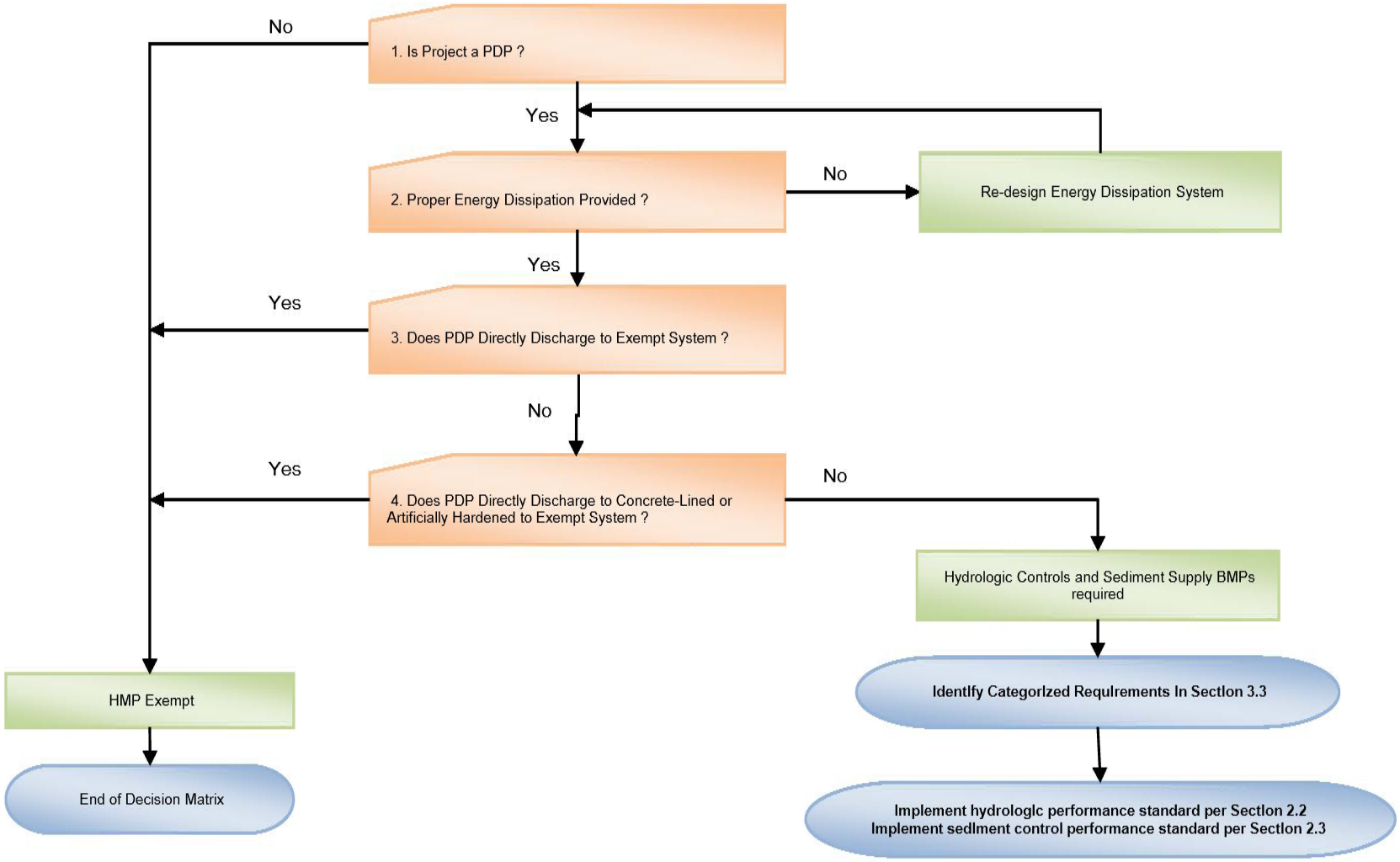

- **Figure 6**, Node 1 – Hydrologic Control BMPs are only required if the proposed project is a PDP, as defined per 2010 SMR MS4 Permit Section F.1.d.
- **Figure 6**, Node 2 – Properly designed energy dissipation systems are required for all PDP outfalls to unlined channels. Such systems should be designed in accordance with the District Standard Drawings and the 1982 Los Angeles County Flood Control District Hydraulic Design Manual or approved alternative to ensure downstream channel protection from concentrated outfalls (identified in **Section 3.1.ii)**.
- **Figure 6**, Node 3 – Exemptions may be granted for PDPs discharging runoff directly to an exempt receiving water, such as Vail Lake or Skinner Lake, or to an exempt channel discharging directly into a large river channel (identified in **Table 3**).
- **Figure 6**, Node 4 – For PDPs discharging runoff directly to a concrete-lined or artificially hardened MS4 facility that has the capacity to convey the 10-year ultimate condition discharge that extends to exempt receiving waters detailed in Node 3, exemptions from HMP Performance Standards may be granted. Such concrete-lined or artificially hardened MS4 facilities that have the capacity to convey the 10-year ultimate condition discharge, include storm drain and channel reaches that have been identified as not-susceptible to Hydromodification (see SMR Hydromodification Susceptibility Study in **Appendix C**).
- **Figure** provides an overview of the SMR, and identifies potentially exempt areas per the requirements of the 2010 SMR MS4 Permit and non-exempt areas.
- **Figure 8** and **Figure 9** zoom geographically into the Temecula area and the Temecula Creek area downstream of Vail Lake, respectively.

3.1.ii Requirement for Proper Energy Dissipation System(s)

As identified in the HMP Decision Matrix in **Figure 6**, properly designed energy dissipation systems are required for all PDP outfalls to unlined channels. The provision is consistent with the District's Standard Design Manual and the 1982 Los Angeles County Flood Control District Hydraulic Design Manual or approved alternative to ensure downstream channel protection from concentrated outfalls.

For reference purposes, the 1982 Los Angeles County Flood Control District Hydraulic Design Manual identifies that (page B-12):

"When a storm drain outlets into a natural channel, an outlet structure shall be provided, which prevents erosion and property damage. Velocity of the flow at the outlet should agree as closely as possible with the existing channel velocity. Fencing and a protection barrier shall be provided…

(1) … When the discharge velocity is high, or supercritical, the designer shall, in addition, consider bank protection in the vicinity of the outlet and an energy dissipation structure."

In order to encroach upon a Copermittee MS4 facility and construct an energy dissipation system, an Encroachment Permit must be obtained during the design phase. The User may contact the District's Operations and Maintenance Division or the Copermittee's Public Works Department, as appropriate, for up-to-date criteria as to location and type of location to be used prior to initiating any design of outlet structure. For a majority of projects seeking encroachment to a MS4 facility, the initial location and type of outlet structures and energy dissipation systems will typically be assessed during the planning phase, specifically during the Environmental Review and Document phase.

Figure 7 - SMR Channel Susceptibility and Exemption Coverage

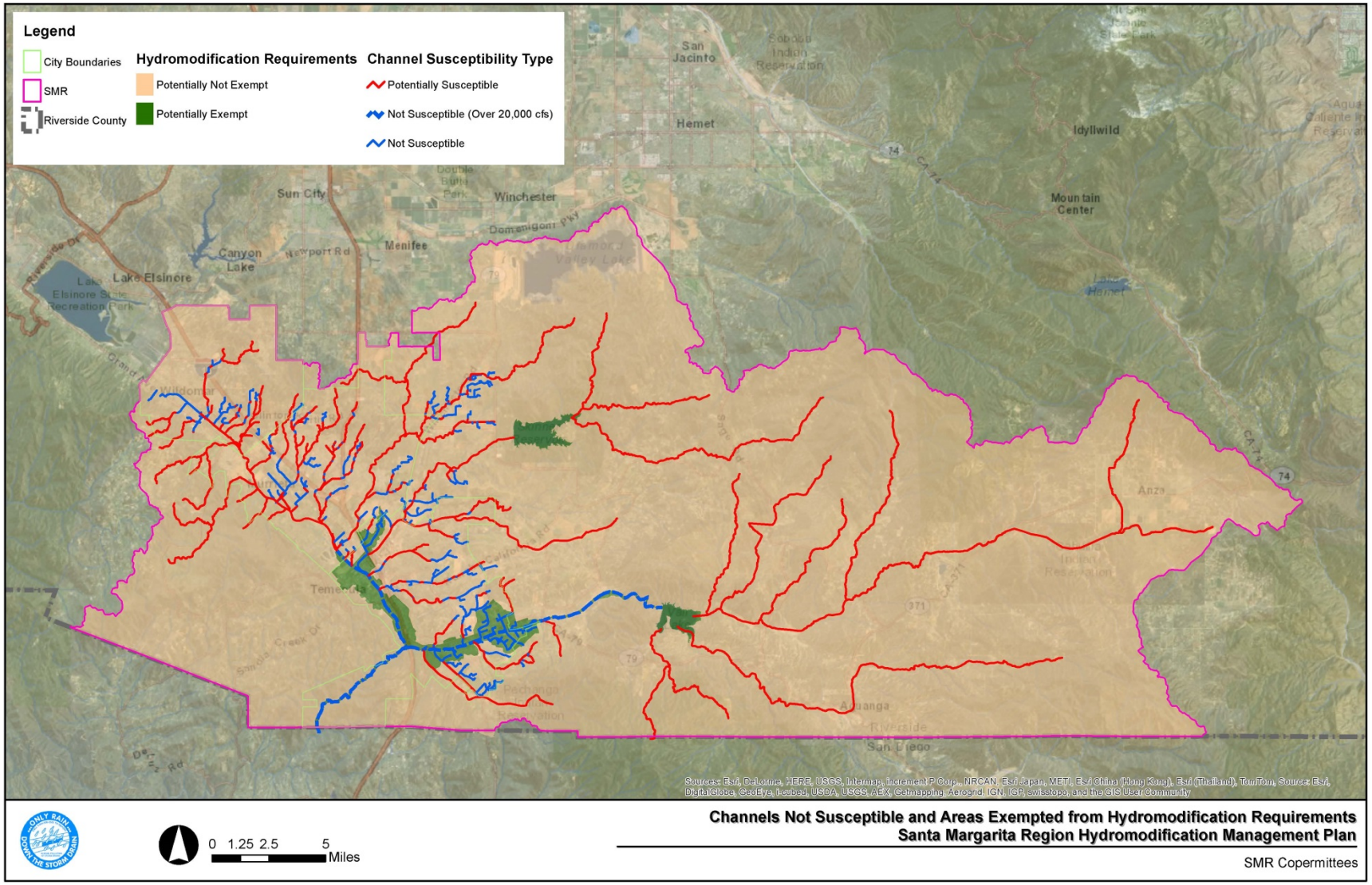

Figure 8 - SMR Channel Susceptibility and Exemption Coverage – Temecula Area

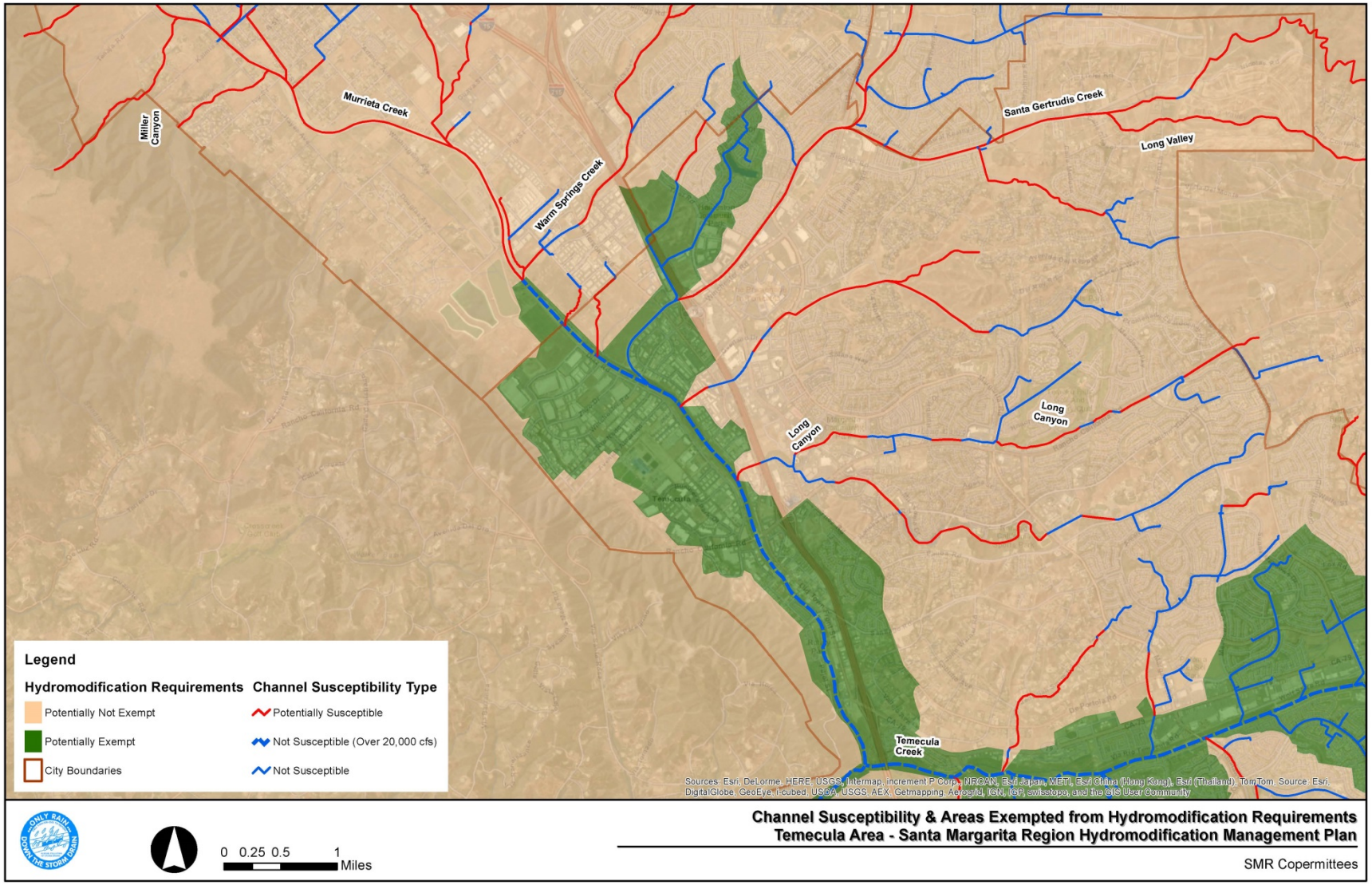

Figure 9 - SMR Channel Susceptibility and Exemption Coverage – Temecula Creek Area

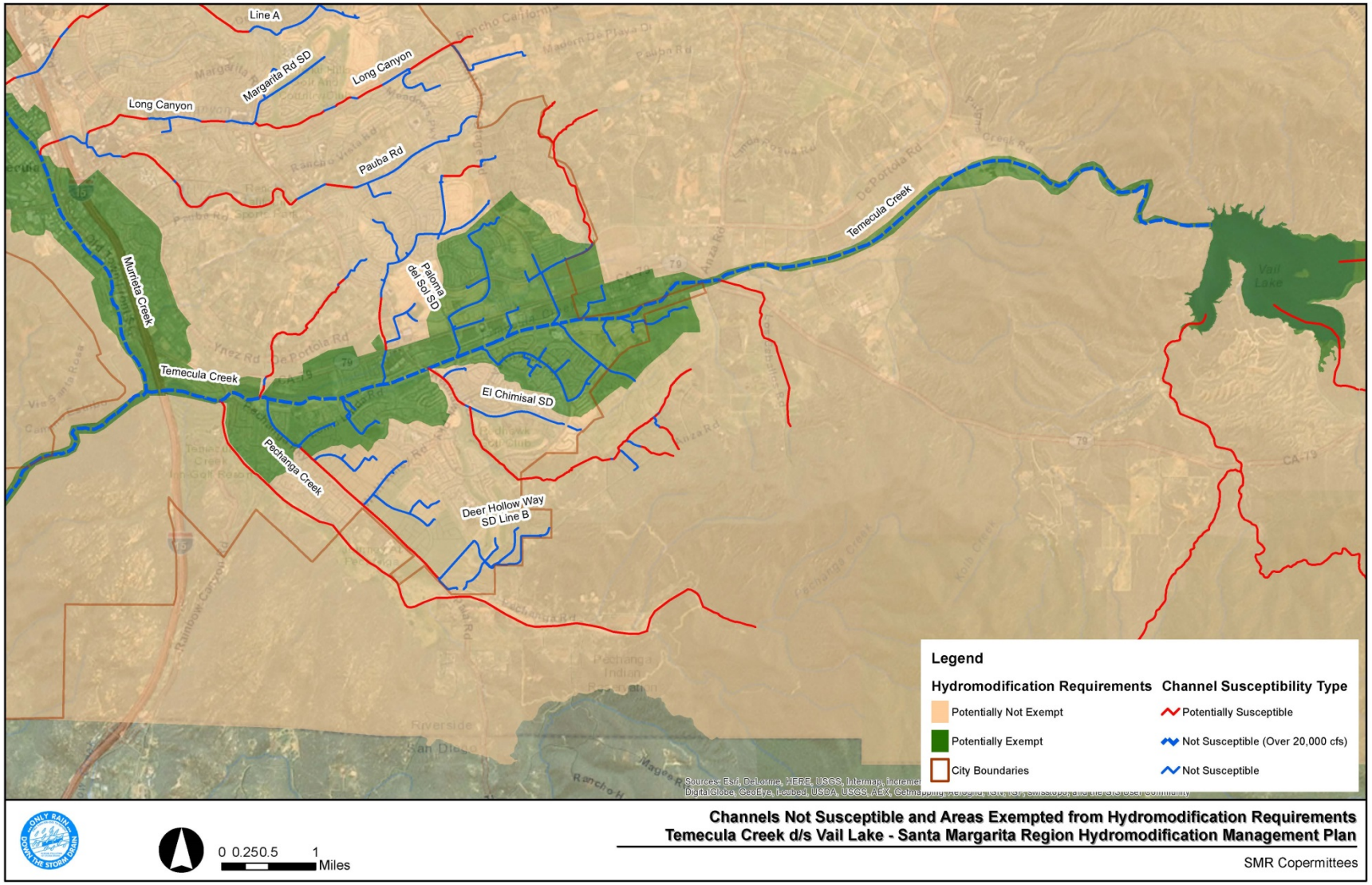

3.2 HMP Exemptions

PDPs may be exempt from HMP Performance Standards based on specific channel or watershed conditions or already approved design guidelines.

3.2.i Concrete-Lined & Artificially Hardened Channel Exempt Areas

The channel exempt areas include those areas that discharge to concrete-lined or artificially hardened channels sections. This includes, as identified in Section F.1.h.(4) of the Permit:

- PDPs that discharge runoff into underground storm drains discharging directly to water storage reservoirs and lakes; or
- PDPs that discharge runoff into MS4 facilities whose bed and bank are concrete lined all the way from the point of discharge to water reservoirs and lakes; or
- PDPs that discharge runoff into other areas identified in the HMP as acceptable to not need to meet the requirements of Section F.1.h by the San Diego Water Board Executive Officer.

Concrete-lined or artificially hardened MS4 facilities that are identified as Engineered, Fully Hardened and Maintained (EFHM) in the SMR Hydromodification Susceptibility Study (see APPENDIX D) are exempt from the HMP Performance Standards. The exemption does not apply to PDPs that discharge to Engineered, Partially Hardened and Maintained (EPHM) and Engineered, Earthen and Maintained (EEM) channels. To confirm the exemption, the succession of existing concrete-lined or artificially hardened MS4 facilities must be continuous from the discharge point to an exempt receiving water, such as a reservoir or a large river. PDPs may evaluate local drainage systems that were not included in the SMR Hydromodification Susceptibility Report for exemption applicability. The User must ensure that the MS4 facilities have been designed to convey the 10-year ultimate condition peak discharge.

The 10-year flow should be calculated based upon the 10-year high confidence synthetic rainfall hydrograph, as detailed in the 1978 RCFCWCD Hydrology Manual. As an alternative, the 10-year ultimate peak discharge may also be determined based on continuous simulation and the results of the SMRHM.

Pursuant to 2010 SMR MS4 Permit Provision F.1.h(1)(a), the SMR was screened to identify and classify susceptible and non-susceptible channels. The screening analysis consisted of verifying the type of material and susceptibility of the GIS-delineated District drainage facilities using as-built plans and aerial photography. For questionable segments, the analysis was complemented by a field visit. Findings are summarized in the Hydromodification Susceptibility Documentation Report and Mapping (see APPENDIX D).

Major MS4 facilities that are exempt from HMP Performance Standards are presented in **Table 3** for reference only. The PDP may use the exemption maps, including Figures 6 through 11 of

this HMP and Map 2: HCOC Applicability Map from the Hydromodification Susceptibility Documentation Report and Mapping: SMR (see APPENDIX D), for planning purposes and must determine if the PDP would discharge runoff into a continuous succession of existing concrete-lined or artificially hardenedMS4 facilities that have the capacity to convey the 10-year ultimate condition discharge all the way to an exempt reservoir or other exempt waterbody. The table contains the name of the channel, as well as the associated downstream and upstream limits. The upstream limit being reported corresponds to the nearest cross street. The resulting map from this effort is presented in **Figure** . The map shows drainage areas that are potentially exempt from HMP Performance Standards.

Table 3 - Channels Exempt from Hydromodification Performance Standards

Channel	Downstream Limit	Upstream Limit
Murrieta Creek	Confluence with Warm Spring Creek	600 feet downstream of Elm Street
Storm Drain RCFC5429	Santa Gertrudis Creek Lateral A,B	Lock Haven Center
Santa Gertrudis Creek Line I	Santa Gertrudis Creek Lateral A,B	End of Line I
Santa Gertrudis Creek Lateral A,B	Murrieta Creek Channel	Confluence with Storm Drain RCFC4057
Wolf Valley Creek Channel	Temecula Creek	Loma Linda Road
Wolf Valley – Loma Linda Road Storm Drain	Wolf Valley Creek Channel	None – all tributaries are exempt
Via Del Coronado Storm Drain	Temecula Creek	None – all tributaries are exempt
Line V / VV of Temecula Creek	Temecula Creek	Upstream of tunneling structure under CA-79
Apis Road Storm Drain	Temecula Creek	None – all tributaries are exempt
Wolf Valley Loop / Margarita Road Storm Drain	Temecula Creek	None – all tributaries are exempt
Mahlon Vail Circle Storm Drain	Temecula Creek	None – all tributaries are exempt
DePortola Road Storm Drain	Temecula Creek	Butterfield Stage Park
Butterfield Stage Road / Macho Road Storm Drain	Temecula Creek	None – all tributaries are exempt
Temecula Creek Road Storm Drain	Temecula Creek	Highway 79
Chaote Street Storm Drain	Temecula Creek	None – all tributaries are exempt
Nighthawk Pass Storm Drain	Temecula Creek	None – all tributaries are exempt
Temecula Creek	Confluence with Santa Margarita River	Outflow of Vail Lake

Table 4 provides a summary of the two exempt reservoirs in the SMR, as identified in the Hydromodification Susceptibility Study. Discharges from PDPs to large reservoirs or lakes can be exempt from HMP Performance Standards since stormwater inflow velocities are naturally managed by the significant tailwater condition in the reservoir. HMP Performance Standard exemptions would only be granted for PDPs discharging runoff directly to the exempt reservoirs or into concrete-lined or artificially hardened MS4 facilities designed convey the 10-year ultimate condition discharging into a lake or reservoir. To qualify for the exemption, the outlet elevation of the MS4 facility must be within (or below) the normal operating water surface elevations of the reservoir and properly designed energy dissipation must be provided.

Table 4 - Reservoirs in the Santa Margarita Region

Reservoir	Watershed
Vail Lake	Temecula Creek

Skinner Lake	Tucalota Creek
Diamond Valley Reservoir	

Figure 10 below displays areas that are potentially exempt for the entire SMR based on the criteria outlined above, where the areas in green are potentially exempt as they discharge to engineered MS4 facilities all the way to exempt receiving waters (large river, water storage reservoirs). **Figure 11** provides the User with an exemption map of higher definition in the Temecula area. **Figure 12** provides the User with an exemption map of higher definition for Temecula Creek downstream of Vail Lake.

Figure 10 - SMR Exemption Area

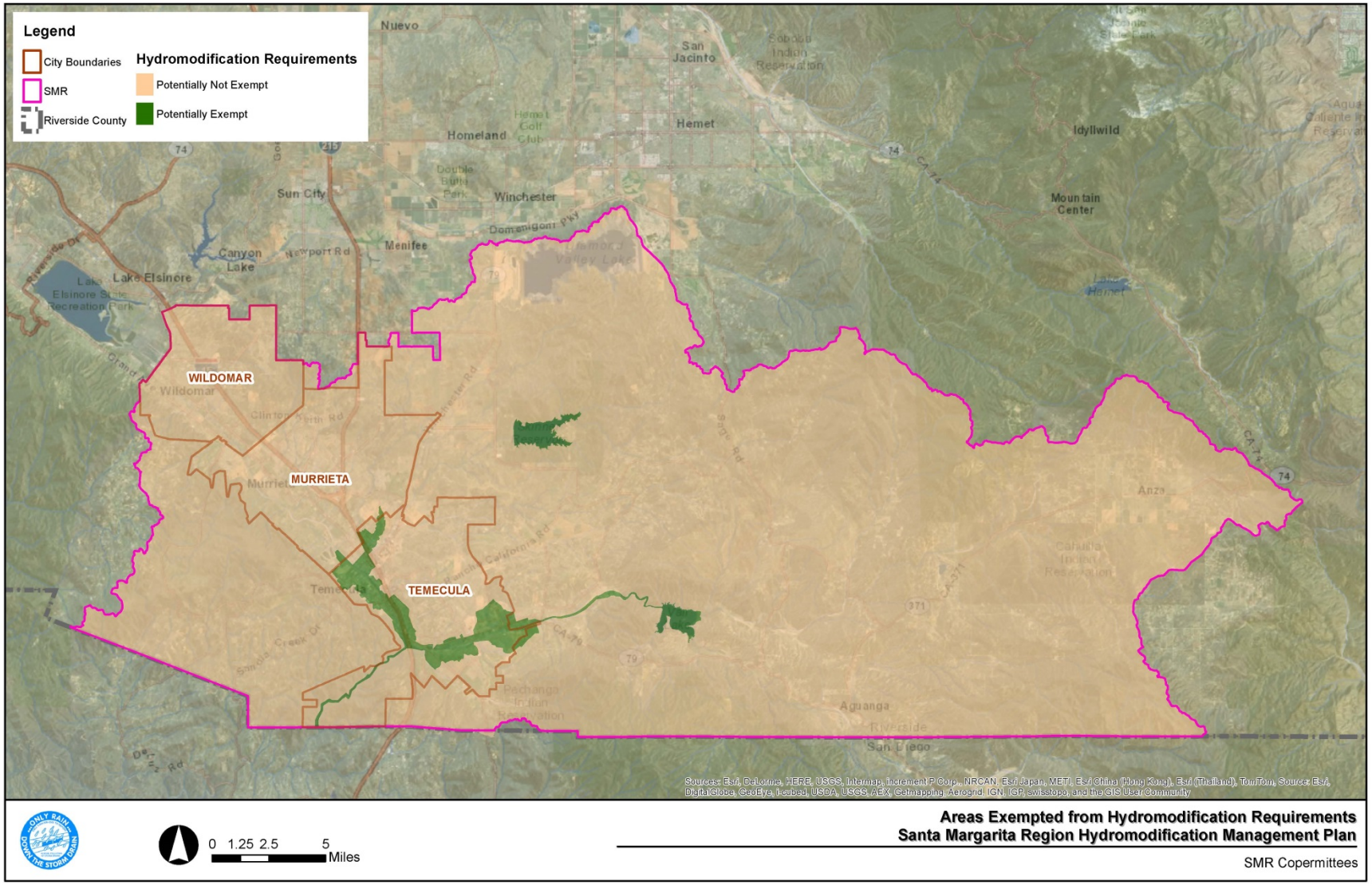

Figure 11 - SMR Exemption Area – Temecula Area

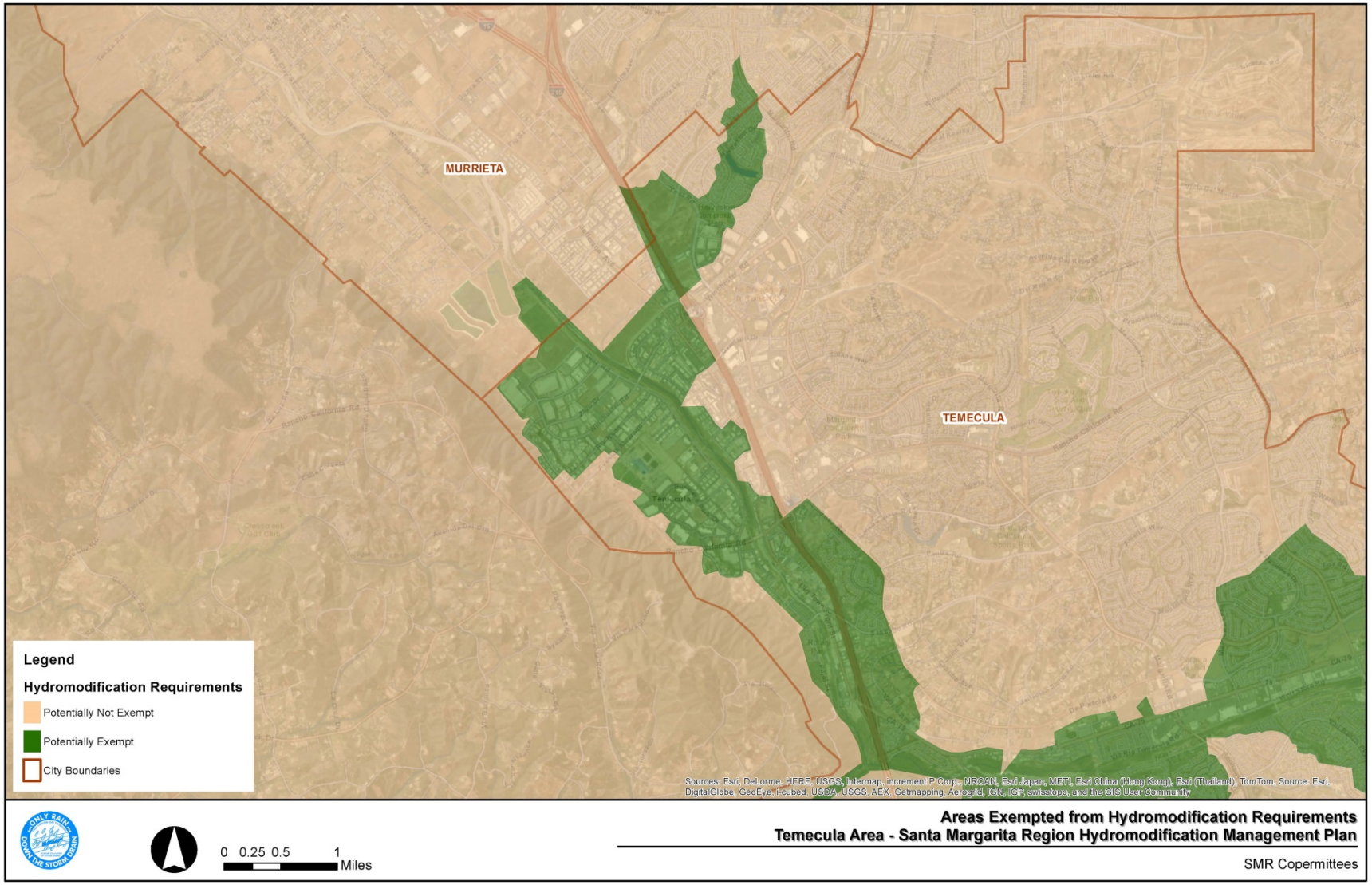

Figure 12 - SMR Exemption Area – Temecula Creek downstream of Vail Lake

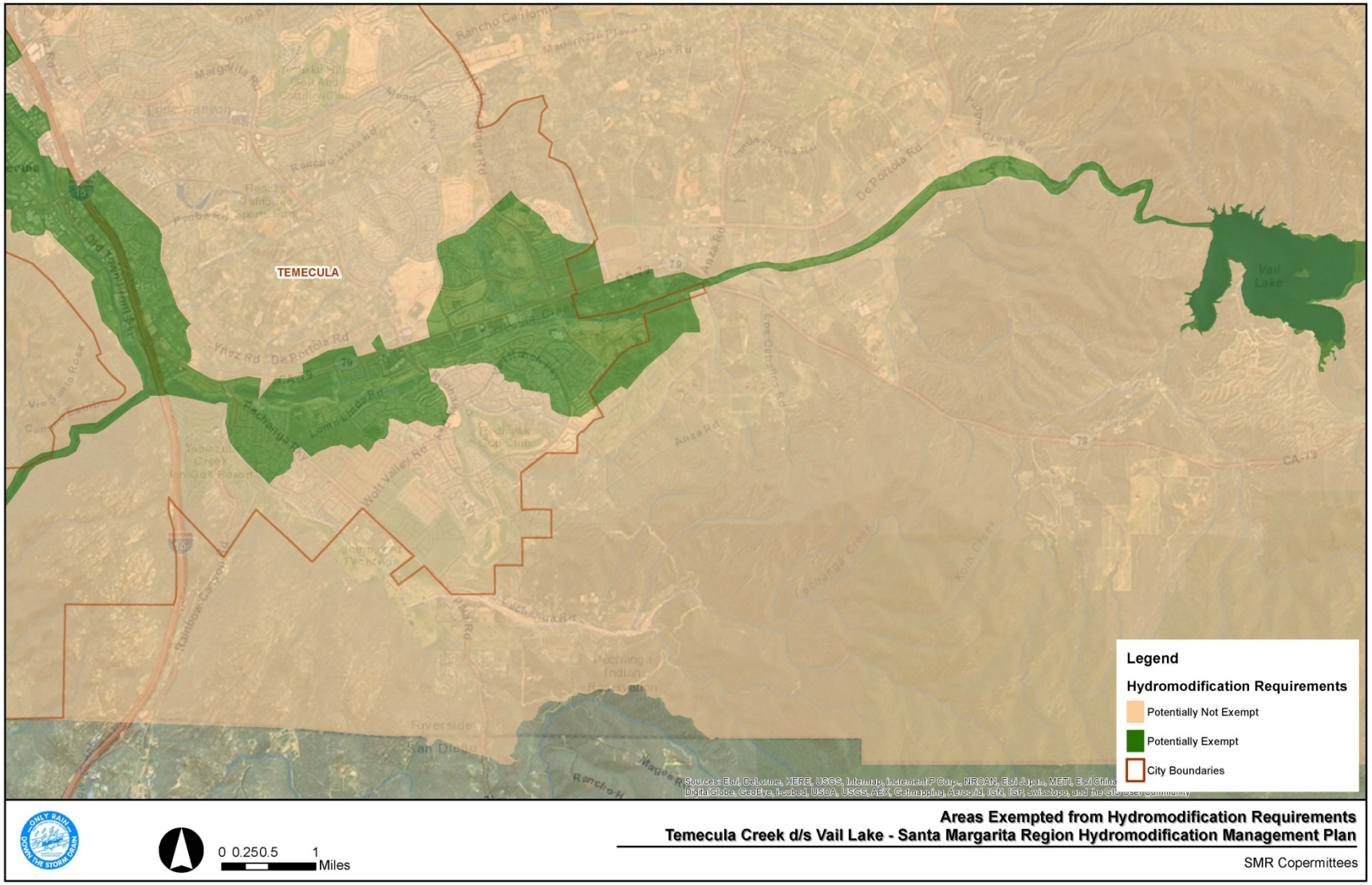

3.2.ii Exemption for Large River Reaches

Effects of cumulative watershed impacts are minimal in channel reaches of large depositional rivers. These large rivers typically have very wide floodplain areas when in the natural condition or are stabilized when in the engineered condition, and are of low gradient.

The results of a flow duration curve analysis that was performed for the San Diego River are presented in the San Diego County HMP. This analysis demonstrated that the effects of cumulative watershed impacts are minimal in those reaches for which the contributing drainage area exceeds 100 square miles and with a 100-year design flow in excess of 20,000 cfs. Development and redevelopment projects that discharge either directly or via an engineered and regularly maintained MS4 facility designed to convey the 10-year ultimate condition into such large river channels are hence exempt from the SMR HMP requirements, provided that properly sized energy dissipation is implemented at the outfall location. As identified in the SMR Hydromodification Susceptibility Study (See APPENDIX D), all exempt river reaches, which are presented in **Table 5** have a drainage area larger than 100 square miles and a 100-year design flow higher than 20,000 cfs. **Table 5** also provides the corresponding upstream and downstream limits to define the exempted reach.

Table 5 - Exempt Channel Reaches in the Santa Margarita Region

River	Downstream Limit	Upstream Limit
Murrieta Creek	Confluence with Santa Margarita River	Above Warm Springs Creek
Temecula Creek	Confluence with Santa Margarita River	Outlet of Vail Lake
Santa Margarita River	Pacific Ocean	At Origin

3.3 PDP Requirements

A proposed PDP that is not located in an exemption zone (see **Figure** , **Figure** , or **Figure**) must meet the HMP Performance Standards defined in **Section 2.1**, following the guidelines described in this section. The User may refer to **Figure** , **Figure** , and **Figure** to identify a potential exemption from Hydromodification requirements. To confirm the eligibility to an exemption from Hydromodification requirements, if any, the User must identify in the Preliminary WQMP:

- The list of successive MS4 facilities and Receiving Waters that the project site is tributary to, from the point of discharge of the project site to an exempt Receiving Water. Exempt Receiving Waters are identified in **Section 3.2**.
- For each listed MS4 facility or Receiving Water, if bed and banks are artificially hardened or concrete-lined.

The exemption from Hydromodification requirements will be considered by the Copermittee having jurisdiction over the project site, if all MS4 facilities and Receiving Waters to an exempt Receiving Water, are concrete-lined and/or artificially hardened.

The User may associate the size and type of the PDP to one of the following Categories and meet all the HMP Performance Standards outlined for that category:

- Category 1 – New Development Projects exceeding one acre or Redevelopment Projects over one acre
- Category 2 – Small-sized projects less than one acre yet defined as a PDP and Copermittee roadway projects

Proposed PDPs face different levels of spatial, environmental, financial, technical, and permitting constraints based on their size and type. As such, the 2010 SMR MS4 Permit was translated into HMP Performance Standards that are specific and adapted to each Category. The definition of each Category was principally derived from the elements of the 2010 SMR MS4 Permit, as well as from a review of the other HMPs (Santa Clara, Alameda, Sacramento, San Diego, and South Orange County). Most individual single-family residential projects will be exempt from the HMP Performance Standards.

The following subsections describe the HMP Performance Standards specific to each Category.

3.3.i Category 1 – PDPs over One Acre

Category 1 PDPs will be subject to a number of spatial, environmental, financial, technical, and permitting constraints.

Hydrologic Control and Sediment Supply BMPs to ensure compliance with the HMP Performance Standards are described in **Section 2.1**. Using this approach, management of both flow and duration is achieved through onsite Hydrologic Control BMPs or implementation of hydrologic controls through a regional or sub-regional BMP that accepts discharges from the project, but is located outside of the project boundaries, and sediment loss is addressed through Sediment Supply BMPs.

If allowed by the Copermittee with jurisdiction over the project site, a PDP that is greater than 100 acres or a PDP in a common development plan that exceeds 100 acres may implement Comprehensive Regional BMPs. Comprehensive Regional BMPs must address the incremental impacts of the PDP on the receiving channels from a regional perspective. The User must delineate the subwatersheds that include entirely the project site to demonstrate compliance with the water quality, hydrologic, and fluvial geomorphologic objectives from a regional perspective. The following objectives must be addressed in implementing Comprehensive Regional BMPs:

- Water Quality Objectives, LID site principles, LID BMPs to capture or biotreat the Design Capture Volume (DCV), and HMP Performance Standards in consistency with the requirements set forth in the SMR WQMP;
- Copermittee and regional hydrologic objectives to manage increases in runoff peak discharges and increases in runoff volumes for the 10-year and 100-year frequency storm events, in consistency with the drainage requirements set forth by the Copermittee having jurisdiction over the project;

- Fluvial geomorphologic objectives to manage the adverse impacts of the PDPs over the existing aggradation/degradation of the receiving channel, and the existing stability and erosion of the receiving channels for the 10-year and 100-year frequency storm events, in consistency with the drainage requirements set forth by the Copermittee having jurisdiction over the project.

A PDP may benefit from the implementation of Comprehensive Regional BMPs instead of separate Hydrologic Control BMPs to address NPDES and Local Drainage requirements through the reduction of the overall footprint of Hydrologic Control BMPs, the simplification of the required MS4 facilities, the streamlined maintenance of facilities for optimal operability, and the potential to create multi-use facilities.

Comprehensive Regional BMPs may be onsite or offsite Hydrologic Control BMPs implemented to address regional water quality, hydrologic, and fluvial geomorphologic objectives consistent with the framework of a regional technical study. Comprehensive Regional BMPs will typically be larger detention facilities with a water quality component that manages the DCV, a Hydromodification component including the design of additional storage and adequate outlet structure to manage the range of geomorphically significant flows (10% of Q2 to Q10, or consistent with the guidelines provided in APPENDIX I), and a drainage mitigation component including the design of additional storage and adequate outlet structure to manage increases in runoff peak discharges, runoff volumes, receiving channel aggradation/degradation, channel erosion & channel stability.

The User must develop a regional technical study to demonstrate that the HMP Performance Standards are met for the sub-watersheds that include entirely the project site, through the implementation of Comprehensive Regional BMPs. The regional technical study must be submitted along with the Project-Specific WQMP. The User may consider the following approaches:

- For the Hydrologic Performance Standard, the User may follow Step 1 in **Section 2.2.iv**. If a HMP Management Bank is available, the PDP can pursue this option. The PDP can also pursue the in-channel restoration or rehabilitation option (Option 1 – Step 2b) identified in **Section 2.2.iv**.
- For the Sediment Control Performance Standard, the User may perform the three-step approach as described in **Section 2.3.i**. The alternative compliance will consist of modifying the hydrologic regime of onsite runoff to compensate for sediment loss, while meeting the established Hydrologic Performance Standard.

The Alternative Compliance Options to meet both the Hydrologic Control and Sediment Control Performance Standards are intrinsically related. A flow chart indicating which HMP Performance Standards should be pursued and implemented for a Category 1 project is shown in **Figure 13**

Figure 13 - Hydromodification Performance Standards for PDPs Over One Acre

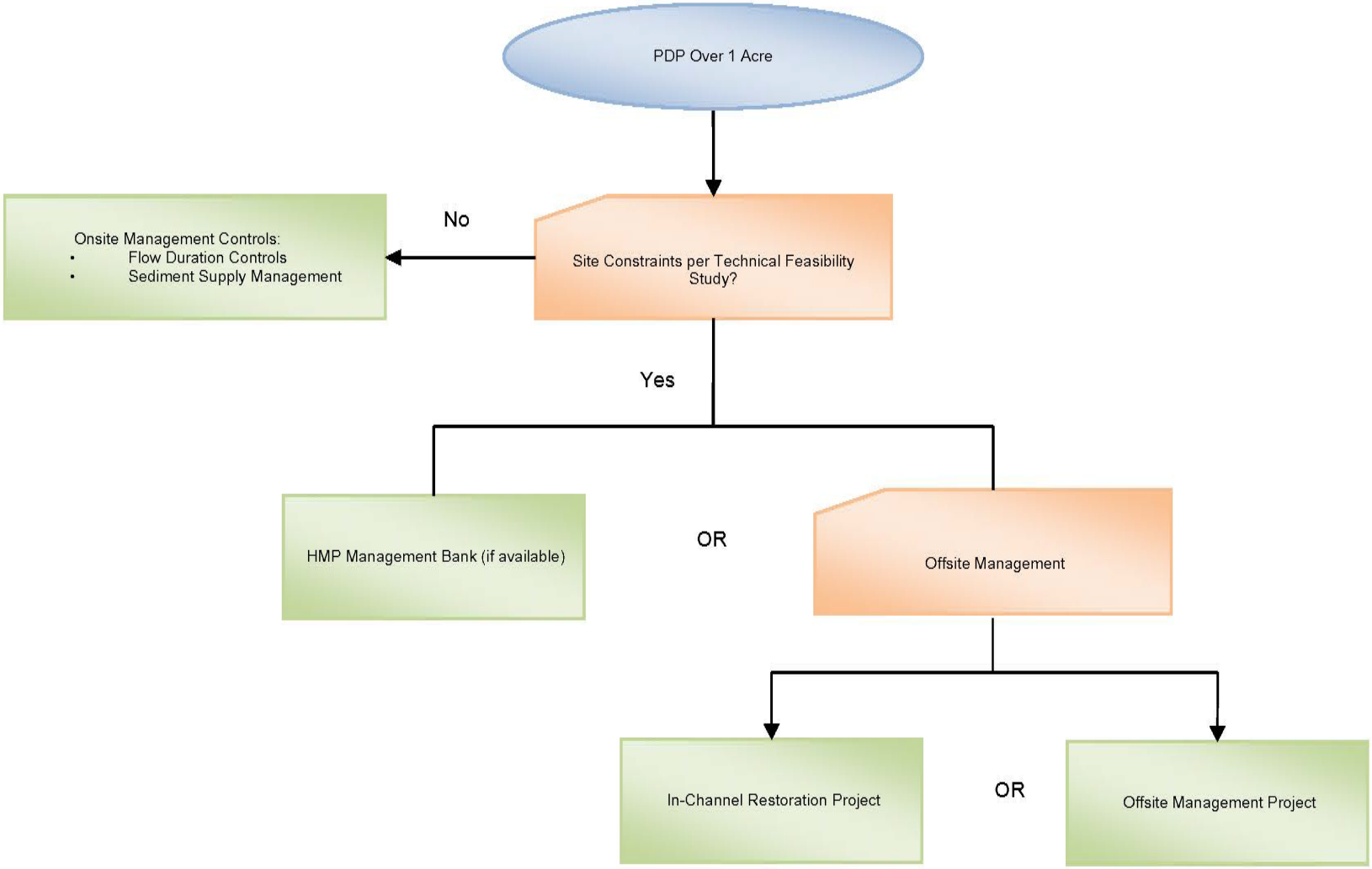

3.3.ii Category 2 –PDPs less than one acre & Copermittee Roadway Projects

Category 2 PDPs are those projects disturbing an area less than one acre but defined as a PDP. Category 2 PDPs may include the following projects, as characterized by 2010 SMR MS4 Permit Provision F.1.d.(1) and Provision F.1.d.(2):

- New Development Projects that are smaller than one acre that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site) including commercial, industrial, residential, mixed-use, and public projects. This category includes New Development Projects on public or private land which fall under the planning and building authority of the Copermittees.
- Projects to construct automotive repair shops, defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.
- Projects to construct restaurants defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812), where the land area for development is greater than 5,000 square feet. Restaurant projects where land development is less than 5,000 square feet must meet all WQMP requirements except for Structural Treatment BMP and numeric sizing criteria requirement F.1.d.(6) and Hydromodification requirement F.1.h.
- All hillside development projects greater than 5,000 square feet but less than one acre. This category is defined as any development which creates 5,000 square feet of impervious surface which is located in an area with known erosive soil conditions, where the development will grade on any natural slope that is 25% or greater.
- All development projects less than one acre that are located within or directly adjacent to or discharging directly to an ESA (where discharges from the development or redevelopment will enter receiving waters within the ESA), which either creates 2,500 square feet of impervious surface on a proposed project site or increases the area of imperviousness of a proposed project site to 10% or more of its naturally occurring condition. "Directly adjacent" means situated within 200 feet of the ESA. "Discharging directly to" means outflow from a drainage channel that is composed entirely of flows from the subject development or redevelopment site, and not commingled with flows from adjacent lands.
- Impervious parking lots 5,000 square feet or more and potentially exposed to runoff. Only parking lots that are less than one acre are included into Tier 3. Parking lots are defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce.
- Retail Gasoline Outlets (RGOs) - This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic of 100 or more vehicles per day. RGO projects that are less than one acre are included into Tier 3.

- Those Redevelopment projects less than one acre that create, add, or replace at least 5,000 square feet of impervious surfaces on an already developed site and the existing development and/or the redevelopment project falls under the project categories or locations listed in 2010 SMR MS4 Permit Provision F.1.d.(2). Where redevelopment results in an increase of less than 50% of the impervious surfaces of a previously existing development, and the existing development was not subject to WQMP requirements, the numeric sizing criteria discussed in 2010 SMR MS4 Permit Provision F.1.d.(6) applies only to the addition or replacement, and not to the entire development. Where redevelopment results in an increase of more than 50% of the impervious surfaces of a previously existing development, the numeric sizing criteria applies to the entire development.

In addition, Copermittee Roadway Projects are included in Category 2. Copermittee Roadway Projects are linear New Development or Redevelopment projects to be completed within a limited right-of-way. Category 2 includes also the following roadway projects, as defined per Permit Provisions F.1.d.(1) and F.1.d.(2):

- Streets, roads, highways, and freeways. This category includes any paved surface that is 5,000 square feet or greater used for the transportation of automobiles, trucks, motorcycles, and other vehicles. To the extent that the Copermittees develop revised standard roadway design and post-construction BMP guidance that comply with the provisions of Section F.1 of the Order, then public works projects that implement the revised standard roadway sections do not have to develop a WQMP.
- Roadway Redevelopment Projects that create, add, or replace at least 5,000 square feet of impervious surfaces. Where a roadway Redevelopment Project results in an increase of less than 50% of the impervious surface within the limits of the project, and the existing development was not subject to WQMP requirements, the numeric sizing criteria discussed in Permit Provision F.1.d.(6) applies only to the addition or replacement, and not to the entire development. Where the roadway Redevelopment Project results in an increase of more than 50% of the impervious surface within the limits of the project, the numeric sizing criteria applies to the entire project.

Attachment C of the 2010 SMR MS4 Permit identifies that:

> "Redevelopment does not include trenching and resurfacing associated with utility work; resurfacing existing roadways; new sidewalk construction, pedestrian ramps, or bike lane on existing roads; and routine replacement of damaged pavement, such as pothole repair."

The majority of Category 2 projects are completed within a limited amount of space, making it unlikely the User will be able to implement onsite Hydrologic Control and Sediment Supply BMPs. The following approaches are available:

- Implementing Hydrologic Control BMPs either within the project boundaries or through a regional or sub-regional BMP that accepts discharges from the project, but is located outside of the project boundaries and Sediment Supply BMPs to ensure compliance with

the HMP Performance Standards identified in **Section 2.1**. Using this approach, management of both flow and duration is achieved through Hydrologic Control BMPs.

- If onsite Hydrologic Control BMPs are not technically feasible due to site constraints, a simplified technical feasibility study must be developed to explain why the HMP Performance Standards cannot be met onsite. The simplified technical feasibility study must include:
    - the soil conditions of the PDP site;
    - a demonstration of the lack of available space for onsite Hydrologic Control BMPs;
    - an explanation of prohibitive costs to implement onsite Hydrologic Control BMPs; and
    - a written opinion from a California Registered Geotechnical Engineer, who will identify the infeasibility due to geotechnical concerns.
- Once the simplified technical feasibility study is accepted by the Copermittee with jurisdiction over the project site, the User may pursue payment into the HMP Management Bank, if one exists and is available to the PDP. If not, the User must pursue either an offsite Hydrologic Control BMP project or an in-channel restoration or rehabilitation project detailed in Option 1 – Step 2b in **Section 2.2.iv**. The offsite management project or in-channel restoration will meet the hydrologic performance standard.

A flow chart indicating which HMP performance standard should be considered for a Category 2 PDP is shown in **Figure 14**.

Figure 14 - Hydromodification Performance Standards for Small Size PDPs

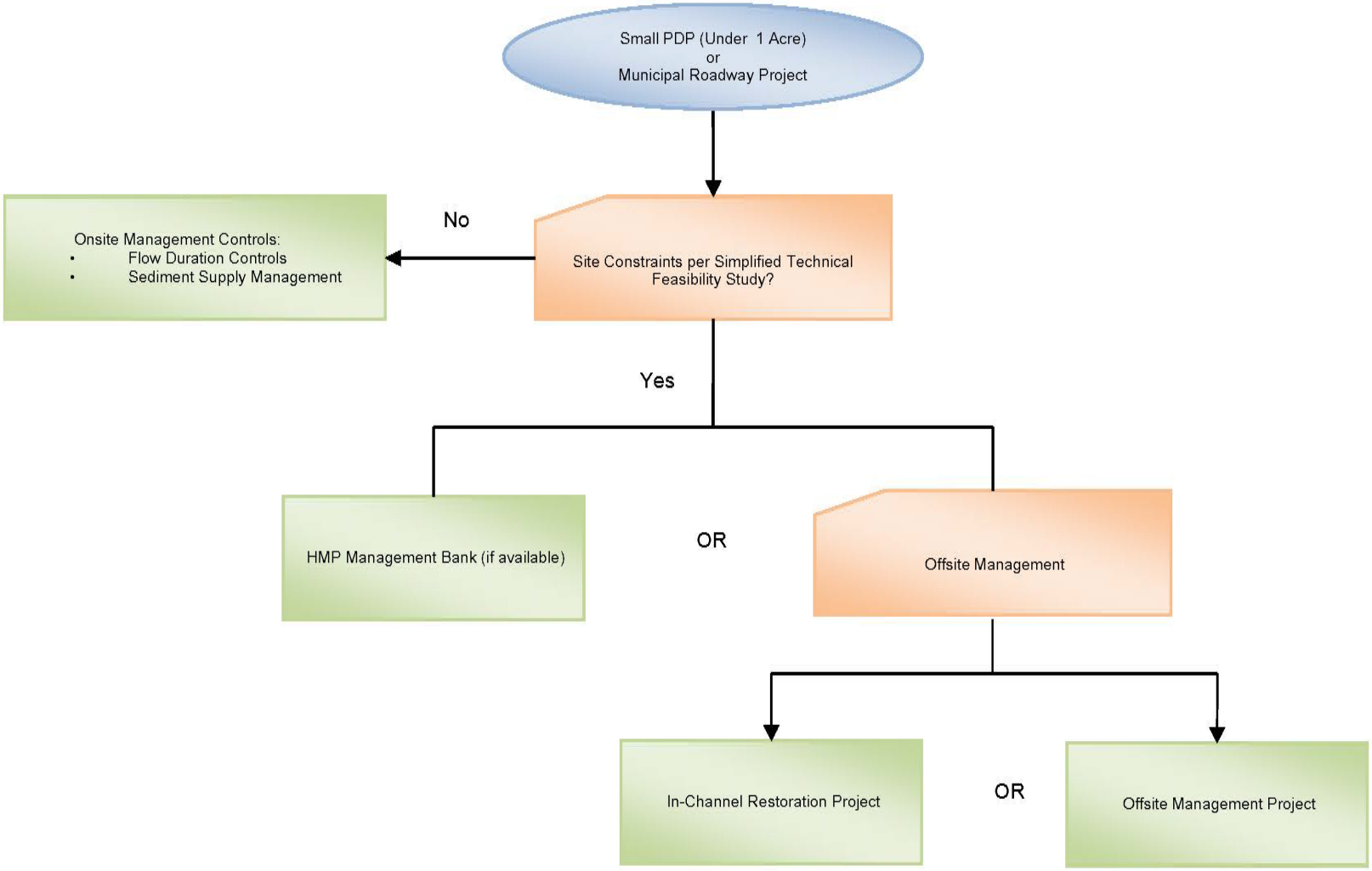

4.0 HMP and Model WQMP Integration

Within the SMR WQMP, the HMP Performance Standards are incorporated into Section 3.6 – Meet Hydromodification Requirements. The section also identifies HMP Performance Standards for Category 1 and 2 PDPs, as well as the methodology and steps that Users must follow to achieve compliance with these Performance Standards. The alternatives for compliance with HMP Performance Standards – Off-Site Management and 3.6.3.b) – HMP Management Bank, and Section 3.6.4 – Meet the Sediment Supply Performance Standard, respectively will also be integrated into Sections 3.6.3.a) of the WQMP.

Guidance regarding the Hydrologic Control BMP technical feasibility study has also been integrated with the LID feasibility analysis as part of Section D of the SMR WQMP Template. Section D of the SMR WQMP Template addresses evaluation of onsite conditions that may require implementation of offsite Hydrologic Control BMPs. The Copermittees will use the SMR WQMP, WQMP Template, and LID BMP Design Handbook to incorporate the HMP Performance Standards into their development approval processes via their WQMPs and ordinances.

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APPENDIX A - User Quick Start Sheet

The quick start summary lists the following steps that a User should follow for their PDP to meet the HMP Performance Standards:

1. The first step consists of verifying if the project is exempt from HMP Performance Standards. Exemption occurs:

    - If the project is not classified as a PDP per the 2010 SMR MS4 Permit Provision F.1.d.;
    - If the proposed project discharges runoff directly to an exempt Receiving Water such as an exempt river reach, or an exempt reservoir. Or, if the proposed project discharges to an engineered MS4 facility with the capacity to convey the 10-year ultimate condition that extends to the an exempt river reach or reservoir (See **Section 3.2.i**);
    - If the project discharges to a large river per the definition provided in **Section 3.2.iii;** or
    - If the project discharges to stable Receiving Waters per the results of a channel stability analysis (See **Section** Error! Reference source not found.).

2. If not exempt from HMP Performance Standards, the User should identify the Performance Standards that apply to the PDP Category of the proposed project. For specific Category Performance Standards, the User may refer to the HMP Decision Matrix referenced in **Section 3.1**and requirements listed in **Section 3.3**. These direct the User to implement, when required, Hydrologic Control and Sediment Supply BMPs following the approach listed in **Section 2.0**:

    a. Hydrologic Control BMPs

Figure 13 summarizes the options that a User may pursue to achieve Hydrologic Control Performance Standards. Prioritization of Hydrologic Control BMPs, as well as the applicability of each type of Hydrologic Control BMPs, is defined in **Figure 13**. Onsite Hydrologic Control BMPs are to be designed based on the SMRHM. Alternatively, the User may develop their own numerical criteria but should support the findings with continuous simulation models. Technical infeasibility of a type of Hydrologic Control BMP should be documented. Specifics are provided in **Section 2.2**.

Figure 13 - SMR HMP Options for Hydrologic Control BMPs

Type of Hydrologic Control BMP	Onsite	Regional	Offsite (management or in-channel restoration)	Management Bank (if available)	Green Street Project or equivalent
Large (>100 ac)	Yes	Yes	n/a	n/a	n/a
Medium (1 ac ≤A≤100 ac)	Yes - #1	n/a	Yes - #2a	Yes - #2b	n/a
Small (<1 ac)	Yes - #1	n/a	Yes - #2a	Yes - #2b	n/a
Public roadway	n/a	n/a	Yes	n/a	Yes

b. Sediment Supply BMPs

The User may follow a three-step process to ensure maintenance of the pre-project sediment supply to the channel:

1. Determine whether the site is a significant source of Bed Sediment Load to the receiving channel.
2. Avoid areas of significant Bed Sediment Load supply in the site design.
3. Replace areas of significant Bed Sediment Load supply that are eliminated through urban development.

If the three-step process is deemed infeasible, an alternative compliance option allows the User to model the site conditions and the receiving channel and provide additional management in site runoff to compensate for the reduction (or addition) of Bed Sediment Load. Specifics are detailed in **Section 2.3.ii**.

1. The User should integrate Hydrologic Control and Sediment Supply BMPs into the project site design, and define the design specifics in the preliminary project-specific WQMP that should be submitted to the Copermittee with jurisdiction over the project site. The Copermittee may approve the proposed design upon identification of compliance with the HMP Performance Standards.

APPENDIX B - Copermittee HMP Development Process

The District was the lead in the Copermittee development of the HMP. The Copermittees participated financially and through participation in HMP workshops. The workshops were scheduled over the course of the project at times corresponded with key decision points in the development of the HMP. Participants in the HMP workshops provided valuable input on the development of the HMP.

The Copermittees will continue to meet to discuss and resolve issues that may arise during HMP implementation. Participants in the HMP development process will also assist in refining and reinforcing methodologies, criteria, and standards established in the HMP.

The group of participants in the SMR HMP development process has met four times since October 2012. **Table 6** shows meeting dates, locations, and agenda items. In addition to the formal meetings, the Copermittees coordinated via email to review and discuss technical documents, deliberate on specific HMP related topics, and concur on issues.

Table 6 - SMR HMP Copermittee Meetings

Date	Location	Agenda
October 29, 2012	District, Riverside	SMR HMP Outline and Approach Presentation of the San Diego Hydrology Model Tool
December 2012	City Hall, Murrieta	Presentation and discussion of the first Draft SMR HMP Presentation and discussion of the HMP Evaluation Program Schematic
March 2013	City Hall, Temecula	Presentation and discussion of the second Draft SMR HMP Presentation and discussion of the Draft HMP Evaluation Program
April 2013	District, Riverside	SMRHM Training Workshop
May 2013	City Hall, Temecula	Presentation and discussion of the Final SMR HMP Presentation of the Final HMP Evaluation Program
June 2014	District, Riverside	Compliance document training

A Draft SMR HMP was submitted to the SDRWQCB in June 2013 and a proposed final HMP that addressed the SDRWQCBs comments was submitted on March 10, 2014. The final HMP was submitted on July 11, 2014 to address the additional SDRWQCBs comments received on April 8, 2014 and incorporate the Final SMR HMP requirements into the SMR WQMP. In addition, the Copermittees used the revised SMR WQMP to incorporate the HMP requirements into their development approval processes through their WQMPs and municipal ordinances.

As required by Permit Provision F.1.h(5)(a), the draft document was posted on the District's website in January 2013 (http://rcflood.org/NPDES/SantaMargaritaWS.aspx) for public review and comment. The Final Draft SMR HMP was also posted on the District's website for a second round of public review and comment.

APPENDIX C - State of the Hydromodification Science: A Literature Review

Pursuant to 2010 SMR MS4 Permit Provision F.1.h(1)(g), this appendix provides the results of a literature review conducted as a basis for the development of the HMP.

Hydromodification in the context of this HMP refers to changes in the magnitude and frequency of channel flows due to urbanization and the resulting impacts on the receiving channels in terms of erosion, sedimentation, and degradation of in-channel habitat. The processes involved in aggradation and degradation are complex, but may be affected by an alteration of the hydrologic regime of a watershed due to increases in impervious surfaces, more efficient MS4 facilities, and a change in historic sediment supply sources, among other factors. The study of Hydromodification is an evolving field, and regulations to manage the impacts of Hydromodification must be grounded in the latest science available.

HMPs seek ways to manage Hydromodificaton that may result from urban development by establishing requirements for controlling runoff from New Development and Redeveloment projects. In order to establish appropriate requirements for New Development and Redevelopment, it is important to understand 1) how land use changes alter stormwater runoff; and 2) how these changes can impact receiving channels. These and other issues central to HMPs adopted in California have been addressed in numerous journal articles, books, and reports. This literature review builds upon previous literature reviews developed for the South Orange County HMP and the San Diego County HMP, including recent studies or information relevant to Southern California.

C.1. Hydromodification Management Concepts

There are many different approaches to managing Hydromodification impacts from urban development, and most HMPs provide multiple options for achieving and documenting compliance with National Pollutant Discharge Elimination System (NPDES) MS4 permit requirements. In general, hydrograph management approaches focus on managing runoff from a developed area to not increase instability in a channel, and in-channel solutions focus on managing the receiving channel to accept an altered flow regime without becoming unstable. This section briefly summarizes various approaches for HMP compliance.

C.1.1. Stability of Alluvial Channels

Southern California channels typically combine steep slopes and erodible materials with a predominance of sand and gravel substrates, which may be assimilated to alluvial channels (SCCWRP, 2011). An exchange of material between the inflowing sediment load and the bed and banks of the channel is established, thus creating a constant adjustment of the channel's width, depth, slope, and planform in response to changes in water or sediment discharge (NEH, 2007). A channel planform is defined as the horizontal alignment of a channel as observed from

a point perpendicular to the Earth's surface (USDA, 2007). Natural alluvial channels constantly form their geometry by moving boundary material to react to changes in precipitation and the rate of tectonic uplift. Lane's interrelationship (1955) conceptualizes this balance between hydrologic and geomorphic processes for alluvial channels:

$$Q_s \times D_{50} \propto Q_w \times S$$

Where:

Q_s = Sediment discharge

D_{50} = Median sediment size

Q_w = Flow

S = Channel Slope

As seen by Lane's interrelationship, if any of the four variables is altered, one or more of the remaining variables must change.

Due to natural and/or man-made conditions, such as construction of Vail Lake and Skinner Reservoir, a majority of channels within the SMR are dynamically adjusting to a new geomorphic equilibrium corresponding to the altered hydrology and sediment transport regimes. The tributary areas to both Vail Lake and Skinner Reservoir consist primarily of mountainous highlands, with narrow, deeply incised drainages whose rate of incision is naturally dependent on precipitation and the rate of tectonic uplift. In addition, the construction of Vail Dam and Skinner Reservoir and historical urbanization within the SMR have progressively altered the hydrology and sediment transport regimes in the downstream channels. Approximately two-thirds of the Upper Santa Margarita River Watershed is controlled by these dams, which conserve virtually all of the runoff for municipal, industrial and agricultural use. Recent observations of the downstream channels show that the latter are still geomorphically adjusting to the altered hydrology and sediment transport regimes. Downstream of the constructed dams, the reduction in frequency and magnitude of discharges into Temecula Creek and Tulacota Creek has resulted in a significant reduction of the cumulative work performed in those downstream channels (See Section C.2.1.), which may result into increased aggradation of Temecula Creek, Tulacota Creek, and their respective downstream reaches. In essence, the SMR is a dynamic system that is still converging towards a geomorphic equilibrium.

In addition to Vail Lake and Skinner Reservoir, the Permittees have constructed a significant storm drain infrastructure to control storm water discharges from urbanized areas and provide an adequate level of protection against flooding hazards in urbanized communities. Currently, two-thirds of the SMR are controlled by controlled-release points, or flood control basins that effectively reduce the magnitude and frequency of incoming storm water discharges. In areas tributary to those controlled-release points, increases in runoff discharge, magnitude, and frequency associated with future urbanization are managed to ensure the long-term stability of downstream channels, thus resulting in aggradation in those downstream channels.

For those channels that are not influenced by dams and controlled-release points, urban development in the upstream reaches will usually result in increased runoff, causing an incremental reduction in channel slope (S) through downcutting or increased channel meander to the existing dynamic adjustment due to the construction of Vail Dam and Skinner Reservoir. Urban development may also result in incremental change in sediment discharge (Qs). Bed sediment load is derived from the channel bed and banks. If channels are altered by urban development in such a way as to reduce or increase sediment discharge, instability may occur.

Only a portion of the total sediment load in a channel is important for channel stability. Total channel sediment load may be classified by size or transport mechanism. The wash load commonly refers to the portion of the total sediment load that remains continuously in suspension (based on particle size). The wash load has a nominal impact on channel stability. Bed sediment load refers to the material that moves along the channel bed via Saltation, and is continuously in contact or exchange with the channel bed. Bed sediment load is the critical portion of total sediment discharge for channel stability.

C.1.2.Hydrologic Management Measures

Facilities that detain or infiltrate runoff to manage development impacts are the focus of most HMP implementation guidance. They work by either reducing the volume of runoff (infiltration facilities) or holding water and releasing it below the critical flow (Qc) (detention facilities). These facilities, also referred to as Hydrologic Control BMPs, can range from regional detention basins designed solely for flow control, to bioretention facilities that serve a number of functions. A number of Hydrologic Control BMPs, including swales, bioretention, flow-through planters, and extended detention basins have been developed to manage stormwater quality, and several resources describe the design of stormwater quality BMPs (CASQA 2003; Richman et al. 2004). In many cases, these facilities can be designed to also meet Hydrologic Performance Standards.

Many HMPs also provide guidance for applying LID approaches to site design and land use planning to preserve the hydrologic cycle of a watershed and manage Hydromodification impacts. These plans typically include decentralized stormwater management systems and protection of natural drainage features, such as wetlands and channel corridors. Runoff is typically directed toward infiltration-based stormwater BMPs that slow and treat runoff. Hydrologic Control BMPs differ from those used to meet Water Quality Objectives in that they focus more on generating a flow duration curve that matches or reduces the undeveloped flow duration curve than on removing potential Pollutants, although these two functions can be combined into one facility. Various methods exist for sizing Hydrologic Control BMPs.

- **Hydrograph Matching** uses an outflow hydrograph for a particular site that matches closely with the pre-project hydrograph for a design storm. This method is most traditionally used to design flood-detention facilities to manage for a particular storm recurrence interval (e.g., the 100-year storm). Although hydrograph matching can be employed for multiple storm recurrence intervals, this method generally does not take into account the smaller, more frequent storms that are identified by the actual state of the science as performing a majority of the erosive work on channels and is therefore not widely accepted for HMP compliance nor recommended for use as a part of this HMP.

- **Volume Control** matches the pre-project and post-construction runoff volume for a project site. Any increase in runoff volume is either infiltrated onsite, or discharged to another location where channels will not be impacted. The magnitude of peak flows and Time of Concentration is not controlled, so while this method ensures there is no increase in total volume of runoff, it can result in higher erosive forces during storms.

- **Flow Duration Control** matches or reduces both the duration and magnitude of a specified range of storms. The entire hydrologic record is taken into account, and pre-project and post-construction runoff magnitudes and volumes are matched as closely as possible. Excess runoff is either infiltrated onsite or discharged below Qcp (Geomorphically critical flow – 10% of the 2-year flow).

The Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVUPPP) HMP reviewed each of these methods and concluded that a Flow Duration Control approach was the most effective in controlling erosive flows. Two examples were evaluated using this approach, one on the Thompson Creek subwatershed in Santa Clara Valley and one on the Gobernadora Creek watershed in Orange County. The evaluation approach used continuous simulation modeling to generate flow duration curves, and then designed a test Hydrologic Control BMP to match pre-project durations and flows.

In addition to the SCVURPP HMP, the flow duration control approach has been applied by the Alameda Countywide Clean Water Program, San Mateo County Water Pollution Prevention Plan, the Fairfield-Suisun Urban Runoff Management Program, Contra Costa Clean Water Program, San Diego County, and South Orange County. Among these agencies, different approaches have emerged on how to demonstrate that proposed Hydrologic Control BMPs meet flow duration control guidelines. Both methods employ continuous simulation to match or reduce flow durations, but differences exist in how continuous simulation is used (site-specific simulation vs. unit area simulation). Differences also exist in the focus of the two approaches (regional detention facilities vs. onsite LID facilities). Both approaches were evaluated by the different RWQCBs and deemed valid (Butcher 2007).

Other existing HMPs have defined an approach to design and implement hydrologic control BMPs, including Counties of the Bay Area and Contra Costa County.

BAHM Approach

The Bay Area Hydrology Model (BAHM) is a continuous simulation rainfall runoff hydrology model developed for ACCWP, SMCWPPP, and SCVURPP. It was developed from the Western Washington Hydrology Model, which focuses primarily on meeting Hydromodification Management Performance Standards using stormwater detention ponds alone or combined with LID facilities (Butcher 2007). The Western Washington Hydrology Model is based on the Hydrologic Simulation Program – FORTRAN (HSPF) modeling platform, developed by the USEPA, and uses HSPF parameters in modeling watersheds.

Users who want to size a Hydrologic Control BMP select the location of their project site from a map of the Bay Area and BAHM correlates the project location to the nearest rainfall gauge and

applies an adjustment factor to the hourly rainfall for the nearest gauge, to produce a weighted hourly rainfall at the project site. The User then enters parameters for the proposed project site describing soil types, slope, and land uses. BAHM then runs the continuous rainfall-runoff simulation for both the pre-project and the post-construction conditions of the project site. Output is provided in the form of flow duration curves that compare the magnitude and timing of storms between the pre-project and the post-construction modeling runs.

If an increase in flow durations is predicted, the User can select and size Hydrologic Control BMPs from a list of modeling elements. An automatic sizing subroutine is available for sizing detention basins and outlet orifices that matches the flow duration curves between the pre-project scenario and a post-construction management scenario. Manual sizing is necessary for other Hydrologic Control BMPs included in the program, such as storage vaults, bioretention areas, and infiltration trenches. The program is designed so that, once a Hydrologic Control BMP is selected and sized, the modeling run can be transferred to the Copermittee with jurisdiction over the project site for approval. The Copermittee model reviewer can launch the program and verify modeling parameters and sizing techniques.

A HMP tool was also developed to support Users with the San Diego County HMP. The San Diego Hydrology Model (SDHM) derives from the BAHM, and integrates parameters that are specific to San Diego County. Similarly, the South Orange Hydrology Model (SOHM) was developed for the purposes of the South Orange County NPDES Permit.

A similar approach will be used for the SMR HMP. The Western Washington Continuous Simulation Hydrology Model (WWHM) has been modified to include local rainfall and loss rate information, in addition to preferred local BMP selection to provide Users a user-friendly tool to develop a Hydromodification management strategy. The SMRHM allows the user to match or reduce the flow duration curve for the selected range of flows using locally preferred BMPs.

Contra Costa Clean Water Program (CCCWP) Approach

The CCCWP developed a protocol for selecting and sizing Hydrologic Control BMPs, which are referred to as Integrated Management Practices (IMPs) in their guidebook. Instead of a User running a site-specific continuous simulation to size Hydrologic Control BMPs, the CCCWP provides sizing factors for designing site level IMPs. Sizing factors are based on the soil type of the project site and are adjusted for Mean Annual Precipitation. Sizing factors are provided for bioretention facilities, flow-through planters, dry wells and a combination cistern and bioretention facility.

Sizing factors were developed through continuous simulation HSPF modeling runs for a variety of development scenarios. Flow durations were developed for a range of soil types, vegetation and land use types, and rainfall patterns for development areas in Contra Costa County. Then, based on a unit area (one acre) of impervious surface, flow durations were modeled using several IMP designs. These IMPs were then sized to achieve flow control for the range of storms required, (from 10% of the 2-year storm up to the 10-year storm). These sizing factors were then transferred to a spreadsheet form for use by Users.

The primary difference between the CCCWP approach and the BAHM approach is the level of modeling required. The CCCWP approach is simplified for the User in that both Hydromodification and water quality management is incorporated into the IMP sizing factors. The BAHM allows for more flexibility in that regional BMPs may be used to meet Hydromodification Performance Standards, and if desired, water quality, in addition to site level approaches. The 2010 SMR MS4 Permit allows for offsite management of Hydromodification, if the onsite infeasibility of Hydrologic Control BMPs has been demonstrated. Therefore, an approach that uses continuous simulation to assess regional or neighborhood level BMP implementation is preferred for this HMP.

C.1.3. Sediment Management Measures

Urban development can reduce the mass of Bed Sediment transported through the elimination of alluvial channel sections. This occurs in site development when first-order and particularly larger channels are lined or placed into underground conduits. First-order channels are identified as the unbranched channels that drain from headwater areas and develop in the uppermost topographic depressions, where two or more contour crenulations (notches or indentations) align and point upslope (NEH, 2007). First-order channels may, in fact, be field ditches, gullies, or ephemeral gullies (NEH, 2007).

There are two general approaches for managing the Bed Sediment Load relative to urbanization and channel stability. The first approach attempts to correct for the change in Bed Sediment Load material load by increasing or decreasing the discharge rate as appropriate to generally maintain the balance between hydrologic and geomorphic processes as conceptualized in Lane's interrelationship. While theoretically a sound approach, this option requires a significant amount of detailed information that is difficult to obtain and requires good calibration of sediment models.

Sediment transport models are non-linear and relatively sensitive to the rate of sediment supply and particle size distribution. This HMP does not recommend any specific sediment transport equation or model as the selection of such a model should be based on channel and watershed specific information, and the amount and quality of available data. Examples of sediment transport equations the designer may consider include: Duboys Formula, Meyer-Peter Formula, Einstein Bed Load Function, Modified Einstein Procedure, Colby's Method, Engelund and Hansen Method, Ackers and White Method. There are several models that use these transport formulas to predict long-term sediment transport. General guidance for site-specific analysis is provided in APPENDIX H

The second approach to maintaining sediment supply is physically based, relying on a field assessment of site locations that may supply Bed Sediment Load to the receiving channel, and protecting those sources during the site planning and development process. With this approach, the User will only provide engineered solutions for flow management. Protection of site Bed Sediment Load sources is the preferred approach since it is physically based and potentially less prone to error. Guidelines for field assessment of Bed Sediment Load sources are provided with the sediment control management approach, which is described in **Section 2.3**.

C.1.4. In-Channel Stabilization Solutions

In-Channel solutions focus on managing the channel corridor to provide stability, modifying the channel to accept an altered flow regime. In cases where development is proposed in a watershed with an impacted channel it may be beneficial to focus on rehabilitating the channel to match the new independent variables of channel cross section, sediment discharge, flow discharge and channel slope rather than retrofitting the watershed or only controlling a percentage of the runoff with onsite controls. This type of approach can restore channel functions, beneficial uses, and values at a much more rapid pace, especially in locations that cannot physically be returned to their natural state due to changes in channel alignment and restrictions on the channel cross section due to adjacent development. In addition, in some cases where a master planned watershed development plan is being implemented it may be more feasible to design a new channel to be stable under the proposed watershed land use rather than to construct distributed onsite facilities.

In-channel stabilization and restoration solutions are available as alternative compliance as a part of the SMR HMP. In-channel restoration projects are available if onsite Hydrologic Control BMPs are not feasible and it has been determined that the receiving water that the project discharges to has impacts due to Hydromodification. Tiered benefits (benthic communities, morphology) of such in-channel restoration projects must offset the hydrologic and sediment changes induced by the associated PDP(s).

A number of methods exist for managing channels to accept altered flow regimes and higher shear forces. These have been covered in detail in a number of sources available to watershed groups and public agencies. A few helpful sources include Riley 1998, Watson and Annable 2003, and FISRWG 1998.

C.1.5. Channel Susceptibility – Domain of Analysis

Southern California Coastal Water Research Project (SCCWRP) has developed a series of screening tools that evaluate the susceptibility of a channel to Hydromodification impacts (SCCWRP, 2010). These screening tools allow a User to rate the susceptibility of the evaluated channel to erosion for a variety of geomorphic scenarios including alluvial fans, broad valley bottoms, incised headwaters, etc.

The development of HMPs in most Southern California counties is correlated to the ultimate findings of SCCWRP studies on Hydromodification (SCCWRP, 2008 through 2011). It is generally acknowledged that SCCWRPs formulation of regional standards for Hydromodification management may serve as a baseline for development of HMP Performance Standards for specific regions in Southern California.

When evaluating the channel susceptibility though the SCCWRP screening tools, a domain of analysis is defined. This domain of analysis corresponds to the reach lengths upstream and downstream from a project from which Hydromodification assessment is required. The domain of analysis determination includes an assessment of the incremental flow accumulations

downstream of the site, identification of grade control points in the downstream channel, and quantification of downstream tributary influences. The SMR program elected not to perform the extensive susceptibility mapping required to correlate channel reaches with variable low flow discharge thresholds, since the return on investment for this type of analysis appears to be very low.

The effects of Hydromodification may propagate for significant distances downstream (and sometimes upstream) from a point of impact such as a MS4 outfall. Accordingly, the domain of analysis serves as a representative buffer domain across which the susceptibility of a channel should be evaluated. This representative domain spans multiple channel types/settings, and is defined as follows in this HMP (SCCWRP, 2010):

Proceed downstream until reaching the closest of the following:

- at least one reach downstream of the first grade-control point (but preferably the second downstream grade-control location)
- tidal backwater/lentic waterbody
- equal order tributary (Strahler 1952)
- a two-fold increase in drainage area

OR demonstrate sufficient flow attenuation through existing hydrologic modeling.

Proceed upstream to extend the domain for a distance equal to 20 channel widths or to grade control in good condition – whichever comes first. Within that reach, identify hard points that could check headward migration, evidence that head cutting is active or could propagate unchecked upstream

Within the analysis domain there may be several reaches that should be assessed independently based on either length or change in physical characteristics. In more urban settings, segments may be logically divided by road crossings (Chin and Gregory, 2005), which may offer grade control, cause discontinuities in the conveyance of water or sediment, etc.

The domain of analysis is discussed here since it may be relevant for use in site-specific analysis as discussed in APPENDIX H . It is not used in this HMP as a discriminator for HMP applicability to a specific project.

C.2. Flow Duration Control Approach

C.2.1. Effects of Urban Development and Critical Flow

The effects of urban developments on channel response have been the focus of many studies (see Paul and Meyer, 2001 for a review), and the widely accepted consensus is that increases in impervious surfaces associated with urbanizing land uses can cause channel degradation. Urban development generally leads to a change in the amount and timing of runoff in a watershed, which may increase erosive forces on channel bank and bed material and can cause

large-scale channel enlargement, general scour, channel bank failure, loss of aquatic habitat, and degradation of water quality.

Channel erosion is a complex process subject to a variety of influences. Channel erosion is non-linear (Philips 2003), meaning the response of channels is not directly proportional to changes in land use and flow regimes. Small changes or temporary disturbances in a watershed may lead to unrecoverable channel instability (Kirkby 1995). These disturbances may give rise to feedback systems whereby small instabilities can be propagated into larger and larger instabilities (Thomas 2001).

A number of studies have sought to correlate the amount of urban development in a watershed and channel instability (Bledsoe 2001; Booth 1990, 1991; Both and Jackson 1997; MacRae 1992; 1993; 1996; Coleman et al. 2005). Evidence from these studies suggests that below a certain threshold of watershed imperviousness, channels maintain stability. This threshold or imperviousness transition zone appears to be around seven to 10% watershed urbanization for perennial channels (Schueler 1998 and Booth 1997), but may begin at a lower level for intermittent channels such as those found in Southern California. Studies done in Santa Fe, New Mexico (Leopold and Dunne 1978) suggest that changes occur at 4% impervious area of the watershed.

Initial studies by Coleman et al. (2005) suggest that a response in the channel may begin to occur at two to 3% watershed imperviousness for intermittent channels in Southern California. It is important to understand that use of impermeable cover alone is a poor predictor of channel erosion due to differences in stormwater detention and infiltration within regions.

In highly urbanized watersheds returning a channel to a natural condition is infeasible due to existing development in the watershed. In these scenarios the focus should be on in-channel restoration to restore the beneficial uses of the Receiving Water.

Though it is well established that watershed urbanization causes channel degradation, a detailed understanding of how development alters runoff and how this altered runoff in turn causes erosion is still being developed.

The ability to transport sediment is proportional to the amount of flow in the channel: as flow increases, the amount of sediment moved within a channel also increases. The ability of a channel to transport sediment is termed stream power, which integrated over time is work. Leopold (1964) introduced the concept of effective work, whereby the flow-frequency relationship of a channel is multiplied by sediment transport rate. This gives a mass-frequency relationship for erosion rates in a channel. Flows on the lower end of the relationship (e.g., two-year flows) may transport less material, but occur more frequently than higher flows, thereby having a greater overall effect on the work within the channel. Conversely, higher magnitude events, while transporting more material, occur infrequently causing less effective work. Leopold found that the maximum point on the effective work curve occurred around the 1-to 2-year frequency range. This maximum point is commonly referred to as the dominant discharge. It corresponds roughly to a bankfull event (a flow that fills the active portion of the channel up to a well-defined break in the bank slope).

The constructions of Vail Lake, Skinner Reservoir, and Diamond Valley Reservoir have effectively created man-made sumps capturing the majority of incoming storm water flows from Temecula Creek, Wilson Creek, Kolb Creek, and Tucalota Creek. At these reservoirs, stormwater may only overtop the spillway(s) and be discharged into the downstream channels during higher magnitude events (10-year and higher magnitude events). Since the completion of the dams, the reduction in frequency and magnitude of discharges into Temecula Creek and Tulacota Creek has resulted in a significant reduction of the cumulative work performed in those downstream channels.

Urban development tends to have the greatest relative impact on flows that are frequent and small, and which tend to generate less-than-bankfull flows. Change is greatest in these events because prior to urban development, infiltration would have absorbed much or all of the potential runoff, but following urban development, a high percent of the rainfall runs off. Thus, events that might have generated little or no flow in a non-urbanized watershed can contribute flow in urban settings. These smaller less-than-bankfull events have been found to cause a significant proportion of the work in urban channels (MacRae 1993) due to their high frequency, and can lead to channel instability. Less frequent, larger magnitude flows (e.g., flows greater than Q10) are less strongly affected by urban development because during such infrequent storm events, the ground rapidly becomes saturated, and acts (for purposes of runoff generation) in a similar manner as impervious surfaces.

Due to the increase in impervious surfaces and fewer opportunities for infiltration of stormwater, urban development creates a higher runoff rate and more runoff volume than an un-urbanized watershed. Opportunities for infiltration of excess stormwater exist in urbanized areas, but many times are infeasible due to cost, technical barriers or land use constraints. Therefore, some of the excess stormwater must be discharged to a receiving channel. In order to achieve a comparable Ep to a pre-developed condition, this excess runoff volume must be discharged at a rate at which insignificant effective channel work is done.

The Bed Sediment Load moves through transmission of shear stress from the flow of water on the channel bed. An increase in the hydraulic radius (measure of channel flow efficiency through a ratio of the channel's cross sectional area of the flow to its wetted perimeter) corresponds to an increase in shear stress. In order to initiate movement of Bed Sediment Load, however, a shear stress threshold must be exceeded. This is commonly referred to as Critical Shear Stress, and is dependent on sediment and channel characteristics. For a given point on a channel where the bed composition and cross-section is known, the Critical Shear Stress can be related to a flow. The flow that corresponds to the Critical Shear Stress is known as the critical flow, or Qc. For a given cross-section, flows that are below the value for Qc do not initiate Bed Sediment Load movement, while flows above this value do initiate Bed Sediment Load movement.

C.2.2. Geomorphically-Significant Flows in Existing HMPs

SCVURPPP expressed Qc as a percentage of the two-year flow in order to develop a common metric across watersheds of different size, and allow for easy application of HMP performance standards. For the two watersheds studied in detail in the SCVURPPP study, a similar

relationship was found where Qc corresponded to 10% of the two-year flow. Several methodologies were used to determine both the two-year flows and the ten-year flows across the evaluated watersheds. The two-year flow was computed based on either the rational method, as described in the Santa Clara Valley Hydrology Procedures, or the Cunnane ranking schema applied to "all event frequency" curves. The ten-year flow was computed based on the Log Pearson type III distribution applied to annual flow frequency curves. This became the basis for the lower range of geomorphically significant flows under the SCVURPPP HMP and is referred to as Qcp to indicate that it is a percentage of flow. That program also adopted the 10-year flow as the upper end of the range of flows to control with the justification that increases in channel work above the 10-year flow were small for urbanized areas.

A similar study was conducted for the Fairfield-Suisun Urban Runoff Management Program (FSURMP) on two watersheds in Fairfield, California following a geomorphic assessment. That study found Qcp to be 20%t of the pre-development two-year flow. The differences in the two values may be attributable to differences in watershed characteristics in Santa Clara County and Fairfield, the number of channels studied, the methodology used to compute the two-year flow, and the precision of the modeling tools. Channels in Fairfield were found to have a more densely vegetated riparian corridor and may have a higher resistance to increases in shear stresses (FSURMP). Values for Qcp appear to be similar among neighboring watersheds, but there appears to be a range of appropriate Qcp values. The characteristics of individual biomes (climatically and geographically defined areas of ecologically similar climatic conditions, such as communities of plants, animals, and soil organisms, often referred to as ecosystems) should be taken into account when developing a Qcp. For example, Western Washington State, which has more densely vegetated riparian zones than either Fairfield or Santa Clara County, has adopted a Qcp of 50% of the 2-year flow.

The Santa Clara HMP focused on using detention basins for Hydromodification management and emphasized the lower flow control limit for site runoff. Extended detention Hydrologic Control BMP basins can be constructed with multi-stage outlets to manage both the duration and magnitude of flows within a prescribed range. To avoid the erosive effects of extended low flows, the maximum rate (depth) at which runoff is discharged is set below the erosive threshold. Per the Santa Clara HMP, the lower flow control limit was defined as the flow rate that generates critical shear stress on the channel bed and banks. Both Santa Clara and Alameda Counties correlated the lower flow control limit to a value equal to 10% of the 2-year runoff event.

The Contra Costa HMP emphasized the importance of using LID methods to meet Hydromodification Performance Standards. LID approaches to Hydrologic Performance Standards rely on site design and distributed LID BMPs to control the frequency and duration of flows, and to manage hydrograph modification impacts. By minimizing directly connected impervious areas and promoting infiltration, LID approaches mimic natural hydrologic conditions to counteract the hydrologic impacts of development. LID systems are sized to achieve flow control for the range of storms required (from 10% of the 2-year storm up to the 10-year storm).

The San Diego County HMP defined an adaptive lower flow threshold based on the channel susceptibility rating (high, medium, or low). Receiving channels in San Diego County were

individually classified by their susceptibility to channel erosion impacts using a critical flow calculator and a channel screening tool developed by SCCWRP. This classification produced three lower flow thresholds which are 0.1Q2, 0.3Q2, and 0.5Q2. The upper range of the management flow was considered the pre-project 10-year storm event.

To date, seven approved HMPs have been published. These include HMPs for SCVURPPP (2005), the CCCWP (2005), the FSURMP (2005), the Alameda Countywide Clean Water Program (ACCCMP 2005), the San Mateo Countywide Stormwater Pollution Prevention Program (SMCWPPP [formerly STOPPP] 2005), the San Diego County HMP (2009), and the South Orange County HMP (2012). In addition, a number of HMPs were implemented while agencies developed their final plans. Interim HMPs are not detailed in this report because these plans have adopted findings from the above listed HMPs. A summary of flow control standards adopted in each of the approved HMPs in California and western Washington is given in **Table 7**.

Table 7 - Summary of Flow Control Standards – Approved HMPs

Permitting Agency	Q_{cp}	Largest Managed Flow
Alameda County	10% of the 2-year flow (0.1Q2)	10-year flow (Q10)
Contra Costa County	10% of the 2-year flow (0.1Q2)	10-year flow (Q10)
Fairfield-Suisun Urban Runoff Management Program	20% of the 2-year flow (0.2Q2)	10-year flow (Q10)
San Diego County	10, 30, or 50 % of the 2-year flow (0.1Q2, 0.3Q2, or 0.5Q2)	10-year flow (Q10)
San Mateo County	10% of the 2-year flow (0.1Q2)	10-year flow (Q10)
Santa Clara County	10% of the 2-year flow (0.1Q2)	10-year flow (Q10)
South Orange County	10% of the 2-year flow (0.1Q2)	10-year flow (Q10)
Western Washington State	50% of the 2-year flow (0.5Q2)	50-year flow (Q50)

C.2.3. Applicable Flow Thresholds for the SMR

HMPs that have been developed in the San Francisco Bay Area, Northern California (Contra Costa, Santa Clara, and Alameda Counties and the Sacramento area), in Southern California (San Diego, South Orange Counties) vary with regard to the emphasis placed on lower flow control thresholds as compared to other approaches, such as distributed LID methods. The SMR HMP was developed using the lower flow control threshold approach. There is consensus in that both the frequency and duration of flows must be controlled using continuous simulation hydrologic modeling (rather than the standard design storm approach used for flood control design) to manage for potential development impacts. At this point, it is generally accepted that events more frequent than the 10-year flow are the most critical for Hydromodification management, since flows within this range of return period (up to the 10-year event) have been documented to perform the most work on the channel bed and banks. However, the range of analysis could potentially change in the future if new studies provide sufficient evidence warranting a modification.

Rates of sediment production from Southern California rivers depend upon bedrock geology, rates of tectonic uplift, land use, and precipitation (Warrick et al., 2003). The California Geological Survey agency identifies 13 unique geomorphic zones based on geology, faults,

topographic relief, and climate (California Department of Conservation, 2002). The SMR is located within the Peninsular Ranges geomorphic zone, whose geology is characterized by the granitic rocks intruding the older metamorphic rocks. South Orange County and San Diego County are also located within the same geomorphic zone, thus exhibits similar macro-scale geomorphic trends to those in the SMR.

The approaches developed for the San Diego County HMP and the South Orange County HMP were approved by the SDRWQCB and selected as the base approach for the SMR HMP. However, the South Orange County program elected not to perform the extensive susceptibility mapping required to correlate channel reaches with variable low flow discharge thresholds. The implementation of HMPs in Northern California, and in San Diego County has shown that numerically larger low flow thresholds generally have very limited applicability in practice. Accordingly, a base low flow threshold (0.1Q2) was selected for this HMP. The selection of the low flow threshold (0.1Q2) was based on other approved HMPs in California with similar hydrologic and geologic conditions. The low flow threshold (0.1Q2) is the most conservative of the potential range identified in the San Diego HMP. Nonetheless, the User may compute a site-specific low flow threshold at their option, following a methodology developed by the User. An example of such a procedure is described in the San Diego County HMP.

If the User opts for developing a site-specific criterion, the selected lower flow threshold should correspond to the critical channel flow that produces the critical shear stress that initiates channel Bed Sediment movement or that erodes the toe of channel banks. For a channel segment that is lined but not exempt by this HMP, the low flow threshold must be computed assuming the lining has been removed.

C.3. Classification and Geomorphic Stability of Channels

Numerous channel stability assessment methods have been proposed to help distinguish which channels are most at risk from hydrograph modification impacts and/or define where HMP Performance Standards should apply. Assessment strategies range from purely empirical approaches to channel evolution models to energy-based models (see Simon et al., 2007 for a critical evaluation). Channel stability assessment methods are useful in assessing the impact of urban development or control programs over time. Their value lies in showing trends as changes in a watershed occur, rather than classifying the reach of a discrete channel section at a given point in time.

C.3.1. Empirical approaches and Models

A recent study by Bledsoe et al. (2008) for SCCWRP describes nine types of classification and mapping systems with an emphasis on assessing channel susceptibility in Southern California. The summary below is taken from that study. Bledsoe also provides a summary of the implications of these classification and mapping systems to the development of Hydromodification tools for Southern California. The article provides a detailed breakdown of guidelines for developing Hydromodification tools given the advantages and disadvantages of each system previously assessed.

General Stability Assessment Procedures

By assessing an array of qualitative and quantitative parameters of channels and floodplains, several investigators have developed qualitative assessment systems for channel and river networks. These assessment methods have been incorporated into models used to analyze channel evolution and stability. Many parameters used to establish methodologies such as the Rosgen approach are extendable to a qualitative assessment of channel response in Californian river networks. Field investigations in Southern California have shown that grade control can be the most important factor in assessing the severity of channel response to Hydromodification. Qualitative methodologies have proven extendable to many regions, and they use many parameters that may provide valuable information for similar assessments in California.

Channel Evolution Models of Incising Channels

The Channel Evolution Model (CEM) developed by Schumm et al. (1984) posits five stages of incised channel instability organized by increasing degrees of instability severity, followed by a final stage of quasi-equilibrium. Work has been done to quantify channel parameters, such as sediment load and specific stream power, through each phase of the CEM. A dimensionless stability diagram was developed by Watson et al. (2002) to represent thresholds in hydraulic and bank stability. This conceptual diagram can be useful for engineering planning and design purposes in channel restoration projects requiring an understanding of the potential for shifts in bank stability.

Figure 15 - Five Stages of the Channel Evolution Model (CEM)

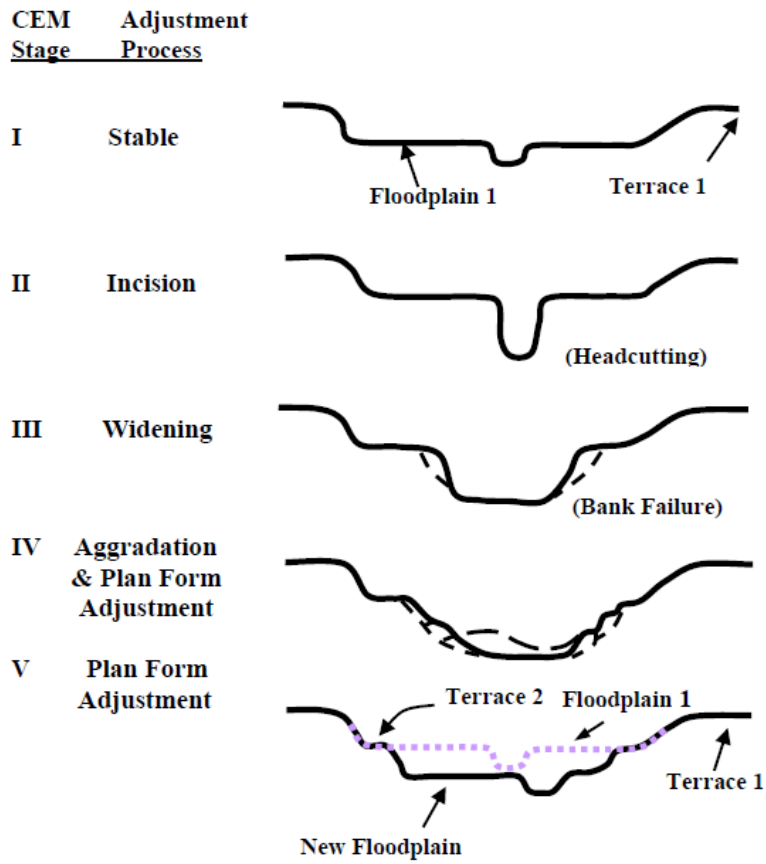

Channel Evolution models Combining Vertical and Lateral Adjustment Trajectories (Schumm et al. 1984)

Originally, CEMs focused primarily on incised channels with geotechnically, rather than fluvially, driven bank failure. Several CEMs have been proposed that incorporate channel responses to erosion and sediment transport into the original framework for channel instability. In these new systems, an emphasis is placed on geomorphic adjustments and stability phases that consider both fluvial and geomorphic factors. The state of Vermont has developed a system of stability classification that suggests channel susceptibility is primarily a function of the existing Rosgen channel type and the current channel condition referenced to a range of variability. This system places more weight on entrenchment (vertical erosion of a channel that occurs faster than the channel can widen, resulting in a more confined channel) and slope than differentiation between bed types.

Equilibrium Models of Supply vs. Transport-capacity / Qualitative Response

The qualitative response model builds on an understanding of the dynamic relationship between the erosive forces of flow and slope relative to the resistive forces of grain size and sediment supply to describe channel responses to adjustments in these parameters. In this system, qualitative schematics provide predictions for channel response to positive or negative fluctuations in physical channel characteristics and Bed Sediment. Refinements to such frameworks have been made to account for channel susceptibility relative to existing capacity and riparian vegetation among other influential characteristics.

Hierarchical Approaches to Mapping Using Aerial Photographs / GIS

It has become an increasingly common practice to characterize channel networks as hierarchical systems. This practice has presented the value in collecting channel and floodplain attributes on a regional scale. Multiple studies have exploited geographical information systems (GIS) to assess hydrogeomorphic behavior at a basin scale. Important valley scale indices such as valley slope, confinement, entrenchment, riparian vegetation influences, and overbank deposits can provide information for river networks in California. Many agencies are developing protocols for geomorphic assessment using GIS and other database associated mapping methodologies. These tools may be useful as they are further developed in a monitoring program, but are not viable at a scale useful for reach-by-reach channel analysis.

The approach taken by this HMP to monitor its effectiveness is embedded in a derivative of the channel classification approach defined by Rosgen (1996). The author distinguishes three different levels of channel classification including: 1) Level I that generally describes channel relief, landform, and valley morphology; 2) Level II that describes the morphology of a channel and associates the later to a channel type based on channel form and Bed Sediment composition. Field measurements of entrenchment, width-to-depth ratio, sinuosity, slope, and representative sampling of channel material may be suitable; and 3) Level III that assesses channel condition and departure. A channel that is geomorphically stable per Rosgen's definition is characterized by two elements: 1) Dimension, pattern, and profile of a channel are maintained over time; and 2) the transport capacity of a watershed's flows and detritus is maintained. As such, physical and biological functions of a geomorphologically stable channel remain at an optimum.

C.3.2. Channel Classification System

Planform Classifications and Predictors

Alluvial channels form a continuum of channel types whose lateral variability is primarily governed by three factors: flow magnitude, bank erodibility, and relative sediment supply. Though many natural channels conform to a gradual continuum between straight and intermediate, meandering, and braided patterns, abrupt transitions in lateral variability imply the existence of geomorphic thresholds where sudden change can occur. The conceptual framework for geomorphic thresholds has proven integral to the study of the effects of disturbance on river and channel patterns. Many empirical and theoretical thresholds have been proposed relating channel power, sediment supply and channel gradient to the transition between braiding and meandering channels. Accounting for the effects of Bed Sediment particle size has been shown to provide a vital modification to the traditional approach of defining a discharge slope combination as the threshold between meandering and braided channel patterns. The many braided planforms in Southern California indicate the need to refine and calibrate established thresholds to river networks of interest. However, at this time there is not a well-accepted model to predict how Hydromodification affects channel planform.

Energy-Based Classifications

The link between channel degradation and urbanization has been studied; however, impervious area is not the solitary factor influencing channel response. Studies have shown that the ratio between specific channel power and median Bed Sediment size D50b, where b is approximately 0.4 to 0.5 for both sand-and gravel-bed channels, can be used as a valuable predictor of channel form. Stream power, which is linearly related to the total discharge, is the most comprehensive descriptor of hydraulic conditions and sedimentation processes in channels. Several studies have been performed relating channel stability to a combination of parameters such as discharge, median Bed Sediment size, and bed slope, as an analog for stream power.

A recent study by Bledsoe et al. (2008) for SCCWRP describes nine types of classification and mapping systems with an emphasis on assessing channel susceptibility in Southern California. The summary below is taken from that study. Bledsoe also provides a summary of the implications of these classification and mapping systems to the development of Hydromodification tools for Southern California. The article provides a detailed breakdown of guidelines for developing Hydromodification tools given the advantages and disadvantages of each system previously assessed.

Sand vs. Gravel Behavior/Threshold vs. Live-Bed Contrasts

It is well recognized that the fluvial-geomorphic behavior varies greatly between sand and gravel/cobble systems. Live bed channels (of which sand channels are good examples) are systems where sediment moves at low flows, and where sediment is frequently in motion. Threshold channels, such as gravel channels, by contrast, require considerable flow to initiate Bed Sediment Load movement. Live bed channels are more sensitive to increases in flow and decreases in sediment supply than threshold channels. Scientific consensus shows that sand bed channels lacking vertical control show greater sensitivity to changes in flow and sediment transport regimes than do their gravel/cobble counterparts. Factors such as slope, and sedimentation regimes are known to have greater impact on sand bed channels. This can be an important issue for stormwater systems receiving runoff from watersheds composed primarily of channels with sandy substrate. The transition between sand and gravel bed behavior can be rapid, enabling the use of geographic mapping methods to prioritize channel segments according to their susceptibility to the effects of Hydromodification.

Bank Instability Classifications

Early investigations provided the groundwork for bank instability classifications by analyzing shear, beam, and tensile failure mechanisms. The dimensionless stability approach developed by Watson characterized bank stability as a function of hydraulic and geotechnical stability. Rosgen (1996) proposed the widely applied Bank Erosion Hazard Index (BEHI) as a qualitative approach based on the general stability assessment procedures outlined above. Other classification systems, like the CEM, determine bank instability according to channel characteristics that control hydrogeomorphic behavior.

As required per 2010 SMR MS4 Permit Provision F.1.h(1)(a), a Hydromodification Susceptibility Study has been performed as part of this HMP effort to identify and map channel segments that

may be vulnerable to Hydromodification and cause a Hydrologic Condition of Concern (HCOC). The study located in APPENDIX D helps Users determine whether or not a project will drain to a potentially susceptible channel segment.

APPENDIX D - Hydromodification Susceptibility Documentation Report and Mapping: Santa Margarita Region

Restoration and Rehabilitation Opportunities in the Santa Margarita Region (refer to Appendix D)

APPENDIX E - HSPF Pervious Land Parameters for SMRHM

Pervious Land Hydrology (PWATER) Parameters

The HSPF hydrology parameters of PWATER are divided into four sections, titled PARM1-4. PARM1 is a series of checks to outline any monthly variability versus constant parameter values within the simulated algorithm; whereas, PARM2 and 3 are a series of climate, geology, topography, and vegetation parameters that require numerical values to be input.

PARM2 involves the basic geometry of the overland flow, the impact of groundwater recession, potential snow impact due to forest cover and the expected infiltration and soil moisture storage. The main parameters of groundwater recession are KVARY and AGWRC. The infiltration and soil moisture storage parameters are INFILT and LZSN.

PARM3 involves the impact of climate temperature during active snow conditions, a wide range of evaporation parameters due to the variability of the onsite soil and existing vegetation and subsurface losses due to groundwater recharge or the existing geology. The main evaporation parameters are INFEXP, INFILD, BASETP, and AGWETP. The parameter for subsurface loss is DEEPFR, which accounts for one of only three major losses from the PWATER water balance (i.e., in addition to evaporation, and lateral and channel outflows).

PARM4 involves the flow and hydrograph characteristics, the expectation of rain interception due to the inherent moisture storage capacity from existing vegetation, land use and/or near surface soil conditions and evaporation due to the root zone of the soil profile. The main interception parameters are CEPSC and UZSN. The parameter for evaporation as a primary function of vegetation is LZETP.

PARM2

KVARY – A groundwater recession flow parameter used to describe non-linear groundwater recession rate (per inches) (initialize with reported values, then calibrate as needed). KVARY is usually one of the last PWATER parameters to be adjusted; it is used when the observed groundwater recession demonstrates a seasonal variability with a faster recession (i.e., higher slope and lower AGWRC values) during wet periods, and the opposite during dry periods. Value ranges are shown in Table A-4. Values that are representative of the conditions in South Orange County have been selected for the SOCHM. Plotting daily flows with a logarithmic scale helps to elucidate the slope of the flow recession.

AGWRC – A groundwater recession rate, or ratio of current groundwater discharge to that from 24 hours earlier (when KVARY is zero) (per day) (estimate, then calibrate).

The overall watershed recession rate is a complex function of watershed conditions, including climate, topography, soils, and land use. Hydrograph separation techniques can be used to estimate the recession rate from observed daily flow data (such as plotting on a logarithmic scale).

INFILT – Index to mean soil infiltration rate (in/hr); (estimate, then calibrate). In HSPF, INFILT is the parameter that effectively controls the overall division of the available moisture from precipitation (after interception) into surface runoff. Since INFILT is not a maximum rate nor an infiltration capacity term, its values are normally much less than published infiltration rates, percolation rates (from soil percolation tests), or permeability rates from the literature. INFILT is primarily a function of soil characteristics, and value ranges have been related to the Soil Conservation Source (SCS) hydrologic soil groups (Donigian and Davis, 1978, p.61, variable INFIL) as follows (**Table 8**):

Table 8 - SCS Hydrologic Soil Group Characteristics

SCS Hydrologic Soil Group	INFILT Estimate		Runoff Potential
	(in/hr)	(mm/hr)	
A	0.4 – 1.0	10.0 – 25.0	Low
B	0.1 – 0.4	2.5 – 10.0	Moderate
C	0.05 – 0.1	1.25 – 2.5	Moderate to High
D	0.01 – 0.05	0.25 – 1.25	High

An alternate estimation method that has not been validated is derived from the premise that the combination of infiltration and interflow in HSPF represents the infiltration commonly modeled in the literature (e.g., Viessman et al., 1989, Chapter 4). With this assumption, the value of 2.0*INFILT*INTFW should approximate the average measured soil infiltration rate at saturation, or mean permeability.

LZSN – Lower zone nominal soil moisture storage (inches). LZSN is related to both precipitation patterns and soil characteristics in the region. Viessman, et al, 1989, provide initial estimates for LZSN in the Stanford Watershed Model (SWM-IV, predecessor model to HSPF) as one-quarter of the mean annual rainfall plus four inches for arid and semiarid regions, or one-eighth annual mean rainfall plus four inches for coastal, humid, or subhumid climates.

PARM3

INFEXP – Exponent that determines how much a deviation from nominal lower zone storage affects the infiltration rate (HSPF Manual, p. 60).

Variations of the Stanford approach have used a POWER variable for this parameter; various values of POWER are included in Donigian and Davis (1978, p. 58). However, the vast majority of HSPF applications have used the default value of 2.0 for this exponent.

INFILD – Ratio of maximum and mean soil infiltration capacities. In the Stanford approach, this parameter has always been set to 2.0, so that the maximum infiltration rate is twice the mean (i.e., input) value; when HSPF was developed, the INFILD parameter was included to allow investigation of this assumption. However, there has been very little research to support using a value other than 2.0.

DEEPFR - The fraction of infiltrating water which is lost to deep aquifers (i.e., inactive groundwater), with the remaining fraction (i.e., 1-DEEPFR) assigned to active groundwater storage that contributes baseflow to the channel.

It is also used to represent any other losses that may not be measured at the flow gauge used for calibration, such as flow around or under the gauge site. Watershed areas at high elevations, or in the upland portion of the watershed, are likely to lose more water to deep groundwater (i.e., groundwater that does not discharge within the area of the watershed), than areas at lower elevations or closer to the gauge.

BASETP – ET by riparian vegetation as active groundwater enters the channel bed; specified as a fraction of potential ET, which is fulfilled only as outflow exists.

If significant riparian vegetation is present in the watershed then non-zero values of BASETP are typically applied. If riparian vegetation is significant, a generic BASETP value of 0.2 is typically representative of the evapotranspiration conditions in the San Juan Hydrologic Unit. This value was established in conjunction with a satisfactory annual water balance.

AGWETP – Fraction of model segment (i.e., pervious land segment) that is subject to direct evaporation from groundwater storage, e.g., wetlands or marsh areas, where the groundwater surface is at or near the land surface, or in areas with phreatophytic vegetation drawing directly from groundwater. This is represented in the model as the fraction of remaining potential ET (i.e., after base ET, interception ET, and upper zone ET are satisfied), that can be met from active groundwater storage.

A value of 0.05 has been selected for inclusion into the SOCHM. This value was adjusted and calibrated in the Aliso Creek watershed HSPF model (Orange County) based on adjustment of the low flow simulation, and ultimately the annual water balance.

PARM4

CEPSC – Amount of rainfall, in inches, which is retained by vegetation, that never reaches the land surface, and is eventually evaporated (estimate, then calibrate). Typical guidance for CEPSC for selected land surfaces is provided in Donigian and Davis (1978, p. 54, variable EPXM) (**Table 9**).

Table 9 - CEPSC for Selected Land Surfaces

Land Cover	Maximum Interception (in)
Grassland	0.10
Cropland	0.10 – 0.25
Forest Cover, light	0.15
Forest Cover, heavy	0.20

LZETP – Index to lower zone evapotranspiration (unitless). LZETP is a coefficient to define the ET opportunity; it affects evapotranspiration from the lower zone, which represents the primary soil moisture storage and root zone of the soil profile. LZETP behaves much like a "crop coefficient" with values mostly in the range of 0.2 to 0.7; as such, it is primarily a function of vegetation. Typical and possible value ranges are shown in **Table 11**, and the following ranges for different vegetation are expected for the "maximum" value during the year (**Table 10**):

Table 10 - LZETP Value Ranges

Land Cover Type	Input Coefficient
Forest	0.6 – 0.8
Grassland 0.4	0.4 - 0.6
Row Crops 0.5	0.5 – 0.7
Barren 0.1	0.1 – 0.4
Wetlands 0.6	0.6 – 0.9

Table 11 - Typical permanent channel cross-section with benchmark locations and points of measurement – Rosgen (1996)

HSPF HYDROLOGY PARAMETERS AND VALUE RANGES

			RANGE OF VALUES					
NAME	DEFINITION	UNITS	TYPICAL		POSSIBLE		FUNCTION OF ...	COMMENT
			MIN	MAX	MIN	MAX		
PWAT - PARM2								
FOREST	Fraction forest cover	none	0.0	0.50	0.0	0.95	Forest cover	Only impact when SNOW is active
LZSN	Lower Zone Nominal Soil Moisture Storage	inches	3.0	8.0	2.0	15.0	Soils, climate	**Calibration**
INFILT	Index to Infiltration Capacity	in/hr	0.01	0.25	0.001	0.50	Soils, land use	**Calibration**, divides surface and subsurface flow
LSUR	Length of overland flow	feet	200	500	100	700	Topography	Estimate from high resolution topo maps or GIS
SLSUR	Slope of overland flow plane	ft/ft	0.01	0.15	0.001	0.30	Topography	Estimate from high resolution topo maps or GIS
KVARY	Variable groundwater recession	1/inches	0.0	3.0	0.0	5.0	Baseflow recession variation	Used when recession rate varies with GW levels
AGWRC	Base groundwater recession	none	0.92	0.99	0.85	0.999	Baseflow recession	**Calibration**
PWAT - PARM3								
PETMAX	Temp below which ET is reduced	deg. F	35.0	45.0	32.0	48.0	Climate, vegetation	Reduces ET near freezing, when SNOW is active
PETMIN	Temp below which ET is set to zero	deg. F	30.0	35.0	30.0	40.0	Climate, vegetation	Reduces ET near freezing, when SNOW is active
INFEXP	Exponent in infiltration equation	none	2.0	2.0	1.0	3.0	Soils variability	Usually default to 2.0
INFILD	Ratio of max/mean infiltration capacities	none	2.0	2.0	1.0	3.0	Soils variability	Usually default to 2.0
DEEPFR	Fraction of GW inflow to deep recharge	none	0.0	0.20	0.0	0.50	Geology, GW recharge	Accounts for subsurface losses
BASETP	Fraction of remaining ET from baseflow	none	0.0	0.05	0.0	0.20	Riparian vegetation	Direct ET from riparian vegetation
AGWETP	Fraction of remaining ET from active GW	none	0.0	0.05	0.0	0.20	Marsh/wetlands extent	Direct ET from shallow GW
PWAT - PARM4								
CEPSC	Interception storage capacity	inches	0.03	0.20	0.01	0.40	Vegetation type/density, land use	Monthly values usually used
UZSN	Upper zone nominal soil moisture storage	inches	0.10	1.0	0.05	2.0	Surface soil conditions, land use	Accounts for near surface retention
NSUR	Manning's n (roughness) for overland flow	none	0.15	0.35	0.05	0.50	Surface conditions, residue, etc.	Monthly values often used for croplands
INTFW	Interflow inflow parameter	none	1.0	3.0	1.0	10.0	Soils, topography, land use	**Calibration**, based on hydrograph separation
IRC	Interflow recession parameter	none	0.5	0.7	0.3	0.85	Soils, topography, land use	Often start with a value of 0.7, and then adjust
LZETP	Lower zone ET parameter	none	0.2	0.7	0.1	0.9	Vegetation type/density, root depth	**Calibration**

Source: USEPA BASINS Technical Note 6

Model assumptions for channel reach infiltration rates were derived through calibration based on data collected within the reaches of Aliso Creek (11 stations) and Rose Creek (6 stations). In the model, infiltration rates vary by soil type. Channel infiltration was calibrated by adjusting a single infiltration value, which was varied for each soil type by factors established from literature ranges (USEPA 2000) of infiltration rates specific to each soil type. The final resulting infiltration rates were 1.368 in/hr (Soil Group A), 0.698 in/hr (Soil Group B), 0.209 in/hr (Soil Group C) and 0.084 in/hr (Soil Group D). The infiltration rates for Soil Groups B, C, and D are within the infiltration range given in literature (Wanielisata et al. 1997). The result for Soil Group A is below the range given in Wanielisata et al. (1997).

APPENDIX F - Channel Classification Procedure

The procedure derives from the "Stream Stability Validation" approach that is described by Rosgen (1996). Channel stability over time may be assessed by monitoring the channel for five factors: 1) aggradation; 2) degradation; 3) shifting of particle sizes of channel Bed Sediment; 4) changing the rate of lateral extension through accelerated bank erosion; and 5) morphological changes following the CEM (Simon et al., 1992). If any hydrological changes or disturbance occurs in the watershed, the five elements defined above are critical to analyze the channel response to the implementation of Hydrologic Control BMPs.

One reference channel station will be used for comparison purposes and should coincide with the station selected for the bioassessment. The reference station should be located in a channel that shows the same lithology, sediment regime, and morphometric parameters as the study channel stations. Annual comparisons of channel stability will be carried out at the same time of the year, at the end of the spring season, thus maximizing the chances to monitor similar weather patterns.

Channel stability will be evaluated on an annual basis at selected cross-sections in the SMR. Evaluation of the vertical or bed stability will serve as the reference method to understand the geomorphological changes of a channel over time. Vertical or bed stability will be evaluated at each of the identified cross-sections; this field method will identify a potential aggradation or degradation, if any, of the channel. Rate, magnitude, and direction of vertical change, if any, will be quantified.

Vertical or bed stability

Rosgen (1996) has documented a couple methods including one, known as the "Monumented Cross-sections Method". At each selected site, the method consists of setting permanently monumented cross-sections that are located on a riffle and pool segment (or step/pool segment), i.e., two monumented cross-sections per site. Annual measurements at the two monumented cross-sections per site will be compared to the reference elevations taken during the initial survey.

Initially, one permanent benchmark should be installed on each bank of the channel: a left temporary benchmark and a right temporary benchmark. These should be made permanent by digging a hole in which a 10-inch stove bolt will be set up by a pad of concrete. The intent is to avoid vandalism damage. These two benchmarks will be located at the cross-section on a stable site above and away from the bankfull channel. Additionally, an elevation cross-section is often needed if the left or right side of the cross-section is located on an unstable slope. An elevation benchmark is established and often does not represent a true representation, but rather a relative elevation set at 100 feet.

During each cross-section survey, a leveled tape line is set above the channel. Measurements originate from the intercept of the rod with the leveled tape line (**Figure 16**).

Figure 16 - Typical permanent channel cross-section with benchmark locations and points of measurement – Rosgen (1996)

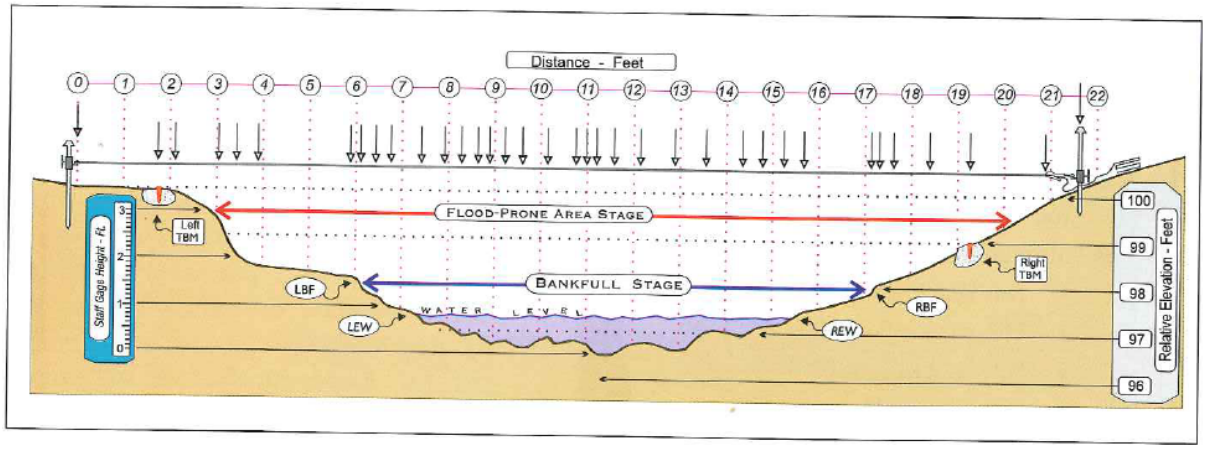

Simple measurements are made with the measuring tape and elevation rod method as described by Rosgen (1996):

- Locate the permanent benchmark on both sides of the channel (or, if on one side, a bearing for the transect is needed)
- Stretch the tape very tight with spring clamp and tape level
- Locate tape at same elevation as reference bolt on benchmark
- Read distance and elevation reading of rod intercept with tape
- Measure major features, such as:
    - Left benchmark (LBM)
    - Left terrace/floodplain (LT, LFP)
    - Left bankfull (LBF)
    - Left bank (LB)
    - Left edge of water (LEW)
    - Various bed features, bars, etc.
    - Thalweg (TW)
    - Inner berm features (IB)
    - Right edge of water (REW)
    - Right bank (RB)
    - Right bankfull (RBF)
    - Right terrace/floodplain (RT, RFP)
    - Right benchmark (RBM)

Measurements must include the floodplain, terraces, and channel adjacent slopes. Other surveying procedures such as auto or laser levels and total station surveys may be adapted from the described "measuring tape and elevation rod" method. If technically feasible, any exceptional event associated with a level higher than the bankfull level needs to be marked and indicated on the cross-section. The cross-section needs to be plotted for each measurement and compared to previous cross-sections to evaluate bed stability.

Finally, the longitudinal slope will be assessed based on measurements taken at two consecutive cross-sections. Rosgen (1996) also recommends developing a vicinity map and detailed site map indicating the locations of monumented cross-sections, as well as upstream and downstream photographs for site documentation. Dimensions for channel classification need to be correlated in order to document morphological comparisons for extrapolation.

Each channel segment being surveyed will be classified on an annual basis per the simplified Rosgen system of channel classification (Rosgen, 1996). Classification will be possible upon identification of the following parameters: floodprone width, bankfull width, bankfull depth, and longitudinal slope. **Figure 17** shows the different types of channels per Rosgen channel classification (Rosgen, 1996).

Figure 17 - Simplified Rosgen Channel Classification (Rosgen, 1996)

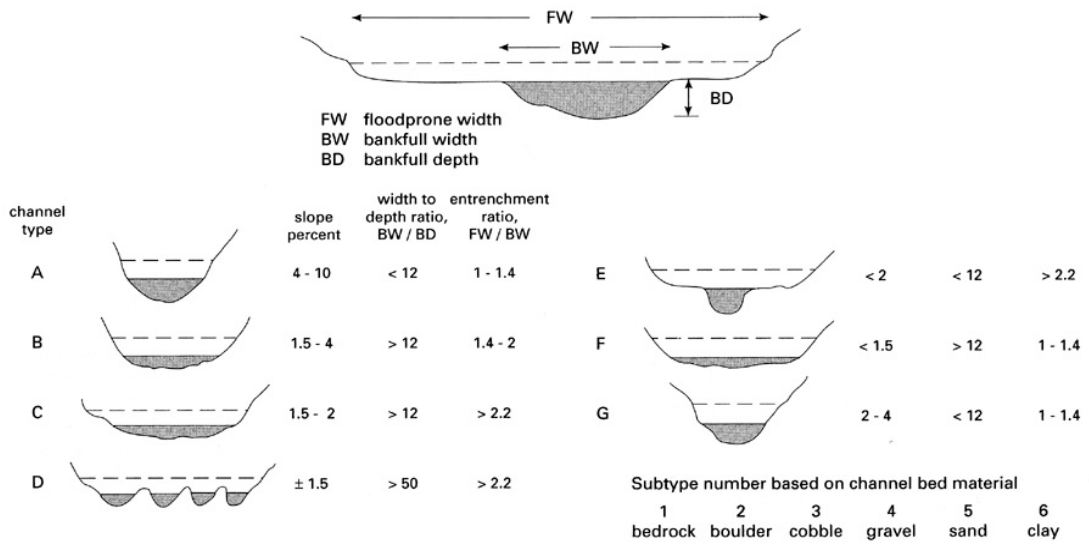

Figure 1.12 The Rosgen system of channel classification.

APPENDIX G - Santa Margarita Region Hydrology Model Guidance Manual

- The *Santa Margarita Region Hydrology Model* program can be downloaded for free on the Riverside County Flood Control and Water Conservation District's NPDES/Municipal Stormwater Management Program website.

http://www.rcflood.org/NPDES/Default.aspx

APPENDIX H - Conducting a Site-Specific Hydromodification Analysis

A User may choose to develop a site-specific Hydromodification susceptibility analysis in lieu of using the continuous simulation tool provided by the SMR HMP. The site-specific analysis must be developed to demonstrate that the project will not adversely impact the receiving channel through either changes in the receiving channel hydrograph, or changes in Bed Sediment Load supply to the channel.

The following items are not intended to be an approach to complete the analysis, rather, they are provided for information as suggestions for the engineering analysis. Each project will have unique conditions and will require a customized approach for analysis. A site-specific analysis may or may not be ultimately approved by the Copermittee with jurisdiction over the project site. It is the responsibility of the User to assess the potential for an analysis to successfully demonstrate that the project is consistent with the guidelines of this HMP.

1. It is recommended that the User develop a study approach and outline, and review it with the Copermittee with jurisdiction over the project site prior to beginning the full study.
2. The study must demonstrate that the project is consistent with the requirements of the 2010 SMR MS4 Permit and this HMP.
3. Site-specific information to characterize Bed Sediment gradation, flow and rainfall data, and watershed hydrologic parameters will be required. Continuous simulation is required.
4. An objective of the study may be to determine if the loss of Bed Sediment Load from the project-site to the receiving channel can be partially or fully managed by additional management of the runoff discharge from the project-site.
5. Sediment transport modeling has inherent uncertainty. The Copermittee with jurisdiction over the project site may not approve a site-specific analysis if it is apparent that the change in conditions that will be modeled are about the same magnitude as the model uncertainty.

The selected lower flow threshold should correspond to the critical channel flow that produces the Critical Shear Stress that initiates channel Bed Sediment Load movement or that erodes the toe of channel banks of a comparable soft-bottom channel.

The method of analysis, including the specific modeling program, the sediment transport function, the reach of the receiving water to be modeled, the method of determining Bed Sediment discharge in the receiving channel, the method of determining Bed Sediment discharge from the project-site, the period of record for continuous simulation and other parameters are left to the discretion of the User. The study report should document and justify the approach, selected models and methods, data requirements, analysis method and results for review.

APPENDIX I - Identification of a Site-Specific Low Flow Threshold

If allowed by the Copermittee with jurisdiction over the project site, Users have the option to use a site-specific low flow threshold for individual projects instead of 10% of the 2-year peak flow specified in the HMP.

A User may assess the viability of pursuing a site-specific low flow threshold based on the results of a planning-level analysis that is presented in this Appendix. The planning-level analysis consists of a critical flow sensitivity assessment, which provides the User with a general indication that a site-specific low flow threshold may be appropriate, but is not sufficient to quantify the threshold. The stepwise approach is consistent with that developed for the San Diego County HMP (2011).

The demonstration of an applicable low flow threshold must be performed based on field geomorphic evaluation, non-uniform hydraulic modeling, and sediment continuity modeling. This Appendix provides general concepts on these topics. A person knowledgeable in sediment processes should be consulted if the User desires to take the next step and establish a site-specific low flow threshold.

A. For Planning Purposes Only: Simplified Stepwise Approach

For initial planning purposes, the User may run the desktop-level analysis using the proposed empirical equations and assess the viability of pursuing a site-specific low flow threshold. To establish viability of a site-specific threshold, the User may perform and document the findings of each of the following six steps.

The simplified stepwise approach is only provided as an attempt to assist the User with a simplified method. The uncertainty associated with each of the variables of the simplified approach can potentially falsely influence the results. It is the User's responsibility to analyze the results and the geomorphic environment of the downstream channel before attempting to pursue a site-specific low flow threshold.

Step A-1: Identify the Typical Range of Rainfall Conditions for the HMP Area

The purpose of Step 1 is to identify the mean annual precipitation at the project site based on existing records from a nearby precipitation station. The mean annual precipitation serves as an input to characterize the dominant discharge for the receiving channel. Based on 70+ years of District SMR rainfall records, the mean annual precipitation ranges from 11.6 to 20.6 inches in the SMR. The User should identify on **Figure 3** of the main document, the meteorological zone where the project site is located, and subsequently refer to **Table 12** to select the associated mean annual precipitation.

Table 12 - SMR Mean Annual Precipitation per Meteorological Zone

Meteorological Zone	Mean Annual Precipitation (in inches)
Eastern Slopes	14.7
Temecula Valley	15.8
Western Plateau	20.6
Wildomar / North Murrieta	11.6

Step A-2: Identify a Range of Typical Receiving Channel Dimensions for Each Watershed Area

Empirical relationships have been developed to express channel dimensions (width, depth, and to a lesser extent, gradient) as a function of the dominant discharge. For undeveloped channels in semi-arid parts of the U.S. such as in the SMR, dominant discharge can be approximated by the 5-year discharge flow.

Step A-2.a – The dominant discharge, Qbf, assumed to be approximately equivalent to the 5-year peak discharge (Q5), may be estimated using the USGS regional regression for undeveloped watersheds in the South Coast Region (Waananen and Crippen, 1977). This equation calculates Q5 (cfs) as a function of watershed area (sq. mi.) as determined in Step 2, and mean annual precipitation (MAP, in/yr) as determined in Step 1. The relationship is:

$$Q_5(cfs) = 0.4 \cdot [Watershed\ Area\ (sq.mi)]^{0.77} \cdot [Mean\ Annual\ Precipitation\ (inches)]^{1.69}$$

Step A-2.b –Identification of the width and the depth of each channel reach: The User may iteratively identify the type of channel as defined in **Table 13** that most corresponds to each individual channel reach that is selected within the domain of analysis (defined in APPENDIX C). In addition to the channel type, **Table 13** identifies the source and the empirical channel geometry relationships. Empirical relationships were developed based on channel geometry and hydrology in Southern California.

Table 13 - Empirical relationships for Channel Dimensions

Channel Type	Source	Empirical Channel Geometry Relationships
Undeveloped channels in Southern California – narrow, deep, and steep dimensions	Coleman et al., 2005	$Width(ft) = 0.6012 \cdot Q_{bf}^{0.6875}$ $Depth(ft) = 0.3854 \cdot Q_{bf}^{0.3652}$ Q_{bf} in cfs
Gravel channels – wide, shallow, flat braided dimensions	Parker et al., 2007	$Width(m) = 4.63 \cdot \frac{Q_{bf}^{2/5}}{9.81^{1/5}} \cdot \left[\frac{Q_{bf} \cdot d_{50}^2}{\sqrt{9.81 \cdot d_{50}}}\right]^{0.0667}$ $Depth(m) = 0.382 \cdot \frac{Q_{bf}^{2/5}}{9.81^{1/5}}$ Q_{bf} in the bankfull discharge in m^3/s d_{50} is the diameter of median channel material in m
Medium width, depth, and gradient channels	Hey and Thorne, 1986	$Width(m) = 2.73 \cdot Q_{bf}^{0.5}$ $Depth(m) = 0.22 \cdot Width^{0.37} \cdot d_{50}^{-0.11}$ Q_{bf} in the bankfull discharge in m^3/s d_{50} is the diameter of median channel material in m

Step A-3.c – Compute a channel slope using Manning's equation such that the wetted cross-sectional area at bankfull depth conveys the dominant discharge. Manning's equation is expressed as:

$$Q = 1.486 \cdot \frac{A \cdot R^{0.67} \cdot \sqrt{s}}{n}$$

Where:

- Q = Flowrate (cfs)
- A = Cross-Section Flow Area (ft2)
- R = Hydraulic Radius (ft) = A / P
- P = Wetted Perimeter (ft)
- s = Energy Gradient Assumed Equal to Longitudinal Slope (ft/ft)
- n = Manning Roughness (unitless)

For planning purposes, the User can assume a Manning Roughness value of 0.025, corresponding to a non-vegetated, straight channel of small slope, after aging whose Bed Sediment is composed of colloidal alluvial silt (ASCE No.77, 1992). However, it is suggested that the User determine the retardance coefficient from

Table 14. This reflects the small, ephemeral receiving channels which are prevalent in Southern California. A different Manning Roughness value may be used only if it has been previously approved by the Copermittee with jurisdiction over the project site. A sensitivity analysis performed in the San Diego HMP found that the retardance coefficient had little effect on the estimated critical shear flow rate.

Table 14 - Critical Shear Stress per Sediment Type (Source: ASCE No.77, 1992)

Material	n	Clear Water		Water Transporting Colloidal Silts	
		V (fps)	τ (lb/ft2)	V (fps)	τ (lb/ft2)
Fine sand, colloidal	0.020	1.50	0.027	2.50	0.075
Sand loam, noncolloidal	0.020	1.75	0.037	2.50	0.075
Silt loam, noncolloidal	0.020	2.00	0.048	3.00	0.11
Alluvial silts, noncolloidal	0.020	2.00	0.048	3.50	0.15
Ordinary firm loam	0.020	2.50	0.075	3.50	0.15
Volcanic ash	0.020	2.50	0.075	3.50	0.15
Stiff clay, very colloidal	0.025	3.75	0.26	5.00	0.46
Alluvial silts, colloidal	0.025	3.75	0.26	5.00	0.46
Shales and hardpans	0.025	6.00	0.67	6.00	0.67
Fine gravel	0.020	2.50	0.075	5.00	0.32
Graded loam to cobbles when noncolloidal	0.030	3.75	0.38	5.00	0.66
Graded silts to cobbles when colloidal	0.030	4.00	0.43	5.50	0.80
Coarse gravel, noncolloidal	0.025	4.00	0.30	6.00	0.67
Cobbles and shingles	0.035	5.00	0.91	5.50	1.10

Step A-3: Identify a Range of Typical Channel Material for Receiving Channels

The User should identify the weakest predominant type of Bed Sediment in each section of the receiving channel within the domain of analysis. A simple identification from aerial imagery, available photography, or existing technical documentation is deemed sufficient for planning purposes, or a field review or a geotechnical investigation can be used. The User should subsequently identify the critical shear stress associated with each type of predominant Bed Sediment using Error! Reference source not found.

Table 14 presents a nonexhaustive list of critical shear stresses for typical channel materials and covers the range of Critical Shear Stresses to be encountered in the SMR.
Table 14 may be used for planning purposes only.

Appropriate references for Critical Shear Stress values are provided in ASCE No.77 (1992) and Fischenich (2001). To account for the effects of vegetation density and channel irregularities, the applied shear stress can be partitioned into form and bed/bank roughness components, and the lowest value of d50 be used for calculations. Other references include the procedure for application of allowable velocity to determine the Critical Shear Stress or equivalent allowable velocity associated with a specific type of Bed Sediment. Design of Open Channels, TR-25 (USDA, 1977) will guide the User through the allowable velocity approach, which relates allowable velocity to sediment concentration, grain diameter of the non-cohesive boundary material, and plasticity index and soil characteristics for cohesive boundary material. Another effective reference is the National Engineering Handbook Part 654, Chapter 8, which contains the Shields diagram and describes the allowable shear stress approach (NEH, 2007).

Step A-4: Identify the Flow Rate at Which Boundary Shear Stress Exceeds Critical Shear Stress for the Channel and Material

The tractive force theory was initially described in Shield's diagram (1936) and further translated into an equation by the Bureau of Reclamation (1987). The tractive force theory establishes that Bed Sediment Load is being displaced when the shear stress applied on the boundary of a particle of Bed Sediment exceeds the critical shear stress associated with that particle. The average boundary shear stress on a particle of Bed Sediment may be expressed as:

$$\tau = \gamma \cdot R \cdot s$$

Where:

- τ = Effective Shear Stress of d_{50} from sieve analysis (lb/ft2)
- γ = Unit Weight of Water (62.4 lb/ft3)
- R= Hydraulic Radius (ft) as determined in Step 2
- s = Longitudinal slope (ft/ft) as determined in Step 2.c

Using Manning's equation for the established channel cross-section, roughness, and gradient, the flow depth is iterated to produce a shear stress rating curve for each of the channel section selected within the domain of analysis. A shear stress rating curve correlates the average boundary shear stress to a discharge, which can be as high as the dominant discharge in this exercise. For the purpose of the exercise, an example shear stress rating curve is shown in **Figure 8**. The example shear stress rating curve was developed with the following parameters: s= 0.005 ft/ft; n= 0.035; side slope = 1H: 1W; bankfull depth = 1.51 feet; bankfull width = 7.91 feet.

Figure 18 - Example Shear Stress Rating Curve

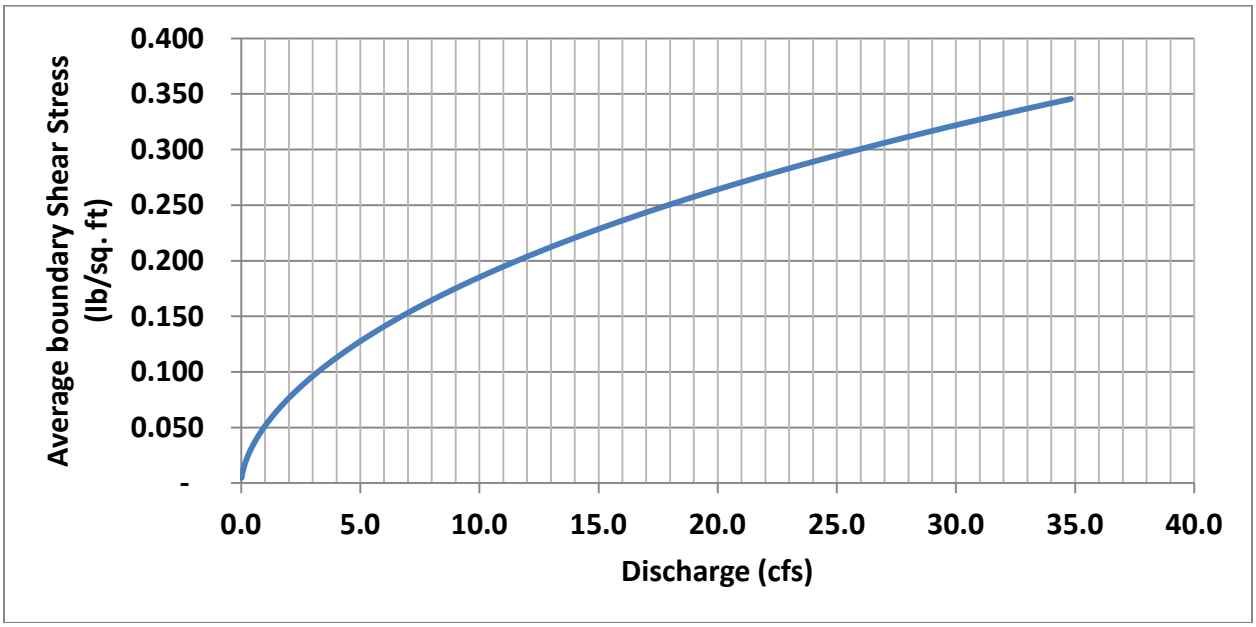

Based on the Critical Shear Stress identified in Step 4, the User should identify on each shear stress rating curve, Qcrit, or the flow rate at which boundary shear stress equals critical shear stress.

Step A-5: Express Critical Flow As A Function of Q2

The User may use the USGS regional regression of the 2-year peak discharge for the South Coast Region (Waananen and Crippen, 1977) to determine the 2-year peak discharge in each channel reach selected within the domain of analysis. The regression equation is expressed, as follows:

$$Q_2(\text{cfs}) = 0.14 \cdot [\text{Watershed Area (sq. mi)}]^{0.72} \cdot [\text{Mean Annual Precipitation (inches)}]^{1.62}$$

The critical flow (Qcrit) is expressed as a function of Q2 to remain consistent with the standardized relationship stated in existing HMPs throughout California.

Step A-6: Identify the Most Conservative Low Flow Threshold

In a final step, the User should summarize in a tabular format the findings of the stepwise approach applied to each section of channel. An example of such tabular representation is showcased in **Table 15**, in which critical flow rates are grouped by type of channel material.

Table 15 - Summary Table of Critical Flow Rates per Section of Channel

Drainage Management Area	Trib Area	Mean Annual Precip	5-year Flowrate	2-year Flowrate	Critical Flowrate	Low Flow Threshold	Bankfull Width	Bankfull Depth
	A	MAP	Q5	Q2	Qcrit	Qcrit/Q2	W	D
	sq mi	in/yr	cfs	cfs	cfs	% of Q2	ft	ft
τ_{crit} = 0.025 lb/ft2, sand bed (low end)								
Section A1	1	15.8	42.5	12.2	0.296	**2.4%**	7.91	1.51
τ_{crit} = 0.05 lb/ft2, sand bed (high end)								
Section A2	1	15.8	42.5	12.2	0.947	**7.7%**	7.91	1.51
τ_{crit} = 0.12 lb/ft2, gravel								
Section A3	1	15.8	42.5	12.2	4.452	**36.4%**	7.91	1.51

In the above example, for Section A1, the ratio between the critical flow and the 2-year peak flow is computed as: (0.296 cfs) / (12.2 cfs) = 0.024 = 2.4%.

From the summary table, the User should identify the most conservative low flow threshold among all downstream sections. For instance, in the presented example, the User should select 2.4% Q2 as the site-specific low flow threshold. In this instance, a site-specific low flow threshold would not be advantageous for the project.

B. For Consideration and Approval by the Copermittee with jurisdiction over the project site: Full-Scale Geomorphic Assessment

For consideration and approval of a site-specific low flow threshold by the Copermittee with jurisdiction over the project site, demonstration must be established based on field geomorphic evaluation, nonuniform hydraulic modeling, and sediment continuity modeling. A person familiar with sediment transport should be consulted if the User was to establish a site-specific low flow threshold.

The field geomorphic assessment, to be performed within the domain of analysis, should identify the geometry of each selected cross-section and characterize the associated Bed Sediment Load. The geomorphic evaluation requires surveying the cross-section and longitudinal profile geometry of the active channel, estimating the hydraulic roughness of the channel, and evaluating the critical shear stress (pounds per square foot) of the most sensitive bed and bank material. For non-cohesive material, a Wolman pebble count or sieve analysis is used to obtain a grain size distribution, which can be converted to Critical Shear Stress using an empirical relationship or reference tables in the literature. For cohesive material, an in-situ jet test or reference tables are used. For banks reinforced with vegetation, reference tables are generally used.

The site-specific hydrologic and hydraulic evaluation should determine the 2-year peak discharge Q2 based on a flow gage record in the receiving channel or a continuous hydrologic model, if available. In computing Q2, the original condition of the watershed tributary to the channel, before development, should be considered. This provides a means of apportioning the critical flow in a channel to individual projects (on a pro-rata area basis) that discharge to that

channel, such that cumulative discharges do not exceed the critical flow (Qcrit) in the channel of concern. This flow apportionment must be provided as a part of the analysis by the User.

The User must demonstrate through a channel stability impact assessment that the changes to both the amount of Bed Sediment transported and the amount of Bed Sediment supplied to the channel, will maintain the general trends of aggradation and degradation in the impacted channel reaches, which are representative of the dynamic equilibrium of a channel.

APPENDIX J – Flow Control Threshold Analysis Report (Appendix A of 2011 San Diego HMP)

APPENDIX K – SMR HMP Evaluation Program

045806

REPORT OF WASTE DISCHARGE

MAY 10, 2015

Submitted to:

SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD
(Order No. R9-2010-0016)

and

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY – REGION IX
(NPDES No. CAS0108766)

RIVERSIDE COUNTY

SANTA MARGARITA RIVER REGION

Principal Permittee:

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

Co-Permittees:

COUNTY OF RIVERSIDE, CITY of MURRIETA,
CITY of TEMECULA, and CITY of WILDOMAR

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1.0 Introduction

This Report of Waste Discharge (ROWD) is an application for renewal of Order No. R9-2010-0016, an area-wide National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Permit (2010 MS4 Permit). The MS4s covered under the 2010 MS4 Permit are owned and operated by the Riverside County Flood Control and Water Conservation District (District), the County of Riverside (County), and the Cities of Murrieta, Temecula and Wildomar (collectively, the Co-Permittees).

On November 10, 2010, the San Diego Regional Water Quality Control Board (Regional Board) adopted the 2010 MS4 Permit, which expires on November 10, 2015. Directive K.2.c of the 2010 MS4 Permit requires that a ROWD be submitted no later than 180 days prior to the expiration date. This ROWD has been prepared in consultation with the Co-Permittees and is submitted on their behalf. Table 1-2 lists the required elements for the ROWD and identifies where those elements can be found in the ROWD.

In order to protect lives and property and to prevent damage to the watershed, the Co-Permittees operate and maintain essential drainage infrastructure in the Santa Margarita Region (SMR). The County and the Cities maintain approximately 317 miles of drainage infrastructure in the SMR while the District maintains approximately 90 miles. Environmental stewardship and integrated water resource management continues to be an essential part of the Co-Permittees' responsibilities.

The diligent work performed by the Co-Permittees under the 2010 MS4 Permit has maintained Receiving Water quality and prevented new impairments despite continued growth in population and development within the region. As shown in Table 1-1, the population in the region is projected to have a steady growth rate and by 2020 the region's population is predicted to grow by 5.6%. The challenges posed by this growing population require the Co-Permittees to continue to adapt their BMPs and watershed programs to protect water quality.

Table 1-1 Santa Margarita Region Population Estimates

Co-Permittee	Year			
	Estimate 2015 (a)	Estimate 2016 (b)	Projected 2020 (b)	Change (2015 to 2020)
City of Murrieta	107,455	108,482	112,591	4.8%
City of Temecula	108,450 b	111,585b	119,422	10.1%
City of Wildomar	35,433	36,310	37,204	5.0%
Unincorporated County of Riverside	51,314	52,436	53,793	2.6%
Total	272,621	276,585	292,017	5.6%

Notes:

(a) Unless otherwise noted, populations were obtained from the State of California, Department of Finance, E-4 Population Estimates for Cities, Counties and the State, *2011-2014, with 2010 Census Benchmark*. Sacramento, California, May 2014.

(b) Data gathered from City of Temecula website, "Demographic Snapshot 2014 Report".

During the term of the 2010 MS4 Permit, the Co-Permittees developed and utilized various programs to help protect water quality. These programs include the development of the Individual Jurisdictional Runoff Management Plan (JRMP) that specifies management programs and activities required of each Co-Permittee, as well as the development of the SMR Monitoring and Reporting Program (MRP). The Upper Santa Margarita River Watershed Water Quality Workplan (Watershed Workplan) was also developed during the permit term to identify and prioritize water quality concerns.

The Co-Permittees have also developed new and improved ways to maximize finite resources to protect Receiving Waters more effectively. Such examples are creating a more efficient process to review priority development projects, WQMPs, and track inspections. The Co-Permittees continue to improve procedures to efficiently respond to spills and other illegal discharges. The Co-Permittees also continue to educate the public about improving water quality through different engagements such as hosting public education events, speaking to employees and customers at home improvement stores, and speaking to students at local schools. The Annual Reports submitted under the 2010 MS4 Permit (which are contained in Appendix C) describe the Co-Permittees' various water quality improvement programs in detail.

This ROWD builds on the discussion in the Annual Reports by highlighting the major accomplishments of the Co-Permittees' programs, describing the challenges that they face and discussing their continuing efforts to protect Receiving Water quality. To promote clarity, terms defined in the 2010 MS4 Permit are capitalized in this ROWD.

1.1 ROWD Required Elements Summary

Table 1-2 Location of Required ROWD Elements per Directive K.2.c of 2010 MS4 Permit

Required ROWD Element	ROWD Location
1) Proposed changes to the Co-Permittees' runoff management programs	Section 3.80, and Appendix C
2) Proposed changes to monitoring programs	Section 3.0 and Appendix C
3) Justification for proposed changes	Section 3.80 and Appendix C
4) Name and mailing addresses of the Co-Permittees	Section 1.2

1.2 Co-Permittee Contact Information

The table below provides the contact information for each of the Co-Permittees in the Santa Margarita Region that have either technical or administrative involvement in the MS4 Permit.

Table 1-3 Co-Permittee Contact Information

Co-Permittee	Primary Contact	Staff Contact	Address
District (Principal)	Warren D. Williams General Manager-Chief Engineer 951.955.1275	David Garcia Engineering Project Manager 951.955.1330 dhgarcia@rcflood.org	1995 Market Street Riverside, CA 92501
City of Murrieta	Bob Moehling City Engineer 951.461.6036. bmoehling@murrieta.org	Bill Woolsey Civil Engineer Associate 951.461.6073 wwoolsey@murrieta.org	1 Town Center 24601 Jefferson Avenue Murrieta, CA 92562
City of Temecula	Tom Garcia Director of Public Works 951.694.6411 tom.garcia@cityoftemecula.org	Aldo Licitra 951.694.6411 aldo.licitra@cityoftemecula.org	41000 Main Street Temecula, CA 92590
City of Wildomar	Dan York Public Works Director 951.677.7751 ext. 216 dyork@cityofwildomar.org	Matt Bennett Deputy City Engineer 951.677.7751 ext. 208 mbennett@cityofwildomar.org	23873 Clinton Keith Road, Suite 201 Wildomar, CA 92595
County of Riverside	Steve Horn Senior Management Analyst 951.955.1110 shorn@rceo.org	Claudia Steiding Senior Transportation Planner (Transportation Land Management Agency) 951.955.1694 csteiding@rctlma.org	4080 Lemon Street, 4th Floor Riverside, CA 92501

1.3 Regional Board Jurisdictional Area Exchange

- **City of Wildomar (San Diego Co-Permittee) -** The City of Wildomar requests that the San Diego Regional Board continue regulating all portions of the city, regardless of Regional Board jurisdictional boundaries, for matters pertaining to MS4 permitting.

- **City of Menifee (Santa Ana Co-Permittee) -** At this time during the SMR ROWD process, the City of Menifee request that the San Diego Regional Board continue designating the Santa Ana Regional Board as the sole regulator of the City of Menifee pertaining to MS4 permitting.

2.0 Santa Margarita Region Permit Area Overview

2.1 Physiography and Geology

The upper Santa Margarita River watershed is defined as that portion of the Santa Margarita River watershed above the confluence of Murrieta and Temecula Creeks, and includes the City of Temecula and portions of the Cities of Menifee, Murrieta, Wildomar, unincorporated County areas, portions of the Cleveland and San Bernardino National Forests, the Cahuilla, Ramona, Pauma, and Pechanga Indian Reservations and properties under the jurisdiction of Caltrans and a variety of special districts. The watershed is bounded by several mountain ranges, including the Santa Ana and Santa Margarita mountains to the North and the Palomar Mountains to the South. The upper Santa Margarita watershed includes areas in Riverside and San Diego Counties and encompasses approximately 588 square miles.

The upper Santa Margarita watershed includes two major sub-basins, drained by Temecula and Murrieta Creeks. Temecula Creek has a drainage area of 366 square miles, with steep rugged topography in the Palomar and Thomas Mountain areas and rolling hills below. The upper 316 square miles of this basin is controlled by Vail Lake (completed in 1949). Murrieta Creek has a drainage area of 222 square miles, with over 50 square miles controlled by Skinner Reservoir (completed in 1974). Approximately 13 square miles are tributary to Diamond Valley Lake. Although the watershed area is somewhat smaller and less rugged than the Temecula Basin, flood flows have the potential to create greater damage as they flow through the cities of Temecula and Murrieta.

Temecula and Murrieta Creeks join along the Elsinore fault zone at the head of Temecula Canyon to form the Santa Margarita River. The Temecula Canyon is approximately five miles long, and is a steep, narrow, and rocky canyon. The San Diego-Riverside county line crosses through the Temecula Canyon. From here, the river traverses 27 miles to the Pacific Ocean.[1]

2.2 Permit Area

The Permit Area is defined as the urbanized area served by the Co-Permittees' MS4 facilities. The Permit Area is located within the area delineated by the County boundary line on the south and the limits of the jurisdiction of the San Diego Regional Board on the north, east, and west. The area encompasses approximately 751 square miles, about 10 percent of the Riverside County. It may seem that with increased population growth within the region that urban land use should have increased, however, data shows that only approximately 9% of the region is designated as Urban Land Use. The remaining portion of the region consists of either: Open space, Preserves, Rural Residential (>1ac.), or Agriculture. The Santa Margarita River Watershed Area Land Use Map is attached as Appendix B.

[1] Santa Margarita Watershed Study: Hydrologic and Watershed Processes, Phillips, Williams and Associates, Ltd., October 26, 1998, page 1.

3.0 SMR Water Quality Data Efforts and Outcomes

3.1 Summary

The SMR includes the portion of the Santa Margarita River Watershed within Riverside County. The monitoring station locations are shown in Figure 3-1 below, and are described in detail in the SMR Monitoring Report (see Appendix C). The SMR monitoring program has two general categories of monitoring stations: Receiving Water stations and MS4 outfall stations:

- Receiving Water monitoring stations are in waters of the U.S., and include reference streams and mass loading stations; and
- MS4 outfall stations are discharge points that are major outfalls.

While accomplishments from implementation of the SMR Monitoring and Reporting Program (MRP) are discussed in this section, the entire MRP is attached as Appendix C.

Each year, the Co-Permittees collect water quality samples at Receiving Water and MS4 outfall stations with various sampling frequencies, ultimately resulting in the collection of approximately 56 water quality samples. Anywhere from 80 to 243 constituents per sample undergo laboratory analysis for a full range of potential pollutants including pesticides, nutrients, metals and bacterial indicators. Only a small minority of the analytes were found to have exceeded federal and state Water Quality Standards. Although we only see a small group of constituents within the region having exceedances, the same class of constituents are seen statewide exceeding Water Quality Standards as evident from the CWA 303(d) list of waterbody impairments. The Co-Permittees are making strides in minimizing the exceedances of these particular constituents. The Co-Permittees' stormwater programs continue to adapt in order to protect Receiving Water quality. Accomplishments are highlighted in Section 3.5 below and in the Co-Permittee's individual JRMP annual reports.

Figure 3-1 SMR Monitoring Stations

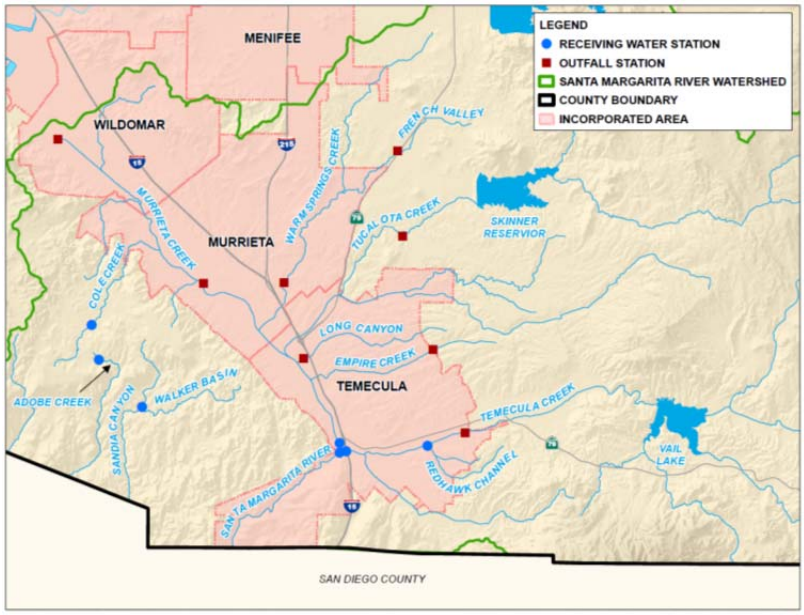

3.2 Analysis Assessment of Water Quality Data

Figure 3-2 SMR Dry Weather Exceedances FYs 2012-2014

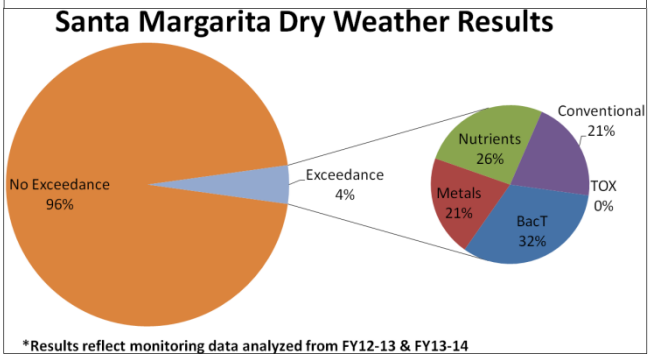

Figure 3-3 SMR Wet Weather Exceedances FYs 2012-2014

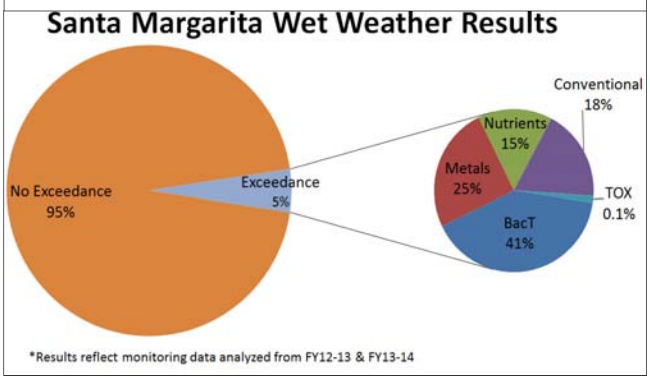

Overall, water quality conditions in SMR Receiving Waters are improving based on the number of waterbody-pollutant pairings in the upper Santa Margarita River watershed. Significant improvements are observed in the water quality sampling data sets. The results are discussed more fully in Section 3.6 (Effectiveness Assessment).

Under the Wet Weather monitoring program, approximately three water quality samples are collected at six Receiving Water stations, as well as one water quality sample from eight MS4 outfall stations. With additional sampling at the outfalls, 11 proximate Receiving Water locations are collected. This results in nearly 1,600 water quality data points.

Additionally, under the Dry Weather monitoring program, approximately two water quality samples are collected at six Receiving Water stations, as well as one water quality sample from eight MS4 outfall stations. With additional sampling at the outfalls, 11 proximate Receiving Water locations are collected. This results in over 1,300 water quality data points. As seen in Figures 3-2 and 3-3, out of the 2,900 water quality data points collected during the permit term, the SMR has only seen approximately 5% exceedances. Long-term trend data, as limited to the mass loading Receiving Water stations, are available in Attachment I (Long-Term Instantaneous Loads and Trends) of the 2013-2014 SMR Monitoring Annual Report attached as Appendix C.

The Co-Permittees have been working diligently to determine the sources of the high priority pollutants by conducting special studies (see Section 3.7.1) and engaging with special work groups (i.e. Nutrient Initiative Group).

3.3 Inherent Limitations to Analyzing Stormwater Quality Data

There are inherent limitations to analyzing water quality data from stormwater. Stormwater runoff greatly contrasts from the wastewater treatment and monitoring process. Discharges from mechanically treated wastewater effluent and industrial discharges usually:

- Come from a single or a few readily identifiable sources;
- Are generally consistent in flow rate and chemical character from day to day; and
- Can be easily instrumented.

Conversely, rain events producing urban runoff and non-point source flows are difficult to collect and analyze due to the fact that they:

- Come from multitudes of unidentifiable or hidden sources, many of which are non-urban in nature:
  - Natural leaching of soils
  - Wildlife
  - Aerial deposition
  - Wildfires
  - State, federal or tribal lands
- Vary widely in flow rate in response to precipitation events
- Vary widely in chemical character at any given moment due to:
  - Unidentified episodic issues related to natural phenomena
  - Magnitude of rainfall and extent of contributing area
  - Potential one-time illicit discharges that were not identified at the time of sampling
  - Unforeseen or unidentified consequences of land use changes
- Are subject to significant natural random variation; and
- Cannot be easily instrumented due to the variation in depth and velocity within water courses or natural stream beds.

Because ephemeral stormwater flows are particularly random in character, it may take many years before statistically significant trends can be identified from the outfall monitoring data in order to properly assess the overall effectiveness of an Urban Runoff water quality control measure.

3.4 Bioassessment Data

Bioassessment is a field collection method in which the health of a specific ecological population of interest is evaluated (e.g. aquatic insects, algae, fish, plants, etc.).

One population evaluated under this monitoring program were insects that live in the bottom substrate of the Receiving Waters. Where sufficient flows exist to support them, these organisms can provide a measure of water quality because they have a very diverse community structure, live a large portion of their lives in water as larvae or adults, have various sensitivities to natural and anthropogenic impacts, are easy to collect, and have life histories that are well studied. Similarly, algae populations were evaluated because they respond to increased stress due to natural and anthropogenic impacts in ways different than aquatic insects, and thereby together provide a picture of the water quality.

Dry weather bioassessments were performed according to the MRP at four designated Receiving Water stations (Lower Murrieta Creek, Lower Temecula Creek, Redhawk Channel, and Upper Santa Margarita River), as well as at two reference stations (Adobe Creek and Sandia Creek). All bioassessments were performed within the appropriate index period in Dry Weather (May 1st to July 30th).

During the Permit Term, the overall biological health, as determined by the SoCal IBI scores[2], was "Poor" or "Very Poor" for the lower watershed stations. Reference sites (e.g., sites higher in the watershed with limited, to no impacts from urbanization) were rated as "Fair". Figure 4-1 depicts the historical summary of SoCal IBI Scores for the SMR monitoring stations.

Figure 4-1: Summary of SoCal IBI Scores for All Monitoring Stations (Spring 2006–Spring 2014)

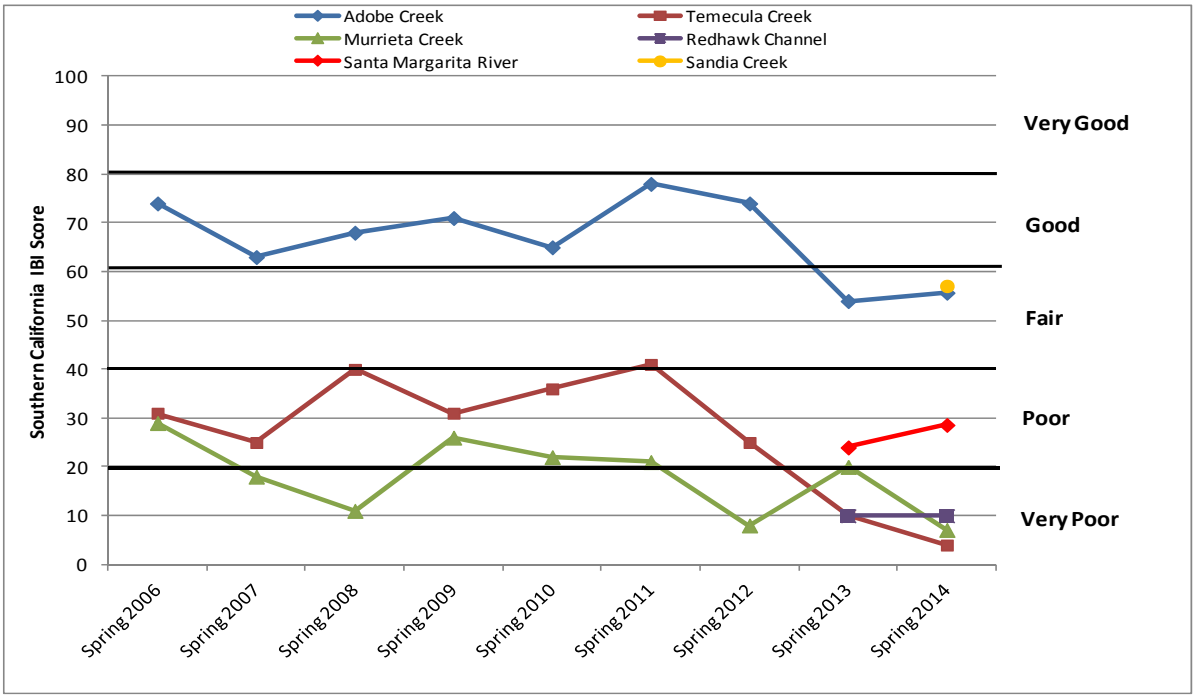

Several differences between the reference sites and the receiving water sites were identified. This affects the overall IBI score and examples of these differences include the following:

- Riparian vegetation differs among the stations monitored. The majority of the monitoring stations are located lower in the watershed and have very little canopy coverage as compared to the reference sites. This tends to impact the water temperatures at the sites.
- Water temperatures measured at the majority of the Receiving Water sites were higher than those recorded at the reference sites. Similar to the previous reporting year, these differences in temperature were most likely due to the amount of overhead tree canopy surrounding the creeks. This, coupled with smaller wetted width at the reference sites, can lead to a denser tree canopy directly overhead of a stream, resulting in lower instream temperatures.
- A large difference noted between stations was the percentage gradient (slope) of the stream. Both reference stations have very high gradients (~2-4%), while the lower watershed stations ranged

[2] The SoCal IBI was developed to assess the biological integrity of freshwater streams in the southern California coastal region. Methods described in the *Quantitative Tool for Assessing the Integrity of SoCal Coastal Streams* (Ode et al., 2005) were used to calculate the Southern California Index of Biological Integrity (SoCal IBI) to evaluate the overall health of the benthic macro invertebrate community, based on the counts of various species contained in the taxonomy results.

from very low to moderate (~0.7-1.5%). The steeper gradients create riffles and microhabitats that tend to yield higher IBI scores.

Overall the SMR is a dynamic system with large seasonal variations in flow, from dry streambeds to high-energy flows. This arid hydrological regime is typical in the southwestern region of California and can have significant impacts on bioassessment results.

Mediterranean climates, such as those in southern California, tend to have extremes in rainfall patterns, oscillating from periods of rainfall above normal to those very much below normal. As presented in Table 8 of the 2013-2014 Monitoring Annual Report (Attachment C), since the 1992-1993 reporting year, only three of the 21 periods have experienced at least "normal" (average) rainfall totals. Droughts influence the BMI community by decreasing overall base flows, increasing temperature, and potentially increasing algal growth. In a report on the patterns of BMI communities in non-perennial streams, Mazor et al. (2012)[3] found that as stream flow decreases, overall IBI scores tended to decrease. In general, data suggests that a historic drought period may negatively influence the IBI scores.

It seems likely that the biological community are more responsive to the amount of water present than they are to water quality. The drought appears to inhibit our ability to clearly isolate water quality as the sole cause of low IBI scores. The method used for bioassessment does not adequately distinguish between the effects of simply not having sufficient water present (e.g., arid or drought conditions) and the effects of poor water quality on the target populations. Therefore falling IBI scores are not necessarily an indicator of worsening water quality in an arid region.

3.5 Monitoring Program Accomplishments

- Updated and enhanced the Consolidated Monitoring Program to incorporate new monitoring collection methods and data analysis protocols.
- Developed watershed boundaries and land use information for all monitoring stations;
- Reorganized the technical content of the Monitoring Annual Report;
- Added fire map information to assist with assessing potential Pollutant sources;
- Enhanced monitoring databases to be compatible with SCCWRP/SMC standard reporting protocols;
- Enhanced monitoring methods to incorporate use of automatic sampling equipment where appropriate;
- Designed and constructed the District's LID BMP Demonstration and Testing Facility. The project acts as a laboratory for testing the water quality and water conservation benefits of LID features;

[3] Mazor, R.D., K. Schiff, P. Ode, and E. Stein. Final Report on Bioassessment in Nonperennial Streams. Report to the State Water Resources Control Board. Southern California Coastal Water Research Project Technical Report 695. June 2012.

- Implemented several programs to detect IC/IDs, including field and MS4 facility inspections, IC/ID based Dry Weather outfall monitoring. Performed annual mock storm event exercises that involve physical inspections of storm drains and Receiving Waters;

- Operating procedures for Non-Stormwater Action Levels was developed during the permit term to help with IC/ID follow-up and reporting procedures. This allowed for consistency between Co-Permittees within the region;

- Participated in the Santa Margarita Watershed Nutrient Initiative – Stakeholder Group. The group was formed to address nutrient issues in the Santa Margarita River watershed. The group hopes to set regulatory targets based on state of the science techniques to ensure the biological, chemical, and physical integrity of the Santa Margarita River and its tributaries;

- Continued participation in regional and statewide monitoring and science efforts such as the Southern California Monitoring Coalition (SMC) to develop:

  – Lab inter-calibration of chemical, bioassessment and Toxicity testing methods

  – Testing methods for bioassessment and Toxicity in Southern California streams

  – A stormwater research needs report for southern California

- Continued participation with SCCWRP on the development of the Regional Watershed Monitoring Program for Southern California. Co-Permittees have representatives on the SMC Executive Committee and the Bioassessment Technical Subcommittee.

3.6 Effectiveness Assessment

A cumulative analysis and evaluation of monitoring data indicate that the Co-Permittees' stormwater programs have been effective in preventing further impairment of SMR Receiving Waters even during a time of population growth in the region. The SMR water quality data is encouraging, and the Co-Permittees continue to assess their programs and adapt their efforts to improve water quality throughout the region.

As set forth in the SMR Monitoring Annual Reports, water quality conditions in Receiving Waters appear to be improving. This is based on a decreasing number of exceedances for 303(d)-listed constituents in the SMR. The pollutants with an increase of concentration are addressed through various programs and management activities. The following pollutant waterbody combinations at historically monitored mass loading stations have exhibited statistically significant long-term trends:

- TDS at Murrieta Creek during dry weather—decreasing concentrations
- Nitrogen (total) at Murrieta Creek during dry weather—decreasing concentrations
- Sulfate at Temecula Creek during wet and dry weather—decreasing concentrations
- Fecal coliform at Temecula Creek during wet and dry weather—decreasing counts
- *E. coli* at Temecula Creek during dry weather—decreasing counts
- Manganese at Murrieta Creek during dry weather—increasing concentrations

- The Co-Permittees initiated a Special Study to determine the cause(s) of the high concentrations of Iron and Manganese in the Region. The study is discussed briefly in Section 3.6.1.

The overall effectiveness of the Co-Permittees program is assessed based on the analysis of water quality data obtained as part of the MRP. The data has been collected and analyzed throughout the current permit term. However, the monitoring requirements of the 2010 MS4 Permit were not implemented until Fiscal Year 2012-2013. Although the initial Receiving Water quality data is encouraging, additional time and data is needed to fully assess the monitoring program results.

3.7 Watershed Program Highlights

The Co-Permittees can report the following accomplishments during the entire period of the 2010 MS4 Permit:

- Development of Best Management Practice (BMP) handbook to standardize post-construction selection and design in Riverside County. The handbook became effective September 2011.
- Development of the Upper Santa Margarita River Watershed Water Quality Workplan. Implementation began in June 2012, after submittal to Regional Board.
- Revised Co-Permittee monitoring programs to reflect new 2010 MS4 Permit changes. The changes were put into effect as of October 2012.
- Development of the Co-Permittees' Individual JRMPs. Implementation of JRMPs began in June 2012.
- Development of a Water Quality Management Plan (WQMP) that addresses post-construction stormwater runoff management for New Priority Development Projects and Redevelopment Projects. The WQMP became effective on July 11, 2014.
- Development and enhancements to the design template for developing project-specific WQMPs. The WQMP Template became effective on July 11, 2014.
- Development of the Santa Margarita Region (SMR) Hydromodification Management Plan (HMP). The Compliance plan became effective on July 11, 2014.
- Developed the Santa Margarita Region Hydrology Model (SMRHM) software to help developers analyze projects to meet the HMP requirements. The software became free to the public to download on July 11, 2014.
- Development of WQMP and HMP training and education courses. The courses were developed in 2014 to introduce the new development programs.
- Development of the Stormwater and Water Conservation Tracking Tool in collaboration with the Santa Ana Region Co-Permittees in Riverside County. The tracking tool became available to the public for use in 2014.
- Development and maintenance of Co-Permittee databases to track construction sites of 1-acre or larger in size. In addition, the Co-Permittees have standardized a construction reporting spreadsheet used for Annual Reports, updated inspection forms, and enhanced the construction outreach program.

- Creation of Co-Permittee databases to track industrial and commercial facilities.
- Continuation of the Riverside County Stormwater Pollution Prevention public education program which offers educational resources and free brochures targeting residents, businesses, developers, contractors, and elementary school children.
- Participation in regional and statewide monitoring efforts such as the Southern California Stormwater Monitoring Coalition (SMC), Southern California Coastal Water Commission and National Water Resources Institute.
- Participation in the California Stormwater Quality Association (CASQA), including various leadership roles.
- Continued partnership in the Upper Santa Margarita Region Integrated Regional Watershed Management Plan
- Performance of multiple special studies during the 2010 MS4 Permit term that have helped to identify causes of pollutants within the Santa Margarita Region. These studies are discussed further in Section 3.7.1

3.7.1 Special Studies Conducted

Sediment Toxicity – The goal of the study was to assess the quality of stream sediments and possible contamination from MS4 runoff in receiving waters. The workplan was finalized, based on approval of the Water Board, in May 2013. The results of monitoring metals, organochlorine pesticides, and synthetic pyrethroid pesticides in sediment indicated that the concentrations were generally below target threshold and effect levels.

Trash and Litter Investigation – The goal of the study was to provide information regarding BMP effectiveness for trash and to help guide management actions and BMP implementation for trash in the SMR. The study was submitted to the Regional Board in 2013 along with the Monitoring Annual Report. The report found that trash and litter was not a significant issue in the receiving waters within SMR.

Agricultural, Federal, Tribal and State Input Study – This study investigates the water quality of agricultural, federal, and tribal runoff that is discharged into the Co-Permittees' MS4. The goal of the study was to characterize stormwater flows that are not regulated by the Co-Permittees but have influence upstream of their MS4s. The preliminary findings have found that the highest levels of pollutant concentrations were measured from agriculture land use. The second year of required monitoring for the special study is currently being completed within FY 2014-2015. A final report is anticipated to be submitted with the 2014-2015 Monitoring Annual report.

Low-Impact Development (LID) Retention Impacts Study – The Co-Permittees participated in the development of the special study in order to assess the impacts of LID on surface flows, the potential relationship to beneficial uses, and the effects on water supply rights of down downstream jurisdictions. The LID Retention Impacts Study was prepared in lieu of the required "MS4 and Receiving Water Maintenance Study" (required under Attachment E, Section II.E.S of the 2010 Order) and the "Intermittent and Ephemeral Stream Perennial Conversion Study" (required under Attachment E, Section II.E.6 of the 2010 Order), as described in correspondence received from the Regional Board dated September 14, 2012.

Per agreements with Board staff, a study scope was prepared to evaluate whether or not LID requirements were likely to have a significant impact on storm flows and base flows to the Santa Margarita Gorge. The project team met with Regional Board staff and jointly developed a modeling approach that would provide an indication as to whether or not further assessment would be required. The study and findings were subject to a peer review conducted under the direction of the Southern California Coastal Watershed Research Project (SCCWRP).

The results of this study indicate that the retention of surface runoff will result in greater evaporation and less stormwater runoff to the Santa Margarita Gorge when LID is implemented, as compared to traditional stormwater BMPs only, but greater stormwater runoff then under current conditions. The reduced streamflow at the Gorge under future full build-out with LID for both new and existing development conditions may impact downstream beneficial uses**.**

The peer review comments reflect issues that may need to be addressed for a more comprehensive modeling exercise. However, given the results of this conceptual modeling study and considering the comments from the peer review panel, our preliminary conclusion is that the impacts from LID implementation in the Upper Santa Margarita River watershed would not be significant under likely development scenarios, and no further actions are recommended.

Source Assessment of Iron and Manganese Study – The Co-Permittees initiated a study investigating the persistent exceedances of iron and manganese water quality objectives (WQOs) within SMR. The Co-Permittees initiated a source analysis indicating that iron and manganese concentrations in Receiving Waters are strongly associated with the geology located throughout the SMR. Additional sources, including MS4 contributions were evaluated, but the weight of evidence suggests that iron and manganese concentrations are consistent with the local geology. High concentrations were also observed in reference streams from undeveloped watersheds of similar geological characteristic. The preliminary results are evidence that natural sources are the cause of elevated levels of iron and manganese in Receiving Waters.

3.8 Proposed Program Modifications and Revisions

3.8.1 SMR Monitoring Program

The Co-Permittees request several revisions and/or modifications to the monitoring program.

Removal of Carbamate Pesticides from Constituent List

In the upcoming 2015-2016 Monitoring Year, the Co-Permittees request that Carbamate Pesticides be removed from the constituent lists, based on the data collected during the Permit term. As evidenced by the results of the Monitoring Annual Reports (e.g., Attachment H, Detected Results located within Appendix C), the Carbamate Pesticides have not been detected in the water quality samples. Furthermore this list of Carbamate Pesticides includes many compounds that have been banned by EPA or are in process of cancelling registrations for use (e.g. Carbofuran). This request is in conformance with the requirements of 40 CFR 122.44. With the removal of these constituents, the Co-Permittees will focus on detected constituents that potentially threaten water quality.

Receiving Water Monitoring Revisions

The 2010 Permit focused on the correlation of the water quality chemistry, toxicity, and stream assessment findings to help identify water quality priorities. However, the data collected from outfalls and receiving water stations was limited due to the severe drought conditions. In several cases there was no

flow in the Receiving Water. In the case of the stream assessment program (see Section 3.4), results yielded low IBI scores induced by drought. The Co-Permittees recommend that the next Permit term refocus monitoring efforts towards reliable data collection such as:

- A detailed reconnaissance of region-wide outfalls to identify intermittent and persistent sources of urban runoff into receiving waters, prioritize those locations, and then relocate the outfall monitoring stations to the high priority outfall locations.
- Limit Receiving Water monitoring to the three mass loading stations (i.e., Adobe, Temecula, and Murrieta) as these locations have historical data available for long-term trend comparison. These long-term stations may provide better utility for data comparisons as programs are implemented.
- As described above in Section 3.4, the drought appears to inhibit the Co-Permittees' ability to use IBI scores to correlate the bioassessment results with water quality impacts. The method used for bioassessment does not adequately distinguish between the effects of simply not having sufficient water present and the effects of poor water quality on the target populations. We note that as the drought continues the IBI scores decrease; therefore, falling IBI scores may not be a reliable indicator of worsening water quality in an arid region. The arid conditions may mask an accurate assessment of the water quality impacts on a stream. The Co-Permittees request that the Regional Board suspend stream assessment until an appropriate protocol is developed for arid region.

Revision of the Definition of Wet/Rainy Season

The Co-Permittees request that the Wet/Rainy Season be modified from October 1st to April 30th, to October 1st to May 31st. The extension would more accurately reflect the watershed's precipitation season, and extend the period for successful Wet Weather sampling opportunities.

3.8.2 Proposed JRMP Revisions

The Co-Permittees do not foresee major changes to their JRMPs at this time. However, the City of Temecula and the County are in the process of a minor revision to their standards to emphasize erosion control as the most important measure for keeping sediment onsite during construction.

4.0 Additional Comments on Proposed Permit

- **Previous Comments** - The Co-Permittees previously have expressed concerns regarding inclusion in the San Diego Regional Board's Regional Permit (Order No. R9-2013-0001, as modified by Order No. R9-2015-0001). The Co-Permittees' concerns and legal objections to inclusion in a regional permit are set out more fully in our written comment letter dated January 10, 2013, in Order No. R9-2013-0001 and November 19, 2014 regarding Order R9-2015-0001. For your convenience, these comments are included as Appendix D.

- **Receiving Water Limitations Language -** The Riverside County Co-Permittees continue to believe strongly that every MS4 Permit should incorporate a clear and achievable path to compliance for Co-Permittees. The Co-Permittees are actively participating in the workshops held by Regional Board staff concerning this important topic.

  The focus of the Watershed Workplan is on an iterative, flexible, and priority-setting approach that is intended to enable the Co-Permittees to focus on the most important water quality impairments in the SMR, and improve water quality. As we have previously commented, if the Co-Permittees have no protection from automatic liability for exceedances of water quality standards, they must address each such exceedance, even when that exceedance may be transitory or of minimal environmental or public health consequence. Stretching resources to address such issues diverts limited Co-Permittee resources from the most important threats to water quality and delays overall water quality improvement.

  State Board staff has already strongly signaled its support of alternative compliance language in MS4 permits, as set forth in the draft Order on the petitions challenging the 2012 Los Angeles County MS4 Permit. The Co-Permittees look forward to working with Regional Board staff, permittees from Orange and San Diego Counties, and the other stakeholders to develop appropriate alternative compliance language.

- **Prior Lawful Approval Language -** The Co-Permittees request language that allows each Co-Permittee to evaluate each project independently, in order to determine at their sole discretion, compliance as it relates to Prior Lawful Approval.

- **CEQA Processing Considerations** – Programmatic requirements that entail structural improvements such as retrofits and/or BMPs will trigger CEQA compliance. Future Permit language should discuss lead agency designation and consider CEQA processing in future workplan implementation timelines.

Appendix A
2015 SMR MS4 Facility Map

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APPENDIX A
SANTA MARGARITA RIVER WATERSHED
2015 ROWD
MS4 PERMIT AREA FACILITIES MAP
EXHIBIT SMR-1

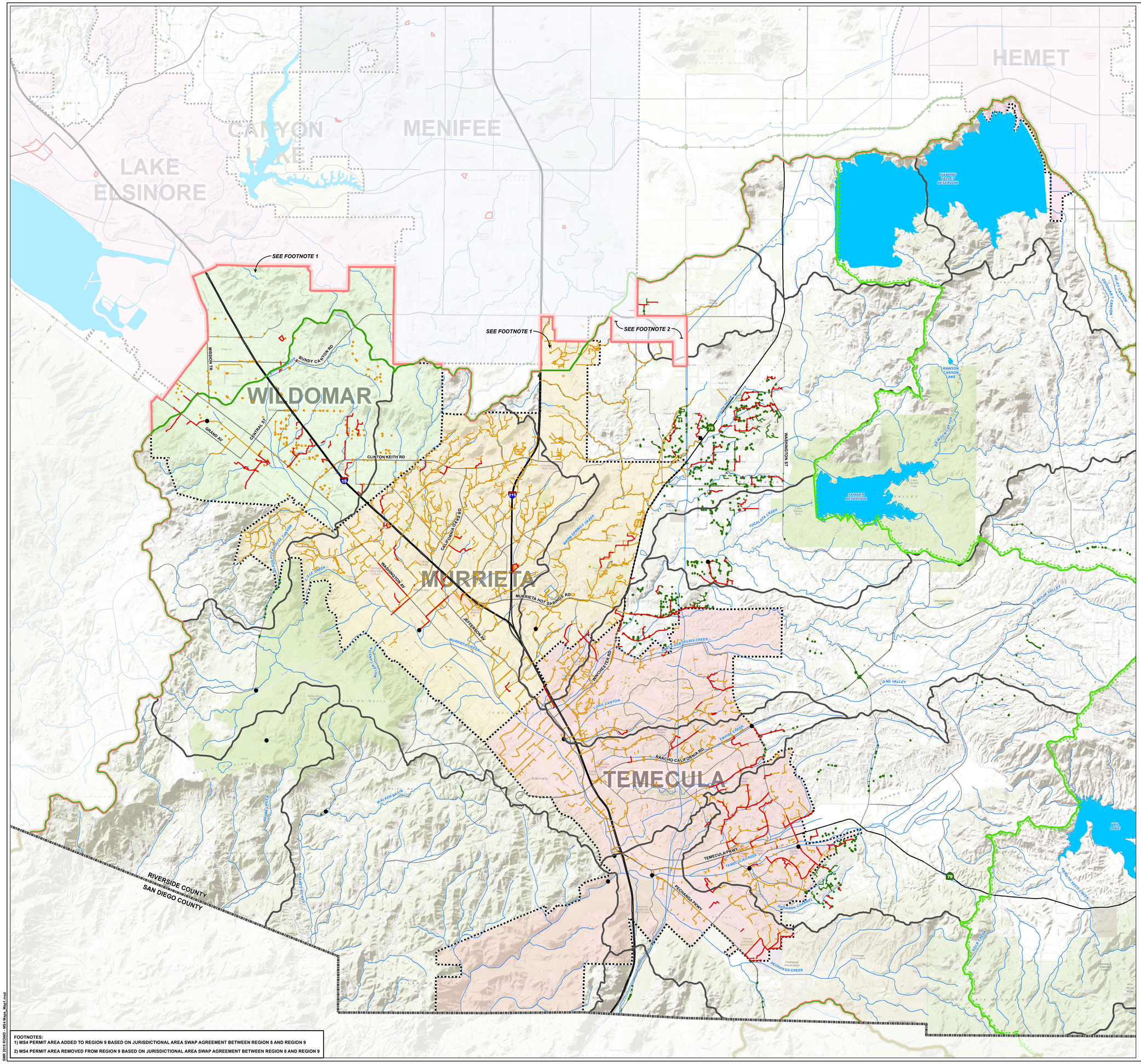

- CITY MS4 FACILITIES
- COUNTY MS4 FACILITIES
- RCFC&WCD MS4 FACILITIES
- SANTA MARGARITA RIVER WATERSHED BOUNDARY
- SANTA MARGARITA RIVER MS4 PERMIT AREA BOUNDARY
- AREA CONTROLLED BY VAIL LAKE & LAKE SKINNER
- HUC SUBWATERSHEDS
- MONITORING STATIONS
- WATERBODIES
- WATERCOURSES
- RIVERSIDE COUNTY BOUNDARY
- INCORPORATED AREAS
- FREEWAYS/HIGHWAYS
- PRIMARY ROADS
- SECONDARY ROADS

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UPDATED MARCH 2015

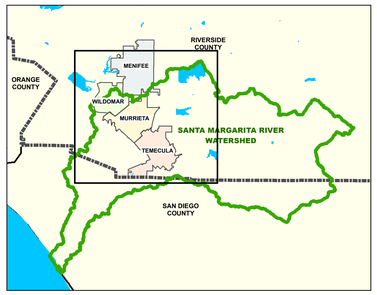

FOOTNOTES:
1) MS4 PERMIT AREA ADDED TO REGION 9 BASED ON JURISDICTIONAL AREA SWAP AGREEMENT BETWEEN REGION 8 AND REGION 9
2) MS4 PERMIT AREA REMOVED FROM REGION 9 BASED ON JURISDICTIONAL AREA SWAP AGREEMENT BETWEEN REGION 8 AND REGION 9

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SMR 2015 ROWD_MS4 Maps_Map1.mxd

045825

APPENDIX A
SANTA MARGARITA RIVER WATERSHED
2015 ROWD
MS4 PERMIT AREA FACILITIES MAP
EXHIBIT SMR-2

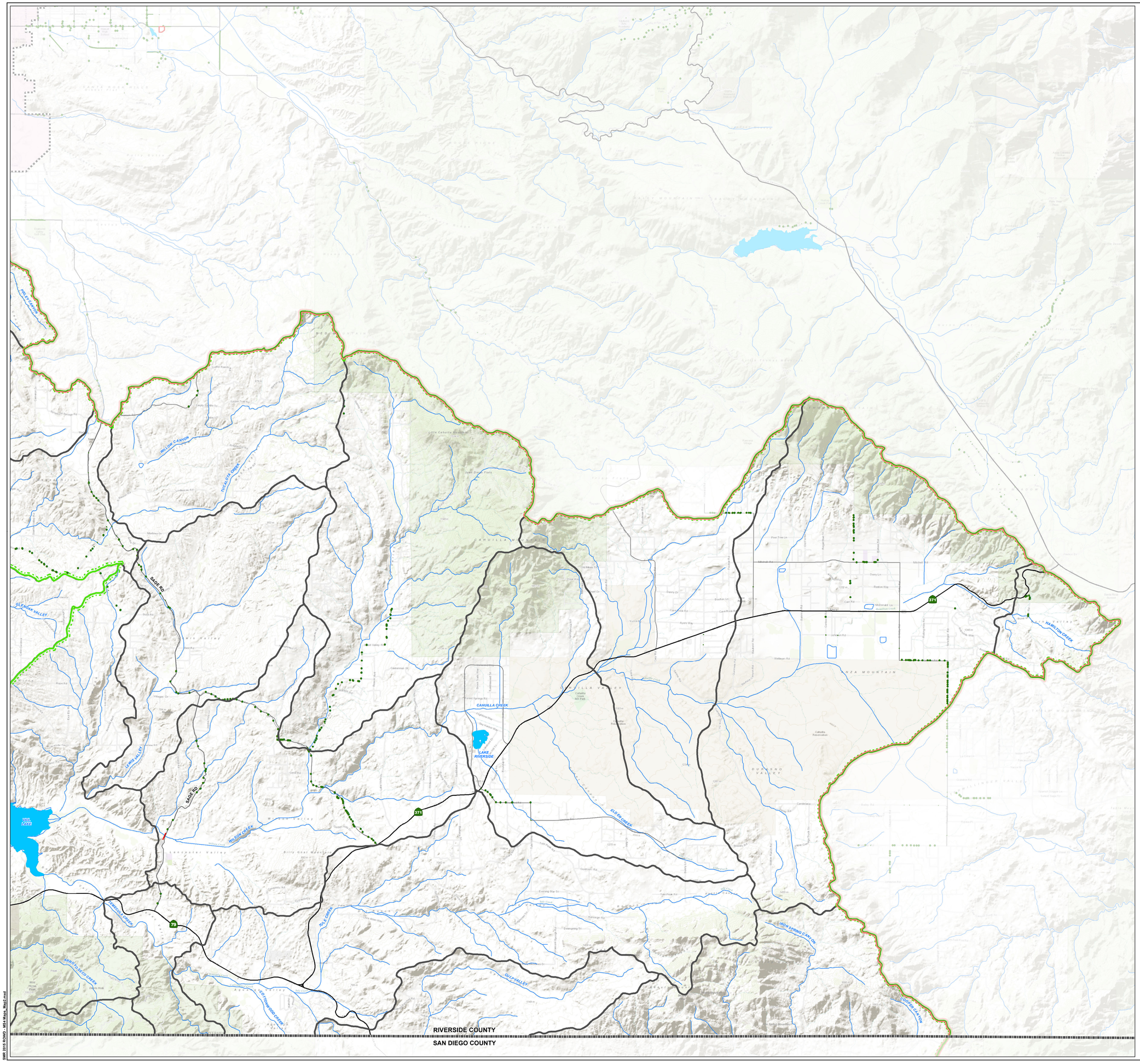

- CITY MS4 FACILITIES
- COUNTY MS4 FACILITIES
- RCFC&WCD MS4 FACILITIES
- SANTA MARGARITA RIVER WATERSHED BOUNDARY
- SANTA MARGARITA RIVER MS4 PERMIT AREA BOUNDARY
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- WATERCOURSES
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- INCORPORATED AREAS
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- SECONDARY ROADS

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UPDATED MARCH 2015

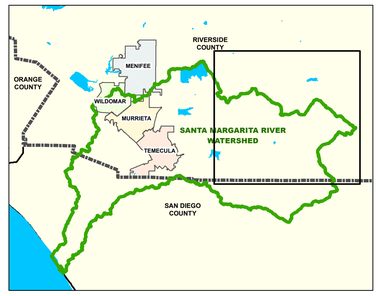

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SMR 2015 ROWD - MS4 Maps_Map2.mxd

Appendix B
2015 SMR Land Use Map

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APPENDIX B
SANTA MARGARITA RIVER WATERSHED 2015 ROWD
AREA LANDUSE MAP - EXHIBIT SMR-1

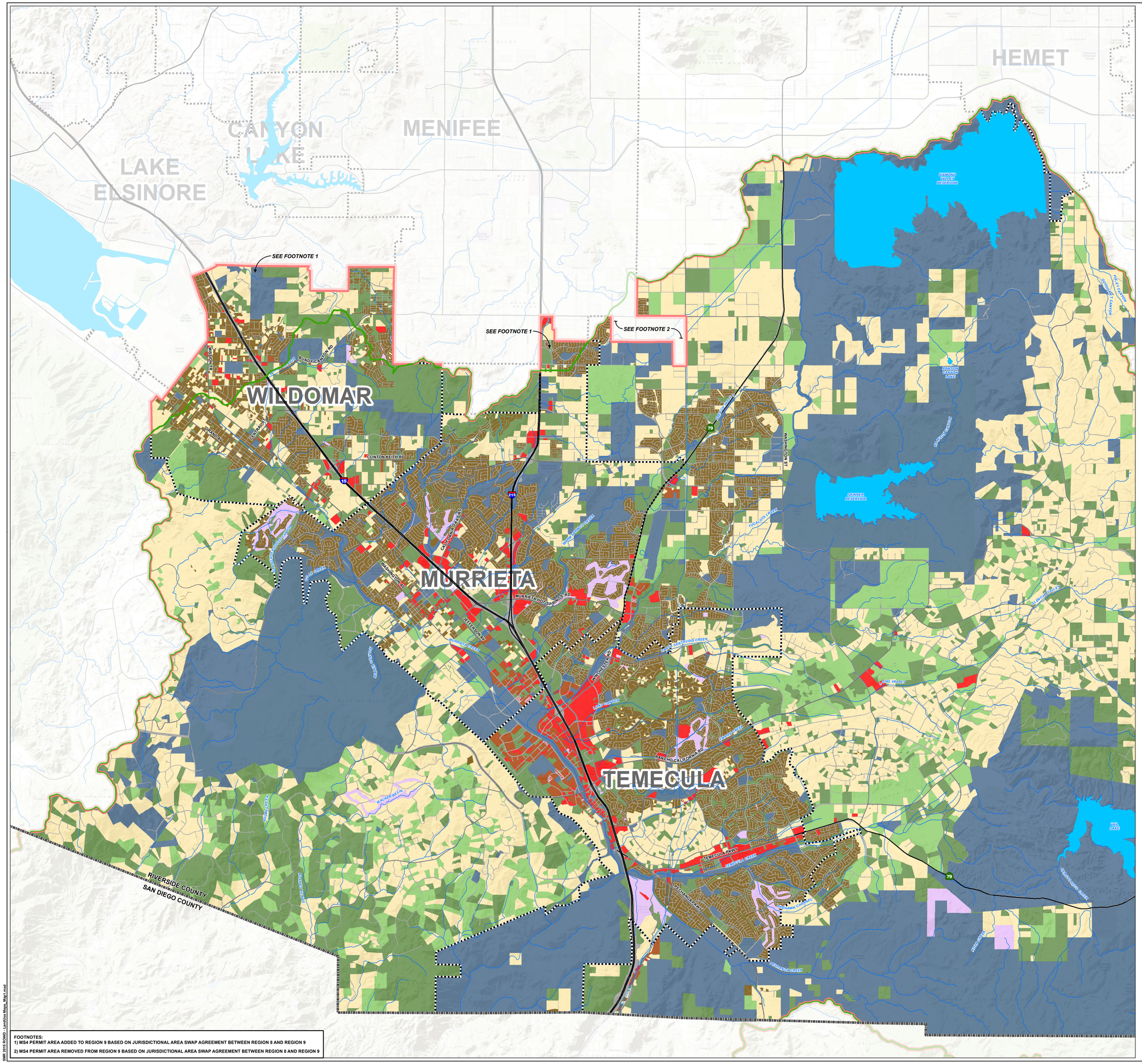

LEGEND:

- SANTA MARGARITA RIVER WATERSHED BOUNDARY
- SANTA MARGARITA RIVER MS4 PERMIT AREA BOUNDARY
- WATERBODIES
- WATERCOURSES
- RIVERSIDE COUNTY BOUNDARY
- INCORPORATED AREAS
- FREEWAYS/HIGHWAYS
- PRIMARY ROADS
- SECONDARY ROADS

NON-URBAN LAND USE:

- AGRICULTURAL
- EXEMPT
- PRESERVES OPEN SPACE
- RURAL RESIDENTIAL (1 ACRE OR MORE)

URBAN LAND USE:

- COMMERCIAL
- INDUSTRIAL
- PARKS AND RECREATION
- STREETS
- URBAN RESIDENTIAL (LESS THAN 1 ACRE)

N

0 0.5 1 1.5 2 MILES

UPDATED MARCH 2015

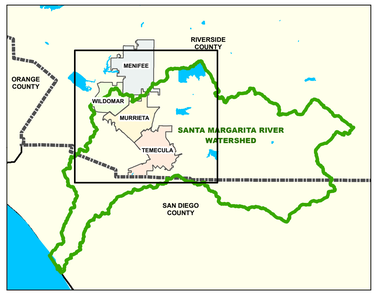

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SMR 2015 ROWD - Landuse Maps_Map1.mxd

045828

APPENDIX B
SANTA MARGARITA RIVER WATERSHED
2015 ROWD
AREA LANDUSE MAP - EXHIBIT SMR-2

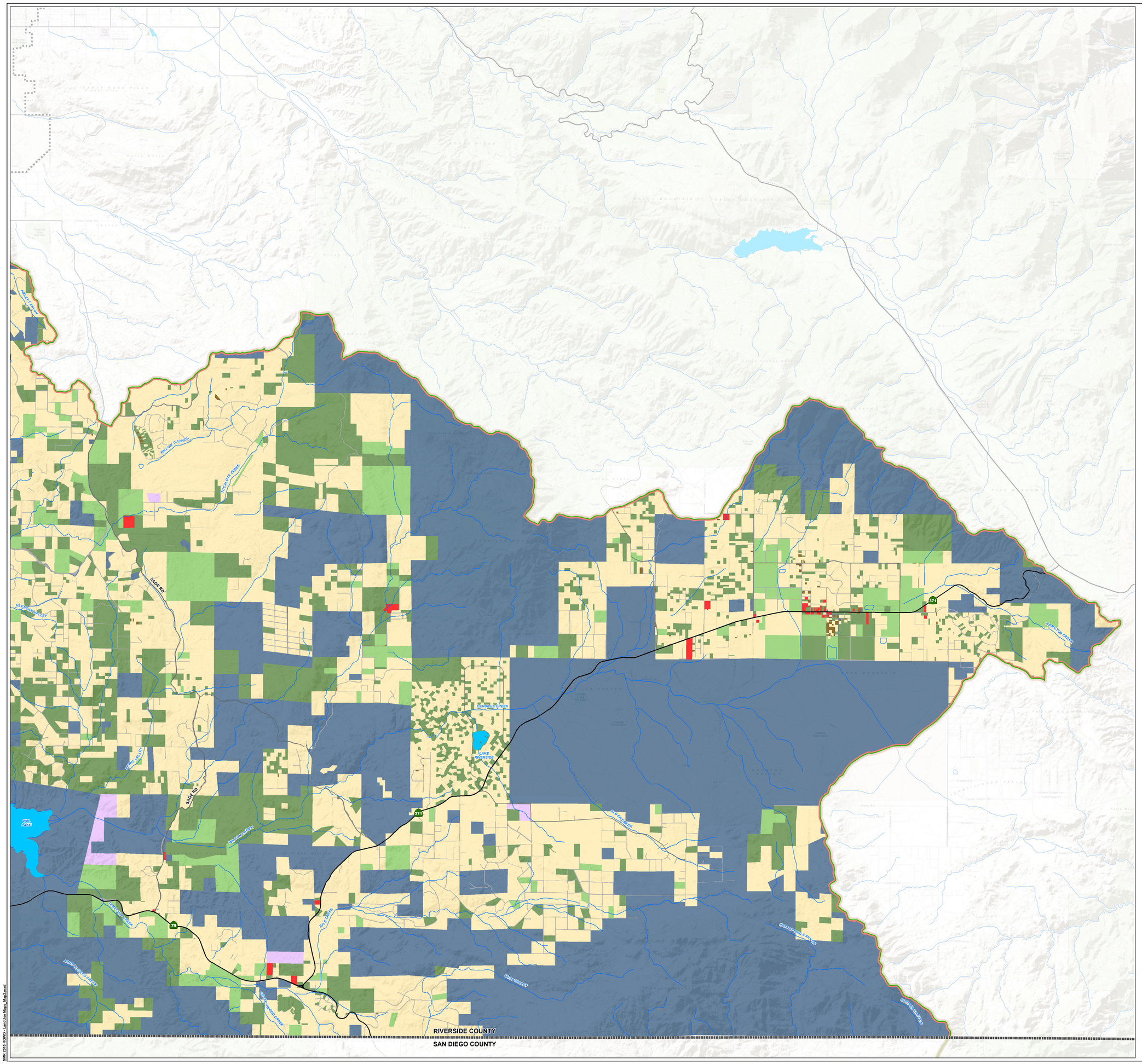

LEGEND:

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UPDATED MARCH 2015

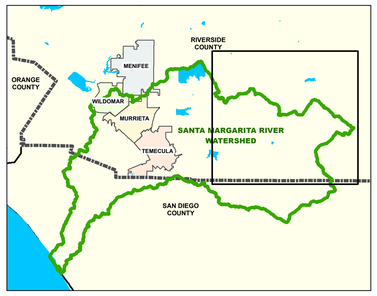

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SMR 2015 ROWD - Landlse Map_Map2.mxd

Appendix C
FY13-14 JRMP / Monitoring Annual Report References

(Note: Due to its large size, this attachment is provided in electronic format only)

Appendix D
2013 Riverside County Co-Permittees Comments for San Diego Regional MS4 permit

WARREN D. WILLIAMS
General Manager-Chief Engineer

045831

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www.rcflood.org

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

November 19, 2014

sent via email 11/19/14: Laurie.Walsh@waterboards.ca.gov

Ms. Laurie Walsh, P.E., WRC Engineer
CRWQCB - San Diego Region
2375 Northside Drive, Suite 100
San Diego, CA 92108

Dear Ms. Walsh:

Re: Comment - Tentative Order No. R9-2015-0001Place ID:65801LWalsh

This letter is written by the Riverside County Flood Control and Water Conservation District (District), on behalf of itself, the County of Riverside and the Cities of Murrieta, Temecula, and Wildomar (collectively, the Riverside County Co-Permittees) regarding Tentative Order No. R9-2015-0001 (Tentative Order). The Tentative Order proposes to add the County of Orange and other agencies located in South Orange County within the existing San Diego County Municipal Separate Storm Sewer System (MS4) Permit. The Riverside County Co-Permittees appreciate the opportunity provided by the San Diego Regional Water Quality Control Board (Regional Board) to offer its comments on the Tentative Order.

The Riverside County Co-Permittees wish to reiterate their concerns regarding a Regional MS4 Permit for San Diego, Orange, and Riverside Counties. Those concerns are set out more fully in our written comment letter dated January 10, 2013, on Order No. R9-2013-0001. The Riverside County Co-Permittees will be submitting a Report of Waste Discharge prior to the expiration of their current MS4 Permit, seeking either modification to the Regional Permit or an individual permit covering only those Co-Permittees. For your convenience, the January 10, 2013 comments are attached to this letter. The Co-Permittees request that this comment letter and attachments be added to the record for the Tentative Order, since most of the issues raised in those comments still pertain to the Tentative Order. The Co-Permittees also request that the oral testimony of Riverside County Co-Permittees on Order No. R9-2013-0001 be included in the record for the Tentative Order. The Riverside County Co-Permittees support the South Orange County Co-Permittees general approach to the issues raised by the Tentative Order.

Notwithstanding the Riverside County Co-Permittees' concerns to a Regional Permit, and subject to it, the Co-Permittees offer the following observations regarding the Tentative Order.

1. Need for Path to Compliance

As set forth in our written and oral comments on Order No. R9-2013-0001, the Riverside County Co-Permittees continue to believe strongly that every MS4 permit, including the Tentative Order, should

incorporate a clear and achievable path to compliance for Co-Permittees. As the Executive Officer and staff indicated in the hearings on Order No. R9-2013-0001, the San Diego County Co-Permittees will be out of compliance with the Permit's receiving water limitations (RWL) provisions for years. We agree with staff's assessment, and state further, that the lack of a provision to allow Co-Permittees to be considered in compliance with the RWL provisions leaves the Co-Permittees open to possible enforcement by third-parties and, as importantly, threatens the compliance approach that has been successfully employed by the Riverside County Co-Permittees to address water quality impairments in the Santa Margarita Region.

The Riverside County Co-Permittees agree with staff that a MS4 permit which allows the Permittees to adopt a "fail early and fail often" iterative approach to water quality is preferable to a permit which simply mandates certain actions. The Santa Margarita River Watershed Water Quality Workplan in Riverside County follows an iterative, flexible, and priority-setting approach that is intended to enable the Co-Permittees to focus on the most important water quality impairments in the Region, and make real, quantifiable improvements in water quality. As we have previously commented, if the Co-Permittees have no protection from liability for exceedances of water quality standards, they must address each such exceedance, even when that exceedance may be transitory or of minimal environmental or public health consequence. Stretching resources to address such issues diverts limited Co-Permittee resources from the most important threats to water quality and delays overall water quality improvement.

Recognizing this deficiency in the 2001 MS4 Permit for the Los Angeles County Co-Permittees, in its 2012 Permit, the Los Angeles Water Board adopted a path to compliance with RWLs through the development of adaptive and prioritized watershed management plans. The Riverside County Co-Permittees believe that a similar approach to RWL compliance should be included in the Tentative Order.

2. Hydromodification Provisions

While most of the substantive changes in the Tentative Order have specific application only to San Diego and/or South Orange Counties, the Riverside County Co-Permittees support exemptions for engineered channels and large river reaches in Provision E.3.c.(2)(e). This provision also provides an interim timeframe exemption for the implementation of hydromodification management BMP requirements for priority development projects.

The exemptions identified in Provision E.3.c.(2)(e) are appropriate and reasonable, and should be made permanent exemptions moving forward.

3. Basin Planning and Water Quality Improvement Plan (WQIP) General Comments

For the WQIPs to ultimately succeed, they need to be based upon regionally appropriate water quality standards. These water quality standards require review to ensure that they reflect sustainable conditions for beneficial uses, explicitly consider regulatory policy and environmental trade-offs

inherent in the protection of beneficial uses, and address the nature and impact of stormwater upon beneficial uses.

The Riverside County Co-Permittees would like to thank the Regional Board and staff for working with the Santa Margarita River Nutrient Initiative Group on such a review. This group, which includes dischargers, tribal interests, interested non-profits, scientists, and Regional Board staff, is using a scientifically based and rigorous approach to evaluate potential water quality targets for, and sources of, nutrients in the Santa Margarita Watershed. It is our belief that this effort will lead to more considered, effective, and appropriate management of local receiving waters, and thereby promote quicker and more effective environmental outcomes. It may also assist with the identification and development of innovative and alternative programs to manage nutrients within the Region. This effort will inform the development of the Santa Margarita River Watershed Water Quality Workplan and other regulatory programs.

The Co-Permittees request and encourage Regional Board staff to work with other stakeholders to consider, prioritize, and address other perceived constraints and inconsistencies within the San Diego Region Basin Plan. Such efforts will ultimately result in a better focus of local and regional compliance programs, including the WQIPs, on actions that are more likely to effectively and quickly address public health risks and environmental risks to receiving waters. Such an approach is exactly in line with staff's emphasis on workable solutions to these challenges.

The Riverside County Co-Permittees appreciate the opportunity to comment on the Tentative Order. Should you have any questions regarding these comments, please contact David Garcia at 951.955.1330/dhgarcia@rcflood.org.

Very truly yours,

for JASON E. UHLEY
Chief of Watershed Protection Division

Attachment

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RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

January 10, 2013

Mr. Wayne Chiu, P.E.
California Regional Water Quality
Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego, California 92123-4340

Dear Mr. Chiu:

Re: Tentative Order No. R9-2013-0001
Regional MS4 Permit
Place ID: 786088Wchiu

The Riverside County Flood Control and Water Conservation District (District) is submitting this comment letter on the above listed Tentative Draft Order on behalf of the Riverside County MS4 Copermittees within the San Diego Region (Riverside County Copermittees) which includes the District, the County of Riverside and the Cities of Murrieta, Temecula and Wildomar. Tentative Draft Order R9-2013-0001 (Draft Permit) was drafted by Board staff to cover Phase I municipal separate storm sewer system (MS4) Copermittees in San Diego County, southern Orange County, and the portion of southwestern Riverside County within the Santa Margarita Hydrologic Unit.

The Riverside County Copermittees have previously commented that the San Diego Water Board lacks authority to adopt a regional permit covering Orange and Riverside Counties, in addition to San Diego County; a comment which is discussed in further detail below and in the attached legal comments. Notwithstanding such objection, and subject to it, the Riverside County Copermittees are providing comments on the Draft Permit.

In the workshop on the Administrative Draft Order held on April 22, 2012 San Diego Water Board staff identified the following desired outcomes for the proposed permit:

- Improving the quality of water discharged from the MS4
- Restoring or enhancing Beneficial Uses and Receiving Water quality

It was further identified by Board staff that to be able to meet those goals, the proposed regional MS4 permit needed to be 1) Strategic, 2) Adaptive, and 3) Synergistic.

Notwithstanding the concerns of the Riverside County Copermittees with regard to the legal authority to issue a regional MS4 permit, the Copermittees agree that being able to adapt and direct resources toward specific water quality priorities in a given watershed, rather than all potential problems simultaneously, is more likely to result in actual and meaningful improvements in water quality. However, to be able to achieve those improvements the MS4 Permit must be crafted to provide the Copermittees with the ability to truly and fully

adaptively manage their programs to focus resources on those BMP strategies and monitoring efforts that are identified as being most effective, consistent with the MEP standard, at addressing watershed priorities.

Unfortunately, many provisions in the Draft Permit, including but not limited to the Receiving Water limitation provisions in Provision A and others discussed in this letter, still do not fully support the achievement of those outcomes. The Draft Permit does not provide the Copermittees with the flexibility to be fully strategic in managing their resources nor the ability to fully adapt their programs to focus on the highest priority water quality needs of the watershed. This comment letter and the other documents submitted herewith (a redline of the Draft Permit and Legal Comments) identify some suggestions which, if adopted by the San Diego Water Board, will help to address these limitations and facilitate the desired improvements.

This comment letter is organized as follows:

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As noted, the Riverside County Copermittees also are submitting a redline of the Draft Permit ("Redline") that proposes alternative language intended at achieving solutions to the various issues raised in this letter, and a Legal Comment document ("Legal Comments") that provides additional legal context for the various issues raised in this letter. The Riverside County Copermittees reserve their right, in the context of filing a Report of Waste Discharge ("ROWD") prior to the expiration of Order R9-2010-0016 (the 2010 MS4 Permit), to again address these issues and others relevant and appropriate to the SMR.

1 BACKGROUND

The Riverside County Copermittees were issued an extensive and prescriptive MS4 Permit in November 2010 which greatly expanded monitoring obligations, required special studies, a jurisdictional runoff management program, and Watershed Workplan requirements that were very different than the requirements set forth in the previous MS4 Permit issued to the Copermittees. Development and implementation of the 2010 MS4 Permit compliance requirements has been very expensive, especially in comparison to the relatively few demonstrated impairments of Beneficial Uses in the region and the Copermittees' resources. These requirements have left other important societal needs unfulfilled by the Riverside County Copermittees during a period of unprecedented and continuing economic distress. Further, the Riverside County Copermittees are still in the process of developing and implementing these 2010 MS4 Permit requirements, which is a serious concern given the very different compliance approach proposed in the Draft Permit. The Copermittees hope that the compliance efforts under the current MS4 Permit are taken into account when they submit their ROWD at the expiration of the 2010 MS4 Permit.

2 General Comments

2.1 Regional Permit

The Riverside County Copermittees respectfully submit that the San Diego Water Board is not authorized under the Clean Water Act or under its implementing regulations to issue a regional permit to Copermittees in San Diego County, South Orange County and the Santa Margarita Region (SMR) of Riverside County. As discussed more fully in the Legal Comments, the only circumstance under which the San Diego Water Board could issue such a permit would be if the Copermittees in these counties agreed to such a permit. Additionally, while the Draft Permit purports to affect the conduct of the Riverside County Copermittees upon expiration of the 2010 MS4 Permit in November 2015, the Riverside County Copermittees have not submitted a ROWD requesting coverage under a regional permit. Because no application has been made for the regional permit, which is a requirement set forth in the CWA regulations, the San Diego Water Board lacks jurisdiction to name the Riverside County Copermittees on the Draft Permit at this time.

Notwithstanding the above, the Riverside County Copermittees are submitting the comments in this letter based on:

- The San Diego Water Board staff's stated intent to enroll the Riverside County Copermittees in this permit upon expiration of the 2010 MS4 Permit.
- Statements made by San Diego Water Board staff that this comment period would serve as the primary opportunity for the Riverside County Copermittees to influence their next term MS4 Permit. The Riverside County Copermittees are entitled, as part of the ROWD process, to again raise relevant issues regarding permit provisions, but have undertaken in these comments to address major current concerns.

2.2 Outcome Focus

As mentioned above, the Copermittees agree that being able to adapt and direct resources toward addressing the specific water quality priorities in a given watershed, rather than all potential problems simultaneously, is more likely to result in actual/meaningful improvements in water quality. However, to be able to achieve those improvements, the MS4 Permit must fully integrate the following principles:

- **The Jurisdictional Program requirements must be fully flexible:** The Permit must be written in a way that allows the Copermittees to truly and adaptively manage their programs to fully focus their existing resources on those BMP strategies and monitoring efforts that are identified within the Water Quality Improvement Plan (WQIP) as being most effective, consistent with the Maximum Extent Practicable (MEP) standard, at addressing the watershed's priorities. We understand this to be the goal of the San Diego Water Board as well. While some elements of the Draft Permit embody this need, others do not and require dedication of resources to specific pre-defined efforts, regardless of the identified need for that effort in the watershed. The specific program areas that need more work to this end are:

    - The approach to addressing Non-stormwater discharges
    - Development Planning
    - Retrofitting
    - Channel Rehabilitation

These issues and proposed new language to address these issues are included throughout this letter and/or in the attached Redline.

- **Basin Plan updates need to be Prioritized by the San Diego Water Board:** For outcome-based permitting to be successful, the desired outcomes must be achievable by and appropriate to the Copermittee. To do that, the outcomes must take into account the background conditions in the watershed, and be appropriate for the attainment of Beneficial Uses in the specific waterbody, based on the specific conditions within and influencing that waterbody. The values in the Basin Plan should be comprehensively re-evaluated to ensure that water quality standards are scientifically justified to protect Beneficial Uses. Without updating the Basin Plan, the outcomes that the Copermittees target in the WQIPs would be arbitrary and not guaranteed to achieve the desired beneficial use improvements. Such an update should be pursued aggressively, led by and adequately funded by the San Diego Water Board, with participation by the MS4 Copermittees and other dischargers and stakeholders in the watershed.

- **Other Dischargers need to be Similarly Regulated by the San Diego Water Board:** The MS4 Copermittees are not the only dischargers of pollutants in the watershed. For example, the SMR of Riverside County includes State Lands (such as Caltrans), Tribal Lands, Agricultural Operators, Industrial Permit dischargers, Construction Permit dischargers, Phase II entities, Water Districts, and 'De Minimus' dischargers issued general permit coverage; all of which:

- Have separate regulatory programs (such as permits or waivers) implemented by the San Diego Water Board;
- May discharge pollutants, including non-stormwater, that can affect the quantity and quality of runoff, both directly within Receiving Waters, and in runoff discharges that may enter into and be discharged from the MS4; and
- Cannot be regulated by the Copermittees for the quantity and quality of their runoff because of their separate permits or waivers granted by the NPDES Program Administrator.

As such, while MS4 Copermittees can implement programs to reduce pollutants in discharges that are within their legal jurisdiction, no amount of effort by the MS4 Copermittees can be expected to fully attain water quality standards in the Receiving Waters. The only way to achieve that outcome will be for the NPDES Program Administrator (the San Diego Water Board in most cases) to directly regulate each of these entities to similar levels and standards as set forth by this Permit.

2.3 Responsibility for meeting goals of CWA

The CWA requires Copermittees subject to any MS4 permit, including the Draft Permit, only to address discharges from their MS4s. 33 U.S.C. § 1342(p)(3)(B). The Copermittees are not required to restore Beneficial Uses in any Receiving Water, or to address sources of pollution to those Receiving Waters that are not being discharged into or from those MS4s. However, in various provisions in the Draft Permit, there is a suggestion that the Copermittees are solely responsible for attaining water quality standards in their respective Receiving Waters. The San Diego Water Board must make clear in the Draft Permit that the responsibilities of the Copermittees are limited to their MS4s and the requirements of the CWA for municipal stormwater dischargers. Redline changes have been proposed in the above referenced portions of the Draft Permit to address this issue.

3 Specific Comments

The following comments represent specific high level concerns that the Riverside County Copermittees have identified at this time. Additional comments on the Draft Permit can be found in the Redline, as well as in the attached Legal Comments.

3.1 Findings

The Riverside County Copermittees have two separate sets of comments on the Findings. The first addresses the need for additional findings, with respect to aspects of California law and the physical setting of the SMR. The second set of comments focuses on existing Findings in the Draft Permit.

3.1.1 Needed Additional Findings

The Findings in the Draft Permit fail to fully address the context and conditions under which the proposed permit requirements are to be applied. A more complete explanation of this background is necessary to ensure that the Provisions ultimately included in the Draft Permit are credible, appropriate and legally required, and that the Permit Provisions (which must stem from the Findings) reflect the

context of the broader issues that affect MS4s within the region. The Riverside County Copermittees request that San Diego Water Board staff work with the MS4 Copermittees to expand the Findings, including the addition of findings to address the following:

California Water Law

California law requires that downstream entities must accept runoff from up-gradient properties. Owners and operators of MS4s are not exempt from this legal mandate, even if that runoff contains pollutants. Moreover, flood control districts, including the District, are mandated by the California Legislature (Legislature) to protect the lives and property of residents from floodwaters. The Riverside County Copermittees request that a finding, in the form set forth in the Redlines, be added to the Draft Permit.

Flooding

Many areas that would be under the jurisdiction of the Draft Permit are subject to periodic catastrophic flooding, which results from natural conditions, specifically the presence of mountains and hilly areas in close proximity to development, along with the effect of strong Pacific storms. This flooding would occur even in the absence of development. The Legislature recognized the importance of this issue in the early 20th Century, when it established flood control districts across the state, including in Riverside, Orange and San Diego Counties. Such flooding has, and if not controlled, could result in loss of life and widespread property damage. Further, the flooding can mobilize significant amounts of pollutants from industrial, commercial, residential and agricultural lands, damaging watercourses, habitat, and the Beneficial Uses therein. MS4 systems are designed and constructed to mitigate these impacts. The Riverside County Copermittees request that a finding in the form set forth in the Redline be added to the Draft Permit.

Flood Control District Acts

As noted above, the Legislature established Flood Control Districts in Orange, Riverside, and San Diego Counties through a series of Flood Control Acts. The Legislature determined that protection of life and property from the effects of flooding through the implementation of flood control improvements was a priority, and assigned those Districts with the sole responsibility to design, construct and maintain those improvements necessary to manage and contain floodwaters to prevent such negative impacts, as well as to conserve floodwaters for beneficial use. As noted above, these improvements represent fundamental water quality BMPs inasmuch as they reduce the widespread exposure of runoff to pollutants. The Flood Control Districts, while owners and operators of MS4s, have no authority or powers beyond those granted by the Legislature. The Legislature did not provide the Flood Control Districts, for example, the authority to regulate land uses within the municipal jurisdictions of Riverside County, nor to control the volume or quality of runoff discharged by those land uses. Findings describing the legislative priority for flood control and the limitations on the governing power of the Flood Control Districts should be added to set forth the appropriate role of the Flood Control Districts as MS4 Copermittees. The Riverside County Copermittees request that a finding, in the form set forth in the Redline, be added to the Draft Permit.

Limits on Extent of Permittee Legal Authority

The MS4 Copermittees lack the authority to regulate many significant sources of pollutants that may impact Receiving Waters. For example, the Copermittees cannot regulate pollutants discharged from federal and state lands, facilities, tribal lands, special districts, utilities, agricultural lands, or railroads. Moreover, the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) preclude local regulation of pesticides. The Riverside County Copermittees request that a finding in the form set forth in the Redline be added to the Draft Permit.

3.1.2 Comments on Existing Findings

Findings 3 and 15 (and elsewhere in Draft Permit)

In Findings 3 and 15 (and throughout the Draft Permit), it is stated that the CWA requires controls to reduce the discharge of pollutants "in stormwater" to the MEP. Finding 15, moreover, states that non-stormwater discharges from the MS4 are "not considered stormwater discharges and therefore are not subject to the MEP standard, stating that the MEP standard "is explicitly for 'Municipal . . . Stormwater Discharges" from the MS4s.

These conclusions are directly contrary to the plain language of the CWA, as set forth in the November 16, 1990 preamble accompanying the CWA stormwater regulations. Those authorities provide that the MEP standard applies to *all* pollutants discharged from the MS4, notwithstanding that some may be transported by non-stormwater. Additionally, the Redline reflects deletion of the limitation of the MEP standard to stormwater discharges in multiple locations, reflecting federal law. For a further discussion of this issue, please see the Legal Comments. The Riverside County Copermittees also request deletion of Finding 15.

Finding 11

This Finding states that "[r]ivers, streams and creeks in developed areas used [to convey runoff] . . . are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and Receiving Water." This statement is incorrect and must be deleted (as reflected in the Redline). For reasons more fully set forth in the Legal Comments, natural streams cannot be considered MS4; there is no MS4 "outfall" from a channelized river or stream to a natural stream; and, USEPA itself requires a distinction between MS4s and Receiving Waters.

Finding 12

This Finding states that as operators of MS4s, "Copermittees cannot passively receive and discharge pollutants from third parties." By providing free and open access to an MS4 that conveys discharges to Waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not prohibit or otherwise control. This statement is incorrect and must be deleted (as set forth in the Redline). As the discussion in the Legal Comments indicates, municipalities must maintain the MS4 to protect the lives and property of their citizens and to prevent nuisance. Flood Control Districts have a statutory obligation to operate and maintain such MS4, an obligation which is not affected by

either the CWA or the terms of the Draft Permit. While an MS4 operator has the obligation to effectively prohibit the entry of non-stormwater into the MS4, it does not have legal responsibility for such discharges, which are the responsibility of the discharger itself and subject to the jurisdiction of the San Diego Water Board, pursuant to Water Code section 13260 *et seq.*

Finding 28

This Finding recites that the San Diego Water Board finds that the requirements of the Draft Permit "are not more stringent than the minimum federal requirements." The Riverside County Copermittees disagree with this finding, as it is not supported by the evidence, *i.e.*, the many requirements in the Draft Permit which exceed the federal MEP standard. Moreover, any decision by the San Diego Water Board to adopt "other provisions" going beyond MEP is not a federal requirement, but rather a discretionary decision taken by a state agency under authorization in the CWA. *See Defenders of Wildlife v. Browner,* 191 F.3d 1159, 1164-65 (9th Cir. 1999). Please see discussion in the Legal Comments. The Finding also indicates that the San Diego Water Board has developed an economic analysis of the Draft Permit. As set forth in the Legal Comments, the Riverside County Copermittees challenge the adequacy of that analysis.

Finding 29

This finding purports to find that the Draft Permit does not constitute an unfunded state mandate. The Riverside County Copermittees disagree with the conclusions set forth in this finding. More importantly, the finding is without legal effect because exclusive jurisdiction as to whether a state mandate exists, and whether it is unfunded lies with the Commission on State Mandates. Government Code §§ 17751 and 17552; *Lucia Mar Unified School District v. Honig* (1988) 44 Cal.3d 830, 837; *Hayes v. Commission on State Mandates* (1992) 11 Cal.App.4th 1546, 1596-97. The finding of an agency that has no jurisdiction to make that finding is entitled to no weight and should be deleted, as shown in the Redline. For an additional discussion of these issues, please see the Legal Comments.

Finding 31

The Riverside County Copermittees believe that the Receiving Water Limitation ("RWL") language set forth in the Draft Permit renders compliance with the permit impossible, since exceedances of water quality standards occur routinely through no fault of the MS4 Permittees. Thus, unless the RWL is modified to provide the Copermittees with a means to be in compliance, those Copermittees risk the threat of arbitrary San Diego Water Board enforcement or the bringing of citizen suit lawsuits under the CWA, which could nullify compliance with all other terms set forth in the Draft Permit, as discussed more fully in the Legal Comments. The exposure to third party litigation from the proposed RWL language is one of the most significant threats to an otherwise collaborative approach to achieving long term water quality improvement. This threat was emphasized by the recent bringing of a citizen suit lawsuit against the City of Malibu, the County of Los Angeles and the Los Angeles County Flood Control District based on similar language in the 2001 Los Angeles County MS4 Permit. The Riverside County Copermittees have suggested modifications to Provision A in the Redline and as discussed below and in the Legal Comments that are intended to better support the Iterative Process for compliance authorized by the State Water Resources Control Board in Order No.

2001-15, through the WQIP process. The Copermittees also note that the State Board considered the problems with the RWL language at a recent workshop, which may eventually result in modifications which should, if applicable, be reflected in the Draft Permit. Other requested changes to the Findings are set forth in the Redline.

3.2 Provision A, Prohibitions and Limitations

As noted above, the requirements set forth in Provision A are of great concern to the Riverside County Copermittees. The Copermittees generally support an approach to compliance that utilizes WIQPs as the implementing mechanism for the 'Iterative Process' described in Provision A.4, and that by implementing that iterative process in accordance with A.4, that the Copermittee should be in compliance with Provisions A.1 and A.2. The Redline reflects edits of Provision A to clarify the linkage between the prohibitions and limitations in Provisions A.1. through A.3. and Provision A.4 – which is described as the method for complying with the prohibitions and limitations. It must be noted, however, that the Riverside County Copermittees do not agree with the approach suggested, that any WQIP-based compliance approach be necessarily accompanied by a Reasonable Assurance Analysis. Such analyses can be extremely complex, expensive and time-intensive to develop, and similar analyses are commonly developed within TMDL models; taking a number of years to develop and refine. Given that the Santa Margarita Watershed has no adopted TMDLs; thus, comprehensive pollutant transport and BMP models are not available for the suite of constituents that might be considered for prioritization within a WQIP for the Santa Margarita Watershed. In the context of a TMDL, such models would be developed by the combined resources of the San Diego Water Board and a range of stakeholders and dischargers. Undertaking such an exercise solely with the public resources of the 275,000 residents of the SMR is beyond the financial ability of the Copermittees and would shift the responsibility for development of TMDLs from the San Diego Water Board to the Copermittees. Comments on Provision A can be found below, in the Redline and in the Legal Comments.

3.2.1 Overview of Key Issues

As noted above, an overriding issue for the Riverside County Copermittees is having a permit that, while being appropriately proactive and aggressive at addressing the prioritized water quality conditions with the Receiving Waters, is one that all Copermittees can remain in compliance with while implementing those requirements. As presently drafted (and as made clear by statements in the Fact Sheet), Provision A imposes immediate potential liability on every Copermittee if monitoring in the Receiving Waters reflects exceedances of water quality standards that may have been caused or contributed to by MS4 discharges. San Diego Water Board staff has repeatedly indicated in workshop presentations that they expect that Copermittees will not be able to comply with the Receiving Water Limitations and Discharge Prohibitions for some time. Staff has separately indicated that they are interested in having the Copermittees undertake bold initiatives in trying to address urban runoff pollution, and that the Copermittees have actually been encouraged to "fail early and fail often" as this would reflect such progress in refining these initiatives. The iterative, flexible and priority-setting approach reflected in the WQIP is intended to allow the Copermittees to focus on the most important problems in their watershed. The entire approach is endangered, however, by RWL provisions which would allow either the San Diego Water Board or a citizen plaintiff to sue the Copermittees for any individual exceedance of the

RWLs. Under the current version of Provision A, the unmitigated risk of such actions leads not to bold initiatives but rather to attempts to minimize liability.

As set forth in the Legal Comments, this approach is not mandated by the CWA, State Board orders or the opinion of the Ninth Circuit Court of Appeals in *Natural Resources Defense Council v. County of Los Angeles*, 673 F.3d 880 (9th Cir. 2011), *reversed*, 568 U.S. __ (January 8, 2013). As importantly, the threat of immediate potential noncompliance actually interferes with the ability of the Copermittees, including the Riverside County Copermittees, to comply with the Draft Permit. Instead of being able to focus on pollutants of highest concern in the watershed, as called for in the WQIP, the Copermittees will be forced to try to address every pollutant monitored, since the exceedance of any water quality standard leads to immediate potential liability. Moreover, because citizen plaintiffs are entitled to injunctive relief under Section 505(a) of the CWA, a federal judge could order the Copermittees to undertake steps completely independent of the WQIP or other compliance provisions in the Draft Permit.

The Riverside County Copermittees do not object to compliance provisions that will provide a means to achieve real improvement in water quality. The Copermittees are willing to undertake these Provisions, because the success or failure is in their control. Compliance with the requirements of Provision A, however, is beyond the control of the Copermittees. Based on the statements made during the workshop process, the Riverside County Copermittees believe that the San Diego Water Board is serious about working with the Copermittees on a permit that provides flexibility and problem solving approaches. To ensure that this flexibility is not lost, the Draft Permit must tie in compliance with Provisions A.1 through A.3 to a process set forth in Provision A.4. This approach is shown in the Redline and is discussed further below.

3.2.2 Comments in support of specific changes

Provision A, Introduction

The introduction notes that pollutants "in stormwater discharges" from the MS4 must be controlled to the MEP. As discussed above, the CWA does not differentiate between stormwater and non-stormwater discharges from the MS4; both must be controlled to the MEP standard. The Riverside County Copermittees have requested revised language in the Redline. Additionally, the linkage between compliance with Discharge Prohibitions (Provision A.1), Receiving Water Limitations (Provision A.2) and Effluent Limitations (Provision A.3) should be noted as being defined by Provision A.4. This change is reflected in the Redline.

A.1.a

First, language must be added providing that compliance may be addressed through the process set forth in Provision A.4. This language is provided in the Redline. Second, the Provision prohibiting discharges which are "threatening to cause" a condition of pollution, etc., is unenforceable, because it prohibits an action that, with respect to MS4 operators, is beyond their control. Moreover, there is no authority for such provisions in the Porter-Cologne Act. The Riverside County Copermittees request

deletion of this phrase, as shown in the Redline. Additionally, as set forth in the Legal Comments, the Provision improperly expands the Discharge Prohibitions to Waters of the State.

A.1.b

40 CFR § 122.26(d)(2)(iv)(B)(1) clarifies that the requirement for an MS4 Copermittee to "effectively prohibit" the discharge of Non-stormwater/illegal discharges into its MS4s is to be accomplished through "a program, including inspections, to implement and enforce an ordinance, orders or similar means…". The language of this Provision should reflect federal law in this respect. The Redline reflects this change.

A.1.c

First, this Provision requires the Copermittees to comply with the Basin Plan prohibitions listed in Attachment A. This list is over-inclusive, as it contains requirements that are not applicable to some or all of the Copermittees' MS4 discharges, or to the Riverside County Copermittees in particular. The Riverside County Copermittees request that this Provision be amended to read as follows: "Discharges from MS4s are subject to all applicable waste Discharge Prohibitions in the Basin Plan." This change is noted in the Redline. Second, language must be added providing that compliance with this restriction can be obtained through the process set forth in Provision A.4. This language is provided in the Redline.

A.2.a

First, this Provision and Provisions A.1. and A.3 should be linked to the iterative process described in A.4. Please see the Redline.

Second, not all plans, policies, etc. set forth in Provision A.2.a.(1)-(4) may qualify as "water quality standards" or be applicable to all the MS4 Copermittees. These subsections should be deleted, and replaced with a reference to "Water Quality Standards," which is a defined term in the Draft Permit (This change is reflected in the Redline). Otherwise, the MS4 Permit would become over inclusive with respect to what is considered a water quality standard. Such standards must be established in accordance with federal and state law. If this process has not been followed for a particular requirement, it is not a "water quality standard."

A.3.a

As discussed above, this Provision erroneously states that pollutants "in stormwater discharges" from MS4s must be reduced to the MEP. Please see the Redline.

A.3.b

This Provision should also provide that compliance with a TMDL constitutes compliance with Provisions A.1 and A.2, for those pollutants/waterbodies subject to the TMDL.

A.4.a

The Riverside County Copermittees support an approach whereby compliance with Provisions A.1 through A.3 are achieved through a truly iterative approach, one which reflects the intent of the

precedential State Water Board Order Nos. 99-05 and 2001-015. As set forth in the Redline, the Riverside County Copermittees believe that they and the other Copermittees under the Draft Permit should be considered in compliance with Provisions A.1, A.2 and A.3, as applicable, through development of the WQIP, unless the San Diego Water Board denies approval of a WQIP or amendment thereof. This ensures that the Iterative Process which is the focus of the WQIP, is utilized to provide a means to be in compliance for the Copermittees.

A.4.c

This Provision should be deleted, as is reflected in the Redline. Again, this Provision defeats the purpose of an iterative approach to compliance with the Provisions A.1 through A.3, because it allows the San Diego Water Board to enforce any provision of the Draft Permit, including those provisions at any time. The San Diego Water Board obviously retains full ability to enforce the provisions of the Draft Permit, including with respect to the failure of the Copermittees to carry out required provisions. To short circuit the WQIP/JRMP process, however, is to defeat the entire intent of the Draft Permit.

3.3 Provision B, Water Quality Improvement Plans

3.3.1 Overview of Key Issues

- The goals and requirements of the WQIP need to be aligned with the requirements of the CWA that were established specifically for MS4 permits, and not impose the restoration of Receiving Waters entirely upon MS4 Copermittees.
- The WQIP should focus on addressing sources of pollutants within the jurisdiction of the respective Copermittees.
- The BMP strategies identified in the WQIP should fully inform the selection and design of programs identified in the JRMP. Some minor edits were proposed in Provision B, with additional edits as warranted in Provisions D and E.

3.3.2 Comments in support of specific changes

Introductory paragraph

The introductory language implies that the WQIP should be designed to unilaterally protect, preserve, enhance, and restore water quality and Beneficial Uses in waters of the state. As noted in Section 2.3 above, MS4 Copermittees are responsible only for discharges from their MS4s, not the unilateral protection of Beneficial Uses within their watersheds.

Redline edits were provided to:

- Tie the goals of the WQIP to the requirements of the CWA applicable to MS4 Permits.
- Replace 'waters of the state' with 'Receiving Waters' to be consistent with federal law.
- Clarify the linkage between Provision A and Provision B.

Additionally, Redline edits were provided to clarify that the strategies identified in the WQIP are intended to guide the specific actions that will be implemented by the Copermittees pursuant to Provision E.

B.1

The Riverside Copermittees support the redlines of the San Diego County Copermittees with regard to setting forth that the WQIP for the Santa Margarita Watershed Management Area (WMA) would commence upon enrollment of the Riverside County Copermittees into the Order.

B.2.e.

Two changes have been proposed, as shown in the Redline:

- The introductory paragraph includes language that clarifies that the Numeric Goals are not enforceable compliance standards, effluent limitations, or Receiving Water limitations. This clarification is consistent with San Diego Water Board staffs' verbally stated intent.
- Provision B.2.e.(1) as written requires that the final Numeric Goals be "capable of demonstrating the achievement of the restoration and/or protection of water quality standards in Receiving Waters". As discussed in Provision 2.3 above, meeting WQS in Receiving Waters is a goal of the overall NPDES regulatory programs under the CWA and not as a requirement to be accomplished alone by MS4 Copermittees. Redline edits have been provided to clarify that such goals are only required to be for MS4 discharges.

B.3.

In the Redline, edits were made to the introductory paragraph to ensure that the requirements are consistent with federal law. The CWA requires the 'effective prohibition' of non-stormwater discharges, not 'preventing' or 'eliminating' them.

Edits were also made to Provision B.3.a. to link the strategies more clearly to the Numeric Goals developed pursuant to Provision B.2.e, as well as to link them to the JRMP programs in Provision E.

B.5

In the Redline, edits were made to the introductory paragraph to clarify that the WQIP (and by extension the JRMP and Monitoring programs) are intended to meet the requirements of Provisions A.1, A.2, and A.3. The Tentative Order particularly excluded Provision A.1.b. (dealing with non-stormwater discharges). However, as discussed in the attached Legal Comments, the CWA requires that illegal discharges must be addressed via a program (as included in Provision E.2), and it is appropriate that the program be guided by the priorities and strategies included in the WQIP.

Other edits were made to clearly link Provision B.5 to the applicable requirements of Provision F.

3.4 Provision C, Action Levels

3.4.1 Overview of Key Issues

- The Action Levels (non-stormwater, and stormwater) applicable within each watershed should only be those that are associated with the priority water quality conditions in that watershed, or that are 303(d) listed for that watershed. For example, if Zinc is not a priority pollutant for a watershed, and is not 303(d) listed, there should not be a Zinc action level. This change is needed because Provision D requires analysis for all 'action level' parameters. Analysis for pollutants that are not a priority for a watershed is a waste of Copermittee resources.
- The Copermittees should be able to establish alternative action levels that are appropriate to the WMA within their WQIP. Such alternative action levels would be subject to Executive Officer approval as part of the WQIP approval process.
- Footnote 8 and 10 need to clarify that the NALs and SALs are not enforceable limitations.
- Various references to 'waters of the state' need to be changed to Receiving Waters for consistency with the Draft Order and the CWA.

Please see the Redline for further detailed comments and language changes.

3.5 Provision D, Monitoring and Assessment

The Riverside County Copermittees appreciate the changes in the monitoring program reflected in the Draft Permit, as compared to the Administrative Draft. However, elements of the revised requirements are still infeasible for the Riverside County Copermittees. The comments below identify modifications of areas of the monitoring requirement's which can significantly improve the Copermittees' ability to implement and comply with the requirements, while still maintaining appropriate jurisdictional accountability and assessment requirements to guide the implementation of the WQIPs and JRMP programs. The Redline provides further detailed comments and language changes.

3.5.1 Overview of Key Issues

- Dry Weather MS4 Outfall Monitoring
  - The level of effort dedicated to monitoring and addressing outfalls with non-stormwater discharges should be commensurate with the potential impact that discharge has on a Receiving Water. If a discharge, whether persistent or transient, has no or little potential for impacting a flowing Receiving Water, (e.g. due to infiltration, evaporation, or treatment of the flows), the outfall should be de-emphasized relative to other outfalls that have discharges that have connectivity to a flowing Receiving Water.
  - Outfall Dry Weather Field Screening – As currently drafted, the number of required visual inspections of outfalls during dry weather required per Provision D.2.a.(2)(a) and Provision D.2.b.(1) is both excessive and disproportionate. This will particularly impact smaller jurisdictions, which may be required to do more visual inspections of MS4 outfalls than would larger jurisdictions with more outfalls and more resources.
  - Similarly, as written, the Persistent Flow Outfall Monitoring requirements of Provision D.2.b.(2)(b) are excessive and also will disproportionately impact smaller jurisdictions.

Jurisdictions with several hundred outfalls will likely have significantly more resources to perform the required monitoring than smaller jurisdictions with fewer outfalls, yet both are required to implement the same level of persistent flow monitoring.

- Assessment Requirements
  - The assessment requirements require modeled extrapolation of monitored outfall data to non-monitored outfalls for the purposes of calculating loads from each outfall in each jurisdiction. Such extrapolations though modeling or other calculations will not accurately reflect actual jurisdictional loads, and have no benefit that directly analyzing the monitored data cannot more accurately provide.

3.5.2 Other Global Issues

- As currently drafted, MS4s operated by a flood control district within a city or county would be effectively double-counted for identification of outfalls in each jurisdiction and for performance of the load calculations from each jurisdiction. Additionally, Flood Control Districts have no land use or enforcement authorities outside of the MS4 and rely on the local Copermittee to address pollutant sources and discharges to their MS4. Redline edits have been included to clarify the relationship between districts and the municipal jurisdictions they serve for the purposes of outfall monitoring and the assessment requirements.
- Timelines for monitoring and assessments were clarified throughout and linked to specific reporting requirements of Provision F in the Redline.

3.5.3 Comments in support of specific changes

D.1.a.(3) and D.1.e.

The Redline clarifies that the Receiving Water monitoring described in these sections must be conducted as applicable to the WMA and the Copermittees' MS4 discharges, because some of the monitoring requirements only apply to MS4 discharges to certain waterbodies. Not all Copermittees within a WMA will have discharges to that waterbody.

D.1.b.

The Redline proposes language to allow for alternative long-term monitoring stations to be identified. Using the SMR as an example, the Copermittees might wish to utilize a location other than the existing stations due to the influence of groundwater during dry weather and/or the general lack of MS4 contributions in dry weather to those locations.

Table D-1 and D-6

The Redline proposes an addition to the list of field observations, an assessment for flow connectivity of any MS4 discharges to the sampled Receiving Water. It is important to know whether the sampled Receiving Water included a contribution of flows from MS4 discharges, or whether the data reflect conditions in the absence of an apparent MS4 discharge contribution.

D.2.a.(2)

The Redline clarifies that the identification of annual outfall monitoring requirements is based on municipal Copermittee boundaries, inclusive of Flood Control District MS4 outfalls within their jurisdiction.

The Redline clarifies that the field screening requirements apply to those outfalls in the Copermittee's inventory that are 'accessible'. If an outfall is inaccessible for safety reasons or due to habitat restrictions, it would not need to be field screened.

The Redline simplifies the 'tiers' in Provision D.2.a.(2)(a) by removing the lower tier (i), and expanding the second tier (ii) to cover all Copermittees with 500 or less outfalls. This resolves the disproportionality that occurs for Copermittees with a number of outfalls near the current 125 outfall threshold. For example, as currently drafted, a city with 150 outfalls would be required to do 150 visual inspections per year, but a smaller city with 120 outfalls would be required to do 192 visual inspections per year. The Redline also maintains the 80% requirement from the first tier to help smaller Copermittees manage their workload for meeting the field screening requirements while also conducting the additional source identifications that are required under the Draft Permit.

The Redline includes edits to Footnote 19 to clarify that persistent flow should effectively be a discharge that is hydraulically connected to a flowing Receiving Water. Any other discharges that are not affecting a flowing Receiving Water (such as pooled or ponded water) would be addressed as a Transient Discharge, with source IDs any time an obvious illegal discharge (i.e. color or odor) is identified.

D.2.a.(3)

The Redline incorporates edits proposed by the San Diego County Copermittees to require 10% of the samples in each WMA to be from a first storm event. As described in the comments of the San Diego County Copermittees, this will help avoid overly skewing of the data to 'first flush' data, while still incorporating such data into the data and analyses.

D.2.b.(1)

The Redline removes the requirement that the number of visual inspections performed be equivalent to the number of inspections required under Provision D.2.a.(2)(a).

As areas within a jurisdiction are confirmed not to have non-stormwater discharges, inspections of other outfalls would have to be perpetually (and unnecessarily) increased to maintain compliance with this requirement. For example, if a Copermittee had 150 outfalls, but after the transitional period it confirmed that 100 of those outfalls had no evidence of non-stormwater discharges to flowing Receiving Waters, it would have to visit the remaining 50 outfalls for up to three times a year to meet the requirement in this Provision. As the Copermittee got closer to eliminating non-stormwater flows at more outfalls, inspections at the remaining outfalls would quickly become excessive and unreasonable. Removing this requirement will better incentivize the elimination of non-stormwater

flows, as a Copermittee can look forward to reducing its workload in areas confirmed to not have non-stormwater flows.

D.2.b.(2)(b)

While the Riverside County Copermittees support the San Diego County Copermittees' proposal to reduce the number of required outfalls from 10 to 5 persistently flowing outfalls per WMA, the Riverside County Copermittees believe that applying the same minimum bar to all Copermittees is inappropriate and disproportionately affects smaller Copermittees that have commensurately less staff and resources.

The Riverside County Copermittees propose requiring monitoring of the top 10% of the prioritized persistent flow outfalls, with a lower and upper limit of 1 and 5 respectively, as shown in the redlines. With this change, the level of effort required of any individual Copermittee would scale consistent with the number of persistent flow outfalls within each Copermittees' jurisdiction.

Additionally, the Riverside County Copermittees request changing the requirement of Provision D.2.b.(2)(b)(ii) to require annual monitoring rather than semi-annual monitoring. With this change, a Copermittee could focus more of their annual budget on conduction Source ID efforts – which can result in eliminating problematic non-stormwater flows, rather than on a second monitoring event. Copermittees would still have the option to conduct a second monitoring event if they have more resources available and want to remove the outfall from their monitoring list sooner in accordance with Sub-Provisions [a] through [d].

D.2.b.(2)(e)

The Riverside County Copermittees support the San Diego County Copermittees' comments regarding allowing for a tailored list of constituents to be developed for each WMA. The Redline incorporates those edits.

D.3.

The Riverside County Copermittees support the changes recommended by the San Diego County Copermittees to this section, and these changes are reflected in the Redline.

D.4.a.(2)

This Provision as drafted would require the MS4 Copermittees to make comprehensive evaluations of Beneficial Uses that are beyond their expertise or the scope of an MS4 permit. Such evaluations and determinations would require advanced studies and cannot be answered with the monitoring data collected through this permit. This Provision should either be deleted or, alternatively the Riverside County Copermittees request that the assessments be focused on determining the status and progress toward addressing any Numeric Goals established for those Receiving Waters in the WQIP. Please see the Redline.

D.4.b.(1)

The Redline clarifies that outfall assessments are to be done for the area covered by each Municipal Copermittee (consistent with the proposed definition), and that the data to be used by each Municipal Copermittee would include the data collected from any Flood Control District Copermittee operated MS4s within its jurisdiction. This ensures that jurisdictional data is not double reported for Flood Control District MS4s within a city or county.

For Sub-Provision D.4.b.(1)(c)(iv) three key changes are requested in the Redline:

1) Annual volumes and pollutant loads should only be calculated from the monitored outfalls with persistent discharge to a flowing Receiving Water. This is directly applicable to the purpose of the Draft Permit and an important change, because volume and pollutant data extrapolated to non-monitored MS4 outfalls would be inaccurate and potentially misused if taken out of context. It is understood that San Diego Water Board staff want to ensure that jurisdictional accountability is maintained. However, since MS4 outfall monitoring will be conducted within each jurisdiction, inter-jurisdiction comparisons and accountability can be accomplished using the monitoring data directly without such extrapolations.
2) Added language to require a Copermittee to include in its jurisdictional load calculations any discharge that was demonstrated to have entered another Copermittees' MS4 before being discharged into the flowing Receiving Waters. This is important to ensure that each Copermittee maintains accountability for pollutants discharged to flowing Receiving Waters from within its jurisdiction.
3) The Redline proposes that the calculations of pollutant loads be only for the priority water quality constituents identified in the WQIP.

D.4.b.(2)(b)

Two key changes are recommended in the Redline:

1) Annual volumes and pollutant loads should only be calculated from the monitored outfalls for the monitored storm events. This is an important change because volume and pollutant data extrapolated to non-monitored events would be inaccurate and potentially misused if taken out of context. It is understood that San Diego Water Board staff want to ensure that jurisdictional accountability is maintained, so the Redline proposes that data from the monitored outfalls be extrapolated to identify loads for each jurisdiction during each monitored event. With this information, inter-jurisdiction comparisons and the desired 'accountability' can be accomplished using the monitoring data directly without such extrapolations to non-monitored events.
2) The Redline requests that calculations of pollutant loads be performed only for the priority water quality constituents identified in the WQIP.

D.4.b.(2)(c)

The Redline edits are consistent with those proposed by the San Diego County Copermittees, with minor modifications for clarity.

D.4.d.(2)(c)

It would be difficult to proactively determine the pollutant load reductions that *would* be necessary to demonstrate that discharges *are not* causing or contributing to exceedances of Receiving Water Limitations. Instead it would make more sense to calculate the necessary pollutant load reductions where the discharge has been demonstrated to be causing or contributing to such exceedances. In such circumstances, the necessary parameters would be known to calculate the needed load reduction. These changes are set forth in the Redline.

3.6 Provision E.1, Legal Authority

3.6.1 Overview of Key Issues

The Riverside County Copermittees note that Provision E.1, relating to the establishment of adequately legal authority, exceeds the requirements of federal CWA regulations in several respects. The federal regulations at 40 CFR 122.26(d)(2)(i)(A)-(F), provide explicit guidance for the Copermittees in developing the necessary legal authority to control MS4 discharges within its jurisdiction. However, several of the subsections of Provision E.1 go beyond these federal requirements, with respect to areas not within the responsibility of MS4 dischargers, such as negotiating with non-Copermittee entities. The Riverside County Copermittees have provided requested changes in the Redline, which are explained briefly below.

3.6.2 Comments in support of specific changes

E.1.a(1)

Changes in the Redline to accurately reflect the language of 40 CFR 122.26(d)(2)(i)(B).

E.1.a(2)

Changes in the Redline to accurately reflect the language of 40 CFR 122.26(d)(2)(i)(A). In addition, the Provision as written improperly requires the Copermittees to control the quality of runoff from sites covered by the state general permits for industrial activity and construction. These general permits are enforced by the State Board and the regional boards, and it is a state responsibility which cannot be handed off to the Municipal Copermittees.

E.1.a(3)

Changes in the Redline to accurately reflect the language of 40 CFR 122.26(d)(2)(i)(C).

E.1.a(5)

The Redline requests deletion of this Provision, which is not a requirement for municipal stormwater dischargers set forth in the CWA regulations. The Provision also improperly requests the Municipal Copermittees to attempt to negotiate with third parties the contribution of pollutants to the Copermittees' MS4. The Copermittees have no jurisdiction over such parties. The San Diego Water

Board has such jurisdiction, and should take responsibility for addressing non-MS4 sources of pollutants that may ultimately enter the MS4.

E.1.a(6)

Changes in the Redline to reflect accurately the language of 40 CFR 122.26(d)(2)(i)(E).

E.1.a(7)

The Redline requests deletion of this Provision, which is not a requirement for municipal stormwater dischargers set forth in the CWA regulations.

E.1.a(8)

The Redline requests deletion of this Provision, which is not a requirement for municipal stormwater dischargers set forth in the CWA regulations.

E.1.a(9)

The Redline requests deletion of this Provision, which is not a requirement for municipal stormwater dischargers set forth in the CWA regulations.

E.1.a(10)

The Redline requests both correction of the language in this Provision to comport with the federal regulations in 40 CFR 122.26(d)(2)(i)(F) and deletion of the second clause of this Provision, which is not found in 40 CFR 122.26(d)(2)(i)(F). Moreover, the requirement to inspect and monitor in the first clause of this Provision covers the issues set forth in the second clause. It is therefore unnecessary.

3.7 Provision E.2, IDDE

3.7.1 Overview of Key Issues

- The Draft Permit requires the Copermittees to address all non-stormwater discharges from the MS4 as illegal discharges, and then describes certain sources that need not be prohibited. This is effectively a 'guilty until proven innocent' provision, where a Copermittee will be required to expend potentially significant resources conducting source identification efforts any time non-stormwater is observed discharging from the MS4. In addition to the issues discussed in the Legal Comments, the Provision raises two practical and logistical problems:

    - This requirement is entirely independent of the determination that there are in fact any significant pollutants in such a discharge. A Copermittee could be spending substantial sums tracking (and then potentially enforcing upon) the source of a discharge that is not negatively impacting Receiving Waters. This not only is a waste of public resources, but would undermine the credibility of stormwater programs.
    - The San Diego Water Board and the State Water Board do not treat non-stormwater flows in the same manner across all of their regulatory mechanisms. For example, Order

> No. R9-2008-0002 allows non-stormwater discharges to occur, POTWs are issued permits for their discharges and agricultural operators can discharge irrigation water. The Copermittees should not be forced to conduct an expensive source investigation, only to find that the discharge complies with a permit or a waiver granted by the Water Board. The Copermittee would have no ability to address such a discharge as an 'illegal discharge', and further would have no ability to recuperate their costs for the source identification.

The best way to address these issues, is to require the Copermittee to have and enforce an effective prohibition of illegal discharges of *pollutants* (through statutes, ordinances, permits, contracts, orders or similar means), and then allow the Copermittee full discretion to determine which non-stormwater discharges have the potential to negatively impact Receiving Waters, consistent with the WQIP priorities – and address those as illegal discharges.

- Several categories of non-stormwater discharge that were previously conditionally exempt consistent with the CWA, are required by the Draft Permit to be treated as illegal discharges, unless they have coverage under another order issued by the San Diego Water Board. In addition to the problems identified above for conducting enforcement in the absence of a pollutant discharge, the San Diego Water Board, not the Copermittees, is responsible for evaluating coverage, need for coverage, and compliance with other orders issued by the Water Board. The Copermittees have neither authority nor jurisdiction. Please see the Redline.
- Several categories of non-stormwater discharge that were previously conditionally exempt consistent with the CWA, are required by the draft permit to be 'controlled' or otherwise prohibited by the Copermittees. The Fact Sheet further describes that such controls are warranted because they could potentially contain pollutants. However, the CWA only requires controls where the discharges are determined to be a significant source of pollutants. Please see Legal Comments for a further discussion of this issue as well as the Redline.
- The Draft Permit eliminates the conditional exemptions for Landscape Irrigation, Irrigation Water, and Lawn Watering (collectively 'irrigation runoff'). The San Diego Water Board has provided no data demonstrating that these discharge categories have contributed a significant pollutant load to Receiving Waters within Riverside County. Information discussed in the Fact Ssheet focuses on data from other counties. The only data from Riverside County is public educational material referring to irrigation runoff; this material, however, was adapted from public education material from other counties. That public educational material was intended to help prevent such discharges from becoming a significant source of impact on the Receiving Waters, and did not constitute a determination that such discharges are in fact, actually a significant source that needs to be subject to a prohibition. See the discussion in the Legal Comments as well as the Redline.
- The Draft Permit, in Provision E.2.a.(7) requires efforts to minimize or eliminate all non-stormwater flows, including those that are natural, conditionally exempt, or otherwise permitted by the San Diego Water Board, regardless of whether or not such discharges are not contributing pollutants to the MS4. Such a requirement conflicts with the prior Provisions E.2.a.(1) through

(5), which state conditions where such discharges need not be prohibited. The requirement should therefore be removed, as set forth in the Redline.

3.7.2 Comments in support of specific changes

E.2.a.(1) and (3)

The Riverside County Copermittees request that this Provision be deleted (as shown in the Redline) and the categories of non-stormwater discharges be re-incorporated into Provision E.2.a.(3). The apparent premise of Provision E.2.a(1) as drafted is that since the San Diego Water Board requires those discharges to have coverage under a separate order, they are illegal if they lack such coverage. The MS4 Copermittees, however, are not responsible for enforcing discharge coverage under separate San Diego Water Board orders; that is the responsibility of the San Diego Water Board itself. Requiring the Copermittees to enforce such entities for their lack of coverage under a separate San Diego Order shifts that responsibility from the Board to Copermittees. This is not authorized by the CWA or the Porter-Cologne Water Quality Act. The Copermittees are, under the CWA, only required to address such discharges as illegal discharges if the discharge is found to be contributing a significant pollutant load to the MS4. By moving those categories to Provision E.2.a.(3), as shown in the Redline, the Copermittees will still be required to treat such discharges as illegal discharges if and when they are found to be contributing significant pollutants to the MS4. This proposed approach is consistent with other MS4 permits in the state, including prior San Diego Water Board orders, and is further consistent with the approach taken for the WQIP, which is intended to allow the Copermittees to focus resources on addressing the specific impacts that MS4 discharges are having on Receiving Water quality.

E.2.a.(2)

This Provision requires the Copermittees to treat water line breaks as illegal discharges, which in turn requires the Copermittee to conduct enforcement measures. Water main breaks are accidental occurrences, or may be the result of acts of nature. It is no more appropriate to treat accidents as illegal and subject to enforcement than it would be for a city to declare vehicular accidents as illegal, and conduct enforcement against those involved. This language needs to be removed as shown in the Redline. Additionally, as discussed in the Legal Comments, a recent case from the federal district court in Virginia suggests that the regulation of mere flow may exceed the authority of the CWA.

E.2.a.(4)

The Redline clarifies that if the 'statues, ordinances, permits, contracts, orders or similar means' are enacted/adopted by a Copermittee, the categories of non-stormwater discharges listed do not need to be treated as illegal discharges. Otherwise, the language could be read to imply that, for example, if it was infeasible for a particular resident to direct wash water to landscaped areas, that the Copermittee would be required to treat that residents' discharge as illegal and enforce upon them.

E.2.a.(5)

Contrary to the provisions of the CWA regulations, prior MS4 permits issued by the San Diego Water Board and other permits in the state, the Draft Permit requires implementation of BMPs, where

feasible, during emergency firefighting activities. During such emergencies, all focus of public resources must appropriately be dedicated to protecting life and property. Any diversions from that mission would only serve to diminish and potentially compromise that mission. The Redline proposes language consistent with that adopted by the San Diego Water Board in 2010 for the Riverside County MS4 Permit (Order R9-2010-0016).

E.2.a.(7)

Provisions E.2.a.(1) through E.2.a.(6) describe circumstances where non-stormwater discharges need not be prohibited. This Provision then requires the Copermittees to minimize such 'conditionally allowed' flows anyway. This requirement exceeds the scope of the CWA and its implementing regulations and makes no sense. The Redline requests deletion of these Provisions.

E.2.b.(1)(d)

This Provision requires the MS4 Copermittees to map all known private outfalls to Receiving Waters. Such a requirement is beyond the scope of an MS4 permit and should be removed, as shown in the Redline. The Draft Permit does not require a Copermittee to address private outfalls to Receiving Waters; this is the responsibility of the San Diego Water Board, which governs all waste dischargers under the authority of the CWA or the Porter-Cologne Act.

E.2.b.(4)

This Provision requires the Copermittees, in conjunction with a spill, to 'prevent contamination of surface water, groundwater, and soil.'This requirement is clearly beyond the scope of an MS4 permit issued under the CWA (which regulates only discharges of water containing pollutants *from* the MS4 to Receiving Waters) and must be removed, as shown in the Redline. The Draft Permit could more appropriately require the Copermittees to 'coordinate, to the extent possible, with spill response teams to prevent entry of spills into the MS4.'

E.2.d.(2)(e)

The Redline requests edits to clarify that the intent of this Provision is to document and attempt to quantify any obvious sources of non-stormwater illegal discharges in response to the outfall monitoring, and that it is not necessary to conduct a full source identification any time there is evidence of water near an outfall.

New Provisions E.2.d.(3)(e)-(f)

The Redline adds two new provisions to this section to address a gap in potential outcomes from a source identification effort. These Provisions address scenarios where a Copermittee identifies A) the illegal discharge is coming from another upstream Copermittees' MS4, or B) that the discharge has been authorized by the San Diego Water Board, either through an order or waiver of WDRs. In the first scenario, the responsibility to continue the source identification, and conduct enforcement, would be transferred to the upstream Copermittee. In the second scenario, the responsibility for follow-up would fall on the San Diego Water Board, after receiving relevant information from the Copermittee. This Provision also provides for reimbursement to the Copermittee for the cost of the source identification, since the San Diego Water Board required the Copermittee to conduct the investigation,

while not commensurately prohibiting all non-storm water discharges from all other sources regulated by the Water Boards.

3.8 Provision E.3, Development Planning

3.8.1 Overview of Key Issues

- Priority Development Projects - The Tentative Order identifies categories of projects that are to be defined as 'Priority Development Projects' (PDPs), which in turn will be required to comply with specific water quality and Hydromodification mitigation and quantitative requirements. The criteria for PDPs is quite broad and would include the majority of development projects, from small convenience stores and residences, to mega malls and specific plan developments. The Fact Sheet describes that while some smaller project types may not have significant pollutant loads, they may have a hydrologic impact upon Receiving Waters. However, it is important to recognize that pursuant to Provision E.3.a., All projects are required to implement a variety of LID principles such as disconnecting impervious surfaces, draining impervious surfaces to landscaped areas, and minimization of soil compaction in landscaped areas. Since such LID principles will be implemented wherever feasible consistent with the MEP standard, these smaller development projects are unlikely to create a pollutant or hydrologic impact. Additionally, the Fact Sheet advocates incentivizing LID design concepts and green infrastructure and building principles. Accordingly, the Redline requests changes to Provision E.3.b.(3) as described in Provision 3.8.2 below. The Legal Comments further note the potential impact of the Virginia case (*Virginia Dept. of Transp. v. U.S. Environmental Protection* Agency) holding that the CWA does not regulate stormwater as a pollutant.
- Design Capture Volume – There are two problems with how the Draft Permit defines the Design Capture Volume:
    - The Draft Permit changes the 'design capture volume' from previous permits by eliminating the term 'runoff'. Prior permits described that the design capture volume is the volume of stormwater <u>runoff</u> from the 24-hour 85th percentile storm event. This permit changes that to be the volume of stormwater <u>produced</u> from a 24-hour 85th percentile storm event. The elimination of the term 'runoff' means that BMPs would need to be sized potentially much larger than previously. For example, if the 85th percentile storm is 1" and a BMP is designed to treat 1 acre of residential land with a coefficient of runoff of 0.6, then under the current permits the BMP must be sized to hold 2,178 cubic feet of water. However, under the language of the Draft Permit, the BMP treating the same area would be required to hold 3,630 cubic feet of water, a 70% increase in BMP size. Accordingly, the Redline restores the term 'runoff'.
    - Additionally, the Draft Permit defines the Design Capture Volume alternatively as: *"the volume of storm water that would be retained onsite if the site was fully undeveloped and naturally vegetated, as determined using continuous simulation modeling techniques based on site-specific soil conditions and typical native vegetative cover."* In addition, to the problem identified above regarding the volume of storm water <u>runoff</u>, this language does not provide a temporal standard for determining which volume to

calculate from a continuous simulation model. Additionally, such models are not commonly used among general practitioners in the civil engineering community. The Redlines propose an alternative and simpler approach for this second definition: "The volume of stormwater runoff produced from a 24-hour 85th percentile storm event, that would be retained onsite in the pre-project condition." This definition is advantageous for several reasons: 1) it is simple for any civil engineer to understand, calculate, and comply with and is based on the same storm and hydrologic calculations as the first option, 2) it respects natural hydrology for the site, which may have had runoff in the pre-project condition, and as such, is more compatible with the intent of LID to mimic natural hydrology, and 3) as a result it is less likely to result in potential degradation of Beneficial Uses downstream, from reductions in flows beyond the pre-project condition.

- Pre-Project vs Pre-Development – Both the Storm Water Pollutant Control BMP requirements and the Hydromodification Management BMP requirements in the Draft Permit specify a 'pre-development' condition as the mitigation standard for all PDPs. In addition to the legal problems with such a standard as set forth in the Legal Comments, there are practical problems with the standard.
    - The presumption made in the discussions in the Fact Sheet are that all Receiving Waters can, and will, be restored to a fully natural condition - effectively to a natural floodplain. This presumption does not address reality, which is that development has occurred in those floodplains over many generations. The San Diego Water Board obviously lacks the authority to force homeowners and businesses to vacate such floodplains to effectuate restored natural conditions. Such an action would represent an unconstitutional taking. Moreover, the Legislature, in the Flood Control Acts covering all three counties proposed to be covered by the Draft Permit, has specifically authorized Flood Control Districts to construct flood control structures required to protect the lives and properties of the citizens.
    - Mitigation to a pre-development condition also may not be necessary to protect Receiving Waters from the effects of Hydromodification. If, for example a Receiving Water with existing development tributary to it, has not experienced increased erosion due to that existing development, there is no reason to require Hydromodification mitigation to anything more than the existing condition. In the counter-example, if under the existing condition the Receiving Water has experienced increased erosion due to that existing development, then, legal issues aside, there would be technical benefit to mitigating to that pre-development condition.

  The Redline proposes alternative language that requires mitigation to a pre-development standard only where it is legal and technically justified based on the conditions of the Receiving Water.
- Alternative Compliance – The alternative compliance project options as set forth in the Draft Permit pose two key problems:

- Several statements are conflicting and thus confusing as to what the required standard is for the various alternative compliance projects. For example, throughout Provision E.3.c. it is stated that 'a PDP may be allowed to comply with Provision E.3.c.(1)(a) and/or Provision E.3.c.(2) if they …'. This language can be mis-read to imply that the project must comply both with Provisions E.3.c.(1)(a) and E.3.c.(2) *and* implement the alternative compliance project (thus negating the benefit of alternative compliance). The Redline clarifies this language.
- The Biofiltration option set forth in the Draft Permit arbitrarily, and without technical basis or justification, **doubles** the sizing standard for biofiltration BMPs from 0.75 times the design capture volume (as set forth in the 2010 MS4 Permit and the 2009 Orange County Permit) to 1.5 times the design capture volume. The existing 0.75 standard was set due to the fact that 1) the 85th percentile 24-hour storm occurs over a period of time, and 2) such BMPs have outflows and will regain some capacity during the storm event, and as such, do not need to instantaneously hold the entire 'Design Capture Volume' to have fully treated that volume. In fact, studies have shown that in addition to yielding excellent pollutant concentration reductions, LID Biofiltration BMPs are excellent at reducing the volume of runoff similar to retention BMPs. According to the ASCE International BMP database 60% or more of the long-term volume of runoff from a site can be retained within a Bioretention BMP (Bioretention BMPs are the primary 'biofiltration' BMP now allowed in Riverside County). In comparison, a Retention BMP sized to hold the runoff from the 85th percentile storm event (the Design Capture Volume) will end up retaining approximately 80% of the long-term volume of runoff. Thus, by simple proportions, a Bioretention BMP sized to 'hold' 100% of the Design Capture Volume may also be able to retain 80% of the long-term volume of runoff. $\left(\frac{0.75\times DCV}{60\%\ retained}=\frac{1.0\times DCV}{80\%\ retained}\right)$. This is being validated through Bioretention BMPs that have been constructed and are being monitored for such volume reductions at the Riverside County Flood Control District's headquarters in Riverside. Further, Biofiltration BMPs have the added benefit of providing better overall treatment of back to back storms. Where a Retention BMP would be full after the first storm, fully bypassing the second storm without treatment, a Biofiltration BMP will have restored some capacity after the first storm, providing for treatment of some or all of the second of the back to back storms. Thus, the attached redlines propose changing the sizing factor for Biofiltration BMPs to 1.0 times the Design Capture Volume. The Redline proposes changes consistent with these comments.

3.8.2 Comments in support of specific changes

Introduction

Provision E.3.g (Strategies to address the highest priority water quality conditions) was moved to the beginning to support and better integrate the development planning programs in the JRMP with the strategies developed in the WQIP.

E.3.a.(3)

The Redline changes the title of this section (and other appropriate references to this Provision) to refer to LID Principles, as identified in the CASQA LID Manual for Southern California (https://www.casqa.org/LIDDemo/LowImpactDevelopmentManual/tabid/242/Default.aspx)

E.3.b.(1)(c) (New Provision)

This Provision was added to clarify the requirements if a project that was already subjected to SSMP requirements redevelops a portion of the site.

E.3.b.(2)

The Redline edits shown for this Provision are primarily to simplify this Provision, by grouping various categories by their applicable square footage threshold and including some of the specifics in the definitions (Attachment C). Other changes (beyond reorganization) include:

- Removing the addition of 'driveways' from subsection (g) as described in Provision 3.8.1 of this letter.
- Adding a footnote for parking lots, to clarify that the trigger would not include parking lots that are not exposed to runoff, such as subterranean or covered parking lots. It is beneficial to not have parking lots exposed to runoff; excluding such parking lots from being defined as a PDP is a good way to encourage such practices.
- Hillside development projects were not included as it is not believed to be necessary anymore with the relatively low threshold (10,000 square feet) identified for other categories included in this and other recent MS4 permits.
- The definition for "Environmentally Sensitive Areas" from existing MS4 permits was restored to include the language referring to discharges that are not commingled with flows from adjacent or other upstream lands (note that the change is shown in the definitions per the re-organization suggested above).

E.3.b.(3)

- The PDP exemption for sidewalks, bicycle lanes, or trails, [E.3.b.(3)(a)] has been expanded to as shown in the Redline to include driveways and parking lots. If those projects implement criteria already described in that section, they are also unlikely to create an impact to Receiving Waters. Further, including those project types in that exemption will further incentivize developers to utilize those LID Principles.
- The exemption described in Provision E.3.b(3)(b), was modified as shown in the Redline, and as discussed in the comment letter submitted by the Riverside County Transportation Department. Please see that letter for a justification for the requested changes.
- As shown in the Redline, the exemptions for new and redeveloped single family residences [E.3.b.(3)(c) and (d)] were consolidated into a new provision [E.3.b.(3)(c)], covering all single family residential projects (both new and redeveloped). The key difference is that such projects would be considered exempt if they are both 1) not part of a larger common plan of development or planned subdivision, and 2) successfully incorporate each of the applicable source control and LID Principles identified in Provision E.2.a.(2)-(3) to the MEP.

- A new Provision-E.3.b.(3)(d), titled 'Watershed Protection Projects' was added in the Redline. The project types described therein are all projects that are undertaken to rehabilitate or prevent environmental, social, and economic damage within the watershed, including Receiving Waters. These projects, while they may in some cases require some level of impervious surfaces to be constructed, are 1) not designed for human use or activity that would generate pollutants, or are designed specifically to mitigate such pollutants; and 2) will implement each of the applicable source control and LID Principles identified in Provision E.2.a.(2)-(3) to the MEP.

E.3.c.(1)

In addition to the edits discussed in Provision 3.8.1 of this letter, the Redline removed subprovision E.3.c.(1)(c) , for two reasons:

- The requirements that must be met to when implementing an alternative compliance project are more fully described in Provision E.3.c.(3).
- The language, as drafted, appeared to require double-mitigation. It requires that: 1) conventional treatment is required to treat the entire volume not retained onsite, and 2) the pollutant load discharged must also be mitigated with an alternative compliance project. Such a scenario would be requiring double-mitigation. The Redline provides a clearer and more simple mitigation standard.

E.3.c.(2)

The Riverside County Copermittees have two concerns with this Provision:

- The first concern is the universal requirement to mitigate to the 'pre-development' standard, as discussed above in section 3.8.1 of this letter. The Copermittees in the Redline propose that this language be changed to the 'pre-project' condition. For new development projects, the 'pre-project' condition will be equivalent to the 'pre-development' condition. For redevelopment projects, the standard would be the conditions that exist onsite prior to the construction of the project. This is appropriate, because in many areas, particularly in areas of existing development that would be subject to 'redevelopment', Receiving Waters are engineered and maintained to 1) provide flood protection for the public, 2) ensure that floodwaters don't comingle with pollutants on adjacent private properties and 3) to ensure that the existing development draining to that system does not cause erosion. In cases where the Receiving Waters are not engineered and maintained, and erosion problems caused by existing development are observed, language has been added to the Redline to provide for additional standards to be developed in the WQIP, based on the WQIP priorities.
- Additionally, the Redline proposes an additional exemption from HMP requirements for projects that discharge into conveyance channels that are engineered and maintained for the build-out condition all the way from the project to a waterbody that is sufficiently resistant to Hydromodification. This language is consistent with the above discussions, and ensures the PDPs are not required to mitigate for non-existent impacts. Please see the specific language in the Redline. The engineered channel exemption can be found in other recent MS4 permits, including the recently adopted Los Angeles County MS4 Permit.

E.3.c.(3)(a) and (b)

These two Provisions were re-written in the Redline to be simpler and clearer on what BMPs, criteria, sizing standards are required for what type of project. This alternative language still meets the intent of the Draft Permit, while being easier to understand and comply with. Aside from simplifying the language, the following other changes were made in the Redline:

- The alternative compliance options must be determined to provide an equal or greater overall water quality benefit for the WMA.
- Additional options were provided for who can design the alternative compliance projects
- All alternative compliance projects are required to be consistent with the strategies in the WQIP. While the specific alternative compliance project would not be required to be identified in the WQIP, the goal of this language is to ensure that allowing the alternative compliance project would not in any way be detrimental to or contrary to the strategies in the WQIP.
- Requirements E.3.c.(3)(a)(iv) and (v) were removed entirely, as they conflict with E.3.c.(3)(a)(iii) which allowed the projects to be in the same WMA (preferably the same HSA)
- Changed the sizing factor for Biofiltration BMPs to 1.0 as discussed in section 3.8.1 of this letter, and deleted the option [d] which required triple mitigation by requiring Biofiltration + Conventional Treatment + Alternative Compliance projects.
- Added Conventional Treatment Control BMPs as an alternative compliance option, only where it has been shown to be technically infeasible to meet E.3.c.(1) and technically infeasible to implement LID Biofiltration Treatment Control BMPs.

E.3.c.(3)(c)

Redline edits in this section are primarily to simplify and consolidate the requirements. Sub-Provision [C] was removed, as it was duplicative of the mitigation standards for the alternative compliance project are specified in E.3.c.(3)(b) and E.3.c.(3)(c)(i)[a].

3.9 Provision E.4, Construction

3.9.1 Overview of Key Issues

This Riverside County Copermittees' comments and edits are set forth in the Redline.

- One key issue for the Copermittees is the edit shown in the Redline to Provision E.4.c, which clarifies that the Copermittees are responsible for *requiring* BMPs at private construction sites, and *implementing* BMPs at Copermittee construction sites.

3.9.2 Comments in support of specific changes

The Redline edits include comments supporting the requested edits.

3.10 Provision E.5., Existing Development

3.10.1 Overview of Key Issues

The Draft Permit includes requirements for advanced programs to identify opportunities and implement programs to facilitate the construction of Retrofit and Stream/Channel/Habitat Rehabilitation projects on private properties. Such requirements are clearly beyond the requirements of the CWA for a management plan to be implemented by an MS4 Copermittee. The Riverside County Copermittees request deletion of these requirements.

Alternatively, the Riverside County Copermittees have the following comments:

While these retrofitting and rehabilitation approaches can be helpful and/or needed in some circumstances, they are not required in all circumstances, nor are required to address all pollutants that may be identified in a WQIP as the highest priority water quality conditions. For example, some pollutants are best addressed with regulatory source controls at the state or federal level, such as the removal of copper from brake pads, and controls on pesticides, while other pollutants can be adequately addressed through inspections and enforcement. There are several problems with requiring Copermittee resources to be invested in such Retrofit and/or Rehabilitation strategies (collectively referred to as 'retrofit'):

- Land Ownership: The land that could potentially be identified for retrofit would likely not be owned by a Copermittee. The Copermittee therefore has no ability to force the property owner to retrofit their property. Although the Copermittee could potentially implement programs to "facilitate" implementation, such a program would still be limited by the rights of the individual property owner. Even if a Copermittee were to attempt to purchase a privately owned existing development for the purposes of retrofit (a step going far beyond any requirements in the CWA or the Porter-Cologne Act), such a process can take many years, and if the owner is unwilling to sell, the retrofit project could never be realized. In any scenario, the process to facilitate such "retrofits" is extremely costly and lengthy, with no guarantee of a benefit to water quality. Retrofits should only be undertaken where the Copermittee identifies it as a necessary step to addressing the MS4 contributions to Receiving Water problems to the MEP. Otherwise, it forces the Copermittee to utilize resources very ineffectively, which is contrary to the goals of the WQIP and may actually be detrimental to water quality.
- Permitting: Aside from the limitations discussed above, stream/channel/habitat restorations have the additional complexities of requiring other regulatory permits that are not the discretion of the San Diego Water Board nor the Copermittees to issue. Such projects can take many decades to implement, and thus, are not expected to be highly effective at addressing the goals of the WQIP, except in rare circumstances.

Redline edits have been provided to clarify that these strategies and programs should only be used when, and to the extent directed by the strategies developed in the WQIP.

3.10.2 Comments in support of specific changes

E.5.b.(1)(b) and (d)

BMP implementation requirements of Provision E.5.b.(1)(b) and (d) have been clarified in the Redline to require the Copermittee to implement BMPs on their existing development, and require implementation of BMPs on private existing development.

E.5.c.(1)(a)(iv)

The Riverside County Copermittees request deletion of this Provision. The Copermittees should be provided the flexibility to schedule inspections as they see fit, provided that the schedules they establish pursuant to E.5.c.(1)(a), and the minimum frequency in E.5.c.(1)(a)(i) are met. Requiring 20% every year will be difficult to track as businesses may be opened or closed throughout the year and throughout the permit term.

Additionally, the Riverside Copermittees understand that other Copermittees may be recommending that E.5.c.(1)(a)(i) be changed to 'once per permit term'. The Riverside Copermittees believe that the current language of 'once every five years' is more appropriate for two reasons: 1) not all Copermittees (i.e. OC and Riverside) will be enrolled into the permit at the beginning of the 'permit term', and 2) not all businesses will be in existence at the beginning of the permit term. Accordingly it is more appropriate to simply require the minimum to be once every five years, that way a program manager can simply look at the last time a facility was inspected, and use that date to schedule the next inspection.

3.11 Provision E.6, Enforcement Response Plans

3.11.1 Overview of Key Issues

The Riverside County Copermittees' edits and comments are shown in the Redline and discussed below.

3.11.2 Comments in support of specific changes

E.6.d.

The terminology in this Provision was changed in the Redline from 'escalated' enforcement to 'progressive' enforcement. The proposed language better reflects the nature of enforcement actions, which are not simply 'escalated' or 'not escalated', as implied by Provision E.6.d.(2), but are progressive as needed in response to the severity of the violation. Since every violation comes with a unique set of circumstances, it is not reasonable to presume that a single set of 'triggers' will universally result in the same level of enforcement.

3.12 Provision E.7, Public Education

3.12.1 Overview of Key Issues

The Riverside County Copermittees' edits and comments are shown in the Redline.

3.13 Provision, E.8 Fiscal Analysis

3.13.1 Overview of Key Issues

The requirement that the Copermittees "must secure all the resources necessary to comply with this Order" exceeds the requirements of the CWA and illegally intrudes on the home rule authority of municipalities to govern themselves. This must be deleted. Please also see Legal Comments.

With regard to other provisions, the Riverside County Copermittees' edits and comments are shown in the Redline.

3.14 Provision F

3.14.1 Overview of Key Issues

- F.1 – WQIP Submittal
  - Based on the schedule for the initial submittal of the Priority Water Quality Conditions and Numeric Goals, and the subsequent 60-day public review, only one month would be left for the Copermittees to finalize strategies based on those conditions and goals and the public input received. This is an insufficient amount of time. The Redline requests modifications to the schedule that would provide for the submittal of the final WQIP within 24 months (instead of 18), to provide additional time for the development of strategies.
- F.1 and F.2.
  - The schedules for submittals should be linked to the receipt of comments on prior submittals, or the approval of prior submittals, rather than the permit adoption date. If it is tied to the permit adoption date, the submittal dates could become out of sync with the comment periods or San Diego Water Board approvals if any unexpected delays occur (for example if the San Diego Water Board is delayed in approving a document, or posting a document online for public comment). The Redline requests appropriate modifications.
  - Implementation dates for the plans are unclear / undefined. The Redline clarifies this issue.
- F.3. Progress Reports
  - The reporting requirements across the transitional period were unclear. Redlines are provided to clarify and consolidate.
  - The Regional Monitoring and Assessment Report language was revised to be consistent with the requirements of the Integrated Assessment of the Water Quality Improvement Plan, rather than an additional, slightly different report, due at the same time.

3.15 Attachments B and C

Comments and edits to Attachments B and C are shown in the Redline.

Very truly yours,

for JASON E. UHLEY
Chief of Watershed Protection Division

CP:cw
P8/

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

TENTATIVE
ORDER NO. R9-2013-0001
NPDES NO. CAS0109266

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION

The San Diego County Copermittees in Table 1a are subject to waste discharge requirements set forth in this Order.

Table 1a. San Diego County Copermittees

Municipal Copermittees	
City of Carlsbad	City of Oceanside
City of Chula Vista	City of Poway
City of Coronado	City of San Diego
City of Del Mar	City of San Marcos
City of El Cajon	City of Santee
City of Encinitas	City of Solana Beach
City of Escondido	City of Vista
City of Imperial Beach	County of San Diego
City of La Mesa	San Diego County Regional Airport Authority
City of Lemon Grove	San Diego Unified Port District
City of National City	

After the San Diego Water Board receives and considers the Orange County Copermittees' Report of Waste Discharge and makes any necessary changes to the Order, the Orange County Copermittees in Table 1b will become subject to waste discharge requirements set forth in this Order after expiration of Order No. R9-2009-0002, NPDES No. CAS0108740 on or after December 16, 2014.

Table 1b. Orange County Copermittees

Municipal Copermittees	
City of Aliso Viejo	City of Rancho Santa Margarita
City of Dana Point	City of San Clemente
City of Laguna Beach	City of San Juan Capistrano
City of Laguna Hills	City of Laguna Woods
City of Laguna Niguel	County of Orange
City of Lake Forest	~~Orange County Flood Control District~~

City of Mission Viejo	
Special District Copermittee	
Orange County Flood Control District	

After the San Diego Water Board receives and considers the Riverside County Copermittees' Report of Waste Discharge and makes any necessary changes to this Order, the Riverside County Copermittees in Table 1c will become subject to waste discharge requirements set forth in this Order after expiration of Order No. R9-2010-0016, NPDES No. CAS0108766 on or after November 10, 2015.

Table 1c. Riverside County Copermittees

Municipal Copermittee	
City of Murrieta	County of Riverside
City of Temecula	~~Riverside County Flood Control and Water Conservation District~~
City of Wildomar	
Special District Copermittee	
Riverside County Flood Control and Water Conservation District	

The Orange County Copermittees and Riverside County Copermittees may become subject to the requirements of this Order at a date earlier than the expiration date of their current Orders subject to the conditions described in Provision F.6 of this Order if the Copermittees in the respective county receive a notification of coverage from the San Diego Water Board.

The term Copermittee in this Order refers to any San Diego County, Orange County, or Riverside County Copermittee covered under this Order, unless specified otherwise.

This Order provides permit coverage for the Copermittee discharges described in Table 2.

Table 2. Discharge Locations and Receiving Waters

Discharge Points	Locations throughout San Diego Region
Discharge Description	Municipal Separate Storm Sewer System (MS4) Discharges
Receiving Waters	Inland Surface Waters, Enclosed Bays and Estuaries, and Coastal Ocean Waters of the San Diego Region

Table 3. Administrative Information

This Order was adopted by the San Diego Water Board on:	**Month Day, 2013**
This Order will become effective on:	**Month Day, 2013**
This Order will expire on:	**Month Day, 2018**
The Copermittees must file a Report of Waste Discharge in accordance with Title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than 180 days in advance of the Order expiration date.	

I, David W. Gibson, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on Month Day, 2013.

TENTATIVE

David W. Gibson
Executive Officer

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ATTACHMENTS

Attachment A - Discharge Prohibitions and Special Protections A-1
Attachment B - Standard Permit Provisions and General Provisions B-1
Attachment C - Acronyms, Abbreviations and Definitions C-1
Attachment D - Jurisdictional Runoff Management Program Annual Report Form D-1
Attachment E - Specific Provisions for Total Maximum Daily Loads Applicable to Order No. R9-2013-0001 ..... E-1
Attachment F - Fact Sheet / Technical Report for Order No. R9-2013-0001 ..... F-1

I. FINDINGS

Comment [A1]: See discussions in section 3.1 of the comment letter

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board), finds that:

JURISDICTION

1. **MS4 Ownership or Operation.** Each of the Copermittees owns or operates an MS4, through which it discharges storm water and non-storm water into waters of the U.S. within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the U.S.

Many geographical areas subject to this Order are subject to the threat of periodic catastrophic flooding resulting from natural conditions, specifically the presence of mountains and hilly areas in close proximity to urban development and the effect of period strong Pacific Ocean storms. Such flooding would occur in the absence of development. The Legislature recognized the importance of this issue when it established flood control districts across the state, including in Orange, Riverside and San Diego Counties. Such flooding has in the past, and if not controlled, could in the future result in loss of life and property damage. Such flooding can also mobilize significant Pollutants from industrial, commercial, residential and agricultural lands, damaging watercourses and the beneficial uses thereof, including habitat. MS4s are designed and constructed to mitigate such impacts.

2. Riverside County Flood Control and Water Conservation District.

Comment [A2]: See discussion in section 3.1.1 of the comment letter.

In 1945, the California Legislature enacted the Riverside County Flood Control and Water Conservation District Act, establishing the Riverside County Flood Control and Water Conservation District (District). The objects and purposes of the Act are to provide for the control and conservation of flood and storm waters and for the protection of watercourses, watersheds, public highways, life and property within the District from damage or destruction from flood waters. Among its other powers, the District also has the power to conserve, reclaim and save such waters for beneficial use. However the Act does not provide the District with the power to control the volume or quality of discharges that runs off of private property, which may end up in the District's flood control system. The District is governed by the District's Board of Supervisors as a separate legal entity from the County of Riverside.

Many of the flood management systems that the District operates are defined by the Clean Water Act as an MS4, and include many of the larger MS4s within the Santa Margarita watershed region of Riverside County (SMR). District does not however

own or operate streets, catch basins or storm drains smaller than 36 inches that collect runoff from the incorporated and unincorporated jurisdictions within the SMR, and commonly connect into the District's flood management system. Such systems are typically owned and operated by either the County of Riverside or the incorporated Cities within the SMR.

The waters and pollutants that may enter the regional receiving waters and/or the District's flood management systems come from various sources. These sources can include storm water and non-storm water from the Municipal Copermittees under this permit as well as from other NPDES and non-NPDES permittees, including industrial waste water dischargers, waste water treatment facilities, industrial and construction stormwater dischargers, water suppliers, tribal lands, other state and federal government entities, and Caltrans. Sources can also include discharges from Phase II entities such as school districts and discharges from entities that have been granted waste discharge requirements or waivers of waste discharge requirements, including agricultural operations.

The District does not own or operate any municipal sanitary sewer systems, public streets, roads, or highways. The District has no planning, zoning, development permitting or other land use authority, thus, it has no permitting or governing authority over industrial or commercial facilities, residents, new developments or re-development projects, and development construction sites located in any incorporated or unincorporated areas within its service area, including the SMR. The Copermittees that have such authority are responsible for implementing a storm water management program to address pollutants discharged from such industrial and commercial facilities, residential areas, new development and re-development projects, and development construction sites within their jurisdictional boundaries. Nonetheless, as an owner and operator of an MS4, the District is required to control pollutant discharges into and from its MS4, such as through interagency agreements among Copermittees and other owners of a MS4, the contribution of pollutants from one portion of the MS4 to another portion of the MS4 within their jurisdiction.

2. **Legal and Regulatory Authority.** This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]) adopted by the United States Environmental Protection Agency (USEPA), and chapter 5.5, division 7 of the California Water Code (CWC) (commencing with section 13370). This Order serves as an NPDES permit for discharges from MS4s to surface waters. This Order also serves as waste discharge requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

   The San Diego Water Board has the legal authority to issue a regional MS4 permit pursuant to its authority under CWA section 402(p)(3)(B) and 40 CFR 122.26(a)(1)(v). The USEPA also made it clear that the permitting authority, in this case the San Diego Water Board, has the flexibility to establish system- or region-wide permits (55 Federal Register [FR] 47990, 48039-48042). The regional nature of this Order will ensure consistency of regulation within watersheds and is expected

to result in overall cost savings for the Copermittees and San Diego Water Board.

The federal regulations make it clear that the Copermittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators (40 CFR 122.26(a)(3)(vi)). This Order does not require the Copermittees to manage storm water outside of their jurisdictional boundaries, but rather to work collectively to improve storm water management within watersheds.

3. **CWA NPDES Permit Conditions.** Pursuant to CWA section 402(p)(3)(B), NPDES permits for storm water discharges from MS4s must include requirements to effectively prohibit non-storm water discharges into MS4s, and require controls to reduce the discharge of pollutants from the MS4s ~~in storm water~~ to the maximum extent practicable (MEP), and to require other provisions as the San Diego Water Board determines are appropriate to control such pollutants. This Order prescribes conditions to assure compliance with the CWA requirements for owners and operators of MS4s to effectively prohibit non-storm water discharges in to the MS4s, and require controls to reduce the discharge of pollutants ~~in storm water~~ from the MS4s to the MEP.

Comment [A3]: See discussion in section 3.1.2 of the comment letter.

4. **CWA and CWC Monitoring Requirements.** CWA section 308(a) and 40 CFR 122.41(h),(j)-(l) and 122.48 require that NPDES permits must specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s also specify additional monitoring and reporting requirements in 40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D), 122.26(d)(2)(iv)(B)(2) and 122.42(c). CWC section 13383 authorizes the San Diego Water Board to establish monitoring, inspection, entry, reporting and recordkeeping requirements. This Order establishes monitoring and reporting requirements to implement federal and State requirements.

5. **Total Maximum Daily Loads.** CWA section 303(d)(1)(A) requires that "[e]ach state shall identify those waters within its boundaries for which the effluent limitations…are not stringent enough to implement any water quality standard applicable to such waters." The CWA also requires states to establish a priority ranking of impaired water bodies known as Water Quality Limited Segments and to establish Total Maximum Daily Loads (TMDLs) for such waters. This priority list of impaired water bodies is called the Clean Water Act Section 303(d) List of Water Quality Limited Segments, commonly referred to as the 303(d) List. The CWA requires the 303(d) List to be updated every two years.

   TMDLs are numerical calculations of the maximum amount of a pollutant that a water body can assimilate and still meet water quality standards. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point sources (waste load allocations or WLAs) and non-point sources (load allocations or LAs), background contribution, plus a margin of safety. Discharges from MS4s are point source discharges. The federal regulations (40 CFR 122.44(d)(1)(vii)(B)) require that NPDES permits to incorporate water quality based effluent limitations (WQBELs) developed to protect a narrative water quality criterion, a numeric water

quality criterion, or both, consistent with the assumptions and requirements of any available WLA for the discharge. Requirements of this Order implement the TMDLs adopted by the San Diego Water Board and approved by USEPA.

6. **Non-Storm Water Discharges.** Pursuant to CWA section 402(p)(3)(B)(ii), this Order requires each Copermittee to effectively prohibit discharges of non-storm water into its MS4. Nevertheless, non-storm water discharges into and from the MS4s continue to be reported to the San Diego Water Board by the Copermittees and other persons. Monitoring conducted by the Copermittees, as well as the 303(d) List, have identified dry weather, non-storm water discharges from the MS4s as a source of pollutants causing or contributing to receiving water quality impairments in the San Diego Region. The federal regulations (40 CFR 122.26(d)(2)(iv)(B)(1)) require the Copermittees to have a program to prevent illicit discharges to the MS4. The federal regulations, however, allow for specific categories of non-storm water discharges or flows to be addressed as illicit discharges only where such discharges are identified as sources of pollutants to waters of the U.S.

7. **In-Stream Treatment Systems.** Pursuant to federal regulations (40 CFR 131.10(a)), in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S. Authorizing the construction of a runoff treatment facility within a water of the U.S., or using the water body itself as a treatment system or for conveyance to a treatment system, would be tantamount to accepting waste assimilation as an appropriate use for that water body. Runoff treatment must occur prior to the discharge of runoff into receiving waters. Treatment control best management practices (BMPs) must not be constructed in waters of the U.S. Construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body.

DISCHARGE CHARACTERISTICS AND RUNOFF MANAGEMENT

8. **Point Source Discharges of Pollutants.** Discharges from the MS4s may contain waste, as defined in the CWC, and pollutants that adversely affect the quality of the waters of the state. A discharge from an MS4 is a "discharge of pollutants from a point source" into waters of the U.S. as defined in the CWA. Storm water and non-storm water discharges from the MS4s may contain pollutants that cause or threaten to cause a violation of surface water quality standards, as outlined in the Water Quality Control Plan for the San Diego Basin (Basin Plan). ~~Storm water and non-storm water discharges from the MS4s are subject to the conditions and requirements established in the Basin Plan for point source discharges.~~

9. **Potential Beneficial Use Impairment.** The discharge of pollutants and/or increased flows from MS4s may cause or threaten to cause the concentration of pollutants to exceed applicable receiving water quality objectives and impair or threaten to impair designated beneficial uses or which may result~~ing~~ in a condition of pollution, contamination, or nuisance. In addition, the reduction of flows below the

existing condition may impact negatively impact beneficial uses.

10. **Pollutants Generated by Land Development.** Land development has created and continues to create new sources of non-storm water discharges and pollutants in storm water discharges as human population density increases. This brings higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash. Pollutants from these sources are dumped or washed off the surface by non-storm water or storm water flows into and from the MS4s. When development converts natural vegetated pervious ground cover to impervious surfaces such as paved highways, streets, rooftops, and parking lots, the natural absorption and infiltration abilities of the land are lost. Therefore, runoff leaving a developed area without BMPs that can maintain pre-development conditions will contain greater pollutant loads and have significantly greater runoff volume, velocity, and peak flow rate than pre-development runoff from the same area.

11. **Runoff Discharges to Receiving Waters.** The MS4s discharge runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within the eleven hydrologic units comprising the San Diego Region. ~~Historic and current development makes use of natural drainage patterns and features as conveyances for runoff. Rivers, streams and creeks in developed areas used in this manner are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and receiving water.~~ Numerous receiving water bodies and water body segments have been designated as impaired by the San Diego Water Board pursuant to CWA section 303(d).

Comment [A4]: See discussion in section 3.1.2 of the comment letter.

Pollutants in Runoff. The most common pollutants in runoff discharged from the MS4s include total suspended solids, sediment, pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., cadmium, copper, lead, and zinc), petroleum products and polynuclear aromatic hydrocarbons, synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus), oxygen-demanding substances (e.g., decaying vegetation, animal waste), detergents, and trash. ~~As operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not effectively prohibit or otherwise control.~~ These discharges may cause or contribute to a condition of pollution or a violation of water quality standards. California law requires downstream landowners, including owners and operators of MS4, to accept upstream flows, even if that flow contains Pollutants. Failure to do can create conditions.

Comment [A5]: See discussion in section 3.1.2 of the comment letter.

Limitation on Powers of Copermittees. This Order regulates the discharge of non-stormwater into and Pollutants from non-agricultural Anthropogenic sources from the MS4s owned and/or operated by the Copermittees. The Copermittees lack legal

Comment [A6]: This finding is based on Findings I.B and I.C in Order R8-2010-33, applicable to portions of Riverside County within the Santa Ana region.

jurisdiction over discharges into their MS4 from agricultural activities, State and federal facilities, public schools and hospitals, utilities, railroads, special districts, Native American tribal lands, wastewater management agencies and other point and non-point source discharges otherwise permitted by the Water Board. The Water Board recognizes that the Copermittees should not be held responsible for discharges from such facilities or Pollutants in those discharges. Also, certain activities and sources that generate pollutants present in urban runoff may be beyond the ability of the Copermittees to prevent or eliminate. Examples of these activities and sources include, but are not limited to: emissions from internal combustion engines, brake pad wear and tear, atmospheric deposition, non-Anthropogenic sources of bacteria (including wildlife and feral cats and dogs), the regulation of pesticides and leaching of naturally occurring nutrients and minerals from local soils. This Order is not intended to address background or naturally occurring Pollutants or flows.

12.

13. **Human Health and Aquatic Life Impairment.** Pollutants in runoff discharged from the MS4s can threaten and adversely affect human health and aquatic organisms. Adverse responses of organisms to chemicals or physical agents in runoff range from physiological responses such as impaired reproduction or growth anomalies to mortality. Increased volume, velocity, rate, and duration of storm water runoff greatly accelerate the erosion of downstream natural channels. This alters stream channels and habitats and can adversely affect aquatic and terrestrial organisms.

14. **Water Quality Effects.** The Copermittees' water quality monitoring data submitted to date documents various persistent exceedances of Basin Plan water quality objectives for runoff-related pollutants at various watershed monitoring stations. Persistent toxicity has also been observed at several watershed monitoring stations. In addition, bioassessment data indicate that the majority of the monitored receiving waters have Poor to Very Poor Index of Biological Integrity (IBI) ratings. ~~These findings indicate that runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in the San Diego Region. Non-storm water discharges from the MS4s have been shown to contribute significant levels of pollutants and flow in arid, developed Southern California watersheds, and contribute significantly to exceedances of applicable receiving water quality objectives.~~

Comment [A7]: These statements are completely unsubstantiated.

15. ~~**Non-Storm Water and Storm Water Discharges.** Non-storm water discharges from the MS4s are not considered storm water discharges and therefore are not subject to the MEP standard of CWA section 402(p)(3)(B)(iii), which is explicitly for "Municipal … *Stormwater Discharges* (emphasis added)" from the MS4s. Pursuant to CWA 402(p)(3)(B)(ii), non-storm water discharges into the MS4s must be effectively prohibited.~~

Comment [A8]: See discussion in section 3.1.2 of the comment letter.

16. **Best Management Practices.** Waste and pollutants which are deposited and accumulate in MS4 drainage structures may~~will~~ be discharged from these structures

to waters of the U.S. unless they are removed. These discharges may cause or contribute to, or threaten to cause or contribute to, a condition of pollution in receiving waters. For this reason, pollutants in storm water discharges from the MS4s can be and must be effectively reduced in runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Pollution prevention is the reduction or elimination of pollutant generation at its source and is the best "first line of defense". Source control BMPs (both structural and non-structural) minimize the contact between pollutants and runoff, therefore keeping pollutants onsite and out of receiving waters. Treatment control BMPs remove pollutants that have been mobilized by storm water or non-storm water flows.

17. **BMP Implementation.** Runoff needs to be addressed during the three major phases of development (planning, construction, and use) in order to reduce the discharge of storm water pollutants to the MEP, effectively prohibit non-storm water discharges, and protect receiving waters. Development which is not guided by water quality planning policies and principles can result in increased pollutant load discharges, flow rates, and flow durations which can negatively affect receiving water beneficial uses. Construction sites without adequate BMP implementation result in sediment runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. Existing development can generate substantial pollutant loads which are discharged in runoff to receiving waters. Retrofitting areas of existing development with storm water pollutant control and hydromodification management BMPs may in many cases be ~~is~~ necessary to address storm water discharges from existing development that may cause or contribute to a condition of pollution or a violation of water quality standards.

Comment [A9]: It is not necessary in all cases.

18. **Long Term Planning and Implementation.** Federal regulations require municipal storm water permits to expire 5 years from adoption, after which the permit must be renewed and reissued. The San Diego Water Board recognizes that the degradation of water quality and impacts to beneficial uses of the waters in the San Diego Region occurred over several decades. The San Diego Water Board further recognizes that a decade or more may be necessary to realize demonstrable improvement to the quality of waters in the Region. This Order includes a long term planning and implementation approach that will require more than a single permit term to complete.

WATER QUALITY STANDARDS

19. **Basin Plan.** The San Diego Water Board adopted the Water Quality Control Plan for the San Diego Basin (Basin Plan) on September 8, 1994 that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for receiving waters addressed through the plan. The Basin Plan was subsequently approved by the State Water

Resources Control Board (State Water Board) on December 13, 1994. Subsequent revisions to the Basin Plan have also been adopted by the San Diego Water Board and approved by the State Water Board. Requirements of this Order implement the Basin Plan.

The Basin Plan identifies the following existing and potential beneficial uses for inland surface waters in the San Diego Region: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Process Supply (PROC), Industrial Service Supply (IND), Ground Water Recharge (GWR), Contact Water Recreation (REC1), Non-contact Water Recreation (REC2), Warm Freshwater Habitat (WARM), Cold Freshwater Habitat (COLD), Wildlife Habitat (WILD), Rare, Threatened, or Endangered Species (RARE), Freshwater Replenishment (FRSH), Hydropower Generation (POW), and Preservation of Biological Habitats of Special Significance (BIOL). The following additional existing and potential beneficial uses are identified for coastal waters of the San Diego Region: Navigation (NAV), Commercial and Sport Fishing (COMM), Estuarine Habitat (EST), Marine Habitat (MAR), Aquaculture (AQUA), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN), and Shellfish Harvesting (SHELL).

20. **Ocean Plan.** The State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, and 2005. The State Water Board adopted the latest amendment on April 21, 2005 and it became effective on February 14, 2006. The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean. Requirements of this Order implement the Ocean Plan.

    The Ocean Plan identifies the following beneficial uses of ocean waters of the state to be protected: Industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture; preservation and enhancement of designated Areas of Special Biological Significance; rare and endangered species; marine habitat; fish spawning and shellfish harvesting

21. **Sediment Quality Control Plan**. On September 16, 2008, the State Water Board adopted the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes: 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

22. **National Toxics Rule and California Toxics Rule.** USEPA adopted the National Toxics Rule (NTR) on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the NTR applied in California. On May 18, 2000, USEPA adopted the California Toxics Rule (CTR). The CTR promulgated

new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants.

23. **Antidegradation Policy.** This Order is in conformance with the federal Antidegradation Policy described in 40 CFR 131.12, and State Water Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality Waters in California*. Federal regulations at 40 CFR 131.12 require that the State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. State Water Board Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies.

CONSIDERATIONS UNDER FEDERAL AND STATE LAW

24. **Coastal Zone Act Reauthorization Amendments.** Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states with approved coastal zone management programs to address non-point source pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point source pollution: agriculture, silviculture, urban, marinas, and hydromodification. This Order addresses the management measures required for the urban category, with the exception of septic systems. The runoff management programs developed pursuant to this Order fulfills the need for coastal cities to develop a runoff non-point source plan identified in the Non-Point Source Program Strategy and Implementation Plan. The San Diego Water Board addresses septic systems through the administration of other programs.

25. **Endangered Species Act.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 USC sections 1531 to 1544). This Order requires compliance with receiving water limits, and other requirements to protect the beneficial uses of waters of the State. The Copermittees are responsible for meeting all requirements of the applicable Endangered Species Act.

26. **Report of Waste Discharge Process.** The waste discharge requirements set forth in this Order are based upon the Report of Waste Discharge submitted by the San Diego County Copermittees prior to the expiration of Order No. R9-2007-0001 (NPDES No. CAS0109266). The Orange County and Riverside County Copermittees are not immediately covered by the waste discharge requirements in this Order. The San Diego Water Board understands that each municipality is

unique although the Counties share watersheds and geographical boundaries. The Order will continue to use the Report of Waste Discharge process prior to initially making Orange County or Riverside County Copermittees subject to the requirements of this Order.

The federal regulations (40 CFR 122.21(d)(2)) and CWC section 13376 impose a duty on the Copermittees to reapply for continued coverage through submittal of a Report of Waste Discharge no later than 180 days prior to expiration of a currently effective permit. This requirement is set forth in the Orange County Copermittees' and Riverside County Copermittees' currently effective permits at Provisions K.2.b and K.2.c, respectively. The Orange County Permit, Order No. R9-2009-0002 (NPDES No. CAS0108740) expires on December 16, 2014 and the Riverside County MS4 Permit, Order No. R9-2010-0016 (NPDES No. CAS0108766) expires on November 10, 2015.

Unless the Orange County or Riverside County Copermittees apply for and receive early coverage under this Order, the Orange County Copermittees' and the Riverside County Copermittees' respective permits will be superseded by this Order upon expiration of their respective permits, subject to any necessary revisions to the requirements of this Order made after the San Diego Water Board considers their respective Reports of Waste Discharge through the public process provided in 40 CFR 124.

Comment [A10]: Please see Comment Letter and Legal Comments regarding regional permit authority,

27. **Integrated Report and Clean Water Act Section 303(d) List.** The San Diego Water Board and State Water Board submit an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the San Diego Region. USEPA issued its *Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act* on July 29, 2005, which advocates the use of a five category approach for classifying the attainment status of water quality standards for water bodies in the Integrated Report. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 in the Integrated Report are placed on the 303(d) List.

Water bodies with available data and/or information that indicate at least one beneficial use is not being supported or is threatened, but a TMDL is not required, are included in Category 4 in the Integrated Report. Impaired surface water bodies may be included in Category 4 if a TMDL has been adopted and approved (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c).

Implementation of the requirements of this Order may allow the San Diego Water Board to include surface waters impaired by discharges from the Copermittees'

MS4s in Category 4 in the Integrated Report for consideration during the next 303(d) List submittal by the State to USEPA.

28. **Economic Considerations.** The California Supreme Court has ruled that although CWC section 13263 requires the State and Regional Water Boards (collectively Water Boards) to consider factors set forth in CWC section 13241 when issuing an NPDES permit, the Water Board may not consider the factors to justify imposing pollutant restrictions that are less stringent than the applicable federal regulations require. (*City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 618, 626-627.) However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

Comment [A11]: See discussion in section 3.1.2 of the Comment Letter and also Legal Comments..

As noted in the following finding, the San Diego Water Board finds that the requirements in this permit are not more stringent than the minimum federal requirements. Therefore, a CWC section 13241 analysis is not required for permit requirements that implement the effective prohibition on the discharge of non-storm water into the MS4 or for controls to reduce the discharge of pollutants ~~in storm water~~ to the MEP, or other provisions that the San Diego Water Board has determined appropriate to control such pollutants, as those requirements are mandated by federal law. Notwithstanding the above, the San Diego Water Board has developed an economic analysis of the requirements in this Order. The economic analysis is provided in the Fact Sheet.

29. ~~**Unfunded Mandates.** This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following:~~

Comment [A12]: See discussion in section 3.1.2 of the comment letter and in the Legal Comments.

~~**a.** This Order implements federally mandated requirements under CWA section 402 (33 USC section 1342(p)(3)(B)).~~

~~**b.** The local agency Copermittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental and new dischargers who are issued NPDES permits for storm water and non-storm water discharges.~~

~~**c.** The local agency Copermittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order.~~

~~**d.** The Copermittees have requested permit coverage in lieu of compliance with the complete effective prohibition against the discharge of pollutants contained in CWA section 301(a) (33 USC section 1311(a)) and in lieu of numeric restrictions on their MS4 discharges (i.e. effluent limitations).~~

~~**e.** The local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under State law predates the enactment of Article XIIIB, Section (6) of the California Constitution.~~

~~f. The provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state develops a TMDL, federal law requires that permits must contain water quality based effluent limitations consistent with the assumptions and requirements of any applicable wasteload allocation (40 CFR 122.44(d)(1)(vii)(B)).~~

~~See the Fact Sheet for further discussion of unfunded mandates.~~

30. **California Environmental Quality Act.** The issuance of waste discharge requirements and an NPDES permit for the discharge of runoff from MS4s to waters of the U.S. is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 et seq.) in accordance with CWC section 13389.

STATE WATER BOARD DECISIONS

31. **Compliance with Prohibitions and Limitations.** The receiving water limitation language specified in this Order is consistent with language recommended by the USEPA and established in State Water Board Order WQ 99-05, *Own Motion Review of the Petition of Environmental Health Coalition to Review Waste Discharge Requirements Order No. 96-03, NPDES Permit No. CAS0108740*, adopted by the State Water Board on June 17, 1999. The receiving water limitation language in this Order requires storm water discharges from MS4s to not cause or contribute to a violation of water quality standards, which is to be achieved through an iterative approach requiring the implementation of improved and better-tailored BMPs over time. Implementation of the iterative approach to comply with receiving water limitations based on applicable water quality standards is necessary to ensure that Pollutant ~~storm water~~ discharges from the MS4 will not ultimately cause or contribute to violations of water quality standards and will not create conditions of pollution, contamination, or nuisance.

Comment [A13]: See discussion in section 3.1.2 of the comment letter.

Comment [A14]: Please see discussion in section 3.1.2 of the Comment Letter and Legal Comments.

32. **Special Conditions for Areas of Special Biological Significance.** On March 20, 2012, the State Water Board approved Resolution No. 2012-0012 approving an exception to the Ocean Plan effective prohibition against discharges to Areas of Special Biological Significance (ASBS) for certain nonpoint source discharges and NPDES permitted municipal storm water discharges. State Water Board Resolution No. 2012-0012 requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, effective prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The City of San Diego's municipal storm water discharges to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's municipal storm water discharges to the Heisler Park ASBS are subject terms and conditions of State Water Board Resolution No. 2012-0012. The Special

Protections contained in Attachment B to Resolution No. 2012-0012, applicable to these discharges, are hereby incorporated into this Order as if fully set forth herein.

ADMINISTRATIVE FINDINGS

33. **Executive Officer Delegation of Authority.** The San Diego Water Board by prior resolution has delegated all matters that may legally be delegated to its Executive Officer to act on its behalf pursuant to CWC section 13223. Therefore, the Executive Officer is authorized to act on the San Diego Water Board's behalf on any matter within this Order unless such delegation is unlawful under CWC section 13223 or this Order explicitly states otherwise.

34. **Standard Provisions.** Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR 122.42, are provided in Attachment B to this Order.

35. **Fact Sheet.** The Fact Sheet for this Order contains background information, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of this Order. The Fact Sheet is hereby incorporated into this Order and constitutes part of the Findings of this Order.

36. **Public Notice.** In accordance with State and federal laws and regulations, the San Diego Water Board notified the Copermittees, and interested agencies and persons of its intent to prescribe waste discharge requirements for the control of discharges into and from the MS4s to waters of the U.S. and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet.

37. **Public Hearing.** The San Diego Water Board held a public hearing on Month Day, 2013 and heard and considered all comments pertaining to the terms and conditions of this Order. Details of the public hearing are provided in the Fact Sheet.

38. **Effective Date.** This Order serves as an NPDES permit pursuant to CWA section 401 or amendments thereto, and becomes effective fifty (50) days after the date of its adoption, provided that the Regional Administrator, USEPA, Region IX, does not object to this Order.

39. **Review by the State Water Board.** Any person aggrieved by this action of the San Diego Water Board may petition the State Water Board to review the action in accordance with CWC section 13320 and California Code of Regulations, title 23, sections 2050, et seq. The State Water Board must receive the petition by 5:00 p.m., 30 days after the San Diego Water Board action, except that if the thirtieth day following the action falls on a Saturday, Sunday or State holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the

Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

THEREFORE, IT IS HEREBY ORDERED that the Copermittees, in order to meet the provisions contained in division 7 of the CWC and regulations adopted thereunder, and the provisions of the CWA and regulations adopted thereunder, must each comply with the following:

II. PROVISIONS

A. PROHIBITIONS AND LIMITATIONS

Comment [A15]: See discussion in section 3.2 of the comment letter.

The purpose of this provision is to describe the conditions under which storm water and non-storm water discharges into and from MS4s are to be effectively prohibited or limited. The goal of the prohibitions and limitations is to protect the water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through the implementation of water quality improvement strategies and runoff management programs that effectively prohibit non-storm water discharges into the Copermittees' MS4s, and reduce pollutants in ~~storm water~~ discharges from the Copermittees' MS4s to the MEP. The process for determination of compliance with the Discharge Prohibitions (A.1), Receiving Water Limitations (A.2), and Effluent Limitations (A.3) is defined in Provisions A.3.b and A.4.

1. Discharge Prohibitions

a. Discharges from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters ~~of the state~~ are to be ~~prohibited.~~ effectively prohibited, unless the Regional Board determines such discharges are addressed by the Copermittee through A.3.b or A.4, including any modifications.~~prohibited.~~

Comment [A16]: See discussion in section 3.2.2 of the comment letter.

b. Non-storm water discharges into MS4s are to be effectively prohibited through a program consistent with the requirements of provision E.2. of this order, including inspections, to implement and enforce an ordinance, orders or similar means to prevent illicit discharges to the MS4, unless such discharges are either authorized by a separate NPDES permit, or the discharge is a category of non-storm water discharges or flows that must be addressed pursuant to Provisions E.2.a.(1)-(5) of this Order.

Comment [A17]: See discussion in section 3.2.2 of the comment letter.

c. Discharges from MS4s are subject to all applicable waste discharge prohibitions in the Basin Plan, included in Attachment A to this Order, unless the Regional Board determines such discharges are addressed by the Copermittee through A.3.b or A.4, including any modifications.

Comment [A18]: See discussion in section 3.2.2 of the comment letter.

d. Storm water discharges from the City of San Diego's MS4 to the San Diego Marine Life Refuge in La Jolla, and the City of Laguna Beach's MS4 to the Heisler Park ASBS are authorized under this Order subject to the Special Protections contained in Attachment B to State Water Board Resolution No.

2012-0012 applicable to these discharges, included in Attachment A to this Order. All other discharges from the Copermittees' MS4s to ASBS are ~~to be effectively~~ prohibited.

2. Receiving Water Limitations

Comment [A19]: See discussion in section 3.2.2 of the comment letter.

a. Discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters, including but not limited to all applicable provisions ~~contained in:~~below, unless the Regional Board determines such discharges are addressed by the Copermittee through A.3.b or A.4::~~contained in:~~

(1) The San Diego Water Board's Basin Plan, including beneficial uses, water quality objectives, and implementation plans;

(2) State Water Board plans for water quality control including the following:

(a) Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries (Thermal Plan), and

(b) The Ocean Plan, including beneficial uses, water quality objectives, and implementation plans;

(3) State Water Board policies for water and sediment quality control including the following:

(a) Water Quality Control Policy for the Enclosed Bays and Estuaries of California,

(b) Sediment Quality Control Plan which includes the following narrative objectives for bays and estuaries:

(i) Pollutants in sediments shall not be present in quantities that, alone or in combination, are toxic to benthic communities, and

(ii) Pollutants shall not be present in sediments at levels that will bioaccumulate in aquatic life to levels that are harmful to human health,

(c) The Statement of Policy with Respect to Maintaining High Quality of Waters in California;[1]

(4) Priority pollutant criteria promulgated by the USEPA through the following:

[1] State Water Board Resolution No. 68-16

(a) National Toxics Rule (NTR)[2] (promulgated on December 22, 1992 and amended on May 4, 1995), and

(b) California Toxics Rule (CTR).[3,4]

b. Discharges from MS4s composed of storm water runoff must not alter natural ocean water quality in an ASBS.

[2] 40 CFR 131.36
[3] 65 Federal Register 31682-31719 (May 18, 2000), adding Section 131.38 to 40 CFR
[4] If a water quality objective and a CTR criterion are in effect for the same priority pollutant, the more stringent of the two applies.

3. Effluent Limitations

a. TECHNOLOGY BASED EFFLUENT LIMITATIONS

Comment [A20]: See discussion in section 3.2.2 of the comment letter.

Pollutants in ~~storm water~~ discharges from MS4s must be reduced to the MEP.[5]

b. WATER QUALITY BASED EFFLUENT LIMITATIONS

This Order establishes water quality based effluent limitations (WQBELs) consistent with the assumptions and requirements of all available TMDL waste load allocations (WLAs) assigned to discharges from the Copermittees' MS4s. Each Copermittee must comply with applicable WQBELs established for the TMDLs in Attachment E to this Order, pursuant to the applicable TMDL compliance schedules.

4. Compliance with Discharge Prohibitions and Receiving Water Limitations

Comment [A21]: See discussion in section 3.2.2 of the comment letter.

Each Copermittee must achieve compliance with Provisions A.1.a~~,~~ through A.1.c and A.2.a of this Order through timely implementation of control measures and other actions as specified in Provisions B and E of this Order, including any modifications. The Water Quality Improvement Plans required under Provision B must be designed and adapted to ultimately achieve compliance with Provisions A.1.a~~,~~ through A.1.c and A.2.a~~.~~, as described in Provision B.2.~~.~~

a. If exceedance(s) of water quality standards persist in receiving waters notwithstanding implementation of this Order, the Copermittees must comply with the following procedures:

(1) For exceedance(s) of a water quality standard in the process of being addressed by the Water Quality Improvement Plan, the Copermittee(s) must implement the Water Quality Improvement Plan as accepted by the San Diego Water Board, and update the Water Quality Improvement Plan, as necessary, pursuant to Provision F.2.c;

(2) Upon a determination by either the Copermittees or the San Diego Water Board that discharges from the MS4 are causing or contributing to a new exceedance of an applicable water quality standard not addressed by the Water Quality Improvement Plan, the Copermittees must submit the following updates to the Water Quality Improvement Plan pursuant to Provision F.2.c or as part of the Annual Report required under Provision F.3.b, unless the San

[5] This does not apply to MS4 discharges which receive subsequent treatment to reduce pollutants in storm water discharges to the MEP prior to entering receiving waters (e.g., low flow diversions to the sanitary sewer). Runoff treatment must occur prior to the discharge of runoff into receiving waters per Finding 7.

Diego Water Board directs an earlier submittal:

(a) The water quality improvement strategies being implemented that are effective and will continue to be implemented,

(b) Water quality improvement strategies (i.e. BMPs, retrofitting projects, stream and/or habitat rehabilitation or restoration projects, adjustments to jurisdictional runoff management programs, etc.) that will be implemented to reduce or eliminate any pollutants or conditions that are causing or contributing to the exceedance of water quality standards,

(c) Updates to the schedule for implementation of the existing and additional water quality improvement strategies, and

(d) Updates to the monitoring and assessment program to track progress toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a of this Order;

(3) The San Diego Water Board may require the incorporation of additional modifications to the Water Quality Improvement Plan required under Provision B. The applicable Copermittees must submit any modifications to the update to the Water Quality Improvement Plan within 90 days of notification that additional modifications are required by the San Diego Water Board, or as otherwise directed;

(4) Within 90 days of the San Diego Water Board determination that the update to the Water Quality Improvement Plan meets the requirements of this Order, the applicable Copermittees must revise the jurisdictional runoff management program documents to incorporate the updated water quality improvement strategies that have been and will be implemented, the implementation schedule, and any additional monitoring required; and

(5) Each Copermittee must implement the updated Water Quality Improvement Plan.

b. The procedure set forth above to achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order do not have to be repeated for continuing or recurring exceedances of the same water quality standard(s) following implementation of scheduled actions unless directed to do otherwise by the San Diego Water Board.

c. Nothing in Provisions A.4.a and A.4.b prevents the San Diego Water Board from enforcing any of provisions B through I of this Order while the applicable Copermittees prepare and implement the above update to the Water Quality Improvement Plan and jurisdictional runoff management programs.

B. WATER QUALITY IMPROVEMENT PLANS

The purpose of this provision is to develop Water Quality Improvement Plans (WQIPs) that guide the Copermittees' jurisdictional runoff management programs towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. The goal of the Water Quality Improvement Plans is to ~~protect, preserve, enhance, and restorerestore the~~address the impacts of MS4 discharges so that such discharges do not impair water quality and designated beneficial uses of receiving waters~~. of the state.~~ Therefore, implementation of the WQIPs also provides the basis for complying with Provisions II.A.1, II.A.2, and II.A.3, as described in Provision II.A.4. This goal will be accomplished through an adaptive planning and management process that identifies the highest priority water quality conditions within a watershed and implements strategies through the jurisdictional runoff management programs to achieve improvements in the quality of discharges from the MS4s ~~and~~ to receiving waters. As such, the requirements outlined in Provision E may be modified for consistency with the WQIP priorities for the applicable Watershed Management Area, if appropriate justification is provided approved within the WQIP.

Comment [A22]: See section 3.3 of the comment letter for discussions of the changes requested herein.

Comment [A23]: See discussion in section 3.3.2 of the comment letter.

1. Watershed Management Areas

Comment [A24]: See discussion in section 3.3.2 of the comment letter.

The Copermittees must develop a Water Quality Improvement Plan for each of the Watershed Management Areas in Table B-1. A total of ten Water Quality Improvement Plans must be developed for the San Diego Region.

Development of the Water Quality Improvement Plan for the Santa Margarita River Watershed Management Area shall commence upon notification of coverage of the Riverside County Copermittees under this Order. Until this time, the County of San Diego shall use the water quality priorities in the Santa Margarita River Watershed Urban Runoff Management Plan, developed pursuant to Order No. R9-2007-0001, to guide implementation of Provisions D and E within its jurisdiction

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
San Juan (901.00)	South Orange County	- Aliso Creek - San Juan Creek - San Mateo Creek - Pacific Ocean - Heisler Park ASBS	- City of Aliso Viejo[1] - City of Dana Point[1] - City of Laguna Beach[1] - City of Laguna Hills[1] - City of Laguna Niguel[1] - City of Laguna Woods[1] - City of Lake Forest[1] - City of Mission Viejo[1] - City of Rancho Santa Margarita[1] - City of San Clemente[1] - City of San Juan Capistrano[1] - County of Orange[1] - Orange County Flood Control District[1]

Table B-1. Watershed Management Areas

Hydrologic Unit(s)	Watershed Management Area	Major Surface Water Bodies	Responsible Copermittees
Santa Margarita (902.00)	Santa Margarita River	- Murrieta Creek - Temecula Creek - Santa Margarita River - Santa Margarita Lagoon - Pacific Ocean	- City of Murrieta[2] - City of Temecula[2] - City of Wildomar[2] - County of Riverside[2] - County of San Diego[3] - Riverside County Flood Control and Water Conservation District[2]
San Luis Rey (903.00)	San Luis Rey River	- San Luis Rey River - San Luis Rey Estuary - Pacific Ocean	- City of Oceanside - City of Vista - County of San Diego
Carlsbad (904.00)	Carlsbad	- Loma Alta Slough - Buena Vista Lagoon - Agua Hedionda Lagoon - Batiquitos Lagoon - San Elijo Lagoon - Pacific Ocean	- City of Carlsbad - City of Encinitas - City of Escondido - City of Oceanside - City of San Marcos - City of Solana Beach - City of Vista - County of San Diego
San Dieguito (905.00)	San Dieguito River	- San Dieguito River - San Dieguito Lagoon - Pacific Ocean	- City of Del Mar - City of Escondido - City of Poway - City of San Diego - City of Solana Beach - County of San Diego
Penasquitos (906.00)	Penasquitos	- Los Penasquitos Lagoon - Pacific Ocean	- City of Del Mar - City of Poway - City of San Diego - County of San Diego
	Mission Bay	- Mission Bay - Pacific Ocean - San Diego Marine Life Refuge ASBS	- City of San Diego
San Diego (907.00)	San Diego River	- San Diego River - Pacific Ocean	- City of El Cajon - City of La Mesa - City of San Diego - City of Santee - County of San Diego
Pueblo San Diego (908.00) Sweetwater (909.00) Otay (910.00)	San Diego Bay	- Sweetwater River - Otay River - San Diego Bay - Pacific Ocean	- City of Chula Vista - City of Coronado - City of Imperial Beach - City of La Mesa - City of Lemon Grove - City of National City - City of San Diego - County of San Diego - San Diego County Regional Airport Authority - San Diego Unified Port District
Tijuana (911.00)	Tijuana River	- Tijuana River - Tijuana Estuary - Pacific Ocean	- City of Imperial Beach - City of San Diego - County of San Diego

Notes:
1. The Orange County Copermittees will be covered under this Order after expiration of Order No. R9-2009-0002, or earlier if the Orange County Copermittees meet the conditions in Provision F.6.
2. The Riverside County Copermittees will be covered under this Order after expiration of Order No. R9-2010-0016, or earlier if the Riverside County Copermittees meet the conditions in Provision F.6.
3. The County of San Diego is required to implement the requirements of Provision B for its jurisdiction within the Santa

Margarita River Watershed Management Area until the Riverside County Copermittees have been notified of coverage under this Order.

2. Priority Water Quality Conditions

The Copermittees must identify the water quality priorities within each Watershed Management Area that will be addressed by the Water Quality Improvement Plan. Where appropriate, Watershed Management Areas may be separated into subwatersheds to focus water quality prioritization and jurisdictional runoff management program implementation efforts by receiving water.

a. Assessment of Receiving Water Conditions

The Copermittees must consider the following, at a minimum, to identify water quality priorities based on impacts of MS4 discharges on receiving water beneficial uses:

(1) Receiving waters listed as impaired on the CWA Section 303(d) List of Water Quality Limited Segments (303(d) List);

(2) TMDLs adopted and under development by the San Diego Water Board;

(3) Receiving waters recognized as sensitive or highly valued by the Copermittees, including estuaries designated under the National Estuary Program under CWA section 320, wetlands defined by the State or U.S. Fish and Wildlife Service's National Wetlands Inventory as wetlands, and receiving waters identified as ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (Attachment A);

(4) The receiving water limitations of Provision A.2;

(5) Known historical versus current physical, chemical, and biological water quality conditions;

(6) Available, relevant, and appropriately collected and analyzed physical, chemical, and biological receiving water monitoring data, including, but not limited to, data describing:

(a) Chemical constituents,

(b) Water quality parameters (i.e. pH, temperature, conductivity, etc.),

(c) Toxicity Identification Evaluations for both receiving water column and sediment,

(d) Trash impacts,

(e) Bioassessments, and

(f) Physical habitat;

(7) Available evidence of erosional impacts in receiving waters due to accelerated flows (i.e. hydromodification);

(8) Available evidence of adverse impacts to the chemical, physical, and biological integrity of receiving waters; and

(9) The potential improvements in the overall condition of the Watershed Management Area that can be achieved.

b. ASSESSMENT OF IMPACTS FROM MS4 DISCHARGES

The Copermittees must consider the following, at a minimum, to identify the potential impacts to receiving waters that may be caused or contributed to by discharges from the Copermittees' MS4s:

(1) The discharge prohibitions of Provision A.1 and effluent limitations of Provision A.3; and

(2) Available, relevant, and appropriately collected and analyzed storm water and non-storm water monitoring data from the Copermittees' MS4 outfalls;

(3) Locations of each Copermittee's MS4 outfalls that discharge to receiving waters;

(4) Locations of MS4 outfalls that are known to persistently discharge non-storm water to receiving waters likely causing or contributing to impacts on receiving water beneficial uses;

(5) Locations of MS4 outfalls that are known to discharge pollutants in storm water causing or contributing to impacts on receiving water beneficial uses; and

(6) The potential improvements in the quality of discharges from the MS4 that can be achieved.

c. IDENTIFICATION OF PRIORITY WATER QUALITY CONDITIONS

(1) The Copermittees must use the information gathered for Provisions B.2.a and B.2.b to develop a list of priority water quality conditions as pollutants, stressors and/or receiving water conditions that are the highest threat to receiving water quality or that most adversely affect the physical, chemical, and biological integrity of receiving waters. The list must include the following information for each priority water quality condition:

(a) The beneficial use(s) associated with the priority water quality condition;

(b) The geographic extent of the priority water quality condition within the Watershed Management Area, if known;

(c) The temporal extent of the priority water quality condition (e.g., dry weather and/or wet weather);

(d) The Copermittees with MS4s discharges that may cause or contribute to the priority water quality condition; and

(e) An assessment of the adequacy of and data gaps in the monitoring data to characterize the conditions causing or contributing to the priority water quality condition, including a consideration of spatial and temporal variation.

(2) The Copermittees must identify the highest priority water quality conditions to be addressed by the Water Quality Improvement Plan, and provide a rationale for selecting a subset of the water quality conditions identified pursuant to Provision B.2.c.(1) as the highest priorities.

d. IDENTIFICATION OF MS4 SOURCES OF POLLUTANTS AND/OR STRESSORS

The Copermittees must identify and prioritize known and suspected sources of storm water and non-storm water pollutants and/or other stressors within their jurisdiction, associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c. ~~The identification of known and suspected sources of pollutants and/or stressors that cause or contribute to the highest priority water quality conditions as identified for Provision B.2.c must~~ considering the following:

(1) Pollutant generating facilities, areas, and/or activities within the Watershed Management Area, including:

(a) Each Copermittee's inventory of construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas,

(b) Publicly owned parks and/or recreational areas,

(c) Open space areas,

(d) All currently operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste,,, and

(e) Areas not within the Copermittees' jurisdictions (e.g., Phase II MS4s, tribal lands, state lands, federal lands) that are known or suspected to be discharging to the Copermittees' MS4s;

(2) Locations of the Copermittees' MS4s, including the following:

(a) All major MS4 outfalls [per 40CFR 122.26 (b)(5)] that discharge to receiving waters, and

(b) Locations of major structural controls for storm water and non-storm water (e.g., retention basins, detention basins, major infiltration devices, etc.);

(3) Other known and suspected sources of non-storm water or pollutants in storm water discharges to receiving waters within the Watershed Management Area, including the following:

(a) Other MS4 outfalls (e.g., Phase II Municipal and Caltrans),

(b) Other NPDES permitted discharges,

(c) Any other discharges that may be considered point sources (e.g., private outfalls), and

(d) Any other discharges that may be considered non-point sources (e.g., agriculture, wildlife or other natural sources);

(4) Review of available data, including but not limited to:

(a) Findings from the Copermittees' illicit discharge detection and elimination programs,

(b) Findings from the Copermittees' MS4 outfall discharge monitoring,

(c) Findings from the Copermittees' receiving water monitoring,

(d) Findings from the Copermittees' MS4 outfall discharge and receiving water assessments, and

(e) Other available, relevant, and appropriately collected data, information, or studies related to pollutant sources and/or stressors that contribute to the highest priority water quality conditions as identified for Provision B.2.c.

(5) The adequacy of the available data to identify and prioritize sources and/or stressors associated with MS4 discharges that cause or contribute to the highest priority water quality conditions identified under Provision B.2.c.

e. NUMERIC GOALS AND SCHEDULES

Comment [A25]: See discussion in section 3.3.2 of the comment letter.

The Copermittees must develop and incorporate action levels, interim and final numeric goals[6] and schedules into the Water Quality Improvement Plan. Numeric goals must be used to support Water Quality Improvement Plan implementation and measure progress towards addressing the highest priority water quality conditions identified under Provision B.2.c. . Action Levels, Numeric goals are not enforceable compliance standards, effluent limitations, or receiving water limitations. When establishing numeric goals and corresponding schedules, the Copermittees must consider the following:

(1) Final numeric goals must be based on measureable criteria or indicators, to be achieved in ~~the receiving waters and/or~~ MS4 discharges for the highest priority water quality conditions which will ~~be capable of demonstrating the achievement of the restoration and/or protection~~ comply with the Receiving Water Limitations (A.2) of this Order; ~~water quality standards in receiving waters;~~

(2) Interim numeric goals must be based on measureable criteria or indicators capable of demonstrating incremental progress toward achieving the final numeric goals in the receiving waters and/or MS4 discharges; and

(3) Schedules must be adequate for measuring progress toward achieving the interim and final numeric goals required for Provisions B.2.e.(1) and B.2.e.(2). Schedules must incorporate the following:

(a) Interim dates for achieving the interim numeric goals,

(b) Compliance schedules for any applicable TMDLs in Attachment E to this Order,

(c) Compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A),

(d) Achievement of the final numeric goals in the receiving waters and/or MS4 discharges for the highest water quality priorities must be as soon as possible, and

[6] Interim and final numeric goals may take a variety of forms such as TMDL established WQBELs, action levels, pollutant concentration, load reductions, number of impaired water bodies delisted from the List of Water Quality Impaired Segments, Index of Biotic Integrity (IBI) scores, or other appropriate metrics. Interim and final numeric goals are not necessarily limited to one criterion or indicator, but may include multiple criteria and/or indicators. Except for TMDL established WQBELs, interim and final numeric goals and corresponding schedules may be revised through the adaptive management process under Provision B.5.

(e) Final dates for achieving the final numeric goals must not initially extend more than 10 years beyond the effective date of this Order, unless a longer period of time is authorized by the San Diego Water Board Executive Officer through an approved WQIP or the schedule includes an applicable TMDL in Attachment E to this Order[7].

Comment [A26]: Clarify that a longer period can be granted through the WQIP process.

[7] Achievement of final numeric goals within 10 years represents progress towards attainment of water quality standards, but is not a requirement to fully attain all applicable water quality standards or all priority receiving water conditions within 10 years.

3. Water Quality Improvement Strategies and Schedules

Comment [A27]: See discussion in section 3.3.2 of the comment letter.

The Copermittees must develop specific water quality improvement strategies to address the highest priority water quality conditions identified within a Watershed Management Area. The water quality improvement strategies must address the highest priority water quality conditions by ensuring the effective prohibition of~~preventing or eliminating~~ non-storm water discharges to and from the MS4, reducing pollutants in ~~storm water~~ discharges from the MS4 to the MEP, as applicable to the priority water quality conditions established per provision B.2. ~~and restoring and/or protecting the water quality standards of receiving waters~~.

a. Water Quality Improvement Strategies

The Copermittees must identify and prioritize water quality improvement strategies based on their likely effectiveness and efficiency, and design the JRMP programs to focus resources on those strategies to~~implement strategies to effectively prohibit non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, improve the physical, chemical, and biological receiving water conditions, and~~ achieve the interim and final numeric goals in accordance with the schedules required for Provision B.2.e.(3). The following water quality improvement strategies must be included and described in the Water Quality Improvement Plan:

(1) Specific strategies and/or activities that may be implemented by one or more Copermittees within their jurisdictions through the jurisdictional runoff management programs that will address the highest priority water quality conditions within the Watershed Management Area, in accordance with the following requirements:

(a) Strategies and/or activities must, at a minimum, be described for each jurisdictional runoff management program component where strategies to address the highest priority water quality conditions are required under Provision E;

(b) The Water Quality Improvement Plan must describe the circumstances or conditions when and where the strategies or/activities should be or will be implemented, but specific details about how each Copermittee will implement the strategies and/or activities within its jurisdiction are not required; and

(c) Descriptions of strategies and/or activities must include any monitoring, information collection, special studies, and/or data analysis that is necessary to assess the effectiveness of the strategy and/or activity toward addressing the highest priority water quality conditions.

(2) Additional strategies and/or activities that may be implemented within the Watershed Management Area on a jurisdictional, sub-watershed, or watershed scale by one or more Copermittees, not specifically required under

Provision E, which are designed to achieve the interim and final numeric goals identified in Provisions B.2.e.(1) and B.2.e.(2);

b. IMPLEMENTATION SCHEDULES

(1) The Copermittees must develop schedules for implementing the water quality improvement strategies identified under Provision B.3.a to achieve the interim and final numeric goals identified under Provision B.2.e.(1) and B.2.e.(2). Schedules must be developed for both the water quality improvement strategies implemented by each Copermittee within its jurisdiction and for strategies that the Copermittees choose to implement on a collaborative basis.

(2) The Copermittees must incorporate the implementation compliance schedules for any ASBS subject to the provisions of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

4. Water Quality Improvement Monitoring and Assessment Program

a. The Copermittees in each Watershed Management Area must develop and incorporate an integrated monitoring and assessment program into the Water Quality Improvement Plan that assesses: 1) the progress toward achieving the numeric goals and schedules, 2) the progress toward addressing the highest priority water quality conditions for each Watershed Management Area, and 3) each Copermittee's overall efforts to implement the Water Quality Improvement Plan.

b. The monitoring and assessment program must incorporate the monitoring and assessment requirements of Provision D, which may allow the Copermittees to modify the program to be consistent with and focus on the highest priority water quality conditions for each Watershed Management Area.

c. For Watershed Management Areas with applicable TMDLs, the monitoring and assessment program must incorporate the specific monitoring and assessment requirements of Attachment E.

d. For Watershed Management Areas with any ASBS, the water quality monitoring and assessment program must incorporate the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012 (see Attachment A).

5. Iterative Approach and Adaptive Management Process

Comment [A28]: See discussion in section 3.3.2 of the comment letter.

The Copermittees in each Watershed Management Area must implement the iterative approach pursuant to Provision A.4 to adapt the Water Quality Improvement Plan, monitoring and assessment program, and jurisdictional runoff management

programs to become more effective toward achieving compliance with Provisions A.1, A.2, and A.3.~~A.1.a, A.1.c and A.2.a~~, and must include the following:

a. RE-EVALUATION OF PRIORITY WATER QUALITY CONDITIONS

The priority receiving water quality conditions, and numeric goals and corresponding schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.2.c and B.2.e, may be re-evaluated by the Copermittees as needed during the term of this Order as part of the Annual Report. Re-evaluation and recommendations for modifications to the priority water quality conditions, and numeric goals and corresponding schedules must be provided in the Regional Monitoring and Assessment Report pursuant to F.3.c~~Report of Waste Discharge~~, and must consider the following:

(1) Achieving the outcome of improved water quality in MS4 discharges and receiving waters through implementation of the water quality improvement strategies identified in the Water Quality Improvement Plan;

(2) Progress toward achieving interim and final numeric goals in receiving waters and/or MS4 discharges for the highest priority water quality conditions in the Watershed Management Area,

(3) Progress toward achieving outcomes according to established schedules;

(4) New information developed when the requirements of Provisions B.2.a-c have been re-evaluated;

(5) New policies or regulations that may affect identified numeric goals;

(6) Spatial and temporal accuracy of monitoring data collected to inform prioritization of water quality conditions and implementation strategies to address the highest priority water quality conditions;

(7) Availability of new information and data from sources other than the jurisdictional runoff management programs within the Watershed Management Area that informs the effectiveness of the actions implemented by the Copermittees;

(8) San Diego Water Board recommendations; and

(9) Recommendations for modifications solicited through a public participation process.

b. ADAPTATION OF STRATEGIES AND SCHEDULES

The water quality improvement strategies and schedules, included in the Water Quality Improvement Plan pursuant to Provisions B.3, must be re-evaluated and adapted as new information becomes available to result in more effective and efficient measures to achieve the numeric goals established pursuant to

Provision B.2.e. Re-evaluation of and modifications to the water quality improvement strategies, if determined to be necessary, must be provided in the applicable Annual Report per F.3.b.(3)., and must consider the following:

(1) Modifications to the priority water quality conditions, and numeric goals and corresponding schedules based on Provision B.5.a;

(2) Measurable or demonstrable reductions of non-storm water discharges to and from each Copermittee's MS4;

(3) Measurable or demonstrable reductions of pollutants in ~~storm water~~ discharges from each Copermittee's MS4 to the MEP;

(4) New information developed when the requirements of Provisions B.2.b and B.2.d have been re-evaluated;

(5) Efficiency in implementing the Water Quality Improvement Plan;

(6) San Diego Water Board recommendations; and

(7) Recommendations for modifications solicited through a public participation process.

c. ADAPTATION OF MONITORING AND ASSESSMENT PROGRAM

The water quality improvement monitoring and assessment program, included in the Water Quality Improvement Plan pursuant to Provisions B.4, must be re-evaluated and adapted when new information becomes available. Re-evaluation and recommendations for modifications to the monitoring and assessment program, pursuant to the requirements of Provision D, may be provided in the Annual Report, but must be provided in the Report of Waste Discharge.

6. Water Quality Improvement Plan Submittal, Updates, and Implementation

a. The Copermittees must submit the Water Quality Improvement Plans in accordance with the requirements of Provision F.1.

b. The Copermittees must submit proposed updates to the Water Quality Improvement Plan for acceptance by the San Diego Water Board Executive Officer in accordance with the requirements of Provision F.2.c.

c. The Copermittees must commence with implementation of the Water Quality Improvement Plans ~~immediately after acceptance by the San Diego Water Board, in accordance with the schedules, or subsequently updated schedules, within the Water Quality Improvement Plan.~~in accordance with Provision F.1.b.(5).

C. ACTION LEVELS

Comment [A29]: See comment letter section 3.4 for a discussion of the redlines shown herein.

The purpose of this provision is for the Copermittees to incorporate numeric non-stormwater action levels (NALs) and stormwater action levels (SALs) in the Water Quality Improvement Plans (Provision B), and numeric non-stormwater action levels (NALs) in the Illicit Discharge Detection and Elimination (IDDE) program (Provision E.2.).

- For the purposes of the WQIPs, ~~T~~the goal of the action levels is to guide ~~Water Quality Improvement Plan~~ the implementation efforts and measure progress towards the protection of the identified high priority water quality conditions and associated designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges. This goal will be accomplished through monitoring and assessing the quality of the MS4 discharges during the implementation of the Water Quality Improvement Plans.

- For the purposes of the IDDE program, the goal of the non-stormwater action levels is to assist in determining whether a persistent non-stormwater discharge into or from the MS4 contains pollutants at levels that have the potential to negatively affect the identified high priority water quality conditions.

Action levels will be developed and incorporated into the WQIP (Provision B) and the IDDE Program (Provision E). Depending upon the goals/objectives for the use of the action levels and the priority receiving water conditions, the constituents and values at which they are set may differ between watersheds. Copermittees may develop Watershed Management Area specific numeric action levels for non-stormwater and stormwater MS4 discharges using an approach approved by the Regional Board or use the default non-stormwater and stormwater action levels prescribed in C.1 and C.2 below.

The Copermittees will submit the action levels as a part of the WQIP and JRMP submittals. The action levels currently established will serve as the interim action levels until revised action levels are completed and approved. Exceedances of the action levels are not subject to enforcement or non-compliance actions under this Order.

1. Default Non-Storm Water Action Levels[8]

~~The Copermittees must develop and incorporate numeric non-storm water action levels (NALs) into the Water Quality Improvement Plan to: 1) support the development and prioritization of water quality improvement strategies for addressing non-storm water discharges to and from the MS4s, 2) assess the effectiveness of the water quality improvement strategies toward addressing MS4~~

Comment [A30]: As discussed in section 2.4 of the Riverside comment letter.

[8] NALs are not ~~considered by the San Diego Water Board to be~~ enforceable limitations under this Order.

~~non-storm water discharges, required pursuant to Provision D.4.b.(1), and 3) support the detection and elimination of non-storm water and illicit discharges to and from the MS4, required pursuant to Provision E.2.~~[9]

a. The following NALs must be incorporated as applicable to the WMA and the Copermittees' MS4 discharges,~~:~~ if the Copermittees do not establish numeric action levels within the WQIP based on watershed priorities:

(1) Non-Storm Water Discharges from MS4s to Ocean Surf Zone

Table C-1. Non-Storm Water Action Levels for Discharges from MS4s to Ocean Surf Zone

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Total Coliform	MPN/100 ml	1,000	-	10,000/1,000[1]	OP
Fecal Coliform	MPN/100 ml	200[2]	-	400	OP
Enterococci	MPN/100 ml	35	-	104[3]	OP

Abbreviations/Acronyms
AMAL – average monthly action level
OP – Ocean Plan water quality objective
MDAL – maximum daily action level
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Total coliform density NAL is 1,000 MPN/100 ml when the fecal/total coliform ratio exceeds 0.1.
2. Fecal coliform density NAL is 200 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas."

[9] ~~The Copermittees may utilize NALs or other benchmarks currently established by the Copermittees as interim NALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.~~

(2) Non-Storm Water Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Table C-2. Non-Storm Water Action Levels for Discharges from MS4s to Bays, Harbors, and Lagoons/Estuaries

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Turbidity	NTU	75	-	225	OP
pH	Units	Within limit of 6.0 to 9.0 at all times			OP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	35	-	104[3]	BP
Priority Pollutants	ug/L	See Table C-3			

Abbreviations/Acronyms:
AMAL – average monthly action level
OP – Ocean Plan water quality objective
NTU – Nephelometric Turbidity Units
ug/L – micrograms per liter
MDAL – maximum daily action level
BP – Basin Plan water quality objective
MPN/100 ml – most probable number per 100 milliliters

Notes:
1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for saltwater "designated beach areas" and is not applicable to waterbodies that are not designated with the water contact recreation (REC-1) beneficial use.

Table C-3. Non-Storm Water Action Levels for Priority Pollutants

Parameter	Units	Freshwater (CTR)		Saltwater (CTR)	
		MDAL	AMAL	MDAL	AMAL
Cadmium	ug/L	**	**	16	8
Copper	ug/L	*	*	5.8	2.9
Chromium III	ug/L	**	**	-	-
Chromium VI	ug/L	16	8.1	83	41
Lead	ug/L	*	*	14	2.9
Nickel	ug/L	**	**	14	6.8
Silver	ug/L	*	*	2.2	1.1
Zinc	ug/L	*	*	95	47

Abbreviations/Acronyms:
CTR – California Toxic Rule
AMAL – average monthly action level
ug/L – micrograms per liter
MDAL – maximum daily action level

Notes:
* Action levels developed on a case-by-case basis (see below)
** Action levels developed on a case-by-case basis (see below), but calculated criteria are not to exceed Maximum Contaminant Levels (MCLs) under the California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64431

The Cadmium, Copper, Chromium (III), Lead, Nickel, Silver and Zinc NALs for MS4 discharges to freshwater receiving waters will be developed on a case-by-case basis because the freshwater criteria are based on site-specific water quality data (receiving water hardness). For these priority pollutants, refer to ~~the following equations (~~40 CFR 131.38.b.2 for details~~) will be required~~:

~~Cadmium (Total Recoverable) = exp(0.7852[ln(hardness)] - 2.715)~~
~~Chromium III (Total Recoverable) = exp(0.8190[ln(hardness)] + 0.6848)~~
~~Copper (Total Recoverable) = exp(0.8545[ln(hardness)] - 1.702)~~
~~Lead (Total Recoverable) = exp(1.273[ln(hardness)] - 4.705)~~
~~Nickel (Total Recoverable) = exp(.8460[ln(hardness)] + 0.0584)~~
~~Silver (Total Recoverable) = exp(1.72[ln(hardness)] - 6.52)~~
~~Zinc (Total Recoverable) = exp(0.8473[ln(hardness)] + 0.884)~~

Comment [A31]: Consistent with SD Permittee recommendations.

(3) Non-Storm Water Discharges from MS4s to Inland Surface Waters

Table C-4. Non-Storm Water Action Levels for Discharges from MS4s to Inland Surface Waters

Parameter	Units	AMAL	MDAL	Instantaneous Maximum	Basis
Dissolved Oxygen	mg/L	Not less than 5.0 in WARM waters and not less than 6.0 in COLD waters			BP
Turbidity	NTU	-	20	See MDAL	BP
pH	Units	Within limit of 6.5 to 8.5 at all times			BP
Fecal Coliform	MPN/100 ml	200[1]	-	400[2]	BP
Enterococci	MPN/100 ml	33	-	61[3]	BP
Total Nitrogen	mg/L	-	1.0	See MDAL	BP
Total Phosphorus	mg/L	-	0.1	See MDAL	BP
MBAS	mg/L	-	0.5	See MDAL	BP
Iron	mg/L	-	0.3	See MDAL	BP
Manganese	mg/L	-	0.05	See MDAL	BP
Priority Pollutants	ug/L	See Table C-3			

Abbreviations/Acronyms:

AMAL – average monthly action level
BP – Basin Plan water quality objective
COLD – cold freshwater habitat beneficial use
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
MDAL – maximum daily action level
WARM – warm freshwater habitat beneficial use
MBAS – Methylene Blue Active Substances
MPN/100 ml – most probable number per 100 milliliters
ug/L – micrograms per liter

Notes:

1. Based on a minimum of not less than five samples for any 30-day period.
2. The NAL is reached if more than 10 percent of total samples exceed 400 MPN per 100 ml during any 30 day period.
3. This value has been set to the Basin Plan water quality objective for freshwater "designated beach areas" and is not applicable to waterbodies that are not designated with the water contact recreation (REC-1) beneficial use.

b. NALs must be identified, developed and incorporated in the Water Quality Improvement Plan for any pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in Receiving waters ~~of the state~~ associated with the highest priority water quality conditions related to non-storm water discharges from the MS4s. NALs must be based on:

(1) Applicable water quality standards which may be dependent upon site-specific or receiving water-specific conditions or assumptions to be identified by the Copermittees; or

(2) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. ~~For the NALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary NALs specific to the Watershed Management Area at levels greater than the NALs required by Provisions C.1.a and C.1.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for addressing non-~~

~~storm water discharges to and from the MS4s, as well as the detection and elimination of non-storm water and illicit discharges to and from the MS4. The secondary NALs may be developed using an approach acceptable to the San Diego Water Board.~~

d. Dry weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.b may be utilized to develop or revise NALs based on watershed-specific data, subject to San Diego Water Board Executive Officer approval.

2. Default Storm Water Action Levels[10]

The Copermittees must develop and incorporate numeric storm water action levels (SALs) in the Water Quality Improvement Plans to: 1) support the development and prioritization of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s, and 2) assess the effectiveness of the water quality improvement strategies toward reducing pollutants in storm water discharges, required pursuant to Provision D.4.b.(2).[11]

a. The following SALs for discharges of storm water from the MS4 must be incorporated~~:~~ if the Copermittees do not establish stormwater action levels within the WQIP based on watershed priorities::~~:~~

Table C-5. Storm Water Action Levels for Discharges from MS4s to Receiving Waters

Parameter	Units	Action Level
Turbidity	NTU	126
Nitrate & Nitrite (Total)	mg/L	2.6
Phosphorus (Total P)	mg/L	1.46
Cadmium (Total Cd)*	µg/L	3.0
Copper (Total Cu)*	µg/L	127
Lead (Total Pb)*	µg/L	250
Zinc (Total Zn)*	µg/L	976

Abbreviations/Acronyms:
NTU – Nephelometric Turbidity Units
mg/L – milligrams per liter
ug/L – micrograms per liter

Notes:
* The sampling must include a measure of receiving water hardness at each MS4 outfall. If a total metal concentration exceeds the corresponding metals SAL in Table C-5, that concentration must be compared to the California Toxics Rule criteria and the USEPA 1-hour maximum concentration for the detected level of receiving water hardness associated with that sample. If it is determined that the sample's total metal concentration for that specific metal exceeds that SAL, but does not exceed the applicable USEPA 1-hour maximum concentration criterion for the measured level of hardness, then the sample result will not be considered above the SAL for that measurement.

[10] SALs are not ~~considered by the San Diego Water Board to be~~ enforceable limitations under this Order.
[11] The Copermittees may utilize SALs or other benchmarks currently established by the Copermittees as interim SALs until the Water Quality Improvement Plans are accepted by the San Diego Water Board Executive Officer.

b. SALs must be identified, developed and incorporated in the Water Quality Improvement Plan for pollutants or waste constituents that cause or contribute, or are threatening to cause or contribute to a condition of pollution or nuisance in Receiving waters ~~of the state~~ associated with the highest water quality priorities related to storm water discharges from the MS4s. SALs must be based on:

(1) Federal and State water quality guidance and/or water quality standards; and

(2) Site-specific or receiving water-specific conditions; or

(3) Applicable numeric WQBELs required to meet the WLAs established for the TMDLs in Attachment E to this Order.

c. ~~For the SALs incorporated into the Water Quality Improvement Plan, the Copermittees may develop and incorporate secondary SALs specific to the Watershed Management Area at levels greater than the SALs required by Provisions C.2.a and C.2.b which can be utilized to further refine the prioritization and assessment of water quality improvement strategies for reducing pollutants in storm water discharges from the MS4s. The secondary SALs may be developed based on the approaches recommended by the State Water Board's Storm Water Panel[12] or using an approach acceptable to the San Diego Water Board.~~

d. Wet weather monitoring data from MS4 outfalls collected in accordance with Provision D.2.c may be used to develop or revise SALs based upon watershed-specific data, subject to San Diego Water Board Executive Officer approval.

~~[12] Storm Water Panel Recommendations to the California State Water Resources Control Board: The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities (June 2006)~~

D. MONITORING AND ASSESSMENT PROGRAM REQUIREMENTS

Comment [A32]: See discussion in section 3.5 of the comment letter.

The purpose of this provision is for the Copermittees to monitor and assess the impact on the chemical, physical, and biological conditions of receiving waters caused by discharges from the Copermittees' MS4s under wet weather and dry weather conditions. The goal of the monitoring and assessment program is to inform the Copermittees about the nexus between the health of receiving waters and the water quality condition of the discharges from their MS4s to those receiving waters.~~.~~ This goal will be accomplished through monitoring and assessing the conditions of the receiving waters, discharges from the MS4s to those receiving waters, pollutant sources and/or stressors, and effectiveness of the water quality improvement strategies implemented as part of the Water Quality Improvement Plans.

1. Receiving Water Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the condition of the receiving waters in each Watershed Management Area during dry weather and wet weather. Following acceptance of the Water Quality Improvement Plans for each Watershed Management Area, the Copermittees must conduct long-term receiving water monitoring during implementation of the Water Quality Improvement Plan to assess the long term trends and determine if water quality conditions in receiving waters are improving. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following receiving water monitoring procedures:

a. TRANSITIONAL RECEIVING WATER MONITORING

Beginning October 1st or May 1st (whichever is sooner) following enrollment under this order and until~~Until~~ the monitoring requirements of Provisions D.1.b-e are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following receiving water monitoring in the Watershed Management Area:

(1) Continue the receiving water monitoring programs required in Order Nos. R9-2007-0001~~,~~ (Attachment A, Section II. A. 1-5),~~,~~ R9-2009-0002, and R9-2010-0016;

(2) Continue the monitoring in the Hydromodification Management Plans approved by the San Diego Water Board;

(3) Participate in the following regional receiving water monitoring programs, as applicable to the Watershed Management Area and each Copermittees' MS4 discharges:

Comment [A33]: See discussion in section 3.5.3 of the comment letter.

(a) Storm Water Monitoring Coalition Regional Monitoring,

(b) Southern California Bight Regional Monitoring, and

(c) Sediment Quality Monitoring;

(4) Implement the monitoring programs developed as part of any implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) for the TMDLs in Attachment E to this Order; and

(5) For Watershed Management Areas with ASBS, implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

b. LONG-TERM RECEIVING WATER MONITORING STATIONS

The Copermittees must select at least one long-term receiving water monitoring station from among the existing mass loading stations, temporary watershed assessment stations, bioassessment stations, and stream assessment stations previously established by the Copermittees to be representative of the receiving water quality in the Watershed Management Area. Additional or alternative long-term receiving water monitoring stations may~~must~~ be selected where necessary to support the implementation and adaptation of the Water Quality Improvement Plan.

Comment [A34]: See discussion in section 3.5.3 of the comment letter.

c. DRY WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three dry weather monitoring events at each of the long-term receiving water monitoring stations. At least one monitoring event must be conducted during the dry season (May 1 – September 30) and at least one monitoring event must be conducted during a dry weather period during the wet season (October 1 – April 30), after the first wet weather event of the season, with an antecedent dry period of at least 72 hours following a storm event producing measureable rainfall of greater than 0.1 inch.

(1) Dry Weather Receiving Water Field Observations

For each dry weather monitoring event, the Copermittees must record field observations consistent with Table D-1 at each long-term receiving water monitoring station.

Table D-1. Field Observations for Receiving Water Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) • Assessment of any observed connectivity of MS4 discharges to a flowing receiving water. • Station description (i.e. deposits or stains, vegetation condition, structural condition, and observable biology) • Presence and assessment of trash in and around station

Comment [A35]: See discussion in section 3.5.3 of the comment letter.

(2) Dry Weather Receiving Water Field Monitoring

For each dry weather monitoring event, if conditions allow the collection of the data, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

Table D-2. Field Monitoring Parameters for Receiving Water Monitoring Stations

Parameters
• pH • Temperature • Specific conductivity • Dissolved oxygen • Turbidity

(3) Dry Weather Receiving Water Analytical Monitoring

For each dry weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity,

dissolved oxygen, turbidity, hardness, and indicator bacteria Grab samples may also be collected for the analyses described in (f) where MS4 discharge runoff constitutes less than ten percent of the flow;

Comment [A36]: The receiving water stations in Riverside County either do not receive runoff from MS4 discharges or receive deminimus flows during dry weather conditions. The flow at these stations during dry weather consists virtually entirely of rising groundwater. Background receiving water quality conditions In such cases composite samples of receiving waters not affected by MS4 discharges is not warranted.

(d) For all other constituents where runoff constitutes more than ten percent of the flow, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable NAL constituents, and

(v) Constituents listed in Table D-3.

Table D-3. Analytical Monitoring Constituents for Receiving Water Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Pesticides	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1]	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Mercury • Nickel • Selenium • Thallium • Zinc	• Organophosphate Pesticides • Pyrethroid Pesticides	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

• Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia			

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(4) Dry Weather Receiving Water Toxicity Monitoring

For each dry weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for toxicity in accordance with Table D-4:

Table D-4. Dry Weather Toxicity Testing for Receiving Water Monitoring Stations

Freshwater Organism	Test Approach	USEPA Protocol[2]
Pimephales promelas	1 acute 1 chronic[1]	EPA-821-R-02-012
Hyalella Azteca	1 acute 1 chronic[1]	EPA-821-R-02-012
Psuedokirchneriella subcapitata	1 acute 1 chronic[1]	EPA-821-R-02-013

Notes:
1. Chronic toxicity testing is not required at receiving water monitoring stations located at mass loading stations if the channel flows are diverted year-round during dry weather conditions to the sanitary sewer for treatment.
2. USEPA protocols must be utilized for toxicity testing unless alternate toxicity testing protocols have been approved by the San Diego Water Board.

(5) Dry Weather Receiving Water Bioassessment Monitoring

Bioassessment monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must conduct bioassessment monitoring during at least one dry weather monitoring event at each long-term receiving water monitoring station as follows:

(a) The following bioassessment samples and measurements must be collected:

(i) Macroinvertebrate samples must be collected in accordance with the "Reachwide Benthos (Multihabitat) Procedure" in the most current Surface Water Ambient Monitoring Program (SWAMP) Bioassessment Standard Operating Procedures (SOP), and amendments, as applicable;[13]

(ii) The "Full" suite of physical habitat characterization measurements

[13] Ode, P.R.. 2007. Standard operating procedures for collecting macroinvertebrate samples and associated physical and chemical data for ambient bioassessments in California. California State Water Resources Control Board Surface Water Ambient Monitoring Program (SWAMP) Bioassessment SOP 001. http://www.swrcb.ca.gov/water_issues/programs/swamp/tools.shtml#monitoring

must be collected in accordance with the most current SWAMP Bioassessment SOP, and as summarized in the SWAMP Stream Habitat Characterization Form – Full Version;[14] and

(iii) Freshwater algae samples must be collected in accordance with the SWAMP Standard Operating Procedures for Collecting Algae Samples.[15] Analysis of samples must include algal taxonomic composition (diatoms and soft algae) and algal biomass.

(b) The bioassessment samples, measurements, and appropriate water chemistry data must be used to calculate the following:

(i) An Index of Biological Integrity (IBI) for macroinvertebrates for each monitoring station where bioassessment monitoring was conducted, based on the most current calculation method;[16] and

(ii) An IBI for algae for each monitoring station where bioassessment monitoring was conducted, when a calculation method is developed.[17]

(c) In lieu of the requirements of Provision D.1.c.(5)(a), the Copermittees may conduct the bioassessment monitoring in accordance with the "Triad" assessment approach[18] to calculate the IBIs required for Provision D.1.c.(5)(b). The Copermittees must conduct sampling, analysis, and reporting of specified in-stream biological and habitat data according to the protocols specified in the SCCWRP Technical Report No. 539, or subsequent protocols, if developed.

(6) Dry Weather Receiving Water Hydromodification Monitoring

In addition to the hydromodification monitoring conducted as part of the Copermittees' Hydromodification Management Plans, hydromodification monitoring for each long-term receiving water monitoring station is required at least once during the term of this Order. The Copermittees must collect the

[14] Available at: http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/reports/fieldforms_fullversion052908.pdf

[15] Fetscher et al. 2009. Standard Operating Procedures for Collecting Stream Algae Samples and Associated Physical Habitat and Chemical Data for Ambient Bioassessments in California.

[16] The most current calculation method at the time the Order was adopted is outlined in "A Quantitative Tool for Assessing the Integrity of Southern California Coastal Streams" (Ode, et al. 2005. Environmental Management. Vol. 35, No. 1, pp. 1-13). If an updated or new calculation method is developed, either both (i.e. current and updated/new) methods must be used, or historical IBIs must be recalculated with the updated or new calculation method.

[17] When a calculation method is developed, IBIs must be calculated for all available and appropriate historical data.

[18] Stormwater Monitoring Coalition Model Monitoring Technical Committee, 2004. Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California. Technical Report #419. August 2004.

following hydromodification monitoring observations and measurements within an appropriate domain of analysis during at least one dry weather monitoring event for each long-term receiving water monitoring station:

(a) Channel conditions, including:

(i) Channel dimensions,

(ii) Hydrologic and geomorphic conditions, and

(iii) Presence and condition of vegetation and habitat;

(b) Location of discharge points;

(c) Habitat integrity;

(d) Photo documentation of existing erosion and habitat impacts, with location (i.e. latitude and longitude coordinates) where photos were taken;

(e) Measurement or estimate of dimensions of any existing channel bed or bank eroded areas, including length, width, and depth of any incisions; and

(f) Known or suspected cause(s) of existing downstream erosion or habitat impact, including flow, soil, slope, and vegetation conditions, as well as upstream land uses and contributing new and existing development.

d. WET WEATHER RECEIVING WATER MONITORING

During the term of the Order, the Copermittees must perform monitoring during at least three wet weather monitoring events at each long-term receiving water monitoring station. At least one wet weather monitoring event must be conducted during the first wet weather event of the wet season (October 1 – April 30), and at least one wet weather monitoring event during a wet weather event that occurs after February 1.

(1) Wet Weather Receiving Water Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each long-term receiving water monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event;

(b) The flow rates and volumes measured or estimated (data from nearby

USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and

(d) Presence and assessment of trash in and around station.

(2) Wet Weather Receiving Water Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each long-term receiving water monitoring station.

(3) Wet Weather Receiving Water Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each long-term receiving water monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24-hour period, which may be collected through the use of automated equipment;

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,

(iv) Applicable SAL constituents, and

(v) Constituents listed in Table D-3.

(4) Wet Weather Receiving Water Toxicity Monitoring

For each wet weather monitoring event, the Copermittees must collect grab or composite samples from each long-term receiving water monitoring station to be analyzed for toxicity in accordance with Table D-5:

Table D-5. Wet Weather Toxicity Testing for Receiving Water Monitoring Stations

Freshwater Organism	Test Approach	USEPA Protocol[1]
Pimephales promelas	1 acute	EPA-821-R-02-012
Hyalella Azteca	1 acute	EPA-821-R-02-012
Psuedokirchneriella subcapitata	1 acute	EPA-821-R-02-013

Notes:
1. USEPA protocols must be utilized for toxicity testing unless alternate toxicity testing protocols have been approved by the San Diego Water Board.

e. OTHER RECEIVING WATER MONITORING REQUIREMENTS

(1) Regional Monitoring

The Copermittees must participate in the following regional receiving waters monitoring programs, as applicable to the Watershed Management Area and the Copermittee's MS4 discharges:

(a) Storm Water Monitoring Coalition Regional Monitoring; and

(b) Southern California Bight Regional Monitoring.

(2) Sediment Quality Monitoring

The applicable Copermittees must perform sediment monitoring to assess compliance with sediment quality receiving water limits applicable to MS4

discharges to enclosed bays and estuaries. The monitoring may be performed either by individual or multiple affected Copermittees to assess compliance with receiving water limits, or through participation in a water body monitoring coalition. The Copermittees must identify sediment sampling stations that are spatially representative of the sediment within the water body segment or region of interest. Sediment quality monitoring must be conducted in conformance with the monitoring requirements set forth in the State Water Board Sediment Quality Control Plan.

(3) ASBS Monitoring

For Watershed Management Areas with ASBS, the applicable Copermittees must implement the monitoring requirements of Attachment B to State Water Board Resolution No. 2012-0012, included in Attachment A to this Order.

f. ALTERNATIVE WATERSHED MONITORING REQUIREMENTS

The San Diego Water Board may direct the Copermittees to participate in an effort to develop alternative watershed monitoring with other regulated entities, other interested parties, and the San Diego Water Board to refine, coordinate, and implement regional monitoring and assessment programs to determine the status and trends of water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and/or 3) streams. As directed by the San Diego Water Board, such alternative watershed monitoring would be done in place and stead of the commensurate requirements set forth in Provision D.1.

2. MS4 Outfall Discharge Monitoring Requirements

The Copermittees must develop and conduct a program to monitor the discharges from the major MS4 outfalls to receiving waters in each Watershed Management Area during dry weather and wet weather. Following acceptance of the Water Quality Improvement Plans and schedule for implementation of monitoring for each Watershed Management Area, the Copermittees must conduct MS4 outfall discharge monitoring during implementation of the Water Quality Improvement Plan to assess the effectiveness of their jurisdictional runoff management programs toward effectively prohibiting non-storm water discharges into the MS4 and reducing pollutants in ~~storm water~~ discharges ~~to and~~ from their MS4s to the MEP. Any available monitoring data not collected specifically for this Order that meet the quality assurance criteria of the Copermittees and the monitoring requirements of this Order may be utilized by the Copermittees. The Copermittees must conduct the following MS4 outfall monitoring procedures:

Comment [A37]: Suggest same edits for SD and OC.

a. TRANSITIONAL MS4 OUTFALL DISCHARGE MONITORING

Beginning October 1st or May 1st (whichever is sooner) following enrollment under this order and until~~Until~~ the monitoring requirements of Provisions D.2.b-c

are incorporated into a Water Quality Improvement Plan and schedule for implementation of monitoring that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following monitoring of MS4 outfall discharges to flowing receiving waters ~~monitoring~~ in the Watershed Management Area:

(1) MS4 Outfall Discharge Monitoring Station Inventory

Each Municipal Copermittee must identify all major MS4 outfalls (including those operated by a Special District Copermittee) that discharge directly to receiving waters within its jurisdiction and geo-locate those outfalls on a map of the MS4 pursuant to Provision E.2.b.(1). This information must be compiled into a MS4 outfall discharge monitoring station inventory, and must include the following information:

(a) Latitude and longitude of MS4 outfall point of discharge;

(b) Watershed Management Area;

(c) Hydrologic subarea;

(d) Outlet size;

(e) Accessibility (i.e. safety and without disturbance of critical habitat);

(f) Approximate drainage area; and

(g) Classification of whether the MS4 outfall is known to have persistent dry weather flows, transient dry weather flows, no dry weather flows, or unknown dry weather flows.

(2) Transitional Dry Weather MS4 Outfall ~~Discharge~~ Field Screening ~~Monitoring~~

Until the monitoring requirements of Provision D.2.b are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, each Municipal Copermittee must perform the following dry weather MS4 outfall field screening monitoring to identify non-storm water and illicit discharges being discharged from MS4s within its jurisdiction in accordance with Provision E.2.c, to determine which discharges are transient ~~flows~~ and which are persistent discharges to flowing receiving waters~~flows~~, and prioritize the dry weather MS4 discharges that will be investigated and eliminated in accordance with Provision E.2.d. ~~Each Copermittee must conduct the following dry weather MS4 outfall discharge field screening monitoring within its jurisdiction:~~

Comment [A38]: Suggested change of title to better characterize the requirements of this section, compared to that of D.2.b.

Comments in this section are discussed in section 3.5.3 of the comment letter.

Comment [A39]: Duplicative of previous sentence

(a) Transitional Dry Weather MS4 Outfall Discharge Field Screening Monitoring Frequency

Each Municipal Copermittee must field screen the accessible MS4 outfalls in its inventory developed pursuant to Provision D.2.a.(1) as follows:

(i) ~~For Copermittees with less than 125 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 80 percent of the outfalls must be visually inspected two times per year during dry weather conditions.~~

(ii) For Municipal Copermittees with ~~125 major MS4 outfalls or more, but~~ less than or equal to 500 MS4 outfalls~~,~~ that discharge to receiving waters within a Watershed Management Area, ~~all~~ at least 80 percent of the accessible outfalls must be visually inspected at least annually during dry weather conditions.

(iii) For Municipal Copermittees with more than 500 major MS4 outfalls that discharge to receiving waters within a Watershed Management Area, at least 500 outfalls must be visually inspected at least annually during dry weather conditions. Copermittees with more than 500 major MS4 outfalls within a Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;
[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and
[e] Flow rate.

(iv) Municipal Copermittees with more than 500 major MS4 outfalls within its jurisdiction that are located in more than one Watershed Management Area, at least 500 major MS4 outfalls within its inventory must be visually inspected at least annually during dry weather conditions. Copermittees with more than 500 major MS4 outfalls in more than one Watershed Management Area must identify and prioritize at least 500 outfalls to be inspected considering the following:

[a] Assessment of connectivity of the discharge to a flowing receiving water;
[b] Reported exceedances of NALs in water quality monitoring data;
[c] Surrounding land uses;

[d] Presence of constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List; and

[e] Flow rate.

(v) Inspections of major MS4 outfalls conducted in response to public reports and staff or contractor reports and notifications may count toward the required visual inspections of MS4 outfall discharge monitoring stations.

(b) Transitional Dry Weather MS4 Outfall Discharge Field Screening Visual Observations

(i) An antecedent dry period of at least 72 hours following any storm event producing measurable rainfall greater than 0.1 inch is required prior to conducting field screening visual observations during a field screening monitoring event.

(ii) During the field screening monitoring event, each Municipal Copermittee must record visual observations consistent with Table D-6 at each MS4 outfall discharge monitoring station inspected.

Table D-6. Field Screening Visual Observations for MS4 Outfall Discharge Monitoring Stations

Field Observations
• Station identification and location • Presence of flow, or pooled or ponded water • If flow is present: - Flow estimation (i.e. width of water surface, approximate depth of water, approximate flow velocity, flow rate) - Flow characteristics (i.e. presence of floatables, surface scum, sheens, odor, color) - Flow source(s) suspected or identified from non-storm water source investigation - Flow source(s) eliminated during non-storm water source identification • If pooled or ponded water is present: - Characteristics of pooled or ponded water (i.e. presence of floatables, surface scum, sheens, odor, color) - Known or suspected source(s) of pooled or ponded water • Assessment of any observed MS4 discharge ~~with~~ to a flowing receiving water. • Station description (i.e. deposits or stains, vegetation condition, structural condition, observable biology) • Presence and assessment of trash in and around station • Evidence or signs of illicit connections or illegal dumping

(iii) Each Municipal Copermittee must implement the requirements of Provisions E.2.d.(2)(c)-(e) based on the field observations.

(iv) Each Copermittee must evaluate field observations together with existing information available from prior reports, inspections and monitoring results to determine whether any observed flowing,

pooled, or ponded waters are likely to be transient or persistent flow.[19]

Comment [A40]: See footnote edits

(c) Transitional Dry Weather MS4 Outfall Discharge Field Screening ~~Monitoring~~ Records

Based upon the results of the transitional dry weather MS4 outfall discharge field screening monitoring conducted pursuant to Provisions D.2.a.(2)(a)-(b), each Municipal Copermittee must update its MS4 outfall discharge monitoring station inventory, compiled pursuant to Provision D.2.a.(1), with any new information on the classification of whether the MS4 outfall produces persistent flow, transient flow, or no dry weather flow.

(3) Transitional Wet Weather MS4 Outfall Discharge Monitoring

Comment [A41]: See discussion in section 3.5.3 of the comment letter.

Until the monitoring requirements of Provision D.2.c are incorporated into a Water Quality Improvement Plan that is accepted by the San Diego Water Board pursuant to Provision F.1, the Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(a) Transitional Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees must select at least five wet weather MS4 outfall discharge monitoring stations from the inventories developed pursuant to Provision D.2.a.(1) that are representative of storm water discharges from areas consisting primarily of residential, commercial, industrial, and typical mixed-use land uses present within the Watershed Management Area.

(b) Transitional Wet Weather MS4 Outfall Discharge Monitoring Frequency

Each wet weather MS4 outfall discharge monitoring station selected pursuant to Provision D.2.a.(3)(a) must be monitored twice during the wet season (October 1 – April 30~~)).~~) in the transitional period. The~~). One~~ wet weather monitoring ~~event~~events shall be selected to be representative of the range of hydrologic conditions experienced in the region. At least 10% of samples~~event~~ must be conducted during the first wet weather event of the wet season, ~~and~~to include~~and one wet weather monitoring event~~ at least one such sample in each Watershed Management Area~~, a month after the first wet weather event of the wet season.~~

[19] Persistent flow, for the purposes of provision II.D.2.b.(2) is defined as the presence of an MS4 discharge that is hydraulically connected to a flowing receiving~~, pooled, or ponded~~ water more than 72 hours after a measureable rainfall event of 0.1 inch or greater, during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

(c) Transitional Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded of the flow from~~at~~ each wet weather MS4 outfall discharge monitoring station:

(i) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(ii) The flow rates and volumes measured or estimated from the outfall (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

(iii) ~~Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and~~

(iv) Presence ~~and assessment~~ of trash in and around station.

Comment [A42]: This isn't appropriate for a wet weather event.

Comment [A43]: This isn't appropriate for a wet weather event.

(d) Transitional Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(e) Transitional Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, and indicator bacteria;

(iv) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant

concentrations and runoff flows using one of the following techniques:

[a] Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

[b] Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

[c] If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours;

(v) Only one analysis of the composite of aliquots is required;

(vi) The samples must be analyzed for the following constituents:

[a] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

[b] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and

[c] Constituents listed in in Table D-7.

Table D-7. Analytical Monitoring Constituents for Wet Weather MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Turbidity • Total Hardness • Total Organic Carbon • Dissolved Organic Carbon • Sulfate • Methylene Blue Active Substances (MBAS) • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen • Ammonia	• Arsenic • Cadmium • Chromium • Copper • Iron • Lead • Nickel • Selenium • Thallium • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

(f) Other Transitional Wet Weather MS4 Outfall Discharge Monitoring

The San Diego County Copermittees must continue the wet weather MS4 outfall monitoring program developed under Order No. R9-2007-0001, as approved by the San Diego Water Board, through its planned completion.

b. DRY WEATHER MS4 OUTFALL DISCHARGE MONITORING

Each Municipal Copermittee must perform the following dry weather MS4 outfall monitoring within its jurisdiction to identify non-storm water and illicit discharges within its jurisdiction pursuant to Provision E.2.c, and to prioritize the dry weather MS4 discharges that will be investigated and eliminated pursuant to Provision E.2.d. ~~Each Copermittee must conduct the following dry weather MS4 outfall discharge monitoring within its jurisdiction:~~

(1) Dry Weather MS4 Outfall Discharge Field Screening Monitoring

Each Municipal Copermittee must continue to perform the dry weather MS4 outfall discharge field screening monitoring in accordance with the requirements of Provision D.2.a.(2). ~~The~~ however the Municipal Copermittee may adjust the field screening monitoring frequencies and locations for the MS4 outfalls in its inventory, as needed, to identify and eliminate sources of persistent ~~flow~~ non-storm water illegal discharges from the MS4 to flowing receiving waters in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan. ~~, provided the~~

Comment [A44]: Repetitive of previous sentence

Comment [A45]: See discussion in section 3.5.3 of the comment letter.

~~number of visual inspections performed is equivalent to the number of visual inspections required under Provision D.2.a.(2)(a).~~

Comment [A46]: See comments in comment letter

(2) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring

Each Municipal Copermittee must perform the following non-storm water monitoring of MS4 outfalls that persistently ~~flow MS4 outfall~~ discharge to flowing receiving waters ~~monitoring~~ to determine which persistent non-storm water discharges contain concentrations of pollutants below NALs, and which persistent non-storm water discharges impact receiving water quality during dry weather. ~~Each Copermittee must conduct the following non-storm water persistent flow MS4 outfall discharge monitoring within its jurisdiction:~~

Comment [A47]: Repetitive of previous sentence.

(a) Prioritization of Non-Storm Water Persistent Flow MS4 Outfalls

Based upon the dry weather MS4 outfall discharge field screening monitoring records developed pursuant to Provision D.2.a.(2)(c), each Municipal Copermittee must identify and prioritize the MS4 outfalls within its jurisdiction that have~~with~~ persistent discharges to flowing receiving waters ~~flows~~ based on the highest priority water quality conditions identified in the Water Quality Improvement Plan and any additional criteria developed by the Copermittee, which may include historical data and data from sources other than what the Copermittee collects.

(b) Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring Frequency

Comment [A48]: See comment letter section 3.5.3

(i) Based on the prioritization of major MS4 outfalls developed under Provision D.2.b.(2)(a), each Municipal Copermittee must identify, at a minimum, the top 10 percent of the~~10~~ highest priority major MS4 outfalls with non-storm water persistent flows that the Copermittee will monitor within each Watershed Management Area within its jurisdiction, with a minimum of one persistent ~~flow~~discharge outfall, and a maximum of 5 required per WMA. The location of the selected highest priority non-storm water persistent ~~flow~~ discharge MS4 outfall monitoring stations must be identified on the map required pursuant to Provision E.2.b.(1).

(ii) Each of the highest priority non-storm water persistent flow MS4 outfall monitoring stations identified pursuant to Provision D.2.b.(2)(b)(i) must be monitored under dry weather conditions at least ~~semi~~ annually until one of the following occurs:

[a] The non-storm water discharges have been effectively eliminated (i.e. no flowing, pooled, or ponded water) for three consecutive dry weather monitoring events; or

[b] The source(s) of the persistent flows has been identified as a category of non-storm water discharges that does not require an NPDES permit and does not have to be addressed as an illicit discharge because it was not identified as a source of pollutants (i.e. constituents in non-storm water discharge do not exceed NALs), and the persistent flow can be re-prioritized to a lower priority; or

[c] The constituents in the persistent flow non-storm water discharge do not exceed NALs, and the persistent flow can be re-prioritized to a lower priority; or

[d] The source(s) of the persistent flows has been identified as a non-storm water discharge authorized by a separate NPDES permit.

(iii) Where the criteria under Provision D.2.b.(2)(c)(ii) are not met, but the threat to water quality has been reduced by the Copermittee, the highest priority persistent flow MS4 outfall monitoring stations may be reprioritized accordingly for continued dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b.(1).

(iv) Each Municipal Copermittee must document removal or re-prioritization of the highest priority persistent flow MS4 outfall monitoring stations identified under Provision D.2.b.(2)(b) in the Annual Report. Persistent flow MS4 outfall monitoring stations that have been removed must be replaced with the next highest prioritized MS4 major outfall in the Watershed Management Area within its jurisdiction, unless there are no remaining qualifying major MS4 outfalls within the Copermittee's jurisdiction in the Watershed Management Area.

(c) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Observations

During each semi-annual monitoring event, each Municipal Copermittee must record field observations consistent with Table D-6 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(d) Non-Storm Water Persistent Flow MS4 Outfall Discharge Field Monitoring

During each ~~semi-annual~~ monitoring event, if conditions allow the collection of the data, each Municipal Copermittee must monitor and record the parameters in Table D-2 at each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction.

(e) Non-Storm Water Persistent Flow MS4 Outfall Discharge Analytical Monitoring

Comment [A49]: See discussion in section 3.5.3 of the comment letter.

During each semi-annual monitoring event in which measurable flow from the MS4 outfall to a flowing receiving water is present, each Municipal Copermittee must collect and analyze samples from each of the highest priority persistent flow MS4 outfall monitoring stations within its jurisdiction as follows:

(i) Analytes that are field measured are not required to be analyzed by a laboratory;

(ii) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(iii) During development of the WQIP, for each WMA, consider the following sources to select constituents for collection of~~Collect~~ grab or composite samples to be analyzed at a qualified analytical laboratory::~~for the following constituents:~~

[a] Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,
[b] Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,
[c] Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order,
[d] Applicable NAL constituents, and
[e] Constituents listed in Table D-8, unless the Copermittee has historical data that can demonstrate or provide justification that the analysis of the constituent is not necessary.

(iv) Copermittees may adjust the analytical list for a given WMA in successive monitoring events to add or eliminate constituents based on data that can demonstrate or provide justification regarding need or lack of need for the analysis of specific constituents.

Table D-8. Analytical Monitoring Constituents for Persistent Flow MS4 Outfall Discharge Monitoring Stations

Conventionals, Nutrients	Metals (Total and Dissolved)	Indicator Bacteria
• Total Dissolved Solids • Total Suspended Solids • Total Hardness • Total Phosphorus • Orthophosphate • Nitrite[1] • Nitrate[1] • Total Kjeldhal Nitrogen	• Cadmium • Copper • Lead • Zinc	• Total Coliform • Fecal Coliform[2] • *Enterococcus*

• Ammonia		

Notes:
1. Nitrite and nitrate may be combined and reported as nitrite+nitrate.
2. *E. Coli* may be substituted for Fecal Coliform.

~~(iv)~~(v) If the Copermittee identifies and eliminates the source of the persistent flow non-storm water discharge, analysis of the sample is not required.

c. WET WEATHER MS4 OUTFALL DISCHARGE MONITORING

The Copermittees must perform wet weather MS4 outfall monitoring to identify sources areas of pollutants in ~~storm water~~ discharges from the MS4s in the Watershed Management Area. The Copermittees must conduct the following wet weather MS4 outfall discharge monitoring within the Watershed Management Area:

(1) Wet Weather MS4 Outfall Discharge Monitoring Stations

The Copermittees may adjust the wet weather MS4 outfall discharge monitoring locations and frequencies in the Watershed Management Area, as needed, to identify sources of pollutants in storm water discharges from MS4s in the Watershed Management Area in accordance with the highest priority water quality conditions identified in the Water Quality Improvement Plan, provided the number of stations is at least equivalent to the number of stations required under Provision D.2.a.(3)(a).

(2) Wet Weather MS4 Outfall Discharge Monitoring Frequency

The Copermittees must monitor the wet weather MS4 outfall discharge monitoring stations in the Watershed Management Area at an appropriate frequency to identify source areas of pollutants in ~~storm water~~ discharges from the MS4s causing or contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan.

(3) Wet Weather MS4 Outfall Discharge Field Observations

For each wet weather monitoring event, the following narrative descriptions and observations must be recorded at each wet weather MS4 outfall discharge monitoring station:

(a) A narrative description of the station that includes the location, date and duration of the storm event(s) sampled, rainfall estimates of the storm event, and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and

(b) The flow rates and volumes measured or estimated (data from nearby USGS gauging stations may be utilized, or flow rates may be measured or

estimated in accordance with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), section 3.2.1, or other method proposed by the Copermittees that is acceptable to the San Diego Water Board);

~~(c) Station condition (i.e. deposits or stains, vegetation condition, structural condition, observable biology); and~~

~~(d) Presence and assessment of trash in and around station.~~

Comment [A50]: These are inappropriate for wet weather observations.

(4) Wet Weather MS4 Outfall Discharge Field Monitoring

For each wet weather monitoring event, the Copermittees must monitor and record the parameters in Table D-2 at each wet weather MS4 outfall discharge monitoring station.

(5) Wet Weather MS4 Outfall Discharge Analytical Monitoring

For each wet weather monitoring event, the Copermittees must collect and analyze samples from each wet weather MS4 outfall discharge monitoring station as follows:

(a) Analytes that are field measured are not required to be analyzed by a laboratory;

(b) The Copermittees must implement consistent sample collection methods for regional comparability of data, unless site-specific conditions indicate the need for alternate methods;

(c) Grab samples may be collected for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria;

(d) For all other constituents, composite samples must be collected for a duration adequate to be representative of changes in pollutant concentrations and runoff flows using one of the following techniques:

(i) Time-weighted composites composed of 24 discrete hourly samples, which may be collected through the use of automated equipment, or

(ii) Flow-weighted composites collected over the length of the storm event or a typical 24 hour period, whichever is shorter, which may be collected through the use of automated equipment, or

(iii) If automated compositing is not feasible, a composite sample may be collected using a minimum of 4 grab samples, collected during the first 24 hours of the storm water discharge, or for the entire storm water discharge if the storm event is less than 24 hours.

(e) Only one analysis of the composite of aliquots is required;

(f) Analysis for the following constituents is required:

(i) Constituents contributing to the highest priority water quality conditions identified in the Water Quality Improvement Plan,

(ii) Constituents listed as a cause for impairment of receiving waters in the Watershed Management Area listed on the CWA section 303(d) List,

(iii) Constituents for implementation plans or load reduction plans (e.g. Bacteria Load Reduction Plans, Comprehensive Load Reduction Plans) developed for watersheds where the Copermittees are listed responsible parties under the TMDLs in Attachment E to this Order, and

(iv) Applicable SAL constituents.

3. Special Studies

Comment [A51]: See discussion in section 3.5.3 of the comment letter.

a. Within the term of this Order, the Copermittees must initiate~~develop and implement~~ the following special studies:

(1) At least two~~three~~ special studies in each Watershed Management Area to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that cause or contribute to highest priority water quality conditions identified in the Water Quality Improvement Plan.

(2) At least one~~two~~ special study~~studies~~ for the San Diego Region to address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that are impacting receiving waters on a regional basis in the San Diego Region.

(3) One of the two~~three~~ special studies in each Watershed Management Area may be replaced by a special study implemented pursuant to Provision D.3.a.(2).

b. The special studies must, at a minimum, be in conformance with the following criteria:

(1) The special studies must be related to the highest priority water quality conditions identified by the Copermittees in the Watershed Management Area and/or for the entire San Diego Region;

(2) The special studies developed pursuant to Provision D.3.a.(1) must:

(a) Be implemented within the applicable Watershed Management Area, and

(b) Require some form of participation by all the Copermittees within the Watershed Management Area;

(3) The special studies developed pursuant to Provision D.3.a.(2) must:

(a) Be implemented within the San Diego Region, and

(b) Require some form of participation by all Copermittees covered under the requirements of this Order.

c. Special studies developed to identify sources of pollutants and/or stressors should be pollutant and/or stressor specific and based on historical monitoring data and monitoring performed pursuant to Provisions D.1 and D.2. Development of source identification special studies should include the following:

(1) A compilation of known information on the specific pollutant and/or stressor, including data on potential sources and movement of the pollutant and/or stressor within the watershed. Data generated by the Copermittees and others, as well as information available from a literature research on the pollutant and/or stressor should be compiled and analyzed as appropriate.

(2) An identification of data gaps, based on the compiled information generated on the specific pollutant and/or stressor in Provision D.3.d.(1). Source identification special studies should be developed to fill identified data gaps.

(3) A monitoring plan that will collect and provide data the Copermittees can utilize to do the following:

(a) Quantify the relative loading or impact of a pollutant and/or stressor from a particular source or pollutant generating activity;

(b) Improve understanding of the fate of a pollutant and/or stressor in the environment;

(c) Develop an inventory of known and suspected sources of a pollutant and/or stressor in the Watershed Management Area; and/or

(d) Prioritize known and suspected sources of a pollutant and/or stressor based on relative magnitude in discharges, geographical distribution (i.e.,

regional or localized), frequency of occurrence in discharges, human health risk, and controllability.

d. Special studies initiated prior to the term~~acceptance~~ of ~~the~~this Order~~the Water Quality Improvement Plan~~ that meet the requirements of Provision D.3.b and are implemented~~completed~~ during the term of this Order may be utilized to fulfill the special study requirements of Provision D.3.a.

e. The Copermittees must submit the monitoring plans for the special studies in the Water Quality Improvement Plans required pursuant to Provision F.1.

f. The Copermittees are encouraged to share the results of the special studies regionally among the Copermittees to provide information useful in improving and adapting the management of non-storm water and storm water runoff through the implementation of the Water Quality Improvement Plans.

4. Assessment Requirements

Each Copermittee must evaluate the data collected pursuant to Provisions D.1, D.2 and D.3, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E, to assess the progress of the water quality improvement strategies in the Water Quality Improvement Plan toward achieving compliance with Provisions A.1.a, A.1.c and A.2.a. Assessments must be performed as described in the following provisions:

a. RECEIVING WATERS ASSESSMENTS

(1) The Copermittees must assess and report the conditions of the receiving waters in the Watershed Management Area as follows:

(a) Based on data collected pursuant to Provision D.1.a, the assessments under Provision D.4.a.(2) must be included in the transitional~~first~~ Annual Report required pursuant to Provision F.3.b.(2~~1~~).

Comment [A52]: See our edits to that section

(b) Based on the data collected pursuant to Provisions D.1.a-e, the assessments required under Provision D.4.a.(2) must be included in the Report of Waste Discharge required pursuant to Provision F.5.b.

(2) The Copermittees must assess the status and trends of receiving water quality conditions in 1) coastal waters, 2) enclosed bays, harbors, estuaries, and lagoons, and 3) streams under dry weather and wet weather conditions, as those conditions are affected by discharges from the Copermittees' MS4, to determine the progress towards meeting interim or final goals of the Water Quality Implementation Plan for the Watershed Management Area~~.~~ For each of the three types of receiving waters that are present in each Watershed Management Area the applicable Copermittees must:

Comment [A53]: See discussion in section 3.5.3 of the comment letter.

(a) Determine whether or not the conditions of the receiving waters are meeting any applicable numeric goals established pursuant to provision B.2.e.~~protective of the designated beneficial uses~~;

~~(b) Identify the most critical beneficial uses that must be protected or restored to ensure overall health of the receiving water;~~

~~(c) Determine whether or not those critical beneficial uses are being protected and where those beneficial used must be restored;~~

~~(d)~~(b) Identify short-term and/or long-term improvements or degradation of Receiving Water conditions related to those numeric goals~~those critical beneficial uses~~;

~~(e)~~(c) Identify data gaps in the monitoring data necessary to assess Provisions D.4.a.(2)(a)-(d).

b. MS4 OUTFALL DISCHARGES ASSESSMENTS

(1) Non-Storm Water Discharges Reduction Assessments

Comment [A54]: See discussion in section 3.5.3 of the comment letter for key changes. Other changes are described in comments below.

(a) ~~Each Copermittee must assess and report the progress of its illicit discharge detection and elimination program, required to be implemented pursuant to Provision E.2, toward reducing and effectively prohibiting non-storm water and illicit discharges into the MS4 within its jurisdiction as follows:~~

~~(i) Based on data collected pursuant to Provisions D.2.a.(2), the assessments under Provision D.4.b.(1)(b) must be included when complete in the Annual Report required pursuant to Provision F.3.b.(1).~~

~~(ii) Based on the data collected pursuant to Provisions D.2.b, the assessments required under Provision D.4.b.(1)(c) must be included in the first Annual Report required pursuant to Provision F.3.b.(1), and annually thereafter.~~

~~(iii) Based on the data collected pursuant to Provisions D.2.b, the assessment required under Provision D.4.b.(1)(c) must be included in the Report of Waste Discharge required pursuant to F.5.b.~~

Comment [A55]: For clarity and simplicity, these timelines were integrated into the following sections.

(b) Based on the transitional dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.a.(2), each

Municipal Copermittee must assess and report the following, as applicable to discharges from the MS4 (including Special District Copermittee MS4s) to flowing receiving waters within their jurisdiction, in the Annual Report required pursuant to Provision F.3.b.(2):~~:~~

(i) Identify the known and suspected controllable sources (e.g. facilities, areas, land uses, pollutant generating activities) of transient and persistent flow discharges to flowing receiving waters~~flows~~ within the Copermittee's jurisdiction in the Watershed Management Area;

(ii) Identify sources of transient and persistent flow discharges to flowing receiving waters~~flows~~ within the Copermittee's jurisdiction in the Watershed Management Area that have been reduced or eliminated; and

(iii) Identify modifications to the field screening monitoring locations and frequencies for the MS4 outfalls in its inventory necessary to identify and eliminate sources of persistent flow non-storm water discharges to flowing receiving waters, pursuant to Provision D.2.b.(1).

(c) Based on the dry weather MS4 outfall discharge field screening monitoring required pursuant to Provision D.2.b, each Municipal Copermittee must assess and report the following, as applicable to discharges from the MS4 (including Special District Copermittee MS4s) within their jurisdiction, in each Annual Report required pursuant to F.3.b.(3) and in the Report of Waste Discharge required pursuant to Provision F.5.b.:~~:~~

(i) The assessments required pursuant to Provision D.4.b.(1)(a~~b~~);

(ii) Based on the data collected and applicable NALs in the Water Quality Improvement Plan, rank the MS4 outfalls in the Copermittee's jurisdiction according to potential threat to receiving water quality, and produce a prioritized list of major MS4 outfalls for follow-up action to update the Water Quality Improvement Plan, with the goal of eliminating persistent flow non-storm water discharges to flowing receiving waters and/or pollutant loads in order of the ranked priority list through targeted programmatic actions and source investigations;

(iii) For the highest priority major MS4 outfalls with persistent flow discharges to a flowing receiving water~~flows~~ that are in exceedance of NALs, identify the known and suspected sources within the Copermittee's jurisdiction in the Watershed Management Area that may cause or contribute to the NAL exceedances;

(iv) Each Copermittee must analyze the data collected pursuant to Provision D.2.b.(2), and: ~~utilize a model or other method, to calculate or estimate the non-storm water volumes and pollutant loads collectively discharged from all the major MS4s outfalls in its jurisdiction identified as having persistent dry weather flows during~~

Comment [A56]: Per edits to that section

Comment [A57]: Per edits to that section

Comment [A58]: Per edits above

Comment [A59]: Edits to this section (and sub-sections) is different than SD edits.

the monitoring year. These calculations or estimates must be updated annually. Each Copermittee must calculate or estimate:

[a] Calculate or estimate annual non-storm water volumes and pollutant loads (associated with the priority constituents identified in the WQIP) collectively discharged from the monitored persistently flowing Copermittee's major MS4 outfalls discharging to flowing receiving waters within the Copermittee's jurisdiction, or discharged into another Copermittee's MS4 as demonstrated through provision E.2.d. with an estimate of the percent contribution from each known and suspected source for each MS4 outfall;

[b] Identify identify and quantify, where feasible, known sources of non-stormwater flows not [b] Annual non-storm water volumes and pollutant loads from areas or facilities subject to the Copermittee's legal authority that are discharged from the Copermittee's major MS4 outfalls to downstream receiving waters.

(v) Each Copermittee must review the data collected pursuant to Provision D.2.b and findings from the assessments required pursuant to Provision D.4.b.(1)(c)(i)-(iv) once per Permit termon an annual basis, and then report within the Regional Monitoring and Assessment Report per Provision F.3.c., the following to:

[a] Identify reductions and progress in achieving reductions in non-storm water and illicit discharges to the Copermittee's MS4 in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction, with an estimate, if possible, of the non-storm water volume and/or pollutant load reductions attributable to specific water quality strategies implemented by the Copermittee; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittee in the Watershed Management Area toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4 to receiving waters within its jurisdiction.

(vi) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(v).

(2) Storm Water Pollutant Discharges Reduction Assessments

(a) The Copermittees must assess and report the progress of the water quality improvement strategies, required to be implemented pursuant to

Comment [A60]: This is to help ensure jurisdictional accountability for what is being discharged from their jurisdiction.

~~Provisions B and E, toward reducing pollutants in storm water discharges from the MS4s within the Watershed Management Area as follows:~~

~~(i) Based on data collected pursuant to Provisions D.2.a.(3), the assessments under Provision D.4.b.(2)(b) must be included in the first Annual Report required pursuant to Provision F.3.b.(1).~~

~~Based on the data collected pursuant to Provisions D.2.c, the assessments required under ProvisionProvision first Annual Report required pursuant to Provision F.3.b.(1), and annually thereafter.~~

~~Based on the data collected pursuant to Provisions D.2.c, the assessment required under Provisions D.4.b.(2)(c)-(d) must be included in the Report of Waste Discharge required pursuant to F.5.b.~~

(b) Based on the transitional wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.a.(3) the Copermittees must assess and report the following in the Transitional Period Monitoring Report required pursuant to Provision F.3.b.(2):

(i) The Copermittees must analyze the monitoring data collected pursuant to Provision D.2.a.(3), and utilize a watershed model or other method, to calculate or estimate: ~~storm water volumes and pollutant loads discharged from the MS4s in each Copermittee's jurisdiction within the Watershed Management Area. The Copermittees must calculate or estimate the following for each monitoring year:~~

[a] The average storm water runoff coefficient for each land use type within the Watershed Management Area;

[b] The volume of storm water and pollutant loads discharged from each of the Copermittee's monitored major MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each monitored storm event with measurable rainfall greater than 0.1 inch, for each of the priority water quality constituents identified in the WQIP;

[c] The total volume and pollutant loads potentially discharged from each Municipal Copermittee's jurisdiction within the watershed management area, for each monitored event, extrapolated from the data produced from the monitored outfalls.

~~The pollutant loads discharged from each of the Copermittee's major MS4 outfalls in its jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch; and~~

~~[d] The percent contribution of storm water volumes and pollutant loads discharged from each land use type within the drainage basin to each of the Copermittee's major MS4 outfalls in its~~

Comment [A61]: See discussion in section 3.5.3 of the comment letter.

Comment [A62]: Removed as this was confusing as it was duplicative of the subsections below.

Comment [A63]: There is no need to perform this analysis for other pollutants not identified as priorities in the WQIP.

~~jurisdiction to receiving waters within the Watershed Management Area for each storm event with measurable rainfall greater than 0.1 inch.~~

(ii) Identify modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify ~~sources~~ pollutants in storm water discharges from the MS4s in the Watershed Management Area pursuant to Provision D.2.c.(1).

(c) Based on the wet weather MS4 outfall discharge monitoring required pursuant to Provision D.2.c the Copermittees must assess and report (i) and (ii) below in the annual reports required per F.3.b.(3), and (i) through (iv) below in the Regional Monitoring and Assessment Report required per F.3.c. ~~the following~~:

(i) The assessments required pursuant to Provision D.4.b.(2)(a~~b~~);

(ii) Based on the data collected and applicable SALs in the Water Quality Improvement Plan, analyze and compare the monitoring data to the analyses and assumptions used to develop the Water Quality Improvement Plans, including strategies developed per Provision B.3, and evaluate whether ~~,rank the MS4 outfalls in the Watershed Management Area according to potential threat to receiving water quality, and produce a prioritized list of major MS4~~ there is a need to update the Water Quality Improvement Plan;

(iii) The Copermittees must review the data collected pursuant to Provision D.2.c and findings from the assessments required pursuant to Provisions D.4.b.(2)(c)(i)-(ii) ~~on an annual basis~~ to:

[a] Identify reductions and progress in achieving reductions in pollutant concentrations and/or pollutant loads from different land uses and/or drainage areas discharging from the Copermittees' MS4s in the Watershed Management Area;

[b] Assess the effectiveness of water quality improvement strategies being implemented by the Copermittees within the Watershed Management Area toward reducing pollutants in ~~storm water~~ discharges from the MS4s to receiving waters within the Watershed Management Area to the MEP, with an estimate, if possible, of the pollutant load reductions attributable to specific water quality strategies implemented by the Copermittees; and

[c] Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittees in the Watershed Management Area toward reducing pollutants in ~~storm water~~ discharges from the MS4s to receiving waters in the Watershed Management Area to the MEP.

(iv) Identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(iii).

Comment [A64]: See discussion in section 3.5.3 of the comment letter.

Comment [A65]: Per edits to that section

Comment [A66]: Per edits above

(d) Within the Regional Monitoring and Assessment report required pursuant to F.3.c.~~The~~ Copermittees must evaluate all the data collected pursuant to Provision D.2.c, and incorporate new outfall monitoring data into time series plots for each long-term monitoring constituent for the Watershed Management Area, and perform statistical trends analysis on the cumulative long-term wet weather MS4 outfall discharge water quality data set.

c. SPECIAL STUDIES ASSESSMENTS

The Copermittees must in the applicable annual report required pursuant to F.3.b.,~~annually~~ evaluate the results and findings from the special studies developed and implemented pursuant to Provision D.3, and assess their relevance to the Copermittees' efforts to characterize receiving water conditions, understand sources of pollutants and/or stressors, and control and reduce the discharges of pollutants from the MS4 outfalls to receiving waters in the Watershed Management Area. The Copermittees must report the results of the special studies assessments applicable to the Watershed Management Area, and identify any necessary modifications or updates to the Water Quality Improvement Plan based on the results in the Annual Reports required pursuant to Provision F.3.b.

d. INTEGRATED ASSESSMENT OF WATER QUALITY IMPROVEMENT PLAN

As part of the iterative approach and adaptive management process required for the Water Quality Improvement Plan pursuant to Provision B.5, the Copermittees in each Watershed Management Area must integrate the data collected pursuant to Provisions D.1-D.3, the findings from the assessments required pursuant to Provisions D.4.a-c, and information collected during the implementation of the jurisdictional runoff management programs required pursuant to Provision E to assess the effectiveness of, and identify necessary modifications to, the Water Quality Improvement Plan as follows:

(1) The Copermittees must re-evaluate the priority water quality conditions and numeric goals for the Watershed Management Area, as needed, during the term of this Order pursuant to Provision B.5.a. The re-evaluation and recommendations for modifications to the priority water quality conditions, and/or numeric goals and corresponding schedules may be provided in the Annual Reports required pursuant to Provision F.3.b, but must at least be provided in the Regional Monitoring and Assessment Report ~~of Waste Discharge~~ pursuant to Provision F.3.c~~5.b~~. The priority water quality conditions and numeric goals for the Watershed Management Area must be re-evaluated as follows:

(a) Re-evaluate the receiving water conditions in the Watershed Management Area in accordance with Provision B.2.a;

(b) Re-evaluate the impacts on receiving waters in the Watershed Management Area from MS4 discharges in accordance with Provision B.2.b;

(c) Re-evaluate the identification of MS4 sources of pollutants and/or stressors in accordance with Provision B.2.d;

(d) Identify beneficial uses of the receiving waters that are protected or must be restored in accordance with Provision D.4.a;

(e) Evaluate the progress toward achieving the interim and final numeric goals for restoring impacted beneficial uses in the receiving waters.

(2) The Copermittees must re-evaluate the water quality improvement strategies for the Watershed Management Area during the term of this Order pursuant to Provision B.5.b. The re-evaluation and recommendations for modifications to the water quality improvement strategies and schedules may be provided in the Annual Reports required pursuant to Provision F.3.b, but must at least be provided in the Regional Monitoring and Assessment Report pursuant to Provision F.3.c~~must be provided in the Annual Reports required pursuant to Provision F.3.b, and provided in the Report of Waste Discharge pursuant to Provision F.5.b~~. The water quality improvement strategies for the Watershed Management Area must be re-evaluated as follows:

(a) Identify the non-storm water and storm water pollutant loads from the Copermittees' MS4 outfalls in the Watershed Management Area, calculated or estimated pursuant to Provisions D.4.b;

(b) Identify the non-storm water and storm water pollutant load reductions, or other improvements to receiving water or water quality conditions, that are necessary to attain the interim and final numeric goals identified in the WQIP~~for restoring impacted beneficial uses in the receiving waters~~;

(c) Identify any~~the~~ non-storm water and storm water pollutant load reductions, or other improvements to the quality of MS4 discharges, that are necessary for the Copermittees to ~~demonstrate that non-storm water and storm water~~ reduce discharges of pollutants from their MS4s that have been demonstrated to be~~are not~~ causing or contributing to exceedances of receiving water limitations;

Comment [A67]: See discussion in section 3.5.3 of the comment letter.

(d) Evaluate the progress of the water quality improvement strategies toward achieving the interim and final numeric goals identified in the WQIP~~for restoring impacted beneficial uses in the receiving waters~~.

(3) The Copermittees must re-evaluate and adapt the water quality monitoring and assessment program for the Watershed Management Area when new information becomes available to improve the monitoring and assessment

program pursuant to Provision B.5.c. The re-evaluation and recommendations for modifications to the monitoring and assessment program may be provided in the Annual Reports required pursuant to Provision F.3.b, but must at least be provided in the Regional Monitoring and Assessment Report ~~of Waste Discharge~~ pursuant to Provision F.3.c~~5.b~~. Modifications to the water quality monitoring and assessment program must be consistent with the requirements of Provision D.1-D.3. The re-evaluation of the water quality monitoring and assessment program for the Watershed Management Area must consider the data gaps identified by the assessments required pursuant to Provisions D.4.a-b, and results of the special studies implemented pursuant to Provision D.4.c.

5. Monitoring Provisions

Each Copermittee must comply with all the monitoring, reporting, and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

E. JURISDICTIONAL RUNOFF MANAGEMENT PROGRAMS

The purpose of this provision is for each Copermittee to implement a program to control the contribution of pollutants to and the discharges from the MS4 within its jurisdiction. The goal of the jurisdictional runoff management programs is to implement strategies that effectively prohibit non-storm water discharges to the MS4 and reduce the discharge of pollutants in ~~storm water~~ to the MEP. This goal will be accomplished through implementing the jurisdictional runoff management programs in accordance with the strategies identified in the Water Quality Improvement Plans.

Each Copermittee must update its jurisdictional runoff management program document, in accordance with Provision F.2.a, to incorporate all the requirements of Provision E, consistent with their legal authority. Until the Copermittee has updated its jurisdictional runoff management program document with the applicable requirements of Provision E, the Copermittee must continue implementing its current jurisdictional runoff management program.

Modification of Jurisdictional Runoff Management Program Requirements

Modifications shall be considered and where selected, proposed according to the process in Provision B.5. Proposed modifications may increase, decrease, and/or replace minimum requirements identified in Provision E.

1. Legal Authority Establishment and Enforcement

Comment [A68]: See discussion in section 3.6 of the comment letter.

a. Each Copermittee must establish, maintain, and enforce adequate legal authority within its jurisdiction to control pollutant discharges into and from its MS4 through statute, ordinance, permit, or series of contracts, ~~order, or similar means~~ which~~. This legal authority must~~, at a minimum, authorize the Copermittee to:

(1) Effectively prohibit through ordinance, order or other similar means~~Prohibit and eliminate all~~ illicit discharges ~~and illicit connections~~ to its MS4;

(2) Control, through ordinance, permit, contract, order or similar means the contribution of pollutants in discharges to the MS4 by storm water discharges ~~of runoff~~ associated with industrial and construction activity~~ to its MS4~~, and ~~control~~ the quality of storm water discharges ~~runoff~~ from sites of industrial and construction activity~~sites~~, whose discharges have not been separately authorized through~~ that do not, including industrial and construction sites which~~ have coverage under the statewide General Permit for Discharges of Storm Water Associated with Industrial Activities (Industrial General Permit) or General Permit for Discharges of Storm Water Associated with Construction Activities (Construction General Permit)~~, as well as to those sites which do not;~~

Comment [A69]: See discussion in section 3.6.2 of the comment letter.

(3) Control, through ordinance, order or similar means the discharge to the MS4 of spills, dumping, or disposal of materials other than storm water~~ into its~~

Comment [A70]: See discussion in section 3.6.2 of the comment letter.

~~MS4~~;

(4) Control through interagency agreements among Copermittees the contribution of pollutants from one portion of the MS4 to another portion of the MS4;

(5) ~~Control, by coordinating and cooperating with other owners of the MS4 such as Caltrans, the U.S. federal government, or sovereign Native American Tribes through interagency agreements, where possible, the contribution of from their portion of the MS4 to the portion of the MS4 within the Copermittee's jurisdiction;~~

(6) Require compliance with conditions in its ~~statutes,~~ ordinances, permits, contracts, or orders~~, or similar means to hold dischargers to its MS4 accountable for their contributions of pollutants and flows~~;

(7) ~~Require the use of BMPs to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;~~

(8) ~~Require documentation on the effectiveness of BMPs implemented to prevent or reduce the discharge of pollutants in storm water from its MS4 to the MEP;~~

(9) ~~Utilize enforcement mechanisms to require compliance with its statutes, ordinances, permits, contracts, orders, or similar means; and~~

(10) Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with permit conditions~~its statutes, ordinances, permits, contracts, orders, or similar means and with the requirements of this Order~~, including the prohibition of illicit discharges and connections to its MS4; ~~the Copermittee must also have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from industrial facilities, including construction sites, discharging into its MS4.~~

b. With the first Annual Report required pursuant to Provision F.3.b, each Copermittee must submit a statement certified by its Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative that the Copermittee has taken the necessary steps to obtain and maintain full legal authority within its jurisdiction to implement and enforce each of the requirements contained in this Order.

2. Illicit Discharge Detection and Elimination

Each Copermittee must implement a program to actively detect and eliminate illicit discharges and improper disposal into the MS4, or otherwise require the discharger

Comment [A71]: See discussion in section 3.6.2 of the comment letter.

Comment [A72]: See discussion in section 3.6.2 of the comment letter.

Comment [A73]: See discussion in section 3.6.2 of the comment letter.

Comment [A74]: See discussion in section 3.6.2 of the comment letter.

Comment [A75]: See discussion in section 3.7 of the comment letter.

to apply for and obtain a separate NPDES permit. The illicit discharge detection and elimination program must be implemented in accordance with the strategies identified in the Water Quality Improvement Plan and include, at a minimum, the following requirements:

STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the illicit discharge detection and elimination program to address ~~non-storm water and~~ illicit discharges and connections that the Copermittee has identified as potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate~~ additional~~ BMPs, focus education, and/or increase/decrease frequency of inspections in specific areas); and

(2) The strategies and/or activities ~~must~~ may be modified from ~~consistent with~~ the default requirements of Provisions E.2.b-e~~a-d~~ ~~and~~ to be consistent with the strategies identified in the Water Quality Improvement Plan;

(3) The requirements of the programs as outlined in the following sub-provisions may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality improvement Plan(s).

a. NON-STORM WATER DISCHARGES

To the extent allowable by law, each~~Each~~ Copermittee must address all non-storm water discharges ~~from~~into the MS4 as illicit discharges, where the likelihood exists that they are a source of pollutants to the Receiving Waters, unless ~~a non-storm water~~the discharge is either identified as a discharge authorized by a separate NPDES permit, or identified as a category of non-storm water discharges or flows that is consistent with~~must be addressed pursuant to~~ the following requirements:

(1) ~~Discharges of non-storm water to the MS4 from the following categories must be addressed as illicit dischargeunless the discharge has coverage under NPDES Permit No. CAG919001 (Order No. R9-2007-0034, or subsequent order) for discharges to San Diego Bay, or NPDES Permit No. CAG919002 (Order No. R9-2008-0002, or subsequent order) for discharges to surface waters other than San Diego Bay.~~

Comment [A76]: See discussion in section 3.7.2 of the comment letter.

~~(a) Uncontaminated pumped ground water;~~

~~(b) Discharges from foundation drains;~~[20]

~~(c) Water from crawl space pumps; and~~

~~(d) Water from footing drains.~~[19]

(2) Discharges of non-storm water from water line flushing and water main breaks to the MS4 must be addressed as illicit discharges unless the discharge has coverage under a valid NPDES Permit, ~~No. CAG 679001~~ (Order No. R9-2010-0003, or a subsequent order). This category includes potable water line flushing ~~and water main break~~ discharges from water purveyors issued a water supply permit by the California Department of Public Health or federal military installations. Discharges from recycled or reclaimed water lines to the MS4 must be addressed as illicit discharges, unless the discharges have coverage under a separate NPDES permit.

(3) Discharges of non-storm water into the MS4 from the following categories must be addressed by the Copermittee as illicit discharges only if the Copermittee or the San Diego Water Board identifies the individual discharge as a source of pollutants to receiving waters:

(a) Diverted stream flows;

(b) Rising ground waters;

(c) Uncontaminated ground water infiltration to MS4s;

(d) Uncontaminated pumped ground water;

(e) Springs;

(f) Water from crawl space pumps;

~~(c)~~(g) Flows from riparian habitats and wetlands;

(h) Landscape irrigation;

(i) Irrigation water;

(j) Lawn watering;

Comment [A77]: See discussion in section 3.7.2 of the comment letter.

Comment [A78]: See discussion in section 3.7.2 of the comment letter.

Comment [A79]: See Legal Comments discussion.

[20] ~~Provision E.2.a.(1) only applies to this category on non-storm water if the system is designed to be located at or below the highest historical groundwater table to actively or passively extract groundwater during any part of the year.~~

~~(d)~~(k) Discharges from potable water sources;

~~(e)~~(l) Discharges from foundation drains;[21] ~~and~~

(m)Discharges from footing drains. .[21]

(4) Discharges of non-storm water into the MS4 from the following categories must be controlled by the requirements given below through statute, ordinance, permit, contract, order, or similar means. ~~Discharges of non-storm water to the MS4 from the following categories not controlled by the requirements given below through~~ If such statutes, ordinances, permits, contracts, orders, or similar means have not been enacted by the Copermittee, the applicable categories below must be addressed by the Copermittee as illicit discharges.

(a) Air conditioning condensation

The discharge of air conditioning condensation should~~must~~ be directed to landscaped areas or other pervious surfaces where feasible.

(b) Individual residential vehicle washing

(i) The discharge of wash water ~~must~~ should be directed to landscaped areas or other pervious surfaces where feasible; and

(ii) Minimize the use of water for vehicle washing, use as little washing detergent and other vehicle wash products as possible, wash vehicles at commercial wash facilities, and implement other practices or behaviors that will prevent the discharge of pollutants associated with individual residential vehicle washing from entering the MS4.

(c) Dechlorinated swimming pool discharges

(i) Eliminate residual chlorine, algaecide, filter backwash, or other pollutants from swimming pools prior to discharging to the MS4; and

(ii) The discharge of saline swimming pool water must be directed to the sanitary sewer, landscaped areas, or other pervious surfaces that can accommodate the volume of water, unless the saline swimming pool water can be discharged via a pipe or concrete channel directly to a naturally saline water body (e.g. Pacific Ocean).

(5) Firefighting discharges to the MS4 must be addressed by the Copermittee as

Comment [A80]: See discussion in section 3.7.2 of the comment letter.

Comment [A81]: See discussion in section 3.7.2 of the comment letter.

[21] ~~Provision E.2.a.(3) only applies to this category of non-storm water discharge if the system is designed to be located above the highest historical groundwater table at all times of the year, and the system is only expected to discharge non-storm water under unusual circumstances.~~

follows:illicit discharges only if the Copermittee or the San Diego Water Board identifies the discharge as a significant source of pollutants to receiving waters. Firefighting discharges to the MS4 not identified as a significant source of pollutants to receiving waters, must be addressed, at a minimum, as follows:

(a) Non-emergency firefighting discharges

(i) Building fire suppression system maintenance discharges (e.g.., sprinkler line flushing) to the MS4 must be addressed as illicit discharges unless appropriate BMPs are implemented.

(ii) Non-emergency firefighting discharges (i.e., discharges from controlled or practice blazes, firefighting training, and maintenance activities not associated with building fire suppression systems) must be addressed by a program, to be developed and implemented by the Copermittee in conjunction with the local Fire Authority/District, to reduce or eliminate pollutants in such discharges from entering the MS4.

(b) Emergency firefighting discharges (i.e., flows necessary for the protection of life or property) do not require BMPs and need not be prohibited.

Each Copermittee should develop and encourage implementation of BMPs to reduce or eliminate pollutants in emergency firefighting discharges to the MS4s and receiving waters within its jurisdiction. During emergency situations, priority of efforts should be directed toward life, property, and the environment (in descending order). BMPs should not interfere with immediate emergency response operations or impact public health and safety.

(6) If the Copermittee or San Diego Water Board identifies any category of non-storm water discharges listed under Provisions E.2.a.(1)-(4) as a source of pollutants to receiving waters, the category must be effectively prohibited through ordinance, order, or similar means and addressed as an illicit discharge.

(7) Each Copermittee must, where feasible, reduce or eliminate non-storm water discharges listed under Provisions E.2.a.(1)-(4) into its MS4 whether or not the non-storm water discharge has been identified as an illicit discharge, unless a non-storm water discharge is identified as a discharge authorized by a separate NPDES permit.

Comment [A82]: See discussion in section 3.7.2 of the comment letter.

b. Prevent And Detect Illicit Discharges And Connections

Each Copermittee must include the following measures within its program to prevent and detect illicit discharges to the MS4:

(1) Each Copermittee must maintain an updated map of its entire MS4 and the corresponding drainage areas. The accuracy of the MS4 map must be confirmed during the field screening required pursuant to Provision E.2.c. The MS4 map must be included as part of the jurisdictional runoff management program document. Any geographic information system (GIS) layers or files used by the Copermittee to maintain the MS4 map must be made available to the San Diego Water Board upon request. The MS4 map must identify the following:

(a) All segments of the MS4 owned, operated, and maintained by the Copermittee;

(b) All known locations of inlets that discharge and/or collect runoff into the Copermittee's MS4;

(c) All known locations of connections with other MS4s not owned or operated by the Copermittee (e.g. Caltrans MS4s);

(d) All known locations of major MS4 outfalls as defined by 40 CFR §122.26(b)(5-6) ~~and private outfalls,~~ that discharge runoff collected from areas within the Copermittee's jurisdiction;

Comment [A83]: See discussion in section 3.7.2 of the comment letter.

(e) All segments of receiving waters within the Copermittee's jurisdiction that receive and convey runoff discharged from the Copermittee's MS4 outfalls;

(f) Locations of the MS4 outfalls, identified pursuant to Provision D.2.a.(1), within its jurisdiction; and

(g) Locations of the non-storm water persistent flow MS4 outfall discharge monitoring stations, identified pursuant to Provision D.2.b.(2)(b), within its jurisdiction.

(2) Each Copermittee must use Copermittee personnel and contractors to assist in identifying and reporting illicit discharges and connections during their daily employment activities.

(3) Each Copermittee must promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges to or from the MS4, including the following methods for public reporting:

(a) Operate a public hotline, which can be Copermittee-specific or shared by the Copermittees, and must be capable of receiving reports in both English and Spanish 24 hours per day and seven days per week; and

(b) Designate an e-mail address for receiving electronic reports from the public, which can be Copermittee-specific or shared by the Copermittees, and must be prominently displayed on the Copermittee's webpage and the Regional Clearinghouse required pursuant to Provision F.4.

(4) Each Copermittee must implement practices and procedures (including a notification mechanism) to prevent, respond to, contain, and clean up any spills that may discharge into the MS4 within its jurisdiction from any source. Such practices and procedures may include the coordination with other parties, such as sanitary sewer operators. The Copermittee must coordinate, to the extent possible, with spill response teams to prevent entry of spills into the MS4~~, and prevent contamination of surface water, ground water, and soil.~~ The Copermittee must coordinate spill prevention, containment, and response activities throughout all appropriate internal~~Copermittee~~ departments, programs, and agencies.

Comment [A84]: See discussion in section 3.7.2 of the comment letter.

(5) Each Copermittee must implement practices and procedures to ~~prevent~~ control and limit infiltration of seepage from sanitary sewers owned by a Copermittee agency (including private laterals and failing septic systems) to the MS4.

(6) Each Copermittee shall~~must~~ coordinate, when necessary, with upstream Copermittees and/or entities to prevent illicit discharges from upstream sources into the MS4 within its jurisdiction.

c. FIELD SCREENING

Each Copermittee must conduct field screening (i.e. visual observations, field testing, and/or analytical testing) of MS4 outfalls and other portions of its MS4 within its jurisdiction to detect non-storm water and illicit discharges and connections to the MS4 in accordance with the dry weather MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.(1).

d. INVESTIGATE AND ELIMINATE ILLICIT DISCHARGES AND CONNECTIONS

Each Copermittee must include the following measures within its program to investigate and eliminate illicit discharges to the MS4 to comply with provision A.1.b:

(1) Each Copermittee must prioritize and determine when follow-up investigations will be performed in response to visual observations and/or water quality monitoring data collected during an investigation of a detected non-storm water ~~or~~ illicit discharge into or from the MS4. The criteria for prioritizing investigations must consider the following:

(a) Pollutants identified as causing or contributing to the highest water quality

priorities identified in the Water Quality Improvement Plan;

(b) Pollutants identified as causing or contributing, or threatening to cause or contribute to impairments in water bodies on the 303(d) List and/or in environmentally sensitive areas (ESAs), located within its jurisdiction;

(c) Pollutants identified from sources or land uses known to exist within the area, drainage basin, or watershed that discharges to the portion of the MS4 within its jurisdiction included in the investigation;

(d) Pollutants identified as causing or contributing to an exceedance of a NAL in the Water Quality Improvement Plan, where the source has not been identified as natural or otherwise permitted; and

(e) Pollutants identified as an immediate and significant threat to human health or the environment.

(2) Each Copermittee must implement procedures to investigate and inspect portions of its MS4 that, based on reports or notifications, field screening, or other appropriate information, indicate a reasonable potential of receiving, containing, or discharging pollutants due to illicit discharges, or illicit connections~~, or other sources of non-storm water~~. The procedures must include the following:

(a) Each Copermittee must develop criteria to:

(i) Assess the validity of each report or notification received; and

(ii) Prioritize the response to each report or notification received.

(b) Each Copermittee must prioritize and respond to each valid report or notification (e.g., public reports, staff or contractor reports and notifications, etc.) of an incident in a timely manner.

(c) ~~Each~~In accordance with the procedures defined in Provision E.2.d.(1), each~~Each~~ Copermittee must investigate and seek to identify the source(s) of discharges of non-storm water illicit discharges or illicit connections ~~where flows are~~ observed into and from the MS4 during the field screening required pursuant to Provision D.2.b.(1) as follows:

(i) Obvious illicit discharges (i.e., unusual color or odor) must be immediately investigated to identify the source(s) of non-storm water illegal discharges;

(ii) The investigation must include field investigations to identify sources or potential sources for the discharge, unless the source or potential source has already been identified during previous investigations; and

(iii) The investigation may include follow-up field investigations and/or reviewing Copermittee inventories and other land use data to identify potential sources of the discharge.

(d) Each Copermittee must maintain records and a database of the following information:

(i) Location of incident, including hydrologic subarea, portion of MS4 receiving the non-storm water ~~or~~ illicit discharge, and point of discharge or potential discharge from MS4 to receiving water;

(ii) Source of information initiating the investigation (e.g., public reports, staff or contractor reports and notifications, field screening, etc.);

(iii) Date the information used to initiate the investigation was received;

(iv) Date the investigation was initiated;

(v) Dates of follow-up investigations;

(vi) Identified or suspected source of the illicit discharge or connection, if determined;

(vii) Known or suspected related incidents, if any;

(viii) Result of the investigation; and

(ix) If a source cannot be identified and the investigation is not continued, a rationale for why a discharge does not pose a threat to water quality and/or does not require additional investigation.

(e) Each Copermittee must ~~track~~ document, and where feasible quantify, any readily~~and seek to~~ identifiable~~y~~ the source(s) of non-storm water illegal discharges from the MS4 where there is evidence of non-storm water ~~having been discharged~~illegal discharges or connections into or from the MS4 (e.g., pooled water), in accordance with MS4 outfall discharge monitoring requirements in Provisions D.2.a.(2) and D.2.b.

Comment [A85]: See discussion in section 3.7.2 of the comment letter.

(3) Each Copermittee must initiate the implementation of procedures, in a timely manner, to eliminate all detected and identified illicit discharges and connections within its jurisdiction. The procedures must include the following responses:

(a) Each Copermittee must enforce its legal authority, as required under Provision E.1, to eliminate illicit discharges and connections to the MS4.

(b) If the Copermittee identifies the source as a controllable source of non-storm water ~~or~~ illicit discharge or connection, the Copermittee must implement its Enforcement Response Plan pursuant to Provision E.6 and enforce its legal authority to effectively prohibit and with the goal of eliminating~~e~~ illicit discharges and connections to its MS4.

(c) If the Copermittee identifies the source of the discharge as a category of non-storm water discharges in Provision E.2.a, and the discharge is in exceedance of NALs in the Water Quality Improvement Plan, then the Copermittee must determine if: (1) this is an isolated incident or set of circumstances that will be addressed through its Enforcement Response Plan pursuant to Provision E.6, or (2) the category of discharge must be addressed through the effective prohibition of that category of discharge as an illicit discharge pursuant to Provision E.2.a.(6).

(d) If the Copermittee suspects the source of the non-storm water discharge as natural in origin (i.e. non-anthropogenically influenced) and in conveyance into the MS4, then the Copermittee must document and provide the data and evidence necessary to demonstrate to the San Diego Water Board that it is natural in origin and does not require further investigation.

(e) If the Copermittee identifies that the discharge is coming from another Copermittees' jurisdiction, the receiving Copermittee must document and provide the findings to the upstream Copermittee. The obligation to implement the requirements of provision E.2.d.(3) are thenceforth the responsibility of the upstream Copermittee.

(f) If the Copermittee identifies the source as a non-storm water discharge that has been separately authorized by the San Diego Water Board, or that is contributing pollutants to the MS4 and that may require coverage under a WDR from the San Diego Water Board, the Copermittee shall provide all relevant findings to the San Diego Water Board and may back charge the Regional Board for the entire cost of conducting the source investigation.

Comment [A86]: See discussion in section 3.7.2 of the comment letter.

~~(e)~~(g) If the Copermittee is unable to identify and document the source of a recurring non-storm water discharge to or from the MS4, then the Copermittee must ~~address the discharge as an illicit discharge and~~ update its jurisdictional runoff management program to address the common and suspected sources of the non-storm water discharge within its jurisdiction in accordance with the Copermittee's priorities.

(4) Each Copermittee must submit a summary of the non-storm water discharges and illicit discharges and connections investigated and eliminated within its jurisdiction with each Annual Report required under Provision F.3.b of this Order.

3. Development Planning

Comment [A87]: See discussion in section 3.8 of the comment letter.

Each Copermittee must, within their jurisdiction, use their land use and planning

authorities, to the extent that they may lawfully impose requirements, to implement a development planning program in accordance with the strategies identified in the Water Quality Improvement Plan and includes, at a minimum, the following requirements:

STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Comment [A88]: See discussion in section 3.8.2 of the comment letter.

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the development planning program to address development and redevelopment projects that may become sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional or alternative BMPs, focus education, increase frequency of verifications and/or inspections, alternative compliance options);

(2) Each Copermittee must identify areas within its jurisdiction where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting and/or stream, channel, or habitat rehabilitation projects;

(3) Each Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify regional alternative compliance projects that Priority Development Projects may be allowed or should be encouraged to implement or participate in implementing; and

(4) The requirements of the programs as outlined in the following sub-provisions may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality improvement Plan(s).~~The strategies and/or activities must be consistent with the requirements of Provisions E.3.a-c and E.3.e-f and the strategies identified in the Water Quality Improvement Plan.~~

a. BMP REQUIREMENTS FOR ALL DEVELOPMENT PROJECTS

Each Copermittee, as practical and feasible, must prescribe the following BMP requirements during the planning process (i.e. prior to project approval and issuance of local permits) for all development projects (regardless of project type or size), where local permits are issued, including unpaved roads and flood management projects, except emergency / public safety projects implemented for the protection of persons and property:

(1) General Requirements

(a) Onsite BMPs must be located so as to remove pollutants from runoff prior to its discharge to any receiving waters, and as close to the source as possible; and

(b) Structural BMPs must not be constructed within a waters of the U.S.. ~~or waters of the state.~~

(2) Source Control BMP Requirements

The following source control BMPs must be implemented at all development projects where applicable and feasible:

(a) Prevention of illicit discharges into the MS4;

(b) Storm drain system stenciling or signage;

(c) Properly designed outdoor material storage areas;

(d) Properly designed outdoor work areas;

(e) Properly designed trash storage areas; and

(f) Any additional BMPs determined necessary by the Copermittee to minimize pollutant generation at each project.

(3) Low Impact Development (LID) ~~BMP Requirements~~Principles

Comment [A89]: See discussion in section 3.8.2 of the comment letter.

The following LID ~~BMPs~~ Principles must be implemented at all development projects where applicable and feasible:

(a) Maintenance or restoration of natural storage reservoirs and drainage corridors (including topographic depressions, areas of permeable soils, natural swales, and ephemeral and intermittent streams);[22]

(b) Buffer zones for natural water bodies (where buffer zones are technically infeasible, require project applicant to include other buffers such as trees, access restrictions, etc.);

(c) Conservation of natural areas within the project footprint including existing trees, other vegetation, and soils;

[22] Development projects proposing to dredge or fill materials in waters of the U.S. must obtain a CWA Section 401 Water Quality Certification. Projects proposing to dredge or fill waters of the state must obtain waste discharge requirements.

(d) Construction of streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided public safety is not compromised;

(e) Minimization of the impervious footprint of the project;

(f) Minimization of soil compaction to landscaped areas;

(g) Disconnection of impervious surfaces through distributed pervious areas;

(h) Landscaped or other pervious areas designed and constructed to effectively receive and infiltrate, retain and/or treat runoff from impervious areas, prior to discharging to the MS4;

(i) Small collection strategies located at, or as close as possible to, the source (i.e. the point where storm water initially meets the ground) to minimize the transport of runoff and pollutants to the MS4 and receiving waters;

(j) Use of permeable materials for projects with low traffic areas and appropriate soil conditions;

(k) Landscaping with native or drought tolerant species; and

(l) Harvesting and using precipitation.

b. PRIORITY DEVELOPMENT PROJECTS

(1) Definition of Priority Development Project

Priority Development Projects include the following:

(a) All new development projects that fall under the Priority Development Project categories listed under Provision E.3.b.(2) (where a new development project feature, such as a parking lot, falls into a Priority Development Project category, the entire project footprint is subject to Priority Development Project requirements); and

(b) Those redevelopment projects that create, add, or replace at least 5,000 square feet of impervious surfaces on an already developed site, and the redevelopment project is a Priority Development Project category listed under Provision E.3.b.(2) (where redevelopment results in an increase of less than fifty percent of the impervious surfaces of a previously existing development, and the existing development was not subject to Priority Development Project requirements, the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) apply only to the addition or replacement, and not to the entire development; where redevelopment

results in an increase of more than fifty percent of the impervious surfaces of a previously existing development, the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) apply to the entire development).

(c) Projects where redevelopment results in an increase of more than fifty percent of impervious surfaces of a previously existing development, and the existing development *was* subject to previous Priority Project Development Requirements, only the altered portion of development is subject to the new Priority Development Project requirements.

Comment [A90]: See discussion in section 3.8.2 of the comment letter.

(2) Priority Development Project Categories

Comment [A91]: See discussion in section 3.8.2 of the comment letter.

(a) New development projects that create 10,000 square feet or more of impervious surfaces (collectively over the entire project site). This category includes commercial, industrial, residential, mixed-use, and public development projects on public or private land which fall under the planning and building authority of the Copermittee.

(b) New development projects that create 5,000 square feet or more of impervious surfaces (collectively over the entire project site), and are designed for support one or more of the following uses (see Appendix for definitions):

(i) Automotive repair shop
(ii) Restaurant
(iii) Parking lot[23]
(iv) Street, road, highway, freeway
(v) Retail gasoline outlet (RGO)

Comment [A92]: See footnote

~~(b) Automotive repair shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.~~

~~(c) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812), where the land area for development is 5,000 square feet or more.~~

~~(d) Hillside development projects. This category includes any development which creates 5,000 square feet or more of impervious surface which is~~

[23] Excluding parking lots that are not subject to runoff, such as but not limited to covered or subterranean parking lots

located in an area with known erosive soil conditions, where the development will grade on any natural slope that is twenty-five percent or greater.

(e)(c) New development projects that create 2,500 square feet or more of impervious surfaces (collectively over the entire project site), and are Environmentally sensitive areas (ESAs). This category includes any development located within, directly adjacent to, or discharging directly to an ESA, which either creates 2,500 square feet of impervious surface on a proposed project site or increases the area of imperviousness of a proposed project site to 10 percent or more of its naturally occurring condition. "Directly adjacent to" means situated within 200 feet of the ESA. "Discharging directly to" means outflow from a drainage conveyance system that collects runoff from the subject development or redevelopment site and terminates at or in receiving waters within the ESA and is not commingled with flows from adjacent or other upstream lands.

(f) Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce that has 5,000 square feet or more of impervious surface.

(g) Streets, roads, highways, freeways, and driveways. This category is defined as any paved impervious surface that is 5,000 square feet or more used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

(h) Retail gasoline outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

(i)(d) Large development projects. This category includes any post-construction pollutant-generating new development projects that result in the permanent disturbance of one acre or more of land.

(3) Priority Development Project Exemptions

Comment [A93]: See discussion in section 3.8.2 of the comment letter.

Each Copermittee has the discretion to exempt the following projects from being defined as Priority Development Projects:

(a) New paved sidewalks, driveways, parking lots, bicycle lanes, or trails that meet the following criteria:

(i) Designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas; OR

(ii) Designed and constructed to be hydraulically disconnected from paved streets or roads; OR

(iii) Designed and constructed with permeable pavements or surfaces in accordance with USEPA Green Streets guidance.[24]

(b) Any impervious surface that is 5,000 square feet or more used for the transportation of automobiles, trucks, motorcycles, and other vehicles that is designed and constructed to the Maximum Extent Practicable in accordance with the USEPA Green Streets Guidance "Managing Wet Weather with Green Infrastructure: Green Streets"[25]. ~~Retrofitting of existing paved alleys, streets or roads that meet the following criteria:~~

~~(i) Must be two lanes or less; AND~~

~~(ii) Must be a retrofitting project implemented as part of an alternative compliance project option under Provision E.3.c.(3)(b)(v) to achieve the performance requirements of Provisions E.3.c.(1) and/or E.3.c.(2) for a Priority Development Project; AND~~

~~(iii) Designed and constructed in accordance with the USEPA Green Streets guidance.[26]~~

(c) Single-family residential projects that meet the following criteria:

(i) Must not be constructed as part of a larger development or proposed subdivision;

(ii) Successfully incorporate and document that they have incorporated, each of the applicable Source Control and LID BMP strategies identified in provisions E.3.a.(2)-(3) to the MEP.

~~(c) New single family residences that meet the following criteria:~~

~~(i) Must not be constructed as part of a larger development or proposed subdivision; AND~~

~~(ii) Designed and constructed to be certified under the U.S. Green Building Council (USGCB) Leadership in Energy and Environmental Design (LEED) for Homes green building certification program, receiving at least four (4) Surface Water Management credits under the Sustainable Sites category[27] OR~~

~~Designed and constructed with structural BMPs that will achieve the~~

[24] USEPA. 2008. http://water.epa.gov/infrastructure/greeninfrastructure/upload/gi_munichandbook_green_streets.pdf and http://water.epa.gov/infrastructure/greeninfrastructure/gi_policy.cfm#municipalhandbook ~~See "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008).~~

~~[26] Ibid.~~

~~[27] See LEED for Homes rating system at http://www.usgbc.org~~

~~performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite~~

~~(d) Redevelopment of existing single family residences that meet the following criteria:~~

~~(i) Designed and constructed to be certified under the USGCB LEED for Homes green building certification program, receiving at least four (4) Surface Water Management credits under the Sustainable Sites category;[28] OR~~

~~(ii) Designed and constructed with structural BMPs that will achieve the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite.~~

(d) Watershed Protection Projects that meet the following criteria:

(i) Projects undertaken to rehabilitate or prevent environmental, social, and economic damage to the watershed, including receiving waters, by providing one or more of the following:

- Water quality protection by the proper management of stormwater and floodplains
- Flood risk reduction to adjacent land uses, stored matter and stockpiled material
- Elimination of the comingling of stormwater and hazardous materials
- Erosion Mitigation
- Restoration of Rivers and Ecosystems
- Groundwater Recharge
- Creation of new open space and wetlands
- Programs for water conservation, stormwater capture and management
- Retrofit projects constructed to improve water quality or address hydromodification.

(ii) AND are not expected to be pollutant generating or are designed to reduce existing pollutant loads

(iii) AND incorporate and document that they have incorporated, each of the applicable Source Control and LID BMP strategies identified in provisions E.3.a.(2)-(3) to the MEP.

(e) Emergency public safety projects in any of the Priority Development Categories may be excluded if the delay caused due to the requirement for a SSMP compromises public safety, public health and/or environmental protection

[28] ~~See LEED for Homes rating system at http://www.usgbc.org~~

c. Priority Development Project Structural BMP Performance Requirements

In addition to the BMP requirements listed for all development projects under Provision E.3.a, Priority Development Projects must also implement structural BMPs that conform to performance requirements below. If watershed-specific performance requirements are ~~may be~~ developed as part of a Water Quality Improvement Plan; these requirements would take precedence over the general performance requirements below. The watershed-specific requirement must provide at least equal protection as the general performance requirements below.

(1) Storm Water Pollutant Control BMP Requirements

Comment [A94]: See discussion in section 3.8.2 of the comment letter.

Each Copermittee must require each Priority Development Project to implement onsite structural BMPs to control pollutants in storm water that may be discharged from a project as follows:

(a) Each Priority Development Project must be required to implement LID BMPs that are designed to retain (i.e. intercept, store, infiltrate, evaporate, and evapotranspire) onsite the pollutants contained in the design capture volume. The design capture volume is equivalent to:

(i) The volume of storm water runoff produced from a 24-hour 85th percentile storm event;[29] OR

(ii) The volume of storm water runoff produced from a 24-hour 85th percentile storm event, that would be retained onsite ~~if~~ in the pre-project condition. ~~site was fully undeveloped and naturally vegetated~~, ~~as determined using continuous simulation modeling techniques based on site-specific soil conditions and typical native vegetative cover.~~

(b) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of~~to~~ complying with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1)(a).

~~(c) If a Priority Development project is allowed to utilize alternative compliance pursuant to Provisions E.3.c.(1)(b), flow-thru conventional~~

[29] This volume is not a single volume to be applied to all areas covered by this Order. The size of the 85th percentile storm event is different for various parts of the San Diego Region. The Copermittees are encouraged to calculate the 85th percentile storm event for each of its jurisdictions using local rain data pertinent to its particular jurisdiction. In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees must describe their method for using isopluvial maps in its BMP Design Manuals. The volume is a single event-based volume that occurs after an extended dry period.

~~treatment control BMPs must be implemented to treat the portion of the design capture volume that is not retained onsite. Additionally, project applicants must mitigate for the portion of the pollutant load in the design capture volume that is not retained onsite through one or more alternative compliance options under Provision E.3.c.(3). Conventional treatment control BMPs must be sized and designed to:~~

~~(i) Remove pollutants from storm water to the MEP;~~

~~(ii) Filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two;~~

~~(iii) Be ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Conventional treatment control BMPs with a low removal efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of conventional treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.~~

(2) Hydromodification Management BMP Requirements

Comment [A95]: See discussion in section 3.8.2 of the comment letter.

Each Copermittee must require each Priority Development Project disturbing greater than one acre to implement management measures~~onsite structural BMPs~~ to ensure ~~manage hydromodification~~ that ~~may be caused by~~ storm water runoff discharged from the~~a~~ project won't cause adverse Hydromodification impacts in the downstream receiving waters as follows:

The Copermittees in each Watershed Management Area may establish within the WQIP, watershed specific mitigation requirements that will apply to priority development projects, based on the susceptibility of the receiving waters to Hydromodification impacts caused by the project, and consistent with the priorities and strategies identified in the WQIP. Such requirements may be uniform across a Hydrologic Unit, or identified at an appropriate smaller scale to ensure that receiving waters are properly protected.

(a) Post-project runoff flow rates and durations must not exceed pre-project ~~development (naturally occurring)~~ runoff flow rates and durations by more than 10 percent (for the range of flows that result in increased potential for erosion, or degraded instream habitat conditions downstream of Priority Development Projects~~)~~.

(i) In evaluating the range of flows that results in increased potential for

erosion of natural (non-hardened) channels, the lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or that erodes the toe of channel banks.

~~(ii) For artificially hardened channels, analysis to identify the lower boundary must use characteristics of a natural stream segment similar to that found in the watershed. The lower boundary must correspond with the critical channel flow that produces the critical shear stress that initiates channel bed movement or erodes the toe of the channel banks.~~

~~(iii)~~(ii) The Copermittees may use monitoring results collected pursuant to Provision D.1.a.(2) to re-define the range of flows resulting in increased potential for erosion, or degraded instream habitat conditions, as warranted by the data.

(b) Priority Development Projects ~~Post-project runoff flow rates and durations~~ must implement appropriate measures to minimize the ~~compensate~~ for the loss of sediment supply delivered ~~due~~ to the Receiving Waters, consistent with WQIP priorities, ~~development project,~~ should loss of sediment supply be anticipated to occur as a result of the development project.

(c) A Priority Development Project may be allowed to utilize alternative compliance under Provision E.3.c.(3) in lieu of~~to comply with~~ the performance requirements of Provisions E.3.c.(2)(a)-(b).

(d) Exemptions

Each Copermittee has the discretion to exempt a Priority Development Project from the hydromodification management BMP performance requirements of Provisions E.3.c.(2)(a)-(b) where the project:

(i) Discharges storm water runoff into existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean;

(ii) Discharges of storm water into conveyance channels whose bed and bank are engineered and maintained for the 10-year ultimate development flow rate all the way from the point of discharge from the project to an water body that is sufficiently resistant to hydromodification (water storage reservoirs, lakes, enclosed embayments, pacific ocean, or other water bodies identified in the WQIP);

~~(ii)~~(iii) Is a redevelopment Priority Development Project that meets the alternative compliance requirements of Provision E.3.c.(3)(b)(ii); or

~~(iii)~~(iv) Discharges storm water runoff into other areas identified by the San Diego Water Board as exempt from the requirements of Provisions E.3.c.(2)(a)-(b), through an approved WQIP.

(3) Alternative Compliance to Onsite Structural BMP Performance Requirements

Comment [A96]: See discussion in section 3.8.2 of the comment letter.

(a) Applicability

At the discretion of each Copermittee, Priority Development Projects may be allowed to implement one or more of the alternative compliance project options described in E.3.c.(3)(b) below, in lieu of complying with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2), under the following conditions:

(i) The Copermittee must determine that implementation of the alternative compliance option will have an equal or greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite;

(ii) The alternative compliance options must be designed by a registered professional engineer, geologist, architect, biologist, hydrologist, landscape architect, or other appropriate certified professional;

(iii) The alternative compliance option must be consistent with the strategies developed within the WQIP, for the highest priority water quality conditions.

(iv) The alternative compliance options must be implemented within the same Watershed Management Area as the Priority Development Project, and preferably within the same hydrologic subarea;

(v) The alternative compliance options must have reliable sources of funding for operation and maintenance.

(b) Alternative Compliance Options

(i) *LID Biofiltration Treatment Control BMPs*

LID biofiltration treatment control BMPs may be used as an alternative compliance option if the BMPs are sized and designed to:

[a] Remove pollutants from storm water to the MEP; AND
[b] Have an appropriate surface loading rate to prevent erosion, scour and channeling; AND
[c] Biofilter at least 1.0 times the design capture volume that is not reliably retained onsite

(ii) *LEED Certified Redevelopment Projects*

Priority Development Projects that are designed and constructed to be certified under the USGCB LEED for New Construction and Major Renovations green building certification program, or other locally accepted certification of equivalent effectiveness, may be considered as an acceptable alternative compliance option if the project meets the following criteria:

[a] The project is designed to receive at least: One (1) Site Design credit, and Two (2) Stormwater Design credits under the Sustainable Sites category.[30] , and

[b] The existing and future configuration of the receiving water must not be unnaturally altered or adversely impacted by the project.

(iii) *Watershed-Based Planned Development Projects*

Priority Development Projects greater than 100 acres in total project size (or smaller than 100 acres in size yet part of a larger common plan of development that is over 100 acres) may be considered as an acceptable alternative compliance option if the project meets the following conditions:

[a] The Priority Development Project was planned utilizing watershed and/or subwatershed based water quality, hydrologic, and fluvial geomorphologic planning principles that implement regional LID BMPs in accordance with the performance and location criteria of this Order and acceptable to the San Diego Water Board;

[b] Regional LID BMPs may be used provided that the BMPs capture and retain the volume of runoff produced from the design capture volume defined in Provision E.3.c.(1)(a)(i) and that such controls are located upstream of receiving waters;

[c] Regional LID BMPs must clearly exhibit that they will not result in a net impact from pollutant loadings over and above the impact caused by capture and retention of the design capture volume;

[d] Any portion of the design capture volume that is not retained by the regional LID BMPs must be treated using biofiltration BMPs; and

[e] Where regional LID BMPs are demonstrated to the Copermittee as technically infeasible to retain the entire design capture volume, any volume up to and including the design capture volume not retained by regional LID BMPs, nor treated by biofiltration BMPs, must be treated using conventional treatment control BMPs and the project applicant must implement additional alternative compliance project, in-lieu fee and/or water quality

[30] See LEED for New Construction and Major Renovations rating system at http://www.usgbc.org

credit system options below.

(iv) *Offsite Projects*

Offsite Projects, such as but not limited to Regional BMPs; Retrofitting Projects; Channel, Stream or Habitat Rehabilitation Projects; Water Supply Augmentation Projects; or other Offsite Projects proposed by a project proponent, may be considered as an acceptable alternative compliance option if the offsite project meets the following requirements:

- The project must provide a net result of at least the same level of pollutant removal, and/or protection from potential downstream and upstream erosion in the receiving water as would be required to meet the performance requirements of Provision E.3.c.(1) and E.3.c.(2), as applicable.
- The project must be consistent with the strategies identified in the WQIP.
- The project must be constructed and operational prior to occupancy being granted for the PDP.

(v) *Conventional Treatment Control BMPs*

Onsite Conventional Treatment Control BMPs may be used as an alternative compliance option, only if the following criteria have been met:

[a] It has been demonstrated to the satisfaction of the Copermittee that it is technically infeasible to comply with the onsite requirements of E.3.c.(1), AND

[b] It has been demonstrated to the satisfaction of the Copermittee that it is technically infeasible to implement onsite Biofiltration Treatment Control BMPs, AND

[c] The Conventional Treatment Control BMPs will remove pollutants from storm water to the MEP; AND

[d] The Conventional Treatment Control BMPs will filter or treat either: 1) the maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event, or 2) the maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity (for each hour of a storm event), as determined from the local historical rainfall record, multiplied by a factor of two; AND

[e] The Conventional Treatment Control BMPs are ranked with high or medium pollutant removal efficiency for the Priority Development Project's most significant pollutants of concern. Conventional treatment control BMPs with a low removal

efficiency ranking must only be approved by a Copermittee when a feasibility analysis has been conducted which exhibits that implementation of conventional treatment control BMPs with high or medium removal efficiency rankings are infeasible for a Priority Development Project or portion of a Priority Development Project.

~~(a) Applicability~~

~~At the discretion of each Copermittee, Priority Development Projects may be allowed to utilize an alternative option to comply with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) under the following conditions:~~

~~(i) The Copermittee must determine that implementation of the alternative compliance option will have a greater overall water quality benefit for the Watershed Management Area than fully complying with the performance requirements of Provisions E.3.c.(1) and E.3.c.(2) onsite;~~

~~(ii) The alternative compliance options must be designed by a registered professional engineer, geologist, architector landscape architect;~~

~~(iii) The alternative compliance options must be implemented within the same hydrologichydrologic unit as the Priority Development Project, and preferably within the same hydrologic subarea;~~

~~(iv) Receiving waters must not be utilized to convey storm water runoff to the alternative compliance options;~~

~~(v) The pollutants in storm water runoff from the Priority Development Project must be treated to the MEP by the alternative compliance options prior to being discharged to receiving waters;~~

~~(vi) Unless otherwise allowed by Provision E.3.c.(3)(b), the alternative compliance options must have a net result of at least the same level of pollutant removal as would have been achieved if the Priority Development Project had fully complied with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1) onsite;~~

~~(vii) Unless otherwise allowed by Provision E.3.c.(3)(b), the alternative compliance options must have a net result of at least the same level of protection from potential downstream and upstream erosion in the receiving water as would have been achieved if the Priority Development Project had fully complied with the hydromodification management BMP performance requirements of Provision E.3.c.(2) onsite; and~~

~~(viii) The alternative compliance options utilized by the Priority Development Project must have reliable sources of funding for operation and maintenance.~~

~~(b) Alternative Compliance Project Options~~

~~The Copermittee may allow implementation of one or more of the following project options as part of an alternative approach to complying with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2):~~

~~(i) *Onsite LID Biofiltration Treatment Control BMPs*~~

~~The Copermittee may allow Priority Development Projects to utilize onsite LID biofiltration treatment control BMPs to comply with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1). Onsite LID biofiltration treatment control BMPs must be sized and designed to:~~

~~[a] Remove pollutants from storm water to the MEP; AND~~
~~[b] Have an appropriate surface loading rate to prevent erosion, scour and channeling within the BMP; AND~~
~~[c] Biofilter at least 1.5 times the design capture volume that is not reliably retained onsite; OR~~
~~[d] Biofilter up to the design capture volume that is not reliably retained onsite, AND 1) treat the remaining portion of the design capture volume not retained onsite with conventional treatment control BMPs in accordance with Provision E.3.c.(1)(c), and 2) if necessary, mitigate for the portion of the pollutant load in the design capture volume not retained onsite through one or more alternative compliance project, in-lieu fee and/or water quality credit system options below.~~

~~(ii) *LEED Certified Redevelopment Projects*~~

~~The Copermittee may allow redevelopment Priority Development Projects to comply with designed and constructed to be certified under the USGCB LEED for New Construction and Major Renovations green building certification program. The Priority Development Project must receive at least one (1) Site Design credit and two (2) Stormwater Design credits under the Sustainable Sites category.[31] In addition, the existing and future configuration of the receiving water must not be unnaturally altered or adversely impacted by storm water flow rates and durations discharged from the site.~~

~~(iii) *Watershed Based Planned Development Projects*~~

~~The Copermittee may allow Priority Development Projects greater than 100 acres in total project size (or smaller than 100 acres in size~~

~~[31] See LEED for New Construction and Major Renovations rating system at http://www.usgbc.org~~

~~yet part of a larger common plan of development that is over 100 acres) to comply with the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2). The Priority Development Project must comply with the following conditions:~~

~~[a] The Priority Development Project was planned utilizing watershed and/or subwatershed based water quality, hydrologic, and fluvial geomorphologic planning principles that implement regional LID BMPs in accordance with the performance and location criteria of this Order and acceptable to the San Diego Water Board;~~

~~[b] Regional LID BMPs may be used provided that the BMPs capture and retain the volume of runoff produced from the design capture volume defined in Provision E.3.c.(1)(a)(i) and that such controls are located upstream of receiving waters;~~

~~[c] Regional LID BMPs must clearly exhibit that they will not result in a net impact from pollutant loadings over and above the impact caused by capture and retention of the design capture volume;~~

~~[d] Any portion of the design capture volume that is not retained by the regional LID BMPs must be treated using biofiltration BMPs; and~~

~~[e] Where regional LID BMPs are demonstrated to the Copermittee as technically infeasible to retain the entire design capture volume, any volume up to and including the design capture volume not retained by regional LID BMPs, nor treated by biofiltration BMPs, must be treated using conventional treatment control BMPs and the project applicant must implement additional alternative compliance project, in-lieu fee and/or water quality credit system options below.~~

~~(iv) *Offsite Regional BMPs*~~

~~[a] The Copermittee may allow Priority Development Projects to utilize offsite regional BMPs to comply with the storm water pollutant control BMP performance requirements of Provision E.3.c.(1) if the offsite regional BMPs have the capacity to receive and retain at least 1.1 times the design capture volume that is not reliably retained onsite.~~

~~[b] The Copermittee may allow Priority Development Projects to utilize offsite regional BMPs to comply with the hydromodification management BMP performance requirements of Provision E.3.c.(2) if the offsite regional BMPs have the capacity to manage the storm water flows rates and durations from the site such that the receiving waters are protected from the potential for increased erosion that would be caused if the unmanaged portion of the runoff was discharged from the site.~~

~~(v) *Offsite Retrofitting Projects*~~

~~The Copermittee may allow Priority Development Projects to utilize offsite retrofitting projects to comply with the storm water pollutant control and hydromodification management BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) if the retrofitting projects have been identified within the strategies included in the Water Quality Improvement Plan, or identified as potential retrofitting projects by the Copermittee pursuant to Provision E.5.~~

~~(vi) *Offsite Channel, Stream, or Habitat Rehabilitation Projects*~~

~~The Copermittee may allow Priority Development Projects to utilize offsite channel, stream, or habitat rehabilitation projects to comply with the hydromodification management BMP performance requirements of Provision E.3.c.(2) if the rehabilitation projects have been identified within the strategies included in the Water Quality Improvement Plan, or identified as potential channel rehabilitation projects by the Copermittee pursuant to Provision E.5. The channel, stream, or habitat rehabilitation project cannot be utilized for pollutant treatmentexcept where artificial wetlands areand located upstream of receiving waters.~~

~~(vii) *Offsite Regional Water Supply Augmentation Projects*~~

~~The Copermittee may allow Priority Development Projects to utilize offsite regional water supply augmentation projects (i.e. groundwater recharge, recycled water, storm water harvesting) to comply with the storm water pollutant control and hydromodification management BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) if the projects have been identified within the strategies included in the Water Quality Improvement Plan.~~

~~(viii) *Project Applicant Proposed Alternative Compliance Projects*~~

~~The Copermittee may allow one or more Priority Development Project applicant(s) to propose and implement alternative compliance projects to comply with the storm water pollutant control and hydromodification management BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2) if the alternative compliance projects are consistent with, and will address the highest water quality priorities of the Water Quality Improvement Plan, and comply with the requirements of Provision E.3.c.(3)(a).~~

(c) Alternative Compliance In-Lieu Fee Option

The Copermittee may develop and implement an alternative compliance in-lieu fee option, individually or with other Copermittees and/or entities, as a means for designing, developing, constructing, operating and/or maintaining offsite alternative compliance projects under Provision E.3.c.(3)(b). Priority Development Projects allowed to utilize the

alternative compliance in-lieu fee option must comply with the following conditions:

(i) The in-lieu fee must be collected and held in accordance with the Mitigation Fee Act and all other applicable development fee laws. ~~transferred to the Copermittee (for public projects) or an escrow account (for private projects) prior to the date construction of the Priority Development Project is initiated~~.

(ii) If the in-lieu fee is applied to the development, design, ~~and~~ construction, operation and maintenance of offsite alternative compliance projects, the following conditions must be met:

[a] The offsite alternative compliance projects must meet ~~allow~~ the criteria identified within E.3.c.(3)(b)-, for each Priority Development Project relying on~~to comply with~~ the alternative compliance project;~~onsite BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2);~~

[b] The offsite alternative compliance projects must be constructed as soon as possible, but no later than 4 years after the certificate of occupancy is granted for the first Priority Development Project that contributed funds toward the construction of the offsite alternative compliance projects, unless a longer period of time is provided for in an approved WQIP~~authorized by the San Diego Water Board Executive Officer~~;

~~[c] The in-lieu fee for the Priority Development Project must include mitigation of the pollutant loads and increased storm water flow rates and durations that are allowed to discharge from the site before the offsite alternative compliance projects are constructed; and~~

[d] The in-lieu fee must also include the cost to operate and maintain the offsite alternative compliance projects for the anticipated life of the constructed priority development project.

(iii) If the in-lieu fee applies only~~is applied~~ to the operation and maintenance of offsite alternative compliance projects that have already been constructed, the offsite alternative compliance projects must meet~~allow~~ the requirements of E.3.c.(3)(a)(iv) and (v) as applicable, for each Priority Development Project relying on~~to comply with~~ the alternative compliance project..~~onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2).~~

(d) Alternative Compliance Water Quality Credit System Option

The Copermittee may develop and implement an alternative compliance water quality credit system option, individually or with other Copermittees

Comment [A97]: Please see Legal Comments.

and/or entities, provided that such a credit system clearly exhibits that it will not allow discharges from Priority Development Projects to cause or contribute to a net impact over and above the impact caused by projects meeting the onsite structural BMP performance requirements of Provisions E.3.c.(1) and E.3.c.(2). Any credit system that a Copermittee chooses to implement must be submitted to the San Diego Water Board Executive Officer for review and acceptance as part of the Water Quality Improvement Plan.

(4) Long-Term Structural BMP Maintenance

Each Copermittee must require the project applicant to submit proof of the mechanism under which ongoing long-term maintenance of all structural BMPs will be conducted.

(5) Infiltration and Groundwater Protection

(a) Structural BMPs designed to primarily function as large, centralized infiltration devices (such as large infiltration trenches and infiltration basins) must not cause or contribute to an exceedance of an applicable groundwater quality objective. At a minimum, such infiltration BMPs must be in conformance with the design criteria listed below, unless the development project applicant demonstrates to the Copermittee that one or more of the specific design criteria listed below are not necessary to protect groundwater quality. The design criteria listed below do not apply to small infiltration systems dispersed throughout a development project.

(i) Runoff must undergo pretreatment such as sedimentation or filtration prior to infiltration;

(ii) Pollution prevention and source control BMPs must be implemented at a level appropriate to protect groundwater quality at sites where infiltration BMPs are to be used;

(iii) Infiltration BMPs must be adequately maintained to remove pollutants in storm water to the MEP;

(iv) The vertical distance from the base of any infiltration BMP to the seasonal high groundwater mark must be at least 10 feet. Where groundwater basins do not support beneficial uses, this vertical distance criteria may be reduced, provided groundwater quality is maintained;

(v) The soil through which infiltration is to occur must have physical and chemical characteristics (e.g., appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of runoff for the protection of groundwater beneficial uses;

(vi) Infiltration BMPs must not be used for areas of industrial or light

industrial activity, and other high threat to water quality land uses and activities as designated by each Copermittee, unless first treated or filtered to remove pollutants prior to infiltration; and

(vii) Infiltration BMPs must be located a minimum of 100 feet horizontally from any water supply wells.

(b) The Copermittee may develop, individually or with other Copermittees, alternative mandatory design criteria to that listed above for infiltration BMPs which are designed to primarily function as centralized infiltration devices. Before implementing the alternative design criteria in the development planning process the Copermitee(s) must:

(i) Notify the San Diego Water Board of the intent to implement the alternative design criteria submitted; and

(ii) Comply with any conditions set by the San Diego Water Board.

d. BMP DESIGN MANUAL UPDATE

Each Copermittee must update and implement its BMP Design Manual[32] pursuant to Provision F.2.b. ~~Until the Copermittee has updated its BMP Design Manual with the requirements of Provisions E.3.a-c, the Copermittee must continue implementing its current BMP Design Manual. Unless directed otherwise by the San Diego Water Board, the Copermittee must implement the BMP Design Manual within 180 days of completing the update.~~ The update of the BMP Design Manual must include the following:

Comment [A98]: This info was incorporated into F.2.b.

(1) Updated procedures to determine the nature and extent of storm water requirements applicable to a potential development or redevelopment projects. These procedures must inform project applicants of the storm water management requirements applicable to their project including, but not limited to, general requirements for all development projects, structural BMP design procedures and requirements, hydromodification management requirements, requirements specific to phased projects, and procedures specific to private developments and public improvement projects;

(2) Updated procedures to identify ~~pollutants and conditions of concern for selecting~~ the most appropriate structural BMPs that consider, at a minimum, the following:

(a) The requirements of E.3.c.(1) and (2)

~~(a)~~(b) Receiving water quality (including pollutants for which receiving waters are listed as impaired under the CWA section 303(d) List);

[32] The BMP Design Manual was formerly known as the Standard Storm Water Mitigation Plan under Order Nos. R9-2007-0001, R9-2009-0002, and R9-2010-0016.

~~(b)~~(c) Pollutants, stressors, and/or receiving water conditions that cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

~~(c)~~(d) Land use type of the project and pollutants associated with that land use type; and

~~(d)~~(e) Pollutants expected to be present onsite.

(3) Updated procedures for designing structural BMPs, including any updated performance requirements to be consistent with the requirements of Provision E.3.c for all structural BMPs listed in the BMP Design Manual;

(4) Long-term maintenance criteria for each structural BMP listed in the BMP Design Manual; and

(5) Alternative compliance criteria, in accordance with the requirements under Provision E.3.c.(3), if the Copermittee elects to allow Priority Development Projects within its jurisdiction to utilize alternative compliance.

e. PRIORITY DEVELOPMENT PROJECT BMP IMPLEMENTATION AND OVERSIGHT

Each Copermittee must implement a program that requires and confirms structural BMPs on all Priority Development Projects are designed, constructed, and maintained to remove pollutants in storm water to the MEP.

(1) Structural BMP Approval and Verification Process

(a) Each Copermittee must require and confirm that for all Priority Development Project applications that have not received prior lawful approval by the Copermittee by 18 months after the commencement of coverage under this Order, the requirements of Provision E.3 are implemented. For project applications that have received prior lawful approval by 18 months after the commencement of coverage under this Order, the Copermittee may allow previous land development requirements to apply.

(b) Each Copermittee must identify the roles and responsibilities of their various municipal departments in implementing the structural BMP requirements, including each stage of a project from application review and approval through BMP maintenance and inspections.

(c) Each Copermittee must require and confirm that appropriate easements and ownerships are properly recorded in public records and the information is conveyed to all appropriate parties when there is a change in project or site ownership.

(d) Each Copermittee must require and confirm that prior to occupancy and/or intended use of any portion of the Priority Development Project, each structural BMP is inspected to verify that it has been constructed and is operating in compliance with all of its specifications, plans, permits, ordinances, and the requirements of this Order.

(2) Priority Development Project Inventory and Prioritization

(a) Each Copermittee must develop, maintain, and update ~~at~~regularly~~at least annually~~, a watershed-based database to track and inventory all constructed Priority Development Projects and associated structural BMPs within its jurisdiction. Inventories must be accurate and complete beginning from January 2002 for the San Diego County Copermittees, February 2003 for the Orange County Copermittees, and July 2005 for the Riverside County Copermittees~~.~~, where data is available.~~.~~ The use of an automated database system, such as GIS, is highly recommended. The database must include, at a minimum, the following information:

(i) Priority Development Project location (address and hydrologic subarea);

(ii) Descriptions of structural BMP type(s);

(iii) Date(s) of construction;

(iv) Party responsible for structural BMP maintenance;

(v) Dates and findings of structural BMP maintenance verifications; and

(vi) Corrective actions and/or resolutions when applicable.

(b) Each Copermittee must prioritize the Priority Development Projects with structural BMPs within its jurisdiction. The designation of Priority Development Projects as high priority must consider the following:

(i) The highest water quality priorities identified in the Water Quality Improvement Plan;

(ii) Receiving water quality;

(iii) Number and sizes of structural BMPs;

(iv) Recommended maintenance frequency of structural BMPs;

(v) Likelihood of operation and maintenance issues of structural BMPs;

(vi) Land use and expected pollutants generated; and

(vii) Compliance record.

(3) Structural BMP Maintenance Verifications and Inspections

Each Copermittee is required to verify that structural BMPs on each Priority

Development Project are adequately maintained, and continue to operate effectively to remove pollutants in storm water to the MEP through inspections, self-certifications, surveys, or other equally effective approaches.

(a) All (100 percent) of the structural BMPs at Priority Development Projects that are designated as high priority must be inspected directly by the Copermittee annually prior to each rainy season;

(b) For verifications performed through a means other than direct Copermittee inspection, adequate documentation must be required by the Copermittee to provide assurance that the required maintenance of structural BMPs at each Priority Development Project has been completed; and

(c) Appropriate follow-up measures (including re-inspections, enforcement, etc.) must be conducted to ensure that structural BMPs at each Priority Development Project continue to reduce pollutants in storm water to the MEP as originally designed.

f. DEVELOPMENT PROJECT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all development projects, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

g. ~~STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS~~

Comment [A99]: This section was moved to the beginning of provision E.3.

~~Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the development planning program to address development and redevelopment projects that may become sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:~~

~~(5) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, increase frequency of verifications and/or inspections, alternative compliance options);~~

~~(6) Each Copermittee must identify areas within its jurisdiction where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting and/or stream, channel, or habitat rehabilitation projects;~~

~~(7) Each Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify regional alternative compliance projects that Priority Development Projects may be allowed or should be encouraged to implement or participate in implementing; and~~

~~(8) The strategies and/or activities must be consistent with the requirements of Provisions E.3.a-c and E.3.e-f and the strategies identified in the Water Quality Improvement Plan.~~

4. Construction Management

Each Copermittee must implement a construction management program in accordance with the strategies identified in the Water Quality Improvement Plan and includes, at a minimum, the following requirements:

STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Comment [A100]: This section was moved from provision E.4.f, Changes are shown in Redline

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented as part of the construction management program to address construction sites that the Copermittee has identified as potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, and/or increase/decrease frequency of inspections for specific types of sites and/or activities); and

(2) The strategies and/or activities must be consistent with the requirements of Provisions E.4.c-e and the strategies identified in the Water Quality Improvement Plan.

(3) The requirements of the programs as outlined in the following sub-provisions may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality improvement Plan(s).

a. PROJECT APPROVAL PROCESS

Prior to issuance of any local permit(s) that allows the commencement of construction projects that involve ground disturbance or soil disturbing activities that has the reasonable potential to discharge a pollutant load to and from the MS4, as defined in each Copermittees' JRMP~~can potentially generate pollutants in storm water runoff~~, each Copermittee must:

(1) Require a ~~site-specific~~ Pollution Control Plan~~pollution control~~, construction BMP, and/or erosion and sediment control plan, to be submitted by the project applicant to the Copermittee;

(2) Confirm the Pollution Control Plan~~pollution control~~, construction BMP, and/or erosion and sediment control plan, complies with the local grading ordinance, other applicable local ordinances, and the requirements of this Order;

(3) Confirm the Pollution Control Plan~~pollution control~~, construction BMP, and/or erosion and sediment control plan, includes seasonally appropriate and effective BMPs and management measures described in Provision E.4.c, as applicable to the project; and

(4) Verify that the project applicant has obtained coverage under ~~applicable permits, including, but not limited to~~ the Construction General Permit~~, Clean Water Act Section 401 Water Quality Certification and Section 404 Permit, and California Department of Fish and Game Streambed Alteration Agreement~~.

b. CONSTRUCTION SITE INVENTORY AND TRACKING

(1) Each Copermittee must maintain, and update ~~at least monthly~~regularly, a watershed-based inventory of all construction projects issued a local permit that allows ground disturbance or soil disturbing activities that can potentially generate pollutants in storm water runoff. The use of an automated database system, such as GIS, is highly recommended. The inventory must include:

(a) Relevant contact information for each site (e.g., name, address, phone, and email for the owner and contractor);

(b) The basic site information including location (address and hydrologic subarea), Waste Discharge Identification (WDID) number (if applicable), size of the site, and approximate area of disturbance;

(c) Whether or not the site is considered a high threat to water quality, as defined in Provision E.4.b.(2) below;

(d) The project start and ~~anticipated~~ completion dates;

~~(e) Current construction phase;~~

~~(f)~~(e) The required inspection frequency, as defined in the Copermittee's jurisdictional runoff management program document;

~~(g)~~(f) The date the Copermittee accepted and/or approved the ~~site-specific~~ pollution control plan, construction BMP, and/or erosion and sediment control plan; and

~~(h)~~(g) Whether or not there are ongoing enforcement actions administered to the site.

Comment [A101]: Some of the info can only be updated based on an inspection, which may or may not be monthly year round for all sites.

Comment [A102]: The anticipated completion date is often unknown and can fluctuate based on unpredictable and unforeseen circumstances. Keeping track of accurate dates in an inventory would be difficult and would not add significant value to the database. Construction Inspectors keep a close eye on the progress of projects and would not need to rely on inventory data to achieve effective stormwater management and oversight. Once a project is completed, the date can be entered into the database,.

(2) Each Copermittee must identify all construction sites within its jurisdiction that represent a high threat to downstream surface water quality. The designation of construction sites as high threat to water quality must consider the following:

(a) Sites located within a hydrologic subarea where sediment is known or suspected to contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Sites located within the same hydrologic subarea and tributary to a water body segment listed as impaired for sediment on the CWA section 303(d) List;

(c) Sites located within, directly adjacent to, or discharging directly to a receiving water within an ESA; and

(d) Other sites determined by the Copermittees or the San Diego Water Board as a high threat to water quality.

c. CONSTRUCTION SITE BMP IMPLEMENTATION

Comment [A103]: See discussion in section 3.9.1 of the comment letter.

Each Copermittee must implement, or require the implementation of effective BMPs (for Copermittee construction sites and private construction sites, respectively) to reduce discharges of pollutants in ~~storm water~~ runoff from construction sites to the MEP, and effectively prohibit~~prevent~~ non-storm water discharges from construction sites into the MS4. These BMPs must be site specific, seasonally appropriate, and construction phase appropriate. BMPs must be implemented at each construction site year round. Dry season BMP implementation must plan for and address unseasonal rain events that may occur during the dry season (May 1 through September 30). Copermittees must implement, or require the implementation of, BMPs in the following categories:

(1) Project Planning;

(2) Good Site Management “Housekeeping”, including waste management;

(3) Non-storm Water Management;

(4) Erosion Control;

(5) Sediment Control;

(6) Run-on and Run-off Control; and

(7) Active/Passive Sediment Treatment Systems, where applicable.

d. CONSTRUCTION SITE INSPECTIONS

Each Copermittee must conduct construction site inspections to require and confirm compliance with its local permits and applicable local ordinances, and the requirements of this Order. Priority for site inspections must consider threat to water quality pursuant to Provision E.4.b as well as the nature of the construction activity, topography, and the characteristics of soils and receiving water quality.

(1) Inspection Frequency

(a) Each Copermittee must conduct inspections at all inventoried sites, including high threat to water quality sites, at an appropriate frequency for each phase of construction to confirm~~ensure~~ the site reduces the discharge of pollutants in runoff~~storm water~~ from construction sites to the MEP, and effectively prevents non-storm water discharges from entering the MS4.

(b) Each Copermittee must establish appropriate inspection frequencies for high threat to water quality sites, and all other sites, for each phase of construction. Inspection frequencies appropriate for addressing the highest water quality priorities identified in the Water Quality Improvement Plan, and for complying with the requirements of this Order must be identified in each Copermittee's jurisdictional runoff management program document.

(c) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e., re-inspection, enforcement) necessary to require and confirm site compliance with its local permits and applicable local ordinances, and the requirements of this Order.

(2) Inspection Content

Inspections of construction sites by the Copermittee must include, at a minimum:

(a) Verification of coverage under the Construction General Permit (Notice of Intent (NOI) and/or WDID number) during initial inspections, when applicable;

(b) Assessment of compliance with its local permits and applicable local ordinances related to pollution prevention, including the implementation and maintenance of applicable BMPs;

(c) Assessment of BMP adequacy and effectiveness;

(d) Visual observations of actual non-storm water discharges;

(e) Visual observations of actual or potential discharge of sediment and/or construction related materials from the site;

(f) Visual observations of actual or potential illicit connections; and

(g) If any violations are found and BMP corrections are needed, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried construction sites. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Site name, location (address and hydrologic subarea), and WDID number (if applicable);

(b) Inspection date;

(c) Weather condition during~~Approximate amount of rainfall since last~~ inspection;

(d) Description of problems observed with BMPs and indication of need for BMP addition/repair/replacement and any scheduled re-inspection, and date of re-inspection;

(e) Descriptions of any other specific inspection comments which must, at a minimum, include rationales for longer compliance time;

(f) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6; and

(g) Resolution of problems noted and date problems fixed.

e. CONSTRUCTION SITE ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried construction sites, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

5. Existing Development Management

Comment [A104]: See discussion in section 3.10 of the comment letter.

Each Copermittee must implement an existing development management program in accordance with the strategies identified in the Water Quality Improvement Plan. and includes, at a minimum, the following requirements:

STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Comment [A105]: Moved from sub-provision e. Changes shown in redline

Each Copermittee must implement the water quality improvement strategies, where necessary, to address areas of existing development within its jurisdiction that are identified as sources of pollutants and/or stressors contributing to the highest priority water quality conditions in the Watershed Management Area. For the existing development management program, the following strategies must be implemented:

(1) Specific Existing Development Management Program Strategies

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented within its jurisdiction to address areas of existing development that the Copermittee has identified as sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(a) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, and/or increase/decrease frequency of inspections for specific types of facilities, areas and/or activities);

(b) The facilities and/or areas within the Copermittee's jurisdiction where the strategies and/or activities will be implemented; and

(2) The requirements of the programs as outlined in the following sub-provisions may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality improvement Plan(s).~~The strategies and/or activities must be consistent with the requirements of Provisions E.5.b-d and the strategies identified in the Water Quality Improvement Plan.~~

a. EXISTING DEVELOPMENT INVENTORY AND TRACKING

Each Copermittee must maintain, and update at least annually, a watershed-based inventory of the existing development within its jurisdiction that ~~may~~has the reasonable potential to~~may~~ discharge a high priority pollutant load to and from the MS4, as defined in the Copermittee's JRMP. The use of an automated database system, such as GIS, is highly recommended. The inventory must, at a minimum, evaluate and include the following if identified as a source of a high priority pollutant~~include~~:

(1) Name, location (hydrological subarea and address, if applicable) of the following types of existing development with its jurisdiction:

(a) Commercial facilities or areas;

(b) Industrial facilities;

(c) Copermittee owned Municipal facilities, including:

(i) MS4 and related structures,[33]

(ii) Roads, streets, and highways,

(iii) Parking facilities,

(iv) Municipal airfields,

(v) Parks and recreation facilities,

(vi) Flood management projects and flood control devices and structures,

(vii) Operating or closed municipal landfills,

(viii) Publicly owned treatment works (including water and wastewater treatment plants) and sanitary sewer collection systems,

(ix) Corporate yards, including maintenance and storage yards for materials, waste, equipment, and vehicles,

(x) Hazardous waste collection facilities,

(xi) Other treatment, storage or disposal facilities for municipal waste, and

(xii) Other Copermittee owned municipal facilities that the Copermittee determines may contribute a significant high priority pollutant load to the MS4; and

(d) Residential areas, which may be designated by one or more of the following:

(i) Residential management area,

(ii) Drainage basin or area,

(iii) Land use (e.g., single family, multi-family, rural),

(iv) Neighborhood,

[33] The inventory may refer to the MS4 map required to be maintained pursuant to Provision E.2.b.(1).

(v) Common Interest Area,

(vi) Home Owner Association,

(vii) Mobile home park, and/or

(viii) Other designations accepted by the San Diego Water Board Executive Officer.

(2) A description of the facility or area, including the following information:

(a) Classification as commercial, industrial, municipal, or residential;

(b) Status of facility or area as active or inactive;

(c) Identification if a business is a mobile business;

(d) SIC Code or NAICS Code, if applicable;

(e) Industrial General Permit NOI and/or WDID number, if applicable;

(f) Identification if a residential area is or includes a Common Interest Area / Home Owner Association, or mobile home park;

(g) Identification of pollutants generated and potentially generated by the facility or area;

(h) Whether the facility or area is adjacent to an ESA;

(i) Whether the facility or area is tributary to and within the same hydrologic subarea as a water body segment listed as impaired on the CWA section 303(d) List and generates pollutants for which the water body segment is impaired; and

(j) Whether the facility or area contributes or potentially contributes to the highest priority water quality conditions identified in the Water Quality Improvement Plan.

(3) An annually updated map showing the location of inventoried existing development, watershed boundaries, and water bodies.

b. EXISTING DEVELOPMENT BMP IMPLEMENTATION AND MAINTENANCE

Each Copermittee must designate a minimum set of BMPs required for all inventoried existing development, including special event venues. The designated minimum BMPs must be specific to facility or area types and pollutant generating activities, as appropriate.

(1) Commercial, Industrial, and Municipal Facilities and Areas

(a) Pollution Prevention

Each Copermittee must require the use of appropriate pollution prevention methods by the commercial, industrial, and municipal facilities and areas in its inventoried existing development, as determined necessary by the Copermittee to address the priorities and strategies addressed in the WQIP.

(b) BMP Implementation

Comment [A106]: See discussion in section 3.10.2 of the comment letter.

Each Copermittee must ~~implement, or~~ require the implementation of, designated BMPs at commercial facilities and areas, industrial facilities, and implement designated BMPs at municipal facilities in its inventoried existing development, as determined necessary by the Copermittee to address the priorities and strategies addressed in the WQIP.

(c) BMP Operation and Maintenance

(i) Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development.

(ii) Each Copermittee must implement a schedule of operation and maintenance activities for its MS4 and related structures (including but not limited to catch basins, storm drain inlets, detention basins, etc.), and verify proper operation of all its municipal structural treatment controls designed to reduce pollutants (including floatables) in storm water discharges to or from its MS4s and related drainage structures. Operation and maintenance activities may include, but is not limited to, the following:

[a] Inspections of the MS4 and related structures;
[b] Cleaning of the MS4 and related structures; and
[c] Proper disposal of materials removed from cleaning of the MS4 and related structures.

(iii) Each Copermittee must implement a schedule of operation and maintenance for public streets, unpaved roads, paved roads, and paved highways and freeways within its jurisdiction to minimize pollutants that can be discharged in storm water.

(iv) Each Copermittee must implement the following controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers:

[a]~~.~~ Copermittees that operate both a municipal sanitary sewer system and a MS4 must implement controls and measures to

prevent and eliminate seeping sewage from infiltrating the MS4.

[b]- Copermittees that do not operate both a municipal sanitary sewer system and a MS4 must coordinate with sewering agencies to keep themselves informed of relevant and appropriate maintenance activities and sanitary sewage projects in their jurisdiction that may cause or contribute to seepage of sewage into the MS4.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Comment [A107]: See discussion in section 3.10.2 of the comment letter.

Each Copermittee must implement BMPs, or require the implementation of BMPs, to reduce pollutants in runoffstorm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from commercial facilities and areas, industrial facilities;, and implement such BMPs at municipal facilities in its inventoried existing development. Such BMPs must include, as appropriate, educational activities, permits, certifications and other measures for applicators and distributors.

(2) Residential Areas

(a) Pollution Prevention

Each Copermittee must promote and encourage the use of pollution prevention methods, where appropriate, by the residential areas in its inventoried existing development.

(b) BMP Implementation

Each Copermittee must promote and encourage the implementation of designated BMPs at residential areas in its inventoried existing development.

(c) BMP Operation and Maintenance

Each Copermittee must properly operate and maintain, or require the proper operation and maintenance of designated BMPs at residential areas in its inventoried existing development.

(d) Pesticides, Herbicides, and Fertilizers BMPs

Each Copermittee must promote and encourage the implementation of BMPs to reduce pollutants in runoffstorm water discharges to the MEP and effectively prohibit non-storm water discharges associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from residential areas in its inventoried existing development.

c. Existing Development Inspections

Each Copermittee must conduct inspections of inventoried existing development that have been identified by the Copermittee as having the reasonable potential to discharge pollutant loads from their MS4, to ensure compliance with applicable local ordinances and permits, and the requirements of this Order.

(1) Inspection Frequency

(a) Each Copermittee must establish appropriate inspection frequencies for inventoried existing development in accordance with the following requirements:

(i) At a minimum, inventoried existing development must be inspected once every five years utilizing one or more of the following methods:

[a] Drive-by inspections by Copermittee municipal and contract staff,
[b] Onsite inspections by Copermittee municipal and contract staff, and/or
[c] Inspections by volunteer monitoring or patrol programs trained by the Copermittee;

(ii) The frequency of inspections must be appropriate to confirm that BMPs are being implemented to reduce the discharge of pollutants in runoff~~storm water~~ from the MS4 to the MEP and effectively prohibit non-storm water discharges to the MS4;

(iii) The frequency of inspections must be based on the potential for a facility or area to discharge non-storm water and pollutants in storm water, and should reflect the priorities set forth in the Water Quality Improvement Plan;

~~(iv) Each Copermittee must annually perform onsite inspections of an equivalent of at least 20 percent of the commercial facilities and areas, industrial facilities, and municipal facilities in its inventoried existing development;[34] and~~

~~(v)~~(iv) Inventoried existing development must be inspected by the Copermittee, as needed, in response to valid public complaints and findings from the Copermittee's municipal and contract staff or volunteer monitoring or patrol program inspections.

(b) Based upon inspection findings, each Copermittee must implement all follow-up actions (i.e. education and outreach, re-inspection, enforcement) necessary to require and confirm compliance with its applicable local

Comment [A108]: Recommend keeping this instead of SD proposed 'during the permit term'. The 'during the permit term' language is problematic for businesses that are added to the inventory during the permit term. For example, if a business is added to the inventory one month before the expiration of the permit, it may not be reasonable to expect it to be immediately inspected. It is also problematic for Riverside (and OC?), who may be added to the permit less than two years before the end of the permit term.

Comment [A109]: See discussion in section 3.10.2 of the comment letter.

~~[34] If any commercial, industrial, or municipal facilities or areas require multiple onsite inspections during any given year, those additional inspection may count toward the total annual inspection requirement. This requirement excludes linear municipal facilities (i.e., MS4, streets, roads and highways).~~

ordinances and permits and the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

(2) Inspection Content

(a) Inspections of existing development by the Copermittee or volunteer monitoring or patrol programs must include, at a minimum:

(i) Visual inspections for actual non-storm water discharges, if present;

(ii) Visual inspections for actual or potential discharge of pollutants, if present;

(iii) Visual inspections for actual or potential illicit connections, if present; and

(iv) Verification that the description of the facility or area in the inventory, required pursuant to Provision E.5.a.(2), has not changed.

(b) Onsite inspections of existing development by the Copermittee must include, at a minimum:

(i) Assessment of compliance with its applicable local ordinances and permits related to non-storm water and storm water discharges and runoff;

(ii) Assessment of the implementation of the designated BMPs;

(iii) Verification of coverage under the Industrial General Permit, when applicable; and

(iv) If any problems or violations are found, inspectors must take and document appropriate actions in accordance with the Enforcement Response Plan pursuant to Provision E.6.

(3) Inspection Tracking and Records

Each Copermittee must track all inspections and re-inspections at all inventoried existing development. The Copermittee must retain all inspection records in an electronic database or tabular format, which must be made available to the San Diego Water Board upon request. Inspection records must include, at a minimum:

(a) Name and location of facility or area (address and hydrologic subarea) consistent with the inventory name and location, pursuant to Provision E.5.a.(1);

(b) Inspection and re-inspection date(s);

(c) Inspection method(s) (i.e. drive-by, onsite);

(d) Observations and findings from the inspection(s);

(e) For onsite inspections of existing development by Copermittee municipal or contract staff, the records must also include, as applicable:

(i) Description of any problems or violations found during the inspection(s),

(ii) Description of enforcement actions issued in accordance with the Enforcement Response Plan pursuant to Provision E.6, and

(iii) The date problems or violations were resolved.

d. EXISTING DEVELOPMENT ENFORCEMENT

Each Copermittee must enforce its legal authority established pursuant to Provision E.1 for all its inventoried existing development, as necessary, to achieve compliance with the requirements of this Order, in accordance with its Enforcement Response Plan pursuant to Provision E.6.

e. RETROFITTING AND REHABILITATION~~STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS~~

~~Each Copermittee must implement the water quality improvement strategies, where necessary, to address areas of existing development within its jurisdiction that are identified as sources of pollutants and/or stressors contributing to the highest priority water quality conditions in the Watershed Management Area. For the existing development management program, the following strategies must be implemented:~~

~~(3) Specific Existing Development Management Program Strategies~~

~~Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented within its jurisdiction to address areas of existing development that the Copermittee has identified as sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:~~

~~(a) Provide specific details about how the strategies and/or activities will be implemented (e.g. designate additional BMPs, focus education, and/or increase/decrease frequency of inspections for specific types of facilities, areas and/or activities);~~

~~(b) The facilities and/or areas within the Copermittee's jurisdiction where the strategies and/or activities will be implemented; and~~

~~(c)~~(a) ~~The strategies and/or activities must be consistent with the requirements of Provisions E.5.b-d and the strategies identified in the Water Quality Improvement Plan.~~

~~(4)~~(3) Retrofitting Areas of Existing Development

Where identified in the WQIP as a required strategy to address the highest priority water quality conditions, each~~Each~~ Copermittee must describe in its jurisdictional runoff management program document, a program to retrofit areas of existing development within its jurisdiction to address identified sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must, where necessary pursuant to the strategies identified in the WQIP, identify areas of existing development as candidates for retrofitting, focusing on areas where retrofitting will address pollutants and/or stressors that contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for retrofitting projects may be utilized to reduce pollutants that may be discharged in storm water from areas of existing development, and/or address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of retrofitting projects, where needed in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance retrofitting projects; and

(e) Where retrofitting projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional retrofitting projects (i.e. projects that can receive and/or treat storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment) adjacent to and/or downstream of the areas of existing development.

~~(5)~~(4) Stream, Channel and/or Habitat Rehabilitation in Areas of Existing Development

Where identified in the WQIP as a required strategy to address the highest priority water quality conditions, each~~Each~~ Copermittee must describe in its jurisdictional runoff management program document, a program to rehabilitate streams, channels, and/or habitats in areas of existing development within its jurisdiction to address the highest priority water quality conditions in the Watershed Management Area. The program must be implemented as follows:

(a) Each Copermittee must, where necessary pursuant to the strategies identified in the WQIP, identify streams, channels, and/or habitats in areas of existing development as candidates for rehabilitation, focusing on areas where stream, channel, and/or habitat rehabilitation projects will address the highest priority water quality conditions identified in the Water Quality Improvement Plan;

(b) Candidates for stream, channel, and/or habitat rehabilitation projects may be utilized to address storm water runoff flows and durations from areas of existing development that cause or contribute to hydromodification in receiving waters, rehabilitate channelized or hydromodified streams, restore wetland and riparian habitat, restore watershed functions, and/or ~~restore~~ protect beneficial uses of receiving waters;

(c) Each Copermittee must develop a strategy to facilitate the implementation of stream, channel, and/or habitat rehabilitation projects, where needed, in areas of existing development identified as candidates;

(d) Each Copermittee should identify areas of existing development where Priority Development Projects may be allowed or should be encouraged to implement or contribute toward the implementation of alternative compliance stream, channel, and/or habitat rehabilitation projects; and

(e) Where stream, channel, and/or habitat rehabilitation projects within specific areas of existing development are determined to be infeasible to address the highest priority water quality conditions in the Water Quality Improvement Plan, the Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify, develop, and implement regional stream, channel, and/or habitat rehabilitation projects (i.e. projects that can receive storm water from one or more areas of existing development and will result in a net benefit to water quality and the environment).

(5) Upon Regional Board Executive Officer approval the Copermittees may reallocate resources in the WQIPs for retrofit and rehabilitation project(s).

6. Enforcement Response Plans

Each Copermittee must develop and implement an Enforcement Response Plan as part of its jurisdictional runoff management program document. The Enforcement Response Plan must describe the applicable approaches and options to enforce its legal authority established pursuant to Provision E.1, as necessary, to achieve compliance with the requirements of this Order. Copermittees may continue to utilize and implement established, equivalent guidelines and procedures for enforcement. If such equivalent guidelines and procedures have not been developed, Tthe Enforcement Response Plan must include the following:

a. ENFORCEMENT RESPONSE PLAN COMPONENTS

The Enforcement Response Plan must include the following individual components:

(1) Illicit Discharge Detection and Elimination Enforcement Component;

(2) Development Planning Enforcement Component;

(3) Construction Management Enforcement Component; and

(4) Existing Development Enforcement Component.

b. ENFORCEMENT RESPONSE APPROACHES AND OPTIONS

Each component of the Enforcement Response Plan must describe the enforcement response approaches that the Copermittee will implement to compel compliance with its statutes, ordinances, permits, contracts, orders, or similar means, and the requirements of this Order. The description must include the protocols for implementing progressively stricter enforcement responses. The enforcement response approaches must include appropriate sanctions, as legally appropriate, to compel compliance, including, at a minimum, the following tools or their equivalent:

(1) Verbal and written notices of violation;

(2) Cleanup requirements;

(3) Fines;

(4) Bonding requirements;

(5) Administrative and criminal (if intentional or criminally negligent) penalties;

(6) Liens;

(7) Stop work orders; and

(8) Permit and occupancy denials.

c. CORRECTION OF VIOLATIONS

(1) Violations must be corrected in a timely manner with the goal of correcting the violations within 30 calendar days after the violations are discovered, or prior to the next predicted rain event, whichever is sooner.

(2) The status of the enforcement actions~~If more than 30 calendar days are required to achieve compliance, then a rationale~~ must be recorded and updated in the applicable electronic database or tabular system used to track violations.

Comment [A110]: This is just asking for paperwork violations if someone forgets to write a specific justification – even if all appropriate steps are being diligently pursued. Request alternatively to simply require that the status be updated as appropriate.

d. ~~ESCALATED~~ PROGRESSIVE ENFORCEMENT

Comment [A111]: See discussion in section 3.11.2 of the comment letter.

(1) The Enforcement Response Plan must include a definition of "~~escalated~~ progressive enforcement." ~~Escalated~~ Progressive enforcement must include a series of enforcement actions that match the severity of the violations and include distinct, progressive steps. ~~any enforcement scenario where a violation or other non-compliance is determined to cause or contribute to the highest priority water quality conditions identified in the Water Quality Improvement Plan~~. ~~Escalated~~ Progressive enforcement may be defined differently for development planning, construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and/or residential areas.

(2) Where the Copermittee determines ~~escalated~~ the identified progressive enforcement steps ~~is~~are not required, a rationale must be recorded in the applicable electronic database or tabular system used to track violations.

(3) ~~Escalated~~ Progressive enforcement actions must continue to increase in severity, as necessary, to compel compliance as soon as possible.

e. REPORTING OF NON-COMPLIANT SITES

(1) Each Copermittee must notify the San Diego Water Board in writing within ~~22~~5 calendar~~2 working~~ days of issuing escalated enforcement (as defined in the Copermittee's Enforcement Response Plan) to a construction site that poses a significant threat to water quality as a result of violations or other non-compliance with its permits and applicable local ordinances, and the requirements of this Order. Written notification may be provided electronically by email.

(2) Each Copermittee must notify the San Diego Water Board of non-filers under the Industrial General Permit and Construction General Permit by email to Nonfilers_R9@waterboards.ca.gov.

7. Public Education and Participation

Each Copermittee must implement, individually or with other Copermittees, a public education and participation program in accordance with the strategies identified in the Water Quality Improvement Plan to promote and encourage the development of programs, management practices, and behaviors that reduce the discharge of pollutants in runoff~~storm water~~ to the MEP, prevent controllable non-storm water discharges from entering the MS4, and protect water quality standards in receiving waters.

STRATEGIES TO ADDRESS THE HIGHEST PRIORITY WATER QUALITY CONDITIONS

Comment [A112]: Recommended move from (c)

Each Copermittee must describe in its jurisdictional runoff management program document the strategies and/or activities that will be implemented within its jurisdiction, as applicable, to educate the public and encourage public participation to address potential sources of pollutants and/or stressors that contribute to the highest priority water quality conditions in the Watershed Management Area as follows:

(1) The target audiences and/or areas within the Copermittee's jurisdiction where the strategies and/or activities will be implemented;

(2) Provide specific details about how the strategies and/or activities will be implemented (e.g. educational topics, materials and/or activities, public outreach and participation programs and/or opportunities);

(3) Each Copermittee should collaborate and cooperate with other Copermittees and/or entities in the Watershed Management Area to identify and implement regional public education and participation activities, programs and opportunities;

(4) Each Copermittee must incorporate a mechanism for evaluating and assessing educational and other public outreach activities, as needed, to identify progress and incorporate modifications necessary to increase the effectiveness of the public education and participation program.

(5) The requirements of the programs as outlined in the following sub-provisions

may be modified and prioritized as appropriate for consistency with the highest water quality priorities and strategies as identified in the corresponding Water Quality improvement Plan(s).

a. PUBLIC EDUCATION

The public education program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) Educational activities, public information activities, and other appropriate outreach activities intended to reduce pollutants associated with the ~~application of pesticides, herbicides and fertilizer- and other pollutants of concern in storm water discharges to and from its MS4 to the MEP, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed to address the~~ highest priority water quality conditions identified in the Water Quality Improvement Plan;

(2) Educational activities, public information activities, and other appropriate outreach activities to facilitate the proper management and disposal of used oil and toxic materials; and

(3) Appropriate education and training measures for specific target audiences, such as construction site operators, residents, underserved target audiences and school-aged children, as determined and prioritized by the Copermittee(s) by jurisdiction and/or watershed, based on high risk behaviors and pollutants of concern.

b. PUBLIC PARTICIPATION

The public participation program component implemented within the Copermittee's jurisdiction must include, at a minimum, the following:

(1) A process for members of the public to participate in updating the highest priority water quality conditions, numeric goals, and water quality improvement strategies in the Water Quality Improvement Plan.

(2) Opportunities for members of the public to participate in providing the Copermittee recommendations for improving the effectiveness of the water quality improvement strategies implemented within its jurisdiction.

(3) Opportunities for members of the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in ~~storm wate~~r discharges from

the MS4, and/or ~~restoration and~~ protection of the quality of receiving waters.

8. Fiscal Analysis

a. ~~Each Copermittee must secure the resources necessary to meet all the requirements of this Order~~.

b. Each Copermittee must conduct an annual fiscal analysis of its jurisdictional runoff management program in its entirety. The fiscal analysis must include the following:

(1) Identification of the various categories of expenditures necessary to implement the requirements of this Order, including a description of the specific capital, operation and maintenance, and other expenditure items to be accounted for in each category of expenditures;

(2) The staff resources needed and allocated to meet the requirements of this Order, including any development, implementation, and enforcement activities required;

(3) The estimated expenditures for Provisions E.8.b.(1) and E.8.b.(2) for the current fiscal year; and

(4) The source(s) of funds that are proposed to meet the necessary expenditures described in Provisions E.8.b.(1) and E.8.b.(2), including legal restrictions on the use of such funds, for the current fiscal year and next fiscal year.

c. Each Copermittee must submit a summary of the annual fiscal analysis with each Annual Report required pursuant to Provision F.3.b.

d. Each Copermittee must provide the documentation used to develop the summary of the annual fiscal analysis upon request by the San Diego Water Board.

Comment [A113]: Since the monitoring period is different than a fiscal year, we won't be able to consistently and accurately report monitoring costs incurred by the Copermittees. (which are a big part of overall budgets)

Comment [A114]: Please see Legal Comments.

F. REPORTING

Comment [A115]: See discussion in section 3.14 of the comment letter.

The purpose of this provision is to determine and document compliance with the requirements set forth in this Order. The goal of reporting is to communicate to the San Diego Water Board and the people of the State of California the implementation status of each jurisdictional runoff management program and compliance with the requirements of this Order. This goal is to be accomplished through the submittal of specific deliverables to the San Diego Water Board by the Copermittees.

1. Water Quality Improvement Plans

Comment [A116]: See discussion in section 3.14.1 of the comment letter.

The Copermittees for each Watershed Management Area must develop and submit the Water Quality Improvement Plan in accordance with the following requirements:

a. WATER QUALITY IMPROVEMENT PLAN DEVELOPMENT

Each Water Quality Improvement Plan must be developed in accordance with the following process:

(1) Priority Water Quality Conditions and Numeric Goals

(a) The Copermittees must implement a public participation process to solicit data and information to be utilized in the development and identification of the priority water quality conditions for the Watershed Management Area.

(b) The Copermittees are encouraged to involve the public and key stakeholders as early and often as possible during the development of the priority water quality conditions and numeric goals to be included in the Water Quality Improvement Plan.

(c) Within 6 months after the commencement of coverage under this Order, the Copermittees must develop and submit the Water Quality Improvement Plan requirements of Provision B.2 to the San Diego Water Board. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of 60 days.

(d) The Copermittees must revise the priority water quality conditions and numeric goals based on comments received and/or recommendations or direction from the San Diego Water Board Executive Officer.

(2) Water Quality Improvement Strategies and Schedules

(a) The Copermittees are encouraged to involve the public and key stakeholders as early and often as possible during the development of the water quality improvement strategies and schedules to be included in the Water Quality Improvement Plan.

(b) Within 9 months after receipt~~the commencement~~ of public comments and/or recommendations from the Executive Officer per (1)(c) above~~coverage under this Order~~, the Copermittees must develop and submit the Water Quality Improvement Plan requirements of Provision B.3 to the San Diego Water Board. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of 60 days.

(c) The Copermittees must revise the water quality improvement strategies and schedules based on comments received and/or recommendations or direction from the San Diego Water Board Executive Officer.

b. WATER QUALITY IMPROVEMENT PLAN SUBMITTAL

(1) Within 6~~18~~ months after receipt~~the commencement~~ of public comments and/or recommendations from the Executive Officer per (2)(c) above~~coverage under this Order~~, the Copermittees for each Watershed Management Area must submit a complete Water Quality Improvement Plan in accordance with the requirements of Provision B to the San Diego Water Board. The San Diego Water Board will issue a public notice and solicit public comments on the Water Quality Improvement Plan for a minimum of 30 days.

(2) Based on the comments received, the San Diego Water Board will determine whether to hold a public hearing or to limit public input to submittal of written comments. If no hearing is held the San Diego Water Board will notify the Copermittees within 6 months that the Water Quality Improvement Plan has been accepted as complete following its review and determination that the Water Quality Improvement Plan meets the requirements of this Order.

(3) The Copermittees must revise the Water Quality Improvement Plan based on comments received and/or recommendations or direction from the San Diego Water Board Executive Officer.

(4) The Water Quality Improvement Plan must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance by the San Diego Water Board.

(5) Copermittees must commence with implementation of the BMP strategies identified in the Water Quality Improvement Plan no later than the fiscal year (July 1) following San Diego Water Board approval of the Water Quality Improvement Plan, and the monitoring strategies identified in the Water Quality Improvement Plan no later than October 1st (or May 1st, whichever is sooner) following the San Diego Water Board approval of the Water Quality Improvement Plan.

2. Updates

Comment [A117]: See discussion in section 3.14.1 of the comment letter.

a. Jurisdictional Runoff Management Program Document Updates

Each Copermittee must update its jurisdictional runoff management program document in accordance with the following requirements:

(1) Each Copermittee is encouraged to involve the public and key stakeholders as early and often as possible to solicit recommendations for updates to its jurisdictional runoff management program document.

(2) Each Copermittee must update its jurisdictional runoff management program document to incorporate the requirements of Provision E and the strategies identified in the applicable WQIPs no later than 6~~18~~ months after approval~~the commencement~~ of the applicable Water Quality Improvement Plans (or updates thereto).~~coverage under this Order.~~

(3) The updated JRMP document must be implemented beginning July 1st following completion of the update, unless directed otherwise by the Executive Officer.

~~(3)~~(4) Each Copermittee must submit any subsequent updates to its jurisdictional runoff management program, with a rationale for the modifications, either in the Annual Report required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge required pursuant to Provision F.5.b.

~~(4)~~(5) The Copermittee must revise the modifications as directed by the San Diego Water Board Executive Officer.

~~(5)~~(6) Updated jurisdictional runoff management program documents must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of submitting the Annual Report.

b. BMP Design Manual Updates

Each Copermittee must update its BMP Design Manual in accordance with the following requirements:

(1) Each Copermittee must update its BMP Design Manual to incorporate the requirements of Provisions E.3.a-d, and E.3.g. no later than 6~~18~~ months after approval~~the commencement~~ of the applicable Water Quality Improvement Plans..

Comment [A118]: This is necessary for the WQIP strategies to inform the Development Planning process

(2) Unless directed otherwise by the San Diego Water Board, the Copermittee must implement the updated BMP Design Manual within 180 days of

Comment [A119]: An implementation date was missing from the Tentative Order

completing updates to the BMP Design Manual.

~~(1)~~(3) Until the Copermittee begins implementation of its updated BMP Design Manual, the Copermittee must continue implementing its current BMP Design Manual~~coverage under this Order~~.

Comment [A120]: This was moved to here

~~(2)~~(4) Subsequent updates must be consistent with the requirements of Provisions E.3.a-d and must be submitted as part of the Annual Reports required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge required pursuant to Provision F.5.b.

~~(3)~~(5) Updated BMP Design Manuals must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of completing the update.

c. WATER QUALITY IMPROVEMENT PLAN UPDATES

The Water Quality Improvement Plans must be updated in accordance with the following process:

(1) The Copermittees must implement a public participation process to solicit data and information to be utilized in updating the Water Quality Improvement Plan.

(2) The Copermittees are encouraged to involve the public and key stakeholders as early and often as possible during the updates to the Water Quality Improvement Plan.

(3) The Copermittees for each Watershed Management Area must submit requested updates to the Water Quality Improvement Plan, with the public input received and the rationale for the requested updates, either in the Annual Reports required pursuant to Provision F.3.b, or as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The requested updates are considered accepted by the San Diego Water Board if no response is provided to the Copermittee after 3 months of submitting the request.

(4) The Copermittees must revise the requested updates as directed by the San Diego Water Board Executive Officer.

(5) Updated Water Quality Improvement Plans must be made available on the Regional Clearinghouse required pursuant to Provision F.4 within 30 days of acceptance of the requested updates by the San Diego Water Board.

3. Progress Reporting

Comment [A121]: See discussion in section 3.14.1 of the comment letter.

a. PROGRESS REPORT PRESENTATIONS

The Copermittees for each Watershed Management Area must appear before the San Diego Water Board, as requested by the San Diego Water Board, to provide progress reports on the implementation of the Water Quality Improvement Plan and jurisdictional runoff management programs.

b. ANNUAL REPORTS

Comment [A122]: See discussion in section 3.14.1 of the comment letter.

(1) Transitional Period JRMP Reports: Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (Attachment D or accepted revision) no later than October 31 of each year prior to the implementation of updated JRMP programs pursuant to F.2.a. Each Copermittee must submit the information on the Jurisdictional Runoff Management Program Annual Report Form specific to the area within its jurisdiction in each Watershed Management Area.

(2) Transitional Period Monitoring Report: The transitional period monitoring conducted pursuant to D.1.a and D.2.a. shall be reported in a single report that covers the entire reporting period from the initiation of the transitional period monitoring (as described in D.1.a and D.2.a.), through September 30th following approval of the Water Quality Improvement Plan. The Transitional Period Monitoring Report shall include the assessments required per D.4.a.(1)(a), D.4.b.(1)(a) and D.4.b.(2)(a); and be submitted by January 31st following completion of the above mentioned transitional period.

~~(1)~~(3) Post-Transitional Annual Reports – Following the initial transitional period after enrollment into this Order, the~~The~~ Copermittees for each Watershed Management Area must submit an combined Annual Report for each reporting period no later than January 31 of the following year. The annual reporting period consists of two periods: 1) July 1 to June 30 of the following year for the jurisdictional runoff management programs, 2) October 1 to September 30 of the following year for the monitoring and assessment programs~~. The first Annual Report must be prepared for the reporting period beginning July 1 after commencement of coverage under this Order, and upon San Diego Water Board determination that the Water Quality Improvement Plan meets the requirements of this Order to June 30 in the following year for the jurisdictional runoff management programs, and September 30 in the following year for the monitoring and assessment programs.~~ Annual Reports must be made available on the Regional Clearinghouse required pursuant to Provision F.4. Each Annual Report must include the following:

(a) The receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, summarized and presented in tabular and graphical form;

(b) Progress of the special studies required pursuant to Provision D.3, and the results or findings when a special study, or each phase of a special study, is completed;

(c) The findings from the applicable assessments required pursuant to Provision D.4;

Comment [A123]: Not all are required annually.

(d) The progress of implementing the Water Quality Improvement Plan, including, but not limited to, the following:

(i) The progress toward achieving the interim and final numeric goals for the highest water quality priorities for the Watershed Management Area,

(ii) The water quality improvement strategies that were implemented and/or no longer implemented by each of the Copermittees during the reporting period and previous reporting periods, and are planned to be implemented during the next reporting period,

(iii) Proposed modifications to the water quality improvement strategies, with public input received and rationale for the proposed modifications,

(iv) Previously proposed modifications or updates incorporated into the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document and implemented by the Copermittees in the Watershed Management Area, and

(v) Proposed modifications or updates to the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document;

(e) A completed Jurisdictional Runoff Management Program Annual Report Form (Attachment D or accepted revision) for each Copermittee in the Watershed Management Area, certified by a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative.

~~(2) Each Copermittee must complete and submit a Jurisdictional Runoff Management Program Annual Report Form (Attachment D or accepted revision) no later than October 31 of each year until the first Annual Report is required to be submitted. Each Copermittee must submit the information on the Jurisdictional Runoff Management Program Annual Report Form specific to the area within its jurisdiction in each Watershed Management Area.~~

Comment [A124]: Adapted into new section (1)

~~(3)~~(4) Each Copermittee must provide any data or documentation utilized in

developing the Annual Report upon request by the San Diego Water Board. ~~Any~~~~Any~~Copermittee~~Any~~ monitoring data utilized in developing the Annual Report must be uploaded to the California Environmental Data Exchange Network (CEDEN).[35] Any Copermittee monitoring and assessment data utilized in developing the Annual Report must be provided on the Regional Clearinghouse required pursuant to Provision F.4.

C. Regional Monitoring and Assessment Report

(1) The Copermittees must submit a Regional Monitoring and Assessment Report no later than 180 days in advance of the expiration date of this Order. The Regional Monitoring and Assessment Report may be submitted as part of the Report of Waste Discharge required pursuant to Provision F.5.b. The Regional Monitoring and Assessment Report shall incorporate the Integrated Assessment of the Water Quality Improvement Plan per D.4.d.

~~(1) The Copermittees must review the receiving water and MS4 outfall discharge monitoring data collected pursuant to Provisions D.1 and D.2, and findings from the assessments required pursuant to Provision D.4, to assess the following:~~

~~(2)~~

~~(3) The beneficial uses of the receiving waters within the San Diego Region that are protected or must be restored;~~

~~(4)~~

~~(5) The progress toward restoring impacted beneficial uses in the receiving waters within the San Diego Region; and~~

~~(6)~~

~~(7) Pollutants or conditions of emerging concern that may impact beneficial uses in the receiving waters within the San Diego Region.~~

~~(8)~~

~~(9) The Regional Monitoring and Assessment Report must include recommendations for improving the implementation and assessment of the Water Quality Improvement Plans and jurisdictional runoff management programs.~~

(2) Each Copermittee must provide any data or documentation utilized in developing the Regional Monitoring and Assessment Report upon request by the San Diego Water Board. Any monitoring and assessment data utilized in developing the Regional Monitoring and Assessment Report must be provided on the Regional Clearinghouse required pursuant to Provision F.4.

[35] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

4. Regional Clearinghouse

The Copermittees must develop, update, and maintain an internet-based Regional Clearinghouse that is made available to the public no later than 18 months after the effective date of this Order.[36]

a. The Copermittees, through the Regional Clearinghouse, must make the following documents and data available, organized by Watershed Management Area, which may be linked to other internet-based data portals and databases where the original documents are stored:

(1) Water Quality Improvement Plan for the Watershed Management Area, and all updated versions with date of update;

(2) Annual Reports for the Watershed Management Area;

(3) Jurisdictional Runoff Management Program document for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(4) BMP Design Manual for each Copermittee within the Watershed Management Area, and all updated versions with date of update;

(5) Reports from special studies (e.g. source identification, BMP effectiveness assessment) conducted in the Watershed Management Area;

(6) Monitoring data collected pursuant to Provision D for each Watershed Management Area must be uploaded to CEDEN,[37] with links to the uploaded data; and

(7) Available GIS data, layers, and/or shapefiles used to develop the maps generated and maintained by the Copermittees for the Water Quality Improvement Plans, Annual Reports, and jurisdictional runoff management program documents.

b. The Copermittees, through the Regional Clearinghouse, must make the following information and documents available:

(1) Contact information (point of contact, phone number, email address, and mailing address) for each Copermittee;

[36] The Copermittee may elect to develop and maintain the clearinghouse(s) provided by other Copermittees or agencies.

[37] Data must be uploaded to CEDEN Southern California Regional Data Center (http://www.sccwrp.org/Data/DataSubmission/SouthernCaliforniaRegionalDataCenter.aspx) using the templates provided on the CEDEN website.

(2) Public hotline number for reporting non-storm water and illicit discharges for each Copermittee;

(3) Email address for reporting non-storm water and illicit discharges for each Copermittee;

(4) Link to each Copermittee's website, if available, where the public may find additional information about the Copermittee's storm water management program and for requesting records for the implementation of its program;

(5) Information about opportunities for the public to participate in programs and/or activities that can result in the prevention or elimination of non-storm water discharges to the MS4, reduction of pollutants in ~~storm water~~ discharges from the MS4, and/or restoration and protection of the quality of receiving waters; and

(6) Reports from regional monitoring programs in which the Copermittees participate (e.g. Southern California Monitoring Coalition, Southern California Coastal Water Research Project Bight Monitoring);

(7) Regional Monitoring and Assessment Reports; and

(8) Any other information, data, and documents the Copermittees determine as appropriate for making available to the public.

5. Report of Waste Discharge

a. The Orange County Copermittees and the Riverside County Copermittees are required to submit a complete Report of Waste Discharge pursuant to the requirements of their current Orders. The San Diego Water Board will review and consider the Reports of Waste Discharge to determine whether modification to this Order, pursuant to the requirements of Provision H, will be required prior the Orange County Copermittees and/or Riverside County Copermittees becoming covered under this Order. The current Orders for the Orange County Copermittees and Riverside County Copermittees are rescinded upon notification of coverage under this Order except for enforcement purposes.

b. The Copermittees subject to the requirements of this Order must submit to the San Diego Water Board a complete Report of Waste Discharge as an application for the re-issuance of this Order and NPDES permit. The Report of Waste Discharge must be submitted no later than 180 days in advance of the expiration date of this Order. The Report of Waste Discharge must contain the following minimum information:

(1) Names and addresses of the Copermittees;

(2) Names and titles of the primary contacts of the Copermittees;

(3) Proposed changes to the Copermittees' Water Quality Improvement Plans and the supporting justification;

(4) Proposed changes to the Copermittees' jurisdictional runoff management programs and the supporting justification;

(5) Any other information necessary for the re-issuance of this Order;

(6) Any information to be included as part of the Report of Waste Discharge pursuant to the requirements of this Order; and

(7) Any other information required by federal regulations for NPDES permit reissuance.

6. Application for Early Coverage

a. The Orange County Copermittees, collectively, or Riverside County Copermittees, collectively, may apply for early coverage under this Order by submitting a Report of Waste Discharge Form 200, with a written request for early coverage under this Order.

Comment [A125]: This form requests information that is not applicable to MS4s.

b. The San Diego Water Board will review the application for early coverage. A notification of coverage under this Order will be issued to the Copermittees in the respective county by the San Diego Water Board upon completion of the early coverage application requirements. The effective coverage date will be specified in the notification of coverage. The Copermittees in the respective county are authorized to have MS4 discharges pursuant to the requirements of this Order starting on the effective coverage date specified in the notification of coverage. The existing Order for the respective county is rescinded upon the effective coverage date specified in the notification of coverage except for enforcement purposes.

7. Reporting Provisions

Each Copermittee must comply with all the reporting and recordkeeping provisions of the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

G. PRINCIPAL WATERSHED COPERMITTEE RESPONSIBILITIES

1. The Copermittees within each Watershed Management Area must designate a Principal Watershed Copermittee and notify the San Diego Water Board of the name of the Principal Watershed Copermittee. ~~An individual Copermittee should not be designated a Principal Watershed Copermittee for more than two Watershed Management Areas.~~ The notification may be submitted with the Water Quality Improvement Plan required pursuant to Provision F.1 of this Order.

2. The Principal Watershed Copermittee is responsible for, at a minimum, the following:

a. Serving as liaison between the Copermittees in the Watershed Management Area and the San Diego Water Board on general permit issues, and when necessary and appropriate, representing the Copermittees in the Watershed Management Area before the San Diego Water Board.

b. Facilitating the development of the Water Quality Improvement Plan in accordance with the requirements of Provision B of this Order

c. Coordinating the submittal of the deliverables required by Provisions F.1, F.2, F.3.a, and F.3.b of this Order.

d. Coordinating the development of~~and developing~~, with the other Principal Watershed Copermittees, the requirements of Provisions F.3.c, F.4, and F.5.b of this Order.

H. MODIFICATION OF PROGRAMS

1. Modifications of the Order may be initiated by the San Diego Water Board or by the Copermittees, including as part of the ROWD process applicable to the Orange County and Riverside County Copermittees. Requests by Copermittees must be made to the San Diego Water Board.

2. Minor modifications to the Order may be made by the San Diego Water Board Executive Officer, where the proposed modification complies with all the effective prohibitions and limitations, and other requirements of this Order.

3. Proposed modifications to the Order outside of the WQIP process that are not minor require amendment of this Order in accordance with this Order's rules, policies, and procedures.

4. The San Diego Water Board may re-open and modify this Order at any time prior to its expiration, after opportunity for public comment and a public hearing, if the State Water Board determines that revisions are warranted to those provisions of the Order addressing compliance with water quality standards in the receiving water and/or those provisions of the Order establishing an iterative process for implementation of management practices to assure compliance with water quality standards in the receiving water.

I. STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

Each Copermittee must comply with all the Standard Permit Provisions and General Provisions contained in Attachment B to this Order.

ATTACHMENT A

DISCHARGE PROHIBITIONS AND SPECIAL PROTECTIONS

1. Basin Plan Waste Discharge Prohibitions

California Water Code Section 13243 provides that a Regional Water Board, in a water quality control plan, may specify certain conditions or areas where the discharge of waste or certain types of waste is not permitted. The following waste discharge effective prohibitions in the Water Quality Control Plan for the San Diego Basin (Basin Plan) are applicable to any person, as defined by Section 13050(c) of the California Water Code, who is a citizen, domiciliary, or political agency or entity of California whose activities in California could affect the quality of waters of the state within the boundaries of the San Diego Region.

1. The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in California Water Code Section 13050, is prohibited.

2. The discharge of waste to land, except as authorized by waste discharge requirements or the terms described in California Water Code Section 13264 is prohibited.

3. The discharge of pollutants or dredged or fill material to waters of the United States except as authorized by a National Pollutant Discharge Elimination System (NPDES) permit or a dredged or fill material permit (subject to the exemption described in California Water Code Section 13376) is prohibited.

4. Discharges of recycled water to lakes or reservoirs used for municipal water supply or to inland surface water tributaries thereto are prohibited, unless this San Diego Water Board issues a NPDES permit authorizing such a discharge; the proposed discharge has been approved by the State Department of Health Services (DHS) and the operating agency of the impacted reservoir; and the discharger has an approved fail-safe long-term disposal alternative.

5. The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the San Diego Water Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

6. The discharge of waste in a manner causing flow, ponding, or surfacing on lands not owned or under the control of the discharger is prohibited, unless the discharge is authorized by the San Diego Water Board.

7. The dumping, deposition, or discharge of waste directly into waters of the state, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the San Diego Water Board.

8. Any discharge to a storm water conveyance system that is not composed entirely of "*storm water*" is effectively prohibited unless authorized by the San Diego Water Board. [The federal regulations, 40 CFR 122.26(b)(13), define storm water as storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from fire fighting activities.] [§122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

9. The unauthorized discharge of treated or untreated sewage to waters of the state or to a storm water conveyance system is prohibited.

10. The discharge of industrial wastes to conventional septic tank/subsurface disposal systems, except as authorized by the terms described in California Water Code Section 13264, is prohibited.

11. The discharge of radioactive wastes amenable to alternative methods of disposal into the waters of the state is prohibited.

12. The discharge of any radiological, chemical, or biological warfare agent into waters of the state is prohibited.

13. The discharge of waste into a natural or excavated site below historic water levels is prohibited unless the discharge is authorized by the San Diego Water Board.

14. The discharge of sand, silt, clay, or other earthen materials from any activity, including land grading and construction, in quantities which cause deleterious bottom deposits, turbidity or discoloration in waters of the state or which unreasonably affect, or threaten to affect, beneficial uses of such waters is prohibited.

15. The discharge of treated or untreated sewage from vessels to Mission Bay, Oceanside Harbor, Dana Point Harbor, or other small boat harbors is prohibited.

16. The discharge of untreated sewage from vessels to San Diego Bay is prohibited.

17. The discharge of treated sewage from vessels to portions of San Diego Bay that are less than 30 feet deep at mean lower low water (MLLW) is prohibited.

18. The discharge of treated sewage from vessels, which do not have a properly functioning US Coast Guard certified Type I or Type II marine sanitation device, to portions of San Diego Bay that are greater than 30 feet deep at mean lower low water (MLLW) is prohibited.

2. Attachment B to State Water Board Resolution 2012-0012

Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges

I. PROVISIONS FOR POINT SOURCE DISCHARGES OF STORM WATER AND NONPOINT SOURCE WASTE DISCHARGES

The following terms, effective prohibitions, and special conditions (hereafter collectively referred to as special conditions) are established as limitations on point source storm water and nonpoint source discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in Areas of Special Biological Significance (ASBS), as required for State Water Quality Protection Areas pursuant to California Public Resources Code Sections 36700(f) and 36710(f). These Special Protections are adopted by the State Water Board as part of the California Ocean Plan (Ocean Plan) General Exception.

The special conditions are organized by category of discharge. The State Water Resources Control Board (State Water Board) and Regional Water Quality Control Boards (Regional Water Boards) will determine categories and the means of regulation for those categories [e.g., Point Source Storm Water National Pollutant Discharge Elimination System (NPDES) or Nonpoint Source].

A. PERMITTED POINT SOURCE DISCHARGES OF STORM WATER

1. General Provisions for Permitted Point Source Discharges of Storm Water

   a. Existing storm water discharges into an ASBS are allowed only under the following conditions:

      (1) The discharges are authorized by an NPDES permit issued by the State Water Board or Regional Water Board;

      (2) The discharges comply with all of the applicable terms, effective prohibitions, and special conditions contained in these Special Protections; and

      (3) The discharges:

         (i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

         (ii) Are designed to prevent soil erosion;

         (iii) Occur only during wet weather;

         (iv) Are composed of only storm water runoff.

   b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

   c. The discharge of trash is effectively prohibited.

d. Only discharges from existing storm water outfalls are allowed. Any proposed or new storm water runoff discharge shall be routed to existing storm water discharge outfalls and shall not result in any new contribution of waste to an ASBS (i.e., no additional pollutant loading). “Existing storm water outfalls” are those that were constructed or under construction prior to January 1, 2005. “New contribution of waste” is defined as any addition of waste beyond what would have occurred as of January 1, 2005. A change to an existing storm water outfall, in terms of re-location or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges are effectively prohibited except as provided below:

(1) The term “non-storm water discharges” means any waste discharges from a municipal separate storm sewer system (MS4) or other NPDES permitted storm drain system to an ASBS that are not composed entirely of storm water.

(2) (i) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability or occur naturally:

(a) Discharges associated with emergency fire fighting operations.

(b) Foundation and footing drains.

(c) Water from crawl space or basement pumps.

(d) Hillside dewatering.

(e) Naturally occurring groundwater seepage via a storm drain.

(f) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(ii) An NPDES permitting authority may authorize non-storm water discharges to an MS4 with a direct discharge to an ASBS only to the extent the NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

2. Compliance Plans for Inclusion in Storm Water Management Plans (SWMP) and Storm Water Pollution Prevention Plans (SWPPP).

The discharger shall specifically address the effective prohibition of non-storm water runoff and the requirement to maintain natural water quality for storm water discharges to an ASBS in an ASBS Compliance Plan to be included in its SWMP or a SWPPP, as appropriate to permit type. If a statewide permit includes a SWMP, then the discharger shall prepare a stand-alone compliance plan for ASBS discharges. The ASBS Compliance Plan is subject to approval by the Executive Director of the State Water Board (statewide permits) or

Executive Officer of the Regional Water Board (for permits issued by Regional Water Boards).

a. The Compliance Plan shall include a map of surface drainage of storm water runoff, showing areas of sheet runoff, prioritize discharges, and describe any structural Best Management Practices (BMPs) already employed and/or BMPs to be employed in the future. Priority discharges are those that pose the greatest water quality threat and which are identified to require installation of structural BMPs. The map shall also show the storm water conveyances in relation to other features such as service areas, sewage conveyances and treatment facilities, landslides, areas prone to erosion, and waste and hazardous material storage areas, if applicable. The SWMP or SWPPP shall also include a procedure for updating the map and plan when changes are made to the storm water conveyance facilities.

b. The ASBS Compliance Plan shall describe the measures by which all non-authorized non-storm water runoff (e.g., dry weather flows) has been eliminated, how these measures will be maintained over time, and how these measures are monitored and documented.

c. For Municipal Separate Storm Sewer System (MS4s), the ASBS Compliance Plan shall require minimum inspection frequencies as follows:

   (1) The minimum inspection frequency for construction sites shall be weekly during rainy season;

   (2) The minimum inspection frequency for industrial facilities shall be monthly during the rainy season;

   (3) The minimum inspection frequency for commercial facilities (e.g., restaurants) shall be twice during the rainy season; and

   (4) Storm water outfall drains equal to or greater than 18 inches (457 mm) in diameter or width shall be inspected once prior to the beginning of the rainy season and once during the rainy season and maintained to remove trash and other anthropogenic debris.

d. The ASBS Compliance Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff, that are necessary to comply with these special conditions, will be achieved through BMPs. Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that such installation would pose a threat to health or safety. BMPs to control storm water runoff discharges (at the end-of-pipe) during a design storm shall be designed to achieve on average the following target levels:

   (1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

   (2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges. The baseline for the reduction is the effective date of the Exception. The

baseline for these determinations is the effective date of the Exception, and the reductions must be achieved and documented within four (4) years of the effective date.

e. The ASBS Compliance Plan shall address erosion control and the prevention of anthropogenic sedimentation in ASBS. The natural habitat conditions in the ASBS shall not be altered as a result of anthropogenic sedimentation.

f. The ASBS Compliance Plan shall describe the non-structural BMPs currently employed and planned in the future (including those for construction activities), and include an implementation schedule. The ASBS Compliance Plan shall include non-structural BMPs that address public education and outreach. Education and outreach efforts must adequately inform the public that direct discharges of pollutants from private property not entering an MS4 are effectively prohibited. The ASBS Compliance Plan shall also describe the structural BMPs, including any low impact development (LID) measures, currently employed and planned for higher threat discharges and include an implementation schedule. To control storm water runoff discharges (at the end-of-pipe) during a design storm, permittees must first consider using LID practices to infiltrate, use, or evapotranspirate storm water runoff on-site.

g. The BMPs and implementation schedule shall be designed to ensure that natural water quality conditions in the receiving water are achieved and maintained by either reducing flows from impervious surfaces or reducing pollutant loading, or some combination thereof.

h. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents in storm water runoff that alter natural ocean water quality and the sources of these constituents.

(2) The report shall describe BMPs that are currently being implemented, BMPs that are identified in the SWMP or SWPPP for future implementation, and any additional BMPs that may be added to the SWMP or SWPPP to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the BMPs.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits), the discharger shall revise its ASBS Compliance Plan to incorporate any new or modified BMPs that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised SWMP or SWPPP, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural ocean water quality conditions due to the same constituent.

(5) Compliance with this section does not excuse violations of any term, effective prohibition, or condition contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within one year from the effective date of the Exception, the discharger shall submit a written ASBS Compliance Plan to the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that describes its strategy to comply with these special conditions, including the requirement to maintain natural water quality in the affected ASBS. The ASBS Compliance Plan shall include a time schedule to implement appropriate non-structural and structural controls (implementation schedule) to comply with these special conditions for inclusion in the discharger's SWMP or SWPPP, as appropriate to permit type.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these special conditions shall be implemented.

d. Within four (4) years of the effective date of the Exception, any structural controls identified in the ASBS Compliance Plan that are necessary to comply with these special conditions shall be operational.

e. Within four (4) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water, pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data, and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

(1) for municipalities, a demonstration of significant hardship to discharger ratepayers, by showing the relationship of storm water fees to annual household income for residents within the discharger's jurisdictional area, and the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or
(2) for other governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process.

B. NONPOINT SOURCE DISCHARGES

[NOT INCLUDED]
[PROVISIONS FOR NONPOINT SOURCE DISCHARGES NOT APPLICABLE]

II. ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES

[NOT INCLUDED]
[ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES NOT APPLICABLE]

III. ADDITIONAL REQUIREMENTS – WATERFRONT AND MARINE OPERATIONS

[NOT INCLUDED]
[ADDITIONAL REQUIREMENTS FOR WATERFRONT AND MARINE OPERATIONS NOT APPLICABLE]

IV. MONITORING REQUIREMENTS

Monitoring is mandatory for all dischargers to assure compliance with the Ocean Plan. Monitoring requirements include both: (A) core discharge monitoring, and (B) ocean receiving water monitoring. The State and Regional Water Boards must approve sampling site locations and any adjustments to the monitoring programs. All ocean receiving water and reference area monitoring must be comparable with the Water Boards' Surface Water Ambient Monitoring Program (SWAMP).

Safety concerns: Sample locations and sampling periods must be determined considering safety issues. Sampling may be postponed upon notification to the State and Regional Water Boards if hazardous conditions prevail.

Analytical Chemistry Methods: All constituents must be analyzed using the lowest minimum detection limits comparable to the Ocean Plan water quality objectives. For metal analysis, all samples, including storm water effluent, reference samples, and ocean receiving water samples, must be analyzed by the approved analytical method with the lowest minimum detection limits (currently Inductively Coupled Plasma/Mass Spectrometry) described in the Ocean Plan.

A. CORE DISCHARGE MONITORING PROGRAM

1. General sampling requirements for timing and storm size:

   Runoff must be collected during a storm event that is greater than 0.1 inch and generates runoff, and at least 72 hours from the previously measurable storm event. Runoff samples shall be collected when post-storm receiving water is sampled, and analyzed for the same constituents as receiving water and reference site samples (see section IV B) as described below.

2. Runoff flow measurements

   a. For municipal/industrial storm water outfalls in existence as of December 31, 2007, 18 inches (457mm) or greater in diameter/width (including multiple outfall pipes in combination having a width of 18 inches, runoff flows must be measured or calculated, using a method acceptable to and approved by the State and Regional Water Boards.
   b. This will be reported annually for each precipitation season to the State and Regional Water Boards.

3. Runoff samples – storm events

   a. For outfalls equal to or greater than 18 inches (0.46m) in diameter or width:

      (1) samples of storm water runoff shall be analyzed during the same storm as receiving water samples for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination, ; and

      (2) samples of storm water runoff shall be analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS

      (3) If an applicant has no outfall greater than 36 inches, then storm water runoff from the applicant's largest outfall shall be further analyzed during the same storm as receiving water samples for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates).

   b. For outfalls equal to or greater than 36 inches (0.91m) in diameter or width:

      (1) samples of storm water runoff shall be analyzed during the same storm as receiving water samples for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

      (2) samples of storm water runoff shall be further analyzed during the same storm as receiving water samples for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides

(pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates) and

(3) samples of storm water runoff shall be analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

c. For an applicant not participating in a regional monitoring program [see below in Section IV (B)] in addition to (a.) and (b.) above, a minimum of the two largest outfalls or 20 percent of the larger outfalls, whichever is greater, shall be sampled (flow weighted composite samples) at least three times annually during wet weather (storm event) and analyzed for all Ocean Plan Table A constituents, Table B constituents for marine aquatic life protection (except for toxicity, only chronic toxicity for three species shall be required), DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, and Ocean Plan indicator bacteria. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one (the largest) such discharge shall be sampled annually in each Region.

4. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may reduce or suspend core monitoring once the storm runoff is fully characterized. This determination may be made at any point after the discharge is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

B. OCEAN RECEIVING WATER AND REFERENCE AREA MONITORING PROGRAM

In addition to performing the Core Discharge Monitoring Program in Section II.A above, all applicants having authorized discharges must perform ocean receiving water monitoring. In order to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS, dischargers may choose either (1) an individual monitoring program, or (2) participation in a regional integrated monitoring program.

1. Individual Monitoring Program: The requirements listed below are for those dischargers who elect to perform an individual monitoring program to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within the affected ASBS. In addition to Core Discharge Monitoring, the following additional monitoring requirements shall be met:

   a. Three times annually, during wet weather (storm events), the receiving water at the point of discharge from the outfalls described in section (IV)(A)(3)(c) above shall be sampled and analyzed for Ocean Plan Table A constituents, Table B constituents for marine aquatic life, DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, salinity, chronic toxicity (three species), and Ocean Plan indicator bacteria.

      The sample location for the ocean receiving water shall be in the surf zone at the point of discharges; this must be at the same location where storm water runoff is sampled. Receiving water shall be sampled at approximately the same time prior to (pre-storm) and during (or immediately after) the same storm (post storm). Reference water quality shall also be sampled and analyzed for the same constituents pre-storm and post-storm, during the same storms when receiving water is sampled. Reference stations will be

determined by the State Water Board's Division of Water Quality and the applicable Regional Water Board(s).

b. Sediment sampling shall occur at least three times during every five (5) year period. The subtidal sediment (sand or finer, if present) at the discharge shall be sampled and analyzed for Ocean Plan Table B constituents for marine aquatic life, DDT, PCBs, PAHs, pyrethroids, and OP pesticides. For sediment toxicity testing, only an acute toxicity test using the amphipod Eohaustorius estuarius must be performed.

c. A quantitative survey of intertidal benthic marine life shall be performed at the discharge and at a reference site. The survey shall be performed at least once every five (5) year period. The survey design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The results of the survey shall be completed and submitted to the State Water Board and Regional Water Board at least six months prior to the end of the permit cycle.

d. Once during each five (5) year period, a bioaccumulation study shall be conducted to determine the concentrations of metals and synthetic organic pollutants at representative discharge sites and at representative reference sites. The study design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The bioaccumulation study may include California mussels (Mytilus californianus) and/or sand crabs (Emerita analoga or Blepharipoda occidentalis). Based on the study results, the Regional Water Board and the State Water Board's Division of Water Quality, may adjust the study design in subsequent permits, or add or modify additional test organisms (such as shore crabs or fish), or modify the study design appropriate for the area and best available sensitive measures of contaminant exposure.

e. Marine Debris: Representative quantitative observations for trash by type and source shall be performed along the coast of the ASBS within the influence of the discharger's outfalls. The design, including locations and frequency, of the marine debris observations is subject to approval by the Regional Water Board and State Water Board's Division of Water Quality.

f. The monitoring requirements of the Individual Monitoring Program in this section are minimum requirements. After a minimum of one (1) year of continuous water quality monitoring of the discharges and ocean receiving waters, the Executive Director of the State Water Board (statewide permits) or Executive officer of the Regional Water Board (Regional Water Board permits) may require additional monitoring, or adjust, reduce or suspend receiving water and reference station monitoring. This determination may be made at any point after the discharge and receiving water is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

2. Regional Integrated Monitoring Program: Dischargers may elect to participate in a regional integrated monitoring program, in lieu of an individual monitoring program, to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS. This regional approach shall characterize natural water quality, pre- and post-storm, in ocean reference areas near the mouths of identified open space watersheds and the effects of the discharges on natural water quality (physical, chemical, and toxicity) in the ASBS receiving waters, and should include benthic marine aquatic life and bioaccumulation components. The design of the ASBS stratum of a regional integrated monitoring program may deviate from the otherwise prescribed individual

monitoring approach (in Section IV.B.1) if approved by the State Water Board's Division of Water Quality and the Regional Water Boards.

a. Ocean reference areas shall be located at the drainages of flowing watersheds with minimal development (in no instance more than 10% development), and shall not be located in CWA Section 303(d) listed waterbodies or have tributaries that are 303(d) listed. Reference areas shall be free of wastewater discharges and anthropogenic non-storm water runoff. A minimum of low threat storm runoff discharges (e.g. stream highway overpasses and campgrounds) may be allowed on a case-by-case basis. Reference areas shall be located in the same region as the ASBS receiving water monitoring occurs. The reference areas for each Region are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean reference water samples must be collected from each station, each from a separate storm. A minimum of one reference location shall be sampled for each ASBS receiving water site sampled per responsible party. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

b. ASBS ocean receiving water must be sampled in the surf zone at the location where the runoff makes contact with ocean water (i.e. at "point zero"). Ocean receiving water stations must be representative of worst-case discharge conditions (i.e. co-located at a large drain greater than 36 inches, or if drains greater than 36 inches are not present in the ASBS then the largest drain greater than18 inches.) Ocean receiving water stations are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean receiving water samples must be collected during each storm season from each station, each from a separate storm. A minimum of one receiving water location shall be sampled in each ASBS per responsible party in that ASBS. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

c. Reference and receiving water sampling shall commence during the first full storm season following the adoption of these special conditions, and post-storm samples shall be collected when annual storm water runoff is sampled. Sampling shall occur in a minimum of two storm seasons. For those ASBS dischargers that have already participated in the Southern California Bight 2008 ASBS regional monitoring effort, sampling may be limited to only one storm season.

d. Receiving water and reference samples shall be analyzed for the same constituents as storm water runoff samples. At a minimum, constituents to be sampled and analyzed in reference and discharge receiving waters must include oil and grease, total suspended solids, Ocean Plan Table B metals for protection of marine life, Ocean Plan PAHs, pyrethroids, OP pesticides, ammonia, nitrate, phosphates, and critical life stage chronic toxicity for three species. In addition, within the range of the southern sea otter, indicator bacteria or some other measure of fecal contamination shall be analyzed.

3. Waterfront and Marine Operations: In addition to the above requirements for ocean receiving water monitoring, additional monitoring must be performed for marinas and boat launch and pier facilities:

a. For all marina or mooring field operators, in mooring fields with 10 or more occupied moorings, the ocean receiving water must be sampled for Ocean Plan indicator bacteria, residual chlorine, copper, zinc, grease and oil, methylene blue active substances (MBAS), and ammonia nitrogen.

   (1) For mooring field operators opting for an individual monitoring program (Section IV.B.1 above), this sampling must occur weekly (on the weekend) from May through October.

   (2) For mooring field operators opting to participate in a regional integrated monitoring program (Section IV.B.2 above), this sampling must occur monthly from May through October on a high use weekend in each month. The Water Boards may allow a reduction in the frequency of sampling, through the regional monitoring program, after the first year of monitoring.

b. For all mooring field operators, the subtidal sediment (sand or finer, if present) within mooring fields and below piers shall be sampled and analyzed for Ocean Plan Table B metals (for marine aquatic life beneficial use), acute toxicity, PAHs, and tributyltin. For sediment toxicity testing, only an acute toxicity test using the amphipod Eohaustorius estuarius must be performed. This sampling shall occur at least three times during a five (5) year period. For mooring field operators opting to participate in a regional integrated monitoring program, the Water Boards may allow a reduction in the frequency of sampling after the first sampling effort's results are assessed.

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ATTACHMENT B

STANDARD PERMIT PROVISIONS AND GENERAL PROVISIONS

1. Standard Permit Provisions

Code of Federal Regulations Title 40 Section 122.41 (40 CFR 122.41) includes conditions, or provisions, that apply to all National Pollutant Discharge Elimination System (NPDES) permits. Additional provisions applicable to NPDES permits are in 40 CFR 122.42. All applicable provisions in 40 CFR 122.41 and 40 CFR 122.42 must be incorporated into this Order and NPDES permit. The applicable 40 CFR 122.41 and 40 CFR 122.42 provisions are as follows:

a. DUTY TO COMPLY [40 CFR 122.41(a)]

The Copermittee must comply with all of the provisions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

(1) The Copermittee must comply with effluent standards or effective prohibitions established under Section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or effective prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement. [40 CFR 122.41(a)(1)]

(2) The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to a civil penalty not to exceed $25,000 per day for each violation. The CWA provides that any person who *negligently* violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, or any requirement imposed in a pretreatment program approved under Section 402(a)(3) or 402(b)(8) of the CWA, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than 2 years, or both. Any person who *knowingly* violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both. Any person who knowingly violates Section 301, 302, 303, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA, and who knows at that time that he thereby places another person in imminent danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of

not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in Section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.
[40 CFR 122.41(a)(2)]

(3) Any person may be assessed an administrative penalty by the San Diego Regional Water Quality Control Board (San Diego Water Board), State Water Resources Control Board (State Water Board), or United States Environmental Protection Agency (USEPA) for violating Section 301, 302, 306, 307, 308, 318 or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000.
[40 CFR 122.41(a)(3)]

b. DUTY TO REAPPLY [40 CFR 122.41(b)]

If a Copermittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Copermittee must apply for and obtain a new permit.

c. NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE [40 CFR 122.41(c)]

It shall not be a defense for a Copermittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

d. DUTY TO MITIGATE [40 CFR 122.41(d)]

The Copermittee must take all reasonable steps to minimize or prevent any discharge or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

e. PROPER OPERATION AND MAINTENANCE [40 CFR 122.41(e)]

The Copermittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Copermittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by a Copermittee only when the operation is necessary to achieve compliance with the conditions of this permit.

f. PERMIT ACTIONS [40 CFR 122.41(f)]

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Copermittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

g. PROPERTY RIGHTS [40 CFR 122.41(g)]

This permit does not convey any property rights of any sort, or any exclusive privilege.

h. DUTY TO PROVIDE INFORMATION [40 CFR 122.41(h)]

The Copermittee must furnish to the San Diego Water Board, State Water Board, or USEPA within a reasonable time, any information which the San Diego Water Board, State Water Board, or USPEA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Copermittee must also furnish to the San Diego Water Board, State Water Board, or USPEA upon request, copies of records required to be kept by this permit.

i. INSPECTION AND ENTRY [40 CFR 122.41(i)]

The Copermittee must allow the San Diego Water Board, State Water Board, USEPA, and/or their authorized representative (including an authorized contractor acting as their representative), upon presentation of credentials and other documents as may be required by law, to:

(1) Enter upon the Copermittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit; [40 CFR 122.41(i)(1)]

(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit; [40 CFR 122.41(i)(2)]

(3) Inspect and photograph at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; [40 CFR 122.41(i)(3)] and

(4) Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location. [40 CFR 122.41(i)(4)]

j. MONITORING AND RECORDS [40 CFR 122.41(j)]

(1) Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity. [40 CFR 122.41(j)(1)]

(2) Except for records of monitoring information required by this permit related to the Copermittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five (5) years (or longer as required by 40 CFR Part 503), the

Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time. [40 CFR 122.41(j)(2)]

(3) Records for monitoring information must include: [40 CFR 122.41(j)(3)]

(a) The date, exact place, and time of sampling or measurements; [40 CFR 122.41(j)(3)(i)]
(b) The individual(s) who performed the sampling or measurements; [40 CFR 122.41(j)(3)(ii)]
(c) The date(s) analyses were performed; [40 CFR 122.41(j)(3)(iii)]
(d) The individual(s) who performed the analyses; [40 CFR 122.41(j)(3)(iv)]
(e) The analytical techniques or methods used; [40 CFR 122.41(j)(3)(v)] and
(f) The results of such analyses. [40 CFR 122.41(j)(3)(vi)]

(4) Monitoring must be conducted according to test procedures under 40 CFR Part 136 unless another method is required under 40 CFR Subchapters N or O. [40 CFR 122.41(j)(4)]

In the case of pollutants for which there are no approved methods under 40 CFR Part 136 or otherwise required under 40 CFR Subchapters N and O, monitoring must be conducted according to a test procedure specified in the permit for such pollutants. [40 CFR 122.44(i)(1)(iv)]

(5) The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. [40 CFR 122.41(j)(5)]

k. SIGNATORY REQUIREMENT [40 CFR 122.41(k)]

(1) All applications, reports, or information submitted to the San Diego Water Board, State Water Board, or USEPA must be signed and certified. (See 40 CFR 122.22) [40 CFR 122.41(k)(1)]

(a) *For a municipality, State, Federal, or other public agency.* [All applications must be signed] [b]y either a principal executive officer or ranking elected official. [40 CFR 122.22(a)(3)]

(b) All reports required by permits, and other information requested by the San Diego Water Board, State Water Board, or USEPA must be signed by a person described in paragraph (a) of this section, or by a duly authorized representative of that person. A person is a duly authorized representative only if: [40 CFR 122.22(b)]

(i) The authorization is made in writing by a person described in paragraph (a) of this section; [40 CFR 122.22(b)(1)]

(ii) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company, (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) [40 CFR 122.22(b)(2)] and,

(iii) The written authorization is submitted to the San Diego Water Board and State Water Board. [40 CFR 122.22(b)(3)]

(c) *Changes to authorization.* If an authorization under paragraph (b) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (b) of this section must be submitted to the San Diego Water Board prior to or together with any reports, information, or applications to be signed by an authorized representative. [40 CFR 122.22(c)]

(d) *Certification.* Any person signing a document under paragraph (a) or (b) of this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." [40 CFR 122.22(d)]

(2) The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both. [40 CFR 122.41(k)(2)]

I. REPORTING REQUIREMENTS [40 CFR 122.41(l)]

(1) *Planned changes.* The Copermittee must give notice to the San Diego Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when: [40 CFR 122.41(l)(1)]

(a) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); [40 CFR 122.41(l)(1)(i)] or

(b) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which

are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1).
[40 CFR 122.41(l)(1)(ii)]

(c) The alteration or addition results in a significant change in the Copermittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. [40 CFR 122.41(l)(1)(iii)]

(2) *Anticipated noncompliance*. The Copermittee must give advance notice to the San Diego Water Board or State Water Board of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.
[40 CFR 122.41(l)(2)]

(3) *Transfers*. This permit is not transferable to any person except after notice to the San Diego Water Board. The San Diego Water Board may require modification or revocation and reissuance of the permit to change the name of the Copermittee and incorporate such other requirements as may be necessary under the CWA.
[40 CFR 122.41(l)(3)]

(4) *Monitoring reports.* Monitoring results must be reported at the intervals specified elsewhere in this permit. [40 CFR 122.41(l)(4)]

(a) Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the San Diego Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices. [40 CFR 122.41(l)(4)(i)]

(b) If the Copermittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or another method required for an industry-specific waste stream under 40 CFR Subchapters N or O, the results of this monitoring must be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the San Diego Water Board or State Water Board.
[40 CFR 122.41(l)(4)(ii)]

(c) Calculations for all limitations which require averaging of measurements must utilize an arithmetic mean unless otherwise specified in the permit.
[40 CFR 122.41(l)(4)(iii)]

(5) *Compliance schedules*. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date. [40 CFR 122.41(l)(5)]

(6) *Twenty-four hour reporting.*

(a) The Copermittee must report any noncompliance that may endanger health or the environment. Any information must be provided orally within 24 hours from the time the Copermittee becomes aware of the circumstances. A written submission must also be provided within five (5) days of the time the Copermittee becomes aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6)(i)]

(b) The following must be included as information which must be reported within 24 hours under this paragraph: [40 CFR 122.41(l)(6)(ii)]

(i) Any unanticipated bypass that exceeds any effluent limitation in the permit (See 40 CFR 122.41(g)). [40 CFR 122.41(l)(6)(ii)(A)]
(ii) Any upset which exceeds any effluent limitation in the permit. [40 CFR 122.41(l)(6)(ii)(B)] and,
(iii) Violation of a maximum daily discharge limitation for any of the pollutants listed by the San Diego Water Board in the permit to be reported within 24 hours. (See 40 CFR 122.44(g)) [40 CFR 122.41(l)(6)(ii)(C)]

(c) The San Diego Water Board may waive the above-required written report on a case-by-case basis if the oral report has been received within 24 hours. [40 CFR 122.41(l)(6)(iii)]

(7) *Other noncompliance.* The Copermittee must report all instances of noncompliance not reported in accordance with the standard provisions required under 40 CFR 122.41(l)(4), (5), and (6), at the time monitoring reports are submitted. The reports must contain the information listed in the standard provisions required under 40 CFR 122.41(l)(6). [40 CFR 122.41(l)(7))]

(8) *Other information.* When the Copermittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the San Diego Water Board, State Water Board, or USEPA, the Copermittee must promptly submit such facts or information. [40 CFR 122.41(l)(8)]

~~**m. BYPASS** [40 CFR 122.41(m)]~~

~~(1) *Definitions.*~~

~~(a) "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. [40 CFR 122.41(m)(1)(i)] or~~

~~(b) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be~~

Comment [A126]: While this is a standard condition for NPDES permits, it is manifestly inapplicable to MS4 permits. Since BMPs constructed to comply with the Order include bypass provisions to protect their entirety, the Copermittees would have to notify the Regional Board whenever a storm was predicted. This provision should be deleted.

~~expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.~~
~~[40 CFR 122.41(m)(1)(ii)]~~

~~(2) *Bypass not exceeding limitations*. The Copermittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the standard provisions required under 40 CFR 122.41(m)(3) and (4).~~
~~[40 CFR 122.41(m)(2)]~~

~~(3) *Notice*.~~

~~(a) *Anticipated bypass*. If the Copermittee knows in advance of the need for a bypass, it must submit a notice, if possible at least ten days before the date of the bypass. [40 CFR 122.41(m)(3)(i)] or~~

~~(b) *Unanticipated bypass*. The Copermittee must submit notice of an unanticipated bypass in accordance with the standard provisions required under 40 CFR 122.41(l)(6) (24 hour notice).~~
~~[40 CFR 122.41(m)(3)(ii)]~~

~~(4) *Prohibition of Bypass*.~~

~~(a) Bypass is prohibited, and the San Diego Water Board may take enforcement action against a Copermittee for bypass, unless:~~
~~[40 CFR 122.41(m)(4)(i)]~~

~~(i) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; [40 CFR 122.41(m)(4)(i)(A)]~~
~~(ii) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance;~~
~~[40 CFR 122.41(m)(4)(i)(B)] and,~~
~~(iii) The Copermittee submitted notice in accordance with the standard provisions required under 40 CFR 122.41(m)(3).~~
~~[40 CFR 122.41(m)(4)(i)(C)]~~

~~(b) The San Diego Water Board may approve an anticipated bypass, after considering its adverse effects, if the San Diego Water Board determines that it will meet the three conditions listed above.~~
~~[40 CFR 122.41(m)(4)(ii)]~~

~~n.~~m. **UPSET** [40 CFR 122.41(n)]

(1) *Definition.* "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Copermittee. An upset does not

include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. [40 CFR 122.41(n)(1)]

(2) *Effect of an upset*. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the standard provisions required under 40 CFR 122.41(n)(3) are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. [40 CFR 122.41(n)(2)]

(3) *Conditions necessary for a demonstration of upset*. A Copermittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that: [40 CFR 122.41(n)(3)]

(a) An upset occurred and that the Copermittee can identify the cause(s) of the upset; [40 CFR 122.41(n)(3)(i)]
(b) The permitted facility was at the time being properly operated; [40 CFR 122.41(n)(3)(ii)] and
(c) The Copermittee submitted notice of the upset in accordance with the standard provisions required under 40 CFR 122.41(l)(6)(ii)(B) (24-hour notice). [40 CFR 122.41(n)(3)(iii)]
(d) The Copermittee complied with any remedial measures pursuant to the standard provisions required under 40 CFR 122.41(d). [40 CFR 122.41(n)(3)(iii)]

(4) *Burden of proof*. In any enforcement proceeding, the Copermittee seeking to establish the occurrence of an upset has the burden of proof. [40 CFR 122.41(n)(4)]

~~o.~~n. STANDARD PERMIT PROVISIONS FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS
[40 CFR 122.42(c)]

The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the San Diego Water Board or State Water Board under 40 CFR 122.26(a)(1)(v) must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report must include:

(1) The status of implementing the components of the storm water management program that are established as permit conditions; [40 CFR 122.42(c)(1)]

(2) Proposed changes to the storm water management programs that are established as permit conditions. Such proposed changes must be consistent with 40 CFR 122.26(d)(2)(iii); [40 CFR 122.42(c)(2)] and

(3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under 40 CFR 122.26(d)(2)(iv) and (v); [40 CFR 122.42(c)(3)]

(4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; [40 CFR 122.42(c)(4)]

(5) Annual expenditures and budget for year following each annual report; [40 CFR 122.42(c)(5)]

(6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; [40 CFR 122.42(c)(6)]

(7) Identification of water quality improvements or degradation. [40 CFR 122.42(c)(7)]

~~p.~~o. **STANDARD PERMIT PROVISIONS FOR STORM WATER DISCHARGES** [40 CFR 122.42(d)]

The initial permits for discharges composed entirely of storm water issued pursuant to 40 CFR 122.26(e)(7) must require compliance with the conditions of the permit as expeditiously as practicable, but in no event later than three years after the date of issuance of the permit.

2. General Provisions

In addition to the standard provisions required to be incorporated into the Order and NPDES permit pursuant to 40 CFR 122.41 and 40 CFR 122.42, several other general provisions apply to this Order. The general provisions applicable to this Order and NPDES permit are as follows:

a. DISCHARGE OF WASTE IS A PRIVILEGE

No discharge of waste into the waters of the State, whether or not such discharge is made pursuant to waste discharge requirements, shall create a vested right to continue such discharge. All discharges of waste into waters of the State are privileges, not rights. [CWC Section 13263(g)]

b. DURATION OF ORDER AND NPDES PERMIT

(1) *Effective date*. This Order and NPDES permit becomes effective on the 50th day after its adoption provided the USEPA has no objection. If the USEPA objects to its issuance, this Order shall not become effective until such objection is withdrawn. This Order supersedes Order No. R9-2007-0001 upon the effective date of this Order, and supersedes Order Nos. R9-2009-0002 and R9-2010-0016 upon their expiration or earlier notice of coverage.

(2) *Expiration*. This Order and NPDES permit expires five years after its effective date. [40 CFR 122.46(a)]

(3) *Continuation of expired order*. After this Order and NPDES permit expires, the terms and conditions of this Order and NPDES permit are automatically continued pending issuance of a new permit if all requirements of the federal NPDES regulations on the continuation of expired permits (40 CFR 122.6) are complied with.

c. AVAILABILITY

A copy of this Order must be kept at a readily accessible location and must be available to on-site personnel at all times.

d. CONFIDENTIALITY OF INFORMATION

Except as provided for in 40 CFR 122.7, no information or documents submitted in accordance with or in application for this Order will be considered confidential, and all such information and documents shall be available for review by the public at the San Diego Water Board office.

Claims of confidentiality for the following information will be denied:
[40 CFR 122.7(b)]

(1) The name and address of any permit applicant or Copermittee;
[40 CFR 122.7(b)(1)] and

(2) Permit applications and attachments, permits, and effluent data.
[40 CFR 122.7(b)(2)]

e. EFFLUENT LIMITATIONS

(1) *Interim effluent limitations*. The Copermittee must comply with any interim effluent limitations as established by addendum, enforcement action, or revised waste discharge requirements which have been, or may be, adopted by the San Diego Water Board.

(2) *Other effluent limitations and standards*. If any applicable toxic effluent standard or effective prohibition (including any schedule of compliance specified in such effluent standard or effective prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant and that standard or effective prohibition is more stringent than any limitation on the pollutant in the permit, the San Diego Water Board shall institute proceedings under these regulations to modify or revoke and reissue the permit to conform to the toxic effluent standard or effective prohibition. [40 CFR 122.44(b)(1~~)]}]}].}~~

f. DUTY TO MINIMIZE OR CORRECT ADVERSE IMPACTS

The Copermittee must take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this Order, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the noncompliance.

g. PERMIT ACTIONS

The filing of a request by the Copermittee for modification, revocation and reissuance, or termination of this Order, or a notification of planned change in or anticipated

noncompliance with this Order does not stay any condition of this Order. (See 40 CFR 122.41(f)) In addition, the following provisions apply to this Order:

(1) Upon application by any affected person, or on its own motion, the San Diego Water Board may review and revise the requirements in this Order. All requirements must be reviewed periodically. [CWC Section 13263(e)]

(2) This Order may be terminated or modified for cause, including, but not limited to, all of the following: [CWC Section 13381]

(a) Violation of any condition contained in the requirements of this Order. [CWC Section 13381(a)]

(b) Obtaining the requirements in this Order by misrepresentation, or failure to disclose fully all relevant facts. [CWC Section 13381(b)]

(c) A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge. [CWC Section 13381(c)]

(3) When this Order is transferred to a new owner or operator, such requirements as may be necessary under the CWC may be incorporated into this Order.

h. NPDES PERMITTED NON-STORM WATER DISCHARGES

The San Diego Water Board has, in prior years, issued a limited number of individual NPDES permits for non-storm water discharges to MS4s. The San Diego Water Board or State Water Board may in the future, upon prior notice to the Copermittee(s), issue an NPDES permit for any non-storm water discharge (or class of non-storm water discharges) to an MS4. A Copermittee will not be held responsible for pollutants in its MS4 discharge originating from an NPDES-permitted non-storm water discharge.

Comment [A127]: This comment reflects the appropriate responsibility between NPDES dischargers.

i. MONITORING

In addition to the standard provisions required under 40 CFR 122.41(j) and (l)(4), the following general monitoring provisions apply to this Order:

(1) Where procedures are not otherwise specified in Order, sampling, analysis and quality assurance/quality control must be conducted in accordance with the Quality Assurance Management Plan (QAMP) for the State of California's Surface Water Ambient Monitoring Program (SWAMP), adopted by the State Water Resources Control Board (State Water Board).

(2) Pursuant to 40 CFR 122.41(j)(2) and CWC Section 13383(a), each Copermittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five (5) years from the date of the sample, measurement, report or application. This period may be extended by request of the San Diego Water Board at any time.

Comment [A128]: This provision and the provision in Attachment B 1.j(2) conflict. The Water Board should reconcile these provisions or delete one.

(3) All chemical, bacteriological, and toxicity analyses must be conducted at a laboratory certified for such analyses by the California Department of Public Health or a laboratory approved by the San Diego Water Board.

(4) For priority toxic pollutants that are identified in the California Toxics Rule (CTR) (65 Fed. Reg. 31682), the Copermittees must instruct their laboratories to establish calibration standards that are equivalent to or lower than the Minimum Levels (MLs) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP). If a Copermittee can demonstrate that a particular ML is not attainable, in accordance with procedures set forth in 40 CFR Part 136, the lowest quantifiable concentration of the lowest calibration standard analyzed by a specific analytical procedure (assuming that all the method specified sample weights, volumes, and processing steps have been followed) may be used instead of the ML listed in Appendix 4 of the SIP. The Copermittee must submit documentation from the laboratory to the San Diego Water Board for approval prior to raising the ML for any priority toxic pollutant.

j. ENFORCEMENT

(1) The San Diego Water Board is authorized to enforce the terms of this Order under several provisions of the CWC, including, but not limited to, CWC Sections 13385, 13386, and 13387.

(2) Nothing in this Order shall be construed to protect the Copermittee from its liabilities under federal, state, or local laws.

(3) The CWC provides for civil and criminal penalties comparable to, and in some cases greater than, those provided for under the CWA.

(4) Except as provided in the standard conditions required under 40 CFR 122.41(m) and (n), nothing in this Order shall be construed to relieve the Copermittee from civil or criminal penalties for noncompliance.

(5) Nothing in this Order shall be construed to preclude the institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties to which the Copermittee is or may be subject to under Section 311 of the CWA.

(6) Nothing in this Order shall be construed to preclude institution of any legal action or relieve the Copermittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authoring preserved by Section 510 of the CWA.

k. SEVERABILITY

The provisions of this Order are severable, and if any provision of this Order, or the application of any provisions of this Order to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this Order shall not be affected thereby.

l. APPLICATIONS

Any application submitted by a Copermittee for reissuance or modification of this Order must satisfy all applicable requirements specified in federal regulations as well as any additional requirements for submittal of a Report of Waste Discharge specified in the CWC and the California Code of Regulations.

m. IMPLEMENTATION

All plans, reports and subsequent amendments submitted in compliance with this Order must be implemented immediately (or as otherwise specified). All submittals by Copermittees must be adequate to implement the requirements of this Order.

n. REPORT SUBMITTALS

(1) All report submittals must include an executive summary, introduction, conclusion, recommendations, and signed certified statement.

(2) Each Copermittee must submit a signed certified statement covering its responsibilities for each applicable submittal.

(3) The Principal Watershed Copermittee(s) must submit a signed certified statement covering its responsibilities for each applicable submittal and the sections of the submittals for which it is responsible.

(4) Unless otherwise directed, the Copermittees must submit one hard copy and one electronic copy of each report required under this Order to the San Diego Water Board, and one electronic copy to the USEPA.

(5) The Copermittees must submit reports and provide notifications as required by this Order to the following:

EXECUTIVE OFFICER
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION
9174 SKY PARK COURT, SUITE 100
SAN DIEGO CA 92123-4340
Telephone: (858) 467-2952 Fax: (858) 571-6972

EUGENE BROMLEY
US ENVIRONMENTAL PROTECTION AGENCY
REGION IX
PERMITS ISSUANCE SECTION (W-5-1)
75 HAWTHORNE STREET
SAN FRANCISCO CA 94105

ATTACHMENT C

ACRONYMS AND ABBREVIATIONS

AMAL	Average Monthly Action Level
ASBS	Area(s) of Special Biological Significance
BMP	Best Management Practice
Basin Plan	Water Quality Control Plan for the San Diego Basin
CEQA	California Environmental Quality Act
CCR	California Code of Regulations
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWC	California Water Code
CZARA	Coastal Zone Act Reauthorization Amendments of 1990
ESAs	Environmentally Sensitive Areas
GIS	Geographic Information System
IBI	Index of Biological Integrity
LID	Low Impact Development
MDAL	Maximum Daily Action Level
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
NAL	Non-Storm Water Action Level
NAICS	North American Industry Classification System
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
ROWD	Report of Waste Discharge (application for NPDES reissuance)
SAL	Storm Water Action Level
San Diego Water Board	California Regional Water Quality Control Board, San Diego Region
SIC	Standard Industrial Classification Code
State Water Board	State Water Resources Control Board
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
WDID	Waste Discharge Identification Number
WLA	Waste Load Allocation
WQBEL	Water Quality Based Effluent Limitation

DEFINITIONS

Active/Passive Sediment Treatment - Using mechanical, electrical or chemical means to flocculate or coagulate suspended sediment for removal from runoff from construction sites prior to discharge.

Anthropogenic Litter – Trash generated from human activities, not including sediment.

Automotive Repair Shop – a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539 or equivalent NAICS code.

Average Monthly Action Level – The highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month, or the geometric mean for bacteria, as applicable.

Beneficial Uses - The uses of water necessary for the survival or wellbeing of man, plants, and wildlife. These uses of water serve to promote tangible and intangible economic, social, and environmental goals. "Beneficial Uses" ~~of the waters of the State~~ that may be protected include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. Existing beneficial uses are uses that were attained in the surface or ground water on or after November 28, 1975; and potential beneficial uses are uses that would probably develop in future years through the implementation of various control measures. "Beneficial Uses" are equivalent to "Designated Uses" under federal law. [California Water Code Section 13050(f)].

Best Management Practices (BMPs) - Defined in 40 CFR 122.2 as schedules of activities, effective prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. In the case of municipal discharge permits, BMPs may be used in the place of numeric effluent limits.

Bioassessment - The use of biological community information to evaluate the biological integrity of a water body and its watershed. With respect to aquatic ecosystems, bioassessment is the collection and analysis of samples of the benthic macroinvertebrate community together with physical/habitat quality measurements associated with the sampling site and the watershed to evaluate the biological condition (i.e. biotic integrity) of a water body.

Biofiltration - Practices that use vegetation and amended soils to detain and treat runoff from impervious areas. Treatment is through filtration, infiltration, adsorption, ion exchange, and biological uptake of pollutants.

Biological Integrity - Defined in Karr J.R. and D.R. Dudley. 1981. Ecological perspective on water quality goals. *Environmental Management* 5:55-68 as: "A balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitat of the region." Also referred to as ecosystem health.

BMP Design Manual – A plan developed to eliminate, reduce, or mitigate the impacts of runoff from development projects, including Priority Development Projects.

Channel Rehabilitation and Improvement – Remedial measures or activities for the purpose of improving or restoring the environmental health of streams, channels or river systems. Techniques may vary from in-stream restoration techniques to off-line stormwater management practices installed in the system corridor or upland areas. Rehabilitation techniques may include, but are not limited to the following: riparian zone restoration, constructed wetlands, bank stabilization, channel modifications, and day lighting of drainage systems.

Comment [A129]: This term should be defined in Attachment C given its use in the Order.

Clean Water Act Section 303(d) Water Body - An impaired water body in which water quality does not meet applicable water quality standards and/or is not expected to meet water quality standards, even after the application of technology based pollution controls required by the CWA. The discharge of runoff to these water bodies by the Copermittees is significant because these discharges can cause or contribute to violations of applicable water quality standards.

Construction Site – Any project, including projects requiring coverage under the Construction General Permit, that involves soil disturbing activities greater than 10,000 square feet including, but not limited to, clearing, grading, disturbances to ground such as stockpiling, and excavation. This does not include interior construction activities such as interior remodeling, plumbing, electrical, or mechanical work.

Contamination - As defined in the Porter-Cologne Water Quality Control Act, contamination is "an impairment of the quality of waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste whether or not waters of the State are affected."

Copermittee – An incorporated city within the County of Orange, County of Riverside, or County of San Diego in the San Diego Region~~,~~ (Region 9),~~,~~ the County of Orange, the County of Riverside, the County of San Diego, the Orange County Flood Control District, the Riverside County Water Conservation and Flood Control District, the San Diego Regional Airport Authority, or the San Diego Unified Port District. See also "Municipal Copermittee" and "Special District Copermittee".

Comment [A130]: As set forth above, the Riverside County Copermittees make a distinction in these classes of Copermittees based on their respective legal authorities.

Copermittees – All of the individual Copermittees, collectively, unless the obligation in question is directed to one or a sub-group of Copermittees.

Comment [A131]: This clarifies that not all obligations in the Order directed to "Copermittees" are in fact applicable to all Copermittees.

Critical Channel Flow (Qc) – The channel flow that produces the critical shear stress that initiates bed movement or that erodes the toe of channel banks. When measuring Qc, it should be based on the weakest boundary material – either bed or bank.

Daily Discharge – Defined as either: (1) the total mass of the constituent discharged over the calendar day or any 24 hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g. concentration.)

The Daily Discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day, or other 24 hour period other than a day), or by the arithmetic mean of analytical results from one or more grab samples taken over the course of a

day.

Development Projects - Construction, rehabilitation, redevelopment, or reconstruction of any public or private residential project, industrial~~,~~ or commercial facility, or any other projects designed for post-construction human activity or occupation and involving land disturbance activities.

Comment [A132]: This definition clarifies the nature of Development Projects covered under the Order.

Direct Discharge to an Environmentally Sensitive Area – refers to outflow from a drainage conveyance system that collects runoff from the subject development or redevelopment site and terminates at or in receiving waters within the ESA, and is not commingled with flows from adjacent or other upstream lands.

Dry Season –May 1 to September 30.

Dry Weather – Weather is considered dry if the preceding 72 hours has been without measurable precipitation (>0.1 inch).

Enclosed Bays – Enclosed bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost bay works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays do not include inland surface waters or ocean waters.

Erosion – When land is diminished or worn away due to wind, water, or glacial ice. Often the eroded debris (silt or sediment) becomes a pollutant via storm water runoff. Erosion occurs naturally but can be intensified by land clearing activities such as farming, development, road building, and timber harvesting. This permit is concerned particularly with non-naturally occurring Erosion that eventually results in a Sediment discharge from MS4s into Receiving Waters.

Environmentally Sensitive Areas (ESAs) - Areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Board and San Diego Water Board; State Water Quality Protected Areas; water bodies designated with the RARE beneficial use by the State Water Board and San Diego Water Board; areas designated as preserves or their equivalent under the Natural Communities Conservation Program within the Cities and County of Orange; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.

Estuaries – Waters, including coastal lagoons, located at the mouth of streams that serve as areas of mixing fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and ocean water. Estuaries do not include inland surface waters or ocean waters.

Existing Development – Any area that has been developed and exists for municipal, commercial, industrial, or residential purposes, uses, or activities. May include areas that are not actively used for its originally developed purpose, but may be re-purposed or redeveloped

for another use or activity.

Flow Duration – The long-term period of time that flows occur above a threshold that causes significant sediment transport and may cause excessive erosion damage to creeks and streams (not a single storm event duration). The simplest way to visualize this is to consider a histogram of pre- and post-project flows using long-term records of hourly data. To maintain pre-development flow duration means that the total number of hours (counts) within each range of flows in a flow-duration histogram cannot increase between the pre- and post-development condition. Flow duration within the range of geomorphologically significant flows is important for managing erosion.

Grading - The cutting and/or filling of the land surface to a desired slope or elevation.

Hazardous Material – Any substance that poses a threat to human health or the environment due to its toxicity, corrosiveness, ignitability, explosive nature or chemical reactivity. These also include materials named by the USEPA in 40 CFR 116 to be reported if a designated quantity of the material is spilled into the waters of the U.S. or emitted into the environment.

Hazardous Waste - Hazardous waste is defined as "any waste which, under Section 600 of Title 22 of this code, is required to be managed according to Chapter 30 of Division 4.5 of Title 22 of this code" [CCR Title 22, Division 4.5, Chapter 11, Article 1].

Household Hazardous Waste – Paints, cleaning products, and other hazardous wastes generated during home improvement or maintenance activities.

Hydromodification – The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

Illicit Connection – Any connection to the MS4 that conveys an illicit discharge.

Illicit Discharge - Any discharge to the MS4 that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from fire fighting activities [40 CFR 122.26(b)(2)]. Discharges from natural sources or from conditionally exempt sources described in this Order are not considered Illicit Discharges.

Inactive Areas – Areas of construction activity that are not active and those that have been active and are not scheduled to be re-disturbed for at least 14 days.

Infiltration – Water other than wastewater that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow [40 CFR 35.2005(20)].

Comment [A133]: Wrong definition. Should be defining infiltration (of stormwater into soil)

Inland Surface Waters – Includes all surface waters of the U.S.~~State~~ that do not include the ocean, enclosed bays, or estuaries.

Jurisdictional Runoff Management Program Document – A written description of the specific jurisdictional runoff management measures and programs that each Copermittee will implement to comply with this Order and ensure that illicit discharges are effectively prohibited, and storm water pollutant discharges in runoff are reduced to the MEP and do not cause or contribute to a violation of water quality standards.

Low Impact Development (LID) – A storm water management and land development strategy that emphasizes conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions.

Low Impact Development Best Management Practices (LID BMPs) – LID BMPs include schedules of activities, effective prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States through storm water management and land development strategies that emphasize conservation ~~s~~and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions. LID BMPs include retention practices that do not allow runoff, such as infiltration, rain water harvesting and reuse, and evapotranspiration. LID BMPs also include flow-through practices such as biofiltration that may have some discharge of storm water following pollutant reduction.

Major Outfall – As defined in the Code of Federal Regulations, a major outfall is a MS4 outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (i.e. discharge from a single conveyance other than a circular pipe which is associated with a drainage area of more than 50 acres); or, for MS4s that receive storm water from lands zoned for industrial activity (based on comprehensive zoning plans or equivalent), a MS4 outfall that discharges from a single pipe with an inside diameter of 12 inches or more or from its equivalent (i.e. discharge from other than a circular pipe associated with a drainage area of 2 acres or more).

Maximum Daily Action Level (MDAL) –The highest allowable daily discharge of a pollutant, over a calendar day (or 24 hour period). For pollutants with action levels expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with action levels expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

Maximum Extent Practicable (MEP) – The technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) ~~for storm water~~ that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) in combination with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than BAT. A definition for MEP is not provided either in the statute or in the regulations. Instead the definition of MEP is dynamic and will be defined by the following process over time: municipalities propose their definition of MEP by way of their runoff management programs. Their total collective and individual activities conducted pursuant to the runoff management programs becomes their proposal for MEP as it applies both to their overall effort, as well as to specific activities (e.g., MEP for street sweeping, or MEP for MS4 maintenance). In the absence of a proposal acceptable to the San Diego Water Board, the San Diego Water Board

defines MEP.

In a memo dated February 11, 1993, entitled "Definition of Maximum Extent Practicable," Elizabeth Jennings, Senior Staff Counsel, SWRCB addressed the achievement of the MEP standard as follows:

> "*To achieve the MEP standard, municipalities must employ whatever Best Management Practices (BMPs) are technically feasible (i.e., are likely to be effective) and are not cost prohibitive. The major emphasis is on technical feasibility. Reducing pollutants to the MEP means choosing effective BMPs, and rejecting applicable BMPs only where other effective BMPs will serve the same purpose, or the BMPs would not be technically feasible, or the cost would be prohibitive. In selecting BMPs to achieve the MEP standard, the following factors may be useful to consider:*
>
> *a. Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?*
> *b. Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?*
> *c. Public Acceptance: Does the BMP have public support?*
> *d. Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?*
> *e. Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc.?*
>
> *The final determination regarding whether a municipality has reduced pollutants to the maximum extent practicable can only be made by the Regional or State Water Boards, and not by the municipal discharger. If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit derived, it would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs that would address a pollutant source, or to pick a BMP based solely on cost, which would be clearly less effective. In selecting BMPs the municipality must make a serious attempt to comply and practical solutions may not be lightly rejected. In any case, the burden would be on the municipal discharger to show compliance with its permit. After selecting a menu of BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented."*

Monitoring Year – October 1 to September 30

Municipal Copermittee – Any Copermittee, exclusive of Special District Copermittees.

Comment [A134]: This definition clarifies distinction between municipal and special district copermittees.

Municipal Separate Storm Sewer System (MS4) – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) Designated or used for collecting or conveying storm water;

(iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.22~~6~~. Copermittees need only comply with permit conditions relating to "discharges from the municipal separate storm sewers for which they are operators." 40 CFR 122.26(a)(vi).

Comment [A135]: These changes correct a citation and clarifies the responsibility of the copermittees as to other MS4s.

National Pollutant Discharge Elimination System (NPDES) - The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the CWA.

Non-Storm Water - All discharges to and from a MS4 that do not originate from precipitation events (i.e., all discharges from a MS4 other than storm water). ~~Non-storm water includes illicit discharges and NPDES permitted discharges.~~

Comment [A136]: This is overly limiting, There are other types of Non-storm discharges that do not fit these two categories (e.g. irrigated agriculture, natural flows, conditionally exempt flows, others). Rather than trying to identify all types of non-stormwater discharges, suggest just deleting this sentence.

Nuisance - As defined in the Porter-Cologne Water Quality Control Act, a nuisance is "anything which meets all of the following requirements: 1) Is injurious to health, or is indecent, or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. 2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. 3) Occurs during, or as a result of, the treatment or disposal of wastes."

Ocean Waters – the territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the State Board's California Ocean Plan.

Order – Unless otherwise specified, refers to this Order, Order No. R9-2013-0001 (NPDES No. CAS0109266)

Outfall – *Outfall* means a *point source* as defined by 40 CFR 122.2 at the point where a MS4 discharges to waters of the United States and does not include open conveyances connecting two MS4s, or pipes, tunnels or other conveyances which connect segments of the same stream or other waters of the United States and are used to convey waters of the United. 40 CFR 122.26(b)(9).

Comment [A137]: This federal regulatory definition clarifies the nature of an outfall.

Parking Lot – a land area or facility for the tempraory parking or storage of motor vehicles used personally, for business, or for commerce.

Comment [A138]: Definition placed in Attachment C for consistency.

Persistent Flow - Persistent flow is defined as the presence of an MS4 discharge that is hydraulically connected to a flowing~~, pooled, or ponded~~ receiving water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient.

Comment [A139]: Changes reflect the necessity of a connection to flowing receiving waters. Discharges that are pooled are not discharges to waters of the United States. Please see Comment Letter section 3.5.3.

Person - A person is defined as an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof [40 CFR 122.2].

Point Source - Any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, landfill leachate collection systems, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return

flows from irrigated agriculture or agricultural storm water runoff.

Pollutant - Any agent that may cause or contribute to the degradation of water quality such that a condition of pollution or contamination is created or aggravated.

Pollution - As defined in the Porter-Cologne Water Quality Control Act, pollution is "the alteration of the quality of the waters of the State by waste, to a degree that unreasonably affects the either of the following: 1) The waters for beneficial uses; or 2) Facilities that serve these beneficial uses." Pollution may include contamination.

Pollution Prevention - Pollution prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control BMPs, treatment control BMPs, or disposal.

Pre-Project~~Development~~ Runoff Conditions – Runoff conditions that exist~~existed~~ onsite immediately before the ~~existing development was constructed, or exists onsite before~~ planned development activities occur. Pre-development is not intended to be interpreted as that period before any human-induced land disturbance has occurred. 64 FR 68761.

Comment [A140]: This definition reflects the exact language used by U.S. EPA in the Federal Register. Moreover, it avoids the constitutional and statutory problems with requiring developers to mitigate for impacts not attributable to their project. It also is consistent with the CEQA standard for project impact mitigation.

Priority Development Projects - New development and redevelopment projects defined under Provision E.3.b of Order No. R9-2012-0011.

Properly Designed – Designed in accordance with the Copermittee's BMP Design Manual and/or any appropriate design requirements set forth by the Copermittee and based on widely accepted design criteria and in accordance with this Order.

Comment [A141]: This definition is required to address this standard, which is mentioned in the Order but not defined.

Rainy Season (aka Wet Season) –October 1 to April 30

Receiving Waters – Waters of the United States.

Receiving Water Limitations - Waste discharge requirements issued by the San Diego Water Board typically include both: (1) "Effluent Limitations" (or "Discharge Limitations") that specify the technology-based or water-quality-based effluent limitations; and (2) "Receiving Water Limitations" that specify the water quality objectives in the Basin Plan as well as any other limitations necessary to attain those objectives. In summary, the "Receiving Water Limitations" provision is the provision used to implement the requirements of CWA section 402(p)(3)(B).

Redevelopment - The creation, addition, and or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include trenching and resurfacing associated with utility work; parking lots; resurfacing existing roadways; cutting and reconfiguring of surface parking lots; new sidewalk construction, pedestrian ramps, or bike lane on existing roads; and routine replacement of damaged pavement, such as pothole repair and emergency restoration and public safety projects.

Comment [A142]: The changes requested in this definition appropriately exempts de minimis or emergency/public safety projects.

Reporting Period – The period of information that is reported in the Annual Report. The reporting period consists of two components: 1) July 1 to June 30, consistent with the fiscal

year, for the implementation of the jurisdictional runoff management programs, and 2) October 1 to September 30, consistent with the monitoring year for the monitoring and assessment programs. Together, these two time periods constitute the reporting year for the Annual Report due January 31 following the end of the monitoring year.

Restaurant – a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812).

Retail gasoline outlet (RGO) – a business that sells automotive or truck fuel to the general public with a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

Retain –Keep or hold in a particular place, condition, or position without discharge to ~~surface~~ Receiving W~~w~~aters.

Retrofitting – Storm water management practices put into place after development has occurred in watersheds where the practices previously did not exist~~.~~ or are ineffective.~~.~~ Retrofitting of developed areas is intended to improve water quality, protect downstream channels, reduce flooding, or meet other specific objectives. Retrofitting developed areas may include, but is not limited to replacing roofs with green roofs, disconnecting downspouts or impervious surfaces to drain to pervious surfaces, replacing impervious surfaces with pervious surfaces, installing rain barrels, installing rain gardens, and trash area enclosures.

Runoff - All flows in a storm water conveyance system that consists of the following components: (1) storm water (wet weather flows) and (2) non-storm water including dry weather flows.

San Diego Water Board – As used in this document the term "San Diego Water Board" is synonymous with the term "Regional Board" as defined in Water Code section 13050(b) and is intended to refer to the California Regional Water Quality Control Board for the San Diego Region as specified in Water Code Section 13200.

Sediment - Soil, sand, and minerals washed from land into water. Sediment resulting from anthropogenic sources (i.e. human induced land disturbance activities) that is discharged into Receiving Waters is considered a pollutant. This Order regulates only the discharges of sediment from anthropogenic sources into Receiving Waters and does not regulate naturally occurring sources of sediment. Sediment can destroy fish-nesting areas, clog animal habitats, and cloud waters so that sunlight does not reach aquatic plants.

Special District Copermittee – A separate legal entity that may own or operate MS4 systems, but has no land use authorities outside of their MS4. The Riverside County Flood Control and Water Conservation District [and Orange County Flood Control District?] is a [are] Special District Copermittee[s].

Source Control BMP – Land use or site planning practices, or structural or nonstructural measures that aim to prevent runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between pollutants and runoff.

Storm Water – Per 40 CFR 122.26(b)(13), means storm water runoff, snowmelt runoff and surface runoff and drainage. ~~Surface runoff and drainage pertains to runoff and drainage resulting from precipitation events.~~

Comment [A143]: Relocation of definition to Attachment C.

Comment [A144]: Definition added for clarity and consistency with prior redlines

Comment [A145]: Edit clarifies intent of definition.

Stream, Channel, or Habitat Rehabilitation – Measures or activities for the purpose of improving or restoring the environmental health (i.e. physical, chemical and biological integrity) of streams, channels, or river systems. Rehabilitation techniques may include, but are not limited to, riparian zone restoration, constructed wetlands, bank stabilization, channel reconfiguration, and daylighting drainage systems.

Street, Road, Highway, Freeway– Any paved impervious surface that is used for the transportation of automobiles, trucks, motorcycles, and other vehicles, with an ADT of at least 100 vehicles per day.

Comment [A146]: Definition relocated to Attachment C.

Comment [A147]: Consistent with RGO definition.

Structural BMPs - A subset of BMPs which detains, retains, filters, removes, or prevents the release of pollutants to surface waters from development projects in perpetuity, after construction of a project is completed.

Total Maximum Daily Load (TMDL) - The maximum amount of a pollutant that can be discharged into a water body from all sources (point and non-point) and still maintain water quality standards. Under CWA section 303(d), TMDLs must be developed for all water bodies that do not meet water quality standards after application of technology-based controls.

Toxicity - Adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies). The water quality objectives for toxicity provided in the Basin Plan, state in part…"All waters shall be free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life….The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge".

Treatment Control BMP – Any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media absorption or any other physical, biological, or chemical process.

Unpaved Road – Any long, narrow stretch without pavement used for traveling by motor passenger vehicles between two or more points. Unpaved roads are generally constructed of dirt, gravel, aggregate or macadam and may be improved or unimproved.

Waste - As defined in CWC Section 13050(d), "waste includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal."

Article 2 of CCR Title 23, Chapter 15 (Chapter 15) contains a waste classification system that applies to solid and semi-solid waste, which cannot be discharged directly or indirectly to water of the state and which therefore must be discharged to land for treatment, storage, or disposal in accordance with Chapter 15. There are four classifications of waste (listed in order of highest to lowest threat to water quality): hazardous waste, designated waste, non-hazardous solid waste, and inert waste.

Water Quality Objective - Numerical or narrative limits on constituents or characteristics of

water designated to protect designated beneficial uses of the water. [California Water Code Section 13050 (h)]. California's water quality objectives are established by the State and Regional Water Boards in the Water Quality Control Plans. Numeric or narrative limits for pollutants or characteristics of water designed to protect the beneficial uses of the water. In other words, a water quality objective is the maximum concentration of a pollutant that can exist in a receiving water and still generally ensure that the beneficial uses of the receiving water remain protected (i.e., not impaired). Since water quality objectives are designed specifically to protect the beneficial uses, when the objectives are violated the beneficial uses are, by definition, no longer protected and become impaired. This is a fundamental concept under the Porter Cologne Act. Equally fundamental is Porter Cologne's definition of pollution. A condition of pollution exists when the water quality needed to support designated beneficial uses has become unreasonably affected or impaired; in other words, when the water quality objectives have been violated. These underlying definitions (regarding beneficial use protection) are the reason why all waste discharge requirements implementing the federal NPDES regulations require compliance with water quality objectives. (Water quality objectives are also called water quality criteria in the CWA.)

Water Quality Standards - Water quality standards, as defined in Clean Water Act section 303(c) consist of the beneficial uses (e.g., swimming, fishing, municipal drinking water supply, etc.,) of a water body and criteria (referred to as water quality objectives in the California Water Code) necessary to protect those uses. Under the Water Code, the water boards establish beneficial uses and water quality objectives in water quality control or basin plans. Together with an anti-degradation policy, these beneficial uses and water quality objectives serve as water quality standards under the Clean Water Act. In Clean Water Act parlance, state beneficial uses are called "designated uses" and state water quality objectives are called "criteria." Throughout this Order, the relevant term is used depending on the statutory scheme.

Waters of the State - Any water, surface or underground, including saline waters within the boundaries of the State [CWC section 13050 (e)]. The definition of the Waters of the State is broader than that for the Waters of the United States in that all water in the State is considered to be a Waters of the State. ~~regardless of circumstances or condition.~~

Comment [A148]: The intent of the definition is to cover natural water sources, and not anthropogenic structures that collect runoff to reduce volume/velocity or pollutants.

Waters of the United States - As defined in the 40 CFR 122.2, the Waters of the U.S. are defined as: "(a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate "wetlands;" (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters otherwise defined as waters of the United States under this definition: (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial seas; and (g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA."

Watershed - That geographical area which drains to a specified point on a water course, usually a confluence of streams or rivers (also known as drainage area, catchment, or river basin).

Wet Season (aka Rainy Season) –October 1 to April 30

Wet Weather – Weather is considered wet if there is a storm event of 0.1 inches and greater and the following 72 hours, unless otherwise defined by the Copermittee for the purposes of monitoring consistent with the USEPA Storm Water Sampling Guidance Document (EPA-833-B-92-001), or developed pursuant to another regulatory mechanism.

Comment [A149]: This is important as the monitoring requirements require you to sample the first 'Wet Weather' event. 0.1" of rainfall doesn't result in runoff in all watersheds. Copermittees should be able to define mobilization criteria to identify storms that are likely to produce runoff in that drainage area consistent with this EPA guidance.

LEGAL AND FACT SHEET COMMENTS ON TENTATIVE ORDER R9-2013-0001 MADE ON BEHALF OF THE RIVERSIDE COUNTY COPERMITTEES

This document provides comments on various legal issues raised by Tentative Order No. R9-2013-0001 (the "Draft Permit") and associated attachments, including Attachment F, the Fact Sheet/Technical Report ("Fact Sheet"), and are made on behalf of the Riverside County Flood Control & Water Conservation District ("District"), the County of Riverside and the Cities of Murrieta, Temecula and Wildomar (collectively, the "Riverside County Copermittees").

These legal comments are in addition to the other comments on the Draft Permit and attachments made by the Riverside County Copermittees (including the Comment Letter dated January 10, 2013 and signed by Jason E. Uhley, Chief of the District's Watershed Protection Division) and the redline attachment ("Redline"), as well as any comments or testimony which may be offered at the public hearing(s) on the Draft Permit. The Comment Letter and Redline also discuss legal issues. The Riverside County Copermittees appreciate this opportunity to comment and welcome any questions that Water Board staff may have.

These comments are submitted subject to the same reservations set forth in the Comment Letter regarding the Water Board's lack of authority, in the absence of agreement by the Riverside County Copermittees or the filing of a Report of Waste Discharge ("ROWD"), to issue a regional municipal separate storm sewer system ("MS4") permit to the Riverside County Copermittees. Submission of these comments does not waive this objection.

Request for Additional Public Comment

Before turning to comments on the Draft Permit, the Riverside County Copermittees wish to note that in view of the extensive comments made by them, as well as what we anticipate will be extensive comments by the South Orange County and San Diego County Copermittees, as well as from other stakeholders, it would greatly facilitate the permit adoption process if the Water Board were to release a revised Tentative Order for further review and comment prior to final adoption of the Permit. This will enable the Water Board staff to address the comments in a more orderly fashion and provide all parties with the opportunity to see how staff proposes to incorporate the comments in the Draft Permit.

Comments on Findings

Finding 2 and Fact Sheet Section VII.B: This finding recites that the Water Board "has the legal authority to issue a regional MS4 permit pursuant to its authority under Clean Water Act ("CWA") section 402(p)(3)(B) and 40 CFR 122.26(a)(i)(v)." Section VII.B of the Fact Sheet provides a more detailed rationale for this finding (at pages F-22-23).

The Riverside County Copermittees respectfully disagree with this finding and the analysis provided in the Fact Sheet. We do not believe that a regional MS4 permit is authorized under the CWA or the implementing regulations, absent agreement by the copermittees to be bound by such a MS4 permit (as is the case with the Bay Area MS4 permit covering discharges into the Bay).

The CWA itself does not explicitly authorize MS4 permits that, like the Draft Permit, cross county lines. CWA section 402(p)(3)(B) provides only that "[p]ermits for discharges from municipal storm sewers . . . may be issued on a system- or jurisdiction-wide basis." This language, contrary to the conclusion in Finding 2, indicates that a multi-county permit, covering several distinct non-interconnected municipal stormwater "systems" in multiple watersheds with multiple receiving waters, is not one issued on a "system-wide" basis and that an MS4 permit covering multiple jurisdictions in three different counties is not one issued on a "jurisdiction-wide basis." Because neither "system-wide" nor "jurisdiction-wide" are defined in the CWA, however, the CWA regulations must also be reviewed.

The regulatory provision cited in Finding 2, 40 CFR § 122.26(a)(1)(v), does not add clarity, since it merely repeats the "system-wide" and "jurisdiction-wide" language of the Act and the regulations define neither term. The regulations do, however, suggest that "system-wide" is not intended to cover multiple large MS4s in different jurisdictions. The regulations, at 40 CFR § 122.26(a)(1)(v) state that in making the determination to designate a system-wide or jurisdiction-wide basis" the permitting authority should consider the location of the "discharge" with respect to waters of the United States, the size of the discharge, the quantity and nature of the pollutants discharge and other relevant factors.

The Draft Permit covers multiple "discharges" into receiving waters located in three separate counties and the size, quality and nature of the discharges vary widely, due to varying hydrologic and climatic conditions in the three areas.

The Fact Sheet cites 40 CFR § 122.26(a)(3)(iv), which provides, in relevant part, that the Water Board "may issue one systemwide permit covering all, or a portion of all municipal separate storm systems in adjacent or interconnected large or medium municipal separate storm sewer systems." This provision does not, however, authorize issuance of a regional MS4 permit covering multiple counties and multiple watersheds that are not interconnected and which do not share a common receiving water. In fact, the only common fact uniting the various MS4s in the three counties under the Water Board's jurisdiction is that common jurisdiction.

First, even if the subject MS4 facilities otherwise met the criteria specified in the federal regulations (which, as noted below, they do not), the prospective permittees must apply for such a MS4 permit, as set forth in the first sentence of 40 CFR § 122.26(a)(3)(iv): "*One permit application may be submitted for all or a portion of all* municipal separate storm sewers within adjacent or interconnected large or medium municipal separate storm sewer systems." (emphasis supplied). No such application has been filed with respect to the Draft Permit. Only the San Diego County copermittees submitted a ROWD for MS4 facilities within that county.[1]

[1] Moreover, the fact that permittees have the ability to determine the geographic scope of the permit is reinforced by the language in 40 CFR § 122.26(a)(3)(iii)(B), which allows an individual municipality to submit "a distinct permit application which only covers discharges from the [MS4] for which the owner is responsible . . ." If a permittee can "opt out" of a multi-MS4 permit by submitting a individual permit application, a permitting authority such as a water board cannot impose a multi-MS4 permit on that permittee.

Second, this provision requires that the MS4s to be covered in the permit be "adjacent or interconnected." This is not true with respect to the MS4s proposed to be included within the Draft Permit. For example, the MS4 within the Santa Margarita Region of Riverside County is not "interconnected" with any other MS4s except those within that region. This is true also of the MS4s within South Orange County and San Diego County, which are not interconnected. Additionally, none of the MS4s in the three counties is "adjacent" to each other – each is separated by miles of non-urban area. In the SMR for example, the confluence of Temecula and Murrieta Creeks to form the Santa Margarita River is miles upstream of Rainbow Creek, the first discharge from San Diego County to the River. And, the confluence of Temecula and Murrieta Creeks is over 30 miles from the discharge of the Santa Margarita River to the Pacific Ocean.

The next inquiry is whether the three separate county MS4s could be considered, together, to form a single "large municipal separate storm sewer system." The federal MS4 regulations define this term as follows:

> *Large municipal separate storm sewer system* means all municipal separate storm sewers that are either:
>
> (i) Located in an incorporated place with a population of 250,000 or more . . . ."
>
> (ii) Located in the counties listed in Appendix H, except municipal separate storm sewers that are located in the incorporated places, townships or towns within such counties; or
>
> (iii) Owned or operated by a municipality other than those described [in paragraphs (i) and (ii)] . . . and that are designated by the Director as part of the large or medium municipal separate storm sewer system due to the interrelationship between the discharges of the designated storm sewer and the discharges from municipal separate storm sewers described [in paragraphs (i) and (ii)]. In making this determination the Director may consider the following factors:
>
> (A) Physical interconnections between the municipal separate storm sewers;
>
> (B) The location of discharges from the designated municipal separate storm sewer relative to discharges from municipal separate storm sewers described in [paragraph (i)];
>
> (C) The quantity and nature of pollutants discharged to waters of the United States;
>
> (D) The nature of the receiving waters; and
>
> (E) Other relevant factors, or
>
> (iv) The Director may, upon petition, designate as a large municipal separate storm sewer system, municipal separate storm sewers located within the boundaries of a region

> defined by a storm water management regional authority based on a jurisdictional, watershed, or other appropriate basis that includes one or more of the systems described [in paragraphs (i), (ii) or (iii)].

40 CFR § 122.26(b)(4).

None of paragraphs (i), (ii) or (iii) authorizes a regional MS4 permit such as that envisioned in the Draft Permit. The Draft Permit applies beyond a single incorporated place, County or municipality. Of these paragraphs, only paragraph (iv) could arguably be used to define the MS4s in the three Counties as a single MS4 and thus authorize a regional permit. The key limiting language is, however, "within the boundaries of a region **defined by a storm water management regional authority,** based on a jurisdictional, watershed, or other appropriate basis . . . ." A regional water board is not a stormwater management regional authority. This is clear from the MS4 regulations, which provide that a "**regional authority may be responsible for submitting a permit application"** under certain conditions. 40 CFR § 122.26(a)(3)(iii)(C). Clearly, a Water Board is not responsible for submitting MS4 permit applications.

U.S. EPA, in the Preamble to the final Phase I MS4 regulations (55 Fed Reg. 47990, November 16, 1990), further illuminated the meaning of the regulatory language. The Preamble indicates that commenters proposed eight different MS4 permitting options:

> Option 1 – systems owned or operated by incorporated places augmented by integrated discharges; Option 2 – systems owned or operated by incorporated places augmented with significant other municipal discharges; Option 3 – systems owned or operated by counties; Option 4 – systems owned and operated by States or State departments of transportation; Option 5 – systems within the boundaries of an incorporated place; Option 6 – systems within the boundaries of counties; Option 7 – systems in census designated urbanized areas; and Option 8 – systems defined by watershed boundaries.

55 Fed Reg. at 48039. None of these options encompasses the fact pattern presented by the Draft Permit, which covers multiple counties and multiple watersheds, are not interconnected, do not share common receiving waters and are located in separate census designated urbanized areas.

In explaining the derivation of 40 CFR 122.26(b)(4)(iv), U.S. EPA noted that it was "an outgrowth of comments on all options, especially Option 4 (State owned systems/State highways) and Option 8 (watersheds)." 55 Fed. Reg. at 48040. Thus, the Caltrans MS4 permit (which applies statewide) is authorized under paragraph (iv), since the "storm water management regional authority" defining the region to be covered is Caltrans itself. No such single authority exists for the three-county area proposed to be included in the Draft Permit, which also would encompass multiple watersheds.

Moreover, paragraph (iv) provides that the regional authority must "petition" the U.S. EPA Director to have a single MS4 designated within the boundaries of the region defined by the regional authority. Because California has been delegated NPDES permitting authority, a regional authority would presumably need to petition its Water Board to authorize such a regional permit. Since no such regional authority exists to establish the geographical basis for a

three-county MS4 permit, there is no such entity to "petition" the Water Board to establish a regional permit. This is clear from the Preamble to the Phase I regulations, which indicate that "regional storm water authorities" established by "some States or counties" may "petition the Director [or its state designee] to assume a regional role. 55 Fed. Reg. at 48042. It is clear from the Preamble that it is not the Water Board that has the authority to make such a petition, but rather the "storm water authorities" (i.e., municipalities, districts and Caltrans).

It should be noted that the Bay Area Regional MS4 Permit was a joint Bay Area Water Board and copermittee effort, coordinated by the Bay Area Stormwater Agencies Management Association ("BASMAA"). It is not the case that the Bay Area Water Board imposed this regional MS4 permit. The copermittees, coordinated by BASMAA, themselves determined to develop a regional MS4 permit. Further, all of the copermittees to the Bay Area Regional MS4 Permit discharge to a common receiving water, San Francisco Bay. Also, an Alaska MS4 permit cited in a letter from the Office of Chief Counsel to county counsel for Orange and Riverside Counties was issued to several municipalities and entities within a single "borough," which is equivalent in Alaska to a county.

Additionally, neither the Riverside County Copermittees nor those in South Orange County have filed ROWDs with the San Diego Water Board, which serve as the application for an NPDES MS4 permit in California. Water Code § 13260. The current Riverside County MS4 permit for the Santa Margarita Region provides that the ROWD is not required to be filed until May 2015, 180 days prior to the November 10, 2015 expiration date of that permit. Order R9-2010-0016, Part II.K.2.c.

> This ROWD must include:
>
> (1) Proposed changes to the Copermittees' runoff management programs; (2) Proposed changes to monitoring programs; (3) Justification for proposed changes; (4) Name and mailing addresses of the Copermittees; (5) Names and titles of primary contacts of the Copermittees; (6) Any other information necessary for the reissuance of this Order and (7) Any other information required by federal regulations for permit reapplications.

Id. It should be noted that several items of this ROWD are specifically intended to assist in the formulation of a new, SMR-specific MS4 permit, including proposed changes to the runoff management and monitoring programs, as well as justification for such changes, information necessary for "reissuance" of the SMR MS4 permit and information required by the federal regulations for MS4 permit reapplications.

As a simple jurisdictional matter, the Water Board cannot issue a regional MS4 permit to MS4 dischargers that have not applied for it. Moreover, as noted above, the SMR copermittees are entitled to apply for an MS4 permit applicable to their jurisdiction. Further, each individual copermittee has the right to apply for a MS4 permit covering only its discharges, as has the City of Long Beach in the Los Angeles Region.

Finding 3, Finding 15, in Fact Sheet Section VII.A and in Multiple Locations Throughout Draft Permit: In Finding 3, the Fact Sheet and in multiple locations throughout the Draft Permit (which are identified in the redline of the Draft Permit submitted with these comments by the Riverside County Copermittees ("Redline")), it is stated that the maximum extent practicable ("MEP") applies only to "storm water" discharges from the MS4. This is not correct.[2]

In fact, the Clean Water Act does not distinguish between non-stormwater and stormwater in terms of MS4 discharges which must be controlled to the MEP standard. *See* 33 U.S.C. § 1342(p)(3)(B)(iii)(the MS4 permit "shall require controls to reduce the discharge of pollutants to the maximum extent practicable . . . ." While the heading of 33 U.S.C. § 1342(p) refers to "Municipal and industrial stormwater discharges," this is not dispositive, as 33 U.S.C. § 1342(p)(3)(B)(ii), which requires the effective prohibition of "non-stormwater discharges" into the MS4. Thus, the language of this heading does not in fact support the argument that the MEP standard applies only to pollutants in stormwater discharges.

That both non-stormwater and stormwater must be controlled to the MEP standard was made clear by U.S. EPA itself in the preamble to the final Phase I stormwater regulations. In that preamble, U.S. EPA made it clear that "MEP control measures" would be implemented to address not only pollutants in "storm water" but also from "non-storm water discharges." As the preamble states:

> "Permittees are required to develop management programs for four types of pollutant sources which discharge to large and medium municipal storm sewer systems. Discharges from [such systems] are usually expected to be composed primarily of: (1) Runoff from commercial and residential areas; (2) storm water runoff from industrial areas; (3) runoff from construction sites; and (4) *non-storm water discharges*. Part 2 of the permit application has been designed to allow [permittees] the opportunity to propose *MEP control measures for each* of these components of the discharge."

55 Fed. Reg. at 48052 (emphasis supplied).

This language sets forth USEPA's understanding of the plain language of the CWA: "pollutants" must be controlled to the MEP from any MS4 "discharge," not merely pollutants in stormwater.

Finding 11: This finding, in relevant part, states that "[h]istoric and current development makes use of natural drainage patterns and features as conveyances for runoff. Rivers, streams and creeks in developed areas used in this manner are part of the Copermittees' MS4s regardless of whether they are natural, anthropogenic, or partially modified features. In these cases, the rivers, streams and creeks in the developed areas of the Copermittees' jurisdictions are both an MS4 and receiving water." This conclusion is legally incorrect.

First, under no circumstance can a natural stream constitute an MS4. The definition of "MS4" in the CWA regulations (a definition found in Attachment C of the Draft Permit) refers to a

[2] Finding 15 also states, erroneously, that the MEP standard "is explicitly for "Municipal . . . *Stormwater Discharges* (emphasis added)" from the MS4.

"conveyance or system of conveyances" "owned or operated" by a municipality. 40 CFR §122.26(b)(8). In California, natural rivers and streams are not "owned" nor "operated" by the municipality through which they flow. Moreover, a municipality obviously cannot "operate" a natural creek or stream. In further support of the point that a MS4 is an artificial, not natural, watercourse, the types of "conveyances" identified in the regulation ("roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains") all refer to anthropogenic structures, not natural streams. 40 CFR § 122.26(b)(8).

Second, a "receiving water" cannot also be an MS4, as is plain from the CWA regulations. An MS4 is itself defined as discharging to waters of the United States. 40 C.F.R. §122.26(b)(8). An MS4 cannot, in essence, discharge to itself. Moreover, an "outfall" from an MS4 (the point at which the discharge enters a receiving water) does not, pursuant to 40 C.F.R §122.26 (b)(9), include conveyances connecting "segments of the same stream or other waters of the United States and are used to convey waters of the United States."

Moreover, U.S. EPA, in the Preamble to the initial version of the MS4 regulations (53 Fed. Reg. 49416 (Dec. 7, 1988)) expressly determined that "streams, wetlands and other water bodies that are waters of the United States are not storm sewers for the purposes of this rule" and that "stream channelization, and stream bed stabilization, which occur in waters of the United States" were not subject to National Pollutant Discharge Elimination System ("NPDES") permits under Section 402 of the CWA. 53 Fed. Reg. at 49442.

Additionally, the United States Supreme Court recently reversed the Ninth Circuit Court of Appeals and ruled that flows from sections of the Los Angeles and San Gabriel Rivers that are comprised of concrete flood control channels are not a "discharge" under the CWA, confirming that such rivers, even if improved, are "receiving waters" along with any natural portions of those rivers. *Los Angeles County Flood Control Dist. v. Natural Resources Defense Council*, 568 U.S. __(January 8, 2013) (slip op.).

The above-cited statement in the finding is incorrect and should be stricken, as recommended in the Redline.

Finding 12: This finding states, in relevant part, that "[a]s operators of the MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to waters of the U.S., the operator essentially accepts responsibility for discharges into the MS4 that it does not prohibit or otherwise control." This statement is legally incorrect, and ignores the salient point that the "discharger" of a pollutant is primarily responsible for controlling/permitting that discharge, under both the CWA and the Porter-Cologne Act. For example, under the Porter-Cologne Act, any persons discharging or proposing to discharge "waste" into waters of the state must file a report of waste discharge and obtain a waste discharge requirement. Water Code §§ 13260, 13263. The operator of the MS4 into which that water eventually flows is not "essentially accepting" responsibility for the discharge. The responsibility of the MS4 operator is established under the CWA, and that is to effectively prohibit non-stormwater discharges into [the MS4] and to control the discharge of pollutants from the MS4 to the MEP.

Moreover, the statement ignores the fact that in California, downstream property owners (including municipalities owning and operating MS4 facilities) must accept the flow of upstream waters. In fact, for a downstream municipality to block such flow would constitute an inverse condemnation or the creation of a nuisance under California law. *See Arreola v. County of Monterey* (2002) 99 Cal.App.4th 722 (obstruction of flood waters by improperly designed highway constituted inverse condemnation and nuisance).

Finding 28 and Fact Sheet Section VI: In the Finding, it is stated that the Water Board "finds that the requirements in this permit are not more stringent than the minimum federal requirements" and that therefore "a CWC section 13241 analysis is not required." The Finding further recites that notwithstanding this fact, "the San Diego Water Board has developed an economic analysis of the requirements in this Order."

For the reasons set forth in the comments of the Riverside County Copermittees, numerous provisions in the Draft Permit are in fact more stringent than the requirements of the CWA and its implementing regulations and therefore require an adequate Water Code § 13241 analysis. Unfortunately, this analysis is not provided in the Fact Sheet.

First, the economic analysis set forth in the Fact Sheet does not meet the requirements of Section 13241, as it does not analyze the six specific factors required to be analyzed under the section. Second, the analysis uses cost data from other sources, only a few of which were from the municipalities proposed to be included under the Draft Permit. These data are also a number of years old; the most recent study referenced in the Fact Sheet, the one done for the State Board by Cal State Sacramento, was dated January 2005 and included decade-old cost data from the City of Encinitas that dated from 2002-2003.

Third, the section of the Fact Sheet discussing the benefits of water quality notes that "there have been no studies for the San Diego Region to quantify the added value that surface waters with healthy water quality can provide." Thus, the Water Board has no evidence with which to compare the costs and benefits of the programs set forth in the Draft Permit. Moreover, the discussion makes the incorrect assumption that the alternative to the programs in the Draft Permit would be no controls on pollutants in urban runoff. As the Fact Sheet correctly notes, the Draft Permit is the fifth term MS4 permit for the copermittees. The previous four permits all contained increasingly complex and expensive control requirements, both structural and non-structural, designed to improve the quality of MS4 discharges. Thus, an appropriate cost analysis must compare the incremental costs of the programs set forth in the Draft Permit and the incremental benefits attributable to that permit. This has not been done in the Fact Sheet. Finally, the analysis does not recognize that the receiving waters provided economic benefits to residents of the San Diego Region long before issuance of the first MS4 permits in 1990. It is thus illogical to suggest that these pre-existing economic benefits would be lost if the Draft Permit is not adopted.

Finding 29 and Fact Sheet Section VII.F: The finding and the supporting argument in the Fact Sheet represents an attempt by Water Board staff to address whether the requirements of the Draft Permit represent an unfunded state mandate. That attempt, however, is beyond the scope of the Water Board's powers, since the *only* agency charged by the Legislature with determining

the presence of a state mandate, and whether that mandate is unfunded, is the Commission on State Mandates. Govt. Code § 17552; *Kinlaw v. State of California* (1991) 54 Cal.3d 326, 333. The Water Board has no jurisdiction to make a legal finding or discuss in the Fact Sheet that the Draft Permit, in whole or in part, does not constitute an unfunded state mandate.

Additionally fact sheets are required, under the CWA regulations, to provide the legal authority and reasons for each substantive permit provision (40 CFR § 124.8(a)(4); 40 CFR § 124.56(a)). *See also City of Rancho Cucamonga v. Regional Water Quality Control Board-Santa Ana Region* (2006), 135 Cal.App.4th 1377, 1382 (stating that fact sheets contains "the legal and factual grounds for the Water Board's recommendation to adopt the . . . permit"). Finding 29 and the discussion in Section VII.F of the Fact Sheet do not relate to any Draft Permit provision, nor provide legal authority or justification for the Draft Permit's adoption. As such, the finding and Fact Sheet discussion are surplussage and should be deleted.

The Riverside County Copermittees disagree with each of the arguments set forth in the Finding and Fact Sheet as to why the Draft Permit does not constitute an unfunded state mandate. Nevertheless, because the exclusive arena for such disagreements is the Commission on State Mandates, whose jurisdiction does not commence unless and until a test claim is filed before the Commission, the Copermittees need not and will not address those arguments.

Comments on Provisions in Draft Permit

Provision A and Fact Sheet Section VIII.A:

Lack of True Iterative Compliance Process

As set forth in the Redline and in the Comment Letter, the Riverside County Copermittees believe that to effectuate the iterative approach to compliance with water quality standards and other discharge prohibitions in the Draft Permit, the copermittees must be provided with the means to be in compliance. Based on monitoring, exceedances of water quality standards are occurring in the receiving waters subject to the Draft Permit, as set forth in Table G-14 to the latest 2011-2012 monitoring report submitted by the Riverside County Copermittees. Thus, if the copermittees are not provided an iterative means to be in compliance, which was contemplated by State Board's Order No. 2001-15, the copermittees will be issued an illegal MS4 permit, since it is a permit with which they cannot comply. This violates the intent of Congress in the CWA, which "is presumed not to have intended absurd (impossible) results." *Hughey v. JMS Development Corp.*, 78 F.3d 1523, 1529 (11th Cir. 1996); *accord, Mississippi River Revival v. City of Minneapolis*, 319 F.3d 1013, 1017-1018 (8th Cir. 2003).

With regard to the iterative process, Water Board staff has indicated numerous times during the workshop process that achievement of water quality standards is expected to take many years. The entire WQIP approach is aimed at the eventual attainment of such standards, as are the TMDLs issued to other copermittees, which have final compliance dates years into the future.

This approach is, however, put into jeopardy by the requirement, as expressed in the Fact Sheet at F-39, that the discharge prohibition and receiving water limitation provisions are

"independently applicable, meaning that compliance with one provision does not provide a 'safe harbor' where there is non-compliance with another provision (i.e., compliance with Provision A.4 does not shield a Copermittee who may have violated Provision A.1.a, A.1.c, or A.2.a from an enforcement action." While the Fact Sheet appropriately notes how this process should work through Provision A.4 (which "essentially requires the Copermittees to implement additional BMPs until MS4 discharges no longer cause or contribute to a violation of water quality standards") it also states that despite this iterative process, "the San Diego Water Board retains the discretion to take other appropriate enforcement and the iterative process does not shield dischargers from citizen suits under the CWA." Fact Sheet at F-40.

The consequences of this approach cannot be overemphasized. Despite the copermittees' good faith undertaking to follow the iterative process outlined in Provision A.4, a Water Board enforcement proceeding or a citizen suit can be brought for violations of water quality standards and, if the citizen plaintiff is successful, a federal judge is empowered to use his/her injunctive powers under Section 505(a) of the CWA to throw out the WQIP, JRMP or other compliance efforts of the copermittees and require other efforts. In such a case, the time and money spent by the copermittees in trying to comply with the Draft Permit, as well as the effort spent by the copermittees and Water Board staff in developing the Draft Permit's terms, are completely wasted.

Thus, the essential conundrum of Provision A, as presently drafted, is clearly exposed. Even though a copermittee may spend significant sums and undertake significant tasks under its WQIP or JRMP, be conducting expensive monitoring and special studies, and be in *full compliance* with all of the programmatic requirements of the Draft Permit, it would still face either a Water Board enforcement action or a citizen suit under Section 505 of the CWA. And, such a suit would allege exceedances of water quality standards (some of which are hardly capable of laboratory detection, much less control) that the Water Board acknowledges cannot be achieved for years.

Provision A is not, however, required by the CWA, as held by the Ninth Circuit in *Defenders of Wildlife v. Browner*, 191 F.3d 1159 (9th Cir. 1999). The holding in *Browner* is further reflected in State Board Order WQ 2001-15 (which the Fact Sheet acknowledges incorporates an "iterative process") which states:

> [O]ur [receiving water limitation] language, similar to the U.S. EPA's permit language discussed in the Browner case, **does not require strict compliance with water quality standards.** Our language requires that **storm water management plans be designed to achieve compliance with water quality standards**. **Compliance is to be achieved over time, through an iterative approach requiring improved BMPs**. As pointed out by the Browner court, there is nothing inconsistent between this approach and the determination that the Clean Water Act does not mandate strict compliance with water quality standards.

Order WQ 2001-15 at 7 (emphasis added). Thus, Provision A is inconsistent with the State Board's own precedential order, which requires the iterative approach effectuated by the suggested Redline changes.[3]

In further support, it may be noted that the U.S. EPA-drafted MS4 permit for the District of Columbia does not contain the type of language found in Provision A, but rather requires "an iterative and an adaptive management process for pollutant reduction and for achieving applicable water quality standard and/or total maximum daily load (TMDL) compliance." DC MS4 Permit Fact Sheet, page 5 (attached as Exhibit A).

Also, despite the assertion in the Fact Sheet that the copermittees are seeking a "safe harbor" from liability, this is incorrect. Every provision of an MS4 permit is subject to enforcement; given the complexity of the Draft Permit, the failure by a copermittee to comply with any provision could lead to such enforcement.

As noted above, MS4 discharges may not be achieving compliance with strict water quality standards, as recognized by the Issue Paper released by State Board staff in preparation for a November 20, 2012 workshop on receiving water limitation issues raised by *NRDC v. County of Los Angeles*. That Issue Paper stated that as "the storm water management programs of municipalities have matured, **an increasing body of monitoring data indicates that water quality standards are in fact not being met by many MS4s.**" (State Board Issue Paper, Page 2, emphasis supplied) (*see* Exhibit B.)

Perhaps most importantly, requiring strict and immediate compliance with discharge prohibition and receiving water limitations inhibits, not supports, the philosophy of the Draft Permit, which is to encourage the copermittees to focus on the most significant problems in their watersheds and to prioritize their resources to address those problems. Provision A, by contrast, discourages innovative approaches or prioritization, since all pollutants exceeding water quality standards create liability. Moreover, as discussed above, in the event of a citizen suit being brought such as that in the *NRDC* case, a federal judge could award injunctive relief to a successful plaintiff that could completely ignore or supplant the WQIP and other permit terms.

For additional discussion of receiving water limitations issues, please see Exhibit C, a letter submitted by the District to the State Board in connection with the recent workshop held by the State Board on receiving water limitations language. The Riverside County Copermittees hereby reference and incorporate this Exhibit into these comments.

The Riverside County Copermittees support a true iterative process that requires refinement and amendment of the WQIP and associated BMPs when receiving water limitation violations are recorded. That is the essence of the iterative process; the identification of problems and the development of BMPs to attempt to address those problems.

[3] While the Fact Sheet cites as authority *Natural Resources Defense Council v. County of Los Angeles*, discussed above, the Ninth Circuit was simply responding to language in the former Los Angeles County MS4 permit, and did not determine that such non-iterative language was required by the CWA.

The Redline proposes a means to achieve compliance using the WQIPs, which are intended to bring the copermittees into compliance with the discharge prohibition and receiving water limitation provisions of the Draft Permit over time. The Redline links compliance with Provisions A.1, A.2 and A.3 to A.4, which indicates that compliance is obtained through the preparation and updating of the WQIPs.

It must be noted, however, that the Riverside County Copermittees do not agree with the approach suggested by others, that any WQIP-based compliance approach be necessarily accompanied by a "Reasonable Assurance Analysis." Such an analysis could be extremely complex, expensive and time intensive to develop. Generally, such analyses are developed in the preparation of TMDLs and take a number of years to develop and refine. Given that the Santa Margarita Watershed has no adopted TMDLs, there are no comprehensive pollutant transport or BMP models available for the suite of constituents that might be considered for prioritization within a WQIP for that watershed. In the context of a TMDL, such models would be developed by the combined resources of the Water Board, stakeholders and dischargers. Requiring such an exercise to be undertaken solely with the public resources of the residents of the SMR is beyond the Copermittees' financial ability and would shift responsibility for development of TMDLs from the Water Board to the Copermittees.

Discussion in Fact Sheet

The Fact Sheet discussion also contains a number of legal and factual errors. First, the statement on page F-34 that non-stormwater discharges from the MS4 are subject to NPDES permitting requirements is unsupported by the plain language of the CWA, which (as noted above) applies the MEP standard to *all* discharges of pollutants from the MS4, not just those in stormwater. Also, such discharges are not subject to separate requirements under the NPDES program, as suggested on F-34, and non-storm water discharges are not the same, legally, as "illicit discharges." Please see discussion below.

Similarly, the Fact Sheet's conclusion that "Regional Water Boards are not limited by the iterative MEP approach to storm water regulation in crafting appropriate regulations for non-storm water discharges" is incorrect. The Fact Sheet correctly states that MEP has not been defined in the CWA or by U.S. EPA in the CWA regulations. However, the Fact Sheet incorrectly concludes that MEP is "ultimately defined" by the Water Boards or the State Board. What constitutes "MEP" is a question of federal law under the CWA, not a matter for definition by agencies which merely have been delegated the authority to enforce the CWA in California. The only source for such a finding is a memorandum from a State Board attorney, not case authority.

Moreover, Provisions B-E of the Draft Permit, far from establishing a "minimum framework" for the copermittees to achieve the MEP standard, sets forth in many cases requirements that far exceed the plain requirements of the CWA, the implementing regulations and in some cases even state law, or which require the copermittees to undertake steps that are not "practicable." These requirements are identified in the comments of the Riverside County Copermittees. In such respects, those requirements do not represent a "minimum framework" for MEP.

Other Issues

The Riverside County Copermittees also object to the provision in A.1.a and other portions of the Draft Permit that prohibit certain discharges into "waters of the state." The CWA regulates discharges into waters of the United States, which are surface waters. Expanding the prohibition to cover waters of the state expands the scope of the Draft Permit to protect groundwater, as a matter of state law. It should be noted that the recent Los Angeles County MS4 Permit appropriately applies this prohibition to waters of the United States.

Provision B.5: As noted in the Comment Letter, the CWA requires that illegal discharges into the MS4 be addressed by a program of steps taken to address such discharges. The Redline emphasizes that this program be guided by WQIP priorities, which is consistent with the overall intent of the Draft Program.

Provision E.2.a and E.2.a.(7): These provisions require the Copermittees to, as a part of their Illicit Discharge Detection and Elimination (IDDE) program, address all non-stormwater discharges as "illicit discharges," thus requiring the copermittees to "reduce or eliminate non-stormwater discharges" whether or not the discharges have been identified as "illicit."

The Fact Sheet asserts that "Provision E.2.a.(7) is consistent with the requirements of the CWA section 402(p)(3)(B)(ii) and 40CFR 122.26(d)(1)(v)(B). That assertion is not correct. Section 402(p)(3)(B)(ii) of the CWA states that MS4 permits "shall include a requirement to *effectively prohibit* non-stormwater discharges into the storm sewers" (emphasis supplied). The CWA regulations include two provisions designed to begin implementation of the "effective prohibition." The first provision requires MS4 permittees to perform a screening analysis, intended to provide sufficient information to develop priorities for a program to detect and remove illicit discharges. 40 CFR 122.26(d)(1)(iv)(D). The second requires MS4 permittees to develop a recommended site-specific management plan to detect and remove illicit discharges (or ensure they are covered by an NPDES permit) and to control improper disposal to MS4s. 40 CFR 122.26(d)(1)(iv)(D) and 122.26(d)(2)(B). The MS4 permittees are required to identify the non-stormwater discharge as an illicit discharge prior to having an obligation to effectively prohibit it. There is not otherwise a presumption to reduce or eliminate it.

40 CFR 122.26(d)(1)(v)(B), cited in the Fact Sheet, requires "[a] description of the existing program to identify illicit connections to the municipal storm sewer system. The description should include inspection procedures and methods for detecting and preventing illicit discharges, and describe areas where this program has been implemented."

The provision and rationale within the Fact Sheet blur the distinction between the copermittees' need to "effectively" prohibit non-stormwater discharges and to detect and eliminate illicit discharges.

- The requirement is "effectively prohibit" non-stormwater discharges, not "reduce or eliminate" non-stormwater discharges.
- Although copermittees are required to have a program to prevent illicit discharges to the MS4, non-stormwater discharges should only be addressed as illicit discharges where

such discharges are identified as sources of pollutants that may cause or contribute to an exceedance of a water quality objective.

- The IDDE program is established to detect and eliminate "illicit discharges", not non-stormwater discharges in general.

Please see the Redline for modifications to Provision E.2 addressing these issues.

Provision E.2.a.(3): In the Redline, the Riverside County Copermittees request that categories of irrigation runoff discharges (landscape irrigation, irrigation water and lawn watering) be considered as conditionally exempt discharges (not subject to treatment as illicit discharges).

The rationale for not including irrigation runoff discharges lacks a legal and factual basis. As noted in the Comment Letter, the only factual basis for this provision with respect to the Riverside County Copermittees is discussion in a public information informational brochure, which was itself based on a similar document from Orange County. Fact Sheet F-76. Despite assertions to the contrary in the Fact Sheet, this brochure does not represent a determination by the Riverside County Copermittees that irrigation runoff is a category of non-stormwater discharge that must be effectively prohibited. The other evidence in support of prohibiting the conditional exemption for irrigation runoff is entirely from different areas of the region, with different urban development patterns, lithology and hydrology. No specific determination has been made by the Copermittees (or the Water Board) that irrigation runoff in the Santa Margarita Region has actually been shown to be significant source of pollutants to receiving waters in the SMR.

EPA, in the preamble to the federal MS4 regulations, required that a *permittee* must make a finding that the "irrigation water" discharges must be a "source of pollutants to waters of the United States . . . ." 55 Fed. Reg. 48037. Moreover, such discharges must represent a "significant" source of pollutants to waters of the United States "under certain conditions." U.S. EPA, *Guidance Manual for the Preparation of Part 2 of the NPDES Permit Application for Discharges from Municipal Separate Storm Sewer Systems,* November 1992 ("EPA Part 2 Guidance Manual"), at p. 6-33. These conditions require a focus not on an entire category of discharges, but rather a discharger-by-discharger examination.

In the MS4 regulatory preamble, EPA stated that "[i]n general, municipalities will not be held responsible for prohibited some specific components of discharges or flows listed below through their [MS4], even though such components may be considered non-storm water discharges, unless such discharges *are specifically identified on a case-by-case basis as needing to be addressed."* 55 Fed. Reg. 47995 (emphasis supplied). In the Guidance Manual, EPA states:

> If an applicant knows . . . that landscape irrigation water from a ***particular site*** flows through and picks up pesticides **or *excess*** nutrients from fertilizer applications, there may be a reasonable potential for a storm water discharge to result in a water quality impact. In such an event, the applicant should contact the NPDES permitting authority to request that the authority order ***the discharger*** . . . to obtain a separate NPDES permit (or in this case, the discharge could be controlled through the storm water management program of the MS4).

EPA Part 2 Guidance Manual, p. 6-33 (emphasis added). Read in this context of this language, the Water Board has no power greater than a municipality in terms of its ability to identify non-stormwater discharges as "illicit" and thus required to be regulated, and must identify specific discharges, and not entire categories of discharges. *See* 55 Fed. Reg. 48037. This has not been done in the Fact Sheet.

Provision E.3(c): This provision requires the Copermittees to compel development projects that may not result in a hydromodification impact to the applicable receiving waters, to implement on-site or "alternative compliance" hydromodification mitigation measures and to use using "pre-development (naturally occurring)" runoff reference condition as applied to sites that are, in fact, developed.

The Riverside County Copermittees are concerned that implementing these requirements would subject the Copermittees to liability under the takings clauses of the U.S. and California Constitutions as well as under the Mitigation Fee Act because of the questionable nexus between such a project's lack of actual hydromodification impacts upon the receiving waters, and the hydromodification management measures required in the Draft Permit.

When imposing a condition on a development permit, a local government is required under the federal and state constitutions to establish that the condition bears a reasonable relationship to the impacts of the development project. This rule applies even to legislatively enacted requirements and impact fees or exactions.[4] Moreover, fees imposed on a discretionary ad hoc basis are subject to heightened scrutiny under a two-part test. First, local governments must show that there is a substantial relationship between the burden created by the impact of development and any fee or exaction.[5] Second, a development project's impacts must bear a "rough proportionality" to any development fee or exaction.[6] Under California law, the *Nollan/Dolan* heightened scrutiny test also applies to in-lieu fees.[7]

The Legislature has memorialized these requirements in the Mitigation Fee Act, which establishes procedures that local governments must follow to impose impact fees.[8] Irrespective of whether the hydromodification management requirements are implemented by legislative act or on an ad hoc basis, the copermittees' attempt to enforce them as proposed in the Draft Permit would likely result in claims by developers and property owners alleging unconstitutional takings of private property and violations of the Mitigation Fee Act. This is because a developer could argue that limiting hydromodification impacts of already developed property to its "naturally occurring" state, or requiring hydromodification mitigation measures for impacts not imposed by the project, would not have a legally sufficient nexus to the impact of the development project.

In addition, the Copermittees wish to bring the Water Board's attention to a recent case, *Virginia Dept. of Transportation v. United States Environmental Protection Agency*, Civ. Action No.

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[4] *Building Indus. Ass'n v. City of Patterson* (2009)171 Cal. App. 4th 886, 898.
[5] *Nollan v. California Coastal Comm'n*, 483 U.S. 825, 837 (1987).
[6] *Dolan v. City of Tigard*, 512 U.S. 374, 391 (1994).
[7] *Ehrlich v. City of Culver City* (1996) 12 Cal. 4th 854, 876.
[8] Cal. Gov't Code §§ 66000-66025.

1:12-CV-775 (E.D. Va. January 3, 2013) (slip op.), which is attached for the Water Board's convenience as Exhibit D. In this case, a federal district judge found that the CWA did not authorize U.S. EPA to regulate stormwater itself as a pollutant. The impact of this case is not known at this time, as it will probably be appealed to the Fourth Circuit Court of Appeals. Still, any approach to hydromodification which focuses on flows *per se*, as opposed to pollutants, may not withstand legal scrutiny.

Provision E.3.c.(3)(c)(i): This provision requires the entire alternative compliance in-lieu fee to be transferred to the copermittee or an escrow account prior to construction of a Priority Development Project (PDP). This provision is problematic, as development fees (which would include the in-lieu fees) are collected at the time of building permit issuance. In large-scale projects, permits may be issued (and development fees collected) in phases. Further, for master-planned developments, fees are generally negotiated through a development agreement to be collected based on certain development milestones. Therefore, collecting and holding the entire in-lieu fee prior to construction interferes with the development practice and may violate the Mitigation Fee Act and local development ordinances. The Redline requests that in-lieu fees be collected in accordance with state and local law.

Provision E.5: In addition to other comments on this provision and others in the Draft Permit relating to retrofitting, any requirements in Draft Permit relating to the retrofitting of engineered channels and other structures employed for flood control purposes must be consistent with the judgment of the flood control districts, to which the Legislature has assigned sole authority for the protection of the lives and property of their citizens from flooding. (Please see Comment Letter and proposed new findings in Redline for further discussion). Due to the urbanization of the counties over the past 150 years, as well as the particular topography and weather conditions found in Southern California, there is a great risk of flooding and hence the need for flood control structures and channels. The flood control districts have both the expertise and the sole legal authority to determine whether retrofitting of flood control structures can be accomplished in light of their statutory obligations, and that expertise and authority must be recognized in the Draft Permit.

Provision E.8: As noted in the Redline, the first requirement under Fiscal Analysis, that each "Copermittee must secure the resources necessary to meet all the requirements of this Order" has been deleted. This requirement is not found in the CWA regulations, which require only the conduct of a fiscal analysis. Moreover, this requirement intrudes on the home rule power of cities and counties by requiring, in essence, that municipal budgets must reflect the priority of compliance with the Order over any competing obligation, including police, fire protection and public health. A key issue in complying with stormwater and MS4 obligations is the ability of municipalities to afford the increasing costs associated with those obligations. In California, of course, the ability to raise taxes to pay for such obligations has been severely curtailed through several voter-approved propositions.

The Riverside County Copermittees request that Provision E.8.a be deleted.

EXHIBIT A

NPDES Permit No. DC0000221

AUTHORIZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM MUNICIPAL SEPARATE STORM SEWER SYSTEM PERMIT

In compliance with the provisions of the Clean Water Act, 33 U.S.C. §§ 1251 *et seq.*

Government of the District of Columbia
The John A. Wilson Building
1350 Pennsylvania Avenue, N.W.
Washington, D.C. 20004

is authorized to discharge from all portions of the municipal separate storm sewer system owned and operated by the District of Columbia to receiving waters named:

Potomac River, Anacostia River, Rock Creek and stream segments tributary to each such water body

in accordance with the Stormwater Management Program(s) dated February 19, 2009, subsequent updates, and related reports, strategies, effluent limitations, monitoring requirements and other conditions set forth in Parts I through IX herein.

The effective issuance date of this permit is: October 7, 2011.

This permit and the authorization to discharge shall expire at midnight, on: October 7, 2016.

Signed this 30th day of September, 2011.

Jon M. Capacasa, Director
Water Protection Division
U.S. Environmental Protection Agency
Region III

1. DISCHARGES AUTHORIZED UNDER THIS PERMIT

1.1 Permit Area

This permit covers all areas within the jurisdictional boundary of the District of Columbia served by, or otherwise contributing to discharges from, the Municipal Separate Storm Sewer System (MS4) owned or operated by the District of Columbia. This permit also covers all areas served by or contributing to discharges from MS4s owned or operated by other entities within the jurisdictional boundaries of the District of Columbia unless those areas have separate NPDES MS4 permit coverage or are specifically excluded herein from authorization under the District's stormwater program. Hereinafter these areas collectively are referred to as "MS4 Permit Area".

1.2 Authorized Discharges

This permit authorizes all stormwater point source discharges to waters of the United States from the District of Columbia's MS4 that comply with the requirements of this permit. This permit also authorizes the discharge of stormwater commingled with flows contributed by process wastewater, non-process wastewater, or stormwater associated with industrial activity provided such discharges are authorized under separate NPDES permits.

This permit authorizes the following non-stormwater discharges to the MS4 when appropriate stormwater activities and controls required through this permit have been applied and which are: (1) discharges resulting from clear water flows, roof drainage, dechlorinated water line flushing, landscape irrigation, ornamental fountains, diverted stream flows, rising ground waters, uncontaminated ground water infiltration to separate storm sewers, uncontaminated pumped ground water, discharges from potable water sources, foundation drains, air conditioning condensation, irrigation waters, springs, footing drains, lawn watering, individual resident car washing, flows from riparian habitats and wetlands, dechlorinated swimming pool discharges, wash water, fire fighting activities, and similar types of activities; and (2) which are managed so that water quality is not further impaired and that the requirements of the federal Clean Water Act, 33 U.S.C. §§ 1251 *et seq.*, and EPA regulations are met.

1.3 Limitations to Coverage

1.3.1 Non-stormwater Discharges

The permittee, as defined herein, shall effectively prohibit non-stormwater discharges into the MS4, except to the extent such discharges are regulated with an NPDES permit.

1.3.2 Waivers and Exemptions

This permit does not authorize the discharge of any pollutant from the MS4 which arises from or is based on any existing waivers and exemptions that may otherwise apply and are not consistent with the Federal Clean Water Act and other pertinent guidance, policies, and regulations. This narrative prohibition on the applicability of such waivers and exemptions extends to any activity that would otherwise be authorized under District law, regulations or

ordinance but which impedes the reduction or control of pollutants through the use of stormwater control measures and/or prevents compliance with the narrative /numeric effluent limits of this permit. Any such discharge not otherwise authorized may constitute a violation of this permit.

1.4 Discharge Limitations

The permittee must manage, implement and enforce a stormwater management program (SWMP) in accordance with the Clean Water Act and corresponding stormwater NPDES regulations, 40 C.F.R. Part 122, to meet the following requirements:

1.4.1. Effectively prohibit pollutants in stormwater discharges or other unauthorized discharges into the MS4 as necessary to comply with existing District of Columbia Water Quality Standards (DCWQS);

1.4.2. Attain applicable wasteload allocations (WLAs) for each established or approved Total Maximum Daily Load (TMDL) for each receiving water body, consistent with 33 U.S.C. § 1342(p)(3)(B)(iii); 40 C.F.R. § 122.44(k)(2) and (3); and

1.4.3. Comply with all other provisions and requirements contained in this permit, and in plans and schedules developed in fulfillment of this permit.

Compliance with the performance standards and provisions contained in Parts 2 through 8 of this permit shall constitute adequate progress toward compliance with DCWQS and WLAs for this permit term.

2. LEGAL AUTHORITY, RESOURCES AND STORMWATER PROGRAM ADMINSTRATION

2.1 Legal Authority

2.1.1 The permittee shall use its existing legal authority to control discharges to and from the Municipal Separate Storm Sewer System in order to prevent or reduce the discharge of pollutants to achieve water quality objectives, including but not limited to applicable water quality standards. To the extent deficiencies can be addressed through regulation or other Executive Branch action, the permittee shall remedy such deficiencies within 120 days. Deficiencies that can only be addressed through legislative action shall be remedied within 2 years of the effective date of this permit, except where otherwise stipulated, in accordance with the District's legislative process. Any changes to or deficiencies in the legal authority shall be explained in each Annual Report.

2.1.2 No later than 18 months following the effective date of this permit, the District shall update and implement Chapter 5 of Title 21 of District of Columbia Municipal Regulations (Water Quality and Pollution) ("updated DC Stormwater Regulations"), to address the control of stormwater throughout the MS4 Permit Area. Such regulations shall be consistent with this

FACT SHEET

National Pollutant Discharge Elimination System (NPDES)
Municipal Separate Storm Sewer System (MS4)
Permit No. DC0000221 (Government of the District of Columbia)

NPDES PERMIT NUMBER: DC0000221 (Reissuance)

FACILITY NAME AND MAILING ADDRESS:

Government of the District of Columbia
The John A. Wilson Building
1350 Pennsylvania Avenue, N.W.
Washington, D.C. 20004

MS4 ADMINISTRATOR NAME AND MAILING ADDRESS:

Director, District Department of the Environment
1200 First Street, N.E., 6th Floor
Washington, D.C. 20002

FACILITY LOCATION:

District of Columbia's Municipal Separate Storm Sewer System (MS4)

RECEIVING WATERS:

Potomac River, Anacostia River, Rock Creek, and Stream Segments Tributary
To Each Such Water Body

INTRODUCTION:

Today's action finalizes reissuance of the District of Columbia Municipal Separate Storm Sewer System (MS4) Permit. In the Final Permit EPA has continued to integrate the adaptive management approach with enhanced control measures to address the complex issues associated with urban stormwater runoff within the corporate boundaries of the District of Columbia, where stormwater discharges via the Municipal Separate Storm Sewer System (MS4).

Since the United States Environmental Protection Agency, Region III (EPA) issued the District of Columbia (the District) its first MS4 Permit in 2000, the Agency has responded to a number of legal challenges involving both that Permit (as well as amendments thereto) and the second-round MS4 Permit issued in 2004. For the better part of ten years, the Agency has worked with various parties in the litigation, including the District and two non-governmental organizations, Defenders of Wildlife and Friends of the Earth, to address the concerns of the various parties. The Agency has engaged in both litigation and negotiation, including formal

mediation.[1] These activities ultimately led to an enhanced stormwater management strategy in the District, consisting of measurable outputs for addressing the issues raised during the litigation and mediation process.

FACILITY BACKGROUND AND DESCRIPTION:

The Government of the District of Columbia owns and operates its own MS4, which discharges stormwater from various outfall locations throughout the District into its waterways.[2]

On April 21, 2010 EPA public noticed the Draft Permit. The Draft Fact Sheet published with that Draft Permit contains more extensive permit background information, and the reader is referred to that document for the history of the District of Columbia MS4 permit.

The public comment period closed on June 4, 2010. EPA received comments from 21 individual commenters and an additional 53 form letters. The Draft Permit, Draft Fact Sheet, and comments received on those documents are all available at: http://www.epa.gov/reg3wapd/npdes/draft_permits.html. The Final Permit reflects many of the comments received. EPA is simultaneously releasing a responsiveness summary responding to these comments.

ACTION TO BE TAKEN:

EPA is today reissuing the District of Columbia NPDES MS4 Permit. The Final Permit replaces the 2004 Permit, which expired on August 18, 2009 and has been administratively extended since that time. The Final Permit incorporates concepts and approaches developed from studies and pilot projects that were planned and implemented by the District under the 2000 and 2004 MS4 permits and modifying Letters of Agreement, and implements Total Maximum Daily Loads (TMDLs) that have been finalized since the prior permit was issued, including the Chesapeake Bay TMDL. A number of applicable measurable performance standards have been incorporated into the Final Permit. These and other changes between the 2004 Permit and today's Final Permit are reflected in a Comparison Document that is part of today's Permit issuance.

WATER QUALITY IN DISTRICT RECEIVING WATERS:

The District's *2008 Integrated Report to the Environmental Protection Agency and U.S. Congress Pursuant to Sections 305(b) and 303(d) Clean Water Act*[3] documents the serious water

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1 A procedural history of Permit appeals can be viewed at the EPA Environmental Appeals Board web: http://yosemite.epa.gov/oa/EAB_Web_Docket.nsf/77355bee1a56a5aa8525711400542d23/b5e5b68e89edabe98525714f00731c6f!OpenDocument&Highlight=2.municipal.

2 Portions of the District are served by a combined sanitary and storm sewer system. The discharges from the combined sewer system are not subject to the MS4 permit, but are covered under NPDES Permit No. xxxx issued to the District of Columbia Water and Sewer Authority.

3 District Department of the Environment, *The District of Columbia Water Quality Assessment, 2008 Integrated Report to the Environmental Protection Agency and U.S. Congress Pursuant to Sections 305(b) and 303(d) Clean Water Act* (hereinafter "2008 Integrated Report").

quality impairments in the surface waters in and around the District. A number of the relevant designated uses are not being met, *e.g.*, aquatic life, fish consumption, and full body contact, and there are a number of specific pollutants of concern that have been identified (for additional discussion on relevant TMDLs *see* Section 4.10 of this Final Fact Sheet).

Commenters on the Draft Permit expressed some frustration over very slow progress or even lack of progress after a decade of implementation of the MS4 program and even longer for other water quality programs. EPA appreciates this concern. Although the District's receiving waters are affected by a range of discharge sources, discharges from the MS4 are a significant contributor of pollutants and cause of stream degradation. EPA also recognizes, however, that stormwater management efforts that achieve a reversal of the ongoing degradation of water quality caused by urban stormwater discharges entail a long term, multi-faceted approach.

Consistent with the federal stormwater regulations for characterizing discharges from the MS4 (40 C.F.R. §122.26(d)(2)(iii)), the first two permit terms for the District's MS4 program required end-of-pipe monitoring to determine the type and severity of pollutants discharging via the system. The monitoring program was not designed to evaluate receiving water quality *per se*, therefore detection of trends or patterns was not reasonably possible. Today's Final Permit includes requirements for a Revised Monitoring Program, and one of the objectives for the program is to use a suite of approaches and indicators to evaluate and track water quality over the long-term (*see* discussion of Section 5.1 in this Final Fact Sheet).
There have been identified improvements in some areas. For example the *2008 Integrated Report* noted improvements in the diversity of submerged aquatic vegetation in the Potomac River, as well as improvements in fish species richness in Rock Creek. Biota metrics are often the best indicators of the integrity of any aquatic system.

EPA also notes that there are a variety of indirect measures indicative of improvement. The federal stormwater regulations foresaw the difficulty, especially in the near-term, of detecting measurable improvement in receiving waters, and relied instead on indirect measures, such as estimates of pollutant load reductions (40 C.F.R. §122.26(d)(2)(v)). The District documents these types of indirect measures in its annual reports, *e.g.*, tons of solids collected from catch basin clean-outs, amount of household hazardous waste collected, number of trees planted, square footage of green roofs installed, and many other measures of success.[4]

EPA believes that documenting trends in water quality, whether improvements, no change, or even further degradation, is an important element of a municipal water quality program. Today's Final Permit recognizes this principle, both in the types of robust measures required as well as the transition to new monitoring paradigms. EPA encourages all interested parties to provide the District with input during the development of these program elements.

THIS FACT SHEET:

(http://ddoe.dc.gov/ddoe/frames.asp?doc=/ddoe/lib/ddoe/information2/water.reg.leg/DC_IR_2008_Revised_9-9-2008.pdf)

4 District MS4 Annual Reports can be found at: http://ddoe.dc.gov/ddoe/cwp/view,a,1209,q,495855.asp

This Final Fact Sheet is organized to correspond with the chronological organization and numbering in today's Final Permit. Where descriptions or discussions may be relevant to more than one element of the Final Permit the reader will be referred to the relevant section(s).

To keep today's Final Fact Sheet of readable length, many of the elements included in the fact sheet published with the Draft Permit (Draft Fact Sheet) on April 21, 2010 have not been repeated, but are referenced. Readers are referred to the Draft Fact Sheet published with the Draft Permit for additional discussion on provisions that have been finalized as proposed.[5] The Final Fact Sheet does discuss significant changes since the 2004 Permit (even if discussed in the Draft Fact Sheet). The Final Fact Sheet also contains additional explanation of the Final Permit where commenters requested additional clarification. In addition, this Final Fact Sheet explains modifications to the Final Permit where provisions were changed in response to comments.

In many cases EPA made a number of very simple modifications to the Final Permit, *e.g.*, a word, phrase, or minor reorganization, simply for purposes of clarification. These modifications were not intended to change the substance of the permit provisions, only to clarify them. Most of those types of edits are not discussed in this Final Fact Sheet, but EPA has provided a Comparison Document of the Draft and Final Permits for readers who would like that level of detail.

Many commenters noted that the Draft Permit was not logically organized. EPA agrees. The major reorganization principles include:

1) There is a new Section 3, Stormwater Management Program (SWMP) Plan consolidating the various plans, strategies and other documents developed in fulfillment of permit requirements.
2) All implementation measures, *i.e.*, those stipulating management measures and implementation policies, are included in Section 4 of today's Final Permit. This includes "Source Identification" elements (Section 3 in the Draft Permit) and "Other Applicable Provisions" elements (Section 8 in the Draft Permit), which included TMDL requirements.
3) All monitoring requirements are consolidated in Section 5 of the Final Permit.
4) All reporting requirements are consolidated in Section 6 of the Final Permit.

EPA also refers readers to the Responsiveness Summary released today along with the Final Permit and Final Fact Sheet, for responses to comments and questions received on the Draft Permit. That document contains additional detailed explanations of the rationale for changes made to the Draft Permit in the Final Permit.

Finally, EPA made significant effort to avoid appending or incorporating by reference other documents containing permit requirements into the Final Permit. In the interest of clarity

5 The Permit and Fact Sheet proposed on April 21, 2010 can be viewed at: http://www.epa.gov/reg3wapd/npdes/draft_permits.html

and transparency EPA, to the extent possible, has included all requirements directly in the permit. Thus, EPA reviewed a variety of documents with relevant implementation measures, *e.g.*, TMDL Implementation Plans and the 2008 Modified Letter of Agreement to the 2004 permit[6], and translated elements of those plans and strategies into specific permit requirements that are now contained in the Final Permit. This Fact Sheet provides an explanation of the sources of provisions that are significant and are a direct result of one of those strategies.

1. DISCHARGES AUTHORIZED UNDER THIS PERMIT

(1.2 Authorized Discharges): The Final Permit authorizes certain non-stormwater discharges, including discharges from water line flushing. One commenter noted that many of these discharges, especially from potable water systems, contain concentrations of chlorine that may exceed water quality standards. EPA agrees, and has therefore clarified that dechlorinated water line flushing is authorized to be discharged under the Final Permit.

(1.4 Discharge Limitations): Comments on the language in Part 1.4 varied widely. Some commenters did not believe it was reasonable to require discharges to meet water quality standards. Other commenters believed this to be an unambiguous requirement of the Clean Water Act.

Today's Final Permit is premised upon EPA's longstanding view that the MS4 NPDES permit program is both an iterative and an adaptive management process for pollutant reduction and for achieving applicable water quality standard and/or total maximum daily load (TMDL) compliance. *See generally,* "National Pollutant Discharge Elimination System Permit Application Regulations for Stormwater Discharges," 55 F.R. 47990 (Nov. 16, 1990).

EPA is aware that many permittees, especially those in highly urbanized areas such as the District, likely will be unable to attain all applicable water quality standards within one or more MS4 permit cycles. Rather the attainment of applicable water quality standards as an incremental process is authorized under section 402(p)(3)(B)(iii) of the Clean Water Act, 33 U.S.C. § 1342(p)(3)(B)(iii), which requires an MS4 permit "to reduce the discharge of pollutants to the maximum extent practicable" (MEP) "and such other provisions" deemed appropriate to control pollutants in municipal stormwater discharges. To be clear, the goal of EPA's stormwater program is attainment of applicable water quality standards, but Congress expected that many municipal stormwater dischargers would need several permit cycles to achieve that goal.

Specifically, the Agency expects that attainment of applicable water quality standards in waters to which the District's MS4 discharges, requires staged implementation and increasingly more stringent requirements over several permitting cycles. During each cycle, EPA will continue to review deliverables from the District to ensure that its activities constitute sufficient progress toward standards attainment. With each permit reissuance EPA will continue to increase

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6 District Department of the Environment, *Modification to the Letter of Agreement dated November 27, 2007 for the NPDES Municipal Separate Storm Sewer (MS4) Permit DC0000222* (2008) http://www.epa.gov/reg3wapd/npdes/pdf/DCMS4/Letter.PDF

stringency until such time as standards are met in all receiving waters. Therefore today's Final Permit is clear that attainment of applicable water quality standards and consistency with the assumptions and requirements of any applicable WLA are requirements of the Permit, but, given the iterative nature of this requirement under CWA Section 402(p)(3)(B)(iii), the Final Permit is also clear that "compliance with all performance standards and provisions contained in the Final Permit shall constitute adequate progress toward compliance with DCWQS and WLAs for this permit term" (Section 1.4).

EPA believes that permitting authorities have the obligation to write permits with clear and enforceable provisions and thus the determination of what is the "maximum extent practicable" under a permit is one that must be made by the permitting authority and translated into provisions that are understandable and measurable. In this Final Permit EPA has carefully evaluated the maturity of the District stormwater program and the water quality status of the receiving waters, including TMDL wasteload allocations. In determining whether certain measures, actions and performance standards are practicable, EPA has also looked at other programs and measures around the country for feasibility of implementation. Therefore today's Final Permit does not qualify any provision with MEP thus leaving this determination to the discretion of the District. Instead each provision has already been determined to be the maximum extent practicable for this permit term for this discharger.

EPA modified the language in the Final Permit to provide clarity on the expectations consistent with the preceding explanation. Specifically Section 1.4.2 of the Final Permit requires that discharges 'attain' applicable wasteload allocations rather than just 'be consistent' with them, since the latter term is somewhat ambiguous.

In addition, the general discharge limitation 'no increase in pollutant loadings from discharges from the MS4 may occur to receiving waters' was removed because of the difficulty in measuring, demonstrating and enforcing this provision. Instead, consistent with EPA's belief that the Final Permit must include all of the enforceable requirements that would achieve this principle, the following discharge limitation is substituted: "comply with all other provisions and requirements contained in this permit, and in plans and schedules developed in fulfillment of this permit."

In addition, EPA made the following modifications: "Compliance with <u>the</u> performance standards and provisions contained in <u>Parts 2 through 8 of</u> this permit shall constitute adequate progress towards compliance with DCWQS <u>and WLAs for this permit term</u>" (*underlined text added*) (Section 1.4 of the Final Permit). EPA eliminated circularity with the addition of "Parts 2 through 8", clarifying that this requirement does not circle back to include the statements in 1.4.1 and 1.4.2, but rather interprets them. Also, although WLAs are a mechanism for attainment of water quality standards, EPA added the specific language "and WLAs" to make this concept explicit rather than just implicit. In addition this revised language emphasizes that the specific measures contained in the Final Permit, while appropriate for this permit term, will not necessarily constitute full compliance in subsequent permit terms. It is the expectation that with each permit reissuance, additional or enhanced requirements will be included with the objective

of ensuring that MS4 discharges do not cause or contribute to an exceedance of applicable water quality standards, including attainment of relevant WLAs.

2. LEGAL AUTHORITY, RESOURCES, AND STORMWATER PROGRAM ADMINISTRATION

(2.1 Legal Authority): Several commenters pointed out that there were a number of requirements in the Draft Permit without clear compliance schedules or deadlines, or with deadlines that did not correspond well to others in the permit. In the Final Permit, EPA has made several revisions to address these comments. For example, EPA changed a requirement that deficiencies in legal authority must be remedied "as soon as possible" to a 120-day requirement for deficiencies that can be addressed through regulation, and two years for deficiencies that require legislative action (Section 2.1.1). Also, EPA increased the compliance schedule for updating the District's stormwater regulation from twelve months to eighteen months, *id.,* so that this action could be adequately coordinated with the development of the District's new offsite mitigation/payment-in-lieu program (for more discussion see Section 4.1.3 below).

(2.2 Fiscal Resources): One commenter suggested eliminating the reference to the District's Enterprise Fund since funding was likely to come from a number of different budgets within the District. EPA agrees with this comment and has removed this reference.

On the other hand, many commenters noted that the implementation costs of the District's stormwater program will be significant. EPA agrees. The federal stormwater regulations identify the importance of adequate financial resources [40 C.F.R. §122.26(d)(1)(vi) and (d)(2)(vi)]. In addition, after seeing notable differences in the caliber of stormwater programs across the country, EPA recognizes that dedicated funding is critical for implementation of effective MS4 programs.[7,8,9] In 2009 the District established, and in 2010 revised, an impervious-based surface area fee for service to provide core funding to the stormwater program[10] (understanding that stormwater-related financing may still come from other sources as they fulfill multiple purposes, *e.g.,* street and public right-of-way retrofits). In conjunction with the 2010 rule-making to revise the fee the District issued a Frequently Asked Questions document[11] that indicates the intent to restrict this fee to its original purpose, *i.e.,* dedicated funding to implement the stormwater program and comply with MS4 permit requirements. EPA believes this action is essential, and he expects that the District will maintain a dedicated source of funding for the stormwater program.

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7 National Research Council, *Urban Stormwater Management in the United States* (2009) National Academy of Sciences http://www.nap.edu/catalog.php?record_id=12465

8 National Association of Flood and Stormwater Agencies, Funded by EPA, *Guidance for Municipal Stormwater Funding* (2006) http://www.nafsma.org/Guidance%20Manual%20Version%202X.pdf

9 EPA, *Funding Stormwater Programs* (2008) http://www.epa.gov/npdes/pubs/region3_factsheet_funding.pdf

10 District of Columbia, Rule 21-566 Stormwater Fees, http://www.dcregs.dc.gov/Gateway/RuleHome.aspx?RuleID=474056

11 District of Columbia, FAQ Document *Changes to the District's Stormwater Fee* (2010) http://ddoe.dc.gov/ddoe/frames.asp?doc=/ddoe/lib/ddoe/information2/water.reg.leg/Stormwater_Fee_FAQ_10-5-10_-final.pdf

EXHIBIT B

CALIFORNIA Water Boards

EDMUND G. BROWN JR. GOVERNOR

MATTHEW RODRIQUEZ SECRETARY FOR ENVIRONMENTAL PROTECTION

State Water Resources Control Board

State Water Resources Control Board

Issue Paper
Municipal Storm Water Permit Receiving Water Limitations
Board Workshop
November 20, 2012

ISSUE:

The State Water Resources Control Board (State Water Board) has been asked, in public comments received on National Pollutant Discharge Elimination System (NPDES) permits for Municipal Separate Storm Sewer Systems (MS4s), to adopt permit provisions that create a partial or complete exemption from enforcement for violations of water quality standards while a discharger engages in an iterative process of improving controls (commonly referred to as a "safe harbor" provision). The State Water Board has scheduled a public workshop to consider the issue.

DISCUSSION:

Background:

The Clean Water Act generally requires NPDES permits to include technology-based effluent limitations and any more stringent limitations necessary to meet water quality standards. In the context of NPDES permits for MS4s, however, the Clean Water Act does not reference the requirement to meet water quality standards. MS4 discharges must meet a technology-based standard of reducing pollutants in the discharge to the Maximum Extent Practicable (MEP), but requirements to meet water quality standards are at the discretion of the permitting agency.[1] Further, under the Porter-Cologne Water Quality Control Act, waste discharge requirements must implement applicable water quality control plans, including water quality objectives; however, the Porter-Cologne Act also affords the State Water Board and regional water quality control boards (collectively, Water Boards) flexibility to consider other factors, such as economics, when establishing any NPDES permit requirements that are more stringent than required by the Clean Water Act.[2]

The State Water Board has exercised its discretion with regard to requiring compliance with water quality standards in MS4 permits by directing, in precedential orders, that MS4 permits contain provisions requiring discharges to be controlled so as not to cause or contribute to exceedances of water quality standards in receiving waters.[3] However, consistent with federal

[1] 33 U.S.C. § 1342(p); *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159.

[2] Wat. Code, §§ 13241, 13263; *City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613.

[3] SWRCB Order WQ 98-01 (*Environmental Health Coalition*), WQ 99-05 (*Environmental Health Coalition)*.

law, the State Water Board has found it appropriate to implement Best Management Practices (BMPs) in lieu of numeric water quality-based effluent limitations to meet water quality standards.[4] Additionally, in lieu of "strict compliance" with water quality standards, the State Water Board has prescribed an iterative process whereby an exceedance of a water quality standard triggers a process of BMP improvements: reporting of the violation, submission of a report describing proposed improvements to BMPs expected to better meet water quality standards, and implementation of these new BMPs.

While the Water Boards have generally directed dischargers to achieve compliance with water quality standards by improving control measures through the iterative process, the iterative process does not provide a "safe harbor" to MS4 permittees: that is, when a discharger is shown to be causing or contributing to an exceedance of water quality standards, that discharger is in violation of the relevant discharge prohibitions and receiving water limitations of the permit and potentially subject to enforcement by the Water Boards or through a citizen suit, even if the discharger is actively engaged in the iterative process. Despite the lack of a safe harbor provision, however, the Water Boards have, as a matter of practice, declined to initiate enforcement actions against MS4 permittees who have been actively engaged in the iterative process. The Water Boards' decisions to decline to include a safe harbor in MS4 permits have been upheld by courts of appeal.[5]

Need for and Purpose of Workshop:

The lack of a safe harbor in the iterative process was recently highlighted by the Ninth Circuit's decision in a citizen suit brought by the Natural Resources Defense Council (NRDC) against the County of Los Angeles and the Los Angeles County Flood Control District for violations of the receiving water limitations of their MS4 permit. The Ninth Circuit confirmed that, as the receiving water limitations of the Water Boards' MS4 permits are currently drafted, engagement in the iterative process does not excuse liability for violations of water quality standards.[6]

As the storm water management programs of municipalities have matured, an increasing body of monitoring data indicates that water quality standards are in fact not being met by many MS4s. MS4s accordingly assert that the receiving water limitations and iterative process provisions of the Water Boards' permits do not afford them with a viable path to compliance for these violations, which may take years of technical efforts to correct, especially for wet weather discharges. MS4s argue that they are increasingly vulnerable to citizen suits and/or Water Board enforcement. This concern has been raised by the California Stormwater Quality Association (CASQA) in comments on the proposed Phase II MS4 permit and by the California Department of Transportation (Caltrans) in comments on the Caltrans MS4 permit adopted

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[4] *See* SWRCB Orders WQ 91-03 (*Citizens for a Better Environment)*, WQ 98-01 (*Environmental Health Coalition*), WQ 2001-15 (*Building Industry Association of San Diego County*); *See also* 40 C.F.R. § 122.44(k); Interim Permitting Approach for Water Quality-Based Effluent Limitations In Storm Water Permits, USEPA, September 1995. In such orders and guidance, the State Water Board and Environmental Protection Agency acknowledge that the storm water program may evolve over time to incorporate stricter limitations, including improved BMPs to meet water quality standards or numeric water quality based effluent limitations.

[5] *Building Industry Assn. of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866; *City of Rancho Cucamonga v. Regional Water Quality Control Bd.* (2006) 135 Cal.App.4th 1377; see also *Natural Resources Defense Council v. County of Los Angeles* (9th Cir. 2011) 673 F.3d 880, 897, n.7.

[6] *Natural Resources Defense Council v. County of Los Angeles, supra*, 673 F.3d at p. 897. On July 13, 2012, the United States Supreme Court granted review of this case on other grounds.

September 19, 2012, as well as by numerous MS4s and interested persons in comments on both permits. The issue is additionally relevant to the Phase I MS4 permits issued by the regional water quality control boards.[7]

At the same time, the environmental community has commented that the iterative process has been underutilized and ineffective to date in bringing MS4 discharges into compliance with water quality standards. Environmental parties argue that direct enforcement of water quality standards is necessary to protect water quality, especially in such second- or third-generation permits where dischargers have already had a number of years to come into compliance.

Because of the broad applicability of any policy decisions regarding the receiving water limitations and iterative process provisions, the State Water Board is holding a public workshop to consider several alternatives in addressing the issue and to seek public input on these alternatives. Following the workshop, the State Water Board may propose revisions to the receiving water limitations in the Caltrans MS4 and Phase II MS4 permits, and as necessary, re-open those permits after public review and comment, to make the revisions.

ALTERNATIVES FOR CONSIDERATION:

The State Water Board may consider the alternatives below, individually or in combination, to address concerns with the receiving water limitations in the Caltrans or Phase II MS4 permits. While the listed alternatives attempt to capture the range of alternatives before the State Water Board, the Board welcomes comments proposing other options and will not be limiting its consideration to the alternatives as listed in this issue paper.

The receiving water limitations language prescribed by State Water Board Order WQ 99-05 is attached as Attachment 1 and forms the basis of Alternative 1. CASQA has submitted specific proposed language for the Receiving Water Limitations provision of the proposed Phase II MS4 permit (CASQA Proposal). The CASQA Proposal is attached as Attachment 2 and is referenced as appropriate in the discussion of the alternatives below.

Alternative 1: Keep the status quo of no safe harbor.

This alternative makes no changes to the existing State Water Board approach or to the current language of the adopted Caltrans MS4 permit or the proposed Phase II MS4 permit. As stated previously, the current MS4 permit provisions laying out the iterative process are based on language set forth in precedential State Water Board orders. (See Attachment 1.) Alternative 1 adheres to the prescribed language. Under this alternative, the Water Boards may choose to exercise their enforcement discretion to refrain from taking action against dischargers engaged in good faith implementation of the iterative process; however, they would not be constrained from enforcing the receiving water limitations when an MS4 causes or contributes to exceedances of water quality standards. As a limitation within an NPDES permit, dischargers who cause or contribute to an exceedance of water quality standards could be subject to citizen suits.

[7] Note that the issue is not relevant to any other NPDES permits, including permits for storm water discharges associated with industrial activity, because all other NPDES permits must include technology-based effluent limitations and any more stringent limitations necessary to meet water quality standards. (33 U.S.C. § 1311(b)(1)(C).)

Alternative 2: No safe harbor, but provide greater clarity and specificity for iterative process implementation and wet weather data analysis.

Greater clarity and specificity in the MS4 permits as to the iterative process requirements may result in increased efforts to improve controls and achieve compliance. Such clarity and specificity may include:

1. Clarification on how compliance with the relevant discharge prohibitions and receiving water limitations is determined, including type and frequency of monitoring;
2. Clarification that dischargers must begin the iterative process after documentation of violations without waiting to be directed to do so by the Water Boards;
3. Specification of the minimum efforts that will constitute meaningful compliance with the iterative process;
4. Specification of the scope of any corrective action, including whether it applies only at the location where exceedances are measured or throughout the relevant watershed;
5. Specification of additional wet weather data analysis to better define and assess the impact of municipal storm water discharges on receiving waters, as well as the efficacy of specific best management practices.

As the MS4 program continues to mature and more data becomes available, this alternative may be enhanced by the development of water quality-based effluent limitations for pollutants, as appropriate, as a means of determining compliance with receiving water limitations. In addition, the enhanced wet weather data could be used to identify surrogates that could be used as a measure of protecting beneficial uses. In time, the data could be used to develop actual wet weather water quality standards or wet weather implementation provisions for existing water quality standards that could be applied consistently on a statewide basis.

Given the nature of storm water discharges and of MS4s, questions such as where and how compliance with water quality standards should be measured and how narrowly or broadly corrective actions should be applied, pose complicated technical issues that require careful study and consideration. These challenges notwithstanding, water quality improvements are more likely to be achieved as the iterative process becomes automatic and dischargers follow clear guidelines for determining and addressing non-compliance with permit terms. Such improvements may dissuade the Water Boards and the public from bringing enforcement actions/citizen suits for all except the most egregious and repeated violations.

In addition to being a stand-alone alternative, Alternative 2 may be considered in combination with Alternatives 3 through 5. The CASQA Proposal incorporates some greater specificity in the iterative process requirements as a component of its proposed receiving water limitations.

Alternative 3: Safe harbor that applies only if a discharger is in compliance with the implementation provisions of an approved TMDL.

Under Alternative 3, the receiving water limitations would be amended to provide a safe harbor for permittees that are in compliance with the implementation provisions of a TMDL. In effect, as long as the permittee is in compliance with the TMDL (including any compliance schedule) the terms of the TMDL would replace the requirement to comply with water quality standards for the pollutants that are covered by the TMDL.

The CASQA Proposal contemplates a safe harbor for dischargers in compliance with a TMDL as a component of the receiving water limitations.

Alternative 4: Safe harbor that applies if a discharger is in compliance with the implementation provisions of an approved TMDL, as in Alternative 3, and, in addition, that applies when the discharger engages in good faith compliance with the iterative process for exceedances caused by wet weather discharges.

In addition to the safe harbor for TMDL implementation, Alternative 4 would provide a safe harbor when dischargers engage in the iterative process in good faith to address violations of permit terms caused by wet weather discharges. Thus, if a storm water discharge from an MS4 is causing or contributing to an exceedance of a water quality standard in the receiving water, the exceedance would not constitute a violation of the permit as long as the discharger was engaged in good faith efforts to address the exceedance through improved controls. Alternative 4 recognizes that wet weather discharges from MS4s frequently cause or contribute to violations of water quality standards and allows the MS4s time to address these violations by improving control measures.

However, the safe harbor would not extend to dry weather discharges. Non-storm water discharges are generally prohibited in MS4 permits and only a few categories of non-storm water discharges are exempted from the prohibition, with the condition that these exempted discharges also be prohibited if they are identified as sources of pollutants to receiving waters.

Alternative 5: Full safe harbor.

This alternative would provide a full safe harbor to dischargers complying with the implementation provisions of a TMDL or engaging in the iterative process to address exceedances caused by wet or dry weather discharges.

The CASQA Proposal attached provides for a full safe harbor.

Attachments Removed

EXHIBIT C

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RIVERSIDE COUNTY FLOOD CONTROL
AND WATER CONSERVATION DISTRICT

November 13, 2012

Honorable Members of the State Water Resources Control Board
Attn: Ms. Jeanine Townsend, Clerk to the Board
State Water Resources Control Board
1001 I Street, 24th Floor
Sacramento, CA 95814

Dear Honorable Board Members and Ms. Townsend:

Re: Comment Letter – Receiving Water Limitations Language Workshop

I am writing on behalf of the Riverside County Flood Control and Water Conservation District ("District") regarding the State Water Resources Control Board's consideration of Receiving Water Limitations ("RWL") language in MS4 permits. This review was triggered by a decision of the Ninth Circuit United States Court of Appeals in *Natural Resources Defense Council v. County of Los Angeles* (9th Cir. 2011) 673 F.3d 880, *cert granted,* __ U.S. __ (June 25, 2012) ("*NRDC*"). This letter is being submitted in advance of the State Board's November 20, 2012 workshop on reform of the RWL language to be incorporated into MS4 permits as a matter of statewide policy.

The District is the Principal Permittee for three Phase I MS4 permits applicable to municipalities across Riverside County: Order R8-2010-0033, issued by the Santa Ana Regional Water Board to municipalities within the Santa Ana River Region of Riverside County; Order R9-2010-016, issued by the San Diego Regional Water Board to municipalities within the Santa Margarita Region of Riverside County; and Order R7-2008-0001, issued by the Colorado River Regional Water Board to municipalities within the Whitewater River Region of Riverside County. Given our unique perspective as the manager of three Phase 1 MS4 permits, the District and its staff thus, have considerable experience and expertise in developing and administering MS4 permits, and a keen understanding of the issues that the above mentioned court case creates.

The District strongly supports reform of the RWL language to make clear the State Board's often-expressed intention that MS4 Permittees' compliance with RWL be effectuated through an iterative process. However, under the Ninth Circuit's interpretation, any MS4 discharge that causes or contributes to an exceedance of a Water Quality Standard subjects the MS4 Permittee to civil penalty liability, injunctive relief and the payment of attorneys' fees in an action brought by a citizen plaintiff, even where the Permittee is fully implementing the programmatic requirements of their MS4 Permit.

The District supports the California Stormwater Quality Association's ("CASQA") efforts to obtain RWL language that ensures that the iterative process favored by the State Board is honored. The District also supports the comments of the California State Association of Counties, and believes the proposed RWL language attached to those comments is a step in the right direction.

This letter contains additional District comments about the RWL language and the iterative process. We believe that they are best expressed in terms of correcting misperceptions regarding the current RWL language, as interpreted by the Ninth Circuit.

Misperception Number One: Strict compliance with Water Quality Standards is required of MS4 Permittees by the Clean Water Act.

The Clean Water Act provides that MS4 discharges must control pollutants in discharges from the MS4 to the "Maximum Extent Practicable" (33 U.S.C. § 1342(p)(3)(B)(iii)). Unlike the case with other NPDES Permittees, the Clean Water Act does not require that municipalities strictly comply with Water Quality Standards, as determined by the Ninth Circuit in *Browner v. Defenders of Wildlife*. The State Board's own precedential Order WQ 2001-15 recognizes this fact and states that the RWL language was intended to be consistent with the *Browner* case. In that Order, which interpreted RWL language similar to that in *NRDC*, the Board stated:

> *[O]ur language, similar to the U.S. EPA's permit language discussed in the Browner case, does not require strict compliance with water quality standards. Our language requires that storm water management plans be designed to achieve compliance with water quality standards. Compliance is to be achieved over time, through an iterative approach requiring improved BMPs. As pointed out by the Browner court, there is nothing inconsistent between this approach and the determination that the Clean Water Act does not mandate strict compliance with water quality standards. [Order WQ 2001-15 at 7 (emphasis added)].*

Unfortunately, the Ninth Circuit completely disregarded this language, and the Order, in holding that strict compliance was required of MS4 Permittees.

USEPA itself has issued MS4 permits (in non-delegated states) that do not contain RWL language requiring strict compliance with Water Quality Standards. Therefore, it is clear that such compliance is not required by the Clean Water Act nor is such compliance established by USEPA policy. The most prominent example of a recent MS4 permit promulgated by USEPA is that for the District of Columbia ("DC Permit") (relevant portions of which are attached as Exhibit A), which was adopted in 2011.

Part 1.4 of the DC Permit contains the requirements relating to Water Quality Standards and provides, in relevant part: "Compliance with the performance standards and provisions contained in Parts 2 through 8 of the permit shall constitute adequate progress towards compliance with DCWQS [water quality standards] and WLAs [established under TMDLs] for this permit term." The DC Permit Fact Sheet explains the rationale for that language as follows [DC Permit Fact Sheet, Pages 5-6, emphasis added, attached as Exhibit B]:

> *Comments on the language in Part 1.4 varied widely. Some commenters did not believe it was reasonable to require discharges to meet water quality standards. Other commenters believed this to be an unambiguous requirement of the Clean Water Act.*

> *Today's Final Permit is premised upon* **EPA's longstanding view that the MS4 NPDES permit program is both an iterative and an adaptive management process for pollutant reduction and for achieving applicable water quality standard and/or total maximum daily load (TMDL) compliance.** *See generally, "National Pollutant Discharge Elimination System Permit Application Regulations for Stormwater Discharges," 55 F.R. 47990 (Nov. 16, 1990).*
>
> **EPA is aware that many Permittees, especially those in highly urbanized areas such as the District, likely will be unable to attain all applicable water quality standards within one or more MS4 permit cycles.** *Rather the attainment of applicable water quality standards* **as an incremental process** *is authorized under section 402(p)(3)(B)(iii) of the Clean Water Act, 33 U.S.C. § 1342(p)(3)(B)(iii), which requires an MS4 permit "to reduce the discharge of pollutants to the maximum extent practicable" (MEP) "and such other provisions" deemed appropriate to control pollutants in municipal stormwater discharges.* **To be clear, the goal of EPA's stormwater program is attainment of applicable water quality standards, but Congress expected that many municipal stormwater dischargers would need several permit cycles to achieve that goal.**
>
> *Specifically, the Agency expects that attainment of applicable water quality standards in waters to which the District's MS4 discharges, requires staged implementation and increasingly more stringent requirements over several permitting cycles. During each cycle, EPA will continue to review deliverables from the District to ensure that its activities constitute sufficient progress toward standards attainment. With each permit reissuance EPA will continue to increase stringency until such time as standards are met in all receiving waters.* **Therefore today's Final Permit is clear that attainment of applicable water quality standards and consistency with the assumptions and requirements of any applicable WLA are requirements of the Permit, but, given the iterative nature of this requirement under CWA Section 402(p)(3)(B)(iii), the Final Permit is also clear that "compliance with all performance standards and provisions contained in the Final Permit shall constitute adequate progress toward compliance with DCWQS and WLAs for this permit term" (Section 1.4).**

USEPA is now proposing clarifying changes to this language and to other sections of the DC Permit as the result of a settlement with various parties. However, those changes do not require strict compliance with Water Quality Standards, but rather compliance through the programs developed under the Permit.

The State Board is thus, free to adopt new RWL language that effectuates its previously expressed intent that MS4 permits not require strict compliance with Water Quality Standards with regard to contributions from discharges from MS4s.

Misperception Number Two: The MS4 Permittees are Seeking a "Safe Harbor" that would Insulate them from Responsibility Under the Clean Water Act.

While State Board staff's "Issue Paper" uses the term "safe harbor" in describing the iterative process, the District believes that this is fundamentally misleading. Even a cursory review of the terms of a typical MS4 permit in California reveals that it is full of compliance points. In the three MS4 Permits in which the District serves as Principal Permittee, literally every sentence is a separate point of compliance.

This fact is supported by the language of the Permits themselves. For example, in Order R8-2010-0033 Part XX.G provides: **"The Permittees must comply with all terms, requirements, and conditions of this Order. Any violation of this Order constitutes a violation of the CWA, its regulations and the California Water Code, and is grounds for enforcement action . . . ."** (emphasis added). Similar provisions are contained in the other two Riverside County MS4 Permits. Even without the strict Water Quality Standard language imposed under the Ninth Circuit's opinion, there is no "safe harbor" from liability under the Clean Water Act or, where applicable, the California Water Code, for any Permittee that fails to fully implement each the detailed and prescriptive requirements of its MS4 Permit.

There is a fundamental difference however, between fully complying with activities within the control and responsibility of the Permittees, such as monitoring, implementing BMPs and performing other programmatic requirements of the MS4 Permit; and being forced to guarantee that MS4 discharges will not cause or contribute to exceedances of Water Quality Standards in Receiving Waters, a guarantee that the Permittees' have no ability to make.

What the District and other MS4 Permittees seek is relief from what is essentially "guaranteed non-compliance" where a Permittee can be found in violation of their MS4 Permit even if the exceedance occurs at no fault of or failure by the Permittee, or put another way, even in circumstances where there is nothing a Permittee could have done to prevent that exceedance from occurring. In such a case, the Permittee can be held liable for potentially millions of dollars in legal costs, penalties and other expenses. We note that the City of Malibu, a city of only 13,000 residents, spent more than $2 million in defending against a citizen suit filed with respect to its MS4 Permit and more than $6 million to settle the case, including payment of $750,000 in attorney fees to plaintiffs. Given the tremendous financial challenges faced by every California municipality, including the District, the County of Riverside and the Permittee cities within the County, such a diversion of resources that otherwise would be directed at clean water programs or other vital municipal programs is a poor policy choice. And, as noted, it is not a policy choice that is required by the Clean Water Act, nor is it required by USEPA in their own Permits.

The District recognizes that regulatory enforcement actions and citizen suits are authorized by the Clean Water Act and that such suits may be an appropriate remedy where, for example, a Permittee has failed to comply with the programmatic requirements of its MS4 Permit. Where, however, the Permittees are complying with those requirements in good faith but, due to circumstances beyond

their control, their MS4 discharge causes or contributes to a Water Quality Standard exceedance in Receiving Waters, a citizen suit based on those exceedances potentially throws away the work done by the Permittees and the Water Boards under the MS4 Permit, as discussed below.

Misperception Number Three: MS4 can achieve compliance with strict Water Quality Standards.

MS4 Permittees cannot guarantee that discharges from their MS4s will in fact, not cause or contribute to an exceedance of Water Quality Standards in a Receiving Water. The monitoring conducted under our MS4 Permits reflects exceedances of various Water Quality Standards in Receiving Waters, and we understand that such results are typical for MS4 discharges around the state (please see Pages 2-3 of the CASQA comment letter dated November 2, 2012). The extreme variability of stormwater quality and quantity itself (which, in Southern California, arrives infrequently and from widely varying storm sizes) combined with a multitude of potential pollutant sources beyond a Permittee's ability to truly "control", make it impossible for a municipality to ensure that no discharges from its MS4 will ever cause or contribute to exceedances of Water Quality Standards in Receiving Waters. This was recognized by the Issue Paper released by State Board staff in preparation for the November 20th workshop, which found that as "the storm water management programs of municipalities have matured, **an increasing body of monitoring data indicates that water quality standards are in fact not being met by many MS4s**" (Issue Paper, Page 2 (emphasis supplied)).

Thus, even if municipal Permittees are to be held strictly liable for the ensuring that no discharges from their MS4s cause or contribute to an exceedance of Water Quality Standards, as the Ninth Circuit has interpreted the current RWL language, those Permittees have no ability to attain those standards. The reasons are several-fold and include the following:

1) Unlike an industrial NPDES Permittee, a municipal Permittee is not typically the source of the pollutants in the MS4 discharge (whether wet or dry). The municipality can regulate sources to some degree (through, for example, the operation of structural and non-structural BMPs and implementation of an Illegal Connection/Illicit Discharge program), but the municipality cannot guarantee that pollutants will not enter the MS4 and then be discharged into the Receiving Waters.

2) Municipalities cannot control natural sources of pollutants that are discharged through the MS4. Monitoring has indicated that many pollutants are likely from natural and not anthropogenic sources.

3) While Permittees conduct extensive public education programs as part of their MS4 programs, municipalities cannot "control" human behavior, or "prevent" an individual from taking an action that might cause pollution to enter the MS4. As an example, a resident may, despite all ordinances, regulations, potential penalties or enforcement, public outreach, available BMPs, etc., choose not to pick up after their pets, and

stormwater may, through no fault of the Permittee, pick up animal waste and deposit into the MS4.

4) MS4 Permittees cannot "prevent" flows from entering their MS4. To protect the health and property of their residents, MS4 operators must allow the legitimate flows of water into their drains. This is especially true for the District, which is charged directly by the Legislature [in Water Code App. §48-9] with the task of taking necessary steps to protect the people, properties and watersheds of Riverside County from the negative impacts of flooding. The District cannot, in effect, cause flooding by preventing flows from entering their storm drain, simply because such flows may contain pollutants that cause a violation of the Receiving Waters Limitation provisions of their MS4 Permits. In fact, California law requires downstream property owners (such as MS4 operators) to accept flows from upstream property owners.

5) Further, the authorities granted to flood control districts, such as this District, by the Legislature are narrow and do not include the authority to condition or regulate the quality or nature of stormwater runoff discharged from up gradient properties. This responsibility is appropriately assigned by the Legislature to the Regional Boards.

Similarly, MS4 Permittees cannot guarantee compliance with Water Quality Standards in dry weather. "Alternative 4" in the staff's Issue Paper suggests an alternative RWL approach that would not extend the iterative approach to dry weather discharges. The District submits that this alternative does not reflect the reality of urban runoff. Monitoring conducted under the Riverside County MS4 Permits reflects exceedances of Water Quality Standards during dry weather as well as wet weather. There is no justification for imposition of strict liability for exceedances during such conditions, for the following reasons:

1) During dry weather, other NPDES-permitted discharges continue to flow into the Receiving Waters. For example, much of the flow in the Santa Ana River during dry weather conditions is from non-MS4 sources, such as publicly owned treatment works. Additionally, numerous other separate NPDES-permitted discharges will occur, potentially at concentrations of pollutants that exceed Water Quality Standards. Evidence generated during the *NRDC* case involving the County of Los Angeles, for example, indicated that NPDES permits covering hundreds of these dischargers, including POTWs allowed the discharge of pollutants at concentrations *greater* than Water Quality Standards. Because of these discharges, which are legal and authorized by the Regional Boards, the MS4 Permittees have essentially no more control over compliance with Water Quality Standards in dry weather than they would have during wet weather conditions.

2) Accidental or even intentional illicit discharges by third parties into the MS4 obviously can occur during dry weather as well as wet weather. Such discharges would potentially have an even greater impact on sampling, since they are not diluted by large volumes of stormwater. For example, a vehicular accident recently caused hundreds of gallons of

asphalt tar to enter Sandia Creek, a Receiving Water in Riverside County. While this spill was not discharged through an MS4, if the vehicular accident had occurred in another portion of the watershed, the spill could feasibly have entered into and been discharged from an MS4. Similarly in many places throughout the State, sanitary sewer systems are owned and operated by special districts that have no relation to the MS4 Permittees that own or operate the MS4 systems. Nevertheless, an overflow of such sanitary sewer systems may cause an unavoidable discharge into, and from a Permittee-owned MS4. Such accidental or illicit discharges cannot be "prevented" or "controlled" by the Permittees except to the extent that they can be cleaned up or blocked if promptly reported. However, if the discharge has reached Receiving Waters and caused a measured exceedance of Water Quality Standards, under the Ninth Circuit's interpretation, liability for civil penalties, injunctive relief and attorneys fees will attach to the MS4 Permittee.

3) Enforcing strict Water Quality Standard limits in dry or wet weather is counter-productive to the watershed planning-based MS4 Permits currently being promulgated by many regional water boards. Enforcing such limits will divert Permittee attention and resources from watershed-based, monitoring-heavy compliance programs, as will be discussed in greater detail below.

In essence, under the Ninth Circuit's interpretation of the current RWL language, the District, and potentially every other MS4 Permittee in the state, is in violation of its Permit any time that an exceedance of a Water Quality Standard is recorded and attributed to a discharge from its MS4. This means that the Regional Water Boards have issued, and continue to adopt permits that include RWL language **which cannot be complied with**. The Clean Water Act, however, does not require Permittees to achieve the impossible. *See, e.g., Hughey v. JMS Development Corp.* (11th Cir. 1996) 78 F.3d 1523, 1530 ("In interpreting the liability provisions of the CWA, we realize that Congress is presumed not to have intended absurd (impossible) results.").

Misperception Number Four: The Current RWL Language is more Protective of Receiving Water Quality.

This statement is not only untrue but maintaining the current RWL language actually **impedes** efforts to protect Receiving Water Quality.

We understand that some stakeholders believe that there should be Numeric Effluent Limitations (NELs) contained in the MS4 Permits for purposes of accountability. In response, we note that many MS4 permits now contain numeric Stormwater and Non-stormwater Action Levels ("SALs" and "NALs") or other numeric targets or goals, the exceedance of which trigger specific compliance responses by the Permittees. It is these action levels (which were advocated by the Blue Ribbon Panel established by the State Board to investigate the appropriateness of NELs in MS4 permits) which provide such "numeric" accountability. This is in addition to the numerous other compliance documentation and reporting provisions required of MS4 Permittees that also provide measures of accountability.

More importantly, the current RWL language as interpreted by the Ninth Circuit actually impedes efforts by municipalities to protect water quality. First, by requiring immediate compliance, the language undermines efforts to bring Water Quality Standard-impaired waterbodies into compliance through the Total Maximum Daily Load ("TMDL") program. TMDLs are designed with the recognition that, due to the complexity of the issues causing the waterbody to be impaired in the first place, meeting these requirements cannot be achieved immediately. Therefore, TMDL compliance plans include timelines to achieve such compliance over periods of years and sometimes decades.

Second, most MS4 permits have begun incorporating sophisticated watershed management plans, which prioritize pollutants by waterbody and attempt, through aggressive monitoring and source identification efforts, to identify and address the sources of those prioritized pollutants. Municipalities subject to strict RWL language will have no ability to prioritize pollutants, since they must address any pollutant that exceeds a Water Quality Standard, irrespective of the relative impact that that discharge may have had upon the environment or beneficial uses. Moreover, these watershed management plan approaches employ cooperative monitoring and other watershed-based approaches. Permittees faced with potential liability for any exceedance of Water Quality Standards in Receiving Waters that may be caused or contributed to by discharges of their MS4s, will not likely volunteer to cooperate on any watershed-based approach, if cooperation could subject them to additional unnecessary liability.

Third, in a citizen suit brought under the Clean Water Act, a federal judge is free to impose any appropriate injunctive relief to enforce a permit (33 U.S.C. § 1365(a)). Thus, for example, a court could ignore the provisions of a MS4 permit in ordering municipal defendants to address Water Quality Standard exceedances in Receiving Water. This means that the thousands of people-hours invested in the Permit's development, implementation and oversight by municipalities, the Regional Water Boards and other stakeholders would be wasted. In essence, under the Ninth Circuit's reading of the RWL language, all other language in an MS4 permit appears to be superfluous, since the RWL language would control all compliance efforts. This result, of course, is not required by plain language of the Clean Water Act.

Fourth, if a municipality is in unavoidable and automatic non-compliance with the requirements of its MS4 Permit, it will be unable to justify budgeting for water quality management programs and BMPs otherwise required by the Permit as the municipality will simply receive no benefit from making compliance investments. To gain public support for stormwater programs, a municipality must demonstrate to its residents that such investments will constitute compliance with the Permit.

Discussion of Alternatives

The State Board staff's Issue Paper sets forth five alternatives for consideration. Alternative 1, no change in the current RWL language, is completely unacceptable to the District (and, we believe, to other municipalities across the state) because it fails to address the "guaranteed non-compliance" problem of the current language.

Alternative 2, which proposes to maintain the language that puts the MS4 Permittees in a situation of unavoidable and potentially "guaranteed" non-compliance, but would add greater specification as to how the iterative process might be carried out, is also unacceptable as the MS4 Permittees will still have no viable means to ensure their compliance with the RWL language. While the District does not object in principle to RWL language that spells out clearly, and in achievable terms, what is required of MS4 Permittees when exceedances are recorded, such a change alone does not address the fundamental issues identified in this letter.

Alternative 3, which proposes to provide an iterative process for compliance with the RWL only for pollutants being addressed by dischargers in compliance with an approved TMDL, is better than the first two alternatives, but is still entirely insufficient. By failing to provide a viable means for compliance with the RWL language for non-TMDL pollutants, this alternative language would force Permittees into unavoidable non-compliance, and require them to redirect their efforts and resources away from the TMDL activities, to those other pollutants, due to the strict liability attached to those exceedances. This would be a poor policy choice, as pollutants that are not subject to a TMDL may have significantly less, or even no impact on beneficial uses in the Receiving Waters, as noted in the CASQA comment letter.

Alternative 4, which excludes dry weather discharges from the iterative process to comply with the RWL, is unacceptable for the reasons previously set forth regarding an MS4 Permittees inability to truly "prevent" or "control" accidental or illegal dry weather discharges.

Alternative 5, which provides viable means for compliance with the RWL, for all types of MS4 discharges, is the only viable solution among the alternatives presented by State Board staff. In an era of limited budgets, the only and best way to make progress toward improving the quality our Receiving Waters, is to provide MS4 Permittees the ability to prioritize their efforts, as required in the Watershed Management Plan provisions contained in the most recent MS4 Permits, including the Los Angeles County Permit and the proposed Regional Permit for the San Diego Regional Water Board. As previously discussed, such prioritization cannot occur in the context of strict liability for the exceedance of Water Quality Standards in the Receiving Waters. For all of the reasons set forth in this letter, no other alternative makes policy sense or is congruent with the Maximum Extent Practicable standard in the Clean Water Act.

The District would add that Alternative 5 should additionally incorporate the concept of achieving RWL compliance through watershed management plans, and requests the Board to direct staff to work with stakeholders to ensure that any revised RWL language does not force intermittent or minor exceedances of Water Quality Standards to become de-facto higher priorities than those set by the watershed stakeholders.

In summary, the District supports CASQA, the California State Association of Counties and other municipal stakeholders in advocating for a fully iterative and viable approach to compliance with RWL language in both wet and dry weather conditions. Only when such an approach is in place and endorsed by the State Board will Permittees, including the District, feel confident that they can focus

fully on efforts to address pollutants in discharges into and from their MS4s, and not on preparing for costly and pointless litigation.

The District therefore, respectfully requests the State Board direct its staff to commence development of new language providing for an enforceable, iterative and viable process for MS4 Permittees to comply with the RWL language included in MS4 permits.

We wish to thank you and State Board staff for your consideration of these comments and any further comments, written or oral, that the District may make on these important issues.

Very truly yours,

Steve Thomas

for WARREN D. WILLIAMS
General Manager-Chief Engineer

CP:cw
P8/150189

EXHIBIT D

FILED
JAN - 3 2013
CLERK, U.S. DISTRICT COURT
ALEXANDRIA, VIRGINIA

IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF VIRGINIA
Alexandria Division

VIRGINIA DEPARTMENT OF TRANSPORTATION, ET AL, Plaintiffs, -v- UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, ET AL, Defendants.	Civil Action No. 1:12-CV-775

Memorandum Opinion

Before the Court is the Plaintiffs' motion for judgment on the pleadings under Federal Rule of Civil Procedure 12(c). The Defendants opposed the motion, and the Plaintiffs replied. The Court heard oral arguments on December 14, 2012 and now issues this memorandum opinion and accompanying order granting the Plaintiffs' motion.

Background

The Clean Water Act, 33 U.S.C. § 1251 et seq., establishes the basic structure for regulating discharge of pollutants into the waters of the United States, and provides certain mechanisms to improve and maintain the quality of surface waters.

One such mechanism is the requirement that states identify "designated uses" for each body of water within their borders, as well as "water quality criteria" sufficient to support those uses. 33 U.S.C. § 1313(c)(2)(A). The Environmental Protection Agency ("EPA") evaluates the uses and criteria developed by the states, and either approves them or else proposes and

promulgates its own set of standards. § 1313(c)(3).

Once the standards are in place, each state is required to maintain a list—also subject to approval or modification by EPA—of its waterbodies that are "impaired" because they do not meet their respective water quality criteria. 33 U.S.C. § 1313(d)(1)(A). For each waterbody on the impaired list, the state is required to establish a set of total maximum daily loads ("TMDLs") sufficient to bring the body back into compliance with its water quality criteria. § 1313(d)(1)(C). Each TMDL establishes the maximum amount of a pollutant that may be added to the waterbody daily from all sources (runoff, point sources, etc.). EPA is required to publish a list of pollutants suitable for maximum daily load measurement, § 1314(a)(2)(D), and it has determined that *all* pollutants are suitable for TMDLs, *see* Total Maximum Daily Loads Under Clean Water Act, 43 Fed. Reg. 60,662. Therefore, any pollutant that falls within the relatively broad definition of "pollutant" set forth in § 1362(6) may be regulated via TMDL. EPA can approve or modify as it sees fit TMDLs proposed by the states. § 1313(d)(2).

Here the state in question is Virginia, and the waterbody is a 25-mile long tributary of the Potomac River, located in Fairfax County, called Accotink Creek. The creek has been the subject of litigation in the past that is not relevant to this matter except the result: EPA was required to set TMDLs for Accotink Creek once Virginia failed to do so by a certain date. Specifically, the creek had been identified as having "benthic impairments," which is to say the community of organisms that live on or near the bottom of the creek were not as numerous or healthy as they should be. EPA was to set appropriate TMDLs to improve the health of the benthic community in Accotink Creek.

On April 18, 2011, EPA established a TMDL for Accotink Creek which limited the flow rate of stormwater into Accotink Creek to 681.8 ft^3/acre-day. The TMDL was designed to

regulate the amount of sediment in the Accotink, because EPA believed sediment was a primary cause of the benthic impairment. Both parties agree that sediment is a pollutant, and that stormwater is not. EPA refers to stormwater flow rate as a "surrogate" for sediment.

The Plaintiffs are now challenging the TMDL on multiple grounds, but presently before the Court is a single issue: Does the Clean Water Act authorize the EPA to regulate the level of a pollutant in Accotink Creek by establishing a TMDL for the flow of a nonpollutant into the creek?

Analysis

I. Standard of Review

Count I of the complaint, at issue here, is brought under the Administrative Procedures Act. *See* Comp. ¶ 169. The APA "confines judicial review of executive branch decisions to the administrative record of proceedings before the pertinent agency." *Shipbuilders Council of Am. V. U.S. Dept. of Homeland Sec.*, 770 F. Supp. 2d 793, 802 (E.D. Va. 2011). As such, the district court "sits as an appellate tribunal," and APA claims can be resolved equally well in the context of Rule 12 or Rule 56. *Univ. Med. Ctr. Of S. Nev. V. Shalala*, 173 F.3d 438, 441 n. 3 (D.C. Cir. 1999).

Because Count I presents a question of statutory interpretation, the Court reviews EPA's decision using the two-step analysis set forth in *Chevron, U.S.A., Inc. v. NRDC, Inc.*, 467 U.S. 837 (1984). For a given question of statutory interpretation, the first step under *Chevron* is to determine whether Congress addressed the "precise question at issue." 467 U.S. at 842. "If the intent of Congress is clear, that is the end of the matter . . . ." *Id.* If the Court cannot find that Congress has squarely addressed the question, the Court must move to Chevron's second step. In

the second step of statutory construction under *Chevron*, the Court must determine whether the agency's interpretation of the statute is "permissible." *Id.* at 843. The agency's construction is permissible if it is reasonable, but it need not be what the Court considers the *best* or *most reasonable* construction. *See id.* at 845. The Court is not to simply impose its own construction on the statute, but instead it gives deference to any reasonable statutory construction by the agency. *Id.* at 843.

II. Chevron Step One

Whether statutory ambiguity exists so that the issue cannot be settled at *Chevron's* first step is for the Court to decide, and the Court "owe[s] the agency no deference on the existence of ambiguity." *Am. Bar Ass'n v. FTC*, 430 F.3d 457, 468 (D.C. Cir. 2005). The Court begins the inquiry by "employing traditional tools of statutory construction." *Chevron*, 467 U.S. at 843 n.9. As always, the analysis begins with the text of the statute. *Nat'l Elec. Mfrs. Ass'n v. U.S. Dept'l of Energy*, 654 F.3d 496, 504 (4th Cir. 2011).

The text of the statute that requires states to establish their own TMDLs, 33 U.S.C. § 1313(d)(1)(C), is:

> Each State shall establish for the waters identified in paragraph (1)(A) of this subsection, and in accordance with the priority ranking, **the total maximum daily load, for those pollutants which the Administrator identifies** under section 1314(a)(2) of this title as suitable for such calculation. Such load shall be established at a level necessary to implement the applicable water quality standards with seasonal variations and a margin of safety which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality. (emphasis added)

The next subsection, § 1313(d)(2), grants EPA the authority to set TMDLs when the state

has not done so adequately. "Pollutant" is a statutorily defined term. 33 U.S.C. § 1362(6).

The Court sees no ambiguity in the wording of this statute. EPA is charged with establishing TMDLs for the appropriate pollutants; that does not give them authority to regulate nonpollutants. The parties agree that sediment is a pollutant under 33 U.S.C. § 1362(6), and stormwater is not. Then how does EPA claim jurisdiction over setting TMDLs for stormwater?

EPA frames the stormwater TMDL as a surrogate. EPA's research apparently indicates that the "[sediment] load in Accotink Creek is a function of the amount of stormwater runoff generated within the watershed." Def. Opp. at 8. And EPA believes that framing the TMDL in terms of stormwater flow rate is superior to simply expressing it in terms of maximum sediment load.

The DC Circuit has considered and rejected a similar attempt by EPA to take liberties with the way Congress intended it to express its TMDLs. In *Friends of the Earth, Inc. v. Env. Protection Agency*, EPA had promulgated TMDLs for the Anacostia River that expressed the maximum load of certain pollutants in terms of annual and seasonal amounts. 446 F.3d 140, 143 (D.C. Cir. 2006). The court found that expressing a TMDL in terms of annual or seasonal maximums was not allowed, because the statute granted authority only for daily loads. *Id.* at 148. The court reached its conclusion even though EPA apparently made a strong argument that expressing TMDLs in terms of annual or seasonal loads was an effective and reasonable approach. *See id.* Presumably a daily load could have been derived by simply dividing the annual load by 365, yet the court still required expression in the terms dictated by Congress.

Here too, EPA hopes to express a TMDL in terms other than those contemplated by the statute, arguing that such an expression is the most effective method. But, as *Friends of the Earth* illustrates, EPA may not regulate something over which it has no statutorily granted power—

annual loads or nonpollutants—as a proxy for something over which it *is* granted power—daily loads or pollutants.

EPA's argument that its surrogate approach should be allowed because the statute does not specifically forbid it fails. EPA is not explicitly forbidden from establishing total maximum *annual* loads any more than they are explicitly barred from establishing TMDLs for nonpollutants. The question is whether the statute grants the agency the authority it is claiming, not whether the statute explicitly withholds that authority. And in this case, as in *Friends of the Earth*, the statute simply does not grant EPA the authority it claims.

The dicta in *Weyerhaeuser Co. v. Costle* is not as helpful to EPA's case as it would like. 590 F.2d 1011, 1022 n.6 (D.C. Cir. 1978). It is true that the court said in a footnote "[i]t is well recognized that EPA can use pollution parameters that are not harmful in themselves, but act as indicators of harm." *Id.* But in that case, the non-harmful pollution parameters the EPA sought to regulate were components of the effluent commonly discharged from paper mills, *id.* at 1022, making them effluents themselves. And power to regulate effluents is expressly granted to the EPA in the relevant statutory section. *See* 33 U.S.C. § 1314(b).

EPA would like to create the impression that Congress has given it loose rein to determine exactly what it could and could not regulate. On page 16 of its opposition to this motion, EPA points out that "Congress authorized EPA to determine which pollutants were suitable for TMDL calculation and measurement." (Internal quotes removed). While this may be true, EPA glosses over the fact that 33 U.S.C. § 1314(a)(2)(D) only gives EPA the power to regulate pollutants as that term is defined—by Congress—elsewhere in the statute. And, as discussed above, sediment is a pollutant for these purposes, but stormwater is not.

In a similar vein, EPA regulations which imply that the agency has discretion to set the

TMDL as it sees fit do not bear on the question now before the Court. EPA has promulgated a regulation allowing TMDLs to be "expressed in terms of either mass per time, toxicity, or other appropriate measure," 40 C.F.R. § 130.2(i), and another that allows TMDLs to be expressed as a "property of pollution," 50 Fed. Reg. 1774, 1776 (Jan. 11, 1985). But, EPA citing these regulations to demonstrate that the surrogate TMDL approach is permissible is mere bootstrapping. To the extent the regulations allow EPA to set TMDLs for nonpollutants, they exceed the statutory authority of EPA.

The plain language of the statute trumps all, but legislative history also supports Plaintiffs' argument. Congress's intent to limit EPA's discretion in this context is evidenced by the committee record cited by Plaintiffs, which has also been used by the Ninth Circuit, in which Senator Randolph, Chairman of the Senate committee that amended the act in 1972, explained, "We have written into law precise standards and definite guidelines on how the environment should be protected. We have done more than just provide broad directives [for] administrators to follow." Pl. Mot. 7, *citing Nw. Envtl. Def. Ctr. v. Brown*, 640 F.3d 1063, 1072 (9th Cir. 2011). Congress created a statutory scheme that included a precise definition of the word "pollutant," and then gave EPA authority to set TMDLs for those pollutants. Senator Randolph's comments strongly imply that Congress did not intend anything more or less than what is written in the statute.

The Court considers the language of 33 U.S.C. § 1313(d)(1)(C) to be unambiguous. Congress has spoken directly on the question at issue, and its answer is that EPA's authority does not extend to establishing TMDLs for nonpollutants as surrogates for pollutants. The legislative history of the CWA is consistent with this reading. Therefore, this Court finds EPA's interpretation of § 1313 and the related provisions to be impermissibly broad based on analysis

under the first step of *Chevron* analysis.

III. Chevron Step Two

Because the Court considers Congress's intent to be clear and unambiguously expressed by the language of the statute, it need not move to the second step of *Chevron* analysis. But the Court notes that there is substantial reason to believe EPA's motives go beyond "permissible gap-filling."

Page 9 of EPA's opposition says, "stormwater flow rates as a surrogate would more effectively address the process by which sediment impairs aquatic life in Accontink Creek." If the sediment levels in Accotink Creek have become dangerously high, what better way to address the problem than by limiting the amount of sediment permitted in the creek? If sediment level is truly "a function of" the amount of stormwater runoff, as EPA claims, then the TMDL could just as easily be expressed in terms of sediment load.

In fact, the Board of Supervisors of Fairfax County argued at the December 14th hearing (without objection from EPA) that EPA has approved 3,700 TMDLs for sediment nationwide, and in Virginia has addressed 111 benthic impairments with TMDLs. None of them regulated the flow rate of stormwater. By comparison, EPA has tried out its novel approach of regulating sediment via flow in only four instances nationwide, and all four attempts were challenged in court. One has settled, the other three are still pending.

The Court suspects that the decision to regulate stormwater flow as a surrogate for sediment load would not constitute a permissible construction of § 1313(d)(1)(C), even given the deference due at *Chevron's* second step. This is especially likely because EPA is attempting to increase the extent of its own authority via flow TMDLs, which courts must examine carefully.

See Brown & Williamson Tobacco Corp. v. Food & Drug Admin., 153 F.3d 155, 161-62 (4th Cir. 1998). EPA's attempt to set TMDLs for nonpollutants probably goes beyond "permissible gap-filling" and is instead an impermissible construction of the statute.

Conclusion

The language of § 1313(d)(1)(C) is clear. EPA is authorized to set TMDLs to regulate pollutants, and pollutants are carefully defined. Stormwater runoff is not a pollutant, so EPA is not authorized to regulate it via TMDL. Claiming that the stormwater maximum load is a surrogate for sediment, which is a pollutant and therefore regulable, does not bring stormwater within the ambit of EPA's TMDL authority. Whatever reason EPA has for thinking that a stormwater flow rate TMDL is a better way of limiting sediment load than a sediment load TMDL, EPA cannot be allowed to exceed its clearly limited statutory authority. For these reasons, the Plaintiffs' motion for Rule 12(c) judgment on the pleadings on Count I of their complaint is granted.

January 3, 2013
Alexandria, Virginia

/s/ LOG
Liam O'Grady
United States District Judge

FILED
JAN - 3 2013
CLERK, U.S. DISTRICT COURT
ALEXANDRIA, VIRGINIA

IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF VIRGINIA
Alexandria Division

VIRGINIA DEPARTMENT OF TRANSPORTATION, ET AL, Plaintiffs, -v- UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, ET AL, Defendants.	Civil Action No. 1:12-CV-775

Order

In accordance with the memorandum opinion that accompanies this order, it is now **ORDERED**:

1. Plaintiffs' motion (Dkt. No. 29) for judgment on the pleadings as to Count I of the complaint is **GRANTED**.
2. The clerk shall enter judgment in favor of the Plaintiffs.
3. The Accotink Creek TMDL is remanded to EPA for reconsideration consistent with this order.

January 3, 2013
Alexandria, Virginia

/s/
Liam O'Grady
United States District Judge

STATE WATER RESOURCES CONTROL BOARD

RESOLUTION NO. 68-16

STATEMENT OF POLICY WITH RESPECT TO MAINTAINING HIGH QUALITY OF WATERS IN CALIFORNIA

WHEREAS the California Legislature has declared that it is the policy of the State that the granting of permits and licenses for unappropriated water and the disposal of wastes into the waters of the State shall be so regulated as to achieve highest water quality consistent with maximum benefit to the people of the State and shall be controlled so as to promote the peace, health, safety and welfare of the people of the State; and

WHEREAS water quality control policies have been and are being adopted for waters of the State; and

WHEREAS the quality of some waters of the State is higher than that established by the adopted policies and it is the intent and purpose of this Board that such higher quality shall be maintained to the maximum extent possible consistent with the declaration of the Legislature;

NOW, THEREFORE, BE IT RESOLVED:

1. Whenever the existing quality of water is better than the quality established in policies as of the date on which such policies become effective, such existing high quality will be maintained until it has been demonstrated to the State that any change will be consistent with maximum benefit to the people of the State, will not unreasonably affect present and anticipated beneficial use of such water and will not result in water quality less than that prescribed in the policies.

2. Any activity which produces or may produce a waste or increased volume or concentration of waste and which discharges or proposes to discharge to existing high quality waters will be required to meet waste discharge requirements which will result in the best practicable treatment or control of the discharge necessary to assure that (a) a pollution or nuisance will not occur and (b) the highest water quality consistent with maximum benefit to the people of the State will be maintained.

3. In implementing this policy, the Secretary of the Interior will be kept advised and will be provided with such information as he will need to discharge his responsibilities under the Federal Water Pollution Control Act.

BE IT FURTHER RESOLVED that a copy of this resolution be forwarded to the Secretary of the Interior as part of California's water quality control policy submission.

CERTIFICATION

The undersigned, Executive Officer of the State Water Resources Control Board, does hereby certify that the foregoing is a full, true, and correct copy of a resolution duly and regularly adopted at a meeting of the State Water Resources Control Board held on October 24, 1968.

Dated: October 28, 1968

Kerry W. Mulligan
Executive Officer
State Water Resources
Control Board

046110

State of California

Memorandum

To : Archie Matthews
Division of Water Quality

Date: FEB 11 1993

Elizabeth M. Jennings

Elizabeth Miller Jennings
Senior Staff Counsel
OFFICE OF THE CHIEF COUNSEL
From : STATE WATER RESOURCES CONTROL BOARD
901 P Street, Sacramento, CA 95814
Mail Code: G-8

Subject: DEFINITION OF "MAXIMUM EXTENT PRACTICABLE"

ISSUE

What is the meaning of the standard "maximum extent practicable" (MEP) as used in the Clean Water Act's storm water provisions, and how can this standard be communicated to the regulated community? How can this concept be included in the draft BMP manual?

CONCLUSION

The standard "maximum extent practicable" is not specifically defined for use in the storm water program. It has been defined in other rules, however, to require taking all actions which are technically feasible. I have included draft language for the manual.

DISCUSSION

Section 402(p) of the Clean Water Act (33 U.S.C. § 1342(p)) provides that permits issued for discharges from municipal separate storm sewers must require controls to reduce the discharge of pollutants "to the maximum extent practicable". The statutory language provides that municipal permits:

> "Shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other

> provisions as the [EPA] Administrator or the State determines appropriate for the control of such pollutants." Clean Water Act Section 402(p)(3)(B)(iii); 33 U.S.C. § 1342(p)(3)(B)(iii).

Neither Congress nor the U.S. Environmental Protection Agency (EPA) has defined the term "maximum extent practicable", and yet this is the critical standard which municipal dischargers must attain in order to comply with their permits. (The State could have spelled out the specific controls which the municipalities were required to undertake. However, such an approach would have relinquished the municipal dischargers of any flexibility in implementing their storm water programs.)

On its face, it is possible to discern some outline of the intent of Congress in establishing the MEP standard. First, the requirement is to reduce the discharge of pollutants, rather than totally prohibit such discharge. Presumably, the reason for this standard (and the difference from the more stringent standard applied to industrial dischargers in Section 402(p)(3)(A)), is the knowledge that it is not possible for municipal dischargers to prevent the discharge of all pollutants in storm water. The second point which is clearly encompassed in the standard is that it is the permitting agency, and not the discharger, which is the ultimate arbiter on whether there has been sufficient reduction of pollutants.

The most difficult issue is determining how much pollutants must be reduced, or, in other words, which best management practices (BMPs) must be employed in order to comply with the MEP standard. While the term is not defined in the Clean Water Act or the EPA regulations, the same term does appear in other federal laws and regulations, and there are some definitions or interpretations which may be useful to the storm water program.

In the Uranium Mill Tailings Radiation Control Act of 1978 (42 U.S.C. § 7901, et seq.), the Department of Energy was required to designate within one year of the Act's adoption "to the maximum extent practicable" contaminated areas within the vicinity of uranium processing sites. In addressing a lawsuit brought after the Department designated very few of the "vicinity properties", the federal court declared that MEP means "a substantial majority of the locations" should have been designated within the year. Sierra Club v. Edwards (D.C.D.C. 1983) 19 ERC 1357. Where a NEPA regulation required that "to the maximum extent practicable" environmental clearance was required for uncompleted projects which had never undergone NEPA review, a court held that the regulation "mandates a meaningful

environmental review" rather than a "perfunctory evaluation". Save the Courthouse Committee v. Lynn (S.D.N.Y. 1975) 408 F.Supp. 1323.

In an interim final regulation recently promulgated by the Department of Transportation, MEP is defined, where operators of onshore oil pipelines must have resources "to the maximum extent practicable" to remove and to mitigate or prevent worst case discharges. 49 CFR Part 194. MEP is defined to mean:

> "The limits of available technology and the practical and technical limits on an individual pipeline operator in planning the response resources required to provide the on-water recovery capability and the shoreline protection and cleanup capability to conduct response activities ...."

Finally, the term MEP is used in the Superfund legislation, wherein permanent solutions and alternative treatment technologies must be selected "to the maximum extent practicable". CERCLA, Section 121(b). The legislative history of the language indicates that the relevant factors in determining whether MEP is met include technical feasibility, cost, and state and public acceptance. 132 Cong. Rec. H 9561 (Oct. 8, 1986).

While each of the above interpretations and definitions varies, they do follow a pattern. The pattern that emerges is that there must be a serious attempt to comply, and that practical solutions may not be lightly rejected. If a municipality reviews a lengthy menu of BMPs, and chooses to select only a few of the least expensive, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit to be derived, it would have met the standard. In any case, the burden would be on the municipal discharger to show compliance.

The definitions contained in the pipeline regulation and the Superfund legislative history are most analogous to storm water regulation. The major emphasis in both of these rules are technical feasibility. Similarly, the municipal dischargers should be required to employ whatever BMPs are feasible, i.e., are likely to be effective and are not cost prohibitive. Thus, where a choice may be made between two BMPs which should provide generally comparative effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs which would address a pollutant source or to pick a BMP based solely on cost, which would be clearly less effective.

As you know, the BMP Guidance manual is being published by the Task Force, which is made up of dischargers, rather than by the State Water Board. As far as I know, there is no intention for the State Water Board to adopt the manual as its own guidance document. Therefore, it is important to stress in the manual, both in the section on MEP and in the front of the manual, that this manual is not a publication of the State or the Regional Water Boards, and that these Boards have not specifically endorsed the contents. Rather, the manual was assembled by a group of dischargers in the interest of assisting themselves and others to comply with the storm water permits. In the section on MEP, it should be stated that the final determination regarding whether a discharger was reduced pollutants to the maximum extent practicable can only be made by the Regional or State Water Boards, but that selection and implementation of BMPs through consideration of the listed factors should assist dischargers in achieving compliance.

The following language is suggested in order to clarify that the manual is not the product of the State Water Board:

> "This Manual was produced and published by the Storm Water Task Force, an advisory body of municipal agencies regulated by the storm water program. This Manual is not a publication of the State Water Resources Control Board or any Regional Water Quality Control Board, and none of these Boards has specifically endorsed the contents thereof. The purpose of this manual is to assist the members of the Task Force and other dischargers subject to storm water permits, in attaining compliance with such permits."

The following language is recommended in place of Insert A in the manual for municipal dischargers:

> "Although MEP is not defined by the federal regulations, use of this manual in selecting BMPs should assist municipalities in achieving MEP. In selecting BMPs which will achieve MEP, it is important to remember that municipalities will be responsible to reduce the discharge of pollutants in storm water <u>to the maximum extent practicable</u>. This means choosing effective BMPs, and rejecting applicable BMPs only where other effective BMPs will serve the same purpose, the BMPs would not be technically feasible, or the cost would be prohibitive. The following factors may be useful to consider:
>
> "1. Effectiveness: Will the BMP address a pollutant of concern?

"2. Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?

"3. Public acceptance: Does the BMP have public support?

"4. Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?

"5. Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc.?

"After selecting a menu of BMPs, it is of course the responsibility of the discharger to insure that all BMPs are implemented."

STATE OF CALIFORNIA
STATE WATER RESOURCES CONTROL BOARD

ORDER: WQ 99 - 05

Own Motion Review of the Petition of
Environmental Health Coalition
to Review Waste Discharge Requirements Order No. 96-03,
NPDES Permit No. CAS0108740
for Storm Water and Urban Runoff from the
Orange County Flood Control District
and the
Incorporated Cities of Orange County
Within the San Diego Region,
Issued by the
California Regional Water Quality Control Board,
San Diego Region.

SWRCB/OCC File A-1041

BY THE BOARD:

In Order WQ 98-01, the State Water Resources Control Board (State Water Board) ordered that certain receiving water limitation language be included in future municipal storm water permits. Following inclusion of that language in permits issued by the San Francisco Bay and San Diego Regional Water Quality Control Boards (Regional Water Boards) for Vallejo and Riverside respectively, the United States Environmental Protection Agency (EPA) objected to the permits. The EPA objection was based on the receiving water limitation language. The EPA has now issued those permits itself and has included receiving water limitation language it deems appropriate.

In light of EPA's objection to the receiving water limitation language in Order WQ 98-01 and its adoption of alternative language, the State Water Board is revising its instructions regarding receiving water limitation language for municipal storm water permits. It is hereby ordered that Order WQ 98-01 will be amended to remove the receiving water limitation language contained therein and to substitute the EPA language. Based on the reasons stated here, and as a precedent decision,[1] the following receiving water limitation language shall be included in future municipal storm water permits.[2]

RECEVING WATER LIMITATIONS

The permittees shall comply with Discharge Prohibitions [ ][3] and Receiving Water Limitations [ ] through timely implementation of control measures and other actions to reduce pollutants in the discharges in accordance with the SWMP and other requirements of this permit including any modifications. The SWMP shall be designed to achieve compliance with Receiving Water Limitations [ ]. If exceedance(s) of water quality objectives or water quality standards (collectively, WQS) persist notwithstanding implementation of the SWMP and other requirements of this permit, the permittees shall assure compliance with Discharge Prohibitions [ ] and Receiving Water Limitations [ ] by complying with the following procedure:

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[1] In SWRCB Order WR 96-1, the State Water Board determined that water quality orders are precedent decisions. (See Gov. Code §11425.60.)

[2] This language may be revised as necessary to ensure that terminology conforms with the rest of the permit.

[3] Insert appropriate numbers for prohibitions and limitations that implement water quality objectives and water quality standards.

a. Upon a determination by either the permittees or the Regional Water Board that discharges are causing or contributing to an exceedance of an applicable WQS, the permittees shall promptly notify and thereafter submit a report to the Regional Water Board that describes BMPs that are currently being implemented and additional BMPs that will be implemented to prevent or reduce any pollutants that are causing or contributing to the exceedance of WQSs. The report may be incorporated in the annual update to the SWMP unless the Regional Water Board directs an earlier submittal. The report shall include an implementation schedule. The Regional Water Board may require modifications to the report.

b. Submit any modifications to the report required by the Regional Water Board within 30 days of notification.

c. Within 30 days following approval of the report described above by the Regional Water Board, the permittees shall revise the SWMP and monitoring program to incorporate the approved modified BMPs that have been and will be implemented, implementation schedule, and any additional monitoring required.

d. Implement the revised SWMP and monitoring program in accordance with the approved schedule.

So long as the permittees have complied with the procedures set forth above and are implementing the revised SWMP, the permittees do not have to repeat the same procedure for continuing or recurring exceedances of the same receiving water limitations unless directed by the Regional Water Board to develop additional BMPs.

///

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ORDER

IT IS ORDERED that Order WQ 98-01 is revised as discussed above.

CERTIFICATION

The undersigned, Administrative Assistant to the Board, does hereby certify that the foregoing is a full, true, and correct copy of an order duly and regularly adopted at a meeting of the State Water Resources Control Board held on June 17, 1999.

AYE: James M. Stubchaer
Mary Jane Forster
John W. Brown
Arthur G. Baggett, Jr.

NO: None

ABSENT: None

ABSTAIN: None

Maureen Marché
Administrative Assistant to the Board

STATE OF CALIFORNIA
STATE WATER RESOURCES CONTROL BOARD

ORDER: WQ 2000 - 11

In the Matter of the Petitions of
THE CITIES OF BELLFLOWER, ET AL., THE CITY OF ARCADIA, AND WESTERN STATES PETROLEUM ASSOCIATION
Review of January 26, 2000 Action of the Regional Board
and
Actions and Failures to Act
by both the
California Regional Water Quality Control Board,
Los Angeles Region and Its Executive Officer
Pursuant to Order No. 96-054,
Permit for Municipal Storm Water and Urban Run-Off Discharges Within
Los Angeles County
[NPDES NO. CAS614001]

SWRCB/OCC FILES A-1280, A-1280(a) and A-1280(b)

BY THE BOARD:

On July 15, 1996, the Los Angeles Regional Water Quality Control Board (Regional Water Board) issued a revised national pollutant discharge elimination system (NPDES) permit in Order No. 96-054 (permit) to the 85 incorporated cities and the county within Los Angeles County (the County).[1] The permit covers storm water discharges from municipal separate storm sewer systems throughout the County.[2]

[1] This was the second storm water permit adopted for Los Angeles County and its cities. The first permit was the subject of an earlier Order. (In the Matter of Natural Resources Defense Council, Inc., Order WQ 91-04). In this permit, the County is designated as the Principal Permittee, and each city is designated as a permittee. The County is required to submit various documents on behalf of all of the permittees.
[2] The Regional Water Board has since issued a separate permit for one city, Long Beach. The relevant provisions of the Long Beach permit are similar to those in Order No. 96-054.

The permit contains provisions for the regulation of storm water discharges from development planning and construction.[3] Pursuant to these provisions, the County was required to submit Standard Urban Storm Water Mitigation Plans (SUSMPs).[4] The SUSMPs are plans that designate best management practices (BMPs) that must be used in specified categories of development projects. The County submitted SUSMPs, but the Regional Water Board approved the SUSMPs only after making revisions. The Executive Officer issued the revised SUSMPs on March 8, 2000.[5]

On February 25, 2000, the State Water Resources Control Board (State Water Board or Board) received a petition for review of the actions and failures to act regarding the SUSMPs from a number of cities, the Building Industry Association of Southern California and the Building Industry Legal Defense Foundation (jointly referred to as Cities). A second petition was received from the City of Arcadia. And a third petition was received from the Western States Petroleum Association (WSPA). On April 7, 2000, the petitioners filed amendments to their petitions, concerning the March 8, 2000 issuance of the SUSMPs. The Cities' amendment also revised the list of cities included in the petition. The Cities' petition now includes 32 cities. The petitions are legally and factually related, and have therefore been consolidated for purposes of review.[6] The petitioners also requested a stay of the SUSMPs. This request was denied by letter, dated May 11, 2000.

[3] Permit, Part 2.III. These provisions focus more on post-construction impacts of development than on discharges from construction activities.
[4] Permit, Part 2.III.A.1.c.
[5] These are referred to herein as the Final SUSMPs. The Final SUSMPs also apply to Long Beach, even though it is subject to a separate permit.
[6] Cal. Code of Regs., tit. 23, section 2054.

On June 7 and 8, 2000, the Board held a hearing in Torrance. Several entities, including the petitioners, the Regional Water Board, and several environmental groups[7], were designated parties. The evidence from that hearing has been included in the record before the Board. The record for comments on the petition was kept open until the end of the hearing. The parties were allowed to submit post-hearing briefs.[8]

I. BACKGROUND

In prior Orders[9] this Board has explained the need for the municipal storm water programs and the emphasis on BMPs in lieu of numeric effluent limitations. The emphasis for preventing pollution from storm water discharges is still on the development and implementation of effective BMPs, but with the expectation that the level of effort will increase over time. In its Interim Permitting Approach[10], the United States Environmental Protection Agency (U.S. EPA) stated that first-round permits should include BMPs, and expanded or better-tailored BMPs in subsequent permits where necessary to attain water quality standards. Dischargers, consultants, and academic institutions in California and nationwide have conducted numerous studies on the effectiveness of BMPs and appropriate design standards. While many questions are still

[7] The environmental groups are Natural Resources Defense Council, Inc., Santa Monica BayKeeper, and Heal the Bay.

[8] There are several documents that were not timely received and, therefore, are not made a part of the record before the Board. The hearing notice specified that all evidence from parties must be received by May 31, 2000. The Regional Water Board submitted documents on June 6, 2000. The hearing notice specified that policy statements were due by the close of the hearing. Several comment letters were received June 12, 13, and 19, 2000. None of these submittals are a part of the record. The post-hearing briefs were subject to a 10-page limit. The environmental groups submitted objections to the post-hearing brief submitted by the Cities. First, the environmental groups challenge the length of the brief. All briefs were subject to a 10-page limit. The Cities submitted a 10-page brief, with a 22-page attachment showing extensive proposed revisions to the SUSMPs. This submittal violates the page limit, and only the brief is considered part of the record. Second, the environmental groups claim that an e-mail message referred to by the petitioners is subject to attorney-client privilege and should not have been used in this hearing. This e-mail message, from the Regional Water Board's counsel to one of its engineers, was placed in the Regional Water Board's administrative record and submitted to the State Water Board. Any privilege that may have attached to the message has been waived and no longer exists. Finally, the post-hearing brief from the City of Arcadia was received late and will not be considered. Documents submitted late for interim deadlines (such as the deadline for submitting responses to the petitions), have been included in the record.

[9] See, especially Orders WQ 91-03 (In the Matter of Citizens for a Better Environment et al.) and WQ 91-04.

[10] Interim Permitting Approach for Water Quality-Based Effluent Limitations in Storm Water Permits. (61 Federal Register 57425.)

outstanding, more is expected of municipal dischargers, and many are implementing more effective programs.

While storm water management plans are improving, our knowledge of the impacts is also growing. Urban runoff has been determined to be a significant contributor of impairment to waters throughout the state. In Los Angeles specifically, beach closures are sometimes associated with urban runoff. In adopting the SUSMPs, the Regional Water Board took note of the urgent need for preventing further pollution from urban runoff and storm water discharges.

It is important to emphasize the role of the SUSMPs within the totality of regulating storm water discharges, and the purpose of these particular control measures. The requirement to prepare SUSMPS was part of the development controls in the permit. In addition to development controls, the permit requires education, public outreach, programs to restrict illicit connections and discharges, and controls on public facilities. In the context of the entire effort required by the permit, the development controls can be seen as preventing the existing situation from becoming worse.

The Final SUSMPs include a list of mandatory BMPs for nine categories of development. There are provisions that are applicable to all categories and lists of BMPs for individual categories. Requirements applicable to all categories include provisions to limit erosion from new development and redevelopment, requirements to conserve natural areas, protection of slopes and channels, and storm drain stenciling. Examples of BMPs specific to categories of discharge include design of loading docks for commercial projects and design of fueling areas for retail gasoline outlets. In most respects, the Final SUSMPs were similar to those proposed by the County. The significant departures were the inclusion of a numeric design standard for structural or treatment control BMPs, and the inclusion of certain types of projects that were not

covered in the County's proposal. The design standard creates objective and measurable criteria for the amount of runoff that must be treated or infiltrated by BMPs.

The record indicates that the purpose of the development controls, including the SUSMPs, is not simply to prevent pollution associated with construction runoff. As the petitioners point out, construction discharges are already subject to this Board's Statewide Construction Permit. The development controls in the SUSMPs, on the other hand, focus on post-construction runoff. They are aimed at limiting not just the pollutants in runoff from the new development, but also the volume of runoff that enters the municipal storm sewer system. By limiting runoff from new development, the SUSMPs prevent increased impacts from urban runoff generally. There is adequate technical information in the record to show that by controlling the volume of runoff from new development, BMPs can be effective in reducing the discharge of pollutants in storm water runoff.

The Procedure for Adopting the SUSMPs

The permit requires a program for controls on Development Planning and Construction. It involved a number of submissions by the County in consultation with the Cities. The first step was submission of a checklist for determining priority projects and exempt projects. The checklist was due on January 30, 1998. A list of recommended BMPs for development projects was also due on that date. The SUSMPs were due within six months of approval of the BMP list, and were to incorporate BMPs for certain categories of development. Following approval of the SUSMPs, the cities and County were to implement development programs for priority projects, consistent with the BMP list and the SUSMPs.

The BMP list was not approved until April 22, 1999. Thereafter, the County submitted proposed SUSMPs on July 22, 1999. The Regional Water Board held a public workshop on

August 10, 1999. Following the workshop, the County submitted revisions to the SUSMPs on August 12, 1999. On August 16, 1999, the Regional water Board gave notice that it would discuss the SUSMPs in a public meeting on September 16, 1999. There was significant discussion at that meeting regarding the intent of the Executive Officer to approve the SUSMPs, but with revisions including a numeric design standard. At the conclusion of the meeting, the Regional Water Board members asked the Executive Officer to revise the SUSMPs and bring them back to another meeting. On December 7, 1999, the Executive Officer circulated revised SUSMPs for public review. This document incorporated a numeric design standard and made other revisions to the permittees' proposal. The Regional Water Board held a hearing on the SUSMPs on January 26, 2000. At that meeting, the Regional Water Board endorsed the SUSMPs revised by the Executive Officer, but directed him to make further changes. The Executive Officer issued the Final SUSMPs on March 8, 2000.

The Contents of the Final SUSMPs

The permit provides that the SUSMPs must incorporate the appropriate elements of the BMP list and, at a minimum, apply to seven development categories: 100-plus home subdivisions; 10-plus home subdivisions; 100,000-plus square foot commercial developments; automotive repair shops; retail gasoline outlets; restaurants; and hillside single-family dwellings.

The SUSMPs proposed by the County applied to these seven categories. Various BMPs applied to the different categories, and the SUSMPs contained narrative mitigation requirements for source control and treatment. The July proposals stated:

> "The development must be designed so as to mitigate (infiltrate and/or treat) the site runoff generated from impervious directly connected areas that may contribute pollutants of concern to the storm water conveyance system."

There were no numeric design criteria for mitigation. According to various participants, earlier County drafts had included design standards to mitigate flows from 0.6-inch storm events. But any numeric criteria had been removed from the version that was submitted.

In its revised SUSMPs, submitted on August 12, the County explained in its cover letter that the mitigation language did not mean that all runoff must be mitigated. Rather, the County's intent was to omit a numerical standard from the SUSMPs. The revised SUSMPs no longer referred to mitigation at all. Instead, the following language replaced the mitigation requirement:

> "The development must be designed so as to minimize, to the maximum extent practicable (MEP), the introduction of pollutants of concern that may result in significant impacts, generated from site runoff of directly connected impervious areas (DCIA), to the storm water conveyance system as approved by the building official."

The Final SUSMPs, as approved by the Executive Officer and the Regional Water Board, included several revisions from the County's submittal. The revision that is of greatest concern to the petitioners is the addition of Design Standards for Structural or Treatment Control BMPs.[11] The design standards require that developments subject to the SUSMPs shall be designed to mitigate storm water runoff (by treatment or infiltration) from one of the following:

> "1. The 85th percentile 24-hour runoff event determined as the maximized capture storm water volume for the area…, or
> 2. The volume of annual runoff based on unit basin storage water quality volume, to achieve 80 percent or more volume treatment…, or
> 3. The volume of runoff produced from a 0.75 inch storm event, prior to its discharge to a storm water conveyance system, or
> 4. The volume of runoff produced from a historical-record based reference 24-hour rainfall criterion for "treatment" (0.75 inch average for the Los Angeles County area) that achieves approximately the same reduction in pollutant loads achieved by the 85th percentile 24-hour runoff event."

[11] The Final SUSMPs also include the narrative language quoted from the County's August 22, 1999 proposal.

The Final SUSMPs also applied to two additional categories of development: parking lots over 5,000 square feet or with 25 or more spaces and exposed to storm water, and to developments in environmentally-sensitive areas. Other revisions included application to all projects in the categories instead of discretionary projects only and the definition of redevelopment.

II. CONTENTIONS AND FINDINGS[12]

Contention: The petitioners contend that the Regional Water Board erred in not complying with the Administrative Review Process within the permit, and acted arbitrarily and capriciously and in violation of the Clean Water Act and state law.

Finding: The permit required the County, in consultation with the cities subject to the permit, to submit SUSMPs. The permit includes some general minimum requirements for the SUSMPs.[13] The Executive Officer is granted authority to approve the SUSMPs.[14]

The permit also contains an administrative review process.[15] The permit states that the administrative review process "formalizes the procedure for review and acceptance of reports and documents" and "provides a method to resolve any differences in compliance expectations between the Regional Board and Permittees, prior to initiating enforcement action."[16] Following this introductory statement, the permit includes two procedures. The first is for review and approval or disapproval of reports and documents. The second is the dispute resolution section that must be followed prior to enforcement action.

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[12] This Order does not address all of the issues raised by the petitioners. The Board finds that the issues that are not addressed are insubstantial and not appropriate for State Water Board review. (See *People v. Barry* (1987) 194 Cal.App.3d 158, [239 Cal.Rptr. 349], Cal. Code Regs., tit. 3, § 052.)
[13] Permit, Part 2, III.A.1.c.
[14] Permit, Part 2, III.A.2.
[15] Permit, Part 2, I.G.
[16] *Id*.

The process for review of documents that are subject to the Executive Officer's approval is that the Executive Officer will notify the permittees of the results of the review and approval or disapproval within 120 days. If the Executive Officer does not do so, the permittees must notify the Regional Water Board of their intent to implement the documents without approval. The Executive Officer then has 10 days to respond, or the permittees may implement the program and the Executive Officer may not make modifications.

The dispute resolution procedure is to be used when the Executive Officer determines that a permittee's storm water program is insufficient to meet the permit's provisions. The Executive Officer must send a "Notice of Intent to Meet and Confer" with the permittee. A meet and confer period then ensues, resulting in a written "Storm Water Program Compliance Amendment (SWPCA)." The permittee is provided time to comply with the SWPCA. The Executive Officer is not allowed to take enforcement action against a permittee until the Executive Officer notifies the permittee in writing that the administrative review process has been exhausted and that a violation exists warranting enforcement.

The petitioners contend that the Executive Officer failed to notify the permittees that their SUSMPs were inadequate within 120 days of its submittal. The petitioners also argue that, by revising the SUSMPs without pursuing the dispute resolution process, the Regional Water Board "violated" the terms of the permit.

The provision for review of documents, which clearly includes the SUSMPs, requires that the Executive Officer notify the permittees of the results of the review and approval or disapproval within 120 days. The County submitted the revised SUSMPs on August 12, 1999. Within 120 days, the Regional Water Board held a workshop where staff expressed their concerns with the SUSMPs. Also within 120 days the Regional Water Board itself held a public

meeting where there was extensive discussion and concern by board members that the SUSMPs did not include a numeric standard. And, prior to any notification by the permittees that they would proceed with implementing their SUSMPs, the Regional Water Board held a hearing January 26, 2000, where it directed the Executive Officer to issue the SUSMPs with revisions. The Executive Officer did so on March 8, 2000.

It is clear from the record that the Executive Officer, and the Regional Water Board itself, did inform the permittees that the SUSMPs were inadequate. There was no requirement for a specific form for expressing disapproval of documents. The extensive discussion and meetings on the need for revisions to the SUSMPs, and the Executive Officer's approval of revised SUSMPs, plainly refutes the allegation that the Regional Water Board never notified the permittees of its disapproval of the County's proposed SUSMPs.

The permittees also claim that the Regional Water Board "violated" the permit by failing to institute the meet and confer process.[17] The dispute resolution process, which includes meet and confer, did not apply to the decision to disapprove the proposed SUSMPs. That process is only required when the Regional Water Board ultimately takes an enforcement action against a permittee. It is separate from the process for review and approval or disapproval of documents, and does not even appear to relate to possible enforcement actions for submission of inadequate documents. This is illustrated by the fact that the provision regarding documents refers to submittals from both the Principal Permittee and the individual permittees, while the dispute resolution provision refers only to the permittees. This distinction is relevant because the County is charged with submitting the documents, while the individual permittees are responsible for compliance. A fair reading of the entire section on the administrative review process is that the

[17] We note that permits are issued to permittees to allow discharges to waters of the state. It is only permittees, and not Regional Water Boards, who can be charged with violating permits.

review and approval or disapproval of documents applies to submission of documents by the County on behalf of the cities, while the dispute resolution process applies to enforcement actions against any permittees for failing to implement adequate programs.

Contention: The petitioners contend that the Regional Water Board was not authorized to revise the SUSMPs to add more stringent requirements.

Finding: The petitioners contend that the mitigation standards in the SUSMPs are more stringent than the requirement in the permit to reduce pollutants in storm water runoff to the maximum extent practicable (MEP)[18]. The issue of what level of protection constitutes MEP will be discussed *Infra*, in the discussion of the reasonableness of the numeric standards. But the petitioners also make certain procedural claims on this point. They argue that in approving the BMP list, the Regional Water Board determined that those BMPs constituted MEP and that the Board could not add additional BMPs in the SUSMPs. They also contend the Regional Water Board itself had no authority to "usurp" the Executive Officer's role in reviewing the SUSMPs.[19] Finally, the petitioners contend that the Regional Water Board was not authorized to mandate a program for the permittees without amending the permit.

The permit requires the County to submit a list of BMPs for approval. The Regional Water Board approved this list. Following approval of the list, the County was required to submit the SUSMPs, which must "incorporate the appropriate elements of the recommended BMPs list."[20] The petitioners contend that by approving the list, the Regional Water Board determined that those BMPs constituted MEP, and that under the terms of the permit the Regional Water Board could not require additional BMPs.

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[18] The technology-based standard for controls under municipal storm water permits is MEP. For a fuller discussion of this standard, see Order WQ 91-03.
[19] It is undisputed that, at its January 26, 2000 meeting, the Board directed the Executive Officer to make additional revisions to the SUSMPs.
[20] Permit, Part 2, III.A.1.c.

In addressing this contention, we face what appears to be a fundamental misunderstanding of the numeric design standards on the part of the petitioners. The design standards are objective criteria that developers must achieve in designing their BMPs. The design standards are not separate BMPs. The standards tell what magnitude of storm event the BMPs must be designed to treat or infiltrate. They do not specify the BMPs that must be employed.

The SUSMPs as submitted by the County specify BMPs for various categories of development. Many of these BMPs are designed to minimize the pollutants in storm water runoff, by reducing flow through infiltration or by treatment. Examples of BMPs proposed by the County include infiltration basins and trenches, oil/water separators, and media filtration. The County's proposed SUSMPs also included language requiring minimizing the introduction of pollutants to the storm water conveyance system. That language remains unchanged in the Final SUSMPs. The only significant difference between the two versions of the SUSMPs was that the Regional Water Board established numeric criteria for designing the BMPs.

In adopting the Final SUSMPs, the Regional Water Board based its decision on the MEP standard.[21] The Regional Water Board did not significantly revise the BMP list or specify further the actions that developers must take to comply with the SUSMPs. Thus, we find that the Regional Water Board did not inappropriately revise its determination of what constituted MEP.

The Regional Water Board is the political body responsible for water quality control in the Los Angeles region.[22] While the Regional Water Board may delegate specified powers and duties to its Executive Officer,[23] it can at any time act on its own behalf. The fact that the Board authorized its Executive Officer to approve the SUSMPs in the permit did not mean that the Board thereby denied itself the opportunity to provide direction to the Executive Officer in his

[21] Resolution R-00-02.
[22] Water Code sections 13200 and 13225.
[23] Water Code section 13223.

approval. Such an interpretation of its delegation authority would result in an improper failure of the Board to assume responsibility for water quality in the region.

We also find that the Regional Water Board was authorized to revise the SUSMPs to achieve compliance with the permit's requirements. The SUSMPs are a part of implementation of the permit. Because the permit regulates storm water discharges throughout the entire Los Angeles region and it is implemented by 85 cities and the County, it is obvious that the permit could not spell out every detail of the program for the five-year term of the permit. Instead, the implementation is through the submission, review and approval, and implementation of various programs, including the SUSMPs.[24] Where it receives a submission that it finds is not consistent with the requirements of the permit, it is reasonable for the Regional Water Board to be able to require revisions. The Regional Water Board is not required to amend the permit each time it approves a submittal or approves a submittal with revisions. On the other hand, if the Regional Water Board's action in requiring revisions is inconsistent with the terms of the permit, then the Board should not act without first amending the permit. While the Regional Water Board could have required the County to make the revisions rather than making them itself, we see no harm in the Regional Water Board's approach.

As will be discussed below, in most respects the Final SUSMPs are consistent with the permit. But there are some portions of the SUSMPs that are not consistent, and in those cases the SUSMPs provisions are further revised in this Order.

Contention: The petitioners make various procedural claims, including that they were denied due process, and that the Regional Water Board violated the Administrative Procedure

[24] A fuller discussion of the use of storm water management plans to incorporate a developing program is found in Order No. WQ 91-03.

Act, the California Environmental Quality Act (CEQA), and the California Constitution, Article XIII B, section 6 (regarding state mandates).

Finding: The petitioners point out that at the January 26, 2000 Regional Water Board hearing, there was some confusion over late changes to the SUSMPs and they contend they were not provided adequate opportunity to comment. There was significant discussion of the SUSMPs over several months. We do not agree with the petitioners that a program of this magnitude must necessarily take years to develop. But we are concerned that at the January 26, 2000 hearing, interested persons and permittees were not given adequate time to review late revisions or to comment on them. Given the intense interest in this issue, the Regional Water Board should have diverged from its strict rule limiting individual speakers to three minutes and conducted a more formal process. Such a process should provide adequate time for comment, including continuances where appropriate.[25] But to the extent the Regional Water Board's process caused any harm, this Board cured those harms. We held a two-day hearing in Los Angeles County, where all parties were allowed significant time to present their positions and testimony. In addition, we allowed the introduction of new evidence that had not been presented to the Regional Water Board. At this point, all parties have been afforded a full opportunity to review the Final SUSMPs, to present their positions and evidence, and to engage in cross-examination. The petitioners' due process rights have been protected.

The Board has already addressed the contentions regarding compliance with other laws in prior decisions. The Administrative Procedure Act exempts the adoption of permits from its requirements.[26] While the SUSMPs are not a permit, they are implementing documents for a

[25] For future adjudicative proceedings that are highly controversial or involve complex factual or legal issues, we encourage regional water boards to follow the procedures for formal hearings set forth in Cal. Code of Regs., tit. 23, section 648 et seq.
[26] Government Code section 11352; See, Order No. 95-4 (In the Matter of the City and County of San Francisco).

permit, and are therefore subject to the exemption. Moreover, they are relevant only to this permit, and are not a general rule of application. The constitutional provisions regarding state mandates also do not apply to NPDES permits.[27] As will be explained below, the SUSMPs as revised herein, are consistent with MEP and therefore are federally mandated. The provisions of CEQA requiring adoption of environmental documents also do not apply to NPDES permits.[28] Again, as an implementing document for the permit, there is no requirement for a separate CEQA analysis.[29]

Contention: The petitioners contend that the SUSMPs do not properly apply the maximum extent practicable standard.

Finding: The permit, consistent with Clean Water Act section 402(p)(3)(B)(iii), requires controls to reduce the discharge of pollutants to the maximum extent practicable, or MEP.[30] In approving the Final SUSMPs, the Regional Water Board acknowledged that one of the primary objectives of the municipal storm water program is the requirement to reduce the discharge of pollutants from storm water conveyance systems to the MEP.[31] While all parties appear to agree that the standard for the SUSMPs is MEP, they disagree about what level of effort is necessary to comply with that standard.

The petitioners approach this issue from two angles. First, they contend that the SUSMPs will not provide water quality benefits that reflect MEP. Second, they contend that there could be adverse impacts on groundwater quality that have not been adequately evaluated.

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[27] See, Order No. WQ 90-3 (In the Matter of San Diego Unified Port District).
[28] Water Code section 13389.
[29] We do note with interest the environmental groups' comment that if the permittees believed it was necessary to comply with the APA and CEQA prior to adoption of the SUSMPs, then they themselves would have violated those acts in their submissions of the proposed SUSMPs.
[30] Permit, Finding 13.
[31] Final SUSMPs, at page 2; Resolution No. R-00-02, at page 3.

Storm Water Design Standards as MEP

In adopting the Final SUSMPs, the Regional Water Board found that many rivers and streams in Los Angeles County are impaired for pollutants found in storm water and urban runoff, and that storm water runoff carries pollutants from nearly all types of developed properties.[32] Pollutant loading from the aggregate of development in the basin results in impairments from sediments, metals, complex organic compounds, oil and grease, nutrients, and pesticides.[33] The Final SUSMPs reflect two goals: to reduce the amounts of these pollutants in runoff and to reduce the ability of runoff to act as a conveyance system to deliver more pollutants to receiving waters. The Final SUSMPs, which include lists of BMPs and design standards requiring treatment or infiltration, address these two goals.

Clean Water Act section 402(p)(3)(B)(iii), which sets forth the requirements for establishing MEP in municipal storm water permits, provides that such permits "shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants." The United States Environmental Protection Agency (U.S. EPA), in a guidance document, explains that BMPs should be used in first-round storm water permits, and "expanded or better-tailored BMPs in subsequent permits, where necessary, to provide for the attainment of water quality standards."[34] The Clean Water Act, as interpreted by U.S. EPA, does require that, in a second-round permit,[35] expanded BMPs may be appropriate. In light of the number of water

[32] Resolution No. R-00-02.
[33] *Id*.
[34] Interim Permitting Approach for Water Quality-Based Effluent Limitations in Storm Water Permits, 61 Federal Register 57425 (1996).
[35] The original permit was issued in 1990. The 1996 permit is a second-round permit.

bodies impaired by runoff in Los Angeles County, it was appropriate to expand the scope of BMPs during the permit term.

The regulations implementing section 402(p) specifically require municipalities to have controls to reduce the discharge of pollutants from their storm sewer systems that "receive discharges from areas of new development and significant redevelopment," including post-construction discharges.[36] Clearly, it was appropriate for the Regional Water Board to require BMPs for new development and significant redevelopment. The permittees, who submitted their own version of SUSMPs with listed BMPs for categories of development, appear to have no real quarrel with this general mandate.

This Board has already endorsed requirements to limit the flow of the "first flush" of storm water, which may contain more significant pollutants.[37] The permittees' own version of the SUSMPs required mitigation of storm water runoff by treatment or infiltration, thus conceding the propriety of these two approaches to lessening the impact of storm water discharges. The crux of the disagreement is that the Regional Water Board added numeric design standards to establish the amount of runoff that must be treated or infiltrated, and required the mandatory application of these standards to categories of development.

The addition of measurable standards for designing the BMPs provides additional guidance to developers and establishes a clear target for the development of the BMPs. The U.S. EPA guidance manual suggests the use of design criteria and performance standards for post-construction BMPs.[38] The numeric criteria the Regional Water Board adopted essentially

[36] 40 CFR section 122.26(d)(2)(iv)(A)(2).
[37] In the Matter of National Steel and Shipbuilding Company, et al., Order WQ 98-07, at slip opinion 7.
[38] Guidance Manual for the Preparation of Part 2 of the NPDES Permit Applications for Discharges from Municipal Separate Strom Sewer Systems, at page 6-4 (November 1992).

requires that 85 percent of the runoff from the development be infiltrated or treated.[39] In adopting these standards, the Regional Water Board based its decision on a research review of standards in other states and a statistical analysis of the rainfall in the area. The standard was set to gain the maximum benefit in mitigation while imposing the least burden on developers.[40] In light of the evidence of the use of this or more stringent standards in other states, the expert testimony supporting this standard, the endorsement by U.S. EPA in its comments, and the cost-effectiveness of its implementation (discussed below), the Regional Water Board acted appropriately in determining that the standards reflect MEP.[41]

We also find that the Regional Water Board appropriately applied these standards to seven of the categories listed in the SUSMPs: single-family hillside residences, 100,000 square foot commercial developments, automotive repair shops, restaurants, home subdivisions with 10 to 99 housing units, home subdivisions with 100 or more housing units, and parking lots with 5,000 square feet or more or with 25 or more parking spaces and potentially exposed to storm water runoff.[42] These categories, except for parking lots, were already targeted for special treatment in the permit. The evidence shows that each listed category can be a significant source of pollutants and/or runoff following development. It is appropriate that the design standards apply so that BMPs for these categories of development result in the infiltration or treatment of a significant about of the runoff.

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[39] Four different methods of calculation are permitted, so the percentage of capture may vary slightly.

[40] At the hearing in this matter, Regional Water Board staff explained that the standard was set at the bottom of the "knee" of the curve where the benefits of the mitigation requirements decrease and the cost increases. Other states have set the standard higher along this curve, requiring 90 to 95 percent mitigation.

[41] This conclusion in no way departs from our acceptance of BMPs in lieu of numeric effluent limitations in storm water permits. (See, e.g., Order WQ 91-03 and Order WQ 91-04.) The numeric standard is a design standard for BMPs. It does not quantify or limit the pollutants in the effluent. It also does not specify which of the listed BMPs must be employed.

[42] As discussed below, this Board is revising the SUSMPs to delete the application of the design standards to retail gasoline outlets and to locations within or directly adjacent to or discharging directly to environmentally-sensitive areas.

Potential Impacts on Ground Water

The petitioners contend that infiltration of runoff may lead to ground water pollution, and that the Regional Water Board did not properly consider such potential impacts. The mitigation standards provide for a waiver where there is a risk of ground water contamination because a known unconfined aquifer lies beneath the land surface or an existing or potential underground source of drinking water is less than ten feet from the soil surface.[43] The Final SUSMPs also include a discussion on how to use infiltration so that the risk of contamination of groundwater is reduced, and where infiltration is not appropriate.[44]

The Regional Water Board did consider the potential impacts to groundwater from infiltration, and included appropriate limitations and guidance on its use as a BMP. These provisions will ensure adequate protection of groundwater from any adverse impacts due to infiltration.

Contention: The petitioners contend the Regional Water Board failed to show that the SUSMPs as adopted are cost-effective and that the benefits to be obtained outweigh the costs.

Finding: The petitioners refer to the Preamble to the Phase II storm water regulations[45] as the basis for their economic argument. The quoted language, however, does not wholly support the petitioners' contention. The Preamble states that President Clinton's Clean Water Initiative clarifies "that the maximum extent practicable standard should be applied in a site-specific, flexible manner, taking into account cost considerations as well as water quality effects."[46] It is clear that cost should be considered in determining MEP; this does not mean that

[43] Final SUSMP, page 14.
[44] *Id*., at page 15.
[45] 64 Federal Register 68722 and following. These regulations do not apply to the permit, but the general language on MEP is relevant to EPA's interpretation of the standard.
[46] 64 Federal Register 68722, 68732 (December 8, 1999).

the Regional Water Board must demonstrate that the water quality benefits outweigh the economic costs.

While the standard of MEP is not defined in the storm water regulations or the Clean Water Act, the term has been defined in other federal rules. Probably the most comparable law that uses the term is the Superfund legislation, or CERCLA, at section 121(b). The legislative history of CERCLA indicates that the relevant factors, to determine whether MEP is met in choosing solutions and treatment technologies, include technical feasibility, cost, and state and public acceptance.[47] Another example of a definition of MEP is found in a regulation adopted by the Department of Transportation for onshore oil pipelines. MEP is defined as to "the limits of available technology and the practical and technical limits on a pipeline operator . . . ."[48]

These definitions focus mostly on technical feasibility, but cost is also a relevant factor. There must be a serious attempt to comply, and practical solutions may not be lightly rejected. If, from the list of BMPs, a permittee chooses only a few of the least expensive methods, it is likely that MEP has not been met. On the other hand, if a permittee employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit to be derived, it would have met the standard. MEP requires permittees to choose effective BMPs, and to reject applicable BMPs only where other effective BMPs will serve the same purpose, the BMPs would not be technically feasible, or the cost would be prohibitive. Thus while cost is a factor, the Regional Water Board is not required to perform a cost-benefit analysis.

In reviewing the record, it is apparent that the Regional Water Board did evaluate the cost of the SUSMPs. While the petitioners claim there is no evidence in the record to show the

[47] 132 Cong. Rec. H 9561 (Oct. 8, 1986).
[48] 49 CFR section 194.5.

SUSMPs are necessary and cost effective, the opposite is true. The record is replete with documentation of costs of pilot mitigation projects, studies from similar programs in other states, and research studies. The Regional Water Board complied with the requirement to consider cost.

The Regional Water Board found that the cost to include BMPs that will meet the mitigation criteria will be one to two percent of the total development cost. This amount appears reasonable, especially in light of the amount of impervious surface already in Los Angeles County and the impacts on impaired water bodies. In considering the cost of compliance, it is also important to consider the costs of impairment. The beach closures in the Los Angeles region, well documented in the evidence, have reached critical proportions. These beach closures clearly have a financial impact on the area, and should be positively affected by the SUSMPs.

We do note that there could be further cost savings for developers if the permittees develop a regional solution for the problem. We recommend that the cities and the County, along with other interested agencies, work to develop regional solutions so that individual dischargers are not forced to create numerous small-scale projects. While the SUSMPs are an appropriate means of requiring mitigation of storm water discharges, we also encourage innovative regional approaches.[49]

Contention: The petitioners have raised contentions regarding details of the SUSMPs, including the amount of time allowed for inclusion of SUSMPs in local ordinances, and their application to both "discretionary" and "non-discretionary" projects. In addition, during the hearing certain ambiguities in the wording of the Final SUSMPs became apparent, including the provisions regarding redevelopment and environmentally-sensitive areas. In this portion of the

[49] We note that the SUSMPs as written do not in any way preclude the development of regional solutions approved by the Regional Water Board as a means to comply with the BMP and design standard requirements.

Order we address these issues and also the application of the design standards to retail gasoline outlets (RGOs) and the waiver funding requirements.

Finding: The testimony at the hearing in this matter revealed that there are specific provisions of the SUSMPs that create confusion as to the types of development projects subject to the mitigation design standards. The petitioners also contend that application of the standards to specific types of development either is unreasonable or is inconsistent with the terms of the permit. The specific requirements are discussed below.

Retail Gasoline Outlets

Petitioner WSPA contends that RGOs should be excluded from the SUSMPs. Its petition raised the same general contentions as the other petitioners, but at the hearing WSPA presented evidence specific to RGOs. In particular, WSPA raised questions about the propriety of applying the design standards for BMPs to RGOs. In considering this issue, we conclude that construction of RGOs is already heavily regulated and that owners may be limited in their ability to construct infiltration facilities. Moreover, in light of the small size of many RGOs and the proximity to underground tanks, treatment may not always be feasible, or safe. The mandatory BMPs that are included in the SUSMPs may be adequate to achieve MEP at RGOs, but the Regional Water Board should add additional mandatory BMPs, such as use of dry cleanup methods (e.g. sweeping) for removal of litter and debris, use of rags and absorbents for leaks and spills, restricting the practice of washing down hard surfaces unless the wash water is collected and disposed of properly, annual training of employees on proper spill cleanup and waste disposal methods, and the inclusion of BMPs to address trash receptacle areas and air/water supply

areas.[50] We conclude that because RGOs are already heavily regulated and may be limited in their ability to construct infiltration facilities or to perform treatment, they should not be subject to the BMP design standards at this time, and recommend that the Regional Water Board undertake further consideration of a threshold relative to size of the RGO, number of fueling nozzles, or some other relevant factor. This Order should not be construed to preclude inclusion of RGOs in the SUSMP design standards, with proper justification, when the permit is reissued.

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Redevelopment Projects

The SUSMPs were written to apply to new development and to some types of redevelopment in nine categories of projects. The definition of "redevelopment" reflected the intent of the Regional Water Board to define the scope of redevelopment projects subject to the requirements. That definition[51], however, was somewhat confusing, and it was apparent from testimony at the hearing that the parties had different understandings of the scope of redevelopment subject to the SUSMPs. In their post-hearing briefs, the various parties appeared to agree on the actual intent of the Regional Water Board in including redevelopment in the SUSMPs. This intent was to include redevelopment that adds or creates at least 5,000 square feet of impervious surface to the original development and, where the addition constitutes less than 50 percent of the original development, to limit the application of the BMP design standards to the addition.

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[50] These BMPs are from a list of BMPs in a publication of the California Storm Water Quality Task Force. (Best Management Practice Guide – Retail Gasoline Outlets. March 1997.) This publication includes BMPs in addition to those listed in the SUSMPs. All BMPs recommended in this publication should be mandated.

[51] The SUSMPs state: "Redevelopment" means, on an already developed site, the creation or addition of at least 5,000 square feet of impervious surfaces or the creation or addition of fifty percent or more of impervious surfaces or the making of improvements to fifty percent or more of the existing structure. Redevelopment includes, but is not limited to: the expansion of a building footprint or addition or replacement of a structure; structural development including an increase in gross floor area and/or exterior construction or remodeling; replacement of impervious surface that is not part of a routine maintenance activity; and land disturbing activities related with structural or impervious surfaces.

While some parties requested further requirements for development, it appears that the Regional Water Board's original intent was relatively simple to apply and results in a fair and appropriate application of the SUSMPs' requirements to redevelopment. Therefore, we will revise the definition in the SUSMPs accordingly.

Environmentally-Sensitive Areas

The permit required that the SUSMPs address at least seven development categories.[52] The final SUSMPs added two more categories: parking lots of 5,000 square feet or more or with 25 or more parking spaces and potentially exposed to storm water runoff; and location within or directly adjacent to an environmentally-sensitive area (ESA). The petitioners contend that the addition of ESAs was inappropriate because the permit refers only to "development categories"[53] and ESA is a location category.

Whether or not the Regional Water Board went beyond the permit's terms in including this category, we find a fundamental problem with the language of the SUSMPs regarding ESAs. All of the other categories are relatively simple to apply because they describe the types of development that fall within the category. For instance, the threshold for a commercial development is 100,000 square feet. If the development is smaller, it is not subject to the SUSMPs. But for developments within ESAs, the SUSMPs contain no threshold. This absence led to speculation by the petitioners that something as small as a new patio on a home in an ESA would make the SUSMPs applicable. The Regional Water Board, at the hearing and in its post-hearing brief, conceded that there should be some threshold. While the Regional Water Board

[52] The categories listed in the permit are: single-family hill residences, 100,000 square-foot commercial developments, automotive repair shops, retail gasoline outlets, restaurants, home subdivisions with 10 to 99 housing units, and home subdivisions with 100 or more housing units. Permit, Part 2, III.A.1.c.
[53] *Id*.

did recommend a specific threshold, we believe that it is inappropriate for this Board to add a threshold that has not been fully discussed by all interested persons.

While it may be appropriate to include more stringent controls for developments in ESAs, we also note that such developments are already subject to extensive regulation under other regulatory programs. Moreover, in light of the permit language limiting the SUSMPs to development categories, ESAs are not an appropriate category within the SUSMPs. The Regional Water Board may choose to consider the issue further when it reissues the permit.

Discretionary and Non-Discretionary, or Ministerial, Projects

The petitioners contend that the SUSMPs should apply only to projects that are considered "discretionary" within the meaning of California Environmental Quality Act (CEQA).[54] They argue that the inclusion of non-discretionary, or ministerial, projects is inconsistent with the terms of the permit.

The permit provisions on development projects do refer to "discretionary" projects in several places. The permittees are directed to develop a checklist for determining priority and exempt projects.[55] Priority projects are defined as development and redevelopment projects requiring discretionary approval, which may have a potential significant effect on storm water quality.[56] The permittees are also required to develop a BMP list.[57] In developing the SUSMPs, the permittees are required to incorporate appropriate elements of the BMP list.[58] Next, the permittees must develop a program on planning control measures for priority projects (which are limited to projects requiring discretionary approval), consistent with the list of BMPs and the

[54] Public Resources Code section 21000 *et seq*.
[55] Permit, Part 2, III.A.1.a.
[56] *Id*.
[57] Permit, Part 2, III.A.1.b.
[58] Permit, Part 2, III.A.1.c.

SUSMPs.[59] The permit further states that, in order to assure compliance with these requirements, the permittees must develop guidelines on preparing CEQA documents that link mitigation conditions to "local discretionary project approvals."[60]

Taken as a whole, the provisions of the permit appear to link the development requirements for SUSMPs to developments that receive discretionary approval by local governments, as defined in CEQA. The SUSMPs are an implementation tool for the permit and must be consistent with the permit. While the limitation of the SUSMPs to discretionary projects may not be sufficiently broad for an effective storm water control program, the Regional Water Board acted inappropriately in expanding the SUSMPs to include non-discretionary projects. The Regional Water Board may consider expanding the development controls beyond CEQA discretionary projects when it reissues the permit. But at this time, the SUSMPs must be revised so that they are limited to development projects requiring discretionary approval within the meaning of CEQA.[61]

Waiver Funding Requirement

Where a waiver is granted from the design standard requirements, the Final SUSMPs provide that the permittee must require the project proponent to transfer the cost savings to a storm water mitigation fund. The fund is to be operated by a public agency or a non-profit entity, to promote regional or alternative solutions for storm water pollution in the same storm watershed. The petitioners contend that the funding requirement will create an additional administrative burden.

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[59] Permit, Part 2, III.a.2.
[60] Permit, Part 2, III.a.3.b.
[61] We note that the Final SUSMPs already include a definition of "discretionary project" consistent with the definition in the CEQA guidelines. Final SUSMPs at page 4 of 25; Title 14, California Code of Regulations, section 15357. Apparently this definition was inadvertently retained after the Regional Water Board decided to expand the SUSMPs beyond discretionary projects.

The concept of a mitigation fund or "bank" is a positive idea for obtaining regional solutions to storm water runoff. As a long-term strategy, municipal storm water dischargers should work to establish regional mitigation facilities, which may be more cost-effective and more technically effective than mitigation structures at individual developments. But at this point there are not sufficient resources in place to require all permittees to establish such funds or to find appropriate non-profit organizations. Before mandating funding, preliminary questions should be answered, including who will manage the fund, what types of projects it will be used for, what entities can legally operate such funds, and how permittees will determine the amount of the assessments. It would be appropriate for the County to consider developing a program with the appropriate flood control agency, or as a model for the separate cities to develop. There may be suitable agencies to administer such funds, but the development of programs may take some time. The Regional Water Board should consider adopting such a program when it reissues the permit, after consultation with the appropriate local agencies.

III. CONCLUSIONS

Based on the discussion above, the Board concludes that:

1. The Regional Water Board complied with the procedural requirements of the permit, including the Administrative Review Process, in approving the Final SUSMPs.
2. The Regional Water Board was authorized to revise the SUSMPs by including more stringent requirements than the permittees had proposed.
3. The Regional Water Board complied with did not violate the Administrative Procedure Act, CEQA, or the Constitutional provisions on state mandates. The petitioners' due process rights have been protected
4. The Regional Water Board considered the costs of the SUSMPs, and acted reasonably in requiring these controls in light of the expected benefits to water quality.

5. The Final SUSMPs reflect a reasonable interpretation of development controls that achieve reduction of pollutants in storm water discharges to the maximum extent practicable.
6. The SUSMPs include adequate protections of groundwater quality from any impacts from infiltration.
7. The SUSMPs will be revised to clarify the intent of the Regional Water Board and to make them consistent with the permit. Specifically, retail gasoline outlets should not be subject to the BMP design standards because they are already heavily regulated and may be limited in their ability to construct infiltration facilities or to perform treatment. Redevelopment projects should be subject to the SUSMPs only if they result in creation or addition of 5,000 square feet of impervious surfaces. Environmentally-sensitive areas should not be listed as a category in the SUSMPs. The SUSMPs should only apply to discretionary projects. The requirement for funding by project proponents who receive waivers should be deleted. The SUSMPs will be amended as shown in the attachment to this Order.
8. In light of the revisions of the SUSMPs made by this Order, and to allow the permittees adequate time to adopt implementing ordinances, the deadline for adopting ordinances will be revised to January 15, 2001, and the effective date of the Final SUSMPs will be revised to February 15, 2001.

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IV. ORDER

IT IS HEREBY ORDERED that the Standard Urban Storm Water Mitigation Plans for Los Angeles County and Cities in Los Angeles County is revised consistent with the amendments attached hereto. In all other respects the petitions are dismissed.

CERTIFICATION

The undersigned, Administrative Assistant to the Board, does hereby certify that the foregoing is a full, true, and correct copy of an order duly and regularly adopted at a meeting of the State Water Resources Control Board held on October 5, 2000.

AYE: Arthur G. Baggett, Jr.
Mary Jane Forster
John W. Brown

NO: None

ABSENT: Peter S. Silva

ABSTAIN: None

/s/
Maureen Marché
Administrative Assistant to the Board

AMENDMENTS TO SUSMPS

[These amendments are to the Final SUSMP, as published March 8, 2000]

Page 3 of 25

First full paragraph:

All **discretionary development and redevelopment** projects that fall into one of ~~seven~~ **the following** categories are ~~identified in the Los Angeles County MS4 Permit as requiring~~ **subject to these** SUSMPs. These categories are:

- Single-family Hillside Residences
- 100,000 Square Foot Commercial Developments
- Automotive Repair Shops
- Retail Gasoline Outlets
- Restaurants
- Home Subdivisions with 10 to 99 housing units
- Home Subdivisions with 100 or more housing units
- **Parking lots 5,000 square feet or more or with 25 or more parking spaces and potentially exposed to storm water runoff**

Second full paragraph:

~~The Regional Board Executive Officer has designated two additional categories subject to SUSMP requirements for the Los Angeles County MS4 Permit. These categories are:~~

- ~~Location within or directly adjacent to or discharging directly to an environmentally sensitive area, and~~
- ~~Parking lots 5,000 square feet or more or with 25 or more parking spaces and potentially exposed to storm water runoff~~

Fourth full paragraph:

Permittees shall amend codes, if necessary, not later than ~~September 8, 2000~~ **January 15, 2001**, to give legal effect to the SUSMP requirements. The SUSMP requirements for projects identified herein shall take effect not later than ~~October 8, 2000~~ **February 15, 2001**.

Page 4 of 25

Delete definition of “Environmentally Sensitive Area”

Revise Definition of “Redevelopment”:

"Redevelopment" means, on an already developed site, the creation or addition of at least 5,000 square feet of impervious surfaces ~~or the creation or addition of fifty percent or more of impervious surfaces or the making of improvements to fifty percent or more of the existing structure~~. Redevelopment includes, but is not limited to: the expansion of a building footprint or addition or replacement of a structure; structural development including an increase in gross floor area and/or exterior construction or remodeling; replacement of impervious surface that is not part of a routing maintenance activity; and land disturbing activities related with structural or impervious surfaces. **Where redevelopment results in an increase of less than fifty percent of the impervious surfaces of a previously existing development, and the existing development was not subject to these SUSMPs, the Design Standards apply only to the addition, and not to the entire development.**

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Add to "Limited Exclusion": Retail Gasoline Outlets

Page 15 of 25

Delete the first full paragraph (storm water mitigation funding)

STATE OF CALIFORNIA
STATE WATER RESOURCES CONTROL BOARD

ORDER WQ 2001- 15

In the Matter of the Petitions of

BUILDING INDUSTRY ASSOCIATION OF SAN DIEGO COUNTY
AND
WESTERN STATES PETROLEUM ASSOCIATION

For Review Of Waste Discharge Requirements Order No. 2001-01
for Urban Runoff from San Diego County
[NPDES No. CAS0108758]
Issued by the
California Water Quality Control Board,
San Diego Region

SWRCB/OCC FILES A-1362, A-1362(a)

BY THE BOARD:

On February 21, 2001, the San Diego Regional Water Quality Control Board (Regional Water Board) issued a revised national pollutant discharge elimination system (NPDES) permit in Order No. 2001-01 (permit) to the County of San Diego (County), the 18 incorporated cities within the County, and the San Diego Unified Port District. The permit covers storm water discharges from municipal separate storm sewer systems (MS4) throughout the County. The permit is the second MS4 permit issued for the County, although the first permit was issued more than ten years earlier.[1]

[1] NPDES permits generally expire after five years, but can be extended administratively where the Regional Water Board is unable to issue a new permit prior to the expiration date. As the record in this matter amply demonstrates, the Regional Water Board engaged in an extensive process of issuing draft permits, accepting comments, and holding workshops and hearings since at least 1995.

The permit includes various programmatic and planning requirements for the permittees, including construction and development controls, controls on municipal activities, controls on runoff from industrial, commercial, and residential sources, and public education. The types of controls and requirements included in the permit are similar to those in other MS4 permits, but also reflect the expansion of the storm water program since the first MS4 permit was adopted for San Diego County 11 years ago.[2]

On March 23, 2001, the State Water Resources Control Board (State Water Board or Board) received petitions for review of the permit from the Building Industry Association of San Diego County (BIA) and from the Western States Petroleum Association (WSPA).[3] The petitions are legally and factually related, and have therefore been consolidated for purposes of review.[4] None of the municipal dischargers subject to the permit filed a petition, nor did they file responses to the petitions.

I. BACKGROUND

MS4 permits are adopted pursuant to Clean Water Act section 402(p). This federal law sets forth specific requirements for permits for discharges from municipal storm sewers. One of the requirements is that permits "shall require controls to reduce the discharge of

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[2] For a discussion of the evolution of the storm water program, consistent with guidance from the United States Environmental Protection Agency (U.S. EPA), see Board Order WQ 2000-11.

[3] On March 23, the State Water Board also received brief letters from the Ramona Chamber of Commerce, the North San Diego County Association of Realtors, the San Diego County Apartment Association, the National Association of Industrial and Office Properties, and the California Building Industry Association. All of these letters state that they are "joining in" the petition filed by BIA. None of the letters contain any of the required information for petitions, which is listed at Cal. Code of Regs., tit. 23, section 2050. These letters will be treated as comments on the BIA petition. To the extent the authors intended the letters be considered petitions, they are dismissed.

[4] Cal. Code of Regs., tit. 23, section 2054.

pollutants to the maximum extent practicable [MEP]." States establish appropriate requirements for the control of pollutants in the permits.

This Board very recently reviewed the need for controls on urban runoff in MS4 permits, the emphasis on best management practices (BMPs) in lieu of numeric effluent limitations, and the expectation that the level of effort to control urban runoff will increase over time.[5] We pointed out that urban runoff is a significant contributor of impairment to waters throughout the state, and that additional controls are needed. Specifically, in Board Order WQ 2000-11 (hereinafter, LA SUSMP order), we concluded that the Los Angeles Regional Water Board acted appropriately in determining that numeric standards for the design of BMPs to control runoff from new construction and redevelopment constituted controls to the MEP.[6]

The San Diego permit incorporates numeric design standards for runoff from new construction and redevelopment similar to those considered in the LA SUSMP order.[7] In addition, the permit addresses programmatic requirements in other areas. The LA SUSMP order was a precedential decision,[8] and we will not reiterate our findings and conclusions from that decision.[9]

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[5] Board Order WQ 2000-11.

[6] As explained in that Order, numeric design standards are not the same as numeric effluent limitations. While BIA contends that the permit under review includes numeric effluent limitations, it does not. A numeric design standard only tells the dischargers how much runoff must be treated or infiltrated; it does not establish numeric effluent limitations proscribing the quality of effluent that can be discharged following infiltration or treatment.

[7] The San Diego permit also includes provisions that are different from those approved in the LA SUSMP Order, but which were not the subject of either petition. Such provisions include the inclusion of non-discretionary projects. We do not make any ruling in this Order on matters that were not addressed in either petition.

[8] Government Code section 11425.60; State Board Order WR 96-1 (Lagunitas Creek), at footnote 11.

[9] BIA restates some of the issues this Board considered in the LA SUSMP order. For instance, BIA contends that it is inappropriate for the permit to regulate erosion control. While this argument was not specifically addressed in our prior Order, it is obvious that the most serious concern with runoff from construction is the potential for increased erosion. It is absurd to contend that the permit should have ignored this impact from urban runoff.

The petitioners make numerous contentions, mostly concerning requirements that they claim the dischargers will not be able to, or should not be required to, comply with. We note that none of the dischargers has joined in these contentions. We further note that BIA raises contentions that were already addressed in the LA SUSMP order. In this Order, we have attempted to glean from the petition issues that are not already fully addressed in Board Order Board Order WQ 2000-11, and which may have some impact on BIA and its members. WSPA restated the contentions it made in the petition it filed challenging the LA SUSMP order. We will not address those contentions again.[10] But we will address whether the Regional Water Board followed the precedent established there as it relates to retail gasoline outlets.[11]

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[10] On November 8, 2001, following the October 31 workshop meeting that was held to discuss the draft order, BIA submitted a "supplemental brief" that includes many new contentions raised for the first time. (Interested persons who were not petitioners filed comments on the draft order asking the State Water Board to address some of these.) The State Water Board will not address these contentions, as they were not timely raised. (Wat. Code § 13320; Cal. Code of Regs., tit. 23, § 2050(a).) Specific contentions that are not properly subject to review under Water Code section 13320 are objections to findings 16, 17, and 38 of the permit, the contention that permit provisions constitute illegal unfunded mandates, challenges to the permit's inspection and enforcement provisions, objections to permit provisions regarding construction sites, the contention that post-construction requirements should be limited to "discretionary" approvals, the challenge to the provisions regarding local government compliance with the California Environmental Quality Act, and contentions regarding the term "discharge" in the permit. BIA did not meet the legal requirements for seeking review of these portions of the permit.

[11] On November 8, 2001, the State Water Board received eight boxes of documents from BIA, along with a "Request for Entry of Documents into the Administrative Record." BIA failed to comply with Cal. Code of Regs., tit. 23, section 2066(b), which requires such requests be made "prior to or during the workshop meeting." The workshop meeting was held on October 31, 2001. The request will therefore not be considered. BIA also objected in this submittal that the Regional Water Board did not include these documents in its record. The Regional Water Board's record was created at the time the permit was adopted, and was submitted to the State Water Board on June 11, 2001. BIA's objection is not timely.

II. CONTENTIONS AND FINDINGS[12]

Contention: BIA contends that the discharge prohibitions contained in the permit are "absolute" and "inflexible," are not consistent with the standard of "maximum extent practicable" (MEP), and financially cannot be met.

Finding: The gist of BIA's contention concerns Discharge Prohibition A.2, concerning exceedance of water quality objectives for receiving waters: "Discharges from MS4s which cause or contribute to exceedances of receiving water quality objectives for surface water or groundwater are prohibited." BIA generally contends that this prohibition amounts to an inflexible "zero contribution" requirement.

BIA advances numerous arguments regarding the alleged inability of the dischargers to comply with this prohibition and the impropriety of requiring compliance with water quality standards in municipal storm water permits. These arguments mirror arguments made in earlier petitions that required compliance with water quality objectives by municipal storm water permittees. (See, e.g., Board Orders WQ 91-03, WQ 98-01, and WQ 99-05.) This Board has already considered and upheld the requirement that municipal storm water discharges must not cause or contribute to exceedances of water quality objectives in the receiving water. We adopted an iterative procedure for complying with this requirement, wherein municipalities must report instances where they cause or contribute to exceedances, and then must review and improve BMPs so as to protect the receiving waters. The language in the permit in Receiving

[12] This Order does not address all of the issues raised by the petitioners. The Board finds that the issues that are not addressed are insubstantial and not appropriate for State Water Board review. (See *People v. Barry* (1987) 194 Cal.App.3d 158 [239 Cal.Rptr. 349]; Cal. Code Regs., tit. 23, § 2052.) We make no determination as to whether we will address the same or similar issues when raised in future petitions.

Water Limitation C.1 and 2 is consistent with the language required in Board Order WQ 99-05, our most recent direction on this issue.[13]

While the issue of the propriety of requiring compliance with water quality objectives has been addressed before in several orders, BIA does raise one new issue that was not addressed previously. In 1999, the Ninth Circuit Court of Appeals issued an opinion addressing whether municipal storm water permits must require "strict compliance" with water quality standards.[14] (*Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159.) The court in *Browner* held that the Clean Water Act provisions regarding storm water permits do not require that municipal storm-sewer discharge permits ensure strict compliance with water quality standards, unlike other permits.[15] The court determined that: "Instead, [the provision for municipal storm water permits] *replaces* the requirements of [section 301] with the requirement that municipal storm-sewer dischargers 'reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator . . . determines appropriate for the control of such pollutants'." (191 F.3d at 1165.) The court further held that the Clean Water Act does grant the permitting agency discretion to determine what pollution controls are appropriate for municipal storm water discharges. (*Id.* at 1166.) Specifically, the court stated

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[13] In addition to Discharge Prohibition A.2, quoted above, the permit includes Receiving Water Limitation C.1, with almost identical language: "Discharges from MS4s that cause or contribute to the violation of water quality standards (designated beneficial uses and water quality objectives developed to protect beneficial uses) are prohibited." Receiving Water Limitation C.2 sets forth the iterative process for compliance with C.1, as required by Board Order WQ 99-05.

[14] "Water quality objectives" generally refers to criteria adopted by the state, while "water quality standards" generally refers to criteria adopted or approved for the state by the U.S. EPA. Those terms are used interchangeably for purposes of this Order.

[15] Clean Water Act § 301(b)(1)(C) requires that most NPDES permits require strict compliance with quality standards.

that U.S. EPA had the authority either to require "strict compliance" with water quality standards through the imposition of numeric effluent limitations, or to employ an iterative approach toward compliance with water quality standards, by requiring improved BMPs over time. (*Id.*) The court in *Browner* upheld the EPA permit language, which included an iterative, BMP-based approach comparable to the language endorsed by this Board in Order WQ 99-05.

In reviewing the language in this permit, and that in Board Order WQ 99-05, we point out that our language, similar to U.S. EPA's permit language discussed in the *Browner* case, does not require strict compliance with water quality standards. Our language requires that storm water management plans be designed to achieve compliance with water quality standards. Compliance is to be achieved over time, through an iterative approach requiring improved BMPs. As pointed out by the *Browner* court, there is nothing inconsistent between this approach and the determination that the Clean Water Act does not mandate strict compliance with water quality standards. Instead, the iterative approach is consistent with U.S. EPA's general approach to storm water regulation, which relies on BMPs instead of numeric effluent limitations.

It is true that the holding in *Browner* allows the issuance of municipal storm water permits that limit their provisions to BMPs that control pollutants to the maximum extent practicable (MEP), and which do not require compliance with water quality standards. For the reasons discussed below, we decline to adopt that approach. The evidence in the record before us is consistent with records in previous municipal permits we have considered, and with the data we have in our records, including data supporting our list prepared pursuant to Clean Water Act section 303(d). Urban runoff is causing and contributing to impacts on receiving waters throughout the state and impairing their beneficial uses. In order to protect beneficial uses and to achieve compliance with water quality objectives in our streams, rivers, lakes, and the ocean, we

must look to controls on urban runoff. It is not enough simply to apply the technology-based standards of controlling discharges of pollutants to the MEP; where urban runoff is causing or contributing to exceedances of water quality standards, it is appropriate to require improvements to BMPs that address those exceedances.

While we will continue to address water quality standards in municipal storm water permits, we also continue to believe that the iterative approach, which focuses on timely improvement of BMPs, is appropriate. We will generally not require "strict compliance" with water quality standards through numeric effluent limitations and we will continue to follow an iterative approach, which seeks compliance over time.[16] The iterative approach is protective of water quality, but at the same time considers the difficulties of achieving full compliance through BMPs that must be enforced throughout large and medium municipal storm sewer systems.[17]

We have reviewed the language in the permit, and compared it to the model language in Board Order WQ 99-05. The language in the Receiving Water Limitations is virtually identical to the language in Board Order WQ 99-05. It sets a limitation on discharges that cause or contribute to violation of water quality standards, and then it establishes an iterative approach to complying with the limitation. We are concerned, however, with the language in Discharge Prohibition A.2, which is challenged by BIA. This discharge prohibition is similar to the Receiving Water Limitation, prohibiting discharges that cause or contribute to exceedance of

[16] Exceptions to this general rule are appropriate where site-specific conditions warrant. For example, the Basin Plan for the Lake Tahoe basin, which protects an outstanding national resource water, includes numeric effluent limitations for storm water discharges.

[17] While BIA argues that the permit requires "zero contribution" of pollutants in runoff, and "in effect" contains numeric effluent limitations, this is simply not true. The permit is clearly BMP-based, and there are no numeric effluent limitations. BIA also claims that the permit will require the construction of treatment plants for storm water similar to the publicly-owned treatment works for sanitary sewage. There is no basis for this contention; there is no requirement in the permit to treat all storm water. The emphasis is on BMPs.

water quality objectives. The difficulty with this language, however, is that it is not modified by the iterative process. To clarify that this prohibition also must be complied with through the iterative process, Receiving Water Limitation C.2 must state that it is also applicable to Discharge Prohibition A.2. The permit, in Discharge Prohibition A.5, also incorporates a list of Basin Plan prohibitions, one of which also prohibits discharges that are not in compliance with water quality objectives. (See, Attachment A, prohibition 5.) Language clarifying that the iterative approach applies to that prohibition is also necessary.[18]

BIA also objects to Discharge Prohibition A.3, which appears to require that treatment and control of discharges must always occur prior to entry into the MS4: "Discharges into and from MS4s containing pollutants which have not been reduced to the [MEP] are prohibited."[19] An NPDES permit is properly issued for "discharge of a pollutant" to waters of the United States.[20] (Clean Water Act § 402(a).) The Clean Water Act defines "discharge of a pollutant" as an "addition" of a pollutant to waters of the United States from a point source. (Clean Water Act section 502(12).) Section 402(p)(3)(B) authorizes the issuance of permits for discharges "from municipal storm sewers."

We find that the permit language is overly broad because it applies the MEP standard not only to discharges "from" MS4s, but also to discharges "into" MS4s. It is certainly

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[18] The iterative approach is not necessary for all Discharge Prohibitions. For example, a prohibition against pollution, contamination or nuisance should generally be complied with at all times. (See, Discharge Prohibition A.1.) Also, there may be discharge prohibitions for particularly sensitive water bodies, such as the prohibition in the Ocean Plan applicable to Areas of Special Biological Significance.

[19] Discharge Prohibition A.1 also refers to discharges into the MS4, but it only prohibits pollution, contamination, or nuisance that occurs "in waters of the state." Therefore, it is interpreted to apply only to discharges to receiving waters.

[20] Since NPDES permits are adopted as waste discharge requirements in California, they can more broadly protect "waters of the state," rather than being limited to "waters of the United States." In general, the inclusion of "waters (footnote continued)

true that in most instances it is more practical and effective to prevent and control pollution at its source. We also agree with the Regional Water Board's concern, stated in its response, that there may be instances where MS4s use "waters of the United States" as part of their sewer system, and that the Board is charged with protecting all such waters. Nonetheless, the specific language in this prohibition too broadly restricts all discharges "into" an MS4, and does not allow flexibility to use regional solutions, where they could be applied in a manner that fully protects receiving waters.[21] It is important to emphasize that dischargers into MS4s continue to be required to implement a full range of BMPs, including source control. In particular, dischargers subject to industrial and construction permits must comply with all conditions in those permits prior to discharging storm water into MS4s.

Contention: State law requires the adoption of wet weather water quality standards, and the permit improperly enforces water quality standards that were not specifically adopted for wet weather discharges.

Finding: This contention is clearly without merit. There is no provision in state or federal law that mandates adoption of separate water quality standards for wet weather conditions. In arguing that the permit violates state law, BIA states that because the permit applies the water quality objectives that were adopted in its Basin Plan, and those objectives were not specifically adopted for wet weather conditions only, the Regional Water Board violated

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of the state" allows the protection of groundwater, which is generally not considered to be "waters of the United States."

[21] There are other provisions in the permit that refer to restrictions "into" the MS4. (See, e.g., Legal Authority D.1.) Those provisions are appropriate because they do not apply the MEP standard to the permittees, but instead require the permittees to demand appropriate controls for discharges into their system. For example, the federal regulations require that MS4s have a program "to reduce pollutants in storm water runoff from construction sites to the municipal storm sewer system . . . ." (40 C.F.R. § 122.26(d)(2)(iv)(D).)

Water Code section 13241. These allegations appear to challenge water quality objectives that were adopted years ago. Such a challenge is clearly inappropriate as both untimely, and because Basin Plan provisions cannot be challenged through the water quality petition process. (See Wat. Code § 13320.) Moreover, there is nothing in section 13241 that supports the claim that Regional Water Boards must adopt separate wet weather water quality objectives. Instead, the Regional Water Board's response indicates that the water quality objectives were based on all water conditions in the area. There is nothing in the record to support the claim that the Regional Water Board did not in fact consider wet weather conditions when it adopted its Basin Plan. Finally, Water Code section 13263 mandates the Regional Water Board to implement its Basin Plan when adopting waste discharge requirements. The Regional Water Board acted properly in doing so.

BIA points to certain federal policy documents that authorize states to promulgate water quality standards specific to wet-weather conditions.[22] Each Regional Water Board considers revisions to its Basin Plan in a triennial review. That would be the appropriate forum for BIA to make these comments.

Contention: BIA contends that the permit improperly classifies urban runoff as "waste" within the meaning of the Water Code.

Finding: BIA challenges Finding 2, which states that urban runoff is a waste, as defined in the Water Code, and that it is a "discharge of pollutants from a point source" under the federal Clean Water Act. BIA contends that the legislative history of section 13050(d) supports

[22] These documents do not support the claim that U.S. EPA and the Clinton Administration indicated that the absence of such regulations "is a major problem that needs to be addressed," as claimed in BIA's Points and Authorities, at page 18.

its position that "waste" should be interpreted to exclude urban runoff. The Final Report of the Study Panel to the California State Water Resources Control Board (March, 1969) is the definitive document describing the legislative intent of the Porter-Cologne Water Quality Control Act. In discussing the definition of "waste," this document discusses its broad application to "current drainage, flow, or seepage into waters of the state of harmful concentrations" of materials, including eroded earth and garbage.

As we stated in Board Order WQ 95-2, the requirement to adopt permits for urban runoff is undisputed, and Regional Water Boards are not required to obtain any information on the impacts of runoff prior to issuing a permit. (At page 3.) It is also undisputed that urban runoff contains "waste" within the meaning of Water Code section 13050(d), and that the federal regulations define "discharge of a pollutant" to include "additions of pollutants into waters of the United States from: surface runoff which is collected or channeled by man." (40 C.F.R. § 122.2.) But it is the waste or pollutants in the runoff that meet these definitions of "waste" and "pollutant," and not the runoff itself.[23] The finding does create some confusion, since there are discharge prohibitions that have been incorporated into the permit that broadly prohibit the discharge of "waste" in certain circumstances. (See Attachment A to the permit.) The finding will therefore be amended to state that urban runoff contains waste and pollutants.

Contention: BIA contends that the Regional Water Board violated California Environmental Quality Act (CEQA).

[23] The Regional Water Board is appropriately concerned not only with pollutants in runoff but also the volume of runoff, since the volume of runoff can affect the discharge of pollutants in the runoff. (See Board Order WQ 2000-11, at page 5.)

Finding: As we have stated in several prior orders, the provisions of CEQA requiring adoption of environmental documents do not apply to NPDES permits.[24] BIA contends that the exemption from CEQA contained in section 13389 applies only to the extent that the specific provisions of the permit are required by the federal Clean Water Act. This contention is easily rejected without addressing whether federal law mandated all of the permit provisions. The plain language of section 13389 broadly exempts the Regional Water Board from the requirements of CEQA to prepare environmental documents when adopting "any waste discharge requirement" pursuant to Chapter 5.5 (§§ 13370 et seq., which applies to NPDES permits).[25] BIA cites the decision in *Committee for a Progressive Gilroy v. State Water Resources Control Board* (1987) 192 Cal.App.3d 847. That case upheld the State Water Board's view that section 13389 applies only to NPDES permits, and not to waste discharge requirements that are adopted pursuant only to state law. The case did not concern an NPDES permit, and does not support BIA's argument.

Contention: WSPA contends that the Regional Water Board did not follow this Board's precedent for retail gasoline outlets (RGOs) established in the LA SUSMP order.

Finding: In the LA SUSMP order, this Board concluded that construction of RGOs is already heavily regulated and that owners may be limited in their ability to construct infiltration facilities. We also noted that, in light of the small size of many RGOs and the proximity to underground tanks, it might not always be feasible or safe to employ treatment methodologies. We directed the Los Angeles Regional Water Board to mandate that RGOs

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[24] Water Code section 13389; see, e.g., Board Order WQ 2000-11.

[25] The exemption does have an exception for permits for "new sources" as defined in the Clean Water Act, which is not applicable here.

employ the BMPs listed in a publication of the California Storm Water Quality Task Force. (*Best Management Practice Guide – Retail Gasoline Outlets* (March 1997).) We also concluded that RGOs should not be subject to the BMP design standards at this time. Instead, we recommended that the Regional Water Board undertake further consideration of a threshold relative to size of the RGO, number of fueling nozzles, or some other relevant factor. The LA SUSMP order did not preclude inclusion of RGOs in the SUSMP design standards, with proper justification, when the permit is reissued.

The permit adopted by the Regional Water Board did not comply with the directions we set forth in the LA SUSMP order for the regulation of RGOs. The permit contains no findings specific to the issues discussed in our prior order regarding RGOs, and includes no threshold for inclusion of RGOs in SUSMPs. Instead, the permit requires the dischargers to develop and implement SUSMPs within one year that include requirements for "Priority Development Project Categories," including "retail gasoline outlets." While other priority categories have thresholds for their inclusion in SUSMPs, the permit states: "Retail Gasoline Outlet is defined as any facility engaged in selling gasoline."[26]

The Regional Water Board responded that it did follow the directions in the LA SUSMP order. First, it points to findings that vehicles and pollutants they generate impact receiving water quality. But the only finding that even mentions RGOs is finding 4, which simply lists RGOs among the other priority development project categories as land uses that generate more pollutants. The Regional Water Board staff also did state some justifications for the inclusion of RGOs in two documents. The Draft Fact Sheet explains that RGOs contribute

[26] Permit at F.1.b(2)(a)(x).

pollutants to runoff, and opines that there are appropriate BMPs for RGOs. The staff also prepared another document after the public hearing, which was distributed to Board Members prior to their vote on the permit, and which includes similar justifications and references to studies.[27] The LA SUSMP order called for some type of threshold for inclusion of RGOs in SUSMPs. The permit does not do so. Also, justifications for permit provisions should be stated in the permit findings or the final fact sheet, and should be subject to public review and debate.[28] The discussion in the document submitted after the hearing did not meet these criteria. There was some justification in the "Draft Fact Sheet," but the fact sheet has not been finalized.[29] In light of our concerns over whether SUSMP sizing criteria should apply to RGOs, it was incumbent on the Regional Water Board to justify the inclusion of RGOs in the permit findings or in a final fact sheet, and to consider an appropriate threshold, addressing the concerns we stated. The Regional Water Board also responded that when the dischargers develop the SUSMPs, the dischargers might add specific BMPs and a threshold as directed in the LA SUSMP order. But the order specifically directed that any threshold, and the justification therefore, should be included in the permit. The Regional Water Board did not comply with these directions.

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[27] See "Comparison Between Tentative Order No. 2001-01 SUSMP Requirements and LARWQCB SUSMP Requirements (as Supported by SWRCB Order WQ 2000-11)."

[28] See 40 C.F.R. sections 124.6(e) and 124.8.

[29] U.S. EPA regulations require that there be a fact sheet accompanying the permit. (40 C.F.R. § 124.8.) The record contains only a draft fact sheet, which was never published or distributed in final form. The Regional Water Board should finalize the fact sheet, accounting for any revisions made in the final permit, and publish it on its web site as a final document.

III. CONCLUSIONS

Based on the discussion above, the Board concludes that:

1. The Regional Water Board appropriately required compliance with water quality standards and included requirements to achieve reduction of pollutants to the maximum extent practicable. The permit must be clarified so that the reference to the iterative process for achieving compliance applies not only to the receiving water limitation, but also to the discharge prohibitions that require compliance with water quality standards. The permit should also be revised so that it requires that MEP be achieved for discharges "from" the municipal sewer system, and for discharges "to" waters of the United States, but not for discharges "into" the sewer system.

2. The Regional Water Board was not required to adopt wet-weather specific water quality objectives.

3. The Regional Water Board inappropriately defined urban runoff as "waste."

4. The Regional Water Board did not violate the California Environmental Quality Act.

5. The permit will be revised to delete retail gasoline outlets from the Priority Development Project Categories for Standard Urban Storm Water Mitigation Plans. The Regional Water Board may consider adding retail gasoline outlets, upon inclusion of appropriate findings and a threshold describing which outlets are included in the requirements.

IV. ORDER

IT IS HEREBY ORDERED that the Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems in San Diego County (Order No. 2001-01) are revised as follows:

1. Part A.3: The words "into and" are deleted.

2. Part C.2: Throughout the first paragraph, the words ", Part A.2, and Part A.5 as it applies to Prohibition 5 in Attachment A" shall be inserted following "Part C.1."

3. Finding 2: Revise the finding to read: **URBAN RUNOFF CONTAINS "WASTE" AND "POLLUTANTS"**: Urban runoff contains waste, as defined in the California Water Code, and pollutants, as defined in the federal Clean Water Act, and adversely affects the quality of the waters of the State.

4. Part F.1.b(2)(a): Delete section "x."

In all other respects the petitions are dismissed.

CERTIFICATION

The undersigned, Clerk to the Board, does hereby certify that the foregoing is a full, true, and correct copy of a resolution duly and regularly adopted at a meeting of the State Water Resources Control Board held on November 15, 2001.

AYE: Arthur G. Baggett, Jr.
Peter S. Silva
Richard Katz

NO: None

ABSENT: None

ABSTAIN: None

Maureen Marché
Clerk to the Board

046169

NPDES Stormwater Cost Survey

Prepared For:

California State Water Resources Control Board

Prepared by:

Office of Water Programs
California State University, Sacramento

January 2005

Includes Appendix H:

Alternative Approaches to Stormwater Control

Prepared by:

Center for Sustainable Cities
University of Southern California

Contract: 02-189-250-0

NPDES Stormwater Cost Survey
Final Report

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January 2005

OFFICE OF WATER PROGRAMS
C S U SACRAMENTO

EXECUTIVE SUMMARY

This report is funded by the California State Water Resources Control Board under contract 02-189-250-0, "Survey of Costs to Develop, Implement, Maintain and Monitor Municipal Separate Storm Sewer System (MS4) Storm Water Management Programs and Description of Alternatives for Control of Stormwater Quality in Los Angeles County."

BACKGROUND

The current costs to implement best management practices (BMPs) have been the basis for lawsuits and petitions challenging the California stormwater regulatory program. Additionally, some permittees contend that current MS4 permits necessitate the use of advanced water treatment to meet water quality standards, which would drastically escalate costs above current levels. This contention is presented in the report titled "An Economic Impact Evaluation of Proposed Storm Water Treatment for Los Angeles County" (Gordon, 2002). This project addresses these issues through two tasks.

Task A – Documenting Stormwater Program Costs

Five California municipalities and one metropolitan area with stormwater programs that are demonstrating meaningful progress toward maximum extent practicable (MEP) compliance as identified by Regional Water Quality Control Board (RWQCB) staff were surveyed for the most recent stormwater compliance costs. Demonstrating meaningful progress is defined in this report as implementing activities specifically presented in the Storm Water Management Plans (SWMPs). Because permits use an iterative approach that increases requirements until water quality objectives are met, current levels of implementation may not be the ultimate MEP standard. This report does not address the benefits of permit compliance activities. Some scenarios addressing ultimate compliance cost are addressed in Task B. Task A was accomplished by the Office of Water Programs (OWP) at California State University, Sacramento (CSUS).

Task B – Alternative Approaches to Stormwater Quality Control

Task B is an assessment of regulatory policy to determine the intent of stormwater regulation regarding advanced treatment. Alternatives for stormwater quality control that are believed to comply with the intent of the regulations are described. Costs were estimated for the Los Angeles Regional Water Quality Control Board (LARWQCB) area. Task B was accomplished by the University of Southern California (USC) and the University of California at Los Angeles (UCLA).

RESULTS

Cost Survey (Task A)

Annual cost per household for the six stormwater programs surveyed ranged from $18 to $46, as seen in Table 1.

EXECUTIVE SUMMARY

Table 1. Stormwater Costs per Household for the California Cost Survey (Task A)

Municipalities	Municipality Description	Cost/Household ($)
City of Encinitas	Coastal tourism, small city	46
City of Fremont	Bay Area, moderately integrated countywide program	45
City of Santa Clarita	Tourism and industrial	39
City of Corona	Industrial	32
City of Sacramento	Pumped stormwater, large city	29
Fresno-Clovis Metropolitan Area	65-90% infiltration, fully integrated multi-city program	18

The Fresno-Clovis Metropolitan Area (FCMA) had substantially lower cost per household. The following factors are thought to contribute to the FCMA costs limit costs being lower than the other survey results:

- flood control and stormwater quality basins are combined,
- land was set aside for water projects,
- climate helps infiltration due to infrequent storms and low annual rainfall,
- lower land cost compared to other cities,
- FMFCD owned land needed for basins prior to storm water permits requirements,
- topography lends to drainage of urban areas to post-construction BMPs, and
- highly permeable soils allow extensive use of infiltration.

These factors are unique or more prevalent for FCMA than for the other cities surveyed. Excluding the FCMA as an ideal situation, the range of cost is $29 to $46 per household.

The results of the survey are compared to values from the USEPA report "Economic Analysis of the Final Phase II Stormwater Rule." This report contains a summary of costs from two separate efforts to estimate Phase II cost per household. The first is the results of a survey stormwater costs for 56 Phase II municipalities performed by the National Association of Flood and Stormwater Management Agencies (NAFSMA). The NAFSMA survey represents the six minimum measures of the Phase II regulations because two measures seemed to have been combined: 1) Public Education and Outreach and 2) Public Involvement and Participation.

The second effort presented in the USEPA report is the results of a review by USEPA of annual stormwater reports from 26 Phase I municipalities. These municipalities were chosen were smaller Phase I cities, were nearly in the first permit term, and had reported cost in their annual reports. The California survey results for the cost categories corresponding to the six minimum measures were extracted to compare to the NAFSMA survey and the EPA review. The results of this comparison are in Table 2.

EXECUTIVE SUMMARY

Table 2. Stormwater Costs per Household for Six[1] Minimum Measures from the California Survey, the NAFSMA[2] Phase II Survey, and the USEPA review of Phase I Annual Reports (USEPA, 1999)

Study	Median (50%) ($)	Mean ($)	Max ($)
Adjusted California Survey[3]	24	26	35
NAFSMA Phase II Survey[4]	4.63	10	61
EPA Phase I Survey[5]	3.16	10	67

1. Public Education and Outreach and Public Involvement and Participation were assumed combined for the NAFSMA survey.
2. NAFSMA: National Association of Flood and Stormwater Management Agencies
3. Based only on costs from cost categories that correspond to the six minimum measures
4. NAFSMA survey based on 56 Phase II respondents to a survey on stormwater costs for five minimum measures. Values adjusted to 2003 dollars.
5. EPA results based on a review of 26 annual reports for smaller Phase I cities that were nearly in their first NPDES term so that costs would be more representative of Phase II programs. Values adjusted to 2003 dollars.

In some cases, programs in the California survey appeared to go beyond the minimum requirements of the permit. The cost of this additional effort was not included when it could be identified or estimated, such as street sweeping in Sacramento that was above the permit required frequency. Including the total cost of the street sweeping program the cost per household for Sacramento would increase $1.69. In some cases the additional effort could not be estimated. This was particularly true when stormwater activities were combined with activities that occurred more frequently than the permit requirement for the stormwater activities, such as when stormwater construction inspections for Santa Clarita were performed at every construction permit inspection and these permit inspections occurred more frequently than the permit requirement.

Description of Alternatives for Control of Stormwater Quality (Task B)

The alternatives for control of stormwater quality focus on source control and runoff reduction. The principle strategy for runoff reduction is by infiltration and evapotranspiration, using common BMPs. Based on this approach, costs for two scenarios are estimated for the area under LARWQCB jurisdiction. One scenario assumes source control BMPs are sufficient to comply with regulations. The other scenario assumes treatment using wetlands and infiltration basins. Two costs were estimated for the treatment scenario based on two different sources of unit costs. These scenarios do not include advanced treatment costs. Equivalent annual costs per household were calculated to compare to cost estimates from other studies. Table 3 compares the cost estimates of the two scenarios to the estimated current stormwater cost for the Los Angeles area.

Current level of effort in the Los Angeles area has only made limited progress in implementing the scenarios described in Task B (Devinny, 2004). If there are cases where discharge from these BMPs still requires advanced treatment, the cost of stormwater treatment would be much less than if advanced treatment was solely used because runoff reductions would reduce the size of treatment plant requirements.

EXECUTIVE SUMMARY

Table 3. Equivalent Cost Per Household For Task B Alternatives

Cost Scenario for the Los Angeles Area	Equivalent Annual Cost, $/household
Current Effort	18
Alternative to Advanced Treatment: Pollution Prevention Scenario (Present worth 2.8 billion)[1]	27
Alternative to Advanced Treatment: Wetlands and Infiltration Basins Scenario, calculated using cost per area (Present worth 5.7 billion)[1]	55
Alternatives to Advanced Treatment: Wetlands and Infiltration Basins Scenario, calculated using cost per capture volume (present worth 7.4 billion)[1]	71

1. Little progress has been made in implementing these scenarios (Devinny, pers. comm., 9/14/04). These costs may be added to the current effort if existing programs continue to be required. Costs based on Devinny et. al. (Appendix H), see Table G-6 for equivalent annual cost calculation.

Table 4 compares several cost estimates in terms of equivalent annual cost per household.

Table 4. Equivalent Annual Cost per Household Comparisons between California Cost Survey Results and Los Angeles Area Future Cost Estimates[1]

Range of Current Cost from the California Survey		Range of Cost Estimates for Alternatives for Control of Stormwater Quality[2]		Maximum TMDL Estimates[3]		Statewide Clean Water Willingness To Pay[4]
				Ballona Creek Metals	L.A. River Trash	
18	46	27	71	75	141	180

1. Calculations are presented in Appendix G and are based on the following sources for each column respectively: survey results in Section 9, Devinny et al (Appendix H), RWQCB, Los Angeles (2004), LARQCB (2001), and Larsen and Lew (2003).
2. Calculated from Task B in Appendix H. Low range is the cost for attaining full compliance using only source control. High range is the cost for attaining full compliance using only treatment BMPs (low tech) estimated on capture volume. It is estimated that this is in addition to the current level of spending in the Los Angeles area.
3. TMDL costs apply to all sources, not just MS4 stormwater sources.
4. Responses were not received from 40% of the mailed surveys. The survey question was for restoring water quality for all waters throughout the state from all impairment, not just within a city or region and not just for impairment from stormwater pollution.

The costs developed by Gordon et al. (2002) were based on capture, collection and advanced treatment of various percentages of the annual runoff volume. An annual runoff capture volume of 70 percent (0.5-inch storm) was selected to compare to the Los Angeles Standard Urban Stormwater Mitigation Plan (SUSMP) capture standards of around 85 percent (0.75-inches). Unfortunately, the next highest capture volume analyzed by Gordon was the 1.25-inch storm. The resulting equivalent annual cost per household using the 0.5-inch storm and assuming a treatment scenario of 65 large regional treatment plants is $459/household. This cost only estimates cost that the cities in Los Angeles County would incur, so they may not directly comparable to the total watershed costs developed in the Total Maximum Daily Load (TMDL) plans because TMDL costs are not restricted to stormwater quality control.

Since some advanced treatment may be required, the future cost will lie between the alternative scenarios estimate and the advanced treatment estimate. Based on the assumption used by the Devinny study, future costs for the Los Angeles area appear to hinge on the ability to reduce stormwater runoff volumes and on the ability to control pollutants through source control.

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This report is funded by the California State Water Resources Control Board (SWRCB) under contract 02-189-250-0, "Survey of Costs to Develop, Implement, Maintain and Monitor Municipal Separate Storm Sewer System (MS4) Storm Water Management Programs and Description of Alternatives for Control of Stormwater Quality in Los Angeles County."

1.1 BACKGROUND

The 1987 amendments to the federal Clean Water Act (CWA) added Section 402(p), which defined stormwater discharges from industrial activities and municipal systems as point sources subject to the National Pollutant Discharge Elimination System (NPDES) Permit Program. The CWA directed the United States Environmental Protection Agency (USEPA) to publish regulations to define the discharges subject to NPDES permits and to establish a framework for regulating these discharges. The stormwater regulations promulgated by USEPA established a two-phase approach for municipal systems. The first phase began in 1990 and addressed discharges from (MS4s) that serve populations greater than 100,000 people. The second phase began in 1999 and addressed discharges from MS4s that serve populations less than 100,000 and are located in urbanized areas. The State Water Resources Control Board and the Regional Water Quality Control Boards (RWQCBs) can apply the Phase I or Phase II rules to areas with smaller populations as needed to protect water quality.

The CWA and federal stormwater regulations require MS4s subject to NPDES permits to reduce the pollutants in stormwater discharges to the maximum extent practicable (MEP). The regulations require the implementation of best management practices (BMPs) to meet the MEP discharge standard. BMPs include both source controls and treatment measures. MS4s are to implement an effective combination of these BMPs to reduce pollutants in stormwater discharges. In California, MS4 permits also require permittees to reduce the discharge of pollutants so that water quality standards are met. However, the permits do not specify strict compliance with numeric water quality standards. Rather, the MS4 permits require the compliance with standards through an iterative approach. Permittees implement BMPs according to storm water management plans. (If the current level of effort does not achieve water quality standards, additional BMPs are implemented until compliance has been achieved).

The current costs to implement BMPs have been the basis for lawsuits and petitions challenging the California stormwater regulatory program. Additionally, some permittees contend that current MS4 permits necessitate the use of advanced water treatment to meet water quality standards, which would drastically escalate costs above current levels (Gordon, 2001). Neither the USEPA nor the SWRCB has estimated costs for the development and implementation of MS4 stormwater programs to achieve MEP. The SWRCB and RWQCBs wish to respond to the contention that the intent of the California stormwater program is to require all stormwater discharges to be treated with advanced treatment devices. This project addresses these issues through two tasks.

Task A – Documenting Stormwater Program Costs

Documenting costs of a subset of California MS4 stormwater programs that were identified by RWQCB staff as demonstrating meaningful progress toward MEP compliance will aid in approximating costs of permit compliance statewide. Making meaningful progress is considered implementing activities specifically presented in the SWMPs. Stormwater program expenditures by those municipalities were compiled. The cost data was analyzed and normalized to identify potential cost factors that can be used to estimate costs for other municipalities to achieve permit compliance. Although compliance with construction and industrial permits is discussed in stormwater permits, the compliance costs for these permits are not included in this report. This report does not address the benefits of permit compliance activities[1].

Only municipal costs are documented; total societal costs are not. There are additional costs borne by developers (passed onto homeowners), businesses, industries and residents that are not addressed in Task A. The Task A was accomplished by personnel from the Office of Water Programs at CSUS.

Task B – Alternative Approaches to Stormwater Quality Control

Task B is an assessment of regulatory policy to determine the intent of stormwater regulation regarding advanced treatment. Alternatives for stormwater quality control that are believed to comply with the intent of the regulations are described and costs are estimated for the Los Angeles Regional Water Quality Control Board (LARWQCB) area. The intent of the regulation was determined by speaking with LARWQCB staff and reviewing past regulatory action. Task B was accomplished by faculty from the University of Southern California and the University of California Los Angeles. This task assumes the MS4 permitting process as it stands presently, using an iterative process of enhancing implementation of BMPs. This scenario may overlap with the Total Maximum Daily Load (TMDL) process, but it is not necessarily the same since the TMDL process address pollution sources other than stormwater.

1.2 REPORT ORGANIZATION

Task A is addressed in Sections 2 through 9. Section 2 presents the methodology for gathering, analyzing, and presenting cost information. Sections 3 through 8 present the NPDES-related stormwater costs and other relevant characteristics for the six municipal areas surveyed. The raw cost data and description of how program costs were developed are shown in Appendices A through F. In Section 9, normalized costs for each major stormwater program element are presented and compared between cities. Explanations for the observed differences are also offered. Appendix G contains the backup calculations for Section 9. Section 10 presents

[1] A subcommittee of the California Stormwater Quality Association (CASQA) is working on developing guidelines for program effectiveness evaluation, which has an ultimate goal of quantifying changes in receiving water quality (the benefit) due to stormwater activities.

recommendations for further cost reporting and analysis. References are in Section 11. Task B is included as Appendix H.

The method for data collection, organization, and quality evaluation is presented in this section. Data sources are also described. Methodology and assumption for Task B are reviewed in the Executive Summary of the report found in Appendix H.

2.1 TECHNICAL ADVISORY GROUP

A technical advisory group (TAG) was formed to assist in the execution of this project. The TAG was comprised of one representative from USEPA, one from RWQCB, three from universities not associated with executing the study, one consultant, and one representative from the California Stormwater Quality Association (CASQA)[2]. TAG members reviewed and commented on each major phase of the study, including the initial city selection, initial scope of the study, initial results from the first city, and the interim draft report. A description of the TAG and their comments are included in Appendix K. The TAG did not review the work done for Task B (Appendix H).

2.2 CITY SELECTION

The following criteria were used in the selection process:

- nominated by RWQCB staff as having a good stormwater program,
- a variety of geographic and hydrologic areas within California,
- have a stormwater fund or equivalent that required the cities to track stormwater costs,
- a variety of populations, with at least one city below 100,000, and
- a variety of income per population or household.

Initial nominations and selection recommendations were presented in a memorandum to the SWRCB (Appendix I). Subsequent discussion with cities and RWQCB staff refined the list. One nominee, Corona, was considered after the memorandum was submitted. All the cities nominated for the inland area of Southern California were not able to participate, so the RWQCB then nominated Corona. Corona was not initially considered because of a lack of familiarity with the progress of their stormwater program. Subsequent review established Corona as a nominee.

The following municipalities were selected and agreed to participate in the cost survey:

- Corona
- Encinitas
- Fremont
- Fresno-Clovis Metropolitan Area
- Sacramento
- Santa Clarita

[2] CASQA is a non-profit organization with mostly municipality membership. CASQA advises the California SWRCB on stormwater issues.

The locations of the participating municipalities are shown in Figure 2-1.

2.3 COST SURVEY CATEGORIES

The Cost Survey Categories were based on the USEPA six minimum measures for Phase II stormwater programs because cities often report cost in annual reports for several of these categories (http://cfpub.epa.gov/npdes/stormwater/menuofbmps/menu.cfm). The six categories initially considered in this study were:

- Public Education and Outreach,
- Public Involvement and Participation,
- Illicit Discharge Detection and Elimination (a.k.a. Illicit Connection and Illicit Discharge),
- Construction Site Stormwater Runoff Control,
- Post Construction Stormwater Management in New Development and Redevelopment, and
- Pollution Prevention and Good Housekeeping for Municipal Operations.

Figure 2-1. Location of Municipal Areas Selected for the Cost Survey

For several cities, Public Education and Outreach and the Public Involvement and Participation costs were not tracked separately. Consequently, differentiating costs between these two categories was often impractical. For these cities, these costs are reported in a "Public Education, Outreach, Involvement, and Participation" category.

Review of the stormwater permits of the selected cities and consultation with SWRCB staff resulted in these additional categories:

- Industrial and Commercial Management Programs,
- Overall Stormwater Program Management,
- Water Quality Monitoring, and
- Watershed Management.

The industrial and commercial management programs were combined because most of the selected cities did not differentiate between the costs associated with industrial sites and commercial sites.

The Watershed Management category includes costs associated with participation in total maximum daily load (TMDL) development processes and watershed management addressing

303(d)[3] pollutants. Most of the cities are not actively implementing TMDLs and costs reported in this category do not include TMDL implementation activities. Furthermore, existing TMDLs suggest stormwater compliance will be through enhancement to current permit compliance activities such as post-construction BMPs.

2.4 IDENTIFYING NEW, EXISTING, AND ENHANCED COSTS

All costs were identified as new, existing, or enhanced according to the extent that the activities existed before the first stormwater permit. New costs are for activities that are exclusively a result of compliance efforts with the stormwater permit. Existing costs are for activities that predated stormwater permits. Enhanced costs are for existing activities that were increased due to permit requirements. Enhanced costs are the total cost for impacted activities. It is not the increase in cost due to permit requirements. This number would have to be developed from 1990 baseline costs, and this is beyond the scope of this project.

2.5 DATA COLLECTION

Because costs for the 2003/2004 fiscal year were not available at the start of this survey, costs for the 2002/2003 fiscal year were collected.

Initially, a questionnaire was developed to facilitate the data collection effort. Questions were developed to capture cost data and descriptions of the stormwater program activities for each city. The questionnaire was organized by cost category and included questions for individual activities or BMPs within each cost category. The questionnaire was given to the city of Sacramento as a test case, but it proved difficult to use as the cost information and description of activities/BMPs available to city staff did not match well with those in the questionnaire. Consequently, the questionnaire was abandoned as the primary data collection tool, though it was shared with other cities as a guide to help staff understand what type of information was being sought.

The data collection methodology is depicted in Figure 2-2. City staff members were contacted by email and with follow-up telephone conversations in which the purpose and scope of the study were described. As mentioned above, a copy of the questionnaire was sent as guidance material. City staff then submitted cost and activity data in whatever format was available. The documents that usually contained the most useful information were the city's annual stormwater report, cost spreadsheets submitted by city staff, the NPDES stormwater permit, and SWMPs, or Stormwater Quality Improvement Plans (SQIPs), or Drainage Area Master Plans (DAMPs).

The next step was to fit the information provided into the cost survey categories. This wasn't always straightforward as there were significant differences among cities in the format and

[3] The term 303(d) pollutants are used here to describe the pollutants in specific waters for which TMDLs are being developed according to Section 303(d) of the CWA.

content of annual stormwater reports. For example, the annual stormwater report for one city was divided into two separate submittals, each covering one half of the year. The study team combined data from each section to represent the whole year. In another example, the annual stormwater reports of two cities did not contain costs. In these cases, cost and activity data was assembled from multiple alternate sources. After working through a variety of reporting formats, costs were allocated among the cost survey categories and entered into tables similar to Table 2-1. These tables were returned to the surveyed cities to give them an opportunity to comment on the allocation of costs. Follow up inquiries were also made when data was incomplete or missing. Data collection, cost allocation, and coordination with the surveyees' continued until all substantial questions were answered. Coordination with city staff members usually resulted in adjustments that more accurately accounted for those stormwater activities related to permit compliance.

Table 2-1. Example of Cost Information Collected for Each Cost Survey Category

Cost Category: Construction Site Stormwater Runoff Control[1]

Activity Names	External Contract	Relation to Permit[2]	Dollar Amount	Activity Statistics	Notes or Units	
Activity 1						
Activity 2						
Activity 3						

1. This example format was repeated within the table for the other cost categories.
2. This column indicates whether required activities were being performed prior to stormwater permits. In some cases activities were enhanced due to permit requirements.

Information was also collected on cost factors that might explain observed differences in costs. These factors were used to "normalize" costs by dividing the cost by the cost factors (activity statistics). Some cost factors were physical characteristics such as population or area. These were collected from census sources, city websites, and through personal communication. Others cost factors, such as number of construction site inspections, reflected stormwater program activities. Cost factors specific to individual activities or cost categories were found in the annual stormwater reports or reported in personal communications from city staff. Identical cost factors were not available for every city because cities often tracked accomplishments differently. For example, one city counted miles of drainage channel cleaned while another measured the weight of trash and debris removed during channel cleaning. As with the costs, the activity statistics were verified by city staff before being entered into tables similar to Table 2-1 under the "Activity Statistics" column.

The TAG suggested that certain fines and penalties from enforcement of ordinances relating to stormwater compliance are available to offset the cost of stormwater programs. Examples include parking tickets to accommodate street sweeping, fines for littering, construction practice violations, commercial facility operations, etc. The net revenue associated with enforcement of city ordinances that support stormwater activities was not available, partly because the cost of enforcement and penalty collection by the municipalities for stormwater violations is not known. Regardless, this does not change the cost of compliance; enforcement only seeks to identify alternative funding sources.

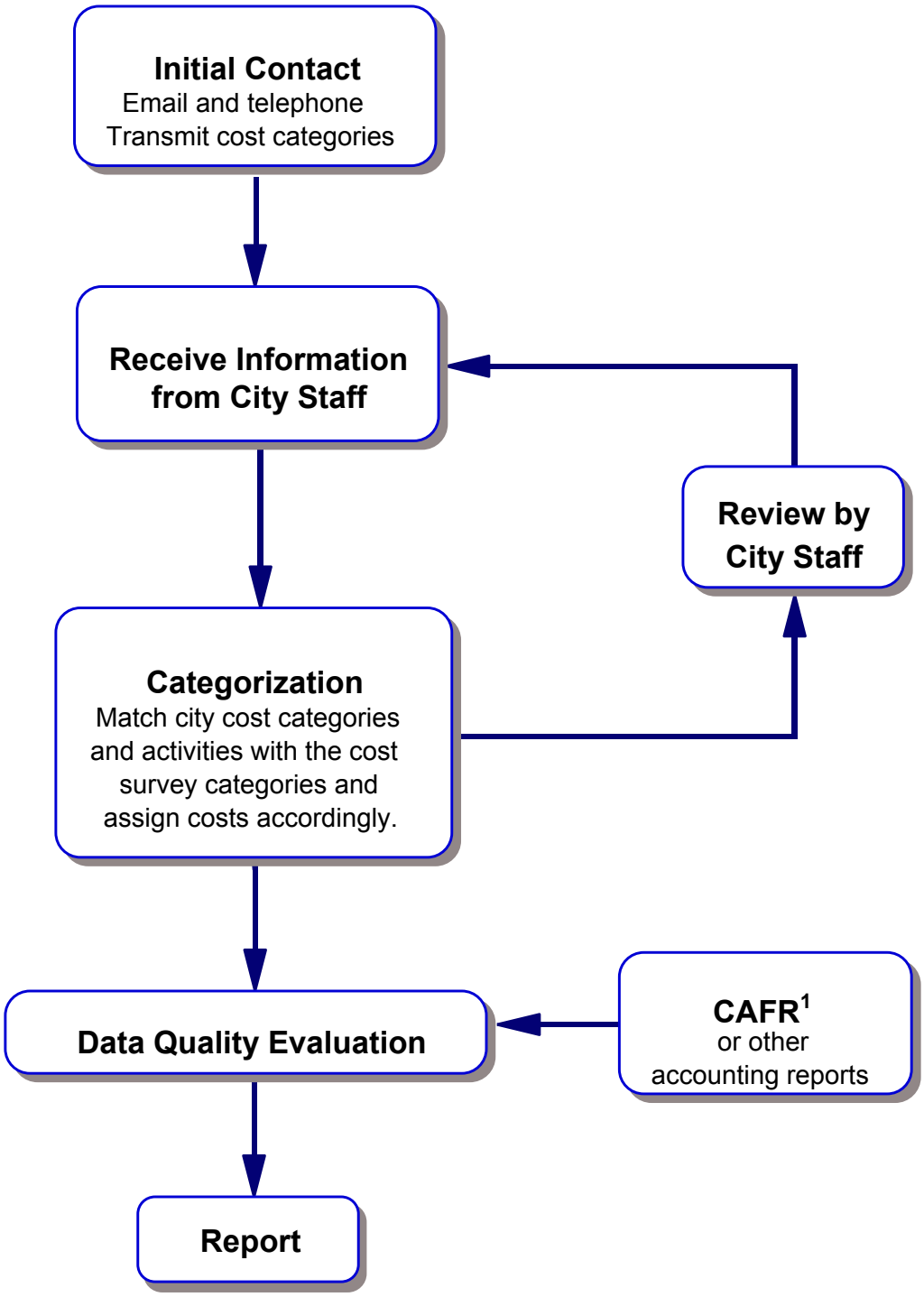

1. CAFR: Comprehensive Annual Financial Report

Figure 2-2. Data Collection Methodology Flow Chart

2.6 DATA QUALITY EVALUATION

After data collection, an assessment was made to assign an appropriate level of confidence in the data. The following confidence levels and criteria were used:

High – Costs were submitted in the form of reports generated by city accounting systems.

Moderately High – Costs were submitted in spreadsheets or other written form and could be checked against stormwater cost entries in the city's Comprehensive Annual Financial Report[4] (CAFR), or other accounting system reports. If a city has established a fund to account for stormwater related financial transactions, confidence was determined by comparing the cost figures found in the CAFR (or accounting system reports) and the data submitted by city stormwater staff. The costs reported in the CAFR should not be less than the staff-reported costs because the CAFR may include costs for stormwater activities not required for permit compliance. If costs submitted by stormwater staff were higher than reported CAFR costs, the inconsistency reduces the level of confidence in the data and casts doubt on the accuracy of the submitted costs.

Moderate – Costs were submitted in spreadsheets or other written form, but comparisons with CAFR stormwater funds or other accounting system reports could not be made.

Low – Costs were submitted verbally through personal communication or major costs for required programs were not available or estimated.

The goal of the data evaluation process was to assign a single confidence level to a city's overall data set. In most cases all of the data submitted by city staff received the same level of confidence because the sources were similar in nature. Where there were differences in data quality because of different data sources, the overall quality was based on the quality of the data representing the majority of the costs. A judgment was also made on the completeness of the data. For example, if major costs are missing, the confidence would be low even though the quality of the data submitted might be high. A commentary on data quality is included in the report sections corresponding to each of the cities surveyed.

2.7 INHERENT LIMITATIONS

As in all cost surveys, this study contains some inherent limitations. The most important of these is the almost complete dependence by the study team on the city staff members to assure the accuracy and completeness of the data provided. While some checks were made against alternate sources (e.g., the CAFRs) and common sense, it was outside the scope of this project for the study team to independently check the quality of each city's stormwater accounting information. Errors can creep into any exercise of this kind. Inherent in the process of recording data are data entry errors such as mistyped numbers. Though unintentional, these errors are

[4] A CAFR is an annual report provides information regarding all funds and account groups under the jurisdiction of a government reporting entity.

sometimes not identified and resolved. Another potential source of error is an incomplete record. Sometimes things are forgotten and overall data quality suffers.

The study team thanks the staff members of the participating cities for their efforts to assure that the data provided are as correct and complete as possible. What errors may have crept into the data are certainly unintentional, and are not believed to be large enough to affect the major findings of the study.

2.8 DATA COMPARISONS TO OTHER STUDIES

A review of literature revealed several sources of cost information throughout the United States. The primary sources reviewed were the Rouge River Watershed project in Michigan, the National Association of Flood and Stormwater Management Agencies (NAFSMA) survey of Phase II municipalities, and the USEPA review of Phase I costs (USEPA, 2004). These costs are discussed in Section 9.6.

The city of Corona is a moderately-sized city located inland in southern California with a population of 124,966 (www.census.gov). It is traditionally an agricultural city. The city is in the Santa Ana River watershed at the junction of State Route 91 and Interstate 15. The stormwater program is coordinated by personnel from the Department of Public Works. Descriptive characteristics for Corona are shown in Table 3-1. Primary personal communication was with Michele Colbert from the city of Corona. The city of Corona costs for 2002/2003 were for complying with their 2002 stormwater permit (RWQCB, Santa Ana, 2002).

Table 3-1. Select Characteristics of the City of Corona

Description	Characteristic	Reference
Mean Income Per Person, $	21,001	www.census.gov
Area, (sq. miles)	35	www.census.gov
Population	124,966	www.census.gov
Curb Miles Swept	20,877	Colbert, pers. comm., 3/12/04
Active Construction Sites	41	Colbert, pers. comm., 3/12/04
Industrial and Commercial Sites	3,050	Colbert, pers. comm., 3/12/04
Households	39,271	www.census.gov
City Actual General Fund Revenue, $	78,413,063	Corona, 2003a.
Annual Rainfall (cm)	29	www.wrcc.dri.edu
Years Since Incorporation	108	www.ci.corona.ca.us

3.1 DATA SOURCES

The following describes the information available from the data sources.

Cost Spreadsheets Submitted by City Staff

A spreadsheet was provided from the city of Corona, which included labor and direct cost information for their stormwater program broken down into different categories by activity (Appendix A, Table A-2). This spreadsheet contained the majority of the city's stormwater program cost. Also, spreadsheets containing cost and other data were submitted for street sweeping and hazardous materials pick-up such as spills from vehicles involved in accidents. (Appendix A, Tables A-10 and A-11).

City of Corona Santa Ana Watershed Annual Reporting Forms 2002/03

This report provided activity statistics (e.g. curb miles swept) for various city stormwater programs. These statistics were used to normalize costs to allow comparison with other cities.

Personal Communication: Interviews, Phone Calls, E-Mail

Personal communication with city of Corona staff provided additional stormwater program costs that augmented the data submitted in their cost spreadsheet. Through personal communication, city staff elaborated on what was accomplished for each cost submitted in their spreadsheet and commented on the allocation of costs among the cost survey categories.

Comprehensive Annual Financial Report (CAFR) 2002/03

The city of Corona has not established a fund to account for overall stormwater transactions, therefore no cost comparisons were made to CAFR figures.

Santa Ana Regional Drainage Area Management Plan (SAR-DAMP) 1993

This document describes the overall stormwater management strategies planned by the municipalities in the Santa Ana drainage area of Riverside County (Corona SAR-DAMP). While no cost figures were obtained from this document, it was used to verify that an activity was required by the permit.

3.2 COST DATA SUMMARY

Table 3-2 summarizes the costs for each survey category. Figure 3-1 shows the relative distribution of costs among the categories. Stormwater staff labor costs were not distributed among survey categories, but were 100 percent allocated to the Overall Stormwater Program Management category. This will make Overall Stormwater Program Management costs appear higher compared to cities that allocate stormwater staff costs to their various programs. According to city staff, the industrial stormwater program is just getting started so costs of that program probably do not represent a mature industrial program (Colbert, personal communication, 3/12/04).

Table 3-2. City of Corona Cost Assigned to Cost Survey Categories

Cost Survey Category	*Costs ($)*
Construction Site Stormwater Runoff Control	53,382
Illicit Discharge Detection and Elimination	20,628
Industrial and Commercial Management Programs	89,916
Overall Stormwater Program Management	317,800
Pollution Prevention and Good Housekeeping for Municipal Operations	720,222
Post Construction Stormwater Management in New Development and Redevelopment	13,509
Public Education, Outreach, Involvement, and Participation	28,409
Water Quality Monitoring	7,000
Watershed Management	0
Total	**1,250,866**

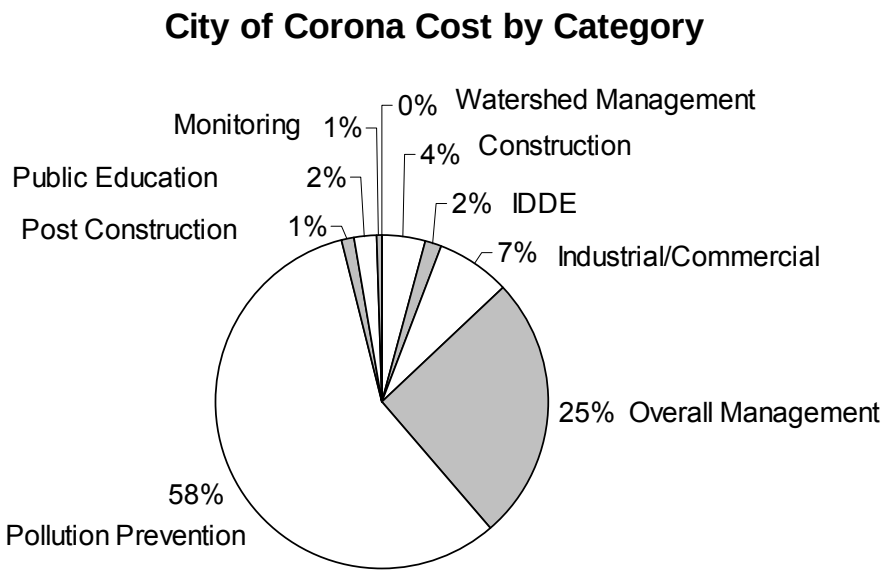

Figure 3-1. Distribution of Corona Stormwater Costs among the Cost Survey Categories.

3.2.1 Discussion of Costs for Each Survey Category

This section presents the major activities for each cost survey category. Further cost breakdown and calculations for each survey category are included in Appendix A. The costs for each survey category are discussed in this section in alphabetical order.

Construction Site Stormwater Runoff Control

The construction program cost was $53,382, which was 4 percent of total stormwater cost. The construction program oversaw 41 active construction sites and performed 564 inspections (Colbert, personal communication, 3/12/04). Including the cost for vehicles, phone usage, training, and stormwater staff labor, the average cost was $95 per inspection and $1,302 per active construction site.

Illicit Discharge Detection and Elimination (IDDE)

The IDDE program cost was $20,628, which was 2 percent of total stormwater cost. The largest cost attributed to this program was for the stormwater share of inspections performed by wastewater staff. The average cost per inspection was $157. Also, new development illicit connection inspections were conducted, which added to the cost of this program (Colbert, personal communication, 3/12/04).

Industrial and Commercial Management Programs

The industrial and commercial program cost was $89,916, which was 7 percent of total stormwater cost. The industrial program had 600 inspections at an average cost of $134 per inspection.

Overall Stormwater Program Management

The overall management program cost was $317,800, which was 25 percent of total stormwater cost. The city was unable to distribute the staff cost among the cost survey categories so all of the stormwater staff cost was assigned to this category. Administrative service charges account for 25 percent of this category's cost. The staff costs represent approximately 62 percent of the costs assigned to this category and 16 percent of total stormwater cost. The remaining 23 percent are for office supplies, reporting, and NPDES fee.

Pollution Prevention and Good Housekeeping for Municipal Operations

The municipal operations program cost was $720,222, which was 58 percent of total stormwater cost. The two primary activities in this category were street sweeping and drain line/channel cleaning. The average cost was $20 per curb mile swept and $8 per linear foot of drain lines and channels cleaned. Street sweeping and drain line and channel cleaning account for 33 percent and 20 percent of total stormwater cost respectively. City staff labor associated with these activities is reported in this category.

Post Construction Stormwater Management in New Development and Redevelopment

The post construction program cost was $13,509, which was 1 percent of total stormwater cost. Post construction cost was primarily for professional consulting services for BMP selection. Also, installation and maintenance of 8 storm drain inlet inserts cost $4,500, averaging $562 per insert per year.

Public Education, Outreach, Involvement, and Participation

The public education program cost was $28,409, which was 2 percent of total stormwater cost. Public education and outreach activities often incorporated public involvement and participation activities. This made differentiating cost between the categories impractical. Because of this, the two programs were combined.

Water Quality Monitoring

The monitoring program cost was $7,000, which was 0.6 percent of total stormwater cost. This cost was associated with the illicit discharge detection and elimination program.

The city of Corona did not allocate any cost to this category. The effort was captured under other programs such as Overall Stormwater Program Management.

3.3 CONFIDENCE IN THE DATA

For the city of Corona, confidence in the data was moderate because most of the cost data submitted was via spreadsheets built, maintained, and updated by the city. However, as with most of the cities selected, the program costs provided could not be verified by city accounting system reports.

Since the city did not have a fund in place to account for overall stormwater related transactions, comparison of stormwater costs submitted by city staff with CAFR cost figures was not possible. This limited the level of confidence in the data to 'moderate.'

The city of Encinitas represents the smallest city selected for the survey with a population of just over 58,000 (www.census.gov). The area of the city is about 20 square miles and is located 25 miles north San Diego. Encinitas is situated along six miles of rugged coastline; characterized by beaches, cliffs, and rolling hills (www.ci.encinitas.ca.us). The stormwater program is coordinated by the Engineering Services Department. Descriptive characteristics for the Encinitas are shown in Table 4-1. Primary personal communication was with Kathy Weldon from the city of Encinitas and Meleah Ashford of Ashford Engineering. The city of Encinitas costs for 2002/2003 were for complying with their 2001 stormwater permit (RWQCB, San Diego, 2001).

Table 4-1. Select Characteristics of the City of Encinitas

Description	Characteristic	Reference
Mean Income Per Person, $	34,336	www.census.gov
Area (sq. miles)	20	www.census.gov
Population	58,014	www.census.gov
Curb Miles Swept	5,832	Encinitas, 2003b
Active Construction Sites	40	Encinitas, 2003b
Industrial and Commercial Sites	417	Encinitas, 2003b, Weldon, pers. comm., 4/2/04
Households	23,843	www.census.gov
City Actual General Fund Revenue, $	42,592,755	Encinitas, 2003a
Annual Rainfall (cm)*	26	www.wrcc.dri.edu
Years Since Incorporation	20	www.ci.encinitas.ca.us
*Rainfall for Oceanside Marina was used.		

4.1 DATA SOURCES

The following describes the information available from the data sources.

Cost Spreadsheets Submitted by City Staff

A spreadsheet was provided by the city of Encinitas that included cost information broken down by activity (Appendix B, Table B-2). The city also submitted another spreadsheet, which allocated the labor, supplies, travel, equipment, and vehicle cost to each stormwater program (Appendix B, Table B-3). The remaining cost data submitted was for public works department costs related to stormwater activities (Appendix B, Table B-4).

Jurisdictional Urban Runoff Management Program (JURMP) Annual Report, FY 2002-2003

This report provided descriptions of the activities and accomplishments of the city's stormwater program (Encinitas, 2003b). Activity statistics (e.g. number of industrial inspections) were provided in this report as well. Stormwater costs were normalized by these statistics. While no

cost figures were obtained from this document, it was used to verify that an activity was required for compliance with the permit.

Personal Communication: Interviews, Phone Calls, E-mail

Personal communication with the city of Encinitas staff provided additional stormwater program costs that augmented the data submitted in their cost spreadsheet. These costs were for stormwater activities performed by the department of public works. They also provided allocations of labor, supplies, travel, equipment, and vehicle to cost survey categories based on estimated percentages. Also, city staff elaborated on what was accomplished for each cost submitted in their spreadsheet and commented on the allocation of costs among the cost survey categories.

Comprehensive Annual Financial Report (CAFR) 2002/03

The city of Encinitas has not established a fund to account for overall stormwater transactions, so no comparisons on cost were made to CAFR figures. During fiscal year 2003/04, the city has since created such a fund (Ashford, personal communication, 4/2/04).

4.2 COST DATA SUMMARY

Table 4-2 summarizes the costs for each survey category. Figure 4-1 shows the relative distribution of costs among the categories. The costs in Table 4-2 include an allocation of stormwater staff time used to develop, oversee, and, in some cases, implement activities within each program.

The backup calculations and source data for these costs are presented and discussed in Appendix B.

Table 4-2. City of Encinitas Cost Assigned to Cost Survey Categories

Cost Survey Category	Costs ($)
Construction Site Stormwater Runoff Control	169,751
Illicit Discharge Detection and Elimination	49,378
Industrial and Commercial Management Programs	65,596
Overall Stormwater Program Management	128,159
Pollution Prevention and Good Housekeeping for Municipal Operations	528,252
Post Construction Water Management in New Development and Redevelopment	15,344
Public Education, Outreach, Involvement, and Participation	41,898
Water Quality Monitoring	76,262
Watershed Management	12,400
Total	**1,087,038**

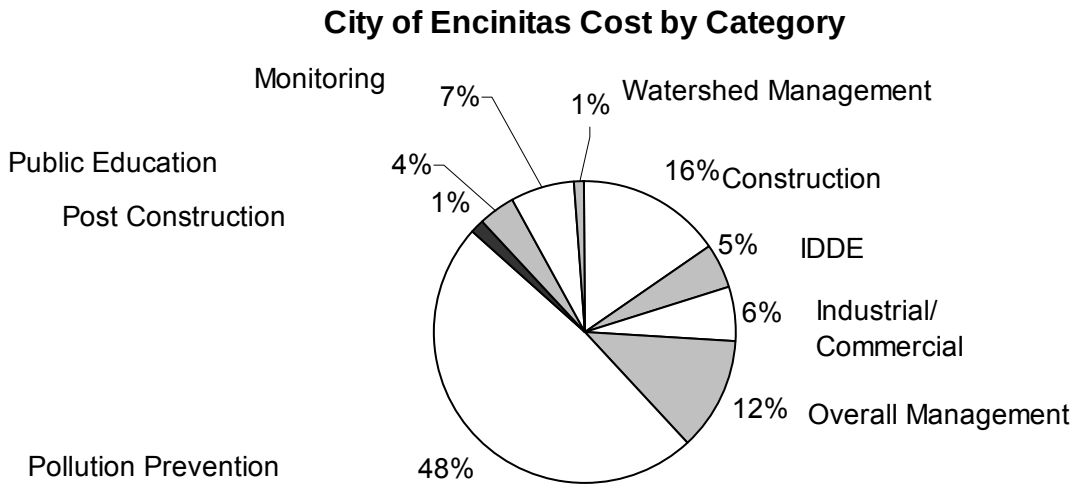

Figure 4-1. Distribution of Encinitas Stormwater Costs Among the Cost Survey Categories.

4.2.1 Discussion of Costs for Each Survey Category

Cost breakdown and calculations for each survey category are found in Appendix B, Table B-1. The costs for each survey category are discussed in this section.

Construction Site Stormwater Runoff Control

The construction program cost was $169,751, which was 16 percent of total stormwater cost. The construction program oversaw 40 active construction sites and performed 401 inspections (Encinitas, 2003b). Including the cost of stormwater staff for oversight and follow-up activities, the average cost was $423 per inspection and $4,244 per active construction site. The normalized cost for Encinitas may be high compared to other cities because the cost includes non-inspection activities such as contractor and inspector training, wet weather monitoring, and BMP manual updating. Stormwater staff also reviewed five SWPPPs, performed general enforcement, issued 13 notices of violation, updated the city BMP manual, educated and trained engineering inspectors with regard to stormwater management and BMP implementation, monitored weather patterns and storms in the Pacific through the National Weather Service, conducted construction education, disseminated brochures and mailings, and held a construction workshop (City of Encinitas, 2003b).

Illicit Discharge Detection and Elimination

The IDDE program cost was $49,378, which was 4 percent of total stormwater cost. The IDDE program conducted 172 education, enforcement, and/or clean-up activities. Using overall IDDE

cost, the average cost per activity was $287. From informal visual inspections, city staff received 76 "complaints," and another 96 complaints were received via the city's stormwater hotline.

Industrial and Commercial Management Programs

The industrial and commercial program cost was $65,596, which was 6 percent of total stormwater cost. This program had 266 inspections at an average cost of $247 per inspection. The normalized cost for Encinitas may be high compared to other cities because the cost includes non-inspection activities such as website updating, facility inventory, education, and enforcement actions (City of Encinitas, 2003b). The city has three industrial sites and 348 commercial sites. Stormwater staff updated the commercial facility inventory, provided BMP manuals and guidance, educated facility staff in regard to stormwater requirements and minimum BMPs, developed a grease program, and issued several enforcement actions (City of Encinitas, 2003b).

Overall Stormwater Program Management

The overall management program cost was $128,159, which was 12 percent of total stormwater cost. Developing a "clean water fee" cost $35,000 (Weldon, personal communication, 4/2/04). This fee pays for stormwater costs and is similar to stormwater fees assessed by other cities. This cost accounts for approximately 27 percent of this category's cost. The other activities in this program were annual reporting and legal support for developing ordinances and plaintiff attorney fees. Costs in this category identified as possibly one-time were for the stormwater fee development, legal fees (ordinances and plaintiff attorneys), and grant writing.

Pollution Prevention and Good Housekeeping for Municipal Operations

The municipal operations program cost was $528,252, which was 49 percent of total stormwater cost. This category had three primary public works activities: cleaning sumps, inlets, and manholes; street sweeping; and cleaning drain lines and channels. Activity statistics were only available for street sweeping which was contracted out with minimal oversight (Weldon, personal communication, 4/2/04). The average cost was $20 per curb mile swept. The street sweeping cost is about 11 percent of total stormwater cost. Street sweeping cost does not include labor of the stormwater staff. This was because stormwater staff time was allocated to all municipal operations for stormwater and not to individual activities (e.g. street sweeping vs. channel cleaning). Other activities included in this program were trash pick-up, sediment disposal, and consulting services for oversight, strategic planning, and management.

Post Construction Stormwater Management in New Development and Redevelopment

The post construction program cost was $15,344, which was 1 percent of total stormwater cost. Post-construction cost was primarily for consulting and oversight of a special project to treat discharge to Moonlight Beach for bacteria. Also, installation and maintenance of 16 storm drain inserts cost $1,908, averaging $119 per insert per year. The cost associated with the "Moonlight Beach" project was possibly a one-time cost.

Public Education, Outreach, Involvement, and Participation

The public education program cost was $41,898, which was 4 percent of total stormwater cost. Public education and outreach activities often incorporated public involvement and participation activities. This made differentiating cost between the categories impractical. Because of this, the two programs were combined. The city of Encinitas had three watershed and beach clean-up activities (City of Encinitas, 2003b). Because the cost of outreach was not available separately and impression statistics were not available, outreach costs were not normalized.

Water Quality Monitoring

The monitoring program cost was $76,262, which was 7 percent of total stormwater cost. The cost was for collection, analysis, and contractor oversight of 48 dry weather bacteria samples (Weldon, personal communication, 4/2/04).

Watershed Management

The cost of this category was $12,400, which was 1 percent of total stormwater cost. These costs were for developing a one time watershed plan and participating in and hosting regional watershed meetings and workshops (Weldon, personal communication, 4/2/04).

4.3 CONFIDENCE IN THE DATA

For the city of Encinitas, confidence in the data was moderately high. This was because only a few cost figures submitted were verbal estimates without backup. Most of the cost data submitted was via spreadsheets built, maintained, and updated by the city. However, as with most of the cities selected, the program costs were provided but could not be verified by city accounting system reports.

For the fiscal year 2002/03, the city did not have a fund in place to account for overall stormwater related transactions. As such, comparison of stormwater costs submitted by city staff with CAFR cost figures was not possible, which did not allow for a higher level of confidence in the data.

Fremont was the third largest city selected and has a population of about 203,000 (www.census.gov). The city is located in Alameda County on the southeast side of the San Francisco Bay between San Jose and Oakland. The stormwater program is coordinated by the Environmental Services Department. Descriptive characteristics for Fremont are shown in Table 5-1. Primary personal communication was with Barbara Silva from the city of Fremont. The FCMA costs for 2002/2003 were for complying with their 2003 stormwater permit (RWQCB, San Francisco Bay, 2003).

Table 5-1. Select Characteristics of the City of Fremont

Description	Characteristic	Reference
Mean Income Per Person, $	31,411	www.census.gov
Area, (sq. miles)	97	Silva, pers. comm., 4/5/04
Population	203,413	www.census.gov
Curb Miles Swept	31,405	Silva, pers. comm., 9/22/04
Active Construction Sites	24	Silva, pers. comm., 4/5/04
Industrial and Commercial Sites	1,028	Silva, pers. comm., 4/5/04
Households	69,452	www.census.gov
City Actual General Fund Revenue, $	98,456,011	Fremont, 2003a
Annual Rainfall (cm)	37	www.wrcc.dri.edu
Years Since Incorporation	48	www.ci.fremont.ca.us

5.1 DATA SOURCES

The following describes the information available from the data sources.

Cost Spreadsheets Submitted by City Staff

The city of Fremont provided a cost spreadsheet that included labor and cost figures for stormwater activities (Appendix C, Table C-2). A further breakdown of one of these cost figures was also provided (Appendix C, Table C-3). A further breakdown of Union Sanitation District[5] (USD) cost is presented in Appendix C, Table C-4. Appendix Table C-5 presents a breakdown of city of Fremont contributions to the Alameda Countywide Clean Water Program (ACCWP).

Alameda Countywide Clean Water Program Fiscal Year 2002/03 Annual Report

The city of Fremont is a member of the ACCWP, so the 2002/03 Annual Report was consulted to obtain activity statistics, descriptions of activities, and accomplishments specifically pertaining

[5] The Union Sanitation District is a special district that provides wastewater collection, treatment and disposal services to the residents and businesses of the city of Fremont, Newark and Union City, in Southern Alameda County in California (www.unionsanitary.com).

to the city of Fremont. As with other cities where relevant activity statistics were available, cost normalization was performed.

Personal Communication: Phone Calls, E-mail

Through personal communication, city staff provided detailed information regarding cost figures. City staff elaborated on what was accomplished for each cost submitted in their spreadsheet and commented on the allocation of costs among the cost survey categories.

Comprehensive Annual Financial Report (CAFR) 2002/03

During the 2002/03 fiscal year, the city of Fremont had a fund in place to account for overall stormwater related transactions. This fund is called the "Urban Runoff/Clean Water" fund (Fremont, 2003a). The cost figures in this fund were used for comparison purposes with costs submitted by city stormwater staff.

Alameda Countywide Clean Water Program, SWMP, July 2001-June 2008

The SWMP provided information regarding the structure, accomplishments, and recent developments of the program. It also gave information regarding objectives and tasks of each program component and specific tasks that the member agencies are required to perform (Fremont, 2003c). While no cost figures were obtained from this document, it was used to verify that an activity was required for compliance with the permit.

5.2 COST DATA SUMMARY

Table 5-2 summarizes the costs for each survey category. Figure 5-1 shows the relative distribution of costs among the categories. Stormwater staff labor costs for the city of Fremont were not distributed among survey categories, but were allocated to Overall Stormwater Program Management. This will make the costs in this category appear higher compared to cities that allocate stormwater staff costs to their various programs. Survey categories (excluding Overall Stormwater Program Management) that include costs or discussion in regard to "stormwater staff labor" only concerns ACCWP labor cost allocated to the city of Fremont. Fremont funded the USD to accomplish portions of the IDDE, industrial/commercial, construction, overall management, and public education programs.

Table 5-2. City of Fremont Cost Assigned to Cost Survey Categories

Cost Survey Category	Costs ($)
Construction Site Stormwater Runoff Control	17,715
Illicit Discharge Detection and Elimination (IDDE)	5,917
Industrial and Commercial Management Programs	210,027
Overall Stormwater Program Management	453,872
Pollution Prevention and Good Housekeeping for Municipal Operations	2,128,175
Post Construction Stormwater Management in New Development and Redevelopment	35,083
Public Education, Outreach, Involvement, and Participation	101,717
Water Quality Monitoring	131,326
Watershed Management	17,610
Total	**3,101,442**

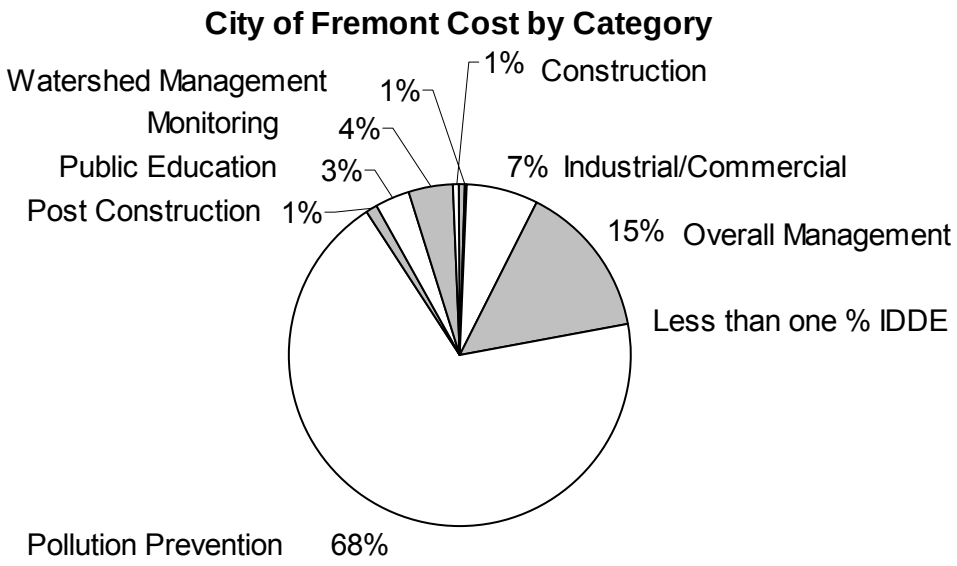

Figure 5-1. Distribution of Fremont Stormwater Costs Among the Cost Survey Categories.

5.2.1 Discussion of Costs for Each Survey Category

Cost breakdown and calculations for each survey category are found in Appendix C, Table C-1. The costs for each survey category are discussed in this section.

Construction Site Stormwater Runoff Control

The construction program (performed by USD), cost was $17,715, which was 1 percent of total stormwater cost. The construction program oversaw 24 active construction sites equal to or greater than five acres (Silva, personal communication, 4/5/04). All of the cost for the program was attributable to inspections (Silva, personal communication, 4/5/04). The program cost,

normalized by construction sites, was $738 per active construction site greater than or equal to five acres.

Illicit Discharge Detection and Elimination

The IDDE program cost was $5,917, which was less than one percent of total stormwater cost. Most of the cost (86 percent) was for assistance to eliminate non-stormwater discharges and reporting. Stormwater staff labor cost represented the remaining 14 percent.

Industrial and Commercial Management Programs

The industrial and commercial program cost was $210,027, which was 7 percent of total stormwater cost. This program was performed by the USD, who performed 482 inspections with 91 follow-up actions of which 81 were enforcement actions. Not including documentation cost, the cost per inspection was $334.

Overall Stormwater Management Program

The overall management program cost was $453,872, which was 15 percent of total stormwater cost. Stormwater staff labor costs are included in this category. The labor costs (including overhead) represent about 69 percent of the cost attributed to this program. The other costs were for administrative services and supplies, permit fees, informational systems, and USD services.

Pollution Prevention and Good Housekeeping for Municipal Operations

The municipal operations program cost was $2,128,175, which was 69 percent of total stormwater cost. The two primary activities of this category were street sweeping, and litter and debris removal. The average cost was $61 per curb mile swept. For this category, street sweeping accounted for approximately 90 percent of the cost and 9 percent was attributable to litter debris and removal. Other activities performed by the city included cleaning drain lines and channels, inlets, cross culverts, and conduits, but costs were not available for these activities.

Post Construction Stormwater Management in New Development and Redevelopment

The post construction program cost was $35,083, which was 1 percent of total stormwater cost. This cost was for engineering, planning, and other city staff to research, track, and report information for the annual stormwater report. It was also for task force meetings to develop strategies for compliance with their permit regarding new development and redevelopment, brochure printing, and stormwater staff labor.

Public Education, Outreach, Involvement, and Participation

The public education program cost was $101,717, which was 3 percent of total stormwater cost. Program activities included production and distribution of citywide newsletters, 28 school outreach presentations, stormwater staff participation in public events, and distribution of

brochures and fliers (Fremont, 2003b). USD was funded $25,897 to provide additional public education outreach services. Outreach materials promote an Integrated Pest Management program that provided businesses and nurseries with shelf displays and fact sheets.

Water Quality Monitoring

The monitoring program cost was $131,326, which was 4 percent of total stormwater cost. This cost was for multiple water quality sampling at two locations. Both chronic and acute toxicity tests were performed (Silva, personal communication, 4/5/04).

Watershed Management

The watershed management program cost was $17,610, which was 1 percent of total stormwater cost. Costs in this category were for developing a watershed study framework, assessment of pilot project activities, and stormwater staff labor (including overhead).

5.3 CONFIDENCE IN THE DATA

For the city of Fremont, confidence in the data was moderately high. Most of the cost data submitted was via spreadsheets built, maintained, and updated by the city. Approximately one-third of the city costs could be corroborated by the 2003/2004 CAFR figures.

The city of Fremont had a fund (Urban Runoff/Clean Water) presented in the CAFR that accounted for stormwater expenditures except street sweeping and litter/debris removal (Cote, 2004). Total expenditures and transfers out for the Urban Runoff/Clean Water fund were $1,234,790. Total stormwater costs submitted by city staff were $3,101,442 but this included $2,115,000 in street sweeping and litter/debris removal costs (Cote, 2004). Subtracting out $2,115,000 leaves $986,442 in stormwater costs compared to the $1,234,790 in the Urban Runoff/Clean Water fund. Because of water conveyance projects, it is expected that compliance costs would be less than this fund reports. The $2,115,000 could not be verified by CAFR figures because it was financed out of larger funds that did not have available breakdown. This cost was about 68 percent of the total stormwater cost.

The Fresno-Clovis Metropolitan Area (FCMA) has a population of 778,000, but a population of nearly 695,000 is used for comparison of normalized costs because this is approximately the population under the jurisdiction of the Fresno Metropolitan Flood Control District (FMFCD), which is the lead agency for compliance efforts. The FCMA is the largest area considered in this cost survey. Fresno is located in the San Joaquin Valley near the Sierra Nevada. Surrounded by agricultural land, the area includes the city of Fresno, the city of Clovis, and other metropolitan areas of Fresno County. The stormwater program is coordinated by the Environmental Services Department. Descriptive characteristics for FCMA and the other agencies, excluding California State University, Fresno (CSUF) are shown in Table 6-1. Primary personal communication was with Daniel Rourke and David Pomaville from the FMFCD. The FCMA costs for 2002/2003 were for complying with their 2002 stormwater permit (RWQCB, Central Valley, 2002a).

Table 6-1. Select Characteristics of the Fresno Metropolitan Area

Description	Fresno-Clovis Area	City of Clovis	County of Fresno	City of Fresno	Reference
Mean Income Per Person, $	*	18,690	15,495	15,010	www.census.gov
Area, (sq. miles)	*	17	6,017	105	www.census.gov
Population	561,120	68,468	65,000***	427,652	www.fresnofloodcontrol.org
Curb Miles Swept	142,411	47,430	21	94,495	FMFCD, 2003b
Active Construction Sites	N/A	N/A	N/A	N/A	N/A
Industrial and Commercial Sites	N/A	N/A	N/A	N/A	N/A
Households**	195,311	25,250	21,036	149,025	www.census.gov
City Actual General Fund Revenue, $	216,089,323	37,707,095	0	178,382,228	Respective CAFRs
Annual Rainfall (cm)	28	28	28	28	www.wrcc.dri.edu
Years Since Incorporation	119	92	N/A	119	www.ci.fresno.ca.us

* Approximately equal to county.
**County of Fresno number of households obtained by dividing the population covered by the stormwater permit by the average number of households in the county according to census 2000. Population provided via personal communication (Pomaville, 6/10/04).
*** County population is only that portion outside the cities but also covered by the FMFCD.

6.1 DATA SOURCES

The following describes the information available from the data sources.

Cost Spreadsheets Submitted by City Staff

The FMFCD provided a spreadsheet generated from an accounting system report. This detailed spreadsheet provided individual expenditures for stormwater except for labor and office supplies (Appendix D, Table D-7).

Fresno-Clovis Storm Water Quality Management Program, Annual Report FY 2002/2003

This report provided descriptions of the activities and accomplishments of the stormwater program. Activity statistics (e.g. number of construction site inspections) were provided in this report, but in most cases numbers were not available for each agency.

Fresno-Clovis Storm Water Quality Management Program (SWQMP), February 1999

The SWQMP presents information regarding objectives and tasks of each program component and specific tasks that the member agencies are required to perform. The report contained budgeted costs incurred by the cities, county, and university in lieu of actual expenditures. These costs were summarized in Appendix D, Table D-3. The cost figures were budgeted amounts and not actual expenditures. The document was also used to verify that an activity was required for compliance with the permit.

Personal Communication: Phone Calls, E-mail

Personal communication with the FMFCD staff provided additional stormwater program costs that augmented the data submitted in their cost spreadsheet. These costs were for labor, office supplies, and street sweeping (Appendix Table D-8). They also provided advice on how to allocate the submitted costs to the cost survey categories. FMFCD staff also advised on where the best available costs were compiled for the other agencies.

Comprehensive Annual Financial Report (CAFR) 2002/03 for the FMFCD, City of Clovis, City of Fresno, and County of Fresno

Except for the FMFCD, the Fresno area agencies had not established a fund to account for overall stormwater transactions, so no comparisons on cost were made to CAFR figures. The CAFR figures were used to determine the general fund revenue, which is considered a potential cost factor.

6.2 COST DATA SUMMARY

Table 6-2 summarizes the stormwater program costs for each cost survey category. Figure 6-1 shows the relative distribution of costs among the categories. Labor cost for the FMFCD staff to develop, oversee, and administer these programs was allocated to the Overall Stormwater Program Management category. The labor costs for the other agencies were allocated to the cost categories.

Table 6-2. Fresno-Clovis Metropolitan Area Cost Assigned to Cost Survey Categories

Cost Survey Category	Costs ($)
Construction Site Stormwater Runoff Control	81,800
Illicit Discharge Detection and Elimination (IDDE)	13,176
Industrial and Commercial Management Programs	47,780
Overall Stormwater Program Management	570,495
Pollution Prevention and Good Housekeeping for Municipal Operations	2,240,605
Post Construction Stormwater Management in New Development and Redevelopment	57,539
Public Education, Outreach, Involvement, and Participation	210,716
Water Quality Monitoring	252,918
Watershed Management	0
Total	**3,475,029**

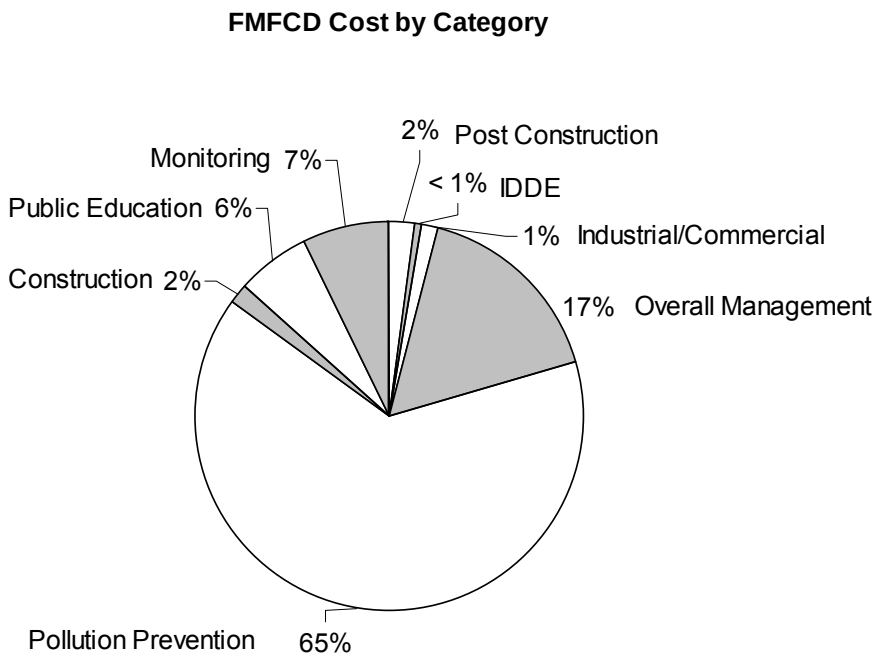

Figure 6-1. Distribution of Fresno-Clovis Metro Area Stormwater Costs Among the Cost Survey Categories

6.2.1 Discussion of Costs for Each Category

Cost breakdown and calculations for each survey category are found in Appendix D, Table D-1. The costs for each survey category are discussed in this section.

Construction Site Stormwater Runoff Control

The construction program cost was $81,800, which was 2 percent of total stormwater cost. The annual stormwater report did not contain the number of inspections for the city of Fresno, so cost could not be normalized by this factor. The number of construction sites was only tracked for the FMFCD so this factor was not used. (FMFCD, 2003b).

Illicit Discharge Detection and Elimination (IDDE)

The IDDE program cost was $13,176, which was less than one percent of total stormwater cost. The number of inspections was not available.

Industrial and Commercial Management Programs

The industrial and commercial program cost was $47,480, which was 1 percent of total stormwater cost. Facilities in the Fresno-Clovis metropolitan area are primarily inspected by Fresno County hazardous waste inspectors, city of Fresno industrial wastewater inspectors, and city of Clovis fire inspectors (FMFCD, 2003b). The number of inspections was only available for the FMFCD so cost could not be normalized on this factor.

Overall Stormwater Program Management

The overall stormwater program management cost was $570,495, which was 16 percent of total stormwater cost. This cost includes the FMFCD staff costs for stormwater (does not include other FMFCD activities such as flood control), which accounted for 98 percent of the cost of this category. The staff costs attributed to stormwater activities were estimated as 11 percent of the total personnel expenses for the FMFCD. The same percentage was applied to obtain office administration costs (Pomaville, 2004). Other costs were for office expenses, office administration, training, and travel.

Pollution Prevention and Good Housekeeping for Municipal Operations

The cost of this program was $2,240,605, which was 64 percent of total stormwater cost. This includes $2,193,296 reported by the city of Clovis and city of Fresno for street sweeping 141,769 of the 142,411 curb miles swept by the agencies (FMFCD, 2003b).

Post Construction Stormwater Management in New Development and Redevelopment

The post construction program cost was $57,539, which was 2 percent of total stormwater cost. This cost was for contracting for maintenance of 8 basins, resulting in an average annual cost of $7,200 per basin.

Public Education, Outreach, Involvement, and Participation

The cost of this program was $210,716, which was 6 percent of total stormwater cost. The Public Education and Outreach category was combined with the Public Involvement and Participation category because the county of Fresno and city of Clovis costs were combined (FMFCD, 1999). There was not a consistently reported activity statistic that could be used for normalization. FCMA agencies were involved in many outreach and participation activities such as public service announcements, brochures, BMP fact sheets, volunteer stenciling, special events, articles, clean-up activities, hotline, school programs, and business outreach (FMFCD, 2003b).

Water Quality Monitoring

The monitoring program cost was $252,918, which was 7 percent of total stormwater cost. The program funded monitoring plan development, sample collection, analysis, reporting, and a Water Environment Research Foundation (WERF) contribution. Only FMFCD reported monitoring costs.

Watershed Management

The Fresno area agencies did not allocate any cost to this category. This effort was captured under other programs such as Overall Stormwater Program Management.

6.3 CONFIDENCE IN THE DATA

For the Fresno-Clovis metropolitan area, confidence in the data was moderate because costs for the other agencies were taken from budgeted numbers out of the SWQMP (FMFCD, 1999). Additionally, baseline labor costs for the cities and county were less than $90,000 (Appendix D, Table D-3), which is approximately the annual cost of one person (salary and overhead). It seems unreasonable that this cost sufficiently covers the pre-existing stormwater labor cost in 1999 for these entities. The street sweeping costs provided for the city of Clovis were corroborated by the city's 2002/03 CAFR within 1 percent.

Surrounded by largely agricultural land, California's capital city is located in the central valley at the conjunction of the Sacramento and American rivers. The city of Sacramento has a population just exceeding 400,000 (www.census.gov). The stormwater program is coordinated by the Department of Utilities. Descriptive characteristics for the city of Sacramento are shown in Table 7-1. Primary personal communication was with Bill Busath from the city of Sacramento. The city of Sacramento costs for 2002/2003 were for complying with their 2002 stormwater permit (RWQCB, Central Valley, 2002b).

Table 7-1. Select Characteristics of the City of Sacramento

Description	Characteristic	Reference
Mean Income Per Person, $	18,721	www.census.gov
Area, (sq. miles)	99	www.census.gov
Population	407,018	www.census.gov
Curb Miles Swept	26,450	Table E-6
Active Construction Sites	417	Sacramento, 2003b
Industrial and Commercial Sites	N/A	N/A
Households	163,957	www.census.gov
City Actual General Fund Revenue, $	267,464,000	Sacramento, 2003a
Annual Rainfall (cm)	46	www.wrcc.dri.edu
Years Since Incorporation	154	www.cityofsacramento.org
*Reporting these numbers started in fiscal year 2004/05 (Sacramento, 2003b)		

7.1 DATA SOURCES

The following describes the information available from the data sources.

Cost Spreadsheets Submitted by City Staff

The staff provided two spreadsheets, which included cost data. One spreadsheet contained direct costs while the other contained labor costs. These spreadsheets represent the entirety of the city's stormwater costs except for the verbal estimates for street sweeping and pump station cleaning activities. The direct and labor cost spreadsheets are presented in Appendix E, Tables E-2 and E-8 respectively. The labor costs as assigned to cost survey categories are presented in Table E-7.

City of Sacramento, Stormwater Management Program, 2002/03 Annual Report

This report provided activity statistics (e.g. curb miles swept) for various city stormwater programs. These statistics were used to normalize costs to allow comparison with other cities.

Personal Communication: Interviews, Phone Calls, E-Mail

Through personal communication, city staff elaborated on what was accomplished for each cost submitted in their spreadsheet and commented on the allocation of costs among the cost survey categories. Also, verbal cost estimates for street sweeping and pump station cleaning activities were provided.

Comprehensive Annual Financial Report (CAFR) 2002/03

During the 2002/03 fiscal year, the city of Sacramento had a fund in place to account for overall stormwater related transactions. This fund is called the "Storm Drainage" fund (Sacramento, 2003a). The cost figures in this fund were used for comparison purposes with costs submitted by city stormwater staff.

City of Sacramento, Stormwater Quality Improvement Plan (SQIP) July 2003

While no cost figures were obtained from this document, it was used to verify that an activity was required for compliance with the permit.

7.2 COST DATA SUMMARY

Table 7-2 summarizes the stormwater program costs for each cost category. Figure 7-1 shows the relative distribution of costs among the categories. These cost figures include labor costs for the stormwater staff.

Table 7-2. City of Sacramento Cost Assigned to Cost Survey Categories

Cost Survey Category	Costs ($)
Construction Site Stormwater Runoff Control	261,716
Illicit Discharge Detection and Elimination (IDDE)	37,507
Industrial and Commercial Management Programs	42,318
Overall Stormwater Program Management	281,502
Pollution Prevention and Good Housekeeping for Municipal Operations	3,510,806
Post Construction Water Management in New Development and Redevelopment	38,517
Public Education, Outreach, Involvement, and Participation	361,440
Water Quality Monitoring	494,577
Watershed Management	31,591
Total	**5,059,973**

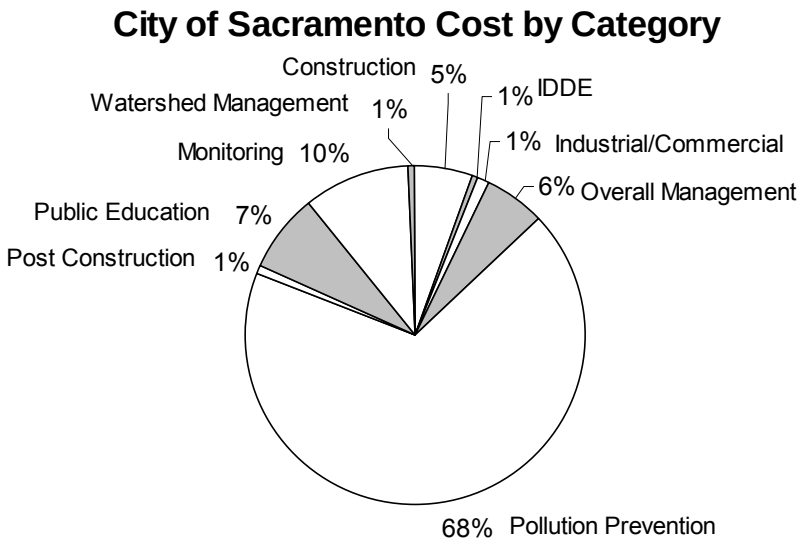

Figure 7-1. Distribution of Sacramento Stormwater Costs Among the Cost Survey Categories

7.2.1 Discussion of Costs for Each Survey Category

Cost breakdown and calculations for each survey category are found in Appendix E, Table E-1. The costs for each survey category are discussed in this section.

Construction Site Stormwater Runoff Control

The construction program cost was $261,716, which was 5 percent of overall stormwater cost. The construction program oversaw 417 active construction sites (Sacramento, 2003b) and performed 6,375 inspections. The average cost was $29 per inspection and $628 per active construction site.

Illicit Discharge Detection and Elimination

The IDDE program cost was $37,507, which was less than 1 percent of total stormwater cost. This cost is the only item attributed to this program and represents stormwater staff labor.

Industrial and Commercial Management Programs

The industrial and commercial management program cost was $42,318, which was less than 1 percent of total stormwater cost. The only cost attributable to this program was for the development of BMP handbooks and labor to do inspections.

Overall Stormwater Program Management

The overall management program cost was $281,501, which was 6 percent of total stormwater cost. Costs in this program were for office products, annual reporting, planning, mailing, CASQA fees, NPDES fee, and legal fees.

Pollution Prevention and Good Housekeeping for Municipal Operations

The municipal operations program cost was $3,510,806, which was 69 percent of total stormwater cost. The two primary activities for this category were street sweeping and pump station cleaning. The average cost was $50 per curb mile swept. Street sweeping and pump station costs are about 38 percent and 12 percent of total stormwater cost respectively. These percentages are based on the estimates provided by city staff and do not include labor cost allocated to oversee this program. Street sweeping costs were discounted because the city performed additional sweeping in their downtown area that was not permit required. This may be an unfair comparison to other permits that are vaguer about the sweeping requirements. In these programs (see Fresno-Clovis Metropolitan Area as an example), all sweeping costs were included because it was assumed that all sweeping was in compliance with the permit. The discounted amount for Sacramento's street sweeping costs was $277,252.

Post Construction Stormwater Management in New Development and Redevelopment

The post construction program cost was $38,517, which was less than 1 percent of total stormwater cost. Post construction cost was primarily for stormwater staff labor and student intern labor associated with working with developers to assure deployment of appropriate post construction BMPs. In addition, $2,500 was spent for the development of BMP handbooks.

Public Education, Outreach, Involvement, and Participation

The public education and outreach program cost was $361,440, which was 7 percent of total stormwater cost. The largest cost for this program was labor, which included both stormwater staff and student internship labor. The total labor cost was approximately 45 percent of the total public education and outreach program cost. The cost of development of integrated pest management (IPM) was about 11 percent and television and newspaper advertisements constituted 19 percent and 5 percent, respectively.

Water Quality Monitoring

The monitoring program cost was $494,577, which was 10 percent of total stormwater cost. Modeling and data analysis accounted for $131,688. Sample collection and lab cost accounted for $303,077. Stormwater staff and student labor accounted for $59,812.

Watershed Management

The cost of this category was $31,591, which was less than 1 percent of total stormwater cost. The primary cost attributed to this category was for stormwater staff labor.

7.3 CONFIDENCE IN THE DATA

For the city of Sacramento, confidence in the data was moderate. Several factors were considered in this assessment. The costs for street sweeping and pump station cleaning were estimated and represent approximately 34 percent of total stormwater program cost for the city. Since 34 percent of total stormwater cost was based on estimates, a higher level of confidence in the data could not be allowed. Secondly, the labor and direct cost data was submitted in spreadsheets built, maintained, and updated by the city staff with the labor costs being based on accounting system generated cost figures. The confidence in the data for Sacramento would be noticeably increased if 2003/04 data were considered (Busath, personal communication, 11/23/04). The city of Sacramento had a fund (Storm Drainage) set up to account for overall stormwater expenditures. Total expenditures for the Storm Drainage fund were $30,926,000[6] (City of Sacramento, 2003a), while total stormwater costs submitted by city staff were $5,046,157. This difference is attributed to the expense for flood control and conveyance work not required by the NPDES permit. Differentiation of stormwater costs in the CAFR was not possible.

[6] This figure represents the sum of operating expenses, interest expense, amortization of deferred charges, loss on disposition of fixed assets, and transfers out.

The city of Santa Clarita is a small to medium-sized city with a population of 151,088 (www.census.gov). The city lies approximately 25 miles from the Pacific coastline in the Santa Clara River watershed. The stormwater program is coordinated by the Field Services Department. Descriptive characteristics for the city of Santa Clarita are shown in Table 8-1. Primary personal communication was with Oliver Cramer and Travis Lange from the city of Santa Clarita. The city of Santa Clarita costs for 2002/2003 were for complying with their 2001 stormwater permit (RWQCB, Los Angeles, 2001).

Table 8-1. Select Characteristics of the City of Santa Clarita

Description	Characteristic	Reference
Mean Income Per Person, $	26,841	www.census.gov
Area, (sq. miles)	48	www.census.gov
Population	151,088	www.census.gov
Curb Miles Swept	46,800	Cramer, pers. comm., 4/22/04
Active Construction Sites	64	Santa Clarita, 2003b
Industrial and Commercial Sites	1,071	Santa Clarita, 2003b
Households	52,442	www.census.gov
City Actual General Fund Revenue, $	61,659,874	Santa Clarita, 2003a
Annual Rainfall (cm)[1]	33	www.wrcc.dri.edu
Years Since Incorporation	17	www.santa-clarita.com

1. Dry Canyon Reservoir rain gage was used.

8.1 DATA SOURCES

The following describes the information available from the data sources.

Los Angeles County Municipal Storm Water Permit (Order 01-182) Individual Annual Report Form, Attachment U-4

This report was the primary source of cost data for the city of Santa Clarita. The report contained labor and direct cost information for the city's stormwater program broken down into categories (Appendix F, Table F-1). The labor cost is described as "Administrative Costs" and were assigned to the Overall Stormwater Management category because the city was unable to distribute these costs among the programs. This report also provided activity statistics (e.g. curb miles swept) for various city stormwater programs. These statistics were used to normalize costs to allow comparison with other cities.

Personal Communication: Interviews, Phone Calls, E-Mail

Through personal communication, city staff elaborated on what was accomplished for each cost submitted in their spreadsheet and commented on the allocation of costs among the cost survey categories.

During the 2002/03 fiscal year, the city of Santa Clarita had a fund in place to account for overall stormwater related transactions. This fund is called the "Stormwater Utility" fund (Santa Clarita, 2003a). The cost figures in this fund were used for comparison purposes with costs submitted by city stormwater staff.

8.2 COST DATA SUMMARY

Table 8-2 summarized the stormwater program costs for each cost category. Figure 8-1 shows the relative distribution of costs among the categories. Since the city staff was unable to distribute stormwater staff labor cost among the programs, it has been captured under Overall Stormwater Program Management.

Table 8-2. City of Santa Clarita Cost Assigned to Cost Survey Categories

Cost Survey Category	Costs ($)
Construction Site Stormwater Runoff Control	74,995
Illicit Discharge Detection and Elimination (IDDE)	114,831
Industrial and Commercial Management Programs	12,600
Overall Stormwater Program Management	515,352
Pollution Prevention and Good Housekeeping for Municipal Operations	859,754
Post Construction Water Management in New Development and Redevelopment	106,925
Public Education, Outreach, Involvement, and Participation	49,130
Water Quality Monitoring	3,300
Watershed Management	332,949
Total	**2,069,836**

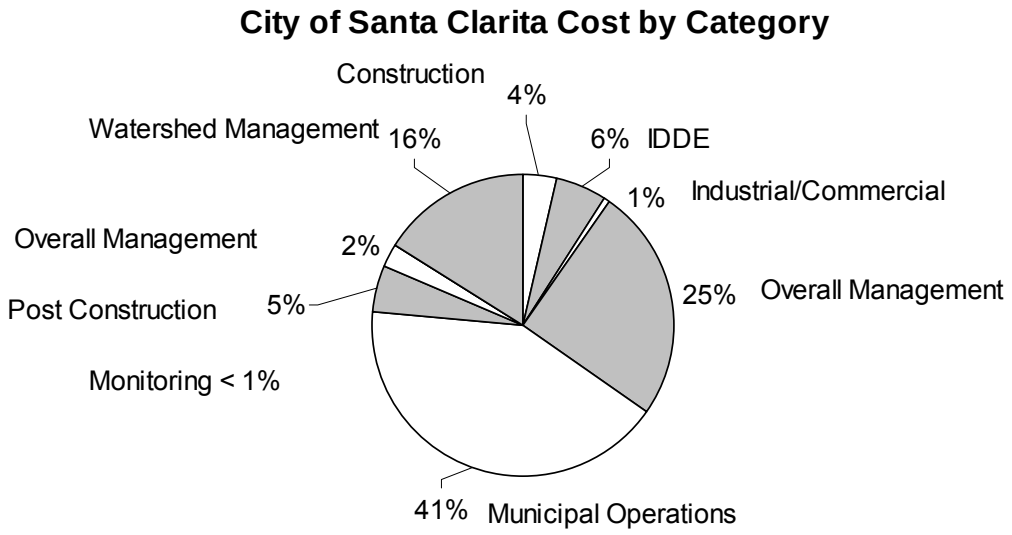

Figure 8-1. Distribution of Santa Clarita Stormwater Costs Among the Cost Survey Categories.

8.2.1 Discussion of Costs for Each Survey Category

Cost breakdown and calculations for each survey category are found in Appendix F, Table F-1. The costs for each survey category are discussed in this section.

Construction Site Stormwater Runoff Control

The construction program cost was $74,995, which was 4 percent of total stormwater cost. The construction program oversaw 64 active construction sites (City of Santa Clarita, 2003b). The average cost was $1,172 per active construction site. The city performed 11,746 inspections, but this reflects all inspections whether or not stormwater inspections were performed. Therefore, it is not appropriate to normalize against number of inspections or compare the number of inspections with other cities. (City of Santa Clarita, 2003b)

The cost of $74,995 was based on the assumption that all construction site inspections averaged a percentage of time for stormwater inspections. This was applied to the cost of all 11,746 inspections whether or not stormwater issues were addressed in all 11,746, but since an average was applied it was not necessary to eliminate non-stormwater inspections for cost estimation. The cost of $74,995 is the best estimate available for the unknown number of stormwater inspections performed in 2002/03.

The city provided an estimate of what the minimum effort might cost should stormwater inspections be performed exclusively and not more often than what is required in the permit (Cramer, personal communication, 6/24/04). Based on 64 sites, $99.21/hr for an inspector and vehicle, and 2 hrs per site including travel, the minimum cost for all inspections was calculated to be $12,699. This cost is not presented in the report, it is only presented to indicate that some cities that perform stormwater inspections concurrently with other inspections are exceeding the minimum requirements of the permit.

Illicit Discharge Detection and Elimination

The IDDE program cost was $114,831, which was 6 percent of total stormwater cost. The cost for this program was attributable to investigations. The average cost per investigation was $311.

Industrial and Commercial Management Programs

The industrial program cost was $12,600, which was less than 1 percent of total stormwater cost. The industrial program had 110 inspections at an average cost of $115 per inspection.

Overall Stormwater Program Management

The overall management program cost was $515,352, which was 25 percent of total stormwater cost. All of the stormwater staff cost was assigned to this category. The staff costs (including overhead allocation) represent approximately 85 percent of the costs assigned to this category and 21 percent of total stormwater cost. The other cost was $76,520 for development planning.

Pollution Prevention and Good Housekeeping for Municipal Operations

The municipal operations program cost was $859,754, which was 42 percent of total stormwater cost. The two primary activities for this category were street sweeping and catch basin cleaning. The average cost was $12 per curb mile swept and $170 per basin cleaning. Street sweeping cost and catch basin cleaning cost are approximately 27 percent and 12 percent of total stormwater cost respectively.

Post Construction Stormwater Management in New Development and Redevelopment

The post construction program cost was $106,925, which was 5 percent of total stormwater cost. Post construction cost was primarily for capital costs, which included purchase of vehicles for catch basin cleaning and ICID equipment (Cramer, personal communication, 6/24/04).

Public Education, Outreach, Involvement, and Participation

The public education program cost was $49,130, which was 2 percent of total stormwater cost. Public education and outreach activities often incorporated public involvement and participation activities. This made differentiating cost between the categories impractical. Because of this, the two programs were combined.

Water Quality Monitoring

The monitoring program cost was $3,300, which was less than 1 percent of total stormwater cost. The total cost of monitoring was $3,300, which was for monitoring for diazinon at a single location (Cramer, personal communication, 6/24/04).

Watershed Management

The watershed management program cost was $332,949, which was 16 percent of total stormwater cost. This cost was for the stormwater share of GIS costs.

8.3 CONFIDENCE IN THE DATA

For the city of Santa Clarita, confidence in the data was high. The cost data was found in the annual reporting forms. Through personal communication (Cramer, personal communication, 4/22/04) with city staff, a couple of adjustments to these numbers were made. These figures were later verified by accounting system reports and comparisons to the CAFR.

Since the city of Santa Clarita had a fund (Stormwater Utility) set up to account for overall stormwater expenditures, the level of confidence in the data was increased. This was because a comparison could be made between CAFR cost figures and those submitted by city staff. Total expenditures for the Stormwater Utility fund were $2,869,025, while total stormwater costs submitted by city staff in the annual reporting forms were $2,219,860. Non-stormwater compliance activities totaled $649,205, which exactly accounts for the difference. Because of this match with CAFR expenditures, the level of confidence in the data was increased.

Analysis of the cost survey results and comparisons to costs published independent of this survey are presented in this section. Backup calculations for the analysis presented in this section are in Appendix G. Costs are analyzed by aggregating costs for all cities and by comparing costs between individual cities.

Aggregate cost is the sum of all costs for all cities in this survey. Aggregating costs results in one cost number for total stormwater costs for all programs surveyed. This number is normalized by the number of households for all cities to calculate an average cost per household. Aggregate costs are broken down into each cost category in Section 9.2. Aggregate costs are presented by cost category and by whether they were enhanced, new, or existed prior to the first stormwater permit.

To take into account the size of the city when making comparisons, costs are normalized by number of households. Number of households was used to normalize costs in other studies. Households were selected because it is the most common cost factor from other studies. Quantitative analysis of cost factors that may affect cost per household are presented in Appendix G.

Section 9.4 presents a breakdown of both aggregate costs and individual city costs into the cost classifications of new, existing, and enhanced.

9.1 COST PER HOUSEHOLD

Table 9-1 presents the number of households for the cities surveyed.

Table 9-1. Number of Households for Surveyed Areas

Area	Households
City of Corona	39,271
City of Encinitas	23,843
City of Fremont	69,452
Fresno-Clovis Metropolitan Area[1]	195,311
City of Sacramento	163,957
City of Santa Clarita	52,442

1. The sum of the number of households for city of Clovis, city of Fresno, and the portion of Fresno County served by the FMFCD, which was calculated using the population of Fresno County served by the district, 65,000 (Pomaville, e-mail communication, 9/13/04), and average persons per household for the county (www.census.gov).

Normalized costs are presented in Table 9-2. Annual total cost per household ranged from $18 to $46 for the six cities. The small data set limits the statistical conclusions which may be drawn. Some anecdotal observations are presented below. These costs, ordered by the size of the city, are displayed in Figure 9-1.

The "true" mean in Table 9-2 is based on the sample of all households in the surveyed municipalities. It is calculated by dividing the total stormwater costs of all cities by the number of households of all cities in this survey. This gives a true average cost per household, while averaging the six cost per household values assigns equal weight to each city regardless of how many households are in each city.

Table 9-2. Summary of Normalized Stormwater Costs for Municipalities

Municipalities	Municipality Description	Cost/Household ($)
City of Encinitas	Coastal tourism, small city	46
City of Fremont	Bay Area, moderately integrated countywide program	45
City of Santa Clarita	Tourism and industrial	39
City of Corona	Industrial	32
City of Sacramento	Pumped stormwater, large city	29
Fresno-Clovis Metropolitan Area	65-90% infiltration, fully integrated multi-city program	18
Summary Statistics		
Mean of the six values for each city		35
Median of the six values for each city		36
Standard Deviation of the six values for each city		11
True Mean[1]		29

1. The "true" mean is the aggregate stormwater cost for all cities surveyed divided by the aggregate number of households

9.1.1 Going Beyond Minimum Requirements

In some cases, programs in the California survey appeared to go beyond the minimum requirements of the permit. The cost of this additional effort was not included when it could be identified or estimated, such as street sweeping in Sacramento that was above the permit required frequency. Including the total cost of the street sweeping program the cost per household for Sacramento would increase $1.69. In some cases the additional effort could not be estimated. This was particularly true when stormwater activities were combined with activities that occurred more frequently than the permit requirement for the stormwater activities, such as when stormwater construction inspections for Santa Clarita were performed at every construction permit inspection and these permit inspections occurred more frequently than the permit requirement.

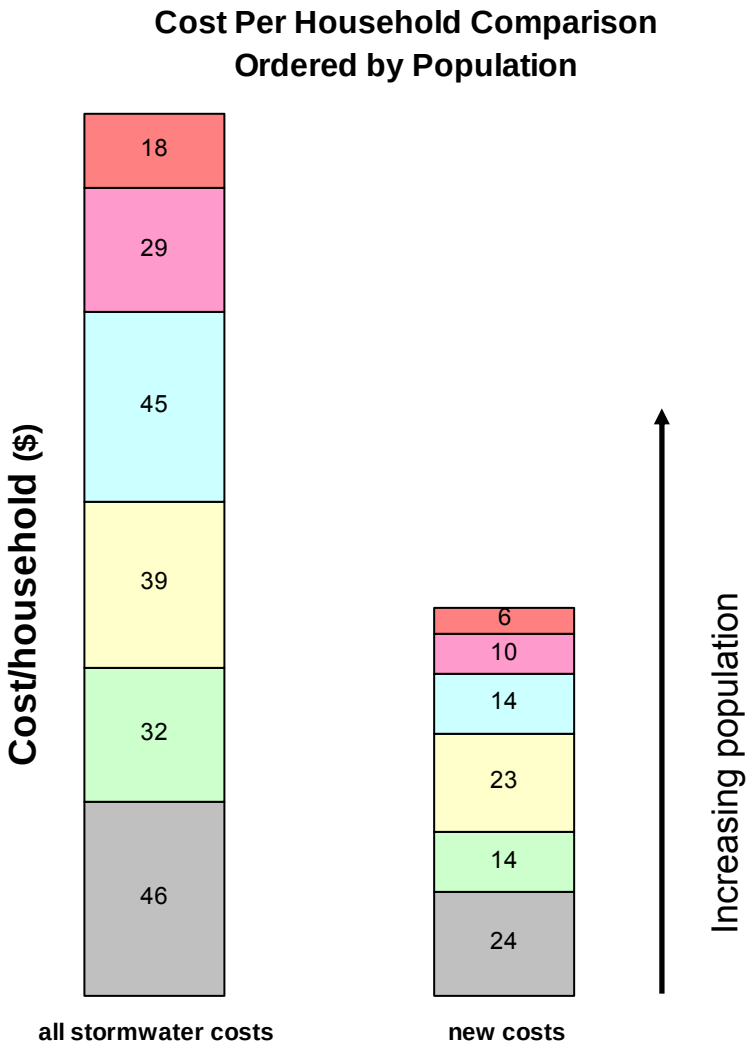

Figure 9-1. Cost per Household Comparison of Each Surveyed City.

9.1.2 Qualitative Discussion of Costs per Households

Qualitative discussion is provided here because quantitatively explaining the variation of costs per households was not successful (see Appendix G for quantitative analyses).

The FCMA had the lowest cost per household. The actual range of costs may be a smaller than what is reported in Table 9-2 because FCMA is at the bottom of this range and FCMA may not have accounted for all cost as well as other survey participants. Recall that the costs for the cities of Fresno and Clovis were based on budgeted numbers. Though the FCMA cost data collected is within the quality expectations of the study team, accounting of actual expenditures may have increased the cost for the FCMA, and decreased the range of costs found in this

survey. However, even if such increases were found, FCMA costs per household would remain substantially lower than the other cities. The following factors are thought to contribute to the FCMA costs limit costs being lower than the other survey results:

- flood control and stormwater quality basins are combined,
- land was set aside for water projects,
- climate helps infiltration due to infrequent storms and low annual rainfall,
- lower land cost compared to other cities,
- FMFCD owned land needed for basins prior to storm water permits requirements,
- topography lends to drainage of urban areas to post-construction BMPs, and
- highly permeable soils allow extensive use of infiltration.

These factors are unique or more prevalent for FCMA than for the other cities surveyed. Excluding the FCMA as an ideal situation, the range of cost is tighter, $29 to $46 per household.

As see in Table 9-2, variation in cost from the other cities is not obviously explainable by the factors of size, location, tourism, and integrated co-permittee programs. These factors are discussed in the following:

Size: Size does not seem to be important as the large cities of Fremont and Sacramento occupy opposite sides of the cost range. Further, Encinitas, population 58,014, and Fremont, population 203,413, had almost identical cost per household. The affect of size on cost per household is shown in Figure 9-1.

Location: Northern versus southern parts of the state do not seem important; however, though it may be coincidental with such a small sample size, the highest cost per household, Encinitas, was adjacent to coastal waters and the next highest, Fremont, is adjacent to South San Francisco Bay.

Tourism: A high dependence on tourism may increase visibility of stormwater problems, such as beach closures and litter. This may not be a very important cost factor because Fremont and Encinitas have very similar cost per household, and yet Encinitas seems to have a far greater reliance on tourism.

Integrated programs: An integrated program is one in which an overseeing agency establishes a common approach in implementing stormwater activities. Certainly in the case of FCMA, an integrated program seems to be an important factor. No other city surveyed had a program in which a single agency implemented a comprehensive plan for post-construction stormwater control for all permittees as did FMFCD for the FCMA. This integration may contribute to relatively low cost per household; however, on the other extreme of the cost range was Fremont, who participates in the Alameda County Clean Water Program.

Not all qualitative factors could be discussed here. Cyre (1983) reports on other qualitative factors that often affect how much a city spends on stormwater activities. Besides the factors discussed above, perceived equity, public acceptance (i.e. willingness-to-pay), and jurisdictional considerations are expected to have an influence on costs.

9.2 AGGREGATE COST BREAKDOWN BY COST CATEGORIES

The distribution of total stormwater costs among the cost categories is shown in Figure 9-2. Note that pollution prevention costs are subdivided into the percent of cost attributed to street sweeping and the percent for all other pollution prevention activities.

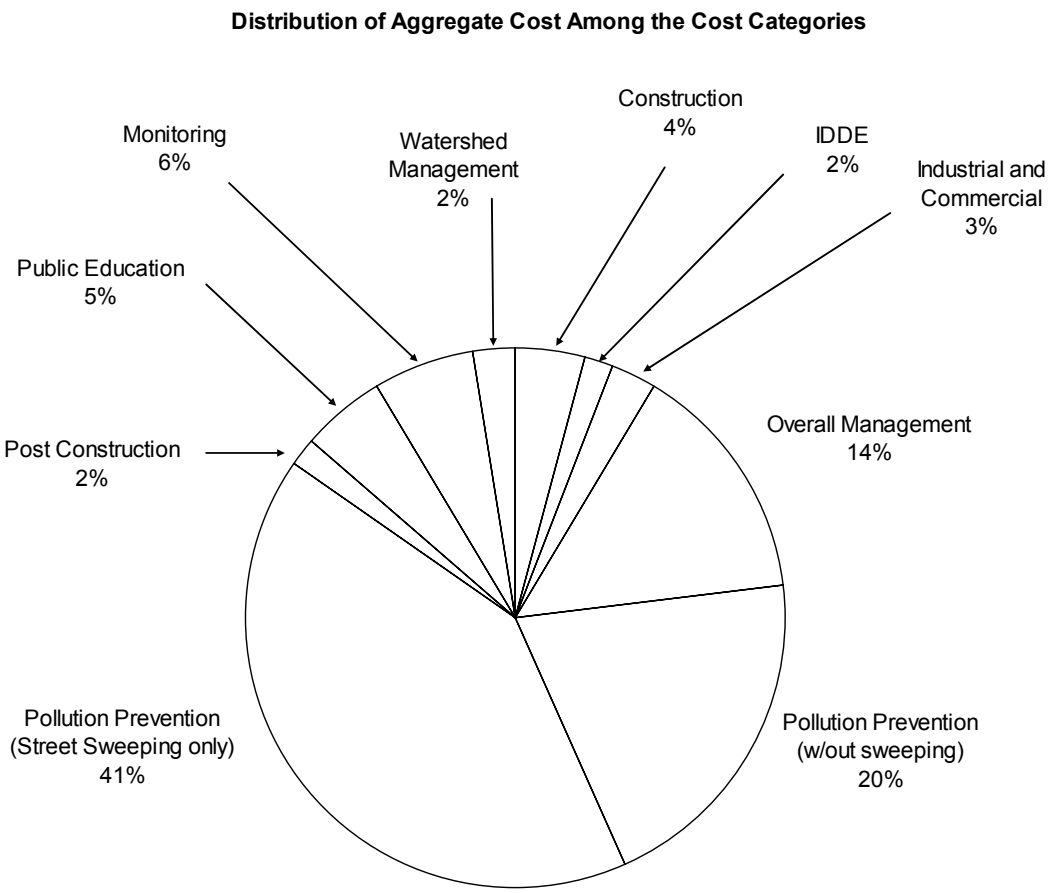

Figure 9-2. Distribution of Aggregate Costs among Cost Categories

9.3 NEW, EXISTING, AND ENHANCED COSTS

Costs for all stormwater activities were identified as new, existing, or enhanced according to the extent that the activity existed before the first stormwater permit. New costs are for activities that are exclusively a result of compliance efforts with the stormwater permit.

Understanding Enhanced Costs

Some stormwater activities preexisted stormwater permits, but permit requirements caused an increase in effort. Enhanced costs include all costs of these impacted activities, and not just the additional amount due to the increase in activities.

Existing costs are for activities that predated stormwater permits. Enhanced costs are for existing activities that were increased due to permit requirements. Street sweeping is a common example of an enhanced activity. Enhanced costs really consist of an unknown fraction of existing and new costs. In the street sweeping case, it seems that the majority, if not all street sweeping costs for some cities, preexisted stormwater permits. Other cases may be similar. Enhanced costs include street sweeping, drain and channel cleaning, and pump station cleaning. Enhanced costs are the total costs for the impacted activities, and not just the increase in cost. Table 9-3 shows the percentage of stormwater costs attributed to new, existing, and enhanced for each city. The distribution of aggregate cost among these classifications is shown in Figure 9-3.

Distribution of Aggregate Cost Between New, Enhanced, and Existing Costs

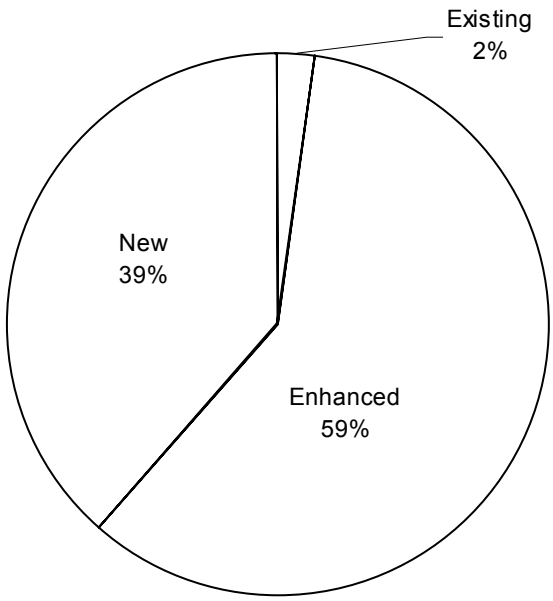

New , Enhanced, and Existing are determined by w hether the cost existed prior to the first stormw ater permit. Enhanced cost existed, but permit requirements caused an increase in cost. Enhanced costs are the total cost for the impacted activities, and not just the increase in cost.

Figure 9-3. Breakdown of Aggregate Costs into New, Existing, and Enhanced Costs

It was proposed in meetings of the TAG that cities with utility fees for stormwater may be less likely to have a high percentage of enhanced costs. This was not observed in the cities surveyed. In fact, cities with a stormwater fee happen to have a larger percentage of ‘enhanced’ costs, but the observation is not conclusive due to limited sample size. This observation is shown in Table 9-3.

Table 9-3. New, Existing, and Enhanced Cost for Each City

Municipality or Area	Existing	% Ex.	Enhanced	% En.	New	% New	Total	Utility Fee
City of Corona	37,651	3%	651,850	52%	561,365	45%	1,250,866	no
City of Encinitas	16,250	1%	490,786	45%	580,002	53%	1,087,038	no
City of Fremont	200,000	6%	1,915,836	62%	985,605	32%	3,101,442	yes
Fresno-Clovis Area	57,539	2%	2,211,196	63%	1,206,295	35%	3,475,029	yes
City of Sacramento	0	0%	3,257,674	68%	1,562,299	32%	4,819,973	yes
City of Santa Clarita	50,403	2%	809,351	39%	1,210,082	59%	2,069,836	yes
Total	**361,842**		**9,336,694**		**6,105,648**		**15,804,184**	

All the enhanced cost activities are under the Pollution Prevention cost category. Of the 59 percent of aggregate cost attributable to enhanced costs, 70 percent was for street sweeping. Figure 9-4 shows the distribution of enhanced cost among the pollution prevention activities.

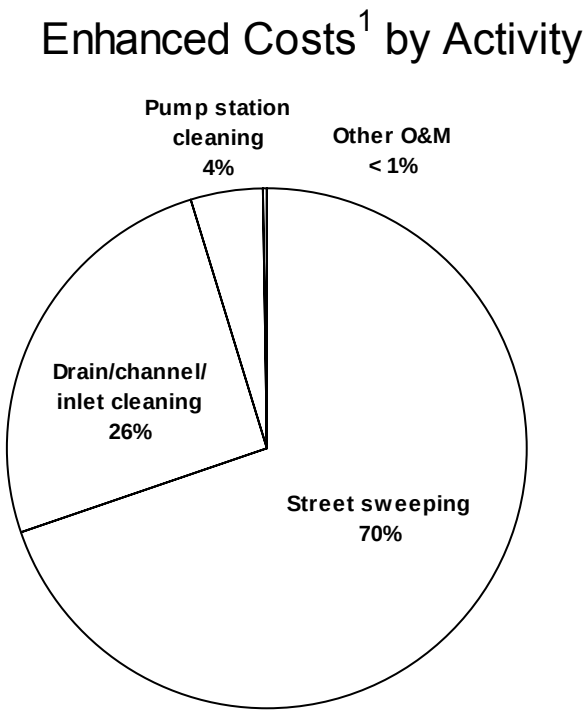

1. Enhanced costs, which is 58% of all costs, has an unknown breakdown between new and exisiting costs

Figure 9-4. Breakdown of Enhanced Costs by Stormwater Activity

Existing costs, while only two percent of all cost, are mostly pollution prevention costs as seen in Figure 9-5. A single activity for one city, litter and debris removal for the city of Encinitas, accounts for 66 percent of the existing pollution prevention cost for all cities.

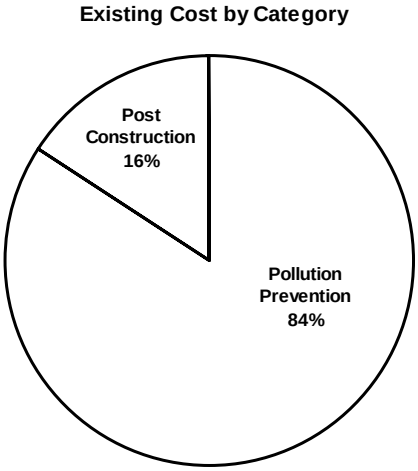

Figure 9-5. Breakdown of Existing Costs by Cost Category

New costs include cost from all categories. One hundred percent of all categories under "new" were identified as new cost, except for post construction and pollution prevention. Figure 9-6 shows the distribution of new costs among the cost categories.

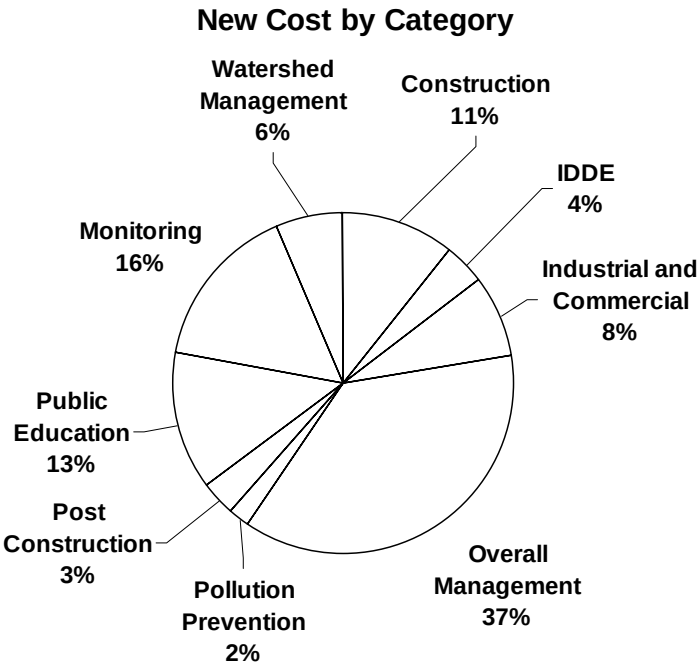

Figure 9-6. Breakdown of New Costs by Cost Category

The distribution, among new, existing, and enhanced, of aggregate cost for all cost categories is shown in Table 9-4. Figure 9-7 shows average cost per household for all stormwater costs and for only new stormwater costs.

Table 9-4. Distribution of Aggregate Cost Category between New, Existing, and Enhanced Classifications[1]

	% New	% Existing	% Enhanced[2]
Construction	100%	0%	0%
IDDE	100%	0%	0%
Industrial and Commercial	100%	0%	0%
Overall Management	100%	0%	0%
Pollution Prevention	1%	3%	96%
Post Construction	78%	22%	0%
Public Education	100%	0%	0%
Monitoring	100%	0%	0%
Watershed Management	100%	0%	0%

1. New, Enhanced, and Existing are determined by whether the cost existed prior to the first stormwater permit. Enhanced cost existed, but permit requirements caused an increase in cost.
2. Enhanced costs are the total cost for the impacted activities, and not just the increase in cost and as such, enhanced costs are made of unknown distribution between new and existing costs.

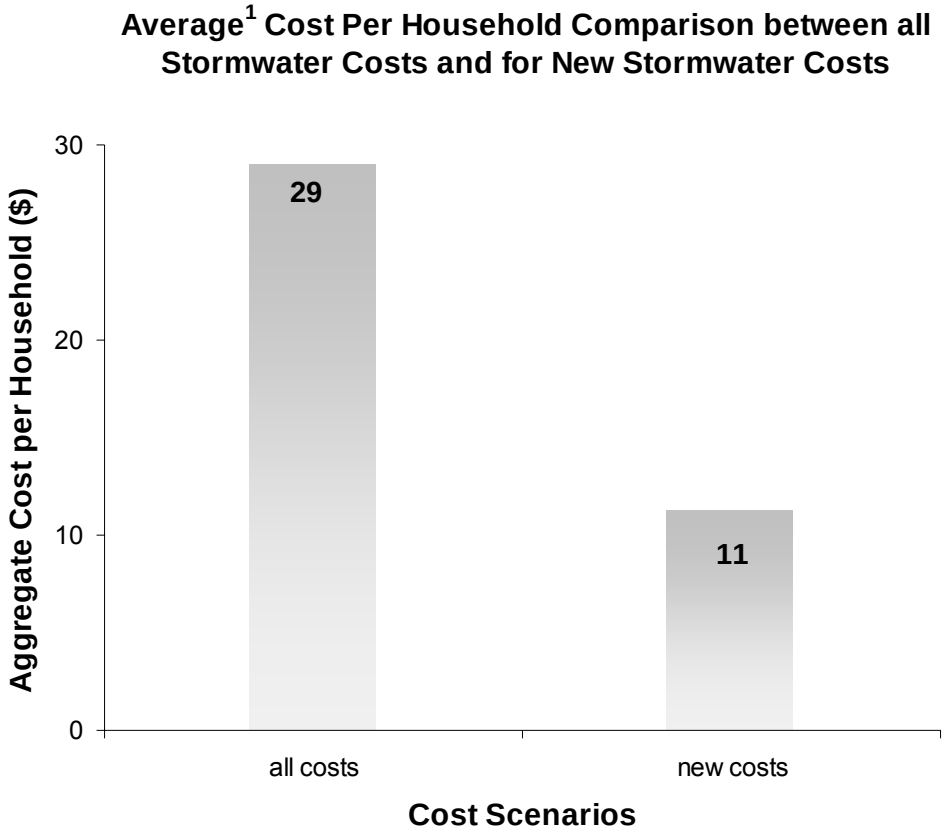

1. Average cost per household is the aggregate cost divided by the aggregate number of households.

Figure 9-7. Comparison of Aggregate Cost per Household for All Costs and for New Costs

9.4 DISCUSSION OF STORMWATER COSTS FOR SELECTED COST CATEGORIES

Noteworthy observations of costs for select categories are presented in this section. Only a qualitative discussion is warranted due to insufficient data.

Overall Stormwater Management: This category included legal fees. Appellant fees are excluded, but legal advice on program implementation and response to citizen suits are included. It is assumed that if legal fees are incurred, it is a cost of running a stormwater program. Legal costs were always less than 18 percent of the total cost of this category.

Pollution Prevention: Street sweeping accounts for 68 percent of the cost of this category as seen in Figure 9-8. The unit cost of street sweeping was a commonly asked question during TAG reviews. A summary of street sweeping statistics is presented in Table 9-5. No explanation was identified for the variation in street sweeping costs, though it does not exceed the estimated cost

from the Rouge River study (see Section 9-6 for comparisons). One suggestion not observed in the data is that frequency has an effect on unit cost because more frequent sweeping increase cost efficiency. Table 9-5 shows unit cost of street sweeping and approximate frequency sorted by unit cost. Clearly, differences in street sweeping practices, such as sweeper speed, will affect costs.

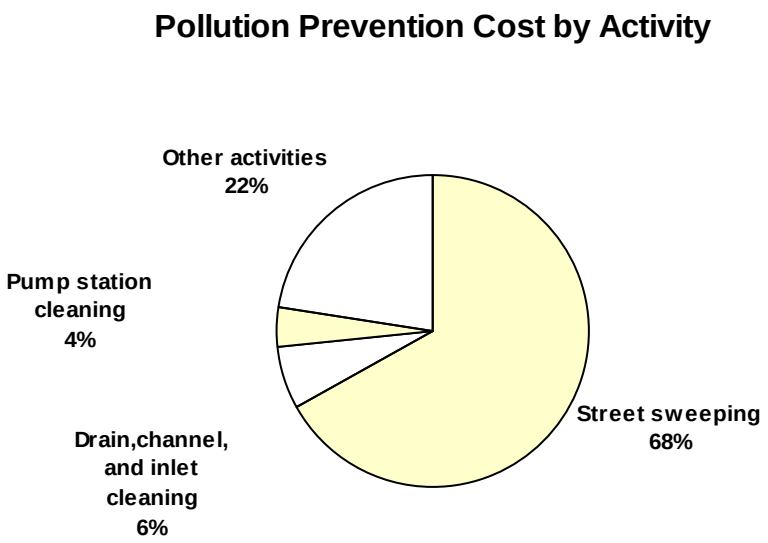

Figure 9-8. Breakdown of Pollution Prevention Costs by Activity.

Table 9-5. Street Sweeping Statistics for Municipalities

Municipality	Street Sweeping Costs ($)	Annual Curb Miles Swept	Cost Per Curb Mile Swept ($/curb mile)	Estimated Annual Frequency[2]
Fremont	1,915,000	31,405	61	12
Sacramento	1,322,748	26,450	50	12
Encinitas	117,962	5,832	20	12
Corona	414,215	20,877	20	26
Fresno-Clovis Area[1]	2,193,296	142,411	15	12
Santa Clarita	557,443	46,800	12	50

1. A breakdown of costs and number of miles swept for the cities of Fresno and Clovis can be found in Appendix Table D-5. Frequency for the city of Fresno was found at http://www.fresno.gov/public_utilities/sanitation/cleanup_street_clean.asp.
2. When an average frequency was not available, frequency was taken as the frequency for residential areas.

Post Construction: Post Construction costs are expected to increase dramatically as cities move into full implementation of SUSMP type requirements for new development and redevelopment.

The reported costs are particularly misleading for cost projection purposes since the research coincides with the start of SUSMP type requirements implementation.

9.5 LIMITATIONS

The information presented is anecdotal. It should not be used to establish a measure of compliance because of the lack of quantitative explanations for the observed variability in cost per household.

9.6 COMPARISONS TO OTHER STUDIES AND SURVEYS

The normalized costs from this cost survey were compared to outside literature (e.g. studies, professional papers, conference proceedings, etc.). Other cost sources include, the NAFSMA survey of Phase II costs, the USEPA review of cost submitted in Phase I permits, the Rouge River National Wet Weather Demonstration Project, street sweeping costs for the city of San Antonio, and projected cost (based on actual expenditures) for the city of Los Angeles. It is important to recognize that the study team did not establish the quality of this other data. However, in some cases literature data could be excluded based on the available information. For example, flow conveyance costs were not included in the California survey; but in some cases they were reported as stormwater costs in other studies, such as the Black and Veach "stormwater utility" survey (2002). This could be because stormwater cost estimates are used to develop a single fee that is used to fund both conveyance and NPDES permit compliance activities.

9.6.1 Current Los Angeles Cost Estimate

Staff of the Los Angeles Regional Water Quality Control Board estimated the cost to comply with the Los Angeles County municipal storm water permit. Using the estimation method believed to be most reliable, Radulescu and Swamikannu (2003) estimated cost per household to be $18. It does not appear that stormwater conveyance costs were included in these costs.

9.6.2 National Association of Flood and Stormwater Management Agencies (NAFSMA) Survey

The USEPA report "Economic Analysis of the Final Phase II Stormwater Rule" contains a summary of costs from two separate efforts to estimate Phase II cost per household. The first is the results of a survey stormwater costs for 56 Phase II municipalities performed by NAFSMA. The NAFSMA survey of five cost measures represents the six minimum measures of the Phase II regulations because two measures seemed to have been combined: 1) Public Education and Outreach and 2) Public Involvement and Participation.

The second effort presented in the USEPA report is that of a review, performed by USEPA, of 26 Phase I municipalities. These 26 municipalities were chosen they were relatively small Phase

I cities, they were nearly in the first permit term, and they had cost published in their annual reports.

The California survey results for the same five minimum measures were extracted to compare to the NAFSMA survey and the EPA review in Table 9-6. The costs were adjusted to 2003 dollars using the Consumer Price Index Urban (U.S. Bureau of Labor Statistics, 2005).

Table 9-6. Stormwater Costs per Household for Six[1] Minimum Measures from the California Survey, the NAFSMA[2] Phase II Survey, and the USEPA review of Phase I Annual Reports (USEPA, 1999)

Study	Median (50%) ($)	Mean ($)	Max ($)
Adjusted California Survey[3]	24	26	35
NAFSMA Phase II Survey[4]	4.63	10	61
EPA Phase I Survey[5]	3.16	10	67

1. Public Education and Outreach and Public Involvement and Participation were assumed combined for the NAFSMA survey.
2. NAFSMA: National Association of Flood and Stormwater Management Agencies
3. Based only on costs from cost categories that correspond to the six minimum measures
4. NAFSMA survey based on 56 Phase II respondents to a survey on stormwater costs for five minimum measures. Values adjusted to 2003 dollars.
5. EPA results based on a review of 26 annual reports for smaller Phase I cities that were nearly in their first NPDES term so that costs would be more representative of Phase II programs. Values adjusted to 2003 dollars.

9.6.3 Rouge River National Wet Weather Demonstration Project (Furguson, 1997)[7]

This study collected cost information for stormwater runoff controls. Total stormwater costs for municipalities in the Rouge River project were not reported. Costs were available for municipal operations and for public education. These costs are not presented here because further information is needed to indicate how the California cities compare to the Rouge River programs. First, municipal operations often include flood conveyance costs and without further information, cost comparisons are not appropriate. Second, without knowing the total stormwater cost of these cities, comparison to individual programs are not presented because cities may focus on different stormwater programs (different cost categories) based on local concerns. This may be especially true of public education costs.

Costs were also available for street sweeping. The Plymouth Township street sweeping costs were reported at $78/curb mile. This number can be compared to the range of cost per curb mile in the California survey, which was $12 to $61 per curb mile. Also, the reported cost range for contracted street sweeping costs for the Rouge River project was from $149 to $172 per curb mile. It was not investigated why contracted street sweeping is so much higher.

[7] All Rouge River costs were presented in 1997 dollars and these were converted to 2003 dollars.

9.6.4 San Antonio Street Sweeping Costs

The city of San Antonio is reported to spend $3.5 million on street sweeping (Brazozowski, 2004). The city of San Antonio estimates that around 45,000 curb miles were swept (Martinez, 2004). This results in a cost per mile swept of $78. The highest cost per mile from the California survey was $61, indicating costs per mile from the survey are reasonable despite a wide range.

This section discusses the significance of cost survey results and suggests standards for reporting cost and activities performed. These suggestions are meant to build the dataset necessary to make management decisions on stormwater program implementation.

10.1 SIGNIFICANCE OF SURVEYED STORMWATER COSTS IN CALIFORNIA

The range of 2002/03 fiscal year stormwater costs for the six municipal areas[8] surveyed was $18 to $46 per household. This only provides a snap shot of costs in 2002/2003 of good California Stormwater programs. Costs will change as requirements change with each new permit.

A specific example of increasing permit requirements is TMDL compliance. TMDL costs are sometimes addressed within the implementation plans or the cost to achieve water quality objectives may already be addressed in 305 (b) reports[9]. Since TMDL requirements will be added to stormwater permits, these cost estimates are an indication of how permit compliance costs will be increasing. However, TMDL allocations may be distributed to a variety of sources besides stormwater, thus stormwater treatment will not bear the entire burden of restoring beneficial use to impaired waters.

Another factor affecting cost in the near term is the increased level of attention given to Standard Urban Stormwater Mitigation Plans (SUSMPs). Post-construction costs in particular are expected to increase significantly, but that cost may be borne by developers and contractors rather than municipalities.

Although compliance with construction and industrial permits is discussed in stormwater permits, the costs for municipalities to comply with these permits are not addressed in this report.

10.2 SUGGESTIONS FOR REPORTING COSTS AND ACCOMPLISHMENTS

Current variability in the organization and content of the data submitted by the cities indicates standards for reporting costs and stormwater activities are needed to allow accurate cost comparisons to be made between stormwater activities. This cost information is crucial in making management decisions regarding which stormwater activities should be implemented.

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[8] The Fresno-Clovis Metropolitan Area includes the stormwater costs of the cities of Fresno and Clovis.

[9] Even if TMDL plans do not address cost, Section 305 (b) states "each State shall prepare and submit….a report which shall include…an estimate of the environmental impact, the economic and social costs necessary to achieve the objective of this chapter in such State, including an estimate of the costs of implementing such programs". First, assuming all 303 (d) listed waters are a subset of 305 (b) waters, it could be assumed that the CWA requires a cost analysis for TMDL implementation plans (which is interpreted as "each State shall prepare…". Otherwise it seems to be required in the State's "305(b) report". Either way, analysis of the cost to restore water quality may be an ongoing requirement.

The following recommendations for cost reporting are only the first step in the process of developing consistent cost reporting. This process includes notifying cities of reporting goals, receiving feedback and data from the cities, reviewing reported costs for quality and consistency, and providing feedback to the cities.

10.2.1 Current Variability

In this survey, there seemed be inconsistent reporting and tracking of stormwater activities and associated costs. This could be from differences in the reporting requirements for each permit. The reasons for these differences were not investigated; however, some possibilities are discussed. One reason may be that interest in cost may vary between RWQCB jurisdictions. Also, cost tracking systems used by the cities may not be designed to accurately track stormwater costs by activity. According to a survey conducted in 2001-2002, only 50 percent of 122 surveyed stormwater utilities said that their accounting system permitted cost tracking by operating activity (e.g. inlet cleaning) (Black and Veatch, 2002). Also, Radulescu and Swamikannu (2003) note that current governmental accounting standards do not require a distinction of stormwater costs. This was confirmed by a review of these standards by the study team.

10.2.2 Proposed Data Tracking and Reporting

A separate fund to account for stormwater related expenditures would provide cities with a starting point for stormwater cost collection. Cities would be able to use this fund for stormwater related expenditures needed for annual stormwater report preparation. It is important that the fund distinguish between stormwater permit compliance costs and stormwater conveyance costs. Having a fund in place also means that the costs reported in the fund would be subject to independent audit on a yearly basis, which would increase the level of confidence in reported cost figures. Stormwater costs should be further broken down into stormwater programs.

Caution for Template Reporting Requirements

Some of the templates used in annual reports reviewed during the survey had yes/no questions for stormwater activities that discouraged quantification of accomplishments.

For all programs, there are several costs that should be tracked for each cost category discussed below. The cost for labor of stormwater staff and benefits should be tracked for each program or allocated to each program on a reasonable basis. Direct costs (e.g. phone, field and office supplies, etc.) and depreciation costs (e.g. vehicles and equipment) should also be tracked for each program. Finally, overhead allocation for the entire stormwater program should be distributed to each cost category. Overhead allocation is often estimated by the cities as a straight percentage of labor cost and includes building fees, payroll, human resources, legal, administration, and other costs that provide ancillary support for stormwater activities.

As with costs, accomplishments should be tracked to support stormwater management decisions. The ultimate goal is to be able to compare cost benefit between stormwater programs and

activities[10]. Reporting accomplishments in terms of receiving water quality benefit is ideal, but currently unrealistic.

Suggested cost categories and what activities they cover are discussed in the following sections.

Construction Site Stormwater Runoff Control

Stormwater permits require cities to implement construction programs that minimize the negative impacts of construction on MS4 stormwater quality. This is commonly accomplished by establishing city ordinances that give the city the legal authority to implement to program. This is a parallel and separate effort from the statewide construction permit issued by the SWRCB. The construction program assists contractors and developers in following appropriate USEPA guidelines for construction sites. Cities accomplish this by instituting ordinances, inspecting sites and providing training to contractors and city inspectors. The USEPA activities that apply to construction sites are divided into four different categories: runoff control, sediment control, erosion control, and good housekeeping. Runoff control activities include minimizing clearing, stabilizing drainage ways, and installing check dams, berms, grass-lined channels, and riprap. The sediment control category includes installing perimeter controls, installing sediment trapping devices, installing drain inlet protection. Erosion control activities include stabilizing exposed soils, permanent seeding, installing sod, soil roughening, protecting steep slopes, geotextiles, gradient terraces, soil retention, temporary slope drain, protecting waterways, temporary stream crossings, vegetated buffers, phase construction, construction sequencing, and dust control (USEPA, 2004).

Cost of stormwater inspections at construction sites, the number of inspections performed, and the number of active construction sites should be tracked. Only inspections should be tracked when stormwater issues are being addressed by a part of the inspection. It is suspected that some building inspectors still count inspections toward stormwater for latter phases of projects, such as interior building work, that has little impact on stormwater. This should be avoided.

Cost of training provided to inspectors and contractors should be tracked, including the cost for the participating inspectors to attend the training. The number of person-hours trained should be tracked for stormwater staff inspectors because the city must pay for each city staff member attending training. For contractor training, the number of training hours provided (regardless of group size) should be reported because the cities do not pay for the contractors to attend as they do for city staff.

Illicit Discharge Detection and Elimination

The IDDE program seeks to identify and eliminate illicit discharges to the storm sewer system. This is done by inspecting connections to the storm sewer system and requiring landowners to remediate illegal discharges. Common IDDE problems include failing septic systems,

[10] A subcommittee of the California Stormwater Quality Association (CASQA) is working on developing guidelines for program effectiveness evaluation.

industrial/business connections, recreational sewage, and sanitary sewer overflows. Costs relating to the activities of identifying illicit connections, wastewater connections to the storm drain system, and illegal dumping should be reported in this category (USEPA, 2004).

For the IDDE program, the cost of inspections for illicit connections and discharges to the stormwater drainage system and the number of inspections should be tracked. Like construction, it is difficult to account for stormwater costs because many activities performed by inspectors serve other purposes, such as inspection of the sanitary sewer system.

Cost of training provided to inspectors should be tracked, including the cost for the participating inspectors to attend the training. The number of person-hours trained should be tracked for stormwater staff inspectors in order to effectively allocate overhead cost.

Industrial and Commercial Management Programs

Similar to the construction program, the industrial and commercial program uses the development and enforcement of city ordinances to minimize pollution of MS4 stormwater. Examples of practices employed by facilities include good housekeeping such as covered material storage, emergency spill equipment, facility sweeping, no “hosing off” into storm drains, and secondary containment of industrial materials.

For the industrial and commercial program, the cost of inspections should be tracked as well as the number of industrial and commercial facilities. Also, the cost of training provided to inspectors should be tracked, including the cost for the participating inspectors to attend the training. The number of person-hours trained should be tracked for stormwater staff inspectors.

Overall Stormwater Program Management

The costs in this category are for stormwater staff costs that could not be allocated to the other cost categories. It includes costs associated with development and oversight of the entire stormwater program. Also, costs for management plans, NPDES fees, reporting, mail, legal support, travel, conferences, printing, producing manuals and handbooks, and other non-labor costs are included that could not be allocated. Normalization for this category is not practical because of the wide variety of activities, and because very few of these activities can be numerically quantified.

Pollution Prevention and Good Housekeeping for Municipal Operations

This program includes costs for source control activities relating to pet waste collection, automobile maintenance, vehicle washing, illegal dumping control, landscaping and lawn care, pest control, parking lot and street cleaning, roadway and bridge maintenance, septic system controls, storm drain system cleaning, and alternative discharge options for chlorinated water. Costs for materials management would be for alternative products, hazardous materials storage, road salt application and storage, spill response and prevention, used oil recycling, and materials management (USEPA, 2004).

For this program, the cost for street sweeping and the number of curb miles swept should be tracked. Also, the cost for drain line and channel cleaning, pump station cleaning, and similar activities along with their associated activity statistics (e.g. lbs. of debris removed) should be tracked.

Post Construction Stormwater Management in New Development and Redevelopment

This program assures that private developers implement post-construction BMPs (treatment BMPs[11] and permanent source control BMPs). This program also includes maintenance of post-construction BMPs on city-owned property. This cost is included, because unlike the construction and industrial programs, post-construction requirements are not regulated by a separate permit.

Treatment BMPs include ponds, dry extended detention ponds, wet ponds, infiltrations practices, basins, trenches, porous pavement, filtration practices, bio-retention, sand and organic filters, vegetative practices, stormwater wetland, grassed swales and filter strips, runoff pretreatment practices, catch basins and inserts, in-line storage, and manufactured products for stormwater inlets. Source control[12] or source reduction BMPs include the following activities: experimental practices, alum injection, on-lot treatment, better site design, buffer zones, open space design, urban forestry, conservation easements, infrastructure planning, narrower residential streets, eliminating curbs and gutters, green parking, alternative turnarounds and pavers, BMP inspection and maintenance, ordinances for post construction runoff, and zoning (USEPA, 2004). If the city performs these activities in-house, the costs should be included in this category.

Public Education, Outreach, Involvement, and Participation

Education and outreach to homeowners would cover topics such as lawn and garden care, water conservation practices, pet waste, trash management, and proper disposal of hazardous waste. General outreach would include outreach relating to commercial activities, tailoring outreach programs to minority and disadvantaged communities and children, classroom education, and educational materials. Outreach relating to new development and existing development would include low impact development, educational displays, pamphlets, booklets, and utility stuffers, media, promotional giveaways, and pollution prevention for businesses. Relating to public involvement and participation, activities would include storm drain marking, stream cleanup and monitoring, volunteer monitoring, reforestation programs, wetland plantings, adopt-a-stream programs, watershed organization, stakeholder meetings, attitude surveys, and community hotlines (USEPA, 2004).

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[11] Treatment BMPs have been called structural BMPs, but the term 'treatment BMP' is preferred since source control BMPs often have structural components.

[12] The USEPA defines these as "nonstructural", but some source controls such as berms and material covers and many erosion controls are structural so the term source control or source reduction is used in this report.

It is unclear at this time of the utility of tracking specific costs of this program and how they may be related to water quality improvements.

Water Quality Monitoring

The program tracks costs related to monitoring or both stormwater and receiving water quality. These costs cover preparation of monitoring plans, sample collection, sampling equipment, laboratory analysis, data analysis, and reporting.

Watershed Management

This program can be used to track cost for watershed meetings, meeting with stakeholders, and development of watershed management plans. It may also be an appropriate category for coordination costs for TMDL planning.

Conclusion on Category Recommendations

It may prove that costs cannot be reported as suggested. Flexibility in compliance is an important aspect to cost effectiveness, however, too much flexibility in reporting requirements generates a useless dataset. At a minimum, it is suggested that annual reports throughout the state follow a standard format for cost reporting, whether the one suggested here is followed or not.

10.3 TAG RECOMMENDATIONS FOR COST TRACKING

The TAG proposes that if the permittees have a correct cost accounting/reporting system, they would be granted an additional quantity of points towards their receipt of a grant under a state/federal program; for example, Section 319(h) grants are evaluated on a point ranking system that is established by a state. If the cost accounting/reporting information were tabulated pursuant to the state's suggested format, that applicant would receive a bonus allotment equal to a boost in total points of approximately 15 percent. This would alert permittees to the benefit in competing for these grants as a prerequisite to establishing the appropriate cost accounting system. The proposed system would benefit from review and acceptance by the California League of Cities.

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USEPA. 2004. "National Menu of Best Management Practices for Stormwater Phase II" http://cfpub.epa.gov/npdes/stormwater/menuofbmps/menu.cfm (20 December 2004)

ACCWP: Alameda Countywide Clean Water Program

BMP: best management practice[13]

CAFR: Comprehensive Annual Financial Report

CASQA: California Stormwater Quality Association

CFR: Code of Federal Regulations

CPR: Coalition for Practical Regulation

CSUF: California State University, Fresno

CSUS: California State University, Sacramento

CWA: Clean Water Act

DAMP: Drainage Area Master Plan

FCMA: Fresno-Clovis Metropolitan Area

FMFCD: Fresno Metropolitan Flood Control District

GIS: Geographic Information System

IDDE: Illicit Discharge Detection and Elimination

IPM: integrated pest management

JURMP: Jurisdictional Urban Runoff Management Program

LAFCD: Los Angeles Flood Control District

LARWQCB: Los Angeles Regional Water Quality Control Board

MEP: maximum extent practicable

MS4: Municipal Separate Storm Sewer System

NAFSMA: National Association of Flood and Stormwater Management Agencies

NPDES: National Pollutant Discharge Elimination System

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[13] BMP, as used in this report, refers to conventional BMPs that operate without power or operators. It does not include advanced treatment.

OWP: Office of Water Programs

RWQCB: Regional Water Quality Control Board

SAR-DAMP: Santa Ana Regional Drainage Area Management Plan

SQIP: Stormwater Quality Improvement Plan

SUSMP: Standard Urban Storm Water Mitigation Plan

SWMP: Storm Water Management Plan

SWPPP: Storm Water Pollution Prevention Plan

SWRCB: State Water Resource Control Board

TAG: technical advisory group

TMDL: total maximum daily load

UCLA: University of California, Los Angeles

USC: University of Southern California

USD: Union Sanitation District

USEPA: United States Environmental Protection Agency

WERF: Water Environment Research Foundation

The backup calculations for the cost for each cost survey category in Section 3 and the sources of the cost data are presented in this appendix. Tables generally are presented by sequentially increasing levels of detail. Figure A-1 illustrates how data is shared throughout the tables.

Table A-1 contains all costs organized into the various standard cost survey categories. The subtotals for each cost category are also presented in Section 3, Table 3-2. The remaining tables (A-2 through A-12) present the detailed back-up information for the numbers in Table A-1. Table A-1 is linked to the back-up tables by the table and item numbers in the 'Source' column. Most of the cost information provided by city staff is listed in Table A-2. Item numbers corresponding to the subtotals in Table A-2 were added to the left hand column to easily show how the numbers are pulled forward to Table A-1. The right hand column in Table A-2 was added to show how costs were allocated to the cost survey categories. Table A-1 entries that were not taken directly from Table A-2 are found in Tables A-3 through A-12.

Table A-1 also provides statistics describing the level of effort for certain activities by numerically representing what or how much was accomplished. References are provided within Table A-1 for the activity statistics. Where relevant statistics are available, normalized costs are calculated in Table A-1. Normalized costs are calculated by dividing the cost of the category or activity by the activity statistic.

For the city of Corona, labor costs of the stormwater staff are not distributed among the cost survey categories. Instead, it is all captured under Overall Stormwater Program Management. Thus, comparing costs with other municipalities where such costs are distributed, Corona's Overall Stormwater Management Program costs will be higher.

Detailed descriptions of how the costs were developed are contained in the following paragraphs.

Construction Site Stormwater Runoff Control

The total cost of this category was $53,382. The costs of the construction runoff control category include labor and vehicle usage expenses for inspections and meetings, vehicle usage expense for stormwater staff for follow-up visits, training stormwater staff for construction, and phone costs by stormwater staff. The labor and vehicle cost for inspections was taken directly from Table A-2. These inspections were performed by the Inspection Division of the Public Works Department (Michele Colbert, personal communication, city of Corona, 3/12/04).

The construction site inspectors also had weekly meetings that covered stormwater issues. City staff estimated that an average of 10 minutes per meeting were spent covering stormwater issues (Michele Colbert, pers. comm., 3/12/04). Table A-8 calculates the cost associated with covering stormwater issues in these meetings, assuming 50 meetings per year.

Follow-up visits for coordination and advisement were performed by the stormwater staff. As mentioned before, these labor costs are not allocated to the construction category because it was

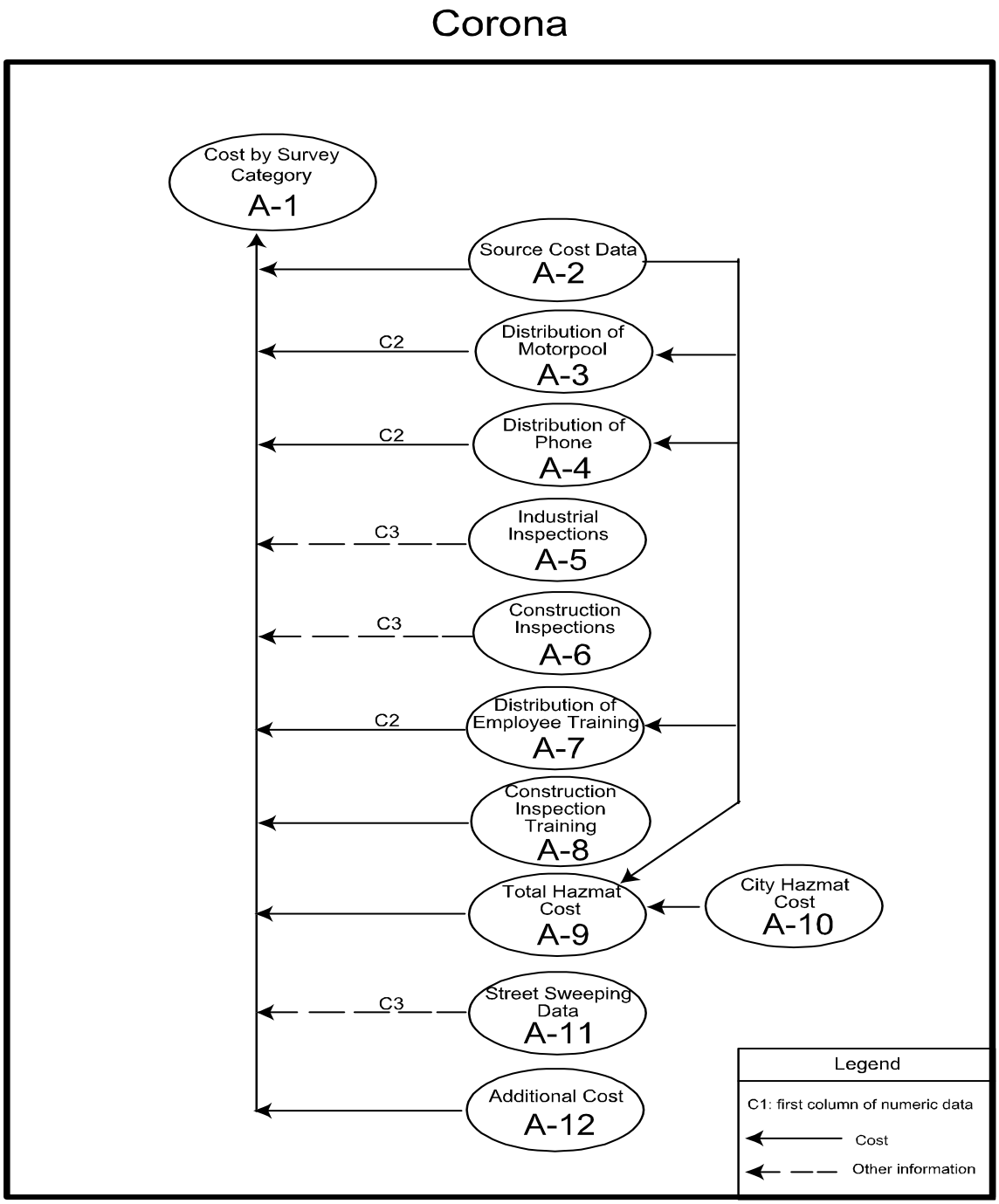

Figure A-1. Corona Flowchart of Cost Tables

difficult for city staff to estimate the distribution of stormwater staff time to the various categories. The allocation of vehicle usage by stormwater staff was estimated by percentages provided by city staff (Michele Colbert, pers. comm., 3/12/04). This information was used in Table A-3 in conjunction with the total cost in Table A-2 to estimate the cost of the vehicle for the construction category. Likewise, the phone charges used on these visits were allocated to construction in Table A-4.

The city of Corona incurred employee training costs (item 26, Table A-2) that had a portion allocated to the construction category in Table A-7 according to percentages provided by city staff (Michele Colbert, pers. comm., 3/12/04).

City staff provided information regarding construction site inspections, which were summarized in Table A-6. Total inspections were calculated in Table A-6 to be 564. The overall normalized cost, calculated by dividing the total cost of the category by the number of inspections is $95/inspection.

Illicit Discharge Detection and Elimination (IDDE)

The total cost of this category was $20,628. The IDDE program was implemented by the source control division and public works inspection division of the city of Corona. The costs attributed to this category were for the stormwater share of inspections performed by source control staff and inspection staff for other illicit connections at industrial, commercial, and new development sites (Table A-2). The source control inspection cost was developed by estimating how much time inspectors took looking for illicit discharges while doing regular inspections of industrial and commercial sites (3,050). Seventy such inspections were made during the 2002/03 fiscal year. The normalized cost calculated by dividing the total cost of the category by the number of inspections, is $295/inspection.

Industrial and Commercial Management Programs

The total cost of this category was $89,916. This program used public works department staff to perform inspections. This cost was taken directly from Table A-2.

As in the construction category, the stormwater staff had vehicle and phone usage expenses to perform follow-up inspections and meetings for industrial facilities. These costs were based on Table A-2, items 14 and 15 and the allocations were calculated in Tables A-3 and A-4.

Training of stormwater staff for this program was allocated according to Table A-7.

Overall Stormwater Program Management

The total cost of this category was $317,800. As discussed previously, stormwater staff costs were not distributed to the other categories. Stormwater staff labor costs are found in Table A-2, items 18 through 21. These costs are loaded costs that include salary, benefits, insurance, etc. Office supplies, telephone, and postage are taken directly from Table A-2, items 24 and 25. The cost of reporting was taken from Table A-2, item 34. Reporting costs paid for updating the Drainage Area Master Plan (DAMP). While not specifically required in the permit the information contained in the report is. For example, the city must address flow velocity and runoff value increases for new development (Permit, R8-2002-0011 section VIII.8-e). The information in the DAMP also allows the city to track spills and identify regional BMPs. The "administration services" charge is taken from Table A-2, item 27. This charge includes the allocation to stormwater for buildings, payroll, accounting, legal, and other overhead charges (Michele Colbert, pers. comm., 3/12/04).

Pollution Prevention and Good Housekeeping for Municipal Operations

The total cost of this category was $720,222. The city of Corona contracted for street sweeping services for 2002/03. These costs are shown in Table A-2, items 1 and 2. The number of curb miles swept was provided by city staff as a stand-alone worksheet. This worksheet is reproduced in Table A-11. The personnel cost of $14,000 (Table A-2, item 2) represents labor cost for the city of Corona to oversee the street sweeping contractor. The cost per curb mile swept ($20) is calculated based on total street sweeping costs.

Drain line and channel cleaning was performed in-house. The equipment rental, labor, and vehicle rental costs are presented in Table A-2 (items 3, 4, and 5 respectively). The normalized cost for this activity is based on the sum of these three costs and the total linear feet of maintained channels and drain lines. The costs for each type of facility could not be separated. Twenty-nine percent of the total linear feet was drain pipe and 71 percent was channels (Corona, 2003a).

Corona also incurred costs for hazardous material spill response. Public works and fire departments incurred costs implementing this program. These costs are calculated in Table A-9 and are based on a stand-alone worksheet provided by city staff reproduced as Table A-10. The normalized costs for hazmat responses ($465/response) are based on the total costs divided by the total number of responses.

Cost for the maintenance of the storm drain geographic information system (GIS) was taken directly from Table A-2.

The allocation of stormwater staff training expenses related to this category are calculated in Table A-7, based on Table A-2, item 26.

The cost incurred by the fire department for implementing SWPPPs for its nine fire stations are taken directly from Table A-2, item 23.

Post Construction Stormwater Management in New Development and Redevelopment

The total cost of this category was $13,509. The city staff identified two costs for this category. Both are taken directly from Table A-2. The professional services costs were for a consultant that advised the city on selection of post-construction BMPs. The drain inlet insert maintenance cost was for 8 drain inlet inserts. The normalized cost calculation gives an approximate cost per drain inlet insert of $563/insert. This normalized value is not expected to be useful in comparing program costs as part of this cost survey.

Public Education and Outreach and Public Involvement and Participation

The total cost of these categories was $28,409. The city did not track these costs separately and dividing the costs would be an artificial exercise (Michele Colbert, pers. comm., 3/12/04). All the costs for these two categories were taken directly from Tables A-2 and A-12. The descriptions for these categories in the annual report did not contain statistics that would be

useful for normalizing the costs of these categories. This was confirmed in the meetings with city staff.

Water Quality Monitoring

The total cost of this category was $7,000. The cost incurred for monitoring was for ad hoc testing in support of the IDDE program. This cost can be found in Table A-2, item 31.

References

City of Corona. 2003a. "Comprehensive Annual Financial Report, 30 June 2003" http://www.ci.corona.ca.us/depts/finance/cafr03/index.cfm (18 March 2004)

City of Corona. 2003b. "Santa Ana Watershed NPDES Municipal Stormwater Permit. Annual Reporting Forms" Corona, CA. July

Table A-1. Corona Cost Organized by Cost Survey Category

Cost Survey Categories

Activity Descriptions

Construction Site Stormwater Runoff Control

Description	External Contract	Relation to Permit[a]	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Inspections by Public Works department		New	46,184.00	Table A-2, Item 13	86.5%	564	inspections	Table A-6	81.89	$/inspection
Share of stormwater issues in weekly inspector meetings		New	6,013.50	Table A-8	11.3%	9	person days	Calculation	641.44	$/person day
Share of vehicle used by stormwater staff for construction		New	419.40	Table A-3	0.8%					
Share of phone used by stormwater staff for construction		New	28.25	Table A-4	0.1%					
Share of training for stormwater staff for construction	x	New	736.67	Table A-7	1.4%	9	person days	Calculation	78.58	$/person day
Total			53,381.82		4.3%	of total stormwater cost				

Overall Cost Category Normalizations						
total category $ per inspection	564	inspections	Table A-6	94.65	total $/inspection
total category $ per active construction site	41	active construction sites	Colbert, pers. comm., 3/12/04	1,302.00	total $/active construction site

Illicit Discharge Detection and Elimination

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Stormwater share of inspections by wastewater staff		New	11,007.00	Table A-2, Item 22	53.4%	70	inspections	Colbert, pers. comm., 4/28/04	157.24	$/inspection
Illicit connection inspections		New	9,621.00	Table A-12	46.6%	20	inspections	Colbert, pers. comm., 4/28/04	481.05	$/inspection
Total			20,628.00		1.6%	of total stormwater cost			294.69	total $/sw inspection

Industrial and Commercial Management Programs

Description	External Contract	Nature	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Inspections		New	80,674.00	Table A-2, Item 11	89.7%	600	inspections	Table A-5	134.46	$/inspection
Share of vehicle used by stormwater staff for industrial programs		New	7,968.60	Table A-3	8.9%					
Share of phone used by stormwater staff for industrial programs		New	536.75	Table A-4	0.6%					
Share of training for industrial programs		New	736.67	Table A-7	0.8%					
Total			89,916.02		7.2%	of total stormwater cost				

Overall Stormwater Program Management

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
100% Public Works staff		New	94,476.00	Table A-2, Item 18	29.7%					
50% Public Works staff		New	59,938.00	Table A-2, Item 19	18.9%					
30% Public Works staff		New	34,874.00	Table A-2, Item 20	11.0%					
10% Public Works staff		New	6,196.00	Table A-2, Item 21	1.9%					
Office supplies and publications		New	730.00	Table A-2, Item 24	0.2%					
Telephone and postage		New	1,200.00	Table A-2, Item 25	0.4%					
Administrative service charges		New	79,367.00	Table A-2, Item 27	25.0%					
NPDES fee		New	18,516.00	Table A-2, Item 28	5.8%					
Reporting-Drainage Master Plan		New	22,503.00	Table A-2, Item 34	7.1%					
Total			317,800.00		25.4%	of total stormwater cost				

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Table A-1. Continued.

Pollution Prevention and Good Housekeeping for Municipal Operations

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Street Sweeping						20,877	curb miles swept	Table A-11	19.84	$/curb mile swept
Street sweeping contract	x	Enhanced	400,215.00	Table A-2, Item 1	55.6%					
Oversight of street sweeping		New	14,000.00	Table A-2, Item 2	1.9%					
Drain lines/channel cleaning						30,305	linear feet inspected	Corona, 2003b	8.30	$/linear foot
Equipment rental		Enhanced	36,211.00	Table A-2, Item 3	5.0%					
Personnel		Enhanced	188,856.00	Table A-2, Item 4	26.2%					
Vehicle rental		Enhanced	26,568.00	Table A-2, Item 5	3.7%					
Hazmat Response						41	responses	Table A-10	465.15	$/response
Public Works		Existing	9,621.10	Table A-9	1.3%					
Fire		Existing	9,450.00	Colbert, 2004	1.3%	47	responses	Colbert, pers. comm., 6/16/04	201.06	$/response
GIS maintenance for storm drains		New	6,300.00	Table A-2, Item 33	0.9%					
Share of training for municipal operations	x	New	736.67	Table A-7	0.1%					
Fire department cost for SWPPP implementation		New	9,685.00	Table A-2, Item 23	1.3%	9	fire stations	Colbert, pers. comm., 4/28/04	1,076.11	$/station
Disposal costs for hazardous waste	x	Existing	12,101.68	Table A-12	1.7%					
Hazmat waste operator training classes	x	Existing	6,478.00	Table A-12	0.9%					
Total			720,222.45		57.6%	of total stormwater cost				

Post Construction Stormwater Management in New Development and Redevelopment

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Professional services (consultant)	x	New	9,009.00	Table A-2, Item 29	66.7%					
Drain inlet insert maintenance		New	4,500.00	Table A-2, Item 35	33.3%	8	inserts	Colbert, pers. comm., 3/12/04	562.50	$/insert
Total			13,509.00		1.1%	of total stormwater cost				

Public Education, Outreach, Involvement, and Participation

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Contribution to regional clean air public education program		New	4,000.00	Table A-2, Item 7	14.1%					
Contribution to countywide public education program		New	12,063.00	Table A-2, Item 8	42.5%					
Response to public stormwater complaints		New	8,700.00	Table A-2, Item 12	30.6%					
Share for stormwater education in new business brochures		New	300.00	Table A-2, Item 30	1.1%					
Household Hazardous Waste Collection Event		New	3,346.00	Table A-12	11.8%					
Total			28,409.00		2.3%	of total stormwater cost				

Water Quality Monitoring

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Laboratory testing for illicit discharge program	x	New	7,000.00	Table A-2, Item 31	100.0%					
Total			7,000.00		0.6%	of total stormwater cost				

Total Stormwater Costs	1,250,866.28

a. This column indicates whether required activities were being performed prior to stormwater permits. In some cases activities were enhanced due to permit requirements.

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Table A -2. Primary Cost Data for Corona

Item #	City of Corona Category	Total Cost	Cost Survey Category[1]
	Street Cleaning/Sweeping		
1	Annual Street Sweeping Contract Cost	400,215	Pollution Prevention
2	Personnel Cost	14,000	Pollution Prevention
	Storm Drain Cleaning		
3	Equipment Rental	36,211	Pollution Prevention
4	Personnel Cost	188,856	Pollution Prevention
5	Motor Pool Rental	26,568	Pollution Prevention
	Public Education		
6	Personnel Time	0	
7	WRCOG - Clean Cities	4,000	Public Education
8	County Implementation Agreement	12,063	Public Education
	Hazmat Reponse		
9	Cost for Fire Dept.	5,000	Pollution Prevention
	Plan Check Activity		
10	Plan Check Activity	0	
	Ordinance Enforcement Activities		
11	Industrial/Commercial Inspection & Follow-Up	80,674	Industrial
12	Residential	8,700	Public Education
13	Construction (Inspection Costs)	46,184	Construction
14	Motorpool (Explorer)	8,388	See Table A-3
15	Phone	565	See Table A-4
	Code Compliance		
16	Code Compliance	0	
	Permit Administration		
17	Personnel Expenses:	0	
18	Michele (100%)	94,476	Management
19	Nabil (50%)	59,938	Management
20	Ati (30%)	34,874	Management
21	Tracy (10%)	6,196	Management
22	Source Control (10%)	11,007	Illicit Discharge
23	Fire Dept. (10%)	9,685	Pollution Prevention
24	Office Supplies and Publications	730	Management
25	Telephone and Postage	1,200	Management
26	Employee Training and Conference	2,210	See Table A-7
27	Administrative Service Charges	79,367	Management
28	Regional Water Quality Control Board	18,516	Management
29	Professional Services	9,009	Post Construction
30	Public Education and Information	300	Public Education
31	Laboratory Testing	7,000	Monitoring
32	Structural BMP	0	
33	GIS Citywide Storm Drain System	6,300	Pollution Prevention
34	Drainage Master Plan	22,503	Management
	NPDES Facilities Mitigation		
35	Facilities Mitigation	4,500	Post Construction
	Total	1,199,235	

(Source: Colbert, pers. comm., 3/12/04)

1. Cost Categories Abbreviated According to the Following:
   - Construction: Construction Site Stormwater Runoff Control
   - Illicit Discharge: Illicit Discharge Detection and Elimination
   - Industrial: Industrial and Commercial Management Programs
   - Management: Overall Stormwater Program Management

Table A – 2. Continued.

Pollution Prevention: Pollution Prevention and Good Housekeeping for Municipal Operations
Post Construction: Post Construction Water Management in New Development and Redevelopment
Public Education: Public Education, Outreach, Involvement, and Participation
Monitoring: Water Quality Monitoring
Watershed: Watershed Management

Table A-3. Distribution of Motorpool (Explorer) between Construction and Industrial/Commercial Programs

Cost	Source	Percent Allocation	Category	Reference	Allocated Cost
8,388.00	Table 2, Item 14	95%	Industrial/Commercial	Colbert, pers. comm., 4/28/04	7,968.60
8,388.00	Table 2, Item 14	5%	Construction	Colbert, pers. comm., 4/28/04	419.40
Total		100%			8,388.00

Table A-4. Distribution of Phone between Construction and Industrial/Commercial Programs

Cost	Source	Percent Allocation	Category	Reference	Allocated Cost
565.00	Table 2, Item 15	95%	Industrial/Commercial	Colbert, pers. comm., 4/28/04	536.75
565.00	Table 2, Item 15	5%	Construction	Colbert, pers. comm., 4/28/04	28.25
Total		100%			565.00

Table A-5. Calculation of Inspections for Industrial Management Programs

Site Type	Source	Annual Inspections	Reference	Inspections	
High Priority	600	1	Colbert, pers. comm., 3/12/04	600	
Medium Priority	540	0.5	Colbert, pers. comm., 3/12/04	0	*
Low Priority	1,910	0.2	Colbert, pers. comm., 4/28/04	0	*
Totals	3,050			600	

* inspections started in 03/04, not inspected in 02/03

Table A-6. Calculation of Inspections for Construction Site Stormwater Runoff Control Programs

Site Type	Number	Annual Inspections	Reference	Inspections
High Priority	6	24	Colbert, pers. comm., 3/12/04	144
Low Priority	35	12	Colbert, pers. comm., 3/12/04	420
Totals	41			564

Table A-7. Distribution of Employee Training Among

Cost	Source	Percent Allocation	Category	Allocated Cost
2,210.00	Table 2, Item 26	33%	Construction	736.67
2,210.00	Table 2, Item 26	33%	Industrial/Commercial	736.67
2,210.00	Table 2, Item 26	33%	Municipal	736.67
Total		100%		2,210.00

(Source: Colbert, pers. comm., 3/12/04)

Table A-8. Cost of Fraction of Construction Inspectors Weekly Meetings Dedicated to Stormwater Issues

Description	Dollar Amount or Statistic	Reference
Meetings per year	50	Corona, 2003b
Minutes per meeting for stormwater issues	10	Colbert, pers. comm., 3/12/04
Number of person hours	9	Calculation
Overhead Rate	$ 80.18	Colbert, pers. comm., 3/12/04
Labor Cost	$ 6,013.50	Calculation

Table A-9. Calculation of Hazmat Response Cost for Municipal Operations Program

Cost Type	Amount	Source
Fire Department	5,000.00	Table A-2, Item 9
Equipment	1,040.88	Table A-10
Materials	171.42	Table A-10
Labor	3,408.80	Table A-10
Total	9,621.10	

Table A-10. Hazardous Materials Worksheet Submitted by City of Corona Staff

Actvity PHAZM	Haz Mat Cleaned Up
Number of jobs	41
Labor Hours	129.75
Labor Cost	3,408.80
Equipment Hours	69.82
Equipment Cost	1,040.88
Materials Cost	171.42
Total Cost	**4,621.10**
Average Cost/Job	112.71
Average Labor Hours/Job	3.16
Average Equipment Hours/Job	1.70

(Source: Colbert, pers. comm., 3/12/04)

Table A-11. Street Sweeping Analysis Submitted by City of Corona Staff

Service Type	Curb Miles	Services/Year	Annual Miles	Percentage	
Residential	655	26	17,019	82%	84%
Alleys (Residential)	38	12	450	2%	
Commercial	54	52	2,786	13%	16%
Medians/Inter (Commercial)	52	12	622	3%	
Totals	797		20,877	100%	100%

(Source: Colbert, pers. comm., 3/12/04)

Table A-12. Additional Costs Identified and Submitted by the City of Corona Staff

Activity Description	Cost	Stormwater Program
Planning and labor for Household Hazardous Waste Collection Event	3,346.00	Public Education
Disposal costs for hazardous waste	12,101.68	Pollution Prevention
Hazmat waste operator training classes	6,478.00	Pollution Prevention
Illicit connection inspections	9,621.00	Ilicit Discharge
Total	31,546.68	

(Source: Colbert, pers. comm., 5/18/04)

The backup calculations for the cost for each cost survey category in Section 4 and the sources of the cost data are presented in this appendix. Tables are generally presented by sequentially increasing levels of detail. Figure B-1 illustrates how data is shared throughout the tables.

Table B-1 contains all costs organized into the various standard cost survey categories. The subtotals for each cost category are also presented in Section 4, Table 4-2. The remaining tables (B-2 through B-6) present the detailed back-up information for the numbers in Table B-1. Table B-1 is linked to the back-up tables by the table and item numbers in the 'Source' column. Most of the cost information provided by city staff is listed in Table B-2. Item numbers corresponding to the subtotals in Table B-2 were added to the left hand column to easily show how the numbers are pulled forward to Table B-1. The right hand column in Table B-2 was added to show how costs were allocated to the cost survey categories. Table B-1 entries that were not taken directly from Table B-2 are found in Tables B-3 through B-6.

For the city of Encinitas, labor, supplies, travel, equipment, and vehicle costs are distributed among the various survey categories according to estimates provided by city staff (Table B-3). Thus, comparing costs with other municipalities where such costs are not distributed, Encinitas's Overall Stormwater Management Program costs will be lower.

City staff has projected new capital projects and labor that will immediately increase their costs over the next few years. Additional labor costs will relate to engineering inspections, planning, and plan checking. Capital project costs will include installation of filter inserts, fire station wash facilities, and a storm drain. Additional operation and maintenance costs will be incurred relating to these capital projects as well.

Detailed descriptions of how the costs were developed are contained in the following paragraphs.

Construction Site Stormwater Runoff Control

The total cost of this category was $169,751. The city of Encinitas Building Department staff performed all 401 inspections during the wet season spanning from October 1, 2002 to April 30, 2003 (Encinitas, 2003b). The normalized cost, calculated by dividing the total cost of the category by the number of inspections, is $423/inspection. The stormwater staff also conducted the following activities in the construction category (descriptions obtained from annual stormwater report):

- Reviewed 5 SWPPPs
- General enforcement
- Issued 13 Notices of Violation
- Monitored weather patterns and storms in the Pacific through the National Weather Service

The costs presented in Table B-1 for the construction category include all of these activities and does not solely represent the cost for inspections. This should be considered when comparing the normalized cost per inspection for the city of Encinitas to other cities.

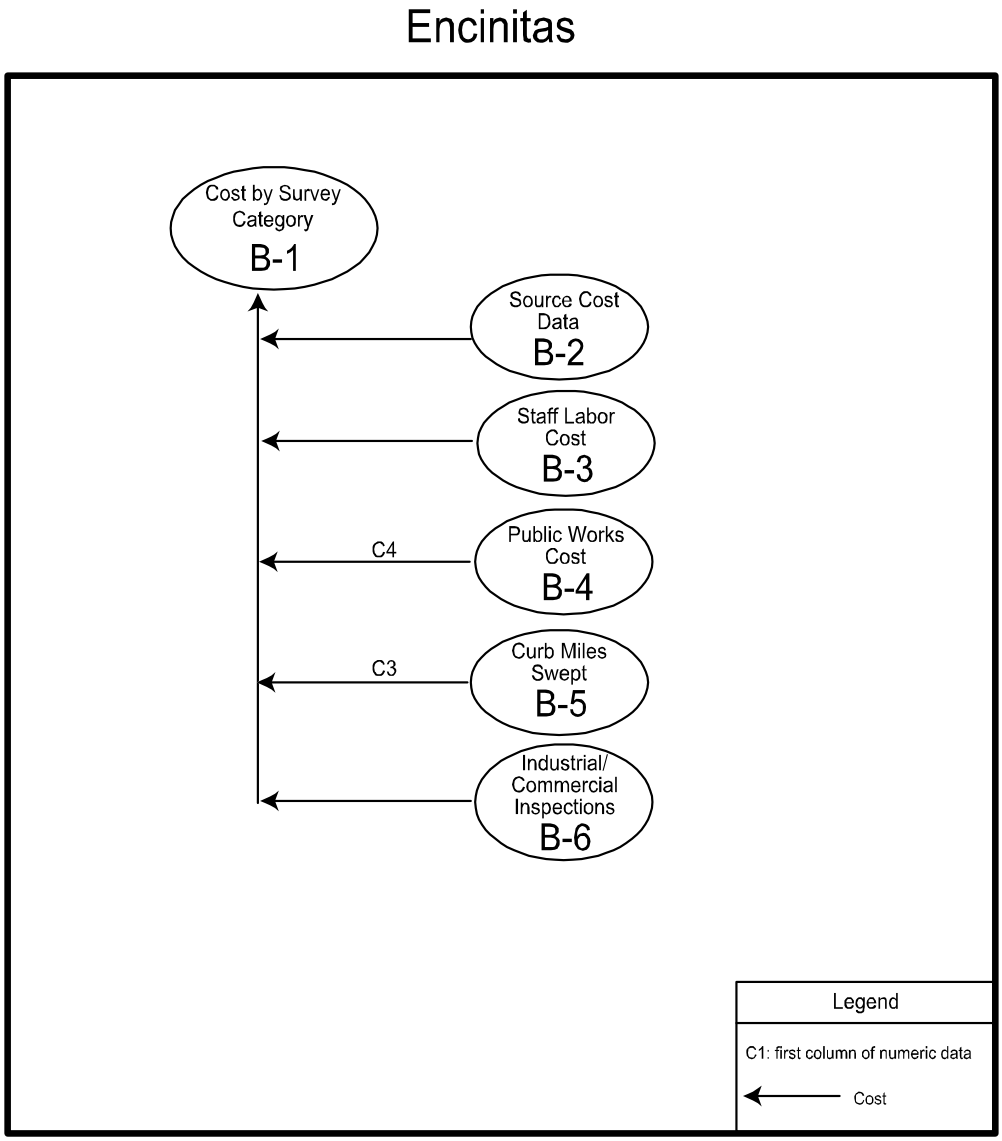

Figure B-1. Encinitas Flowchart of Cost Tables

Illicit Discharge Detection and Elimination (IDDE)

The total cost of this category was $49,378. The IDDE program was implemented by the stormwater staff. The program consists of dry weather monitoring, investigating complaints, and looking for illicit connections during regular inspections and visual inspections of the MS4 (Encinitas, 2003b). The number of inspections for the IDDE program was not available because city staff did not have a formal inspection program. However, 76 "complaints" were filed by city staff from the informal visual inspections. Another 96 complaints were received via the city's stormwater hotline. There were 172 follow up actions to these complaints. (Encinitas, 2003b).

Consequently, cost is normalized by dividing the total cost of the category by the number of follow-up activities resulting in a normalized cost of $287 per follow-up action.

Industrial and Commercial Management Programs

The total cost of this category was $65,596. Costs for this category included consultant administration services and costs for inspections. During 2002/2003, the city performed 266 industrial and commercial inspections (Table B-6). The normalized cost per inspection was $247. The city is planning on increasing inspections to 400 per year (Weldon, pers. comm., 4/2/04), which means this cost will significantly increase. Monitoring is performed at each industrial facility on an on-going basis (Encinitas, 2003b). Activities performed by the stormwater staff relating to the commercial component of this category are as follows (descriptions obtained from the annual stormwater report):

- Updated commercial facility inventory
- Provided BMP manuals and guidance
- Educated facility staff in regard to stormwater requirements and minimum BMPs
- Began development of a grease program
- Issued several enforcement actions

The costs presented in Table B-1 for this category include the cost for all of these activities and do not solely represent the cost for inspections. This should be considered when comparing the normalized cost per inspection for the city of Encinitas to other cities.

Overall Stormwater Program Management

The total cost of this category was $128,159. The city had a cost of $35,000 for developing a stormwater fee. The other activities in this category were for annual reporting and legal support for developing ordinances and plaintiff attorney fees.

Pollution Prevention and Good Housekeeping for Municipal Operations

The total cost of this category was $528,252. The largest cost of this category was street sweeping, which cost $117,962. Drain line and channel cleaning cost was $114,711 while sump, inlet, and manhole cleaning cost was $258,113. Additional activities performed were as follows (descriptions obtained from annual stormwater report):

- Engineering services for oversight, strategic planning, and management
- Trash pick-up
- Disposal of sediment
- Performed capital projects
- Updated municipal inventory

Tables B-1 and B-4 contain a breakdown of costs.

Post Construction Stormwater Management in New Development and Redevelopment

The total cost for this category was $15,344. This cost includes storm drain insert installation and maintenance costs (Weldon, pers. comm., 4/2/04). Also, professional services for UV consulting, administration, report preparation, and presentations were acquired in regard to the Moonlight Beach project.

Public Education and Outreach and Public Involvement and Participation

The total cost of these categories was $41,898. These categories were combined for the city of Encinitas due to major overlap between the two. All direct costs came directly from the data in Tables B-2 and B-4. Statistics were only available for the number of posters distributed. Activities in this category included the following (descriptions obtained from annual stormwater report):

- Dissemination of general stormwater brochures
- Stencils placed at all inlets
- Updated city website with stormwater related information
- Dissemination of door hangers
- Design, purchase, and dissemination of promotional key chains
- Dissemination of pens
- Published 9 local newspaper articles with information regarding the city's Clean Water Program and its accomplishments
- Production and dissemination of a general stormwater poster at public events
- Training of city staff
- Made two presentations to the city council and public attendees; an estimated 20 people were present at each meeting
- Printed materials were provided to contractors and developers via brochures
- Held a 2-hour construction workshop to inform the construction and development community about stormwater regulations and BMP requirements; 50 people attended
- Sent two special mailings relating to stormwater issues were sent to developers and contractors
- Special mailers were sent to restaurants and automotive businesses
- Held a workshop with the local nursery constituency to present nursery BMPs
- Held "garden care" type workshops; approximately 46 people attended
- Performed stormwater sampling with a 5th grade class and made a presentation

- Presented the watershed model to a 3rd grade class; approximately 200 children participated in the presentation
- Initiated a collaborative workgroup of several cities in the North County to develop educational outreach products and approaches on a watershed basis
- Held commercial business workshops
- Participated in a public opinion survey
- Held several community events

Water Quality Monitoring

The total cost for this category was $76,262. Costs were not normalized because they vary according to type of water quality analysis performed.

Watershed Management

The total cost for this category was $12,400. These costs consisted of watershed plan development costs and stormwater staff labor costs.

References

City of Encinitas, 2003. "City of Encinitas Stormwater Annual Report" 2003

Table B-1. Encinitas Cost Organized by Cost Survey Category

Cost Survey Categories

Activity Description

Construction Site Stormwater Runoff Control

Description	External Contract	Relation to Permit[a]	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Construction inspections		New	150,000.00	Table B-2, Item 28	88.4%	401	inspections	Encinitas 2003b	374.06	$/inspection
Allocated labor		New	19,751.20	Table B-3	11.6%					
Total			169,751.20		15.6%	of total stormwater cost				

Overall Cost Category Normalizations					
total category $ per inspection	401	inspections	Encinitas 2003b	423.32	total $/inspection
total category $ per active construction site	40	active construction sites	Encinitas 2003b	4,243.78	total $/active constructtion site

Illicit Discharce Detection and Elimination

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Allocated labor		New	49,378.00	Table B-3	100.0%	172	follow-up activities	Encinitas 2003b	287.08	$/follow-up activitiy
Total			49,378.00		4.5%	of total stormwater cost				

Industrial and Commercial Management Programs

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Inspections						266	inspections	Table B-6	246.60	$/inspection
D-Max	x	New	43,600.00	Table B-2, Item 13	66.5%					
Ashford Engineering	x	New	12,120.00	Table B-2, Item 14	18.5%					
Allocated labor		New	9,875.60	Table B-3	15.1%					
Total			65,595.60		6.0%	of total stormwater cost				

Overall Stormwater Program Management

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Annual reporting (ashford)	x	New	25,080.00	Table B-2, Item 23	19.6%					
Storm water fee development		New	35,000.00	Table B-2, Item 29	27.3%					
Miscellaneous		New	520.73	Table B-2, Item 27	0.4%					
NPDES fee		New	3,750.00	Table B-2, Item 5	2.9%					
Legal fees-ordinances	x	New	11,915.50	Table B-2, Item 25	9.3%					
Legal fees-plaintiff attorneys	x	New	9,950.00	Table B-2, Item 26	7.8%					
Grant writing		New	2,440.00	Table B-2, Item 24	1.9%					
Allocated labor		New	39,502.40	Table B-3	30.8%					
Total			128,158.63		11.8%	of total stormwater cost				

Pollution Prevention and Good Housekeeping for Municipal Operations

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Ashford Engineering	x	New	8,840.00	Table B-2, Item 7	1.7%	4	inspections	Encinitas 2003b	2,210.00	$/inspection
Trash pick-up		Existing	2,850.00	Table B-2, Item 12	0.5%					
Trash pick-up (public works)		Existing	13,400.00	Table B-4	2.5%					
Disposal of sediment		New	2,500.00	Table B-2, Item 8	0.5%					
Allocated labor		New	9,875.60	Table B-3	1.9%					
Sumps, inlets, manholes		Enhanced	258,113.00	Table B-4	48.9%					
Drain lines and channels		Enhanced	114,711.00	Table B-4	21.7%					
Street sweeping		Enhanced	117,962.00	Table B-4	22.3%	5,832	curb miles swept	Table B-5	20.23	$/curb mile swept
Total			528,251.60		48.6%	of total stormwater cost				

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Table B-1. Continued.

Post Construction Water Management in New Development and Redevelopment

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Overall Storm Drain Inserts Maintenance						16	inserts installed	Encinitas, 2003b	119.25	$/insert installed
Storm drain inserts		New	1,240.00	Table B-2, Item 9	8.1%					
Storm drain inserts		New	668.01	Table B-2, Item 10	4.4%					
Ashford Engineering (moonlight)	x	New	3,560.00	Table B-2, Item 11	23.2%					
Allocated labor		New	9,875.60	Table B-3	64.4%					
Total			15,343.61		1.4%	of total stormwater cost				

Public Education, Outreach, Involvement, and Participation

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Surveys and posters		New	3,292.47	Table B-2, Item 20	7.9%					
Surveys and posters		New	2,000.00	Table B-2, Item 21	4.8%					
UC Extension workshop with nurseries.		New	2,374.00	Table B-2, Item 15	5.7%					
Ashford engineering	x	New	14,480.00	Table B-2, Item 22	34.6%					
Allocated labor		New	19,751.20	Table B-3	47.1%					
Total			41,897.67		3.9%	of total stormwater cost				

Water Quality Monitoring

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Wet weather monitoring		New	25,186.00	Table B-2, Item 6	33.0%					
ICID dry weather monitoring		New	14,893.00	Table B-2, Item 16	19.5%					
ICID dry weather monitoring		New	3,161.00	Table B-2, Item 17	4.1%					
ICID dry weather monitoring		New	3,395.00	Table B-2, Item 18	4.5%					
Allocated labor		New	29,626.80	Table B-3	38.8%					
Total			76,261.80		7.0%	of total stormwater cost				

Watershed Management

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Watershed plan development		New	2,524.00	Table B-2, Item 19	20.4%					
Allocated labor		New	9,875.60	Table B-3	79.6%					
Total			12,399.60		1.1%	of total stormwater cost				

Total stormwater costs	1,087,037.71

a. This column indicates whether required activities were being performed prior to stormwater permits. In some cases activities were enhanced due to permit requirements.

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Table B-2. Source Data Table Submitted by City of Encinitas (cost survey categories added)

Item #	City of Encinitas Category	Cost	Cost Survey Category[1]
1	Staff Salary	147,760.00	See Table B-3
2	Contract Staff	41,743.00	See Table B-3
3	Supplies/Travel/Equipment	5,409.00	See Table B-3
4	Vehicle	2,600.00	See Table B-3
	Permit Fees:		
5	State Water Resources Control Board	3,750.00	Management
6	Copermittee MOU Fees	25,186.00	Monitoring
	Municipal Programs:		
	Miscellaneous Contracting		
7	Ashford Engineering	8,840.00	Pollution Prevention
8	AMEC	2,500.00	Pollution Prevention
9	BMP Implementation & Maintenance	1,240.00	Post Construction
10	Downstream Services	668.01	Post Construction
11	Ashford Engineering (Moonlight)	3,560.00	Post Construction
12	Clean Up/Abatement Programs	2,850.00	Pollution Prevention
	Industrial/Commercial Programs:		
	Inspections		
13	D-Max	43,600.00	Industrial
14	Ashford Engineering	12,120.00	Industrial
	Nursery Program:		
	Inspections		
15	Education Activities (UC Regents)	2,374.00	Public Education
	Construction Programs:	0.00	
	IC/ID Program:		
	Source Tracking/Spills/Inspections	0.00	
	Water Quality Monitoring:		
16	Encina	14,893.00	Monitoring
17	Del Mar Analytical	3,161.00	Monitoring
18	San Elijo JPA	3,395.00	Monitoring
	Watershed Urban Runoff Management:		
19	Ashford Engineering	2,524.00 [2]	Watershed
20	City of Oceanside (survey& posters)	3,292.47	Public Education
21	City of Carlsbad (survey)	2,000.00	Public Education
	Education:		
22	Ashford Engineering	14,480.00	Public Education
	Reporting (JURMP/WURMP Annual Report):		
23	Ashford Engineering	25,080.00	Management
24	Grant Writing:	2,440.00	Management
	Legal Fees:		
25	Glenn Sabine	11,915.50	Management
26	Marco Gonzalez	9,950.00	Management
27	Misc.: BMP Cottonwood Creek & San Elijo Outlet	520.73	Management
28	Construction	150,000.00	Construction
29	Appropriation for Stormwater Fee Vote	35,000.00 [3]	Management
30	B&D Construction	35,887.00 [4]	Unallocated
	Total Expenditures	618,738.71	

(Source: Weldon, pers. comm., 4/2/04)

1. Cost Categories Abbreviated According to the Following:
   - Construction: Construction Site Stormwater Runoff Control
   - Illicit Discharge: Illicit Discharge Detection and Elimination
   - Industrial: Industrial and Commercial Management Programs
   - Management: Overall Stormwater Program Management

Table B-2. Continued.

Pollution Prevention: Pollution Prevention and Good Housekeeping for Municipal Operations
Post Construction: Post Construction Water Management in New Development and Redevelopment
Public Education: Public Education, Outreach, Involvement, and Participation
Monitoring: Water Quality Monitoring
Watershed: Watershed Management

2. Per personal communication with Kathy Weldon, this number was reduced to $2,524 from $12,880.
3. Per personal communication with Meleah Ashford, this number was reduced to $35,000 from $100,000.
4. Construction of storm drain was not attibuted to permit compliance.

Table B-3. Distribution of Labor ($189,503) and Supplies/Travel/Equipment/Vehicle ($8,009) Costs Submitted by City of Encinitas Staff

Category	Percent All Clean Water Program Staff	Cost Allocated by Percentages
Public Outreach	5%	9,875.60
Public Involvement	5%	9,875.60
ICID	25%	49,378.00
Construction	10%	19,751.20
Post Construction (SUSMP)	5%	9,875.60
Industrial	5%	9,875.60
Pollution Prevention for Municipal	5%	9,875.60
Monitoring	15%	29,626.80
Overall Stormwater Management	20%	39,502.40
Watershed Management	5%	9,875.60
Total	100%	197,512.00

(Source: Ashford, pers. comm., 4/15/04)

Table B-4. Public Works Cost Data Submitted by City of Encinitas Staff

Description	Cost Type Labor	Equipment	Contract	Total
Sumps, inlets, manholes	101,404.00	72,968.00	83,741.00	258,113.00
Drain lines and channels	101,405.00	13,306.00	0.00	114,711.00
Trash pick-up	0.00	0.00	13,400.00	13,400.00
Street sweeping	0.00	0.00	117,962.00	117,962.00
Total	202,809.00	86,274.00	215,103.00	504,186.00

(Source: Ashford, pers. comm., 4/15/04)

Table B-5. Calculation of Number of Curb Miles Swept

Street Miles Swept	Frequency (yearly)	Reference	Annual Street Miles Swept	Annual Curb Miles Swept[1]
243	12	Encinitas, 2003b	2,916	5,832

1. Calculated by multiplying the "annual street miles swept" by 2.

Table B-6. Calculation of Industrial/Commercial Inspections

Type	Number	Reference
Industrial	3	Encinitas, 2003b
Commercial (DMAX)	202	Encinitas, 2003b
Commercial, nurseries	5	Encinitas, 2003b
Complaint driven (Ashford)	56	Encinitas, 2003b
Total	266	

The backup calculations for the cost for each cost survey category in Section 5 and the sources of the cost data are presented in this appendix. Tables generally are presented by sequentially increasing levels of detail. Figure C-1 illustrates how data is shared throughout the tables.

Table C-1 contains all costs organized into the various standard cost survey categories. The subtotals for each cost category are also presented in Section 5, Table 5-2. The remaining tables (C-2 through C-5) present the detailed back-up information for the numbers in Table C-1. Table C-1 is linked to the back-up tables by the table and item numbers in the 'Source' column. Most of the cost information provided by city staff is listed in Table C-2. Item numbers corresponding to the subtotals in Table C-2 were added to the left hand column to easily show how the numbers are pulled forward to Table C-1. The right hand column in Table C-2 was added to show how costs were allocated to the cost survey categories. Table C-1 entries that were not taken directly from Table C-2 are found in Tables C-3 through C-5.

Table C-1 also provides statistics describing the level of effort for certain activities by numerically representing what or how much was accomplished. References are provided within Table C-1 for the activity statistics. Where relevant statistics are available, normalized costs are calculated in Table C-1. Normalized costs are calculated by dividing the cost of the category or activity by the activity statistic.

For the city of Fremont, labor costs of the stormwater staff are not distributed among the various survey categories. Instead, it is all captured under Overall Stormwater Program Management. Thus, comparing costs with other municipalities where such costs are distributed, Fremont's Overall Stormwater Management Program costs will be higher.

The Union Sanitation District (USD) is under contract with the city of Fremont to provide facility and illicit discharge services, construction inspections, public education, countywide clean water program meeting participation, reports, database, and vehicles. The breakdown of the USD cost is presented in Table C-4.

The contribution made to the Alameda County Clean Water Program (ACCWP) was allocated according to Table C-5. Table C-5 has the total cost of the ACCWP broken into stormwater program categories. ACCWP supports subcommittee meetings, legal advice, regulatory advice, agency education and information sharing. On the bottom of the table is the dollar amounts contributed from each of the participating agencies. Fremont contributed $339,990 out of the total ACCWP expenses of $2,342,113. The ratio of Fremont contribution to the total ACCWP program cost was used to determine the contribution Fremont made to the individual programs. This calculation is in the far right column of Table C-5.

Detailed descriptions of how the costs were developed are contained in the following paragraphs.

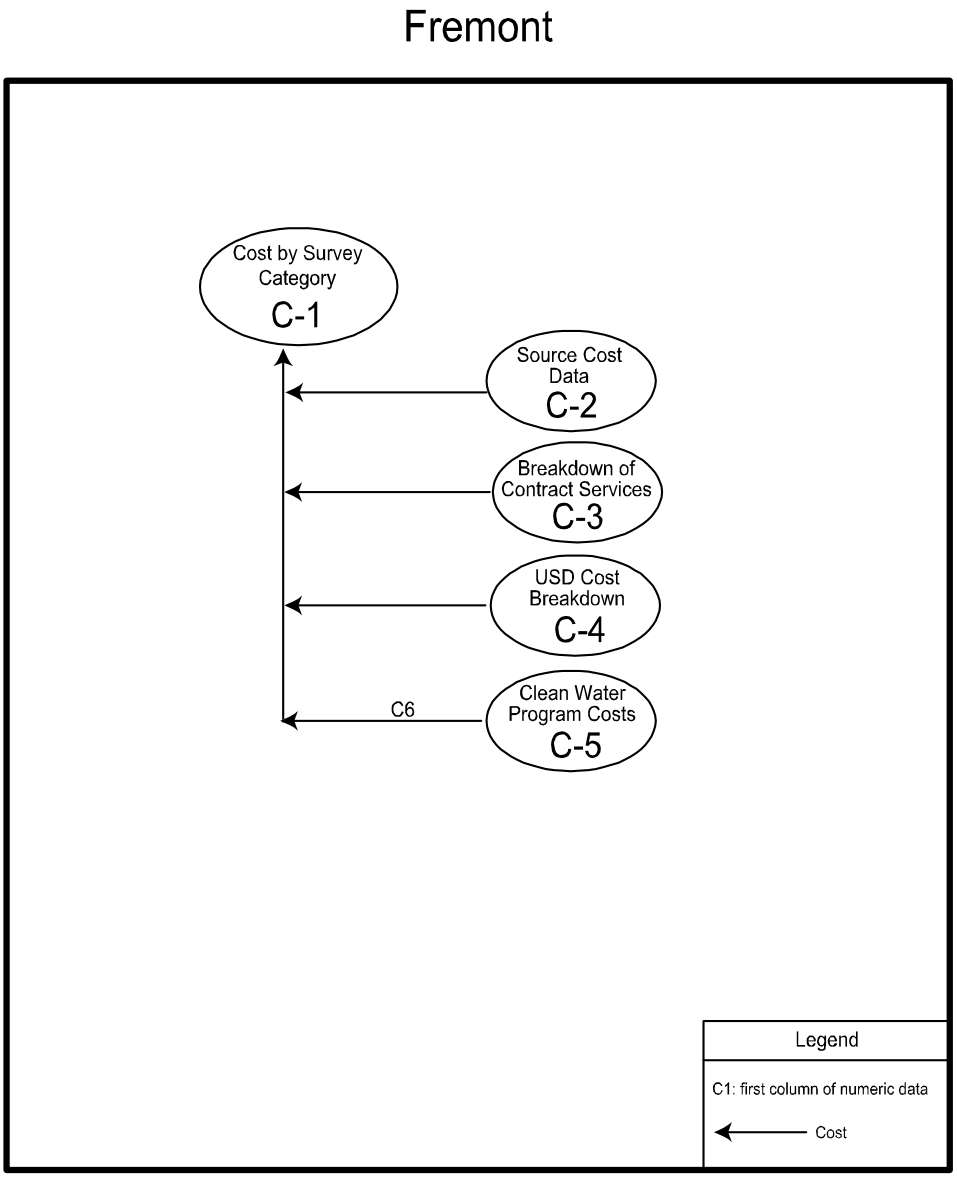

Figure C-1. Fremont Flowchart

Construction Site Stormwater Runoff Control

The total cost of this category was $17,715. The costs of this category were for inspection of active construction sites and for plan checking to verify appropriate post construction BMPs were being used (Fremont, 2003b). Employee training and 58 erosion control inspections were conducted (Fremont, 2003b). USD performed 139 general stormwater inspections.

Illicit Discharge Detection and Elimination (IDDE)

The total cost of this category was $5,917. All of the costs in this category represent contributions to the ACCWP for assistance in eliminating non-stormwater discharges, analyzing

findings, reporting, and staff labor. During the year, 118 follow-up activities were conducted (Fremont, 2003b).

Industrial and Commercial Management Programs

The total cost of this category was $210,027. Most of the activities for this category were performed by USD. A cost breakdown by activity was not provided. The total number of inspections was 482, which includes 91 re-inspections. The city had 81 enforcement actions in 2002/03 and identified and abated 32 "Potential Exposure" and 18 "Non-Stormwater" discharges. (Fremont, 2003b). Inspection documentation costs amounted to $31,697. Though USD also performed some construction inspections, this cost was included here because the majority of inspections were for the industrial/commercial program. Inspection costs were $160,861 resulting in a cost of $436/inspection.

Contributions to the ACCWP totaled $17,469 and were for outreach, refining guidelines, training, and reporting.

Overall Stormwater Program Management

The total cost of this category was $453,872. Sixty-nine percent of the cost allocated to this category was for the stormwater staff labor and allocation of overhead cost. The city staff was unable to distribute the labor costs among the survey categories. Other costs in this category were for USD services, NPDES fees, consultant services, and various administrative costs. USD staff participated in ACCWP subcommittees at a cost of $12,928, $7,659 in reporting costs, $6,107 for meeting attendance, and $135 for mitigation work. The mitigation work was a minor cost and therefore allocated to this cost category rather than investigate for a description of the work.

Contributions to the ACCWP totaled $95,560 and were for regulatory advising, instituting improvements, support committees, legal advice, website, newsletters, dues, permit fees, business water quality incentives, miscellaneous expenses, and staff labor.

Pollution Prevention and Good Housekeeping for Municipal Operations

The total cost of this category was $2,128,175. Of this amount, 85 percent was for street sweeping. The costs for this category were for the activities of street sweeping, litter/debris removal, and GIS. The city performed other activities but was unable to provide the associated costs. These activities were cleaning drain lines and channels, inlets, cross culverts, and conduits (Silva, pers. comm., 9/22/04). Additional activities obtained from the annual stormwater report included employee training, maintenance staff attendance at maintenance subcommittee meetings, mailing information packets to new businesses, workshops, partnered with USD to develop, print, and mail a newsletter (Fremont, 2003b).

Contributions to the ACCWP totaled $13,175 and were for performance standard development and updating, and staff labor.

Post Construction Stormwater Management in New Development and Redevelopment

The total cost of this category was $19,746. This cost was for engineering, planning, and city staff to research, track, and report information for the annual stormwater report. It was also for task force meetings to develop strategies for compliance with their permit regarding new development and redevelopment. The source table (C-2) describes this cost as a "quasi-external expenditure" because it is the amount that was transferred to engineering and other departments to cover stormwater related activities.

Contributions to the ACCWP totaled $15,337 and were for controls guidance, watershed inventory, construction activities, performance standards, coordination, brochures, and staff labor.

Public Education and Outreach and Public Involvement and Participation

The total cost allocated to these categories was $101,717. Advertising costs (including billboards and newsletters) were for public education and outreach. Creek clean-up had both public involvement, participation, and outreach components. Due to this overlap, the programs were combined for the city of Fremont. Approximately 70 percent of the creek clean-up was done by city staff and volunteers accounted for 30 percent of the effort (Silva, pers. comm., 9/22/04). Other activities in these categories included the following (descriptions obtained from the annual stormwater report):

- 24 school outreach presentations to 5th grade classrooms
- 4 school outreach presentations at middle school "special day" classes
- Stormwater staff participated in a Safety Fair at Gomez Elementary by doing a watershed demonstration and distributing pamphlets
- Stormwater staff participated in several public events including the Fremont Festival of the Arts, Good Neighbor Day, Boston Scientific Health and Wellness Fair, and National Night Out
- Rock Steady Juggling performance to 1,490 students who were educated about urban runoff issues
- Educated 680 students about urban runoff issues at the Caterpillar Puppet show
- Participated in and helped fund the "Kids in Creek" workshops
- A city of Fremont staff member served as a panelist at California State University Hayward's "Careers in the Environmental Sciences". The staff member discussed career opportunities in the stormwater field with students.
- Distributed brochures and fliers to Devry University
- The city of Fremont Environmental Services Department funded Math/Science Nucleus (MSN) and city of Fremont Park and Recreation Department to develop and lead field trips to educate 140 students and 26 parents about urban runoff issues. The city also

funded Irvington Academy High School to educate students about urban runoff issues. (Fremont, 2003)

USD provided $25,897 worth of public education services, accounting for 51 percent of the cost in this category. USD provides a website with BMP fact sheets for citizens and business owners and participates in school outreach activities. The materials promote Integrated Pest Management and the Bay Area-wide campaign called Our Water/Our World. USD also provides brochures and facility inspection checklists for businesses such as restaurants and printer shops.

Contributions to the ACCWP totaled $50,796 and were for effectiveness evaluations, staff training, implementation assistance, educational outreach for organized activities and events, community stewardship grants, elementary education, environmental education at a fair, and staff labor.

Water Quality Monitoring

The total cost of this category was $131,326. Of this cost, $7,200 was for water quality sampling at two locations. Both chronic and acute toxicity tests were performed (Silva, pers. comm., 9/22/04).

Contributions to the ACCWP totaled $124,126 and were for regional state board annual fees, mercury testing, watershed inventory, data management, GIS assistance, fishery assessment, contract recreation, litter and leaf control, TMDL compliance tasks, diazinon grant, analytical services, a monitoring project, and staff labor.

Watershed Management

The total cost of this category was $17,610. All of the costs in this category represent contributions to the ACCWP for development of a watershed study framework, assessment of pilot project activities, and staff labor.

References

City of Fremont, 2003. “Alameda Countywide Clean Water Program Fiscal Year 2002/03 Annual Report”. Volume III of IV.

Table C- 1. Fremont Cost Organized by Cost Survey Category

Cost Survey Categories

Activity Description

Construction Site Stormwater Runoff Control

Description	External Contract	Relation to Permit[a]	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Construction inspections by USD		New	17,715	Table C-4	100%	197	inspections[b]	Fremont, 2004b	89.93	$/inspection
Total			17,715		0.6%	of total stormwater cost				

Illicit Discharge Detection and Elimination

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Assistance to eliminate non-stormwater discharges, analyze findings, reporting		New	5,081	Table C-5, Item 8.1	85.9%					
Staff labor (including overhead)		New	836	Table C-5, Item 8.2	14.1%					
Total			5,917		0.2%	of total stormwater cost				

Industrial and Commercial Management Programs

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Business inspection		New	160,861	Table C-4	76.6%	482	inspections	Silva, pers. comm. 9/22/04	333.74	$/inspection
Inspection documentation		New	31,697	Table C-4	15.1%					
Inspections, outreach activity, track findings, refine guidelines, training, reporting		New	16,694	Table C-5, Item 9.1	7.9%					
Staff labor (including overhead)		New	775	Table C-5, Item 9.2	0.4%					
Total			210,027		6.8%	of total stormwater cost				
Overall Cost Category Normalizations										
total category $ per inspection						482	inspections	Silva, pers. comm. 9/22/04	435.74	total $/inspection

Overall Stormwater Program Management

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Labor for city stormwater staff		New	171,047	Table C-2, Items 1,2,3, and 4	37.7%					
Office supplies		New	558	Table C-2, item 7	0.1%					
Periodicals		New	469	Table C-2, item 8	0.1%					
Printing		New	1,688	Table C-2, item 9	0.4%					
Collection fee		New	11,777	Table C-2, Item 11	2.6%					
NPDES fee		New	8,750	Table C-2, Item 16	1.9%					
Telephone		New	13	Table C-2, item 19	0.0%					
Postage		New	75	Table C-2, item 20	0.0%					
Travel expenses		New	403	Table C-2, item 21	0.1%					
Training		New	840	Table C-2, item 22	0.2%					
Technical training		New	1,750	Table C-2, item 23	0.4%					
Office machines<$5k		New	350	Table C-2, item 28	0.1%					
Informational systems		New	19,375	Table C-2, Item 33	4.3%					
Worker's comp		New	590	Table C-2, item 34	0.1%					
General liability		New	3,058	Table C-2, item 35	0.7%					
Overhead allocation		New	110,737	Table C-2, Item 37	24.4%					
ACCWP participation		New	12,928	Table C-4	2.8%					
Reporting		New	7,659	Table C-4	1.7%					
Meeting		New	6,107	Table C-4	1.3%					
Mitigation		New	136	Table C-4	0.0%					
Regulatory advising, institute improvements, support committees, legal advice, website, and newsletter		New	32,372	Table C-5, Item 2.1	7.1%					

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Table C – 1. Continued.

Dues for regional stormwater representation groups and tasks of regional benefit		New	10,887	Table C-5, Item 2.2	2.4%					
NPDES permit fee (ACCWP)		New	2,903	Table C-5, Item 2.3	0.6%					
Program contingency		New	10,670	Table C-5, Item 2.4	2.4%					
Contribution to support business-water quality incentives program		New	2,903	Table C-5, Item 2.5	0.6%					
Miscellaneous		New	5,081	Table C-5, Item 2.6	1.1%					
Staff labor for ACCWP (including overhead)		New	30,745	Table C-5, Item 2.8	6.8%					
Total			453,872		14.6%	of total stormwater cost				

Pollution Prevention and Good Housekeeping for Municipal Operations

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Street Sweeping Program						31,405	curb miles swept	Silva, pers. comm., 9/22/04	60.98	$/curb mile swept
Street sweeping		Enhanced	115,000	Table C-2, Item 30	5.4%					
Street sweeping		Enhanced	1,800,000	Table C-2, Item 31	84.6%					
Litter/debris removal		Existing	200,000	Table C-2, Item 32	9.4%					
Performance standard updating and development		New	12,339	Table C-5, Item 6.1	0.6%					
Staff labor (including overhead)		Enhanced	836	Table C-5, Item 6.2	0.0%					
Total			2,128,175		68.6%	of total stormwater cost				

Table C1 continued

Post Construction Stormwater Management in New Development and Redevelopment

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Quasi external expenditure		New	19,746	Table C-2, Item 36	56.3%					
Controls guidance, watershed inventory, consruction activities, performance standards, coordination		New	11,613	Table C-5, Item 7.1	33.1%					
Reprographic services (brochures)		New	2,177	Table C-5, Item 7.2	6.2%					
Staff labor (including overhead)		New	1,546	Table C-5, Item 7.3	4.4%					
Total			35,083		1.1%	of total stormwater cost				

Public Education, Outreach, Involvement, and Participation

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Creek clean-up		New	5,200	Table C-2, Item 6	5.1%					
Advertising		New	310	Table C-2, Item 24	0.3%					
Storage space rental		New	210	Table C-2, Item 25	0.2%					
Math Science Nucleus (MSN) Environmental Education		New	6,803	Table C-3	6.7%					
Citywide newsletter		New	12,500	Table C-3	12.3%					
Public Education		New	25,897	Table C-4	25.5%					
Effectiveness evaluation, staff training, implemenation assistance		New	6,532	Table C-5, Item 5.2	6.4%					
Educational outreach for organized activities and events		New	4,355	Table C-5, Item 5.3	4.3%					
Community stewardship grants, implementation assistance		New	13,282	Table C-5, Item 5.4	13.1%					
Baysavers elementary education curriculum and implemenation		New	8,129	Table C-5, Item 5.5	8.0%					
Bay area environmental education resource fair		New	363	Table C-5, Item 5.6	0.4%					
General outreach		New	7,258	Table C-5, Item 5.7	7.1%					
Staff labor (including overhead)		New	10,876	Table C-5, Item 5.8	10.7%					
Total			101,717		3.3%	of total stormwater cost				

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Table C – 1. Continued.

Water Quality Monitoring

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Water quality sampling		New	7,200	Table C-3	5.5%					
Regional state board annual fee		New	20,323	Table C-5, Item 4.1	15.5%					
Murcury testing		New	9,436	Table C-5, Item 4.2	7.2%					
Watershed inventory, data management, and GIS asstistance		New	20,323	Table C-5, Item 4.3	15.5%					
Fishery assessment, contract recreation, litter and leaf control		New	18,871	Table C-5, Item 4.4	14.4%					
Contribution to TMDL compliance tasks		New	23,226	Table C-5, Item 4.5	17.7%					
Diazinon grant		New	1,452	Table C-5, Item 4.6	1.1%					
Analytical services		New	6,678	Table C-5, Item 4.7	5.1%					
Monitoring project		New	5,807	Table C-5, Item 4.8	4.4%					
Staff labor (inlcuding overhead)		New	18,011	Table C-5, Item 4.10	13.7%					
Total			131,326		4.2%	of total stormwater cost				

Watershed Management

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Development of watershed study framework, assessment of pilot project activities		New	9,435.65	Table C-5, Item 3.2	53.6%					
Staff labor (including overhead)		New	8,173.96	Table C-5, Item 3.4	46.4%					
Total			17,609.60		0.6%	of total stormwater cost				

Total Stormwater Costs 3,101,442

a. This column indicates whether required activities were being performed prior to stormwater permits. In some cases activities were enhanced due to permit requirements.
b. Inspections for construction includes 58 erosion control inspections and 157 construction site inspections.

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Table C-2. Source Data Table Submitted by City of Fremont (cost survey categories added)

Item #	City of Fremont Category	Total Cost	Cost Survey Category[1]
1	Salaries	115,954.72	Management
2	Benefits	37,413.57	Management
3	Overtime	928.78	Management
4	Part time salaries	16,750.10	Management
5	Promotional Materials	0.00	
6	Misc Operating Supplies	5,199.59	Public Education
7	Office Supplies	558.25	Management
8	Periodicals	469.06	Management
9	Printing	1,687.98	Management
10	Legal	0.00	
11	Consultant Services	11,777.40	Management
12	Contractual Services	26,503.39	See Table C-3
13	Photographic Services	0.00	
	Governmental Services[2]		
14	Union Sanitary District	263,000.00	See Table C-4
15	Alameda Countywide Clean Water Program	339,990.00	3 See Table C-5
16	State Water Resource Control Board	8,750.00	Management
	Media Purchase/Advertising		
18	Other Professional Services	0.00	
19	Telephone	12.96	Management
20	Postage	75.00	Management
21	Travel Expenses	403.43	Management
22	Training	840.29	Management
23	Technical Training	1,750.00	Management
24	Advertising development	310.00	Public Education
25	Space Rental	210.00	Public Education
26	Equipment Rental	0.00	
27	Office Machines > $5k	0.00	
28	Office Machines<$5k	350.00	Management
29	Office Furniture	0.00	
30	Interfund Transfers	115,000.00	Pollution Prevention
31	Interfund Transfers	1,800,000.00	Pollution Prevention
32	Interfund Transfers	200,000.00	Pollution Prevention
33	Info Systems	19,375.20	Management
	Transfer to Veh Repl Rund		
34	Worker's Comp	590.42	Management
35	General Liability	3,058.22	Management
36	Quasi-External Expenditure	19,746.31	Post Construction
37	Overhead Allocation	110,737.00	Management
	Total	3,101,441.67	

(Source: Silva, pers. comm., 4/5/04)

1. Cost Categories Abbreviated According to the Following:
   Construction: Construction Site Stormwater Runoff Control

Table C-2. Continued.

Illicit Discharge: Illicit Discharge Detection and Elimination
Industrial: Industrial and Commercial Management Programs
Management: Overall Stormwater Program Management
Pollution Prevention: Pollution Prevention and Good Housekeeping for Municipal Operations
Post Construction: Post Construction Water Management in New Development and Redevelopment
Public Education: Public Education, Outreach, Involvement, and Participation
Monitoring: Water Quality Monitoring
Watershed: Watershed Management

2. The original total submitted for total governmental services was $611,417. This figure was changed per email from Barbara Silva on 6/10/04 to 611,750 as shown by the breakdown between Union Sanitary District, Alameda Countywide Clean Water Program, and State Water Resource Control Board.

3. This number was adjusted down from $340,000 upon reciept of contract breakdown (see Table C-5).

Table C-3. Breakdown of Contractual Services (Table C-2, Item 12)

Description	Cost	Cost Survey Category
Math Science Nucleus (MSN) Environmental Education	6,803	Public Education
Water quality sampling (Pacific Eco Risk)	7,200	Monitoring
Citywide newsletter	12,500	Public Education
Total	26,503	

(Source: Silva, pers. comm., 4/15/04)

Table C-4. Breakdown of Union Sanitation District (USD) Cost (Table C-2, Item 14)

Description	Cost	Cost Survey Category
Public education	25,897	Public Education
ACCWP participation	12,928	Management
Reporting	7,659	Management
Meeting	6,107	Management
Inspection documentation	31,697	Industrial
Mitigation	136	Management
Construction inspection	17,715	Construction
Business inspection	160,861	Industrial
	263,000	

(Source: Silva, pers. comm., 4/15/04)

Table C-5. ACCWP Cost Breakdown

GENERAL CLEAN WATER PROGRAM 2002-2003

Budget Unit 50201 **F15W81** **PROGRAM MANAGER: Jim Scanlin**

2. PLANNING AND REGULATORY COMPLIANCE

MAKE ENTRIES IN YELLOW BOXES

						GENERAL PROGRAM AMOUNT	% of Grand Total	Fremont Contribution
1	EISENBERG OLIVIERI ASSOCIATES	E01				$223,000	10%	32,372
	Regulatory Advising, Institute Improvements, Support Committees, Legal Advice, Website, and Newsletter							
2	PARTICIPATION IN REGIONAL STORMWATER EFFORTS	J11				$75,000	3%	10,887
	Dues for Regional Stormwater Representation Groups and tasks of regional benefit							
3	NPDES PERMIT FEE	J11				$20,000	1%	2,903
	Fee for Countywide Clean Water Program Permit - Required by Regional Water Board							
4	CONTINGENCY					$73,500	3%	10,670
	Program Contingency Amount							
5	GREEN BAY BUSINESS PROGRAM	J11				$20,000	1%	2,903
	Contribution to Support Business - Water Quality Incentives Program							
6	SPECIAL DEPARTMENTAL ACCOUNT					$35,000	1%	5,081
	Dan will tell us what this covers							
7	CONTRACT					$0	0%	0
	To fulfill Total Maximum Daily Load (TMDL) requirements							
8	STAFF --					$211,793	9%	30,745
	R. HALE	J01	300	85.00	$25,500			
	J. SCANLIN	J02	1,332	80.00	$106,560			
	G. SHAWLEY	J02	145	63.00	$9,135			
	LABOR OVERHEAD				$70,598			
				TOTAL PROGRAM ADMINISTRATION		$658,293	28%	95,560
		CLEAN WATER DIV. STAFF HRS.	1,777					

3. FOCUSED WATERSHED STUDIES

1	CONTRACTOR TO BE DETERMINED	E03				$0	0%	0
	Watershed Activities in Watersheds Tributary to Lake Merritt and Laguna Creek							
2	APPLIED MARINE SCIENCES	E03				$65,000	3%	9,436
	Develop Watershed Study Framework, Assess Pilot Project Activities							
3	NAME OF CONTRACTOR							
	Dexcription of service							
4	STAFF					$56,309	2%	8,174
	E. DA COSTA	J03	29	58.00	$1,682			
	A. FENG	J03	399	63.00	$25,137			
	J. SCANLIN	J03	134	80.00	$10,720			
	LABOR OVERHEAD				$18,770			
				TOTAL FOCUSED WATERSHED STUDIES		$121,309	5%	17,610
		HRS.	562					

4. WATER QUALITY MONITORING

							% of Grand Total	Fremont Contribution
1	REGIONAL WATER BOARD FEE FOR REGIONAL MONITORING PROGRAM	E04				$140,000	6%	20,323
	Annual Fee Required by Regional Water Board to Monitor and Report on Health (Water Quality) of San Francisco Bay Estuary							
2	APPLIED MARINE SCIENCES (AMS)	E04				$65,000	3%	9,436
	Mercury Testing							
3	ENVIRONMENTAL IMPACT PLANNING CORP. (EIP)	E04				$140,000	6%	20,323
	Watershed Inventory, Data Management, and Geographical Information Systems Assistance							
4	URS CONSULTANTS	E04				$130,000	6%	18,871
	Assess Fisheries, Contact Recreation, Litter and Leaf Control							
5	REQUIRED CONTRIBUTION TO WATER QUALITY ATTAINMENT STRATEGIES	E04				$160,000	7%	23,226
	Contribution to MOU-based Total Maximum Daily Load compliance tasks.							
6	DIAZINON GRANT	E04				$10,000	0%	1,452
	Diazinon Grant							
7	SYSTECH ENGINEERING					$46,000	2%	6,678
	Analytical Services							
8	CLEAN WATER AGENCIES TMDL COPPER-NICKEL MONITORING PROJECT					$40,000	2%	5,807
	Dexcription of service							
9	NAME OF CONTRACTOR							
	Dexcription of service							
10	STAFF					$124,077	5%	18,011
	E. DA COSTA	J04	20	58.00	$1,160			
	A. FENG	J04	956	63.00	$60,228			
	S. MILLER	J04	300	43.00	$12,900			
	TRAINEE	J04	40	26.00	$1,040			
	J. SCANLIN	J04	53	80.00	$4,240			
	G. SHAWLEY	J04	50	63.00	$3,150			
	LABOR OVERHEAD				$41,359			
				TOTAL WATER QUALITY MONITORING		$855,077	37%	124,126
		HRS.	1,419					

5. PUBLIC INFORMATION/PARTICIPATION

			GENERAL PROGRAM AMOUNT	% of Grand Total	Fremont Contribution
1	TARGETED OUTREACH / REGIONAL ADVERTISING	E05	$0	0%	0
	Targeted Outreach to Meet Public Information Requirements - REGIONAL ADVERTISING				
2	EISENBERG OLIVIERI ASSOCIATES (EOA)	E05	$45,000	2%	6,532
	Evaluate Effectiveness, Clean Water City and County Staff Training, Assist Implementation				

Table C-5. Continued.

3	**ESTUARY ACTION CHALLENGE**	E05				$30,000	1%	4,355
	Educational Outreach for Organized Activities and Events							
4	**AQUATIC OUTREACH INST. (AOI) Kids in Creeks**	E05				$91,500	4%	13,282
	Community Stewardship Grants, Educ.Outreach (Kids in Creeks, Gardens, Marshes & Workshops) Assist Implementation							
5	**RESOURCE CONSERVATION DIST. (RCD) - Baysavers**	E05				$56,000	2%	8,129
	Educational Support - Baysavers Elementary Education Curriculum and Implementation							
6	**BAY AREA ENVIRONMENTAL EDUCATION RESOURCE FAIR (BAEER FAIR)**	E05				$2,500	0%	363
	Educational Support							
7	**CONTRACTOR TO BE DETERM. GEN'L OUTREACH**					$50,000	2%	7,258
	Reinforce Message in Communities							
8	**STAFF**					$74,925	3%	10,876
	L. CERVANTES	J05	850	53.00	$45,050			
	S. GOSSELIN	J05	70	70.00	$4,900			
	LABOR OVERHEAD				$24,975			
					TOTAL PUBLIC INFORMATION / PARTICIPATION	**$349,925**	15%	50,796
		HRS.	920					

6. MUNICIPAL MAINTENANCE PRACTICES

							% of Grand Total	Fremont Contribution
1	**EISENBERG OLIVIERI ASSOCIATES (EOA)**	E06				$85,000	4%	12,339
	Update and Develop Perform. Stds, Coordinate Maint Actvties, ID Struct Controls, Maint. Data Mgmt, Maint. Outreach, Maint Component Mgmt.							
2	**STAFF**					$5,760	0%	836
	J. SCANLIN	J06	48	80.00	$3,840			
	LABOR OVERHEAD				$1,920			
					TOTAL MUNICIPAL MAINTENANCE	**$90,760**	4%	13,175
		HRS.	48					

7. NEW DEVELOPMENT AND CONSTRUCTION SITE CONTROLS

1	**EISENBERG OLIVIERI ASSOCIATES (EOA)**	E07				$80,000	3%	11,613
	Guidance on Stormwtr Controls, Constr. Actvties, Outreach, Perf. Stds. Wshed Inventry, Coord. w/ District, Component Mgmt.							
2	**REPROGRAPHIC SVCS. ALCOLINK (Brochures)**					$15,000	1%	2,177
	Dexcription of service							
3	**STAFF**					$10,650	0%	1,546
	D. BACH	J07	100	47.00	$4,700			
	J. SCANLIN	J07	30	80.00	$2,400			
	LABOR OVERHEAD				$3,550			
					TOTAL NEW DEVELOPMENT AND CONSTRUCTION SITE CONTROLS	**$105,650**	5%	15,337
		HRS.	130					

8. ILLICIT DISCHARGE CONTROLS

1	**EISENBERG OLIVIERI ASSOCIATES (EOA)**	E08				$35,000	1%	5,081
	Assist to Eliminate Non-Stormwater Discharges, Analyze Illicit Discharge Findings, Share Information on Non-Stormwater Discharges, Illicit Discharge Reporting							
2	**STAFF**					$5,760	0%	836
	J. SCANLIN	J08	48	80.00	$3,840			
	LABOR OVERHEAD				$1,920			
					TOTAL ILLICIT DISCHARGE CONTROLS	**$40,760**	2%	5,917
		HRS.	48					

9. INDUSTRIAL INSPECTION PROGRAM

1	**EISENBERG OLIVIERI ASSOCIATES (EOA)**	E09				$115,000	5%	16,694
	Conduct Insp & Outreach Activtes, Track Findings, Share Info on Facilites, Refine Indus BMP Guidelilnes, Insp Training, Insp Reporting							
2	**STAFF**					$5,340	0%	775
	J. SCANLIN	J09	45	80.00	$3,560			
	LABOR OVERHEAD				$1,780			
					TOTAL INDUSTRIAL INSPECTION PROGRAM	**$120,340**	5%	17,469
		CLEAN WATER DIV. STAFF HRS.	45					

TOTAL GENERAL PROGRAM	**$2,342,113**	100%	339,990

MAKE ENTRIES IN YELLOW SHADED CELLS ONLY

To change revision date, go to tab entitled ALTERNATIVES - STAFFING & COSTS

REVISION: 2/3/02

STAFF	HRS	AMOUNT
D. Bach	100	$4,700
L. Cervantes	850	$45,050
E. da Costa	49	$2,842
A. Feng	1,355	$85,365
S. Gosselin	70	$4,900
R. Hale	300	$25,500
S. Miller	300	$12,900
J. Scanlin	1,690	$135,160
G. Shawley	195	$12,285
Trainee	40	$1,040
TOTAL HOURS	4,949	
TOTAL BURDENED LABOR		$329,742
TOTAL STAFF with overhead		**$494,613**

FUNDING

AVAILABLE FUND BALANCE

$242,113 (for current fiscal year)

	CONTRIBUTIONS	PROPORTION	
5083	$83,580	0.03980	ALAMEDA
5084	$21,000	0.01000	ALBANY
5085	$107,310	0.05110	BERKELEY
5086	$49,350	0.02350	DUBLIN
5087	$21,000	0.01000	EMERYVILLE
5088	$339,990	0.16190	FREMONT
5089	$235,410	0.11210	HAYWARD
5090	$123,270	0.05870	LIVERMORE
5091	$57,750	0.02750	NEWARK
5092	$462,420	0.22020	OAKLAND
5093	$21,000	0.01000	PIEDMONT
5094	$114,030	0.05430	PLEASANTON
5096	$104,160	0.04960	SAN LEANDRO
5097	$104,790	0.04990	UNION CITY
5082	$254,940	0.12140	UNINCORPORATED AREA (from F15W82 spread)
TOTAL CONTRIBUTIONS	$2,100,000	1.00000	**TOTAL SHARES**
TOTAL FUNDING	**$2,342,113**		

PROGRAM DETAILS:

STAFF WITH OVERHEAD	$494,613
SPECIALIZED SERVICES	$1,752,500
OTHER EXPENSES (fees, etc.)	$95,000
PROGRAM TOTAL:	**$2,342,113**

DETAIL:	MULTI-TASK CONSULTANTS
EOA TOTAL	$583,000
AMS TOTAL	$130,000

(Source: Hale, pers. comm., 7/15/04)

Appendix D Fresno-Clovis Metropolitan Area

This appendix contains backup calculations for each cost survey category in Section 6 and the sources of the cost data. The Fresno-Clovis Metropolitan Area (FCMA) covers the area served by the Fresno Metropolitan Flood Control District (FMFCD). Stormwater permittees in this area include the County of Fresno, city of Fresno, city of Clovis, and the California State University at Fresno (CSUF). The FMFCD was the lead agency for communication on this project. Figure D-1 illustrates how data is shared throughout the tables.

Table D-1 contains all costs from all copermittees organized into the cost survey categories and the remaining tables provide backup to the numbers in Table D-1. The relationship of these tables is described below and presented in figure D-1. Table D-2 contains FMFCD cost organized by survey category but with added detail than what is provided in Table D-1. The cost figures in Table D-2 were summarized from the FMFCD accounting system cost summary (Table D-7).

Table D-3 summarizes the costs for the city of Clovis, Fresno County, city of Fresno, and CSUF respectively. These costs include budgeted costs and actual street sweeping costs, which are subtotaled for each cost survey category.

Table D-4 presents the allocation of city staff labor cost to the stormwater program. Table D-5 presents street sweeping data while Table D-6 presents a recreated portion of an FMFCD financial statement which was used for comparison to stormwater costs submitted by city staff.

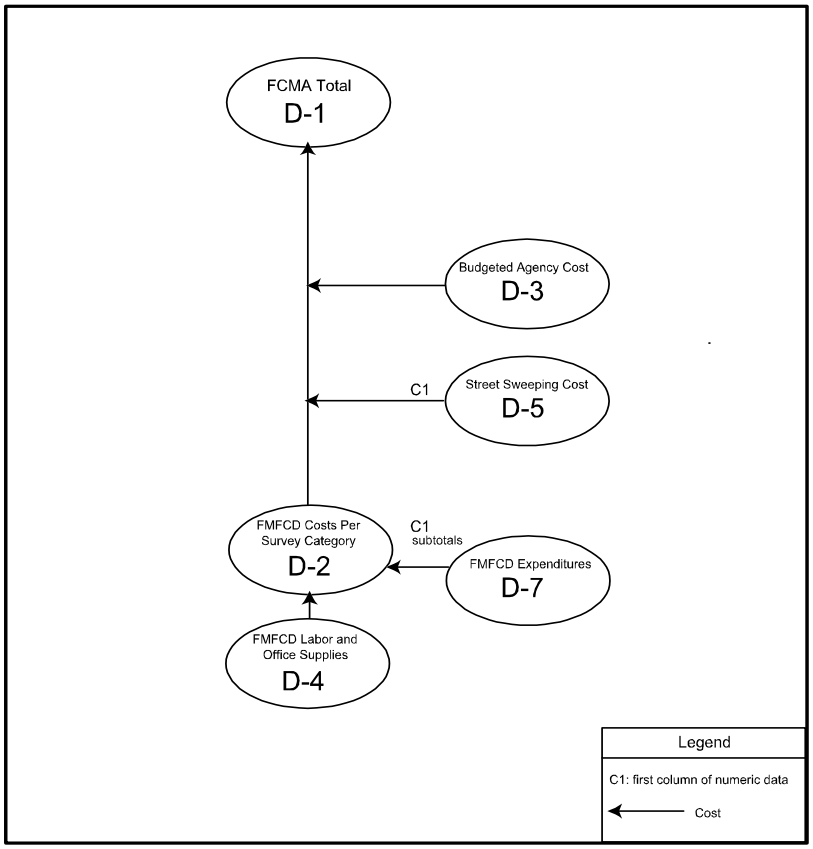

Figure D-1. Fresno-Clovis Metropolitan Area Flowchart

Other Agency Breakdown

Table D-3 contains the budgeted costs contained in the SWQMP report (FMFCD, 1999). These costs are subtotaled for each cost survey category and the subtotals are brought forward to Table D-1. Except for the FMFCD, which submitted actual costs, the costs were taken from the 00/01 budget for the other agencies as presented in the SWMP published in 1999 (FMFCD, 1999). The 00/01 year was used because the implementation of the program under the new permit was delayed for two years. The SWMP assumed the permit would be adopted in 1999 and the first fiscal year of the new program would be 99/00. The permit was not adopted until 2001 and the first fiscal year implementing the new stormwater permit was 00/01. In 02/03, the program only had one year of development. Thus, the second year costs were taken from the SWMP to represent 02/03 costs on the advice of FMFCD staff. Table D-3 includes a 'baseline' cost element. This is for the staff labor of the programs as they already existed at the start of the new permit (Rourke, pers. comm., 6/25/04). Table D-3 also contains an added line item for actual street sweeping costs pulled forward from Table D-5.

Table D-5 contains the street sweeping data collected for the FCMA. Table D-9 also calculates street sweeping cost per mile and estimated sweeping frequency. It should be noted that the estimated frequency for the city of Clovis is nearly four times a week for all streets. This seemed high and it could not be verified with the city. The cost per mile was relatively low ($13), which indicates the costs may be accurate and only the total miles swept is in question.

Notes on Labor Cost

For the FMFCD, the labor costs of the stormwater staff is not distributed among the various programs. Instead, it is all captured under Overall Stormwater Program Management. However, the labor costs from the other agencies within the FMFCD were able to distribute their labor among various programs. This should be considered when comparing costs to other municipalities where such costs are distributed.

Detailed descriptions of how the costs were developed are contained in the following paragraphs.

The reason we allocate FMFCD cost, but not other overall program costs for other cities is because the services provided by outside agencies (e.g. ACCWP to Fremont) are paid for by Fremont. FMFCD gets funds for stormwater directly from households "user fees", "utility bills". If FMFCD did not provide this "free" service, the cities would have to pay for them.

For agencies other than FMFCD, external contracting was not determined for each cost. It is only presented in the text of this appendix on a case-by-case basis. For FMFCD this information is presented in Table D-2.

Construction Site Stormwater Runoff Control

The total cost of this category was $81,800. The costs allocated for this category were only from the city of Clovis (Table D-2), county of Fresno (Table D-3), and the city of Fresno (Table D-4). No statistics were available that described the activity except for the city of Clovis. Clovis conducted 713 inspections at a cost of $29,600, which averages to $42 per inspection. The primary activities performed by each agency were plan reviews, site inspections, enforcement, and employee training. Other activities performed were as follows (source: annual stormwater report, FMFCD, 2003b):

- Identified 163 private detention basins and mailed pond maintenance and vector control fact sheets to pond owners
- Conducted 9 stormwater training workshops and safety tailgate sessions for general contractors, construction site superintendents, field inspectors, plan designers, and municipal regulators
- Increased construction sire inspections and follow-up inspection referrals to the District
- Reviewed construction site guidelines
- Sent out an "Action Alert" notifying area construction sites and companies of new Phase II regulations and schedules
- Included new regulations in training courses and site visits
- Modified the SWPPP to include sampling and analysis guidance
- The District conducted 48 inspections at 15 construction sites

Illicit Discharge Detection and Elimination (IDDE)

The total cost of this category was $13,176. This cost was for investigation, inspection and enforcement. The costs for the FMFCD, county of Fresno, the city of Clovis, and the city of Fresno accounted for two percent, eight percent, eighty-two percent, and eight percent of the IDDE costs, respectively. Activities in this category included the following (source: annual stormwater report, FMFCD, 2003b):

- Field inspectors were trained to identify and report illegal disposals
- Fifty thousand paint sticks were distributed at 17 paint retailers throughout the permit area
- Recharged irrigation waters and nuisance flows
- Participated in Water Awareness Committee and P2 Committee
- Reviewed and revised referral procedures between the District and Copermittees
- Conducted inspector training via workshops and tailgates
- Conducted firefighter training

- The County sponsored the California Conservation Corp to stencil 527 storm drain inlets in Clovis
- Students stenciled 73 storm drain inlets in the city of Clovis
- The District conducted 71 complaint inspections in response to citizen or Copermittee referrals
- The Clovis Fire Department responded to 82 hazardous waste spills
- The District developed and aired water conservation theater advertisement slides at two major movie theaters with over 30 screens and sent out 23,000 utility bill inserts to Clovis households in their monthly water bill
- The city of Clovis sent out notices to 22,360 customers reminding them of the outdoor watering rules and what they can to reduce runoff
- In Fresno County, the emergency response team program documented over 289 units of filed activity involving hazardous waste, which included complaints and follow-up enforcement inspections

Industrial and Commercial Management Programs

The cost for this category was $47,480. FMFCD activities include the purchase of phone complaint forms employee training of the other agencies. Other activities in this category included (source: annual stormwater report, FMFCD, 2003b):

- Held industrial training workshops
- Distributed over 65 model SWPPPs
- Coordinated with County Hazardous Waste and Fresno Industrial Waste inspectors to review inspection and referral procedures
- Conducted audits of 5 Copermittee corporation yards
- The District conducted 14 complaint-driven commercial and industrial inspections and 42 routine industrial inspections at NPDES permitted facilities

Overall Stormwater Program Management

The total cost of this category was $560,495. FMFCD accounted for approximately 98 percent of this category's cost. Most of this was labor cost (see Table D-7 for details). The other costs for this category were attributable to the following activities:

- Travel
- Meetings and conferences
- Dues and fees
- Food
- Printing

- Office supplies
- SWRCB fees
- Handbooks

Pollution Prevention and Good Housekeeping for Municipal Operations

The total cost for this category was $2,240,605. Clovis accounted for 28% and the city of Fresno accounted for 70% due primarily to street sweeping costs (Table D-9).

Other agency costs were for road maintenance, street cleaning, corporation yard guidance, and staff labor.

Other specific activities attributed to this category included (source: annual stormwater report, FMFCD, 2003b):

- Completed digitizing the District's stormwater conveyance system into the District's GIS system
- Developed, organized, and facilitated stormwater pollution prevention training courses for parks and open space maintenance personnel
- The District removed accumulated sediments from their retention basins
- Training of employees

Post Construction Stormwater Management in New Development and Redevelopment

The total cost of this category was $57,539. Most of the cost for this category was for the detention and retention basin operation and maintenance funded by FMFCD. The following detention and retention maintenance activities were performed:

- Cleaned 35 basins
- Rodent control
- Tree care
- Sediment removal and disposal
- Equipment rental
- Vegetation removal and recycling
- Vaccum truck cleaning
- Reviewed monitoring studies
- Completed standards research
- The District incorporated post construction standards in its Code of Requirements
- Soil monitoring

- Fence repair

The other agencies had no cost attributable to this category.

Public Education and Outreach and *Public Involvement and Participation*

The total cost of this category was $210,716. Most of the $208,016 paid by FMFCD was for professional services, newspaper advertisements, utility bill inserts, and other miscellaneous costs. The other agency costs were for school education, staff labor, and coordination with other programs. Other activities performed were (source: annual stormwater report, FMFCD, 2003b):

- Developed and aired three new Public Service Announcements (English and Spanish) targeting pollution prevention and water awareness
- Completed seven Clean Storm Water Grants to community organizations focused on stormwater education
- Continued implementation of a community wide integrated pest management program
- Conducted numerous presentations to community groups and school programs
- Produced a new brochure
- Participated in the local Pollution Prevention Committee
- Provided training for local inspectors
- The District maintained active membership with WERF, participated with the National Association of Flood and Storm Water Managers Association, provided $10,000 to WERF for stormwater research initiatives, and provided comments to EPA though the Storm Water Quality Task Force
- Participated in 18 community and public education events
- Provided a public education display illustrating ways to manage solid waste to incorporated cities throughout the County
- Conducted tours of the American Avenue Landfill for fourth grade to college level students
- Developed training manuals, theater slides, bus signage, pond maintenance fact sheets, mosquito abatement, control, and home owner fact sheets to promote BMPs and the SWQMP program
- Updated public education and technical assistance outreach materials
- Developed and implemented IPM Point of Purchase program
- Awarded 20 grants totaling $20,000
- Provided teacher workshops

Water Quality Monitoring

The total cost of this category was $252,918. The costs were for the FMFCD for the following activities:

- Monitoring
- Consulting
- Phone usage
- Communications
- WERF subscription

The other agencies had no cost attributable to this category.

References

FMFCD. 2003. "Annual Report FY 2002-2003, Fresno-Clovis Storm Water Quality Management Program" Volume 1: Program Evaluations.

Table D-1. Fresno-Clovis Metropolitan Area Costs Organized by Cost Survey Category

Cost Survey Categories

Activity Description

Construction Site Stormwater Runoff Control

Description	Relation to Permit[a]	Dollar Amount	Source	% of Category
FMFCD		0	N/A	0.0%
City of Clovis	New	29,600	Table D-3	36.2%
County of Fresno	New	6,900	Table D-3	8.4%
City of Fresno	New	45,300	Table D-3	55.4%
CSUF		0	N/A	0.0%
Total		81,800		2.4% *

Illicit Discharge Detection and Elimination

Description	Relation to Permit	Dollar Amount	Source	% of Category
FMFCD	New	76	Table D-2	0.6%
City of Clovis	New	10,100	Table D-3	76.7%
County of Fresno	New	1,000	Table D-3	7.6%
City of Fresno	New	1,000	Table D-3	7.6%
CSUF	New	1,000	Table D-3	7.6%
Total		13,176		0.4% *

Industrial and Commercial Management Programs

Description	Relation to Permit	Dollar Amount	Source	% of Category
FMFCD	New	22,180	Table D-2	46.4%
City of Clovis	New	6,100	Table D-3	12.8%
County of Fresno	New	8,200	Table D-3	17.2%
City of Fresno	New	10,400	Table D-3	21.8%
CSUF	New	900	Table D-3	1.9%
Total		47,780		1.4% *

Overall Stormwater Program Management

Description	Relation to Permit	Dollar Amount	Source	% of Category
FMFCD	New	560,895	Table D-2	98.3%
City of Clovis	New	1,600	Table D-3	0.3%
County of Fresno	New	3,200	Table D-3	0.6%
City of Fresno	New	3,200	Table D-3	0.6%
CSUF	New	1,600	Table D-3	0.3%
Total		570,495		16.4% *

Table D-1. Continued.

Pollution Prevention and Good Housekeeping for Municipal Operations

Description	Relation to Permit	Dollar Amount	Source	% of Category
FMFCD	New	29,409	Table D-2	1.3%
City of Clovis	Enhanced	631,696	Table D-3	28.2%
County of Fresno	Enhanced	5,300	Table D-3	0.2%
City of Fresno	Enhanced	1,572,500	Table D-3	70.2%
CSUF	Enhanced	1,700	Table D-3	0.1%
Total		2,240,605		64.5% *

Post Construction Stormwater Management in New Development and Redevelopment

Description	Relation to Permit	Dollar Amount	Source	% of Category
FMFCD	Existing	57,539	Table D-2	100.0%
City of Clovis		0	N/A	0.0%
County of Fresno		0	N/A	0.0%
City of Fresno		0	N/A	0.0%
CSUF		0	N/A	0.0%
Total		57,539		1.7% *

Public Education, Outreach, Involvement, and Participation

Description	Relation to Permit	Dollar Amount	Source	% of Category
FMFCD	New	208,016	Table D-2	98.7%
City of Clovis	New	200	Table D-3	0.1%
County of Fresno	New	2,500	Table D-3	1.2%
City of Fresno		0	N/A	0.0%
CSUF		0	N/A	0.0%
Total		210,716		6.1% *

Water Quality Monitoring

Description	Relation to Permit	Dollar Amount	Source	% of Category
FMFCD	New	252,918	Table D-2	100.0%
City of Clovis		0	N/A	0.0%
County of Fresno		0	N/A	0.0%
City of Fresno		0	N/A	0.0%
CSUF		0	N/A	0.0%
Total		252,918		7.3% *

Total Stormwater Cost	**3,475,029**

a. This column indicates whether required activities were being performed prior to stormwater permits. In some cases activities were enhanced due to permit requirements.

* This percentage is calculated by dividing the total "cost survey category" cost by the "total stormwater cost".

Table D-2. FMFCD Costs Organized by Cost Survey Category

Cost Survey Categories

Activity Description

Construction Site Stormwater Runoff Control

Description	External Contract	Relation to Permit[a]	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
			0							
Total			0			of total FMFCD stormwater program costs				

Illicit Discharge Detection and Elimination

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Investigation, Inspection, Enforcement		New	76	Table D-7, Item 39	100%					
Total			76		0.0%	of total FMFCD stormwater program costs				

Industrial and Commercial Management Programs

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Phone complaints		New	333	Table D-7, Item 58	1.5%					
Geosyntec services	x	New	21,791	Table D-7, Items 15 & 16	98.2%					
Miscellaneous		New	56	Table D-7, Item 17	0.3%					
Total			22,180		2.0%	of total FMFCD stormwater program costs				

Table D-1 continued

Overall Stormwater Program Management

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Travel		New	2,382	Table D-7, Items 10 & 50	0.4%					
Meetings and conferences		New	1,508	Table D-7, Items 11& 51	0.3%					
Dues and fees		New	10,000	Table D-7, Item 12	1.8%					
Training		New	1,261	Table D-7, Items 13 & 53	0.2%					
Miscellaneous expenses		New	7,519	Table D-7, Items 14 & 56	1.3%					
Food		New	341	Table D-7, Item 45	0.1%					
Printing		New	622	Table D-7, Item 47	0.1%					
Office supplies		New	172	Table D-7, Item 48	0.0%					
SWRCB fees		New	17,750	Table D-7, Item 49	3.2%					
Handbooks		New	66	Table D-7, Item 54	0.0%					
Program expenses		New	112	Table D-7, Item 57	0.0%					
Personnel expenses		New	498,300	Table D-4	88.8%					
Office administration		New	20,864	Table D-4	3.7%					
Total			560,895		49.6%	of total FMFCD stormwater program costs				

046298

Table D-2. Continued.

Pollution Prevention and Good Housekeeping for Municipal Operations

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
BMP Hanbook Update		New	10,000	Table D-7, Item 2	34.0%					
Geosyntec services	x	New	1,996	Table D-7, Item 3	6.8%					
Truck cleaning		New	15,749	Table D-7, Items 33 & 35	53.6%					
Utility expense		New	1,007	Table D-7, Item 36	3.4%					
Fresno Pipeline		New	657	Table D-7, Item 34	2.2%					
Total			29,409		2.6%	of total FMFCD stormwater program costs				

Table D-7 continued

Post Construction Stormwater Management in New Development and Redevelopment

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Basin maintenance		Existing	8,174	Table D-7, Item 19	14.2%	8	basins	FMFCD, 2003b	7,192.34	category $/basin
Wild agreement	x	Existing	2,460	Table D-7, Item 20	4.3%					
Rodent control		Existing	1,380	Table D-7, Item 21	2.4%					
Tree care		Existing	290	Table D-7, Item 22	0.5%					
Spruce Ave		Existing	3,439	Table D-7, Item 23	6.0%					
Miscellaneous expenses		Existing	2,237	Table D-7, Item 24	3.9%					
Fuel expense		Existing	1,230	Table D-7, Item 25	2.1%					
Matt and sons agreement	x	Existing	16,989	Table D-7, Item 26	29.5%					
Equipment rental		Existing	433	Table D-7, Item 27	0.8%					
Greenwaste		Existing	2,365	Table D-7, Item 28	4.1%					
Vaccum truck cleaning		Existing	1,015	Table D-7, Item 29	1.8%					
Matt and sons	x	Existing	2,129	Table D-7, Item 30	3.7%					
Cerutti agreement	x	Existing	1,825	Table D-7, Item 31	3.2%					
Emmetts agreement	x	Existing	2,560	Table D-7, Item 32	4.4%					
Fence repair		Existing	584	Table D-7, Item 37	1.0%					
Soil monitoring		Existing	10,428	Table D-7, Item 38	18.1%					
Total			57,539		5.1%	of total FMFCD stormwater program costs				

046299

Table D-2. Continued.

Public Education, Outreach, Involvement, and Participation

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Panagraph Inc.	x	New	47,008	Table D-7, Item 7	22.6%					
Panagraph services	x	New	39,177	Table D-7, Item 8	18.8%					
Miscellaneous expenses		New	96,690	Table D-7, Items 9, 18, & 46	46.5%					
Utility bill inserts		New	2,525	Table D-7, Item 55	1.2%					
Newspaper description		New	15,095	Table D-7, Item 59	7.3%					
Grant		New	7,521	Table D-7, Item 52	3.6%					
Total			208,016		18.4%	of total stormwater cost				

Table D-1 continued

Water Quality Monitoring

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Geosyntec monitoring	x	New	44,334	Table D-7, Item 1	17.5%					
Sheit, Handon and Hall	x	New	298	Table D-7, Item 4	0.1%					
LWA monitoring	x	New	156,663	Table D-7, Items 5 & 40	61.9%					
LWA services	x	New	40,258	Table D-7, Items 6 & 43	15.9%					
Phone expense		New	282	Table D-7, Item 41	0.1%					
Communication expense		New	1,083	Table D-7, Item 42	0.4%					
WERF		New	10,000	Table D-7, Item 44	4.0%					
Total			252,918		22.4%	of total FMFCD stormwater program costs				

Total FMFCD Stormwater Cost **1,131,033**

a. This column indicates whether required activities were being performed prior to stormwater permits. In some cases activities were enhanced due to permit requirements.

046300

Table D-3. Summary of Budgeted Stormwater Costs for Fresno Agencies

Item #	Program	Description	City of Clovis	County of Fresno	City of Fresno	CSUF
	Public Involvement and Education	Coordinate with other programs	0	400	0	0
	Public Involvement and Education	Maintain and promote school education	200	0	0	0
	Public Involvement and Education	Baseline costs	0	2,100	0	0
1	**Subtotal**		**200**	**2,500**	**0**	**0**
	Illicit Discharge	Implement inspector training	3,200	0	0	0
	Illicit Discharge	Train response personnel	3,200	0	0	0
	Illicit Discharge	Baseline costs	3,700	1,000	1,000	1,000
2	**Subtotal**		**10,100**	**1,000**	**1,000**	**1,000**
	Operations and Maintenance	Implement guidance for road maintenance activities	700	0	0	0
	Operations and Maintenance	Implement street cleaning practices (see 'Actual' costs)	100	0	0	0
	Operations and Maintenance	Implement corporation yard operation guidance	2,500	0	0	0
	Operations and Maintenance	Baseline costs	3,300	5,300	4,300	1,700
	Operations and Maintenance	*Actual street sweeping cost*	625,096	0	1,568,200	0
3	**Subtotal**		**631,696**	**5,300**	**1,572,500**	**1,700**
	Construction and Development	Review plans, inspect sites, enforce control requirement	19,100	2,600	13,700	0
	Construction and Development	Train agency personnel and development community	100	1,100	10,500	0
	Construction and Development	Baseline costs	10,100	3,200	19,000	0
	Construction and Development	Consider standard requirements	300	0	0	0
	Construction and Development	Implement construction site guidelines	0	0	2,100	0
4	**Subtotal**		**29,600**	**6,900**	**45,300**	**0**
	Commercial and Industrial	Implement inspection and enforcement procedures	0	100	0	0
	Commercial and Industrial	Train employees	1,600	100	0	0
	Commercial and Industrial	Baseline costs	4,500	8,000	10,400	900
5	**Subtotal**		**6,100**	**8,200**	**10,400**	**900**
6	***Overall Stormwater Program Man.*** [1]	Administration and management	**1,600**	**3,200**	**3,200**	**1,600**
	Total		**679,296**	**27,100**	**1,632,400**	**5,200**

Source: Fresno-Clovis Storm Water Quality Management Program, 00/01 budget (Fresno, 1999)

1. The program title was assigned and did not come from the reference.

046301

Table D-4. Calculation of Labor and Office Supply Costs for Stormwater

CAFR Description	Amount	Allocation to Stormwater	Reference	Stormwater Cost
Personnel expense[1]	$4,529,998	11%	Palmoville, pers. comm., 6/10/04	$ 498,299.78
Office Administration[1]	$189,671	11%	Palmoville, pers. comm., 6/10/04	$ 20,863.81

1. From page 20 of FMFCD CAFR, Statement of Revenues, Expenditures and Changes in Fund Balance - Government Funds and Reconcilliation to the Statement of Activities

Table D-5. Street Sweeping Data Submitted by City Staff and Normalization

Entity	Cost[1]	Curb Miles Swept[2]	Cost Per Mile Swept	Approximate City Street Miles
City of Fresno	1,568,200	94,495	16.60	
City of Clovis	625,096	47,430	13.18	235
CSUF	N/A	465	N/A	
County of Fresno	N/A	21	N/A	
Total	2,193,296	142,411	15.40	

1. (Source: Rourke, pers. comm., 8/02/04)
2. (Source: FMFCD, 2003b)

Table D-6. Recreated Portion of FMFCD Financial Statement

Fresno Metropolitan Flood Control District
Statement of Activities
for the year ended June 30, 2003

Functions/Programs	Expenses
General government	$6,388,084
Flood control system	4,010,377
Storm water quality	611,870
Interest on long-term debt	1,010,490
Total	12,020,821

(Source: FMFCD, 2003a.)

Table D-7. Source Data Table Submitted by FMFCD (cost survey categories added)

FMFCD Category	Item Number	DESC	APDesc	GL_Amt	Cost Survey Category[1]
Municipal NPDES Program Development 7030-7036					
		Consulting Services			
	1	GeoSyntec Consultants	2001-2002 SWQM	4,575.17	Monitoring
	1	GeoSyntec Consultants	2001-2002 Stormwater Quality M	952.22	Monitoring
	2	San Bernardino County	Updated Best Mgmt Practice Han	10,000.00	Pollution Prevention
	3	GeoSyntec Consultants	Service through 12/03/2002	683.78	Pollution Prevention
	3	GeoSyntec Consultants Inc	Service thru 01/07/2003	230.94	Pollution Prevention
	1	GeoSyntec Consultants Inc	03/2003 SWQ Monitoring	7,029.84	Monitoring
	1	GeoSyntec Consultants Inc	03/2003 SWQ Monitoring	2,343.45	Monitoring
	3	GeoSyntec Consultants Inc	05/2002 Communication Fee	0.30	Pollution Prevention
	1	GeoSyntec Consultants Inc	4/2003 Storm Water Monitoring	8,262.75	Monitoring
	1	GeoSyntec Consultants Inc	02-03 Storm Water Monitoring	7,302.26	Monitoring
	1	GeoSyntec Consultants Inc	02-03 Stormwater Quality Monit	4,867.72	Monitoring
	3	GeoSyntec Consultants Inc	Service thru 06/30/03	1,081.33	Pollution Prevention
	1	GeoSyntec Consultants Inc	02-03 Stormwater Monitoring	9,000.47	Monitoring
	Item Number		**Total Consulting Services**	**56,330.23**	
Subtotals	1		GeoSWQM7031	44,333.88	Monitoring
	2		SanBMPHan7031	10,000.00	Pollution Prevention
	3		GeoService7031	1,996.35	Pollution Prevention
			Total	56,330.23	
			Difference	0.00	
		Monitoring			
	4	Scheidt Haydon & Hall	SWQM BM02-01 6/26/02-7/02/02 W	298.06	Monitoring
	5	Larry Walker Associates Inc	Storm Water Quality Monitoring	3,530.00	Monitoring
	5	Larry Walker Associates Inc	2001-2002 Stormwater Monitorin	1,680.00	Monitoring
	5	Larry Walker Associates Inc	2001-2002 Stormwater Monitorin	1,680.00	Monitoring
	6	Larry Walker Associates Inc	09/01/02-09/18/02 Professional	173.25	Monitoring
	5	Larry Walker Associates Inc	2002-2003 SWQ Monitoring	132.00	Monitoring
	5	Larry Walker Associates Inc	02-03 Stormwater Quality Monit	2,262.50	Monitoring
	5	Larry Walker Associates Inc	02-03 Stormwater Monitoring	3,515.00	Monitoring
	Item Number		**Total Monitoring**	**13,270.81**	
Subtotals	4		SHHSWQM7033	298.06	Monitoring
	5		LWASWQM7033	12,799.50	Monitoring
	6		LWAProf7033	173.25	Monitoring
			Total	13,270.81	
			Difference	0.00	
		Public Information			
	9	Bank of America	Horizon	25.28	Public Education
	7	Panagraph Inc	07/2002 SWQMP Public Informati	3,831.50	Public Education
	9	Reed & Graham Inc	Bags of Gravel	42.83	Public Education
	7	Panagraph Inc	2002-2003 SWQMP Public Info &	1,636.25	Public Education
	7	Panagraph Inc	2001-2002 SWQMP Public Info &	8,227.38	Public Education
	7	Panagraph Inc	2002-2003 SWQMP Education	5,100.00	Public Education
	7	Panagraph Inc	2001-2002 SWQMP Education	1,713.50	Public Education
	7	Panagraph Inc	10/2002 SWQMP Public Info	4,250.00	Public Education
	9	Bank of America	Water Education Foundation	218.43	Public Education
	8	Panagraph Inc	Service through 10/31/2002	2,677.50	Public Education
	8	Panagraph Inc	Service thru 01/2003	3,271.54	Public Education
	8	Panagraph Inc	Services thru 12/2002	4,160.33	Public Education
	7	Panagraph Inc	2002-2003 SWQMP	5,876.97	Public Education
	8	Panagraph Inc	Services thru 03/2003	9,220.35	Public Education
	7	Panagraph Inc	SWQMP Public Info & Education	16,372.78	Public Education
	8	Panagraph Inc	02-03 Public Info & Education	15,036.32	Public Education
	8	Panagraph Inc	06/2003 Services SWQMP Info	4,810.73	Public Education
	Item Number		**Total Public Information**	**86,471.69**	
Subtotals	7		PanSWQMP7034	47,008.38	Public Education
	8		PanServices7034	39,176.77	Public Education
	9		Misc7034	286.54	Public Education
			Total	86,471.69	
			Difference	0.00	

Table D-7. Continued.

		General Expenses			
	10	Bank of America	Hyatt Regency	180.00	Management
	10	Bank of America	Hertz	93.13	Management
	10	Bank of America	City of Fresno Airport	6.00	Management
	10	David J Pomaville	Travel Reimbursement	5.32	Management
	10	Bank of America	Host Airport Hotel	124.75	Management
	10	Bank of America	Hertz	155.50	Management
	10	Bank of America	City of Fresno Parking	12.00	Management
	10	David J Pomaville	Travel Reimbursement	4.00	Management
	10	Doug Harrison	Travel Reimbursement	32.79	Management
	10	Doug Harrison	Travel Reimbursement	40.00	Management
	10	IMPAC Government Services	Radisson Hotel Sacramento	58.96	Management
	14	IMPAC Government Services	Maguire's Chevron	4.75	Management
	10	IMPAC Government Services	Hertz	81.30	Management
	14	IMPAC Government Services	Flag City	9.55	Management
	11	Calif Stormwater Quality Tas	SWQTF September Meeting Fee	40.00	Management
	10	Bank of America	Doubletree Hotel	108.31	Management
	10	Bank of America	City of Fresno Airport Parking	16.00	Management
	10	Bank of America	The Broiler Restaurant	31.37	Management
	10	Bank of America	Hertz Rent A Car	75.60	Management
	10	David J Pomaville	Reimbursement for Parking	7.00	Management
	11	Groundwater Resources Assoc	Nitrate in Groundwater Conf Re	150.00	Management
	12	SWQTF	2002/2003 Annual Dues	10,000.00	Management
	11	Beck & Duke Travel Service	SWQTF Conference-Ontario	526.00	Management
	10	Bank of America	Holiday Inn on the Bay	109.40	Management
	10	Bank of America	Hertz Rent a Car	63.00	Management
	11	California Storm Water Quali	CASQA Annual Board Meeting	40.00	Management
	10	Bank of America	Oakland Intl Airport Parking	12.00	Management
	10	Bank of America	City of Fresno Airport Parking	8.00	Management
	10	Bank of America	Hertz Rental Car	87.02	Management
	11	Beck & Duke Travel Service	Storm Water Quality Conf San D	374.00	Management
	10	David J Pomaville	Reimbursement Circle K Fuel	12.33	Management
	10	Bank of America	Anthony's Fish Grotto-San Dieg	22.88	Management
	10	Bank of America	Holiday Inn on the Bay	244.88	Management
	10	David J Pomaville	Meal Reimb-Cafe Care Ole'	5.00	Management
	10	David J Pomaville	Meal Reimbursement	15.00	Management
	10	David J Pomaville	Orange Cab-San Diego	12.00	Management
	10	Bank of America	Holiday Inn on the Bay	-109.40	Management
	13	Calif Storm Water Quality As	CASQA BMP Training	480.00	Management
	10	Bank of America	Hertz Rent a Car	-63.00	Management
	13	Calif Storm Water Quality As	CASWA CA BMP Training	480.00	Management
	11	Bank of America	CASQA & APWA Mtgs-Oakland Intl	25.00	Management
	11	Bank of America	CASQA & APWA Mtgs-Union 76	10.82	Management
	11	Bank of America	CASQA & APWA Mtgs-Hertz	152.55	Management
	11	Bank of America	CASQA & APWA Mtgs-City of Fres	16.00	Management
	11	David J Pomaville	CASQA Meeting	62.00	Management
	10	Bank of America	CASQA - Hyatt Regency	155.72	Management
	10	Bank of America	CASQA Meeting-Fresno Parking	16.00	Management
	10	Bank of America	CASQA - Hertz	152.19	Management
	10	Bank of America	CASQA - City of Sacto Parking	5.25	Management
	Item Number		**Total General Expenses**	**14,150.97**	
Subtotals	10		Travel7035	1,780.30	Management
	11		Meetings/Conferences7035	1,396.37	Management
	12		Dues/Fees7035	10,000.00	Management
	13		Training7035	960.00	Management
	14		Misc7035	14.30	Management
			Total	14,150.97	
			Difference	0.00	

Table D-7. Continued.

Industrial NPDES Prog Development 7040-7046

		Consulting Services			
	15	GeoSyntec Consultants	2001-2002 Stormwater Monitorin	518.75	Industrial
	15	GeoSyntec Consultants	2001-2002 SWQM	20.75	Industrial
	15	GeoSyntec Consultants	2001-2002 SWQ Monitoring	2,488.20	Industrial
	16	GeoSyntec Consultants	Service through 12/03/2002	2,842.11	Industrial
	15	GeoSyntec Consultants Inc	03/2003 SWQ Monitoring	1,258.50	Industrial
	17	GeoSyntec Consultants Inc	05/2002 Communication Fee	56.16	Industrial
	15	GeoSyntec Consultants Inc	4/2003 Storm Water Monitoring	8,106.58	Industrial
	15	GeoSyntec Consultants Inc	02-03 Storm Water Monitoring	1,320.00	Industrial
	16	GeoSyntec Consultants Inc	Service thru 06/30/03	3,465.00	Industrial
	15	GeoSyntec Consultants Inc	02-03 Stormwater Monitoring	1,771.00	Industrial
	Item Number		**Total Consulting Services**	**21,847.05**	
Subtotal	15		GeoSWQM7041	15,483.78	Industrial
	16		GeoService7041	6,307.11	Industrial
	17		Misc7041	56.16	Industrial
			Total	21,847.05	
			Difference	0.00	
Public Information					
	18	Bank of America	Albertson-PIE Meeting	26.16	Public Education

SWQM Operations & Maintenance 7050-7057

		SWQM Detention Basin Operations and Maintenance			
	20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
	20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
	20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
	20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
	20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
	20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
	20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
	24	R/C Mow-N-Edge Corporation		136.51	Post Construction
	20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
	24	Mow-N-Edge Corporation	Dev Unit II	136.51	Post Construction
	21	Wildlife Control Technology	2003 Rodent Control Srvc	60.00	Post Construction
	24	Pacific Gas & Electric Compa	Line Extension Deficiency	403.86	Post Construction
	19	Mow-N-Edge Corporation	2003 Developed Basin Maint Uni	136.51	Post Construction
	21	Wildlife Control Technology	4/2003 Rodent Control	60.00	Post Construction
	24	Cobb's Tree Care	Agreement 2003-12	320.00	Post Construction
	19	Mow-N-Edge Corporation	2003 Developed Basin Maint Uni	136.51	Post Construction
	21	Wildlife Control Technology	5/2003 Rodent Control	60.00	Post Construction
	19	Mow-N-Edge Corporation	6/03 Dev Basin Maint-Unit 2	136.51	Post Construction
	19	Mow-N-Edge Corporation	6/03 Dev Basin Maint-Unit 2	-150.00	Post Construction
	21	Wildlife Control Technology	6/2003 Rodent Control	60.00	Post Construction
	20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
	20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
	21	Wildlife Control Technology	2003 Rodent Control Srvc	60.00	Post Construction
	21	Wildlife Control Technology	4/2003 Rodent Control	40.00	Post Construction
	21	Wildlife Control Technology	5/2003 Rodent Control	40.00	Post Construction
	21	Wildlife Control Technology	6/2003 Rodent Control	40.00	Post Construction
	19	Lucas Weed Control, LLC	07/2002 Undeveloped Basin Main	106.37	Post Construction
	19	Lucas Weed Control, LLC	08/2002 Undeveloped Basin Main	106.37	Post Construction
	20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
	20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
	19	Lucas Weed Control, LLC	09/2002 Undeveloped Basin Main	106.37	Post Construction
	20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
	19	Lucas Weed Control, LLC	10/2002 Undeveloped Basin Main	106.37	Post Construction
	19	Lucas Weed Control, LLC	11/2002 Undeveloped Basin Main	106.37	Post Construction
	20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
	19	Lucas Weed Control, LLC	12/2002 Undeveloped Basin Main	106.37	Post Construction

Table D-7. Continued.

20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
19	Irly-Bird Landscape Company	01/2003 Undev Basin Maint	82.89	Post Construction
20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
19	Irly-Bird Landscape Company	2003 Undev Basin Maint Unit II	82.89	Post Construction
20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
21	Wildlife Control Technology	2003 Rodent Control Srvc	60.00	Post Construction
19	Irly-Bird Landscape Company	3/03 Undev Basin Maint Unit II	82.89	Post Construction
21	Wildlife Control Technology	4/2003 Rodent Control	60.00	Post Construction
19	Irly-Bird Landscape Company	4/03 Undev Basin Maint Unit II	82.89	Post Construction
21	Wildlife Control Technology	5/2003 Rodent Control	60.00	Post Construction
21	Wildlife Control Technology	6/2003 Rodent Control	60.00	Post Construction
22	Cobb's Tree Care	Agreement #2002-12	290.00	Post Construction
20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
24	Mow-N-Edge Corporation	2002 SWQM Detention Basin O &	562.49	Post Construction
19	Lucas Weed Control, LLC	07/02 Undev Basin Maint-Extra	80.00	Post Construction
20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
23	City of Fresno	6302 W Spruce Ave	1,329.68	Post Construction
19	Mow-N-Edge Corporation	2002 Developed Basin Maint	562.49	Post Construction
19	Mow-N-Edge Corporation	2002 Developed Basin Maint	49.00	Post Construction
20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
19	Mow-N-Edge Corporation	09/2002 Developed Basin Mainte	562.49	Post Construction
20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
23	City of Fresno	6302 W Spruce Ave	1,048.86	Post Construction
19	Mow-N-Edge Corporation	10/2002 Developed Basin Mainte	562.49	Post Construction
19	Mow-N-Edge Corporation	11/2002 Developed Basin Mainte	562.49	Post Construction
20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
23	City of Fresno	6302 W Spruce Ave	223.42	Post Construction
19	Mow-N-Edge Corporation	12/2002 Developed Basin Mainte	562.49	Post Construction
20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
19	Mow-N-Edge Corporation	01/2003 Developed Basin Mainte	573.73	Post Construction
19	Mow-N-Edge Corporation	2003 Developed Basin Maint Uni	573.73	Post Construction
23	City of Fresno	6302 W Spruce Ave	115.62	Post Construction
20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
24	Mow-N-Edge Corporation	Dev Unit II Extra Work	104.13	Post Construction
24	Mow-N-Edge Corporation	Dev Unit II	573.73	Post Construction
21	Wildlife Control Technology	2003 Rodent Control Srvc	60.00	Post Construction
23	City of Fresno	6302 W Spruce Ave	128.46	Post Construction
19	Mow-N-Edge Corporation	2003 Developed Basin Maint Uni	573.73	Post Construction
21	Wildlife Control Technology	4/2003 Rodent Control	60.00	Post Construction
19	Mow-N-Edge Corporation	2003 Developed Basin Maint Uni	573.73	Post Construction
21	Wildlife Control Technology	5/2003 Rodent Control	60.00	Post Construction
23	City of Fresno	6302 W Spruce Ave	592.84	Post Construction
19	Mow-N-Edge Corporation	6/03 Dev Basin Maint-Unit 2	573.73	Post Construction
21	Wildlife Control Technology	6/2003 Rodent Control	60.00	Post Construction
19	Lucas Weed Control, LLC	07/2002 Undeveloped Basin Main	102.50	Post Construction
20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
19	Lucas Weed Control, LLC	08/2002 Undeveloped Basin Main	102.50	Post Construction
20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
19	Lucas Weed Control, LLC	09/2002 Undeveloped Basin Main	102.50	Post Construction
20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
19	Lucas Weed Control, LLC	10/2002 Undeveloped Basin Main	102.50	Post Construction
19	Lucas Weed Control, LLC	11/2002 Undeveloped Basin Main	102.50	Post Construction
20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
19	Lucas Weed Control, LLC	12/2002 Undeveloped Basin Main	102.50	Post Construction
20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
19	Irly-Bird Landscape Company	01/2003 Undev Basin Maint	68.95	Post Construction
20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
19	Irly-Bird Landscape Company	2003 Undev Basin Maint Unit II	68.95	Post Construction
20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
21	Wildlife Control Technology	2003 Rodent Control Srvc	60.00	Post Construction
19	Irly-Bird Landscape Company	3/03 Undev Basin Maint Unit II	68.95	Post Construction
21	Wildlife Control Technology	4/2003 Rodent Control	60.00	Post Construction
19	Irly-Bird Landscape Company	4/03 Undev Basin Maint Unit II	68.95	Post Construction

Table D-7. Continued.

	21	Wildlife Control Technology	5/2003 Rodent Control	60.00	Post Construction
	21	Wildlife Control Technology	6/2003 Rodent Control	60.00	Post Construction
	19	Lucas Weed Control, LLC	07/2002 Undeveloped Basin Main	38.68	Post Construction
	20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
	19	Lucas Weed Control, LLC	08/2002 Undeveloped Basin Main	38.68	Post Construction
	20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
	20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
	19	Lucas Weed Control, LLC	09/2002 Undeveloped Basin Main	38.68	Post Construction
	20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
	19	Lucas Weed Control, LLC	10/2002 Undeveloped Basin Main	38.68	Post Construction
	19	Lucas Weed Control, LLC	11/2002 Undeveloped Basin Main	38.68	Post Construction
	20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
	19	Lucas Weed Control, LLC	12/2002 Undeveloped Basin Main	38.68	Post Construction
	20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
	19	Irly-Bird Landscape Company	01/2003 Undev Basin Maint	2.94	Post Construction
	20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
	19	Irly-Bird Landscape Company	2003 Undev Basin Maint Unit II	2.94	Post Construction
	20	Wildlife Control Technology	Agreement #2002-04	60.00	Post Construction
	21	Wildlife Control Technology	2003 Rodent Control Srvc	60.00	Post Construction
	19	Irly-Bird Landscape Company	3/03 Undev Basin Maint Unit II	2.94	Post Construction
	21	Wildlife Control Technology	4/2003 Rodent Control	60.00	Post Construction
	19	Irly-Bird Landscape Company	4/03 Undev Basin Maint Unit II	2.94	Post Construction
	21	Wildlife Control Technology	5/2003 Rodent Control	60.00	Post Construction
	21	Wildlife Control Technology	6/2003 Rodent Control	60.00	Post Construction
Item Number			**Total SWQM Detention Basins Operations & Maintenance**	**17,980.16**	
Subtotal	19		Undev/DevBasinMaint7051	8,174.05	Post Construction
	20		WildAgree2002-047051	2,460.00	Post Construction
	21		RodentControl7051	1,380.00	Post Construction
	22		CobbAgree2002-127051	290.00	Post Construction
	23		CitySpruceAve7051	3,438.88	Post Construction
	24		Misc7051	2,237.23	Post Construction
			Total	17,980.16	
			Difference	0.00	

	SWQM Retention Basin Operations and Maintenance			
	Seibert's Oil Company Inc	07/2002 Diesel Fuel	114.50	Post Construction
	Seibert's Oil Company Inc	07/2002 Diesel Fuel	117.90	Post Construction
	Seibert's Oil Company Inc	07/2002 Diesel Fuel	115.33	Post Construction
	Seibert's Oil Company Inc	08/2002 Diesel Fuel	80.27	Post Construction
	Matthews & Son	Agreement #2002-01	1,630.50	Post Construction
	Matthews and Sons	Agreement #2002-01	35.00	Post Construction
	Safety Network	Equipment Rental	180.00	Post Construction
	Safety Network	7/21/02-8/02/02 Equip Rental	253.00	Post Construction
	Chevron	Fuel	9.86	Post Construction
	Cardlock Fuels System Inc	Fuel through 5/31/03	33.41	Post Construction
	Matthews and Sons	Agreement #2002-01	280.00	Post Construction
	R/C Matthews & Son		455.00	Post Construction
	Cardlock Fuels System Inc	07/31/2002 Fuel	9.53	Post Construction
	Matthews and Sons	Agreement #2002-01	4,345.13	Post Construction
	Video Inspection Specialists	Cleaning w/ Vacuum Truck	435.00	Post Construction
	R/C Matthews and Sons		273.75	Post Construction
	R/C Matthews and Sons		542.50	Post Construction
	Cerutti & Sons Transportatio	Agreement #2002-09	290.55	Post Construction
	Matthews and Sons	Agreement #2002-01	180.84	Post Construction
	Emmetts Excavation Grading &	Agreement #2002-18	770.00	Post Construction
	Cardlock Fuels System Inc	08/2002 Pump Fuel	68.49	Post Construction
	Cardlock Fuels System Inc	09/2002 Diesel	59.49	Post Construction
	Cardlock Fuels System Inc	10/15/2002 Pump Fuel/Truck Fue	28.27	Post Construction
	Cardlock Fuels System Inc	10/31/2002 Diesel Fuel	15.02	Post Construction
	Cerutti & Sons Transportatio	Agreement #2002-09	961.05	Post Construction
	Matthews and Sons	Agreement #2002-01	180.83	Post Construction
	Emmetts Excavation Grading &	Agreement #2002-18	770.00	Post Construction
	Cardlock Fuels System Inc	08/2002 Pump Fuel	62.98	Post Construction
	Cardlock Fuels System Inc	08/2002 Truck Fuel	7.14	Post Construction

Table D-7. Continued.

		Cardlock Fuels System Inc	09/2002 Diesel Fuel	40.49	Post Construction
		Cardlock Fuels System Inc	09/2002 Diesel	389.47	Post Construction
		Cardlock Fuels System Inc	10/15/2002 Pump Fuel/Truck Fue	28.26	Post Construction
		Cardlock Fuels System Inc	10/31/2002 Diesel Fuel	20.16	Post Construction
		Cardlock Fuels System Inc	09/2002 Diesel Fuel	29.62	Post Construction
		R/C Matthews & Son		350.00	Post Construction
		R/C Matthews and Sons		245.00	Post Construction
		Matthews and Sons	Agreement #2002-01	1,487.50	Post Construction
		Video Inspection Specialists	Cleaning w/ Vacuum Truck	580.00	Post Construction
		R/C Matthews and Sons		262.50	Post Construction
		E & J Gallo Winery	Greenwaste Deliveries	1,155.00	Post Construction
		Matthews and Sons	Agreement #2002-01	7,731.25	Post Construction
		Matthews and Sons	Agreement #2002-01	326.26	Post Construction
		E & J Gallo Winery	09/2002 Greenwaste Deliveries	1,195.00	Post Construction
		Matthews and Sons	Agreement #2002-01	611.25	Post Construction
		E & J Gallo Winery	11/2002 Greenwaste	15.00	Post Construction
		Cerutti & Sons Transportatio	Agreement #2002-09	573.65	Post Construction
		Matthews and Sons	Agreement #2002-01	180.83	Post Construction
		Emmetts Excavation Grading &	Agreement #2002-18	1,020.00	Post Construction
	Item Number		**Total SWQM Retention Basin O&M**	**28,546.58**	
Subtotal	25		Fuel7052	1,230.19	Post Construction
	26		M&SAgree2002-017052	16,989.39	Post Construction
	27		EquipRental7052	433.00	Post Construction
	28		Greenwaste7052	2,365.00	Post Construction
	29		CleaningVacuumTruck7052	1,015.00	Post Construction
	30		M&SBlank7052	2,128.75	Post Construction
	31		CeruttiAgree2002-097052	1,825.25	Post Construction
	32		EmmettsAgree2002-187052	2,560.00	Post Construction
			Total	28,546.58	
			Difference	0.00	
		SWQM Structures Operations and Maintenance			
	33	Video Inspection Specialists	12/2002 Vacuum Truck Cleaning	24.17	Pollution Prevention
	33	Video Inspection Specialists	12/2002 Vacuum Truck Cleaning	290.00	Pollution Prevention
	33	Video Inspection Specialists	11/2002 Vacuum Cleaning	435.00	Pollution Prevention
	33	Video Inspection Specialists	11/2002 Vacuum Cleaning	330.00	Pollution Prevention
	33	Video Inspection Specialists	11/2002 Cleaning & Root Cuttin	330.00	Pollution Prevention
	33	Video Inspection Specialists	10/2002 Vacuum Cleaning	217.50	Pollution Prevention
	33	Video Inspection Specialists	Cleaning w/ Vacuum Truck	362.50	Pollution Prevention
	33	Video Inspection Specialists	Clean w/Vacuum Truck	1,550.00	Pollution Prevention
	33	Video Inspection Specialists	12/2002 Vacuum Truck Cleaning	217.50	Pollution Prevention
	33	Video Inspection Specialists	12/2002 Vacuum Truck Cleaning	145.00	Pollution Prevention
	33	Video Inspection Specialists	12/2002 Vacuum Truck Cleaning	24.17	Pollution Prevention
	33	Video Inspection Specialists	11/2002 Vacuum Cleaning	290.00	Pollution Prevention
	33	Video Inspection Specialists	Clean w/Vacuum Truck & TV Insp	2,195.00	Pollution Prevention
	34	City of Fresno	7/02-3/03 Pipeline Maint	288.10	Pollution Prevention
	34	City of Fresno	7/02-3/03 Pipeline Maint	296.10	Pollution Prevention
	33	Video Inspection Specialists	10/2002 Vacuum Cleaning	217.50	Pollution Prevention
	33	Video Inspection Specialists	12/2002 Vacuum Truck Cleaning	145.00	Pollution Prevention
	33	Video Inspection Specialists	12/2002 Vacuum Truck Cleaning	24.16	Pollution Prevention
	34	City of Fresno	7/02-3/03 Pipeline Maint	72.36	Pollution Prevention
	33	Video Inspection Specialists	12/2002 Vacuum Cleaning	362.50	Pollution Prevention
	33	Video Inspection Specialists	10/2002 Vacuum Cleaning	217.50	Pollution Prevention
	33	Video Inspection Specialists	03/2003 Vacuum Truck Cleaning	310.00	Pollution Prevention
	33	Video Inspection Specialists	11/2002 Vacuum Cleaning	145.00	Pollution Prevention
	33	Video Inspection Specialists	11/2002 Vacuum Cleaning	580.00	Pollution Prevention
	33	Video Inspection Specialists	11/2002 Cleaning & Root Cuttin	290.00	Pollution Prevention
	33	Video Inspection Specialists	12/2002 Vacuum Cleaning	507.50	Pollution Prevention
	33	Video Inspection Specialists	Clean w/Vacuum Truck	310.00	Pollution Prevention
	Item Number		**Total SWQM Structures O&M**	**10,176.56**	
Subtotal	33		VISTruckCleaning7054	9,520.00	Pollution Prevention
	34		FresnoPipeline7054	656.56	Pollution Prevention
			Total	10,176.56	
			Difference	0.00	

Table D-7. Continued.

		SWQM Pump Operations and Maintenance			
	35	Video Inspection Specialists	Clean w/Vacuum Truck	155.00	Pollution Prevention
	35	Video Inspection Specialists	7/2002 Pump Station Vacuum Cle	580.00	Pollution Prevention
	35	Video Inspection Specialists	7/2002 Pump Station Vacuum Cle	507.50	Pollution Prevention
	35	Video Inspection Specialists	11/2002 Cleaning & Root Cuttin	742.50	Pollution Prevention
	35	Video Inspection Specialists	Clean w/Vacuum Truck	787.50	Pollution Prevention
	35	Video Inspection Specialists	11/2002 Vacuum Cleaning	253.75	Pollution Prevention
	35	Video Inspection Specialists	Clean w/Vacuum Truck	310.00	Pollution Prevention
	35	Video Inspection Specialists	11/2002 Cleaning & Root Cuttin	330.00	Pollution Prevention
	35	Video Inspection Specialists	Clean w/Vacuum Truck	232.50	Pollution Prevention
	35	Video Inspection Specialists	03/2003 Vacuum Truck Cleaning	290.00	Pollution Prevention
	35	Video Inspection Specialists	11/2002 Vacuum Cleaning	217.50	Pollution Prevention
	35	Video Inspection Specialists	10/2002 Vacuum Cleaning	217.50	Pollution Prevention
	35	Video Inspection Specialists	10/2002 Vacuum Cleaning	290.00	Pollution Prevention
	35	Video Inspection Specialists	10/2002 Vacuum Cleaning	72.50	Pollution Prevention
	35	Video Inspection Specialists	10/2002 Vacuum Cleaning	580.00	Pollution Prevention
	35	Video Inspection Specialists	10/2002 Vacuum Cleaning	72.50	Pollution Prevention
	36	Pacific Gas & Electric Compa	10/03/02-11/18/02 Service	49.49	Pollution Prevention
	36	Pacific Gas & Electric Compa	Service through 12/17/2002	32.56	Pollution Prevention
	36	Pacific Gas & Electric Compa	Service thru 10/12/02-01/03/03	51.17	Pollution Prevention
	36	Pacific Gas & Electric Compa	Service thru 04/17/03	7.67	Pollution Prevention
	36	Pacific Gas & Electric Compa	Service thru 05/12/03 Pump Sit	28.67	Pollution Prevention
	36	Pacific Gas & Electric Compa	Service through 7/18/03	86.03	Pollution Prevention
	36	Pacific Gas & Electric Compa	Service through 6/18/03	86.03	Pollution Prevention
	36	Pacific Gas & Electric Compa	07/03/02-08/02/02 Service	10.80	Pollution Prevention
	36	Pacific Gas & Electric Compa	08/02/02-09/03/02 Service	10.80	Pollution Prevention
	36	Pacific Gas & Electric Compa	09/03/02-10/02/02 Service	10.80	Pollution Prevention
	36	Pacific Gas & Electric Compa	10/02/02-10/31/02 Service	10.80	Pollution Prevention
	36	Pacific Gas & Electric Compa	10/31/02-11/27/02 Service	11.50	Pollution Prevention
	36	Pacific Gas & Electric Compa	Service thru 10/12/02-01/03/03	12.98	Pollution Prevention
	36	Pacific Gas & Electric Compa	10/12/02-01/03/03 Service	14.22	Pollution Prevention
	36	Pacific Gas & Electric Compa	03/2003 Site Pump Utilities	12.47	Pollution Prevention
	36	Pacific Gas & Electric Compa	Service thru 04/10/03 Pump Sit	11.94	Pollution Prevention
	36	Pacific Gas & Electric Compa	Service thru 05/12/03 Pump Sit	11.91	Pollution Prevention
	36	Pacific Gas & Electric Compa	Service thru 06/11/03 Pump Sit	22.37	Pollution Prevention
	36	Pacific Gas & Electric Compa	Service thru 7/11/03	10.29	Pollution Prevention
	36	Pacific Gas & Electric Compa	07/03/02-08/02/02 Service	126.05	Pollution Prevention
	36	Pacific Gas & Electric Compa	08/02/02-09/03/02 Service	79.22	Pollution Prevention
	36	Pacific Gas & Electric Compa	09/03/02-10/02/02 Service	76.74	Pollution Prevention
	36	Pacific Gas & Electric Compa	10/02/02-10/31/02 Service	57.03	Pollution Prevention
	36	Pacific Gas & Electric Compa	10/31/02-11/27/02 Service	24.12	Pollution Prevention
	36	Pacific Gas & Electric Compa	Service thru 10/12/02-01/03/03	10.29	Pollution Prevention
	36	Pacific Gas & Electric Compa	10/12/02-01/03/03 Service	11.36	Pollution Prevention
	36	Pacific Gas & Electric Compa	03/2003 Site Pump Utilities	10.65	Pollution Prevention
	36	Pacific Gas & Electric Compa	Service thru 04/10/03 Pump Sit	10.65	Pollution Prevention
	36	Pacific Gas & Electric Compa	Service thru 05/12/03 Pump Sit	11.39	Pollution Prevention
	36	Pacific Gas & Electric Compa	Service thru 06/11/03 Pump Sit	13.46	Pollution Prevention
	36	Pacific Gas & Electric Compa	Service thru 7/11/03	83.81	Pollution Prevention
	35	Video Inspection Specialists	10/2002 Vacuum Cleaning	145.00	Pollution Prevention
	35	Video Inspection Specialists	11/2002 Vacuum Cleaning	108.75	Pollution Prevention
	35	Video Inspection Specialists	11/2002 Vacuum Cleaning	181.25	Pollution Prevention
	35	Video Inspection Specialists	Clean w/Vacuum Truck	155.00	Pollution Prevention
	Item Number		**Total SWQM Pump O&M**	**7,236.02**	
Subtotal	35		VISTruckCleaning7055	6,228.75	Pollution Prevention
	36		PGEService7055	1,007.27	Pollution Prevention
			Total	7,236.02	
			Difference	0.00	
SWQM Other Operations and Maintenance					
	37	Melco Fence	02/2003 Fence Repair	584.00	Post Construction
		SWQM Soil Monitoring			
	38	BSK Analytical Laboratories	Low Level Lead Profile	297.00	Post Construction
	38	BSK Analytical Laboratories	07/10/2002 Low Level Lead Prof	99.00	Post Construction
	38	BSK Analytical Laboratories	Low Level Lead Profile	396.00	Post Construction
	38	BSK Analytical Laboratories	07/2002 Low Level Lead Profile	363.00	Post Construction
	38	BSK Analytical Laboratories	07/2002 Low Level Lead Profile	264.00	Post Construction
	38	BSK Analytical Laboratories	07/03/2002 Low Level Lead Prof	198.00	Post Construction
	38	BSK Analytical Laboratories	Low Level Lead Profile	363.00	Post Construction
	38	BSK Analytical Laboratories	08/2002 Low Level Lead Profile	99.00	Post Construction
	38	BSK Analytical Laboratories	Low Level Lead Profile	198.00	Post Construction
	38	BSK Analytical Laboratories	07/03/2002 Low Level Lead Prof	66.00	Post Construction
	38	BSK Analytical Laboratories	Low Level Lead Profile	132.00	Post Construction
	38	BSK Analytical Laboratories	07/10/2002 Low Level Lead Prof	99.00	Post Construction
	38	BSK Analytical Laboratories	07/11/2002 Low Level Lead Prof	396.00	Post Construction
	38	BSK Analytical Laboratories	07/15/2002 Low Level Lead Prof	396.00	Post Construction
	38	BSK Analytical Laboratories	Low Level Lead Profile	396.00	Post Construction
	38	BSK Analytical Laboratories	Low Level Lead Profile	198.00	Post Construction
	38	BSK Analytical Laboratories	07/10/2002 Low Level Lead Prof	99.00	Post Construction
	38	BSK Analytical Laboratories	07/10/2002 Low Level Lead Prof	99.00	Post Construction
	38	BSK Analytical Laboratories	07/2002 Low Level Lead Profile	132.00	Post Construction
	38	BSK Analytical Laboratories	07/2002 Low Level Lead Profile	99.00	Post Construction
	38	BSK Analytical Laboratories	Low Level Lead Profile-II3	165.00	Post Construction
	38	BSK Analytical Laboratories	07/2002 Low Level Lead Profile	396.00	Post Construction
	38	BSK Analytical Laboratories	08/2002 Low Level Lead Profile	264.00	Post Construction
	38	BSK Analytical Laboratories	Low Level Lead Profile	198.00	Post Construction

Table D-7. Continued.

38	BSK Analytical Laboratories	Low Level Lead Profile	198.00	Post Construction
38	BSK Analytical Laboratories	10/2002 Low Level Lead Profile	396.00	Post Construction
38	BSK Analytical Laboratories	11/2002 Low Level Lead Profile	99.00	Post Construction
38	BSK Analytical Laboratories	10/2002 Low Level Lead Profile	99.00	Post Construction
38	BSK Analytical Laboratories	11/2002 Low Level Lead Profile	99.00	Post Construction
38	BSK Analytical Laboratories	07/2002 Low Level Lead Profile	99.00	Post Construction
38	BSK Analytical Laboratories	09/2002 Low Level Lead Profile	297.00	Post Construction
38	BSK Analytical Laboratories	09/2002 Low Level Lead Profile	231.00	Post Construction
38	BSK Analytical Laboratories	08/2002 Low Level Lead Profile	396.00	Post Construction
38	BSK Analytical Laboratories	08/2002 Low Level Lead Profile	198.00	Post Construction
38	BSK Analytical Laboratories	09/2002 Low Level Lead Profile	198.00	Post Construction
38	BSK Analytical Laboratories	07/2002 Low Level Lead Profile	396.00	Post Construction
38	BSK Analytical Laboratories	07/2002 Low Level Lead Profile	297.00	Post Construction
38	BSK Analytical Laboratories	08/2002 Low Level Lead Profile	279.00	Post Construction
38	BSK Analytical Laboratories	Low Level Lead Profile-Bal Due	18.00	Post Construction
38	BSK Analytical Laboratories	07/10/2002 Low Level Lead Prof	231.00	Post Construction
38	BSK Analytical Laboratories	07/2002 Low Level Lead Profile	231.00	Post Construction
38	BSK Analytical Laboratories	08/2002 Low Level Lead Profile	66.00	Post Construction
38	BSK Analytical Laboratories	09/2002 Low Level Lead Profile	198.00	Post Construction
38	BSK Analytical Laboratories	05/2002 Low Level Lead Profile	165.00	Post Construction
38	BSK Analytical Laboratories	08/2002 Low Level Lead Profile	297.00	Post Construction
38	BSK Analytical Laboratories	10/2002 Low Level Lead Profile	99.00	Post Construction
38	BSK Analytical Laboratories	11/2002 Low Level Lead Profile	99.00	Post Construction
38	BSK Analytical Laboratories	05/2002 Low Level Lead Profile	165.00	Post Construction
38	BSK Analytical Laboratories	05/2002 Low Level Lead Profile	165.00	Post Construction
Item Number				
38		**Total SWQM Soil Monitoring**	10,428.00	Post Construction

Municipal NPDES Program Implementation 7060-7066

Investigation, Inspection, Enforcement

39	Fotech Color Labs	08/2002 Photos	6.00	Illicit Discharge
39	Fotech Color Labs	07/2002 Photos	16.66	Illicit Discharge
39	Fotech Color Labs	Photo Developing	53.83	Illicit Discharge
Item Number				
39		**Total Investigation, Inspection, Enforcement**	76.49	Illicit Discharge

Monitoring

42	AirLink Communications	08/2002 IP Activation Fee	45.00	Monitoring
41	AT&T Wireless Services	07/14/2002-08/13/2002 Services	26.18	Monitoring
40	Larry Walker Associates Inc	Storm Water Quality Monitoring	10,552.33	Monitoring
41	AT&T Wireless Services	08/14/02-09/13/02 Service Peri	23.76	Monitoring
42	AirLink Communications	07/24/02-08/23/02 Telemetry Fe	58.06	Monitoring
40	Larry Walker Associates Inc	2002-2003 Stormwater Monitorin	1,823.85	Monitoring
40	Larry Walker Associates Inc	2001-2002 Stormwater Monitorin	8,756.96	Monitoring
40	Larry Walker Associates Inc	2001-2002 Stormwater Monitorin	3,192.74	Monitoring
42	AirLink Communications	10/2002 Telemetry Monthly Fee	98.00	Monitoring
41	AT&T Wireless Services	09/14/02-10/13/02 Service	23.35	Monitoring
42	Airlink Communications Inc	09/24/02-10/23/02 Monthly Fee	98.00	Monitoring
41	AT&T Wireless Services	10/14/02-11/13/02 Service	23.98	Monitoring
43	Larry Walker Associates Inc	10/01/02-10/31/02 Professional	7,816.19	Monitoring
43	Larry Walker Associates Inc	09/01/02-09/18/02 Professional	4,692.12	Monitoring
40	Larry Walker Associates Inc	2002-2003 SWQ Monitoring	18,662.34	Monitoring
42	Airlink Communications Inc	Service through 11/23/2002	98.00	Monitoring
41	AT&T Wireless Services	Service through 12/13/2002	23.56	Monitoring
41	AT&T Wireless Services	Service thru 01/15/2003	23.46	Monitoring
43	Larry Walker Associates Inc	Service thru 12/31/2002	27,576.10	Monitoring
42	Airlink Communications Inc	Services thru 12/23/2002	98.00	Monitoring
41	AT&T Wireless Services	Service thru 02/13/03	25.75	Monitoring
40	Larry Walker Associates Inc	2002-2003 SWQ Monitoring	17,728.24	Monitoring
42	Airlink Communications Inc	Service thru 01/23/03	98.00	Monitoring
42	Airlink Communications Inc	02/23/03 Monthly Fee	98.00	Monitoring
41	AT&T Wireless Services	03/15/03 Billing	23.61	Monitoring
40	Larry Walker Associates Inc	02/2003 SWQ Monitoring	14,544.32	Monitoring

Table D-7. Continued.

	41	AT&T Wireless Services	Service thru 04/13/03	21.18	Monitoring
	40	Larry Walker Associates Inc	02-03 Storm Water Monitoring	14,464.70	Monitoring
	42	Airlink Communications Inc	IP Local - Unlimited	98.00	Monitoring
	42	Airlink Communications Inc	IP Local Unlimited	98.00	Monitoring
	41	AT&T Wireless Services	Service Through 5/13/2003	23.24	Monitoring
	40	Larry Walker Associates Inc	02-03 Storm Water Monitoring	17,532.15	Monitoring
	44	Water Env Research Foundatio	03/04 Subscription to WERF	10,000.00	Monitoring
	40	Larry Walker Associates Inc	02-03 Stormwater Quality Monit	12,274.56	Monitoring
	42	Airlink Communications Inc	IP Usage through 6/23/03	98.00	Monitoring
	42	Airlink Communications Inc	IP Local Service through 5/23/	98.00	Monitoring
	41	AT&T Wireless Services	Service through 6/15/2003	22.42	Monitoring
	41	AT&T Wireless Services	Service through 7/13/03	21.50	Monitoring
	40	Larry Walker Associates Inc	02-03 Stormwater Monitoring	24,331.20	Monitoring
	Item Number		**Total Monitoring**	**195,312.85**	
Subtotal	40		LWASWQM7063	143,863.39	Monitoring
	41		ATTService7063	281.99	Monitoring
	42		AirlinkIP7063	1,083.06	Monitoring
	43		LWAProf7063	40,084.41	Monitoring
	44		WERF7063	10,000.00	Monitoring
			Total	195,312.85	
			Difference	0.00	
		Public Information			
	45	Cash	Vons	10.70	Management
	46	David J Pomaville	Clean Water Award Reimbursemen	22.62	Public Education
	46	Pro Image Video LLC	Transfer PSA from VHS to Digit	276.97	Public Education
	48	Bank of America	Office Depot	55.16	Management
	46	Pro Image Video LLC	08/2002 Duplicate PSA VHS Tape	21.58	Public Education
	46	Fotech Color Labs	Dev & Prints	18.72	Public Education
	52	River Parkway Trust	Reimbursement Storm Water Gran	1,920.00	Public Education
	45	Cash	Casa Valadez Mexican Restauran	12.40	Management
	46	Panagraph Inc	2002-2003 SWQMP Public Info &	255.00	Public Education
	47	Fotech Color Labs	09/2002 Dev & Print	7.51	Management
	48	Fresno Ag Hardware	09/2002 Supplies	4.80	Management
	46	San Joaquin River Parkway	Clean Storm Water Grant Reimb	1,899.45	Public Education
	45	Bank of America	Vons Grocery Store	11.49	Management
	45	Bank of America	Vons Grocery Store	24.33	Management
	48	Cash	Orchard Supply	5.18	Management
	45	Cash	Riverfest 2002 Food	15.50	Management
	47	Prestige Printing	10/2002 Letterheads-Storm Wate	606.26	Management
	48	Bank of America	Office Max	28.80	Management
	56	San Joaquin River Parkway Tr	Fresno City Parks & Rec CSW Gr	1,000.00	Management
	46	City Press	10/2002 Action Alert Flyers	625.00	Public Education
	46	City Press	10/2002 Action Alert Flyers	49.22	Public Education
	45	Bank of America	Vons	44.98	Management
	49	SWRCB	Waste Discharge Req Annual Fee	1,500.00	Management
	49	SWRCB	Waste Discharge Req Annual Fee	10,000.00	Management
	49	SWRCB	Waste Discharge Req Annual Fee	2,500.00	Management
	49	SWRCB	Waste Discharge Req Annual Fee	3,750.00	Management
	46	Bank of America	Kinko's	224.10	Public Education
	48	Bank of America	OfficeMax	37.65	Management
	45	Bank of America	Bobby Salazar's	29.35	Management
	56	Bank of America	Env-Sol-Com	203.00	Management
	52	River Parkway Trust	Clean Storm Water Grant Reimb	50.00	Public Education
	50	Daniel P Rourke	Mileage Reimbursement	85.05	Management
	46	Pro Image Video LLC	12/2002 Public Information	149.08	Public Education
	45	Bank of America	Bobby Salazars	37.87	Management
	56	Bank of America	Amazon.Com	232.20	Management
	50	Bank of America	Hyatt Regency Monterey	297.68	Management
	45	Cash	SaveMart Supermarkets	9.14	Management
	50	Daniel P Rourke	Ineligible Portion-Hyatt	-4.28	Management
	51	Daniel P Rourke	CWEA Conference-Peninsula Rest	22.50	Management
	50	Daniel P Rourke	CWEA Conference Mileage Reimb	115.20	Management
	51	Daniel P Rourke	CWEA Conference-Goomba's Kitch	19.00	Management
	51	Daniel P Rourke	CWEA Conference-Jugem Japanese	13.89	Management

Table D-7. Continued.

46	Panagraph Inc	Service thru 01/2003	2,015.13	Public Education
46	City Press	02/2003 Storm Water Pollution	1,048.39	Public Education
51	Daniel P Rourke	03/2003 WRPPN Meetings-040-LJX	11.50	Management
51	Daniel P Rourke	WRPPN Committee Meeting-Zocalo	12.50	Management
51	Daniel P Rourke	03/2003 WRPPN Meetings-Hamburg	13.04	Management
51	Daniel P Rourke	WRPPN Committee Meeting-Hungry	7.50	Management
46	Panagraph Inc	2002-2003 SWQMP	382.50	Public Education
45	Bank of America	Fresno Audio Visual - Vons	24.70	Management
56	Bank of America	Fresno Audio Visual - Cinnamon	141.25	Management
56	Bank of America	Fresno Audio Visual - Mariscos	24.92	Management
45	Bank of America	Fresno Audio Visual - Food 4 L	2.85	Management
56	Bank of America	OSH-Brass Grommet	25.94	Management
56	Bank of America	Fresno Audio Visual - DiCiccos	65.59	Management
56	Bank of America	Fresno Audio Visual - Cinnamon	47.00	Management
45	Bank of America	Fresno Audio Visual - Vons	17.85	Management
56	Bank of America	Fresno Audio Visual - Draper S	18.32	Management
56	Cash	Fresno Pollution Prevention Gr	16.53	Management
52	Central Unified School Distr	2003 Clean Storm Water Grant	1,527.49	Public Education
48	Fresno Ag Hardware	Devoe Traffic Gal/Pail/Bucket	40.27	Management
52	Liberty Elementary	2003 Clean Storm Water Grant	52.00	Public Education
54	Daniel P Rourke	CASQA-BMP Handbook Workshop	27.40	Management
52	Liberty Elementary	Clean Storm Water Grant	68.00	Public Education
56	Bank of America	Vons-Me n Eds-Intergrated Pest	50.65	Management
46	Panagraph Inc	Services thru 03/2003	616.25	Public Education
56	Asian Pacific American Herit	Booth Space/Sponsorship	250.00	Management
47	Cash	Aerial Photocopies	2.00	Management
46	Zoo Lynx	2003 Earth Day Ad & Clean Up	965.00	Public Education
47	Airport Blueprint Inc	Aerial Photos	5.83	Management
55	Consolidated Printworks	Utility Bill Inserts	316.00	Public Education
46	Panagraph Inc	SWQMP Public Info & Education	38,102.22	Public Education
52	UC Regents	Clean Storm Water Grant	2,000.00	Public Education
54	Bank of America	El Pollo-CASQA BMP Handbook Mt	6.80	Management
54	Bank of America	CASQA BMP Handbook Workshop	25.00	Management
53	Bank of America	Hertz-SWQ BMP Training	152.95	Management
53	Bank of America	Hyatt-SWQ BMP Training	95.58	Management
56	Bank of America	The Upper Crust-SWQ BMP Traini	13.21	Management
56	Bank of America	The Thai House-GeoSyntec Meeti	49.00	Management
56	Bank of America	NTIS-EPA-Document	56.00	Management
54	Bank of America	Mariscos-CASQA BMP Handbook Mt	7.01	Management
53	Bank of America	Hyatt-SWQ BMP Training-Parking	12.00	Management
53	Bank of America	Hyatt-SWQ BMP Training-Meals	40.09	Management
55	City Press	Utility Bill Inserts	1,097.74	Public Education
56	Cash	Fresno Audio Visual	21.04	Management
56	Cash	Costco-Open Space Const	67.39	Management
51	Cash	Vons-Phase II Meeting	11.83	Management
56	Solon Manufacturing Co Inc	Paint Paddles	6,829.59	Management
52	Central High School-Env Scie	2003 Clean Storm Water Grant	1,823.87	Public Education
55	City Press	Utility Bill Inserts	1,111.18	Public Education
56	City Press	Stormwater Pollution Packets	878.60	Management
56	City Press	Gardening Tips Bill Insert Cre	-296.05	Management
50	Daniel P Rourke	Mileage Reimbursement	108.36	Management
56	State of CA-WRCB		-2,500.00	Management
56	Consolidated Printworks	Watering Schedule Insert	222.93	Management
46	Panagraph Inc	02-03 Public Info & Education	44,846.40	Public Education
56	Bank of America	City of Fresno-Zoning Ordinanc	25.00	Management
45	Bank of America	Bobby Salazars-Lunch Meeting	64.52	Management
56	Bank of America	OSH-Garden Sprayer	21.62	Management
45	Bank of America	Javiers-Business Lunch	35.00	Management
46	Bank of America	Sir Speedy Printing-Clovis Zon	20.55	Public Education
56	Bank of America	Paper Plus-Environmental Fact	40.93	Management
46	City of Fresno Parks & Recre	2002 Clean Storm Water Grant	1,000.00	Management
46	Jack Nadel, Inc	#2 Pencils/Screen Set Up Charg	1,350.41	Management
46	Linda Jacobsen	Clean Storm Water Grant Reimb	43.11	Management
46	Panagraph Inc	06/2003 Services SWQMP Info	2,445.61	Management
52	San Joaquin River Parkway &	2003 Clean Storm Water Grant	80.00	Management

Table D-7. Continued.

	Item Number				
			Total Public Information	**133,892.99**	
Subtotal	45		Food7064	340.68	Management
	46		PublicEducation7064	96,377.31	Public Education
	47		Printing7064	621.60	Management
	48		OfficeSupplies7064	171.86	Management
	49		SWRCBFees7064	17,750.00	Management
	50		Travel7064 (Mileage, Hotels)	602.01	Management
	51		ConferenceMeetings7064	111.76	Management
	52		Grant7064	7,521.36	Public Education
	53		Training7064	300.62	Management
	54		Handbooks7064	66.21	Management
	55		UtilityBill7064	2,524.92	Public Education
	56		Misc7064	7,504.66	Management
			Total	133,892.99	
			Difference	0.00	
		General Expenses		0.00	
		Program Expenses			
	57	Quercus Publications	Streams of the SJV Book	55.50	Management
	57	Bank of America	NTIS-Groundwater Contamination	56.00	Management
	Item Number				
	57		**Total Program Expenses**	**111.50**	Management
Industrial NPDES Program Implementation 7070-7076					
		Investigation, Inspection, Enforcement			
	58	City Press	Phone Complaints - Forms	332.96	Industrial
		Monitoring		0.00	
		Public Information			
	59	The Business Journal	Newspaper Subscription	88.00	Public Education
	59	EXCAL Visual Communications	08/2002 Storm Water Training K	1,013.50	Public Education
	59	Panagraph Inc	Services thru 12/2002	13,993.30	Public Education
	Item Number				
	59		**Total Public Information**	**15,094.80**	Public Education
(Source: Rourke, pc, 3/23/04			**Total of Subtotals**	**$ 611,843.66**	

1. Cost Categories Abbreviated According to the Following:

Construction: Construction Site Stormwater Runoff Control
Illicit Discharge: Illicit Discharge Detection and Elimination
Industrial: Industrial and Commercial Management Programs
Management: Overall Stormwater Program Management
Pollution Prevention: Pollution Prevention and Good Housekeeping for Municipal Operations
Post Construction: Post Construction Water Management in New Development and Redevelopment
Public Education: Public Education, Outreach, Involvement, and Participation
Monitoring: Water Quality Monitoring
Watershed: Watershed Management

The backup calculations for the cost for each cost survey category in Section 7 and the sources of the cost data are presented in this appendix. Tables are generally presented by sequentially increasing levels of detail. Figure E-1 illustrates how data is shared throughout the tables.

Table E-1 contains all costs organized into the various standard cost survey categories. The subtotals for each cost category are also presented in Section 7, Table 7-2. The remaining tables (E-2 through E-9) present the detailed back-up information for the numbers in Table E-1. Table E-1 is linked to the back-up tables by the table and item numbers in the 'Source' column. Most of the cost information provided by city staff is listed in Table E-2. Item numbers corresponding to the subtotals in Table E-2 were added to the left hand column to easily show how the numbers are pulled forward to Table E-1. The right hand column in Table E-2 was added to show how costs were allocated to the cost survey categories. Table E-1 entries that were not taken directly from Table E-2 are found in Tables E-3 through E-9.

For the city of Sacramento, labor costs are distributed among the various cost survey categories according to labor cost spreadsheets provided by city staff (Table E-7). Thus, comparing costs with other municipalities where such costs are not distributed, Sacramento's Overall Stormwater Management Program costs will be lower.

Detailed descriptions of how the costs were developed are contained in the following paragraphs.

Construction Site Stormwater Runoff Control

The total cost for this category was $261,716. The costs for this category include labor, which was broken down into three categories: inspections, student interns, and all other activities. There was also cost identified for developing BMP handbooks (one time annual cost, but may occur at a time later than one year). Other activities performed included (descriptions obtained from annual stormwater report):

- Issued 144 grading permits
- Reviewed 68 SWPPPs
- Issued 384 enforcement actions
- Sent winterization letters to property owners with active construction sites to remind contractors to prepare their construction sites for the rainy season and to submit winterization certifications
- Developed a Microsoft Access database to track all stormwater inspections and enforcement actions for private development construction sites

Sacramento

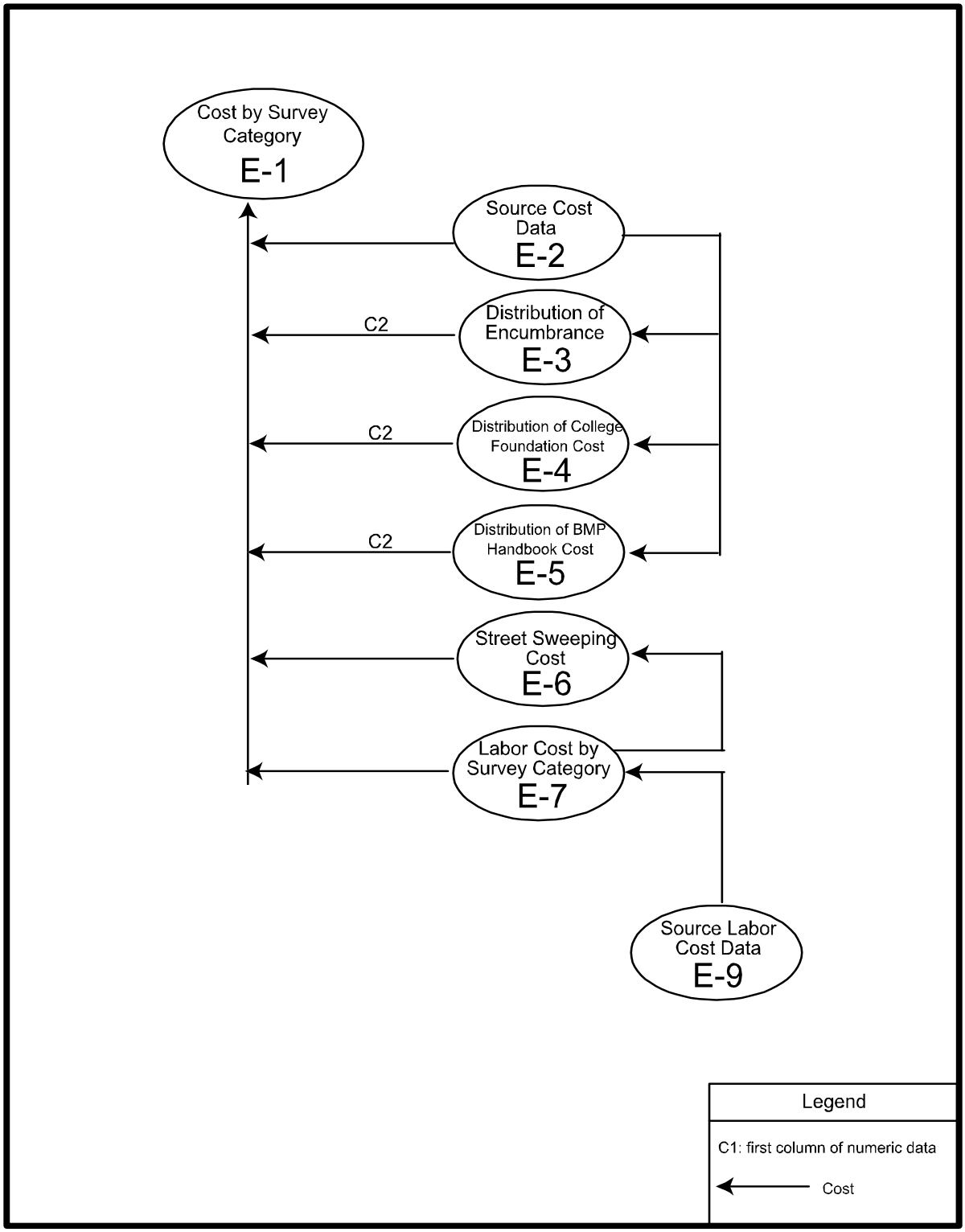

Figure E-1. Sacramento Flowchart

Illicit Discharge Detection and Elimination (IDDE)

The total cost for this category was $37,507. Labor cost is the only cost allocated to this category. Activities performed included issuance of 55 enforcement actions and investigation of all 83 calls received involving suspected illicit discharge (Sacramento, 2003b).

Industrial and Commercial Management Programs

The total cost for this category was $42,318. Approximately 94 percent of the cost was for stormwater staff labor. The other identified cost was for developing BMP handbooks (one time annual cost, but may occur at a time later than one year). Other activities included issuance of 41 enforcement actions, development of BMP brochures for the auto body, auto washing, and auto repair industry, and creation of a Clean Water Business Partner program for the mobile pressure washing industry (Sacramento, 2003b).

Overall Stormwater Program Management

The total cost for this category was $281,501. Activities in this program were as follows:

- Office products
- Planning
- Annual reporting
- CASQA membership fees
- Mailing
- NPDES fees
- Legal fees
- Miscellaneous
- Stormwater staff labor

Pollution Prevention and Good Housekeeping for Municipal Operations

The total cost for this category was $3,270,806. Most of the cost for this category was for the activities of street sweeping (40 percent), drainage system maintenance (46 percent), and pump station cleaning (13 percent).

Street sweeping costs were also estimated by city staff. Street sweeping cost was estimated at $1.6 million. Street sweeping costs included the cost of sweeping 3 percent of the core downtown area 7 extra times a month which is beyond the city's permit requirement (Busath, pers. comm., 11/21/04). Due to this an annual required compliance cost was calculated for the city based on the $1.6 million estimate and permit required street sweeping frequencies (Table E-7). The calculated annual required compliance cost was $1,322,748.

Sump, drain inlet, manhole, and drain line and channel cleaning performed by city staff was reported under the Field Services labor category in Table E-8. Equipment costs for this effort was not available, but was roughly estimated as 75 percent of the labor costs as a result of consultation with city staff. This brings the total cost for drainage system maintenance to $1,514,926.

Lastly, $2,500 was attributable to this category for development of BMP handbooks (one time cost, but may occur less frequent than annually due to updates). The city also performed inspection and maintenance of parking lots (Sacramento, 2003b).

Due to inaccurate use of labor codes by city personnel for pump station cleaning, these costs were estimated by the city of Sacramento staff rather than relying on accounting record reports (Busath, pers. comm., 11/21/03). The reported labor cost of $22,552 from Table E-8 was not used in this report. Pump station cleaning, including equipment costs, was estimated at $420,000 (Busath, pers. comm., 1/11/05).

Post Construction Stormwater Management in New Development and Redevelopment

The total cost of this category was $38,517. The labor costs for this category were broken down in the same way as the Construction Site Stormwater Runoff Control category. There was also cost identified for development of BMP handbooks (one time annual cost, but may occur at a time later than one year)

Public Education, Outreach, Involvement, and Participation

The total cost of this category was $361,440. The costs associated with this category were for the following activities:

- Developing Integrated Pest Management (IPM)
- Television
- Radio
- Billboard
- Newspaper
- Mailings
- Participation in public events
- Water Education Foundation grant
- Project development
- Agriculture outreach
- Pet outreach
- Elementary education

- Student intern labor
- Stormwater staff labor
- University grant

Where activity statistics were available, normalized costs were calculated. Activity statistics were not available for each activity. Therefore, normalization based on total cost was not possible.

Water Quality Monitoring

The total cost of this category was $494,577. Modeling and data analysis accounted for $131,688. Sample collection and lab cost was $303,077 and stormwater staff and student labor cost was $59,812.

Watershed Management

The total cost of this category was $31,591, which was primarily for stormwater staff labor.

References

City of Sacramento. 2003. "Stormwater Management Program 2002/2003 Annual Report"

Table E - 1. Sacramento Costs Organized by Cost Survey Category

Cost Survey Categories

Activity Description

Construction Site Stormwater Runoff Control

Description	External Contract	Relation to Permit[a]	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Overall Program										
College Foundation costs		New	12,475.20	Table E-4	4.8%					
BMP handbooks (CASQA)		New	2,500.00	Table E-5	1.0%					
Other constuction element		New	64,778.39	Table E-7, Item 1	24.8%					
Construction inpections		New	181,962.17	Table E-7, Item 2	69.5%	6,375	inspections	Sacramento, 2003b	28.54	$/inspection
Total			261,715.76		5.4%	of total stormwater cost				
Overall Cost Category Normalizations										
total category $ per inspection						6,375	inspections	Sacramento, 2003b	41.05	$/inspection
total category $ per active construction site						417	active construction sites	Sacramento, 2003b	627.62	$/active construction site

Illicit Discharge Detection and Elimination

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Illegal discharge inspection		New	13,816.15	Table E-7, Item 8	36.8%					
Other iillegal discharge		New	23,690.64	Table E-7, Item 7	63.2%					
Total			37,506.79		0.8%	of total stormwater cost				

Industrial and Commercial Management Programs

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
BMP Handbooks (CASQA)		New	2,500.00	Table E-5	5.9%					
Industrial inspections		New	1,823.89	Table E-7, Item 6	4.3%	39	inspections	Sacramento, 2003b	46.77	$/inspection
Other industrial		New	37,993.92	Table E-7, Item 5	89.8%					
Total			42,317.81		0.9%	of total stormwater cost				

Overall Stormwater Program Management

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Planning-Bill Crooks	x	New	13,550.00	Table E-2, Item 38	4.8%					
NPDES fee		New	10,000.00	Table E-2, Item 40	3.6%					
Legal Fees	x	New	29,585.00	Table E-2, Item 43	10.5%					
Federal Express		New	110.00	Table E-2, Item 44	0.0%					
Legal Fees	x	New	915.00	Table E-2, Item 45	0.3%					
Petty cash		New	1,527.00	Table E-2, Item 48	0.5%					
Viking office products		New	324.00	Table E-2, Item 51	0.1%					
Annual Reporting-Wendy Alexander	x	New	2,480.00	Table E-2, Item 54	0.9%					
CASQA		New	5,000.00	Table E-2, Item 55	1.8%					
Miscellaneous expenses		New	1,108.00	Table E-2, Item 56	0.4%					
General stormwater activiites		New	52,696.90	Table E-7, Item 3	18.7%					
Program management		New	160,161.19	Table E-7, Item 28	56.9%					
Program management		New	4,044.41	Table E-7, Item 29	1.4%					
Total			281,501.50		5.8%	of total stormwater cost				

Table E-1 continued

Pollution Prevention and Good Housekeeping for Municipal Operations

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Pump stations		Enhanced	420,000.00	Busath, 2004	12.8%		includes equipment and labor	Busath, pers. comm., 1/12/05		
Street sweeping		Enhanced	1,322,748.02	Table E-6	40.4%	26,450	adjusted curb miles swept	Table E-6	50.01	$/curb mile swept
BMP handbooks (CASQA)		New	2,500.00	Table E-5	0.1%					

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Table E – 1. Continued

Field services (drainage system maintenance)		Enhanced	865,672.17	Table E-7	26.5%		equipment estimated below	Busath, pers. comm., 1/12/05		
Water waste activities		New	896.73	Table E-7, Item 27	0.0%					
Other municipal operations		New	9,735.09	Table E-7, Item 15	0.3%					
Equipment (drainage system maintenance)		Enhanced	649,254.13	Busath, 2004	19.8%		calculated as 75% of field services	Busath, pers. comm., 1/12/05		(no backup available)
Total			3,270,806.13		67.9%	of total stormwater cost				

Post Construction Stormwater Management in New Development and Redevelopment

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
New development		New	29,779.10	Table E-7, Item 4	77.3%					
College Foundation costs		New	6,237.60	Table E-4	16.2%					
BMP handbooks (CASQA)		New	2,500.00	Table E-5	6.5%					
Total			38,516.70		0.8%	of total stormwater cost				

Public Education, Outreach, Involvement, and Participation

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Develop IPM	x	New	4,710.00	Table E-2, Item 9	1.3%					
Develop IPM	x	New	34,812.00	Table E-2, Item 11	9.6%					
Develop IPM	x	New	577.00	Table E-2, Item 12	0.2%					
Television						201	days	Sacramento, 2003b	331.79	subtotal $/day
Univsion 19	x	New	13,010.00	Table E-2, Item 19	3.6%					
Comcast	x	New	26,284.00	Table E-2, Item 4	7.3%					
KCRA	x	New	24,000.00	Table E-2, Item 6	6.6%					
KXTV	x	New	3,396.00	Table E-2, Item 8	0.9%					
Radio						64	days	Sacramento, 2003b	92.25	subtotal $/day
Clear Channel	x	New	4,374.00	Table E-2, Item 3	1.2%					
KSSJ	x	New	1,530.00	Table E-2, Item 7	0.4%					
Billboards						1	days	Sacramento, 2003b	5,208.00	subtotal $/day
Sign Effects	x	New	2,578.00	Table E-2, Item 16	0.7%					
Brownies	x	New	2,630.00	Table E-2, Item 39	0.7%					
Newspaper						34	days	Sacramento, 2003b	601.32	subtotal $/day
Sac Bee	x	New	736.00	Table E-2, Item 13	0.2%					
Z.C. Optimal Solutions	x	New	18,781.00	Table E-2, Item 22	5.2%					
Sacramento Business Journal	x	New	928.00	Table E-2, Item 23	0.3%					
Mailing						34,488	impressions	Sacramento, 2003b	0.06	subtotal $/impression
Vitali-gage Communic	x	New	1,522.00	Table E-2, Item 21	0.4%					
Auto Mailing		New	653.00	Table E-2, Item 37	0.2%					
Public Event Participation										
Pacific Rim		New	100.00	Table E-2, Item 1	0.0%					
Sac Zoo		New	7,000.00	Table E-2, Item 15	1.9%					
Other Activities										
Wayne Neilsen	x	New	1,717.00	Table E-2, Item 52	0.5%					
Jack Nadel	x	New	10,406.00	Table E-2, Item 5	2.9%					
Safe Designs	x	New	764.00	Table E-2, Item 49	0.2%					
Water ED Found Grant										
Water Edu Found		New	2,500.00	Table E-2, Item 18	0.7%					
Grant		New	2,500.00	Table E-2, Item 10	0.7%					
Project Development										
David John Darold	x	New	1,756.00	Table E-2, Item 42	0.5%					
Lee Pitt	x	New	419.00	Table E-2, Item 46	0.1%					
Linda Taylor	x	New	43.00	Table E-2, Item 47	0.0%					
ATV video Center	x	New	387.00	Table E-2, Item 2	0.1%					
UC Regents	x	New	3,589.00	Table E-2, Item 17	1.0%					
Misc encumbrance		New	15,500.00	Table E-3	4.3%					

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Table E – 1. Continued.

Urban creeks		New	750.00	Table E-2, Item 20	0.2%					
Agriculture outreach (cures)		New	2,639.00	Table E-2, Item 34	0.7%					
Pet outreach (doggie bags)		New	4,149.00	Table E-2, Item 35	1.1%					
Elementary Education (sac theatre co)		New	5,100.00	Table E-2, Item 14	1.4%					
Public education		New	93,986.89	Table E-7, Item 9	26.0%					
School outreach		New	23,465.49	Table E-7, Item 10	6.5%					
Landscape grant		New	6,676.64	Table E-7, Item 12	1.8%					
Clean Water Business Partnership		New	2,279.54	Table E-7, Item 13	0.6%					
Grants to agencies within city jurisdiction		New	2,500.00	Table E-2, Item 41	0.7%					
Storm drain stenciling program		New	1,503.76	Table E-7, Item 11	0.4%					
College Foundation costs		New	31,188.00	Table E-4	8.6%					
Total			361,440.32		7.5%	of total stormwater cost				

Table E-1 continued

Water Quality Monitoring

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Modeling and Data Analysis										
Kathy Russick	x	New	76,017.00	Table E-2, Item 27	15.4%					
LWA	x	New	43,748.00	Table E-2, Item 29	8.8%					
Geosyntec	x	New	4,690.00	Table E-2, Item 32	0.9%					
CSUS foundation		New	7,233.00	Table E-2, Item 31	1.5%					
Implementation: Sample Collection and Lab Analysis										
Aerospeed	x	New	167.70	Table E-2, Item 24	0.0%					
Caltest	x	New	37,197.00	Table E-2, Item 25	7.5%					
County	x	New	247,274.00	Table E-2, Item 26	50.0%					
Kinetic Labs	x	New	2,938.00	Table E-2, Item 28	0.6%					
Project Development		New	15,500.00	Table E-3	3.1%					
General monitoring		New	27,291.38	Table E-7, Item 19	5.5%					
NPDES compliance monitoring		New	9,525.69	Table E-7, Item 20	1.9%					
BMP effectiveness monitoring		New	341.74	Table E-7, Item 21	0.1%					
Special monitoring studies		New	409.30	Table E-7, Item 22	0.1%					
Coordinated monitoring program		New	390.75	Table E-7, Item 23	0.1%					
Coordinated monitoring program		New	368.56	Table E-7, Item 24	0.1%					
Coordinated monitoring program		New	617.52	Table E-7, Item 25	0.1%					
Coordinated monitoring program		New	8,392.24	Table E-7, Item 26	1.7%					
College Foundation costs		New	12,475.20	Table E-4	2.5%					
Total			494,577.08		10.3%	of total stormwater cost				

Watershed Management

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Acchibald and Wallberg	x	New	9,595.00	Table E-2, Item 33	30.4%					
Brake Pad Patnership		New	2,500.00	Table E-2, Item 36	7.9%					
Watershed stewardship		New	5,565.92	Table E-7, Item 14	17.6%					
Target pollutant		New	13,930.08	Table E-7, Item 18	44.1%					
Total			31,591.00		0.7%	of total stormwater cost				

Total Stormwater Costs 4,819,973.09

a. This column indicates whether required activities were being performed prior to stormwater permits. In some cases activities were enhanced due to permit requirements.

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Table E-2. Source Data Table Submitted by City of Sacramento (cost survey categories added)

Item #	City of Sacramento Category	Cost	Cost Survey Category[1]
	Public Outreach		
1	Pacific Rim	100	Public Education
2	ATV video Center	387	Public Education
3	Clear Channel	4,374	Public Education
4	Comcast	26,284	Public Education
5	Jack Nadel	10,406	Public Education
6	KCRA	24,000	Public Education
7	KSSJ	1,530	Public Education
8	KXTV	3,396	Public Education
9	Mark McCarthy	4,710	Public Education
10	Grant	2,500	Public Education
11	Ogilvy	34,812	Public Education
12	Rooney Design	577	Public Education
13	Sac Bee	736	Public Education
14	Sac Theater Co	5,100	Public Education
15	Sac Zoo	7,000	Public Education
16	Sign Effects	2,578	Public Education
17	UC Regents	3,589	Public Education
18	Water Edu Found	2,500	Public Education
19	Univision 19	13,010	Public Education
20	Urban Creeks	750	Public Education
21	Vitali-gage Communic	1,522	Public Education
22	Z.C. Optimal Solutions	18,781	Public Education
23	Sac Business Jour	928	Public Education
	Monitoring		
24	Aerospeed	168	Monitoring
25	Caltest	37,197	Monitoring
26	County	247,274	Monitoring
27	Kathy Russick	76,017	Monitoring
28	Kinetic Labs	2,938	Monitoring
29	LWA	43,748	Monitoring
30	Sequoia Analytical	0	
31	CSUS foundation	7,233	Monitoring
32	Geosyntec	4,690	Monitoring

Table E-2. Continued.

	Target Pollutant		
33	Acchibald and Wallberg	9,595	Watershed
34	Cures	2,639	Public Education
35	Doggie Bags	4,149	Public Education
36	Brake Pad Patnership	2,500	Watershed
	Misc		
37	Auto Mailing	653	Public Education
38	Bill Crooks	13,550	Management
39	Brownies	2,630	Public Education
40	NPDES fee	10,000	Management
41	CSUS	2,500	Public Education
42	David John Darold	1,756	Public Education
43	Downey Brand	29,585	Management
44	Fedex	110	Management
45	George & Shapiro	915	Management
46	Lee Pitt	419	Public Education
47	Linda Taylor	43	Public Education
48	Petty cash	1,527	Management
49	Safe Designs	764	Public Education
50	BMP handbooks	10,000	See Table E-5
51	Viking Office Prods	324	Management
52	Wayne Neilsen	1,717	Public Education
53	Misc encumbrance	31,000	See Table E-3
54	Wendy Alexander	2,480	Management
55	CASQA	5,000	Management
56	Misc Expenses	1,108	Management
	Students		
57	College Foundation	62,376	See Table E-4
	Total	786,175	

(Source: Busath, pers. comm., 11/21/03)

1. Cost Categories Abbreviated According to the Following:
   - Construction: Construction Site Stormwater Runoff Control
   - Illicit Discharge: Illicit Discharge Detection and Elimination
   - Industrial: Industrial and Commercial Management Programs
   - Management: Overall Stormwater Program Management
   - Pollution Prevention: Pollution Prevention and Good Housekeeping for Municipal Operations
   - Post Construction: Post Construction Water Management in New Development and Redevelopment
   - Public Education: Public Education, Outreach, Involvement, and Participation
   - Monitoring: Water Quality Monitoring
   - Watershed: Watershed Management

Table E-3. Distribution of Miscellaneous Encumbrance Between Public Education and Monitoring

Cost	Source	Percent Allocation	Category	Reference	Allocated Cost
31,000.00	Table 2, Item 53	50%	Public Education	Busath, pers. comm., 1/22/04	15,500.00
31,000.00	Table 2, Item 53	50%	Monitoring	Busath, pers. comm., 1/22/04	15,500.00
Total		100%			31,000.00

Table E-4. Distribution of College Foundation Costs for Student Internship Program

Cost	Source	Percent Allocation	Category	Reference	Allocated Cost
62,376.00	Table E-2, Item 57	50%	Public Education	Busath, pers. comm., 1/22/04	31,188.00
62,376.00	Table E-2, Item 57	20%	Construction	Busath, pers. comm., 1/22/04	12,475.20
62,376.00	Table E-2, Item 57	20%	Monitoring	Busath, pers. comm., 1/22/04	12,475.20
62,376.00	Table E-2, Item 57	10%	Post Construction	Busath, pers. comm., 1/22/04	6,237.60
Total		100%			62,376.00

Table E-5. Distribution of BMP Handbooks (CASQA) between Industrial, Municipal, New Development, and Construction

Cost	Source	Percent Allocation	Category	Reference	Allocated Cost
10,000.00	Table E-2, Item 50	25%	Industrial/Commercial	Busath, pers. comm., 1/22/04	2,500.00
10,000.00	Table E-2, Item 50	25%	Municipal	Busath, pers. comm, 1/22/04	2,500.00
10,000.00	Table E-2, Item 50	25%	Post Construction	Busath, pers. comm, 1/22/04	2,500.00
10,000.00	Table E-2, Item 50	25%	Construction	Busath, pers. comm, 1/22/04	2,500.00
Total		100%			10,000.00

Table E-6. Calculation of Street Sweeping Cost

Description	Dollar Amount of Statistic	Reference
Actual Cost	1,600,000.00	Busath, pers. comm., 1/22/04
monthly req. miles	2,200	Sacramento, 2003b
6/year req. miles	0	Sacramento, 2003b
1/year req. miles	50	Sacramento, 2003b
annual required	26,450	Calculation
monthly actual est. mi.	2,662	Busath, pers. comm., 1/22/04
6/year actual est. mi.	0	Sacramento, 2003b
1/year actual est. mi.	50	Sacramento, 2003b
annual actual est. mi.	31,994	Calculation
annual req. cost est.	1,322,748.02	Calculation

Table E-7. Labor Allocations for Sacramento Categories with Corresponding Cost Survey Categories

Item #	Sacramento Category	City Labor Code	Labor Cost	Cost Survey Category
1	Construction Element	HA	64,778.39	Construction
2	Construction Inspections	HA1	181,962.17	Construction
3	General Stormwater Actvities	HAA	52,696.90	Management
4	New Development Element	HB	29,779.10	Post Construction
5	Industrial Element	HC	37,993.92	Industrial
6	Industrial Inspection	HC1	1,823.89	Industrial
7	Illegal Discharge Program	HD	23,690.64	Illicit Discharge
8	Illegal Discharge Inspection	HD1	13,816.15	Illicit Discharge
9	Public Education Program	HE	93,986.89	Public Education
10	School Outreach Program	HE1	23,465.49	Public Education
11	Stormdrain Stenciling Program	HE2	1,503.76	Public Education
12	NN Landscape Grant	HE3	6,676.64	Public Education
13	CWBP	HE4	2,279.54	Public Education
14	Watershed Stewardship	HF	5,565.92	Watershed
15	Municipal Operations	HG	9,735.09	Pollution Prevention
16	Plant Services Stormwater Activities	HH	22,552.19	See Table E-1, pump stations
17	Field Services Stormwater Activities	HI	865,672.17	Pollution Prevention
18	Target Pollutant	HJ	13,930.08	Watershed
19	Monitoring	HK	27,291.38	Monitoring
20	NPDES Compliance Monitoring	HK1	9,525.69	Monitoring
21	BMP Effectiveness Monitoring	HK2	341.74	Monitoring
22	Special Monitoring Studies	HK3	409.30	Monitoring
23	Coordinated Monitoring Program	HK4	390.75	Monitoring
24	Coordinated Monitoring Program	HK5	368.56	Monitoring
25	Coordinated Monitoring Program	HK6	617.52	Monitoring
26	Coordinated Monitoring Program	HK7	8,392.24	Monitoring
27	Water Waste Activities	HL	896.73	Pollution Prevention
28	Program Management	HM	160,161.19	Management
29	Program Management	PM	4,044.41	Management
	Total		1,664,348.44	

(Source: Table E-8)

Table E-8. Labor Cost Data as Submitted by City of Sacramento Staff

City of Sacramento
Department of Utilities
Project Accounting Management System (PAMS)

Job #	Description	Org	Rept Catg	Total Employee Expense	Indiv Hourly Expense
21233	NPDES PROGRAM	3322	HH	665.49	95.1
		3323	HH	4,122.06	64.4
			HH	1,410.18	58.8
			HH	3,508.67	48.7
			HH	1,944.98	44.2
			HH	1,766.04	31.5
			HH	1,124.38	70.3
			HA1	108,293.85	63.9
			HH	868.3	64.3
			HH	1,023.82	64
			HH	930.52	58.2
			HH	198.42	49.6
			HH	448.59	64.1
			HH	384.49	64.1
			HH	656.76	41
			HH	283.2	35.4
			HH	1,122.86	70.2
		3331	HH	2,009.09	24.8
			HH	84.34	42.2
			HA	2,371.26	25.9
			HA1	6,658.08	26.4
			HAA	2,949.16	26.4
			HAA	1,463.31	41.8
			HD	49.61	24.8
			HE	655.9	25.7
			HE1	1,916.75	26.1
			HE2	417.95	26.1
			HF	99.23	24.8
			HK	244.3	27.1
			HK3	198.43	24.8
		3332	HAA	6,475.21	89.9
			HE	2,116.34	90.1
			HE1	1,461.61	89.5
			HG	8,302.14	90.2
			HJ	11,187.93	89.6

Table E-8. Continued.

			HK	17,265.87	89.4
			HK1	4,597.83	89
			HK2	162.9	89
			HK4	266.5	88.8
		3333	HK5	368.56	0
			HK6	617.52	65
			HK7	8,392.24	88.8
21233	NPDES PROGRAM	3333	HA	7,712.62	61.2
			HA	52,918.39	89
			HA	1,776.12	44.4
			HA1	5,602.74	62.3
			HA1	61,407.50	43.6
			HAA	12,504.88	61.9
			HAA	13,331.24	66.7
			HAA	12,627.60	89.2
			HAA	3,345.50	65
			HB	4,303.02	62.4
			HB	25,476.08	88.5
			HC	1,745.21	62.3
			HC	35,847.63	66.5
			HC	401.08	89.1
			HC1	248.44	62.1
			HC1	1,575.45	65.6
			HD	23,193.44	66.6
			HD	447.59	89.5
			HD1	13,816.15	68.2
			HE	11,310.88	62.3
			HE	156.04	62.4
			HE	928.86	88.5
			HE	78,818.87	69.4
			HE1	4,083.84	67.5
			HE1	4,279.00	89.1
			HE1	11,724.29	67.6
			HE2	1,085.81	67.9
			HE3	6,676.64	65.5
			HE4	2,279.54	67.4
			HF	62.43	62.4
			HF	987.49	89.8
			HF	4,416.77	63.1
			HG	1,164.59	68.5
			HG	268.36	89.5
			HJ	1,133.19	100.7
			HJ	1,608.96	67
			HK	804.75	100.6
			HK	1,499.54	68.2
			HK	7,266.64	89.2

Table E-8. Continued.

		HK	210.28	70.1
		HK1	4,927.86	55.7
		HK2	178.84	89.4
21233 NPDES PROGRAM	3333	HK3	210.87	38.3
		HK4	124.25	62.1
		HL	800.31	66.7
		HL	96.42	48.2
		HM	160,070.30	100.4
		HM	90.89	29.5
		PM	4,044.41	101.1
	3342	HI	1,440.10	53.3
	3343	HI	2,252.63	56.3
		HI	205.78	51.4
		HI	16,387.75	46.6
		HI	29,009.49	45.6
		HI	53,108.99	54.6
		HI	945.65	43
		HI	2,059.16	51.5
		HI	1,486.70	41.3
		HI	46,709.55	50
		HI	60,251.76	55.9
		HI	421.01	52.6
		HI	23,368.00	44.3
		HI	11,685.67	46.6
		HI	24,722.55	44
		HI	1,420.81	52.6
		HI	1,197.95	33.3
		HI	33,694.50	48.8
		HI	25,045.38	42.7
		HI	12,318.28	50.3
		HI	15,905.71	44.8
		HI	28,123.15	56
		HI	43,011.80	55.8
		HI	77,791.72	49.9
		HI	6,085.05	56.9
		HI	89,605.65	62.8
		HI	84,737.98	55.3
		HI	2,041.63	51
		HI	4,134.41	51.7
		HI	61,389.23	40.7
		HI	510.55	63.8
		HI	22,888.86	48.5
		HI	1,291.63	47.8
		HI	80,423.09	54.1
		Total	1664348.44	59.92

(Source: Busath, pers. comm., 11/21/03)

The backup calculations for the cost for each cost survey category in Section 8 and the sources of the cost data are presented in this appendix. Tables are generally presented by sequentially increasing levels of detail. Figure F-1 illustrates how data is shared throughout the tables.

Table F-1 contains all costs organized into the various standard cost survey categories. The subtotals for each cost category are also presented in Section 8, Table 8-2. The remaining tables (F-2 through F-7) present the detailed back-up information for the numbers in Table F-1. Table F-1 is linked to the back-up tables by the table and item numbers in the 'Source' column. Most of the cost information provided by city staff is listed in Table F-2. Item numbers corresponding to the subtotals in Table F-2 were added to the left hand column to easily show how the numbers are pulled forward to Table F-1. The right hand column in Table F-2 was added to show how costs were allocated to the cost survey categories. Table F-1 entries that were not taken directly from Table F-2 are found in Tables F-3 through F-7.

For the city of Santa Clarita, labor costs of the stormwater staff are not distributed among the various survey categories. Instead, it is all captured under Overall Stormwater Program Management. Thus, comparing costs with other municipalities where such costs are distributed, Santa Clarita's Overall Stormwater Management Program costs will be higher.

Detailed descriptions of how the costs were developed are contained in the following paragraphs.

Construction Site Stormwater Runoff Control

The total cost of this category was $74,995. The only cost attributed to this category was for inspections. The city conducted 11,746 inspections, but this number reflects multiple inspections for various construction activities at the same site (Santa Clarita, 2003b). Since this number does not solely represent stormwater inspections, this should be considered when comparing these inspection statistics with that of the other cities. Therefore, cost was normalized per active construction site (64) (Santa Clarita, 2003b). Other activities in this category included:

- Development of pollution prevention handouts directly related to specific construction functions
- The city's Environmental, Building and Safety, and Public Works inspectors completed site visits on a daily basis
- Cited contractors in the event of illicit connection detection

Santa Clarita

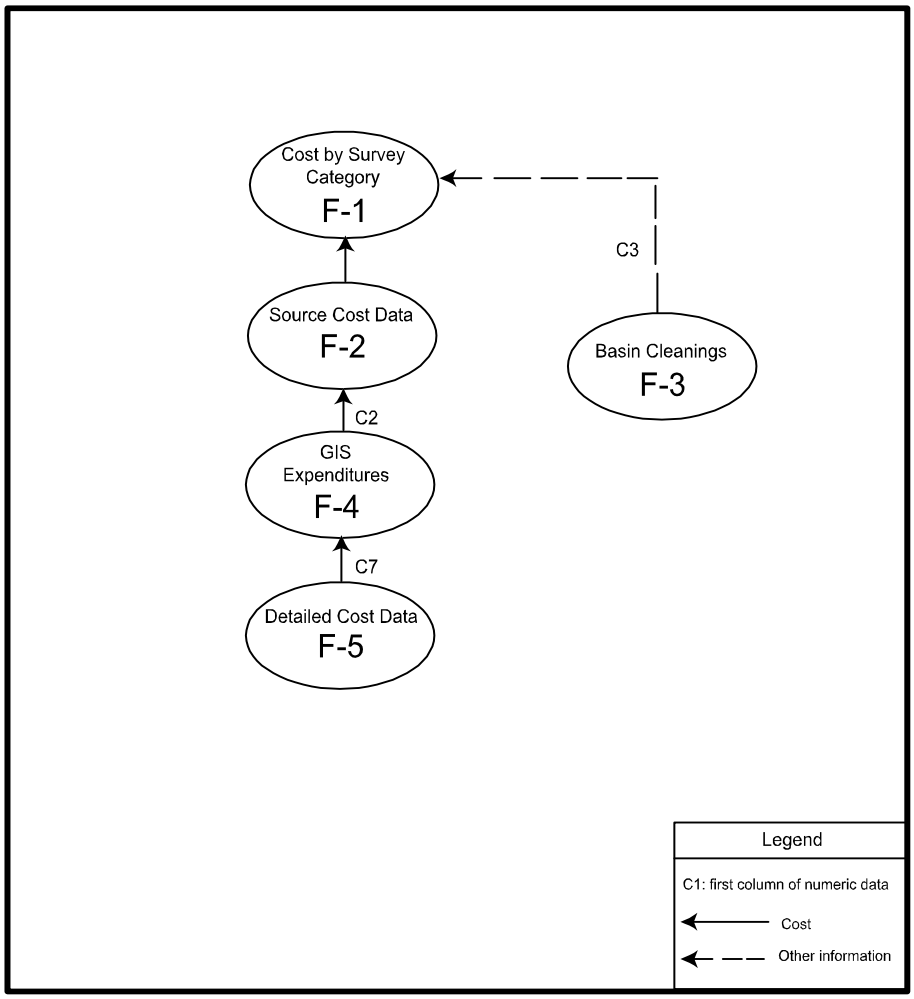

Figure F-1. Santa Clarita Flowchart

Illicit Discharge Detection and Elimination (IDDE)

The total cost of this category was $114,831. Though the city labeled this cost as operation and maintenance activities, activities were specific to identification and elimination of illicit connections and discharges.

The Los Angeles Flood Control District (LAFCD) owns and maintains 122,354 feet of open channel all of which was screened for illicit connections during the 2002/03 fiscal year. Out of the 20 illicit connections that were identified by screening, all were investigated, terminated, removed, and resulted in enforcement action (Santa Clarita, 2003b).

Also, 349 illicit discharges were reported. Of these, 291 were discontinued/cleaned up voluntarily through enforcement and the source identified, 2 were cleaned up with no source identified, 50 resulted in no evidence of discharge, 27 were determined to be conditionally

exempt, and 305 resulted in enforcement action. (Santa Clarita, 2003b). Normalized cost is $311 per investigation of both illicit connections and illicit discharges (20+349). This includes all associated follow up activities performed by the city as described above.

Industrial and Commercial Management Programs

The total cost of this category was $12,600. The only cost for this category was for inspection of industrial and commercial facilities. The city inspection staff performed 110 inspections during 2002/03. The city of Santa Clarita contracts with Los Angeles County of perform these inspections but are done by city staff (Cramer, pers. comm., 4/22/04). Enforcement actions were issued which included 17 verbal warnings and 4 notices to comply. (Santa Clarita, 2003b).

Overall Stormwater Program Management

The total cost for this category was $515,352. These costs are for administrative activities and development planning. Stormwater staff time (including overhead allocation) used to oversee or implement the activities in the other cost categories accounted for $438,832. Overhead allocation (other supporting city functions, building, etc.) was $253,073. This number is described in the footnote to Table F-2. Development planning cost was $76,520. These costs were for activities the city does to insure developers are following SUSMP[1] standards. Maintenance of the stormwater section of city's website was also performed.

Pollution Prevention and Good Housekeeping for Municipal Operations

The total cost for this category was $859,754. Activities performed in this category were for catch basin cleaning, trash pick-up, and street sweeping. The cost attributed to catch basin cleaning was $251,908. During 2002/03, 1,482 catch basins were cleaned (Table F-3). The cost attributed to street sweeping was $557,443. The city sweeps all streets once a week (Santa Clarita, 2003b). A total of 900 curb miles were swept per week in 2002/03 (Cramer, pers. comm., 4/22/04). Trash pick-up costs were $50,403 for the household hazardous waste program.

Post Construction Stormwater Management in New Development and Redevelopment

The adjusted cost of this category was $106,925. The total cost for this category submitted by the city of Santa Clarita was $256,950. Of the cost, $97,813 was for vehicles for catch basin cleaning (Cramer, pers. comm., 4/22/04). These capital costs were recurring for other projects at an unknown interval and were assumed to be annual for the purposes of this survey. The remaining $9,112 was for maintenance and conveyance of one detention basin (Cramer, pers. comm., 4/22/04).

---

[1] SUSMP: Standard Urban Storm Water Mitigation Plans (SUSMPs) are often referenced by permits. They set treatment requirements for new construction and redevelopment. (www.swrcb.ca.gov)

Public Education and Outreach and *Public Involvement and Participation*

The total cost for these categories was $49,130. These categories were combined for the city of Santa Clarita. This cost includes employee training to administer these categories. Activities in this category included:

- Storm drain stenciling: Out of the city owned 440 drain inlets, 45 were marked with a no dumping message
- Maintained stormwater hotline: The city received approximately 30 calls per day relating to trash, household hazardous waste, and stormwater (Cramer, pers. comm., 4/22/04)
- Print, television, radio, and other media: Approximately 5 million impressions were made (for the entire permitted area). A breakdown for Santa Clarita was not available
- School outreach: An environmental mascot visited schools and public events to educate attendees on stormwater issues. Children's activity books were distributed at appearances. Flyers were distributed to promote the River Rally event
- Cooperated with the principal permittee to develop specific outreach programs to target pollutants in their area
- Distributed pollutant-specific materials
- Developed and distributed brochures and door hangers to specific residents
- Attended 4 workshop/community events to discuss stormwater pollution

Programs supported by the principal permittee were funded in part by a contribution from the city of Santa Clarita in the amount of $45,822. The remaining activities were performed by stormwater staff and that cost breakdown was not available.

Water Quality Monitoring

The total cost of this category was $3,300 (Table F-2). This included monitoring for diazinon multiple times at one site (Cramer, pers. comm., 4/22/04).

Watershed Management

The total cost of this category was $332,949. This cost was allocated to this category based on estimates from city staff. The staff estimated that 50 percent of GIS cost was attributable to stormwater activities (Table F-4).

References

City of Santa Clarita. 2003. "Los Angeles County Municipal Storm Water Permit (Order 01-182) Individual Annual Reporting Form, Attachment U-4"

Table F - 1. Santa Clarita Cost Organized by Cost Category

Cost Survey Categories

Activity Description

Construction Site Stormwater Runoff Control

Description	External Contract	Relation to Permit[a]	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Construction inspections		New	74,995.00	Table F-2, Item 9	100%	64	active construction sites	Santa Clarita, 2003b	1,171.80	$/active construction site
Total			74,995.00		3.6%	of total stormwater cost				

Illicit Discharge Detection and Elimination

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Operations and maintenance		New	114,831.05	Table F-2, Item 16	100%	369	investigations	Santa Clarita, 2003b	311.20	$/investigation
Total			114,831.05		5.5%	of total stormwater cost				

Industrial and Commercial Management Programs

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Industrial/Commercial site visit activities		New	12,600.00	Table F-2, Item 7	100%	110	inspections	Santa Clarita, 2003b	114.55	$/inspection
Total			12,600.00		0.6%	of total stormwater cost				

Overall Stormwater Program Management

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Administrative costs		New	438,832.00	Table F-2, Item 1	85.2%					
Development planning		New	76,519.55	Table F-2, Item 8	14.8%					
Total			515,351.55		24.9%	of total stormwater cost				

Pollution Prevention and Good Housekeeping for Municipal Operations

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Catch basin cleaning		Enhanced	251,907.99	Table F-2, Item 12	29.3%	1,482	basin cleanings	Table F-3	169.98	$/basin cleaning
Trash pick-up		Existing	50,402.55	Table F-2, Item 13	5.9%					
Street sweeping		Enhanced	557,443.16	Table F-2, Item 11	64.8%	46,800	curb miles swept	Cramer, pers. comm., 4/22/04	11.91	$/curb mile swept
Total			859,753.70		41.5%	of total stormwater cost				

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Table F – 1. Continued.

Post Construction Stormwater Management in New Development and Redevelopment

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
BMP maintenance		New	9,111.93	Table F-2, Item 10	8.5%					
Capital costs		New	97,813.00	Table F-2, Item 14	91.5%					
Total			106,924.93		5.2%	of total stormwater cost				

Public Education, Outreach, Involvement, and Participation

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Public education and outreach		New	45,821.98	Table F-2, Item 3	93.3%					
Employee training		New	3,308.39	Table F-2, Item 4	6.7%					
Total			49,130.37		2.4%	of total stormwater cost				

Water Quality Monitoring

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Monitoring		New	3,300.00	Table F-2, Item 18	100%					
Total			3,300.00		0.2%	of total stormwater cost				

Watershed Management

Description	External Contract	Relation to Permit	Dollar Amount	Source	% of Category	Activity Statistic	Notes/Units	Reference	Normalized Cost	Notes/Units
Watershed management		New	332,949.00	Table F-2, Item 19	100%					
Total			332,949.00		16.1%	of total stormwater cost				

Total Stormwater Costs	2,069,835.60

a. This column indicates whether required activities were being performed prior to stormwater permits. In some cases activities were enhanced due to permit requirements.

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Table F-2. Source Data Table Submitted by City of Santa Clarita in their Annual Report Form for Los Angeles County Municipal Stormwater Permit (cost survey categories added)

Item #	City of Santa Clarita Category	Cost	Cost Survey Category[1]
	Program Mangement		
1	Administrative Costs	438,832.00	2 Management
2	Capital Costs	0.00	
	Public Information and Participation		
3	Public Outreach/Education	45,821.98	Public Education
4	Employee Training	3,308.39	Public Education
5	Corporate Outreach	0.00	
6	Business Assistance	0.00	
7	Industrial/Commercial Inspection/Site Visit Actvities	12,600.00	Industrial
8	Development Planning	76,519.55	Management
	Development Construction		
9	Construction Inspections	74,995.00	Construction
	Public Agency Activities		
10	Maintenance of structural and treatment control BMPs	9,111.93	Post Construction
11	Municipal Street Sweeping	557,443.16	Pollution Prevention
12	Catch Basin Cleaning	251,907.99	Pollution Prevention
13	Trash Collection/Recycling	50,402.55	Pollution Prevention
14	Capital Costs	97,813.00	3 Post Construction
15	Other	0.00	
	IC/ID Program		
16	Operations and Maintenance	114,831.05	Illicit Discharge
17	Capital Costs	0.00	
18	Monitoring	3,300.00	Monitoring
19	Other (Watershed Management)	332,949.00	4 Watershed
	Total	2,069,835.60	

(Source: Santa Clarita 2003b)

1. Cost Categories Abbreviated According to the Following:
   - Construction: Construction Site Stormwater Runoff Control
   - Illicit Discharge: Illicit Discharge Detection and Elimination
   - Industrial: Industrial and Commercial Management Programs
   - Management: Overall Stormwater Program Management
   - Pollution Prevention: Pollution Prevention and Good Housekeeping for Municipal Operations
   - Post Construction: Post Construction Water Management in New Development and Redevelopment
   - Public Education: Public Education, Outreach, Involvement, and Participation
   - Monitoring: Water Quality Monitoring
   - Watershed: Watershed Management

2. Cost reported in the annual report form was $184,710. Per personal communication with Dan Smith, this number was adjusted up to $185,759 because of $1,049 in previously unallocated labor for stormwater staff. Another $253,073 was also added as the cost of overhead allocation. Overhead allocation was not included in the annual report and it pays for support by other departments such a payroll, human resources, etc. as well as a fraction of building costs.

3. $137,784 was adjusted down to $97,813 after a more thorough review by city finance staff. The city suggested we add $150,025 for the curb line and gutter maintenance program, but this cost could not be established as a stormwater compliance cost.

4. From Table 7-3.

Table F-3. Calculation of Number of Basin Cleanings

Type	Number	Reference	Frequency (yearly)	Reference	Total Cleanings
Priority A	65	Santa Clarita, 2003b	3	Santa Clarita, 2003b	195
Priority B	180	Santa Clarita, 2003b	3	Santa Clarita, 2003b	540
Priority C	249	Santa Clarita, 2003b	3	Santa Clarita, 2003b	747
Total	494				1,482

Table F-4. Calculation of GIS Expenditures Relating to Stormwater

Amount	Source	Percent Allocation	Category	Reference	Allocated Cost
665,897.12	Table F-5	50%	Watershed Management	Cramer, pers. comm., 6/9/04	332,948.56
665,897.12	Table F-5	50%	Not Related to Stormwater	Cramer, pers. comm., 6/9/04	332,948.56
Total		100%			665,897.12

Table F-5. Financial Cost Data Submitted by City of Santa Clarita

STORMWATER UTILITY FINANCIAL PROJECTIONS
Financial History

		1996-97 Actuals	1997-98 Actuals	1998-99 Actuals	1999-00 Actuals	2000-01 Actuals	2001-02 Actuals	2002-03 Actuals
REVENUES:								
	User Fee	1,847,538	2,149,920	2,527,683	1,925,118	2,101,130	1,954,966	2,251,307
	(Supplemental Refund)							
	Interest Income	42,104	58,193	79,913	86,125	143,197	96,382	81,505
	Misc. Revenues		103	1,811			103,285	147,464
	Sale of Maps & Publications			140	1,792	1,696	2,597	1,929
	Operating Transfers In			53,633	125,028	277,836	323,142	289,765
Total Revenues		**1,889,642**	**2,208,216**	**2,663,179**	**2,138,063**	**2,523,859**	**2,480,373**	**2,771,971**
OPERATING EXPENDITURES:								
2314	GIS	965,352	327,471	213,712	232,334	486,642	504,794	665,897
4311	Stormwater Engineering				56,652	17,924		
5720	Stormwater Utility Admin		312,673	323,391	691,677	539,508	1,561,987	554,823
5740	Stormwater Field Activities	572,534	601,604	627,845	688,919	740,401	994,760	928,992
8140	Stormwater Attorney Services							
	Transfers Out							
	Overhead Allocation - 11% of Rev	197,820	197,820	197,820	197,820	197,820	203,895	253,073
	Audit Adj - AR Allowance							
TOTAL OPERATING EXPENDITURES		**1,735,706**	**1,439,567**	**1,362,768**	**1,867,401**	**1,982,295**	**3,265,435**	**2,402,785**
CAPITAL PROJECTS:								
	1996-97 Access Ramp	0	18,636	6,364				
	1997-98 Curb Gutter & Flowline			115,000				
	1999-00 Stormdrain Repairs					0		
	1999-00 Curb Gutter Flowline				157,415			
	Storm Drain Repairs			(97,660)	110,170	17,500		
M0031	Annual Curb Gutter Flowline						151,766	
M0032	Storm Drain Transfer Program						73,428	316,215
M0037	Annual Curb Gutter Flowline			190,668				150,025
	Water Discharge Retrofit			16,683				
	Galeton Street Improvements			18,850				
	2000-01 Curb Gutter Flowline					177,000		
	Annual Stormdrain Repairs					0		
TOTAL CAPITAL PROJECTS		**0**	**18,636**	**249,905**	**267,585**	**194,500**	**225,194**	**466,240**
Total Expenditures		**1,735,706**	**1,458,203**	**1,612,673**	**2,134,987**	**2,176,795**	**3,490,629**	**2,869,025**
EXCESS (DEFICIENCY) REVENUES OVER		**153,936**	**750,013**	**1,050,506**	**3,077**	**347,065**	**(1,010,256)**	**(97,054)**
FUND BALANCE - BEGINNING OF YEAR		**$ 898,435**	**$ 1,052,371**	**$ 1,802,383**	**$ 2,852,890**	**$ 2,855,966**	**$ 3,203,031**	**$ 2,192,775**
FUND BALANCE - END OF YEAR		**$ 1,052,371**	**$ 1,802,383**	**$ 2,852,890**	**$ 2,855,966**	**$ 3,203,031**	**$ 2,192,775**	**2,095,721**
Reserve For Vehicle Replacement				**47,998**	**65,183**	**83,039**	**115,776**	**175,000**
C.	**RECEIVABLE - NON PAYING CUSTOMERS**						**$ 84,658**	
D.	**REMAINING SCHOOL RECEIVABLES**						**$ 535,611**	
Unreserved Fund Balance		**$ 1,052,371**	**$ 1,802,383**	**$ 2,804,892**	**$ 2,790,783**	**$ 3,119,992**	**$ 1,456,730**	**$ 1,920,721**

Appendix G Calculations and Comparisons

Section G-1 of this appendix contains backup calculations for certain results in Section 9 and additional cost analysis that did not prove useful, but is presented here to demonstrate their lack of utility (Section G-1). This is particularly true of regressions of normalized cost versus cost factors. Section G-2 of this appendix contains analysis of future cost to compare various cost scenarios using equivalent annual cost.

To compare costs from years greater than a year different from the year of this study (2003 dollars), the Consumer Price Index Urban (CPIU) was used (U.S. Bureau of Labor Statistics, 2005). CPIU was used because it is a common measure of inflation, it was similar to the Engineering News Review Construction Cost Index (CCI) from the Engineering News Record (ENR), yet CPIU reflects more broadly on how inflation than the CCI. As an example of similarity between the two indices, the CPIU adjustment factor from 1998 to 2003 agreed with the CCI to three significant figures. Because CPIU was similar to the ENR CCI and for consistency, CPIU was used to adjust both construction costs (e.g. treatment plant) and city stormwater costs that fund mostly non-construction activities such as inspection programs and maintenance of city infrastructure.

G.1 COST SURVEY ANALYSIS

This section contains costs normalized by both number of households and population. Since cost per households is the most common in the literature, several regressions against this parameter are also presented in this section.

Survey Category Costs per Household

Table G-1 presents survey category costs normalized by households.

Table G-1. Survey Category Costs Per Household

	Const.	IDDE	Ind/Com	Overall Man.	Pollution Prevention	Post. Con.	Pub. Ed.	Mon.	W. Man.
Entity	$/HH	$/HH	$/HH	$/HH	$/HH	$/HH	$/HH	$/HH	$/HH
City of Corona	1.36	0.53	2.29	8.09	18.34	0.34	0.72	0.18	0.00
City of Encinitas	7.12	2.07	2.75	5.38	22.16	0.64	1.76	3.20	0.52
City of Fremont	0.26	0.09	3.02	6.54	30.64	0.51	1.46	1.89	0.25
Fresno-Clovis Area	0.42	0.07	0.24	2.92	11.47	0.29	1.08	1.29	0.00
City of Sacramento	1.60	0.23	0.26	1.72	21.41	0.23	2.20	3.02	0.19
City of Santa Clarita	1.43	2.19	0.24	9.83	16.39	2.04	0.94	0.06	6.35
Average	2.03	0.86	1.47	5.74	20.07	0.68	1.36	1.61	1.22
Median	1.39	0.38	1.27	5.96	19.88	0.42	1.27	1.59	0.22
Minimum	0.26	0.07	0.24	1.72	11.47	0.23	0.72	0.06	0.00
Maximum	7.12	2.19	3.02	9.83	30.64	2.04	2.20	3.20	6.35

Survey Category Costs Per Capita

Table G-2 presents survey category costs normalized by population.

Table G-2. Survey Category Costs Per Capita

	Const.	IDDE	Indust.	Overall Man.	Pollution Prevent.	Post. Con.	Pub. Ed.	Mon.	W. Man.
	$/capita								
City of Corona	0.43	0.17	0.72	2.54	5.76	0.11	0.23	0.06	0.00
City of Encinitas	2.93	0.85	1.13	2.21	9.11	0.26	0.72	1.31	0.21
City of Fremont	0.09	0.03	1.03	2.23	10.46	0.17	0.50	0.65	0.09
Fresno-Clovis Area	0.15	0.02	0.09	1.02	3.99	0.10	0.38	0.45	0.00
City of Sacramento	0.64	0.09	0.10	0.69	8.04	0.09	0.89	1.22	0.08
City of Santa Clarita	0.50	0.76	0.08	3.41	5.69	0.71	0.33	0.02	2.20
Average	0.79	0.32	0.53	2.02	7.27	0.24	0.51	0.62	0.43
Median	0.46	0.13	0.41	2.22	7.19	0.14	0.44	0.55	0.08
Minimum	0.09	0.02	0.08	0.69	3.99	0.09	0.23	0.02	0.00
Maximum	2.93	0.85	1.13	3.41	10.46	0.71	0.89	1.31	2.20

Construction Program Cost Normalizations

Table G-3 presents construction program costs normalized by several cost factors. In some cases, activity statistics were not available and, as such, normalization was not possible. In such instances, the average and median statistics are only based on the data available. Construction costs were normalized by number of active construction sites and inspections. The large variability in normalized cost may be a result of inconsistent reporting of these cost factors.

Table G-3. Construction Program Unit Costs

Entity	Construction Cost	Active Sites	Construction $/active site	Inspections	Construction $/inspection
City of Corona	53,382	41	1,302	564	95
City of Encinitas	169,751	40	4,244	401	423
City of Fremont	17,715	24	738	197	90
Fresno-Clovis Area	81,800	N/A	N/A	N/A	N/A
City of Sacramento	261,716	417	628	6,375	41
City of Santa Clarita	74,995	64	1,172	N/A	N/A
Average			1,617		162
Median			1,172		92

Industrial and Commercial Program Cost Normalizations

Table G-4 presents industrial and commercial program costs normalized by several cost factors. In some cases, activity statistics were not available and as such, normalization was not possible. In such instances, the average and median statistics are only based on the data available. Industrial and commercial program costs were normalized by population, number of industrial and commercial sites, and number of inspections.

Table G-4. Industrial and Commercial Program Units

Entity	Program Cost	Sites	Industrial $/site	Inspections	Industrial $/inspection
City of Corona	89,916	3,050	29	600	150
City of Encinitas	65,596	417	157	266	247
City of Fremont	210,027	1,028	204	482	436
Fresno-Clovis Metropolitan Area	47,780	N/A	N/A	N/A	N/A
City of Sacramento	42,318	N/A	N/A	39	N/A
City of Santa Clarita	12,600	1,071	12	110	115
Average			101		406
Median			93		247

Additional Regression Analysis

Many of the following regressions have outer and inner confidence limits. Though practically useless, they are displayed to indicate how much inaccuracy results from the regressions. The inner limits are the 90 percent confidence interval for the mean cost from the total population of

"good" stormwater programs in California. The outer limits are the 90 percent confidence interval for cost of any one "good" California stormwater program.

Mean personal income appears to be the best indicator of total cost per household, but as a model not very useful because the predicted value nearly doubles when considering the confidence limits. Cost per household versus mean personal income is displayed in Figure G-1.

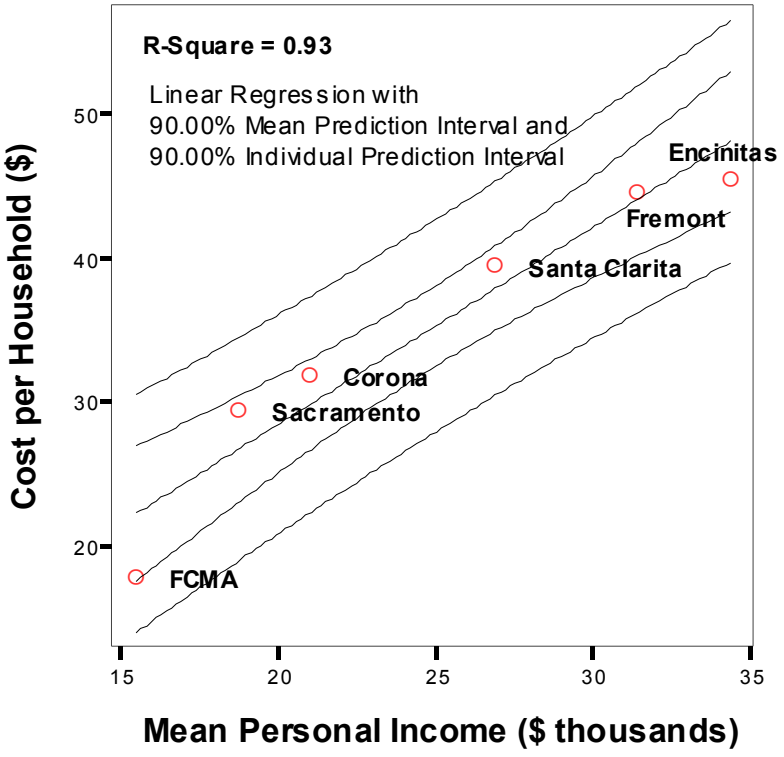

Figure G-1. Cost Per Household versus Mean Personal Income

In the regression of total cost per household verses income per household the theory is that the more money households bring in, the more a city would be able to collect for stormwater activities. However, this may not indicate more is accomplished because of higher cost for areas of higher income may limit how much can be accomplished. Cost per household versus mean household income is displayed in Figure G-2.

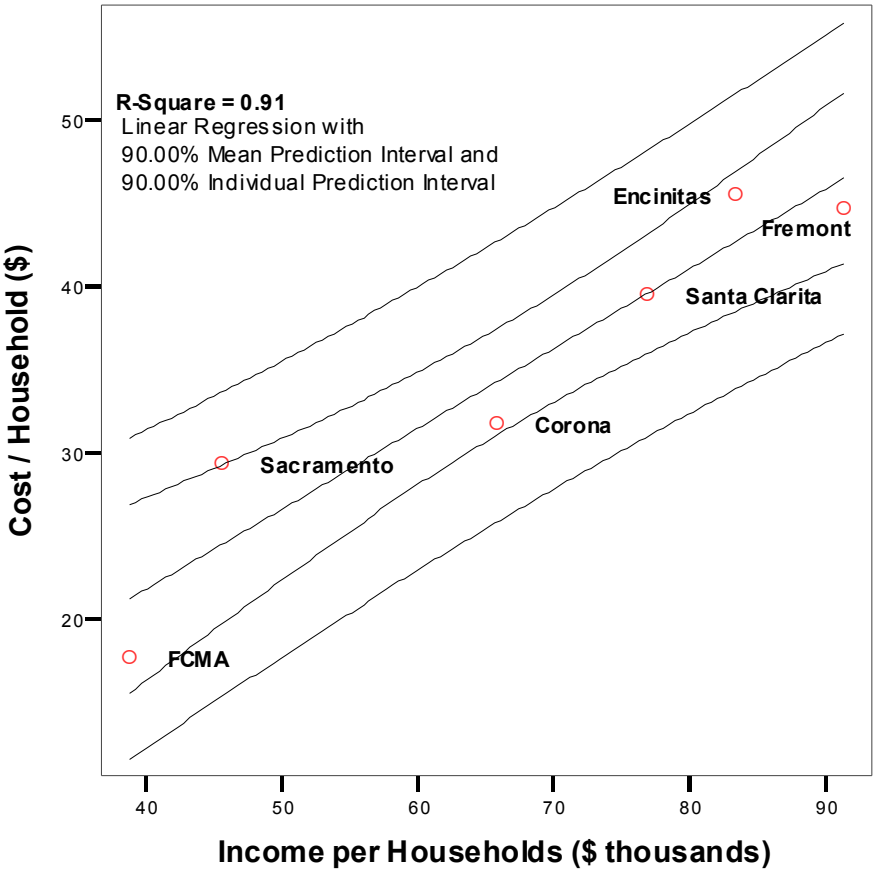

Figure G-2. Cost Per Household verses Income Per Household

As graphically demonstrated in Figure G-3, Fremont and Corona costs are particularly not well behaved in the regression of cost per household verses population. The conclusion is that city size is not a good predictor of stormwater cost per household (this is also discussed in Section 9.1). This is also demonstrated by the regression in Figure G-7.

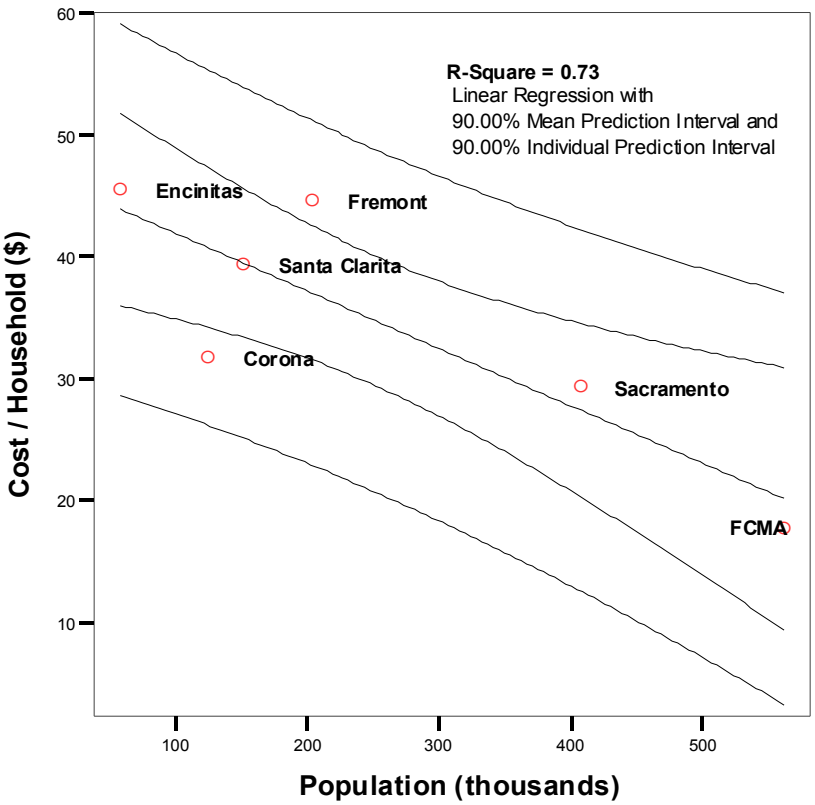

Figure G-3. Cost Per Household verses Population

Figures G-4 through G-7 show regressions using cost factors that are not useful in explaining costs. They are presented because there was some logic that they may be useful, and perhaps with more data they may prove to be helpful in more complicated models. However, they do not seem as important as the factors discussed qualitatively in Section 9.2 of the report. Each factor-years since incorporation, rainfall, income density, and incorporated area were considered for the following reasons:

- Years Since Incorporation was thought to increase cost because older cities would have higher maintenance costs
- Rainfall was thought to increase maintenance costs because of higher pollutant loads and a higher need for inspections
- Income Density was thought to generate a higher tax base for a given area. This would translate into more money available for stormwater.
- Area merely reflects the size of the city much like population. Area was considered because some activities, like street sweeping, may have been more dependent on area than population.

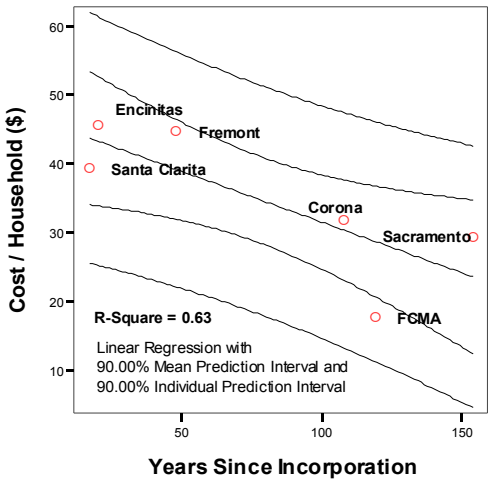

Figure G-4. Cost Per Household versus Years Since Incorporation

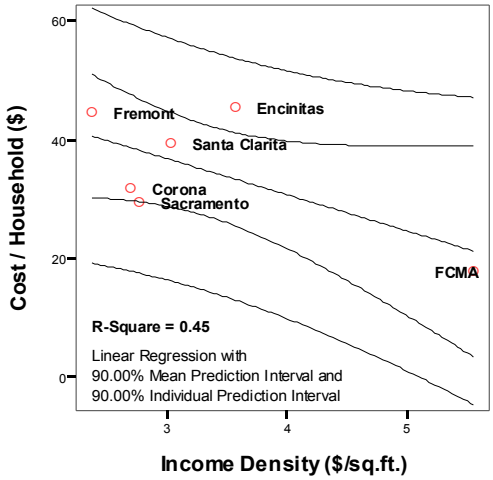

Figure G-5. Cost Per Household versus Annual Rainfall

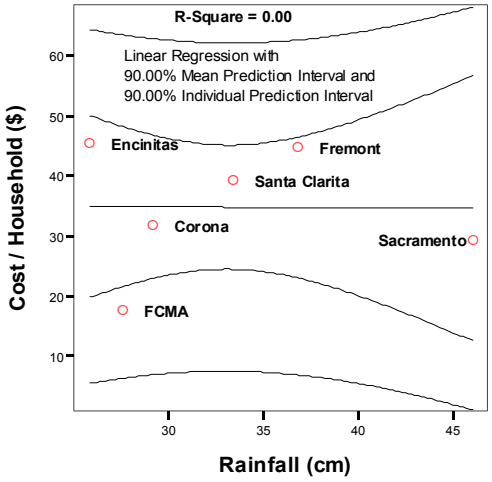

Figure G-6. Cost Per Household versus Income Density

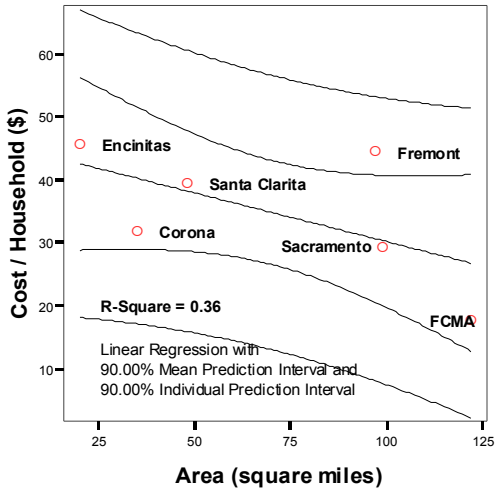

Figure G-7. Cost Per Household versus Area

Figure G-8 demonstrates that even though street sweeping is the highest cost activity, curb miles swept is not a very good predictor of stormwater costs. This is not surprising given the wide variability in street sweeping unit cost.

Another possible cost factor is type of land use but this could not be investigated due to land use data being inconsistent, or in several cases not available.

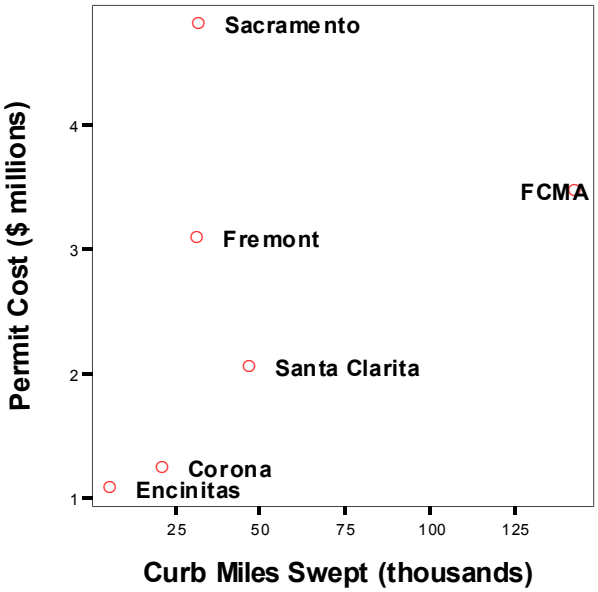

Figure G-8. Permit Cost verses Curb Mile Swept

G.2. FUTURE COST ESTIMATES FOR THE LOS ANGELES AREA

Examples of future costs are restricted to the Los Angeles area where the future compliance cost has been a source of continued controversy. Costs estimates were taken from USC studies, the Los Angeles River Trash TMDL, the Ballona Creek and Estuary Metals TMDL, and the city of Los Angeles. TMDL estimates are for control of all sources of the pollutant, not just stormwater sources. These costs are presented since future permits will reflect TMDL requirements of the TMDL costs will be attributable to stormwater quality management.

To compare these cost estimates with each other, equivalent annual cost was calculated. Equivalent annual cost is calculated by taking the present worth of all capital and annual costs and then multiplying by 3 percent to get an infinite series of annual payments. Observations on these comparisons are discussed in the following sections. Use caution when comparing costs. Each type of cost addresses certain pollutant and source scenarios. TMDLs address sources other than stormwater and also address specific pollutants. Conversely, the USC studies focus solely on stormwater pollution control but address all pollutants causing impairment to water bodies.

Costs from the Description of Alternatives for Control of Stormwater Quality in the Los Angeles County (Devinny et.al., Task B: Appendix H)

Task B is an assessment of regulatory policy to determine the intent to stormwater regulation regarding advanced treatment. Alternatives to advanced treatment that may comply with the intent of the regulations are described and costs are estimated. Task B was accomplished by faculty from the University of Southern California and the University of California Los Angeles and it is included as Appendix H.

The alternatives to advanced treatment focus on runoff reduction. The principle strategy is to reduce runoff by infiltration. The remaining runoff could be treated by conventional post-construction BMPs that are less expensive than advanced treatment. If certain discharges from these conventional BMPs still require advanced treatment, the cost of stormwater would be much less than if advanced treatment exclusively for stormwater pollution control. Based on this approach, costs for several alternatives are estimated for the area under jurisdiction by the LARWQCB. These alternatives do not include cost estimates for cases where advanced treatment is required because this need is assumed to be greatly limited. To compare these cost estimates with cost estimates from other studies, equivalent annual cost was calculated.

If source control[1] BMPs are sufficient to comply with regulations, the present worth cost is estimated at $2.8 billion ($84 million equivalent annual cost). The present worth cost, including low-tech treatment BMPs applied regionally, is between $5.7 billion and $7.4 billion ($171 million to $222 million equivalent annual cost) depending on whether cost per acre or cost per volume, respectively, were used in the estimates. Current level of effort in the Los Angeles area has only made limited progress in implementing the ideas described in Task B (Devinny, 2004). The current annual estimate of this effort is estimated at $18 per household (Radulescu and Swamikannu, 2003).

Table G-5. Equivalent Annual Cost Per Household for Task B Alternatives

Cost Scenario for the Los Angeles Area	Equivalent Annual Cost, $/household
Current Effort	18
Alternative to Advanced Treatment: Pollution Prevention Scenario (Present worth 2.8 billion)[1]	27
Alternative to Advanced Treatment: Wetlands and Infiltration Basins Scenario, calculated using cost per area (Present worth 5.7 billion)[1]	55
Alternatives to Advanced Treatment: Wetlands and Infiltration Basins Scenario, calculated using cost per capture volume (present worth 7.4 billion)[1]	71

1. Little progress has been made in implementing these scenarios (Devinny, pers. comm., 9/14/2004). These costs may be added to the current effort if existing programs continue to be required. Costs based on Devinny et. al. (Appendix H), see Table G-6 for equivalent annual cost calculation.

[1] The term "Non-structural BMP" was used by Devinny et. al. in Appendix H.

Table G-6. Calculation of Equivalent Annual Cost Per Household for Task B Alternatives

	Present Worth, 10^9	Equivalent Annual Cost, 10^6	Los Angeles County Households	Normalized Equivalent Annual Cost, $/Household
Pollution Prevention[1]	2.8	84.00	3,133,774	26.80
Wetlands and Infiltration Basins, based on unit cost per watershed area	5.7	171.00	3,133,774	54.57
Wetlands and Infiltration Basins, based on unit cost per detention volume	7.4	222.00	3,133,774	70.84

1. The pollution prevention scenario may include a small fraction of what cities are currently spending.

City of Los Angeles Bond Initiative and Future Bond Cost Estimates

On July 8, 2004, the Los Angeles Times reported that the council members of the city of Los Angeles agreed to place a $500 million bond on the November ballot to clean up local surface waters in compliance with the federal Clean Water Act. The bond revenue would pay for the first five years of projects to help the city comply with certain Clean Water Act regulations. City officials estimate they will need an additional $435 million and $750 million to fully comply with requirements to reduce pollutants including bacteria. (Garrison, 2004) Using the total compliance costs ($500, $435, and $750 million) results in $40/household[2] in equivalent annual costs.

Los Angeles River Trash TMDL

There are three cost estimates to comply with this TMDL (RWQCB, Los Angeles, 2001). Using catch basin inserts would have annual recurring costs of $66 million ($51/household), small separation units would have annual recurring costs of $183 million ($140/household), and large separation units would have annual recurring costs of $18 million ($14/household). It was not investigated why the cost of larger units is an order of magnitude less than smaller units.

Table G-7 presents the calculation worksheet for converting cost in the TMDL to equivalent annual cost per household.

[2] A discount rate of 3% and 1,275,412 households were used to calculate equivalent annual costs per household.

Table G-7. Cost Calculations for Los Angeles River Trash TMDL[1]

Scenario	2001 dollars		2003 dollars				
	Capital Cost, 10^6	Recurring O&M, 10^6	Capital Cost, 10^6	Recurring O&M, 10^6	Annualized Capital Cost[2], 10^6	Total Annual Cost, 10^6	Cost Per Household[3], $
Catch Basin Inserts Only	120	60	125	62.3	3.7	66.1	51
Small Separation Units	945	148	982	154	29.5	183	140
Large Separation Units	332	7.4	345	7.7	10.3	18.0	14

1. 2001 costs were adjusted for inflation to obtain 2003 cost figures (in millions, except cost per household).
2. A rate of 3 percent was used to calculate these costs.
3. Based on 1,300,000 households in the Los Angeles River watershed.

Ballona Creek and Estuary Metals TMDL

The Ballona Creek watershed covers 128 square miles in Los Angeles County. Open space comprises 17.5 square miles and water comprises 0.75 square miles of the Ballona Creek watershed. Cost estimates are based on the remaining 110 square miles.

Infiltration trenches and sand filters were assumed to cover 40 percent of the urbanized portion. The remaining costs were an estimate of approaches including source control and pollution prevention measures (RWQCB, Los Angeles, 2004). The equivalent annual cost per household in the watershed are estimated to be between $70 and $75.

It is noted in the TMDL that the retrofit cost per area for these devices in the Caltrans BMP Retrofit Pilot Study was nearly 10 times greater for stand alone retrofit projects. It is expected that cost will be reduced if BMPs are installed within larger reconstruction projects (Caltrans, 2004).

Table G-8 provides cost information relating to compliance with this TMDL. Annualized construction costs were calculated by multiplying the construction cost by three percent. Ranges of total annual cost were determined based on the estimates. The low side of the range includes the FHWA annualized construction cost and the USEPA recurring maintenance cost. The high side of the range includes the USEPA annualized construction cost and the recurring maintenance cost. It was assumed that 40 percent of the urbanized portion of the watershed would need to be treated by structural BMPs. Of this 40 percent, infiltration trenches would treat 20 percent of the watershed and sand filters would treat the other 20 percent. The remaining 60 percent would include enhanced pollution prevention activities (e.g. street sweeping).

Table G-8. Cost Calculations for Ballona Creek and Estuary Metals TMDL

Cost Basis	Construction Cost	Recurring Maintenance Cost	Annualized Construction Cost[2]	Total Annual Cost[3]	Cost Per Household
USEPA estimate (1999)	336	36	10.1	46.1	75
FHWA estimate (1994)	245	not reported	7.4	43.4	70

1. Dollars in millions (except cost per household).
2. A rate of 3 percent was used to calculate these costs.
3. Total cost for the FHWA includes their annualized construction cost and the USEPA recurring maintenance cost.

California Willingness to Pay for Statewide Clean Water

According to a survey (Larsen and Lew, 2003), California residents are willing to pay on average $180 per year to remove all impairments from all water bodies in the state (not just urban areas). Potential limitations with this estimate are discussed here.

This assumes cleaning water from all sources of contaminants, not just urban stormwater sources so this may not be directly compared to the cost of stormwater programs. Also, the cost of stormwater programs is only what the cities pay per household. It does not include other cost passed along to the household or individual. These costs are not incurred by the cities but by developers complying with the construction permit and Standard Urban Stormwater Mitigation Plan (SUSMPs) and industries complying with the industrial permit and businesses and individuals complying with the stormwater permit.

The survey also had 40% non-responders. This may overestimate the willingness to pay based on the assumption the people that do not respond to an environmental survey are less likely to care about environmental issues and people that do not care are less willing to pay for water quality improvement. It does not appear that these issues were addressed by the study.

The study did adjust the willingness to pay based on the average education of Californians. The sample population surveyed had a longer education than average Californians and a statistically significant correlation was found between willingness to pay and years of education. However, it is unclear from the report if the correlation was extrapolated to years of education below that of the surveyed population. This would assume that the relationship between education and willingness is the same for lower years of education.

Comparing Task B Alternatives to Advanced Treatment and TMDL Cost Estimates

The ‘alternatives’ described in Task B are meant to address all pollutants, while the metals or trash TMDLs only address single type pollutants yet the cost estimate is higher. In both cases, advanced treatment is not considered and common BMP costs are used. This comparison indicates the variability in cost estimates for similar stormwater scenarios. Comparing the two TMDL maximum cost estimates also demonstrate the sensitivity of cost estimates to BMP deployment scenarios. Metals are more difficult to remove than litter and thus it is expected the cost would be less, however, the metals TMDL assumed only 40% of the watershed would be retrofitted with treatment BMPs while the trash TMDL assumed 100% deployment of litter removal BMPs. A major cause of variation in these estimates is that the unit cost used in these

estimates vary from study to study. For example, the TMDL estimates use BMP unit cost that are around 10 percent of the unit cost reported by Caltrans, but the Caltrans experience was in a fully developed watershed (Los Angeles and San Diego urban areas) where utility conflicts and space limitations are common. An additional factor is that the Caltrans experience was in a stand-alone retrofit environment which likely caused cost increases over projects integrated into larger projects (Caltrans, 2004). This indicates that costs are extremely site specific and estimating regional cost is very difficult.

Table G-9 compares current costs from the California survey with various estimates to meet certain stormwater management goals. Table G-9 also includes a comparison to the California willingness-to-pay.

Table G-9. Equivalent Annual Cost per Household Comparisons between California Cost Survey Results and various estimates for water quality Los Angeles Area Future Cost Estimates[1]

Range of Current Cost from Six Surveyed California Cities		Range of Alternatives to Advanced Treatment[2]		Maximum TMDL Estimates		City of Los Angeles Bond Estimates	Statewide Clean Water Willingness To Pay Estimate[3]
				Ballona Creek Metals	L.A. River Trash		
18	46	27	71	75	141	40	180

1. Calculations are presented in Tables G-10 through G-12 and are based on the following sources for each column respectively: survey results, Devinny et al (2004), Gordon et al (2002), LARQCB (2004), LARQCB (2001), Garrison (2004), and Larsen (2003).

2. Calculated from Task B in Appendix H. Low range is the cost for attaining full compliance using only source control. High range is the cost for attaining full compliance using only treatment BMPs (low tech) estimated on capture volume.

3. Responses were not received from 40% of the mailed surveys. The survey question was for restoring water quality for all waters throughout the state from all impairment, not just within a city or region and not just for impairment from stormwater pollution (Larsen and Lew, 2003).

Cost of Advanced Treatment (Gordon et.al.)

This study presents a comprehensive analysis of the potential costs required to meet new and emerging stormwater regulations in the Los Angeles area. It assumes that advanced treatment of storm flows will be required to meet current and anticipated federal and state water quality standards. The study presents three scenarios in treatment plant size and distribution among 65 sub-basins. These scenarios are 480 plants per sub-basin, one plant per sub-basin, or one plant per city. Three runoff quantity scenarios (0.5 inch, 1.25 inch, and 2.25 inch storms) were assumed for each treatment plant scenario. The least expensive alternative for the 0.5 inch storm was using 480 plants per sub-basin. This storm depth was chosen because it was closest to the 0.75 inch storm required for treatment in the Los Angeles SUSMP. Table G-10 calculates the equivalent annual cost per household for two treatment plant scenarios for treating the 0.5 inch storm.

Table G-10. Equivalent Annual Cost Calculation for Costs from Gordon et al.

70% Capture of Annual Rainfall (0.5 inch capture volume)	Capital Cost, $\$10^9$	O&M Cost, $\$10^6$	Equivalent Annual Cost (EAC)[1], $\$10^6$	EAC/Household, $
130 small plants	48	91	1,540	491
65 large plants	44	127	1,439	459

1. Cost includes collection system and land cost and maintenance of the collection system (Gordon et al. p. 40-41, 2002).

Comparing Alternatives to Advanced Treatment to Advanced Treatment Estimates

Since some advanced treatment may be required, the future cost will lie between the alternative scenarios estimate and the advanced treatment estimate. Based on the assumption used by the Devinny study, future costs for the Los Angeles area appear to hinge on the ability to reduce stormwater runoff volumes and on the ability to control pollutants through source control.

Significance of Future Compliance Cost Estimates

The range of cost estimates presented for the Los Angeles area should not be used for other areas of California. TMDL compliance, and thus ultimate permit compliance, is only addressed for certain pollutant types in the Los Angeles area. TMDL implementation plans will vary in complexity, pollutant being addressed, other non-stormwater sources, and watershed size. Some watersheds may not have a TMDL. Determining future cost for other California communities is a case-by-case exercise.

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Alternative Approaches to Stormwater Quality Control

Prepared for the Los Angeles Regional Water Quality Control Board

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2004

USC UNIVERSITY OF SOUTHERN CALIFORNIA

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EXECUTIVE SUMMARY

Background

A recent, widely debated study entitled *An Economic Impact Evaluation of Proposed Storm Water Treatment for Los Angeles County* projects extremely high costs for compliance with stormwater quality regulations (Gordon et al., 2002). These estimates followed from the study's fundamental assumption that the only way to comply with water quality regulations is to capture most or all of the flow and subject it to advanced treatment, and to do so at rates equal to peak runoff rates. *In contrast, this report shows that there are far less expensive approaches available that, should they be implemented, will achieve high levels of compliance with current federal water quality standards.*

Alternatives Considered

This report reviews present federal and state regulations and regulatory policy to determine whether advanced ultrafiltration treatment of the entire runoff flow is required to meet water quality standards, or whether compliance can be achieved through the widespread adoption of the various "best management practices" (BMPs) more commonly used for runoff quality control. The work identified and analyzed alternative measures that can be employed to meet present federal and state water quality standards. Particular attention was paid to strategies that concern ground water recharge, pollutant source control, and runoff detention, capture, and BMP treatment.

The report reviews possible approaches for controlling runoff water quality in the Los Angeles Region (the jurisdiction of the Los Angles Regional Water Quality Control Board) and presents a conceptual regional plan, including rough cost estimates. The study pursued a broad approach, providing an evaluation of total costs and benefits for the region, including those for municipalities, businesses, and individuals. The objective of the study was to outline a complete solution to stormwater quality problems, i.e., the plan is intended to meet the requirements of the stormwater permit and Total Maximum Daily Loads and provide acceptable water quality for the area. The alternatives of best management practices (BMPs) for control of individual pollutants (source control), and if necessary, a regional system of wetlands and infiltration facilities to provide final treatment and groundwater replenishment were chosen. These will be much cheaper than advanced treatment plants, and will provide benefits whose value exceeds costs.

Assumptions Made for Determining Costs

Following the review of possible remedial actions for stormwater pollution, a conceptual plan for the Los Angeles Region was developed. It was predicated on the following assumptions:

Because source control is always cheaper than cleaning polluted water, efforts should begin with preventing the release of pollutants to runoff. This includes measures like litter control, improved street cleaning, improved industrial housekeeping and others. Such approaches may constitute sufficient control for runoff coming from residential areas, so that these areas will require no further action.

For new residential development, anecdotal information indicates that landscaping that captures and infiltrates the first-flush storm will be of comparable cost to traditional landscaping, and should therefore be used. For commercial construction, costs may be higher, and adequate regional facilities might be substituted.

Where non-structural BMPs will not be adequate, or where implementation is very expensive, efforts must expand to include regional wetlands and stormwater parks (multiple-use infiltration basins).

Large portions of the Los Angeles Region are already built out to various degrees, constraining available stormwater management solutions. This report assumes that 1000 square miles can be characterized as "low density", and that these regions can be served by a combination of source control, treatment wetlands, and infiltration systems. Another 1000 square miles is "high density" and can be served by source control and infiltration systems. About 50 square miles are "extremely high density" (such as downtown areas) and will require more sophisticated infiltration or treatment devices that occupy smaller areas.

Estimated Costs

Total costs for compliance with runoff water quality regulations were predicted to be between $2.8 billion (if non-structural systems are sufficient for the entire region) to between $5.7 billion and $7.4 billion (if regional treatment or infiltration systems must also be constructed throughout the entire area). It is likely that regional systems will be required for at least some, but not all, of the area, so that the final costs will be somewhere between these extremes.

- Enforcement of littering, pet waste, and chemical use ordinances is expected to cost about $9 million per year.

- Public education will cost about $5 million per year. A program to detect and prevent illicit discharges to the system will cost about $80 million per year at first, but can be reduced to much lower levels as compliance is achieved.

- Increased cleaning of storm drains will be needed if regional solutions are not used, and will cost about $27 million per year.

- Trash discharges to receiving waters can be controlled by installing screening devices on catch basins, enforcing litter laws, and improving street cleaning services. Estimates are that the immediate cost of instituting these measures will be about $600 million over the Los Angeles Region.

- During periods of low flow, runoff water should be diverted to existing wastewater treatment plants. Construction costs for this effort will be about $28 million.

- Trash control and removal of particulates and their associated pollutants can be facilitated by improved street cleaning. It is expected that this will cost $7.5 million per year more than current street cleaning programs, with a present worth of $250 million.

- On-site BMPs required for individual firms might cost about $240 million. Costs associated with compliance with the ¾-inch rule for new construction will be a modest fraction of construction costs.

- With regard to structural BMPs, total costs (regional wetlands and infiltration systems) were first estimated by determining the costs per square mile of drainage area incurred at other sites, and multiplying by the area over which they will be applied. Wetlands for the "low density" areas were estimated to cost $420,000 per square mile of drainage area, for a total cost of $420 million. Infiltration systems for the "high density" areas were estimated to cost $3.7 million per square mile of drainage, for a total cost of $3.7 billion. More sophisticated treatment BMPs (such as sediment traps and oil adsorbers) for the "extremely dense" areas were estimated to cost $33 million per square mile of drainage, for a total of $1.7 billion. Thus total new facilities costs are $5.8 billion.

- A second method for estimating structural BMP costs utilized costs per acre-foot of retention capacity as determined by the Los Angeles County Department of Public Works Sun Valley Project. Presuming that runoff from a ¾-inch storm must be captured in the low-density, high density, and extremely high density areas with runoff coefficients of 0.4, 0.6, and 1.0, costs are $53,000, $98,000, and $470,000 per acre-foot, respectively. The overall facilities cost estimate using this method is $4.0 billion.

Estimated Benefits

There are substantial benefits to the examined approaches that extend beyond the value of stormwater quality control. Reductions in pollutant releases will improve public health and neighborhood livability. Restoration of the hydrologic cycle will replenish groundwater reservoirs, reduce flood risks, and provide greenspace for recreation and wildlife habitat. It was determined that the total value of benefits from the alternatives for runoff quality control described will exceed the costs. Total benefits for the non-structural stormwater quality control programs in the Los Angeles Region are estimated at $5.6 billion. Implementation of the non-structural and regional measures throughout the Los Angeles Region would have benefits worth $18 billion.

- Reduced need for flood control is expected to save about $400 million.

- Property value increases from additional greenspace and bodies of water are expected to amount to $5 billion over the Los Angeles region.

- Additional groundwater supplies created by infiltration will have a current worth of about $7.2 billion.

- "Willingness to pay" surveys in similar circumstances suggest that the public amenity value of avoiding stormwater pollution of local bodies of water is about $2.5 billion.

- Cleaner streets are worth about $950 million.

- Improved beach tourism will bring in about $100 million.

- Preservation of the nature's services in the marine coastal zone, such as nutrient recycling and chemical maintenance of the atmosphere, is worth about $2 billion.

- Reduction of sedimentation in local harbors will save $330 million.

- Improvements in public health associated with reduced exposure to fine particles from streets are likely significant, but could not be quantified.

Recommendations for Immediate Action

Municipalities that have the responsibility for meeting runoff quality regulations should take some immediate steps.

- Outreach programs, explaining to citizens the need for runoff quality control and discouraging illegal discharges such as littering, should begin.

- Data should be collected on the stormwater discharges from subwatersheds to determine what BMPs are workable, and general plans should be updated to include policies that promote stormwater control.

- An administrative structure should be established which includes the relevant stakeholders and funding agencies for each watershed (such as watershed councils).

- Funding plans should be developed.

- Building codes that work against runoff quality control should be changed immediately—in particular, all parking lots built from now on should also be stormwater infiltration systems.

- All new street cleaning equipment should be high-quality vacuuming systems. Appropriate agencies should be encouraged to use the latest microbiological

techniques to investigate sources of pathogenic organisms in runoff, so that mitigation efforts can be optimally designed.

INTRODUCTION

This report identifies and analyzes alternatives for control of stormwater runoff in Los Angeles County. A recent, widely debated study entitled, *An Economic Impact Evaluation of Proposed Storm Water Treatment for Los Angeles County* projects extremely high costs for compliance with stormwater quality regulations (Gordon et al., 2002). These estimates followed from the study's fundamental assumption that the only way to comply with water quality regulations is to capture most or all of the flow and subject it to advanced treatment, and to do so at rates equal to peak runoff rates. As this report shows, however, there are far less expensive approaches that, if implemented, can achieve high levels of compliance with current federal water quality standards.

A broad approach was taken: an evaluation was made of total costs and benefits for the region, including those for municipalities, businesses, and individuals. A complete solution to stormwater quality problems was considered—that is, the plan is intended to meet the requirements of the stormwater permit and Total Maximum Daily Load and provide acceptable water quality for the area. The recommendations for steps to be taken are not limited to the Los Angeles Regional Water Quality Control Board (LA Regional Water Board). Action by other governmental agencies will also be required. The study begins with a brief description of runoff sources and contaminants. A review of present federal and state regulations and regulatory policy to was done to determine whether advanced ultrafiltration treatment of the entire runoff flow will be required, or whether compliance can be achieved through the widespread adoption of the various "best management practices" (BMPs) more commonly used for runoff quality control. The study then identifies and analyzes alternative measures that can be employed to meet present federal and state water quality standards. Particular attention is paid to strategies that facilitate ground water recharge, source control measures, storm water detention and capture, and BMP treatment. While prevailing uncertainties make an overall cost estimate only approximate at this time, costs of specific approaches are illustrated with examples. Financial benefits, such as those regarding groundwater replenishment, more appealing beach environments, improved public health, and the creation of additional urban green space, are also addressed in the report. Clearly, water is a scarce resource in this region of the country, and economic evaluations of different management techniques for stormwater runoff must also consider the benefits of improved water quality and water supply as well as flood control. Prior to reviewing federal and state water quality regulation and policy, this study provides an overview of more general policy and regulation theory.

Runoff

The bulk of urban runoff is generated during rainfall events, and can properly be termed stormwater. This flow is extremely irregular, especially in Southern California, where most days are dry, and measurable rain occurs on average of only 32 days per year. Total rainfall in the area is modest, averaging about 16 inches per year. A large storm in this area might drop as much as three inches of rainfall in 24 hours, but this is

still much less intense than typical rainfall events in other states, such as those on the East Coast.

Even so, high flows and flooding do occur in Southern California because of the topography. Water from large watersheds drains into local rivers, and slopes are steep, so that rainfall is rapidly collected and concentrated.

Water also enters the storm drains from non-rainfall sources. Sprinklers left on overnight, car washing, and hoses used to clean sidewalks and driveways generate smaller streams sometimes called nuisance flows. These flow in the storm drain system all year, and with residual stream flows (and in a some areas, recycled wastewater), constitute dry-weather flow. The terms "stormwater" and "runoff" are often used interchangeably. However, it is important in some cases to recognize the difference—stormwater arrives suddenly in huge amounts, while nuisance flows are much smaller and run all year.

Urbanization of the landscape substantially changes the amount and composition of runoff. Because less water infiltrates (percolates) into soils, the total amount of runoff is increased. Because the water runs off pavement more rapidly, it is concentrated to make peak flows higher. Recharge of groundwater is reduced, and the shallow groundwater that feeds some streams dries up, so surface flows decrease in some areas. Surface flows may increase during dry weather in other areas because of nuisance flows from over-irrigation and car washing. In general, the storage and buffering effects of soils and groundwater reservoirs are reduced. Runoff flowing through vegetation, or entering and leaving shallow groundwater, is subject to the effects of filtration and biodegradation, which has a considerable purifying effect. Water runoff from pavement is not cleaned, and indeed is contaminated by whatever dirt and pollutants are on the pavement.

Pollutants

The cities of Southern California use "separate" systems, meaning stormwater is collected apart from the wastewater generated by toilets and showers. The wastewater enters a closed network of pipes and is carried to treatment plants. Stormwater may initially flow in underground conduits, but eventually passes to open flood control channels, rivers, and the ocean. This storm water drainage system is called a Municipal Separate Storm Sewer System (MS4). Runoff pollutants are different in nature from those in sewage. Pathogens are present, but in far smaller concentrations, as are nutrients such as phosphorus and nitrogen. There may be more petroleum hydrocarbons, dust, sediments, and settled air pollutants in runoff, but total organic content in runoff is usually much lower than in wastewater.

The pollutant load of stormwater varies greatly with location. The water contains pollutants that wash off rooftops, parking lots, industrial facilities, and the streets. Pollutants may also be discharged illegally, when individuals pour motor oil into the storm drains or industries release toxic pollutants.

Water flowing in the streets picks up trash, dust, dirt and other materials that have been deposited on the pavement. The dust includes fine particles of rubber from tire wear, settled air pollutants, trace metals from brake pads and other mechanical sources, and pet feces. Cars drip motor oil onto the pavement and the early flows of fall may carry a petroleum sheen.

Stormwater quality protection measures may be placed in three general categories. Infiltration allows percolation of the water into the ground, relying on the soil to remove pollutants from the replenishing groundwater and eliminating the discharge to runoff. Source control measures prevent the release of pollutants, so that the water is never contaminated. Treatment systems remove the pollutants from the stormwater before it reaches the ocean.

Runoff Sources and Quality

Stormwater and runoff come from a great variety of sources and carry a varied suite of pollutants. There are many approaches to the task of protecting receiving waters, and the best choice depends on stormwater source and quality. Runoff from a residential area of single-family homes, for example, is unlikely to carry industrial pollutants, but may have small amounts of oil and grease from roads, microbiological contamination from pet feces., and dissolved nutrients from fertilizers. These are readily removed by filtration in soil, so groundwater recharge, with its additional benefit of replenishing aquifers, is a good choice. Runoff from construction sites is less likely to carry harmful microorganisms, but may have heavy loads of sediment. The best choice here is to use dikes, detention ponds, and other measures to allow the sediment to settle out of the water before it is percolated to groundwater or released to storm drains. The dispersed and difficult-to-control pollutants of urban commercial areas may best be dealt with by providing regional solutions, such as parkland designed to serve simultaneously as a flood control basin, a groundwater recharge site, and a sedimentation basin for large amounts of water.

Streets

Streets, particularly those in dense commercial areas, are the most difficult source of urban runoff to manage. They receive litter, dust and dirt, air pollutant particulates, pet feces, occasional human waste, trace metals and oil from cars, various illegal discharges, and other pollutants. Because they are the first part of the stormwater collection and transport system, they receive and pass on pollutants that are carried away from parking lots, commercial establishments, and industries.

Exposed Commercial Activity

Manufacturing and other commercial activities, even those dealing with hazardous materials, have no effect on stormwater quality if the work is carried out under cover. However, for some large-scale activities, such as oil refining, this is not practical. Rain falling on machinery, materials, or contaminated surfaces can pick up pollutants. Measures can be taken to cover individual activities, or treatment systems can be installed to clean the water before release.

Construction Sites

Frequently, the first step taken in construction of new facilities is to clear the land of vegetation and pavement. The exposed soil is highly vulnerable to erosion by rainfall, and the movement of trucks and machinery can “track” soil to the adjacent streets.

Residences

Single-family homes are a source of some pollutants. Roof runoff will contain dust, bird feces and settled air pollutants. Runoff from gardens may contain pesticides

and fertilizers. Occasionally, homeowners will (illegally) dispose motor oil or paint waste into storm drains. For the most part, however, runoff from neighborhoods of single-family homes is relatively less polluted (if household toxics such as pesticides are properly used). Multiple-family residences produce many of the same pollutants, but typically have a higher ratio of rooftop and impervious surface to permeable landscaping, so that more water runs off.

Commercial Rooftops

Roof runoff from commercial facilities may be slightly polluted with air pollutant dusts, bird droppings, hydrocarbons from roof tar, and occasionally, some trace metals from rooftop machinery. The contaminants present may be very similar to those found on residential roofs, but handling the runoff may be more difficult because commercial areas have a high ratio of roof area to land area, and often have little landscaping.

Parking Lots and Landscaping

A significant fraction of urban land is devoted to parking lots. Parking lots are commonly polluted by litter, heavy metals from auto-parts and road wear, and by oil leaking from cars. Spilled food is present near establishments that sell food, and pet feces, bird droppings, and settled air pollutants will also be present, and all of these can be washed away in the runoff. Virtually all parking lots are designed for rapid drainage to the street or storm drain. Indeed, where grass or other plantings are present, these are commonly surrounded by curbs that prevent flow of the water from the lot into the soil. Many designs, in fact, promote runoff from the vegetation to the pavement.

ASSESSMENT OF REGULATORY POLICY

Overview of Policy and Regulation Theory

This report, in identifying and assessing BMPs, takes a strategic regulatory planning approach to managing stormwater runoff in Los Angeles County. Strategic regulatory planning involves a close examination of the legislative goals concerning the given policy. The ultimate end of strategic regulatory planning is to control behavior through methods that agree with legislative goals and societal values regarding the issues at hand. Thus, a strategic approach demands careful consideration first of whether enforcement is appropriate; and second, if enforcement is appropriate, to what degree should the parties involved be pressured to comply; and third, how coercive should the regulatory devices be? Compliance with existing laws and regulations, in this case the provisions of the federal Clean Water Act and state law, is a major goal of the strategic regulatory planning process.

How compliance is defined can vary markedly depending upon the actors involved and the policymaking context. In this sense "compliance" means the degree to which members of a target group conform to the directives of an agency, court, legislative body, or some other governmental agency. One way to determine whether members of a target group are in compliance with an environmental law is to monitor levels of pollution on a regular basis. We assume that the greater the number of individuals and firms that are in compliance with rules, the more likely pollution will decrease in a given locality.

When legislators pass laws, they generally expect them to be vigorously enforced and fully obeyed. Only idealists, however, actually believe that this is possible or even necessary in all cases. Political and economic factors usually force policymakers to take a more realistic approach to enforcement by setting a desired and attainable level of compliance prior to program implementation. At this stage, policymakers must consider whether 100 percent compliance is necessary. If not, they must determine what degree of compliance is needed in order to meet environmental quality goals. While the desired degree of compliance is often only a rough estimate, several factors must be kept in mind. Policymakers must take into account, for example, the extent to which members of a target group are making a “reasonable” effort to change their behavior and follow the law.

If it is either unrealistic or undesirable to aim for total compliance on the part of the target population, a clear decision rule must be formulated concerning enforcement priorities. In a policy area where polluters vary a great deal in size and how much they pollute, for example, it is commonly most prudent to concentrate enforcement efforts on the largest polluters. If firms are roughly the same size and pollute about the same amount, however, alternative guidelines for identification and discrimination must be set. For example, will businesses be selected randomly for monitoring and inspection? Is systematic enforcement, perhaps based on location, possible? Or, is self-regulation the preferable approach? The decision rule should relate to the strategic goals, resources, and motivations of all those involved. Further considerations include the legal authority

for enforcement, the resources of the enforcement agency, and the fragmentation of the enforcement agency (or agencies).

In the ex post review/revision stage, policymakers determine the effectiveness of the regulatory program after it has been implemented. Feedback and evaluation are used to assess program performance. Legislative goals are used as a guide in determining whether regulatory approaches are succeeding or failing.

If policymakers determine that the program goals are still desirable, they will continue the same course of action. If they determine that the goals are being met, they will either maintain present enforcement levels or perhaps decrease enforcement efforts. The latter decision should only be made if policymakers believe they can save time and money and feel reasonably certain that compliance rates will not suffer. Appropriate and immediate action is required, of course, if the objectives are no longer desirable or if the objectives are not being achieved. In nearly every case, the aim of policy revision will be improvement in compliance and environmental quality. According to Ingram, the implementation phase of a statutory program "should contribute toward policy improvement or the evolution toward more tractable problems for which there are more doable and agreeable responses." (1990:476) Realization of the statutory goal, therefore, is not the only way to gauge the success of program implementation.

The conceptual perspective for the selection of BMPs analyzed in this report relies on Lowi's (1964) policy classification scheme, with further elaboration by Salisbury (1968). Lowi classifies policies as distributive (non zero-sum policies in which nearly everyone benefits), redistributive (policies that approach zero-sum, in which some benefit and some lose), and regulatory (policies that also tend toward zero-sum, and in which government prescribes rules of behavior for particular groups). Salisbury added a critical dimension to Lowi's typology by identifying self-regulation policies as a fourth policy type. Self-regulation policies are frequently offered as a noncoercive alternative by sectors of society targeted for external regulation, and they are invariably non zero-sum. These policies also impose constraints upon a group, but are perceived only to increase, not decrease, the beneficial options to a particular segment of the population.

Under this classification scheme, policies are *either* self-regulatory *or* regulatory. Thus, the Lowi and Salisbury typologies suggest that regulatory policies are either noncoercive (through self-regulation) or coercive (through direct command-and-control regulation). In the real world, however, regulatory devices tend to fall at different points along a continuum of coerciveness. In other words, devices intended to control behavior tend to vary according to their restrictiveness. Non-coercive approaches (through self-regulation) occupy one end of the continuum while coercive approaches (through direct command-and-control regulation) occupy the other end.

Conceptualizing regulation in these terms provides water quality policymakers a flexible framework in which to assess alternative regulatory mechanisms. Water quality policymakers have a menu of regulatory approaches from which to choose, and careful thought must be given as to which regulatory devices are best suited to control stormwater runoff without being unnecessarily harsh. If members of the target population (e.g., citizens, small businesses, municipalities, etc.) unanimously believe that stormwater regulations and deadlines are too restrictive and unfair, they will likely ignore what they are being told to do. At the same time, if regulatory devices are too weak and not sufficiently coercive to lead to improvement in water quality, then efforts to control

stormwater runoff will fail. Water quality policymakers, therefore, must be familiar with the target population and possess considerable information before they select the most appropriate regulatory mechanisms that embody the level of coercion necessary to achieve an optimum degree of compliance.

Cost is a second dimension that characterizes regulatory mechanisms. Cost here refers to the amount of money government must spend to administer a particular regulatory approach (cost to the regulated community will be considered later). In general, the most coercive activities (e.g., imprisoning polluters) require the greatest government involvement and therefore are more expensive to administer than the least coercive activities (e.g., economic incentives). Limited government revenues obviously make this an important variable. This is especially the case in current government efforts to control stormwater pollution.

The total cost and coerciveness of the selected regulatory program represent the overall government effort necessary to attain compliance and control water pollution. Compliance can be achieved in varying degrees and is best conceptualized along a continuum ranging from avoidance to adherence. Under optimal conditions (e.g., a harmonious political environment), policymakers will be able to use the least coercive enforcement techniques (e.g., reporting by firms and municipalities and formal compliance tracking) at the least cost to achieve full compliance. The expectation is that least coercive mechanisms are always preferable to more coercive mechanisms if only because the former devices are more cost-effective. In contrast, extremely restrictive enforcement arrangements (e.g., court injunctions) will necessitate direct government involvement and thus require substantial cost. Under ideal conditions, therefore, policymakers will select regulatory devices that are the least coercive and least costly and that lead to compliant behavior.

Unfortunately for policymakers, optimal conditions are rare. Many times the conditions that do exist (e.g., a lack of agency funds or a small staff) tend to diminish the effectiveness of the least coercive approaches, often to the point where the outcomes are in danger of moving toward avoidance behavior. In order to prevent outcomes from moving in this direction, policymakers must select techniques, either singularly or in combination, that are affordable and sufficiently coercive to produce compliant behavior.

Naturally, policymaking is a dynamic process and circumstances tend to change over time. Decision makers are continuously gauging the potential impact of given conditions on regulatory mechanisms and making adjustments as they see fit. Eventually, they may be forced to adopt expensive and restrictive approaches that will result in compliant behavior in an attempt to prevent outcomes from moving toward avoidance behavior. When accurate information is available and incorporated into deliberations, policymakers usually will achieve the greatest level of compliance possible with the least effort and expense regardless of the conditions that exist at the time. This underscores the importance of obtaining the most accurate data available as changes occur over time.

In a pluralist, multi-level system like the United States, some communities may favor avoidance behavior in the face of unpopular regulations. While such situations may arise from time to time, in most cases policymakers will want their regulatory devices to achieve the highest level of compliance possible under given conditions.

Stormwater Regulation and Regulatory Intent

The federal Clean Water Act utilizes two approaches to managing water quality: technology-based requirements and national water quality standards. Section 303(d) of the Act integrates these two approaches by stipulating that states make a list of water bodies that are not attaining standards after the technology-based rules are implemented. For water bodies on this list, as well as where the U.S. Environmental Protection Agency (EPA) Administrator believes appropriate, the states are to formulate TMDLs which must account for all sources of the contaminants that forced the listing of the water bodies. Under federal law, TMDLs must account for contributions from point sources (federally permitted discharges) and pollution from nonpoint sources. The U.S. EPA must review and approve the list of contaminated waters and every TMDL. In the event that the U.S. EPA does not approve the list of impaired water bodies or a TMDL, the Agency must establish them for the state. (www.swrcb.ca.gov/tmdl/background.html, July 15, 2003)

The Clean Water Act does not specifically require the adoption of TMDLs. Instead, Section 303(d), Section 303(e), and their provisions stipulate TMDLs be included in water quality plans. The U.S. EPA has adopted rules (40 CFR 122) requiring that the National Pollutant Discharge Elimination System (NPDES) permits be modified to be consistent with all approved TMDLs. An NPDES permit outlines specific limits of pollution for a particular discharger. Nearly all the states, including California, are permitted to administer the NPDES permit program. (U.S. EPA administers the permit system in the remaining states.) Implementation plans are to be formulated along with the TMDLs.

California Law

California effectuates the provisions under the Clean Water Act principally through institutions and procedures set out in certain provisions of the California Water Code, including those of the California Porter-Cologne Water Quality Control Act. These provisions established the State Water Resources Control Board (SWRCB) within the California Environmental Protection Agency to develop and implement state policy for water quality control.

The Porter-Cologne Act also established nine California Regional Water Quality Control Boards that operate under the authority of the SWRCB. Each Regional Board is comprised of nine members and an executive officer appointed by the members of each board. The Regional Boards develop and adopt water quality control plans for all areas within their region. The SWRCB formulates, adopts, and revises general procedures for the development, adoption, and execution of water quality plans by the Regional Boards. It reviews these plans and either approves them or returns them for revision and resubmission. Water quality plans do not become effective until the SWRCB endorses the plans, followed by approval by the California Office of Administrative Law.

The Evolution of Water Pollution Control

During the 1970s, policymakers considered point source pollution to be the biggest threat to the water quality of the nation's inland lakes, rivers, and streams. (www.swrcb.ca.gov/tmdl/background.html, July 15, 2003) The Clean Water Act established a number of programs to address point sources of pollution, and most federal money went to formulate and implement point source controls. California pursued the same approach in its effort to improve the state's water quality. In addition, the State and

Regional Boards implement smaller scale corrective actions for nonpoint source pollution as permitted under the Porter-Cologne Act.

A major goal of the Clean Water Act was to expand treatment of wastewaters. According to Rosenbaum (2002), all treatment plants in operation before July 1, 1977 were required to have "secondary treatment" levels. All treatment facilities, regardless of age, were required to have "the best practicable treatment technology" by July 1, 1983. The Act also appropriated 18 billion dollars between 1973 and 1975 to assist local communities in building necessary wastewater treatment facilities. The federal government paid for 75 percent of the capital cost for building the new facilities. Programs focusing on treatment facilities resulted in significant improvements in water quality by the late 1980s.

Concerns over the nation's water quality arose again due to the growing impacts of nonpoint source pollution, and environmental groups looked to the TMDL requirements to ameliorate continuing water quality problems. A series of lawsuits ensued to force regulators to adopt an aggressive approach to TMDL development. Thus far, over 40 lawsuits have been filed throughout the nation, most of them by environmental groups. (www.swrcb.ca.gov/tmdl/background.html, July 15, 2003) The lawsuits are commonly filed against the U.S. EPA due to its responsibility to approve TMDLs. Several of them have led to negotiated settlements and consent decrees that are overseen by the courts. At present, California is operating under three consent decrees covering most of the North Coast Region, the entire Los Angeles Region, and Newport Bay and its tributaries in the Santa Ana Region.

TMDLs in California are established either by the Regional Boards or by the U.S. EPA. Those established by the Regional Boards are designed as Basin Plan amendments and include implementation rules. Those formulated by the U.S. EPA normally contain the total waste load allocations as required by Section 303(d), but do not include extensive implementation rules, primarily because U.S. EPA implementation of nonpoint source pollution control strategies are generally confined to education and outreach in accordance with CWA Section 319. (www.swrcb.ca.gov/tmdl/background.html, July 15, 2003) Presently, TMDLs are required for all waters and pollutants on the 303(d) list and must consider and include allocations to both point sources and nonpoint sources of contaminants. The limitations in a TMDL may be other than "daily load" limits. There also can be multiple TMDLs on a specific body of water, or there can be one TMDL that focuses on many contaminants. Current examples of TMDLs in the Los Angeles Region include the trash TMDLs for the Ballona Creek and Wetland, Los Angeles River Watershed, and East Fork San Gabriel River, and the wet-weather bacteria TMDL for the Santa Monica Bay Beaches. At this time the Section 303(d) list contains over 1,400 water body/pollutant combinations. Based on this list, the State Board estimates that about 800 TMDLs are needed. The Regional Boards are now developing over 120 TMDLs, with several addressing multiple pollutants.
(www.swrcb.ca.gov/tmdl/background.html, July 15, 2003)

Concerns over implementation have become a significant issue in the formulation of TMDLs. (www.swrcb.ca.gov/tmdl/background.html, July 15, 2003) Although these concerns generally fall outside the provisions of Section 303(d), they are nevertheless important to achieving water quality improvements as a result of the establishment of TMDLs. While it is possible to conduct technical assessments of total load without

considering implementation issues, one must address the possible mechanisms by which pollution can be reduced in determining allocations to various sources. Considering different implementation options can help analysts avoid adopting allocation schemes that are far more costly than necessary or, even worse, unachievable. The TMDL strategy in California seeks to engage the public and cultivate an understanding of watershed issues. It relies on an adaptive process that matches management capabilities with scientific knowledge and information.

The Stormwater Permit

The Los Angeles Regional Water Quality Control Board (LA Regional Water Board) has adopted a NPDES permit containing waste discharge requirements for MS4 discharges within the County of Los Angeles (with the City of Long Beach excluded because it is covered under a separate MS4 permit). The main intent of the Permit is to reduce significantly the amount of various pollutants contained in stormwater runoff. The County of Los Angeles has identified seven critical industrial and commercial sources of contamination: 1. wholesale trade (scrap recycling, automobile dismantling), 2. automotive repair/parking, 3. fabricated metal products, 4. motor freight, 5. chemical and allied products, 6. automotive dealers/gasoline stations, and 7. primary metal products. The priority industrial sectors and automobile repair facilities/ gas stations (two of the commercial sectors) on the list contribute substantial concentrations of heavy metals to stormwater. Overall, the Permit is intended to establish and implement a timely, comprehensive, cost-effective stormwater pollution control program to reduce the discharge of pollutants in stormwater to the Maximum Extent Practicable (MEP) from the permitted regions in the County of Los Angeles to the waters of the U.S. subject to the jurisdiction of the Permittees and also meet water quality standards. BMPs must be identified and implemented to reduce the discharge of pollutants in stormwater to the MEP and also meet water quality standards.

The Permit has established an iterative process that allows municipalities in Los Angeles County to measure noncompliance, test alternative BMPs, and consult County and regional water quality authorities. Thus, the Permit provides a mechanism to make adjustments to the required BMPs as necessary to ensure their adequate performance. According to the U.S. EPA, "Water quality-based effluent limits for NPDES-regulated stormwater discharges that implement wasteload allocations in TMDLs *may* be expressed in the form of BMPs under specified circumstances….If BMPs alone adequately implement wasteload allocations, then additional controls are not necessary." (U.S. EPA, Memorandum, November 22, 2002, p.2)

Regulatory Mechanisms

Pollution control regulations can range from programs that prescribe very specifically what the regulated community is to do, to programs that only set goals and leave the community to find the best methods to reach the goals. Programs of the first kind are often criticized by the regulated community for lack of flexibility—the standard complaint is "This approach does not work well for our particular case. We could do this in another way and accomplish the goals for a lower price". Programs of the second kind provide flexibility, but are often criticized for vagueness: "We don't know how to do this. We are not sure what we have to do to come into compliance".

The stormwater management program is clearly of the second type, and it should be so. Stormwater quality control is an extremely complex issue, influencing, if not everything under the sun, then everything under the rain. The best means of compliance will certainly differ from city to city, depending on land uses, land prices, and a host of physical characteristics of the landscape. It is likely that, as the nation engages the problem, new approaches will be developed. Entrepreneurs will develop new devices and methods as others are tried and discarded. Strict specification of methods at this time might well eliminate approaches that are more economical and effective, so a flexible approach is best.

However, an inevitable side effect of maintaining flexibility is that the regulated community faces an unsettling level of uncertainty. Mayors and city councils faced with planning future infrastructure and future budgets are understandably uncomfortable facing mandatory water quality goals without specified means of reaching those goals. This level of uncertainty will decline as plans are developed and experience with water quality control measures accumulates.

There is a historical precedent for this approach in the program for control of air pollution in Southern California. Like stormwater pollution, it is generated by a very large number of sources with varying compositions and emissions rates. Many of the sources are difficult to monitor and regulate. Implementation of pollution controls has been accompanied by intense political controversy. Even so, air pollution control efforts have been relatively successful—pollution levels and their associated health effects have declined. While costs have been high and some high-polluting marginally profitable businesses have closed or left the area, it is also clearly true that the economy of the area has not collapsed, as some predicted. Few people would suggest that we should return to days when taking a deep breath was literally painful.

Policy Implementation

Our research indicates that the LA Regional Water Board is strongly committed to abating pollution from stormwater runoff as effectively and inexpensively as possible. The U.S. EPA supports the LA Regional Water Board's efforts to require individual municipalities in Los Angeles County to adopt necessary BMPs to control stormwater runoff. Federal and state policymakers along with environmental group leaders believe that BMPs, if widely and strategically implemented, can significantly reduce stormwater pollution and improve water quality throughout Los Angeles County. Given the proven effectiveness of BMPs in different areas of the country (and the world), the LA Regional Water Board does not envision the need to build new advanced treatment plants throughout the region, and indeed has expressed the specific intent that such plants should not be required. Advanced treatment is viewed as an absolute last resort given the huge expense it would entail and the confidence policymakers and environmental leaders have in the ability of BMPs to reduce pollution significantly and allow the region to meet federal clean water standards. The authors of this report concur with this position. Some municipal leaders in Los Angeles County have asked why they should be forced to adopt BMPs when there is a possibility that advanced wastewater treatment plants will ultimately be required. Even if advanced treatment plants are necessary in the future, which is highly unlikely, the adoption of BMPs will dramatically reduce the amount of water and the mass of pollutants these plants will treat. This will reduce pollution

treatment costs and improve the effectiveness and ability of plants to handle large volumes of water during heavy rain periods. That is, BMPs will be used as part of any program to build advanced treatment plants because the much cheaper BMPs will reduce the costs of the very expensive advanced treatment plants. Implementing BMPs now will be a good investment even in the unlikely event that an advanced treatment plant is required.

The LA Regional Water Board has focused some efforts on reducing trash in stormwater runoff, and it has adopted a "zero trash" rule to achieve this goal. The Board does not expect all communities to eliminate every single piece of trash from inclusion in stormwater runoff. Instead, the Board policy is that communities in Los Angeles County make reasonable efforts to prevent trash from entering storm drains. "Trash" is defined as materials larger than ½ cm, so municipalities can comply with this regulation by installing ½-cm screening devices on their catch basins, by enforcing litter laws already on the books and by conducting street sweeping in areas where trash tends to accumulate. Public education about littering and the installation and maintenance of catch basin devices can provide substantial progress in preventing garbage from entering storm drains.

In order to avoid a costly court battle with state water pollution policymakers, the County and City of Los Angeles have recently agreed to spend $168 million to reduce by half the amount of trash that collects in the 51-mile-long Los Angeles River (McGreevy and Weiss, 2003). In addition, the City of Los Angeles agreed to drop its lawsuit against state policymakers over the overall plan to abate polluted stormwater runoff. The agreement settles a lawsuit filed by the city and county that opposed the LA Regional Water Board's requirement to reduce trash entering the river 10 percent annually over the next 10 years. The LA Regional Water Board officials negotiated the deal, which requires the city and county to reduce rubbish going into the river and Ballona Creek 50 percent by September 2008, at which point state regulators will consider whether further rules are necessary. The agreement also provides local officials more flexibility in trying less-costly approaches of reducing trash. Environmental groups such as Heal the Bay, Santa Monica BayKeeper, and Friends of the L.A. River applauded the agreement. Rather than spend money on litigation, county and city officials will allocate funds to improve water quality.

Clearly, all communities in Los Angeles County will have to share the financial burden in helping to reduce contamination from stormwater runoff. This may require many communities to modify their budget priorities.

As long as communities make a reasonable, good faith effort to address stormwater pollution issues, it is unlikely that federal and state officials will take legal action. Thus far, this has been the case. Failure to make such an effort, however, will certainly result in legal action against violators. Moreover, environmental groups can choose to file lawsuits against federal and state officials if they do not continue to pursue polluters. Such action will lead to costly delays in meeting federal water quality standards and will likely lead to even more draconian measures given present federal and state law and previous judicial decisions.

Previous Actions by the LA Regional Water Board

The impacts on water quality and the heightened risks to public health from MS4 discharges that affect receiving waters across the U.S. and in Los Angeles County and its coastline have been well studied and documented. Accordingly, the LA Regional Water Board has taken a number of significant actions to control such discharges (LARWQCB, 2001)

In 1990, the LA Regional Water Board adopted Order No. 90-079, the Los Angeles County MS4 Permit. That permit required the Los Angeles County Flood Control District, the County of Los Angeles, and the incorporated municipalities in Los Angeles County to implement stormwater pollution controls including updating ordinances, optimizing existing pollutant controls such as street sweeping, construction site controls, and others. The Regional Board required all Permittees to adopt at least 13 specific BMPs for consistency across the County. The 1990 permit was executed on a system wide basis due to the highly interconnected storm drain system serving a population substantially larger than 100,000 residents. At this point, the region was committed to MEP standards—cleaning up stormwater to the maximum extent practicable.

On July 15, 1996 the LA Regional Water Board issued Order No. 96-054 that updated the 1990 permit. The 1996 Los Angeles County MS4 permit required model programs be formulated and implemented by the Permittees for Public Information and Public Participation, Industrial/Commercial Activities, Development Construction, Illicit Connections and Illicit Discharges, Public Agency Activities, and Development Planning. These model programs will change with time as more data on stormwater impacts are collected and become available.

On January 31, 2001 the Los Angeles County Department of Public Works formerly requested to renew their MS4 permit in the form of an ROWD for the County of Los Angeles and the incorporated cities, except the City of Long Beach. This request began the process of reissuance of the permit, which entered into its third permit term. On the same day the Los Angeles County Flood Control District submitted an ROWD. The Regional Board staff invested considerable time and effort in providing opportunities for public participation and comment. Over 30 meetings, two workshops, and many outreach activities were conducted to allow the public, Permittees, and other interested parties enough opportunity to participate in the development of permit requirements and language prior to consideration by the Regional Board for adoption. The reissued MS4 permit committed the region to meeting water quality standards based on the State Water Resources Control Board's precedential Orders.

Implementation of the MS4 permit requirements should reduce pollutants in stormwater in a cost-effective manner. The adoption of BMPs should also reduce pollutant discharges and enhance the quality of surface water.

The final steps of the regulatory process are now under way—TMDLs for the various impaired water bodies of the region are being promulgated.

Overall, it is clear that the LA Regional Water Board does not intend to require that municipalities build advanced treatment plants: indeed, they have publicly expressed the sentiment that they oppose this solution.

Implementation of Regional Solutions

A regional infiltration and BMP treatment system, in combination with source control of trash, pesticides, and trace metals, can substitute for individual site controls on land parcels within the drainage area. This could take the form of "Local Equivalent Area Drainages", implementing regional solutions that would achieve better results than the application of new source controls, which, in built up areas, will have significant effects only over the long term during which existing structures are rebuilt.

Funding for regional solutions may pose a challenge because of Proposition 13 and other restrictions on tax policy. The challenge however is not insurmountable if property-owners and voters become adequately informed and educated. Nevertheless, regional solutions may significantly shift administrative and cost burdens for water quality protection from businesses and development firms to local government.

Trading Schemes

"Cap and trade" systems, in which regulatory agencies set a cap on the amount of pollution allowable and allow trading of discharge rights within the constraints of the cap, have been successful in several fields. A group of municipalities, for example, might assign discharge rights to landowners within a watershed such that total releases meet the constraints of the TMDLs. They could then allow trading in the discharge rights, so that those who can reduce discharges at least cost are the first to do so, and the overall cost of meeting the TMDL is minimized. Municipalities themselves, as owners of parks and open space, might be able to develop regional solutions and fund them through sales of discharge rights to others.

Stormwater pollution control may be particularly amenable to this approach because the costs of control are highly site-specific. In many cases, there may be considerable economy in applying regional solutions in the best possible sites rather than controlling every site individually.

DESCRIPTION OF ALTERNATIVE APPROACHES

Infiltration

Before the City of Los Angeles was established, most of the rain that fell in the region evaporated or percolated into the soil. The groundwater was continually replenished and runoff flows were small. As population grew, impermeable surfaces such as paved roads, parking lots, and rooftops covered more and more of the land. Residences, commercial facilities, and roads were designed to shed water as rapidly as possible. Historical measurements of discharges to the Los Angeles River at Firestone Boulevard indicate that runoff has increased from 5% to 45% of rainfall. This change adversely affected stormwater quality in two ways. First it increased the amount of stormwater flow, magnifying the cost of any measures to control quality (and also requiring ever more costly flood control measures). Second, water that flowed directly to streams and the ocean no longer benefited from the purifying action of soil and vegetation, which can remove particulates through physical filtering, sequester some chemicals by adsorption, and destroy organic and biological contaminants by biodegradation.

Any program for remediation of stormwater contamination should reverse this trend, reducing the load of both water and pollutants on other parts of the system. At the same time, pollution of groundwater must be avoided. However, infiltration will benefit from the very considerable capacity of soils to filter particles, adsorb contaminants, and biodegrade organic materials. A relative estimate of the magnitude of the problem may be made by comparison with examples of leaking underground storage tanks at gasoline stations. In many cases, spills of tens or hundreds of gallons of gasoline are now being handled by "intrinsic remediation"—allowing natural biodegradation to degrade the hydrocarbons. The acceptability of this approach has been supported by extensive research. Hydrocarbon infiltration with stormwater will involve far lower concentrations of hydrocarbon, and will mostly be the higher-molecular-weight compounds that are much less mobile in soils than gasoline.

We can also compare stormwater infiltration to the effects of septic tanks. These systems infiltrate sewage that has received only a modest degree of treatment. Yet they are still in use in the Los Angeles Region, and indeed are the primary waste disposal method for 15% of households in the U.S. Groundwater contamination from septic tanks has occurred, but most are considered effective and safe waste disposal systems.

This comparison suggests that the relatively low concentrations of pollutants in common stormwater, with appropriate controls on sources of specific contaminants, will not pose a significant threat to groundwater quality.

The permeability of soils in the Los Angeles basin varies from place to place. Beneath the Whittier Narrows spreading basins, for example, sand and gravel deposits allow very high rates of infiltration. In other areas, clay-rich soils reduce rates of infiltration. However, the historically low rates of runoff indicate that infiltration is capable of handling the bulk of the rainfall in the Los Angeles Region. Many areas routinely considered as having poor infiltration rates will never the less be useful as multi-purpose infiltration systems. A soccer field, for example, can be used as an

infiltration basin at little additional cost, and will make a valuable contribution even if infiltration rates are low in comparison to those in spreading basins.

Source Control

Industrial Releases

Industrial discharges can be controlled by a vigorous program of source identification and control. Businesses have a fundamental responsibility to do their work without contaminating their neighborhoods, and in the great majority of cases can do so without significant interference with their activities.

Trash Management

Many businesses and some homeowners contribute a disproportionate amount of trash to the urban burden. Paper waste often accumulates in the parking lots of fast food outlets and strip malls, where it can wash into the street during rainstorms. Inadequate dumpsters and garbage cans are overloaded so that trash spills into the streets. Poorly covered trucks can allow trash to fly out on the streets. In addition, citizens throw trash from their cars onto the streets (it has been estimated that as much as 60% of trash on freeways by weight is cigarette butts). All of these practices are illegal, but enforcement is currently rare and weak. While perfect compliance with anti-litter laws is not expected, there could certainly be major improvements through enforcement. Much of the cost of such efforts could be recovered through fines, with the satisfying result that those causing the problem would be paying for cleaning it up.

Municipalities are responsible for the trash deposited on their streets, and most will respond by installing screens on catch basins. These are sometimes referred to as catch basin "inserts". They will have half-centimeter openings and will be designed to collect trash during periods of low or modest flow, but to bypass the flow during heavy storms or if they are clogged. This will avoid local flooding that would be caused by clogging.

Street Cleaning

Trash that escapes enforcement efforts can be collected by street cleaning before it reaches the storm drains. Enhanced street cleaning is likely to be necessary as cities install half-centimeter screens on their catch basins. Trash that is now washed out of sight (at least until it reaches the beaches) will accumulate on the screens and possibly clog them. More effective and more frequent street cleaning will reduce this problem.

A major fraction of the pollutants in stormwater runoff are adsorbed on particles—this is particularly true of trace metals and pesticides, which are significant contributors to impairment of the receiving waters. Some of this particulate matter can be removed from streets by higher-quality street vacuuming equipment, which collects the dirt much as a vacuum cleaner does. This equipment is more expensive to purchase and operate, but it would make a significant contribution to reducing chemical pollutants in stormwater.

The Port of Seattle has tested high-quality street sweepers as a cleanup method in its container storage area (FHWA, 2003). The approach was successful, removing one-third to one-half of particulates and their associated pollutants. While the equipment is somewhat more expensive than simple sweepers to purchase, operations costs are about

the same. The fine particles carry a significant portion of the pollutants, but they constitute only a small portion of the total mass of material on the streets, so their collection and disposal does not significantly increase costs. Such street cleaning may be more effective in Southern California, where the long dry season allows dust to accumulate for many months.

As explained in detail later, there would be substantial secondary benefits associated with improved street cleaning. Neighborhoods would look better, and residents would be exposed to less resuspended road dust, which dirties buildings and may have significant negative health effects.

Some investigators have also proposed street washing, using recycled water. If this were done during dry weather, and all of the dry-weather flow were being collected for treatment in wastewater treatment plants, street pollutants would be kept out of the rivers.

Pesticide Substitutions

Many of the receiving waters in the Los Angeles Region are impaired by pesticides, particularly Diazinon and Chlorpyrifos. The approach to this pollution should be the same as it has been historically for other pesticides that threatened environmental quality. None has ever been dealt with by treating contaminated waters. Those who use the pesticides should be responsible for ensuring that no water pollution results from that use. Pesticides that cannot be properly managed by appropriate use protocols such as labeling or use rules enforcement and which have an inherent tendency to persist in the environment should be banned. Pesticide controls are instituted by the state and federal governments, so additional political effort will be needed if a bans on specific compounds are required.

We presume that these pesticides are used in many cases because they are currently the most economical approach to insect control, and that substitution of another method would involve some cost. However, there are many possible alternatives, including use of more readily degraded pesticides, insect-resistant strains of plants, biological control with natural insect predators, and others. There are many examples of success with such integrated pest management (IPM), particularly at golf courses (NRDC, 1999). In some cases owners were pleased to find that costs actually declined when they switched from pesticide-dominated approaches to IPM.

Trace Metals

Trace metals enter stormwater as rain drains from industrial operations, transportation land uses, and other sources. Brake pad wear on cars produces a fine dust of copper. Zinc is released when galvanized equipment contacts the water. Trace metals in stormwater can be controlled by covering machinery and materials that release trace metals, by capturing and treating runoff from large industrial operations and transportation land uses, and by developing alternative materials for brake pads (research is currently under way on this objective).

Control of Automotive-Related Sources

Motor vehicles and related facilities are the source of many types of runoff pollutants, including hydrocarbons from oil and fuel leaks, and road wear. Vacuum street cleaning is effective in dealing with particle-bound hydrocarbons left on the street,

and infiltration can effectively deal with hydrocarbons that are transported or deposited off the street surface.

Control of Bacteria

Bacterial contamination in stormwater is typically measured as counts of "coliform" bacteria, a category that contains many species of bacteria. While very few of the coliforms cause disease, some of these species are very abundant in human waste, and so detection of the group has long been used as a marker for sewage pollution. Efforts to interrupt the fecal-oral transmission of disease have commonly taken the elimination of coliforms from water as a surrogate for judging efforts to prevent the spread of the microorganisms that do cause disease. Where coliform counts in drinking water have been reduced (in much of the industrialized world) transmission of water-borne disease has indeed been largely eliminated. Thus the use of coliform counts as a marker for disease control has been remarkably successful. In some cases, a more specific test for "fecal coliforms" is used, because the test is an indicator of contamination by warm-blooded animals, including humans. While we have always counted coliforms, the real concern is pathogens—microorganisms that can cause disease. For sewage pollution, the association between the two has been strong, and controlling coliforms has been equivalent to controlling disease. The situation for stormwater, however, may be far more complex. Because there are many non-human sources of coliforms, it is possible that the test for their presence may be positive even when no human pathogens are present.

The sources of the coliforms found in stormwater remain uncertain. Pet wastes certainly include bacteria that test positive as coliforms, but the degree to which pet wastes constitute a disease threat is uncertain. Wild mammals, such as raccoons, possums, skunks and coyotes, may contribute when their wastes are left on paved surfaces. It has been proposed that fecal matter from homeless people denied access to restrooms may be a source, but there has been no study confirming this. In less developed areas with poor soil infiltration conditions, it is likely that poorly operated septic tanks and illegal disposal of gray water are contributing to the coliform counts detected in runoff. If septic tanks are the source, strict enforcement of waste control ordinances is appropriate. If homeless people are the source, provision of restroom facilities would be far cheaper than any imaginable stormwater treatment system (as well as being more humane). If pet feces are the source, the only approach is, through public outreach and enforcement, to press people to clean up after their pets. It must be expected, however, that such an approach will not be 100% effective. The contribution of wild animals seems uncontrollable.

Because the sources and significance of the coliform counts remain uncertain, it is important that research on the topic be pursued immediately. The recent development of genetic techniques for precise and rapid identification of bacterial species now provides the tool needed to provide the information needed to develop effective policies.

Coliforms, and presumably the associated human pathogens, are substantially reduced in treatment wetlands. Infiltration of course removes them from runoff flows, and adsorption on soils and biodegradation are effective at protecting groundwater. Water storage, because it holds coliforms in an environment for which they are not adapted, and because it allows settling of particles to which they may be attached, has

some beneficial effect. Disinfection, using chlorine, chloramines, or ultraviolet light is possible, but relatively expensive.

Water Quality Control Board Rules allow for 17 exceedences of the coliform limit per year. There are about 32 days per year of significant rainfall in the region, so it has been anticipated that exceedences during the heavy winter storms will be difficult to control, and will be allowed.

Improved Enforcement

It is important that source control efforts include genuine and credible enforcement. Rules that are widely ignored, of course, will not help clean up runoff water, and a considerable fraction of runoff contaminants come from illicit discharges or disposal. Trash is an obvious example—littering is already illegal, so 100% of the trash in stormwater represents illegal release.

The Environmental Protection agency describes an example in which improved enforcement of existing law was effective (USEPA, 1999):

"…during a 12-month period, the Houston, Texas, Public Utilities Department identified 132 sources of discharges leading to Buffalo Bayou, the local drinking water source, with estimated flow rates ranging from 0.3 to 31.5 liters per second. Houston's program involved monthly sampling from bridge crossings; analysis of samples for carbonaceous biochemical oxygen demand, ammonia and nitrate nitrogen, pH, TSS, DO, temperature, fecal coliform, and chlorine residual; comparison of samples to baseline flow concentrations; weekly sampling of temperature, dissolved oxygen (DO), and fecal coliform in stream reaches suspected of contamination; boat sampling to identify the contaminating outfalls along the reach; and, finally, a land-based search to pinpoint the source. Of the flows identified during the program, 85% were due to broken or clogged wastewater lines and 10% were due to illicit connections (Glanton et al., 1992). Eight months after an illicit discharge detection and elimination program began, fecal bacteria log mean concentration was reduced from 20,000 colonies/100mL to 2,000 colonies/100ml."

Thus, in this example, a 90% reduction in bacterial contamination resulted from a careful enforcement program alone.

Detention and BMP Treatment

Stormwater Detention Basins

Many of the problems of stormwater management are associated with its very irregular rate of flow. During dry periods runoff flow rates are so low that the water can be handled by existing sanitary wastewater treatment systems. During rainstorms, the water comes so fast that municipalities have had difficulty doing anything beyond avoiding floods.

The first step toward dealing with this problem is to increase infiltration—substantial reductions in the peak flow rates are possible. The second approach is to provide storage systems that will hold water back during the peak flow periods. Detention basins will reduce peak flows, collect trash, provide quiet water for settlement of particles and their associated pollutants, and promote infiltration. Analysis of the

National BMP Database (Strecker et al., 2003) shows that detention basins infiltrate an average of 30% of the water they receive.

The primary difficulty with this approach is the shortage of available sites to construct large reservoirs. The topography of the Los Angeles area does not include any deep canyons in lower reaches of the rivers that could easily be made into reservoirs. Moreover, virtually all of the land is already occupied by other uses and would accordingly be very expensive to acquire.

This means that detention basins must be conceived as a distributed network of smaller systems, with each serving multiple uses. A useful model is the Sepulveda Dam Recreational Area, which retains water during storms to prevent downstream flooding. For the great majority of the days in the year, the basin is mostly empty, and serves as a park and a wildlife refuge.

A rough estimate of the general feasibility of a regional-park-based approach can be calculated. The City of Los Angeles currently has about 5% of its area in parks (Wolch et al., 2002) and it is reasonable to presume that at least a similar fraction is park throughout the LA Region. Thus, moving the rainfall from adjacent developed areas to the parks would constitute concentration of the flow by a factor of 20 (20 acres of land would drain to 1 acre of park). If the runoff coefficient for the developed areas is 0.5, a rainfall of ¾ inch would thus put 8 inches of water in the parks. This is less than the 24-inch depth of flooding assumed for the stormwater parks planned in the Sun Valley project, suggesting that this approach is feasible on the large scale in terms of the amount of land required.

This calculation is quite approximate: the runoff coefficient is uncertain, and several other factors are poorly known. Never the less, the calculation suggests that a joint program could simultaneously provide the region with needed parks and needed stormwater infiltration capacity.

Sanitary Treatment of Dry Weather Flows

During dry weather, small flows are present in the stormwater system as a result of overwatering of lawns, car washing, and other discharges. This modest amount of water can be collected and passed through existing wastewater treatment plants, which commonly have more than enough excess capacity for this purpose. Because the dry season in Southern California is very long, this would prevent runoff pollution of the oceans for much of the year.

Where this is done, street washing with recycled water would be possible. Collecting and treating the contaminants during dry periods would leave the streets clean for the rainstorms, when the water cannot be collected.

Treatment Wetlands

Wetlands remove many pollutants from the water that passes through them. The low flow velocities allow sediments to settle, removing particulates and any pollutants that are adsorbed on them. Algae and rooted plants absorb nitrate and phosphate as they grow. Vigorous microbiological activity degrades organic chemicals, as microbial predators consume disease organisms. These observations suggest that wetlands can be constructed to serve as treatment systems for stormwater and dry weather runoff. While this approach requires dedication of land, it has the considerable secondary benefit of providing riparian wildlife habitat and esthetic values.

A system of treatment wetlands has been designed for the San Diego Creek Watershed that drains to Newport Bay, in Orange County, California. The system will serve an area of 120 square miles, and is expected to cost in the low tens of millions of dollars. It is expected to meet the low-flow nitrogen TMDL, the phosphorus TMDL during most years, and the fecal coliform TMDL during low flows.

A similar system has been constructed to provide stormwater quality protection for the Ballona Wetlands Watershed in the City of Los Angeles.

BMP Treatment of Flows from Problem Watersheds such as Industrial Areas

If source control is not successful for some industrial areas, it may be necessary to collect the runoff water and use more sophisticated BMP treatment. These might best be constructed as private facilities serving a consortium of local industries, and funded by them for the purpose. A public/private partnership could be created, perhaps with public loan guarantees. Past experience with business improvement districts could serve as a model.

Partial Treatment in Curbside Units

Many proprietary devices have been developed for treatment of runoff as it enters curbside catch basins. These generally remove trash from the flow, and may also collect sediments. Some include adsorbants to remove hydrocarbons and trace metals. They have the disadvantage that they are designed to bypass during higher volume wet-weather flows. All require some degree of maintenance, and some are expensive to install. Trash and sediment must be removed on a regular basis, and adsorbants must be replaced when they are exhausted. Never the less, they may be useful for treatment of problem dry weather flows in specific areas, such as industrial or commercial zones.

Public Outreach and Education

Much of the pollution in runoff water arises from actions of individuals—litter is discarded in the street, for example, or pesticides are used carelessly in a residential garden. This pollutant load can be reduced by educating citizens and urging them to behave in a way that protects water quality.

An effort in Oregon, conducted by the Tillamook Bay Rural Clean Water Project, was made to educate local farmers about the steps they could take to protect local streams. This involved personal visits, tours of successful BMPs, newsletters, and presentations (USEPA, 1999). Four years after the program began, bacterial concentrations dropped 40% to 60% in Tillamook Bay and 50% to 80% in local rivers. Thus in some cases significant progress can be made at very low cost through public education.

Good Housekeeping for Municipal Operations

While the behavior of individual citizens may be difficult to control, municipalities have far more control over their own operations. Efforts can be made to avoid careless use of pesticides and fertilizers on municipal facilities. Such steps have modest, but measurable impacts. An EPA report notes (USEPA, 1999):

> "…the City of Bellevue, Washington, found that street cleaning three times a week removed about only 10% of urban runoff pollutants; catch basin cleaning

twice a year was estimated to be about 25% effective" (Pitt and Bissonnette, 1984).

Combined Approaches for Stormwater Quality Management

A general classification of rainfall receivers and appropriate methods for dealing with runoff they produce is shown in Figure 1. While the approach it describes is quite general, and other mixes of alternatives are possible, it shows one set of measures that can be used to control stormwater pollution.

Streets

The first step in reducing pollutants on streets is to restrict pollutant discharges from adjacent properties. Source control measures should prevent the release of industrial pollutants and construction sites should be managed to contain sediments. Litter laws and pet dropping collection laws should be enforced, although it must be acknowledged that it is not possible to prevent these inputs entirely. To stop litter from entering the storm drains, cities should install half-centimeter screens on their catch basins. The use of such screens will require diligent street cleaning, to ensure that the drains are not blocked during storms. In Southern California, rains mostly occur during a well-defined season, and frequently weather reports give two or three days warning of major storms. Cities should develop contingency plans for rapid-response street cleaning when storms are coming, to minimize stormwater contamination and the chances of flooding caused by clogged screens.

In some areas, where runoff water quality is relatively good, the streets themselves might be used as groundwater recharge facilities, by converting unused alleys to park/detention basins or by using permeable pavements.

It remains likely, however, that much street runoff will be of marginal quality. For the immediate future, it is also likely that a major portion of runoff from other sources will be initially discharged to streets, so that efforts to make use of stormwater as a water resource will require collection, and a degree of treatment before infiltration.

In most cases, this can be done with regional solutions. Water from storm drains can be collected in detention basins and wetlands, where sedimentation and biological activity will reduce pollutant load, and groundwater recharge can occur. The detention basins will serve as parks during the greater part of the year when water is not present, and the wetlands will double as much-needed wildlife habitat.

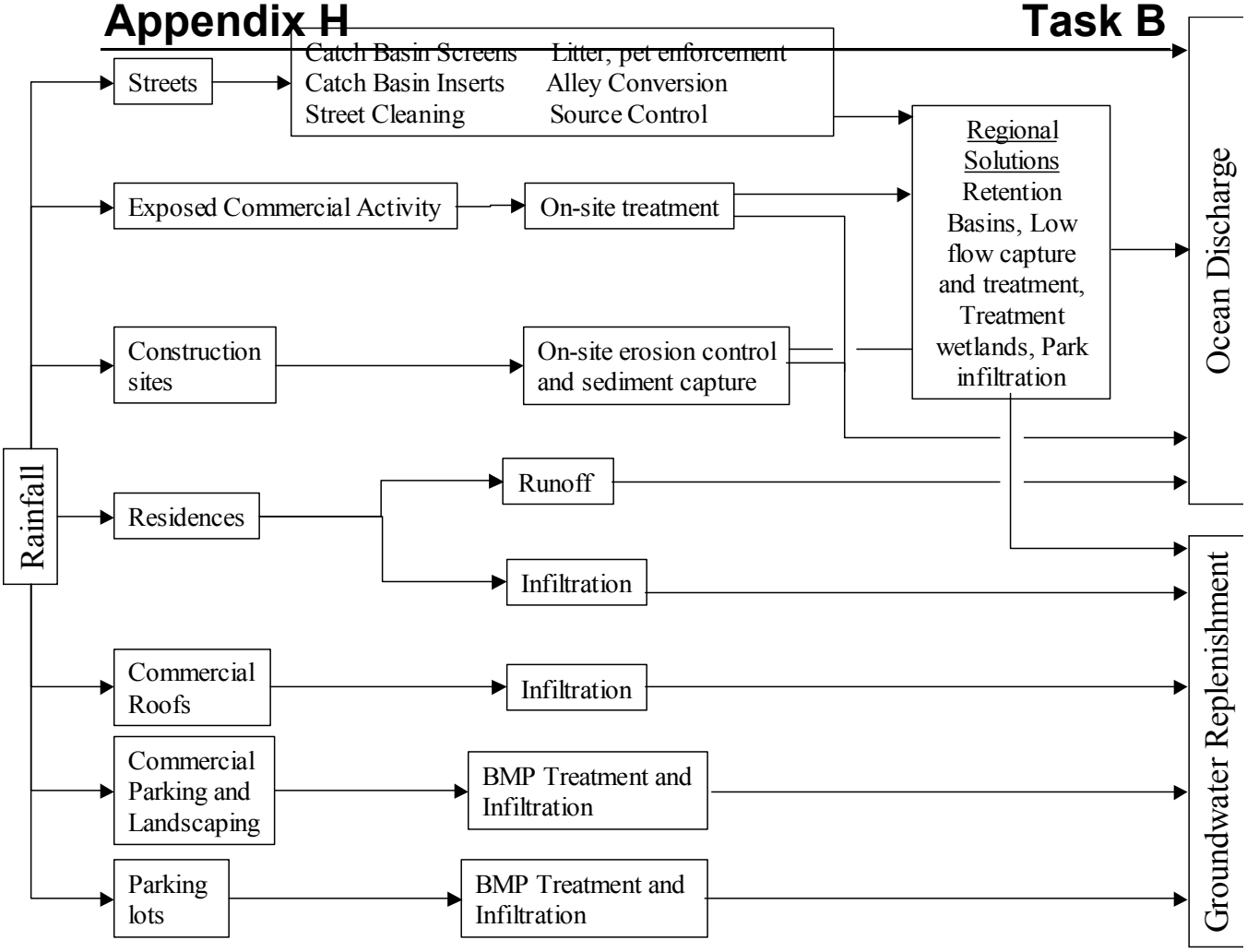

Figure 1. Stormwater quality control solutions for Southern California

Alleys for Public Use and Infiltration

Some alleys in urban areas are no longer necessary for access purposes. Indeed, many have become nuisance areas because of illicit trash disposal and criminal activity. Many of these could be gated and converted to small parks, with keys provided for local residents. They could simultaneously serve as infiltration facilities or as bioswales. There are currently 2.3 square miles of alleys in Los Angeles, for example. While many must be retained for access purposes, the fraction that could be converted could constitute a significant stormwater retention and infiltration resource. Alleys maintained for access might be candidates for partial or permeable pavements.

Similar approaches could be used for power line rights-of-way.

Exposed Commercial Activity

Very often the cheapest approach to stormwater quality control for exposed commercial activities is simply to cover them. Stormwater will thereafter come in contact only with the rooftop, and runoff will be much less polluted and more easily dealt with. However, for some large-scale activities, such as oil refining, it is not physically possible to provide a roof. For others, such as auto dismantling, the large area needed and the relatively low value of the activity may mean that a roof is not financially possible. Such facilities must be required to collect and treat runoff from their facilities, and indeed this is already being done in many cases. While there certainly are costs involved, it has generally proven possible, through a combination of better housekeeping, substitution of non-polluting materials, and simple on-site treatment processes, to solve these problems. Requirements for on-site treatment are advantageous because the cost of such treatment is borne by the business that produces the pollutant, providing incentives for conversion to less-polluting products and methods. Consequently, green manufacturing will become increasingly common.

Construction Sites

Release of sediments from construction sites can be ameliorated if the construction crew provides erosion control measures, such as maintaining vegetation or spraying exposed soil with polymer stabilizers, and an adequate on-site retention pond for rainfall, along with dikes, silt fences, and appropriate vehicle entrance construction to prevent runoff. Detention allows the sediments to settle out and the exposed soils can function effectively for groundwater recharge. It is anticipated that the costs of these measures will be small in comparison to construction costs. A more detailed list of best management practices for construction sites appears in Appendix I.

Residences

In most cases, homes and the surrounding landscaping have been designed to facilitate rapid runoff. It is necessary that water not pool in depths sufficient to flood houses, and ponding is viewed with irritation, even if it is harmless and temporary. However, single-family homes typically are surrounded with a significant area of land that could serve well for infiltration. Commonly, the land is planted or covered with

grass. The runoff from landscaping and residential rooftops typically contains only small amounts of pollutants that are readily removed by percolation through the root zone.

Landscaping for the typical single-family home could be arranged to infiltrate all of the rainfall that it receives (except, perhaps, in the most severe storms). Lawns a few inches below surrounding sidewalks could serve as infiltration ponds, gardens could receive roof runoff, and downspouts could conduct runoff to dry wells. Because the water would have had very little contact with pollutants, such infiltration would be an excellent addition to groundwater resources.

However, very few residences are arranged in this manner and, indeed, building codes often specify features that promote rapid runoff to the street. Building codes should be changed to utilize single-family homes as recharge sites. It is anticipated, however, that the effect on runoff will be seen only slowly in built-up areas as old homes are gradually replaced. Retrofit of existing homes will be expensive and politically difficult, but for new construction, single-family homes could be made to produce essentially zero discharge at little or no additional cost.

Xeriscaping—planting with native and other drought-tolerant plants—can also help to provide space for water infiltration, and it reduces watering and therefore the chance of irrigation runoff. Such landscaping also requires less fertilizer and pesticide, and so reduces incidental contamination.

In many cases, cities may be able to take interim steps to reduce runoff from homes. They have control over the "city strip" land that lies between the sidewalk and the gutter. It would be possible to institute a program of replacing the lawns after minor excavation, so that these areas would lie below the sidewalk and curb and serve as runoff detention and percolation basins.

Where infiltration is not possible, much residential runoff may be acceptable for direct discharge to the ocean, as long as it is not contaminated first by passing through polluted streets. More contaminated water can be conveyed to regional water cleanup and recharge facilities.

Low-flow Treatment in Wastewater Treatment Plants

Wastewater treatment plants are built with excess capacity in order to handle increased flow during rainy weather. While sanitary systems are designed to exclude stormwater, holes in manhole covers, leaks in piping, and illegal connections all allow the entry of some water during rainstorms. The flow is a very small portion of the rainwater, but can produce a significant increase in the much smaller sanitary flows—sometimes up to 50%. Treatment plants are designed with excess capacity to handle these peak loads.

This excess capacity can be used to treat dry weather runoff during periods when there is no rain. While these flows are not, by definition, stormwater, and indeed are governed by a separate set of regulations, dry weather runoff is often a significant contributor to impairment of receiving waters and its treatment would contribute to the objectives of stormwater control. It is also possible to use this capacity in concert with "street washing". In this approach, tank trucks filled with recycled water could be used to wash the streets, particularly in the months before the first rain of the fall. Contaminants removed from the streets and drains by the washing would be treated in the

wastewater plants, leaving the streets far cleaner when the rains came. At present, municipal street cleaning is a prohibited activity where it results in flows to the storm drain system.

This treatment approach for dry weather runoff could also treat runoff from small rainstorms.

It is likely that all of dry weather runoff could be treated for much of the Los Angeles Region. Such a step would eliminate essentially all runoff pollutants in the areas where this is possible. Because this approach uses capacity that is already in place, the cost for this alternative is low.

This approach would be particularly significant for control of coliforms. Sanitary treatment of dry weather flows would eliminate coliforms through much of the year. Rain occurs during only 32 days of the year, on average (Some of these storms are so small that the runoff could still be treated. On the other hand, untreatably high levels of runoff typically continue for a few days after a major storm). The LA Regional Water Board allows variances for 17 days of wet weather flow during the year. Thus it seems likely that dry weather runoff treatment at wastewater treatment plants, plus some degree of source control, plus the variances, will be sufficient to bring most areas into compliance with the bacteria rules. Further study, including some basic research on the sources of coliforms, is necessary to confirm this.

In considering the acceptability of this approach, it is important to note that beach use declines during wet weather, so that closures during the variance days would have a small effect on overall beach use and public health.

Capture and Use of Rooftop Runoff

In many cases, the pollutants from commercial rooftops, like those from residential roofs, could be readily removed by soil infiltration. With appropriate controls to avoid specific pollutants from commercial activities, roof runoff could be used for groundwater recharge. Designs exist for infiltration planters, in which the planter has high sides that allow it to function as a reservoir, and an open bottom that allows infiltrating water to pass into the soil. Risks of groundwater pollution could be mitigated through the use of biologically active and adsorbant soils. Commercial rooftops are commonly associated with large parking areas, which could be adapted for infiltration. Such efforts will be more difficult than those for homes, because most commercial facilities have a higher ratio of roof area to land area. In some cases it may be possible to store runoff for future irrigation use.

The Washington State Department of Ecology (2001) has developed a decision tree for dealing with downspout discharges. For lots larger than 22,000 square feet, it specifies either dispersion or infiltration systems for runoff. For smaller lots on suitable soil, infiltration systems are required. Where soils do not readily accept infiltration, surface dispersion may be appropriate. If water quality is good and infiltration and dispersal are not possible, disposal to the storm drains is accepted.

Parking Lots and Landscaping

Parking areas occupy a very large amount of land in Southern California, and accordingly represent a significant opportunity for improvement in stormwater

management. Construction costs for parking lots are far smaller per square foot than those for buildings, so that alterations are cheaper. They are reconstructed more frequently, so that requirements applying to new construction or reconstruction will propagate through the parking lot inventory much more rapidly than those for buildings.

In most cases, parking lots could serve as sites for rainwater infiltration. Trash can be collected on grates and be disposed of properly by the lot owners. The curbs around plantings (which are often necessary to avoid damage to the plants from cars) can be slotted so that water passes through them to infiltrate in the planter soils. Planted areas must be below grade, so that they collect and temporarily store water, and could be expanded, utilizing more space where cars don't actually park, such as the areas between and behind the parking bumpers. In some areas, permeable pavements could be used. Collected water could be passed to leach fields built under the parking lot.

An example of this sort of development is provided by the 6-acre parking lot of the Oregon Museum of Science and Industry (NRDC, 1999). It had originally been proposed as a traditional design, with water draining to catch basins, storm drains, and eventually the Willamette River. At the request of the Portland Bureau of Environmental Services, it was redesigned to use vegetated medians and landscaping as swales and linear wetlands. The parking lot is now able to infiltrate the water from a storm of 0.83 inches in 24 hours. Overall construction costs for the revised design were actually lower, because of the reduced costs for catch basins and drains.

Pervious pavements have also been developed so that even the space where cars are parked can be used for infiltration.

There is some concern over whether infiltration from parking lots will pollute underlying aquifers. Sediments, hydrocarbons, and trace metals are likely to be present in parking lot runoff from ordinary commercial establishments. But all of these are generally well retained on soils, particularly if the soils are selected to serve this purpose. Adsorbent materials might be added as a surface layer, to further retain hydrocarbons and trace metals.

It will be necessary to develop new guidelines for parking lots. The public and lot owners will not tolerate flooding that requires them to wade to their cars, so detention and infiltration systems will have to be carefully designed. Overflow will occur in extreme storms, and the lot and remediation areas should be designed so that the excess water flows to the street without impeding access to parked vehicles. Redesigned lots can be required for any new construction or for major renovations, but complete retrofit of all lots is likely to be too expensive for political acceptance.

This will require some additional maintenance. If adsorbants are included in the recharge areas to help control hydrocarbon infiltration, for example, these will have to be renewed from time to time. Regular trash collection will be required.

It is anticipated that most parking lots could become zero runoff areas, contributing substantially to water conservation and pollutant remediation. Further, very large parking lots, such as those at "big box" stores and shopping malls, could be reconstructed as stormwater infiltration facilities serving surrounding neighborhoods. In a cap and trade system, the lots would become financial opportunities for the retailers.

River Greening

The Los Angeles Region has become infamous for its historical conversion of rivers to concrete-lined flood control channels. While these have served the purpose of moving water rapidly to the ocean and avoiding flooding, they have also prevented infiltration in the riverbed. For this and many other reasons, advocates have proposed "greening" the river. This would involve widening the river at some points and replacing the steep concrete walls with gently sloping vegetated shores. Parks and wildlife habitat could be developed alongside the river, designed such that they would flood when the river is high. This would allow infiltration to occur, and by providing temporary storage, would decrease peak flood flows. In many areas it may be possible to replace the concrete bottoms of rivers with permeable surfaces.

The Sepulveda Dam Recreation Area is an excellent example of such a facility. It stores water during heavy rains, but serves as a park and wildlife refuge during the greater part of the year when it is not flooded. It promotes infiltration of water during rain events.

Certainly, any such modifications of the rivers must be designed carefully so that flood risk is not increased. But this is clearly possible. Indeed, increased infiltration and storage capacity along the river will reduce peak flows and therefore the frequency of floods, and reduce the associated costs.

Infiltration in Residential Streets

Many areas in Southern California are primarily residential, and runoff from these areas is only moderately polluted—it could be used for direct infiltration without treatment. In newly developed areas, homes could be designed so the runoff is near zero. However, many areas are currently already built out. In these, preventing runoff to the street would be expensive. In many cases, it may be possible to install infiltration devices in the public streets.

Infiltration in Parks

Public parks, in most cases consisting predominantly of grassy areas, are already contributing to groundwater infiltration. However, some portions still contribute to runoff, and could be regraded to collect water rather than shedding it. Indeed, many could be rebuilt to serve as groundwater infiltration systems serving surrounding areas. Playgrounds could be sunk below surrounding areas in order to collect water during rainfall events. Designs would have to include provision for infiltration at acceptable rates—water left standing for days could become a nuisance. In some areas, soil conditions might preclude this approach.

During the few days after water is collected and before it percolates, that area of the park will be unavailable for other uses. However, parks are little used during rainy weather in any case, and detention will only occur on a few days each year, so the interference will be minimal.

Public Facilities

Runoff from public facilities could be reduced by many of the measures previously discussed. Parking lots could be used for infiltration and rooftop runoff could

go to planters serving as infiltration systems. Retrofit of government facilities could begin more quickly than for individual homes, as part of the effort required to meet regulations.

PRIMARY BENEFITS OF RUNOFF QUALITY CONTROL

The immediate purpose of runoff quality control is protection of the receiving waters. In the Los Angeles Region, this refers primarily to rivers, coastal wetlands, bays, and the ocean. Many benefits are definable.

Fishing

Pollutants in stormwater can adversely affect fishing. Commercial fishing is a small and declining industry in the waters local to Southern California, but sportfishing remains a significant activity, bringing income to coastal businesses and providing recreational opportunity for many people. Cleanup of stormwater will preserve and enhance this activity by ensuring that fish are safe for consumption and by preserving fish breeding grounds in estuaries.

Swimming

Ocean swimming, as part of a visit to the beach, is a recreational activity enjoyed by millions of people each year in Southern California. It attracts tourists who contribute substantially to coastal economies. It is discouraged if trash litters the beach or if fear of disease discourages water contact. It is prevented entirely in the event of beach closures, which are a common result of polluted stormwater runoff.

Boating

Powerboats and sailboats are widely used in Southern California and represent a substantial industry in manufacture, maintenance, provision of slips, and various associated shoreside activities. Polluted waters, particularly in the form of trash, can significantly degrade the quality of the boating experience.

Noncontact Recreation and Nonconsumptive Wildlife Uses

Some recreational activities involve bodies of water without contact: sitting or bicycle riding along rivers or lake shores are examples. These activities are seriously degraded if the water produces bad odors or is littered with trash. A stormwater quality program will protect and enhance these uses.

Observation of wildlife is often a valuable part of the outdoor experience. Continuation of this activity requires water quality sufficient to support birds and animals and the plants and insects that they eat. Many migratory birds are dependent on local bodies of water for their sustenance during their yearly movements.

Reduced Illness from Contaminated Seafood

Some illnesses are transmitted through consumption of contaminated seafood. Control of the microbiological quality of runoff waters will reduce the extent of such illnesses.

Reduced Illness from Swimming in Contaminated Waters

Recent studies have indicated that people swimming near storm drains are more likely to contract waterborne diseases than those swimming far from storm drains. Microbiological control of runoff quality, particularly through sanitary treatment of dry weather flows, could reduce the incidence of these diseases.

Enhanced Esthetic Values

The trash cleanup associated with stormwater quality control will improve the appearance of our harbors, rivers, streets, and commercial establishments. Esthetic enjoyment of wildlife habitats such as wetlands, in particular, is hindered if trash is present.

Preservation of Natural Ecosystems

Polluted urban runoff damages natural ecosystems in many ways: toxic material can sicken or kill organisms, trash can choke marine mammals or birds, additional turbidity can prevent the penetration of light necessary for seaweed growth, sediment can bury habitats and prevent attachment of organisms to rocky surfaces, and nutrients can fertilize overgrowth of mosses and plankton. This damage can be prevented by stormwater quality control, and is one of the prime reasons for the program.

SECONDARY BENEFITS OF STORMWATER QUALITY CONTROL

Urban runoff comes from a huge variety of sources and contacts much of the environment around us. The efforts made to clean up runoff, which have the primary purpose of preventing water pollution in receiving waters, will have many secondary benefits and these should be included in any cost-benefit analysis. Indeed, some of these benefits are so substantial that they suggest the agencies responsible for the resources in question should also be providing financial support for runoff quality control efforts.

Groundwater Restoration

Total rainfall in the Los Angeles basin in an average year is equal to about half of the amount used for drinking water supply. It is strange indeed that we pollute this water and discharge it to the ocean even as we import ecologically, politically, and financially expensive water from the Colorado River, Northern California, and the Owens Valley. The primary difficulty in making productive use of this water is the lack of storage capacity. Rainfalls are infrequent but intense: most of the time there is no rainfall available for use, but occasionally it is so abundant that it causes flooding. Surface water reservoirs are the traditional solution to this problem—water is stored during the rainy season to prevent floods and becomes available for valuable uses the weather is dry. But there are few workable sites for large, year-round surface water reservoirs in the Los Angeles area. Groundwater aquifers, however, can also serve as water reservoirs, being drawn down in the dry season and replenished during the wet season. Infiltration will constitute a use of this storage capacity, reducing future dependence on outside sources of water and avoiding expensive alternatives like desalination of seawater. Because environmental and political factors may make increasing water imports impossible at any price, better utilization of local rainfall through the use of the groundwater reservoirs may be necessary for future growth.

Improvement of groundwater supplies within Southern California would save money now spent on imported water, and would save the concomitant external costs of the environmental impact on source areas. It would also reduce political friction with source areas. Ultimately, it may be the only economically and politically feasible method by which the water supply in Southern California can be increased, and as such, it may be the key to continued development in the area.

Flood Control

As the fraction of the Los Angeles Region occupied by impermeable surface has increased, the amount of water runoff has also increased, putting an ever-growing load on the flood control system. A recent project improved flood control for the lower Los Angeles River by increasing the height of the dikes on the channels, at a cost of about $200 million. Future increases in channel capacity would be even more expensive—not only will the walls have to be made higher, several bridges will have to be raised. Increased infiltration will reduce runoff, reducing the maintenance costs on the system and eliminating the need for further capacity increases.

The possible magnitude of the impact can be judged by considering the case of the San Gabriel Valley. Runoff from the valley is mostly captured in spreading basins in

the Whittier Narrows area and used for groundwater recharge. This makes the runoff coefficient for the valley overall 5%. In the urbanized areas of Los Angeles, the value is about 40%. Thus if the urbanized area were as well controlled as the San Gabriel Valley, runoff could decrease by a factor of eight. Flood risks would essentially disappear.

Increased Parkland and Wildlife Habitat

The regional alternatives for stormwater quality control include the development of parks and wetlands. The parks would serve as detention basins and infiltration facilities, but would be used for that purpose only during rainy periods, which comprise about 32 days per year in Southern California. During the rest of the year, these areas could serve the typical purposes for which parks are built, acting as recreational sites, playgrounds, soccer and baseball fields, and wildlife habitat. Because people are less likely to engage in these activities during rainstorms in any case, the conflict between the uses will be small. The Los Angeles area is notably short of public parks in comparison to other major cities, particularly in its poorer neighborhoods (Wolch et al., 2002). Because it is likely that residents will demand more park space in the future, the development of areas for dual use is particularly valuable. Ideally, the cost of development could be borne by both agencies intent on improving stormwater quality and by those responsible for parks and recreation. The planned redevelopment of the Corn Fields site in Los Angeles, for example, might provide a detention basin as well as the new park that is being planned.

Wetlands must be kept wet all year, but can withstand flooding during the rainy season. Thus reestablishment of these habitats, which have been largely lost in the Los Angeles Region, could simultaneously serve the purposes of wildlife restoration, flood control, and stormwater quality control. In many cases, it will be possible to develop wetlands within existing channels, reducing the need for additional land purchases.

Some of the parks and wetlands could be created as a part of river greening projects, and so would also serve the purposes of reestablishing esthetically appealing naturalistic rivers.

Improved Property Values from Trash Control

Often one of the most powerful visual cues that gives a visitor the perception of a "bad" neighborhood is the presence of trash on the streets. One approach to reducing pollutant discharge to storm drains will be improved enforcement of litter laws and additional street cleaning. These will have the secondary benefit of improving the appearance and livability of streets throughout the area. The "broken windows" campaigns of many police departments—indicating that improving the appearance of neighborhoods reduces crime—suggests that apparently cosmetic changes can have substantial benefits for neighborhoods. Certainly property values in a neighborhood with clean streets will be higher than they would if the streets are routinely littered with trash.

Reduction in Harbor Sedimentation

Sediments carried by runoff are moved because the water moves rapidly, and because small particles remain suspended in the low-salt-content chemical environment of fresh water. When runoff enters bays and harbors, however, the velocity of the water

is slowed, allowing the particles to settle to the bottom. The higher salt content of marine waters promotes flocculation of the small particles, so that most of them will also settle to the bottom. The deposited sediment fills channels, blocking the passage of ships and recreational boats, and filling areas set aside for preservation of aquatic ecosystems. Ultimately, harbor dredging is required, and frequently the collected sediment has been contaminated, so that it requires special handling. Dredging associated with storm drains in Los Angeles Harbor, for example, costs between $1 million and $3 million per year. Sedimentation in Upper Newport Bay is considered a significant threat to its function as a wildlife refuge. Stormwater quality control measures would avoid sediments discharges or remove it from the runoff, ameliorating these problems for downstream communities.

Improved Public Health

A significant portion of exposure to particulate air pollutants arises when small particles are resuspended from roadways by traffic and wind. Tire dust, settled air pollutant particles, pet feces, particles with adsorbed trace metals and trash are pounded into fine powder and lifted into the air. Such resuspension includes an ultrafine particle fraction, which is most dangerous to human health. More frequent street cleaning, particularly using vacuum bag type cleaners, would reduce public exposure to fine materials carrying trace metals, hydrocarbons, and microorganisms. Some public health improvement is likely, but its magnitude cannot be estimated.

REGIONAL PROGRAMS DESIGNED FOR STORMWATER QUALITY CONTROL

While there has been a substantial amount of work on individual facilities for runoff quality control, such as detention ponds and grassy swales, there have been only a few studies that have tried to determine the regional cost and effectiveness for a system of these "green solutions". It is important to ask whether it is possible to create an overall program within realistic constraints of land availability and costs that will bring the watershed into compliance with regulations.

We have sought descriptions of example projects that include overall costs and the area of land that drains to the facility, so that cost per square mile of area served can be calculated. In a few cases, these are area-wide systems that are the best evidence that an overall solution is possible. In others, they are single installations, for which we make the assumption that duplication is possible—ten facilities like the one described could be built to serve ten times the area. Because economies of scale are important in determining facility design and even regulatory policy, we have taken special interest in some sources that describe how the size of the drainage area (and the necessary BMP treatment facility) affects cost per square mile. Finally, we have included examples that have actually been built and tested, and others that have only been designed. While data for the latter may be less reliable, most systems perform as designed, and these designed-but-not-built systems provide some of the most useful results.

The chosen examples are described briefly below, and listed in Table 2. Results useful for determining the relationship between facility size and cost per square mile are plotted in Figures 2 and 3.

Area-Wide Systems

Sun Valley

The Sun Valley project was funded by Los Angeles County to develop an alternative approach for flood control and runoff quality management for the Sun Valley district. This is an urbanized area with considerable industrial development that currently does not have storm drains. It is consequently frequently plagued with flooding. The project was undertaken to determine whether there was an approach to flood control other than simply building storm drains.

Four alternative plans were produced, designed to maximize infiltration, to maximize water conservation and wildlife habitat, to maximize stormwater reuse by industry, and emphasizing conveyence to traditional storm drains. Notably, an alternative that maximized the use of onsite BMPs was rejected as too expensive. The components of the plans included industrial reuse, infiltration basins in parks, tree planting and mulching, infiltration in parking lots, and infiltration in vaults beneath the streets.

Because the emphasis of this project was flood control rather than water quality control, the hydraulic control objectives were quite stringent: the system was designed to collect and infiltrate all of the water produced by a 50-year, 96 hour storm. This means that the runoff from the area, if the project is built, will be reduced to near zero. Thus, this project, which includes flood control and water quality control, constitutes an "upper

bound" estimate on the costs for water quality control. Achieving such complete collection and infiltration would certainly substantially exceed water quality goals, and costs for a stormwater quality control system in an area with storm drains already in place would certainly be lower.

San Diego Creek

A project supported by the Irvine Ranch Water District and Orange County and performed by Geosyntec Consultants has developed a plan for natural treatment systems—wetlands and stormwater detention ponds—for the San Diego Creek watershed. This watershed occupies 120 square miles of developed land that drains into Newport Bay. Newport Bay has been designated as impaired, requiring that stormwater discharges be cleaned up.

Geosyntec proposed a plan consisting of 44 facilities, including ponds and wetlands constructed within existing drainage channels or built outside. These are typically facilities with both deeper open water and shallow water supporting emergent vegetation (such as cattails).

Water quality improvements expected from the system are described in the report (Strecker et al., 2002): "The NTS Plan is estimated to achieve total nitrogen (TN) TMDL for base flows and reduce in-stream TN concentration below current standards at most locations. Total phosphorous TMDL targets would be met in all but the wettest years. The fecal coliform TMDL would be met during the dry season, but not all wet season base flow conditions, and not under storm conditions. The NTS Plan is not designed to meet the sediment TMDL, but would capture, on average, about 1,9000 tons/yr (1,724,000 kg/yr) of sediment from urban areas. The wetlands are estimated to remove 11% of the total copper and lead, and 18% of the total zinc in storm runoff. The NTS provides a cost-effective alternative to routing dry-weather flows to the sanitary treatment system."

While final budget numbers were not provided, it was anticipated that the first 13 treatment sites would be constructed for $12 million, and that the overall cost would be substantially less that the $60 million anticipated for low-flow sanitary treatment. This value is listed as the upper bound of cost in Table 2. For comparison of cost vs. unit drainage area size, it was presumed that the average area served by each of the 44 facilities was 120 mi^2/44 = 2.7 mi^2.

Constructed wetlands will collect any trash that enters the storm drain, and should be effective at reducing concentrations of coliform organisms, hydrocarbons, particles, and the suite of pollutants associated with particles. They may constitute a complete control system if they are combined with vigorous source control for metals and pesticides and storm drain screens to minimize the trash loading.

Murray City, Utah, Golf Course and Wetlands

Officials in Murray City recognized an opportunity when the interstate highway I-215 was being built. They agreed to take soil from the excavation and runoff water from the freeway to make a golf course. The links, with an associated string of settling ponds, accept and treat all of the drain water from the eastbound lanes of 4.5 miles of the freeway (NRDC, 1999; Hill, 2003). The golf course has been a commercial success, and now produces $900,000 in revenue against $450,000 in operating and maintenance costs each year. The city has created other treatment wetlands for essentially all of the runoff

from the City and from the westbound lanes of the freeway. The total cost of these wetlands has been less than $1,000,000. Overall, if the golf course infiltration system and the other wetlands are considered as a single stormwater control system, it pays for itself. Because this is an unusual circumstance, for calculation we ignored the income from the golf course, and presume the wetlands cost $1,000,000 and serve the area of Murray City, which is 9.5 mi^2.

Fresno Metropolitan Flood Control District

The Fresno Metropolitan Flood Control District serves the area including and surrounding the city of Fresno. It operates 130 infiltration basins that drain a region of about 120 square miles devoted to agriculture, residential areas, and urban landscape (NRDC, 1999; Pomaville, 2003). Some of the basins are turfed and serve as parks, while others are bare and serve seasonal infiltration needs. The basins succeed in infiltrating 80% to 90% of the stormwater in their drainage areas, and only 2% enters a receiving water without receiving some degree of treatment. To protect groundwater, the District also instituted a program of industrial inspections. While monitoring is still done to check for pollution of the San Joaquin River, the District anticipates no additional infrastructure will be necessary to meet water quality control regulations. For calculations, the unit area for each basin was assumed to be 1 mi^2.

Individual Systems

Long Lake Retrofit, Littleton, Massachusetts

Geosyntec Consultants also designed a low-impact-development program for Littleton, Massachusetts (Roy et al., 2003). The 1.5-square-mile watershed that contains the town drains into Long Lake, which has been subject to eutrophication and other water quality problems associated with urban runoff. The storm drain system collects water at 200 catch basins and releases it to the lake through 18 outfalls. The plan for mitigation of the problem includes a treatment wetland, grass and vegetated swales, bioretention cells (swales with underdrains), rain gardens, rain barrels, and an outreach program to promote source control for fertilizers.

The total budget for the project is estimated at $630,000, or $420,000 per square mile.

Tule Pond, Alameda, California

The Tule Ponds project is a group of three treatment wetlands that was constructed using information developed in the Demonstration Urban Storm Water Treatment Marsh in the early 1980s. It receives urban runoff, passing it through the three ponds in series and discharging it to an existing natural pond. It serves a drainage area of 0.8 square miles and cost $360,000, for a cost of $450,000 per square mile.

Treasure lsland, San Francisco Bay

Treasure Island is an artificial island of 403 acres in San Francisco Bay that was used for many years as a Navy base. It has recently been converted to residential use. A treatment wetland is planned as the means for stormwater quality control. It is anticipated that wetland construction will cost $800,000 to $ 1,100,000 (Bachand, 2003), or $1.2 million to $1.7 million per square mile. However, the island is a tourist destination, and it has been estimated that the increase in visitor spending associated with

the wetland could be $4 million to $11 million (Fine, 2003). It was also estimated that the overall value of the project could be twice these values.

Herrerra Study of Stormwater Regulations Costs

As a part of the effort to determine the costs of complying with stormwater regulations in Western Washington, Herrerra Environmental Consultants (2001) prepared designs for typical projects needed to contain and treat stormwater on site in small projects of new construction. In both cases, the systems were planned for a 1.7-inch rainfall. The first hypothetical project was a ten-acre residential development with 40 individual home sites. It was presumed that runoff from the homes would be collected in a detention pond. Construction of the permanent facilities was determined to cost $240,000 to $230,000, depending on the quality of soils. This is about $15 million per square mile.

The second hypothetical site was a restaurant built on a one-acre site, with the area not occupied by the building used as a parking lot. Runoff was to be collected in subsurface infiltration vaults. Costs were determined to be $280,000 or $570,000, depending on the permeability of the soil, or $175 million to $356 million.

Dover Mall, Delaware

The Dover Mall has 30 acres of parking lot or otherwise impermeable surface. Runoff drains to a wetland that is sized to retain a 1-inch rainfall (NRDC, 1999). It includes a forebay that allows containment of exceptional spills. The total project cost was $171,000 (although much of this was defrayed by in-kind donations). The wetland is considered a considerable esthetic resource. The cost was $3.5 million per square mile.

Oakland Park Industrial Area, Florida

A BMP treatment system was developed for five acres of Oakland Park that included auto repair shops, paint shops and plating facilities. A short treatment train was developed, including a trash removal basin and absorbent media. The system cost $261,000, and was successful in removing 71% to 95% of oil and grease, along with all trash and most sediment. Costs were $33 million per square mile of drainage.

Clear Lake Packed Bed Wetland Filter System

Clear Lake, in Orlando, Florida, receives runoff water from 121 acres of nearby urban land and water quality in the lake has deteriorated significantly as a result of pollution. Packed beds, consisting of 10 filter beds composed of crushed concrete or granite media with growing aquatic plants, allow removal of sediments and nutrients. An initial wet detention pond is used to contain the first flush. The system cost $917,646. In calculations, the system was considered a single installation treating 121 acres of drainage. Costs were $4.6 million per square mile.

Sand Filters in Alexandria, Virginia

Two sand filters were built to treat runoff from an airport parking lot near National Airport in Alexandria, Virginia. The area drained was 1.95 acres, and the filters cost $40,000. While some initial problems with anaerobic conditions were encountered, the filters eventually achieved good treatment. The cost, calculated from the data reported by FHWA (2003), was $12.9 million per square mile.

Compost Filter Facility, Hillsboro, Oregon

A compost filter was constructed to decontaminate water upstream of a grassy swale. The treatment train received water from a five-lane highway, draining a total area of 74 acres. The 1200-square-foot filter contained 120 cubic yards of compost and was constructed and filled for $13,700. The cost, not including the swale, was thus $110,000 per square mile of drainage area.

Infiltration Trenches

The Federal Highway Administration (FHWA 2003) has estimated the costs for constructing infiltration trenches as $C_A = 1317 \times V^{(0.63)}$ where C is the cost in dollars and V is the volume in cubic meters. Calculations for this report are made assuming the need to provide detention for a ¾-inch storm. For one square mile (2.6×10^6 m^2), a ¾-in rainstorm will produce 5×10^4 m^3 of water. The cost per square mile is equal to the cost for each trench divided by the drainage area it serves, or $C_{mi2} = C_A/A = (1/A) \times 1317 \times V^{(0.63)} = 1.2 \times 10^6 \times A^{(-0.37)}$. The total cost for these systems thus declines as each system becomes larger—there are economies of scale. Costs for land are not included, but it is likely that trenches could be installed in land also used for other purposes. In some cases it might be necessary to collect more than ¾ inch of rain. On the other hand, the calculation assumes that no infiltration occurs in the trench during the storm. Also, this presumes that the runoff coefficient for the area served is 1.0—thus the typical systems described could treat a ¾-inch storm on totally impervious area or a 1.5-inch storm on an area with a runoff coefficient of 0.5, which is a commonly observed value. Thus the total seems a reasonable approximation.

Infiltration Basins

The Federal Highway Administration (FHWA 2003) has estimated costs for construction of open infiltration basins (dry basins) as $C = (V/0.02832)^{(0.69)}$, where C is the cost in dollars and V is the volume in cubic meters. As for the infiltration trenches, it is assumed the basins will be designed to treat a ¾-inch storm in an impervious drainage. Thus the cost per square mile is $C_{mi2} = C_A/A = (1/A) \times (V/0.02832)^{(0.69)} = 204{,}000 \times A^{(-0.31)}$. Costs for land are not included, and would be substantial. However, the basins could be used for other purposes for much of the year. Again, the systems assumed could treat a 1.5-inch storm in a drainage area with a runoff coefficient of 0.5.

Bioretention Areas

Stormwater can be collected in areas filled with highly permeable soils and planted with trees and other vegetation. Water that infiltrates is filtered by contact with the soils and may continue to move downward to replenish the groundwater. Much of it will also be taken up by the vegetation and returned to the atmosphere through evapotranspiration. The FHWA (2003) cost estimate for these bioretention areas is $10,000 per impervious acre, or $6.2 million per square mile of impervious watershed. Bioretention areas can readily serve multiple purposes as wildlife habitat and parks.

Detention and Retention Wetlands

The Federal Highway Commission Report (FHWA, 2003) has provided a general formula describing the cost of detention ponds as a function of size. Costs were estimated as $C_A = 168\times V^{(0.699)}$, where C_A is the cost in dollars and V is the volume of the pond in cubic meters. The cost per square mile is $C_{mi2} = C_A/A = (1/A) \times 168 \times V^{(0.699)} =$

$324{,}000 \times A^{(-0.301)}$. Land costs are not included, but these areas can serve other purposes during the larger part of the year when the weather is dry—they can be parks, wildlife areas, and playing fields.

Detention Vaults

In highly urbanized areas, water can be detained in underground vaults, which may be made of concrete or of corrugated steel pipe. Such systems primarily store water to avoid flooding or excessive hydraulic load on downstream systems, but some sedimentation may occur. This provides marginal treatment, but also requires that the vaults be cleaned out on a regular basis. The FHWA estimate for costs of such systems is $C = 38.1 \times (V/0.02832)^{(0.6816)}$. Cost per square mile of drainage area is $C_{mi2} = (1/A) \times 38.1 \times (V/0.02832)^{(0.6816)} = 690{,}000 \times A^{(-0.3184)}$.

Underground Sand Filters

Sand filters are quite effective at removing particulates from urban stormwater, and are commonly employed upstream of other systems in order to protect them from excessive sedimentation. They can be installed underground in densely urban areas, but are correspondingly expensive. The FHWA estimate for such systems is $10,000 to $14,000 per impervious acre served, or $8.7 million per square mile. Here we have chosen the upper estimate because costs are likely to be high in the Los Angeles area.

Surface Sand Filters

Sand filters may also be constructed at the surface, which reduces their cost. However, they occupy a relative large amount of land area, and cannot contribute to a secondary use. There are strong economies of scale. For facilities serving more than 5 impervious acres, the FHWA estimate of cost is $3,400 per acre or $2.1 million per square mile.

Dry Swales and Filter Strips

A vegetated dry swale is an area of land shaped so that stormwater flows through it in a broad, relative flat stream. Flow through the grass removes sediments from the water. At the same time, significant amounts of infiltration may occur. It may be necessary to prepare the soils to maximize infiltration before the grass is planted. Swales can be used for other purposes during the periods when it is not raining. The FHWA estimate of construction costs for swales is $1500 per impervious acre, or $930,000 per square mile.

Filter strips are similar installations, in which the water flows as a flat sheet. The FHWA estimate of constructions costs for filter strips is $2000 per acre or $1,240,000 per square mile.

Results from the ASCE-EPA BMP Database

A cooperative effort of the American Society of Civil Engineers and the U.S. Environmental Protection Agency has compiled data on the success of best management practices. Data were carefully vetted, put as much as possible in common format, and arranged so that they could be searched according to several parameters. Several searches of the database were done to gather data for this study.

A search for dry detention basins, serving watersheds of 0-100,000 acres, with 0-30 in annual rainfall, produced 17 responses, of which only four included cost data. All

of the four were associated with freeways and served small watersheds of 1-14 acres. This may be the reason why costs were exceptionally high.

A search for wetlands, serving watersheds of 0-100,000 acres, with 0-30 in annual rainfall, produced 10 responses, only one of which included cost data. Costs for this facility were exceptionally low. It was described as a "natural" wetland, perhaps implying that much of the system was already in place before construction was done.

A search for wetlands, draining 0-100,000 acres, with 0-30 in annual rainfall, produced 9 responses, including 6 with cost data. These also served very small watersheds, and costs per square mile were very high.

A search for hydrodynamic devices serving 0-100,000 acres, in areas of 0-30 in annual rainfall, produced 12 responses, including 8 with cost data. Costs ranged from $344,000 per square mile to $86 million per square mile, showing very strong economies of scale.

A search for grassy swales serving 0-100,000 acres, in areas of 0-30 in rainfall, produced 26 responses, including 7 with cost data. The cost per square mile ranged from $12 million to $341 million, and showed strong economies of scale. This was a surprising result—grassy swales are very simple and cheaply constructed systems—but it reflects the fact that each installation serves only very small areas.

ESTIMATES OF COSTS AND RECOMMENDED APPROACH

Ultimately, stormwater pollution is a symptom of two anthropogenic changes: we are releasing pollutants into our local environment, and we have disrupted the hydrologic cycle of the Los Angeles Region by covering the soil with impervious surfaces. These changes have other symptoms as well. Local pollution impairs health, damages the esthetic quality of life, and reduces property values. Reducing infiltration increases runoff rates and the risk of flooding, and at the same time, reduces recharge of groundwater resources. Finally, impervious surfaces cannot support vegetation, and we suffer the loss of natural habitat, recreational areas, and aesthetic value of green space.

Cost Estimates

The solution proposed in the report by Gordon et al. (2002)—advanced treatment plants to clean up stormwater after it has entered the storm drains—constitutes treatment of a single symptom without correction of the fundamental problem. It is expensive, and has little benefit beyond the single objective of protecting receiving waters. A more fundamental approach—eliminating pollutant releases and restoring the hydrologic cycle—is cheaper. Further, because it will mitigate all of the effects of pollution and hydrologic disruption, it will have benefits whose value exceeds the costs.

While a rudimentary cost-benefit analysis is attempted here, the limitations of such an approach should be kept in mind. Many costs and benefits are difficult to evaluate—the psychological benefit to citizens who live on a clean street rather than a trashy one, for example, or the long term effects on local business of a general perception of regulatory burdens. In past cost-benefit analyses, it has been common that costs and benefits that are difficult to measure have been assumed to be zero, certainly producing misleading results. It remains true that two good-faith investigators can produce quite different cost-benefit results, especially for a complex problem like stormwater quality control. Assumptions may depend greatly on the value system of the investigators. A recent cost-benefit study was criticized, for example, because it put a lower value on the lives of elderly persons. This is reasonable in the sense that the death of and older person represents fewer years of life lost, and less loss of earnings, and it is a common presumption in cost-benefit studies. However, there was outrage among those who felt that this approach was offensive to the elderly and the general principle that we all have equal rights.

In this particular study, because the costs and expenditures are of many different kinds, it was necessary to use a variety of estimation methods. The results are necessarily approximate, and comparisons among them must be viewed with caution. To use technical terms, contingent valuation studies are included with benefits transfer estimates, and results from various investigators are combined. We anticipate that these steps may be criticized, but we hope that we can provide a framework approach that can be improved and refined as further research is done.

Finally, cost-benefit analysis frequently ignores the issues that arise because the costs and benefits are not borne by the same parties. One might suggest that pollution should not be cleaned up if the cost of doing so exceeds the benefits of relief from the pollution. But it is commonly the case that the polluter who is saving money is not the

same person who is suffering from the effects of the pollution. Does your neighbor have the right to throw his trash in your yard if he can show that it saves him more money than it costs you? The principle of "polluter pays" has a satisfying moral aspect and it also puts the incentives right—the parties with the ability to reduce pollution are given the motivation to find a way to do so.

For these reasons, and because in this short study the numbers are particularly only estimates, we present our cost benefit analysis with the caution that more precise and detailed assessments are desperately needed.

Cost estimates have been prepared by examining case studies. Reports were chosen where information was available for both the total cost of the system described and the land area served, or the initial stormwater retention volume, in order to calculate the cost of stormwater management per square mile of watershed. Several assumptions and caveats must be observed:

1. In the cost-per-square-mile calculations, no attempt was made to adjust costs on the basis of the amount of rainfall in the watershed. Sufficient data were generally not available for this purpose. In most cases, data came from areas where annual rainfalls are greater than in Los Angeles, and this may cause the cost estimates to be high.
2. In the cost-per-square mile calculation, the cost data were not available in a uniform format. It was not possible to calculate an accurate "present worth" including operations and maintenance costs for each case. In some cases operations and maintenance data were included, while in others they were not. In most cases operations and maintenance costs are low in comparison to installation costs, and they would be further reduced by discounting to present worth. Never the less, this may cause the cost estimates to be low.
3. Installation costs may vary depending on the slope of the land, the nature of the soils, depth to water table, local labor costs, and a wide variety of other factors that change with locality. No attempt was made to adjust the costs for these factors, and this may make the estimates high or low.
4. It is presumed that the systems described will be sufficient, in conjunction with source control efforts, to comply with water quality regulations. There was no case reported in which the quality control efforts were described as failing, or for which regulators asked for additional measures after the systems were complete. However, few data were shown for after-construction water quality, and most of the systems have not been in place for enough time to allow long-term assessment. The degree of success for source control efforts, while likely to be substantial, cannot be guaranteed.
5. Several of the projects described have been designed, but not implemented. It is assumed that they will perform as designed. In the case of the Federal Highway Administration formulas, these are regression results rather than individual case results.
6. It is likely that implementation in the Los Angeles area would involve projects that are larger than most of those listed. There likely will be economies of scale. This may cause the cost estimates to be high.

Summary of Case Study Project Costs
"I or D" refer to Implemented or Designed

Project	I or D	Description	Unit Size, square miles	Cost, $M	Cost, $M per square mile
Infiltration Systems					
Fresno Metropolitan Flood Control District Regional Infiltration Basins (NRDC, 1999; Dave Pomaville, 2003)	I	130 turfed or unturfed infiltration basins serving residential areas. Treats or infiltrates 98% of runoff over area of 120 square miles	1		2.5 to 3.7
Study of Stormwater Regulations Cost (Herrerra Environmental Consultants, 2001)	D	Hypothetical calculation of costs for new residential development	0.016	.24	15
Study of Stormwater Regulations Cost (Herrerra Environmental Consultants, 2001)	D	Hypothetical calculation of costs for new commercial development	0.0016	0.28 to 0.57	175 to 356
Wetlands					
Tule Pond, Alameda (Wetzig, 1999)	I	Stormwater treatment pond for urban runoff	0.8	0.36	0.45
Treasure Island, San Francisco Bay (NRDC, 1999: Galvanis, 2003)	D	Wetland treatment system for local runoff	0.65	0.8 to 1.1	1.2 to 1.7
Long Lake Retrofit, Littleton, Mass. (Roy et al., 2003)	I	Swales, constructed wetlands, bioretention cells, outreach	1.5	0.63	0.42
San Diego Creek Natural Treatment System Master Plan (Strecker et al., 2003)	D	Network of open-water ponds and wetlands in Newport Bay drainage, 120 square mile area	2.7	<60	<0.5
Murray City, Utah (NRDC 1999: Hill,	I	Golf course and wetlands treat runoff from 4.5 miles of I-215	9.5	1.0	0.11

2003)		and the city			
Dover Mall, Delaware, (NRDC 1999)	I	Wetland installed on mall grounds drains 30 acres of 100% impervious cover	0.048	0.17	3.5
Sun Valley Project, Los Angeles County	D	Combination of various measures for flood and quality control in L.A. Basin	4.4	172 to 297	39 to 68
BMP Treatment Processes					
Oakland Park, Fla, industrial area (NRDC 1999)	I	Oil, grease, sediment, and trash removal by sedimentation and absorbance	0.008	0.261	33
Clear Lake Packed Bed Wetland Filter System (NRDC 1999: FHWA, 2003)	I	Oil, grease, nutrients, trace metal removal for water entering Clear lake	0.2	0.92	4.6
Compost Filter Facility, Hillsboro, Or. (FHWA, 2003)	I	Oil, grease, removal and filtration for highway runoff	0.12	0.12	0.11
Alexandria, Va, airport parking lot	I	Sand filters installed along the borders of a 1.95-acre parking lot	0.003	0.04	12.9
Bioretention Areas, FHWA cost estimate	D	Areas of highly permeable soil planted with trees and other vegetation			6.2
Underground Sand Filters	D	Porous medium filters placed in underground vaults, appropriate for highly urban areas			8.7
Dry Swales	D	Broad, shallow vegetated drainways covered with vegetation, usually grass			0.93
Surface Sand Filters	D	Porous medium filters installed at the surface			2.1
Filter Strips	D	Flat vegetated drainways covered with vegetation, usually grass			1.2
Port of Seattle container area cleanup	I	High quality street sweeping with sediment trap catch basins			3.1
Cost:Area Formulas from FHWA					
Infiltration trenches, FHWA cost estimate	D	Gravel-filled trenches. Infiltration eliminates runoff discharge.	$C_{mi2} = C_A/A$ $= (1/A)\times 1317\times V^{(0.63)}$ $= 1.2\times 10^6\times A^{(-0.37)}$		

Infiltration basins, FHWA cost estimate	D	Open basins, dry at most times, store and infiltrate runoff. Infiltration eliminates runoff discharge.	$C_{mi2} = C_A/A$ $= (1/A)\times(V/0.02832)^{(0.69)}$ $= 204{,}000\times A^{(-0.31)}$		
Detention and retention wetlands, FHWA cost estimate	D	Wetlands used for treating stormwater, with storage capacity available	$C_{mi2} = C_A/A$ $= (1/A)\times 168\times V^{(0.699)}$ $= 324{,}000\times A^{(-0.301)}$		
Detention vaults, FHWA cost estimate	D	Underground reservoirs for storage of runoff to reduce peak flows	$C_{mi2} =$ $(1/A)$ $\times 38.1\times(V/0.02832)^{(0.6816)}$ $= 690{,}000\times A^{(-0.3184)}$		
Results from ASCE-EPA BMP Database					
Dry Detention Basins					
I-605/SR-91 EDB	I		0.0013	0.077	60
I-5/Manchester (East)	I		0.0077	0.33	43
I-5 SR 6	I		0.0085	0.14	17
I-75/SR-78 EDB	I		0.022	0.82	38
Wetlands					
Swift Run Wetland	I		1.95	0.049	0.025
Sand Filters					
I-5/SR-78 P&R	I		0.0013	0.22	170
Escondido MS	I		0.0013	0.45	348
Eastern Eastern Regional MS	I		0.0024	0.34	141
Foothill MS (Sand Filter)	I		0.0029	0.48	164
Termination P&R	I		0.0045	0.46	102
LaCosta P&R	I		0.0045	0.23	49
Hydrodynamic Devices					
Jensen Precast (UVA)-Phase II	I		0.00045	0.039	86
I-210/Orcas Avenue	I		0.0018	0.04	22
Jensen Precast, (Sacramento)	I		0.0032	0.062	19
I-210/Filmore Street	I		0.0040	0.05	12
Charlottesville Stormceptor	I		0.0040	0.017	4.2
Sunset Park Baffle Box	I		0.040	0.023	0.57
Indian River Lagoon CDS Unit	I		0.098	0.055	0.56
Austin Rec Center	I		0.15	0.05	0.34

OSTC					
Grassy Swales					
I-650/SR-91 Swale	I		0.00032	0.11	341
Cerrito MS	I		0.00065	0.06	93
1-605/DelAmo	I		0.0011	0.13	115
I5/I-605 Swale	I		0.0011	0.073	64
Monticello High School	I		0.0013	0.015	11
SR-78 Melrose Dr	I		0.0039	0.13	34
I-5 North of Palomar Airport Road	I		0.0074	0.14	18
I-650/SR-91 Swale	I		0.00032	0.11	341

Economies of Scale

The costs listed in Table 2 reflect the cost for an individual facility ("Cost, $M" and "Cost, $M/mi^2") and associate it with the drainage area served, referred to as the "Unit Size". The costs per square mile for the individual units can be plotted to determine the effects of unit size (Figures 1 and 2). While there is a great deal of scatter in the data, it is clear that there is considerable economy of scale. Units serving drainages of a half square mile are typically 30% more expensive that those serving 1 square mile. Those serving drainages of one-tenth square mile are twice as expensive and small installations are extremely expensive in dollars per square mile. The most notable example of this is grassy swales: while each unit is relatively inexpensive, their small service areas make them very expensive per square mile served.

For some of the BMPs there are not sufficient data to judge the economies of scale, and as described, all of the data must be taken as approximate. Never the less, it seems that there is a good case to suggest that regional systems for handling runoff water will be most economical. This is clearly true of wetlands and infiltration basins, which are likely to be the most widely used approaches in the Los Angeles Region as a whole. This supports the position that the best solution will be a wetland or an infiltration basin also serving as a park, playing filed, or wildlife habitat as the stormwater management unit for a neighborhood of a square mile or greater.

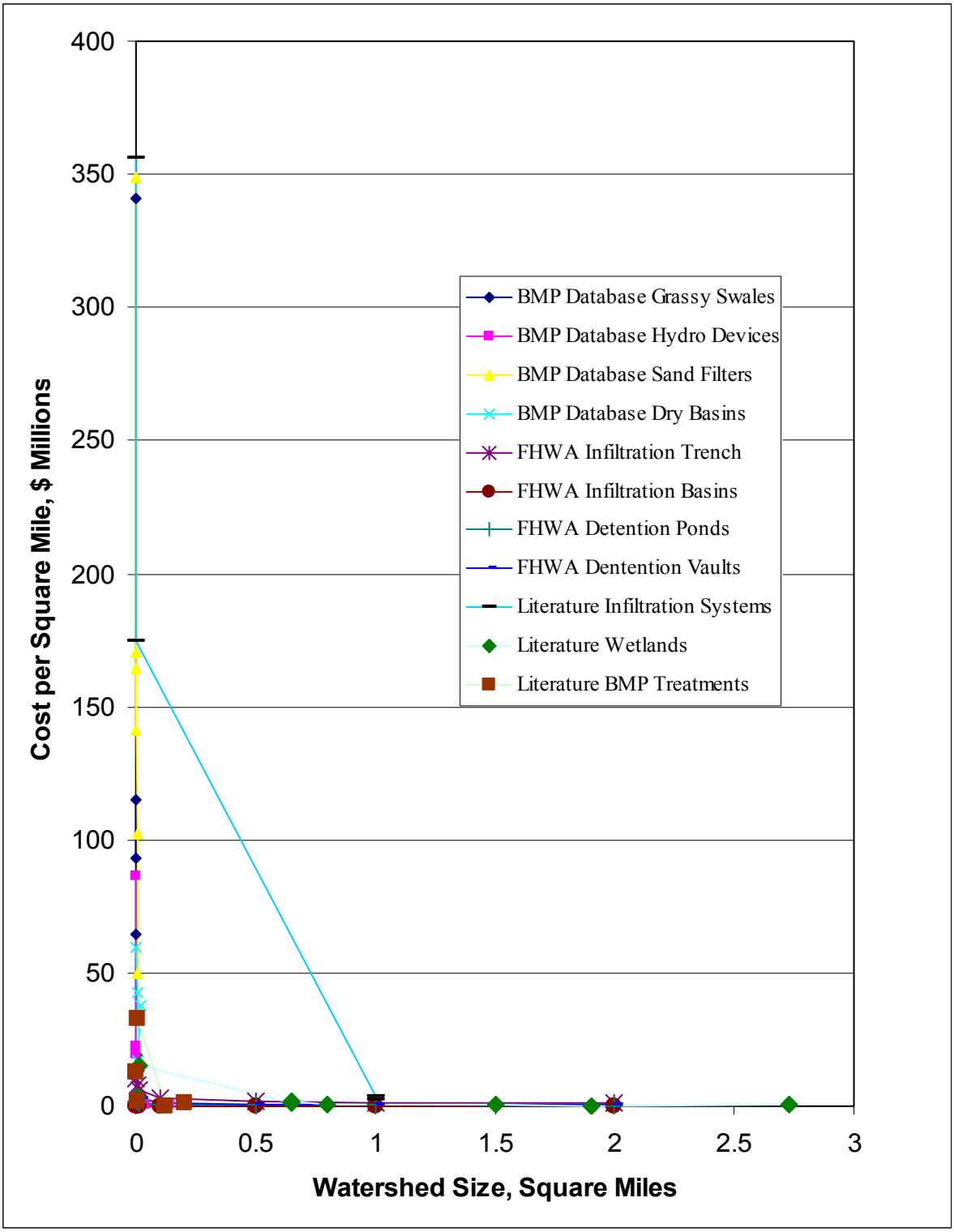

Figure 1. Plot of data for which costs per square mile and unit areas are known.

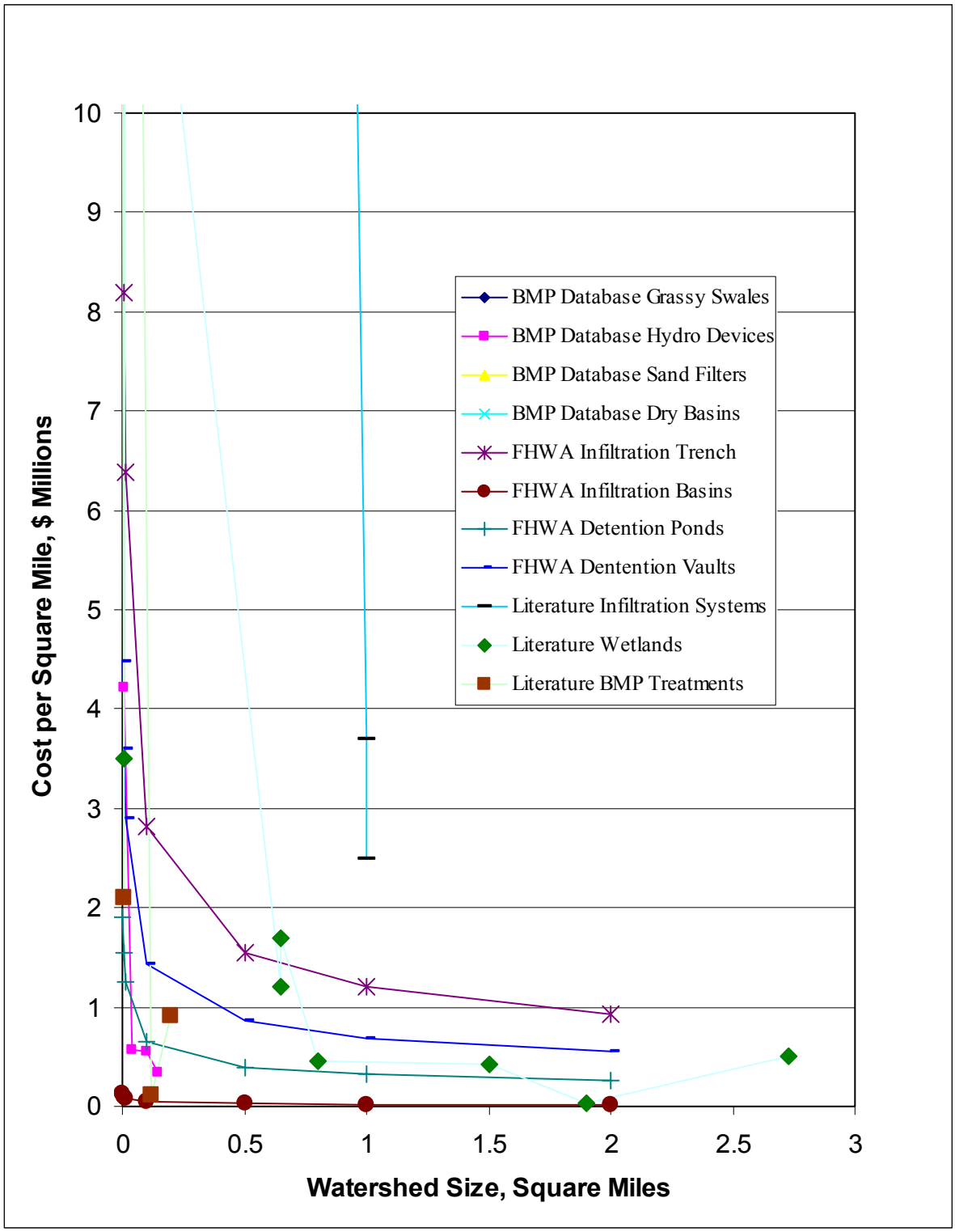

Figure 2. Cost per square mile versus unit size. Data are the same as those shown in Figure 1, but the axes have been magnified to show detail near the origin. Many data points fall outside of the plot.

Overall Costs of Stormwater Quality Control

It remains very difficult to produce an estimate of the total costs for complying with regulations in the Los Angeles Region. While there is substantial information on individual units that have been designed or implemented elsewhere, local factors are likely to make costs different in the Region. In most cases, it seems likely that costs in the Los Angeles Region will be higher than those reported elsewhere because land and labor costs are higher. Therefore, where a range of values is given, we have chosen the higher numbers.

This difficulty is compounded by the great variability in the data reported. To give just one example, the Federal Highway Administration formula estimates the cost of an infiltration basin needed to serve one square mile as $200,000. At the other extreme, the Herrerra Consultants report said that a detention/infiltration system for a residential area would cost $15 million per square mile. In preparing our total estimate, we have avoided using data that seem like outliers in comparison to the general run of the data.

The results compiled suggest two possible scenarios for stormwater quality control. The first approach is to rely on non-structural BMPs, such as programs to reduce littering, control pet waste, collect trash, prevent release of pollutants, and clean existing drains. This approach is less expensive because it involves no construction. However, there remains considerable doubt whether it will be sufficient to meet stormwater quality goals expressed as TMDLs (Total Maximum Daily Loads). Control of pollutant release will be only partial—we cannot expect that everyone will comply with the rules—and the amount of runoff will be reduced only slightly.

The second scenario presumes implementation of non-structural BMPs (except storm drain cleaning) and construction of a network of wetlands and infiltration basins sufficient to capture the first three-quarters of an inch of rainfall, which typically carries the bulk of the pollutants. These relatively simple installations are not likely to be sufficient without complementary measures to reduce releases of coliforms, trace metals, fertilizers and toxic organics. Wetlands help to remove these, but will not be effective if inputs are too high. Infiltration avoids all pollutant discharge, because it prevents release of the water, but it is necessary to protect groundwater quality, so once again, inputs must be restricted. The wetlands and infiltration basins would be designed to have sufficient retention capacity to hold the first ¾ inch of rainfall—this "first flush" carries most of the pollutants, but pollutant discharges must be sufficiently reduced so that subsequent flows can be discharged directly to storm drains.

In combination with the non-structural BMPs, wetlands and infiltration basins (designed as "stormwater parks") are likely to bring stormwater quality into compliance. This system will be more expensive, but it also carries greater secondary benefits: the region will gain much-needed greenspace, property values will be improved, and most important, it will substantially increase the availability of groundwater.

It is our recommendation that the responsible municipalities and agencies in the region begin at once on assessing stormwater quality on a neighborhood basis and implementing the non-structural controls. As the success of these measures is measured, it will become apparent whether the structural BMPs are needed. It seems certain that they will be needed in some areas, but they may not be needed throughout the region. Thus our estimate of costs ranges from a minimum budget needed for the non-structural

BMPs to a maximum representing the cost of an area-wide system of wetlands and infiltration basins. The following section provides the details of how the cost estimates were prepared.

Non-structural BMPs

An estimate of costs for non-structural BMPs has been prepared by the American Public Works Association (APWA, 1992). They defined five levels of BMPs that might be workable, with the appropriate level depending on the stringency of discharge requirements and the success of the individual measures. Their analysis included ten source control measures with cost data, and has been used as the starting point for the analysis here. Our treatment of each measure is described in the following paragraphs.

No littering ordinance. Litter laws are in place in the region, but there is a need for far more vigorous public education and enforcement. The APWA study determined that each municipality would spend $20,000 to put an enforcement program in place, and hire a half time person to manage the program ($30,000 per year). There are about a hundred municipalities in the Los Angeles Region, so this implies a startup cost of $200,000 and yearly costs of $3 million. Some officers will be necessary, but it is assumed that their pay will be covered by revenue from fines. Total costs are estimated to be $3 million plus the present worth of $3 million per year at 3%, or $103 million.

Pet waste ordinance. APWA predicted that the effort to control pet waste would be similar to that for litter, and estimated the same costs.

Chemical use and storage ordinance. APWA determined that a program to control the use and storage of chemicals would be similar is scope and cost to that for litter or pet waste. The same costs are estimated here. This would include the cost of programs to bring auto dismantlers and other local businesses into compliance.

Recycling programs. APWA predicted less trash would be discarded if convenient recycling programs were in place. Because these currently exist in most Los Angeles Region cities, and are justified by other concerns, no additional costs are estimated for this purpose.

Public education programs. Developing public support for stormwater quality control and explaining the need for citizen action will be vital to its success. The APWA determined a program costing $275,000 in each municipality would be necessary. However, it would be confusing and unnecessarily duplicative to have each of the one hundred municipalities in the Los Angeles Region conduct its own program. We instead assume a single program will be funded at the level of $5 million per year, which is approximately the current rate of expenditure. It also seems likely that education will not be needed indefinitely—to the degree that the message is successful, it will certainly become ingrained after perhaps ten years of advertising. We therefore estimate a total of $50 million for public education.

Vacant lot cleanup programs. This function will be part of the improved trash collection program, so funds are not separately allocated.

Spill prevention ordinance. APWA determined a separate program would be necessary to reduce the frequency of chemical spills and facilitate their rapid cleanup. This function has largely been overtaken by hazardous waste management regulations, and so is estimated to require no additional costs here.

Program to prevent illicit discharges. APWA determined that vigorous efforts would be needed to find and eliminate illicit discharges to the storm drain system. We agree that this will be necessary to avoid loads of non-biodegradable pollutants, such as trace metals, on treatment wetlands and infiltration basins, and to prevent excessive loading of organic contaminants and coliforms. APWA predicted a cost of $4 per acre of watershed to start, and $50 per acre per year thereafter in order to deploy and monitor sampling devices and to trace down points of discharge. For the 2,050 square miles in which stormwater protection is needed, this amounts to $6.5 million in capital expenses and $80 million per year in ongoing costs. We expect however, that many illicit connections will be found at first, and that after these are eliminated, only a small program will be needed to detect new illicit connections. We therefore estimate that the ongoing costs will continue for only five years, totaling $407 million.

Improved cleaning of storm drains. During dry periods, storm drains collect trash from illicit dumping and wind blown litter (we expect no trash will enter through the catch basins because screens will be installed). Sediments also accumulate in the channels. Releases to the rivers and ocean could be reduced by a summer program of storm drain cleaning. The APWA estimates such a program can be put in place for $21 per acre per year, or about $27 million per year over the area of concern. The present worth of $27 million per year is $900 million (assuming an interest rate of 3%). No storm drain cleaning is expected for the wetlands and infiltration scenarios, on the presumption that trash and sediments will be removed from the water before it enters the drains.

Trash control. Trash must be removed from the runoff. A settlement agreement on Trash TMDL between the LA Regional Water Board and the City of Los Angeles includes spending of $168 million to reduce trash releases by 50% in five years. Cleaning up the region required removing all of the trash from an urban area more than twice the size of the city. Thus the estimate of $600 million seems reasonable.

Low flow treatment. One of the best steps, in terms of water quality benefits per dollar, is to use excess capacity in the wastewater treatment plants for treatment of low flows. This will keep the rivers and oceans clean for most of the year at little additional cost. The City of Los Angeles estimates the cost of building the necessary diversion structures at $14 million (Kharaghani, 2003). The urban region is about twice the size of the city, so we have estimated a total cost of $28 million. This does not include operation costs. While there will be modest cost increases associated with the greater flows, the biggest costs are associated with the installed treatment capacity, which is already in place.

Improved street sweeping. The APWA report determined that sweeping should be improved by increasing its frequency. Research results developed since the APWA report suggest that more frequent sweeping with traditional brush machines produces only a modest improvement. However, changing to vacuum sweepers is effective, and can remove up to 50% of particulate pollutants.

The upgrade of street sweeping in the region will require purchasing new vacuum-type sweepers to replace those currently in use. There are about 400 street sweeping machines in use, which must be replaced once every four years, so 100 machines will be purchased each year. Vacuum machines cost about $150,000 rather than the $75,000 for standard machines. Thus the additional costs of higher quality

sweeping are $75,000 per machine or about $7.5 million per year. Assuming an interest rate of 3%, this has a present worth of about $250 million.

Costs for on-site BMPs for private firms. It is anticipated that application of non-structural BMPS will include requirements that businesses make efforts to reduce pollution and runoff from their facilities. Efforts are likely to be highly variable: an accounting firm whose work is all done in offices might need to do no more that redirect its roof runoff to landscaping areas. A manufacturing facility might install sand filters and oil-water separators. Parking lots may be remodeled. It is difficult to provide an estimate for these efforts, but a general approximation for the total can be approached if firms are considered by size (Table 3). Data on the number of firms within chosen size ranges, measured by the number of employees, have been compiled for Los Angeles County by the California Employment Development Department (2001). Again, this area is not the same as the Los Angeles Region governed by LA Regional Water Board, but there is substantial overlap and the demographics are similar.

Table 3. Estimate of On-site BMP Costs for Los Angeles County Firms by Size Class

Number of Employees	Number of Firms	Average Cost per Firm	Total Costs
0-4	219,974	10	$2,199,740
5-9	37,125	500	18,562,500
10-19	25,366	1,000	25,366,000
20-49	19,682	2,000	39,364,000
50-99	7,745	5,000	38,725,000
100-249	4,239	10,000	42,390,000
250-499	1,138	25,000	28,450,000
500-999	408	50,000	20,400,000
1000+	260	100,000	26,000,000
Totals	315,937		241,457,240
		Average cost per firm	$764

Most small firms will not spend any money, so the average cost per firm is expected to be very low. A few might be required to improve trash disposal methods or reroute their rooftop drainage. At the other extreme, the largest companies might improve trash disposal and materials handling methods, build infiltration system planters, install oil-water separators, institute parking lot and work area sweeping. Companies that install new parking lots or reconstruct old ones may incur significant costs.

Costs for compliance with the "3/4-inch rule". The SUSMP regulations promulgated by the LA Regional Water Board require that new developments larger than one acre and redevelopment must provide for infiltration or minimal treatment of runoff from the first ¾-inch of rainfall from a storm event. It is difficult to determine how much this will cost. Proponents have suggested the costs will be minimal, while opponents

have predicted high costs. Experts contacted during this study were of the general opinion that landscaping designed to infiltrate the runoff from a ¾-inch storm would be different, but not significantly more expensive, than traditional landscaping. On the other hand, engineers in the discipline believe that most builders are choosing treatment systems rather than infiltration. The stormwater control costs will likely be a small fraction of building costs. Ultimately, we have concluded that there are not sufficient data to make a numerical cost estimate. The costs are therefore described here only as "modest", and further study is recommended.

Wetlands and Infiltration Basins: Estimate Based on Cost per Square Mile of Watershed

The land within the Los Angeles Region varies from lightly settled areas, like the upper reaches of the Santa Clara River Watershed or the Santa Monica Mountains, through neighborhoods of single family homes with yards, to the extremely dense development of downtown Los Angeles or the Wilshire District. There are about 1,375 square miles of incorporated cities in Los Angeles County. The region of the LA Regional Water Board includes parts of Ventura County, and parts of both counties that are not incorporated are never the less populated. To evaluate the possible alternatives for runoff control, we have conceptually divided the 3,100-square-mile region that is under the jurisdiction of the Los Angeles Regional Water Quality Control Board into four parts 1000 square miles is estimated to be of "low density", requiring some runoff BMP treatment, but having sufficient land for development of treatment wetlands or infiltration systems. 1,000 square miles is estimated to be "high density" requiring infiltration systems but excluding wetlands. 50 square miles is estimated to be extremely dense downtown development, requiring some more sophisticated BMP treatment systems. The remainder of the region is considered rural, and we presume the only cost is for source control outreach and enforcement. These definitions and numbers are approximate, but there is also flexibility in the applicability of the various technologies.

For the low density urban areas, we assume some combination of infiltration systems and treatment wetlands will be constructed. The range of reported costs for treatment wetlands runs from $110,000 per square mile for Murray City, Utah, to $1.7 million per square mile for the Treasure Island wetland in San Francisco. The San Diego Creek wetland system seems an excellent example—it is designed for a populated region of Orange County that is quite similar to many areas in Los Angeles County. However, it is specifically designed to treat low flows only, and the total cost of the system has not been provided (except that it is less than $500,000 per square mile). The Long Lake retrofit also seems like an appropriate example. It uses a mix of wetland, infiltration and biological BMPs in an urban residential area, and has a well-established cost of $420,000 per square mile. We have therefore used this value in our total estimate of $420 million for the low density areas.

In areas of high density housing, where yards are small, or in industrial areas with large roof and parking areas, runoff coefficients are higher and there is less land available. Here it seems likely that infiltration systems will be necessary. The best example for comparison is the Fresno Metropolitan Flood Control District, which installed 130 basins over an area of 120 square miles, with many of the facilities dedicated to multiple uses as parks and playing fields. Cost estimates for the system range from $2.5 million to $3.7 million per square mile. While a similar system built in

the Los Angeles Region could take advantage of existing parks, power line rights-of-way, parking lots, and other available land, it seems appropriate to use the higher number because land here will be more expensive. Thus we estimate cost in these areas to be $3.7 million per square mile for a total of $3.7 billion.

In extremely dense areas, neither wetlands nor infiltration systems will be possible. Pollutant loads, despite source control efforts, will be considerable in the near future. Underground sand filters, sediment traps, oil and grease adsorbants and other more elaborate treatment BMPs will be needed. The lowest-cost processes are filter strips, dry swales and bioretention areas, but these require space that is unlikely to be available (the Hillsboro, Oregon compost filter, at $110,000 per square mile is considered an outlier). Even the Alexandria, Virginia airport parking lot solution is unlikely to be workable because so much of the parking area is in multi-level structures in downtown areas. This combination of more pollutants and less space suggests that the Oakland Park, Florida system for treating industrial runoff is the best case example. Its cost was equivalent to $33 million per square mile, for a total of $1.65 billion over the extremely dense urban area.

Together, this approach estimates that the total BMP facilities cost will be about $5.7 billion.

Wetlands and Infiltration Basins: Estimate Based on Needed Retention Capacity

Investigators working on the Sun Valley Project (Los Angeles County Department of Public Works, 2003, Figure 4-3 of page 4-8) have designed several BMPs and provided carefully calculated cost estimates. These are recent figures, reduced to present worth, and reflecting the local conditions in the urban Los Angeles Region. They provide costs in terms of dollars per acre-foot of stormwater storage capacity for several BMPs. Three examples have been chosen for consideration here: Stonehurst Park and Wentworth Park (which simply lower the park level to two feet below the surrounding area so that they serve as infiltration basins, or "stormwater parks"), and storage in below-street infiltration vaults. A system that stores the runoff from a ¾-inch storm will comply with SUSMP requirements. In the low density areas, it is estimated that the runoff coefficient is 0.4. In the high density areas, it is estimated to be 0.6, and in the extremely dense areas it is estimated to be 1.0.

We estimate that the low-density areas can be served at the Stonehurst Park price, the high density areas can be served at the Wentworth Park price, and the extremely dense areas can be served by street infiltration vaults. This approach to estimating the total cost is completely independent of the first approach, but the final estimate of $4.0 billion for BMP facilities is reasonably similar.

Wetlands and Infiltration Basins: Estimation of Total Costs from the APWA Study

The APWA study produced total estimates for costs for the nation for five scenarios for stormwater quality control. One estimate was for a system of detention basins and wetlands, as is being proposed for the structural BMPs described here. They estimated that a national system would cost $91 billion. For 260 million people in the United States, this is about $350 per capita. For the 10 million people in the Los Angeles Region, this produces an estimate of $3.5 billion. The APWA anticipated maintenance costs for detention and retention basins at about 1% of the construction cost per year. Discounted to present worth, this increases the total cost by 33%, or $1.2 billion. APWA

numbers thus indicate a total cost of $4.7 billion. This estimate is similar to those shown for the entries in Table 3 for facilities costs for alternatives B and C.

Wetlands and Infiltration Basins: An "Upper Bound" Provided by the Sun Valley Study

The Sun Valley study developed a detailed design for a 4.4 square mile watershed that currently has no storm drains. It was designed to contain the water from a 50-year, 3-day storm—14.8 inches of rain—using stormwater parks and below-street infiltration vaults. Because this approach will infiltrate essentially all of the rain that runs off from the area, and because the design criterion of 14.8 inches greatly exceeds the ¾ inch assumed here, it unquestionably constitutes a plan that would overcomply with the strictest imaginable stormwater quality control regulations. Further, because it is a complete and detailed design, it is essentially certain that it can be built for the cost estimated. Figures are recent, and reflect the costs of construction in the Southern California area.

The costs determined can therefore serve as an "upper bound" multiple benefit expenditure that a municipality could imaginable be required to incur—while there is every reason to suppose that the easier goal of stormwater quality control can be done for a much lower cost. The low cost alternative described was $171 million for 4.4 square miles, or $39 million per square mile. For the 1050 square miles of the high density and extremely dense urban Los Angeles Region, this would result in a cost of $41 billion. Wetlands for the low-density areas and trash control for the entire region would add about $1 billion more. Thus we can say with great certainty that no alternative more expensive than $42 billion will be needed.

Overall Benefits of Stormwater Quality Control

The Esthetic Value of a Clean Ocean

Much of the value of living near clean streams and a pollution-free ocean is difficult to quantify. People enjoy the view, they like watching wildlife, and they prefer vegetation and sand and water to pavement. Some efforts to place a dollar value on these benefits have been made by the EPA (1999) and others (Kramer, 2003; Soderqvist, 2000; Whitehead, et al., 2000).

Soderqvist asked residents in the area of the Stockholm archipelago how much they were willing to pay in order to reduce eutrophication of the nearby ocean. The effects of oceanic eutrophication are relatively subtle—less obvious than floating trash or debris washed up on the beach. He determined the willingness to pay to be between $54 and $90 per person.

Whitehead investigated resident willingness to pay for reduction of eutrophication of the Neuse River Basin in North Carolina. He found 44,000 landowners were willing to pay about $76 each for the water quality improvement.

Kramer surveyed people in the area of the Catawba River in North and South Carolina, asking about willingness to pay for improved water. The average result was $139 per taxpayer.

The EPA surveyed people across the U.S., asking about their willingness to pay for the various services associated with improvements in fresh water quality. They found people willing to pay $210 per household for improvement of water quality sufficient to support boating, $158 for the further improvement sufficient to support fishing, $177 for

further improvement sufficient to allow swimming, and $158 for improvement sufficient to support natural aquatic life. Of the total of $703, however, only 67% was ascribed to local water quality improvement, while the rest was associated with improvement nationwide. Assuming 2.5 persons per household, this results in an estimate of $188 per person for willingness to pay for local freshwater improvements, similar to the estimate by Kramer for the Catawba River.

We have chosen the EPA estimate for freshwater improvements: the higher estimate seems reasonable because freshwater resources in the LA basin are generally in very poor condition, and because we have ignored the national effect (their results indicated that people throughout the nation were willing to pay for improvements throughout the nation—we are not counting the willingness of people outside the LA Region to pay for improvements here, and that number is not zero). Adding this to a mid-range value of the Soderqvist estimate for improvements in ocean water quality produces a result of $260 per person. This seems a quite reasonable value. 9.5 million people live in the Los Angeles Region, so this value indicates a total willingness to pay, based solely on the value of living in a region of clean waters, of about $2.5 billion.

Larsen and Kew (2003) have surveyed residents of California to determine their total willingness to pay for removing all impairments from bodies of water in the state. They determined that the average willingness to pay was $15.46 per month. Assuming 2.5 persons per household, this is $6.18 per person per month. For 9.5 million residents in the Los Angeles Region, this is $58.7 million per month, with a present worth of $23 billion. This represents the value of removing all impairments—including those caused by wastewater pollution, shoreside development, pollution from boats, and others. Our estimate for stormwater pollution alone is about one-tenth of this. Thus the Larsen and Kew results suggest our estimate is reasonable and conservative.

General support for these numbers was found in a survey done for the Packard Foundation performed by Mark Baldassare (Weisse, 2003). He determined that seven of ten Californians are concerned about the decline in coastal resources. Sixty-nine percent said the condition of the coastline is very important to their quality of life, and 75% visit the coast at least several times each year. Seventy-two percent favor reducing stormwater pollution, even if the cost leads to higher utility bills.

Ecosystem Services

A primary purpose of stormwater quality control is protection of nearshore marine ecosystems. These ecosystems provide humanity with a wide variety of services, ranging from educational opportunity to fish resources to chemical maintenance of the atmosphere. While the effort to value such ecosystem services is necessarily difficult and approximate, some studies have been made. Costanza, et al. (1997) in an article published in the respected journal *Nature*, assessed the value of coastal ecosystems at $12 trillion per year worldwide. The World Resources Institute estimates that there are 1.6 million kilometers of coastline (measured at a resolution of 1 kilometer). If we assume that stormwater discharges from the Los Angeles Region affect about 100 miles, or 160 kilometers of coastline, this is 0.01% of the world's total, suggesting that the value of local coastal resources is $1.2 billion per year. Assuming an interest rate of 3%, this income stream has a present worth of $40 billion. Finally, we can make the general

approximation that stormwater pollution reduces the services provided by the local coastal ecosystem by 5%. This suggests that the value of lost services is $2 billion.

This number is quite approximate. It must secondly be interpreted thoughtfully because it includes services such as nutrient cycling and maintenance of the atmosphere, which are of undoubted value to the world, but which do not show up in the daily budgets of local citizens or local municipalities. The services are nevertheless quite real and quite valuable, and should be included in the accounting.

Additional Water Supply

Infiltration of stormwater will add to area groundwater reserves. These are a valuable resource that currently provides a substantial fraction of the Los Angeles Region water supply. Water that is infiltrated from the stormwater quality control system will add to local resources, reducing the need for imported water. We assumed that water will be collected from 2050 square miles. Rainfall ranges from 12 to 16 inches per year in the region, and infiltration is from 2 to 8 inches per year. It is conservative to assume that installation of a distributed system of infiltration basins will increase infiltration in this area by an average of 3 inches per year, corresponding to collection of four storms of ¾ inches (or a larger number of smaller storms). Thus total infiltration will be 300,000 acre-feet per year. Some of this may be unrecoverable, having entered contaminated or otherwise unusable aquifers. However, even this will contribute to reducing the problems of seawater intrusion. We estimate that about 90% or 270,000 acre-feet of the infiltrated water will be available.

Current importation costs are about $450 per acre-foot. However, current supply shortages are forcing serious consideration of desalination as an alternative source because political and environmental factors preclude significant increases in importation. We predict that continued growth in the Los Angeles Region will require that water be obtained from such high-cost sources, so we have used $800 per acre-foot as the value of the infiltrated ground water. Further, even if water is available for $450 per-acre foot, this is only the marginal financial cost of import—the true life cycle cost, including environmental impacts in source areas, is surely much higher. 270,000 acre-feet of water per year at $800 per acre-foot amounts to $216 million per year. The present worth of this income stream is $7.2 billion.

The appropriate number is highly dependent on assumptions: if conservation measures are effective and growth is slow, desalination might not be necessary. However if we include the costs of political friction with source areas, and the environmental impact of water transfers on those areas—that is, the full life-cycle cost of imported water, even the cost estimate of $800 per acre-foot may be low.

Flood Control

The flood control system in Los Angeles County is currently designed to cope with runoff from areas with a runoff coefficient on the order of 0.5. Stormwater quality control measures could substantially reduce this number—currently the coefficient for the San Gabriel Valley, measured below the spreading grounds at Whittier Narrows, is 0.05. Calculations suggest that the recent Army Corps of Engineers project that raised the embankments along the lower Los Angeles River have eliminated the 100-year flood plain for now, and property owners have correspondingly been relieved of flood insurance costs of $20 million or $30 million per year. However, if development

continues to increase the runoff coefficient of the region, progressively more expensive projects will be required—it is likely that further protection would require rebuilding many bridges. Alternatively, flood insurance will once again be necessary, and uninsured properties will be at risk. It is perhaps reasonable to presume that infiltration systems will avoid the cost of the next embankment project, which could easily costs twice as much as the one just completed, or $400 million.

A second estimate can be developed this way: The National Flood Insurance Program says there are 25,620 policies held in Los Angeles County with an average premium of $550, for a total yearly cost of $14 million. The present worth at 3% is $466 million. Presumably, most but not all of this could be avoided with a complete stowmwater quality control system. Thus the estimate of $400 million seems reasonable.

Property Value Improvements from Greenspace and Water

Certainly additional parks and other greenspace would add to property values. Developers frequently add central lakes or greenspace to large developments, demonstrating their belief that the value of the land for additional housing is less than its value as an amenity. In a study compiled in 1995, the U.S. EPA said (U.S. EPA, 1995):

> "People have a strong emotional attachment to water, arising from its aesthetic qualities--tranquility, coolness, and beauty. As a result, most waterbodies within developments can be used as marketing tools to set the tone for entire projects (Tourbier and Westmacott, 1992). A recent study conducted by the National Association of Home Builders indicates that "whether a beach, pond, or stream, the proximity to water raises the value of a home by up to 28 percent." A 1991 American Housing Survey conducted by the Department of Housing and Urban Development and the Department of Commerce also concurs that "when all else is equal, the price of a home located within 300 feet from a body of water increases by up to 27.8 percent" (NAHB, 1993). Dick Dillingham, President of the National Association of Realtors' Residential Sales Council, declares, "Water makes a difference . . . there is such a very small supply of properties that can claim a water location and it is something you cannot add" (Lehman, 1994)."

Homes overlooking the new wetlands and greenspace will see the greatest increase in property values. Those farther away will appreciate less. A study reported by Fairfax County, Virginia, (Environmental Coordinating Committee, 2003) interpreted the EPA results and concluded that an aesthetically valuable pond raises the value of nearby houses by $10,000 each. In Los Angeles County, the median home is valued at about $400,000, so a $10,000 increase is about 2.5%, which seems a reasonable number. Demographic data for Los Angeles County (This is not the same as the Los Angeles Region governed by the Water Quality Control Board, but there is considerable overlap, and the demographics are quite similar) indicate there are 3.27 million homes, of which 47.9%, or 1.55 million, are owner-occupied. We expect that about one-third of these, or 500,000 homes, would benefit from additional greenspace in a complete stormwater control system (the others could be too remote, or might already have sufficient greenspace). Increasing the value of each home by $10,000 provides a total benefit of $5 billion.

Improved Property Values from Trash Control

Enforcement of litter laws and improved street cleaning would improve the appearance of our neighborhoods. It is believed that the esthetic improvement would have a value to individuals at least equal to the esthetic benefits of a cleaner ocean, so we have valued this at $100 per person, for a total of $950 million.

Cost Savings from Reduced Dredging

Costs for sediment dredging and disposal in area harbors range from about $10 per ton, when the sediment is clean and a nearby disposal site is available, to $30 per ton when the sediment is contaminated or the disposal site is distant. Disposal of sediments classified as toxic may cost $100 per ton. Personnel at Los Angeles Harbor estimate that about 40% of currently dredged sediment is contaminated, and occasional loads are toxic. In general, acceptable disposal sites are becoming harder to find, so distant sites are likely to be the rule. Thus, an estimate for future sediment removal of $30 per ton is reasonable. The Environmental Protection Agency has estimated overall costs and effectiveness for sediment control at construction sites, and the results indicate that preventing the runoff of a ton of sediment costs from $69 to $86 (Appendix II). Therefore, the savings associated with alleviation of harbor sedimentation alone offset about a third of the costs of construction site measures. Savings for Los Angeles Harbor will be about $3 million per year. Regional savings will be about $10 million, with a present worth of $330 million.

To cite another example, it is estimated that the San Joaquin Marsh wetland preserve collects 50,000 tons of sediment per year. Assuming a removal cost of $30 per ton, the benefit for Newport Bay, which is just downstream, is $1.5 million per year.

Cost Savings from Improved Public Health

Sufficient data do not exist for estimating the value of benefits from reduced exposure to air pollutants. Certainly fine particles are an important part of the causes of health impairment, and experts agree that resuspension of road dust is an important contributor to fine particle exposure at street level where we live. They also contribute substantially to settlement of dust and dirt on buildings, requiring cleaning expenses. However, estimates of the magnitude of this effect are not currently possible.

Summary of predicted costs and benefits

Table 3 presents a summary of the estimated costs and benefits. Three estimates are included. In the first (A), non-structural BMPs are presumed to be the only measures employed. In the second (B), wetlands and infiltration basins are assumed, and the costs are estimated on a cost-per-square-mile basis. The third set of columns (C) again describes the wetlands and infiltration basins scenario, but makes cost estimates on a per-acre-foot-detention basis. The second and third estimates also presume implementation of the non-structural BMPs, except for storm drain cleaning.

Benefits differ because implementation on non-structural BMPs does not produce property increases associated with greenspace, does not significantly increase groundwater supply, and does not reduce harbor sedimentation.

The costs of stormwater quality control are significant. Non-structural BMPs alone will cost $2.6 billion. Structural systems, including wetlands and infiltration basins, will cost between $5.7 billion and $7.4 billion. However, it should be noted that these costs will be borne over a period of many years—probably ten years at least. More

importantly, the benefits of these expenditures considerably exceed their costs. For the non-structural BMPs alone, the benefit-to-cost ratio is 1.9. For the structural approach the estimates are 2.5 and 3.3. Control of pollution and reestablishment of the hydrologic cycle will produce a greener city with higher property values, better esthetics, cleaner rivers and a cleaner ocean, and a larger and more stable water supply.

Table 2. Overall Cost Estimate for Stormwater Quality Control in the Los Angeles Region

Sums are rounded to two significant figures

		A. Non-Structural BMPs, modified from APWA			B. Wetlands and Infiltration Basins, watershed area basis		C. Wetlands and Infiltration Basins, detention volume basis		
Regions and BMPs	**Area, sq. miles**	**Capi-tal Cost $M**	**O&M Costs $M**	**Total $M**	**Cost / square mile, $M**	**Cost or Bene-fit $M**	**Acre-feet initial flow**	**Cost per acre-foot**	**Cost or Bene-fit, $M**
Costs for Non-Structural BMPs									
No Littering Ordinance		2.5	3	103		103			103
Pet Waste Ordinance		2.5	3	103		103			103
Chemical Use and Storage		2.5	3	103		103			103
Public Education			5	50		50			50
Illicit Discharge Program		6.5	80	407		407			407
Increased Cleaning of Drains			27	900					
Trash Control				608		608			608
Low Flow Sanitary Treatment				28		28			28
Improved Street Cleaning	2050			250		250			250
Private On-site BMPs		241		241		241			241
New construction rules				Mod-est		Mod-est			Mod-est
Total N-S BMPs				2791		1891			1891
Costs for Structural BMPs									
Rural	1050					0			0
Low Density, Industrial (C=0.4)	1000				0.42	420	15,500	0.053	822
High Density (C=0.6)	1000				3.70	3,700	23,250	0.098	2,279
Extremely Dense (C=1.0)	50				33.00	1,650	1,938	0.470	911
Total Facilities Costs						5,770			4,011
Total Cost, LA Region				**2550**		**7420**			**5661**
Benefits									
Flood Control						400			400
Greenspace, Water Property Values						5,000			5,000
Clean Ocean Esthetics				2500		2,500			2,500
Clean Streets Esthetics				950		950			950
Groundwater Replenishment						7,200			7,200
Improved Beach Tourism				100		100			100
Preservation of Ocean Ecosystems				2000		2,000			2,000
Reduced Harbor Sedimentation						330			330
Improved Health, Cleaner Buildings, Reduced Exposure to Particulates						Sig-nificant			Sig-nificant
Total Benefits, LA Region				**5600**		**18,000**			**18,000**

Recommendations for Action

The results developed here indicate that a distributed approach to stormwater quality control, employing non-structural BMPS with a system of wetlands and infiltration basins will achieve stormwater quality compliance and will be far cheaper than advanced treatment plants. It is recommended that the responsible organizations begin immediately with the non-structural measures, analyze their effectiveness, and add wetlands and infiltration systems as necessary to achieve the goal of protecting the rivers and coastal zones of the Los Angeles Region. Our results indicate that the benefit-to-cost ratio for the non-structural BMPs is about two, and for the larger effort is about 3. Thus both the beginning effort and the full response represent good investments for the people of the region.

Outreach

Municipalities that are finding themselves responsible for stormwater cleanup should act immediately to lay the groundwork for comprehensive programs. Outreach programs should be developed to inform the public of the problems and of what they can do to help with the solution. Vigorous efforts to reduce littering, for example, will reduce costs in subsequent steps as programs develop. Current regulations controlling release of sediments from construction sites should be enforced and supplemented with contractor education efforts.

Data Collection and Planning

Municipalities should immediately begin the process of determining the extent and nature of their individual stormwater quality problems. Many may find, for example, that stormwater from neighborhoods of single-family homes can be discharged to rivers or infiltrated with little or no treatment. Early identification and elimination of problem sources might greatly reduce later expenditures on treatment systems—the programs of thorough data collection and vigorous enforcement described earlier were notably effective at reducing pollutant concentrations in discharges and cost very little. It will certainly be a tragedy if we build expensive treatment systems to solve a problem that can be eliminated with a citation.

Municipalities should also immediately assess their property holdings. Cities frequently own substantial amounts of land, and some of this will be appropriate for stormwater control facilities. Purchasing programs should be developed immediately, so that cities can take advantage of opportunities for economical land acquisition as they arise.

Administrative Structure

Adding to the daunting technical and financial problems, the distributed approach for stormwater control requires that problems be solved by a holistic effort for each sub-watershed. The boundaries of sub-watersheds do not correspond to political boundaries, and cities will be forced to cooperate in ways that have never been required before. Further, controlling local pollution releases and restoring the hydrologic cycle involve issues that have traditionally be dealt with by an astonishing variety of agencies. If we imagine controlling the runoff quality of a sub-watershed by installing a park/infiltration system with associated wetlands, for example, efforts should include the sanitation

districts for the cities overlapping the sub-watershed (because of stormwater quality control), the Water Replenishment District (because of groundwater infiltration), the County Flood Control District (because the park will contribute to flood control and reduce the cost of downstream facilities), parks departments (because a recreational area will result), and wildlife agencies (governing the habitat created). It is reasonable to expect, moreover, that each of these agencies will contribute to the funding necessary for construction and maintenance. It is likely that, with appropriate apportionment, such a facility will have a favorable cost/benefit ratio for each of the agencies involved. It is certain that gaining the cooperation and contributions of all of these agencies will be extremely difficult. It may be appropriate that legislation be passed at the state level to provide a means for bringing these agencies together.

Funding

While runoff quality can be controlled by methods significantly cheaper than the massive construction of advanced treatment plants, the cost remains significant, and comes at a time when state and local governments are desperately short of funds. It is reasonable to suggest that funding should come from those who contribute to the problem, so that the taxation system mimics a market—assigning costs to the activity that generates them. Hundreds of municipal stormwater utilities, for example, have instituted a tax that is proportional to the number of square feet of impermeable surface on the land. An extension to this approach is to give property-owners fee rebates for installing BMPs that lower runoff quantity or increase water quality. This approach, or others that encourage owners to reduce their runoff, could fund the solution even as they reduce the magnitude of the problem. Certainly fines for littering should be used to fund litter law enforcement in the way that parking fines fund parking enforcement. Efforts to control illegal discharges could be at least partially supported by fines of those making the discharges. All of these approaches would be consistent with the principle that the polluter should pay, and would provide incentives that would contribute to stormwater cleanup.

A “cap and trade” system would be one means of approaching the funding dilemma. If all landowners were given the choice of either purchasing tradable discharge allowances or cleaning up runoff, a free-market trading system would allow owners to trade these allowances and in the process assign stormwater runoff reduction to owners who are able to cheaply install BMPs. This system, or a combined stormwater utility fee with BMP credits, would tend to produce the lowest cost solution overall. A study under way in Cincinnati, Ohio, suggests that such systems could be successful (Thurston et al., 2003).

Changes in Building Codes

This study indicates that parking lots constitute a significant resource for promoting stormwater infiltration. Building codes should be amended immediately to require that all new or reconstructed parking lots be designed to infiltrate the water that they collect. While there will be costs associated with the infiltration systems, the work described above indicates that much—and often all—of these costs can be offset by reduced costs for curbs and drainage systems.

Very large facilities, such as those for malls, should be considered sites for installation of subsurface infiltration vaults that could receive water from surrounding areas as well. These could be installed in sections, to minimize disruption to the commercial establishments. A mechanism could be established by which the site owners are compensated for the costs of handling the runoff.

Other building codes should be changed to encourage on-site infiltration of water rather than rapid drainage to the street. It may also be appropriate to consider limitations on the use of architectural copper sheeting, which can release copper ions to stormwater, and on the use of galvanized materials, which can release zinc.

Purchase of High-Efficiency Street Sweeping Equipment

Improved street sweeping seems very likely to be an important part of future stormwater programs. It can remove 30 to 50 percent of the particulate-associated pollutants, substantially reducing the load on downstream systems. It will have the secondary benefits of improving neighborhood appearance and reducing the exposure to air pollutants at street level. Municipalities should make the decision now to purchase only high-efficiency vacuum sweepers as they make routine replacements of their street cleaning machinery.

Investigation of Coliform Sources

Additional studies, particularly employing newly available methods for rapid identification of microorganisms, should be done to determine the sources of pathogenic organisms in stormwater.

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APPENDIX I.
BEST MANAGEMENT PRACTICES FOR CONSTRUCTION SITES

(Adapted from the Washington State Department of Ecology Water Quality Program, 2001).

The **12 Elements** of Storm Water Pollution Prevention Plan (SWPPP):

Mark Clearing Limits

Prior to beginning land disturbing activities all clearing limits, sensitive areas and their buffers, and trees that are to be preserved shall be clearly marked, both in the field and on the plans, to prevent damage and offsite impacts.

Preserving Natural Vegetation

The purpose of preserving natural vegetation is to reduce erosion wherever practicable. Limiting site disturbance is the single most effective method for reducing erosion.

Buffer Zones

An undisturbed area or strip of natural vegetation or an established suitable planting will provide a living filter to reduce soil erosion and runoff velocities.

High Visibility Plastic or Metal Fence, Stake and Wire Fence

Fencing is intended to: (1) restrict clearing to approved limits; (2) prevent disturbance of sensitive areas, their buffers; (3) limit construction traffic to designated construction entrances or roads; and, (4) protect areas where marking with survey tape may not provide adequate protection.

Establish Construction Access

To minimize the tracking of sediment onto public roads and into surface waters:

Stabilized Construction Entrance

Construction entrances are stabilized to reduce the amount of sediment transported onto paved roads by vehicles or equipment by constructing a stabilized pad of quarry spalls at entrances to construction sites.

Wheel Wash

Wheel washes reduce the amount of sediment transported onto paved roads by motor vehicles.

Construction Road/Parking Area Stabilization

Stabilizing subdivision roads, parking areas, and other onsite vehicle transportation routes immediately after grading reduces erosion caused by construction traffic or runoff.

Control Flow Rates

Properties and waterways downstream from development sites shall be protected from erosion due to increases in the volume, velocity, and peak flow rate of stormwater runoff from the project site.

Sediment Trap

A sediment trap is a small temporary ponding area with a gravel outlet used to collect and store sediment from sites cleared and/or graded during construction.

Temporary Sediment Pond

Sediment ponds remove sediment from runoff originating from disturbed areas of the site. Sediment ponds are typically designed to remove sediment no smaller than medium silt (0.02 mm).

Install Sediment Controls

Straw Bale Barrier

To decrease the velocity of sheet flows and intercept and detain small amounts of sediment from disturbed areas of limited extent, preventing sediment from leaving the site.

Brush Barrier

The purpose of brush barriers is to reduce the transport of coarse sediment from a construction site by providing a temporary physical barrier to sediment and reducing the runoff velocities of overland flow.

Gravel Filter Berm

A gravel filter berm is constructed on rights-of-way or traffic areas within a construction site to retain sediment by using a filter berm of gravel or crushed rock.

Silt Fence

Use of a silt fence reduces the transport of coarse sediment from a construction site by providing a temporary physical barrier to sediment and reducing the runoff velocities of overland flow.

Vegetated Strip

Vegetated strips reduce the transport of coarse sediment from a construction site by providing a temporary physical barrier to sediment and reducing the runoff velocities of overland flow.

Straw Wattles

Straw wattles are temporary erosion and sediment control barriers consisting of straw that is wrapped in biodegradable tubular plastic or similar encasing material. They reduce the velocity and can spread the flow of rill and sheet runoff, and can capture and retain sediment.

Sediment Trap

A sediment trap is a small temporary ponding area with a gravel outlet used to collect and store sediment from sites cleared and/or graded during construction.

Temporary Sediment Pond

Sediment ponds remove sediment from runoff originating from disturbed areas of the site. Sediment ponds are typically designed to remove sediment no smaller than medium silt (0.02 mm).

Construction Stormwater Chemical Treatment

Turbidity is difficult to control once fine particles are suspended in stormwater runoff from a construction site. Sedimentation ponds are effective at removing larger particulate matter by gravity settling, but are ineffective at removing smaller particulates such as clay and fine silt. Sediment ponds are typically designed to remove sediment no smaller than medium silt (0.02 mm). Chemical treatment may be used to reduce the turbidity of stormwater runoff.

Construction Stormwater Filtration

Filtration removes sediment from runoff originating from disturbed areas of the site.

Stabilize Soils

Exposed and unworked soils shall be stabilized by application of effective BMPs that protect the soil from the erosive forces of raindrops, flowing water, and wind.

Temporary and Permanent Seeding

Seeding is intended to reduce erosion by stabilizing exposed soils. A well-established vegetative cover is one of the most effective methods of reducing erosion.

Mulching

The purpose of mulching soils is to provide immediate temporary protection from erosion. Mulch also enhances plant establishment by conserving moisture, holding fertilizer, seed, and topsoil in place, and moderating soil temperatures.

Nets and Blankets

Erosion control nets and blankets are intended to prevent erosion and hold seed and mulch in place on steep slopes and in channels so that vegetation can become well established. In addition, some nets and blankets can be used to permanently reinforce turf to protect drainage ways during high flows.

Plastic Covering

Plastic covering provides immediate, short-term erosion protection to slopes and disturbed areas.

Sodding

The purpose of sodding is to establish permanent turf for immediate erosion protection and to stabilize drainage ways where concentrated overland flow will occur.

Topsoiling

Addition of topsoil will provide a suitable growth medium for final site stabilization with vegetation. While not a permanent cover practice in itself, topsoiling is an integral component of providing permanent cover in those areas where there is an unsuitable soil surface for plant growth. Native soils and disturbed soils that have been organically amended not only retain much more stormwater, but they also serve as effective biofilters for urban pollutants and, by supporting more vigorous plant growth, reduce the water, fertilizer and pesticides needed to support installed landscapes. Topsoil does not include any subsoils but only the material from the top several inches, including organic debris.

Polyacrylamide for Soil Erosion Protection

Polyacrylamide (PAM) is used on construction sites to prevent soil erosion. Applying PAM to bare soil in advance of a rain event significantly reduces erosion and controls sediment in two ways. First, PAM increases the soil's available pore volume, thus increasing infiltration through flocculation and reducing the quantity of stormwater runoff. Second, it increases flocculation of suspended particles and aids in their deposition, thus reducing stormwater runoff turbidity and improving water quality.

Surface Roughening

Surface roughening aids in the establishment of vegetative cover, reduces runoff velocity, increases infiltration, and provides for sediment trapping through the provision of a rough soil surface.

Gradient Terraces

Gradient terraces reduce erosion damage by intercepting surface runoff and conducting it to a stable outlet at a non-erosive velocity.

Dust Control

Dust control prevents wind transport of dust from disturbed soil surfaces onto roadways, drainage ways, and surface waters.

Small Project Construction Stormwater Pollution Prevention

To prevent the discharge of sediment and other pollutants to the maximum extent practicable from small construction projects.

Protect Slopes

Design, construct, and phase cut and fill slopes in a manner that will minimize erosion, considering soil type and its potential for erosion.

Temporary and Permanent Seeding

Seeding is intended to reduce erosion by stabilizing exposed soils. A well-established vegetative cover is one of the most effective methods of reducing erosion.

Surface Roughening

Surface roughening aids in the establishment of vegetative cover, reduces runoff velocity, increases infiltration, and provides for sediment trapping through the provision of a rough soil surface.

Gradient Terraces

Gradient terraces reduce erosion damage by intercepting surface runoff and conducting it to a stable outlet at a non-erosive velocity.

Interceptor Dike and Swale

Provide a ridge of compacted soil, or a ridge with an upslope swale, at the top or base of a disturbed slope or along the perimeter of a disturbed construction area to convey stormwater. Using the dike and/or swale to intercept the runoff from unprotected areas and direct it to areas where erosion can be controlled. This can prevent storm runoff from entering the work area or sediment-laden runoff from leaving the construction site.

Grass-Lined Channels

Channels lined with grass can convey runoff without erosion, and will provide some degree of treatment and infiltration.

Pipe Slope Drains

Piping can be used to convey stormwater anytime water needs to be diverted away from or over bare soil to prevent gullies, channel erosion, and saturation of slide-prone soils.

Subsurface Drains

Drains below the surface can intercept, collect, and convey ground water to a satisfactory outlet. These can be a perforated pipe or conduit below the ground surface. The perforated pipe provides a dewatering mechanism to drain excessively wet soils, provide a stable base for construction, improve stability of structures with shallow foundations, or to reduce hydrostatic pressure to improve slope stability.

Level Spreader

To provide a temporary outlet for dikes and diversions consisting of an excavated depression constructed at zero grade across a slope. To convert concentrated runoff to sheet flow and release it onto areas stabilized by existing vegetation or an engineered filter strip.

Check Dams

Construction of small dams across a swale or ditch reduces the velocity of concentrated flow and dissipates energy at the check dam.

Triangular Silt Dike (Geotextile-Encased Check Dam)

Triangular silt dikes may be used as check dams, for perimeter protection, for temporary soil stockpile protection, for drop inlet protection, or as a temporary interceptor dike.

Protect Drain Inlets

Storm drain inlets operable during construction shall be protected so that stormwater runoff does not enter the conveyance system without first being filtered or treated to remove sediment.

Storm Drain Inlet Protection

To prevent coarse sediment from entering drainage systems prior to permanent stabilization of the disturbed area:

Stabilize Channels And Outlets

Temporary on-site conveyance channels shall be designed, constructed, and stabilized to prevent erosion from the expected flow velocity of a 2-year, 24-hour frequency storm for the developed condition.

Channel Lining

Lining will protect erodible channels by providing a channel liner using either blankets or riprap.

Outlet Protection

Outlet protection prevents scour at conveyance outlets and minimizes the potential for downstream erosion by reducing the velocity of concentrated stormwater flows.

Control Pollutants

All pollutants, including waste materials and demolition debris, that occur on site during construction shall be handled and disposed of in a manner that does not cause contamination of stormwater.

Concrete Handling

Concrete work can generate process water and slurry that contain fine particles and high pH, both of which can violate water quality standards in the receiving water. Concrete handling is intended to minimize and eliminate concrete process water and slurry from entering waters of the state.

Sawcutting and Surfacing Pollution Prevention

Sawcutting and surfacing operations generate slurry and process water that contain fine particles and high pH (concrete cutting), both of which can violate the water quality standards in the receiving water. Collection of this water is intended to minimize and eliminate process water and slurry from entering waters of the State.

Control De-Watering

Foundation, vault, and trench de-watering water shall be discharged into a controlled conveyance system prior to discharge to a sediment pond.

Maintain BMPs

Temporary and permanent erosion and sediment control BMPs shall be maintained and repaired as needed to assure continued performance of their intended function. Maintenance and repair shall be conducted in accordance with BMPs.

Manage the Project

Development projects shall be phased where feasible in order to prevent, to the maximum extent practicable, the transport of sediment from the development site during construction. Revegetation of exposed areas and maintenance of that vegetation shall be an integral part of the clearing activities for any phase.

APPENDIX II. ESTIMATION OF COSTS FOR CONTROLLING SEDIMENT RELEASES AT CONSTRUCTION SITES

EPA described the costs of the Phase II program in Chapter 4 of the economic analysis (U.S. EPA, 1995). This appendix is a summary of that description, and the figures presented come from that document. The costs were divided into 4 categories: municipal costs, construction costs, federal costs and state costs. Each of these was considered separately.

Construction costs:

Construction costs were described in parts 4-8 to 4-25. All the cost calculations are based on 1998 dollar value.

Because the Phase II program targets construction areas of 1 to 5 acres of land, the cost analysis are done for these land sizes. EPA divided the construction costs into two parts. The first part requires the owners and operators of construction sites disturbing one to five acres of land to plan and implement erosion and sediment control BMPs. The second part requires the implementation of post-construction stormwater runoff controls on construction sites located in Phase II municipalities.

Erosion and sediment control costs

EPA developed a national level cost estimate for implementing erosion and sediment controls on sites that disturb between one and 5 acres. EPA estimated a per site compliance cost for sites of one, three, and five acres and multiplied the cost by the total number of Phase II construction starts expected to incur incremental cost in these size categories to obtain a national cost estimate. EPA used construction start data from fourteen municipalities and 1994 Census Bureau construction permit data to estimate the number of construction starts disturbing between one and five acres of land. Of the estimated 129,675 construction starts likely to incur incremental costs, EPA expects that 110,223 (85%) will require erosion and sediment controls to comply with the regulation.

Exhibit 4–4. Summary Characteristics of Municipalities Where Construction Start Data was Collected

Municipality	Population 1996 (Estimates)[1]	Population Growth 1990 to 1996	Median Household Income (1989)	Area (Sq. Mi.)
Austin, TX	541,278	+14.7%	$25,414	217.8
Baltimore County, MD	720,662	+4.1%	$38,837	599.0
Cary, NC	75,676	+70.5%	$46,259	31.2
Fort Collins, CO	104,196	+19.1%	$28,826	41.2
Lacey, WA	27,381	+42.0%	$29,726	10.1
Loudoun County, VA	133,493	+54.9%	$52,064	520.0
New Britain, CT	71,512	–5.3%	$30,121	13.3
Olympia, WA	39,006	+15.6%	$27,785	16.1
Prince George's County, MD	770,633	+5.6%	$43,127	486.0
Raleigh, NC	243,835	+15.0%	$32,451	88.1
South Bend, IN	102,100	–3.2%	$24,131	36.4
Tallahassee, FL	136,751	+9.6%	$34,764	63.3
Tucson, AZ	449,002	+9.1%	$21,748	156.3
Waukesha, WI	60,197	+5.8%	$36,192	17.3
United States	265 million	+6.6%	$35,225	

Source: US Department of Commerce, Bureau of the Census. [http://www.census.gov].
[1] US Census Bureau Data (1996).

Per-Site Compliance Costs: Installation and O&M.

EPA used standard cost estimates from R.S. Means (R.S. Means, 1997a and 1997b) and the WEF database to estimate construction BMP costs for 27 model sites of typical site conditions in the United States. The model sites included three different site sizes (one, three, and five acres), three slope variations (3%, 7%, and 12%), and three soil erosivity conditions (low, medium, and high). EPA used the WEF database to determine BMP combinations appropriate to the model site conditions. For example, sites with shallow slopes and a low erosivity require few BMPs, while larger, steeper, and more erosive sites required more BMPs. Detailed site plans, assumptions, and BMPs that could be used are presented in Appendices B–2 and B–3. Based on the assumption that any combination of site factors is equally likely to occur on a given site, EPA averaged the matrix of estimated costs to develop an average cost for one-, three-, and five-acre starts for all soil erodibilities and slopes.

Exhibit 4–6. BMPs Used for the Model Sites

Site Size (acres)	Soil Erodibility	Slope		
		3%	7%	12%
1	low	a	a,b	a,c,e
	med	a,b	a,c,e	a,c,e
	high	a,c,e	a,c,e	c,e,f,g1
3	low	a,b	a,c,e	c,d,e,f,g2
	med	a,c,e	a,c,e	c,d,e,f,g2
	high	a,c,e	c,d,e,f,g2	c,d,e,f,g2
5	low	a,c,d,e	c,d,e,f,g3	c,d,e,f,g3
	med	a,c,d,e	c,d,e,f,g3	c,d,e,f,g3
	high	c,d,e,f,g3	c,d,e,f,g3	c,d,e,f,g3

a = silt fence
b = mulch
c = seed and mulch
d = stabilized construction entrance
e = stone check dam
f = earthen dike directing runoff to sediment trap
g = sediment trap (1=1,800 cf, 2=5,400 cf, 3=9,000 cf)

Costs related to each BMP and the description of the BMP were shown in Exhibit 4-7 of the original document.

Exhibit 4–8. Estimated Cost of BMPs for the Model Sites (1998 dollars)

Site Size (acres)	Soil Erodibility	Cost by Slope			Average Cost
		3%	7%	12%	
1	low	$317	$814	$1,422	$1,206
	med	$814	$1,422	$1,422	
	high	$1,422	$1,422	$1,799	
3	low	$1,978	$3,804	$6,047	$4,598
	med	$3,804	$3,804	$6,047	
	high	$3,804	$6,047	$6,047	
5	low	$6,245	$9,334	$9,519	$8,709
	med	$6,245	$9,334	$9,519	
	high	$9,334	$9,334	$9,519	

Per-Site Compliance Costs: Administrative.

EPA then estimated administrative costs per construction site for the following elements required under the Phase II rule: submittal of a notice of intent (application) for permit coverage; notification to municipalities; development of a stormwater pollution prevention plan (SWPPP); record retention; and submittal of a notice of termination. The average total administrative cost per site was estimated to be $937.

Exhibit 4–10. Estimated Other Administrative Phase II Construction Costs Per Site (1998 Dollars)

Administrative Requirement	Cost
NOI	$126.50
Municipal Notification	$17.10
SWPPP	$772.25
Record Retention	$4.51
NOT	$17.10
Estimated Total Cost (per site)	$937.46

Summing the average BMP costs and the administrative costs yields a total compliance cost of $2,143 for sites disturbing between one and two acres of land, $5,535 for sites disturbing between two and four acres of land, and $9,646 for sites disturbing between four and five acres of land. To estimate national level incremental annual costs for Phase II construction starts, EPA multiplied the total costs of compliance for one to two acre, two to four acre, and four to five acre sites by the total number of Phase II construction starts within each of those size categories. This yielded an estimated annual compliance cost of approximately $499.8 million (based on 110,223 construction starts in 1998).

EPA anticipates that 19,452 (15%) of the estimated Phase II incremental construction universe will qualify for a waiver from program requirements by meeting one of two conditions. Construction sites can be waived if they are either located in areas with low rainfall potential or if water quality analyses show that there is no need for regulation. EPA estimates the incremental administrative cost associated with preparing and submitting a waiver to be approximately $665,000 (1998). Total costs (national compliance and waiver costs) resulting from implementation of the Phase II erosion and sediment control provision are estimated to be **$500.4 million**.

Exhibit 4–11. Estimated National Phase II Construction Compliance Costs by Climatic Zones for Year 1998 (1998 Dollars)

Climatic Zone	Representative City	Number of Starts 1–2 Acres	Number of Starts 2–4 Acres	Number of Starts 4–5 Acres	Total Starts	Costs for Starts 1–2 Acres	Costs for Starts 2–4 Acres	Costs for Starts 4–5 Acres	Total Costs
A	Portland, OR	1,683	1,471	659	3,813	$3,608,528	$8,141,052	$6,360,054	$18,356,897
B	Boise, ID	1,508	1,345	576	3,429	$3,232,932	$7,443,548	$5,556,280	$16,455,088
C	Fresno, CA	2,388	2,018	974	5,380	$5,118,068	$11,171,812	$9,400,679	$26,039,422
D	Las Vegas, NV	7,154	6,256	3,035	16,445	$15,335,047	$34,628,344	$29,276,500	$80,306,157
E	Denver, CO	1,787	1,613	636	4,036	$3,829,714	$8,928,128	$6,135,764	$18,893,606
F	Bismarck, ND	560	469	156	1,185	$1,199,916	$2,595,370	$1,508,877	$5,304,163
G	Helena, MT	1,067	921	348	2,336	$2,287,796	$5,098,377	$3,354,650	$10,740,823
H	Amarillo, TX	3,295	2,838	1,152	7,285	$7,063,767	$15,708,383	$11,110,516	$33,882,666
I	San Antonio, TX	1,105	960	414	2,479	$2,368,045	$5,314,569	$3,997,033	$11,679,647
K	Duluth, MN	2,957	1,796	326	5,078	$6,339,106	$9,939,565	$3,141,089	$19,419,760
M	Des Moines, IA	9,335	7,599	2,695	19,629	$20,009,581	$42,063,182	$26,002,165	$88,074,928
N	Nashville, TN	5,801	4,707	1,705	12,212	$12,434,357	$26,052,990	$16,445,128	$54,932,475
P	Atlanta, GA	5,157	2,956	1,127	9,241	$11,054,430	$16,364,835	$10,875,252	$38,294,517
R	Hartford, CT	6,909	5,324	2,116	14,348	$14,808,848	$29,468,120	$20,412,901	$64,689,869
T	Charleston, SC	1,194	675	263	2,132	$2,560,342	$3,736,824	$2,535,496	$8,832,662
V	Hawaii	504	423	218	1,145	$1,080,648	$2,340,928	$2,099,447	$5,521,023
W,X,Y	Alaska	22	20	8	50	$47,885	$112,127	$72,563	$232,575
Total		52,426	41,389	16,408	110,223	$112,379,010	$229,108,154	$158,284,394	$499,771,558

Note: Number of sites include only those where storm water BMPs are not currently required by Federal or State programs. Totals may not add because of rounding.

Exhibit 4–12. Phase II Erosion and Sediment Control Annual Costs

Construction Costs	Universe	Estimated Total National Annual Costs (1998 dollars)
Compliance Costs	110,223	$499,771,558
Waiver Costs*	19,452	$665,064
Total	129,675	$500,436,622

*Based on an engineering assistant's wage of $34.19 per hour. U.S. Department of Labor, 1996.

EPA also estimated incremental costs attributable to the post-construction runoff control measures. The Phase II municipal program requires municipalities to develop, implement, and enforce a program that addresses stormwater runoff from new development and redevelopment sites on which land disturbance is greater than one acre and that discharge into a regulated MS4. To develop a cost estimate associated with this measure, EPA estimated a per site BMP cost, including operation and maintenance, for 12 model sites of varying size (1, 3, 5, and 7 acres) and imperviousness (35%, 65%, and 85%). The per site BMP cost was then multiplied by the total number of multi-family, institutional, and commercial construction starts that are located in Phase II urbanized areas to obtain a national cost estimate. Using this total of 13,364 postconstruction starts, EPA estimated a range of national costs associated with this measure from $44.6 to $178.3 million (see Appendix B–4). EPA estimates total annual costs to construction operators, including implementation of erosion and sediment controls and post-construction controls, to be between **$545.0 – $678.7 million.**

Exhibit 4–15. Estimated Post-Construction Runoff Control Costs

Area	35% Impervious (Multi-Family Residential)	65% Impervious (Multi-Family/ Commercial/ Institutional)	85% Impervious (Commercial)	Total Cost (1998 dollars)
1 Acre	$503,163	$14,318,035	$25,530,478	$40,351,676
3 Acres	$1,486,961	$29,571,535	$29,588,931	$60,647,426
5 Acres	$2,001,641	$11,835,630	$9,151,038	$22,988,309
7 Acres	$3,863,272	$23,910,571	$26,494,414	$54,268,258
Total Cost	$7,855,037	$79,635,771	$90,764,861	$178,255,669

Summary of results of the total costs of the phase II program are shown below:

Exhibit 4–21. Potential Annual Costs for Phase II Storm Water Regulation

Phase II Element	Universe	Estimated Total National Annual Costs (1998 dollars)
Municipal	32,458,000 Households	$297,318,623
Construction	129,675 Erosion & Sediment Control Starts and 13,364 Post-Construction Starts	$545,000,539 – $678,692,291
Federal and State	53 States and Territories	$5,318,668
Total		$847,637,830 – $981,329,582

Reduced Sediment Delivery From Construction Starts:

To estimate reduced sediment delivery from Phase II construction starts, the US ACE developed a model based on EPA's 27 model sites to estimate sediment loads from construction starts with and without Phase II controls (US ACE, 1998). The US ACE model uses the construction site version of the Revised Universal Soil Loss Equation (RUSLE) to generate sediment delivery estimates for 15 climatic regions with each of the following variations: three site sizes (one, three, and five acres), three soil erodibility levels (low, medium, and high), three slopes (3%, 7%, and 12%), and the BMP combinations from EPA's 27 model sites. The 15 climatic regions represent the various rainfall and temperature conditions throughout the United States. Sediment delivery represents the quantity of sediment that BMPs placed at the base of the hill slope are unable to capture. EPA estimated that the average reduction in soil loss from the model sites implementing BMPs would be 89.6 tons per site. (Calculations in Exhibit 4-24)

To determine the reduction in soil loss using the estimated 80% effectiveness rate, EPA multiplied the weighted average soil loss per start (89.6 tons) by 80%. This resulted in an estimated reduction in soil loss of 71.7 tons per site. Multiplying this reduction by the 110,223 construction starts expected to implement erosion and sediment controls for the year 1998, results in an estimated 7.9 million ton reduction in soil loss annually.

Exhibit 4–25. National Reduction Estimates for Municipalities and Construction Starts (tons/year)

Phase II Element	20% Reduction	80% Reduction
Municipal TSS Loading	639,115	4,062,815
Soil loss from Construction Sites	1,975,196	7,900,785

Summary

EPA has not presented the total cost of prevention of sediments leaving the site per ton of the sediment. ES.11 (in executive summary) describes only the costs effectiveness related to the Municipal TSS loading reduction. It seems that by a simple

calculation from the two former exhibits (4-24 and 4-25) that the total cost assuming 80% reduction in the sediments would be between $69 - $86 per ton of sediment.

Appendix I Scoping Memo

MEMORANDUM

OFFICE OF WATER PROGRAMS
CSU SACRAMENTO
7801 Folsom Boulevard, Suite 102
Sacramento, CA 95826

Date: **August 15, 2003**
To: **Pamela Barksdale, State Water Resource Control Board**
From: **Brian Currier**
Subject: **Scope for the storm water cost survey**

This memorandum presents additional information and recommendations in order to proceed with Task A of the "Survey of Costs to Develop, Implement, Maintain and Monitor Municipal Separate Storm Sewer System (MS4) Stormwater Management Programs (SWMP) and Description of Alternatives for Control of Stormwater Quality in Los Angeles County" (See Attachment A). A presentation of candidate municipalities, corresponding demographics, and recommendations for the six municipalities to be surveyed are presented herein.

Nomination of Municipalities

The identification of candidate municipalities began with a conference call on June 23, 2003 with the State Water Resources Control Board and representatives from interested Regional Water Quality Control Boards. The scope and intent of the study was shared with the conference call participants. The Regional Boards then nominated municipalities within their jurisdiction that appear are complying with their permits and are taking appropriate steps toward meeting water quality objectives. Some nominees were subsequently eliminated upon further discussion with either the municipality or the regional board. The remaining municipalities are presented in Table 1 along with a limited set of city characteristics.

Table 1. Nominated Municipalities for the Stormwater Cost Survey

CITY	TOTAL POPULATION	AREA (Sq. Miles)	MEDIAN INCOME/ HOUSEHOLD ($)	MEAN INCOME ($)	INCOME DENSITY ($/ft^2)	STORM WATER DRAINAGE SYSTEM FUND
CALIFORNIA	33,871,648	163,696	47,493	22,711	0.2	
Los Angeles	3,694,820	498	36,687	20,671	5.5	Yes
Fresno	427,652	105	32,236	15,010	2.2	Yes
Sacramento	407,018	99	37,049	18,721	2.8	Yes
Oakland	399,484	78	40,055	21,936	4.0	Yes
Anaheim	328,014	50	47,122	18,266	4.3	Yes
Fremont	203,413	87	76,579	31,411	2.6	No[1]
Huntington Beach	189,594	32	64,824	31,964	6.9	Yes
Ontario	158,007	50	42,452	14,244	1.6	Yes
Santa Clarita	151,088	48	66,717	26,841	3.0	Yes
Salinas	150,724	19	43,720	14,495	4.1	Yes
Santa Monica	84,084	16	50,714	42,874	8.1	Yes
Encinitas	58,014	20	63,954	34,336	3.5	No
Poway	48,044	39	71,708	29,788	1.3	Yes
San Clemete	49,861	18	63,507	34,169	3.3	Yes

Selection Criteria

In order to present compliance costs that are representative of the widest range of California environments, a diverse selection of municipalities from the nominees is recommended. The primary factors considered are location, population, income, rainfall, and whether a stormwater drainage system (SDS) fund exists. Location is given the highest priority to ensure that the results of this survey have the widest statewide applicability. A comment from the conference call participants was to place a high priority on whether a city had a separate storm water fund. This is an indication that the city currently accounts for stormwater related expenses, allowing for further analysis of those costs. Population and income are both considered important factors, but their relative importance is unknown at this time. To make the study results more useful to other communities, it is generally sought to include both large and small cities and include cities with a variety of income parameters. Including at least one municipality with a population smaller than 100,000 will help in understanding cost for smaller cities (including NPDES Phase II municipalities). Income is a consideration as higher income communities generate a higher tax base. This may not directly relate to stormwater expenditures, but at this point it should not be ignored if it proves to be a factor. Rainfall was not a major consideration. Selecting cities by location (different geographical areas) adequately represent the range of rainfall. The range of rainfall of the candidate cities is 10 to 23 inches per year.

[1] Footnote added 1/20/05: Fremont does have a drainage fund; the original memorandum was incorrect.

Selection Recommendations

In considering location, the state can be divided into three sections: north, central, and south. For this exercise, the dividing lines are roughly south of San Jose and north of Santa Clarita. Each section is further distinguished between coastal and inland areas. Thus, one coastal and one inland municipality can be recommended from each section.

For Northern California, Fremont, Oakland, and Sacramento are nominated. Sacramento is the only inland city and it has a storm water fund. For coastal areas, Oakland has the advantage over Fremont because of its storm water fund. Oakland also offers a higher population density compared to Sacramento and Fremont. Based on these observations Sacramento and Oakland are recommended for the cost survey, if Oakland can overcome some timing issues regarding availability of staff time to support this project. If not Fremont could be substituted.

For Central California, Salinas and Fresno are nominated. They are ideal for location (coastal vs. inland), size (151,000 vs. 428,000), and income density (4\$/ft^2 vs. 2\$/ft^2). Therefore, Salinas and Fresno are recommended for the cost survey.

For Southern California, the selection is a bit more complex. San Clemente, Anaheim, Huntington Beach, Ontario, Santa Clarita, Santa Monica, Encinitas and Poway are nominated. Because smaller size communities have not been selected anywhere in California it is recommended that one of the two municipalities in Southern California be smaller (i.e. San Clemente, Santa Monica, Encinitas, or Poway). Encinitas (pop 58,000), is recommended based on their small size and upon the strong recommendation by the San Diego Regional Board. Ontario is the furthest inland, followed by Santa Clarita. The Regional Board highly recommends Ontario, and it also has a stormwater fund. Ontario's willingness to participate has not been confirmed, but their staff that was initially contacted suggested participation may not be a problem. Encinitas and Ontario are recommended for the cost survey.

Although it was not used as a criterion in the above process, income characteristics vary adequately among the recommended municipalities.

Final selection of municipalities will be made after further consultation with you and the Technical Advisory Group.

Please call me with any comments or questions at (916) 278-8109.

Appendix J TAG Comments

This appendix contains a description of the Technical Advisory Group (TAG), written TAG comments, and action items from the final meeting with the TAG. In the action items, the study team condensed all applicable TAG comments each affected section of the report. Additional notes that did not result in changes to the report are listed after the action items.

TECHNICAL ADVISORY GROUP MEMBERS

Dr. Steven Frates is a Senior Fellow at the Rose Institute of State and Local Government at Claremont McKenna College. Dr. Frates has extensive experience in public policy analysis, with particular emphasis on local government finance. He has served as an assistant in municipal government, as the executive director of a major metropolitan taxpayer association, and on the California Constitutional Revision Commission. Dr. Frates has been a faculty member at the University of Colorado and the University of Southern California, and has lectured at other universities and colleges.

Dr. Jay Lund, is Professor of Civil and Environmental Engineering at the University of California in Davis. Dr. Lund's research involves application of systems analysis, economic, and management methods to infrastructure and public works problems. His recent work is primarily in water resources and environmental system engineering. While most of this work involves the application of economics, optimization, and simulation modeling, his interests also include more qualitative policy, planning, and management studies. His work has applied contemporary methods in cost-effectiveness and benefit-cost analysis to evaluate stormwater quality control measures, including both their costs and their likely water quality benefits. Dr. Lund is a past editor of the ASCE Journal of Water Resources Planning and Management and is a member of the International Water Academy.

Dr. Bowman Cutter is a professor of water resources management at U.C. Riverside in the Department of Environmental Sciences. His research examines cost-effective water pollution regulation, environmental federalism, and state and local environmental enforcement efforts. Current projects examine the effect of water pricing on water pollution and analyzing the cost-effectiveness of using stormwater to recharge Los Angeles area aquifers. He currently serves on the Southern California Association of Government's Water Policy Task Force.

Eugene Bromley is an environmental engineer with the Environmental Protection Agency. Mr. Bromley has 25 years experience in water quality protection. As stormwater coordinator in EPA Region 9, Mr. Bromley provides expertise to the stormwater programs in California, Arizona, Nevada, and Hawaii. In California, he participates with the California Stormwater Quality Association, giving updates on EPA policy and projects that could affect the members of CASQA.

Dan Radulescu is a senior engineer with the L.A. Regional Water Quality Control Board, MS4 stormwater permit coordinator. Mr. Radulescu has a P.E. registration in civil engineering with the state of California. Mr. Radulescu has extensive experience with stormwater implementation costs and levels of compliance. He was the primary author of a report that reviewed and analyzed stormwater budget data submitted to the Regional Board by L.A. Region permittees.

Robert Hale is a Supervising Scientist for the Alameda County Public Works, Clean Water Division. Mr. Hale is on the Board of Directors for the California Stormwater Quality Association, where he also serves as an Executive Program Committee member. He has many years of experience with stormwater programs, from his work with Alameda County and from his participation and consultation with other stormwater programs throughout the state.

Steven Sedgwick is an environmental engineer with Camp Dresser & McKee Inc. Mr. Sedgwick has more than 35 years of experience in comprehensive drainage and stormwater planning, stormwater utility evaluations, feasibility studies, pilot plant investigations, regional water resources planning, river basin planning, water and wastewater facilities design, land application and site-specific studies, value engineering and engineering assistance during construction.

TECHNICAL ADVISORY GROUP COMMENTS

- GENERAL COMMENTS: For the 2002-3 data, I think that you did an excellent job of collecting and analyzing fragmented and somewhat non-commensurate data in order to look at the costs from two years ago. I also appreciate the depth of thought that went into your discussion of possible future costs (regardless of the shortcomings mentioned above). The nature of the available information has, I think, necessarily limited your ability to predict accurately the magnitude of costs associated with the recently added permit requirements. As a result, the report would seem to be most useful as a baseline or starting point for future cost documentation efforts. (Hale)
- GENERAL COMMENTS: First, we want to commend the research team for their outstanding job to find, if not some definitive answers, at least the right questions regarding this difficult subject of the relationship between costs and the MS4 permits implementation. It is difficult because MEP is not a clearly defined standard, MS4 permits language depend strongly on the local conditions and the willingness of the local communities to implement those requirements to protect water quality in the existing fiscal conditions. There is little guidance, if any, on this subject, and the estimates on the stormwater program implementation varies wildly depending on the initial premises for the study. Another difficult component is to determine a direct relationship between costs and water quality improvements. If we have any comments, they are triggered by the complex nature of the subject and not necessarily because of any shortcomings of the research itself. As we said, very few nationwide studies are focusing on this subject and even U.S. EPA has provided very little guidance on the subject. We also want to point out that this study focuses on the costs, and not necessarily on the benefits in water quality from the measures implemented due to MS4 permits. Therefore the reader of the study must keep in mind that there is an additional dimension of the economic equation when assessing the implications of MS4 permits costs to give a balanced view of the whole issue. (Dan)
- GENERAL COMMENTS: Due to inherent limitations, the research did not evaluate the impact in funding options, Stormwater Utility Fee vs. General Fund. Cities that rely on the General Fund to cover costs of compliance face different challenges than those with a separate, stable and dedicated funding mechanism. It is also true that municipalities funding their storm water MS4 permit costs through General Fund have a higher tendency to apply pre-existing programs, such as street sweeping, trash collection, storm

drain maintenance, etc., and their costs to the mandatory costs of compliance. In their case, it is even more difficult to discern the origin of costs in pre-existing, new, enhanced, in the absence of clear guidelines. In extreme instances, in some cases of municipalities depending on General Fund and pre-existing programs, contingent on how the requirements of the permit and costs are interpreted, the cost of compliance can vary from low hundreds of thousand dollars to a high dozen million dollars (!) per year for the same small municipality. A number of municipalities even pointed out this discrepancy, based on different interpretations, in their annual reports. This lack of guidance also fuels the debate of the correct impact of MS4 permit compliance costs that can vary from single to hundreds of dollars(!) per household per year. Obviously there is a significant difference from manageable to exorbitant costs. Unless there are clear guidelines and transparency on how to determine the correct compliance costs with MS4 permit requirements we will face this debate from reasonable to exorbitant for years to come.

- WATER QUALITY (Sect. 3) Review major water quality problems that SW Program addresses for each city (Lund)
- IDENTIFYING TRUE COSTS: Establish a 1990 costs baseline and then determine what are the true additional costs due to the stormwater regulations by comparing the 1990 baseline with the data investigated (2002-03). One example is to use per capita costs: if in 1990, the city was spending $10/y/capita for street sweeping, in 2002 the cost (in dollars adjusted for inflation) would be (e.g.)$14/y/capita. Then determine the portion attributable to the SWMP implementation and MS4 permit compliance. Only this type of transparent analysis will reveal the true additional costs, new financial burden, mandated by the existing MS4 permits. This type of analysis may add new findings to the one identified presently in the study. This approach should be used for street sweeping, catch basins and storm drain system, trash collection, hazardous waste recycling programs, flood control component of the city's overall stormwater management, etc…

  How these facts impact the conclusion of the research?

  These types of observations are very important since they reveal the significant importance of such expenditures, such as street sweeping, in the make up of the attributed costs for compliance with the MS4 permits.

  This is even more necessary for cities that depend solely on General Fund money to comply with the MS4 permit requirements. Many pre-existing, well-established programs, in some cities, count now as "exorbitant" MS4 permit costs compliance, when the only change was to move the expense from one column into another in the cities financial reports. (Dan)

- COST/DATA REPORTING: We suggest that a better option for reporting is to use GASB or similar standardized approaches to costs and infrastructure inventory may be a better way to assure transparency. The ways suggested by the research to report cost data seem reasonable, but if this effort can be tied to an existing standardized approach, such as GASB, that may be very valuable since it will provide for consistency statewide and even nationwide. It may be that GASB does not cover all reporting categories. The reporting may use a hybrid between the existing GASB itemization and the approach suggested by the research. An additional approach maybe to lobby the GAS Board to make changes in the accounting rules to allow for water quality itemization. (Dan)

- COST ALLOCATION BY CATEGORY: I would replace the regressions with the interesting analyses contained in appendix G as a starting point. First look at how much the variation in the cost of each program component contributes to the overall cost variation. It appears that the variation in the Municipal category is the biggest driver. However, what I am not sure is whether that is because categories are not consistent across cities and different cities place different costs in the municipal category. Please comment on that possibility. It looks like the variation in overall management is the second biggest driver of the overall cost variation. Again, please comment on whether this is due to "true" cost differences or category-confusion. A very rough statistical methodology to tease this out is to find out the correlation coefficients between each of these two categories and each of the other categories. If you find some strong negative correlations, this is an indicator that really the cost differences are just due to category confusion. In the end this may be a topic that calls for a more qualitative answer. I would like to see a discussion of, taking into account what you know about data quality, whether you think the high cost/household cities tend to have higher costs across the board, or whether their higher costs are generally due to having higher costs in one category or another. From the data, the latter appears to be true, but I don't have a sense of the data quality and how the categories are affected by cost-shifting. (Cutter)
- BUDGET/COST ALLOCATION: (table 6.2) Can percentages of cost assignment add up to 100% to show how the total budget is allocated? (Lund)
- INDUSTRIAL PROGRAM COST PER INSPECTION AND SITE, AND THE EQUIVALENT NUMBERS FOR THE CONSTRUCTION PROGRAM COSTS. Both these programs have almost order of magnitude differences in costs. Please write up the reasons for these differences more thoroughly. I suspect that some of the reason for these large cost differences is cost-category confusion. You should indicate whether you think that is the case, and then indicate which citie(s)' normalized inspection costs you judge to be most satisfactory and why. I know this is going out on a limb, but few observations call for a more qualitative analysis. The large cost ranges diminishes the amount of information in the report and an indication of where the cost numbers likely lie for your best data cases would add quite a bit. (Cutter)
- STREET SWEEPING COSTS: Another possible angle to examine the overall cost range is to break out street-sweeping vs. non-street-sweeping expenditures, since street sweeping seems to be the largest element of the biggest category, and see what the cost/household ranges are in this breakdown. Then you could comment on whether street-sweeping costs are the big driver behind cost differences. Further, you could remark on whether it appears that some communities are doing more street-sweeping than necessary to comply with their permit (do we have a curb miles swept and total curb miles for each city?).(Cutter)
- STREET SWEEPING COSTS: (Table 9.3) Explain street sweeping unit and $cost/curb mile swept variability, in particular the low/high values. (Lund)
- STREET SWEEPING COSTS: On page 52, the paragraph just above the Table 9-5, states: "cost savings can be realized if cities are allowed to focus on the most cost effective programs rather the following overly prescriptive permit requirements." For example, since street sweeping is the most significant share of the stormwater costs maybe it

should be determined if this program is also cost effective the way it is performed presently. This is one avenue to improve the cost-effectiveness relationship. Why spend a significant amount of money if the impact may be insignificant? Some studies in the literature suggest that fact. Secondly, the permits are "overly prescriptive" in many instances due to Permittees specific request to the Regional Board for clarification and guidance in the permits on what they are required to accomplish, when and how. (Dan)

- WATERSHED MANAGEMENT COSTS (Sect. 8 ,Pg. 44) Elaborate on watershed management cost (Lund)
- TMDL COSTS: We strongly recommend the inclusion of TMDL portion of the report in a separate attachment or appendix. The TMDLs cost review were not part of this proposal. The costs vary in a wide range, based on various assumptions and scenarios, none of the cities are currently implementing TMDLs via a MS4 permit. We believe that the inclusion of TMDL discussion in the body of the main report will confuse things. The job of accurately estimating TMDLs implementation costs is complex and open to many interpretations. It is opportune to present various ranges and costs under the research done up to date but we are a long way to agreeing on one set of values. Therefore we believe that the TMDL research on future costs should be included in an Appendix to the report. (Dan)
- TMDL COSTS: p.55 section headed Adding future costs…This is pretty unclear, either expand it or drop it. I think you mean to say something like if current cost estimates are X, and TMDL estimated costs are Y, total costs should be something less than X+Y since current and TMDL expenditures overlap. But I am not quite sure that is what you mean. (Cutter)
- LAND ACQUISITION COSTS: The Advanced Treatment (Gordon, et al.) discussion mentions that land costs were included in that $37 billion cost estimate. However, Section 9 draws in part from Appendix H. Most of the discussions of treatment system examples in the Appendix do not make it clear whether land acquisition costs were included in the cost figures given. In my view, this omission tends to weaken the credibility of the figures used. In the case of the Tule Ponds (the one with which I am most familiar) the $360,000 cost figure does not include any consideration of land costs. The site was, and is owned by the Flood Control District so no purchase price is included. The Authors do touch on the subject when they mention in some examples how land necessary for other purposes (e.g., parking lots) can be put to dual use for stormwater treatment (which makes land acquisition unnecessary). However, the dollar figures given for the various systems need to include mention of whether land costs were included and what they might be if the were not. This is especially true (as you point out) in densely populated urban areas. In the Tule Ponds case, if land were to be purchased on the open market in the center of Fremont, the total cost of the project would be an order of magnitude higher. On the issue of land costs being lower in less densely populated areas (a point that the report makes). In the San Francisco Bay Area, the need for treatment is greatest in densely urbanized areas and almost non-existent in rural areas. In our area, population density tends to increase as one moves toward the Bay. Since stormwater can't really be pumped uphill to treatment facilities, our need for such facilities tends to

be greatest exactly where land prices are highest. This limits our flexibility in locating treatment facilities based on land costs. (Hale)

- DUAL BENEFITS: It is not clear how to account for dual benefit activities. In the case of city of Sacramento, pump station cleaning may be attributable also to maintaining the hydraulic integrity of the system, a water quantity, flood control issue, not necessarily due to water quality concerns. (Dan)
- DATA ANALYSIS: More can be done on the attempts to define what factors lead to higher or lower costs for total costs as well as element by element. The first step is to relegate the various regression analyses to appendices or to drop them altogether. Seven observations are not sufficient for a statistical analysis. This is evidenced by the confidence intervals in Figure 1, which appear to be below zero for three cities. However, there is even less information in this regression than it first appears. Comparing aggregate stormwater spending to aggregate household income is somewhat misleading because they are both driven simply by the overall size of the city. A better regression would be per-household stormwater spending on household mean or median income. I suspect the R2 would be quite a bit less and the confidence intervals correspondingly greater. My recommendation is to simply drop the regressions from the body of the report. (Cutter)
- DATA ANALYSIS: (Section 9.1) Analysis seems simplistic. Should cost be related to the problem, which might be proportional to population or level of economic activity? Cost/ HH values need to be further explained. (Lund)
- DATA ANALYSIS: p.52 2nd par. Sentence beginning with: The present worth cost… please explain this sentence further, why is there such a large cost range? Explain to the reader why the cost-per-acre and cost-per-volume estimated difference and the range in the land prices. You can do this in a footnote. (Cutter)
- DATA ANALYSIS: Explain rainfall as the best indicator for cost (Lund)
- VARIABILITY IN COSTS AMONG CITIES: I would like a final summing up in the report of why the overall cost/household range is large. Again, this will probably have to be more qualitative, but I think that is fine. I would like the reader to come away with a sense of why one city has costs almost three times larger on a per-household basis. That qualitative analysis should think through the following questions: 1) even within the category of cities with good stormwater programs are some cities doing a lot more activities than others?; 2) If so, is the extra activity necessitated by say, greater amounts of construction or other factors? Are some cities in the midst of infrastructure activities so that you would expect say a three year average of stormwater costs to be in a much closer range? Perhaps you will conclude that the cost differences are really inexplicable given what you know. If so, that in itself is interesting and you should suggest further avenues for research into hypotheses suggested by your experience in this project and explain why this research does not give insight into the reasons behind the large cost range. (Cutter)

TAG MEETING NOTES FROM DECEMBER 14, 2004:

Action Items

1. Clarify that, beyond the objectives identified in the report and contract, this report also serves as a step toward establishing cost numbers to be used in budgeting and cost/benefit evaluations. Note that this report does not address the benefits of those permit required stormwater activities that are assumed to improve water quality. Note that the reports use as a budgeting tool may only be timely for Phase II permittees. **Location of Change: pg ES-1, Section "Task A"; Section 1, section "Task A"**

2. Double check consistency of classifying costs (e.g. existing, enhanced, new). Add discussion defining these terms and discuss the likelihood that enhanced cost is, for the most part, pre-existing. Display graphically. Note any differences between the accounting practices of cities with a SW utility fee and those without, especially regarding the amount of the costs that are 'existing' or 'enhanced'. If apparent from the study, discuss the relative importance of having a fee versus having a designated fund, without a fee to fund it. **Location of Change: Figure 9.4 and Section 2.5 and additions to Section 9.1, p49.**

3. Replace the regressions in report with qualitative discussion on cost differences between cities. List major water quality control strategies and affected water bodies for each city. This may help explain some cost variation. Explain differences in cost between cities qualitatively. (e.g. Fresno low because joint use facilities, permeable soils, available land). Note any large infrastructure campaigns of the cities. Move regressions to appendix with the note that we tried various correlations but a model was not successfully developed, partly due to the small sample size. Only do regressions on normalized cost, not aggregate costs, which are only a surrogate for city size. Include a note in the body of the report that the failure of the regressions was expected due to small sample size and that the regressions are presented in an appendix as anecdotal information.
Location of Change: Discussion additions and modifications to Section 9.1, Deleted regression figures in ES and section 9.

4. Move TMDL and future cost discussion from Section 9 to an appendix. Add a note to the appendix and executive summary that Task B research was done assuming the MS4 permitting process as it stands presently, using an iterative process of enhancing implementation of BMPs. This scenario may overlap with TMDL process, but it is not necessarily the same. TMDLs may be folded in MS4 permit as allocations, as appropriate, depending on the impairments to receiving waters. Note that the costs for LA may be specific for LA only and are difficult to extend to other areas with

different characteristics. **Location of Change: Note added to Introduction and modified discussion moved to appendix G**

5. Downplay comparisons between TMDL costs, which are future costs that are variously estimated, and MS4 permit compliance costs incurred by the cities surveyed costs. TMDL cost estimates are total costs and not the cost to the cities exclusively. Similarly, note that Gordon costs are city-only costs. Take Gordon costs out of table in Executive Summary and discuss in the text.
   Location of Change: Section 9 future cost discussion, including TMDLs, modified and moved to Appendix G. Gordon costs taken from ES table and moved to text

6. Add TAG comment section in Section 10 on cost tracking benefits. Propose that if the permittees have a correct cost accounting/reporting system, they would be granted an additional quantity of points towards their receipt of a grant under a state/federal program; for example, Section 319(h) grants are evaluated on a point ranking system that is established by a state. If the cost accounting/reporting information were tabulated pursuant to the state's suggested format, that applicant would receive a bonus allotment equal to a boost in total points of approximately 15 percent. This would alert that permittee to the benefit in competing for these grants as a pre-requisite to establishing the appropriate cost accounting system. The proposed system would benefit from review and acceptance by the California League of Cities. Note the process in developing consistent cost reporting in the region and the associated benefit to the city with developing and justifying stormwater utility fees. Note that our recommendations for cost reporting are only the first step in this process of developing consistent cost reporting. This process includes notifying cities of reporting goals, identifying whether costs are minor and local and applicable to other cities, review reported costs for quality and consistency, and provide feedback to the cities. Identify appropriate categories with definitions to allow clarification between differences; with appropriate definitions, the individual entities could probably better assist the permittees to understand the benefit of reporting costs in a correct fashion. For example, a reported cost item may be illegal discharge elimination and would have clarified definitions to differentiate between end-of-pipe actions, in-pipe actions, source identification, and source detection. **Location of Change: Discussion added to Section 10.2 and 10.3, pages 51 and 56. Regressions moved to Appendix G.**

7. Make sure legal fees are properly discussed. Appellant fees are excluded, but legal advice on program implementation and response to citizen suits are included. We assume that if legal fees are incurred, it is part of the cost of doing business. This is not an assumption that all lawsuits are frivolous and therefore attorney fees are justified expenses. Neither is it an assumption that all legal advice is to challenge the lawsuit rather than to acquiesce to the demands of the lawsuit. **Location of Change: See discussion in section 9.5**

8. Append all written TAG comments to the report. **Location of Change: See Appendix J.**

9. Report cost without existing and enhanced 'big-ticket' items such as street sweeping trash collection, storm drain maintenance, drain line cleaning, channel cleaning, and pump station cleaning, recycling, hazardous waste roundups, etc. Note that an unknown portion of an "enhanced" cost is appropriate to count toward the additional financial burden of permit compliance. Also, include a suggestion that a three years average, 1987-1990, may be used as a baseline cost to figure out "enhancement" portion costs based on the post 1990 MS4 permit requirements and caveat that unit cost for sweeping varies. Note that sweeping is an enhanced cost and the majority of effort pre-existed the first stormwater permits. Also caveat that all programs may still have hidden costs that could not be identified by the cities. An example is backup equipment for street sweeping, but note that these costs are also preexisting. **Location of Change: See section 9.4 for added discussion of existing and enhanced costs and see Section 2.5 for discussion of using baseline costs.**

10. Consider using pie charts for each city to show distribution of costs among categories. **Location of Change: See individual city sections (sections 3-8)**

11. Note that Post Construction costs are expected to increase as cities move into full implementation of SUSMP type requirements for new development and redevelopment. Note that the reported costs are particularly misleading for cost projection purposes since the research coincides with the start of SUSMP type requirements implementation. **Location of Change: Section 9.5, Qualitative Discussion of Stormwater Costs for Selected Cost Categories**

Additional meeting notes

1. Cities may try to push as much general fund expenses as possible to stormwater a fee, but public response to fees helps balance cost. [I believed we discussed that cities successful in passing a SW fee were very transparent in the process, limited in scope, and going to great lengths to tie the SW fee to activities and capital investments related directly to water quality enhancements and benefits. Probably is not a bad idea to put some positive "lessons learned" from those successful cases in passing a SW fee.] (Dan)
2. GASB 34 may not be a realistic method to encourage cost reporting, especially on the short term. [is there a way to move this idea at a national level? That GASB can develop some standards for such a purpose, or add to an existing one?] (Dan).
3. Hamilton County, Ohio costs were not captured till 2001, for Phase II non-Cincinnati areas. Took two years to establish more consistent cost reporting. The cost had been

accounted for from 2001 through 2003 for Phase II cities, but that even these costs were "too vague" to allow appropriate interpretation by all 44 permittees. When CDM conducted the next evaluation required to establish a charge for these functional activities, CDM had to more precisely define the activities and quantify the level of effort for each action (Steve).

4. Wisconsin and Florida: cities are given points for having a fee, points awarded if utility charges are above $3.50 (80), below (40), and none (0). Points are a criterion for grant applications. Expand the last sentence to read “This approach would assure that permittees competing for grants would receive between 15 and 20 percent bonus points in the priority ranking system utilized by these states to award grants” (Steve).
5. Average cost per billing unit is $2.92/month for all stormwater including flood. Only for cities with stormwater fund/fee. Insert “Based upon evaluations conducted for stormwater utilities charging a stormwater user fee as of December 31, 2003, the total monthly charge per residential dwelling unit was $2.92/month. The services provided for this fee included all components that a given jurisdiction was incorporating into the stormwater management program, but could have been augmented/supplemented with additional monies from other sources that weren't clear in the writer's review. However, greater than 75 percent of those systems reviewed included some costs for quantity management in this fee.” (Steve). [See my comment at first point, it seems that a focused SW quality fee will be on average much less that $3/month/billing unit. city of LA with its current $18/yr/household seems to be right there, at the average.] (Dan)

046465

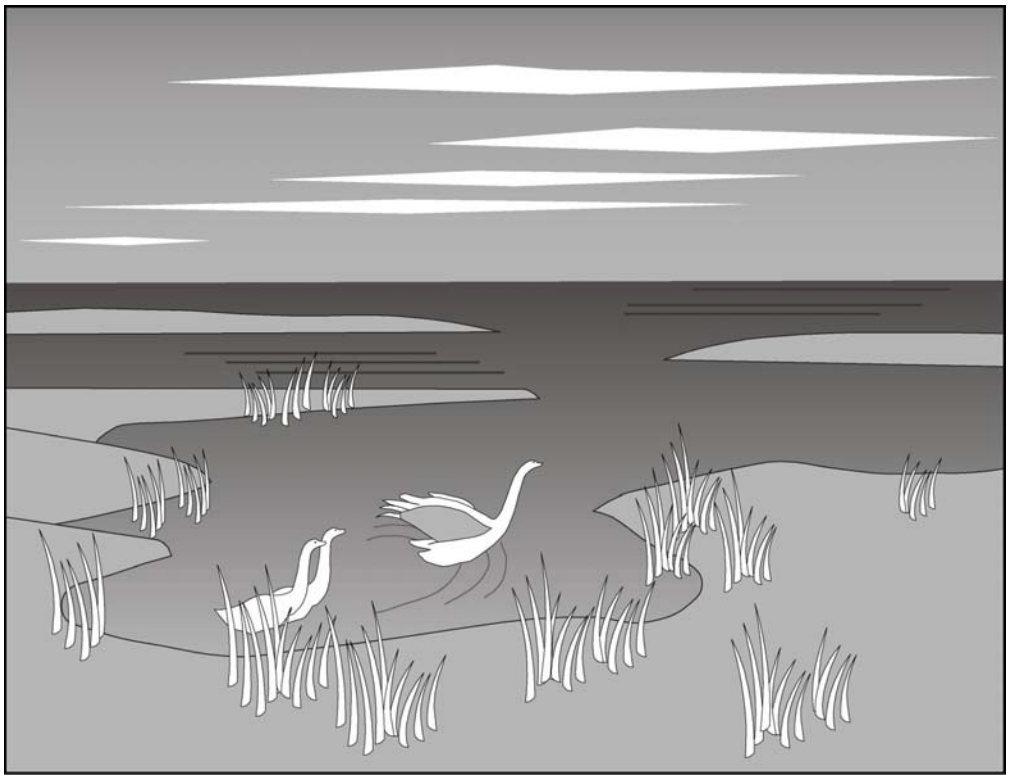

Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California

2005

STATE WATER RESOURCES CONTROL BOARD
California Environmental Protection Agency

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STATE WATER BOARD

RESOLUTION NO. 2005-0019

ADOPT AMENDMENTS TO THE POLICY FOR
IMPLEMENTATION OF TOXICS STANDARDS FOR
INLAND SURFACE WATERS, ENCLOSED BAYS,
AND ESTUARIES OF CALIFORNIA (SIP)

WHEREAS:

1. In March 2000, the State Water adopted the SIP, which implements criteria for priority toxic pollutants contained in the California Toxics Rule promulgated by the U.S. Environmental Protection Agency (USEPA) as well as other priority toxic pollutant criteria and objectives.

2. Section 303 of the federal Water Pollution Control Act (Clean Water Act) mandates that water quality standards be reviewed and revised, as necessary, at least once every three years. As part of the standards development program, the State Water Board periodically review its policies.

3. In October 2002, the State Water Board solicited comments on potential revisions to the SIP.

4. In December 2002, approximately 313 comments were received from 26 individuals and organizations.

5. State Water Board staff reviewed, carefully considered, and responded to all comments received.

6. State Water Board staff prepared an August 2003 report that contains recommendations for revisions to the SIP. Staff's recommended revisions are those that will improve the SIP's clarity and functionality and that can be made in a reasonable amount of time with existing resources.

7. The State Water Board notified interested parties of its recommended SIP revisions and provided an additional 30-day comment period.

8. The State Water Board held a public workshop on September 30, 2003 regarding issues to be addressed in future SIP amendments.

9. The State Water Board adopted Resolution No. 2003-0070 authorizing staff to prepare draft amendments and support documents to the SIP on October 15, 2003.

10. State Water Board staff completed the revisions to the SIP and provided a functional equivalent document for public review on December 15, 2004.

11. In January 2005, public comments were received from six organizations regarding the proposed amendment documents.

12. The State Water Board held a public hearing on February 2, 2005 regarding the proposed SIP amendments and addressed public comments.

13. In Order WQO 2003-0012, the State Water Board determined that (1) the propriety of including numeric effluents for chronic toxicity in NPDES permits for publicly-owned treatment works should be considered in a regulatory setting, in order to allow for full public discussion and deliberation; and (2) the SIP be modified to specifically address the issue.

THEREFORE BE IT RESOLVED THAT:

The State Water Board:

1. Adopts amendments to the SIP (Attachment A) that:

    a. Allow water effects ratios to be established in individual National Pollutant Discharge Elimination System permits, rather than in the Basin Planning process as currently required.
    b. Eliminate the reasonable potential trigger for situations where ambient background pollutant concentrations are greater than a priority pollutant objective or criterion.
    c. Make non-regulatory language corrections to improve clarity.
    d. Add mutual water companies to section 5.3 (exceptions).

2. Authorizes the State Water Board Executive Director to sign the Certificate of Fee Exemption (Attachment B).

3. Authorizes the State Water Board Executive Director or designee to submit the SIP revisions to the Office of Administrative Law and the USEPA for final approval.

4. Directs staff to introduce an amendment to the SIP to address narrative toxicity control provisions by January 2006.

CERTIFICATION

The undersigned, Clerk to the Board, does hereby certify that the foregoing is a full, true, and correct copy of a resolution duly and regularly adopted at a meeting of the State Water Board held on February 24, 2005.

Debbie Irvin
Clerk to the Board

3/17/2005

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POLICY FOR IMPLEMENTATION OF TOXICS STANDARDS FOR INLAND SURFACE WATERS, ENCLOSED BAYS, AND ESTUARIES OF CALIFORNIA

INTRODUCTION

This state policy for water quality control (Policy), adopted by the State Water Resources Control Board on March 2, 2000 and effective by May 22, 2000 (See "Note" below), applies to discharges of toxic pollutants into the *inland surface waters, *enclosed bays, and *estuaries of California subject to regulation under the State's Porter-Cologne Water Quality Control Act (Division 7 of the Water Code) and the federal Clean Water Act (CWA). Such regulation may occur through the issuance of National Pollutant Discharge Elimination System (NPDES) permits, or other relevant regulatory approaches.[1] The goal of this Policy is to establish a standardized approach for permitting discharges of toxic pollutants to non-*ocean surface waters in a manner that promotes statewide consistency. As such, this Policy is a tool to be used in conjunction with watershed management approaches and, where appropriate, the development of Total Maximum Daily Loads (TMDLs) to ensure achievement of water quality standards (i.e., water quality criteria or objectives, and the beneficial uses they are intended to protect, as well as the State and federal antidegradation policies).

This Policy establishes: (1) implementation provisions for priority pollutant criteria promulgated by the U.S. Environmental Protection Agency (U.S. EPA) through the National Toxics Rule (NTR)[2] (promulgated on December 22, 1992 and amended on May 4, 1995) and through the California Toxics Rule (CTR)[3], and for priority pollutant objectives established by Regional Water Quality Control Boards (RWQCBs) in their water quality control plans (basin plans)[4]; (2) monitoring requirements for 2,3,7,8-TCDD equivalents; and (3) chronic toxicity control provisions. In addition, this Policy includes special provisions for certain types of discharges and factors that could affect the application of other provisions in this Policy.

Note: This Policy was effective on April 28, 2000 with respect to the priority pollutant criteria promulgated by the U.S. EPA through the National Toxics Rule and to the priority pollutant objectives established by Regional Water Quality Control Boards in their water quality control plans (basin plans), with the exception of the provision on alternate test procedures in section 2.3., item (1). The alternate test procedures provision was effective on May 22, 2000. This Policy was effective on May 18, 2000 with respect to the priority pollutant criteria promulgated by the U.S. EPA through the California Toxics Rule.

[1] This Policy does not apply to discharges of toxic pollutants from combined sewer overflows. These discharges will continue to be regulated in accordance with the federal "Combined Sewer Overflow (CSO) Control Policy," published April 19, 1994 (59 Fed. Register 18688-18698). This Policy does not apply to regulation of storm water discharges. The SWRCB has adopted precedential decisions addressing regulation of municipal storm water discharges in Orders WQ 91-03, 91-04, 96-13, 98-01, 99-05, and 2001-15. The SWRCB has also adopted two statewide general permits regulating the discharge of pollutants contained in storm water from industrial and construction activities. See SWRCB Orders 99-08-DWQ and 97-03-DWQ. This Policy does not apply to regulation of nonpoint source discharges.

[2] 40 CFR 131.36

[3] 65 Fed. Register 31682-31719 (May 18, 2000), adding Section 131.38 to 40 CFR.

[4] If a water quality objective and a CTR criterion are in effect for the same priority pollutant, the more stringent of the two applies.

With the exception of Appendix 5 (Special Studies) and Appendix 6 (Watershed Management and TMDLs), the provisions of this Policy have full regulatory effect. Appendix 5 is provided as guidance that may be followed in planning and conducting special studies that may be needed to implement the provisions of this Policy. Appendix 6 is provided as information on the role of watershed management approaches and TMDL development in achieving water quality standards.

Except as provided in section 4, this Policy supersedes basin plan provisions to the extent that (1) they apply to implementation of water quality standards for priority pollutants, and (2) they regard the same subject matter as that addressed in this Policy with respect to priority pollutant standards. For example, the Policy supersedes basin plan mixing zone provisions to the extent that they apply to implementation of water quality standards for priority pollutants.

Reference to a RWQCB also refers to SWRCB, where appropriate. Terms indicated with an asterisk (*) are defined in Appendix 1.

1. ESTABLISHING WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR PRIORITY POLLUTANT CRITERIA/OBJECTIVES

The following sections address the issues of: (1) applicable priority pollutant criteria and objectives (section 1.1); (2) data requirements and adjustments (section 1.2); (3) determining priority pollutants requiring water quality-based effluent limitations (section 1.3); (4) calculating effluent limitations (section 1.4); (5) translators for metals and selenium (section 1.4.1); (6) mixing zones and dilution credits (section 1.4.2); (7) ambient background concentrations (section 1.4.3); and (8) intake water credits (section 1.4.4). Notwithstanding the provisions of these sections, effluent limitations must protect beneficial uses and comply with the State and federal antidegradation policies[5], federal antibacksliding requirements[6], and other applicable provisions of law.

1.1 Applicable Priority Pollutant Criteria and Objectives

Federal water quality criteria and State water quality objectives for priority pollutants have been established for non-ocean surface waters of California by the U.S. EPA and some RWQCBs, respectively. Federal priority pollutant criteria have been promulgated by the U.S. EPA in the 1992 NTR (amended in 1995) and in the 2000 CTR. For California, the criteria in the CTR supplement the criteria in the NTR (i.e., the CTR does not change or supersede any criteria previously promulgated for California in the NTR, but it does include them in the table of criteria for convenience). State priority pollutant objectives are contained in RWQCB basin plans.[4]

The RWQCB basin plans designate the beneficial uses that apply to the surface water bodies within their respective regions. Priority pollutant criteria/objectives are specifically established for the protection of aquatic life and human health beneficial uses designated in basin plans. Aquatic life criteria/objectives are established for fresh and salt waters. The CTR specifies the salinities to which the freshwater and saltwater criteria apply. The CTR also states that, except

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[5] SWRCB Resolution No. 68-16 (Statement of Policy with Respect to Maintaining High Quality of Waters in California), and 40 CFR 131.12 (revised as of July 1, 1996), respectively.

[6] CWA Sections 402(o)(1) and 303(d)(4), and 40 CFR 122.44(l) and 40 CFR 122.62 (revised as of July 1, 1996).

as specified in the CTR, the federal criteria apply to all waters assigned any aquatic life or human health use designated in basin plans. It further states that the application of the criteria are based on the presence in all waters of some aquatic life designation and the presence or absence of the municipal and domestic supply (MUN) designation (i.e., the aquatic life criteria and the human health criteria for consuming water and organisms apply to MUN-designated water bodies; the aquatic life criteria and the human health criteria for consuming organisms only apply to non-MUN water bodies).

Designated beneficial uses to which aquatic life criteria or objectives would apply include, but are not necessarily limited to, warm freshwater habitat (WARM), cold freshwater habitat (COLD), and estuarine habitat (EST). Designated beneficial uses to which human health criteria/objectives would apply include, but are not necessarily limited to, municipal and domestic supply (MUN) and water contact recreation (REC1). Human health criteria/objectives are differentiated by whether organisms alone from the water body are consumed compared to whether both organisms and water from the water body are consumed. Where MUN is designated, the latter situation applies.

1.2 Data Requirements and Adjustments

The RWQCB may adjust the criteria/objective for metals with *discharger-specific Water Effect Ratios established in accordance with U.S. EPA guidance – Interim Guidance on Determination and Use of Water Effect Ratios for Metals (EPA-823-B-94-001) or Streamlined Water-Effect Ratio Procedure for Discharges of Copper (EPA-822-R-01-005), if appropriate[7].

It is the discharger's responsibility to provide all data and other information requested by the RWQCB before the issuance, reissuance, or modification of a permit to the extent feasible. When implementing the provisions of this Policy, the RWQCB shall use all available, valid, relevant, representative data and information, as determined by the RWQCB. The RWQCB shall have discretion to consider if any data are inappropriate or insufficient for use in implementing this Policy. Instances where such consideration is warranted include, but are not limited to, the following: evidence that a sample has been erroneously reported or is not representative of effluent or ambient receiving water quality; questionable quality control/quality assurance practices; and varying seasonal conditions. The lack of a site-specific objective for a priority pollutant shall not be considered insufficient data.

When implementing the provisions of this Policy, the RWQCB shall ensure that criteria/objectives are properly adjusted for hardness or pH, if applicable, using the hardness or pH values for the receiving water, and that translators are appropriately applied (in accordance with section 1.4.1), if applicable. The RWQCB shall also ensure that pollutant and flow data are expressed in the appropriate forms and units for purposes of comparability and calculations.

1.3 Determination of Priority Pollutants Requiring Water Quality-Based Effluent Limitations

The RWQCB shall conduct the analysis in this section for each priority pollutant with an applicable criterion or objective, excluding priority pollutants for which a Total Maximum Daily Load (TMDL) has been developed, to determine if a water quality-based effluent limitation is

[7] A Water Effect Ratio may also be used to develop a site-specific metal objective, as described in Section 5.2.

required in the discharger's permit. It is the discharger's responsibility to provide all information requested by the RWQCB for use in the analysis. The RWQCB shall use all available, valid, relevant, representative information, as described in section 1.2, to determine whether a discharge may: (1) cause, (2) have a reasonable potential to cause, or (3) contribute to an excursion above any applicable priority pollutant criterion or objective. If the following analysis (which is depicted as a flowchart in Appendix 2) indicates that a limitation for a pollutant is required, the RWQCB shall establish the limitation in accordance with section 1.4. Within each step below, if it is necessary to express a dissolved metal or selenium value as total recoverable and a site-specific translator has not yet been developed, as described in section 1.4.1, the RWQCB shall use the applicable U.S. EPA conversion factor (Appendix 3).

Step 1: Identify applicable water quality criteria and objectives for priority pollutants as described in section 1.1. Determine the lowest (most stringent) water quality criterion or objective for the pollutant applicable to the receiving water (C). Adjust the criterion or objective for hardness and/or pH, if applicable, as described in section 1.2.

Step 2: Identify all effluent data for the pollutant as described in section 1.2 and proceed with *Step 3*. If effluent data are unavailable or insufficient, as described in section 1.2, proceed with *Step 5*.

Step 3: Determine the observed maximum pollutant concentration for the effluent (MEC). If the pollutant was detected, proceed with *Step 4*. If the pollutant was **not** detected in any of the effluent samples **and** any of the reported detection limits are below the C, use the lowest detection limit as the MEC and proceed with *Step 4*. If the pollutant was **not** detected in any of the effluent samples **and** all of the reported detection limits are greater than or equal to the C value, proceed with *Step 5*.

Step 4: Adjust the MEC from *Step 3,* if applicable, as described in section 1.2. Compare the MEC from *Step 3* or the adjusted MEC to the C from *Step 1*. If the MEC is greater than or equal to the C, an effluent limitation is required and the analysis for the subject pollutant is complete. If the MEC is less than the C, proceed with *Step 5*.

Step 5: Determine the observed maximum ambient background concentration for the pollutant (B) as described in section 1.4.3.1. If the pollutant was detected, proceed with *Step 6*. If B data are unavailable or insufficient, as described in section 1.2, proceed with *Step 7*.

Step 6: Adjust the B from *Step 5,* if applicable, as described in section 1.2. Compare the B from *Step 5* or the adjusted B to the C from *Step 1*. If the B is greater than the C and the pollutant is detected in the effluent, an effluent limitation is required and the analysis for the subject pollutant is complete. If B is greater than the C and the pollutant was not detected in any of the effluent samples, effluent monitoring is required (as described in *Step 8)* proceed with *Step 7*. If the B is less than or equal to the C, proceed with *Step 7*.

Step 7: Review other information available to determine if a water quality-based effluent limitation is required, notwithstanding the above analysis in *Steps 1* through *6*, to protect beneficial uses.

Information that may be used to aid in determining if a water quality-based effluent limitation is required includes: the facility type, the discharge type, solids loading analysis, lack of dilution, history of compliance problems, potential toxic impact of discharge, fish tissue residue data, water quality and beneficial uses of the receiving water, CWA 303(d) listing for the pollutant, the presence of endangered or threatened species or critical habitat, and other information. If data or other information is unavailable or insufficient, as described in section 1.2, to determine if a water quality-based effluent limitation is required, proceed with *Step 8.*

Step 8: If data are unavailable or insufficient, as described in section 1.2, to conduct the above analysis for the pollutant, or if all reported detection limits of the pollutant in the effluent are greater than or equal to the C value, the RWQCB shall require additional monitoring for the pollutant in place of a water quality-based effluent limitation. Upon completion of the required monitoring, the RWQCB shall use the gathered data to conduct the analysis in *Steps 1* through *7* above and determine if a water quality-based effluent limitation is required. If, upon completion of the monitoring required by Step 8 and the subsequent analysis in *Steps 1* through *7*, a specific pollutant was not detected in any effluent or if ambient background sample and applicable detection limits are greater than or equal to the C value, the RWQCB may require periodic monitoring of the pollutant.

The RWQCB shall require periodic monitoring (at least once prior to the issuance and reissuance of a permit) for pollutants for which criteria or objectives apply and for which no effluent limitations have been established; however, the RWQCB may choose to exempt low volume discharges, determined to have no significant adverse impact on water quality, from this monitoring requirement.

1.4 Calculation of Effluent Limitations

When a RWQCB determines, using the procedures described in section 1.3, that water quality-based effluent limitations are necessary to control a priority pollutant in a discharge, the permit shall contain effluent limitations developed using one or more of the following methods:

A. If a TMDL is in effect, assign a portion of the loading capacity of the receiving water to each identified priority pollutant source of waste, point and non-point, based on the TMDL (see Appendix 6);

B. Use the following procedure based on a steady-state model:

   Step 1: For each priority pollutant identified in section 1.3, identify the applicable water quality criteria/objectives for the pollutant as described in section 1.1. Adjust the criterion or objective, if applicable, as described in section 1.2. If it is necessary to express a dissolved metal or selenium criterion/objective as total recoverable and a site-specific translator has not yet been developed, as described in section 1.4.1, the RWQCB shall use the applicable U.S. EPA conversion factor (Appendix 3). If data are insufficient to calculate the effluent limitation, the RWQCB shall establish interim requirements in accordance with section 2.2.2.

Step 2: For each water quality criterion/objective, calculate the effluent concentration allowance (*ECA*) using the following steady-state mass balance equation:

$ECA = C + D(C - B)$ when $C > B$, and
$ECA = C$ when $C \leq B$,

where C = the priority pollutant criterion/objective, adjusted (as described in section 1.2), if necessary, for hardness, pH, and translators (as described in section 1.4.1);
D = the dilution credit (as determined in section 1.4.2); and
B = the ambient background concentration. The ambient background concentration shall be the observed maximum as determined in accordance with section 1.4.3.1 with the exception that an *ECA* calculated from a priority pollutant criterion/objective that is intended to protect human health from carcinogenic effects shall use the ambient background concentration as an arithmetic mean determined in accordance with section 1.4.3.2.

The concentration units for *C* and *B* must be identical. Both C and B shall be expressed as total recoverable, unless inappropriate. The dilution credit is unitless.

Step 3: For each *ECA* based on an aquatic life criterion/objective, determine the long-term average discharge condition (*LTA*) by multiplying the *ECA* with a factor (multiplier) that adjusts for effluent variability. The multiplier shall be calculated as described below, or shall be found in Table 1. To use Table 1, the *coefficient of variation (*CV*) for the effluent pollutant concentration data must first be calculated. If (a) the number of effluent data points is less than ten, or (b) at least 80 percent of the data are reported as not detected, the *CV* shall be set equal to 0.6. When calculating *CV* in this procedure, if an effluent data point is below the detection limit for the pollutant in that sample, one-half of the detection limit shall be used as a value in the calculations. Multipliers for acute and chronic criteria/objectives that correspond to the *CV* can then be found in Table 1.

ECA Multipliers

$$\text{ECA multiplier}_{acute_{99}} = e^{(0.5\sigma^2 - z\sigma)}$$

$$\text{ECA multiplier}_{chronic_{99}} = e^{(0.5\sigma_4^2 - z\sigma_4)}$$

Where σ = *standard deviation
σ = $[ln(CV^2 + 1)]^{0.5}$
σ^2 = $ln(CV^2 + 1)$
σ_4 = $[ln(CV^2/4 + 1)]^{0.5}$
σ_4^2 = $ln(CV^2/4 + 1)$
z = 2.326 for 99th percentile probability basis

Table 1. Effluent Concentration Allowance (ECA) Multipliers for Calculating Long-Term Averages (LTAs)

Coefficient Of Variation (CV)	Acute Multiplier	Chronic Multiplier
	99th Percentile Occurrence Probability	99th Percentile Occurrence Probability
0.1	0.797	0.891
0.2	0.643	0.797
0.3	0.527	0.715
0.4	0.440	0.643
0.5	0.373	0.581
0.6	0.321	0.527
0.7	0.281	0.481
0.8	0.249	0.440
0.9	0.224	0.404
1.0	0.204	0.373
1.1	0.187	0.345
1.2	0.174	0.321
1.3	0.162	0.300
1.4	0.153	0.281
1.5	0.144	0.264
1.6	0.137	0.249
1.7	0.131	0.236
1.8	0.126	0.224
1.9	0.121	0.214
2.0	0.117	0.204
2.1	0.113	0.195
2.2	0.110	0.187
2.3	0.107	0.180
2.4	0.104	0.174
2.5	0.102	0.168
2.6	0.100	0.162
2.7	0.098	0.157
2.8	0.096	0.153
2.9	0.094	0.148
3.0	0.093	0.144
3.1	0.091	0.141
3.2	0.090	0.137
3.3	0.089	0.134
3.4	0.088	0.131
3.5	0.087	0.128
3.6	0.086	0.126
3.7	0.085	0.123
3.8	0.084	0.121
3.9	0.083	0.119
4.0	0.082	0.117

LTA Equations

LTA_{acute} = ECA_{acute} * ECA $multiplier_{acute_{99}}$ (from Table 1 or as calculated above)

$LTA_{chronic}$ = $ECA_{chronic}$ * ECA $multiplier_{chronic_{99}}$ (from Table 1 or as calculated above)

Step 4: Select the lowest (most limiting) of the *LTA*s for the pollutant derived in *Step 3*.

Step 5: Calculate water quality-based effluent limitations (an *average monthly effluent limitation, AMEL, and a *maximum daily effluent limitation, MDEL) by multiplying the most limiting *LTA* (as selected in *Step 4*) with a factor (multiplier) that adjusts for the averaging periods and exceedance frequencies of the criteria/objectives and the effluent limitations, and the effluent monitoring frequency as follows:

$AMEL_{aquatic\ life}$ = *LTA * AMEL* $multiplier_{95}$ (from Table 2 or as calculated below)
$MDEL_{aquatic\ life}$ = *LTA * MDEL* $multiplier_{99}$ (from Table 2 or as calculated below)

The AMEL and MDEL multipliers shall be calculated as described below, or shall be found in Table 2 using the previously calculated *CV* and the monthly sampling frequency (*n*) of the pollutant in the effluent. If the sampling frequency is four times a month or less, *n* shall be set equal to 4. For this method only, maximum daily effluent limitations shall be used for publicly-owned treatment works (POTWs) in place of average weekly limitations.

AMEL and MDEL Multipliers

$$\text{AMEL multiplier}_{95} = e^{(z\sigma_n - 0.5\sigma_n^2)}$$

Where $\sigma_n = [ln(CV^2/n + 1)]^{0.5}$
$\sigma_n^2 = ln(CV^2/n + 1)$
z = 1.645 for 95th percentile probability basis
n = number of samples per month

$$\text{MDEL multiplier}_{99} = e^{(z\sigma - 0.5\sigma^2)}$$

Where $\sigma = [ln(CV^2 + 1)]^{0.5}$
$\sigma^2 = ln(CV^2 + 1)$
z = 2.326 for 99th percentile probability basis

Step 6: For the applicable human health criterion/objective, set the AMEL equal to the *ECA* (from *Step 2*).

$AMEL_{human\ health}$ = ECA

To calculate the MDEL for a human health criterion/objective, multiply the *ECA* by the ratio of the MDEL multiplier to the AMEL multiplier.

Table 2. Long-Term Average (LTA) Multipliers for Calculating Effluent Limitations

Coefficient of Variation	MDEL Multiplier	AMEL Multiplier			MDEL/AMEL Multiplier		
	99th Percentile Occurrence Probability	95th Percentile Occurrence Probability			MDEL = 99th Percentile AMEL = 95th Percentile Occurrence Probability		
(CV)		n = 4	n = 8	n = 30	n = 4	n = 8	n = 30
0.1	1.25	1.08	1.06	1.03	1.16	1.18	1.22
0.2	1.55	1.17	1.12	1.06	1.33	1.39	1.46
0.3	1.90	1.26	1.18	1.09	1.50	1.60	1.74
0.4	2.27	1.36	1.25	1.12	1.67	1.82	2.02
0.5	2.68	1.45	1.31	1.16	1.84	2.04	2.32
0.6	3.11	1.55	1.38	1.19	2.01	2.25	2.62
0.7	3.56	1.65	1.45	1.22	2.16	2.45	2.91
0.8	4.01	1.75	1.52	1.26	2.29	2.64	3.19
0.9	4.46	1.85	1.59	1.29	2.41	2.81	3.45
1.0	4.90	1.95	1.66	1.33	2.52	2.96	3.70
1.1	5.34	2.04	1.73	1.36	2.62	3.09	3.93
1.2	5.76	2.13	1.80	1.39	2.70	3.20	4.13
1.3	6.17	2.23	1.87	1.43	2.77	3.30	4.31
1.4	6.56	2.31	1.94	1.47	2.83	3.39	4.47
1.5	6.93	2.40	2.00	1.50	2.89	3.46	4.62
1.6	7.29	2.48	2.07	1.54	2.93	3.52	4.74
1.7	7.63	2.56	2.14	1.57	2.98	3.57	4.85
1.8	7.95	2.64	2.20	1.61	3.01	3.61	4.94
1.9	8.26	2.71	2.27	1.64	3.05	3.65	5.02
2.0	8.55	2.78	2.33	1.68	3.07	3.67	5.09

Note:
n = monthly sampling frequency of the effluent concentration data

Table 2. Continued

Coefficient of Variation	MDEL Multiplier	AMEL Multiplier			MDEL/AMEL Multiplier		
	99th Percentile Occurrence Probability	95th Percentile Occurrence Probability			MDEL = 99th Percentile AMEL = 95th Percentile Occurrence Probability		
(CV)		n = 4	n = 8	n = 30	n = 4	n = 8	n = 30
2.1	8.83	2.85	2.39	1.72	3.10	3.70	5.14
2.2	9.09	2.91	2.45	1.75	3.12	3.72	5.19
2.3	9.34	2.97	2.50	1.79	3.15	3.73	5.22
2.4	9.58	3.03	2.56	1.82	3.17	3.74	5.25
2.5	9.81	3.08	2.61	1.86	3.18	3.75	5.27
2.6	10.0	3.13	2.67	1.90	3.20	3.76	5.29
2.7	10.2	3.18	2.72	1.93	3.22	3.76	5.30
2.8	10.4	3.23	2.77	1.97	3.23	3.77	5.30
2.9	10.6	3.27	2.82	2.00	3.25	3.77	5.30
3.0	10.8	3.31	2.86	2.04	3.26	3.77	5.30
3.1	11.0	3.35	2.91	2.07	3.27	3.77	5.29
3.2	11.1	3.38	2.95	2.11	3.29	3.77	5.28
3.3	11.3	3.42	2.99	2.14	3.30	3.77	5.27
3.4	11.4	3.45	3.03	2.17	3.31	3.77	5.25
3.5	11.6	3.48	3.07	2.21	3.32	3.77	5.24
3.6	11.7	3.51	3.10	2.24	3.33	3.76	5.22
3.7	11.8	3.53	3.14	2.27	3.34	3.76	5.20
3.8	11.9	3.56	3.17	2.30	3.35	3.76	5.18
3.9	12.1	3.58	3.21	2.34	3.36	3.76	5.16
4.0	12.16	3.60	3.24	2.37	3.37	3.76	5.14

Note:
n = monthly sampling frequency of the effluent concentration data.

$$\text{MDEL/AMEL multiplier} = \text{MDEL multiplier}_{99} \div \text{AMEL multiplier}_{95}$$

$$\text{MDEL}_{\text{human health}} = \text{ECA} * \text{MDEL/AMEL multiplier}$$

Step 7: Identify the lower of (1) the AMEL and MDEL calculated based on the aquatic life criteria/objectives, and (2) the AMEL and MDEL calculated based on the human health criterion/objective.

C. Apply a *dynamic model, approved by the RWQCB, where sufficient effluent and receiving water data exist; or

D. Establish effluent limitations that consider intake water pollutants according to section 1.4.4.

The RWQCB shall impose more restrictive water quality-based effluent limitations (e.g., discharge prohibitions established in accordance with Water Code Section 13243) where necessary for the protection of beneficial uses or where otherwise required by law[1]. Seasonal effluent limitations may be established where appropriate (such as in applying translators and mixing zones/dilution credits). Any significant change in effluent quantity or quality shall be cause for reevaluation of effluent limitations.

Regardless of which method is used for deriving water quality-based effluent limitations, the calculated water quality-based effluent limitations shall be compared to the technology-based effluent limitations for the pollutant, and the most protective of the two types of limitations shall be included in the permit.

Effluent limitations shall apply to the total effluent of a waste discharge at the end-of-pipe, except in the rare situations where it is impractical or infeasible (e.g., where the final discharge point is inaccessible, or the pollutants are so diluted by cooling water as to make monitoring impractical, or interferences among pollutants make analysis infeasible). In these cases, some effluent limitations and monitoring requirements for the discharge may be modified to apply to internal waste streams instead, provided that the permit fact sheet fully states the circumstances for allowing this to occur and the permit also contains the unmodified effluent limitations (see 40 CFR 122.45(h), revised as of July 1, 1996).

For pollutants that are so diluted by cooling water as to make monitoring impractical, effluent limitations for internal waste streams shall be based on the same averaging periods as the unmodified effluent limitations and shall be calculated as follows

[1] For example, to implement the State and federal antidegradation policies, and the federal antibacksliding requirements.

$$IL = EL + (EL - CC) * CF/IF$$
$$IL = EL + (EL - CC) * (EF - IF)/IF$$

where *IL* = the limitation for the internal waste stream;
EL = the unmodified effluent limitation;
CC = the concentration of the pollutant in the cooling water;
CF = the cooling water flow, which is equal to the effluent flow minus the internal waste stream flow;
IF = the internal waste stream flow; and
EF = the effluent flow.

These equations do not apply when intake water credits (as described in section 1.4.4) are being provided.

1.4.1 Translators for Metals and Selenium

To derive total recoverable effluent limitations for aquatic life metals and selenium criteria/objectives that are expressed in the dissolved form, a translator first must be applied to the criterion/objective to express it as total recoverable. The translator shall be the U.S. EPA conversion factor (see Appendix 3) that applies to the dissolved aquatic life metals criterion as specified in the CTR (i.e., the dissolved criterion/objective would be divided by the applicable U.S. EPA conversion factor to calculate a total recoverable criterion) unless:

A. the discharger, in the permit application, (1) commits to (a) completing a defensible site-specific translator study and (b) proposing a dissolved to total recoverable translator to the RWQCB, and (2) describes the method(s) to be used in developing the translator; and

B. the discharger, within a time period specified by the RWQCB not exceeding two years from the date of issuance/reissuance of the permit, submits to the RWQCB (1) the proposed translator, and (2) all data and calculations related to its derivation.

Site-specific translators can be developed from field data by either direct determination of the fraction dissolved, or by development of a site-specific partition coefficient that relates the fraction dissolved to ambient background conditions such as pH, suspended load, or organic carbon. The fraction of metal that is dissolved in a water body can vary depending on when and where measurements are taken. A site-specific translator must (1) account for spatial and/or seasonal variability in areas of the water body that are affected by the discharger's effluent and (2) protect against toxic effects during critical conditions. The translator shall be derived using the *median of data for translation of chronic criteria and the *90th percentile of observed data for translation of acute criteria. If systematic seasonal variation in the translator is demonstrated, seasonal effluent limitations may be justified. If a spatial gradient in the translator is demonstrated, the highest translator value should be used unless the permit allows for a mixing zone (in accordance with section 1.4.2), in which case measurements should be taken outside the mixing zone. The site-specific study plan (including sampling design) must be approved by the RWQCB, after consultation with the California Department of Fish and Game, prior to conducting the study. Translator studies may be conducted by one or more dischargers discharging to the same receiving water body, as described in the permit application, subject to approval by the RWQCB. The planning and undertaking of the study may follow the guidelines presented in Appendix 5, as applicable.

Alternatively, the RWQCB may consider applying a previously approved site-specific translator or translator based on a study completed prior to the adoption of this Policy if the RWQCB believes the translator adequately reflects existing conditions (including spatial and/or seasonal variability) in the areas of the water body affected by the discharger's effluent.

While a translator study is being conducted, a final effluent limitation based on the applicable U.S. EPA conversion factor shall be included in the provisions of the permit and interim requirements shall be established (in accordance with section 2.2.2). An interim deadline to submit the results of the study shall be specified by the RWQCB, and shall not exceed two years from the date of issuance/reissuance of the permit. Once the translator is developed by the discharger(s) and approved by the RWQCB, the RWQCB shall reopen the permit and a new effluent limitation shall be calculated using a method described in section 1.4 after adjusting the dissolved metal or selenium criterion/objective by dividing it by the translator. In the event a translator study is not completed within the specified time, the U.S. EPA conversion factor-based effluent limitation in the provisions of the permit shall become effective as a default limitation.

1.4.2 Mixing Zones and Dilution Credits

With the exception of effluent limitations derived from TMDLs, in establishing and determining compliance with effluent limitations for applicable human health, acute aquatic life, or chronic aquatic life priority pollutant criteria/objectives or the toxicity objective for aquatic life protection in a RWQCB basin plan, the RWQCB may grant *mixing zones and *dilution credits to dischargers in accordance with the provisions of this section. To the extent permitted by applicable law, mixing zones may be considered for TMDL-derived effluent limitations. Effluent limitations based on a TMDL shall meet the mixing zone conditions specified in section 1.4.2.2.A.

The applicable priority pollutant criteria and objectives are to be met throughout a water body except within any mixing zone granted by a RWQCB. The allowance of mixing zones is discretionary and shall be determined on a discharge-by-discharge basis. A RWQCB may consider allowing mixing zones and dilution credits only for discharges with a physically identifiable point of discharge that are regulated through an NPDES permit issued by the RWQCB.

1.4.2.1 <u>Dilution Credits</u>

The dilution credit, D, is a numerical value associated with the mixing zone that accounts for the receiving water entrained into the discharge. The dilution credit is a value used in the calculation of effluent limitations (described in section 1.4). Dilution credits may be limited or denied on a pollutant-by-pollutant basis, which may result in a dilution credit for all, some, or no priority pollutants in a discharge.

Before establishing a mixing zone and a dilution credit for a discharge, it must first be determined if, and how much (if any), receiving water is available to dilute the discharge. In determining the appropriate available receiving water flow, the RWQCBs may take into account actual and seasonal variations of the receiving water and the effluent. For example, a RWQCB may prohibit mixing zones during seasonal low flows and allow them during seasonal high flows. However, for year-round mixing zones, the mixing zone and dilution credit shall be

determined using the parameters specified in Table 3.

Table 3. Effluent and Receiving Water Flows for Calculating Dilution Ratios

In calculating a dilution ratio for:	**Use the critical receiving water flow[1] of:**	**Use the discharged effluent flow of:**
Acute aquatic life criteria/objectives	*1Q10	*maximum daily flow during period of discharge
Chronic aquatic life criteria/objectives Chronic toxicity objective for aquatic life[2]	*7Q10	*four-day average of daily maximum flows during period of discharge
Human health criteria/objectives	*harmonic mean	*long-term arithmetic mean flow during period of discharge

The approach to making a mixing zone determination also depends on whether a discharge is *completely-mixed or *incompletely-mixed with the receiving water as discussed below.

Completely Mixing Discharges

For completely-mixed discharges, as determined by the RWQCB and based on information provided by the discharger, the amount of receiving water available to dilute the effluent shall be determined by calculating the *dilution ratio (i.e., the critical receiving water flow divided by the effluent flow) using the appropriate flows in Table 3. In no case shall the RWQCB grant a dilution credit that is greater than the calculated dilution ratio. The dilution credit may be set equal to the dilution ratio only if the site-specific conditions concerning the discharge and the receiving water do not indicate that a smaller dilution credit is necessary to protect beneficial uses and meet the conditions of this Policy. If, however, dilution ratios that are calculated using the Table 3 parameters are inappropriate for use due to site-specific issues, the mixing zone and dilution credit shall be determined using site-specific information and procedures detailed for incompletely-mixed discharges.

Incompletely-Mixed Discharges

Dilution credits and mixing zones for incompletely-mixed discharges shall be considered by the

[1] U.S. EPA's *biologically-based receiving water flows may be used in place of these critical receiving water flows where sufficient data are available.

[2] These objectives are included in RWQCB basin plans and may address both chronic and acute toxicity to aquatic life. The flows in Table 3 apply to the chronic component of the objective.

RWQCB only after the discharger has completed an independent mixing zone study and demonstrated to the satisfaction of the RWQCB that a dilution credit is appropriate. Mixing zone studies may include, but are not limited to, tracer studies, dye studies, modelling studies, and monitoring upstream and downstream of the discharge that characterize the extent of actual dilution. These studies may be conducted in accordance with the procedures outlined in Appendix 5.

1.4.2.2 Mixing Zone Conditions

A mixing zone shall be as small as practicable. The following conditions must be met in allowing a mixing zone:

A. A mixing zone shall not:

(1) compromise the integrity of the entire water body;
(2) cause *acutely toxic conditions to aquatic life passing through the mixing zone;
(3) restrict the passage of aquatic life;
(4) adversely impact biologically sensitive or critical habitats, including, but not limited to, habitat of species listed under federal or State endangered species laws;
(5) produce undesirable or nuisance aquatic life;
(6) result in floating debris, oil, or scum;
(7) produce objectionable color, odor, taste, or turbidity;
(8) cause *objectionable bottom deposits;
(9) cause nuisance;
(10) dominate the receiving water body or overlap a mixing zone from different outfalls; or
(11) be allowed at or near any drinking water intake. A mixing zone is not a *source of drinking water. To the extent of any conflict between this determination and the Sources of Drinking Water Policy (SWRCB Resolution No. 88-63), this determination supersedes the provisions of that policy.

B. The RWQCB shall deny or significantly limit a mixing zone and dilution credit as necessary to protect beneficial uses, meet the conditions of this Policy, or comply with other regulatory requirements. Such situations may exist based upon the quality of the discharge, hydraulics of the water body, or the overall discharge environment (including water column chemistry, organism health, and potential for bioaccumulation). For example, in determining the extent of or whether to allow a mixing zone and dilution credit, the RWQCB shall consider the presence of pollutants in the discharge that are *carcinogenic, *mutagenic, *teratogenic, *persistent, *bioaccumulative, or attractive to aquatic organisms. In another example, the RWQCB also shall consider, if necessary to protect the beneficial uses, the level of flushing in water bodies such as lakes, reservoirs, enclosed bays, estuaries, or other water body types where pollutants may not be readily flushed through the system. In the case of multiple mixing zones, proximity to other outfalls shall be carefully considered to protect the beneficial uses.

If a RWQCB allows a mixing zone and dilution credit, the permit shall specify the method by which the mixing zone was derived, the dilution credit granted, and the point(s) in the receiving water where the applicable criteria/objectives must be met. The application for the permit shall include, to the extent feasible, the information needed by the RWQCB to make a

determination on allowing a mixing zone, including the calculations for deriving the appropriate receiving water and effluent flows, and/or the results of a mixing zone study. If the results of the mixing zone study are unavailable by the time of permit issuance/reissuance, the RWQCB may establish interim requirements in accordance with section 2.2.2.

1.4.3 Ambient Background Concentrations

Ambient background concentration, B, of a priority pollutant in the receiving water body shall be calculated on a pollutant-by-pollutant basis and on a discharge-by-discharge or water body-by-water body basis at the RWQCB's discretion. The ambient background concentration shall be the observed maximum ambient water column concentration in accordance with section 1.4.3.1 or the *arithmetic mean of observed ambient water concentrations in accordance with section 1.4.3.2 where these sections are specifically referenced in this Policy (i.e., sections 1.3 and 1.4).

1.4.3.1 Ambient Background Concentration as an Observed Maximum

Step 1: Identify all available, applicable ambient background data for the pollutant in accordance with section 1.2. If possible, preference should be given to ambient water column concentrations measured immediately upstream or near the discharge, but not within an allowed mixing zone for the discharge. The RWQCB shall have discretion to consider if any samples are invalid for use as applicable data due to evidence that the sample has been erroneously reported or the sample is not representative of the ambient receiving water column that will mix with the discharge. For example, the RWQCB shall have discretion to consider samples to be invalid that have been taken during peak flows of significant storm events.

Step 2: If all samples are below the reported detection limits, the ambient background concentration shall be set equal to the lowest of the individual reported detection limits. If any sample is reported with a detected concentration, as either measured or estimated by the laboratory, the ambient background concentration shall be set equal to the maximum of the individual reported measured or estimated concentrations.

1.4.3.2 Ambient Background Concentration as an Arithmetic Mean

Step 1: Identify all available, applicable ambient background data for the pollutant in accordance with section 1.2. If possible, preference should be given to ambient water column concentrations measured immediately upstream or near the discharge, but not within an allowed mixing zone for the discharge. The RWQCB shall have discretion to consider if any samples are invalid for use as applicable data due to evidence that the sample has been erroneously reported or the sample is not representative of the ambient receiving water column that will mix with the discharge.

Step 2: If all samples are below the reported detection limits, the ambient background concentration shall be set equal to the lowest of the individual reported detection limits. If any sample is reported with a detected concentration, as either measured or estimated by the laboratory, the ambient background concentration shall be set equal to the arithmetic mean of the individual reported measured or estimated concentrations. The arithmetic mean shall be calculated using the reported detection limits for samples that are reported below detection

limits.

1.4.4 Intake Water Credits

A RWQCB may consider priority pollutants in intake water on a pollutant-by-pollutant and discharge-by-discharge basis when establishing water quality-based effluent limitations, provided that the discharger has demonstrated to the satisfaction of the RWQCB that the following conditions are met:

(1) The observed maximum ambient background concentration, as determined in section 1.4.3.1, and the intake water concentration of the pollutant exceeds the most stringent applicable criterion/objective for that pollutant;

(2) The intake water credits provided are consistent with any TMDL applicable to the discharge that has been approved by the RWQCB, SWRCB, and U.S. EPA;

(3) The intake water is from the same water body as the receiving water body. The discharger may demonstrate this condition by showing that:

(a) the ambient background concentration of the pollutant in the receiving water, excluding any amount of the pollutant in the facility's discharge, is similar to that of the intake water;

(b) there is a direct hydrological connection between the intake and discharge points;

(c) the water quality characteristics are similar in the intake and receiving waters; and

(d) the intake water pollutant would have reached the vicinity of the discharge point in the receiving water within a reasonable period of time and with the same effect had it not been diverted by the discharger.

The RWQCB may also consider other factors when determining whether the intake water is from the same water body as the receiving water body;

(4) The facility does not alter the intake water pollutant chemically or physically in a manner that adversely affects water quality and beneficial uses; and

(5) The timing and location of the discharge does not cause adverse effects on water quality and beneficial uses that would not occur if the intake water pollutant had been left in the receiving water body.

Where the above conditions are met, the RWQCB may establish effluent limitations allowing the facility to discharge a mass and concentration of the intake water pollutant that is no greater than the mass and concentration found in the facility's intake water. A discharger may add mass of the pollutant to its waste stream if an equal or greater mass is removed prior to discharge, so there is no net addition of the pollutant in the discharge compared to the intake water. Where proper operation and maintenance of a facility's treatment system results in the removal of an intake water pollutant, the RWQCB may establish limitations that reflect the lower mass and

concentration of the pollutant achieved by such treatment.

Where intake water for a facility is provided by a municipal water supply system and the supplier provides treatment of the raw water that removes an intake water pollutant, the concentration of the intake water pollutant shall be determined at the point where the water enters the water supplier's distribution system.

Where a facility discharges pollutants from multiple sources that originate from the receiving water body and from other water bodies, the RWQCB may derive an effluent limitation reflecting the flow-weighted amount of each source of the pollutant provided that adequate monitoring to determine compliance can be established and is included in the permit. When calculating the flow-weighted effluent limitation, the pollutant from the receiving water body shall be assumed to have a concentration that is no greater than the concentration in the facility's intake water; the same pollutant from other sources shall be assumed to have a concentration that is no greater than the most stringent applicable criterion/objective.

The permit shall specify how compliance with mass- and concentration-based limitations for the intake water pollutant will be assessed. This may be done by basing the effluent limitation on ambient background concentration data. Alternatively, the RWQCB may determine compliance by simultaneously monitoring the pollutant concentrations in the intake water and in the effluent. This monitoring may be supplemented by monitoring internal waste streams or by a RWQCB evaluation of the use of *best management practices.

2. DETERMINING COMPLIANCE WITH PRIORITY POLLUTANT CRITERIA/OBJECTIVES AND WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR PRIORITY POLLUTANT CRITERIA/OBJECTIVES

Compliance with priority pollutant criteria/objectives and water quality-based effluent limitations established pursuant to section 1 shall be determined according to the following provisions for (1) compliance schedules (section 2.1), (2) interim requirements (section 2.2), (3) monitoring requirements (section 2.3), and (4) reporting requirements including compliance determinations (section 2.4). In determining compliance with effluent limitations based on intake water credits, only the monitoring requirements (section 2.3) and the reporting requirements (section 2.4) apply. In determining compliance with effluent limitations derived from TMDLs, only the compliance schedule provisions (section 2.1) apply.

2.1 Compliance Schedules

Based on an *existing discharger's request and demonstration that it is *infeasible for the discharger to achieve immediate compliance with a CTR criterion[3], or with an effluent limitation based on a CTR criterion, the RWQCB may establish a compliance schedule in an NPDES permit. Compliance schedules shall not be allowed in permits for *new dischargers.

A schedule of compliance shall include a series of required actions to be undertaken for the purpose of achieving a CTR criterion and/or effluent limitations based on a CTR criterion. These actions shall demonstrate reasonable progress toward the attainment of a CTR criterion and/or effluent limitations. The compliance schedule shall include a schedule for completion

[3] CTR criteria, for purposes of this section, exclude NTR criteria.

that reflects a realistic assessment of the shortest practicable time required to perform each task. The compliance schedule shall contain a final compliance date based on the shortest practicable time required to achieve compliance. The deadlines to complete each action in the compliance schedule shall be specified in the NPDES permit and shall be accompanied by interim requirements as described in section 2.2.1. When a compliance schedule exceeds one year from the date of permit issuance, interim limitations with specific compliance dates (as described in section 2.2.1) shall be included in the NPDES permit. If the final compliance date extends beyond the permit term, the final compliance date and supporting explanation shall be included in the permit findings.

The discharger shall submit to the RWQCB the following justification before compliance schedules may be authorized in a permit: (a) documentation that diligent efforts have been made to quantify pollutant levels in the discharge and the sources of the pollutant in the waste stream, and the results of those efforts; (b) documentation of source control and/or pollution minimization efforts currently underway or completed; (c) a proposed schedule for additional or future source control measures, *pollutant minimization actions, or waste treatment (i.e., facility upgrades); and (d) a demonstration that the proposed schedule is as short as practicable.

The schedule of compliance for point source dischargers in an NPDES permit shall be as short as practicable but in no case exceed the following:

A. Up to <u>five</u> years <u>from the date of permit issuance, reissuance, or modification</u> to complete actions (such as pollutant minimization or facility upgrades) necessary to comply with CTR criterion-based effluent limitations that are derived with or without a TMDL. Such actions shall include the development and adoption of a site-specific objective, if appropriate, as provided in section 5.2.

B. Up to <u>15</u> years <u>from the effective date of this Policy</u> to develop and adopt a TMDL, and accompanying Waste Load Allocations (WLAs) and Load Allocations (LAs), as described in section 2.1.1, below.

In no case (unless an exception has been granted in accordance with section 5.3) shall a compliance schedule for these dischargers exceed, from the effective date of this Policy:
(a) 10 years to establish and comply with CTR criterion-based effluent limitations; or
(b) 20 years to develop and adopt a TMDL, and to establish and comply with WLAs derived from a TMDL for a CTR criterion (i.e., up to 15 years to complete the TMDL and up to five years to comply with a TMDL-derived effluent limitation).

2.1.1 TMDL-Based Compliance Schedule

The compliance schedule provisions for the development and adoption of a TMDL only apply when: (a) the discharger requests and demonstrates that it is *infeasible for the discharger to achieve immediate compliance with a CTR criterion, or with an effluent limitation based on a CTR criterion; and (b) the discharger has made appropriate commitments to support and expedite the development of the TMDL. In determining appropriate commitments, the RWQCB should consider the discharge's contribution to current loadings and the discharger's ability to participate in TMDL development.

For *bioaccumulative priority pollutants for which the receiving water has been included on the

CWA Section 303(d) list, the RWQCB should consider whether the mass loading of the bioaccumulative pollutant(s) should be limited to representative, current levels pending TMDL development in order to implement the applicable water quality standard.

2.2 Interim Requirements

If a compliance schedule is allowed (in accordance with section 2.1) or a schedule is allowed to collect and provide data needed to establish water quality-based effluent limitations for a CTR criterion (in accordance with provisions in section 1), interim requirements shall be included in an NPDES permit.

2.2.1 Interim Requirements Under a Compliance Schedule

If a compliance schedule is granted (in accordance with section 2.1), the RWQCB shall establish interim requirements and dates for their achievement in the NPDES permit. If the compliance schedule exceeds one year, the RWQCB shall establish interim numeric limitations for the priority pollutant in the permit and may also impose interim requirements to control the pollutant, such as *pollutant minimization and source control measures. Numeric interim limitations for the pollutant must be based on current treatment facility performance or on existing permit limitations, whichever is more stringent. If the existing permit limitations are more stringent, and the discharger is not in compliance with those limitations, the noncompliance under the existing permit must be addressed through appropriate enforcement action before the permit can be reissued, unless antibacksliding provisions are met.

There shall be no more than one year between interim dates. The interim requirements shall state that the discharger must notify the RWQCB, in writing, no later than 14 days following each interim date, of its compliance or noncompliance with the interim requirements.

If the compliance schedule is within the term of the permit, the final effluent limitations shall be included in the permit provisions. If the compliance schedule exceeds the length of the permit, the final effluent limitations shall be included in the permit findings. In the latter case, the findings shall include: (1) the water quality to be achieved; (2) the reason that a final water quality-based effluent limitation is not being incorporated into the permit as an enforceable limitation at this time; (3) a statement that it is the intent of the RWQCB to include, in a subsequent permit revision, the final water quality-based effluent limitation as an enforceable limitation (based either on the CTR criterion directly or on future regulatory developments, such as TMDL or site-specific objective development). The permit findings shall also state the appropriate enforcement actions that may be taken by the RWQCB if interim limitations and requirements are not met.

2.2.2 Reserved

2.3 Monitoring Requirements

The RWQCB shall require dischargers to conduct self-monitoring programs and shall clearly state in all permits the objective and purpose of the monitoring. Furthermore, the RWQCB shall determine, and specify under the monitoring and reporting requirements, the sampling parameters, monitoring frequencies, locations, and analytical methods to be used. To evaluate compliance with effluent limitations, effluent and ambient monitoring should occur within a

brief enough period to be able to evaluate the effect of the effluent on the ambient water quality. All data shall be reported in accordance with section 2.4. Options for analytical methods are:

(1) those methods listed in Appendix 4 and described in Tables 1A, 1B, 1C, 1D, and 1E of 40 CFR 136.3 (revised as of May 14, 1999); or alternate test procedures for individual discharges that have been approved by the U.S. EPA Regional Administrator pursuant to 40 CFR 136.4 (a) through (c), inclusive, and 40 CFR 136.5 (a) through (d), inclusive (revised as of May 14, 1999); or

(2) where no methods are specified for a given pollutant in the tables described in (1) above, methods approved by the SWRCB or RWQCB.

Laboratories analyzing monitoring samples shall be certified by the Department of Health Services, in accordance with the provision of Water Code Section 13176, and must include quality assurance/quality control data with their reports.

Dischargers are also encouraged to submit monitoring data in electronic formats approved by the SWRCB or RWQCB.

Furthermore, it is the policy of the SWRCB that individual permit monitoring complement and be coordinated with water body, watershed, and regional monitoring programs to the extent practicable.

2.4 Reporting Requirements

The discharger shall submit to the RWQCB reports necessary to determine compliance with effluent limitations for priority pollutants in permits. The reports shall comply with the requirements of sections 2.4.1 through 2.4.4.

2.4.1 Reporting Levels

The RWQCB shall require in the permit that the discharger shall report with each sample result:

1. The Reporting Level (RL) (selected from the MLs listed in Appendix 4 in accordance with section 2.4.2 or established in accordance with section 2.4.3); and

2. The laboratory's current *Method Detection Limit (MDL), as determined by the procedure found in 40 CFR 136 (revised as of July 3, 1999).

2.4.2 Selection and Use of Appropriate ML Value

Reporting Level Selection: When there is more than one ML value for a given substance, the RWQCB shall include as RLs, in the permit, all ML values, and their associated analytical methods, listed in Appendix 4 that are below the calculated effluent limitation. The discharger may select any one of those cited analytical methods for compliance determination. If no ML value is below the effluent limitation, then the RWQCB shall select as the RL, the lowest ML value, and its associated analytical method, listed in Appendix 4 for inclusion in the permit.

ML Usage: The ML value in Appendix 4 represents the lowest quantifiable concentration in a

sample based on the proper application of all method-based analytical procedures and the absence of any matrix interferences. Assuming that all method-specific analytical steps are followed, the ML value will also represent, after the appropriate application of method-specific factors, the lowest standard in the calibration curve for that specific analytical technique. Common analytical practices sometimes require different treatment of the sample relative to calibration standards. Some examples are given below:

Substance or Grouping	Method-Specified Treatment	Most Common Method-Specific Factor(s)
Volatile organic	No differential treatment	1
Semi-Volatile organic	Samples concentrated by extraction	1000
Metals	Samples diluted or concentrated	½, 2, and 4
Pesticides	Samples concentrated by extraction	100

Other factors may be applied to the ML depending on the specific sample preparation steps employed. For example, the treatment typically applied in cases where there are matrix-effects is to dilute the sample or sample aliquot by a factor of ten. In such cases, this additional factor must be applied in the computation of the reporting limit. Application of such factors will alter the RL (as described in section 2.4.1).

Dischargers are to instruct laboratories to establish calibration standards so that the ML value (or its equivalent if there is differential treatment of samples relative to calibration standards) is the lowest calibration standard. At no time is the discharger to use analytical data derived from *extrapolation* beyond the lowest point of the calibration curve. The discharger's laboratory(ies) may, as allowed for by the rules governing alterations to ML values in section 2.4.3 below, employ a calibration standard lower than the ML value in Appendix 4.

2.4.3 Deviation from MLs Listed in Appendix 4

The RWQCB, in consultation with the SWRCB's Quality Assurance Program, shall establish an RL that is not contained an ML in Appendix 4 to be included in the discharger's permit in any of the following situations:

1. When the pollutant under consideration is not included in Appendix 4.

2. When the discharger and the RWQCB agree to include in the permit a test method that is more sensitive than those specified in 40 CFR 136 (revised as of July 3, 1999).

3. When a discharger agrees to use an RL that is lower than the MLs listed in Appendix 4.

4. When a discharger demonstrates that the calibration standard matrix is sufficiently different from that used to establish the ML in Appendix 4 and proposes an appropriate ML for their matrix.

5. When the discharger uses a method whose quantification practices are not consistent with the definition of an ML. Examples of such methods are the U.S. EPA-approved method 1613 for dioxins and furans, method 1624 for volatile organic substances, and method 1625 for semi-volatile organic substances. In such cases, the discharger, the RWQCB, and the SWRCB shall agree on a lowest quantifiable limit and that limit will substitute for

the RL for reporting and compliance determination purposes.

2.4.4 Reporting Protocols

The discharger shall report the results of analytical determinations for the presence of chemical constituents in a sample using the following reporting protocols:

1. Sample results greater than or equal to the RL shall be reported as measured by the laboratory (i.e., the measured chemical concentration in the sample).

2. Sample results less than the RL, but greater than or equal to the laboratory's MDL, shall be reported as "Detected, but Not Quantified," or DNQ. The *estimated chemical concentration of the sample shall also be reported.

   For the purposes of data collection, the laboratory shall write the estimated chemical concentration next to DNQ as well as the words "Estimated Concentration" (may be shortened to "Est. Conc."). The laboratory may, if such information is available, include numerical estimates of the data quality for the reported result. Numerical estimates of data quality may be percent accuracy (± a percentage of the reported value), numerical ranges (low to high), or any other means considered appropriate by the laboratory.

3. Sample results less than the laboratory's MDL shall be reported as "Not Detected," or ND.

2.4.5 Compliance Determination

Compliance with effluent limitations shall be determined as follows:

1. Dischargers shall be deemed out of compliance with an effluent limitation, if the concentration of the priority pollutant in the monitoring sample is greater than the effluent limitation and greater than or equal to the RL.

2. Dischargers shall be required to conduct a Pollutant Minimization Program (PMP) in accordance with section 2.4.5.1 when there is evidence (e.g., sample results reported as DNQ when the effluent limitation is less than the MDL, sample results from analytical methods more sensitive than those methods included in the permit in accordance with sections 2.4.2 or 2.4.3 above, presence of whole effluent toxicity, health advisories for fish consumption, results of benthic or aquatic organism tissue sampling) that the priority pollutant is present in the effluent above an effluent limitation and either:

   a. A sample result is reported as DNQ and the effluent limitation is less than the RL; or

   b. A sample result is reported as ND and the effluent limitation is less than the MDL.

   RWQCBs may include special provisions in the permit to require the gathering of evidence to determine whether the constituent of concern is present in the effluent at levels above a calculated effluent limitation.

When determining compliance with an AMEL and more than one sample result is available in a month, the discharger shall compute the arithmetic mean unless the data set contains one or more reported determinations of DNQ or ND. In those cases, the discharger shall compute the median

in place of the arithmetic mean in accordance with the following procedure:

1. The data set shall be ranked from low to high, reported ND determinations lowest, DNQ determinations next, followed by quantified values (if any). The order of the individual ND or DNQ determinations is unimportant.

2. The median value of the data set shall be determined. If the data set has an odd number of data points, then the median is the middle value. If the data set has an even number of data points, then the median is the average of the two values around the middle unless one or both of the points are ND or DNQ, in which case the median value shall be the lower of the two data points where DNQ is lower than a value and ND is lower than DNQ.

If a sample result, or the arithmetic mean or median of multiple sample results, is below the RL, and there is evidence that the priority pollutant is present in the effluent above an effluent limitation and the discharger conducts a PMP (as described in section 2.4.5.1), the discharger shall not be deemed out of compliance.

2.4.5.1 Pollutant Minimization Program

The goal of the PMP shall be to reduce all potential sources of a priority pollutant(s) through *pollutant minimization (control) strategies, including *pollution prevention measures as appropriate,[4] to maintain the effluent concentration at or below the water quality-based effluent limitation. The RWQCB may consider cost-effectiveness when establishing the requirements of a PMP. The program shall include, but not be limited to, the following actions and submittals acceptable to the RWQCB:

1. An annual review and semi-annual monitoring of potential sources of the reportable priority pollutant(s), which may include fish tissue monitoring and other bio-uptake sampling;

2. Quarterly monitoring for the reportable priority pollutant(s) in the influent to the wastewater treatment system;

3. Submittal of a control strategy designed to proceed toward the goal of maintaining concentrations of the reportable priority pollutant(s) in the effluent at or below the effluent limitation;

4. Implementation of appropriate cost-effective control measures for the reportable priority pollutant(s), consistent with the control strategy; and

5. An annual status report that shall be sent to the RWQCB including:

    a. All PMP monitoring results for the previous year;

    b. A list of potential sources of the reportable priority pollutant(s);

    c. A summary of all actions undertaken pursuant to the control strategy; and

[4] Pollution prevention measures may be particularly appropriate for persistent bioaccumulative priority pollutants where there is evidence that beneficial uses are being impacted.

d. A description of actions to be taken in the following year.

The permit shall contain a reopener clause authorizing modifications, or revocation and reissuance of the permit, as a result of the detection of a reportable priority pollutant generated by special conditions included in the permit. These special conditions in the permit may be, but are not limited to, fish tissue sampling, whole effluent toxicity tests, monitoring requirements on internal waste stream(s), and monitoring for surrogate parameters. Additional requirements may be included in the permit as a result of the special condition monitoring data.

The completion and implementation of a pollution prevention plan, required pursuant to Water Code Section 13263.3(d), shall be considered to fulfill the PMP requirements of this section.

3. 2,3,7,8-TCDD EQUIVALENTS

The CTR includes criteria for 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD). In addition to this compound, there are many congeners of chlorinated dibenzodioxins (2,3,7,8-CDDs) and chlorinated dibenzofurans (2,3,7,8-CDFs) that exhibit toxic effects similar to those of 2,3,7,8-TCDD. The U.S. EPA has published toxic equivalency factors (TEFs) for 17 of the congeners. The TEFs express the relative toxicities of the congeners compared to 2,3,7,8-TCDD (whose TEF equals 1.0). In June 1997, participants in a World Health Organization (WHO) expert meeting revised TEF values for 1,2,3,7,8-PentaCDD, OctaCDD, and OctaCDF. The current TEFs for the 17 congeners, which include the three revised values, are shown in Table 4:

Table 4. Toxic Equivalency Factors (TEFs) for 2,3,7,8-TCDD Equivalents

Congener	TEF
2,3,7,8-TetraCDD	1
1,2,3,7,8-PentaCDD	1.0
1,2,3,4,7,8-HexaCDD	0.1
1,2,3,6,7,8-HexaCDD	0.1
1,2,3,7,8,9-HexaCDD	0.1
1,2,3,4,6,7,8-HeptaCDD	0.01
OctaCDD	0.0001
2,3,7,8-TetraCDF	0.1
1,2,3,7,8-PentaCDF	0.05
2,3,4,7,8-PentaCDF	0.5
1,2,3,4,7,8-HexaCDF	0.1
1,2,3,6,7,8-HexaCDF	0.1
1,2,3,7,8,9-HexaCDF	0.1
2,3,4,6,7,8-HexaCDF	0.1
1,2,3,4,6,7,8-HeptaCDF	0.01

1,2,3,4,7,8,9-HeptaCDF	0.01
OctaCDF	0.0001

TEF Reference: Van den Berg, M., et al. (22 additional authors). 1998. Toxic Equivalency Factors (TEFs) for PCBs, PCDDs, PCDFs, for humans and wildlife. Environmental Health Perspectives 106(12):775-792.

Whether or not an effluent limitation is required for 2,3,7,8-TCDD in accordance with section 1.3 of this Policy, each RWQCB shall require (as described below) major and minor POTW and industrial dischargers in its region to conduct effluent monitoring for the 2,3,7,8-TCDD congeners listed above. The purpose of the monitoring is to assess the presence and amounts of the congeners being discharged to inland surface waters, enclosed bays, and estuaries for the development of a strategy to control these chemicals in a future multi-media approach.

Within one year of the effective date of this Policy, each RWQCB shall either (1) amend the NPDES permits, or (2) send a written request for the information pursuant to California Water Code Section 13267 or 13383, for NPDES permittees in their respective regions, requiring, for a period of three consecutive years from the date the permit is amended or the request is sent, that: (1) each major POTW and major industrial discharger monitor its effluent for the presence of the 17 congeners once during dry weather and once during wet weather each of the three years; and (2) each minor POTW and minor industrial discharger monitor its effluent for the presence of the 17 congeners once during dry weather and once during wet weather for one year during the three-year period.

The RWQCB should coordinate this region-wide monitoring to provide data that are consistent with the purpose of the provisions of this section to the extent possible. The RWQCB shall encourage public and private dischargers, and local governments, to develop a coordinated, cooperative regional monitoring program to gather this information.

The RWQCB shall require the discharger to report for each congener the analytical results of the effluent monitoring, including the quantifiable limit[5] and the MDL, and the measured or estimated concentration. In addition, the RWQCB shall require the discharger to multiply each measured or estimated congener concentration by its respective TEF value (presented above) and report the sum of these values. This information shall be submitted to the RWQCB as part of the discharger's self-monitoring reports, in accordance with section 2.3. The RWQCB shall, subsequently, submit the information to the SWRCB.

Based on the monitoring results, the RWQCB may, at its discretion, increase the monitoring requirement (e.g., increase sampling frequency) to further investigate frequent or significant detections of any congener. At the conclusion of the three-year monitoring period, the SWRCB and RWQCBs will assess the data (a total of six samples each from major POTWs and industrial dischargers, and a total of two samples each from minor POTWs and industrial dischargers), and determine whether further monitoring is necessary.

[5] As determined by the procedure found in section 2.4.3, number 5.

4. TOXICITY CONTROL PROVISIONS

This section establishes minimum toxicity control requirements for implementing the narrative toxicity objectives for aquatic life protection in RWQCB basin plans. These provisions are intended to supplement basin plan requirements and do not supersede existing RWQCB toxicity requirements.

Water Quality-Based Toxicity Control

A chronic toxicity effluent limitation is required in permits for all discharges that will cause, have reasonable potential to cause, or contribute to chronic toxicity in receiving waters.

To determine compliance with the chronic aquatic life toxicity objective in a RWQCB basin plan, or an effluent limitation based on the objective, the RWQCB shall require, in a permit or other appropriate order, the use of short-term chronic toxicity tests. At least three test species with approved test protocols shall be used to measure compliance with the toxicity objective. If possible, the test species shall include a vertebrate, an invertebrate, and an aquatic plant. After a screening period, monitoring may be reduced to the most sensitive species. Dilution and control waters should be obtained from an area unaffected by the discharge in the receiving waters. For rivers and streams, dilution water should be obtained immediately upstream of the wastewater outfall. Standard dilution water can be used if the above sources exhibit toxicity or if approved by the RWQCB. The sensitivity of the test organisms to a reference toxicant shall be determined concurrently with each bioassay and reported with the test results.

The tests contained in Appendix II, "Chapter IV. Compliance With Toxicity Limitations and Objectives", of the California Ocean Plan (amended March 20, 1997 and effective July 23, 1997) are incorporated by reference and one or more of these tests shall be used to measure toxicity in salt water. This incorporation-by-reference is prospective, including future changes to the incorporated provisions as the changes take effect. One or more of the tests in Table 5 shall be used to measure chronic toxicity in fresh water.

Table 5. Short-term Methods for Estimating Chronic Toxicity-Fresh Water

Species	Effect	Test duration (days)
fathead minnow (*Pimephales promelas*)	larval survival; growth	7
water flea (*Ceriodaphnia dubia*)	survival; number of young	6 to 8
alga (*Selenastrum capricornutum*)	growth rate	4

Toxicity Test Reference: U.S. EPA. 1994. Short-term methods for estimating the chronic toxicity of effluents and receiving waters to freshwater organisms. Third edition. U.S. EPA Environmental Monitoring Systems Laboratory, Cincinnati, Ohio. EPA/600/4-91-002.

Toxicity Reduction Requirements

If a discharge causes or contributes to chronic toxicity in a receiving water body, a *toxicity reduction evaluation (TRE) is required. Where multiple dischargers to the same water body are required to conduct TREs, the TREs may be coordinated with the approval of the RWQCB. The TRE shall include all reasonable steps to identify the source(s) of toxicity. Once the source of toxicity is identified, the discharger shall take all reasonable steps necessary to eliminate toxicity.

The following shall be incorporated into permits: (1) a requirement to conduct a TRE if repeated tests reveal toxicity as a result of the waste discharge; (2) a provision requiring a discharger to take all reasonable steps to control toxicity once the source of toxicity is identified; and (3) a statement that failure to conduct required toxicity tests or a TRE within a designated period shall result in the establishment of effluent limitations for chronic toxicity in a permit or appropriate enforcement action.

5. SPECIAL PROVISIONS

The following sections include provisions that address certain discharges and factors that could affect the application of other provisions in this Policy. They include: (1) nonpoint source discharges (section 5.1); (2) site-specific objectives (section 5.2); and (3) exceptions to the Policy provisions (section 5.3).

5.1 Nonpoint Source Discharges

It is the intent of the SWRCB, in adopting this Policy, that the implementation of the priority pollutant criteria/objectives and other requirements of this Policy for nonpoint source discharges shall be consistent with the State's " Policy for the Implementation and Enforcement of the Nonpoint Source Pollution Control Program, 2004."

5.2 Site-Specific Objectives

If a priority pollutant criterion or objective is inappropriate for a particular water body (i.e., it does not protect the beneficial uses or, based on site-specific conditions, a less stringent standard may be warranted), a water quality objective that differs from the applicable criterion or objective may be developed for the site. A RWQCB may develop site-specific objectives whenever it determines, in the exercise of its professional judgement, that it is appropriate to do so. Where a priority pollutant criterion or objective is not being attained in the water body, under certain circumstances, it may be more appropriate to pursue other approaches to achieve the applicable criterion or objective rather than develop a site-specific objective. These approaches include, but are not limited to, watershed management and development of TMDLs (see Appendix 5 and Appendix 6). The RWQCB may investigate, facilitate, or implement such approaches as appropriate.

Regardless of an action taken by the RWQCB as described above, the RWQCB shall, at a public meeting, consider initiating the development of a site-specific objective under the following conditions:

(1) A written request for a site-specific study, accompanied by a preliminary commitment to fund the study, subject to development of a workplan[6], is filed with the RWQCB; and

(2) Either:

(a) a priority pollutant criterion or objective is not achieved in the receiving water; or
(b) a holder of an NPDES permit demonstrates that they do not, or may not in the future, meet an existing or potential effluent limitation based on the priority pollutant criterion or objective; and

(3) A demonstration that the discharger cannot be assured of achieving the criterion or objective and/or effluent limitation through reasonable treatment, source control, and *pollution prevention measures. This demonstration may include, but is not limited to, as determined by the RWQCB:

(a) an analysis of compliance and consistency with all relevant federal and State plans, policies, laws, and regulations;
(b) a thorough review of historical limits and compliance with those limits;
(c) a thorough review of current technology and technology-based limits; and
(d) an economic analysis of compliance with the priority pollutant criterion or objective of concern.

During the period when site-specific objectives studies are being conducted, the RWQCB shall place effluent limitations based upon the applicable priority pollutant criteria or objectives into permits only in conjunction with an appropriate compliance schedule and interim requirements, as described in sections 2.1 and 2.2.

A discharger subject to a schedule for compliance with a CTR criterion or CTR criterion-based effluent limitations, as described in section 2.1, may choose to, concurrently with the actions necessary to achieve compliance, conduct the studies necessary to support the development and adoption of a site-specific objective.[7]

Following adoption of a site-specific objective by the RWQCB, existing effluent limitations shall be replaced with effluent limitations (calculated as described in section 1.4) based on the adopted site-specific objective if the analysis in section 1.3 indicates that a limitation for the pollutant is required. In the event that, for reasons beyond the control of the discharger, a decision whether or not to adopt site-specific objectives has not been made by the RWQCB before the end of the compliance schedule, the compliance schedule shall be extended for an additional period to allow time for a decision whether or not to adopt the objective. However, in no event may a compliance schedule exceed the maximum time period allowed for compliance with the CTR criteria (as described in section 2.1) or priority pollutant objectives (as described in the basin plan, if applicable), unless an exception has been granted (in accordance with section 5.3).

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[6] The elements presented under the "Special Studies Process" in Appendix 5 should be considered in developing the site-specific objectives workplan.

[7] A RWQCB may include a compliance schedule in a water quality standard based on a site-specific objective. Such a compliance schedule is separate and distinct from the compliance schedules established by this Policy.

Development of Site-Specific Objectives

Water quality objectives shall be developed in a manner consistent with State and federal law and regulations. In accordance with the State's Porter-Cologne Water Quality Control Act (Division 7 of the Water Code), objectives must provide for the reasonable protection of beneficial uses based on consideration of the factors listed in Water Code Section 13241. In accordance with federal law (CWA) and regulations (40 CFR 131.11, revised as of July 1, 1997), the objectives must be based on sound scientific rationale and protect the designated beneficial uses of the receiving water.

The RWQCB shall use scientifically defensible methods appropriate to the situation to derive the objectives. Such methods may include U.S. EPA-approved methods (e.g., Water Effects Ratio [WER] procedure, recalculation procedure, a combination of recalculation and WER procedures, Resident Species Procedure), and/or other methods specified in the workplan.

A site-specific objective adopted by the RWQCB may include a compliance schedule. However, if attainment of the potential objective(s) developed under the study is anticipated to be infeasible (as defined in 40 CFR 131.10(g), revised as of July 1, 1997), or if the RWQCB otherwise determines it is appropriate, a *use attainability analysis (UAA) may be conducted. The RWQCB shall conduct, with the participation of interested persons, as appropriate, the UAA in accordance with 40 CFR 131.10(j) (revised as of July 1, 1997). If the UAA shows that attainment of the designated beneficial use(s) is not feasible (pursuant to 40 CFR 131.10(g) (revised as of July 1, 1997), the RWQCB shall designate an alternative beneficial use or subcategory of use, and develop appropriate water quality objectives to protect the new use(s). Both the use(s) and the objective(s) established to protect it would be reevaluated during the triennial reviews of the State's water quality standards.

5.3 Exceptions

Categorical and case-by-case exceptions to this Policy may be granted pursuant to the provisions below.

Categorical Exceptions

The RWQCB may, after compliance with the California Environmental Quality Act (CEQA), allow short-term or seasonal exceptions from meeting the priority pollutant criteria/objectives if determined to be necessary to implement control measures either:

1. for resource or pest management (i.e., vector or weed control, pest eradication, or fishery management) conducted by *public entities or *mutual water companies to fulfill statutory requirements, including, but not limited to, those in the California Fish and Game, Food and Agriculture, Health and Safety, and Harbors and Navigation codes; or

2. regarding drinking water conducted to fulfill statutory requirements under the federal Safe Drinking Water Act or the California Health and Safety Code. Such categorical exceptions may also be granted for draining water supply reservoirs, canals, and pipelines for maintenance, for draining municipal storm water conveyances for cleaning or maintenance, or for draining water treatment facilities for cleaning or maintenance.

For each project, the discharger shall notify potentially affected public and governmental agencies. Also, the discharger shall submit to the Executive Officer of the appropriate RWQCB, for approval:

(1) A detailed description of the proposed action, including the proposed method of completing the action;

(2) A time schedule;

(3) A discharge and receiving water quality monitoring plan (before project initiation, during the project, and after project completion, with the appropriate quality assurance and quality control procedures);

(4) CEQA documentation;

(5) Contingency plans;

(6) Identification of alternate water supply (if needed); and

(7) Residual waste disposal plans.

Additionally, upon completion of the project, the discharger shall provide certification by a qualified biologist that the receiving water beneficial uses have been restored.

To prevent unnecessary delays in taking emergency actions or to expedite the approval process for expected or routine activities that fall under categorical exceptions, the discharger is advised to file with the appropriate RWQCB, in advance of seeking RWQCB approval, the information required in items (1)-(7) above, to the extent possible.

Case-by-Case Exceptions

Where site-specific conditions in individual water bodies or watersheds differ sufficiently from statewide conditions and those differences cannot be addressed through other provisions of this Policy, the SWRCB may, in compliance with the CEQA, subsequent to a public hearing, and with the concurrence of the U.S. EPA, grant an exception to meeting a priority pollutant criterion/objective or any other provision of this Policy where the SWRCB determines:

1. The exception will not compromise protection of enclosed bay, estuarine, and inland surface waters for beneficial uses; and

2. The public interest will be served.

An example of where a case-by-case exception would be appropriate is where it is necessary to accommodate wastewater reclamation or water conservation.

APPENDIX 1

Definition of Terms

ACUTELY TOXIC CONDITIONS, as used in the context of mixing zones, refers to lethality that occurs to mobile aquatic organisms that move or drift through the mixing zone.

ARITHMETIC MEAN (μ), also called the average, is the sum of measured values divided by the number of samples. For ambient water concentrations, the arithmetic mean is calculated as follows:

Arithmetic mean = $\mu = \Sigma x / n$ where: Σx is the sum of the measured ambient water concentrations, and
n is the number of samples.

AVERAGE MONTHLY EFFLUENT LIMITATION (AMEL) means the highest allowable average of daily pollutant discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of measurements.

BEST MANAGEMENT PRACTICES (BMPs) are methods, measures, or practices designed and selected to reduce or eliminate the discharge of pollutants to surface waters from point and nonpoint source discharges including storm water. BMPs include structural and non-structural controls, and operation and maintenance procedures, which can be applied before, during, and/or after pollution producing activities.

BIOACCUMULATIVE pollutants are those substances taken up by an organism from its surrounding medium through gill membranes, epithelial tissue, or from food and subsequently concentrated and retained in the body of the organism.

BIOLOGICALLY-BASED RECEIVING WATER FLOW refers to the method for determining receiving water flows developed by the U.S. EPA Office of Research and Development which directly uses the averaging periods and exceedance frequencies specified in the acute and chronic aquatic life criteria for individual pollutants (e.g., 1 day and 3 years for acute criteria, and 4 days and 3 years for the chronic criteria). Biologically-based flows can be calculated using the program DFLOW.

CARCINOGENIC pollutants are substances that are known to cause cancer in living organisms.

COEFFICIENT OF VARIATION (*CV*) is a measure of the data variability and is calculated as the estimated standard deviation divided by the arithmetic mean of the observed values.

COMPLETELY-MIXED DISCHARGE condition means not more than a 5 percent difference, accounting for analytical variability, in the concentration of a pollutant exists across a transect of the water body at a point within two stream/river widths from the discharge point.

DILUTION CREDIT is the amount of dilution granted to a discharge in the calculation of a water quality-based effluent limitation, based on the allowance of a specified mixing zone. It is calculated from the dilution ratio or determined through conducting a mixing zone study or modeling of the discharge and receiving water.

DILUTION RATIO is the critical low flow of the upstream receiving water divided by the flow of the effluent discharged.

DISCHARGER-SPECIFIC WER is a WER that is applied to individual pollutant limits in an NPDES permit issued to a particular permit holder. A discharger-specific WER applies only to the applicable limits in the discharger's permit. Discharger-specific WERs are distinguished for WERs that are developed on a waterbody or watershed basis as part of a water quality standards action resulting in adoption of an SSO.

DYNAMIC MODELS used for calculating effluent limitations predict the effects of receiving water and effluent flow and of concentration variability. The outputs of dynamic models can be used to base effluent limitations on probability estimates of receiving water concentrations rather than critical conditions (which are used in the steady-state model). The three dynamic modeling techniques recommended by the U.S. EPA for calculating effluent limitations are continuous simulation, Monte Carlo simulation, and lognormal probability modeling.

EFFLUENT CONCENTRATION ALLOWANCE (ECA) is a value derived from the water quality criterion/objective, dilution credit, and ambient background concentration that is used, in conjunction with the coefficient of variation for the effluent monitoring data, to calculate a long-term average (LTA) discharge concentration. The ECA has the same meaning as waste load allocation (WLA) as used in U.S. EPA guidance (Technical Support Document For Water Quality-based Toxics Control, March 1991, second printing, EPA/505/2-90-001).

ENCLOSED BAYS means indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost harbor works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays include, but are not limited to, Humboldt Bay, Bodega Harbor, Tomales Bay, Drake's Estero, San Francisco Bay, Morro Bay, Los Angeles-Long Beach Harbor, Upper and Lower Newport Bay, Mission Bay, and San Diego Bay. Enclosed bays do not include inland surface waters or ocean waters.

ESTIMATED CHEMICAL CONCENTRATION is the estimated chemical concentration that results from the confirmed detection of the substance by the analytical method below the ML value.

ESTUARIES means waters, including coastal lagoons, located at the mouths of streams that serve as areas of mixing for fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and seawater. Estuarine waters included, but are not limited to, the Sacramento-San Joaquin Delta, as defined in Water Code Section 12220,

Suisun Bay, Carquinez Strait downstream to the Carquinez Bridge, and appropriate areas of the Smith, Mad, Eel, Noyo, Russian, Klamath, San Diego, and Otay rivers. Estuaries do not include inland surface waters or ocean waters.

EXISTING DISCHARGER means any discharger that is not a new discharger. An existing discharger includes an "increasing discharger" (i.e., an existing facility with treatment systems in place for its current discharge that is or will be expanding, upgrading, or modifying its existing permitted discharge after the effective date of this Policy).

FOUR-DAY AVERAGE OF DAILY MAXIMUM FLOWS is the average of daily maximums taken from the data set in four-day intervals.

HARMONIC MEAN flows are expressed as $Q_{hm} = (n)/(\Sigma^{n}_{i=1} 1/x_i)$, where x_i = specific data values and n = number of data values.

INCOMPLETELY-MIXED DISCHARGE is a discharge that contributes to a condition that does not meet the meaning of a completely-mixed discharge condition.

INFEASIBLE means not capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors.

INLAND SURFACE WATERS are all surface waters of the State that do not include the ocean, enclosed bays, or estuaries.

LOAD ALLOCATION (LA) is the portion of a receiving water's total maximum daily load that is allocated to one of its nonpoint sources of pollution or to natural background sources.

LONG-TERM ARITHMETIC MEAN FLOW is at least two years of flow data used in calculating an arithmetic mean as defined in this appendix.

MAXIMUM DAILY FLOW is the maximum flow sample of all samples collected in a calendar day.

MAXIMUM DAILY EFFLUENT LIMITATION (MDEL) means the highest allowable daily discharge of a pollutant, over a calendar day (or 24-hour period). For pollutants with limitations expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

MEDIAN is the middle measurement in a set of data. The median of a set of data is found by first arranging the measurements in order of magnitude (either increasing or decreasing order). If the number of measurements (n) is odd, then the median = $X_{(n+1)/2}$. If n is even, then the median = $(X_{n/2} + X_{(n/2)+1})/2$ (i.e., the midpoint between the $n/2$ and $n/2+1$).

METHOD DETECTION LIMIT (MDL) is the minimum concentration of a substance that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero, as defined in 40 CFR 136, Appendix B, revised as of May 14, 1999.

MINIMUM LEVEL (ML) is the concentration at which the entire analytical system must give a recognizable signal and acceptable calibration point. The ML is the concentration in a sample that is equivalent to the concentration of the lowest calibration standard analyzed by a specific analytical procedure, assuming that all the method specified sample weights, volumes, and processing steps have been followed.

MIXING ZONE is a limited volume of receiving water that is allocated for mixing with a wastewater discharge where water quality criteria can be exceeded without causing adverse effects to the overall water body.

MUTAGENIC pollutants are substances that are known to cause a mutation (i.e., change in a gene or chromosome) in living organisms.

MUTUAL WATER COMPANY is defined in the Public Utilities Code, section 2725 as: "any private corporation or association organized for the purpose of delivering water to its stockholders and members at cost, including use of works for conserving, treating and reclaiming water".

NEW DISCHARGER includes any building, structure, facility, or installation from which there is, or may be, a discharge of pollutants, the construction of which commenced after the effective date of this Policy.

OBJECTIONABLE BOTTOM DEPOSITS are an accumulation of materials or substances on or near the bottom of a water body, which creates conditions that adversely impact aquatic life, human health, beneficial uses, or aesthetics. These conditions include, but are not limited to, the accumulation of pollutants in the sediments and other conditions that result in harm to benthic organisms, production of food chain organisms, or fish egg development. The presence of such deposits shall be determined by RWQCB(s) on a case-by-case basis.

OCEAN WATERS are the territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the SWRCB's California Ocean Plan.

PERSISTENT pollutants are substances for which degradation or decomposition in the environment is nonexistent or very slow.

POLLUTANT MINIMIZATION means waste minimization and pollution prevention actions that include, but are not limited to, product substitution, waste stream recycling, alternative waste management methods, and education of the public and businesses.

POLLUTION PREVENTION means any action that causes a net reduction in the use or generation of a hazardous substance or other pollutant that is discharged into water and includes,

but is not limited to, input change, operational improvement, production process change, and product reformulation (as defined in Water Code Section 13263.3). Pollution prevention does not include actions that merely shift a pollutant in wastewater from one environmental medium to another environmental medium, unless clear environmental benefits of such an approach are identified to the satisfaction of the SWRCB or RWQCB.

PROCESS OPTIMIZATION means minor changes to the existing facility and treatment plant operations that optimize the effectiveness of the existing treatment processes.

PUBLIC ENTITY includes the federal government or a state, county, city and county, city, district, public authority, or public agency.

SOURCE OF DRINKING WATER is any water designated as municipal or domestic supply (MUN) in a RWQCB basin plan.

STANDARD DEVIATION (σ) is a measure of variability that is calculated as follows:

$$\sigma = (\sum[(x - \mu)^2]/(n - 1))^{0.5}$$

where:

x is the observed value;

μ is the arithmetic mean of the observed values; and

n is the number of samples.

TERATOGENIC pollutants are substances that are known to cause structural abnormalities or birth defects in living organisms.

TOXICITY REDUCTION EVALUATION (TRE) is a study conducted in a step-wise process designed to identify the causative agents of effluent or ambient toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in toxicity. The first steps of the TRE consist of the collection of data relevant to the toxicity, including additional toxicity testing, and an evaluation of facility operations and maintenance practices, and best management practices. A Toxicity Identification Evaluation (TIE) may be required as part of the TRE, if appropriate. (A TIE is a set of procedures to identify the specific chemical(s) responsible for toxicity. These procedures are performed in three phases (characterization, identification, and confirmation) using aquatic organism toxicity tests.)

USE ATTAINABILITY ANALYSIS is a structured scientific assessment of the factors affecting the attainment of the use which may include physical, chemical, biological and economic factors as described in 40 CFR 131.10(g) (40 CFR 131.3, revised as of July 1, 1997).

WATER-EFFECT RATIO (WER) is an appropriate measure of the toxicity of a material obtained in a site water divided by the same measure of the toxicity of the same material obtained simultaneously in a laboratory dilution water.

1Q10 is the lowest flow that occurs for one day with a statistical frequency of once every 10 years.

7Q10 is the average low flow that occurs for seven consecutive days with a statistical frequency of once every 10 years.

90th PERCENTILE OF OBSERVED DATA is the measurement in the ordered set of data (lowest to highest) where 90 percent of the reported measurements are less than or equal to that value.

APPENDIX 2

Determination of Pollutants Requiring Water Quality-Based Effluent Limitations

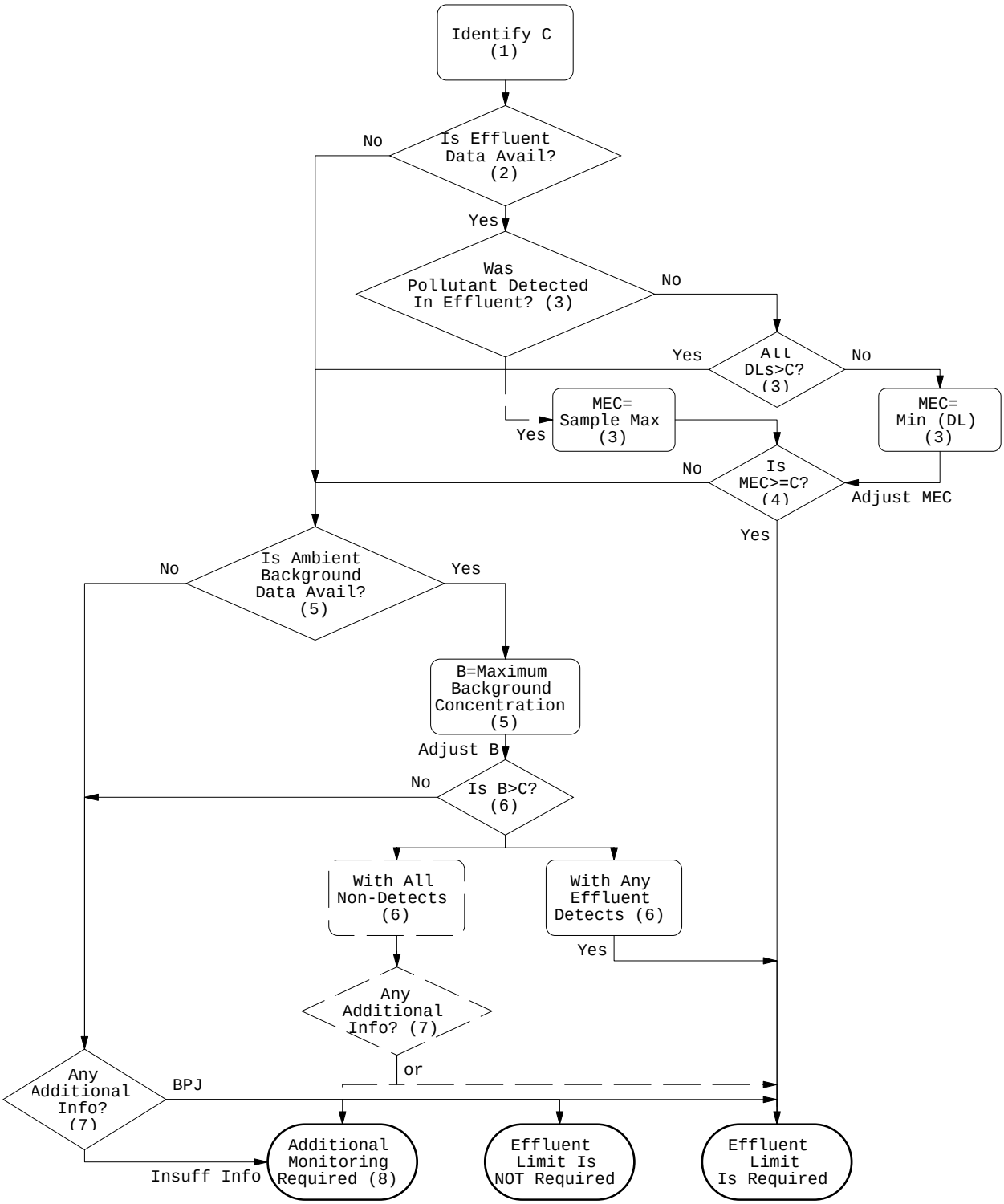

APPENDIX 3

U.S. Environmental Protection Agency Conversion Factors

Metal	Conversion Factor (CF) for Freshwater Acute Criteria	CF for Freshwater Chronic Criteria	CF for Saltwater Acute Criteria	CF(a) for Saltwater Chronic Criteria
Antimony	(d)	(d)	(d)	(d)
Arsenic	1.000	1.000	1.000	1.000
Beryllium	(d)	(d)	(d)	(d)
Cadmium (b)	0.944	0.909	0.994	0.994
Chromium (III)	0.316	0.860	(d)	(d)
Chromium (VI)	0.982	0.962	0.993	0.993
Copper	0.960	0.960	0.83	0.83
Lead (b)	0.791	0.791	0.951	0.951
Mercury	0.85	0.85	0.85	0.85
Nickel	0.998	0.997	0.990	0.990
Selenium	(c)	(c)	0.998	0.998
Silver	0.85	(d)	0.85	(d)
Thallium	(d)	(d)	(d)	(d)
Zinc	0.978	0.986	0.946	0.946

Footnotes:

(a) Conversion Factors for chronic marine criteria are not currently available. Conversion Factors for acute marine criteria have been used for both acute and chronic marine criteria.

(b) Conversion Factors for these pollutants are hardness dependent. CFs are based on a hardness of 100 mg/l as calcium carbonate ($CaCO_3$). Other hardness can be used; CFs should be recalculated using the following equations:
Cadmium: Acute: CF = 1.136672 - [(ln {hardness})(0.041838)]
Cadmium: Chronic: CF = 1.101672 - [(ln {hardness})(0.041838)]
Lead: Acute and Chronic: CF = 1.46203 - [ln {hardness})(0.145712)]

(c) Bioaccumulative compound and inappropriate to adjust to percent dissolved.

(d) U.S. EPA has not published an aquatic life criterion value.

NOTE: The term "Conversion Factor" represents the recommended conversion factor for converting a metal criterion expressed as the total recoverable fraction in the water column to a criterion expressed as the dissolved fraction in the water column. See "Office of Water Policy and Technical Guidance on Interpretation and Implementation of Aquatic Life Metals Criteria," October 1, 1993, by Martha G. Prothro, Acting Assistant Administrator for Water, available from the Water Resource Center, USEPA, 401 M St. SW., mail code RC 4100, Washington, DC 20460; and 40 CFR §131.36(b)(1).

Source: CTR (65 Fed. Register 31682-31719 (May 18, 2000), adding Section 131.38 to 40 CFR).

APPENDIX 4

SWRCB Minimum Levels in ppb (μg/L)

The Minimum Levels (MLs) in this appendix are for use in reporting and compliance determination purposes in accordance with section 2.4 of this Policy. These MLs were derived from data for priority pollutants provided by State certified analytical laboratories in 1997 and 1998. These MLs shall be used until new values are adopted by the SWRCB and become effective. The following tables (Tables 2a - 2d) present MLs for four major chemical groupings: volatile substances, semi-volatile substances, inorganics, and pesticides & PCBs.

Table 2a - VOLATILE SUBSTANCES*	GC	GCMS
1,1 Dichloroethane	0.5	1
1,1 Dichloroethene	0.5	2
1,1,1 Trichloroethane	0.5	2
1,1,2 Trichloroethane	0.5	2
1,1,2,2 Tetrachloroethane	0.5	1
1,2 Dichlorobenzene (volatile)	0.5	2
1,2 Dichloroethane	0.5	2
1,2 Dichloropropane	0.5	1
1,3 Dichlorobenzene (volatile)	0.5	2
1,3 Dichloropropene (volatile)	0.5	2
1,4 Dichlorobenzene (volatile)	0.5	2
Acrolein	2.0	5
Acrylonitrile	2.0	2
Benzene	0.5	2
Bromoform	0.5	2
Bromomethane	1.0	2
Carbon Tetrachloride	0.5	2
Chlorobenzene	0.5	2
Chlorodibromo-methane	0.5	2
Chloroethane	0.5	2
Chloroform	0.5	2
Chloromethane	0.5	2
Dichlorobromo-methane	0.5	2
Dichloromethane	0.5	2
Ethylbenzene	0.5	2
Tetrachloroethene	0.5	2
Toluene	0.5	2
trans-1,2 Dichloroethylene	0.5	1
Trichloroethene	0.5	2
Vinyl Chloride	0.5	2

*The normal method-specific factor for these substances is 1, therefore, the lowest standard concentration in the calibration curve is equal to the above ML value for each substance.

Table 2b - SEMI-VOLATILE SUBSTANCES*	GC	GCMS	LC	COLOR
1,2 Benzanthracene	10	5		
1,2 Dichlorobenzene (semivolatile)	2	2		
1,2 Diphenylhydrazine		1		
1,2,4 Trichlorobenzene	1	5		
1,3 Dichlorobenzene (semivolatile)	2	1		
1,4 Dichlorobenzene (semivolatile)	2	1		
2 Chlorophenol	2	5		
2,4 Dichlorophenol	1	5		
2,4 Dimethylphenol	1	2		
2,4 Dinitrophenol	5	5		
2,4 Dinitrotoluene	10	5		
2,4,6 Trichlorophenol	10	10		
2,6 Dinitrotoluene		5		
2- Nitrophenol		10		
2-Chloroethyl vinyl ether	1	1		
2-Chloronaphthalene		10		
3,3’ Dichlorobenzidine		5		
3,4 Benzofluoranthene		10	10	
4 Chloro-3-methylphenol	5	1		
4,6 Dinitro-2-methylphenol	10	5		
4- Nitrophenol	5	10		
4-Bromophenyl phenyl ether	10	5		
4-Chlorophenyl phenyl ether		5		
Acenaphthene	1	1	0.5	
Acenaphthylene		10	0.2	
Anthracene		10	2	
Benzidine		5		
Benzo(a) pyrene(3,4 Benzopyrene)		10	2	
Benzo(g,h,i)perylene		5	0.1	
Benzo(k)fluoranthene		10	2	
bis 2-(1-Chloroethoxyl) methane		5		
bis(2-chloroethyl) ether	10	1		
bis(2-Chloroisopropyl) ether	10	2		
bis(2-Ethylhexyl) phthalate	10	5		
Butyl benzyl phthalate	10	10		
Chrysene		10	5	
di-n-Butyl phthalate		10		
di-n-Octyl phthalate		10		
Dibenzo(a,h)-anthracene		10	0.1	
Diethyl phthalate	10	2		

Table 2b - SEMI-VOLATILE SUBSTANCES*	GC	GCMS	LC	COLOR
Dimethyl phthalate	10	2		
Fluoranthene	10	1	0.05	
Fluorene		10	0.1	
Hexachloro-cyclopentadiene	5	5		
Hexachlorobenzene	5	1		
Hexachlorobutadiene	5	1		
Hexachloroethane	5	1		
Indeno(1,2,3,cd)-pyrene		10	0.05	
Isophorone	10	1		
N-Nitroso diphenyl amine	10	1		
N-Nitroso-dimethyl amine	10	5		
N-Nitroso -di n-propyl amine	10	5		
Naphthalene	10	1	0.2	
Nitrobenzene	10	1		
Pentachlorophenol	1	5		
Phenanthrene		5	0.05	
Phenol **	1	1		50
Pyrene		10	0.05	

* With the exception of phenol by colorimetric technique, the normal method-specific factor for these substances is 1000, therefore, the lowest standard concentration in the calibration curve is equal to the above ML value for each substance multiplied by 1000.

** Phenol by colorimetric technique has a factor of 1.

Table 2c – INORGANICS*	FAA	GFAA	ICP	ICPMS	SPGFAA	HYDRIDE	CVAA	COLOR	DCP
Antimony	10	5	50	0.5	5	0.5			1000
Arsenic		2	10	2	2	1		20	1000
Beryllium	20	0.5	2	0.5	1				1000
Cadmium	10	0.5	10	0.25	0.5				1000
Chromium (total)	50	2	10	0.5	1				1000
Chromium VI	5							10	
Copper	25	5	10	0.5	2				1000
Cyanide								5	
Lead	20	5	5	0.5	2				10,000
Mercury				0.5			0.2		
Nickel	50	5	20	1	5				1000
Selenium		5	10	2	5	1			1000
Silver	10	1	10	0.25	2				1000
Thallium	10	2	10	1	5				1000
Zinc	20		20	1	10				1000

* The normal method-specific factor for these substances is 1, therefore, the lowest standard concentration in the calibration curve is equal to the above ML value for each substance.

Table 2d - PESTICIDES – PCBs*	GC
4,4'-DDD	0.05
4,4'-DDE	0.05
4,4'-DDT	0.01
a-Endosulfan	0.02
a-Hexachloro-cyclohexane	0.01
Aldrin	0.005
b-Endosulfan	0.01
b-Hexachloro-cyclohexane	0.005
Chlordane	0.1
d-Hexachloro-cyclohexane	0.005
Dieldrin	0.01
Endosulfan Sulfate	0.05
Endrin	0.01
Endrin Aldehyde	0.01
Heptachlor	0.01
Heptachlor Epoxide	0.01
Lindane(g-Hexachloro-cyclohexane)	0.02
PCB 1016	0.5
PCB 1221	0.5
PCB 1232	0.5
PCB 1242	0.5
PCB 1248	0.5
PCB 1254	0.5
PCB 1260	0.5
Toxaphene	0.5

* The normal method-specific factor for these substances is 100, therefore, the lowest standard concentration in the calibration curve is equal to the above ML value for each substance multiplied by 100.

Techniques:

GC - Gas Chromatography
GCMS - Gas Chromatography/Mass Spectrometry
HRGCMS - High Resolution Gas Chromatography/Mass Spectrometry (i.e., EPA 1613, 1624, or 1625)
LC - High Pressure Liquid Chromatography
FAA - Flame Atomic Absorption
GFAA - Graphite Furnace Atomic Absorption
HYDRIDE - Gaseous Hydride Atomic Absorption
CVAA - Cold Vapor Atomic Absorption
ICP - Inductively Coupled Plasma
ICPMS - Inductively Coupled Plasma/Mass Spectrometry
SPGFAA - Stabilized Platform Graphite Furnace Atomic Absorption (i.e., EPA 200.9)
DCP - Direct Current Plasma
COLOR - Colorimetric

APPENDIX 5

Special Studies

Pre-Evaluation for Special Studies
Decision Tree with Attached Narrative Discussion

A special study is sometimes conducted as part of a regulatory process (standard setting and permit writing) and may be conducted as part of a collaborative watershed planning effort. Special studies can provide site-specific data that can assist in decision-making regarding water quality and beneficial use issues.

Many water quality problems may be best addressed on a watershed or water body basis. The SWRCB believes that stakeholders should be able to develop flexible and innovative solutions for water quality problems in their watershed. For special studies conducted as part of a watershed management plan, the watershed management group should be involved in the design of the study, and study information should be provided back to the committee. Watershed or water body studies may gather data regarding topics such as:

- TMDLs, WLAs, and LAs (see Appendix 6);
- Regional ambient monitoring (regional ambient monitoring is the collection of scientific information regarding water quality and impacts to beneficial uses for a specified portion of, or an entire, watershed or water body); and
- Contaminant fate and transport monitoring (contaminant fate and transport monitoring is the gathering of scientific information regarding how a specific pollutant[s] moves through the environment and how the pollutant[s] degrades or is otherwise transformed in the environment).

These types of studies are useful to collect integrated, comprehensive, and systematic data regarding:

- Baseline concentrations of toxic pollutants in the water and sediment;
- Seasonal, annual, and long-term trends in water quality;
- Causes and effects of water quality problems;
- Effectiveness of a water quality control effort;

- Greater certainty regarding existing monitoring data; etc.

Any of the studies discussed below may be undertaken as part of a watershed approach to addressing regional water quality issues. Information collected as part of a watershed or water body study can be used as a way to define parameters (e.g., ambient background concentrations, mixing zones, etc.) related to the development of effluent limitations as part of the permitting process or to evaluate whether changes in water quality standards are appropriate. A watershed or water body approach is also useful to dischargers because information collected as a part of one effluent limitation or standard-setting study can be shared with other stakeholders in the same water body.

Studies for Setting Effluent Limitations

Studies regarding establishing effluent limitations can be done as part of the permitting process. Such studies may be simpler and there may be fewer interested stakeholders than studies involving more than one discharger, or an entire water body or watershed. However, when such studies are undertaken individually, the discharger, the RWQCB, and other stakeholders do not gain the benefit of data collected from others in the watershed.

Special studies may address topics such as the following:

- Determining pollutants requiring effluent limitations (see section 1.3);
- Metals translators (see section 1.4.1); or
- Mixing zones (see section 1.4.2).

Studies For Changes to Water Quality Standards

Establishing or modifying water quality standards (i.e., beneficial uses and water quality criteria/objectives) may involve complex and resource intensive studies. A detailed workplan will normally be needed because early planning and coordination with the RWQCB and U.S. EPA is critical to the development of a successful study. In addition, a workplan will normally be appropriate because there will be more stakeholder interest and involvement of other public agencies (e.g., Department of Fish and Game, U.S. Fish and Wildlife Service, etc.). Involvement in a watershed management planning effort would facilitate the sharing of information among stakeholders in the watershed, both in gathering information for the study and in sharing the results. Studies related to changes in water quality standards may address topics such as the following:

- Site-specific objective studies (see section 5.2); and

- Use attainability analysis (UAA) (see section 5.2).

Pre-Evaluation

As a first step in determining whether and how to conduct a special study, the RWQCB or other stakeholders may want to evaluate whether it would be appropriate to address a water quality issue through a watershed management approach. To do that, the factors in the following flowchart may be considered:

1. Is there a watershed management group?[a]		
↓ Yes		
2. Has a watershed management approach been developed?[b]	→→→→→ No	GO TO start of Decision Tree[d] if water issue involves toxics.
↓ Yes		
3. Are toxic pollutants part of the reason beneficial uses are impaired or water quality objectives are exceeded?[c]	→→→→→ No	Issue is outside scope of this Policy.
↓ Yes		
GO TO #9 in Decision Tree[d], or other point in Decision Tree as determined by stakeholders.		

[a] Is there a committee of local interests in both the public and private sectors that are actively involved in the management of the watershed area?

[b] Has a watershed management approach that identifies key issues, boundaries, objectives, and early actions been developed?

[c] A study may be necessary to determine whether toxics are part of the cause of the impairment of beneficial uses. This Policy applies only to the CTR and NTR criteria~~,~~ and applicable chemical-specific basin plan objectives for priority toxic pollutants.

[d] The decision tree is on page DRAFT APPENDIX 5 - 6.

The decision tree and associated narrative discussion in Appendix 5 are provided to assist RWQCBs and stakeholders in identifying whether there is a current or potential water quality issue requiring attention [Compliance Status], the nature of the identified water quality issue [Screening-level Evaluation], and possible action to address the issue [Potential Options].

Based on this information, the RWQCB and stakeholders can determine whether a special study is needed and the scope of the study. This approach can help avoid initiation of costly and time-consuming studies which are not appropriately designed to resolve the specific issue in question. The decision tree is not meant to preclude the exploration of any other creative solutions; it is meant to encourage constructive dialogue among stakeholders.

Two specific considerations should be kept in mind when conducting the pre-evaluation suggested by this decision tree. First, users must be familiar with the quality of the data under review and the potential need to augment data which are not of adequate quality. Second, users should know what the existing beneficial uses are (i.e., uses attained since 1975).

Special Studies Process

A. Workplan

If appropriate, the RWQCB may participate in developing a detailed workplan with interested persons (which can include, but are not limited to, U.S. EPA, the RWQCB, the SWRCB, and affected dischargers) prior to proceeding with a special study. The workplan may include the following elements:

(1) Formation of a project team for the workplan, which may include the Department of Fish and Game, the U.S. Fish and Wildlife Service, and other stakeholders;

(2) Purpose of the workplan;

(3) Responsibilities of the persons associated with the workplan;

(4) Budget and cost-sharing plan. This plan must be determined on a case-by-case basis; however, the SWRCB encourages sharing of costs (based on availability of funding), where there are multiple persons who wish to support the goals of the study;

(5) Development of the following elements:

(a) Identification of tasks(s),
(b) Purpose of tasks(s),
(c) Method by which task(s) will be implemented,
(d) Products of the tasks(s),
(e) Schedule for the task(s),
(f) Responsibility for implementing the task(s), and
(g) Budget and funding for the task(s);

(6) Administrative policies and procedures to govern oversight of the special studies process (e.g., amending the workplan, conflict resolution, etc.); and

(7) Project schedule.

B. Scientific Review Panel

If, during the data interpretation phase of a special study, the RWQCB, SWRCB, U.S. EPA, or other stakeholders have differing opinions with regard to the interpretation of data, the RWQCB and stakeholders may want to seek the advice of an independent scientific review panel. The method of selecting the panel, cost reimbursement, and other details regarding the conflict resolution process could be included in the workplan.

C. Compliance Schedule

A permit compliance schedule (as described in section 2.1) may allow sufficient time for collection of data, completion of a study, and determination of compliance measures. While special studies are being conducted, interim requirements may be established by the RWQCB (as described in section 2.2). However, in no event may a compliance schedule exceed the time period allowed in this Policy, unless an exception has been granted.

D. Environmental and Economic Impacts

To ensure that environmental and economic impacts are adequately addressed, the RWQCB staff shall, as part of the special study workplan:

(1) Comply with CEQA, if applicable; and

(2) Direct the preparation of an analysis documenting economic impacts if site-specific objectives or a change in designated beneficial uses is being considered under 40 CFR 131.10(g)(6), revised as of July 1, 1997.

E. Antidegradation and Other Legal Requirements

RWQCB staff shall, as part of the special study workplan, ensure compliance with SWRCB Resolution No. 68-16 (Statement of Policy with Respect to Maintaining High Quality of Waters in California) and any other applicable legal requirements.

Pre-Evaluation for Special Studies
Decision Tree with Attached Narrative Discussion

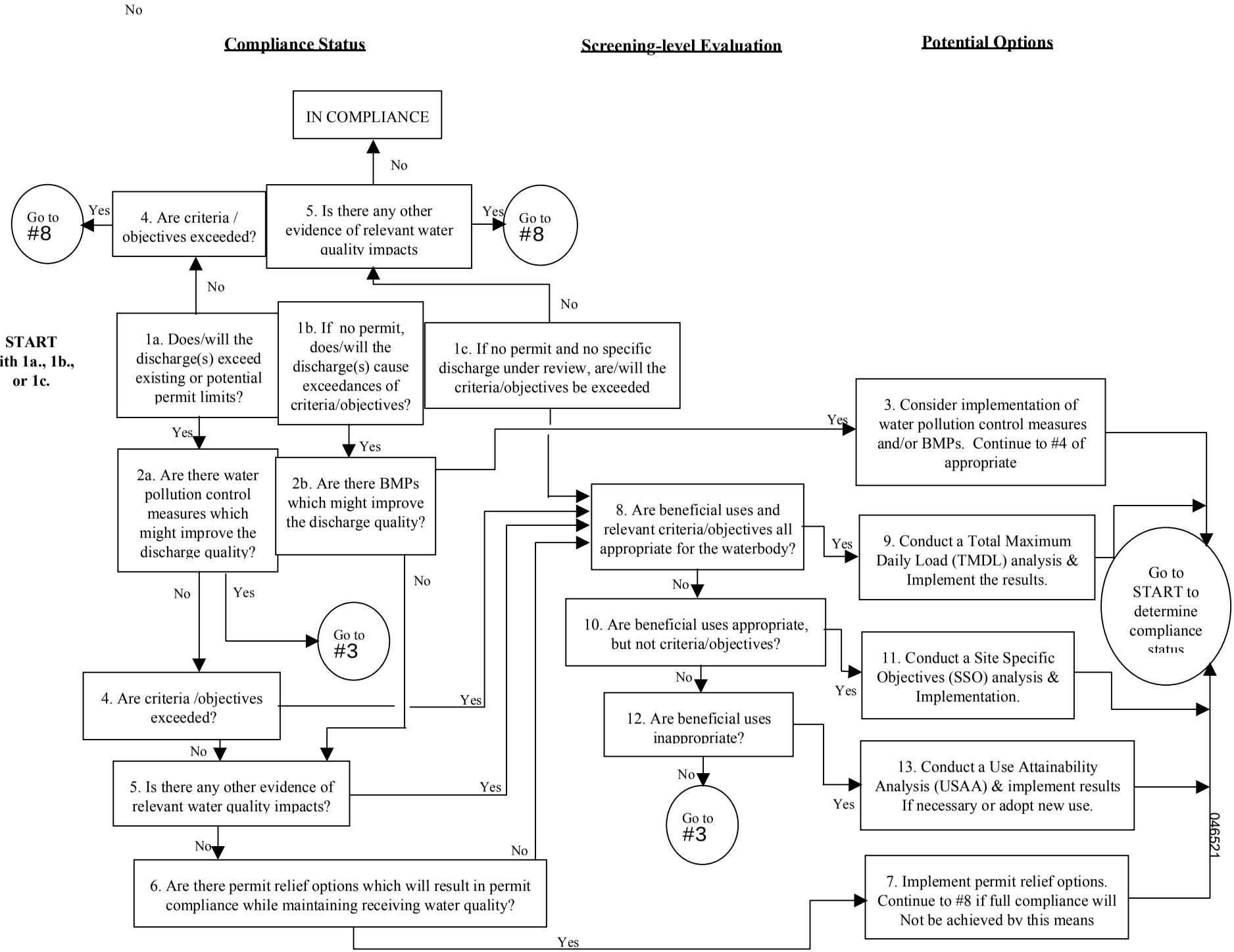

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Narrative Discussion of Decision Tree:

la. Does/will a discharge exceed existing or potential permit limits for toxic pollutants? This question applies to discharges regulated by a National Pollutant Discharge Elimination System (NPDES) permit or Waste Discharge Requirements (WDRs). If the discharge(s) in question is not regulated by a discharge permit, proceed to #1b. It is assumed that data used to answer this question are reliable.

1b. If no permit, does the discharge(s) cause exceedances of criteria/objectives? This question primarily applies to nonpoint discharges, though it could conceivably apply to point source discharges which are not currently permitted. It is assumed that data used to answer this question are reliable.

1c. If no permit and no specific discharge(s) are under review, are criteria/objectives exceeded? It is assumed that data used to answer this question are reliable.

2a. Are there water pollution control measures which might improve the water quality? A water pollution control program may include, as appropriate: pollution control technologies; pretreatment requirements; and pollution prevention, waste minimization, and source control measures. This question is meant to elicit consideration of effluent quality control measures which could be implemented as a full or partial solution to the identified permit noncompliance issue. It is not intended as a barrier to the exploration of other potential forms of regulatory adjustment.

2b. Are there Best Management Practices (BMPs) which might improve water quality? BMPs are pollution management measures designed to reduce the water quality impacts, where they exist, associated primarily with non-point source discharges. As with #2a above, this question is meant to elicit consideration of discharge control measures which could be implemented as a full or partial solution to the identified noncompliance issue. It is not intended as a barrier to the exploration of other potential forms of regulatory adjustment.

3. Consider whether implementation of water pollution control measures and/or BMPs will lead to compliance. Simultaneously, continue to #4 if deemed appropriate, considering such questions as whether or not full compliance will be achieved by these means, or whether it would be cost effective. As stated, the simple determination that implementation of pollution control measures and/or BMPs might improve the discharge or water quality should not preclude the exploration of other potential regulatory adjustment options, as well. For clarity, the reviewer should proceed not to box four prime, but to box four.

4. Are criteria/objectives exceeded? It is assumed that data used to answer this question are reliable and appropriate hardness adjustments have been made.

5. Is there any other evidence of relevant water quality impacts? This question is meant to capture those situations, where the criteria/objective for the pollutant of concern do not exist or appear to be under protective. "Other evidence" might include: bioconcentration or biocriteria data, population studies, food web analyses, etc. Impacts to wildlife should be considered as should impacts to threatened and endangered species. The potential for impacts to be of a seasonal nature should also be considered in this pre-evaluation. "Relevant water quality impacts" are those impacts which have a demonstrable relationship to the pollutant(s) of concern.

6. Are there permit relief options which will result in permit compliance while maintaining receiving water quality? Permit relief options might include, where appropriate: development of a mixing zone, modification of the averaging periods, adoption of a variance, etc. For unpermitted discharges or pre-evaluations involving no specific discharges, the user should continue to box #8.

7. Implement permit relief options. Continue to #8 if full compliance will not be achieved by these means. The development of permit relief options would occur through a request to the RWQCB.

8. Are beneficial uses and criteria/objectives both appropriate for the water body? To answer this question, a screening-level evaluation may be necessary, including an evaluation of the associated regulatory history; the site-specific conditions; and the status of current, applicable scientific understanding. It is assumed that data used to answer this question are reliable.

   This question is best answered when a watershed stakeholder group has formed and collectively either: 1) evaluated the condition of the watershed through a watershed management plan, 2) evaluated the condition of the watershed through less formal means, or 3) convened discussions regarding the condition of the watershed. If one does not currently exist, a watershed stakeholder group should be formed if it appears to be a useful forum for discussion and review. The following more specific questions may apply:

   - Is the water effluent dominated, agricultural drainage water dominated, etc.? These water bodies may be likely candidates for the appropriate application of regulatory adjustments (e.g., SSO or UAA).

   - Were the current beneficial uses applied on a national, state-wide, or region-wide basis or have they been specifically designated for the water body in question? While not the only candidates, water bodies for which beneficial uses have been applied on a national, state-wide, or region-wide basis may be candidates for the appropriate application of regulatory adjustments (e.g., SSO).

   - Are there rare, threatened, or endangered species, or ecological conditions which the currently applied beneficial uses do not adequately describe or the water quality objectives do not fully protect?

- Has the beneficial use and the water quality necessary to maintain the beneficial use been attained since 1975?

- How do anti-degradation requirements apply?

- Are elevated constituents the result of 1) natural phenomena or 2) anthropogenic activities that ceased prior to 1975?

- Do the currently designated beneficial uses protect all existing and appropriate potential uses?

- Are natural, ephemeral, intermittent, or low flow conditions or water levels preventing the attainment of the designated non-existing uses?

- Are there human-caused conditions or sources of pollution which prevent attainment of the uses but either cannot be remedied or would cause greater environmental damage if corrected?

- Does the presence of dams, diversions, or other types of hydrologic modifications preclude the attainment of designated non-existing beneficial uses?

- Do the physical conditions of the water body preclude attainment of aquatic life protection uses (i.e., lack of proper substrate, cover, flow, depth, pools, riffles, and the like)?

- Does attainment of designated beneficial uses require the application of controls which would result in substantial and widespread economic and social impact?

- Have the appropriate water characteristics (e.g., hardness, pH) been accounted for in the CTR criteria?

- Has an appropriate set of species been evaluated in setting the CTR criteria and toxicity objective?

9. Conduct a total maximum daily load analysis and implement the results. Conducting a TMDL could result in, among other things, waste load allocations, BMP implementation for non-point dischargers, and/or effluent trading options for point and non-point source dischargers. (See Appendix 6 regarding TMDLs.)

10. Are beneficial uses appropriate but not criteria/objectives for toxic pollutants? See #8 above.

11. Conduct a site-specific objectives analysis. An SSO study will include one or more of the following activities:

- Recalculation of objective;
- Water effects ratio or other similar method; or
- Any scientifically defensible process.

U.S. EPA's "Guidelines for Deriving Numerical Aquatic Site Specific Water Quality Criteria by Modifying National Criteria," dated 1984 (EPA-600/3-84-099) provides guidance for conducting an SSO study.

U.S. EPA's "Water Quality Standards Handbook" dated 1994 also provides general guidance in this area.

12. Are beneficial uses inappropriate? See #8 above.

13. Conduct a use attainability analysis (UAA) and implement the results. When a use is proposed for dedesignation, i.e., removed or replaced with a subcategory requiring less stringent standards, a UAA is necessary. In a case where a use is proposed to be added, a UAA is not necessary. A new use designation can be added for a water body following the normal public review process. A UAA will determine if physical, chemical, and/or biological factors affect the attainability of a designated use via a water body survey and assessment. An analysis of economic factors can also be included to determine whether substantial and widespread economic and social impacts would be caused by stringent pollution control requirements.

    U.S. EPA's "Technical Support Manual: Water body Survey and Assessment for Conducting Use Attainability Analyses" dated 1983 provides guidance for conducting a UAA as does Region 9's Interim Final "Guidance for Modifying Water Quality Standards and Protecting Effluent-Dependent Ecosystems" dated 1992. U.S. EPA's "Water Quality Standards Handbook" dated 1994 also provides general guidance in this area.

APPENDIX 6

Watershed Management and TMDLs

Watershed Management

The SWRCB will utilize and promote, to the extent feasible, a watershed approach to address water quality issues involving toxic pollutants. Compared to the more traditional, programmatic approach to water management, the watershed approach can look at all types of pollution and all sources of pollution. One consequence of the more global perspective is that attention can be trained on the most effective strategies for management (rather than the most programmatically expedient). Another consequence is that a much larger universe of interested persons becomes important to the management of water quality, and the ability to work with these people creates added value for water management. In utilizing the watershed approach, the SWRCB will work to marshall the expertise and resources of other agencies and the private sector to collaboratively manage water quality.

In a collaborative, stewardship effort, local interests are engaged with State and federal interests, and land managers, to work with water managers to solve complex resource management problems. A watershed perspective can also enhance interagency coordination by focusing programs on resource needs throughout the watershed.

Watershed management is an integrated holistic approach for restoring and protecting aquatic ecosystems and protecting human health in a geographic area. Watershed management may include diverse issues as defined by the watershed's stakeholders (persons with some interest in the watershed) to ensure comprehensive solutions. It reflects a growing consensus that many of the existing water quality problems can be best addressed by a more integrated, basin-wide approach. The purpose of watershed management is variously viewed as (1) a method for increasing participation at the local level in water quality protection, (2) an approach to reducing the impact of nonpoint sources, (3) a strategy for integrating management of all components of aquatic ecosystems, and (4) a process for optimizing the cost effectiveness of a blend of point and nonpoint source control efforts.

Whichever purpose or blend of purposes predominates, watershed management is not a new centralized program that competes with or replaces existing programs. The significant advantage of the watershed management approach is that it encourages a collaborative, stewardship-driven process where diverse interests (individuals, landowners, farmers, POTWs, industries, environmentalists, and agencies) can work in conjunction with SWRCB and RWQCB staff to develop a consensus on, and share responsibility for, addressing water quality problems. The watershed approach assumes all stakeholders are brought to the table; therefore, there should be one watershed group that can develop a plan for the watershed that addresses the interests of stakeholders in the watershed. Furthermore, watershed management provides a mechanism for considering social and economic interests, in the context of resolving water quality issues. The SWRCB and RWQCBs will work to preserve the integrity of the watershed process and facilitate an open and timely resolution of issues.

In some cases, there is no active watershed management group that has evolved far enough to have identified key issues, boundaries, objectives, and early actions. In these instances, a group of government agencies may work together to define the conditions in a water body and to identify the specific parameters contributing to beneficial use impairments. In any event, the RWQCBs may have to act more or less independently to meet legal requirements using primarily in-house staff. Participation from other interested persons, under these circumstances, is accomplished through the SWRCB and RWQCB public hearing processes.

Watershed management planning and implementation actions will occur primarily at the RWQCB and local level. However, the SWRCB will provide training in stewardship and watershed management, and support educational efforts involving K through 12 programs as well as land owners/managers.

TMDLs and Watershed Management

TMDLs are required for all waters listed pursuant to CWA Section 303(d)(1)(A). The SWRCB is committed to expeditiously addressing these water quality problems.

A TMDL establishes the amount of a pollutant that may be discharged into a water body and still maintain water quality standards with seasonal variations and a margin of safety that takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality. The TMDL process is defined in federal regulations (40 CFR 130.7, revised as of July 1, 1996) and generally consists of five steps:

(1) Identification by each state of water quality-limited waters that do not now, or are not expected to, attain state water quality standards after implementation of technology-based effluent limitations, more stringent effluent limitations required by federal, State, or local authority, and other pollution control requirements (e.g., best management practices) required by local, State, or federal authority, and identification of impairment;

(2) Establishment of priority rankings for the development of TMDLs;

(3) Development of waste load allocations (WLAs), load allocations (LAs), and TMDLs;

(4) Incorporation of the loadings in the RWQCB basin plans; and

(5) Submittal of segments identified, priority ranking, and loads established to U.S. EPA for approval.

Development of TMDLs can utilize the watershed approach to assess and identify water quality-limited segments and pollutants causing impairment, identify sources, and allocate pollutant loads. The watershed approach may address a broader range of issues than the TMDLs, but the approach can: (1) result in achieving or maintaining water quality standards so that waters are not added to the 303(d) list; (2) result in attainment of water quality standards, through means other than the TMDL process, so that waters can be removed from the 303(d) list; or (3) be used to develop TMDLs. A watershed group can develop a TMDL if the TMDL complies with applicable federal requirements.

046528

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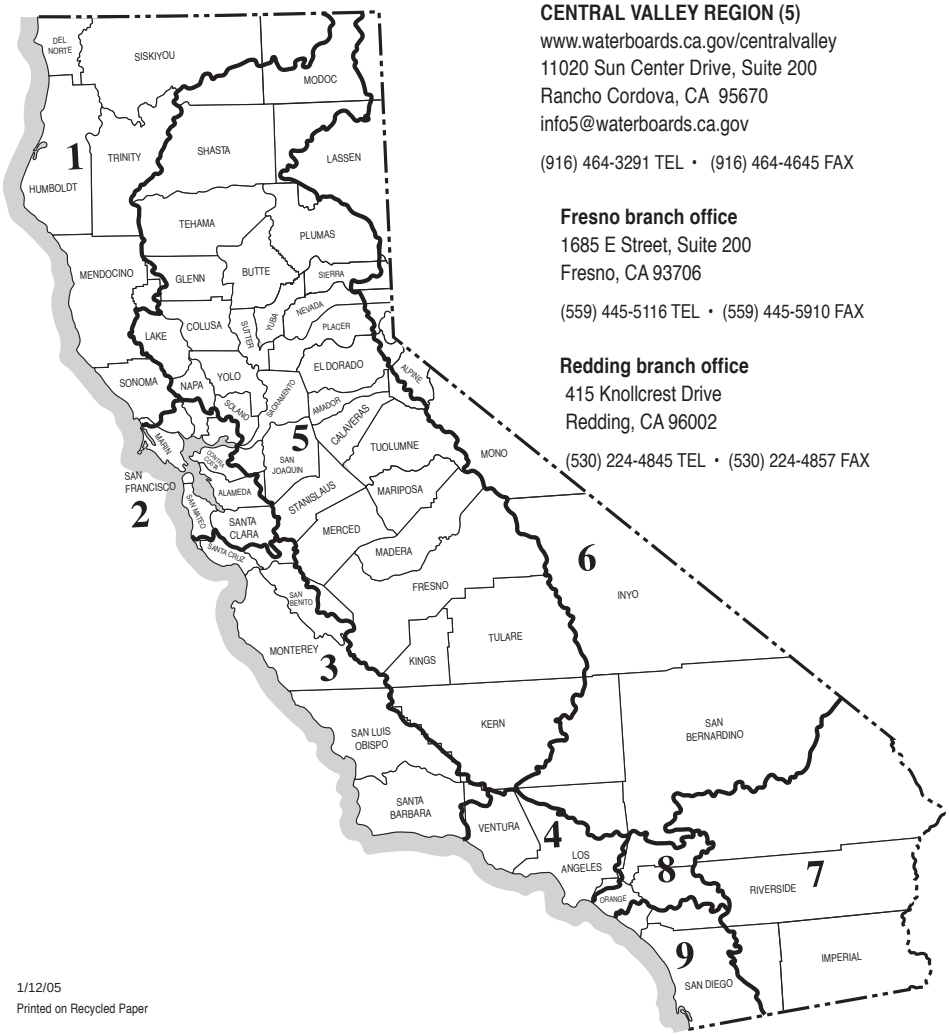

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SWAMP
Surface Water Ambient Monitoring Program

SWAMP Bioassessment Procedures 2007

Standard Operating Procedures for Collecting Benthic Macroinvertebrate Samples and Associated Physical and Chemical Data for Ambient Bioassessments in California

February 2007

CALIFORNIA Water Boards

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046530

Standard Operating Procedures for Collecting Benthic Macroinvertebrate Samples and Associated Physical and Chemical Data for Ambient Bioassessments in California

Prepared by: Peter R. Ode Peter Ode, SWAMP Bioassessment Coordinator, California Department of Fish and Game, Aquatic Bioassessment Laboratory

Preparation Date: January 23rd, 2007

Approved by: Beverly van Buuren, SWAMP QA Officer

Approval Date: 01/17/07

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ACKNOWLEDGEMENTS A

The protocols described here represent the contributions of a wide range of researchers and field crews. Most of the physical habitat methods are close modifications of those used in the U.S. Environmental Protection Agency's (EPA's) Environmental Monitoring and Assessment Program (EMAP) and developed by EPA's Office of Research and Development (ORD, Peck et al. 2004). The benthic macroinvertebrate collection methods are based on EMAP methods (EPA's targeted riffle methods were derived in turn from methods developed at Utah State University; Hawkins et al. 2003).

The current version of these protocols was established by Peter Ode (Department of Fish and Game's (DFG's) Aquatic Bioassessment Laboratory (ABL)) and David Herbst (UC Santa Barbara's Sierra Nevada Aquatic Research Laboratory) with significant contributions from staff at the ABL (Jim Harrington, Shawn McBride, Doug Post, Andy Rehn, and Jennifer York), the Surface Water Ambient Monitoring Program (SWAMP) Quality Assurance (QA) Team, Thomas Suk and other members of the SWAMP bioassessment committee (Mary Adams, Lilian Busse, Matt Cover, Robert Holmes, Sean Mundell, and Jay Rowan) and three external reviewers: Chuck Hawkins, Dave Peck, and Phil Kaufmann.

Ode, P.R.. 2007. Standard operating procedures for collecting macroinvertebrate samples and associated physical and chemical data for ambient bioassessments in California. California State Water Resources Control Board Surface Water Ambient Monitoring Program (SWAMP) Bioassessment SOP 001.

046534

SWAMP GUIDANCE SG

SWAMP GUIDANCE FOR MACROINVERTEBRATE FIELD PROTOCOLS FOR WADEABLE STREAMS

Background: The SWAMP Bioassessment Committee met in December, 2004, and agreed that the SWAMP Quality Assurance Management Plan (QAMP) should be amended to provide greater consistency in bioassessment sampling protocols for wadeable streams. The Committee's recommendations were reviewed and accepted by the full SWAMP Roundtable[1] in February, 2005 (some of the key considerations are contained in Appendix A).

The current guidance for macroinvertebrate sampling under the SWAMP program is as follows:

1. For ambient bioassessment monitoring of wadeable streams in California, two methods are to be used at sites with riffle habitats (i.e., one "multihabitat" sample, and one sample that targets the "richest" habitat):
   - **For sites with sufficient riffle habitat,** the two samples shall be: (1) the reachwide benthos (RWB) method (also known as "multihabitat" sampling.); and (2) the targeted-riffle composite (TRC) method.
   - **For low-gradient sites that do not have sufficient riffle habitat**, the RWB method is the standard method, but we also recommend the option of collecting a sample with (2) the "Margin-Center-Margin" (MCM) method until ongoing methods comparisons are completed (see Appendix A).
   - **Notes:** (1) The protocols for each method are provided in this document; (2) Other appropriate method(s) will be allowed if the specific monitoring objectives require use of alternative method(s). (See Item #2, below.); (3) The protocol recommendations specified above will be reevaluated as results become available from ongoing methods comparison studies. (See Appendix A for more information.)

2. The SWAMP QAMP allows flexibility in sampling methods so that the most appropriate method(s) may be used to address hypothesis tests and project-specific objectives that differ from program objectives. Such situations may include, but are not necessarily limited to, special studies (e.g., evaluation of point source discharges, above/below comparisons where statistical replication is needed), stressor identification investigations, and long-term monitoring projects where consistent data comparability is desired and an alternative method is needed to achieve that comparability. In addition, in some rare cases where funding limitations would make it cost-prohibitive to complete a project in compliance with the protocols listed in #1, above, the project proponent may request to complete laboratory analysis of only one sample, and "archive" one of the macroinvertebrate samples (i.e., the RWB sample in streams with riffles) to reduce lab costs. Deviations from the protocols specified in #1 above may be granted by the SWAMP Bioassessment Coordinator or the full SWAMP Roundtable.

1. The SWAMP Roundtable is the coordinating entity for the program. Participants include staff from the State and Regional Water Boards, USEPA, the Department of Fish and Game, the Marine Pollution Studies Laboratory, Moss Landing Marine Laboratories, contractors, and other interested entities.

046535

SECTION 1 INTRODUCTION

This document describes two standard procedures (TRC and RWB) for sampling benthic macroinvertebrate (BMI) assemblages for ambient bioassessments. This document also contains procedures for measuring instream and riparian habitats and ambient water chemistry associated with BMI samples. These sampling methods replace previous bioassessment protocols referred to as the California Stream Bioassessment Procedure (CSBP, Harrington 1995, 1999, 2002).

These procedures can produce quantitative and repeatable measures of a stream's physical/habitat condition and benthic invertebrate assemblages, but they require field training and implementation of QA measures throughout the field season.

The sampling layout described here provides a framework for systematically collecting a variety of physical, chemical, and biological data. The biological sampling methods are designed to nest within the overall framework for assessing the biotic, physical, and chemical condition of a reach. The layout used in these procedures and most of the physical habitat methods are close modifications of those used in EPA's EMAP and developed by EPA's ORD (Peck et al. 2004). Data collected using this methodology are generally directly comparable to equivalent EMAP data, except for the difference in reach length. Other exceptions are noted in the text.

The following steps are presented in an order suggested for efficient data collection. The specific order of collection for the physical parameters may be modified according to preferences of field crews, with the caveat that care must always be taken to not disturb the substrates within the streambed before BMI samples are collected.

PHYSICAL HABITAT METHODS

The physical habitat scoring methods described here can be used as a stand-alone evaluation or used in conjunction with a bioassessment sampling event. However, measurements of instream and riparian habitat and ambient water chemistry are essential to interpretation of bioassessment data and should always accompany bioassessment samples. This information can be used to classify stream reaches, associate physical and chemical condition with biotic condition, and explain patterns in the biological data.

046536

Because bioassessment samples can be collected to answer a variety of questions, this document describes the component measures of instream and riparian habitat as independent modules. Although individual modules can be added or subtracted from the procedure to reflect specific project objectives, a standard set of modules will normally accompany bioassessment samples. This document describes two standard groupings of modules that represent two different levels of intensity for characterizing the chemical and physical habitat data (Table 1). The BASIC physical habitat characterization represents a minimum amount of physical and chemical data that should be taken along with any ambient BMI sample, the FULL physical habitat characterization represents the suite of data that should be collected with most professional level bioassessment samples (e.g., SWAMP regional monitoring programs). In addition to these data, we also briefly introduce additional data modules (e.g., excess sediment, periphyton) that can be collected as supplements to the full set (OPTIONAL). Table 1 lists the physical and chemical variables that should be measured under the different levels.

Note: *SWAMP intends to develop guidance for selecting appropriate physical habitat modules to the intended uses of data. Until this guidance is available, users of these protocols should consult with representatives of the Regional Water Quality Control Boards (Regional Boards) or the SWAMP Bioassessment Coordinator when selecting modules.*

FIELD CREW SIZE AND TIME ESTIMATES

These methods are designed to be completed by either two or three (or more) person field crews. A very experienced field crew can expect to complete the full suite of physical habitat measurements and the two BMI sampling protocols in approximately two hours. Less experienced crews will probably take closer to three or four hours to complete the work depending on the complexity of the reach. Note that this estimate includes only time at the site, not travel time between sites.

Equipment and Supplies

Recommended equipment and supplies are listed in Table 2.

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Table 1. Summary of physical habitat and water chemistry and proposal for basic, full, and optional levels of effort.

Survey Task	Parameter(s)	Basic	Full	Option	Comments
REACH DELINEATION and WATER QUALITY [Conducted before entering stream to sample BMIs or conduct any habitat surveys]	Layout reach and mark transects, record GPS coordinates	X	X		Use 150-m reach length if wetted width ≤10 m; Use 250-m reach length if wetted width > 10 m
	Temperature, pH, specific conductance, DO, alkalinity	X	X		Multi-meter (e.g., YSI, Hydrolab, VWR Symphony)
	Turbidity, Silica			X	Use test kit or meter
	Notable field conditions	X	X		Recent rainfall, fire events, dominant local landuse
CROSS-SECTIONAL TRANSECTS BASIC Measurements at main 11 transects only FULL Measurements at 11 main transects (A, B, C, D, E, F, G, H, I, J, K) or 21 transects (11 main plus 10 inter-transects) for substrate size classes only	Wetted width	X	X		Stadia rod is useful here
	Flow habitat delineation	X	X		Record proportion of habitat classes in each inter-transect zone
	Depth and Pebble Count + CPOM		X		5 -point substrate size, depth and CPOM records at all 21 transects
	Cobble embeddedness		X		All cobble-sized particles in pebble count. Supplement with "random walk" if needed for 25
	Slope (%)	See reach scale	X		Average slope calculated from 10 transect to transect slope measurements. Use autolevel for slopes ≤ 1%; clinometer is OK for steeper gradients
	Sinuosity		X		Record compass readings between transect centers
	Canopy cover	X	X		Four densiometer readings at center of channel (facing L bank R bank, Upstream +Downstream)
	Riparian Vegetation		X		Record % or categories
	Instream Habitat		X		
	Human Influence		X		
	Bank Stability	X	X		Eroding / Vulnerable / Stable
	Bankfull Dimensions		X		
	Excess Sediment Transect Measures (optional)				
	Bankfull width and height, bank angles			X	
	Large woody debris counts			X	Tallies of woody debris in several size classes
	Thalweg profile			X	100 equidistant points along thalweg

046538

Survey Task	Parameter(s)	Basic	Full	Option	Comments
DISCHARGE TRANSECT	Discharge measurements		X		Velocity-Area Method or Neutrally Buoyant Object Method
REACH SCALE MEASUREMENTS:	EPA-RBP visual scoring of habitat features	*		X	*Used for citizen monitoring and comparison with legacy data
	Selected RBP visuals:		X		Channel alteration, sediment deposition, epifaunal substrate (redundant if doing EPA-RBP scoring)
	Slope (%, not degrees)	X	See transect scale		Single measurement for entire reach only for BASIC. Use autolevel for slopes ≤ 1%, clinometer is OK for higher gradients
	Photo documentation	X	X		Upstream (A, F, K) Downstream (F)
OTHER OPTIONAL COMPONENTS					
FOOD RESOURCE QUANTIFICATION	Periphyton (3 replicates)			X	Qualitative characterization of diatom growth and filamentous algal growth, quantification of biomass (AFDM, chl-a)
	CPOM & FPOM (3 replicates)			X	CPOM field measure of wet mass >1 mm particles, FPOM as 0.25 – 1 mm fraction (AFDM in lab)

Table 2. Field equipment and supplies

Physical Habitat	BMI Collection	General/ Ambient Chemistry
• GPS receiver • topographic maps • measuring tape (150-m) • small metric ruler or gravelometer for substrate measurements • digital watch, random number table or ten-sided die • stadia rod • clinometer • autolevel (for slopes < 1%) • handlevel (optional) • current velocity meter • stopwatch for velocity measurements • convex spherical densitometer • flags/ flagging tape • rangefinder	• D-frame kick net (fitted with 500-µ mesh bag) • standard # 35 sieve (500-µ mesh) • wide-mouth 500-mL or 1000 mL plastic jars • white sorting pan (enamel or plastic) • 95% EtOH • fine tipped forceps or soft forceps • waterproof paper and tape for attaching labels • 10-20-L plastic bucket for sample elutriation • preprinted waterproof labels (e.g., Rite-in-the-Rain™) • disposable gloves/ elbow length insulated gloves	• sampling SOP (this document) • hip or chest waders, or wading boots/shoes • field forms printed on waterproof paper (e.g., Rite-in-the-Rain™) • clip board and pencils • digital camera • centigrade thermometer • pH meter • DO meter • conductivity meter • field alkalinity meter • water chemistry containers • calibration standards • spare batteries for meters • first aid kit

046539

SECTION 2
REACH DELINEATION AND WATER QUALITY

REACH LAYOUT AND GENERAL DOCUMENTATION

The systematic positioning of transects is essential to collecting representative samples and to the objective quantification of physical habitat measures. The standard sampling layout consists of a 150-m reach (length measured along the bank) divided into 11 equidistant transects that are arranged perpendicular to the direction of flow (Figure 1, Figure 2). Ten additional transects (designated "inter-transects") located between the main transects give a total of 21 transects per reach. Main transects are designated A through K while inter-transects are designated by their nearest upstream and downstream transects (e.g., AB, BC, etc.). In extreme circumstances, reach length can be shorter than 150 m (e.g., if upstream and downstream barriers preclude a 150-m reach), but this should be avoided whenever possible. If the actual reach length is other than 150 m or 250 m this should be noted and explained on the field forms.

Note 1: *The standard reach length differs from that used in the EMAP design, in which reach length was defined as 40x stream width, with a minimum reach length of 150 m. The EMAP reach length approach is used to ensure that enough habitat is sampled to support accurate fish assemblage estimates and relatively precise characterization of channel characteristics (e.g., residual pool volumes and woody debris estimates, which that are critical for relative bed stability estimates). Programs wishing to sample fish assemblages or produce relative bed stability estimates should strongly consider adopting the EMAP guidance for setting reach length.*

Note 2: *Streams > 10 m wetted width should use a reach length of 250 m. Some very large streams (i.e., > 20-m wetted width) may not be adequately represented even by a 250-m reach. In these cases, field crews should define a reach length that is representative of the larger stream segment being studied (i.e., attempt to include two to three meander cycles, or four to six riffle-pool sequences when possible).*

Note 3: *When the exact reach location is not restricted by the sampling design, attempt to position reaches upstream of bridges to avoid this influence.*

Step 1. Upon arrival at the sampling site, fill out the reach documentation section of the field forms (site and project identification, stream and watershed name, crew members, and date/time). If known at the time of sampling, record the Site Code following SWAMP site code formats. Determine the geographic coordinates of the downstream end of the reach (preferably in decimal degrees to at least four decimal places) with a GPS receiver and record the datum setting of the unit (preferably NAD83/ WGS84).

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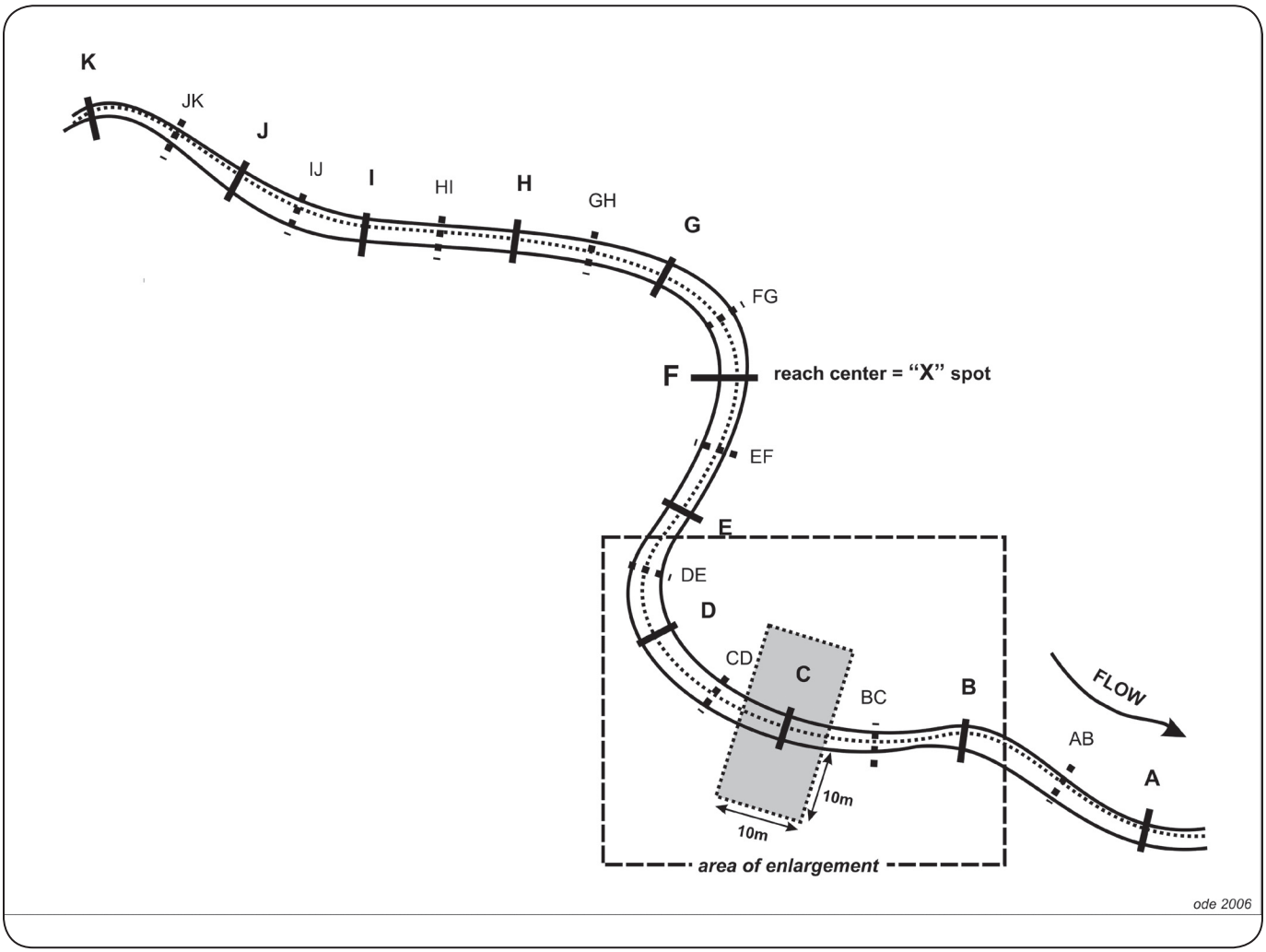

Figure 1. Reach layout geometry for physical habitat and biological sampling showing positions of 11 main transects (A – K) and the 10 supplemental inter-transects (AB- JK). The area highlighted in the figure is expanded in Figure 2. Note: reach length = 150 m for streams ≤ 10-m average wetted width, and reach length = 250 m for streams > 10-m average wetted width.

Step 2. Once a site has been identified, make an initial survey of the reach from the stream banks (being sure to not disturb the instream habitat). If TRC samples will be collected, identify all riffle habitats suitable for sampling (see Section IIIa for suitable habitat types) and note their positions so that a subset can be identified for sampling.

Step 3. Determine if the average wetted width is greater or less than 10 m. If the average wetted width ≤ 10 m, use a 150-m reach length. If the average wetted width > 10 m, use a 250-m reach length.

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Step 4. Starting at one end of the reach, establish the position of the 11 main transects (labeled A-K from downstream to upstream) by measuring 15 m (25 m for streams > 10 m wetted width) along the bank from the previous transect. The 10 inter-transects should be established equidistant from the adjacent main transects (i.e., 7.5 m from main transects for 150-m reaches, 12.5 m for 250-m reaches). Since the data collection will start at the downstream end, is often easiest to establish transects starting from the upstream end. For easy setup and breakdown, mark the main transects with easily removable markers (e.g., large washers tied with strips of flagging, surveyor's flags).

Note 1: *While it is usually easiest to establish transect positions from the banks (this also reduces disturbance to the stream channel), this can result in uneven spacing of transects in complex stream reaches. To avoid this, estimate transect positions by projecting from the mid-channel to the banks.*

Note 2: *Flagging of a single bank is recommended to reduce mistakes caused by missed markers.*

Step 5. Measure and record common ambient water chemistry measurements (pH, DO, specific conductance, alkalinity, water temperature) at the downstream end of the reach (near same location as the GPS coordinates were taken). These are typically taken with a handheld water quality meter (e.g., YSI, Hydrolab), but field test kits (e.g., Hach) can provide acceptable information if they are properly calibrated. For appropriate calibration methods and calibration frequency, consult the current SWAMP QAMP (Appendix F), or follow manufacturer's guidelines.

Note 1: *If characteristics of the site prohibit downstream entry, measurements may be taken at other points in the reach. In all cases, ambient chemistry measurements should be taken at the beginning of the reach survey.*

Note 2: *Alkalinity test kits may not perform well in low ionic strength waters. Programs should consider collecting lab samples for these sites (see SWAMP QAMP for guidance on collecting water chemistry samples).*

Step 6. Take a minimum of four (4) photographs of the reach at the following locations: a) Transect A facing upstream, b) Transect F facing upstream, c) Transect F facing downstream, and d) Transect K facing downstream. It may also be desirable to take a photograph at Transect A facing downstream and Transect K facing upstream to document conditions immediately adjacent to the reach. Digital photographs should be used when possible. Record the image numbers on the front page of the field form.

Note 1: *When possible, photograph names should follow SWAMP coding conventions ("StationCode_yyyy_mm_dd_uniquecode"). The unique code should include one of the following codes to indicate direction: RB (right bank), LB (left bank), BB (both banks), US (upstream), DS (downstream). SWAMP suggests using unique codes created by the camera to facilitate file organization. Example: 603WQLB02_2004_03_20_RBDS1253.*

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Step 7. Record the dominant land use and land cover in the area surrounding the reach (evaluate land cover within 50 m of either side of the stream reach).

Step 8. At the bottom of the form, record evidence of recent flooding, fire, or other disturbances that might influence bioassessment samples. Especially note if flow conditions have been affected by recent rainfall, which can cause significant under-sampling of BMI diversity (see note in the following section). If you are unaware of recent fire or rainfall events, select the "no" option on the forms.

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SECTION 3
COLLECT BENTHIC MACROINVERTEBRATES

MULTIPLE HABITAT AND TARGETED RIFFLE PROTOCOLS

Note 1: *BMI samples intended for ambient bioassessments are generally collected when streams are at or near base flow (i.e., not influenced by surface runoff) as sudden flow increases can dramatically alter local community composition.*

Note 2: *Guidance for choosing among TRC sampling, RWB sampling or both will be provided in a separate document (see Appendix A for current guidance for sampling under SWAMP).*

Once the reach transects have been laid out, the biological samples (BMIs and algae if included) should be collected before any other physical habitat measures so that substrates are not disturbed prior to sampling. Both TRC and RWB methods use 500-µ mesh D-frame nets (see list of BMI sampling equipment in Table 2). The two samples can be collected at the same time by carrying two D-nets and compositing the material from the two samples in their respective nets. If a two person field crew is responsible for both the physical habitat data and benthic invertebrate samples, it is generally best to collect the benthos at each transect, then immediately record the physical habitat data before moving to the next transect. Obviously, this requires especially careful handling of the D-nets during the course of sampling to avoid loss or contamination of the samples. It can be helpful to clearly label the two D nets as RWB and TRC. Larger field crews may choose to split the sampling between biological team and a physical habitat team and have the biological team go through the reach first. The positions of the TRC and RWB subsampling locations are illustrated in Figure 2.

SECTION III A. TARGETED RIFFLE COMPOSITE PROCEDURE

The TRC method is designed for sampling BMIs in wadeable streams that contain fast-water (riffle/run) habitats and is not appropriate for waterbodies without fastwater habitats. The RWB protocol should be used in these situations. Riffles are often used for collecting biological samples (e.g., the old CSBP methods) because they often have the highest BMI diversity in wadeable streams. This method expands the definition to include other fast water habitats, however care should be taken when attempting to apply this method in low gradient streams.

Note: *Since all streams (even low gradient streams) have variation in flow habitats within the channel, this guidance should not be interpreted as including areas within low gradient streams that are only marginally faster than the surrounding habitats. The RWB protocol should be applied in these situations.*

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The TRC was developed by the Western Center for Monitoring and Assessment of Freshwater Ecosystems (www.cnr.usu.edu/wmc) in Logan, Utah (Hawkins et al. 2003) and slightly modified by the EPA program (Peck et al. 2004). The TRC has been widely used in California (US Forest Service (USFS), the EMAP Western Pilot, and the California Monitoring and Assessment Program (CMAP)), and in the interest of methodological consistency between state and federal water resource agencies, has been adopted as the standard riffle protocol for bioassessment in California. The version described here is the EMAP modification, which distributes the sampling effort throughout the reach.

Sampling Locations – Acceptable Habitat Types

Riffles are the preferred habitat for TRC sampling, but other fast water habitats are acceptable for sampling if riffles are sparse. Common flow-defined habitat types are listed in Table 3 in decreasing order of energy. Most streams contain some or all of the following fast water habitat types: 1) cascades/falls, 2) rapids, 3) riffles, 4) runs. All of these are acceptable for TRC sampling if riffles are not available.

Note: *Because the common habitat types are arranged on a continuum between high to low energy environments, the categories grade into each other continuously and are not discrete. Thus, determination of habitat types requires somewhat subjective decision-making.*

Table 3. Common habitat types in stream channels, arranged in decreasing order of energy

Flow Habitat Type	Description
Cascades	Short, high gradient drop in stream bed elevation often accompanied by boulders and considerable turbulence
Falls	High gradient drop in elevation of the stream bed associated with an abrupt change in the bedrock
Rapids	Sections of stream with swiftly flowing water and considerable surface turbulence. Rapids tend to have larger substrate sizes than riffles
Riffles	Shallow sections where the water flows over coarse stream bed particles that create mild to moderate surface turbulence; (< 0.5 m deep, > 0.3 m/s)
Step-Runs	A series of runs that are separated by short riffles or flow obstructions that cause discontinuous breaks in slope
Runs	Long, relatively straight, low-gradient sections without flow obstructions. The stream bed is typically even and the water flows faster than it does in a pool; (> 0.5 m deep, > 0.3 m/s)
Glides	A section of stream with little or no turbulence, but faster velocity than pools; (< 0.5 m deep, < 0.3 m/s)
Pools	A reach of stream that is characterized by deep, low-velocity water and a smooth surface ; (> 0.5 m deep, < 0.3 m/s)

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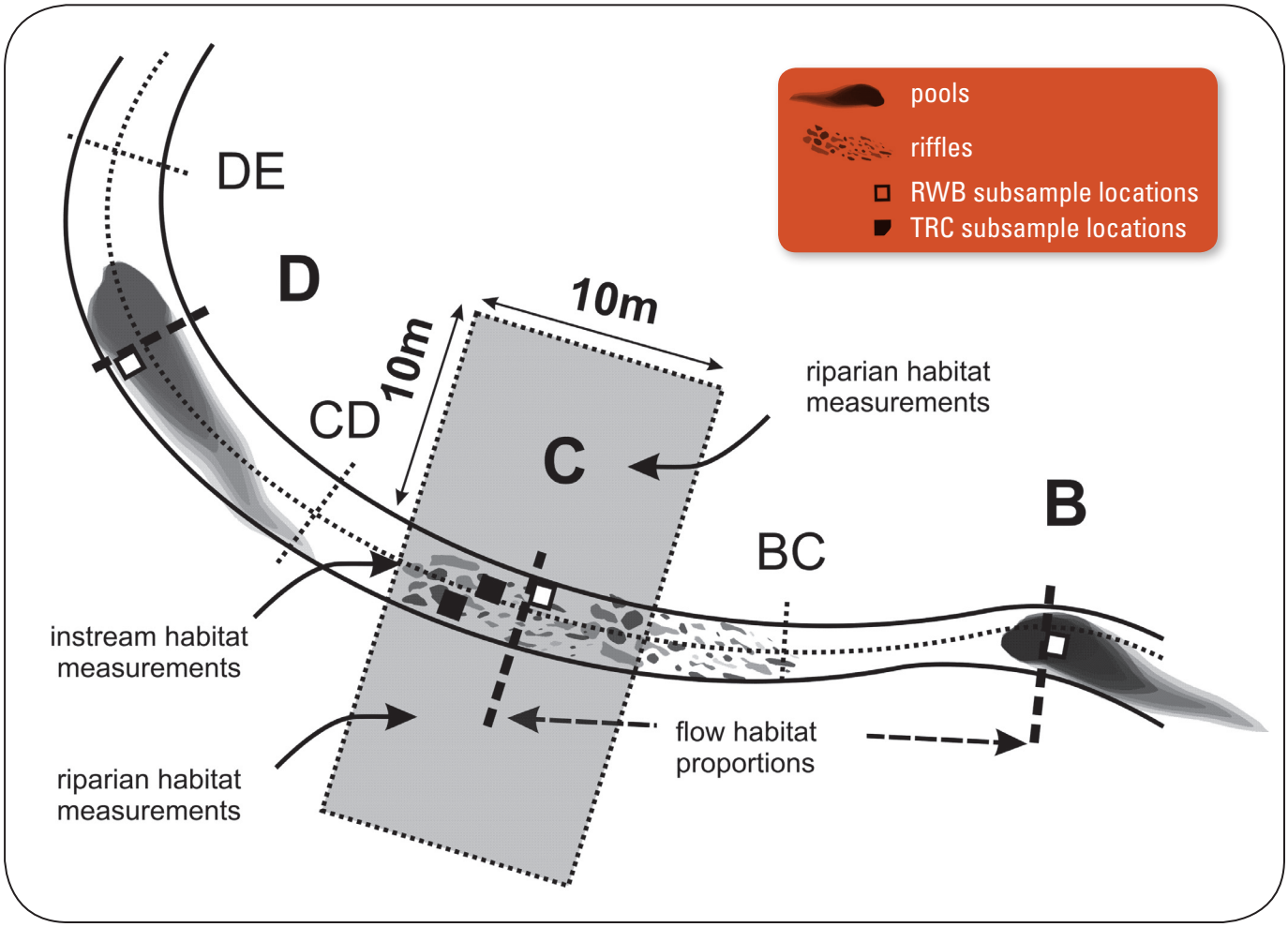

Figure 2. Section of the standard reach expanded from Figure 1 showing the appropriate positions for collecting benthic macroinvertebrate samples, instream and riparian habitat measurements and flow habitat proportion measurements.

Sampling Locations – Selecting Habitat Units

A TRC sample is a composite of eight individual kick samples of 1 ft^2 (0.09 m^2) of substrate each. During your initial layout of the reach, take a mental note of the number and position of the main riffles in a reach (and other fast water habitats if needed). Randomly distribute the eight sub-samples among the fast water habitats in the reach, giving preference to riffles where possible. Unless you are sampling in small streams, try to avoid very small riffle units (i.e., < 5 ft^2). If fewer than eight riffles are present in a reach, more than one sample may be taken from a single riffle, especially if the riffles are large.

Sampling Procedure

Begin sampling at the downstream end of the reach at the first randomly selected riffle and work your way upstream.

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TRC-Step 1. Determine net placement within each habitat unit by generating a pair of random numbers between 0 and 9. Examples of convenient random number generators include the hundredths place on the stopwatch feature of a digital watch, a 10 sided die and a random number chart. The first number in each pair (multiplied by 10) represents the percent upstream along the habitat unit's length. The second number in each pair represents the percent of the riffle width from right bank. For example, if the two generated random numbers are 4 and 7, you will walk upstream 40% of the distance of the riffle and then go 70% of the distance across the riffle (see Figure 3). This position is the center of the 1 ft^2 (0.09 m^2) sampling quadrat for that riffle. If you are unable to sample this location because it is too deep or it is occupied by a large boulder, select a new pair of random numbers and pick a new spot.

TRC-Step 2. Position a 500-µ D-net (with the net opening perpendicular to the flow and facing upstream) quickly and securely on the stream bottom to eliminate gaps under the frame. Avoid, and if necessary remove, large rocks that prevent the sampler from seating properly on the stream bottom.

TRC-Step 3. Holding the net in position on the substrate, visually define a square quadrat that is one net width wide and one net width long upstream of the net opening. Since D-nets are 12 inches wide, the area within this quadrat is 1ft^2 (0.09 m^2). Restrict your sampling to within that area. If desired, a wire frame of the correct dimensions can be placed in front of the net to help delineate the quadrat to be sampled, but it is often sufficient to use the net dimensions to keep the sampling area consistent.

TRC-Step 4. Working backward from the upstream edge of the sampling plot, check the quadrat for heavy organisms such as mussels, snails, and stone-cased caddisflies. Remove these organisms from the substrate by hand and place them into the net. Carefully pick up and rub stones directly in front of the net to remove attached animals. Remove and clean all of the rocks larger than a golf ball (~3 cm) within your sampling quadrat such that all the organisms attached to them are washed downstream into your net. Set these rocks outside your sampling quadrat after you have cleaned them. If the substrate is consolidated or comprised of large, heavy rocks, use your feet to kick and dislodge the substrate to displace BMIs into the net. If you cannot remove a rock from the stream bottom, rub it (concentrating on cracks or indentations) thereby loosening any attached insects. As you are disturbing the plot, let the water current carry all loosened material into the net.

Note 1: *Brushes are sometimes used in other bioassessment protocols to help loosen organisms, but in the interest of standardizing collections, do not use a brush when following this protocol.*

Note 2: *In sandy-bottomed streams, kicking within run habitats can quickly fill the sampling net with sand. In these situations, follow the standard procedures but use care to disturb the substrate gently and avoid kicking.*

TRC-Step 5. Once the coarser substrates have been removed from the quadrat, dig your fingers through the remaining underlying material to a depth of about 10 cm (this material is often comprised of gravels and finer particles). Thoroughly manipulate the substrates in the quadrat.

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Note: The sampler may spend as much time as necessary to inspect and clean larger substrates, but should take a standard time of 30 seconds to perform Step 5.

TRC-Step 6. Let the water run clear of any insects or organic material before carefully lifting the net. Immerse the net in the stream several times to remove fine sediments and to concentrate organisms at the end of the net, but be careful to avoid having any water or foreign material enter the mouth of the net during this operation.

TRC-Step 7. Move upstream to the next randomly selected habitat unit and repeat steps one through six, taking care to keep the net wet but uncontaminated by foreign material when moving the net from riffle to riffle. Sometimes, the net will become so full of material from the streambed that it is no longer effective at capturing BMIs. In these cases, the net should be emptied into sample jars as frequently as necessary, following guidelines described below in the "Preparation of BMI Sample Jars" section. Continue until you have sampled eight 1ft^2 (0.09 m^2) of benthos.

TRC-Step 8. PROCEED to Section IIIc. Filling and Labeling BMI Sample Jars.

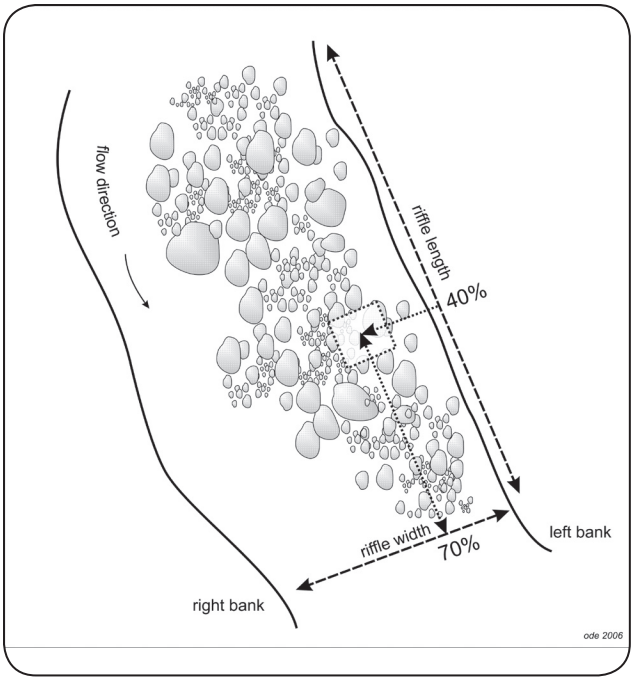

Figure 3. Example showing the method for selecting a subsampling position within a selected riffle under the TRC method. In this example, the random numbers 4 and 7 were selected

SECTION III B. REACHWIDE BENTHOS (MULTIHABITAT) PROCEDURE

The RWB procedure employs an objective method for selecting subsampling locations that is built upon the 11 transects used for physical habitat measurements. The RWB procedure can be used to sample any wadeable stream reach since it does not target specific habitats. Because sampling locations are defined by the transect layout, the position of individual sub-samples may fall in a variety of erosional or depositional habitats.

Note: Sampling locations should be displaced one meter downstream of the transects to avoid disturbing substrates for subsequent physical habitat assessments.

RWB -Step 1. The sampling position within each transect is alternated between the left, center and right positions along a transect (25%, 50% and 75% of wetted width, respectively) as you move upstream from transect to transect. Starting with the downstream transect (Transect

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A), identify a point that is 25% of the stream width from the right bank (note that the right bank will be on your left as you face upstream). If you cannot collect a sample at the designated point because of deep water obstacles or unsafe conditions, relocate the point as close as possible to the designated position.

Note: *A modification to this procedure is currently being investigated by SWAMP. This "margin-center-margin" (MCM) modification replaces the samples at 25% and 75% of wetted width with samples of the marginal habitats (including emergent and submergent vegetation).*

RWB -Step 2. Place a 500-µ D-net in the water so the mouth of the net is perpendicular to and facing into the flow of the water. If there is sufficient current in the area at the sampling point to fully extend the net, use the normal D-net collection technique to collect the sub-sample (TRC-Step 3 through TRC-Step 6 above). If flow volume and velocity is not sufficient to use the normal collection technique, use the sampling procedure for "slack water" habitats (RWB-Step 3 through RWB-Step 7 below).

RWB -Step 3. Visually define a 1 ft^2 (0.09 m^2) quadrat that is one net-width wide and one net-width long at the sampling point.

RWB -Step 4. Working backward from the upstream edge of the sampling plot, check the quadrat for heavy organisms such as mussels and snails. Remove these organisms from the substrate by hand and place them into the net. Carefully pick up and rub stones directly in front of the net to remove attached animals. Remove and clean all of the rocks larger than a golf ball within your sampling quadrat such that all the organisms attached to them are washed downstream into your net. Set these rocks outside your sampling quadrat after you have cleaned them. Large rocks that are less than halfway into the sampling area should be pushed aside. If the substrate is consolidated or comprised of large, heavy rocks, use your feet to kick and dislodge the substrate to displace BMIs into the net. If you cannot remove a rock from the stream bottom, rub it (concentrating on cracks or indentations) thereby loosening any attached insects.

RWB -Step 5. Vigorously kick the remaining finer substrate within the quadrat with your feet while dragging the net repeatedly through the disturbed area just above the bottom. Keep moving the net all the time so that the organisms trapped in the net will not escape. Continue kicking the substrate and moving the net for 30 seconds. For vegetation-choked sampling points, sweep the net through the vegetation within a 1ft^2 (0.09 m^2) quadrat for 30 seconds.

Note: *If flow volume is insufficient to use a D- net, spend 30 seconds hand picking a sample from 1ft^2 of substrate at the sampling point, then stir up the substrate with your gloved hands and use a sieve with 500-µ mesh size to collect the organisms from the water in the same way the net is used in larger pools.*

RWB -Step 6. After 30 seconds, remove the net from the water with a quick upstream motion to wash the organisms to the bottom of the net.

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RWB -Step 7. PROCEED to Section IIIc: Filling and Labeling BMI Sample Jars

SECTION III C. FILLING AND LABELING BENTHIC MACROINVERTEBRATE SAMPLE JARS

Step 1. Once all sub-samples (eight for TRC, 11 for RWB) have been collected, transfer benthos to a 500-mL or 1000-mL wide-mouth plastic sample jar using one of the following methods.

Note: *Field elutriation should only be used by well-trained field crews who are proficient at removing all benthic organisms from the discarded inorganic material. Training in the recognition of aquatic invertebrates is highly recommended.*

Step 1a. Complete Transfer of all Sampled Material – Invert the contents of the kick net into the sample jar. Perform this operation over a white enameled tray to avoid loss of any sampled material and make recovery of spilled organisms easier. If possible, remove the larger twigs and rocks by hand after carefully inspecting for clinging organisms, but be sure not to lose any organisms. Use forceps to remove any organisms clinging to the net and place these in the sample jar.

Step 1b. Field Elutriation of Samples – Empty the contents of the net into a large plastic bucket (10-20 L is sufficient). Use forceps to remove any organisms clinging to the net and place these in the bucket. Add stream water to the bucket and gently swirl the contents of the bucket in order to suspend the organic material (being certain to not introduce entrained organisms from the source water). Pour the organic matter from the bucket through a 500-µ sieve (or use the 500-µ net). Repeat this process until no additional material can be elutriated (i.e., only inorganic material is left in the bucket). If possible, remove the larger twigs and rocks by hand after carefully inspecting for clinging organisms, but be sure not to lose any organisms. Transfer all of the material in the sieve (invertebrates and organic matter) into the sample jar. Carefully inspect the gravel and debris remaining in the bottom of the bucket for any cased caddisflies, clams, snails, or other dense animals that might remain. Remove any remaining animals by hand and place them in the sample jar.

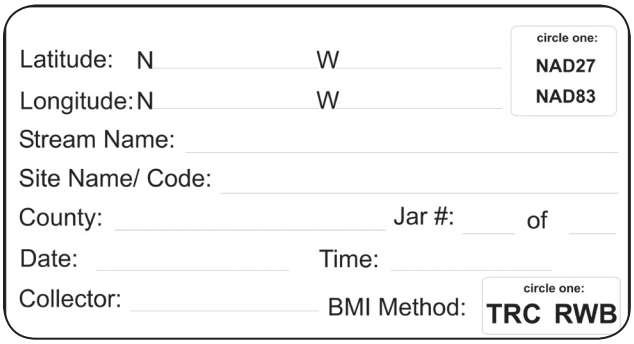
Latitude: N _____ W _____
Longitude: N _____ W _____
circle one: NAD27 NAD83
Stream Name: _____
Site Name/ Code: _____
County: _____ Jar #: ____ of ____
Date: _____ Time: _____
Collector: _____ BMI Method: circle one: TRC RWB

Figure 4. Example date - locality label for all BMI samples.

Step 2. Place a completed date/locality label (see Figure 4) on the inside of the jar (use pencil only as most "permanent" inks dissolve in ethanol) and completely fill with 95% ethanol. Place a second label on the outside of the jar. Note that the target concentration of ethanol is 70%, but 95% ethanol is used in the field to account for dilution from water in the sample. If organic and inorganic material does not accumulate in the net quickly, it may be possible to transfer all the material in the net into one jar. Otherwise, divide the material evenly among several jars

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(being careful to clearly label them as part of a set). To ensure proper preservation of benthic macroinvertebrates it is critical that the ethanol is in contact with the BMIs in the sample jar. Never fill a jar more than 2/3 full with sampled material, and gently rotate jars that contain mostly mud or sand to ensure that the ethanol is well distributed. If jars will be stored for longer than a month prior to processing, jars should not contain more than 50% sample material.

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SECTION 4 MAIN CROSS-SECTIONAL TRANSECT MEASURES

SECTION IVA. PHYSICAL MEASURES

The majority of physical habitat measurements in this protocol are made relative to the main cross-sectional transects (Figure 5). All the measures taken relative to each transect are recorded on forms specific to that transect. Start with the downstream transect (Transect A) and repeat steps 6-15 for all 11 main transects.

Module A. Transect Dimensions: Wetted Width and Bankfull Dimensions

Wetted Width – The wetted channel is the zone that is inundated with water and the wetted width is the distance between the sides of the channel at the point where substrates are no longer surrounded by surface water. Measure the wetted stream width and record this in the box at the top of the transect form.

Bankfull Width and Depth – The bankfull channel is the zone of maximum water inundation in a normal flow year (one to two year flood events). Since most channel formation processes are believed to act when flows are within this zone (Mount 1995), bankfull dimensions provide a valuable indication of relative size of the waterbody.

Note: *Bankfull dimensions are notoriously difficult to assess, even by experienced field crews (see Heil and Johnson 1995). It is often useful to discuss the interpretation of bankfull locations among the field crew members to reach a consensus. The USFS Stream Team provides a good set of instructional videos for improving consistency in accurate bankfull measurements (http://www.stream.fs.fed.us/publications/videos.html).*

Step 1. Scout along the stream margins to identify the location of the bankfull margins on either bank by looking for evidence of annual or semi-annual flood events. Examples of useful evidence includes topographic, vegetative, or geologic cues (changes in bank slope, changes from annual to perennial vegetation, changes in the size distribution of surface sediments). While the position of drift material caught in vegetation may be a helpful aid, this can lead to very misleading measurements.

Note: *The exact nature of this evidence varies widely across a range of stream types and geomorphic characteristics. It is helpful to investigate the entire reach when attempting to interpret this evidence because the true bankfull margin may be obscured at various points along the reach. Often the bankfull position is easier to interpret from one bank than the other; in these cases, it is easiest to infer the opposite bank position by projecting across the channel. Additionally, height can be verified by measuring the height from both edges of the wetted channel to the bankfull height (these heights should be equal).*

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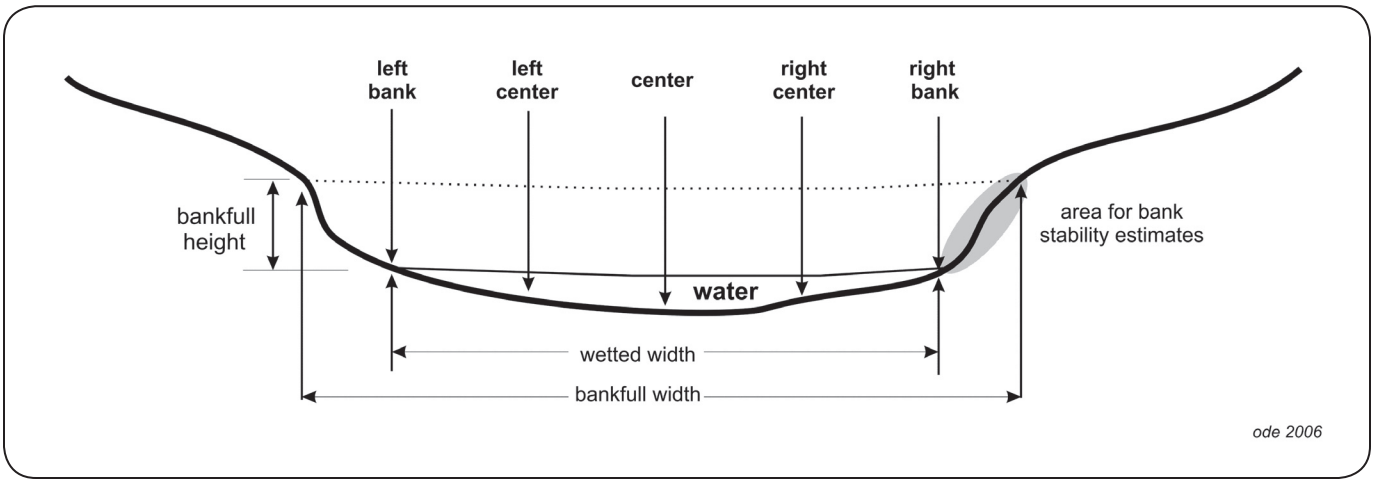

Figure 5. Cross sectional diagram of a typical stream channel showing locations of substrate measurements, wetted and bankfull width measurements, and bank stability visual estimates.

Step 2. Stretch a tape from bank to bank at the bankfull position. Measure the width of the bankfull channel from bank to bank at bankfull height and perpendicular to the direction of stream flow.

Step 3. Measure bankfull height (the vertical distance between the water height of the water and the height of the bank, Figure 5) and record.

Module B. Transect Substrate Measurements

Particle size frequency distributions often provide valuable information about instream habitat conditions that affect BMI distributions. The Wolman pebble count technique (Wolman 1954) is a widely used and cost-effective method for estimating the particle size distribution and produces data that correlates with costly, but more quantitative bulk sediment samples. The method described here follows the EMAP protocol, which records sizes of 105 particles in a reach (five particles from each of 11 main transects and 10 inter-transects).

Note: *The size cutoff for the finest particle sizes in the EMAP protocol (< 0.06 mm) differs from that used by the Sierra Nevada Aquatic Research Laboratory (SNARL) program (0.25 mm), although the narrative description for this cutoff is the same (the point at which fine particles rubbed between one's fingers no longer feel gritty).*

Coarse particulate organic matter (CPOM, particles of decaying organic material such as leaves that are greater than 1.0 mm in diameter) is a general indicator of the amount of allochthonous organic matter available at a site, and its measurement can provide valuable information about the basis of the food web in a stream reach. The presence of CPOM associated with each particle is quantified at the same time that particles are measured for the pebble counts.

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Step 1. Transect substrate measurements are taken at five equidistant points along each transect (Figure 5). Divide the wetted stream width by four to get the distance between the five points (Left Bank, Left Center, Center, Right Center and Right Bank) and use a measuring device to locate the positions of these points (a stadia rod is especially helpful here). Once the positions are identified, lower a graduated rod (e.g., a marked ski pole) though the water column perpendicular to both the flow and the transect to objectively select the particle located at the tip of the rod.

Step 2. Measure the depth from the water surface to the top of the particle with the graduated rod and record to the nearest cm.

Step 3. Record the presence or absence of CPOM >1mm within 1 cm of the particle.

Step 4. If the particle is cobble-sized (64-250 mm), record the percent of the cobble that is embedded by fine particles (<2 mm) to the nearest 5% (see cobble embeddedness text below).

Step 5. Remove the particle from the streambed, then measure and record the length of its intermediate axis to the nearest mm (see Figure 6). Alternatively, assign the particle to one of the size classes listed in the bottom of the transect form. Particle sizes classes can be estimated visually or with a quantitative measuring device (e.g., pass/ no-pass template, "gravelometer"). Regardless of the method, all particles less than 0.06 mm should be recorded as fines, all particles between 0.06mm and 2.0 mm recorded as sand. Field crews may want to carry vials containing sediment particles with these size ranges until they are familiar with these particles.

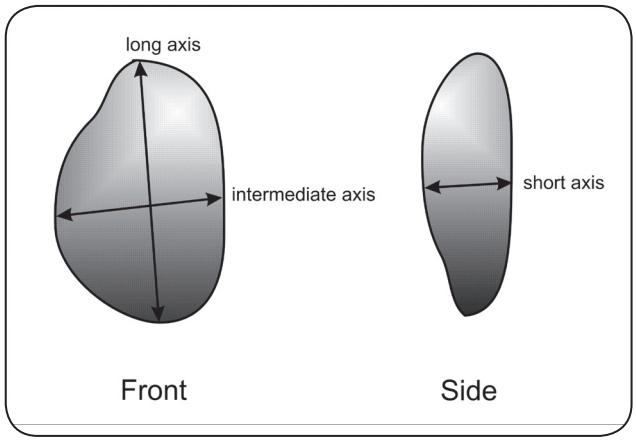

Figure 6. Diagram of three major perpendicular axes of substrate particles. The intermediate axis is recorded for pebble counts.

Module C. Cobble Embeddedness

The quantification of substrate embeddedness has long been a challenge to stream geomorphologists and ecologists (Klamt 1976, Kelley and Dettman 1980). It is generally agreed that the degree to which fine particles fill interstitial spaces has a significant impact on the ecology of benthic organisms and fish, but techniques for measuring this impact vary greatly (this is summarized well by Sylte and Fischenich 2002, http://stream.fs.fed.us/news/streamnt/pdf/StreamOCT4.pdf). Here we define embeddedness as the volume of cobble-sized particles (64-250 mm) that is buried by fine particles (<2.0 mm diameter).

Note: *This method differs from the EMAP method for measuring embeddedness, which measures embeddedness of all particles larger than 2 mm.*

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Table 4. Size class codes and definitions for particle size measurements

Size Class Code	Size Class Description	Common Size Reference	Size Class Range
RS	bedrock, smooth	larger than a car	> 4 m
RR	bedrock, rough	larger than a car	> 4 m
XB	boulder, large	meter stick to car	1 - 4 m
SB	boulder, small	basketball to meter stick	25 cm - 1.0 m
CB	cobble	tennis ball to basketball	64 - 250 mm
GC	gravel, coarse	marble to tennis ball	16 - 64 mm
GF	gravel, fine	ladybug to marble	2 – 16 mm
SA	sand	gritty to ladybug	0.06 – 2 mm
FN	fines	not gritty	< 0.06 mm
HP	hardpan (consolidated fines)		< 0.06 mm
WD	wood		
RC	concrete/ asphalt		
OT	other		

Step 1. Every time a cobble-sized particle is encountered during the pebble count, remove the cobble from the stream bed and visually estimate the percentage of the cobble's volume that has been buried by fine particles. Since visual estimates of volume and surface area are subject to large amounts of observer error, field crews should routinely calibrate their estimates with each other and with other field crews.

Step 2. In the spaces to the right of the pebble count data, record the embeddedness of all cobble-sized particles encountered during the pebble count.

Note: *The cobble embeddedness scores do not correspond with the specific particles in the pebble count cells to the left, but are merely a convenient place to record the data.*

Step 3. If 25 cobbles are not encountered during the pebble count, supplement the cobbles by conducting a "random walk" through the reach. Starting at a random point in the reach, follow a transect from one bank to the other at a randomly chosen angle. Once at the other bank reverse the process with a new randomly chosen angle. Record embeddedness of cobble-sized particles in the cobble embeddedness boxes on the transect forms until you reach 25 cobbles. If 25 cobble-sized particles are not present in the entire reach, then record the values for cobbles that are present.

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Module D. Canopy Cover

This method uses the Strickler (1959) modification of a convex spherical densiometer to correct for over-estimation of canopy density that occurs with unmodified readings. Read the densiometer by counting the number of line intersections that are obscured by overhanging vegetation (see Figure 7). Taping off the lower left and right portions of the mirror emphasizes overhead vegetation over foreground vegetation (the main source of bias in canopy density measurements). All densiometer readings should be taken with the bubble leveled and 0.3 m (1 ft) above the water surface.

Step 1. Using a modified convex spherical densitometer, take and record four 17-point readings all taken from the center of each transect: a) facing upstream, b) facing downstream, c) facing the left bank, d) facing the right bank.

Note: *This method deviates slightly from that of EMAP (in which two additional readings are taken at the left and right wetted edges to increase representation of bank vegetation).*

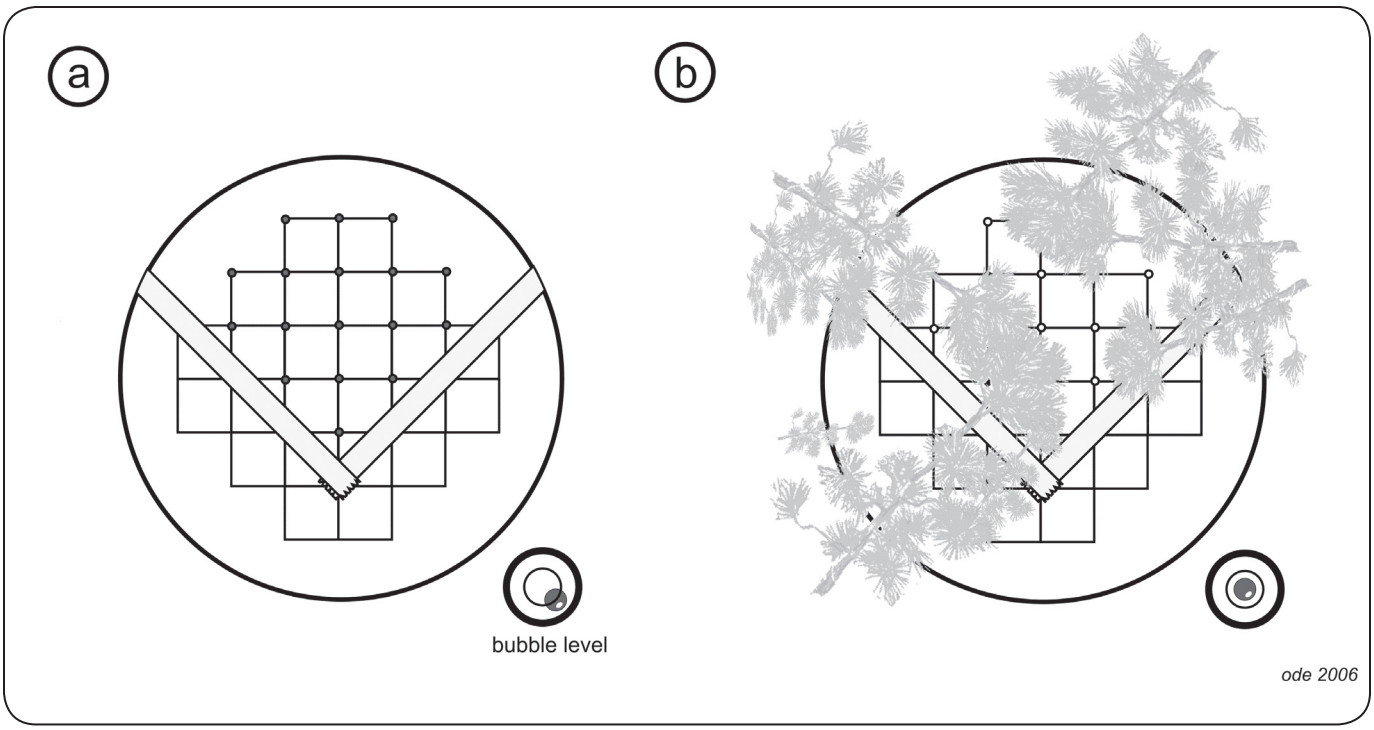

Figure 7. Representation of the mirrored surface of a convex spherical densiometer showing the position for taping the mirror and the intersection points used for the densiometer reading. The score for the hypothetical condition in (b) is 10 covered intersection points out of 17 possible. Note the position of the bubble level in (b) when the densiometer is leveled.

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Module E. Gradient and Sinuosity

The gradient of a stream reach is one of the major stream classification variables, giving an indication of potential water velocities and stream power, which are in turn important controls on aquatic habitat and sediment transport within the reach. The gradient (slope) of a stream reach is often strongly correlated with many BMI metrics and other physical habitat measures and is therefore very useful when interpreting BMI data.

The "full" physical habitat method uses 10 transect to transect measurements to calculate the average slope through a reach. Although this is a little more time intensive than the reach-scale transect measures used in the "basic" protocol, it results in more precise slope determination and the ability to quantify slope variability within a reach. Sinuosity (calculated as the ratio of the length of the flow path between the ends of the reach and the straight line distance between the ends of the reach, Kaufmann et al. 1999) is measured at the same time as slope. These two measurements work best with two people, one taking the readings at the upstream transect ("backsighting") and the other holding a stadia rod at the downstream transect. If you cannot see the mid point of the next transect from the starting point, use the supplemental sections (indicating the proportion of the total length represented by each section). Otherwise, leave these blank.

Note 1: *An auto level should be used for reaches with a percent slope of less than or equal to 1%. All methods (clinometer, hand level, or auto level) may be used for reaches with a percent slope of greater than 1%. The following description is for clinometer-based slope measurements, but the same principles apply to use of an auto or hand level.*

Note 2: *In reaches that are close to 1%, you will not know whether you are above or below the 1% slope cutoff before taking readings. In these cases, default to use of an autolevel.*

Step 1. Beginning with the upper transect (Transect K), one person (the measurer) should stand at the water margin with a clinometer held at eye level. A second person should stand at the margin of the next downstream transect (Transect J) with a stadia rod flagged at the eye level of the person taking the clinometer readings. Be sure you mark your eye level while standing on level ground! Adjust for water depth by measuring from the same height above the water surface at both transects. This is most easily accomplished by holding the base of the pole at water level.

Note: *An alternative technique is to use two stadia rods pre-flagged at the eye-height of the person taking the readings.*

Step 2. Use a clinometer to measure the percent slope of the water surface (not the streambed) between the upstream transect and the downstream transect by sighting to the flagged position on the stadia rod. The clinometer reads both percent slope and degree of the slope. Be careful to read and record percent slope rather than degrees slope (these measurements differ by a factor of ~ 2.2). Percent slope is the scale on the right hand side as you look through most clinometers (e.g., Suunto models).

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Note: *If an auto level or hand level is used, record the elevation difference (rise) between transects and the segment length (run) instead of the percent slope.*

Step 3. If the stream reach geometry makes it difficult to sight a line between transects, divide the distance into two or three sections and record the slope and the proportion of the total segment length between transects for each of these sections in the appropriate boxes on the slope form (supplemental segments).

Note: *Never measure slope across dry land (e.g., across a meander bend).*

Step 4. Take a compass reading from the center of each main transect to the center of the next main transect downstream and record this bearing to the nearest degree on the slope and bearing section of the form. Bearing measurements should always be taken from the upstream to downstream transect.

Step 5. Proceed downstream to the next transect pair (I-J) and continue to record slope and bearing between each pair of transects until measurements have been recorded for all transects.

SECTION IVB. VISUAL ESTIMATES OF HUMAN INFLUENCE, INSTREAM HABITAT, AND RIPARIAN VEGETATION

The transect-based approach used here permits semi-quantitative calculations from visual estimates even though most are categorical data (i.e., either presence/ absence or size classes) because we can calculate the percentage of transects that fall into different categories. These modules are adapted directly from EMAP protocols with some modifications as noted.

Module F. Human Influence

The influence of human activities on stream biota is of critical concern in bioassessment analyses. Quantification of human activities for these analyses is often performed with GIS techniques, which are very useful but are not capable of accounting for human activities occurring at the reach scale. Reach scale observations are often critical for explaining results that might seem anomalous on the basis of only remote mapping tools.

Step 1. For the left and right banks, estimate a 10 x 10 m riparian area centered on the edges of the transect (see Figure 2). Record the presence of 11 human influence categories in three spatial zones relative to this 10 x 10 m square (between the wetted edge and bankfull margin, between the bankfull margin and 10 m from the stream, and between 10 m and 50 m beyond the stream margins): 1) walls/rip-rap/dams, 2) buildings, 3) pavement/cleared lots, 4) roads/railroads, 5) pipes (inlets or outlets), 6) landfills or trash, 7) parks or lawns (e.g., golf courses), 8) row crops, 9) pasture/ rangelands, 10) logging/ timber harvest activities, 11) mining activities, 12) vegetative management (herbicides, brush removal, mowing), 13) bridges/ abutments, 14) orchards or vineyards. Circle all combinations of impacts and locations that apply, but be careful to not double-count any human influence observations.

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Step 2. Record the presence of any of the 11 human influence categories in the stream channel within a zone 5 m upstream and 5 m downstream of the transect.

Module G. Riparian Vegetation

Riparian vegetation (vegetation in the region beyond the bankfull margins) has a strong influence on the composition of stream communities through its direct and indirect roles in controlling the food base, moderating sediment inputs and acting as a buffer between the stream channel and the surrounding environment. These methods provide a cursory survey of the condition of the riparian corridor. Observations are made in the same 10 x 10 m riparian area used for assessing human influence (see Figure 2).

Note: *Riparian vegetation measurements should only include living or recently dead vegetation.*

The riparian vegetation categories used here were condensed from the EMAP version, which further breaks the canopy classes into different components. However, because we have consolidated EMAP categories into fewer categories rather than creating new categories, existing EMAP data can be easily converted to this format simply by combining the appropriate categories.

Step 1. Divide the riparian zone into three elevation zones: 1) ground cover (<0.5 m), 2) lower canopy (0.5 m - 5 m), and 3) upper canopy (>5 m). Record the density of the following riparian classes: 1) Upper Canopy–Trees and Saplings, 2) Lower Canopy–Woody Shrubs and Saplings, 3) Woody Ground Cover–Shrubs, Saplings, 4) Herbaceous Ground Cover–Herbs and Grasses, and 5) Ground Cover–Barren, Bare Soil and Duff. Artificial banks (e.g., rip-rap, concrete, asphalt) should be recorded as barren.

Step 2. Indicate the areal cover (i.e., shading) by each riparian vegetative class as either: 1) absent, 2) sparse (<10%), 3) moderate (10-40%), 4) heavy (40-75%), or 5) very heavy (>75%).

Module H. Instream Habitat Complexity

Instream habitat complexity was developed by the EMAP program to quantify fish concealment features in the stream channel, but it also provides good information about the general condition and complexity of the stream channel. Estimates should include features within the banks and outside the wetted margins of the stream.

Step 1. Record the amount of nine different channel features within a zone 5m upstream and 5m downstream of the transect (see Figure 2): 1) filamentous algae (long-stranded algal forms that are large enough to see with the naked eye), 2) aquatic macrophytes (include mosses and vascular plants), 3) boulders (>25 cm), 4 and 5) woody debris (break into two classes- larger and smaller than 30 cm diameter), 6) undercut banks, 7) overhanging vegetation, 8) live tree roots and 9) artificial structures (includes any anthropogenic objects including large trash objects like tires and shopping carts). Indicate the areal cover of each feature as either: 1) absent, 2) sparse (<10%), 3) moderate (10-40%), 4) heavy (40-75%), or 5) very heavy (>75%).

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SECTION 5 INTER-TRANSECT MEASURES

While most measures are taken at or relative to the main transects, a few measures are recorded at transects located at the midpoint between main transects. These are called "inter-transects".

Module B (Part 2) Pebble Counts (same as for transects, but no cobble embeddedness measures)

Step 1. Divide the wetted stream width by four to get the distance between the five points (Left Bank, Left Center, Center, Right Center and Right Bank) and use a measuring device to locate the positions of these points (a stadia rod is especially helpful here, see Figure 5). Once the positions are identified, lower a graduated rod through the water column perpendicular to both the flow and the transect to objectively select the particle located at its tip.

Step 2. With the graduated rod, measure the depth from the water surface to the top of the particle and record to the nearest cm.

Step 3. Remove the particle from the streambed, then measure and record the length of its intermediate axis to the nearest mm (see Figure 6). Alternatively, assign the particle to one of the size classes listed in the bottom of the transect form (see Table 3 for a list of size classes). Particle size classes may be estimated visually or with a quantitative measuring device (e.g., pass/ no-pass template, gravelometer). Regardless of the method, all particles less than 0.06 mm should be recorded as fines, while all particles between 0.06 mm and 2.0 mm should be recorded as sand. Field crews may want to carry vials containing sediment particles with these size ranges until they are familiar with these particle size classes.

Step 4. Record the presence (P) or absence (A) of any CPOM within 1 cm of each particle.

Module J. Flow Habitats

Because many benthic macroinvertebrates prefer specific flow and substrate microhabitats, the proportional representation of these habitats in a reach is often of interest in bioassessments. There are many different ways to quantify the proportions of different flow habitats (for example, see text on EMAP's "thalweg profile" below). Like the riparian and instream measures listed above, this procedure produces a semi-quantitative measure consisting of 10 transect-based visual estimates.

Note: *The categories used here are based on those used in the EMAP protocol, with pools combined into one class and cascades and falls combined into another class.*

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Step 1. At each inter-transect, identify the proportion of six different habitat types in the region between the upstream transect and downstream transect: 1) cascades/falls, 2) rapids, 3) riffles, 4) runs, 5) glides, 6) pools, 7) dry areas. Record percentages to the nearest 5% — the total percentage of surface area for each section must total 100%.

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SECTION 6 DISCHARGE

Stream discharge is the volume of water that moves past a point in a given amount of time and is generally reported as either cubic meters per second (cms) or cubic feet per second (cfs). Because discharge is directly related to water volume, discharge affects the concentration of nutrients, fine sediments and pollutants; and discharge measurements are critical for understanding impacts of disturbances such as impoundments, water withdrawals and water augmentation. Discharge is also closely related to many habitat characteristics including temperature regimes, physical habitat diversity, and habitat connectivity. As a direct result of these relationships, stream discharge is often also a strong predictor of biotic community composition. Since stream volume can vary significantly on many different temporal scales (diurnal, seasonal, inter-annually), it can also be very useful for understanding variation in stream condition.

This procedure (modified from the EMAP protocol) provides for two different methods for calculating discharge. It is preferable to take discharge measurements in sections where flow velocities are greater than 0.15 m/s and most depths are greater than 15 cm, but slower velocities and shallower depths can be used. If flow volume is sufficient for a transect-based "velocity-area" discharge calculation, this is by far the preferred method. If flow volume is too low to permit this procedure or if your flow meter fails, use the "neutrally buoyant object/ timed flow" method.

Note: *Programs that sample fixed sites repeatedly may want to consider installing permanent discharge estimation structures (e.g., stage gauges, wiers).*

Module K. Discharge: Velocity Area Method

The layout for discharge measurements under the velocity-area (VA) method is illustrated in Figure 8. Flow velocity should be measured with either a Swoffer Instruments propeller-type flow meter or a Marsh-McBirney inductive probe flow meter. Refer to the manufacturers' instrument manuals for calibration procedures.

VA-Step 1. Select the best location in the reach for measuring discharge. To maximize the repeatability of the discharge measurement, choose a transect with the most uniform flow (select hydraulically smooth flow whenever possible) and simplest cross-sectional geometry. It is acceptable to move substrates or other obstacles to create a more uniform cross-section before beginning the discharge measurements.

VA-Step 2. Measure the wetted width of the discharge transect and divide this into 10 to 20 equal segments. The use of more segments gives a better discharge calculation, but is impractical in small channels. A minimum of 10 intervals should be used when stream width permits, but interval width should not be less than 15 cm.

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VA-Step 3. Record the distance from the bank to the end of the first interval. Using the top-setting rod that comes with the flow velocity meter, measure the median depth of the first interval.

VA-Step 4. Standing downstream of the transect to avoid interfering with the flow, use the top-setting rod to set the probe of the flow meter (either the propeller or the electromagnetic probe) at the midpoint of each interval, at 0.6 of the interval depth (this position generally approximates average velocity in the water column), and at right angles to the transect (facing upstream). See Figure 8 for positioning detail.

VA-Step 5. Allow the flow velocity meter to equilibrate for 10-20 seconds then record velocity to the nearest m/s. If the option is available, use the flow averaging setting on the flow meter.

Note: *Under very low flow conditions, flow velocity meters may register readings of zero even when there is noticeable flow. In these situations, record a velocity of 0.5x the minimum flow detection capabilities of the instrument.*

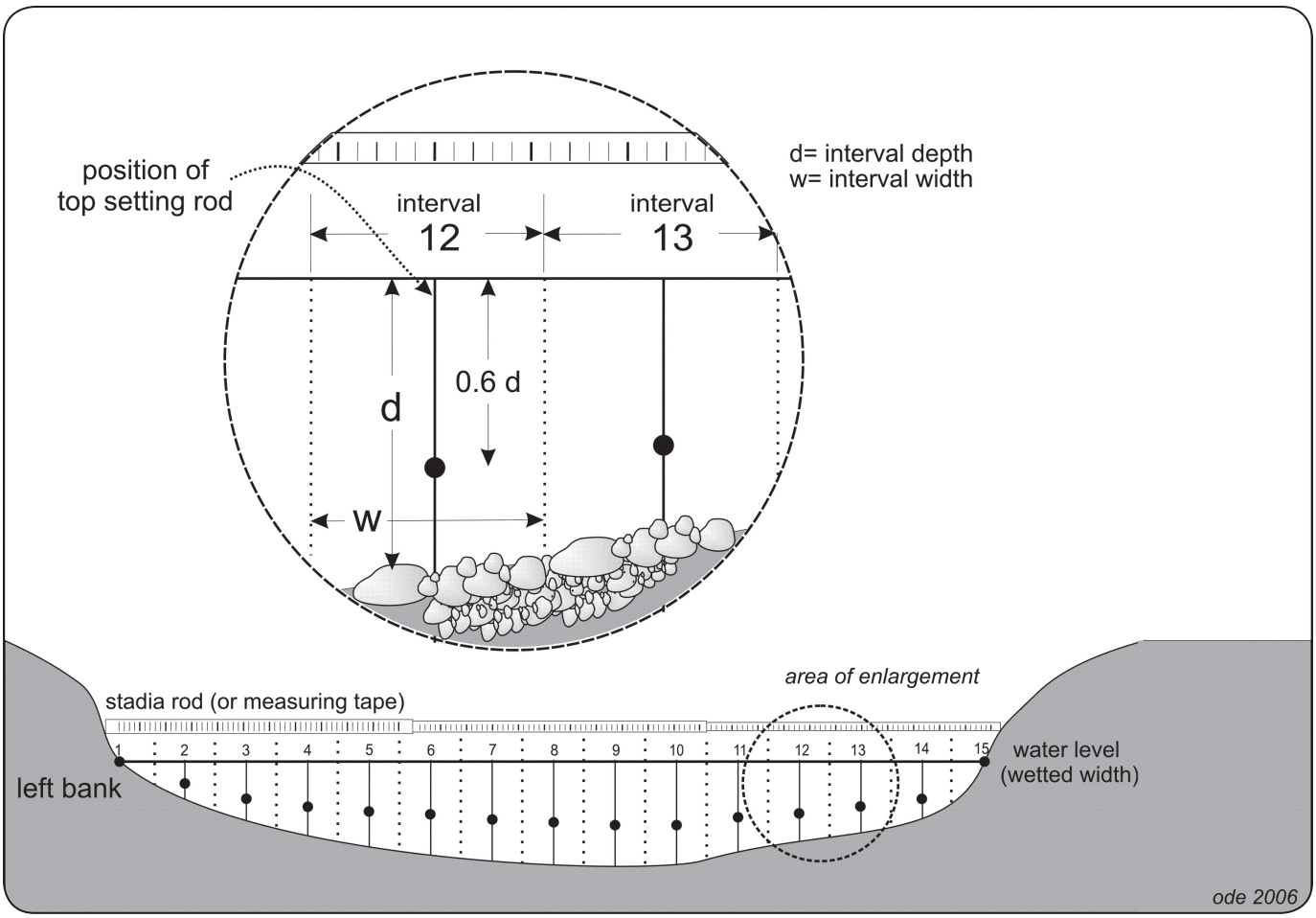

Figure 8. Diagram of layout for discharge measurements under the velocity-area method showing proper positions for velocity probe (black dots).

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VA-Step 6. Complete Steps 3 through 5 on the remaining intervals.

Note: *The first and last intervals usually have depths and velocities of zero.*

Module L. Discharge: Neutrally Buoyant Object Method

If streams are too shallow to use a flow velocity meter, the neutrally buoyant object (NBO) method should be used to measure flow velocity. However, since this method is less precise than the flow velocity meter it should only be used if absolutely necessary. A neutrally buoyant object (one whose density allows it to just balance between sinking and floating) will act as if it were nearly weightless, thus it's movement will approximate that of the water it floats in better than a light object. To estimate the flow velocity through a reach, three transects are used to measure the cross-sectional areas within the test section sub-reach and three flow velocity estimates are used to measure average velocity through the test reach. To improve precision in velocity measurements, the reach segment should be long enough for the float time to last at least 10-15 seconds.

NBO-Step 1. The position of the discharge sub-reach is not as critical as it is for the velocity-area method, but the same criteria for selection of a discharge reach apply to the neutrally buoyant object method. Identify a section that has relatively uniform flow and a uniform cross sectional shape.

NBO-Step 2. The cross sectional area is estimated in a manner that is similar but less precise than that used in the velocity area method. Measure the cross sectional area in one to three places in the section designated for the discharge measurement (three evenly-spaced cross sections are preferred, but one may be used if the cross section through the reach is very uniform). Record the width once for each cross section and measure depth at five equally-spaced positions along each transect.

NBO-Step 3. Record the length of the discharge reach.

NBO-Step 4. Place a neutrally buoyant object (e.g., orange, rubber ball, heavy piece of wood, etc.) in the water upstream of the discharge reach and record the length of time in seconds that it takes for the object to pass between the upstream and downstream boundaries of the reach. Repeat this timed float three times.

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SECTION 7
POST-SAMPLING OBSERVATIONS

Module M. Rapid Bioassessment Procedures Visual Assessment Scores (for Basic Physical Habitat, or optional supplement)

EPA's Rapid Bioassessment Procedures (RBPs, Barbour et al. 1999) include a set of 10 visual criteria for assessing instream and riparian habitat. The RBP has been used in the CSBP since its first edition (1995) and thus, this information is often valuable for comparison to legacy datasets. The criteria also have a useful didactic role since they help force the user to quantify key features of the physical environment where bioassessment samples are collected.

Module N. Additional Habitat Characterization (Full Physical Habitat only)

The RBP stream habitat visual estimates described in Step 1 are not included in the Full Physical Habitat version because they are generally replaced by more quantitative measurements of similar variables. However, we have found that three of the RBP measures are reasonably repeatable and include them in the reachwide assessment portion of the Full Physical Habitat version.

Note: *This is the only case in which a measurement included in the basic procedure is not included in the full.*

Module O. Reach Slope (for Basic Physical Habitat only)

Reach slope should be recorded as percent slope as opposed to degrees slope to avoid confusion. Slope measurements work best with two people, one taking the readings at the upstream transect and the other holding a stadia rod at the downstream transect. If you cannot see the mid point of the next transect from the starting point, use the supplemental sections (indicating the proportion of the total length represented by each section).

An auto level (with a tripod) should be used for reaches with a percent slope of less than or equal to 1%. All methods (clinometer, hand level, or auto level) may be used for reaches with a percent slope of greater than 1%. In reaches that are close to 1%, you will not know whether you are above or below the 1% slope cutoff. In these cases, default to use of an autolevel.

Step 1. Divide the reach into multiple segments such that stadia rod markings can be easily read with the measuring device to be employed (this is especially a factor for clinometer and hand level readings).

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Step 2. Use a clinometer, hand level, or auto level to measure the percent slope of the water surface (not the streambed) between the top and bottom of each segment. Be sure to adjust for water depth by measuring from the same height above the water surface at both transects. Also be sure to record percent slope, not degrees slope. Record the segment length for each of these sections in the appropriate boxes on the BASIC slope form.

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SECTION 8
OPTIONAL EXCESS SEDIMENT MEASURES

Future editions of these protocols will include supplemental modules, including a full discussion of the measurements used for calculating the excess sediment index (sometimes referred to as log relative bed stability, LRBS). However, since several of the measurements in EMAP's physical habitat protocols are interwoven into the layout of this protocol, a brief overview of the additional measurements collected for the LRBS calculations is included here for information purposes only. For detailed explanations of these measurements, consult Peck et al. 2004.

Woody Debris Tallies

Large woody debris (logs, snags, branches, etc.) that is capable of obstructing flow when the channel is at bankfull condition (just short of flood stage) contributes to the "roughness" of a channel. The effect of this variable is to reduce water velocity and thereby reduce the stream's competence to move substrate particles. The EMAP protocol tallies all woody debris with a diameter greater than 10 cm (~4") into one of 12 size classes based on the length and width of each object. Tallies are conducted in the zone between the main transects.

Thalweg Measurements

A stream's thalweg is a longitudinal profile that connects the deepest points of successive cross-sections of the stream. The thalweg defines the primary path of water flow through the reach. Thalweg measurements perform many functions in the EMAP protocols, producing measurements for the excess sediment calculations (residual pool volume, stream size, channel complexity) and flow habitat variability.

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SECTION 9
OPTIONAL PERIPHYTON QUANTIFICATION

Periphyton Quantification

Characterization of periphyton has a dual role in bioassessments, as periphyton is both a food and habitat resource for benthic macroinvertebrates and fish and an effective bioindicator on its own. Quantification of periphytic resources will be covered under a separate SWAMP bioassessment protocol, but will include procedures for qualitative characterization of diatom assemblages, documentation of filamentous algal growth, and biomass quantification (e.g., ash-free dry mass and chlorophyll a).

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SECTION 10
QUALITY ASSURANCE & CONTROL PROCEDURES

The SWAMP bioassessment group is currently developing guidelines for quality assurance and quality control for bioassessment procedures. Future revisions to this document will include guidance covering personnel qualifications, training and field audit procedures, procedures for field calibration, procedures for chain of custody documentation, requirements for measurement precision, health and safety warnings, cautions (actions that would result in instrument damage or compromised samples), and interferences (consequences of not following the standard operating procedure, SOP).

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DEFINITIONS OF TERMS USED IN SOP D

Terms & Definitions	
TERM	**DEFINITION**
ABL	California Department of Fish and Game's Aquatic Bioassessment Laboratory
Allocthonous	Derived from a source external to the stream channel (e.g., riparian vegetation) as opposed to autochthonous, which indicates a source inside the stream channel (e.g., periphyton).
Ambient Bioassessment	Biological monitoring that is intended to describe general biotic condition as opposed to a diagnosis of sources of impairment
Bankfull	The bankfull channel is the zone of maximum water inundation in a normal flow year (one to two year flood events)
BMI	Benthic macroinvertebrates: bottom-dwelling invertebrates large enough to be seen with the unaided eye
Cobble Embeddedness	The volume of cobble-sized particles (64-250 mm) that is buried by fine particles (<2.0 mm diameter)
CPOM	Coarse particulate organic matter (CPOM, particles of decaying organic material such as leaves that are greater than 1.0 mm in diameter)
CSBP	California State Bioassessment Procedures
DFG	California Department of Fish and Game
EMAP	The U.S. Environmental Protection Agency's Environmental Monitoring and Assessment Program
EPA	The U.S. Environmental Protection Agency
Fines	Substrate particles less than 0.06 mm diameter (not gritty to touch)
Inter-transects	Transects established at points equidistant between the main transects
MCM	Margin-Center-Margin alternative procedure for sampling low gradient habitats
ORD	EPA's Office of Research and Development
QAMP	Quality assurance management plan
RBP	EPA's Rapid Bioassessment Procedures
Reach	A segment of the stream channel
Riparian	An area of land and vegetation adjacent to a stream that has a direct effect on the stream.
RWB	Reach-wide benthos composite sampling method for benthic macroinvertebrates, also referred to as multi-habitat method
SCCWRP	Southern Coastal California Water Research Project
SNARL	Sierra Nevada Aquatic Research Laboratory
Substrate	The composition of a streambed, including both inorganic and organic particles
SWAMP	The State Water Resources Control Board's Surface Water Ambient Monitoring Program
Thalweg	A longitudinal profile that connects the deepest points at successive cross-sections of the stream. The thalweg defines the primary path of water flow through the reach

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TERM	DEFINITION
Transects	Lines drawn perpendicular to the path of flow used for standardizing sampling locations
TRC	Targeted riffle composite sampling method for benthic macroinvertebrates
USFS	The United States Forest Service
Wadeable Streams	Streams that can be sampled by field crews wearing chest waders (generally less that 0.5 m - 1.0 meters deep)

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APPENDIX A

FACTORS TO CONSIDER WHEN RECOMMENDING/ CHANGING BIOASSESSMENT METHODS

Beyond the primary considerations of precision and accuracy, there are at least five other key issues that SWAMP has considered and should consider in the future, when recommending or changing its official methods for bioassessment. These issues include:

1. Costs of Collecting Samples via Multiple Protocols – Collecting, processing, and interpreting samples using more than one method for each indicator (e.g., algae, macroinvertebrates, fish) per site adds significant costs to bioassessment monitoring programs. SWAMP should strive to identify the minimum set of protocols necessary for each indicator. However, this should not come at the expense of sound monitoring. If more than one method is needed to interpret the biological response, then this decision should be based on a cost-benefit assessment.

2. Costs of Maintaining Multiple SWAMP Protocols – While multiple methods for monitoring a given indicator may provide additional accuracy in specific habitats, there are significant costs to maintaining multiple protocols:

a. Need to maintain method-specific infrastructure (e.g., separate reference samples, separate indices of biotic integrity (IBIs), separate O/E models, etc.).
b. May lose or impair ability to compare across sites if different methods are used (see Issue 5 below).
c. Guidance on when to use methods becomes more complex. For example, we need to define very specifically which methods to use at each water body type; and thus, which tools can be used to interpret them.

Recommendation: *SWAMP should maintain as few protocols as necessary. If we elect to add new or modified protocols it should be because we have determined that the added value is worth all of the costs listed above.*

3. Separating Physical Impairment from Water Quality Impairment – One of the original reasons for adding a multihabitat component to SWAMP bioassessment programs was the potential for distinguishing physical and water quality impairment sources (see recommendations in Barbour and Hill 2002). In regards to macroinvertebrate indicators, the conventional wisdom has been that reachwide (RW, sometimes referred to as multihabitat or MH) samples should be relatively more responsive to physical habitat alteration (i.e., fine sediment inputs) than targeted-riffle (TR) samples because it is believed that erosional habitats take longer

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to respond to sediment stresses, and because pockets of riffle habitat are thought to act as refugia from habitat loss. To the extent that this is true, RW and TR samples may offer complementary information that allows us to separate these sources of impairment.

While very few studies have addressed this conventional wisdom directly, recent studies suggest that this may not be as much a factor as previously believed. In a recent comparison of TR and RW samples at nearly 200 sites statewide, the ABL found at most weak evidence to support this notion (Rehn et al. 2007). Gerth and Herlihy (2006) came to the same conclusion in their analysis of ~500 sites in the eastern and western United States. However, this issue is far from resolved and SWAMP scientists currently are not in agreement regarding this issue. Since the majority of bioassessment programs in California have emphasized targeted riffle sampling, SWAMP will undoubtedly want to evaluate this question further before making any policy decision to discontinue TR sampling.

Recommendation: *Until this issue can be evaluated further and resolved to SWAMP's satisfaction, ambient macroinvertebrate sampling should include collection of both RW samples and richest targeted habitat (TR or MCM) samples at every site. (The TR method should be used where sufficient riffles are present, and the MCM method should be used at low-gradient sites where sufficient riffle habitat is not available.)*

4. Compatibility with Previous Data – To address this issue, at least three sets of macroinvertebrate sampling method comparisons have been conducted in California.

a. **Targeted Riffle Methods –** Comparisons are complete. Samples collected under the current TR protocols are considered interchangeable with both CSBP and SNARL samples (Ode et al. 2005, Herbst and Silldorff 2006).
b. **Low Gradient Sand-Dominated Streams –** Collaborative studies are currently underway between Water Board Regions 3 and 5, the Southern California Coastal Water Research Project (SCCWRP), and ABL to compare the performance of: (1) the "low-gradient" CSBP; (2) RW samples; and (3) a modification of the RW method designed to emphasize habitats along stream margins (MCM). The results of these low-gradient methods comparisons are not yet available.
c. **Targeted Riffle vs. Reachwide Methods –** A recent comparison of RW and TR samples collected from nearly 200 EMAP/ CMAP sites is in peer review press (Rehn et al. 2007). Results demonstrate remarkably similar performance of the methods across a wide range of habitats. Gerth and Herlihy (2006) recently published a similar analysis with the same conclusions. However, the bioassessment committee has yet to carefully review and discuss these analyses and their implications for SWAMP biomonitoring.

5. Comparability Among Sites – The ability to compare biological condition across sites is a common requirement of most ambient bioassessment programs. This type of analysis is confounded if different methods are used at these sites. One of the big advantages of reachwide (i.e., multihabitat) methods is that they can be applied anywhere because they don't require a specific habitat for sampling. Statewide

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bioassessments and most regional programs will require the ability to compare their bioassessment results among multiple sites (e.g., within a watershed, within a region, statewide).

INTERIM RECOMMENDATIONS FOR MACROINVERTEBRATE SAMPLING (UPDATED DECEMBER 2006):

1. Until we can reach consensus on the outstanding issues (i.e., whether a single method for macroinvertebrate sampling will meet our needs, and the outcome of RW vs. MCM comparison studies for low-gradient wadeable streams/rivers), SWAMP recommends collecting both a reachwide (i.e., multihabitat) and a targeted habitat sample at each site. In high gradient streams, this means using both the RW and TR methods. In low-gradient streams, we recommend collecting both RW and MCM samples until the results are available from the low-gradient ("non-riffle") comparison. In rare cases where monitoring objectives cannot be met following these recommendations, the SWAMP Bioassessment Coordinator may authorize deviations. For example, where project-specific objectives differ from ambient monitoring, the SWAMP Bioassessment Coordinator may authorize alternate methods. In rare cases where funding is extremely limited and the cost of following the above recommendations would be prohibitive, the SWAMP Bioassessment Coordinator may authorize cost-saving options such as collecting both samples, but archiving one of the samples for later lab analysis.

2. SWAMP should develop guidance specifying when and where different methods should be used. For example, at "low gradient" sites, what is the slope cut-off (or other channel feature criteria to use) when deciding whether to apply TR or MCM? In addition, while SWAMP may eventually choose to adopt a single method (such as RW) at most sites, some regions may determine that the value of targeted habitat sampling merits continued sampling with supplemental protocols. In the latter case, or if SWAMP determines that distinct methods are needed for different habitat types, the guidance should specify the types of waterbodies or classes of waterbodies that require different methods.

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STATE WATER RESOURCES CONTROL BOARD
REGIONAL WATER QUALITY CONTROL BOARDS

WATER QUALITY CONTROL PLAN FOR ENCLOSED BAYS AND ESTUARIES - PART 1 SEDIMENT QUALITY

Effective August 25, 2009

STATE WATER RESOURCES CONTROL BOARD

California Environmental Protection Agency

State of California
Arnold Schwarzenegger, Governor

California Environmental Protection Agency
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Jonathan Bishop, Chief Deputy Director

Thomas Howard, Chief Deputy Director

History of Plan
Adopted by the State Water Resources Control Board on September 16, 2008
Approved by the Office of Administrative Law on January 5, 2009
Approved by the U. S. Environmental Protection Agency on August 25, 2009

Prepared by
Chris Beegan, Ocean Unit, Division of Water Quality

STATE WATER RESOURCES CONTROL BOARD
RESOLUTION NO. 2008-0070

ADOPTION OF A WATER QUALITY CONTROL PLAN FOR ENCLOSED BAYS AND ESTUARIES – PART 1 SEDIMENT QUALITY

WHEREAS:

1. California Water Code section 13393 requires the State Water Resources Control Board (State Water Board) to develop sediment quality objectives for toxic pollutants for California's enclosed bays and estuaries.

2. In 1991, the State Water Board adopted a workplan for the development of sediment quality objectives for California's enclosed bays and estuaries (1991 Workplan).

3. Due to funding constraints, the State Water Board did not implement the 1991 Workplan; consequently, litigation by environmental interests against the State Water Board ensued.

4. In August 2001, the Sacramento County Superior Court ruled against the state and ordered the State Water Board to initiate development of sediment quality objectives. On May 21, 2003, the State Water Board adopted a revised workplan.

5. Based upon the scope of work in the revised workplan, staff developed narrative sediment quality objectives to protect benthic communities, which utilize an approach based upon multiple lines of evidence.

6. Narrative sediment quality objectives have also been developed to protect human health from exposure to contaminants in fish tissue.

7. Staff also developed an implementation program for the narrative sediment quality objectives based upon input from the Scientific Steering Committee, Sediment Quality Advisory Committee, and staff of the State Water Board and the Regional Water Quality Control Boards (Regional Water Boards), and staff from other state and federal agencies. The work that has been completed, to date, is Phase 1 of the sediment quality objectives program.

8. The State Water Board recognizes this effort is an iterative process. Staff additionally have initiated a second phase of the sediment quality objectives program (Phase 2), which includes extensive sediment sampling in the Delta; further development of the estuarine chemistry, sediment toxicity, and benthic community indicators; and completion of a more prescriptive framework to address human health and exposure to contaminants in fish tissue. The tools, indicators, and framework developed under Phase 2 will be adopted into the draft plan in 2010. Phase 3 is proposed as the development, within available resources, of a

framework to protect fish and/or wildlife from the effects of pollutants in sediment. During Phases 2 and 3, staff would continue to evaluate the tools developed during the initial phase and the implementation language. As the Water Boards experience grows, the draft plan would be updated and amended as necessary to more effectively interpret and implement the narrative objectives.

9. In the process of developing SQOs, the State Water Board has identified the need to address statewide consistency in the regulation of dredging activities under the water quality certification program. While this issue is outside the scope of this plan, the State Water Board will consider initiating policy development in the future to address regulation of dredging activities under the water quality certification program.

10. The State Water Board's Clean Water Act section 303(d) listing policy was adopted prior to the development of SQOs and without the benefit of the scientific evidence supporting their development. The State Water Board recognizes the need to ensure that the listing policy and this plan are consistent. The State Water Board will, therefore, consider amending the 303(d) listing policy in the future to ensure consistency with this plan.

11. Staff has responded to significant verbal and written comments received from the public and made minor revisions to the draft plan in response to the comments.

12. In adopting this draft plan, the State Water Board has considered the requirements in Water Code section 13393. In particular, the sediment quality objectives are based on scientific information, including chemical monitoring, bioassays, and established modeling procedures; and the objectives provide adequate protection for the most sensitive aquatic organisms. In addition, sediment quality objectives for the protection of human health from contaminants in fish tissue are based on a health risk assessment.

13. As required by Water Code section 13393, the State Water Board has followed the procedures for adoption of water quality control plans in Water Code sections 13240 through 13247, in adopting this draft plan. In addition to the procedural requirements, the State Water Board has considered the substantive requirements in Water Code sections 13241 and 13242. The State Water Board has considered the past, present, and probable future beneficial uses of estuarine and bay waters that can be impacted by toxic pollutants in sediments; environmental characteristics of these waters; water quality conditions that can reasonably be achieved through the control of all factors affecting sediment quality; and economic considerations. Adoption of this draft plan is unlikely to affect housing needs or the development or use of recycled water. Further, the State Water Board has developed an implementation program to achieve the sediment quality objectives, which describes actions to be taken to achieve the objectives and monitoring to determine compliance with the objectives. Time schedules to achieve the objectives will be developed on a case-by-case basis by the appropriate Regional Water Board.

14. This draft plan is consistent with the state and federal antidegradation policies (State Water Board Resolution No. 68-16 and 40 C.F.R. Section 131.12, respectively). No lowering of water quality is anticipated to result from adoption of the draft plan. The draft plan contains scientifically-defensible sediment quality objectives for bays and estuaries, which can be consistently applied statewide to assess sediment quality, regulate waste discharges that can impact sediment quality, and provide the basis for appropriate remediation activities, where necessary. Adoption of the draft plan should result in improved sediment quality.

15. The Resources Agency has approved the State and Regional Water Boards' planning process as a "certified regulatory program" that adequately satisfies the California Environmental Quality Act (CEQA) requirements for preparing environmental documents. State Water Board staff has prepared a "substitute environmental document" for this project that contains the required environmental documentation under the State Water Board's CEQA regulations. (California Code of Regulations, title 23, section 3777.) The substitute environmental documents include the "Draft Staff Report – Water Quality Control Plan for Enclosed Bays and Estuaries, Part 1. Sediment Quality," the environmental checklist, the comments and responses to comments, the plan itself, and this resolution. The project is the adoption of sediment quality objectives and an implementation program, as Part 1 of the Water Quality Control Plan for Enclosed Bays and Estuaries.

16. CEQA scoping hearings were conducted on October 23, 2006 in San Diego, California, on November 8, 2006 in Oakland, California, and on November 28, 2006 in Rancho Cordova, California.

17. On September 26, 2007, staff circulated the draft plan – Part 1 Sediment Quality for public comment.

18. On November 19, 2007, the State Water Board conducted a public hearing on the draft plan and supporting Draft Staff Report and Substitute Environmental Document. Written comments were received through November 30, 2007.

19. The State Water Board adopted the Plan on February 19, 2008, and submitted it to the Office of Administrative Law (OAL) on February 29, 2008. Review by OAL revealed that the statutorily-required newspaper notification of the November 2007 hearing had not occurred. The State Water Board has, therefore, noticed and conducted a new public hearing for the draft plan on September 16, 2008.

20. In preparing the substitute environmental documents, the State Water Board has considered the requirements of Public Resources Code section 21159 and California Code of Regulations, title 14, section 15187, and intends these documents to serve as a Tier 1 environmental review. The State Water Board has considered the reasonably foreseeable consequences of adoption of the draft plan; however, project level impacts may need to be considered in any subsequent environmental analysis performed by lead agencies, pursuant to Public Resources Code section 21159.1.

21. Consistent with CEQA, the substitute environmental documents do not engage in speculation or conjecture but, rather, analyze the reasonably foreseeable environmental impacts related to methods of compliance with the draft plan, reasonably foreseeable mitigation measures to reduce those impacts, and reasonably feasible alternatives means of compliance that would avoid or reduce the identified impacts.

22. The draft plan could have a potentially significant adverse effect on the environment. However, there are feasible alternatives or feasible mitigation measures that, if employed, would reduce the potentially significant adverse impacts identified in the substitute environmental documents to less than significant levels. These alternatives or mitigation measures are within the responsibility and jurisdiction of other public agencies. When the sediment quality objectives are implemented on a project-specific basis, the agencies responsible for the project can and should incorporate the alternatives or mitigation measures into any subsequent project or project approvals.

23. From a program-level perspective, incorporation of the mitigation measures described in the substitute environmental documents will foreseeably reduce impacts to less than significant levels.

24. The substitute environmental documents for this draft plan identify broad mitigation approaches that should be considered at the project level.

25. Pursuant to Health and Safety Code section 57400, the draft Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality has undergone external peer review through an interagency agreement with the University of California.

26. This draft plan must be submitted for review and approval to the State Office of Administrative Law (OAL) and the United States Environmental Protection Agency (USEPA). The draft plan will become effective upon approval by OAL and USEPA.

27. If, during the OAL approval process, OAL determines that minor, non-substantive modifications to the language of the draft plan are needed for clarity or consistency, the Executive Director or designee may make such changes consistent with the State Water Board's intent in adopting this draft plan, and shall inform the State Water Board of any such changes.

THEREFORE BE IT RESOLVED THAT:

The State Water Board:

1. Approves and adopts the CEQA substitute environmental documentation, including all findings contained in the documentation, which was prepared in accordance with Public Resources Code section 21159 and California Code of

Regulations, Title 14, section 15187, and directs the Executive Director or designee to sign the environmental checklist;

2. After considering the entire record, including oral testimony at the public hearing, hereby adopts the proposed Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality;

3. Directs staff to submit the administrative record to OAL for review and approval; and

4. If, during the OAL approval process, OAL determines that minor, non-substantive modifications to the language of the draft plan are needed for clarity or consistency, directs the Executive Director or designee to make such changes and inform the State Water Board of any such changes.

5. Directs staff to initiate appropriate proceedings to amend the section 303(d) listing policy by February 2009.

CERTIFICATION

The undersigned Acting Clerk to the Board does hereby certify that the foregoing is a full, true, and correct copy of a resolution duly and regularly adopted at a meeting of the State Water Resources Control Board held on September 16, 2008.

AYE:	Chair Tam M. Doduc Arthur G. Baggett, Jr. Charles R. Hoppin Frances Spivy-Weber
NAY:	None
ABSENT:	Vice Chair Gary Wolff, P.E., Ph.D
ABSTAIN:	None

Jeanine Townsend

Jeanine Townsend
Clerk to the Board

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I. INTENT AND SUMMARY

A. INTENT OF PART 1 OF THE WATER QUALITY CONTROL PLAN FOR ENCLOSED BAYS AND ESTUARIES (PART 1)

It is the goal of the State Water Resources Control Board (State Water Board) to comply with the legislative directive in Water Code §13393 to adopt sediment quality objectives (SQOs). Part 1 integrates chemical and biological measures to determine if the sediment dependent biota are protected or degraded as a result of exposure to toxic pollutants* in sediment and to protect human health. Part 1 is not intended to address low dissolved oxygen, pathogens or nutrients including ammonia. Part 1 represents the first phase of the State Water Board's SQO development effort and focuses primarily on the protection of benthic* communities in enclosed bays* and estuaries*. The State Water Board has committed in the second phase to the refinement of benthic community protection indicators for estuarine waters and the development of an improved approach to address sediment quality related human health risk associated with consumption of fish tissue.

B. SUMMARY OF PART 1

Part 1 includes**:**

1. Narrative SQOs for the protection of aquatic life and human health;
2. Identification of the beneficial uses that these objectives are intended to protect;
3. A program of implementation that contains:
   a. Specific indicators, tools and implementation provisions to determine if the sediment quality at a station or multiple stations meets the narrative objectives;
   b. A description of appropriate monitoring programs; and
   c. A sequential series of actions that shall be initiated when a sediment quality objective is not met including stressor identification and evaluation of appropriate targets.
4. A glossary that defines all terms denoted by an asterisk

II. USE AND APPLICABILITY OF SQOS

A. AMBIENT SEDIMENT QUALITY

The SQOs and supporting tools shall be utilized to assess ambient sediment quality.

B. RELATIONSHIP TO OTHER NARRATIVE OBJECTIVES

1. Except as provided in 2 below, Part 1 supersedes all applicable narrative water quality objectives and related implementation provisions in water quality control plans (basin plans) to the extent that the objectives and provisions are applied to protect bay or estuarine benthic communities from toxic pollutants in sediments.
2. The supersession provision in 1. above does not apply to existing sediment cleanup activities where a site assessment was completed and submitted to the Regional Water Board by February 19, 2008.

C. APPLICABLE WATERS

Part 1 applies to enclosed bays[1] and estuaries[2] only. Part 1 does not apply to ocean waters* including Monterey Bay and Santa Monica Bay, or inland surface waters*.

D. APPLICABLE SEDIMENTS

Part 1 applies to subtidal surficial sediments* that have been deposited or emplaced seaward of the intertidal zone. Part 1 does not apply to:

1. Sediments characterized by less than five percent of fines or substrates composed of gravels, cobbles, or consolidated rock.
2. Sediment as the physical pollutant that causes adverse biological response or community degradation related to burial, deposition, or sedimentation.

E. APPLICABLE DISCHARGES

Part 1 is applicable in its entirety to point source* discharges. Nonpoint sources* of toxic pollutants are subject to Sections II, III, IV, V, and VI of Part 1.

III. BENEFICIAL USES

Beneficial uses protected by Part 1 and corresponding target receptors are identified in Table 1.

Table 1. Beneficial Uses and Target Receptors

Beneficial Uses	Target Receptors
Estuarine Habitat	Benthic Community
Marine Habitat	Benthic Community
Commercial and Sport Fishing	Human Health
Aquaculture	Human Health
Shellfish Harvesting	Human Health

[1] ENCLOSED BAYS are indentations along the coast which enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between headlands or outermost harbor works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. This definition includes, but is not limited to: Humboldt Bay, Bodega Harbor, Tomales Bay, Drakes Estero, San Francisco Bay, Morro Bay, Los Angeles Harbor, Upper and Lower Newport Bay, Mission Bay, and San Diego Bay.

[2] ESTUARIES AND COASTAL LAGOONS are waters at the mouths of streams that serve as mixing zones for fresh and ocean waters during a major portion of the year. Mouths of streams that are temporarily separated from the ocean by sandbars shall be considered as estuaries. Estuarine waters will generally be considered to extend from a bay or the open ocean to the upstream limit of tidal action but may be considered to extend seaward if significant mixing of fresh and salt water occurs in the open coastal waters. The waters described by this definition include, but are not limited to, the Sacramento-San Joaquin Delta as defined by Section 12220 of CWC, Suisun Bay, Carquinez Strait downstream to Carquinez Bridge, and appropriate areas of the Smith, Klamath, Mad, Eel, Noyo, and Russian Rivers.

IV. SEDIMENT QUALITY OBJECTIVES

A. AQUATIC LIFE – BENTHIC COMMUNITY PROTECTION

Pollutants in sediments shall not be present in quantities that, alone or in combination, are toxic to benthic communities in bays and estuaries of California. This narrative objective shall be implemented using the integration of multiple lines of evidence (MLOE) as described in Section V of Part 1.

B. HUMAN HEALTH

Pollutants shall not be present in sediments at levels that will bioaccumulate in aquatic life to levels that are harmful to human health. This narrative objective shall be implemented as described in Section VI of Part 1.

V. BENTHIC COMMUNITY PROTECTION

A. MLOE APPROACH TO INTERPRET THE NARRATIVE OBJECTIVE

The methods and procedures described below shall be used to interpret the Narrative Objective described in Section IV.A. These tools are intended to assess the condition of benthic communities relative to potential for exposure to toxic pollutants in sediments. Exposure to toxic pollutants at harmful levels will result in some combination of a degraded benthic community, presence of toxicity, and elevated concentrations of pollutants in sediment. The assessment of sediment quality shall consist of the measurement and integration of three lines of evidence (LOE). The LOE are:

- ***Sediment Toxicity***—Sediment toxicity is a measure of the response of invertebrates exposed to surficial sediments under controlled laboratory conditions. The sediment toxicity LOE is used to assess both pollutant related biological effects and exposure. Sediment toxicity tests are of short durations and may not duplicate exposure conditions in natural systems. This LOE provides a measure of exposure to all pollutants present, including non-traditional or unmeasured chemicals.
- ***Benthic Community Condition***—Benthic community condition is a measure of the species composition, abundance and diversity of the sediment-dwelling invertebrates inhabiting surficial sediments*. The benthic community LOE is used to assess impacts to the primary receptors targeted for protection under Section IV.A. Benthic community composition is a measure of the biological effects of both natural and anthropogenic stressors.
- ***Sediment Chemistry***—Sediment chemistry is the measurement of the concentration of chemicals of concern* in surficial sediments. The chemistry LOE is used to assess the potential risk to benthic organisms from toxic pollutants in surficial sediments. The sediment chemistry LOE is intended only to evaluate overall exposure risk from chemical pollutants. This LOE does not establish causality associated with specific chemicals.

B. LIMITATIONS

None of the individual LOE is sufficiently reliable when used alone to assess sediment quality impacts due to toxic pollutants. Within a given site, the LOEs applied to assess exposure as described in Section V.A. may underestimate or overestimate the risk to benthic

communities and do not indicate causality of specific chemicals. The LOEs applied to assess biological effects can respond to stresses associated with natural or physical factors, such as sediment grain size, physical disturbance, or organic enrichment.

Each LOE produces specific information that, when integrated with the other LOEs, provides a more confident assessment of sediment quality relative to the narrative objective. When the exposure and effects tools are integrated, the approach can quantify protection through effects measures and also provide predictive capability through the exposure assessment.

C. WATER BODIES

1. The tools described in the Sections V.D. through V.I. are applicable to Euhaline* Bays and Coastal Lagoons* south of Point Conception and Polyhaline* San Francisco Bay that includes the Central and South Bay Areas defined in general by waters south and west of the San Rafael Bridge and north of the Dumbarton Bridge.
2. For all other bays and estuaries where LOE measurement tools are unavailable, station assessment will follow the procedure described in Section V.J.

D. FIELD PROCEDURES

1. All samples shall be collected using a grab sampler.
2. Benthic samples shall be screened through:
   a. A 0.5 millimeter (mm)-mesh screen in San Francisco Bay and the Sacramento-San Joaquin Delta;
   b. A 1.0 mm-mesh screen in all other locations.
3. Surface sediment from within the upper 5 cm shall be collected for chemistry and toxicity analyses.
4. The entire contents of the grab sample, with a minimum penetration depth of 5 cm, shall be collected for benthic community analysis.
5. Bulk sediment chemical analysis will include at a minimum the pollutants identified in Attachment A.

E. LABORATORY TESTING

All samples will be tested in accordance with U.S. Environmental Protection Agency (USEPA) or American Society for Testing and Materials (ASTM) methodologies where such methods exist. Where no EPA or ASTM methods exist, the State Water Board or Regional Water Quality Control Boards (Regional Water Boards) (collectively Water Boards) shall approve the use of other methods. Analytical tests shall be conducted by laboratories certified by the California Department of Health Services in accordance with Water Code Section 13176.

F. SEDIMENT TOXICITY

1. Short Term Survival Tests—A minimum of one short-term survival test shall be performed on sediment collected from each station. Acceptable test organisms and methods are summarized in Table 2.

Table 2. Acceptable Short Term Survival Sediment Toxicity Test Methods

Test Organism	Exposure Type	Duration	Endpoint*
Eohaustorius estuarius	Whole Sediment	10 days	Survival
Leptocheirus plumulosus	Whole Sediment	10 days	Survival
Rhepoxynius abronius	Whole Sediment	10 days	Survival

2. Sublethal Tests—A minimum of one sublethal test shall be performed on sediment collected from each station. Acceptable test organisms and methods are summarized in Table 3.

Table 3. Acceptable Sublethal Sediment Toxicity Test Methods

Test Organism	Exposure Type	Duration	Endpoint
Neanthes arenaceodentata	Whole Sediment	28 days	Growth
Mytilus galloprovincialis	Sediment-water Interface	48 hour	Embryo Development

3. Assessment of Sediment Toxicity—Each sediment toxicity test result shall be compared and categorized according to responses in Table 4. The response categories are:
   a. Nontoxic—Response not substantially different from that expected in sediments that are uncontaminated and have optimum characteristics for the test species (e.g., control sediments).
   b. Low toxicity—A response that is of relatively low magnitude; the response may not be greater than test variability.
   c. Moderate toxicity—High confidence that a statistically significant toxic effect is present.
   d. High toxicity—High confidence that a toxic effect is present and the magnitude of response includes the strongest effects observed for the test.

Table 4. Sediment Toxicity Categorization Values

Test Species/ Endpoint	Statistical Significance	Nontoxic (Percent)	Low Toxicity (Percent of Control)	Moderate Toxicity (Percent of Control)	High Toxicity (Percent of Control)
Eohaustorius Survival	Significant	90 to 100	82 to 89	59 to 81	< 59
Eohaustorius Survival	Not Significant	82 to 100	59 to 81		<59
Leptocheirus Survival	Significant	90 to 100	78 to 89	56 to 77	<56
Leptocheirus Survival	Not Significant	78 to 100	56 to 77		<56
Rhepoxynius Survival	Significant	90 to 100	83 to 89	70 to 82	< 70
Rhepoxynius Survival	Not Significant	83 to 100	70 to 82		< 70
Neanthes Growth	Significant	90 to 100*	68 to 90	46 to 67	<46
Neanthes Growth	Not Significant	68 to 100	46 to 67		<46
Mytilus Normal	Significant	80 to 100	77 to 79	42 to 76	< 42
Mytilus Normal	Not Significant	77 to 79	42 to 76		< 42

* Expressed as a percentage of the control.

4. Integration of Sediment Toxicity Categories—The average of all test response categories shall determine the final toxicity LOE category. If the average falls midway between categories it shall be rounded up to the next higher response category.

G. BENTHIC COMMUNITY CONDITION

1. General Requirements.
   a. All benthic invertebrates in the screened sample shall be identified to the lowest possible taxon and counted.
   b. Taxonomic nomenclature shall follow current conventions established by local monitoring programs and professional organizations (e.g., master species list).
2. Benthic Indices—The benthic condition shall be assessed using the following methods:
   a. Benthic Response Index (BRI), which was originally developed for the southern California mainland shelf and extended into California's bays and estuaries. The BRI is the abundance-weighted average pollution* tolerance score of organisms occurring in a sample.
   b. Index of Biotic Integrity (IBI), which was developed for freshwater streams and adapted for California's bays and estuaries. The IBI identifies community measures that have values outside a reference range.
   c. Relative Benthic Index (RBI), which was developed for embayments in California's Bay Protection and Toxic Cleanup Program. The RBI is the weighted sum of: (a) several community parameters (total number of species, number of crustacean species, number of crustacean individuals, and number of mollusc species), and abundances of (b) three positive, and (c) two negative indicator species.
   d. River Invertebrate Prediction and Classification System (RIVPACS), which was originally developed for British freshwater streams and adapted for California's bays and estuaries. The approach compares the assemblage at a site with an expected species composition determined by a multivariate predictive model that is based on species relationships to habitat gradients.
3. Assessment of Benthic Community Condition—Each benthic index result shall be categorized according to disturbance as described in Table 5. The disturbance categories are:
   a. Reference—A community composition equivalent to a least affected or unaffected site.
   b. Low disturbance— A community that shows some indication of stress, but could be within measurement error of unaffected condition.
   c. Moderate disturbance—Confident that the community shows evidence of physical, chemical, natural, or anthropogenic stress.
   d. High disturbance—The magnitude of stress is high.
4. Integration of Benthic Community Categories—The median of all benthic index response categories shall determine the benthic condition LOE category. If the median falls between categories it shall be rounded up to the next higher effect category.

Table 5. Benthic Index Categorization Values

Index	Reference	Low Disturbance	Moderate Disturbance	High Disturbance
Southern California Marine Bays				
BRI	< 39.96	39.96 to 49.14	49.15 to 73.26	> 73.26
IBI	0	1	2	3 or 4
RBI	> 0.27	0.17 to 0.27	0.09 to 0.16	< 0.09
RIVPACS	> 0.90 to < 1.10	0.75 to 0.90 or 1.10 to 1.25	0.33 to 0.74 or > 1.25	< 0.33
Polyhaline Central San Francisco Bay				
BRI	< 22.28	22.28 to 33.37	33.38 to 82.08	> 82.08
IBI	0 or 1	2	3	4
RBI	> 0.43	0.30 to 0.43	0.20 to 0.29	< 0.20
RIVPACS	> 0.68 to < 1.32	0.33 to 0.68 or 1.32 to 1.67	0.16 to 0.32 or > 1.67	< 0.16

H. SEDIMENT CHEMISTRY

1. All samples shall be tested for the analytes identified in Attachment A—This list represents the minimum analytes required to assess exposure. In water bodies where other toxic pollutants are believed to pose risk to benthic communities, those toxic pollutants shall be included in the analysis. Inclusion of additional analytes cannot be used in the exposure assessment described below. However, the data can be used to conduct more effective stressor identification studies as described in Section VII. F.
2. Sediment Chemistry Guidelines—The sediment chemistry exposure shall be assessed using the following two methods:
   a. Chemical Score Index (CSI), that uses a series of empirical thresholds to predict the benthic community disturbance category (score) associated with the concentration of various chemicals (Table 6). The CSI is the weighted sum of the individual scores (Equation 1).

      Equation 1. $CSI = \Sigma(w_i \times cat_i)/\Sigma w$

      Where: cat_i = predicted benthic disturbance category for chemical I;
      w_i = weight factor for chemical I;
      Σw = sum of all weights.

   b. California Logistic Regression Model (CA LRM), that uses logistic regression models to predict the probability of sediment toxicity associated with the concentration of various chemicals (Table 7 and Equation 2). The CA LRM exposure value is the maximum probability of toxicity from the individual models (P_{max})

      Equation 2. $p = e^{B0+B1\,(x)} / (1 + e^{B0+B1\,(x)})$

      Where: p = probability of observing a toxic effect;
      B0 = intercept parameter;
      B1 = slope parameter; and
      x = concentration the chemical.

Table 6. Category Score Concentration Ranges and Weighting Factors for the CSI

Chemical	Units	Weight	Score (Disturbance Category)			
			1 Reference	2 Low	3 Moderate	4 High
Copper	mg/kg	100	≤52.8	> 52.8 to 96.5	> 96.5 to 406	> 406
Lead	mg/kg	88	≤ 26.4	> 26.4 to 60.8	> 60.8 to 154	> 154
Mercury	mg/kg	30	≤ 0.09	> 0.09 to 0.45	> 0.45 to 2.18	> 2.18
Zinc	mg/kg	98	≤ 112	> 112 to 200	> 200 to 629	> 629
PAHs, total high MW	µg/kg	16	≤ 312	> 312 to 1325	> 1325 to 9320	>9320
PAHs, total low MW	µg/kg	5	≤ 85.4	> 85.4 to 312	> 312 to 2471	> 2471
Chlordane, alpha-	µg/kg	55	≤ 0.50	> 0.50 to 1.23	> 1.23 to 11.1	>11.1
Chlordane, gamma-	µg/kg	58	≤ 0.54	> 0.54 to 1.45	> 1.45 to 14.5	> 14.5
DDDs, total	µg/kg	46	≤ 0.50	> 0.50 to 2.69	> 2.69 to 117	> 117
DDEs, total	µg/kg	31	≤ 0.50	> 0.50 to 4.15	> 4.15 to 154	> 154
DDTs, total	µg/kg	16	≤ 0.50	> 0.50 to 1.52	> 1.52 to 89.3	> 89.3
PCBs, total	µg/kg	55	≤11.9	> 11.9 to 24.7	> 24.7 to 288	> 288

Table 7. CA LRM Regression Parameters

Chemical	Units	B0	B1
Cadmium	mg/kg	0.29	3.18
Copper	mg/kg	-5.59	2.59
Lead	mg/kg	-4.72	2.84
Mercury	mg/kg	-0.06	2.68
Zinc	mg/kg	-5.13	2.42
PAHs, total high MW	µg/kg	-8.19	2.00
PAHs, total low MW	µg/kg	-6.81	1.88
Chlordane, alpha	µg/kg	-3.41	4.46
Dieldrin	µg/kg	-1.83	2.59
Trans nonachlor	µg/kg	-4.26	5.31
PCBs, total	µg/kg	-4.41	1.48
p,p' DDT	µg/kg	-3.55	3.26

3. Assessment of Sediment Chemistry Exposure—Each sediment chemistry guideline result shall be categorized according to exposure as described in Table 8. The exposure categories are:
   a. Minimal exposure—Sediment-associated contamination* may be present, but exposure is unlikely to result in effects.
   b. Low exposure—Small increase in pollutant exposure that may be associated with increased effects, but magnitude or frequency of occurrence of biological impacts is low.
   c. Moderate exposure—Clear evidence of sediment pollutant exposure that is likely to result in biological effects; an intermediate category.
   d. High exposure—Pollutant exposure highly likely to result in possibly severe biological effects; generally present in a small percentage of the samples.

Table 8. Sediment Chemistry Guideline Categorization Values

Guideline	Minimal Exposure	Low Exposure	Moderate Exposure	High Exposure
CSI	< 1.69	1.69 to 2.33	2.34 to 2.99	>2.99
CA LRM	< 0.33	0.33 to 0.49	0.50 to 0.66	> 0.66

4. Integration of Sediment Chemistry Categories—The average of all chemistry exposure categories shall determine the final sediment chemistry LOE category. If the average falls midway between categories it shall be rounded up to the next higher exposure category.

I. INTERPRETATION AND INTEGRATION OF MLOE

Assessment as to whether the aquatic life sediment quality objective has been attained at a station is accomplished by the interpretation and integration of MLOE. The categories assigned to the three LOE, sediment toxicity, benthic community condition and sediment chemistry are evaluated to determine the station level assessment. The assessment category represented by each of the possible MLOE combinations reflects the presence and severity of two characteristics of the sample: severity of biological effects, and potential for chemically-mediated effects.

1. Severity of Biological Effects—The severity of biological effects present at a site shall be determined by the integration of the toxicity LOE and benthic condition LOE categories using the decision matrix presented in Table 9.
2. Potential for Chemically-Mediated Effects—The potential for effects to be chemically-mediated shall be determined by the integration of the toxicity LOE and chemistry LOE categories using the decision matrix presented in Table 10.

Table 9. Severity of Biological Effects Matrix

		Toxicity LOE Category			
		Nontoxic	Low Toxicity	Moderate Toxicity	High Toxicity
Benthic Condition LOE Category	Reference	Unaffected	Unaffected	Unaffected	Low Effect
	Low Disturbance	Unaffected	Low Effect	Low Effect	Low Effect
	Moderate Disturbance	Moderate Effect	Moderate Effect	Moderate Effect	Moderate Effect
	High Disturbance	Moderate Effect	High Effect	High Effect	High Effect

Table 10. Potential for Chemically Mediated Effects Matrix

		Toxicity LOE Category			
		Nontoxic	**Low Toxicity**	**Moderate Toxicity**	**High Toxicity**
Sediment Chemistry LOE Category	Minimal Exposure	Minimal Potential	Minimal Potential	Low Potential	Moderate Potential
	Low Exposure	Minimal Potential	Low Potential	Moderate Potential	Moderate Potential
	Moderate Exposure	Low Potential	Moderate Potential	Moderate Potential	Moderate Potential
	High Exposure	Moderate Potential	Moderate Potential	High Potential	High Potential

3. Station Level Assessment—The station level assessment shall be determined using the decision matrix presented in Table 11. This assessment combines the intermediate classifications for severity of biological effect and potential for chemically-mediated effect to result in six categories of impact at the station level:
   a. Unimpacted—Confident that sediment contamination is not causing significant adverse impacts to aquatic life living in the sediment at the site.
   b. Likely Unimpacted—Sediment contamination at the site is not expected to cause adverse impacts to aquatic life, but some disagreement among the LOE reduces certainty in classifying the site as unimpacted.
   c. Possibly Impacted—Sediment contamination at the site may be causing adverse impacts to aquatic life, but these impacts are either small or uncertain because of disagreement among LOE.
   d. Likely Impacted—Evidence for a contaminant-related impact to aquatic life at the site is persuasive, even if there is some disagreement among LOE.
   e. Clearly Impacted—Sediment contamination at the site is causing clear and severe adverse impacts to aquatic life.
   f. Inconclusive—Disagreement among the LOE suggests that either the data are suspect or that additional information is needed before a classification can be made.

Table 11. Station Assessment Matrix

		Severity of Effect			
		Unaffected	**Low Effect**	**Moderate Effect**	**High Effect**
Potential For Chemically-Mediated Effects	Minimal Potential	Unimpacted	Likely Unimpacted	Likely Unimpacted	Inconclusive
	Low Potential	Unimpacted	Likely Unimpacted	Possibly Impacted	Possibly Impacted
	Moderate Potential	Likely Unimpacted	Possibly Impacted or Inconclusive[1]	Likely Impacted	Likely Impacted
	High Potential	Inconclusive	Likely Impacted	Clearly Impacted	Clearly Impacted

[1] Inconclusive category when chemistry is classified as minimal exposure, benthic response is classified as reference, and toxicity response is classified as high.

The station assessment resulting from each possible combination of the three LOEs is shown in Attachment B. As an alternative to Tables 9, 10 and 11, each LOE

category can be applied to Attachment B to determine the overall condition of the station. The results will be the same regardless of the tables used.

4. Relationship to the Aquatic Life – Benthic Community Protection Narrative Objective.
   a. The categories designated as **Unimpacted** and **Likely Unimpacted** shall be considered as achieving the protective condition at the station. All other categories shall be considered as degraded except as provided in b. below.
   b. The Water Board shall designate the category **Possibly Impacted** as meeting the protective condition if the studies identified in Section VII.F demonstrate that the combination of effects and exposure measures are not responding to toxic pollutants in sediments and that other factors are causing these responses within a specific reach segment or waterbody. In this situation, the Water Board will consider only the Categories **Likely Impacted** and **Clearly Impacted** as degraded when making a determination on receiving water limits and impaired water bodies described in Section VII.

J. MLOE Approach to Interpret the Narrative Objective in Other Bays and Estuaries

Station assessments for waterbodies identified in Section V.C.2. will be conducted using the same conceptual approach and similar tools to those described in Sections V.D-H. Each LOE will be evaluated by measuring a set of readily available indicators in accordance with Tables 12 and 13.

1. Station assessment shall be consistent with the following key principles of the assessment approach described in Sections V.D. through V.I:
   a. Results for a single LOE shall not be used as the basis for an assessment.
   b. Evidence of both elevated chemical exposure and biological effects must be present to indicate pollutant-associated impacts.
   c. The categorization of each LOE shall be based on numeric values or a statistical comparison.
2. Lines of Evidence and Measurement Tools—Sediment chemistry, toxicity, and benthic community condition shall be measured at each station. Table 12 lists the required tools for evaluation of each LOE. Each measurement shall be conducted using standardized methods (e.g., EPA or ASTM guidance) where available.
3. Categorization of LOEs—Determination of the presence of an LOE effect (i.e., biologically significant chemical exposure, toxicity, or benthic community disturbance) shall be based on a comparison to a numeric response value or a statistical comparison to reference stations. The numeric values or statistical comparisons (e.g., confidence interval) used to classify a LOE as Effected shall be comparable to those specified in Sections V.F-H. to indicate High Chemical Exposure, High Toxicity, or High Disturbance. Reference stations shall be located in an area expected to be uninfluenced by the discharge or pollutants of concern in the assessment area and shall be representative of other habitat characteristics of the assessment area (e.g., salinity, grain size). Comparison to reference shall be accomplished by compiling data for appropriate regional reference sites and determining the reference envelope using statistical methods (e.g., tolerance interval).

Table 12. Tools for Use in Evaluation of LOEs

LOE	Tools	Metrics
Chemistry	Bulk sediment chemistry to include existing list (Attachment A) plus other chemicals of concern	CA LRM P_{max} Concentration on a dry weight basis
Sediment Toxicity	10-Day amphipod survival using a species tolerant of the sample salinity and grain size characteristics. e.g., *Hyalella azteca* or *Eohaustorius estuarius*	Percent of control survival
Benthic Community Condition	Invertebrate species identification and abundance	Species richness* Presence of sensitive indicator taxa Dominance by tolerant indicator taxa Presence of diverse functional and feeding groups Total abundance

Table 13. Numeric Values and Comparison Methods for LOE Categorization

Metric	Threshold value or Comparison
CA LRM	Pmax > 0.66
Chemical Concentration	Greater than reference range or interval
Percent of Control Survival	*E. estuarius*: < 59 *H. azteca*: < 62 or SWAMP criterion
Species Richness	Less than reference range or interval
Abundance of Sensitive Indicator Taxa	Less than reference range or interval
Abundance of Tolerant Indicator Taxa	Greater than reference range or interval
Total Abundance	Outside of reference range or interval

4. Station Level Assessment—The station level assessment shall be determined using the decision matrix presented in Table 14. This assessment combines the classifications for each LOE to result in two categories of impact at the station level:
   a. Unimpacted—No conclusive evidence of both high pollutant exposure and high biological effects present at the site. Evidence of chemical exposure and biological effects may be within natural variability or measurement error.
   b. Impacted—Confident that sediment contamination present at the site is causing adverse direct impacts to aquatic life.

Table 14. Station Assessment Matrix for Other Bays and Estuaries

Chemistry LOE Category	Toxicity LOE Category	Benthic Condition LOE Category	Station Assessment
No effect	No effect	No effect	Unimpacted
No effect	No effect	Effect	Unimpacted
No effect	Effect	No effect	Unimpacted
No effect	Effect	Effect	Impacted
Effect	No effect	No effect	Unimpacted
Effect	No effect	Effect	Impacted
Effect	Effect	No effect	Impacted
Effect	Effect	Effect	Impacted

5. Relationship to the Aquatic Life – Benthic Community Protection Narrative Objective— The category designated as **Unimpacted** shall be considered as achieving the protective condition at the station.

VI. HUMAN HEALTH

The narrative human health objective in Section IV. B. of this Part 1 shall be implemented on a case-by-case basis, based upon a human health risk assessment. In conducting a risk assessment, the Water Boards shall consider any applicable and relevant information, including California Environmental Protection Agency's (Cal/EPA) Office of Environmental Health Hazard Assessment (OEHHA) policies for fish consumption and risk assessment, Cal/EPA's Department of Toxic Substances Control (DTSC) Risk Assessment, and USEPA Human Health Risk Assessment policies.

VII. PROGRAM OF IMPLEMENTATION

Implementation of Part 1 shall be conducted in accordance with the following provisions and consistent with the process shown in Figures 1 and 2.

A. DREDGE MATERIALS

1. Part 1 shall not apply to dredge material suitability determinations.
2. The Water Boards shall not approve a dredging project that involves the dredging of sediment that exceeds the objectives in Part 1, unless the Water Boards determine that:
   a. The polluted sediment is removed in a manner that prevents or minimizes water quality degradation.
   b. The polluted sediment is not deposited in a location that may cause significant adverse effects to aquatic life, fish, shellfish, or wildlife or may harm the beneficial uses of the receiving waters, or does not create maximum benefit to the people of the State.
   c. The activity will not cause significant adverse impacts upon a federal sanctuary, recreational area, or other waters of significant national importance.

B. NPDES RECEIVING WATER AND EFFLUENT LIMITS

1. If a Water Board determines that discharge of a toxic pollutant to bay or estuarine waters has the reasonable potential to cause or contribute to an exceedance of the SQOs, the Water Board shall apply the objectives as receiving water limits.
2. The Permittee shall be in violation of such limits if it is demonstrated that the discharge is causing or contributing to the SQO exceedance as defined in Section VII.C.
3. Receiving water monitoring required by an NPDES permit may be satisfied by a Permitee's participation in a regional SQO monitoring program described in Section VII.E.
4. The sediment chemistry guidelines shall not be translated into or applied as effluent limits. Effluent limits established to protect or restore sediment quality shall be developed only after:
   a. A clear relationship has been established linking the discharge to the degradation,

b. The pollutants causing or contributing to the degradation have been identified, and

c. Appropriate loading studies have been completed to estimate the reductions in pollutant loading that will restore sediment quality.

These actions are described further in Sections VII.F and VII.G. Nothing in this section shall limit a Water Board's authority to develop and implement waste* load allocations* for Total Maximum Daily Loads. However, it is recommended that the Water Boards develop TMDL allocations using the methodology described herein, wherever possible.

C. EXCEEDANCE OF RECEIVING WATER LIMIT

Exceedance of a receiving water limit is demonstrated when:

1. Using a binomial distribution*, the total number of stations designated as not meeting the protective condition as defined in Sections V.I.4. or V.J.4. supports rejection of the null hypothesis* as presented in Table 15. The stations included in this analysis will be those located in the vicinity of the discharge and identified in the permit, and
2. It is demonstrated that the discharge is causing or contributing to the SQO exceedance, following the completion of the stressor identification studies described in Section VII.F.
3. If studies by the Permittee demonstrate that other sources may also be contributing to the degradation of sediment quality, the Regional Water Board shall, as appropriate, require the other sources to initiate studies to assess the extent to which these sources are a contributing factor.

Table 15. Minimum Number of Measured Exceedances Needed to Exceed the Direct Effects SQO as a Receiving Water Limit

Sample Size	List If the Number of Exceedances Equals or Is Greater Than
2 – 24	2*
25 – 36	3
37 – 47	4
48 – 59	5
60 – 71	6
72 – 82	7
83 – 94	8
95 – 106	9
107 – 117	10
118 – 129	11

Note: Null Hypothesis: Actual exceedance proportion $\leq$ 3 percent. Alternate Hypothesis: Actual exceedance proportion > 18 percent. The minimum effect size* is 15 percent.

*Application of the binomial test requires a minimum sample size of 16. The number of exceedances required using the binomial test at a sample size of 16 is extended to smaller sample sizes.

Exceedance will require the Permittee to perform additional studies as described in Sections VII.F and VII.G.

D. RECEIVING WATER LIMITS MONITORING FREQUENCY

1. Phase I Stormwater Discharges and Major Discharges—Sediment Monitoring shall not be required less frequently than twice per permit cycle. For Stations that are consistently classified as unimpacted or likely unimpacted the frequency may be reduced to once per permit cycle. The Water Board may limit receiving water monitoring to a subset of outfalls for Phase I Stormwater Permitees.
2. Phase II Stormwater and Minor Discharges—Sediment Monitoring shall not be required more often then twice per permit cycle or less then once per permit cycle. For stations that are consistently classified as unimpacted or likely unimpacted, the number of stations monitored may be reduced at the discretion of the Water Board. The Water Board may limit receiving water monitoring to a subset of outfalls for Phase II Stormwater Permitees.
3. Other Regulated Discharges and Waivers—The frequency of the monitoring for receiving water limits for other regulated discharges and waivers will be determined by the Water Board.

E. SEDIMENT MONITORING

1. Objective—Bedded sediments in bays contain an accumulation of pollutants from a wide variety of past and present sources discharged either directly into the bay or indirectly into waters draining into the bay. Embayments also represent highly disturbed or altered habitats as a result of dredging and physical disturbance caused by construction and maintenance of harbor works, boat and ship traffic, and development of adjacent lands. Due to the multitude of stressors and the complexity of the environment, a well-designed monitoring program is necessary to ensure that the data collected adequately characterizes the condition of sediment in these water bodies.
2. Permitted Discharges—Monitoring may be performed by individual Permitees to assess compliance with receiving water limits, or through participation in a regional or water body monitoring coalition as described under VII.E.3, or both as determined by the Water Board.
3. Monitoring Coalitions—To achieve maximum efficiency and economy of resources, the State Water Board encourages the regulated community in coordination with the Regional Water Boards to establish water body-monitoring coalitions. Monitoring coalitions enable the sharing of technical resources, trained personnel, and associated costs and create an integrated sediment-monitoring program within each major water body. Focusing resources on regional issues and developing a broader understanding of pollutants effects in these water bodies enables the development of more rapid and efficient response strategies and facilitates better management of sediment quality.
    a. If a regional monitoring coalition is established, the coalition shall be responsible for sediment quality assessment within the designated water body and for ensuring that appropriate studies are completed in a timely manner.
    b. The Water Board shall provide oversight to ensure that coalition participants are proactive and responsive to potential sediment quality related issues as they arise during monitoring and assessment.
    c. Each regional monitoring coalition shall prepare a workplan that describes the monitoring, a map of the stations, participants and a schedule that shall be submitted to the Water Board for approval.

4. Methods—Sediments collected from each station shall be tested or assessed using the methods and metrics described in Section V.
5. Design.
   a. The design of sediment monitoring programs, whether site-specific or region wide, shall be based upon a conceptual model. A conceptual model is useful for identifying the physical and chemical factors that control the fate and transport of pollutants and receptors that could be exposed to pollutants in the sediment. The conceptual model serves as the basis for assessing the appropriateness of a study design. The detail and complexity of the conceptual model is dependent upon the scope and scale of the monitoring program. A conceptual model shall consider:
      - Points of discharge into the segment of the waterbody or region of interest
      - Tidal flow and/or direction of predominant currents
      - Historic and or legacy conditions in the vicinity
      - Nearby land and marine uses or actions
      - Beneficial uses
      - Potential receptors of concern
      - Changes in grain size salinity water depth and organic matter
      - Other sources or discharges in the immediate vicinity.
   b. Sediment monitoring programs shall be designed to ensure that the aggregate stations are spatially representative of the sediment within the water body.
   c. The design shall take into consideration existing data and information of appropriate quality.
   d. Stratified random design shall be used where resources permit to assess conditions throughout a water body.
   3. Identification of appropriate strata shall consider characteristics of the water body including sediment transport, hydrodynamics, depth, salinity, land uses, inputs (both natural and anthropogenic) and other factors that could affect the physical, chemical, or biological condition of the sediment.
   f. Targeted designs shall be applied to those Permitees that are required to meet receiving water limits as described in Section VII. B.
6. Index Period—All stations shall be sampled between the months of June through September to be consistent with the benthic community condition index period.
7. Regional Monitoring Schedule and Frequency.
   a. Regional sediment quality monitoring will occur at a minimum of once every three years.
   b. Sediments identified as exceeding the narrative objective will be evaluated more frequently.
8. Evaluating Waters for placement on the Section 303(d) list —In California, water segments are placed on the section 303(d) list for sediment toxicity based either on toxicity alone or toxicity that is associated with a pollutant. The listing criteria are contained in the State Water Board's Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List (2004)(Listing Policy). Part 1 adds an additional listing criterion that applies only to listings for exceedances of the narrative sediment quality objective for aquatic life protection in Section IV.A. The criterion under Part 1 is described in subsection a. below and the relationship

between the sediment toxicity listing criteria under the Listing Policy and the criterion under Part 1 is described in subsections b. and c., below.

1. Water segments shall be placed on the section 303(d) list for exceedance of the narrative sediment quality objective for aquatic life protection in Section IV.A. of Part 1 only if the number of stations designated as not achieving the protective condition as defined in Sections V.I. and V.J. supports rejection of the null hypothesis, as provided in Table 3.1 of the State Water Board's Listing Policy.
2. Water segments that exhibit sediment toxicity but that are not listed for an exceedance of the narrative sediment quality objective for aquatic life protection in Section IV.A. shall continue to be listed in accordance with Section 3.6 of the Listing Policy.
3. If a water segment is listed under Section 3.6 of the Listing Policy and the Regional Water Board later determines that the applicable water quality standard that is impaired consists of the sediment quality objective in Section IV.A. of Part 1 and a bay or estuarine habitat beneficial use, the Regional Water Board shall reevaluate the listing in accordance with Sections V.I and V.J. If the Regional Water Board reevaluates the listing and determines that the water segment does not meet the criteria in subsection a. above, the Regional Water Board shall delist the water segment.

F. STRESSOR IDENTIFICATION

If sediments fail to meet the narrative SQOs in accordance with Sections V. and VI. the Water Boards shall direct the regional monitoring coalitions or Permittees to conduct stressor identification.

The Water Boards shall assign the highest priority for stressor identification to those segments or reaches with the highest percentage of sites designated as Clearly Impacted and Likely Impacted.

Where segments or reaches contain Possibly Impacted but no Clearly or Likely Impacted sites, confirmation monitoring shall be conducted prior to initiating stressor identification.

The stressor identification approach consists of development and implementation of a work plan to seek confirmation and characterization of pollutant-related impacts, pollutant identification and source identification. The workplan shall be submitted to the Water Board for approval. Stressor identification consists of the following studies:

1. Confirmation and Characterization of Pollutant Related Impacts—Exceedance of the direct effects SQO at a site indicates that pollutants in the sediment are the likely cause but does not identify the specific pollutant responsible. The MLOE assessment establishes a linkage to sediment pollutants; however, the lack of confounding factors (e.g., physical disturbance, non-pollutant constituents) must be confirmed. There are two generic stressors that are not related to toxic pollutants that may cause the narrative to be exceeded:
   a. Physical Alteration—Examples of physical stressors include reduced salinity, impacts from dredging, very fine or coarse grain size, and prop wash from passing ships. These types of stressors may produce a non-reference condition* in the benthic community that is similar to that caused by pollutants. If impacts to a site are purely due to physical disturbance, the LOE characteristics will likely show a degraded benthic community with little or no toxicity and low chemical concentrations.

b. Other Pollutant Related Stressors—These constituents, which include elevated total organic carbon, ammonia, nutrients and pathogens, may have sources similar to chemical pollutants. Chemical and microbiological analysis will be necessary to determine if these constituents are present. The LOE characteristics for this type of stressor would likely be a degraded benthic community with possibly an indication of toxicity, and low chemical concentrations.

To further assess a site that is impacted by toxic pollutants, there are several lines of investigation that may be pursued, depending on site-specific conditions. These studies may be considered and evaluated in the work plan for the confirmation effort:

a. Evaluate the spatial extent of the Area of Concern. This information can be used to evaluate the potential risk associated with the sediment, distinguish areas of known physical disturbance or pollution and evaluate the proximity to anthropogenic source gradient from such inputs as outfalls, storm drains, and industrial and agricultural activities.

b. Body burden data may be examined from animals exposed to the site's sediment to indicate if pollutants are being accumulated and to what degree.

c. Chemical specific mechanistic benchmarks* may be applied to interpret sediment chemistry concentrations.

d. Chemistry and biology data from the site should be examined to determine if there is a correlation between the two LOE.

e. Alternate biological effects data may be pursued, such as bioaccumulation* experiments and pore water toxicity or chemical analysis.

f. Other investigations that may commonly be performed as part of a Phase 1 Toxicity Identification Evaluation* (TIE).

If there is compelling evidence that the SQO exceedances contributing to a receiving water limit exceedance are not due to toxic pollutants, then the assessment area shall be designated as having achieved the receiving water limit.

2. Pollutant Identification—Methods to help determine cause may be statistical, biological, chemical or a combination. Pollutant identification studies should be structured to address site-specific conditions, and may be based upon the following:

a. Statistical methods—Correlations between individual chemicals and biological endpoints (toxicity and benthic community).

b. Gradient analysis—Comparisons are made between different samples taken at various distances from a chemical hotspot to examine patterns in chemical concentrations and biological responses. The concentrations of causative agents should decrease as biological effects decrease.

c. Additional Toxicity Identification Evaluation efforts—A toxicological method for determining the cause of impairments is the use of toxicity identification evaluations (TIE). Sediment samples are manipulated chemically or physically to remove classes of chemicals or render them biologically unavailable. Following the manipulations, biological tests are performed to determine if toxicity has been removed. TIEs should be conducted at a limited number of stations, preferably those with strong biological or toxicological effects.

d. Bioavailability*—Chemical pollutants may be present in the sediment but not biologically available to cause toxicity or degradation of the benthic community. There are several measures of bioavailability that can be made. Chemical and

toxicological measurements can be made on pore water to determine the availability of sediment pollutants. Metal compounds may be naturally bound up in the sediment and rendered unavailable by the presence of sulfides. Measurement of acid volatile sulfides and simultaneously extracted metals analysis can be conducted to determine if sufficient sulfides are present to bind the observed metals. Similarly, organic compounds can be tightly bound to sediments. Measurements of sediment organic carbon and other binding phases can be conducted to determine the bioavailable fraction of organic compounds. Solid phase microextraction (SPME) or laboratory desorption experiments can also be used to identify which organics are bioavailable to benthic organisms.

e. Verification—After specific chemicals are identified as likely causes of impairment, analysis should be performed to verify the results. Sediments can be spiked with the suspected chemicals to verify that they are indeed toxic at the concentrations observed in the field. Alternately, animals can be transplanted to suspected sites for *in situ* toxicity and bioaccumulation testing.

When stressor Identification yields inconclusive results for sites classified as Possibly Impacted, the Water Board shall require the Permittee or regional monitoring coalition to perform a one-time augmentation to that study or, alternatively, the Water Board may suspend further stressor identification studies pending the results of future routine SQO monitoring.

3. Sources Identification and Management Actions.
   a. Determine if the sources are ongoing or legacy sources.
   b. Determine the number and nature of ongoing sources.
   c. If a single discharger is found to be responsible for discharging the stressor pollutant at a loading rate that is significant, the Regional Water Board shall require the discharger to take all necessary and appropriate steps to address exceedance of the SQO, including but not limited to reducing the pollutant loading into the sediment.
   d. When multiple sources are present in the water body that discharge the stressor pollutant at a loading rate that is significant, the Regional Water Board shall require the sources to take all necessary and appropriate steps to address exceedance of the SQO. If appropriate, the Regional Water Board may adopt a TMDL to ensure attainment of the sediment standard.

G. CLEANUP AND ABATEMENT

Cleanup and abatement actions covered by Water Code section 13304 for sediments that exceed the objectives in Chapter IV shall comply with Resolution No. 92-49 (Policies and Procedures for Investigation and Cleanup and Abatement of Discharges under Water Code Section 13304), Cal. Code Regs., tit. 23, §§2907, 2911.

H. DEVELOPMENT OF SITE-SPECIFIC SEDIMENT MANAGEMENT GUIDELINES

The Regional Water Boards may develop site-specific sediment management guidelines where appropriate, for example, where toxic stressors have been identified and controllable sources of these stressors exist or remedial goals are desired.

Development of site-specific sediment management guidelines is the process to estimate the level of the stressor pollutant that will meet the narrative sediment quality objective. The guideline can serve as the basis for cleanup goals or revision of effluent limits described in B. 4

above, depending upon the situation or sources. All guidelines when applied for cleanup, must comply with 92-49.

Guideline development should only be initiated after the stressor has been identified. The goal is to establish a relationship between the organism's exposure and the biological effect. Once this relationship is established, a pollutant specific guideline may be designated that corresponds with minimum biological effects. The following approaches can be applied to establish these relationships:

1. Correspondence with sediment chemistry. An effective guideline can best be derived based upon the site-specific, or reach- specific relationship between the stressor pollutant exposure and biological response. Therefore the correspondence between the bulk sediment stressor concentration and biological effects should be examined.
2. Correspondence with bioavailable pollutant concentration. The concentration of the bioavailable fraction of the stressor pollutants is likely to show a less variable relationship to biological effects that bulk sediment chemistry. Interstitial water analysis, SPME, desorption experiments, selective extractions, or mechanistic models may indicate the bioavailable pollutant concentration. The correspondence between the bioavailable stressor concentration and biological effects should be examined.
3. Correspondence with tissue residue. The concentration of the stressor accumulated by a target organism may provide a measure of the stressor dose for some chemicals (e.g., those that are not rapidly metabolized). The tissue residue threshold concentration associated with unacceptable biological effects can be combined with a bioaccumulation factor or model to estimate the loading or sediment concentration guideline.
4. Literature review. If site-specific analyses are ambiguous or unable to determine a guideline, then the results of similar development efforts for other areas should be reviewed. Scientifically credible values from other studies can be combined with mechanistic or empirical models of bioavailability, toxic potency, and organism sensitivity to estimate guidelines for the area of interest.
5. The chemistry LOE of Section V.H.2, including the threshold values (e.g. CSI and CALRM), shall not be used for setting cleanup levels or numeric values for technical TMDLs.

VIII. GLOSSARY

BENTHIC: Living on or in bottom of the ocean, bays, and estuaries, or in the streambed.

BINOMIAL DISTRIBUTION: Mathematical distribution that describes the probabilities associated with the possible number of times particular outcomes will occur in series of observations (i.e., samples). Each observation may have only one of two possible results (e.g., standard exceeded or standard not exceeded).

BIOACCUMULATION: A process in which an organism's body burden of a pollutant exceeds that in its surrounding environment as a result of chemical uptake through all routes of chemical exposure; dietary and dermal absorption and transport across the respiratory surface.

BIOAVAILABILITY: The fraction of a pollutant that an organism is exposed to that is available for uptake through biological membranes (gut, gills).

CHEMICALS OF CONCERN (COCS): Pollutants that occur in environmental media at levels that pose a risk to ecological receptors or human health.

CONTAMINATION: An impairment of the quality of the waters of the State by waste to a degree that creates a hazard to the public health through poisoning or through the spread of disease. “Contamination” includes any equivalent effect resulting from the disposal of waste whether or not waters of the State are affected (CWC section 13050(k)).

EFFECT SIZE: The maximum magnitude of exceedance frequency that is tolerated.

ENCLOSED BAYS: Indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between headlands or outermost harbor works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. This definition includes, but is not limited to: Humboldt Bay, Bodega Harbor, Tomales Bay, Drakes Estero, San Francisco Bay, Morro Bay, Los Angeles Harbor, Upper and Lower Newport Bay, Mission Bay, and San Diego Bay.

ENDPOINT: A measured response of a receptor to a stressor. An endpoint can be measured in a toxicity test or in a field survey.

ESTUARIES AND COASTAL LAGOONS: Waters at the mouths of streams that serve as mixing zones* for fresh and ocean waters during a major portion of the year. Mouths of streams that are temporarily separated from the ocean by sandbars shall be considered as estuaries. Estuarine waters will generally be considered to extend from a bay or the open ocean to the upstream limit of tidal action but may be considered to extend seaward if significant mixing of fresh and salt water occurs in the open coastal waters. The waters described by this definition include, but are not limited to, the Sacramento-San Joaquin Delta as defined by Section 12220 of the California Water Code, Suisun Bay, Carquinez Strait downstream to Carquinez Bridge, and appropriate areas of the Smith, Klamath, Mad, Eel, Noyo, and Russian Rivers.

EUHALINE: Waters ranging in salinity from 25–32 practical salinity units (psu).

INLAND SURFACE WATERS: All surface waters of the State that do not include the ocean, enclosed bays, or estuaries.

LOAD ALLOCATION (LA): The portion of a receiving water's total maximum daily load that is allocated to one of its nonpoint sources of pollution or to natural background sources.

MECHANISTIC BENCHMARKS: Chemical guidelines developed based upon theoretical processes governing bioavailability and the relationship to biological effects.

MIXING ZONE: A limited zone within a receiving water that is allocated for mixing with a wastewater discharge where water quality criteria can be exceeded without causing adverse effects to the overall water body.

NONPOINT SOURCES: Sources that do not meet the definition of a point source as defined below.

NULL HYPOTHESIS: A statement used in statistical testing that has been put forward either because it is believed to be true or because it is to be used as a basis for argument, but has not been proved.

OCEAN WATERS: Territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the State Water Board’s California Ocean Plan.

POINT SOURCE: Any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock,

concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged. This term does not include agricultural stormwater discharges and return flows from irrigated agriculture.

POLLUTANT: Defined in section 502(6) of the CWA as “dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water.”

POLLUTION: Defined in section 502(19) of the CWA as the “the man-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of water.” *Pollution* is also defined in CWC section 13050(1) as an alternation of the quality of the waters of the State by waste to a degree that unreasonably affects either the waters for beneficial uses or the facilities that serve these beneficial uses.

POLYHALINE: Waters ranging in salinity from 18–25 psu.

REFERENCE CONDITION: The characteristics of water body segments least impaired by human activities. As such, reference conditions can be used to describe attainable biological or habitat conditions for water body segments with common watershed/catchment characteristics within defined geographical regions.

SPECIES RICHNESS: The number of species in a sample.

SURFICIAL SEDIMENTS: Those sediments representing recent depositional materials and containing the majority of the benthic invertebrate community.

STATISTICAL SIGNIFICANCE: When it can be demonstrated that the probability of obtaining a difference by chance only is relatively low.

TOXICITY IDENTIFICATION EVALUATION (TIE): Techniques used to identify the unexplained cause(s) of toxic events. TIE involves selectively removing classes of chemicals through a series of sample manipulations, effectively reducing complex mixtures of chemicals in natural waters to simple components for analysis. Following each manipulation the toxicity of the sample is assessed to see whether the toxicant class removed was responsible for the toxicity.

WASTE: As used in this document, waste includes a discharger’s total discharge, of whatever origin, i.e., gross, not net, discharge.

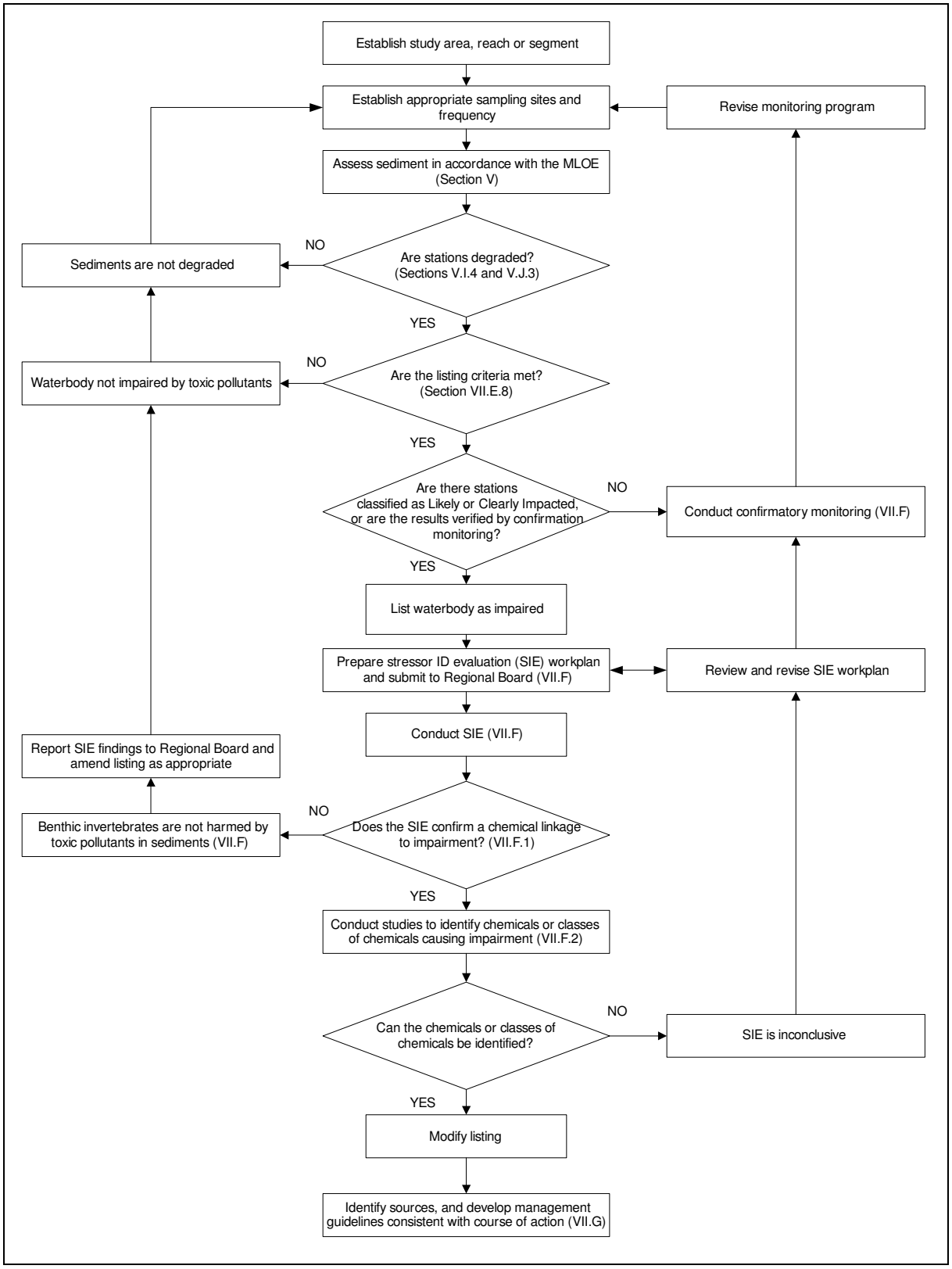

Figure 1. Waterbody Assessment Process

Figure 2. Point Source Assessment Process

Attachment A. List of chemical analytes needed to characterize sediment contamination exposure and effect.

Chemical Name	Chemical Group	Chemical Name	Chemical Group
Total Organic Carbon	General	Alpha Chlordane	Pesticide
Percent Fines	General	Gamma Chlordane	Pesticide
		Trans Nonachlor	Pesticide
Cadmium	Metal	Dieldrin	Pesticide
Copper	Metal	o,p'-DDE	Pesticide
Lead	Metal	o,p'-DDD	Pesticide
Mercury	Metal	o,p'-DDT	Pesticide
Zinc	Metal	p,p'-DDD	Pesticide
		p,p'-DDE	Pesticide
		p,p'-DDT	Pesticide
Acenaphthene	PAH	2,4'-Dichlorobiphenyl	PCB congener
Anthracene	PAH	2,2',5-Trichlorobiphenyl	PCB congener
Biphenyl	PAH	2,4,4'-Trichlorobiphenyl	PCB congener
Naphthalene	PAH	2,2',3,5'-Tetrachlorobiphenyl	PCB congener
2,6-dimethylnaphthalene	PAH	2,2',5,5'-Tetrachlorobiphenyl	PCB congener
Fuorene	PAH	2,3',4,4'-Tetrachlorobiphenyl	PCB congener
1-methylnaphthalene	PAH	2,2',4,5,5'-Pentachlorobiphenyl	PCB congener
2-methylnaphthalene	PAH	2,3,3',4,4'-Pentachlorobiphenyl	PCB congener
1-methylphenanthrene	PAH	2,3',4,4',5-Pentachlorobiphenyl	PCB congener
Phenanthrene	PAH	2,2',3,3',4,4'-Hexachlorobiphenyl	PCB congener
Benzo(a)anthracene	PAH	2,2',3,4,4',5'-Hexachlorobiphenyl	PCB congener
Benzo(a)pyrene	PAH	2,2',4,4',5,5'-Hexachlorobiphenyl	PCB congener
Benzo(e)pyrene	PAH	2,2',3,3',4,4',5-Heptachlorobiphenyl	PCB congener
Chrysene	PAH	2,2',3,4,4',5,5'-Heptachlorobiphenyl	PCB congener
Dibenz(a,h)anthracene	PAH	2,2',3,4',5,5',6-Heptachlorobiphenyl	PCB congener
Fluoranthene	PAH	2,2',3,3',4,4',5,6-Octachlorobiphenyl	PCB congener
Perylene	PAH	2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl	PCB congener
Pyrene	PAH	Decachlorobiphenyl	PCB congener

Attachment B. Station assessment category resulting from each possible MLOE combination

LOE Category Combination	Sediment Chemistry Exposure	Benthic Community Condition	Sediment Toxicity	Station Assessment
1	Minimal	Reference	Nontoxic	Unimpacted
2	Minimal	Reference	Low	Unimpacted
3	Minimal	Reference	Moderate	Unimpacted
4	Minimal	Reference	High	Inconclusive
5	Minimal	Low	Nontoxic	Unimpacted
6	Minimal	Low	Low	Likely unimpacted
7	Minimal	Low	Moderate	Likely unimpacted
8	Minimal	Low	High	Possibly impacted
9	Minimal	Moderate	Nontoxic	Likely unimpacted
10	Minimal	Moderate	Low	Likely unimpacted
11	Minimal	Moderate	Moderate	Possibly impacted
12	Minimal	Moderate	High	Likely impacted
13	Minimal	High	Nontoxic	Likely unimpacted
14	Minimal	High	Low	Inconclusive
15	Minimal	High	Moderate	Possibly impacted
16	Minimal	High	High	Likely impacted
17	Low	Reference	Nontoxic	Unimpacted
18	Low	Reference	Low	Unimpacted
19	Low	Reference	Moderate	Likely unimpacted
20	Low	Reference	High	Possibly impacted
21	Low	Low	Nontoxic	Unimpacted
22	Low	Low	Low	Likely unimpacted
23	Low	Low	Moderate	Possibly impacted
24	Low	Low	High	Possibly impacted
25	Low	Moderate	Nontoxic	Likely unimpacted
26	Low	Moderate	Low	Possibly impacted
27	Low	Moderate	Moderate	Likely impacted
28	Low	Moderate	High	Likely impacted
29	Low	High	Nontoxic	Likely unimpacted
30	Low	High	Low	Possibly impacted
31	Low	High	Moderate	Likely impacted
32	Low	High	High	Likely impacted
33	Moderate	Reference	Nontoxic	Unimpacted
34	Moderate	Reference	Low	Likely unimpacted
35	Moderate	Reference	Moderate	Likely unimpacted
36	Moderate	Reference	High	Possibly impacted
37	Moderate	Low	Nontoxic	Unimpacted
38	Moderate	Low	Low	Possibly impacted
39	Moderate	Low	Moderate	Possibly impacted
40	Moderate	Low	High	Possibly impacted
41	Moderate	Moderate	Nontoxic	Possibly impacted
42	Moderate	Moderate	Low	Likely impacted
43	Moderate	Moderate	Moderate	Likely impacted
44	Moderate	Moderate	High	Likely impacted

LOE Category Combination	Sediment Chemistry Exposure	Benthic Community Condition	Sediment Toxicity	Station Assessment
45	Moderate	High	Nontoxic	Possibly impacted
46	Moderate	High	Low	Likely impacted
47	Moderate	High	Moderate	Likely impacted
48	Moderate	High	High	Likely impacted
49	High	Reference	Nontoxic	Likely unimpacted
50	High	Reference	Low	Likely unimpacted
51	High	Reference	Moderate	Inconclusive
52	High	Reference	High	Likely impacted
53	High	Low	Nontoxic	Likely unimpacted
54	High	Low	Low	Possibly impacted
55	High	Low	Moderate	Likely impacted
56	High	Low	High	Likely impacted
57	High	Moderate	Nontoxic	Likely impacted
58	High	Moderate	Low	Likely impacted
59	High	Moderate	Moderate	Clearly impacted
60	High	Moderate	High	Clearly impacted
61	High	High	Nontoxic	Likely impacted
62	High	High	Low	Likely impacted
63	High	High	Moderate	Clearly impacted
64	High	High	High	Clearly impacted

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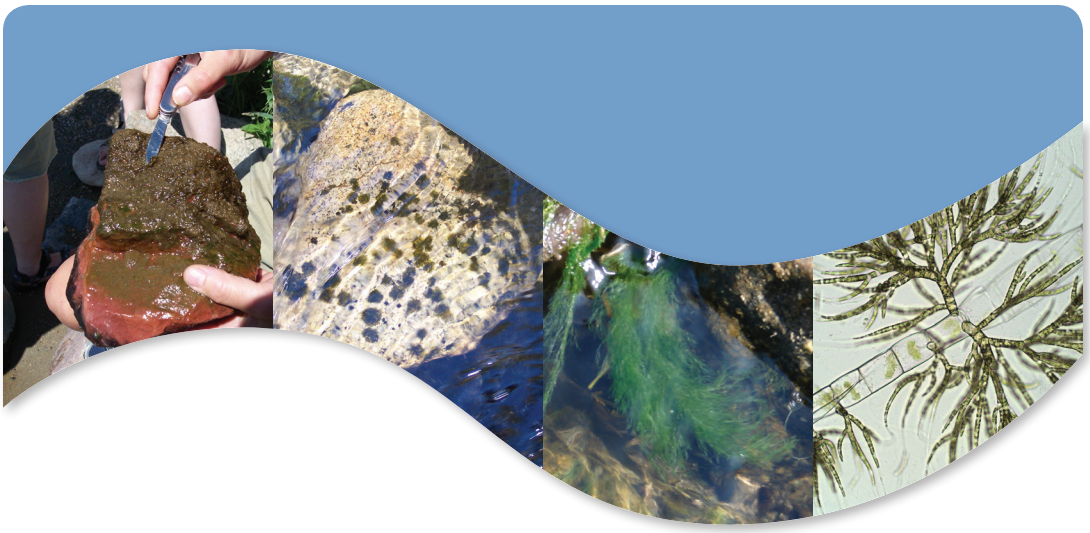

SWAMP
Surface Water Ambient Monitoring Program

SWAMP Bioassessment Procedures 2010

Standard Operating Procedures for Collecting Stream Algae Samples and Associated Physical Habitat and Chemical Data for Ambient Bioassessments in California

June 2009, updated May 2010

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This Standard Operating Procedures (SOP) manual represents the contributions of a wide range of researchers and field crews. The algal specimen collection methodology presented represents a modification of the U.S. Environmental Protection Agency's (EPA's) Environmental Monitoring and Assessment Program (EMAP) multihabitat sampling protocol (Peck et al. 2006). Point-intercept estimation of macroalgal cover has been adapted from the U.S. Geological Survey's (USGS's) National Water Quality Assessment (NAWQA) pilot procedures (J. Berkman, pers comm.), and assessment of microalgal thickness has been adapted from Stevenson and Rollins (2006). The physical habitat (PHab) methods are identical to those presented in the SWAMP Bioassessment protocol of Ode (2007), with the exception of the point-intercept method for determining algal cover, which is an add-on to the PHab pebble count procedure. The PHab procedures are, in turn, minor modifications of those used in EMAP and developed by EPA's Office of Research and Development (ORD, Peck et al. 2006).

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LIST OF ACRONYMS & ABBREVIATIONS L

Acronyms & Abbreviations	Definitions
AFDM	Ash-Free Dry Mass
BMI	Benthic Macroinvertebrate
chl a	Chlorophyll *a*
CPOM	Coarse Particulate Organic Matter
DO	Dissolved Oxygen
EMAP	Environmental Monitoring and Assessment Program (of the U.S. EPA)
GPS	Global Positioning System
IBI	Index of Biotic Integrity
MCM	Margin-Center-Margin
NAD	North American Datum
NAWQA	National Water Quality Assessment (of the U.S. Geological Survey)
NBO	Neutrally Buoyant Object
NNE	Nutrient Numeric Endpoints
OSPR	Office of Spill Prevention and Response (of the California Department of Fish and Game)
PHab	Physical Habitat
QAPrP	Quality Assurance Program Plan (of SWAMP)
ORD	Office of Research and Development (of the U.S. EPA)
RBP	Rapid Bioassessment Procedures
RWB	Reachwide Benthos
SOP	Standard Operating Procedures
SWAMP	Surface Water Ambient Monitoring Program
TRC	Targeted Riffle Composite

SECTION 1 INTRODUCTION

This document is the Standard Operating Procedure (SOP) for collecting and field-processing stream algae for the California State Water Resources Control Board's Surface Water Ambient Monitoring Program (SWAMP). Instructions are provided for the following:

- collection of samples for taxonomic identification of diatoms and soft-bodied algae
- collection of samples for determination of biomass based on chlorophyll *a* and ash-free dry mass (AFDM)
- estimation of percent algal cover

The document is designed to serve as a stand-alone SOP if algae are the only bioindicators being assessed at a given site. However, it can also serve as an add-on module to the existing SWAMP SOP for bioassessment using benthic macroinvertebrates (BMIs). Much of the procedure for collecting physical habitat (PHab) data is identical for these two assemblages. However, some PHab elements assessed in conjunction with BMI bioassessment are not included for algal bioassessment, because they are more specific to BMI habitat needs than to algae. Conversely, one PHab element for algal bioassessment (i.e., point-intercept estimation of algal cover) is not part of the BMI SOP. It should also be noted that, while the standard PHab protocol associated with BMI sampling includes both a "Full" and a "Basic" (simplified) version, a distinction between basic and full protocols for algae has not been established.

This SOP requires the reachwide benthos (RWB) sampling method to be used whenever algae bioassessment is conducted under the SWAMP program. Other appropriate sampling methods will be allowed if specific monitoring objectives require the use of alternative methods or if consistent data comparability in long-term monitoring projects is desired. For SWAMP funded projects, the project proponent must have the approval of the SWAMP bioassessment coordinator and the SWAMP Quality Assurance Officer before the use of alternative methods. For other projects and/or programs working towards SWAMP comparability, deviations should be approved by their project manager and project Quality Assurance (QA) officer.

For quick reference, Table 1 provides a list of elements common and distinct to the two SWAMP bioassessment assemblages. In general, if both BMIs and algae are being collected at a given site, the PHab procedure as described in Ode (2007) should be followed, with the exception of the pebble count, which should be conducted according to this SOP, because it incorporates instructions for algal cover point-intercept data collection. More specifically, if bioassessment involving the Full BMI protocol plus algae is to be implemented at a given site, practitioners should follow the Full protocol of Ode (2007), and add only Section 3.4 (re: water chemistry), Sections 4 and 5, and Sections 6.9-6.11 from this SOP.

Table 1
Sample and data collection elements included in algal and BMI bioassessment (Ode 2007).
X indicates elements included in algal bioassessment. F indicates elements that are part of the "Full" protocol for conducting BMI bioassessment, B corresponds to elements of the "Basic" BMI protocol, and O indicates elements that are "Optional".

Element	Algae[1]	BMIs
Layout of reach, marking transects, recording GPS coordinates	X	B, F
Notable field conditions	X	B, F
Temperature, pH, specific conductance, DO, alkalinity	X	B, F
Turbidity, Silica	O	O
Water chemistry for lab analysis (see list in Section 3.4)	X	
Algal Sampling for Taxonomic IDs	X	
Algal Sampling for Biomass Assessment	X	O
BMI Sampling for Taxonomic IDs		B, F
Wetted Width	X	B, F
Bankfull Dimensions	X	F
Depth and Pebble Count + CPOM	X	F
Percent Algal Cover (point-intercept with Pebble Count)	X	
Cobble Embeddedness	X	F
Canopy Cover	X	B, F
Gradient	X	B[2], F
Sinuosity		F
Human Influence	X	F
Riparian Vegetation		F
Instream Habitat		F
Bank Stability	X	B, F
Flow Habitat Delineation	X	B, F
Discharge	X	F
Photo documentation	X	B,F
Selected Rapid Bioassessment Procedure (RBP) visuals		F

1. A distinction between Basic and Full protocols for algae has not been established.
2. For BMIs, a single, reachwide measurement of gradient is required for Basic, but gradient is measured between all adjacent transect pairs for Full.

Depending upon the requirements of the monitoring effort, different components of this SOP might be incorporated or omitted. For instance, if stream productivity in terms of algae is the primary concern of the assessment, one may wish to collect only biomass samples and algal cover point-intercept data. Alternatively, one will need to collect algal assemblages (for quantification of diatom and/or soft-bodied algal taxa) in order to make more refined inferences about water quality and stream condition (e.g., by applying an algal Index of Biotic Integrity (IBI)).

This SOP is organized in such a way as to facilitate the inclusion or omission of certain elements based on the goals of the monitoring effort. A list of field supplies is provided in Appendix A. It is organized according to the materials needed for each type of sampling and data collection. In order to facilitate decisions about algal indicators to assess for program-specific needs, the introduction to Section 4 discusses what algal indicators serve which monitoring purposes.

SECTION 2 GETTING STARTED

Several considerations come into play when planning an algae-sampling effort. For instance, time of year can be an important determinant of stream algae abundance as well as the type of community likely to be encountered. Likewise, a minimum amount of surface water is a prerequisite to conducting bioassessment. The following section provides guidelines to help practitioners determine when sampling is appropriate for a given reach and also some pointers to help prepare for field work.

2.1 WHEN TO SAMPLE

It is recommended that sampling for stream algae be carried out during the same period as BMI sampling, generally from May through September, depending on the region. This time frame may eventually be modified (e.g., expanded) based on the results of ongoing index period studies.

It should be noted that high-velocity storm flows can remove macroalgae and biofilms from the stream bottom. Sampling must be done at least a month after any storm event that has generated enough stream power to mobilize cobbles and sand/silt capable of scouring stream substrates, in order to allow ample time for recolonization of scoured surfaces (Round 1991; Kelly et al. 1998; Stevenson and Bahls in Barbour et al. 1999).

2.2 BEFORE SETTING OUT FOR THE FIELD

- Proper precautions should be taken at all times in order to avoid transferring invasive organisms and pathogens between sites. This includes the implementation of effective equipment decontamination procedures. Refer to Appendix B for additional information.
- Use the equipment checklist provided in Appendix A to make sure all necessary supplies are brought along.
- Check with contract lab on sampling containers, and shipping and storage of samples.
- Have in mind at least three sites to visit per day (target two, but plan for at least one additional site as a back up if one of the first two sites is not useable.)
- Prepare, and double check, site dossiers to make sure they are complete with maps/directions to sites and scaled aerial photo(s). Bring along county maps, atlases, and Thomas Guides to further aid location of sites. Also bring along any site access permits, passes, and/or keys, as needed (and be aware that some landowners require notice prior to each site visit).

2.3 BEFORE LEAVING VEHICLE FOR SITE

Make sure the vehicle is parked in a safe spot and there are no "No Parking" signs. Stick a business card with cell phone number in the driver's window. Be sure to display the brown administrative pass placard if you are on National Forest land (or a letter of permission, if applicable).

2.4 DETERMINING WHETHER SITE IS APPROPRIATE FOR SAMPLING

Make an initial survey of the potential monitoring reach from the stream banks (being sure to not disturb the instream habitat). Ensure that there is sufficient water in the stream reach to facilitate collection of algae and water samples. In order for a reach to be in appropriate condition for sampling, at least half of the reach should have a wetted width of at least 1m, and there should be no more than 3 transects that are completely dry. If there is some flexibility in terms of where to place the sampling reach, strive for as few dry transects as possible (and preferably none).

Sites should be safe to sample and legally accessible. The time required to access the sampling sites should also be a consideration in planning which sites to visit, in order to ensure that sample holding times can be met (see Table 2 on page 11 for holding-time information).

REACH DELINEATION AND WATER CHEMISTRY SAMPLING 3

Before sample and data collection can begin, the monitoring reach must be identified and delineated. This requires setting up sampling transects along the stream reach of interest. Once the reach is delineated, information about reach location and condition will need to be documented. Water chemistry parameters must also be recorded, and certain samples collected.

A set of field forms for recording information about monitoring sites, algal samples, and associated water chemistry and PHab data is provided on the SWAMP website (see below). The field forms are also available in electronic version on an portable computer. It is imperative that you confirm throughout the data collection effort at each site that all necessary data have been recorded on the field forms correctly, by double-checking values, and confirming spoken values with your field partner(s). As a general practice, you should conduct a final check across all datasheets to confirm that there are no missing values before you leave the site, and rectify any blanks. *Note: Field forms may be updated periodically. It is imperative that field crews ensure that they are always using the most current field forms. Updated forms can be accessed from the SWAMP website at: http://swamp.mpsl.mlml.calstate.edu/resources-and-downloads*

3.1 DELINEATING AND DOCUMENTING THE MONITORING REACH

To delineate the monitoring reach, you will need to scout it in its entirety in order to make sure that it is of adequate length for sampling algae. During this process, try to stay out of the channel as much as possible, to avoid disturbing the stream bottom, which could compromise the samples and data that will be collected.

SWAMP's standard algae (and BMI) sampling layout consists of a 150 m reach or a 250 m reach, depending upon the average wetted width of the channel. In some circumstances (see below), reach length can be $<$ 150 m, but this should be avoided whenever possible. If the actual reach length is other than 150 m or 250 m, this should be noted and explained on the field forms. Under these circumstances, you will need to determine the useable length of the reach, and how to space your transects so that you can fit them into the reach at equal distances from one to the next.

The wetted channel is the zone that is inundated with water and the wetted width is the distance between the sides of the channel at the point where substrates are no longer surrounded by surface water. Estimate the average wetted width of the reach. If this value is $\leq$ 10 m, you will end up using 150 m for your monitoring reach length. If the average wetted width is $>$ 10 m, you will use a 250 m long reach.

To set up the monitoring reach, begin a little outside of what you anticipate will be the outer boundary (based on aerials and maps) and count 150 large steps, or 250 large steps (for most adults, a large step is roughly equal to a meter), by walking along the bank. This will give a rough idea about the location of the ends of the study reach. However, keep in mind that once this is determined, the actual distances between transects and intertransects (and consequently, the reach length) will need to be more accurately measured.

As you go, identify where hydrologic inputs that could potentially modify the water chemistry environment occur along the length of the reach. If possible, there should be no tributaries or "end-of-pipe" outfalls feeding into the channel within the monitoring reach. Other features that should not be present within a monitoring reach are: bridge crossings (which shade the stream bottom and can artificially reduce or prevent algal growth), changes between natural and man-made (i.e., concrete) channel bottoms, waterfalls, and impoundments (dams and weirs). If any of such features occur within the reach, and there is not enough room to accommodate a 150-m reach or 250-m reach entirely upstream or downstream of such a feature, then the reach can be somewhat < 150 m. Whatever the reach length turns out to be (150 m, 250 m, or other), record it on the datasheet under "Reach Length".

3.2 MARKING THE TRANSECTS

The monitoring reach will be divided into 11 equidistant main transects that are arranged perpendicularly to the direction of flow. There will also be 10 additional transects (designated "inter-transects"), one between each pair of adjacent main transects, to give a total of 21 transects per monitoring reach. Main transects are designated "A" through "K", while inter-transects are designated by their nearest upstream and downstream main transects ("AB", "BC", etc.).

Once you have identified the upper and lower limits of the monitoring reach, determine the coordinates of the downstream end using a Global Positioning System (GPS) set to the North American Datum 1983 (NAD 83)[3], and record this information in decimal degrees (to five decimal places) on the datasheet under "Reach Documentation". Install a colored flag at water's edge on one of the banks at this location to indicate the first "main transect", or "A". Establish the positions of the remaining transects and inter-transects by heading along the entire length of the monitoring reach (again, staying out of the water/channel as much as possible) and using the transect tape or a segment of rope of appropriate length to measure off successive segments of 7.5 m (for streams of wetted width ≤ 10 m), or 12.5 m (for streams > 10 m wetted width). For monitoring reaches of non-standard length, you will divide the total, targeted length of the reach by 20 to derive the distance between the adjacent main, and inter-, transects. As you measure off the distances, always follow the virtual, mid-channel line, and not the water's edge (which may be irregular, and not reflective of the true stream curvilinear distance).

3. Be aware that some GPS units re-set themselves to factory default settings when the batteries are changed. This can include the datum. Therefore, anytime you remove batteries from your unit, double check that the unit is still set to the NAD83 datum after the batteries have been replaced.

At the end of each measured segment as you head along the stream, mark the transect location on the bank with a flag. We recommend alternating between two different flag colors (e.g., orange could correspond to main transects, and yellow to inter-transects). Determine transect orientations, and where on the banks to place the flags, by visually projecting perpendicularly from the mid-channel to the banks. Refer to Figure 1 for a visual representation of proper transect alignment relative to the stream's direction of flow. When you have finished, the downstream-most flag will correspond to main transect "A", and the upstream-most flag (the 21st in the entire series of main and inter- transects) will correspond to main transect "K".

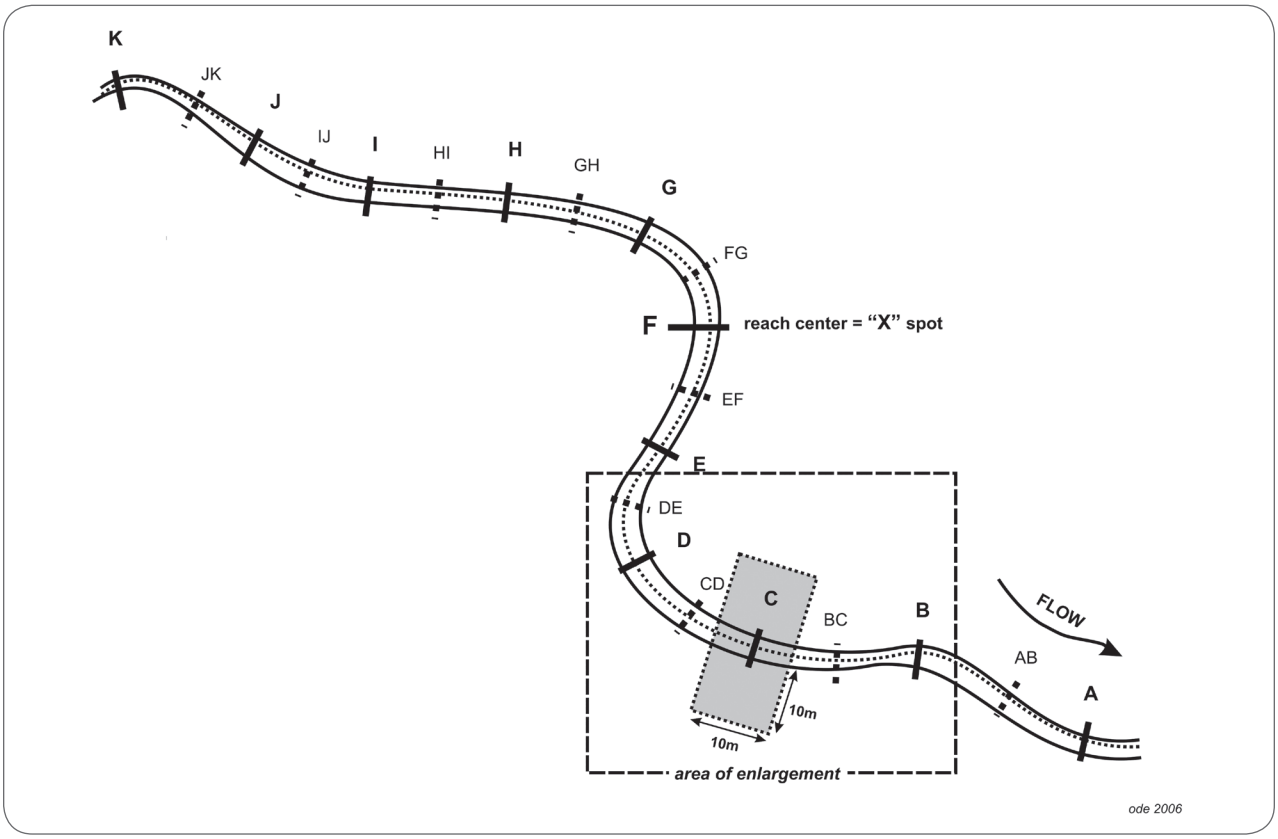

Figure 1. Reach layout geometry for physical habitat (PHab) and biological sampling showing positions of 11 main transects (A-K) and the 10 supplemental inter-transects (AB-JK). The area highlighted in the figure is expanded in Figure 11. Note: reach length = 150 m for streams ≤ 10 m average wetted width, and reach length = 250 m for streams > 10 m average wetted width (reprinted from Ode 2007).

3.3 NOTABLE FIELD CONDITIONS

Record under "Notable Field Conditions" any evidence of recent flooding, fire, or other disturbances that might influence algae samples. Especially note if flow conditions have been affected by recent rainfall, which can cause significant under-sampling of algal biomass and diversity. If you are unaware of recent fire or rainfall events, select the "no" option on the forms. Record the dominant land use and land cover in the area surrounding the reach by evaluating land cover within 50 m of either side of the stream reach. You can

use a scaled aerial photograph of the site and vicinity to guide you. *Note: Before heading out to the field, it is convenient to add a 150 m (or 250 m) line adjacent the stream to be sampled in order to get an idea about the anticipated approximate upstream and downstream boundaries of the monitoring reach.*

3.4 WATER CHEMISTRY

Measure and record common ambient water chemistry measurements (pH, dissolved oxygen (DO), specific conductance, alkalinity, and water temperature) just outside of the reach, at the downstream end, near the same location that the GPS coordinates were taken. This should be done in such a way that it does not interfere with biotic sampling and PHab data collection, but also in such a way that water samples are not compromised by other sampling activities upstream (e.g., by suspension of matter from the stream bottom into the water column, and consequently the introduction of this matter into the water chemistry samples).

Water chemistry measurements are typically taken with a handheld, water-quality meter (e.g., YSI, Hydrolab), but field test kits (e.g., Hach) can provide acceptable information if they are properly calibrated. For appropriate calibration methods, calibration frequency, and accuracy checks, consult the current SWAMP Quality Assurance Program Plan (QAPrP)[4], or follow manufacturer's guidelines. *Note 1: If characteristics of the site prohibit downstream entry, measurements may be taken at other points in the reach. In all cases, ambient chemistry measurements should be taken at the start of the survey (i.e., before algae sampling and PHab data collection). Note 2: A digital titrator (e.g., Hach) using low-concentration acid (such as 0.16N H_2SO_4) as the titrant is recommended for determining alkalinity in low-alkalinity streams (i.e., approximately 100 mg/L $CaCO_3$ or less).*

A suite of analytes must also be evaluated to aid in interpretation of the algal data. These are listed below. Consult the SWAMP QAPrP for specific instructions on the proper techniques for collecting, preserving, and storing these water samples until analysis.

- Nitrate as N (NO_3)
- Nitrite as N (NO_2)
- Ammonia as N (NH_3)
- Nitrogen, Total (TN)[5]
- Orthophosphate as P (dissolved; SRP)
- Phosphorous, Total (TPHOS)
- Dissolved Organic Carbon (DOC)
- Chloride (Cl)

- Silica as SiO_2, dissolved (Note: this analyte is recommended for research purposes, but is not part of the standard algae protocol)

4. This document is available online from the SWAMP website: http://www.swrcb.ca.gov/water_issues/programs/swamp/docs/qapp/swamp_qapp_master090108a.pdf
5. Total Nitrogen can be calculated from Total Kjeldahl Nitrogen (TKN), Nitrate (NO_3) and Nitrite (NO_2)

SECTION 4
REACHWIDE BENTHOS SAMPLING OF ALGAE

The following is a short introduction of several types of algal indicators that can be monitored as part of a bioassessment effort. For a more detailed discussion, see Fetscher and McLaughlin (2008). The most appropriate indicators to include in a given program will ultimately depend upon that program's goals, because the various indicators provide information at varying levels of resolution and applicability to different uses. Likewise, the various indicators require different levels of investment in terms of field work and lab work. Percent algal cover, for instance, is a rapid means of estimating algal primary productivity that can be carried out entirely in the field and is conducted in tandem with the PHab pebble count. Therefore, percent algal cover is an appropriate, fast, and inexpensive parameter for citizen monitoring groups if they are concerned about increased algal biomass. Other estimators of algal biomass include chlorophyll *a* and AFDM, which involve quantitative collection of algae, preservation, and subsequent laboratory analysis. Algal biomass is a key component of the California Nutrient Numeric Endpoints (NNE) framework. Higher resolution information about algal assemblages can be used in algal IBIs, and offers more in-depth insight into water quality. For this type of data, algal specimens must be collected quantitatively (and qualitatively, in the case of soft-bodied algae). The quantitative samples are then fixed/preserved carefully and subjected to taxonomic analysis.

While the percent algal cover data are recorded in conjunction with standard PHab procedures, and do not require the collection of samples, all the other types of data described in this protocol require reachwide benthos (RWB) sampling of algal specimens in a manner analogous to that which is carried out for BMIs.

All four of the algal samples described in this SOP: chlorophyll *a*, AFDM, diatom assemblage, and soft-bodied algal assemblage, can be obtained from a single composite sample generated by the RWB method. Which combination of these samples to prepare and submit for laboratory processing will depend on the needs of the monitoring program. To aid in the selection of algal indicators, Table 2 provides a summary of their attributes.

Table 2
Types of algal indicators and considerations for their assessment.

	Algal indicator for	Collection method	Collection vessel	Preservation/fixation methods and holding times	Qualitative live sample required?
Percent algal cover	Stream productivity measured as algal abundance	Point-intercept add-on to the PHab pebble count	N/A	N/A	N/A
Chlorophyll a[6]	Stream productivity measured as algal biomass; key indicator for the Nutrient Numeric Endpoints (NNE) framework	RWB sample collection	Glass-fiber filter	Wet ice, dark (foil-wrapped); freezing within 4h, and analysis within 28d	N/A
AFDM	Stream productivity measured as biomass of organic matter (including algae); indicator for the NNE framework	RWB sample collection	Glass-fiber filter (pre-combusted[7])	Wet ice, dark (foil-wrapped); freezing within 4h, and analysis within 28d	N/A
Diatoms	Used in IBIs. Indicative of factors such as trophic status; organic enrichment; low DO; siltation; pH; metals	RWB sample collection	50 mL centrifuge tube	Add 10% buffered formalin for a 2% final concentration immediately after collection; keep dark and away from heat	Optional
Soft-bodied algae[8]	Used in IBIs. Indicative of factors such as nitrogen limitation/ trophic status; siltation; pH; temperature, light availability, nuisance/ toxic algal blooms	RWB sample collection	50 mL centrifuge tube	Keep unfixed samples in dark on wet (NOT DRY) ice; add glutaraldehyde (to a 2.5% final concentration) as soon as possible, but no later than 4 days after sampling; after fixing, keep dark and away from heat	Required

6. It is valuable to assess both chlorophyll *a* and phaeophytin *a* (the degradation product of the former) content of algal samples, as this may provide a more robust assessment of algal biomass.
7. Precombustion is recommended in order to remove any possible residual organic matter from the filter.
8. For the purposes of this SOP, the soft-bodied assemblage includes cyanobacteria (an explanation of the rationale for this is provided in Fetscher and McLaughlin 2008)

4.1 GENERAL CONSIDERATIONS FOR SAMPLING ALGAE

This SOP describes the RWB method for collecting stream algae. It employs an objective approach for selecting sub-sampling locations that is built upon the 11 main transects described in the previous section. This approach is analogous to the SWAMP procedure for BMI sampling (Ode 2007), and is ultimately based on EPA's Environmental Monitoring and Assessment Program (EMAP; Peck et al. 2006). After collection, the 11 sub-samples are composited into a single sample per site (sampling reach).

The RWB method can be used to sample any wadeable stream reach since it does not target specific habitats. Because sampling locations are defined by the transect layout, the position of individual sub-sampling spots may fall within a variety of "erosional[9]" or "depositional[10]" habitats, each of which has implications for the type of substrate likely to be encountered and therefore the type of sampling device to use.

For the RWB method, the sub-sampling position alternates between left, center, and right portions of the transects, as one proceeds upstream from one transect to the next. These sampling locations are defined as the points at 25% ("left[11]"), 50% ("center") and 75% ("right") of the wetted width in high-gradient systems, and at "margin-center-margin" (MCM) positions in low-gradient systems. The RWB-MCM method should be only used in low-gradient streams where channel substrates are nearly uniform, resulting in low diversity within the channel. The interim cut-off between "low" and "high" gradient is 1%. Best professional judgment can be used to estimate whether the stream reach should be treated as low- or high-gradient. However, if there is uncertainty about the gradient, it should be measured prior to collecting the biotic assemblage samples. See Section 4.2 for specific instructions about where algae sampling locations should be positioned at the margins of low-gradient sampling reaches.

Algae should be sampled prior to PHab data collection (described in Sections 6-8), so as not to disturb the algae by trampling the transects, as occurs during the PHab process. Furthermore, to avoid disturbing the transects for eventual collection of PHab data, as with BMIs, algae should be collected at a location that is systematically offset from each transect (see Section 4.2).

4.2 COLLECTION OF ALGAE IN CONJUNCTION WITH BENTHIC MACROINVERTEBRATES

If only algae (or only BMIs) are being collected for bioassessment, then the specimens should be collected 1m downstream of the transects. If both assemblages are being sampled, then the algae should be collected upstream of the spot where the BMIs are collected, according to the schematic in Figure 2. BMIs must be collected BEFORE algae at each of the transects, in order to minimize the chances disturbing BMIs during algal collection. After the BMIs are collected at each spot, the algae sample should be taken ¼ m upstream

9. Erosional – habitats in the stream that are dominated by fast-moving water, such as riffles, where stream power is more likely to facilitate erosion (suspension) of loose benthic material than deposition; examples of "erosional" substrates include cobbles and boulders.
10. Depositional – habitats in the stream that are dominated by slow-moving water, such as pools, where deposition of materials from the water column is more likely to occur than erosion (or (re)suspension) of bed materials; examples of "depositional" substrates include silt and sand.
11. For our purposes, "left" is defined as the left bank when facing downstream.

from the center of the upper edge of the "scar" in the stream bottom left from the BMI sampling. It is important to make sure that the surface from which algae will be collected has not been disturbed (by the BMI sampling, or otherwise) prior to sampling the algae.

Note: If only algae (and not BMIs) are being collected in a low-gradient reach, the collection location should be 1 m downstream of the transect and, for each of the "margin" positions, at a distance of 15 cm from the wetted margin of the bank. Fifteen centimeters is chosen because it is approximately ½ the width of a D-frame net.

If duplicates are to be sampled (of either or both assemblages), locations for sampling them should be arranged as depicted in Figure 2 (the duplicates are shown in light grey). *Note: For convenience, only Transects A through C are shown, but the same pattern of placement should be rotated across all 11 transects.*

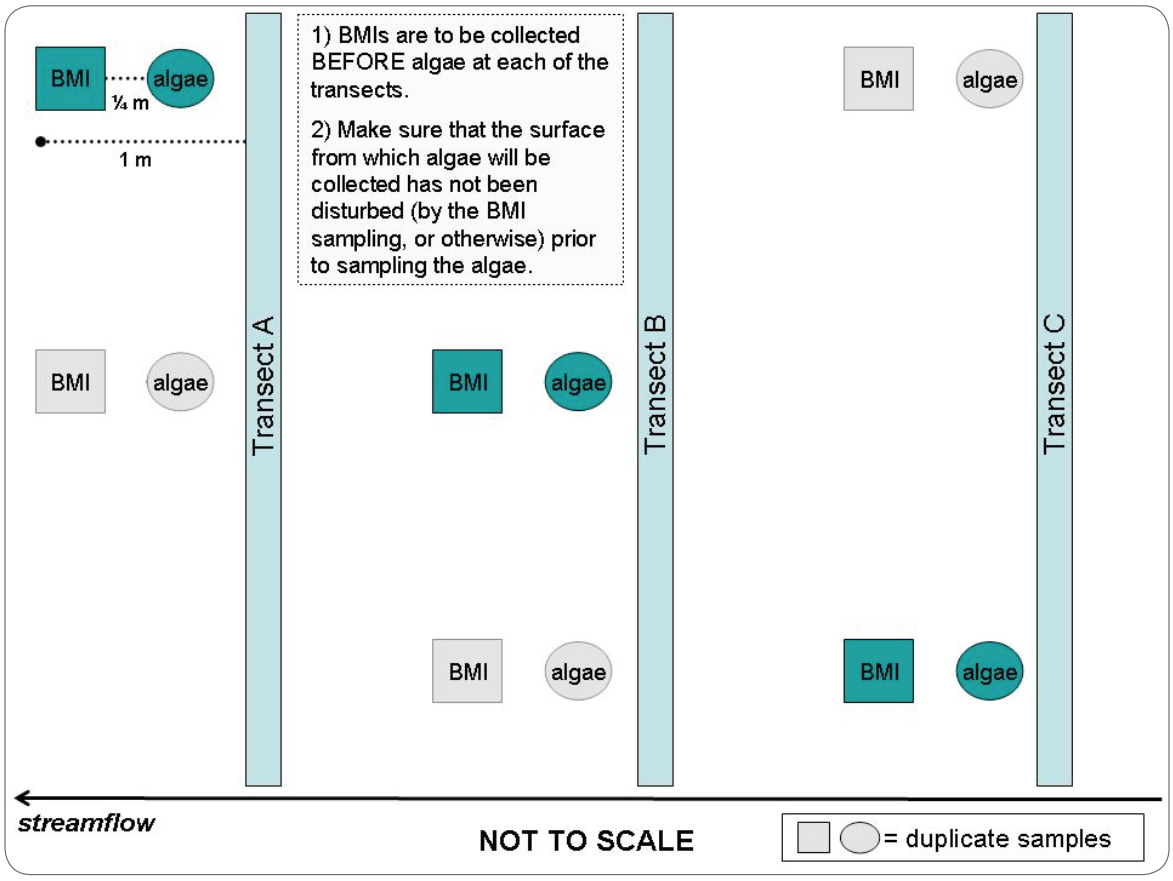

Figure 2. Sampling array for collection of algae, BMIs, and duplicates of each assemblage. For convenience, only Transects A through C are shown, but the same pattern of placement should be rotated across all 11 transects.

4.3 PROCEDURE FOR COLLECTION OF QUANTITATIVE ALGAL SAMPLES

During all phases of algae sampling and processing, in order to preserve specimen integrity, every attempt should be made to keep the sample material out of the sun, and in general, to protect the algae from heat and desiccation, as much as possible. This is necessary in order to reduce the risk of chlorophyll *a* degradation, limit cell division post-collection, and curb senescence/decay of live soft-bodied algae (especially for the qualitative samples; see Section 5.4). The need to maintain the integrity of the algal samples during collection and processing should always be borne in mind when planning the sampling scheme for a given site.

In addition, before sampling at any given site, the dish tub that will contain sample material must be scrubbed with a stiff-bristled brush or scouring pad and thoroughly rinsed with stream water, so that no algal material is carried over from the previous site to contaminate the current sample. The same applies to all other algae sampling apparati (toothbrushes for scrubbing, graduated cylinders, turkey basters, PVC and rubber delimiters, spatulas, syringe scrubbers, etc.).

4.3.1 Identifying the Sampling Locations

As with BMIs, algae sample collection should begin at Transect A and proceed upstream to Transect K. Except in circumstances in which the substrate to be sampled cannot be removed from the stream, a single sample of substrate material that corresponds to the objectively determined sampling point is gathered at each transect and placed in the plastic dish tub. The sample should always be collected from the substrate that is "uppermost" within the stream, and therefore has the highest probability of exposure to sun. For example, if at a given sampling point there is a thick layer of macroalgae above the stream bottom, the substrate collected at that point would be macroalgae itself, not the cobble, sand, or whatever other substrate lies beneath it. Proceeding from transect to transect with the dish tub, the sample collector rotates through the three collection positions in the following order: left at the first transect ("A"), center at the next transect ("B"), right at the next transect ("C"), then back to the left side ("D"), and so on through Transect K.

As substrates are gathered, a tally is taken of the number of samples that correspond to each of the classes of sampling device based on the surface area they sample: 1) 12.6 cm^2 for the PVC or rubber delimiters, and 2) 5.3 cm^2 for the syringe scrubber. The tallies are recorded in the Algae Samples field form under Collection Device. This information will ultimately be used to determine total stream surface area sampled at each site, which in turn will be used to calculate the soft-bodied algal biovolume and the biomass values. It may be helpful to use a tally meter in order to avoid having to carry a datasheet during substrate collection.

4.3.2 Collecting Erosional Substrates

If the substrate type that falls under the sampling spot is in erosional habitat and can be removed from the stream (e.g., a cobble, a piece of wood, or a piece of coarse gravel with an exposed surface area of at least 12.6 cm^2), carefully lift the substrate, moving slowly in an effort to disturb its top surface as minimally as

possible, and remove it from the stream. Then wipe any excess sand, silt, or BMIs, if present, off the bottom of the piece of substrate, and place it in the dish tub. It is helpful to place the substrate in such a way that makes it obvious what surface was facing upward when it was removed from the stream. Eventually, when you isolate a sample of algae from this substrate, you will want to obtain your sample from the portion of the substrate that had been exposed to the surface of the stream (and not buried) during the period leading up to the sampling event. For pieces of substrate with an exposed surface area that is $< 12.6\ cm^2$, the PVC delimiter should be used (Section 4.3.3).

Be sure to place the substrate (e.g., cobble) in the dish tub in such a way that surfaces covered with non-target algae are not rubbing against anything, which could cause non-target algae to slough off into the tub, thus artificially inflating the amount of algae collected. To avoid this problem, and especially if a large number of cobbles are likely to be sampled across a given stream reach, one may choose to isolate the algal specimen from each cobble as it is selected, rather than collecting all the cobbles into the dish tub and then isolating the algal specimens from them after all transects have been sampled. See Section 4.3.9 for further elaboration on this alternative approach.

Figure 3. PVC Delimiter

4.3.3 Collecting Depositional Substrates

If the substrate type that falls under the sampling spot is removable and is in depositional habitat (e.g., silt, sand, fine gravel), and/or has an exposed surface area per particle that is $< 12.6\ cm^2$, you will use a PVC delimiter. This is a plastic coring device with an internal diameter of 4 cm (Figure 3). Instructions for making a PVC delimiter are provided in Appendix C.

Isolate a specific quantity of sand/silt/gravel, centered on the sampling spot, by pressing into the top 1 cm of sediment with a PVC delimiter. Gently slide a masonry or kitchen spatula beneath the delimiter, being careful to keep the collected sediment contained within. Pull the PVC delimiter out of the water (with the spatula still in place) and remove any extra sediment from the spatula around the outside of the delimiter. Transfer the contents held in the delimiter by the spatula to the dish tub. Be sure not to pour the sediment sample on top of any cobbles that may be in the dish tub, as this could result in the sloughing of non-target algae from the cobbles into the dish tub, thus artificially inflating the amount of algae collected.

4.3.4 Collecting Sections of Macroalgae

If the substrate you hit on a given transect is a mass of macroalgae (e.g., a mass of attached filamentous algae underwater, or an unattached, floating mat that is believed to be native to the reach being sampled, and not imported from upstream), position the spatula directly under the macroalgae and press the PVC delimiter into the algae to define a $12.6\ cm^2$ area. Use a sharp razor blade or knife to cut away and discard any extra material from around the edges of the delimiter (do not simply pull it away, as this will distort the specimen and remove biomass from the targeted material). Add the macroalgal specimen that was isolated by the PVC delimiter to the dish tub.

When collecting a mass/mat of macroalgae, it is important to capture the full thickness of the macroalgae within the delimiter. To do this, from the side of the sampling area, slide your hand under the mat to feel where the bottom is, slide the spatula down to that spot, and then press the PVC delimiter downward slowly to "sandwich" the targeted section of macroalgae between the delimiter and the spatula. It is important to try not to bunch the macroalgae up nor stretch it out unnaturally, as the goal is to collect a representative sample of the algae as it occurs in the stream.

4.3.5 Collecting Sections of Macrophytes

If the substrate to be sampled is part of an immersed macrophyte, or old, dead leaves settled at the bottom of a pool, use the PVC delimiter/spatula combination to isolate a 12.6 cm^2 section of substrate that has been exposed to the surface of the stream. As with the macroalgae (Section 4.3.4), cut away and discard the extra material that falls outside the delimiter using a razor blade.

Figure 4. Syringe Scrubber

4.3.6 Collecting from Concrete, Bedrock, and Boulders

If the substrate falling under a sampling spot cannot be removed from the water (as in the case of bedrock, a boulder, or a concrete channel bottom), use a "syringe scrubber" device (Davies and Gee 1993; Figure 4) to collect an algae sample underwater. Instructions for making a syringe scrubber are provided in Appendix C.

To use this device, affix a fresh, white scrubbing pad circle onto the bottom of the syringe plunger using the Velcro® hooks on the end of the plunger. Press the plunger down so that the bottom of the scrubbing pad is flush with the bottom of the barrel. Then submerge the instrument, press the syringe firmly against the substrate, and rotate the syringe scrubber 3 times in order to collect the biofilm from the substrate surface onto the scrubbing pad. If the surface of the substrate where your sampling point fell is not flat enough to allow for a tight seal with the syringe barrel, objectively choose whatever sufficiently flat area on the exposed face of the substrate is closest to where the original point fell, and sample there.

After sampling, and before removing the syringe scrubber from the substrate, gently retract the plunger just slightly, so it is not up against the substrate anymore, but not so much that it pulls a lot of water into the barrel. Carefully slide the spatula under syringe barrel (which should be pulled just slightly away from the substrate on one side to allow the spatula to slide under), trying not to allow too much water to rush into the barrel. Then pull the instrument back up out of the water with the spatula still firmly sealed against the syringe-barrel bottom.

Hold the syringe scrubber over the dish tub and then remove the spatula, allowing any water to fall into the tub. Carefully detach the pad from the plunger and hold the pad over the tub. Using rinse water sparingly, remove as much algal material from the pad as possible by rinsing it off with the wash bottle, or a turkey baster, filled with stream water (from the current site—never carried over from a previous site), and

wringing it into the dish tub before discarding the used pad. Start this process by rinsing from the backside of the pad (the side that had been affixed to the plunger) to "push" the collected algae forward out of the front surface of the pad.

It is recommended that a fresh (new) pad be used each time a sample is collected, even within the same stream reach. Under no circumstances should the same pad be used at more than one site.

4.3.7 Collecting from Other Substrate Types

If other substrate types are encountered, they can be sampled from as long as there is good reason to believe that they were not recently introduced into the stream (e.g., by flowing from the upstream regions, or by recently falling into the stream), as they would then not be representative of the local instream environment. Use the collection instrument you deem to be most appropriate to sample the substrate and, as with any substrate, be sure to account for the surface area sampled (in this case, using the "Other" box on the Collection Device portion of the field forms).

4.3.8 Removal of Algae from Collected Substrates

After having sub-sampled substrates across the monitoring reach, there should be 11 transects' worth of material in the dish tub. Depending on the types of habitats in the stream and substrates encountered, the tub may contain cobbles, and/or sand, and/or gravel, and/or small pieces of wood, macroalgae, or macrophyte. Now a measured quantity of the algae clinging to these substrates must be removed and suspended in water to form a "composite sample" according to the instructions in the following sections.

For erosional substrate types that were removed from the stream (e.g., cobbles and small pieces of wood), use a rubber delimiter to isolate a 12.6 cm^2 area from which algae will be removed. A rubber delimiter can be made from a mountain bike tube with a hole cut out and reinforced with an appropriately sized rubber washer (Figure 5). Appendix C describes the procedure for making a rubber delimiter.

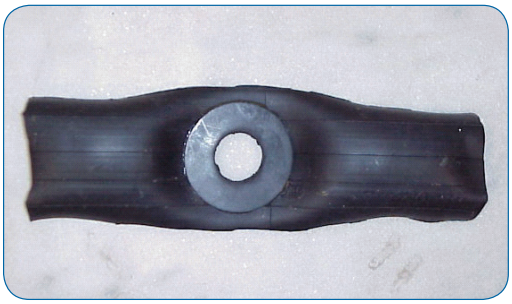

Figure 5. Rubber Delimiter

Wrap the rubber delimiter around the substrate to expose the desired sampling surface through the hole. Take care to ensure that the surface that will be scrubbed is truly the upper (generally at least somewhat "slimy") surface of the substrate as it had been oriented in the stream. Dislodge attached algae from this area by brushing it with a firm-bristled toothbrush (remember that this toothbrush must first have been thoroughly rinsed since the previous site to avoid contamination with algal specimens from other streams). If there is a thick mat of algae, or the algae is firmly encrusted on the surface of the substrate, use forceps or a razor blade first to dislodge the larger matter and put this in the dish tub. Then scrub the area with the brush.

Make sure that the entire surface within the delimiter has been scrubbed well in order to remove all the algae in that area. Fill a wash bottle or turkey baster with stream water from the current site (never carried over from a previous stream). Using as minimal a volume of water as possible, rinse the scrubbed algae from the sample area into the dish tub. Take care to squirt water only on the surface that is showing through the hole in the delimiter, and not anywhere else on the substrate's surface. It is helpful to invert the rock when rinsing so that the target surface is facing down toward the dish tub, and the rinsate drips off the sampling spot directly into the tub rather than flowing along the (non-target) sides of the substrate. Use water sparingly for each piece of substrate, because you should attempt to use no more than 400-500 mL total for the full suite of 11 samples collected along the transects (this includes any water used for rinsing algae off of sampling devices into the dish tub). After scrubbing is complete, rinse the delimiter and the brush into the dish tub, also. The scrubbed part of the substrate should feel relatively rough when you have finished, meaning that essentially all of the algae have been removed. After the sampling area on the piece of substrate has been thoroughly scrubbed and rinsed, the piece of substrate can be returned to the stream.

For depositional samples (e.g., silt, sand, or gravel), there is no need to isolate a specific area of the substrate within the dish tub, because the sample area was pre-isolated by using the PVC delimiter during collection. Simply massage all the sand and/or silt in the dish tub thoroughly between the fingers to dislodge any clinging algae. For pieces of gravel, use a toothbrush to remove algal material from surfaces.

Rinse the sediment thoroughly (but as sparingly as possible) with stream water so as to create a suspension of the dislodged microalgae (i.e., the sample). The final volume of the sample liquid in the dish tub will be measured before the algal taxonomic and biomass samples are prepared (described below). To do this, the liquid in the tub will be separated from the rinsed sediment such that the volume measured does not include sediment. After the liquid sample has been retrieved and measured, the rinsed sediment will be discarded back into the stream.

Other types of substrate, like pieces of macrophyte or dead leaves that had been collected with the PVC delimiter, should also be massaged between the fingers and rinsed into the tub in order to remove the algae coating them.

For macroalgal clumps there is a special step required for processing the samples. This procedure is described in detail in Section 5.3.

4.3.9 Alternative Approach: Processing Samples at Each Transect

It is also acceptable to isolate the algal specimens from each "piece" of substrate collected before moving on to the next transect. This approach has the disadvantage of requiring that all algae sampling/scraping tools be carried along with the collector as s/he proceeds up the stream, and that s/he pause to isolate the algae several times across the stream reach rather than one time at the end of all the transects. However, it limits the amount of substrate material that needs to be carried in the dish tub, thus making it lighter. This could be particularly important if a large number of cobbles are encountered across sampling points, such that it

could be difficult or impossible to carry them all to Transect K, or to carry them in such a way that non-target algae can easily be prevented from sloughing off into the tub via abrasion. For convenience, one may elect to wear a fisherman's vest to facilitate carrying all the algae sampling/scraping tools that will need to be brought along on the substrate sampling trip if employing this alternative approach.

SECTION 5
ALGAL SAMPLE PROCESSING

Four different types of laboratory samples may be prepared from the composite sample:

- Identification/Enumeration Samples
  1. Diatoms
  2. Soft-bodied algae
- Biomass Samples
  3. Chlorophyll *a* ("chl *a*")
  4. Ash-free dry mass ("AFDM")

5.1 GENERAL CONSIDERATIONS FOR PROCESSING ALGAL SAMPLES

The general process for sample preparation is as follows. The Identification/enumeration samples are each aliquoted into 50-mL centrifuge tubes and chemically fixed (preserved). Diatom samples are fixed in the field with formalin immediately following collection, and soft-bodied algae samples are fixed in a laboratory with glutaraldehyde within four days of collection. The chlorophyll *a* and AFDM samples are collected on filters in the field and stored on wet ice, and then frozen as soon as possible after returning from the field (and within four hours of collection). The filters are kept frozen until analysis, which should occur within 28 days of collection. If the field crew is spending the night in a hotel, it is necessary to buy dry ice to freeze the biomass filters upon finishing the day's fieldwork, and to keep them on dry ice until the samples can be transferred to the freezer back at the lab.

Contract/ Billing Code: _____ circle one: chl *a* AFDM
Project: _____ Date: _____ Time: _____
Site Code: _____ Sample ID: _____
Repl #: _____ Vol Filtered (mL): _____
Composite Vol (mL): _____
Delimiter Grabs (Rub.+PVC): ☐ # Syringe: ☐
Stream Name: _____
County: _____ Collector: _____

Contract/ Billing Code: _____ circle one: diatoms soft
Project: _____ Date: _____ Time: _____
Site Code: _____ Sample ID: _____
Repl #: _____ Vol Aliquotted (mL): _____
Composite Vol (mL): _____
Delimiter Grabs (Rub.+PVC): ☐ # Syringe: ☐
Fixative Added: _____
Stream Name: _____
County: _____ Collector: _____

Contract/ Billing Code: _____ qualitative (soft)
Project: _____ Date: _____ Time: _____
Site Code: _____ Sample ID: _____
Site Name: _____
NO FIXATIVE *IS ADDED TO THE QUALITATIVE*
Stream Name: _____
County: _____ Collector: _____

Figure 6. Labels for biomass and taxonomic identification samples.

Algae sample labels are shown in Figure 6. Recorded on each sample label are the volume of the composite sample (described in Sections 5.2.1 and 5.3.2), and the TOTAL area of stream bottom sampled (based on which sampling devices were used; described in Sections 4.3.2 - 4.3.7), as well as the volume of sample aliquoted (for the taxonomic ID samples) or filtered (for the chlorophyll *a* and ADFM samples). All of these values should be recorded on the field forms, as well, under the Algae Samples section. On the sample labels, the sample type: "chl *a*", "AFDM", "diatoms", or "soft" is circled, and all the remaining information on each label, like Site Code, Date, and site coordinates is filled out.

Before preparing the algae samples it is necessary to determine two things:

- Are there any clumps of macroalgae in the composite sample (as opposed to just microalgae suspended in liquid)?

AND

- Is a soft-bodied algal taxonomic sample going to be prepared?

The answers to these questions will determine the course of action for preparing the algae samples for a given site:

- If there is no macroalgal clump, liquid composite sample will simply be added to each taxonomic ID sample tube (40 mL for diatoms and 45 mL for soft-bodied algae). Biomass samples will also be prepared using the liquid composite sample, as is.
- If there is a macroalgal clump present, but no soft-bodied sample will be prepared, the entire clump will be chopped into fine bits (resulting in strands that are eyelash-length or shorter) and incorporated directly into the liquid portion of the composite sample, and the mixture will be shaken to homogenize it before preparing the diatom and/or biomass samples.
- If there is a macroalgal clump AND a soft-bodied algal taxonomic ID sample is to be prepared, then a more complex procedure must be employed in order to properly process the macroalgae before preparing the various samples.

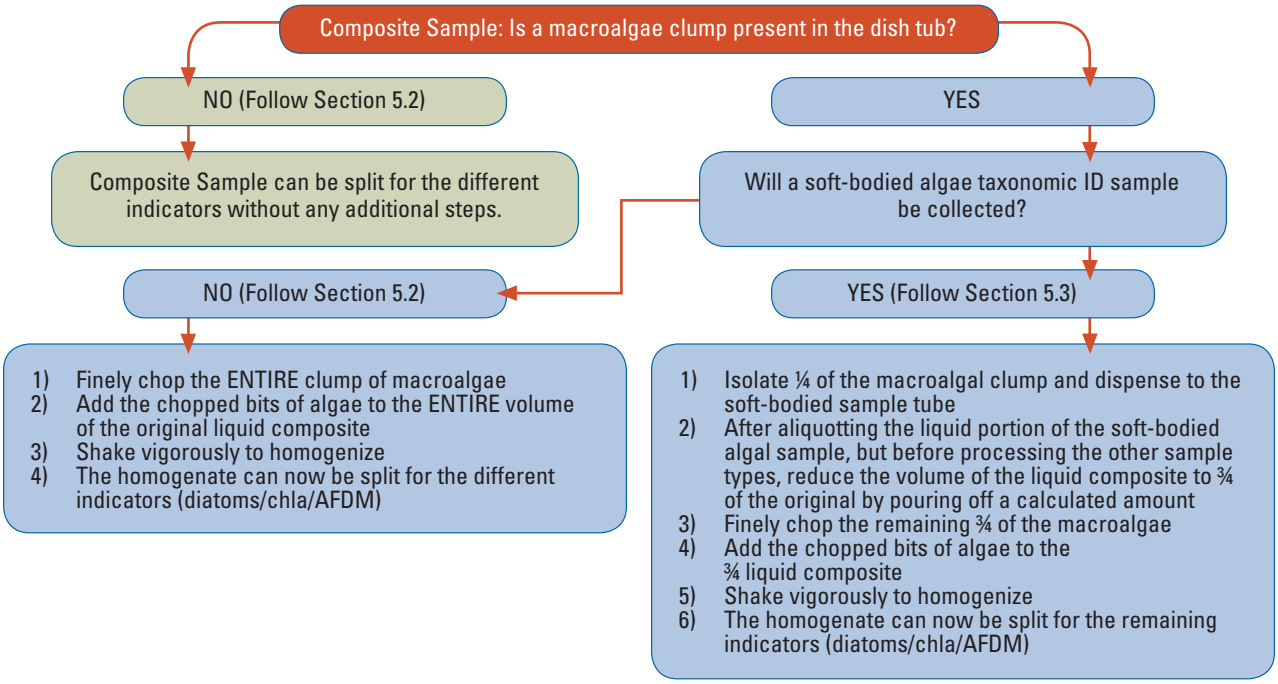

Figure 7. Summary of major sample-processing decision points based on presence of macroalgal clump(s) and need to prepare soft-bodied algal samples.

Figure 7 provides a summary of the various sample-processing steps that are involved, and the following sections describe the procedures in detail. Use Section 5.2. if there is NO macroalgal clump present in the dish tub OR a soft-bodied algal sample will be NOT be prepared. Use Section 5.3 if there IS a macroalgal clump present AND a soft-bodied algal sample will be prepared.

5.2 SAMPLE PROCESSING WHEN THERE IS NO MACROALGAL CLUMP OR WHEN NO SOFT-BODIED SAMPLE IS BEING PREPARED

This section describes the sample-processing procedure for the situation in which there was either 1) no macroalgal clump in the dish tub containing the composite sample material, or 2) no soft-bodied algal sample will be prepared. If there was no macroalgal clump but both soft bodied algae AND other sample types are to be prepared, follow all the instruction in this section with the exception of the final portion of Section 5.2.1 that is italicized and in orange font, and discusses how to process macroalgae when preparing only diatom and/or biomass samples.

If there is a macroalgal clump, but no soft-bodied algae sample is to be collected, follow the instructions in this section, including the final, italicized portion of Section 5.2.1, and skip Section 5.2.2, which deals with soft-bodied algal sample processing.

5.2.1 Measuring the Composite Liquid Volume

Once algal specimens have been removed from all the substrates (e.g., sand, gravel, cobble, wood, leaves) in the dish tub, according to the procedure described in Section 4, thoroughly agitate the liquid to get as much as possible of the microalgae into suspension, and then immediately pour the liquid into a CLEAN graduated cylinder to measure its volume. Try to leave all substrate material (e.g., silt, sand) behind. Transfer the measured liquid into a CLEAN 1L plastic bottle. Using a minimal amount of stream water, rinse the substrate once or twice with stream water until it appears that little to no additional suspended material (microalgae) is coming off. Add this rinsate to the graduated cylinder to measure it also. If necessary, repeat this process (regularly agitating the dish tub) until all the liquid has been measured and transferred to the sample bottle. Use water sparingly, because the total sample volume (plus rinsate) should be no more than about 400-500 mL.

Because you are leaving as much as possible of the silt, sand, and any large substrate material behind, the final volume should reflect only the liquid component of the sample plus rinse water. Record the total volume of all the liquid that had been in the dish tub, including any that was used for rinsing the substrates and sampling devices, on the field sheet under the Algae Samples section. This is the COMPOSITE VOLUME. This value will also be recorded on all algae sample labels (i.e., for the diatom and soft-bodied algae taxonomic ID samples, the chlorophyll *a*, and the AFDM).

Note: If no soft-bodied algae sample is to be prepared, but there is a macroalgal clump in the sample, separate the clump from the liquid portion of the sample, measure and record the composite volume of the liquid (as described above), then cut the macroalgal clump into very fine pieces (resulting in strands that are eyelash-length or shorter) with CLEAN scissors and add these pieces to the composite liquid. The pieces should be chopped small enough so that they practically "blend" into the liquid (i.e., distinct fragments of macroalgae are not easily discernible), because the goal is to "homogenize" the macroalgae into the liquid as much as possible. Shake vigorously to homogenize the macroalgal fragments into the liquid. Then proceed to Section 5.2.3 and beyond to prepare the diatom and/or biomass samples.

5.2.2 Preparing the Soft-Bodied Algae Taxonomic ID Sample

Pour freshly-agitated liquid composite sample into the soft-bodied algae sample tube to the 45 mL mark. Midway through pouring, the composite sample should be swirled some more (first clockwise, then counter-clockwise) to ensure that the microalgae are still fully suspended. Cap the tube tightly. Completely fill out a sample label and affix it to the sample tube. Cover the label completely with clear plastic tape to prevent the writing on the label from smearing. Place the tube in the wet ice chest to keep it in the dark and as cold as possible, but make sure it is never allowed to freeze.

Note: As soon as possible, and no longer than four days after collection of the sample, glutaraldehyde must be added to the tube (to a final concentration of 2.5%, by adding 5 mL of 25% glutaraldehyde to 45 mL of sample) and distributed throughout the sample by agitation and turning the tube upside down repeatedly. Glutaraldehyde is necessary for fixing soft-bodied algal samples in order to preserve fine morphological features and the color of pigments, as both can be crucial characters for taxonomic determination. Glutaraldehyde is a hazardous substance that poses a number of safety risks. As such, it should be handled in a fume hood by trained personnel wearing appropriate gear. Refer to Appendix D for an SOP for the use of glutaraldehyde.

Members of the field crew can either have the glutaraldehyde added to the samples back at their own lab, or arrange for the glutaraldehyde to be added to the samples by the taxonomy lab. In either case, the unfixed samples must be kept in the dark and on wet ice (but not allowed to freeze), and must be fixed within four days of collection (and preferably sooner). If the taxonomy lab will be adding the fixative, it is imperative to plan ahead to arrange for this to be done, and also to clearly mark which tubes will need to have fixative added to them. Once the samples are fixed, it is no longer imperative to store them on wet ice. Following fixation, they can simply be stored in a cool, dark place.

5.2.3 Preparing the Diatom Taxonomic ID Sample

Diatom samples should be fixed as soon as possible after collection to reduce the possibility of cell division post-sampling. A 10% solution of buffered formalin is used to fix diatoms, and instructions for preparing this solution are provided in Appendix C.

To prepare the diatom sample, aliquot 40 mL of freshly-agitated composite liquid into the diatom ID sample tube, swirling the composite sample bottle again midway through pouring to keep the microalgae suspended. Add 10 mL of the 10% buffered formalin to the sample. This can be done using a small syringe or bulb pipette. Alternatively, if preferred, the centrifuge tubes for the diatom samples can be pre-loaded with 10 mL of the 10% buffered formalin and 40 mL of sample can be added carefully to the fixative, to avoid having to dispense the fixative in the field.

Notes: Fixatives such as formalin must be used with great care. Be sure to wear formalin-safe gloves and safety goggles when using the fixative, as it should never be touched with bare hands or allowed to splash onto skin or into eyes. Also make sure it is used only in a very well-ventilated place and avoid breathing in any fumes. Minimize the amount of time that vessels containing formalin are open. Fixative added to the sample must not be allowed to ooze outside the vessel that contains it, including the sample tubes. Refer to Appendix E for an SOP for the use of formalin.

Cap the tube tightly and shake it to mix the formalin into the sample. Fill out a sample label and affix it to the sample tube. Cover the label completely with clear plastic tape to prevent the writing on the label from smearing. Keep the fixed diatom samples in the dark and away from extreme heat.

5.2.4 Preparing the Biomass Samples

The remaining composite sample liquid can be used to prepare the chlorophyll *a* and AFDM filters as described below.

Chlorophyll *a* samples:

The procedure to filter chlorophyll *a* samples should be carried out quickly, and in the shade as much as possible, to minimize exposure of the sample to light, and minimize chlorophyll *a* degradation thereby. For the chlorophyll *a* samples, use CLEAN filter forceps (rinsed with DI water three times) to center a glass fiber filter (47 mm, 0.7 µm pore size) onto the mesh platform of a CLEAN filtering tower apparatus (rinsed with DI water three times), and rinse the filter a little with DI water to seat it well into the mesh before attaching the filter reservoir on top. Never touch the filters with hands or anything other than clean forceps.

Agitate the composite sample to resuspend all the microalgal material. Carefully measure 25 mL using a small, CLEAN graduated cylinder (rinsed with DI water three times). Midway through pouring the 25 mL, swirl the composite sample again to ensure that the material is still fully suspended. Pour the remainder of the 25 mL, and then pour the measured sample into the filter reservoir. Once empty, rinse the graduated cylinder with a few mL of DI water, and add this to the reservoir.

To filter the sample, create a gentle vacuum with the hand pump. Be sure to proceed very slowly, and pump only one stroke at a time until all of the liquid in the sample is passed through the filter. Pressure on the sample should never exceed 7 psi, as this could cause cells to burst and release contents, including chlorophyll *a*, into the filtrate and be lost. If it becomes impossible to filter a whole 25 mL of the sample and

remove the water efficiently, discard the filter and try again with a smaller volume (e.g., 10 mL). It is not necessary to collect on multiple filters to try to achieve a total volume of 25 mL. Simply filter as much as possible on a single filter, up to 25 mL, and then use that filter as the sample. Be sure to record the volume of the composite sample that was actually filtered, both on the datasheet, and on the sample label.

Rinse the sides of the filter reservoir with a few mL of DI water, and continue filtering until the water is drawn down. The filter should not be sucked dry, but rather left slightly moist, in order to avoid applying excessive pressure to the sample, which could cause algal cells to burst. After the liquid has passed through, check the filter to see if there are any bits of non-algal plant matter (like tiny seedlings or bits of leaves). If so, remove them with clean forceps, being careful not to remove any algae in the process. If possible, rinse the removed items with DI water onto the filter before discarding them. Remove the filter from the filtering device. *Note: Always thoroughly rinse the sides of the filter reservoir and the interface between the mesh filter seating and the screw-on part of the reservoir with DI water between samples.*

Being careful not to remove any of the collected material from the filter, fold the filter in half (with the sample material on the inside) using the forceps, and place it inside a clean, snap-top Petri dish[13]. Envelop the Petri dish completely within a small sheet of aluminum foil in order to prevent any light from reaching the filter. Place the covered Petri dish and its corresponding, completely filled-out sample label (face outward) into a 100 mL Whirl-pak bag[14], purge as much of the air out of the bag as possible, "whirl" it shut, and seal it tightly with its wire tabs, so that water in the cooler will not be able to enter the bag. *Note 1: If the Whirl-pak bags contain a lot of air, they will float on top of the ice water in the cooler, and they then run the risk of not being kept cold enough. Shove the sample packet down into the ice in the cooler. Note 2: A clean, clear plastic centrifuge tube is also an acceptable container in which to store the filter. It must also be properly labeled, wrapped in aluminum foil, and kept submerged in wet ice.*

Keep chlorophyll *a* filters as cold as possible and place in the freezer or dry ice as soon as possible (and within four hours of collection); the holding time for the chlorophyll *a* filters is 28 days from collection, when kept frozen.

Ash-free dry mass (AFDM) samples:

For the AFDM samples, you should use glass-fiber filters (47 mm, 0.7 µm pore size) that have been precombusted. Never touch the filters with hands or anything other than a CLEAN forceps (rinsed with DI water three times). The filters to use should be labeled "for AFDM", and stored in aluminum sleeves. Follow the same process as that used for chlorophyll *a* sample filtering. After all the liquid has passed through, check the filter to see if there are any pieces of non-algal plant matter (such bits of leaves or wood). If so, remove them with a clean forceps (rinsed with DI water three times), being careful not to remove any algae in the process. The goal with AFDM, for the purposes of this SOP, is to target the ALGAL portion of the organic matter in the sample, and therefore field crews should do their best to remove non-algal contributors

13. It may be beneficial to write the Site Code or sample ID code on the Petri dish itself, in addition to filling out the full sample label.
14. Other bag types are acceptable only if they are water-tight (note that Ziploc bags often leak when submerged).

of organic matter from the sample. Remove the filter from the filtering device. *Note: Always thoroughly rinse the sides of the filter reservoir and the interface between the mesh filter seating and the screw-on part of the reservoir with DI water between samples.*

Use the forceps to fold the AFDM filter in half (with the sample material on the inside) and wrap it loosely in a small sleeve of clean aluminum foil. Be careful not to squeeze the filter, which could cause the sample to ooze from the filter onto the aluminum sleeve. Store the filter in a sealed 100 mL Whirl-pak bag containing a completely filled-out sample label, including the volume that was filtered (i.e., 25 mL or otherwise). As with the chlorophyll *a*, purge as much of the air out of each bag as possible, "whirl" it shut, and seal tightly with the wire tabs. Shove the sample packet down into the ice in the cooler. *Note: A clean, clear plastic centrifuge tube is also an acceptable container in which to store the filter. It must also be properly labeled and kept submerged in wet ice.*

Keep AFDM filters as cold as possible until the samples can be frozen back at the lab that evening, or place on dry ice until they can be stored in the lab freezer. The holding time for the AFDM samples is 28 days from collection, when kept frozen.

5.3 PROCESSING SOFT-BODIED AND OTHER SAMPLE TYPES WHEN A MACROALGAL CLUMP IS PRESENT

The following is a description of how to proceed when a soft-bodied algal taxonomic ID sample is to be prepared AND macroalgal clump(s) are present in the sample in the dish tub. A flowchart of this procedure is provided in Appendix F. It is recommended that this flowchart be printed out in color, laminated (if possible) or printed out on water-proof paper, and brought along to the field for quick reference on handling macroalgal clumps in the composite sample. The reason for the extra step in the processing of the macroalgae for the purposes of the soft-bodied algae sample is that it maintains larger, more intact macroalgal specimens for examination in the laboratory, rather than chopping up all of the macroalgal specimens before sending them to the lab. This is important, because availability of intact specimens greatly improves the chances that the taxonomist will be able to identify the soft-bodied algae to low taxonomic levels.

5.3.1 Isolating and Dividing the Macroalgal Clump

For this procedure, the macroalgal clump is first removed from the dish tub, wrung out gently, and rolled into a cylinder shape that is relatively even in thickness along its length. If there is more than one type of macroalgae in the sample, the various types should be layered on top of one another lengthwise so that they are represented in roughly constant proportions across the length of the "cylinder". The cylinder is measured with a ruler and a quarter of its length is cut off with scissors and put into the (still empty) soft-bodied algae ID centrifuge tube[15]. The clump is pushed down into the tube, and the top is flattened, so that the volume

15. It is unlikely that the ¼ macroalgal clump will occupy all the space in the sample tube, but if it does, a second tube will be needed in order to accommodate all the sample material plus liquid. If such an action is taken, it should be noted in the Comments section of the field sheets and the tubes should be clearly identified as belonging to the same sample, for record keeping purposes.

of the clump can be estimated using the graduations on the tube. The estimated volume of this clump will be used in a calculation (see Equation 1 and Figure 8). The remaining three-quarters length of cylinder is set aside in the shade/cool. It is recommended that this section be placed in a Ziploc bag, sealed, and put in the wet ice cooler.

5.3.2 Measuring the Composite Liquid Volume

Once algal specimens have been removed from all the substrates (e.g., sand, gravel, cobble, wood, leaves) in the dish tub, according to the procedure described in Section 4, gently agitate the dish tub to suspend the microalgae in the liquid, and then start pouring this suspension into a CLEAN graduated cylinder to measure the volume of the liquid. Try to leave all substrate material (e.g., silt, sand) behind. Transfer the measured liquid into a CLEAN 1L plastic bottle. Using a minimal amount of stream water, rinse the substrate once or twice with stream water until it appears that little to no additional suspended material (microalgae) is coming off. Add this rinsate to the graduated cylinder to measure it also. If necessary, repeat this process (regularly agitating the dish tub) until all the liquid has been measured and transferred to the sample bottle. Use water sparingly, because the total sample volume plus rinsate should be no more than about 400-500 mL.

Because you are leaving as much of the silt, sand, and any large substrate material behind as possible, the final volume should reflect only the liquid component of the sample plus rinse water. Record the total volume of all the liquid that had been in the dish tub, including any that was used for rinsing the substrates and sampling devices, on the field sheet under the Algae Samples section. This is the COMPOSITE VOLUME. This value will also be recorded on all algae sample labels (i.e., for the diatom and soft-bodied algae taxonomic ID samples, the chlorophyll *a*, and the AFDM).

5.3.3 Preparing the Soft-Bodied Algae Taxonomic ID Sample

Pour freshly-agitated liquid composite sample from the 1-L bottle into the soft-bodied algae sample tube (on top of the clump of macroalgae) up to the 45 mL mark. Midway through pouring, the composite sample should be swirled some more (first clockwise, then counter-clockwise) to ensure that the microalgae are still fully suspended. Cap the tube tightly. Completely fill out a sample label and affix it to the sample tube. Cover the label completely with clear plastic tape to prevent the writing on the label from smearing. Place the tube in the wet ice chest to keep it in the dark and as cold as possible, but make sure it is never allowed to freeze.

Note: As soon as possible, and no longer than four days after collection of the sample, glutaraldehyde must be added to the tube (to a final concentration of 2.5%, by adding 5 mL of 25% glutaraldehyde to 45 mL of sample) and distributed throughout the sample by agitation and turning the tube upside down repeatedly. Glutaraldehyde is necessary for soft-bodied algal samples in order to preserve fine morphological features and the color of pigments, as both can be crucial characters for taxonomic determination. Glutaraldehyde is a hazardous substance that poses a number of safety risks. As such, it should be handled in a fume hood by trained personnel wearing appropriate gear. Refer to Appendix D for an SOP for the use of glutaraldehyde.

Members of the field crew can either have the glutaraldehyde added to the samples back at their own lab, or arrange for the glutaraldehyde to be added to the samples by the taxonomy lab. In either case, the unfixed samples must be kept in the dark and on wet ice (but not allowed to freeze), and must be fixed within four days of collection (and preferably sooner). If the taxonomy lab will be adding the fixative, it is imperative to plan ahead to arrange for this to be done, and also to clearly mark which tubes will need to have fixative added to them. Once the samples are fixed, it is no longer imperative to store them on wet ice. Following fixation, they can simply be stored in a cool, dark place.

5.3.4 Preparing the Diatom Taxonomic ID Sample

After the soft-bodied algal sample has been prepared, and before preparing the diatom sample (and biomass samples, which will be discussed in the next section), the volume of the remaining composite liquid must be reduced to equal ¾ of the original volume[16]. This is necessary because ¼ of the macroalgae clump was taken out of the composite sample but a full ¼ was not removed from the water portion. As such, the original ratio between water and macroalgae must be restored before further sample preparation.

The following procedure is used to reduce the volume of liquid composite to ¾ of the original. For convenience, you can use this formula (Figure 8) to calculate how many mL to pour off and discard from the composite:

Equation 1. Adjusting the volume of composite sample

volume (mL) of composite to pour off = (0.25 * C) – 45 + A

where "C" is the original composite volume and "A" is the approximate volume of the clump of macroalgae that was placed in the soft-bodied algae sample tube (tamped down and flattened). You may wish to fill out a copy of the Ratio Restoration worksheet shown in Figure 8 to calculate the amount of composite to pour off.

Liquid Portion of Composite Sample: _____ mL = C

Volume of 1/4 macroalgal chunk: _____ mL = A

Volume of Liquid Composite to Pour Off: (0.25 * C) – 45 + A = _____ mL

Figure 8. Ratio restoration worksheet.

16. For example, if the original composite volume was 480mL, you will be discarding enough composite liquid to get down to 360 mL.

As always, be sure to agitate the composite liquid adequately in order to resuspend any settled microalgae before pouring off the calculated volume.

Once the required amount of composite liquid has been discarded, the remaining ¾ of the macroalgal clump ("cylinder") is cut into very fine pieces with a scissors (resulting in strands that are eyelash-length or shorter), and these are added to the reduced-volume composite liquid. The pieces should be chopped small enough so that they practically "blend" into the liquid (i.e., distinct fragments of macroalgae are not easily discernible), because the goal is to "homogenize" the macroalgae into the liquid as much as possible. Now the ratio of macroalgae to liquid from the original sample in the dish tub is restored. Cap the composite bottle and shake vigorously to homogenize the bits into the liquid as much as possible, while not agitating so hard as to risk busting cells and releasing chlorophyll.

Diatom samples should be fixed as soon as possible after collection to reduce the possibility of cell division post-sampling. A 10% solution of buffered formalin is used to fix diatoms, and instructions for preparing this solution are provided in Appendix C.

To prepare the diatom sample, aliquot 40 mL of freshly-agitated sample homogenate into the diatom ID sample tube, swirling the composite sample bottle again midway through pouring to keep the algal material suspended. Add 10mL of the 10% buffered formalin to the sample. This can be done using a small syringe or bulb pipette. Alternatively, if preferred, the centrifuge tubes for the diatom samples can be pre-loaded with 10 mL of the 10% buffered formalin and 40 mL of sample can be added carefully to the fixative, to avoid having to dispense the fixative in the field.

Note: Fixatives such as formalin must be used with great care. Be sure to wear formalin-safe gloves and safety goggles when using the fixative, as it should never be touched with bare hands or allowed to splash onto skin or into eyes. Also make sure it is used only in a very well-ventilated place and avoid breathing in any fumes. Minimize the amount of time that vessels containing formalin are open. Fixative added to the sample must not be allowed to ooze outside the vessel that contains it, including the sample tubes. Refer to Appendix E for an SOP for the use of formalin.

Cap the tube tightly and shake it to mix the formalin into the sample. Fill out a sample label and affix it to the sample tube. Cover the label completely with clear plastic tape to prevent the writing on the label from smearing. Keep the fixed diatom samples in the dark and away from extreme heat.

5.3.5 Preparing the Biomass Samples

The remaining composite sample homogenate can be used to prepare the chlorophyll *a* and AFDM filters according to the following procedure.

Chlorophyll *a* samples:

The procedure to filter chlorophyll *a* samples should be carried out quickly, and in the shade as much as possible, to minimize exposure of the sample to light, and minimize chlorophyll *a* degradation thereby. For the chlorophyll *a* samples, use CLEAN filter forceps (rinsed with DI water three times) to center a glass fiber filter (47 mm, 0.7 µm pore size) onto the mesh platform of CLEAN filtering tower apparatus (rinsed with DI water three times), and rinse the filter a little with DI water to seat it well into the mesh before attaching the filter reservoir on top. Never touch the filters with hands or anything other than clean forceps.

Agitate the composite sample homogenate to resuspend all the macroalgal fragments and microalgal material. Carefully measure 25 mL using a small, CLEAN graduated cylinder (rinsed with DI water three times). Midway through pouring the 25 mL, swirl the homogenate again to ensure that the material is still fully suspended. Pour the remainder of the 25 mL, and then pour the measured homogenate into the filter reservoir. Once empty, rinse the graduated cylinder with a few mL of DI water, and add this to the reservoir.

To filter the sample, create a gentle vacuum with the hand pump. Be sure to proceed very slowly, and pump only one stroke at a time until all of the liquid in the sample is passed through the filter. Pressure on the sample should never exceed 7 psi, as this could cause cells to burst and release contents, including chlorophyll *a*, into the filtrate and be lost. If it becomes impossible to filter a whole 25 mL of the sample and remove the water efficiently, discard the filter and try again with a smaller volume (e.g., 10 mL). It is not necessary to collect on multiple filters to try to achieve a total volume of 25 mL. Simply filter as much as possible on a single filter, up to 25 mL, and then use that filter as the sample. Be sure to record the volume of the composite sample that was actually filtered, both on the datasheet, and on the sample label.

Rinse the sides of the filter reservoir with a few mL of DI water, and continue filtering until the water is drawn down. The filter should not be sucked dry, but rather left slightly moist, in order to avoid applying excessive pressure to the sample, which could cause algal cells to burst. After all the liquid has passed through, check the filter to see if there are any bits of non-algal plant matter (like tiny seedlings or bits of leaves). If so, remove them with clean forceps, being careful not to remove any algae in the process. Remove the filter from the filtering device. *Note: Always thoroughly rinse the sides of the filter reservoir and the interface between the mesh filter seating and the screw-on part of the reservoir with DI water between samples.*

Fold the filter in half (with the sample material on the inside) using the forceps, and place it inside a clean, snap-top Petri dish. Envelope the Petri dish completely within a small sheet of aluminum foil in order to prevent any light from reaching the filter. Place the covered Petri dish and its corresponding, completely filled-out sample label (face outward) into a 100 mL Whirl-pak bag, purge as much of the air out of the bag as possible, "whirl" it shut, and seal it tightly with its wire tabs, so that water in the cooler will not be able to enter the bag. *Note: If the Whirl-pak bags contain a lot of air, they will float on top of the ice water in the cooler, and they then run the risk of not being kept cold enough. Shove the sample packet down into the ice in the cooler.*

Keep chlorophyll *a* filters as cold as possible and place in the freezer or dry ice as soon as possible (and within four hours of collection); the holding time for the chlorophyll *a* filters is 28 days from collection, when kept frozen.

Ash-free dry mass (AFDM) samples:

For the AFDM samples, you should use glass-fiber filters (47 mm, 0.7 µm pore size) that have been precombusted. Never touch the filters with hands or anything other than a clean forceps (rinsed with DI water three times). The filters to use should be labeled "for AFDM", and stored in aluminum sleeves. Follow the same process as that used for chlorophyll *a* sample filtering. After all the liquid has passed through, check the filter to see if there are any bits of non-algal plant matter (such as bits of leaves or wood). If so, remove them with clean forceps (rinsed with DI water three times), being careful not to remove any algae in the process. Remove the filter from the filtering device. *Note: Always thoroughly rinse the sides of the filter reservoir and the interface between the mesh filter seating and the screw-on part of the reservoir with DI water between samples.*

Use the forceps to fold the AFDM filter in half (with the sample material on the inside) and wrap it loosely in a small sleeve of clean aluminum foil. Be careful not to squeeze the filter, which could cause the sample to ooze from the filter onto the aluminum sleeve. Store the filter in a sealed 100 mL Whirl-pak bag containing a completely filled-out sample label, including the volume that was filtered (i.e., 25 mL or otherwise). As with the chlorophyll *a*, purge as much of the air out of each bag as possible, "whirl" it shut, and seal tightly with the wire tabs. Shove the sample packet down into the ice in the cooler.

Keep AFDM filters as cold as possible until the samples can be frozen back at the lab that evening, or place on dry ice until they can be stored in the lab freezer. The holding time for the AFDM samples is 28 days from collection, when kept frozen.

5.4 PROCEDURE FOR COLLECTING QUALITATIVE ALGAL SAMPLES

If your program calls for the collection of soft-bodied taxonomic ID samples, then you will also need to collect a "qualitative" sample at every monitoring reach. The qualitative samples consist of a composite of all types of soft-bodied algae visible within the reach. This is of value because it can provide a fairly exhaustive list of soft-bodied algal taxa present at the site and can also aid identification of taxa captured in the RWB sampling, since it allows larger, more intact specimens to be collected than those that may end up in the more heavily processed quantitative sample (described above). In addition, if the qualitative sample is kept cool and in the dark, and is delivered to the lab in a timely manner (i.e., as quickly as possible, and within two weeks of collection), the live specimens can be cultured, which can also aid in identification. For example, some taxa in the Zygnematales cannot be identified to species level unless they are in a sexual phase during examination. If asexual at the time of collection (which is the typical situation), live specimens could be induced to a sexual phase in the lab. Collection of a qualitative diatom sample is optional, and is typically not needed for general bioassessment purposes.

For qualitative soft-bodied algal samples, collect specimens of all obviously different types of macroalgal filaments and mats, as well as microalgae (in the forms of scrapings using a razor blade or knife), and depositional samples (suctioned from along the surface of sediments using a clean turkey baster). Note that some algae (e.g., species of *Chara*, *Paralemanea*, and *Vaucheria*) have morphologies similar to submerged macrophytes or mosses. In addition, algae are not always green, and may instead be dark-brownish, golden, reddish, or bluish-green. Some cyanobacteria (which should also be collected for the qualitative sample), such as members of the genus *Nostoc*, look like gelatinous globules, or sacs, ranging in size anywhere from smaller than a pea to larger than a lime. Online image searches of these taxa and others will help the collector develop an eye for the variety of types of algae that may be encountered in streams. If you suspect something may be algae, but are not sure, it is always preferable to collect some of it for the qualitative sample. The laboratory will determine whether it qualifies for inclusion in the species list. Collect from as many distinct locations as possible throughout the reach so as to capture as much of the apparent diversity in the reach as you can. Also, when possible, try to grab part of the holdfast structures that attached the macroalgae to the substrate, as these structures can be useful for taxonomic identification.

Since these samples are merely qualitative, and not quantitative, you need not worry about collecting them in a manner that is representative of their relative abundances within the reach. *Note: If there is only a small amount of macroalgae in the stream, it should be allocated preferentially to the soft-bodied algae laboratory sample, as opposed to the diatoms (if a diatom qualitative sample is being collected), because it is primarily needed for the soft-bodied algal identification work (although diatoms can live as epiphytes on macroalgae, so macroalgal samples are also of values for the diatom work).*

Using a thick, waterproof marker, label a Whirl-pak bag with the Site Code, Date, Sample ID, and "soft" (or "diatom", if also collecting a diatom sample). Fill the bag with a total volume of up to 100 mL of qualitative algae sample + water. Purge any extra air from the bag, seal with the wire tabs by twisting them together (not just folding them, as this can result in leakage), tuck the ends of the wire tabs inward so that they cannot poke other bags, and store in the cooler on wet ice in the field. Be careful not to place the bags right up against ice or frozen blue-ice bags, because this could cause the algae to freeze and thus destroy the sample. Unlike with the quantitative samples, **do not add glutaraldehyde or formalin** (or any other fixative) to these qualitative samples. Keep the qualitative samples on wet ice and refrigerate immediately upon return to the lab. Because they are not preserved, these samples should be examined by a taxonomist as soon as possible (and within two weeks, at most), as they can decompose fairly rapidly. Decomposition is of particular concern for the soft-bodied algae sample.

If it is impossible to get the soft-bodied qualitative samples to a taxonomist within two weeks of sample collection, then split the qualitative samples in half, transfer one half to a 50 mL centrifuge tube and preserve it with glutaraldehyde (to a 2.5% final concentration) and leave the other half un-fixed (but continue to store in the cold/dark until examination by a taxonomist). This should be done in order to preserve part of the sample for morphological identification, but still maintain some possibility of keeping some specimens alive, in case culturing is necessary. *Note: Glutaraldehyde is a hazardous substance that can*

pose health and safety risks. Add glutaraldehyde in a fume hood, wearing safety goggles and glutaraldehyde-safe gloves. Refer to Appendix D for more detailed instructions on the safe handling of glutaraldehyde.

5.5 ALGAL SAMPLING QUALITY ASSURANCE / QUALITY CONTROL

The SWAMP bioassessment group is currently developing guidelines for quality assurance and quality control for bioassessment procedures. Future revisions to this document will include more specific information covering personnel qualifications, training and field audit procedures, procedures for field calibration, procedures for chain of custody documentation, requirements for measurement precision, health and safety warnings, cautions (actions that would result in instrument damage or compromised samples), and interferences (consequences of not following the SOP).

It is recommended that duplicate sampling of algae occur at 10% of study sites. The recommended method for collecting duplicates is at adjacent positions along the sampling transect according to the scheme depicted in Figure 2. Both samples should be collected at each transect before moving on to the next transect. When duplicate samples are collected at a site, the full suite of information about the algae samples (composite volume, numbers of each sampling device used, amount filtered, etc.) will need to be recorded for each replicate. This information can be recorded on a duplicate copy of the "Algae Samples" field sheet. Alternatively, the data cells on this sheet can be divided in half to accommodate information for each replicate. If the latter, it is important to keep track of which values go with which replicate.

In addition to including composite volume, area sampled (total, for all sampling devices used), and amount filtered (for the biomass samples) on the sample labels and field sheets, this information should also be included on the chain-of-custody sheets that are submitted to the algae analytical and taxonomy laboratories. This will facilitate efficient calculation of several types of data output, because this information is needed both for the biomass results and for the soft-bodied algae biovolume results.

6 PHYSICAL HABITAT TRANSECT-BASED MEASUREMENTS TO ACCOMPANY ALGAL BIOASSESSMENT

Once all algae samples have been collected at a given transect, PHab data collection can begin there. PHab data are designed to assess the physical habitat conditions of the stream reach being sampled. Knowledge about the PHab parameters can aid interpretation of the biotic assemblage data collected. Data for the following PHab parameters will be entered on transect-specific datasheets (corresponding to each of the 11 main transects along the monitoring reach). These datasheets are provided on the SWAMP website.

It should be noted that the data collection procedures for the parameters below reflect those that are described in the SWAMP BMI Bioassessment SOP (Ode 2007). With respect to PHab assessment, the only deviation between this SOP and that of Ode (2007) is in terms of omission of certain parameters. However, where there is overlap in parameters between the two SOPs, they are assessed in exactly the same manner. The one exception to this is the addition, in this SOP, of percent algal cover determination to the pebble count as described in Ode (2007). Also, note that because the datasheets are multi-purpose datasheets, developed for both BMIs and algae, they include some PHab parameters that are not a part of this SOP. Specifically, the following PHab data that appear on the datasheets are not collected when only algae are being sampled: 1) Riparian vegetation, and 2) Instream habitat complexity. As such, these sections are not filled out on the datasheets when only algae samples are being collected.

6.1 WETTED WIDTH

The wetted channel is the zone that is inundated with water and the wetted width is the distance between the sides of the channel at the point where substrates are no longer surrounded by surface water. Measure the wetted stream width and record this in the box at the top of the Transect data form.

6.2 BANKFULL WIDTH

The bankfull channel is the zone of maximum water inundation in a normal flow year (one-to-two year flood events). Since most channel formation processes are believed to act when flows are within this zone, bankfull dimensions provide a valuable indication of relative size of the waterbody.

Scout along the stream margins to identify the location of the bankfull margins on either bank by looking for evidence of annual or semi-annual flood events. Examples of useful evidence include topographic, vegetative, or geologic cues (changes in bank slope, changes from annual to perennial vegetation, changes in the size distribution of surface sediments). While the position of drift material caught in vegetation may be

a helpful aid, this can lead to very misleading measurements. *Note: The exact nature of this evidence varies widely across a range of stream types and geomorphic characteristics. It is helpful to investigate the entire reach when attempting to interpret this evidence because the true bankfull margin may be obscured at various points along the reach. Often the bankfull position is easier to interpret from one bank than the other; in these cases, it is easiest to infer the opposite bank position by projecting across the channel. Additionally, height can be verified by measuring the height from both edges of the wetted channel to the bankfull height (these heights should be equal).*

Stretch a tape from bank to bank at the bankfull position. Measure the width of the bankfull channel from bank to bank at bankfull height and perpendicular to the direction of stream flow.

6.3 BANKFULL HEIGHT

Measure bankfull height (the vertical distance between the **water surface** and the height of the bank, Figure 9) and record in the boxes at the top of the Transect data form under "Bankfull Width" and "Bankfull Height".

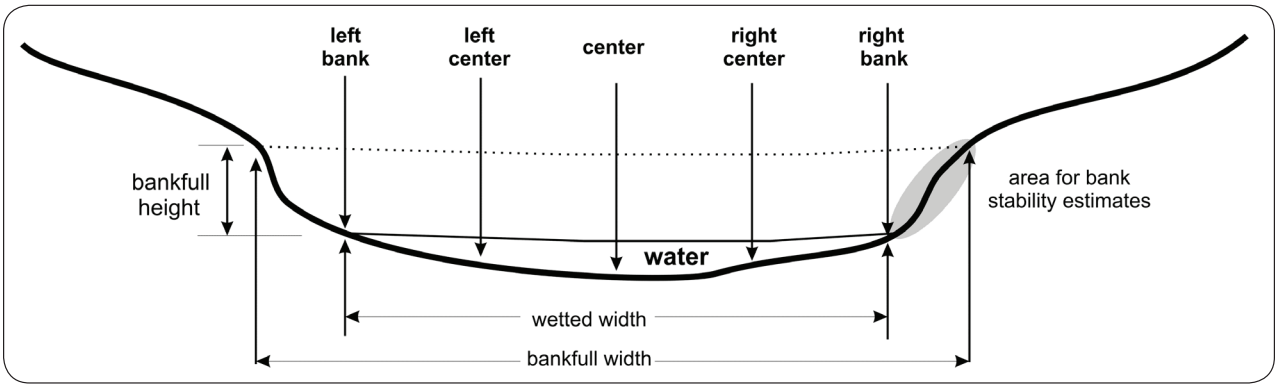

Figure 9. Cross sectional diagram of a typical stream channel showing locations of substrate measurements, wetted and bankfull width measurements, and bank stability visual estimates (reprinted from Ode 2007).

6.4 "PEBBLE COUNT": TRANSECT SUBSTRATES

Particle size frequency distributions often provide valuable information about instream habitat conditions that affect benthic communities. The Wolman pebble count technique is a widely used and cost-effective method for estimating the particle size distribution and produces data that correlate with costly, but more quantitative bulk sediment samples. Coarse particulate organic matter (CPOM, particles of organic material such as leaves that are greater than 1.0 mm in diameter) is a general indicator of the amount of

allochthonous organic matter available at a site, and its measurement can provide valuable information about the basis of the food web in a stream reach. The presence of CPOM associated with each particle is quantified at the same time that particles are measured for the pebble counts.

Transect substrate measurements are taken at five equidistant points along each transect (Figure 9). Divide the wetted stream width by four to get the distance between the five points (Left Bank, Left Center, Center, Right Center and Right Bank) and use a measuring device to locate the positions of these points (e.g., a stadia rod or measuring tape). Once the positions are identified, lower a folding meter stick through the water column perpendicular to both the flow and the transect to identify the particle located at the tip of the meter stick. *Note: It is important that you are not subjective about selecting a particle, as this will result in failing to generate an accurate assessment of the size class distribution of particles present in that stream reach.*

6.5 DEPTH

With the folding meter stick, measure the depth from the water surface to the top of the particle to the nearest cm and record on the datasheet.

Table 3
Particle size class codes, descriptions, and measurements (adapted from Ode 2007)

Size Class	Code Size Class Description	Common Size Reference	Size Class Range
RS	bedrock, smooth	larger than a car	> 4 m
RR	bedrock, rough	larger than a car	> 4 m
XB	boulder, large	meter stick to car	1 - 4 m
SB	boulder, small	basketball to meter stick	25 cm - 1.0 m
CB	cobble	tennis ball to basketball	64 - 250 mm
GC	gravel, coarse	marble to tennis ball	16 - 64 mm
GF	gravel, fine	ladybug to marble	2 – 16 mm
SA	sand	gritty to ladybug	0.06 – 2 mm
FN	fines	not gritty	< 0.06 mm
HP	hardpan (consolidated fines)		< 0.06 mm
WD	wood		
RC	concrete/ asphalt		
OT	other		

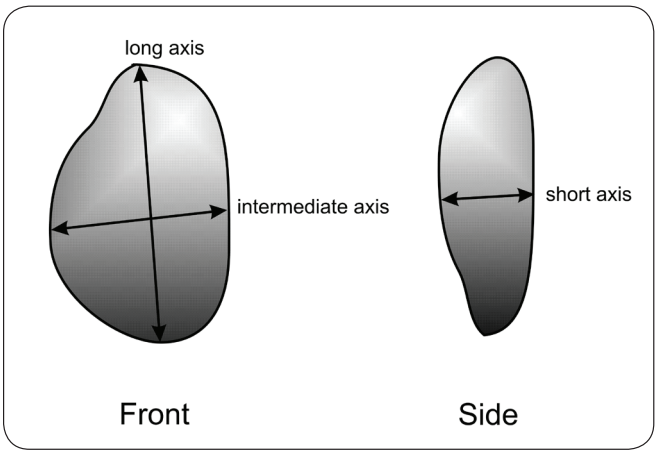

Figure 10. Diagram of three major perpendicular axes of substrate particles. The intermediate axis is recorded for pebble counts (reprinted from Ode 2007).

6.6 PARTICLE SIZE CLASS

Remove the particle from the streambed. Assign the particle to one of the size classes listed in Table 3 (these are also provided in a box on the transect form), based on its intermediate axis length (Figure 10). Record this information under Substrate size class.

Be sure to use measurements or the established codes for particle size class. If the latter, confirm the 2-letter codes for the particles as you call them out to your partner recording the data to ensure you are using the correct codes.

6.7 COBBLE EMBEDDEDNESS

It is generally agreed that the degree to which fine particles fill interstitial spaces has a significant impact on the ecology of benthic organisms and fish, but techniques for measuring this impact vary greatly. Here we define embeddedness as the volume of cobble-sized particles (64-250 mm) that is buried by fine and sand particles (< 2.0 mm diameter).

When a cobble-sized particle is encountered during the pebble count, visually estimate the percentage of the cobble's volume that has been buried by fine/sand particles (this will likely require removing the cobble from the streambed). Record, to the nearest 5%, the embeddedness of up to 25 cobble-sized particles within the sampling reach in the corresponding "% Cobble Embed" field for each cobble.

If 25 cobbles are not encountered during the pebble count, supplement the cobbles by conducting a "random walk" through the reach. Starting at a random point in the reach, follow a line from one bank to the other at a randomly chosen angle. Once at the other bank reverse the process with a new randomly chosen angle. Enter any of these additional embeddedness values at the bottom of the first page of the set of field forms, under "ADDITIONAL COBBLE EMBEDDEDNESS MEASURES".

If 25 cobble sized particles are not present in the entire reach, then record the values for however many cobbles are present.

6.8 CPOM

Record the presence or absence of Coarse Particulate Organic Matter (CPOM) that is > 1 mm diameter, and within 1 cm of the particle.

6.9 ALGAL COVER

Algal cover refers to the amount of algae in the stream reach, both in terms of 1) microalgal coatings ("slimy-ness") on stream substrates and 2) macroalgae (e.g., filaments, mats, globules). Algal cover is estimated by a point-intercept approach that entails collecting information about the presence/absence of both types of algae (as well as thickness, for the microalgae) at each of the points along the transects associated with the pebble count. If the imaginary point corresponding to each pebble in the pebble count intercepts algae, then algae is recorded as "present" at that point. The percentage of the points across the sampling reach that have algae present yields an estimate of the percent algal cover.

For each point along the pebble count, record information about algae as follows. For any film-like coating of algae (referred to as "Microalgae" on the datasheet) present on the surface of the substrate at that point, estimate the presence/thickness category according to the scheme in Table 4. For thicker microalgal layers, a small metal or plastic rod with demarcations at 1, 5, and 20 mm can be used for measurement. For layers too thin to measure, use the diagnostic criteria listed in the last column of Table 4. Note that these thickness codes refer only to microalgal coatings/films on substrate. They do not refer to thickness of macroalgal filaments/mats; macroalgal thickness is not assessed in this protocol. Be sure to collect microalgal thickness data from whatever substrate is topmost within the stream and therefore is most likely to be exposed to sunlight. Sometimes this substrate is not the actual pebble used in the pebble count, but rather a substrate type that occurs above the pebble, such as a thick mat of macroalgae that is above (and covering) the stream bottom. Microalgal species (which can include diatoms and unicellular soft-bodied algae) can grow as "epiphytes" upon macroalgal filaments and mats, coating them with a slimy, tinted film.

Table 4
Microalgal thickness codes and descriptions (adapted from Stevenson and Rollins 2006).

Code	Thickness	Diagnostics
0	No microalgae present	The surface of the substrate feels rough, not slimy.
1	Present, but not visible	The surface of the substrate feels slimy, but the microalgal layer is too thin to be visible.
2	<1mm	Rubbing fingers on the substrate surface produces a brownish tint on them, and scraping the substrate leaves a visible trail, but the microalgal layer is too thin to measure.
3	1-5mm	
4	5-20mm	
5	> 20mm	
UD	Cannot determine if a microalgal layer is present	
D	Dry point	

Note: Sometimes, due to the nature of the substrate, it can be difficult to discern whether a microalgal layer is present (particularly if it is very thin). For example, in the case of very fine sediments, the dark color of the silt can obscure the diagnostic color of a microalgal layer, and the inherent "sliminess" of very fine silt may make tactile determination of microalgae impossible. Therefore, when silt is the substrate, only relatively thick layers of microalgae might be easily discernible. If presence/absence of a microalgal layer cannot be determined with certainty, score microalgal thickness as "UD".

In addition to recording the presence and thickness of microalgae on the surfaces of substrates, record the presence/absence of attached macroalgae in the water column, as well as unattached, floating macroalgal mats on the water's surface, corresponding to each pebble count sampling point. Do this by envisioning an imaginary "line" extending from the water's surface down to the stream bottom where the target "pebble" lies (particularly in turbulent water, it may be helpful to use a viewing bucket (Appendix C) in order to see below the water's surface; the use of the viewing bucket is optional). If this line intercepts macroalgae, either floating on the water's surface, or somewhere within the water column, the appropriate algal class(es) should be recorded as "present". Attached macroalgal filaments have an obvious physical connection to something (like a cobble, boulder, or a gravel bed) lying on the bottom of the stream, whereas for unattached macroalgae, there is no obvious physical connection with the streambed, and the algae is just freely floating at or near the water's surface. For each class of macroalgae (Attached and Unattached), mark "P" (for "present") if intercepted by the sampling point and "A" (for "absent") if not intercepted.

Bear in mind that, because pebble counts span the "wetted width" of each transect, the expectation is that even the pebbles at the bank positions will generally be at least moist, and sometimes even submerged. As such, it is important to realize that algal cover can occur at the bank positions of the pebble count as well as intermediate positions across the stream. An exception to this is when the pebble surface is completely dry. Section 6.11 provides instructions for data collection in this situation.

6.10 MACROPHYTES

If a vascular plant (i.e., a macrophyte) is intercepted by the imaginary line associated with the pebble count point, mark "P" for "present" under Macrophytes. Otherwise, mark "A" for absent. Include only herbaceous plants that are rooted underwater. Examples of macrophytes include cattails, tules, rushes, sedges, monkeyflowers, speedwells, knotweeds, and watercress.

6.11 DRY SUBSTRATES

To determine how to collect data at dry sampling points, it is necessary to first establish whether the dry area in question lies within the stream's active channel (i.e., therefore regularly inundated during storms), or whether the point is on a stable island (i.e., therefore rarely, if ever, inundated). Stable islands are typically

vegetated, often with woody shrubs or trees, and have heights near or exceeding bankfull height. Pebble counts should not be conducted on stable islands. If the transect spans a portion of the study reach in which the channel is bifurcated such that there are two channels with an intervening island, the entire transect should be placed across the dominant channel, and all five pebble count points should be located on that side.

If the point falls on a dry surface that is within the usual active channel (i.e., subject to regular disturbance by flows), then pebble count/algal cover data from the dry point should be recorded as follows:

- score Depth as 0
- score particle Size Class and Embeddedness as described above for wet particles
- score all the algae variables (Microalgae, Macroalgae Attached, and Macroalgae Unattached) as "D" for "dry"
- leave CPOM and Macrophytes "blank" (i.e., do not circle anything). These parameters will register as NR (Not Recorded) in the database.

Ordinarily, the sampling transect would span the wetted width of the channel, but when no water is present at a given transect, evidence of the typical wetted extent of the active channel will need to be used to infer appropriate transect boundaries. Such indicators can include the transition from vegetated to unvegetated area (i.e., moving from banks to active channel), as well as the presence of dried algae, water stains, microtopographic transitions, changes in substrate composition, and others.

6.12 BANK STABILITY

The vulnerability of stream banks to erosion is often of interest in bioassessments because of its direct relationship with sedimentation.

For each transect, record a visual assessment of bank vulnerability in the region between the wetted width and bankfull width of the stream margins and between the upstream and downstream inter-transects. Choose one of three vulnerability states: eroded (evidence of mass wasting), vulnerable (obvious signs of bank erosion or unprotected banks), or stable.

6.13 HUMAN INFLUENCE

For the left and right banks, estimate a 10 x 10 m riparian area centered on the edges of the transect (see Figure 11). In the "Human Influence" section of the Transect data sheet, record the presence of 14 human influence categories in three spatial zones relative to this 10 x 10 m square (between the wetted edge and bankfull margin, between the bankfull margin and 10 m from the stream, and between 10 m and 50 m beyond the stream margins): 1) walls/rip-rap/dams, 2) buildings, 3) pavement/cleared lots, 4) roads/

railroads, 5) pipes (inlets or outlets), 6) landfills or trash, 7) parks or lawns (e.g., golf courses), 8) row crops, 9) pasture/ rangelands, 10) logging/ timber harvest activities, 11) mining activities, 12) vegetative management (herbicides, brush removal, mowing), 13) bridges/ abutments, 14) orchards or vineyards. Circle all combinations of impacts and locations that apply, but be careful to not double-count any human influence observations.

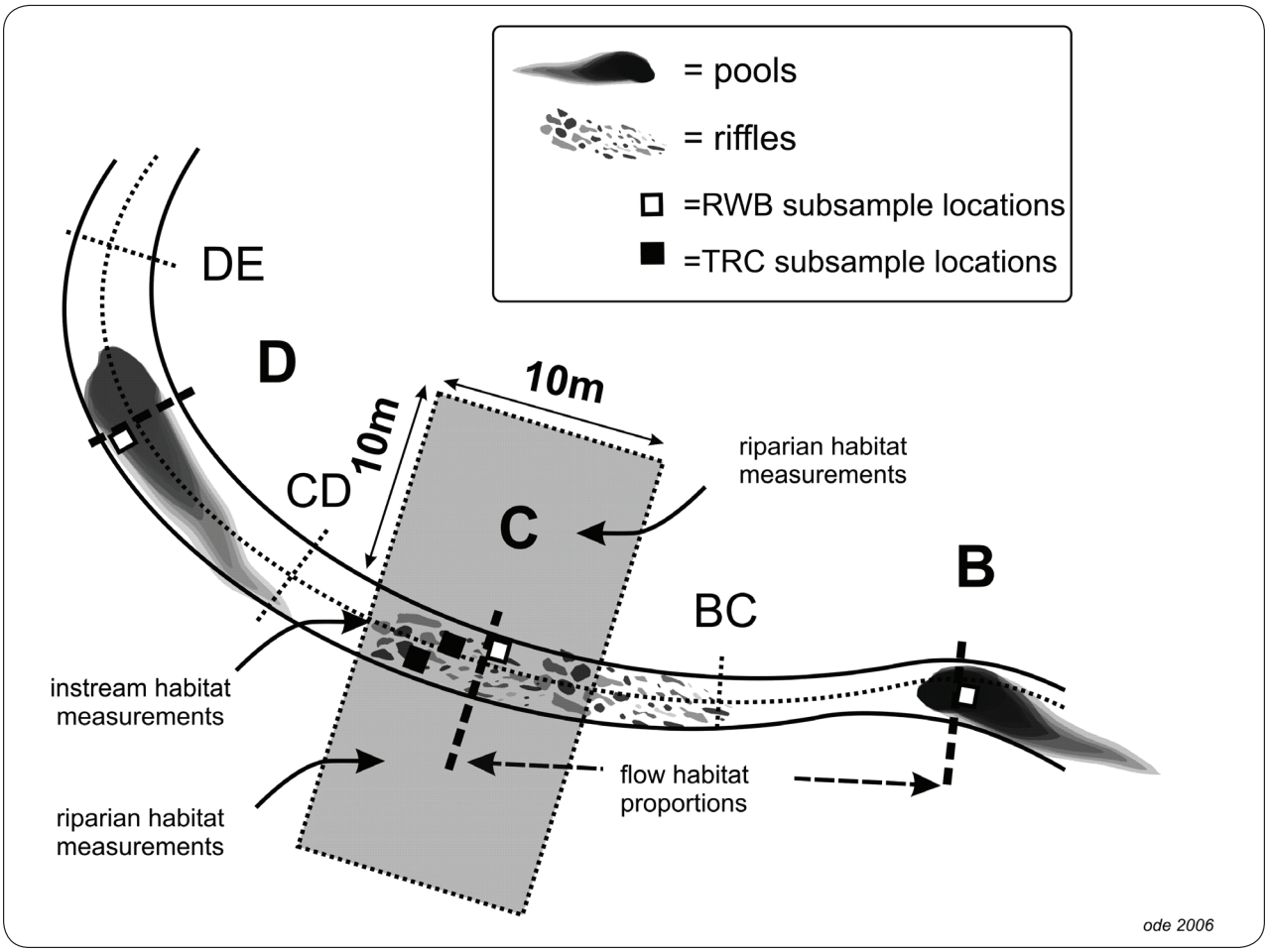

Figure 11. Section of the standard reach expanded from Figure 1 showing the appropriate positions for collecting algae samples (the white square, labeled "RWB" in the legend box) and flow habitat proportion measurements (reprinted from Ode 2007).

Record the presence of any of the 14 human influence categories in the stream channel within a zone 5 m upstream and 5 m downstream of the transect.

6.14 DENSIOMETER READINGS (CANOPY COVER)

The densiometer is read by counting the number of line intersections that are obscured by overhanging vegetation. Before using, the densiometer should be modified by taping off the lower left and right portions of the mirror in order to emphasize overhead vegetation over foreground vegetation (the main source of bias in canopy density measurements; see Figure 12.)

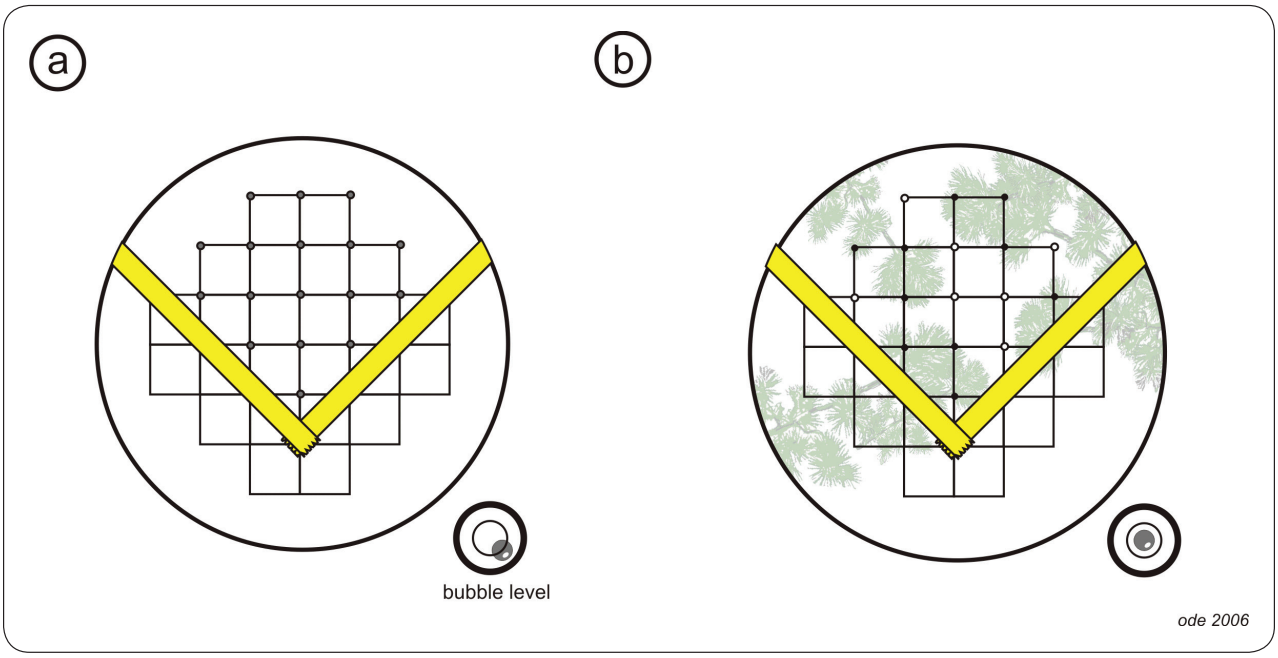

Figure 12. Representation of the mirrored surface of a convex spherical densiometer showing the position for taping the mirror and the intersection points used for the densiometer reading. The score for the hypothetical condition in (b) is 10 covered intersection points out of 17 possible. Note the position of the bubble level in (b) when the densiometer is leveled (reprinted from Ode 2007).

All densiometer readings should be taken with the bubble leveled, and 0.3 m (1 ft) above the water surface. The densiometer should be held just far enough from the squatting observer's body so that his/her forehead is just barely obscured by the intersection of the two pieces of tape.

Take and record four 17-point readings from the center of each transect: a) facing upstream, b) facing downstream, c) facing the left bank, d) facing the right bank. Optional readings can also be taken at the left and right banks (facing away from the stream, for these positions).

PHYSICAL HABITAT INTER-TRANSECT-BASED MEASUREMENTS 7

While most measures are taken at or relative to the main transects, a few measures are recorded at transects located at the midpoint between main transects. These are called "Inter-transects". The following measurements are taken relative to the Inter-transects: 1) Wetted Width, 2) Flow Habitats, and 3) "Pebble Count": Transect Substrates (including algal cover, as for the main transects).

7.1 INTER-TRANSECT WETTED WIDTH

Measure the same way that Transect wetted width was measured.

7.2 INTER-TRANSECT SUBSTRATES AND PERCENT ALGAL COVER

Collect these data the same way that Transect substrates and percent algal cover data were collected.

7.3 FLOW HABITATS

Because many benthic organisms prefer specific flow and substrate microhabitats, the proportional representation of these habitats in a reach is often of interest in bioassessments. There are many different ways to quantify the proportions of different flow habitats. This procedure produces a semi-quantitative measure consisting of 10 transect-based visual estimates.

At each Inter-transect, identify the percentage of six different habitat types in the region between the upstream Transect and downstream Transect: 1) cascades, 2) falls, 3) rapids, 4) riffles, 5) runs, 6) glides, 7) pools, and 8) dry areas. Record percentages to the nearest 5% — the total percentage of surface area for each section must equal 100%.

A description of each of these flow habitat types is provided below:

- cascades: short, high-gradient drops in stream bed elevation often accompanied by boulders and considerable turbulence
- falls: high-gradient drops in elevation of the stream bed associated with an abrupt change in the bedrock
- rapids: sections of stream with swiftly flowing water and considerable surface turbulence (rapids tend to have larger substrate sizes than riffles)
- riffles: "shallow/fast"; riffles are shallow sections where the water flows over coarse stream bed particles that create mild to moderate surface turbulence (< 0.5 m deep, > 0.3 m/s)
- runs: "deep/fast"; long, relatively straight, low-gradient sections without flow obstructions. The stream bed is typically even and the water flows faster than it does in a pool (> 0.5 m deep, > 0.3 m/s)
- glides: "shallow/slow"; sections of stream with little or no turbulence, but faster velocity than pools (< 0.5 m deep, < 0.3 m/s)
- pools: "deep/slow"; a reach of stream that is characterized by deep, low-velocity water and a smooth surface (> 0.5 m deep, < 0.3 m/s)
- dry: any surface area within the channel's wetted width that is above water

After you have collected all the above Transect-, and Inter-transect-, based measurements, collect data on Gradient. Also, if you have not already done so, take photographs at specific Transects, as indicated below. After you have collected Gradient data at each Transect, and have taken photographs where indicated, remove the corresponding flag from the stream bank.

7.4 PHOTOGRAPHS

Take a minimum of four (4) photographs of the reach at the following locations: a) Transect A facing upstream, b) Transect F facing upstream, c) Transect F facing downstream, and d) Transect K facing downstream. It is also desirable to take a photograph at Transect A facing downstream and Transect K facing upstream to document conditions immediately adjacent to the reach. Digital photographs should be used. Record the image numbers on the front page of the field form under "Photographs". *Note: An easy way to keep track of which site each series of photographs belongs to is to take a close-up of the front data sheet (containing legible site code and date) for that site prior to taking the series of photos.*

SECTION 8 REACHWIDE MEASUREMENTS

This last section describes PHab measurements of attributes specific to the stream reach as a whole. These include gradient of the reach and stream discharge.

8.1 GRADIENT

The gradient of a stream reach is one of the major stream classification variables, giving an indication of potential water velocities and stream power, which are in turn important controls on aquatic habitat and sediment transport within the reach. The data collected for gradient are recorded on the "Slope and Bearing" form.

Note: An autolevel should be used for reaches with a percent slope of less than or equal to 1%. Either a clinometer or an autolevel may be used for reaches with a percent slope of greater than 1%, and sometimes a clinometer is preferable in really steep areas that are also heavily vegetated. The following description is for clinometer-based slope measurements. In reaches that are close to 1%, you will not know whether you are above or below the 1% slope cutoff. In these cases, default to use of an autolevel, which is described further below.

Clinometer method:

Transect to transect measurements taken with a clinometer are used to calculate the average slope through a reach. This measurement works best with two people, one taking the readings at the upstream transect ("backsighting") and the other holding a stadia rod at the downstream transect. If you cannot see the mid point of the next transect from the starting point, use the supplemental sections (indicating the proportion of the total length represented by each section). Otherwise, leave these blank.

Beginning with the upper transect (Transect K), one person (the measurer) should stand at the water margin with a clinometer held at eye level. A second person should stand at the margin of the next downstream transect (Transect J) with a stadia rod flagged at the eye level of the person taking the clinometer readings. Be sure you mark your eye level while standing on level ground! Adjust for water depth by measuring from the same height above the water surface at both transects. This is most easily accomplished by holding the base of the stadia rod at water level. *Note: An alternative technique is to use two stadia rods pre-flagged at the eye-height of the person taking the readings.*

Use a clinometer to measure the percent slope of the water surface (not the streambed) between the upstream transect and the downstream transect by sighting to the flagged position on the stadia rod. The clinometer reads both percent slope and degree of the slope. Be careful to read and record percent slope

rather than degrees slope (the measurements differ by a factor of ~2.2). Percent slope is the scale on the right hand side as you look through most clinometers. *Note: If an autolevel or hand level is used, record the elevation difference (rise) between transects and the segment length (run) instead of the percent slope (autolevel instructions are provided in the following section).*

If the stream reach geometry makes it difficult to sight a line between transects, divide the distance into two sections and record the slope and the proportion of the total segment length between transects for each of these sections in the appropriate boxes on the slope form (supplemental segments). Do not measure slope across dry land (e.g., across a meander bend).

Proceed downstream to the next transect pair (I-J) and continue to record slope between each pair of transects until measurements have been recorded for all transects. If you have finished all the other transect and inter-transect based measurements for PHab, you may remove the transect flags as you go.

Autolevel method (preferred):

To measure gradient using an autolevel, identify a good spot to set up the autolevel, preferably somewhere around the center of the reach (if there is good visibility from this location to both the upstream and downstream ends of the reach.) Set up the autolevel on very stable, and preferably fairly flat, ground. Set the height of the autolevel to comfortable eye level for the operator. Level the plane of view of the autolevel by balancing it using the bubble. Start by adjusting the legs, and then fine-tune the adjustment using the knobs. Once balanced, begin "shooting" the change in the height of the water level of the stream from transect to transect. Try to start with one of the outer transects (like A). Have a field partner at Transect A hold the Stadia rod at water's edge and perpendicular to the ground. Viewing through the autolevel (and focusing as necessary), look at the Stadia rod and note to the smallest demarcation on the stadia rod the height at which the autolevel line of view (i.e., the middle line in the viewfinder) hits. Record this information, and then have the Stadia rod holder proceed to the next transect (e.g., Transect B), again holding the base of the Stadia rod at water's edge. Very carefully, rotate the head of the autolevel so that it points to the new Stadia rod location. *Note: Take care not to bump the autolevel out of its position, because if this happens, you will not be able to take a height measurement of Transect B's water surface relative to that of Transect A, to determine the slope between the two transects.*

If the autolevel is bumped out of position before all the measurements are done, or if there is a point along the reach at which there is no longer a clear line of sight from the autolevel to the Stadia rod positioned at the transect, at water's edge, a new location must be set up for the autolevel. In order to maintain a relationship between water heights of the various transects already measured, it will be necessary to "re-shoot" the height of the water at the last transect for which a valid measurement was attained. From there, assuming there is no more disturbance to the position of the autolevel, you can continue cycling through the remaining transects from the new position. On the Slope and Bearing Form corresponding to autolevel use, indicate when the autolevel's position has been changed. If it is necessary to move the autolevel at some point, the transect that was measured from the original and the new position will be listed twice on

the datasheet: once for the original position, and once for the new. Also indicate the distance between main transects (i.e., 15 m, 25 m or other). These pieces of information will later be used to determine the slopes between transects and for the reach as a whole.

8.2 STREAM DISCHARGE

Stream discharge is the volume of water that moves past a point in a given amount of time and is generally reported as cubic feet per second (cfs) or cubic meters per second (cms). Because discharge is directly related to water volume, discharge affects the concentration of nutrients, fine sediments and pollutants; and discharge measurements are critical for understanding impacts of disturbances such as impoundments, water withdrawals and water augmentation. Discharge is also closely related to many habitat characteristics including temperature regimes, physical habitat diversity, and habitat connectivity. As a direct result of these relationships, stream discharge is often also a strong predictor of biotic community composition. Since stream volume can vary significantly on many different temporal scales (diurnal, seasonal, inter-annually), it can also be very useful for understanding variation in stream condition.

It is preferable to take discharge measurements in sections where flow velocities are greater than 0.5 ft/s and most depths are greater than 15 cm, but slower velocities and shallower depths can be used. If flow volume is sufficient for a transect-based "velocity-area" discharge calculation, this is by far the preferred method. If flow volume is too low to permit this procedure or if your flow meter fails, use the "neutrally buoyant object/ timed flow" method.

8.2.1 Discharge: Velocity Area Method

The layout for discharge measurements under the velocity-area (VA) method is illustrated in Figure 13. Flow velocity should be measured with either a Swoffer Instruments propeller-type flow meter or a Marsh-McBirney inductive probe flow meter.

Select the best location in the reach for measuring discharge. To maximize the repeatability of the discharge measurement, choose a transect with the most uniform flow (select hydraulically smooth flow whenever possible) and simplest cross-sectional geometry. It is acceptable to move substrates or other obstacles to create a more uniform cross-section before beginning the discharge measurements.

Data for this parameter will be entered in the "Discharge Measurements" section of the datasheet with the basic site information at the top ("Reach Documentation"). Measure the wetted width of the discharge transect and divide this into 10 to 20 equal segments. The use of more segments gives a better discharge calculation, but is impractical in small channels. A minimum of 10 intervals should be used when stream width permits, but interval width should not be less than 15 cm.

At each interval, record the distance from the bank to the end of the interval. Using the top-setting rod that comes with the flow velocity meter, measure the median depth of the interval. Standing downstream of the

transect to avoid interfering with the flow, use the top-setting rod to set the probe of the flow meter at the midpoint of the interval, at 0.6 of the interval depth (this position generally approximates average velocity in the water column), and at right angles to the transect (facing upstream). See Figure 13 for positioning detail.

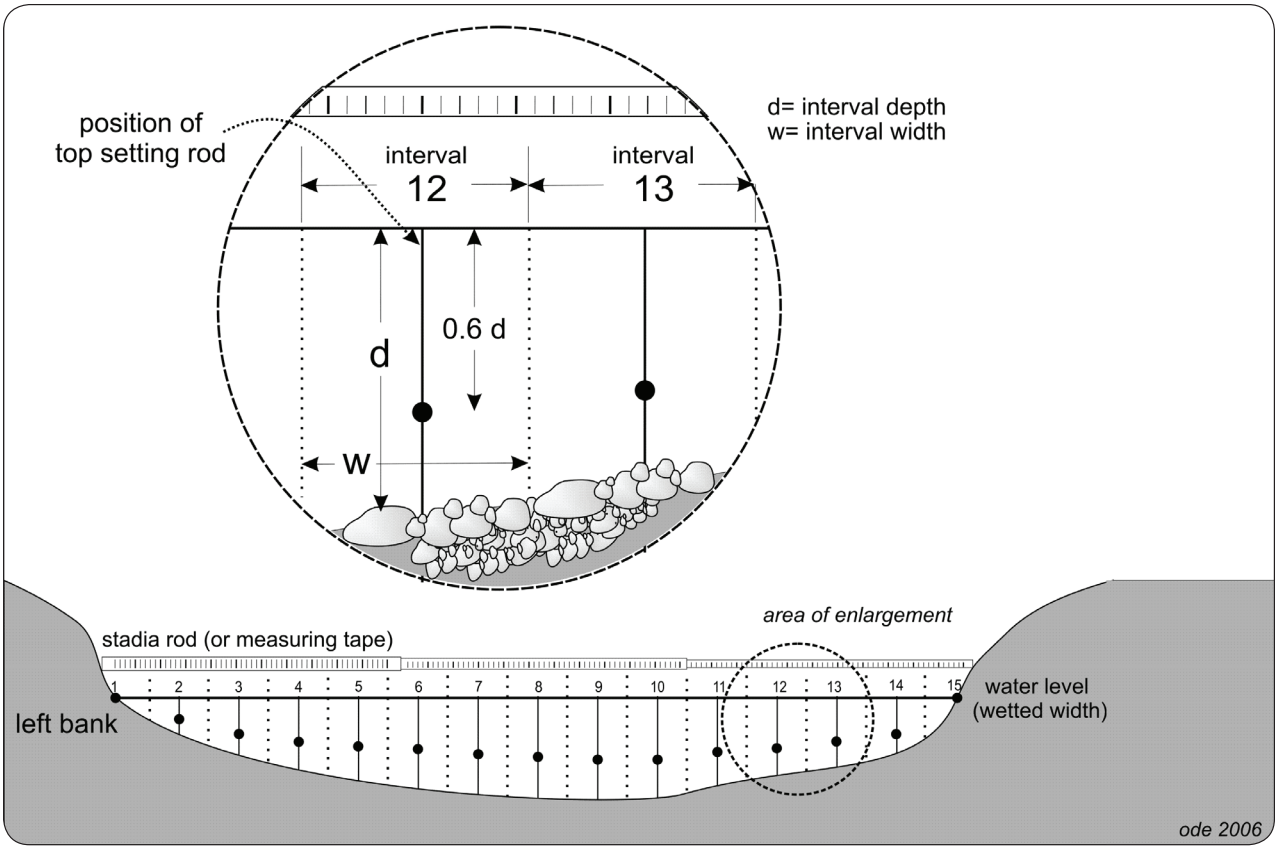

Figure 13. Diagram of layout for discharge measurements under the velocity-area method showing proper positions for velocity probe (black dots; reprinted from Ode 2007).

Allow the flow velocity meter to equilibrate for 10-20 seconds, then record velocity to the nearest ft/s. If the option is available, use the flow averaging setting on the flow meter. *Note 1: Under very low flow conditions, flow velocity meters may register readings of zero even when there is noticeable flow. In these situations, record a velocity of 0.5x the minimum flow detection capabilities of the instrument. Complete these steps on each of the intervals across the stream. Note 2: The first and last intervals usually have depths and velocities of zero.*

8.2.2 Discharge: Neutrally Buoyant Object Method

If streams are too shallow to use a flow velocity meter, the neutrally buoyant object (NBO) method should be used to measure flow velocity. However, since this method is less precise than the flow velocity meter

it should only be used if absolutely necessary. A neutrally buoyant object (one whose density allows it to just balance between sinking and floating) will act as if it were nearly weightless, thus its movement will approximate that of the water it floats in better than a light object. A piece of orange peel works well. To estimate the flow velocity through a reach, three transects are used to measure the cross-sectional areas within the test section sub-reach and three flow velocity estimates are used to measure average velocity through the test reach. To improve precision in velocity measurements, the reach segment should be long enough for the float time to last at least 10-15 seconds.

The position of the discharge sub-reach is not as critical as it is for the velocity-area method, but the same criteria for selection of a discharge reach apply to the neutrally buoyant object method. Identify a section that has relatively uniform flow and a uniform cross sectional shape.

The cross sectional area is estimated in a manner that is similar to, but less precise than, that used in the velocity area method. Measure the cross sectional area in one to three places in the section designated for the discharge measurement (three evenly-spaced cross sections are preferred, but one may be used if the cross section through the reach is very uniform). Record the width once for each cross section and measure depth at five equally-spaced positions along each transect.

Record the length of the discharge reach.

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GLOSSARY OF TERMS USED IN SOP G

Terms & Definitions	
TERM	**DEFINITION**
Aliquot	a measured portion of a sample, or subsample, or to measure a portion of a sample or subsample
Ash-free dry mass (AFDM)	the portion, by mass, of a dried sample that is represented by organic matter; the concentration of AFDM per stream surface area sampled can be used as a surrogate for algal biomass
Benthic algae	algae that are anchored to, or have at one point been anchored to, the stream bottom, in contrast to planktonic algae which are free-floating in the water column
Biofilm	a matrix/film adhering to stream substrata and consisting of microorganisms (e.g., algae, fungi, bacteria, protozoans) and detritus
Chlorophyll *a*	primary light receptor/photosynthetic pigment in algae and higher plants; the concentration of this pigment per stream surface area sampled provides an estimate of algal biomass
Composite sample	volume of all the liquid material amassed during sampling, including water used for rinsing substrate and sampling devices. Final composite volume should not exceed 400-500 ml.
Cyanobacteria	historically referred to as "blue-green" algae, but actually bacteria that are capable of photosynthesis and co-occur with true benthic algae in streams; useful as a bioindicator, and field-sampled and laboratory-processed concurrently with soft-bodied algae
Depositional	habitats in the stream that are dominated by slow-moving water, such as pools, where deposition of materials from the water column is more likely to occur than erosion (or (re)suspension) of loose bed materials; examples of "depositional" substrates include silt and sand
Diatom	a unicellular alga that possesses a rigid, silicified (silica-based) cell wall in the form of a "pill box"
Erosional	habitats in the stream that are dominated by fast-moving water, such as riffles, where stream power is more likely to facilitate erosion (suspension) of loose benthic material than deposition; examples of "erosional" substrates include cobbles and boulders
Homogenate	mixture of liquid composite sample and finely chopped fragments of macroalgae
Index of Biotic Integrity (IBI)	a quantitative assessment tool that uses information about the composition of one or more assemblages of organisms to make inferences about condition the environment they occupy (e.g., the assemblage of interest could be diatoms or benthic macroinvertebrates living in a stream)
Macroalgae	soft bodied algae that form macroscopically discernible filaments, mats, or globose structures
Microalgae	diatoms and microscopic soft-bodied algae, including unicellular forms; can co-occur with other microorganisms in a biofilm
Reachwide benthos (RWB)	method for biotic assemblage sample collection that does not target a specific substrate type, but rather objectively selects sampling locations across the reach, allowing for any of a number of substrate types to be represented in the resulting composite sample
Soft-bodied algae	non-diatom algal taxa; for the purposes of this SOP, cyanobacteria are subsumed under this assemblage
Wetted width	the distance between the sides of the channel at the point where substrates are no longer surrounded by surface water

List of Supplies for Stream Algae Sampling and Associated Data Collection A

Table 5.
General Supplies and Ambient Water Chemistry Collection

Item	Quantity / Site	Specifications
Sampling SOP (this document)	1/person	
Equipment decontamination supplies		See Appendix B
Hip or chest waders, or wading boots/shoes (not felt-soled)	at least 1 pair/ person	
Digital camera	1	
Full set of datasheets printed on waterproof paper (e.g., Rite-in-the-Rain™)	1 full set (and spare set recommended)	
Fine-tipped and thick-tipped waterproof/alcohol-proof pens and markers; pencils	2-3 each	
Clipboard	2-3	
Site dossier containing site maps, aerials, etc.	1	Add a 150 m scale line to aerials adjacent to stream
Thomas Guide and regional maps	as needed	
Centigrade thermometer	1	
pH meter	1	
DO meter and spare membrane	1	
Conductivity meter	1	
Turbidimeter and vial(s) (optional)	1	
Field alkalinity meter or test kit (e.g., Hach)	1	
Water chemistry containers	as needed	
Calibration standards	1	
Spare batteries for meters	as needed	
First aid kit	1	

Table 6.
Algal Taxonomic and Biomass Sample Collection

Needed for[1]:	Item	Quantity / Site	Specifications
D, S, C, A	White dish tub, rectangular, plastic, 11.5 qt	1	Use white, not colored
D, S, C, A	Scrubbing brush or scouring pad to clean dish tub, etc.	1	
D, S, C, A	Composite sample receiving bottle with cap, 1 L, plastic	1	Fisher 02-912-038
D, S, C, A	Graduated cylinder, 500 mL and 25 mL, plastic	1 each	Fisher 03-007-42 & 03-007-39
D, S, C, A	Bottle brush to clean graduated cylinders, etc.	1 sm, 1 lg	
D, S, C, A	PVC delimiter, 12.6 cm^2 area	1	See Appendix C
D, S, C, A	Spatula (> 12.6 cm^2 surface area)	1	
D, S, C, A	Rubber delimiter, 12.6 cm^2 area	1	See Appendix C
D, S, C, A	Toothbrush, firm-bristled	1	
D, S, C, A	Syringe scrubber, 60 mL syringe, 5.3 cm^2 area	1	See Appendix C
D, S, C, A	White (non-pigmented) scrubbing-pad circles	11 per replicate	See Appendix C
D, S, C, A	Tally meter (optional)	1	Ben Meadows 9JB-102385
D, S, C, A	Scissors	1	
D, S, C, A	Wash bottles	2	Label bottles with "stream water", and "DI water"
D, S, C, A	Razor blades or Swiss army knife	1	
D, S, C, A	Sample labels (printed on waterproof paper)	4 per replicate	See Figure 6
D, S, C, A	Clear plastic tape, 5 cm wide	Length of ~20cm per replicate	
D, S, C, A	Ice chest with wet ice	1 (2 preferred if multiple sites to be sampled)	
D, S, C, A	Fisherman's vest (optional)	1	
D, S	Centrifuge tubes, 50 mL, plastic	2 per replicate	Cole Parmer 06344-27
D, S	Rack for 50 mL centrifuge tubes	1	
D	10% formalin solution buffered with borax	10 mL per replicate	See Appendix C
D	Formalin-resistant gloves	1 pair	
D	Safety goggles or face shield	1	
D	Small syringe or bulb pipette	1	

1. "D" = diatom sample, "S" = soft-bodied algal sample, "C" = chlorophyll a sample, "A" = ash-free dry mass sample

Needed for[1]:	Item	Quantity / Site	Specifications
D	Vermiculite packing material	as needed	
S	Turkey baster	1	
S (see note)	25% glutaraldehyde solution (to be dispensed in a laboratory fume hood, wearing appropriate safety gear)	5 mL per replicate	*Note: could be added by taxonomy lab, with prior notification*
S	Calculator	1	
S	Small metric ruler (waterproof)	1	
S	Small Ziploc bag	1	
S, C, A	Whirl-pak bag, 100 mL	3 per replicate	Cole Parmer 06498-00
C, A	Filter forceps	1	Fisher 0975350
C, A	Filtering chamber/tower, 47 mm, plastic	1	Hach 2254400
C, A	Hand vacuum pump	1	Fisher 13-874-612B
C, A	Aluminum foil	~100 cm^2 per replicate	
C, A	Deionized water	500 mL	
C, A	Dry ice (if not returning to lab immediately following the day's fieldwork)	10 lbs	
C	Glass fiber filter, 47 mm, 0.7 µm pore size	1 per replicate	Fisher 09804142H
C	Snapping Petri dish, 47 µm	1 per replicate	Fisher 08-757-105
A	Glass fiber filter, 47 mm, 0.7 µm pore size; foil-wrapped and pre-combusted for ash-free dry mass (AFDM)	1 per replicate	

1. "D" = diatom sample, "S" = soft-bodied algal sample, "C" = chlorophyll a sample, "A" = ash-free dry mass sample

Table 7.
Physical Habitat Data Collection

Item	Quantity / Site	Specifications
GPS receiver	1	
Transect tape; 150 m	1	
Lengths of rope (7.5 m and 12.5 m)	1 each	
Small metric folding ruler (waterproof)	1	
Digital watch	1	
Stadia rod	1	
Clinometer	1	
Autolevel and tripod	1	
Current velocity meter and top-setting rod	1	
Convex spherical densiometer	1	Taped to expose only 17 intersections of the grid (see Figure 12)
Transect flags	21 total	Two colors; label with main transect (11 ct.) and inter-transect (10 ct.) names
Algae viewing bucket (optional)	1	See Appendix C
Small/slender rod with 1, 5, and 20 mm marks	1	For measuring microalgal thickness
Rangefinder (optional)	1	
Fresh orange peel	1	

Information Resources for Avoiding Introduction of Invasive Species and Pathogens into Streams

B

The following is an adaptation of an excerpt taken from an EMAP-based Quality Assurance Project Plan developed by the California Department of Fish and Game Aquatic Bioassessment Laboratory (2008).

Organisms of concern in the U.S. include, but may not be limited to, Eurasian watermilfoil (*Myriophyllum spicatum*), New Zealand mud snail (*Potamopyrgus antipodarum*), zebra mussel (*Dreissena polymorpha*), *Myxobolus cerebralis* (the sporozoan parasite that causes salmonid whirling disease), and *Batrachochytrium dendrobatidis* (a chytrid fungus that threatens amphibian populations).

Field crews must be aware of regional species of concern, and take appropriate precautions to avoid transfer of these species. Crews should make every attempt to be apprised of the most up-to-date information regarding the emergence of new species of concern, as well as new advances in approaches to hygiene and decontamination to prevent the spread of all such organisms (e.g., Hosea and Finlayson, 2005; Schisler et al., 2008).

There are several online sources of information regarding invasive species, including information on cleaning and disinfecting gear:

Whirling Disease Foundation
www.whirling-disease.org

USDA Forest Service - Preventing Accidental Introductions of Freshwater Invasive Species
www.fs.fed.us/invasivespecies/documents/Aquatic_is_prevention.pdf

California Department of Fish and Game
www.dfg.ca.gov

U.S. Geological Survey Nonindigenous Aquatic Species: general information about freshwater invasive species
http://nas.er.usgs.gov

Protect Your Waters - Co-sponsored by the U.S. Fish and Wildlife Service
www.protectyourwaters.net/hitchhikers

The California State Water Resources Control Board Aquatic Invasive Species website

www.swrcb.ca.gov/water_issues/programs/swamp/ais

REFERENCES

Hosea, R.C. and B. Finlayson. 2005. Controlling the spread of New Zealand mudsnails of wading gear. California Department of Fish and Game, Office of Spill Prevention and Response, Administrative Report 2005-02, Sacramento.

Schisler, G.J., N.K.M. Vieira, and P.G. Walker. 2008. Application of Household Disinfectants to Control New Zealand Mudsnails. North American Journal of Fisheries Management 28:1171-1176.

CONSTRUCTION OF ALGAE SAMPLING TOOLS C

This appendix provides step-by-step instructions for constructing the devices used for sampling algae. It also provides a recipe for the formalin fixative for diatoms.

1. RUBBER DELIMITER

The rubber delimiter for use on "erosional"/hard substrates like cobbles and wood is made from a sliced-open mountain bike inner tube that has a 4-cm diameter hole cut in the middle. The hole should be reinforced with a rubber gasket affixed to the tube with rubber cement.

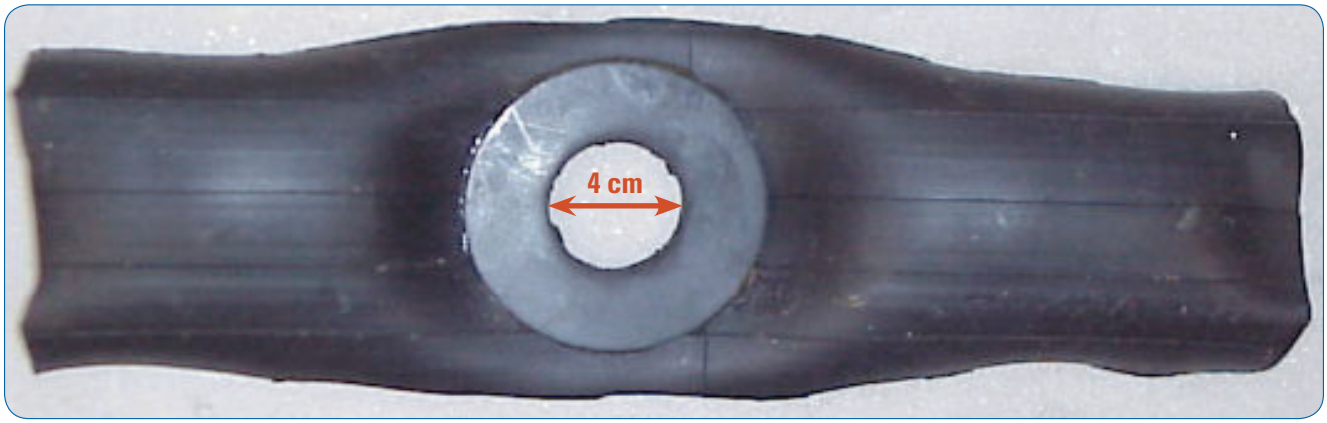

2. PVC DELIMITER

The PVC delimiter for "depositional"/soft substrates like sand, small gravel, and silt is made from a 1½" sewer cleanout, which can be found at a home-improvement or plumbing supply store. The hole in the bottom of the cleanout is 4 cm in diameter. The bottom edge of the cleanout is filed to make it sharp, to ease insertion into silt/sand. To facilitate consistent sampling, it is useful to paint a bright line indicating a depth of 1 cm around the outer surface of the bottom of the sampling device. This indicates the depth to which to insert the delimiter when sampling.

3. SYRINGE SCRUBBER

The syringe scrubber is for use on hard substrates that cannot be picked up out of the stream, like submerged bedrock and concrete channel bottoms. It is made from a 60 mL syringe barrel with the end cut off and its plunger fitted with Velcro-type material. Disposable, white (non-pigmented) scrubbing pads circles are then affixed to the end of the plunger and used to scrub the algae from the substrate.

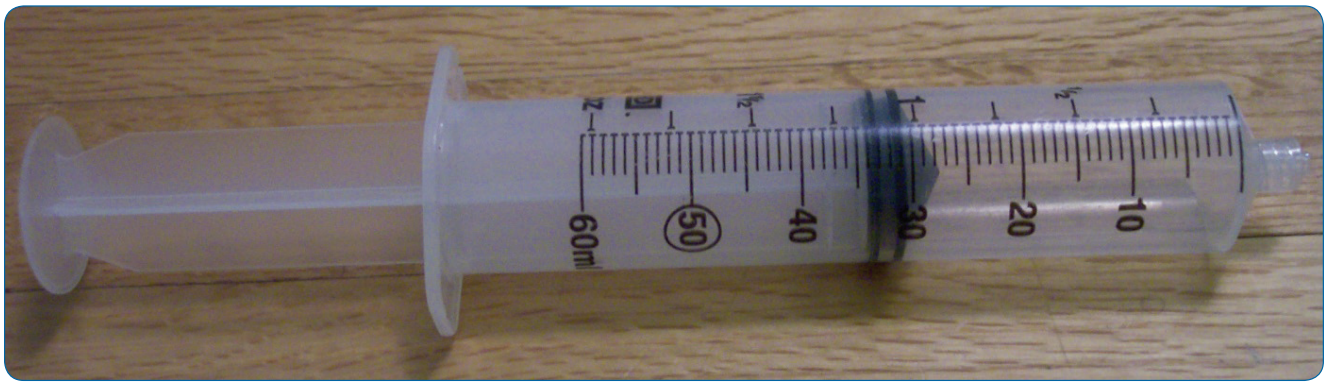

You will need a 60-mL plastic syringe for each sampler you want to make. Remove the plunger and saw the conical end off the plastic syringe, then sand the bottom so it is flat all the way around and fits tightly against a flat surface.

Firmly affix the rubber end to the plastic plunger by removing the rubber tip, applying glue to the "naked" end of the plunger, and replacing the rubber cap. Allow glue to cure. Then cut the conical part off the plunger tip so that only a flat surface of rubber remains.

Cut a circle of Velcro®-style hook material to fit the size of the plunger. Use a waterproof adhesive to affix the "Velcro®" circle to the end of the plunger.

Obtain some white scrubbing pad material (make sure it is not pigmented so it will not end up interfering with eventual chlorophyll *a* analysis of the samples collected.) Cut a supply of circles to fit the size of the plunger.

Before each sampling event, attach a fresh circular scrubbing pad to the end of the plunger. This is a head-on view of the plunger, with the scrubbing pad circle attached.

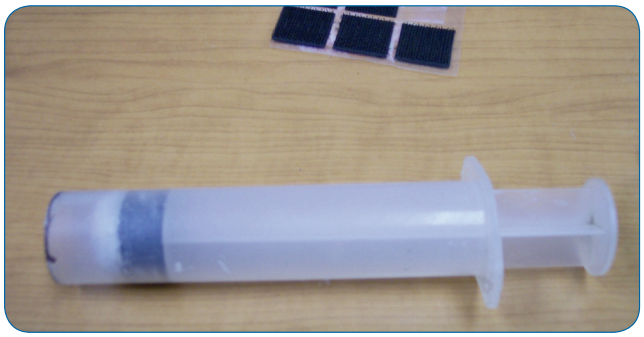

This is what the syringe sampler looks like when it is ready to be used.

4. VIEWING BUCKET (OPTIONAL)

A viewing bucket can be useful for visualizing submerged algae, particularly in instances of a turbulent stream surface that obscures the stream bottom. A viewing bucket can be constructed from a narrow cylinder of clear Plexiglas (approximately 8 inches in diameter) whose bottom is fitted with a circle of thick glass, and secured in place with a silicone seal. If desired, one or two handles can also be fashioned out of Plexiglas and attached to the side(s) of the cylinder. The use of the viewing bucket is optional.

5. PREPARING A 1-L SOLUTION OF 10-PERCENT BUFFERED FORMALIN (MOULTON ET AL. 2002)

1. Add 100 mL of formaldehyde (37-40%) to 900 mL of water in a chemically resistant, non-breakable bottle.
2. Add about 3 g of borax to 10 mL of water and mix.
3. Add dissolved borax solute, to buffer formalin solution.
4. Tightly seal the bottle and mix by carefully inverting the bottle several times.
5. Label the outside of the bottle with "10-percent buffered formalin," the date of preparation, and related hazardous chemical stickers.

REFERENCE

Moulton II, S.R., J.G. Kennen, R.M. Goldstein, and J.A. Hambrook. 2002. Revised protocols for sampling algal, invertebrate, and fish communities as part of the National Water-Quality Assessment Program, Open-File Report 02-150.

STANDARD OPERATING PROCEDURES (SOP) FOR USING GLUTARALDEHYDE FOR THE PRESERVATION OF SOFT ALGAE

D

(adapted from the Aquatic Bioassessment Laboratory, California Department of Fish and Game)

Note: Glutaraldehyde must only be handled by trained individuals who understand the safe handling and use of this chemical

1. SCOPE AND APPLICATION

Glutaraldehyde is a colorless liquid with a pungent odor used as a preservative and sterilant. This SOP covers the use of Glutaraldehyde by Department of Fish and Game OSPR laboratories as a preservative for soft bodied algae.

2. PHYSICAL HAZARDS

The physical hazards associated with the use of Glutaraldehyde include:

- Incompatibility with strong oxidizing substances and bases
- Corrosive to metals
- Production of Carbon Monoxide and Carbon Dioxide during decomposition
- Discolors on exposure to air

3. HEALTH HAZARDS

The health hazards associated with the use of Glutaraldehyde include;

Inhalation

- Regulatory limit of 0.05 ppm as a ceiling level
- Chemical burns to the respiratory tract
- Asthma and shortness of breath
- Headache, dizziness, and nausea

Skin

- Sensitization or allergic reactions, hives
- Irritations and burns
- Staining of the hands (brownish or tan)

Eyes

- Irritation and burns. Eye contact causes moderate to severe irritation, experienced as discomfort or pain, excessive blinking and tear production
- May cause permanent visual impairment
- Conjunctivitis and corneal damage

Ingestion

- Gastrointestinal tract burns; Central nervous system depression, excitement
- Nausea, vomiting
- Unconsciousness, coma, respiratory failure, death

Note: Oral toxicity of Glutaraldehyde ***increases*** *with dilution*

4. ENGINEERING CONTROLS

Strict engineering controls will be followed when using Glutaraldehyde. This chemical and processes using this chemical will only be used under a laboratory fume hood meeting the requirements of Title 8, CCR Section 5154.1. At no time will containers of Glutaraldehyde be opened outside of an operating fume hood. Personnel using Glutaraldehyde will designate an area of the lab for its use. The area where it is used will be noticed with a sign reading:

CAUTION GLUTARALDEHYDE IN USE

Only trained personnel will be allowed to enter the designated area when using Glutaraldehyde.

5. PERSONAL PROTECTIVE EQUIPMENT

Personal Protective Equipment (PPE) is required to be worn at all times when working with Glutaraldehyde. This includes:

Eye Protection

- Chemical splash goggles; or
- Safety glasses with face shield

Hand Protection

- Nitrile or Polyvinyl Chloride (vinyl) gloves

Body Protection

- Lab coat with polypropylene splash apron that cover the arms

Any PPE with noticeable contamination will be immediately removed and the affected area washed with water. Gloves and apron will be removed before leaving the designated area. Disposable PPE (gloves and aprons) will not be re-worn. Disposable PPE will be disposed of in a sealed waste receptacle approved for hazardous waste. Any non-disposable PPE (lab coats, chemical goggles) with noticeable contamination will be rinsed or cleaned as soon as practical, and secured in a manner that does not allow contamination of laboratory personnel. Respiratory protection will not be required as long as strict engineering controls are followed.

6. SAFETY SHOWER AND EYEWASH

All employees using Glutaraldehyde must be aware of the location and use of the laboratory safety shower and eyewash, and must be able to reach it within 10 seconds from the time of contamination. At no time will processes using Glutaraldehyde be allowed that do not provide access to a safety shower and eyewash. Employees who have skin or eye contact with Glutaraldehyde will immediately stop all processes and proceed to the safety shower and eyewash station. The employee will rinse the affected area for a minimum of 15 minutes. If eye contact has occurred, the upper and lower eyelids must be lifted to allow adequate flushing of the eyes.

7. SPECIAL HANDLING PROCEDURES AND STORAGE REQUIREMENTS

Procedures will be followed that reduce exposure to Glutaraldehyde vapor to the lowest reasonable level. This includes:

- Ensure Glutaraldehyde is only used under a fume hood
- Use only enough Glutaraldehyde to perform the required procedure
- Every effort must be made to minimize splashing, spilling, and personnel exposure
- Once specimens are preserved, they will be capped or secured in a way that does not allow Glutaraldehyde vapor to escape into the lab
- At no time will open containers be removed from the fume hood
- All containers of Glutaraldehyde or solutions containing Glutaraldehyde will be appropriately marked with the chemical name, and hazard warning label at the end of the work day or whenever there is a personnel change
- Glutaraldehyde will be stored in tightly closed containers in a cool, secure, and properly marked location

8. WASTE DISPOSAL

Excess Glutaraldehyde and all waste material containing Glutaraldehyde must be placed in an unbreakable secondary container labeled with the following “HAZARDOUS WASTE GLUTARALDEHYDE.” Wastes will be disposed of through the laboratory hazardous waste contract.

9. SPILL AND ACCIDENT PROCEDURES

Drips and splashes will be wiped up immediately with a sponge, towel, or mop. Any material used to clean spills will be disposed of as hazardous waste. Large spills (Greater than 300 CC) require response by a local Hazmat team. The Hazmat team will be called by the laboratory supervisor. In the event of a large spill personnel will immediately leave the laboratory, and not re-enter until cleared by the laboratory supervisor.

10. TRAINING

All personnel engaged in the use of Glutaraldehyde will be trained on the hazards associated with this chemical, before use. The training will include;

- OSPR's Hazard Communication Program and information contained in the chemical's Material Safety Data Sheet (MSDS)
- Health hazards and routes of exposure
- Specific procedures and techniques for use and handling
- Use of PPE and engineering controls
- The contents and requirements of this Standard Operating Procedure.

STANDARD OPERATING PROCEDURES (SOP) FOR USING FORMALIN FOR THE PRESERVATION OF DIATOMS

E

(adapted from the US EPA EMAP program; Peck et al. 2006)

Note: Formalin must only be handled by trained individuals who understand the safe handling and use of this chemical. All personnel engaged in the use of formalin will be trained on the hazards associated with this chemical before use. The training will include the information contained in the chemical's Material Safety Data Sheet (MSDS).

Formaldehyde (or formalin) is highly allergenic, toxic, and dangerous to human health (potentially carcinogenic) if utilized improperly. Formalin vapors and solution are extremely caustic and may cause severe irritation on contact with skin, eyes, or mucous membranes. Formaldehyde is a potential carcinogen, and contact with it should be avoided. Wear gloves and safety glasses and always work in a well-ventilated area. In case of contact with skin or eyes, rinse immediate with large quantities of water. Store stock solution in sealed containers in a safety cabinet or cooler lined with vermiculite or other absorbent material. If possible, transport outside the passenger compartment of a vehicle.

During the course of field activities, a team may observe or be involved with an accidental spill or release of hazardous materials. In such cases, take the proper action and do not become exposed to something harmful. The following guidelines should be applied:

- First and foremost during any environmental incident, it is extremely important to protect the health and safety of all personnel. Take any necessary steps to avoid injury or exposure to hazardous materials. You should always err on the side of personal safety for yourself and your fellow field crew members.
- Never disturb, or even worse, retrieve improperly disposed hazardous materials from the field and bring them back to a facility for disposal. To do so may worsen the impact to the area of the incident, incur personal or organizational liability, cause personal injury, or cause unbudgeted expenditures of time and money for proper treatment and disposal of material. However, it is important not to ignore environmental incidents. You are required to notify the proper authorities of any incident of this type so they can take the necessary actions to respond properly to the incident.

Follow Department of Transportation (DOT) and the Occupational Safety and Health Administration (OSHA) regulations for handling, transporting, and shipping hazardous material such as formalin and ethanol. Regulations pertaining to formalin are in the Code of Federal Regulations (CFR, specifically 29 CFR 1910.1048).

These requirements should be summarized for all hazardous materials being used for the project and provided to field personnel. Transport formalin and ethanol in appropriate containers with absorbent material. Dispose of all wastes in accordance with approved procedures (e.g., National Institute for Occupational Safety and Health 1981, US EPA 1986).

To dispense formalin in the field, wear formalin-safe gloves and safety goggles. Use a small syringe or bulb pipette to add 10 mL of 10% buffered formalin solution to 40 mL of the diatom sample in a 50 mL centrifuge tube. Alternatively, in order to avoid dispensing formalin solution in the field, clean 50 mL centrifuge tubes that will hold the diatom samples can also be pre-loaded with 10 mL of 10% buffered formalin in a laboratory fume hood prior to going into the field.

The preparation of the 10% buffered formalin stock solution should always be done by trained personnel under a laboratory fume hood while wearing protective gloves, clothing, and goggles.

REFERENCE

Peck, D. V., A. T. Herlihy, B. H. Hill, R. M. Hughes, P. R. Kaufmann, D. Klemm, J. M. Lazorchak, F. H. McCormick, S. A. Peterson, P. L. Ringold, T. Magee, and M. Cappaert. 2006. Environmental Monitoring and Assessment Program-Surface Waters Western Pilot Study: Field operations manual for wadeable streams. U.S. Environmental Protection Agency, Washington, D.C. EPA/620/R-06/003.

PROCESSING SOFT-BODIED ALGAL AND DIATOM SAMPLES WHEN MACROALGAL CLUMPS ARE IN THE SAMPLE

F

The first step involves delivering a known quantity of macroalgae to the soft-bodied algae sample tube.

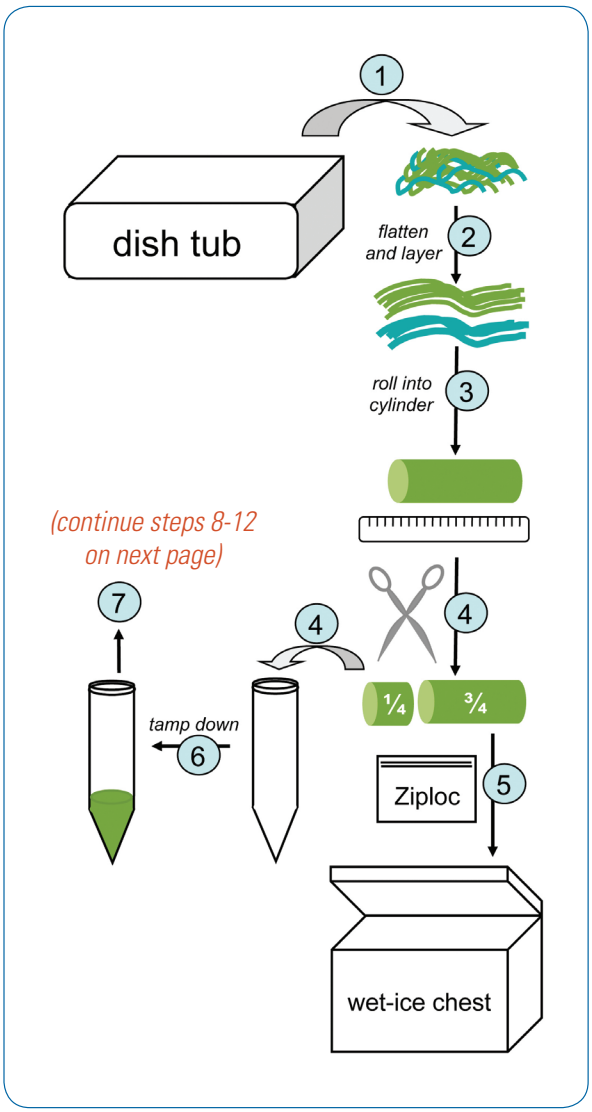

1) Gently wring excess water out of macroalgae and remove from dish tub.

2) Flatten each distinct taxon of macroalgae into even "sheets" and lay atop one another to distribute the volume of each as equally as possible.

3) Once the various layers of macroalgae are evenly spread upon one another, gently roll the stack into a cylinder shape that is roughly straight and even in thickness along its length.

4) Measure and cut off ¼ of the cylinder and place that piece into the empty soft-bodied algae taxonomic ID sample tube.

5) Seal the remaining ¾ of the macroalgae in a clean plastic bag and place inside a cool, dark place such as the wet-ice chest.

6) Using a clean, blunt-ended object, tamp down the ¼ clump of macroalgae in the tube to make it dense and flatten the top surface. Estimate the volume of the macroalgal clump using the graduations on the tube and record this value on the Ratio Restoration worksheet (Figure 8).

7) Add composite sample solution to the tube according to directions on next page.

Some of the liquid composite sample is now added to the tube containing the macroalgae, but first the volume of the entire liquid composite collected must be measured.

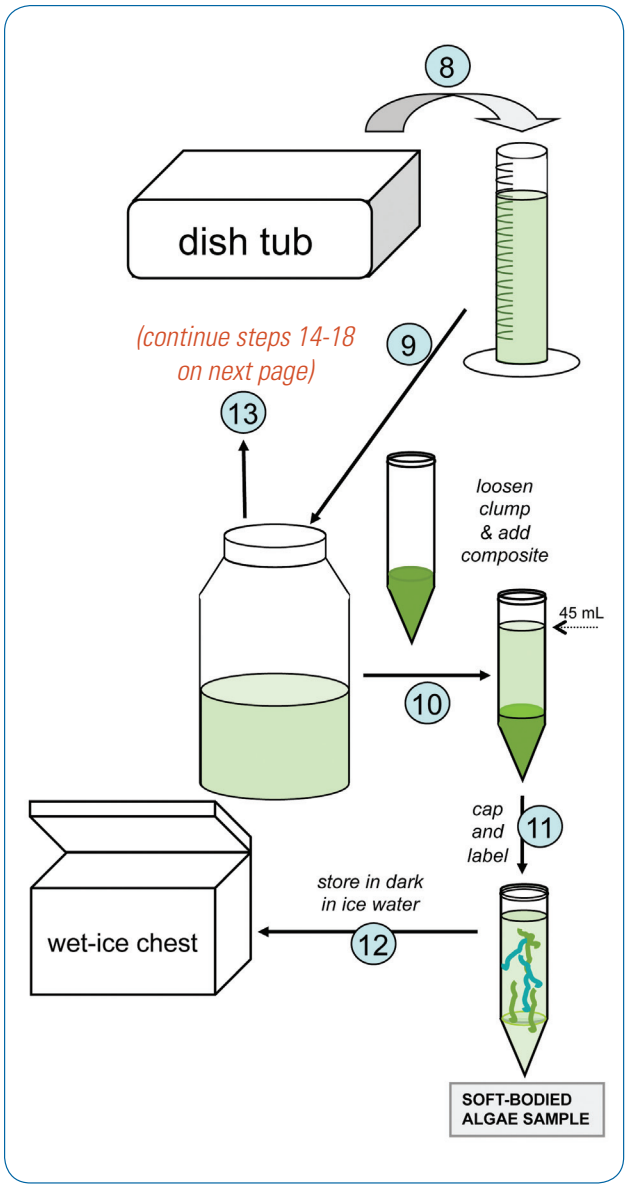

8) Agitate the composite sample in the dish tub in order to suspend and mix the microalgae. Wait a few seconds to let the sand/silt settle. Quickly pour only the liquid (leaving silt/sand behind) into a graduated cylinder to measure its volume. Rinse substrate as necessary. Record TOTAL volume of the composite liquid (+ rinsate) on the datasheet, sample labels, and Ratio Restoration worksheet.

9) Pour the liquid composite sample into a clean, 1 L sample bottle

10) Loosen the macroalgae in the sample tube a little so it is no longer a dense clump lodged in the bottom and then pour freshly-agitated composite liquid into sample tube up to the 45 mL mark.

11) Cap the sample tube tightly. Affix a filled-out label to sample tube and cover with clear tape.

12) Place the tube in the dark in a wet-ice chest (not dry ice). Do not allow the algae to freeze. **Glutaraldehyde will need to be added to the tube within 4 days of sample collection, and preferably as soon as possible.**

13) According to directions on the next page, restore the original ratio of macroalgae to liquid composite in order to prepare the remainder of the samples.

The remainder of the macroalgae is now cut into tiny bits, which are added back to the liquid composite. **But the original ratio of macroalgae:liquid must first be restored.** The diatom and biomass samples are then prepared.

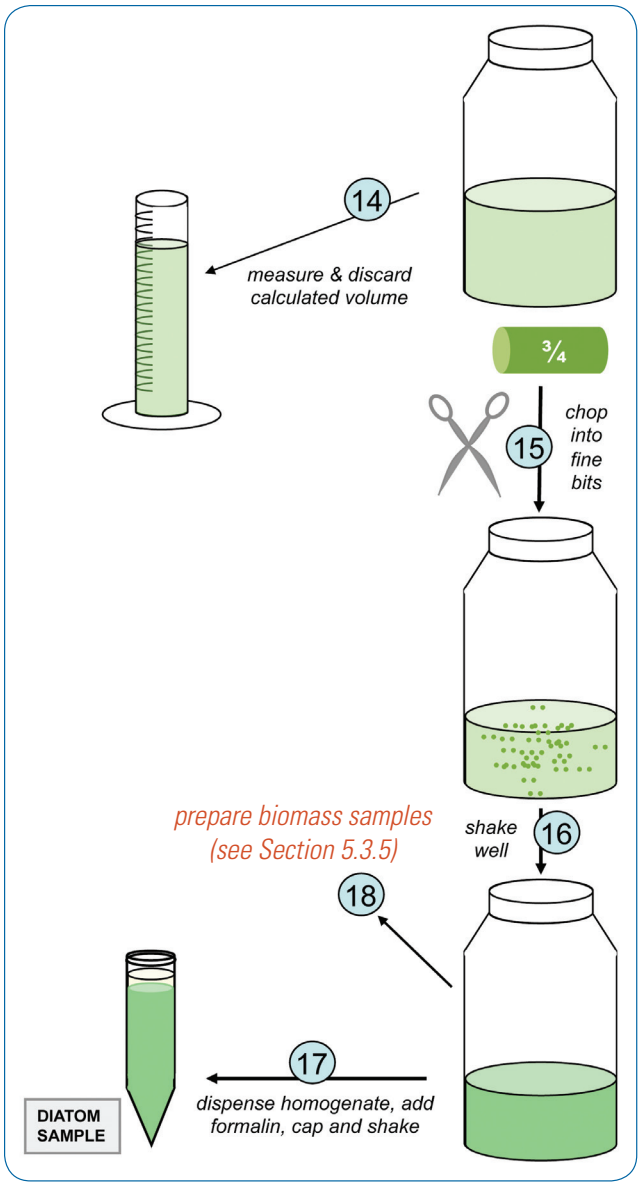

14) Use your Ratio Restoration worksheet to determine how much of the liquid composite to pour off. First shake the bottle vigorously, then measure and discard the appropriate volume.

15) Remove the macroalgal clump from the wet-ice chest. Chop the algae into **very fine** (eyelash length or smaller) pieces and add these to the liquid composite.

16) Cap and shake the bottle vigorously in order to homogenize the chopped algae into the liquid as thoroughly as possible.

17) Pour 40 mL of the freshly-agitated homogenate into the diatom sample tube. Add 10 mL 10% buffered formalin solution, observing all formalin safety precautions. Cap the tube, shake, and affix a sample label.

18) After both taxonomic ID samples have been prepared, the remainder of the homogenate is used for the biomass samples (chlorophyll *a* and ash-free dry mass). 25 mL of freshly shaken homogenate is filtered for each biomass sample. See Section 5.3.5.

046695

SWAMP
Surface Water
Ambient Monitoring
Program

For more information, please contact:

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Linda S. Adams
Secretary for
Environmental Protection

Arnold Schwarzenegger
Governor

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I. BACKGROUND

A. History

In 1972, the Federal Water Pollution Control Act (also referred to as the Clean Water Act [CWA]) was amended to provide that the discharge of pollutants to waters of the United States from any point source is unlawful unless the discharge is in compliance with a National Pollutant Discharge Elimination System (NPDES) permit. The 1987 amendments to the CWA added Section 402(p), which establishes a framework for regulating municipal and industrial storm water discharges under the NPDES Program. On November 16, 1990, the U.S. Environmental Protection Agency (USEPA) published final regulations that established storm water permit application requirements for specified categories of industries. The regulations provide that discharges of storm water to waters of the United States from construction projects that encompass five or more acres of soil disturbance are effectively prohibited unless the discharge is in compliance with an NPDES Permit. Regulations (Phase II Rule) that became final on December 8, 1999 lowered the permitting threshold from five acres to one acre.

While federal regulations allow two permitting options for storm water discharges (Individual Permits and General Permits), the State Water Board has elected to adopt only one statewide General Permit at this time that will apply to most storm water discharges associated with construction activity.

On August 19, 1999, the State Water Board reissued the General Construction Storm Water Permit (Water Quality Order 99-08-DWQ). On December 8, 1999 the State Water Board amended Order 99-08-DWQ to apply to sites as small as one acre.

The General Permit accompanying this fact sheet regulates storm water runoff from construction sites. Regulating many storm water discharges under one permit will greatly reduce the administrative burden associated with permitting individual storm water discharges. To obtain coverage under this General Permit, dischargers shall electronically file the Permit Registration Documents (PRDs), which includes a Notice of Intent (NOI), Storm Water Pollution Prevention Plan (SWPPP), and other compliance related documents required by this General Permit and mail the appropriate permit fee to the State Water Board. It is expected that as the storm water program develops, the Regional Water Quality Control Boards (Regional Water Boards) may issue General Permits or Individual Permits containing more specific permit provisions. When this occurs, this General Permit will no longer regulate those dischargers.

B. Legal Challenges and Court Decisions

1. Early Court Decisions

Shortly after the passage of the CWA, the USEPA promulgated regulations exempting most storm water discharges from the NPDES permit requirements. (See 40 C.F.R. § 125.4 (1975); see also *Natural Resources Defense Council v. Costle* (D.C. Cir. 1977) 568 F.2d 1369, 1372 (*Costle*); *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159, 1163 (*Defenders of Wildlife*).) When environmental groups challenged this exemption in federal court, the District of Columbia Court of Appeals invalidated the regulation, holding that the USEPA "does not have authority to exempt categories of point sources from the permit requirements of [CWA] § 402." (*Costle*, 568 F.2d at 1377.) The *Costle* court rejected the USEPA's argument that effluent-based storm sewer regulation was administratively infeasible because of the variable nature of storm water pollution and the number of affected storm sewers throughout the country. (*Id.* at 1377-82.) Although the court acknowledged the practical problems relating to storm sewer regulation, the court found the USEPA had the flexibility under the CWA to design regulations that would overcome these problems. (*Id.* at 1379-83.) In particular, the court pointed to general permits and permits based on requiring best management practices (BMPs).

During the next 15 years, the USEPA made numerous attempts to reconcile the statutory requirement of point source regulation with the practical problem of regulating possibly millions of diverse point source discharges of storm water. (See *Defenders of Wildlife*, 191 F.3d at 1163; see also Gallagher, Clean Water Act in Environmental Law Handbook (Sullivan, edit., 2003)
p. 300 (Environmental Law Handbook); Eisen, *Toward a Sustainable Urbanism: Lessons from Federal Regulation of Urban Storm Water Runoff* (1995) 48 Wash. U.J. Urb. & Contemp. L.1, 40-41 [Regulation of Urban Storm Water Runoff].)

In 1987, Congress amended the CWA to require NPDES permits for storm water discharges. (See CWA § 402(p), 33 U.S.C. § 1342(p); *Defenders of Wildlife,* 191 F.3d at 1163; *Natural Resources Defense Council v. USEPA* (9th Cir. 1992) 966 F.2d 1292, 1296.) In these amendments, enacted as part of the Water Quality Act of 1987, Congress distinguished between industrial and municipal storm water discharges. With respect to industrial storm water discharges, Congress provided that NPDES permits "shall meet all applicable provisions of this section and section 1311 [requiring the USEPA to establish effluent limitations under specific timetables]." (CWA § 402(p)(3)(A), 33 U.S.C. § 1342(p)(3)(A); see also *Defenders of Wildlife,* 191 F.3d at 1163-64.)

In 1990, USEPA adopted regulations specifying what activities were considered "industrial" and thus required discharges of storm water associated with those activities to obtain coverage under NPDES permits. (55 Fed. Reg. 47,990 (1990); 40 C.F.R. § 122.26(b)(14).) Construction activities, deemed a subset of the industrial activities category, must also be regulated by an NPDES permit. (40 C.F.R. § 122.26(b)(14)(x)). In 1999, USEPA issued regulations for "Phase II" of storm water regulation, which required most small construction sites (1-5 acres) to be regulated under the NPDES program. (64 Fed. Reg. 68,722; 40 C.F.R. § 122.26(b)(15)(i).)

2. Court Decisions on Public Participation

Two recent federal court opinions have vacated USEPA rules that denied meaningful public review of NPDES permit conditions. On January 14, 2003, the Ninth Circuit Court of Appeals held that certain aspects of USEPA's Phase II regulations governing MS4s were invalid primarily because the general permit did not contain express requirements for public participation. (*Environmental Defense Center v. USEPA* (9th Cir. 2003) 344 F.3d 832.) Specifically, the court determined that applications for general permit coverage (including the Notice of Intent (NOI) and Storm Water Management Program (SWMP)) must be made available to the public, the applications must be reviewed and determined to meet the applicable standard by the permitting authority before coverage commences, and there must be a process to accommodate public hearings. (*Id.* at 852-54.) Similarly, on February 28, 2005, the Second Circuit Court of Appeals held that the USEPA's confined animal feeding operation (CAFO) rule violated the CWA because it allowed dischargers to write their own nutrient management plans without public review. (*Waterkeeper Alliance v. USEPA* (2d Cir. 2005) 399 F.3d 486.) Although neither decision involved the issuance of construction storm water permits, the State Water Board's Office of Chief Counsel has recommended that the new General Permit address the courts' rulings where feasible[1].

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[1] In *Texas Independent Producers and Royalty Owners Assn. v. USEPA* (7th Cir. 2005) 410 F.3d 964, the Seventh Circuit Court of Appeals held that the USEPA's construction general permit was not required to provide the public with the opportunity for a public hearing on the Notice of Intent or Storm Water Pollution Prevention Plan. The Seventh Circuit briefly discussed why it agreed with the Ninth Circuit's dissent in *Environmental Defense Center*, but

The CWA and the USEPA's regulations provide states with the discretion to formulate permit terms, including specifying best management practices (BMPs), to achieve strict compliance with federal technology-based and water quality-based standards. (*Natural Resources Defense Council v. USEPA* (9th Cir. 1992) 966 F.2d 1292, 1308.) Accordingly, this General Permit has developed specific BMPs as well as numeric action levels (NALs) in order to achieve these minimum federal standards. In addition, the General Permit requires a SWPPP and REAP (another dynamic, site-specific plan) to be developed but has removed all language requiring the discharger to implement these plans – instead, the discharger is required to comply with specific requirements. By requiring the dischargers to implement these specific BMPs and NALs, this General Permit ensures that the dischargers do not "write their own permits." As a result this General Permit does not require each discharger's SWPPP and REAP to be reviewed and approved by the Regional Water Boards.

This General Permit also requires dischargers to electronically file all permit-related compliance documents. These documents include, but are not limited to, NOIs, SWPPPs, annual reports, Notice of Terminations (NOTs), and numeric action level (NAL) exceedance reports. Electronically submitted compliance information is immediately available to the public, as well as the Regional Water Quality Control Board (Regional Water Board) offices, via the Internet. In addition, this General Permit enables public review and hearings on permit applications when appropriate. Under this General Permit, the public clearly has a meaningful opportunity to participate in the permitting process.

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generally did not discuss the substantive holdings in *Environmental Defense Center* and *Waterkeeper Alliance*, because neither court addressed the initial question of whether the plaintiffs had standing to challenge the permits at issue. However, notwithstanding the Seventh Circuit's decision, it is not binding or controlling on the State Water Board because California is located within the Ninth Circuit.

C. Blue Ribbon Panel of Experts and Feasibility of Numeric Effluent Limitations

In 2005 and 2006, the State Water Board convened an expert panel (panel) to address the feasibility of numeric effluent limitations (NELs) in California's storm water permits. Specifically, the panel was asked to address:

"Is it technically feasible to establish numeric effluent limitations, or some other quantifiable limit, for inclusion in storm water permits? How would such limitations or criteria be established, and what information and data would be required?"

"The answers should address industrial general permits, construction general permits, and area-wide municipal permits. The answers should also address both technology-based limitations or criteria and water quality-based limitations or criteria. In evaluating establishment of any objective criteria, the panel should address all of the following:

The ability of the State Water Board to establish appropriate objective limitations or criteria;

How compliance determinations would be made;

The ability of dischargers and inspectors to monitor for compliance; and

The technical and financial ability of dischargers to comply with the limitations or criteria."

Through a series of public participation processes (State Water Board meetings, State Water Board workshops, and the solicitation of written comments), a number of water quality, public process and overall program effectiveness problems were identified. Some of these problems are addressed through this General Permit.

D. Summary of Panel Findings on Construction Activities

The panel's final report can be downloaded and viewed through links at www.waterboards.ca.gov or by clicking here[2].

The panel made the following observations:

"Limited field studies indicate that traditional erosion and sediment controls are highly variable in performance, resulting in highly variable turbidity levels in the site discharge."

"Site-to-site variability in runoff turbidity from undeveloped sites can also be quite large in many areas of California, particularly in more arid regions with less natural vegetative cover and steep slopes."

[2] http://www.waterboards.ca.gov/stormwtr/docs/numeric/swpanel_final_report.pdf

"Active treatment technologies involving the use of polymers with relatively large storage systems now exist that can provide much more consistent and very low discharge turbidity. However, these technologies have as yet only been applied to larger construction sites, generally five acres or greater. Furthermore, toxicity has been observed at some locations, although at the vast majority of sites, toxicity has not occurred. There is also the potential for an accidental large release of such chemicals with their use."

"To date most of the construction permits have focused on TSS and turbidity, but have not addressed other, potentially significant pollutants such as phosphorus and an assortment of chemicals used at construction sites."

"Currently, there is no required training or certification program for contractors, preparers of soil erosion and sediment control Storm Water Pollution Prevention Plans, or field inspectors."

"The quality of storm water discharges from construction sites that effectively employ BMPs likely varies due to site conditions such as climate, soil, and topography."

"The States of Oregon and Washington have recently adopted similar concepts to the Action Levels described earlier."

In addition, the panel made the following conclusions:

"It is the consensus of the Panel that active treatment technologies make Numeric Limits technically feasible for pollutants commonly associated with storm water discharges from construction sites (e.g. TSS and turbidity) for larger construction sites. Technical practicalities and cost-effectiveness may make these technologies less feasible for smaller sites, including small drainages within a larger site, as these technologies have seen limited use at small construction sites. If chemical addition is not permitted, then Numeric Limits are not likely feasible."

"The Board should consider Numeric Limits or Action Levels for other pollutants of relevance to construction sites, but in particular pH. It is of particular concern where fresh concrete or wash water from cement mixers/equipment is exposed to storm water."

"The Board should consider the phased implementation of Numeric Limits and Action Levels, commensurate with the capacity of the dischargers and support industry to respond."

E. How the Panel's Findings are Used in this General Permit

The State Water Board carefully considered the findings of the panel and related public comments. The State Water Board also reviewed and considered the comments regarding statewide storm water policy and the reissuance of the Industrial General Permit. From the input received the State Water Board identified some permit and program performance gaps that are addressed in this General Permit. The Summary of Significant Changes (below) in this General Permit are a direct result of this process.

F. Summary of Significant Changes in This General Permit

The State Water Board has significant changes to Order 99-08-DWQ. This General Permit differs from Order 99-08-DWQ in the following significant ways:

Rainfall Erosivity Waiver: this General Permit includes the option allowing a small construction site (>1 and <5 acres) to self-certify if the rainfall erosivity value (R value) for their site's given location and time frame compute to be less than or equal to 5.

Technology-Based Numeric Action Levels: this General Permit includes NALs for pH and turbidity.

Risk-Based Permitting Approach: this General Permit establishes three levels of risk possible for a construction site. Risk is calculated in two parts: 1) Project Sediment Risk, and 2) Receiving Water Risk.

Minimum Requirements Specified: this General Permit imposes more minimum BMPs and requirements that were previously only required as elements of the SWPPP or were suggested by guidance.

Project Site Soil Characteristics Monitoring and Reporting: this General Permit provides the option for dischargers to monitor and report the soil characteristics at their project location. The primary purpose of this requirement is to provide better risk determination and eventually better program evaluation.

Effluent Monitoring and Reporting: this General Permit requires effluent monitoring and reporting for pH and turbidity in storm water discharges. The purpose of this monitoring is to evaluate whether NALs and NELs for Active Treatment Systems included in this General Permit are exceeded.

Receiving Water Monitoring and Reporting: this General Permit requires some Risk Level 3 and LUP Type 3 dischargers to monitor receiving waters and conduct bioassessments.

Post-Construction Storm Water Performance Standards: this General Permit specifies runoff reduction requirements for all sites not covered by a Phase I or Phase II MS4 NPDES permit, to avoid, minimize and/or mitigate post-construction storm water runoff impacts.

Rain Event Action Plan: this General Permit requires certain sites to develop and implement a Rain Event Action Plan (REAP) that must be designed to protect all exposed portions of the site within 48 hours prior to any likely precipitation event.

Annual Reporting: this General Permit requires all projects that are enrolled for more than one continuous three-month period to submit information and annually certify that their site is in compliance with these requirements. The primary purpose of this requirement is to provide information needed for overall program evaluation and pubic information.

Certification/Training Requirements for Key Project Personnel: this General Permit requires that key personnel (e.g., SWPPP preparers, inspectors, etc.) have specific training or certifications to ensure their level of knowledge and skills are adequate to ensure their ability to design and evaluate project specifications that will comply with General Permit requirements.

Linear Underground/Overhead Projects: this General Permit includes requirements for all Linear Underground/Overhead Projects (LUPs).

II. RATIONALE

A. General Permit Approach

A general permit for construction activities is an appropriate permitting approach for the following reasons:

1. A general permit is an efficient method to establish the essential regulatory requirements for a broad range of construction activities under differing site conditions;

2. A general permit is the most efficient method to handle the large number of construction storm water permit applications;

3. The application process for coverage under a general permit is far less onerous than that for individual permit and hence more cost effective;

4. A general permit is consistent with USEPA's four-tier permitting strategy, the purpose of which is to use the flexibility provided by the CWA in designing a workable and efficient permitting system; and

5. A general permit is designed to provide coverage for a group of related facilities or operations of a specific industry type or group of industries. It is appropriate when the discharge characteristics are sufficiently similar, and a standard set of permit requirements can effectively provide environmental protection and comply with water quality standards for discharges. In most cases, the general permit will provide sufficient and appropriate management requirements to protect the quality of receiving waters from discharges of storm water from construction sites.

There may be instances where a general permit is not appropriate for a specific construction project. A Regional Water Board may require any discharger otherwise covered under the General Permit to apply for and obtain an Individual Permit or apply for coverage under a more specific General Permit. The Regional Water Board must determine that this General Permit does not provide adequate assurance that water quality will be protected, or that there is a site-specific reason why an individual permit should be required.

B. Construction Activities Covered

1. **Construction activity subject to this General Permit:**

Any construction or demolition activity, including, but not limited to, clearing, grading, grubbing, or excavation, or any other activity that results in a land disturbance of equal to or greater than one acre.

Construction activity that results in land surface disturbances of less than one acre if the construction activity is part of a larger common plan of development or sale of one or more acres of disturbed land surface.

Construction activity related to residential, commercial, or industrial development on lands currently used for agriculture including, but not limited to, the construction of buildings related to agriculture that are considered industrial pursuant to USEPA regulations, such as dairy barns or food processing facilities.

Construction activity associated with LUPs including, but not limited to, those activities necessary for the installation of underground and overhead linear facilities (e.g., conduits, substructures, pipelines, towers, poles, cables, wires, connectors, switching, regulating and transforming equipment and associated ancillary facilities) and include, but are not limited to, underground utility mark-out, potholing, concrete

and asphalt cutting and removal, trenching, excavation, boring and drilling, access road and pole/tower pad and cable/wire pull station, substation construction, substructure installation, construction of tower footings and/or foundations, pole and tower installations, pipeline installations, welding, concrete and/or pavement repair or replacement, and stockpile/borrow locations.

Discharges of sediment from construction activities associated with oil and gas exploration, production, processing, or treatment operations or transmission facilities.[3]

Storm water discharges from dredge spoil placement that occur outside of U.S. Army Corps of Engineers jurisdiction[4] (upland sites) and that disturb one or more acres of land surface from construction activity are covered by this General Permit. Construction projects that intend to disturb one or more acres of land within the jurisdictional boundaries of a CWA § 404 permit should contact the appropriate Regional Water Board to determine whether this permit applies to the project.

2. Linear Underground/Overhead Projects (LUPs) subject to this General Permit:

Underground/overhead facilities typically constructed as LUPs include, but are not limited to, any conveyance, pipe, or pipeline for the transportation of any gaseous, liquid (including water, wastewater for domestic municipal services), liquescent, or slurry substance; any cable line or wire for the transmission of electrical energy; any cable line or wire for communications (e.g., telephone, telegraph, radio or television messages); and associated ancillary facilities. Construction activities associated with LUPs include, but are not limited to, those activities necessary for the installation of underground and overhead linear facilities (e.g., conduits, substructures, pipelines, towers, poles, cables, wires, connectors, switching, regulating and transforming equipment and associated ancillary facilities) and include, but are not limited to, underground utility mark-out, potholing, concrete and asphalt cutting and removal, trenching, excavation, boring and drilling, access road and pole/tower pad and cable/wire pull station, substation construction, substructure installation, construction of tower footings and/or foundations, pole and tower installations, pipeline installations, welding, concrete and/or pavement repair or replacement, and stockpile/borrow locations.

Water Quality Order 2003-0007-DWQ regulated construction activities associated with small LUPs that resulted in land disturbances greater than one acre, but less than five acres. These projects were considered non-traditional construction projects. Attachment A of this Order now regulates all construction activities from LUPs resulting in land disturbances greater than one acre.

3. Common Plan of Development or Sale

USEPA regulations include the term “common plan of development or sale” to ensure that acreage within a common project does not artificially escape the permit requirements because construction activities are phased, split among smaller parcels, or completed by different owners/developers. In the absence of an

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[3] Pursuant to the Ninth Circuit Court of Appeals’ decision in *NRDC v. EPA* (9th Cir. 2008) 526 F.3d 591, and subsequent denial of the USEPA’s petition for reconsideration in November 2008, oil and gas construction activities discharging storm water contaminated only with sediment are no longer exempt from the NPDES program.

[4] A construction site that includes a dredge and/or fill discharge to any water of the United States (e.g., wetland, channel, pond, or marine water) requires a CWA Section 404 permit from the U.S. Army Corps of Engineers and a CWA Section 401 Water Quality Certification from the Regional Water Board or State Water Board.

exact definition of “common plan of development or sale,” the State Water Board is required to exercise its regulatory discretion in providing a common sense interpretation of the term as it applies to construction projects and permit coverage. An overbroad interpretation of the term would render meaningless the clear “one acre” federal permitting threshold and would potentially trigger permitting of almost any construction activity that occurs within an area that had previously received area-wide utility or road improvements.

Construction projects generally receive grading and/or building permits (Local Permits) from local authorities prior to initiating construction activity. These Local Permits spell out the scope of the project, the parcels involved, the type of construction approved, etc. Referring to the Local Permit helps define “common plan of development or sale.” In cases such as tract home development, a Local Permit will include all phases of the construction project including rough grading, utility and road installation, and vertical construction. All construction activities approved in the Local Permit are part of the common plan and must remain under the General Permit until construction is completed. For custom home construction, Local Permits typically only approve vertical construction as the rough grading, utilities, and road improvements were already independently completed under the a previous Local Permit. In the case of a custom home site, the homeowner must submit plans and obtain a distinct and separate Local Permit from the local authority in order to proceed. It is not the intent of the State Water Board to require permitting for an individual homeowner building a custom home on a private lot of less than one acre if it is subject to a separate Local Permit. Similarly, the installation of a swimming pool, deck, or landscaping that disturbs less than one acre that was not part of any previous Local Permit are not required to be permitted.

The following are several examples of construction activity of less than one acre that would require permit coverage:

a. A landowner receives a building permit(s) to build tract homes on a 100-acre site split into 200 one-third acre parcels, (the remaining acreage consists of streets and parkways) which are sold to individual homeowners as they are completed. The landowner completes and sells all the parcels except for two. Although the remaining two parcels combined are less than one acre, the landowner must continue permit coverage for the two parcels.

b. One of the parcels discussed above is sold to another owner who intends to complete the construction as already approved in the Local Permit. The new landowner must file Permit Registration Documents (PRDs) to complete the construction even if the new landowner is required to obtain a separate Local Permit.

c. Landowner in (1) above purchases 50 additional one half-acre parcels adjacent to the original 200-acre project. The landowner seeks a Local Permit (or amendment to existing Local permit) to build on 20 parcels while leaving the remaining 30 parcels for future development. The landowner must amend PRDs to include the 20 parcels 14 days prior to commencement of construction activity on those parcels.

C. Construction Activities Not Covered

1. Traditional Construction Projects Not Covered

This General Permit does not apply to the following construction activity:

a. Routine maintenance to maintain original line and grade, hydraulic capacity, or original purpose of the facility.

b. Disturbances to land surfaces solely related to agricultural operations such as disking, harrowing, terracing and leveling, and soil preparation.

c. Discharges of storm water from areas on tribal lands; construction on tribal lands is regulated by a federal permit.

d. Discharges of storm water within the Lake Tahoe Hydrologic Unit. The Lahontan Regional Water Board has adopted its own permit to regulate storm water discharges from construction activity in the Lake Tahoe Hydrologic Unit (Regional Water Board 6SLT). Owners of construction projects in this watershed must apply for the Lahontan Regional Water Board permit rather than the statewide Construction General Permit. Construction projects within the Lahontan region must also comply with the Lahontan Region Project Guideline for Erosion Control (R6T-2005-0007 Section), which can be found at **http://www.waterboards.ca.gov/lahontan/Adopted_Orders/2005/r6t_2005_0007.pdf**

e. Construction activity that disturbs less than one acre of land surface, unless part of a larger common plan of development or the sale of one or more acres of disturbed land surface.

f. Construction activity covered by an individual NPDES Permit for storm water discharges.

g. Landfill construction activity that is subject to the Industrial General Permit.

h. Construction activity that discharges to Combined Sewer Systems.

i. Conveyances that discharge storm water runoff combined with municipal sewage.

j. Discharges of storm water identified in CWA § 402(*l*)(2), 33 U.S.C. § 1342(*l*)(2).

2. **Linear Projects Not Covered**

a. LUP construction activity does not include linear routine maintenance projects. Routine maintenance projects are projects associated with operations and maintenance activities that are conducted on existing lines and facilities and within existing right-of-way, easements, franchise agreements, or other legally binding agreements of the discharger. Routine maintenance projects include, but are not limited to projects that are conducted to:

i. Maintain the original purpose of the facility or hydraulic capacity.

ii. Update existing lines[5] and facilities to comply with applicable codes, standards, and regulations regardless if such projects result in increased capacity.

iii. Repairing leaks.

[5]Update existing lines includes replacing existing lines with new materials or pipes.

Routine maintenance does not include construction of new[6] lines or facilities resulting from compliance with applicable codes, standards, and regulations.

Routine maintenance projects do not include those areas of maintenance projects that are outside of an existing right-of-way, franchise, easements, or agreements. When a project must secure new areas, those areas may be subject to this General Permit based on the area of disturbed land outside the original right-of-way, easement, or agreement.

b. LUP construction activity does not include field activities associated with the planning and design of a project (e.g., activities associated with route selection).

c. Tie-ins conducted immediately adjacent to "energized" or "pressurized" facilities by the discharger are not considered construction activities where all other LUP construction activities associated with the tie-in are covered by an NOI and SWPPP of a third party or municipal agency.

3. **EPA's Small Construction Rainfall Erosivity Waiver**

EPA's Storm Water Phase II Final Rule provides the option for a Small Construction Rainfall Erosivity Waiver. This waiver applies to small construction sites between 1 and 5 acres, and allows permitting authorities to waive those sites that do not have adverse water quality impacts.

Dischargers eligible for this waiver are exempt from Construction General Permit Coverage. In order to obtain the waiver, the discharger must certify to the State Water Board that small construction activity will occur only when the rainfall erosivity factor is less than 5 ("R" in the Revised Universal Soil Loss Equation). The period of construction activity begins at initial earth disturbance and ends with final stabilization. Where vegetation will be used for final stabilization, the date of installation of a practice that provides interim non-vegetative stabilization can be used for the end of the construction period. The operator must agree (as a condition waiver eligibility) to periodically inspect and properly maintain the area until the criteria for final stabilization as defined in the General Permit have been met. If use of this interim stabilization eligibility condition was relied on to qualify for the waiver, signature on the waiver with a certification statement constitutes acceptance of and commitment to complete the final stabilization process. The discharger must submit a waiver certification to the State Board prior to commencing construction activities.

USEPA funded a cooperative agreement with Texas A&M University to develop an online rainfall erosivity calculator. Dischargers can access the calculator from EPA's website at: www.epa.gov/npdes/stormwater/cgp. Use of the calculator allows the discharger to determine potential eligibility for the rainfall erosivity waiver. It may also be useful in determining the time periods during which construction activity could be waived from permit coverage.

[6]New lines are those that are not associated with existing facilities and are not part of a project to update or replace existing lines.

D. Obtaining and Terminating Permit Coverage

The appropriate Legally Responsible Person (LRP) must obtain coverage under this General Permit. To obtain coverage, the LRP or the LRP's Approved Signatory must file Permit Registration Documents (PRDs) prior to the commencement of construction activity. Failure to obtain coverage under this General Permit for storm water discharges to waters of the United States is a violation of the CWA and the California Water Code.

To obtain coverage under this General Permit, LRPs must electronically file the PRDs, which include a Notice of Intent (NOI), Storm Water Pollution Prevention Plan (SWPPP), and other documents required by this General Permit, and mail the appropriate permit fee to the State Water Board. It is expected that as the storm water program develops, the Regional Water Boards may issue General Permits or Individual Permits that contain more specific permit provisions. When this occurs, this General Permit will no longer regulate those dischargers that obtain coverage under Individual Permits.

Any information provided to the Regional Water Board shall comply with the Homeland Security Act and any other federal law that concerns security in the United States; any information that does not comply should not be submitted.

The application requirements of the General Permit establish a mechanism to clearly identify the responsible parties, locations, and scope of operations of dischargers covered by the General Permit and to document the discharger's knowledge of the General Permit's requirements.

This General Permit provides a grandfathering exception to existing dischargers subject to Water Quality Order No. 99-08-DWQ. Construction projects covered under Water Quality Order No. 99-08-DWQ shall obtain permit coverage at Risk Level 1. LUP projects covered under Water Quality Order No. 2003-0007-DWQ shall obtain permit coverage at LUP Type 1. The Regional Water Boards have the authority to require Risk Determination to be performed on projects currently covered under Water Quality Order No. 99-08-DWQ and 2003-0007-DWQ where they deem necessary.

LRPs must file a Notice of Termination (NOT) with the Regional Water Board when construction is complete and final stabilization has been reached or ownership has been transferred. The discharger must certify that all State and local requirements have been met in accordance with this General Permit. In order for construction to be found complete, the discharger must install post-construction storm water management measures and establish a long-term maintenance plan. This requirement is intended to ensure that the post-construction conditions at the project site do not cause or contribute to direct or indirect water quality impacts (i.e., pollution and/or hydromodification) upstream and downstream. Specifically, the discharger must demonstrate compliance with the post-construction standards set forth in this General Permit (Section XIII). The discharger is responsible for all compliance issues including all annual fees until the NOT has been filed and approved by the local Regional Water Board.

E. Discharge Prohibitions

This General Permit authorizes the discharge of storm water to surface waters from construction activities that result in the disturbance of one or more acres of land, provided that the discharger satisfies all permit conditions set forth in the Order. This General Permit prohibits the discharge of pollutants other than storm water and non-storm water discharges authorized by this General Permit or another NPDES permit. This General Permit also prohibits all discharges which contain a hazardous substance in excess of reportable quantities established in 40 C.F.R. §§ 117.3 and 302.4, unless a separate NPDES Permit has been issued to regulate those discharges. In addition, this General Permit incorporates discharge prohibitions contained in water quality control plans, as implemented by the nine Regional Water Boards. Discharges to Areas of Special Biological Significance (ASBS) are prohibited unless covered by an exception that the State Water Board has approved.

Non-storm water discharges include a wide variety of sources, including improper dumping, spills, or leakage from storage tanks or transfer areas. Non-storm water discharges may contribute significant pollutant loads to receiving waters. Measures to control spills, leakage, and dumping, and to prevent illicit connections during construction must be addressed through structural as well as non-structural BMPs. The State Water Board recognizes, however, that certain non-storm water discharges may be necessary for the completion of construction projects. Authorized non-storm water discharges may include those from de-chlorinated potable water sources such as: fire hydrant flushing, irrigation of vegetative erosion control measures, pipe flushing and testing, water to control dust, uncontaminated ground water dewatering, and other discharges not subject to a separate general NPDES permit adopted by a region. Therefore this General Permit authorizes such discharges provided they meet the following conditions.

These authorized non-storm water discharges must:

1. be infeasible to eliminate;
2. comply with BMPs as described in the SWPPP;
3. filter or treat, using appropriate technology, all dewatering discharges from sedimentation basins;
4. meet the NALs for pH and turbidity; and
5. not cause or contribute to a violation of water quality standards.

Additionally, authorized non-storm water discharges must not be used to clean up failed or inadequate construction or post-construction BMPs designed to keep materials onsite. Authorized non-storm water dewatering discharges may require a permit because some Regional Water Boards have adopted General Permits for dewatering discharges.

This General Permit prohibits the discharge of storm water that causes or threatens to cause pollution, contamination, or nuisance.

F. Effluent Standards for All Types of Discharges

1. Technology-Based Effluent Limitations

Permits for storm water discharges associated with construction activity must meet all applicable provisions of Sections 301 and 402 of the CWA. These provisions require controls of pollutant discharges that utilize best available technology economically achievable (BAT) for toxic pollutants and non conventional pollutants and best conventional pollutant control technology (BCT) for conventional pollutants. Additionally, these provisions require controls of pollutant discharges to reduce pollutants and any more stringent controls necessary to meet water quality standards. The USEPA has already established such limitations, known as effluent limitation guidelines (ELGs), for some industrial categories. This is not the case with construction discharges. In instances where there are no ELGs the permit writer is to use best professional judgment (BPJ) to establish requirements that the discharger must meet using BAT/BCT technology. This General Permit contains only narrative effluent limitations and does not contain numeric effluent limitations, except for Active Treatment Systems (ATS).

Order No. 2009-0009-DWQ, as originally adopted by the State Water Board on September 2, 2009, contained numeric effluent limitations for pH (within the range of 6.0 and 9.0 pH units) and turbidity (500 NTU) that applied only to Risk Level 3 and LUP Type 3 construction sites. The State Water Board adopted the numeric effluent limitations as technology-based effluent limitations based upon its best professional judgment. The California Building Industry Association, the Building Industry Legal Defense

Foundation, and the California Business Properties Association (petitioners) challenged Order No. 2009-0009-DWQ in *California Building Industry Association et al. v. State Water Resources Control Board*. On December 27, 2011, the Superior Court issued a judgment and writ of mandamus. The Superior Court ruled in favor of the State Water Board on almost all of the issues the petitioners raised, but the Superior Court invalidated the numeric effluent limitations for pH and turbidity for Risk Level 3 and LUP Type 3 sites because it determined that the State Water Board did not have sufficient BMP performance data to support those numeric effluent limitations. Therefore, the Superior Court concluded that the State Water Board did not comply with the federal regulations that apply to the use of best professional judgment. In invalidating the numeric effluent limitations, the Superior Court also suspended two ancillary requirements (a compliance storm event provision and receiving water monitoring at Risk Level 3 and LUP Type 3 sites that violated the numeric effluent limitations) that related solely to the invalidated numeric effluent limitations.

As a result of the Superior Court's writ of mandamus, this Order no longer contains numeric effluent limitations for pH and turbidity, except for ATS. In addition, as a result of the Superior Court's writ of mandamus, the receiving water monitoring requirements for Risk Level 3 and LUP Type 3 sites were suspended until the State Water Board amended this Order to restore the receiving water monitoring requirements. As amended, this Order now requires Risk Level 3 and LUP Type 3 Dischargers with direct discharges to surface waters to conduct receiving water monitoring whenever their effluent exceeds specified receiving water monitoring triggers. The receiving water monitoring triggers were established at the same levels as the previous numeric effluent limitations (effluent pH outside the range of 6.0 and 9.0 pH units or turbidity exceeding 500 NTU). In restoring the receiving water monitoring requirements, the State Water Board determined that it was appropriate to require receiving water monitoring for these types of sites with direct discharges to surface waters that exceeded the receiving water monitoring triggers under any storm event scenarios, because these sites represent the highest threat to receiving water quality. An exceedance of a receiving water monitoring trigger does not constitute a violation of this General Permit. These receiving water monitoring requirements take effect on the effective date of the amendment to this Order.

BAT/BCT technologies not only include passive systems such as conventional runoff and sediment control, but-also treatment systems such as coagulation/flocculation using sand filtration, when appropriate. Such technologies allow for effective treatment of soil particles less 0.02 mm (medium silt) in diameter. The discharger must install structural-controls, as necessary, such as erosion and sediment controls that meet BAT and BCT to achieve compliance with water quality standards. The narrative effluent limitations constitute compliance with the requirements of the CWA.

Because the permit is an NPDES permit, there is no legal requirement to address the factors set forth in Water Code sections 13241 and 13263, unless the permit is more stringent than what federal law requires. (See *City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 618, 627.) None of the requirements in this permit are more stringent than the minimum federal requirements, which include technology-based requirements achieving BAT/BCT and strict compliance with water quality standards. The inclusion of numeric effluent limitations (NELs) in the permit for Active Treatment Systems does not cause the permit to be more stringent than current federal law. NELs and best management practices are simply two different-methods of achieving the same federal requirement: strict compliance with state water quality standards. Federal law authorizes both narrative and numeric effluent limitations to meet state water quality standards. The use of NELs to achieve compliance with water quality standards is not a more stringent requirement than the use of BMPs. (State Water Board Order No. WQ 2006-0012 (*Boeing*).) Accordingly, the State Water Board does not need to take into account the factors in Water Code sections 13241 and 13263.

The State Water Board has concluded that the establishment of BAT/BCT will not create or aggravate other environmental problems through increases in air pollution, solid waste generation, or energy consumption.–While there may be a slight increase in non-water quality impacts due to the implementation of additional monitoring or the construction of additional BMPs, these impacts will be negligible in comparison with the construction activities taking place on site and would be justified by the water quality benefits associated with compliance.

pH Receiving Water Monitoring Trigger

Given the potential contaminants, the minimum standard method for control of pH in runoff requires the use of preventive measures such as avoiding concrete pours during rainy weather, covering concrete and directing flow away from fresh concrete if a pour occurs during rain, covering scrap drywall and stucco materials when stored outside and potentially exposed to rain, and other housekeeping measures. If necessary, pH-impaired storm water from construction sites can be treated in a filter or settling pond or basin, with additional natural or chemical treatment required to meet pH limits set forth in this permit. The basin or pond acts as a collection point and holds storm water for a sufficient period for the contaminants to be settled out, either naturally or artificially, and allows any additional treatment to take place. The State Water Board considers these techniques to be equivalent to BCT. In determining the pH concentration trigger for discharges, the State Water Board used BPJ to set these limitations.

The chosen trigger was established by calculating three standard deviations above and below the mean pH of runoff from highway construction sites[7] in California. Proper implementation of BMPs should result in discharges that are within the range of 6.0 to 9.0 pH Units.

Turbidity Receiving Water Monitoring Trigger

The Turbidity receiving water monitoring trigger of 500 NTU is a technology-based trigger and was developed using three different analyses aimed at finding the appropriate threshold to set the technology-based limit to ensure environmental protection, effluent quality and cost-effectiveness. The analyses fell into three, main types: (1) an ecoregion-specific dataset developed by Simon et. al. (2004) [8]; (2) Statewide Regional Water Quality Control Board enforcement data; and (3) published, peer-reviewed studies and reports on in-situ performance of best management practices in terms of erosion and sediment control on active construction sites.

A 1:3 relationship between turbidity (expressed as NTU) and suspended sediment concentration (expressed as mg/L) is assumed based on a review of suspended sediment and turbidity data from three gages used in the USGS National Water Quality Assessment Program:

USGS 11074000 SANTA ANA R BL PRADO DAM CA
USGS 11447650 SACRAMENTO R A FREEPORT CA
USGS 11303500 SAN JOAQUIN R NR VERNALIS CA

The receiving water monitoring trigger represents staff determination that the trigger value is the most practicable based on available data. The turbidity receiving water monitoring trigger represents a bridge between the narrative effluent limitations and receiving water limitations. To support this receiving water monitoring trigger, State Water Board staff analyzed construction site discharge information (monitoring data, estimates) and receiving water monitoring information.

Since the turbidity receiving water monitoring trigger represents an appropriate threshold level expected at a site, compliance with this value does not necessarily represent compliance with either the narrative effluent limitations (as enforced through the BAT/BCT standard) or the receiving water limitations. In the San Diego region, some inland surface waters have a receiving water objective for turbidity equal to 20 NTU. Obviously a discharge up to, but not exceeding, the turbidity receiving water monitoring trigger of

[7] Caltrans Construction Sites Runoff Characterization Study, 2002. Available at: http://www.dot.ca.gov/hq/env/stormwater/pdf/CTSW-RT-02-055.pdf.

500 NTU may still cause or contribute to the exceedance of the 20 NTU standard. Most of the waters of the State are protected by turbidity objectives based on background conditions.

Table 1 - Regional Water Board Basin Plans, Water Quality Objectives for Turbidity

REGIONAL WATER BOARD	WQ Objective	Background/Natural Turbidity	Maximum Increase
1	Based on background	All levels	20%
2	Based on background	> 50 NTU	10%
3	Based on background	0-50 JTU 50-100 JTU > 100 JTU	20% 10 NTU 10%
4	Based on background	0-50 NTU > 50 NTU	20% 10%
5	Based on background	0-5 NTU 5-50 NTU 50-100 NTU >100 NTU	1 NTU 20% 10 NTU 10%
6	Based on background	All levels	10%
7	Based on background	N/A	N/A
8	Based on background	0-50 NTU 50-100 NTU >100 NTU	20% 10 NTU 10%
9	Inland Surface Waters, 20 NTU All others, based on background	0-50 NTU 50-100 NTU >100 NTU	20% 10 NTU 10%

Table 2 shows the suspended sediment concentrations at the 1.5 year flow recurrence interval for the 12 ecoregions in California from Simon et. al (2004).

Table 2 - Results of Ecoregion Analysis

Ecoregion	Percent of California Land Area	Median Suspended Sediment Concentration (mg/L)
1	9.1	874
4	0.2	120
5	8.8	35.6
6	20.7	1530
7	7.7	122
8	3.0	47.4
9	9.4	284
13	5.2	143
14	21.7	5150
78	8.1	581
80	2.4	199
81	3.7	503
Area-weighted average		1633

If a 1:3 relationship between turbidity and suspended sediment is assumed, the median turbidity is 544 NTU.

The following table is composed of turbidity readings measured in NTUs from administrative civil liability (ACL) actions for construction sites from 2003 - 2009. This data was derived from the complete listing of construction-related ACLs for the six year period. All ACLs were reviewed and those that included turbidimeter readings at the point of storm water discharge were selected for this dataset.

Table 3 – ACL Sampling Data taken by Regional Water Board Staff

WDID#	Region	Discharger	Turbidity (NTU)
5S34C331884	5S	Bradshaw Interceptor Section 6B	1800
5S05C325110	5S	Bridalwood Subdivision	1670
5S48C336297	5S	Cheyenne at Browns Valley	1629
5R32C314271	5R	Grizzly Ranch Construction	1400
6A090406008	6T	El Dorado County Department of Transportation, Angora Creek	97.4
5S03C346861	5S	TML Development, LLC	1600
6A31C325917	6T	Northstar Village	See Subdata Set

Subdata Set - Turbidity for point of storm water runoff discharge at Northstar Village

Date	Turbidity (NTU)	Location
10/5/2006	900	Middle Martis Creek
11/2/2006	190	Middle Martis Creek
01/04/2007	36	West Fork, West Martis Creek
02/08/2007	180	Middle Martis Creek
02/09/2007	130	Middle Martis Creek
02/09/2007	290	Middle Martis Creek
02/09/2007	100	West Fork, West Martis Creek
02/10/2007	28	Middle Martis Creek
02/10/2007	23	Middle Martis Creek
02/10/2007	32	Middle Martis Creek
02/10/2007	12	Middle Martis Creek
02/10/2007	60	West Fork, West Martis Creek
02/10/2007	34	West Fork, West Martis Creek

A 95% confidence interval for mean turbidity in an ACL order was constructed. The data set used was a small sample size, so the 500 NTU (the value derived as the receiving water monitoring trigger for this General Permit) needed to be verified as a possible population mean. In this case, the population refers to a hypothetical population of turbidity measurements of which our sample of 20 represents. A t-distribution was assumed due to the small sample size:

Mean: 512.23 NTU
Standard Deviation: 686.85
Margin of Error: 321.45
Confidence Interval: 190.78 NTU (Low)
833.68 NTU (High)

Based on a constructed 95% confidence interval, an ACL order turbidity measurement will be between 190.78 – 833.68 NTU. 500 NTU falls within this range. Using the same data set, a small-sample hypothesis test was also performed to test if the ACL turbidity data set contains enough information to cast doubt on choosing a 500 NTU as a mean. 500 NTU was again chosen due to its proposed use as an acceptable value. The test was carried out using a 95% confidence interval. Results indicated that the ACL turbidity data set *does not* contain significant sample evidence to reject the claim of 500 NTU as an acceptable mean for the ACL turbidity population.

There are not many published, peer-reviewed studies and reports on in-situ performance of best management practices in terms of erosion and sediment control on active construction sites. The most often cited study is a report titled, "Improving the Cost Effectiveness of Highway Construction Site Erosion and Pollution Control" (Horner, Guedry, and Kortenhof 1990, http://www.wsdot.wa.gov/Research/Reports/200/200.1.htm). In a comment letter summarizing this report sent to the State Water Board, the primary author, Dr. Horner, states:

"The most effective erosion control product was wood fiber mulch applied at two different rates along with a bonding agent and grass seed in sufficient time before the tests to achieve germination. Plots treated in this way reduced influent turbidity by more than 97 percent and discharged effluent exhibiting mean and maximum turbidity values of 21 and 73 NTU, respectively. Some other mulch and blanket materials performed nearly as well. These tests demonstrated the control ability of widely available BMPs over a very broad range of erosion potential."

Other technologies studied in this report produced effluent quality at or near 100 NTU. It is the BPJ of the State Water Board staff that erosion control, while preferred, is not always an option on construction sites and that technology performance in a controlled study showing effluent quality directly leaving a BMP is always easier and cheaper to control than effluent being discharged from the project (edge of property, etc.). As a result, it is the BPJ of the State Water Board staff that it is not cost effective or feasible, at this time, for all risk level and type 3 sites in California to achieve effluent discharges with turbidity values that are less than 100 NTU.

To summarize, the analysis showed that: (1) results of the Simon et. al dataset reveals turbidity values in background receiving water in California's ecoregions range from 16 NTU to 1716 NTU (with a mean of 544 NTU); (2) based on a constructed 95% confidence interval, construction sites will be subject to administrative civil liability (ACL) when their turbidity measurement falls between 190.78 – 833.68 NTU; and (3) sites with highly controlled discharges employing and maintaining good erosion control practices can discharge effluent from the BMP with turbidity values less than 100 NTU. State Water Board staff has determined, using its BPJ, that it is most cost effective to set the receiving water monitoring trigger for turbidity at 500 NTU.

i. *Compliance Storm Event*

While this General Permit no longer contains "compliance storm event" exceptions from technology-based NELs, the "compliance storm event" exception from the ATS NELs remain in effect. See Section K of this Fact Sheet, and Attachment F of this General Permit for more information.

a. TMDLs and Waste Load Allocations

Dischargers located within the watershed of a CWA § 303(d) impaired water body, for which a TMDL for sediment has been adopted by the Regional Water Board or USEPA, must comply with the approved TMDL if it identifies "construction activity" or land disturbance as a source of sediment. If it does, the

TMDL should include a specific waste load allocation for this activity/source. The discharger, in this case, may be required by a separate Regional Water Board order to implement additional BMPs, conduct additional monitoring activities, and/or comply with an applicable waste load allocation and implementation schedule. If a specific waste load allocation has been established that would apply to a specific discharge, the Regional Water Board may adopt an order requiring specific implementation actions necessary to meet that allocation. In the instance where an approved TMDL has specified a general waste load allocation to construction storm water discharges, but no specific requirements for construction sites have been identified in the TMDL, dischargers must consult with the state TMDL authority[9] to confirm that adherence to a SWPPP that meets the requirements of the General Permit will be consistent with the approved TMDL.

2. Determining Compliance with Effluent Standards

a. Technology-Based Numeric Action Levels (NALs)

This General Permit contains technology-based NALs for pH and turbidity, and requirements for effluent monitoring at all Risk level 2 & 3, and LUP Type 2 & 3 sites. Numeric action levels are essentially numeric benchmark values for certain parameters that, if exceeded in effluent sampling, trigger the discharger to take actions. Exceedance of an NAL does not itself constitute a violation of the General Permit. If the discharger fails to take the corrective action required by the General Permit, though, that may consititute a violation.

The primary purpose of NALs is to assist dischargers in evaluating the effectiveness of their on-site measures. Construction sites need to employ many different systems that must work together to achieve compliance with the permit's requirements. The NALs chosen should indicate whether the systems are working as intended.

Another purpose of NALs is to provide information regarding construction activities and water quality impacts. This data will provide the State and Regional Water Boards and the rest of the storm water community with more information about levels and types of pollutants present in runoff and how effective the dischargers BMPs are at reducing pollutants in effluent. The State Water Board also hopes to learn more about the linkage between effluent and receiving water quality. In addition, these requirements will provide information on the mechanics needed to establish compliance monitoring programs at construction sites in future permit deliberations.

i. *pH*

The chosen limits were established by calculating one standard deviation above and below the mean pH of runoff from highway construction sites[10] in California. Proper implementation of BMPs should result in discharges that are within the range of 6.5 to 8.5 pH Units.

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[9] http://www.waterboards.ca.gov/tmdl/tmdl.html.
[10] Caltrans Construction Sites Runoff Characterization Study, 2002. Available at: http://www.dot.ca.gov/hq/env/stormwater/pdf/CTSW-RT-02-055.pdf.

The Caltrans study included 33 highway construction sites throughout California over a period of four years, which included 120 storm events. All of these sites had BMPs in place that would be generally implemented at all types of construction sites in California.

ii. ***Turbidity***

BPJ was used to develop an NAL that can be used as a learning tool to help dischargers improve their site controls, and to provide meaningful information on the effectiveness of storm water controls. A statewide turbidity NAL has been set at 250 NTU.

G. Receiving Water Limitations

Construction-related activities that cause or contribute to an exceedance of water quality standards must be addressed. The dynamic nature of construction activity gives the discharger the ability to quickly identify and monitor the source of the exceedances. This is because when storm water mobilizes sediment, it provides visual cues as to where corrective actions should take place and how effective they are once implemented.

This General Permit requires that storm water discharges and authorized non-storm water discharges must not contain pollutants that cause or contribute to an exceedance of any applicable water quality objective or water quality standards. The monitoring requirements in this General Permit for sampling and analysis procedures will help determine whether BMPs installed and maintained are preventing pollutants in discharges from the construction site that may cause or contribute to an exceedance of water quality standards.

Water quality standards consist of designated beneficial uses of surface waters and the adoption of ambient criteria necessary to protect those uses. When adopted by the State Water Board or a Regional Water Board, the ambient criteria are termed “water quality objectives.” If storm water runoff from construction sites contains pollutants, there is a risk that those pollutants could enter surface waters and cause or contribute to an exceedance of water quality standards. For that reason, dischargers should be aware of the applicable water quality standards in their receiving waters. (The best method to ensure compliance with receiving water limitations is to implement BMPs that prevent pollutants from contact with storm water or from leaving the construction site in runoff.)

In California, water quality standards are published in the Basin Plans adopted by each Regional Water Board, the California Toxics Rule (CTR), the National Toxics Rule (NTR), and the Ocean Plan.

Dischargers can determine the applicable water quality standards by contacting Regional Water Board staff or by consulting one of the following sources. The actual Basin Plans that contain the water quality standards can be viewed at the website of the appropriate Regional Water Board. (http://www.waterboards.ca.gov/regions.html), the State Water Board site for statewide plans (http://www.waterboards.ca.gov/plnspols/index.html), or the USEPA regulations for the NTR and CTR (40 C.F.R. §§ 131.36-38). Basin Plans and statewide plans are also available by mail from the appropriate Regional Water Board or the State Water Board. The USEPA regulations are available at http://www.epa.gov/. Additional information concerning water quality standards can be accessed through http://www.waterboards.ca.gov/stormwtr/gen_const.html.

H. Training Qualifications and Requirements

The Blue Ribbon Panel (BRP) made the following observation about the lack of industry-specific training requirements:

“Currently, there is no required training or certification program for contractors, preparers of soil erosion and sediment control Storm Water Pollution Prevention Plans, or field inspectors.”

Order 99-08-DWQ required that all dischargers train their employees on how to comply with the permit, but it did not specificy a curriculum or certification program. This has resulted in inconsistent implementation by all affected parties - the dischargers, the local governments where the construction activity occurs, and the regulators required to enforce 99-08-DWQ. This General Permit requires Qualified SWPPP Developers and practitioners to obtain appropriate training, and makes this curriculum mandatory two years after adoption, to allow time for course completion. The State and Regional Water Board are working with many stakeholders to develop the curriculum and mechanisms needed to develop and deliver the courses.

To ensure that the preparation, implementation, and oversight of the SWPPP is sufficient for effective pollution prevention, the Qualified SWPPP Developer and Qualified SWPPP Practitioners responsible for creating, revising, overseeing, and implementing the SWPPP must attend a State Water Board-sponsored or approved Qualified SWPPP Developer and Qualified SWPPP Practitioner training course.

I. Sampling, Monitoring, Reporting and Record Keeping

1. Traditional Construction Monitoring Requirements

This General Permit requires visual monitoring at all sites, and effluent water quality at all Risk Level 2 & 3 sites. It requires receiving water monitoring at some Risk Level 3 sites. All sites are required to submit annual reports, which contain various types of information, depending on the site characteristics and events. A summary of the monitoring and reporting requirements is found in Table 4.

Table 4 - Required Monitoring Elements for Risk Levels

	Visual	Non-visible Pollutant	Effluent	Receiving Water
Risk Level 1	three types required for all Risk Levels: non-storm water, pre-rain and post-rain	As needed for all Risk Levels (see below)	where applicable	not required
Risk Level 2			pH, turbidity	not required
Risk Level 3			pH, turbidity	(if Receiving Water Monitoring Trigger exceeded) pH, turbidity and SSC. Bioassessment for sites 30 acres or larger.

a. Visual

All dischargers are required to conduct quarterly, non-storm water visual inspections. For these inspections, the discharger must visually observe each drainage area for the presence of (or indications of prior) unauthorized and authorized non-storm water discharges and their sources. For storm-related inspections, dischargers must visually observe storm water discharges at all discharge locations within two business days after a qualifying event. For this requirement, a qualifying rain event is one producing precipitation of ½ inch or more of discharge. Dischargers must conduct a post-storm event inspection to (1) identify whether BMPs were adequately designed, implemented, and effective, and (2) identify any additional BMPs necessary and revise the SWPPP accordingly. Dischargers must maintain on-site records of all visual observations, personnel performing the observations, observation dates, weather conditions, locations observed, and corrective actions taken in response to the observations.

b. Non-Visible Pollutant Monitoring

This General Permit requires that all dischargers develop a sampling and analysis strategy for monitoring pollutants that are not visually detectable in storm water. Monitoring for non-visible pollutants must be required at any construction site when the exposure of construction materials occurs and where a discharge can cause or contribute to an exceedance of a water quality objective.

Of significant concern for construction discharges are the pollutants found in materials used in large quantities at construction sites throughout California and exposed throughout the rainy season, such as cement, flyash, and other recycled materials or by-products of combustion. The water quality standards that apply to these materials will depend on their composition. Some of the more common storm water pollutants from construction activity are not CTR pollutants. Examples of non-visible pollutants include glyphosate (herbicides), diazinon and chlorpyrifos (pesticides), nutrients (fertilizers), and molybdenum (lubricants). The use of diazinon and chlorpyrifos is a common practice among landscaping professionals and may trigger sampling and analysis requirements if these materials come into contact with storm water. High pH values from cement and gypsum, high pH and SSC from wash waters, and chemical/fecal contamination from portable toilets, also are not CTR pollutants. Although some of these constituents do have numeric water quality objectives in individual Basin Plans, many do not and are subject only to narrative water quality standards (i.e. not causing toxicity). Dischargers are encouraged to discuss these issues with Regional Water Board staff and other storm water quality professionals.

The most effective way to avoid the sampling and analysis requirements, and to ensure permit compliance, is to avoid the exposure of construction materials to precipitation and storm water runoff. Materials that are not exposed do not have the potential to enter storm water runoff, and therefore receiving waters sampling is not required. Preventing contact between storm water and construction materials is one of the most important BMPs at any construction site.

Preventing or eliminating the exposure of pollutants at construction sites is not always possible. Some materials, such as soil amendments, are designed to be used in a manner that will result in exposure to storm water. In these cases, it is important to make sure that these materials are applied according to the manufacturer's instructions and at a time when they are unlikely to be washed away. Other construction materials can be exposed when storage, waste disposal or the application of the material is done in a manner not protective of water quality. For these situations, sampling is required unless there is capture and containment of all storm water that has been exposed. In cases where construction materials may be exposed to storm water, but the storm water is contained and is not allowed to run off the site, sampling will only be required when inspections show that the containment failed or is breached, resulting in potential exposure or discharge to receiving waters.

The discharger must develop a list of potential pollutants based on a review of potential sources, which will include construction materials soil amendments, soil treatments, and historic contamination at the site. The discharger must review existing environmental and real estate documentation to determine the potential for pollutants that could be present on the construction site as a result of past land use activities.

Good sources of information on previously existing pollution and past land uses include:

i. Environmental Assessments;

ii. Initial Studies;

iii. Phase 1 Assessments prepared for property transfers; and

iv. Environmental Impact Reports or Environmental Impact Statements prepared under the requirements of the National Environmental Policy Act or the California Environmental Quality Act.

In some instances, the results of soil chemical analyses may be available and can provide additional information on potential contamination.

The potential pollutant list must include all non-visible pollutants that are known or should be known to occur on the construction site including, but not limited to, materials that:

i. are being used in construction activities;

ii. are stored on the construction site;

iii. were spilled during construction operations and not cleaned up;

iv. were stored (or used) in a manner that created the potential for a release of the materials during past land use activities;

v. were spilled during previous land use activities and not cleaned up; or

vi. were applied to the soil as part of past land use activities.

C. Effluent Monitoring

Federal regulations[11] require effluent monitoring for discharges subject to NALs. Subsequently, all Risk Level 2 and 3 dischargers must perform sampling and analysis of effluent discharges to characterize discharges associated with construction activity from the entire area disturbed by the project. Dischargers must collect samples of stored or contained storm water that is discharged subsequent to a storm event producing precipitation of ½ inch or more at the time of discharge.

Table 5 - Storm Water Effluent Monitoring Requirements by Risk Level

	Frequency	Effluent Monitoring (Section E, below)
Risk Level 1	when applicable	non-visible pollutant parameters (if applicable)
Risk Level 2	Minimum of 3 samples per day during qualifying rain event characterizing discharges associated with construction activity from the entire project disturbed area.	pH, turbidity, and non-visible pollutant parameters (if applicable)
Risk Level 3	Minimum of 3 samples per day during qualifying rain event characterizing discharges associated with construction activity from the entire project disturbed area.	pH, turbidity, and non-visible pollutant parameters if applicable

Risk Level 1 dischargers must analyze samples for:

i. any parameters indicating the presence of pollutants identified in the pollutant source assessment required in Attachment C contained in the General Permit.

[11] 40 C.F.R. § 122.44.

Risk Level 2 dischargers must analyze samples for:

i. pH and turbidity;

ii. any parameters indicating the presence of pollutants identified in the pollutant source assessment required in Attachment D contained in the General Permit, and

iii. any additional parameters for which monitoring is required by the Regional Water Board.

Risk Level 3 dischargers must analyze samples for:

i. pH, turbidity;

ii. any parameters indicating the presence of pollutants identified in the pollutant source assessment required in Attachment E contained in the General Permit, and

iii. any additional parameters for which monitoring is required by the Regional Water Board.

2. Linear Monitoring and Sampling Requirements

Attachment A, establishes minimum monitoring and reporting requirements for all LUPs. It establishes different monitoring requirements depending on project complexity and risk to water quality. The monitoring requirements for Type 1 LUPs are less than Type 2 & 3 projects because Type 1 projects have a lower potential to impact water quality.

A discharger shall prepare a monitoring program prior to the start of construction and immediately implement the program at the start of construction for LUPs. The monitoring program must be implemented at the appropriate level to protect water quality at all times throughout the life of the project.

a. Type 1 LUP Monitoring Requirements

A discharger must conduct daily visual inspections of Type 1 LUPs during working hours while construction activities are occurring. Inspections are to be conducted by qualified personnel and can be conducted in conjunction with other daily activities. Inspections will be conducted to ensure the BMPs are adequate, maintained, and in place at the end of the construction day. The discharger will revise the SWPPP, as appropriate, based on the results of the daily inspections. Inspections can be discontinued in non-active construction areas where soil disturbing activities have been completed and final stabilization has been achieved (e.g., trench has been paved, substructures have been installed, and successful final vegetative cover or other stabilization criteria have been met).

A discharger shall implement the monitoring program for inspecting Type 1 LUPs. This program requires temporary and permanent stabilization BMPs after active construction is completed. Inspection activities will continue until adequate permanent stabilization has been established and will continue in areas where re-vegetation is chosen until minimum vegetative coverage has been established. Photographs shall be taken during site inspections and submitted to the State Water Board.

b. Type 2 & 3 LUP Monitoring Requirements

A discharger must conduct daily visual inspections of Type 2 & 3 LUPs during working hours while construction activities are occurring. Inspections are to be conducted by qualified personnel and can be in conjunction with other daily activities.

All dischargers of Type 2 & 3 LUPs are required to conduct inspections by qualified personnel of the construction site during normal working hours prior to all anticipated storm events and after actual storm events. During extended storm events, the discharger shall conduct inspections during normal working hours for each 24-hour period. Inspections can be discontinued in non-active construction areas where soil disturbing activities have been completed and final stabilization has been achieved (e.g., trench has been paved, substructures installed, and successful vegetative cover or other stabilization criteria have been met).

The goals of these inspections are (1) to identify areas contributing to a storm water discharge; (2) to evaluate whether measures to reduce pollutant loadings identified in the SWPPP are adequate and properly installed and functioning in accordance with the terms of the General Permit; and (3) to determine whether additional control practices or corrective maintenance activities are needed. Equipment, materials, and workers must be available for rapid response to failures and emergencies. All corrective maintenance to BMPs shall be performed as soon as possible, depending upon worker safety.

All dischargers shall develop and implement a monitoring program for inspecting Type 2 & 3 LUPs that require temporary and permanent stabilization BMPs after active construction is completed. Inspections will be conducted to ensure the BMPs are adequate and maintained. Inspection activities will continue until adequate permanent stabilization has been established and will continue in areas where revegetation is chosen until minimum vegetative coverage has been established.

A log of inspections conducted before, during, and after the storm events must be maintained in the SWPPP. The log will provide the date and time of the inspection and who conducted the inspection. Photographs must be taken during site inspections and submitted to the State Water Board.

C. Sampling Requirements for all LUP Project Types

LUPs are also subject to sampling and analysis requirements for visible pollutants (i.e., sedimentation/siltation, turbidity) and for non-visible pollutants.

Sampling for visible pollutants is required for Type 2 & 3 LUPs.

Non-visible pollutant monitoring is required for pollutants associated with construction sites and activities that (1) are not visually detectable in storm water discharges, and (2) are known or should be known to occur on the construction site, and (3) could cause or contribute to an exceedance of water quality objectives in the receiving waters. Sample collection for non-visible pollutants must only be required (1) during a storm event when pollutants associated with construction activities may be discharged with storm water runoff due to a spill, or in the event there was a breach, malfunction, failure, and/or leak of any BMP, and (2) when the discharger has failed to adequately clean the area of material and pollutants. Failure to implement appropriate BMPs will trigger the same sampling requirements as those required for a breach, malfunction and/or leak, or when the discharger has failed to implement appropriate BMPs prior to the next storm event.

Additional monitoring parameters may be required by the Regional Water Boards.

It is not anticipated that many LUPs will be required to collect samples for pollutants not visually detected in runoff due to the nature and character of the construction site and activities as previously described in this fact sheet. Most LUPs are constructed in urban areas with public access (e.g., existing roadways, road shoulders, parking areas, etc.). This raises a concern regarding the potential contribution of pollutants from vehicle use and/or from normal activities of the public (e.g., vehicle washing, landscape fertilization, pest spraying, etc.) in runoff from the project site. Since the dischargers are not the land owners of the project area and are not able to control the presence of these pollutants in the storm water that runs through their projects, it is not the intent of this General Permit to require dischargers to sample for these pollutants. This General Permit does not require the discharger to sample for these types of pollutants except where the discharger has brought materials onsite that contain these pollutants and when a condition (e.g., breach, failure, etc.) described above occurs.

3. Receiving Water Monitoring

In order to ensure that receiving water limitations are met, discharges subject to receiving water monitoring triggers (i.e., Risk Level 3 and LUP Type 3 sites) or numeric effluent limitations (i.e., Risk Level 3 and LUP Type 3 sites utilizing ATS with direct discharges into receiving waters) must also monitor the downstream receiving water(s) for turbidity, SSC, and pH (if applicable) when a receiving water monitoring trigger or NEL is exceeded.

a. Bioassessment Monitoring

This General Permit requires a bioassessment of receiving waters for dischargers of Risk Level 3 or LUP Type 3 construction projects equal to or larger than 30 acres with direct discharges into receiving waters. Benthic macroinvertebrate samples will be taken upstream and downstream of the site's discharge point in the receiving water. Bioassessments measure the quality of the stream by analyzing the aquatic life present. Higher levels of appropriate aquatic species tend to indicate a healthy stream; whereas low levels of organisms can indicate stream degradation. Active construction sites have the potential to discharge large amounts of sediment and pollutants into receiving waters. Requiring a bioassessment for large project sites, with the most potential to impact water quality, provides a snapshot of the health of the receiving water prior to initiation of construction activities. This snapshot can be used in comparison to the health of the receiving water after construction has commenced.

Each ecoregion (biologically and geographically related area) in the State has a specific yearly peak time where stream biota is in a stable and abundant state. This time of year is called an Index Period. The bioassessment requirements in this General Permit, requires benthic macroinvertebrate sampling within a sites index period. The State Water Board has developed a map designating index periods for the ecoregions in the State (see State Water Board Website).

This General Permit requires the bioassessment methods to be in accordance with the Surface Water Ambient Monitoring Program (SWAMP) in order to provide data consistency within the state as well as generate useable biological stream data.

Table 6 - Receiving Water Monitoring Requirements

	Receiving Water Monitoring Parameters
Risk Level 1 /LUP Type 1	not required
Risk Level 2 / LUP Type 2	not required
Risk Level 3 / LUP Type 3	If Receiving Water Monitoring Trigger exceeded: pH (if applicable), turbidity, and SSC. Bioassessment for sites 30 acres or larger.

4. Reporting Requirements

a. NAL Exceedance Report

All Risk Level 3 and LUP Type 3 dischargers must electronically submit all storm event sampling results to the State And Regional Boards, via the electronic data system, no later than 10 days after the conclusion of the storm event.

b. Annual Report

All dischargers must prepare and electronically submit an annual report no later than September 1 of each year using the Storm water Multi-Application Reporting and Tracking System (SMARTS). The

Annual Report must include a summary and evaluation of all sampling and analysis results, original laboratory reports, chain of custody forms, a summary of all corrective actions taken during the compliance year, and identification of any compliance activities or corrective actions that were not implemented.

5. Record Keeping

According to 40 C.F.R. Parts 122.21(p) and 122.41(j), the discharger is required to retain paper or electronic copies of all records required by this General Permit for a period of at least three years from the date generated or the date submitted to the State Water Board or Regional Water Boards. A discharger must retain records for a period beyond three years as directed by Regional Water Board.

J. Risk Determination

1. Traditional Projects

a. Overall Risk Determination

There are two major requirements related to site planning and risk determination in this General Permit. The project's overall risk is broken up into two elements – (1) project sediment risk (the relative amount of sediment that can be discharged, given the project and location details) and (2) receiving water risk (the risk sediment discharges pose to the receiving waters).

Project Sediment Risk:
Project Sediment Risk is determined by multiplying the R, K, and LS factors from the Revised Universal Soil Loss Equation (RUSLE) to obtain an estimate of project-related bare ground soil loss expressed in tons/acre. The RUSLE equation is as follows:

A = (R)(K)(LS)(C)(P)

Where: A = the rate of sheet and rill erosion
R = rainfall-runoff erosivity factor
K = soil erodibility factor
LS = length-slope factor
C = cover factor (erosion controls)
P = management operations and support practices (sediment controls)

The C and P factors are given values of 1.0 to simulate bare ground conditions.

There is a map option and a manual calculation option for determining soil loss. For the map option, the R factor for the project is calculated using the online calculator at http://cfpub.epa.gov/npdes/stormwater/LEW/lewCalculator.cfm. The product of K and LS are shown on Figure 1. To determine soil loss in tons per acre, the discharger multiplies the R factor times the value for K times LS from the map.

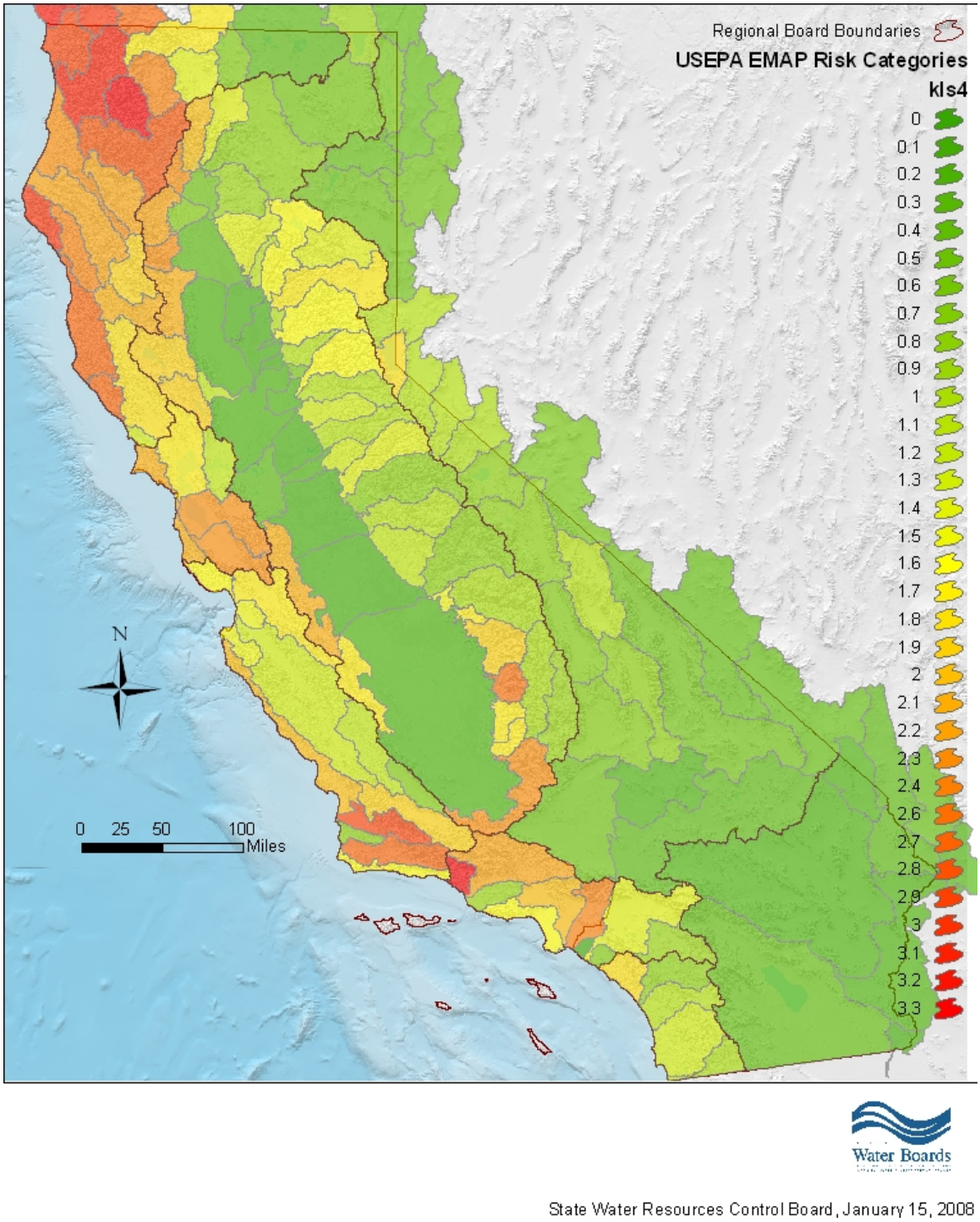

Figure 1 -Statewide Map of K * LS

For the manual calculation option, the R factor for the project is calculated using the online calculator at http://cfpub.epa.gov/npdes/stormwater/LEW/lewCalculator.cfm. The K and LS factors are determined using Appendix 1.

Soil loss of less than 15 tons/acre is considered **low** sediment risk.
Soil loss between 15 and 75 tons/acre is **medium** sediment risk.
Soil loss over 75 tons/acre is considered **high** sediment risk.

The soil loss values and risk categories were obtained from mean and standard deviation RKLS values from the USEPA EMAP program. High risk is the mean RKLS value plus two standard deviations. Low risk is the mean RKLS value minus two standard deviations.

Receiving Water Risk:
Receiving water risk is based on whether a project drains to a sediment-sensitive waterbody. A sediment-sensitive waterbody is either

on the most recent 303d list for waterbodies impaired for sediment;
has a USEPA-approved Total Maximum Daily Load implementation plan for sediment; **or**
has the beneficial uses of COLD, SPAWN, and MIGRATORY.

A project that meets at least one of the three criteria has a high receiving water risk. A list of sediment-sensitive waterbodies will be posted on the State Water Board's website. It is anticipated that an interactive map of sediment sensitive water bodies in California will be available in the future.

The Risk Levels have been altered by eliminating the possibility of a Risk Level 4, and expanding the constraints for Risk Levels 1, 2, and 3. Therefore, projects with high receiving water risk and high sediment risk will be considered a Risk Level 3 risk to water quality.

In response to public comments, the Risk Level requirements have also been changed such that Risk Level 1 projects will be subject to minimum BMP and visual monitoring requirements, Risk Level 2 projects will be subject to NALs and some additional monitoring requirements, and Risk Level 3 projects will be subject to NALs, and more rigorous monitoring requirements such as receiving water monitoring and in some cases bioassessment.

Table 7 - Combined Risk Level Matrix

Combined Risk Level Matrix				
Receiving Water Risk		Sediment Risk		
		Low	Medium	High
	Low	Level 1	Level 2	
	High	Level 2		Level 3

b. Effluent Standards

All dischargers are subject to the narrative effluent limitations specified in the General Permit. The narrative effluent limitations require storm water discharges associated with construction activity to meet all applicable provisions of Sections 301 and 402 of the CWA. These provisions require controls of pollutant discharges that utilize BAT and BCT to reduce pollutants and any more stringent controls necessary to meet water quality standards.

Risk Level 2 dischargers that pose a medium risk to water quality are subject to technology-based NALs for pH and turbidity. Risk Level 3 dischargers that pose a high risk to water quality are also subject to technology-based NALs for pH and turbidity.

c. Good Housekeeping

Proper handling and managing of construction materials can help minimize threats to water quality. The discharger must consider good housekeeping measures for: construction materials, waste management, vehicle storage & maintenance, landscape materials, and potential pollutant sources. Examples include; conducting an inventory of products used, implementing proper storage & containment, and properly cleaning all leaks from equipment and vehicles.

d. Non-Storm Water Management

Non-storm water discharges directly connected to receiving waters or the storm drain system have the potential to negatively impact water quality. The discharger must implement measures to control all non-storm water discharges during construction, and from dewatering activities associated with construction. Examples include; properly washing vehicles in contained areas, cleaning streets, and minimizing irrigation runoff.

e. Erosion Control

The best way to minimize the risk of creating erosion and sedimentation problems during construction is to disturb as little of the land surface as possible by fitting the development to the terrain. When development is tailored to the natural contours of the land, little grading is necessary and, consequently, erosion potential is lower.[14] Other effective erosion control measures include: preserving existing vegetation where feasible, limiting disturbance, and stabilizing and re-vegetating disturbed areas as soon as possible after grading or construction activities. Particular attention must be paid to large, mass-graded sites where the potential for soil exposure to the erosive effects of rainfall and wind is great and where there is potential for significant sediment discharge from the site to surface waters. Until permanent vegetation is established, soil cover is the most cost-effective and expeditious method to protect soil particles from detachment and transport by rainfall. Temporary soil stabilization can be the single most important factor in reducing erosion at construction sites. The discharger is required to consider measures such as: covering disturbed areas with mulch, temporary seeding, soil stabilizers, binders, fiber rolls or blankets, temporary vegetation, and permanent seeding. These erosion control measures are only examples of what should be considered and should not preclude new or innovative approaches currently available or being developed. Erosion control BMPs should be the primary means of preventing storm water contamination, and sediment control techniques should be used to capture any soil that becomes eroded.[12]

Risk Level 3 dischargers pose a higher risk to water quality and are therefore additionally required to ensure that post-construction soil loss is equivalent to or less than the pre-construction levels.

f. Sediment Control

Sediment control BMPs should be the secondary means of preventing storm water contamination. When erosion control techniques are ineffective, sediment control techniques should be used to capture any soil that becomes eroded. The discharger is required to consider perimeter control measures such as: installing silt fences or placing straw wattles below slopes. These sediment control measures are only

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[12] U.S. Environmental Protection Agency. 2007. Developing Your Storm Water Pollution Prevention Plan: A Guide for Construction Sites.

examples of what should be considered and should not preclude new or innovative approaches currently available or being developed.

Because Risk Level 2 and 3 dischargers pose a higher risk to water quality, additional requirements for the application of sediment controls are imposed on these projects. This General Permit also authorizes the Regional Water Boards to require Risk Level 3 dischargers to implement additional site-specific sediment control requirements if the implementation of other erosion or sediment controls are not adequately protecting the receiving waters.

g. Run-on and Runoff Control

Inappropriate management of run-on and runoff can result in excessive physical impacts to receiving waters from sediment and increased flows. The discharger is required to manage all run-on and runoff from a project site. Examples include: installing berms and other temporary run-on and runoff diversions.

Risk Level 1 dischargers with lower risks to impact water quality are not subject to the run-on and runoff control requirements unless an evaluation deems them necessary or visual inspections show that such controls are required.

h. Inspection, Maintenance and Repair

All measures must be periodically inspected, maintained and repaired to ensure that receiving water quality is protected. Frequent inspections coupled with thorough documentation and timely repair is necessary to ensure that all measures are functioning as intended.

i. Rain Event Action Plan (REAP)

A Rain Event Action Plan (REAP) is a written document, specific for each rain event. A REAP should be designed that when implemented it protects all exposed portions of the site within 48 hours of any likely precipitation event forecast of 50% or greater probability.

This General Permit requires Risk Level 2 and 3 dischargers to develop and implement a REAP designed to protect all exposed portions of their sites within 48 hours prior to any likely precipitation event. The REAP requirement is designed to ensure that the discharger has adequate materials, staff, and time to implement erosion and sediment control measures that are intended to reduce the amount of sediment and other pollutants generated from the active site. A REAP must be developed when there is likely a forecast of 50% or greater probability of precipitation in the project area. (The National Oceanic and Atmospheric Administration (NOAA) defines a chance of precipitation as a probability of precipitation of 30% to 50% chance of producing precipitation in the project area.[13] NOAA defines the probability of precipitation (PoP) as the likelihood of occurrence (expressed as a percent) of a measurable amount (0.01 inch or more) of liquid precipitation (or the water equivalent of frozen precipitation) during a specified period of time at any given point in the forecast area.) Forecasts are normally issued for 12-hour time periods. Descriptive terms for uncertainty and aerial coverage are used as follows:

Table 8 -National Oceanic and Atmospheric Administration (NOAA) Definition of Probability of Precipitation (PoP)

[13] http://www.crh.noaa.gov/lot/severe/wxterms.php.

PoP	Expressions of Uncertainty	Aerial Coverage
0%	none used	none used
10%	none used	isolated
20%	slight chance	isolated
30-50%	chance	scattered
60-70%	likely	numerous
80-100%	none used	none used

The discharger must obtain the precipitation forecast information from the National Weather Service Forecast Office (http://www.srh.noaa.gov/).

2. Linear Projects

a. Linear Risk Determination

LUPs vary in complexity and water quality concerns based on the type of project. This General Permit has varying application requirements based on the project's risk to water quality. Factors that lead to the characterization of the project include location, sediment risk, and receiving water risk.

Based on the location and complexity of a project area or project section area, LUPs are separated into project types. As described below, LUPs have been categorized into three project types.

i. *Type 1 LUPs*

Type 1 LUPs are those construction projects where:

(1) 70 percent or more of the construction activity occurs on a paved surface and where areas disturbed during construction will be returned to preconstruction conditions or equivalent protection established at the end of the construction activities for the day, or

(2) greater than 30 percent of construction activities occur within the non-paved shoulders or land immediately adjacent to paved surfaces, or where construction occurs on unpaved improved roads, including their shoulders or land immediately adjacent to them where:

Areas disturbed during construction will be returned to pre-construction conditions or equivalent protection established at the end of the construction activities for the day to minimize the potential for erosion and sediment deposition, and

Areas where established vegetation was disturbed during construction will be stabilized and re-vegetated by the end of project. When required, adequate temporary stabilization Best Management Practices (BMPs) will be installed and maintained until vegetation is established to meet minimum cover requirements established in this General Permit for final stabilization.

Type 1 LUPs typically do not have a high potential to impact storm water quality because (1) these construction activities are not typically conducted during a rain event, (2) these projects are normally constructed over a short period of time[14], minimizing the duration that pollutants could potentially be exposed to rainfall; and (3) disturbed soils such as those from trench excavation are required to be hauled away, backfilled into the trench, and/or covered (e.g., metal plates, pavement, plastic covers over spoil piles) at the end of the construction day.

Type 1 LUPs are determined during the risk assessment found in Attachment A.1 to be 1) low sediment risk and low receiving water risk; 2) low sediment risk and medium receiving water risk; and 3) medium sediment risk and low receiving water risk.

This General Permit requires the discharger to ensure a SWPPP is developed for these construction activities that is specific to project type, location and characteristics.

ii. ***Type 2 LUPs:***

Type 2 projects are determined to have a combination of High, Medium, and Low project sediment risk along with High, Medium, and Low receiving water risk. Like Type 1 projects, Type 2 projects are typically constructed over a short period of time. However, these projects have a higher potential to impact water quality because they:

(1) typically occur outside the more urban/developed areas;

(2) have larger areas of soil disturbance that are not closed or restored at the end of the day;

(3) may have onsite stockpiles of soil, spoil and other materials;

(4) cross or occur in close proximity to a wide variety of sensitive resources that may include, but are not limited to, steep topography and/or water bodies; and

(5) have larger areas of disturbed soils that may be exposed for a longer time interval before final stabilization, cleanup and/or reclamation occurs.

This General Permit requires the discharger to develop and implement a SWPPP for these construction activities that are specific for project type, location and characteristics.

iii. ***Type 3 LUPs:***

[14] Short period of time refers to a project duration of weeks to months, but typically less than one year in duration.

Type 3 projects are determined to have a combination of High and Medium project sediment risk along with High and Medium receiving water risk. Similar to Type 2 projects, Type 3 projects have a higher potential to impact water quality because they:

(1) typically occur outside of the more urban/developed areas;

(2) have larger areas of soil disturbance that are not closed or restored at the end of the day;

(3) may have onsite stockpiles of soil, spoil and other materials;

(4) cross or occur in close proximity to a wide variety of sensitive resources that may include, but are not limited to, steep topography and/or water bodies; and

(5) have larger areas of disturbed soils that may be exposed for a longer time interval before final stabilization, cleanup and/or reclamation occurs.

This General Permit requires the discharger to develop and implement a SWPPP for these construction activities that are specific for project type, location, and characteristics.

b. Linear Effluent Standards

All LUPs are subject to the narrative effluent limitations specified in the General Permit.

Type 2 and Type 3 projects are subject to technology-based NALs for pH and turbidity.

c. Linear Good Housekeeping

Improper use and handling of construction materials could potentially cause a threat to water quality. In order to ensure proper site management of these construction materials, all LUP dischargers must comply with a minimum set of Good Housekeeping measures specified in Attachment A of this General Permit.

d. Linear Non-Storm Water Management

In order to ensure control of all non-storm water discharges during construction, all LUP dischargers must comply with the Non-Storm Water Management measures specified in Attachment A of this General Permit.

e. Linear Erosion Control

This General Permit requires all LUP dischargers to implement effective wind erosion control measures, and soil cover for inactive areas. Type 3 LUPs posing a higher risk to water quality are additionally required to ensure the post-construction soil loss is equivalent to or less than the pre-construction levels.

f. Linear Sediment Control

In order to ensure control and containment of all sediment discharges, all LUP dischargers must comply with the general Sediment Control measures specified in Attachment A or this General Permit. Additional requirements for sediment controls are imposed on Type 2 & 3 LUPs due to their higher risk to water quality.

g. Linear Run-on and Runoff Control

Discharges originating outside of a project's perimeter and flowing onto the property can adversely affect the quantity and quality of discharges originating from a project site. In order to ensure proper management of run-on and runoff, all LUPs must comply with the run-on and runoff control measures specified in Attachment A of this General Permit. Due to the lower risk of impacting water quality, Type 1 LUPs are not required to implement run-on and runoff controls unless deemed necessary by the discharger.

h. Linear Inspection, Maintenance and Repair

Proper inspection, maintenance, and repair activities are important to ensure the effectiveness of on-site measures to control water quality. In order to ensure that inspection, maintenance, and repair activities are adequately performed, the all LUP dischargers a re required to comply with the Inspection, Maintenance, and Repair requirements specified in Attachment A of this General Permit.

K. ATS[15] Requirements

There are instances on construction sites where traditional erosion and sediment controls do not effectively control accelerated erosion. Under such circumstances, or under circumstances where storm water discharges leaving the site may cause or contribute to an exceedance of a water quality standard, the use of an Active Treatment System (ATS) may be necessary. Additionally, it may be appropriate to use an ATS when site constraints inhibit the ability to construct a correctly sized sediment basin, when clay and/or highly erosive soils are present, or when the site has very steep or long slope lengths.[16]

Although treatment systems have been in use in some form since the mid-1990s, the ATS industry in California is relatively young, and detailed regulatory standards have not yet been developed. Many developers are using these systems to treat storm water discharges from their construction sites. The new ATS requirements set forth in this General Permit are based on those in place for small wastewater treatment systems, ATS regulations from the Central Valley Regional Water Quality Control Board (September 2005 memorandum "2005/2006 Rainy Season – Monitoring Requirements for Storm Water Treatment Systems that Utilize Chemical Additives to Enhance Sedimentation"), the Construction Storm Water Program at the State of Washington's Department of Ecology, as well as recent advances in technology and knowledge of coagulant performance and aquatic safety.

The effective design of an ATS requires a detailed survey and analysis of site conditions. With proper planning, ATS performance can provide exceptional water quality discharge and prevent significant impacts to surface water quality, even under extreme environmental conditions.

These systems can be very effective in reducing the sediment in storm water runoff, but the systems that use additives/polymers to enhance sedimentation also pose a potential risk to water quality (e.g., operational failure, equipment failure, additive/polymer release, etc.). The State Water Board is concerned about the potential acute and chronic impacts that the polymers and other chemical additives may have on fish and aquatic organisms if released in sufficient quantities or concentrations. In addition

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[15] An ATS is a treatment system that employs chemical coagulation, chemical flocculation, or electrocoagulation in order to reduce turbidity caused by fine suspended sediment.
[16] Pitt, R., S. Clark, and D. Lake. 2006. Construction Site Erosion and Sediment Controls: Planning, Design, and Performance. DEStech Publications. Lancaster, PA. 370pp.

to anecdotal evidence of polymer releases causing aquatic toxicity in California, the literature supports this concern.[17] For example, cationic polymers have been shown to bind with the negatively charged gills of fish, resulting in mechanical suffocation.[18] Due to the potential toxicity impacts, which may be caused by the release of additives/polymers into receiving waters, this General Permit establishes residual polymer monitoring and toxicity testing requirements have been established in this General Permit for discharges from construction sites that utilize an ATS in order to protect receiving water quality and beneficial uses.

The primary treatment process in an ATS is coagulation/flocculation. ATS's operate on the principle that the added coagulant is bound to suspended sediment, forming floc, which is gravitationally settled in tanks or a basin, or removed by sand filters. A typical installation utilizes an injection pump upstream from the clarifier tank, basin, or sand filters, which is electronically metered to both flow rate and suspended solids level of the influent, assuring a constant dose. The coagulant mixes and reacts with the influent, forming a dense floc. The floc may be removed by gravitational setting in a clarifier tank or basin, or by filtration. Water from the clarifier tank, basin, or sand filters may be routed through cartridge(s) and/or bag filters for final polishing. Vendor-specific systems use various methods of dose control, sediment/floc removal, filtration, etc., that are detailed in project-specific documentation. The particular coagulant/flocculant to be used for a given project is determined based on the water chemistry of the site because the coagulants are specific in their reactions with various types of sediments. Appropriate selection of dosage must be carefully matched to the characteristics of each site.

ATS's are operated in two differing modes, either Batch or Flow-Through. Batch treatment can be defined as Pump-Treat-Hold-Test-Release. In Batch treatment, water is held in a basin or tank, and is not discharged until treatment is complete. Batch treatment involves holding or recirculating the treated water in a holding basin or tank(s) until treatment is complete or the basin or storage tank(s) is full. In Flow-Through treatment, water is pumped into the ATS directly from the runoff collection system or storm water holding pond, where it is treated and filtered as it flows through the system, and is then directly discharged. "Flow-Through Treatment" is also referred to as "Continuous Treatment."

1. Effluent Standards

This General Permit establishes NELs for discharges from construction sites that utilize an ATS. These systems lend themselves to NELs for turbidity and pH because of their known reliable treatment. Advanced systems have been in use in some form since the mid-1990s. An ATS is considered reliable, can consistently produce a discharge of less than 10 NTU, and has been used successfully at many sites in several states since 1995 to reduce turbidity to very low levels.[19]

This General Permit contains "compliance storm event" exceptions from the technology-based NELs for ATS discharges. The rationale is that technology-based requirements are developed assuming a certain design storm. In the case of ATS the industry-standard design storm is 10-year, 24-hour (as stated in

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[17] RomØen, K., B. Thu, and Ø. Evensen. 2002. Immersion delivery of plasmid DNA II. A study of the potentials of a chitosan based delivery system in rainbow trout (*Oncorhynchus mykiss*) fry. *Journal of Controlled Release* **85**: 215-225.

[18] Bullock, G., V. Blazer, S. Tsukuda, and S. Summerfelt. 2000. Toxicity of acidified chitosan for cultured rainbow trout (*Oncorhynchus mykiss*). *Aquaculture* **185**:273-280.

[19] Currier, B., G. Minton, R. Pitt, L. Roesner, K. Schiff, M. Stenstrom, E. Strassler, and E. Strecker. 2006. The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities.

Attachment F of this General Permit), so the compliance storm event has been established as the 10-year 24-hour event as well to provide consistency.

2. **Training**

Operator training is critical to the safe and efficient operation and maintenance of the ATS, and to ensure that all State Water Board monitoring and sampling requirements are met. The General Permit requires that all ATS operators have training specific to using ATS's liquid coagulants.

L. Post-Construction Requirements

Under past practices, new and redevelopment construction activities have resulted in modified natural watershed and stream processes. This is caused by altering the terrain, modifying the vegetation and soil characteristics, introducing impervious surfaces such as pavement and buildings, increasing drainage density through pipes and channels, and altering the condition of stream channels through straightening, deepening, and armoring. These changes result in a drainage system where sediment transport capacity is increased and sediment supply is decreased. A receiving channel's response is dependent on dominant channel materials and its stage of adjustment.

Construction activity can lead to impairment of beneficial uses in two main ways. First, during the actual construction process, storm water discharges can negatively affect the chemical, biological, and physical properties of downstream receiving waters. Due to the disturbance of the landscape, the most likely pollutant is sediment, however pH and other non-visible pollutants are also of great concern. Second, after most construction activities are completed at a construction site, the finished project may result in significant modification of the site's response to precipitation. New development and redevelopment projects have almost always resulted in permanent post-construction water quality impacts because more precipitation ends up as runoff and less precipitation is intercepted, evapotranspired, and infiltrated.

General Permit 99-08-DWQ required the SWPPP to include a description of all post-construction BMPs on a site and a maintenance schedule. An effective storm water management strategy must address the full suite of storm events (water quality, channel protection, overbank flood protection, extreme flood protection) (Figure 2).

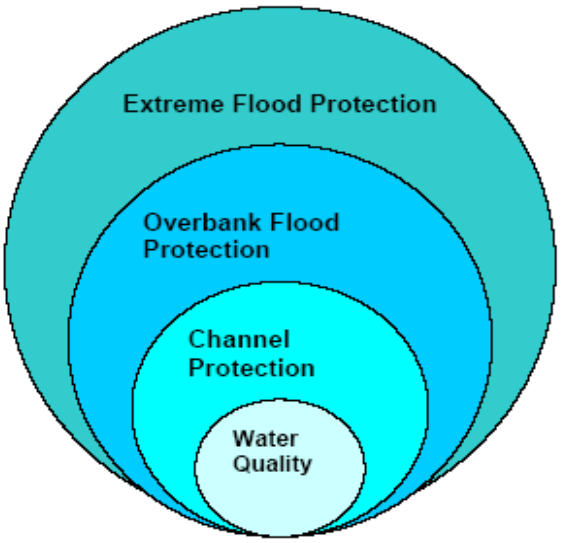

Figure 2 - Suite of Storm Events

The post-construction storm water performance standards in this General Permit specifically address water quality and channel protection events. Overbank flood protection and extreme flood protection events are traditionally dealt with in local drainage and flood protection ordinances. However, measures in this General Permit to address water quality and channel protection also reduce overbank and extreme flooding impacts. This General Permit aims to match post-construction runoff to pre-construction runoff for the 85th percentile storm event, which not only reduces the risk of impact to the receiving water's channel morphology but also provides some protection of water quality.

This General Permit clarifies that its runoff reduction requirements only apply to projects that lie outside of jurisdictions covered by a Standard Urban Storm water Management Plan (SUSMP) (or other more protective) post-construction requirements in either Phase I or Phase II permits.

Figures 3 and 4, below, show the General Permit enrollees (to Order 99-08-DWQ, as of March 10, 2008) overlaid upon a map with SUSMP (or more protective) areas in blue and purple. Areas without blue or purple indicate where the General Permit's runoff reduction requirements would actually apply.

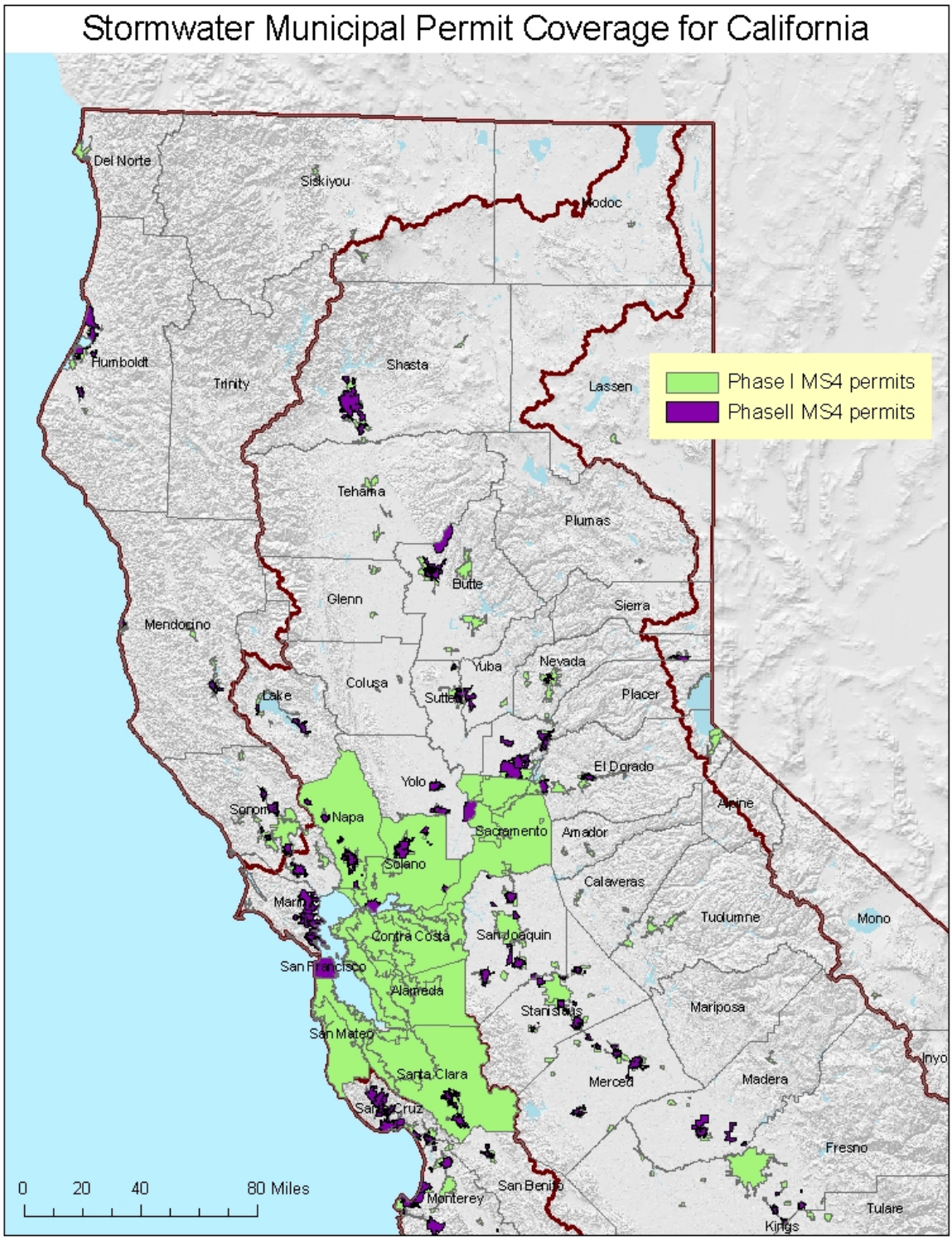

Figure 3 - Northern CA (2009) Counties / Cities With SUSMP-Plus Coverage

Figure 4 - Southern CA (2009) Counties / Cities With SUSMP-Plus Coverage

Water Quality:
This General Permit requires dischargers to replicate the pre-project runoff water balance (defined as the amount of rainfall that ends up as runoff) for the smallest storms up to the 85th percentile storm event, or the smallest storm event that generates runoff, whichever is larger. Contemporary storm water management generally routes these flows directly to the drainage system, increasing pollutant loads and potentially causing adverse effects on receiving waters. These smaller water quality events happen much more frequently than larger events and generate much higher pollutant loads on an annual basis. There are other adverse hydrological impacts that result from not designing according to the site's pre-construction water balance. In Maryland, Klein[20] noted that baseflow decreases as the extent of urbanization increases. Ferguson and Suckling[21] noted a similar relation in watersheds in Georgia. On Long Island, Spinello and Simmons[22] noted substantial decreases in base flow in intensely urbanized watersheds.

The permit emphasizes runoff reduction through on-site storm water reuse, interception, evapo-transpiration and infiltration through non-structural controls and conservation design measures (e.g., downspout disconnection, soil quality preservation/enhancement, interceptor trees). Employing these measures close to the source of runoff generation is the easiest and most cost-effective way to comply with the pre-construction water balance standard. Using low-tech runoff reduction techniques close to the source is consistent with a number of recommendations in the literature.[23] In many cases, BMPs implemented close to the source of runoff generation cost less than end-of the pipe measures.[24] Dischargers are given the option of using Appendix 2 to calculate the required runoff volume or a watershed process-based, continuous simulation model such as the EPA's Storm Water Management Model (SWMMM) or Hydrologic Simulation Program Fortran (HSPF). Such methods used by the discharger will be reviewed by the Regional Water Board upon NOT application.

Channel Protection:
In order to address channel protection, a basic understanding of fluvial geomorphic concepts is necessary. A dominant paradigm in fluvial geomorphology holds that streams adjust their channel dimensions (width and depth) in response to long-term changes in sediment supply and bankfull discharge (1.5 to 2 year recurrence interval). The bankfull stage corresponds to the discharge at which channel maintenance is the most effective, that is, the discharge at which the moving sediment, forming or removing bars, forming or changing bends and meanders, and generally doing work that results in the average morphologic characteristics of channels.[25] Lane (1955 as cited in Rosgen 1996[26]) showed the generalized relationship between sediment load, sediment size, stream discharge and stream slope in

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[20] Klein 1979 as cited in Delaware Department of Natural Resources (DDNR). 2004. Green Technology: The Delaware Urban Runoff Management Approach. Dover, DE. 117 pp.
[21] Ferguson and Suckling 1990 as cited Delaware Department of Natural Resources (DDNR). 2004. Green Technology: The Delaware Urban Runoff Management Approach. Dover, DE. 117 pp.
[22] Center for Watershed Protection (CWP). 2000. The Practice of Watershed Protection: Techniques for protecting our nation's streams, lakes, rivers, and estuaries. Ellicott City, MD. 741 pp.
[23] Bay Area Storm Water Management Agencies Association (BASMAA). 1997. Start at the Source: Residential Site Planning and Design Guidance Manual for Storm Water Quality Protection. Palo Alto, CA;
McCuen, R.H. 2003 Smart Growth: hydrologic perspective. Journal of Professional Issues in Engineering Education and Practice. Vol (129), pp.151-154;
Moglen, G.E. and S. Kim. 2007. Impervious imperviousness-are threshold based policies a good idea? Journal of the American Planning Association, Vol 73 No. 2. pp 161-171.
[24] Delaware Department of natural Resources (DDNR). 2004. Green technology: The Delaware urban Runoff Management Approcah. Dover, DE. 117 pp.
[25] Dunne, T and L.B. Leopold. 1978. Water in Environmental Planning. San Francisco W.H. Freeman and Company
[26] Rosgen. D.L. 1996. Applied River Morphology. Pagosa Springs. Wildland Hydrology

Figure 5. A change in any one of these variables sets up a series of mutual adjustments in the companion variables with a resulting direct change in the physical characteristics of the stream channel.

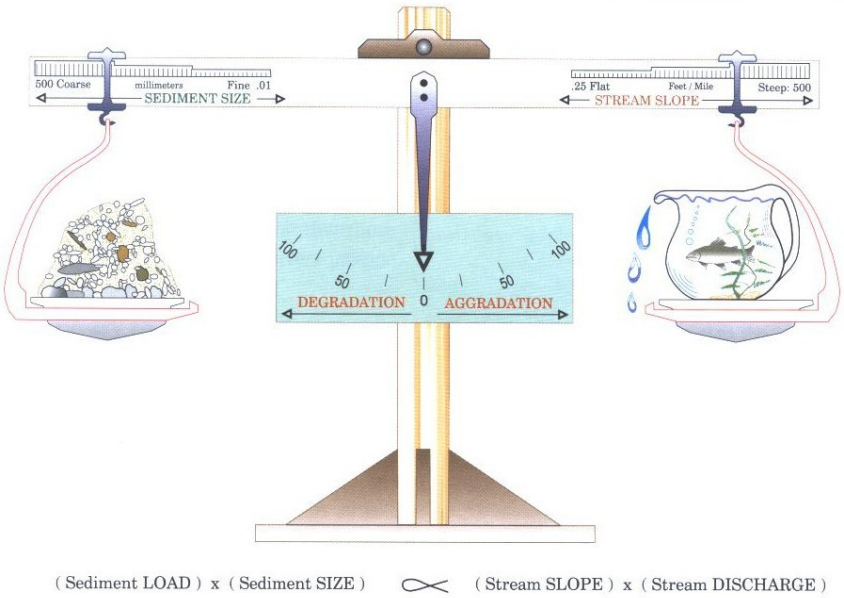

Figure 5 - Schematic of the Lane Relationship

After Lane (1955) as cited in Rosgen (1996)

Stream slope multiplied by stream discharge (the right side of the scale) is essentially an approximation of stream power, a unifying concept in fluvial geomorphology (Bledsoe 1999). Urbanization generally increases stream power and affects the resisting forces in a channel (sediment load and sediment size represented on the left side of the scale).

During construction, sediment loads can increase from 2 to 40,000 times over pre-construction levels.[27] Most of this sediment is delivered to stream channels during large, episodic rain events.[28] This increased sediment load leads to an initial aggradation phase where stream depths may decrease as sediment fills the channel, leading to a decrease in channel capacity and increase in flooding and overbank deposition. A degradation phase initiates after construction is completed.

Schumm et. al (1984) developed a channel evolution model that describes the series of adjustments from initial downcutting, to widening, to establishing new floodplains at lower elevations (Figure 6).

---

[27] Goldman S.J., K. Jackson, and T.A. Bursztynsky. 1986. Erosion and Sediment Control Handbook. McGraw Hill. San Francisco.

[28] Wolman 1967 as cited in Paul, M.P. and J.L. Meyer. 2001. Streams in the Urban Landscape. *Annu. Rev.Ecol. Syst.* 32: 333-365.

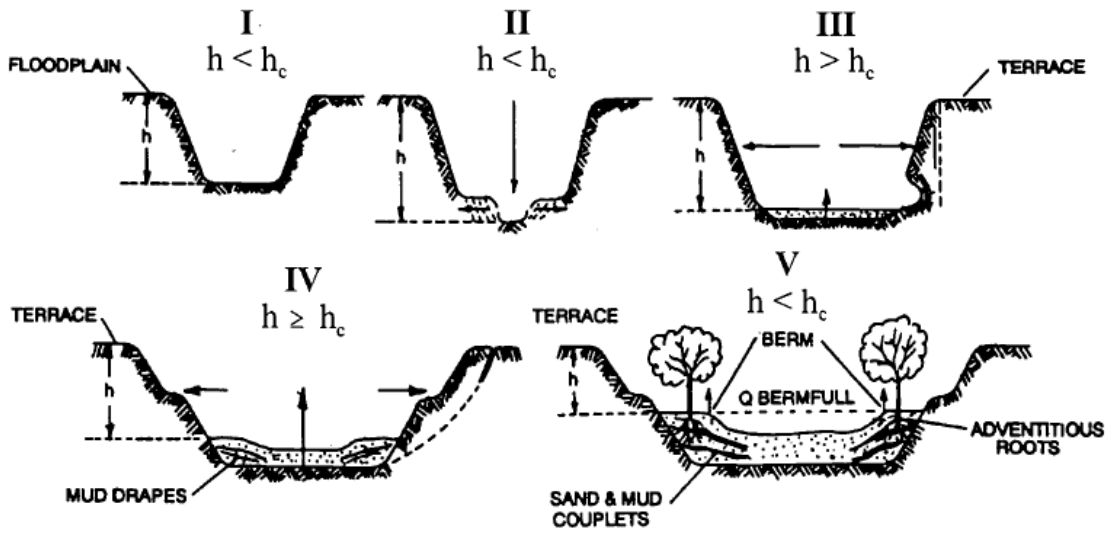

Figure 6 - Channel Changes Associated with Urbanization

After Incised Channel Evolution Sequence in Schumm et. al 1984

Channel incision (Stage II) and widening (Stages III and to a lesser degree, Stage IV) are due to a number of fundamental changes on the landscape. Connected impervious area and compaction of pervious surfaces increase the frequency and volume of bankfull discharges.[29] Increased drainage density (miles of stream length per square mile of watershed) also negatively impacts receiving stream channels.[30] Increased drainage density and hydraulic efficiency leads to an increase in the frequency and volume of bankfull discharges because the time of concentration is shortened. Flows from engineered pipes and channels are also often “sediment starved” and seek to replenish their sediment supply from the channel.

Encroachment of stream channels can also lead to an increase in stream slope, which leads to an increase in stream power. In addition, watershed sediment loads and sediment size (with size generally represented as the median bed and bank particle size, or d_{50}) decrease during urbanization.[31] This means

[29] Booth, D. B. and C. R. Jackson. 1997. Urbanization of Aquatic Systems: Degradation Thresholds, Storm Water Detection, and the Limits of Mitigation. Journal of the American Water Resources Association Vol. 33, No.5, pp. 1077-1089.

[30] May, C.W. 1998. Cumulative effects of urbanization on small streams in the Puget Sound Lowland ecoregion. Conference proceedings from Puget Sound Research '98 held March 12, 13 1998 in Seattle, WA;
Santa Clara Valley Urban Runoff Pollution Prevention Program. 2002. Hydromodification Management Plan Literature Review. 80 pp.

[31] Finkenbine, J.K., D.S. Atwater, and D.S. Mavinic. 2000. Stream health after urbanization. *J. Am. Water Resour. Assoc.* 36:1149-60;

that even if pre- and post-development stream power are the same, more erosion will occur in the post-development stage because the smaller particles are less resistant (provided they are non-cohesive).

As shown in Stages II and III, the channel deepens and widens to accommodate the increased stream power [32]and decrease in sediment load and sediment size. Channels may actually narrow as entrained sediment from incision is deposited laterally in the channel. After incised channels begin to migrate laterally (Stage III), bank erosion begins, which leads to general channel widening.[33] At this point, a majority of the sediment that leaves a drainage area comes from within the channel, as opposed to the background and construction related hillslope contribution. Stage IV is characterized by more aggradation and localized bank instability. Stage V represents a new quasi-equilibrium channel morphology in balance with the new flow and sediment supply regime. In other words, stream power is in balance with sediment load and sediment size.

The magnitude of the channel morphology changes discussed above varies along a stream network as well as with the age of development, slope, geology (sand-bedded channels may cycle through the evolution sequence in a matter of decades whereas clay-dominated channels may take much longer), watershed sediment load and size, type of urbanization, and land use history. It is also dependent on a channel's stage in the channel evolution sequence when urbanization occurs. Management strategies

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Pizzuto, J.E. W.S. Hession, and M. McBride. 2000. Comparing gravel-bed rivers in paired urban and rural catchments of southeastern Pennsylvania. *Geology* 28:79-82.

[32] Hammer 1973 as cited in Delaware Department of Natural Resources (DDNR). 2004. Green Technology: The Delaware Urban Runoff Management Approach. Dover, DE. 117 pp;
Booth, D.B. 1990. Stream Channel Incision Following Drainage Basin Urbanization. *Water Resour. Bull.* 26:407-417.

[33] Trimble, S.W. 1997. Contribution of Stream Channel Erosion to Sediment Yield from an Urbanizing Watershed. *Science*: Vol. 278 (21), pp. 1442-1444.

must take into account a channel's stage of adjustment and account for future changes in the evolution of channel form (Stein and Zaleski 2005).[34]

Traditional structural water quality BMPs (e.g. detention basins and other devices used to store volumes of runoff) unless they are highly engineered to provide adequate flow duration control, do not adequately protect receiving waters from accelerated channel bed and bank erosion, do not address post-development increases in runoff volume, and do not mitigate the decline in benthic macroinvertebrate communities in the receiving waters[35] suggest that structural BMPs are not as effective in protecting aquatic communities as a continuous riparian buffer of native vegetation. This is supported by the findings of Zucker and White[36], where instream biological metrics were correlated with the extent of forested buffers.

This General Permit requires dischargers to maintain pre-development drainage densities and times of concentration in order to protect channels and encourages dischargers to implement setbacks to reduce channel slope and velocity changes that can lead to aquatic habitat degradation.

There are a number of other approaches for modeling fluvial systems, including statistical and physical models and simpler stream power models.[37] The use of these models in California is described in Stein and Zaleski (2005).[38] Rather than prescribe a specific one-size-fits-all modeling method in this permit, the State Water Board intends to develop a stream power and channel evolution model-based framework to assess channels and develop a hierarchy of suitable analysis methods and management strategies. In time, this framework may become a State Water Board water quality control policy.

Permit Linkage to Overbank and Extreme Flood Protection
Site design BMPs (e.g. rooftop and impervious disconnection, vegetated swales, setbacks and buffers) filter and settle out pollutants and provide for more infiltration than is possible for traditional centralized structural BMPs placed at the lowest point in a site. They provide source control for runoff and lead to a reduction in pollutant loads. When implemented, they also help reduce the magnitude and volume of larger, less frequent storm events (e.g., 10-yr, 24-hour storm and larger), thereby reducing the need for expensive flood control infrastructure. Nonstructural BMPs can also be a landscape amenity, instead of a large isolated structure requiring substantial area for ancillary access, buffering, screening and maintenance facilities.[25] The multiple benefits of using non-structural benefits will be critically important as the state's population increases and imposes strains upon our existing water resources.

Maintaining predevelopment drainage densities and times of concentration will help reduce post-development peak flows and volumes in areas not covered under a municipal permit. The most effective way to preserve drainage areas and maximize time of concentration is to implement landform grading,

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[34] Stein, E.S. and S. Zaleski. 2005.Managing runoff to protect natural stream: the latest developments on investigation and management of hydromodification in California. Southern California Coastal Water Research Project Technical Report 475. 26 pp.
[35] Horner, R.R. 2006. Investigation of the Feasibility and Benefits of Low-Impact Site Design Practices (LID) for the San Diego Region. Available at: http://www.projectcleanwater.org/pdf/permit/case-study_lid.pdf.
[36] Delaware Department of Natural Resources (DDNR). 2004. Green Technology: The Delaware Urban Runoff Management Approach. Dover, DE. 117 pp.
[37] Finlayson, D.P. and D.R. Montgomery. 2003. Modeling large-scale fluvial erosion in geographic information systems. Geomorphology (53), pp. 147-164).
[38] Stein, E.S. and S. Zaleski. 2005.Managing runoff to protect natural stream: the latest developments on investigation and management of hydromodification in California. Southern California Coastal Water Research Project Technical Report 475. 26 pp.

incorporate site design BMPs and implement distributed structural BMPs (e.g., bioretention cells, rain gardens, rain cisterns).

M. Storm Water Pollution Prevention Plans

USEPA's Construction General Permit requires that qualified personnel conduct inspections. USEPA defines qualified personnel as "a person knowledgeable in the principles and practice of erosion and sediment controls who possesses the skills to assess conditions at the construction site that could impact storm water quality and to assess the effectiveness of any sediment and erosion control measures selected to control the quality of storm water discharges from the construction activity."[39] USEPA also suggests that qualified personnel prepare SWPPPs and points to numerous states that require certified professionals to be on construction sites at all times. States that currently have certification programs are Washington, Georgia, Florida, Delaware, Maryland, and New Jersey. The Permit 99-08-DWQ did not require that qualified personnel prepare SWPPPs or conduct inspections. However, to ensure that water quality is being protected, this General Permit requires that all SWPPPs be written, amended, and certified by a Qualified SWPPP Developer. A Qualified SWPPP Developer must possess one of the eight certifications and or registrations specified in this General Permit and effective two years after the adoption date of this General Permit, must have attended a State Water Board-sponsored or approved Qualified SWPPP Developer training course. Table 9 provides an overview of the criteria used in determining qualified certification titles for a QSD and QSP.

39 US Environmental Protection Agency. Stormwater Pollution Prevention Plans for Construction Activities. <http://cfpub.epa.gov/npdes/stormwater/swppp.cfm> and <http://www.epa.gov/npdes/pubs/sw_swppp_guide.pdf>.

Table 9 - Qualified SWPPP Developer/ Qualified SWPPP Practitioner Certification Criteria

Certification/ Title	Registered By	QSD/QSP	Certification Criteria
Professional Civil Engineer	California	Both	1. Approval Process 2. Code of Ethics 3. Accountability 4. Pre-requisites
Professional Geologist or Engineering Geologist	California	Both	1. Approval Process 2. Code of Ethics 3. Accountability 4. Pre-requisites
Landscape Architect	California	Both	1. Approval Process 2. Code of Ethics 3. Accountability 4. Pre-requisites
Professional Hydrologist	American Institute of Hydrology	Both	1. Approval Process 2. Code of Ethics 3. Accountability 4. Pre-requisites
Certified Professional in Erosion and Sediment Control™ (CPESC)	Enviro Cert International Inc.	Both	1. Approval Process 2. Code of Ethics 3. Accountability 4. Pre-requisites 5. Continuing Education
Certified Inspector of Sediment and Erosion Control™ (CISEC)	Certified Inspector of Sediment and Erosion Control, Inc.	QSP	1. Approval Process 2. Code of Ethics 3. Accountability 4. Pre-requisites 5. Continuing Education
Certified Erosion, Sediment and Storm Water Inspector™ (CESSWI)	Enviro Cert International Inc.	QSP	1. Approval Process 2. Code of Ethics 3. Accountability 4. Pre-requisites 5. Continuing Education
Certified Professional in Storm Water Quality™ (CPSWQ)	Enviro Cert International Inc.	Both	1. Approval Process 2. Code of Ethics 3. Accountability 4. Pre-requisites 5. Continuing Education

The previous versions of the General Permit required development and implementation of a SWPPP as the primary compliance mechanism. The SWPPP has two major objectives: (1) to help identify the sources of sediment and other pollutants that affect the quality of storm water discharges; and (2) to describe and ensure the implementation of BMPs to reduce or eliminate sediment and other pollutants in storm water and non-storm water discharges. The SWPPP must include BMPs that address source control, BMPs that address pollutant control, and BMPs that address treatment control.

This General Permit shifts some of the measures that were covered by this general requirement to specific permit requirements, each individually enforceable as a permit term. This General Permit emphasizes the use of appropriately selected, correctly installed and maintained pollution reduction BMPs. This approach provides the flexibility necessary to establish BMPs that can effectively address source control of pollutants during changing construction activities. These specific requirements also improve both the clarity and the enforceability of the General Permit so that the dischargers understand, and the public can determine whether the discharges are in compliance with, permit requirements.

The SWPPP must be implemented at the appropriate level to protect water quality at all times throughout the life of the project. The SWPPP must remain on the site during construction activities, commencing with the initial mobilization and ending with the termination of coverage under the General Permit. For LUPs the discharger shall make the SWPPP available at the construction site during working hours while construction is occurring and shall be made available upon request by a State or Municipal inspector. When the original SWPPP is retained by a crewmember in a construction vehicle and is not currently at the construction site, current copies of the BMPs and map/drawing will be left with the field crew and the original SWPPP shall be made available via a request by radio or telephone. Once construction activities are complete, until stabilization is achieved, the SWPPP shall be available from the SWPPP contact listed in the PRDs

A SWPPP must be appropriate for the type and complexity of a project and will be developed and implemented to address project specific conditions. Some projects may have similarities or complexities, yet each project is unique in its progressive state that requires specific description and selection of BMPs needed to address all possible generated pollutants

N. Regional Water Board Authorities

Because this General Permit will be issued to thousands of construction sites across the State, the Regional Water Boards retain discretionary authority over certain issues that may arise from the discharges in their respective regions. This General Permit does not grant the Regional Water Boards any authority they do not otherwise have; rather, it merely emphasizes that the Regional Water Boards can take specific actions related to this General Permit. For example, the Regional Water Boards will be enforcing this General Permit and may need to adjust some requirements for a discharger based on the discharger's compliance history.

046746

Linda S. Adams
Secretary for Environmental Protection

State Water Resources Control Board

Division of Water Quality
1001 I Street • Sacramento, California 95814 • (916) 341-5455
Mailing Address: P.O. Box 100 • Sacramento, California • 95812-0100
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Arnold Schwarzenegger
Governor

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
GENERAL PERMIT FOR
STORM WATER DISCHARGES
ASSOCIATED WITH CONSTRUCTION AND LAND DISTURBANCE
ACTIVITIES

ORDER NO. 2009-0009-DWQ
NPDES NO**. CAS000002**

This Order was adopted by the State Water Resources Control Board on:	**September 2, 2009**
This Order shall become effective on:	**July 1, 2010**
This Order shall expire on:	**September 2, 2014**

IT IS HEREBY ORDERED, that this Order supersedes Order No. 99-08-DWQ [as amended by Order No. 2010-0014-DWQ] except for enforcement purposes. The Discharger shall comply with the requirements in this Order to meet the provisions contained in Division 7 of the California Water Code (commencing with section 13000) and regulations adopted thereunder, and the provisions of the federal Clean Water Act and regulations and guidelines adopted thereunder.

I, Jeanine Townsend, Clerk to the Board, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the State Water Resources Control Board, on September 2, 2009.

AYE: Vice Chair Frances Spivy-Weber
Board Member Arthur G. Baggett, Jr.
Board Member Tam M. Doduc

NAY: Chairman Charles R. Hoppin

ABSENT: None

ABSTAIN: None

Jeanine Townsend

Jeanine Townsend
Clerk to the Board

046747

State Water Resources Control Board

Linda S. Adams
Secretary for Environmental Protection

Division of Water Quality
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Arnold Schwarzenegger
Governor

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) GENERAL PERMIT FOR STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION AND LAND DISTURBANCE ACTIVITIES

ORDER NO. 2010-0014-DWQ
NPDES NO. CAS000002

Order No. 2009-0009-DWQ was adopted by the State Water Resources Control Board on:	**September 2, 2009**
Order No. 2009-0009-DWQ became effective on:	**July 1, 2010**
Order No. 2009-0009-DWQ shall expire on:	**September 2, 2014**
This Order, which amends Order No. 2009-0009-DWQ, was adopted by the State Water Resources Control Board on:	**November 16, 2010**
This Order shall become effective on:	**February 14, 2011**

IT IS HEREBY ORDERED that this Order amends Order No. 2009-0009-DWQ. Additions to Order No. 2009-0009-DWQ are reflected in blue-underline text and deletions are reflected in red-strikeout text.

IT IS FURTHER ORDERED that staff are directed to prepare and post a conformed copy of Order No. 2009-0009-DWQ incorporating the revisions made by this Order.

I, Jeanine Townsend, Clerk to the Board, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the State Water Resources Control Board, on **November 16, 2010.**

AYE: Chairman Charles R. Hoppin
Vice Chair Frances Spivy-Weber
Board Member Arthur G. Baggett, Jr.
Board Member Tam M. Doduc

NAY: None

ABSENT: None

ABSTAIN: None

Jeanine Townsend

Jeanine Townsend
Clerk to the Board

046748

CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

State Water Resources Control Board

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
GENERAL PERMIT FOR
STORM WATER DISCHARGES
ASSOCIATED WITH CONSTRUCTION AND LAND DISTURBANCE ACTIVITIES

ORDER NO. 2012-0006-DWQ
NPDES NO**. CAS000002**

Order No. 2009-0009-DWQ was adopted by the State Water Resources Control Board on:	**September 2, 2009**
Order No. 2009-0009-DWQ became effective on:	**July 1, 2010**
Order No. 2010-0014-DWQ became effective on:	**February 14, 2011**
Order No. 2009-0009-DWQ as amended by 2010-0014-DWQ shall expire on:	**September 2, 2014**
This Order, which amends Order No. 2009-0009-DWQ as amended by 2010-0014-DWQ, was adopted by the State Water Resources Control Board on:	**July 17, 2012**
This Order No. 2012-0006-DWQ shall become effective on:	**July 17, 2012**

IT IS HEREBY ORDERED that this Order amends Order No. 2009-0009-DWQ. Additions to Order No. 2009-0009-DWQ are reflected in blue-underline text and deletions are reflected in red-strikeout text.

IT IS FURTHER ORDERED that staff are directed to prepare and post a conformed copy of Order No. 2009-000-DWQ incorporating the revisions made by this Order.

I, Jeanine Townsend, Clerk to the Board, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the State Water Resources Control Board, on July 17, 2012.

AYE: Chairman Charles R. Hoppin
Vice Chair Frances Spivy-Weber
Board Member Tam M. Doduc
Board Member Steven Moore
Board Member Felicia Marcus

NAY: None

ABSENT: None

ABSTAIN: None

Jeanine Townsend

Jeanine Townsend
Clerk to the Board

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STATE WATER RESOURCES CONTROL BOARD
ORDER NO. 2009-0009-DWQ
[AS AMENDED BY ORDER NO. 2010-0014-DWQ]
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
GENERAL PERMIT NO. CAS000002

WASTE DISCHARGE REQUIREMENTS
FOR
DISCHARGES OF STORM WATER RUNOFF ASSOCIATED WITH
CONSTRUCTION AND LAND DISTURBANCE ACTIVITIES

I. FINDINGS

A. General Findings

The State Water Resources Control Board (State Water Board) finds that:

1. The federal Clean Water Act (CWA) prohibits certain discharges of storm water containing pollutants except in compliance with a National Pollutant Discharge Elimination System (NPDES) permit (Title 33 United States Code (U.S.C.) §§ 1311 and 1342(p); also referred to as Clean Water Act (CWA) §§ 301 and 402(p)). The U.S. Environmental Protection Agency (U.S. EPA) promulgates federal regulations to implement the CWA's mandate to control pollutants in storm water runoff discharges. (Title 40 Code of Federal Regulations (C.F.R.) Parts 122, 123, and 124). The federal statutes and regulations require discharges to surface waters comprised of storm water associated with construction activity, including demolition, clearing, grading, and excavation, and other land disturbance activities (except operations that result in disturbance of less than one acre of total land area and which are not part of a larger common plan of development or sale), to obtain coverage under an NPDES permit. The NPDES permit must require implementation of Best Available Technology Economically Achievable (BAT) and Best Conventional Pollutant Control Technology (BCT) to reduce or eliminate pollutants in storm water runoff. The NPDES permit must also include additional requirements necessary to implement applicable water quality standards.

2. This General Permit authorizes discharges of storm water associated with construction activity so long as the dischargers comply with all requirements, provisions, limitations and prohibitions in the permit. In addition, this General Permit regulates the discharges of storm water associated with construction activities from all Linear

Underground/Overhead Projects resulting in the disturbance of greater than or equal to one acre (Attachment A).

3. This General Permit regulates discharges of pollutants in storm water associated with construction activity (storm water discharges) to waters of the United States from construction sites that disturb one or more acres of land surface, or that are part of a common plan of development or sale that disturbs more than one acre of land surface.

4. This General Permit does not preempt or supersede the authority of local storm water management agencies to prohibit, restrict, or control storm water discharges to municipal separate storm sewer systems or other watercourses within their jurisdictions.

5. This action to adopt a general NPDES permit is exempt from the provisions of Chapter 3 of the California Environmental Quality Act (CEQA) (Public Resources Code Section 21100, et seq.), pursuant to Section 13389 of the California Water Code.

6. Pursuant to 40 C.F.R. § 131.12 and State Water Board Resolution No. 68-16,[1] which incorporates the requirements of § 131.12 where applicable, the State Water Board finds that discharges in compliance with this General Permit will not result in the lowering of water quality standards, and are therefore consistent with those provisions. Compliance with this General Permit will result in improvements in water quality.

7. This General Permit serves as an NPDES permit in compliance with CWA § 402 and will take effect on July 1, 2010 by the State Water Board provided the Regional Administrator of the U.S. EPA has no objection. If the U.S. EPA Regional Administrator objects to its issuance, the General Permit will not become effective until such objection is withdrawn.

8. Following adoption and upon the effective date of this General Permit, the Regional Water Quality Control Boards (Regional Water Boards) shall enforce the provisions herein.

9. Regional Water Boards establish water quality standards in Basin Plans. The State Water Board establishes water quality standards in various statewide plans, including the California Ocean Plan. U.S. EPA establishes water quality standards in the National Toxic Rule (NTR) and the California Toxic Rule (CTR).

[1] Resolution No. 68-16 generally requires that existing water quality be maintained unless degradation is justified based on specific findings.

10. This General Permit does not authorize discharges of fill or dredged material regulated by the U.S. Army Corps of Engineers under CWA § 404 and does not constitute a waiver of water quality certification under CWA § 401.

11. The primary storm water pollutant at construction sites is excess sediment. Excess sediment can cloud the water, which reduces the amount of sunlight reaching aquatic plants, clog fish gills, smother aquatic habitat and spawning areas, and impede navigation in our waterways. Sediment also transports other pollutants such as nutrients, metals, and oils and greases.

12. Construction activities can impact a construction site's runoff sediment supply and transport characteristics. These modifications, which can occur both during and after the construction phase, are a significant cause of degradation of the beneficial uses established for water bodies in California. Dischargers can avoid these effects through better construction site design and activity practices.

13. This General Permit recognizes four distinct phases of construction activities. The phases are Grading and Land Development Phase, Streets and Utilities Phase, Vertical Construction Phase, and Final Landscaping and Site Stabilization Phase. Each phase has activities that can result in different water quality effects from different water quality pollutants. This General Permit also recognizes inactive construction as a category of construction site type.

14. Compliance with any specific limits or requirements contained in this General Permit does not constitute compliance with any other applicable requirements.

15. Following public notice in accordance with State and Federal laws and regulations, the State Water Board heard and considered all comments and testimony in a public hearing on 06/03/2009. The State Water Board has prepared written responses to all significant comments.

16. Construction activities obtaining coverage under the General Permit may have multiple discharges subject to requirements that are specific to general, linear, and/or active treatment system discharge types.

17. The State Water Board may reopen the permit if the U.S. EPA adopts a final effluent limitation guideline for construction activities.

B. Activities Covered Under the General Permit

18. Any construction or demolition activity, including, but not limited to, clearing, grading, grubbing, or excavation, or any other activity that results in a land disturbance of equal to or greater than one acre.

19. Construction activity that results in land surface disturbances of less than one acre if the construction activity is part of a larger common plan of development or the sale of one or more acres of disturbed land surface.

20. Construction activity related to residential, commercial, or industrial development on lands currently used for agriculture including, but not limited to, the construction of buildings related to agriculture that are considered industrial pursuant to U.S. EPA regulations, such as dairy barns or food processing facilities.

21. Construction activity associated with Linear Underground/Overhead Utility Projects (LUPs) including, but not limited to, those activities necessary for the installation of underground and overhead linear facilities (e.g., conduits, substructures, pipelines, towers, poles, cables, wires, connectors, switching, regulating and transforming equipment and associated ancillary facilities) and include, but are not limited to, underground utility mark-out, potholing, concrete and asphalt cutting and removal, trenching, excavation, boring and drilling, access road and pole/tower pad and cable/wire pull station, substation construction, substructure installation, construction of tower footings and/or foundations, pole and tower installations, pipeline installations, welding, concrete and/or pavement repair or replacement, and stockpile/borrow locations.

22. Discharges of sediment from construction activities associated with oil and gas exploration, production, processing, or treatment operations or transmission facilities.[2]

23. Storm water discharges from dredge spoil placement that occur outside of U.S. Army Corps of Engineers jurisdiction (upland sites) and that disturb one or more acres of land surface from construction activity are covered by this General Permit. Construction sites that intend to disturb one or more acres of land within the jurisdictional boundaries of

[2] Pursuant to the Ninth Circuit Court of Appeals' decision in *NRDC v. EPA* (9th Cir. 2008) 526 F.3d 591, and subsequent denial of the U.S. EPA's petition for reconsideration in November 2008, oil and gas construction activities discharging storm water contaminated only with sediment are no longer exempt from the NPDES program.

a CWA § 404 permit should contact the appropriate Regional Water Board to determine whether this permit applies to the site.

C. Activities Not Covered Under the General Permit

24. Routine maintenance to maintain original line and grade, hydraulic capacity, or original purpose of the facility.

25. Disturbances to land surfaces solely related to agricultural operations such as disking, harrowing, terracing and leveling, and soil preparation.

26. Discharges of storm water from areas on tribal lands; construction on tribal lands is regulated by a federal permit.

27. Construction activity and land disturbance involving discharges of storm water within the Lake Tahoe Hydrologic Unit. The Lahontan Regional Water Board has adopted its own permit to regulate storm water discharges from construction activity in the Lake Tahoe Hydrologic Unit (Regional Water Board 6SLT). Owners of construction sites in this watershed must apply for the Lahontan Regional Water Board permit rather than the statewide Construction General Permit.

28. Construction activity that disturbs less than one acre of land surface, and that is not part of a larger common plan of development or the sale of one or more acres of disturbed land surface.

29. Construction activity covered by an individual NPDES Permit for storm water discharges.

30. Discharges from small (1 to 5 acre) construction activities with an approved Rainfall Erosivity Waiver authorized by U.S. EPA Phase II regulations certifying to the State Board that small construction activity will occur only when the Rainfall Erosivity Factor is less than 5 (“R” in the Revised Universal Soil Loss Equation).

31. Landfill construction activity that is subject to the Industrial General Permit.

32. Construction activity that discharges to Combined Sewer Systems.

33. Conveyances that discharge storm water runoff combined with municipal sewage.

34. Discharges of storm water identified in CWA § 402(*l*)(2), 33 U.S.C. § 1342(*l*)(2).

35. Discharges occurring in basins that are not tributary or hydrologically connected to waters of the United States (for more information contact your Regional Water Board).

D. Obtaining and Modifying General Permit Coverage

36. This General Permit requires all dischargers to electronically file all Permit Registration Documents (PRDs), Notices of Termination (NOT), changes of information, annual reporting, and other compliance documents required by this General Permit through the State Water Board's Storm water Multi-Application and Report Tracking System (SMARTS) website.

37. Any information provided to the Regional Water Board shall comply with the Homeland Security Act and any other federal law that concerns security in the United States; any information that does not comply should not be submitted.

38. This General Permit grants an exception from the Risk Determination requirements for existing sites covered under Water Quality Orders No. 99-08-DWQ, and No. 2003-0007-DWQ. For certain sites, adding additional requirements may not be cost effective. Construction sites covered under Water Quality Order No. 99-08-DWQ shall obtain permit coverage at the Risk Level 1. LUPs covered under Water Quality Order No. 2003-0007-DWQ shall obtain permit coverage as a Type 1 LUP. The Regional Water Boards have the authority to require Risk Determination to be performed on sites currently covered under Water Quality Orders No. 99-08-DWQ and No. 2003-0007-DWQ where they deem it necessary. The State Water Board finds that there are two circumstances when it may be appropriate for the Regional Water Boards to require a discharger that had filed an NOI under State Water Board Order No. 99-08-DWQ to recalculate the site's risk level. These circumstances are: (1) when the discharger has a demonstrated history of noncompliance with State Water Board Order No. 99-08-DWQ or; (2) when the discharger's site poses a significant risk of causing or contributing to an exceedance of a water quality standard without the implementation of the additional Risk Level 2 or 3 requirements.

E. Prohibitions

39. All discharges are prohibited except for the storm water and non-storm water discharges specifically authorized by this General Permit or another NPDES permit. Non-storm water discharges include a wide variety of sources, including improper dumping, spills, or leakage from storage tanks or transfer areas. Non-storm water discharges may

contribute significant pollutant loads to receiving waters. Measures to control spills, leakage, and dumping, and to prevent illicit connections during construction must be addressed through structural as well as non-structural Best Management Practices (BMPs)[3]. The State Water Board recognizes, however, that certain non-storm water discharges may be necessary for the completion of construction.

40. This General Permit prohibits all discharges which contain a hazardous substance in excess of reportable quantities established in 40 C.F.R. §§ 117.3 and 302.4, unless a separate NPDES Permit has been issued to regulate those discharges.

41. This General Permit incorporates discharge prohibitions contained in water quality control plans, as implemented by the State Water Board and the nine Regional Water Boards.

42. Pursuant to the Ocean Plan, discharges to Areas of Special Biological Significance (ASBS) are prohibited unless covered by an exception that the State Water Board has approved.

43. This General Permit prohibits the discharge of any debris[4] from construction sites. Plastic and other trash materials can cause negative impacts to receiving water beneficial uses. The State Water Board encourages the use of more environmentally safe, biodegradable materials on construction sites to minimize the potential risk to water quality.

F. Training

44. In order to improve compliance with and to maintain consistent enforcement of this General Permit, all dischargers are required to appoint two positions - the Qualified SWPPP Developer (QSD) and the Qualified SWPPP Practitioner (QSP) - who must obtain appropriate training. Together with the key stakeholders, the State and Regional Water Boards are leading the development of this curriculum through a collaborative organization called The Construction General Permit (CGP) Training Team.

45. The Professional Engineers Act (Bus. & Prof. Code section 6700, et seq.) requires that all engineering work must be performed by a California licensed engineer.

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[3] BMPs are scheduling of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the discharge of pollutants to waters of the United States. BMPs also include treatment requirements, operating procedures, and practice to control site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

[4] Litter, rubble, discarded refuse, and remains of destroyed inorganic anthropogenic waste.

G. Determining and Reducing Risk

46. The risk of accelerated erosion and sedimentation from wind and water depends on a number of factors, including proximity to receiving water bodies, climate, topography, and soil type.

47. This General Permit requires dischargers to assess the risk level of a site based on both sediment transport and receiving water risk. This General Permit contains requirements for Risk Levels 1, 2 and 3, and LUP Risk Type 1, 2, and 3 (Attachment A). Risk levels are established by determining two factors: first, calculating the site's sediment risk; and second, receiving water risk during periods of soil exposure (i.e. grading and site stabilization). Both factors are used to determine the site-specific Risk Level(s). LUPs can be determined to be Type 1 based on the flowchart in Attachment A.1.

48. Although this General Permit does not mandate specific setback distances, dischargers are encouraged to set back their construction activities from streams and wetlands whenever feasible to reduce the risk of impacting water quality (e.g., natural stream stability and habitat function). Because there is a reduced risk to receiving waters when setbacks are used, this General Permit gives credit to setbacks in the risk determination and post-construction storm water performance standards. The risk calculation and runoff reduction mechanisms in this General Permit are expected to facilitate compliance with any Regional Water Board and local agency setback requirements, and to encourage voluntary setbacks wherever practicable.

49. Rain events can occur at any time of the year in California. Therefore, a Rain Event Action Plan (REAP) is necessary for Risk Level 2 and 3 traditional construction projects (LUPs exempt) to ensure that active construction sites have adequate erosion and sediment controls implemented prior to the onset of a storm event, even if construction is planned only during the dry season.

50. Soil particles smaller than 0.02 millimeters (mm) (i.e., finer than medium silt) do not settle easily using conventional measures for sediment control (i.e., sediment basins). Given their long settling time, dislodging these soils results in a significant risk that fine particles will be released into surface waters and cause unacceptable downstream impacts. If operated correctly, an Active Treatment System (ATS[5]) can prevent or reduce the release of fine particles from construction sites.

[5] An ATS is a treatment system that employs chemical coagulation, chemical flocculation, or electro coagulation in order to reduce turbidity caused by fine suspended sediment.

Use of an ATS can effectively reduce a site's risk of impacting receiving waters.

51. Dischargers located in a watershed area where a Total Maximum Daily Load (TMDL) has been adopted or approved by the Regional Water Board or U.S. EPA may be required by a separate Regional Water Board action to implement additional BMPs, conduct additional monitoring activities, and/or comply with an applicable waste load allocation and implementation schedule. Such dischargers may also be required to obtain an individual Regional Water Board permit specific to the area.

H. Effluent Standards

52. The State Water Board convened a blue ribbon panel of storm water experts that submitted a report entitled, "The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities," dated June 19, 2006. The panel concluded that numeric limits or action levels are technically feasible to control construction storm water discharges, provided that certain conditions are considered. The panel also concluded that numeric effluent limitations (NELs) are feasible for discharges from construction sites that utilize an ATS. The State Water Board has incorporated the expert panel's suggestions into this General Permit, which includes numeric action levels (NALs) for pH and turbidity, and special numeric limits for ATS discharges.

Determining Compliance with Numeric Limitations

53. This General Permit sets a pH NAL of 6.5 to 8.5, and a turbidity NAL of 250 NTU. The purpose of the NAL and its associated monitoring requirement is to provide operational information regarding the performance of the measures used at the site to minimize the discharge of pollutants and to protect beneficial uses and receiving waters from the adverse effects of construction-related storm water discharges. An exceedance of a NAL does not constitute a violation of this General Permit.

54. This General Permit requires dischargers with NAL exceedances to immediately implement additional BMPs and revise their Storm Water Pollution Prevention Plans (SWPPPs) accordingly to either prevent pollutants and authorized non-storm water discharges from contaminating storm water, or to substantially reduce the pollutants to levels consistently below the NALs. NAL exceedances are reported in the State Water Boards SMARTS system, and the discharger is

required to provide an NAL Exceedance Report when requested by a Regional Water Board.

I. Receiving Water Limitations

55. This General Permit requires all enrolled dischargers to determine the receiving waters potentially affected by their discharges and to comply with all applicable water quality standards, including any more stringent standards applicable to a water body.

J. Sampling, Monitoring, Reporting and Record Keeping

56. Visual monitoring of storm water and non-storm water discharges is required for all sites subject to this General Permit.

57. Records of all visual monitoring inspections are required to remain on-site during the construction period and for a minimum of three years.

58. For all Risk Level 3/LUP Type 3 and Risk Level 2/LUP Type 2 sites, this General Permit requires effluent monitoring for pH and turbidity. Sampling, analysis and monitoring requirements for effluent monitoring for pH and turbidity are contained in this General Permit.

59. Risk Level 3 and LUP Type 3 sites with effluent that exceeds the Receiving Water Monitoring Triggers contained in this General Permit and with direct discharges to receiving water are required to conduct receiving water monitoring. An exceedance of a Receiving Water Monitoring Trigger does not constitute a violation of this General Permit.

60. This General Permit establishes a 5 year, 24 hour (expressed in inches of rainfall) as an exemptions to the receiving water monitoring requirements for Risk Level 3 and LUP Type 3 dischargers.

61. If run-on is caused by a forest fire or any other natural disaster, then receiving water monitoring triggers do not apply.

62. For Risk Level 3 and LUP Type 3 sites larger than 30 acres and with direct discharges to receiving waters, this General Permit requires bioassessment sampling before and after site completion to determine if significant degradation to the receiving water's biota has occurred. Bioassessment sampling guidelines are contained in this General Permit.

63. A summary and evaluation of the sampling and analysis results will be submitted in the Annual Reports.

64. This General Permit contains sampling, analysis and monitoring requirements for non-visible pollutants at all sites subject to this General Permit.

65. Compliance with the General Permit relies upon dischargers to electronically self-report any discharge violations and to comply with any Regional Water Board enforcement actions.

66. This General Permit requires that all dischargers maintain a paper or electronic copy of all required records for three years from the date generated or date submitted, whichever is last. These records must be available at the construction site until construction is completed. For LUPs, these documents may be retained in a crew member's vehicle and made available upon request.

K. Active Treatment System (ATS) Requirements

67. Active treatment systems add chemicals to facilitate flocculation, coagulation and filtration of suspended sediment particles. The uncontrolled release of these chemicals to the environment can negatively affect the beneficial uses of receiving waters and/or degrade water quality (e.g., acute and chronic toxicity). Additionally, the batch storage and treatment of storm water through an ATS' can potentially cause physical impacts on receiving waters if storage volume is inadequate or due to sudden releases of the ATS batches and improperly designed outfalls.

68. If designed, operated and maintained properly an ATS can achieve very high removal rates of suspended sediment (measured as turbidity), albeit at sometimes significantly higher costs than traditional erosion/sediment control practices. As a result, this General Permit establishes NELs consistent with the expected level of typical ATS performance.

69. This General Permit requires discharges of storm water associated with construction activity that undergo active treatment to comply with special operational and effluent limitations to ensure that these discharges do not adversely affect the beneficial uses of the receiving waters or cause degradation of their water quality.

70. For ATS discharges, this General Permit establishes technology-based NELs for turbidity.

71. This General Permit establishes a 10 year, 24 hour (expressed in inches of rainfall) Compliance Storm Event exemption from the technology-based numeric effluent limitations for ATS discharges. Exceedances of the ATS turbidity NEL constitutes a violation of this General Permit.

L. Post-Construction Requirements

72. This General Permit includes performance standards for post-construction that are consistent with State Water Board Resolution No. 2005-0006, "Resolution Adopting the Concept of Sustainability as a Core Value for State Water Board Programs and Directing Its Incorporation," and 2008-0030, “Requiring Sustainable Water Resources Management.“ The requirement for all construction sites to match pre-project hydrology will help ensure that the physical and biological integrity of aquatic ecosystems are sustained. This “runoff reduction” approach is analogous in principle to Low Impact Development (LID) and will serve to protect related watersheds and waterbodies from both hydrologic-based and pollution impacts associated with the post-construction landscape.

73. LUP projects are not subject to post-construction requirements due to the nature of their construction to return project sites to pre-construction conditions.

M. Storm Water Pollution Prevention Plan Requirements

74. This General Permit requires the development of a site-specific SWPPP. The SWPPP must include the information needed to demonstrate compliance with all requirements of this General Permit, and must be kept on the construction site and be available for review. The discharger shall ensure that a QSD develops the SWPPP.

75. To ensure proper site oversight, this General Permit requires a Qualified SWPPP Practitioner to oversee implementation of the BMPs required to comply with this General Permit.

N. Regional Water Board Authorities

76. Regional Water Boards are responsible for implementation and enforcement of this General Permit. A general approach to permitting is not always suitable for every construction site and environmental circumstances. Therefore, this General Permit recognizes that Regional Water Boards must have some flexibility and authority to alter, approve, exempt, or rescind permit authority granted under this

General Permit in order to protect the beneficial uses of our receiving waters and prevent degradation of water quality.

IT IS HEREBY ORDERED that all dischargers subject to this General Permit shall comply with the following conditions and requirements (including all conditions and requirements as set forth in Attachments A, B, C, D, E and F)[6]:

II. CONDITIONS FOR PERMIT COVERAGE

A. Linear Underground/Overhead Projects (LUPs)

1. Linear Underground/Overhead Projects (LUPs) include, but are not limited to, any conveyance, pipe, or pipeline for the transportation of any gaseous, liquid (including water and wastewater for domestic municipal services), liquescent, or slurry substance; any cable line or wire for the transmission of electrical energy; any cable line or wire for communications (e.g. telephone, telegraph, radio or television messages); and associated ancillary facilities. Construction activities associated with LUPs include, but are not limited to, (a) those activities necessary for the installation of underground and overhead linear facilities (e.g., conduits, substructures, pipelines, towers, poles, cables, wires, connectors, switching, regulating and transforming equipment, and associated ancillary facilities); and include, but are not limited to, (b) underground utility mark-out, potholing, concrete and asphalt cutting and removal, trenching, excavation, boring and drilling, access road and pole/tower pad and cable/wire pull station, substation construction, substructure installation, construction of tower footings and/or foundations, pole and tower installations, pipeline installations, welding, concrete and/ or pavement repair or replacement, and stockpile/borrow locations.

2. The Legally Responsible Person is responsible for obtaining coverage under the General Permit where the construction of pipelines, utility lines, fiber-optic cables, or other linear underground/overhead projects will occur across several properties unless the LUP construction activities are covered under another construction storm water permit.

3. Only LUPs shall comply with the conditions and requirements in Attachment A, A.1 & A.2 of this Order. The balance of this Order is not applicable to LUPs except as indicated in Attachment A.

[6] These attachments are part of the General Permit itself and are not separate documents that are capable of being updated independently by the State Water Board.

B. Obtaining Permit Coverage Traditional Construction Sites

1. The Legally Responsible Person (LRP) (see Special Provisions, Electronic Signature and Certification Requirements, Section IV.I.1) must obtain coverage under this General Permit.

2. To obtain coverage, the LRP must electronically file Permit Registration Documents (PRDs) prior to the commencement of construction activity. Failure to obtain coverage under this General Permit for storm water discharges to waters of the United States is a violation of the CWA and the California Water Code.

3. PRDs shall consist of:

   a. Notice of Intent (NOI)
   b. Risk Assessment (Section VIII)
   c. Site Map
   d. Storm Water Pollution Prevention Plan (Section XIV)
   e. Annual Fee
   f. Signed Certification Statement

   Any information provided to the Regional Water Board shall comply with the Homeland Security Act and any other federal law that concerns security in the United States; any information that does not comply should not be submitted.

   Attachment B contains additional PRD information. Dischargers must electronically file the PRDs, and mail the appropriate annual fee to the State Water Board.

4. This permit is effective on July 1, 2010.

   a. **Dischargers Obtaining Coverage On or After July 1, 2010:** All dischargers requiring coverage on or after July 1, 2010, shall electronically file their PRDs prior to the commencement of construction activities, and mail the appropriate annual fee no later than seven days prior to the commencement of construction activities. Permit coverage shall not commence until the PRDs and the annual fee are received by the State Water Board, and a WDID number is assigned and sent by SMARTS.

   b. **Dischargers Covered Under 99-08-DWQ and 2003-0007-DWQ:** Existing dischargers subject to State Water Board Order No. 99-08-DWQ (existing dischargers) will continue coverage under 99-08-DWQ until July 1, 2010. After July 1, 2010, all NOIs subject to State Water Board Order No. 99-08-DWQ will be terminated.

Existing dischargers shall electronically file their PRDs no later than July 1, 2010. If an existing discharger's site acreage subject to the annual fee has changed, it shall mail a revised annual fee no less than seven days after receiving the revised annual fee notification, **or else lose permit coverage**. All existing dischargers shall be exempt from the risk determination requirements in Section VIII of this General Permit until two years after permit adoption. All existing dischargers are therefore subject to Risk Level 1 requirements regardless of their site's sediment and receiving water risks. However, a Regional Board retains the authority to require an existing discharger to comply with the Section VIII risk determination requirements.

5. The discharger is only considered covered by this General Permit upon receipt of a Waste Discharger Identification (WDID) number assigned and sent by the State Water Board Storm water Multi-Application and Report Tracking System (SMARTS). In order to demonstrate compliance with this General Permit, the discharger must obtain a WDID number and must present documentation of a valid WDID upon demand.

6. During the period this permit is subject to review by the U.S. EPA, the prior permit (State Water Board Order No. 99-08-DWQ) remains in effect. Existing dischargers under the prior permit will continue to have coverage under State Water Board Order No. 99-08-DWQ until this General Permit takes effect on July 1, 2010. Dischargers who complete their projects and electronically file an NOT prior to July 1, 2010, are not required to obtain coverage under this General Permit.

7. Small Construction Rainfall Erosivity Waiver

   EPA's Small Construction Erosivity Waiver applies to sites between one and five acres demonstrating that there are no adverse water quality impacts.

   Dischargers eligible for a Rainfall Erosivity Waiver based on low erosivity potential shall complete the electronic Notice of Intent (NOI) and Sediment Risk form through the State Water Board's SMARTS system, certifying that the construction activity will take place during a period when the value of the rainfall erosivity factor is less than five. Where the LRP changes or another LRP is added during construction, the new LRP must also submit a waiver certification through the SMARTS system.

   If a small construction site continues beyond the projected completion date given on the waiver certification, the LRP shall recalculate the

rainfall erosivity factor for the new project duration and submit this information through the SMARTS system. If the new R factor is below five (5), the discharger shall update through SMARTS all applicable information on the waiver certification and retain a copy of the revised waiver onsite. The LRP shall submit the new waiver certification 30 days prior to the projected completion date listed on the original waiver form to assure exemption from permitting requirements is uninterrupted. If the new R factor is five (5) or above, the LRP shall be required to apply for coverage under this Order.

8. In the case of a public emergency that requires immediate construction activities, a discharger shall submit a brief description of the emergency construction activity within five days of the onset of construction, and then shall submit all PRDs within thirty days.

C. Revising Permit Coverage for Change of Acreage or New Ownership

1. The discharger may reduce or increase the total acreage covered under this General Permit when a portion of the site is complete and/or conditions for termination of coverage have been met (See Section II.D Conditions for Termination of Coverage); when ownership of a portion of the site is sold to a different entity; or when new acreage, subject to this General Permit, is added to the site.

2. Within 30 days of a reduction or increase in total disturbed acreage, the discharger shall electronically file revisions to the PRDs that include:

   a. A revised NOI indicating the new project size;

   b. A revised site map showing the acreage of the site completed, acreage currently under construction, acreage sold/transferred or added, and acreage currently stabilized in accordance with the Conditions for Termination of Coverage in Section II.D below.

   c. SWPPP revisions, as appropriate; and

   d. Certification that any new landowners have been notified of applicable requirements to obtain General Permit coverage. The certification shall include the name, address, telephone number, and e-mail address of the new landowner.

   e. If the project acreage has increased, dischargers shall mail payment of revised annual fees within 14 days of receiving the revised annual fee notification.

3. The discharger shall continue coverage under the General Permit for any parcel that has not achieved "Final Stabilization" as defined in Section II.D.

4. When an LRP with active General Permit coverage transfers its LRP status to another person or entity that qualifies as an LRP, the existing LRP shall inform the new LRP of the General Permit's requirements. In order for the new LRP to continue the construction activity on its parcel of property, the new LRP, or the new LRP's approved signatory, must submit PRDs in accordance with this General Permit's requirements.

D. Conditions for Termination of Coverage

1. Within 90 days of when construction is complete or ownership has been transferred, the discharger shall electronically file a Notice of Termination (NOT), a final site map, and photos through the State Water Boards SMARTS system. Filing a NOT certifies that all General Permit requirements have been met. The Regional Water Board will consider a construction site complete only when all portions of the site have been transferred to a new owner, or all of the following conditions have been met:

   a. For purposes of "final stabilization," the site will not pose any additional sediment discharge risk than it did prior to the commencement of construction activity;

   b. There is no potential for construction-related storm water pollutants to be discharged into site runoff;

   c. Final stabilization has been reached;

   d. Construction materials and wastes have been disposed of properly;

   e. Compliance with the Post-Construction Standards in Section XIII of this General Permit has been demonstrated;

   f. Post-construction storm water management measures have been installed and a long-term maintenance plan[7] has been established; and

   g. All construction-related equipment, materials and any temporary BMPs no longer needed are removed from the site.

[7] For the purposes of this requirement a long-term maintenance plan will be designed for a minimum of five years, and will describe the procedures to ensure that the post-construction storm water management measures are adequately maintained.

2. The discharger shall certify that final stabilization conditions are satisfied in their NOT. Failure to certify shall result in continuation of permit coverage and annual billing.

3. The NOT must demonstrate through photos, RUSLE or RUSLE2, or results of testing and analysis that the site meets all of the conditions above (Section II.D.1) and the final stabilization condition (Section II.D.1.a) is attained by one of the following methods:

   a. "70% final cover method," no computational proof required

      OR:

   b. "RUSLE or RUSLE2 method," computational proof required

      OR:

   c. "Custom method", the discharger shall demonstrate in some other manner than a or b, above, that the site complies with the "final stabilization" requirement in Section II.D.1.a.

III. DISCHARGE PROHIBITIONS

A. Dischargers shall not violate any discharge prohibitions contained in applicable Basin Plans or statewide water quality control plans. Waste discharges to Areas of Special Biological Significance (ASBS) are prohibited by the California Ocean Plan, unless granted an exception issued by the State Water Board.

B. All discharges are prohibited except for the storm water and non-storm water discharges specifically authorized by this General Permit or another NPDES permit.

C. Authorized non-storm water discharges may include those from de-chlorinated potable water sources such as: fire hydrant flushing, irrigation of vegetative erosion control measures, pipe flushing and testing, water to control dust, uncontaminated ground water from dewatering, and other discharges not subject to a separate general NPDES permit adopted by a Regional Water Board. The discharge of non-storm water is authorized under the following conditions:

1. The discharge does not cause or contribute to a violation of any water quality standard;

2. The discharge does not violate any other provision of this General Permit;

3. The discharge is not prohibited by the applicable Basin Plan;

4. The discharger has included and implemented specific BMPs required by this General Permit to prevent or reduce the contact of the non-storm water discharge with construction materials or equipment.

5. The discharge does not contain toxic constituents in toxic amounts or (other) significant quantities of pollutants;

6. The discharge is monitored and meets the applicable NALs; and

7. The discharger reports the sampling information in the Annual Report.

If any of the above conditions are not satisfied, the discharge is not authorized by this General Permit. The discharger shall notify the Regional Water Board of any anticipated non-storm water discharges not already authorized by this General Permit or another NPDES permit, to determine whether a separate NPDES permit is necessary.

D. Debris resulting from construction activities are prohibited from being discharged from construction sites.

E. When soil contamination is found or suspected and a responsible party is not identified, or the responsible party fails to promptly take the appropriate action, the discharger shall have those soils sampled and tested to ensure proper handling and public safety measures are implemented. The discharger shall notify the appropriate local, State, and federal agency(ies) when contaminated soil is found at a construction site, and will notify the appropriate Regional Water Board.

IV. SPECIAL PROVISIONS

A. Duty to Comply

1. The discharger shall comply with all of the conditions of this General Permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and the Porter-Cologne Water Quality Control Act and is grounds for enforcement action and/or removal from General Permit coverage.

2. The discharger shall comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants within the time provided in the regulations that establish these standards or prohibitions, even if this General Permit has not yet been modified to incorporate the requirement.

B. General Permit Actions

1. This General Permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the discharger for a General Permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not annul any General Permit condition.

2. If any toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant which is present in the discharge and that standard or prohibition is more stringent than any limitation on the pollutant in this General Permit, this General Permit shall be modified or revoked and reissued to conform to the toxic effluent standard or prohibition and the dischargers so notified.

C. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for a discharger in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this General Permit.

D. Duty to Mitigate

The discharger shall take all responsible steps to minimize or prevent any discharge in violation of this General Permit, which has a reasonable likelihood of adversely affecting human health or the environment.

E. Proper Operation and Maintenance

The discharger shall at all times properly operate and maintain any facilities and systems of treatment and control (and related appurtenances) which are installed or used by the discharger to achieve compliance with the conditions of this General Permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. Proper operation and maintenance may require the operation of backup or auxiliary facilities or similar systems installed by a discharger when necessary to achieve compliance with the conditions of this General Permit.

F. Property Rights

This General Permit does not convey any property rights of any sort or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor does it authorize any infringement of Federal, State, or local laws or regulations.

G. Duty to Maintain Records and Provide Information

1. The discharger shall maintain a paper or electronic copy of all required records, including a copy of this General Permit, for three years from the date generated or date submitted, whichever is last. These records shall be available at the construction site until construction is completed.

2. The discharger shall furnish the Regional Water Board, State Water Board, or U.S. EPA, within a reasonable time, any requested information to determine compliance with this General Permit. The discharger shall also furnish, upon request, copies of records that are required to be kept by this General Permit.

H. Inspection and Entry

The discharger shall allow the Regional Water Board, State Water Board, U.S. EPA, and/or, in the case of construction sites which discharge through a municipal separate storm sewer, an authorized representative of the municipal operator of the separate storm sewer system receiving the discharge, upon the presentation of credentials and other documents as may be required by law, to:

1. Enter upon the discharger's premises at reasonable times where a regulated construction activity is being conducted or where records must be kept under the conditions of this General Permit;

2. Access and copy at reasonable times any records that must be kept under the conditions of this General Permit;

3. Inspect at reasonable times the complete construction site, including any off-site staging areas or material storage areas, and the erosion/sediment controls; and

4. Sample or monitor at reasonable times for the purpose of ensuring General Permit compliance.

I. Electronic Signature and Certification Requirements

1. All Permit Registration Documents (PRDs) and Notices of Termination (NOTs) shall be electronically signed, certified, and submitted via SMARTS to the State Water Board. Either the Legally Responsible Person (LRP), as defined in Appendix 5 – Glossary, or a person legally authorized to sign and certify PRDs and NOTs on behalf of the LRP (the LRP's Approved Signatory, as defined in Appendix 5 - Glossary) must submit all information electronically via SMARTS.

2. Changes to Authorization. If an Approved Signatory's authorization is no longer accurate, a new authorization satisfying the requirements of paragraph (a) of this section must be submitted via SMARTS prior to or together with any reports, information or applications to be signed by an Approved Signatory.

3. All Annual Reports, or other information required by the General Permit (other than PRDs and NOTs) or requested by the Regional Water Board, State Water Board, U.S. EPA, or local storm water management agency shall be certified and submitted by the LRP or the LRP's Approved Signatory.

J. Certification

Any person signing documents under Section IV.I above, shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, to the best of my knowledge and belief, the information submitted is, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

K. Anticipated Noncompliance

The discharger shall give advance notice to the Regional Water Board and local storm water management agency of any planned changes in the construction activity, which may result in noncompliance with General Permit requirements.

L. Bypass

Bypass[8] is prohibited. The Regional Water Board may take enforcement action against the discharger for bypass unless:

1. Bypass was unavoidable to prevent loss of life, personal injury or severe property damage;[9]

2. There were no feasible alternatives to bypass, such as the use of auxiliary treatment facilities, retention of untreated waste, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass that could occur during normal periods of equipment downtime or preventative maintenance;

3. The discharger submitted a notice at least ten days in advance of the need for a bypass to the Regional Water Board; or

4. The discharger may allow a bypass to occur that does not cause effluent limitations to be exceeded, but only if it is for essential maintenance to assure efficient operation. In such a case, the above bypass conditions are not applicable. The discharger shall submit notice of an unanticipated bypass as required.

M. Upset

1. A discharger that wishes to establish the affirmative defense of an upset[10] in an action brought for noncompliance shall demonstrate,

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[8] The intentional diversion of waste streams from any portion of a treatment facility

[9] Severe property damage means substantial physical damage to property, damage to the treatment facilities that causes them to become inoperable, or substantial and permanent loss of natural resources that can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

[10] An exceptional incident in which there is unintentional and temporary noncompliance the technology based numeric effluent limitations because of factors beyond the reasonable control of the discharger. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventative maintenance, or careless or improper operation.

through properly signed, contemporaneous operating logs, or other relevant evidence that:

a. An upset occurred and that the discharger can identify the cause(s) of the upset

b. The treatment facility was being properly operated by the time of the upset

c. The discharger submitted notice of the upset as required; and

d. The discharger complied with any remedial measures required

2. No determination made before an action of noncompliance occurs, such as during administrative review of claims that noncompliance was caused by an upset, is final administrative action subject to judicial review.

3. In any enforcement proceeding, the discharger seeking to establish the occurrence of an upset has the burden of proof

N. Penalties for Falsification of Reports

Section 309(c)(4) of the CWA provides that any person who knowingly makes any false material statement, representation, or certification in any record or other document submitted or required to be maintained under this General Permit, including reports of compliance or noncompliance shall upon conviction, be punished by a fine of not more than $10,000 or by imprisonment for not more than two years or by both.

O. Oil and Hazardous Substance Liability

Nothing in this General Permit shall be construed to preclude the institution of any legal action or relieve the discharger from any responsibilities, liabilities, or penalties to which the discharger is or may be subject to under Section 311 of the CWA.

P. Severability

The provisions of this General Permit are severable; and, if any provision of this General Permit or the application of any provision of this General Permit to any circumstance is held invalid, the application of such provision to other circumstances and the remainder of this General Permit shall not be affected thereby.

Q. Reopener Clause

This General Permit may be modified, revoked and reissued, or terminated for cause due to promulgation of amended regulations, receipt of U.S. EPA guidance concerning regulated activities, judicial decision, or in accordance with 40 Code of Federal Regulations (CFR) 122.62, 122.63, 122.64, and 124.5.

R. Penalties for Violations of Permit Conditions

1. Section 309 of the CWA provides significant penalties for any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the CWA or any permit condition or limitation implementing any such section in a permit issued under Section 402. Any person who violates any permit condition of this General Permit is subject to a civil penalty not to exceed $37,500[11] per calendar day of such violation, as well as any other appropriate sanction provided by Section 309 of the CWA.

2. The Porter-Cologne Water Quality Control Act also provides for civil and criminal penalties, which in some cases are greater than those under the CWA.

S. Transfers

This General Permit is not transferable.

T. Continuation of Expired Permit

This General Permit continues in force and effect until a new General Permit is issued or the SWRCB rescinds this General Permit. Only those dischargers authorized to discharge under the expiring General Permit are covered by the continued General Permit.

[11] May be further adjusted in accordance with the Federal Civil Penalties Inflation Adjustment Act.

V. EFFLUENT STANDARDS & RECEIVING WATER MONITORING

A. Narrative Effluent Limitations

1. Storm water discharges and authorized non-storm water discharges regulated by this General Permit shall not contain a hazardous substance equal to or in excess of reportable quantities established in 40 C.F.R. §§ 117.3 and 302.4, unless a separate NPDES Permit has been issued to regulate those discharges.

2. Dischargers shall minimize or prevent pollutants in storm water discharges and authorized non-storm water discharges through the use of controls, structures, and management practices that achieve BAT for toxic and non-conventional pollutants and BCT for conventional pollutants.

Table 1- Numeric Action Levels, Test Methods, Detection Limits, and Reporting Units

Parameter	Test Method	Discharge Type	Min. Detection Limit	Units	Numeric Action Level
pH	Field test with calibrated portable instrument	Risk Level 2	0.2	pH units	lower NAL = 6.5 upper NAL = 8.5
		Risk Level 3			lower NAL = 6.5 upper NAL = 8.5
Turbidity	EPA 0180.1 and/or field test with calibrated portable instrument	Risk Level 2	1	NTU	250 NTU
		Risk Level 3			250 NTU

B. Numeric Action Levels (NALs)

1. For Risk Level 2 and 3 dischargers, the lower storm event average NAL for pH is 6.5 pH units and the upper storm event average NAL for

pH is 8.5 pH units. The discharger shall take actions as described below if the discharge is outside of this range of pH values.

2. For Risk Level 2 and 3 dischargers, the NAL storm event daily average for turbidity is 250 NTU. The discharger shall take actions as described below if the discharge is outside of this range of turbidity values.

3. Whenever the results from a storm event daily average indicate that the discharge is below the lower NAL for pH, exceeds the upper NAL for pH, or exceeds the turbidity NAL (as listed in Table 1), the discharger shall conduct a construction site and run-on evaluation to determine whether pollutant source(s) associated with the site's construction activity may have caused or contributed to the NAL exceedance and shall immediately implement corrective actions if they are needed.

4. The site evaluation shall be documented in the SWPPP and specifically address whether the source(s) of the pollutants causing the exceedance of the NAL:

   a. Are related to the construction activities and whether additional BMPs are required to (1) meet BAT/BCT requirements; (2) reduce or prevent pollutants in storm water discharges from causing exceedances of receiving water objectives; and (3) determine what corrective action(s) were taken or will be taken and with a description of the schedule for completion.

      AND/OR:

   b. Are related to the run-on associated with the construction site location and whether additional BMPs measures are required to (1) meet BAT/BCT requirements; (2) reduce or prevent pollutants in storm water discharges from causing exceedances of receiving water objectives; and (3) what corrective action(s) were taken or will be taken with a description of the schedule for completion.

C. Receiving Water Monitoring Triggers

1. The receiving water monitoring triggers for Risk Level 3 dischargers with direct discharges to surface waters are triggered when the daily average effluent pH values during any site phase when there is a high risk of pH discharge[12] fall outside of the range of 6.0 and 9.0 pH units, or when the daily average effluent turbidity exceeds 500 NTU.

2. Risk Level 3 dischargers with with direct discharges to surface waters shall conduct receiving water monitoring whenever their effluent monitoring results exceed the receiving water monitoring triggers. If the pH trigger is exceeded, the receiving water shall be monitored for pH for the duration of coverage under this General Permit. If the turbidity trigger is exceeded, the receiving water shall be monitored for turbidity and SSC for the duration of coverage under this general permit.

3. Risk Level 3 dischargers with direct discharges to surfaces waters shall initiate receiving water monitoring when the triggers are exceeded unless the storm event causing the exceedance is determined after the fact to equal to or greater than the 5-year 24-hour storm (expressed in inches of rainfall) as determined by using these maps:

   http://www.wrcc.dri.edu/pcpnfreq/nca5y24.gif
   http://www.wrcc.dri.edu/pcpnfreq/sca5y24.gif

   Verification of the 5-year 24-hour storm event shall be done by reporting on-site rain gauge readings as well as nearby governmental rain gauge readings.

4. If run-on is caused by a forest fire or any other natural disaster, then receiving water monitoring triggers do not apply.

[12] A period of high risk of pH discharge is defined as a project's complete utilities phase, complete vertical build phase, and any portion of any phase where significant amounts of materials are placed directly on the land at the site in a manner that could result in significant alterations of the background pH of the discharges.

VI. RECEIVING WATER LIMITATIONS

A. The discharger shall ensure that storm water discharges and authorized non-storm water discharges to any surface or ground water will not adversely affect human health or the environment.

B. The discharger shall ensure that storm water discharges and authorized non-storm water discharges will not contain pollutants in quantities that threaten to cause pollution or a public nuisance.

C. The discharger shall ensure that storm water discharges and authorized non-storm water discharges will not contain pollutants that cause or contribute to an exceedance of any applicable water quality objectives or water quality standards (collectively, WQS) contained in a Statewide Water Quality Control Plan, the California Toxics Rule, the National Toxics Rule, or the applicable Regional Water Board's Water Quality Control Plan (Basin Plan).

D. Dischargers located within the watershed of a CWA § 303(d) impaired water body, for which a TMDL has been approved by the U.S. EPA, shall comply with the approved TMDL if it identifies "construction activity" or land disturbance as a source of the pollution.

VII. TRAINING QUALIFICATIONS AND CERTIFICATION REQUIREMENTS

A. General

The discharger shall ensure that all persons responsible for implementing requirements of this General Permit shall be appropriately trained in accordance with this Section. Training should be both formal and informal, occur on an ongoing basis, and should include training offered by recognized governmental agencies or professional organizations. Those responsible for preparing and amending SWPPPs shall comply with the requirements in this Section VII.

The discharger shall provide documentation of all training for persons responsible for implementing the requirements of this General Permit in the Annual Reports.

B. SWPPP Certification Requirements

1. **Qualified SWPPP Developer:** The discharger shall ensure that SWPPPs are written, amended and certified by a Qualified SWPPP Developer (QSD). A QSD shall have one of the following registrations or certifications, and appropriate experience, as required for:

   a. A California registered professional civil engineer;

   b. A California registered professional geologist or engineering geologist;

   c. A California registered landscape architect;

   d. A professional hydrologist registered through the American Institute of Hydrology;

   e. A Certified Professional in Erosion and Sediment Control (CPESC) ™ registered through Enviro Cert International, Inc.;

   f. A Certified Professional in Storm Water Quality (CPSWQ) ™ registered through Enviro Cert International, Inc.; or

   g. A professional in erosion and sediment control registered through the National Institute for Certification in Engineering Technologies (NICET).

Effective two years after the adoption date of this General Permit, a QSD shall have attended a State Water Board-sponsored or approved QSD training course.

2. The discharger shall list the name and telephone number of the currently designated Qualified SWPPP Developer(s) in the SWPPP.

3. **Qualified SWPPP Practitioner:** The discharger shall ensure that all BMPs required by this General Permit are implemented by a Qualified SWPPP Practitioner (QSP). A QSP is a person responsible for non-storm water and storm water visual observations, sampling and analysis. Effective two years from the date of adoption of this General Permit, a QSP shall be either a QSD or have one of the following certifications:

   a. A certified erosion, sediment and storm water inspector registered through Enviro Cert International, Inc.; or

   b. A certified inspector of sediment and erosion control registered through Certified Inspector of Sediment and Erosion Control, Inc.

   Effective two years after the adoption date of this General Permit, a QSP shall have attended a State Water Board-sponsored or approved QSP training course.

4. The LRP shall list in the SWPPP, the name of any Approved Signatory, and provide a copy of the written agreement or other mechanism that provides this authority from the LRP in the SWPPP.

5. The discharger shall include, in the SWPPP, a list of names of all contractors, subcontractors, and individuals who will be directed by the Qualified SWPPP Practitioner. This list shall include telephone numbers and work addresses. Specific areas of responsibility of each subcontractor and emergency contact numbers shall also be included.

6. The discharger shall ensure that the SWPPP and each amendment will be signed by the Qualified SWPPP Developer. The discharger shall include a listing of the date of initial preparation and the date of each amendment in the SWPPP.

VIII. RISK DETERMINATION

The discharger shall calculate the site's sediment risk and receiving water risk during periods of soil exposure (i.e. grading and site stabilization) and use the calculated risks to determine a Risk Level(s) using the methodology in

Appendix 1. For any site that spans two or more planning watersheds,[13] the discharger shall calculate a separate Risk Level for each planning watershed. The discharger shall notify the State Water Board of the site's Risk Level determination(s) and shall include this determination as a part of submitting the PRDs. If a discharger ends up with more than one Risk Level determination, the Regional Water Board may choose to break the project into separate levels of implementation.

IX. RISK LEVEL 1 REQUIREMENTS

Risk Level 1 Dischargers shall comply with the requirements included in Attachment C of this General Permit.

X. RISK LEVEL 2 REQUIREMENTS

Risk Level 2 Dischargers shall comply with the requirements included in Attachment D of this General Permit.

XI. RISK LEVEL 3 REQUIREMENTS

Risk Level 3 Dischargers shall comply with the requirements included in Attachment E of this General Permit.

XII. ACTIVE TREATMENT SYSTEMS (ATS)

Dischargers choosing to implement an ATS on their site shall comply with all of the requirements in Attachment F of this General Permit.

[13] Planning watershed: defined by the Calwater Watershed documents as a watershed that ranges in size from approximately 3,000 to 10,000 acres http://cain.ice.ucdavis.edu/calwater/calwfaq.html, http://gis.ca.gov/catalog/BrowseRecord.epl?id=22175 .

XIII. POST-CONSTRUCTION STANDARDS

A. All dischargers shall comply with the following runoff reduction requirements unless they are located within an area subject to post-construction standards of an active Phase I or II municipal separate storm sewer system (MS4) permit that has an approved Storm Water Management Plan.

1. This provision shall take effect three years from the adoption date of this permit, or later at the discretion of the Executive Officer of the Regional Board.

2. The discharger shall demonstrate compliance with the requirements of this section by submitting with their NOI a map and worksheets in accordance with the instructions in Appendix 2. The discharger shall use non-structural controls unless the discharger demonstrates that non-structural controls are infeasible or that structural controls will produce greater reduction in water quality impacts.

3. The discharger shall, through the use of non-structural and structural measures as described in Appendix 2, replicate the pre-project water balance (for this permit, defined as the volume of rainfall that ends up as runoff) for the smallest storms up to the 85th percentile storm event (or the smallest storm event that generates runoff, whichever is larger). Dischargers shall inform Regional Water Board staff at least 30 days prior to the use of any structural control measure used to comply with this requirement. Volume that cannot be addressed using non-structural practices shall be captured in structural practices and approved by the Regional Water Board. When seeking Regional Board approval for the use of structural practices, dischargers shall document the infeasibility of using non-structural practices on the project site, or document that there will be fewer water quality impacts through the use of structural practices.

4. For sites whose disturbed area exceeds two acres, the discharger shall preserve the pre-construction drainage density (miles of stream length per square mile of drainage area) for all drainage areas within the area serving a first order stream[14] or larger stream and ensure that post-project time of runoff concentration is equal or greater than pre-project time of concentration.

[14] A first order stream is defined as a stream with no tributaries.

B. All dischargers shall implement BMPs to reduce pollutants in storm water discharges that are reasonably foreseeable after all construction phases have been completed at the site (Post-construction BMPs).

XIV. SWPPP REQUIREMENTS

A. The discharger shall ensure that the Storm Water Pollution Prevention Plans (SWPPPs) for all traditional project sites are developed and amended or revised by a QSD. The SWPPP shall be designed to address the following objectives:

1. All pollutants and their sources, including sources of sediment associated with construction, construction site erosion and all other activities associated with construction activity are controlled;

2. Where not otherwise required to be under a Regional Water Board permit, all non-storm water discharges are identified and either eliminated, controlled, or treated;

3. Site BMPs are effective and result in the reduction or elimination of pollutants in storm water discharges and authorized non-storm water discharges from construction activity to the BAT/BCT standard;

4. Calculations and design details as well as BMP controls for site run-on are complete and correct, and

5. Stabilization BMPs installed to reduce or eliminate pollutants after construction are completed.

B. To demonstrate compliance with requirements of this General Permit, the QSD shall include information in the SWPPP that supports the conclusions, selections, use, and maintenance of BMPs.

C. The discharger shall make the SWPPP available at the construction site during working hours while construction is occurring and shall be made available upon request by a State or Municipal inspector. When the original SWPPP is retained by a crewmember in a construction vehicle and is not currently at the construction site, current copies of the BMPs and map/drawing will be left with the field crew and the original SWPPP shall be made available via a request by radio/telephone.

XV. REGIONAL WATER BOARD AUTHORITIES

A. In the case where the Regional Water Board does not agree with the discharger's self-reported risk level (e.g., they determine themselves to be a Level 1 Risk when they are actually a Level 2 Risk site), Regional Water Boards may either direct the discharger to reevaluate the Risk Level(s) for their site or terminate coverage under this General Permit.

B. Regional Water Boards may terminate coverage under this General Permit for dischargers who fail to comply with its requirements or where they determine that an individual NPDES permit is appropriate.

C. Regional Water Boards may require dischargers to submit a Report of Waste Discharge / NPDES permit application for Regional Water Board consideration of individual requirements.

D. Regional Water Boards may require additional Monitoring and Reporting Program Requirements, including sampling and analysis of discharges to sediment-impaired water bodies.

E. Regional Water Boards may require dischargers to retain records for more than the three years required by this General Permit.

XVI. ANNUAL REPORTING REQUIREMENTS

A. All dischargers shall prepare and electronically submit an Annual Report no later than September 1 of each year.

B. The discharger shall certify each Annual Report in accordance with the Special Provisions.

C. The discharger shall retain an electronic or paper copy of each Annual Report for a minimum of three years after the date the annual report is filed.

D. The discharger shall include storm water monitoring information in the Annual Report consisting of:

1. a summary and evaluation of all sampling and analysis results, including copies of laboratory reports;

2. the analytical method(s), method reporting unit(s), and method detection limit(s) of each analytical parameter (analytical results that are less than the method detection limit shall be reported as "less than the method detection limit");

3. a summary of all corrective actions taken during the compliance year;

4. identification of any compliance activities or corrective actions that were not implemented;

5. a summary of all violations of the General Permit;

6. the names of individual(s) who performed the facility inspections, sampling, visual observation (inspections), and/or measurements;

7. the date, place, time of facility inspections, sampling, visual observation (inspections), and/or measurements, including precipitation (rain gauge); and

8. the visual observation and sample collection exception records and reports specified in Attachments C, D, and E.

E. The discharger shall provide training information in the Annual Report consisting of:

1. documentation of all training for individuals responsible for all activities associated with compliance with this General Permit;

2. documentation of all training for individuals responsible for BMP installation, inspection, maintenance, and repair; and

3. documentation of all training for individuals responsible for overseeing, revising, and amending the SWPPP.

ATTACHMENT A
Linear Underground/ Overhead Requirements

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All Linear Underground/Overhead project dischargers who submit permit registration documents (PRDs) indicating their intention to be regulated under the provisions of this General Permit shall comply with the following:

A. DEFINITION OF LINEAR UNDERGROUND/OVERHEAD PROJECTS

1. Linear Underground/Overhead Projects (LUPs) include, but are not limited to, any conveyance, pipe, or pipeline for the transportation of any gaseous, liquid (including water and wastewater for domestic municipal services), liquiescent, or slurry substance; any cable line or wire for the transmission of electrical energy; any cable line or wire for communications (e.g., telephone, telegraph, radio, or television messages); and associated ancillary facilities. Construction activities associated with LUPs include, but are not limited to, (a) those activities necessary for the installation of underground and overhead linear facilities (e.g., conduits, substructures, pipelines, towers, poles, cables, wires, connectors, switching, regulating and transforming equipment, and associated ancillary facilities); and include, but are not limited to, (b) underground utility mark-out, potholing, concrete and asphalt cutting and removal, trenching, excavation, boring and drilling, access road and pole/tower pad and cable/wire pull station, substation construction, substructure installation, construction of tower footings and/or foundations, pole and tower installations, pipeline installations, welding, concrete and/ or pavement repair or replacement, and stockpile/borrow locations.

2. LUP evaluation shall consist of two tasks:

a. Confirm that the project or project section(s) qualifies as an LUP. The State Water Board website contains a project determination guidance flowchart. http://www.waterboards.ca.gov/water_issues/programs/stormwater/constpermits.shtml

b. Identify which Type(s) (1, 2 or 3 described in Section I below) are applicable to the project or project sections based on project sediment and receiving water risk. (See Attachment A.1)

3. A Legally Responsible Person (LRP) for a Linear Underground/Overhead project is required to obtain CGP coverage under one or more permit registration document (PRD) electronic submittals to the State Water Board's Storm Water Multi-Application and Report Tracking (SMARTs) system. Attachment A.1 contains a flow chart to be used when determining if a linear project qualifies for coverage and to determine LUP Types. Since a LUP may be constructed within both developed and undeveloped locations and portions of LUPs may be constructed by different contractors, LUPs may be broken into logical permit sections. Sections may be determined based on portions of a project conducted by one contractor. Other situations may also occur, such as the time period in which the sections of a project will be constructed (e.g. project phases), for which separate permit coverage is possible. For projects that are broken into separate sections, a description of how each section relates to the overall project and the definition of the boundaries between sections shall be clearly stated.

4. Where construction activities transverse or enter into different Regional Water Board jurisdictions, LRPs shall obtain permit coverage for each Regional Water Board area involved prior to the commencement of construction activities.

5. Small Construction Rainfall Erosivity Waiver

EPA's Small Construction Erosivity Waiver applies to sites between one and five acres demonstrating that there are no adverse water quality impacts.

Dischargers eligible for a Rainfall Erosivity Waiver based on low erosivity potential shall complete the electronic Notice of Intent (NOI) and Sediment Risk form through the State Water Board's SMARTS system, certifying that the construction activity will take place during a period when the value of the rainfall erosivity factor is less than five. Where the LRP changes or another LRP is added during construction, the new LRP must also submit a waiver certification through the SMARTS system.

If a small linear construction site continues beyond the projected completion date given on the waiver certification, the LRP shall recalculate the rainfall erosivity factor for the new project duration and submit this information through the SMARTS system. If the new R factor is below five (5), the discharger shall update through SMARTS all applicable information on the waiver certification and retain a copy of the revised waiver onsite. The LRP shall submit the new waiver certification 30 days prior to the projected completion date listed on the original waiver form to assure exemption from permitting requirements is uninterrupted. If the new R factor is five (5) or above, the LRP shall be required to apply for coverage under this Order.

B. LINEAR PROJECT PERMIT REGISTRATION DOCUMENTS (PRDs)

Any information provided to the Regional Water Board shall comply with the Homeland Security Act and any other federal law that concerns security in the United States; any information that does not comply should not be submitted. PRDs shall consist of the following:

1. Notice of Intent (NOI)

Prior to construction activities, the LRP of a proposed linear underground/overhead project shall utilize the processes and methods provided in Attachment A.2, Permit Registration Documents (PRDs) – General Instructions for Linear Underground/Overhead Projects to comply with the Construction General Permit.

2. Site Maps

LRPs submitting PRDs shall include at least 3 maps. The first map will be a zoomed[1] 1000-1500 ft vicinity map that shows the starting point of the project. The second will be a zoomed map of 1000-1500 ft showing the ending location of the project. The third will be a larger view vicinity map, 1000 ft to 2000 ft, displaying the entire project location depending on the project size, and indicating the LUP type (1, 2 or 3) areas within the total project footprint.

3. Drawings

LRPs submitting PRDs shall include a construction drawing(s) or other appropriate drawing(s) or map(s) that shows the locations of storm drain

[1] An image with a close-up/enhanced detailed view of site features that show minute details such as streets and neighboring structures.
Or: An image with a close-up/enhanced detailed view of the site's surrounding infrastructure.
Or: An image with a close up detailed view of the project and its surroundings.

inlets and waterbodies[2] that may receive discharges from the construction activities and that shows the locations of BMPs to be installed for all those BMPs that can be illustrated on the revisable drawing(s) or map(s). If storm drain inlets, waterbodies, and/or BMPs cannot be adequately shown on the drawing(s) or map(s) they should be described in detail within the SWPPP.

4. Storm Water Pollution Prevention Plan (SWPPP)

LUP dischargers shall comply with the SWPPP Preparation, Implementation, and Oversight requirements in Section K of this Attachment.

5. Contact information

LUP dischargers shall include contact information for all contractors (or subcontractors) responsible for each area of an LUP project. This should include the names, telephone numbers, and addresses of contact personnel. Specific areas of responsibility of each contact, and emergency contact numbers should also be included.

6. In the case of a public emergency that requires immediate construction activities, a discharger shall submit a brief description of the emergency construction activity within five days of the onset of construction, and then shall submit all PRDs within thirty days.

C. LINEAR PROJECT TERMINATION OF COVERAGE REQUIREMENTS

The LRP may terminate coverage of an LUP when construction activities are completed by submitting an electronic notice of termination (NOT) through the State Water Board's SMARTS system. Termination requirements are different depending on the complexity of the LUP. An LUP is considered complete when: (a) there is no potential for construction-related storm water pollution; (b) all elements of the SWPPP have been completed; (c) construction materials and waste have been disposed of properly; (d) the site is in compliance with all local storm water management requirements; and (e) the LRP submits a notice of termination (NOT) and has received approval for termination from the appropriate Regional Water Board office.

1. LUP Stabilization Requirements

The LUP discharger shall ensure that all disturbed areas of the construction site are stabilized prior to termination of coverage under this General Permit. Final stabilization for the purposes of submitting an NOT

[2] Includes basin(s) that the MS4 storm sewer systems may drain to for Hydromodification or Hydrological Conditional of Concerns under the MS4 permits.

is satisfied when all soil disturbing activities are completed and one of the following criteria is met:

a. In disturbed areas that were vegetated prior to construction activities of the LUP, the area disturbed must be re-established to a uniform vegetative cover equivalent to 70 percent coverage of the preconstruction vegetative conditions. Where preconstruction vegetation covers less than 100 percent of the surface, such as in arid areas, the 70 percent coverage criteria is adjusted as follows: if the preconstruction vegetation covers 50 percent of the ground surface, 70 percent of 50 percent (.70 X .50=.35) would require 35 percent total uniform surface coverage; or

b. Where no vegetation is present prior to construction, the site is returned to its original line and grade and/or compacted to achieve stabilization; or

c. Equivalent stabilization measures have been employed. These measures include, but are not limited to, the use of such BMPs as blankets, reinforced channel liners, soil cement, fiber matrices, geotextiles, or other erosion resistant soil coverings or treatments.

2. LUP Termination of Coverage Requirements

The LRP shall file an NOT through the State Water Board's SMARTS system. By submitting an NOT, the LRP is certifying that construction activities for an LUP are complete and that the project is in full compliance with requirements of this General Permit and that it is now compliant with soil stabilization requirements where appropriate. Upon approval by the appropriate Regional Water Board office, permit coverage will be terminated.

3. Revising Coverage for Change of Acreage

When the LRP of a portion of an LUP construction project changes, or when a phase within a multi-phase project is completed, the LRP may reduce the total acreage covered by this General Permit. In reducing the acreage covered by this General Permit, the LRP shall electronically file revisions to the PRDs that include:

a. a revised NOI indicating the new project size;

b. a revised site map showing the acreage of the project completed, acreage currently under construction, acreage sold, transferred or added, and acreage currently stabilized.

c. SWPPP revisions, as appropriate; and

d. certification that any new LRPs have been notified of applicable requirements to obtain General Permit coverage. The certification shall include the name, address, telephone number, and e-mail address (if known) of the new LRP.

If the project acreage has increased, dischargers shall mail payment of revised annual fees within 14 days of receiving the revised annual fee notification.

D. DISCHARGE PROHIBITIONS

1. LUP dischargers shall not violate any discharge prohibitions contained in applicable Basin Plans or statewide water quality control plans. Waste discharges to Areas of Special Biological Significance (ASBS) are prohibited by the California Ocean Plan, unless granted an exception issued by the State Water Board.

2. LUP dischargers are prohibited from discharging non-storm water that is not otherwise authorized by this General Permit. Non-storm water discharges authorized by this General Permit[3] may include, fire hydrant flushing, irrigation of vegetative erosion control measures, pipe flushing and testing, water to control dust, street cleaning, dewatering,[4] uncontaminated groundwater from dewatering, and other discharges not subject to a separate general NPDES permit adopted by a Regional Water Board. Such discharges are allowed by this General Permit provided they are not relied upon to clean up failed or inadequate construction or post-construction BMPs designed to keep materials on site. These authorized non-storm water discharges:

[3] Dischargers must identify all authorized non-storm water discharges in the LUP's SWPPP and identify BMPs that will be implemented to either eliminate or reduce pollutants in non-storm water discharges. Regional Water Boards may direct the discharger to discontinue discharging such non-storm water discharges if determined that such discharges discharge significant pollutants or threaten water quality.
[4] Dewatering activities may be prohibited or need coverage under a separate permit issued by the Regional Water Boards. Dischargers shall check with the appropriate Regional Water Boards for any required permit or basin plan conditions prior to initial dewatering activities to land, storm drains, or waterbodies.

a. Shall not cause or contribute to a violation of any water quality standard;

b. Shall not violate any other provision of this General Permit;

c. Shall not violate any applicable Basin Plan;

d. Shall comply with BMPs as described in the SWPPP;

e. Shall not contain toxic constituents in toxic amounts or (other) significant quantities of pollutants;

f. Shall be monitored and meets the applicable NALs; and

g. Shall be reported by the discharger in the Annual Report.

If any of the above conditions are not satisfied, the discharge is not authorized by this General Permit. The discharger shall notify the Regional Water Board of any anticipated non-storm water discharges not authorized by this General Permit to determine the need for a separate NPDES permit.

Additionally, some LUP dischargers may be required to obtain a separate permit if the applicable Regional Water Board has adopted a General Permit for dewatering discharges. Wherever feasible, alternatives, that do not result in the discharge of non-storm water, shall be implemented in accordance with this Attachment's Section K.2 - SWPPP Implementation Schedule.

3. LUP dischargers shall ensure that trench spoils or any other soils disturbed during construction activities that are contaminated[5] are not discharged with storm water or non-storm water discharges into any storm drain or water body except pursuant to an NPDES permit.

When soil contamination is found or suspected and a responsible party is not identified, or the responsible party fails to promptly take the appropriate action, the LUP discharger shall have those soils sampled and tested to ensure that proper handling and public safety measures are

[5] Contaminated soil contains pollutants in concentrations that exceed the appropriate thresholds that various regulatory agencies set for those substances. Preliminary testing of potentially contaminated soils will be based on odor, soil discoloration, or prior history of the site's chemical use and storage and other similar factors. When soil contamination is found or suspected and a responsible party is not identified, or the responsible party fails to promptly take the appropriate action, the discharger shall have those soils sampled and tested to ensure proper handling and public safety measures are implemented. The legally responsible person will notify the appropriate local, State, or federal agency(ies) when contaminated soil is found at a construction site, and will notify the Regional Water Board by submitting an NOT at the completion of the project.

implemented. The LUP discharger shall notify the appropriate local, State, and federal agency(ies) when contaminated soil is found at a construction site, and will notify the appropriate Regional Water Board.

4. Discharging any pollutant-laden water that will cause or contribute to an exceedance of the applicable Regional Water Board's Basin Plan from a dewatering site or sediment basin into any receiving water or storm drain is prohibited.

5. Debris[6] resulting from construction activities are prohibited from being discharged from construction project sites.

E. SPECIAL PROVISIONS

1. Duty to Comply

a. The LUP discharger must comply with all of the conditions of this General Permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and the Porter-Cologne Water Quality Control Act and is grounds for enforcement action and/or removal from General Permit coverage.

b. The LUP discharger shall comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants within the time provided in the regulations that establish these standards or prohibitions, even if this General Permit has not yet been modified to incorporate the requirement.

2. General Permit Actions

a. This General Permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the discharger for a General Permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not annul any General Permit condition.

[6] Litter, rubble, discarded refuse, and remains of something destroyed.

b. If any toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant which is present in the discharge and that standard or prohibition is more stringent than any limitation on the pollutant in this General Permit, this General Permit shall be modified or revoked and reissued to conform to the toxic effluent standard or prohibition and the dischargers so notified.

3. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for an LUP discharger in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this General Permit.

4. Duty to Mitigate

The LUP discharger shall take all responsible steps to minimize or prevent any discharge in violation of this General Permit, which has a reasonable likelihood of adversely affecting human health or the environment.

5. Proper Operation and Maintenance

The LUP discharger shall at all times properly operate and maintain any facilities and systems of treatment and control (and related appurtenances) which are installed or used by the discharger to achieve compliance with the conditions of this General Permit and with the requirements of the Storm Water Pollution Prevention Plan (SWPPP). Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. Proper operation and maintenance may require the operation of backup or auxiliary facilities or similar systems installed by a discharger when necessary to achieve compliance with the conditions of this General Permit.

6. Property Rights

This General Permit does not convey any property rights of any sort or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor does it authorize any infringement of Federal, State, or local laws or regulations.

7. Duty to Maintain Records and Provide Information

a. The LUP discharger shall maintain a paper or electronic copy of all required records, including a copy of this General Permit, for three years from the date generated or date submitted, whichever is last. These records shall be kept at the construction site or in a crew

member's vehicle until construction is completed, and shall be made available upon request.

b. The LUP discharger shall furnish the Regional Water Board, State Water Board, or USEPA, within a reasonable time, any requested information to determine compliance with this General Permit. The LUP discharger shall also furnish, upon request, copies of records that are required to be kept by this General Permit.

8. Inspection and Entry

The LUP discharger shall allow the Regional Water Board, State Water Board, USEPA, and/or, in the case of construction sites which discharge through a municipal separate storm sewer, an authorized representative of the municipal operator of the separate storm sewer system receiving the discharge, upon the presentation of credentials and other documents as may be required by law, to:

a. Enter upon the discharger's premises at reasonable times where a regulated construction activity is being conducted or where records must be kept under the conditions of this General Permit;

b. Access and copy at reasonable times any records that must be kept under the conditions of this General Permit;

c. Inspect at reasonable times the complete construction site, including any off-site staging areas or material storage areas, and the erosion/sediment controls; and

d. Sample or monitor at reasonable times for the purpose of ensuring General Permit compliance.

9. Electronic Signature and Certification Requirements

a. All Permit Registration Documents (PRDs) and Notices of Termination (NOTs) shall be electronically signed, certified, and submitted via SMARTS to the State Water Board. Either the Legally Responsible Person (LRP), as defined in Appendix 5 – Glossary, or a person legally authorized to sign and certify PRDs and NOTs on behalf of the LRP (the LRP's Approved Signatory, as defined in Appendix 5 - Glossary) must submit all information electronically via SMARTS.

b. Changes to Authorization. If an Approved Signatory's authorization is no longer accurate, a new authorization satisfying the requirements of paragraph (a) of this section must be submitted via SMARTS prior to or

together with any reports, information or applications to be signed by an Approved Signatory.

c. All SWPPP revisions, annual reports, or other information required by the General Permit (other than PRDs and NOTs) or requested by the Regional Water Board, State Water Board, USEPA, or local storm water management agency shall be certified and submitted by the LRP or the LRP's Approved Signatory.

10. Certification

Any person signing documents under Section E.9 above, shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, to the best of my knowledge and belief, the information submitted is, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

11. Anticipated Noncompliance

The LUP discharger shall give advance notice to the Regional Water Board and local storm water management agency of any planned changes in the construction activity, which may result in noncompliance with General Permit requirements.

12. Penalties for Falsification of Reports

Section 309(c)(4) of the CWA provides that any person who knowingly makes any false material statement, representation, or certification in any record or other document submitted or required to be maintained under this General Permit, including reports of compliance or noncompliance shall upon conviction, be punished by a fine of not more than $10,000 or by imprisonment for not more than two years or by both.

13. Oil and Hazardous Substance Liability

Nothing in this General Permit shall be construed to preclude the institution of any legal action or relieve the discharger from any responsibilities, liabilities, or penalties to which the LUP discharger is or may be subject to under Section 311 of the CWA.

14. Severability

The provisions of this General Permit are severable; and, if any provision of this General Permit or the application of any provision of this General Permit to any circumstance is held invalid, the application of such provision to other circumstances and the remainder of this General Permit shall not be affected thereby.

15. Reopener Clause

This General Permit may be modified, revoked and reissued, or terminated for cause due to promulgation of amended regulations, receipt of USEPA guidance concerning regulated activities, judicial decision, or in accordance with 40 Code of Federal Regulations (CFR) 122.62, 122.63, 122.64, and 124.5.

16. Penalties for Violations of Permit Conditions

a. Section 309 of the CWA provides significant penalties for any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the CWA or any permit condition or limitation implementing any such section in a permit issued under Section 402. Any person who violates any permit condition of this General Permit is subject to a civil penalty not to exceed $37,500[7] per calendar day of such violation, as well as any other appropriate sanction provided by Section 309 of the CWA.

b. The Porter-Cologne Water Quality Control Act also provides for civil and criminal penalties, which in some cases are greater than those under the CWA.

17. Transfers

This General Permit is not transferable. A new LRP of an ongoing construction activity must submit PRDs in accordance with the requirements of this General Permit to be authorized to discharge under this General Permit. An LRP who is a property owner with active General Permit coverage who sells a fraction or all the land shall inform the new property owner(s) of the requirements of this General Permit.

18. Continuation of Expired Permit

This General Permit continues in force and effect until a new General Permit is issued or the SWRCB rescinds this General Permit. Only those

[7] May be further adjusted in accordance with the Federal Civil Penalties Inflation Adjustment Act

dischargers authorized to discharge under the expiring General Permit are covered by the continued General Permit.

F. EFFLUENT STANDARDS & RECEIVING WATER MONITORING

1. Narrative Effluent Limitations

a. LUP dischargers shall ensure that storm water discharges and authorized non-storm water discharges regulated by this General Permit do not contain a hazardous substance equal to or in excess of reportable quantities established in 40 C.F.R. §§ 117.3 and 302.4, unless a separate NPDES Permit has been issued to regulate those discharges.

b. LUP dischargers shall minimize or prevent pollutants in storm water discharges and authorized non-storm water discharges through the use of structural or non-structural controls, structures, and management practices that achieve BAT for toxic and non-conventional pollutants and BCT for conventional pollutants.

Table 1. Numeric Action Levels, Test Methods, Detection Limits, and Reporting Units

Parameter	Test Method	Discharge Type	Min. Detection Limit	Units	Numeric Action Level
pH	Field test with calibrated portable instrument	LUP Type 2	0.2	pH units	lower NAL = 6.5 upper NAL = 8.5
		LUP Type 3			lower NAL = 6.5 upper NAL = 8.5
Turbidity	EPA 0180.1 and/or field test with calibrated portable instrument	LUP Type 2	1	NTU	250 NTU
		LUP Type 3			250 NTU

2. Numeric Action Levels (NALs)

a. For LUP Type 2 and 3 dischargers, the lower storm event daily average NAL for pH is 6.5 pH units and the upper storm event daily average NAL for pH is 8.5 pH units. The LUP discharger shall take actions as described below if the storm event daily average discharge is outside of this range of pH values.

b. For LUP Type 2 and 3 dischargers, the storm event daily average NAL for turbidity is 250 NTU. The discharger shall take actions as described below if the storm event daily average discharge is outside of this range of turbidity values.

c. Whenever daily average analytical effluent monitoring results indicate that the discharge is below the lower NAL for pH, exceeds the upper NAL for pH, or exceeds the turbidity NAL (as listed in Table 1), the LUP discharger shall conduct a construction site and run-on evaluation to determine whether pollutant source(s) associated with the site's construction activity may have caused or contributed to the NAL exceedance and shall immediately implement corrective actions if they are needed.

d. The site evaluation will be documented in the SWPPP and specifically address whether the source(s) of the pollutants causing the exceedance of the NAL:

i Are related to the construction activities and whether additional BMPs or SWPPP implementation measures are required to (1) meet BAT/BCT requirements; (2) reduce or prevent pollutants in storm water discharges from causing exceedances of receiving water objectives; and (3) determine what corrective action(s) were taken or will be taken and with a description of the schedule for completion.

AND/OR:

ii Are related to the run-on associated with the construction site location and whether additional BMPs or SWPPP implementation measures are required to (1) meet BAT/BCT requirements; (2) reduce or prevent pollutants in storm water discharges from causing exceedances of receiving water objectives; and (3) decide what corrective action(s) were taken or will be taken, including a description of the schedule for completion.

3. Receiving Water Monitoring Triggers

a. The receiving water monitoring triggers for LUP Type 3 dischargers with direct discharges to surface waters are triggered when the daily average effluent pH values during any site phase when there is a high risk of pH discharge[8] fall outside of the range of 6.0 and 9.0 pH units, or when the daily average effluent turbidity exceeds 500 NTU.

b. LUP Type 3 dischargers with direct discharges to surface waters shall conduct receiving water monitoring whenever their effluent monitoring results exceed the receiving water monitoring triggers. If the pH trigger is exceeded, the receiving water shall be monitored for pH for the duration of coverage under this General Permit. If the turbidity trigger is exceeded, the receiving water shall be monitored for turbidity and SSC for the duration of coverage under this General Permit.

c. LUP Type 3 dischargers with direct discharges to surfaces waters shall initiate receiving water monitoring when the triggers are exceeded unless the storm event causing the exceedance is determined after the fact to equal to or greater than the 5-year 24-hour storm (expressed in inches of rainfall) as determined by using these maps:

   http://www.wrcc.dri.edu/pcpnfreq/nca5y24.gif
   http://www.wrcc.dri.edu/pcpnfreq/sca5y24.gif

   Verification of the 5-year 24-hour storm event shall be done by reporting on-site rain gauge readings as well as nearby governmental rain gauge readings.

d. If run-on is caused by a forest fire or any other natural disaster, then receiving water monitoring triggers do not apply.

G. RECEIVING WATER LIMITATIONS

1. LUP dischargers shall ensure that storm water discharges and authorized non-storm water discharges to any surface or ground water will not adversely affect human health or the environment.

2. LUP dischargers shall ensure that storm water discharges and authorized non-storm water discharges will not contain pollutants in quantities that threaten to cause pollution or a public nuisance.

3. LUP dischargers shall ensure that storm water discharges and authorized non-storm water discharges will not contain pollutants that cause or

[8] A period of high risk of pH discharge is defined as a project's complete utilities phase, complete vertical build phase, and any portion of any phase where significant amounts of materials are placed directly on the land at the site in a manner that could result in significant alterations of the background pH of the discharges.

contribute to an exceedance of any applicable water quality objectives or water quality standards (collectively, WQS) contained in a Statewide Water Quality Control Plan, the California Toxics Rule, the National Toxics Rule, or the applicable Regional Water Board's Water Quality Control Plan (Basin Plan).

H. TRAINING QUALIFICATIONS

1. General

All persons responsible for implementing requirements of this General Permit shall be appropriately trained. Training should be both formal and informal, occur on an ongoing basis, and should include training offered by recognized governmental agencies or professional organizations. Persons responsible for preparing, amending and certifying SWPPPs shall comply with the requirements in this Section H.

2. SWPPP Certification Requirements

a. **Qualified SWPPP Developer:** The LUP discharger shall ensure that all SWPPPs be written, amended and certified by a Qualified SWPPP Developer (QSD). A QSD shall have one of the following registrations or certifications, and appropriate experience, as required for:

i A California registered professional civil engineer;

ii A California registered professional geologist or engineering geologist;

iii A California registered landscape architect;

iv A professional hydrologist registered through the American Institute of Hydrology;

v A certified professional in erosion and sediment control (CPESC) ™ registered through Enviro Cert International, Inc;

vi A certified professional in storm water quality (CPSWQ)™ registered through Enviro Cert International, Inc.; or

vii A certified professional in erosion and sediment control registered through the National Institute for Certification in Engineering Technologies (NICET).

Effective two years after the adoption date of this General Permit, a QSD shall have attended a State Water Board-sponsored or approved QSD training course.

b. The LUP discharger shall ensure that the SWPPP is written and amended, as needed, to address the specific circumstances for each construction site covered by this General Permit prior to commencement of construction activity for any stage.

c. The LUP discharger shall list the name and telephone number of the currently designated Qualified SWPPP Developer(s) in the SWPPP.

d. **Qualified SWPPP Practitioner:** The LUP discharger shall ensure that all elements of any SWPPP for each project will be implemented by a Qualified SWPPP Practitioner (QSP). A QSP is a person responsible for non-storm water and storm water visual observations, sampling and analysis, and for ensuring full compliance with the permit and implementation of all elements of the SWPPP. Effective two years from the date of adoption of this General Permit, a QSP shall be either a QSD or have one of the following certifications:

   i A certified erosion, sediment and storm water inspector registered through Certified Professional in Erosion and Sediment Control, Inc.; or

   ii A certified inspector of sediment and erosion control registered through Certified Inspector of Sediment and Erosion Control, Inc.

   Effective two years after the adoption date of this General Permit, a QSP shall have attended a State Water Board-sponsored or approved QSP training course.

e. The LUP discharger shall ensure that the SWPPP include a list of names of all contractors, subcontractors, and individuals who will be directed by the Qualified SWPPP Practitioner, and who is ultimately responsible for implementation of the SWPPP. This list shall include telephone numbers and work addresses. Specific areas of responsibility of each subcontractor and emergency contact numbers shall also be included.

f. The LUP discharger shall ensure that the SWPPP and each amendment be signed by the Qualified SWPPP Developer. The LUP discharger shall include a listing of the date of initial preparation and the dates of each amendment in the SWPPP.

I. TYPES OF LINEAR PROJECTS

This attachment establishes three types (Type 1, 2 & 3) of complexity for areas within an LUP or project section based on threat to water quality. Project area Types are determined through Attachment A.1.

The Type 1 requirements below establish the baseline requirements for all LUPs subject to this General Permit. Additional requirements for Type 2 and Type 3 LUPs are labeled.

1. Type 1 LUPs*:*

LUP dischargers with areas of a LUP designated as Type 1 shall comply with the requirements in this Attachment. Type 1 LUPs are:

a. Those construction areas where 70 percent or more of the construction activity occurs on a paved surface and where areas disturbed during construction will be returned to preconstruction conditions or equivalent protection established at the end of the construction activities for the day; or

b. Where greater than 30 percent of construction activities occur within the non-paved shoulders or land immediately adjacent to paved surfaces, or where construction occurs on unpaved improved roads, including their shoulders or land immediately adjacent to them where:

   i Areas disturbed during construction will be returned to preconstruction conditions or equivalent protection is established at the end of the construction activities for the day to minimize the potential for erosion and sediment deposition, and

   ii Areas where established vegetation was disturbed during construction will be stabilized and re-vegetated by the end of project. When required, adequate temporary stabilization BMPs will be installed and maintained until vegetation is established to meet minimum cover requirements established in this General Permit for final stabilization.

c. Where the risk determination is as follows:

   i Low sediment risk, low receiving water risk, or

   ii Low sediment risk, medium receiving water risk, or

   iii Medium sediment risk, low receiving water risk

2. Type 2 LUPs:

Type 2 LUPs are determined by the Combined Risk Matrix in Attachment A.1. Type 2 LUPs have the specified combination of risk:

d. High sediment risk, low receiving water risk, or

e. Medium sediment risk, medium receiving water risk, or

f. Low sediment risk, high receiving water risk

Receiving water risk is either considered "Low" for those areas of the project that are not in close proximity to a sensitive receiving watershed, "Medium" for those areas of the project within a sensitive receiving watershed yet outside of the flood plain of a sensitive receiving water body, and "High" where the soil disturbance is within close proximity to a sensitive receiving water body. Project sediment risk is calculated based on the Risk Factor Worksheet in Attachment C of this General Permit.

3. Type 3 LUPs:

Type 3 LUPs are determined by the Combined Risk Matrix in Attachment A.1. Type 3 LUPs have the specified combination of risk:

a. High sediment risk, high receiving water risk, or

b. High sediment risk, medium receiving water risk, or

c. Medium sediment risk, high receiving water risk

Receiving water risk is either considered "Medium" for those areas of the project within a sensitive receiving watershed yet outside of the flood plain of a sensitive receiving water body, or "High" where the soil disturbance is within close proximity to a sensitive receiving water body. Project sediment risk is calculated based on the Risk Factor Worksheet in Attachment C.

J. LUP TYPE-SPECIFIC REQUIREMENTS

1. Effluent Standards

a. Narrative – LUP dischargers shall comply with the narrative effluent standards below.

i Storm water discharges and authorized non-storm water discharges regulated by this General Permit shall not contain a hazardous substance equal to or in excess of reportable quantities established in 40 C.F.R. §§ 117.3 and 302.4, unless a separate NPDES Permit has been issued to regulate those discharges.

ii LUP dischargers shall minimize or prevent pollutants in storm water discharges and authorized non-storm water discharges through the use of controls, structures, and management practices that achieve BAT for toxic and non-conventional pollutants and BCT for conventional pollutants.

b. Numeric – LUP Type 1 dischargers are not subject to a numeric effluent standard

c. Numeric –LUP Type 2 dischargers are subject to a pH NAL of 6.5-8.5, and a turbidity NAL of 250 NTU.

d. Numeric – LUP Type 3 dischargers are subject to a pH NAL of 6.5-8.5, and a turbidity NAL of 250 NTU.

2. Good Site Management "Housekeeping"

a. LUP dischargers shall implement good site management (i.e., "housekeeping") measures for construction materials that could potentially be a threat to water quality if discharged. At a minimum, the good housekeeping measures shall consist of the following:

i Identify the products used and/or expected to be used and the end products that are produced and/or expected to be produced. This does not include materials and equipment that are designed to be outdoors and exposed to environmental conditions (i.e. poles, equipment pads, cabinets, conductors, insulators, bricks, etc.).

ii Cover and berm loose stockpiled construction materials that are not actively being used (i.e. soil, spoils, aggregate, fly-ash, stucco, hydrated lime, etc.).

iii Store chemicals in watertight containers (with appropriate secondary containment to prevent any spillage or leakage) or in a storage shed (completely enclosed).

iv Minimize exposure of construction materials to precipitation (not applicable to materials designed to be outdoors and exposed to the environment).

v Implement BMPs to control the off-site tracking of loose construction and landscape materials.

b. LUP dischargers shall implement good housekeeping measures for waste management, which, at a minimum, shall consist of the following:

i Prevent disposal of any rinse or wash waters or materials on impervious or pervious site surfaces or into the storm drain system.

ii Ensure the containment of sanitation facilities (e.g., portable toilets) to prevent discharges of pollutants to the storm water drainage system or receiving water.

iii Clean or replace sanitation facilities and inspecting them regularly for leaks and spills.

iv Cover waste disposal containers at the end of every business day and during a rain event.

v Prevent discharges from waste disposal containers to the storm water drainage system or receiving water.

vi Contain and securely protect stockpiled waste material from wind and rain at all times unless actively being used.

vii Implement procedures that effectively address hazardous and non-hazardous spills.

viii Develop a spill response and implementation element of the SWPPP prior to commencement of construction activities. The SWPPP shall require that:

(1) Equipment and materials for cleanup of spills shall be available on site and that spills and leaks shall be cleaned up immediately and disposed of properly; and

(2) Appropriate spill response personnel are assigned and trained.

ix Ensure the containment of concrete washout areas and other washout areas that may contain additional pollutants so there is no discharge into the underlying soil and onto the surrounding areas.

c. LUP dischargers shall implement good housekeeping for vehicle storage and maintenance, which, at a minimum, shall consist of the following:

   i Prevent oil, grease, or fuel from leaking into the ground, storm drains or surface waters.

   ii Implement appropriate BMPs whenever equipment or vehicles are fueled, maintained or stored.

   iii Clean leaks immediately and disposing of leaked materials properly.

d. LUP dischargers shall implement good housekeeping for landscape materials, which, at a minimum, shall consist of the following:

   i Contain stockpiled materials such as mulches and topsoil when they are not actively being used.

   ii Contain fertilizers and other landscape materials when they are not actively being used.

   iii Discontinue the application of any erodible landscape material at least 2 days before a forecasted rain event[9] or during periods of precipitation.

   iv Applying erodible landscape material at quantities and application rates according to manufacture recommendations or based on written specifications by knowledgeable and experienced field personnel.

   v Stacking erodible landscape material on pallets and covering or storing such materials when not being used or applied.

e. LUP dischargers shall conduct an assessment and create a list of potential pollutant sources and identify any areas of the site where additional BMPs are necessary to reduce or prevent pollutants in storm water discharges and authorized non-storm water discharges. This potential pollutant list shall be kept with the SWPPP and shall identify all non-visible pollutants which are known, or should be known, to occur on the construction site. At a minimum, when developing BMPs, LUP dischargers shall do the following:

[9] 50% or greater chance of producing precipitation.

i Consider the quantity, physical characteristics (e.g., liquid, powder, solid), and locations of each potential pollutant source handled, produced, stored, recycled, or disposed of at the site.

ii Consider the degree to which pollutants associated with those materials may be exposed to and mobilized by contact with storm water.

iii Consider the direct and indirect pathways that pollutants may be exposed to storm water or authorized non-storm water discharges. This shall include an assessment of past spills or leaks, non-storm water discharges, and discharges from adjoining areas.

iv Ensure retention of sampling, visual observation, and inspection records.

v Ensure effectiveness of existing BMPs to reduce or prevent pollutants in storm water discharges and authorized non-storm water discharges.

f. LUP dischargers shall implement good housekeeping measures on the construction site to control the air deposition of site materials and from site operations.

3. Non-Storm Water Management

a. LUP dischargers shall implement measures to control all non-storm water discharges during construction.

b. LUP dischargers shall wash vehicles in such a manner as to prevent non-storm water discharges to surface waters or MS4 drainage systems.

c. LUP dischargers shall clean streets in such a manner as to prevent unauthorized non-storm water discharges from reaching surface water or MS4 drainage systems.

4. Erosion Control

a. LUP dischargers shall implement effective wind erosion control.

b. LUP dischargers shall provide effective soil cover for inactive[10] areas and all finished slopes, and utility backfill.

[10] Areas of construction activity that have been disturbed and are not scheduled to be re-disturbed for at least 14 days

c. LUP dischargers shall limit the use of plastic materials when more sustainable, environmentally friendly alternatives exist. Where plastic materials are deemed necessary, the discharger shall consider the use of plastic materials resistant to solar degradation.

5. Sediment Controls

a. LUP dischargers shall establish and maintain effective perimeter controls as needed, and implement effective BMPs for all construction entrances and exits to sufficiently control erosion and sediment discharges from the site.

b. On sites where sediment basins are to be used, LUP dischargers shall, at minimum, design sediment basins according to the guidance provided in CASQA's Construction BMP Handbook.

c. **Additional LUP Type 2 & 3 Requirement:** LUP Type 2 & 3 dischargers shall apply linear sediment controls along the toe of the slope, face of the slope, and at the grade breaks of exposed slopes to comply with sheet flow lengths[11] in accordance with Table 2 below.

Table 2 – Critical Slope/Sheet Flow Length Combinations

Slope Percentage	Sheet flow length not to exceed
0-25%	20 feet
25-50%	15 feet
Over 50%	10 feet

d. **Additional LUP Type 2 & 3 Requirement:** LUP Type 2 & 3 dischargers shall ensure that construction activity traffic to and from the project is limited to entrances and exits that employ effective controls to prevent off-site tracking of sediment.

e. **Additional LUP Type 2 & 3 Requirement:** LUP Type 2 & 3 dischargers shall ensure that all storm drain inlets and perimeter controls, runoff control BMPs, and pollutant controls at entrances and exits (e.g. tire washoff locations) are maintained and protected from activities that reduce their effectiveness.

f. **Additional LUP Type 2 & 3 Requirement:** LUP Type 2 & 3 dischargers shall inspect all immediate access roads. At a minimum daily and prior to any rain event, the discharger shall remove any

[11] Sheet flow length is the length that shallow, low velocity flow travels across a site.

sediment or other construction activity-related materials that are deposited on the roads (by vacuuming or sweeping).

g. **Additional LUP Type 3 Requirement:** The Regional Water Board may require LUP Type 3 dischargers to implement additional site-specific sediment control requirements if the implementation of the other requirements in this section are not adequately protecting the receiving waters.

6. Run-on and Run-off Controls

a. LUP dischargers shall effectively manage all run-on, all runoff within the site and all runoff that discharges off the site. Run-on from off site-shall be directed away from all disturbed areas or shall collectively be in compliance with the effluent limitations in this Attachment.

b. Run-on and runoff controls are not required for Type 1 LUPs unless the evaluation of quantity and quality of run-on and runoff deems them necessary or visual inspections show that the site requires such controls.

7. Inspection, Maintenance and Repair

a. All inspection, maintenance repair and sampling activities at the discharger's LUP location shall be performed or supervised by a QSP representing the discharger. The QSP may delegate any or all of these activities to an employee trained to do the task(s) appropriately, but shall ensure adequate deployment.

b. LUP dischargers shall conduct visual inspections and observations daily during working hours (not recorded). At least once each 24-hour period during extended storm events, **LUP Type 2 & 3 dischargers** shall conduct visual inspections to identify and record BMPs that need maintenance to operate effectively, that have failed, or that could fail to operate as intended. Inspectors shall be the QSP or be trained by the QSP.

c. Upon identifying failures or other shortcomings, as directed by the QSP, LUP dischargers shall begin implementing repairs or design changes to BMPs within 72 hours of identification and complete the changes as soon as possible.

d. For each pre- and post-rain event inspection required, LUP dischargers shall complete an inspection checklist, using a form provided by the State Water Board or Regional Water Board or in an alternative format that includes the information described below.

e. The LUP discharger shall ensure that the checklist remains on-site or with the SWPPP. At a minimum, an inspection checklist should include:

i Inspection date and date the inspection report was written.

ii Weather information, including presence or absence of precipitation, estimate of beginning of qualifying storm event, duration of event, time elapsed since last storm, and approximate amount of rainfall in inches.

iii Site information, including stage of construction, activities completed, and approximate area of the site exposed.

iv A description of any BMPs evaluated and any deficiencies noted.

v If the construction site is safely accessible during inclement weather, list the observations of all BMPs: erosion controls, sediment controls, chemical and waste controls, and non-storm water controls. Otherwise, list the results of visual inspections at all relevant outfalls, discharge points, downstream locations and any projected maintenance activities.

vi Report the presence of noticeable odors or of any visible sheen on the surface of any discharges.

vii Any corrective actions required, including any necessary changes to the SWPPP and the associated implementation dates.

viii Photographs taken during the inspection, if any.

ix Inspector's name, title, and signature.

K. STORM WATER POLLUTION PREVENTION PLAN (SWPPP) REQUIREMENTS

1. Objectives

SWPPPs for all LUPs shall be developed and amended or revised by a QSD. The SWPPP shall be designed to address the following objectives:

a. All pollutants and their sources, including sources of sediment, associated with construction activities associated with LUP activity are controlled;

b. All non-storm water discharges are identified and either eliminated, controlled, or treated;

c. BMPs are effective and result in the reduction or elimination of pollutants in storm water discharges and authorized non-storm water discharges from LUPs during construction; and

d. Stabilization BMPs installed to reduce or eliminate pollutants after construction is completed are effective and maintained.

2. SWPPP Implementation Schedule

a. LUPs for which PRDs have been submitted to the State Water Board shall develop a site/project location SWPPP prior to the start of land-disturbing activity in accordance with this Section and shall implement the SWPPP concurrently with commencement of soil-disturbing activities.

b. For an ongoing LUP involving a change in the LRP, the new LRP shall review the existing SWPPP and amend it, if necessary, or develop a new SWPPP within 15 calendar days to conform to the requirements set forth in this General Permit.

3. Availability

The SWPPP shall be available at the construction site during working hours while construction is occurring and shall be made available upon request by a State or Municipal inspector. When the original SWPPP is retained by a crewmember in a construction vehicle and is not currently at the construction site, copies of the BMPs and map/drawing will be left with the field crew and the original SWPPP shall be made available via a request by radio/telephone.

L. REGIONAL WATER BOARD AUTHORITIES

1. Regional Water Boards shall administer the provisions of this General Permit. Administration of this General Permit may include, but is not limited to, requesting the submittal of SWPPPs, reviewing SWPPPs, reviewing monitoring and sampling and analysis reports, conducting compliance inspections, gathering site information by any medium including sampling, photo and video documentation, and taking enforcement actions.

2. Regional Water Boards may terminate coverage under this General Permit for dischargers who fail to comply with its requirements or where they determine that an individual NPDES permit is appropriate.

3. Regional Water Boards may issue separate permits for discharges of storm water associated with construction activity to individual dischargers, categories of dischargers, or dischargers in a geographic area. Upon issuance of such permits by a Regional Water Board, dischargers subject to those permits shall no longer be regulated by this General Permit.

4. Regional Water Boards may direct the discharger to reevaluate the LUP Type(s) for the project (or elements/areas of the project) and impose the appropriate level of requirements.

5. Regional Water Boards may terminate coverage under this General Permit for dischargers who negligently or with willful intent incorrectly determine or report their LUP Type (e.g., they determine themselves to be a LUP Type 1 when they are actually a Type 2).

6. Regional Water Boards may review PRDs and reject or accept applications for permit coverage or may require dischargers to submit a Report of Waste Discharge / NPDES permit application for Regional Water Board consideration of individual requirements.

7. Regional Water Boards may impose additional requirements on dischargers to satisfy TMDL implementation requirements or to satisfy provisions in their Basin Plans.

8. Regional Water Boards may require additional Monitoring and Reporting Program Requirements, including sampling and analysis of discharges to sediment-impaired water bodies.

9. Regional Water Boards may require dischargers to retain records for more than the three years required by this General Permit.

10. Based on an LUP's threat to water quality and complexity, the Regional Water Board may determine on a case-by-case basis that an LUP, or a portion of an LUP, is not eligible for the linear project requirements contained in this Attachment, and require that the discharger comply with all standard requirements in this General Permit.

11. The Regional Water Board may require additional monitoring and reporting program requirements including sampling and analysis of discharges to CWA § 303(d)-listed water bodies. Additional requirements imposed by the Regional Water Board shall be consistent with the overall monitoring effort in the receiving waters.

M. MONITORING AND REPORTING REQUIREMENTS

Table 3. LUP Summary of Monitoring Requirements

LUP Type	Visual Inspections				Sample Collection		
	Daily Site BMP	Pre-storm Event / Baseline	Daily Storm BMP	Post Storm	Storm Water Discharge	Receiving Water	Non-Visible (when applicable)
1	X						x
2	X	X	X	X	X		x
3	X	X	X	X	X	X	x

1. Objectives

LUP dischargers shall prepare a monitoring and reporting program (M&RP) prior to the start of construction and immediately implement the program at the start of construction for LUPs. The monitoring program must be implemented at the appropriate level to protect water quality at all times throughout the life of the project. The M&RP must be a part of the SWPPP, included as an appendix or separate SWPPP chapter.

2. M&RP Implementation Schedule

a. LUP dischargers shall implement the requirements of this Section at the time of commencement of construction activity. LUP dischargers are responsible for implementing these requirements until construction activity is complete and the site is stabilized.

b. LUP dischargers shall revise the M&RP when:

i Site conditions or construction activities change such that a change in monitoring is required to comply with the requirements and intent of this General Permit.

ii The Regional Water Board requires the discharger to revise its M&RP based on its review of the document. Revisions may include, but not be limited to, conducting additional site inspections, submitting reports, and certifications. Revisions shall be submitted via postal mail or electronic e-mail.

iii The Regional Water Board may require additional monitoring and reporting program requirements including sampling and analysis of discharges to CWA § 303(d)-listed water bodies. Additional requirements imposed by the Regional Water Board shall be consistent with the overall monitoring effort in the receiving waters.

3. LUP Type 1 Monitoring and Reporting Requirements

a. LUP Type 1 Inspection Requirements

i LUP Type 1 dischargers shall ensure that all inspections are conducted by trained personnel. The name(s) and contact number(s) of the assigned inspection personnel should be listed in the SWPPP.

ii LUP Type 1 dischargers shall ensure that all visual inspections are conducted daily during working hours and in conjunction with other daily activities in areas where active construction is occurring.

iii LUP Type 1 dischargers shall ensure that photographs of the site taken before, during, and after storm events are taken during inspections, and submitted through the State Water Board's SMARTS website once every three rain events.

iv LUP Type 1 dischargers shall conduct daily visual inspections to verify that:

(1) Appropriate BMPs for storm water and non-storm water are being implemented in areas where active construction is occurring (including staging areas);

(2) Project excavations are closed, with properly protected spoils, and that road surfaces are cleaned of excavated material and construction materials such as chemicals by either removing or storing the material in protective storage containers at the end of every construction day;

(3) Land areas disturbed during construction are returned to pre-construction conditions or an equivalent protection is used at the end of each workday to eliminate or minimize erosion and the possible discharge of sediment or other pollutants during a rain event.

v Inspections may be discontinued in non-active construction areas where soil-disturbing activities are completed and final soil stabilization is achieved (e.g., paving is completed, substructures

are installed, vegetation meets minimum cover requirements for final stabilization, or other stabilization requirements are met).

vi Inspection programs are required for LUP Type 1 projects where temporary and permanent stabilization BMPs are installed and are to be monitored after active construction is completed. Inspection activities shall continue until adequate permanent stabilization is established and, in areas where re-vegetation is chosen, until minimum vegetative coverage is established in accordance with Section C.1 of this Attachment.

b. LUP Type 1 Monitoring Requirements for Non-Visible Pollutants

LUP Type 1 dischargers shall implement sampling and analysis requirements to monitor non-visible pollutants associated with (1) construction sites; (2) activities producing pollutants that are not visually detectable in storm water discharges; and (3) activities which could cause or contribute to an exceedance of water quality objectives in the receiving waters.

i Sampling and analysis for non-visible pollutants is only required where the LUP Type 1 discharger believes pollutants associated with construction activities have the potential to be discharged with storm water runoff due to a spill or in the event there was a breach, malfunction, failure and/or leak of any BMP. Also, failure to implement BMPs may require sample collection.

(1) Visual observations made during the monitoring program described above will help the LUP Type 1 discharger determine when to collect samples.

(2) The LUP Type 1 discharger is not required to sample if one of the conditions described above (e.g., breach or spill) occurs and the site is cleaned of material and pollutants and/or BMPs are implemented prior to the next storm event.

ii LUP Type 1 dischargers shall collect samples down-gradient from all discharge locations where the visual observations were made triggering the monitoring, and which can be safely accessed. For sites where sampling and analysis is required, personnel trained in water quality sampling procedures shall collect storm water samples.

iii If sampling for non-visible pollutant parameters is required, LUP Type 1 dischargers shall ensure that samples be analyzed for parameters indicating the presence of pollutants identified in the pollutant source assessment required in Section J.2.a.i.

iv LUP Type 1 dischargers shall collect samples during the first two hours of discharge from rain events that occur during business hours and which generate runoff.

v LUP Type 1 dischargers shall ensure that a sufficiently large sample of storm water that has not come into contact with the disturbed soil or the materials stored or used on-site (uncontaminated sample[12]) will be collected for comparison with the discharge sample. Samples shall be collected during the first two hours of discharge from rain events that occur during daylight hours and which generate runoff.

vi LUP Type 1 dischargers shall compare the uncontaminated sample to the samples of discharge using field analysis or through laboratory analysis. Analyses may include, but are not limited to, indicator parameters such as: pH, specific conductance, dissolved oxygen, conductivity, salinity, and Total Dissolved Solids (TDS).

vii For laboratory analyses, all sampling, sample preservation, and other analyses must be conducted according to test procedures pursuant to 40 C.F.R. Part 136. LUP Type 1 dischargers shall ensure that field samples are collected and analyzed according to manufacturer specifications of the sampling devices employed. Portable meters shall be calibrated according to manufacturer's specification.

viii LUP Type 1 dischargers shall ensure that all field and/or analytical data are kept in the SWPPP document.

c. <u>LUP Type 1 Visual Observation Exceptions</u>

i LUP Type 1 dischargers shall be prepared to collect samples and conduct visual observation (inspections) to meet the minimum visual observation requirements of this Attachment. The Type 1 LUP discharger is not required to physically collect samples or conduct visual observation (inspections) under the following conditions:

(1) During dangerous weather conditions such as flooding and electrical storms;

(2) Outside of scheduled site business hours.

(3) When access to the site is unsafe due to storm events.

[12] Sample collected at a location unaffected by contruction activities.

ii If the LUP Type 1 discharger does not collect the required samples or visual observation (inspections) due to these exceptions, an explanation why the sampling or visual observation (inspections) were not conducted shall be included in both the SWPPP and the Annual Report.

d. Particle Size Analysis for Risk Justification

LUP Type 1 dischargers utilizing justifying an alternative project risk shall report a soil particle size analysis used to determine the RUSLE K-Factor. ASTM D-422 (Standard Test Method for Particle-Size Analysis of Soils), as revised, shall be used to determine the percentages of sand, very fine sand, silt, and clay on the site.

4. LUP Type 2 & 3 Monitoring and Reporting Requirements

a. LUP Type 2 & 3 Inspection Requirements

i LUP Type 2 & 3 dischargers shall ensure that all inspections are conducted by trained personnel. The name(s) and contact number(s) of the assigned inspection personnel should be listed in the SWPPP.

ii LUP Type 2 & 3 dischargers shall ensure that all visual inspections are conducted daily during working hours and in conjunction with other daily activities in areas where active construction is occurring.

iii LUP Type 2 & 3 dischargers shall ensure that photographs of the site taken before, during, and after storm events are taken during inspections, and submitted through the State Water Board's SMARTS website once every three rain events.

iv LUP Type 2 & 3 dischargers shall conduct daily visual inspections to verify that appropriate BMPs for storm water and non-storm water are being implemented and in place in areas where active construction is occurring (including staging areas).

v LUP Type 2 & 3 dischargers shall conduct inspections of the construction site prior to anticipated storm events, during extended storm events, and after actual storm events to identify areas contributing to a discharge of storm water associated with construction activity. Pre-storm inspections are to ensure that BMPs are properly installed and maintained; post-storm inspections are to assure that BMPs have functioned adequately. During

extended storm events, inspections shall be required during normal working hours for each 24-hour period.

vi Inspections may be discontinued in non-active construction areas where soil-disturbing activities are completed and final soil stabilization is achieved (e.g., paving is completed, substructures are installed, vegetation meets minimum cover requirements for final stabilization, or other stabilization requirements are met).

vii LUP Type 2 & 3 dischargers shall implement a monitoring program for inspecting projects that require temporary and permanent stabilization BMPs after active construction is complete. Inspections shall ensure that the BMPs are adequate and maintained. Inspection activities shall continue until adequate permanent stabilization is established and, in vegetated areas, until minimum vegetative coverage is established in accordance with Section C.1 of this Attachment.

viii If possible, LUP Type 2 & 3 dischargers shall install a rain gauge on-site at an accessible and secure location with readings made during all storm event inspections. When readings are unavailable, data from the closest rain gauge with publically available data may be used.

ix LUP Type 2 & 3 dischargers shall Include and maintain a log of the inspections conducted in the SWPPP. The log will provide the date and time of the inspection and who conducted the inspection.

b. <u>LUP Type 2 & 3 Storm Water Effluent Monitoring Requirements</u>

Table 4. LUP Type 2 & 3 Effluent Monitoring Requirements

LUP Type	Frequency	Effluent Monitoring
2	Minimum of 3 samples per day characterizing discharges associated with construction activity from the project active areas of construction.	Turbidity, pH, and non-visible pollutant parameters (if applicable)
3	Minimum of 3 samples per day characterizing discharges associated with construction activity from the project active areas of construction.	turbidity, pH, and non-visible pollutant parameters (if applicable)

i LUP Type 2 & 3 dischargers shall collect storm water grab samples from sampling locations characterizing discharges associated with activity from the LUP active areas of construction. At a minimum, 3 samples shall be collected per day of discharge.

ii LUP Type 2 & 3 dischargers shall collect samples of stored or contained storm water that is discharged subsequent to a storm event producing precipitation of ½ inch or more at the time of discharge.

iii LUP Type 2 & 3 dischargers shall ensure that storm water grab sample(s) obtained be representative of the flow and characteristics of the discharge.

iv LUP Type 2 & 3 dischargers shall analyze their effluent samples for:

(1) pH and turbidity
(2) Any additional parameter for which monitoring is required by the Regional Water Board.

c. <u>LUP Type 2 & 3 Storm Water Effluent Sampling Locations</u>

i LUP Type 2 & 3 dischargers shall perform sampling and analysis of storm water discharges to characterize discharges associated with construction activity from the entire disturbed project or area.

ii LUP Type 2 & 3 dischargers may monitor and report run-on from surrounding areas if there is reason to believe run-on may contribute to exceedance of NALs.

iii LUP Type 2 & 3 dischargers shall select analytical test methods from the list provided in Table 5 below.

iv LUP Type 2 & 3 dischargers shall ensure that all storm water sample collection preservation and handling shall be conducted in accordance with the “Storm Water Sample Collection and Handling Instructions” below.

d. <u>LUP Type 3 Receiving Water Monitoring Requirements</u>

i In the event that an LUP Type 3 discharger’s effluent exceeds the receiving water monitoring triggers of 500 NTU turbidity or pH range of 6.0-9.0, contained in this General Permit and has a direct discharge to receiving waters, the LUP discharger shall subsequently sample Receiving Waters (RWs) for turbidity, pH (if applicable) and SSC for the duration of coverage under this General Permit. In the event that an LUP Tupe 3 discharger utilizing ATS with direct discharges into receiving waters discharges effluent that exceeds the NELs in this permit, the discharger shall

subsequently sample RWs for turbidity, pH (if applicable), and SSC for the duration of coverage under this General Permit.

ii LUP Type 3 dischargers that meet the project criteria in Appendix 3 of this General Permit and have more than 30 acres of soil disturbance in the project area or project section area designated as Type 3, shall comply with the Bioassessment requirements prior to commencement of construction activity.

iii LUP Type 3 dischargers shall obtain RW samples in accordance with the requirements of the Receiving Water Sampling Locations section (Section M.4.c. of this Attachment).

e. LUP Type 3 Receiving Water Sampling Locations

i **Upstream/up-gradient RW samples**: LUP Type 3 dischargers shall obtain any required upstream/up-gradient receiving water samples from a representative and accessible location as close as possible to and upstream from the effluent discharge point.

ii **Downstream/down-gradient RW samples**: LUP Type 3 dischargers shall obtain any required downstream/down-gradient receiving water samples from a representative and accessible location as close as possible to and downstream from the effluent discharge point.

iii If two or more discharge locations discharge to the same receiving water, LUP Type 3 dischargers may sample the receiving water at a single upstream and downstream location.

f. LUP Type 2 & 3 Monitoring Requirements for Non-Visible Pollutants

LUP Type 2 & 3 dischargers shall implement sampling and analysis requirements to monitor non-visible pollutants associated with (1) construction sites; (2) activities producing pollutants that are not visually detectable in storm water discharges; and (3) activities which could cause or contribute to an exceedance of water quality objectives in the receiving waters.

i Sampling and analysis for non-visible pollutants is only required where LUP Type 2 & 3 dischargers believe pollutants associated with construction activities have the potential to be discharged with storm water runoff due to a spill or in the event there was a breach, malfunction, failure and/or leak of any BMP. Also, failure to implement BMPs may require sample collection.

(1) Visual observations made during the monitoring program described above will help LUP Type 2 & 3 dischargers determine when to collect samples.

(2) LUP Type 2 & 3 dischargers are not required to sample if one of the conditions described above (e.g., breach or spill) occurs and the site is cleaned of material and pollutants and/or BMPs are implemented prior to the next storm event.

ii LUP Type 2 & 3 dischargers shall collect samples down-gradient from the discharge locations where the visual observations were made triggering the monitoring and which can be safely accessed. For sites where sampling and analysis is required, personnel trained in water quality sampling procedures shall collect storm water samples.

iii If sampling for non-visible pollutant parameters is required, LUP Type 2 & 3 dischargers shall ensure that samples be analyzed for parameters indicating the presence of pollutants identified in the pollutant source assessment required in Section J.2.a.i.

iv LUP Type 2 & 3 dischargers shall collect samples during the first two hours of discharge from rain events that occur during business hours and which generate runoff.

v LUP Type 2 & 3 dischargers shall ensure that a sufficiently large sample of storm water that has not come into contact with the disturbed soil or the materials stored or used on-site (uncontaminated sample[13]) will be collected for comparison with the discharge sample. Samples shall be collected during the first two hours of discharge from rain events that occur during daylight hours and which generate runoff.

vi LUP Type 2 & 3 dischargers shall compare the uncontaminated sample to the samples of discharge using field analysis or through laboratory analysis. Analyses may include, but are not limited to, indicator parameters such as: pH, specific conductance, dissolved oxygen, conductivity, salinity, and Total Dissolved Solids (TDS).

vii For laboratory analyses, all sampling, sample preservation, and other analyses must be conducted according to test procedures pursuant to 40 C.F.R. Part 136. LUP Type 2 & 3 dischargers shall ensure that field samples are collected and analyzed according to manufacturer specifications of the sampling devices employed.

[13] Sample collected at a location unaffected by construction activities

Portable meters shall be calibrated according to manufacturer's specification.

viii LUP Type 2 & 3 dischargers shall ensure that all field and/or analytical data are kept in the SWPPP document.

g. LUP Type 2 & 3 Visual Observation and Sample Collection Exceptions

i LUP Type 2 & 3 dischargers shall be prepared to collect samples and conduct visual observation (inspections) to meet the minimum visual observation requirements of this Attachment. Type 2 & 3 LUP dischargers are not required to physically collect samples or conduct visual observation (inspections) under the following conditions:

(1) During dangerous weather conditions such as flooding and electrical storms;

(2) Outside of scheduled site business hours.

(3) When access to the site is unsafe due to storm events.

ii If the LUP Type 2 or 3 discharger does not collect the required samples or visual observation (inspections) due to these exceptions, an explanation why the sampling or visual observation (inspections) were not conducted shall be included in both the SWPPP and the Annual Report.

h. LUP Type 2 & 3 Storm Water Sample Collection and Handling Instructions

LUP Type 2 & 3 dischargers shall refer to Table 5 below for test Methods, detection Limits, and reporting Units. During storm water sample collection and handling, the LUP Type 2 & 3 discharger shall:

i Identify the parameters required for testing and the number of storm water discharge points that will be sampled. Request the laboratory to provide the appropriate number of sample containers, types of containers, sample container labels, blank chain of custody forms, and sample preservation instructions.

ii Determine how to ship the samples to the laboratory. The testing laboratory should receive samples within 48 hours of the physical sampling (unless otherwise required by the laboratory). The options are to either deliver the samples to the laboratory, arrange to have the laboratory pick them up, or ship them overnight to the laboratory.

iii Use only the sample containers provided by the laboratory to collect and store samples. Use of any other type of containers could contaminate your samples.

iv Prevent sample contamination, by not touching, or putting anything into the sample containers before collecting storm water samples.

v Not overfilling sample containers. Overfilling can change the analytical results.

vi Tightly screw the cap of each sample container without stripping the threads of the cap.

vii Complete and attach a label to each sample container. The label shall identify the date and time of sample collection, the person taking the sample, and the sample collection location or discharge point. The label should also identify any sample containers that have been preserved.

viii Carefully pack sample containers into an ice chest or refrigerator to prevent breakage and maintain temperature during shipment. Remember to place frozen ice packs into the shipping container. Samples should be kept as close to 4° C (39° F) as possible until arriving at the laboratory. Do not freeze samples.

ix Complete a Chain of Custody form for each set of samples. The Chain of Custody form shall include the discharger's name, address, and phone number, identification of each sample container and sample collection point, person collecting the samples, the date and time each sample container was filled, and the analysis that is required for each sample container.

x Upon shipping/delivering the sample containers, obtain both the signatures of the persons relinquishing and receiving the sample containers.

xi Designate and train personnel to collect, maintain, and ship samples in accordance with the above sample protocols and good laboratory practices.

xii Refer to the Surface Water Ambient Monitoring Program's (SWAMP) 2008 Quality Assurance Program Plan (QAPrP) for more

information on sampling collection and analysis. See http://www.waterboards.ca.gov/water_issues/programs/swamp/[14]

Table 5. Test Methods, Detection Limits, Reporting Units and Applicable NALs

Parameter	Test Method	Discharge Type	Min. Detection Limit	Reporting Units	Numeric Action Levels	(LUP Type 3) Receiving Water Monitoring Trigger
pH	Field test with calibrated portable instrument	Type 2 & 3	0.2	pH units	Lower = 6.5 upper = 8.5	Lower = 6.0 upper = 9.0
Turbidity	EPA 0180.1 and/or field test with calibrated portable instrument	Type 2 & 3	1	NTU	250 NTU	500 NTU
SSC	ASTM Method D 3977-97[15]	Type 3 if Receiving Water Monitoring Trigger is exceeded	5	Mg/L	N/A	N/A
Bioassessment	(STE) Level I of (SAFIT),[16] fixed-count of 600 org/sample	Type 3 LUPs > 30 acres	N/A	N/A	N/A	N/A

i. <u>LUP Type 2 & 3 Monitoring Methods</u>

i The LUP Type 2 or 3 discharger's project M&RP shall include a description of the following items:

(1) Visual observation locations, visual observation procedures, and visual observation follow-up and tracking procedures.

[14] Additional information regarding SWAMP's QAPrP can be found at: http://www.waterboards.ca.gov/water_issues/programs/swamp/.
[15] ASTM, 1999, Standard Test Method for Determining Sediment Concentration in Water Samples: American Society of Testing and Materials, D 3977-97, Vol. 11.02, pp. 389-394
[16] The current SAFIT STEs (28 November 2006) list requirements for both the Level I and Level II taxonomic effort, and are located at: http://www.swrcb.ca.gov/swamp/docs/safit/ste_list.pdf. When new editions are published by SAFIT, they will supersede all previous editions. All editions will be posted at the State Water Board's SWAMP website.

(2) Sampling locations, and sample collection and handling procedures. This shall include detailed procedures for sample collection, storage, preservation, and shipping to the testing lab to assure that consistent quality control and quality assurance is maintained. Dischargers shall attach to the monitoring program a copy of the Chain of Custody form used when handling and shipping samples.

(3) Identification of the analytical methods and related method detection limits (if applicable) for each parameter required in Section M.4.f above.

ii LUP Type 2 & 3 dischargers shall ensure that all sampling and sample preservation be in accordance with the current edition of "Standard Methods for the Examination of Water and Wastewater" (American Public Health Association). All monitoring instruments and equipment (including a discharger's own field instruments for measuring pH and turbidity) shall be calibrated and maintained in accordance with manufacturers' specifications to ensure accurate measurements. All laboratory analyses shall be conducted according to test procedures under 40 CFR Part 136, unless other test procedures have been specified in this General Permit or by the Regional Water Board. With the exception of field analysis conducted by the discharger for turbidity and pH, all analyses shall be sent to and conducted at a laboratory certified for such analyses by the State Department of Health Services (SSC exception). The LUP discharger shall conduct its own field analysis of pH and may conduct its own field analysis of turbidity if the discharger has sufficient capability (qualified and trained employees, properly calibrated and maintained field instruments, etc.) to adequately perform the field analysis.

j. <u>LUP Type 2 & 3 Analytical Methods</u>

LUP Type 2 & 3 dischargers shall refer to Table 5 above for test Methods, detection Limits, and reporting Units.

i **pH**: LUP Type 2 & 3 dischargers shall perform pH analysis on-site with a calibrated pH meter or pH test kit. The LUP discharger shall record pH monitoring results on paper and retain these records in accordance with Section M.4.o, below.

ii **Turbidity**: LUP Type 2 & 3 dischargers shall perform turbidity analysis using a calibrated turbidity meter (turbidimeter), either on-site or at an accredited lab. Acceptable test methods include Standard Method 2130 or USEPA Method 180.1. The results shall

be recorded in the site log book in Nephelometric Turbidity Units (NTU).

iii **Suspended sediment concentration (SSC)**: LUP Type 3 dischargers exceeding the turbidity Receiving Water Monitoring Trigger, shall perform SSC analysis using ASTM Method D3977-97.

iv **Bioassessment**: LUP Type 3 dischargers shall perform bioassessment sampling and analysis according to Appendix 3 of this General Permit.

k. Watershed Monitoring Option

If an LUP Type 2 or 3 discharger is part of a qualified regional watershed-based monitoring program the LUP Type 2 or 3 discharger may be eligible for relief from the monitoring requirements in this Attachment. The Regional Water Board may approve proposals to substitute an acceptable watershed-based monitoring program if it determines that the watershed-based monitoring program will provide information to determine each discharger's compliance with the requirements of this General Permit.

l. Particle Size Analysis for Risk Justification

LUP Type 2 & 3 dischargers justifying an alternative project risk shall report a soil particle size analysis used to determine the RUSLE K-Factor. ASTM D-422 (Standard Test Method for Particle-Size Analysis of Soils), as revised, shall be used to determine the percentages of sand, very fine sand, silt, and clay on the site.

m. NAL Exceedance Report

i In the event that any effluent sample exceeds an applicable NAL, the Regional Water Boards may require LUP Type 2 & 3 dischargers to submit NAL Exceedance Reports.

ii LUP Type 2 & 3 dischargers shall certify each NAL Exceedance Report in accordance with the Special Provisions for Construction Activity.

iii LUP Type 2 & 3 dischargers shall retain an electronic or paper copy of each NAL Exceedance Report for a minimum of three years after the date the exceedance report is filed.

iv LUP Type 2 & 3 dischargers shall include in the NAL Exceedance Report:

(1) the analytical method(s), method reporting unit(s), and method detection limit(s) of each analytical parameter (analytical results that are less than the method detection limit shall be reported as "less than the method detection limit"); and
(2) the date, place, time of sampling, visual observation (inspections), and/or measurements, including precipitation.
(3) Description of the current BMPs associated with the effluent sample that exceeded the NAL and the proposed corrective actions taken.

n. Monitoring Records

LUP Type 2 & 3 dischargers shall ensure that records of all storm water monitoring information and copies of all reports (including Annual Reports) required by this General Permit be retained for a period of at least three years. LUP Type 2 & 3 dischargers may retain records off-site and make them available upon request. These records shall include:

i The date, place, time of facility inspections, sampling, visual observation (inspections), and/or measurements, including precipitation (rain gauge);

ii The individual(s) who performed the facility inspections, sampling, visual observation (inspections), and or measurements;

iii The date and approximate time of analyses;

iv The individual(s) who performed the analyses;

v A summary of all analytical results from the last three years, the method detection limits and reporting units, the analytical techniques or methods used, and all chain of custody forms;

vi Quality assurance/quality control records and results;

vii Non-storm water discharge inspections and visual observation (inspections) and storm water discharge visual observation records (see Section M.4.a above);

viii Visual observation and sample collection exception records (see Section M.4.g above); and

ix The records of any corrective actions and follow-up activities that resulted from analytical results, visual observation (inspections), or inspections.

ATTACHMENT A.1
LUP Project Area or Project Section Area Type Determination

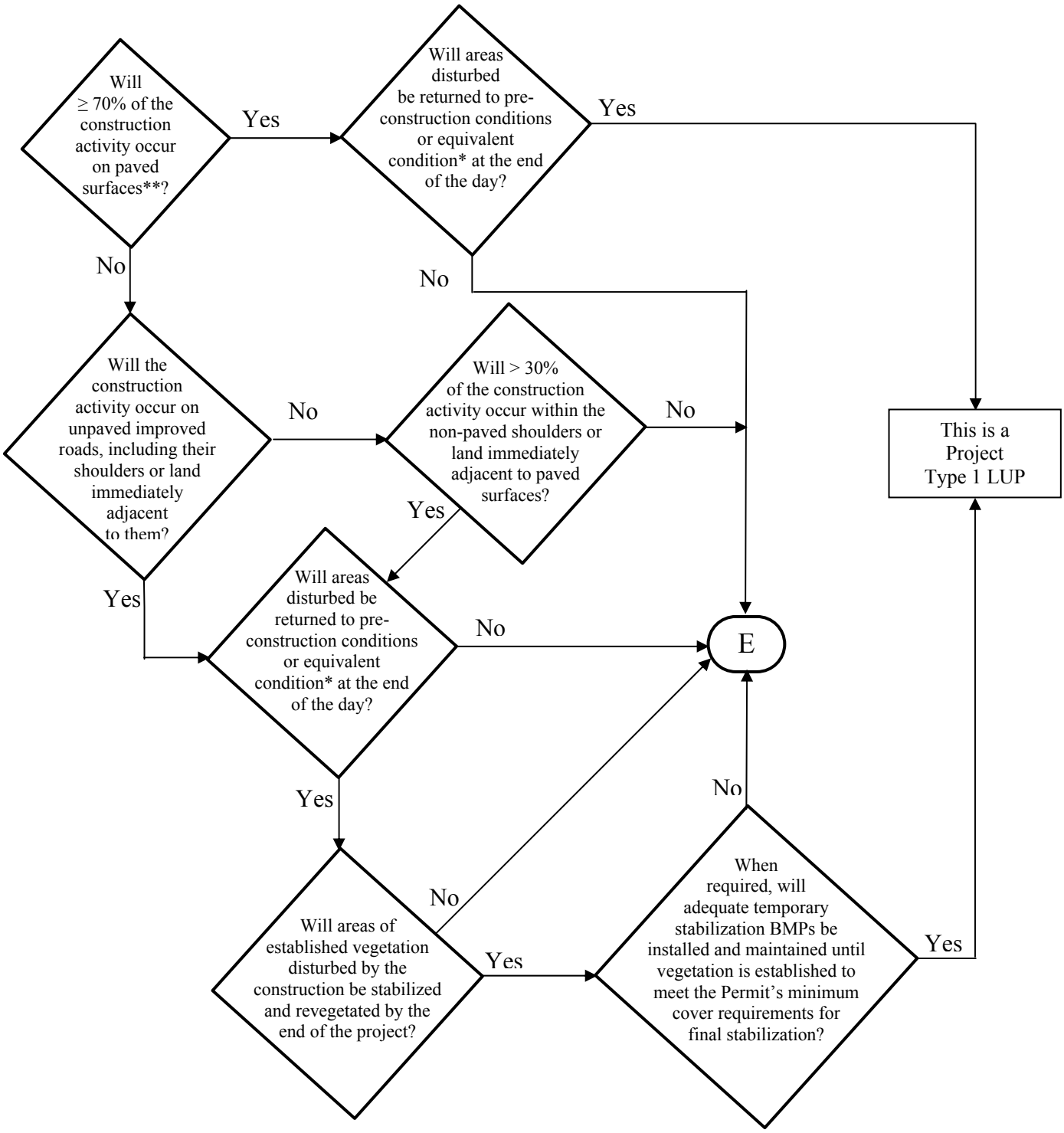

*See Definition of Terms
** Or: "Will < 30% of the soil disturbance occur on unpaved surfaces?

ATTACHMENT A.1
LUP Project Area or Project Section Area Type Determination

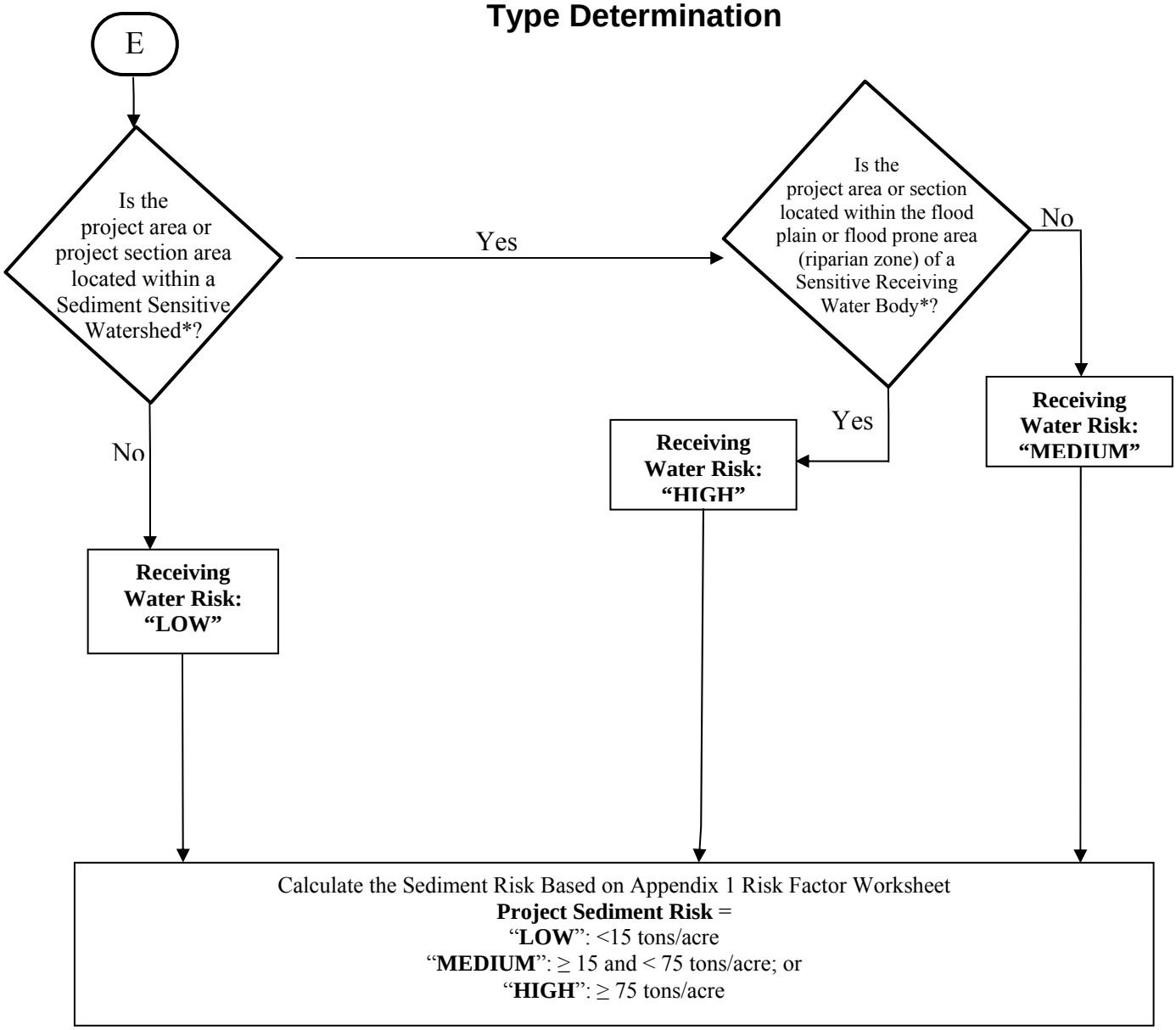

* See Definition of Terms

PROJECT SEDIMENT RISK

RECEIVING WATER RISK	**LOW**	**MEDIUM**	**HIGH**
LOW	Type 1	Type 1	Type 2
MEDIUM	Type 1	Type 2	Type 3
HIGH	Type 2	Type 3	Type 3

ATTACHMENT A.1
Definition of Terms

1. **Equivalent Condition** – Means disturbed soils such as those from trench excavation are required to be hauled away, backfilled into the trench, and/or covered (e.g., metal plates, pavement, plastic covers over spoil piles) at the end of the construction day.
2. **Linear Construction Activity** – Linear construction activity consists of underground/ overhead facilities that typically include, but are not limited to, any conveyance, pipe or pipeline for the transportation of any gaseous, liquid (including water, wastewater for domestic municipal services), liquescent, or slurry substance; any cable line or wire for the transmission of electrical energy; any cable line or wire for communications (e.g., telephone, telegraph, radio or television messages); and associated ancillary facilities. Construction activities associated with LUPs include, but are not limited to those activities necessary for the installation of underground and overhead linear facilities (e.g., conduits, substructures, pipelines, towers, poles, cables, wires, connectors, switching, regulating and transforming equipment and associated ancillary facilities) and include, but are not limited to, underground utility mark-out, potholing, concrete and asphalt cutting and removal, trenching, excavation, boring and drilling, access road and pole/ tower pad and cable/ wire pull station, substation construction, substructure installation, construction of tower footings and/or foundations, pole and tower installations, pipeline installations, welding, concrete and/or pavement repair or replacement, and stockpile/ borrow locations.
3. **Sediment Sensitive Receiving Water Body –** Defined as a water body segment that is listed on EPA's approved CWA 303(d) list for sedimentation/siltation, turbidity, or is designated with beneficial uses of SPAWN, MIGRATORY, and COLD.
4. **Sediment Sensitive Watershed –** Defined as a watershed draining into a receiving water body listed on EPA's approved CWA 303(d) list for sedimentation/siltation, turbidity, or a water body designated with beneficial uses of SPAWN, MIGRATORY, and COLD.

ATTACHMENT A.2
PERMIT REGISTRATION DOCUMENTS (PRDs)
GENERAL INSTRUCTIONS FOR LINEAR UNDERGROUND/OVERHEAD PROJECTS TO COMPLY WITH THE CONSTRUCTION GENERAL PERMIT

GENERAL INSTRUCTIONS

Who Must Submit

This permit is effective on July 1, 2010.

The Legally Responsible Person (LRP) for construction activities associated with linear underground/overhead project (LUP) must electronically apply for coverage under this General Permit on or after July 1, 2010. If it is determined that the LUP construction activities require an NPDES permit, the Legally Responsible Person[1] (LRP) shall submit PRDs for this General Permit in accordance with the following:

LUPs associated with Private or Municipal Development Projects

1. For LUPs associated with pre-development and pre-redevelopment construction activities:

   The LRP must obtain coverage[2] under this General Permit for its pre-development and pre-redevelopment construction activities where the total disturbed land area of these construction activities is greater than 1 acre.

2. For LUPs associated with new development and redevelopment construction projects:

   The LRP must obtain coverage under this General Permit for LUP construction activities associated with new development and redevelopment projects where the total disturbed land area of the LUP is greater than 1 acre. Coverage under this permit is not required where the same LUP construction activities are covered by another NPDES permit.

LUPs not associated with private or municipal new development or redevelopment projects:

The LRP must obtain coverage under this General Permit on or after July 1, 2010 for its LUP construction activities where the total disturbed land area is greater than 1 acre.

PRD Submittal Requirements

Prior to the start of construction activities a LRP must submit PRDs and fees to the State Water Board for each LUP.

New and Ongoing LUPs

Dischargers of new LUPs that commence construction activities after the adoption date of this General Permit shall file PRDs prior to the commencement of construction and implement the SWPPP upon the start of construction.

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[1] person possessing the title of the land on which the construction activities will occur for the regulated site
[2] obtain coverage means filing PRDs for the project.

PERMIT REGISTRATION DOCUMENTS (PRDs)
GENERAL INSTRUCTIONS (CONTINUED)

Dischargers of ongoing LUPs that are currently covered under State Water Board Order No. 2003-0007 (Small LUP General Permit) shall electronically file Permit Registration Documents no later than July 1, 2010. After July 1, 2010, all NOIs subject to State Water Board Order No. 2003-0007-DWQ will be terminated. All existing dischargers shall be exempt from the risk determination requirements in Attachment A. All existing dischargers are therefore subject to LUP Type 1 requirements regardless of their project's sediment and receiving water risks. However, a Regional Board retains the authority to require an existing discharger to comply with the risk determination requirements in Attachment A.

Where to Apply

The Permit Registration Documents (PRDs) can be found at www.waterboards.ca.gov/water_issues/programs/stormwater/

Fees

The annual fee for storm water permits are established through the State of California Code of Regulations.

When Permit Coverage Commences

To obtain coverage under the General Permit, the LRP must include the complete PRDs and the annual fee. All PRDs deemed incomplete will be rejected with an explanation as to what is required to complete submittal. Upon receipt of complete PRDs and associated fee, each discharger will be sent a waste discharger's identification (WDID) number.

Projects and Activities Not Defined As Construction Activity

1. LUP construction activity does not include routine maintenance projects to maintain original line and grade, hydraulic capacity, or original purpose of the facility. Routine maintenance projects are projects associated with operations and maintenance activities that are conducted on existing lines and facilities and within existing right-of-way, easements, franchise agreements or other legally binding agreements of the discharger. Routine maintenance projects include, but are not limited to projects that are conducted to:

    - Maintain the original purpose of the facility, or hydraulic capacity.
    - Update existing lines[3] and facilities to comply with applicable codes, standards and regulations regardless if such projects result in increased capacity.
    - Repairing leaks.

    Routine maintenance does not include construction of new[4] lines or facilities resulting from compliance with applicable codes, standards and regulations.

[3] Update existing lines includes replacing existing lines with new materials or pipes.
[4] New lines are those that are not associated with existing facilities and are not part of a project to update or replace existing lines.

PERMIT REGISTRATION DOCUMENTS (PRDs)
GENERAL INSTRUCTIONS (CONTINUED)

Routine maintenance projects do not include those areas of maintenance projects that are outside of an existing right-of-way, franchise, easements, or agreements. When a project must acquire new areas, those areas may be subject to this General Permit based on the area of disturbed land outside the original right-of-way, easement, or agreement.

2. LUP construction activity does not include field activities associated with the planning and design of a project (e.g., activities associated with route selection).

3. Tie-ins conducted immediately adjacent to "energized" or "pressurized" facilities by the discharger are not considered small construction activities where all other LUP construction activities associated with the tie-in are covered by a NOI and SWPPP of a third party or municipal agency.

Calculating Land Disturbance Areas of LUPs

The total land area disturbed for LUPs is the sum of the:

- Surface areas of trenches, laterals and ancillary facilities, plus
- Area of the base of stockpiles on unpaved surfaces, plus
- Surface area of the borrow area, plus
- Areas of paved surfaces constructed for the project, plus
- Areas of new roads constructed or areas of major reconstruction to existing roads (e.g. improvements to two-track surfaces or road widening) for the sole purpose of accessing construction activities or as part of the final project, plus
- Equipment and material storage, staging, and preparation areas (laydown areas) not on paved surfaces, plus
- Soil areas outside the surface area of trenches, laterals and ancillary facilities that will be graded, and/or disturbed by the use of construction equipment, vehicles and machinery during construction activities.

Stockpiling Areas

Stockpiling areas, borrow areas and the removal of soils from a construction site may or may not be included when calculating the area of disturbed soil for a site depending on the following conditions:

- For stockpiling of soils onsite or immediately adjacent to a LUP site and the stockpile is not on a paved surface, the area of the base of the stockpile is to be included in the disturbed area calculation.

- The surface area of borrow areas that are onsite or immediately adjacent to a project site are to be included in the disturbed area calculation.

- For soil that is hauled offsite to a location owned or operated by the discharger that is not a paved surface, the area of the base of the stockpile is to be included in the disturbed area calculation except when the offsite location is already subject to a separate storm water permit.

PERMIT REGISTRATION DOCUMENTS (PRDs)
GENERAL INSTRUCTIONS (CONTINUED)

- For soil that is brought to the project from an off-site location owned or operated by the discharger the surface area of the borrow pit is to be included in the disturbed area calculation except when the offsite location is already subject to a separate storm water permit.

- Trench spoils on a paved surface that are either returned to the trench or excavation or hauled away from the project daily for disposal or reuse will not be included in the disturbed area calculation.

If you have any questions concerning submittal of PRDs, please call the State Water Board at (866) 563-3107.

ATTACHMENT B
PERMIT REGISTRATION DOCUMENTS (PRDs) TO COMPLY WITH THE TERMS OF THE GENERAL PERMIT TO DISCHARGE STORM WATER ASSOCIATED WITH CONSTRUCTION ACTIVITY

GENERAL INSTRUCTIONS

A. All Linear Construction Projects shall comply with the PRD requirements in Attachment A.2 of this Order.

B. Who Must Submit

Discharges of storm water associated with construction that results in the disturbance of one acre or more of land must apply for coverage under the General Construction Storm Water Permit (General Permit). Any construction activity that is a part of a larger common plan of development or sale must also be permitted, regardless of size. (For example, if 0.5 acre of a 20-acre subdivision is disturbed by the construction activities of discharger A and the remaining 19.5 acres is to be developed by discharger B, discharger A must obtain a General Storm Water Permit for the 0.5 acre project).

Other discharges from construction activities that are covered under this General Permit can be found in the General Permit Section II.B.

It is the LRP's responsibility to obtain coverage under this General Permit by electronically submitting complete PRDs (Permit Registration Documents).

In all cases, the proper procedures for submitting the PRDs must be completed before construction can commence.

C. Construction Activity Not Covered By This General Permit

Discharges from construction that are not covered under this General Permit can be found in the General Permit Sections II.A &B..

D. Annual Fees and Fee Calculation

Annual fees are calculated based upon the total area of land to be disturbed not the total size of the acreage owned. However, the calculation includes all acres to be disturbed during the duration of the project. For example, if 10 acres are scheduled to be disturbed the first year and 10 in each subsequent year for 5 years, the annual fees would be based upon 50 acres of disturbance. The State Water Board will evaluate adding acreage to an existing Permit Waste Discharge Identification (WDID) number on a case-by-case basis. In general, any acreage to be considered must be contiguous to the permitted land area and the existing

SWPPP must be appropriate for the construction activity and topography of the acreage under consideration. As acreage is built out and stabilized or sold, the Change of Information (COI) form enables the applicant to remove those acres from inclusion in the annual fee calculation. Checks should be made payable to: State Water Board.

The Annual fees are established through regulations adopted by the State Water Board. The total annual fee is the current base fee plus applicable surcharges for all construction sites submitting an NOI, based on the total acreage to be disturbed during the life of the project. Annual fees are subject to change by regulation.

Dischargers that apply for and satisfy the Small Construction Erosivity Wavier requirements shall pay a fee of $200.00 plus an applicable surcharge, see the General Permit Section II.B.7.

E. When to Apply

LRP's proposing to conduct construction activities subject to this General Permit must submit their PRDs prior to the commencement of construction activity.

F. Requirements for Completing Permit Registration Documents (PRDs)

All dischargers required to comply with this General Permit shall electronically submit the required PRDs for their type of construction as defined below.

G. Standard PRD Requirements (All Dischargers)

1. Notice of Intent
2. Risk Assessment (Standard or Site-Specific)
3. Site Map
4. SWPPP
5. Annual Fee
6. Certification

H. Additional PRD Requirements Related to Construction Type

1. Discharger in unincorporated areas of the State (not covered under an adopted Phase I or II SUSMP requirements) and that are not a linear project shall also submit a completed:
   a. Post-Construction Water Balance Calculator (Appendix 2).

2. Dischargers who are proposing to implement ATS shall submit:
   a. Complete ATS Plan in accordance with Attachment F at least 14 days prior to the planned operation of the ATS and a paper copy shall be available onsite during ATS operation.

b. Certification proof that design done by a professional in accordance with Attachment F.

3. Dischargers who are proposing an alternate Risk Justification:
   a. Particle Size Analysis.

I. Exceptions to Standard PRD Requirements

Construction sites with an R value less than 5 as determined in the Risk Assessment are not required to submit a SWPPP.

J. Description of PRDs

1. Notice of Intent (NOI)

2. Site Map(s) Includes:
   a. The project's surrounding area (vicinity)
   b. Site layout
   c. Construction site boundaries
   d. Drainage areas
   e. Discharge locations
   f. Sampling locations
   g. Areas of soil disturbance (temporary or permanent)
   h. Active areas of soil disturbance (cut or fill)
   i. Locations of all runoff BMPs
   j. Locations of all erosion control BMPs
   k. Locations of all sediment control BMPs
   l. ATS location (if applicable)
   m. Locations of sensitive habitats, watercourses, or other features which are not to be disturbed
   n. Locations of all post-construction BMPs
   o. Locations of storage areas for waste, vehicles, service, loading/unloading of materials, access (entrance/exits) points to construction site, fueling, and water storage, water transfer for dust control and compaction practices

3. **SWPPPs**
   A site-specific SWPPP shall be developed by each discharger and shall be submitted with the PRDs.

4. **Risk Assessment**
   All dischargers shall use the Risk Assessment procedure as describe in the General Permit Appendix 1.

   a. The Standard Risk Assessment includes utilization of the following:
      i. Receiving water Risk Assessment interactive map

ii. EPA Rainfall Erosivity Factor Calculator Website
iii. Sediment Risk interactive map
iv. Sediment sensitive water bodies list

b. The Site-Specific Risk Assessment includes the completion of the hand calculated R value Risk Calculator

5. **Post-Construction Water Balance Calculator**
All dischargers subject to this requirement shall complete the Water Balance Calculator (in Appendix 2) in accordance with the instructions.

6. **ATS Design Document and Certification**
All dischargers using ATS must submit electronically their system design (as well as any supporting documentation) and proof that the system was designed by a qualified ATS design professional (See Attachment F).

To obtain coverage under the General Permit PRDs must be included and completed. If any of the required items are missing, the PRD submittal is considered incomplete and will be rejected. Upon receipt of a complete PRD submittal, the State Water Board will process the application package in the order received and assign a (WDID) number.

Questions?

If you have any questions on completing the PRDs please email stormwater@waterboards.ca.gov or call (866) 563-3107.

ATTACHMENT C
RISK LEVEL 1 REQUIREMENTS

A. Effluent Standards

[These requirements are the same as those in the General Permit order.]

1. Narrative – Risk Level 1 dischargers shall comply with the narrative effluent standards listed below:

   a. Storm water discharges and authorized non-storm water discharges regulated by this General Permit shall not contain a hazardous substance equal to or in excess of reportable quantities established in 40 C.F.R. §§ 117.3 and 302.4, unless a separate NPDES Permit has been issued to regulate those discharges.

   b. Dischargers shall minimize or prevent pollutants in storm water discharges and authorized non-storm water discharges through the use of controls, structures, and management practices that achieve BAT for toxic and non-conventional pollutants and BCT for conventional pollutants.

2. Numeric – Risk Level 1 dischargers are not subject to a numeric effluent standard.

B. Good Site Management "Housekeeping"

1. Risk Level 1 dischargers shall implement good site management (i.e., "housekeeping") measures for construction materials that could potentially be a threat to water quality if discharged. At a minimum, Risk Level 1 dischargers shall implement the following good housekeeping measures:

   a. Conduct an inventory of the products used and/or expected to be used and the end products that are produced and/or expected to be produced. This does not include materials and equipment that are designed to be outdoors and exposed to environmental conditions (i.e. poles, equipment pads, cabinets, conductors, insulators, bricks, etc.).

   b. Cover and berm loose stockpiled construction materials that are not actively being used (i.e. soil, spoils, aggregate, fly-ash, stucco, hydrated lime, etc.).

c. Store chemicals in watertight containers (with appropriate secondary containment to prevent any spillage or leakage) or in a storage shed (completely enclosed).

d. Minimize exposure of construction materials to precipitation. This does not include materials and equipment that are designed to be outdoors and exposed to environmental conditions (i.e. poles, equipment pads, cabinets, conductors, insulators, bricks, etc.).

e. Implement BMPs to prevent the off-site tracking of loose construction and landscape materials.

2. Risk Level 1 dischargers shall implement good housekeeping measures for waste management, which, at a minimum, shall consist of the following:

a. Prevent disposal of any rinse or wash waters or materials on impervious or pervious site surfaces or into the storm drain system.

b. Ensure the containment of sanitation facilities (e.g., portable toilets) to prevent discharges of pollutants to the storm water drainage system or receiving water.

c. Clean or replace sanitation facilities and inspecting them regularly for leaks and spills.

d. Cover waste disposal containers at the end of every business day and during a rain event.

e. Prevent discharges from waste disposal containers to the storm water drainage system or receiving water.

f. Contain and securely protect stockpiled waste material from wind and rain at all times unless actively being used.

g. Implement procedures that effectively address hazardous and non-hazardous spills.

h. Develop a spill response and implementation element of the SWPPP prior to commencement of construction activities. The SWPPP shall require that:

i. Equipment and materials for cleanup of spills shall be available on site and that spills and leaks shall be cleaned up immediately and disposed of properly; and

ii. Appropriate spill response personnel are assigned and trained.

i. Ensure the containment of concrete washout areas and other washout areas that may contain additional pollutants so there is no discharge into the underlying soil and onto the surrounding areas.

3. Risk Level 1 dischargers shall implement good housekeeping for vehicle storage and maintenance, which, at a minimum, shall consist of the following:

   a. Prevent oil, grease, or fuel to leak in to the ground, storm drains or surface waters.

   b. Place all equipment or vehicles, which are to be fueled, maintained and stored in a designated area fitted with appropriate BMPs.

   c. Clean leaks immediately and disposing of leaked materials properly.

4. Risk Level 1 dischargers shall implement good housekeeping for landscape materials, which, at a minimum, shall consist of the following:

   a. Contain stockpiled materials such as mulches and topsoil when they are not actively being used.

   b. Contain fertilizers and other landscape materials when they are not actively being used.

   c. Discontinue the application of any erodible landscape material within 2 days before a forecasted rain event or during periods of precipitation.

   d. Apply erodible landscape material at quantities and application rates according to manufacture recommendations or based on written specifications by knowledgeable and experienced field personnel.

   e. Stack erodible landscape material on pallets and covering or storing such materials when not being used or applied.

5. Risk Level 1 dischargers shall conduct an assessment and create a list of potential pollutant sources and identify any areas of the site where additional BMPs are necessary to reduce or prevent pollutants in storm water discharges and authorized non-storm water discharges. This potential pollutant list shall be kept with the SWPPP and shall identify

all non-visible pollutants which are known, or should be known, to occur on the construction site. At a minimum, when developing BMPs, Risk Level 1 dischargers shall do the following:

a. Consider the quantity, physical characteristics (e.g., liquid, powder, solid), and locations of each potential pollutant source handled, produced, stored, recycled, or disposed of at the site.

b. Consider the degree to which pollutants associated with those materials may be exposed to and mobilized by contact with storm water.

c. Consider the direct and indirect pathways that pollutants may be exposed to storm water or authorized non-storm water discharges. This shall include an assessment of past spills or leaks, non-storm water discharges, and discharges from adjoining areas.

d. Ensure retention of sampling, visual observation, and inspection records.

e. Ensure effectiveness of existing BMPs to reduce or prevent pollutants in storm water discharges and authorized non-storm water discharges.

6. Risk Level 1 dischargers shall implement good housekeeping measures on the construction site to control the air deposition of site materials and from site operations. Such particulates can include, but are not limited to, sediment, nutrients, trash, metals, bacteria, oil and grease and organics.

C. Non-Storm Water Management

1. Risk Level 1 dischargers shall implement measures to control all non-storm water discharges during construction.

2. Risk Level 1 dischargers shall wash vehicles in such a manner as to prevent non-storm water discharges to surface waters or MS4 drainage systems.

3. Risk Level 1 dischargers shall clean streets in such a manner as to prevent unauthorized non-storm water discharges from reaching surface water or MS4 drainage systems.

D. Erosion Control

1. Risk Level 1 dischargers shall implement effective wind erosion control.

2. Risk Level 1 dischargers shall provide effective soil cover for inactive[1] areas and all finished slopes, open space, utility backfill, and completed lots.

3. Risk Level 1 dischargers shall limit the use of plastic materials when more sustainable, environmentally friendly alternatives exist. Where plastic materials are deemed necessary, the discharger shall consider the use of plastic materials resistant to solar degradation.

E. Sediment Controls

1. Risk Level 1 dischargers shall establish and maintain effective perimeter controls and stabilize all construction entrances and exits to sufficiently control erosion and sediment discharges from the site.

2. On sites where sediment basins are to be used, Risk Level 1 dischargers shall, at minimum, design sediment basins according to the method provided in CASQA's Construction BMP Guidance Handbook.

F. Run-on and Runoff Controls

Risk Level 1 dischargers shall effectively manage all run-on, all runoff within the site and all runoff that discharges off the site. Run-on from off site shall be directed away from all disturbed areas or shall collectively be in compliance with the effluent limitations in this General Permit.

G. Inspection, Maintenance and Repair

1. Risk Level 1 dischargers shall ensure that all inspection, maintenance repair and sampling activities at the project location shall be performed or supervised by a Qualified SWPPP Practitioner (QSP) representing the discharger. The QSP may delegate any or all of these activities to an employee trained to do the task(s) appropriately, but shall ensure adequate deployment.

2. Risk Level 1 dischargers shall perform weekly inspections and observations, and at least once each 24-hour period during extended

[1] Inactive areas of construction are areas of construction activity that have been disturbed and are not scheduled to be re-disturbed for at least 14 days.

storm events, to identify and record BMPs that need maintenance to operate effectively, that have failed, or that could fail to operate as intended. Inspectors shall be the QSP or be trained by the QSP.

3. Upon identifying failures or other shortcomings, as directed by the QSP, Risk Level 1 dischargers shall begin implementing repairs or design changes to BMPs within 72 hours of identification and complete the changes as soon as possible.

4. For each inspection required, Risk Level 1 dischargers shall complete an inspection checklist, using a form provided by the State Water Board or Regional Water Board or in an alternative format.

5. Risk Level 1 dischargers shall ensure that checklists shall remain onsite with the SWPPP and at a minimum, shall include:

    a. Inspection date and date the inspection report was written.

    b. Weather information, including presence or absence of precipitation, estimate of beginning of qualifying storm event, duration of event, time elapsed since last storm, and approximate amount of rainfall in inches.

    c. Site information, including stage of construction, activities completed, and approximate area of the site exposed.

    d. A description of any BMPs evaluated and any deficiencies noted.

    e. If the construction site is safely accessible during inclement weather, list the observations of all BMPs: erosion controls, sediment controls, chemical and waste controls, and non-storm water controls. Otherwise, list the results of visual inspections at all relevant outfalls, discharge points, downstream locations and any projected maintenance activities.

    f. Report the presence of noticeable odors or of any visible sheen on the surface of any discharges.

    g. Any corrective actions required, including any necessary changes to the SWPPP and the associated implementation dates.

    h. Photographs taken during the inspection, if any.

    i. Inspector’s name, title, and signature.

H. Rain Event Action Plan

Not required for Risk Level 1 dischargers.

I. Risk Level 1 Monitoring and Reporting Requirements

Table 1- Summary of Monitoring Requirements

Risk Level	Visual Inspections					Sample Collection	
	Quarterly Non-storm Water Discharge	Pre-storm Event		Daily Storm BMP	Post Storm	Storm Water Discharge	Receiving Water
		Baseline	REAP				
1	X	X		X	X		

1. **Construction Site Monitoring Program Requirements**

   a. Pursuant to Water Code Sections 13383 and 13267, all dischargers subject to this General Permit shall develop and implement a written site-specific Construction Site Monitoring Program (CSMP) in accordance with the requirements of this Section. The CSMP shall include all monitoring procedures and instructions, location maps, forms, and checklists as required in this section. The CSMP shall be developed prior to the commencement of construction activities, and revised as necessary to reflect project revisions. The CSMP shall be a part of the Storm Water Pollution Prevention Plan (SWPPP), included as an appendix or separate SWPPP chapter.

   b. Existing dischargers registered under the State Water Board Order No. 99-08-DWQ shall make and implement necessary revisions to their Monitoring Programs to reflect the changes in this General Permit in a timely manner, but no later than July 1, 2010. Existing dischargers shall continue to implement their existing Monitoring Programs in compliance with State Water Board Order No. 99-08-DWQ until the necessary revisions are completed according to the schedule above.

   c. When a change of ownership occurs for all or any portion of the construction site prior to completion or final stabilization, the new discharger shall comply with these requirements as of the date the ownership change occurs.

2. **Objectives**

   The CSMP shall be developed and implemented to address the following objectives:

   a. To demonstrate that the site is in compliance with the Discharge Prohibitions;

b. To determine whether non-visible pollutants are present at the construction site and are causing or contributing to exceedances of water quality objectives;

c. To determine whether immediate corrective actions, additional Best Management Practice (BMP) implementation, or SWPPP revisions are necessary to reduce pollutants in storm water discharges and authorized non-storm water discharges; and

d. To determine whether BMPs included in the SWPPP are effective in preventing or reducing pollutants in storm water discharges and authorized non-storm water discharges.

3. **Risk Level 1 - Visual Monitoring (Inspection) Requirements for Qualifying Rain Events**

a. Risk Level 1 dischargers shall visually observe (inspect) storm water discharges at all discharge locations within two business days (48 hours) after each qualifying rain event.

b. Risk Level 1 dischargers shall visually observe (inspect) the discharge of stored or contained storm water that is derived from and discharged subsequent to a qualifying rain event producing precipitation of ½ inch or more at the time of discharge. Stored or contained storm water that will likely discharge after operating hours due to anticipated precipitation shall be observed prior to the discharge during operating hours.

c. Risk Level 1 dischargers shall conduct visual observations (inspections) during business hours only.

d. Risk Level 1 dischargers shall record the time, date and rain gauge reading of all qualifying rain events.

e. Within 2 business days (48 hours) prior to each qualifying rain event, Risk Level 1 dischargers shall visually observe (inspect):

i. All storm water drainage areas to identify any spills, leaks, or uncontrolled pollutant sources. If needed, the discharger shall implement appropriate corrective actions.

ii. All BMPs to identify whether they have been properly implemented in accordance with the SWPPP. If needed, the discharger shall implement appropriate corrective actions.

iii. Any storm water storage and containment areas to detect leaks and ensure maintenance of adequate freeboard.

f. For the visual observations (inspections) described in e.i and e.iii above, Risk Level 1 dischargers shall observe the presence or absence of floating and suspended materials, a sheen on the surface, discolorations, turbidity, odors, and source(s) of any observed pollutants.

g. Within two business days (48 hours) after each qualifying rain event, Risk Level 1 dischargers shall conduct post rain event visual observations (inspections) to (1) identify whether BMPs were adequately designed, implemented, and effective, and (2) identify additional BMPs and revise the SWPPP accordingly.

h. Risk Level 1 dischargers shall maintain on-site records of all visual observations (inspections), personnel performing the observations, observation dates, weather conditions, locations observed, and corrective actions taken in response to the observations.

4. **Risk Level 1 – Visual Observation Exemptions**

a. Risk Level 1 dischargers shall be prepared to conduct visual observation (inspections) until the minimum requirements of Section I.3 above are completed. Risk Level 1 dischargers are not required to conduct visual observation (inspections) under the following conditions:

i. During dangerous weather conditions such as flooding and electrical storms.

ii. Outside of scheduled site business hours.

b. If no required visual observations (inspections) are collected due to these exceptions, Risk Level 1 dischargers shall include an explanation in their SWPPP and in the Annual Report documenting why the visual observations (inspections) were not conducted.

5. **Risk Level 1 – Monitoring Methods**

Risk Level 1 dischargers shall include a description of the visual observation locations, visual observation procedures, and visual observation follow-up and tracking procedures in the CSMP.

6. **Risk Level 1 – Non-Storm Water Discharge Monitoring Requirements**

a. Visual Monitoring Requirements:

   i. Risk Level 1 dischargers shall visually observe (inspect) each drainage area for the presence of (or indications of prior) unauthorized and authorized non-storm water discharges and their sources.

   ii. Risk Level 1 dischargers shall conduct one visual observation (inspection) quarterly in each of the following periods: January-March, April-June, July-September, and October-December. Visual observation (inspections) are only required during daylight hours (sunrise to sunset).

   iii. Risk Level 1 dischargers shall ensure that visual observations (inspections) document the presence or evidence of any non-storm water discharge (authorized or unauthorized), pollutant characteristics (floating and suspended material, sheen, discoloration, turbidity, odor, etc.), and source. Risk Level 1 dischargers shall maintain on-site records indicating the personnel performing the visual observation (inspections), the dates and approximate time each drainage area and non-storm water discharge was observed, and the response taken to eliminate unauthorized non-storm water discharges and to reduce or prevent pollutants from contacting non-storm water discharges.

7. **Risk Level 1 – Non-Visible Pollutant Monitoring Requirements**

   a. Risk Level 1 dischargers shall collect one or more samples during any breach, malfunction, leakage, or spill observed during a visual inspection which could result in the discharge of pollutants to surface waters that would not be visually detectable in storm water.

   b. Risk Level 1 dischargers shall ensure that water samples are large enough to characterize the site conditions.

   c. Risk Level 1 dischargers shall collect samples at all discharge locations that can be safely accessed.

   d. Risk Level 1 dischargers shall collect samples during the first two hours of discharge from rain events that occur during business hours and which generate runoff.

   e. Risk Level 1 dischargers shall analyze samples for all non-visible pollutant parameters (if applicable) - parameters indicating the

presence of pollutants identified in the pollutant source assessment required (Risk Level 1 dischargers shall modify their CSMPs to address these additional parameters in accordance with any updated SWPPP pollutant source assessment).

f. Risk Level 1 dischargers shall collect a sample of storm water that has not come in contact with the disturbed soil or the materials stored or used on-site (uncontaminated sample) for comparison with the discharge sample.

g. Risk Level 1 dischargers shall compare the uncontaminated sample to the samples of discharge using field analysis or through laboratory analysis.[2]

h. Risk Level 1 dischargers shall keep all field /or analytical data in the SWPPP document.

8. **Risk Level 1 – Particle Size Analysis for Project Risk Justification**

Risk Level 1 dischargers justifying an alternative project risk shall report a soil particle size analysis used to determine the RUSLE K-Factor. ASTM D-422 (Standard Test Method for Particle-Size Analysis of Soils), as revised, shall be used to determine the percentages of sand, very fine sand, silt, and clay on the site.

9. **Risk Level 1 – Records**

Risk Level 1 dischargers shall retain records of all storm water monitoring information and copies of all reports (including Annual Reports) for a period of at least three years. Risk Level 1 dischargers shall retain all records on-site while construction is ongoing. These records include:

a. The date, place, time of facility inspections, sampling, visual observation (inspections), and/or measurements, including precipitation.

b. The individual(s) who performed the facility inspections, sampling, visual observation (inspections), and or measurements.

c. The date and approximate time of analyses.

d. The individual(s) who performed the analyses.

[2] For laboratory analysis, all sampling, sample preservation, and analyses must be conducted according to test procedures under 40 CFR Part 136. Field discharge samples shall be collected and analyzed according to the specifications of the manufacturer of the sampling devices employed.

e. A summary of all analytical results from the last three years, the method detection limits and reporting units, and the analytical techniques or methods used.

f. Rain gauge readings from site inspections.

g. Quality assurance/quality control records and results.

h. Non-storm water discharge inspections and visual observation (inspections) and storm water discharge visual observation records (see Sections I.3 and I.6 above).

i. Visual observation and sample collection exception records (see Section I.4 above).

j. The records of any corrective actions and follow-up activities that resulted from analytical results, visual observation (inspections), or inspections.

ATTACHMENT D
RISK LEVEL 2 REQUIREMENTS

A. Effluent Standards

[These requirements are the same as those in the General Permit order.]

1. Narrative – Risk Level 2 dischargers shall comply with the narrative effluent standards listed below:

   a. Storm water discharges and authorized non-storm water discharges regulated by this General Permit shall not contain a hazardous substance equal to or in excess of reportable quantities established in 40 C.F.R. §§ 117.3 and 302.4, unless a separate NPDES Permit has been issued to regulate those discharges.

   b. Dischargers shall minimize or prevent pollutants in storm water discharges and authorized non-storm water discharges through the use of controls, structures, and management practices that achieve BAT for toxic and non-conventional pollutants and BCT for conventional pollutants.

2. Numeric – Risk level 2 dischargers are subject to a pH NAL of 6.5-8.5, and a turbidity NAL of 250 NTU.

B. Good Site Management "Housekeeping"

1. Risk Level 2 dischargers shall implement good site management (i.e., "housekeeping") measures for construction materials that could potentially be a threat to water quality if discharged. At a minimum, Risk Level 2 dischargers shall implement the following good housekeeping measures:

   a. Conduct an inventory of the products used and/or expected to be used and the end products that are produced and/or expected to be produced. This does not include materials and equipment that are designed to be outdoors and exposed to environmental conditions (i.e. poles, equipment pads, cabinets, conductors, insulators, bricks, etc.).

   b. Cover and berm loose stockpiled construction materials that are not actively being used (i.e. soil, spoils, aggregate, fly-ash, stucco, hydrated lime, etc.).

c. Store chemicals in watertight containers (with appropriate secondary containment to prevent any spillage or leakage) or in a storage shed (completely enclosed).

d. Minimize exposure of construction materials to precipitation. This does not include materials and equipment that are designed to be outdoors and exposed to environmental conditions (i.e. poles, equipment pads, cabinets, conductors, insulators, bricks, etc.).

e. Implement BMPs to prevent the off-site tracking of loose construction and landscape materials.

2. Risk Level 2 dischargers shall implement good housekeeping measures for waste management, which, at a minimum, shall consist of the following:

a. Prevent disposal of any rinse or wash waters or materials on impervious or pervious site surfaces or into the storm drain system.

b. Ensure the containment of sanitation facilities (e.g., portable toilets) to prevent discharges of pollutants to the storm water drainage system or receiving water.

c. Clean or replace sanitation facilities and inspecting them regularly for leaks and spills.

d. Cover waste disposal containers at the end of every business day and during a rain event.

e. Prevent discharges from waste disposal containers to the storm water drainage system or receiving water.

f. Contain and securely protect stockpiled waste material from wind and rain at all times unless actively being used.

g. Implement procedures that effectively address hazardous and non-hazardous spills.

h. Develop a spill response and implementation element of the SWPPP prior to commencement of construction activities. The SWPPP shall require:

i. Equipment and materials for cleanup of spills shall be available on site and that spills and leaks shall be cleaned up immediately and disposed of properly.

ii. Appropriate spill response personnel are assigned and trained.

i. Ensure the containment of concrete washout areas and other washout areas that may contain additional pollutants so there is no discharge into the underlying soil and onto the surrounding areas.

3. Risk Level 2 dischargers shall implement good housekeeping for vehicle storage and maintenance, which, at a minimum, shall consist of the following:

   a. Prevent oil, grease, or fuel to leak in to the ground, storm drains or surface waters.

   b. Place all equipment or vehicles, which are to be fueled, maintained and stored in a designated area fitted with appropriate BMPs.

   c. Clean leaks immediately and disposing of leaked materials properly.

4. Risk Level 2 dischargers shall implement good housekeeping for landscape materials, which, at a minimum, shall consist of the following:

   a. Contain stockpiled materials such as mulches and topsoil when they are not actively being used.

   b. Contain all fertilizers and other landscape materials when they are not actively being used.

   c. Discontinue the application of any erodible landscape material within 2 days before a forecasted rain event or during periods of precipitation.

   d. Apply erodible landscape material at quantities and application rates according to manufacture recommendations or based on written specifications by knowledgeable and experienced field personnel.

   e. Stack erodible landscape material on pallets and covering or storing such materials when not being used or applied.

5. Risk Level 2 dischargers shall conduct an assessment and create a list of potential pollutant sources and identify any areas of the site where additional BMPs are necessary to reduce or prevent pollutants in storm water discharges and authorized non-storm water discharges. This potential pollutant list shall be kept with the SWPPP and shall identify

all non-visible pollutants which are known, or should be known, to occur on the construction site. At a minimum, when developing BMPs, Risk Level 2 dischargers shall do the following:

a. Consider the quantity, physical characteristics (e.g., liquid, powder, solid), and locations of each potential pollutant source handled, produced, stored, recycled, or disposed of at the site.

b. Consider the degree to which pollutants associated with those materials may be exposed to and mobilized by contact with storm water.

c. Consider the direct and indirect pathways that pollutants may be exposed to storm water or authorized non-storm water discharges. This shall include an assessment of past spills or leaks, non-storm water discharges, and discharges from adjoining areas.

d. Ensure retention of sampling, visual observation, and inspection records.

e. Ensure effectiveness of existing BMPs to reduce or prevent pollutants in storm water discharges and authorized non-storm water discharges.

6. Risk Level 2 dischargers shall implement good housekeeping measures on the construction site to control the air deposition of site materials and from site operations. Such particulates can include, but are not limited to, sediment, nutrients, trash, metals, bacteria, oil and grease and organics.

7. **Additional Risk Level 2 Requirement:** Risk Level 2 dischargers shall document all housekeeping BMPs in the SWPPP and REAP(s) in accordance with the nature and phase of the construction project. Construction phases at traditional land development projects include Grading and Land Development Phase, Streets and Utilities, or Vertical Construction for traditional land development projects.

C. Non-Storm Water Management

1. Risk Level 2 dischargers shall implement measures to control all non-storm water discharges during construction.

2. Risk Level 2 dischargers shall wash vehicles in such a manner as to prevent non-storm water discharges to surface waters or MS4 drainage systems.

3. Risk Level 2 dischargers shall clean streets in such a manner as to prevent unauthorized non-storm water discharges from reaching surface water or MS4 drainage systems.

D. Erosion Control

1. Risk Level 2 dischargers shall implement effective wind erosion control.

2. Risk Level 2 dischargers shall provide effective soil cover for inactive[1] areas and all finished slopes, open space, utility backfill, and completed lots.

3. Risk Level 2 dischargers shall limit the use of plastic materials when more sustainable, environmentally friendly alternatives exist. Where plastic materials are deemed necessary, the discharger shall consider the use of plastic materials resistant to solar degradation.

E. Sediment Controls

1. Risk Level 2 dischargers shall establish and maintain effective perimeter controls and stabilize all construction entrances and exits to sufficiently control erosion and sediment discharges from the site.

2. On sites where sediment basins are to be used, Risk Level 2 dischargers shall, at minimum, design sediment basins according to the method provided in CASQA's Construction BMP Guidance Handbook.

3. **Additional Risk Level 2 Requirement:** Risk Level 2 dischargers shall implement appropriate erosion control BMPs (runoff control and soil stabilization) in conjunction with sediment control BMPs for areas under active[2] construction.

4. **Additional Risk Level 2 Requirement:** Risk Level 2 dischargers shall apply linear sediment controls along the toe of the slope, face of the slope, and at the grade breaks of exposed slopes to comply with sheet flow lengths[3] in accordance with Table 1.

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[1] Inactive areas of construction are areas of construction activity that have been disturbed and are not scheduled to be re-disturbed for at least 14 days.
[2] Active areas of construction are areas undergoing land surface disturbance. This includes construction activity during the preliminary stage, mass grading stage, streets and utilities stage and the vertical construction stage.
[3] Sheet flow length is the length that shallow, low velocity flow travels across a site.

Table 1 - Critical Slope/Sheet Flow Length Combinations

Slope Percentage	Sheet flow length not to exceed
0-25%	20 feet
25-50%	15 feet
Over 50%	10 feet

5. **Additional Risk Level 2 Requirement:** Risk Level 2 dischargers shall ensure that construction activity traffic to and from the project is limited to entrances and exits that employ effective controls to prevent offsite tracking of sediment.

6. **Additional Risk Level 2 Requirement:** Risk Level 2 dischargers shall ensure that all storm drain inlets and perimeter controls, runoff control BMPs, and pollutant controls at entrances and exits (e.g. tire washoff locations) are maintained and protected from activities that reduce their effectiveness.

7. **Additional Risk Level 2 Requirement:** Risk Level 2 dischargers shall inspect on a daily basis all immediate access roads daily. At a minimum daily (when necessary) and prior to any rain event, the discharger shall remove any sediment or other construction activity-related materials that are deposited on the roads (by vacuuming or sweeping).

F. Run-on and Run-off Controls

Risk Level 2 dischargers shall effectively manage all run-on, all runoff within the site and all runoff that discharges off the site. Run-on from off site shall be directed away from all disturbed areas or shall collectively be in compliance with the effluent limitations in this General Permit.

G. Inspection, Maintenance and Repair

1. Risk Level 2 dischargers shall ensure that all inspection, maintenance repair and sampling activities at the project location shall be performed or supervised by a Qualified SWPPP Practitioner (QSP) representing the discharger. The QSP may delegate any or all of these activities to an employee appropriately trained to do the task(s).

2. Risk Level 2 dischargers shall perform weekly inspections and observations, and at least once each 24-hour period during extended storm events, to identify and record BMPs that need maintenance to operate effectively, that have failed, or that could fail to operate as intended. Inspectors shall be the QSP or be trained by the QSP.

3. Upon identifying failures or other shortcomings, as directed by the QSP, Risk Level 2 dischargers shall begin implementing repairs or design changes to BMPs within 72 hours of identification and complete the changes as soon as possible.

4. For each inspection required, Risk Level 2 dischargers shall complete an inspection checklist, using a form provided by the State Water Board or Regional Water Board or in an alternative format.

5. Risk Level 2 dischargers shall ensure that checklists shall remain onsite with the SWPPP and at a minimum, shall include:

   a. Inspection date and date the inspection report was written.

   b. Weather information, including presence or absence of precipitation, estimate of beginning of qualifying storm event, duration of event, time elapsed since last storm, and approximate amount of rainfall in inches.

   c. Site information, including stage of construction, activities completed, and approximate area of the site exposed.

   d. A description of any BMPs evaluated and any deficiencies noted.

   e. If the construction site is safely accessible during inclement weather, list the observations of all BMPs: erosion controls, sediment controls, chemical and waste controls, and non-storm water controls. Otherwise, list the results of visual inspections at all relevant outfalls, discharge points, downstream locations and any projected maintenance activities.

   f. Report the presence of noticeable odors or of any visible sheen on the surface of any discharges.

   g. Any corrective actions required, including any necessary changes to the SWPPP and the associated implementation dates.

   h. Photographs taken during the inspection, if any.

   i. Inspector's name, title, and signature.

H. Rain Event Action Plan

1. **Additional Risk Level 2 Requirement:** The discharger shall ensure a QSP develop a Rain Event Action Plan (REAP) 48 hours prior to any

likely precipitation event. A likely precipitation event is any weather pattern that is forecast to have a 50% or greater probability of producing precipitation in the project area. The discharger shall ensure a QSP obtain a printed copy of precipitation forecast information from the National Weather Service Forecast Office (e.g., by entering the zip code of the project's location at http://www.srh.noaa.gov/forecast).

2. **Additional Risk Level 2 Requirement:** The discharger shall ensure a QSP develop the REAPs for all phases of construction (i.e., Grading and Land Development, Streets and Utilities, Vertical Construction, Final Landscaping and Site Stabilization).

3. **Additional Risk Level 2 Requirement:** The discharger shall ensure a QSP ensure that the REAP include, at a minimum, the following site information:

   a. Site Address
   b. Calculated Risk Level (2 or 3)
   c. Site Storm Water Manager Information including the name, company, and 24-hour emergency telephone number
   d. Erosion and Sediment Control Provider information including the name, company, and 24-hour emergency telephone number
   e. Storm Water Sampling Agent information including the name, company, and 24-hour emergency telephone number

4. **Additional Risk Level 2 Requirement:** The discharger shall ensure a QSP include in the REAP, at a minimum, the following project phase information:

   a. Activities associated with each construction phase
   b. Trades active on the construction site during each construction phase
   c. Trade contractor information
   d. Suggested actions for each project phase

5. **Additional Risk Level 2 Requirement:** The discharger shall ensure a QSP develop additional REAPs for project sites where construction activities are indefinitely halted or postponed (Inactive Construction). At a minimum, Inactive Construction REAPs must include:

   a. Site Address
   b. Calculated Risk Level (2 or 3)
   c. Site Storm Water Manager Information including the name, company, and 24-hour emergency telephone number

d. Erosion and Sediment Control Provider information including the name, company, and 24-hour emergency telephone number
e. Storm Water Sampling Agent information including the name, company, and 24-hour emergency telephone number
f. Trades active on site during Inactive Construction
g. Trade contractor information
h. Suggested actions for inactive construction sites

6. **Additional Risk Level 2 Requirement:** The discharger shall ensure a QSP begin implementation and make the REAP available onsite no later than 24 hours prior to the likely precipitation event.

7. **Additional Risk Level 2 Requirement:** The discharger shall ensure a QSP maintain onsite a paper copy of each REAP onsite in compliance with the record retention requirements of the Special Provisions in this General Permit.

I. Risk Level 2 Monitoring and Reporting Requirements

Table 2- Summary of Monitoring Requirements

Risk Level	Visual Inspections					Sample Collection	
	Quarterly Non-storm Water Discharge	Pre-storm Event		Daily Storm BMP	Post Storm	Storm Water Discharge	Receiving Water
		Baseline	REAP				
2	X	X	X	X	X	X	

1. Construction Site Monitoring Program Requirements

   a. Pursuant to Water Code Sections 13383 and 13267, all dischargers subject to this General Permit shall develop and implement a written site-specific Construction Site Monitoring Program (CSMP) in accordance with the requirements of this Section. The CSMP shall include all monitoring procedures and instructions, location maps, forms, and checklists as required in this section. The CSMP shall be developed prior to the commencement of construction activities, and revised as necessary to reflect project revisions. The CSMP shall be a part of the Storm Water Pollution Prevention Plan (SWPPP), included as an appendix or separate SWPPP chapter.

   b. Existing dischargers registered under the State Water Board Order No. 99-08-DWQ shall make and implement necessary revisions to their Monitoring Program to reflect the changes in this General Permit in a timely manner, but no later than July 1, 2010. Existing dischargers shall continue to implement their existing Monitoring Programs in compliance with State Water Board Order No. 99-08-DWQ until the necessary revisions are completed according to the schedule above.

   c. When a change of ownership occurs for all or any portion of the construction site prior to completion or final stabilization, the new discharger shall comply with these requirements as of the date the ownership change occurs.

2. **Objectives**

   The CSMP shall be developed and implemented to address the following objectives:

   a. To demonstrate that the site is in compliance with the Discharge Prohibitions and applicable Numeric Action Levels (NALs).

b. To determine whether non-visible pollutants are present at the construction site and are causing or contributing to exceedances of water quality objectives.

c. To determine whether immediate corrective actions, additional Best Management Practice (BMP) implementation, or SWPPP revisions are necessary to reduce pollutants in storm water discharges and authorized non-storm water discharges.

d. To determine whether BMPs included in the SWPPP/Rain Event Action Plan (REAP) are effective in preventing or reducing pollutants in storm water discharges and authorized non-storm water discharges.

3. **Risk Level 2 – Visual Monitoring (Inspection) Requirements for Qualifying Rain Events**

a. Risk Level 2 dischargers shall visually observe (inspect) storm water discharges at all discharge locations within two business days (48 hours) after each qualifying rain event.

b. Risk Level 2 dischargers shall visually observe (inspect) the discharge of stored or contained storm water that is derived from and discharged subsequent to a qualifying rain event producing precipitation of ½ inch or more at the time of discharge. Stored or contained storm water that will likely discharge after operating hours due to anticipated precipitation shall be observed prior to the discharge during operating hours.

c. Risk Level 2 dischargers shall conduct visual observations (inspections) during business hours only.

d. Risk Level 2 dischargers shall record the time, date and rain gauge reading of all qualifying rain events.

e. Within 2 business days (48 hours) prior to each qualifying rain event, Risk Level 2 dischargers shall visually observe (inspect):

i. all storm water drainage areas to identify any spills, leaks, or uncontrolled pollutant sources. If needed, the discharger shall implement appropriate corrective actions.

ii. all BMPs to identify whether they have been properly implemented in accordance with the SWPPP/REAP. If needed, the discharger shall implement appropriate corrective actions.

iii. any storm water storage and containment areas to detect leaks and ensure maintenance of adequate freeboard.

f. For the visual observations (inspections) described in c.i and c.iii above, Risk Level 2 dischargers shall observe the presence or absence of floating and suspended materials, a sheen on the surface, discolorations, turbidity, odors, and source(s) of any observed pollutants.

g. Within two business days (48 hours) after each qualifying rain event, Risk Level 2 dischargers shall conduct post rain event visual observations (inspections) to (1) identify whether BMPs were adequately designed, implemented, and effective, and (2) identify additional BMPs and revise the SWPPP accordingly.

h. Risk Level 2 dischargers shall maintain on-site records of all visual observations (inspections), personnel performing the observations, observation dates, weather conditions, locations observed, and corrective actions taken in response to the observations.

4. **Risk Level 2 – Water Quality Sampling and Analysis**

a. Risk Level 2 dischargers shall collect storm water grab samples from sampling locations, as defined in Section I.5. The storm water grab sample(s) obtained shall be representative of the flow and characteristics of the discharge.

b. At minimum, Risk Level 2 dischargers shall collect 3 samples per day of the qualifying event.

c. Risk Level 2 dischargers shall ensure that the grab samples collected of stored or contained storm water are from discharges subsequent to a qualifying rain event (producing precipitation of ½ inch or more at the time of discharge).

<u>Storm Water Effluent Monitoring Requirements</u>

d. Risk Level 2 dischargers shall analyze their effluent samples for:

i. pH and turbidity.

ii. Any additional parameters for which monitoring is required by the Regional Water Board.

5. **Risk Level 2 – Storm Water Discharge Water Quality Sampling Locations**

Effluent Sampling Locations

a. Risk Level 2 dischargers shall perform sampling and analysis of storm water discharges to characterize discharges associated with construction activity from the entire project disturbed area.

b. Risk Level 2 dischargers shall collect effluent samples at all discharge points where storm water is discharged off-site.

c. Risk Level 2 dischargers shall ensure that storm water discharge collected and observed represent[4] the effluent in each drainage area based on visual observation of the water and upstream conditions.

d. Risk Level 2 dischargers shall monitor and report site run-on from surrounding areas if there is reason to believe run-on may contribute to an exceedance of NALs.

e. Risk Level 2 dischargers who deploy an ATS on their site, or a portion on their site, shall collect ATS effluent samples and measurements from the discharge pipe or another location representative of the nature of the discharge.

f. Risk Level 2 dischargers shall select analytical test methods from the list provided in Table 3 below.

g. All storm water sample collection preservation and handling shall be conducted in accordance with Section I.7 “Storm Water Sample Collection and Handling Instructions” below.

6. **Risk Level 2 – Visual Observation and Sample Collection Exemptions**

a. Risk Level 2 dischargers shall be prepared to collect samples and conduct visual observation (inspections) until the minimum requirements of Sections I.3 and I.4 above are completed. Risk Level 2 dischargers are not required to physically collect samples or conduct visual observation (inspections) under the following conditions:

[4] For example, if there has been concrete work recently in an area, or drywall scrap is exposed to the rain, a pH sample shall be taken of drainage from the relevant work area. Similarly, if sediment laden water is flowing through some parts of a silt fence, samples shall be taken of the sediment-laden water even if most water flowing through the fence is clear.

i. During dangerous weather conditions such as flooding and electrical storms.

ii. Outside of scheduled site business hours.

b. If no required samples or visual observation (inspections) are collected due to these exceptions, Risk Level 2 dischargers shall include an explanation in their SWPPP and in the Annual Report documenting why the sampling or visual observation (inspections) were not conducted.

7. **Risk Level 2 – Storm Water Sample Collection and Handling Instructions**

a. Risk Level 2 dischargers shall refer to Table 3 below for test methods, detection limits, and reporting units.

b. Risk Level 2 dischargers shall ensure that testing laboratories will receive samples within 48 hours of the physical sampling (unless otherwise required by the laboratory), and shall use only the sample containers provided by the laboratory to collect and store samples.

c. Risk Level 2 dischargers shall designate and train personnel to collect, maintain, and ship samples in accordance with the Surface Water Ambient Monitoring Program's (SWAMP) 2008 Quality Assurance Program Plan (QAPrP).[5]

8. **Risk Level 2 – Monitoring Methods**

a. Risk Level 2 dischargers shall include a description of the following items in the CSMP:

i. Visual observation locations, visual observation procedures, and visual observation follow-up and tracking procedures.

ii. Sampling locations, and sample collection and handling procedures. This shall include detailed procedures for sample collection, storage, preservation, and shipping to the testing lab to assure that consistent quality control and quality assurance is maintained. Dischargers shall attach to the monitoring program

[5] Additional information regarding SWAMP's QAPrP can be found at http://www.waterboards.ca.gov/water_issues/programs/swamp/. QAPrP:http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/qapp/swamp_qapp_master090108a.pdf.

an example Chain of Custody form used when handling and shipping samples.

iii. Identification of the analytical methods and related method detection limits (if applicable) for each parameter required in Section I.4 above.

b. Risk Level 2 dischargers shall ensure that all sampling and sample preservation are in accordance with the current edition of "Standard Methods for the Examination of Water and Wastewater" (American Public Health Association). All monitoring instruments and equipment (including a discharger's own field instruments for measuring pH and turbidity) should be calibrated and maintained in accordance with manufacturers' specifications to ensure accurate measurements. Risk Level 2 dischargers shall ensure that all laboratory analyses are conducted according to test procedures under 40 CFR Part 136, unless other test procedures have been specified in this General Permit or by the Regional Water Board. With the exception of field analysis conducted by the discharger for turbidity and pH, all analyses should be sent to and conducted at a laboratory certified for such analyses by the State Department of Health Services. Risk Level 2 dischargers shall conduct their own field analysis of pH and may conduct their own field analysis of turbidity if the discharger has sufficient capability (qualified and trained employees, properly calibrated and maintained field instruments, etc.) to adequately perform the field analysis.

9. **Risk Level 2 – Analytical Methods**

a. Risk Level 2 dischargers shall refer to Table 3 below for test methods, detection limits, and reporting units.

b. **pH**: Risk Level 2 dischargers shall perform pH analysis on-site with a calibrated pH meter or a pH test kit. Risk Level 2 dischargers shall record pH monitoring results on paper and retain these records in accordance with Section I.14, below.

c. **Turbidity**: Risk Level 2 dischargers shall perform turbidity analysis using a calibrated turbidity meter (turbidimeter), either on-site or at an accredited lab. Acceptable test methods include Standard Method 2130 or USEPA Method 180.1. The results will be recorded in the site log book in Nephelometric Turbidity Units (NTU).

10. **Risk Level 2 - Non-Storm Water Discharge Monitoring Requirements**

a. Visual Monitoring Requirements:

   i. Risk Level 2 dischargers shall visually observe (inspect) each drainage area for the presence of (or indications of prior) unauthorized and authorized non-storm water discharges and their sources.

   ii. Risk Level 2 dischargers shall conduct one visual observation (inspection) quarterly in each of the following periods: January-March, April-June, July-September, and October-December. Visual observation (inspections) are only required during daylight hours (sunrise to sunset).

   iii. Risk Level 2 dischargers shall ensure that visual observations (inspections) document the presence or evidence of any non-storm water discharge (authorized or unauthorized), pollutant characteristics (floating and suspended material, sheen, discoloration, turbidity, odor, etc.), and source. Risk Level 2 dischargers shall maintain on-site records indicating the personnel performing the visual observation (inspections), the dates and approximate time each drainage area and non-storm water discharge was observed, and the response taken to eliminate unauthorized non-storm water discharges and to reduce or prevent pollutants from contacting non-storm water discharges.

b. Effluent Sampling Locations:

   i. Risk Level 2 dischargers shall sample effluent at all discharge points where non-storm water and/or authorized non-storm water is discharged off-site.

   ii. Risk Level 2 dischargers shall send all non-storm water sample analyses to a laboratory certified for such analyses by the State Department of Health Services.

   iii. Risk Level 2 dischargers shall monitor and report run-on from surrounding areas if there is reason to believe run-on may contribute to an exceedance of NALs.

11. **Risk Level 2 – Non-Visible Pollutant Monitoring Requirements**

a. Risk Level 2 dischargers shall collect one or more samples during any breach, malfunction, leakage, or spill observed during a visual

inspection which could result in the discharge of pollutants to surface waters that would not be visually detectable in storm water.

b. Risk Level 2 dischargers shall ensure that water samples are large enough to characterize the site conditions.

c. Risk Level 2 dischargers shall collect samples at all discharge locations that can be safely accessed.

d. Risk Level 2 dischargers shall collect samples during the first two hours of discharge from rain events that occur during business hours and which generate runoff.

e. Risk Level 2 dischargers shall analyze samples for all non-visible pollutant parameters (if applicable) - parameters indicating the presence of pollutants identified in the pollutant source assessment required (Risk Level 2 dischargers shall modify their CSMPs to address these additional parameters in accordance with any updated SWPPP pollutant source assessment).

f. Risk Level 2 dischargers shall collect a sample of storm water that has not come in contact with the disturbed soil or the materials stored or used on-site (uncontaminated sample) for comparison with the discharge sample.

g. Risk Level 2 dischargers shall compare the uncontaminated sample to the samples of discharge using field analysis or through laboratory analysis.[6]

h. Risk Level 2 dischargers shall keep all field /or analytical data in the SWPPP document.

12. **Risk Level 2 – Watershed Monitoring Option**

Risk Level 2 dischargers who are part of a qualified regional watershed-based monitoring program may be eligible for relief from the requirements in Sections I.5. The Regional Water Board may approve proposals to substitute an acceptable watershed-based monitoring program by determining if the watershed-based monitoring program will provide substantially similar monitoring information in evaluating discharger compliance with the requirements of this General Permit.

[6] For laboratory analysis, all sampling, sample preservation, and analyses must be conducted according to test procedures under 40 CFR Part 136. Field discharge samples shall be collected and analyzed according to the specifications of the manufacturer of the sampling devices employed.

13. **Risk Level 2 – Particle Size Analysis for Project Risk Justification**

Risk Level 2 dischargers justifying an alternative project risk shall report a soil particle size analysis used to determine the RUSLE K-Factor. ASTM D-422 (Standard Test Method for Particle-Size Analysis of Soils), as revised, shall be used to determine the percentages of sand, very fine sand, silt, and clay on the site.

14. **Risk Level 2 – Records**

Risk Level 2 dischargers shall retain records of all storm water monitoring information and copies of all reports (including Annual Reports) for a period of at least three years. Risk Level 2 dischargers shall retain all records on-site while construction is ongoing. These records include:

a. The date, place, time of facility inspections, sampling, visual observation (inspections), and/or measurements, including precipitation.

b. The individual(s) who performed the facility inspections, sampling, visual observation (inspections), and or measurements.

c. The date and approximate time of analyses.

d. The individual(s) who performed the analyses.

e. A summary of all analytical results from the last three years, the method detection limits and reporting units, the analytical techniques or methods used, and the chain of custody forms.

f. Rain gauge readings from site inspections;

g. Quality assurance/quality control records and results.

h. Non-storm water discharge inspections and visual observation (inspections) and storm water discharge visual observation records (see Sections I.3 and I.10 above).

i. Visual observation and sample collection exception records (see Section I.6 above).

j. The records of any corrective actions and follow-up activities that resulted from analytical results, visual observation (inspections), or inspections.

15. **Risk Level 2 – NAL Exceedance Report**

a. In the event that any effluent sample exceeds an applicable NAL, Risk Level 2 dischargers shall electronically submit all storm event sampling results to the State Water Board no later than 10 days after the conclusion of the storm event. The Regional Boards have the authority to require the submittal of an NAL Exceedance Report.

b. Risk Level 2 dischargers shall certify each NAL Exceedance Report in accordance with the Special Provisions for Construction Activity.

c. Risk Level 2 dischargers shall retain an electronic or paper copy of each NAL Exceedance Report for a minimum of three years after the date the annual report is filed.

d. Risk Level 2 dischargers shall include in the NAL Exceedance Report:

   i. The analytical method(s), method reporting unit(s), and method detection limit(s) of each analytical parameter (analytical results that are less than the method detection limit shall be reported as “less than the method detection limit”).

   ii. The date, place, time of sampling, visual observation (inspections), and/or measurements, including precipitation.

   iii. A description of the current BMPs associated with the effluent sample that exceeded the NAL and the proposed corrective actions taken.

Table 3 – Risk Level 2 Test Methods, Detection Limits, Reporting Units and Applicable NALs/NELs

Parameter	Test Method / Protocol	Discharge Type	Min. Detection Limit	Reporting Units	Numeric Action Level
pH	Field test with calibrated portable instrument	Risk Level 2 Discharges	0.2	pH units	lower NAL = 6.5 upper NAL = 8.5
Turbidity	EPA 0180.1 and/or field test with calibrated portable instrument	Risk Level 2 Discharges other than ATS	1	NTU	250 NTU
		For ATS discharges	1	NTU	N/A

ATTACHMENT E
RISK LEVEL 3 REQUIREMENTS

A. Effluent Standards

[These requirements are the same as those in the General Permit order.]

1. Narrative – Risk Level 3 dischargers shall comply with the narrative effluent standards listed below:

   a. Storm water discharges and authorized non-storm water discharges regulated by this General Permit shall not contain a hazardous substance equal to or in excess of reportable quantities established in 40 C.F.R. §§ 117.3 and 302.4, unless a separate NPDES Permit has been issued to regulate those discharges.

   b. Dischargers shall minimize or prevent pollutants in storm water discharges and authorized non-storm water discharges through the use of controls, structures, and management practices that achieve BAT for toxic and non-conventional pollutants and BCT for conventional pollutants.

2. Numeric –Risk Level 3 dischargers are subject to a pH NAL of 6.5-8.5, and a turbidity NAL of 250 NTU.

B. Good Site Management "Housekeeping"

1. Risk Level 3 dischargers shall implement good site management (i.e., "housekeeping") measures for construction materials that could potentially be a threat to water quality if discharged. At a minimum, Risk Level 3 dischargers shall implement the following good housekeeping measures:

   a. Conduct an inventory of the products used and/or expected to be used and the end products that are produced and/or expected to be produced. This does not include materials and equipment that are designed to be outdoors and exposed to environmental conditions (i.e. poles, equipment pads, cabinets, conductors, insulators, bricks, etc.).

   b. Cover and berm loose stockpiled construction materials that are not actively being used (i.e. soil, spoils, aggregate, fly-ash, stucco, hydrated lime, etc.).

c. Store chemicals in watertight containers (with appropriate secondary containment to prevent any spillage or leakage) or in a storage shed (completely enclosed).

d. Minimize exposure of construction materials to precipitation. This does not include materials and equipment that are designed to be outdoors and exposed to environmental conditions (i.e. poles, equipment pads, cabinets, conductors, insulators, bricks, etc.).

e. Implement BMPs to prevent the off-site tracking of loose construction and landscape materials.

2. Risk Level 3 dischargers shall implement good housekeeping measures for waste management, which, at a minimum, shall consist of the following:

a. Prevent disposal of any rinse or wash waters or materials on impervious or pervious site surfaces or into the storm drain system.

b. Ensure the containment of sanitation facilities (e.g., portable toilets) to prevent discharges of pollutants to the storm water drainage system or receiving water.

c. Clean or replace sanitation facilities and inspecting them regularly for leaks and spills.

d. Cover waste disposal containers at the end of every business day and during a rain event.

e. Prevent discharges from waste disposal containers to the storm water drainage system or receiving water.

f. Contain and securely protecting stockpiled waste material from wind and rain at all times unless actively being used.

g. Implement procedures that effectively address hazardous and non-hazardous spills.

h. Develop a spill response and implementation element of the SWPPP prior to commencement of construction activities. The SWPPP shall require that:

i. Equipment and materials for cleanup of spills shall be available on site and that spills and leaks shall be cleaned up immediately and disposed of properly; and

ii. Appropriate spill response personnel are assigned and trained.

i. Ensure the containment of concrete washout areas and other washout areas that may contain additional pollutants so there is no discharge into the underlying soil and onto the surrounding areas.

3. Risk Level 3 dischargers shall implement good housekeeping for vehicle storage and maintenance, which, at a minimum, shall consist of the following:

   a. Prevent oil, grease, or fuel to leak in to the ground, storm drains or surface waters.

   b. Place all equipment or vehicles, which are to be fueled, maintained and stored in a designated area fitted with appropriate BMPs.

   c. Clean leaks immediately and disposing of leaked materials properly.

4. Risk Level 3 dischargers shall implement good housekeeping for landscape materials, which, at a minimum, shall consist of the following:

   a. Contain stockpiled materials such as mulches and topsoil when they are not actively being used.

   b. Contain fertilizers and other landscape materials when they are not actively being used.

   c. Discontinuing the application of any erodible landscape material within 2 days before a forecasted rain event or during periods of precipitation.

   d. Applying erodible landscape material at quantities and application rates according to manufacture recommendations or based on written specifications by knowledgeable and experienced field personnel.

   e. Stacking erodible landscape material on pallets and covering or storing such materials when not being used or applied.

5. Risk Level 3 dischargers shall conduct an assessment and create a list of potential pollutant sources and identify any areas of the site where additional BMPs are necessary to reduce or prevent pollutants in storm water discharges and authorized non-storm water discharges. This potential pollutant list shall be kept with the SWPPP and shall identify

all non-visible pollutants which are known, or should be known, to occur on the construction site. At a minimum, when developing BMPs, Risk Level 3 dischargers shall do the following:

a. Consider the quantity, physical characteristics (e.g., liquid, powder, solid), and locations of each potential pollutant source handled, produced, stored, recycled, or disposed of at the site.

b. Consider the degree to which pollutants associated with those materials may be exposed to and mobilized by contact with storm water.

c. Consider the direct and indirect pathways that pollutants may be exposed to storm water or authorized non-storm water discharges. This shall include an assessment of past spills or leaks, non-storm water discharges, and discharges from adjoining areas.

d. Ensure retention of sampling, visual observation, and inspection records.

e. Ensure effectiveness of existing BMPs to reduce or prevent pollutants in storm water discharges and authorized non-storm water discharges.

6. Risk Level 3 dischargers shall implement good housekeeping measures on the construction site to control the air deposition of site materials and from site operations. Such particulates can include, but are not limited to, sediment, nutrients, trash, metals, bacteria, oil and grease and organics.

7. **Additional Risk Level 3 Requirement:** Risk Level 3 dischargers shall document all housekeeping BMPs in the SWPPP and REAP(s) in accordance with the nature and phase of the construction project. Construction phases at traditional land development projects include Grading and Land Development Phase, Streets and Utilities, or Vertical Construction for traditional land development projects.

C. Non-Storm Water Management

1. Risk Level 3 dischargers shall implement measures to control all non-storm water discharges during construction.

2. Risk Level 3 dischargers shall wash vehicles in such a manner as to prevent non-storm water discharges to surface waters or MS4 drainage systems.

3. Risk Level 3 dischargers shall clean streets in such a manner as to prevent unauthorized non-storm water discharges from reaching surface water or MS4 drainage systems.

D. Erosion Control

1. Risk Level 3 dischargers shall implement effective wind erosion control.

2. Risk Level 3 dischargers shall provide effective soil cover for inactive[1] areas and all finished slopes, open space, utility backfill, and completed lots.

3. Dischargers shall limit the use of plastic materials when more sustainable, environmentally friendly alternatives exist. Where plastic materials are deemed necessary, the discharger shall consider the use of plastic materials resistant to solar degradation.

E. Sediment Controls

1. Risk Level 3 dischargers shall establish and maintain effective perimeter controls and stabilize all construction entrances and exits to sufficiently control erosion and sediment discharges from the site.

2. On sites where sediment basins are to be used, Risk Level 3 dischargers shall, at minimum, design sediment basins according to the method provided in CASQA's Construction BMP Guidance Handbook.

3. **Additional Risk Level 3 Requirement:** Risk Level 3 dischargers shall implement appropriate erosion control BMPs (runoff control and soil stabilization) in conjunction with sediment control BMPs for areas under active[2] construction.

4. **Additional Risk Level 3 Requirement:** Risk Level 3 dischargers shall apply linear sediment controls along the toe of the slope, face of the slope, and at the grade breaks of exposed slopes to comply with sheet flow lengths[3] in accordance with Table 1.

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[1] Inactive areas of construction are areas of construction activity that have been disturbed and are not scheduled to be re-disturbed for at least 14 days.
[2] Active areas of construction are areas undergoing land surface disturbance. This includes construction activity during the preliminary stage, mass grading stage, streets and utilities stage and the vertical construction stage
[3] Sheet flow length is the length that shallow, low velocity flow travels across a site.

Table 1 - Critical Slope/Sheet Flow Length Combinations

Slope Percentage	Sheet flow length not to exceed
0-25%	20 feet
25-50%	15 feet
Over 50%	10 feet

5. **Additional Risk Level 3 Requirement:** Risk Level 3 dischargers shall ensure that construction activity traffic to and from the project is limited to entrances and exits that employ effective controls to prevent offsite tracking of sediment.

6. **Additional Risk Level 3 Requirement:** Risk Level 3 dischargers shall ensure that all storm drain inlets and perimeter controls, runoff control BMPs, and pollutant controls at entrances and exits (e.g. tire washoff locations) are maintained and protected from activities that reduce their effectiveness.

7. **Additional Risk Level 3 Requirement:** Risk Level 3 dischargers shall inspect on a daily basis all immediate access roads daily. At a minimum daily (when necessary) and prior to any rain event, the discharger shall remove any sediment or other construction activity-related materials that are deposited on the roads (by vacuuming or sweeping).

8. **Additional Risk Level 3 Requirement:** The Regional Water Board may require Risk Level 3 dischargers to implement additional site-specific sediment control requirements if the implementation of the other requirements in this section are not adequately protecting the receiving waters.

F. Run-on and Run-off Controls

Risk Level 3 dischargers shall effectively manage all run-on, all runoff within the site and all runoff that discharges off the site. Run-on from off site shall be directed away from all disturbed areas or shall collectively be in compliance with the effluent limitations in this General Permit.

G. Inspection, Maintenance and Repair

1. Risk Level 3 dischargers shall ensure that all inspection, maintenance repair and sampling activities at the project location shall be performed or supervised by a Qualified SWPPP Practitioner (QSP) representing the discharger. The QSP may delegate any or all of these activities to an employee appropriately trained to do the task(s).

2. Risk Level 3 dischargers shall perform weekly inspections and observations, and at least once each 24-hour period during extended storm events, to identify and record BMPs that need maintenance to operate effectively, that have failed, or that could fail to operate as intended. Inspectors shall be the QSP or be trained by the QSP.

3. Upon identifying failures or other shortcomings, as directed by the QSP, Risk Level 3 dischargers shall begin implementing repairs or design changes to BMPs within 72 hours of identification and complete the changes as soon as possible.

4. For each inspection required, Risk Level 3 dischargers shall complete an inspection checklist, using a form provided by the State Water Board or Regional Water Board or in an alternative format.

5. Risk Level 3 dischargers shall ensure that checklists shall remain onsite with the SWPPP and at a minimum, shall include:

    a. Inspection date and date the inspection report was written.

    b. Weather information, including presence or absence of precipitation, estimate of beginning of qualifying storm event, duration of event, time elapsed since last storm, and approximate amount of rainfall in inches.

    c. Site information, including stage of construction, activities completed, and approximate area of the site exposed.

    d. A description of any BMPs evaluated and any deficiencies noted.

    e. If the construction site is safely accessible during inclement weather, list the observations of all BMPs: erosion controls, sediment controls, chemical and waste controls, and non-storm water controls. Otherwise, list the results of visual inspections at all relevant outfalls, discharge points, downstream locations and any projected maintenance activities.

    f. Report the presence of noticeable odors or of any visible sheen on the surface of any discharges.

    g. Any corrective actions required, including any necessary changes to the SWPPP and the associated implementation dates.

    h. Photographs taken during the inspection, if any.

i. Inspector's name, title, and signature.

H. Rain Event Action Plan

1. **Additional Risk Level 3 Requirement:** The discharger shall ensure a QSP develop a Rain Event Action Plan (REAP) 48 hours prior to any likely precipitation event. A likely precipitation event is any weather pattern that is forecast to have a 50% or greater probability of producing precipitation in the project area. The QSP shall obtain a printed copy of precipitation forecast information from the National Weather Service Forecast Office (e.g., by entering the zip code of the project's location at http://www.srh.noaa.gov/forecast).

2. **Additional Risk Level 3 Requirement:** The discharger shall ensure a QSP develop the REAPs for all phases of construction (i.e., Grading and Land Development, Streets and Utilities, Vertical Construction, Final Landscaping and Site Stabilization).

3. **Additional Risk Level 3 Requirement:** The discharger shall ensure a QSP ensure that the REAP include, at a minimum, the following site information:

   a. Site Address.
   b. Calculated Risk Level (2 or 3).
   c. Site Storm Water Manager Information including the name, company, and 24-hour emergency telephone number.
   d. Erosion and Sediment Control Provider information including the name, company, and 24-hour emergency telephone number.
   e. Storm Water Sampling Agent information including the name, company, and 24-hour emergency telephone number.

4. **Additional Risk Level 3 Requirement:** The QSP shall include in the REAP, at a minimum, the following project phase information:

   a. Activities associated with each construction phase.
   b. Trades active on the construction site during each construction phase.
   c. Trade contractor information.
   d. Suggested actions for each project phase.

5. **Additional Risk Level 3 Requirement:** The QSP shall develop additional REAPs for project sites where construction activities are indefinitely halted or postponed (Inactive Construction). At a minimum, Inactive Construction REAPs must include:

a. Site Address.
b. Calculated Risk Level (2 or 3).
c. Site Storm Water Manager Information including the name, company, and 24-hour emergency telephone number.
d. Erosion and Sediment Control Provider information including the name, company, and 24-hour emergency telephone number.
e. Storm Water Sampling Agent information including the name, company, and 24-hour emergency telephone number.
f. Trades active on site during Inactive Construction.
g. Trade contractor information.
h. Suggested actions for inactive construction sites.

6. **Additional Risk Level 3 Requirement:** The discharger shall ensure a QSP begin implementation and make the REAP available onsite no later than 24 hours prior to the likely precipitation event.

7. **Additional Risk Level 3 Requirement:** The discharger shall ensure a QSP maintain onsite a paper copy of each REAP onsite in compliance with the record retention requirements of the Special Provisions in this General Permit.

I. Risk Level 3 Monitoring and Reporting Requirements

Table 2- Summary of Monitoring Requirements

Risk Level	Visual Inspections					Sample Collection	
	Quarterly Non-storm Water Discharge	Pre-storm Event		Daily Storm BMP	Post Storm	Storm Water Discharge	Receiving Water
		Baseline	REAP				
3	X	X	X	X	X	X	X[4]

1. Construction Site Monitoring Program Requirements

   a. Pursuant to Water Code Sections 13383 and 13267, all dischargers subject to this General Permit shall develop and implement a written site-specific Construction Site Monitoring Program (CSMP) in accordance with the requirements of this Section. The CSMP shall include all monitoring procedures and instructions, location maps, forms, and checklists as required in this section. The CSMP shall be developed prior to the commencement of construction activities, and revised as necessary to reflect project revisions. The CSMP shall be a part of the Storm Water Pollution Prevention Plan (SWPPP), included as an appendix or separate SWPPP chapter.

   b. Existing dischargers registered under the State Water Board Order No. 99-08-DWQ shall make and implement necessary revisions to their Monitoring Program to reflect the changes in this General Permit in a timely manner, but no later than July 1, 2010. Existing dischargers shall continue to implement their existing Monitoring Program in compliance with State Water Board Order No. 99-08-DWQ until the necessary revisions are completed according to the schedule above.

   c. When a change of ownership occurs for all or any portion of the construction site prior to completion or final stabilization, the new discharger shall comply with these requirements as of the date the ownership change occurs.

2. **Objectives**

   The CSMP shall be developed and implemented to address the following objectives:

[4] When receiving water monitoring trigger is exceeded

a. To demonstrate that the site is in compliance with the Discharge Prohibitions and applicable Numeric Action Levels (NALs) of this General Permit.

b. To determine whether non-visible pollutants are present at the construction site and are causing or contributing to exceedances of water quality objectives.

c. To determine whether immediate corrective actions, additional Best Management Practice (BMP) implementation, or SWPPP revisions are necessary to reduce pollutants in storm water discharges and authorized non-storm water discharges.

d. To determine whether BMPs included in the SWPPP/Rain Event Action Plan (REAP) are effective in preventing or reducing pollutants in storm water discharges and authorized non-storm water discharges.

3. **Risk Level 3 – Visual Monitoring (Inspection) Requirements for Qualifying Rain Events**

a. Risk Level 3 dischargers shall visually observe (inspect) storm water discharges at all discharge locations within two business days (48 hours) after each qualifying rain event.

b. Risk Level 3 dischargers shall visually observe (inspect) the discharge of stored or contained storm water that is derived from and discharged subsequent to a qualifying rain event producing precipitation of ½ inch or more at the time of discharge. Stored or contained storm water that will likely discharge after operating hours due to anticipated precipitation shall be observed prior to the discharge during operating hours.

c. Risk Level 3 dischargers shall conduct visual observations (inspections) during business hours only.

d. Risk Level 3 dischargers shall record the time, date and rain gauge reading of all qualifying rain events.

e. Within 2 business days (48 hours) prior to each qualifying rain event, Risk Level 3 dischargers shall visually observe (inspect):

i. all storm water drainage areas to identify any spills, leaks, or uncontrolled pollutant sources. If needed, the discharger shall implement appropriate corrective actions.

ii. all BMPs to identify whether they have been properly implemented in accordance with the SWPPP/REAP. If needed, the discharger shall implement appropriate corrective actions.

iii. any storm water storage and containment areas to detect leaks and ensure maintenance of adequate freeboard.

f. For the visual observations (inspections) described in c.i. and c.iii above, Risk Level 3 dischargers shall observe the presence or absence of floating and suspended materials, a sheen on the surface, discolorations, turbidity, odors, and source(s) of any observed pollutants.

g. Within two business days (48 hours) after each qualifying rain event, Risk Level 3 dischargers shall conduct post rain event visual observations (inspections) to (1) identify whether BMPs were adequately designed, implemented, and effective, and (2) identify additional BMPs and revise the SWPPP accordingly.

h. Risk Level 3 dischargers shall maintain on-site records of all visual observations (inspections), personnel performing the observations, observation dates, weather conditions, locations observed, and corrective actions taken in response to the observations.

4. **Risk Level 3 – Water Quality Sampling and Analysis**

a. Risk Level 3 dischargers shall collect storm water grab samples from sampling locations, as defined in Section I.5. The storm water grab sample(s) obtained shall be representative of the flow and characteristics of the discharge.

b. At minimum, Risk Level 3 dischargers shall collect 3 samples per day of the qualifying event.

c. Risk Level 3 dischargers shall ensure that the grab samples collected of stored or contained storm water are from discharges subsequent to a qualifying rain event (producing precipitation of ½ inch or more at the time of discharge).

<u>Storm Water Effluent Monitoring Requirements</u>

d. Risk Level 3 dischargers shall analyze their effluent samples for:

i. pH and turbidity.

ii. Any additional parameters for which monitoring is required by the Regional Water Board.

e. Risk 3 dischargers shall electronically submit all storm event sampling results to the State Water Board no later than 10 days after the conclusion of the storm event.

Receiving Water Monitoring Requirements

f. In the event that a Risk Level 3 discharger's effluent exceeds the daily average receiving water monitoring trigger of 500 NTU turbidity or the daily average pH range 6.0-9.0 contained in this General Permit and has a direct discharge into receiving waters, the Risk Level 3 discharger shall subsequently sample receiving waters (RWs) for turbidity, pH (if applicable), and SSC for the duration of coverage under this General Permit. If a Risk Level 3 discharger utilizing ATS with direct discharges into receiving waters discharges effluent that exceeds the NELs in this permit, the discharger shall subsequently sample RWs for turbidity, pH (if applicable), and SSC for the duration of coverage under this General Permit.

g. Risk Level 3 dischargers disturbing 30 acres or more of the landscape and with direct discharges into receiving waters shall conduct or participate in benthic macroinvertebrate bioassessment of RWs prior to commencement of construction activity (See Appendix 3).

h. Risk Level 3 dischargers shall obtain RW samples in accordance with the Receiving Water sampling location section (Section I.5), below.

5. **Risk Level 3 – Storm Water Discharge Water Quality Sampling Locations**

Effluent Sampling Locations

a. Risk Level 3 dischargers shall perform sampling and analysis of storm water discharges to characterize discharges associated with construction activity from the entire project disturbed area.

b. Risk Level 3 dischargers shall collect effluent samples at all discharge points where storm water is discharged off-site.

c. Risk Level 3 dischargers shall ensure that storm water discharge collected and observed represent[5] the effluent in each drainage area based on visual observation of the water and upstream conditions.

d. Risk Level 3 dischargers shall monitor and report site run-on from surrounding areas if there is reason to believe run-on may contribute to an exceedance of NALs.

e. Risk Level 3 dischargers who deploy an ATS on their site, or a portion on their site, shall collect ATS effluent samples and measurements from the discharge pipe or another location representative of the nature of the discharge.

f. Risk Level 3 dischargers shall select analytical test methods from the list provided in Table 3 below.

g. All storm water sample collection preservation and handling shall be conducted in accordance with Section I.7 "Storm Water Sample Collection and Handling Instructions" below.

Receiving Water Sampling Locations

h. **Upstream/up-gradient RW samples**: Risk Level 3 dischargers shall obtain any required upstream/up-gradient receiving water samples from a representative and accessible location as close as possible and upstream from the effluent discharge point.

i. **Downstream/down-gradient RW samples**: Risk Level 3 dischargers shall obtain any required downstream/down-gradient receiving water samples from a representative and accessible location as close as possible and downstream from the effluent discharge point.

j. If two or more discharge locations discharge to the same receiving water, Risk Level 3 dischargers may sample the receiving water at a single upstream and downstream location.

[5] For example, if there has been concrete work recently in an area, or drywall scrap is exposed to the rain, a pH sample shall be taken of drainage from the relevant work area. Similarly, if sediment-laden water is flowing through some parts of a silt fence, samples shall be taken of the sediment laden water even if most water flowing through the fence is clear.

6. **Risk Level 3 – Visual Observation and Sample Collection Exemptions**

   a. Risk Level 3 dischargers shall be prepared to collect samples and conduct visual observation (inspections) until the minimum requirements of Sections I.3 and I.4 above are completed. Risk Level 3 dischargers are not required to physically collect samples or conduct visual observation (inspections) under the following conditions:

      i. During dangerous weather conditions such as flooding and electrical storms.

      ii. Outside of scheduled site business hours.

   b. If no required samples or visual observation (inspections) are collected due to these exceptions, Risk Level 3 dischargers shall include an explanation in their SWPPP and in the Annual Report documenting why the sampling or visual observation (inspections) were not conducted.

7. **Risk Level 3 – Storm Water Sample Collection and Handling Instructions**

   a. Risk Level 3 dischargers shall refer to Table 3 below for test methods, detection limits, and reporting units.

   b. Risk Level 3 dischargers shall ensure that testing laboratories will receive samples within 48 hours of the physical sampling (unless otherwise required by the laboratory), and shall use only the sample containers provided by the laboratory to collect and store samples.

   c. Risk Level 3 dischargers shall designate and train personnel to collect, maintain, and ship samples in accordance with the Surface Water Ambient Monitoring Program's (SWAMP) 2008 Quality Assurance Program Plan (QAPrP).[6]

[6] Additional information regarding SWAMP's QAPrP can be found at http://www.waterboards.ca.gov/water_issues/programs/swamp/.
QAPrP:http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/qapp/swamp_qapp_master090108a.pdf

8. **Risk Level 3 – Monitoring Methods**

   a. Risk Level 3 dischargers shall include a description of the following items in the CSMP:

      i. Visual observation locations, visual observation procedures, and visual observation follow-up and tracking procedures.

      ii. Sampling locations, and sample collection and handling procedures. This shall include detailed procedures for sample collection, storage, preservation, and shipping to the testing lab to assure that consistent quality control and quality assurance is maintained. Dischargers shall attach to the monitoring program an example Chain of Custody form used when handling and shipping samples.

      iii. Identification of the analytical methods and related method detection limits (if applicable) for each parameter required in Section I.4 above.

   b. Risk Level 3 dischargers shall ensure that all sampling and sample preservation are in accordance with the current edition of "Standard Methods for the Examination of Water and Wastewater" (American Public Health Association). All monitoring instruments and equipment (including a discharger's own field instruments for measuring pH and turbidity) should be calibrated and maintained in accordance with manufacturers' specifications to ensure accurate measurements. Risk Level 3 dischargers shall ensure that all laboratory analyses are conducted according to test procedures under 40 CFR Part 136, unless other test procedures have been specified in this General Permit or by the Regional Water Board. With the exception of field analysis conducted by the discharger for turbidity and pH, all analyses should be sent to and conducted at a laboratory certified for such analyses by the State Department of Health Services (SSC exception). Risk Level 3 dischargers shall conduct their own field analysis of pH and may conduct their own field analysis of turbidity if the discharger has sufficient capability (qualified and trained employees, properly calibrated and maintained field instruments, etc.) to adequately perform the field analysis.

9. **Risk Level 3 – Analytical Methods**

   a. Risk Level 3 dischargers shall refer to Table 3 below for test methods, detection limits, and reporting units.

b. **pH**: Risk Level 3 dischargers shall perform pH analysis on-site with a calibrated pH meter or a pH test kit. Risk Level 3 dischargers shall record pH monitoring results on paper and retain these records in accordance with Section I.14, below.

c. **Turbidity**: Risk Level 3 dischargers shall perform turbidity analysis using a calibrated turbidity meter (turbidimeter), either on-site or at an accredited lab. Acceptable test methods include Standard Method 2130 or USEPA Method 180.1. The results will be recorded in the site log book in Nephelometric Turbidity Units (NTU).

d. **Suspended sediment concentration (SSC)**: Risk Level 3 dischargers that exceed the turbidity Receiving Water Monitoring Trigger shall perform SSC analysis using ASTM Method D3977-97.

e. **Bioassessment**: Risk Level 3 dischargers shall perform bioassessment sampling and analysis according to Appendix 3 of this General Permit.

10. **Risk Level 3 - Non-Storm Water Discharge Monitoring Requirements**

a. Visual Monitoring Requirements:

i. Risk Level 3 dischargers shall visually observe (inspect) each drainage area for the presence of (or indications of prior) unauthorized and authorized non-storm water discharges and their sources.

ii. Risk Level 3 dischargers shall conduct one visual observation (inspection) quarterly in each of the following periods: January-March, April-June, July-September, and October-December. Visual observation (inspections) are only required during daylight hours (sunrise to sunset).

iii. Risk Level 3 dischargers shall ensure that visual observations (inspections) document the presence or evidence of any non-storm water discharge (authorized or unauthorized), pollutant characteristics (floating and suspended material, sheen, discoloration, turbidity, odor, etc.), and source. Risk Level 3 dischargers shall maintain on-site records indicating the personnel performing the visual observation (inspections), the dates and approximate time each drainage area and non-storm water discharge was observed, and the response taken to eliminate unauthorized non-storm water discharges and to

reduce or prevent pollutants from contacting non-storm water discharges.

b. Effluent Sampling Locations:

i. Risk Level 3 dischargers shall sample effluent at all discharge points where non-storm water and/or authorized non-storm water is discharged off-site.

ii. Risk Level 3 dischargers shall send all non-storm water sample analyses to a laboratory certified for such analyses by the State Department of Health Services.

iii. Risk Level 3 dischargers shall monitor and report run-on from surrounding areas if there is reason to believe run-on may contribute to an exceedance of NALs.

11. **Risk Level 3 – Non-Visible Pollutant Monitoring Requirements**

a. Risk Level 3 dischargers shall collect one or more samples during any breach, malfunction, leakage, or spill observed during a visual inspection which could result in the discharge of pollutants to surface waters that would not be visually detectable in storm water.

b. Risk Level 3 dischargers shall ensure that water samples are large enough to characterize the site conditions.

c. Risk Level 3 dischargers shall collect samples at all discharge locations that can be safely accessed.

d. Risk Level 3 dischargers shall collect samples during the first two hours of discharge from rain events that occur during business hours and which generate runoff.

e. Risk Level 3 dischargers shall analyze samples for all non-visible pollutant parameters (if applicable) - parameters indicating the presence of pollutants identified in the pollutant source assessment required (Risk Level 3 dischargers shall modify their CSMPs to address these additional parameters in accordance with any updated SWPPP pollutant source assessment).

f. Risk Level 3 dischargers shall collect a sample of storm water that has not come in contact with the disturbed soil or the materials stored or used on-site (uncontaminated sample) for comparison with the discharge sample.

g. Risk Level 3 dischargers shall compare the uncontaminated sample to the samples of discharge using field analysis or through laboratory analysis.[7]

h. Risk Level 3 dischargers shall keep all field /or analytical data in the SWPPP document.

12. **Risk Level 3 – Watershed Monitoring Option**

Risk Level 3 dischargers who are part of a qualified regional watershed-based monitoring program may be eligible for relief from the requirements in Sections I.5. The Regional Water Board may approve proposals to substitute an acceptable watershed-based monitoring program by determining if the watershed-based monitoring program will provide substantially similar monitoring information in evaluating discharger compliance with the requirements of this General Permit.

13. **Risk Level 3 – Particle Size Analysis for Project Risk Justification**

Risk Level 3 dischargers justifying an alternative project risk shall report a soil particle size analysis used to determine the RUSLE K-Factor. ASTM D-422 (Standard Test Method for Particle-Size Analysis of Soils), as revised, shall be used to determine the percentages of sand, very fine sand, silt, and clay on the site.

14. **Risk Level 3 – Records**

Risk Level 3 dischargers shall retain records of all storm water monitoring information and copies of all reports (including Annual Reports) for a period of at least three years. Risk Level 3 dischargers shall retain all records on-site while construction is ongoing. These records include:

a. The date, place, time of facility inspections, sampling, visual observation (inspections), and/or measurements, including precipitation.

b. The individual(s) who performed the facility inspections, sampling, visual observation (inspections), and or measurements.

c. The date and approximate time of analyses.

[7] For laboratory analysis, all sampling, sample preservation, and analyses must be conducted according to test procedures under 40 CFR Part 136. Field discharge samples shall be collected and analyzed according to the specifications of the manufacturer of the sampling devices employed.

d. The individual(s) who performed the analyses.

e. A summary of all analytical results from the last three years, the method detection limits and reporting units, the analytical techniques or methods used, and the chain of custody forms.

f. Rain gauge readings from site inspections.

g. Quality assurance/quality control records and results.

h. Non-storm water discharge inspections and visual observation (inspections) and storm water discharge visual observation records (see Sections I.3 and I.10 above).

i. Visual observation and sample collection exception records (see Section I.6 above).

j. The records of any corrective actions and follow-up activities that resulted from analytical results, visual observation (inspections), or inspections.

15. **Risk Level 3 – NAL Exceedance Report**

a. Risk Level 3 dischargers shall electronically submit all storm event sampling results to the State Water Board no later than 10 days after the conclusion of the storm event. The Regional Boards have the authority to require the submittal of an NAL Exceedance Report.

b. Risk Level 3 dischargers shall certify each NAL Exceedance Report in accordance with the Special Provisions for Construction Activity In this General Permit.

c. Risk Level 3 dischargers shall retain an electronic or paper copy of each NAL Exceedance Report for a minimum of three years after the date the annual report is filed.

d. Risk Level 3 dischargers shall include in the NAL Exceedance Report:

i. The analytical method(s), method reporting unit(s), and method detection limit(s) of each analytical parameter (analytical results that are less than the method detection limit shall be reported as “less than the method detection limit”).

ii. The date, place, time of sampling, visual observation (inspections), and/or measurements, including precipitation.

iii. A description of the current BMPs associated with the effluent sample that exceeded the NAL and the proposed corrective actions taken.

16. **Risk Level 3 – Bioassessment**

a. Risk Level 3 dischargers with a total project-related ground disturbance exceeding 30 acres shall:

i. Conduct bioassessment monitoring, as described in Appendix 3.

ii. Include the collection and reporting of specified in stream biological data and physical habitat.

iii. Use the bioassessment sample collection and Quality Assurance & Quality Control (QA/QC) protocols developed by the State of California's Surface Water Ambient Monitoring Program (SWAMP).[8]

b. Risk Level 3 dischargers qualifying for bioassessment, where construction commences out of an index period for the site location shall:

i. Receive Regional Board approval for the sampling exception.

ii. Conduct bioassessment monitoring, as described in Appendix 3.

iii. Include the collection and reporting of specified instream biological data and physical habitat.

iv. Use the bioassessment sample collection and Quality Assurance & Quality Control (QA/QC) protocols developed by the State of California's Surface Water Ambient Monitoring Program (SWAMP).

OR

v. Make a check payable to: Cal State Chico Foundation (SWAMP Bank Account) or San Jose State Foundation (SWAMP Bank Account) and include the WDID# on the check for the amount calculated for the exempted project.

[8] http://www.waterboards.ca.gov/water_issues/programs/swamp/.

vi. Send a copy of the check to the Regional Water Board office for the site's region.

vii. Invest $**7,500.00 X The number of samples required** into the SWAMP program as compensation (upon regional board approval).

Table 3 – Risk Level 3 Test Methods, Detection Limits, Reporting Units and Applicable NALs

Parameter	Test Method / Protocol	Discharge Type	Min. Detection Limit	Reporting Units	Numeric Action Level	Numeric Effluent Limitation	Receiving Water Monitoring Trigger
pH	Field test with calibrated portable instrument	Risk Level 3 Discharges	0.2	pH units	lower NAL = 6.5 upper NAL = 8.5	N/A	lower limit = 6.0 upper limit = 9.0
Turbidity	EPA 0180.1 and/or field test with calibrated portable instrument	Risk Level 3 Discharges other than ATS	1	NTU	250 NTU	N/A	500 NTU
		For ATS discharges	1	NTU	N/A	10 NTU for Daily Weighted Average & 20 NTU for Any Single Sample	10 NTU for Daily Weighted Average & 20 NTU for Any Single Sample
SSC	ASTM Method D 3977-97[9]	Risk Level 3 (if Receiving Water Monitoring Trigger exceeded)	5	mg/L	N/A	N/A	N/A
Bioassessment	(STE) Level I of (SAFIT),[10] fixed-count of 600 org/sample	Risk Level 3 projects> 30 acres	N/A	N/A	N/A	N/A	N/A

[9] ASTM, 1999, Standard Test Method for Determining Sediment Concentration in Water Samples: American Society of Testing and Materials, D 3977-97, Vol. 11.02, pp. 389-394.

[10] The current SAFIT STEs (28 November 2006) list requirements for both the Level I and Level II taxonomic effort, and are located at: http://www.swrcb.ca.gov/swamp/docs/safit/ste_list.pdf. When new editions are published by SAFIT, they will supersede all previous editions. All editions will be posted at the State Water Board's SWAMP website.

ATTACHMENT F:
Active Treatment System (ATS) Requirements

Table 1 – Numeric Effluent Limitations, Numeric Action Levels, Test Methods, Detection Limits, and Reporting Units

Parameter	Test Method	Discharge Type	Min. Detection Limit	Units	Numeric Action Level	Numeric Effluent Limitation
Turbidity	EPA 0180.1 and/or field test with a calibrated portable instrument	For ATS discharges	1	NTU	N/A	10 NTU for Daily Flow-Weighted Average & 20 NTU for Any Single Sample

A. Dischargers choosing to implement an Active Treatment System (ATS) on their site shall comply with all of the requirements in this Attachment.

B. The discharger shall maintain a paper copy of each ATS specification onsite in compliance with the record retention requirements in the Special Provisions of this General Permit.

C. ATS Design, Operation and Submittals

1. The ATS shall be designed and approved by a Certified Professional in Erosion and Sediment Control (CPESC), a Certified Professional in Storm Water Quality (CPSWQ); a California registered civil engineer; or any other California registered engineer.

2. The discharger shall ensure that the ATS is designed in a manner to preclude the accidental discharge of settled floc[1] during floc pumping or related operations.

3. The discharger shall design outlets to dissipate energy from concentrated flows.

4. The discharger shall install and operate an ATS by assigning a lead person (or project manager) who has either a minimum of five years construction storm

[1] Floc is defined as a clump of solids formed by the chemical action in ATS systems.

water experience or who is a licensed contractors specifically holding a California Class A Contractors license.[2]

5. The discharger shall prepare an ATS Plan that combines the site-specific data and treatment system information required to safely and efficiently operate an ATS. The ATS Plan shall be electronically submitted to the State Water Board at least 14 days prior to the planned operation of the ATS and a paper copy shall be available onsite during ATS operation. At a minimum, the ATS Plan shall include:

   a. ATS Operation and Maintenance Manual for All Equipment.

   b. ATS Monitoring, Sampling & Reporting Plan, including Quality Assurance/Quality Control (QA/QC).

   c. ATS Health and Safety Plan.

   d. ATS Spill Prevention Plan.

6. The ATS shall be designed to capture and treat (within a 72-hour period) a volume equivalent to the runoff from a 10-year, 24-hour storm event using a watershed runoff coefficient of 1.0.

D. Treatment – Chemical Coagulation/Flocculation

1. Jar tests shall be conducted using water samples selected to represent typical site conditions and in accordance with ASTM D2035-08 (2003).

2. The discharger shall conduct, at minimum, six site-specific jar tests (per polymer with one test serving as a control) for each project to determine the proper polymer and dosage levels for their ATS.

3. Single field jar tests may also be conducted during a project if conditions warrant, for example if construction activities disturb changing types of soils, which consequently cause change in storm water and runoff characteristics.

E. Residual Chemical and Toxicity Requirements

1. The discharger shall utilize a residual chemical test method that has a method detection limit (MDL) of 10% or less than the maximum allowable threshold

[2] Business and Professions Code Division 3, Chapter 9, Article 4, Class A Contractor: A general engineering contractor is a contractor whose principal contracting business is in connection with fixed works requiring specialized engineering knowledge and skill. [http://www.cslb.ca.gov/General-Information/library/licensing-classifications.asp].

concentration[3] (MATC) for the specific coagulant in use and for the most sensitive species of the chemical used.

2. The discharger shall utilize a residual chemical test method that produces a result within one hour of sampling.

3. The discharger shall have a California State certified laboratory validate the selected residual chemical test. Specifically the lab will review the test protocol, test parameters, and the detection limit of the coagulant. The discharger shall electronically submit this documentation as part of the ATS Plan.

4. If the discharger cannot utilize a residual chemical test method that meets the requirements above, the discharger shall operate the ATS in Batch Treatment[4] mode.

5. A discharger planning to operate in Batch Treatment mode shall perform toxicity testing in accordance with the following:

   a. The discharger shall initiate acute toxicity testing on effluent samples representing effluent from each batch prior to discharge[5]. All bioassays shall be sent to a laboratory certified by the Department of Health Services (DHS) Environmental Laboratory Accreditation Program (ELAP). The required field of testing number for Whole Effluent Toxicity (WET) testing is E113.[6]

   b. Acute toxicity tests shall be conducted with the following species and protocols. The methods to be used in the acute toxicity testing shall be those outlined for a 96-hour acute test in "Methods for Measuring the Acute Toxicity of Effluents and Receiving Water to Freshwater and Marine Organisms, USEPA-841-R-02-012" for Fathead minnow, *Pimephales promelas* (fathead minnow). Acute toxicity for *Oncorhynchus mykiss* (Rainbow Trout) may be used as a substitute for testing fathead minnows.

   c. All toxicity tests shall meet quality assurance criteria and test acceptability criteria in the most recent versions of the EPA test method for WET testing.

   d. The discharger shall electronically report all acute toxicity testing.

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[3] The Maximum Allowable Threshold Concentration (MATC) is the allowable concentration of residual, or dissolved, coagulant/flocculant in effluent. The MATC shall be coagulant/flocculant-specific, and based on toxicity testing conducted by an independent, third-party laboratory. A typical MATC would be:
The MATC is equal to the geometric mean of the NOEC (No Observed Effect Concentration) and LOEC (Lowest Observed Effect Concentration) Acute and Chronic toxicity results for most sensitive species determined for the specific coagulant. The most sensitive species test shall be used to determine the MATC.
[4] Batch Treatment mode is defined as holding or recirculating the treated water in a holding basin or tank(s) until treatment is complete or the basin or storage tank(s) is full.
[5] This requirement only requires that the test be initiated prior to discharge.
[6] http://www.dhs.ca.gov/ps/ls/elap/pdf/FOT_Desc.pdf.

F. Filtration

1. The ATS shall include a filtration step between the coagulant treatment train and the effluent discharge. This is commonly provided by sand, bag, or cartridge filters, which are sized to capture suspended material that might pass through the clarifier tanks.

2. Differential pressure measurements shall be taken to monitor filter loading and confirm that the final filter stage is functioning properly.

G. Residuals Management

1. Sediment shall be removed from the storage or treatment cells as necessary to ensure that the cells maintain their required water storage (i.e., volume) capability.

2. Handling and disposal of all solids generated during ATS operations shall be done in accordance with all local, state, and federal laws and regulations.

H. ATS Instrumentation

1. The ATS shall be equipped with instrumentation that automatically measures and records effluent water quality data and flow rate.

2. The minimum data recorded shall be consistent with the Monitoring and Reporting requirements below, and shall include:

   a. Influent Turbidity

   b. Effluent Turbidity

   c. Influent pH

   d. Effluent pH

   e. Residual Chemical

   f. Effluent Flow rate

   g. Effluent Flow volume

3. Systems shall be equipped with a data recording system, such as data loggers or webserver-based systems, which records each measurement on a frequency no longer than once every 15 minutes.

4. Cumulative flow volume shall be recorded daily. The data recording system shall have the capacity to record a minimum of seven days continuous data.

5. Instrumentation systems shall be interfaced with system control to provide auto shutoff or recirculation in the event that effluent measurements exceed turbidity or pH.

6. The system shall also assure that upon system upset, power failure, or other catastrophic event, the ATS will default to a recirculation mode or safe shut down.

7. Instrumentation (flow meters, probes, valves, streaming current detectors, controlling computers, etc.) shall be installed and maintained per manufacturer's recommendations, which shall be included in the QA/QC plan.

8. The QA/QC plan shall also specify calibration procedures and frequencies, instrument method detection limit or sensitivity verification, laboratory duplicate procedures, and other pertinent procedures.

9. The instrumentation system shall include a method for controlling coagulant dose, to prevent potential overdosing. Available technologies include flow/turbidity proportional metering, periodic jar testing and metering pump adjustment, and ionic charge measurement controlling the metering pump.

I. ATS Effluent Discharge

1. ATS effluent shall comply with all provisions and prohibitions in this General Permit, specifically the NELs.

2. NELs for discharges from an ATS:

   a. Turbidity of all ATS discharges shall be less than 10 NTU for daily flow-weighted average of all samples and 20 NTU for any single sample.

   b. Residual Chemical shall be < 10% of MATC[7] for the most sensitive species of the chemical used.

[7] The Maximum Allowable Threshold Concentration (MATC) is the allowable concentration of residual, or dissolved, coagulant/flocculant in effluent. The MATC shall be coagulant/flocculant-specific, and based on toxicity testing conducted by an independent, third-party laboratory. The MATC is equal to the geometric mean of the NOEC (No Observed Effect Concentration) and LOEC (Lowest Observed Effect Concentration) Acute and Chronic toxicity results for most sensitive species determined for the specific coagulant. The most sensitive species test shall be used to determine the MATC.

3. If an analytical effluent sampling result exceeds the turbidity NEL (as listed in Table 1), the discharger is in violation of this General Permit and shall electronically file the results in violation within 24-hours of obtaining the results.

4. If ATS effluent is authorized to discharge into a sanitary sewer system, the discharger shall comply with any pre-treatment requirements applicable for that system. The discharger shall include any specific criteria required by the municipality in the ATS Plan.

5. Compliance Storm Event:

   Discharges of storm water from ATS shall comply with applicable NELs (above) unless the storm event causing the discharges is determined after the fact to be equal to or larger than the Compliance Storm Event (expressed in inches of rainfall). The Compliance Storm Event for ATS discharges is the 10 year, 24 hour storm, as determined using these maps:

   http://www.wrcc.dri.edu/pcpnfreq/nca10y24.gif
   http://www.wrcc.dri.edu/pcpnfreq/sca10y24.gif

   This exemption is dependent on the submission of rain gauge data verifying the storm event is equal to or larger than the Compliance Storm.

J. Operation and Maintenance Plan

1. Each Project shall have a site-specific Operation and Maintenance (O&M) Manual covering the procedures required to install, operate and maintain the ATS.[8]

2. The O&M Manual shall only be used in conjunction with appropriate project-specific design specifications that describe the system configuration and operating parameters.

3. The O&M Manual shall have operating manuals for specific pumps, generators, control systems,and other equipment.

K. Sampling and Reporting Quality Assurance/ Quality Check (QA/QC) Plan

4. A project-specific QA/QC Plan shall be developed for each project. The QA/QC Plan shall include at a minimum:

   a. Calibration – Calibration methods and frequencies for all system and field instruments shall be specified.

[8] The manual is typically in a modular format covering generalized procedures for each component that is utilized in a particular system.

b. Method Detection Limits (MDLs) – The methods for determining MDLs shall be specified for each residual coagulant measurement method. Acceptable minimum MDLs for each method, specific to individual coagulants, shall be specified.

c. Laboratory Duplicates – Requirements for monthly laboratory duplicates for residual coagulant analysis shall be specified.

L. Personnel Training

1. Operators shall have training specific to using an ATS and liquid coagulants for storm water discharges in California.

2. The training shall be in the form of a formal class with a certificate and requirements for testing and certificate renewal.

3. Training shall include a minimum of eight hours classroom and 32 hours field training. The course shall cover the following topics:

   a. Coagulation Basics –Chemistry and physical processes

   b. ATS System Design and Operating Principles

   c. ATS Control Systems

   d. Coagulant Selection – Jar testing, dose determination, etc.

   e. Aquatic Safety/Toxicity of Coagulants, proper handling and safety

   f. Monitoring, Sampling, and Analysis

   g. Reporting and Recordkeeping

   h. Emergency Response

M. Active Treatment System (ATS) Monitoring Requirements

Any discharger who deploys an ATS on their site shall conduct the following:

1. Visual Monitoring

   a. A designated responsible person shall be on site daily at all times during treatment operations.

b. Daily on-site visual monitoring of the system for proper performance shall be conducted and recorded in the project data log.

   i. The log shall include the name and phone number of the person responsible for system operation and monitoring.

   ii. The log shall include documentation of the responsible person's training.

2. Operational and Compliance Monitoring

   a. Flow shall be continuously monitored and recorded at not greater than 15-minute intervals for total volume treated and discharged.

   b. Influent and effluent pH must be continuously monitored and recorded at not greater than 15-minute intervals.

   c. Influent and effluent turbidity (expressed in NTU) must be continuously monitored and recorded at not greater than 15-minute intervals.

   d. The type and amount of chemical used for pH adjustment, if any, shall be monitored and recorded.

   e. Dose rate of chemical used in the ATS system (expressed in mg/L) shall be monitored and reported 15-minutes after startup and every 8 hours of operation.

   f. Laboratory duplicates – monthly laboratory duplicates for residual coagulant analysis must be performed and records shall be maintained onsite.

   g. Effluent shall be monitored and recorded for residual chemical/additive levels.

   h. If a residual chemical/additive test does not exist and the ATS is operating in a batch treatment mode of operation refer to the toxicity monitoring requirements below.

3. Toxicity Monitoring

   A discharger operating in batch treatment mode shall perform toxicity testing in accordance with the following:

   a. The discharger shall initiate acute toxicity testing on effluent samples representing effluent from each batch prior to discharge.[9] All bioassays shall be sent to a laboratory certified by the Department of Health Services (DHS)

[9] This requirement only requires that the test be initiated prior to discharge.

Environmental Laboratory Accreditation Program (ELAP). The required field of testing number for Whole Effluent Toxicity (WET) testing is E113.[10]

b. Acute toxicity tests shall be conducted with the following species and protocols. The methods to be used in the acute toxicity testing shall be those outlined for a 96-hour acute test in "Methods for Measuring the Acute Toxicity of Effluents and Receiving Water to Freshwater and Marine Organisms, USEPA-841-R-02-012" for Fathead minnow, *Pimephales promelas or* Rainbow trout *Oncorhynchus mykiss* may be used as a substitute for fathead minnow.

c. All toxicity tests shall meet quality assurance criteria and test acceptability criteria in the most recent versions of the EPA test method for WET testing.[11]

4. Reporting and Recordkeeping

At a minimum, every 30 days a LRP representing the discharger shall access the State Water Boards Storm Water Mulit-Application and Report Tracking system (SMARTS) and electronically upload field data from the ATS. Records must be kept for three years after the project is completed .

5. Non-compliance Reporting

a. Any indications of toxicity or other violations of water quality objectives shall be reported to the appropriate regulatory agency as required by this General Permit.

b. Upon any measurements that exceed water quality standards, the system operator shall immediately notify his supervisor or other responsible parties, who shall notify the Regional Water Board.

c. If any monitoring data exceeds any applicable NEL in this General Permit, the discharger shall electronically submit a NEL Violation Report to the State Water Board within 24 hours after the NEL exceedance has been identified.

i. ATS dischargers shall certify each NEL Violation Report in accordance with the Special Provisions for Construction Activity in this General Permit.

ii. ATS dischargers shall retain an electronic or paper copy of each NEL Violation Report for a minimum of three years after the date the annual report is filed.

iii. ATS dischargers shall include in the NEL Violation Report:

[10] http://www.dhs.ca.gov/ps/ls/elap/pdf/FOT_Desc.pdf.
[11] http://www.epa.gov/waterscience/methods/wet/.

(1) The analytical method(s), method reporting unit(s), and method detection limit(s) of each analytical parameter (analytical results that are less than the method detection limit shall be reported as “less than the method detection limit”);

(2) The date, place, time of sampling, visual observation (inspections), and/or measurements, including precipitation; and

(3) A description of the current onsite BMPs, and the proposed corrective actions taken to manage the NEL exceedance.

iv. Compliance Storm Exemption - In the event that an applicable NEL has been exceeded during a storm event equal to or larger than the Compliance Storm Event, ATS dischargers shall report the on-site rain gauge reading and nearby governmental rain gauge readings for verification.

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Version 8/17/2011												
2		**Risk Determination Worksheet**											
3													
4			**Step 1**	Determine Sediment Risk via one of the options listed:									
5				1. GIS Map Method - EPA Rainfall Erosivity Calculator & GIS map									
6				2. Individual Method - EPA Rainfall Erosivity Calculator & Individual Data									
7			**Step 2**	Determine Receiving Water Risk via one of the options listed:									
8				1. GIS map of Sediment Sensitive Watersheds provided									
9				2. Site Specific Analysis (support documentation required)									
10			**Step 3**	Determine Combined Risk Level									
11													
12													
13													
14													
15													
16													
17													
18													
19													
20													

	A	B	C
1	**Sediment Risk Factor Worksheet**		**Entry**
2	**A) R Factor**		
3	Analyses of data indicated that when factors other than rainfall are held constant, soil loss is directly proportional to a rainfall factor composed of total storm kinetic energy (E) times the maximum 30-min intensity (I30) (Wischmeier and Smith, 1958). The numerical value of R is the average annual sum of EI30 for storm events during a rainfall record of at least 22 years. "Isoerodent" maps were developed based on R values calculated for more than 1000 locations in the Western U.S. Refer to the link below to determine the R factor for the project site.		
4	http://cfpub.epa.gov/npdes/stormwater/LEW/lewCalculator.cfm		
5	**R Factor Value**		0
6	**B) K Factor (weighted average, by area, for all site soils)**		
7	The soil-erodibility factor K represents: (1) susceptibility of soil or surface material to erosion, (2) transportability of the sediment, and (3) the amount and rate of runoff given a particular rainfall input, as measured under a standard condition Fine-textured soils that are high in clay have low K values (about 0.05 to 0.15) because the particles are resistant to detachment. Coarse-textured soils, such as sandy soils, also have low K values (about 0.05 to 0.2) because of high infiltration resulting in low runoff even though these particles are easily detached. Medium-textured soils, such as a silt loam, have moderate K values (about 0.25 to 0.45) because they are moderately susceptible to particle detachment and they produce runoff at moderate rates. Soils having a high silt content are especially susceptible to erosion and have high K values, which can exceed 0.45 and can be as large as 0.65. Silt-size particles are easily detached and tend to crust, producing high rates and large volumes of runoff. Use Site-specific data must be submitted.		
8	Site-specific K factor guidance		
9	**K Factor Value**		0
10	**C) LS Factor (weighted average, by area, for all slopes)**		
11	The effect of topography on erosion is accounted for by the LS factor, which combines the effects of a hillslope-length factor, L, and a hillslope-gradient factor, S. Generally speaking, as hillslope length and/or hillslope gradient increase, soil loss increases. As hillslope length increases, total soil loss and soil loss per unit area increase due to the progressive accumulation of runoff in the downslope direction. As the hillslope gradient increases, the velocity and erosivity of runoff increases. Use the LS table located in separate tab of this spreadsheet to determine LS factors. Estimate the weighted LS for the site prior to construction.		
12	LS Table		
13	**LS Factor Value**		0
14			
15	**Watershed Erosion Estimate (=RxKxLS) in tons/acre**	0	
16	**Site Sediment Risk Factor**	**Low**	
17	Low Sediment Risk: < 15 tons/acre		
18	Medium Sediment Risk: >=15 and <75 tons/acre		
19	High Sediment Risk: >= 75 tons/acre		
20			
21			
22			
23	**GIS Map Method:**		
24	**1.** The R factor for the project is calculated using the online calculator at:		
25	http://cfpub.epa.gov/npdes/stormwater/LEW/lewCalculator.cfm		
26			
27	**2**. The K and LS factors may be obtained by accessing the GIS maps located on the State Water Board FTP website at:		
28	ftp://swrcb2a.waterboards.ca.gov/pub/swrcb/dwq/cgp/Risk/		
29			

Receiving Water (RW) Risk Factor Worksheet	Entry	Score
A. Watershed Characteristics	**yes/no**	
A.1. Does the disturbed area discharge (either directly or indirectly) to a **303(d)-listed waterbody impaired by sediment** (For help with impaired waterbodies please visit the link below) or has a **USEPA approved TMDL implementation plan for sediment**?:	**no**	**Low**
http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml		
OR		
A.2. Does the disturbed area discharge to a waterbody with designated beneficial uses of SPAWN & COLD & MIGRATORY? (For help please review the appropriate Regional Board Basin Plan)		
http://www.waterboards.ca.gov/waterboards_map.shtml		
Region 1 Basin Plan		
Region 2 Basin Plan		
Region 3 Basin Plan		
Region 4 Basin Plan		
Region 5 Basin Plan		
Region 6 Basin Plan		
Region 7 Basin Plan		
Region 8 Basin Plan		
Region 9 Basin Plan		

Combined Risk Level Matrix

Receiving Water Risk	Sediment Risk: Low	Sediment Risk: Medium	Sediment Risk: High
Low	Level 1	Level 2	
High	Level 2		Level 3

Project Sediment Risk: Low

Project RW Risk: Low

Project Combined Risk: Level 1

Soil Erodibility Factor (K)

The K factor can be determined by using the nomograph method, which requires that a particle size analysis (ASTM D-422) be done to determine the percentages of sand, very fine sand, silt and clay. Use the figure below to determine appropriate K value.

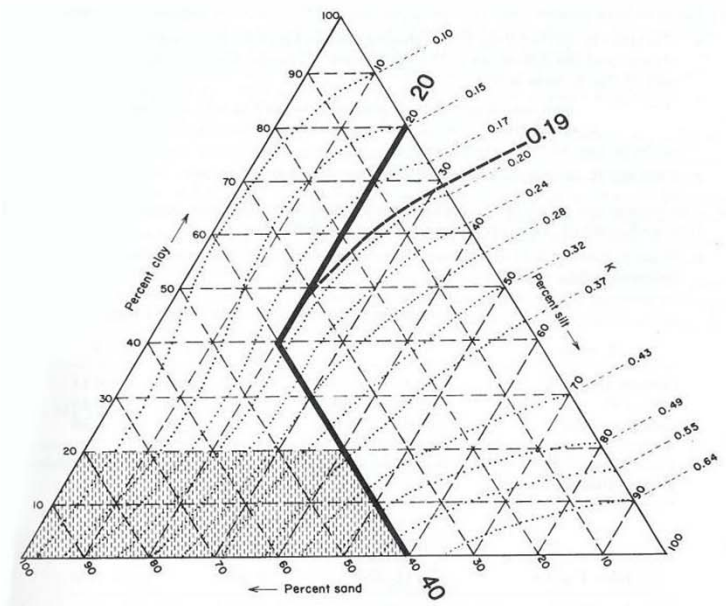

Erickson triangular nomograph used to estimate soil erodibility (K) factor.
The figure above is the USDA nomograph used to determine the K factor for a soil, based on its texture (% silt plus very fine sand, % sand, % organic matter, soil structure, and permeability). *Nomograph from Erickson 1977 as referenced in Goldman et. al., 1986.*

Sheet Flow Length (ft)	Average Watershed Slope (%) 0.2	0.5	1.0	2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	20.0	25.0	30.0	40.0	50.0	60.0
<3	0.05	0.07	0.09	0.13	0.17	0.20	0.23	0.26	0.32	0.35	0.36	0.38	0.39	0.41	0.45	0.48	0.53	0.58	0.63
6	0.05	0.07	0.09	0.13	0.17	0.20	0.23	0.26	0.32	0.37	0.41	0.45	0.49	0.56	0.64	0.72	0.85	0.97	1.07
9	0.05	0.07	0.09	0.13	0.17	0.20	0.23	0.26	0.32	0.38	0.45	0.51	0.56	0.67	0.80	0.91	1.13	1.31	1.47
12	0.05	0.07	0.09	0.13	0.17	0.20	0.23	0.26	0.32	0.39	0.47	0.55	0.62	0.76	0.93	1.08	1.37	1.62	1.84
15	0.05	0.07	0.09	0.13	0.17	0.20	0.23	0.26	0.32	0.40	0.49	0.58	0.67	0.84	1.04	1.24	1.59	1.91	2.19
25	0.05	0.07	0.10	0.16	0.21	0.26	0.31	0.36	0.45	0.57	0.71	0.85	0.98	1.24	1.56	1.86	2.41	2.91	3.36
50	0.05	0.08	0.13	0.21	0.30	0.38	0.46	0.54	0.70	0.91	1.15	1.40	1.64	2.10	2.67	3.22	4.24	5.16	5.97
75	0.05	0.08	0.14	0.25	0.36	0.47	0.58	0.69	0.91	1.20	1.54	1.87	2.21	2.86	3.67	4.44	5.89	7.20	8.37
100	0.05	0.09	0.15	0.28	0.41	0.55	0.68	0.82	1.10	1.46	1.88	2.31	2.73	3.57	4.59	5.58	7.44	9.13	10.63
150	0.05	0.09	0.17	0.33	0.50	0.68	0.86	1.05	1.43	1.92	2.51	3.09	3.68	4.85	6.30	7.70	10.35	12.75	14.89
200	0.06	0.10	0.18	0.37	0.57	0.79	1.02	1.25	1.72	2.34	3.07	3.81	4.56	6.04	7.88	9.67	13.07	16.16	18.92
250	0.06	0.10	0.19	0.40	0.64	0.89	1.16	1.43	1.99	2.72	3.60	4.48	5.37	7.16	9.38	11.55	15.67	19.42	22.78
300	0.06	0.10	0.20	0.43	0.69	0.98	1.28	1.60	2.24	3.09	4.09	5.11	6.15	8.23	10.81	13.35	18.17	22.57	26.51
400	0.06	0.11	0.22	0.48	0.80	1.14	1.51	1.90	2.70	3.75	5.01	6.30	7.60	10.24	13.53	16.77	22.95	28.60	33.67
600	0.06	0.12	0.24	0.56	0.96	1.42	1.91	2.43	3.52	4.95	6.67	8.45	10.26	13.94	18.57	23.14	31.89	39.95	47.18
800	0.06	0.12	0.26	0.63	1.10	1.65	2.25	2.89	4.24	6.03	8.17	10.40	12.69	17.35	23.24	29.07	40.29	50.63	59.93
1000	0.06	0.13	0.27	0.69	1.23	1.86	2.55	3.30	4.91	7.02	9.57	12.23	14.96	20.57	27.66	34.71	48.29	60.84	72.15

LS Factors for Construction Sites. *Table from Renard et. al., 1997.*

APPENDIX 2:
Post-Construction Water Balance Performance Standard Spreadsheet

The discharger shall submit with their Notice of Intent (NOI) the following information to demonstrate compliance with the New and Re-Development Water Balance Performance Standard.

Map Instructions

The discharger must submit a small-scale topographic map of the site to show the existing contour elevations, pre- and post-construction drainage divides, and the total length of stream in each watershed area. Recommended scales include 1 in. = 20 ft., 1 in. = 30 ft., 1 in. = 40 ft., or 1 in = 50 ft. The suggested contour interval is usually 1 to 5 feet, depending upon the slope of the terrain. The contour interval may be increased on steep slopes. Other contour intervals and scales may be appropriate given the magnitude of land disturbance.

Spreadsheet Instructions

The intent of the spreadsheet is to help dischargers calculate the project-related increase in runoff volume and select impervious area and runoff reduction credits to reduce the project-related increase in runoff volume to pre-project levels.

The discharger has the option of using the spreadsheet (**Appendix 2.1)** or a more sophisticated, watershed process-based model (e.g. Storm Water Management Model, Hydrological Simulation Program Fortran) to determine the project-related increase in runoff volume.

In* Appendix 4.1**, ***you must complete the worksheet for each land use/soil type combination for each project sub-watershed.

Steps 1 through 9 pertain specifically to the Runoff Volume Calculator:

Step 1: Enter the county where the project is located in cell H3.

Step 2: Enter the soil type in cell H6.

Step 3: Enter the existing pervious (dominant) land use type in cell H7.

Step 4: Enter the proposed pervious (dominant) land use type in cell H8.

Step 5: Enter the total project site area in cell H11 or J11.

Step 6: Enter the sub-watershed area in cell H12 or J12.

Step 7: Enter the existing rooftop area in cell H17 or J17, the existing non-rooftop impervious area in cell H18 or J18, the proposed rooftop area in cell H19 or J19, and the proposed non-rooftop impervious area in cell H20 or J20

Step 8: Work through each of the impervious area reduction credits and claim credits where applicable. Volume that cannot be addressed using non-structural practices must be captured in structural practices and approved by the Regional Water Board.

Step 9: Work through each of the impervious volume reduction credits and claim credits where applicable. Volume that cannot be addressed using non-structural practices must be captured in structural practices and approved by the Regional Water Board.

Non-structural Practices Available for Crediting

- ***Porous Pavement***
- ***Tree Planting***
- ***Downspout Disconnection***
- ***Impervious Area Disconnection***
- ***Green Roof***
- ***Stream Buffer***
- ***Vegetated Swales***
- ***Rain Barrels and Cisterns***
- ***Landscaping Soil Quality***

Post-Construction Water Balance Calculator

3	User may make changes from any cell that is orange or brown in color (similar to the cells to the immediate right). Cells in green are calculated for you.		(Step 1a) If you know the 85th percentile storm event for your location enter it in the box below	(Step 1b) If you can not answer 1a then select the county where the project is located (click on the cell to the right for drop-down): This will determine the average 85th percentile 24 hr. storm event for your site, which will appear under precipitation to left.	***SACRAMENTO***
4				(Step 1c) If you would like a more percise value select the location closest to your site. If you do not recgonize any of these locations, leave this drop-down menu at location. The average value for the County will be used.	**SACRAMENTO FAA ARPT**
5	***Project Information***			***Runoff Calculations***	
6	***Project Name:***	***Optional***		(Step 2) Indicate the Soil Type (dropdown menu to right):	***Group C Soils*** / **Low infiltration. Sandy clay loam. Infiltration rate 0.05 to 0.15 inch/hr when wet.**
7	***Waste Discharge Identification (WDID):***	***Optional***		(Step 3) Indicate the existing **dominant** non-built land Use Type (dropdown menu to right):	***Wood & Grass: <50% ground cover***
8	***Date:***	***Optional***		(Step 4) Indicate the proposed **dominant** non-built land Use Type (dropdown menu to right):	***Lawn, Grass, or Pasture covering more than 75% of the open space***
9	***Sub Drainage Area Name (from map):***	***Optional***			**Complete Either**
10	***Runoff Curve Numbers***				**Sq Ft** / **Acres** / **Acres**
11	**Existing Pervious Runoff Curve Number**		**82**	*(Step 5) Total Project Site Area:*	**5.00** / **5.00**
12	**Proposed Development Pervious Runoff Curve Number**		**74**	*(Step 6) Sub-watershed Area:*	**5.00** / **5.00**
13	***Design Storm***			*Percent of total project :*	**100%**
14	Based on the County you indicated above, we have included the 85 percentile average 24 hr event - P85 (in)^ for your area.	**0.62**	**in**		
15	The Amount of rainfall needed for runoff to occur (Existing runoff curve number -P from existing RCN (in)^)	**0.44**	**In**	***(Step 7) Sub-watershed Conditions***	**Complete Either** / **Calculated Acres**
16	P used for calculations (in) (the greater of the above two criteria)	**0.62**	**In**	Sub-watershed Area (acres)	**Sq Ft** / **Acres** / **5.00**
17	^Available at www.cabmphandbooks.com			Existing Rooftop Impervious Coverage	**0** / **0.00**
18				Existing Non-Rooftop Impervious Coverage	**0** / **0.00**
19				Proposed Rooftop Impervious Coverage	**0** / **0.00**
20				Proposed Non-Rooftop Impervious Coverage	**0** / **0.00**
21					
22				***Credits***	**Acres** / **Square Feet**
23				Porous Pavement	**0.00** / **0**
24				Tree Planting	**0.00** / **0**
25	**Pre-Project Runoff Volume (cu ft)**	**247**	**Cu.Ft.**	Downspout Disconnection	**0.00** / **0**
26	**Project-Related Runoff Volume Increase w/o credits (cu ft)**	**0**	**Cu.Ft.**	Impervious Area Disconnection	**0.00** / **0**
27				Green Roof	**0.00** / **0**
28				Stream Buffer	**0.00** / **0**
29				Vegetated Swales	**0.00** / **0**
30	**Project-Related Volume Increase with Credits (cu ft)**	**0**	**Cu.Ft.**	**Subtotal**	**0.00** / **0**
31				**Subtotal Runoff Volume Reduction Credit**	**0 Cu. Ft.**
32	You have achieved your minimum requirements				
33				***(Step 9) Impervious Volume Reduction Credits***	**Volume (cubic feet)**
34				Rain Barrels/Cisterns	**0 Cu. Ft.**
35				Soil Quality	**0 Cu. Ft.**
36				**Subtotal Runoff Volume Reduction**	**0 Cu. Ft.**
37				**Total Runoff Volume Reduction Credit**	**0 Cu. Ft.**
38					
39					

Porous Pavement Credit Worksheet

Please fill out a porous pavement credit worksheet for each project sub-watershed.

For the PROPOSED Development:

Proposed Porous Pavement	Runoff Reduction*	Fill in either Acres or SqFt In SqFt.	In Acres	Equivalent Acres
Area of **Brick without Grout** on less than 12 inches of base with at least 20% void space over soil	0.45			0.00
Area of **Brick without Grout** on more than 12 inches of base with at least 20% void space over soil	0.90			0.00
Area of **Cobbles** less than 12 inches deep and over soil	0.30			0.00
Area of **Cobbles** less than 12 inches deep and over soil	0.60			0.00
Area of **Reinforced Grass Pavement** on less than 12 inches of base with at least 20% void space over soil	0.45			0.00
Area of **Reinforced Grass Pavement** on at least 12 inches of base with at least 20% void space over soil	0.90			0.00
Area of **Porous Gravel Pavement** on less than 12 inches of base with at least 20% void space over soil	0.38			0.00
Area of **Porous Gravel Pavement** on at least 12 inches of base with at least 20% void space over soil	0.75			0.00
Area of **Poured Porous Concrete or Asphalt Pavement** with less than 4 inches of gravel base (washed stone)	0.40			0.00
Area of **Poured Porous Concrete or Asphalt Pavement** with 4 to 8 inches of gravel base (washed stone)	0.60			0.00
Area of **Poured Porous Concrete or Asphalt Pavement** with 8 to 12 inches of gravel base (washed stone)	0.80			0.00
Area of **Poured Porous Concrete or Asphalt Pavement** with 12 or more inches of gravel base (washed stone)	1.00			0.00

*=1-Rv**

Return to Calculator

**Using Site Design Techniques to meet Development Standards for Stormwater Quality (BASMAA 2003)

**NCDENR Stormwater BMP Manual (2007)

Tree Planting Credit Worksheet

Please fill out a tree canopy credit worksheet for each project sub-watershed.

Tree Canopy Credit Criteria	Number of Trees Planted	Credit (acres)
Number of proposed evergreen trees to be planted (credit = number of trees x 0.005)*	0	0.00
Number of proposed deciduous trees to be planted (credit = number of trees x 0.0025)*		0.00
	Square feet Under Canopy	
Square feet under an existing tree canopy, that will remain on the property, with an average diameter at 4.5 ft above grade (i.e., diameter at breast height or DBH) is LESS than 12 in diameter.		0.00
Square feet under an existing tree canopy that will remain on the property, with an average diameter at 4.5 ft above grade (i.e., diameter at breast height or DBH) is 12 in diameter or GREATER.		0.00
Please describe below how the project will ensure that these trees will be maintained.		

0

Return to Calculator

* credit amount based on credits from Stormwater Quality Design Manual for the Sacramento and South Placer Regions

Downspout Disconnection Credit Worksheet
Please fill out a downspout disconnection credit worksheet for each project subwatershed. If you answer yes to all questions, all rooftop area draining to each downspout will be subtracted from your proposed rooftop impervious coverage.

Downspout Disconnection Credit Criteria					
Do downspouts and any extensions extend at least six feet from a basement and two feet from a crawl space or concrete slab?				○ Yes	◉ No
Is the area of rooftop connecting to each disconnected downspout 600 square feet or less?				○ Yes	◉ No
Is the roof runoff from the design storm event fully contained in a raised bed or planter box or does it drain as sheet flow to a landscaped area large enough to contain the roof runoff from the design storm event?				○ Yes	◉ No
The Stream Buffer and/or Vegetated Swale credits **will not** be taken in this sub-watershed area?				○ Yes	◉ No
Percentage of existing	0.00	Acres	of rooftop surface has disconnected downspouts		
Percentage of the proposed	0.00	Acres	of rooftop surface has disconnected downspouts	50	
				Return to Calculator	

Impervious Area Disconnection Credit Worksheet

Please fill out an impervious area disconnection credit worksheet for each project sub-watershed. If you answer yes to all questions, all non-rooftop impervious surface area will be subtracted from your proposed non-rooftop impervious coverage.

Non-Rooftop Disconnection Credit Criteria	Response
Is the maximum contributing impervious flow path length less than 75 feet or, if equal or greater than 75 feet, is a storage device (e.g. French drain, bioretention area, gravel trench) implemented to achieve the required disconnection length?	◉ Yes ○ No
Is the impervious area to any one discharge location less than 5,000 square feet?	◉ Yes ○ No
The Stream Buffer credit **will not** be taken in this sub-watershed area?	◉ Yes ○ No

Percentage of existing	0.00	Acres non-rooftop surface area disconnected	
Percentage of the proposed	0.00	Acres non-rooftop surface area disconnected	70

Return to Calculator

Green Roof Credit Worksheet

Please fill out a greenroof credit worksheet for each project sub-watershed. If you answer yes to all questions, 70% of the greenroof area will be subtracted from your proposed rooftop impervious coverage.

Green Roof Credit Criteria	Response
Is the roof slope less than 15% or does it have a grid to hold the substrate in place until it forms a thick vegetation mat?	◉ Yes ○ No
Has a professional engineer assessed the necessary load reserves and designed a roof structure to meet state and local codes?	◉ Yes ○ No
Is the irrigation needed for plant establishment and/or to sustain the green roof during extended dry periods, is the source from stored, recycled, reclaimed, or reused water?	◉ Yes ○ No
Percentage of existing 0.00 Acres rooftop surface area in greenroof	
Percentage of the proposed 0.00 Acres rooftop surface area in greenroof	

Return to Calculator

Stream Buffer Credit Worksheet

Please fill out a stream buffer credit worksheet for each project sub-watershed. If you answer yes to all questions, you may subtract all impervious surface draining to each stream buffer that has not been addressed using the Downspout and/or Impervious Area Disconnection credits.

Stream Buffer Credit Criteria				Response
Does runoff enter the floodprone width* or within 500 feet (whichever is larger) of a stream channel as sheet flow**?				○ Yes ◉ No
Is the contributing overland slope 5% or less, or if greater than 5%, is a level spreader used?				○ Yes ◉ No
Is the buffer area protected from vehicle or other traffic barriers to reduce compaction?				○ Yes ◉ No
Will the stream buffer be maintained in an ungraded and uncompacted condition and will the vegetation be maintained in a natural condition?				○ Yes ◉ No
Percentage of existing	0.00	Acres	impervious surface area draining into a stream buffer:	
Percentage of the proposed	0.00	Acres	impervious surface area that will drain into a stream buffer:	
Please describe below how the project will ensure that the buffer areas will remain in ungraded and uncompacted condition and that the vegetation will be maintained in a natural condition.				

Return to Calculator

* floodprone width is the width at twice the bankfull depth.
** the maximum contributing length shall be 75 feet for impervious area

Vegetated Swale Credit Worksheet

Please fill out a vegetated swale worksheet for each project subwatershed. If you answer yes to all questions, you may subtract all impervious surface draining to each stream buffer that has not been addressed using the Downspout Disconnection credit.

Vegetated Swale Credit Criteria

Have all vegetated swales been designed in accordance with Treatment Control BMP 30 (TC-30 - Vegetated Swale) from the California Stormwater BMP Handbook, New Development and Redevelopment (available at www.cabmphandbooks.com)?	○ Yes ◉ No
Is the maximum flow velocity for runoff from the design storm event less than or equal to 1.0 foot per second?	○ Yes ◉ No

Percentage of existing	0.00	Acres of impervious area draining to a vegetated swale	
Percentage of the proposed	0.00	Acres of impervious area draining to a vegetated swale	

Return to Calculator

Rain Barrel/Cistern Credit Worksheet

Please fill out a rain barrel/cistern worksheet for each project sub-watershed.

Rain Barrel/Cistern Credit Criteria	Response
Total number of rain barrel(s)/cisterns	
Average capacity of rain barrel(s)/cistern(s) (in gallons)	
Total capacity rain barrel(s)/cistern(s) (in cu ft) [1]	0

[1] accounts for 10% loss

Return to Calculator

Please fill out a soil quality worksheet for each project sub-watershed.

	Response
Will the landscaped area be lined with an impervious membrane?	
Will the soils used for landscaping meet the ideal bulk densities listed in Table 1 below? [1]	○ Yes ◉ No
If you answered yes to the question above, and you know the area-weighted bulk density within the top 12 inches for soils used for landscaping (in g/cm^3)* , fill in the cell to the right and skip to cell G11. If not select from the drop-down menu in G10.	1.3
If you answered yes to the question above, but you do not know the exact bulk density, which of the soil types in the drop down menu to the right best describes the top 12 inches for soils used for landscaping (in g/cm^3).	Sandy loams, loams
What is the average depth of your landscaped soil media meeting the above criteria (inches)?	12
What is the total area of the landscaped areas meeting the above criteria (in acres)?	2.97

Return to Calculator

Table 1

Sands, loamy sands	<1.6
Sandy loams, loams	<1.4
Sandy clay loams, loams, clay loams	<1.4
Silts, silt loams	<1.3
Silt loams, silty clay loams	<1.1
Sandy clays, silty clays, some clay loams (35-45% clay)	<1.1
Clays (>45% clay)	<1.1

Porosity (%) 50.94%

Mineral grains in many soils are mainly quartz and feldspar, so 2.65 a good average for particle density. To determine percent porosity, use the formula: Porosity (%) = (1-Bulk Density/2.65) X 100

[1] USDA NRCS. "Soil Quality Urban Technical Note No.2-Urban Soil Compaction". March 2000. http://soils.usda.gov/sqi/management/files/sq_utn_2.pdf

* To determine how to calculate density see: http://www.globe.gov/tctg/bulkden.pdf?sectionID=94

APPENDIX 3
Bioassessment Monitoring Guidelines

Bioassessment monitoring is required for projects that meet all of the following criteria:

1. The project is rated Risk Level 3 or LUP Type 3
2. The project directly discharges runoff to a freshwater wadeable stream (or streams) that is either: (a) listed by the State Water Board or USEPA as impaired due to sediment, and/or (b) tributary to any downstream water body that is listed for sediment; and/or have the beneficial use SPAWN & COLD & MIGRATORY
3. Total project-related ground disturbance exceeds 30 acres.

For all such projects, the discharger shall conduct bioassessment monitoring, as described in this section, to assess the effect of the project on the biological integrity of receiving waters.
Bioassessment shall include:

1. The collection and reporting of specified instream biological data
2. The collection and reporting of specified instream physical habitat data

<u>Bioassessment Exception</u>
If a site qualifies for bioassessment, but construction commences out of an index period for the site location, the discharger shall:

1. Receive Regional Water Board approval for the sampling exception
2. Make a check payable to: Cal State Chico Foundation (SWAMP Bank Account) or San Jose State Foundation (SWAMP Bank Account) and include the WDID# on the check for the amount calculated for the exempted project.
3. Send a copy of the check to the Regional Water Board office for the site's region
4. Invest **7,500.00 X The number of samples required** into the SWAMP program as compensation (upon Regional Water Board approval).
5. Conduct bioassessment monitoring, as described in Appendix 4
6. Include the collection and reporting of specified instream biological data and physical habitat
7. Use the bioassessment sample collection and Quality Assurance & Quality Control (QA/QC) protocols developed by the State of California's Surface Water Ambient Monitoring Program (SWAMP)

<u>Site Locations and Frequency</u>
Macroinvertebrate samples shall be collected both before ground disturbance is initiated and after the project is completed. The "after" sample(s) shall be collected after at least one winter season resulting in surface runoff has transpired after project-related ground disturbance has ceased. "Before" and "after" samples shall be collected both upstream and downstream of the project's

discharge. Upstream samples should be taken immediately before the sites outfall and downstream samples should be taken immediately after the outfall (when safe to collect the samples). Samples should be collected for each freshwater wadeable stream that is listed as impaired due to sediment, or tributary to a water body that is listed for sediment. Habitat assessment data shall be collected concurrently with all required macroinvertebrate samples.

Index Period (Timing of Sample Collection)
Macroinvertebrate sampling shall be conducted during the time of year (i.e., the "index period") most appropriate for bioassessment sampling, depending on ecoregion. This map is posted on the State Water Board's Website: http://www.waterboards.ca.gov/water_issues/programs/stormwater/construction.shtml

Field Methods for Macroinvertebrate Collections
In collecting macroinvertebrate samples, the discharger shall use the "Reachwide Benthos (Multi-habitat) Procedure" specified in *Standard Operating Procedures for Collecting Benthic Macroinvertebrate Samples and Associated Physical and Chemical Data for Ambient Bioassessments in California* (Ode 2007).[1]

Physical - Habitat Assessment Methods
The discharger shall conduct, concurrently with all required macroinvertebrate collections, the "Full" suite of physical habitat characterization measurements as specified in *Standard Operating Procedures for Collecting Benthic Macroinvertebrate Samples and Associated Physical and Chemical Data for Ambient Bioassessments in California* (Ode 2007), and as summarized in the Surface Water Ambient Monitoring Program's *Stream Habitat Characterization Form — Full Version*.

Laboratory Methods
Macroinvertebrates shall be identified and classified according to the Standard Taxonomic Effort (STE) Level I of the Southwestern Association of Freshwater Invertebrate Taxonomists (SAFIT),[2] and using a fixed-count of 600 organisms per sample.

Quality Assurance
The discharger or its consultant(s) shall have and follow a quality assurance (QA) plan that covers the required bioassessment monitoring. The QA plan shall include, or be supplemented to include, a specific requirement for external QA checks (i.e., verification of taxonomic identifications and correction of data where

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[1] This document is available on the Internet at: ~~http://www.swrcb.ca.gov/swamp/docs/phab_sopr6.pdf~~. http://swamp.mpsl.mlml.calstate.edu/wp-content/uploads/2009/04/swamp_sop_bioassessment_collection_020107.pdf.

[2] The current SAFIT STEs (28 November 2006) list requirements for both the Level I and Level II taxonomic effort, and are located at: ~~http://www.swrcb.ca.gov/swamp/docs/safit/ste_list.pdf~~ http://www.safit.org/Docs/ste_list.pdf. When new editions are published by SAFIT, they will supersede all previous editions. All editions will be posted at the State Water Board's SWAMP website.

errors are identified). External QA checks shall be performed on one of the discharger's macroinvertebrate samples collected per calendar year, or ten percent of the samples per year (whichever is greater). QA samples shall be randomly selected. The external QA checks shall be paid for by the discharger, and performed by the California Department of Fish and Game's Aquatic Bioassessment Laboratory. An alternate laboratory with equivalent or better expertise and performance may be used if approved in writing by State Water Board staff.

Sample Preservation and Archiving

The original sample material shall be stored in 70 percent ethanol and retained by the discharger until: 1) all QA analyses specified herein and in the relevant QA plan are completed; and 2) any data corrections and/or re-analyses recommended by the external QA laboratory have been implemented. The remaining subsampled material shall be stored in 70 percent ethanol and retained until completeness checks have been performed according to the relevant QA plan. The identified organisms shall be stored in 70 percent ethanol, in separate glass vials for each final ID taxon. (For example, a sample with 45 identified taxa would be archived in a minimum of 45 vials, each containing all individuals of the identified taxon.) Each of the vials containing identified organisms shall be labeled with taxonomic information (i.e., taxon name, organism count) and collection information (i.e., site name/site code, waterbody name, date collected, method of collection). The identified organisms shall be archived (i.e., retained) by the discharger for a period of not less than three years from the date that all QA steps are completed, and shall be checked at least once per year and "topped off" with ethanol to prevent desiccation. The identified organisms shall be relinquished to the State Water Board upon request by any State Water Board staff.

Data Submittal

The macroinvertebrate results (i.e., taxonomic identifications consistent with the specified SAFIT STEs, and number of organisms within each taxa) shall be submitted to the State Water Board in electronic format. The State Water Board's Surface Water Ambient Monitoring Program (SWAMP) is currently developing standardized formats for reporting bioassessment data. All bioassessment data collected after those formats become available shall be submitted using the SWAMP formats. Until those formats are available, the biological data shall be submitted in MS-Excel (or equivalent) format.[3]

The physical/habitat data shall be reported using the standard format titled *SWAMP Stream Habitat Characterization Form — Full Version*.[4]

[3] Any version of Excel, 2000 or later, may be used.
[4] Available at: http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/reports/fieldforms_fullversion052908.pdf

Invasive Species Prevention

In conducting the required bioassessment monitoring, the discharger and its consultants shall take precautions to prevent the introduction or spread of aquatic invasive species. At minimum, the discharger and its consultants shall follow the recommendations of the California Department of Fish and Game to minimize the introduction or spread of the New Zealand mudsnail.[5]

[5] Instructions for controlling the spread of NZ mudsnails, including decontamination methods, can be found at: http://www.dfg.ca.gov/invasives/mudsnail/
More information on AIS More information on AIS
http://www.waterboards.ca.gov/water_issues/programs/swamp/ais/

Appendix 4 Non Sediment TMDLs

Region 1 Lost River-DIN and CBOD

Region 1 Source: Cal Trans Construction TMDL Completion Date: 12 30 2008 TMDL Type: River, Lake Watershed Area= 2996 mi^2	**Pollutant Stressors/WLA**	
	Dissolved inorganic nitrogen (DIN) (metric tons/yr)	**Carbonaceous biochemical oxygen demand (CBOD) (metric tons/yr)**
Lost River from the Oregon border to Tule Lake	.1	.2
Tule Lake Refuge	.1	.2
Lower Klamath Refuge	.1	.2

Region 2 San Francisco Bay-Mercury

Region 2 Source:Non-Urban Stormwater Runoff TMDL Type: Bay	**Name**	**Pollutant Stressor/WLA**	**TMDL Completion Date**
	San Francisco Bay	Mercury 25 kg/year	08 09 2006

Region 4 Ballona Creek-Metals and Selenium

Region 4 Source: NPDES General Construction TMDL Completion Date: 12 22 2005 TMDL Type: Creek	**Pollutant Stressors/WLA**							
	Copper (Cu)		**Lead (Pb)**		**Selenium (Se)**		**Zinc (Zn)**	
	g/day	g/day/acre	g/day	g/day/acre	g/day	g/day/acre	g/day	g/day/acre
Ballona Creek	4.94E-07 x Daily storm volume (L)	2.20E-10 x Daily storm volume (L)	1.62E-06 x Daily storm volume (L)	7.20E-10 x Daily storm volume (L)	1.37E-07 x Daily storm volume (L)	6.10E-11 x Daily storm volume (L)	3.27E-06 x Daily storm volume (L)	1.45E-09 x Daily storm volume (L)

General Construction Storm Water Permits:
Waste load allocations will be incorporated into the State Board general permit upon renewal or into a watershed-specific general permit developed by the Regional Board.

- Dry-weather Implementation Non-storm water flows authorized by the General Permit for Storm Water Discharges Associated with Construction Activity (Water Quality Order No. 99-08 DWQ), or any successor order, are exempt from the dry-weather waste load allocation equal to zero as long as they comply with the provisions of sections C.3 and A.9 of the Order No. 99-08 DWQ, which state that these authorized non-storm discharges shall be:
  (1) infeasible to eliminate
  (2) comply with BMPs as described in the Storm Water Pollution Prevention Plan prepared by the permittee, and
  (3) not cause or contribute to a violation of water quality standards, or comparable provisions in any successor order.
  Unauthorized non-storm water flows are already prohibited by Order No. 99-08 DWQ.
- Wet-weather Implementation Within seven years of the effective date of the TMDL, the construction industry will submit the results of BMP effectiveness studies to determine BMPs that will achieve compliance with the final waste load allocations assigned to construction storm water permittees.
- Regional Board staff will bring the recommended BMPs before the Regional Board for consideration within eight years of the effective date of the TMDL.
- General construction storm water permittees will be considered in compliance with final waste load allocations if they implement these Regional Board approved BMPs. All permittees must implement the approved BMPs within nine years of the effective date of the TMDL. If no effectiveness studies are conducted and no BMPs are approved by the Regional Board within eight years of the effective date of the TMDL, each general construction storm water permit holder will be subject to site-specific BMPs and monitoring requirements to demonstrate compliance with final waste load allocations.

Region 4 Calleaguas Creek-OC Pesticides, PCBs, and Siltation

Interim Requirements

Region 4 Calleaguas Creek Source: Minor NPDES point sources/WDRs TMDL Completion Date: 3 14 2006 TMDL Type:Creek	**Pollutant Stressor**	**WLA Daily Max (µg/L)**	**WLA Monthly Ave (µg/L)**
	Chlordane	1.2	0.59
	4,4-DDD	1.7	0.84
	4,4-DDE	1.2	0.59
	4,4-DDT	1.2	0.59
	Dieldrin	0.28	0.14
	PCB's	0.34	0.17
	Toxaphene	0.33	0.16

Final WLA (ng/g)							
Region 4 Calleaguas Creek Source: Stormwater Permittees TMDL Completion Date: 3 14 2006 TMDL Type:Creek	Chlordane	4,4-DDD	4,4-DDE	4,4-DDT	Dieldrin	PCB's	Toxaphene
Mugu Lagoon*	3.3	2.0	2.2	0.3	4.3	180.0	360.0
Callegaus Creek	3.3	2.0	1.4	0.3	0.2	120.0	0.6
Revolon Slough (SW)*	0.9	2.0	1.4	0.3	0.1	130.0	1.0
Arroyo Las posas(SW)*	3.3	2.0	1.4	0.3	0.2	120.0	0.6
Arroyo Simi	3.3	2.0	1.4	0.3	0.2	120.0	0.6
Conejo Creek	3.3	2.0	1.4	0.3	0.2	120.0	0.6
Interim Requirements (ng/g)							
Mugu Lagoon*	25.0	69.0	300.0	39.0	19.0	180.	22900.0
Callegaus Creek	17.0	66.0	470.0	110.0	3.0	3800.0	260.0
Revolon Slough (SW)*	48.0	400.0	1600.0	690.0	5.7	7600.0	790.0
Arroyo Las posas(SW)*	3.3	290.0	950.0	670.0	1.1	25700.0	230.0
Arroyo Simi	3.3	14.0	170.0	25.0	1.1	25700.0	230.0
Conejo Creek	3.4	5.3	20.0	2.0	3.0	3800.0	260.0

*(SW)=Subwatershed
*Mugu Lagoon includes Duck pond/Agricultural Drain/Mugu/Oxnard Drain #2
Compliance with sediment based WLAs is measured as an instream annual average at the base of each subwatershed where the discharges are located.

Region 4 Calleguas Creek-Salts

Final Dry Weather Pollutant WLA (mg/L)					
Region 4 Calleaguas Creek Source Permitted Stormwater Dischargers TMDL Completion Date: 12 2 2008 TMDL Type:Creek	**Critical Condition Flow Rate (mgd)**	**Chloride (lb/day)**	**TDS (lb/day)**	**Sulfate (lb/day)**	**Boron (lb/day)**
Simi	1.39	1738.0	9849.0	2897.0	12.0
Las Posas	0.13	157.0	887.0	261.0	N/A
Conejo	1.26	1576.0	8931.0	2627.0	N/A

Camarillo	0.06	72.0	406.0	119.0	N/A
Pleasant Valley (Calleguas)	0.12	150.0	850.0	250.0	N/A
Pleasant Valley (Revolon)	0.25	314.0	1778.0	523.0	2.0

Dry Weather Interim Pollutant WLA (mg/L)				
	Chloride (mg/L)	**TDS (mg/L)**	**Sulfate (mg/L)**	**Boron (mg/L)**
Simi	230.0	1720.0	1289.0	1.3
Las Posas	230.0	1720.0	1289.0	1.3
Conejo	230.0	1720.0	1289.0	1.3
Camarillo	230.0	1720.0	1289.0	1.3
Pleasant Valley (Calleguas)	230.0	1720.0	1289.0	1.3
Pleasant Valley (Revolon)	230.0	1720.0	1289.0	1.3

- General Construction permittees are assigned a dry weather wasteload allocation equal to the average dry weather critical condition flow rate multiplied by the numeric target for each constituent. Waste load allocations apply in the receiving water at the base of each subwatershed. Dry weather allocations apply when instream flow rates are below the 86th percentile flow and there has been no measurable precipitation in the previous 24 hours.
- Because wet weather flows transport a large mass of salts at low concentrations, these dischargers meet water quality objectives during wet weather.
- Interim limits are assigned for dry weather discharges from areas covered by NPDES stormwater permits to allow time to implement appropriate actions. The interim limits are assigned as concentration based receiving water limits set to the 95th percentile of the discharger data as a monthly average limit except for chloride. The 95th percentile for chloride was 267 mg/L which is higher than the recommended criteria set forth in the Basin Plan for protection of sensitive beneficial uses including aquatic life. Therefore, the interim limit for chloride for Permitted Stormwater Dischargers is set equal to 230 mg/L to ensure protection of sensitive beneficial uses in the Calleguas Creek watershed.

Region 4 San Gabriel River and Tributaries-Metals and Selenium

Region 4 San Gabriel River and Tributaries Source: Construction Stormwater Dischargers TMDL Completion Date: 3 2007 TMDL Type: Creek	**Pollutant Stressor**	**Wet weather Allocations**	**Dry Weather Allocations**	**% of Watershed**

San Gabriel Reach 2	Lead (Pb)	0.7% * 166 µg/l * Daily Storm Vol	N/A	0.7%
San Gabriel Reach 2	Lead (Pb) Mass based	0.8 kg/d	N/A	0.7%
Coyote Creek	Copper (Cu)	0.285 kg/d	0	5.0%
Coyote Creek	Lead (Pb)	1.70 kg/d	N/A	5.0%
Coyote Creek	Zinc (Zn)	2.4 kg/d	N/A	5.0%
San Jose Creek Reach 1 and 2	Selenium	5 µg/L	5 µg/L	5.0%

Wet-weather allocations for lead in San Gabriel River Reach 2. Concentration-based allocations apply to non-stormwater NPDES discharges. Stormwater allocations are expressed as a percent of load duration curve. Mass-based values presented in table are based on a flow of 260 cfs (daily storm volume = 6.4 $x10^8$ liters).

There are 1555 acres of water in the entire watershed, 37.4 acres of water in the Reach 1 subwatershed (2.4%), and 269 acres in the Coyote Creek subwatershed (17%).

General Construction Storm Water Permits

Waste load allocations for the general construction storm water permits may be incorporated into the State Board general permit upon renewal or into a watershed-specific general permit developed by the Regional Board. An estimate of direct atmospheric deposition is developed based on the percent area of surface water in the watershed. Approximately 0.4% of the watershed area draining to San Gabriel River Reach 2 is comprised of water and approximately 0.2% of the watershed area draining to Coyote Creek is comprised of water.

Region 4 The Harbor Beaches of Ventura County-Bacteria

The TMDL has a multi-part numeric target based on the bacteriological water quality objectives for marine water to protect the water contact recreation use. These targets are the most appropriate indicators of public health risk in recreational waters. Bacteriological objectives are set forth in Chapter 3 of the Basin Plan. The objectives are based on four bacteria indicators and include both geometric mean limits and single sample limits. The Basin Plan objectives that serve as the numeric targets for this TMDL are:

The General NPDES Construction permit is seen as a minor contributor and is given no allocation

General NPDES permits, individual NPDES permits, the Statewide Industrial Storm Water General Permit, the Statewide Construction Activity Storm Water General Permit, and WDR permittees in the Channel Islands Harbor subwatershed are assigned WLAs of zero (0) days of allowable exceedances for all three time periods and for the single sample limits and the rolling 30-day geometric mean. Any future enrollees under a general NPDES permit, individual NPDES permit, the Statewide Industrial Storm Water General Permit, the Statewide Construction Activity Storm Water General Permit, and WDR will also be subject to a WLA of zero (0) days of allowable exceedances.

Region 4 Resolution No. 03-009 Los Angeles River and Tributaries-Nutrients

Minor Point Sources
Waste loads are allocated to minor point sources enrolled under NPDES or WDR permits including but not limited to Tapia WRP, Whittier Narrows WRP, Los Angeles Zoo WRP, industrial and construction stormwater, and municipal storm water and urban runoff from municipal separate storm sewer systems (MS4s)

Region 4 Minor Point Sources for NPDES/WDR Permits TMDL Completion Date: 7 10 2003 TMDL Type: River	Pollutant Stressor/WLA				
	Total Ammonia (NH_3)		**Nitrate-nitrogen (NO_3-N)**	**Nitrite-nitrogen (NO_2-N)**	**NO_3-N + NO_3-N**
	1 Hr Ave mg/l	30 Day Ave mg/l	30 Day Ave mg/l		30 Day Ave mg/l
LA River Above Los Angeles-Glendale WRP (LAG)	4.7	1.6	8.0	1.0	8.0
LA River Below LAG	8.7	2.4	8.0	1.0	8.0
Los Angeles Tributaries	10.1	2.3	8.0	1.0	8.0

Malibu Creek Attachment A to Resolution No. 2004-019R-Bacteria

12 13 2004 The WLAs for permittees under the NPDES General Stormwater Construction Permit are zero (0) days of allowable exceedances for all three time periods and for the single sample limits and the rolling 30-day geometric mean.

Region 4 Marina del Rey Harbor, Mothers' Beach and Back Basins

Attachment A to Resolution No. 2003-012-Bacteria

8 7 2003 As discussed in "Source Analysis", discharges from general NPDES permits, general industrial storm water permits and general construction storm water permits are not expected to be a significant source of bacteria. Therefore, the WLAs for these discharges are zero (0) days of allowable exceedances for all three time periods and for the single sample limits and the rolling 30-day geometric mean. Any future enrollees under a general NPDES permit, general industrial storm water permit or general construction storm water permit within the MdR Watershed will also be subject to a WLA of zero days of allowable exceedances.

Region 4 San Gabriel River and Tributaries-Metals and Selenium

Dry Weather Selenium WLA
A zero WLA is assigned to the industrial and construction stormwater permits during dry weather. Non-storm water discharges are already prohibited or restricted by existing general permits.

Region 4 General Construction Permittees TMDL Completion Date: 7 13 2006 TMDL Type: River	**Total Recoverable Metals (kg/day)**		
	Copper (Cu) Kg/day	**Lead (Pb) Kg/day**	**Zinc (Zn) Kg/day**
San Gabriel River Reach 2 and upstream reaches/tributaries	**XXXX**	Daily storm volume x 1.24 µg/L	**XXXX**
Coyote Creek and Tributaries	Daily storm volume x 0.7 µg/L	Daily storm volume x 4.3 µg/L	Daily storm volume x 6.2 µg/L

Each enrollee under the general construction stormwater permit receives a WLA on a per acre basis

Region 4 General Construction Permittees TMDL Completion Date: 7 13 2006 TMDL Type: River	**Total Recoverable Metals (kg/day/acre)**		
	Copper (Cu) Kg/acre/day	**Lead (Pb) Kg/acre/day**	**Zinc (Zn) Kg/acre/day**
San Gabriel River Reach 2 and upstream reaches/tributaries	**XXXX**	Daily storm volume x 0.56 µg/L	**XXXX**

Coyote Creek and Tributaries	Daily storm volume x 0.12 µg/L	Daily storm volume x 0.70 µg/L	Daily storm volume x 1.01 µg/L

For the general industrial and construction storm water permits, the daily storm volume is measured at USGS station 11085000 for discharges to Reach 2 and above and at LACDPW flow gauge station F354-R for discharges to Coyote Creek.

General construction storm water permits
WLAs will be incorporated into the State Board general permit upon renewal or into a watershed-specific general permit developed by the Regional Board.
Dry-weather implementation
Non-storm water flows authorized by the General Permit for Storm Water Discharges Associated with Construction Activity (NPDES Permit No. CAS000002), or any successor permit, are exempt from the dry-weather WLA equal to zero as long as they comply with the provisions of sections C.3.and A.9 of the Order No. 99-08 DWQ, which state that these authorized non-storm discharges shall be (1) infeasible to eliminate (2) comply with BMPs as described in the Storm Water Pollution Prevention Plan prepared by the permittee, and (3) not cause or contribute to a violation of water quality standards, or comparable provisions in any successor order. Unauthorized non-storm water flows are already prohibited by Permit No. CAS000002.

Upon permit issuance, renewal, or re-opener
Non-storm water flows not authorized by Order No. 99-08 DWQ, or any successor order, shall achieve dry-weather WLAs. WLAs shall be expressed as NPDES water quality-based effluent limitations specified in accordance with federal regulations and state policy on water quality control. Effluent limitations may be expressed as permit conditions, such as the installation, maintenance, and monitoring of Regional Board-approved BMPs.

Six years from the effective date of the TMDL
The construction industry will submit the results of wet-weather BMP effectiveness studies to the Los Angeles Regional Board for consideration. In the event that no effectiveness studies are conducted and no BMPs are approved, permittees shall be subject to site-specific BMPs and monitoring to demonstrate BMP effectiveness.

Seven years from the effective date of the TMDL
The Los Angeles Regional Board will consider results of the wet weather BMP effectiveness studies and consider approval of BMPs.

Eight years from the effective date of the TMDL
All general construction storm water permittees shall implement Regional Board-approved BMPs.

Total Maximum Daily Loads (TMDLs) for San Diego Creek,
Upper and Lower Newport Bay, Orange County, California

Region 8 NPDES Construction Permit TMDL Completion Date: 1 24 1995 TMDL Type: River. Cr, Bay	Organochlorine Compounds							
	Total DDT		**Chlordane**		**Total PCBs**		**Toxaphene**	
	g/day	g/yr	g/day	g/yr	g/day	g/yr	g/day	g/yr
San Diego Creek	.27	99.8	**.18***	**64.3***	**.09***	**31.5***	.004	1.5
Upper Newport Bay	.11	40.3	.06	23.4	.06	23.2	**X**	**X**
Lower Newport Bay	.04	14.9	.02	8.6	.17	60.7	**X**	**X**

*Red= Informational WLA only, not for enforcement purposes

Organochlorine Compounds TMDLs Implementation Tasks and Schedule

Regional Board staff shall develop a SWPPP Improvement Program that identifies the Regional Board's expectations with respect to the content of SWPPPs, including documentation regarding the selection and implementation of BMPs, and a sampling and analysis plan. The Improvement Program shall include specific guidance regarding the development and implementation of monitoring plans, including the constituents to be monitored, sampling frequency and analytical protocols. The SWPPP Improvement Program shall be completed by (*the date of OAL approval of this BPA*). ***No later than two months*** from completion of the Improvement Program, Board staff shall assure that the requirements of the Program are communicated to interested parties, including dischargers with existing authorizations under the General Construction Permit. Existing, authorized dischargers shall revise their project SWPPPs as needed to address the Program requirements as soon as possible but ***no later than (three months of completion of the SWPPP Improvement Program)***. Applicable SWPPPs that do not adequately address the Program requirements shall be considered inadequate and enforcement by the Regional Board shall proceed accordingly. The Caltrans and Orange County MS4 permits shall be revised as needed to assure that the permittees communicate the Regional Board's SWPPP expectations, based on the SWPPP Improvement Program, with the Standard Conditions of Approval.

Appendix 4 Sediment TMDLs

Implemented Sediment TMDLs in California. Construction was listed as a source in all fo these TMDLs in relation to road construction. Although construction was mentioned as a source, it was not given a specific allocation amount. The closest allocation amount would be for the road activity management WLA. **Implementation Phase** – Adoption process by the Regional Board, the State Water Resources Control Board, the Office of Administrative Law, and the US Environmental Protection Agency completed and TMDL being implemented.

A. Region	**Type**	**Name**	**Pollutant Stressor**	**Potential Sources**	**TMDL Completion Date**	**Watershed Acres**	**WLA** tons mi^2 yr
1 R1.epa.albionfinaltmdl	R	Albion River	Sedimentation	Road Construction	2001	43 acres	See A (table 6)

B Region	**Type**	**Name**	**Pollutant Stressor**	**Potential Sources**	**TMDL Completion Date**	**Watershed Acres**	**WLA** tons mi^2 yr
1 R1.epa.EelR-middle.mainSed.temp	R	Middle Main Eel River and Tributaries (from Dos Rios to the South Fork)	Sedimentation	Road Construction	2005-2006	521 mi^2	100

C Region	**Type**	**Name**	**Pollutant Stressor**	**Potential Sources**	**TMDL Completion Date**	**Watershed Acres**	**WLA** tons mi^2 yr
1 R1.epa.EelRsouth.sed.temp	R	South Fork Eel River	Sedimentation	Road Construction	12 1999	See chart	473

D Region	**Type**	**Name**	**Pollutant Stressor**	**Potential Sources**	**TMDL Completion Date**	**Watershed Acres**	**WLA** tons mi^2 yr
1 R1.epa.bigfinaltmdl	R	Big River	Sedimentation	Road Construction	12 2001	181 mi^2 watershed drainage	TMDL = loading capacity = nonpoint sources + background =

							393 t mi2 yr

E Region	Type	Name	Pollutant Stressor	Potential Sources	TMDL Completion Date	Watershed Acres	WLA tons mi^2 yr
1 R1.epa.EelR-lower.Sed.temp-121807-signed	R	Lower Eel River	Sedimentation	Road Construction	12 2007	300 square-mile watershed	898

F Region	Type	Name	Pollutant Stressor	Potential Sources	TMDL Completion Date	Watershed Acres	WLA tons mi^2 yr
1 R1.epa.EelR-middle.Sed.temp-	R	Middle Fork Eel River	Sedimentation	Road Construction	12 2003	753 mi^2 (approx. 482,000 acres)	82

G Region	Type	Name	Pollutant Stressor	Potential Sources	TMDL Completion Date	Watershed Acres Mi^2	WLA tons mi^2 yr
1 R1.epa.EelRnorth-Sed.temp.final-121807-signed	R	North Fork Eel River	Sedimentation	Road Construction	12 30 2002	289 (180,020 acres)	20

H Region	Type	Name	Pollutant Stressor	Potential Sources	TMDL Completion Date	Watershed Acres Mi^2	WLA tons mi^2 yr
1 R1.epa.EelR-upper.mainSed.temp-	R	Upper Main Eel River and Tributaries (including Tomki Creek, Outlet Creek and Lake Pillsbury)	Sedimentation	Road Construction	12 29 2004	688 (approx. 440,384 acres)	14

I Region	Type	Name	Pollutant Stressor	Potential Sources	TMDL Completion Date	Watershed Acres	WLA tons mi^2 yr
1 R1.epa.gualalafinaltmdl	R	Gualala River	Sedimentation	Road Construction	Not sure	300 (191,145 acres)	7

J Region	Type	Name	Pollutant Stressor	Potential Sources	TMDL Completion Date	Watershed Acres mi^2	WLA tons mi^2 yr
1 R1.epa.Mad-sed.turbidity	R	Mad River	Sedimentation	Road Construction	12 21 2007	480	174

K Region	Type	Name	Pollutant Stressor	Potential Sources	TMDL Completion Date	Watershed Acres mi^2	WLA tons mi^2 yr
1 R1.epa.mattole.sediment	R	Mattole River	Sedimentation	Road Construction	12 30 2003	296	27 or 520+27 = 547

L Region	Type	Name	Pollutant Stressor	Potential Sources	TMDL Completion Date	Watershed Acres mi^2	WLA tons mi^2 yr
1 R1.epa.navarro.sed.temp	R	Navarro River	Sedimentation	Road Construction	Not sure	315 (201,600 acres).	50

M Region	Type	Name	Pollutant Stressor	Potential Sources	TMDL Completion Date	Watershed Acres mi^2	WLA tons mi^2 yr
1 R1.epa.noyo.sediment	R	Noyo River	Sedimentation	Road Construction	12 16 1999	113 (72,323 acres)	68 (three areas measured) Table 16 in the TMDL

N Region	Type	Name	Pollutant Stressor	Potential Sources	TMDL Completion Date	Watershed Acres mi^2	WLA tons mi^2 yr
1 R1.epa.RedwoodCk.sed	Cr	Redwood Creek	Sedimentation	Road Construction	12 30 1998	278	1900 Total allocation

O Region	Type	Name	Pollutant Stressor	Potential Sources	TMDL Completion Date	Watershed Acres mi^2	WLA – Roads tons mi^2 yr
1 R1.epa.tenmile.sed	R	Ten Mile River	Sedimentation	Road Construction	2000	120	9

P Region	Type	Name	Pollutant Stressor	Potential Sources	TMDL Completion Date	Watershed Acres mi^2	WLA management tons mi^2 yr
1 R1.epa.trinity.sed	R	Trinity River	Sedimentation	Road Construction	12 20 2001	2000 of 3000 covered in this TMDL	See rows below
1	Cr	Horse Linto Creek	Sedimentation	Road Construction	12 20 2001	64	528
1	Cr	Mill creek and Tish Tang	Sedimentation	Road Construction	12 20 2001	39	210
1	Cr	Willow Creek	Sedimentation	Road Construction	12 20 2001	43	94
1	Cr	Campbell Creek and Supply Creek	Sedimentation	Road Construction	12 20 2001	11	1961
1	Cr	Lower Mainstem and Coon Creek	Sedimentation	Road Construction	12 20 2001	32	63
1	R	Reference	Sedimentation	Road	12 20 2001	434	24

		Subwatershed [1]		Construction			
1	Cr	Canyon Creek	Sedimentation	Road Construction	12 20 2001	64	326
1	R	Upper Tributaries[2]	Sedimentation	Road Construction	12 20 2001	72	67
1	R	Middle Tributaries[3]	Sedimentation	Road Construction	12 20 2001	54	53
1	R	Lower Tributaries[4]	Sedimentation	Road Construction	12 20 2001	96	55
1	Cr	Weaver and Rush Creeks	Sedimentation	Road Construction	12 20 2001	72	169
1	Cr	Deadwood Creek Hoadley Gulch Poker Bar	Sedimentation	Road Construction	12 20 2001	47	68
1	L	Lewiston Lake	Sedimentation	Road Construction	12 20 2001	25	49
1	Cr	Grassvalley Creek	Sedimentation	Road Construction	12 20 2001	37	44
1	Cr	Indian Creek	Sedimentation	Road Construction	12 20 2001	34	81
1	Cr	Reading and Browns Creek	Sedimentation	Road Construction	12 20 2001	104	66
1	Cr	Reference Subwatersheds[5]	Sedimentation	Road Construction	12 20 2001	235	281
1	L, Cr	Westside tributaries[6]	Sedimentation	Road Construction	12 20 2001	93	105
1	R, Cr, G	Upper trinity[7]	Sedimentation	Road Construction	12 20 2001	161	690
1	R, Cr, G	East Fork Tributaries[8]	Sedimentation	Road Construction	12 20 2001	115	65

1
2
3
4
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8

1	R, L	Eastside Tributaries[9]	Sedimentation	Road Construction	12 20 2001	89	60

1 New River, Big French, Manzanita, North Fork, East Fork, North Fork
2 Dutch, Soldier, Oregon gulch, Conner Creek
3 Big Bar, Prairie Creek, Little French Creek
4 Swede, Italian, Canadian, Cedar Flat, Mill, McDonald, Hennessy, Quimby, Hawkins, Sharber
5 Stuarts Fork, Swift Creek, Coffee Creek
6 Stuart Arm, Stoney Creek, Mule Creek, East Fork, Stuart Fork, West Side Trinity Lake, Hatchet Creek, Buckeye Creek,
7 Upper Trinity River, Tangle Blue, Sunflower, Graves, Bear Upper Trinity Mainstream, Ramshorn Creek, Ripple Creek, Minnehaha Creek, Snowslide Gulch, Scorpion Creek
8 East Fork Trinity, Cedar Creek, Squirrel Gulch
9 East Side Tributaries, Trinity Lake

Q Region	**Type**	**Name**	**Pollutant Stressor**	**Potential Sources**	**TMDL Completion Date**	**Watershed Acres** mi^2	**WLA** tons mi^2 yr
1 R1.epa.trinity.so.sed	R, Cr	South Fork Trinity River and Hayfork Creek	Sedimentation	Road Construction	12 1998	Not given, 19 miles long	33 (road total)

R Region	**Type**	**Name**	**Pollutant Stressor**	**Potential Sources**	**TMDL Completion Date**	**Watershed Acres** mi^2	**WLA** tons mi^2 yr
1 R1.epa.vanduzen.sed	R, Cr	Van Duzen River and Yager Creek	Sedimentation	Various	12 16 1999	429	1353 total allocation
1		Upper Basin	Sedimentation	Road Construction			7
1		Middle Basin	Sedimentation	Road Construction			22
1		Lower Basin	Sedimentation	Road Construction			20

S Region	**Type**	**Name**	**Pollutant Stressor**	**Potential**	**TMDL**	**Watershed**	**WLA** tons mi^2

9

				Sources	**Completion Date**	**Acres** mi^2	yr
6 R6.blackwood.sed	Cr	Blackwood Creek (Placer County)	Bedded Sediment	Various	9 2007	11	17272 total

T Region	**Type**	**Name**	**Pollutant Stressor**	**Potential Sources**	**TMDL Completion Date**	**Watershed Acres** mi^2	**WLA** tons mi^2 yr
6 R6.SquawCk.sed	R	Squaw Creek (Placer County)	Sedimentation /controllable sources	Various – basin plan amendment	4 13 2006	8.2	10,900

Adopted TMDLs for Construction Sediment Sources

Region	Type	Name	Pollutant Stressor	Potential Sources	**TMDL Completion Date**	**Watershed Area** mi^2	Waste load Allocation tons mi^2 yr
8	R	Newport Bay San Diego Creek Watershed	Sedimentation	Construction Land Development	1999	2.24 (1432 acres)	125,000 tons per Year (no more than 13,000 tons per year from construction sites)

APPENDIX 5:
Glossary

Active Areas of Construction
All areas subject to land surface disturbance activities related to the project including, but not limited to, project staging areas, immediate access areas and storage areas. All previously active areas are still considered active areas until final stabilization is complete. [The construction activity Phases used in this General Permit are the Preliminary Phase, Grading and Land Development Phase, Streets and Utilities Phase, and the Vertical Construction Phase.]

Active Treatment System (ATS)
A treatment system that employs chemical coagulation, chemical flocculation, or electrocoagulation to aid in the reduction of turbidity caused by fine suspended sediment.

Acute Toxicity Test
A chemical stimulus severe enough to rapidly induce a negative effect; in aquatic toxicity tests, an effect observed within 96 hours or less is considered acute.

Air Deposition
Airborne particulates from construction activities.

Approved Signatory
A person who has been authorized by the Legally Responsible Person to sign, certify, and electronically submit Permit Registration Documents, Notices of Termination, and any other documents, reports, or information required by the General Permit, the State or Regional Water Board, or U.S. EPA. The Approved Signatory must be one of the following:

1. For a corporation or limited liability company: a responsible corporate officer. For the purpose of this section, a responsible corporate officer means: (a) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation or limited liability company; or (b) the manager of the facility if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;

2. For a partnership or sole proprietorship: a general partner or the proprietor, respectively;

3. For a municipality, State, Federal, or other public agency: a principal executive officer, ranking elected official, city manager, council president, or any other authorized public employee with managerial responsibility over the

construction or land disturbance project (including, but not limited to, project manager, project superintendent, or resident engineer);

4. For the military: any military officer or Department of Defense civilian, acting in an equivalent capacity to a military officer, who has been designated;

5. For a public university: an authorized university official;

6. For an individual: the individual, because the individual acts as both the Legally Responsible Person and the Approved Signatory; or

7. For any type of entity not listed above (e.g. trusts, estates, receivers): an authorized person with managerial authority over the construction or land disturbance project.

Beneficial Uses
As defined in the California Water Code, beneficial uses of the waters of the state that may be protected against quality degradation include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves.

Best Available Technology Economically Achievable (BAT)
As defined by USEPA, BAT is a technology-based standard established by the Clean Water Act (CWA) as the most appropriate means available on a national basis for controlling the direct discharge of toxic and nonconventional pollutants to navigable waters. The BAT effluent limitations guidelines, in general, represent the best existing performance of treatment technologies that are economically achievable within an industrial point source category or subcategory.

Best Conventional Pollutant Control Technology (BCT)
As defined by USEPA, BCT is a technology-based standard for the discharge from existing industrial point sources of conventional pollutants including biochemical oxygen demand (BOD), total suspended sediment (TSS), fecal coliform, pH, oil and grease.

Best Professional Judgment (BPJ)
The method used by permit writers to develop technology-based NPDES permit conditions on a case-by-case basis using all reasonably available and relevant data.

Best Management Practices (BMPs)
BMPs are scheduling of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the discharge of pollutants. BMPs also include treatment requirements, operating procedures,

and practices to control site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Chain of Custody (COC)
Form used to track sample handling as samples progress from sample collection to the analytical laboratory. The COC is then used to track the resulting analytical data from the laboratory to the client. COC forms can be obtained from an analytical laboratory upon request.

Coagulation
The clumping of particles in a discharge to settle out impurities, often induced by chemicals such as lime, alum, and iron salts.

Common Plan of Development
Generally a contiguous area where multiple, distinct construction activities may be taking place at different times under one plan. A plan is generally defined as any piece of documentation or physical demarcation that indicates that construction activities may occur on a common plot. Such documentation could consist of a tract map, parcel map, demolition plans, grading plans or contract documents. Any of these documents could delineate the boundaries of a common plan area. However, broad planning documents, such as land use master plans, conceptual master plans, or broad-based CEQA or NEPA documents that identify potential projects for an agency or facility are not considered common plans of development.

Daily Average Discharge
The discharge of a pollutant measured during any 24-hour period that reasonably represents a calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged during the day. For pollutants with limitations expressed in other units of measurement (e.g., concentration) the daily discharge is calculated as the average measurement of the pollutant throughout the day (40 CFR 122.2). In the case of pH, the pH must first be converted from a log scale.

Debris
Litter, rubble, discarded refuse, and remains of destroyed inorganic anthropogenic waste.

Direct Discharge
A discharge that is routed directly to waters of the United States by means of a pipe, channel, or ditch (including a municipal storm sewer system), or through surface runoff.

Discharger
The Legally Responsible Person (see definition) or entity subject to this General Permit.

Dose Rate (for ATS)
In exposure assessment, dose (e.g. of a chemical) per time unit (e.g. mg/day), sometimes also called dosage.

Drainage Area
The area of land that drains water, sediment, pollutants, and dissolved materials to a common outlet.

Effluent
Any discharge of water by a discharger either to the receiving water or beyond the property boundary controlled by the discharger.

Effluent Limitation
Any numeric or narrative restriction imposed on quantities, discharge rates, and concentrations of pollutants which are discharged from point sources into waters of the United States, the waters of the contiguous zone, or the ocean.

Erosion
The process, by which soil particles are detached and transported by the actions of wind, water, or gravity.

Erosion Control BMPs
Vegetation, such as grasses and wildflowers, and other materials, such as straw, fiber, stabilizing emulsion, protective blankets, etc., placed to stabilize areas of disturbed soils, reduce loss of soil due to the action of water or wind, and prevent water pollution.

Field Measurements
Testing procedures performed in the field with portable field-testing kits or meters.

Final Stabilization
All soil disturbing activities at each individual parcel within the site have been completed in a manner consistent with the requirements in this General Permit.

First Order Stream
Stream with no tributaries.

Flocculants
Substances that interact with suspended particles and bind them together to form flocs.

Good Housekeeping BMPs
BMPs designed to reduce or eliminate the addition of pollutants to construction site runoff through analysis of pollutant sources, implementation of proper handling/disposal practices, employee education, and other actions.

Grading Phase (part of the Grading and Land Development Phase)
Includes reconfiguring the topography and slope including; alluvium removals; canyon cleanouts; rock undercuts; keyway excavations; land form grading; and stockpiling of select material for capping operations.

Hydromodification
Hydromodification is the alteration of the hydrologic characteristics of coastal and non-coastal waters, which in turn could cause degradation of water resources. Hydromodification can cause excessive erosion and/or sedimentation rates, causing excessive turbidity, channel aggradation and/or degradation.

Identified Organisms
Organisms within a sub-sample that is specifically identified and counted.

Inactive Areas of Construction
Areas of construction activity that are not active and those that have been active and are not scheduled to be re-disturbed for at least 14 days.

Index Period
The period of time during which bioassessment samples must be collected to produce results suitable for assessing the biological integrity of streams and rivers. Instream communities naturally vary over the course of a year,and sampling during the index period ensures that samples are collected during a time frame when communities are stable so that year-to-year consistency is obtained. The index period approach provides a cost-effective alternative to year-round sampling. Furthermore, sampling within the appropriate index period will yield results that are comparable to the assessment thresholds or criteria for a given region, which are established for the same index period. Because index periods differ for different parts of the state, it is essential to know the index period for your area.

K Factor
The soil erodibility factor used in the Revised Universal Soil Loss Equation (RUSLE). It represents the combination of detachability of the soil, runoff potential of the soil, and the transportability of the sediment eroded from the soil.

Legally Responsible Person
The Legally Responsible Person (LRP) will typically be the project proponent. The categories of persons or entities that are eligible to serve as the LRP are set forth below. For any construction or land disturbance project where multiple persons or entities are eligible to serve as the LRP, those persons or entities

shall select a single LRP. In exceptional circumstances, a person or entity that qualifies as the LRP may provide written authorization to another person or entity to serve as the LRP. In such a circumstance, the person or entity that provides the authorization retains all responsibility for compliance with the General Permit. Except as provided in category 2(d), a contractor who does not satisfy the requirements of any of the categories below is not qualified to be an LRP.

The following persons or entities may serve as an LRP:

1. A person, company, agency, or other entity that possesses a real property interest (including, but not limited to, fee simple ownership, easement, leasehold, or other rights of way) in the land upon which the construction or land disturbance activities will occur for the regulated site.

2. In addition to the above, the following persons or entities may also serve as an LRP:

   a. For linear underground/overhead projects, the utility company, municipality, or other public or private company or agency that owns or operates the LUP;

   b. For land controlled by an estate or similar entity, the person who has day-to-day control over the land (including, but not limited to, a bankruptcy trustee, receiver, or conservator);

   c. For pollution investigation and remediation projects, any potentially responsible party that has received permission to conduct the project from the holder of a real property interest in the land; or

   d. For U.S. Army Corp of Engineers projects, the U.S. Army Corps of Engineers may provide written authorization to its bonded contractor to serve as the LRP, provided, however, that the U.S. Army Corps of Engineers is also responsible for compliance with the general permit, as authorized by the Clean Water Act or the Federal Facilities Compliance Act.

Likely Precipitation Event
Any weather pattern that is forecasted to have a 50% or greater chance of producing precipitation in the project area. The discharger shall obtain likely precipitation forecast information from the National Weather Service Forecast Office (e.g., by entering the zip code of the project's location at http://www.srh.noaa.gov/forecast).

Maximum Allowable Threshold Concentration (MATC)
The allowable concentration of residual, or dissolved, coagulant/flocculant in effluent. The MATC shall be coagulant/flocculant-specific, and based on toxicity

testing conducted by an independent, third-party laboratory. A typical MATC would be:

The MATC is equal to the geometric mean of the NOEC (No Observed Effect Concentration) and LOEC (Lowest Observed Effect Concentration) Acute and Chronic toxicity results for most sensitive species determined for the specific coagulant. The most sensitive species test shall be used to determine the MATC.

Natural Channel Evolution
The physical trend in channel adjustments following a disturbance that causes the river to have more energy and degrade or aggrade more sediment. Channels have been observed to pass through 5 to 9 evolution types. Once they pass though the suite of evolution stages, they will rest in a new state of equilibrium.

Non-Storm Water Discharges
Discharges are discharges that do not originate from precipitation events. They can include, but are not limited to, discharges of process water, air conditioner condensate, non-contact cooling water, vehicle wash water, sanitary wastes, concrete washout water, paint wash water, irrigation water, or pipe testing water.

Non-Visible Pollutants
Pollutants associated with a specific site or activity that can have a negative impact on water quality, but cannot be seen though observation (ex: chlorine). Such pollutants being discharged are not authorized.

Numeric Action Level (NAL)
Level is used as a warning to evaluate if best management practices are effective and take necessary corrective actions. Not an effluent limit.

Original Sample Material
The material (i.e., macroinvertebrates, organic material, gravel, etc.) remaining after the subsample has been removed for identification.

pH
Unit universally used to express the intensity of the acid or alkaline condition of a water sample. The pH of natural waters tends to range between 6 and 9, with neutral being 7. Extremes of pH can have deleterious effects on aquatic systems.

Post-Construction BMPs
Structural and non-structural controls which detain, retain, or filter the release of pollutants to receiving waters after final stabilization is attained.

Preliminary Phase (Pre-Construction Phase - Part of the Grading and Land Development Phase)
Construction stage including rough grading and/or disking, clearing and grubbing operations, or any soil disturbance prior to mass grading.

Project

Qualified SWPPP Developer
Individual who is authorized to develop and revise SWPPPs.

Qualified SWPPP Practitioner
Individual assigned responsibility for non-storm water and storm water visual observations, sampling and analysis, and responsibility to ensure full compliance with the permit and implementation of all elements of the SWPPP, including the preparation of the annual compliance evaluation and the elimination of all unauthorized discharges.

Qualifying Rain Event
Any event that produces 0.5 inches or more precipitation with a 48 hour or greater period between rain events.

R Factor
Erosivity factor used in the Revised Universal Soil Loss Equation (RUSLE). The R factor represents the erosivity of the climate at a particular location. An average annual value of R is determined from historical weather records using erosivity values determined for individual storms. The erosivity of an individual storm is computed as the product of the storm's total energy, which is closely related to storm amount, and the storm's maximum 30-minute intensity.

Rain Event Action Plan (REAP)
Written document, specific for each rain event, that when implemented is designed to protect all exposed portions of the site within 48 hours of any likely precipitation event.

Remaining Sub sampled Material
The material (e.g., organic material, gravel, etc.) that remains after the organisms to be identified have been removed from the subsample for identification. (Generally, no macroinvertebrates are present in the remaining subsampled material, but the sample needs to be checked and verified using a complete Quality Assurance (QA) plan)

Routine Maintenance
Activities intended to maintain the original line and grade, hydraulic capacity, or original purpose of a facility.

Runoff Control BMPs
Measures used to divert runon from offsite and runoff within the site.

Run-on
Discharges that originate offsite and flow onto the property of a separate project site.

Revised Universal Soil Loss Equation (RUSLE)
Empirical model that calculates average annual soil loss as a function of rainfall and runoff erosivity, soil erodibility, topography, erosion controls, and sediment controls.

Sampling and Analysis Plan
Document that describes how the samples will be collected, under what conditions, where and when the samples will be collected, what the sample will be tested for, what test methods and detection limits will be used, and what methods/procedures will be maintained to ensure the integrity of the sample during collection, storage, shipping and testing (i.e., quality assurance/quality control protocols).

Sediment
Solid particulate matter, both mineral and organic, that is in suspension, is being transported, or has been moved from its site of origin by air, water, gravity, or ice and has come to rest on the earth's surface either above or below sea level.

Sedimentation
Process of deposition of suspended matter carried by water, wastewater, or other liquids, by gravity. It is usually accomplished by reducing the velocity of the liquid below the point at which it can transport the suspended material.

Sediment Control BMPs
Practices that trap soil particles after they have been eroded by rain, flowing water, or wind. They include those practices that intercept and slow or detain the flow of storm water to allow sediment to settle and be trapped (e.g., silt fence, sediment basin, fiber rolls, etc.).

Settleable Solids (SS)
Solid material that can be settled within a water column during a specified time frame. It is typically tested by placing a water sample into an Imhoff settling cone and then allowing the solids to settle by gravity for a given length of time. Results are reported either as a volume (mL/L) or a mass (mg/L) concentration.

Sheet Flow
Flow of water that occurs overland in areas where there are no defined channels where the water spreads out over a large area at a uniform depth.

Site

Soil Amendment
Any material that is added to the soil to change its chemical properties, engineering properties, or erosion resistance that could become mobilized by storm water.

Streets and Utilities Phase
Construction stage including excavation and street paving, lot grading, curbs, gutters and sidewalks, public utilities, public water facilities including fire hydrants, public sanitary sewer systems, storm sewer system and/or other drainage improvements.

Structural Controls
Any structural facility designed and constructed to mitigate the adverse impacts of storm water and urban runoff pollution

Suspended Sediment Concentration (SSC)
The measure of the concentration of suspended solid material in a water sample by measuring the dry weight of all of the solid material from a known volume of a collected water sample. Results are reported in mg/L.

Total Suspended Solids (TSS)
The measure of the suspended solids in a water sample includes inorganic substances, such as soil particles and organic substances, such as algae, aquatic plant/animal waste, particles related to industrial/sewage waste, etc. The TSS test measures the concentration of suspended solids in water by measuring the dry weight of a solid material contained in a known volume of a sub-sample of a collected water sample. Results are reported in mg/L.

Toxicity
The adverse response(s) of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies.

Turbidity
The cloudiness of water quantified by the degree to which light traveling through a water column is scattered by the suspended organic and inorganic particles it contains. The turbidity test is reported in Nephelometric Turbidity Units (NTU) or Jackson Turbidity Units (JTU).

Vertical Construction Phase
The Build out of structures from foundations to roofing, including rough landscaping.

Waters of the United States
Generally refers to surface waters, as defined by the federal Environmental Protection Agency in 40 C.F.R. § 122.2.[1]

Water Quality Objectives (WQO)
Water quality objectives are defined in the California Water Code as limits or levels of water quality constituents or characteristics, which are established for the reasonable protection of beneficial uses of water or the prevention of nuisance within a specific area.

[1] The application of the definition of "waters of the United States" may be difficult to determine; there are currently several judicial decisions that create some confusion. If a landowner is unsure whether the discharge must be covered by this General Permit, the landowner may wish to seek legal advice.

APPENDIX 6:
Acronym List

ASBS	Areas of Special Biological Significance
ASTM	American Society of Testing and Materials; Standard Test Method for Particle-Size Analysis of Soils
ATS	Active Treatment System
BASMAA	Bay Area Storm water Management Agencies Association
BAT	Best Available Technology Economically Achievable
BCT	Best Conventional Pollutant Control Technology
BMP	Best Management Practices
BOD	Biochemical Oxygen Demand
BPJ	Best Professional Judgment
CAFO	Confined Animal Feeding Operation
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CGP	NPDES General Permit for Storm Water Discharges Associated with Construction Activities
CIWQS	California Integrated Water Quality System
CKD	Cement Kiln Dust
COC	Chain of Custody
CPESC	Certified Professional in Erosion and Sediment Control
CPSWQ	Certified Professional in Storm Water Quality
CSMP	Construction Site Monitoring Program
CTB	Cement Treated Base
CTR	California Toxics Rule
CWA	Clean Water Act
CWC	California Water Code
CWP	Center for Watershed Protection
DADMAC	Diallyldimethyl-ammonium chloride
DDNR	Delaware Department of Natural Resources
DFG	Department of Fish and Game
DHS	Department of Health Services
DWQ	Division of Water Quality
EC	Electrical Conductivity
ELAP	Environmental Laboratory Accreditation Program
EPA	Environmental Protection Agency
ESA	Environmentally Sensitive Area
ESC	Erosion and Sediment Control
HSPF	Hydrologic Simulation Program Fortran
JTU	Jackson Turbidity Units
LID	Low Impact Development
LOEC	Lowest Observed Effect Concentration
LRP	Legally Responsible Person
LUP	Linear Underground/Overhead Projects

MATC	Maximum Allowable Threshold Concentration
MDL	Method Detection Limits
MRR	Monitoring and Reporting Requirements
MS4	Municipal Separate Storm Sewer System
MUSLE	Modified Universal Soil Loss Equation
NAL	Numeric Action Level
NEL	Numeric Effluent Limitation
NICET	National Institute for Certification in Engineering Technologies
NOAA	National Oceanic and Atmospheric Administration
NOEC	No Observed Effect Concentration
NOI	Notice of Intent
NOT	Notice of Termination
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NTR	National Toxics Rule
NTU	Nephelometric Turbidity Units
O&M	Operation and Maintenance
PAC	Polyaluminum chloride
PAM	Polyacrylamide
PASS	Polyaluminum chloride Silica/sulfate
POC	Pollutants of Concern
PoP	Probability of Precipitation
POTW	Publicly Owned Treatment Works
PRDs	Permit Registration Documents
PWS	Planning Watershed
QAMP	Quality Assurance Management Plan
QA/QC	Quality Assurance/Quality Control
REAP	Rain Event Action Plan
Regional Board	Regional Water Quality Control Board
ROWD	Report of Waste Discharge
RUSLE	Revised Universal Soil Loss Equation
RW	Receiving Water
SMARTS	Storm water Multi Application Reporting and Tracking System
SS	Settleable Solids
SSC	Suspended Sediment Concentration
SUSMP	Standard Urban Storm Water Mitigation Plan
SW	Storm Water
SWARM	Storm Water Annual Report Module
SWAMP	Surface Water Ambient Monitoring Program
SWMM	Storm Water Management Model
SWMP	Storm Water Management Program
SWPPP	Storm Water Pollution Prevention Plan
TC	Treatment Control
TDS	Total Dissolved Solids

TMDL	Total Maximum Daily Load
TSS	Total Suspended Solids
USACOE	U.S. Army Corps of Engineers
USC	United States Code
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
WDID	Waste Discharge Identification Number
WDR	Waste Discharge Requirements
WLA	Waste Load Allocation
WET	Whole Effluent Toxicity
WRCC	Western Regional Climate Center
WQBEL	Water Quality Based Effluent Limitation
WQO	Water Quality Objective
WQS	Water Quality Standard

APPENDIX 7:
State and Regional Water Resources Control Board Contacts

NORTH COAST REGION (1)
5550 Skylane Blvd, Ste. A
Santa Rose, CA 95403
(707) 576-2220 FAX: (707)523-0135

SAN FRANCISCO BAY REGION (2)
1515 Clay Street, Ste. 1400
Oakland, CA 94612
(510) 622-2300 FAX: (510) 622-2640

CENTRAL COAST REGION (3)
895 Aerovista Place, Ste 101
San Luis Obispo, CA 93401
(805) 549-3147 FAX: (805) 543-0397

LOS ANGELES REGION (4)
320 W. 4th Street, Ste. 200
Los Angeles, CA 90013
(213) 576-6600 FAX: (213) 576-6640

LAHONTAN REGION (6 SLT)
2501 Lake Tahoe Blvd.
South Lake Tahoe, CA 96150
(530) 542-5400 FAX: (530) 544-2271

VICTORVILLE OFFICE (6V)
14440 Civic Drive, Ste. 200
Victorville, CA 92392-2383
(760) 241-6583 FAX: (760) 241-7308

CENTRAL VALLEY REGION (5S)
11020 Sun Center Dr., #200
Rancho Cordova, CA 95670-6114
(916) 464-3291 FAX: (916) 464-4645

FRESNO BRANCH OFFICE (5F)
1685 E St.
Fresno, CA 93706
(559) 445-5116 FAX: (559) 445-5910

REDDING BRANCH OFFICE (5R)
364 Knollcrest Drive, Ste. 205
Redding, CA 96002
(530) 224-4845 FAX: (530) 224-4857

COLORADO RIVER BASIN REGION (7)
73-720 Fred Waring Dr., Ste. 100
Palm Desert, CA 92260
(760) 346-7491 FAX: (760) 341-6820

SANTA ANA REGION (8)
3737 Main Street, Ste. 500
Riverside, CA 92501-3339
Phone (951) 782-4130 FAX: (951) 781-6288

SAN DIEGO REGION (9)
9174 Sky Park Court, Ste. 100
San Diego, CA 92123-4340
(858) 467-2952 FAX: (858) 571-6972

STATE WATER BOARD
PO Box 1977
Sacramento, CA 95812-1977
stormwater@waterboards.ca.gov

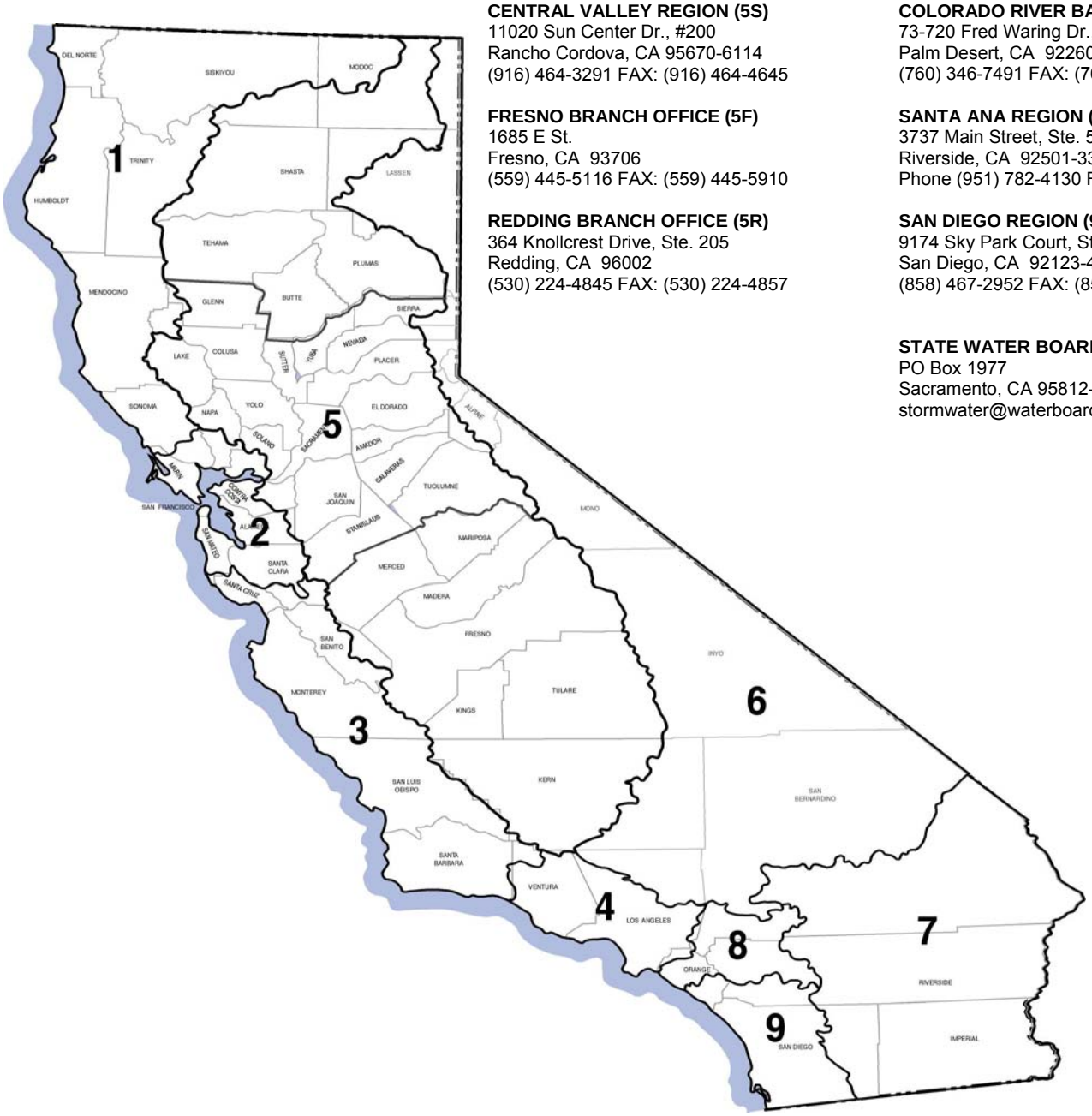

STATE WATER RESOURCES CONTROL BOARD
RESOLUTION NO. 2012-0012

APPROVING EXCEPTIONS TO THE CALIFORNIA OCEAN PLAN FOR SELECTED DISCHARGES INTO AREAS OF SPECIAL BIOLOGICAL SIGNIFICANCE, INCLUDING SPECIAL PROTECTIONS FOR BENEFICIAL USES, AND CERTIFYING A PROGRAM ENVIRONMENTAL IMPACT REPORT

WHEREAS:

1. The State Water Resources Control Board (State Water Board) adopted the California Ocean Plan (Ocean Plan) on July 6, 1972 and revised the Ocean Plan in 1978, 1983, 1988, 1990, 1997, 2000, 2005, and 2009.

2. The Ocean Plan prohibits the discharge of waste to designated Areas of Special Biological Significance (ASBS).

3. ASBS are designated by the State Water Board as ocean areas requiring protection of species or biological communities to the extent that alteration of natural water quality is undesirable.

4. Under the Marine Managed Areas Improvement Act, all ASBS are designated as a subset of state water quality protection areas and require special protection as determined by the State Water Board pursuant to the Ocean Plan and the Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California (Thermal Plan).

5. In state water quality protection areas, waste discharges must be prohibited or limited by special conditions, in accordance with the Porter-Cologne Water Quality Control Act, California Water Code §13000 et seq., and implementing regulations, including the Ocean Plan and Thermal Plan.

6. The Ocean Plan authorizes the State Water Board to grant an exception to Ocean Plan provisions where the board determines that the exception will not compromise protection of ocean waters for beneficial uses and the public interest will be served.

7. On October 18, 2004, the State Water Board notified a number of parties that they must cease the discharge of storm water and nonpoint source waste into ASBS or request an exception to the Ocean Plan.

8. The State Water Board has now received 27 applications for an exception to the Ocean Plan prohibition against waste discharges into an ASBS. The applicants, who are listed in Attachment A to this resolution, discharge storm water and nonpoint source waste into ASBS.

9. The State Water Board finds that granting the requested exceptions will not compromise protection of ocean waters for beneficial uses, provided that the applicants comply with the prohibitions and special conditions that comprise the Special Protections contained in this resolution. The prohibitions and special conditions in the Special Protections, contained in Attachment B to this resolution, are intended to ensure that storm water

and nonpoint source discharges are controlled to protect the beneficial uses of the affected ASBS, including marine aquatic life and habitat, and to maintain natural water quality within ASBS. The Special Protections are also intended to maintain the natural hydrologic cycle and coastal ecology by allowing the flow of clean precipitation runoff into the ocean, while preserving coastal slope stability and preventing anthropogenic erosion.

10. The State Water Board finds that granting the requested exceptions is in the public interest because the various discharges are essential for flood control, slope stability, erosion prevention, and maintenance of the natural hydrologic cycle between terrestrial and marine ecosystems, public health and safety, public recreation and coastal access, commercial and recreational fishing, navigation, and essential military operations (national security).

11. The State Water Board staff conducted scoping meetings on August 1, 8, and 15, 2006. The comment period for CEQA scoping closed August 15, 2006. The State Water Board heard a status report on ASBS at the April 1, 2008 meeting.

12. The State Water Board staff prepared and circulated a Program Environmental Impact Report for the proposed exceptions, in accordance with the California Environmental Quality Act (CEQA) and implementing regulations.

13. The State Water Board held a public hearing on May 18, 2011, to receive comments on the proposed exceptions and the Program Environmental Impact Report. The written comment period ended on May 20, 2011. The State Water Board staff has considered the comments and prepared written response. The State Water Board finds, based on the whole record, including the applications, Draft Program Environmental Impact Report, comments, and responses, that there is no substantial evidence that approval of the exceptions will have a significant effect on the environment because of the terms and conditions incorporated into the project. The Program Environmental Impact Report reflects the State Water Board's independent judgment and analysis.

14. Granting the exceptions is consistent with federal and state antidegradation policies, in 40 C.F.R. §131.12 and State Water Board Resolution No. 68-16, respectively. The terms, special conditions, and prohibitions that comprise these Special Protections will not authorize a lowering of water quality, but rather will improve water quality conditions in the affected ASBS.

15. This resolution only grants an exception from the Ocean Plan prohibition against waste discharges into ASBS to the applicants listed in Attachment A. It does not authorize waste discharges to state waters. In order to legally discharge waste into an ASBS, the applicants must have both coverage under this resolution and an appropriate authorization to discharge. Authorization to discharge for point source waste discharges to navigable waters consists of coverage under the National Pollutant Discharge Elimination System (NPDES) permit program. Nonpoint source discharges of waste must be regulated under waste discharge requirements, a conditional waiver, or a conditional prohibition.

16. The exceptions will be reviewed during the next triennial review of the Ocean Plan. If the State Water Board finds cause to revoke or re-open the exceptions, the board may do so during the triennial review or at any other time. During the next triennial review period staff will also evaluate those aspects of the exception that are successfully protecting beneficial uses, to make recommendations on a potential Ocean Plan amendment to address storm runoff into ASBS.

17. The State Water Board's record of proceedings in this matter is located at 1001 I Street, Sacramento, California, 95814 and the custodian is the Division of Water Quality.

THEREFORE BE IT RESOLVED THAT:

The State Water Board:

1. The State Water Board certifies that the Final EIR has been completed in compliance with CEQA. The State Water Board has reviewed and considered the information contained in these documents, which reflect the State Water Board's independent judgment and analysis.

2. Approves the exceptions to the Ocean Plan prohibition against waste discharges to ASBS for discharges of storm water and nonpoint source waste by the applicants listed in Attachment A to this resolution provided that:

    a. The discharges are covered under an appropriate authorization to discharge waste to the ASBS, such as an NPDES permit and/or waste discharge requirements;
    b. The authorization incorporates all of the Special Protections, contained in Attachment B to this resolution, which are applicable to the discharge; and
    c. Only storm water and nonpoint source waste discharges by the applicants listed in Attachment A to this resolution are covered by this resolution. All other waste discharges to ASBS are prohibited, unless they are covered by a separate, applicable Ocean Plan exception.

3. Authorizes the Executive Director or designee to file the Notice of Determination with the Governor's Office of Planning and Research.

4. Authorizes the Executive Director or designee to transmit the exceptions to the United States Environmental Agency (U.S. EPA) for concurrence.

5. Directs staff to consider development of, and make recommendations for, an Ocean Plan amendment to address storm runoff into ASBS, during the next triennial review period.

6. Directs staff to propose for Board consideration up to $1 million from the Proposition 50 Coastal Nonpoint Source (CNPS) program for additional ASBS Regional Monitoring, starting in the fall of 2012.

7. Directs staff, pending budget authority, to propose for Board consideration the use of CNPS funds (approximately $10 million) in conjunction with the remaining Proposition 84 ASBS funds ($3.6 million) for additional ASBS BMP projects.

CERTIFICATION

The undersigned Clerk to the Board does hereby certify that the foregoing is a full, true, and correct copy of a resolution duly and regularly adopted at a meeting of the State Water Resources Control Board held on March 20, 2012.

AYE:	Chairman Charles R. Hoppin Vice Chair Frances Spivy-Weber Board Member Tam M. Doduc
NAY:	None
ABSENT:	None
ABSTAIN:	None

Jeanine Townsend
Clerk to the Board

Attachment A – Applicants

Applicant	ASBS
Carmel by the Sea, City of	Carmel Bay
Connolly-Pacific Company	Southeast Santa Catalina Island
Department of Parks and Recreation	Redwoods National Park, Trinidad Head, King Range, Jughandle Cove, Gerstle Cove, James V. Fitzgerald, Año Nuevo, Carmel Bay, Point Lobos, Julia Pfeiffer Burns, Laguna Point to Latigo Point, Irvine Coast
Department of Transportation (CalTrans)	Redwoods National Park, Saunders Reef,James V. Fitzgerald, Año Nuevo, Carmel Bay, Point Lobos, Julia Pfeiffer Burns, Salmon Creek Coast, Laguna Point to Latigo Point, Irvine Coast
Humboldt County	King Range
Humboldt Bay Harbor District	King Range
Irvine Company	Irvine Coast
Laguna Beach, City of	Heisler Park
Los Angeles County	Laguna Point to Latigo Point
Los Angeles County Flood Control District	Laguna Point to Latigo Point
Malibu, City of	Laguna Point to Latigo Point
Marin County	Duxbury Reef
Monterey, City of	Pacific Grove
Monterey, County of	Carmel Bay
Newport Beach, City of, and on behalf of the Pelican Point Homeowners	Robert E. Badham And Irvine Coast
Pacific Grove, City of	Pacific Grove
Pebble Beach Company, and on behalf of the Pebble Beach Stillwater Yacht Club	Carmel Bay
San Diego, City of	La Jolla
San Mateo County	James V. Fitzgerald
Santa Catalina Island Company, and on behalf of the Santa Catalina Island Conservancy	Northwest Santa Catalina Island And Western Santa Catalina Island
Sea Ranch Association	Del Mar Landing
Trinidad, City of	Trinidad Head
Trinidad Rancheria	Trinidad Head
U.S. Dept. of Interior, Point Reyes National Seashore	Point Reyes Headlands, Duxbury Reef
U.S. Dept. of Interior, Redwoods National and State Park	Redwoods National Park
U.S. Dept. of Defense, Air Force	James V. Fitzgerald
U.S. Dept. of Defense, Navy	San Nicolas Island & Begg Rock
U.S. Dept. of Defense, Navy	San Clemente Island

Attachment B - Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges

I. PROVISIONS FOR POINT SOURCE DISCHARGES OF STORM WATER AND NONPOINT SOURCE WASTE DISCHARGES

The following terms, prohibitions, and special conditions (hereafter collectively referred to as special conditions) are established as limitations on point source storm water and nonpoint source discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in Areas of Special Biological Significance (ASBS), as required for State Water Quality Protection Areas pursuant to California Public Resources Code Sections 36700(f) and 36710(f). These Special Protections are adopted by the State Water Board as part of the California Ocean Plan (Ocean Plan) General Exception.

The special conditions are organized by category of discharge. The State Water Resources Control Board (State Water Board) and Regional Water Quality Control Boards (Regional Water Boards) will determine categories and the means of regulation for those categories [e.g., Point Source Storm Water National Pollutant Discharge Elimination System (NPDES) or Nonpoint Source].

A. PERMITTED POINT SOURCE DISCHARGES OF STORM WATER

1. General Provisions for Permitted Point Source Discharges of Storm Water

   a. Existing storm water discharges into an ASBS are allowed only under the following conditions:

      (1) The discharges are authorized by an NPDES permit issued by the State Water Board or Regional Water Board;

      (2) The discharges comply with all of the applicable terms, prohibitions, and special conditions contained in these Special Protections; and

      (3) The discharges:

         (i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

         (ii) Are designed to prevent soil erosion;

         (iii) Occur only during wet weather;

         (iv) Are composed of only storm water runoff.

   b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

c. The discharge of trash is prohibited.

d. Only discharges from existing storm water outfalls are allowed. Any proposed or new storm water runoff discharge shall be routed to existing storm water discharge outfalls and shall not result in any new contribution of waste to an ASBS (i.e., no additional pollutant loading). "Existing storm water outfalls" are those that were constructed or under construction prior to January 1, 2005. "New contribution of waste" is defined as any addition of waste beyond what would have occurred as of January 1, 2005. A change to an existing storm water outfall, in terms of re-location or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges are prohibited except as provided below:

(1) The term "non-storm water discharges" means any waste discharges from a municipal separate storm sewer system (MS4) or other NPDES permitted storm drain system to an ASBS that are not composed entirely of storm water.

(2) (i) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability or occur naturally:

(a) Discharges associated with emergency fire fighting operations.

(b) Foundation and footing drains.

(c) Water from crawl space or basement pumps.

(d) Hillside dewatering.

(e) Naturally occurring groundwater seepage via a storm drain.

(f) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(ii) An NPDES permitting authority may authorize non-storm water discharges to an MS4 with a direct discharge to an ASBS only to the extent the NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

2. Compliance Plans for Inclusion in Storm Water Management Plans (SWMP) and Storm Water Pollution Prevention Plans (SWPPP).

The discharger shall specifically address the prohibition of non-storm water runoff and the requirement to maintain natural water quality for storm water discharges to an ASBS in an ASBS Compliance Plan to be included in its SWMP or a SWPPP, as appropriate to permit type. If a statewide permit includes a SWMP, then the discharger shall prepare a stand-alone

compliance plan for ASBS discharges. The ASBS Compliance Plan is subject to approval by the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (for permits issued by Regional Water Boards).

a. The Compliance Plan shall include a map of surface drainage of storm water runoff, showing areas of sheet runoff, prioritize discharges, and describe any structural Best Management Practices (BMPs) already employed and/or BMPs to be employed in the future. Priority discharges are those that pose the greatest water quality threat and which are identified to require installation of structural BMPs. The map shall also show the storm water conveyances in relation to other features such as service areas, sewage conveyances and treatment facilities, landslides, areas prone to erosion, and waste and hazardous material storage areas, if applicable. The SWMP or SWPPP shall also include a procedure for updating the map and plan when changes are made to the storm water conveyance facilities.

b. The ASBS Compliance Plan shall describe the measures by which all non-authorized non-storm water runoff (e.g., dry weather flows) has been eliminated, how these measures will be maintained over time, and how these measures are monitored and documented.

c. For Municipal Separate Storm Sewer System (MS4s), the ASBS Compliance Plan shall require minimum inspection frequencies as follows:

   (1) The minimum inspection frequency for construction sites shall be weekly during rainy season;

   (2) The minimum inspection frequency for industrial facilities shall be monthly during the rainy season;

   (3) The minimum inspection frequency for commercial facilities (e.g., restaurants) shall be twice during the rainy season; and

   (4) Storm water outfall drains equal to or greater than 18 inches (457 mm) in diameter or width shall be inspected once prior to the beginning of the rainy season and once during the rainy season and maintained to remove trash and other anthropogenic debris.

d. The ASBS Compliance Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff, that are necessary to comply with these special conditions, will be achieved through BMPs. Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that such installation would pose a threat to health or safety. BMPs to control storm water runoff discharges (at the end-of-pipe) during a design storm shall be designed to achieve on average the following target levels:

   (1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

(2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges.

The baseline for these determinations is the effective date of the Exception, except for those structural BMPs installed between January 1, 2005 and adoption of these Special Protections, and the reductions must be achieved and documented within four (4) years of the effective date.

e. The ASBS Compliance Plan shall address erosion control and the prevention of anthropogenic sedimentation in ASBS. The natural habitat conditions in the ASBS shall not be altered as a result of anthropogenic sedimentation.

f. The ASBS Compliance Plan shall describe the non-structural BMPs currently employed and planned in the future (including those for construction activities), and include an implementation schedule. The ASBS Compliance Plan shall include non-structural BMPs that address public education and outreach. Education and outreach efforts must adequately inform the public that direct discharges of pollutants from private property not entering an MS4 are prohibited. The ASBS Compliance Plan shall also describe the structural BMPs, including any low impact development (LID) measures, currently employed and planned for higher threat discharges and include an implementation schedule. To control storm water runoff discharges (at the end-of-pipe) during a design storm, permittees must first consider, and use where feasible, LID practices to infiltrate, use, or evapotranspirate storm water runoff on-site, if LID practices would be the most effective at reducing pollutants from entering the ASBS.

g. The BMPs and implementation schedule shall be designed to ensure that natural water quality conditions in the receiving water are achieved and maintained by either reducing flows from impervious surfaces or reducing pollutant loading, or some combination thereof.

h. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents in storm water runoff that alter natural ocean water quality and the sources of these constituents.

(2) The report shall describe BMPs that are currently being implemented, BMPs that are identified in the SWMP or SWPPP for future implementation, and any additional BMPs that may be added to the SWMP or SWPPP to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the BMPs.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits), the discharger shall revise its ASBS Compliance Plan to incorporate any new or modified BMPs that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised SWMP or SWPPP, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural ocean water quality conditions due to the same constituent.

(5) The requirements of this section are in addition to the terms, prohibitions, and conditions contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within eighteen (18) months from the effective date of the Exception, the discharger shall submit a draft written ASBS Compliance Plan to the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that describes its strategy to comply with these special conditions, including the requirement to maintain natural water quality in the affected ASBS. The ASBS Compliance Plan shall include a description of appropriate non-structural controls and a time schedule to implement structural controls (implementation schedule) to comply with these special conditions for inclusion in the discharger's SWMP or SWPPP, as appropriate to permit type. The final ASBS Compliance Plan, including a description and final schedule for structural controls based on the results of runoff and receiving water monitoring, must be submitted within thirty (30) months from the effective date of the Exception.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these special conditions shall be implemented.

d. Within six (6) years of the effective date of the Exception, any structural controls identified in the ASBS Compliance Plan that are necessary to comply with these special conditions shall be operational.

e. Within six (6) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water, pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data, and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe

the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. for municipalities, a demonstration of significant hardship to discharger ratepayers, by showing the relationship of storm water fees to annual household income for residents within the discharger's jurisdictional area, and the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or

2. for other governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

B. NONPOINT SOURCE DISCHARGES

1. General Provisions for Nonpoint Sources

   a. Existing nonpoint source waste discharges are allowed into an ASBS only under the following conditions:

      (1) The discharges are authorized under waste discharge requirements, a conditional waiver of waste discharge requirements, or a conditional prohibition issued by the State Water Board or a Regional Water Board.

      (2) The discharges are in compliance with the applicable terms, prohibitions, and special conditions contained in these Special Protections.

      (3) The discharges:

         (i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

         (ii) Are designed to prevent soil erosion;

         (iii) Occur only during wet weather;

         (iv) Are composed of only storm water runoff.

   b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

c. The discharge of trash is prohibited.

d. Only existing nonpoint source waste discharges are allowed. "Existing nonpoint source waste discharges" are discharges that were ongoing prior to January 1, 2005. "New nonpoint source discharges" are defined as those that commenced on or after January 1, 2005. A change to an existing nonpoint source discharge, in terms of relocation or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges from nonpoint sources (those not subject to an NPDES Permit) are prohibited except as provided below:

(1) The term "non-storm water discharges" means any waste discharges that are not composed entirely of storm water.

(2) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability, or occur naturally:

(i) Discharges associated with emergency fire fighting operations.

(ii) Foundation and footing drains.

(iii) Water from crawl space or basement pumps.

(iv) Hillside dewatering.

(v) Naturally occurring groundwater seepage via a storm drain.

(vi) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

f. At the San Clemente Island ASBS, discharges incidental to military training and research, development, test, and evaluation operations are allowed. Discharges incidental to underwater demolition and other in-water explosions are not allowed in the two military closure areas in the vicinity of Wilson Cove and Castle Rock. Discharges must not result in a violation of the water quality objectives, including the protection of the marine aquatic life beneficial use, anywhere in the ASBS.

g. At the San Nicolas Island and Begg Rock ASBS, discharges incidental to military research, development, testing, and evaluation of, and training with, guided missile and other weapons systems, fleet training exercises, small-scale amphibious warfare training, and special warfare training are allowed. Discharges incidental to underwater demolition and other in-water explosions are not allowed. Discharges must not result in a violation of the water quality objectives, including the protection of the marine aquatic life beneficial use, anywhere in the ASBS.

h. All other nonpoint source discharges not specifically authorized above are prohibited.

2. Planning and Reporting

a. The nonpoint source discharger shall develop an ASBS Pollution Prevention Plan, including an implementation schedule, to address storm water runoff and any other nonpoint source discharges from its facilities. The ASBS Pollution Prevention Plan must be equivalent in contents to an ASBS Compliance Plan as described in I (A)(2) in this document. The ASBS Pollution Prevention Plan is subject to approval by the Executive Director of the State Water Board (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements).

b. The ASBS Pollution Prevention Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff that are necessary to comply with these special conditions, will be achieved through Management Measures and associated Management Practices (Management Measures/Practices). Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director or Regional Water Board Executive Officer that such installation would pose a threat to health or safety. Management Measures to control storm water runoff during a design storm shall achieve on average the following target levels:

(1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

(2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges.

The baseline for these determinations is the effective date of the Exception, except for those structural BMPs installed between January 1, 2005 and adoption of these Special Protections, and the reductions must be achieved and documented within four (4) years of the effective date.

c. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff or other nonpoint source pollution is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and the Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents that alter natural water quality and the sources of these constituents.

(2) The report shall describe Management Measures/Practices that are currently being implemented, Management Measures/Practices that are identified in the ASBS Pollution Prevention Plan for future implementation, and any additional Management Measures/Practices that may be added to the Pollution Prevention Plan to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the Management Measures/Practices.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements), the discharger shall revise its ASBS Pollution Prevention Plan to incorporate any new or modified Management Measures/Practices that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised ASBS Pollution Prevention Plan, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural water quality conditions due to the same constituent.

(5) The requirements of this section are in addition to the terms, prohibitions, and conditions contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within eighteen (18) months from the effective date of the Exception, the discharger~~s~~ shall submit a draft written ASBS Pollution Prevention Plan to the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) that describes its strategy to comply with these special conditions, including the requirement to maintain natural ocean water quality in the affected ASBS. The Pollution Prevention Plan shall include a description of appropriate non-structural controls and a time schedule to implement structural controls to comply with these special conditions for inclusion in the discharger's Pollution Prevention Plan. The final ASBS Pollution Prevention Plan, including a description and final schedule for structural controls based on the results of runoff and receiving water monitoring, must be submitted within thirty (30) months from the effective date of the Exception.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these Special Protections shall be implemented.

d. Within six (6) years of the effective date of the Exception, any structural controls identified in the ASBS Pollution Prevention Plan that are necessary to comply with these special conditions shall be operational.

e. Within six (6) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. a demonstration that the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or

2. for governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

II. ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES

In addition to the provisions in Section I (A) or I (B), respectively, a discharger with parks and recreation facilities shall comply with the following:

A. The discharger shall include a section in an ASBS Compliance Plan (for NPDES dischargers) or an ASBS Pollution Prevention Plan (for nonpoint source dischargers) to address storm water runoff from parks and recreation facilities.

1. The plan shall identify all pollutant sources, including sediment sources, which may result in waste entering storm water runoff. Pollutant sources include, but are not limited to, roadside rest areas and vistas, picnic areas, campgrounds, trash receptacles, maintenance facilities, park personnel housing, portable toilets, leach fields, fuel tanks, roads, piers, and boat launch facilities.

2. The plan shall describe BMPs or Management Measures/Practices that will be implemented to control soil erosion (both temporary and permanent erosion controls) and reduce or eliminate pollutants in storm water runoff in order to achieve and maintain natural water quality conditions in the affected ASBS. The plan shall include BMPs or

Management Measures/Practices to ensure that trails and culverts are maintained to prevent erosion and minimize waste discharges to ASBS.

3. The plan shall include BMPs or Management Measures/Practices to prevent the discharge of pesticides or other chemicals, including agricultural chemicals, in storm water runoff to the affected ASBS.

4. The plan shall include BMPs or Management Measures/Practices that address public education and outreach. The goal of these BMPs or Management Measures/Practices is to ensure that the public is adequately informed that waste discharges to the affected ASBS are prohibited or limited by special conditions in these Special Protections. The BMPs or Management Measures/Practices shall include signage at camping, picnicking, beach and roadside parking areas, and visitor centers, or other appropriate measures, which notify the public of any applicable requirements of these Special Protections and identify the ASBS boundaries.

5. The plan shall include BMPs or Management Measures/Practices that address the prohibition against the discharge of trash to ASBS. The BMPs or Management Measures/Practices shall include measures to ensure that adequate trash receptacles are available for public use at visitor facilities, including parking areas, and that the receptacles are adequately maintained to prevent trash discharges into the ASBS. Appropriate measures include covering trash receptacles to prevent trash from being wind blown and periodically emptying the receptacles to prevent overflows.

6. The plan shall include BMPs or Management Measures/Practices to address runoff from parking areas and other developed features to ensure that the runoff does not alter natural water quality in the affected ASBS. BMPs or Management Measures/Practices shall include measures to reduce pollutant loading in runoff to the ASBS through installation of natural area buffers (LID), treatment, or other appropriate measures.

B. Maintenance and repair of park and recreation facilities must not result in waste discharges to the ASBS. The practice of road oiling must be minimized or eliminated, and must not result in waste discharges to the ASBS.

III. ADDITIONAL REQUIREMENTS – WATERFRONT AND MARINE OPERATIONS

In addition to the provisions in Section I (A) or I (B), respectively, a discharger with waterfront and marine operations shall comply with the following:

A. For discharges related to waterfront and marine operations, the discharger shall develop a Waterfront and Marine Operations Management Plan (Waterfront Plan). This plan shall contain appropriate Management Measures/Practices to address nonpoint source pollutant discharges to the affected ASBS.

1. The Waterfront Plan shall contain appropriate Management Measures/Practices for any waste discharges associated with the operation and maintenance of vessels, moorings, piers, launch ramps, and cleaning stations in order to ensure that beneficial uses are protected and natural water quality is maintained in the affected ASBS.

2. For discharges from marinas and recreational boating activities, the Waterfront Plan shall include appropriate Management Measures, described in The Plan for California's Nonpoint Source Pollution Control Program, for marinas and recreational boating, or equivalent practices, to ensure that nonpoint source pollutant discharges do not alter natural water quality in the affected ASBS.

3. The Waterfront Plan shall include Management Practices to address public education and outreach to ensure that the public is adequately informed that waste discharges to the affected ASBS are prohibited or limited by special conditions in these Special Protections. The management practices shall include appropriate signage, or similar measures, to inform the public of the ASBS restrictions and to identify the ASBS boundaries.

4. The Waterfront Plan shall include Management Practices to address the prohibition against trash discharges to ASBS. The Management Practices shall include the provision of adequate trash receptacles for marine recreation areas, including parking areas, launch ramps, and docks. The plan shall also include appropriate Management Practices to ensure that the receptacles are adequately maintained and secured in order to prevent trash discharges into the ASBS. Appropriate Management Practices include covering the trash receptacles to prevent trash from being windblown, staking or securing the trash receptacles so they don't tip over, and periodically emptying the receptacles to prevent overflow.

5. The discharger shall submit its Waterfront Plan to the by the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) within six months of the effective date of these special conditions. The Waterfront Plan is subject to approval by the State Water Board Executive Director or the Regional Water Board Executive Officer, as appropriate. The plan must be fully implemented within 18 months of the effective date of the Exception.

B. The discharge of chlorine, soaps, petroleum, other chemical contaminants, trash, fish offal, or human sewage to ASBS is prohibited. Sinks and fish cleaning stations are point source discharges of wastes and are prohibited from discharging into ASBS. Anthropogenic accumulations of discarded fouling organisms on the sea floor must be minimized.

C. Limited-term activities, such as the repair, renovation, or maintenance of waterfront facilities, including, but not limited to, piers, docks, moorings, and breakwaters, are authorized only in accordance with Chapter III.E.2 of the Ocean Plan.

D. If the discharger anticipates that the discharger will fail to fully implement the approved Waterfront Plan within the 18 month deadline, the discharger shall submit a technical report as soon as practicable to the State Water Board Executive Director or the Regional Water Board Executive Officer, as appropriate. The technical report shall contain reasons for failing to meet the deadline and propose a revised schedule to fully implement the plan.

E. The State Water Board or the Regional Water Board may, for good cause, authorize additional time to comply with the Waterfront Plan. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in Section III.A.5. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality. The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. a demonstration of significant hardship by showing that the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate.

2. for governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

IV. MONITORING REQUIREMENTS

Monitoring is mandatory for all dischargers to assure compliance with the Ocean Plan. Monitoring requirements include both: (A) core discharge monitoring, and (B) ocean receiving water monitoring. The State and Regional Water Boards must approve sampling site locations and any adjustments to the monitoring programs. All ocean receiving water and reference area monitoring must be comparable with the Water Boards' Surface Water Ambient Monitoring Program (SWAMP).

Safety concerns: Sample locations and sampling periods must be determined considering safety issues. Sampling may be postponed upon notification to the State and Regional Water Boards if hazardous conditions prevail.

Analytical Chemistry Methods: All constituents must be analyzed using the lowest minimum detection limits comparable to the Ocean Plan water quality objectives. For metal analysis, all samples, including storm water effluent, reference samples, and ocean receiving water samples, must be analyzed by the approved analytical method with the lowest minimum detection limits (currently Inductively Coupled Plasma/Mass Spectrometry) described in the Ocean Plan.

A. CORE DISCHARGE MONITORING PROGRAM

1. General sampling requirements for timing and storm size:

   Runoff must be collected during a storm event that is greater than 0.1 inch and generates runoff, and at least 72 hours from the previously measurable storm event. Runoff samples shall be collected during the same storm and at approximately the same time when post-

storm receiving water is sampled, and analyzed for the same constituents as receiving water and reference site samples (see section IV B) as described below.

2. Runoff flow measurements

   a. For municipal/industrial storm water outfalls in existence as of December 31, 2007, 18 inches (457mm) or greater in diameter/width (including multiple outfall pipes in combination having a width of 18 inches, runoff flows must be measured or calculated, using a method acceptable to and approved by the State and Regional Water Boards.

   b. This will be reported annually for each precipitation season to the State and Regional Water Boards.

3. Runoff samples – storm events

   a. For outfalls equal to or greater than 18 inches (0.46m) in diameter or width:

      (1) samples of storm water runoff shall be collected during the same storm as receiving water samples and analyzed for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

      (2) samples of storm water runoff shall be collected and analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

      (3) If an applicant has no outfall greater than 36 inches, then storm water runoff from the applicant's largest outfall shall be further collected during the same storm as receiving water samples and analyzed for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates).

   b. For outfalls equal to or greater than 36 inches (0.91m) in diameter or width:

      (1) samples of storm water runoff shall be collected during the same storm as receiving water samples and analyzed for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

      (2) samples of storm water runoff shall be further collected during the same storm as receiving water samples and analyzed for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates); and

      (3) samples of storm water runoff shall be collected and analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

b. For an applicant not participating in a regional monitoring program [see below in Section IV (B)] in addition to (a.) and (b.) above, a minimum of the two largest outfalls or 20 percent of the larger outfalls, whichever is greater, shall be sampled (flow weighted composite samples) at least three times annually during wet weather (storm event) and analyzed for all Ocean Plan Table A constituents, Table B constituents for marine aquatic life protection (except for toxicity, only chronic toxicity for three species shall be required), DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, and Ocean Plan indicator bacteria. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one (the largest) such discharge shall be sampled annually in each Region.

4. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may reduce or suspend core monitoring once the storm runoff is fully characterized. This determination may be made at any point after the discharge is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

B. Ocean Receiving Water and Reference Area Monitoring Program

In addition to performing the Core Discharge Monitoring Program in Section II.A above, all applicants having authorized discharges must perform ocean receiving water monitoring. In order to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS, dischargers may choose either (1) an individual monitoring program, or (2) participation in a regional integrated monitoring program.

1. Individual Monitoring Program: The requirements listed below are for those dischargers who elect to perform an individual monitoring program to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within the affected ASBS. In addition to Core Discharge Monitoring, the following additional monitoring requirements shall be met:

   a. Three times annually, during wet weather (storm events), the receiving water at the point of discharge from the outfalls described in section (IV)(A)(3)(c) above shall be sampled and analyzed for Ocean Plan Table A constituents, Table B constituents for marine aquatic life, DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, salinity, chronic toxicity (three species), and Ocean Plan indicator bacteria.

      The sample location for the ocean receiving water shall be in the surf zone at the point of discharges; this must be at the same location where storm water runoff is sampled. Receiving water shall be sampled prior to (pre-storm) and during (or immediately after) the same storm (post storm). Post storm sampling shall be during the same storm and at approximately the same time as when the runoff is sampled. Reference water quality shall also be sampled three times annually and analyzed for the same constituents pre-storm and post-storm, during the same storm seasons when receiving water is sampled. Reference stations will be determined by the State Water Board's Division of Water Quality and the applicable Regional Water Board(s).

   b. Sediment sampling shall occur at least three times during every five (5) year period. The subtidal sediment (sand or finer, if present) at the discharge shall be sampled and analyzed for Ocean Plan Table B constituents for marine aquatic life, DDT, PCBs, PAHs,

pyrethroids, and OP pesticides. For sediment toxicity testing, only an acute toxicity test using the amphipod *Eohaustorius estuarius* must be performed.

c. A quantitative survey of intertidal benthic marine life shall be performed at the discharge and at a reference site. The survey shall be performed at least once every five (5) year period. The survey design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The results of the survey shall be completed and submitted to the State Water Board and Regional Water Board at least six months prior to the end of the permit cycle.

d. Once during each five (5) year period, a bioaccumulation study shall be conducted to determine the concentrations of metals and synthetic organic pollutants at representative discharge sites and at representative reference sites. The study design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The bioaccumulation study may include California mussels (*Mytilus californianus*) and/or sand crabs (*Emerita analoga* or *Blepharipoda occidentalis*). Based on the study results, the Regional Water Board and the State Water Board's Division of Water Quality, may adjust the study design in subsequent permits, or add or modify additional test organisms (such as shore crabs or fish), or modify the study design appropriate for the area and best available sensitive measures of contaminant exposure.

e. Marine Debris: Representative quantitative observations for trash by type and source shall be performed along the coast of the ASBS within the influence of the discharger's outfalls. The design, including locations and frequency, of the marine debris observations is subject to approval by the Regional Water Board and State Water Board's Division of Water Quality.

f. The monitoring requirements of the Individual Monitoring Program in this section are minimum requirements. After a minimum of one (1) year of continuous water quality monitoring of the discharges and ocean receiving waters, the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may require additional monitoring, or adjust, reduce or suspend receiving water and reference station monitoring. This determination may be made at any point after the discharge and receiving water is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

2. Regional Integrated Monitoring Program: Dischargers may elect to participate in a regional integrated monitoring program, in lieu of an individual monitoring program, to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS. This regional approach shall characterize natural water quality, pre- and post-storm, in ocean reference areas near the mouths of identified open space watersheds and the effects of the discharges on natural water quality (physical, chemical, and toxicity) in the ASBS receiving waters, and should include benthic marine aquatic life and bioaccumulation components. The design of the ASBS stratum of a regional integrated monitoring program may deviate from the otherwise prescribed individual monitoring approach (in Section IV.B.1) if approved by the State Water Board's Division of Water Quality and the Regional Water Boards.

   a. Ocean reference areas shall be located at the drainages of flowing watersheds with minimal development (in no instance more than 10% development), and shall not be located in CWA Section 303(d) listed waterbodies or have tributaries that are 303(d)

listed. Reference areas shall be free of wastewater discharges and anthropogenic non-storm water runoff. A minimum of low threat storm runoff discharges (e.g. stream highway overpasses and campgrounds) may be allowed on a case-by-case basis. Reference areas shall be located in the same region as the ASBS receiving water monitoring occurs. The reference areas for each Region are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean reference water samples must be collected from each station, each from a separate storm during the same storm season that receiving water is sampled. A minimum of one reference location shall be sampled for each ASBS receiving water site sampled per responsible party. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

b. ASBS ocean receiving water must be sampled in the surf zone at the location where the runoff makes contact with ocean water (i.e. at "point zero"). Ocean receiving water stations must be representative of worst-case discharge conditions (i.e. co-located at a large drain greater than 36 inches, or if drains greater than 36 inches are not present in the ASBS then the largest drain greater than18 inches.) Ocean receiving water stations are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean receiving water samples must be collected during each storm season from each station, each from a separate storm. A minimum of one receiving water location shall be sampled in each ASBS per responsible party in that ASBS. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

c. Reference and receiving water sampling shall commence during the first full storm season following the adoption of these special conditions, and post-storm samples shall be collected during the same storm event when storm water runoff is sampled. Sampling shall occur in a minimum of two storm seasons. For those ASBS dischargers that have already participated in the Southern California Bight 2008 ASBS regional monitoring effort, sampling may be limited to only one storm season.

d. Receiving water and reference samples shall be analyzed for the same constituents as storm water runoff samples. At a minimum, constituents to be sampled and analyzed in reference and discharge receiving waters must include oil and grease, total suspended solids, Ocean Plan Table B metals for protection of marine life, Ocean Plan PAHs, pyrethroids, OP pesticides, ammonia, nitrate, phosphates, and critical life stage chronic toxicity for three species. In addition, within the range of the southern sea otter, indicator bacteria or some other measure of fecal contamination shall be analyzed.

3. Waterfront and Marine Operations: In addition to the above requirements for ocean receiving water monitoring, additional monitoring must be performed for marinas and boat launch and pier facilities:

   a. For all marina or mooring field operators, in mooring fields with 10 or more occupied moorings, the ocean receiving water must be sampled for Ocean Plan indicator bacteria, residual chlorine, copper, zinc, grease and oil, methylene blue active substances (MBAS), and ammonia nitrogen.

(1) For mooring field operators opting for an individual monitoring program (Section IV.B.1 above), this sampling must occur weekly (on the weekend) from May through October.

(2) For mooring field operators opting to participate in a regional integrated monitoring program (Section IV.B.2 above), this sampling must occur monthly from May through October on a high use weekend in each month. The Water Boards may allow a reduction in the frequency of sampling, through the regional monitoring program, after the first year of monitoring.

b. For all mooring field operators, the subtidal sediment (sand or finer, if present) within mooring fields and below piers shall be sampled and analyzed for Ocean Plan Table B metals (for marine aquatic life beneficial use), acute toxicity, PAHs, and tributyltin. For sediment toxicity testing, only an acute toxicity test using the amphipod *Eohaustorius estuarius* must be performed. This sampling shall occur at least three times during a five (5) year period. For mooring field operators opting to participate in a regional integrated monitoring program, the Water Boards may allow a reduction in the frequency of sampling after the first sampling effort's results are assessed.

Glossary

At the point of discharge(s) – Means in the surf zone immediately where runoff from an outfall meets the ocean water (a.k.a., at point zero).

Areas of Special Biological Significance (ASBS) – Those areas designated by the State Water Board as ocean areas requiring protection of species or biological communities to the extent that alteration of natural water quality is undesirable. All Areas of Special Biological Significance are also classified as a subset of State Water Quality Protection Areas.

Design storm – For purposes of these Special Protections, a design storm is defined as the volume of runoff produced from one inch of precipitation per day or, if this definition is inconsistent with the discharger's applicable storm water permit, then the design storm shall be the definition included in the discharger's applicable storm water permit.

Development – Relevant to reference monitoring sites, means urban, industrial, agricultural, grazing, mining, and timber harvesting land uses.

Higher threat discharges - Permitted storm drains discharging equal to or greater than 18 inches, industrial storm drains, agricultural runoff discharged through an MS4, discharges associated with waterfront and marina operations (e.g., piers, launch ramps, mooring fields, and associated vessel support activities, except for passive discharges defined below), and direct discharges associated with commercial or industrial activities to ASBS.

Low Impact Development (LID) – A sustainable practice that benefits water supply and contributes to water quality protection. Unlike traditional storm water management, which entails collecting and conveying storm water runoff through storm drains, pipes, or other conveyances to a centralized storm water facility, LID focuses on using site design and storm water management to maintain the site's pre-development runoff rates and volumes. The goal of LID is to mimic a site's predevelopment hydrology by using design techniques that infiltrate, filter, store, evaporate, and detain runoff close to the source of rainfall.

Marine Operations – Marinas or mooring fields that contain slips or mooring locations for 10 or more vessels.

Management Measure (MM) - Economically achievable measures for the control of the addition of pollutants from various classes of nonpoint sources of pollution, which reflect the greatest degree of pollutant reduction achievable through the application of the best available nonpoint pollution control practices, technologies, processes, siting criteria, operating methods, or other alternatives. For example, in the "marinas and recreational boating" land-use category specified in the Plan for California's Nonpoint Source Pollution Control Program (NPS Program Plan) (SWRCB, 1999), "boat cleaning and maintenance" is considered a MM or the source of a specific class or type of NPS pollution.

Management Practice (MP) - The practices (e.g., structural, non-structural, operational, or other alternatives) that can be used either individually or in combination to address a specific MM class or classes of NPS pollution. For example, for the "boat cleaning and maintenance" MM, specific MPs can include, but are not limited to, methods for the selection of environmentally sensitive hull paints or methods for cleaning/removal of hull copper anti-fouling paints.

Municipal Separate Storm Sewer System (MS4) – A municipally-owned storm sewer system regulated under the Phase I or Phase II storm water program implemented in compliance with Clean Water Act section 402(p). Note that an MS4 program's boundaries are not necessarily congruent with the permittee's political boundaries.

Natural Ocean Water Quality - The water quality (based on selected physical, chemical and biological characteristics) that is required to sustain marine ecosystems, and which is without apparent human influence, *i.e.*, an absence of significant amounts of: (a) man-made constituents (*e.g.,* DDT); (b) other chemical (*e.g.,* trace metals), physical (temperature/thermal pollution, sediment burial), and biological (*e.g.*, bacteria) constituents at concentrations that have been elevated due to man's activities above those resulting from the naturally occurring processes that affect the area in question; and (c) non-indigenous biota (*e.g.,* invasive algal bloom species) that have been introduced either deliberately or accidentally by man. Discharges "*shall not alter natural ocean water quality*" as determined by a comparison to the range of constituent concentrations in reference areas agreed upon via the regional monitoring program(s). If monitoring information indicates that *natural ocean water quality* is not maintained, but there is sufficient evidence that a discharge is not contributing to the alteration of natural water quality, then the Regional Water Board may make that determination. In this case, sufficient information must include runoff sample data that has equal or lower concentrations for the range of constituents at the applicable reference area(s).

Nonpoint source – Nonpoint pollution sources generally are sources that do not meet the definition of a point source. Nonpoint source pollution typically results from land runoff, precipitation, atmospheric deposition, agricultural drainage, marine/boating operations or hydrologic modification. Nonpoint sources, for purposes of these Special Protections, include discharges that are not required to be regulated under an NPDES permit.

Non-storm water discharge – Any runoff that is not the result of a precipitation event. This is often referred to as "dry weather flow."

Non-structural control – A Best Management Practice that involves operational, maintenance, regulatory (e.g., ordinances) or educational activities designed to reduce or eliminate pollutants in runoff, and that are not structural controls (i.e. there are no physical structures involved).

Physical impossibility - Means any act of God, war, fire, earthquake, windstorm, flood or natural catastrophe; unexpected and unintended accidents not caused by discharger or its employees' negligence; civil disturbance, vandalism, sabotage or terrorism; restrain by court order or public authority or agency; or action or non-action by, or inability to obtain the necessary authorizations or approvals from any governmental agency other than the permittee.

Representative sites and monitoring procedures – Are to be proposed by the discharger, with appropriate rationale, and subject to approval by Water Board staff.

Sheet-flow – Runoff that flows across land surfaces at a shallow depth relative to the cross-sectional width of the flow. These types of flow may or may not enter a storm drain system before discharge to receiving waters.

Storm Season – Also referred to as rainy season, means the months of the year from the onset of rainfall during autumn until the cessation of rainfall in the spring.

Structural control – A Best Management Practice that involves the installation of engineering solutions to the physical treatment or infiltration of runoff.

Surf Zone - The surf zone is defined as the submerged area between the breaking waves and the shoreline at any one time.

Surface Water Ambient Monitoring Program (SWAMP) comparable – Means that the monitoring program must 1) meet or exceed 2008 SWAMP Quality Assurance Program Management Plan (QAPP) Measurement Quality Objectives, or 2) have a Quality Assurance Project Plan that has been approved by SWAMP; in addition data must be formatted to match the database requirements of the SWAMP Information Management System. Adherence to the measurement quality objectives in the Southern California Bight 2008 ASBS Regional Monitoring Program QAPP and data base management comprises being SWAMP comparable.

Waterfront Operations - Piers, launch ramps, and cleaning stations in the water or on the adjacent shoreline.

Attachment 1
Special Protections Sections I(A)(3)(e) and I(B)(3)(e)
Flowchart to Determine Compliance with Natural Water Quality

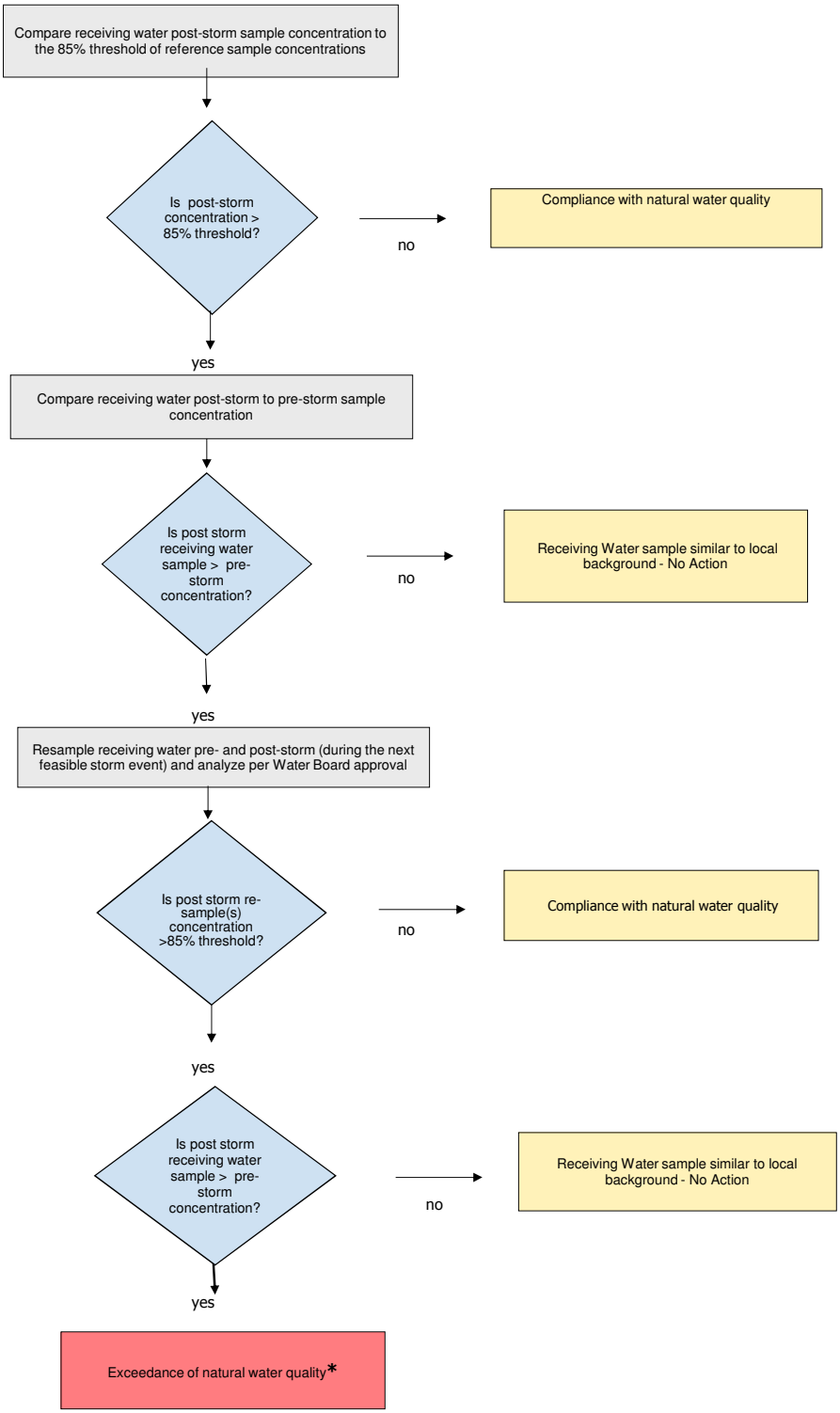

*** When an exceedance of natural water quality occurs, the discharger must comply with section I.A.2.h (for permitted storm water) or section I.B.2.c (for nonpoint sources). Note, when sampling data is available, end-of-pipe effluent concentrations will be considered by the Water Boards in making this determination.**

STATE WATER RESOURCES CONTROL BOARD
RESOLUTION NO. 2012-0031

AMENDING THE GENERAL EXCEPTION TO THE CALIFORNIA OCEAN PLAN FOR SELECTED DISCHARGES INTO AREAS OF SPECIAL BIOLOGICAL SIGNIFICANCE, INCLUDING SPECIAL PROTECTIONS FOR BENEFICIAL USES

WHEREAS:

1. The State Water Resources Control Board (State Water Board) adopted the California Ocean Plan (Ocean Plan) on July 6, 1972 and revised the Ocean Plan in 1978, 1983, 1988, 1990, 1997, 2000, 2005, and 2009.

2. The Ocean Plan prohibits the discharge of waste to designated Areas of Special Biological Significance (ASBS).

3. ASBS are designated by the State Water Board as ocean areas requiring protection of species or biological communities to the extent that alteration of natural water quality is undesirable.

4. Under the Marine Managed Areas Improvement Act, all ASBS are designated as a subset of state water quality protection areas and require special protection as determined by the State Water Board pursuant to the Ocean Plan and the Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California (Thermal Plan).

5. In state water quality protection areas, waste discharges must be prohibited or limited by special conditions, in accordance with the Porter-Cologne Water Quality Control Act, (Wat. Code, §13000 et seq.) and implementing regulations, including the Ocean Plan and Thermal Plan.

6. The Ocean Plan authorizes the State Water Board to grant an exception to Ocean Plan provisions where the State Water Board determines that the exception will not compromise protection of ocean waters for beneficial uses and the public interest will be served.

7. On October 18, 2004, the State Water Board notified a number of parties that they must cease the discharge of storm water and nonpoint source waste into ASBS or request an exception to the Ocean Plan.

8. The State Water Board received 27 applications for an exception to the Ocean Plan prohibition against waste discharges into an ASBS. The applicants discharge storm water and nonpoint source waste into ASBS.

9. On March 20, 2012, in Resolution 2012-0012, the State Water Board adopted a General Exception to the Ocean Plan ASBS waste discharge prohibition, for storm water and nonpoint source discharges from these 27 applicants, including Special Protections for Beneficial Uses.

10. The State Water Board's stated intention when adopting the General Exception with Special Protections for Beneficial Uses was for compliance with natural ocean water quality within six years of the effective date.

11. Two sections in the Special Protections to ASBS Compliance Plans, section A. 2.d(2), and ASBS Pollution Prevention Plans, section B.2.b(2), were not corrected and retained a four year, instead of six year, compliance deadline.

THEREFORE BE IT RESOLVED THAT:

The State Water Board:

1. Amends sections A.2.d(2) and B.2.b(2) of the Special Protections in Attachment B to the General Exception, originally adopted in Resolution 2012-0012, to require pollutant reductions to be achieved within six years, to be consistent with the compliance schedules in sections I.A.3 and I.B.3.

2. Authorizes the Executive Director or designee to transmit the amended General Exception to the United States Environmental Agency (U.S. EPA) for concurrence.

CERTIFICATION

The undersigned Clerk to the Board does hereby certify that the foregoing is a full, true, and correct copy of a resolution duly and regularly adopted at a meeting of the State Water Resources Control Board held on June 19, 2012.

AYE:	Chairman Charles R. Hoppin Vice Chair Frances Spivy-Weber Board Member Tam M. Doduc Board Member Steven Moore
NAY:	None
ABSENT:	None
ABSTAIN:	None

Jeanine Townsend

Jeanine Townsend
Clerk to the Board

Attachment A – Applicants

Applicant	ASBS
Carmel by the Sea, City of	Carmel Bay
Connolly-Pacific Company	Southeast Santa Catalina Island
Department of Parks and Recreation	Redwoods National Park, Trinidad Head, King Range, Jughandle Cove, Gerstle Cove, James V. Fitzgerald, Año Nuevo, Carmel Bay, Point Lobos, Julia Pfeiffer Burns, Laguna Point to Latigo Point, Irvine Coast
Department of Transportation (CalTrans)	Redwoods National Park, Saunders Reef,James V. Fitzgerald, Año Nuevo, Carmel Bay, Point Lobos, Julia Pfeiffer Burns, Salmon Creek Coast, Laguna Point to Latigo Point, Irvine Coast
Humboldt County	King Range
Humboldt Bay Harbor District	King Range
Irvine Company	Irvine Coast
Laguna Beach, City of	Heisler Park
Los Angeles County	Laguna Point to Latigo Point
Los Angeles County Flood Control District	Laguna Point to Latigo Point
Malibu, City of	Laguna Point to Latigo Point
Marin County	Duxbury Reef
Monterey, City of	Pacific Grove
Monterey, County of	Carmel Bay
Newport Beach, City of, and on behalf of the Pelican Point Homeowners	Robert E. Badham And Irvine Coast
Pacific Grove, City of	Pacific Grove
Pebble Beach Company, and on behalf of the Pebble Beach Stillwater Yacht Club	Carmel Bay
San Diego, City of	La Jolla
San Mateo County	James V. Fitzgerald
Santa Catalina Island Company, and on behalf of the Santa Catalina Island Conservancy	Northwest Santa Catalina Island And Western Santa Catalina Island
Sea Ranch Association	Del Mar Landing
Trinidad, City of	Trinidad Head
Trinidad Rancheria	Trinidad Head
U.S. Dept. of Interior, Point Reyes National Seashore	Point Reyes Headlands, Duxbury Reef
U.S. Dept. of Interior, Redwoods National and State Park	Redwoods National Park
U.S. Dept. of Defense, Air Force	James V. Fitzgerald
U.S. Dept. of Defense, Navy	San Nicolas Island & Begg Rock
U.S. Dept. of Defense, Navy	San Clemente Island

Attachment B - Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges

I. PROVISIONS FOR POINT SOURCE DISCHARGES OF STORM WATER AND NONPOINT SOURCE WASTE DISCHARGES

The following terms, prohibitions, and special conditions (hereafter collectively referred to as special conditions) are established as limitations on point source storm water and nonpoint source discharges. These special conditions provide Special Protections for marine aquatic life and natural water quality in Areas of Special Biological Significance (ASBS), as required for State Water Quality Protection Areas pursuant to California Public Resources Code Sections 36700(f) and 36710(f). These Special Protections are adopted by the State Water Board as part of the California Ocean Plan (Ocean Plan) General Exception.

The special conditions are organized by category of discharge. The State Water Resources Control Board (State Water Board) and Regional Water Quality Control Boards (Regional Water Boards) will determine categories and the means of regulation for those categories [e.g., Point Source Storm Water National Pollutant Discharge Elimination System (NPDES) or Nonpoint Source].

A. PERMITTED POINT SOURCE DISCHARGES OF STORM WATER

1. General Provisions for Permitted Point Source Discharges of Storm Water

   a. Existing storm water discharges into an ASBS are allowed only under the following conditions:

      (1) The discharges are authorized by an NPDES permit issued by the State Water Board or Regional Water Board;

      (2) The discharges comply with all of the applicable terms, prohibitions, and special conditions contained in these Special Protections; and

      (3) The discharges:

         (i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

         (ii) Are designed to prevent soil erosion;

         (iii) Occur only during wet weather;

         (iv) Are composed of only storm water runoff.

   b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

c. The discharge of trash is prohibited.

d. Only discharges from existing storm water outfalls are allowed. Any proposed or new storm water runoff discharge shall be routed to existing storm water discharge outfalls and shall not result in any new contribution of waste to an ASBS (i.e., no additional pollutant loading). "Existing storm water outfalls" are those that were constructed or under construction prior to January 1, 2005. "New contribution of waste" is defined as any addition of waste beyond what would have occurred as of January 1, 2005. A change to an existing storm water outfall, in terms of re-location or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges are prohibited except as provided below:

(1) The term "non-storm water discharges" means any waste discharges from a municipal separate storm sewer system (MS4) or other NPDES permitted storm drain system to an ASBS that are not composed entirely of storm water.

(2) (i) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability or occur naturally:

(a) Discharges associated with emergency fire fighting operations.

(b) Foundation and footing drains.

(c) Water from crawl space or basement pumps.

(d) Hillside dewatering.

(e) Naturally occurring groundwater seepage via a storm drain.

(f) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(ii) An NPDES permitting authority may authorize non-storm water discharges to an MS4 with a direct discharge to an ASBS only to the extent the NPDES permitting authority finds that the discharge does not alter natural ocean water quality in the ASBS.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

2. Compliance Plans for Inclusion in Storm Water Management Plans (SWMP) and Storm Water Pollution Prevention Plans (SWPPP).

The discharger shall specifically address the prohibition of non-storm water runoff and the requirement to maintain natural water quality for storm water discharges to an ASBS in an ASBS Compliance Plan to be included in its SWMP or a SWPPP, as appropriate to permit type. If a statewide permit includes a SWMP, then the discharger shall prepare a stand-alone

compliance plan for ASBS discharges. The ASBS Compliance Plan is subject to approval by the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (for permits issued by Regional Water Boards).

a. The Compliance Plan shall include a map of surface drainage of storm water runoff, showing areas of sheet runoff, prioritize discharges, and describe any structural Best Management Practices (BMPs) already employed and/or BMPs to be employed in the future. Priority discharges are those that pose the greatest water quality threat and which are identified to require installation of structural BMPs. The map shall also show the storm water conveyances in relation to other features such as service areas, sewage conveyances and treatment facilities, landslides, areas prone to erosion, and waste and hazardous material storage areas, if applicable. The SWMP or SWPPP shall also include a procedure for updating the map and plan when changes are made to the storm water conveyance facilities.

b. The ASBS Compliance Plan shall describe the measures by which all non-authorized non-storm water runoff (e.g., dry weather flows) has been eliminated, how these measures will be maintained over time, and how these measures are monitored and documented.

c. For Municipal Separate Storm Sewer System (MS4s), the ASBS Compliance Plan shall require minimum inspection frequencies as follows:

   (1) The minimum inspection frequency for construction sites shall be weekly during rainy season;

   (2) The minimum inspection frequency for industrial facilities shall be monthly during the rainy season;

   (3) The minimum inspection frequency for commercial facilities (e.g., restaurants) shall be twice during the rainy season; and

   (4) Storm water outfall drains equal to or greater than 18 inches (457 mm) in diameter or width shall be inspected once prior to the beginning of the rainy season and once during the rainy season and maintained to remove trash and other anthropogenic debris.

d. The ASBS Compliance Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff, that are necessary to comply with these special conditions, will be achieved through BMPs. Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that such installation would pose a threat to health or safety. BMPs to control storm water runoff discharges (at the end-of-pipe) during a design storm shall be designed to achieve on average the following target levels:

   (1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

(2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges.

The baseline for these determinations is the effective date of the Exception, except for those structural BMPs installed between January 1, 2005 and adoption of these Special Protections, and the reductions must be achieved and documented within six (6) years of the effective date.

e. The ASBS Compliance Plan shall address erosion control and the prevention of anthropogenic sedimentation in ASBS. The natural habitat conditions in the ASBS shall not be altered as a result of anthropogenic sedimentation.

f. The ASBS Compliance Plan shall describe the non-structural BMPs currently employed and planned in the future (including those for construction activities), and include an implementation schedule. The ASBS Compliance Plan shall include non-structural BMPs that address public education and outreach. Education and outreach efforts must adequately inform the public that direct discharges of pollutants from private property not entering an MS4 are prohibited. The ASBS Compliance Plan shall also describe the structural BMPs, including any low impact development (LID) measures, currently employed and planned for higher threat discharges and include an implementation schedule. To control storm water runoff discharges (at the end-of-pipe) during a design storm, permittees must first consider, and use where feasible, LID practices to infiltrate, use, or evapotranspirate storm water runoff on-site, if LID practices would be the most effective at reducing pollutants from entering the ASBS.

g. The BMPs and implementation schedule shall be designed to ensure that natural water quality conditions in the receiving water are achieved and maintained by either reducing flows from impervious surfaces or reducing pollutant loading, or some combination thereof.

h. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents in storm water runoff that alter natural ocean water quality and the sources of these constituents.

(2) The report shall describe BMPs that are currently being implemented, BMPs that are identified in the SWMP or SWPPP for future implementation, and any additional BMPs that may be added to the SWMP or SWPPP to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the BMPs.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits), the discharger shall revise its ASBS Compliance Plan to incorporate any new or modified BMPs that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised SWMP or SWPPP, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural ocean water quality conditions due to the same constituent.

(5) The requirements of this section are in addition to the terms, prohibitions, and conditions contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within eighteen (18) months from the effective date of the Exception, the discharger shall submit a draft written ASBS Compliance Plan to the State Water Board Executive Director (statewide permits) or Regional Water Board Executive Officer (Regional Water Board permits) that describes its strategy to comply with these special conditions, including the requirement to maintain natural water quality in the affected ASBS. The ASBS Compliance Plan shall include a description of appropriate non-structural controls and a time schedule to implement structural controls (implementation schedule) to comply with these special conditions for inclusion in the discharger's SWMP or SWPPP, as appropriate to permit type. The final ASBS Compliance Plan, including a description and final schedule for structural controls based on the results of runoff and receiving water monitoring, must be submitted within thirty (30) months from the effective date of the Exception.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these special conditions shall be implemented.

d. Within six (6) years of the effective date of the Exception, any structural controls identified in the ASBS Compliance Plan that are necessary to comply with these special conditions shall be operational.

e. Within six (6) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water, pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data, and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe

the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. for municipalities, a demonstration of significant hardship to discharger ratepayers, by showing the relationship of storm water fees to annual household income for residents within the discharger's jurisdictional area, and the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or

2. for other governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

B. NONPOINT SOURCE DISCHARGES

1. General Provisions for Nonpoint Sources

   a. Existing nonpoint source waste discharges are allowed into an ASBS only under the following conditions:

      (1) The discharges are authorized under waste discharge requirements, a conditional waiver of waste discharge requirements, or a conditional prohibition issued by the State Water Board or a Regional Water Board.

      (2) The discharges are in compliance with the applicable terms, prohibitions, and special conditions contained in these Special Protections.

      (3) The discharges:

         (i) Are essential for flood control or slope stability, including roof, landscape, road, and parking lot drainage;

         (ii) Are designed to prevent soil erosion;

         (iii) Occur only during wet weather;

         (iv) Are composed of only storm water runoff.

   b. Discharges composed of storm water runoff shall not alter natural ocean water quality in an ASBS.

c. The discharge of trash is prohibited.

d. Only existing nonpoint source waste discharges are allowed. "Existing nonpoint source waste discharges" are discharges that were ongoing prior to January 1, 2005. "New nonpoint source discharges" are defined as those that commenced on or after January 1, 2005. A change to an existing nonpoint source discharge, in terms of relocation or alteration, in order to comply with these special conditions, is allowed and does not constitute a new discharge.

e. Non-storm water discharges from nonpoint sources (those not subject to an NPDES Permit) are prohibited except as provided below:

(1) The term "non-storm water discharges" means any waste discharges that are not composed entirely of storm water.

(2) The following non-storm water discharges are allowed, provided that the discharges are essential for emergency response purposes, structural stability, slope stability, or occur naturally:

(i) Discharges associated with emergency fire fighting operations.

(ii) Foundation and footing drains.

(iii) Water from crawl space or basement pumps.

(iv) Hillside dewatering.

(v) Naturally occurring groundwater seepage via a storm drain.

(vi) Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(3) Authorized non-storm water discharges shall not cause or contribute to a violation of the water quality objectives in Chapter II of the Ocean Plan nor alter natural ocean water quality in an ASBS.

f. At the San Clemente Island ASBS, discharges incidental to military training and research, development, test, and evaluation operations are allowed. Discharges incidental to underwater demolition and other in-water explosions are not allowed in the two military closure areas in the vicinity of Wilson Cove and Castle Rock. Discharges must not result in a violation of the water quality objectives, including the protection of the marine aquatic life beneficial use, anywhere in the ASBS.

g. At the San Nicolas Island and Begg Rock ASBS, discharges incidental to military research, development, testing, and evaluation of, and training with, guided missile and other weapons systems, fleet training exercises, small-scale amphibious warfare training, and special warfare training are allowed. Discharges incidental to underwater demolition and other in-water explosions are not allowed. Discharges must not result in a violation of the water quality objectives, including the protection of the marine aquatic life beneficial use, anywhere in the ASBS.

h. All other nonpoint source discharges not specifically authorized above are prohibited.

2. Planning and Reporting

a. The nonpoint source discharger shall develop an ASBS Pollution Prevention ~~P~~lan, including an implementation schedule, to address storm water runoff and any other nonpoint source discharges from its facilities. The ASBS Pollution Prevention Plan must be equivalent in contents to an ASBS Compliance Plan as described in I (A)(2) in this document. The ASBS Pollution Prevention Plan is subject to approval by the Executive Director of the State Water Board (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements).

b. The ASBS Pollution Prevention Plan shall address storm water discharges (wet weather flows) and, in particular, describe how pollutant reductions in storm water runoff that are necessary to comply with these special conditions, will be achieved through Management Measures and associated Management Practices (Management Measures/Practices). Structural BMPs need not be installed if the discharger can document to the satisfaction of the State Water Board Executive Director or Regional Water Board Executive Officer that such installation would pose a threat to health or safety. Management Measures to control storm water runoff during a design storm shall achieve on average the following target levels:

(1) Table B Instantaneous Maximum Water Quality Objectives in Chapter II of the Ocean Plan; or

(2) A 90% reduction in pollutant loading during storm events, for the applicant's total discharges.

The baseline for these determinations is the effective date of the Exception, except for those structural BMPs installed between January 1, 2005 and adoption of these Special Protections, and the reductions must be achieved and documented within six (6) years of the effective date.

c. If the results of the receiving water monitoring described in IV.B. of these special conditions indicate that the storm water runoff or other nonpoint source pollution is causing or contributing to an alteration of natural ocean water quality in the ASBS, the discharger shall submit a report to the State Water Board and the Regional Water Board within 30 days of receiving the results.

(1) The report shall identify the constituents that alter natural water quality and the sources of these constituents.

(2) The report shall describe Management Measures/Practices that are currently being implemented, Management Measures/Practices that are identified in the ASBS Pollution Prevention Plan for future implementation, and any additional Management Measures/Practices that may be added to the Pollution Prevention Plan to address the alteration of natural water quality. The report shall include a new or modified implementation schedule for the Management Measures/Practices.

(3) Within 30 days of the approval of the report by the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements), the discharger shall revise its ASBS Pollution Prevention Plan to incorporate any new or modified Management Measures/Practices that have been or will be implemented, the implementation schedule, and any additional monitoring required.

(4) As long as the discharger has complied with the procedures described above and is implementing the revised ASBS Pollution Prevention Plan, the discharger does not have to repeat the same procedure for continuing or recurring exceedances of natural water quality conditions due to the same constituent.

(5) The requirements of this section are in addition to the terms, prohibitions, and conditions contained in these Special Protections.

3. Compliance Schedule

a. On the effective date of the Exception, all non-authorized non-storm water discharges (e.g., dry weather flow) are effectively prohibited.

b. Within eighteen (18) months from the effective date of the Exception, the discharger~~s~~ shall submit a draft written ASBS Pollution Prevention Plan to the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) that describes its strategy to comply with these special conditions, including the requirement to maintain natural ocean water quality in the affected ASBS. The Pollution Prevention Plan shall include a description of appropriate non-structural controls and a time schedule to implement structural controls to comply with these special conditions for inclusion in the discharger's Pollution Prevention Plan. The final ASBS Pollution Prevention Plan, including a description and final schedule for structural controls based on the results of runoff and receiving water monitoring, must be submitted within thirty (30) months from the effective date of the Exception.

c. Within 18 months of the effective date of the Exception, any non-structural controls that are necessary to comply with these Special Protections shall be implemented.

d. Within six (6) years of the effective date of the Exception, any structural controls identified in the ASBS Pollution Prevention Plan that are necessary to comply with these special conditions shall be operational.

e. Within six (6) years of the effective date of the Exception, all dischargers must comply with the requirement that their discharges into the affected ASBS maintain natural ocean water quality. If the initial results of post-storm receiving water quality testing indicate levels higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, then the discharger must re-sample the receiving water pre- and post-storm. If after re-sampling the post-storm levels are still higher than the 85th percentile threshold of reference water quality data and the pre-storm receiving water levels, for any constituent, then natural ocean water quality is exceeded. See attached Flowchart.

f. The Executive Director of the State Water Board (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) may only authorize additional time to comply with the special conditions d. and e., above if good cause exists to do so. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in d. or e. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality.

The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. a demonstration that the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate; or

2. for governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

II. ADDITIONAL REQUIREMENTS FOR PARKS AND RECREATION FACILITIES

In addition to the provisions in Section I (A) or I (B), respectively, a discharger with parks and recreation facilities shall comply with the following:

A. The discharger shall include a section in an ASBS Compliance Plan (for NPDES dischargers) or an ASBS Pollution Prevention Plan (for nonpoint source dischargers) to address storm water runoff from parks and recreation facilities.

1. The plan shall identify all pollutant sources, including sediment sources, which may result in waste entering storm water runoff. Pollutant sources include, but are not limited to, roadside rest areas and vistas, picnic areas, campgrounds, trash receptacles, maintenance facilities, park personnel housing, portable toilets, leach fields, fuel tanks, roads, piers, and boat launch facilities.

2. The plan shall describe BMPs or Management Measures/Practices that will be implemented to control soil erosion (both temporary and permanent erosion controls) and reduce or eliminate pollutants in storm water runoff in order to achieve and maintain natural water quality conditions in the affected ASBS. The plan shall include BMPs or

Management Measures/Practices to ensure that trails and culverts are maintained to prevent erosion and minimize waste discharges to ASBS.

3. The plan shall include BMPs or Management Measures/Practices to prevent the discharge of pesticides or other chemicals, including agricultural chemicals, in storm water runoff to the affected ASBS.

4. The plan shall include BMPs or Management Measures/Practices that address public education and outreach. The goal of these BMPs or Management Measures/Practices is to ensure that the public is adequately informed that waste discharges to the affected ASBS are prohibited or limited by special conditions in these Special Protections. The BMPs or Management Measures/Practices shall include signage at camping, picnicking, beach and roadside parking areas, and visitor centers, or other appropriate measures, which notify the public of any applicable requirements of these Special Protections and identify the ASBS boundaries.

5. The plan shall include BMPs or Management Measures/Practices that address the prohibition against the discharge of trash to ASBS. The BMPs or Management Measures/Practices shall include measures to ensure that adequate trash receptacles are available for public use at visitor facilities, including parking areas, and that the receptacles are adequately maintained to prevent trash discharges into the ASBS. Appropriate measures include covering trash receptacles to prevent trash from being wind blown and periodically emptying the receptacles to prevent overflows.

6. The plan shall include BMPs or Management Measures/Practices to address runoff from parking areas and other developed features to ensure that the runoff does not alter natural water quality in the affected ASBS. BMPs or Management Measures/Practices shall include measures to reduce pollutant loading in runoff to the ASBS through installation of natural area buffers (LID), treatment, or other appropriate measures.

B. Maintenance and repair of park and recreation facilities must not result in waste discharges to the ASBS. The practice of road oiling must be minimized or eliminated, and must not result in waste discharges to the ASBS.

III. ADDITIONAL REQUIREMENTS – WATERFRONT AND MARINE OPERATIONS

In addition to the provisions in Section I (A) or I (B), respectively, a discharger with waterfront and marine operations shall comply with the following:

A. For discharges related to waterfront and marine operations, the discharger shall develop a Waterfront and Marine Operations Management Plan (Waterfront Plan). This plan shall contain appropriate Management Measures/Practices to address nonpoint source pollutant discharges to the affected ASBS.

1. The Waterfront Plan shall contain appropriate Management Measures/Practices for any waste discharges associated with the operation and maintenance of vessels, moorings, piers, launch ramps, and cleaning stations in order to ensure that beneficial uses are protected and natural water quality is maintained in the affected ASBS.

2. For discharges from marinas and recreational boating activities, the Waterfront Plan shall include appropriate Management Measures, described in The Plan for California's Nonpoint Source Pollution Control Program, for marinas and recreational boating, or equivalent practices, to ensure that nonpoint source pollutant discharges do not alter natural water quality in the affected ASBS.

3. The Waterfront Plan shall include Management Practices to address public education and outreach to ensure that the public is adequately informed that waste discharges to the affected ASBS are prohibited or limited by special conditions in these Special Protections. The management practices shall include appropriate signage, or similar measures, to inform the public of the ASBS restrictions and to identify the ASBS boundaries.

4. The Waterfront Plan shall include Management Practices to address the prohibition against trash discharges to ASBS. The Management Practices shall include the provision of adequate trash receptacles for marine recreation areas, including parking areas, launch ramps, and docks. The plan shall also include appropriate Management Practices to ensure that the receptacles are adequately maintained and secured in order to prevent trash discharges into the ASBS. Appropriate Management Practices include covering the trash receptacles to prevent trash from being windblown, staking or securing the trash receptacles so they don't tip over, and periodically emptying the receptacles to prevent overflow.

5. The discharger shall submit its Waterfront Plan to the by the State Water Board Executive Director (statewide waivers or waste discharge requirements) or Executive Officer of the Regional Water Board (Regional Water Board waivers or waste discharge requirements) within six months of the effective date of these special conditions. The Waterfront Plan is subject to approval by the State Water Board Executive Director or the Regional Water Board Executive Officer, as appropriate. The plan must be fully implemented within 18 months of the effective date of the Exception.

B. The discharge of chlorine, soaps, petroleum, other chemical contaminants, trash, fish offal, or human sewage to ASBS is prohibited. Sinks and fish cleaning stations are point source discharges of wastes and are prohibited from discharging into ASBS. Anthropogenic accumulations of discarded fouling organisms on the sea floor must be minimized.

C. Limited-term activities, such as the repair, renovation, or maintenance of waterfront facilities, including, but not limited to, piers, docks, moorings, and breakwaters, are authorized only in accordance with Chapter III.E.2 of the Ocean Plan.

D. If the discharger anticipates that the discharger will fail to fully implement the approved Waterfront Plan within the 18 month deadline, the discharger shall submit a technical report as soon as practicable to the State Water Board Executive Director or the Regional Water Board Executive Officer, as appropriate. The technical report shall contain reasons for failing to meet the deadline and propose a revised schedule to fully implement the plan.

E. The State Water Board or the Regional Water Board may, for good cause, authorize additional time to comply with the Waterfront Plan. Good cause means a physical impossibility or lack of funding.

If a discharger claims physical impossibility, it shall notify the Board in writing within thirty (30) days of the date that the discharger first knew of the event or circumstance that caused or would cause it to fail to meet the deadline in Section III.A.5. The notice shall describe the reason for the noncompliance or anticipated noncompliance and specifically refer to this Section of this Exception. It shall describe the anticipated length of time the delay in compliance may persist, the cause or causes of the delay as well as measures to minimize the impact of the delay on water quality, the measures taken or to be taken by the discharger to prevent or minimize the delay, the schedule by which the measures will be implemented, and the anticipated date of compliance. The discharger shall adopt all reasonable measures to avoid and minimize such delays and their impact on water quality. The discharger may request an extension of time for compliance based on lack of funding. The request for an extension shall require:

1. a demonstration of significant hardship by showing that the discharger has made timely and complete applications for all available bond and grant funding, and either no bond or grant funding is available, or bond and/or grant funding is inadequate.

2. for governmental agencies, a demonstration and documentation of a good faith effort to acquire funding through that agency's budgetary process, and a demonstration that funding was unavailable or inadequate.

IV. MONITORING REQUIREMENTS

Monitoring is mandatory for all dischargers to assure compliance with the Ocean Plan. Monitoring requirements include both: (A) core discharge monitoring, and (B) ocean receiving water monitoring. The State and Regional Water Boards must approve sampling site locations and any adjustments to the monitoring programs. All ocean receiving water and reference area monitoring must be comparable with the Water Boards' Surface Water Ambient Monitoring Program (SWAMP).

Safety concerns: Sample locations and sampling periods must be determined considering safety issues. Sampling may be postponed upon notification to the State and Regional Water Boards if hazardous conditions prevail.

Analytical Chemistry Methods: All constituents must be analyzed using the lowest minimum detection limits comparable to the Ocean Plan water quality objectives. For metal analysis, all samples, including storm water effluent, reference samples, and ocean receiving water samples, must be analyzed by the approved analytical method with the lowest minimum detection limits (currently Inductively Coupled Plasma/Mass Spectrometry) described in the Ocean Plan.

A. CORE DISCHARGE MONITORING PROGRAM

1. General sampling requirements for timing and storm size:

   Runoff must be collected during a storm event that is greater than 0.1 inch and generates runoff, and at least 72 hours from the previously measurable storm event. Runoff samples shall be collected during the same storm and at approximately the same time when post-

storm receiving water is sampled, and analyzed for the same constituents as receiving water and reference site samples (see section IV B) as described below.

2. Runoff flow measurements

   a. For municipal/industrial storm water outfalls in existence as of December 31, 2007, 18 inches (457mm) or greater in diameter/width (including multiple outfall pipes in combination having a width of 18 inches, runoff flows must be measured or calculated, using a method acceptable to and approved by the State and Regional Water Boards.

   b. This will be reported annually for each precipitation season to the State and Regional Water Boards.

3. Runoff samples – storm events

   a. For outfalls equal to or greater than 18 inches (0.46m) in diameter or width:

      (1) samples of storm water runoff shall be collected during the same storm as receiving water samples and analyzed for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

      (2) samples of storm water runoff shall be collected and analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

      (3) If an applicant has no outfall greater than 36 inches, then storm water runoff from the applicant's largest outfall shall be further collected during the same storm as receiving water samples and analyzed for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates).

   b. For outfalls equal to or greater than 36 inches (0.91m) in diameter or width:

      (1) samples of storm water runoff shall be collected during the same storm as receiving water samples and analyzed for oil and grease, total suspended solids, and, within the range of the southern sea otter indicator bacteria or some other measure of fecal contamination; and

      (2) samples of storm water runoff shall be further collected during the same storm as receiving water samples and analyzed for Ocean Plan Table B metals for protection of marine life, Ocean Plan polynuclear aromatic hydrocarbons (PAHs), current use pesticides (pyrethroids and OP pesticides), and nutrients (ammonia, nitrate and phosphates); and

      (3) samples of storm water runoff shall be collected and analyzed for critical life stage chronic toxicity (one invertebrate or algal species) at least once during each storm season when receiving water is sampled in the ASBS.

c. For an applicant not participating in a regional monitoring program [see below in Section IV (B)] in addition to (a.) and (b.) above, a minimum of the two largest outfalls or 20 percent of the larger outfalls, whichever is greater, shall be sampled (flow weighted composite samples) at least three times annually during wet weather (storm event) and analyzed for all Ocean Plan Table A constituents, Table B constituents for marine aquatic life protection (except for toxicity, only chronic toxicity for three species shall be required), DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, and Ocean Plan indicator bacteria. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one (the largest) such discharge shall be sampled annually in each Region.

4. The Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may reduce or suspend core monitoring once the storm runoff is fully characterized. This determination may be made at any point after the discharge is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

B. Ocean Receiving Water and Reference Area Monitoring Program

In addition to performing the Core Discharge Monitoring Program in Section II.A above, all applicants having authorized discharges must perform ocean receiving water monitoring. In order to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS, dischargers may choose either (1) an individual monitoring program, or (2) participation in a regional integrated monitoring program.

1. Individual Monitoring Program: The requirements listed below are for those dischargers who elect to perform an individual monitoring program to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within the affected ASBS. In addition to Core Discharge Monitoring, the following additional monitoring requirements shall be met:

   a. Three times annually, during wet weather (storm events), the receiving water at the point of discharge from the outfalls described in section (IV)(A)(3)(c) above shall be sampled and analyzed for Ocean Plan Table A constituents, Table B constituents for marine aquatic life, DDT, PCBs, Ocean Plan PAHs, OP pesticides, pyrethroids, nitrates, phosphates, salinity, chronic toxicity (three species), and Ocean Plan indicator bacteria.

      The sample location for the ocean receiving water shall be in the surf zone at the point of discharges; this must be at the same location where storm water runoff is sampled. Receiving water shall be sampled prior to (pre-storm) and during (or immediately after) the same storm (post storm). Post storm sampling shall be during the same storm and at approximately the same time as when the runoff is sampled. Reference water quality shall also be sampled three times annually and analyzed for the same constituents pre-storm and post-storm, during the same storm seasons when receiving water is sampled. Reference stations will be determined by the State Water Board's Division of Water Quality and the applicable Regional Water Board(s).

   b. Sediment sampling shall occur at least three times during every five (5) year period. The subtidal sediment (sand or finer, if present) at the discharge shall be sampled and analyzed for Ocean Plan Table B constituents for marine aquatic life, DDT, PCBs, PAHs,

pyrethroids, and OP pesticides. For sediment toxicity testing, only an acute toxicity test using the amphipod *Eohaustorius estuarius* must be performed.

c. A quantitative survey of intertidal benthic marine life shall be performed at the discharge and at a reference site. The survey shall be performed at least once every five (5) year period. The survey design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The results of the survey shall be completed and submitted to the State Water Board and Regional Water Board at least six months prior to the end of the permit cycle.

d. Once during each five (5) year period, a bioaccumulation study shall be conducted to determine the concentrations of metals and synthetic organic pollutants at representative discharge sites and at representative reference sites. The study design is subject to approval by the Regional Water Board and the State Water Board's Division of Water Quality. The bioaccumulation study may include California mussels (*Mytilus californianus*) and/or sand crabs (*Emerita analoga* or *Blepharipoda occidentalis*). Based on the study results, the Regional Water Board and the State Water Board's Division of Water Quality, may adjust the study design in subsequent permits, or add or modify additional test organisms (such as shore crabs or fish), or modify the study design appropriate for the area and best available sensitive measures of contaminant exposure.

e. Marine Debris: Representative quantitative observations for trash by type and source shall be performed along the coast of the ASBS within the influence of the discharger's outfalls. The design, including locations and frequency, of the marine debris observations is subject to approval by the Regional Water Board and State Water Board's Division of Water Quality.

f. The monitoring requirements of the Individual Monitoring Program in this section are minimum requirements. After a minimum of one (1) year of continuous water quality monitoring of the discharges and ocean receiving waters, the Executive Director of the State Water Board (statewide permits) or Executive Officer of the Regional Water Board (Regional Water Board permits) may require additional monitoring, or adjust, reduce or suspend receiving water and reference station monitoring. This determination may be made at any point after the discharge and receiving water is fully characterized, but is best made after the monitoring results from the first permit cycle are assessed.

2. Regional Integrated Monitoring Program: Dischargers may elect to participate in a regional integrated monitoring program, in lieu of an individual monitoring program, to fulfill the requirements for monitoring the physical, chemical, and biological characteristics of the ocean receiving waters within their ASBS. This regional approach shall characterize natural water quality, pre- and post-storm, in ocean reference areas near the mouths of identified open space watersheds and the effects of the discharges on natural water quality (physical, chemical, and toxicity) in the ASBS receiving waters, and should include benthic marine aquatic life and bioaccumulation components. The design of the ASBS stratum of a regional integrated monitoring program may deviate from the otherwise prescribed individual monitoring approach (in Section IV.B.1) if approved by the State Water Board's Division of Water Quality and the Regional Water Boards.

   a. Ocean reference areas shall be located at the drainages of flowing watersheds with minimal development (in no instance more than 10% development), and shall not be located in CWA Section 303(d) listed waterbodies or have tributaries that are 303(d)

listed. Reference areas shall be free of wastewater discharges and anthropogenic non-storm water runoff. A minimum of low threat storm runoff discharges (e.g. stream highway overpasses and campgrounds) may be allowed on a case-by-case basis. Reference areas shall be located in the same region as the ASBS receiving water monitoring occurs. The reference areas for each Region are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean reference water samples must be collected from each station, each from a separate storm during the same storm season that receiving water is sampled. A minimum of one reference location shall be sampled for each ASBS receiving water site sampled per responsible party. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

b. ASBS ocean receiving water must be sampled in the surf zone at the location where the runoff makes contact with ocean water (i.e. at "point zero"). Ocean receiving water stations must be representative of worst-case discharge conditions (i.e. co-located at a large drain greater than 36 inches, or if drains greater than 36 inches are not present in the ASBS then the largest drain greater than18 inches.) Ocean receiving water stations are subject to approval by the participants in the regional monitoring program and the State Water Board's Division of Water Quality and the applicable Regional Water Board(s). A minimum of three ocean receiving water samples must be collected during each storm season from each station, each from a separate storm. A minimum of one receiving water location shall be sampled in each ASBS per responsible party in that ASBS. For parties discharging to ASBS in more than one Regional Water Board region, at a minimum, one reference station and one receiving water station shall be sampled in each region.

c. Reference and receiving water sampling shall commence during the first full storm season following the adoption of these special conditions, and post-storm samples shall be collected during the same storm event when storm water runoff is sampled. Sampling shall occur in a minimum of two storm seasons. For those ASBS dischargers that have already participated in the Southern California Bight 2008 ASBS regional monitoring effort, sampling may be limited to only one storm season.

d. Receiving water and reference samples shall be analyzed for the same constituents as storm water runoff samples. At a minimum, constituents to be sampled and analyzed in reference and discharge receiving waters must include oil and grease, total suspended solids, Ocean Plan Table B metals for protection of marine life, Ocean Plan PAHs, pyrethroids, OP pesticides, ammonia, nitrate, phosphates, and critical life stage chronic toxicity for three species. In addition, within the range of the southern sea otter, indicator bacteria or some other measure of fecal contamination shall be analyzed.

3. Waterfront and Marine Operations: In addition to the above requirements for ocean receiving water monitoring, additional monitoring must be performed for marinas and boat launch and pier facilities:

   a. For all marina or mooring field operators, in mooring fields with 10 or more occupied moorings, the ocean receiving water must be sampled for Ocean Plan indicator bacteria, residual chlorine, copper, zinc, grease and oil, methylene blue active substances (MBAS), and ammonia nitrogen.

(1) For mooring field operators opting for an individual monitoring program (Section IV.B.1 above), this sampling must occur weekly (on the weekend) from May through October.

(2) For mooring field operators opting to participate in a regional integrated monitoring program (Section IV.B.2 above), this sampling must occur monthly from May through October on a high use weekend in each month. The Water Boards may allow a reduction in the frequency of sampling, through the regional monitoring program, after the first year of monitoring.

b. For all mooring field operators, the subtidal sediment (sand or finer, if present) within mooring fields and below piers shall be sampled and analyzed for Ocean Plan Table B metals (for marine aquatic life beneficial use), acute toxicity, PAHs, and tributyltin. For sediment toxicity testing, only an acute toxicity test using the amphipod *Eohaustorius estuarius* must be performed. This sampling shall occur at least three times during a five (5) year period. For mooring field operators opting to participate in a regional integrated monitoring program, the Water Boards may allow a reduction in the frequency of sampling after the first sampling effort's results are assessed.

Glossary

At the point of discharge(s) – Means in the surf zone immediately where runoff from an outfall meets the ocean water (a.k.a., at point zero).

Areas of Special Biological Significance (ASBS) – Those areas designated by the State Water Board as ocean areas requiring protection of species or biological communities to the extent that alteration of natural water quality is undesirable. All Areas of Special Biological Significance are also classified as a subset of State Water Quality Protection Areas.

Design storm – For purposes of these Special Protections, a design storm is defined as the volume of runoff produced from one inch of precipitation per day or, if this definition is inconsistent with the discharger's applicable storm water permit, then the design storm shall be the definition included in the discharger's applicable storm water permit.

Development – Relevant to reference monitoring sites, means urban, industrial, agricultural, grazing, mining, and timber harvesting land uses.

Higher threat discharges - Permitted storm drains discharging equal to or greater than 18 inches, industrial storm drains, agricultural runoff discharged through an MS4, discharges associated with waterfront and marina operations (e.g., piers, launch ramps, mooring fields, and associated vessel support activities, except for passive discharges defined below), and direct discharges associated with commercial or industrial activities to ASBS.

Low Impact Development (LID) – A sustainable practice that benefits water supply and contributes to water quality protection. Unlike traditional storm water management, which entails collecting and conveying storm water runoff through storm drains, pipes, or other conveyances to a centralized storm water facility, LID focuses on using site design and storm water management to maintain the site's pre-development runoff rates and volumes. The goal of LID is to mimic a site's predevelopment hydrology by using design techniques that infiltrate, filter, store, evaporate, and detain runoff close to the source of rainfall.

Marine Operations – Marinas or mooring fields that contain slips or mooring locations for 10 or more vessels.

Management Measure (MM) - Economically achievable measures for the control of the addition of pollutants from various classes of nonpoint sources of pollution, which reflect the greatest degree of pollutant reduction achievable through the application of the best available nonpoint pollution control practices, technologies, processes, siting criteria, operating methods, or other alternatives. For example, in the "marinas and recreational boating" land-use category specified in the Plan for California's Nonpoint Source Pollution Control Program (NPS Program Plan) (SWRCB, 1999), "boat cleaning and maintenance" is considered a MM or the source of a specific class or type of NPS pollution.

Management Practice (MP) - The practices (e.g., structural, non-structural, operational, or other alternatives) that can be used either individually or in combination to address a specific MM class or classes of NPS pollution. For example, for the "boat cleaning and maintenance" MM, specific MPs can include, but are not limited to, methods for the selection of environmentally sensitive hull paints or methods for cleaning/removal of hull copper anti-fouling paints.

Municipal Separate Storm Sewer System (MS4) – A municipally-owned storm sewer system regulated under the Phase I or Phase II storm water program implemented in compliance with Clean Water Act section 402(p). Note that an MS4 program's boundaries are not necessarily congruent with the permittee's political boundaries.

Natural Ocean Water Quality - The water quality (based on selected physical, chemical and biological characteristics) that is required to sustain marine ecosystems, and which is without apparent human influence, *i.e.*, an absence of significant amounts of: (a) man-made constituents (*e.g.,* DDT); (b) other chemical (*e.g.,* trace metals), physical (temperature/thermal pollution, sediment burial), and biological (*e.g.*, bacteria) constituents at concentrations that have been elevated due to man's activities above those resulting from the naturally occurring processes that affect the area in question; and (c) non-indigenous biota (*e.g.,* invasive algal bloom species) that have been introduced either deliberately or accidentally by man. Discharges "*shall not alter natural ocean water quality*" as determined by a comparison to the range of constituent concentrations in reference areas agreed upon via the regional monitoring program(s). If monitoring information indicates that *natural ocean water quality* is not maintained, but there is sufficient evidence that a discharge is not contributing to the alteration of natural water quality, then the Regional Water Board may make that determination. In this case, sufficient information must include runoff sample data that has equal or lower concentrations for the range of constituents at the applicable reference area(s).

Nonpoint source – Nonpoint pollution sources generally are sources that do not meet the definition of a point source. Nonpoint source pollution typically results from land runoff, precipitation, atmospheric deposition, agricultural drainage, marine/boating operations or hydrologic modification. Nonpoint sources, for purposes of these Special Protections, include discharges that are not required to be regulated under an NPDES permit.

Non-storm water discharge – Any runoff that is not the result of a precipitation event. This is often referred to as "dry weather flow."

Non-structural control – A Best Management Practice that involves operational, maintenance, regulatory (e.g., ordinances) or educational activities designed to reduce or eliminate pollutants in runoff, and that are not structural controls (i.e. there are no physical structures involved).

Physical impossibility - Means any act of God, war, fire, earthquake, windstorm, flood or natural catastrophe; unexpected and unintended accidents not caused by discharger or its employees' negligence; civil disturbance, vandalism, sabotage or terrorism; restrain by court order or public authority or agency; or action or non-action by, or inability to obtain the necessary authorizations or approvals from any governmental agency other than the permittee.

Representative sites and monitoring procedures – Are to be proposed by the discharger, with appropriate rationale, and subject to approval by Water Board staff.

Sheet-flow – Runoff that flows across land surfaces at a shallow depth relative to the cross-sectional width of the flow. These types of flow may or may not enter a storm drain system before discharge to receiving waters.

Storm Season – Also referred to as rainy season, means the months of the year from the onset of rainfall during autumn until the cessation of rainfall in the spring.

Structural control – A Best Management Practice that involves the installation of engineering solutions to the physical treatment or infiltration of runoff.

Surf Zone - The surf zone is defined as the submerged area between the breaking waves and the shoreline at any one time.

Surface Water Ambient Monitoring Program (SWAMP) comparable – Means that the monitoring program must 1) meet or exceed 2008 SWAMP Quality Assurance Program Management Plan (QAPP) Measurement Quality Objectives, or 2) have a Quality Assurance Project Plan that has been approved by SWAMP; in addition data must be formatted to match the database requirements of the SWAMP Information Management System. Adherence to the measurement quality objectives in the Southern California Bight 2008 ASBS Regional Monitoring Program QAPP and data base management comprises being SWAMP comparable.

Waterfront Operations - Piers, launch ramps, and cleaning stations in the water or on the adjacent shoreline.

Attachment 1
Special Protections Sections I(A)(3)(e) and I(B)(3)(e)
Flowchart to Deteremine Compliance with natural Water Quality

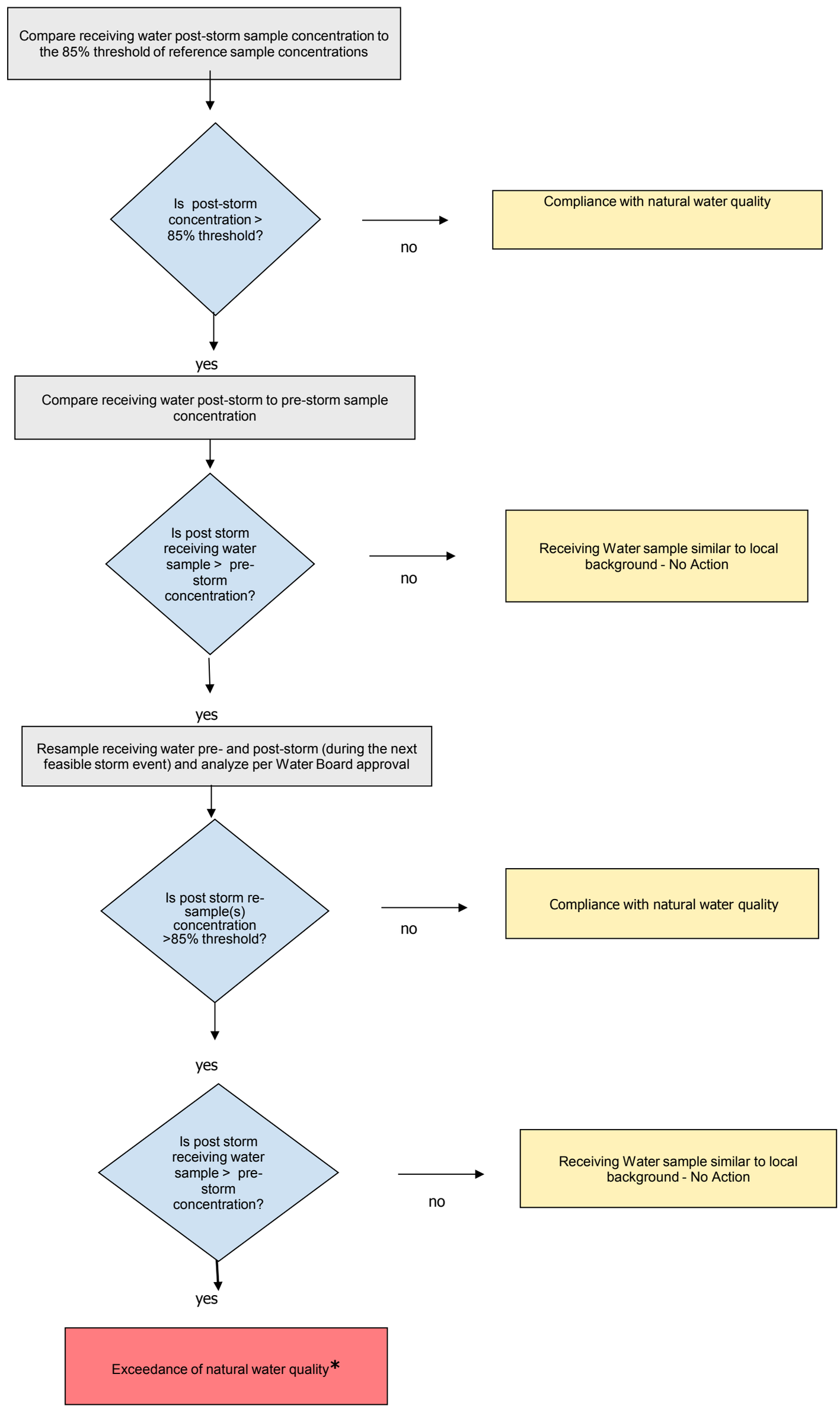

*** When an exceedance of natural water quality occurs, the discharger must comply with section I.A.2.h (for permitted storm water) or section I.B.2.c (for nonpoint sources). Note, when sampling data is available, end-of-pipe effluent concentrations will be considered by the Water Boards in making this determination.**

WATER QUALITY CONTROL PLAN

OCEAN WATERS OF CALIFORNIA

2012

STATE WATER RESOURCES CONTROL BOARD

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

CALIFORNIA
Water Boards
STATE WATER RESOURCES CONTROL BOARD
REGIONAL WATER QUALITY CONTROL BOARDS

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STATE WATER RESOURCES CONTROL BOARD

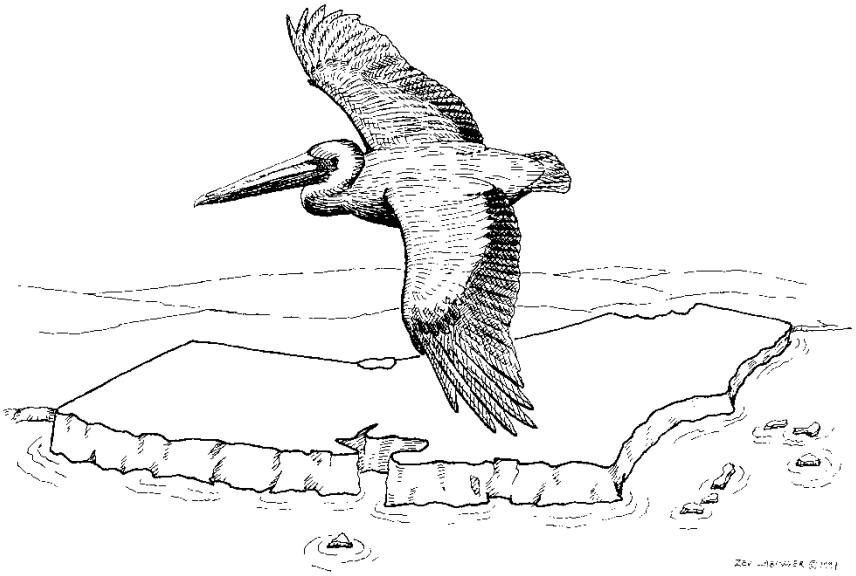

2012

CALIFORNIA OCEAN PLAN

WATER QUALITY CONTROL PLAN

OCEAN WATERS OF CALIFORNIA

Effective August 19, 2013

Adopted October 16, 2012

Approved by the Office of Administrative Law on July 03, 2013

STATE WATER RESOURCES CONTROL BOARD
RESOLUTION NO. 2012-0056

ADOPTING THE CALIFORNIA OCEAN PLAN AMENDMENT IMPLEMENTING STATE WATER BOARD RESOLUTIONS 2010-0057 AND 2011-0013 REGARDING STATE WATER QUALITY PROTECTION AREAS AND MARINE PROTECTED AREAS

WHEREAS:

1. The State Water Resources Control Board (State Water Board) adopted the California Ocean Plan (Ocean Plan) in 1972 and revised it in 1978, 1983, 1988, 1990, 1997, 2001, 2005 and 2009.

2. The State Water Board is responsible for reviewing Ocean Plan water quality standards and for modifying and adopting standards in accordance with Section 303 (c)(1) of the federal Clean Water Act and section 13170.2(b) of the California Water Code.

3. On November 16, 2010, the State Water Board adopted Resolution No. 2010–0057, Marine Protected Areas and State Water Quality Protection Areas. The Resolution directed State Water Board staff to propose amendments to the Ocean Plan to address designation of new State Water Quality Protection Areas and to clarify requirements for existing discharges relative to Marine Protected Areas.

4. On March 15, 2011, the State Water Board adopted the Triennial Review Workplan 2011-2013, in Resolution No. 2011-0013, which included under Issue 1 direction to staff to propose an amendment to the Ocean Plan addressing State Water Quality Protection Areas and Marine Protected Areas.

5. On July 8, 2011, the State Water Board held a scoping meeting regarding potential Ocean Plan Amendments to solicit input from public agencies and members of the public on the scope and content of the substitute environmental documentation to be prepared in support of the amendment.

6. On May 1, 2012, the State Water Board conducted a public hearing. Twenty- four written public comments were received and reviewed. Staff considered comments and input from Board Members and the public and drafted revisions to the proposed amendments and draft SED, which were circulated on February 28, 2012.

7. On August 22, 2012, the State Water Board conducted a public workshop to consider changes proposed by staff in response to comments received. A written comment period from July 31, 2012 through August 31, 2012, allowed for submission of comments on the changes from the earlier draft documents.

8. The Ocean Plan is clear that there shall not be degradation of marine communities or other exceedances of water quality objectives due to waste discharges. This is true for all near coastal ocean waters, regardless of whether a Marine Protected Area is present. If sound scientific information becomes available demonstrating that discharges are causing or contributing to the degradation of marine communities, or causing or contributing to the exceedance of narrative or numeric water quality objectives, then new or modified limitations or conditions may be placed in the NPDES permit to provide protections for marine life, both inside and outside of Marine Protected Areas.

9. The State Water Board prepared and circulated a draft Substitute Environmental Document (SED) in accordance with the provisions of the California Environmental Quality Act and title 14, California Code of Regulations section 15251(g) and in compliance with State Water Board regulations governing certified regulatory programs. (See Cal. Code Regs., tit. 23, § 3777) The SED consists of the draft SED dated January 6, 2012, and updated on February 23 and July 25, 2012, and responses to comments on the draft SED and the proposed project. Together, these documents constitute the required environmental documentation under CEQA. (See Cal. Code Regs., tit. 14, §§ 15250, 15252; Cal. Code of Regs., tit. 23, § 3777.)

10. The State Water Board has considered the SED, which analyzes the project, alternatives to the project and reasonably foreseeable methods of compliance with the proposed amendments and concludes that the project will not result in adverse environmental impacts.

11. These amendments to the Ocean Plan do not become effective until approved by the Office of Administrative Law (OAL).

THEREFORE BE IT RESOLVED THAT:

The State Water Board:

1. After considering the entire record, including oral comments at the public hearing, adopts the State Water Quality Protection Areas and Marine Protected Areas amendment to the Ocean Plan.

2. Approves the final SED, which includes the responses to comments, and directs the Executive Director or designee to transmit the Notice of Decision to the Secretary of Resources.

3. Authorizes the Executive Director or designee to submit the amended Ocean Plan to OAL for review and approval.

4. Directs the Executive Director or designee to make minor, non-substantive modifications to the language of the amendment, if OAL determines during its

approval process that such changes are needed, and inform the State Water Board of any such changes.

CERTIFICATION

The undersigned Clerk to the Board does hereby certify that the foregoing is a full, true, and correct copy of a resolution duly and regularly adopted at a meeting of the State Water Resources Control Board held on October 16, 2012.

AYE:	Chairman Charles R. Hoppin
	Vice Chair Frances Spivy-Weber
	Board Member Tam M. Doduc
	Board Member Steven Moore
	Board Member Felicia Marcus
NAY:	None
ABSENT:	None
ABSTAIN:	None

Jeanine Townsend

Jeanine Townsend
Clerk to the Board

STATE WATER RESOURCES CONTROL BOARD RESOLUTION NO. 2012-0057

ADOPTION OF THE CALIFORNIA OCEAN PLAN AMENDMENTS REGARDING MODEL MONITORING, VESSEL DISCHARGES, AND NON-SUBSTANTIVE CHANGES

WHEREAS:

1. The State Water Resources Control Board (State Water Board) adopted the California Ocean Plan (Ocean Plan) in 1972 and revised it in 1978, 1983, 1988, 1990, 1997, 2001, 2005 and 2009.

2. The State Water Board is responsible for reviewing Ocean Plan water quality standards and for modifying and adopting standards in accordance with Section 303 (c)(1) of the federal Clean Water Act and section 13170.2(b) of the California Water Code.

3. On August 1, 8, and 15, of 2006, the State Water Board conducted public scoping meetings in Santa Rosa, Los Angeles, and Monterey respectively to receive public comments for potential revisions to the Ocean Plan.

4. On June 26, 2007, the State Water Board held a public scoping meeting in San Francisco regarding potential Ocean Plan Amendments and solicited public comments on the scope and content of the environmental information that the State Water Board must consider.

5. On March 15, 2011, the State Water Board adopted the Ocean Plan Triennial Review Work Plan for 2011-2013 by Resolution 2011-0013. The work plan identifies issues for which further action is needed, including model monitoring, vessel discharges, and non- substantive changes, which are addressed by the proposed amendments to the Ocean Plan.

6. On November 1, 2011, the State Water Board conducted a public hearing for the proposed amendments to the Ocean Plan. Public comments were received and reviewed, and staff developed edits based on these comments.

7. On August 22, 2012, the State Water Board conducted a public workshop, where the State Water Board solicited comments on staff edits to the proposed amendments to the Ocean Plan related to model monitoring, vessel discharges and non-substantive changes.

8. The State Water Board prepared and circulated a draft Substitute Environmental Document (SED) in accordance with the provisions of the California Environmental Quality Act and title 14, California Code of Regulations section 15251(g) and in compliance with State Water Board regulations governing certified regulatory programs. (See Cal. Code Regs., tit. 23, § 3777) The SED consists of the draft SED

dated January 6, 2012, and updated on February 23 and July 25, 2012, and responses to comments on the draft SED and the proposed project. Together, these documents constitute the required environmental documentation under CEQA. (See Cal. Code Regs., tit. 14, §§ 15250, 15252; Cal. Code of Regs., tit. 23, § 3777.)

9. The State Water Board has considered the SED, which analyzes the project, alternative to the project and reasonably foreseeable methods of compliance with the proposed amendments and concludes that the project will not result in adverse environmental impacts.

10. These amendments to the Ocean Plan do not become affective until approved by the Office of Administrative Law (OAL).

THEREFORE BE IT RESOLVED THAT:

The State Water Board:

1. After considering the entire record, including oral comments at the public hearing, adopts the proposed amendments to the Ocean Plan regarding model monitoring, vessel discharges and non-substantive administrative changes.

2. Approve the final SED, which includes the response to comments and directs the Executive Director or designee to transmit the Notice of Decision to the Secretary of Resources.

3. Authorizes the Executive Director or designee to submit the amended Ocean Plan to OAL for review and approval.

4. Directs the Executive Director or designee to make minor, non-substantive modifications to the language of the Policy, if during the OAL approval process, OAL determines that such changes are needed for clarity or consistency, and inform the State Water Board of any changes.

CERTIFICATION

The undersigned Clerk to the Board does hereby certify that the foregoing is a full, true, and correct copy of a resolution duly and regularly adopted at a meeting of the State Water Resources Control Board held on October 16, 2012.

AYE:	Chairman Charles R. Hoppin
	Vice Chair Frances Spivy-Weber
	Board Member Tam M. Doduc
	Board Member Steven Moore
	Board Member Felicia Marcus
NAY:	None
ABSENT:	None
ABSTAIN:	None

Jeanine Townsend

Jeanine Townsend
Clerk to the Board

CALIFORNIA OCEAN PLAN

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CALIFORNIA OCEAN PLAN

WATER QUALITY CONTROL PLAN FOR OCEAN WATERS OF CALIFORNIA

INTRODUCTION

A. Purpose and Authority

1. In furtherance of legislative policy set forth in Section 13000 of Division 7 of the California Water Code (CWC) (Stats. 1969, Chap. 482) pursuant to the authority contained in Section 13170 and 13170.2 (Stats. 1971, Chap. 1288) the State Water Resources Control Board (State Water Board) hereby finds and declares that protection of the quality of the ocean* waters for use and enjoyment by the people of the State requires control of the discharge of waste* to ocean* waters in accordance with the provisions contained herein. The Board finds further that this plan shall be reviewed at least every three years to guarantee that the current standards are adequate and are not allowing degradation* to marine species or posing a threat to public health.

B. Principles

1. Harmony Among Water Quality Control Plans and Policies.

   a. In the adoption and amendment of water quality control plans, it is the intent of this Board that each plan will provide for the attainment and maintenance of the water quality standards of downstream waters.

   b. To the extent there is a conflict between a provision of this plan and a provision of another statewide plan or policy, or a regional water quality control plan (basin plan), the more stringent provision shall apply except where pursuant to Chap. III.J of this Plan, the State Water Board has approved an exception to the Plan requirements.

C. Applicability

1. This plan is applicable, in its entirety, to point source discharges to the ocean*. Nonpoint sources of waste* discharges to the ocean* are subject to Chapter I Beneficial Uses, Chapter II - WATER QUALITY OBJECTIVES (wherein compliance with water quality objectives shall, in all cases, be determined by direct measurements in the receiving waters*) and Chapter III - PROGRAM OF IMPLEMENTATION Parts A.2, D, E, and I.

2. This plan is not applicable to discharges to enclosed* bays and estuaries* or inland waters or the control of dredged* material.

3. Provisions regulating the thermal aspects of waste* discharged to the ocean* are set forth in the Water Quality Control Plan for the Control of Temperature in the Coastal and Interstate Waters and Enclosed* Bays and Estuaries* of California.

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* See Appendix I for definition of terms.

4. Within this Plan, references to the State Board or State Water Board shall mean the State Water Resources Control Board. References to a Regional Board or Regional Water Board shall mean a California Regional Water Quality Control Board. References to the Environmental Protection Agency, USEPA, or EPA shall mean the federal Environmental Protection Agency.

* See Appendix I for definition of terms.

I. BENEFICIAL USES

A. The beneficial uses of the ocean* waters of the State that shall be protected include industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture*; preservation and enhancement of designated Areas* of Special Biological Significance (ASBS); rare and endangered species; marine habitat; fish migration; fish spawning and shellfish* harvesting.

* See Appendix I for definition of terms.

II. WATER QUALITY OBJECTIVES

A. General Provisions

1. This chapter sets forth limits or levels of water quality characteristics for ocean* waters to ensure the reasonable protection of beneficial uses and the prevention of nuisance. The discharge of waste* shall not cause violation of these objectives.

2. The Water Quality Objectives and Effluent Limitations are defined by a statistical distribution when appropriate. This method recognizes the normally occurring variations in treatment efficiency and sampling and analytical techniques and does not condone poor operating practices.

3. Compliance with the water quality objectives of this chapter shall be determined from samples collected at stations representative of the area within the waste field where initial* dilution is completed.

B. Bacterial Characteristics

1. Water-Contact Standards

Both the State Water Board and the California Department of Public Health (CDPH) have established standards to protect water contact recreation in coastal waters from bacterial contamination. Subsection a of this section contains bacterial objectives adopted by the State Water Board for ocean waters used for water contact recreation. Subsection b describes the bacteriological standards adopted by CDPH for coastal waters adjacent to public beaches and public water contact sports areas in ocean waters.

a. State Water Board Water-Contact Standards

(1) Within a zone bounded by the shoreline and a distance of 1,000 feet from the shoreline or the 30-foot depth contour, whichever is further from the shoreline, and in areas outside this zone used for water contact sports, as determined by the Regional Board (i.e., waters designated as REC-1), but including all kelp* beds, the following bacterial objectives shall be maintained throughout the water column:

30-day Geometric Mean – The following standards are based on the geometric mean of the five most recent samples from each site:

i. Total coliform density shall not exceed 1,000 per 100 mL;
ii. Fecal coliform density shall not exceed 200 per 100 mL; and
iii. Enterococcus density shall not exceed 35 per 100 mL.

Single Sample Maximum:

i. Total coliform density shall not exceed 10,000 per 100 mL;
ii. Fecal coliform density shall not exceed 400 per 100 mL;
iii. Enterococcus density shall not exceed 104 per 100 mL; and

* See Appendix I for definition of terms.

iv. Total coliform density shall not exceed 1,000 per 100 mL when the fecal coliform/total coliform ratio exceeds 0.1.

(2) The “Initial* Dilution Zone” of wastewater outfalls shall be excluded from designation as "kelp* beds” for purposes of bacterial standards, and Regional Boards should recommend extension of such exclusion zone where warranted to the State Water Board (for consideration under Chapter III. J.). Adventitious assemblages of kelp plants on waste discharge structures (e.g., outfall pipes and diffusers) do not constitute kelp* beds for purposes of bacterial standards.

b. CDPH Standards

CDPH has established minimum protective bacteriological standards for coastal waters adjacent to public beaches and for public water-contact sports areas in ocean waters. These standards are found in the California Code of Regulations, title 17, section 7958, and they are identical to the objectives contained in subsection a. above. When a public beach or public water-contact sports area fails to meet these standards, CDPH or the local public health officer may post with warning signs or otherwise restrict use of the public beach or public water-contact sports area until the standards are met. The CDPH regulations impose more frequent monitoring and more stringent posting and closure requirements on certain high-use public beaches that are located adjacent to a storm drain that flows in the summer.

For beaches not covered under AB 411 regulations, CDPH imposes the same standards as contained in Title 17 and requires weekly sampling but allows the county health officer more discretion in making posting and closure decisions.

2. Shellfish* Harvesting Standards

a. At all areas where shellfish* may be harvested for human consumption, as determined by the Regional Board, the following bacterial objectives shall be maintained throughout the water column:

(1) The median total coliform density shall not exceed 70 per 100 mL, and not more than 10 percent of the samples shall exceed 230 per 100 mL.

C. Physical Characteristics

1. Floating particulates and grease and oil shall not be visible.

2. The discharge of waste* shall not cause aesthetically undesirable discoloration of the ocean* surface.

3. Natural* light shall not be significantly* reduced at any point outside the initial* dilution zone as the result of the discharge of waste*.

4. The rate of deposition of inert solids and the characteristics of inert solids in ocean* sediments shall not be changed such that benthic communities are degraded*.

* See Appendix I for definition of terms.

D. Chemical Characteristics

1. The dissolved oxygen concentration shall not at any time be depressed more than 10 percent from that which occurs naturally, as the result of the discharge of oxygen demanding waste* materials.
2. The pH shall not be changed at any time more than 0.2 units from that which occurs naturally.
3. The dissolved sulfide concentration of waters in and near sediments shall not be significantly* increased above that present under natural conditions.
4. The concentration of substances set forth in Chapter II, Table 1, in marine sediments shall not be increased to levels which would degrade* indigenous biota.
5. The concentration of organic materials in marine sediments shall not be increased to levels that would degrade* marine life.
6. Nutrient materials shall not cause objectionable aquatic growths or degrade* indigenous biota.
7. Numerical Water Quality Objectives
   a. Table 1 water quality objectives apply to all discharges within the jurisdiction of this Plan. Unless otherwise specified, all metal concentrations are expressed as total recoverable concentrations.
   b. Table 1 Water Quality Objectives

* See Appendix I for definition of terms.

TABLE 1 (formerly TABLE B)
WATER QUALITY OBJECTIVES

	Units of Measurement	Limiting Concentrations 6-Month Median	Daily Maximum	Instantaneous Maximum
OBJECTIVES FOR PROTECTION OF MARINE AQUATIC LIFE				
Arsenic	µg/L	8.	32.	80.
Cadmium	µg/L	1.	4.	10.
Chromium (Hexavalent) (see below, a)	µg/L	2.	8.	20.
Copper	µg/L	3.	12.	30.
Lead	µg/L	2.	8.	20.
Mercury	µg/L	0.04	0.16	0.4
Nickel	µg/L	5.	20.	50.
Selenium	µg/L	15.	60.	150.
Silver	µg/L	0.7	2.8	7.
Zinc	µg/L	20.	80.	200.
Cyanide (see below, b)	µg/L	1.	4.	10.
Total Chlorine Residual (For intermittent chlorine sources see below, c)	µg/L	2.	8.	60.
Ammonia (expressed as nitrogen)	µg/L	600.	2400.	6000.
Acute* Toxicity	TUa	N/A	0.3	N/A
Chronic* Toxicity	TUc	N/A	1.	N/A
Phenolic Compounds (non-chlorinated)	µg/L	30.	120.	300.
Chlorinated Phenolics	µg/L	1.	4.	10.
Endosulfan	µg/L	0.009	0.018	0.027
Endrin	µg/L	0.002	0.004	0.006
HCH*	µg/L	0.004	0.008	0.012
Radioactivity	Not to exceed limits specified in Title 17, Division 1, Chapter 5, Subchapter 4, Group 3, Article 3, Section 30253 of the California Code of Regulations. Reference to Section 30253 is prospective, including future changes to any incorporated provisions of federal law, as the changes take effect.			

* See Appendix I for definition of terms.

TABLE 1 (formerly TABLE B) Continued

Chemical	30-day Average (µg/L) Decimal Notation	Scientific Notation
OBJECTIVES FOR PROTECTION OF HUMAN HEALTH – NONCARCINOGENS		
acrolein	220.	2.2×10^{2}
antimony	1,200.	1.2×10^{3}
bis(2-chloroethoxy) methane	4.4	4.4×10^{0}
bis(2-chloroisopropyl) ether	1,200.	1.2×10^{3}
chlorobenzene	570.	5.7×10^{2}
chromium (III)	190,000.	1.9×10^{5}
di-n-butyl phthalate	3,500.	3.5×10^{3}
dichlorobenzenes*	5,100.	5.1×10^{3}
diethyl phthalate	33,000.	3.3×10^{4}
dimethyl phthalate	820,000.	8.2×10^{5}
4,6-dinitro-2-methylphenol	220.	2.2×10^{2}
2,4-dinitrophenol	4.0	4.0×10^{0}
ethylbenzene	4,100.	4.1×10^{3}
fluoranthene	15.	1.5×10^{1}
hexachlorocyclopentadiene	58.	5.8×10^{1}
nitrobenzene	4.9	4.9×10^{0}
thallium	2.	$2. \times 10^{0}$
toluene	85,000.	8.5×10^{4}
tributyltin	0.0014	1.4×10^{-3}
1,1,1-trichloroethane	540,000.	5.4×10^{5}
OBJECTIVES FOR PROTECTION OF HUMAN HEALTH – CARCINOGENS		
acrylonitrile	0.10	1.0×10^{-1}
aldrin	0.000022	2.2×10^{-5}
benzene	5.9	5.9×10^{0}
benzidine	0.000069	6.9×10^{-5}
beryllium	0.033	3.3×10^{-2}
bis(2-chloroethyl) ether	0.045	4.5×10^{-2}
bis(2-ethylhexyl) phthalate	3.5	3.5×10^{0}
carbon tetrachloride	0.90	9.0×10^{-1}
chlordane*	0.000023	2.3×10^{-5}
chlorodibromomethane	8.6	8.6×10^{0}

* See Appendix I for definition of terms.

TABLE 1 (formerly TABLE B) Continued

Chemical	30-day Average (µg/L) Decimal Notation	Scientific Notation
OBJECTIVES FOR PROTECTION OF HUMAN HEALTH – CARCINOGENS		
chloroform	130.	1.3×10^{2}
DDT*	0.00017	1.7×10^{-4}
1,4-dichlorobenzene	18.	1.8×10^{1}
3,3'-dichlorobenzidine	0.0081	8.1×10^{-3}
1,2-dichloroethane	28.	2.8×10^{1}
1,1-dichloroethylene	0.9	9×10^{-1}
dichlorobromomethane	6.2	6.2×10^{0}
dichloromethane	450.	4.5×10^{2}
1,3-dichloropropene	8.9	8.9×10^{0}
dieldrin	0.00004	4.0×10^{-5}
2,4-dinitrotoluene	2.6	2.6×10^{0}
1,2-diphenylhydrazine	0.16	1.6×10^{-1}
halomethanes*	130.	1.3×10^{2}
heptachlor	0.00005	5×10^{-5}
heptachlor epoxide	0.00002	2×10^{-5}
hexachlorobenzene	0.00021	2.1×10^{-4}
hexachlorobutadiene	14.	1.4×10^{1}
hexachloroethane	2.5	2.5×10^{0}
isophorone	730.	7.3×10^{2}
N-nitrosodimethylamine	7.3	7.3×10^{0}
N-nitrosodi-N-propylamine	0.38	3.8×10^{-1}
N-nitrosodiphenylamine	2.5	2.5×10^{0}
PAHs*	0.0088	8.8×10^{-3}
PCBs*	0.000019	1.9×10^{-5}
TCDD equivalents*	0.0000000039	3.9×10^{-9}
1,1,2,2-tetrachloroethane	2.3	2.3×10^{0}
tetrachloroethylene	2.0	2.0×10^{0}
toxaphene	0.00021	2.1×10^{-4}
trichloroethylene	27.	2.7×10^{1}
1,1,2-trichloroethane	9.4	9.4×10^{0}
2,4,6-trichlorophenol	0.29	2.9×10^{-1}
vinyl chloride	36.	3.6×10^{1}

* See Appendix I for definition of terms.

Table 1 Notes:

a) Dischargers may at their option meet this objective as a total chromium objective.

b) If a discharger can demonstrate to the satisfaction of the Regional Water Board (subject to EPA approval) that an analytical method is available to reliably distinguish between strongly and weakly complexed cyanide, effluent limitations for cyanide may be met by the combined measurement of free cyanide, simple alkali metal cyanides, and weakly complexed organometallic cyanide complexes. In order for the analytical method to be acceptable, the recovery of free cyanide from metal complexes must be comparable to that achieved by the approved method in 40 CFR PART 136, as revised May 14, 1999.

c) Water quality objectives for total chlorine residual applying to intermittent discharges not exceeding two hours, shall be determined through the use of the following equation:

$$\log y = -0.43 (\log x) + 1.8$$

where: y = the water quality objective (in µg/L) to apply when chlorine is being discharged;
x = the duration of uninterrupted chlorine discharge in minutes.

E. Biological Characteristics

1. Marine communities, including vertebrate, invertebrate, and plant species, shall not be degraded*.

2. The natural taste, odor, and color of fish, shellfish*, or other marine resources used for human consumption shall not be altered.

3. The concentration of organic materials in fish, shellfish* or other marine resources used for human consumption shall not bioaccumulate to levels that are harmful to human health.

F. Radioactivity

1. Discharge of radioactive waste* shall not degrade* marine life.

* See Appendix I for definition of terms.

III. PROGRAM OF IMPLEMENTATION

A. General Provisions

1. Effective Date

a. The *Water Quality Control Plan, Ocean Waters of California, California Ocean Plan* was adopted and has been effective since 1972. There have been multiple amendments of the Ocean Plan since its adoption.

2. General Requirements For Management Of Waste Discharge To The Ocean*

a. Waste* management systems that discharge to the ocean* must be designed and operated in a manner that will maintain the indigenous marine life and a healthy and diverse marine community.

b. Waste discharged* to the ocean* must be essentially free of:

(1) Material that is floatable or will become floatable upon discharge.

(2) Settleable material or substances that may form sediments which will degrade* benthic communities or other aquatic life.

(3) Substances which will accumulate to toxic levels in marine waters, sediments or biota.

(4) Substances that significantly* decrease the natural* light to benthic communities and other marine life.

(5) Materials that result in aesthetically undesirable discoloration of the ocean* surface.

c. Waste* effluents shall be discharged in a manner which provides sufficient initial* dilution to minimize the concentrations of substances not removed in the treatment.

d. Location of waste* discharges must be determined after a detailed assessment of the oceanographic characteristics and current patterns to assure that:

(1) Pathogenic organisms and viruses are not present in areas where shellfish* are harvested for human consumption or in areas used for swimming or other body-contact sports.

(2) Natural water quality conditions are not altered in areas designated as being of special biological significance or areas that existing marine laboratories use as a source of seawater.

(3) Maximum protection is provided to the marine environment.

* See Appendix I for definition of terms.

e. Waste* that contains pathogenic organisms or viruses should be discharged a sufficient distance from shellfishing* and water-contact sports areas to maintain applicable bacterial standards without disinfection. Where conditions are such that an adequate distance cannot be attained, reliable disinfection in conjunction with a reasonable separation of the discharge point from the area of use must be provided. Disinfection procedures that do not increase effluent toxicity and that constitute the least environmental and human hazard should be used.

3. Areas of Special Biological Significance

   a. ASBS* shall be designated by the State Water Board following the procedures provided in Appendix IV. A list of ASBS* is available in Appendix V.

4. Combined Sewer Overflow: Not withstanding any other provisions in this plan, discharges from the City of San Francisco's combined sewer system are subject to the US EPA's Combined Sewer Overflow Policy.

B. Table 2 Effluent Limitations

TABLE 2 (formerly TABLE A)
EFFLUENT LIMITATIONS

		Limiting Concentrations		
	Unit of Measurement	Monthly (30-day Average)	Weekly (7-day Average)	Maximum at any time
Grease and Oil	mg/L	25.	40.	75.
Suspended Solids			See below +	
Settleable Solids	mL/L	1.0	1.5	3.0
Turbidity	NTU	75.	100.	225.
pH	Units		Within limit of 6.0 to 9.0 at all times	

Table 2 Notes:

\+ Suspended Solids: Dischargers shall, as a 30-day average, remove 75% of suspended solids from the influent stream before discharging wastewaters to the ocean*, except that the effluent limitation to be met shall not be lower than 60 mg/l. Regional Boards may recommend that the State Water Board (Chapter III.J), with the concurrence of the Environmental Protection Agency, adjust the lower effluent concentration limit (the 60 mg/l above) to suit the environmental and effluent characteristics of the discharge. As a further consideration in making such recommendation for adjustment, Regional Water Boards should evaluate effects on existing and potential water* reclamation projects.

If the lower effluent concentration limit is adjusted, the discharger shall remove 75% of suspended solids from the influent stream at any time the influent concentration exceeds four times such adjusted effluent limit.

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1. Table 2 effluent limitations apply only to publicly owned treatment works and industrial discharges for which Effluent Limitations Guidelines have not been established pursuant to Sections 301, 302, 304, or 306 of the Federal Clean Water Act.

* See Appendix I for definition of terms.

2. Table 2 effluent limitations shall apply to a discharger's total effluent, of whatever origin (i.e., gross, not net, discharge), except where otherwise specified in this Plan.

3. The State Water Board is authorized to administer and enforce effluent limitations established pursuant to the Federal Clean Water Act. Effluent limitations established under Sections 301, 302, 306, 307, 316, 403, and 405 of the aforementioned Federal Act and administrative procedures pertaining thereto are included in this plan by reference. Compliance with Table 2 effluent limitations, or Environmental Protection Agency Effluent Limitations Guidelines for industrial discharges, based on Best Practicable Control Technology, shall be the minimum level of treatment acceptable under this plan, and shall define reasonable treatment and waste control technology.

C. Implementation Provisions for Table 1

1. Effluent concentrations calculated from Table 1 water quality objectives shall apply to a discharger's total effluent, of whatever origin (i.e., gross, not net, discharge), except where otherwise specified in this Plan.

2. If the Regional Water Board determines, using the procedures in Appendix VI, that a pollutant is discharged into ocean* waters at levels which will cause, have the reasonable potential to cause, or contribute to an excursion above a Table 1 water quality objective, the Regional Water Board shall incorporate a water quality-based effluent limitation in the Waste Discharge Requirement for the discharge of that pollutant.

3. Effluent limitations shall be imposed in a manner prescribed by the State Water Board such that the concentrations set forth below as water quality objectives shall not be exceeded in the receiving water* upon completion of initial* dilution, except that objectives indicated for radioactivity shall apply directly to the undiluted waste* effluent.

4. Calculation of Effluent Limitations

a. Effluent limitations for water quality objectives listed in Table 1, with the exception of acute* toxicity and radioactivity, shall be determined through the use of the following equation:

Equation 1: $Ce = Co + Dm (Co - Cs)$

where:

Ce = the effluent concentration limit, µg/L

Co = the concentration (water quality objective) to be met at the completion of initial* dilution, µg/L

Cs = background seawater concentration (see Table 3 below, with all metals expressed as total recoverable concentrations), µg/L

Dm = minimum probable initial* dilution expressed as parts seawater per part wastewater.

* See Appendix I for definition of terms.

TABLE 3 (formerly TABLE C) BACKGROUND SEAWATER CONCENTRATIONS (Cs)	
Waste Constituent	Cs (µg/L)
Arsenic	3.
Copper	2.
Mercury	0.0005
Silver	0.16
Zinc	8.
For all other Table 1 parameters, Cs = 0.	

b. Determining a Mixing Zone for the Acute* Toxicity Objective

The mixing zone for the acute* toxicity objective shall be ten percent (10%) of the distance from the edge of the outfall structure to the edge of the chronic mixing zone (zone of initial dilution). There is no vertical limitation on this zone. The effluent limitation for the acute* toxicity objective listed in Table 1 shall be determined through the use of the following equation:

Equation 2: $Ce = Ca + (0.1)\ Dm\ (Ca)$

where:

Ca = the concentration (water quality objective) to be met at the edge of the acute mixing zone.

Dm = minimum probable initial* dilution expressed as parts seawater per part wastewater (This equation applies only when Dm > 24).

c. Toxicity Testing Requirements based on the Minimum Initial* Dilution Factor for Ocean Waste Discharges

(1) Dischargers shall conduct acute* toxicity testing if the minimum initial* dilution of the effluent is greater than 1,000:1 at the edge of the mixing zone.

(2) Dischargers shall conduct either acute* or chronic* toxicity testing if the minimum initial* dilution ranges from 350:1 to 1,000:1 depending on the specific discharge conditions. The Regional Water Board shall make this determination.

(3) Dischargers shall conduct chronic* toxicity testing for ocean waste discharges with minimum initial* dilution factors ranging from 100:1 to 350:1. The Regional Water Board may require that acute toxicity testing be conducted in addition to chronic as necessary for the protection of beneficial uses of ocean waters.

(4) Dischargers shall conduct chronic toxicity testing if the minimum initial* dilution of the effluent falls below 100:1 at the edge of the mixing zone.

* See Appendix I for definition of terms.

d. For the purpose of this Plan, minimum initial* dilution is the lowest average initial* dilution within any single month of the year. Dilution estimates shall be based on observed waste flow characteristics, observed receiving water* density structure, and the assumption that no currents, of sufficient strength to influence the initial* dilution process, flow across the discharge structure.

e. The Executive Director of the State Water Board shall identify standard dilution models for use in determining Dm, and shall assist the Regional Board in evaluating Dm for specific waste discharges. Dischargers may propose alternative methods of calculating Dm, and the Regional Board may accept such methods upon verification of its accuracy and applicability.

f. The six-month median shall apply as a moving median of daily values for any 180-day period in which daily values represent flow weighted average concentrations within a 24-hour period. For intermittent discharges, the daily value shall be considered to equal zero for days on which no discharge occurred.

g. The daily maximum shall apply to flow weighted 24 hour composite samples.

h. The instantaneous maximum shall apply to grab sample determinations.

i. If only one sample is collected during the time period associated with the water quality objective (e.g., 30-day average or 6-month median), the single measurement shall be used to determine compliance with the effluent limitation for the entire time period.

j. Discharge requirements shall also specify effluent limitations in terms of mass emission rate limits utilizing the general formula:

Equation 3: $\text{lbs/day} = 0.00834 \times Ce \times Q$

where:

Ce = the effluent concentration limit, µg/L

Q = flow rate, million gallons per day (MGD)

k. The six-month median limit on daily mass emissions shall be determined using the six-month median effluent concentration as Ce and the observed flow rate Q in millions of gallons per day. The daily maximum mass emission shall be determined using the daily maximum effluent concentration limit as Ce and the observed flow rate Q in millions of gallons per day.

l. Any significant change in waste* flow shall be cause for reevaluating effluent limitations.

5. Minimum* Levels

For each numeric effluent limitation, the Regional Board must select one or more Minimum* Levels (and their associated analytical methods) for inclusion in the permit.

* See Appendix I for definition of terms.

The "reported" Minimum* Level is the Minimum* Level (and its associated analytical method) chosen by the discharger for reporting and compliance determination from the Minimum* Levels included in their permit.

a. Selection of Minimum* Levels from Appendix II

The Regional Water Board must select all Minimum* Levels from Appendix II that are below the effluent limitation. If the effluent limitation is lower than all the Minimum* Levels in Appendix II, the Regional Board must select the lowest Minimum* Level from Appendix II.

b. Deviations from Minimum* Levels in Appendix II

The Regional Board, in consultation with the State Water Board's Quality Assurance Program, must establish a Minimum* Level to be included in the permit in any of the following situations:

1. A pollutant is not listed in Appendix II.
2. The discharger agrees to use a test method that is more sensitive than those described in 40 CFR 136 (revised May 14, 1999).
3. The discharger agrees to use a Minimum* Level lower than those listed in Appendix II.
4. The discharger demonstrates that their calibration standard matrix is sufficiently different from that used to establish the Minimum* Level in Appendix II and proposes an appropriate Minimum* Level for their matrix.
5. A discharger uses an analytical method having a quantification practice that is not consistent with the definition of Minimum* Level (e.g., US EPA methods 1613, 1624, 1625).

6. Use of Minimum* Levels

a. Minimum* Levels in Appendix II represent the lowest quantifiable concentration in a sample based on the proper application of method-specific analytical procedures and the absence of matrix interferences. Minimum* Levels also represent the lowest standard concentration in the calibration curve for a specific analytical technique after the application of appropriate method-specific factors.

Common analytical practices may require different treatment of the sample relative to the calibration standard. Some examples are given below:

Substance or Grouping	Method-Specific Treatment	Most Common Factor
Volatile Organics	No differential treatment	1
Semi-Volatile Organics	Samples concentrated by extraction	1000
Metals	Samples diluted or concentrated	½ , 2 , and 4
Pesticides	Samples concentrated by extraction	100

b. Other factors may be applied to the Minimum* Level depending on the specific sample preparation steps employed. For example, the treatment typically applied when there are matrix effects is to dilute the sample or sample aliquot by a factor of ten. In such cases, this additional factor must be applied during the

* See Appendix I for definition of terms.

computation of the reporting limit. Application of such factors will alter the reported Minimum* Level.

c. Dischargers are to instruct their laboratories to establish calibration standards so that the Minimum* Level (or its equivalent if there is differential treatment of samples relative to calibration standards) is the lowest calibration standard. At no time is the discharger to use analytical data derived from *extrapolation* beyond the lowest point of the calibration curve. In accordance with Section 4b, above, the discharger's laboratory may employ a calibration standard lower than the Minimum* Level in Appendix II.

7. Sample Reporting Protocols

a. Dischargers must report with each sample result the reported Minimum* Level (selected in accordance with Section 4, above) and the laboratory's current MDL*.

b. Dischargers must also report the results of analytical determinations for the presence of chemical constituents in a sample using the following reporting protocols:

(1) Sample results greater than or equal to the reported Minimum* Level must be reported "as measured" by the laboratory (i.e., the measured chemical concentration in the sample).

(2) Sample results less than the reported Minimum* Level, but greater than or equal to the laboratory's MDL*, must be reported as "Detected, but Not Quantified", or DNQ. The laboratory must write the estimated chemical concentration of the sample next to DNQ as well as the words "Estimated Concentration" (may be shortened to "Est. Conc.").

(3) Sample results less than the laboratory's MDL* must be reported as "Not Detected", or ND.

8. Compliance Determination

Sufficient sampling and analysis shall be required to determine compliance with the effluent limitation.

a. Compliance with Single-Constituent Effluent Limitations

Dischargers are out of compliance with the effluent limitation if the concentration of the pollutant (see Section 7c, below) in the monitoring sample is greater than the effluent limitation and greater than or equal to the reported Minimum* Level.

b. Compliance with Effluent Limitations expressed as a Sum of Several Constituents

Dischargers are out of compliance with an effluent limitation which applies to the sum of a group of chemicals (e.g., PCB's) if the sum of the individual pollutant concentrations is greater than the effluent limitation. Individual pollutants of the group will be considered to have a concentration of zero if the constituent is reported as ND or DNQ.

c. Multiple Sample Data Reduction

* See Appendix I for definition of terms.

The concentration of the pollutant in the effluent may be estimated from the result of a single sample analysis or by a measure of central tendency (arithmetic mean, geometric mean, median, etc.) of multiple sample analyses when all sample results are quantifiable (i.e., greater than or equal to the reported Minimum* Level). When one or more sample results are reported as ND or DNQ, the central tendency concentration of the pollutant shall be the median (middle) value of the multiple samples. If, in an even number of samples, one or both of the middle values is ND or DNQ, the median will be the lower of the two middle values.

d. Powerplants and Heat Exchange Dischargers

Due to the large total volume of powerplant and other heat exchange discharges, special procedures must be applied for determining compliance with Table 1 objectives on a routine basis. Effluent concentration values (Ce) shall be determined through the use of equation 1 considering the minimal probable initial* dilution of the combined effluent (in-plant waste streams plus cooling water flow). These concentration values shall then be converted to mass emission limitations as indicated in equation 3. The mass emission limits will then serve as requirements applied to all inplant waste* streams taken together which discharge into the cooling water flow, except that limits for total chlorine residual, acute* (if applicable per Section (3)(c)) and chronic* toxicity and instantaneous maximum concentrations in Table 1 shall apply to, and be measured in, the combined final effluent, as adjusted for dilution with ocean water. The Table 1 objective for radioactivity shall apply to the undiluted combined final effluent.

9. Pollutant Minimization Program

a. Pollutant Minimization Program Goal

The goal of the Pollutant Minimization Program is to reduce all potential sources of a pollutant through pollutant minimization (control) strategies, including pollution prevention measures, in order to maintain the effluent concentration at or below the effluent limitation.

Pollution prevention measures may be particularly appropriate for persistent bioaccumulative priority pollutants where there is evidence that beneficial uses are being impacted. The completion and implementation of a Pollution Prevention Plan, required in accordance with CA Water Code Section 13263.3 (d) will fulfill the Pollution Minimization Program requirements in this section.

b. Determining the need for a Pollutant Minimization Program

1. The discharger must develop and conduct a Pollutant Minimization Program if all of the following conditions are true:

(a) The calculated effluent limitation is less than the reported Minimum* Level

(b) The concentration of the pollutant is reported as DNQ

(c) There is evidence showing that the pollutant is present in the effluent above the calculated effluent limitation.

2. Alternatively, the discharger must develop and conduct a Pollutant Minimization Program if all of the following conditions are true:

* See Appendix I for definition of terms.

(a) The calculated effluent limitation is less than the Method Detection Limit*.

(b) The concentration of the pollutant is reported as ND.

(c) There is evidence showing that the pollutant is present in the effluent above the calculated effluent limitation.

c. Regional Water Boards may include special provisions in the discharge requirements to require the gathering of evidence to determine whether the pollutant is present in the effluent at levels above the calculated effluent limitation. Examples of evidence may include:

1. health advisories for fish consumption,
2. presence of whole effluent toxicity,
3. results of benthic or aquatic organism tissue sampling,
4. sample results from analytical methods more sensitive than methods included in the permit (in accordance with Section 4b, above).
5. the concentration of the pollutant is reported as DNQ and the effluent limitation is less than the MDL

d. Elements of a Pollutant Minimization Program

The Regional Board may consider cost-effectiveness when establishing the requirements of a Pollutant Minimization Program. The program shall include actions and submittals acceptable to the Regional Board including, but not limited to, the following:

1. An annual review and semi-annual monitoring of potential sources of the reportable pollutant, which may include fish tissue monitoring and other bio-uptake sampling;
2. Quarterly monitoring for the reportable pollutant in the influent to the wastewater treatment system;
3. Submittal of a control strategy designed to proceed toward the goal of maintaining concentrations of the reportable pollutant in the effluent at or below the calculated effluent limitation;
4. Implementation of appropriate cost-effective control measures for the pollutant, consistent with the control strategy; and,
5. An annual status report that shall be sent to the Regional Board including:

(a) All Pollutant Minimization Program monitoring results for the previous year;

(b) A list of potential sources of the reportable pollutant;

(c) A summary of all action taken in accordance with the control strategy; and,

(d) A description of actions to be taken in the following year.

* See Appendix I for definition of terms.

10. Toxicity Reduction Requirements

a. If a discharge consistently exceeds an effluent limitation based on a toxicity objective in Table 1, a toxicity reduction evaluation (TRE) is required. The TRE shall include all reasonable steps to identify the source of toxicity. Once the source(s) of toxicity is identified, the discharger shall take all reasonable steps necessary to reduce toxicity to the required level.

b. The following shall be incorporated into waste discharge requirements: (1) a requirement to conduct a TRE if the discharge consistently exceeds its toxicity effluent limitation, and (2) a provision requiring a discharger to take all reasonable steps to reduce toxicity once the source of toxicity is identified.

D. Implementation Provisions for Bacterial Characteristics

1. Water-Contact Monitoring

a. Weekly samples shall be collected from each site. The geometric mean shall be calculated using the five most recent sample results.

b. If a single sample exceeds any of the single sample maximum (*SSM*) standards, repeat sampling at that location shall be conducted to determine the extent and persistence of the exceedance. Repeat sampling shall be conducted within 24 hours of receiving analytical results and continued until the sample result is less than the SSM standard or until a sanitary survey is conducted to determine the source of the high bacterial densities.

i) Total coliform density will not exceed 10,000 per 100 mL; or
ii) Fecal coliform density will not exceed 400 per 100 mL; or
iii) Total coliform density will not exceed 1,000 per 100 mL when the ratio of fecal/total coliform exceeds 0.1;
iv) enterococcus density will not exceed 104 per 100 mL.

When repeat sampling is required because of an exceedance of any one single sample density, values from all samples collected during that 30-day period will be used to calculate the geometric mean.

c. It is state policy that the geometric mean bacterial objectives are strongly preferred for use in water body assessment decisions, for example, in developing the Clean Water Act section 303(d) list of impaired waters, because the geometric mean objectives are a more reliable measure of long-term water body conditions. In making assessment decisions on bacterial quality, single sample maximum data must be considered together with any available geometric mean data. The use of only single sample maximum bacterial data is generally inappropriate unless there is a limited data set, the water is subject to short-term spikes in bacterial concentrations, or other circumstances justify the use of only single sample maximum data.

d. For monitoring stations outside of the defined water-contact recreation zone (REC-1), samples will be analyzed for total coliform only.

* See Appendix I for definition of terms.

E. Implementation Provisions for Marine Managed Areas*

1. Section E addresses the following Marine Managed Areas*:

(a) State Water Quality Protection Areas (SWQPAs)* consisting of:

(1) SWQPA – Areas of Special Biological Significance (ASBS) designated by the State Water Board that require special protections as defined under section 4 below.

(2) SWQPA – General Protection (GP) designated by the State Water Board to protect water quality within Marine Protected Areas (MPAs) that require protection under the provisions described under section 5 below.

(b) Marine Protected Areas as defined in the California Public Resources Code as State Marine Reserves, State Marine Parks and State Marine Conservation Areas, established by the Fish and Game Commission, or the Parks and Recreation Commission.

2. The designation of State Marine Parks and State Marine Conservation Areas may not serve as the sole basis for new or modified limitations, substantive conditions, or prohibitions upon existing municipal point source wastewater discharge outfalls. This provision does not apply to State Marine Reserves.

3. The State Water Board may designate SWQPAs* to prevent the undesirable alteration of natural water quality within MPAs. These designations may include either SWQPA-ASBS or SWQPA-GP or in combination. In considering the designation of SWQPAs over MPAs, the State Water Board will consult with the affected Regional Water Quality Control Board, the Department of Fish and Game and the Department of Parks and Recreation, in accordance with the requirements of Appendix IV.

4. Implementation Provisions for SWQPA-ASBS*

(a) Waste* shall not be discharged to areas designated as being of special biological significance. Discharges shall be located a sufficient distance from such designated areas to assure maintenance of natural water quality conditions in these areas.

(b) Regional Water Boards may approve waste discharge requirements or recommend certification for limited-term (i.e. weeks or months) activities in ASBS*. Limited-term activities include, but are not limited to, activities such as maintenance/repair of existing boat facilities, restoration of sea walls, repair of existing storm water pipes, and replacement/repair of existing bridges. Limited-term activities may result in temporary and short-term changes in existing water quality. Water quality degradation shall be limited to the shortest possible time. The activities must not permanently degrade water quality or result in water quality lower than that necessary to protect existing uses, and all practical means of minimizing such degradation shall be implemented.

* See Appendix I for definition of terms.

5. Implementation Provisions for SWQPAs-GP*

(a) Implementation provisions for existing point source wastewater discharges (NPDES)

(1) An SWQPA-GP shall not be designated over existing permitted point source wastewater outfalls or encroach upon the zone of initial dilution associated with an existing discharge. This requirement does not apply to discharges less than one million gallons per day.

(2) Designation of an SWQPA-GP shall not include conditions to move existing point source wastewater outfalls.

(3) Where a new SWQPA-GP is established in the vicinity of existing municipal wastewater outfalls, there shall be no new or modified limiting condition or prohibitions for the SWQPA-GP relative to those wastewater outfalls.

(4) Regulatory requirements for discharges from existing treated municipal wastewater outfalls shall be derived from the Chapter II – Water Quality Objectives and Chapter III – Program of Implementation.

(b) Implementation provisions for existing seawater intakes

(1) Existing permitted seawater intakes must be controlled to minimize entrainment and impingement by using best technology available. Existing permitted seawater intakes with a capacity less than one million gallons per day are excluded from this requirement.

(c) Implementation provisions for permitted separate storm sewer system (MS4) discharges and nonpoint source discharges.

(1) Existing waste discharges are allowed, but shall not cause an undesirable alteration in natural water quality. For purposes of SWQPA-GP, an undesirable alteration in natural water quality means that for intermittent (e.g. wet weather) discharges, Table 1 instantaneous maximum concentrations for chemical constituents, and daily maximum concentrations for chronic toxicity, must not be exceeded in the receiving water.

(2) An NPDES permitting authority may authorize NPDES-permitted non-storm water discharges to an MS4 with a direct discharge to an SWQPA-GP only to the extent the NPDES permitting authority finds that the discharge does not cause an undesirable alteration in natural water quality in an SWQPA-GP.

(3) Non-storm water (dry weather) flows are effectively prohibited as required by the applicable permit. Where capacity and infrastructure exists, all dry weather flows shall be diverted to municipal sanitary sewer systems. The permitting authority may allow discharges essential for emergency response purposes, structural stability, and slope stability, which may include but are not limited to the following:

* See Appendix I for definition of terms.

a. Discharges associated with emergency fire fighting operations.
b. Foundation and footing drains.
c. Water from crawl space or basement pumps.
d. Hillside dewatering.

(4) The following naturally occurring discharges are allowed:

a. Naturally occurring groundwater seepage via a storm drain
b. Non-anthropogenic flows from a naturally occurring stream via a culvert or storm drain, as long as there are no contributions of anthropogenic runoff.

(5) Existing storm water discharges into an SWQPA-GP shall be characterized and assessed to determine what effect if any these inputs are having on natural water quality in the SWQPA-GP. Such assessments shall include an evaluation of cumulative impacts as well as impacts stemming from individual discharges. Information to be considered shall include:

a. Water quality;
b. Flow;
c. Watershed pollutant sources; and
d. Intertidal and/ or subtidal biological surveys.

Within each SWQPA-GP the assessment shall be used to rank these existing discharges into low, medium and high threat impact categories. Cumulative impacts will be ranked similarly as well.

(6) An initial analysis shall be performed for pre- and post-storm receiving water quality of Table 1 constituents and chronic toxicity. If post-storm receiving water quality has larger concentrations of constituents relative to pre-storm, and Table 1 instantaneous maximum concentrations for chemical constituents, and daily maximum concentrations for chronic toxicity, are exceeded, then receiving water shall be re-analyzed along with storm runoff (end of pipe) for the constituents that are exceeded.

(7) If undesirable alterations of natural water quality and/or biological communities are identified, control strategies/measures shall be implemented for those discharges characterized as a high threat or those contributing to higher threat cumulative impacts first.

(8) If those strategies fail, additional control strategies/measures will be implemented for discharges characterized as medium impact discharges. If these strategies do not result in improvement of water quality, those discharges classified as low threat shall also implement control strategies/measures.

(d) Implementation Provisions for New Discharges

(1) Point Source Wastewater Outfalls
No new point source wastewater outfalls shall be established within an SWQPA-GP.

* See Appendix I for definition of terms.

(2) Seawater intakes
No new surface water seawater intakes shall be established within an SWQPA-GP. This does not apply to sub-seafloor intakes where studies are prepared showing there is no predictable entrainment or impingement of marine life.

(3) All Other New Discharges
There shall be no increase in nonpoint sources or permitted storm drains directly into an SWQPA-GP.

6. Impaired Tributaries to MPAs, SWQPA-ASBS and SWQPA-GP

All water bodies draining to, or that are designated as, MPAs and SWQPAs that appear on the State's CWA Section 303(d) list shall be given a high priority to have a TMDL developed and implemented.

F. Revision of Waste* Discharge Requirements

1. The Regional Water Boards may establish more restrictive water quality objectives and effluent limitations than those set forth in this Plan as necessary for the protection of beneficial uses of ocean* waters.

2. Regional Water Boards may impose alternative less restrictive provisions than those contained within Table 1 of the Plan, provided an applicant can demonstrate that:

   a. Reasonable control technologies (including source control, material substitution, treatment and dispersion) will not provide for complete compliance; or

   b. Any less stringent provisions would encourage water* reclamation;

3. Provided further that:

   a. Any alternative water quality objectives shall be below the conservative estimate of chronic* toxicity, as given in Table 4 (with all metal concentrations expressed as total recoverable concentrations), and such alternative will provide for adequate protection of the marine environment;

   b. A receiving water* quality toxicity objective of 1 TUc is not exceeded; and

   c. The State Water Board grants an exception (Chapter III.J.) to the Table 1 limits as established in the Regional Board findings and alternative limits.

* See Appendix I for definition of terms.

G. Compliance Schedules in National Pollutant Discharge Elimination System (NPDES) Permits

1. Compliance schedules in NPDES permits are authorized in accordance with the provisions of the State Water Board's Policy for Compliance Schedules in [NPDES] Permits (2008).

TABLE 4 (formerly TABLE D)
CONSERVATIVE ESTIMATES OF CHRONIC TOXICITY

Constituent	**Estimate of Chronic Toxicity (µg/L)**
Arsenic	19.
Cadmium	8.
Hexavalent Chromium	18.
Copper	5.
Lead	22.
Mercury	0.4
Nickel	48.
Silver	3.
Zinc	51.
Cyanide	10.
Total Chlorine Residual	10.0
Ammonia	4000.0
Phenolic Compounds (non-chlorinated)	a) (see below)
Chlorinated Phenolics	a)
Chlorinated Pesticides and PCB's	b)

Table 4 Notes:

a) There are insufficient data for phenolics to estimate chronic toxicity levels. Requests for modification of water quality objectives for these waste* constituents must be supported by chronic toxicity data for representative sensitive species. In such cases, applicants seeking modification of water quality objectives should consult the Regional Water Quality Control Board to determine the species and test conditions necessary to evaluate chronic effects.

b) Limitations on chlorinated pesticides and PCB's shall not be modified so that the total of these compounds is increased above the objectives in Table 1.

H. Monitoring Program

1. The Regional Water Boards shall require dischargers to conduct self-monitoring programs and submit reports necessary to determine compliance with the waste* discharge requirements, and may require dischargers to contract with agencies or persons acceptable to the Regional Water Board to provide monitoring reports.

* See Appendix I for definition of terms.

Monitoring provisions contained in waste discharge requirements shall be in accordance with the Monitoring Procedures provided in Appendices III and VI.

2. The Regional Water Board may require monitoring of bioaccumulation of toxicants in the discharge zone. Organisms and techniques for such monitoring shall be chosen by the Regional Water Board on the basis of demonstrated value in waste* discharge monitoring.

I. Discharge Prohibitions

1. Hazardous Substances

a. The discharge of any radiological, chemical, or biological warfare agent or high-level radioactive waste* into the ocean* is prohibited.

2. Areas Designated for Special Water Quality Protection

a. Waste* shall not be discharged to designated Areas* of Special Biological Significance except as provided in Chapter III. E. Implementation Provisions for Marine Managed Areas*.

3. Sludge

a. Pipeline discharge of sludge to the ocean* is prohibited by federal law; the discharge of municipal and industrial waste* sludge directly to the ocean*, or into a waste* stream that discharges to the ocean*, is prohibited by this Plan. The discharge of sludge digester supernatant directly to the ocean*, or to a waste* stream that discharges to the ocean* without further treatment, is prohibited.

b. It is the policy of the State Water Board that the treatment, use and disposal of sewage sludge shall be carried out in the manner found to have the least adverse impact on the total natural and human environment. Therefore, if federal law is amended to permit such discharge, which could affect California waters, the State Water Board may consider requests for exceptions to this section under Chapter III. J of this Plan, provided further that an Environmental Impact Report on the proposed project shows clearly that any available alternative disposal method will have a greater adverse environmental impact than the proposed project.

4. By-Passing

a. The by-passing of untreated wastes* containing concentrations of pollutants in excess of those of Table 2 or Table 1 to the ocean* is prohibited.

5. Vessels

a. Discharges of hazardous waste (as defined in California Health and Safety Code section 25117 et seq. [but not including sewage]), oily bilgewater, medical waste (as defined in section 117600 et seq. of the California Health and Safety Code) dry-cleaning waste, and film-processing waste from large passenger vessels and oceangoing vessels are prohibited.

* See Appendix I for definition of terms.

b. Discharges of graywater* and sewage* from large passenger vessels are prohibited.

c. Discharges of sewage and sewage sludge from vessels are prohibited in No Discharge Zones promulgated by U.S. EPA.

J. State Board Exceptions to Plan Requirements

1. The State Water Board may, in compliance with the California Environmental Quality Act, subsequent to a public hearing, and with the concurrence of the Environmental Protection Agency, grant exceptions where the Board determines:

   a. The exception will not compromise protection of ocean* waters for beneficial uses, and,

   b. The public interest will be served.

2. All exceptions issued by the State Water Board and in effect at the time of the Triennial Review will be reviewed at that time. If there is sufficient cause to re-open or revoke any exception, the State Water Board may direct staff to prepare a report and to schedule a public hearing. If after the public hearing the State Water Board decides to re-open, revoke, or re-issue a particular exception, it may do so at that time.

K. Implementation Provisions for Vessel Discharges

1. Vessel discharges must comply with State Lands Commission (SLC) requirements for ballast water discharges and hull fouling to control and prevent the introduction of non-indigenous species, found in the Public Resources Code sections 71200 et seq. and title 2, California Code of Regulations, section 22700 et. seq.

2. Discharges incidental to the normal operation large passenger vessels and ocean-going vessels must be covered and comply with an individual or general NPDES permit.

3. Vessel discharges must not result in violations of water quality objectives in this plan.

4. Vessels subject to the federal NPDES Vessel General Permit (VGP) which are not large passenger vessels must follow the best management practices for graywater* as required in the VGP, including the use of only those cleaning agents (e.g., soaps and detergents) that are phosphate-free, non-toxic, and non-bioaccumulative.

* See Appendix I for definition of terms.

APPENDIX I
DEFINITION OF TERMS

ACUTE TOXICITY

a. Acute Toxicity (TUa)

Expressed in Toxic Units Acute (TUa)

$$TUa = \frac{100}{96\text{-hr LC } 50\%}$$

b. Lethal Concentration 50% (LC 50)

LC 50 (percent waste giving 50% survival of test organisms) shall be determined by static or continuous flow bioassay techniques using standard marine test species as specified in Appendix III. If specific identifiable substances in wastewater can be demonstrated by the discharger as being rapidly rendered harmless upon discharge to the marine environment, but not as a result of dilution, the LC 50 may be determined after the test samples are adjusted to remove the influence of those substances.

When it is not possible to measure the 96-hour LC 50 due to greater than 50 percent survival of the test species in 100 percent waste, the toxicity concentration shall be calculated by the expression:

$$TUa = \frac{\log (100 - S)}{1.7}$$

where:

S = percentage survival in 100% waste. If S > 99, TUa shall be reported as zero.

AREAS OF SPECIAL BIOLOGICAL SIGNIFICANCE (ASBS) are those areas designated by the State Water Board as ocean areas requiring protection of species or biological communities to the extent that maintenance of natural water quality is assured. All Areas of Special Biological Significance are also classified as a subset of STATE WATER QUALITY PROTECTION AREAS. ASBS are also referred to as State Water Quality Protection Areas – Areas of Special Biological Significance (SWQPA-ASBS).

CHLORDANE shall mean the sum of chlordane-alpha, chlordane-gamma, chlordene-alpha, chlordene-gamma, nonachlor-alpha, nonachlor-gamma, and oxychlordane.

CHRONIC TOXICITY: This parameter shall be used to measure the acceptability of waters for supporting a healthy marine biota until improved methods are developed to evaluate biological response.

a. Chronic Toxicity (TUc)

Expressed as Toxic Units Chronic (TUc)

* See Appendix I for definition of terms.

$$TUc = \frac{100}{NOEL}$$

b. No Observed Effect Level (NOEL)

The NOEL is expressed as the maximum percent effluent or receiving water* that causes no observable effect on a test organism, as determined by the result of a critical life stage toxicity test listed in Appendix III, Table III-1.

DDT shall mean the sum of 4,4'DDT, 2,4'DDT, 4,4'DDE, 2,4'DDE, 4,4'DDD, and 2,4'DDD.

DEGRADE: Degradation shall be determined by comparison of the waste field and reference site(s) for characteristic species diversity, population density, contamination, growth anomalies, debility, or supplanting of normal species by undesirable plant and animal species. Degradation occurs if there are significant differences in any of three major biotic groups, namely, demersal fish, benthic invertebrates, or attached algae. Other groups may be evaluated where benthic species are not affected, or are not the only ones affected.

DICHLOROBENZENES shall mean the sum of 1,2- and 1,3-dichlorobenzene.

DOWNSTREAM OCEAN WATERS shall mean waters downstream with respect to ocean currents.

DREDGED MATERIAL: Any material excavated or dredged from the navigable waters of the United States, including material otherwise referred to as "spoil".

ENCLOSED BAYS are indentations along the coast which enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between headlands or outermost harbor works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. This definition includes but is not limited to: Humboldt Bay, Bodega Harbor, Tomales Bay, Drakes Estero, San Francisco Bay, Morro Bay, Los Angeles Harbor, Upper and Lower Newport Bay, Mission Bay, and San Diego Bay.

ENDOSULFAN shall mean the sum of endosulfan-alpha and -beta and endosulfan sulfate.

ESTUARIES AND COASTAL LAGOONS are waters at the mouths of streams that serve as mixing zones for fresh and ocean waters during a major portion of the year. Mouths of streams that are temporarily separated from the ocean by sandbars shall be considered as estuaries. Estuarine waters will generally be considered to extend from a bay or the open ocean to the upstream limit of tidal action but may be considered to extend seaward if significant mixing of fresh and salt water occurs in the open coastal waters. The waters described by this definition include but are not limited to the Sacramento-San Joaquin Delta as defined by Section 12220 of the California Water Code, Suisun Bay, Carquinez Strait downstream to Carquinez Bridge, and appropriate areas of the Smith, Klamath, Mad, Eel, Noyo, and Russian Rivers.

GRAYWATER is drainage from galley, dishwasher, shower, laundry, bath, and lavatory wash basin sinks, and water fountains, but does not include drainage from toilets, urinals, hospitals, or cargo spaces.

* See Appendix I for definition of terms.

HALOMETHANES shall mean the sum of bromoform, bromomethane (methyl bromide) and chloromethane (methyl chloride).

HCH shall mean the sum of the alpha, beta, gamma (lindane) and delta isomers of hexachlorocyclohexane.

INDICATOR BACTERIA includes total coliform bacteria, fecal coliform bacteria (or *E. coli*), and/or Enterococcus bacteria.

INITIAL DILUTION is the process which results in the rapid and irreversible turbulent mixing of wastewater with ocean water around the point of discharge.

For a submerged buoyant discharge, characteristic of most municipal and industrial wastes that are released from the submarine outfalls, the momentum of the discharge and its initial buoyancy act together to produce turbulent mixing. Initial dilution in this case is completed when the diluting wastewater ceases to rise in the water column and first begins to spread horizontally.

For shallow water submerged discharges, surface discharges, and nonbuoyant discharges, characteristic of cooling water wastes and some individual discharges, turbulent mixing results primarily from the momentum of discharge. Initial dilution, in these cases, is considered to be completed when the momentum induced velocity of the discharge ceases to produce significant mixing of the waste, or the diluting plume reaches a fixed distance from the discharge to be specified by the Regional Board, whichever results in the lower estimate for initial dilution.

KELP BEDS, for purposes of the bacteriological standards of this plan, are significant aggregations of marine algae of the genera Macrocystis and Nereocystis. Kelp beds include the total foliage canopy of Macrocystis and Nereocystis plants throughout the water column.

LARGE PASSENGER VESSELS are vessels of 300 gross registered tons or greater engaged in carrying passengers for hire. The following vessels are not large passenger vessels:
(1) Vessels without berths or overnight accommodations for passengers;
(2) Noncommercial vessels, warships, vessels operated by nonprofit entities as determined by the Internal Revenue Service, and vessels operated by the state, the United States, or a foreign government;
(3) Oceangoing vessels, as defined below (e.g. those used to transport cargo).

MARICULTURE is the culture of plants and animals in marine waters independent of any pollution source.

MARINE MANAGED AREAS are named, discrete geographic marine or estuarine areas along the California coast designated by law or administrative action, and intended to protect, conserve, or otherwise manage a variety of resources and their uses. According to the California Public Resources Code (sections 36600 et. seq.) there are six classifications of marine managed areas, including State Marine Reserves, State Marine Parks and State Marine Conservation Areas, State Marine Cultural Preservation Areas, State Marine Recreational Management Areas, and State Water Quality Protection Areas.

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* See Appendix I for definition of terms.

MATERIAL: (a) In common usage: (1) the substance or substances of which a thing is made or composed (2) substantial; (b) For purposes of this Ocean Plan relating to waste disposal, dredging and the disposal of dredged material and fill, MATERIAL means matter of any kind or description which is subject to regulation as waste, or any material dredged from the navigable waters of the United States. See also, DREDGED MATERIAL.

MDL (Method Detection Limit) is the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero, as defined in 40 CFR PART 136 Appendix B.

MINIMUM LEVEL (ML) is the concentrations at which the entire analytical system must give a recognizable signal and acceptable calibration point. The ML is the concentration in a sample that is equivalent to the concentration of the lowest calibration standard analyzed by a specific analytical procedure, assuming that all the method-specified sample weights, volumes and processing steps have been followed.

NATURAL LIGHT: Reduction of natural light may be determined by the Regional Board by measurement of light transmissivity or total irradiance, or both, according to the monitoring needs of the Regional Board.

NO DISCHARGE ZONE (NDZ) is an area in which both treated and untreated sewage discharges from vessels are prohibited. Within NDZ boundaries, vessel operators are required to retain their sewage discharges onboard for disposal at sea (beyond three miles from shore) or onshore at a pump-out facility.

NON-STORM WATER DISCHARGE is any runoff that is not the result of a precipitation event. This is often referred to as “dry weather flow.”

OCEAN WATERS are the territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. If a discharge outside the territorial waters of the State could affect the quality of the waters of the State, the discharge may be regulated to assure no violation of the Ocean Plan will occur in ocean waters.

OCEANGOING VESSELS (i.e., oceangoing ships) means commercial vessels of 300 gross registered tons or more calling on California ports or places, excluding active military vessels.

OILY BILGE WATER includes bilge water that contains used lubrication oils, oil sludge and slops, fuel and oil sludge, used oil, used fuel and fuel filters, and oily waste.

PAHs (polynuclear aromatic hydrocarbons) shall mean the sum of acenaphthylene, anthracene, 1,2-benzanthracene, 3,4-benzofluoranthene, benzo[k]fluoranthene, 1,12-benzoperylene, benzo[a]pyrene, chrysene, dibenzo[ah]anthracene, fluorene, indeno[1,2,3-cd]pyrene, phenanthrene and pyrene.

PCBs (polychlorinated biphenyls) shall mean the sum of chlorinated biphenyls whose analytical characteristics resemble those of Aroclor-1016, Aroclor-1221, Aroclor-1232, Aroclor-1242, Aroclor-1248, Aroclor-1254 and Aroclor-1260.

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* See Appendix I for definition of terms.

PERMITTING AUTHORITY means the State Water Board or Regional Water Board, whichever issues the permit.

RECEIVING WATER, for permitted storm water discharges and nonpoint sources, should be measured at the point of discharge(s), in the surf zone immediately where runoff from an outfall meets the ocean water (a.k.a., at point zero).

SHELLFISH are organisms identified by the California Department of Public Health as shellfish for public health purposes (i.e., mussels, clams and oysters).

SIGNIFICANT difference is defined as a statistically significant difference in the means of two distributions of sampling results at the 95 percent confidence level.

STATE WATER QUALITY PROTECTION AREAS (SWQPAs) are nonterrestrial marine or estuarine areas designated to protect marine species or biological communities from an undesirable alteration in natural water quality. All Areas of Special Biological Significance (ASBS) that were previously designated by the State Water Board in Resolutions 74-28, 74-32, and 75-61 are now also classified as a subset of State Water Quality Protection Areas and require special protections afforded by this Plan.

STATE WATER QUALITY PROTECTION AREAS – GENERAL PROTECTION (SWQPA-GP) designated by the State Water Board to protect marine species and biological communities from an undesirable alteration in natural water quality within State Marine Parks and State Marine Conservation Areas.

TCDD EQUIVALENTS shall mean the sum of the concentrations of chlorinated dibenzodioxins (2,3,7,8-CDDs) and chlorinated dibenzofurans (2,3,7,8-CDFs) multiplied by their respective toxicity factors, as shown in the table below.

Isomer Group	Toxicity Equivalence Factor
2,3,7,8-tetra CDD	1.0
2,3,7,8-penta CDD	0.5
2,3,7,8-hexa CDDs	0.1
2,3,7,8-hepta CDD	0.01
octa CDD	0.001
2,3,7,8 tetra CDF	0.1
1,2,3,7,8 penta CDF	0.05
2,3,4,7,8 penta CDF	0.5
2,3,7,8 hexa CDFs	0.1
2,3,7,8 hepta CDFs	0.01
octa CDF	0.001

WASTE: As used in this Plan, waste includes a discharger's total discharge, of whatever origin, i.e., gross, not net, discharge.

* See Appendix I for definition of terms.

WATER RECLAMATION: The treatment of wastewater to render it suitable for reuse, the transportation of treated wastewater to the place of use, and the actual use of treated wastewater for a direct beneficial use or controlled use that would not otherwise occur.

* See Appendix I for definition of terms.

APPENDIX II
MINIMUM* LEVELS

The Minimum* Levels identified in this appendix represent the lowest concentration of a pollutant that can be quantitatively measured in a sample given the current state of performance in analytical chemistry methods in California. These Minimum* Levels were derived from data provided by state-certified analytical laboratories in 1997 and 1998 for pollutants regulated by the California Ocean Plan and shall be used until new values are adopted by the State Water Board. There are four major chemical groupings: volatile chemicals, semi-volatile chemicals, inorganics, pesticides & PCB's. "No Data" is indicated by "--".

TABLE II-1
MINIMUM* LEVELS – VOLATILE CHEMICALS

		Minimum* Level (µg/L)	
Volatile Chemicals	**CAS Number**	**GC Method [a]**	**GCMS Method [b]**
Acrolein	107028	2.	5
Acrylonitrile	107131	2.	2
Benzene	71432	0.5	2
Bromoform	75252	0.5	2
Carbon Tetrachloride	56235	0.5	2
Chlorobenzene	108907	0.5	2
Chlorodibromomethane	124481	0.5	2
Chloroform	67663	0.5	2
1,2-Dichlorobenzene (volatile)	95501	0.5	2
1,3-Dichlorobenzene (volatile)	541731	0.5	2
1,4-Dichlorobenzene (volatile)	106467	0.5	2
Dichlorobromomethane	75274	0.5	2
1,1-Dichloroethane	75343	0.5	1
1,2-Dichloroethane	107062	0.5	2
1,1-Dichloroethylene	75354	0.5	2
Dichloromethane	75092	0.5	2
1,3-Dichloropropene (volatile)	542756	0.5	2
Ethyl benzene	100414	0.5	2
Methyl Bromide	74839	1.	2
Methyl Chloride	74873	0.5	2
1,1,2,2-Tetrachloroethane	79345	0.5	2
Tetrachloroethylene	127184	0.5	2
Toluene	108883	0.5	2
1,1,1-Trichloroethane	71556	0.5	2
1,1,2-Trichloroethane	79005	0.5	2
Trichloroethylene	79016	0.5	2
Vinyl Chloride	75014	0.5	2

Table II-1 Notes

a) GC Method = Gas Chromatography
b) GCMS Method = Gas Chromatography / Mass Spectrometry
* To determine the lowest standard concentration in an instrument calibration curve for these techniques, use the given ML (see Chapter III, "Use of Minimum* Levels").

* See Appendix I for definition of terms.

TABLE II-2
MINIMUM* LEVELS – SEMI VOLATILE CHEMICALS

Semi-Volatile Chemicals	CAS Number	Minimum* Level (µg/L) GC Method [a, *]	GCMS Method [b, *]	HPLC Method [c,*]	COLOR Method [d]
Acenapthylene	208968	--	10	0.2	--
Anthracene	120127	--	10	2	--
Benzidine	92875	--	5	--	--
Benzo(a)anthracene	56553	--	10	2	--
Benzo(a)pyrene	50328	--	10	2	--
Benzo(b)fluoranthene	205992	--	10	10	--
Benzo(g,h,i)perylene	191242	--	5	0.1	--
Benzo(k)floranthene	207089	--	10	2	--
Bis 2-(1-Chloroethoxy) methane	111911	--	5	--	--
Bis(2-Chloroethyl)ether	111444	10	1	--	--
Bis(2-Chloroisopropyl)ether	39638329	10	2	--	--
Bis(2-Ethylhexyl) phthalate	117817	10	5	--	--
2-Chlorophenol	95578	2	5	--	--
Chrysene	218019	--	10	5	--
Di-n-butyl phthalate	84742	--	10	--	--
Dibenzo(a,h)anthracene	53703	--	10	0.1	--
1,2-Dichlorobenzene (semivolatile)	95504	2	2	--	--
1,3-Dichlorobenzene (semivolatile)	541731	2	1	--	--
1,4-Dichlorobenzene (semivolatile)	106467	2	1	--	--
3,3-Dichlorobenzidine	91941	--	5	--	--
2,4-Dichlorophenol	120832	1	5	--	--
1,3-Dichloropropene	542756	--	5	--	
Diethyl phthalate	84662	10	2	--	--
Dimethyl phthalate	131113	10	2	--	--
2,4-Dimethylphenol	105679	1	2	--	--
2,4-Dinitrophenol	51285	5	5	--	--
2,4-Dinitrotoluene	121142	10	5	--	--
1,2-Diphenylhydrazine	122667	--	1	--	--
Fluoranthene	206440	10	1	0.05	--
Fluorene	86737	--	10	0.1	--
Hexachlorobenzene	118741	5	1	--	--
Hexachlorobutadiene	87683	5	1	--	--
Hexachlorocyclopentadiene	77474	5	5	--	--

Table II-2 continued on next page…

* See Appendix I for definition of terms.

Table II-2 (Continued)
Minimum* Levels – Semi Volatile Chemicals

Semi-Volatile Chemicals	CAS Number	Minimum* Level (µg/L) GC Method [a, *]	GCMS Method [b, *]	HPLC Method [c,*]	COLOR Method [d]
Hexachloroethane	67721	5	1	--	--
Indeno(1,2,3-cd)pyrene	193395	--	10	0.05	--
Isophorone	78591	10	1	--	--
2-methyl-4,6-dinitrophenol	534521	10	5	--	--
3-methyl-4-chlorophenol	59507	5	1	--	--
N-nitrosodi-n-propylamine	621647	10	5	--	--
N-nitrosodimethylamine	62759	10	5	--	--
N-nitrosodiphenylamine	86306	10	1	--	--
Nitrobenzene	98953	10	1	--	--
2-Nitrophenol	88755	--	10	--	--
4-Nitrophenol	100027	5	10	--	--
Pentachlorophenol	87865	1	5	--	--
Phenanthrene	85018	--	5	0.05	--
Phenol	108952	1	1	--	50
Pyrene	129000	--	10	0.05	--
2,4,6-Trichlorophenol	88062	10	10	--	--

Table II-2 Notes:

a) GC Method = Gas Chromatography
b) GCMS Method = Gas Chromatography / Mass Spectrometry
c) HPLC Method = High Pressure Liquid Chromatography
d) COLOR Method = Colorimetric

* To determine the lowest standard concentration in an instrument calibration curve for this technique, multiply the given ML by 1000 (see Chapter III, “Use of Minimum* Levels”).

* See Appendix I for definition of terms.

TABLE II-3
MINIMUM* LEVELS - INORGANICS

Inorganic Substances	CAS Number	Minimum* Level (µg/L) COLOR Method[a]	DCP Method[b]	FAA Method[c]	GFAA Method[d]	HYDRIDE Method[e]	ICP Method[f]	ICPMS Method[g]	SPGFAA Method[h]	CVAA Method[i]
Antimony	7440360	--	1000.	10.	5.	0.5	50.	0.5	5.	--
Arsenic	7440382	20.	1000.	--	2.	1.	10.	2.	2.	--
Beryllium	7440417	--	1000.	20.	0.5	--	2.	0.5	1.	--
Cadmium	7440439	--	1000.	10.	0.5	--	10.	0.2	0.5	--
Chromium (total)	--	--	1000.	50.	2.	--	10.	0.5	1.	--
Chromium (VI)	18540299	10.	--	5.	--	--	--	--	--	--
Copper	7440508	--	1000.	20.	5.	--	10.	0.5	2.	--
Cyanide	57125	5.	--	--	--	--	--	--	--	--
Lead	7439921	--	10000.	20.	5.	--	5.	0.5	2.	--
Mercury	7439976	--	--	--	--	--	--	0.5	--	0.2
Nickel	7440020	--	1000.	50.	5.	--	20.	1.	5.	--
Selenium	7782492	--	1000.	--	5.	1.	10.	2.	5.	--
Silver	7440224	--	1000.	10.	1.	--	10.	0.2	2.	--
Thallium	7440280	--	1000.	10.	2.	--	10.	1.	5.	--
Zinc	7440666	--	1000.	20.	--	--	20.	1.	10.	--

Table II-3 Notes

a) COLOR Method = Colorimetric
b) DCP Method = Direct Current Plasma
c) FAA Method = Flame Atomic Absorption
d) GFAA Method = Graphite Furnace Atomic Absorption
e) HYDRIDE Method = Gaseous Hydride Atomic Absorption
f) ICP Method = Inductively Coupled Plasma
g) ICPMS Method = Inductively Coupled Plasma / Mass Spectrometry
h) SPGFAA Method = Stabilized Platform Graphite Furnace Atomic Absorption (i.e., US EPA 200.9)
i) CVAA Method = Cold Vapor Atomic Absorption

* To determine the lowest standard concentration in an instrument calibration curve for these techniques, use the given ML (see Chapter III, "Use of Minimum* Levels").

* See Appendix I for definition of terms.

TABLE II-4
MINIMUM* LEVELS – PESTICIDES AND PCBs*

Pesticides – PCB's	CAS Number	Minimum* Level (µg/L) GC Method[a,*]
Aldrin	309002	0.005
Chlordane	57749	0.1
4,4'-DDD	72548	0.05
4,4'-DDE	72559	0.05
4,4'-DDT	50293	0.01
Dieldrin	60571	0.01
a-Endosulfan	959988	0.02
b-Endosulfan	33213659	0.01
Endosulfan Sulfate	1031078	0.05
Endrin	72208	0.01
Heptachlor	76448	0.01
Heptachlor Epoxide	1024573	0.01
a-Hexachlorocyclohexane	319846	0.01
b-Hexachlorocyclohexane	319857	0.005
d-Hexachlorocyclohexane	319868	0.005
g-Hexachlorocyclohexane (Lindane)	58899	0.02
PCB 1016	--	0.5
PCB 1221	--	0.5
PCB 1232	--	0.5
PCB 1242	--	0.5
PCB 1248	--	0.5
PCB 1254	--	0.5
PCB 1260	--	0.5
Toxaphene	8001352	0.5

Table II-4 Notes

a) GC Method = Gas Chromatography

* To determine the lowest standard concentration in an instrument calibration curve for this technique, multiply the given ML by 100 (see Chapter III, “Use of Minimum* Levels”).

* See Appendix I for definition of terms.

APPENDIX III
STANDARD MONITORING PROCEDURES

1. INTRODUCTION

The purpose of this appendix is to provide guidance to the Regional Water Boards on implementing the Ocean Plan and to ensure the reporting of useful information. Monitoring should be question driven rather than just gathering data and should be focused on assuring compliance with narrative and numeric water quality standards, the status and attainment of beneficial uses, and identifying sources of pollution.

It is not feasible to prescribe requirements in the Ocean Plan that encompass all circumstances and conditions that could be encountered by all dischargers, nor is it desirable to limit the flexibility of the Regional Water Boards in the monitoring of ocean waters. This appendix should therefore be considered the basic framework for the design of an ocean discharger monitoring program. The Regional Water Boards are responsible for issuing monitoring and reporting programs (MRPs) that will implement this monitoring guidance. Regional Water Boards can deviate from the procedures required in the appendix only with the approval of the State Water Resources Control Board.

This monitoring guidance utilizes a model monitoring framework. The model monitoring framework has three components that comprise a range of spatial and temporal scales: (1) core monitoring, (2) regional monitoring, and (3) special studies.

1) Core monitoring consists of the basic site-specific monitoring necessary to measure compliance with individual effluent limits and/or impacts to receiving water* quality. Core monitoring is typically conducted in the immediate vicinity of the discharge by examining local scale spatial effects.

2) Regional monitoring provides information necessary to make assessments over large areas and serves to evaluate cumulative effects of all anthropogenic inputs. Regional monitoring data also assists in the interpretation of core monitoring studies. It is recommended that the Regional Water Boards require participation by the discharger in an approved regional monitoring program, if available, for the receiving water*. In the event that a regional monitoring effort takes place during a permit cycle in which the MRP does not specifically address regional monitoring, a Regional Water Board may allow relief from aspects of core monitoring components in order to encourage participation.

3) Special studies are directed monitoring efforts designed in response to specific management or research questions identified through either core or regional monitoring programs. Often they are used to help understand core or regional monitoring results, where a specific environmental process is not well understood, or to address unique issues of local importance. Regional Water Boards may require special studies as appropriate. Special studies are not addressed further in this guidance because they are beyond its scope.

The Ocean Plan does not address all site-specific monitoring issues and allows the Regional Water Boards to select alternative protocols with the approval of the State Water Board. If no direction is given in this appendix for a specific provision of the Ocean Plan, it is within the

* See Appendix I for definition of terms.

discretion of the Regional Water Boards to establish the monitoring requirements for that provision.

2. QUALITY ASSURANCE

All receiving and ambient water monitoring conducted in compliance with MRPs must be comparable with the Quality Assurance requirements of the Surface Water Ambient Monitoring Program (SWAMP).

SWAMP comparable means all sample collection and analyses shall meet or exceed the measurement quality objectives (MQOs) – including all sample types, frequencies, control limits and holding time requirements – as specified in the SWAMP Quality Assurance Project Plan (QAPrP)

The SWAMP QAPrP is located at:
http://www.waterboards.ca.gov/water_issues/programs/swamp/tools.shtml#qa.

For those measurements that do not have SWAMP MQOs available, then MQOs shall be at the discretion of the Regional Water Board. Refer to the USEPA guidance document (EPA QA/G-4) for selecting data quality objectives, located at http://www.epa.gov/quality/qs-docs/g4-final.pdf.

Water Quality data must be reported according to the California Environmental Data Exchange Network (CEDEN) "Data Template" format for all constituents that are monitored in receiving and ambient water. CEDEN Data Template are available at: http://ceden.org.

3. TYPE OF WASTE DISCHARGE SOURCES

Discharges to ocean waters are highly diverse and variable, exhibiting a wide range of constituents, effluent quality and quantity, location and frequency of discharge. Different types of discharges will require different approaches. This Appendix provides specific direction for three broad types of discharges: (1) Point Sources, (2) Storm Water Point Sources and (3) Non-point Sources.

3.1. Point Sources

Industrial, municipal, marine laboratory and other traditional point sources of pollution that discharge wastewater directly to surface waters and are required to obtain NPDES permits.

3.2. Storm Water Point Sources

Storm Water Point Sources, hereafter referred to as Storm Water Sources, are those NPDES permitted discharges regulated by Construction or Industrial Storm Water General Permits or municipal separate storm sewer system (MS4s) Permits. MS4 Permits are further divided into Phase I and II Permits. A Phase I MS4 Permit is issued by a Regional Water Board for medium (serving between 100,000 and 250,000 people) and large (serving 250,000 or more people) municipalities. A Phase II MS4 General Permit is issued by the State Water Resources Control Board for the discharge of storm water for smaller municipalities, and includes nontraditional Small MS4s, which are governmental facilities such as military bases, public campuses, prison and hospital complexes.

* See Appendix I for definition of terms.

3.3. Non-point Sources

A Non-point Point Source is any source of pollutants that is not a Point Source described in Section 3.1 or a Storm Water Point Source as described in Section 3.2. Land use categories contributing to non-point sources include but are not limited to:

a. Agriculture
b. Grazing
c. Forestry/timber harvest
d. Urban not covered under an NPDES permit
e. Marinas and mooring fields
f. Golf Courses not covered under an NPDES Permit

Only agricultural and golf course related non-point source discharge monitoring is addressed in this Appendix, but Regional Water Boards may issue MRPs for other non-point sources at their discretion. Agriculture includes irrigated lands. Irrigated lands are where water is applied for the purpose of producing crops, including, but not limited to, row and field crop, orchards, vineyard, rice production, nurseries, irrigated pastures, and managed wetlands.

4. INDICATOR BACTERIA*

4.1. Point Sources

Primary questions to be addressed:

1. Does the effluent comply with the water quality standards in the receiving water*?
2. Does the sewage effluent reach water contact zones or commercial shellfish beds?

To answer these questions, core monitoring shall be conducted in receiving water* on the shoreline for the indicator bacteria* at a minimum weekly for any point sources discharging treated sewage effluent:

a. within one nautical mile of shore, or
b. within one nautical mile of a commercial shellfish bed, or
c. if the discharge is in excess of 10 million gallons per day (MGD).

Alternatively, these requirements may be met through participation in a regional monitoring program to assess the status of marine contact recreation water quality. If the permittee participates in a regional monitoring program, in conjunction with local health organization(s), core monitoring may be suspended for that period at the discretion of the Regional Water Board. Regional monitoring should be used to answer the above questions, and may be used to answer additional questions. These additional questions may include, but are not limited to, questions regarding the extent and magnitude of current or potential receiving water* indicator bacteria* problems, or the sources of indicator bacteria.

4.2. Storm Water

* See Appendix I for definition of terms.

Primary questions to be addressed:

1. Does the receiving water* comply with water quality standards?
2. Is the condition of the receiving water* protective of contact recreation and shellfish harvesting beneficial uses?
3. Are the indicator bacteria levels in receiving water* getting better or worse?
4. What is the relative contribution of indicator bacteria to the receiving water* from storm water runoff?

To answer these questions, core monitoring for indicator bacteria* shall be required periodically for storm water discharges representative of the area of concern. At a minimum, for municipal storm water discharges, all receiving water* at outfalls greater than 36 inches in diameter or width must be monitored (ankle depth, point zero) at the following frequencies:

a. During wet weather with a minimum of three storms per year, and
b. When non-storm water discharges* occur (flowing during dry weather), and if located at an AB 411 beach, at least weekly. (An AB 411 Beach is defined as a beach visited by more than 50,000 people annually and located on an area adjacent to a storm drain that flows in the summer. (Health & Saf. Code § 115880.)).

Regional Water Boards may waive monitoring once structural best management practices have been installed, evaluated and determined to have successfully controlled indicator bacteria.

Alternatively, these requirements may be met through participation in a regional monitoring program to assess the status of marine contact recreation water quality. If the permittee participates in a regional monitoring program, in conjunction with local health organization(s), core monitoring may be suspended for that period at the discretion of the Regional Water Board. Regional monitoring should be used to answer the above questions, and may be used to answer additional questions. These additional questions may include, but are not limited to, questions regarding the extent and magnitude of current or potential receiving water* indicator bacteria problems, or the sources of indicator bacteria*.

4.3. Non-point Sources

Primary questions to be addressed:

1. Does the receiving water* comply with water quality standards?
2. Do agricultural and golf course non-point source discharges reach water contact or shellfish harvesting zones?
3. Are the indicator bacteria levels in receiving water* getting better or worse?
4. What is the relative contribution of indicator bacteria* to the receiving water* from agricultural and golf course non-point sources?

To answer these questions, core monitoring of representative agricultural irrigation tail water and storm water runoff, at a minimum, will be conducted in receiving water* (ankle depth, point zero) for indicator bacteria:

a. During wet weather, at a minimum of two storm events per year, and
b. When non-storm water discharges* occur (flowing during dry weather), and if located at an AB 411 beach or within one nautical mile of shellfish bed, at least weekly.

* See Appendix I for definition of terms.

Alternatively, these requirements may be met through participation in a regional monitoring program to assess the status of marine contact recreation water quality. If the discharger participates in a regional monitoring program, in conjunction with local health organization(s), core monitoring may be suspended for that period at the discretion of the Regional Water Board. Regional monitoring should be used to answer the above questions, and may be used to answer additional questions. These additional questions may include, but are not limited to, questions regarding the extent and magnitude of current or potential receiving water* indicator bacteria problems, or the sources of indicator bacteria*.

5. CHEMICAL CONSTITUENTS

5.1. Point Sources

Primary questions addressed:

1. Does the effluent meet permit effluent limits thereby ensuring that water quality standards are achieved in the receiving water*?
2. What is the mass of the constituents that are discharged annually?
3. Is the effluent concentration or mass changing over time?

Consistent with Appendix VI, the core monitoring for the substances in Table 1 and Table 2 shall be required periodically. For discharges less than 10 MGD, the monitoring frequency shall be at least one complete scan of the Table 1 substances annually. Discharges greater than 10 MGD shall be required to monitor at least semiannually.

5.2. Storm Water

Primary questions addressed:

1. Does the receiving water* meet the water quality standards?
2. Are the conditions in receiving water* getting better or worse?
3. What is the relative runoff contribution to pollution in the receiving water*?

For Phase I and Phase II MS4 dischargers, core receiving water* monitoring will be required at a minimum for 10 percent of all outfalls greater than 36 inches in diameter or width once per year. If a discharger has less than five outfalls exceeding 36 inches in diameter or width, they shall conduct monitoring at a minimum of only once per outfall during a five year period. Monitoring shall be for total suspended solids, oil & grease, total organic carbon, pH, temperature, biochemical oxygen demand, turbidity, Table 1 metals, PAHs*, and pesticides determined by the Regional Water Boards. Regional Water Boards may waive monitoring once structural best management practices have been installed, evaluated and determined to have successfully controlled pollutants.

For industrial storm water discharges, runoff monitoring must be conducted at all outfalls at least two storm events per year. In addition, at least one representative receiving water* sample must be collected per industrial storm water permittee during two storm events per year. Monitoring shall be conducted for total suspended solids, oil & grease, total organic carbon, pH, temperature, biochemical oxygen demand, turbidity, and Table 1 metals and PAHs*.

* See Appendix I for definition of terms.

The requirements for individual core monitoring for Table 1 metals, PAHs* and pesticides may be waived at the discretion of the Regional Water Board, if the permittee participates in a regional program for monitoring runoff and/or receiving water* to answer the above questions as well as additional questions. Additional questions may include, but are not limited to, questions regarding the extent and magnitude of current or potential receiving water* problems from storm water runoff, or sources of any runoff pollutants.

5.3. Non-point Sources

The primary questions are:

1. Does the agricultural or golf course runoff meet water quality standards in the receiving water*?
2. Are nutrients present that would contribute to objectionable aquatic algal blooms or degrade indigenous biota?
3. Are the conditions in receiving water* getting better or worse?
4. What is the relative agricultural runoff or golf course contribution to pollution in the receiving water*?

To answer these questions, a statistically representative sample (determined by the Regional Water Board) of receiving water at the sites of agricultural irrigation tail water and storm water runoff, and golf course runoff in each watershed will be monitored for Ocean Plan Table 1 metals, ammonia as N, nitrate as N, phosphate as P, and pesticides determined by the Regional Board:

a. During wet weather, at a minimum of two storm events per year, and
b. During dry weather, when flowing, at a frequency determined by the Regional Boards.

This requirement may be satisfied by core monitoring individually, or through participation in a regional program for monitoring runoff and receiving water* at the discretion of the Regional Water Board to answer the above questions as well as additional questions. Additional questions may include, but are not limited to, questions regarding the sources of agricultural pollutants.

6. SEDIMENT MONITORING

All Sources:

1. Is the dissolved sulfide concentration of waters in sediments significantly increased above that present under natural conditions?
2. Is the concentration of substances set forth in Table 1, for protection of marine aquatic life, in marine sediments at levels which would degrade the benthic community?
3. Is the concentration of organic pollutants in marine sediments at levels that would degrade the benthic community?

6.1. Point Sources

For discharges greater than 10 MGD, acid volatile sulfides, OP Pesticides, Table 1 metals, ammonia N, PAHs*, and chlorinated hydrocarbons will be measured in sediments annually in a core monitoring program approved by the Regional Water Board. Sediment sample locations will be determined by the Regional Water Board. If sufficient data exists from previous water

* See Appendix I for definition of terms.

column monitoring for these parameters, the Regional Water Board at its discretion may reduce the frequency of monitoring, or may allow this requirement to be satisfied through participation in a regional monitoring program.

6.2. Storm Water

For Phase I MS4 permittees, discharges greater than 72 inches in diameter or width discharging to low energy coastal environments with the likelihood of sediment deposition, acid volatile sulfides, OP Pesticides, Ocean Plan Table 1 metals, ammonia N, PAHs*, and chlorinated hydrocarbons will be measured in sediments once per permit cycle.

Regional Water Boards may waive monitoring once structural best management practices have been installed, evaluated and determined to have successfully controlled pollutants.

This requirement may be satisfied by core monitoring individually or through participation in a regional monitoring program at the discretion of the Regional Water Board. Sediment sample locations will be determined by the Regional Water Board.

7. AQUATIC LIFE TOXICITY

Toxicity tests are another method used to assess risk to aquatic life. These tests assess the overall toxicity of the effluent, including the toxicity of unmeasured constituents and/or synergistic effects of multiple constituents.

7.1. Point Sources

1. Does the effluent meet permit effluent limits for toxicity thereby ensuring that water quality standards are achieved in the receiving water*?
2. If not:
   a. Are unmeasured pollutants causing risk to aquatic life?
   b. Are pollutants in combinations causing risk to aquatic life?

Core monitoring for Table 1 effluent toxicity shall be required periodically. For discharges less than 0.1 MGD the monitoring frequency for acute and/or chronic toxicity shall be twice per permit cycle. For discharges between 0.1 and 10 MGD, the monitoring frequency for acute and/or chronic toxicity of the effluent should be at least annually. For discharges greater than 10 MGD, the monitoring frequency for acute and/or chronic toxicity of the effluent should be at least semiannually.

For discharges greater than 10 MGD in a low energy coastal environment with the likelihood of sediment deposition, Core monitoring for acute sediment toxicity is required and will utilize alternative amphipod species (*Eohaustorius estuarius, Leptocheirus plumulosus, Rhepoxynius abronius*).

If an exceedance is detected, six additional toxicity tests are required within a 12-week period. If an additional exceedance is detected within the 12-week period, a toxicity reduction evaluation (TRE) is required, consistent with Section III.C.10. which requires a TRE if a discharge consistently exceeds an effluent limitation based on a toxicity objective in Table 1.

* See Appendix I for definition of terms.

7.2. Storm Water

1. Does the runoff meet objectives for toxicity in the receiving water*?
2. Are the conditions in receiving water* getting better or worse with regard to toxicity
3. What is the relative runoff contribution to the receiving water* toxicity?
4. What are the causes of the toxicity and the sources of the constituents responsible?

For Phase I MS4, Phase II MS4, and industrial storm water discharges, core toxicity monitoring will be required at a minimum for 10 percent of all outfalls greater than 36 inches in diameter or width at a minimum of once per year. Receiving water* monitoring shall be for Table 1 critical life stage chronic toxicity for a minimum of one invertebrate species.

For storm water discharges greater than 72 inches in diameter or width in a low energy coastal environment with the likelihood of sediment deposition, core sediment monitoring for acute sediment toxicity is required and will utilize alternative amphipod species (*Eohaustorius estuarius, Leptocheirus plumulosus, Rhepoxynius abronius*).

Regional Water Boards may waive monitoring once structural best management practices have been installed, evaluated and determined to have successfully controlled toxicity.

If an exceedence is detected, an additional toxicity test is required during the subsequent storm event. If an additional exceedance is detected at that time, a TRE is required, consistent with Section III.C.10. which requires a TRE if a discharge consistently exceeds an effluent limitation based on a toxicity objective in Table 1. A sufficient volume must be collected to conduct a TIE, if necessary, as a part of a TRE.

The requirement for core toxicity monitoring may be waived at the discretion of the Regional Water Board, if the permittee participates in a regional monitoring program to answer the above questions, as well as any other additional questions that may be developed by the regional monitoring program.

7.3. Non-point Sources

1. Does the agricultural and golf course runoff meet water quality standards for toxicity in the receiving water*?
2. Are the conditions in receiving water* getting better or worse with regard to toxicity?
3. What is the relative agricultural and golf course runoff contribution to receiving water* toxicity?
4. What are the causes of the toxicity, and the sources of the constituents responsible?

To answer these questions, a statistically representative sample (determined by the Regional Water Board) of receiving water* at the sites of agricultural irrigation tail water and storm water runoff, and golf course runoff, in each watershed will be monitored:

a. During wet weather, at a minimum of two storm events per year, and
b. During dry weather, when flowing, at a frequency determined by the Regional Boards.

Core receiving water* monitoring shall include Table 1 critical life stage chronic toxicity for a minimum of one invertebrate species.

* See Appendix I for definition of terms.

For runoff in a low energy coastal environment with the likelihood of sediment deposition, core sediment monitoring shall include acute sediment toxicity utilizing alternative amphipod species (*Eohaustorius estuarius, Leptocheirus plumulosus, Rhepoxynius abronius*) at a minimum once per year.

If an exceedence is detected, an additional toxicity test is required during the subsequent storm event. If an additional exceedance is detected, a TRE is required, consistent with Section III.C.10. which requires a TRE if a discharge consistently exceeds an effluent limitation based on a toxicity objective in Table 1. A sufficient volume must be collected to conduct a TIE, if necessary, as a part of a TRE.

The requirement for core monitoring may be waived at the discretion of the Regional Water Board, if the permittee participates in a regional monitoring program to answer the above questions, as well as any other additional questions that may be developed by the regional monitoring program.

8. BENTHIC COMMUNITY HEALTH

8.1. Point Sources

1. Are benthic communities degraded as a result of the discharge?

To answer this question, benthic community monitoring shall be conducted

a. for all discharges greater than 10 MGD, or
b. those discharges greater than 0.1 MGD and one nautical mile or less from shore, or
c. discharges greater than 0.1 MGD and one nautical mile or less from a State Water Quality Protection Area or a State Marine Reserve.

The minimum frequency shall be once per permit cycle, except for discharges greater than 100 MGD the minimum frequency shall be at least twice per permit cycle.

This requirement may be satisfied by core monitoring individually or through participation in a regional monitoring program at the discretion of the Regional Board.

9. BIOACCUMULATION

9.1. Point Sources

1. Does the concentration of pollutants in fish, shellfish*, or other marine resources used for human consumption bioaccumulate to levels that are harmful to human health?
2. Does the concentration of pollutants in marine life bioaccumulate to levels that degrade marine communities?

To answer these questions, bioaccumulation monitoring shall be conducted, at a minimum, once per permit cycle for:

a. discharges greater than 10 MGD, or
b. those discharges greater than 0.1 MGD and one nautical mile or less from shore, or
c. discharges greater than 0.1 MGD and one nautical mile or less from a State Water Quality Protection Area or a State Marine Reserve, Park or Conservation Area.

* See Appendix I for definition of terms.

Constituents to be monitored must include pesticides (at the discretion of the Regional Board), Table 1 metals, and PAHs*. Bioaccumulation may be monitored by a mussel watch program or a fish tissue program. Resident mussels are preferred over transplanted mussels. Sand crabs and/or fish may be added or substituted for mussels at the discretion of the Regional Water Board.

This requirement may be satisfied individually as core monitoring or through participation in a regional monitoring program at the discretion of the Regional Water Board.

9.2. Storm Water

1. Does the concentration of pollutants in fish, shellfish*, or other marine resources used for human consumption bioaccumulate to levels that are harmful to human health?
2. Does the concentration of pollutants in marine life bioaccumulate to levels that degrade marine communities?

For Phase I MS4 dischargers, bioaccumulation monitoring shall be conducted, at a minimum, once per permit cycle. Constituents to be monitored must include OP Pesticides, Ocean Plan Table 1 metals, Table 1 PAHs*, Table 1 chlorinated hydrocarbons, and pyrethroids. Bioaccumulation may be monitored by a mussel watch program or a fish tissue program. Sand crabs, fish, and/or Solid Phase Microextraction may be added or substituted for mussels at the discretion of the Regional Water Board.

This requirement may be satisfied individually as core monitoring or through participation in a regional monitoring program at the discretion of the Regional Water Board.

10. RECEIVING WATER* CHARACTERISTICS

All Sources:

1. Is natural light significantly reduced at any point outside the zone of initial dilution as the result of the discharge of waste?
2. Does the discharge of waste cause a discoloration of the ocean surface?
3. Does the discharge of oxygen demanding waste cause the dissolved oxygen concentration to be depressed at any time more than 10 percent from that which occurs naturally, as the result of the discharge of oxygen demanding* waste materials?
4. Does the discharge of waste cause the pH to change at any time more than 0.2 units from that which occurs naturally?
5. Does the discharge of waste cause the salinity to become elevated in the receiving water*?
6. Do nutrients cause objectionable aquatic growth or degrade indigenous biota?

10.1. Point Sources

For discharges greater than 10 MGD, turbidity (alternatively light transmissivity or surface water transparency), color [Chlorophyll-A and/or color dissolved organic matter (CDOM)], dissolved oxygen and pH shall be measured in the receiving water* seasonally, at a minimum, in a core monitoring program approved by the Regional Water Board. If sufficient data exists from previous water column monitoring for these parameters, the Regional Water Board, at its

* See Appendix I for definition of terms.

discretion, may reduce the frequency of water column monitoring, or may allow this requirement to be satisfied through participation in a regional monitoring program. Use of regional ocean observing programs, such as the Southern California Coastal Ocean Observing System (SCCOOS) and the Central and Northern California Ocean Observing System (CeNCCOOS) is encouraged.

Salinity must also be monitored by all point sources discharging desalination brine as part of their core monitoring program.

10.2. Storm Water

At a minimum, at 10 percent of Phase I MS4 discharges greater than 36 inches in diameter or width, receiving water* turbidity, color, dissolved oxygen, pH, nitrate, phosphate, and ammonia shall be measured annually in a core monitoring program approved by the Regional Water Board.

Regional Water Boards may waive monitoring once structural best management practices have been installed, evaluated and determined to have successfully controlled pollutants. The Regional Water Board, at its discretion, may also allow this requirement to be satisfied through participation in a regional monitoring program.

10.3. Non-point Sources

Representative agricultural and golf course discharges shall be measured, at a minimum twice annually (during the storm season and irrigation season) for receiving water* turbidity, color, dissolved oxygen, pH, nitrate, phosphate, ammonia in a core monitoring program approved by the Regional Water Board. The Regional Water Board, at its discretion, may allow this requirement to be satisfied through participation in a regional monitoring program.

11. ANALYTICAL REQUIREMENTS

Procedures, calibration techniques, and instrument/reagent specifications shall conform to the requirements of 40 CFR PART 136. Compliance monitoring shall be determined using an U.S. EPA approved protocol as provided in 40 CFR PART 136. All methods shall be specified in the monitoring requirement section of waste discharge requirements.

Where methods are not available in 40 CFR PART 136, the Regional Water Boards shall specify suitable analytical test methods in waste discharge requirements. Acceptance of data should be predicated on demonstrated laboratory performance.

Laboratories analyzing monitoring data shall be certified by the California Department of Public Health, in accordance with the provisions of Water Code section 13176, and must include quality assurance quality control data with their reports.

Sample dilutions for total and fecal coliform bacterial analyses shall range from 2 to 16,000. Sample dilutions for enterococcus bacterial analyses shall range from 1 to 10,000 per 100 mL. Each test method number or name (e.g., EPA 600/4-85/076, Test Methods for *Escherichia coli* and *Enterococci* in Water by Membrane Filter Procedure) used for each analysis shall be specified and reported with the results.

* See Appendix I for definition of terms.

Test methods used for coliforms (total and fecal) shall be those presented in Table 1A of 40 CFR PART 136, unless alternate test methods have been approved in advance by U.S. EPA pursuant to 40 CFR PART 136.

Test methods used for enterococcus shall be those presented in U.S. EPA publication EPA 600/4-85/076, Test Methods for *Escherichia coli* and *Enterococci* in Water by Membrane Filter Procedure or any improved test method determined by the Regional Board to be appropriate. The Regional Water Board may allow analysis for *Escherichia coli* (*E. coli)* by approved test methods to be substituted for fecal coliforms if sufficient information exists to support comparability with approved test methods and substitute the existing test methods.

The State or Regional Water Board may, subject to U.S. EPA approval, specify test methods which are more sensitive than those specified in 40 CFR PART 136. Because storm water and non-point sources are not assigned a dilution factor, sufficient sampling and analysis shall be required to determine compliance with Table 1 Water Quality Objectives. Total chlorine residual is likely to be a test method detection limit effluent limitation in many cases. The limit of detection of total chlorine residual in standard test methods is less than or equal to 20 µg/L.

Toxicity monitoring requirements in permits prepared by the Regional Water Boards shall use marine test species instead of freshwater species when measuring compliance. The Regional Water Board shall require the use of critical life stage toxicity tests specified in this Appendix to measure TUc. For Point Sources, a minimum of three test species with approved test protocols shall be used to measure compliance with the toxicity objective. If possible, the test species shall include a fish, an invertebrate, and an aquatic plant. After a screening period, monitoring can be reduced to the most sensitive species.

Dilution and control water should be obtained from an unaffected area of the receiving waters*. The sensitivity of the test organisms to a reference toxicant shall be determined concurrently with each bioassay test and reported with the test results.

Use of critical life stage bioassay testing shall be included in waste discharge requirements as a monitoring requirement for all Point Source discharges greater than 100 MGD

Procedures and test methods used to determine compliance with benthic monitoring should use the following federal guidelines when applicable: Macroinvertebrate Field and Laboratory Methods for Evaluating the Biological Integrity of Surface Waters (1990) -- EPA/600/4-90/030 (PB91-171363). This manual describes guidelines and standardized procedures for the use of macroinvertebrates in evaluating the biological integrity of surface waters.

Procedures used to determine compliance with bioaccumulation monitoring should use the U.S. EPA. Guidance for Assessing Chemical Contaminant Data for Use in Fish Advisories (November 2000, EPA 823-B-00-007), NOAA Technical Memorandum NOS ORCA 130, Sampling and Analytical Methods of the National Status and Trends Program Mussel Watch Project (1998 update), and/or State Mussel Watch Program, 1987-1993 Data Report, State Water Resources Control Board 94-1WQ.

* See Appendix I for definition of terms.

TABLE III-1
APPROVED TESTS – CHRONIC TOXICITY (TUc)

Species	Effect	Tier	Reference
giant kelp, *Macrocystis pyrifera*	percent germination; germ tube length	1	1,3
red abalone, *Haliotis rufescens*	Abnormal shell development	1	1,3
oyster, *Crassostrea gigas*; mussels, *Mytilus spp.*	Abnormal shell development; percent survival	1	1,3
urchin, *Strongylocentrotus purpuratus*; sand dollar, *Dendraster excentricus*	Percent normal development	1	1,3
urchin, *Strongylocentrotus purpuratus*; sand dollar, *Dendraster excentricus*	Percent fertilization	1	1,3
shrimp, *Holmesimysis costata*	Percent survival; growth	1	1,3
shrimp, *Mysidopsis bahia*	Percent survival; growth; fecundity	2	2,4
topsmelt, *Atherinops affinis*	Larval growth rate; percent survival	1	1,3
Silversides, *Menidia beryllina*	Larval growth rate; percent survival	2	2,4

Table III-1 Notes

The first tier test methods are the preferred toxicity tests for compliance monitoring. A Regional Water Board can approve the use of a second tier test method for waste discharges if first tier organisms are not available.

* See Appendix I for definition of terms.

Protocol References

1. Chapman, G.A., D.L. Denton, and J.M. Lazorchak. 1995. Short-term methods for estimating the chronic toxicity of effluents and receiving waters to west coast marine and estuarine organisms. U.S. EPA Report No. EPA/600/R-95/136.

2. Klemm, D.J., G.E. Morrison, T.J. Norberg-King, W.J. Peltier, and M.A. Heber. 1994. Short-term methods for estimating the chronic toxicity of effluents and receiving water to marine and estuarine organisms. U.S. EPA Report No. EPA-600-4-91-003.

3. SWRCB 1996. Procedures Manual for Conducting Toxicity Tests Developed by the Marine Bioassay Project. 96-1WQ.

4. Weber, C.I., W.B. Horning, I.I., D.J. Klemm, T.W. Nieheisel, P.A. Lewis, E.L. Robinson, J. Menkedick and F. Kessler (eds). 1988. Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms. EPA/600/4-87/028. National Information Service, Springfield, VA.

* See Appendix I for definition of terms.

APPENDIX IV
PROCEDURES FOR THE NOMINATION AND DESIGNATION OF STATE WATER QUALITY PROTECTION AREAS*.

1. Any person may nominate areas of ocean waters for designation as SWQPA-ASBS or SWQPA-GP by the State Water Board. Nominations shall be made to the appropriate Regional Water Board and shall include:

   (a) Information such as maps, reports, data, statements, and photographs to show that:

      (1) Candidate areas are located in ocean waters as defined in the "Ocean Plan".

      (2) Candidate areas are intrinsically valuable or have recognized value to man for scientific study, commercial use, recreational use, or esthetic reasons.

      (3) Candidate areas need protection beyond that offered by waste discharge restrictions or other administrative and statutory mechanisms.

   (b) Data and information to indicate whether the proposed designation may have a significant effect on the environment.

      (1) If the data or information indicate that the proposed designation will have a significant effect on the environment, the nominee must submit sufficient information and data to identify feasible changes in the designation that will mitigate or avoid the significant environmental effects.

2. The State Water Board or a Regional Water Board may also nominate areas for designation as SWQPA-ASBS or SWQPA-GP on their own motion.

3. A Regional Water Board may decide to (a) consider individual SWQPA-ASBS or SWQPA-GP nominations upon receipt, (b) consider several nominations in a consolidated proceeding, or (c) consider nominations in the triennial review of its water quality control plan (basin plan). A nomination that meets the requirements of 1. above may be considered at any time but not later than the next scheduled triennial review of the appropriate basin plan or Ocean Plan.

4. After determining that a nomination meets the requirements of paragraph 1. above, the Executive Officer of the affected Regional Water Board shall prepare a Draft Nomination Report containing the following:

   (a) The area or areas nominated for designation as SWQPA-ASBS or SWQPA-GP.

   (b) A description of each area including a map delineating the boundaries of each proposed area.

   (c) A recommendation for action on the nomination(s) and the rationale for the recommendation. If the Draft Nomination Report recommends approval of the proposed designation, the Draft Nomination Report shall comply with the CEQA documentation requirements for a water quality control plan amendment in Section 3777, Title 23, California Code of Regulations.

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* See Appendix I for definition of terms.

5. The Executive Officer shall, at a minimum, seek informal comment on the Draft Nomination Report from the State Water Board, Department of Fish and Game, other interested state and federal agencies, conservation groups, affected waste dischargers, and other interested parties. Upon incorporation of responses from the consulted agencies, the Draft Nomination Report shall become the Final Nomination Report.

6. (a) If the Final Nomination Report recommends approval of the proposed designation, the Executive Officer shall ensure that processing of the nomination complies with the CEQA consultation requirements in Section 3778, Title 23, California Code of Regulations and proceed to step 7 below.

   (b) If the Final Nomination Report recommends against approval of the proposed designation, the Executive Officer shall notify interested parties of the decision. No further action need be taken. The nominating party may seek reconsideration of the decision by the Regional Water Board itself.

7. The Regional Water Board shall conduct a public hearing to receive testimony on the proposed designation. Notice of the hearing shall be published three times in a newspaper of general circulation in the vicinity of the proposed area or areas and shall be distributed to all known interested parties 45 days in advance of the hearing. The notice shall describe the location, boundaries, and extent of the area or areas under consideration, as well as proposed restrictions on waste discharges within the area.

8. The Regional Water Board shall respond to comments as required in Section 3779, Title 23, California Code of Regulations, and 40 C.F.R. Part 25 (July 1, 1999).

9. The Regional Water Board shall consider the nomination after completing the required public review processes required by CEQA.

   (a) If the Regional Water Board supports the recommendation for designation, the board shall forward to the State Water Board its recommendation for approving designation of the proposed area or areas and the supporting rationale. The Regional Water Board submittal shall include a copy of the staff report, hearing transcript, comments, and responses to comments.

   (b) If the Regional Water Board does not support the recommendation for designation, the Executive Officer shall notify interested parties of the decision, and no further action need be taken.

10. After considering the Regional Water Board recommendation and hearing record, the State Water Board may approve or deny the recommendation, refer the matter to the Regional Water Board for appropriate action, or conduct further hearing itself. If the State Water Board acts to approve a recommended designation, the State Water Board shall amend Appendix V, Table V-1, of this Plan. The amendment will go into effect after approval by the Office of Administrative Law and US EPA. In addition, after the effective date of a designation, the affected Regional Water Board shall revise its water quality control plan in the next triennial review to include the designation.

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* See Appendix I for definition of terms.

12. The State Water Board Executive Director shall advise other agencies to whom the list of designated areas is to be provided that the basis for an SWQPA-ASBS or SWQPA-GP designation is limited to protection of marine life from waste discharges.

* See Appendix I for definition of terms.

APPENDIX V
STATE WATER QUALITY PROTECTION AREAS
AREAS OF SPECIAL BIOLOGICAL SIGNIFICANCE

TABLE V-1
STATE WATER QUALITY PROTECTION AREAS
AREAS OF SPECIAL BIOLOGICAL SIGNIFICANCE
(DESIGNATED OR APPROVED BY THE STATE WATER RESOURCES CONTROL BOARD)

No.	ASBS Name	Date Designated	State Water Board Resolution No.	Region No.
1.	Jughandle Cove	March 21, 1974,	74-28	1
2.	Del Mar Landing	March 21, 1974,	74-28	1
3.	Gerstle Cove	March 21, 1974,	74-28	1
4.	Bodega	March 21, 1974,	74-28	1
5.	Saunders Reef	March 21, 1974,	74-28	1
6.	Trinidad Head	March 21, 1974,	74-28	1
7.	King Range	March 21, 1974,	74-28	1
8.	Redwoods National Park	March 21, 1974,	74-28	1
9.	James V. Fitzgerald	March 21, 1974,	74-28	2
10.	Farallon Islands	March 21, 1974,	74-28	2
11.	Duxbury Reef	March 21, 1974,	74-28	2
12.	Point Reyes Headlands	March 21, 1974,	74-28	2
13.	Double Point	March 21, 1974,	74-28	2
14.	Bird Rock	March 21, 1974,	74-28	2
15.	Año Nuevo	March 21, 1974,	74-28	3
16.	Point Lobos	March 21, 1974,	74-28	3
17.	San Miguel, Santa Rosa, and Santa Cruz Islands	March 21, 1974,	74-28	3
18.	Julia Pfeiffer Burns	March 21, 1974,	74-28	3
19.	Pacific Grove	March 21, 1974,	74-28	3
20.	Salmon Creek Coast	March 21, 1974,	74-28	3
21.	San Nicolas Island and Begg Rock	March 21, 1974,	74-28	4
22.	Santa Barbara and Anacapa Islands	March 21, 1974,	74-28	4
23.	San Clemente Island	March 21, 1974,	74-28	4

Table V-1 Continued on next page…

* See Appendix I for definition of terms.

Table V-1 (Continued)

Areas of Special Biological Significance
(Designated or Approved by the State Water Resources Control Board)

No.	ASBS Name	Date Designated	State Water Board Resolution No.	Region No.
24.	Laguna Point to Latigo Point	March 21, 1974,	74-28	4
25.	Northwest Santa Catalina Island	March 21, 1974,	74-28	4
26.	Western Santa Catalina Island	March 21, 1974,	74-28	4
27.	Farnsworth Bank	March 21, 1974,	74-28	4
28.	Southeast Santa Catalina	March 21, 1974,	74-28	4
29.	La Jolla	March 21, 1974,	74-28	9
30.	Heisler Park	March 21, 1974,	74-28	9
31.	San Diego-Scripps	March 21, 1974,	74-28	9
32.	Robert E. Badham	April 18, 1974	74-32	8
33.	Irvine Coast	April 18, 1974	74-32	8,9
34.	Carmel Bay	June 19, 1975	75-61	3

* See Appendix I for definition of terms.

APPENDIX VI

REASONABLE POTENTIAL ANALYSIS PROCEDURE FOR DETERMINING WHICH TABLE 1 OBJECTIVES REQUIRE EFFLUENT LIMITATIONS

In determining the need for an effluent limitation, the Regional Water Board shall use all representative information to characterize the pollutant discharge using a scientifically defensible statistical method that accounts for the averaging period of the water quality objective, accounts for and captures the long-term variability of the pollutant in the effluent, accounts for limitations associated with sparse data sets, accounts for uncertainty associated with censored data sets, and (unless otherwise demonstrated) assumes a lognormal distribution of the facility-specific effluent data.

The purpose of the following procedure (see also Figure VI-1) is to provide direction to the Regional Water Boards for determining if a pollutant discharge causes, has the reasonable potential to cause, or contributes to an excursion above Table 1 water quality objectives in accordance with 40 CFR 122.44 (d)(1)(iii). The Regional Water Board may use an alternative approach for assessing reasonable potential such as an appropriate stochastic dilution model that incorporates both ambient and effluent variability. The permit fact sheet or statement of basis will document the justification or basis for the conclusions of the reasonable potential assessment. This appendix does not apply to permits or any portion of a permit where the discharge is regulated through best management practices (BMP) unless such discharge is also subject to numeric effluent limitations.

Step 1: Identify C_o, the applicable water quality objective from Table 1 for the pollutant.

Step 2: Does information about the receiving water* body or the discharge support a reasonable potential assessment (RPA) without characterizing facility-specific effluent monitoring data? If yes, go to *Step 13* to conduct an RPA based on best professional judgment (BPJ). Otherwise, proceed to *Step 3*.

Step 3: Is facility-specific effluent monitoring data available? If yes, proceed to *Step 4.* Otherwise, go to *Step 13.*

Step 4: Adjust all effluent monitoring data C_e, including censored (ND or DNQ) values to the concentration *X* expected after complete mixing. For Table 1 pollutants use $X = (C_e + D_m C_s) / (D_m + 1)$; for acute toxicity use $X = C_e / (0.1 D_m + 1)$; where D_m is the minimum probable initial dilution expressed as parts seawater per part wastewater and C_s is the background seawater concentration from Table ~~C~~3. For ND values, C_e is replaced with "<MDL;" for DNQ values C_e is replaced with "<ML." Go to *Step 5*.

Step 5: Count the total number of samples *n*, the number of censored (ND or DNQ) values, *c* and the number of detected values, *d, such that n = c + d*.

Is any *detected* pollutant concentration after complete mixing greater than C_o? If yes, the discharge causes an excursion of C_o; go to *Endpoint 1*. Otherwise, proceed to *Step 6*.

* See Appendix I for definition of terms.

Step 6: Does the effluent monitoring data contain three or more detected observations ($d \geq 3$)? If yes, proceed to *Step 7* to conduct a parametric RPA. Otherwise, go to *Step11* to conduct a nonparametric RPA.

Step 7: Conduct a parametric RPA. Assume data are lognormally distributed, unless otherwise demonstrated. Does the data consist entirely of detected values ($c/n = 0$)? If yes,

- calculate summary statistics M_L and S_L, the mean and standard deviation of the natural logarithm transformed effluent data expected after complete mixing, ln(X),
- go to *Step 9*.

Otherwise, proceed to *Step 8*.

Step 8: Is the data censored by 80% or less ($c/n \leq 0.8$)? If yes,

- calculate summary statistics M_L and S_L using the censored data analysis method of Helsel and Cohn (1988),
- go to *Step 9*.

Otherwise, go to Step 11.

Step 9: Calculate the UCB i.e., the one-sided, upper 95 percent confidence bound for the 95th percentile of the effluent distribution after complete mixing. For lognormal distributions, use $UCBL_{(.95,.95)} = \exp(M_L + S_L\, g'_{(.95,.95,n)})$, where g' is a normal tolerance factor obtained from the table below (Table VI-1). Proceed to *Step 10*.

Step 10: Is the UCB greater than C_o? If yes, the discharge has a reasonable potential to cause an excursion of C_o; go to *Endpoint 1*. Otherwise, the discharge has no reasonable potential to cause an excursion of C_o; go to *Endpoint 2*.

Step 11: Conduct a non-parametric RPA. Compare each data value X to C_o. Reduce the sample size n by 1 for each tie (i.e., inconclusive censored value result) present. An adjusted ND value having C_o < MDL is a tie. An adjusted DNQ value having C_o < ML is also a tie.

Step 12: Is the adjusted $n > 15$? If yes, the discharge has no reasonable potential to cause an excursion of C_o; go to *Endpoint 2*. Otherwise, go to *Endpoint 3*.

Step 13: Conduct an RPA based on BPJ. Review all available information to determine if a water quality-based effluent limitation is required, notwithstanding the above analysis in *Steps 1* through *12*, to protect beneficial uses. Information that may be used includes: the facility type, the discharge type, solids loading analysis, lack of dilution, history of compliance problems, potential toxic impact of discharge, fish tissue residue data, water quality and beneficial uses of the receiving water*, CWA 303(d) listing for the pollutant, the presence of endangered or threatened species or critical habitat, and other information.

Is data or other information unavailable or insufficient to determine if a water quality-based effluent limitation is required? If yes, go to *Endpoint 3.* Otherwise, go to either *Endpoint 1* or *Endpoint 2* based on BPJ.

Endpoint 1: An effluent limitation must be developed for the pollutant. Effluent monitoring for the pollutant, consistent with the monitoring frequency in Appendix III, is required.

* See Appendix I for definition of terms.

Endpoint 2: An effluent limitation is not required for the pollutant. Appendix III effluent monitoring is not required for the pollutant; the Regional Board, however, may require occasional monitoring for the pollutant or for whole effluent toxicity as appropriate.

Endpoint 3: The RPA is inconclusive. Monitoring for the pollutant or whole effluent toxicity testing, consistent with the monitoring frequency in Appendix III, is required. An existing effluent limitation for the pollutant shall remain in the permit, otherwise the permit shall include a reopener clause to allow for subsequent modification of the permit to include an effluent limitation if the monitoring establishes that the discharge causes, has the reasonable potential to cause, or contributes to an excursion above a Table 1 water quality objective.

Appendix VI References:

Helsel D. R. and T. A. Cohn. 1988. Estimation of descriptive statistics for multiply censored water quality data. Water Resources Research, Vol 24(12):1977-2004.

Hahn J. H. and W. Q. Meeker. 1991. Statistical Intervals, A guide for practitioners. J. Wiley & Sons, NY.

TABLE VI-1: Tolerance factors $g'_{(.95,.95,n)}$ for calculating normal distribution one-sided upper 95 percent tolerance bounds for the 95th percentile (Hahn & Meeker 1991)

n	$g'_{(.95,.95,n)}$	***n***	$g'_{(.95,.95,n)}$
2	26.260	21	2.371
3	7.656	22	2.349
4	5.144	23	2.328
5	4.203	24	2.309
6	3.708	25	2.292
7	3.399	26	2.275
8	3.187	27	2.260
9	3.031	28	2.246
10	2.911	29	2.232
11	2.815	30	2.220
12	2.736	35	2.167
13	2.671	40	2.125
14	2.614	50	2.065
15	2.566	60	2.022
16	2.524	120	1.899
17	2.486	240	1.819
18	2.453	480	1.766
19	2.423	∞	1.645
20	2.396		

* See Appendix I for definition of terms.

Figure VI-1. Reasonable potential analysis flow chart

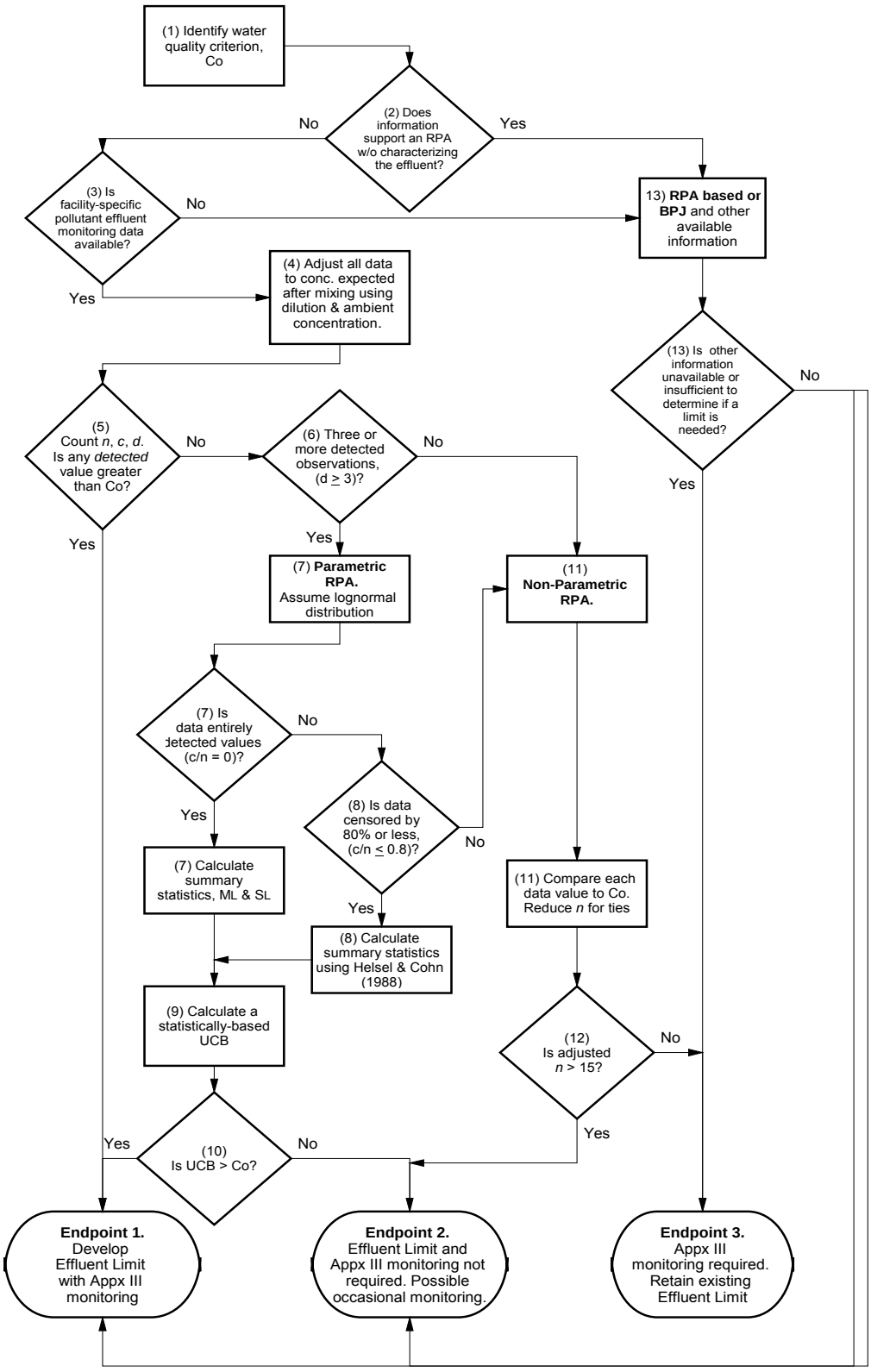

* See Appendix I for definition of terms.

APPENDIX VII

EXCEPTIONS TO THE CALIFORNIA OCEAN PLAN

TABLE VII-1
EXCEPTIONS TO THE OCEAN PLAN

(GRANTED BY THE STATE WATER RESOURCES CONTROL BOARD)

Year	Resolution	Applicable Provision	Discharger
1977	77-11	Discharge Prohibition, ASBS #23	US Navy San Clemente Island
1979	79-16	Discharge Prohibition for wet weather discharges from combined storm and wastewater collection system.	The City and County of San Francisco
1983	83-78	Discharge Prohibition, ASBS #7	Humboldt County Resort Improvement District No.1
1984	84-78	Discharge Prohibition, ASBS #34	Carmel Sanitary District
1988	88-80	Total Chlorine Residual Limitation	Haynes Power Plant Harbor Power Plant Scattergood Power Plant Alamitos Power Plant El Segundo Power Plant Long Beach Power Plant Mandalay Power Plant Ormond Beach Power Plant Redondo Power Plant
1990	90-105	Discharge Prohibition, ASBS #21	US Navy San Nicolas Island
2004	2004-0052	Discharge Prohibition, ASBS #31	UC Scripps Institution of Oceanography
2006	2006-0013	Discharge Prohibition, ASBS #25	USC Wrigley Marine Science Center
2007	2007-0058	Discharge Prohibition, ASBS #4	UC Davis Bodega Marine Laboratory
2011	2011-0049	Discharge Prohibition, ASBS #6	HSU Telonicher Marine lab
2011	2011-0050	Discharge Prohibition, ASBS #19	Monterey Bay Aquarium
2011	2011-0051	Discharge Prohibition, ASBS #19	Stanford Hopkins Marine Station
2012	2012-0012, as amended on June 19	ASBS Discharge Prohibition, General Exception for Storm Water and Nonpoint Sources	27 applicants for the General Exception

* See Appendix I for definition of terms.

	2012; in 2012-0031		

* See Appendix I for definition of terms.

APPENDIX VIII
MAPS OF THE OCEAN, COAST, AND ISLANDS

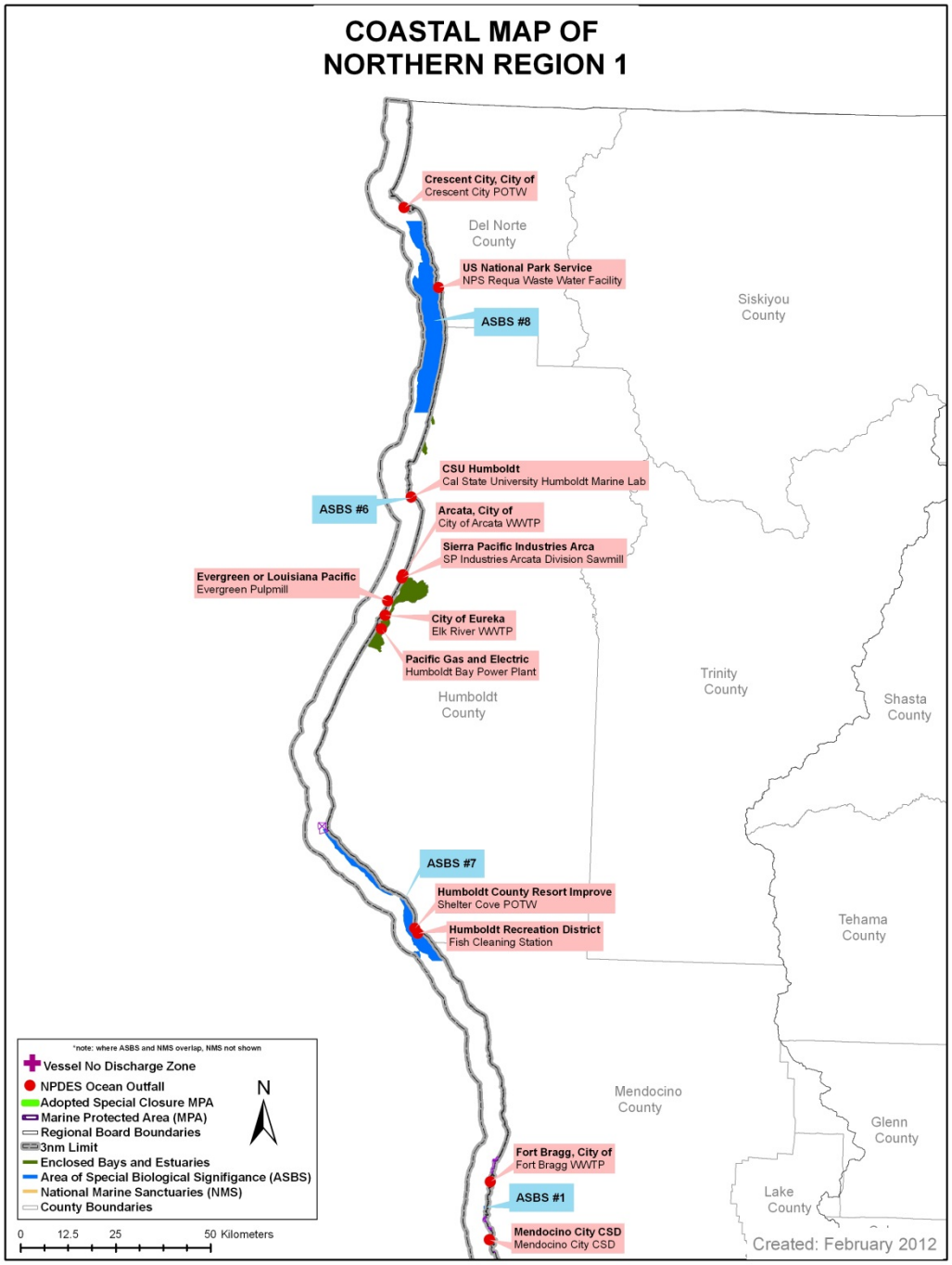

Figure VIII-1. ASBS Boundaries, MPA Boundaries, Wastewater Outfall Points, Marine Sanctuary Boundaries, and Enclosed Bays in northern Region 1.

* See Appendix I for definition of terms.

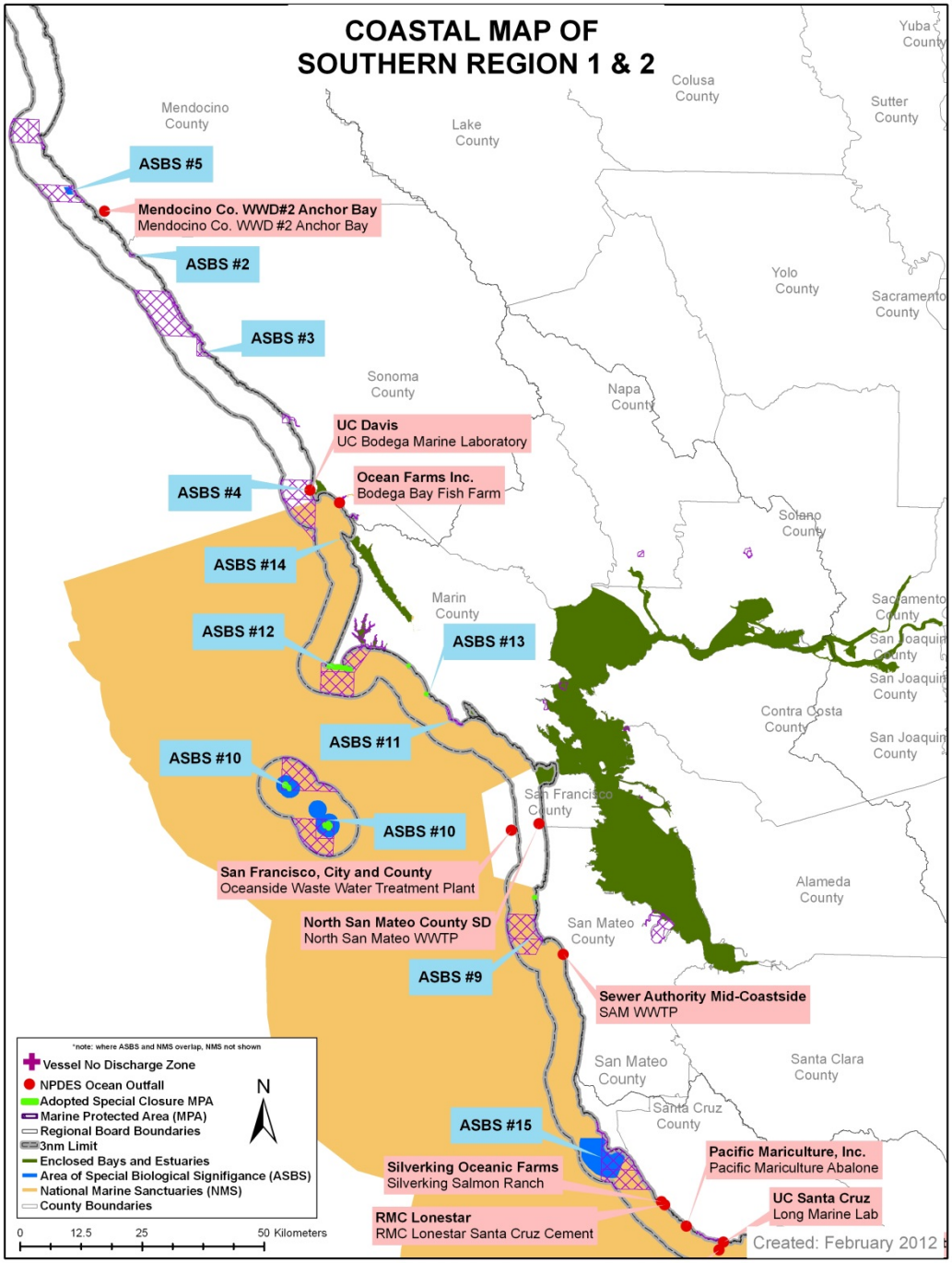

Figure VIII-2. ASBS Boundaries, MPA Boundaries, Wastewater Outfall Points, Marine Sanctuary Boundaries, and Enclosed Bays in southern Region 1 and Region 2.

* See Appendix I for definition of terms.

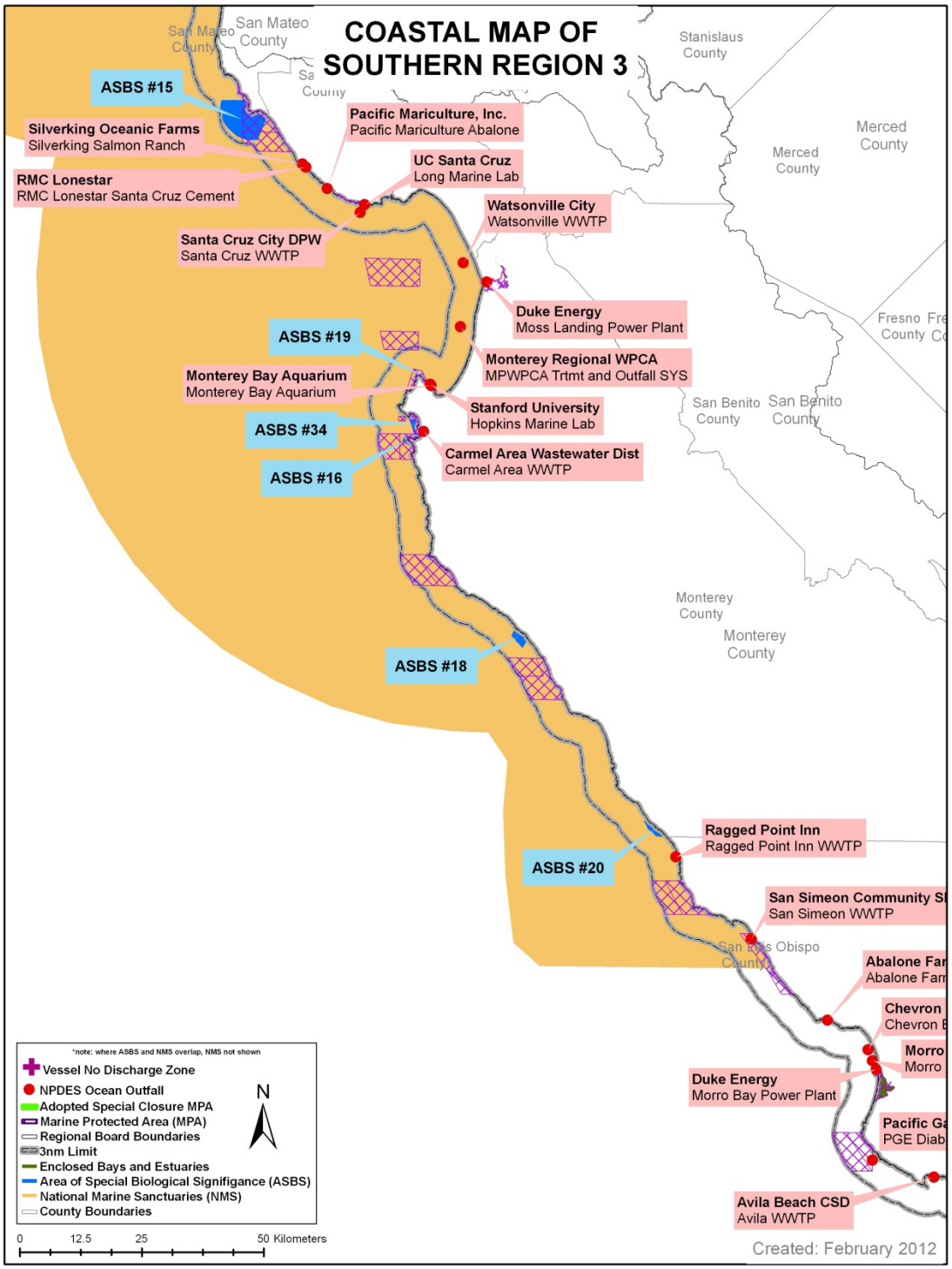

Figure VIII-3. ASBS Boundaries, MPA Boundaries, Wastewater Outfall Points, Marine Sanctuary Boundaries, and Enclosed Bays in northern Region 3.

* See Appendix I for definition of terms.

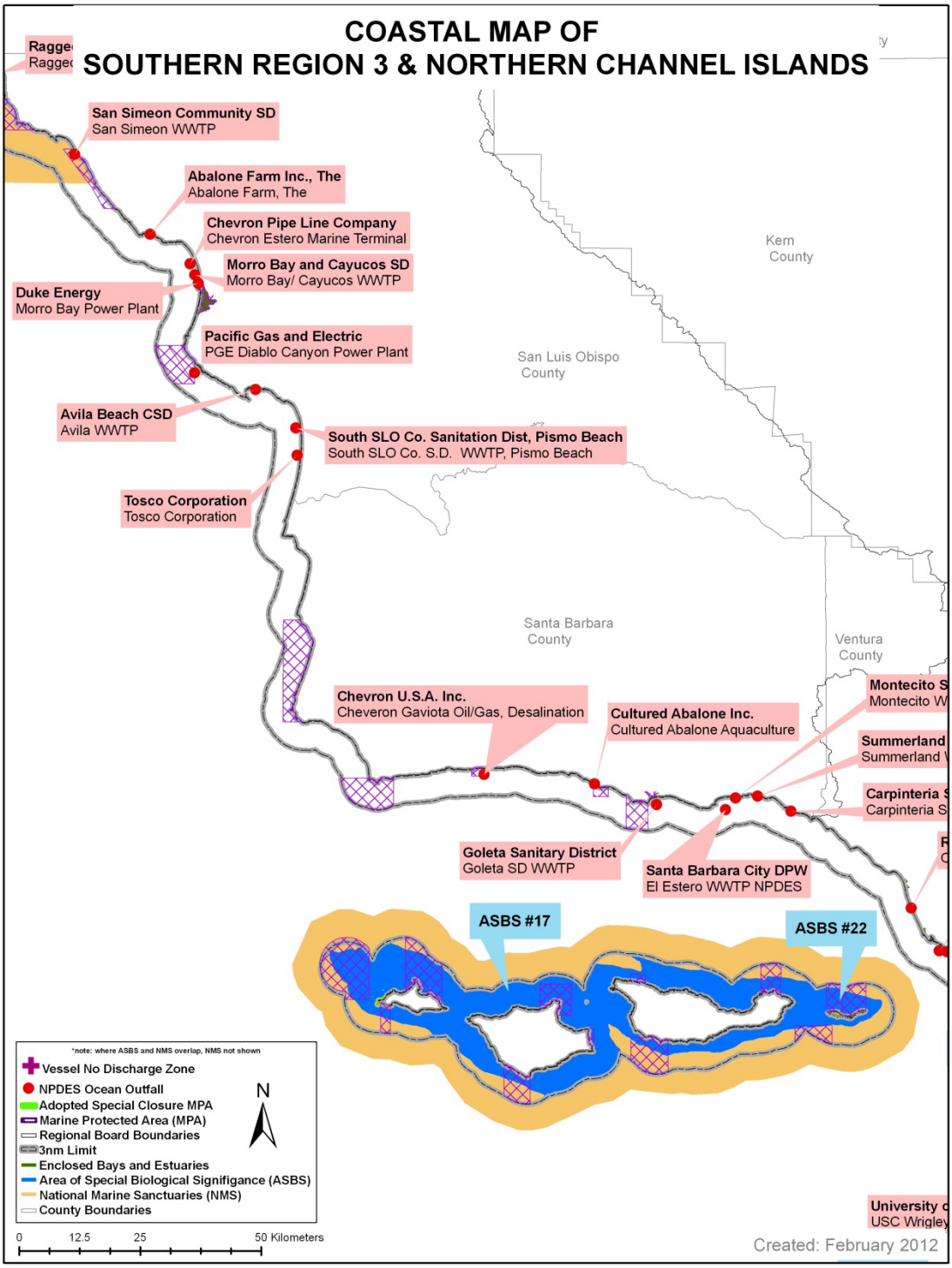

Figure VIII-4. ASBS Boundaries, MPA Boundaries, Wastewater Outfall Points, Marine Sanctuary Boundaries, and Enclosed Bays in southern Region 3 and northern Channel Islands.

* See Appendix I for definition of terms.

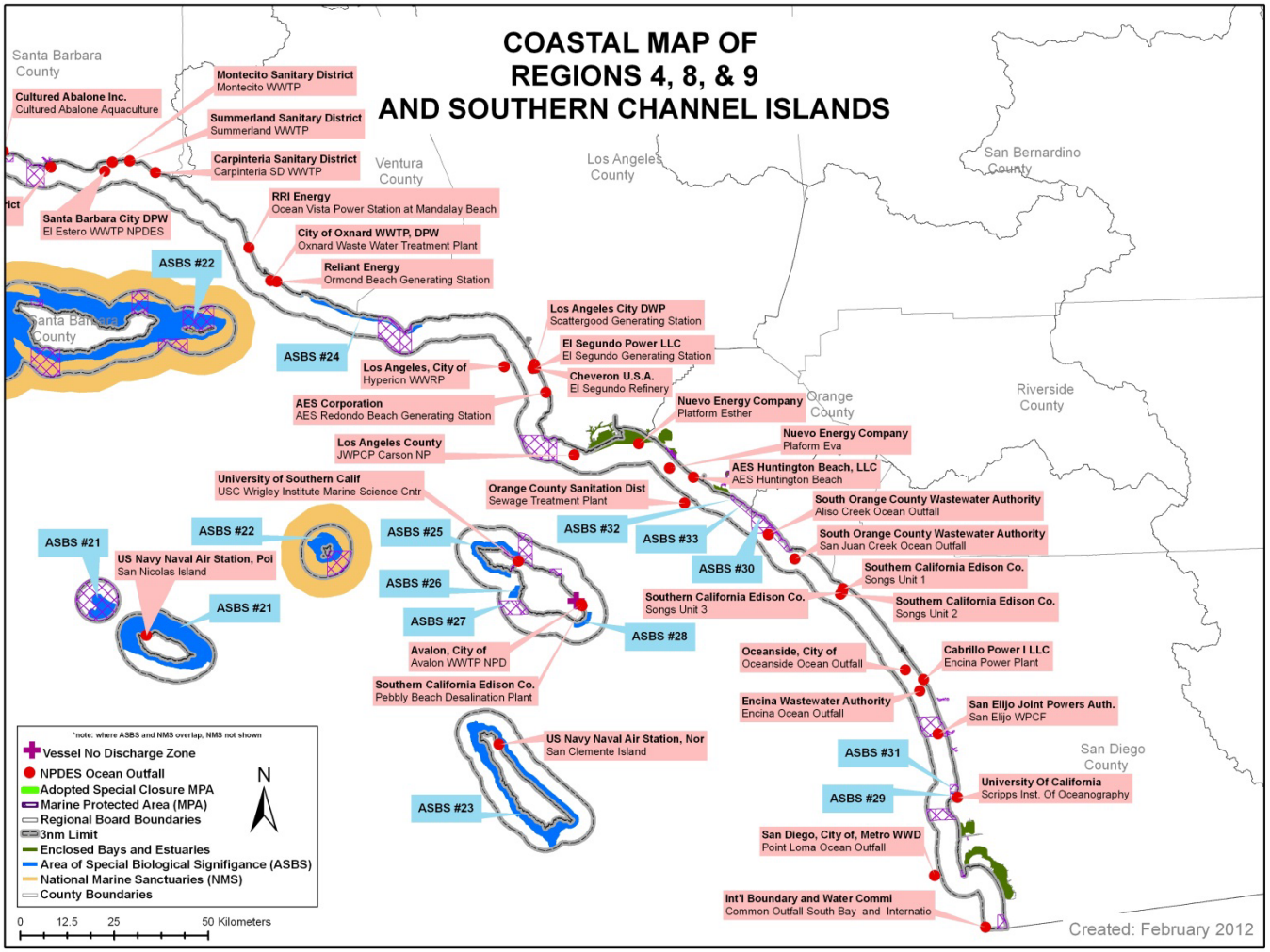

Figure VIII-5. ASBS Boundaries, MPA Boundaries, Wastewater Outfall Points, Marine Sanctuary Boundaries, and Enclosed Bays in southern Channel Islands and Regions 4, 8 and 9.

* See Appendix I for definition of terms.

STATE WATER RESOURCES CONTROL BOARD

1001 I Street, Sacramento, California 95814
http://www.waterboards.ca.gov/water_issues/programs/npdes

ORDER WQ 2014-0194-DWQ
GENERAL ORDER NO. CAG140001

STATEWIDE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT FOR DRINKING WATER SYSTEM DISCHARGES TO WATERS OF THE UNITED STATES

Discharges from drinking water systems to surface waters in California are subject to waste discharge requirements as set forth in this Order, and as authorized by a Notice of Applicability issued by the Deputy Director of Water Quality (Deputy Director). Definitions for the purpose of this Order are included in Attachment A. Key definitions are as follows:

Table 1. Key Definitions for the Purpose of this Order

Drinking Water System[1]	A system with 1000[2] connections or greater that are regulated by the State Water Board Division of Drinking Water or a local county department of health, with the primary purpose of transmitting, treating and distributing safe drinking water. Drinking water systems include state owned/operated facilities such as parks, campgrounds, and rest areas *[1] This Order applies to community water systems as defined in Attachment A of this Order. This Order does not apply to non-community water systems or non-transient water systems as defined in Attachment A of this Order.* *[2] Systems with fewer than 1000 connections that discharge to waters of the United States have the option to enroll in this Order. Non-enrollment does not exempt dischargers from Clean Water Act requirements.*
Drinking Water System Discharge	Short-term or seasonal discharges from a drinking water system of water that has been dedicated for drinking water purposes
Water Purveyor	Any entity that discharges from a drinking water system, including water purveyors, wholesalers, distributors, districts, municipalities, private companies, and other entities that own or operate a community drinking water system
Discharger	A water purveyor that is authorized to discharge under this Order through an approved Notice of Applicability issued by the Deputy Director of Water Quality
Waters of the United States	Generally refers to surface waters, as defined for the purposes of the federal Clean Water Act. For the purpose of this Order, the terms “surface water,” and “receiving water” are interchangeably used to mean “waters of the United States,” unless noted otherwise

Table 2. Administrative Information

This Order was adopted by the State Water Board on November 18, 2014:
This Order shall become effective on February 26, 2015 (100 days after the adoption date of this Order)
This Order shall expire on February 25, 2020

CERTIFICATION

I, Jeanine Townsend, Clerk to the Board, do hereby certify that this Order with all attachments is a full, true, and correct copy of the Order adopted by the State Water Board on November 18, 2014.

AYE: Chair Felicia Marcus
Vice Chair Frances Spivy-Weber
Board Member Tam M. Doduc
Board Member Steven Moore
Board Member Dorene D'Adamo

NAY: None

ABSENT: None

ABSTAIN: None

Jeanine Townsend

Jeanine Townsend
Clerk to the Board

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I. SCOPE OF STATEWIDE GENERAL ORDER AND REQUIRED REGULATORY COVERAGE

This Order is a National Pollutant Discharge Elimination System (NPDES) general permit that authorizes discharges from drinking water systems, as defined on Page 1 of this Order. This Order provides regulatory coverage for short-term or seasonal planned and emergency (unplanned) discharges resulting from a water purveyor's essential operations and maintenance activities undertaken to comply with the federal Safe Drinking Water Act, the California Health and Safety Code, and the State Water Board's Division of Drinking Water permitting requirements for providing reliable delivery of safe drinking water.

Planned discharges include regularly scheduled, automated, or non-regularly scheduled activities that must take place to comply with mandated regulations and that the water purveyor knows in advance will result in a discharge to surface water. Emergency discharges include unplanned discharges that occur due to facility leaks, system failures, operational errors, or catastrophic events for which the water purveyor is not aware of the discharge until after the discharge has commenced. Planned and emergency discharges may occur directly, through a constructed storm drain or through another conveyance system, to waters of the United States (U.S.).

The Federal Water Pollution Control Act (also referred to as the Clean Water Act) section 402 requires that a discharge of any pollutant or combination of pollutants to surface waters that are deemed waters of the U.S., with certain exceptions, be regulated by a NPDES permit. (For the purpose of this Order, the terms "waters of the United States [or U.S.]", "surface waters" and "receiving waters" are used interchangeably unless noted otherwise.) On September 22, 1989, the U.S. Environmental Protection Agency (U.S. EPA) granted the State of California, through the State Water Resources Control Board (State Water Board) and the Regional Water Quality Control Boards (Regional Water Boards), the authority to issue NPDES permits pursuant to title 40 Code of Federal Regulations parts 122 and 123.

Discharges of a pollutant from a drinking water system, regardless of the size of the system, are required to be regulated by an NPDES permit if the discharges flow into a water of the U.S. Title 40 Code of Federal Regulations part 122.28 provides for issuance of general permits to regulate a category of dischargers if they involve the same or substantially similar types of operations; discharge the same type of waste; require the same type of effluent limitations or operating conditions; require similar monitoring; and are more appropriately regulated under a general order rather than individual orders. Discharges from drinking water systems that result from mandated activities to protect public health are of substantially similar types of operations, discharging the same type of waste.

This Order requires all water purveyors in California with drinking water system discharges to waters of the U.S. as described in Section I.B of this Order, except those water purveyors that meet the exception criteria identified in section I.A of this Order, to obtain NPDES regulatory coverage through enrollment in this statewide NPDES General Order. The water purveyor shall submit an application package to the State Water Board in accordance with section II.C.1 *Application Package Requirements* any time after the effective date of the permit but no later than **September 1, 2015**.

A. Water Purveyors NOT Required to Enroll in This Order

Water purveyors that meet any of the following criteria, items 1 through 6, are NOT required to submit an application package to obtain coverage through enrollment in this particular statewide NPDES General Order; this Order is, however, available for water purveyors that meet the criteria of items 1 through 3 below and choose to enroll. (This Order does not exempt any water purveyor from federal Clean Water Act requirements to obtain NPDES regulatory coverage for its discharges to waters of the U.S.) By **September 1, 2015**, water purveyors that meet any one of the items 2 through 5 below shall submit to the State Water Board a Notice of Non-Applicability form (see Attachment B-2) that certifies NPDES regulatory coverage from this Order is not required. A water purveyor with multiple community water systems in California need only submit one Notice of Non-Applicability for its systems that meet the same criterion.

1. The drinking water system has fewer than 1000 connections that deliver drinking water to end users. (This does not include water wholesalers as defined in Attachment A that deliver water to other drinking water systems); or

2. The water purveyor discharges solely to a municipal separate storm sewer system(s) (MS4) and has an established local agreement with the MS4 permittee to discharge into its system(s),

   AND

   The corresponding Regional Water Board Executive Officer provides written confirmation to the State Water Board Deputy Director that the local agreement provides sufficient regulation of the subject drinking water system discharges through an existing MS4 NPDES permit; or

3. The water purveyor is an MS4 permittee, or co-permittee, named on a State Water Board or a Regional Water Board issued MS4 permit that also authorizes discharges from drinking water systems, and all drinking water system discharges solely discharge into its own MS4 system; or

4. The water purveyor's discharge is regulated under an existing individual site-specific NPDES permit issued by the Regional Water Board because: (1) the discharge from the system is outside of the scope of this low threat Order, and/or (2) a Total Maximum Daily Load (TMDL) was adopted and the Regional Water Board determined that TMDL-specific permit requirements for its drinking water system(s) discharges are appropriate because those discharges may contribute to the impairment of the water body; or

5. All discharges from the drinking water system do not discharge to a water of the U.S.; or

6. The discharge is exempt from the legal requirement to obtain an NPDES permit under federal law.

After review, a Notice of Non-Applicability Approval by the State Water Board's Deputy Director of Water Quality (Deputy Director) may be issued. If the Notice of Non-Applicability is not complete or the discharge is deemed ineligible, the Deputy Director will send a response letter to the applicant outlining: (1) the missing information that deems the Notice of Non-Applicability incomplete, or (2) why the described discharge is not eligible and thus the water purveyor must obtain coverage under this Order. The State Water Board will provide the water purveyor **60 days from the date of the response letter** to provide State Water Board staff the items necessary to complete the Notice of Non-Applicability or to submit a complete application package in accordance with section II.C of this Order.

B. Discharges Authorized Under This Order

This Order authorizes drinking water system discharges (as defined on Page 1) resulting from a water purveyor's essential operations and activities undertaken to comply with the federal Safe Drinking Water Act, the California Health and Safety Code, and the State Water Board's Division of Drinking Water permitting requirements. Discharges authorized by this Order are composed solely of water that is dedicated by drinking water facilities for the primary purpose of providing safe and reliable drinking water. Additionally, discharges authorized under this Order are determined to not adversely affect or impact beneficial uses of the receiving waters when properly managed through best management practices. Such discharges include, but are not limited to, discharges from supply wells, transmission systems, water treatment facilities, water distribution systems, and storage facilities. Any discharges that are likely to cause or contribute to an exceedance of a water quality objective other than those granted an exception under the State Water Board Resolution 2014-0067, will not be authorized under this Order.

This Order authorizes single discharges at one identified location and multiple simultaneous discharges at multiple locations. Authorized discharges to waters of the U.S. may include, but are not limited to, the following discharges:

1. Planned Discharges Due To:

a. Groundwater supply well flushing or pump-to-waste.
b. Groundwater well development, rehabilitation, and testing.
c. Groundwater monitoring for purpose of supply well development, rehabilitation and testing.
d. Trench dewatering of drinking water during planned repairs.
e. Transmission system installation, cleaning, and testing.
f. Water treatment plant operations (excluding filter backwash that is discharged to a water of the U.S).
g. Distribution system storage tank or reservoir releases.
h. Distribution system dewatering, flushing, and pressure testing.
i. Fire flow / fire hydrant testing.
j. Meter testing.

k. Automated water quality analyzers operations.
l. Pressure relief valves.
m. Unscheduled activities that must be undertaken to comply with mandates of the Federal Drinking Water Act and California Health and Safety Code.

2. Emergency (Unplanned) Discharges Due To:

a. Emergency drinking water system failures and repairs including transmission and distribution system failures and repairs.
b. Trench dewatering due to an emergency failure.
c. Operation errors.
d. Catastrophic events.

C. Discharges Not Authorized Under This Order

The State Water Board does not authorize any of the following discharges to waters of the U.S. under this Order:

1. Discharges that are not within the scope of this Order as described in section I and/or are not authorized by a Notice of Applicability issued by the Deputy Director of Water Quality (Deputy Director); or

2. Discharges to a water of the U.S. with a total maximum daily load (TMDL) that prescribes a waste load allocation to a water purveyor, where the Deputy Director determines that the requirements of this Order are not consistent with the assumptions and requirements of the TMDL and thus compliance with this Order is not sufficient for the water purveyor to comply with the imposed TMDL requirements; or

3. Discharges from new drinking water systems (not an expansion of an existing system) into a Clean Water Act section 303(d)-listed impaired water body that is impaired for a constituent that exists in the new discharge at a concentration greater than the criteria used to establish the impairment of the water body, and for which a regional water board has issued an individual permit that addresses the TMDL requirements; or

4. Direct discharges into areas designated by the State Water Board as Areas of Special Biological Significance (ASBS).

II. PERMIT COVERAGE AND APPLICATION REQUIREMENTS

A. Permit Coverage

This Order provides regulatory coverage to water purveyors with existing and potential authorized discharges as set forth in section I.B to waters of the U.S. from a community drinking water system that does not adversely affect or impact beneficial uses of the

receiving water. Permit coverage may include discharges from work conducted by contractors on behalf of the water purveyor.

B. Permit Effective Date

This Order becomes effective **February 26, 2015**, 100 days after the adoption date of this Order. Any time after the effective date but no later than **September 1, 2015**, all water purveyors that do not meet the criteria of section I.A. of this Order shall submit a complete application package in accordance with the following section II.C.

C. Application Package Requirements

To obtain regulatory coverage under this Order, a water purveyor must submit to the State Water Board a complete application package that includes all the following items. A water purveyor with multiple drinking water systems in California need only submit one complete application package (with individual Notice of Intent forms for each of its drinking water systems) and obtain one Notice of Applicability for regulatory coverage of all its systems that discharge to waters of the U.S.

1. **Notice of Intent.** A completed Notice of Intent form for each of its drinking water systems (shown as Attachment B1 of this Order), signed and certified in accordance with section V.B., *Signatory and Certification Requirements*, of Attachment D – Standard Provisions.

2. **Application Package Fee.** A fee payable to the State Water Board in accordance with California Code of Regulations, title 23, or subsequent fee regulations updates. The current fee schedule is available at the following website: http://www.waterboards.ca.gov/resources/fees

   Only one fee is required for an application package requesting coverage for multiple drinking water systems.

3. **Site Information.**
   a. A site schematic showing the following items:
      i. The general location of the community drinking water facilities and/or the boundaries of the water purveyor's service area(s); and
      ii. The general location of groundwater supply wells and/or any discharge locations to surface waters; and
      iii. General identification of the portion of the community water system that discharges within a 300-foot conveyance distance from the receiving water(s) and/or within a 300-foot radius of the receiving water(s).
   b. Names of all named receiving water bodies and/or major downstream water bodies.

c. A description of the multiple uses of the water prior to surface water discharge or beneficial reuse that the discharges will serve (i.e. ground water recharge, irrigation).
d. Reason(s) that the discharge water cannot be utilized for multiple uses or beneficial reuse. (Refer to section VI. MULTIPLE USES OR BENEFICIAL REUSE, below)

4. **Total Maximum Daily Loads (TMDL) Constituent-specific Application Package Supplement** (applicable for discharges into waters of the U.S. identified in section III. K of the Fact Sheet). A supplement to the application requirements listed above shall include the following items:
   i. **Laboratory Analysis of TMDL-specific constituent(s).** (The laboratory analysis shall be conducted by a laboratory certified by the Environmental Laboratory Accreditation Program (ELAP).) The application package supplement shall include a laboratory analysis sheet(s) indicating the concentration of the applicable TMDL specific constituent(s) in the drinking water system discharge at the point of discharge. The monitoring and analysis shall be conducted in accordance with title 40 Code of Federal Regulations part 136. The water purveyor shall submit the following items for the application supplement to be deemed complete:
      a) A minimum of two samples representative of the drinking water system discharge that contains or has the potential to contain the greatest concentration or level of constituent/parameter associated with the TMDL constituent/parameter. The samples shall be taken at a location after the appropriate treatment or controls are implemented for the constituent associated with the TMDL; and
      b) The estimated minimum and maximum discharge volume per discharge event; and
      c) The estimated average discharge volume from the system per year. The estimated volumes may be based on historical data.
   ii. **TMDL-specific Best Management Practices.** Description of site-specific best management practices that properly treat and/or control corresponding TMDL constituents in the discharge to a concentration or level less than the water purveyor's applicable TMDL-specific permit requirement (s) as set forth in Attachment G, if any.

The supplemental analytical information will be used to confirm that the discharge does not contribute to the specific impairment of the TMDL-related waterbody(ies) and that the requirements in this Order are sufficient to ensure compliance with the specific TMDLs.

D. State Water Board Notice of Applicability

After the water purveyor's application package is deemed complete, the Deputy Director will issue a Notice of Applicability. Regulatory coverage for the planned and emergency

discharges that occur within the areas identified in the application package commences with the date of issuance of a Notice of Applicability to the water purveyor. If the submitted application package is not complete in accordance with previous section II.C., or the discharge is deemed ineligible for coverage under this Order, the Deputy Director will send a response letter to the applicant outlining: (1) the missing information that renders the application package incomplete, or (2) why the described discharge is not eligible for coverage under this Order. The water purveyor will have **60 days from the date of the response letter** to provide State Water Board staff the items necessary to complete the application package.

E. Permit Coverage Termination

1. **Termination of Existing Regional Water Board Permit Coverage.** Upon the issuance of the NOA in accordance with this Order, the State Water Board expects the applicable Regional Water Board to terminate regulatory coverage under an existing non-MS4 Regional Water Board NPDES permit for discharges within the scope of this Order.

2. **Termination of Statewide Permit Coverage or Revocation of Notice of Non-Applicability.** The Deputy Director may terminate coverage or revoke a Notice of Non-Applicability Approval (NONAA) under this Order for any of the specified causes, and require application for coverage under an individual or other NPDES permit as set forth in title 40 Code of Federal Regulations part 122.28(b)(3). Causes for permit coverage termination or NONAA revocation include, but are not limited to, the following:
   a. Violation of any term or condition of this Order; or
   b. Misrepresentation or failure to disclose all relevant facts in obtaining permit coverage or non-applicability status under this Order, or
   c. Written request from a Discharger to terminate enrollment because discharge has ceased or that the permit is no longer needed.

   Annual permit fees will be assessed by the State Water Board up to the date of written termination notification from the State Water Board to the Discharger, or the date of a termination request letter from the Discharger to the State Water Board, whichever is applicable.

3. **Qualified Biologist Certification Following Project Completion.** Upon completion of the project, the Discharger shall provide certification by a qualified biologist that beneficial uses of the receiving waters have been restored. For drinking water system discharges, completion of the project is when the water purveyor ceases discharges from its drinking water system under this Order, or when the State terminates NPDES permit coverage for the discharge(s).

F. Permit Transfer

A change in ownership of the facilities authorized to discharge through coverage under this Order requires the current owner to provide written notice to the State Water Board

at least 30 days in advance of transfer of ownership. The Deputy Director may determine that the new owner must submit an application package to seek coverage under this Order if the nature or location(s) of the discharge(s) have changed from the application package on file.

III. FINDINGS

The State Water Board finds the following:

A. Legal Authorities. This Order serves as statewide Waste Discharge Requirements (WDRs) pursuant to California Water Code article 4, chapter 4, division 7 (commencing with § 13260). This Order is also issued pursuant to federal Clean Water Act (CWA) section 402 and implementing regulations adopted by the U.S. EPA, and the California Water Code, chapter 5.5, division 7 (commencing with § 13370). This Order shall serve as a statewide general NPDES permit for point source discharges from single or multiple discharge points to surface waters, storm drains, and other storm water conveyances leading to waters of the U.S.

B. Background and Rationale for Requirements. The Fact Sheet (Attachment F) contains background information and rationale for the requirements in this Order, and is hereby incorporated into and constitutes findings for this Order. Attachments A through E, G, and H are also incorporated into this Order.

C. Termination of Existing Coverage Under Similar Regional Water Board Orders. The State Water Board's intention in the issuance of this statewide NPDES Permit is to provide consistent and efficient regulation of discharges from drinking water systems statewide. To provide such consistency, the State Water Board intends that existing regulatory coverage under an existing non-MS4 Regional Water Board NPDES permit for discharges regulated under this Order will be terminated by the applicable regional water board upon issuance of the Notice of Applicability to a water purveyor per the terms of this Order.

D. Threat and Complexity of Discharge.
When mitigated through implementation of appropriate management practices, treatment and/or controls, discharges from community water systems, as defined under this Order, pose no adverse effects or impacts to beneficial uses of the receiving waters. In accordance with the State Water Board fee regulations, the discharges that are regulated under this general NPDES Permit require minimal or no additional treatment systems to meet limits and pose no significant threat to water quality and therefore are of low threat and low complexity.

E. State Implementation Policy. As adopted in March 2000, and amended in February 2005, the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (State Implementation Policy or SIP) establishes implementation provisions for priority pollutant criteria, and objectives and provisions for chronic toxicity control. Section 5.3 of the SIP allows for the granting of a categorical exception for drinking water system activities conducted to fulfill statutory requirements mandated by federal and state regulations.

F. **California Ocean Plan.** In 1972, the State Water Board adopted the Water Quality Control Plan for Ocean Waters of California (hereinafter Ocean Plan), as amended. The latest Ocean Plan amendment became effective on August 19, 2013. The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean waters of the State. To protect the beneficial uses of ocean water, the Ocean Plan establishes water quality objectives and a program of implementation. Requirements of this Order implement the Ocean Plan and are applicable to those discharges directly into the Ocean or indirectly via a storm water system that drains into the Ocean near the location of discharge. This Order does not authorize direct discharges into Areas of Special Biological Significance (ASBS).

   Section III.J of the Ocean Plan allows the State Water Board to grant an exception where the State Water Board determines that the exception will not compromise protection of the ocean waters or beneficial uses and the public interest will be served.

G. **Exception Resolution**. On November 18, 2014, the State Water Board adopted a Resolution approving an exception to the State Implementation Policy and the Ocean Plan to water purveyors statewide for discharges from drinking water systems from complying with specified priority pollutant criteria and ocean plan objectives. As provided in Resolution 2014-0067, the State Water Board granted an exception per section 5.3 of the State Implementation Policy to water purveyors statewide, for planned and emergency discharges to inland surface waters, enclosed bays and estuaries. Similarly, as provided in Resolution 2014-0067, the State Water Board granted water purveyors with drinking water system discharges to the ocean, other than direct discharges into ASBS, an Ocean Plan exception for compliance with specified Ocean Plan objectives. As further discussed in the Fact Sheet (Attachment F), the State Water Board finds that in accordance with the requirements of the SIP and Ocean Plan, discharges from drinking water systems qualify for an exception of the State Implementation Policy and Ocean Plan per Resolution 2014-0067.

H. **California Environmental Quality Act.** Under Water Code section 13389, this action to adopt an NPDES permit is exempt from the provisions of Chapter 3 of the California Environmental Quality Act (CEQA), (commencing with section 21100) of Division 13 of the Public Resources Code.

   Additionally, pursuant to CEQA, Public Resources Code section 21100 et seq., on November 18, 2014 the State Water Board adopted Resolution 2014-0067 approving a Mitigated Negative Declaration for excepting the type of discharges as covered under this Order from specified requirements of the State Implementation Policy and the California Ocean Plan.

I. **Total Maximum Daily Load (TMDL) Implementation.** A review of Regional Water Board TMDLs found that, as of the adoption date of this Order, only the Los Angeles Regional Water Board and the San Diego Regional Water Board have TMDLs that either directly apply waste load allocations to, or may indirectly imply that waste load allocations are applicable to, the discharges from drinking water systems regulated under this General Order. None of these TMDLs established waste load allocations that apply exclusively to discharges from drinking water systems. These TMDLs are

applicable to the discharges from drinking water systems authorized under this Order and are therefore implemented by this Order.

This Order requires TMDL-related sampling of discharges from drinking water systems identified in a TMDL. If a Regional Water Board determines that any of these TMDLs, or any newly approved TMDLs, establish requirements that should be implemented through TMDL-specific permit requirements for the discharges from drinking water systems that are authorized under this Order, the Regional Water Board may issue permit(s) for those discharges, with coverage under this Order subsequently terminated. Alternatively, if further TMDLs are adopted that address pollutants that are likely to be in discharges from drinking water systems, and allocate waste loads specifically to water purveyors regulated under this Order, the State Water Board may consider adding additional TMDL-specific permit requirements to Attachment G of this Order in a subsequent permit amendment or renewal.

J. **Notification of Interested Parties.** State and Regional Water Board staffs have conducted eight stakeholder meetings statewide, and numerous other informal communications, and have notified prospective water purveyors and interested agencies and persons of the intent to issue this statewide NPDES permit and prescribe these statewide waste discharge requirements. The State Water Board provided an opportunity for all interested parties to submit written comments and testimony.

K. **Consideration of Public Comment.** The State Water Board, in an August 5, 2014 public hearing, heard and considered public comments pertaining to the draft Order. The State Water Board also considered all written public comments submitted by the public comment due date of August 19, 2014, prior to adopting this Order. The Fact Sheet (Attachment F) provides details regarding the public notice and public hearing.

THEREFORE, IT IS HEREBY ORDERED that, in order to meet the provisions contained in California Water Code, Division 7 (commencing with section 13000) and regulations adopted thereunder, and the provisions contained in the Clean Water Act and regulations and guidelines adopted thereunder, a water purveyor shall comply with the requirements of this Order. Water purveyors that have obtained coverage under this Order shall comply with the requirements in sections IV. through VII. (Discharge Specifications and Effluent Limitations, Receiving Water Limitations, Multiple Uses or Beneficial Uses Provisions, and Compliance Determination), Attachments D and E (Standard Provisions and Monitoring and Reporting Program) of this Order, and Attachment G (TMDL-related requirements) as applicable.

IV. DISCHARGE SPECIFICATIONS AND EFFLUENT LIMITATIONS (ONLY APPLICABLE TO DISCHARGES THAT ENTER A WATER OF THE U.S.)

For purposes of this Order, references to “discharge(s)” mean discharge(s) that may occur directly, through a constructed storm drain, or through other conveyance system, to waters of U.S. The Discharger shall comply with the following discharge specifications and effluent limitations.

A. Specification for Implementation of Best Management Practices

1. The Discharger shall implement best management practices (BMPs) that treat or control pollutants from its discharges to maintain compliance with this Order. Implementation of BMPs includes proper management, and routing of discharges to control the pollutants of concern. The Discharger shall properly manage planned discharges and implement proven BMPs provided by professional associations or institutes such as the American Water Works Association, to protect beneficial uses of the receiving water body(ies). For emergency discharges, the Discharger shall implement BMP procedures as soon as feasible while concurrently protecting public health and safety. Attachment C of this Order provides example BMPs.

   At minimum, the Discharger shall implement BMPs for planned discharges to achieve the following performance measures:

   i. Prevent aquatic toxicity by using dechlorination chemical additions, implementing equivalent proven dechlorination methods, and/or assuring that the chlorine in the discharge dissipates naturally; such that the level of chlorine in the discharge is less than 0.019 mg/L prior to entering a receiving water.

   ii. Prevent riparian erosion and hydromodification by implementing flow dissipation, erosion control, and hydromodification-prevention measures; and

   iii. Minimize sediment discharge, turbidity and color impacts by implementing sediment, turbidity, erosion and color control measures.

2. For Groundwater Supply Well Operations, the Discharger shall implement treatment systems or BMPs for all groundwater well development, rehabilitation, or operation discharges to waters of the U.S. to ensure these discharges:

   (1) Do not cause or contribute to an exceedance of the receiving water limitation for turbidity in Section V.G. of this Order, and

   (2) Comply with a turbidity action level of 100 Nephelometric Turbidity Units (NTUs) or less in the discharge. An exceedance of the turbidity numeric action level of 100 NTU is not a violation of this Order, but any exceedance does require that the Discharger take action to modify, change or enhance BMPs when the turbidity level is greater than 100 NTU, until the turbidity level is 100 NTU or less.

3. The Discharger shall implement quality assurance and quality control protocol to assure best management practices, monitoring, and reporting are effective, valid, and in compliance with this Order. The Discharger shall train all personnel operating the drinking water system and responding to emergency discharges to assure the quality assurance and quality control protocol is properly implemented.

4. For planned discharges, BMPs shall be implemented prior to and during discharges that enter a water of the U.S. For planned discharges from pressure relief valves (*i.e.*, due to testing or maintenance) and unchlorinated pump-to waste wells, BMPs

shall be implemented unless infeasible (e.g., inaccessible, inadequate space). For emergency discharges, BMPs shall be implemented as soon as feasible following assurance that public safety, property, and infrastructure are protected.

5. In fulfilling the requirements of this section, the Discharger may implement the example BMPs contained in Attachment C, or proven BMPs per updated approved guidance established by industry experts, professional associations, or entities (e.g. *2014 Edition of the BMP Manual for Drinking Water System Releases* published by the California-Nevada Section of the American Water Works Association).
6. The Discharger shall maintain a documented log of all BMPs implemented for its different types of discharges that enter a water of the U.S., and make it available to State and Regional Water Board staff upon request.
7. The Discharger shall modify BMPs as necessary to maintain compliance with the requirements of this Order. If monitoring results or other available information demonstrate that the discharge is not in compliance, the Discharger shall determine the source of non-compliance, and develop and implement new or revised BMPs as necessary. As part of this process, the Discharger shall validate the effectiveness of any new or revised BMPs to achieve the requirements of this Order. All non-compliance and corresponding corrective actions to address non-compliance shall be reported to the State Water Board in the annual report, as required in the Monitoring and Reporting Program (Attachment E) of this Order. A log documenting the additional or revised BMPs shall be made available upon request by staff of the State and/or Regional Water Board.

B. Effluent Limitations

1. All Discharges of Superchlorinated Water:

a. The total chlorine residual concentration in the discharge shall not exceed 0.019 mg/L.

b. A field monitoring result with a total residual chlorine concentration greater than or equal to 0.1 mg/L shall be deemed out of compliance with a chlorine effluent limitation.

2. All Planned Discharges directly into, or within 300 feet of, Inland Surface Waters, Enclosed Bays, and Estuaries

a. The total chlorine residual concentration in the discharge shall not exceed 0.019 mg/L.
b. A field monitoring result with a total residual chlorine concentration greater than or equal to 0.1 mg/L shall be deemed out of compliance with a chlorine effluent limitation.

3. All Planned Discharges directly into, or within 300 feet of, Ocean Waters

a. The total chlorine residual concentration in the discharge shall not exceed 0.008 mg/L.
b. A field monitoring result with a total residual chlorine concentration greater than or equal to 0.1 mg/L shall be deemed out of compliance with a chlorine effluent limitation.

c. The turbidity concentration in the discharge shall not exceed 225 NTU at any time.

V. RECEIVING WATER LIMITATIONS

Receiving water limitations are based on water quality objectives contained in Regional Water Quality Control Board Basin Plans and State Water Board water quality control plans, including the Ocean Plan, and policies, and are a required part of this Order. Drinking water system discharges to the receiving water that are authorized to discharge under this Order shall not cause or contribute to the exceedance of a water quality objective or standard in the receiving water, other than water quality objectives or standards for parameters that have been granted an exception under the State Water Board Resolution 2014-0067 and are not part of a TMDL, and at minimum shall not cause or contribute to an occurrence of the following in the receiving water:

A. pH. The pH level to be outside the range of the pH receiving water objective in a corresponding Regional Water Board basin plan.

B. Chemical Constituents. Chemical constituents to be present in concentrations that adversely affect beneficial uses.

C. Floating Material and Trash. Floating material, debris or trash to be present that cause nuisance or adversely affect beneficial uses.

D. Sediment and Total Suspended Solids. The sediment load and total suspended solids discharge rate of surface waters to be altered in such a manner as to cause nuisance or adversely affect beneficial uses.

E. Toxicity. Toxic substances to be present, individually or in combination, in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life.

F. Hydromodification. Velocity and/or volume of discharge to modify the existing physical characteristics of a water body.

G. Turbidity. Turbidity concentrations to exceed corresponding Regional Water Board basin plan water quality objectives for turbidity.

VI. MULTIPLE USES OR BENEFICIAL REUSE

The discharge to surface waters may be considered wasteful when it is feasible for the water to be used prior to discharge. The State Water Board strongly encourages all water purveyors to put all or part of the discharge water to multiple uses or a beneficial reuse prior to discharge into surface water. Because of the high quality of the discharge water addressed in this Order, discharges authorized under this Order that are put to multiple use or beneficial reuse are not required to be monitored and generally not required to obtain any other waste discharge requirements if the water that would otherwise be discharged is instead collected and reused for landscape irrigation, agricultural irrigation or other uses in

a manner that augments the existing water supply, or if the discharge is directly or indirectly discharged to: (1) storm water capture basin(s), (2) low impact development features, or (3) other groundwater-recharge system(s).

VII. PROVISIONS

A. Standard Provisions

The Discharger shall comply with all Standard Provisions in Attachment D.

B. Monitoring and Reporting Program Requirements

The Discharger shall comply with the Monitoring and Reporting Program requirements in Attachment E.

C. Special Provisions

1. Reopener Provisions

The State Water Board may modify or reopen this Order prior to its expiration date in any of the following circumstances:

a. If present or future investigations demonstrate that the discharges governed by, and in compliance with, this Order cause adverse impacts on water quality or beneficial uses of the receiving waters;

b. If State Water Board precedential decisions, new policies, new laws, or new regulations are adopted;

c. To include specific implementation provisions in Attachment G for any existing or newly adopted TMDLs;

d. If an administrative or judicial decision on a separate NPDES permit or Waste Discharge Requirements addresses requirements applicable to discharges authorized in this Order; and/or

e. As otherwise authorized by law.

D. Noncompliance

Noncompliance with any requirement of this Order may be subject to enforcement action by the State Water Board and/or Regional Water Board as authorized under the Porter Cologne Water Quality Control Act (Water Code Section 13000), consistent with the State Water Board's enforcement policy.

VIII. COMPLIANCE DETERMINATION FOR PLANNED DISCHARGES

Compliance with the final effluent limitations contained in Section IV.B of this Order will be determined as specified below:

A. Permit Compliance for Planned Discharges only

Compliance with applicable effluent limitations, BMP implementation requirements, receiving water limitations, monitoring, notification, and reporting requirements of the permit constitutes compliance with this Order. Due to the infeasibility of a Discharger to self-monitor compliance with receiving water limits in distant receiving water bodies (for discharges into drainage conveyance systems), non-compliance with receiving water limitations for indirect discharges will be determined based on additional site-specific information made available to the Water Boards indicating that drinking water system discharges caused or contributed to the exceedance of the receiving water limitations and adversely impacted beneficial uses.

B. General

Compliance with effluent limitations shall be determined using monitoring and reporting protocols defined in the Monitoring and Reporting Program of this Order. For purposes of reporting and administrative enforcement by the State and/or Regional Water Boards, the Discharger shall be deemed out of compliance with the effluent limitations if the constituent concentration or level is greater than the effluent limitation and greater than or equal to the minimum level (ML, also known as the Reporting Level (RL)) of properly calibrated in-field monitoring equipment.

C. Total Residual Chlorine

Handheld chlorine measuring devices that are U.S. EPA-approved are appropriate to measure residual chlorine in the field for compliance determination. The minimum level of a hand-held chlorine meter used to determine compliance with the total chlorine residual effluent limitations is 0.1 mg/L or lower. A discharge monitoring result with a total residual chlorine concentration greater than or equal to 0.1 mg/L shall be deemed out of compliance with a chlorine effluent limitation. Due to other possible interferences of these handheld devices, if readings are false positives, these will not be evaluated for compliance if explanation of cause of false positive is provided.

ATTACHMENT A – DEFINITIONS

Adverse Effect or Adverse Impact to Beneficial Uses of a Receiving Water Body
A detrimental effect upon water quality or beneficial uses of a receiving water body caused by a discharge or loading of a pollutant or pollutants.

Authorized Discharge
Any discharge that is authorized pursuant to this National Pollutant Discharge Elimination System (NPDES) permit and meets the requirements and conditions set forth in this Order.

Basin Plan
The Water Quality Control Plan(s) adopted by a Regional Water Quality Control Board. A Basin Plan designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve water quality objectives for all waters of the Basin.

Beneficial Uses
The existing or potential uses of receiving waters in the permit area as designated by a Regional Water Board basin plan or other water quality control plan.

Best Management Practices (BMPs)
Methods, measures, or practices designed and selected to reduce or eliminate the discharge of pollutants to surface waters from point and nonpoint source discharges. BMPs include structural and nonstructural controls, and operation and maintenance procedures, which can be applied before, during, and/or after pollution producing activities.

Community Water System
A public water system for the provision of water for human consumption through pipes or other constructed conveyances that has 15 or more service connections or regularly serves at least 25 individuals daily at least 60 days out of the year.

Drinking Water System
A system regulated by the State Water Resources Control Board Division of Drinking Water or a local county department of health, with the primary purpose of conveying, treating, storing and distributing safe drinking water to at least 15 service connections used by yearlong residents or regularly serves at least 25 year around residents of the area served by the system.

Deputy Director
The Deputy Director of Water Quality for the State Water Resources Control Board or any person(s) delegated by the Deputy Director to serve as acting Deputy Director.

Direct Discharge
Any discharge that enters a Water of the U.S. without first traveling via a storm drain or any other constructed conveyance system.

Discharger
Any water purveyor named in this Order as being responsible for permit requirements within its jurisdiction. A discharger to this Order includes a public or private water purveyor, wholesaler, or district, or a contractor working on behalf of the water purveyor, wholesaler or district.

Drinking Water System Discharges
Release of flows from drinking water intakes, transmission, storage, pumping, treatment and distribution systems including flows due to: (1) system failures and pressure releases, (2) system development, testing and maintenance that is performed to comply with the federal Safe Drinking Water Act, the California Health and Safety Code, and State Water Board Division of Drinking Water permit requirements.

Emergency Discharge
A discharge due to a sudden unexpected occurrence involving a clear and imminent danger, demanding immediate action to prevent or mitigate loss of, or damage to, life, health, property, or essential public services, including the provision of drinking water supplies in accordance with applicable drinking water statutes and regulations.

Estuaries
Surface waters, including coastal lagoons, located at the mouths of streams that serve as areas of mixing for fresh and ocean waters. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and seawater.

Enclosed Bays
Enclosed bays are hydrological indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost harbor works is less than 75 percent of the greatest dimension of the enclosed portion of the bay.

Impaired Water Body
A water body that is currently listed on the Clean Water Act section 303(d) list.

Indirect Discharge
Any discharge that enters a Water of the U.S. by first traveling via a storm drain or any other constructed conveyance system.

Inland Surface Waters
All surface waters of the state that do not include the ocean, enclosed bays, or estuaries.

Low Impact Development (LID)
A storm water management and land development strategy that emphasizes water conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions.

Method Detection Limit (MDL)
Minimum concentration of a substance that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero, as defined in in 40 C.F.R. part 136, Attachment B, revised as of July 3, 1999.

Minimum Level (ML) and Reporting Level (RL)
The minimum level (ML) means the concentration at which a properly calibrated monitoring system gives a recognizable signal and acceptable calibration point. The ML is the concentration in a sample that is equivalent to the concentration of the lowest calibration standard analyzed by a specific monitoring procedure, assuming that all the method specified sample weights, volumes, and processing steps have been followed. A reporting level (RL) is the ML for reporting and compliance determination included in this Order.

MS4 Operator
The MS4 Operator is the entity responsible for the operation of its local municipal separate storm sewer system subject to an MS4 NPDES Permit.

Monitoring Well
Specialized wells in which the depth to groundwater can be measured and samples of ground water can be collected for analysis for the purpose of managing drinking water aquifers and/or to fulfill requirements mandated by the federal Safe Drinking Water Act and the California Health and Safety Code.

Non-community Water System
A water system that is not a community water system, as defined in this attachment. A non-community water system is a water system that generally serves less than 15 service connections used by yearlong residents or does not regularly serve at least 25 year around residents with the water system's service area.

Not Detected (ND)
Sample results less than the properly calibrated monitoring equipment's MDL.

Non-transient Water System
A water system that is not a community water system, as defined in this attachment, and that regularly serves at least 25 of the same persons over six months per year. Non-transient water systems are regulated by the State Water Board Division of Drinking Water.

National Pollutant Discharge Elimination System (NPDES)
The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Clean Water Act sections 307, 402, 318, and 405.

Pollutants
Substances defined in Clean Water Act section 502(6) (33 U.S.C. § 1362(6)), and incorporated by reference into Water Code section 13373.

Pollution Prevention
Any action that causes a net reduction in the use or generation of a hazardous substance or other pollutant that is discharged into water and includes, but is not limited to, input change, operational improvement, production process change, and product reformulation (as defined in Water Code section 13263.3). Pollution prevention does not include actions that merely shift a pollutant in discharge water from one environmental medium to another environmental medium, unless clear environmental benefits of such an approach are identified to the satisfaction of the State Water Board or Regional Water Board.

Receiving Water
The term receiving water is used interchangeably with the term waters of the U.S.

Superchlorinated Water
Water that is dosed with chlorine in order to adequately sanitize and disinfect drinking water system facilities

Supply Well
A groundwater well that is installed, operated, maintained and/or rehabilitated in accordance with the federal Safe Drinking Water Act and the California Health and Safety Code to pump ground water for the primary purpose of delivering drinking water to a municipality or community.

Transmission Systems
Transmission systems include pipes, pumps, canals, pump houses, and other components used to move water from the point of origin to storage reservoirs, treatment facilities, and distribution systems. Transmission systems do not have connections to serve end users.

Water Purveyor
Any entity that discharges from a drinking water system, including water purveyors, wholesalers, distributors, districts, municipalities, private companies, and other entities that own or operate a community drinking water system.

Water Wholesaler
An entity that provides potable water to a person, political subdivision, or municipality that is not the ultimate consumer of the service.

Waters of the State
Any surface water or groundwater, including saline waters, within boundaries of the state.

Waters of the United States (U.S.)
Generally refers to surface waters, as defined for the purposes of the federal Clean Water Act.

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ATTACHMENT B1 – NOTICE OF INTENT

STATE WATER RESOURCES CONTROL BOARD TO APPLY FOR REGULATORY COVERAGE UNDER ORDER WQ 2014-0194-DWQ, NPDES NO. CAG140001 FOR DRINKING WATER SYSTEM DISCHARGES TO WATERS OF THE U.S.

1. DRINKING WATER SYSTEM OWNER[1]

Name		Number of Connections:_____	
State Water Board Division of Drinking Water Drinking Water System No.:_____ (If Applicable - Conceptual Letter Approval – System No.:_____)			
Mailing Address			
City	State	ZIP	Phone
Contact Person			
Signature:[2]		Date:	

2. APPLICANT (IF DIFFERENT FROM SYSTEM OWNER)

Name			
Mailing Address			
City	State	ZIP	Phone
Contact Person			
Signature:[2]		Date:	

3. WATER SUPPLIERS (IF APPLICABLE)

Name			
Mailing Address			
City	State	ZIP	Phone
Contact Person			
Signature:[2]		Date:	

4. BILLING ADDRESS

Name			
Mailing Address			
City	State	ZIP	Phone
Contact Person			

[1] If additional property owners are involved, provide the information in a supplementary letter.
[2] By signing this notice of intent, you are certifying under penalty of perjury that the information provided in this application and in any attachments is true and accurate to the best of your knowledge. By signing this Notice of Intent, you agree to closely monitor and stop the discharge if there is any violation of Order WQ 2014-0194-DWQ or impact to receiving water beneficial uses.

5. PLANNED DISCHARGE INFORMATION

Identify the type of facilities that will have drinking water system discharge (all that apply)

☐	Intake and/or Transmission Facilities	☐	Distribution Systems
☐	Storage Tanks and/or Reservoirs	☐	Supply Wells
☐	Water Treatment Facilities	☐	Other (explain below)

List and description of other discharges.

Are the discharges existing discharges as of the adoption date of this Order)? _____

If not, identify the new discharges that are proposed to take place prior to the expiration date of this Order?

List any additives to the drinking water not affiliated with drinking water treatment, their purpose, and quantity: (For example, algaecides, anticorrosion agents, etc.)

6. MULTIPLE WATER USE OR BENEFICIAL USE OPTIONS

Is using a portion of the discharge for irrigation, groundwater infiltration/recharge or other use a viable option?	☐ Yes	☐ No
Is land disposal of a portion of your discharge a viable option?	☐ Yes	☐ No

Provide a brief description of the discharge (or portion thereof), that is collected and applied for irrigation or other beneficial reuse. If no multiple water use options of any portion of your discharge are viable, explain why (attach additional sheet as necessary).

7. RECEIVING WATER INFORMATION (provide on separate sheet if necessary) *Note that identification of receiving waters does not necessarily constitute a formal finding that any specific water body is a water of the U.S.*

Name of all named receiving water bodies and/or major downstream water bodies:		
Circle the Regional Water Quality Control Board(s) where receiving water body (ies) is/are located: REGION 1, 2, 3, 4, 5, 6, 7, 8, or 9 (See Attachment H for identification of the various regions)		
Are any of the receiving water bodies receiving drinking water system discharges listed on the current 303d list[1] for a constituent in your discharge?[1]	☐ Yes	☐ No
If Yes, then list the water bodies on the 303d list, the constituent causing the impairment:		
Does/Do the receiving water body(ies) have applicable waste load allocations identified in Section K of the Fact Sheet or TMDL-related requirements in Attachment G? If yes, the following items must be attached to this form for the application package to be deemed complete: a. Laboratory Analysis and estimated volume of your discharge per section II.C.1.d.i. of this Order b. If applicable, a description of the additional best management practices, including applicable treatment or controls that will be implemented to comply with TMDL-related requirements per section II.C.1.d.ii. of this Order	☐ Yes	☐ No

[1] See http://www.waterboards.ca.gov/water_issues/programs/tmdl/ for current Clean Water Act section 303(d) listing.

8. BEST MANAGEMENT PRACTICES (CHECK ALL THAT APPLY)

☐ Best Management Practices (BMPs) are being implemented by trained personnel of the subject drinking water system(s) and an instruction copy of the BMPs are available to all personnel and available at the water purveyor's main office(s) upon State or Regional Water Board staff request.

Date that implementation of BMPs commenced for the above identified Drinking Water System: _____

If not, provide date BMPs will be implemented and available. (Date must be within 6 months of the effective date of this Order.) _____

9. APPLICATION FEE

☐ Provide the appropriate applicable fees. Information on applicable fees can be found at http://www.waterboards.ca.gov/resources/fees/ Checks shall be made payable to the State Water Resources Control Board.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

_____ _____

Signature Date

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ATTACHMENT B2 – NOTICE OF NON-APPLICABILITY

STATE WATER RESOURCES CONTROL BOARD

CERTIFYING NON-APPLICABILITY OF REGULATORY COVERAGE UNDER ORDER WQ 2014-0194-DWQ, NPDES NO. CAG140001

1. DRINKING WATER SYSTEM OWNER

Name			State Board Division of Drinking Water Drinking Water System Permit No.:
Mailing Address			
City	State	ZIP	Phone
Contact Person			
Signature:			Date:

2. WATER PURVEYOR (IF DIFFERENT FROM ABOVE)

Name			
Mailing Address			
City	State	ZIP	Phone
Contact Person			
Signature:			Date:

3. REASON FOR NON-APPLICABILITY: (check one that applies and complete information)

Discharges from the above system(s):

☐ Are regulated by a separate individual NPDES Permit issued by a Regional Water Board to address site-specific discharges outside the scope of this Order or a Total Maximum Daily Load (TMDL) –related water quality impairments:

Regional Water Board Order No. _____NPDES Permit No._____

☐ Are covered under a local agreement with an municipal sewer storm system (MS4) permittee (Attach a copy of agreement and acknowledgement by the corresponding Regional Water Board)

☐ Are from a drinking water system owned/operated by an (MS4) permittee or co-permittee named on an existing Water Board NPDES Permit and <u>all</u> discharges flow into the same regulated storm drain system.

Provide Order No. _____NPDES Permit No._____

☐ Do not discharge to a water of the U.S. or a conveyance that drains to a water of the U.S.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

_____ _____

Signature Date

ATTACHMENT C – EXAMPLE BEST MANAGEMENT PRACTICES (BMPs)

The Discharger shall implement BMPs to comply with the requirements of this Order, to protect the beneficial uses of the receiving waters and to prevent erosion or hydromodification caused by drinking water system discharges. Required BMPs include but are not limited to the proven practices established by the American Water Works Association, or other professional associations or institutes, in accordance with updated available technology. Dischargers shall implement BMPs comparable to the following example procedures and measures to achieve compliance.

I. Example BMP Procedures

A. Chlorinated Water Discharges

All chlorinated water shall be dechlorinated chemically or naturally. Filter bags, filter rolls and fabric filters, shall be used to remove any sand, silt or debris from entering the surface water or storm drain system.

B. Superchlorinated Water Discharges

All superchlorinated water shall be dechlorinated at the point of discharge directly into a surface water or the point of discharge into any storm water conveyance system. Filter bags or rolls, or equivalent, shall be used to remove any sand, silt or debris from entering the surface water or storm drain system.

C. Facility Drainage Discharges

All discharges from transmission, treatment, storage and distribution facility draining for cleaning and maintenance shall be dechlorinated. Filter bags, filter rolls and fabric filters shall be used to remove sediment prior to discharging to surface waters or storm drains.

D. Groundwater Supply Well Discharges

During flushing, rehabilitation, or development of water supply wells, multi-baffled settling tanks, or equivalent, shall be used if necessary to remove large particles and to reduce turbidity. If further management is needed to reduce solids after settling, the Discharger shall filter the water implementing a filter-bag filtration system, or equivalent practice, before discharging to achieve a turbidity threshold that is in compliance with this Order.

II. Example BMP Measures

A. Sediment and Erosion Control

Sediment and erosion control BMPs that assess and prevent potential impacts to receiving waters, at discharge points and downstream reaches.

1. **Receiving Waters.** The Discharger shall identify methods for locating discharge points and receiving waters to determine appropriate sediment and erosion control measures.

2. **Sediment Control.** Sediment control practices shall be used to filter and trap sediment particles, and prevent them from reaching storm drains or receiving waters. Sediment control practices to control sedimentation discharge and buildup in receiving waters include:

   (a) Straw wattles and gravel bags may be placed in a flow pathway and around storm drain inlets;

   (b) Plastic sheets may be used to line a trench and flow pathway to prevent water contact with soil;

   (c) Check dams may be constructed to dissipate flow energy and minimize the potential for discharges to dislodge soil; and

   (d) A storm water swale, if available nearby to the point of discharge that has sufficient capacity for the discharge.

   (e) Discharge to an open field or turf to remove sand and/or silt or larger particles prior to surface water discharge.

3. **Erosion Controls.** Erosion control practices shall be used to protect soil surfaces at discharge points and receiving waters. Erosion control practices shall be used to prevent re-suspension of ambient sediment within a receiving water, and shoreline erosion and streambed scour. Such controls shall minimize the energy of discharges by managing flow velocities and volumes, and shall be appropriately designed so that the discharge does not exceed the hydraulic capacity of the receiving water at the point of discharge and areas downstream of the discharge point. The following measures may be used to control erosion in receiving waters:

   (a) Construct check dams to slow down the flow;

   (b) Install flow diffusers at discharge point;

   (c) Fashion discharge flow path with as little slope as possible; and

   (d) Decrease discharge flow rates and duration.

B. Dechlorination

The following types of dechlorination methods, or equivalent, to remove chlorine:

1. Dechlorinating Diffuser – The dechlorinating diffuser connects directly to a discharge nozzle (e.g., to a fire hydrant or fire hose) and contains a chamber that houses dechlorination agent. Some diffusers feature a siphon for dechlorinating agent tablets or a solution to dechlorinate the water.

2. Dechlorination Mats – These mats are used to facilitate effective contact between the flow and dechlorinating agent during dechlorination. For dechlorination of discharges from trenches during main breaks, the tablets are placed inside synthetic mesh fabric pockets sewn together in a grid or line. The dechlorinating mats are laid across the flow path or over the storm water conveyance system.

As the discharged water contacts the tablets, dechlorinating agent is released and chlorine is inactivated.

3. Broadcast Dechlorination – Dechlorination granules are spread over an area, such as pavement, where chlorinated water is flowing toward a storm water conveyance system inlet. As the discharged water contacts the tablets, dechlorinating agent is released and chlorine is inactivated.
4. Chemical Injection Metering Pump – Occasionally, a dechlorination agent is injected into a discharge pipe, such as a tank drain, to dechlorinate the water before entering the storm water system.

Addition of dechlorination chemicals shall be managed to ensure the dechlorination agent does not adversely affect or impact beneficial uses of the receiving waters.

C. Copper and Zinc Management

A Discharger that applies copper-based herbicides or zinc-based corrosion inhibitors to its water shall implement BMP measures to eliminate or reduce copper and zinc concentrations in its discharges to the extent feasible, including but not limited to the following:

1. Record keeping of where, when and how much zinc or copper is used to treat water that has the potential to be discharged to a surface water.
2. Implementation of BMPs that eliminate planned discharges and minimize emergency discharges to surface water bodies from occurring within 48 hours of applying copper-based herbicides or zinc-based corrosion inhibitors.
3. Implementation of BMPs to eliminate or reduce to the extent feasible the use of copper-based herbicides or zinc-based corrosion inhibitors by using less toxic agents or other methods in place of copper-based herbicides or zinc-based corrosion inhibitors.

D. Training

All personnel using, operating and maintaining all facilities and equipment shall be properly trained to implement BMPs to discharges when conducting mandated operational and maintenance activities. The Discharger's staff and/or contractors shall be properly trained to understand permit compliance needs and perform the required monitoring, notification and reporting.

E. Equipment and Supplies

Equipment and sampling meters shall be inspected, maintained and calibrated per manufacturer instructions and specifications.

ATTACHMENT D – STANDARD PROVISIONS

I. STANDARD PROVISIONS – PERMIT COMPLIANCE

A. Duty to Comply

1. The Discharger shall comply with all of the conditions of this Order. Any noncompliance constitutes a violation of the Clean Water Act (CWA) and the California Water Code (Water Code) and is grounds for a potential enforcement action, permit termination, revocation and reissuance, or modification; or denial of a permit renewal application. (40 C.F.R. § 122.41(a).)

B. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this Order. (40 C.F.R. § 122.41(c).)

C. Duty to Mitigate

The Discharger shall take all reasonable steps to minimize or prevent any discharge in violation of this Order that has a reasonable likelihood of adversely affecting human health or the environment. (40 C.F.R. § 122.41(d).)

D. Proper Operation and Maintenance

The Discharger shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Water Purveyor to achieve compliance with the conditions of this Order. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision includes the operation of backup or auxiliary facilities or similar systems that are installed by a Water Purveyor only when necessary to achieve compliance with the conditions of this Order. (40 C.F.R. § 122.41(e).)

E. Property Rights

1. This Order does not convey any property rights of any sort or any exclusive privileges. (40 C.F.R. § 122.41(g).)

2. The issuance of this Order does not authorize any injury to persons or property or invasion of other private rights, or any infringement of state or local law or regulations. (40 C.F.R. § 122.5(c).)

F. Inspection and Entry

The Water Purveyor shall allow State and/or Regional Water Board staff, United States Environmental Protection Agency (U.S. EPA), and/or their authorized representatives

(including an authorized contractor acting as their representative), upon the presentation of credentials and other documents, as may be required by law, to (40 C.F.R. § 122.41(i); Water Code section 13383):

1. Enter upon the Discharger's premises where a regulated facility or activity is located or conducted, or where records are kept under the conditions of this Order (40 C.F.R. § 122.41(i)(1));

2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this Order (40 C.F.R. § 122.41(i)(2));

3. Inspect and photograph, at reasonable times, any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Order (40 C.F.R. § 122.41(i)(3)); and

4. Sample or monitor, at reasonable times, for the purposes of assuring Order compliance or as otherwise authorized by the CWA or the Water Code, any substances or parameters at any location. (40 C.F.R. § 122.41(i)(4).)

II. STANDARD PROVISIONS – PERMIT ACTION

A. General

This Order may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Discharger for modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any Order condition. (40 C.F.R. § 122.41(f).)

B. Duty to Reapply

If the Discharger chooses to continue a discharge regulated by this Order after the expiration date of this Order and after the State Water Board has reissued this Order, the Discharger shall apply for and obtain new permit coverage as required by the new Order. (40 C.F.R. § 122.41(b).)

C. Transfers

This Order is not transferable to any person except after notice to the State Water Board. The State Water Board may require modification or revocation and reissuance of the Order or Notice of Applicability to change the name of the Discharger and incorporate such other requirements as may be necessary under the CWA and the Water Code. (40 C.F.R. § 122.41(l)(3) and 122.61.)

III. STANDARD PROVISIONS – MONITORING

A. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. (40 C.F.R. § 122.41(j)(1).)

B. If applicable, monitoring results shall be conducted according to test procedures under 40 Code of Federal Regulations part 136. (40 C.F.R. § 122.41(j)(4) and 122.44(i)(1)(iv).)

IV. STANDARD PROVISIONS – RECORDS

A. Records Retention

The Discharger shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this Order, and records of all data used to complete the application for this Order, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the State Water Board's Division of Water Quality Deputy Director at any time. (40 C.F.R. § 122.41(j)(2).)

B. Records of monitoring information shall include:

1. The date, exact place, and time of sampling or measurements (40 C.F.R. § 122.41(j)(3)(i));

2. The individual(s) who performed the sampling or measurements (40 C.F.R. § 122.41(j)(3)(ii));

3. The date(s) sampling and monitoring were performed (40 C.F.R. § 122.41(j)(3)(iii));

4. The individual(s) who performed the analyses (40 C.F.R. § 122.41(j)(3)(iv)); and

5. The results of such monitoring. (40 C.F.R. § 122.41(j)(3)(vi).)

C. Claims of confidentiality for the following information will be denied (40 C.F.R. § 122.7(b)):

1. The name and address of any permit applicant or Discharger (40 C.F.R. § 122.7(b)(1)); and

2. Permit applications and attachments, permits and monitoring data. (40 C.F.R. § 122.7(b)(2).)

V. STANDARD PROVISIONS – REPORTING

A. Duty to Provide Information

The Discharger shall furnish to the State Water Board or the United States Environmental Protection Agency (U.S. EPA) within a reasonable time, any information which the State Water Board or U.S. EPA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this Order or to determine compliance with this Order. Upon request, the Discharger shall also furnish to the State Water Board, a Regional Water Board or U.S. EPA copies of records required to be maintained by this Order. (40 C.F.R. § 122.41(h) and Wat. Code, §§ 13267, 13383.)

B. Signatory and Certification Requirements

1. All applications, reports, or information submitted to the State Water Board, and/or U.S. EPA shall be signed and certified in accordance with Standard Provisions – Reporting sections V.B.2 through V.B.7, below. (40 C.F.R. § 122.41(k).)

2. For a corporation, a responsible corporate officer shall sign all permit applications. For the purpose of this section, a responsible corporate officer means: (i) A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures. (40 C.F.R. § 122.22(a)(1).)

3. For a partnership or sole proprietorship, a general partner or the proprietor shall sign all permit applications, respectively. (40 C.F.R. § 122.22(a)(2).)

4. For a municipality, State, federal, or other public agency, all permit applications shall be signed by either a principal executive officer or ranking elected official. For purposes of this provision, a principal executive officer of a federal agency includes: (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrators of U.S. EPA). (40 C.F.R. § 122.22(a)(3).).

5. All reports required by this Order and other information requested by the State Water Board, a Regional Water Board or U.S. EPA shall be signed by a person described in Standard Provisions – Reporting V.B.2 above, or by a duly authorized representative of that person. A person is a duly authorized representative only if:

a. The authorization is made in writing by a person described in Standard Provisions – Reporting V.B.2 above (40 C.F.R. § 122.22(b)(1));

b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) (40 C.F.R. § 122.22(b)(2)); and

c. The written authorization is submitted to the State Water Board. (40 C.F.R. § 122.22(b)(3).)

6. If an authorization under Standard Provisions – Reporting V.B.3 above is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of Standard Provisions – Reporting V.B.3 above shall be submitted to the State and Regional Water Board prior to or together with any reports, information, or applications, to be signed by an authorized representative. (40 C.F.R. § 122.22(c).)

7. Any person signing a document under Standard Provisions – Reporting V.B.2 or V.B.3 above is making the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." (40 C.F.R. § 122.22(d).)

C. Monitoring Reports

1. Monitoring results shall be reported at the intervals specified in the Monitoring and Reporting Program in Attachment E of this Order.

2. If the Discharger monitors any pollutant more frequently than required by this Order using test procedures approved under 40 Code of Federal Regulations part 136, the results of this monitoring shall be included in the calculation and reporting of the data to the State Water Board. (40 C.F.R. § 122.41(l)(4)(ii).)

D. Twenty-Four Hour Reporting

1. The Discharger shall report any noncompliance that may endanger health or the environment to the Regional Water Board. Any information shall be provided orally within 24 hours from the time the Discharger becomes aware of the circumstances.

A written submission shall also be provided to the applicable regional water quality control board within five (5) days of the time the Discharger becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. (40 C.F.R. § 122.41(l)(6)(i).)

2. The State Water Board or a Regional Water Board may waive the above-required written report under this provision on a case-by-case basis if an oral report has been received within 24 hours. (40 C.F.R. § 122.41(l)(6)(iii).)

E. Anticipated Noncompliance

The Discharger shall give advance notice to the appropriate Regional Water Board or State Water Board of any planned changes in the permitted facility or activity that may result in noncompliance with General Order requirements. (40 C.F.R. § 122.41(l)(2).)

F. Other Noncompliance

The Discharger shall report all instances of noncompliance not reported under Standard Provisions – Reporting V.C and V.D above at the time monitoring reports are submitted. The reports shall contain the information listed in Standard Provision – Reporting V.D above. (40 C.F.R. § 122.41(l)(7).)

G. Other Information

When the Water Purveyor becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Regional Water Board, State Water Board, or U.S. EPA, the Water Purveyor shall promptly submit such facts or information. (40 C.F.R. § 122.41(l)(8).)

VI. Standard Provisions – Enforcement

The State and Regional Water Board are authorized to enforce the terms of this permit under several provisions of the Water Code, including, but not limited to, sections 13385, 13386, and 13387.

ATTACHMENT E – MONITORING AND REPORTING PROGRAM

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ATTACHMENT E – MONITORING AND REPORTING PROGRAM

Discharges from drinking water systems, as authorized by this Order, shall be properly managed to not adversely affect or impact beneficial uses of a receiving water body. The purpose of the monitoring and reporting requirements contained in the following Monitoring and Reporting Program is to provide information demonstrating that management practices are properly implemented to protect surface water quality. The objective of the monitoring is to validate that the management practices are performing properly to maintain compliance with this Order and protect receiving waters from adverse impacts to beneficial uses.

Title 40 Code of Federal Regulations part 122.48 requires that all National Pollutant Discharge Elimination System (NPDES) permits specify monitoring and reporting requirements. California Water Code sections 13267 and 13383 also authorize the State Water Resources Control Board (State Water Board) and a Regional Water Quality Control Board (Regional Water Board) to require technical and monitoring reports. This Monitoring and Reporting Program establishes monitoring and reporting requirements, which implement the federal and State of California regulations.

Dischargers authorized under this Order shall comply with all Standard Provisions in Attachment D related to monitoring, reporting and recordkeeping.

I. GENERAL MONITORING PROVISIONS

A. Samples and measurements taken as required herein shall be representative of the nature of the monitored discharge after implementation of best management practices (BMPs). All samples shall be taken at the monitoring locations specified below and, unless otherwise specified, before the discharge flow joins or is diluted by any other waste stream or body of water.

B. Chemical analyses that require laboratory testing are not required in this Order (with the exception of application requirements for discharge into a water body with already established TMDL requirements identified in Section K of the Fact Sheet and/or TMDL-related requirements prescribed to the water purveyors listed in Attachment G). The Discharger shall conduct onsite field measurements for pH, turbidity, and total chlorine residual per quality assurance and quality control (QA/QC) protocol that conform to U.S. EPA guidelines, or procedures approved by the American Water Works Association or other professional drinking water industry association.

C. The Discharger shall maintain sufficient resources, including trained personnel and properly calibrated and maintained field instruments to adequately perform all field measurements required in this Order. Onsite field measurements shall be performed using handheld devices by trained personnel acting on the Discharger's behalf. A manual containing the proper operating procedures for all onsite field monitoring equipment, shall be maintained onsite or at the water purveyor's office, and shall be available for inspection by State or Regional Water Board staff.

D. Appropriate field meter devices shall be selected consistent with accepted scientific practices and used to ensure the accuracy and reliability of measurements of monitored discharges. All devices shall be properly maintained and calibrated per manufacturer instructions and as necessary to ensure their continued accuracy.

II. MONITORING REQUIREMENTS FOR PLANNED DISCHARGES

A. Event Monitoring Requirements for Superchlorinated, Well development and/or rehabilitation, and Large Volume Discharges.

The Discharger shall monitor all superchlorinated discharges, all discharges from well development and/or rehabilitation activities, and individual discharges greater than 325,850 gallons (one acre-foot) for the constituents specified in Table E-1 and per the frequency specified in Table E-2.

Table E-1. Event Monitoring of Superchlorinated Discharges, Well Development and/or Rehabilitation, and Individual Discharge Events Greater than 325,850 Gallons

Parameter	Units	Sampling [2]	Sample Type
Chlorine, Total Residual [1,3,4]	mg/L	1/Event	Grab[1]
Volume	Gallons	1/Event	Estimate [5]
pH [6]	Standard Units	1/Event	Grab
Turbidity	NTU	1/Event	Visual Estimate
Turbidity for Well Development and/or Rehabilitation Only[1]	NTU	1/Event	Grab[1]

[1] A handheld field meter shall be used, provided the meter utilizes a U.S. EPA-approved algorithm/method and is calibrated and maintained in accordance with the manufacturer's instructions. The Discharger shall maintain a calibration and maintenance log for each meter used for monitoring required by this Monitoring and Reporting Program.
[2] Sampling shall take place downstream of management practices, as feasible.
[3] Total chlorine residual shall be monitored with a method sensitive to and accurate at a minimum level of 0.1 mg/L. False positives are acceptable if explanation of the cause is included.
[4] Total Chlorine Residual monitoring is not required of non-chlorinated discharges.
[5.] Calculated estimate using available meter reading information or visual estimate.
[6] pH monitoring is required for superchlorinated discharges only.

Table E-2. Event Frequency Requirements for Superchlorinated Discharges, Well Development and/or Rehabilitation Discharges to a Water of the U.S., and Discharges Greater than 325,850 Gallons

Duration of Discharge	Sampling Requirements
Less than 20 minutes	One sample is required during the first 10 minutes of the discharge.
20 minutes to 60 minutes	One sample is required during the first 10 minutes of the discharge, plus a second sample is required within the last 10 minutes of the discharge.
Greater than 60 minutes	One sample is required within the first 10 minutes, a second sample is required within the next 50 minutes, and a third sample is required approximately within the last 10 minutes of the discharge or as close to the end of the discharge as is feasible.

B. Annual Representative Monitoring Requirements

This Order allows discharges of similar nature to be monitored on a representative basis. Representative monitoring is the use of monitoring results of one water quality monitoring sample to represent other discharges expected to have the same water quality. A representative monitoring measurement must represent discharges of similar nature, meaning discharges that have all the following items in common:

(a) The same general water source (ground water or surface water of similar water quality), and

(b) The same water treatment, and

(c) The same type of implemented BMPs.

The Discharger shall monitor all planned discharges not listed in Section II.A above, using representative monitoring, as previously defined in this section, for the constituents specified in Table E-3 and per the frequency specified in Table E-4.

Table E-3. Annual Representative Monitoring Requirements

Parameter	Units	Sampling[2]	Sample Type[1]
Chlorine, Total Residual [3,4]	mg/L	1/Year	Grab[1]
Volume	Gallons	1/Year	Estimate [5]
Turbidity	NTU	1/Year	Visual Estimate

[1] A handheld field meter shall be used, provided the meter utilizes a U.S. EPA-approved algorithm/method and is calibrated and maintained in accordance with the manufacturer's instructions. The Discharger shall maintain a calibration and maintenance log for each meter used for monitoring required by this Monitoring and Reporting Program.
[2] Sampling shall take place downstream of management practices, as feasible.
[3] Total chlorine residual shall be monitored with a method sensitive to and accurate at a minimum level of 0.1 mg/L. False positives are acceptable if explanation of the cause is included.
[4] Total Chlorine Residual monitoring is not required of non-chlorinated discharges.
[5] Calculated estimate using available meter reading information or visual estimate.

Table E-4. Annual Representative Monitoring Frequency Requirements

Duration of Discharge	Sampling Requirements
Less than 20 minutes	One sample is required during the first 10 minutes of the discharge.
20 minutes to 60 minutes	One sample is required during the first 10 minutes of the discharge, plus a second sample is required within the last 10 minutes of the discharge.
Greater than 60 minutes	One sample is required within the first 10 minutes, a second sample is required within the next 50 minutes, and a third sample is required approximately within the last 10 minutes of the discharge or as close to the end of the discharge as is feasible.

In its annual report, the Discharger shall:

(a) Submit a copy of its site schematic submitted in its application for enrollment with labeled representative monitoring locations, and

(b) Identify the portions of its system that the representative monitoring results represent, and
(c) Identify all changes in its representative monitoring locations that have occurred during the monitoring-year.

C. Annual Discharge Volume Monitoring Requirements

The Discharger shall keep:
(a) A record of the number of direct discharges to a water of the U.S. that is greater than 50,000 gallons, during each calendar year,
(b) An estimate of the total volume discharged to surface water during each calendar year, and
(c) An estimate of the total volume of discharge water directed to a reuse or beneficial use in accordance with section VI. of this Order.

D. Monitoring Not Required

Monitoring is not required for any discharges that:
(a) Do not ultimately reach a water of the U.S., and
(b) Are put to multiple uses or beneficial reuse, in accordance with section VI. of the Order, prior to surface water discharge.

E. Increase in Monitoring Requirements

The Deputy Director may increase the monitoring or frequency at any time to ensure the protection of beneficial uses of the receiving water. Any requirement for increased monitoring will be based on site-specific data or information that indicates a site-specific discharge threatens to cause or contribute to an exceedance of a receiving water quality criteria or objective.

III. RECEIVING WATER MONITORING REQUIREMENTS DURING NON-COMPLIANCE WITH THIS ORDER

The receiving water must be monitored for all direct planned discharges that do not comply with the requirements contained in section IV of the Order and the discharge potentially causes or contributes to an adverse effect or impact to beneficial uses. Receiving water monitoring shall be conducted during or immediately after the Discharger became aware of a non-compliant discharge that adversely effects or impacts beneficial uses of the receiving water. The Discharger shall monitor the point of confluence of the discharge and the receiving water. If the receiving water presents hazards to the monitoring personnel, visual monitoring shall be conducted using telephoto lenses and binoculars. If further hazards exist beyond such measures, monitoring is not required, and the hazards shall be documented in the corresponding monitoring report.

Receiving water monitoring shall consist of digital photographs and documentation of observed effects and impacts the discharge has on the receiving water body including the presence or absence of:

a. Erosion;

- **b.** Floating or suspended matter;
- **c.** Discoloration;
- **d.** Impact on aquatic life;
- **e.** Visible films, sheens, or coatings; and
- **f.** Potential nuisance conditions.

Photographs and documented observations of the receiving water conditions shall be included in the annual monitoring report, and made available to State and Regional Water Board staff upon request.

Receiving water monitoring is not required for emergency discharges.

IV. POST-NOTIFICATION OF EMERGENCY OR NON-COMPLIANT DISCHARGES THAT ADVERSELY EFFECT OR IMPACT BENEFICIAL USES

Within 24 hours of the Discharger becoming aware of an adverse effect(s) or impact on beneficial uses of the receiving water body due to non-compliance with this Order, or due to a system failure or emergency involving a discharge from its drinking water system, the Discharger shall notify the corresponding Regional Water Board and the MS4 operator if applicable, and shall confirm this notification in writing within five days.

The notification shall include all of the following:

- **a.** The location and extent of non-compliance or emergency discharge;
- **b.** The cause of the non-compliance or emergency discharge;
- **c.** The date, time and expected duration of the non-compliance or emergency discharge;
- **d.** The estimated volume of discharge;
- **e.** The applicable receiving water body; and
- **f.** The corrective actions taken (or being taken) to prevent future non-compliance or repair the system failure.

V. PRE-NOTIFICATION OF LARGE PLANNED DISCHARGES GREATER THAN ONE ACRE-FOOT (325,850 GALLONS)

Three (3) days prior to initiation of a planned discharge (or retroactively within 24-hours after the Discharger is informed to conduct an urgent planned discharge) of a volume equal to or greater than one acre-foot (325,850 gallons), the Discharger shall notify the MS4 operator if applicable, and the appropriate Regional Water Board and provide:

- **a.** The start date of discharge
- **b.** The location of discharge and the applicable receiving water
- **c.** The estimated volume of discharge, and
- **d.** The reasons for discharge

VI. REPORTING AND RECORDKEEPING REQUIREMENTS

A. Self-Monitoring Report Requirements

1. Self-monitoring reports including compliant and non-compliant discharge monitoring information shall be maintained in the Discharger's main office and made available upon request of State and Regional Water Board staff.

2. Monitoring periods and reporting for all required monitoring shall be completed according to the schedule in Table E-5 below. Each discharge event that meets the conditions in section II and Table E-1 of this MRP shall be monitored.

Table E-5. Monitoring Periods and Reporting Schedule

Sampling Frequency	Monitoring Period	Record Keeping Due Date
1/Event or Year	January 1 thru December 31	1 March

3. The Discharger shall arrange and summarize any reported numerical data in a tabular format. When electronic submittal of data is required and CIWQS does not provide for entry into a tabular format within the system, the Discharger shall electronically submit the data in a tabular format as an attachment.

4. If no discharge occurred during the reporting period, the monitoring report shall report that there was no discharge.

5. Authorized Dischargers shall maintain the results for all monitoring specified in this Monitoring and Reporting Program and as specified in this Order. If a Discharger monitors any pollutant more frequently than required by this Order, the results of this monitoring shall be included in the self-monitoring report.

B. REPORTING REQUIREMENTS TO STATE WATER BOARD

1. Dischargers shall report to the State Water Board any toxic chemical release data it reports to the State Emergency Response Commission within 15 days of reporting the data to the Commission pursuant to section 313 of the "Emergency Planning and Community Right to Know Act" of 1986.

2. By March 1 of every year, all non-compliant discharge monitoring information contained in the Discharger's self-monitoring report for the past calendar year shall be submitted to the State Water Board annually and shall include all non-compliant monitoring results required in this Monitoring and Reporting Program. All non-compliant discharge monitoring information shall be accompanied by the corrective actions the Discharger has taken to return the discharge to compliance. Dischargers shall also submit the annual discharge volume monitoring requirements specified in section II.C of this Attachment.

3. The Discharger shall attach a cover letter to the SMR. The information contained in the cover letter shall clearly identify discharge events of non-compliance with the permit; discuss corrective actions taken or planned; and the proposed time schedule for corrective actions. Identified non-compliance shall include a description of the requirement that was violated and a description of the violation.
4. Monitoring reports shall be submitted to the State Water Board, signed and certified as required by the Standard Provisions (Attachment D), to the address listed below:

   State Water Resources Control Board
   Division of Water Quality
   NPDES Permitting Unit
   1001 I Street, 15th Floor
   Sacramento, CA 95814

5. At any time during the term of this permit, the Deputy Director may notify authorized Dischargers to electronically submit monitoring reports using the State Water Board's California Integrated Water Quality System (CIWQS) Program Web site (http://www.waterboards.ca.gov/ciwqs/index.html). Until such notification is given, each Discharger shall submit a hard copy of its monitoring reports. Subsequent guidance will be provided to the Discharger upon the Deputy Director's notification for electronic submittal of reports. (Direction and guidance for electronic SMR submittals is currently available on the CIWQS Web site at http://www.waterboards.ca.gov/water_issues/programs/ciwqs/chc_npdes.shtml

ATTACHMENT F – FACT SHEET

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This Fact Sheet includes the legal requirements and technical rationale that serve as the basis for the requirements of this Order. As described in section III.B of the Order, the State Water Board incorporates this Fact Sheet as its findings supporting the issuance of the Order.

I. PERMIT INFORMATION

A. Background

Water wholesalers and purveyors are responsible for developing water supplies and providing drinking water to their communities and customers in accordance with statutory requirements of the federal Safe Drinking Water Act and the California Health and Safety Code. Mandatory system-development and system-maintenance activities often result in surface water discharges, either via storm drain systems or other conveyance systems, or directly to a surface water body.

The Federal Water Pollution Control Act (also referred to as the Clean Water Act) section 402 requires that a discharge of any pollutant or combination of pollutants to surface waters that are waters of the United States, with certain exceptions, be regulated by a National Pollutant Discharge Elimination System (NPDES) permit. (For the purpose of this Order, the terms “waters of the United States”, “surface waters” and “receiving waters” are used interchangeably unless noted otherwise.) On September 22, 1989, the U.S. Environmental Protection Agency (U.S. EPA) granted the State of California, through the State Water Resources Control Board (State Water Board) and the Regional Water Quality Control Boards (Regional Water Boards), the authority to issue general NPDES permits pursuant to title 40 Code of Federal Regulations parts 122 and 123.

Discharges to waters of the U.S. required to be regulated with an NPDES permit, in accordance with the Clean Water Act, include discharges of pollutants from drinking water systems. The Clean Water Act does not include an exemption from federal regulation based on volume or flow of discharge; therefore, all sizes of drinking water systems, including very small systems with small volumes of surface water discharges, are required to be regulated with an NPDES permit. Many drinking water system discharges in California that enter waters of the U.S. (either directly or via a storm water conveyance system) are unregulated. The systems that are regulated are permitted with Regional Water Quality Control Board (Regional Water Board) permits.

The State Water Board recognizes that although the quality of the discharges from different locations within a system (raw water, potable water, chlorinated water, etc.) varies, the set of discharges from the different systems throughout the state are fairly uniform. The discharges are of water that must be discarded as water purveyors conduct similar mandatory activities to assure the water that is ultimately delivered is safe for drinking and other potable uses.

Although the discharges are similar in nature, they are regulated differently throughout the state. Some are not regulated at all. Others are regulated by various Regional Water Boards permits, depending on the region the system is located. Some Regional

Water Boards regulate the raw and potable drinking water discharges using region-wide low threat-type general NPDES permits that regulate a broad range of constituents through differing regulatory approaches. Other Regional Water Board general permits do not address the constituents of concern from these types of discharges, and/or contain requirements that are not feasible for water purveyors to comply without creating obstacles to the proper operation of drinking water systems. The following table illustrates more detail on part of the Regional Water Boards' differing regulatory approaches for discharges from drinking water systems:

Table F-1. Differences in Existing Regional Water Boards' Permit Requirements

Region	Effluent Limitations[0]										
	Chlorine Residual (mg/L)	Settleable Solids (ml/L)	pH (standard units.)	TDS (mg/L)	BOD_5 (mg/L)	Ammonia	Turbidity (Nep Turbidity Units)	O&G (mg/L)	Temp (˚F)	Priority Pollutant	Acute Toxicity
1	0.11[1] and 0.019[2]	0.1	6.5[3] and 8.5[4]	BPO[17]	--	--	--	--	--	--	--
2[5]	--	--	--	--	--	--	--	--	--	--	--
3	0.02	--	--	BPO[17]	--	--	--	--	--	MCLs	--
4	0.1[6]	0.3[6] and 0.1[7]	6.5[3] and 8.5[4]	150[6] and 50[7]	30[6] and 20[7]	--	150[6] and 50[7]	15[6] and 10[7]	86 ˚F	--	90% Survival
5	0.11[1] and 0.019[2]	0.1[6]	[8]6.5 - 8.5 [9]7.5 – 9.5 [10]6.5 – 8.3	--	[11]30[6], 15[12], and 10[7]	--	--	--	--	MCLs	--
6[14]	0.003[4] and 0.002[13]	--	BPO[17]	--	--	BPO[17]	--	--	--	--	--
7	0.11[1] and 0.019[2]	0.2	6.0[3] and 9.0[4]	--	55 and 95	--	75	25	--	--	--
8	0.1[6]	--	6.5[3] and 8.5[4]	BPO[17]	75[6, 15]	--	--	15	--	--	--
9	0.1[16]	--	6.0[3] and 9.0[4]	--	--	--	--	--	--	--	--

0. TDS=Total Dissolved Solids, BOD5=5-day Biochemical Oxygen Demand, O&G=Oil and Grease, Temp=Temperature
1. 4-day Average
2. 1-hour Average
3. minimum value
4. maximum value
5. Region 2 recently issued a tentative individual NPDES Permit for public review and comment
6. Daily Maximum
7. Monthly Average
8. 6.5 minimum and 8.5 maximum for discharges to Sacramento/San Joaquin River Basins
9. 7.5 minimum and 9.5 maximum for discharges to Goose Creek
10. 6.5 minimum and 8.3 maximum for discharges to Tulare Lake Basin
11. Same effluent limits for Total Suspended Solids (TSS)
12. Weekly Average

13. Median value of daily measurements
14. Also has effluent limits for bacteria and dissolved oxygen based on the basin plan objective
15. TSS only
16. 90 percentile of all samples during discharge
17. Basin Plan Objective
18. Region 1 - North Coast Region, 2 - San Francisco Bay Region, 3 - Central Coast Region, 4 - Los Angeles Region, 5 - Central Valley Region, 6 - Lahontan Region, 7 - Colorado River Region, 8 - Santa Ana Region, 9 - San Diego Region

Additionally, most large and small municipalities have Municipal Separate Storm Sewer System (MS4) NPDES permits for discharge of storm water to waters of the United States (U.S.). Some MS4 permit holders (permittees) allow drinking water system discharges to enter their storm water systems as authorized non-storm water discharges, typically through established local agreements. Other MS4 permittees do not allow such discharges to enter their storm water systems unless the State Water Board or Regional Water Board separately regulates those discharges prior to entering the system.

Title 40 Code of Federal Regulations part 122.28 provides for issuance of general permits to regulate a category of point sources if the sources: (1) involve the same or substantially similar types of operations; (2) discharge the same type of waste; (3) require the same type of effluent limitations or operating conditions; (4) require similar monitoring; and (5) are more appropriately regulated under a general order rather than individual orders. Thus:

1. This Order issues NPDES Permit No. CAG140001 with the intent to provide consistent and efficient regulatory coverage and requirements for drinking water system discharges statewide that have a low threat to water quality when properly mitigated through implementation of best management practices.
2. This Order authorizes drinking water system discharges of water that is dedicated to drinking water facilities for the primary purpose of providing safe and reliable drinking water including, but not limited to treatment facilities, storage and distribution systems, transmission systems, and water supply and monitoring wells in drinking water aquifers. Owners or operators of drinking water systems that apply for coverage under this Order and that are issued a Notice of Applicability are hereinafter referred to as “dischargers”. For the purposes of this Order, references to “discharger” or “permittee” in applicable federal and State laws, regulations, plans, and policy are considered equivalent to references to the Dischargers herein.

   Regulatory coverage under this Order serves as authorization for the Discharger to discharge water from its drinking water system(s) to waters of the United States (U.S.) either directly into waters of the U.S. or via other conveyance, including through a municipal storm sewer system. Coverage under this Order does not authorize discharges into a municipal storm water system. The municipal storm water system owner/operator has authority to allow these non-storm water discharges into the system. A municipal storm water system owner/operator retains authority to impose further conditions, restrictions or limitations, above and beyond the requirements of this Order, on water purveyors, as a condition for discharging into the system.

B. Water Purveyors NOT Required to Enroll in This Order

All water purveyors that have discharges to waters of the U.S. as described in this Order require an NPDES permit to discharge. The State Water Board is not mandating that small systems of less than 1,000 service connections enroll in this Order. However, the State Water Board strongly encourages water purveyors with small systems to obtain the regulatory coverage under this Order to comply with the Clean Water Act. The State Water Board recognizes that some water purveyors have obtained regulatory coverage through MS4 permits, or, due to their discharge contributing to an impairment managed by a previously-adopted Total Maximum Daily Load, the discharge must be regulated by a separate individual NPDES permit.

The State Water Board issues statewide NPDES permits for the regulation of storm water discharges from small communities and non-traditional entities. Regional Water Quality Control Boards issue NPDES permits for the regulation of storm water from large (non-small) municipalities. These storm water orders may authorize non-storm water discharges from fire hydrant flushing, operation, maintenance, or testing of potable water systems, and groundwater dewatering systems, similar to discharges covered under this Order. The State Water Board will not require a water purveyor that holds a local agreement with a municipal storm water permittee to obtain regulatory coverage under this Order provided the corresponding Regional Water Board acknowledges in writing that the local agreement demonstrates coverage under the municipal storm water permit.

This Order requires that, **by September 1, 2015**, water purveyors that meet the criteria **below** submit a Notice of Non-Applicability form (Attachment B2) certifying, in accordance with section V.B., *Signatory and Certification Requirements*, of Attachment D – Standard Provisions, that regulatory coverage from this Order is not required.

- The water purveyor discharges solely to a municipal separate storm sewer system(s) (MS4) and has an established local agreement with the MS4 permittee to discharge into its system(s), **AND** the corresponding Regional Water Board Executive Officer provides written confirmation to the State Water Board Deputy Director of Water Quality that the local agreement provides sufficient regulation of the subject drinking water system discharges through an existing MS4 NPDES permit; or
- The water purveyor is an MS4 permittee, or co-permittee, named on a State Water Board or a Regional Water Board issued MS4 permit that also authorizes discharges from drinking water systems, and all drinking water system discharges solely discharge into its own MS4 system.

Also by **September 1, 2015**, this Order requires water purveyors that meet the criteria **below** to submit a Notice of Non-Applicability form (Attachment B2) certifying, in accordance with section V.B., *Signatory and Certification Requirements*, of Attachment D – Standard Provisions, that regulatory coverage from this Order is not required.

- The water purveyor is regulated under an existing NPDES permit issued by the Regional Water Board because a Total Maximum Daily Load (TMDL) was adopted and the Regional Water Board determined that TMDL-specific permit requirements for its drinking water system(s) discharges are appropriate because those discharges may contribute to the impairment of the water body.

Also by **September 1, 2015**, this Order allows water purveyors that meet the criteria **below** the option of submitting a Notice of Non-Applicability form (Attachment B2) certifying, in accordance with section V.B., *Signatory and Certification Requirements*, of Attachment D – Standard Provisions, that regulatory coverage from this Order is not required.

- All discharges from the drinking water system do not discharge to a water of the U.S.

A water purveyor with multiple drinking water systems in California need only submit one Notice of Non-Applicability for its systems that meet the same criterion.

After review of each submitted Notice of Non-Applicability, the State Water Board's Deputy Director of Water Quality (Deputy Director) will either issue 1) a Notice of Non-Applicability Approval or 2) a response letter to the applicant outlining: (a) the missing information that deems the Notice of Non-Applicability incomplete, or (b) why the described discharge is not eligible and thus the water purveyor must obtain coverage under this Order. The water purveyor will have **60 days from the date of the response letter** to submit the items necessary to complete the Notice of Non-Applicability or to submit a complete application package in accordance with section II.C of this Order. A notice may be issued to a water purveyor that holds a drinking water system permit through the State Water Board Division of Drinking Water, and that has not submitted a Notice of Non-Applicability (or an application package for enrollment, as explained later in this Fact Sheet) by September 1, 2015, if that purveyor discharges from its drinking water system to a water of the U.S.

Drinking water systems that serve less than 1,000 connections that serve end users (this does not include water wholesalers), maintain the option to enroll in this Order and are not required to submit the Notice of Non-Applicability form.

C. Facilities and Discharges Covered Under this Order

This Order covers discharges from drinking water systems that qualify as a "community water system" as defined in the California Health and Safety Code, and wholesalers of water to community water systems. Community water systems provide daily drinking water for at least 15 service connections and at least 25 individuals at least 60 days each year. Community water systems must comply with the California Health and Safety Code per the California Code of Regulations titles 17 and 22. Title 17 ensures that water delivered by community water systems is wholesome and potable. Title 22 contains potable water standards, including the primary and secondary maximum contaminant levels (MCLs), and requires monitoring and reporting on surface water and groundwater drinking water sources.

Community water systems authorized to discharge under this Order include the following facilities:

1. **Transmission Systems.** Transmission systems are the pipes, pumps, canals, pump houses, and other components used to move water from the point of origin to storage reservoirs, treatment facilities, and distribution systems. Transmission systems do not have connections to serve end users. Above ground and underground pipes generally range in diameter from 24 inches to 90 inches. Some facilities are open channels. The water in transmission systems may or may not meet standards for human consumption.

2. **Distribution and Storage Systems.** Distribution systems are the pipes and associated pumps, valves, hydrants, storage facilities and other structures that distribute and store potable water from treatment plants, wells, reservoirs, and transmission systems to end users. Distribution pipes generally range in diameter from 2 inches to 24 inches.

3. **Wells in Drinking Water Aquifers.** Drinking water supply wells are installed in borings advanced into the ground to extract groundwater for use as drinking water. These types of wells are typically 12 inches to 36 inches in diameter. Monitoring wells are also in borings advanced into the ground to gage the depth to groundwater for drinking water aquifer management purposes such as groundwater overdraft protection. In addition monitoring wells serve as access points to sample the aquifer to characterize the water quality and to detect contaminants such as bacteria before the contaminant reaches the water supply. Monitoring wells are typically 12 inches or less in diameter. Discharges from water supply and monitoring wells occur during well development, maintenance (including flushing), rehabilitation, and sampling. This Order covers discharges from wells in unpolluted drinking water aquifers, and discharges from polluted drinking water aquifers that are properly treated to not cause or contribute to an adverse effect or impact to beneficial uses of the receiving waters.

4. **Water Treatment Plant or Facility.** Water treatment facilities treat water to the quality that is suitable for potable drinking water in accordance with the federal Safe Drinking Water Act, California Health and Safety Code and the State Water Board Division of Drinking Water permitting requirements. Water treatment systems range from large treatment plants to small treatment facilities including well head treatment apparatuses.

D. Discharge Description

This Order provides regulatory coverage for planned and emergency discharges. Planned discharges are part of a water purveyor's essential activities to comply with the federal Safe Drinking Water Act, the California Health and Safety Code, and State Water Board Division of Drinking Water permitting requirements for providing reliable and safe drinking water. Planned discharges include scheduled and unscheduled discharges that take place under the control of the Discharger to comply with regulatory mandates. Emergency discharges occur due to system failures and emergencies. This Order serves as a general

NPDES permit for the discharge to waters of the U.S. of surface water or groundwater that may be altered by chlorine, corrosion inhibiting agents, algaecides, or addition of other chemicals, but that does not adversely affect or impact beneficial uses of the receiving waters.

E. Discharger's Activities

This Order covers discharges that are essential to comply with the federal Safe Drinking Water Act, the California Health and Safety Code, and State Water Board Division of Drinking Water permitting requirements for providing reliable and safe drinking water. Discharges from these activities described in detail below are intermittent, short-term or seasonal in nature.

1. **Maintenance and Repair.** Facility maintenance and repairs occur frequently (e.g., multiple times a day) at different locations within a system. Discharges may be necessary when dewatering the repair or maintenance site. Underground facilities require excavation for access, and dewatering is necessary to prevent flooding. The resulting "trench dewatering" discharges are usually turbid because the discharge velocity may be high enough to dislodge and transport sediment from trenches and pits. Discharges may also be necessary to maintain positive water pressure within the drinking water system. Positive pressure may be necessary during repair and replacement of pipes, valves, and other components to prevent sediment, debris, and microorganisms from entering the system.
2. **System Flushing.** Flushing portions of a system may be necessary to replace stagnant water when demand is low, or to remove poor quality drinking water. Flushing may also be needed to respond to consumer complaints. Fire hydrants serve as access portals for flushing water distribution systems. Flushing can also occur from other valves or standpipe connections. Flushing may be part of routine operations, and can occur daily, weekly, monthly, or annually based on seasonal water use or known water quality trends. New system facilities or facilities that are periodically taken out of service for maintenance or in response to low water demands may necessitate flushing with super-chlorinated water prior to full operation.
3. **Pipeline, Tunnel, and Reservoir Drainage.** Occasionally, pipelines, tunnels, and reservoirs must be taken out of service for maintenance, such as inspections, repairs, and upgrades. Planned discharges may occur as often as once per year or as infrequently as once every 20 years. These facilities may also be drained in emergency circumstances due to unanticipated drinking water quality concerns.
4. **Groundwater Pumping.** The most common type of discharge from a supply well is well "blow-off" or purging water from the well. Well blow-off is required to reactivate a well after it has been out of service, to purge the system to collect a monitoring sample, or to purge the system when monitoring indicates that the water supply does not meet drinking water quality requirements. Discharges from water supply wells also occur as a result of well maintenance, such as unclogging a filter screen from sediment and mineral build-up.

F. Types of Discharges from Discharger's Activities

This Order covers planned and emergency discharges that occur daily throughout the State. Planned discharges are a part of the Discharger's essential activities, described in part in the previous section of this Fact Sheet. Emergency discharges occur when pipelines or other infrastructure break or leak, valves malfunction, or other unanticipated events occur, such as noncompliance with drinking water standards or hydraulic releases necessary to prevent pipeline rupture. Planned and emergency discharges may include, but are not limited to the following:

1. **Planned Discharges include discharges from:**
   a. Water treatment plant operations (excluding filter backwash that is discharged to a water of the U.S.)
   b. Distribution system storage tanks
   c. Distribution system dewatering, flushing, and pressure testing
   d. Fire flow/fire hydrant testing
   e. Meter testing
   f. Automated water quality analyzers
   g. Pressure relief valves
   h. Groundwater supply well flushing
   i. Groundwater well development, rehabilitation, and testing.
   j. Groundwater monitoring for purpose of supply well development, rehabilitation, and testing.
   k. Transmission system installation, cleaning, and testing.
2. **Emergency Discharges include discharges from:**
   a. Emergency system repairs, including transmission system failure or leaks, and distribution system pipe breaks.
   b. Trench dewatering.
   c. Catastrophic events.

G. Water Treatment Methods and Additives

This Order covers discharges to waters of the U.S. of surface water or groundwater that may be altered by chlorine, corrosion-inhibiting or algaecides agents containing metals such as zinc and copper, or other chemicals but that do not adversely affect or impact beneficial uses of the receiving water when properly managed. For disinfection, water purveyors treat their water with chlorine to comply with California Code of Regulations title 22 or to control microbial growth that can lead to corrosion. Chlorine removal, (also referred to as dechlorination) and its effectiveness depends in part on chemical dose and contact time. Discharger's disinfection and dechlorination processes may include, but are not limited to the following:

1. **Disinfection Treatment Methods.**
   a. **Chlorination.** Most dischargers use chlorine to disinfect their drinking water in accordance with California Code of Regulations, title 22, or to control microbial growth that can lead to corrosion. Chlorine reacts with organic matter and pipe materials (such as iron). As a result, the total chlorine residual decreases following chlorine treatment as water flows throughout the distribution system, making a system vulnerable to bacterial regrowth. Dischargers manage the lack of adequate chlorine concentrations in the distribution system by occasionally flushing water from dead end areas or other parts of their system with new water that has a sufficient chlorine residual concentration. Dischargers may also use booster stations to inject additional chlorine.
   b. **Chloramination.** Some Dischargers prefer chloramine over chlorine. Chloramine forms when chlorine and ammonia combine. Chloramine's disinfection power is one-hundredth that of free chlorine, but chloramine is also more stable and less reactive. Chloramine is also more persistent when released into the environment. Chloramine provides longer-lasting, more reliable protection against bacterial regrowth.
   c. **Super-chlorination.** Some treatment processes require superchlorinated treatment of the drinking water. Superchlorination is necessary when disinfecting new facilities, when returning facilities to service after taking them offline, and when contamination is detected. Superchlorinated water typically has a total chlorine residual concentration greater than 4.0 mg/L.

2. **Dechlorination Treatment Methods.** During planned discharges, flows may be connected to devices that add dechlorinating chemicals prior to discharge. During emergency discharges, dissolving pellets or mesh bags containing the dechlorinating chemicals may be placed in the path of the flow.

H. Example Drinking Water Discharge Characteristics

The following table illustrates the typical characteristics of the types of discharges covered by this Order. This table is not inclusive of all potential discharges:

Table F-1. Typical Characteristics of Drinking Water System Discharges

Facility and Discharge Category [1]	Planned or Emergency	Flow Rate (gpm) [2]	Duration [2]	Frequency [2]	Total Residual Chlorine (mg/L) Or Turbidity (NTU) [2]
Transmission Systems					
Dewatering for new construction, maintenance, or inspection [3]	Planned	200 to 3,500	2 hours to 21 days	Once per year to 20 years	0.8 to 2.5 mg/L
Disinfecting of new construction	Planned	200 to 1,350	2 hours to 14 days	Upon start-up	10 to 50 mg/L
Maintenance or construction	Planned	50 to 200	2 to 10 minutes	Once per year to 20 years	0.8 to 2.5 mg/L
Aqueduct dewatering	Planned	250 to 50,000	1 to 2 days	Once per 2 to 10 years	0.8 to 2.5 mg/L
Disinfecting (new pipeline or storage facility after repair) [4]	Both	Up to 3,500	1 hour to 21 days	Upon initial use	25 to 200 mg/L
Water pipeline breaks, pipeline diameter > 24 inches (includes trench dewatering)	Emergency	5 to 3,500	30 minutes to 2 day		0.8 to 2.5 mg/L
Storage Facilities					
Drain valve testing	Planned	5 to 300	60 to 120 minutes	Once per 5 to 10 years	0.8 to 2.5 mg/L
Reservoir rehabilitation pipe flushing	Planned	Varies	Varies		0.8 to 2.5 mg/L
Tank and reservoir draining for maintenance	Planned	200 to 1,350	1 to 14 days	2 per year to 1 per 5 years	0.8 to 2.5 mg/L
Reservoir overflow	Emergency	Varies	Varies	Varies	0.8 to 2.5 mg/L
Distribution Systems					
Standpipe cleaning	Planned	500 to 2,000	1 to 2 days		0.8 to 2.5 mg/L
Water meter field testing	Planned	50 to 1,000	30 to 60 minutes		0.8 to 2.5 mg/L
Dead-end pumping	Both	200 to 2,000	30 minutes to 1 hour	4 to 12 per year	0.8 to 2.5 mg/L
Line flushing through a hydrant	Both	700 to 1,600	≤10 to 60 minutes	1 to 3 per year per hydrant	0.8 to 2.5 mg/L
Distribution system maintenance or pipe breaks, pipeline diameter < 24 inches (includes trench dewatering)	Both	5 to 1,350	10 to 60 minutes		0.8 to 2.5 mg/L

Facility and Discharge Category [1]	Planned or Emergency	Flow Rate (gpm) [2]	Duration [2]	Frequency [2]	Total Residual Chlorine (mg/L) Or Turbidity (NTU) [2]
Water quality management and water quality sampling (e.g., for bacteria; metals; taste; odor; etc.)	Both	100 to 15,000	5 minutes to several hours	1 to 50 (for management); up to 5,000+ events per year (for sampling)	0.8 to 2.5 mg/L
Unauthorized hydrant opening	Emergency	500 to 1,000	60 minutes to 8 hours		0.8 to 2.5 mg/L
Groundwater Well Operations					
Water supply well development	Planned	500 to 5,000	15 to 40 hours	Upon start-up	500 to 25,000 NTU
Water supply well rehabilitations	Planned	500 to 3,500	7 days	As-needed; up to 4 per year	500 to 20,000 NTU
Monitoring well sampling	Planned	15-60	20 minutes to 3 hours per well	Semi-annual or as needed	500 to 5000 NTU
Water supply well disinfection		500 to 3,500	30 minutes to 24 hours	As needed	≤ 200 mg/L
Monitoring well development	Planned	15-60	3-8 hours	Semi-annual or as needed	500 to 25,000 NTU
Discharge by water supply well ("blow-off") for reactivation or monitoring	Both	500 to 3,500	30 minutes to 24 hours	Up to 4 per year (planned); or more frequently for emergency circumstances	500 to 20,000 NTU

Unit Abbreviations:

gpm = gallons per minute

mg/L = milligrams per liter

Footnotes:

[1] Source: Tikkanen, Maria, John Schroeter, Lawrence Y.C. Leong, and Rajagopalon Ganesh, 2001. Guidance Manual for the Disposal of Chlorinated Water. Denver, CO. AWWA Research Foundation and American Water Works Association; with modifications by the Alameda County Water District, Alameda County and San Jose Water Company, Santa Clara County, 2013.

[2] Milligrams per liter or Nephelometric Turbidity Units prior to implementation of best management practice. The data presented are typical ranges; actual conditions may vary outside of these ranges.

[3] This information does not apply to raw unaltered water.

[4] The processes to disinfect water pipelines and storage facilities use different chlorination methods, which have different chlorine contact times. Chlorinated water is dechlorinated before discharge under planned operations.

I. Example Discharges, Potential Threat to Receiving Water and Corresponding Permit Requirements.

As shown above, discharges to waters of the U.S. from the discharger's essential activities may have the potential to impact the receiving water. The threat to water

quality is from toxicity of chlorination or metal-containing agents, loading of solids, large volume discharges, and discharges having high velocities. This Order contains permit requirements specifically targeted to protect the beneficial uses of the receiving water from impacts due to these threats, as shown in the following examples:

1. Direct discharge to inland surface waters, enclosed bays and estuaries
   Threat: Toxicity to aquatic life; Potential adverse impact on beneficial uses due to:
   (1) concentrations of chemical constituents, (2) sediment and turbidity loading from discharge water and erosion, and (3) hydromodification.
   Applicable Permit Requirements:
   section IV.A Best Management Practices specifications,
   section IV.C.1. Total chlorine effluent limitation,
   section VI. Receiving water limitations,
   Attachment E., section II. Monitoring requirements,
   Attachment E., section VII. Reporting and record-keeping requirements.

2. Discharge to a municipal storm water system where the discharge travels less than 300 feet from the point of discharge into the storm drain system to the receiving water body; if the length of the storm drain conveyance is unknown, the distance shall be a direct 300 feet to a water of the U.S.
   Threat: Toxicity to aquatic life; Potential adverse impact on beneficial uses due to:
   (1) concentrations of chemical constituents, (2) sediment, debris, trash and turbidity loading from discharge water and street scouring, and (3) hydromodification.
   Applicable Permit Requirements:
   section IV.A Best Management Practices specifications,
   section IV.C.1. Total chlorine effluent limitation,
   section VI. Receiving water limitations,
   Attachment E., section II. Monitoring requirements,
   Attachment E., section VII. Reporting and record-keeping requirements.

3. Discharge to a municipal storm water system where: (1) the discharge travels more than 300 feet, or (2) the receiving water body outside of a 300-foot radius of the location of discharge into the storm drain.
   Threat: Potential adverse impact on beneficial uses due to: (1) sediment, debris, trash and turbidity loading from discharge water and street scouring, and (2) hydromodification.
   Applicable Permit Requirements:
   section IV.A Best Management Practices specifications,
   section VI. Receiving water limitations,
   Attachment E., section II. Monitoring requirements,
   Attachment E., section VII. Reporting and record-keeping requirements.

4. Discharges of superchlorinated, supply well water due to development and rehabilitation, and large volume discharge, either directly or via a storm water system, to waters of the U.S.

Threat: Toxicity to aquatic life. Potential adverse impact on beneficial uses due to:

(1) concentrations of chemical constituents, (2) sediment, debris, trash and turbidity loading from discharge water and street scouring, and

(3) hydromodification.

Applicable Permit Requirements:

section IV.A Best Management Practices specifications,
section IV.B.1. Final total chlorine effluent limitation,
Attachment E., section II. Event Monitoring Requirements for Superchlorinated,
Attachment E., section VII. Reporting Requirements.

5. Discharges from portions of the drinking water system that:

(1) Directly discharge into or discharge to a storm water conveyance system that conveys the discharge into:

i. Storm water capture basin(s),

ii. Low impact development features, or

iii. Other groundwater-recharge system(s); and

(2) Are collected and used for landscape irrigation and/or other beneficial reuse.

Threat: No threat to water of the U.S. or water of the state.

Applicable Permit Requirements: Reporting only. No effluent limits or monitoring requirements. No further waste discharge requirements necessary.

J. Discharge Points and Receiving Waters

Although drinking water system discharges potentially occur along any point of the system alignment, and may occur concurrently, the discharges are considered “point source discharges” – discharges of a pollutant from a distinct point source, as defined more fully in title 40 Code of Federal Regulations part 122.2, to a water of the U.S. Discharges flow directly into receiving waters or indirectly to receiving waters via storm drains and other conveyance systems. Discharges into creeks, rivers, lakes, enclosed bays, estuaries, and the ocean occur throughout the State. The application package for coverage under this Order requires the water purveyor to identify the receiving waters for its discharges. If the system discharges into numerous small tributaries prior to discharging into a major water body, the application only requires a general description of the immediate receiving water bodies and the name of the major downstream water body(ies).

II. NOTIFICATION REQUIREMENTS

A. General Order Application

Dischargers enrolling for coverage under this General Order are required to submit a complete application package, including a Notice of Intent (NOI), Attachment B1 of this Order any time after the effective date of the Permit but no later than **September 1, 2015**. A water purveyor with multiple community water systems need only submit one complete application package, containing individual NOIs for each of its water systems and obtain one Notice of Applicability for regulatory coverage of all its systems that discharge to waters of the U.S. The application package must include all of the following items to be deemed complete:

1. A Notice of Intent for each community water system, including general information about the water purveyor and the existing or proposed discharge(s).

2. A site map that identifies:
a. The boundaries of the water purveyor's service areas,
b. The general location of the drinking water system,
c. The approximate general location of groundwater supply wells, and
d. The general identification of the portion of the community water system that discharges within a 300-foot conveyance distance from the receiving water(s) and/or within a 300-foot radius of the receiving water(s).

The intent of the site map is to provide general information regarding where the discharges are originating and their locations relative to receiving waters. The site map is part of the application package. Regulatory coverage applies to discharges identified in the application package. By providing boundaries of service areas and/or approximate locations of facilities, regulatory coverage of all potential discharges is included in the Notice of Applicability.

3. An application fee payable to the State Water Board that shall be in accordance with California Code of Regulations, title 23, or subsequent fee regulations updates. The current fee schedule is available at http://www.waterboards.ca.gov/resources/fees.

4. Evaluation of multiple water use or beneficial reuse options, or the reason(s) that the discharge water cannot be placed for multiple uses or beneficial uses, as encouraged by the State Water Board in accordance with Article X, section 2 of the California Constitution, and Water Code section 100 (prohibition of the waste or unreasonable use of water). Pursuant to these state policies, the State Water Board strongly encourages discharges of water from drinking water systems to be captured for multiple uses prior to surface water discharge, or to be routed to groundwater infiltration facilities. Therefore, to obtain coverage under this Order, a water purveyor is required to evaluate its water reuse options. These options include:

a. Discharging into a storm water system that employs low impact development practices or flows into storm water capture basins to recharge groundwater.

b. Collecting and using the water for landscape or agricultural irrigation or other appropriate uses in lieu of potable drinking water supply.

Discharges to land from drinking water systems that do not drain to waters of the U.S. do not need authorization to discharge under an NPDES permit. Discharges to groundwater may require waste discharge requirements issued by the State and/or Regional Water Boards. As an incentive to promote multiple uses of drinking water system discharges, the State Water Board generally will not require separate waste discharge requirements or monitoring for discharges otherwise regulated under this Order that are beneficially reused because they are intermittent and of relatively-good quality (not including waste that threatens ground water quality). A water purveyor must estimate the quantity of water discharged from its system that is beneficially reused, and report it in the annual report. If the entire drinking water system does not discharge to waters of the U.S., NPDES permit coverage is not needed.

5. Receiving water information, including names of receiving water bodies and major downstream water bodies.

6. For applicable discharges into waters of the U.S. identified in section III.K of this Fact Sheet, a TMDL constituent-specific supplement to the application package that includes: a) laboratory analysis of TMDL-specific constituents listed in section III.K, and b) TMDL-specific Best Management Practices to address the constituents.

B. State Water Board Notice of Applicability or Ineligibility for Coverage Under this Order

After the water purveyor's application package is deemed complete, the State Water Board's Deputy Director of Water Quality (Deputy Director) will issue a Notice of Applicability (NOA). Regulatory coverage for the planned and emergency discharges that occur within the areas identified in the application package commences with the date of issuance of a Notice of Applicability to the water purveyor. If the submitted application package is not complete in accordance with this Order, or the discharge is deemed ineligible for coverage under this Order, the Deputy Director will send a response letter to the applicant outlining: (1) the missing information that renders the application package incomplete, or (2) why the described discharge is not eligible for coverage under this Order. The water purveyor has **60 days from the date of the response letter** to provide State Water Board staff the items necessary to complete the application package.

C. Permit Coverage Termination

1. **Termination of Existing Regional Water Board Permit Coverage.** Upon the issuance of the NOA in accordance with this Order, the State Water Board expects the applicable Regional Water Board to terminate regulatory coverage under an existing non-MS4 Regional Water Board NPDES permit for discharges newly

regulated under this Order. The State Water Board expects all Regional Water Board permit coverage of drinking water systems that are not separately regulated due to site-specific TMDL requirements to be terminated within one year of the Adoption Date of this Order.

2. **Termination of Statewide Permit Coverage or Revocation of Notice of Non-Applicability.** The Deputy Director may terminate coverage or revoke a Notice of Non-Applicability Approval (NONAA) under this Order for any of the specified causes, and require application for coverage under an individual or other NPDES permit as set forth in title 40 Code of Federal Regulations part 122.28(b)(3). Causes for permit coverage termination or NONAA revocation include, but are not limited to, the following:
   a. Violation of any term or condition of this Order; or
   b. Misrepresentation or failure to disclose all relevant facts in obtaining permit coverage or non-applicability status under this Order; or
   c. Written request from a Discharger to terminate enrollment because discharge has ceased or that the permit is no longer needed.

   Annual permit fees will be assessed by the State Water Board up to the date of written termination notification from the State Water Board to the Discharger, or the date of a termination request letter from the Discharger to the State Water Board, whichever is applicable.

D. Permit Transfer

A change in ownership of the facilities authorized to discharge through coverage under this Order requires the current owner to provide written notice to the State Water Board at least 30 days in advance of transfer of ownership. The Deputy Director may determine that the new owner must submit an application package to seek coverage under this Order if the nature or location(s) of the discharge(s) have changed from the application package on file.

III. APPLICABLE PLANS, POLICIES, AND REGULATIONS

The requirements contained in this Order are based on the applicable plans, policies, and regulations identified in the Findings in section III of this Order. This section provides supplemental information, where appropriate, for the plans, policies, and regulations relevant to the discharge.

A. Legal Authorities

This Order serves as Waste Discharge Requirements pursuant to California Water Code article 4, chapter 4, division 7 (commencing with § 13260). This Order is also issued pursuant to federal Clean Water Act (CWA) section 402 and implementing regulations adopted by U.S. EPA, and California Water Code chapter 5.5, division 7 (commencing with § 13370). It shall serve as an NPDES permit for point source

discharges from multiple discharge points to surface waters, storm drains, and other conveyances leading to surface waters.

B. State Implementation Policy

The *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (State Implementation Policy or SIP) establishes implementation provisions for priority pollutant criteria, and objectives and provisions for chronic toxicity control. However, section 5.3 of the SIP allows the State Water Board to grant categorical exceptions from meeting priority pollutant criteria/objectives for discharges from drinking water systems conducted by the owners or operators to fulfill statutory requirements mandated by the federal Safe Drinking Water Act and the California Health and Safety Code. The California Toxics Rule contains criteria for 126 priority pollutants that may be present in these drinking water systems discharges. In many cases, discharges from drinking water systems do not comply with all of the applicable priority pollutant criteria (such as for the protection of aquatic life) since potable and treated drinking water are only required to comply with maximum contaminant levels (MCLs) for the protection of public health. A review of the 126 priority pollutants found that there are priority pollutant criteria that are more stringent than the established MCLs.

The planned and emergency drinking water systems discharges covered under this Order are in accordance with the exception granted by the State Water Board through Resolution 2014-0067, allowing water purveyors an exception to comply with priority pollutant criteria for the priority pollutants that have an applicable California Toxic Rule (CTR) criterion more stringent than its corresponding MCL, or do not have an adopted pollutant-specific MCL. The exception was granted in accordance with the requirements set forth in Section 5.3 of the State Implementation Policy.

C. California Ocean Plan

In 1972, the State Water Board adopted the Water Quality Control Plan for Ocean Waters of California (hereinafter Ocean Plan), as amended. The latest Ocean Plan amendment became effective on August 19, 2013. The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean waters of the State. To protect the beneficial uses of ocean water, the Ocean Plan establishes water quality objectives and a program of implementation. Requirements of this Order implement the Ocean Plan and are applicable for those discharges entering directly into the Ocean or indirectly via a storm water system that drains into the Ocean near the location of discharge. This Order does not authorize direct discharges into Areas of Special Biological Significance (ASBS).

Section III.J of the Ocean Plan allows the State Water Board to grant an exception to specified Ocean Plan requirements where the State Water Board determines that the exception will not compromise protection of beneficial uses of ocean waters and the public interest will be served. In many cases, discharges from drinking water systems due to

mandated activities do not comply with all of the established Ocean Plan objectives (such as for protection of aquatic life or human health based on more stringent carcinogenic objectives) since these discharges are only required to comply with MCLs for the purpose of public health and safety. A review of the Ocean Plan pollutant water quality objectives shows that there are a number of pollutants that may occur in mandated drinking water system discharges, with Ocean Plan objectives that are more stringent than the MCLs. State Water Board Resolution 2014-0067 granted an Ocean Plan exception to water purveyors for the pollutants that have an Ocean Plan objective more stringent than its corresponding MCL or do not have an adopted pollutant-specific MCL. The exception was granted in accordance with the Ocean Plan exception requirements.

D. California Environmental Quality Act (CEQA).

Under Water Code section 13389, this action to adopt an NPDES permit is exempt from the provisions of Chapter 3 of CEQA, (commencing with section 21100) of Division 13 of the Public Resources Code.

Pursuant to CEQA, Public Resources Code section 21100 et seq., on November 18, 2014 the State Water Board adopted Resolution 2014-0067 approving a Mitigated Negative Declaration (MND) for exceptions from specified requirements of the State Implementation Policy and California Ocean Plan for statewide discharges resulting from mandated activities required by the federal Safe Drinking Water Act and California Health and Safety Code. The MND concludes that discharges from drinking water systems have less than significant impact to the environment with appropriate mitigation incorporated. This Order implements Resolution 2014-0067 and establishes appropriate mitigation requirements for discharges authorized under this Order.

E. Regional Water Boards' Water Quality Control Plans

The Regional Water Boards have adopted Water Quality Control Plans (hereinafter Basin Plans) that designate beneficial uses, establish water quality objectives, and contain implementation programs and policies to achieve those objectives. In addition, the Basin Plans implement State Water Board Resolution No. 88- 63, which established state policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply. The Basin Plans identify typical beneficial uses as follows: municipal and domestic supply, agricultural irrigation, stock watering, process supply, service supply, hydropower supply, water contact recreation, canoeing and rafting recreation, other non-contact water recreation, warm freshwater aquatic habitat, cold freshwater habitat, warm fish migration habitat, cold fish migration habitat, warm and cold spawning habitat, wildlife habitat, navigation, rare, threatened, or endangered species habitat, groundwater recharge, and freshwater replenishment. Requirements of this Order implement provisions contained in the applicable Basin Plans.

F. Antidegradation Policy

Section 131.12 of 40 C.F.R. requires that state water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution 68-16. Resolution 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. Resolution 68-16 requires that existing high water quality be maintained unless degradation is justified based on specific findings. The State Water Board and Regional Water Board's Water Quality Control Plans implement, and incorporate by reference, both the state and federal antidegradation policies. The permitted discharges must be consistent with the antidegradation provision of section 131.12 and State Water Board Resolution 68-16.

Given the nature of a general permit and the broad range of beneficial uses to be protected across the state, it is not feasible to analyze each surface water body in the state to determine which water bodies are of high quality for the constituents in the discharges authorized by this Order. The State Water Board finds that, due to the intermittent, seasonal and temporary characteristics of these discharges, the impact on existing surface water quality from these discharges will be insignificant, as further explained in the MND approved by the State Water Board in Resolution 2014-0067. While surface waters may be temporarily degraded and there may be temporary excursions above water quality objectives in the immediate vicinity of these discharges, any such impacts to surface water quality that may occur are consistent with the maximum social and economic benefit of the people of the state, provided that the discharges comply with this Order. The discharges are a necessary consequence of providing safe, clean, affordable, and accessible drinking water to the people of the state in accordance with the state policy declared in Water Code section 106.3, subdivision (a), and the discharges are mandated by drinking water laws and regulations. The BMPs required under this Order constitute best practical treatment and control of these discharges. Therefore the discharges permitted under this Order are consistent with the antidegradation provision of section 131.12 and the State Water Board Resolution 68-16.

G. Anti-Backsliding Requirements

Sections 402(o)(2) and 303(d)(4) of the CWA and title 40 Code of Federal Regulations part 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require that effluent limitations in a reissued permit must be as stringent as those in the previous permit, with some exceptions in which limitations may be relaxed. This Order is a new statewide NPDES permit that regulates discharges from community drinking water systems statewide. Some of these same discharges are currently regulated under existing Regional Water Board NPDES permits. Some of these same discharges are not regulated at all. This Order, when implemented, will provide consistent regulatory requirements that apply to discharges from drinking water systems statewide. The following existing Regional Water Board NPDES permits regulate discharges from community drinking water systems, among other types of discharges, and were used to

guide the development of this Order. Existing NPDES permits' effluent limitations and requirements in these Regional Water Board permits were analyzed for the purpose of analyzing backsliding.

The San Francisco Bay Regional Water Board Permit (Order R2-2009-0033) is a general permit applicable only to surface water treatment facilities for potable supply discharges for either long term or short term. The short term discharges include limits for TSS, settleable matter, pH, total chlorine residual, total trihalomethanes (TTHMs), zinc, and acute toxicity. The treatment of any surface waters to make them suitable for drinking includes filtration and disinfection. This treatment is expected to remove any BOD, TSS or settleable matter present in the surface water. For the other effluent limits of TTHMs and zinc, the discharges would be in compliance with MCLs for TTHMs as required by the federal Safe Drinking Water Act, the California Health and Safety Code, and the State Water Board's Division of Drinking Water permitting requirements. In addition, pursuant to the SIP and Ocean Plan exceptions, the discharges covered under this Order are not required to comply with zinc objectives. Therefore, there is no need to establish TSS, TTHMs and zinc effluent limitations, nor an effluent limitation for pH.

The Los Angeles Regional Water Board Permit (Order R4-2003-0108) is a general permit for discharges of groundwater from potable water supply wells to surface waters and it includes limits of TSS, turbidity, BOD, settleable solids, chlorine residual, pH, TTHMs, Methyl tertiary butyl ether (MTBE) and a list of 15 volatile organic compounds (VOCs) that are also considered priority pollutants, PCBs, and various limits for TDS, Sulfate, Chloride, Boron and Nitrogen applicable per watershed/stream reach. Groundwater that is suitable for drinking water purposes receives natural or well-head treatment so it is not expected to have BOD, TSS, or settleable solids. For this reason and as previously discussed, there is no need to impose limits for BOD, TSS, settleable solids, pH, and TTHMs. In the case of PCBs and the 15 VOCs, as these are priority pollutants that are granted exceptions, it is not necessary to establish limits for these pollutants. With regards to the limits for TDS, Sulfate, and chloride, compliance with the federal Safe Drinking Water Act, the California Health and Safety Code, and the State Water Board's Division of Drinking Water permitting requirements, should result in compliance with the TDS, sulfate, and chloride limits, so there is no need to impose the same limitations in this Order. With regards to nitrogen, compliance with the nitrate MCL should ensure compliance with the nitrogen limitations. During the effective period of R4-2003-0108 there were no issues of non-compliance with the boron limitations. This is new information to justify that there is no reasonable potential to exceed the boron limits. Therefore, there is no need to impose a boron limitation.

The Central Valley Regional Water Board Permit (Order R5-2013-0074) is a general permit applicable to dewatering activities and other types of low threat discharges to surface waters including discharges from drinking water systems. It includes limitations for Biochemical Oxygen Demand (BOD), Total Suspended Solids (TSS), settleable solids, pH, and total chlorine residual. Since this Permit applies to a large set of what the Central Valley Water Board considered low threat discharges, it established a wide range of effluent limitations to ensure protection of beneficial uses.

This statewide Order and its requirements are specifically applicable to drinking water systems that discharge either groundwater and/or surface water that have/has received treatment per state regulations. As previously discussed, treated surface water and groundwater suitable for drinking water purposes are not expected to have BOD, TSS, or settleable solids. In addition, sedimentation and erosion control BMPs are required to be implemented to prevent the discharges authorized by this Order from carrying sediment and causing soil erosion that would add TSS and settleable solids in their discharge prior to entering a storm drain or receiving water directly. It is therefore unnecessary to establish effluent limits for BOD, TSS, or settleable solids in this Order.

Community drinking water systems are required to maintain a pH of 7.0 in their distribution systems as part of their corrosion control treatment plans (40 C.F.R. section 141.82(f)). For all other community systems that do not need to maintain a corrosion control plan, it is expected that they will have no issues with pH levels because they have no issues with corrosion of their systems. Including an effluent limitation for pH in this Order would unnecessarily regulate those systems that are already required to comply with a 7.0 pH level and force other community drinking water systems to add additional chemicals prior to discharging, which in turn may add salts and other pollutants that may cause water quality impacts. Therefore, it is unnecessary to include an effluent limitation for pH in this Order.

<u>The San Diego Regional Water Board Permit (Order R9-2010-0003)</u> is a general permit for discharges of hydrostatic test water and potable water to surface waters and storm drains or other conveyance systems. It establishes limits for total chlorine residual and pH. As previously discussed there is no need to include an effluent limit for pH.

This statewide Order requires that discharges be managed by the use of multiple BMPs, and also contains effluent limitations for chlorine residual and turbidity and receiving water limitations for pH, chemical constituents, sediment and total suspended solids, and toxicity, among other requirements. This Order does not include specific effluent limitations for BOD, TSS, settleable solids or settleable matter, pH, TTHMs, zinc, acute toxicity, MTBE, 15 priority pollutants VOCs, PCBs, TDS, sulfate, chloride, boron and nitrogen, which are included in some of the comparable Regional Water Board permits, as described above. To the extent that this Order may impose less stringent limitations than those contained in the existing Regional Water Board permits, applicable exceptions to the anti-backsliding prohibition that are supported by the analysis above include: waters in attainment, where permit requirements are consistent with antidegradation (§ 303(d)(4)(B)); new information available (§ 402(o)(2)(B)(i)); and events beyond dischargers' control (§ 402(o)(2)(C)), due to the mandatory or emergency nature of the discharges. All requirements under this Order, when implemented, will increase the regulatory requirements over drinking water system discharges on a statewide basis. The effluent limitations for chlorine residual and numerical threshold of 100 NTU for turbidity in this Order are as stringent as the Regional Water Board permits. Effluent limits in broader Regional Board General Permits for discharges to inland waters, enclosed bays and estuaries consist of monthly averages of 50 NTU or 75 NTU. The 100 NTU numerical threshold in this Order is an instantaneous numeric action level that requires further implementation of BMPs when

exceeded. An instantaneous action level of 100 NTU for applicable discharges that are short term and intermittent is as protective, if not more protective, than a monthly average of 50 NTU or 75 NTU.

H. Monitoring and Reporting Requirements

Title 40 Code of Federal Regulations part 122.48, requires that all NPDES permits specify requirements for recording and reporting monitoring results. Section 13267 and section 13383 of the Water Code authorize the regional boards to require technical and monitoring reports. The Monitoring and Reporting Program (MRP) in this Order establishes monitoring, recordkeeping, notification, and reporting requirements to implement State and federal requirements. This MRP is provided in Attachment E.

To address the cost of compliance to dischargers and the cost of implementation to the Water Boards, the monitoring and reporting requirements in this Order are designed to provide necessary information for the discharger to make informed decisions regarding implementation of best management practices, and for the reporting of information that has pertinent value to the protection of water quality. This Order implements representative monitoring requirements, allowing one monitoring sample to represent the quality of other repetitive discharges that are similar in nature. Discharges that are considered to be similar in nature include those that have the following elements in common: (1) the same general water supply, (2) undergo the same water treatment, and (3) are managed through the same series of best management practices. This Order additionally requires annual monitoring and reporting of non-compliant discharges, mandatory recordkeeping, Regional Water Board notification of high volume discharges, reporting of estimated annual volumes discharged to surface water and reporting of the estimated volume of water put to multiple uses prior to surface water discharge or routed to ground water infiltration.

I. Endangered Species Act

This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code § 2050 et. seq) or the Federal Endangered Species Act (16 U.S.C.A. § 1531 et. seq). This Order requires compliance with effluent limitations, receiving water limitations, and other requirements to protect the beneficial uses of waters of the state. The Discharger is responsible for meeting all requirements of the applicable Endangered Species Act.

J. Impaired Water Bodies on CWA 303(d) List

Under section 303(d) of the 1972 CWA, states, territories, and authorized tribes are required to develop lists of water quality limited segments. The waters on these lists do not meet water quality standards, even after discharges of point sources of pollution have installed the minimum required levels of pollution control technology. On

October 11, 2011, U.S. EPA gave final approval to California's 2010 section 303(d) List of Water Quality Limited Segments. The Basin Plans reference this list of Water Quality Limited Segments (WQLSs), which are defined as "…*those sections of lakes, streams, rivers or other fresh water bodies where water quality does not meet (or is not expected to meet) water quality standards even after the application of appropriate limitations for point sources* (40 C.F.R. part 130.2(j))." The Basin Plans also state, "*Additional treatment beyond minimum federal standards will be imposed on dischargers to [WQLSs]. Dischargers will be assigned or allocated a maximum allowable load of critical pollutants so that water quality objectives can be met in the segment*." Impaired waters are those waters not meeting quality standards pursuant to section 303(d) of the CWA, thus do not support beneficial uses. States must also prioritize the water bodies on the list and develop action plans, called total maximum daily loads (TMDLs) to improve the water quality. California impaired waters, as approved by the State Water Board, are listed on http://www.waterboards.ca.gov/water_issues/programs/tmdl/2010state_ir_reports/2010_combo303d.xls.

This Order does not authorize discharges from new drinking water systems (not an expansion of an existing system) into an impaired water body that is impaired for a constituent that exists in the new discharge at a concentration greater than the criteria used to establish the impairment of the water body.

K. Applicable Total Maximum Daily Loads (TMDLs) with Waste Load Allocations (WLAs) to Water Purveyors

TMDLs in California are developed either by the Regional Water Boards or by U.S. EPA. TMDLs developed by Regional Water Boards are designed as Basin Plan amendments and include implementation provisions. TMDLs developed by U.S. EPA typically contain the total load and load allocations required by section 303(d), but do not contain comprehensive implementation provisions. This stems from the fact that U.S. EPA authorities related to implementation of nonpoint source pollution control measures are generally limited to education and outreach as provided by CWA section 319. TMDLs are currently required for all waters and pollutants on the 303(d) list. TMDLs must consider and include allocations to both point sources and nonpoint sources of listed pollutants. Although the abbreviation stands for "Total Maximum Daily Load," the limitations contained in a TMDL may be other than "daily load" limits. There also can be multiple TMDLs on a particular water body, or there can be one TMDL that addresses numerous pollutants. The basis for grouping pollutants into one TMDL is typically whether or not there can be a common analytical approach to the assessment or a common management response to the impairment.

A review of Regional Water Board TMDLs found that, as of the adoption date of this Order, only the Los Angeles Regional Water Board and the San Diego Regional Water Board have existing (previously adopted) TMDLs in their basin plans that may indirectly imply that waste load allocations are applicable to the discharges from drinking water systems regulated under this General Order. In many of the existing TMDLs, waste

load allocations apply to general categories of discharges (such as “other NPDES discharges”, “general NPDES discharges” or “minor NPDES discharges”) that indirectly include discharges from drinking water systems.

The State Water Board is required to ensure that the effluent limits in this Order are “consistent with the assumptions and requirements of any available waste load allocation for the discharge.” (40 C.F.R. § 122.44(d)(1)(vii)(B).) Although these TMDLs apply to the discharges that are authorized under this Order, none of the TMDLs or supporting staff reports indicate that the discharges from drinking water systems authorized under this Order are significant sources of the relevant pollutants. Based on the data that is currently available, and due to the high quality and intermittent and short-term nature of the discharges from drinking water systems authorized under this Order, it is unlikely that these discharges contribute to the impairment of the TMDL-related water bodies. The State Water Board has determined that the intermittent, short-term and seasonal discharges regulated under this Order do not contribute to the impairment, and requirements more stringent than those included in this Order will not contribute to the actions needed to address the impairment. Therefore, it is consistent with the assumptions and requirements of the waste load allocation in these TMDLs for this Order to not include any TMDL-specific effluent limitations. However, due to the existing language in the TMDLs identified in this section, the State Water Board is requiring laboratory sampling to be included in the application process of this Order, to confirm that pollutants in the subject drinking water system discharges are not at levels that are contributing to the existing impairment. The State Water Board is also requiring that applicants describe and implement applicable TMDL pollutant-specific management practices to reduce the subject pollutant concentration to the maximum extent possible. The data submitted will be evaluated on a case by case basis and in consultation with Regional Board staff. The evaluation will be based on specific factors such as the amount of discharge, duration of discharge, type of pollutant, and consideration of the applicable established Waste Load Allocations for each TMDL to determine whether the conditions of this Order address the applicable TMDL requirements.

If the Deputy Director determines that any of these TMDLs, or any newly approved TMDLs, establish waste load allocations that should be implemented through TMDL-specific permit requirements for the discharges from drinking water systems that are authorized under this Order, the water purveyor will be required to enroll in this Order and maintain enrollment unless and until the Regional Water Board issues an individual or general permit for those discharges contributing to the impairment. Alternatively, if further TMDLs are adopted that address pollutants that are likely to be in discharges from drinking water systems, and allocate waste loads specifically to water purveyors regulated under this Order, the State Water Board may consider adding additional TMDL-specific permit requirements to Attachment G of this Order in a subsequent permit amendment or renewal.

To facilitate a water purveyor’s identification of an applicable TMDL in the Los Angeles and San Diego regions, the following table has been provided to identify the receiving water bodies and corresponding pollutants for which an applicant must provide an application supplement, in accordance with Section II.C.4 of this Order. The table

below includes only the TMDL-specific constituents that may pertain to drinking water discharges and/or additional pollutants the discharges assimilate as they flow into receiving waters. A summary providing general information regarding each TMDL adopted by U.S. EPA or the Regional Water Boards for the Los Angeles and San Diego regions that are applicable to the discharges from drinking water systems authorized under this Order, is provided following the table.

Table F-2. Los Angeles Regional Water Boards' 303(d) list Waterbodies and applicable TMDL-specific constituents

TMDL WATERBODY	TMDL CONSTITUENT
Ballona Creek	Copper Lead Zinc
Ballona Creek Estuary	Cadmium Copper Lead Silver Zinc TSS Chlordane DDTs DDD Total PCBs
Ballona Creek, Ballona Estuary and Sepulveda Channel	Total Coliform E. coli
Calleguas Creek	Boron Total Dissolved Solids Sulfate Chloride Chronic Toxicity Unit (TU_c) Chlorpyrifos Diazinon Chlordane 4,4-DDD 4,4,-DDE 4,4,-DDT Dieldrin PCBs Toxaphene
Calleguas Creek, Reach 1, 2, 3, 4, 5, 9, 10, 11, 12, and 13	Copper Nickel
Calleguas Creek, Reach 4 and 5	Selenium

Colorado Lagoon	Chlordane Dieldrin Lead Zinc PAHs PCBs DDT
Dominguez Channel	Toxicity
Dominguez Channel and Torrance Lateral	Copper Lead Zinc
Dominguez Channel Estuary	PAHs Chlordane Dieldrin
Dominguez Channel Estuary and Greater Harbor Waters	Copper Lead Zinc 4-4-DDT Total PCBs
Compton Creek	Copper Lead
Echo Lake	Total Nitrogen Total Phosphorus
El Dorado Park Lake	Total Nitrogen Total Phosphorus Mercury
Lake Calabasas	Total Nitrogen Total Phosphorus
Lincoln Lake	Total Nitrogen Total Phosphorus
Long Beach City Beaches and the Los Angeles River Estuary	Total Coliform
Los Angeles Harbor	Total Coliform

Los Angeles River	Nitrate-nitrogen Nitrite-nitrogen Nitrate-nitrogen + nitrite-nitrogen Cadmium Copper Lead Zinc E. coli
Los Angeles River above LA-Glendale WRP	Ammonia
Los Angeles River below LA-Glendale WRP	Ammonia
Los Angeles River Reach 1	Copper Lead
Los Angeles River Reach 2 and Arroyo Seco	Copper Lead
Los Angeles River Reach 3 above LA- Glendale WRP and Verdugo	Copper Lead
Los Angeles River Reach 3 below LA- Glendale WRP	Copper Lead
Los Angeles River Reach 4	Copper Lead
Los Angeles River Reach 5,6 and Bell Creek	Copper Lead Selenium
Los Angeles River Burbank Western Channel, above WRP	Copper Lead
Los Angeles River Burbank Western Channel, below WRP	Copper Lead
Los Angeles River tributaries	Ammonia
Los Cerritos Channel	Copper Lead Zinc
Macado Lake	Total PCB DDD (all congeners) DDE (all congeners) DDT (all congeners) Total DDT Chlordane Dieldrin

Malibu Creek	E. coli
Malibu Creek Lagoon	Total Coliform
Marina Del Rey Mothers Beach and Back Basins	Total Coliform
Park Lake, Peck Rd	Total Nitrogen Total Phosphorus
Rainbow Creek	Total Nitrogen Total Phosphorus
Rio Hondo Reach 1	Copper Lead Zinc
San Gabriel River Estuary	Copper
San Gabriel River, Reach 1	Copper
San Gabriel River, Reach 2	Lead
San Gabriel River, Coyote Creek	Copper Lead Zinc
San Gabriel River, San Jose Creek, Reach 1 and 2	Selenium
Santa Clara River	Total Coliform E. coli
Santa Clara River, Reach 7	Ammonia as Nitrogen Nitrate plus Nitrite as Nitrogen
Santa Clara River, Reach 3	Ammonia as Nitrogen Nitrate plus Nitrite as Nitrogen
Santa Fe Dam Park Lake	Total Nitrogen Total Phosphorus
Santa Monica Bay	Total Coliform
Upper Santa Clara River, Reach 3	Chloride
Upper Santa Clara River, Reaches 4B, 5 and 6	Chloride
Ventura Coastal (Miscellaneous)	Total Coliform
Ventura River	Total Nitrogen Total Phosphorus

Table F-3. San Diego Regional Water Boards' 303(d) list Waterbodies and applicable TMDL-specific constituents

TMDL WATERBODY	POLLUTANT
Alisa Hydrologic Subarea	Total Coliform
Chollas Creek	Copper Lead Zinc
Chollas Hydrologic Subarea	Total Coliform
Dana Point Hydrologic Subarea	Total Coliform
Lower San Juan Hydrologic Subarea	Total Coliform
Miramar Reservoir Hydrologic Subarea	Total Coliform
Mission San Diego Hydrologic Subarea & Santee Hydrological Subarea	Total Coliform
Rainbow Creek	Total Nitrogen Total Phosphorus
San Clemente Hydrologic Subarea	Total Coliform
San Dieguito Hydrologic Subarea	Total Coliform
San Joaquin Hills Hydrologic Subarea & Laguna Hills Hydrologic Subarea	Total Coliform
San Marcos Hydrologic Subarea	Total Coliform
San Luis Rey Hydrologic Subarea	Total Coliform
Scripps Hydrologic Subarea	Total Coliform
Tecolote Hydrologic Subarea	Total Coliform

Summary of Los Angeles Region Water Quality Control Board TMDLs

The following is a summary of TMDLs in the Los Angeles region that have waste load allocations for general NPDES discharge categories, followed by a general description. Table F-2 in this section lists the 303(d) list water bodies and TMDL-specific constituents. These TMDLs have been adopted by the Regional Water Board, and approved by the State Water Board and/or the U.S. EPA under Clean Water Act section 303(c), prior to the adoption date of this Order. This Order solely implements the requirements of existing TMDLs; this Order does not modify an existing TMDL or basin plan language. Further detailed information on the summary of listed TMDLs below, as adopted by the Regional Water Quality Control Boards or U.S. EPA, can be found at the following websites:

http://www.waterboards.ca.gov/losangeles/water_issues/programs/tmdl/
or
http://epa.gov/region09/water/tmdl/final.html

1. Total Maximum Daily Load for Nitrogen, Phosphorus, Mercury, Trash, Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs) in the Los Angeles Area Lakes

U.S. EPA established TMDLs in the following nine lakes in the Los Angeles region, for the following pollutants:

- Peck Road Park Lake: nitrogen, phosphorus, chlordane, DDT, dieldrin, PCBs, trash
- Lincoln Park Lake: nitrogen, phosphorus, trash
- Echo Park Lake: nitrogen, phosphorus, chlordane, dieldrin, PCBs, trash
- Lake Calabasas: nitrogen, phosphorus
- El Dorado Park Lakes: nitrogen, phosphorus, mercury
- Legg Lakes (North, Center and Legg): nitrogen, phosphorus
- Puddingstone Reservoir: nitrogen, phosphorus, chlordane, DDT, PCBs, mercury, dieldrin
- Santa Fe Dam Park: nitrogen, phosphorus
- Lake Sherwood: mercury

The NPDES permits in the watersheds draining to the impaired lakes include municipal separate storm sewer system (MS4) permits, a California Department of Transportation (Caltrans) storm water permit, general construction storm water permits, general industrial storm water permits, and a general NPDES permit. Other than the MS4 and Caltrans storm water permits, there are no major individual NPDES permits in the watersheds draining to the impaired lakes. Sources of pollutants include discharges of potable water used to maintain lake levels.

2. Total Maximum Daily Load for Chloride in the Upper Santa Clara River

Chloride levels in Reach 3 of the Santa Clara River exceed the water quality objective (WQO) of 80 mg/L for chloride in Reach 3 established in the Water Quality Control Plan, Los Angeles Region (Basin Plan). U.S. EPA established a TMDL for Reach 3. There are two major point sources that discharge into Reach 3, the Santa Paula and Fillmore Water Reclamation Plants. Minor point source discharges to Reach 3 include:

- storm water regulated under the NPDES municipal stormwater permit
- runoff from construction sites regulated under the statewide construction general NPDES permit,
- storm water regulated under the Caltrans statewide NPDES permit,
- runoff from industrial sites regulated under the statewide industrial facility general NPDES permit, and
- dewatering operations regulated under NPDES permits

In addition, elevated chloride concentrations are causing impairments of the water quality objective of 100 mg/L in Reach 5 (EPA 303(d) list Reach 7) and Reach 6 (EPA 303(d) list Reach 8) of the Santa Clara River (SCR). These reaches were on the 1998 and 2002 Clean Water Act (CWA) 303(d) lists of impaired water bodies as impaired due to chloride. The objectives for these reaches were set to protect all beneficial uses; agricultural beneficial uses have been determined to be most sensitive, and not currently attained at the downstream end of Reach 5 (EPA 303(d) list Reach 7) and Reach 6 (EPA 303(d) list Reach 8) in the Upper Santa Clara River (USCR). Irrigation of salt sensitive crops such as avocados, strawberries, and nursery crops with water containing elevated levels of chloride results in reduced crop yields. Chloride levels in groundwater in Piru Basin underlying the reach downstream of Reach 5 are also rising.

3. Total Maximum Daily Load for Bacteria in the Santa Monica Bay

Many of the beaches along Santa Monica Bay (SMB) were listed on the California's 1998 section 303(d) List, due to impairments for coliform or for beach closures associated with bacteria generally. The Los Angeles Regional Board adopted TMDLs to address bacteriological water quality impairments for 44 beaches along Santa Monica Bay located in Los Angeles County, California. WLA(s) are expressed as the number of sample days at a shoreline monitoring site that may exceed the following single sample numeric targets:

- Total coliform density shall not exceed 10,000/100ml.
- Fecal coliform density shall not exceed 400/100ml
- Enterococcus density shall not exceed 104/100ml
- Total coliform density shall not exceed 1000/100 ml if the ratio of fecal-to-total coliform exceeds 0.1.

With the exception of isolated sewage spills, storm water runoff conveyed by storm drains and creeks is the primary source of elevated bacterial indicator densities to the SMB beaches during wet weather. Waste load allocations are expressed as allowable exceedance days because the bacterial density and frequency of single sample exceedances are the most relevant to public health protection. All responsible jurisdictions and responsible agencies (local agencies that are responsible for discharges from a publicly owned treatment works to the SMB watershed or directly to the Bay, permittees or co-permittees on a municipal storm water permit, the California Department of Transportation, and other agencies that have jurisdiction over a beach adjacent to SMB) within a subwatershed are jointly responsible for complying with established allowable number of exceedance days.

4. Total Maximum Daily Load for Nutrients in the Los Angeles River

Reaches of the Los Angeles River and its tributaries were listed as impaired for nitrogen compounds (ammonia, nitrate, and nitrate) and related effects such as

algae, pH, odor, and scum on the 2002 303(d) list. These reaches were listed because numeric and narrative water quality objectives for nitrogen compounds and related effects were exceeded, thereby impairing warm, freshwater, and wildlife habitats, and recreation beneficial uses.

The principal source of nitrogen compounds to the Los Angeles River is discharges from the Donald C. Tillman Water Reclamation Plant (WRP), the Los Angeles-Glendale WRP, and the Burbank WRP. During dry weather period, the major POTWs contribute 84.1% of the total dry weather nitrogen load. Urban runoff, storm water, and groundwater discharge may also contribute nitrate loads. Further evaluation of these sources is set forth in the Implementation Plan

Concentration based WLAs for nitrogen compounds are allocated to minor point sources enrolled under NPDES or WDR permits including but not limited to Tapia Water Reclamation Plant (WRP), Whittier Narrows WRP, Los Angeles Zoo WRP, industrial and construction storm water, and municipal storm water and urban runoff from municipal separate storm sewer systems (MS4s). The WLA(s) are listed by receiving water and established as the applicable one-hour and thirty-day average effluent limitations at the point of discharge.

5. Total Maximum Daily Load for Nutrients in the Santa Clara River

Discharge of wastes containing nitrite, nitrate and ammonia to the Santa Clara River causes exceedances of water quality objectives for ammonia, nitrate and nitrite established in the Basin Plan. The Santa Clara River is listed as impaired by ammonia in Reach 3 and by nitrate plus nitrite in Reach 7 on the 2002 303(d) list of impaired water bodies. Reach 8 of the Santa Clara River is included on the State Monitoring List for organic enrichment/dissolved oxygen, which may be caused by excessive nitrogen. Nitrate and nitrate are biostimulatory substances that can cause eutrophic effects such as low dissolved oxygen and algae growth. Excessive ammonia can cause aquatic life toxicity.

The principal source of ammonia, nitrite, and nitrate to the Santa Clara River is discharges from the Saugus and Valencia Water Reclamation Plants (WRPs) and the Fillmore and Santa Paula Publicly Owned Treatment Works (POTWs). Agricultural runoff, storm water discharge and groundwater discharge may also contribute nitrate loads. Further evaluation of these sources is set forth in the Implementation Plan.

Concentration-based waste loads are allocated to major point sources of ammonia and nitrate+nitrite in Reach 3, which include the Fillmore and Santa Paula POTWs; concentration-based waste loads are allocated to major point sources of ammonia and nitrite+nitrate in Reaches 7 and 8, which include the Valencia and Saugus WRPs. Concentration-based waste loads are also allocated to municipal, industrial and construction storm water sources regulated under NPDES permits and minor discharges enrolled under NPDES or WDR permits. The allocations for minor point sources are based on the water quality

objectives for ammonia, nitrite, nitrate and nitrite plus nitrate. The WLAs are established as one-hour and thirty day average concentrations.

6. Total Maximum Daily Load for Bacteria in the Marina del Rey Mothers Beach and Back Basins

Elevated bacterial indicator densities are causing impairment of the water contact recreation (REC-1) beneficial use at Marina del Rey Harbor (MdRH) Mothers' Beach and back basins. Dry-weather urban runoff and storm water conveyed by storm drains are the primary sources of elevated bacterial indicator densities to MdRH Mothers' Beach and back basins during dry and wet-weather. As of December 2002, there were seven dischargers located within the Marina del Rey watershed. These dischargers were issued general NPDES permits, general industrial and/or general construction storm water permits. The bacteria loads associated with these discharges are largely unknown, since most do not monitor for bacteria. However, these discharges are not expected to be a significant source of bacteria.

The Los Angeles County MS4 and Caltrans storm water permittees and co-permittees are assigned waste load allocations (WLAs) expressed as the number of daily or weekly sample days that may exceed the single sample targets identified under "Numeric Target" at a monitoring site. Waste load allocations are expressed as allowable exceedance days because the bacterial density and frequency of single sample exceedances are the most relevant to public health protection.

According to the TMDL, discharges from general NPDES permits, general industrial storm water permits and general construction storm water permits are not expected to be a significant source of bacteria.

7. Total Maximum Daily Load for Bacteria in the Los Angeles Harbor

Elevated bacterial indicator densities are causing impairment of the water contact recreation (REC-1) beneficial use of Inner Cabrillo Beach and the potential REC-1 uses of the Main Ship Channel in the Los Angeles Harbor.

Dry-weather urban runoff and storm water conveyed by storm drains are major sources of elevated bacterial indicator densities to Inner Cabrillo Beach and the Main Ship Channel during dry and wet-weather. As of March 2004, there are 15 active individual and 15 active general, NPDES permits for discharges to the Inner or Outer Los Angeles Harbor including the Terminal Island Treatment Plant. While the fecal coliform counts in the wastewater field indicate a contribution of bacteria to the Harbor by the Terminal Treatment Plant, the wastewater field is sufficiently diluted and the bacterial densities are so much lower in the Harbor than the high bacterial densities and exceedances at the sites at Cabrillo Beach and in the Main Ship Channel that it appears that the

Treatment Plant is not a significant source of bacteria to the Beach or to the Ship Channel.

Waste load allocations are expressed as allowable exceedance days because the bacterial density and frequency of single sample exceedances are the most relevant to public health protection. According to the TMDL, discharges from general NPDES permits, general industrial storm water permits and general construction storm water permits are not expected to be a significant source of bacteria.

8. Total Maximum Daily Load for Bacteria in Malibu Creek and Lagoon

Elevated bacterial indicator densities are causing impairment of the water contact recreation (REC-1) beneficial use at Malibu Creek, Lagoon, and adjacent beach. Fecal coliform bacteria may be introduced from a variety of sources including storm water runoff, dry-weather runoff, onsite wastewater treatment systems, and animal wastes. Waste Load Allocations (WLAs) are expressed as the number of daily sample days that may exceed the single sample limits as identified under "Numeric Target." WLAs are expressed as allowable exceedance days because the bacterial density and frequency of single sample exceedances are the most relevant to public health protection.

The responsible jurisdictions and responsible agencies are the County of Los Angeles, County of Ventura, the cities of Malibu, Calabasas, Agoura Hills, Hidden Hills, Simi Valley, Westlake Village, and Thousand Oaks; Caltrans, and the California Department of Parks and Recreation. The responsible jurisdictions and responsible agencies include the permittees and co-permittees of the municipal storm water (MS4) permits for Los Angeles County and Ventura County, and Caltrans. In addition, according to the TMDL, discharges from Tapia WWRF and effluent irrigation, and general construction storm water permits are not expected to be a significant source of bacteria.

9. Total Maximum Daily Load for Metals in the Los Angeles River

Segments of the Los Angeles River and its tributaries are on the Clean Water Act section 303(d) list of impaired waterbodies for copper, cadmium, lead, zinc, aluminum and selenium. The metals subject to this TMDL are toxic pollutants, and the existing water quality objectives for the metals reflect national policy that the discharge of toxic pollutants in toxic amounts be prohibited. When one of the metals subject to this TMDL is present at levels exceeding the existing numeric objectives, then the receiving water is toxic. The beneficial uses impaired by metals in the Los Angeles River and its tributaries are those associated with aquatic life and water supply, including wildlife habitat, rare, threatened or endangered species, warm freshwater habitat, wetlands, and groundwater recharge.

There are significant differences in the sources of metals loadings during dry weather and wet weather. During dry weather, most of the metals loadings are in the dissolved form. The three major publicly owned treatment works (POTWs) that discharge to the river (Tillman WRP, LA-Glendale WRP, and Burbank WRP) constitute the majority of the flow and metals loadings during dry weather. The storm drains also contribute a large percentage of the loadings during dry weather because although their flows are typically low, concentrations of metals in urban runoff may be quite high. The remaining portion of the dry weather flow and metals loadings represents a combination of tributary flows, groundwater discharge, and flows from other permitted NPDES discharges within the watershed.

TMDLs are developed for reaches on the 303(d) list and for reaches where recent data indicate additional impairments. Addressing the impairing metals throughout the Los Angeles River watershed will ensure that the metals do not contribute to an impairment elsewhere in the watershed. Metals allocations are therefore developed for upstream reaches and tributaries that drain to impaired reaches. These TMDLs address wet- and dry-weather discharges of copper, lead, zinc and selenium and wet-weather discharges of cadmium.

Impairments related to cadmium only occur during wet weather. Impairments related to selenium are confined to Reach 6 and its tributaries. Dry-weather impairments related to zinc only occur in Rio Hondo Reach 1. The aluminum listing was based on water quality objectives set to support the municipal water supply beneficial use (MUN). MUN is a conditional use in the Los Angeles River watershed. The United States Environmental Protection Agency (U.S. EPA) has determined that TMDLs are not required for impairments of conditional uses.

10. Total Maximum Daily Load for Metals in Ballona Creek

Ballona Creek is on Clean Water Act Section 303(d) list of impaired waterbodies for dissolved copper, dissolved lead, total selenium, and dissolved zinc and Sepulveda Canyon Channel is 303(d) listed for lead. TMDLs are developed for reaches on the 303(d) list and metal allocations are developed for tributaries that drain to impaired reaches. Recent data indicates that selenium is not present at levels exceeding existing numeric targets and is not impairing the designated beneficial uses. Therefore a TMDL for selenium is not included. This TMDL address dry- and wet-weather discharges of copper, lead, and zinc in Ballona Creek and Sepulveda Canyon Channel.

There are significant differences in the sources of copper, lead, and zinc loadings during dry weather and wet weather. During dry weather, most of the metals loadings are in the dissolved form. Storm drains convey a large percentage of the metals loadings during dry weather because although their flows are typically low, concentrations of metals in urban runoff may be quite high. During dry years, dry weather loadings account for 25-35 percent of the annual metals loadings. Additional sources of dry weather flow and metals loading include groundwater

discharge and flows from other permitted NPDES discharges within the watershed. During wet weather, most of the metals loadings in Ballona Creek are in the particulate form and are associated with wet-weather storm water flows.

Concentration-based dry- and wet-weather waste load allocations are assigned to the minor NPDES permits and general non-storm water NPDES permits that discharge to Ballona Creek or its tributaries.

11. Total Maximum Daily Load for Toxic Pollutants in the Ballona Creek Estuary

Ballona Creek Estuary (Estuary) is on the Clean Water Act Section 303(d) list of impaired water bodies for cadmium, copper, lead, silver, zinc, chlordane, DDT, PCBs, PAHs and toxicity in sediments. Urban storm water has been recognized as a substantial source of metals. Numerous researchers have documented that the most prevalent metals in urban storm water (i.e., copper, lead, zinc, and to a lesser degree cadmium) are consistently associated with suspended solids. Because metals are typically associated with fine particles in storm water runoff, they have the potential to accumulate in estuarine sediments where they may pose a risk of toxicity.

TMDLs are developed for cadmium, copper, lead, silver, zinc, chlordane, DDT, and PCBs within the sediments of the Ballona Creek Estuary. WLAs are assigned to point sources for the Ballona Creek watershed. A grouped mass-based waste load allocation is developed for the storm water permittees (Los Angeles County MS4, Caltrans, General Construction and General Industrial permittees) by subtracting the load allocations from the total loading capacity.

Sediment based waste load allocations are assigned to minor NPDES permits and general non-storm water NPDES permits that discharge to Ballona Creek or its tributaries. The Los Angeles Water Board implements an approach for compliance for these waste load allocations by establishing a total suspended solids (TSS) effluent limitation together with a concentration-based limit for the each specific TMDL pollutant.

12. Total Maximum Daily Load for Toxicity in Calleguas Creek

Discharge of wastes containing chlorpyrifos, diazinon, other pesticides and/or other toxicants to Calleguas Creek, its tributaries and Mugu Lagoon cause exceedances of water quality objectives for toxicity established in the Basin Plan. Source analysis determined that agricultural and urban uses are the largest sources of chlorpyrifos and diazinon in the watershed.

A waste load of 1.0 TUc is allocated to the major point sources (POTWs) discharging to the Calleguas Creek Watershed. Minor sources include NPDES

permittees other than wastewater treatment plants, and urban storm water co-permittees (MS4s) discharging to the Calleguas Creek watershed.

A WLA of 1.0 TUc is allocated to minor point sources. In addition, WLAs for acute and chronic toxicity for diazinon and chloropyrifos are allocated to the minor point sources.

13. Total Maximum Daily Load for Organochlorine (OC) Pesticides and Polychlorinated Biphenyls (PCBs) in Calleguas Creek

Eleven of fourteen reaches in the Calleguas Creek Watershed (CCW) were identified on the 2002 303(d) list of water-quality limited segments as impaired due to elevated levels of organochlorine (OC) pesticides and/or polychlorinated biphenyls (PCBs) in water, sediment and/or fish tissue. Additionally, Mugu Lagoon was listed as impaired for sedimentation/siltation. OC pesticides and PCBs can bioaccumulate in fish tissue and cause toxicity to aquatic life in estuarine and inland waters. Siltation may transport OC Pesticides and PCBs to surface waters and impair aquatic life and wildlife habitats.

Monitoring data from major NPDES discharges and land use runoff were analyzed to estimate the magnitude of OC pesticides and PCBs loads to Calleguas Creek, its tributaries and Mugu Lagoon. The largest source of OC pesticides in the listed waters is agricultural runoff. Most PCB residues are due to past use of PCBs as coolants and lubricants in transformers, capacitors, and other electrical equipment. Atmospheric deposition is also a potential source of PCBs. Urban runoff and POTWs are minor sources of OC pesticides and PCBs.

14. Total Maximum Daily Load for Toxics in the Marina del Rey Harbor

The back basins of Marina del Rey Harbor are on the Clean Water Act Section 303(d) list of impaired water bodies for chlordane, copper, lead, zinc, PCBs, DDT, dieldrin, sediment toxicity and a fish consumption advisory. Review of available data during the development of this TMDL indicated that dieldrin and DDT are no longer causes of impairment. The following designated beneficial uses are impaired by chlordane, copper, lead, zinc, PCBs, and toxicity: water contact recreation (REC1); marine habitat (MAR); wildlife habitat (WILD); commercial and sport fishing (COMM); and shellfish harvesting (SHELL).

Urban storm water has been recognized as a substantial source of metals. Numerous researchers have documented that the most prevalent metals in urban storm water (i.e., copper, lead, and zinc) are consistently associated with suspended solids. Because metals are typically associated with fine particles in storm water runoff, they have the potential to accumulate in marine sediments where they may pose a risk of toxicity. Similar to metals, the majority of organic constituents in storm water are associated with particulates.

Waste load allocations (WLA) are assigned to point sources for the Marina del Rey watershed. A grouped mass-based waste load allocation is developed for the storm water permittees (Los Angeles County MS4, Caltrans, General Construction and General Industrial) by subtracting the load allocations from the total loading capacity. Sediment concentration-based waste load allocations are developed for other point sources in the watershed.

15. Total Maximum Daily Load for Bacteria in Ballona Creek, the Ballona Estuary, and the Sepulveda Channel

Elevated bacterial indicator densities are causing impairment of the water contact recreation (REC-1) beneficial use designated for Ballona Estuary and Sepulveda Channel, limited water contact recreation (LREC) designated for Ballona Creek Reach 2, and non-contact recreation (REC-2) beneficial uses of Ballona Creek Reach 1.

The major contributors of flows and associated bacteria loading to Ballona Creek and Estuary are dry- and wet-weather urban runoff discharges from the storm water conveyance system. Run-off to Ballona Creek is regulated as a point source under the Los Angeles County MS4 Permit, the Caltrans Storm Water Permit, and the General Construction and Industrial Storm Water Permits. In addition to these regulated point sources, the Ballona Estuary receives input from the Del Rey Lagoon and Ballona Wetlands through connecting tide gates.

The Los Angeles County MS4 and Caltrans storm water permittees and co-permittees are assigned waste load allocations (WLAs) expressed as the number of daily or weekly sample days that may exceed the single sample targets equal to the TMDLs established for the impaired reaches.

Waste load allocations are expressed as allowable exceedance days because the bacterial density and frequency of single sample exceedances are the most relevant to public health protection. According to the TMDL, discharges from general NPDES permits, general industrial storm water permits and general construction storm water permits are not expected to be a significant source of bacteria.

16. Total Maximum Daily Load for Metals in the Calleguas Creek Watershed

Three of fourteen reaches in the Calleguas Creek Watershed (CCW) including Revolon Slough, Lower Calleguas Creek – Reach 2, and Mugu Lagoon are identified on the 2002 Clean Water Act Section 303(d) list of water-quality limited segments as impaired due to elevated levels of metals and selenium in water. The 303(d) listings, which were approved by the State Water Resources Control Board in February 2003, require the development of Total Maximum Daily Loads (TMDLs) to establish the maximum amount of pollutants a water body can receive without exceeding water quality standards.

Significant sources of metals and selenium include urban runoff, agricultural runoff, groundwater seepage, and POTW effluent. For mercury, open space was also a significant source. Sources were also analyzed as a function of wet and dry weather. Higher loads were delivered during wet weather for all constituents, due to the association between metals and particulate matter.

In the case of copper, nickel, and selenium, waste load allocations (WLAs) were developed for both wet and dry-weather. The dry-weather WLAs apply to days when flows in the stream are less than the 86th percentile flow rate for each reach. The wet-weather WLAs apply to days when flows in the stream exceed the 86th percentile flow rate for each reach. Annual mass loads of mercury in suspended sediment were developed according to low, medium, and high annual flow categories. Final WLAs were established for POTWs, permitted storm water dischargers, and for all other NPDES dischargers.

17. Total Maximum Daily Load for Salts in the Calleguas Creek Watershed

Eleven of fourteen reaches in the Calleguas Creek Watershed (CCW) are identified on the 2002 Clean Water Act Section 303(d) list of water quality limited segments as impaired due to elevated levels of boron, chloride, sulfate, or total dissolved solids (TDS) (these constitutions are commonly referred to as salts). Sources of salts in the watershed include water supply (water imported from the State Water Project or Freeman Diversion and deep aquifer groundwater pumping), water softeners that discharge to publicly owned treatment works (POTWs), POTW treatment chemicals, atmospheric deposition, pesticides and fertilizers, and indoor water use (chemicals, cleansers, food, etc.). Salts that are transported during dry weather to the surface water are quantified via the following mechanisms: groundwater pumping, groundwater exfiltration, POTWs, dry weather urban and agricultural runoff. Wet weather loadings from each of these sources have the potential to be significant, but tend to be lower in concentration and do not occur during the critical conditions for salts. Wet weather loads are significant from the perspective of transporting stranded salts off the watershed.

The TMDL includes WLAs for five POTWs, permitted storm water dischargers, and all other NPDES dischargers. Concentration-based WLAs are assigned to all other NPDES dischargers based on the Basin Plan objectives.

18. Total Maximum Daily Load for Bacteria in the Harbor Beaches of Ventura County

Elevated bacteria indicator densities are causing impairment of the water contact recreation (REC-1) beneficial use at Kiddie Beach and Hobie Beach. Kiddie and Hobie Beach are referenced in the Staff Report as the Harbor Beaches of Ventura County. Bacteria sources in the Harbor Beaches of Ventura County include anthropogenic and non-anthropogenic sources and point and non-point sources. Each of these sources contributes to the elevated levels of bacteria

indicator densities at the Harbor Beaches of Ventura County during dry- and wet-weather.

WLAs are expressed as allowable exceedance days. According to the TMDL, discharges from general NPDES permits, general industrial storm water permits and general construction storm water permits are not expected to be a significant source of bacteria.

19. Total Maximum Daily Load for OC Pesticides, Polycyclic Aromatic Hydrocarbons (PAHs), Polychlorinated Biphenyls (PCB), and Metals in the Colorado Lagoon

Colorado Lagoon is identified on the 1998, 2002, and 2006 Clean Water Act Section 303(d) lists of water quality limited segments as impaired due to elevated levels of OC pesticides, PCBs, sediment toxicity, PAHs, and metals in fish tissue and sediment. The point sources of OC pesticides, PCBs, PAHs, and metals discharged to Colorado Lagoon are urban runoff and storm water discharges from MS4s and the California Department of Transportation (Caltrans).

Mass-based WLAs for MS4 permittees including the City of Long Beach, Los Angeles County Flood Control District, and Caltrans are allocated to the five major storm drain outfalls that currently discharge to the lagoon. Concentration-based WLAs for sediment are also assigned to these mentioned permittees. For all other point sources such as minor NPDES permits, other storm water and non-storm water permittees, sediment concentration-based WLAs are also assigned.

20. Total Maximum Daily Load for Bacteria in the Santa Clara River

Elevated bacterial indicator densities are causing impairment of the water contact recreation (REC-1) beneficial use designated for the Santa Clara River (SCR) Estuary and Reaches 3, 5, 6, and 7. Recreating in waters with elevated bacterial indicator densities has long been associated with adverse human health effects. The significant contributors of bacteria loading to the SCR and Estuary are dry- and wet-weather urban runoff discharges from the storm water conveyance system.

General NPDES permits, individual NPDES permits, the Statewide Industrial Stormwater General Permit, the Statewide Construction Activity Storm Water General Permit, and the Statewide Stormwater Permit for Caltrans Activities are assigned WLAs of zero (0) allowable exceedance days of the single sample targets for both dry and wet weather and no exceedances of the geometric mean targets.

Discharges from general NPDES permits, general industrial storm water permits and general construction storm water permits are not expected to be a significant source of bacteria.

21. Total Maximum Daily Load for Toxics in Machado Lake

Machado Lake is identified on the 1998, 2002, 2006, and 2008 Federal Clean Water Act Section 303(d) lists of impaired water bodies due to chlordane, DDT, dieldrin, Chem A, and PCBs in fish tissue. Chem A (the abbreviation for 'chemical group A') is a suite of bio-accumulative pesticides that includes chlordane and dieldrin. The 1998 303(d) listing (and subsequent listings) for Chem A was predominately based on fish tissue concentrations of chlordane and dieldrin; there was only minimal detection of other Chem A pollutants in 1983 and 1984. Chlordane and dieldrin have been recently detected in fish tissue, while other Chem A pollutants have not been detected in 25 years. Therefore, this TMDL only addresses the Chem A pollutants (chlordane and dieldrin) that are causing impairment.

Because of potential harm to human health and the environment, the use of these pollutants has been banned for many years; however, the physiochemical properties of the pollutants cause them to persist in the environment. These pollutants, bound to soil particles, are easily transported with surface runoff to water bodies. Contaminated sediments accumulate in the receiving water bodies and aquatic organisms are exposed to the toxic pollutants. Sediment toxicity has been documented at Machado Lake, and it is likely that pesticides and PCBs contribute to the toxic condition of the sediments. Moreover, all of these pollutants biomagnify as they move up the food chain, thereby increasing concentrations in higher trophic-lever aquatic organisms and wildlife.

22. Total Maximum Daily Load for Bacteria in the Los Angeles River

General NPDES permits, individual NPDES permits, the Statewide Industrial Storm Water General Permit, the Statewide Construction Activity Storm Water General Permit, and WDR permittees in the Los Angeles River Watershed are assigned WLAs of zero (0) days of allowable exceedances of the single sample target for both dry and wet weather.

Discharges from general NPDES permits, general industrial storm water permits and general construction storm water permits are not expected to be a significant source of bacteria. Therefore, the WLAs for these discharges are zero (0) days of allowable exceedances for all three time periods and for single sample limits.

23. Total Maximum Daily Load for Metals and Toxics in the Los Angeles and Long Beach Harbors

The waters of Dominguez Channel and the Greater Los Angeles and Long Beach Harbor area are impaired by heavy metals and organic pollutants. These water bodies are included on the State's Clean Water Act 303(d) impaired waters list for one or more of the following pollutants: cadmium, chromium, copper, mercury, lead, zinc, chlordane, dieldrin, toxaphene, DDT, PCBs, certain PAH compounds, benthic community effects and toxicity. These impairments exist in

one or more environmental media—water, sediment, or tissue. Impairments in fish tissue are for DDT, PCBs, toxaphene, chlordane and dieldrin. Beneficial uses designated in these waters to protect aquatic life include the marine habitat use (MAR) and rare, threatened or endangered species habitat use (RARE). In addition, the estuaries (EST) are recognized as areas for spawning, reproduction and/or early development (SPWN), migration of aquatic organisms (MIGR), and wildlife habitat (WILD). Dominguez Channel also has an existing designated use of warm freshwater habitat (WARM) and the Los Angeles River Estuary has the designated use of wetland habitat (WET). Beneficial uses associated with human use of these waters include recreational use for water contact (REC1), non-contact water recreation (REC2), industrial service supply (IND), navigation (NAV), commercial and sport fishing (COMM), and shellfish harvesting (SHELL).

24. Total Maximum Daily Load for Algae, Eutrophic Conditions and Nutrients in the Ventura River and its Tributaries

The Ventura River Estuary and Reaches 1 and 2 are on the Clean Water Act (CWA) section 303(d) list as impaired for algae and eutrophic conditions. San Antonio Creek and Cañada Larga are on the CWA section 303(d) list as impaired for nitrogen and dissolved oxygen, respectively. Recent data confirm these impairments and demonstrate additional impairments for low dissolved oxygen in the Estuary, San Antonio Creek, and Reaches 1-4. The algae and nutrient related impairments are caused by excessive loading of nutrients, particularly nitrogen and phosphorus, to Ventura River and its tributaries. The water quality impairments due to eutrophication and increased nutrient loading occur during the dry season when algae growth primarily occurs. For purposes related to this TMDL, the dry season is defined as occurring from May 1 to September 30.

Waste load allocations addressing point and non-point sources of nutrients are assigned to discharges to the Ventura River watershed**.**

25. Total Maximum Daily Load for Metals in the San Gabriel River

Segments of the San Gabriel River and its tributaries are on the Clean Water Act section 303(d) list of impaired water bodies for copper, lead, zinc, and selenium. The constituents subject to this TMDL are toxic pollutants, and the existing water quality objectives for these constituents reflect national policy that the discharge of toxic pollutants in toxic amounts be prohibited. When one of the constituents subject to this TMDL is present at levels exceeding the existing numeric objectives, then the receiving water is toxic. The beneficial uses impaired by metals and selenium in the San Gabriel River and its tributaries are those associated with aquatic life and water supply, including wildlife habitat, rare, threatened or endangered species, warm freshwater habitat, wetlands, and groundwater recharge.

TMDLs are developed for reaches on the 303(d) list and for reaches where recent data indicate additional impairments. Addressing the impairing metals and selenium throughout the San Gabriel River watershed will ensure that they do not contribute to impairments elsewhere in the watershed. Metals and selenium allocations are therefore developed for upstream reaches and tributaries that drain to impaired reaches.

These TMDLs address dry-weather impairments of copper in the estuary and selenium in San Jose Creek Reach 1 and wet-weather impairments of lead in San Gabriel River Reach 2 and copper, lead, and zinc in Coyote Creek.

26. Total Maximum Daily Load for Metals in the Los Cerritos Channel

Los Cerritos Channel was included on the 1998, 2002 and 2006 California 303(d) lists as an impaired water body for copper, zinc, and lead. (Regional Board, 1998 and California State Water Resources Control Board, 2002 and 2006.)

The NPDES permits in the Los Cerritos Channel Freshwater Watershed include municipal separate storm sewer system (MS4) permits, the California Department of Transportation (Caltrans) storm water permit, general construction storm water permits, general industrial storm water permits, minor NPDES permits, and general NPDES permits.

Concentration based waste load allocations are established for minor NPDES permits and general non-storm water permits that discharge to the Los Cerritos Channel to ensure that these discharges do not contribute to exceedances of the California Toxic Rule criteria. The waste load allocation for these metals is based on dry and wet weather flows.

27. Total Maximum Daily Load for Indicator Bacteria in the Long Beach City Beaches and Los Angeles River Estuary

General NPDES permits, individual NPDES permits, the Statewide Industrial Storm Water General Permit, the Statewide Construction Activity Storm Water General Permit, the Statewide General Waste Discharge Requirements for Sanitary Systems, and the Vessel General Permit in the Long Beach City Beaches Watershed are assigned WLAs of zero (0) days of allowable exceedances for all time periods for the single sample targets and no exceedances of the 30-day geometric mean targets because they are not expected to be a significant source of indicator bacteria.

<u>San Diego Regional Board TMDLs</u>

Continuing the listing from above, the following is a summary of the TMDLs in the San Diego region that have waste load allocation for general NPDES discharge categories, followed by a general summary. Further detailed information on the already adopted

TMDLs can be found at the following website:

http://www.waterboards.ca.gov/sandiego/water_issues/programs/tmdls/index.shtml

28. Total Maximum Daily Load for Metals in Chollas Creek

Chollas Creek was placed on the Clean Water Act (CWA) section 303(d) List of Water Quality Limited Segments (List of Water Quality Limited Segments) in 1996 for the metals copper, lead, and zinc. Storm water samples from Chollas Creek collected between 1994 and 2003 periodically exceeded California Toxics Rule (CTR) water quality criteria for copper, lead, and zinc, dissolved copper, lead and zinc concentrations in Chollas Creek violate numeric water quality criteria for copper, lead, and zinc promulgated in the California Toxics Rule, and the narrative objective for toxicity. Concentrations of these metals in Chollas Creek threaten and impair the designated beneficial uses of warm freshwater habitat (WARM), and wildlife habitat (WILD). For Chollas Creek, essentially all metals sources (point and nonpoint) are discharged through municipal separate storm sewer systems (MS4) that are regulated under waste discharge requirements (WDRs), NPDES Permits. The point source discharges that could affect Chollas Creek are the MS4 discharges, storm water discharges from industrial sites, and discharges of extracted groundwater. All point source discharges to Chollas Creek will be required to achieve this WLA.

This TMDL establishes concentration-based WLAs set equal to 90 percent of the numeric water quality objectives for copper, lead, and zinc, as defined in the California Toxics Rule. Because the concentration of these metals resulting in toxic effects varies significantly with hardness, the resulting WLAs are hardness dependent.

29. Total Maximum Daily Load for Total Nitrogen and Total Phosphorus in Rainbow Creek

Nitrate, total nitrogen, and total phosphorus concentrations in Rainbow Creek exceed the inorganic chemicals nitrate and biostimulatory substances water quality objectives. These exceedances threaten to unreasonably impair the municipal supply (MUN), warm freshwater habitat (WARM), cold freshwater habitat (COLD), and wildlife habitat (WILD) beneficial uses of Rainbow Creek. Excessive nutrient levels in Rainbow Creek promote the growth of algae in localized areas, creating a nuisance condition, that unreasonably interferes with aesthetics and contact and non-contact water recreation (REC1, REC2) and threatens to impair WARM, COLD and WILD beneficial uses. State highways, agricultural fields and orchards, commercial nurseries, residential and urban areas, and septic tank disposal systems contribute to increased nutrient levels in Rainbow Creek as a result of storm water runoff, irrigation return flows, and ground water contributions to the creek.

WLAs for the discharge of total nitrogen and total phosphorus into Rainbow Creek were established. Identified dischargers of total nitrogen and total phosphorus loading include Caltrans, County of San Diego and nonpoint sources. The TMDL provides WLAs of 2 percent of the total annual TMDL for both total nitrogen and total phosphorus for additional point sources, however the TMDL Implementation Action Plan does not provide for the assignment of WLAs to unidentified point source discharges, effectively resulting in the prohibition of discharges of total nitrogen and total phosphorus into Rainbow Creek.

30. Total Maximum Daily Load Indicator Bacteria in Twenty Beaches and Creeks in the San Diego Region for Direct Discharges Only

Bacteria densities in the Pacific Ocean at various beach and coastal creek mouth segments (referred to hereafter as “beaches”) exceed water quality objectives (WQOs) for indicator bacteria. Bacteria densities in ocean water at these beaches unreasonably impair and threaten to impair the water quality needed to support the contact water recreation (REC-1) designated beneficial use. Bacteria densities in the waters of Aliso Creek, San Juan Creek, Tecolote Creek, Forrester Creek, the (lower) San Diego River, and Chollas Creek exceed WQOs for indicator bacteria. Bacteria densities in these creeks unreasonably impair and threaten to impair the water quality needed to support REC-1. The federal Clean Water Act requires the establishment of Total Maximum Daily Loads (TMDLs) for pollutants that exceed the WQOs needed to support designated beneficial uses, i.e., that cause or contribute to exceedances of state “water quality standards”.

Unidentified point sources have not been assigned WLAs, which is equivalent to being assigned a WLA of zero. No discharges of bacteria are expected or allowed from unidentified point sources under the dry or wet weather TMDLs.

IV. RATIONALE FOR DISCHARGE SPECIFICATIONS AND EFFLUENT LIMITATIONS

The Clean Water Act (CWA) requires point source dischargers to control the amount of conventional, non-conventional, and toxic pollutants discharged into waters of the United States. The control of pollutants discharged during drinking water system discharge events is established primarily through required Best Management Practices specifications established to require water purveyors to implement a minimum level of pollutant control through best management practices that are proven to be effective in the water supply industry. Numeric effluent limitations are established for chlorine in circumstances where the water discharged from a drinking water system poses an immediate threat to aquatic life with receiving waters. There are two principal bases for effluent limitations: 40 C.F.R. section 122.44(a) requires that permits include applicable technology-based limitations and standards, and 40 C.F.R. section 122.44(d) requires that permits include water quality-based effluent limitations to attain and maintain applicable water quality objectives and criteria to protect the beneficial uses of receiving waters.

A. Applicable Objectives and Criteria

This Order authorizes discharges to inland surface waters, enclosed bays, estuaries and the ocean, statewide. The water quality objectives and criteria applicable to these receiving waters are contained in the corresponding Basin Plan(s), other water quality control plans, and policies, such as the State Implementation Plan and the California Ocean Plan, that implement federal and state water quality objectives.

1. **Regional Boards Basin Plans Objectives.** Basin Plans specify various narrative and numeric water quality objectives, including the maximum contaminant levels (MCLs) in California Code of Regulations, title 22. Typical narrative objectives most relevant to this Order are listed below:

   a. **Toxicity.** The toxicity objective typically states, "All waters shall be maintained free of toxic substances in concentrations that are lethal to or that produce other detrimental responses in aquatic organisms." U.S. EPA water quality criteria were used to translate this objective with respect to chlorine. U.S. EPA's recommended 1-hour average acute criterion for chlorine is 0.019 mg/L and its 4-day average chronic criterion is 0.011 mg/L (the acute or chronic criteria are not to be exceeded more than once every three years on average in any single location).

   b. **pH.** The pH objective in basin plans vary; some objectives are fixed numeric objectives while others provide a numeric range such as *"the pH shall not to be depressed below 6.5 nor raised above 8.5. This encompasses the pH range usually found in waters. Controllable water quality factors shall not cause changes greater than 0.5 units in normal ambient pH levels."*

   c. **Sediment.** Sediment objectives in basin plans vary; however, the basin plans typically provide a narrative objective such as, *"The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses."*

   d. **Settleable Material.** The settleable material objectives in basin plans vary; however, the basin plans typically provide a narrative objective such as, *"Waters shall not contain substances in concentrations that result in the deposition of material that cause nuisance or adversely affect beneficial uses."*

   e. **Suspended Material.** The suspended material objectives in basin plans vary; however, the basin plans typically provide a narrative objective that typically states, *"Waters shall not contain suspended material in concentrations that cause nuisance or adversely affect beneficial uses."*

   f. **Turbidity.** The turbidity objectives in basin plans vary; some objectives are fixed numeric objectives while others provide a narrative objective such as, *"Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses. Increases from normal background light penetration or turbidity*

relatable to waste discharge shall not be greater than 10 percent in areas where natural turbidity is greater than 50 NTU."

2. **California Toxic Rule (CTR) Criteria.** The CTR specifies numeric aquatic life and human health criteria for numerous priority pollutants. Some human health criteria are for consumption of "water and organisms" and others are for consumption of "organisms only." The criteria applicable to "water and organisms" apply to many receiving waters subject to this Order because they are potential drinking water sources with the municipal and domestic supply (MUN) beneficial use. In accordance with Resolution 2014-0067, this Order implements a SIP exception to the CTR criteria for a number of priority pollutants on the basis that these discharges are less than significant with mitigation, and that mandated activities to protect public safety and health are held paramount.

3. **Ocean Plan Water Quality Objectives.** The Ocean Plan specifies in Table 1 of the Ocean Plan numeric water quality objectives for the protection of Marine Aquatic Life and Human Health (Carcinogens and non-carcinogens) for numerous priority pollutants. In accordance with Resolution 2014-0067, this Order implements an exception to the Ocean Plan water quality objectives for a number of priority pollutants on the basis that these discharges are less than significant with mitigation, and that mandated activities to protect public safety and health are held paramount.

4. **Sediment Quality Objectives.** The *Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1, Sediment Quality* contains a narrative water quality objective: "Pollutants in sediments shall not be present in quantities that, alone or in combination, are toxic to benthic communities in bays and estuaries of California." This objective is to be implemented by integrating three lines of evidence: sediment toxicity, benthic community condition, and sediment chemistry. The policy requires that if the Water Board determines that a discharge has reasonable potential to cause or contribute to an exceedance of this objective, it is to impose the objective as a receiving water limit.

B. Technology-Based Effluent Specifications and Effluent Limitations

CWA section 301(b) and 40 C.F.R. section 122.44 require that permits include conditions meeting technology-based requirements at a minimum, and any more stringent effluent limitations necessary to meet water quality standards. The CWA requires U.S. EPA to develop effluent limitations guidelines (ELGs), and standards representing application of best practicable treatment control technology (BPT), best available technology economically achievable (BAT), best conventional pollutant control technology (BCT), and best available demonstrated control technology for new sources (NSPS). CWA section 402(a)(1) and 40 C.F.R. section 125.3 authorize the use of Best Professional Judgment to derive technology-based requirements and effluent limitations on a case-by-case basis when ELGs are unavailable.

1. Technology-Based Best Management Practices Effluent Specifications

This Order does not establish technology-based effluent limitations because U.S. EPA has not established ELGs for the types of discharges this Order authorizes. Moreover, data necessary to develop technology-based effluent limitations on a case-by-case basis for each water body in California, using Best Professional Judgment, are unavailable. The State Water Board finds that the technology-based effluent limitations in Regional Water Board Basin Plans apply to discharges that are continuous in nature and contain "wastes". This statewide Order regulates intermittent and seasonal discharges of drinking water that are short-term, and in and of themselves do not contain the degree of "waste" contained in municipal or industrial wastewater or storm water. Therefore technology-based effluent limitations are not included.

The State Water Board finds that technology is available to control solids in drinking water system discharges, and chemical constituents such as chlorine and other chemical agents added to the water supply source, treatment, and distribution process. Therefore numeric and narrative technology-based best management practices specifications are included in this Order. Attachment C of this Order provides example of such BMPs.

To assure that implemented BMPs are effective, this Order requires:

- Dischargers to assure that quality assurance and quality control protocol is implemented to assure best management practices, monitoring, and reporting are effective, valid, and in compliance with this Order. A Discharger shall train all personnel operating the drinking water system and responding to emergency discharges to assure the quality assurance and quality control protocol is properly implemented.
- For planned discharges, a Discharger shall implement BMPs prior to and during discharges that enter a water of the U.S. For planned but unscheduled or automated discharges from pressure relief valves and unchlorinated pump-to waste wells, BMPs shall be implemented unless infeasible (e.g., inaccessible, inadequate space). For emergency discharges, the BMPs shall be implemented as soon as feasible following assurance that public safety, property, and infrastructure are protected.
- In fulfilling the requirements of this section, the Discharger may implement the example BMPs contained in Attachment C, or proven BMPs per updated approved guidance established by industry experts, professional associations, or entities (e.g. *2014 Edition of the BMP Manual for Drinking Water System Releases* published by the California-Nevada Section of the American Water Works Association).
- The Discharger shall maintain a documented log of all BMPs implemented for its different types of discharges that enter a water of the U.S, and make it available to State and Regional Water Board staff upon request.

- The Discharger shall modify its BMPs as necessary to maintain compliance with the requirements of this Order. If monitoring results or other available information demonstrates that the discharge is not in compliance, the Discharger shall determine the source of non-compliance, and develop and implement new or revised BMPs as necessary. As part of this process, the Discharger shall validate the effectiveness of any new or revised BMPs to comply with the requirements of this Order. All non-compliance and corresponding corrective actions to address non-compliance are required to be reported to the State Water Board in the annual report, as required in the Monitoring and Reporting Program (Attachment E) of this Order. A log documenting the additional or revised BMPs shall be made available upon request by staff of the State and/or Regional Water Board.

2. **Toxicity (Chlorine and other chemical agents).** This Order translates the narrative toxicity objective with respect to chlorine by using U.S. EPA's water quality criteria for chlorine. Water distribution systems are usually chlorinated to meet the minimum total chlorine residual requirements in California Code of Regulations, title 22. According to the most recent Annual Consumer Confidence Reports from various water agencies, the typical average total chlorine residual concentration in a distribution system is about 2.0 mg/L, which is roughly 100 times U.S. EPA's acute water quality criterion of 0.019 mg/L. However, chlorine in water discharges can dissipate from volatilization and reaction with dirt and organic matter on streets and storm drain systems. Based on the analysis in section IV.C. below, reasonable potential for toxicity exists only for superchlorinated waters and other chlorinated waters that are in closer proximity to receiving waters (within 300 feet). For all other discharges, this Order establishes narrative technology-based specifications, specifying that proven management practices must be implemented to treat or control pollutants from its discharges to maintain compliance with this Order.

   At minimum, this Order requires that dischargers properly manage <u>all</u> planned discharges and implement proven dechlorination or chemical-control BMPs provided by professional associations or institutes such as the American Water Works Association, to assure that beneficial uses of the receiving water body(ies) are not adversely affected or impacted. Such BMPs include natural dissipation of chlorine in the discharge prior to it reaching the surface water body. For emergency discharges, the Discharger shall implement BMP procedures as soon as feasible while concurrently protecting public health and safety. Attachment C of this Order provides example of such dechlorination BMPs.

   Copper and zinc are known constituents in chemical agents used for to control algae in water supplies and control corrosion in drinking water facilities. Management practices proven to control copper and other metals during pesticide applications are not the same management practices needed to control these metals in drinking water system discharges. Although the State Water Board has granted a regulatory exception to CTR constituents including copper and zinc, the State Water Board expects dischargers to implement BMPs to reduce metals concentrations to the best

extent possible. Attachment C of this Order provides example BMPs for copper and zinc concentration reduction specifically in drinking water system discharges.

3. Solids (Sediment, Settleable Material, Suspended Material, Debris, and Turbidity)

Various discharges from drinking water systems may contain sediment as follows:

- Sediment accumulates at the dead ends of distribution systems during periods of low water demand. The sediment within a system must be flushed periodically.
- Raw transmitted water may contain sediment due to naturally occurring minerals and organic debris.
- Trench dewatering can result in relatively high sediment loads, depending on soil type, flow rate and duration, and excavation size.
- Discharges from new well development and inactive well rehabilitation may have high sediment loads due to drilling mud, cuttings, and removal of solids from the bottom of the well and around the screen casing.

Discharges can also contribute to sediment loading, solids loading and erosion within receiving waters due to high flows and volumes. Such discharges can dislodge sediment and transport it to receiving waters, or destabilize and erode shorelines or other natural receiving water features.

At minimum, this Order requires that dischargers implement BMP for planned discharges to:

- Prevent riparian erosion and hydromodification by implementing flow dissipation, erosion control, and hydromodification-prevention measures; and
- Minimize sediment discharge, turbidity and color impacts by implementing sediment, turbidity, erosion and color control measures.

For groundwater supply well operations, this Order requires dischargers to implement treatment systems or BMPs for all groundwater well development, rehabilitation, or operation discharges to waters of the U.S. to assure these discharges:

- Do not cause or contribute to an exceedance of the receiving water limitation for turbidity in Section V.G. of this Order, and
- Comply with a turbidity action level of 100 Nephelometric Turbidity Units (NTUs) or less in the discharge. An exceedance of the turbidity numeric action level of 100 NTU is not a violation of this Order, but any exceedance does require the Discharger take action to modify, change, or enhance BMPs when the turbidity level is greater than 100 NTU, until the turbidity level is 100 NTU or less.

4. **Instream Sediment Quality.** Pollutants in some receiving water sediments may be present in quantities that alone or in combination are toxic to benthic communities. Efforts are underway to identify stressors causing such conditions. Due to the relative clean nature of potable water, it is unlikely that these discharges contribute to sediment toxicity. However, to date there is no evidence either way; therefore, the State Water Board cannot draw a definitive conclusion about reasonable potential for these discharges to cause or contribute to exceedances of the sediment quality objectives.

C. Water Quality Based Effluent Limitations

1. Scope and Authority

This Order contains water quality-based effluent limitations (WQBELs) that implement water quality objectives and criteria that protect beneficial uses. CWA section 301(b) and 40 C.F.R. section 122.44(d) require that permits include limitations more stringent than federal technology-based requirements where necessary to achieve applicable water quality standards. According to 40 C.F.R. section 122.44(d)(1)(i), permits must include effluent limitations for all pollutants that are or may be discharged at levels that have a reasonable potential to cause or contribute to an exceedance of a water quality standard, including numeric and narrative objectives within a standard. Where reasonable potential has been established for a pollutant, but there is no numeric criterion or objective, WQBELs must be established using: (1) U.S. EPA criteria guidance under CWA section 304(a), supplemented where necessary by other relevant information; (2) an indicator parameter for the pollutant of concern; or (3) a calculated numeric water quality criterion, such as a proposed state criterion or policy interpreting a narrative criterion, supplemented with relevant information (40 C.F.R. § 122.44[d][1][vi]). The process for determining reasonable potential and calculating WQBELs is intended to establish effluent limitations for discharges to comply with applicable water quality objectives established to protect designated beneficial uses of receiving waters.

2. Need for Water Quality Based Effluent Limitations (Reasonable Potential Analysis)

Assessing whether a pollutant has reasonable potential to exceed a water quality objective or criterion is the fundamental step in determining whether a water quality based effluent limitation is required. As explained below, this Order finds reasonable potential for toxicity due to the chlorinated drinking water system discharges.

a. **Analysis for Numeric Objectives and Promulgated Criteria.** The State Implementation Plan (SIP), section 1.3 sets forth the method used in this Order for assessing whether a pollutant has reasonable potential to exceed a numeric water quality objective or promulgated criterion. The analysis begins with identifying the maximum effluent concentration (MEC) observed for each pollutant based on available effluent concentration data and the ambient background concentration (B). The SIP, section 1.4.3 states that ambient

background concentrations are either the maximum ambient concentration observed or, for water quality objectives intended to protect human health, the arithmetic mean of observed concentrations. There are three triggers in determining reasonable potential and the need for a numeric effluent limitation:

- Trigger 1 is activated if the maximum effluent concentration is greater than or equal to the lowest applicable water quality objective (MEC $\geq$ water quality objective).

- Trigger 2 is activated if the ambient background concentration observed in the receiving water (B) is greater than the water quality objective (B > water quality objective) *and* the pollutant is present in any effluent sample.

- Trigger 3 is activated if a review of other information indicates that a WQBEL is needed to protect beneficial uses.

The Ocean Plan provides a similar method for assessing reasonable potential as described in Appendix V of the Ocean Plan.

Water in drinking water systems is required to comply with maximum contaminant levels (MCLs) per state regulations; therefore for pollutants that have MCLs more stringent than the CTR or Ocean Plan water quality objectives, this Order finds those priority pollutants do not have reasonable potential to exceed a water quality objective. However for the remaining priority pollutants for which the MCL is not the most stringent applicable water quality objective, an exception to those objectives has been granted through Resolution 2014-0067.

b. Analysis for Toxicity due to Chlorine. This Order translates the narrative toxicity objective with respect to chlorine by using U.S. EPA's water quality criteria for chlorine. Water distribution systems are usually chlorinated to meet the minimum total chlorine residual requirements in California Code of Regulations title 22. According to the most recent Annual Consumer Confidence Reports from various water agencies, the typical average total chlorine residual concentration in a distribution system is about 2.0 mg/L, which is roughly 100 times U.S. EPA's acute water quality criterion of 0.019 mg/L. However, chlorine in water discharges can dissipate from volatilization and reaction with dirt and organic matter on streets and storm drain systems. Based on the analysis below, reasonable potential for toxicity exists only for superchlorinated waters and other chlorinated waters that are in closer proximity to receiving waters (within 300 feet). Therefore this Order contains numeric chlorine water quality based effluent limitations for superchlorinated discharges and chlorinated water discharged within 300 feet of a surface water body.

Numeric effluent limitations are not included in this Order for sediment, settleable material, and suspended material, as there is no readily available means to translate the sediment, settleable material, and suspended material objectives into numeric WQBELs appropriate for the many receiving waters that could be affected by the discharges covered by this Order. This Order controls sediment,

settleable material, and suspended material through BMPs as discussed above in this fact sheet.

All 126 priority pollutants in the California Toxic Rule and pollutants with Ocean Plan water quality objectives have also been considered. The pollutants with MCLs as the most stringent water quality objective have shown no reasonable potential because these discharges are already required to comply with MCLs per state regulations and State Water Board Division of Drinking Water permits. For the remaining pollutants, a categorical SIP and Ocean Plan exception has been granted, therefore there is no reasonable potential since the exceptions lead to no applicable numeric criteria for these discharges.

3. Calculation of Water Quality Based Effluent Limitations (WQBELs)

Regulations at 40 C.F.R. section 122.44(k)(3) require numeric WQBELs unless numeric WQBELs are infeasible. This Order imposes numeric WQBELs for total residual chlorine because it is feasible and necessary to calculate numeric WQBELs for this toxic pollutant in order to protect beneficial uses in the receiving water bodies. Field chlorine meters are readily available and used to measure chlorine in drinking water system discharges, therefore it is feasible to collect representative total residual chlorine concentration data to determine compliance.

The total chlorine residual WQBEL established in this Order for discharges to inland surface waters, enclosed bays and estuaries is 0.019 mg/L based on U.S. EPA's acute water quality criterion for chlorine, which is expressed as a one-hour average. The total chlorine residual WQBEL established in this Order for discharges to the ocean is 0.008, mg/L based on the Ocean Plan criteria for chlorine. The numeric WQBELs for total residual chlorine are applicable to: (1) all superchlorinated discharges, and (2) chlorinated discharges located within 300 feet of a receiving water body.

According to a controlled field study conducted by East Bay Municipal Utilities District (EBMUD), when dechlorination BMPs are properly implemented, the total chlorine residual concentration in chlorinated discharges is fully neutralized within 200 feet to concentrations below a minimum level of 0.1 mg/L (Tikkanen et. al, 2001, *Guidance Manual for Disposal of Chlorinated Water*). The study analyzed samples from nine fire hydrants discharging at varying flow rates and treated with dechlorination BMPs within the EBMUD jurisdiction. Similarly, the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP) analyzed samples from ten fire hydrants discharging at varying flow rates and treated with dechlorination BMPs in the Cities of Palo Alto, San Jose and Sunnyvale. Based on the SCVURPPP study, eight of the discharge events monitored achieved full neutralization (to concentrations below 0.1 mg/L) by 160 feet. The two remaining discharge events spiked above the minimum level of 0.1 mg/L, but ultimately achieved full neutralization within 425 feet. The spike in concentration was suspected to be due to turbidity interference.

Based on these data and adding an additional safety factor due to the immediate toxicity to aquatic life from chlorine, the State Water Board determines that discharges where dechlorination BMPs (chemically or naturally) have been properly implemented that are more than 300 feet from a receiving water body do not pose a reasonable potential to exceed the applicable total residual chlorine water quality objective. Thus, the numeric WQBEL is not applicable to such discharges.

The turbidity numeric WQBEL established in this Order for discharges to the ocean is 225 NTU based on the Ocean Plan criteria for turbidity. The numeric WQBELs for turbidity is applicable to all discharges located within 300 feet of the ocean. These discharges pose a reasonable potential to cause exceedance of ocean turbidity water quality objective due to high solids levels in drinking water systems discussed in detail above in this fact sheet.

V. DISCHARGES NOT AUTHORIZED BY THIS ORDER

This Order implements the regulatory exceptions granted to water purveyors by Resolution 2014-0067. Requirements in this Order are designed for discharges described in the corresponding Mitigated Negative Declaration (attached to Resolution 2014-0067) that, when properly mitigated through the implementation of BMPs, monitoring, and reporting, do not pose a significant threat to the environment. .

Discharges not authorized by this Order include:

- Discharges other than those authorized in the Notice of Applicability issued by the Deputy Director of Water Quality; or
- Discharges to a water of the U.S. with a total maximum daily load (TMDL) that prescribes a waste load allocation to a water purveyor, where the Deputy Director determines that the requirements of this Order are not consistent with the assumptions and requirements of the TMDL, and thus compliance with this Order is not sufficient for the water purveyor to comply with the imposed TMDL requirements; or
- Discharges from new drinking water systems (not an expansion of an existing system) into an impaired water body that is impaired for a constituent that exists in the new discharge at a concentration greater than the criteria used to establish the impairment of the water body; or
- Direct discharges into areas designated by the State Water Board as Areas of Special Biological Significance (ASBS).

VI. RATIONALE FOR RECEIVING WATER LIMITATIONS

The receiving water limitations in this Order are established in accordance with federal and State water quality standards per the CWA and regulations adopted thereunder, and

narrative and numeric water quality objectives in the Regional Water Boards' Basin Plans and State Water Board water quality control plans and policies.

VII. RATIONALE FOR MONITORING AND REPORTING REQUIREMENTS

Title 40 Code of Federal Regulations part 122.48 requires that all NPDES permits specify requirements for recording and reporting monitoring results. Water Code sections 13267 and 13383 authorize the Regional Water Board to require technical and monitoring reports. The Monitoring and Reporting Program (Attachment E) of this Order, establishes monitoring, recordkeeping and reporting requirements to implement federal and state requirements. The following provides the rationale for the monitoring and reporting requirements contained in Attachment E of this Order.

A. Effluent Monitoring

Pursuant to the requirements of title 40 Code of Federal Regulations part 122.44(i)(2), reporting of effluent monitoring is required for all constituents with effluent limitations and specifications. Effluent monitoring is necessary to assess compliance with effluent limitations and specifications, assess the effectiveness of the implemented BMPs and treatment process (where applicable), and to assess the impacts of the discharge on the receiving water.

Effluent monitoring requirements have been established in this Order to provide: (1) the Discharger with necessary information to make informed decisions regarding the implementation of effective management practices, and (2) the State Water Board to determine compliance with effluent specifications and limitations. Required effluent monitoring includes event monitoring and representative monitoring as follows:

1. **Event Monitoring.** This Order requires monitoring of all superchlorinated discharges, all discharges from well development and rehabilitation activities, and individual discharge events that are greater than 325,850 gallons (one acre-foot). The Discharger shall monitor all such events per the sample types and frequencies specified in Attachment E.

2. **Annual Representative Monitoring.** This Order allows discharges of similar nature to be monitored on a representative basis. Representative monitoring is the use of monitoring results of one water quality monitoring sample to represent other discharges expected to have the same water quality. A representative monitoring measurement must represent discharges of similar nature, meaning discharges that have all the following items in common:

   (i) The same general water source (ground water or surface water of similar water quality), and

   (ii) The same water treatment, and

(iii) The same type of implemented BMPs.

The Discharger shall monitor all planned discharges not defined as events (Item 1. above) using representative monitoring per the sample types and frequencies specified in Attachment E. In its annual report, the Discharger shall:

(a) Submit a copy of its site schematic submitted in its application for enrollment with labeled representative monitoring locations, and
(b) Identify the portions of its system in which the representative monitoring results represent, and
(c) Include any changes in its representative monitoring locations that have occurred during the monitoring-year, as applicable.

3. Annual Discharge Volume Monitoring Requirements

This Order requires the Discharger to monitor and keep record of:

(a) The number of direct discharge to a water of the U.S that is greater than 50,000 gallons, during each calendar year,
(b) An estimate of the total volume discharged to surface water during each calendar year, and
(c) An estimate of the total volume of discharge water directed to a reuse or beneficial use in accordance with section VI. of this Order.

4. Monitoring Not Required

This Order does not establish monitoring requirements for any discharges that: (a) do not ultimately reach a water of the U.S., (b) are implemented for multiple uses or routed to a beneficial reuse, in accordance with section V. of the Order, prior to surface water discharge, or (c) are emergency discharges.

B. Receiving Water Monitoring

This Order requires visual receiving water monitoring for all direct planned discharges that do not comply with the requirements contained in section IV of the Order, and that may potentially adversely affect or impact beneficial uses of the receiving waters. Receiving water monitoring shall be conducted during or immediately after the Discharger became aware of a non-compliant discharge that adversely effects or impacts beneficial uses of the receiving water. The Discharger shall monitor the point of confluence of the discharge and the receiving water. If the receiving water presents hazards to the monitoring personnel, visual monitoring shall be conducted using telephoto lenses and binoculars. If further hazards exist beyond such measures, monitoring is not required, and the hazards shall be documented in the corresponding monitoring report.

C. Post-Notification Requirements

Within 24 hours of the Discharger becoming aware of an adverse effect(s) or impact on beneficial uses of the receiving water body due to non-compliance with this Order, or

due to a system failure or emergency involving a discharge from its drinking water system, the Discharger shall notify the corresponding Regional Water Board and the MS4 operator, and the Discharger shall confirm this notification in writing within five days. The notification shall include all of the following:

1. The location and extent of non-compliance or emergency discharge;
2. The cause of the non-compliance or emergency discharge;
3. The date, time and expected duration of the non-compliance or emergency discharge;
4. The estimated volume of discharge;
5. The applicable receiving water body; and
6. The corrective actions taken (or being taken) to prevent future non-compliance or repair the system failure.

D. Pre-Notification Requirements

Three (3) days prior to initiation of a planned discharge (or retroactively within 24-hours after the Discharger is informed to conduct an urgent planned discharge) of a volume equal to or greater than one acre-foot (325,850 gallons), the Discharger shall notify the MS4 operator, if applicable, and the appropriate Regional Water Board and provide:

1. The start date of discharge
2. The location of discharge and the applicable receiving water
3. The estimated volume of discharge, and
4. The reasons for discharge

E. Reporting and Recordkeeping Requirements

1. This Order requires the Discharger to maintain self-monitoring reports, including compliant and non-compliant discharge monitoring information, in its main office and to make those reports available upon request of State and Regional Water Board staff.

2. Monitoring periods and reporting for all required monitoring shall be completed according to the schedule in Attachment E.

3. The Order requires the Discharger to arrange and summarize any reported numerical data in a tabular format.

4. If a Discharger monitors any pollutant more frequently than required by this Order, the results of this monitoring shall be included in the self-monitoring report.

5. The Order requires the Discharger to report to the State Water Board any toxic chemical release data it reports to the State Emergency Response Commission within 15 days of reporting the data to the Commission pursuant to section 313 of the "Emergency Planning and Community Right to Know Act" of 1986.

6. This Order requires the Discharger to report, by March 1 of every year, all non-compliant discharge monitoring information contained in the Discharger's self-monitoring report for the past calendar year. All non-compliant discharge monitoring information shall be accompanied by the corrective actions the Discharger has taken to return the discharge to compliance. Identified non-compliance must include a description of the requirement that was violated and a description of the violation.

7. The Discharger is required to attach a cover letter to the report that clearly identifies discharge events of non-compliance with the permit; discuss corrective actions taken or planned; and the proposed time schedule for corrective actions.

F. Increase in Monitoring Requirements

The Deputy Director may modify the monitoring and reporting requirements at any time to ensure the protection of the beneficial uses of the receiving water. The modified requirements will be based on site-specific data or information indicating that a site-specific discharge threatens to cause or contribute to an exceedance of a receiving water quality criteria or objective.

At any time during the term of this permit, the Deputy Director may notify authorized Dischargers to electronically submit monitoring reports using the State Water Board's California Integrated Water Quality System (CIWQS) Program Web site (http://www.waterboards.ca.gov/ciwqs/index.html). Until such notification is given, each Discharger shall submit a hard copy of its monitoring reports. Subsequent guidance will be provided to the Discharger upon the Deputy Director's notification for electronic submittal of reports. (Direction and guidance for electronic SMR submittals is currently available on the CIWQS Web site at http://www.waterboards.ca.gov/water_issues/programs/ciwqs/chc_npdes.shtml

VIII. RATIONALE FOR PROVISIONS

A. Standard Provisions

Standard Provisions, which apply to all NPDES permits in accordance with 40 Code of Federal Regulations part 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 Code of Federal Regulations part 122.42, are provided in Attachment D. The discharger must comply with all standard provisions and with those additional conditions that are applicable under 40 Code of Federal Regulations part 122.42.

Title 40 Code of Federal Regulations part 122.41(a)(1) and (b) through (n) establish conditions that apply to all State-issued NPDES permits. These conditions must be incorporated into the permits either expressly or by reference. If incorporated by reference, a specific citation to the regulations must be included in the Order. Title 40 Code of Federal Regulations part 123.25(a) allows the state to omit or modify conditions to impose more stringent requirements. In accordance with

40 Code of Federal Regulations part 123.25, this Order omits federal conditions that address enforcement authority specified in 40 Code of Federal Regulations part 122.41(j)(5) and (k)(2) because the enforcement authority under the Water Code is more stringent. In lieu of these conditions, this Order incorporates by reference Water Code section 13387(e).

B. Special Reopener Provisions

The reopener provisions in this Order provide an explanation of the State Water Board authority to reopen this Order in accordance with 40 Code of Federal Regulations part 122.62. For example, the State Water Board is developing a Proposed Total Residual Chlorine and Chlorine-Produced Oxidants Policy of California, which when adopted is intended to establish consistent standards and implementation procedures for regulating chlorine statewide. This provision is the avenue by which the State Water Board may reopen this Order to include a revised reporting level to determine compliance with effluent limitations for total residual chlorine if a statewide policy for total residual chlorine is adopted during the term of this Order.

IX. PUBLIC PARTICIPATION

The State Water Board adopted this Order that serves as a statewide general NPDES permit for low threat discharges from drinking water systems on November 18, 2014. State Water Board staff developed the draft Order using input from water purveyors and other interested parties over the course at least two years. The language and requirements in the draft order were developed to eliminate, where possible, unnecessary interference with mandated activities to protect public health. State Water Board staff held nine stakeholder meetings statewide and other verbal correspondences to incorporate the most crucial concerns related to small systems, and the feasibility and cost of permit compliance. The State Water Board encouraged public participation at the August 5, 2014 public hearing, the October 21, 2014 workshop meeting and the November 18, 2014 adoption meeting for this item.

A. Notification of Interested Parties

The State Water Board notified interested agencies, parties, and persons of its intent to consider adoption of this general Order for low threat discharges from drinking water systems and provided them with an opportunity to submit their written comments and recommendations. Notification was provided to interested parties through specific mailings, distribution through the Water Board Lyris Email System and through publication in the following newspapers for the following communities:

- Inter-City Express - Alameda County
- Tahoe Daily Tribune - Alpine County
- Fresno Bee - Fresno County
- Imperial Valley Press - Imperial County
- Los Angeles Daily Journal - LA County
- Orange County Recorder - Orange County

- Daily Recorder - Sacramento County
- San Diego Commerce - San Diego County
- New Times - San Luis Obispo County
- Record Searchlight - Shasta County
- Sonoma County Herald - Sonoma County

B. Public Comments

A draft Order was issued for public comment and review on June 6, 2014. Interested persons were invited to submit written comments concerning the draft Order. A revised draft Order was issued on July 3, 2014, mainly incorporating TMDL implementation language to the previously issued draft Order. For State Water Board staff and the State Water Board to be fully responsive and consider public comments, all comments were required to be submitted to the State Water Board by noon on August 19, 2014.

C. Public Hearing

The State Water Board held a public hearing on the draft Order during its regular Board meeting on the following date and time and at the following location:

Date:	August 5, 2014
Time:	9:00 a.m.
Location:	California Environmental Protection Agency Headquarters Office 1001 I Street, 2nd Floor Sacramento, CA 95814

Interested persons were invited to attend. At the public hearing, the State Water Board heard testimony pertinent to the subject discharges, and this Order. Oral testimony was heard; however, for accuracy of the record, important testimony was required to be submitted in writing.

The State Water Board considered comments that were provided orally at the public hearing, and in writing in accordance with the public notice issued for this Order, for the development of the final draft permit. Due to the numerous changes to the draft permit, a subsequent public workshop was held on October 21, 2014, and further oral comments were heard as the final draft permit was considered for adoption on November 18, 2014.

All pertinent dates, documents and agendas were kept updated and accessible on the NPDES Program Page of the State Water Board website at the following web address: http://www.waterboards.ca.gov/water_issues/programs/npdes/.

D. Waste Discharge Requirements

This Order serves as statewide Waste Discharge Requirements (WDRs) pursuant to California Water Code, article 4, chapter 4, division 7 (commencing with § 13260). This Order is also issued pursuant to federal Clean Water Act (CWA) section 402 and implementing regulations adopted by the U.S. Environmental Protection Agency

(U.S. EPA), and California Water Code chapter 5.5, division 7 (commencing with § 13370). This Order shall serve as a statewide general NPDES permit for point source discharges from single or multiple discharge points to surface waters, storm drains, and other storm water conveyances leading to waters of the U.S.

Due to the drought conditions and the State of California water conservation goals, the State Water Board strongly encourages water purveyors with a discharge authorized under this Order to place the discharge water to multiple uses prior to surface water discharge, or to a beneficial reuse. The multiple use or beneficial reuse of the discharges authorized under this Order generally does not require coverage under waste discharge requirements if the discharge is collected and reused for landscape irrigation or other uses in a manner that augments the existing supply, or if the discharge is directly or indirectly discharged to:

- Storm water capture basin(s),
- Low impact development features
- Other groundwater-recharge system(s), or

Discharges from drinking water systems to land that do not drain to waters of the U.S. do not need authorization to discharge under an NPDES permit. Although discharges to groundwater may require waste discharge requirements issued by the State and/or Regional Water Boards, as an incentive to promote multiple uses of drinking water system discharges, the State Water Board generally will not require waste discharge requirements or monitoring for such drinking water system discharges that are beneficially reused rather than discharged to a water of the U.S. A water purveyor must estimate and report in its annual report, the quantity of water that would otherwise have been discharged but is used multiple times or is beneficially reused for this provision to apply.

E. Register of Interested Persons

Any person interested in being placed on the mailing list for information regarding this Order must register on the Drinking Water Systems Discharge Permit lyris listing at http://www.waterboards.ca.gov/resources/email_subscriptions/swrcb_subscribe.shtml, by selecting 'Water Quality Topics', then selecting 'Drinking Water Systems Discharges'.

F. Additional Information

Requests for additional information or questions regarding this Order should be directed to Ms. Diana Messina, staff of the State Water Board, at diana.messina@waterboards.ca.gov.

ATTACHMENT G – WATER BODIES WITH TOTAL MAXIMUM DAILY LOADS (TMDLs) AND WASTE LOAD ALLOCATIONS (WLAs) TO WATER PURVEYORS

As of the adoption date of this Order, no already-adopted TMDLs have established WLAs that apply exclusively to discharges from drinking water systems regulated under this Order. Due to the nature of the discharges authorized under this Order, it is unlikely that these discharges contribute to the impairment of the TMDL-related water bodies; therefore existing TMDL-related requirements that include WLAs to general categories of discharges are not applicable.

This Attachment is reserved for the State Water Board to include additional permit requirements in a subsequent permit renewal to implement future TMDLs that:

1) address pollutants likely to be in discharges from drinking water systems, and

2) allocate waste loads specifically to water purveyors regulated under this Order.

ATTACHMENT H - MAP OF THE REGIONAL WATER QUALITY CONTROL BOARDS

To find the Regional Water Board for a particular location, click on the map or enter a street address at the following website:*http://www.waterboards.ca.gov/waterboards_map.shtml#rwqcbs*

Or click on the map below:

STATE OF CALIFORNIA

STATE WATER RESOURCES CONTROL BOARD

ORDER WQ 2015-0075

In the Matter of Review of

Order No. R4-2012-0175, NPDES Permit No. CAS004001

WASTE DISCHARGE REQUIREMENTS FOR MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) DISCHARGES WITHIN THE COASTAL WATERSHEDS OF LOS ANGELES COUNTY, EXCEPT THOSE DISCHARGES ORIGINATING FROM THE CITY OF LONG BEACH MS4

Issued by the
California Regional Water Quality Control Board,
Los Angeles Region

SWRCB/OCC FILES A-2236 (a)-(kk)

BY THE BOARD:

In this order, the State Water Resources Control Board (State Water Board) reviews Order No. R4-2012-0175 (NPDES Permit No. CAS004001) adopted by the Los Angeles Regional Water Quality Control Board (Los Angeles Water Board) on November 8, 2012. Order No. R4-2012-0175 regulates discharges of storm water and non-storm water from the municipal separate storm sewer systems (MS4s) located within the coastal watersheds of Los Angeles County, with the exception of the City of Long Beach MS4, and is hereinafter referred to as the "Los Angeles MS4 Order" or the "Order." We received 37 petitions challenging various provisions of the Los Angeles MS4 Order. For the reasons discussed herein, we generally uphold the Los Angeles MS4 Order, but with a number of revisions to the findings and provisions in response to issues raised in the petitions and as a result of our own review of the Order.

I. BACKGROUND

The Los Angeles MS4 Order regulates discharges from the MS4s operated by the Los Angeles County Flood Control District, Los Angeles County, and 84 municipal permittees (Permittees) in a drainage area that encompasses more than 3,000 square miles and multiple watersheds. The Order was issued by the Los Angeles Water Board in

accordance with section 402(p)(3)(B) of the Clean Water Act[1] and sections 13263 and 13377 of the Porter-Cologne Water Quality Control Act (Porter-Cologne Act),[2] as a National Pollutant Discharge Elimination System (NPDES) permit to control storm water and non-storm water discharges that enter the area's water bodies from the storm sewer systems owned or operated by the multiple governmental entities named in the Order. The Los Angeles MS4 Order superseded Los Angeles Water Board Order No. 01-182 (2001 Los Angeles MS4 Order), and is the fourth iteration of the NPDES permit for MS4 discharges in the relevant area.

The Los Angeles MS4 Order incorporates most of the pre-existing requirements of the 2001 Los Angeles MS4 Order, including the water quality-based requirement to not cause or contribute to exceedances of water quality standards in the receiving water. The Los Angeles MS4 Order also requires Permittees to comply with new water quality-based requirements to implement 33 watershed-based total maximum daily loads (TMDLs) for the region. The Order links both of these water quality-based requirements to the programmatic elements of the Order by allowing Permittees to comply with the water quality-based requirements, in part, by developing and implementing a watershed management program (WMP) or enhanced watershed management program (EWMP), as more specifically defined in the Order.

Following adoption of the Los Angeles MS4 Order, we received 37 timely petitions challenging various provisions of the Order and, in particular, the provisions implementing TMDLs and integrating water quality-based requirements and watershed-based program implementation. Several petitioners asked that their petitions be held in abeyance;[3] however, due to the number of active petitions also seeking review, we declined to hold those petitions in abeyance at that time.[4] Five petitioners additionally requested that we partially stay the Los Angeles MS4 Order. Following review, the Executive Director of the State Water Board denied the stay requests for failure to comply with the prerequisites for a stay as specified in California Code of Regulations, title 23, section 2053.

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[1] 33 U.S.C. § 1342(p)(3)(B).

[2] Wat. Code, §§ 13263, 13377.

[3] See Cal. Code Regs., tit. 23, § 2050.5, subd. (d).

[4] By letter dated January 30, 2013, we provided an opportunity for petitioners to submit an explanation for why a petition should be held in abeyance notwithstanding the existence of the active petitions. In response, two petitioners, City of Signal Hill and the City of Claremont, argued that their petitions raised unique issues not common to the remaining petitions and therefor appropriate for abeyance. We thereafter denied their requests on July 29, 2013, finding that the unique issues could nevertheless be resolved concurrently with the issues in the other petitions. On October 9, 2013, the City of Claremont withdrew two of the claims in its petition.

We deemed the petitions complete by letter dated July 8, 2013, and, as permitted under our regulations,[5] consolidated the petitions for review.

An issue front and center in the petitions is the appropriateness of the approach of the Los Angeles MS4 Order in addressing what we generally refer to as "receiving water limitations." Receiving water limitations in MS4 permits are requirements that specify that storm water and non-storm water discharges must not cause or contribute to exceedances of water quality standards in the waters of the United States that receive those discharges. In precedential State Water Board Order WQ 99-05 (*Environmental Health Coalition*), we directed that all MS4 permits contain specific language that explains how the receiving water limitations will be implemented. (For clarity, we refer to MS4 permit language that relates to implementation of the permit's receiving water limitations as "receiving water limitations provisions.") We held a workshop on November 20, 2012, concerning receiving water limitations in MS4 permits. The purpose of the workshop was to receive public comment on an issue paper discussing several alternatives to the receiving water limitations provisions currently included in MS4 permits as directed by Order WQ 99-05 (Receiving Water Limitations Issue Paper).[6]

Because the Los Angeles MS4 Order contains new provisions that authorize the Permittees to develop and implement WMP/EWMPs in lieu of requiring compliance with the receiving water limitations provisions, we view our review of the Order as an appropriate avenue for resolving some of the issues raised in our November 20, 2012 workshop. Through notice to all interested persons, we bifurcated the responses to the petitions and solicited two separate sets of responses: (1) Responses to address issues related to whether the WMP/EWMP alternatives contained in the Los Angeles MS4 Order are an appropriate approach to revising the receiving water limitations provisions in MS4 permits (August 15, 2013 Receiving Water Limitations Submissions); and (2) Responses to address all other issues raised in the petitions (October 15, 2013 Responses).[7] We held a workshop on October 8, 2013, to hear public comment on the first set of responses.

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[5] Cal. Code Regs., tit. 23, § 2054.

[6] Information on that workshop is available at <http://www.waterboards.ca.gov/water_issues/programs/stormwater/rwl.shtml> (as of Nov 18, 2014).

[7] We requested the bifurcated responses initially by letter dated July 15, 2013. Subsequent letters on July 29, 2013, and September 18, 2013, clarified the nature of the submissions and extended the submission deadline for the second response.

State Water Board regulations generally require final disposition on petitions within 270 days of the date a petition is deemed complete.[8] However, in this case, we required additional time to review the large number of issues raised in the petitions. When the State Water Board anticipates addressing a petition on the merits after the review period passes, it may indicate that it will review the matter on its own motion.[9] On April 1, 2014, we adopted Order WQ 2014-0056 taking up review of the issues in the petitions on our own motion.[10]

We now resolve the issues in the petitions with this order.

II. ISSUES AND FINDINGS

The 37 petitions raise over sixty contentions claiming deficiencies in the Los Angeles MS4 Order. This Order addresses the most significant contentions. To the extent petitioners raised issues that are not discussed in this Order, such issues are dismissed as not raising substantial issues appropriate for State Water Board review.[11]

Before proceeding to the merits of the petitions, we will resolve several procedural issues.

Requests to Take Official Notice or Supplement the Record with Additional Evidence

We received a number of requests to take official notice of documents not in the administrative record of the adoption of the Los Angeles MS4 Order by the Los Angeles Water Board (hereinafter Administrative Record)[12] and a number of requests to admit supplemental evidence not considered by the Los Angeles Water Board.[13] We reviewed the requests with

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[8] Cal. Code Regs., tit. 23, § 2050.5, subd. (b).

[9] See Wat. Code, § 13320, subd. (a); Cal. Code Regs., tit. 23, § 2050.5, subd. (c).

[10] To avoid premature litigation on the petition issues as a result of our review extending past the 270 day-regulatory review period, at our suggestion most of the petitioners asked that their petitions be placed in abeyance until adoption by the State Water Board of a final order. We granted those requests. Simultaneously with adopting this order, we are removing the petitions from abeyance and acting upon them.

[11] *People v. Barry* (1987) 194 Cal.App.3d 158, 175-177; *Johnson v. State Water Resources Control Bd.* (2004) 123 Cal.App.4th 1107, 1114; Cal. Code Regs., tit. 23, § 2052, subd. (a)(1).

[12] The Administrative Record was prepared by the Los Angeles Water Board and is available at <http://www.waterboards.ca.gov/losangeles/water_issues/programs/stormwater/municipal/AdminRecordOrderNoR4_2012_0175/index.shtml> (as of Nov. 18, 2014).

[13] Several requests for official notice or to admit supplemental evidence were received concurrently with submission of the petitions, with the August 15, 2013 Receiving Water Limitations Submissions, and with the October 15, 2013 Responses. Additional requests for official notice were submitted concurrently with comments on first and revised public drafts of this order and were opposed by several parties. (Request for Official Notice, Natural Resources Defense Council, Los Angeles Waterkeeper, and Heal the Bay, Jan. 21, 2015; Request for Official Notice, Natural Resources Defense Council, Los Angeles Waterkeeper and Heal the Bay, June 2, 2015.) Although we have reviewed these additional requests for official notice, we have not granted the requests for the various reasons articulated in this section, in Section II.B.8, and in footnote 74.

consideration of whether they were appropriate for notice or admission based on the legal standards governing our proceedings[14] and whether the documents would materially aid in our review of the issues in the proceedings. We grant the requests with regard to documents 1-7 below, and additionally take official notice on our own motion of documents 8, 9, and 10:[15]

1. Order No. 2013-0001-DWQ, NPDES Permit for Storm Water Discharges from Small MS4s, adopted by State Water Board, February 5, 2013;[16]
2. Modified NPDES Permit No. DC0000022 for the MS4 for the District of Columbia issued by the United States Environmental Protection Agency (USEPA), November 9, 2012, and a responsiveness summary issued in support of its original adoption of the permit, October 7, 2011;[17]
3. Administrative Procedures Update Number 90-004 on Antidegradation Policy Implementation for NPDES Permitting, issued by the State Water Board, July 2, 1990;[18]
4. Chapter 7 of the NPDES Permit Writers' Manual, updated by USEPA, September 2010;[19]
5. Letter to the Water Management Administration, Maryland Department of the Environment, issued by USEPA, August 8, 2012;[20]

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[14] For official notice see Cal. Code Regs., tit. 23, § 648.2; Gov. Code, § 11515; Evid. Code, § 452. For admission of supplemental evidence see Cal. Code Regs., tit. 23, § 2050.6.

[15] We note that two documents for which we received requests for official notice are already in the administrative record: USEPA, Memorandum Setting Forth Revisions to the November 22, 2002 Memorandum Establishing Total Maximum Daily Load Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs (Nov. 12, 2010) (Administrative Record, section 10.II, RB-AR23962-23968); USEPA, Chapter 6 of the NPDES Permit Writers' Manual (updated Sept. 2010) (Administrative Record, section 10.IV, RB-AR24905-24932).

[16] County of Los Angeles October 15, 2013 Response, Att. C; also available at <http://www.waterboards.ca.gov/water_issues/programs/stormwater/docs/phsii2012_5th/order_final.pdf> (as of Nov. 18, 2014).

[17] Los Angeles Water Board Request for State Water Board to Take Official Notice of Or Accept as Supplemental Evidence Exhibit A through SS (Oct. 15, 2013) (Los Angeles Water Board Request for Official Notice), Exh.'s A, B; also available at <http://www.epa.gov/reg3wapd/pdf/pdf_npdes/stormwater/DCMS4/MS4FinalLimitedModDocument/FinalModifiedPermit_10-25-12.pdf> and <http://www.epa.gov/reg3wapd/pdf/pdf_npdes/stormwater/DCMS4/FinalPermit2011/DCMS4FINALResponsivenessSummary093011.pdf> (as of Nov. 18, 2014).

[18] Los Angeles Water Board Request for Official Notice, Exh.C; also available at <http://www.swrcb.ca.gov/water_issues/programs/npdes/docs/apu_90_004.pdf> (as of Nov.18, 2014).

[19] Chapter 7 of USEPA's NPDES Permit Writers' Manual, EPA-833-K-10-001, September 2010 (NPDES Permit Writers' Manual) was submitted as Exhibit C to Natural Resources Defense Council, Los Angeles Waterkeeper and Heal the Bay Request for Official Notice (Dec. 10, 2012) (Environmental Petitioners' Request for Official Notice). The chapter may additionally be accessed through links at <http://water.epa.gov/polwaste/npdes/basics/NPDES-Permit-Writers-Manual.cfm> (as of Nov.18, 2014).

6. Memorandum to the Water Management Division Directors, Regions I-X, and NPDES State Directors, issued by USEPA, 1989;[21]
7. "Guidance on Implementing the Antidegradation Provisions of 40 C.F.R. 131.12," issued by USEPA, Region 9, June 3, 1987;[22]
8. Order WQ 2014-0077-DWQ, amending NPDES Statewide Storm Water Permit for State of California Department of Transportation, Order 2012-0011-DWQ, adopted by State Water Board, May 20, 2014;[23]
9. Statement from USEPA soliciting comments on the USEPA Memorandum Setting forth Revisions to the November 22, 2002 Memorandum Establishing Total Maximum Daily Load Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs (November 12, 2010), issued March 17, 2011.[24]
10. Memorandum, "Revisions to the November 22, 2002 Memorandum 'Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs,'" issued by USEPA, November 26, 2014.[25]

In addition, we are incorporating the administrative record of the November 20, 2012 workshop on receiving water limitations, including the Receiving Water Limitations Issue Paper and comments by interested persons, into our record for the petitions on the Los Angeles MS4 Order.[26]

(continued from previous page)

[20] Environmental Petitioners' Request for Official Notice, Exh.B, available at <http://www.waterboards.ca.gov/public_notices/petitions/water_quality/docs/a2236/a2236m_rfon.pdf> (as of Nov. 18, 2014).

[21] Environmental Petitioners' Request for Official Notice, Exh.D; also available at <http://www.epa.gov/npdes/pubs/owm0231.pdf> (as of Nov. 18, 2014).

[22] Environmental Petitioners' Request for Official Notice, Exh.E; available at <http://www.waterboards.ca.gov/public_notices/petitions/water_quality/docs/a2236/a2236m_rfon.pdf> (as of Nov. 18, 2014).

[23] Available at <http://www.waterboards.ca.gov/board_decisions/adopted_orders/water_quality/2014/wqo2014_0077_dwq.pdf> (as of Nov. 18, 2014).

[24] Available at <http://water.epa.gov/polwaste/npdes/stormwater/upload/sw_tmdlwla_comments.pdf> (as of Nov. 18, 2014).

[25] Available at <http://water.epa.gov/polwaste/npdes/stormwater/upload/EPA_SW_TMDL_Memo.pdf> (as of March 30, 2015).

[26] The Receiving Water Limitations Issue Paper and comments and workshop presentations by interested person are available at <http://www.waterboards.ca.gov/water_issues/programs/stormwater/rwl.shtml>.

Among other requests, we are not granting the requests to take official notice of or supplement the Administrative Record with the notices of intent, workplans, draft programs, and other documents filed by Permittees toward development of WMPs/EWMPs and associated monitoring programs following adoption of the Los Angeles MS4 Order or comments submitted on those documents, or the conditional approvals of several of the programs. With regard to factual evidence regarding actions taken by Permittees to comply with the Los Angeles MS4 Order after it was adopted, we believe it appropriate to close the record with the adoption of the Los Angeles MS4 Order. However, we are keenly aware that the success of the Los Angeles MS4 Order in addressing water quality issues depends primarily on the careful and effective development and implementation of programs consistent with the requirements of the Order; we speak to that issue later in our discussion.

City of El Monte's Amended Petition

Petitioner City of El Monte (El Monte) timely filed a petition on December 10, 2012, challenging a number of provisions of the Los Angeles MS4 Order. Thereafter, on February 19, 2013, El Monte filed an amended petition, based on information it asserted was not available prior to the deadline for submission of the petition.

Water Code section 13320, subdivision (a) provides that a petition for review of a regional water quality control board (regional water board) action must be filed within 30 days of the regional water board's action.[27] The State Water Board interprets that requirement strictly and petitions filed more than 30 days from regional water board action are rejected as untimely. El Monte asserted that the two additional arguments raised in the amended petition were based on information that was not available prior to the deadline for submitting the petition and were therefore appropriate for State Water Board consideration.

Even if we were required by statute or regulation to accept amended petitions based on new information, here, El Monte's new arguments are not supported by information previously unavailable. First, El Monte argues that the Supreme Court's decision in *Los Angeles County Flood Control District v. Natural Resources Defense Council* (2013) 133 S.Ct. 710 invalidated certain provisions of the Los Angeles MS4 Order that require compliance with water quality standards and total maximum daily load requirements through receiving water monitoring. Contrary to El Monte's assertion, the decision by the Supreme Court did not invalidate any requirements of the Los Angeles MS4 Order and did not result in any changes to

[27] See also Cal. Code Regs., tit. 23, § 2050.

the Order. The Supreme Court decision, to the extent it applies to the legal issues before us in this matter, constitutes precedential case law and must be considered in our review of the Los Angeles MS4 Order, but it does not constitute new information that supports an amended petition.[28]

Second, El Monte argues that the Los Angeles Water Board failed to consider various provisions of the California Watershed Improvement Act of 2009[29] when it adopted the Los Angeles MS4 Order. To the extent El Monte believed that the California Watershed Improvement Act was relevant to adoption of the Los Angeles MS4 Order, El Monte had the opportunity to raise that issue in comments before the Los Angeles Water Board and in its timely petition to the State Water Board. Having failed to raise the issue before the Los Angeles Water Board and in its timely petition, El Monte cannot raise the issue in an amended petition.[30]

We reject El Monte's amended petition as untimely.

Environmental Petitioners' Motion to Strike

Petitioners Natural Resources Defense Council, Los Angeles Waterkeeper, and Heal the Bay (Environmental Petitioners), submitted a motion on November 11, 2013, requesting that the State Water Board strike sections of the October 15, 2013 Responses by six petitioners (Motion to Strike). The relevant sections respond to a collateral estoppel argument made by the Environmental Petitioners in their August 15, 2013 Receiving Water Limitations Submission to the State Water Board. Several parties asserted in their petitions that requiring compliance with water quality standards in MS4 permits violates federal law or conflicts with prior State Water Board precedent. The Environmental Petitioners responded in their August 15, 2013 Receiving Water Limitations Submission that these arguments were barred by collateral estoppel because the claims were settled in prior court cases challenging the 2001 Los Angeles MS4 Order. Six of the October 15, 2013 Responses, namely those by the Cities of

[28] We note that the State Water Board has the option of allowing additional briefing when there are material legal developments concerning issues raised in a petition, but we did not find such briefing would aid review of the petitions in this case.

[29] Wat. Code, § 16100 et seq.

[30] In addition to being untimely, El Monte's argument lacks merit. The California Watershed Improvement Act of 2009 grants authority to local government permittees regulated by an MS4 permit to develop and implement watershed improvement plans, but does not limit the authority of a regional water board to impose terms related to watershed management in an MS4 permit. Further, the terms of the WMPs/EWMPs are largely consistent with the watershed improvement plans authorized by the Act, so a permittee can comply with the Los Angeles MS4 Order while also using the authority provided by the California Watershed Improvement Act of 2009 if it so chooses.

Arcadia, Claremont, Covina, Duarte and Huntington Park, San Marino et al.,[31] and Sierra Madre, incorporated a response to the collateral estoppel argument.

We stated in a July 15, 2013 letter that"[i]nterested persons may not use the [October 15] [32] deadline for responses on the remaining petition issues as an opportunity to respond to comments filed on the receiving water limitations approach." We clarified further in a July 29, 2013 letter: "[W]hen submitting subsequent responses to the petitions in accordance with the [October 15] deadline, petitioners and interested persons should not raise new issues related to the specific questions regarding the watershed management program/enhanced watershed management program or respond to any August 15, 2013, submissions; however petitioners and interested persons will not be precluded from responding to specific issues raised in the original petitions on grounds that the issues are related to the receiving water limitations language."

We find that the collateral estoppel responses by the six petitioners are disallowed by the direction we provided in our July 15 and July 29, 2013 letters. However, as will be apparent in our discussion in section II.A, we do not rely on the Environmental Petitioners' collateral estoppel argument in resolving the petitions. Our determination that portions of the October 15, 2013 Responses are disallowed is, therefore, immaterial to the resolution of the issues.[33]

Having resolved the procedural issues, we turn to the merits of the Petitions.

A. Implementation of the Iterative Process as Compliance with Receiving Water Limitations

The Los Angeles MS4 Order includes receiving water limitations provisions that are consistent with our direction in Order WQ 99-05 in Part V.A of the Los Angeles MS4 Order. Part V.A. provides, in part, as follows:

1. Discharges from the MS4 that cause or contribute to the violation of receiving water limitations are prohibited.

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[31] The cities of San Marino, Rancho Palos Verdes, South El Monte, Norwalk, Artesia, Torrance, Beverly Hills, Hidden Hills, Westlake Village, La Mirada, Vernon, Monrovia, Agoura Hills, Commerce, Downey, Inglewood, Culver City, and Redondo Beach submitted a joint October 15, 2013 Response.

[32] The July 15, 2013 letter set a deadline of September 20, 2013, which was subsequently extended to October 15, 2013.

[33] In a November 21, 2013 letter, we indicated that we would consider the Motion to Strike concurrently with drafting of this Order, but that we would not accept any additional submissions in this matter, including any responses to the Motion to Strike. City of San Marino objected to the letter and submitted an opposition to the Motion to Strike. Several petitioners submitted joinders in City of San Marino's motion. For the same reasons articulated above, we are not accepting these submissions; they would not affect our resolution of the issues.

2. Discharges from the MS4 of storm water, or non-storm water, for which a Permittee is responsible [footnote omitted], shall not cause or contribute to a condition of nuisance.
3. The Permittees shall comply with Parts V.A.1 and V.A.2 through timely implementation of control measures and other actions to reduce pollutants in the discharges in accordance with the storm water management program and its components and other requirements of this Order including any modifications. . . .[34]

The petitioners that are permittees (hereinafter referred to as "Permittee Petitioners")[35] argue that the above language either means, or should be read and/or clarified to mean, that good faith engagement in the requirements of Part V.A.3, traditionally referred to as the "iterative process," constitutes compliance with Parts V.A.1. and V.A.2. The position put forth by Permittee Petitioners is one we took up when we initiated a process to re-examine the receiving water limitations and iterative process in MS4 permits statewide with our Receiving Water Limitations Issue Paper and the November 20, 2012 workshop. We summarize the law and policy regarding Permittee Petitioners' position again here and ultimately disagree with Permittee Petitioners that implementation of the iterative process does or should constitute compliance with receiving water limitations.

The Clean Water Act generally requires NPDES permits to include technology-based effluent limitations and any more stringent limitations necessary to meet water quality standards.[36] In the context of NPDES permits for MS4s, however, the Clean Water Act does not explicitly reference the requirement to meet water quality standards. MS4 discharges must meet a technology-based standard of prohibiting non-storm water discharges and reducing pollutants in the discharge to the Maximum Extent Practicable (MEP) in all cases, but requiring strict compliance with water quality standards (e.g., by imposing numeric effluent limitations) is at the discretion of the permitting agency.[37] Specifically the Clean Water Act states as follows:

> Permits for discharges from municipal storm sewers –
>
> . . .
>
> (ii) shall include a requirement to effectively prohibit non-stormwater discharges into the storm sewers; and

[34] Los Angeles MS4 Order, Part V.A, pp. 38-39.

[35] For ease of reference, where an argument is made by multiple Permittee Petitioners, even if not by all, we attribute that argument to Permittee Petitioners generally, and do not list which of the 37 Permittee Petitioners in fact make the argument. Where only one or two Permittee Petitioners make a particular argument, we have identified the specific Permittee Petitioner(s).

[36] 33 U.S.C. §§ 1311, 1342(a).

[37] 33 U.S.C. § 1342(p)(3)(B); *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159.

> (iii) shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as . . . the State determines appropriate for the control of such pollutants.[38]

Thus, a permitting agency imposes requirements related to attainment of water quality standards where it determines that those provisions are "appropriate for the control of [relevant] pollutants" pursuant to the Clean Water Act municipal storm water provisions.

Under the Porter-Cologne Act, waste discharge requirements must implement applicable water quality control plans, which include the beneficial uses to be protected for a given water body and the water quality objectives reasonably required for that protection.[39] In this respect, the Porter-Cologne Act treats MS4 dischargers and other dischargers even-handedly and anticipates that all waste discharge requirements will implement the water quality control plans. However, when implementing requirements under the Porter-Cologne Act that are not compelled by federal law, the State Water Board and regional water boards (collectively, "water boards") have some flexibility to consider other factors, such as economics, when establishing the appropriate requirements.[40] Accordingly, since the State Water Board has discretion under federal law to determine whether to require strict compliance with the water quality standards of the water quality control plans for MS4 discharges, the State Water Board may also utilize the flexibility under the Porter-Cologne Act to decline to require strict compliance with water quality standards for MS4 discharges.

We have previously exercised the discretion we have under federal law in favor of requiring compliance with water quality standards, but have required less than strict compliance. We have directed, in precedential orders, that MS4 permits require discharges to be controlled so as not to cause or contribute to exceedances of water quality standards in receiving waters,[41] but have prescribed an iterative process whereby an exceedance of a water quality standard triggers a process of BMP improvements. That iterative process involves reporting of the violation, submission of a report describing proposed improvements to BMPs

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[38] 33 U.S.C. § 1342(p)(3)(B).

[39] Wat. Code, § 13263. The term "water quality standards" encompasses the beneficial uses of the water body and the water quality objectives (or "water quality criteria" under federal terminology) that must be met in the waters of the United States to protect beneficial uses. Water quality standards also include the federal and state antidegradation policy.

[40] Wat. Code, §§ 13241, 13263; *City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613.

[41] State Water Board Orders WQ 98-01 (*Environmental Health Coalition*), WQ 99-05 (*Environmental Health Coalition)*, WQ 2001-15 (*Building Industry Association of San Diego*).

expected to better meet water quality standards, and implementation of these new BMPs.[42] The current language of the existing receiving waters limitations provisions was actually developed by USEPA when it vetoed two regional water board MS4 permits that utilized a prior version of the State Water Board's receiving water limitations provisions.[43] In State Water Board Order WQ 99-05, we directed that all regional boards use USEPA's receiving water limitations provisions.

There has been significant confusion within the regulated MS4 community regarding the relationship between the receiving water limitations and the iterative process, in part because the water boards have commonly directed dischargers to achieve compliance with water quality standards by improving control measures through the iterative process. But the iterative process, as established in our precedential orders and as generally written into MS4 permits adopted by the water boards, does not provide a "safe harbor" to MS4 dischargers. When a discharger is shown to be causing or contributing to an exceedance of water quality standards, that discharger is in violation of the permit's receiving water limitations and potentially subject to enforcement by the water boards or through a citizen suit, regardless of whether or not the discharger is actively engaged in the iterative process.[44]

The position that the receiving water limitations are independent from the provisions that establish the iterative process has been judicially upheld on several occasions. The receiving water limitations provisions of the 2001 Los Angeles MS4 Order specifically have been litigated twice, and in both cases, the courts upheld the provisions and the Los Angeles Water Board's interpretation of the provisions. In a decision resolving a challenge to the 2001 Los Angeles MS4 Order, the Los Angeles County Superior Court stated: "[T]he Regional [Water] Board acted within its authority when it included [water quality standards compliance] in

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[42] State Water Board Order WQ 99-05, pp. 2-3; see also State Water Board Order WQ 2001-15, pp. 7-9. Additionally, consistent with federal law, we found it appropriate to require implementation of BMPs in lieu of numeric water quality-based effluent limitations to meet water quality standards. *See* State Water Board Orders WQ 91-03 (*Citizens for a Better Environment)*, WQ 91-04 (*Natural Resources Defense Council*), WQ 98-01, WQ 2001-15. This issue is discussed in greater detail in Section II.C. of this order.

[43] See State Water Board Orders WQ 99-05, WQ 2001-15.

[44] Several Permittee Petitioners have argued that the State Water Board's opinion in State Water Board Order WQ 2001-15 must be read to endorse a safe harbor in the iterative process. We disagree. Regardless, the State Water Board's position that the iterative process of the subject permit did not create a "safe harbor" from compliance with receiving water limitations was clearly established in subsequent litigation on that order. (See *Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (Super. Ct. 2003, No. GIC780263), affd. *Building Industry Assn. of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866.)

the Permit without a 'safe harbor,' whether or not compliance therewith requires efforts that exceed the 'MEP' standard."[45] The lack of a safe harbor in the iterative process of the 2001 Los Angeles MS4 Order was again acknowledged in 2011 and 2013, this time by the Ninth Circuit Court of Appeal. In these instances, the Ninth Circuit was considering a citizen suit brought by the Natural Resources Defense Council against the County of Los Angeles and the Los Angeles County Flood Control District for alleged violations of the receiving water limitations of that order. The Ninth Circuit held that, as the receiving water limitations of the 2001 Los Angeles MS4 Order (and accordingly as the precedential language in State Water Board Order WQ 99-05) was drafted, engagement in the iterative process does not excuse liability for violations of water quality standards.[46] The California Court of Appeal has come to the same conclusion in interpreting similar receiving water limitations provisions in MS4 Orders issued by the San Diego Regional Water Quality Control Board in 2001 and the Santa Ana Regional Water Quality Control Board in 2002.[47]

While we reiterate that the judicial rulings have been consistent with the water boards' intention and position regarding the relationship between the receiving water limitations and the iterative process, we acknowledge that some in the regulated community perceived the 2011 Ninth Circuit opinion in particular as a re-interpretation of that relationship. Our Receiving Water Limitations Issue Paper and subsequent workshop reflected our desire to re-examine the issue in response to concerns expressed by the regulated community in the aftermath of that ruling.

As stated above, both the Clean Water Act and the Porter-Cologne Act afford some discretion to not require strict compliance with water quality standards for MS4 discharges. In each of the discussed court cases above, the court's decision is based on the specific permit language; thus the cases do not address our authority with regard to requiring compliance with water quality standards in an MS4 permit as a threshold matter, and they do not require us to continue to exercise our discretion as we decided in State Water Board Order

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[45] *In re Los Angeles County Municipal Storm Water Permit Litigation* (L.A. Super. Ct., No. BS 080548, Mar. 24, 2005) Statement of Decision from Phase I Trial on Petitions for Writ of Mandate, pp. 4-5, 7. The decision was affirmed on appeal (*County of Los Angeles v. State Water Resources Control Board* (2006) 143 Cal.App.4th 985); however, this particular issue was not discussed in the court of appeal's decision.

[46] *Natural Resources Defense Council v. County of Los Angeles* (9th Cir. 2011) 673 F.3d. 880, rev'd on other grounds sub nom. *Los Angeles County Flood Control Dist. v. Natural Resources Defense Council* (2013) 133 S.Ct. 710, mod. by *Natural Resources Defense Council v. County of Los Angeles* (9th Cir. 2013) 725 F.3d 1194, cert. den. *Los Angeles County Flood Control Dist. v. Natural Resources Defense Council* (2014) 134 S.Ct. 2135.

[47] *Building Industry Assn. of San Diego County, supra*,124 Cal.App.4th 866; *City of Rancho Cucamonga v. Regional Water Quality Control Bd.* (2006) 135 Cal.App.4th 1377.

WQ 99-05. Although it would be inconsistent with USEPA's general practice of requiring compliance with water quality standards over time through an iterative process,[48] we may even have the flexibility to reverse[49] our own precedent regarding receiving water limitations and receiving water limitations provisions and make a policy determination that, going forward, we will either no longer require compliance with water quality standards in MS4 permits, or will deem good faith engagement in the iterative process to constitute such compliance.[50]

However, with this Order, we now decline to do either. As the storm water management programs of municipalities have matured, an increasing body of monitoring data indicates that many water quality standards are in fact not being met by many MS4s. The iterative process has been underutilized and ineffective to date in bringing MS4 discharges into compliance with water quality standards. Compliance with water quality standards is and should remain the ultimate goal of any MS4 permit. We reiterate and confirm our determination that provisions requiring compliance with receiving water limitations are "appropriate for the control of . . . pollutants" addressed in MS4 permits and that therefore, consistent with our authority under the Clean Water Act, we will continue to require compliance with receiving water limitations.[51]

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[48] See, e.g. Modified NPDES Permit No. DC0000022 for the MS4 for the District of Columbia, *supra*, fn. 17.

[49] Of course any change of direction would be subject to ordinary principles of administrative law. (See Code Civ. Proc., § 1094.5, subd. (b).)

[50] As such, it is not necessary to address the collateral estoppel arguments raised by the Environmental Petitioners and opposed by Permittee Petitioners. We agree that it is settled law that we have the discretion to require compliance with water quality standards in an MS4 permit under federal and state law. We also agree that it is settled law that the receiving water limitations provisions currently spelled out in our MS4 permits do not carve out a safe harbor in the iterative process. But the question for us is whether we should continue to exercise our discretion to utilize the same approach to receiving water limitations established under our prior precedent, or proceed in a new direction.

[51] Several Permittee Petitioners argued in comments submitted on the first draft of this order that, because we find that we have some discretion under Clean Water Act section 402(p)(3) to not require compliance with receiving water limitations, the Los Angeles Water Board's action in requiring such compliance -- and our action in affirming it -- is pursuant to state authority. (See, e.g., Cities of Arcadia, Claremont, and Covina, Comment Letter, Jan. 21, 2015.) The Permittee Petitioners argue that the action is therefore subject to evaluation in light of the factors set out in Water Code section 13263 and 13241 pursuant to *City of Burbank, supra,* 35 Cal.4th 613. Under *City of Burbank,* a regional water board must consider the factors specified in section 13241 when issuing waste discharge requirements under section 13263, subdivision (a), but only to the extent those waste discharge requirements exceed the requirements of the federal Clean Water Act. (35 Cal.4th at 627.) Nowhere in our discussion in this section do we mean to disavow either that the Los Angeles Water Board acted under federal authority to impose "such other provisions as . . .determine[d] appropriate for the control of . . . pollutants" in adopting the receiving water limitations provisions of the Los Angeles MS4 Order in the first instance or that we are acting under federal authority in upholding those provisions. (33 U.S.C. § 1342(p)(3)(B)(iii).) The receiving water limitations provisions do not exceed the requirements of federal law. We nevertheless also point out that the Los Angeles Water Board engaged in an analysis of the factors under section 13241 when adopting the Order. (See Los Angeles MS4 Order, Att. F, Fact Sheet, pp. F-139 to F-155.)

As we explained in 2001, "[u]rban runoff is causing and contributing to impacts on receiving waters throughout the state and impairing their beneficial uses."[52] More than a decade later, this is still true. By definition, many of our urban waterways will never attain water quality standards and fully realize their beneficial uses if municipal runoff is allowed to continue to cause or contribute to exceedances of water quality standards. Further, the efforts of other dischargers who are required to not cause or contribute to exceedances of water quality standards would be largely in vain if we did not regulate MS4 dischargers with a somewhat even hand.

Such an approach is additionally consistent with the Porter-Cologne Act's emphasis on water quality control plans as the cornerstone of water quality planning and regulation and the act's expectation that all waste discharge requirements will implement the water quality control plans. We believe that direct enforcement of water quality standards is necessary to protect water quality, at a minimum as a back-stop where dischargers fail to meet requirements of the Order designed to achieve progress toward meeting the standards. We will not reverse our precedential determination in State Water Board Order WQ 99-05 that established the receiving water limitations provisions for MS4 permits statewide and reiterate that we will continue to read those provisions consistent with how the courts have: engagement in the iterative process does not excuse exceedances of water quality standards. We accordingly also decline to direct any revisions to the receiving water limitations provisions of the Los Angeles MS4 Order, which are consistent with our precedential language.[53]

Yet, we are sympathetic to the assertions made by MS4 dischargers that the receiving water limitations provisions mandated by our Order WQ 99-05 may result in many years of permit noncompliance, because it may take years of technical efforts to achieve compliance with the receiving water limitations, especially for wet weather discharges.

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[52] State Water Board Order WQ 2001-15, p. 7.

[53] We disagree with Permittee Petitioners' argument that the receiving water limitations in Part V.A of the Los Angeles MS4 Order are confusing, unclear, or overbroad, because they prohibit causing or contributing to a violation of a receiving water limitation rather than a violation of water quality standards. The Los Angeles Water Board defines "receiving water" as "[a] 'water of the United States' in to which waste and/or pollutants are or may be discharged." (Los Angeles MS4 Order, Att. A., p. A-16.) The Los Angeles Water Board further defines "receiving water limitations" as "[a]ny applicable numeric or narrative water quality objective or criterion, or limitation to implement the applicable water quality objective or criterion, for the receiving water as contained in Chapter 3 or 7 of the Water Quality Control Plan for the Los Angeles Region (Basin Plan), water quality control plans or policies adopted by the State Water Board, or federal regulations, including but not limited to, 40 CFR §131.38." (*Ibid.*) Receiving water limitations are therefore the water quality standards, including water quality objectives and criteria, that apply to the receiving water as expressed in the water quality control plan for the region, statewide water quality control plans that specify objectives for water bodies in the region, State Water Board policies for water quality control, and federal regulations.

Accordingly, we believe that the MS4 permits should incorporate a well-defined, transparent, and finite alternative path to permit compliance that allows MS4 dischargers that are willing to pursue significant undertakings beyond the iterative process to be deemed in compliance with the receiving water limitations.

With the WMP/EWMP provisions of the Los Angeles MS4 Order, the Los Angeles Water Board is striving to allow one such alternative compliance path. As such, the fundamental issue for review before us in this matter is whether the Los Angeles MS4 Order's WMP/EWMP provisions constitute a legal and technically sound compliance alternative for achieving receiving water limitations. We discuss and resolve this issue in the next section.

B. WMP/EWMP as Alternative Compliance Options for Complying with Receiving Water Limitations

The WMP/EWMP provisions allow Permittees to choose an integrated and collaborative watershed-based approach to meeting the requirements of the Los Angeles MS4 Order, including the receiving water limitations. Permittees develop a plan, either collaboratively or individually, that addresses water quality priorities within a watershed. Permittees first prioritize water quality issues within each watershed. Permittees may use the WMP/EWMP to address water body-pollutant combinations for which a TMDL has been developed, giving highest priority to those with interim and final compliance deadlines within the permit term. Permittees may also address water body-pollutant combinations for which no TMDL has been developed, but where the water body is impaired or shows exceedances of the standards for the relevant pollutant from an MS4 source. Once prioritization is completed, Permittees assess the sources of the pollutants and select watershed strategies that are designed to eliminate non-storm water discharges to the MS4 that are a source of pollutants, that meet all applicable TMDL-derived interim and final water quality-based effluent limitations (WQBELs) and/or limitations to be met in the receiving water (referred to herein as "other TMDL-specific limitations")[54] pursuant to corresponding compliance schedules, and that ensure that discharges from the MS4 do not cause or contribute to exceedances of receiving water limitations. Except as described below for storm water retention projects, Permittees conduct a "reasonable assurance analysis" for each water body-pollutant combination incorporated into the

[54] Some of the TMDL limitations of the Los Angeles MS4 Order are expressed not as WQBELs but as standards to be met in the receiving water. The Los Angeles MS4 Order refers to these limitations as "receiving water limitations;" however, in order to avoid confusion with the general receiving water limitations in Part V.A., we will use the term "other TMDL-specific limitations." Accordingly, while the Los Angeles MS4 Order uses the term "receiving water limitations" to refer to both the receiving water limitations in part V.A and some of the TMDL-based requirements in Attachments L-R, when we use the term we refer only to the receiving water limitations in part V.A.

WMP/EWMP to demonstrate the ability of the program to meet those objectives. Permittees additionally implement an integrated monitoring and assessment program to determine progress, adapting strategies and measures as necessary.[55]

In addition to all the requirements above, for those Permittees that choose to develop and implement an EWMP, the EWMP provisions also require that Permittees collaborate on multi-benefit regional projects and, wherever feasible, retain all non-storm runoff, as well as all storm water runoff from the 85th percentile 24-hour storm event (hereinafter "storm water retention approach") for the drainage areas tributary to the projects.[56]

The primary controversy concerning the WMP/EWMP provisions of the Los Angeles MS4 Order is the manner in which they interact with the receiving water limitations and the WQBELs and other TMDL-specific limitations. Under certain conditions detailed in the Order, Permittees may be deemed in compliance with the receiving water limitations and the WQBELs and other TMDL-specific limitations by fully implementing the WMP/EWMP, rather than by demonstrating that the receiving water limitations and the WQBELs and other TMDL-specific limitations have actually been achieved. Specifically:

1. Permittees that develop and implement a WMP/EWMP and fully comply with all requirements and dates of achievement for the WMP/ EWMP as established in the Los Angeles MS4 Order, are deemed to be in compliance with the receiving water limitations in Part V.A for the water body-pollutant combinations addressed by the WMP/EWMP.[57]

2. Permittees fully in compliance with the requirements and dates of achievement of the WMP/EWMP are deemed in compliance with the *interim* WQBELs and other TMDL-specific limitations in Attachments L-R for the water body-pollutant combinations addressed by the WMP/EWMP.[58]

3. Permittees implementing an EWMP and utilizing the storm water retention approach in a drainage area tributary to the applicable water body are deemed in compliance with the *final* WQBELs and other TMDL-specific limitations in Attachments L-R for the water body-pollutant combinations addressed by the storm water retention approach.[59]

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[55] Los Angeles MS4 Order, Part VI.C., pp. 49-67.

[56] *Id.*, Part VI.C.1.g., pp. 48-49.

[57] *Id.*, Part VI.C.2.b., p. 52.

[58] *Id.*, Parts VI.C.3.a., p. 53, VI.E.2.d.i.4., pp. 143-44. The Los Angeles MS4 Order establishes separate requirements for Trash TMDLs and the WMP/EWMP are not a means of achieving compliance with the Trash TMDL provisions. (See Part VI.E.5, pp. 147-154.) References to TMDLs in this section exclude the Trash TMDLs.

[59] *Id.*, Part VI.E.2.e.i.(4), p. 145. As with Part VI.E.2.d.i.4, this Part does not apply to Trash TMDLs.

4. Because the Order additionally provides that full compliance with the general TMDL requirements in Part VI.E and the WQBELs and other TMDL-specific limitations in Attachments L through R constitutes compliance with the receiving water limitations in V.A for the specific pollutants addressed by the relevant TMDL,[60] provisions 2 and 3 above also constitute compliance with the receiving water limitations for the particular water body-pollutant combinations.

5. Finally, Permittees that have declared their intention to develop a WMP/EWMP may be deemed in compliance with receiving water limitations and with interim WQBELs with compliance deadlines occurring prior to approval of the WMP/EWMP if they meet certain conditions during the development phase.[61]

Both Environmental Petitioners and Permittee Petitioners put forth a number of arguments to the effect that the WMP/EWMP provisions of the Los Angeles MS4 Order are contrary to federal and state law or reflect poor policy. We discuss each argument below.

1. Anti-backsliding

The Environmental Petitioners argue that the inclusion of the WMP/EWMP in the Los Angeles MS4 Order violates the anti-backsliding provisions of the Clean Water Act and of the federal regulations.[62] The Clean Water Act generally prohibits the relaxation of an effluent limitation established in an NPDES permit when that permit is renewed; the federal regulations include similar provisions. The Environmental Petitioners argue that the WMP/EWMP of the Los Angeles MS4 Order, by allowing a discharger to be deemed in compliance with receiving water limitations, even where a discharger may in fact be causing or contributing to an exceedance of a water quality standard, represent a relaxation of the receiving water limitations provisions contained in the 2001 Los Angeles MS4 Order.[63]

We do not agree with the Environmental Petitioners that the WMP/EWMP provisions of the Los Angeles MS4 Order violate the anti-backsliding provisions of either the Clean Water Act or the federal regulations. Anti-backsliding provisions are an important aspect

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[60] *Id.*, Part VI.E.2.c.ii., p. 143. Although this provision reflects a departure from provisions in previous MS4 permits, the provision has not generated controversy and has not been contested in the petitions. The State Water Board supports this provision in MS4 permits, as discussed at section II.B.5.b. of this order.

[61] *Id.*, Parts VI.C. 2.d., pp. 52-53, VI.E.2.d.i.(4)(d), p. 144.

[62] 33 U.S.C. § 1342(o); 40 C.F.R. §122.44(*l*).

[63] The receiving water limitations of the 2001 Los Angeles MS4 Order (like the receiving water limitations in Section V.A. of the Los Angeles MS4 Order) were modeled on the precedential language in State Water Board Order WQ 99-05.

of the Clean Water Act that generally promote continued progress toward clean water, but the provisions do not apply in all circumstances and are subject to certain exceptions. The 2001 Los Angeles MS4 Order required compliance with receiving water limitations, directed Permittees to achieve those limitations through the iterative process, but retained the Los Angeles Water Board's discretion to enforce compliance with the receiving water limitations at any time. The Los Angeles MS4 Order requires compliance with receiving water limitations, but allows implementation of control measures through the WMPs/EWMPs to constitute such compliance, and reserves direct enforcement of the receiving water limitations to situations where a permittee fails to comply with the WMP/EWMP provisions. The approaches under the prior and current orders are designed to achieve the same results – compliance with receiving water limitations – but through distinct paths that are not easily comparable for purposes of the specific, technical anti-backsliding requirements laid out in federal law.[64] We nevertheless discuss the provisions below.

The Clean Water Act contains both statutory anti-backsliding provisions in section 402(o) and regulatory anti-backsliding provisions in 40 C.F.R. section 122.44(*l*). The Clean Water Act's statutory prohibition against backsliding applies under a narrow set of criteria specified in Clean Water Act section 402(o). First, section 402(o) prohibits relaxing effluent limitations originally established based on best professional judgment, when there is a newly revised effluent limitation guideline.[65] The WMP/EWMP is not derived from an effluent limitation guideline, so this first prohibition is inapplicable. Second, section 402(o) prohibits relaxing effluent limitations imposed pursuant to Clean Water Act sections 301(b)(1)(C) or 303(d) or (e).[66] The receiving water limitations provisions in the 2001 Los Angeles MS4 Order were not

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[64] Responding to an argument that NPDES Permit No. DC00000221 for MS4 discharges to the District of Columbia violated anti-backsliding requirements by removing certain numeric limitations in the prior permit, USEPA stated: "The Commenter implies that a Permit that replaces a numeric effluent limit with a non-numeric one is somehow automatically less stringent on that parameter. However, the narrative requirement only violates the anti-backsliding prohibition if the two provisions are comparable. . . . In this case, the two provisions are not comparable: EPA has determined that compliance with the performance standards in the Final Permit will result in more water quality protections for the DC MS4's receiving streams than did the previous aggregate numeric limit." (Responsiveness Summary, p. 84, *supra,* fn.17, citing *Communities for a Better Environment v. State Water Resources Control Bd.* (2005) 132 Cal. App. 4th 1313.)

[65] 33 U.S.C. § 1342(o)(1) ("In the case of effluent limitations established on the basis of subsection (a)(1)(B) of this section, a permit may not be renewed, reissued, or modified on the basis of effluent guidelines promulgated under section 1314 (b) of this title subsequent to the original issuance of such permit, to contain effluent limitations which are less stringent than the comparable effluent limitations in the previous permit.").

[66] *Ibid.* ("In the case of effluent limitations established on the basis of section 1311 (b)(1)(C) or section 1313 (d) or (e) of this title, a permit may not be renewed, reissued, or modified to contain effluent limitations which are less stringent than the comparable effluent limitations in the previous permit except in compliance with section 1313 (d)(4) of this title.").

established based on either section 301(b)(1)(C) or section 303(d) or (e), so this prohibition on backsliding is inapplicable.[67] The receiving water limitations provisions in MS4 permits are imposed under section 402(p)(3)(B) of the Clean Water Act rather than under section 301(b)(1)(C),[68] and are accordingly not subject to the anti-backsliding requirements of section 402(o).

With respect to the regulatory anti-backsliding provisions in 40 Code of Federal Regulations section 122.44(*l*), the non-applicability is less clear cut. USEPA promulgated 40 Code of Federal Regulations section 122.44(*l*)(1) and its predecessor anti-backsliding regulations prior to the Water Quality Act of 1987, which established the municipal permitting requirements of section 402(p)(3)(B). There is ample regulatory history to demonstrate USEPA's intent in establishing the anti-backsliding policy and regulations with respect to evolving technology standards for traditional point sources.[69] We have found no definitive guidance, however, since that time from USEPA or the courts applying the general provisions of section 122.44(*l*) in the context of municipal storm water permits.[70] Further, we have previously noted that anti-backsliding principles may be difficult to assess in the context of non-

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[67] The Environmental Petitioners do not argue that the Los Angeles MS4 Order is contrary to Clean Water Act section 303(d)(4) (33 U.S.C. § 1313(d)(4)), which also sets out anti-backsliding requirements. Section 303(d)(4) sets out the conditions under which effluent limitations based on TMDL wasteload allocations may be relaxed. Specifically, effluent limitations for a discharge impacting an impaired water body where standards have not yet been attained may only be relaxed if either the cumulative effect of the revisions still assures the attainment of the water quality standards or the designated use that is not being attained is removed. (33 U.S.C. § 1313(d)(4)(A).) Where a water body has attained standards, effluent limitations may only be relaxed consistent with the federal antidegradation policy. (33 U.S.C. § 1313(d)(4)(B).)

[68] *Defenders of Wildlife*, *supra*, 191 F.3d at pp. 1165-1166.

[69] See, e.g., 44 Fed.Reg. 32854, 32864 (Jun. 7, 1979) (describing codification of predecessor regulation codified at 40 C.F.R. 122.15(i).) In the context of municipal storm water, the MEP standard is the technology standard; the record here supports that MEP, as reflected in the permit conditions, has evolved since the issuance of the 2001 Los Angeles MS4 Order to become more stringent. (See, e.g., Los Angeles MS4 Order, Part VI.D.9.h.vii., p.132, compared to 2001 Los Angeles MS4 Order, Part 4.F.5.c., pp.48-49 [trash controls]; Los Angeles MS4 Order, Part VI.D.7.c., pp. 97-109, as compared to 2001 Los Angeles MS4 Order, Part 4.D.3., pp.36-37 [new development/redevelopment project performance criteria]; Los Angeles MS4 Order, Part VI.D.8.d., pp.113-114, as compared to 2001 Los Angeles MS4 Order, Part 4.E., pp.42-45 [requirements for construction sites less than one acre].)

[70] As requested by the Environmental Petitioners, we took official notice of a Letter to the Water Management Administration, Maryland Department of the Environment, issued by USEPA Region III on August 8, 2012. (See fn. 19). We acknowledge that the letter states at page 3 that a provision in the Prince George County, Maryland, Phase I MS4 draft permit allowing for more time to complete tasks that were required under the previous permit constituted backsliding. The letter refers in passing to section 122.44(*l*)(1), but the letter has no regulatory effect and, further, is devoid of any analysis. The Environmental Petitioners have also pointed us to discussion of the regulatory anti-backsliding provisions in the NPDES Permit Writers' Manual. (NPDES Permit Writers' Manual, p. 7-4.) The relevant section of the NPDES Permit Writers' Manual does not explicitly distinguish between municipal storm water permits and traditional NPDES Permits in its discussion of the applicability of regulatory anti-backsliding provisions; however, nor does it specifically direct application of the anti-backsliding regulatory provisions to municipal storm water permits. We do not find this discussion to be to be determinative on the issue.

quantitative, non-numeric requirements such as BMPs and plans.[71] It is unnecessary, however, to resolve the ultimate applicability of the regulatory anti-backsliding provisions, because, assuming for the sake of argument they do apply, the WMP/EWMP provisions would qualify for an exception to backsliding as discussed below.

Even if the receiving water limitations in MS4 permits could be considered subject to the anti-backsliding requirements of the Clean Water Act or the federal regulations, backsliding would be permissible based on the new information available to the Los Angeles Water Board when it developed and adopted the Los Angeles MS4 Order. The Clean Water Act and federal regulations contain exceptions to the anti-backsliding requirements where new information is available to the permitting authority that was not available at the time of the issuance of the prior permit and that would have justified the imposition of less stringent effluent limitations at that time.[72] The Los Angeles Water Board makes a compelling argument in its October 15, 2013 Response that the development of 33 watershed-based TMDLs adopted since 2001, the inclusion and implementation of three of those TMDLs in the 2001 Los Angeles MS4 Order, and the TMDL-specific and general monitoring and analysis during implementation, have made new information available to the Los Angeles Water Board that fundamentally shaped the WMP/EWMP alternative of the Los Angeles MS4 Order. The Los Angeles Water Board states that the new information resulted in a new understanding that "time to plan, design, fund, operate and maintain [best management practices (BMPs)] is necessary to attain water quality improvements, and these BMPs are best implemented on a watershed scale."[73] The Los Angeles Water Board further points out that, in terms of water supply, there has been a paradigm shift in the last decade from viewing storm water as a liability to viewing it as a regional asset, and that the Los Angeles MS4 Order was drafted to incorporate this new paradigm into its structure.

The WMP/EWMP approach represents a comprehensive attempt to implement the Board's new understanding regarding how to make progress toward achieving water quality

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[71] See Order WQ 96-13 (*Save San Francisco Bay Association*) at pp. 8-10. Although the relevant portion of that decision primarily concerned Clean Water Act section 402(o), its analysis is equally instructive with respect to 40 C.F.R. section 122.44(*l*). (In passing, we note that the order appears to assume that the permit's water quality-based requirements for the MS4 permit were derived pursuant to section 301(b)(1)(C); however, that assumption is in error based on the *Defenders of Wildlife* decision and subsequent State Water Board precedent.)

[72] See 33 U.S.C. § 1342(o)(2)(B)(i); 40 C.F.R. § 122.44(*l*)(1) (anti-backsliding does not apply if the circumstances on which the previous permit was based have materially and substantially changed and would constitute cause for permit modification under 40 C.F.R. section 122.62); 40 C.F.R. § 122.62(a)(2) (stating that new information not available at the time the previous permit was issued is cause for modification); see also 40 C.F.R. §122.44(*l*)(2)(i)(B)(1).

[73] Los Angeles Water Board October 15, 2013 Response, p. 51.

standards as well as supporting the development of new water supplies.[74] The anti-backsliding requirements of the Clean Water Act and the federal regulations thus did not foreclose the incorporation of the WMP/EWMP alternatives into the Los Angeles MS4 Order even though the alternatives allow additional time to achieve receiving water limitations as compared to the immediate compliance required under the 2001 Los Angeles MS4 Order.

We shall amend Finding II.N. and Part III.D.4, page F-20, of Attachment F, Fact Sheet, as follows:

> **Finding II.N:**
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> **N. Anti-Backsliding Requirements.** Section 402(o)(2) of the CWA and federal regulations at 40 CFR section 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations may be relaxed. All effluent limitations in this Order are at least as stringent as the effluent limitations in the previous permit. **The Fact Sheet of this Order contains further discussion regarding anti-backsliding.**
>
> **Attachment F, Fact Sheet, Part III.D.4:**
>
> **4. Anti-Backsliding Requirements.** Sections 402(o)(2) and 303(d)(4) of the CWA and federal regulations at 40 CFR section 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations may be relaxed. ~~All effluent limitations in this Order are at least as stringent as the effluent limitations in the previous permit.~~ **While this Order allows implementation of Watershed Management Plans/EWMPs to constitute compliance with receiving water limitations under certain circumstances, the availability of that alternative and the corresponding availability of additional time to come into compliance with receiving water limitations, does not violate the anti-backsliding provisions. The receiving**

[74] The Environmental Petitioners argue that information relied on to develop the WMP/EWMP approach was available to the Los Angeles Water Board at the time of the issuance of the 2001 Los Angeles MS4 Order, since regional and watershed based strategies and technologies in storm water planning, as well as the potential benefits of storm water for water supply, were considered prior to the last permit cycle. Similarly, the Environmental Petitioners argue that some of the data gathered through TMDL development was through the process of assessing impairments and through preparing drafts of the TMDL and was therefore available to the Los Angeles Water Board in 2001. (Environmental Petitioners, Written Comments, Jan. 21, 2015, pp. 15-17, 23-25.) The Environmental Petitioners have asked us to take official notice of several documents that support these assertions. It is not necessary for us to do so because we do not disagree with the Environmental Petitioners that some of the information that the Los Angeles Water Board has cited in support of an exception to the anti-backsliding requirements was available at the time of the adoption of the 2001 Los Angeles MS4 Order. We nevertheless concur with the Los Angeles Water Board that the more than a decade of implementation of storm water requirements, as well as the development and implementation of TMDL requirements, since 2001, has, as a whole, fundamentally reshaped our understanding of the physical and time scale on which such measures must be implemented to bring MS4s into compliance with receiving water limitations. Further, we find that all regional water boards are informed by the information gained in the Los Angeles region, so that any regional water board that adopts an alternative compliance path in a subsequent Phase I permit would not be in violation of anti-backsliding requirements, regardless of the particular storm water permitting history of that region.

water limitations provisions of this Order are imposed under section 402(p)(3)(B) of the Clean Water Act rather than based on best professional judgment, or based on section 301(b)(1)(C) or sections 303(d) or (e), and are accordingly not subject to the anti-backsliding requirements of section 402(o). Although the non-applicability is less clear with respect to the regulatory anti-backsliding provisions in 40 Code of Federal Regulations section 122.44(*l*), the regulatory history suggests that USEPA's intent was to establish the anti-backsliding regulations with respect to evolving technology standards for traditional point sources. (See, e.g., 44 Fed.Reg. 32854, 32864 (Jun. 7, 1979)). It is unnecessary, however, to resolve the ultimate applicability of the regulatory anti-backsliding provisions, because the WMP/EWMP provisions qualify for an exception to backsliding as based on new information. The Watershed Management Plan/EWMP provisions of this Order were informed by new information available to the Board from experience and knowledge gained through the process of developing 33 watershed-based TMDLs and implementing several of the TMDLs since the adoption of the previous permit. In particular, the Board recognized the significance of allowing time to plan, design, fund, operate and maintain watershed-based BMPs necessary to attain water quality improvements and additionally recognized the potential for municipal storm water to benefit water supply. Thus, even if the receiving water limitations are subject to anti-backsliding requirements, they were revised based on new information that would support an exception to the anti-backsliding provisions. (33 U.S.C. § 1342(o)(2)(B)(i); 40 C.F.R. § 122.44(l)(1); 40 C.F.R. §122.44(l)(2)(i)(B)(1)).

2. Antidegradation

The Environmental Petitioners argue that the WMP/EWMP provisions of the Los Angeles MS4 Order violate the federal and state antidegradation policies.[75] The federal and state antidegradation policies generally require that the existing quality of water bodies be maintained, unless degradation is justified through specific findings. At a minimum, any degradation may not lower the quality of the water below the water quality standards.[76]

The federal and state antidegradation policies are not identical; however, where the federal antidegradation policy is applicable, the State Water Board has interpreted State Water Board Resolution No. 68-16, the state antidegradation policy, to incorporate the federal antidegradation policy.[77] In the context of the Los Angeles MS4 Order, a federal NPDES permit, compliance with the federal antidegradation policy would require consideration of the following: First, the Los Angeles MS4 Order must ensure that "existing instream uses and the level of

[75] 40 C.F.R. § 131.12; State Water Board Resolution No. 68-16, Statement of Policy with Respect to Maintaining High Quality Waters in California (State Water Board Resolution No. 68-16).

[76] *Ibid.*

[77] State Water Board Order WQ 86-17 (*Fay*), pp. 16-19.

water quality necessary to protect the existing uses" is maintained and protected.[78] Second, if the baseline quality of a water body for a given constituent "exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water, that quality shall be maintained and protected" through the requirements of the Los Angeles MS4 Order unless the Los Angeles Water Board makes findings that (1) any lowering of the water quality is "necessary to accommodate important economic or social development in the area in which the waters are located;" (2) "water quality adequate to protect existing uses fully" is assured; and (3) "the highest statutory and regulatory requirements for all new and existing point sources and all cost-effective and reasonable best management practices for nonpoint source control" are achieved.[79]

The Los Angeles MS4 Order must also comply with any requirements of State Water Board Resolution No. 68-16 beyond those imposed through incorporation of the federal antidegradation policy.[80] In particular, the Los Angeles Water Board must find that not only present, but also anticipated future uses of water are protected, and must ensure "best practicable treatment or control" of the discharges."[81] The baseline quality considered in making the appropriate findings is the best quality of the water since 1968, the year of the adoption of Resolution No. 68-16, or a lower level if that lower level was allowed through a permitting action that was consistent with the federal and state antidegradation policies.[82]

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[78] 40 C.F.R. § 131.12(a)(1). This provision has been interpreted to mean that, "[i]f baseline water quality is equal to or less than the quality as defined by the water quality objective, water quality shall be maintained or improved to a level that achieves the objectives." (State Water Board, Administrative Procedures Update, Antidegradation Policy Implementation for NPDES Permitting, 90-004 (APU 90-004), p. 4.) This provision is completely consistent with, and implemented by, the receiving water limitations provisions discussed above.

[79] 40 C.F.R. § 131.12(a)(2); see also State Water Board Resolution No. 68-16, Resolve 2. The federal regulations additionally require strict maintenance of water quality for "outstanding national resources." (40 C.F.R. § 131.12(a)(3).) There are no designated outstanding national resource waters covered by the Los Angeles MS4 Order.

[80] See State Water Board Order WQ 86-17 (*Fay)*, p. 23, fn. 11.

[81] State Water Board Resolution No. 68-16, Resolve 2. Best practicable treatment or control is not defined in Resolution No. 68-16; however, the State Water Board has evaluated what level of treatment or control is technically achievable using "best efforts." (See State Water Board Orders WQ 81-5 (*City of Lompoc*), WQ 82-5 (*Chino Basin Municipal Water District)*, WQ 90-6 (*Environmental Resources Protection Council*).) A Questions and Answers document on Resolution No. 68-16 by the State Water Board states as follows: "To evaluate the best practicable treatment or control method, the discharger should compare the proposed method to existing proven technology; evaluate performance data, e.g. through treatability studies; compare alternative methods of treatment or control; and/or consider the method currently used by the discharger or similarly situated dischargers . . .The costs of the treatment or control should also be considered . . . ." (Questions and Answers, Resolution No. 68-16, State Water Board (Feb. 16, 1995), pp. 5-6.)

[82] APU 90-004, p.4. The baseline for application of the federal antidegradation policy is 1975. For state antidegradation requirements, see also *Asociacion de Gente Unida por el Agua v. Central Valley Water Board* (2012) 210 Cal.App.4th 1255,1270. The baseline for the application of the state antidegradation policy is generally the highest water quality achieved since 1968. However, where a water quality objective for a particular constituent was adopted after 1968, the baseline for that constituent is the highest water quality achieved since the adoption of the *(Continued)*

The Los Angeles MS4 Order contains a conclusory antidegradation finding, but the Fact Sheet contains additional discussion.[83] The Fact Sheet discussion essentially conveys that, where there are high quality waters in the region, the antidegradation requirements are met because the Order requires best practicable treatment or control in the form of MEP and water quality standards compliance and, further, where the water quality is already impaired, the Order requires implementation of TMDL requirements to achieve water quality standards over time. The Fact Sheet also finds that the Los Angeles MS4 Order does not authorize an increase in waste discharges. The Los Angeles Water Board argues that it was not required to make more detailed findings because, using its best professional judgment and available data, it concluded that the Los Angeles MS4 Order would prevent any degradation. For this proposition, the Los Angeles Water Board cites to State Water Board guidance from 1990 (APU 90-004).[84] The guidance may be construed to exempt the Los Angeles Water Board from conducting an extensive pollutant by pollutant analysis for each water body in the region, but it does not exempt the Board from clearly stating its basis for finding that its action is consistent with the antidegradation policies.

The Los Angeles Water Board has provided a more extensive analysis of why the Los Angeles MS4 Order complies with the antidegradation policies in its October 15, 2013 Response. The Los Angeles Water Board argues that most of the water bodies impacted by the Los Angeles MS4 Order are already impaired for multiple constituents and that, even if some of these water bodies may have been higher quality in 1968, a scenario largely contradicted by the available data,[85] the appropriate baseline for the quality of such waters is the level of control achieved under the prior permit. The Los Angeles Water Board further argues that the Los Angeles MS4 Order has provisions that are equally or more stringent than those of the

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(continued from previous page)
objective. Resolution 68-16 requires a comparison of the existing quality to "the quality established in policies as of the date on which such policies become effective." (Resolution 68-16, Resolve 1.)

[83] Los Angeles MS4 Order, Finding II.M; Fact Sheet, Att. F, pp. F19-F20.

[84] APU 90-004, p. 2.

[85] We reviewed the Administrative Record, including the 1998 Clean Water Act section 303(d) List (May 12, 1999) (Administrative Record, section 10.VI.E., RB-AR35684-35733), the 2010 Clean Water Act section 303(d) List (Oct.11, 2011) (Administrative Record, section 10.VI.E., RB-AR35734-35785), Santa Monica Bay Restoration Project, An Assessment of Inputs of Fecal Indication Organisms and Human Enteric Viruses from Two Santa Monica Bay Storm Drains (1990) (Administrative Record, section 10.VI.E, RB-AR43363-43413), Toxic Substances Monitoring Program, 10 Year Summary Report 1978-1987 (Administrative Record, Order No. 01-182, R0044602-0045053) and comments submitted by interested persons to the Los Angeles Water Board (Administrative Record RB-AR1006-1038, RB-AR1100-1128, RB-AR1768-2119, RB-AR2653-2847, RB-AR5642-17888). We found no specific evidence presented to the Los Angeles Water Board of high quality waters in the region with regard to pollutants typically associated with storm water discharges; however, we also recognize that in the absence of specific evidence of high quality waters, a blanket statement that there are no high quality water body-pollutant combinations may be overbroad.

2001 Los Angeles MS4 Order and therefore will not allow water quality to degrade below the level of control achieved under the prior permit.

We agree with the Los Angeles Water Board that the Los Angeles MS4 Order maintains and improves the level of control achieved under the 2001 Los Angeles MS4 Order. We expect that the Los Angeles MS4 Order's TMDL requirements and receiving water limitations, which may be implemented through the WMP/EWMP provisions, will be the means for achieving water quality standards for the majority of degraded water bodies in the region. To assert, as the Environmental Petitioners do, that compliance with the receiving water limitations provisions of the 2001 Los Angeles Order is more stringent than establishing specific implementation requirements with clear deadlines for TMDL and receiving water limitations compliance is misguided. We are concerned with the totality of the provisions in the two permits and find that, viewed from that broader perspective, the Los Angeles MS4 Order is at least as stringent in addressing degradation as its predecessor.[86] The Los Angeles MS4 Order improves on past practices that have been inadequate to protect water quality, and includes a monitoring and assessment program that will identify any changes in water quality.[87] In general, under the Los Angeles MS4 Order, we expect to see a trajectory away from any past degradation, even if there may be some continued short-term degradation.

We are not persuaded, however, that the level of control achieved under the 2001 Los Angeles MS4 Order necessarily represents the baseline for purposes of an antidegradation analysis. The 2001 Los Angeles MS4 Order had only minimal findings regarding antidegradation and it is not apparent that any degradation that may have continued under the conditions of the 2001 Los Angeles MS4 Order was anticipated by the Los Angeles Water Board and supported with appropriate analysis regarding economic and social benefits[88] and best practicable treatment or control. We therefore find that the appropriate baseline remains 1968 or the highest quality of receiving waters attained since 1968. We acknowledge

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[86] In making this finding we also recognize that the Permittees may be deemed in compliance with receiving water limitations prior to approval of the WMP/EWMP. (Los Angeles MS4 Order Parts VI.C.2.d., pp. 52-53, VI.E.2.d.i.(4)(d), p. 144.) As discussed further under section II.B.6., we find that the Los Angeles Water Board reasonably exercised its discretion in allowing for compliance during the program development phase and further that the program development phase does not detract from the overall effectiveness of the permit provisions.

[87] *See Asociacion de Gente Unida, supra*, 210 Cal.App.4th at p. 1278.

[88] We note that the administrative record provides evidence that some discharge of storm water is to the maximum benefit of the people of the state because such discharge is necessary for flood control and public safety and helps accommodate development. (See, e.g., Administrative Record, section 10.VI.C, RB-AR30101; RB-AR32557-32558.)

that the evidence in the record indicates that it is unlikely that many water bodies were high quality even as far back as 1968, but we cannot make a blanket statement to that effect.[89]

Despite this conclusion, we will not remand the antidegradation issue to the Los Angeles Water Board for further consideration, but will make the findings ourselves based on the record before us. Our findings are necessarily made at a generalized level. Even if the directive of APU 90-004 to carry out a complete antidegradation analysis for each water body-pollutant combination is applicable here, there is simply insufficient data available (to us or the Los Angeles Water Board) to make such findings. The APU 90-004 contemplates the appropriate antidegradation analysis for a discrete discharge or facility. It has limited value when considering antidegradation in the context of storm water discharges from diffuse sources, conveyed through multiple outfalls, with multiple pollutants impacting multiple water bodies within a municipality, or in this case, region, especially given that reliable data on the baseline water quality from 1968 is not available.[90]

The Environmental Petitioners propose that antidegradation be addressed in subsequent actions of the Los Angeles Water Board by requiring that the reasonable assurance analysis (discussed in greater detail in section II.B.4.c. of this Order) supporting a WMP/EWMP also demonstrate that the proposed control measures will maintain high quality of waters with regard to pollutants for which they are not impaired. We reject this approach for two reasons. First, the Los Angeles Water Board was required under the federal and state antidegradation policies to evaluate whether permit conditions would lead to degradation of high quality waters at the time of permit issuance. Second, requiring Permittees to incorporate an evaluation of all water body-pollutant combinations, including those where there are no impairments or exceedances, would require them to expand the reasonable assurance analysis beyond its useful function and manageable scope.

We shall amend Finding II.M and Part D.3 at pages F-19 to F-20 of Attachment F, the Fact Sheet, as follows:

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[89] See fn. 85.

[90] We note that USEPA did not conduct a detailed antidegradation analysis in issuing NPDES Permit No. DC00000221 for MS4 discharges to the District of Columbia, presumably for similar reasons. The court in *Asociacion de Gente Unida* relied on APU 90-004 in part in rejecting an antidegradation analysis conducted by the Central Valley Regional Water Quality Control Board for discharges of pollutants to groundwater from dairy facilities region-wide, but the court's objection was to the regional water board's reliance on an illusory prohibition of discharge to groundwater in finding that no antidegradation analysis was required, not to the sufficiency of any generalized antidegradation analysis the Board might have conducted in lieu of its reliance on the prohibition. (210 Cal.App.4th at pp. 1271-1273.)

Finding II. M.

M. Antidegradation Policy
40 CFR section 131.12 requires that state water quality standards include an antidegradation policy consistent with the federal antidegradation policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16 ("Statement of Policy with Respect to Maintaining the Quality of the Waters of the State"). Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. Resolution No. 68-16 requires that existing water quality be maintained unless degradation is justified based on specific findings. The Regional Water Board's Basin Plan implements, and incorporates by reference, both the state and federal antidegradation policies. The permitted discharge is consistent with the antidegradation provision of section 131.12 and State Water Board Resolution No. 68-16 **as set out in the Fact Sheet.**

Attachment F, Fact Sheet Part III.D.3.

3. Antidegradation Policy. 40 CFR section 131.12[4] requires that the state water quality standards include an antidegradation policy consistent with the federal antidegradation policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16 ("Statement of Policy with Respect to Maintaining the Quality of the Waters of the State"). Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. The Regional Water Board's Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies. Resolution No. 68-16 and 40 CFR section 131.12 require the Regional Water Board to maintain high quality waters of the State **unless degradation is justified based on specific findings. First, the Board must ensure that "existing instream uses and the level of water quality necessary to protect the existing uses" are maintained and protected. Second, if the baseline quality of a water body for a given constituent exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water, that quality shall be maintained and protected through the requirements of the Order unless the Board makes findings that (1) any lowering of the water quality is necessary to accommodate important economic or social development in the area in which the waters are located; (2) water quality adequate to protect existing uses fully is assured; and (3) the highest statutory and regulatory requirements for all new and existing point sources and all cost-effective and reasonable best management practices for nonpoint source control are achieved. The Board must also comply with any requirements of State Water Board Resolution No. 68-16 beyond those imposed through incorporation of the federal antidegradation policy. In particular, the Board must find that not only present, but also anticipated future uses of water are protected, and must ensure best practicable treatment or control of the discharges. The baseline quality considered in making the appropriate findings is the best quality of the water since 1968, the year of the adoption of Resolution No. 68-16, or a lower level if that lower level was allowed through a permitting action that was consistent with the federal and state antidegradation policies.** ~~until it is demonstrated that any change in quality will~~

~~be consistent with maximum benefit to the people of the State, will not unreasonably affect beneficial uses, and will not result in water quality less than that described in the Regional Water Board's policies. Resolution 68-16 requires that discharges of waste be regulated to meet best practicable treatment or control to assure that pollution or nuisance will not occur and the highest water quality consistent with the maximum benefit to the people of the State be maintained.~~

The discharges permitted in this Order are consistent with the antidegradation provisions of 40 CFR section 131.12 and Resolution 68-16 **as set out in the Findings below:**~~.~~

1. ~~Many of the water bodies within the area covered by this Order are of high quality. The Order requires the Permittees to meet best practicable treatment or control to meet water quality standards. As required by 40 CFR section 122.44(a), the Permittees must comply with the "maximum extent practicable" technology-based standard set forth in CWA section 402(p).~~ Many of the waters within the area covered by this Order are impaired ~~and~~ **for multiple pollutants discharged through MS4s and are not high quality waters with regard to these pollutants. In most cases, there is insufficient data to determine whether these water bodies were impaired as early as 1968, but the limited available data shows impairment dating back for more than two decades. Many such water bodies are** listed on the State's CWA Section 303(d) List and either the Regional Water Board or USEPA has established TMDLs to address the impairments. **This Order ensures that existing instream (beneficial) water uses and the level of water quality necessary to protect the existing uses is maintained and protected**. This Order requires the Permittees to comply with permit provisions to implement the WLAs set forth in the TMDLs in order to restore the beneficial uses of the impaired water bodies consistent with the assumptions and requirements of the TMDLs. **This Order further requires compliance with receiving water limitations to meet water quality standards in the receiving water either by demonstrating compliance pursuant to Part V.A and the Permittee's monitoring and reporting program pursuant to Part VI.B or by implementing Watershed Management Programs/EWMPs with a compliance schedule.** This Order includes requirements to develop and implement storm water management programs, achieve water quality-based effluent limitations, and effectively prohibit non-storm water discharges through the MS4.

2. To the extent that some of the water bodies within the jurisdiction are high quality waters with regard to some constituents, this Order finds as follows:

a. Allowing limited degradation of high quality water bodies through MS4 discharges is necessary to accommodate important economic or social development in the area and is consistent with the maximum benefit to the people of the state. The discharge of storm water in certain circumstances is to the maximum benefit to the people of the state because it can assist with maintaining instream flows that support beneficial uses, may spur the development of multiple-benefit projects, and may be necessary for flood control, and public safety as well as to accommodate development in the

area. The alternative – capturing all storm water from all storm events – would be an enormous opportunity cost that would preclude MS4 permittees from spending substantial funds on other important social needs. The Order ensures that any limited degradation does not affect existing and anticipated future uses of the water and does not result in water quality less than established standards. The Order requires compliance with receiving water limitations that act as a floor to any limited degradation.

b. The Order requires the highest statutory and regulatory requirements and requires that the Permittees meet best practicable treatment or control. The Order prohibits all non-storm water discharges, with a few enumerated exceptions, through the MS4 to the receiving waters. As required by 40 CFR section 122.44(a), the Permittees must comply with the "maximum extent practicable" technology-based standard set forth in CWA section 402(p), and implement extensive minimum control measures in a storm water management program. Recognizing that best practicable treatment or control may evolve over time, the Order includes new and more specific requirements as compared to Order No. 01-182. The Order incorporates options to implement Watershed Management Programs or EWMPs that must specify concrete and detailed structural and non-structural storm water controls that must be implemented in accordance with an approved time schedule. The Order contains provisions to encourage, wherever feasible, retention of the storm water from the 85th percentile 24-hour storm event.

~~The issuance of this Order does not authorize an increase in the amount of discharge of waste. The Order includes new requirements to implement WLAs assigned to Los Angeles County MS4 discharges that have been established in 33 TMDLs, most of which were not included in the previous Order.~~

3. Compliance Schedules and the Appropriateness of Enforcement Orders

The Environmental Petitioners concede that immediate compliance with receiving water limitations is not achievable in many instances and that some additional time to reach compliance is warranted. They have proposed an alternative to the WMP/EWMP that would incorporate many of the provisions of those programs but require implementation through the mechanism of a time schedule order or other enforcement order rather than as permit conditions. The Los Angeles MS4 Order already provides that Permittees who are out of compliance with final WQBELs and other TMDL-specific limitations may request a time schedule order.[91] Under the alternative proposed by the Environmental Petitioners, all Permittees that are currently out of compliance with receiving water limitations not addressed by a TMDL as well as with interim TMDL requirements with passed compliance deadlines, would be issued a time schedule order or other enforcement order not to exceed the five year term of

[91] Los Angeles MS4 Order, Part VI.E.4., pp.146-147.

the permit. The Permittees would then implement a WMP/EWMP type plan to achieve compliance with the appropriate limitations within the confines of the enforcement order.

In the prior two sections, we found that the WMP/EWMP provisions are not contrary to the anti-backsliding or antidegradation requirements of federal and state law. We therefore disagree with the Environmental Petitioners that the relevant provisions must be stricken from the Order and incorporated instead into an enforcement order for those reasons. We also find that, given that strict compliance with water quality standards is discretionary in MS4 permits, the Los Angeles Water Board was not restricted to limiting the schedule for compliance with receiving water limitations to the term of the Los Angeles MS4 Order.

Further, from a policy perspective, we find that the MS4 Permittees that are developing and implementing a WMP/EWMP should be allowed additional time to come into compliance with receiving water limitations and interim and final TMDLs through provisions built directly into their permit, rather than through enforcement orders. Building a time schedule into the permit itself, as the Los Angeles MS4 Order does, is appropriate because it allows a more efficient regulatory structure compared to having to issue multiple enforcement orders. More importantly, it is appropriate to regulate Permittees in a manner that allows them to strive for compliance with the permit terms, provided no provision of law otherwise precludes including the schedule in the NPDES permit. For example, for traditional point source discharges subject to strict compliance with water quality standards pursuant to section 301(b)(1)(C), the terms of a compliance schedule are dictated by our compliance schedule policy (State Water Board Resolution 2008-0025) and any additional time for compliance could only be under the auspices of an enforcement order outside the permit.[92]

The WMP/EWMP provisions constitute an effort to set ambitious, yet achievable, targets for Permittees; receiving water limitations, on the other hand, while the ultimate goal of MS4 permitting, may not in all cases be achievable within the five-year permit cycle. Generally, permits are best structured so that enforcement actions are employed when a discharger shows some shortcoming in achieving a realistic, even if ambitious, permit condition and not under circumstances where even the most diligent and good faith effort will fail to achieve the required condition. We add that it is our intention to encourage a watershed-based approach to addressing storm water issues going forward and that it would be contrary to that intention to

[92] We also note that the State Water Board's Policy for the Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (2005) (State Implementation Policy) and the CTR itself (40 C.F.R. § 131.38(e)) restrict the scope of compliance schedules for effluent limitations addressing the discharge of toxic pollutants; however the policy does not apply to storm water discharges. (State Implementation Policy, p.3, fn.1.)

structure the watershed-based requirements as an enforcement order. We will not require Permittees that propose and timely implement a WMP/EWMP to request time schedule orders or other enforcement orders as a precondition of being in compliance with the receiving water limitations or interim TMDL requirements of the Los Angeles MS4 Order.

While declining to structure the WMP/EWMP provisions generally as an enforcement order, we acknowledge that time schedule orders are appropriate under some circumstances. We have already noted that the Los Angeles MS4 Order allows a Permittee to request a time schedule order where a final compliance deadline for a state-adopted TMDL has passed and the Permittee believes that additional time to comply with the requirement is necessary.[93] We expect that a Permittee will request a time schedule order also if the Permittee fails to meet a final compliance deadline for a TMDL after the adoption date of the Los Angeles MS4 Order. We will also provide that a Permittee may request a time schedule order if the Permittee fails to meet a final compliance deadline for a receiving water limitation set in the Permittee's WMP/EWMP.

We shall add a new Part VI.C.6.b and revise Part VI.E.4.b as follows:

Part VI.C.6

b. Where a Permittee believes that additional time to comply with a final receiving water limitation compliance deadline set within a WMP/EWMP is necessary, and the Permittee fails to timely request or is not granted an extension by the Executive Officer, a Permittee may, no less than 90 days prior to the final compliance deadline, request a time schedule order pursuant to California Water Code section 13300 for the Regional Water Board's consideration.

Part VI.E.4

b. Where a Permittee believes that additional time to comply with the final water quality-based effluent limitations and/or receiving water limitations is necessary, a Permittee may within 45 days of Order adoption**, or no less than 90 days prior to the final compliance deadline if after adoption of the Order,** request a time schedule order pursuant to California Water Code section 13300 for the Regional Water Board's consideration.

4. Rigor and Accountability in the WMPs/EWMPs

We now turn to a consideration, from a technical as well as policy lens, as to whether the WMPs/EWMPs are structured in a manner that will maximize the likelihood of

[93] *Ibid.*

reaching the ultimate goal of the compliance alternative – achieving receiving water limitations.[94] We can support an alternative approach to compliance with receiving water limitations only to the extent that that approach requires clear and concrete milestones and deadlines toward achievement of receiving water limitations and a rigorous and transparent process to ensure that those milestones and deadlines are in fact met. Conversely, we cannot accept a process that leads to a continuous loop of iterative WMP/EWMP implementation without ultimate achievement of receiving water limitations.

We find below that the WMP/EWMP provisions generally ensure the appropriate rigor, transparency, and accountability, and that, with the few revisions we direct, are designed to lead to achievement of receiving water limitations.[95]

a. Milestones and Compliance Deadlines

We first consider whether the WMP/EWMP provisions require clear, concrete, and finite milestones and deadlines.

For water body-pollutant combinations addressed by TMDLs, the Los Angeles MS4 Order requires the Permittees to incorporate the compliance schedules found in Attachments L through R of the Order, which reflect previously adopted TMDL-based requirements, into the WMP/EWMP, and, as necessary, to develop interim milestones and dates for their achievement.[96] A Permittee that does not thereafter comply with the approved compliance schedule must instead demonstrate compliance with the WQBELs and other TMDL-specific limitations of the Order.[97] For water body-pollutant combinations not addressed by a TMDL, but where the relevant pollutant is one for which the water body is identified as impaired on the Clean Water Act section 303(d) List and the pollutant is in the same class as a TMDL pollutant, the Order requires that the WMP/EWMP incorporate a schedule consistent with the TMDL schedule for the same class pollutant.[98] A Permittee that does not thereafter comply with

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[94] From a legal standpoint, our analysis serves to verify that the Los Angeles MS4 Order's alternative compliance approach through WMPs/EWMPs is supported by the findings and by evidence in the record. (*Topanga Assn. for a Scenic Community v. County of Los Angeles* (1974) 11 Cal.3d 506.)

[95] We do not agree with Permittee Petitioners that the WMP/EWMP provisions are precluded by the program requirements of 40 Code of Federal Regulations section 122.26. Nor do we agree that the requirements are vague or lack definition. The WMP/EWMP provisions of the Order are guidelines for development of a subsequent program with more specificity to be approved by the Los Angeles Water Board or its Executive Officer.

[96] Los Angeles MS4 Order, Part VI.C.5.c., pp.64-65.

[97] *Id.*, Part VI.E.2.d.i(4)(c), p.144.

[98] *Id.*, Part VI.C.2.a.i., pp. 49-50.

the approved compliance schedule must instead demonstrate immediate compliance with the receiving water limitations in Part V.A.[99] We will not disturb these provisions.

With regard to exceedances of receiving water limitations not addressed by a TMDL, and where the pollutant is not in the same class as a pollutant addressed by a TMDL, the Order requires that the WMP/EWMP include milestones based on measurable criteria or indicators and a schedule for achieving the milestones. The WMP/EWMP must also incorporate a final date for achievement of receiving water limitations, but that date is circumscribed simply as "as soon as possible."[100] Parts VI.C.2.a.ii.(4) and VI.C.2.a.iii.(2)(c) help clarify the meaning of "as soon as possible:"

> Permittees shall identify enforceable requirements and milestones and dates for their achievement to control MS4 discharges such that they do not cause or contribute to exceedances of receiving water limitations within a timeframe(s) that is as short as possible, taking into account the technological, operation, and economic factors that affect the design, development, and implementation of the control measures that are necessary. The time between dates shall not exceed one year. Milestones shall relate to a specific water quality endpoint (e.g., x% of the MS4 drainage area is meeting the receiving water limitations) and dates shall relate either to taking a specific action or meeting a milestone.[101]

We will make a revision to the compliance schedule provisions to make it clear that the term "as soon as possible" is to be interpreted consistent with the more specific direction cited above. However, because the WMP/EWMP, and therefore the proposed compliance schedule, is subject to public review and comment and approval by the Los Angeles Water Board or its

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[99] *Id.*, Part VI.C.2.c., p.52.

[100] *Id.*, Part VI.C.5.c.iii.(3), p. 65. If the pollutant is not in the same class as those addressed in a TMDL, but the water body is still identified as impaired for that pollutant, the WMP/EWMP must either have a final compliance deadline within the 5 year permit term or Permittees are expected to initiate development of a stakeholder-proposed TMDL and incorporate a compliance schedule consistent with the TMDL. (*Id.*, Part VI.C.2.a. ii., pp. 50-51) (If the exceedances are in a drainage area implementing the storm water retention approach, there is no requirement to initiate the TMDL development process.) The requirement to address receiving water limitations is ongoing. As exceedances are found through monitoring for water body-pollutant combinations not identified on the 303(d) List, Permittees must either meet receiving water limitations or include the water body-pollutant combination in the WMP/EWMP and set enforceable requirements and milestones and dates for their achievement within a time frame that is as short as possible. (*Id.*, Part VI.C.2.a.iii, pp. 51-52.) Permittees are deemed in compliance with receiving water limitations only for water body-pollutant combinations addressed in the WMP/EWMPs. Thus, as pointed out by several interested parties, for lower priority water body-pollutant combinations not incorporated into a WMP/EWMP for which exceedances are detected, Permittees may be in violation of the receiving water limitations. A Permittee always has the ability to reprioritize a water body-pollutant combination from low priority to high priority and amend its WMP/EWMP to incorporate measures to address that water body-pollutant combination.

[101] *Id.*, Parts VI.C.2.a.ii.4, p. 50, VI.C.2.a.iii.(2)(c), p. 51 (identical language).

Executive Officer,[102] we do not find it necessary to constrain the determination of milestones and dates for the achievement of receiving water limitations any further.

We shall amend Part VI.C.5.c.iii.(3)(b) as follows:

(b) A final date for achieving the receiving water limitations as soon as possible**, consistent with Parts VI.C.2.a.ii.(4) & VI.C.2.a.iii.(2)(c)**.

b. Constraints on Extension of Deadlines

The fact that the Los Angeles MS4 Order requires the establishment of concrete and rigorous deadlines within the WMP/EWMP for the achievement of receiving water limitations is critical to ensuring progress on such achievement; however, the Order also contemplates that the deadlines, with the exception of those compliance deadlines established in a TMDL, may be extended.[103] The WMP/EWMP is subject to an adaptive management process. Based on the results of that process the Permittees may propose modifications, including modifications to compliance deadlines and interim milestones, in the Annual Report.[104]

The potential for multiple extensions is nevertheless ameliorated by the fact that extensions of compliance deadlines and interim milestones require Los Angeles Water Board Executive Officer approval,[105] and are accordingly, subject to a 30-day public comment period.[106] The public comment period will allow all other interested persons to weigh in on the appropriateness of any requested extensions. If thereafter dissatisfied with the determination made by the Executive Officer, interested persons may additionally seek review of the Executive Officer's decision by the Los Angeles Water Board.[107] Of course, in cases where no extension

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[102] *Id.*, Part VI.C.4.c., p.56, Table 9, p. 54, Part VI.A.5.b., p. 42, Att. F, Fact Sheet, p. F-42. Under Part VI.A.5.b, "[a]ll documents submitted to the Regional Water Board Executive Officer for approval shall be made available to the public for a 30-day period to allow for public comment."

[103] *Id.*, Parts VI.C.7, p.66, VI.C.8, pp.66-67.

[104] *Id.*, Part, VI.C.8, p.67. Under another provision of the Order, Permittees may at any time request an extension of deadlines for achievement of interim milestones established to address exceedances of receiving water limitations not otherwise addressed by a TMDL. (*Id.*, Part VI.C.6.a., p.65.) (We note that the cited provision refers to "milestones established pursuant to Part VI.C.4.c.ii.(3)," but the intent appears to have been to reference Part VI.C.5.c.iii.(3).) But as we read the Los Angeles MS4 Order, extensions of not just interim deadlines for achievement of milestones but also final compliance deadlines to achieve receiving water limitations are already allowed under the adaptive management provisions of Part VI.C.8.a.ii.: "Based on the results of the adaptive management process, Permittees shall report any modifications, including where appropriate *new compliance deadlines* and interim milestones, with the exception of those compliance deadlines established in a TMDL, necessary to improve the effectiveness of the Watershed Management Program or EWMP, in the Annual Report . . . ." (Emphasis added.)

[105] *Id.*, Parts VI.C.8, p.67, VI.C.6.a., p.65. We recognize that as currently written the adaptive management provisions in effect deem any modifications to the WMPs/EWMPs approved if the Executive Officer "expresses no objections" within 60 days. (*Id.,* Part VI.C.8.a.iii., p. 67.) With our revisions, any deadline extensions must be affirmatively approved by the Executive Officer.

[106] *Id.*, Part VI.A.5.b, p. 42.

[107] *Id.*, Part VI.A.6, p.42.

is available, as with final deadlines established in TMDLs,[108] or where no extension is requested or granted, failure to meet a deadline means that the Permittee will have to comply from that time forward with the receiving water limitations or WQBELs and other TMDL-specific limitations or request a time schedule order. Therefore, Permittees cannot rely on the certainty of a deadline extension, and Permittees have a strong incentive to implement control measures that will in fact get them to compliance by the established deadline. Given that the Permittees and the Los Angeles Water Board are working with limited data regarding storm water impacts and control measure performance, especially where TMDLs have not been developed, we are hesitant to remove all flexibility for deadline extensions, and find that the Order strikes an appropriate balance.

Permittee Petitioners seek even greater flexibility under the WMP/EWMP provisions for adjusting approved control measures and time lines. They advocate for amendments that would allow a Permittee to propose alternative controls or time lines upon a demonstration that required controls for timely achievement of a limitation are either technically infeasible or otherwise constitute a substantial hardship to the Permittee. We have found above that, in the case of final deadlines set in the WMP/EWMP for achievement of receiving water limitations not otherwise addressed in a TMDL, the Los Angeles MS4 Order already provides for an opportunity to propose new deadlines through the adaptive management process. We will make a clarifying revision below to confirm that Permittees may ask for extensions in meeting receiving water limitations not addressed by a TMDL. Technical infeasibility or substantial hardship may be grounds for such a request. The Los Angeles Water Board Executive Officer, in turn, may, after allowing for public review and comment, choose to (1) extend the deadline, (2) decline the extension but approve any time schedule order requested by the Permittee, or (3) decline the extension and not approve a time schedule order, with the result that the Permittee will be out of compliance with the provision of the WMP/EWMP and therefore the receiving water limitations of Part V.A. As stated previously, interested persons may thereafter ask the Los Angeles Water Board to review the Executive Officer's determination.[109]

With regard to final deadlines for WQBELs and other TMDL-specific limitations, we will not amend the WMP/EWMP provisions to add flexibility for extensions. We find that the only option appropriately available to a Permittee unable to meet final deadlines that are set out in a TMDL and incorporated into the Los Angeles MS4 Order and the WMP/EWMPs, is to

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[108] *Id.*, Part VI.C.8.a.ii., p.67.

[109] *Id.*, Part VI.A.6, p.42.

request a time schedule order, consistent with Part VI.E.2.e. of the Order, as that Part was amended in section II.B.3. above.[110]

We shall amend Part VI.C.6.a as follows:

a. Permittees may request an extension of deadlines for achievement of interim milestones **and final compliance deadlines** established pursuant to Part VI.C.4**5**.c.iii.~~(3) only~~**, with the exception of those final compliance deadlines established in a TMDL**. Permittees shall provide requests in writing at least 90 days prior to the deadline and shall include in the request the justification for the extension. Extensions ~~shall be subject to approval by~~ **must be affirmatively approved by** the Regional Water Board Executive Officer, **notwithstanding Part VI.C.8.a.iii.**

c. Rigor and Accountability in the Process

We see three additional components of the WMPs/EWMPs as essential to ensuring that the proposed WMPs/EWMPs are in fact designed to achieve receiving water limitations within the appropriate time frame.

First, as documents to be approved by either the Los Angeles Water Board or its Executive Officer, the WMPs/EWMPs are subject to a public review and comment period.[111] Such review includes consideration of proposed control measures, deadlines for achievement of final limitations, and the reasonable assurance analysis that supports the WMP/EWMP. We expect this public process to vet the proposed WMPs/EWMPs and facilitate revisions to strengthen the programs as needed, thereby providing some assurance that approved WMPs/EWMPs will achieve the water quality targets set out.

Second, the requirement for a reasonable assurance analysis in particular is designed to ensure that Permittees are choosing appropriate controls and milestones for the WMP/EWMP.[112] Competent use of the reasonable assurance analysis should facilitate achievement of final compliance within the specified deadlines.[113]

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[110] Final TMDL deadlines are established and incorporated into the Basin Plans during the TMDL development process. That process invites stakeholder participation and the proposed schedule is subject to public review and comment and approval by the relevant regional water board, the State Water Board, and USEPA. The deadlines are established with consideration of the time needed for compliance for all dischargers contributing to an impairment, including industrial and construction storm water dischargers and traditional NPDES dischargers. Although we recognize that it may not always be feasible for municipal storm water dischargers to meet final TMDL deadlines, short of amending the Basin Plan to modify the deadlines (see *California Association of Sanitation Agencies v. State Water Resources Control Board* (2012) 208 Cal.App.4th 1438), we find it appropriate for the dischargers to request time schedule orders rather than be granted an extension within the provisions of the Los Angeles MS4 Order.

[111] See Los Angeles MS4 Order, Parts VI.C.4.d., p. 57, VI.C.6, p. 65, Table 9, p.54; see also id., Part VI.A.5., p. 42.

[112] *Id.*, Part VI.C.5.b.iv.(5), pp. 63-64.

[113] We note that the Los Angeles Water Board has released guidance on the development of a reasonable assurance analysis. The guidance was released after adoption of the Los Angeles MS4 Order and accordingly is not

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Third, the adaptive management provisions of the Order ensure that the Permittees will evaluate monitoring data and other new information every two years and consider progress up to that point on achieving WQBELs and other TMDL-specific limitations. Permittees are required as part of the adaptive management process to propose modifications to improve the effectiveness of the WMP/EWMP and implement those modifications.[114]

While we are supportive of all of these measures, we find that they should be strengthened. As a preliminary matter, we will require the Permittees to submit specific information, concurrently with the two-year adaptive management process, that will assist the Los Angeles Water Board in determining how effective the WMP/EWMP path is in spurring the completion of on-the-ground structural control measures that lead to measurable water quality improvement. As we discuss further in Section II.B.8 of this Order, we will direct the Los Angeles Water Board to report to the State Water Board periodically on the effectiveness of the WMP/EWMP approach and expect the additional information submitted by the Permittees to inform that report.

More significantly, we will add a provision that requires Permittees to comprehensively update the reasonable assurance analysis and the WMP/EWMP, following an opportunity to implement the adaptive management process. Given the limitations inherent in models, as well as the potential incentive to choose the lowest effort and cost level predicted by the model to achieve receiving water limitations,[115] we are concerned that reliance on one initial reasonable assurance analysis is insufficient to ensure that in the long term WMPs/EWMPs will

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part of the Administrative Record. We nevertheless take this opportunity to state that we expect any revisions and updates to the guidance to be subject to a public process as part of reissuance of the Los Angeles MS4 Order.

[114] Los Angeles MS4 Order, Part VI.C.8., pp. 66-67. We add that the adaptive management process will also allow Permittees to revise their WMPs/EWMPs to take advantage of funding opportunities as they arise in the future, including funding opportunities through Assembly Bill 2403 (approved by Governor, June 28, 2014 (2013-2014 Reg. Sess.)) and Proposition 1 (approved by ballot Nov. 4, 2014). We are cognizant of criticism that the adaptive management process is just another version of the ineffective iterative process of the receiving water limitations. These arguments are misplaced. Unlike the iterative process of the receiving water limitations, the adaptive management process is only one component of a series of actions required under the WMP/EWMP and acts as a periodic check to ensure that all the other requirements are achieving the stated goals of the WMP/EWMP within clearly stated deadlines. As our discussion above makes clear, we would not endorse an alternative compliance path with the sole requirement to adaptively manage implemented control measures. Further, the adaptive management process in the Los Angeles MS4 Order differs from the iterative process in that Permittees must carry out the adaptive management process every two years, limiting any discretionary determination as to when the program must be evaluated. (Los Angeles MS4 Order, Part VI.C.8.a.)

[115] The numerical analysis methods and models approved for use by Permittees for estimating hydrologic conditions and contaminant fate and transport in the watersheds should, in principle, be able to propagate any and all known uncertainty to the outputs and results. It is in the public interest that the Los Angeles Water Board communicate this uncertainty to all stakeholders, as the results in most cases will affect the beneficial uses of California waters. Moreover, it is highly desirable that, to the extent possible, the Los Angeles Water Board define a minimum level of uncertainty (or level of confidence) acceptable for a reasonable assurance analysis to be approved.

achieve relevant water quality goals. . Currently, as stated above, the Permittees are required to implement the adaptive management process every two years from the date of program approval. Under the provision we add, the Permittees will be required to comprehensively update the reasonable assurance analysis (including potentially considering whether the model itself and its assumptions require updating) and the WMP/EWMP after several years of adaptive management, based on previous years' monitoring data and other performance measures. The Permittee will submit a full revised package to the Los Angeles Water Board Executive Officer for approval, following public review.

Given that the WMPs/EWMPs in many cases address water quality targets that are to be achieved a decade or more in the future, a periodic, complete re-consideration and recalibration of the assumptions and predictions that support the proposed control measures and implementation schedule in light of new data, above and beyond the two-year adaptive management requirements of the Los Angeles MS4 Order, is essential, notwithstanding the additional time and effort that Permittees must expend on the update. We also recognize that such review is a staff intensive process for the Los Angeles Water Board, but addressing storm water impacts is a priority for that Board. Although we expect that the update will be necessary in most cases, the new requirements provide that the Executive Officer of the Los Angeles Water Board may waive the requirement for an update if the Permittee demonstrates through water quality monitoring that the WMP/EWMP is meeting appropriate targets. Our direction to require a comprehensive update of the reasonable assurance analyses and the WMPs/EWMPs after several cycles of adaptive management should in no way be construed as limiting the Los Angeles Water Board Executive Officer's discretion to request such updates earlier in the implementation process or the obligation of the Permittees to initiate such updates earlier in the implementation process based on the ongoing adaptive management process.

The second added provision will not be relevant for the permit term of the order before us; however, we anticipate that the next iteration of an MS4 Order for the Los Angeles area will closely track the Los Angeles MS4 Order to allow for continued implementation of the WMP/EWMPs.

We shall amend Part VI.C.8 by adding new subsections a.iv. and b. as follows:

a.

iv. Permittees shall report the following information to the Regional Water Board concurrently with the reporting for the adaptive management process:

(1) On-the-ground structural control measures completed;

(2) Non-structural control measures completed;

(3) Monitoring data that evaluates the effectiveness of implemented control measures in improving water quality;

(4) Comparison of the effectiveness of the control measures to the results projected by the RAA;

(5) Comparison of control measures completed to date with control measures projected to be completed to date pursuant to the Watershed Management Program or EWMP;

(6) Control measures proposed to be completed in the next two years pursuant to the Watershed Management Program or EWMP and the schedule for completion of those control measures;

(7) Status of funding and implementation for control measures proposed to be completed in the next two years.

b. Watershed Management Program Resubmittal Process

i. In addition to adapting the Watershed Management Program or EWMP every two years as described in Part VI.C.8.a., Permittees must submit an updated Watershed Management Program or EWMP with an updated Reasonable Assurance Analysis by June 30, 2021, or sooner as directed by the Regional Water Board Executive Officer or as deemed necessary by Permittees through the Adaptive Management Process, for review and approval by the Regional Water Board Executive Officer. The updated Reasonable Assurance Analysis must incorporate both water quality data and control measure performance data, and any other information informing the two-year adaptive management process, gathered through December 31, 2020. As appropriate, the Permittees must consider any new numeric analyses or other methods developed for the reasonable assurance analysis. The updated Watershed Management Program or EWMP must comply with all provisions in Part VI.C. The Regional Water Board Executive Officer will allow a 60-day public review and comment period with an option to request a hearing. The Regional Water Board Executive Officer must approve or disapprove the updated Watershed Management Program or EWMP by June 30, 2022. The Executive Officer may waive the requirement of this provision, following a 60-day public review and comment period, if a Permittee demonstrates through water quality monitoring data that the approved Watershed Management Program or EWMP is meeting appropriate water quality targets in accordance with established deadlines.

5. Determination of Compliance with Final Requirements

a. Compliance with Final TMDL Requirements[116]

Part VI.E.2.e.i.4. of the Los Angeles MS4 Order provides that Permittees will be deemed in compliance with the final WQBELs and other TMDL-specific limitations if "[i]n drainage areas where Permittees are implementing an EWMP, (i) all non-storm water and (ii) all storm water runoff up to and including the volume equivalent to the 85th percentile, 24 hour event is retained for the drainage area tributary to the applicable receiving water."[117] Part VI.E.2.e.i.4 is one of four options available to the Permittee in Part VI.E.2.e. to be deemed in compliance with WQBELs and other TMDL-specific limitations. The other three options allow a Permittee to establish compliance with a final WQBEL or other TMDL-specific limitation by showing that (1) there are no violations of the final WQBEL; (2) there are no exceedances of the receiving water limitation for the specific pollutant in the receiving water at or downstream of the Permittee's outfall, or (3) there is no direct or indirect discharge from the Permittee's MS4 to the receiving water during any relevant time period.[118] These three options ensure that either the receiving water limitations or WQBELs and other TMDL-specific limitations are in fact being complied with. In contrast, the storm water retention approach assumes compliance with *final* WQBELs and other TMDL-specific limitations, and accordingly, compliance with the receiving water limitations in Part V for the relevant water body-pollutant combinations,[119] even if the final WQBELs and other TMDL-specific limitations are not actually being achieved. The Environmental Petitioners argue that the Los Angeles Water Board has failed to establish through findings and record evidence that the storm water retention approach will in fact achieve compliance with the WQBELs and other TMDL-specific limitations and that the Los Angeles

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[116] The Los Angeles MS4 Order additionally deems compliance with *interim* WQBELs and other TMDL-specific limitations if the "Permittee has submitted and is fully implementing an approved" WMP/EWMP. (Los Angeles MS4 Order, Part VI.E.2.d.i.(4), p. 143; see also *id.*, Part VI.C.3.a., p. 53.) Because Permittees are required to incorporate into the WMP/EWMP compliance schedules "compliance deadlines occurring within the permit term for all applicable interim . . . water quality-based effluent limitations and/or receiving water limitations in Part VI.E and Attachments L through R," we expect that in most cases full implementation of the WMP/EWMP necessarily results in compliance with interim WQBELs and other TMDL-specific limitations. However, to the extent this is not the result reached, we find that requiring implementation of the WMP/EWMP with control measures designed to achieve interim WQBELs and other TMDL-specific limitations, in lieu of showing actual compliance with any *interim* numeric requirements, is consistent with the assumptions and requirements of the wasteload allocations of the relevant TMDLs. (40 C.F.R. § 122.44(d)(1)(vii)(B).)

[117] Los Angeles MS4 Order, Part VI.E.2.e.i.(4), p. 145.

[118] *Id.*, Part VI.E.2.e.i.(1)-(3), pp. 144-45.

[119] We note again that Part VI.E.2.c.i. states that Part VI.E establishes the manner of achieving compliance with the receiving water limitations in Part V.A where the receiving water limitations are associated with water body-pollutant combinations addressed in a TMDL.

MS4 Order's reliance on the storm water retention approach for final compliance determination is therefore contrary to the law.

We are supportive of the EWMP's use of the storm water retention approach as a technical requirement. Retention of storm water is likely to be an effective path to water quality improvement. Furthermore, in addition to preventing pollutants from reaching the receiving water except as a result of high precipitation events (which also generally result in significant dilution in the receiving water), the storm water retention approach has additional benefits including recharge of groundwater, increased water supply, reduced hydromodification effects, and creation of more green space to support recreation and habitat.[120]

We have some concerns, however, with the lack of verification in the Los Angeles MS4 Order that final WQBELs and other TMDL-specific limitations or receiving water limitations will in fact be met as a result of implementation of the storm water retention approach. We acknowledge that, in most cases, the final TMDLs have deadlines outside of the permit term for the Los Angeles MS4 Order and that, therefore, with regard to those, our concerns are more theoretical at this point than immediate. Nevertheless, we agree with the Environmental Petitioners that the evidence in the Administrative Record is not sufficient to establish that the storm water retention approach will in all cases result in achievement of final WQBELs and other TMDL-specific limitations and, more importantly, are concerned that the Order itself does not incorporate clear requirements that would provide for such verification in the process of implementation.

With regard to evidence in the Administrative Record, it is clear that the storm water retention approach is a promising approach for achieving compliance with receiving water limitations, with multiple additional environmental benefits. But the research regarding the storm water retention approach is still in early stages and we cannot say with certainty at this point that implementation will lead to compliance with receiving water limitations in all cases.[121]

With that conclusion in mind, we look to the Los Angeles MS4 Order itself to determine if there are sufficient additional provisions to assure that, in the long run, the storm water retention approach will achieve the ultimate goal of compliance with receiving water limitations. We first note that the Order does not require a reasonable assurance analysis when

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[120] See e.g. Administrative Record, section 10.VI.C, RB-AR29263-29311, RB-AR32318-32350.

[121] We reviewed the citations to the Administrative Record provided in the Los Angeles Water Board October 15, 2013 Response and in the October 15, 2013 Responses of many of the Petitioners. We find that the cited studies show the storm water retention to be a promising approach to meeting water quality standards, but do not establish, at a sufficiently high level of confidence, that the storm water retention approach will definitively achieve compliance with the receiving water limitations.

a Permittee opts for the storm water retention approach. Permittees are required to conduct a reasonable assurance analysis for each water body-pollutant combination addressed by a WMP, with the objective of demonstrating the ability of the controls to ensure that MS4 discharges achieve applicable WQBELs and do not cause or contribute to exceedances of receiving water limitations.[122] The relevant provisions reference EWMPs, but elsewhere the Order states that the reasonable assurance analysis is only required for areas covered by the EWMP where retention of the 85th percentile, 24-hour storm event is not feasible.[123] The Fact Sheet also implies that the requirement for a reasonable assurance analysis is confined to situations where the storm water retention approach is not feasible.[124] In sum, then, Permittees that choose to develop and implement an EWMP are required to conduct a reasonable assurance analysis for each waterbody-pollutant combination addressed by the EWMP, except in the drainage areas that are tributary to the storm water retention projects.

The fact that the storm water retention approach does not require a reasonable assurance analysis prior to implementation to demonstrate the ability of the approach to achieve compliance with the limitations is mitigated in part by required monitoring and adaptive management to verify compliance following implementation. Although the provision could be clearer, we read the language "[i]n drainage areas where Permittees are implementing an EWMP" in Part VI.E.2.e.i.(4) to require Permittees to be in compliance with all aspects of the EWMP, including the monitoring and adaptive management provisions of Parts VI.C.7 and 8, to be deemed in compliance with final limitations through the storm water retention approach. As we read the Order, a Permittee's showing that it has retained all non-storm water and all storm water up to and including the volume equivalent to the 85th percentile, 24-hour event, establishes compliance, but only if the Permittee continues to conduct monitoring and adapt the EWMP in response to the monitoring. The Los Angeles Water Board appears to read the Order the way we do, as it states in its October 15, 2013 Response that "the Permit requires monitoring and adaptive management, which will continue to inform the Los Angeles Water Board regarding the efficacy of this storm water retention approach in conjunction with implementation of the other storm water management program elements and any needed

[122] Los Angeles MS4 Order, Part VI.C.5.b.iv.(5), pp. 63-64.

[123] *Id.*, Part VI.C.1.g., p. 48.

[124] *Id.*, Att. F, Fact Sheet, p. F-39.

modifications to the approach."[125] The Los Angeles Water Board further states in comments submitted on a draft of this order, as follows:

> The Los Angeles MS4 Order does not exclude EWMPs or areas within an EWMP where the stormwater retention standard is achieved from the integrated watershed monitoring, assessment and adaptive management processes. Neither does the Los Angeles MS4 Order specify or contemplate an end to the monitoring, assessment and adaptive management processes in the case of a Watershed Management Program (WMP) or EWMP. These required elements, including receiving water and outfall monitoring, evaluation of these monitoring data, and modification of the EWMP to improve its effectiveness, will be continually conducted throughout the Watershed Management Area addressed by the EWMP. . . . The Los Angeles Water Board understood that these regional multi-benefit projects would take time to implement and that Permittees needed to be afforded this time in the Los Angeles MS4 Order. The Los Angeles Water Board will continually evaluate progress during the implementation period. If, as full implementation nears, some Receiving Water Limitations are still not achieved, the Los Angeles Water Board and State Water Board have a variety of tools that can be used at a regional or statewide level including reconsideration of TMDLs, Basin Planning actions, policy development and permitting, among others.[126]

We will make a revision to Part VI.E.2.e.i. to make it clear that the Permittee must be in compliance with all other requirements of the EWMP in addition to implementation of the storm water retention approach in order to be deemed in compliance with the final WQBELs and other TMDL-specific limitations.

With no definitive evidence in the record establishing that the storm water retention approach will achieve final requirements, no reasonable assurance analysis required at the outset, and reliance only on subsequent monitoring and adaptive management to improve results if final limitations are not in fact achieved, the storm water retention approach does not provide a level of assurance of success that would lead us to conclude that its implementation, with nothing else, is sufficient to constitute compliance with final WQBELs and other TMDL-specific limitations. We understand that there are nevertheless very good reasons to encourage its use. Certainly for all non-storm water and for all storm water generated in storms up to the 85th percentile storm, the storm water retention approach achieves compliance because there is no discharge. And there are significant benefits beyond water quality, including most importantly benefits to water supply. We also believe that public projects requiring investment of this magnitude are unlikely to be carried out without a commitment from the water boards that Permittees will be considered in compliance even if the resulting improvement in water quality

[125] Los Angeles Water Board, October 15, 2013 Response, p. 62.

[126] Los Angeles Water Board, Comment Letter, January 21, 2015, pp. 2-3.

does not rise all the way to complete achievement of the final WQBELs and other TMDL-specific limitations.

We are not willing to go as far as saying that compliance with the storm water retention approach alone constitutes compliance with final WQBELs and other TMDL-specific limitations for all time, regardless of the actual results.[127] Nonetheless, we anticipate that implementation of such projects will bring the drainage area most and, in many cases, all of the way to achievement of water quality standards. Where there is still a gap in required water quality improvement, we expect the Executive Officer of the Los Angeles Water Board to require appropriate actions, consistent with the provisions of the Los Angeles MS4 Order and the Los Angeles Water Board's stated interpretation of those provisions,[128] to close that gap with additional control measures in order for the Permittee to be considered in compliance with the WQBEL or other TMDL-specific limitation. There are various mechanisms to provide assurances that additional control measures will be implemented to achieve the WQBEL or other TMDL-specific limitation, and in some instances, it may be appropriate for the Los Angeles Water Board to issue a time schedule order governing the implementation of further control measures. Further, as acknowledged by the Los Angeles Water Board in its comments, in some circumstances, reconsideration of the underlying TMDLs and the final deadlines within those TMDLs may instead be warranted.[129] We additionally recognize that municipal storm water management is an area of continued development and, with continued research and data evaluation, water quality standards may evolve and become more nuanced or sophisticated over time.

While we decline to interpret the storm water retention approach to, in and of itself, constitute compliance with final WQBELs and other TMDL-specific limitations, we emphasize here that any additional control measures to reach compliance that may be required by the Los Angeles Water Board must not require changes to installed storm water retention projects. Any revisions should be prospective in nature and should not disturb projects that Permittees have already installed in good faith to comply with the provisions of their EWMP.

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[127] Further, Permittees still have substantial incentive to develop and implement an EWMP. If a permittee pursues an EWMP, it will be deemed in compliance with the receiving water limitations during the EWMP development phase, and it may also recognize significant non-water quality benefits.

[128] Los Angeles Water Board, Comment Letter, January 21, 2015, pp. 2-3. As explained in footnote 110, at this time we see limited options available to the Los Angeles Water Board in addressing compliance with final deadlines for WQBELs and other TMDL-specific limitations.

[129] We also acknowledge the need for and commit to supporting state-wide solutions for source reduction as appropriate, similar to the brake pad legislation adopted to address copper discharges. (Senate Bill 346 (approved by the Governor September 27, 2010).)

Ultimately, we must set out to verify through appropriate monitoring that final WQBELs and other TMDL-specific limitations can be achieved through the storm water retention approach, or be willing to revise that approach. However, new or additional measures required at that point should be additive to the storm water retention approach measures already installed.

In sum, despite the uncertainty inherent in allowing the storm water retention approach, we concur in its use in the Los Angeles MS4 Order, with the clarification that ultimate compliance is subject to continued planning, monitoring and adaptive management. We shall amend Part VI.E.2.e.i. as follows:

> i. A Permittee shall be deemed in compliance with an applicable final water quality-based effluent limitation and final receiving water limitation for the pollutant(s) associated with a specific TMDL if any of the following is demonstrated:
>
> . . .
>
> (4) In drainage areas where Permittees are implementing an EWMP, (i) all non-storm water and (ii) all storm water runoff up to and including the volume equivalent to the 85th percentile, 24 hour event is retained for the drainage area tributary to the applicable receiving water**, and the Permittee is implementing all requirements of the EWMP, including, but not limited to, Parts VI.C.7 and VI.C.8 of this Order**. This provision (4) shall not apply to final trash WQBELs.

b. Compliance with Final Receiving Water Limitations

The Los Angeles MS4 Order states that for receiving water limitations associated with water-body pollutant combinations addressed in a TMDL, compliance with the TMDL requirements of the Order in Part VI.E and Attachments L through R constitutes compliance with the receiving water limitations in Part V.A.[130] In other words, if there is an exceedance for a pollutant in a water body that has a TMDL addressing that pollutant, as long as the Permittee is complying with the requirements for the TMDL, the Permittee is deemed in compliance with the receiving water limitation. No petitioner has contested this provision and we find that it constitutes an appropriate approach to compliance with receiving water limitations for water body-pollutant combinations that are addressed by a TMDL.

For exceedances of receiving water limitations for a water body-pollutant combination not addressed by a TMDL, as previously discussed, the Permittee must either incorporate control measures to address the exceedances into the Permittee's WMP/EWMP or comply directly with the receiving water limitations provisions of Part V.A of the Order. For

[130] Los Angeles MS4 Order, Part VI.E.2.c.ii., p. 143.

Permittees that choose the WMP/EWMP approach, the WMP/EWMP must incorporate "a final date for achieving the receiving water limitation."[131] To the extent the Permittee does not achieve the limitation by that final date and does not request and receive an extension, the Permittee has "fail[ed] to meet [a] requirement or date for its achievement in an approved Watershed Management Program or EWMP"[132] and is immediately subject to the receiving water limitations provisions of the Order, with the same result that it is out of compliance. In other words, implementation of non-structural and structural control measures in accordance with the timelines established in the WMP/EWMP constitutes compliance with the receiving water limitations up until the final deadline for achievement of the relevant receiving water limitation; however, at the deadline for final compliance, there must be verification of achievement based on the receiving water limitation itself. While we find that the Order provisions lead to this result as written, for the sake of greater clarity, we will specifically state that final compliance with receiving water limitations must be determined through verification that the receiving water limitation is actually being achieved.

We shall amend Part VI.C.2.c. as follows:

c. If a Permittee fails to meet any requirement or date for its achievement in an approved Watershed Management Program or EWMP, the Permittee shall be subject to the provisions of Part V.A. for the waterbody-pollutant combination(s) that were to be addressed by the requirement. **For water body-pollutant combinations that are not addressed by a TMDL, final compliance with receiving water limitations is determined by verification through monitoring that the receiving water limitation provisions in Part V.A.1 and 2 have been achieved.**

c. Compliance with the Non-Storm Water Discharge Prohibition

The Environmental Petitioners suggest that the Los Angeles MS4 Order is unclear as to whether compliance with the WMP/EWMP may also constitute compliance with the non-storm water discharge prohibition of the Order. We disagree that the Los Angeles MS4 Order is unclear on this issue. The Permittees' obligation to comply with the receiving water limitations and WQBELs and other TMDL-specific limitations in Parts V.A and VI.E is independent of the Permittees' obligation to comply with the effective prohibition of non-storm water discharges in Part III.A. The several provisions stating that Permittees will be deemed to be in compliance with the receiving water limitations of the Los Angeles MS4 Order for implementing the WMP/EWMP specifically reference Parts V.A and VI.E of the Order and not

[131] *Id.*, Part VI.C.5.c.iii.(3)(b), p. 65.

[132] *Id.*, Part VI.C.2.c., p. 52.

III.A.[133] This notwithstanding, Parts VI.C.1.d and VI.C.5.b.iv.(2) require that a Permittee's WMP/EWMP include program elements and control measures to effectively prohibit non-storm water discharges consistent with Part III.A and Part VI.D.4.d or VI.D.10. Therefore, a Permittee's implementation of program elements and control measures consistent with Part III.A and Part VI.D.4.d or VI.D.10, through its approved WMP/EWMP, may provide a mechanism for compliance with Part III.A. Although we accordingly see no need to direct revisions to the Order, we provide this clarification here to respond to the Environmental Petitioners' concern and address any confusion that may exist.

6. "Safe Harbor" During the Planning Phase for the WMP/EWMP

Under the Los Angeles MS4 Order, a Permittee that has declared its intention to develop a WMP/EWMP is deemed in compliance with the receiving water limitations and with interim WQBELs with due dates prior to approval of the WMP/EWMP for the water body-pollutant combinations the WMP/EWMP addresses, provided it meets certain conditions, even though the Permittee is developing, not implementing the WMP/EWMP. Specifically, the Permittee is deemed in compliance if the Permittee (1) provides timely notice of its intent to develop a WMP/EWMP; (2) meets all interim and final deadlines for development of a WMP/EWMP; (3) targets implementation of watershed control measures in the existing program

[133] Los Angeles MS4 Order, Parts VI.C.2.b., p. 52, VI.C.3.a., p. 53, VI.E.2.c.ii., p. 143, VI.C. 2.d., pp. 52-53, VI.E.2.d.i.(4)(d), p. 144. To the extent that a non-storm water discharge authorized by Part III.A may be causing or contributing to an exceedance of receiving water limitations in V.A, compliance with the WMP/EWMP provisions would constitute compliance with the receiving water limitations and any relevant interim WQBELs and other TMDL-specific limitations, as long as the WMP/EWMP addresses the water body-pollutant combination for that water body. However, the discharger would have to additionally comply with requirements in Part III.A. and Part VI.D.4.d or VI.D.10 through its approved WMP/EWMP for conditionally exempt non-storm water discharges that are found to cause or contribute to an exceedance in the receiving water. (See *id.*, Part III.A.4.c.-e., pp. 31-32.) We disagree that every discharge from a Permittee's MS4 to the receiving water of non-storm water that is not specifically authorized under Part III.A will necessarily be subject to enforcement under the Los Angeles MS4 Order. Section 402(p)(3)(B)(ii) of the Clean Water Act imposes a requirement to "effectively prohibit" non-storm water discharges. Part III.A of the Los Angeles MS4 Order effectuates that requirement with a requirement for the Permittee to prohibit non-storm water discharges: "Each Permittee shall, for the portion of the MS4 for which it is an owner or operator, prohibit non-storm water discharges through the MS4 to receiving waters, except where such discharges are . . . [listing exceptions]." (Los Angeles MS4 Order, Part III.A.1, p. 27.) The Los Angeles MS4 Order incorporates a specific and detailed programmatic requirement – the Illicit Connections and Illicit Discharges Elimination Program – for the Permittees to achieve their obligation to effectively prohibit non-storm water discharges. (Los Angeles MS4 Order, Parts VI.D.4.d., pp. 81-86, VI.D.10, pp. 137-141.) We recognize that even the most comprehensive efforts to address unauthorized non-storm water discharges may not eliminate all such discharges. Where a Permittee is fully implementing its Illicit Connections and Illicit Discharges Elimination Program, either pursuant to Parts VI.D.4.d. or VI.D.10, or by incorporation of customized actions into a WMP/EWMP as approved by the Los Angeles Water Board (see Los Angeles MS4 Order Part VI.D.1.a., p. 67), we would expect any enforcement action under Part III.A to be supported by a fact-specific analysis of the nature and source of the unauthorized non-storm water discharge and the efforts of the Permittee to prohibit the discharge.

to address known contributions of pollutants; and (4) receives approval of the WMP/EWMP within the specified time periods.[134]

The Environmental Petitioners object to the availability of a "safe harbor" during the planning phase. We disagree with the Environmental Petitioners that providing a "safe harbor" in the planning phase is disallowed by applicable law -- see our discussion of anti-backsliding requirements in section II.B.1. and antidegradation requirements in section II.B.2. However, we understand that deeming a discharger in compliance with receiving water limitations during the planning phase, not just the implementation phase, could weaken the incentive for Permittees to efficiently and timely seek approval of a WMP/EWMP and to move on to implementation. It is the implementation of the WMP/EWMP that will in fact lead to progress toward compliance with receiving water limitations; the planning phase is essential, but should be only as long as necessary for a well-planned program with carefully analyzed controls to be developed. Given the significance of the water quality issues addressed by the WMP/EWMPs, it is paramount that implementation begin as soon as feasible. Accordingly, the "safe harbor" in the planning phase is appropriate only if it is clearly constrained in a manner that sustains incentives to move on to approval and implementation and is structured with clear, enforceable provisions.

Having reviewed the planning sections of the WMP/EWMP provisions carefully, we find that the Los Angeles MS4 Order does sufficiently constrain the planning phase, so that the "safe harbor" provided is not unreasonable. As already stated, compliance is deemed only if the Permittee is meeting the relevant deadlines for development and approval of the WMP/EWMP.[135] There are no provisions in the Order that allow for extensions to these deadlines. If a Permittee fails to obtain approval within the allowed number of months for the development of a WMP/EWMP, the Order states that the Permittee must then instead demonstrate actual compliance with receiving water limitations and with applicable interim WQBELs.[136] The Los Angeles MS4 Order is also clear that achievement of any TMDL-associated final deadlines occurring prior to the approval deadlines for the WMP/EWMP cannot be excused through commitment to planning for a WMP/EWMP.[137]

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[134] *Id.*, Parts VI.C.2.d., p. 52, VI.C.3.b., p. 53, VI.E.2.d.i.(4)(d), p. 144.

[135] *Id.*, Parts VI.C.2.d., p. 52, VI.C.3.b., p. 53, VI.E.2.d.i.(4)(d), p. 144.

[136] *Id.*, Part VI.C.4.e., p. 58.

[137] *Id.*, Parts VI.C.3.c., p. 53, VI.C.4.d.iii, p. 58. Under Part VI.C.4.d.iii., Permittees must ensure that MS4 discharges achieve compliance with interim, in addition to final, trash WQBELs during the planning phase.

Further, Permittees are subject to a number of conditions during the planning phase that will ensure that progress toward achievement of receiving water limitations is not put on hold pending approval of the plan. These include requirements to put in place Low Impact Development (LID) ordinances and green streets policies[138] and to continue to implement watershed control measures in the existing storm water management programs, including those to eliminate non-storm water discharges,[139] but in a manner that is targeted to address known pollutants.[140]

Given the clear, enforceable requirements limiting the planning phase of the WMP/EWMP provisions, we find that the Los Angeles MS4 Order's inclusion of provisions deeming compliance with the receiving water limitations and with interim WQBELs during development of the programs is reasonable.

In fact, we are concerned that the Los Angeles Water Board has left no room for any deviation from the prescribed development schedule for WMP/EWMPs. A Permittee working in good faith to develop a WMP/EWMP over multiple months may encounter an issue that requires it to ask for a short extension on an interim or final deadline. Under such circumstances, the Los Angeles Water Board should be able to consider the request for the extension, rather than have its hands tied and have to reject a WMP/EWMP based on lack of timeliness. We will add a provision to the Order that provides the Los Angeles Water Board or its Executive Officer discretion in granting such extensions, but the Permittee will not be deemed in compliance with the applicable receiving water limitations and WQBELs during the period of the extension.

We shall add a new Part VI.C.4.g. as follows:

g. Permittees may request an extension of the deadlines for notification of intent to develop a Watershed Management Program or EWMP, submission of a draft plan, and submission of a final plan. The extension is subject to approval by the Regional Water Board or the Executive Officer. Permittees that are granted an extension for any deadlines for development of the WMP/EWMP shall be subject to the baseline requirements in Part VI.D and shall demonstrate compliance with receiving water limitations pursuant to Part V.A. and with applicable interim water quality-based effluent limitations in Part VI.E pursuant to subparts VI.E.2.d.i.(1)-(3) until the Permittee has an approved WMP/EWMP in place.

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[138] *Id.*, Part VI.C.4.c., pp. 56-57.

[139] *Id.*, Part VI.C.4.d.i.-ii., pp. 57-58.

[140] *Id.*, Parts VI.C.2.d.iii., pp. 52-53, VI.C.3.b.iii., p. 53, VI.E.2.d.i.(4)(d)(3), p. 144.

7. Conclusion

In conclusion, we uphold the WMP/EWMP provisions as a reasonable alternative compliance option for meeting receiving water limitations and uphold the WMP/EWMP provisions in all other aspects, except as specifically stated above. We find that the WMP/EWMP approach is a clearly defined, implementable, and enforceable alternative to the receiving water limitations provisions that we mandated in Order WQ 99-05, and that the alternative provides Permittees an ambitious, yet achievable, path forward for steady and efficient progress toward achievement of those limitations while remaining in compliance with the terms of the permit.

We direct all regional water boards to consider the WMP/EWMP approach to receiving water limitations compliance when issuing Phase I MS4 permits going forward.[141] In doing so, we acknowledge that regional differences may dictate a variation on the WMP/EWMP approach, but believe that such variations must nevertheless be guided by a few principles.[142] We expect the regional water boards to follow these principles unless a regional water board makes a specific showing that application of a given principle is not appropriate for region-specific or permit-specific reasons.

1. The receiving water limitations provisions of Phase I MS4 permits should continue to require compliance with water quality standards in the receiving water and should not deem good faith engagement in the iterative process to constitute such compliance. The Phase I MS4 permits should therefore continue to use the receiving water limitations provisions as directed by State Water Board Order WQ 99-05.

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[141] We acknowledge that small MS4s permitted under the statewide General Permit for WDRs for Storm Water Discharges from Small MS4s (Order No. 2013-0001-DWQ) (General Phase II MS4 Permit) have similar practical issues as Phase I permittees in complying with receiving water limitations. Nevertheless, because the General Phase II MS4 Permit is issued by the State Water Board, not the regional water boards, we limit our guidance to regional water boards to the Phase I permits. The State Water Board is committed to working with small MS4s, the regional water boards, and interested persons in developing an alternative compliance option for the General Phase II MS4 Permit.

[142] In considering appropriate guidance for regional water boards drafting alternative compliance paths in municipal storm water permits, we have reviewed the proposed “strategic compliance program” model language that was submitted by the California Stormwater Quality Association (CASQA) and supported in whole or in part by a number of interested persons. (CASQA August 15, 2013 Receiving Water Limitations Submission, Attachment A, Section E.) While we have not in these proceedings adopted the CASQA language, or, for that matter, any specific language, for alternative compliance path provisions, regional water boards remain free to consider and incorporate the CASQA approach into their municipal storm water permits to the extent they determine and document that the approach, including any modifications, satisfies the principles we set out in this section as well as all other direction we have provided in this order.

2. The Phase I MS4 permits should include a provision stating that, for water body-pollutant combinations with a TMDL, full compliance with the requirements of the TMDL constitutes compliance with the receiving water limitations for that water body-pollutant combination.
3. The Phase I MS4 permits should incorporate an ambitious, rigorous, and transparent alternative compliance path that allows permittees appropriate time to come into compliance with receiving water limitations without being in violation of the receiving water limitations during full implementation of the compliance alternative.
4. The alternative compliance path should encourage watershed-based approaches, address multiple contaminants, and incorporate TMDL requirements.
5. The alternative compliance path should encourage the use of green infrastructure and the adoption of low impact development principles.
6. The alternative compliance path should encourage multi-benefit regional projects that capture, infiltrate, and reuse storm water and support a local sustainable water supply.
7. The alternative compliance path should have rigor and accountability. Permittees should be required, through a transparent process, to show that they have analyzed the water quality issues in the watershed, prioritized those issues, and proposed appropriate solutions. Permittees should be further required, again through a transparent process, to monitor the results and return to their analysis to verify assumptions and update the solutions. Permittees should be required to conduct this type of adaptive management on their own initiative without waiting for direction from the regional water board.

8. Direction to the Los Angeles Water Board to Report to the State Water Board on Implementation

We recognize that our review has been limited to the provisions of the Los Angeles MS4 Order. The success of the WMP/EWMP approach depends in large part on the steps that follow adoption of these provisions, i.e., the effort invested by Permittees in developing WMPs/EWMPs that truly address the stringent provisions of the Order, the precision with which the Los Angeles Water Board reviews the draft programs and requires revisions, and, most importantly, the actual implementation and appropriate enforcement of the programs once approved. The work going forward must ensure that the WMPs/EWMPs in fact exhibit the rigor and accountability the provisions of the Los Angeles MS4 Order demand. We expect that the Los Angeles Water Board will make careful oversight and enforcement a priority and that they will be aided in this process by the public review and comment opportunities built into the terms of the Order.

The process of developing the WMPs/EWMPs is currently ongoing -- the Los Angeles Water Board has been reviewing draft and revised draft WMPs and workplans for EWMPs – and, although we have been asked by the Environmental Petitioners to take official notice of some of the submissions and conditional approvals in the process, it is premature for the State Water Board to speak to the sufficiency of the resulting WMPs/EWMPs until the Los Angeles Water Board, with full input from the stakeholders, has had the opportunity to consider, revise, and finally approve the programs. We note again that all documents submitted to the Los Angeles Water Board Executive Officer for approval are subject to a 30-day public comment period[143] and that any formal determination or approval by the Executive Officer may be reviewed by the Los Angeles Water Board upon request by an interested person.[144] And an interested person may petition the State Water Board to review an action or failure to act of the Los Angeles Water Board.[145]

Once the WMPs/EWMPs are approved, ensuring that they are diligently and timely implemented must remain a top priority for the Los Angeles Water Board. We expect that the Los Angeles Water Board will continue to work cooperatively and closely with the Permittees, the Environmental Petitioners, and other interested persons in this process, but that the Board will also use its enforcement authority to ensure that appropriate progress is made toward water quality goals. We intend to remain involved in this process, as we must learn statewide from the successes and shortcomings of the approach we are endorsing with this order. We accordingly direct the Los Angeles Water Board to report to us on progress in implementation of the WMPs/EWMPs, and progress in improving water quality during this and the next permit term by February 28, 2018, by February 29, 2020, and by March 31, 2022. Specifically, we ask that the Los Angeles Water Board report on region-wide data for the following:

- On-the-ground structural control measures completed;
- Non-structural control measures completed;
- Monitoring data that evaluates the effectiveness of implemented control measures in improving water quality;

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[143] Los Angeles MS4 Order, Part V.A.5.b, p. 42.

[144] *Id*., Part V.A.6, p. 42.

[145] Wat. Code, § 13320. On April 28, 2015, the Executive Officer of the Los Angeles Water Board conditionally approved several submitted WMPs. On May 28, 2015, the Environmental Petitioners filed a petition challenging the conditional approvals and requesting review by the Los Angeles Water Board and by the State Water Board of the Executive Officer's determination.

- Comparison of the effectiveness of the control measures to the results projected by the reasonable assurance analyses;
- Comparison of control measures completed to date with control measures projected to be completed to date pursuant to the WMPs/EWMPs;
- Control measures proposed to be completed in the next two years pursuant to the WMPs/EWMPs and the schedule for completion of those control measures;
- Status of funding and implementation for control measures proposed to be completed in the next two years;
- Trends in receiving water quality related to pollutants typically associated with storm water;
- Available permit compliance data, including requests for compliance extensions;
- Enforcement actions taken and results.

In addition to covering the above information, the third report shall summarize and reflect the comprehensive information gathered through the updates of the reasonable assurance analyses and WMPs/EWMPs conducted by the Permittees in the second permit term.

C. Appropriateness of TMDL Requirements

Section 303(d) of the Clean Water Act requires the water boards to identify impaired water bodies that do not meet water quality standards after applying required technology-based effluent limitations.[146] TMDLs are developed by either the regional water boards or by USEPA in response to section 303(d) listings of impaired water bodies. A TMDL is defined as the sum of the individual wasteload allocations for point sources of pollution, the load allocations for nonpoint sources of pollution, and the contribution from background sources of pollution,[147] and represents the maximum amount of a pollutant that a water body may receive and still achieve water quality standards. TMDLs developed by regional water boards include implementation provisions[148] and are typically incorporated into the regional water board's water quality control plan.[149] TMDLs developed by USEPA typically contain the total load and load allocations required by section 303(d), but do not set out comprehensive implementation provisions.[150] Most TMDLs are not self-executing, but instead rely upon subsequently-issued permits to impose requirements on discharges that implement the TMDLs' wasteload

[146] 33 U.S.C. § 1313(d).

[147] 40 C.F.R. § 130.2(i).

[148] Wat. Code, §§ 13050, subd. (j), 13242.

[149] See 40 C.F.R. §§ 130.6(c)(1).

[150] *Am. Farm Bureau Fed'n v. U.S. E.P.A.* (M.D. Pa. 2013) 984 F. Supp. 2d 289, 314.

allocations.[151] The Los Angeles MS4 Order includes TMDL-specific requirements that implement 33 TMDLs (twenty-five adopted by the Los Angeles Water Board, seven established by USEPA, and one adopted by the Santa Ana Regional Water Quality Control Board that assigned requirements to two Permittees of the Los Angeles MS4 Order) in Part VI.E and in Attachments L-R.

Petitioners raise a number of challenges to the TMDL-based requirements of the Los Angeles MS4 Order. We take up several of those arguments in this section.[152]

1. Inclusion of Numeric WQBELs

Permittee Petitioners argue that the numeric WQBELs incorporated into the Los Angeles MS4 Order as TMDL-based limitations are contrary to the Clean Water Act and to state law and policy. We disagree.

Under the federal regulations implementing the Clean Water Act, effluent limitations in NPDES permits developed to achieve water quality standards must be consistent with the assumptions and requirements of any available wasteload allocation for the discharge.[153] In addition, the Porter-Cologne Act requires that waste discharge requirements implement any relevant water quality control plans,[154] including TMDL requirements that have been incorporated into the water quality control plans. The Los Angeles MS4 Order incorporates numeric WQBELs and other limitations that the Los Angeles Water Board found are consistent with the TMDL requirements applicable to the Permittees.

Permittee Petitioners argue that there is no requirement under federal law for incorporation of TMDL requirements into an MS4 permit and that the inclusion of the requirements in Part VI.E and in Attachments L-R was therefore at the discretion of the Los Angeles Water Board. They point out, as we acknowledged in section II.A, that MS4 discharges must meet a technology-based standard of prohibiting non-storm water discharges and reducing pollutants in the discharge to the MEP, but that requirements to strictly meet water quality standards are at the discretion of the permitting agency.[155] Because TMDL requirements are a path to achieving water quality standards, the Permittee Petitioners argue, the Los Angeles Water Board had the discretion not to include them in the Los Angeles MS4 Order.

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[151] *City of Arcadia v. EPA* (N.D. Cal. 2013) 265 F.Supp.2d 1142, 1144-1145.

[152] We note that we do not take up any arguments that challenge the terms of the TMDLs. Those arguments should have been made during the public process when the TMDLs were adopted. They are untimely now.

[153] 40 C.F.R. § 122.44(d)(1)(vii)(B).

[154] Wat. Code, § 13263, subd. (a).

[155] 33 U.S.C. § 1342(p); *Defenders of Wildlife*, *supra*, 191 F.3d 1159.

Answering the question of whether the Los Angeles Water Board was required under federal law to strictly effectuate TMDL compliance through the Los Angeles MS4 Order is a largely irrelevant exercise because we have already reaffirmed in this order that we will continue to require water quality standards compliance in MS4 permits. Further, given the back-stop nature of TMDLs, and the fact that each set of dischargers must meet their share of the allocation to reach the total reductions set out, a regime in which municipal storm water dischargers were given a pass on TMDL obligations would render the promise of water quality standards achievement through TMDLs illusory. This is especially true in a large urbanized area where pollutants in storm water constitute a significant share of the impairment and where other dischargers would be disproportionately burdened if MS4s were not held to their allocations. Although not dispositive, we also note that USEPA has assumed in guidance (discussed in more detail below) issued on storm water and TMDL implementation that MS4 permits must incorporate effluent limitations consistent with the assumptions and requirements of relevant wasteload allocations.[156] To the extent the TMDL provisions of the Clean Water Act and the federal regulations could be read to preclude mandatory incorporation of wasteload allocations into an MS4 permit, effluent limitations consistent with those load allocations should nevertheless be required under Clean Water Act section 402, subsection (p)'s direction that the MS4 permit shall require "such other controls" as the permitting authority determines "appropriate for the control of such pollutants."[157] Finally, for TMDLs incorporated into water quality control plans, the implementation plan associated with the TMDL applies to all dischargers named, including MS4 permittees, and the MS4 permits must be consistent with the direction in the water quality control plan.[158]

Having found that the Los Angeles Water Board acted in a manner consistent with federal and state law when it developed WQBELs to address applicable TMDLs, we next turn to whether *numeric* WQBELs were appropriate. We find that the Los Angeles Water Board

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[156] USEPA, Memorandum, "Establishing Total Maximum Daily Load Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs," (Nov. 22, 2002) (2002 USEPA Memorandum); see also USEPA, Memorandum, "Revisions to the November 22, 2002 Memorandum 'Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs,' " (Nov. 26, 2014) (2014 USEPA Memorandum). The 2014 USEPA Memorandum replaced a memorandum with the same title issued on November 12, 2010, which was subsequently opened to public comment. (USEPA Statement (March 17, 2011), available at <http://water.epa.gov/polwaste/npdes/stormwater/upload/sw_tmdlwla_comments.pdf> (as of Nov. 18, 2014).)

[157] 33 U.S.C. § 1342(p)(3)(B)(iii). See, e.g., State Water Board Orders WQ 91-03, WQ 91-04, WQ 98-01, WQ 99-05, WQ 2001-15.

[158] Wat. Code, § 13263, subd. (a); see also *State Water Res. Control Bd. Cases* (2006) 136 Cal. App. 4th 674, 730 (noting the obligation of the water boards to follow the program of implementation included in a water quality control plan).

acted within its legal authority when establishing numeric WQBELs, and further that its choice of numeric WQBELs was a reasonable exercise of its policy discretion.

In the context of MS4 discharges, effluent limitations in NPDES permits may be expressed in the form of either numeric limitations or best management practices (BMPs). The federal regulations specifically state that BMP-based effluent limitations may be used to control pollutants for storm water discharges.[159] USEPA has issued two memoranda, on November 22, 2002 (2002 USEPA Memorandum), and on November 26, 2014 (2014 USEPA Memorandum), providing guidance to the states on translating wasteload allocations for storm water into effluent limitations in NPDES Permits.[160] The 2002 USEPA Memorandum contemplated that "the NPDES permitting authority will review the information provided by the TMDL . . . and determine whether the effluent limit is appropriately expressed using a BMP approach (including an iterative BMP approach) or a numeric limit."[161] The 2002 USEPA Memorandum further stated that "EPA expects that most WQBELs for NPDES-regulated municipal . . . storm water discharges will be in the form of BMPs, and that numeric limits will be used only in rare instances."[162] The 2014 USEPA Memorandum, after noting the increased information available to the permitting agencies after more than a decade of experience with setting wasteload allocations and effluent limitations, explained that:

> Where the TMDL includes WLAs for stormwater sources that provide numeric pollutant loads, the WLA should, where feasible, be translated into effective, measurable WQBELs that will achieve this objective. This could take the form of a numeric limit, or of a measurable, objective BMP-based limit that is projected to achieve the WLA. . . . The permitting authority's decision as to how to express the WQBEL(s), either as numeric effluent limitations or as BMPs, with clear, specific, and measurable elements, should be based on an analysis of the specific facts and circumstances surrounding the permit, and/or the underlying

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[159] 40 C.F.R. § 122.44(k)(2); see also 33 U.S.C. § 1342(p)(3)(B)(iii). 40 Code of Federal Regulations section 122.44(k)(3) further contemplates that BMP-based effluent limitations are appropriate where it is infeasible to develop a numeric effluent limitation.

[160] 2002 USEPA Memorandum; 2014 USEPA Memorandum. In addition to the two memoranda, USEPA published guidance titled "Interim Permitting Approach for Water Quality-Based Effluent Limitations in Storm Water Permits" ((Sept. 1996) 61 Federal Register 57425), which recommended inclusion of BMPs in first-round permits, and expanded or better-tailored BMPs in subsequent permits. In 2005, the State Water Board assembled a blue ribbon panel to address the feasibility of including numeric effluent limits as part of NPDES municipal, industrial, and construction storm water permits. The panel issued a report dated June 19, 2006, which included recommendations as to the feasibility of including numeric limitations in storm water permits. The report concluded that it was not feasible, at that time, to set enforceable numeric effluent limitations for municipal storm water discharges.

[161] 2002 USEPA Memorandum, p. 5.

[162] *Id*., p. 2.

> WLA, including the nature of the stormwater discharge, available data, modeling results, and other relevant information. [163]

Both options – to choose BMP-based WQBELs or to choose numeric WQBELs – were legally available to the Los Angeles Water Board. In adopting numeric WQBELs, the Los Angeles Water Board analyzed the specific facts and circumstances surrounding storm water discharges in the region and reasonably concluded that numeric WQBELs were warranted because storm water discharges constituted a significant contributor to the water quality standards exceedances in the area and the exceedances had not been to date resolved through BMP-based requirements. Moreover, the Los Angeles Water Board concluded that it could feasibly develop numeric WQBELs following the extensive work already conducted to develop the TMDLs, which involved analyzing pollutant sources and allocating loads using empirical relationships or quantitative models. We will not second-guess the determination of the Los Angeles Water Board, given its extensive and unique role in developing the TMDLs and the permit to implement the TMDLs, that numeric WQBELs were appropriate for the Los Angeles MS4 Order.[164]

We emphasize, however, that we are not taking the position that numeric WQBELs are appropriate in all MS4 permits or even with respect to certain TMDLs within an MS4 permit. In a recent amendment to State Water Board Order 2011-0011-DWQ, NPDES Statewide Storm Water Permit for State of California Department of Transportation (Caltrans),[165] we found BMP-based TMDL requirements to be "consistent with the assumptions and requirements of the WLAs" of the TMDLs applicable to Caltrans. That determination was based on a number of factors including the fact that Caltrans, a single discharger, was named in over 80 TMDLs statewide, the fact that Caltrans had relatively little contribution to the exceedances in each of those TMDLs, and the consideration that there was significant efficiency to be gained by streamlining and standardizing control measure implementation throughout Caltrans' statewide storm water program. Similarly, regional water boards may find BMP-based requirements to be appropriate based on TMDL-specific, region-specific, or permittee-specific

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[163] 2014 USEPA Memorandum, p. 6.

[164] The Los Angeles Water Board incorporated a discussion in the Fact Sheet of how the TMDL wasteload allocations were translated into numeric WQBELs in order to implement the TMDLs in the Los Angeles MS4 Order. (Los Angeles MS4 Order, Att.F, Fact Sheet, pp. F-89-F-100). See 40 C.F.R. § 124.8. We are not independently reviewing the calculations and analyses underlying the specific numeric limitations arrived at by the Los Angeles Water Board; rather, our review has been limited to a determination of whether the choice of numeric rather than BMP-based limitations was reasonable. To the extent any petitioners asked us to independently review the issue in their petitions seeking review of the Order, the issue is dismissed. See fn. 11.

[165] State Water Board Order WQ 2014-0077-DWQ.

considerations. In many ways, the Los Angeles MS4 Order was uniquely positioned to incorporate numeric WQBELs because of the extensive TMDL development in the region in the past decade and the documented role of MS4 discharges in contributing to the impairments addressed by those TMDLs. Thus, while we decline to remove the numeric WQBELs from the Los Angeles MS4 Order, we also decline to urge the regional water boards to use numeric WQBELs in all MS4 permits. [166]

2. Requirement for Reasonable Potential Analysis

The federal regulations implementing NPDES permitting require the permitting authority to establish WQBELs for point source discharges when those discharges cause, have the "reasonable potential" to cause, or contribute to an excursion above water quality standards.[167] Permittee Petitioners argue that the Los Angeles Water Board did not conduct an appropriate reasonable potential analysis prior to imposing numeric WQBELs. The argument is misguided. The Los Angeles Water Board established that the MS4 discharges can cause or contribute to exceedances of water quality standards through the process of developing TMDLs and assigning wasteload allocations. At the permitting stage, the Los Angeles Water Board's legal obligation was to develop WQBELs "consistent with the assumptions and requirements of any wasteload allocation" in the TMDLs,[168] and not to reconsider reasonable potential.[169]

3. USEPA-Established TMDLs

USEPA has established seven TMDLs that include wasteload allocations for MS4 discharges covered by the Los Angeles MS4 Order. In contrast to state-adopted TMDLs, USEPA-established TMDLs do not contain an implementation plan or schedule for achievement of the wasteload allocations,[170] with the effect that Permittees must comply with wasteload allocations immediately. To avoid this result, the regional water board may either adopt a

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[166] Relying on the 2014 USEPA Memorandum, Permittee Petitioners also argue that the Los Angeles Water Board was required to disaggregate storm water sources within applicable TMDLs. The 2014 USEPA Memorandum only encourages permit writers to assign specific shares of the wasteload allocation to specific permittees during the permitting process, reasoning that permit writers may have more detailed information than the TMDL writers to assign reductions for specific sources. (2014 USEPA Memorandum, p.8.) In an MS4 system as complex and interconnected as that covered under the Los Angeles MS4 Order, we do not expect the permitting authority to be able to disaggregate wasteload allocations by discharger. Further, as discussed in section II.F. on joint responsibility, the Los Angeles MS4 Order has provided a means for Permittees with commingled discharges to demonstrate that they are not responsible for any given exceedance of a limitation.

[167] 40 C.F.R. § 122.44(d)(1)(iii).

[168] 40 C.F.R. § 122.44(d)(1)(vii)(B).

[169] See USEPA, NPDES Permit Writers Manual (updated September 2010), Chapter 6, section 6.3.3.

[170] See, e.g., *Am. Farm Bureau Fed'n v. U.S. E.P.A., supra,* 984 F. Supp. 2d at p. 314.

separate implementation plan as a water quality control plan amendment[171] or issue the Permittee a compliance order with a compliance schedule.[172] For the seven USEPA-established TMDLs applicable to the Permittees, the Los Angeles Water Board authorizes Permittees subject to a wasteload allocation in a USEPA-established TMDL to propose control measures that will be effective in meeting the wasteload allocation, and a schedule for their implementation that is as short as possible, as part of a WMP/EWMP. [173] Permittees that do not submit an adequate WMP/EWMP are required to demonstrate compliance with the wasteload allocations immediately.[174]

Permittee Petitioners argue that the Los Angeles Water Board has acted inconsistently in requiring BMP-based compliance with the USEPA-established TMDLs but requiring numeric WQBELs for the state-established TMDLs. We have already stated above in section C.1 that the permitting authority has discretion to choose between BMP-based and numeric effluent limitations depending on fact-specific considerations. The Los Angeles Water Board was not restricted to choosing one single uniform approach to implementing all 33 TMDLs in the Los Angeles MS4 Order. In fact, straight-jacketing NPDES permit writers to choose one approach to the exclusion of another, even within the confines of a single MS4 permit, would run afoul of USEPA's expectations in the 2014 USEPA Memorandum for a fact-specific, documented justification for the permit requirements included to implement a wasteload allocation.

The Environmental Petitioners argue that the provisions are contrary to law because they excuse Permittees from complying with final numeric wasteload allocations as long as they are implementing the BMPs proposed in the WMP/EWMP. The approach taken by the Los Angeles MS4 Order to compliance here is similar to the provisions for compliance with receiving water limitations that are not otherwise addressed by a TMDL: The Permittee proposes control measures and a timeline that is as short as possible and is considered in compliance with the final numeric limitations while implementing the control measures consistent with the schedule. We find that, given the absence of an implementation plan with final compliance deadlines specified in the Los Angeles Water Board's water quality control

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[171] Wat. Code, § 13242.

[172] *Id.*, See, e.g., § 13300.

[173] The Los Angeles MS4 Order's Fact Sheet states that the Los Angeles Water Board may choose to adopt implementation plans or issue enforcement orders in the future. (Los Angeles MS4 Order, Att. F, Fact Sheet, p. F-111.)

[174] Los Angeles MS4 Order, Part VI.E.3., pp. 145-146.

plan, this approach is consistent with the assumptions and requirements of the relevant wasteload allocations. We will not revise the provisions.

D. Non-Storm Water Discharge Provisions

Permittee Petitioners argue that the non-storm water discharge provisions of the Los Angeles MS4 Order are contrary to the Clean Water Act. Specifically, Permittee Petitioners assert that the Los Angeles MS4 Order improperly regulates non-storm water discharges from the MS4 to the receiving waters by imposing the prohibition of discharge "through the MS4 to the receiving waters" and by imposing WQBELs and other numeric limitations, rather than the MEP standard, on dry weather discharges.

The Los Angeles MS4 Order states that "[e]ach Permittee shall, for the portion of the MS4 for which it is an owner or operator, prohibit non-storm water discharges through the MS4 to receiving waters" with certain exceptions including discharges separately regulated under an NPDES permit and discharges conditionally exempt from the prohibition consistent with the federal regulations.[175] Permittee Petitioners take issue with the imposition of the prohibition "through the MS4 to receiving waters" because the language does not track the specific requirement of the Clean Water Act that the MS4 permit "include a requirement to effectively prohibit non-stormwater discharges *into the storm sewer."* (Emphasis added.)[176]

We find the variation in language to be a distinction without a difference. Whether the Los Angeles MS4 Order prohibits non-storm water discharges *into* the MS4 or *through* the MS4 to receiving waters, the intent and effect of the prohibition is to prevent non-exempt non-storm water discharges from reaching the receiving waters.[177] The legal standard governing non-storm water – effective prohibition -- is not altered because the Los Angeles MS4 Order imposes the prohibition at the point of entry into the receiving water rather than the point of entry into the MS4 itself. Instructively, USEPA has used the terms "into," "from," and "through" interchangeably when describing the prohibition.[178]

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[175] *Id.*, Part III.A, pp 27-33.

[176] 33 U.S.C. § 1342(p)(3)(B)(ii).

[177] The Los Angeles Water Board notes that the language in the Los Angeles MS4 Order is not significantly changed from the version in the 2001 Los Angeles MS4 Order, which prohibited non-storm water discharges "into the MS4 and watercourses." The Board additionally asserts that phrasing the prohibition as "through the MS4 to receiving waters" provides Permittees with greater flexibility to use measures that control non-storm water after it enters the MS4, including regional solutions such as low-flow diversions and catch-basin inserts.

[178] See, e.g., 55 Fed. Reg. 47990, 47995-47996 ("Section 402(p)(B)(3) of the CWA requires that permits for discharges *from municipal separate storm sewer systems* require the municipality to 'effectively prohibit' non-storm water discharges *from the municipal separate storm sewer*…Ultimately, such non-storm water discharges *through a municipal separate storm sewer* must either be removed from the system or become subject to an NPDES permit. . . . *(Continued)*

Permittee Petitioners' objection to the phrasing of the prohibition in the Los Angeles MS4 Order appears to be based largely on the assumption that prohibiting non-storm water discharges at the point of entry into the receiving water rather than at the point of entry into the MS4 allows the Los Angeles Water Board to impose requirements on those discharges that would otherwise not be available under the Clean Water Act and federal regulations. We disagree.

As a preliminary matter, regardless of the phrasing of the non-storm water discharge prohibition, MEP is not the standard that governs non-storm water discharges. Permittee Petitioners have asserted that, for non-storm water discharges that enter the MS4, MEP is the governing standard just as it is for storm water discharges. This assertion misinterprets the statute. The Clean Water Act imposes two separate standards for regulation of non-storm water and storm water in an MS4 permit: The MS4 permit "shall include a requirement to effectively prohibit non-stormwater discharges" into the MS4, and "shall require controls to reduce the discharge of pollutants to the maximum extent practicable. . . ."[179] Although the statute imposes the MEP standard to control of "pollutants" rather than specifically to "pollutants in storm water," any reading of section 402(p)(3)(B)(iii) to apply generally to both non-storm water and storm water would render the effective prohibition of non-storm water in section 402(p)(3)(B)(ii) meaningless. The federal regulations confirm the distinction between the treatment of storm water and non-storm water by establishing requirements to prevent illicit discharges from entering the MS4.[180] While the regulations have no definition for "non-storm water discharges," illicit discharges most closely represent the statutory term and are defined as "any discharge to a municipal separate storm sewer that is not composed entirely of storm water except discharges pursuant to a NPDES permit . . . and discharges resulting from firefighting activities."[181] Further, contrary to assertions by Permittee Petitioners, the definition of storm water in the federal regulations is not inclusive of dry weather discharges. The federal regulations define storm water as "storm water runoff, snow melt runoff, and surface runoff and

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The CWA prohibits the point source discharge of non-storm water not subject to an NPDES permit *through municipal separate storm sewers to waters of the United States.*" (Emphasis added.))

[179] 33 U.S.C. § 1342(p)(3)(b)(iii).

[180] 40 C.F.R. § 122.26(d)(2)(iv)(B).

[181] *Id.*, § 122.26(b)(2). The preamble to the regulations states: "Today's rule defines the term 'illicit discharge' to describe any discharge through a municipal separate storm sewer system that is not composed entirely of storm water and that is not covered by an NPDES permit." (55 Fed. Reg. 47990, 47995 (Nov. 16, 1990).)

drainage."[182] Surface runoff and drainage cannot be understood to refer to dry weather discharges where USEPA has specifically stated in the preamble to the relevant regulations that it would not expand the definition of storm water to include "a number of classes of discharges which are not in any way related to precipitation events."[183] Accordingly, dry weather discharges are not a component of storm water discharges subject to the MEP standard.[184]

Second, the Los Angeles Water Board's legal authority to impose TMDL-based WQBELs and other limitations on dry weather discharges is derived not from the phrasing of the discharge prohibition in the statute but from the TMDLs themselves, as well as the Clean Water Act direction to require "such other provisions" as the permitting authority "determines appropriate for the control of such pollutants." We have already found that the Los Angeles MS4 Order reasonably (and legally) incorporated numeric WQBELs and other limitations to implement the TMDLs. The Los Angeles Water Board's authority to impose the limitations for dry weather conditions is accordingly independent of the provisions establishing the non-storm water effective prohibition.

Permittee Petitioners also assert that requiring compliance with the non-storm water discharge prohibition through and from the MS4 would frustrate enforcement of the illicit connection and illicit discharge elimination programs of the Los Angeles MS4 Order, which continue to require the Permittee to prohibit illicit discharges and connections *to* the MS4.[185] On this point, we agree with the Los Angeles Water Board that the illicit connection and illicit discharge elimination program is a means to implement the non-storm water prohibition and independently implementable and enforceable. We are more sympathetic to the argument by Permittee Petitioners that, in the context of a complex MS4 system with commingled discharges, the prohibition of discharges through the MS4 to the receiving waters poses greater compliance challenges than a prohibition of discharges into the MS4; however, the Los Angeles MS4 Order's Monitoring and Reporting Program contains a procedure by which a Permittee will notify the Board and the upstream jurisdiction when non-exempted, non-storm water discharges pose an issue in commingled discharges.[186] Further, the Los Angeles Water Board states in its

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[182] 40 C.F.R. § 122.26(b)(13).

[183] 55 Fed. Reg. 47990, 47995 (Nov. 16, 1990).

[184] We disagree that the phrasing of the non-storm water discharge prohibition in the Los Angeles MS4 Order means that *any* dry weather discharges from the MS4 could be construed as a violation of the Clean Water Act for the same reasons articulated in footnote 133 of this order.

[185] Los Angeles MS4 Order, Parts VI.A.2.a.iii, p. 40, VI.D.4.d., p. 81-86, VI.D.10, p. 137-141.

[186] Los Angeles MS4 Order, Att. E, Monitoring and Reporting Program, Part IX.F.6, p. E-27.

October 15, 2013 Response that the upstream jurisdiction would then have the responsibility to further investigate and address the discharge.[187] The challenge of addressing compliance and enforcement in the context of interconnected MS4s and commingled discharges is a challenge pervasive in the MS4 regulatory structure and not unique to non-storm water discharges. We are not sufficiently persuaded by Permittee Petitioners' arguments regarding compliance to disturb the non-storm water prohibitions as currently established in the Los Angeles MS4 Order.

E. Monitoring Provisions

Relying on Water Code sections 13165, 13225, and 13267, Permittee Petitioners argue that the Los Angeles Water Board was required to conduct a cost-benefit analysis to support the monitoring and reporting requirements of the Los Angeles MS4 Order. Because the monitoring and reporting provisions of the Los Angeles MS4 Order are incorporated pursuant to federal law, the cited provisions are inapplicable here. The monitoring and reporting provisions of the Los Angeles MS4 Order were established under the Clean Water Act and USEPA's regulations.[188] Further, under state law, Water Code section 13383, rather than Water Code section 13267, controls monitoring and reporting requirements in the context of NPDES permitting, and that provision does not include a requirement to ensure that the burden, including costs of the report, bear a reasonable relationship to the need for the report.[189]

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[187] Los Angeles Water Board, October 15, 2013 Response, p. 33 & fn. 116.

[188] See 33 U.S.C. §§ 1318, 1342(a)(2); 40 C.F.R. §§ 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)D), 122.41(h), 122.41(j), 122.41(*l*), 122.42(c),122.44(i), 122.48.

[189] Permittee Petitioners argue that the cost considerations of Water Code sections 13225 and 13267 are relevant to the Los Angeles MS4 Order notwithstanding the fact that it was issued under federal authority because the requirements of those section are not inconsistent with the requirements of section 13383. (See Water Code, §13372, subd. (a) ("To the extent other provisions of this division are consistent with the requirements for state programs . . . those provisions apply . . . ").) This exact assertion was taken up by the trial court in litigation challenging the 2001 Los Angeles MS4 Order and decided in favor of the Los Angeles Water Board. The trial court stated: "As noted in *Silkwood v. Kerr-McGee Corp.* (1984) 464 U.S. 238, the Court held, in part: 'state law is still preempted. . . where the state law stands as an obstacle to the accomplishment of the full purposes and objectives of Congress.' (464 U.S. at p. 248.) Applying Water Code sections 13225 and 13267 would stand, in the words of *Silkwood* as: 'an obstacle to the accomplishment of the full purposes and objectives of [the federal law].' (Ibid)." (*In re Los Angeles County Municipal Storm Water Permit Litigation* (L.A. Super. Ct., No. BS 080548, Mar. 24, 2005) Statement of Decision from Phase II Trial on Petitions for Writ of Mandate, at pp.19-20 (Administrative Record, section 10.II., RB-AR23197-23198.). Further, we note that Water Code section 13383, subdivision (c) specifically references subdivision (c) of section 13267 when establishing facility inspection requirements; in contrast, section 13383, subdivision (a) does not reference subdivision (b) of section 13267, which incorporates the requirement that "[t]he burden, including costs, of these reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports." Water Code section 13383, subdivision (a), was therefore arguably intended to stand in place of the requirements in section 13267(b). Finally, even where authority to impose a monitoring and reporting requirement is clearly derived from Water Code section 13267, the provision requires consideration of the costs and benefits of monitoring and reporting, but not a full cost-benefit analysis. We therefore find that the Los Angeles Water Board did not fail to meet its legal obligations by not carrying out a full cost-benefit analysis specific to the monitoring and reporting requirements of the Los Angeles MS4 Order. However, in making this finding, in no way do we mean to disavow the significance of cost consideration in permitting actions, even where not specifically required by law. We note again that the Los Angeles Water Board carefully considered the costs of
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Moreover, the monitoring and reporting requirements of the Los Angeles MS4 Order do not exceed the requirements of the Clean Water Act and the federal regulations.[190] In particular, we find that the receiving water monitoring requirements of the Order are reasonable in light of the need to identify water quality exceedances and evaluate progress in compliance with water quality standards. The argument made by several Permittee Petitioners that the federal regulations allow only two types of monitoring – effluent and ambient – for compliance is without support in the relevant regulations. The relevant law is clear that the permitting authority is required to incorporate monitoring and reporting requirements sufficient to determine compliance with the permit conditions.[191] In contrast, nothing in the Clean Water Act or the regulations states that requiring wet weather receiving water monitoring is beyond the authority of the permitting agency.[192] Further, accepting such a constrained interpretation of the Clean Water Act's monitoring requirements would undermine storm water permitting assessment. Excluding wet weather receiving water monitoring would preclude storm water dischargers from assessing the impacts of their discharges on waters of the United States during the events for which they are primarily being permitted—storm events. We find nothing in the text or preamble of the federal regulations to support a narrow interpretation of monitoring to exclude wet weather receiving monitoring.

To the extent Permittee Petitioners are arguing that the MEP standard, applied at the outfall, constrains the permitting authority's discretion to require monitoring beyond the outfall, we also find no support in the law for that proposition. We have already stated that we will continue to require compliance with water quality standards in MS4 permits. Wet weather receiving water monitoring is fundamental to assessing the effects of storm water discharges on water quality and determining the trends in water quality as Permittees implement control

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compliance with the Los Angeles MS4 Order generally as summarized in the Fact Sheet. (See Los Angeles MS4 Order, Att. F, Fact Sheet, pp. F-144-F-149.) Further, the Los Angeles Water Board considered monitoring costs-related comments on earlier drafts of the Los Angeles MS4 Order, and, in a number of cases, where presented with an argument that a cost related to a particular monitoring requirement was not commensurate with the benefits to be received from that requirement, made revisions to the requirement. (See, e.g., Administrative Record, section 8, RB-AR19653-19654, RB-AR19666, RB-AR19674, RB-AR19681.)

[190] The Los Angeles Water Board provided its rationale for the receiving water monitoring requirements in the Fact Sheet of the Los Angeles MS4 Order. (Los Angeles MS4 Order, Att. F, Fact Sheet, F-113-F-137.)

[191] See 33 U.S.C. § 1318(a)(2); 40 C.F.R. § 122.26(d)(2)(i)(F). While we do not interpret these requirements to mean that each and every permit condition must have a corresponding monitoring and reporting requirement, neither do we see any constraints on the water boards' authority to establish monitoring and reporting requirements.

[192] Permittee Petitioners reference language in the federal regulations concerning "effluent and ambient monitoring" (40 C.F.R. § 122.44(d)(1)(vi)(C)(3)) and appear to be using the phrase as support for their argument. That section is inapposite as it applies to situations where a State has not established a water quality objective for a pollutant present in the effluent and instead establishes effluent limitations on an indicator parameter for the pollutant of concern.

measures. Compliance may be determined at the outfall – for example, where a permittee determines that the discharge does not exceed an applicable WQBEL or receiving water limitation – but outfall monitoring alone cannot provide the broader data related to trends in storm water discharge impacts on the receiving water. Accordingly, receiving water monitoring is a legal and reasonable component of the monitoring and reporting program. Further, because Permittees are responsible for impacts to the receiving waters resulting from their MS4 discharges, Permittees may be required to participate in monitoring not only in receiving waters within their jurisdiction but also in monitoring all receiving waters that their discharges impact.

We will make no revisions to the Monitoring and Reporting provisions of the Order.

F. Joint Responsibility

In the extensive and interconnected system regulated by the Los Angeles MS4 Order, discharges originating from one Permittee's MS4 frequently commingle with discharges from other Permittees' MS4s within or outside of the Permittee's jurisdiction. Permittee Petitioners argue that the Los Angeles MS4 Order improperly ascribes responsibility to all Permittees with commingled discharges where those commingled discharges exceed a WQBEL or cause or contribute to exceedances of receiving water limitations. Specifically, Permittee Petitioners take issue with the fact that the Los Angeles MS4 Order ascribes "joint responsibility"[193] to the co-Permittees without a showing that a particular Permittee has in fact discharged the pollutant causing or contributing to the exceedance.

The Los Angeles Water Board counters that the joint responsibility regime is consistent with the intent of the Clean Water Act and further that it does not compel a Permittee to clean up the discharge of another Permittee. The Los Angeles Water Board points to two provisions for this latter proposition. First, even with joint responsibility, Permittees that have commingled MS4 discharges need only comply with permit conditions relating to discharges from the MS4 for which they are owners or operators.[194] Second, even where joint responsibility is presumed, a Permittee may subsequently counter the presumption of joint responsibility by

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[193] "Joint responsibility" is the term used in the Los Angeles MS4 Order. (See Los Angeles MS4 Order, Part II.K.1, p. 23 ("'Joint responsibility' means that the Permitttees that have commingled MS4 discharges are responsible for implementing programs in their respective jurisdictions, or within the MS4 for which they are an owner and/or operator, to meet the water quality-based effluent limitations and/or receiving water limitations assigned to such commingled MS4 discharges.") As defined by the Los Angeles Water Board and as discussed below, this term does not have the same meaning and scope as the legal doctrine of "joint liability."

[194] Los Angeles MS4 Order, Parts II.K.1, pp. 23-24, VI.A.4.a., p. 41; 40 C.F.R. § 122.26(a)(3)(vi); see also, *id*., Part VI.E.2.b.ii., p. 142 (stating in the context of TMDL requirements that, where discharges are commingled and assigned a joint WLA, "each Permittee is only responsible for discharges from the MS4 for which they are owners and/or operators.")

affirmatively demonstrating that its MS4 discharge did not cause or contribute to the relevant exceedances.[195]

Given the size and complexity of the MS4s regulated under the Los Angeles MS4 Order and the challenges inherent in designing a monitoring program that could parse out responsibility for each individual Permittee, we find that a joint responsibility regime is a reasonable approach to assigning initial responsibility for an exceedance. The Los Angeles MS4 Order provisions addressing TMDLs also appropriately take a joint responsibility approach, given that the wasteload allocations from which the WQBELs and other TMDL-specific limitations are derived are most frequently expressed as joint allocations shared by all MS4 dischargers in the watershed. We further agree with the Los Angeles Water Board that the regime is one that is permissible under applicable law. The Clean Water Act contemplates that MS4 permits may be issued on a system-wide or jurisdiction-wide basis[196] and the federal regulations anticipate the need for inter-governmental cooperation.[197] Further, the United States Court of Appeal, Ninth Circuit, recently stated in *Natural Resources Defense Council v. County of Los Angeles* (2013) 725 F.3d 1194 that the permitting authority has wide discretion concerning the terms of a permit, including the manner in which permittees share liability.[198]

Yet, we also find that joint responsibility in an MS4 Order is only appropriate if the ultimate responsibility for addressing an exceedance rests with those permittees that actually cause or contribute to the exceedance in question. The re-issued Los Angeles MS4 Order contains additional specificity and monitoring, beyond that contained in the 2001 Los Angeles MS4 Order, to document compliance and the presence or absence of an individual municipality's contribution of pollutants to the storm water. For this reason, the general reasoning of the Ninth Circuit's 2013 *Natural Resources Defense Council v. County of Los Angeles* decision finding liability based solely on the presence of pollutants above water quality standards in the receiving waters is of limited forward-looking importance. Generally, in the context of MS4 permits, we do not sanction joint responsibility to the extent that that joint

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[195] *Id.*, Part VI.E.2., pp.141-42; see also id., Part II.K.1, pp. 23-24.

[196] 33 U.S.C. § 1342(p)(3)(B)(i).

[197] See 40 C.F.R. §§ 122.26(d)(2)(i)(D), 122.26(d)(2)(iv), 122.26(d)(2)(vii).

[198] *Natural Resources Defense Council v. County of Los Angeles* (9th Cir. 2013) 725 F.3d 1194, 1205, fn. 16, cert. den. *Los Angeles County Flood Control Dist. v. Natural Resources Defense Council* (2014) 134 S.Ct. 2135. The Ninth Circuit went on to find that, based on the specific language of the 2001 Los Angeles MS4 Order, the Permittees were jointly liable for exceedances detected by mass emissions monitoring.

responsibility would require each Permittee to take full responsibility for addressing violations, regardless of whether, and to what extent, each permittee contributed to the violation.[199]

The Los Angeles MS4 Order does not impose such a joint responsibility regime where each Permittee must take full responsibility for addressing other Permittees' violations. In addition to clearly stating that permittees are responsible only for their contribution to the commingled discharges, the Los Angeles MS4 Order provides that Permittees may affirmatively show that their discharge did not cause or contribute to an exceedance. Joint responsibility, as applied by the Los Angeles MS4 Order, is thus consistent with our expectation that ultimate responsibility for addressing an exceedance rests with those Permittees that actually cause or contribute to the exceedance and consistent with the regulatory direction that co-permittees need only comply with permit conditions relating to discharges from the MS4 for which they are owners or operators.

While the result is that the burden rests on the Permittee to demonstrate that its commingled discharge is not the source of an exceedance, rather than on the Los Angeles Water Board to demonstrate that a Permittee's commingled discharge is causing or contributing to the exceedance, the result is not contrary to law. The Los Angeles Water Board has the initial burden to show that a violation of the Los Angeles MS4 Order has occurred,[200] but the Board can do so by establishing an exceedance of a limitation by jointly responsible Permittees and need not identify the exact source of the exceedance. This scheme represents a reasonable policy approach to a complicated compliance question where the Permittees are more closely familiar than the Los Angeles Water Board with their outfalls and their discharges in the extensive and interconnected MS4 network.

We are, however, concerned that the Los Angeles MS4 Order's treatment of the joint responsibility issue is too narrow. The Los Angeles Water Board addresses the issue of joint responsibility primarily in the context of compliance with the TMDL requirements of the Order. Commingled discharges pose the same questions of assigning responsibility where receiving water limitations are exceeded in water bodies receiving MS4 discharges from multiple jurisdictions, but where the pollutant is not addressed by a TMDL. A similar approach to

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[199] In a "joint and several liability" scheme, a plaintiff may collect his or her entire damages from any one defendant, and the defendants must then rely on principles of indemnity or contribution to apportion ultimate liability amongst themselves. (See *American Motorcycle Assn. v. Superior Court of Los Angeles County* (1978) 20 Cal. 3d 578, 586-590.) Because the Los Angeles MS4 Order's joint responsibility scheme does not equate to joint liability, and because we do not find such liability appropriate from a policy perspective, we do not address Petitioners' legal arguments as to whether joint or joint and several liability in the storm water context would be consistent with applicable law.

[200] See e.g. *Sackett v. E.P.A.* (9th Cir. 2010) 622 F.3d 1139 rev'd on other grounds *Sackett v. E.P.A.* (2012) 132 S. Ct. 1367.

assigning responsibility for addressing the exceedances is appropriate there. We will add new language to the Los Angeles MS4 Order mirroring Part VI.E.2.b., but applying the principles more generally.

We also take this opportunity to emphasize that all MS4 permits should be drafted to avoid one potential, but likely unintended, result arising from *Natural Resources Defense Council v. County of Los Angeles*. The broadest reading of the Ninth Circuit's holding following remand from the U.S. Supreme Court would assign joint liability to all Permittees for any exceedance at a monitoring location designated for the purpose of compliance determination, even if the particular pollutant is not typically found in storm water and has a likely alternative source such as an industrial discharger or waste water treatment plan. Providing municipalities an opportunity to demonstrate that they did not contribute to a pollutant present in receiving waters above standards will prevent this outcome.

We shall amend Part VI.B. as follows:

B. Monitoring and Reporting Program (MRP) Requirements

1. Dischargers shall comply with the MRP and future revisions thereto, in Attachment E of this Order or may, in coordination with an approved Watershed Management Program per Part VI.C, implement a customized monitoring program that achieves the five Primary Objectives set forth in Part II.A. of Attachment E and includes the elements set forth in Part II.E. of Attachment E.

2. Compliance Determination for Commingled Discharges

a. For commingled discharges addressed by a TMDL, a Permittee shall demonstrate compliance with the requirements of Part E as specified at Part E.2.b.

b. For commingled discharges not addressed by a TMDL, a Permittee shall demonstrate compliance with the requirements of Part V.A as follows:

i. Pursuant to 40 CFR section 122.26(a)(3)(vi), each Permittee is only responsible for discharges from the MS4 for which they are owners and/or operators.

ii. Where Permittees have commingled discharges to the receiving water, or where Permittees' discharges commingle in the receiving water, compliance in the receiving water shall be determined for the group of Permittees as a whole unless an individual Permittee demonstrates that its discharge did not cause or contribute to the exceedance, pursuant to subpart iv. below.

iii. For purposes of compliance determination, each Permittee is responsible for demonstrating that its discharge did not cause or contribute to an exceedance of the receiving water limitation in the target receiving water.

iv. A Permittee may demonstrate that its discharge did not cause or contribute to an exceedance of a receiving water limitation in one of the following ways:

(1) Demonstrate that there was no discharge from the Permittee's MS4 into the applicable receiving water during the relevant time period;

(2) Demonstrate that the discharge from the Permittee's MS4 was controlled to a level that did not cause or contribute to the exceedance in the receiving water;

(3) Demonstrate that there is an alternative source of the pollutant that caused the exceedance, that the pollutant is not typically associated with MS4 discharges, and that the pollutant was not discharged from the Permittee's MS4; or

(4) Demonstrate that the Permittee is in compliance with the Watershed Management Programs provisions under VI.C.

G. Separation of Functions in Advising the Los Angeles Water Board

Petitioners Cities of Duarte and Huntington Park (Duarte and Huntington Park) argue that their rights to due process of law were violated when the same attorneys advised both the Los Angeles Water Board staff and the Board itself in the course of the proceedings to adopt the Los Angeles MS4 Order. We disagree and reaffirm our position that permitting actions do not require the water boards to separate functions when assigning counsel to advise in development and adoption of a permit.

A water board proceeding to adopt a permit, including an NPDES permit, waste discharge requirements, or a waiver of waste discharge requirements, is an adjudicative proceeding subject to the Administrative Procedure Act's administrative adjudication statutes in Government Code section 11400 et seq.[201] Section 11425.10, part of the "Administrative Adjudication Bill of Rights," provides that "[t]he adjudicative function shall be separated from the investigative, prosecutorial, and advocacy functions with the agency . . . ."[202] In accordance with

[201] See Cal. Code Regs., tit. 23, § 648, subd. (b).

[202] Gov. Code, § 11425.10, subd. (a)(4). Subdivision (a)(4) references section 11425.30, which addresses disqualification of a presiding officer that has served as "investigator, prosecutor, or advocate" in the proceeding or its preadjudicative stage or is subject to "the authority, direction, or discretion" of a person who has served in such roles.

this directive, the water boards separate functions in all enforcement cases, assigning counsel and staff to prosecute the case, and separate counsel and staff to advise the board.

In a permitting action, water board counsel have an advisory role, not an investigative, prosecutorial, or advocacy role. Permitting actions are not investigative in nature and there is no consideration of liability or penalties that would make the action prosecutorial in nature. Further, while both counsel and staff are expected to develop recommendations for their boards, the role of counsel and staff is not to act as an advocate for one particular position or party concerning the permitting action, but to advise the board as neutrals, with consideration of the legal, technical, and policy implications of all options before the board. In the case of counsel, such consideration and advice includes not just legal evaluation of the substantive options for permitting but also of procedural issues such as admissibility of the evidence, conduct of the hearing, and avoidance of board member conflicts. Because counsel and staff are advisors to the board rather than advocates for a particular position, the same counsel may advise staff in the course of development of the permit and the board in the adoption proceedings.

A primary purpose of separation of functions in adjudicatory proceedings is the need to prevent improper ex parte communications.[203] The exceptions to the ex parte communications rules further support the position that counsel advising board staff may also advise the board itself. While section 11430.10 of the Government Code generally prohibits communications concerning issues in a pending administrative proceeding between the presiding officer and an employee of the agency that is a party,[204] one exception provides that a communication "for the purpose of assistance and advice to the presiding officer," in this case the board, "from a person who has not served as investigator, prosecutor, or advocate in the proceeding or its preadjudicative stage" is permissible. Even if board counsel could be considered an advocate in the proceeding, another provision (specifically referencing the water boards) excepts the communication from the general ex parte communications rules. A communication is not an ex parte communication if:

> (c) The communication is for the purpose of advising the presiding officer concerning any of the following matters in an adjudicative hearing that is nonprosecutorial in character:

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[203] See *Dept. of Alcoholic Beverage Control v. Alcoholic Beverage Control Appeals Bd.* (2006) 40 Cal.4th 1, 9-10.

[204] Government Code section 11430.10 prohibits communications between an employee that is a "party" to a pending proceeding and the presiding officer. We disagree that Los Angeles Water Board staff, as an advisor to the Board, was a "party" to the proceedings for adoption of the Los Angeles MS4 Order, but, even if staff could be considered a party, the cited exceptions to the ex parte communications rules would apply.

> . . .
> (2) The advice involves an issue in a proceeding of the San Francisco Bay Conservation and Development Commission, California Tahoe Regional Planning Agency, Delta Protection Commission, Water Resources Control Board, or a regional water quality control board.[205]

The fact that communications that would otherwise be considered prohibited ex parte communications are specifically permitted in non-prosecutorial adjudicative proceedings of the water boards further supports the position that the water boards are not obligated by law to separate functions in permitting actions.

We acknowledge that there may be some unique factual circumstances under which a permitting proceeding could violate due process or the Administrative Procedure Act because board counsel either acted or gave the appearance of acting as a prosecutor or advocate. Duarte and Huntington Park point to a writ of mandate issued by the Los Angeles Superior Court in 2010,[206] holding that a 2006 proceeding to incorporate provisions of the Santa Monica Bay Beaches TMDL into the 2001 Los Angeles MS4 Order was not fairly conducted because Los Angeles Water Board counsel had acted as an advocate for Board staff, directly examining Board staff witnesses, cross-examining witnesses called by permittees, objecting to questions asked by permittees, and making a closing argument on behalf of Board staff, while simultaneously advising the Board. The proceedings to adopt the Los Angeles MS4 Order did not follow the type of adversarial structure that led the Superior Court to find a violation of separation of functions in the 2006 proceedings.[207] Further, nothing in the conduct of the Los Angeles Water Board attorneys in the Los Angeles MS4 Order proceedings leads us to find that they acted as advocates for a particular position or party, rather than as advisors to the Board.

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[205] Gov. Code, § 11430.30. We note that the Law Revision Commission comments on section 11430.30, subdivision (c), state that "[s]ubdivision (c) applies to nonprosecutorial types of administrative adjudications, such as . . . proceedings . . . setting *water quality protection…requirements."* (Emphasis added.) The notes further state that "[t]he provision recognizes that the length and complexity of many cases of this type may as a practical matter make it impossible for any agency to adhere to the restrictions of [ex parte communications], given limited staffing and personnel." (25 Cal.L.Rev.Comm. Reports 711 (1995).) We agree that the lengthy and complex nature of permitting proceedings, and the limited staffing resources of the water boards, caution against an expansive interpretation of separation of functions in non-prosecutorial adjudications.

[206] *County of Los Angeles v. State Water Resources Control Board* (Super. Ct., Los Angeles Co. (June 2, 2010, Minute Order) No. BS122724) (Administrative Record, section 10.II, RB-AR23665-23667.)

[207] We also note that, although the writ directed that petitioners were entitled to a new hearing "in which the same person does not act as both an advocate before the Board and an advisor to the Board," the writ had no direct bearing on the separate proceedings to adopt the Los Angeles MS4 Order. In any case, as discussed, Board attorneys did not act as advocates in the proceedings to adopt the Los Angeles MS4 Order.

The two specific cases pointed to by Duarte and Huntington Park – advice by Board counsel to Board member Mary Ann Lutz regarding recusal due to ex parte communications and advice to the Board generally on the lack of a cost-benefit analysis requirement in federal law – may be contrary to the legal position held by Duarte and Huntington Park, but there is nothing in the record to suggest that the advice was driven by biased advocacy for a Board staff position.[208] In the absence of such evidence, we find no reason to depart from the general rule that separation of functions is not required in a permitting proceeding[209] and find that Los Angeles Water Board counsel acted in accordance with applicable laws in advising Board staff and the Board itself.

H. Signal Hill's Inclusion in the Order

The City of Signal Hill (Signal Hill) argues that the Los Angeles Water Board acted contrary to relevant law when it issued the system-wide Los Angeles MS4 Order that included Signal Hill, even though Signal Hill had submitted an application for an individual permit.[210] We disagree.

Signal Hill points out that the federal regulations allow an operator of an MS4 to choose between submitting an application jointly with one or more other operators for a joint permit or individually for a distinct permit.[211] However, the choice of application does not necessarily dictate the type of permit that the permitting authority ultimately deems appropriate. The permitting authority in turn has discretion to determine if the permit should be issued on a

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[208] See Administrative Record, section 7, RB-AR18309-18316, RB-AR18397-18400 (Transcript of Proceedings on Oct. 4, 2012), section 7, RB-AR18892-18894 (Transcript of Proceedings on Oct. 5, 2012).

[209] Although *Morongo Band of Mission Indians v. State Water Resources Control Board* (2009) 45 Cal.4th 731 concerned an enforcement proceeding and therefore is not on point for our legal determination above, we take note of the direction by the California Supreme Court that separation of functions in an administrative tribunal should not be expanded beyond its appropriate scope: "In construing the constitutional due process right to an impartial tribunal, we take a more practical and less pessimistic view of human nature in general and of state administrative agency adjudicators in particular . . . [and where proper procedure is followed and in the absence of a specific demonstration of bias or unacceptable risk of bias] we remain confident that state administrative agency adjudicators will evaluate factual and legal arguments on their merits, applying the law to the evidence in the record to reach fair and reasonable decisions." (*Morongo Band of Mission Indians, supra*, at pp. 741-742.)

[210] Signal Hill was one of several permittees under the 2001 Los Angeles MS4 Order that elected not to submit an application jointly with the other permittees for the renewed permit. The other parties have not challenged their inclusion under the Los Angeles MS4 Order. The Los Angeles Water Board rejected Signal Hill's application as incomplete; however, our determination that the Los Angeles Water Board had the discretion to issue the system-wide Los Angeles MS4 Order is not dependent on that fact.

[211] 40 C.F.R. § 122.26(a)(3)(iii). Signal Hill has also cited regulations applicable to Small MS4s at 40 Code of Federal Regulations sections 122.30 through 122.37. These regulations are not applicable here because the Los Angeles Water Board has designated the Greater Los Angeles County MS4, which includes the incorporated cities and the unincorporated areas of Los Angeles County within coastal watersheds, as a large MS4 pursuant to 40 Code of Federal Regulations section 122.26(b)(4).

jurisdictional or system-wide basis.[212] While the federal regulations do not specifically state that, in exercising that discretion, the permitting authority may override the permit applicant's preference for an individual permit, nothing in the regulations constrains its authority to do so. Section 122.26(a)(3)(iii) of 40 Code of Federal Regulations does not require the permitting authority to take any specific action in response to the submission of an individual application. And sections 122.26(a)(3)(ii) and 122.26(a)(3)(iv) provide that the permitting authority "may issue" system-wide or distinct permits. The preamble to the regulations similarly contemplates wide discretion for the permitting authority to choose system-wide permits, including a permit that would allow an entire system in a geographical region to be designated under one permit.[213] Particularly because the option of a system-wide permit would be significantly frustrated if MS4 operators were allowed to opt out at their discretion, the most reasonable reading of the regulations is that the permitting authority, not the applicant, makes the ultimate decision as to the scope of the permit that will be issued. Accordingly, we find that the Los Angeles Water Board had the discretion under the relevant law to issue the Los Angeles MS4 Order with Signal Hill as a permittee.

We also find that the Los Angeles Water Board's decision regarding Signal Hill was appropriately supported by findings in the Order and in the Fact Sheet.[214] Finding C of the Los Angeles MS4 Order, as well as discussion in the Fact Sheet,[215] establishes that the Los Angeles Water Board found a system-wide permit to be appropriate for a number of reasons, including that Permittees' MS4s comprise a large interconnected system with frequently commingled discharges, that the TMDLs to be implemented apply to the jurisdictional areas of multiple Permittees, that the passage of Assembly Bill 2554[216] in 2010 provided a potential means for funding collaborative water quality improvement plans among Permittees, and that the results of an online survey conducted by Los Angeles Water Board staff showed that the

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[212] 33 U.S.C. § 1342(p)(3)(B)(i); 40 C.F.R. § 122.26(a)(1)(v), (a)(3)(ii), (a)(3)(iv).

[213] See 55 Fed. Reg. 47990, 48039-48043 (preamble to the Phase I regulations noting that section 122.26(a)(3)(iv) would allow an entire system in a geographical region to be designated under one permit and further discussing that sections 122.26(a)(1)(v) and (a)(3)(ii) allow the permitting authority broad discretion in issuing system-wide permits).

[214] *Topanga Assn.*, *supra*, 11 Cal.3d at 515.

[215] Los Angeles MS4 Order, Part II.C., pp. 14-15; id., Att. F, Fact Sheet, pp. F-15-F-18.

[216] Assembly Bill No. 2554, Chapter 602, an act to amend sections 2 and 16 of the Los Angeles County Flood Control Act (Chapter 755 of the Statutes of 1915), relating to the Los Angeles County Flood Control District, Sept. 30, 2010 (Administrative Record, section 10.VI.C., RB-AR29172-29179). The Bill allows the Los Angeles County Flood Control District to assess a property-related fee or charge, subject to voter approval in accordance with proposition 218, for storm water and clean water programs.

majority of Permittees favored either a single MS4 permit for Los Angeles County or several watershed-based permits.

Signal Hill points out that the reasons enumerated by the Los Angeles Water Board as grounds for issuance of a system-wide permit did not preclude the Los Angeles Water Board from issuing an individual permit to the City of Long Beach (Long Beach).[217] The Los Angeles Water Board has provided the rationale for distinguishing Signal Hill and Long Beach in its October 15, 2013 Response. The Los Angeles Water Board explains that Long Beach has had an individual permit for more than a decade and that, unlike Signal Hill, it was not permitted under the 2001 Los Angeles MS4 Order. The Board's decision to issue a separate permit to Long Beach was originally the result of a settlement agreement that resolved litigation on the MS4 permit issued by the Los Angeles Water Board in 1996, and Long Beach has a proven track record in implementing the individual permit while cooperating with Permittees under the Los Angeles MS4 Order.[218] We find that the Los Angeles Water Board reasonably distinguished between Long Beach and the Permittees under the Los Angeles MS4 Order in making determinations as to individual permitting. We will not reverse its determination but we will add a brief statement reflecting that reasoning to the Fact Sheet.

We shall amend section III.D.1.a. at page F-18, Attachment F, Fact Sheet, as follows:

> The Regional Water Board determined that the cities of Signal Hill and Downey, the five upper San Gabriel River cities, and the LACFCD are included as Permittees in this Order. **In making that determination, the Regional Water Board distinguished between the permitting status of those cities and the permitting status of the City of Long Beach at this time because the City of Long Beach has a proven track record in implementing an individual permit and developing a robust monitoring program under that individual permit, as well as in cooperation with other MS4 dischargers on watershed based implementation. While all other incorporated cities with discharges within the coastal watersheds of Los Angeles County, as well as Los Angeles County and the Los Angeles County Flood Control District, are permitted under this Order**, ~~I~~individually tailored permittee requirements are provided in this Order, where appropriate.

[217] Signal Hill is located in the geographical middle of Long Beach and is entirely surrounded by that city.

[218] Los Angeles Water Board, October 15, 2013 Response, p. 25, fn. 78.

III. CONCLUSION

Based on the above discussion, we conclude as follows:

1. Although we are not bound by federal law or state law to require compliance with water quality standards in municipal storm water permits, we will not depart from our prior precedent regarding compliance with water quality standards. The regional water boards shall continue to require compliance with receiving water limitations in municipal storm water permits through incorporation of receiving water limitations provisions consistent with State Water Board Order WQ 99-05.
2. However, we find that municipal storm water dischargers may not be able to achieve water quality standards in the near term and therefore that it is appropriate for municipal storm water permits to incorporate a well-defined, transparent, and finite alternative path to permit compliance that allows MS4 dischargers that are willing to pursue significant undertakings beyond the iterative process to be deemed in compliance with the receiving water limitations.
3. We find that the WMP/EWMP provisions of the Los Angeles MS4 Order, with minor revisions that we incorporate herein, are an appropriate alternative to immediate compliance with receiving water limitations. The WMP/EWMP provisions are ambitious, yet achievable, and include clear and enforceable deadlines for the achievement of receiving water limitations and a rigorous and transparent process for development and implementation of the WMPs/EWMPs.
4. We find that the WMP/EWMP provisions do not violate anti-backsliding requirements.
5. We find that the WMP/EWMP provisions do not violate antidegradation requirements; however, we find that the antidegradation findings made by the Los Angeles Water Board are too cursory and revise those findings consistent with the federal and state antidegradation policies.
6. We find that issuance of time schedule orders is appropriate where a final receiving water limitations deadline set in the WMP/EWMP or a final TMDL-related deadline is not met; however we find that the WMP/EWMP compliance schedule need not otherwise be structured as an enforcement order.
7. We clarify the WMP/EWMP provisions to make it clear that final compliance with receiving water limitations and final WQBELs and other TMDL-specific limitations must be verified through monitoring.

8. We clarify the WMP/EWMP provisions to make it clear that Permittees may request extensions of deadlines incorporated into the WMPs/EWMPs except those final deadlines established in a TMDL. However, any deadline extensions must be approved by the Executive Officer after public review and comment.
9. In order to add greater rigor and accountability to the process of achieving receiving water limitations, we revise the WMP/EWMP provisions to add that the Permittees must comprehensively evaluate new data and information and revise the WMPs/EWMPs, including the supporting reasonable assurance analysis, by June 30, 2021, for approval by the Executive Officer.
10. We find that the storm water retention approach is a promising approach to achieving receiving water limitations, but also find that the Administrative Record does not support a finding that the approach will necessarily lead to achievement of water quality standards in all cases. We revise the WMP/EWMP provisions to clarify that, in the case of implementation of an EWMP with the storm water retention approach, if compliance with a final WQBEL or other TMDL-specific limitation is not in fact achieved in the drainage area, a Permittee will be considered in compliance with the relevant limitation only if the Permittee continues to adaptively manage the EWMP to achieve ultimate compliance with the WQBEL or other TMDL limitation.
11. We find reasonable the WMP/EWMP provisions that allow permittees to be deemed in compliance with receiving water limitations during the planning and development phase of the WMP/EWMP. We revise the WMP/EWMP provisions to state that, if a Permittee fails to meet one of the deadlines, the Permittee may still develop a WMP/EWMP for approval by the Los Angeles Water Board or its Executive Officer; however, the Permittee will not be deemed in compliance with receiving water limitations or WQBELs and other TMDL-specific limitations during the subsequent WMP/EWMP development period.
12. We recognize that the Los Angeles MS4 Order WMP/EWMP compliance path alternative may not be appropriate in all MS4 permits. In order to provide guidance to regional water boards preparing Phase I MS4 permits, we lay out several principles to be followed in drafting receiving water limitations compliance alternatives: Phase I MS4 permits should (1) continue to require compliance with water quality standards in accordance with our Order WQ 99-05; (2) allow compliance with TMDL requirements to constitute compliance with receiving water limitations; (3) provide for a compliance

alternative that allows permittees to achieve compliance with receiving water limitations over a period of time as described above; (4) encourage watershed-based approaches, address multiple contaminants, and incorporate TMDL requirements; (5) encourage the use of green infrastructure and the adoption of low impact development principles; (6) encourage the use of multi-benefit regional projects that capture, infiltrate, and reuse storm water; and (7) require rigor, accountability, and transparency in identification and prioritization of issues in the watershed, in proposal and implementation of control measures, in monitoring of water quality, and in adaptive management of the program. We expect the regional water boards to follow these principles unless the regional water board makes a specific showing that application of a given principle is not appropriate for region-specific or permit-specific reasons.

13. We recognize that the success of the WMP/EWMP approach depends in large part on the steps that follow adoption of the provisions, including the development and approval of rigorous WMPs/EWMPs and the implementation and appropriate enforcement of the programs once approved. We direct the Los Angeles Water Board to periodically report specific information to the State Water Board regarding implementation of the WMPs/EWMPs, including on-the-ground structural control measures completed, monitoring data evaluating the effectiveness of such measures, control measures proposed to be completed and proposed funding and schedule, trends in receiving water quality related to storm water discharges, and compliance and enforcement data.

14. We find that the Los Angeles Water Board acted in a manner consistent with the law when establishing numeric WQBELs. We further find that the development of numeric WQBELs was a reasonable exercise of the Los Angeles Water Board's policy discretion, given its experience in developing the relevant TMDLs and the significance of storm water impacts in the region. However, we find that numeric WQBELs are not necessarily appropriate in all MS4 permits or for all parameters in any single MS4 permit.

15. We find that the Los Angeles Water Board's choice of BMP-based WQBELs, to be proposed by the Permittee in the WMP/EWMP to address USEPA-established TMDLs was reasonable.

16. We find that the Los Angeles Water Board did not act contrary to federal law when it prohibited the discharge of non-storm water "through the MS4 to receiving water" instead of "into" the MS4. Regardless of the exact wording of the prohibition, the standard that applies to non-storm water is the requirement of "effective prohibition." However, the Los Angeles Water Board also has authority to regulate any dry weather discharges from the MS4s under the applicable TMDLs.
17. We find that the monitoring and reporting provisions of the Los Angeles MS4 Order are consistent with applicable law and reasonable.
18. We find that assigning joint responsibility for commingled discharges that cause exceedances is not contrary to applicable law. Given the size and complexity of the MS4s regulated under the Los Angeles MS4 Order, the joint responsibility regime also constitutes a reasonable policy choice. The Los Angeles MS4 Order specifically allows a permittee to avoid joint responsibility by demonstrating that its commingled discharge is not the source of an exceedance.
19. We find that representation of the Los Angeles Water Board and the Los Angeles Water Board staff by the same attorneys in the proceedings to adopt the Los Angeles MS4 Order was lawful and reasonable.
20. We find that the Los Angeles Water Board acted in a manner consistent with applicable law and reasonably when it issued a system-wide permit that included Signal Hill.

Addressing the water quality impacts of municipal storm water is a complex and difficult undertaking, requiring innovative approaches and significant investment of resources. We recognize and appreciate the commendable effort of the Los Angeles Water Board to come up with a workable and collaborative solution to the difficult technical, policy, and legal issues, as well as the demonstrated commitment of many of the area's MS4 dischargers and of the environmental community to work with the Los Angeles Water Board in the development and implementation of the proposed solution. We also recognize the extensive work that interested persons from across the state, including CASQA, have invested in assisting us in understanding how the watershed-based alternative compliance approach developed by the Los Angeles Water Board may inform statewide approaches to addressing achievement of water quality requirements. While storm water poses an immediate water quality problem, we believe that a rigorous and transparent watershed-based approach that emphasizes low impact development, green infrastructure, multi-benefit projects, and capture, infiltration, and reuse of storm water is

a promising long-term approach to addressing the complex issues involved. We must balance requirements for and enforcement of immediate, but often incomplete, solutions with allowing enough time and leeway for dischargers to invest in infrastructure that will provide for a more reliable trajectory away from storm water-caused pollution and degradation. We believe that the Los Angeles MS4 Order, with the revisions we have made, strikes that balance at this stage in our storm water programs, but expect that we will continue to revisit the question of the appropriate balance as the water boards' experience in implementing watershed-based solutions to storm water grows.

IV. ORDER

IT IS HEREBY ORDERED that the Los Angeles MS4 Order is amended as described above in this order. The Los Angeles Water Board is directed to prepare a complete version of the Los Angeles MS4 Order (including any necessary non-substantive conforming corrections), post the conformed Los Angeles MS4 Order on its website, and distribute it as appropriate.

CERTIFICATION

The undersigned, Clerk to the Board, does hereby certify that the foregoing is a full, true, and correct copy of an order duly and regularly adopted at a meeting of the State Water Resources Control Board held June 16, 2015.

AYE:	Chair Felicia Marcus Vice Chair Frances Spivy-Weber Board Member Tam M. Doduc Board Member Steven Moore Board Member Dorene D'Adamo
NAY:	None
ABSENT:	None
ABSTAIN:	None

Jeanine Townsend

Jeanine Townsend
Clerk to the Board

Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000 – 2003

Los Angeles County Municipal Storm Water Permit

A Report to the California Regional Water Quality Control Board Los Angeles Region

January 2003

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EXECUTIVE SUMMARY

There has been considerable controversy over the costs associated with compliance of the 2001 Los Angeles County Municipal Storm Water Permit (LA County MS4 Permit). This report is intended to provide the Regional Board with an analysis, performed by Regional Board staff, of the cost of compliance submitted to the Regional Board as part of Annual Report submissions by the municipal storm water permittees. Additionally, this report provides some additional information on expected costs of compliance over the life of the current permit, i.e., five years from date of adoption.

The review comes to several key conclusions. These are:

1. A substantial portion of the reported cost of compliance can be attributed to longstanding programs, e.g., street sweeping, that have been conducted by cities for many years preceding the adoption of the earliest storm water permit in 1990. The pre-existing costs are, by far, the largest component of cost for most permittees.

2. Regional Board staff cost assessments appear to validate U.S. EPA estimates for permit compliance.

3. Reported costs of compliance for the same program element vary widely from city to city and by a very great margin that cannot be explained. Attempts made by staff to validate what appear to be grossly inflated numbers were unsuccessful. Selected audits of these permittees are recommended to obtain numbers that reflect actual expenditures. If, as a result of an audit, reported numbers are found to be wholly without foundation, enforcement action may be appropriate.

4. Reports of costs of compliance not tied to specific permit requirements are being widely reported. The reports are based on assumptions that are invalid and which do not comport with the provisions of the storm water permit which is Best Management Practices (BMP)-based and which does not contain numerical effluent limits. Costs for the implementation of the least expensive BMPs that will meet water quality requirements are not well developed, if at all.

Neither the Governmental Accounting Standards Board (GASB) nor the Federal Accounting Standards Advisory Board (FASAB) has established Generally Accepted Accounting Principles (GAAP) guidelines for reporting storm water budgets.[1] Thus, the development of a standard protocol for program budget reporting in partnership with municipalities appears to be necessary to ensure that cost figures, reported to the LA Regional Board, are provided in a consistent and comparable format.

[1] The two accounting rule-making authorities for government bodies in the U.S. are the GASB for local and State government, and the FASAB for the Federal government.

1.0 INTRODUCTION

The LA County MS4 Permit covers the County of Los Angeles and 84 cities within LA County except for the City of Long Beach. The Los Angeles Regional Water Quality Control Board reissued the LA County MS4 Permit on December 13, 2001.

The Regional Board (RB) staff considered costs in crafting the 2001 LA County MS4 Permit and the requirements therein.[2] While cost is a factor, the Regional Water Board is not required to perform a detailed cost-benefit analysis. In performing the cost analysis, the RB staff relied on a number of documents: (1) *Report to Congress on the Phase II Storm Water Regulations*, EPA 833-R-99-001 (1999); (2) *NPDES Report to Congress on the Phase II Storm Water Regulations; 64 Fed. Reg. 68791-68796*; (3) Workbook: *Designing and Implementing an Effective Storm Water Management Program - Storm Water NPDES Phase II Regulations* – American Public Works Association, Kansas City, MO (2000); (4) a cost estimate document[3] submitted by the City of Los Angeles as part as its formal comment on the first draft of the LA County MS4 Permit; and, (5) other documents listed in the Administrative Record.

The U.S. EPA performed a full cost/benefit analysis before promulgating Phase II regulations. In its cost/benefit analysis, the federal agency reviewed costs data from Phase I municipalities implementing similar programs as required by the LA County MS4 permit, in order to determine the budget burden for implementation on Phase II municipalities. Costs estimates from Phase I municipalities were considered valuable since many of the cities were implementing the first or second generation permits for some time and had the opportunity to fine tune their cost expenditures for program implementation. It is important to mention that the same survey of cost implementation performed by the U.S. EPA included a Southern California MS4 program (Orange County and Cities), where three-fourths of the co-permittees have populations less than 100,000 people. It is also significant to mention that the fiscal analysis required in the Orange County MS4 Program requires that budgets be accounted for as pre-existing costs for activities performed prior to the promulgation of the storm water regulations, and new costs thereafter.

2.0 METHOD

RB staff used several methods to estimate the cost per household for implementation of the LA County MS4 Storm Water Permit.

These are:

A. Extrapolation from U.S. EPA estimates for implementation of Phase II: National average per household estimates were adjusted for inflation and then an increment of 25 percent added to account for the cost of new programs under the 2001 permit.

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[2] See Response of the LA Regional Board to the LA County MS4 Petition for Stay (2002) at: http://www.swrcb.ca.gov/~rwqcb4/html/programs/stormwater/la_ms4_final/petition_for_stay/02_0402_LARWQCB_LA_MS4_Response.pdf

[3] Storm Water Pollution Abatement Charge - Budget Estimate for 2001-2002, 2002-2003 and Actual Budget Estimate for 2000-2001 (dated June 18, 2001)

B. Computation from budget estimates submitted by permittees: The budget-cost estimates submitted by permittees were divided by the number of households in the municipality based on the 2000 U.S. Census. The cost estimate divided by the number of households provided the estimated per household cost of implementation for each permitee. A second computation was performed dividing the countywide cost estimate by the number of households countywide to derive the mean estimated per household cost for LA County.

C. Extrapolation from City of LA Budget: The City of LA provided a budget based on a dedicated special fund, which was considered reliable because its sole purpose was to pay for the storm water program. Pre-existing program costs such as trash collection and street sweeping were excluded from this budget. RB staff then compared budget breakdown for implementation of the 1996 permit and the 2001 permit provided by the City of LA. The increase in cost for each program element was then taken to be the cost increment associated with the implementation of the 2001 permit for that program.

3.0 RESULTS AND ANALYSIS

3.1 Implementation Cost Estimates

The U.S. EPA, in its survey, determined that costs for Phase I municipalities averaged $9.08 (1998 dollars) per household per year to implement the requirements of the MS4 permits, with a median value of $2.86. U.S. EPA's cost benefit analysis identified a range of annual costs from $0.62 to $60.43 per household for the communities it surveyed.

The estimated average cost of implementation for the specific requirements of the 2001 permit lies somewhere between the U.S. EPA's estimated national cost for Phase 1, at $9.64 (adjusted for inflation), and the extrapolated figure of $17.21 per household per year from the City of LA budget data. If one were to use the budget data reported by permittees on face value, the mean household cost of compliance is between $50 and $63 per year[4], and the median cost of compliance is about $28.

[4] The difference arises based on the way the countywide per household cost is computed. Whether it is averaged based on the countywide total budget or it is averaged after summing each municipalities per household cost.

Table 1. Household cost for implementation of the LA County MS4 Permit using a selection of methods.

	Costs per Household
Computation with U.S. EPA Assumption[5]	$9.64
Assuming 25% Incremental cost[6]	$12.00
Computation with Orange County's Estimate[6]	$12.50
Extrapolation from City of LA Data[7]	$17.21
Reported Mean for LA County MS4 permittees[7]	$50.00 - $ 63.00
Reported Median for LA County MS4 permittees[7]	$28.00
CALTRANS Study[8]	$1509.00

A cursory review of the Orange County MS4 Permit Annual Report[9] budget section reveals that the amount attributable to implement the Drainage Area Management Plan (DAMP similar to Storm Water Quality Management Plan [SQMP] in the LA County MS4 Permit) is 20% of the total budget. The rest, 80% is attributable to pre-existing programs costs. Thus if we assume that cost per household is $50 and that one fifth of the sum is new cost because of the storm water program, then $10 per household is a reasonable cost estimate per household for implementation of storm water requirements. Assuming that the 2001 permit imposed a 25% incremental cost in new programs, the average cost per household cost becomes $12.50, which is very close to U.S. EPA's figure of $12.

3.2 Wide Ranging Inconsistencies

In the storm water budgets reported by LA County MS4 permittees, there was no consistency in program costs when one considers average costs, similar counts of population and similar land use. Very dissimilar costs per household with orders of magnitude differences for similar population counts were noted. Average cost per household varies from $1 to 515.[10] The median value is $28. The City of Los Angeles estimated expenditure per household at $18, which is about twice the value reported ($9.08 in 1998 dollars) by U.S. EPA for Phase I cities in its cost/benefit analysis for Phase II. Overall county average cost per household is $50 to $63 depending on the method of calculation.[11] This figure is five times the average household cost estimated in U.S. EPA's cost survey.

[5] 1998 dollars adjusted for inflation at 2% annually.
[6] Segregating pre-existing program expenditures and new costs to implement the storm water program.
[7] Not segregating between pre-existing program expenditures and new costs to implement the storm water program.
[8] Annualized cost.
[9] http://www.ocwatersheds.com/StormWater/swp_documents_annual.asp (accessed August 2002)
[10] As explained before, Vernon and City of Industry where not considered in the analysis due to their very low resident population.
[11] *Supra* footnote 4.

For example, the City of Glendale reported costs eleven times more, on average cost per household, than the City of Los Angeles[12] to implement the same permit requirements. Another example is the City of Rolling Hills when compared to the City of Hidden Hills: they have similar population and land uses, but Hidden Hills seems to spend one and a half times more than Rolling Hills does. A few additional examples follow.

Table 2. Cost per Household estimates for selected cities with similar characteristics.

City	Reported Cost per Household	Population	Households
Rolling Hills	$66	1,871	624
Hidden Hills	$109	1,875	625
San Marino	$22	12,945	4,315
Palos Verdes Estates	$300	13,340	4,447
Artesia	$5	16,380	5,460
Santa Fe Springs	$136	17,438	5,813
Culver City	$434	38,816	12,939
West Hollywood	$144	38,900	12,967
San Gabriel	$46	39,804	13,268

Some times differences among cities may be appropriate if they can be explained. Such examples are the City of Vernon and the City of Industry. These cities are unique because they are heavily industrialized with low resident populations. The annual per household cost in these cities would appear very high as a result. But in most cases the reason for differences in per household costs among cities are difficult to discern.

3.3 Incremental Cost of Permit Compliance

The 2001 permit contains a number of specific provisions that are new and will require an additional expenditure to achieve compliance. These specific provisions are identified below and an estimate of compliance cost increase is provided for each program area:

- Public Information and Involvement (Pollutant specific outreach)
- Industrial/ Commercial Inspection
- Illicit connection/ discharge elimination (Proactive identification and MS4 system mapping)

[12] City of Los Angeles has a dedicated special fund called the storm water pollution abatement charge.

- Development Planning (Standard Urban Stormwater Mitigation Plans for ministerial and discretionary projects)
- Development Construction (Local Storm Water Pollution Plans for projects 1 acre or larger)
- Public Agency (Catch-basin cleaning and trash receptacles at transit shelters)
- Monitoring (Expanded monitoring)

Table 3. Incremental cost of compliance from the 1996 permit to the 2001 permit.

LA County MS4 Storm Water Programs	2001 Permit Cost per household	1996 Permit Cost per household	Percent increase
Program Management	$1.66	$1.56	6%
Public Information and Participation	$1.38	$1.30	6%
Industrial/ Commercial Inspection	$0.99	$0.90	9%
Development Planning	$0.84	$0.79	6%
Development Construction	$0.05	$0.05	6%
Public Agency Activities	$11.50	$10.82	6%
Illicit Connection/ Discharge Elimination	$0.80	$0.75	6%
Total Cost per Household	$17.21	$16.18	6%

*The incremental costs to LA County municipalities were computed by extrapolation using the City of Los Angeles' budget information provided for 2000/2001 (1996 permit) and 2001/ 2002 (2001 permit). The City of Los Angeles has a dedicated special fund (storm water pollution abatement charge). Costs reported by the City of Los Angeles were considered most reliable.

* Costs of the monitoring program are not included because the County of Los Angeles as Principal Permittee almost exclusively conducts monitoring on behalf of the cities. If computed on a countywide basis, the cost of annual monitoring as reported by the County of Los Angeles increased from $ 0.16 to $0.24 per household.

The incremental cost of compliance under the 2001 permit was estimated to be less than ten percent, if City of LA data is extrapolated to be indicative of compliance cost to other permittees.

4.0 DISCUSSION

4.1 Overview of Budget Estimates

Permittees have provided annual budget estimates for implementing the 1996 permit, as required under the monitoring and reporting program for that permit. The estimates aggregated to $142 million and $145 million for fiscal years 2000/01 and 2001/02 respectively. Overall, the total estimated cost for compliance with 1996 permit is close to five hundred million dollars over a five-year period. However, the permittees included questionable estimates and creative accounting. For example, for the fiscal year 2000/01, the City of Glendale reported $5.6 million for public agency activities, the City of Downey reported $1.6 million for monitoring, and the City of Hermosa Beach reported $2.8 million for elimination of illicit discharges and

connections. On follow-up inquiry, City staff was unable or did not substantiate these reported expenditures.

With few exceptions, permittees failed to provide additional data regarding program costs during the permit reissuance process. One exception was a cost estimate, dated June 18, 2001, that the City of Los Angeles[13] submitted as part of its formal comments on the first draft permit. The Regional Board considered these comments, and made substantial reductions in certain requirements in the third draft, such as the frequency of sweeping streets.

Permittees' cost estimates range widely (from zero to $4.2 million) as reported for the program to eliminate illicit discharges and connections in 2000/01, vis-à-vis the illicit discharges and connections elimination activity actually reported by the permittees to have been completed. The expenditures do not appear to bear any rational relationship to illicit discharges and connections elimination efforts.

RB staff review and inquiry of municipal staff, indicates that some cities are computing their storm water budgets by estimating a percentage of each of the city's line item budget that seems to be related to MS4 permit compliance. In other words it is only a rough "guess estimate". Sometimes costs associated with complying with the general industrial storm water permit, a separate program, appear to have been included under the MS4 permit expenditures.

4.2 Pre-existing Programs

Many jurisdictions have ongoing programs and activities that are related, to some degree, to improving storm water quality. These ongoing or pre-existing programs, such as hazardous waste permitting and inspection, recycling programs, road and street maintenance, sanitary sewer maintenance, flood control channel maintenance, catch basin clean-up, street sweeping, to name a few, are already in place due to other regulatory requirements or pre-existing programs. Even for cities that were incorporated after the promulgation of storm water regulations (1990) such as Calabasas and Malibu, it cannot be claimed that the expenditures for these types of activities are due to storm water regulations in their entirety. These services were performed prior to the existence of a storm water permit under a contract with the county or another administrative entity.

Inclusion of pre-existing programs (e.g. street sweeping) cause exaggeration of permit compliance costs, possibly representing more than 50% of the estimated reported budgets in many cases. Such costs should be listed separately since they are not a true new expenditure to comply with the MS4 permit requirements. The actual new expenditures for the implementation of the storm water requirements, in excess of what cities were already spending before the introduction of storm water regulations, may be much less than 50% of the currently estimated budgets reported to the Regional Board. Street Sweeping and Trash Collection costs account for most of the Public Agency Activities Program implementation expenditures, up to 98% of a program's budget in some cases, and up to 90% of the total storm water program implementation

[13] This cost estimate includes $0.8 million for implementation of trash TMDL and $3.3 million to implement the pathogen TMDL.

expenditures for some cities. Overall, Public Agency Activities Program implementation costs amount to $122 million (including street sweeping and trash collection which are the major portion of costs in this program) and account for 85% of the total budget expenditures of $143 million. One may conclude that the permittees are spending on average $41 per household for the Public Agencies Activities alone. To implement the rest of the storm water program, cities spend no more than 15% of their reported budgets, which is around $22 million or $9 on average per household. This figure of $9 is almost identical to the U.S. EPA's cost estimate (See Table 1).

Program cost exaggeration may be a problem with other MS4 programs in the LA region as well such as the City of Long Beach and the Ventura County MS4 Program. Consider the case of the City of Long Beach (which is covered by its own MS4 permit). A review of its budget estimate indicates that street sweeping costs $10 million, which corresponds to half of the reported budget of $19 million. However, this is not a new expenditure for the City of Long Beach attributable to the storm water regulations. Street sweeping pre-dates the storm water regulations, so it cannot be considered an extra burden on the city's budget. It is not a new expense. The only instance that may qualify as a new expenditure is an increase in frequency of street sweeping due to storm water requirements in excess of normal frequencies, e.g. the increase from an existing one time per month to two times per month street sweeping in commercial areas. A closer look may reveal that several other pre-existing programs are being claimed as new expenditures to comply with the 2001 permit requirements. These may include, flood control maintenance, sewer maintenance activities, storm drain reconstruction, road maintenance, hazardous waste collection, and solid waste recycling programs. This pattern of accounting appears to be repeated in the FY 2002/03 estimated budgets. The Public Agency Activities Program estimates provided at $210 million (including street sweeping and trash collection) account for 73% of the total budget of $288 million[14], while only 27% or $78 million accounts for the cost of all the other programs combined.

The primary issue is what is the true additional financial burden for the implementation of the storm water regulations. Many of the activities performed by the cities can be listed as costs under the storm water costs budget, but they were incurred by the city before the storm water regulations, therefore they are not a true new expenditure or new burden on city revenues. In order to be accurate, only that portion of cost increase due to a new permit requirement and not otherwise already pre-existing should be identified as a new incremental in cost for the municipality. It is imperative to separate the budgets reported under the storm water requirements under pre-existing and new costs of compliance with the specific MS4 permit requirements to have a clear picture of what the true cost and burden of the storm water regulations are. Otherwise, the impression is given that the cost of compliance is huge and everything is a new burden, which is misleading. Costs to be attributed toward implementation of the MS4 permit requirements must be strictly attributable to new tasks specified in the Storm Water Management Plan.

[14] The estimated budgets for FY 2002/03 are incomplete since a number of cities reported that they were unable to estimate the costs of implementation of the new permit requirements. The data may be reconciled when cities report the expenditures actually incurred in the 2003-2004 Annual Report.

4.3 Municipal Cost Sharing.

Another problem area appears to be how the County of Los Angeles and the LA County Flood Control District budget fits into the overall cost picture. The County of Los Angeles' budget accounts for nearly 40% of the total estimated costs for all permittees combined, but it is not clear how this supports activities for all cities and how the cost is being accounted for (raising the possibility of double counting). For example, the County of Los Angeles does almost all of the monitoring required by the LA County MS4 Permit but other cities also report monitoring expenses. If these cities participate in the funding of this effort or on special projects, that may be appropriate, otherwise the cost estimate is dubious.

4.4 Comparison of Estimates with Expenditures

A review of the Annual Report for 2001/02, which covers the last six months of the 1996 permit and the first six months of the new permit, indicates that a number of cities revised upward the expenditure figures by orders of magnitude relative to the estimated budget figures provided in the previous year's fiscal analysis. Other cities reported that the amount budgeted for was the exact amount spent, and some others reported a slight decrease in expenditures versus estimated budget.

Upon closer review of the status of implementation of specific programs under the 2001 permit, it becomes apparent that most of the permittees continued to implement the 1996 permit requirements, because updated Model Programs were not available until July 2002. Therefore, the apparent significant increase in expenditures for some cities versus estimated budgets, is likely due to changes in accounting practices and not due to any new activity.

4.5 Site Education Program

Another example of accounting irregularity is the Site Visit Education program. The County of Los Angeles performed site education activities for 37 contract cities, paid for through existing funds, and as a consequence, some of the cities reported $0 expense for this task. Other cities reported an additional separate expense. Some of the cities performed the site education visits themselves, and the County of Los Angeles reimbursed them a standard amount. In some cases, it appears that these cities did not subtract the reimbursed amount from their own estimated budget cost that they reported to the Regional Board.

Furthermore, an examination of the fiscal analysis in the 2001/02 Annual Report for expenditures for the site visit program for the last six months of the 1996 permit reveal more irregularities. For the first six months of the new inspection program of the 2001 permit, no site visits or inspections have been reported as completed in the Annual Report but significant amounts of expenditures are being reported as having been incurred. It is highly unlikely that the high costs

were incurred for logistics – such as setting up a critical source database or other administrative activities without any fieldwork. Therefore, the reported expenditures are questionable.

A RB staff brief review of the Site Visit Education Program under the 1996 permit, for six cities, revealed a $2 million difference between the estimated budgets and the actual amount spent to conduct the site visit. For example, City of Glendale reported an estimated budget of $1.86 million to perform the site visits, but the actual amount spent was about $100,000. Similarly the City of Industry, for the same task, estimated a budget of $276,280 but actually spent just $35,618.

4.6 Cost of the Inspection Program

The 2001 permit upgraded the site visit program to a facility inspection. Based on RB staff review, the inspection program at industrial/commercial facilities can be performed within the existing reported budget estimates. In reality there may be a moderate increase in expenditure.

The average cost per site visit for the Site Visit Program ranged from $50 to $100 (the County of Los Angeles' reimbursement rate was $50 for industrial/commercial sites and $34 for restaurants). The time spent on each site ranged from 30 minutes to an hour (data reported by permittees). Assuming that the average cost of a site education visit was $100 per site and multiplying this figure with the total number of site visits reported during the five year permit term, the total cost of implementation of this task equals $6.5 million. Therefore, the projected budget of $8 million for inspections is only a 23% incremental cost added to the existing budget. Further, assuming that a site inspection will involve twice as much effort as a site education visit, the average unit cost per site inspection can be reasonably estimated to be in the range of $100 to $200. This new requirement to elevate the site visit education program to an inspection program at industrial/commercial facilities in the 2001 permit appears not to have been so burdensome after all.

The County of Los Angeles, the principal permittee, has estimated the cost for the industrial and commercial inspection. The inspection program was generally claimed by many permittees to be the most cost-prohibitive element of the 2001 permit. As documented in memoranda prepared by the County of Los Angeles, dated December 5, 2001 and January 3, 2002, these inspections would cost the County and the cities an estimated $8 million over the 5-year permit term. This $8 million cost annualizes to $1.6 million, and can be spread among all 84 permittees. In comparison with the estimated $15.5 million spent during the previous permit term to implement the site education visit program, the inspection cost as determined constitutes a nearly 50 percent savings. Perhaps this is so because the logistical aspects were worked out during the site visit phase and that the inspection step-up imposes only a slight increase in burden.

Noteworthy is the fact that the inspection program is estimated to cost $3.1 million (this may be the most expensive year due to start-up costs), in the FY 2002/03 fiscal analysis. The inspection requirement was identified as one of the more onerous provisions of the 2001 permit, but the cost appears to represent only 1.1% of the total estimated budget of $288 million as reported by permittees.[14] The apparent marginal cost burden to the majority of the permittees to conduct

industrial and commercial inspections might be so because the City of LA and the County of Los Angeles carry the predominant share. The City of Los Angeles has its own inspection program and accounts for approximately 50% of all industrial/commercial facilities in Los Angeles County. The County of Los Angeles covers another significant portion of the industrial/commercial base. Thus, the other 83 permittees combined have jurisdiction over no more than the remaining 20% to 30%. Many cities can and have effectively used existing inspection programs such as pretreatment, code enforcement, public works, fire department, Certified Unified Public Agencies (CUPAs) to integrate the storm water inspection requirements.

4.7 Misuse of Program Cost Estimates

Some permittees' extensive use of circumspect estimates to demonstrate how financially burdensome the implementation of the LA County MS4 Permit is disingenuous. In order to establish credibility of program costs, permittees must thoroughly review the way the budgets are built, and the relationship between budget projections and actual expenditures of activities directly related to the implementation of the LA County MS4 Permit requirements.

Also the $54 billion cost estimate cited by the California Department of Transportation (Caltrans) in June 1998 bears no relationship to the LA County MS4 permit provisions. Several municipal officials have widely cited this estimate as an annual cost that permittees will bear over the next 10 years. This is misleading because the Caltrans estimate was not prepared to meet the requirements that are specific to the LA County MS4 permit. The Caltrans estimate is invalid because of several erroneous assumptions. These include, namely that permittees are required to shift their strategy from BMPs that focus on preventing pollution at its source, to a regional treatment facility. Such a strategy would call for substantial land acquisition and capital costs to: (a) capture runoff from 1.2 inches of precipitation; and (b) construct 6 plants to treat all pollutants in the runoff, at a rate of 500 million gallons per day. This is clearly not the requirement reflected in the LA County MS4 permit, which relies upon, and provides flexibility for permittees to devise cost-effective BMPs to prevent pollutants from coming into contact with storm water and to reduce pollutants discharged in the storm water.

4.8 Comparison with Palm Beach County, FL MS4 Program

A comparison with the budget analysis of another Phase I MS4 Permit, Palm Beach County, Florida, shows similar accounting difficulties as for LA County, in the absence of clear guidelines from the U.S. EPA.

In the Palm Beach County Annual Report however, the costs under pre-existing programs is recognized. The first term Palm Beach County MS4 Permit includes the federally required inspection program at high-risk industrial/commercial sites. Looking at a comparison of scales, the population of Palm Beach County is one eighth of the population of LA County. The Palm Beach County MS4 program is funded by a combination of general funds and utility fee assessment.

Table 4. Comparison of MS4 program costs between Los Angeles County, CA and Palm Beach County, FL.

	Los Angeles County, CA	Palm Beach County, FL
Median cost per household[15]	$30	$32
Average cost per household	$50	$48
Range of cost per household	$1 to $515[16]	$3 to $526
Population	9,335,522	1,131,184
Estimated budget	$149,166,730	$23,382,702
Average cost per household largest city[17]	$18	$130

4.9 Comparison with MS4 Programs in Other U.S. Communities

There are few studies to date to provide a thorough analysis of the cost estimates for the implementation of the municipal storm water programs. The U.S. EPA performed a cost/ benefit analysis for the promulgation of Phase II Storm Water Regulations. A recent article[18] discusses the evaluation of cost estimates for the implementation of the six minimum control elements for small municipalities under Phase II rules. The author investigated two scenarios: one for a small community of 10,000 people and another for a medium sized urban area of 50,000 people. It is interesting to note that the small community scenario assumes it is adjacent to a larger city that has obtained a Phase I permit and can assist it in many of its permit responsibilities. This scenario resembles the situation in LA County urban area for many small cities.

The author concludes that the range of costs is similar to those identified by U.S. EPA in its estimate. The cost per capita was $5.63 for the medium sized city (population of 100,000 or more) for the implementation of the municipal storm water in a five-year permit term following the first permit term and $1.11 for the smaller city.

Extrapolating these figures by multiplying the per capita cost with the average number of 2.92 persons per household in Los Angeles County, we obtain a range between $3.24 and $16.43 per household for small to mid-sized cities. These findings tend to validate City of Los Angeles' average estimated cost of $18 per household as a credible estimate noting that these costs are incurred by a significantly larger municipality implementing additional elements required by Phase I regulations.

[15] Household in LA County is defined as 3 persons, in PB County is 2.34 persons
[16] Excluding cities of Vernon and Industry
[17] Los Angeles, West Palm Beach
[18] NPDES Phase II Cost Estimates by Andrew J. Reese, P.E in Proceedings for National Conference on Tools for Urban Water Resource Management and Protection (February 2000) Chicago, IL.

The author also states that based on his own experience working in over 100 communities, he estimates that comprehensive storm water programs that include advanced storm water quality programs cost between $7 to $20 per capita per year. That translates in LA County to a value of $58 average cost per household at the highest end. In contrast, the cost data reported by the municipalities in LA County show a value of $515 average cost per household at the highest end, with 24 cities (28% of the total number of permittees) well above the maximum average cost per household estimated by the author.

5.0 RESPONSE TO COMMENTS ON DRAFT REPORT

We extend our appreciation to the municipalities who responded to our draft document released in August 2002 and provided comments that enabled us to present a more in-depth analysis. The analysis should provide a basis for further discussions and help in creating a framework for how to match budget estimates with the true implementation costs for purposes of transparency and accountability.

The following summarizes RB staff responses to comments received:

Base Year for Cost Analysis – A commenter suggested that using the 2000-2001 estimates as a basis for cost analysis is flawed, and instead to use the 2002-2003 estimates, which would be the first full year of implementation under the 2001 permit. Among RB staffs' purpose during the current analysis was to review some of the previous assumptions and estimates made under the 1996 permit term and determine if the estimates truly reflected the costs of program implementation. The analysis identified a number of discrepancies and errors, and as a consequence a number of permittees updated some of their previously submitted budget figures. This is not to say that there were no municipalities that went through a thorough analysis and attempted to come up with a budget estimate as accurate as possible. Such diligence was simply very difficult to discern.

Site Education Visit Analysis – Commenters challenged the cost analysis for the implementation of the site education visits program, but no one provided hard numbers or tangible figures to dispute the facts presented in the analysis. As it stands, the analysis showed that for the site education visits implementation program, permittees spent a combined $15.5 million dollars during the second permit term. In contrast, the County of Los Angeles County estimates that under the 2001 permit, the total cost will be $8 million for the industrial/commercial inspection program.

Inspection Cost Estimate - In was suggested that the unit cost of the site inspection should be closer to the $400 per inspection estimated by the consultants performing inspections on behalf of the U.S. EPA and Regional Boards at industrial sites covered by the Industrial Storm Water General Permit. We note that there might be a significant reduction in unit cost for municipal

permittees because municipal inspectors are not required to review the Storm Water Pollution Prevention Plan (SWPPP) and monitoring data. In addition, the municipalities may have reduced overhead costs usually incurred by an outside contractor. The estimated cost range projected by the RB staff analysis is between $100 to $200 per site inspection and is a very reasonable assumption.

Equating big budgets to better compliance - It appears that some permittees infer that RB staff consider "the bigger the amount, the better the compliance" with permit requirements. A high budget estimate means a chance to "look good" on paper and not draw the attention during report review. There is a misconception that a small budget equates to a red flag indicating that the permittee is not allocating enough resources to program implementation. Quite the contrary, RB staff performed in-depth analysis. Any intentional budget inflation, when discovered through a program audit, may lead to Regional Board enforcement action.

Tiered compliance – Some permittees perceive that different tiers of efforts to comply are appropriate and acceptable even though the Maximum Extent Practicable (MEP) standard applies equally to all Permittees. Some commenters noted that some cities are aggressive in implementation and therefore spend more, and others spend excessively because of previous lawsuits. The rest, who spend significantly less, should not be compared with the former groups, simply because their effort is less aggressive, or because they were never challenged with a lawsuit. As far as the RB staff is concerned MEP applies equally to all permittees. A tiering of effort does not constitute compliance with the MEP standard.

Pre-existing Programs - One commenter suggested that the idea of pre-existing programs does not make sense any more, since the new permit carries over most of the programs established under the 1996 permit. Therefore, the true comparison should be made between pre-existing programs under the 1996 permit, and the new requirements under the new permit. We note that in surveying Phase I municipalities, to prepare its *Report to Congress on the Phase I Storm Water Regulations,* the U.S. EPA sent out a survey form to Phase 1 NPDES Municipal Storm Water permittees. The survey's purpose was to determine the costs of storm water regulations and their financial impact on Phase 2 municipalities. One of the questions on the survey was:

> "6) Please estimate (a) your agency's cost of activities from before the Phase 1 program that you now include as part of your phase 1 permit (b) your agency's new activities that you are now required to do as part of the phase 1 permit that you were not doing previously."

It is clear that the U.S. EPA intends for MS4 permittees to distinguish between pre-existing program costs prior to the inception of the storm water permit and new costs incurred since, when reporting budgets.

Inclusion of the Cost of TMDL Implementation - Some commenters contended that the cost of TMDL implementation should be included in storm water budget reporting. However, except for the trash TMDL specifically mentioned in the 2001 permit, all the other TMDLs are not described in the permit provisions and therefore, the cost of implementation is unknown. When a particular TMDL becomes part of the LA County MS4 permit requirements, then it would be an

appropriate practice to include the cost of TMDL compliance with the particular TMDL in the storm water budget estimate.

6.0 FUTURE COMPLIANCE COSTS

It is highly speculative to estimate what future permit compliance costs will be. However, future costs can be divided into two broad categories: 1) Compliance with direct permit costs and 2) compliance with receiving water limitations. The first category is specific to the costs associated with the prescriptive elements of the permit, excluding the receiving water limitations provision (Part 2 of the permit). This report has, in essence, focused on this quantifiable category of costs. Costs for compliance with the receiving water limitations have not been assessed or included in this report given that this provision of the permit has not yet been invoked and such costs, to the extent costs are incurred, will depend on the successive, iterative application of cost-effective BMPs designed to achieve water quality standards.

The "iterative process" is a mechanism by which compliance with the LA County MS4 permit's receiving water limitation provision can be achieved over time. "Receiving Water" refers to that body of water into which the discharge of storm water from the municipal separate storm sewer system is placed, i.e., a river, stream, ocean or lake. The LA County MS4 permit's receiving water limitations' language is structured so that discharges of pollutants from the municipal storm sewer do not degrade the "receiving water" quality below the quality allowed by long-established water quality standards. The water quality standards are contained primarily in the Regional Board's Basin Plan and reflect the level of water quality necessary to support aquatic life and safe human use of the water. The iterative process recognizes that degraded water quality from a storm water discharge sometimes cannot be restored to compliance with water quality standards through the application of a single round of BMPs. Rather, the concept is that a municipal permittee should develop a reasoned suite of BMPs, apply them, measure the water quality improvement achieved, and, if the original suite of BMPs have not, over time, achieved water quality standards, that they should be augmented with additional BMPs until water quality standards are achieved.

A key element of this process is the selection of BMPs by the permittees. Given that the selection of BMPs is both prospective and unknown at this time, a specific cost estimate for compliance cannot be developed. However, some general conclusions can be drawn as to the range of costs involved. Most importantly, the permit does not mandate any specific BMPs for use in the iterative process and, presumes that the most cost effective BMPs will be selected by the permittees.

Source control is one of the most important and cost effective strategies available to address storm water pollution. Clearly, if you have removed or dramatically reduced the presence of pollutants that can be discharged in storm water, the need for any downstream controls is either eliminated or dramatically reduced. Inspections of industrial sites to ensure compliance with municipal storm water ordinances (as provided in the LA County MS4 permit), therefore, becomes a very significant BMP that can reduce the presence of pollutants before they become entrained in storm water. Inspections are one of the most cost effective strategies that can be

used to reduce the presence of storm water pollutants, especially of toxic metals.

Some cost assessments have been or are being developed on the basis of applying sophisticated chemical and biological treatment to the entire flow of storm water during a major rain event. Storm water flows in Southern California produce very large volumes of water that can carry pollutants. As noted above, source control and other cost-effective BMPs can be effectively used to substantially reduce pollutant loadings in storm water and the Regional Board staff believes that these BMP approaches are the most appropriate to pursue. The collection and treatment of storm water flows in massive, high cost, and sophisticated treatment systems is not required by the LA County MS4 permit which presumes that source control and cost-effective BMPs will be effectively applied through the iterative process.

7.0 CONCLUSION

1. It is essential to identify budget items separately as "costs of pre-existing programs" vs. "new costs" due to the implementation of the storm water program, in order to determine the incremental costs of the reissued 2001 permit. However, LA County cities have never accounted for the storm water program in their budgets in this manner.

2. The average combined household cost, based on the reported budgets is in the range of $50 to $63 per year. Using the assumption of segregating the budgets into pre-existing programs and expenditures to implement the storm water program, the average cost per household per year goes down to $12.50 - $18 for implementing the new programs required by the municipal permits.

3. The 2001 LA County MS4 permit costs may involve at most a 15% to 25% overall incremental increase over the cost to implement permit requirements in the second permit term (1996-2001) in terms of average annual costs per household. This is demonstrated by the educational site visits vs. inspection program comparison (the elevation from site visits to inspection program was considered the single largest increase in expenditures). If we accept the assumption presented previously that the actual total cost of implementing the site visits was $6.5 million under the previous permit, the $8 million estimate for site inspection in the new permit, represents a 23% increase. On a recent conversation with a knowledgeable municipal representative, it was confirmed that the assumption of 15% to 25% incremental increases in costs in upgrading from site educational visits to inspections seemed reasonable. In this particular instance, a city may already be performing regulatory inspections for other programs and the storm water inspections can be readily incorporated with the other activities for efficiency. Some municipalities have expressed their intent to integrate their storm water inspection activities with other existing inspection programs such as CUPA.

4. A closer look at the budget accounting practices of municipalities reveals that their claim of excessive financial burden to comply with the MS4 permit requirements is at best exaggerated. It is also apparent that until clear accounting and budget reporting guidelines are formulated, and

financial audits are performed, budget numbers reported by the cities will be difficult to compare, as there are widely varying ways of accounting for the costs of implementation. In the absence of clear guidelines, (See U.S. General Accounting Office Report: "WATER QUALITY – Better Data and Evaluation of Urban Runoff Programs Needed to Assess Effectiveness." [2001],[19] it is difficult to determine with any certainty the cost the cities incur to implement the MS4 permit requirements and to differentiate costs between pre-existing programs and new expenditures.

5. RB staff recommends that a "Storm Water Budget Reporting Guidelines" workgroup be established. The objective of the workgroup would be to develop some generally accepted budget-reporting guidelines. The workgroup would assist in developing guidelines on how storm water budgets and costs should be reported so that its endusers, such as the public and environmental regulators, are able to determine implementation, progress, performance, and make across municipal program comparisons with a high level of confidence.

[19] The report uses the LA County MS4 Program reported estimated budgets from FY 1999 to make national comparisons.

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Alternative Approaches to Stormwater Quality Control

Prepared for the Los Angeles Regional Water Quality Control Board

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EXECUTIVE SUMMARY

Background

A recent, widely debated study entitled *An Economic Impact Evaluation of Proposed Storm Water Treatment for Los Angeles County* projects extremely high costs for compliance with stormwater quality regulations (Gordon et al., 2002). These estimates followed from the study's fundamental assumption that the only way to comply with water quality regulations is to capture most or all of the flow and subject it to advanced treatment, and to do so at rates equal to peak runoff rates. *In contrast, this report shows that there are far less expensive approaches available that, should they be implemented, will achieve high levels of compliance with current federal water quality standards.*

Alternatives Considered

This report reviews present federal and state regulations and regulatory policy to determine whether advanced ultrafiltration treatment of the entire runoff flow is required to meet water quality standards, or whether compliance can be achieved through the widespread adoption of the various "best management practices" (BMPs) more commonly used for runoff quality control. The work identified and analyzed alternative measures that can be employed to meet present federal and state water quality standards. Particular attention was paid to strategies that concern ground water recharge, pollutant source control, and runoff detention, capture, and BMP treatment.

The report reviews possible approaches for controlling runoff water quality in the Los Angeles Region (the jurisdiction of the Los Angles Regional Water Quality Control Board) and presents a conceptual regional plan, including rough cost estimates. The study pursued a broad approach, providing an evaluation of total costs and benefits for the region, including those for municipalities, businesses, and individuals. The objective of the study was to outline a complete solution to stormwater quality problems, i.e., the plan is intended to meet the requirements of the stormwater permit and Total Maximum Daily Loads and provide acceptable water quality for the area. The alternatives of best management practices (BMPs) for control of individual pollutants (source control), and if necessary, a regional system of wetlands and infiltration facilities to provide final treatment and groundwater replenishment were chosen. These will be much cheaper than advanced treatment plants, and will provide benefits whose value exceeds costs.

Assumptions Made for Determining Costs

Following the review of possible remedial actions for stormwater pollution, a conceptual plan for the Los Angeles Region was developed. It was predicated on the following assumptions:

Because source control is always cheaper than cleaning polluted water, efforts should begin with preventing the release of pollutants to runoff. This includes measures like litter control, improved street cleaning, improved industrial housekeeping and others. Such approaches may constitute sufficient control for runoff coming from residential areas, so that these areas will require no further action.

For new residential development, anecdotal information indicates that landscaping that captures and infiltrates the first-flush storm will be of comparable cost to traditional landscaping, and should therefore be used. For commercial construction, costs may be higher, and adequate regional facilities might be substituted.

Where non-structural BMPs will not be adequate, or where implementation is very expensive, efforts must expand to include regional wetlands and stormwater parks (multiple-use infiltration basins).

Large portions of the Los Angeles Region are already built out to various degrees, constraining available stormwater management solutions. This report assumes that 1000 square miles can be characterized as "low density", and that these regions can be served by a combination of source control, treatment wetlands, and infiltration systems. Another 1000 square miles is "high density" and can be served by source control and infiltration systems. About 50 square miles are "extremely high density" (such as downtown areas) and will require more sophisticated infiltration or treatment devices that occupy smaller areas.

Estimated Costs

Total costs for compliance with runoff water quality regulations were predicted to be between $2.8 billion (if non-structural systems are sufficient for the entire region) to between $5.7 billion and $7.4 billion (if regional treatment or infiltration systems must also be constructed throughout the entire area). It is likely that regional systems will be required for at least some, but not all, of the area, so that the final costs will be somewhere between these extremes.

- Enforcement of littering, pet waste, and chemical use ordinances is expected to cost about $9 million per year.

- Public education will cost about $5 million per year. A program to detect and prevent illicit discharges to the system will cost about $80 million per year at first, but can be reduced to much lower levels as compliance is achieved.

- Increased cleaning of storm drains will be needed if regional solutions are not used, and will cost about $27 million per year.

- Trash discharges to receiving waters can be controlled by installing screening devices on catch basins, enforcing litter laws, and improving street cleaning services. Estimates are that the immediate cost of instituting these measures will be about $600 million over the Los Angeles Region.

- During periods of low flow, runoff water should be diverted to existing wastewater treatment plants. Construction costs for this effort will be about $28 million.

- Trash control and removal of particulates and their associated pollutants can be facilitated by improved street cleaning. It is expected that this will cost $7.5 million per year more than current street cleaning programs, with a present worth of $250 million.

- On-site BMPs required for individual firms might cost about $240 million. Costs associated with compliance with the ¾-inch rule for new construction will be a modest fraction of construction costs.

- With regard to structural BMPs, total costs (regional wetlands and infiltration systems) were first estimated by determining the costs per square mile of drainage area incurred at other sites, and multiplying by the area over which they will be applied. Wetlands for the "low density" areas were estimated to cost $420,000 per square mile of drainage area, for a total cost of $420 million. Infiltration systems for the "high density" areas were estimated to cost $3.7 million per square mile of drainage, for a total cost of $3.7 billion. More sophisticated treatment BMPs (such as sediment traps and oil adsorbers) for the "extremely dense" areas were estimated to cost $33 million per square mile of drainage, for a total of $1.7 billion. Thus total new facilities costs are $5.8 billion.

- A second method for estimating structural BMP costs utilized costs per acre-foot of retention capacity as determined by the Los Angeles County Department of Public Works Sun Valley Project. Presuming that runoff from a ¾-inch storm must be captured in the low-density, high density, and extremely high density areas with runoff coefficients of 0.4, 0.6, and 1.0, costs are $53,000, $98,000, and $470,000 per acre-foot, respectively. The overall facilities cost estimate using this method is $4.0 billion.

Estimated Benefits

There are substantial benefits to the examined approaches that extend beyond the value of stormwater quality control. Reductions in pollutant releases will improve public health and neighborhood livability. Restoration of the hydrologic cycle will replenish groundwater reservoirs, reduce flood risks, and provide greenspace for recreation and wildlife habitat. It was determined that the total value of benefits from the alternatives for runoff quality control described will exceed the costs. Total benefits for the non-structural stormwater quality control programs in the Los Angeles Region are estimated at $5.6 billion. Implementation of the non-structural and regional measures throughout the Los Angeles Region would have benefits worth $18 billion.

- Reduced need for flood control is expected to save about $400 million.

- Property value increases from additional greenspace and bodies of water are expected to amount to $5 billion over the Los Angeles region.

- Additional groundwater supplies created by infiltration will have a current worth of about $7.2 billion.

- "Willingness to pay" surveys in similar circumstances suggest that the public amenity value of avoiding stormwater pollution of local bodies of water is about $2.5 billion.

- Cleaner streets are worth about $950 million.

- Improved beach tourism will bring in about $100 million.

- Preservation of the nature's services in the marine coastal zone, such as nutrient recycling and chemical maintenance of the atmosphere, is worth about $2 billion.

- Reduction of sedimentation in local harbors will save $330 million.

- Improvements in public health associated with reduced exposure to fine particles from streets are likely significant, but could not be quantified.

Recommendations for Immediate Action

Municipalities that have the responsibility for meeting runoff quality regulations should take some immediate steps.

- Outreach programs, explaining to citizens the need for runoff quality control and discouraging illegal discharges such as littering, should begin.

- Data should be collected on the stormwater discharges from subwatersheds to determine what BMPs are workable, and general plans should be updated to include policies that promote stormwater control.

- An administrative structure should be established which includes the relevant stakeholders and funding agencies for each watershed (such as watershed councils).

- Funding plans should be developed.

- Building codes that work against runoff quality control should be changed immediately—in particular, all parking lots built from now on should also be stormwater infiltration systems.

- All new street cleaning equipment should be high-quality vacuuming systems. Appropriate agencies should be encouraged to use the latest microbiological

techniques to investigate sources of pathogenic organisms in runoff, so that mitigation efforts can be optimally designed.

INTRODUCTION

This report identifies and analyzes alternatives for control of stormwater runoff in Los Angeles County. A recent, widely debated study entitled, *An Economic Impact Evaluation of Proposed Storm Water Treatment for Los Angeles County* projects extremely high costs for compliance with stormwater quality regulations (Gordon et al., 2002). These estimates followed from the study's fundamental assumption that the only way to comply with water quality regulations is to capture most or all of the flow and subject it to advanced treatment, and to do so at rates equal to peak runoff rates. As this report shows, however, there are far less expensive approaches that, if implemented, can achieve high levels of compliance with current federal water quality standards.

A broad approach was taken: an evaluation was made of total costs and benefits for the region, including those for municipalities, businesses, and individuals. A complete solution to stormwater quality problems was considered—that is, the plan is intended to meet the requirements of the stormwater permit and Total Maximum Daily Load and provide acceptable water quality for the area. The recommendations for steps to be taken are not limited to the Los Angeles Regional Water Quality Control Board (LA Regional Water Board). Action by other governmental agencies will also be required. The study begins with a brief description of runoff sources and contaminants. A review of present federal and state regulations and regulatory policy to was done to determine whether advanced ultrafiltration treatment of the entire runoff flow will be required, or whether compliance can be achieved through the widespread adoption of the various "best management practices" (BMPs) more commonly used for runoff quality control. The study then identifies and analyzes alternative measures that can be employed to meet present federal and state water quality standards. Particular attention is paid to strategies that facilitate ground water recharge, source control measures, storm water detention and capture, and BMP treatment. While prevailing uncertainties make an overall cost estimate only approximate at this time, costs of specific approaches are illustrated with examples. Financial benefits, such as those regarding groundwater replenishment, more appealing beach environments, improved public health, and the creation of additional urban green space, are also addressed in the report. Clearly, water is a scarce resource in this region of the country, and economic evaluations of different management techniques for stormwater runoff must also consider the benefits of improved water quality and water supply as well as flood control. Prior to reviewing federal and state water quality regulation and policy, this study provides an overview of more general policy and regulation theory.

Runoff

The bulk of urban runoff is generated during rainfall events, and can properly be termed stormwater. This flow is extremely irregular, especially in Southern California, where most days are dry, and measurable rain occurs on average of only 32 days per year. Total rainfall in the area is modest, averaging about 16 inches per year. A large storm in this area might drop as much as three inches of rainfall in 24 hours, but this is still much less intense than typical rainfall events in other states, such as those on the East Coast.

Even so, high flows and flooding do occur in Southern California because of the topography. Water from large watersheds drains into local rivers, and slopes are steep, so that rainfall is rapidly collected and concentrated.

Water also enters the storm drains from non-rainfall sources. Sprinklers left on overnight, car washing, and hoses used to clean sidewalks and driveways generate smaller streams sometimes called nuisance flows. These flow in the storm drain system all year, and with residual stream flows (and in a some areas, recycled wastewater), constitute dry-weather flow. The terms "stormwater" and "runoff" are often used interchangeably. However, it is important in some cases to recognize the difference—stormwater arrives suddenly in huge amounts, while nuisance flows are much smaller and run all year.

Urbanization of the landscape substantially changes the amount and composition of runoff. Because less water infiltrates (percolates) into soils, the total amount of runoff is increased. Because the water runs off pavement more rapidly, it is concentrated to make peak flows higher. Recharge of groundwater is reduced, and the shallow groundwater that feeds some streams dries up, so surface flows decrease in some areas. Surface flows may increase during dry weather in other areas because of nuisance flows from over-irrigation and car washing. In general, the storage and buffering effects of soils and groundwater reservoirs are reduced. Runoff flowing through vegetation, or entering and leaving shallow groundwater, is subject to the effects of filtration and biodegradation, which has a considerable purifying effect. Water runoff from pavement is not cleaned, and indeed is contaminated by whatever dirt and pollutants are on the pavement.

Pollutants

The cities of Southern California use "separate" systems, meaning stormwater is collected apart from the wastewater generated by toilets and showers. The wastewater enters a closed network of pipes and is carried to treatment plants. Stormwater may initially flow in underground conduits, but eventually passes to open flood control channels, rivers, and the ocean. This storm water drainage system is called a Municipal Separate Storm Sewer System (MS4). Runoff pollutants are different in nature from those in sewage. Pathogens are present, but in far smaller concentrations, as are nutrients such as phosphorus and nitrogen. There may be more petroleum hydrocarbons, dust, sediments, and settled air pollutants in runoff, but total organic content in runoff is usually much lower than in wastewater.

The pollutant load of stormwater varies greatly with location. The water contains pollutants that wash off rooftops, parking lots, industrial facilities, and the streets. Pollutants may also be discharged illegally, when individuals pour motor oil into the storm drains or industries release toxic pollutants.

Water flowing in the streets picks up trash, dust, dirt and other materials that have been deposited on the pavement. The dust includes fine particles of rubber from tire wear, settled air pollutants, trace metals from brake pads and other mechanical sources, and pet feces. Cars drip motor oil onto the pavement and the early flows of fall may carry a petroleum sheen.

Stormwater quality protection measures may be placed in three general categories. Infiltration allows percolation of the water into the ground, relying on the soil to remove pollutants from the replenishing groundwater and eliminating the discharge to runoff.

Source control measures prevent the release of pollutants, so that the water is never contaminated. Treatment systems remove the pollutants from the stormwater before it reaches the ocean.

Runoff Sources and Quality

Stormwater and runoff come from a great variety of sources and carry a varied suite of pollutants. There are many approaches to the task of protecting receiving waters, and the best choice depends on stormwater source and quality. Runoff from a residential area of single-family homes, for example, is unlikely to carry industrial pollutants, but may have small amounts of oil and grease from roads, microbiological contamination from pet feces., and dissolved nutrients from fertilizers. These are readily removed by filtration in soil, so groundwater recharge, with its additional benefit of replenishing aquifers, is a good choice. Runoff from construction sites is less likely to carry harmful microorganisms, but may have heavy loads of sediment. The best choice here is to use dikes, detention ponds, and other measures to allow the sediment to settle out of the water before it is percolated to groundwater or released to storm drains. The dispersed and difficult-to-control pollutants of urban commercial areas may best be dealt with by providing regional solutions, such as parkland designed to serve simultaneously as a flood control basin, a groundwater recharge site, and a sedimentation basin for large amounts of water.

Streets

Streets, particularly those in dense commercial areas, are the most difficult source of urban runoff to manage. They receive litter, dust and dirt, air pollutant particulates, pet feces, occasional human waste, trace metals and oil from cars, various illegal discharges, and other pollutants. Because they are the first part of the stormwater collection and transport system, they receive and pass on pollutants that are carried away from parking lots, commercial establishments, and industries.

Exposed Commercial Activity

Manufacturing and other commercial activities, even those dealing with hazardous materials, have no effect on stormwater quality if the work is carried out under cover. However, for some large-scale activities, such as oil refining, this is not practical. Rain falling on machinery, materials, or contaminated surfaces can pick up pollutants. Measures can be taken to cover individual activities, or treatment systems can be installed to clean the water before release.

Construction Sites

Frequently, the first step taken in construction of new facilities is to clear the land of vegetation and pavement. The exposed soil is highly vulnerable to erosion by rainfall, and the movement of trucks and machinery can “track” soil to the adjacent streets.

Residences

Single-family homes are a source of some pollutants. Roof runoff will contain dust, bird feces and settled air pollutants. Runoff from gardens may contain pesticides and fertilizers. Occasionally, homeowners will (illegally) dispose motor oil or paint waste into storm drains. For the most part, however, runoff from neighborhoods of

single-family homes is relatively less polluted (if household toxics such as pesticides are properly used). Multiple-family residences produce many of the same pollutants, but typically have a higher ratio of rooftop and impervious surface to permeable landscaping, so that more water runs off.

Commercial Rooftops

Roof runoff from commercial facilities may be slightly polluted with air pollutant dusts, bird droppings, hydrocarbons from roof tar, and occasionally, some trace metals from rooftop machinery. The contaminants present may be very similar to those found on residential roofs, but handling the runoff may be more difficult because commercial areas have a high ratio of roof area to land area, and often have little landscaping.

Parking Lots and Landscaping

A significant fraction of urban land is devoted to parking lots. Parking lots are commonly polluted by litter, heavy metals from auto-parts and road wear, and by oil leaking from cars. Spilled food is present near establishments that sell food, and pet feces, bird droppings, and settled air pollutants will also be present, and all of these can be washed away in the runoff. Virtually all parking lots are designed for rapid drainage to the street or storm drain. Indeed, where grass or other plantings are present, these are commonly surrounded by curbs that prevent flow of the water from the lot into the soil. Many designs, in fact, promote runoff from the vegetation to the pavement.

ASSESSMENT OF REGULATORY POLICY

Overview of Policy and Regulation Theory

This report, in identifying and assessing BMPs, takes a strategic regulatory planning approach to managing stormwater runoff in Los Angeles County. Strategic regulatory planning involves a close examination of the legislative goals concerning the given policy. The ultimate end of strategic regulatory planning is to control behavior through methods that agree with legislative goals and societal values regarding the issues at hand. Thus, a strategic approach demands careful consideration first of whether enforcement is appropriate; and second, if enforcement is appropriate, to what degree should the parties involved be pressured to comply; and third, how coercive should the regulatory devices be? Compliance with existing laws and regulations, in this case the provisions of the federal Clean Water Act and state law, is a major goal of the strategic regulatory planning process.

How compliance is defined can vary markedly depending upon the actors involved and the policymaking context. In this sense "compliance" means the degree to which members of a target group conform to the directives of an agency, court, legislative body, or some other governmental agency. One way to determine whether members of a target group are in compliance with an environmental law is to monitor levels of pollution on a regular basis. We assume that the greater the number of individuals and firms that are in compliance with rules, the more likely pollution will decrease in a given locality.

When legislators pass laws, they generally expect them to be vigorously enforced and fully obeyed. Only idealists, however, actually believe that this is possible or even necessary in all cases. Political and economic factors usually force policymakers to take a more realistic approach to enforcement by setting a desired and attainable level of compliance prior to program implementation. At this stage, policymakers must consider whether 100 percent compliance is necessary. If not, they must determine what degree of compliance is needed in order to meet environmental quality goals. While the desired degree of compliance is often only a rough estimate, several factors must be kept in mind. Policymakers must take into account, for example, the extent to which members of a target group are making a “reasonable” effort to change their behavior and follow the law.

If it is either unrealistic or undesirable to aim for total compliance on the part of the target population, a clear decision rule must be formulated concerning enforcement priorities. In a policy area where polluters vary a great deal in size and how much they pollute, for example, it is commonly most prudent to concentrate enforcement efforts on the largest polluters. If firms are roughly the same size and pollute about the same amount, however, alternative guidelines for identification and discrimination must be set. For example, will businesses be selected randomly for monitoring and inspection? Is systematic enforcement, perhaps based on location, possible? Or, is self-regulation the preferable approach? The decision rule should relate to the strategic goals, resources, and motivations of all those involved. Further considerations include the legal authority for enforcement, the resources of the enforcement agency, and the fragmentation of the enforcement agency (or agencies).

In the ex post review/revision stage, policymakers determine the effectiveness of the regulatory program after it has been implemented. Feedback and evaluation are used to assess program performance. Legislative goals are used as a guide in determining whether regulatory approaches are succeeding or failing.

If policymakers determine that the program goals are still desirable, they will continue the same course of action. If they determine that the goals are being met, they will either maintain present enforcement levels or perhaps decrease enforcement efforts. The latter decision should only be made if policymakers believe they can save time and money and feel reasonably certain that compliance rates will not suffer. Appropriate and immediate action is required, of course, if the objectives are no longer desirable or if the objectives are not being achieved. In nearly every case, the aim of policy revision will be improvement in compliance and environmental quality. According to Ingram, the implementation phase of a statutory program "should contribute toward policy improvement or the evolution toward more tractable problems for which there are more doable and agreeable responses." (1990:476) Realization of the statutory goal, therefore, is not the only way to gauge the success of program implementation.

The conceptual perspective for the selection of BMPs analyzed in this report relies on Lowi's (1964) policy classification scheme, with further elaboration by Salisbury (1968). Lowi classifies policies as distributive (non zero-sum policies in which nearly everyone benefits), redistributive (policies that approach zero-sum, in which some benefit and some lose), and regulatory (policies that also tend toward zero-sum, and in which government prescribes rules of behavior for particular groups). Salisbury added a critical dimension to Lowi's typology by identifying self-regulation policies as a fourth policy type. Self-regulation policies are frequently offered as a noncoercive alternative by sectors of society targeted for external regulation, and they are invariably non zero-sum. These policies also impose constraints upon a group, but are perceived only to increase, not decrease, the beneficial options to a particular segment of the population.

Under this classification scheme, policies are *either* self-regulatory *or* regulatory. Thus, the Lowi and Salisbury typologies suggest that regulatory policies are either noncoercive (through self-regulation) or coercive (through direct command-and-control regulation). In the real world, however, regulatory devices tend to fall at different points along a continuum of coerciveness. In other words, devices intended to control behavior tend to vary according to their restrictiveness. Non-coercive approaches (through self-regulation) occupy one end of the continuum while coercive approaches (through direct command-and-control regulation) occupy the other end.

Conceptualizing regulation in these terms provides water quality policymakers a flexible framework in which to assess alternative regulatory mechanisms. Water quality policymakers have a menu of regulatory approaches from which to choose, and careful thought must be given as to which regulatory devices are best suited to control stormwater runoff without being unnecessarily harsh. If members of the target population (e.g., citizens, small businesses, municipalities, etc.) unanimously believe that stormwater regulations and deadlines are too restrictive and unfair, they will likely ignore what they are being told to do. At the same time, if regulatory devices are too weak and not sufficiently coercive to lead to improvement in water quality, then efforts to control stormwater runoff will fail. Water quality policymakers, therefore, must be familiar with

the target population and possess considerable information before they select the most appropriate regulatory mechanisms that embody the level of coercion necessary to achieve an optimum degree of compliance.

Cost is a second dimension that characterizes regulatory mechanisms. Cost here refers to the amount of money government must spend to administer a particular regulatory approach (cost to the regulated community will be considered later). In general, the most coercive activities (e.g., imprisoning polluters) require the greatest government involvement and therefore are more expensive to administer than the least coercive activities (e.g., economic incentives). Limited government revenues obviously make this an important variable. This is especially the case in current government efforts to control stormwater pollution.

The total cost and coerciveness of the selected regulatory program represent the overall government effort necessary to attain compliance and control water pollution. Compliance can be achieved in varying degrees and is best conceptualized along a continuum ranging from avoidance to adherence. Under optimal conditions (e.g., a harmonious political environment), policymakers will be able to use the least coercive enforcement techniques (e.g., reporting by firms and municipalities and formal compliance tracking) at the least cost to achieve full compliance. The expectation is that least coercive mechanisms are always preferable to more coercive mechanisms if only because the former devices are more cost-effective. In contrast, extremely restrictive enforcement arrangements (e.g., court injunctions) will necessitate direct government involvement and thus require substantial cost. Under ideal conditions, therefore, policymakers will select regulatory devices that are the least coercive and least costly and that lead to compliant behavior.

Unfortunately for policymakers, optimal conditions are rare. Many times the conditions that do exist (e.g., a lack of agency funds or a small staff) tend to diminish the effectiveness of the least coercive approaches, often to the point where the outcomes are in danger of moving toward avoidance behavior. In order to prevent outcomes from moving in this direction, policymakers must select techniques, either singularly or in combination, that are affordable and sufficiently coercive to produce compliant behavior.

Naturally, policymaking is a dynamic process and circumstances tend to change over time. Decision makers are continuously gauging the potential impact of given conditions on regulatory mechanisms and making adjustments as they see fit. Eventually, they may be forced to adopt expensive and restrictive approaches that will result in compliant behavior in an attempt to prevent outcomes from moving toward avoidance behavior. When accurate information is available and incorporated into deliberations, policymakers usually will achieve the greatest level of compliance possible with the least effort and expense regardless of the conditions that exist at the time. This underscores the importance of obtaining the most accurate data available as changes occur over time.

In a pluralist, multi-level system like the United States, some communities may favor avoidance behavior in the face of unpopular regulations. While such situations may arise from time to time, in most cases policymakers will want their regulatory devices to achieve the highest level of compliance possible under given conditions.

Stormwater Regulation and Regulatory Intent

The federal Clean Water Act utilizes two approaches to managing water quality: technology-based requirements and national water quality standards. Section 303(d) of the Act integrates these two approaches by stipulating that states make a list of water bodies that are not attaining standards after the technology-based rules are implemented. For water bodies on this list, as well as where the U.S. Environmental Protection Agency (EPA) Administrator believes appropriate, the states are to formulate TMDLs which must account for all sources of the contaminants that forced the listing of the water bodies. Under federal law, TMDLs must account for contributions from point sources (federally permitted discharges) and pollution from nonpoint sources. The U.S. EPA must review and approve the list of contaminated waters and every TMDL. In the event that the U.S. EPA does not approve the list of impaired water bodies or a TMDL, the Agency must establish them for the state. (www.swrcb.ca.gov/tmdl/background.html, July 15, 2003)

The Clean Water Act does not specifically require the adoption of TMDLs. Instead, Section 303(d), Section 303(e), and their provisions stipulate TMDLs be included in water quality plans. The U.S. EPA has adopted rules (40 CFR 122) requiring that the National Pollutant Discharge Elimination System (NPDES) permits be modified to be consistent with all approved TMDLs. An NPDES permit outlines specific limits of pollution for a particular discharger. Nearly all the states, including California, are permitted to administer the NPDES permit program. (U.S. EPA administers the permit system in the remaining states.) Implementation plans are to be formulated along with the TMDLs.

California Law

California effectuates the provisions under the Clean Water Act principally through institutions and procedures set out in certain provisions of the California Water Code, including those of the California Porter-Cologne Water Quality Control Act. These provisions established the State Water Resources Control Board (SWRCB) within the California Environmental Protection Agency to develop and implement state policy for water quality control.

The Porter-Cologne Act also established nine California Regional Water Quality Control Boards that operate under the authority of the SWRCB. Each Regional Board is comprised of nine members and an executive officer appointed by the members of each board. The Regional Boards develop and adopt water quality control plans for all areas within their region. The SWRCB formulates, adopts, and revises general procedures for the development, adoption, and execution of water quality plans by the Regional Boards. It reviews these plans and either approves them or returns them for revision and resubmission. Water quality plans do not become effective until the SWRCB endorses the plans, followed by approval by the California Office of Administrative Law.

The Evolution of Water Pollution Control

During the 1970s, policymakers considered point source pollution to be the biggest threat to the water quality of the nation's inland lakes, rivers, and streams. (www.swrcb.ca.gov/tmdl/background.html, July 15, 2003) The Clean Water Act established a number of programs to address point sources of pollution, and most federal money went to formulate and implement point source controls. California pursued the

same approach in its effort to improve the state's water quality. In addition, the State and Regional Boards implement smaller scale corrective actions for nonpoint source pollution as permitted under the Porter-Cologne Act.

A major goal of the Clean Water Act was to expand treatment of wastewaters. According to Rosenbaum (2002), all treatment plants in operation before July 1, 1977 were required to have "secondary treatment" levels. All treatment facilities, regardless of age, were required to have "the best practicable treatment technology" by July 1, 1983. The Act also appropriated 18 billion dollars between 1973 and 1975 to assist local communities in building necessary wastewater treatment facilities. The federal government paid for 75 percent of the capital cost for building the new facilities. Programs focusing on treatment facilities resulted in significant improvements in water quality by the late 1980s.

Concerns over the nation's water quality arose again due to the growing impacts of nonpoint source pollution, and environmental groups looked to the TMDL requirements to ameliorate continuing water quality problems. A series of lawsuits ensued to force regulators to adopt an aggressive approach to TMDL development. Thus far, over 40 lawsuits have been filed throughout the nation, most of them by environmental groups. (www.swrcb.ca.gov/tmdl/background.html, July 15, 2003) The lawsuits are commonly filed against the U.S. EPA due to its responsibility to approve TMDLs. Several of them have led to negotiated settlements and consent decrees that are overseen by the courts. At present, California is operating under three consent decrees covering most of the North Coast Region, the entire Los Angeles Region, and Newport Bay and its tributaries in the Santa Ana Region.

TMDLs in California are established either by the Regional Boards or by the U.S. EPA. Those established by the Regional Boards are designed as Basin Plan amendments and include implementation rules. Those formulated by the U.S. EPA normally contain the total waste load allocations as required by Section 303(d), but do not include extensive implementation rules, primarily because U.S. EPA implementation of nonpoint source pollution control strategies are generally confined to education and outreach in accordance with CWA Section 319. (www.swrcb.ca.gov/tmdl/background.html, July 15, 2003) Presently, TMDLs are required for all waters and pollutants on the 303(d) list and must consider and include allocations to both point sources and nonpoint sources of contaminants. The limitations in a TMDL may be other than "daily load" limits. There also can be multiple TMDLs on a specific body of water, or there can be one TMDL that focuses on many contaminants. Current examples of TMDLs in the Los Angeles Region include the trash TMDLs for the Ballona Creek and Wetland, Los Angeles River Watershed, and East Fork San Gabriel River, and the wet-weather bacteria TMDL for the Santa Monica Bay Beaches. At this time the Section 303(d) list contains over 1,400 water body/pollutant combinations. Based on this list, the State Board estimates that about 800 TMDLs are needed. The Regional Boards are now developing over 120 TMDLs, with several addressing multiple pollutants. (www.swrcb.ca.gov/tmdl/background.html, July 15, 2003)

Concerns over implementation have become a significant issue in the formulation of TMDLs. (www.swrcb.ca.gov/tmdl/background.html, July 15, 2003) Although these concerns generally fall outside the provisions of Section 303(d), they are nevertheless

important to achieving water quality improvements as a result of the establishment of TMDLs. While it is possible to conduct technical assessments of total load without considering implementation issues, one must address the possible mechanisms by which pollution can be reduced in determining allocations to various sources. Considering different implementation options can help analysts avoid adopting allocation schemes that are far more costly than necessary or, even worse, unachievable. The TMDL strategy in California seeks to engage the public and cultivate an understanding of watershed issues. It relies on an adaptive process that matches management capabilities with scientific knowledge and information.

The Stormwater Permit

The Los Angeles Regional Water Quality Control Board (LA Regional Water Board) has adopted a NPDES permit containing waste discharge requirements for MS4 discharges within the County of Los Angeles (with the City of Long Beach excluded because it is covered under a separate MS4 permit). The main intent of the Permit is to reduce significantly the amount of various pollutants contained in stormwater runoff. The County of Los Angeles has identified seven critical industrial and commercial sources of contamination: 1. wholesale trade (scrap recycling, automobile dismantling), 2. automotive repair/parking, 3. fabricated metal products, 4. motor freight, 5. chemical and allied products, 6. automotive dealers/gasoline stations, and 7. primary metal products. The priority industrial sectors and automobile repair facilities/ gas stations (two of the commercial sectors) on the list contribute substantial concentrations of heavy metals to stormwater. Overall, the Permit is intended to establish and implement a timely, comprehensive, cost-effective stormwater pollution control program to reduce the discharge of pollutants in stormwater to the Maximum Extent Practicable (MEP) from the permitted regions in the County of Los Angeles to the waters of the U.S. subject to the jurisdiction of the Permittees and also meet water quality standards. BMPs must be identified and implemented to reduce the discharge of pollutants in stormwater to the MEP and also meet water quality standards.

The Permit has established an iterative process that allows municipalities in Los Angeles County to measure noncompliance, test alternative BMPs, and consult County and regional water quality authorities. Thus, the Permit provides a mechanism to make adjustments to the required BMPs as necessary to ensure their adequate performance. According to the U.S. EPA, "Water quality-based effluent limits for NPDES-regulated stormwater discharges that implement wasteload allocations in TMDLs *may* be expressed in the form of BMPs under specified circumstances….If BMPs alone adequately implement wasteload allocations, then additional controls are not necessary." (U.S. EPA, Memorandum, November 22, 2002, p.2)

Regulatory Mechanisms

Pollution control regulations can range from programs that prescribe very specifically what the regulated community is to do, to programs that only set goals and leave the community to find the best methods to reach the goals. Programs of the first kind are often criticized by the regulated community for lack of flexibility—the standard complaint is "This approach does not work well for our particular case. We could do this in another way and accomplish the goals for a lower price". Programs of the second kind

provide flexibility, but are often criticized for vagueness: "We don't know how to do this. We are not sure what we have to do to come into compliance".

The stormwater management program is clearly of the second type, and it should be so. Stormwater quality control is an extremely complex issue, influencing, if not everything under the sun, then everything under the rain. The best means of compliance will certainly differ from city to city, depending on land uses, land prices, and a host of physical characteristics of the landscape. It is likely that, as the nation engages the problem, new approaches will be developed. Entrepreneurs will develop new devices and methods as others are tried and discarded. Strict specification of methods at this time might well eliminate approaches that are more economical and effective, so a flexible approach is best.

However, an inevitable side effect of maintaining flexibility is that the regulated community faces an unsettling level of uncertainty. Mayors and city councils faced with planning future infrastructure and future budgets are understandably uncomfortable facing mandatory water quality goals without specified means of reaching those goals. This level of uncertainty will decline as plans are developed and experience with water quality control measures accumulates.

There is a historical precedent for this approach in the program for control of air pollution in Southern California. Like stormwater pollution, it is generated by a very large number of sources with varying compositions and emissions rates. Many of the sources are difficult to monitor and regulate. Implementation of pollution controls has been accompanied by intense political controversy. Even so, air pollution control efforts have been relatively successful—pollution levels and their associated health effects have declined. While costs have been high and some high-polluting marginally profitable businesses have closed or left the area, it is also clearly true that the economy of the area has not collapsed, as some predicted. Few people would suggest that we should return to days when taking a deep breath was literally painful.

Policy Implementation

Our research indicates that the LA Regional Water Board is strongly committed to abating pollution from stormwater runoff as effectively and inexpensively as possible. The U.S. EPA supports the LA Regional Water Board's efforts to require individual municipalities in Los Angeles County to adopt necessary BMPs to control stormwater runoff. Federal and state policymakers along with environmental group leaders believe that BMPs, if widely and strategically implemented, can significantly reduce stormwater pollution and improve water quality throughout Los Angeles County. Given the proven effectiveness of BMPs in different areas of the country (and the world), the LA Regional Water Board does not envision the need to build new advanced treatment plants throughout the region, and indeed has expressed the specific intent that such plants should not be required. Advanced treatment is viewed as an absolute last resort given the huge expense it would entail and the confidence policymakers and environmental leaders have in the ability of BMPs to reduce pollution significantly and allow the region to meet federal clean water standards. The authors of this report concur with this position. Some municipal leaders in Los Angeles County have asked why they should be forced to adopt BMPs when there is a possibility that advanced wastewater treatment plants will

ultimately be required. Even if advanced treatment plants are necessary in the future, which is highly unlikely, the adoption of BMPs will dramatically reduce the amount of water and the mass of pollutants these plants will treat. This will reduce pollution treatment costs and improve the effectiveness and ability of plants to handle large volumes of water during heavy rain periods. That is, BMPs will be used as part of any program to build advanced treatment plants because the much cheaper BMPs will reduce the costs of the very expensive advanced treatment plants. Implementing BMPs now will be a good investment even in the unlikely event that an advanced treatment plant is required.

The LA Regional Water Board has focused some efforts on reducing trash in stormwater runoff, and it has adopted a "zero trash" rule to achieve this goal. The Board does not expect all communities to eliminate every single piece of trash from inclusion in stormwater runoff. Instead, the Board policy is that communities in Los Angeles County make reasonable efforts to prevent trash from entering storm drains. "Trash" is defined as materials larger than ½ cm, so municipalities can comply with this regulation by installing ½-cm screening devices on their catch basins, by enforcing litter laws already on the books and by conducting street sweeping in areas where trash tends to accumulate. Public education about littering and the installation and maintenance of catch basin devices can provide substantial progress in preventing garbage from entering storm drains.

In order to avoid a costly court battle with state water pollution policymakers, the County and City of Los Angeles have recently agreed to spend $168 million to reduce by half the amount of trash that collects in the 51-mile-long Los Angeles River (McGreevy and Weiss, 2003). In addition, the City of Los Angeles agreed to drop its lawsuit against state policymakers over the overall plan to abate polluted stormwater runoff. The agreement settles a lawsuit filed by the city and county that opposed the LA Regional Water Board's requirement to reduce trash entering the river 10 percent annually over the next 10 years. The LA Regional Water Board officials negotiated the deal, which requires the city and county to reduce rubbish going into the river and Ballona Creek 50 percent by September 2008, at which point state regulators will consider whether further rules are necessary. The agreement also provides local officials more flexibility in trying less-costly approaches of reducing trash. Environmental groups such as Heal the Bay, Santa Monica BayKeeper, and Friends of the L.A. River applauded the agreement. Rather than spend money on litigation, county and city officials will allocate funds to improve water quality.

Clearly, all communities in Los Angeles County will have to share the financial burden in helping to reduce contamination from stormwater runoff. This may require many communities to modify their budget priorities.

As long as communities make a reasonable, good faith effort to address stormwater pollution issues, it is unlikely that federal and state officials will take legal action. Thus far, this has been the case. Failure to make such an effort, however, will certainly result in legal action against violators. Moreover, environmental groups can choose to file lawsuits against federal and state officials if they do not continue to pursue polluters. Such action will lead to costly delays in meeting federal water quality

standards and will likely lead to even more draconian measures given present federal and state law and previous judicial decisions.

Previous Actions by the LA Regional Water Board

The impacts on water quality and the heightened risks to public health from MS4 discharges that affect receiving waters across the U.S. and in Los Angeles County and its coastline have been well studied and documented. Accordingly, the LA Regional Water Board has taken a number of significant actions to control such discharges (LARWQCB, 2001)

In 1990, the LA Regional Water Board adopted Order No. 90-079, the Los Angeles County MS4 Permit. That permit required the Los Angeles County Flood Control District, the County of Los Angeles, and the incorporated municipalities in Los Angeles County to implement stormwater pollution controls including updating ordinances, optimizing existing pollutant controls such as street sweeping, construction site controls, and others. The Regional Board required all Permittees to adopt at least 13 specific BMPs for consistency across the County. The 1990 permit was executed on a system wide basis due to the highly interconnected storm drain system serving a population substantially larger than 100,000 residents. At this point, the region was committed to MEP standards—cleaning up stormwater to the maximum extent practicable.

On July 15, 1996 the LA Regional Water Board issued Order No. 96-054 that updated the 1990 permit. The 1996 Los Angeles County MS4 permit required model programs be formulated and implemented by the Permittees for Public Information and Public Participation, Industrial/Commercial Activities, Development Construction, Illicit Connections and Illicit Discharges, Public Agency Activities, and Development Planning. These model programs will change with time as more data on stormwater impacts are collected and become available.

On January 31, 2001 the Los Angeles County Department of Public Works formerly requested to renew their MS4 permit in the form of an ROWD for the County of Los Angeles and the incorporated cities, except the City of Long Beach. This request began the process of reissuance of the permit, which entered into its third permit term. On the same day the Los Angeles County Flood Control District submitted an ROWD. The Regional Board staff invested considerable time and effort in providing opportunities for public participation and comment. Over 30 meetings, two workshops, and many outreach activities were conducted to allow the public, Permittees, and other interested parties enough opportunity to participate in the development of permit requirements and language prior to consideration by the Regional Board for adoption. The reissued MS4 permit committed the region to meeting water quality standards based on the State Water Resources Control Board's precedential Orders.

Implementation of the MS4 permit requirements should reduce pollutants in stormwater in a cost-effective manner. The adoption of BMPs should also reduce pollutant discharges and enhance the quality of surface water.

The final steps of the regulatory process are now under way—TMDLs for the various impaired water bodies of the region are being promulgated.

Overall, it is clear that the LA Regional Water Board does not intend to require that municipalities build advanced treatment plants: indeed, they have publicly expressed the sentiment that they oppose this solution.

Implementation of Regional Solutions

A regional infiltration and BMP treatment system, in combination with source control of trash, pesticides, and trace metals, can substitute for individual site controls on land parcels within the drainage area. This could take the form of "Local Equivalent Area Drainages", implementing regional solutions that would achieve better results than the application of new source controls, which, in built up areas, will have significant effects only over the long term during which existing structures are rebuilt.

Funding for regional solutions may pose a challenge because of Proposition 13 and other restrictions on tax policy. The challenge however is not insurmountable if property-owners and voters become adequately informed and educated. Nevertheless, regional solutions may significantly shift administrative and cost burdens for water quality protection from businesses and development firms to local government.

Trading Schemes

"Cap and trade" systems, in which regulatory agencies set a cap on the amount of pollution allowable and allow trading of discharge rights within the constraints of the cap, have been successful in several fields. A group of municipalities, for example, might assign discharge rights to landowners within a watershed such that total releases meet the constraints of the TMDLs. They could then allow trading in the discharge rights, so that those who can reduce discharges at least cost are the first to do so, and the overall cost of meeting the TMDL is minimized. Municipalities themselves, as owners of parks and open space, might be able to develop regional solutions and fund them through sales of discharge rights to others.

Stormwater pollution control may be particularly amenable to this approach because the costs of control are highly site-specific. In many cases, there may be considerable economy in applying regional solutions in the best possible sites rather than controlling every site individually.

DESCRIPTION OF ALTERNATIVE APPROACHES

Infiltration

Before the City of Los Angeles was established, most of the rain that fell in the region evaporated or percolated into the soil. The groundwater was continually replenished and runoff flows were small. As population grew, impermeable surfaces such as paved roads, parking lots, and rooftops covered more and more of the land. Residences, commercial facilities, and roads were designed to shed water as rapidly as possible. Historical measurements of discharges to the Los Angeles River at Firestone Boulevard indicate that runoff has increased from 5% to 45% of rainfall. This change adversely affected stormwater quality in two ways. First it increased the amount of stormwater flow, magnifying the cost of any measures to control quality (and also requiring ever more costly flood control measures). Second, water that flowed directly to streams and the ocean no longer benefited from the purifying action of soil and vegetation, which can remove particulates through physical filtering, sequester some chemicals by adsorption, and destroy organic and biological contaminants by biodegradation.

Any program for remediation of stormwater contamination should reverse this trend, reducing the load of both water and pollutants on other parts of the system. At the same time, pollution of groundwater must be avoided. However, infiltration will benefit from the very considerable capacity of soils to filter particles, adsorb contaminants, and biodegrade organic materials. A relative estimate of the magnitude of the problem may be made by comparison with examples of leaking underground storage tanks at gasoline stations. In many cases, spills of tens or hundreds of gallons of gasoline are now being handled by "intrinsic remediation"—allowing natural biodegradation to degrade the hydrocarbons. The acceptability of this approach has been supported by extensive research. Hydrocarbon infiltration with stormwater will involve far lower concentrations of hydrocarbon, and will mostly be the higher-molecular-weight compounds that are much less mobile in soils than gasoline.

We can also compare stormwater infiltration to the effects of septic tanks. These systems infiltrate sewage that has received only a modest degree of treatment. Yet they are still in use in the Los Angeles Region, and indeed are the primary waste disposal method for 15% of households in the U.S. Groundwater contamination from septic tanks has occurred, but most are considered effective and safe waste disposal systems.

This comparison suggests that the relatively low concentrations of pollutants in common stormwater, with appropriate controls on sources of specific contaminants, will not pose a significant threat to groundwater quality.

The permeability of soils in the Los Angeles basin varies from place to place. Beneath the Whittier Narrows spreading basins, for example, sand and gravel deposits allow very high rates of infiltration. In other areas, clay-rich soils reduce rates of infiltration. However, the historically low rates of runoff indicate that infiltration is capable of handling the bulk of the rainfall in the Los Angeles Region. Many areas routinely considered as having poor infiltration rates will never the less be useful as multi-purpose infiltration systems. A soccer field, for example, can be used as an

infiltration basin at little additional cost, and will make a valuable contribution even if infiltration rates are low in comparison to those in spreading basins.

Source Control

Industrial Releases

Industrial discharges can be controlled by a vigorous program of source identification and control. Businesses have a fundamental responsibility to do their work without contaminating their neighborhoods, and in the great majority of cases can do so without significant interference with their activities.

Trash Management

Many businesses and some homeowners contribute a disproportionate amount of trash to the urban burden. Paper waste often accumulates in the parking lots of fast food outlets and strip malls, where it can wash into the street during rainstorms. Inadequate dumpsters and garbage cans are overloaded so that trash spills into the streets. Poorly covered trucks can allow trash to fly out on the streets. In addition, citizens throw trash from their cars onto the streets (it has been estimated that as much as 60% of trash on freeways by weight is cigarette butts). All of these practices are illegal, but enforcement is currently rare and weak. While perfect compliance with anti-litter laws is not expected, there could certainly be major improvements through enforcement. Much of the cost of such efforts could be recovered through fines, with the satisfying result that those causing the problem would be paying for cleaning it up.

Municipalities are responsible for the trash deposited on their streets, and most will respond by installing screens on catch basins. These are sometimes referred to as catch basin "inserts". They will have half-centimeter openings and will be designed to collect trash during periods of low or modest flow, but to bypass the flow during heavy storms or if they are clogged. This will avoid local flooding that would be caused by clogging.

Street Cleaning

Trash that escapes enforcement efforts can be collected by street cleaning before it reaches the storm drains. Enhanced street cleaning is likely to be necessary as cities install half-centimeter screens on their catch basins. Trash that is now washed out of sight (at least until it reaches the beaches) will accumulate on the screens and possibly clog them. More effective and more frequent street cleaning will reduce this problem.

A major fraction of the pollutants in stormwater runoff are adsorbed on particles—this is particularly true of trace metals and pesticides, which are significant contributors to impairment of the receiving waters. Some of this particulate matter can be removed from streets by higher-quality street vacuuming equipment, which collects the dirt much as a vacuum cleaner does. This equipment is more expensive to purchase and operate, but it would make a significant contribution to reducing chemical pollutants in stormwater.

The Port of Seattle has tested high-quality street sweepers as a cleanup method in its container storage area (FHWA, 2003). The approach was successful, removing one-third to one-half of particulates and their associated pollutants. While the equipment is somewhat more expensive than simple sweepers to purchase, operations costs are about

the same. The fine particles carry a significant portion of the pollutants, but they constitute only a small portion of the total mass of material on the streets, so their collection and disposal does not significantly increase costs. Such street cleaning may be more effective in Southern California, where the long dry season allows dust to accumulate for many months.

As explained in detail later, there would be substantial secondary benefits associated with improved street cleaning. Neighborhoods would look better, and residents would be exposed to less resuspended road dust, which dirties buildings and may have significant negative health effects.

Some investigators have also proposed street washing, using recycled water. If this were done during dry weather, and all of the dry-weather flow were being collected for treatment in wastewater treatment plants, street pollutants would be kept out of the rivers.

Pesticide Substitutions

Many of the receiving waters in the Los Angeles Region are impaired by pesticides, particularly Diazinon and Chlorpyrifos. The approach to this pollution should be the same as it has been historically for other pesticides that threatened environmental quality. None has ever been dealt with by treating contaminated waters. Those who use the pesticides should be responsible for ensuring that no water pollution results from that use. Pesticides that cannot be properly managed by appropriate use protocols such as labeling or use rules enforcement and which have an inherent tendency to persist in the environment should be banned. Pesticide controls are instituted by the state and federal governments, so additional political effort will be needed if a bans on specific compounds are required.

We presume that these pesticides are used in many cases because they are currently the most economical approach to insect control, and that substitution of another method would involve some cost. However, there are many possible alternatives, including use of more readily degraded pesticides, insect-resistant strains of plants, biological control with natural insect predators, and others. There are many examples of success with such integrated pest management (IPM), particularly at golf courses (NRDC, 1999). In some cases owners were pleased to find that costs actually declined when they switched from pesticide-dominated approaches to IPM.

Trace Metals

Trace metals enter stormwater as rain drains from industrial operations, transportation land uses, and other sources. Brake pad wear on cars produces a fine dust of copper. Zinc is released when galvanized equipment contacts the water. Trace metals in stormwater can be controlled by covering machinery and materials that release trace metals, by capturing and treating runoff from large industrial operations and transportation land uses, and by developing alternative materials for brake pads (research is currently under way on this objective).

Control of Automotive-Related Sources

Motor vehicles and related facilities are the source of many types of runoff pollutants, including hydrocarbons from oil and fuel leaks, and road wear. Vacuum street cleaning is effective in dealing with particle-bound hydrocarbons left on the street,

and infiltration can effectively deal with hydrocarbons that are transported or deposited off the street surface.

Control of Bacteria

Bacterial contamination in stormwater is typically measured as counts of "coliform" bacteria, a category that contains many species of bacteria. While very few of the coliforms cause disease, some of these species are very abundant in human waste, and so detection of the group has long been used as a marker for sewage pollution. Efforts to interrupt the fecal-oral transmission of disease have commonly taken the elimination of coliforms from water as a surrogate for judging efforts to prevent the spread of the microorganisms that do cause disease. Where coliform counts in drinking water have been reduced (in much of the industrialized world) transmission of water-borne disease has indeed been largely eliminated. Thus the use of coliform counts as a marker for disease control has been remarkably successful. In some cases, a more specific test for "fecal coliforms" is used, because the test is an indicator of contamination by warm-blooded animals, including humans. While we have always counted coliforms, the real concern is pathogens—microorganisms that can cause disease. For sewage pollution, the association between the two has been strong, and controlling coliforms has been equivalent to controlling disease. The situation for stormwater, however, may be far more complex. Because there are many non-human sources of coliforms, it is possible that the test for their presence may be positive even when no human pathogens are present.

The sources of the coliforms found in stormwater remain uncertain. Pet wastes certainly include bacteria that test positive as coliforms, but the degree to which pet wastes constitute a disease threat is uncertain. Wild mammals, such as raccoons, possums, skunks and coyotes, may contribute when their wastes are left on paved surfaces. It has been proposed that fecal matter from homeless people denied access to restrooms may be a source, but there has been no study confirming this. In less developed areas with poor soil infiltration conditions, it is likely that poorly operated septic tanks and illegal disposal of gray water are contributing to the coliform counts detected in runoff. If septic tanks are the source, strict enforcement of waste control ordinances is appropriate. If homeless people are the source, provision of restroom facilities would be far cheaper than any imaginable stormwater treatment system (as well as being more humane). If pet feces are the source, the only approach is, through public outreach and enforcement, to press people to clean up after their pets. It must be expected, however, that such an approach will not be 100% effective. The contribution of wild animals seems uncontrollable.

Because the sources and significance of the coliform counts remain uncertain, it is important that research on the topic be pursued immediately. The recent development of genetic techniques for precise and rapid identification of bacterial species now provides the tool needed to provide the information needed to develop effective policies.

Coliforms, and presumably the associated human pathogens, are substantially reduced in treatment wetlands. Infiltration of course removes them from runoff flows, and adsorption on soils and biodegradation are effective at protecting groundwater. Water storage, because it holds coliforms in an environment for which they are not adapted, and because it allows settling of particles to which they may be attached, has

some beneficial effect. Disinfection, using chlorine, chloramines, or ultraviolet light is possible, but relatively expensive.

Water Quality Control Board Rules allow for 17 exceedences of the coliform limit per year. There are about 32 days per year of significant rainfall in the region, so it has been anticipated that exceedences during the heavy winter storms will be difficult to control, and will be allowed.

Improved Enforcement

It is important that source control efforts include genuine and credible enforcement. Rules that are widely ignored, of course, will not help clean up runoff water, and a considerable fraction of runoff contaminants come from illicit discharges or disposal. Trash is an obvious example—littering is already illegal, so 100% of the trash in stormwater represents illegal release.

The Environmental Protection agency describes an example in which improved enforcement of existing law was effective (USEPA, 1999):

"…during a 12-month period, the Houston, Texas, Public Utilities Department identified 132 sources of discharges leading to Buffalo Bayou, the local drinking water source, with estimated flow rates ranging from 0.3 to 31.5 liters per second. Houston's program involved monthly sampling from bridge crossings; analysis of samples for carbonaceous biochemical oxygen demand, ammonia and nitrate nitrogen, pH, TSS, DO, temperature, fecal coliform, and chlorine residual; comparison of samples to baseline flow concentrations; weekly sampling of temperature, dissolved oxygen (DO), and fecal coliform in stream reaches suspected of contamination; boat sampling to identify the contaminating outfalls along the reach; and, finally, a land-based search to pinpoint the source. Of the flows identified during the program, 85% were due to broken or clogged wastewater lines and 10% were due to illicit connections (Glanton et al., 1992). Eight months after an illicit discharge detection and elimination program began, fecal bacteria log mean concentration was reduced from 20,000 colonies/100mL to 2,000 colonies/100ml."

Thus, in this example, a 90% reduction in bacterial contamination resulted from a careful enforcement program alone.

Detention and BMP Treatment

Stormwater Detention Basins

Many of the problems of stormwater management are associated with its very irregular rate of flow. During dry periods runoff flow rates are so low that the water can be handled by existing sanitary wastewater treatment systems. During rainstorms, the water comes so fast that municipalities have had difficulty doing anything beyond avoiding floods.

The first step toward dealing with this problem is to increase infiltration—substantial reductions in the peak flow rates are possible. The second approach is to provide storage systems that will hold water back during the peak flow periods. Detention basins will reduce peak flows, collect trash, provide quiet water for settlement of particles and their associated pollutants, and promote infiltration. Analysis of the

National BMP Database (Strecker et al., 2003) shows that detention basins infiltrate an average of 30% of the water they receive.

The primary difficulty with this approach is the shortage of available sites to construct large reservoirs. The topography of the Los Angeles area does not include any deep canyons in lower reaches of the rivers that could easily be made into reservoirs. Moreover, virtually all of the land is already occupied by other uses and would accordingly be very expensive to acquire.

This means that detention basins must be conceived as a distributed network of smaller systems, with each serving multiple uses. A useful model is the Sepulveda Dam Recreational Area, which retains water during storms to prevent downstream flooding. For the great majority of the days in the year, the basin is mostly empty, and serves as a park and a wildlife refuge.

A rough estimate of the general feasibility of a regional-park-based approach can be calculated. The City of Los Angeles currently has about 5% of its area in parks (Wolch et al., 2002) and it is reasonable to presume that at least a similar fraction is park throughout the LA Region. Thus, moving the rainfall from adjacent developed areas to the parks would constitute concentration of the flow by a factor of 20 (20 acres of land would drain to 1 acre of park). If the runoff coefficient for the developed areas is 0.5, a rainfall of ¾ inch would thus put 8 inches of water in the parks. This is less than the 24-inch depth of flooding assumed for the stormwater parks planned in the Sun Valley project, suggesting that this approach is feasible on the large scale in terms of the amount of land required.

This calculation is quite approximate: the runoff coefficient is uncertain, and several other factors are poorly known. Never the less, the calculation suggests that a joint program could simultaneously provide the region with needed parks and needed stormwater infiltration capacity.

Sanitary Treatment of Dry Weather Flows

During dry weather, small flows are present in the stormwater system as a result of overwatering of lawns, car washing, and other discharges. This modest amount of water can be collected and passed through existing wastewater treatment plants, which commonly have more than enough excess capacity for this purpose. Because the dry season in Southern California is very long, this would prevent runoff pollution of the oceans for much of the year.

Where this is done, street washing with recycled water would be possible. Collecting and treating the contaminants during dry periods would leave the streets clean for the rainstorms, when the water cannot be collected.

Treatment Wetlands

Wetlands remove many pollutants from the water that passes through them. The low flow velocities allow sediments to settle, removing particulates and any pollutants that are adsorbed on them. Algae and rooted plants absorb nitrate and phosphate as they grow. Vigorous microbiological activity degrades organic chemicals, as microbial predators consume disease organisms. These observations suggest that wetlands can be constructed to serve as treatment systems for stormwater and dry weather runoff. While

this approach requires dedication of land, it has the considerable secondary benefit of providing riparian wildlife habitat and esthetic values.

A system of treatment wetlands has been designed for the San Diego Creek Watershed that drains to Newport Bay, in Orange County, California. The system will serve an area of 120 square miles, and is expected to cost in the low tens of millions of dollars. It is expected to meet the low-flow nitrogen TMDL, the phosphorus TMDL during most years, and the fecal coliform TMDL during low flows.

A similar system has been constructed to provide stormwater quality protection for the Ballona Wetlands Watershed in the City of Los Angeles.

BMP Treatment of Flows from Problem Watersheds such as Industrial Areas

If source control is not successful for some industrial areas, it may be necessary to collect the runoff water and use more sophisticated BMP treatment. These might best be constructed as private facilities serving a consortium of local industries, and funded by them for the purpose. A public/private partnership could be created, perhaps with public loan guarantees. Past experience with business improvement districts could serve as a model.

Partial Treatment in Curbside Units

Many proprietary devices have been developed for treatment of runoff as it enters curbside catch basins. These generally remove trash from the flow, and may also collect sediments. Some include adsorbants to remove hydrocarbons and trace metals. They have the disadvantage that they are designed to bypass during higher volume wet-weather flows. All require some degree of maintenance, and some are expensive to install. Trash and sediment must be removed on a regular basis, and adsorbants must be replaced when they are exhausted. Never the less, they may be useful for treatment of problem dry weather flows in specific areas, such as industrial or commercial zones.

Public Outreach and Education

Much of the pollution in runoff water arises from actions of individuals—litter is discarded in the street, for example, or pesticides are used carelessly in a residential garden. This pollutant load can be reduced by educating citizens and urging them to behave in a way that protects water quality.

An effort in Oregon, conducted by the Tillamook Bay Rural Clean Water Project, was made to educate local farmers about the steps they could take to protect local streams. This involved personal visits, tours of successful BMPs, newsletters, and presentations (USEPA, 1999). Four years after the program began, bacterial concentrations dropped 40% to 60% in Tillamook Bay and 50% to 80% in local rivers. Thus in some cases significant progress can be made at very low cost through public education.

Good Housekeeping for Municipal Operations

While the behavior of individual citizens may be difficult to control, municipalities have far more control over their own operations. Efforts can be made to avoid careless use of pesticides and fertilizers on municipal facilities. Such steps have modest, but measurable impacts. An EPA report notes (USEPA, 1999):

> "…the City of Bellevue, Washington, found that street cleaning three times a week removed about only 10% of urban runoff pollutants; catch basin cleaning twice a year was estimated to be about 25% effective" (Pitt and Bissonnette, 1984).

Combined Approaches for Stormwater Quality Management

A general classification of rainfall receivers and appropriate methods for dealing with runoff they produce is shown in Figure 1. While the approach it describes is quite general, and other mixes of alternatives are possible, it shows one set of measures that can be used to control stormwater pollution.

Streets

The first step in reducing pollutants on streets is to restrict pollutant discharges from adjacent properties. Source control measures should prevent the release of industrial pollutants and construction sites should be managed to contain sediments. Litter laws and pet dropping collection laws should be enforced, although it must be acknowledged that it is not possible to prevent these inputs entirely. To stop litter from entering the storm drains, cities should install half-centimeter screens on their catch basins. The use of such screens will require diligent street cleaning, to ensure that the drains are not blocked during storms. In Southern California, rains mostly occur during a well-defined season, and frequently weather reports give two or three days warning of major storms. Cities should develop contingency plans for rapid-response street cleaning when storms are coming, to minimize stormwater contamination and the chances of flooding caused by clogged screens.

In some areas, where runoff water quality is relatively good, the streets themselves might be used as groundwater recharge facilities, by converting unused alleys to park/detention basins or by using permeable pavements.

It remains likely, however, that much street runoff will be of marginal quality. For the immediate future, it is also likely that a major portion of runoff from other sources will be initially discharged to streets, so that efforts to make use of stormwater as a water resource will require collection, and a degree of treatment before infiltration.

In most cases, this can be done with regional solutions. Water from storm drains can be collected in detention basins and wetlands, where sedimentation and biological activity will reduce pollutant load, and groundwater recharge can occur. The detention basins will serve as parks during the greater part of the year when water is not present, and the wetlands will double as much-needed wildlife habitat.

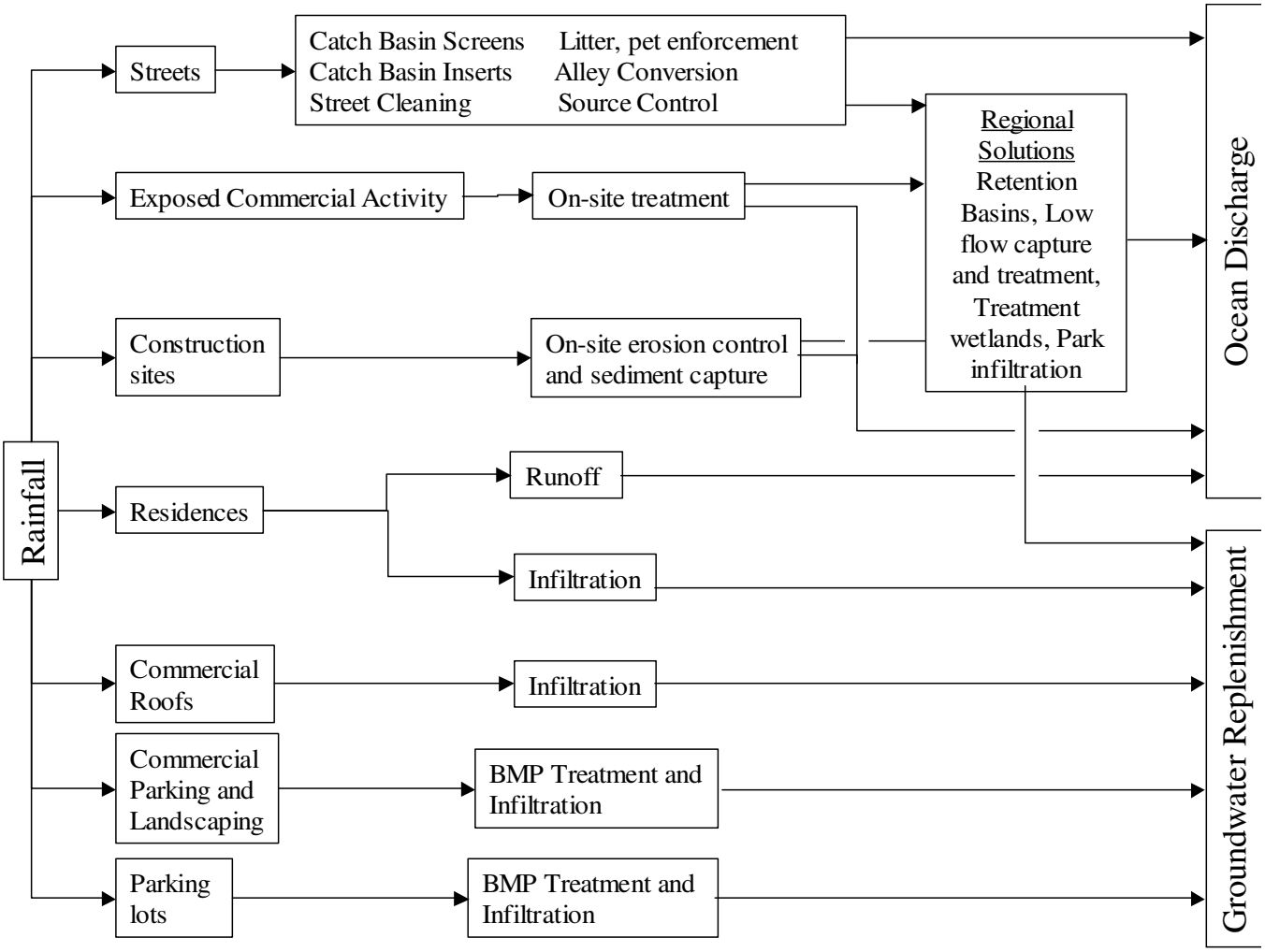

Figure 1. Stormwater quality control solutions for Southern California

Alleys for Public Use and Infiltration

Some alleys in urban areas are no longer necessary for access purposes. Indeed, many have become nuisance areas because of illicit trash disposal and criminal activity. Many of these could be gated and converted to small parks, with keys provided for local residents. They could simultaneously serve as infiltration facilities or as bioswales. There are currently 2.3 square miles of alleys in Los Angeles, for example. While many must be retained for access purposes, the fraction that could be converted could constitute a significant stormwater retention and infiltration resource. Alleys maintained for access might be candidates for partial or permeable pavements.

Similar approaches could be used for power line rights-of-way.

Exposed Commercial Activity

Very often the cheapest approach to stormwater quality control for exposed commercial activities is simply to cover them. Stormwater will thereafter come in contact only with the rooftop, and runoff will be much less polluted and more easily dealt with. However, for some large-scale activities, such as oil refining, it is not physically possible to provide a roof. For others, such as auto dismantling, the large area needed and the relatively low value of the activity may mean that a roof is not financially possible. Such facilities must be required to collect and treat runoff from their facilities, and indeed this is already being done in many cases. While there certainly are costs involved, it has generally proven possible, through a combination of better housekeeping, substitution of non-polluting materials, and simple on-site treatment processes, to solve these problems. Requirements for on-site treatment are advantageous because the cost of such treatment is borne by the business that produces the pollutant, providing incentives for conversion to less-polluting products and methods. Consequently, green manufacturing will become increasingly common.

Construction Sites

Release of sediments from construction sites can be ameliorated if the construction crew provides erosion control measures, such as maintaining vegetation or spraying exposed soil with polymer stabilizers, and an adequate on-site retention pond for rainfall, along with dikes, silt fences, and appropriate vehicle entrance construction to prevent runoff. Detention allows the sediments to settle out and the exposed soils can function effectively for groundwater recharge. It is anticipated that the costs of these measures will be small in comparison to construction costs. A more detailed list of best management practices for construction sites appears in Appendix I.

Residences

In most cases, homes and the surrounding landscaping have been designed to facilitate rapid runoff. It is necessary that water not pool in depths sufficient to flood houses, and ponding is viewed with irritation, even if it is harmless and temporary. However, single-family homes typically are surrounded with a significant area of land that could serve well for infiltration. Commonly, the land is planted or covered with

grass. The runoff from landscaping and residential rooftops typically contains only small amounts of pollutants that are readily removed by percolation through the root zone.

Landscaping for the typical single-family home could be arranged to infiltrate all of the rainfall that it receives (except, perhaps, in the most severe storms). Lawns a few inches below surrounding sidewalks could serve as infiltration ponds, gardens could receive roof runoff, and downspouts could conduct runoff to dry wells. Because the water would have had very little contact with pollutants, such infiltration would be an excellent addition to groundwater resources.

However, very few residences are arranged in this manner and, indeed, building codes often specify features that promote rapid runoff to the street. Building codes should be changed to utilize single-family homes as recharge sites. It is anticipated, however, that the effect on runoff will be seen only slowly in built-up areas as old homes are gradually replaced. Retrofit of existing homes will be expensive and politically difficult, but for new construction, single-family homes could be made to produce essentially zero discharge at little or no additional cost.

Xeriscaping—planting with native and other drought-tolerant plants—can also help to provide space for water infiltration, and it reduces watering and therefore the chance of irrigation runoff. Such landscaping also requires less fertilizer and pesticide, and so reduces incidental contamination.

In many cases, cities may be able to take interim steps to reduce runoff from homes. They have control over the "city strip" land that lies between the sidewalk and the gutter. It would be possible to institute a program of replacing the lawns after minor excavation, so that these areas would lie below the sidewalk and curb and serve as runoff detention and percolation basins.

Where infiltration is not possible, much residential runoff may be acceptable for direct discharge to the ocean, as long as it is not contaminated first by passing through polluted streets. More contaminated water can be conveyed to regional water cleanup and recharge facilities.

Low-flow Treatment in Wastewater Treatment Plants

Wastewater treatment plants are built with excess capacity in order to handle increased flow during rainy weather. While sanitary systems are designed to exclude stormwater, holes in manhole covers, leaks in piping, and illegal connections all allow the entry of some water during rainstorms. The flow is a very small portion of the rainwater, but can produce a significant increase in the much smaller sanitary flows—sometimes up to 50%. Treatment plants are designed with excess capacity to handle these peak loads.

This excess capacity can be used to treat dry weather runoff during periods when there is no rain. While these flows are not, by definition, stormwater, and indeed are governed by a separate set of regulations, dry weather runoff is often a significant contributor to impairment of receiving waters and its treatment would contribute to the objectives of stormwater control. It is also possible to use this capacity in concert with "street washing". In this approach, tank trucks filled with recycled water could be used to wash the streets, particularly in the months before the first rain of the fall. Contaminants removed from the streets and drains by the washing would be treated in the wastewater

plants, leaving the streets far cleaner when the rains came. At present, municipal street cleaning is a prohibited activity where it results in flows to the storm drain system.

This treatment approach for dry weather runoff could also treat runoff from small rainstorms.

It is likely that all of dry weather runoff could be treated for much of the Los Angeles Region. Such a step would eliminate essentially all runoff pollutants in the areas where this is possible. Because this approach uses capacity that is already in place, the cost for this alternative is low.

This approach would be particularly significant for control of coliforms. Sanitary treatment of dry weather flows would eliminate coliforms through much of the year. Rain occurs during only 32 days of the year, on average (Some of these storms are so small that the runoff could still be treated. On the other hand, untreatably high levels of runoff typically continue for a few days after a major storm). The LA Regional Water Board allows variances for 17 days of wet weather flow during the year. Thus it seems likely that dry weather runoff treatment at wastewater treatment plants, plus some degree of source control, plus the variances, will be sufficient to bring most areas into compliance with the bacteria rules. Further study, including some basic research on the sources of coliforms, is necessary to confirm this.

In considering the acceptability of this approach, it is important to note that beach use declines during wet weather, so that closures during the variance days would have a small effect on overall beach use and public health.

Capture and Use of Rooftop Runoff

In many cases, the pollutants from commercial rooftops, like those from residential roofs, could be readily removed by soil infiltration. With appropriate controls to avoid specific pollutants from commercial activities, roof runoff could be used for groundwater recharge. Designs exist for infiltration planters, in which the planter has high sides that allow it to function as a reservoir, and an open bottom that allows infiltrating water to pass into the soil. Risks of groundwater pollution could be mitigated through the use of biologically active and adsorbant soils. Commercial rooftops are commonly associated with large parking areas, which could be adapted for infiltration. Such efforts will be more difficult than those for homes, because most commercial facilities have a higher ratio of roof area to land area. In some cases it may be possible to store runoff for future irrigation use.

The Washington State Department of Ecology (2001) has developed a decision tree for dealing with downspout discharges. For lots larger than 22,000 square feet, it specifies either dispersion or infiltration systems for runoff. For smaller lots on suitable soil, infiltration systems are required. Where soils do not readily accept infiltration, surface dispersion may be appropriate. If water quality is good and infiltration and dispersal are not possible, disposal to the storm drains is accepted.

Parking Lots and Landscaping

Parking areas occupy a very large amount of land in Southern California, and accordingly represent a significant opportunity for improvement in stormwater management. Construction costs for parking lots are far smaller per square foot than

those for buildings, so that alterations are cheaper. They are reconstructed more frequently, so that requirements applying to new construction or reconstruction will propagate through the parking lot inventory much more rapidly than those for buildings.

In most cases, parking lots could serve as sites for rainwater infiltration. Trash can be collected on grates and be disposed of properly by the lot owners. The curbs around plantings (which are often necessary to avoid damage to the plants from cars) can be slotted so that water passes through them to infiltrate in the planter soils. Planted areas must be below grade, so that they collect and temporarily store water, and could be expanded, utilizing more space where cars don't actually park, such as the areas between and behind the parking bumpers. In some areas, permeable pavements could be used. Collected water could be passed to leach fields built under the parking lot.

An example of this sort of development is provided by the 6-acre parking lot of the Oregon Museum of Science and Industry (NRDC, 1999). It had originally been proposed as a traditional design, with water draining to catch basins, storm drains, and eventually the Willamette River. At the request of the Portland Bureau of Environmental Services, it was redesigned to use vegetated medians and landscaping as swales and linear wetlands. The parking lot is now able to infiltrate the water from a storm of 0.83 inches in 24 hours. Overall construction costs for the revised design were actually lower, because of the reduced costs for catch basins and drains.

Pervious pavements have also been developed so that even the space where cars are parked can be used for infiltration.

There is some concern over whether infiltration from parking lots will pollute underlying aquifers. Sediments, hydrocarbons, and trace metals are likely to be present in parking lot runoff from ordinary commercial establishments. But all of these are generally well retained on soils, particularly if the soils are selected to serve this purpose. Adsorbent materials might be added as a surface layer, to further retain hydrocarbons and trace metals.

It will be necessary to develop new guidelines for parking lots. The public and lot owners will not tolerate flooding that requires them to wade to their cars, so detention and infiltration systems will have to be carefully designed. Overflow will occur in extreme storms, and the lot and remediation areas should be designed so that the excess water flows to the street without impeding access to parked vehicles. Redesigned lots can be required for any new construction or for major renovations, but complete retrofit of all lots is likely to be too expensive for political acceptance.

This will require some additional maintenance. If adsorbants are included in the recharge areas to help control hydrocarbon infiltration, for example, these will have to be renewed from time to time. Regular trash collection will be required.

It is anticipated that most parking lots could become zero runoff areas, contributing substantially to water conservation and pollutant remediation. Further, very large parking lots, such as those at "big box" stores and shopping malls, could be reconstructed as stormwater infiltration facilities serving surrounding neighborhoods. In a cap and trade system, the lots would become financial opportunities for the retailers.

River Greening

The Los Angeles Region has become infamous for its historical conversion of rivers to concrete-lined flood control channels. While these have served the purpose of moving water rapidly to the ocean and avoiding flooding, they have also prevented infiltration in the riverbed. For this and many other reasons, advocates have proposed "greening" the river. This would involve widening the river at some points and replacing the steep concrete walls with gently sloping vegetated shores. Parks and wildlife habitat could be developed alongside the river, designed such that they would flood when the river is high. This would allow infiltration to occur, and by providing temporary storage, would decrease peak flood flows. In many areas it may be possible to replace the concrete bottoms of rivers with permeable surfaces.

The Sepulveda Dam Recreation Area is an excellent example of such a facility. It stores water during heavy rains, but serves as a park and wildlife refuge during the greater part of the year when it is not flooded. It promotes infiltration of water during rain events.

Certainly, any such modifications of the rivers must be designed carefully so that flood risk is not increased. But this is clearly possible. Indeed, increased infiltration and storage capacity along the river will reduce peak flows and therefore the frequency of floods, and reduce the associated costs.

Infiltration in Residential Streets

Many areas in Southern California are primarily residential, and runoff from these areas is only moderately polluted—it could be used for direct infiltration without treatment. In newly developed areas, homes could be designed so the runoff is near zero. However, many areas are currently already built out. In these, preventing runoff to the street would be expensive. In many cases, it may be possible to install infiltration devices in the public streets.

Infiltration in Parks

Public parks, in most cases consisting predominantly of grassy areas, are already contributing to groundwater infiltration. However, some portions still contribute to runoff, and could be regraded to collect water rather than shedding it. Indeed, many could be rebuilt to serve as groundwater infiltration systems serving surrounding areas. Playgrounds could be sunk below surrounding areas in order to collect water during rainfall events. Designs would have to include provision for infiltration at acceptable rates—water left standing for days could become a nuisance. In some areas, soil conditions might preclude this approach.

During the few days after water is collected and before it percolates, that area of the park will be unavailable for other uses. However, parks are little used during rainy weather in any case, and detention will only occur on a few days each year, so the interference will be minimal.

Public Facilities

Runoff from public facilities could be reduced by many of the measures previously discussed. Parking lots could be used for infiltration and rooftop runoff could go to planters serving as infiltration systems. Retrofit of government facilities could begin more quickly than for individual homes, as part of the effort required to meet regulations.

PRIMARY BENEFITS OF RUNOFF QUALITY CONTROL

The immediate purpose of runoff quality control is protection of the receiving waters. In the Los Angeles Region, this refers primarily to rivers, coastal wetlands, bays, and the ocean. Many benefits are definable.

Fishing

Pollutants in stormwater can adversely affect fishing. Commercial fishing is a small and declining industry in the waters local to Southern California, but sportfishing remains a significant activity, bringing income to coastal businesses and providing recreational opportunity for many people. Cleanup of stormwater will preserve and enhance this activity by ensuring that fish are safe for consumption and by preserving fish breeding grounds in estuaries.

Swimming

Ocean swimming, as part of a visit to the beach, is a recreational activity enjoyed by millions of people each year in Southern California. It attracts tourists who contribute substantially to coastal economies. It is discouraged if trash litters the beach or if fear of disease discourages water contact. It is prevented entirely in the event of beach closures, which are a common result of polluted stormwater runoff.

Boating

Powerboats and sailboats are widely used in Southern California and represent a substantial industry in manufacture, maintenance, provision of slips, and various associated shoreside activities. Polluted waters, particularly in the form of trash, can significantly degrade the quality of the boating experience.

Noncontact Recreation and Nonconsumptive Wildlife Uses

Some recreational activities involve bodies of water without contact: sitting or bicycle riding along rivers or lake shores are examples. These activities are seriously degraded if the water produces bad odors or is littered with trash. A stormwater quality program will protect and enhance these uses.

Observation of wildlife is often a valuable part of the outdoor experience. Continuation of this activity requires water quality sufficient to support birds and animals and the plants and insects that they eat. Many migratory birds are dependent on local bodies of water for their sustenance during their yearly movements.

Reduced Illness from Contaminated Seafood

Some illnesses are transmitted through consumption of contaminated seafood. Control of the microbiological quality of runoff waters will reduce the extent of such illnesses.

Reduced Illness from Swimming in Contaminated Waters

Recent studies have indicated that people swimming near storm drains are more likely to contract waterborne diseases than those swimming far from storm drains. Microbiological control of runoff quality, particularly through sanitary treatment of dry weather flows, could reduce the incidence of these diseases.

Enhanced Esthetic Values

The trash cleanup associated with stormwater quality control will improve the appearance of our harbors, rivers, streets, and commercial establishments. Esthetic enjoyment of wildlife habitats such as wetlands, in particular, is hindered if trash is present.

Preservation of Natural Ecosystems

Polluted urban runoff damages natural ecosystems in many ways: toxic material can sicken or kill organisms, trash can choke marine mammals or birds, additional turbidity can prevent the penetration of light necessary for seaweed growth, sediment can bury habitats and prevent attachment of organisms to rocky surfaces, and nutrients can fertilize overgrowth of mosses and plankton. This damage can be prevented by stormwater quality control, and is one of the prime reasons for the program.

SECONDARY BENEFITS OF STORMWATER QUALITY CONTROL

Urban runoff comes from a huge variety of sources and contacts much of the environment around us. The efforts made to clean up runoff, which have the primary purpose of preventing water pollution in receiving waters, will have many secondary benefits and these should be included in any cost-benefit analysis. Indeed, some of these benefits are so substantial that they suggest the agencies responsible for the resources in question should also be providing financial support for runoff quality control efforts.

Groundwater Restoration

Total rainfall in the Los Angeles basin in an average year is equal to about half of the amount used for drinking water supply. It is strange indeed that we pollute this water and discharge it to the ocean even as we import ecologically, politically, and financially expensive water from the Colorado River, Northern California, and the Owens Valley. The primary difficulty in making productive use of this water is the lack of storage capacity. Rainfalls are infrequent but intense: most of the time there is no rainfall available for use, but occasionally it is so abundant that it causes flooding. Surface water reservoirs are the traditional solution to this problem—water is stored during the rainy season to prevent floods and becomes available for valuable uses the weather is dry. But there are few workable sites for large, year-round surface water reservoirs in the Los Angeles area. Groundwater aquifers, however, can also serve as water reservoirs, being drawn down in the dry season and replenished during the wet season. Infiltration will constitute a use of this storage capacity, reducing future dependence on outside sources of water and avoiding expensive alternatives like desalination of seawater. Because environmental and political factors may make increasing water imports impossible at any price, better utilization of local rainfall through the use of the groundwater reservoirs may be necessary for future growth.

Improvement of groundwater supplies within Southern California would save money now spent on imported water, and would save the concomitant external costs of the environmental impact on source areas. It would also reduce political friction with source areas. Ultimately, it may be the only economically and politically feasible method by which the water supply in Southern California can be increased, and as such, it may be the key to continued development in the area.

Flood Control

As the fraction of the Los Angeles Region occupied by impermeable surface has increased, the amount of water runoff has also increased, putting an ever-growing load on the flood control system. A recent project improved flood control for the lower Los Angeles River by increasing the height of the dikes on the channels, at a cost of about $200 million. Future increases in channel capacity would be even more expensive—not only will the walls have to be made higher, several bridges will have to be raised. Increased infiltration will reduce runoff, reducing the maintenance costs on the system and eliminating the need for further capacity increases.

The possible magnitude of the impact can be judged by considering the case of the San Gabriel Valley. Runoff from the valley is mostly captured in spreading basins in the Whittier Narrows area and used for groundwater recharge. This makes the runoff coefficient for the valley overall 5%. In the urbanized areas of Los Angeles, the value is about 40%. Thus if the urbanized area were as well controlled as the San Gabriel Valley, runoff could decrease by a factor of eight. Flood risks would essentially disappear.

Increased Parkland and Wildlife Habitat

The regional alternatives for stormwater quality control include the development of parks and wetlands. The parks would serve as detention basins and infiltration facilities, but would be used for that purpose only during rainy periods, which comprise about 32 days per year in Southern California. During the rest of the year, these areas could serve the typical purposes for which parks are built, acting as recreational sites, playgrounds, soccer and baseball fields, and wildlife habitat. Because people are less likely to engage in these activities during rainstorms in any case, the conflict between the uses will be small. The Los Angeles area is notably short of public parks in comparison to other major cities, particularly in its poorer neighborhoods (Wolch et al., 2002). Because it is likely that residents will demand more park space in the future, the development of areas for dual use is particularly valuable. Ideally, the cost of development could be borne by both agencies intent on improving stormwater quality and by those responsible for parks and recreation. The planned redevelopment of the Corn Fields site in Los Angeles, for example, might provide a detention basin as well as the new park that is being planned.

Wetlands must be kept wet all year, but can withstand flooding during the rainy season. Thus reestablishment of these habitats, which have been largely lost in the Los Angeles Region, could simultaneously serve the purposes of wildlife restoration, flood control, and stormwater quality control. In many cases, it will be possible to develop wetlands within existing channels, reducing the need for additional land purchases.

Some of the parks and wetlands could be created as a part of river greening projects, and so would also serve the purposes of reestablishing esthetically appealing naturalistic rivers.

Improved Property Values from Trash Control

Often one of the most powerful visual cues that gives a visitor the perception of a "bad" neighborhood is the presence of trash on the streets. One approach to reducing pollutant discharge to storm drains will be improved enforcement of litter laws and additional street cleaning. These will have the secondary benefit of improving the appearance and livability of streets throughout the area. The "broken windows" campaigns of many police departments—indicating that improving the appearance of neighborhoods reduces crime—suggests that apparently cosmetic changes can have substantial benefits for neighborhoods. Certainly property values in a neighborhood with clean streets will be higher than they would if the streets are routinely littered with trash.

Reduction in Harbor Sedimentation

Sediments carried by runoff are moved because the water moves rapidly, and because small particles remain suspended in the low-salt-content chemical environment of fresh water. When runoff enters bays and harbors, however, the velocity of the water is slowed, allowing the particles to settle to the bottom. The higher salt content of marine waters promotes flocculation of the small particles, so that most of them will also settle to the bottom. The deposited sediment fills channels, blocking the passage of ships and recreational boats, and filling areas set aside for preservation of aquatic ecosystems. Ultimately, harbor dredging is required, and frequently the collected sediment has been contaminated, so that it requires special handling. Dredging associated with storm drains in Los Angeles Harbor, for example, costs between $1 million and $3 million per year. Sedimentation in Upper Newport Bay is considered a significant threat to its function as a wildlife refuge. Stormwater quality control measures would avoid sediments discharges or remove it from the runoff, ameliorating these problems for downstream communities.

Improved Public Health

A significant portion of exposure to particulate air pollutants arises when small particles are resuspended from roadways by traffic and wind. Tire dust, settled air pollutant particles, pet feces, particles with adsorbed trace metals and trash are pounded into fine powder and lifted into the air. Such resuspension includes an ultrafine particle fraction, which is most dangerous to human health. More frequent street cleaning, particularly using vacuum bag type cleaners, would reduce public exposure to fine materials carrying trace metals, hydrocarbons, and microorganisms. Some public health improvement is likely, but its magnitude cannot be estimated.

REGIONAL PROGRAMS DESIGNED FOR STORMWATER QUALITY CONTROL

While there has been a substantial amount of work on individual facilities for runoff quality control, such as detention ponds and grassy swales, there have been only a few studies that have tried to determine the regional cost and effectiveness for a system of these "green solutions". It is important to ask whether it is possible to create an overall program within realistic constraints of land availability and costs that will bring the watershed into compliance with regulations.

We have sought descriptions of example projects that include overall costs and the area of land that drains to the facility, so that cost per square mile of area served can be calculated. In a few cases, these are area-wide systems that are the best evidence that an overall solution is possible. In others, they are single installations, for which we make the assumption that duplication is possible—ten facilities like the one described could be built to serve ten times the area. Because economies of scale are important in determining facility design and even regulatory policy, we have taken special interest in some sources that describe how the size of the drainage area (and the necessary BMP treatment facility) affects cost per square mile. Finally, we have included examples that have actually been built and tested, and others that have only been designed. While data for the latter may be less reliable, most systems perform as designed, and these designed-but-not-built systems provide some of the most useful results.

The chosen examples are described briefly below, and listed in Table 2. Results useful for determining the relationship between facility size and cost per square mile are plotted in Figures 2 and 3.

Area-Wide Systems

Sun Valley

The Sun Valley project was funded by Los Angeles County to develop an alternative approach for flood control and runoff quality management for the Sun Valley district. This is an urbanized area with considerable industrial development that currently does not have storm drains. It is consequently frequently plagued with flooding. The project was undertaken to determine whether there was an approach to flood control other than simply building storm drains.

Four alternative plans were produced, designed to maximize infiltration, to maximize water conservation and wildlife habitat, to maximize stormwater reuse by industry, and emphasizing conveyence to traditional storm drains. Notably, an alternative that maximized the use of onsite BMPs was rejected as too expensive. The components of the plans included industrial reuse, infiltration basins in parks, tree planting and mulching, infiltration in parking lots, and infiltration in vaults beneath the streets.

Because the emphasis of this project was flood control rather than water quality control, the hydraulic control objectives were quite stringent: the system was designed to collect and infiltrate all of the water produced by a 50-year, 96 hour storm. This means that the runoff from the area, if the project is built, will be reduced to near zero. Thus, this project, which includes flood control and water quality control, constitutes an "upper

bound" estimate on the costs for water quality control. Achieving such complete collection and infiltration would certainly substantially exceed water quality goals, and costs for a stormwater quality control system in an area with storm drains already in place would certainly be lower.

San Diego Creek

A project supported by the Irvine Ranch Water District and Orange County and performed by Geosyntec Consultants has developed a plan for natural treatment systems—wetlands and stormwater detention ponds—for the San Diego Creek watershed. This watershed occupies 120 square miles of developed land that drains into Newport Bay. Newport Bay has been designated as impaired, requiring that stormwater discharges be cleaned up.

Geosyntec proposed a plan consisting of 44 facilities, including ponds and wetlands constructed within existing drainage channels or built outside. These are typically facilities with both deeper open water and shallow water supporting emergent vegetation (such as cattails).

Water quality improvements expected from the system are described in the report (Strecker et al., 2002): "The NTS Plan is estimated to achieve total nitrogen (TN) TMDL for base flows and reduce in-stream TN concentration below current standards at most locations. Total phosphorous TMDL targets would be met in all but the wettest years. The fecal coliform TMDL would be met during the dry season, but not all wet season base flow conditions, and not under storm conditions. The NTS Plan is not designed to meet the sediment TMDL, but would capture, on average, about 1,9000 tons/yr (1,724,000 kg/yr) of sediment from urban areas. The wetlands are estimated to remove 11% of the total copper and lead, and 18% of the total zinc in storm runoff. The NTS provides a cost-effective alternative to routing dry-weather flows to the sanitary treatment system."

While final budget numbers were not provided, it was anticipated that the first 13 treatment sites would be constructed for $12 million, and that the overall cost would be substantially less that the $60 million anticipated for low-flow sanitary treatment. This value is listed as the upper bound of cost in Table 2. For comparison of cost vs. unit drainage area size, it was presumed that the average area served by each of the 44 facilities was 120 mi^2/44 = 2.7 mi^2.

Constructed wetlands will collect any trash that enters the storm drain, and should be effective at reducing concentrations of coliform organisms, hydrocarbons, particles, and the suite of pollutants associated with particles. They may constitute a complete control system if they are combined with vigorous source control for metals and pesticides and storm drain screens to minimize the trash loading.

Murray City, Utah, Golf Course and Wetlands

Officials in Murray City recognized an opportunity when the interstate highway I-215 was being built. They agreed to take soil from the excavation and runoff water from the freeway to make a golf course. The links, with an associated string of settling ponds, accept and treat all of the drain water from the eastbound lanes of 4.5 miles of the freeway (NRDC, 1999; Hill, 2003). The golf course has been a commercial success, and now produces $900,000 in revenue against $450,000 in operating and maintenance costs

each year. The city has created other treatment wetlands for essentially all of the runoff from the City and from the westbound lanes of the freeway. The total cost of these wetlands has been less than $1,000,000. Overall, if the golf course infiltration system and the other wetlands are considered as a single stormwater control system, it pays for itself. Because this is an unusual circumstance, for calculation we ignored the income from the golf course, and presume the wetlands cost $1,000,000 and serve the area of Murray City, which is 9.5 mi^2.

Fresno Metropolitan Flood Control District

The Fresno Metropolitan Flood Control District serves the area including and surrounding the city of Fresno. It operates 130 infiltration basins that drain a region of about 120 square miles devoted to agriculture, residential areas, and urban landscape (NRDC, 1999; Pomaville, 2003). Some of the basins are turfed and serve as parks, while others are bare and serve seasonal infiltration needs. The basins succeed in infiltrating 80% to 90% of the stormwater in their drainage areas, and only 2% enters a receiving water without receiving some degree of treatment. To protect groundwater, the District also instituted a program of industrial inspections. While monitoring is still done to check for pollution of the San Joaquin River, the District anticipates no additional infrastructure will be necessary to meet water quality control regulations. For calculations, the unit area for each basin was assumed to be 1 mi^2.

Individual Systems

Long Lake Retrofit, Littleton, Massachusetts

Geosyntec Consultants also designed a low-impact-development program for Littleton, Massachusetts (Roy et al., 2003). The 1.5-square-mile watershed that contains the town drains into Long Lake, which has been subject to eutrophication and other water quality problems associated with urban runoff. The storm drain system collects water at 200 catch basins and releases it to the lake through 18 outfalls. The plan for mitigation of the problem includes a treatment wetland, grass and vegetated swales, bioretention cells (swales with underdrains), rain gardens, rain barrels, and an outreach program to promote source control for fertilizers.

The total budget for the project is estimated at $630,000, or $420,000 per square mile.

Tule Pond, Alameda, California

The Tule Ponds project is a group of three treatment wetlands that was constructed using information developed in the Demonstration Urban Storm Water Treatment Marsh in the early 1980s. It receives urban runoff, passing it through the three ponds in series and discharging it to an existing natural pond. It serves a drainage area of 0.8 square miles and cost $360,000, for a cost of $450,000 per square mile.

Treasure lsland, San Francisco Bay

Treasure Island is an artificial island of 403 acres in San Francisco Bay that was used for many years as a Navy base. It has recently been converted to residential use. A treatment wetland is planned as the means for stormwater quality control. It is anticipated that wetland construction will cost $800,000 to $ 1,100,000 (Bachand, 2003), or $1.2

million to $1.7 million per square mile. However, the island is a tourist destination, and it has been estimated that the increase in visitor spending associated with the wetland could be $4 million to $11 million (Fine, 2003). It was also estimated that the overall value of the project could be twice these values.

Herrerra Study of Stormwater Regulations Costs

As a part of the effort to determine the costs of complying with stormwater regulations in Western Washington, Herrerra Environmental Consultants (2001) prepared designs for typical projects needed to contain and treat stormwater on site in small projects of new construction. In both cases, the systems were planned for a 1.7-inch rainfall. The first hypothetical project was a ten-acre residential development with 40 individual home sites. It was presumed that runoff from the homes would be collected in a detention pond. Construction of the permanent facilities was determined to cost $240,000 to $230,000, depending on the quality of soils. This is about $15 million per square mile.

The second hypothetical site was a restaurant built on a one-acre site, with the area not occupied by the building used as a parking lot. Runoff was to be collected in subsurface infiltration vaults. Costs were determined to be $280,000 or $570,000, depending on the permeability of the soil, or $175 million to $356 million.

Dover Mall, Delaware

The Dover Mall has 30 acres of parking lot or otherwise impermeable surface. Runoff drains to a wetland that is sized to retain a 1-inch rainfall (NRDC, 1999). It includes a forebay that allows containment of exceptional spills. The total project cost was $171,000 (although much of this was defrayed by in-kind donations). The wetland is considered a considerable esthetic resource. The cost was $3.5 million per square mile.

Oakland Park Industrial Area, Florida

A BMP treatment system was developed for five acres of Oakland Park that included auto repair shops, paint shops and plating facilities. A short treatment train was developed, including a trash removal basin and absorbent media. The system cost $261,000, and was successful in removing 71% to 95% of oil and grease, along with all trash and most sediment. Costs were $33 million per square mile of drainage.

Clear Lake Packed Bed Wetland Filter System

Clear Lake, in Orlando, Florida, receives runoff water from 121 acres of nearby urban land and water quality in the lake has deteriorated significantly as a result of pollution. Packed beds, consisting of 10 filter beds composed of crushed concrete or granite media with growing aquatic plants, allow removal of sediments and nutrients. An initial wet detention pond is used to contain the first flush. The system cost $917,646. In calculations, the system was considered a single installation treating 121 acres of drainage. Costs were $4.6 million per square mile.

Sand Filters in Alexandria, Virginia

Two sand filters were built to treat runoff from an airport parking lot near National Airport in Alexandria, Virginia. The area drained was 1.95 acres, and the filters cost $40,000. While some initial problems with anaerobic conditions were encountered,

the filters eventually achieved good treatment. The cost, calculated from the data reported by FHWA (2003), was $12.9 million per square mile.

Compost Filter Facility, Hillsboro, Oregon

A compost filter was constructed to decontaminate water upstream of a grassy swale. The treatment train received water from a five-lane highway, draining a total area of 74 acres. The 1200-square-foot filter contained 120 cubic yards of compost and was constructed and filled for $13,700. The cost, not including the swale, was thus $110,000 per square mile of drainage area.

Infiltration Trenches

The Federal Highway Administration (FHWA 2003) has estimated the costs for constructing infiltration trenches as $C_A = 1317 \times V^{(0.63)}$ where C is the cost in dollars and V is the volume in cubic meters. Calculations for this report are made assuming the need to provide detention for a ¾-inch storm. For one square mile (2.6×10^6 m^2), a ¾-in rainstorm will produce 5×10^4 m^3 of water. The cost per square mile is equal to the cost for each trench divided by the drainage area it serves, or $C_{mi2} = C_A/A = (1/A) \times 1317 \times V^{(0.63)} = 1.2 \times 10^6 \times A^{(-0.37)}$. The total cost for these systems thus declines as each system becomes larger—there are economies of scale. Costs for land are not included, but it is likely that trenches could be installed in land also used for other purposes. In some cases it might be necessary to collect more than ¾ inch of rain. On the other hand, the calculation assumes that no infiltration occurs in the trench during the storm. Also, this presumes that the runoff coefficient for the area served is 1.0—thus the typical systems described could treat a ¾-inch storm on totally impervious area or a 1.5-inch storm on an area with a runoff coefficient of 0.5, which is a commonly observed value. Thus the total seems a reasonable approximation.

Infiltration Basins

The Federal Highway Administration (FHWA 2003) has estimated costs for construction of open infiltration basins (dry basins) as $C = (V/0.02832)^{(0.69)}$, where C is the cost in dollars and V is the volume in cubic meters. As for the infiltration trenches, it is assumed the basins will be designed to treat a ¾-inch storm in an impervious drainage. Thus the cost per square mile is $C_{mi2} = C_A/A = (1/A) \times (V/0.02832)^{(0.69)} = 204{,}000 \times A^{(-0.31)}$. Costs for land are not included, and would be substantial. However, the basins could be used for other purposes for much of the year. Again, the systems assumed could treat a 1.5-inch storm in a drainage area with a runoff coefficient of 0.5.

Bioretention Areas

Stormwater can be collected in areas filled with highly permeable soils and planted with trees and other vegetation. Water that infiltrates is filtered by contact with the soils and may continue to move downward to replenish the groundwater. Much of it will also be taken up by the vegetation and returned to the atmosphere through evapotranspiration. The FHWA (2003) cost estimate for these bioretention areas is $10,000 per impervious acre, or $6.2 million per square mile of impervious watershed. Bioretention areas can readily serve multiple purposes as wildlife habitat and parks.

Detention and Retention Wetlands

The Federal Highway Commission Report (FHWA, 2003) has provided a general formula describing the cost of detention ponds as a function of size. Costs were estimated as $C_A = 168 \times V^{(0.699)}$, where C_A is the cost in dollars and V is the volume of the pond in cubic meters. The cost per square mile is $C_{mi2} = C_A/A = (1/A) \times 168 \times V^{(0.699)} = 324{,}000 \times A^{(-0.301)}$. Land costs are not included, but these areas can serve other purposes during the larger part of the year when the weather is dry—they can be parks, wildlife areas, and playing fields.

Detention Vaults

In highly urbanized areas, water can be detained in underground vaults, which may be made of concrete or of corrugated steel pipe. Such systems primarily store water to avoid flooding or excessive hydraulic load on downstream systems, but some sedimentation may occur. This provides marginal treatment, but also requires that the vaults be cleaned out on a regular basis. The FHWA estimate for costs of such systems is $C = 38.1 \times (V/0.02832)^{(0.6816)}$. Cost per square mile of drainage area is $C_{mi2} = (1/A) \times 38.1 \times (V/0.02832)^{(0.6816)} = 690{,}000 \times A^{(-0.3184)}$.

Underground Sand Filters

Sand filters are quite effective at removing particulates from urban stormwater, and are commonly employed upstream of other systems in order to protect them from excessive sedimentation. They can be installed underground in densely urban areas, but are correspondingly expensive. The FHWA estimate for such systems is $10,000 to $14,000 per impervious acre served, or $8.7 million per square mile. Here we have chosen the upper estimate because costs are likely to be high in the Los Angeles area.

Surface Sand Filters

Sand filters may also be constructed at the surface, which reduces their cost. However, they occupy a relative large amount of land area, and cannot contribute to a secondary use. There are strong economies of scale. For facilities serving more than 5 impervious acres, the FHWA estimate of cost is $3,400 per acre or $2.1 million per square mile.

Dry Swales and Filter Strips

A vegetated dry swale is an area of land shaped so that stormwater flows through it in a broad, relative flat stream. Flow through the grass removes sediments from the water. At the same time, significant amounts of infiltration may occur. It may be necessary to prepare the soils to maximize infiltration before the grass is planted. Swales can be used for other purposes during the periods when it is not raining. The FHWA estimate of construction costs for swales is $1500 per impervious acre, or $930,000 per square mile.

Filter strips are similar installations, in which the water flows as a flat sheet. The FHWA estimate of constructions costs for filter strips is $2000 per acre or $1,240,000 per square mile.

Results from the ASCE-EPA BMP Database

A cooperative effort of the American Society of Civil Engineers and the U.S. Environmental Protection Agency has compiled data on the success of best management

practices. Data were carefully vetted, put as much as possible in common format, and arranged so that they could be searched according to several parameters. Several searches of the database were done to gather data for this study.

A search for dry detention basins, serving watersheds of 0-100,000 acres, with 0-30 in annual rainfall, produced 17 responses, of which only four included cost data. All of the four were associated with freeways and served small watersheds of 1-14 acres. This may be the reason why costs were exceptionally high.

A search for wetlands, serving watersheds of 0-100,000 acres, with 0-30 in annual rainfall, produced 10 responses, only one of which included cost data. Costs for this facility were exceptionally low. It was described as a "natural" wetland, perhaps implying that much of the system was already in place before construction was done.

A search for wetlands, draining 0-100,000 acres, with 0-30 in annual rainfall, produced 9 responses, including 6 with cost data. These also served very small watersheds, and costs per square mile were very high.

A search for hydrodynamic devices serving 0-100,000 acres, in areas of 0-30 in annual rainfall, produced 12 responses, including 8 with cost data. Costs ranged from $344,000 per square mile to $86 million per square mile, showing very strong economies of scale.

A search for grassy swales serving 0-100,000 acres, in areas of 0-30 in rainfall, produced 26 responses, including 7 with cost data. The cost per square mile ranged from $12 million to $341 million, and showed strong economies of scale. This was a surprising result—grassy swales are very simple and cheaply constructed systems—but it reflects the fact that each installation serves only very small areas.

ESTIMATES OF COSTS AND RECOMMENDED APPROACH

Ultimately, stormwater pollution is a symptom of two anthropogenic changes: we are releasing pollutants into our local environment, and we have disrupted the hydrologic cycle of the Los Angeles Region by covering the soil with impervious surfaces. These changes have other symptoms as well. Local pollution impairs health, damages the esthetic quality of life, and reduces property values. Reducing infiltration increases runoff rates and the risk of flooding, and at the same time, reduces recharge of groundwater resources. Finally, impervious surfaces cannot support vegetation, and we suffer the loss of natural habitat, recreational areas, and aesthetic value of green space.

Cost Estimates

The solution proposed in the report by Gordon et al. (2002)—advanced treatment plants to clean up stormwater after it has entered the storm drains—constitutes treatment of a single symptom without correction of the fundamental problem. It is expensive, and has little benefit beyond the single objective of protecting receiving waters. A more fundamental approach—eliminating pollutant releases and restoring the hydrologic cycle—is cheaper. Further, because it will mitigate all of the effects of pollution and hydrologic disruption, it will have benefits whose value exceeds the costs.

While a rudimentary cost-benefit analysis is attempted here, the limitations of such an approach should be kept in mind. Many costs and benefits are difficult to evaluate—the psychological benefit to citizens who live on a clean street rather than a trashy one, for example, or the long term effects on local business of a general perception of regulatory burdens. In past cost-benefit analyses, it has been common that costs and benefits that are difficult to measure have been assumed to be zero, certainly producing misleading results. It remains true that two good-faith investigators can produce quite different cost-benefit results, especially for a complex problem like stormwater quality control. Assumptions may depend greatly on the value system of the investigators. A recent cost-benefit study was criticized, for example, because it put a lower value on the lives of elderly persons. This is reasonable in the sense that the death of and older person represents fewer years of life lost, and less loss of earnings, and it is a common presumption in cost-benefit studies. However, there was outrage among those who felt that this approach was offensive to the elderly and the general principle that we all have equal rights.

In this particular study, because the costs and expenditures are of many different kinds, it was necessary to use a variety of estimation methods. The results are necessarily approximate, and comparisons among them must be viewed with caution. To use technical terms, contingent valuation studies are included with benefits transfer estimates, and results from various investigators are combined. We anticipate that these steps may be criticized, but we hope that we can provide a framework approach that can be improved and refined as further research is done.

Finally, cost-benefit analysis frequently ignores the issues that arise because the costs and benefits are not borne by the same parties. One might suggest that pollution should not be cleaned up if the cost of doing so exceeds the benefits of relief from the pollution. But it is commonly the case that the polluter who is saving money is not the

same person who is suffering from the effects of the pollution. Does your neighbor have the right to throw his trash in your yard if he can show that it saves him more money than it costs you? The principle of "polluter pays" has a satisfying moral aspect and it also puts the incentives right—the parties with the ability to reduce pollution are given the motivation to find a way to do so.

For these reasons, and because in this short study the numbers are particularly only estimates, we present our cost benefit analysis with the caution that more precise and detailed assessments are desperately needed.

Cost estimates have been prepared by examining case studies. Reports were chosen where information was available for both the total cost of the system described and the land area served, or the initial stormwater retention volume, in order to calculate the cost of stormwater management per square mile of watershed. Several assumptions and caveats must be observed:

1. In the cost-per-square-mile calculations, no attempt was made to adjust costs on the basis of the amount of rainfall in the watershed. Sufficient data were generally not available for this purpose. In most cases, data came from areas where annual rainfalls are greater than in Los Angeles, and this may cause the cost estimates to be high.
2. In the cost-per-square mile calculation, the cost data were not available in a uniform format. It was not possible to calculate an accurate "present worth" including operations and maintenance costs for each case. In some cases operations and maintenance data were included, while in others they were not. In most cases operations and maintenance costs are low in comparison to installation costs, and they would be further reduced by discounting to present worth. Never the less, this may cause the cost estimates to be low.
3. Installation costs may vary depending on the slope of the land, the nature of the soils, depth to water table, local labor costs, and a wide variety of other factors that change with locality. No attempt was made to adjust the costs for these factors, and this may make the estimates high or low.
4. It is presumed that the systems described will be sufficient, in conjunction with source control efforts, to comply with water quality regulations. There was no case reported in which the quality control efforts were described as failing, or for which regulators asked for additional measures after the systems were complete. However, few data were shown for after-construction water quality, and most of the systems have not been in place for enough time to allow long-term assessment. The degree of success for source control efforts, while likely to be substantial, cannot be guaranteed.
5. Several of the projects described have been designed, but not implemented. It is assumed that they will perform as designed. In the case of the Federal Highway Administration formulas, these are regression results rather than individual case results.
6. It is likely that implementation in the Los Angeles area would involve projects that are larger than most of those listed. There likely will be economies of scale. This may cause the cost estimates to be high.

Summary of Case Study Project Costs
"I or D" refer to Implemented or Designed

Project	I or D	Description	Unit Size, square miles	Cost, $M	Cost, $M per square mile
Infiltration Systems					
Fresno Metropolitan Flood Control District Regional Infiltration Basins (NRDC, 1999; Dave Pomaville, 2003)	I	130 turfed or unturfed infiltration basins serving residential areas. Treats or infiltrates 98% of runoff over area of 120 square miles	1		2.5 to 3.7
Study of Stormwater Regulations Cost (Herrerra Environmental Consultants, 2001)	D	Hypothetical calculation of costs for new residential development	0.016	.24	15
Study of Stormwater Regulations Cost (Herrerra Environmental Consultants, 2001)	D	Hypothetical calculation of costs for new commercial development	0.0016	0.28 to 0.57	175 to 356
Wetlands					
Tule Pond, Alameda (Wetzig, 1999)	I	Stormwater treatment pond for urban runoff	0.8	0.36	0.45
Treasure Island, San Francisco Bay (NRDC, 1999: Galvanis, 2003)	D	Wetland treatment system for local runoff	0.65	0.8 to 1.1	1.2 to 1.7
Long Lake Retrofit, Littleton, Mass. (Roy et al., 2003)	I	Swales, constructed wetlands, bioretention cells, outreach	1.5	0.63	0.42
San Diego Creek Natural Treatment System Master Plan (Strecker et al., 2003)	D	Network of open-water ponds and wetlands in Newport Bay drainage, 120 square mile area	2.7	<60	<0.5
Murray City, Utah (NRDC 1999: Hill, 2003)	I	Golf course and wetlands treat runoff from 4.5 miles of I-215 and the city	9.5	1.0	0.11
Dover Mall,	I	Wetland installed on mall	0.048	0.17	3.5

Delaware, (NRDC 1999)		grounds drains 30 acres of 100% impervious cover			
Sun Valley Project, Los Angeles County	D	Combination of various measures for flood and quality control in L.A. Basin	4.4	172 to 297	39 to 68
BMP Treatment Processes					
Oakland Park, Fla, industrial area (NRDC 1999)	I	Oil, grease, sediment, and trash removal by sedimentation and absorbance	0.008	0.261	33
Clear Lake Packed Bed Wetland Filter System (NRDC 1999: FHWA, 2003)	I	Oil, grease, nutrients, trace metal removal for water entering Clear lake	0.2	0.92	4.6
Compost Filter Facility, Hillsboro, Or. (FHWA, 2003)	I	Oil, grease, removal and filtration for highway runoff	0.12	0.12	0.11
Alexandria, Va, airport parking lot	I	Sand filters installed along the borders of a 1.95-acre parking lot	0.003	0.04	12.9
Bioretention Areas, FHWA cost estimate	D	Areas of highly permeable soil planted with trees and other vegetation			6.2
Underground Sand Filters	D	Porous medium filters placed in underground vaults, appropriate for highly urban areas			8.7
Dry Swales	D	Broad, shallow vegetated drainways covered with vegetation, usually grass			0.93
Surface Sand Filters	D	Porous medium filters installed at the surface			2.1
Filter Strips	D	Flat vegetated drainways covered with vegetation, usually grass			1.2
Port of Seattle container area cleanup	I	High quality street sweeping with sediment trap catch basins			3.1
Cost:Area Formulas from FHWA					
Infiltration trenches, FHWA cost estimate	D	Gravel-filled trenches. Infiltration eliminates runoff discharge.	$C_{mi2} = C_A/A$ $= (1/A)\times 1317\times V^{(0.63)}$ $= 1.2\times 10^6\times A^{(-0.37)}$		

Infiltration basins, FHWA cost estimate	D	Open basins, dry at most times, store and infiltrate runoff. Infiltration eliminates runoff discharge.	$C_{mi2} = C_A/A$ $= (1/A)\times(V/0.02832)^{(0.69)}$ $= 204{,}000\times A^{(-0.31)}$		
Detention and retention wetlands, FHWA cost estimate	D	Wetlands used for treating stormwater, with storage capacity available	$C_{mi2} = C_A/A$ $= (1/A)\times 168\times V^{(0.699)}$ $= 324{,}000\times A^{(-0.301)}$		
Detention vaults, FHWA cost estimate	D	Underground reservoirs for storage of runoff to reduce peak flows	$C_{mi2} =$ $(1/A)$ $\times 38.1\times(V/0.02832)^{(0.6816)}$ $= 690{,}000\times A^{(-0.3184)}$		
Results from ASCE-EPA BMP Database					
Dry Detention Basins					
I-605/SR-91 EDB	I		0.0013	0.077	60
I-5/Manchester (East)	I		0.0077	0.33	43
I-5 SR 6	I		0.0085	0.14	17
I-75/SR-78 EDB	I		0.022	0.82	38
Wetlands					
Swift Run Wetland	I		1.95	0.049	0.025
Sand Filters					
I-5/SR-78 P&R	I		0.0013	0.22	170
Escondido MS	I		0.0013	0.45	348
Eastern Eastern Regional MS	I		0.0024	0.34	141
Foothill MS (Sand Filter)	I		0.0029	0.48	164
Termination P&R	I		0.0045	0.46	102
LaCosta P&R	I		0.0045	0.23	49
Hydrodynamic Devices					
Jensen Precast (UVA)-Phase II	I		0.00045	0.039	86
I-210/Orcas Avenue	I		0.0018	0.04	22
Jensen Precast, (Sacramento)	I		0.0032	0.062	19
I-210/Filmore Street	I		0.0040	0.05	12
Charlottesville Stormceptor	I		0.0040	0.017	4.2
Sunset Park Baffle Box	I		0.040	0.023	0.57
Indian River Lagoon CDS Unit	I		0.098	0.055	0.56

Austin Rec Center OSTC	I		0.15	0.05	0.34
Grassy Swales					
I-650/SR-91 Swale	I		0.00032	0.11	341
Cerrito MS	I		0.00065	0.06	93
1-605/DelAmo	I		0.0011	0.13	115
I5/I-605 Swale	I		0.0011	0.073	64
Monticello High School	I		0.0013	0.015	11
SR-78 Melrose Dr	I		0.0039	0.13	34
I-5 North of Palomar Airport Road	I		0.0074	0.14	18
I-650/SR-91 Swale	I		0.00032	0.11	341

Economies of Scale

The costs listed in Table 2 reflect the cost for an individual facility ("Cost, $M" and "Cost, $M/mi^2") and associate it with the drainage area served, referred to as the "Unit Size". The costs per square mile for the individual units can be plotted to determine the effects of unit size (Figures 1 and 2). While there is a great deal of scatter in the data, it is clear that there is considerable economy of scale. Units serving drainages of a half square mile are typically 30% more expensive that those serving 1 square mile. Those serving drainages of one-tenth square mile are twice as expensive and small installations are extremely expensive in dollars per square mile. The most notable example of this is grassy swales: while each unit is relatively inexpensive, their small service areas make them very expensive per square mile served.

For some of the BMPs there are not sufficient data to judge the economies of scale, and as described, all of the data must be taken as approximate. Never the less, it seems that there is a good case to suggest that regional systems for handling runoff water will be most economical. This is clearly true of wetlands and infiltration basins, which are likely to be the most widely used approaches in the Los Angeles Region as a whole. This supports the position that the best solution will be a wetland or an infiltration basin also serving as a park, playing filed, or wildlife habitat as the stormwater management unit for a neighborhood of a square mile or greater.

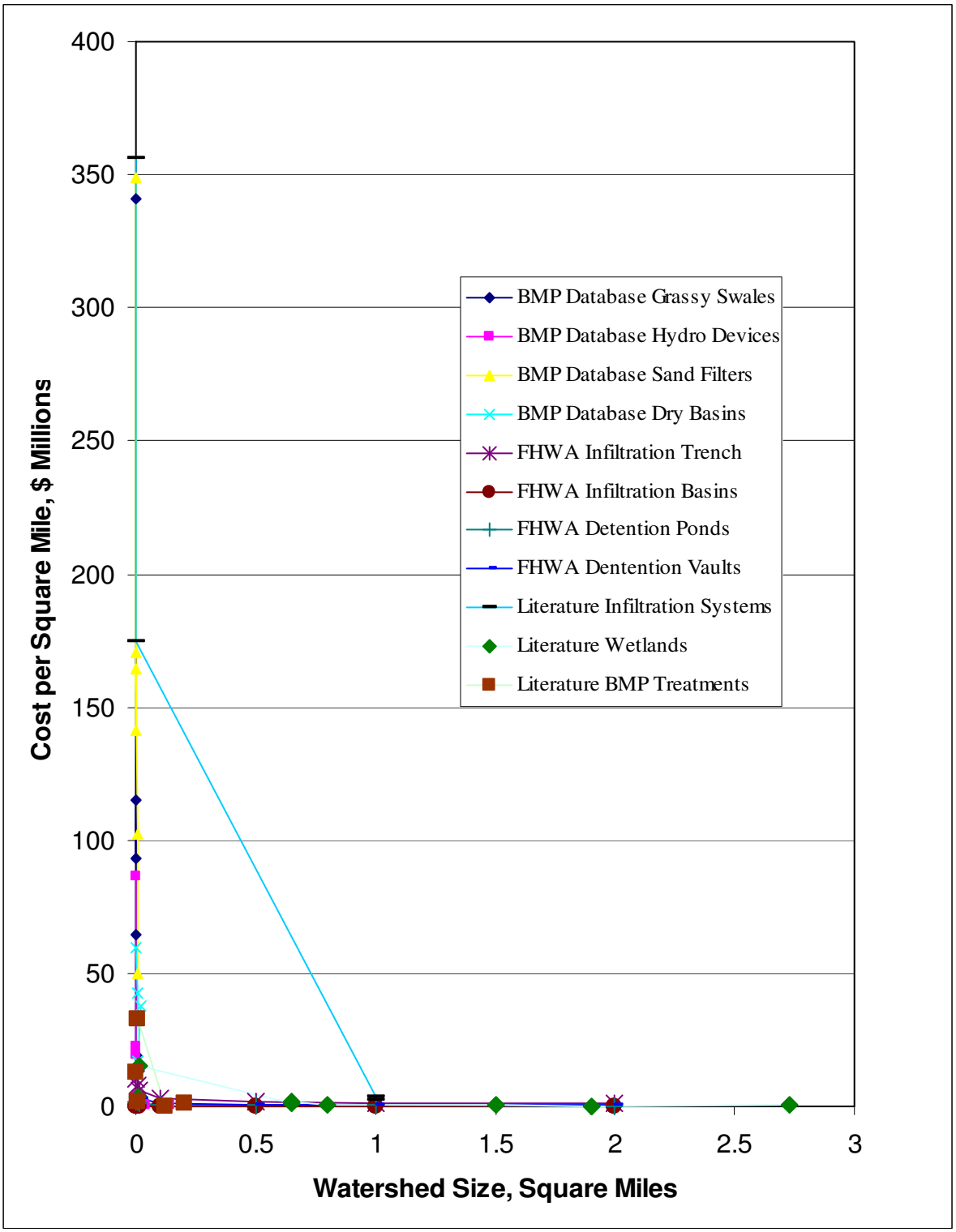

Figure 1. Plot of data for which costs per square mile and unit areas are known.

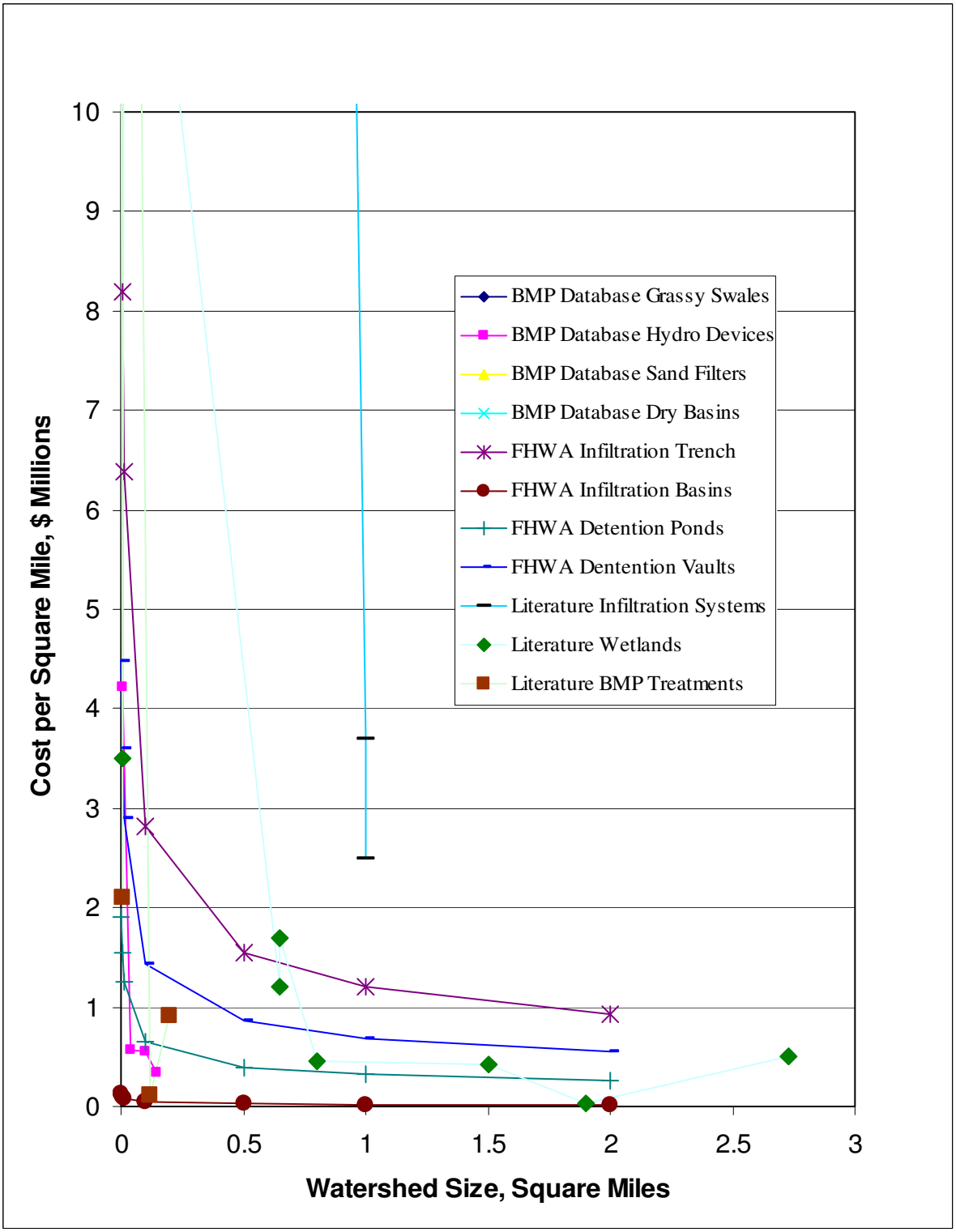

Figure 2. Cost per square mile versus unit size. Data are the same as those shown in Figure 1, but the axes have been magnified to show detail near the origin. Many data points fall outside of the plot.

Overall Costs of Stormwater Quality Control

It remains very difficult to produce an estimate of the total costs for complying with regulations in the Los Angeles Region. While there is substantial information on individual units that have been designed or implemented elsewhere, local factors are likely to make costs different in the Region. In most cases, it seems likely that costs in the Los Angeles Region will be higher than those reported elsewhere because land and labor costs are higher. Therefore, where a range of values is given, we have chosen the higher numbers.

This difficulty is compounded by the great variability in the data reported. To give just one example, the Federal Highway Administration formula estimates the cost of an infiltration basin needed to serve one square mile as $200,000. At the other extreme, the Herrerra Consultants report said that a detention/infiltration system for a residential area would cost $15 million per square mile. In preparing our total estimate, we have avoided using data that seem like outliers in comparison to the general run of the data.

The results compiled suggest two possible scenarios for stormwater quality control. The first approach is to rely on non-structural BMPs, such as programs to reduce littering, control pet waste, collect trash, prevent release of pollutants, and clean existing drains. This approach is less expensive because it involves no construction. However, there remains considerable doubt whether it will be sufficient to meet stormwater quality goals expressed as TMDLs (Total Maximum Daily Loads). Control of pollutant release will be only partial—we cannot expect that everyone will comply with the rules—and the amount of runoff will be reduced only slightly.

The second scenario presumes implementation of non-structural BMPs (except storm drain cleaning) and construction of a network of wetlands and infiltration basins sufficient to capture the first three-quarters of an inch of rainfall, which typically carries the bulk of the pollutants. These relatively simple installations are not likely to be sufficient without complementary measures to reduce releases of coliforms, trace metals, fertilizers and toxic organics. Wetlands help to remove these, but will not be effective if inputs are too high. Infiltration avoids all pollutant discharge, because it prevents release of the water, but it is necessary to protect groundwater quality, so once again, inputs must be restricted. The wetlands and infiltration basins would be designed to have sufficient retention capacity to hold the first ¾ inch of rainfall—this "first flush" carries most of the pollutants, but pollutant discharges must be sufficiently reduced so that subsequent flows can be discharged directly to storm drains.

In combination with the non-structural BMPs, wetlands and infiltration basins (designed as "stormwater parks") are likely to bring stormwater quality into compliance. This system will be more expensive, but it also carries greater secondary benefits: the region will gain much-needed greenspace, property values will be improved, and most important, it will substantially increase the availability of groundwater.

It is our recommendation that the responsible municipalities and agencies in the region begin at once on assessing stormwater quality on a neighborhood basis and implementing the non-structural controls. As the success of these measures is measured, it will become apparent whether the structural BMPs are needed. It seems certain that

they will be needed in some areas, but they may not be needed throughout the region. Thus our estimate of costs ranges from a minimum budget needed for the non-structural BMPs to a maximum representing the cost of an area-wide system of wetlands and infiltration basins. The following section provides the details of how the cost estimates were prepared.

Non-structural BMPs

An estimate of costs for non-structural BMPs has been prepared by the American Public Works Association (APWA, 1992). They defined five levels of BMPs that might be workable, with the appropriate level depending on the stringency of discharge requirements and the success of the individual measures. Their analysis included ten source control measures with cost data, and has been used as the starting point for the analysis here. Our treatment of each measure is described in the following paragraphs.

No littering ordinance. Litter laws are in place in the region, but there is a need for far more vigorous public education and enforcement. The APWA study determined that each municipality would spend $20,000 to put an enforcement program in place, and hire a half time person to manage the program ($30,000 per year). There are about a hundred municipalities in the Los Angeles Region, so this implies a startup cost of $200,000 and yearly costs of $3 million. Some officers will be necessary, but it is assumed that their pay will be covered by revenue from fines. Total costs are estimated to be $3 million plus the present worth of $3 million per year at 3%, or $103 million.

Pet waste ordinance. APWA predicted that the effort to control pet waste would be similar to that for litter, and estimated the same costs.

Chemical use and storage ordinance. APWA determined that a program to control the use and storage of chemicals would be similar is scope and cost to that for litter or pet waste. The same costs are estimated here. This would include the cost of programs to bring auto dismantlers and other local businesses into compliance.

Recycling programs. APWA predicted less trash would be discarded if convenient recycling programs were in place. Because these currently exist in most Los Angeles Region cities, and are justified by other concerns, no additional costs are estimated for this purpose.

Public education programs. Developing public support for stormwater quality control and explaining the need for citizen action will be vital to its success. The APWA determined a program costing $275,000 in each municipality would be necessary. However, it would be confusing and unnecessarily duplicative to have each of the one hundred municipalities in the Los Angeles Region conduct its own program. We instead assume a single program will be funded at the level of $5 million per year, which is approximately the current rate of expenditure. It also seems likely that education will not be needed indefinitely—to the degree that the message is successful, it will certainly become ingrained after perhaps ten years of advertising. We therefore estimate a total of $50 million for public education.

Vacant lot cleanup programs. This function will be part of the improved trash collection program, so funds are not separately allocated.

Spill prevention ordinance. APWA determined a separate program would be necessary to reduce the frequency of chemical spills and facilitate their rapid cleanup.

This function has largely been overtaken by hazardous waste management regulations, and so is estimated to require no additional costs here.

Program to prevent illicit discharges. APWA determined that vigorous efforts would be needed to find and eliminate illicit discharges to the storm drain system. We agree that this will be necessary to avoid loads of non-biodegradable pollutants, such as trace metals, on treatment wetlands and infiltration basins, and to prevent excessive loading of organic contaminants and coliforms. APWA predicted a cost of $4 per acre of watershed to start, and $50 per acre per year thereafter in order to deploy and monitor sampling devices and to trace down points of discharge. For the 2,050 square miles in which stormwater protection is needed, this amounts to $6.5 million in capital expenses and $80 million per year in ongoing costs. We expect however, that many illicit connections will be found at first, and that after these are eliminated, only a small program will be needed to detect new illicit connections. We therefore estimate that the ongoing costs will continue for only five years, totaling $407 million.

Improved cleaning of storm drains. During dry periods, storm drains collect trash from illicit dumping and wind blown litter (we expect no trash will enter through the catch basins because screens will be installed). Sediments also accumulate in the channels. Releases to the rivers and ocean could be reduced by a summer program of storm drain cleaning. The APWA estimates such a program can be put in place for $21 per acre per year, or about $27 million per year over the area of concern. The present worth of $27 million per year is $900 million (assuming an interest rate of 3%). No storm drain cleaning is expected for the wetlands and infiltration scenarios, on the presumption that trash and sediments will be removed from the water before it enters the drains.

Trash control. Trash must be removed from the runoff. A settlement agreement on Trash TMDL between the LA Regional Water Board and the City of Los Angeles includes spending of $168 million to reduce trash releases by 50% in five years. Cleaning up the region required removing all of the trash from an urban area more than twice the size of the city. Thus the estimate of $600 million seems reasonable.

Low flow treatment. One of the best steps, in terms of water quality benefits per dollar, is to use excess capacity in the wastewater treatment plants for treatment of low flows. This will keep the rivers and oceans clean for most of the year at little additional cost. The City of Los Angeles estimates the cost of building the necessary diversion structures at $14 million (Kharaghani, 2003). The urban region is about twice the size of the city, so we have estimated a total cost of $28 million. This does not include operation costs. While there will be modest cost increases associated with the greater flows, the biggest costs are associated with the installed treatment capacity, which is already in place.

Improved street sweeping. The APWA report determined that sweeping should be improved by increasing its frequency. Research results developed since the APWA report suggest that more frequent sweeping with traditional brush machines produces only a modest improvement. However, changing to vacuum sweepers is effective, and can remove up to 50% of particulate pollutants.

The upgrade of street sweeping in the region will require purchasing new vacuum-type sweepers to replace those currently in use. There are about 400 street sweeping

machines in use, which must be replaced once every four years, so 100 machines will be purchased each year. Vacuum machines cost about $150,000 rather than the $75,000 for standard machines. Thus the additional costs of higher quality sweeping are $75,000 per machine or about $7.5 million per year. Assuming an interest rate of 3%, this has a present worth of about $250 million.

Costs for on-site BMPs for private firms. It is anticipated that application of non-structural BMPS will include requirements that businesses make efforts to reduce pollution and runoff from their facilities. Efforts are likely to be highly variable: an accounting firm whose work is all done in offices might need to do no more that redirect its roof runoff to landscaping areas. A manufacturing facility might install sand filters and oil-water separators. Parking lots may be remodeled. It is difficult to provide an estimate for these efforts, but a general approximation for the total can be approached if firms are considered by size (Table 3). Data on the number of firms within chosen size ranges, measured by the number of employees, have been compiled for Los Angeles County by the California Employment Development Department (2001). Again, this area is not the same as the Los Angeles Region governed by LA Regional Water Board, but there is substantial overlap and the demographics are similar.

Table 3. Estimate of On-site BMP Costs for Los Angeles County Firms by Size Class

Number of Employees	Number of Firms	Average Cost per Firm	Total Costs
0-4	219,974	10	$2,199,740
5-9	37,125	500	18,562,500
10-19	25,366	1,000	25,366,000
20-49	19,682	2,000	39,364,000
50-99	7,745	5,000	38,725,000
100-249	4,239	10,000	42,390,000
250-499	1,138	25,000	28,450,000
500-999	408	50,000	20,400,000
1000+	260	100,000	26,000,000
Totals	315,937		241,457,240
		Average cost per firm	$764

Most small firms will not spend any money, so the average cost per firm is expected to be very low. A few might be required to improve trash disposal methods or reroute their rooftop drainage. At the other extreme, the largest companies might improve trash disposal and materials handling methods, build infiltration system planters, install oil-water separators, institute parking lot and work area sweeping. Companies that install new parking lots or reconstruct old ones may incur significant costs.

Costs for compliance with the "3/4-inch rule". The SUSMP regulations promulgated by the LA Regional Water Board require that new developments larger than one acre and redevelopment must provide for infiltration or minimal treatment of runoff from the first ¾-inch of rainfall from a storm event. It is difficult to determine how much this will cost. Proponents have suggested the costs will be minimal, while opponents have predicted high costs. Experts contacted during this study were of the general opinion that landscaping designed to infiltrate the runoff from a ¾-inch storm would be different, but not significantly more expensive, than traditional landscaping. On the other hand, engineers in the discipline believe that most builders are choosing treatment systems rather than infiltration. The stormwater control costs will likely be a small fraction of building costs. Ultimately, we have concluded that there are not sufficient data to make a numerical cost estimate. The costs are therefore described here only as "modest", and further study is recommended.

Wetlands and Infiltration Basins: Estimate Based on Cost per Square Mile of Watershed

The land within the Los Angeles Region varies from lightly settled areas, like the upper reaches of the Santa Clara River Watershed or the Santa Monica Mountains, through neighborhoods of single family homes with yards, to the extremely dense development of downtown Los Angeles or the Wilshire District. There are about 1,375 square miles of incorporated cities in Los Angeles County. The region of the LA Regional Water Board includes parts of Ventura County, and parts of both counties that are not incorporated are never the less populated. To evaluate the possible alternatives for runoff control, we have conceptually divided the 3,100-square-mile region that is under the jurisdiction of the Los Angeles Regional Water Quality Control Board into four parts 1000 square miles is estimated to be of "low density", requiring some runoff BMP treatment, but having sufficient land for development of treatment wetlands or infiltration systems. 1,000 square miles is estimated to be "high density" requiring infiltration systems but excluding wetlands. 50 square miles is estimated to be extremely dense downtown development, requiring some more sophisticated BMP treatment systems. The remainder of the region is considered rural, and we presume the only cost is for source control outreach and enforcement. These definitions and numbers are approximate, but there is also flexibility in the applicability of the various technologies.

For the low density urban areas, we assume some combination of infiltration systems and treatment wetlands will be constructed. The range of reported costs for treatment wetlands runs from $110,000 per square mile for Murray City, Utah, to $1.7 million per square mile for the Treasure Island wetland in San Francisco. The San Diego Creek wetland system seems an excellent example—it is designed for a populated region of Orange County that is quite similar to many areas in Los Angeles County. However, it is specifically designed to treat low flows only, and the total cost of the system has not been provided (except that it is less than $500,000 per square mile). The Long Lake retrofit also seems like an appropriate example. It uses a mix of wetland, infiltration and biological BMPs in an urban residential area, and has a well-established cost of $420,000 per square mile. We have therefore used this value in our total estimate of $420 million for the low density areas.

In areas of high density housing, where yards are small, or in industrial areas with large roof and parking areas, runoff coefficients are higher and there is less land available.

Here it seems likely that infiltration systems will be necessary. The best example for comparison is the Fresno Metropolitan Flood Control District, which installed 130 basins over an area of 120 square miles, with many of the facilities dedicated to multiple uses as parks and playing fields. Cost estimates for the system range from $2.5 million to $3.7 million per square mile. While a similar system built in the Los Angeles Region could take advantage of existing parks, power line rights-of-way, parking lots, and other available land, it seems appropriate to use the higher number because land here will be more expensive. Thus we estimate cost in these areas to be $3.7 million per square mile for a total of $3.7 billion.

In extremely dense areas, neither wetlands nor infiltration systems will be possible. Pollutant loads, despite source control efforts, will be considerable in the near future. Underground sand filters, sediment traps, oil and grease adsorbants and other more elaborate treatment BMPs will be needed. The lowest-cost processes are filter strips, dry swales and bioretention areas, but these require space that is unlikely to be available (the Hillsboro, Oregon compost filter, at $110,000 per square mile is considered an outlier). Even the Alexandria, Virginia airport parking lot solution is unlikely to be workable because so much of the parking area is in multi-level structures in downtown areas. This combination of more pollutants and less space suggests that the Oakland Park, Florida system for treating industrial runoff is the best case example. Its cost was equivalent to $33 million per square mile, for a total of $1.65 billion over the extremely dense urban area.

Together, this approach estimates that the total BMP facilities cost will be about $5.7 billion.

Wetlands and Infiltration Basins: Estimate Based on Needed Retention Capacity

Investigators working on the Sun Valley Project (Los Angeles County Department of Public Works, 2003, Figure 4-3 of page 4-8) have designed several BMPs and provided carefully calculated cost estimates. These are recent figures, reduced to present worth, and reflecting the local conditions in the urban Los Angeles Region. They provide costs in terms of dollars per acre-foot of stormwater storage capacity for several BMPs. Three examples have been chosen for consideration here: Stonehurst Park and Wentworth Park (which simply lower the park level to two feet below the surrounding area so that they serve as infiltration basins, or "stormwater parks"), and storage in below-street infiltration vaults. A system that stores the runoff from a ¾-inch storm will comply with SUSMP requirements. In the low density areas, it is estimated that the runoff coefficient is 0.4. In the high density areas, it is estimated to be 0.6, and in the extremely dense areas it is estimated to be 1.0.

We estimate that the low-density areas can be served at the Stonehurst Park price, the high density areas can be served at the Wentworth Park price, and the extremely dense areas can be served by street infiltration vaults. This approach to estimating the total cost is completely independent of the first approach, but the final estimate of $4.0 billion for BMP facilities is reasonably similar.

Wetlands and Infiltration Basins: Estimation of Total Costs from the APWA Study

The APWA study produced total estimates for costs for the nation for five scenarios for stormwater quality control. One estimate was for a system of detention

basins and wetlands, as is being proposed for the structural BMPs described here. They estimated that a national system would cost $91 billion. For 260 million people in the United States, this is about $350 per capita. For the 10 million people in the Los Angeles Region, this produces an estimate of $3.5 billion. The APWA anticipated maintenance costs for detention and retention basins at about 1% of the construction cost per year. Discounted to present worth, this increases the total cost by 33%, or $1.2 billion. APWA numbers thus indicate a total cost of $4.7 billion. This estimate is similar to those shown for the entries in Table 3 for facilities costs for alternatives B and C.

Wetlands and Infiltration Basins: An "Upper Bound" Provided by the Sun Valley Study

The Sun Valley study developed a detailed design for a 4.4 square mile watershed that currently has no storm drains. It was designed to contain the water from a 50-year, 3-day storm—14.8 inches of rain—using stormwater parks and below-street infiltration vaults. Because this approach will infiltrate essentially all of the rain that runs off from the area, and because the design criterion of 14.8 inches greatly exceeds the ¾ inch assumed here, it unquestionably constitutes a plan that would overcomply with the strictest imaginable stormwater quality control regulations. Further, because it is a complete and detailed design, it is essentially certain that it can be built for the cost estimated. Figures are recent, and reflect the costs of construction in the Southern California area.

The costs determined can therefore serve as an "upper bound" multiple benefit expenditure that a municipality could imaginable be required to incur—while there is every reason to suppose that the easier goal of stormwater quality control can be done for a much lower cost. The low cost alternative described was $171 million for 4.4 square miles, or $39 million per square mile. For the 1050 square miles of the high density and extremely dense urban Los Angeles Region, this would result in a cost of $41 billion. Wetlands for the low-density areas and trash control for the entire region would add about $1 billion more. Thus we can say with great certainty that no alternative more expensive than $42 billion will be needed.

Overall Benefits of Stormwater Quality Control

The Esthetic Value of a Clean Ocean

Much of the value of living near clean streams and a pollution-free ocean is difficult to quantify. People enjoy the view, they like watching wildlife, and they prefer vegetation and sand and water to pavement. Some efforts to place a dollar value on these benefits have been made by the EPA (1999) and others (Kramer, 2003; Soderqvist, 2000; Whitehead, et al., 2000).

Soderqvist asked residents in the area of the Stockholm archipelago how much they were willing to pay in order to reduce eutrophication of the nearby ocean. The effects of oceanic eutrophication are relatively subtle—less obvious than floating trash or debris washed up on the beach. He determined the willingness to pay to be between $54 and $90 per person.

Whitehead investigated resident willingness to pay for reduction of eutrophication of the Neuse River Basin in North Carolina. He found 44,000 landowners were willing to pay about $76 each for the water quality improvement.

Kramer surveyed people in the area of the Catawba River in North and South Carolina, asking about willingness to pay for improved water. The average result was $139 per taxpayer.

The EPA surveyed people across the U.S., asking about their willingness to pay for the various services associated with improvements in fresh water quality. They found people willing to pay $210 per household for improvement of water quality sufficient to support boating, $158 for the further improvement sufficient to support fishing, $177 for further improvement sufficient to allow swimming, and $158 for improvement sufficient to support natural aquatic life. Of the total of $703, however, only 67% was ascribed to local water quality improvement, while the rest was associated with improvement nationwide. Assuming 2.5 persons per household, this results in an estimate of $188 per person for willingness to pay for local freshwater improvements, similar to the estimate by Kramer for the Catawba River.

We have chosen the EPA estimate for freshwater improvements: the higher estimate seems reasonable because freshwater resources in the LA basin are generally in very poor condition, and because we have ignored the national effect (their results indicated that people throughout the nation were willing to pay for improvements throughout the nation—we are not counting the willingness of people outside the LA Region to pay for improvements here, and that number is not zero). Adding this to a mid-range value of the Soderqvist estimate for improvements in ocean water quality produces a result of $260 per person. This seems a quite reasonable value. 9.5 million people live in the Los Angeles Region, so this value indicates a total willingness to pay, based solely on the value of living in a region of clean waters, of about $2.5 billion.

Larsen and Kew (2003) have surveyed residents of California to determine their total willingness to pay for removing all impairments from bodies of water in the state. They determined that the average willingness to pay was $15.46 per month. Assuming 2.5 persons per household, this is $6.18 per person per month. For 9.5 million residents in the Los Angeles Region, this is $58.7 million per month, with a present worth of $23 billion. This represents the value of removing all impairments—including those caused by wastewater pollution, shoreside development, pollution from boats, and others. Our estimate for stormwater pollution alone is about one-tenth of this. Thus the Larsen and Kew results suggest our estimate is reasonable and conservative.

General support for these numbers was found in a survey done for the Packard Foundation performed by Mark Baldassare (Weisse, 2003). He determined that seven of ten Californians are concerned about the decline in coastal resources. Sixty-nine percent said the condition of the coastline is very important to their quality of life, and 75% visit the coast at least several times each year. Seventy-two percent favor reducing stormwater pollution, even if the cost leads to higher utility bills.

Ecosystem Services

A primary purpose of stormwater quality control is protection of nearshore marine ecosystems. These ecosystems provide humanity with a wide variety of services, ranging from educational opportunity to fish resources to chemical maintenance of the atmosphere. While the effort to value such ecosystem services is necessarily difficult and approximate, some studies have been made. Costanza, et al. (1997) in an article published in the respected journal *Nature*, assessed the value of coastal ecosystems at $12

trillion per year worldwide. The World Resources Institute estimates that there are 1.6 million kilometers of coastline (measured at a resolution of 1 kilometer). If we assume that stormwater discharges from the Los Angeles Region affect about 100 miles, or 160 kilometers of coastline, this is 0.01% of the world's total, suggesting that the value of local coastal resources is $1.2 billion per year. Assuming an interest rate of 3%, this income stream has a present worth of $40 billion. Finally, we can make the general approximation that stormwater pollution reduces the services provided by the local coastal ecosystem by 5%. This suggests that the value of lost services is $2 billion.

This number is quite approximate. It must secondly be interpreted thoughtfully because it includes services such as nutrient cycling and maintenance of the atmosphere, which are of undoubted value to the world, but which do not show up in the daily budgets of local citizens or local municipalities. The services are nevertheless quite real and quite valuable, and should be included in the accounting.

Additional Water Supply

Infiltration of stormwater will add to area groundwater reserves. These are a valuable resource that currently provides a substantial fraction of the Los Angeles Region water supply. Water that is infiltrated from the stormwater quality control system will add to local resources, reducing the need for imported water. We assumed that water will be collected from 2050 square miles. Rainfall ranges from 12 to 16 inches per year in the region, and infiltration is from 2 to 8 inches per year. It is conservative to assume that installation of a distributed system of infiltration basins will increase infiltration in this area by an average of 3 inches per year, corresponding to collection of four storms of ¾ inches (or a larger number of smaller storms). Thus total infiltration will be 300,000 acre-feet per year. Some of this may be unrecoverable, having entered contaminated or otherwise unusable aquifers. However, even this will contribute to reducing the problems of seawater intrusion. We estimate that about 90% or 270,000 acre-feet of the infiltrated water will be available.

Current importation costs are about $450 per acre-foot. However, current supply shortages are forcing serious consideration of desalination as an alternative source because political and environmental factors preclude significant increases in importation. We predict that continued growth in the Los Angeles Region will require that water be obtained from such high-cost sources, so we have used $800 per acre-foot as the value of the infiltrated ground water. Further, even if water is available for $450 per-acre foot, this is only the marginal financial cost of import—the true life cycle cost, including environmental impacts in source areas, is surely much higher. 270,000 acre-feet of water per year at $800 per acre-foot amounts to $216 million per year. The present worth of this income stream is $7.2 billion.

The appropriate number is highly dependent on assumptions: if conservation measures are effective and growth is slow, desalination might not be necessary. However if we include the costs of political friction with source areas, and the environmental impact of water transfers on those areas—that is, the full life-cycle cost of imported water, even the cost estimate of $800 per acre-foot may be low.

Flood Control

The flood control system in Los Angeles County is currently designed to cope with runoff from areas with a runoff coefficient on the order of 0.5. Stormwater quality control measures could substantially reduce this number—currently the coefficient for the San Gabriel Valley, measured below the spreading grounds at Whittier Narrows, is 0.05. Calculations suggest that the recent Army Corps of Engineers project that raised the embankments along the lower Los Angeles River have eliminated the 100-year flood plain for now, and property owners have correspondingly been relieved of flood insurance costs of $20 million or $30 million per year. However, if development continues to increase the runoff coefficient of the region, progressively more expensive projects will be required—it is likely that further protection would require rebuilding many bridges. Alternatively, flood insurance will once again be necessary, and uninsured properties will be at risk. It is perhaps reasonable to presume that infiltration systems will avoid the cost of the next embankment project, which could easily costs twice as much as the one just completed, or $400 million.

A second estimate can be developed this way: The National Flood Insurance Program says there are 25,620 policies held in Los Angeles County with an average premium of $550, for a total yearly cost of $14 million. The present worth at 3% is $466 million. Presumably, most but not all of this could be avoided with a complete stowmwater quality control system. Thus the estimate of $400 million seems reasonable.

Property Value Improvements from Greenspace and Water

Certainly additional parks and other greenspace would add to property values. Developers frequently add central lakes or greenspace to large developments, demonstrating their belief that the value of the land for additional housing is less than its value as an amenity. In a study compiled in 1995, the U.S. EPA said (U.S. EPA, 1995):

> "People have a strong emotional attachment to water, arising from its aesthetic qualities--tranquility, coolness, and beauty. As a result, most waterbodies within developments can be used as marketing tools to set the tone for entire projects (Tourbier and Westmacott, 1992). A recent study conducted by the National Association of Home Builders indicates that "whether a beach, pond, or stream, the proximity to water raises the value of a home by up to 28 percent." A 1991 American Housing Survey conducted by the Department of Housing and Urban Development and the Department of Commerce also concurs that "when all else is equal, the price of a home located within 300 feet from a body of water increases by up to 27.8 percent" (NAHB, 1993). Dick Dillingham, President of the National Association of Realtors' Residential Sales Council, declares, "Water makes a difference . . . there is such a very small supply of properties that can claim a water location and it is something you cannot add" (Lehman, 1994)."

Homes overlooking the new wetlands and greenspace will see the greatest increase in property values. Those farther away will appreciate less. A study reported by Fairfax County, Virginia, (Environmental Coordinating Committee, 2003) interpreted the EPA results and concluded that an aesthetically valuable pond raises the value of nearby houses by $10,000 each. In Los Angeles County, the median home is valued at about $400,000, so a $10,000 increase is about 2.5%, which seems a reasonable number.

Demographic data for Los Angeles County (This is not the same as the Los Angeles Region governed by the Water Quality Control Board, but there is considerable overlap, and the demographics are quite similar) indicate there are 3.27 million homes, of which 47.9%, or 1.55 million, are owner-occupied. We expect that about one-third of these, or 500,000 homes, would benefit from additional greenspace in a complete stormwater control system (the others could be too remote, or might already have sufficient greenspace). Increasing the value of each home by $10,000 provides a total benefit of $5 billion.

Improved Property Values from Trash Control

Enforcement of litter laws and improved street cleaning would improve the appearance of our neighborhoods. It is believed that the esthetic improvement would have a value to individuals at least equal to the esthetic benefits of a cleaner ocean, so we have valued this at $100 per person, for a total of $950 million.

Cost Savings from Reduced Dredging

Costs for sediment dredging and disposal in area harbors range from about $10 per ton, when the sediment is clean and a nearby disposal site is available, to $30 per ton when the sediment is contaminated or the disposal site is distant. Disposal of sediments classified as toxic may cost $100 per ton. Personnel at Los Angeles Harbor estimate that about 40% of currently dredged sediment is contaminated, and occasional loads are toxic. In general, acceptable disposal sites are becoming harder to find, so distant sites are likely to be the rule. Thus, an estimate for future sediment removal of $30 per ton is reasonable. The Environmental Protection Agency has estimated overall costs and effectiveness for sediment control at construction sites, and the results indicate that preventing the runoff of a ton of sediment costs from $69 to $86 (Appendix II). Therefore, the savings associated with alleviation of harbor sedimentation alone offset about a third of the costs of construction site measures. Savings for Los Angeles Harbor will be about $3 million per year. Regional savings will be about $10 million, with a present worth of $330 million.

To cite another example, it is estimated that the San Joaquin Marsh wetland preserve collects 50,000 tons of sediment per year. Assuming a removal cost of $30 per ton, the benefit for Newport Bay, which is just downstream, is $1.5 million per year.

Cost Savings from Improved Public Health

Sufficient data do not exist for estimating the value of benefits from reduced exposure to air pollutants. Certainly fine particles are an important part of the causes of health impairment, and experts agree that resuspension of road dust is an important contributor to fine particle exposure at street level where we live. They also contribute substantially to settlement of dust and dirt on buildings, requiring cleaning expenses. However, estimates of the magnitude of this effect are not currently possible.

Summary of predicted costs and benefits

Table 3 presents a summary of the estimated costs and benefits. Three estimates are included. In the first (A), non-structural BMPs are presumed to be the only measures employed. In the second (B), wetlands and infiltration basins are assumed, and the costs are estimated on a cost-per-square-mile basis. The third set of columns (C) again describes the wetlands and infiltration basins scenario, but makes cost estimates on a per-

acre-foot-detention basis. The second and third estimates also presume implementation of the non-structural BMPs, except for storm drain cleaning.

Benefits differ because implementation on non-structural BMPs does not produce property increases associated with greenspace, does not significantly increase groundwater supply, and does not reduce harbor sedimentation.

The costs of stormwater quality control are significant. Non-structural BMPs alone will cost $2.6 billion. Structural systems, including wetlands and infiltration basins, will cost between $5.7 billion and $7.4 billion. However, it should be noted that these costs will be borne over a period of many years—probably ten years at least. More importantly, the benefits of these expenditures considerably exceed their costs. For the non-structural BMPs alone, the benefit-to-cost ratio is 1.9. For the structural approach the estimates are 2.5 and 3.3. Control of pollution and reestablishment of the hydrologic cycle will produce a greener city with higher property values, better esthetics, cleaner rivers and a cleaner ocean, and a larger and more stable water supply.

Table 2. Overall Cost Estimate for Stormwater Quality Control in the Los Angeles Region

Sums are rounded to two significant figures

		A. Non-Structural BMPs, modified from APWA			B. Wetlands and Infiltration Basins, watershed area basis		C. Wetlands and Infiltration Basins, detention volume basis		
Regions and BMPs	**Area, sq. miles**	**Capi-tal Cost $M**	**O&M Costs $M**	**Total $M**	**Cost / square mile, $M**	**Cost or Bene-fit $M**	**Acre-feet initial flow**	**Cost per acre-foot**	**Cost or Bene-fit, $M**
Costs for Non-Structural BMPs									
No Littering Ordinance		2.5	3	103		103			103
Pet Waste Ordinance		2.5	3	103		103			103
Chemical Use and Storage		2.5	3	103		103			103
Public Education			5	50		50			50
Illicit Discharge Program		6.5	80	407		407			407
Increased Cleaning of Drains			27	900					
Trash Control				608		608			608
Low Flow Sanitary Treatment				28		28			28
Improved Street Cleaning	2050			250		250			250
Private On-site BMPs		241		241		241			241
New construction rules				Mod-est		Mod-est			Mod-est
Total N-S BMPs				2791		1891			1891
Costs for Structural BMPs									
Rural	1050					0			0
Low Density, Industrial (C=0.4)	1000				0.42	420	15,500	0.053	822
High Density (C=0.6)	1000				3.70	3,700	23,250	0.098	2,279
Extremely Dense (C=1.0)	50				33.00	1,650	1,938	0.470	911
Total Facilities Costs						5,770			4,011
Total Cost, LA Region				**2550**		**7420**			**5661**
Benefits									
Flood Control						400			400
Greenspace, Water Property Values						5,000			5,000
Clean Ocean Esthetics				2500		2,500			2,500
Clean Streets Esthetics				950		950			950
Groundwater Replenishment						7,200			7,200
Improved Beach Tourism				100		100			100
Preservation of Ocean Ecosystems				2000		2,000			2,000
Reduced Harbor Sedimentation						330			330
Improved Health, Cleaner Buildings, Reduced Exposure to Particulates						Sig-nificant			Sig-nificant
Total Benefits, LA Region				**5600**		**18,000**			**18,000**

Recommendations for Action

The results developed here indicate that a distributed approach to stormwater quality control, employing non-structural BMPS with a system of wetlands and infiltration basins will achieve stormwater quality compliance and will be far cheaper than advanced treatment plants. It is recommended that the responsible organizations begin immediately with the non-structural measures, analyze their effectiveness, and add wetlands and infiltration systems as necessary to achieve the goal of protecting the rivers and coastal zones of the Los Angeles Region. Our results indicate that the benefit-to-cost ratio for the non-structural BMPs is about two, and for the larger effort is about 3. Thus both the beginning effort and the full response represent good investments for the people of the region.

Outreach

Municipalities that are finding themselves responsible for stormwater cleanup should act immediately to lay the groundwork for comprehensive programs. Outreach programs should be developed to inform the public of the problems and of what they can do to help with the solution. Vigorous efforts to reduce littering, for example, will reduce costs in subsequent steps as programs develop. Current regulations controlling release of sediments from construction sites should be enforced and supplemented with contractor education efforts.

Data Collection and Planning

Municipalities should immediately begin the process of determining the extent and nature of their individual stormwater quality problems. Many may find, for example, that stormwater from neighborhoods of single-family homes can be discharged to rivers or infiltrated with little or no treatment. Early identification and elimination of problem sources might greatly reduce later expenditures on treatment systems—the programs of thorough data collection and vigorous enforcement described earlier were notably effective at reducing pollutant concentrations in discharges and cost very little. It will certainly be a tragedy if we build expensive treatment systems to solve a problem that can be eliminated with a citation.

Municipalities should also immediately assess their property holdings. Cities frequently own substantial amounts of land, and some of this will be appropriate for stormwater control facilities. Purchasing programs should be developed immediately, so that cities can take advantage of opportunities for economical land acquisition as they arise.

Administrative Structure

Adding to the daunting technical and financial problems, the distributed approach for stormwater control requires that problems be solved by a holistic effort for each sub-watershed. The boundaries of sub-watersheds do not correspond to political boundaries, and cities will be forced to cooperate in ways that have never been required before. Further, controlling local pollution releases and restoring the hydrologic cycle involve issues that have traditionally be dealt with by an astonishing variety of agencies. If we imagine controlling the runoff quality of a sub-watershed by installing a park/infiltration system with associated wetlands, for example, efforts should include the sanitation

districts for the cities overlapping the sub-watershed (because of stormwater quality control), the Water Replenishment District (because of groundwater infiltration), the County Flood Control District (because the park will contribute to flood control and reduce the cost of downstream facilities), parks departments (because a recreational area will result), and wildlife agencies (governing the habitat created). It is reasonable to expect, moreover, that each of these agencies will contribute to the funding necessary for construction and maintenance. It is likely that, with appropriate apportionment, such a facility will have a favorable cost/benefit ratio for each of the agencies involved. It is certain that gaining the cooperation and contributions of all of these agencies will be extremely difficult. It may be appropriate that legislation be passed at the state level to provide a means for bringing these agencies together.

Funding

While runoff quality can be controlled by methods significantly cheaper than the massive construction of advanced treatment plants, the cost remains significant, and comes at a time when state and local governments are desperately short of funds. It is reasonable to suggest that funding should come from those who contribute to the problem, so that the taxation system mimics a market—assigning costs to the activity that generates them. Hundreds of municipal stormwater utilities, for example, have instituted a tax that is proportional to the number of square feet of impermeable surface on the land. An extension to this approach is to give property-owners fee rebates for installing BMPs that lower runoff quantity or increase water quality. This approach, or others that encourage owners to reduce their runoff, could fund the solution even as they reduce the magnitude of the problem. Certainly fines for littering should be used to fund litter law enforcement in the way that parking fines fund parking enforcement. Efforts to control illegal discharges could be at least partially supported by fines of those making the discharges. All of these approaches would be consistent with the principle that the polluter should pay, and would provide incentives that would contribute to stormwater cleanup.

A “cap and trade” system would be one means of approaching the funding dilemma. If all landowners were given the choice of either purchasing tradable discharge allowances or cleaning up runoff, a free-market trading system would allow owners to trade these allowances and in the process assign stormwater runoff reduction to owners who are able to cheaply install BMPs. This system, or a combined stormwater utility fee with BMP credits, would tend to produce the lowest cost solution overall. A study under way in Cincinnati, Ohio, suggests that such systems could be successful (Thurston et al., 2003).

Changes in Building Codes

This study indicates that parking lots constitute a significant resource for promoting stormwater infiltration. Building codes should be amended immediately to require that all new or reconstructed parking lots be designed to infiltrate the water that they collect. While there will be costs associated with the infiltration systems, the work described above indicates that much—and often all—of these costs can be offset by reduced costs for curbs and drainage systems.

Very large facilities, such as those for malls, should be considered sites for installation of subsurface infiltration vaults that could receive water from surrounding areas as well. These could be installed in sections, to minimize disruption to the commercial establishments. A mechanism could be established by which the site owners are compensated for the costs of handling the runoff.

Other building codes should be changed to encourage on-site infiltration of water rather than rapid drainage to the street. It may also be appropriate to consider limitations on the use of architectural copper sheeting, which can release copper ions to stormwater, and on the use of galvanized materials, which can release zinc.

Purchase of High-Efficiency Street Sweeping Equipment

Improved street sweeping seems very likely to be an important part of future stormwater programs. It can remove 30 to 50 percent of the particulate-associated pollutants, substantially reducing the load on downstream systems. It will have the secondary benefits of improving neighborhood appearance and reducing the exposure to air pollutants at street level. Municipalities should make the decision now to purchase only high-efficiency vacuum sweepers as they make routine replacements of their street cleaning machinery.

Investigation of Coliform Sources

Additional studies, particularly employing newly available methods for rapid identification of microorganisms, should be done to determine the sources of pathogenic organisms in stormwater.

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APPENDIX I.
BEST MANAGEMENT PRACTICES FOR CONSTRUCTION SITES

(Adapted from the Washington State Department of Ecology Water Quality Program, 2001).

The **12 Elements** of Storm Water Pollution Prevention Plan (SWPPP):

Mark Clearing Limits

Prior to beginning land disturbing activities all clearing limits, sensitive areas and their buffers, and trees that are to be preserved shall be clearly marked, both in the field and on the plans, to prevent damage and offsite impacts.

Preserving Natural Vegetation

The purpose of preserving natural vegetation is to reduce erosion wherever practicable. Limiting site disturbance is the single most effective method for reducing erosion.

Buffer Zones

An undisturbed area or strip of natural vegetation or an established suitable planting will provide a living filter to reduce soil erosion and runoff velocities.

High Visibility Plastic or Metal Fence, Stake and Wire Fence

Fencing is intended to: (1) restrict clearing to approved limits; (2) prevent disturbance of sensitive areas, their buffers; (3) limit construction traffic to designated construction entrances or roads; and, (4) protect areas where marking with survey tape may not provide adequate protection.

Establish Construction Access

To minimize the tracking of sediment onto public roads and into surface waters:

Stabilized Construction Entrance

Construction entrances are stabilized to reduce the amount of sediment transported onto paved roads by vehicles or equipment by constructing a stabilized pad of quarry spalls at entrances to construction sites.

Wheel Wash

Wheel washes reduce the amount of sediment transported onto paved roads by motor vehicles.

Construction Road/Parking Area Stabilization

Stabilizing subdivision roads, parking areas, and other onsite vehicle transportation routes immediately after grading reduces erosion caused by construction traffic or runoff.

Control Flow Rates

Properties and waterways downstream from development sites shall be protected from erosion due to increases in the volume, velocity, and peak flow rate of stormwater runoff from the project site.

Sediment Trap

A sediment trap is a small temporary ponding area with a gravel outlet used to collect and store sediment from sites cleared and/or graded during construction.

Temporary Sediment Pond

Sediment ponds remove sediment from runoff originating from disturbed areas of the site. Sediment ponds are typically designed to remove sediment no smaller than medium silt (0.02 mm).

Install Sediment Controls

Straw Bale Barrier

To decrease the velocity of sheet flows and intercept and detain small amounts of sediment from disturbed areas of limited extent, preventing sediment from leaving the site.

Brush Barrier

The purpose of brush barriers is to reduce the transport of coarse sediment from a construction site by providing a temporary physical barrier to sediment and reducing the runoff velocities of overland flow.

Gravel Filter Berm

A gravel filter berm is constructed on rights-of-way or traffic areas within a construction site to retain sediment by using a filter berm of gravel or crushed rock.

Silt Fence

Use of a silt fence reduces the transport of coarse sediment from a construction site by providing a temporary physical barrier to sediment and reducing the runoff velocities of overland flow.

Vegetated Strip

Vegetated strips reduce the transport of coarse sediment from a construction site by providing a temporary physical barrier to sediment and reducing the runoff velocities of overland flow.

Straw Wattles

Straw wattles are temporary erosion and sediment control barriers consisting of straw that is wrapped in biodegradable tubular plastic or similar encasing material. They reduce the velocity and can spread the flow of rill and sheet runoff, and can capture and retain sediment.

Sediment Trap

A sediment trap is a small temporary ponding area with a gravel outlet used to collect and store sediment from sites cleared and/or graded during construction.

Temporary Sediment Pond

Sediment ponds remove sediment from runoff originating from disturbed areas of the site. Sediment ponds are typically designed to remove sediment no smaller than medium silt (0.02 mm).

Construction Stormwater Chemical Treatment

Turbidity is difficult to control once fine particles are suspended in stormwater runoff from a construction site. Sedimentation ponds are effective at removing larger particulate matter by gravity settling, but are ineffective at removing smaller particulates such as clay and fine silt. Sediment ponds are typically designed to remove sediment no smaller than medium silt (0.02 mm). Chemical treatment may be used to reduce the turbidity of stormwater runoff.

Construction Stormwater Filtration

Filtration removes sediment from runoff originating from disturbed areas of the site.

Stabilize Soils

Exposed and unworked soils shall be stabilized by application of effective BMPs that protect the soil from the erosive forces of raindrops, flowing water, and wind.

Temporary and Permanent Seeding

Seeding is intended to reduce erosion by stabilizing exposed soils. A well-established vegetative cover is one of the most effective methods of reducing erosion.

Mulching

The purpose of mulching soils is to provide immediate temporary protection from erosion. Mulch also enhances plant establishment by conserving moisture, holding fertilizer, seed, and topsoil in place, and moderating soil temperatures.

Nets and Blankets

Erosion control nets and blankets are intended to prevent erosion and hold seed and mulch in place on steep slopes and in channels so that vegetation can become well established. In addition, some nets and blankets can be used to permanently reinforce turf to protect drainage ways during high flows.

Plastic Covering

Plastic covering provides immediate, short-term erosion protection to slopes and disturbed areas.

Sodding

The purpose of sodding is to establish permanent turf for immediate erosion protection and to stabilize drainage ways where concentrated overland flow will occur.

Topsoiling

Addition of topsoil will provide a suitable growth medium for final site stabilization with vegetation. While not a permanent cover practice in itself, topsoiling is an integral component of providing permanent cover in those areas where there is an unsuitable soil surface for plant growth. Native soils and disturbed soils that have been organically amended not only retain much more stormwater, but they also serve as effective biofilters for urban pollutants and, by supporting more vigorous plant growth, reduce the water, fertilizer and pesticides needed to support installed landscapes. Topsoil does not include any subsoils but only the material from the top several inches, including organic debris.

Polyacrylamide for Soil Erosion Protection

Polyacrylamide (PAM) is used on construction sites to prevent soil erosion. Applying PAM to bare soil in advance of a rain event significantly reduces erosion and controls sediment in two ways. First, PAM increases the soil's available pore volume, thus increasing infiltration through flocculation and reducing the quantity of stormwater runoff. Second, it increases flocculation of suspended particles and aids in their deposition, thus reducing stormwater runoff turbidity and improving water quality.

Surface Roughening

Surface roughening aids in the establishment of vegetative cover, reduces runoff velocity, increases infiltration, and provides for sediment trapping through the provision of a rough soil surface.

Gradient Terraces

Gradient terraces reduce erosion damage by intercepting surface runoff and conducting it to a stable outlet at a non-erosive velocity.

Dust Control

Dust control prevents wind transport of dust from disturbed soil surfaces onto roadways, drainage ways, and surface waters.

Small Project Construction Stormwater Pollution Prevention

To prevent the discharge of sediment and other pollutants to the maximum extent practicable from small construction projects.

Protect Slopes

Design, construct, and phase cut and fill slopes in a manner that will minimize erosion, considering soil type and its potential for erosion.

Temporary and Permanent Seeding

Seeding is intended to reduce erosion by stabilizing exposed soils. A well-established vegetative cover is one of the most effective methods of reducing erosion.

Surface Roughening

Surface roughening aids in the establishment of vegetative cover, reduces runoff velocity, increases infiltration, and provides for sediment trapping through the provision of a rough soil surface.

Gradient Terraces

Gradient terraces reduce erosion damage by intercepting surface runoff and conducting it to a stable outlet at a non-erosive velocity.

Interceptor Dike and Swale

Provide a ridge of compacted soil, or a ridge with an upslope swale, at the top or base of a disturbed slope or along the perimeter of a disturbed construction area to convey stormwater. Using the dike and/or swale to intercept the runoff from unprotected areas and direct it to areas where erosion can be controlled. This can prevent storm runoff from entering the work area or sediment-laden runoff from leaving the construction site.

Grass-Lined Channels

Channels lined with grass can convey runoff without erosion, and will provide some degree of treatment and infiltration.

Pipe Slope Drains

Piping can be used to convey stormwater anytime water needs to be diverted away from or over bare soil to prevent gullies, channel erosion, and saturation of slide-prone soils.

Subsurface Drains

Drains below the surface can intercept, collect, and convey ground water to a satisfactory outlet. These can be a perforated pipe or conduit below the ground surface. The perforated pipe provides a dewatering mechanism to drain excessively wet soils, provide a stable base for construction, improve stability of structures with shallow foundations, or to reduce hydrostatic pressure to improve slope stability.

Level Spreader

To provide a temporary outlet for dikes and diversions consisting of an excavated depression constructed at zero grade across a slope. To convert concentrated runoff to sheet flow and release it onto areas stabilized by existing vegetation or an engineered filter strip.

Check Dams

Construction of small dams across a swale or ditch reduces the velocity of concentrated flow and dissipates energy at the check dam.

Triangular Silt Dike (Geotextile-Encased Check Dam)

Triangular silt dikes may be used as check dams, for perimeter protection, for temporary soil stockpile protection, for drop inlet protection, or as a temporary interceptor dike.

Protect Drain Inlets

Storm drain inlets operable during construction shall be protected so that stormwater runoff does not enter the conveyance system without first being filtered or treated to remove sediment.

Storm Drain Inlet Protection

To prevent coarse sediment from entering drainage systems prior to permanent stabilization of the disturbed area:

Stabilize Channels And Outlets

Temporary on-site conveyance channels shall be designed, constructed, and stabilized to prevent erosion from the expected flow velocity of a 2-year, 24-hour frequency storm for the developed condition.

Channel Lining

Lining will protect erodible channels by providing a channel liner using either blankets or riprap.

Outlet Protection

Outlet protection prevents scour at conveyance outlets and minimizes the potential for downstream erosion by reducing the velocity of concentrated stormwater flows.

Control Pollutants

All pollutants, including waste materials and demolition debris, that occur on site during construction shall be handled and disposed of in a manner that does not cause contamination of stormwater.

Concrete Handling

Concrete work can generate process water and slurry that contain fine particles and high pH, both of which can violate water quality standards in the receiving water. Concrete handling is intended to minimize and eliminate concrete process water and slurry from entering waters of the state.

Sawcutting and Surfacing Pollution Prevention

Sawcutting and surfacing operations generate slurry and process water that contain fine particles and high pH (concrete cutting), both of which can violate the water quality standards in the receiving water. Collection of this water is intended to minimize and eliminate process water and slurry from entering waters of the State.

Control De-Watering

Foundation, vault, and trench de-watering water shall be discharged into a controlled conveyance system prior to discharge to a sediment pond.

Maintain BMPs

Temporary and permanent erosion and sediment control BMPs shall be maintained and repaired as needed to assure continued performance of their intended function. Maintenance and repair shall be conducted in accordance with BMPs.

Manage the Project

Development projects shall be phased where feasible in order to prevent, to the maximum extent practicable, the transport of sediment from the development site during construction. Revegetation of exposed areas and maintenance of that vegetation shall be an integral part of the clearing activities for any phase.

APPENDIX II. ESTIMATION OF COSTS FOR CONTROLLING SEDIMENT RELEASES AT CONSTRUCTION SITES

EPA described the costs of the Phase II program in Chapter 4 of the economic analysis (U.S. EPA, 1995). This appendix is a summary of that description, and the figures presented come from that document. The costs were divided into 4 categories: municipal costs, construction costs, federal costs and state costs. Each of these was considered separately.

Construction costs:

Construction costs were described in parts 4-8 to 4-25. All the cost calculations are based on 1998 dollar value.

Because the Phase II program targets construction areas of 1 to 5 acres of land, the cost analysis are done for these land sizes. EPA divided the construction costs into two parts. The first part requires the owners and operators of construction sites disturbing one to five acres of land to plan and implement erosion and sediment control BMPs. The second part requires the implementation of post-construction stormwater runoff controls on construction sites located in Phase II municipalities.

Erosion and sediment control costs

EPA developed a national level cost estimate for implementing erosion and sediment controls on sites that disturb between one and 5 acres. EPA estimated a per site compliance cost for sites of one, three, and five acres and multiplied the cost by the total number of Phase II construction starts expected to incur incremental cost in these size categories to obtain a national cost estimate. EPA used construction start data from fourteen municipalities and 1994 Census Bureau construction permit data to estimate the number of construction starts disturbing between one and five acres of land. Of the estimated 129,675 construction starts likely to incur incremental costs, EPA expects that 110,223 (85%) will require erosion and sediment controls to comply with the regulation.

Exhibit 4–4. Summary Characteristics of Municipalities Where Construction Start Data was Collected

Municipality	Population 1996 (Estimates)[1]	Population Growth 1990 to 1996	Median Household Income (1989)	Area (Sq. Mi.)
Austin, TX	541,278	+14.7%	$25,414	217.8
Baltimore County, MD	720,662	+4.1%	$38,837	599.0
Cary, NC	75,676	+70.5%	$46,259	31.2
Fort Collins, CO	104,196	+19.1%	$28,826	41.2
Lacey, WA	27,381	+42.0%	$29,726	10.1
Loudoun County, VA	133,493	+54.9%	$52,064	520.0
New Britain, CT	71,512	–5.3%	$30,121	13.3
Olympia, WA	39,006	+15.6%	$27,785	16.1
Prince George's County, MD	770,633	+5.6%	$43,127	486.0
Raleigh, NC	243,835	+15.0%	$32,451	88.1
South Bend, IN	102,100	–3.2%	$24,131	36.4
Tallahassee, FL	136,751	+9.6%	$34,764	63.3
Tucson, AZ	449,002	+9.1%	$21,748	156.3
Waukesha, WI	60,197	+5.8%	$36,192	17.3
United States	265 million	+6.6%	$35,225	

Source: US Department of Commerce, Bureau of the Census. [http://www.census.gov].
[1] US Census Bureau Data (1996).

Per-Site Compliance Costs: Installation and O&M.

EPA used standard cost estimates from R.S. Means (R.S. Means, 1997a and 1997b) and the WEF database to estimate construction BMP costs for 27 model sites of typical site conditions in the United States. The model sites included three different site sizes (one, three, and five acres), three slope variations (3%, 7%, and 12%), and three soil erosivity conditions (low, medium, and high). EPA used the WEF database to determine BMP combinations appropriate to the model site conditions. For example, sites with shallow slopes and a low erosivity require few BMPs, while larger, steeper, and more erosive sites required more BMPs. Detailed site plans, assumptions, and BMPs that could be used are presented in Appendices B–2 and B–3. Based on the assumption that any combination of site factors is equally likely to occur on a given site, EPA averaged the matrix of estimated costs to develop an average cost for one-, three-, and five-acre starts for all soil erodibilities and slopes.

Exhibit 4–6. BMPs Used for the Model Sites

Site Size (acres)	Soil Erodibility	Slope		
		3%	7%	12%
1	low	a	a,b	a,c,e
	med	a,b	a,c,e	a,c,e
	high	a,c,e	a,c,e	c,e,f,g1
3	low	a,b	a,c,e	c,d,e,f,g2
	med	a,c,e	a,c,e	c,d,e,f,g2
	high	a,c,e	c,d,e,f,g2	c,d,e,f,g2
5	low	a,c,d,e	c,d,e,f,g3	c,d,e,f,g3
	med	a,c,d,e	c,d,e,f,g3	c,d,e,f,g3
	high	c,d,e,f,g3	c,d,e,f,g3	c,d,e,f,g3

a = silt fence
b = mulch
c = seed and mulch
d = stabilized construction entrance
e = stone check dam
f = earthen dike directing runoff to sediment trap
g = sediment trap (1=1,800 cf, 2=5,400 cf, 3=9,000 cf)

Costs related to each BMP and the description of the BMP were shown in Exhibit 4-7 of the original document.

Exhibit 4–8. Estimated Cost of BMPs for the Model Sites (1998 dollars)

Site Size (acres)	Soil Erodibility	Cost by Slope			Average Cost
		3%	7%	12%	
1	low	$317	$814	$1,422	$1,206
	med	$814	$1,422	$1,422	
	high	$1,422	$1,422	$1,799	
3	low	$1,978	$3,804	$6,047	$4,598
	med	$3,804	$3,804	$6,047	
	high	$3,804	$6,047	$6,047	
5	low	$6,245	$9,334	$9,519	$8,709
	med	$6,245	$9,334	$9,519	
	high	$9,334	$9,334	$9,519	

Per-Site Compliance Costs: Administrative.

EPA then estimated administrative costs per construction site for the following elements required under the Phase II rule: submittal of a notice of intent (application) for permit coverage; notification to municipalities; development of a stormwater pollution prevention plan (SWPPP); record retention; and submittal of a notice of termination. The average total administrative cost per site was estimated to be $937.

Exhibit 4–10. Estimated Other Administrative Phase II Construction Costs Per Site (1998 Dollars)

Administrative Requirement	Cost
NOI	$126.50
Municipal Notification	$17.10
SWPPP	$772.25
Record Retention	$4.51
NOT	$17.10
Estimated Total Cost (per site)	$937.46

Summing the average BMP costs and the administrative costs yields a total compliance cost of $2,143 for sites disturbing between one and two acres of land, $5,535 for sites disturbing between two and four acres of land, and $9,646 for sites disturbing between four and five acres of land. To estimate national level incremental annual costs for Phase II construction starts, EPA multiplied the total costs of compliance for one to two acre, two to four acre, and four to five acre sites by the total number of Phase II construction starts within each of those size categories. This yielded an estimated annual compliance cost of approximately $499.8 million (based on 110,223 construction starts in 1998).

EPA anticipates that 19,452 (15%) of the estimated Phase II incremental construction universe will qualify for a waiver from program requirements by meeting one of two conditions. Construction sites can be waived if they are either located in areas with low rainfall potential or if water quality analyses show that there is no need for regulation. EPA estimates the incremental administrative cost associated with preparing and submitting a waiver to be approximately $665,000 (1998). Total costs (national compliance and waiver costs) resulting from implementation of the Phase II erosion and sediment control provision are estimated to be **$500.4 million**.

Exhibit 4–11. Estimated National Phase II Construction Compliance Costs by Climatic Zones for Year 1998 (1998 Dollars)

Climatic Zone	Representative City	Number of Starts 1–2 Acres	Number of Starts 2–4 Acres	Number of Starts 4–5 Acres	Total Starts	Costs for Starts 1–2 Acres	Costs for Starts 2–4 Acres	Costs for Starts 4–5 Acres	Total Costs
A	Portland, OR	1,683	1,471	659	3,813	$3,608,528	$8,141,052	$6,360,054	$18,356,897
B	Boise, ID	1,508	1,345	576	3,429	$3,232,932	$7,443,548	$5,556,280	$16,455,088
C	Fresno, CA	2,388	2,018	974	5,380	$5,118,068	$11,171,812	$9,400,679	$26,039,422
D	Las Vegas, NV	7,154	6,256	3,035	16,445	$15,335,047	$34,628,344	$29,276,500	$80,306,157
E	Denver, CO	1,787	1,613	636	4,036	$3,829,714	$8,928,128	$6,135,764	$18,893,606
F	Bismarck, ND	560	469	156	1,185	$1,199,916	$2,595,370	$1,508,877	$5,304,163
G	Helena, MT	1,067	921	348	2,336	$2,287,796	$5,098,377	$3,354,650	$10,740,823
H	Amarillo, TX	3,295	2,838	1,152	7,285	$7,063,767	$15,708,383	$11,110,516	$33,882,666
I	San Antonio, TX	1,105	960	414	2,479	$2,368,045	$5,314,569	$3,997,033	$11,679,647
K	Duluth, MN	2,957	1,796	326	5,078	$6,339,106	$9,939,565	$3,141,089	$19,419,760
M	Des Moines, IA	9,335	7,599	2,695	19,629	$20,009,581	$42,063,182	$26,002,165	$88,074,928
N	Nashville, TN	5,801	4,707	1,705	12,212	$12,434,357	$26,052,990	$16,445,128	$54,932,475
P	Atlanta, GA	5,157	2,956	1,127	9,241	$11,054,430	$16,364,835	$10,875,252	$38,294,517
R	Hartford, CT	6,909	5,324	2,116	14,348	$14,808,848	$29,468,120	$20,412,901	$64,689,869
T	Charleston, SC	1,194	675	263	2,132	$2,560,342	$3,736,824	$2,535,496	$8,832,662
V	Hawaii	504	423	218	1,145	$1,080,648	$2,340,928	$2,099,447	$5,521,023
W,X,Y	Alaska	22	20	8	50	$47,885	$112,127	$72,563	$232,575
Total		52,426	41,389	16,408	110,223	$112,379,010	$229,108,154	$158,284,394	$499,771,558

Note: Number of sites include only those where storm water BMPs are not currently required by Federal or State programs. Totals may not add because of rounding.

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Exhibit 4–12. Phase II Erosion and Sediment Control Annual Costs

Construction Costs	Universe	Estimated Total National Annual Costs (1998 dollars)
Compliance Costs	110,223	$499,771,558
Waiver Costs*	19,452	$665,064
Total	129,675	$500,436,622

*Based on an engineering assistant's wage of $34.19 per hour. U.S. Department of Labor, 1996.

EPA also estimated incremental costs attributable to the post-construction runoff control measures. The Phase II municipal program requires municipalities to develop, implement, and enforce a program that addresses stormwater runoff from new development and redevelopment sites on which land disturbance is greater than one acre and that discharge into a regulated MS4. To develop a cost estimate associated with this measure, EPA estimated a per site BMP cost, including operation and maintenance, for 12 model sites of varying size (1, 3, 5, and 7 acres) and imperviousness (35%, 65%, and 85%). The per site BMP cost was then multiplied by the total number of multi-family, institutional, and commercial construction starts that are located in Phase II urbanized areas to obtain a national cost estimate. Using this total of 13,364 postconstruction starts, EPA estimated a range of national costs associated with this measure from $44.6 to $178.3 million (see Appendix B–4). EPA estimates total annual costs to construction operators, including implementation of erosion and sediment controls and post-construction controls, to be between **$545.0 – $678.7 million.**

Exhibit 4–15. Estimated Post-Construction Runoff Control Costs

Area	35% Impervious (Multi-Family Residential)	65% Impervious (Multi-Family/ Commercial/ Institutional)	85% Impervious (Commercial)	Total Cost (1998 dollars)
1 Acre	$503,163	$14,318,035	$25,530,478	$40,351,676
3 Acres	$1,486,961	$29,571,535	$29,588,931	$60,647,426
5 Acres	$2,001,641	$11,835,630	$9,151,038	$22,988,309
7 Acres	$3,863,272	$23,910,571	$26,494,414	$54,268,258
Total Cost	$7,855,037	$79,635,771	$90,764,861	$178,255,669

Summary of results of the total costs of the phase II program are shown below:

Exhibit 4–21. Potential Annual Costs for Phase II Storm Water Regulation

Phase II Element	Universe	Estimated Total National Annual Costs (1998 dollars)
Municipal	32,458,000 Households	$297,318,623
Construction	129,675 Erosion & Sediment Control Starts and 13,364 Post-Construction Starts	$545,000,539 – $678,692,291
Federal and State	53 States and Territories	$5,318,668
Total		$847,637,830 – $981,329,582

Reduced Sediment Delivery From Construction Starts:

To estimate reduced sediment delivery from Phase II construction starts, the US ACE developed a model based on EPA's 27 model sites to estimate sediment loads from construction starts with and without Phase II controls (US ACE, 1998). The US ACE model uses the construction site version of the Revised Universal Soil Loss Equation (RUSLE) to generate sediment delivery estimates for 15 climatic regions with each of the following variations: three site sizes (one, three, and five acres), three soil erodibility levels (low, medium, and high), three slopes (3%, 7%, and 12%), and the BMP combinations from EPA's 27 model sites. The 15 climatic regions represent the various rainfall and temperature conditions throughout the United States. Sediment delivery represents the quantity of sediment that BMPs placed at the base of the hill slope are unable to capture. EPA estimated that the average reduction in soil loss from the model sites implementing BMPs would be 89.6 tons per site. (Calculations in Exhibit 4-24)

To determine the reduction in soil loss using the estimated 80% effectiveness rate, EPA multiplied the weighted average soil loss per start (89.6 tons) by 80%. This resulted in an estimated reduction in soil loss of 71.7 tons per site. Multiplying this reduction by the 110,223 construction starts expected to implement erosion and sediment controls for the year 1998, results in an estimated 7.9 million ton reduction in soil loss annually.

Exhibit 4–25. National Reduction Estimates for Municipalities and Construction Starts (tons/year)

Phase II Element	20% Reduction	80% Reduction
Municipal TSS Loading	639,115	4,062,815
Soil loss from Construction Sites	1,975,196	7,900,785

Summary

EPA has not presented the total cost of prevention of sediments leaving the site per ton of the sediment. ES.11 (in executive summary) describes only the costs effectiveness related to the Municipal TSS loading reduction. It seems that by a simple

calculation from the two former exhibits (4-24 and 4-25) that the total cost assuming 80% reduction in the sediments would be between $69 - $86 per ton of sediment.

STATE OF CALIFORNIA

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LOS ANGELES REGION

ORDER R4-2010-0108
NPDES PERMIT NO. CAS004002
WASTE DISCHARGE REQUIREMENTS
FOR
STORM WATER (WET WEATHER) AND NON-STORM WATER (DRY WEATHER) DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS WITHIN THE VENTURA COUNTY WATERSHED PROTECTION DISTRICT, COUNTY OF VENTURA AND THE INCORPORATED CITIES THEREIN.

July 8, 2010

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STATE OF CALIFORNIA

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LOS ANGELES REGION

ORDER R4-2010-0108
NPDES PERMIT NO. CAS004002
WASTE DISCHARGE REQUIREMENTS
FOR
STORM WATER AND NON-STORM WATER DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEM WITHIN THE VENTURA COUNTY WATERSHED PROTECTION DISTRICT, COUNTY OF VENTURA AND THE INCORPORATED CITIES THEREIN

FINDINGS

The California Regional Water Quality Control Board, Los Angeles Region (hereinafter called Regional Water Board), finds that:

A. Permit Parties and History

1. Ventura County Watershed Protection District (Principal Permittee and Co-permittee), County of Ventura, cities of Camarillo, Fillmore, Moorpark, Ojai, Oxnard, Port Hueneme, San Buenaventura (Ventura), Santa Paula, Simi Valley and Thousand Oaks (hereinafter referred to separately as Permittees) have joined together to form the Ventura Countywide Storm Water Quality Management Program to discharge wastes. The Permittees discharge or contribute to discharges of storm water and non-storm water from municipal separate storm sewer systems (MS4s), also called storm drain systems, into the Watershed Management Areas of Ventura River, Santa Clara River, Calleguas Creek, Malibu Creek and Miscellaneous Ventura Coastal all within Ventura County and Los Angeles County (see Attachment "A").

2. Prior to the issuance of this permit, storm water discharges from the Ventura County MS4 were covered under the countywide waste discharge requirements contained in Order No. 09-0057, adopted by the Regional Water Board on May 7, 2009, which replaced Order No. 00-108, adopted by the Regional Water Board on July 27, 2000, which replaced Order No. 94-082, adopted by the Regional Water Board on August 22, 1994. Order No. 09-0057 also served as a National Pollutant Discharge Elimination System (NPDES) permit for the discharge of municipal storm water.

3. On June 8, 2009, the Building Industry Legal Defense Foundation, Construction Industry Coalition on Water Quality, and the Building Industry Association of Southern California, Inc. (collectively, "BIA") submitted a petition to the State Water Resources Control Board (State Water Board) challenging Order No. 09-0057. On

March 10, 2010, the State Water Board requested that the Regional Water Board agree to a voluntary remand of Order No. 09-0057 in order to address perceived procedural issues in connection with adoption of Order No. 09-0057. The State Water Board also requested that BIA agree to place its petition in abeyance. On March 11, 2010, the Regional Water Board agreed to a voluntary remand, and stated its intention to hold a hearing to reconsider the permit in July 2010. Since BIA did not agree to place its petition in abeyance, BIA's petition was thereafter dismissed by operation of law. On May 5, 2010, the Regional Water Board notified the Permittees, the parties and other interested persons of its intent to reconsider Order No. 09-0057 and has provided them with an opportunity to submit written comments on provisions of the permit that were not previously subject to notice and comment.

4. The Ventura County Board of Supervisors approved the concept of a countywide NPDES permit program and the use of the Flood Management District (presently the Watershed Protection District) benefit assessment authority to finance it on April 14, 1992. On June 30, 1992, the Ventura County Board of Supervisors adopted a benefit assessment levy for storm water and flood management in the unincorporated areas of Ventura County and the cities within the County, to be used in part to finance the implementation of a countywide NPDES municipal storm water permit program. The Ventura County MS4 Permittees have entered into an agreement with the Watershed Protection District to finance the activities related to the Ventura County MS4 Permit for shared and district wide expenses. The Permittees are also given the option to use the Benefit Assessment Program to finance their respective activities related to reducing the discharge of storm water pollutants under the MS4 Permit.

5. The Regional Water Board may require a separate NPDES permit for any entity that discharges storm water into the watersheds of Ventura County. Such an entity can be any State or Federal facility, special district or other public or private party.

B. Nature of Discharge

1. Storm water discharges consist of surface water runoff generated from various land uses in all the hydrologic drainage basins, which discharge into Waters of the State. The quality of these discharges varies and is affected by geology, land use, season, hydrology, and sequence and duration of hydrologic events. Based on the Ventura Countywide Storm Water Monitoring Program's Water Quality Monitoring Reports which were required under Order No. 00-108, the dry weather and wet weather Pollutants of Concern (POC) in urban stormwater include chloride, fecal indicator bacteria, conventional pollutants, metals, nitrogen, organic compounds, and pesticides. The POC are identified in Attachment "B" of this Order. Many of the POC listed are causing impairments identified on the federal Clean Water Act (CWA) § 303(d) list of impaired waterbodies.

The State Water Board submits a report (a list of water quality limited segments (§ 303[d] list)) on the State's water quality to the U.S. EPA pursuant to § 305(b) of the

1972 CWA, and Title 40, CFR 130.7, every 2 years. The Report provides water quality information to the general public and serves as the basis for the U.S. EPA's National Water Quality Inventory Report to Congress. Section 303(d) requires that all waters that are not attaining standards after the implementation of those controls required by 1977, shall be included on the list. Title 40 CFR 130.7(b)(3) defines "water quality standard applicable to such waters" as "those water quality standards established under § 303 of the Clean Water Act, including numeric criteria, narrative criteria, waterbody uses, and antidegradation requirements."

2. Common pollutants in urban storm water and their respective sources include, but are not limited to: bacteria from illegal discharges, illicit connections and animal waste; Polycyclic Aromatic Hydrocarbons (PAHs) from the products of internal combustion engine operation and parking lot sealants; nitrogen compounds from fertilizer application; pesticides from pest mitigating applications and from plant mitigating applications; bis (2-ethylhexyl) phthalate from the break down of plastic products; mercury from atmospheric fallout and improper disposal of mercury switches; lead from fuels, paints and automotive parts; copper from brake pad wear and roofing materials; zinc from tire wear and galvanized sheeting and fencing; sediment from land disturbance and erosion; trash; and dioxins as products of combustion.

3. In general, the pollutants that are found in municipal storm water runoff can harm human health and aquatic ecosystems. In addition, the high volumes and high velocities of storm water discharged from MS4s into receiving waters can adversely impact aquatic ecosystems and stream habitat and cause stream bank erosion and physical modifications; these changes are collectively termed hydromodification. Hydromodification and discharges of runoff and stormwater from urbanized areas remain a leading cause of impairment of surface waters in California and nationwide (U.S. EPA 2009).

4. Ammonia as Nitrogen, and Nitrate plus Nitrite as Nitrogen are biostimulatory substances that can cause or contribute to eutrophic effects such as low dissolved oxygen and algae growth impairing aquatic and wildlife habitats as well as recreational uses. At elevated concentrations, ammonia is highly toxic to fish and other aquatic life.

5. Elevated bacterial indicator densities impair the water contact recreation (REC-1) beneficial use at beaches, creeks, lakes, estuaries, lagoons, and marinas. Swimming in waters with elevated bacterial indicator densities has been associated with adverse health effects. Specifically, local and national epidemiological studies indicate that there is a causal relationship between adverse health effects and recreational water quality, as measured by bacterial indicator densities (Pruss, 1998, Review of epidemiological studies on health effects from exposure to recreational waters, International Journal of Epidemiology; Haile et al., 1996, An epidemiological study of possible adverse health effects of swimming in Santa Monica Bay, Santa Monica Bay Restoration Project; and Haile et al., 1999, The health effects of swimming in

ocean water contaminated by storm drain runoff, Epidemiology). Sources of elevated bacteria to marine and fresh waters may also include illegal discharges from improperly maintained standard septic systems, on-site wastewater treatment systems (OWTS) and illicit discharges from private drains.

6. Pesticides are substances used to prevent, destroy, repel or mitigate pests such as insects, weeds, and microorganisms. Their effects can be direct (e.g. fish die from exposure to a pesticide entering waterways, or birds do not reproduce after ingesting contaminated fish), or indirect (a hawk becomes sick from eating a mouse dying from pesticide poisoning). Pesticide categories include: Organochlorine, Organophosphorus, Organophosphate, and Pyrethroid.

7. Polychlorinated Biphenyls (PCBs) are a subset of the synthetic organic chemicals known as chlorinated hydrocarbons. Concern over PCBs' toxicity, persistence (chemical stability) in the environment and bioconcentration in aquatic organisms has led to prohibitions on PCBs.

8. Rising groundwater and swimming pool water have been found to be sources of pollutants such as salts (chloride). Salts increase the salinity of otherwise freshwater systems and disrupt physiological processes. The Regional Water Board has waterbodies listed on the CWA § 303(d) list for impairment due to salts and has adopted Basin Plan amendments to include Total Maximum Daily Loads (TMDLs) for salts. This Order includes provisions to control the discharges from these activities in order to directly or indirectly reduce or eliminate the discharge of salts to fresh water systems where salts may impair water quality and beneficial uses.

9. Trash and debris are pervasive pollutants which accumulate in streams, rivers, bays, and the ocean throughout Southern California. They pose a serious threat to our oceans and coasts, navigation, biological resources, recreation, human health and safety, aesthetics, and economies.

10. Municipal storm water (wet weather) and non-storm water (dry weather) discharges may contain pollutants that cause or threaten to cause an exceedance of the water quality standards, as outlined in the Los Angeles Region's Basin Plan. Wet weather and dry weather discharges from the MS4 are subject to conditions and requirements established in the Basin Plan for point source discharges. Discharges from the MS4 may not cause or contribute to exceedances of water quality standards.

11. Biological communities act to integrate the effects of water quality conditions in a stream by responding with changes in their population abundances and species composition over time. These populations are sensitive to multiple aspects of water and habitat quality, and provide expressions of ecological health easier to understand than the results of chemical and toxicity tests. Biological assessments and criteria address the cumulative impacts of all stressors, especially habitat degradation, and chemical contamination, which result in a loss of biological diversity. Biological

information can help provide an ecologically based assessment of the status of a waterbody. Bioassessment is a cost-effective tool and protocol for assessing the biological and physical habitat conditions of streams and rivers for evaluation of the overall health of a watershed. The Principal Permittee consents to participate in the Southern California Storm Water Monitoring Coalition (SMC) Southern California Regional Bioassessment Monitoring Program.

12. Studies indicate that facilities with paved surfaces subject to frequent motor vehicular traffic (such as: strip malls, parking lots, commercial business parks, and fast food restaurants), or facilities that perform vehicle repair, maintenance, or fueling (automotive service facilities) are potential sources of POC in storm water (*California Stormwater Quality Association, Stormwater Best Management Practice Handbook, Municipal, January 2003).*

13. Retail Gasoline Outlets (RGOs) are points of convergence for vehicular traffic and are similar to parking lots and urban roads. Studies indicate that storm water discharges from RGOs have high concentrations of hydrocarbons and heavy metals (*California Stormwater Quality Association, Stormwater Best Management Practice Handbook, Municipal, January 2003).*

14. The industries and businesses listed in this Order that are to be inspected by Permittees have the potential to discharge contaminated storm water into the MS4. This storm water is an environmental threat because it can adversely impact public health and safety, and the quality of receiving waters. For example, pretreatment program compliance inspections and audits performed in the Los Angeles and Ventura Counties indicate that automotive service and food service facilities sometimes discharge polluted storm water to the MS4s. The POC in such wash waters include oil and grease, toxic chemicals, and food waste. Spills from clogged sanitary sewer lines have a high likelihood to reach the receiving waters via MS4s. Overall, the most common POC identified in storm water discharge to the MS4s are: (i) heavy metals, (ii) oil and grease/ PAHs, (iii) sediments, (iv) oxygen demanding substances, (v) litter/ trash/ debris, (vi) nutrients, (vii) other toxic materials, such as pesticides. Municipal storm water monitoring data and industrial storm water monitoring data indicate that industrial and commercial sites continue to contribute significant quantities of pollutants in storm water runoff.

15. Development and urbanization increase pollutant loads, volume, and discharge velocity. First, natural vegetated pervious ground cover is converted to impervious surfaces (paved) such as highways, streets, rooftops and parking lots. While natural vegetated soil can both absorb rainwater and remove pollutants providing an effective natural purification process, in contrast, impervious surfaces (such as pavement and concrete) can neither absorb water nor remove pollutants, and thus the natural purification characteristics are lost. Second, urban development creates new pollution sources as the increased density of human population brings proportionately higher levels of vehicle emissions, vehicle maintenance wastes, municipal sewage waste,

pesticides, household hazardous wastes, pet wastes, trash, and other anthropogenic pollutants. Development and urbanization especially threaten environmentally sensitive areas. Such areas have a much lower capacity to withstand pollutant shocks than might be acceptable in the general circumstance. In essence, development that is ordinarily insignificant in its impact on the environment may become significant in a particularly sensitive environment. These environmentally sensitive areas (ESAs) designated by the State in the Ventura County watershed are defined in Part 6 (Definitions).

16. The increased volume, increased velocity, and discharge duration of storm water runoff from developed areas has the potential to accelerate downstream erosion and impair stream habitat in natural drainages. Studies have demonstrated a direct relationship between the degree of imperviousness of an area and waterbody degradation *(Impacts of Impervious Cover on Aquatic Systems, Center for Watershed Protection, March 2003; Management Strategies for Urban Stream Rehabilitation, Booth, D. et al., February 2003).* Significant declines in the biological integrity and physical habitat of streams and other receiving waters have been found to occur with as little as 3-10 percent conversion from natural to impervious surfaces in a subwatershed. Recent studies conducted in California indicate that intermittent and ephemeral streams are even more susceptible to the effects of hydromodification than streams from other regions of the U.S. with stream degradation being recognized when the associated catchment's impervious cover is as little as 3-5% *(Managing Runoff to Protect Natural Streams: The Latest Development on Investigation and Management of Hydromodification in California, Stein, E. and Zaleski, S., December 2005; Effect of Increase in Peak Flows and Imperviousness on the Morphology of Southern California Streams, Coleman, D., April 2005).* The percentage of impervious cover is one indicator and predictor of potential water quality degradation expected from new development.

17. The Order requires projects where it has been demonstrated to be technically infeasible to achieve less than 30% Effective Impervious Area, to mitigate off-site 1.5 times the volume that would normally be required to be retained on site. The increase in off-site mitigation is warranted because it has been concluded that, at impervious land cover over 30%, impacts on streams and wetlands become more severe, and degradation is almost unavoidable without special measures (Prince George's County, MD 1999; BASMAA 1999; Center for Watershed Protection 2003). The off-site mitigation volume requirement may be met through retention and/or biofiltration.

18. Low Impact Development (LID) is an effective approach to minimizing the adverse effects of urbanization and development on waterbodies and their beneficial uses that has been endorsed by California and other states. The California Ocean Protection Council (OPC), in a resolution adopted on May 15, 2008, found that LID is a practicable and superior approach that new and redevelopment projects can implement to minimize and mitigate increases in runoff and runoff pollutants and the resulting impacts on downstream uses, coastal resources and communities. In its

Strategic Plan Update 2008-2012, the State Water Board reiterated sustainability as a key principle, stating its commitment to "enhancing and encouraging sustainability within the administration of Water Board programs and activities by promoting water management strategies such as low impact development..." (SWRCB 2008).

19. LID is a comprehensive source control strategy first pioneered by Prince George's County, Maryland in 1997 to help address the growing economic and environmental limitations of conventional stormwater management practices. As LID was developed by a local government, it is sensitive to addressing local government's unique environmental and regulatory needs in the most economical manner possible by reducing costs associated with stormwater infrastructure design, construction, maintenance and enforcement. LID also provides for local government's need for economic vitality through reasonable and continued growth and redevelopment. LID allows for greater development potential with less environmental impacts through the use of smarter designs and advanced technologies to achieve a better balance between conservation, growth, ecosystem protection and public health / quality of life. (Low Impact Development: Smart Technology For Clean Water Definitions, Issues, Roadblocks, and Next Steps, Coffman, Larry)

20. The implementation of LID techniques across the United States and Canada has demonstrated that the proper implementation of LID techniques results in more benefits than single purpose stormwater and flood control infrastructure, including increased water quality protection, enhanced property values, improved aquatic and terrestrial habitat, aesthetic amenities, and improved quality of life (Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices, USEPA Doc No. EPA 841-F-07-006, December 2007). Further, properly implemented LID techniques can help mimic the pre-project runoff volume and time of concentration, thus minimizing the adverse effects of hydromodification on stream habitat and biological condition (A Review of Low Impact Development Policies: Removing Institutional Barriers to Adoption, Low Impact Development Center and State of California, State Water Resources Control Board, December 2007). The requirements of this Order facilitate the implementation of LID strategies to protect water quality, reduce runoff volume, and to garner additional benefits.

21. The implementation of LID techniques have been associated with the following environmental benefits: improved air quality due to the increased use of trees and vegetation, reduced urban temperatures due to the shade offered by increased vegetation and the reduction of heat absorbing materials (concrete, etc.), the moderation of climate change due to reduced urban temperatures, increased energy efficiency due to lower ambient temperatures when LID practices are implemented on and around buildings, and aesthetic benefits due to the increased use of trees and vegetation (U.S. EPA Technical Guidance on Implementing the Storm Water Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act).

22. Furthermore, the implementation of LID not only benefits water quality, but also enhances water supply. LID is consistent with and supports the Governor's 20 x 2020 Water Conservation Plan (February 2010); the State Board's 2008-2012 Strategic Plan Update (i.e. to promote sustainable local water supplies); the State Board's Recycled Water Policy (Resolution No. 2009-0011) objective to increase [beneficial] use of stormwater; requirements of the Water Conservation in Landscaping Act of 2006 (AB 1881, Laird), which requires cities and counties to adopt landscape water conservation ordinances by January 1, 2010; and the Department of Water Resources' Water Efficient Landscape Ordinance (Cal. Code Regs. §492.15).

23. This Order requires specified New Development and Redevelopment projects to control pollutants, pollutant loads, and runoff volume emanating from impervious surfaces by specifying a 5% Effective Impervious Area (EIA) site limitation and a fixed runoff volume to be retained on site. There is a growing acceptance by stormwater professionals and local governments to integrate LID strategies that limit impervious area, and associated onsite retention criteria, into stormwater management programs and MS4 permits. For example, West Virginia's Small MS4 Permit # WV0116025, requires the on-site retention of the volume of runoff produced from the first inch of a 24-hour storm; the U.S. EPA's Technical Guidance on Implementing the Storm Water Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act, requires the on-site retention of the volume of runoff produced from the 95th percentile storm event where technically feasible; the City of Philadelphia requires the onsite retention of the volume of runoff produced from the first inch of a 24-hour storm; and the City of Portland, Oregon requires the onsite infiltration of the runoff volume from a 10-year, 24-hour design storm.

24. Based on a study conducted by Horner (2007) in Ventura County, it was found that a 5% EIA threshold can be met in typical developments. This result was reached assuming the use of native soils typical to Ventura County; soil enhancements can further increase onsite infiltration potential. Using six different development types, the Horner study tested the feasibility of draining all but 3% of impervious area to pervious land on the sites. Five of the six sites had adequate or greater capacity to infiltrate the full annual runoff volume from the "Not-Connected Impervious Area" (NCIA) and pervious areas where EIA is limited to 3% of the total site area. By showing that it is possible to retain all runoff from pervious areas where EIA is limited to 3% of the total site area under typical site conditions (i.e. native soils) and a wide range of development types, the study results provide support for the feasibility of the 5% EIA threshold.

25. Horner (2007) also found that developments implementing low impact strategies can achieve significant reductions in pollutant loading and runoff volume as well as greatly enhanced recharge rates compared to both developments with no BMPs and developments with traditional treatment BMPs.

26. In some circumstances, however, site conditions and the type of development can limit the feasibility of retaining, infiltrating, and reusing stormwater at sites due to a variety of site specific conditions. Factors that affect the feasibility of a fixed volume capture standard include, but are not limited to: successive storms, soil infiltration capacity, subsurface pollution, and infill in urban core centers (e.g. R. Horner, *Investigation of the Feasibility and Benefits of Low-Impact Site Design Practices ("LID") for Ventura County* (February 2007); E. Strecker, A. Poresky, D. Christsen, *Memorandum: Rainwater Harvesting and Reuse Scenarios and Cost Consideration* (April, 2009)).

27. A major concern expressed by commenters is the 30% EIA limitation may not allow some projects to be built. Part of the rationale supporting the feasibility of on site retention in Order 09-0057 was derived from the Richard Horner (2007) study. The Horner study purports to demonstrate that stormwater infiltration is feasible throughout Ventura County and is the key study for an upper-bound EIA requirement. Horner's approach to demonstrate feasibility is to estimate stormwater runoff volume and compare it to infiltration capacity. While the Horner report has value at a general level and complements findings of other studies in Southern California and elsewhere. Staff has the following concerns with the Horner study conclusions with regard to the universal feasibility of achieving less than 30% EIA:

    - The Horner analysis is based on engineered infiltration basins rather than undisturbed pervious cover.
    - The Horner analysis cites the UCSB infiltration studies which are based on a relatively high permeability soils. However, the EIR cited in the study by Horner shows a significant quantity percentage of the Ventura County soils are described as sandy loamy and are classified as "low permeability and slow draining.
    - The Horner analysis normalizes runoff rates and infiltration capacity to an annual basis which may not address the critical conditions appropriate for the seasonal precipitation patterns in Ventura County.
    - Horner states the study was limited in scope such that its universal applicability throughout Ventura County is not well supported.

    Staff recognizes the significance of the 30% EIA threshold but cannot justify a strict cap.

28. In a letter dated April 10, 2009, the Ventura County Permittees, NRDC and Heal the Bay presented an agreement to the Regional Water Board proposing new development/redevelopment criteria, including on-site retention requirements, a 5% EIA limitation, infeasibility criteria, a 30% EIA cap, and off-site mitigation provisions; the elimination of Municipal Action Levels (MALs); and weekly, year-round beach water quality monitoring at 10 sites. The letter was signed by representatives of the parties, including NRDC, Heal the Bay, Ventura, Oxnard, Simi Valley, and the County of Ventura. At the Regional Board hearing on May 7, 2009,

the Ventura County Permittees, NRDC, and Heal the Bay reiterated their support for the agreement set forth in their joint April 10, 2009 comment letter and advocated that the agreement be incorporated into the permit in its entirety.

29. Specific LID strategies include bioretention and rainwater harvesting for reuse. Bioretention is a method of treating stormwater by pooling water on the surface and allowing filtering and settling of suspended solids and sediment at the mulch layer, prior to entering the plant/soil/microbe complex media for infiltration and pollutant removal. Rain Gardens / bioretention techniques are used to accomplish water quality improvement and water quantity reduction. Prince George's County, Maryland, and Alexandria, Virginia have used this BMP since 1992 with success in many urban and suburban settings. Rain Gardens can be integrated into a site with a high degree of flexibility and can balance nicely with other structural management systems, including porous asphalt parking lots, infiltration trenches, as well as non-structural stormwater BMPs. The Rain Garden vegetation serves to filter (water quality) and transpire (water quantity) runoff, and the root systems can enhance infiltration. The plants take up pollutants; the soil medium filters out pollutants and allows storage and infiltration of stormwater runoff; and the infiltration bed provides additional volume control ("Rain Gardens", River-Friendly Landscaping Coalition, Sacramento, CA). Properly designed bioretention techniques mimic natural forest ecosystems through species diversity, density and distribution of vegetation, and the use of native species, resulting in a system that is resistant to insects, disease, pollution, and climatic stresses (Draft - Pennsylvania Stormwater Management Manual).

    As an alternative to redirection of stormwater to functional landscape, rain gutter flows can be directed into rain barrels or cisterns for later use in irrigating lawns and gardens. Disconnections of rain gutters can effectively be implemented on existing properties with little change to present site designs. The benefits of urban area rainwater harvesting can be huge, providing supplemental water for many local uses. Such as irrigating a vegetable garden and surrounding landscape, which also leaves more treated water in the municipal water supply to help cities through times of drought or other shortages. A number of cities in the Los Angeles Region, including Los Angeles, Long Beach and Santa Monica, have implemented successful rainwater harvesting incentive programs.

30. Traditional approaches to stormwater management involve conveying runoff off-site to receiving waters, to a combined sewer system, or to a regional facility that treats runoff from multiple sites. These designs typically include hard infrastructure, such as curbs, gutters, and piping. LID-based designs, in contrast, are designed to use natural drainage features or engineered swales and vegetated contours for runoff conveyance and treatment. In terms of costs, LID techniques like conservation design can reduce the amount of materials needed for paving roads and driveways and for installing curbs and gutters. Conservation designs can be used to reduce the total amount of impervious surface, which results in reduced road and driveway lengths and reduced costs. Other LID techniques, such as grassed swales, can be used to infiltrate roadway

runoff and eliminate or reduce the need for curbs and gutters, thereby reducing infrastructure costs. Also, by infiltrating or evaporating runoff, LID techniques can reduce the size and cost of flood-control structures (Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices, U.S. EPA).

The U.S. EPA looked at 17 case studies throughout the country to determine if LID strategies were a cost effective alternative to conventional storm water control measures. They found that the use of LID practices can be both fiscally and environmentally beneficial to communities. They found total capital cost savings ranging from 15% to 80% when LID strategies were used compared with traditional stormwater control measures, with only a few cases noted where LID projects resulted in higher costs than traditional storm water controls. In the majority of the cases, costs for projects implementing LID strategies were found to be less due to reduced costs for site grading and preparation, stormwater infrastructure, site paving, and landscaping (Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices, U.S. EPA).

31. The use of LID strategies also has the potential to create larger economic benefits, including but not limited to, reduced need for flood control, which could save up to $400 million; increased property values, which could amount to up to $5 billion; and creation of additional groundwater supplies worth up to $7.2 billion (Devinny et al. 2004; MacMullan, E., Assessing Low Impact Developments Using a Benefit-Cost Approach, 2nd National Low Impact Development Conference, March 12-14, 2007).

32. The Regional Water Board adopted a Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands (Order No. R4-2005-0080) on November 3, 2005. The objective of the program is to monitor runoff from irrigated agriculture facilities in the coastal watersheds of Ventura and Los Angeles Counties. The Basin Plan, which designates beneficial uses and establishes water quality objectives for the Region, recognizes that agricultural activities can generate pollutants such as sediment, pesticides, and nutrients that upon discharge to receiving water can degrade water quality and impair beneficial uses. A category identified by the Conditional Waiver as a source of pollutants is nursery operations. This Order includes requirements for the municipal operator to confirm that nursery operators implement pollutant reduction and control measures with the objective of reducing pollutants in storm water runoff discharges.

33. Research conducted on the contribution of aerial deposition of trace heavy metals in Los Angeles County watersheds indicates that dry indirect deposition may account for a significant load of pollutants into surface waters. Similar patterns of aerial deposition likely occur in Ventura County. Of the atmospherically deposited pollutants on the watersheds, ten to twenty percent may account for the total load for copper, zinc, nickel, lead, and chromium to the waterbodies. Land reservoirs and sequestration may account for the remaining eighty to ninety percent of the atmospherically deposited pollutants on the watersheds. Emissions of semi-volatile

organics such as polycyclic aromatic hydrocarbons (PAHs) and pesticides and their subsequent deposition may contribute to the contamination of receiving waters but appear to be less significant. The remaining percentage is stored in land reservoirs and eventually shows up in receiving waters.

C. Permit Background

1. The essential components of the Storm Water Management Program, as required by the Code of Federal Regulations (CFR) [40 CFR 122.26(d)] are:
   (a) Adequate Legal Authority.
   (b) Fiscal Resources.
   (c) Storm Water Quality Management Program (SMP)
      (1) Public Information and Participation Program
      (2) Industrial/ Commercial Facilities Program
      (3) Planning and Land Development Program
      (4) Development Construction Program
      (5) Public Agency Activities Program
      (6) Illicit Connection and Illicit Discharges Elimination Program
   (d) Reporting Program (Monitoring Report and Program Report)

2. The Ventura County SMP, dated November 2001 (revision 2) identifies seven program areas, which are listed below and were previously approved under Board Order No. 00-108. For purposes of consistency, they are titled as follows:
   (a) Ventura County SMP.
      (1) Program Management
      (2) Programs for Residents
      (3) Programs for Industrial/ Commercial Businesses
      (4) Programs for Planning and Land Development
      (5) Programs for Construction Sites
      (6) Programs for Public Agency Activities
      (7) Programs for Illicit Connections/ Illegal Discharges
   (b) For purposes of region-wide consistency, the program titles are revised and consolidated into the six areas listed in the preceding C.1(c). All Permittee storm water documents submitted to the Regional Water Board are to follow the organization enumerated in C.1(c).

3. The Permittees filed a Report of Waste Discharge (ROWD), dated January 26, 2005. The Permittees applied for renewal of their waste discharge requirements for a 5-year period, which serves as an NPDES permit to discharge wastes to surface waters.

4. The Regional Water Board reviewed the ROWD and determined it to be partially complete under the reapplication policy for MS4s issued by the United States Environmental Protection Agency (U.S. EPA) (61 Fed. Reg. 41697). The Regional Water Board has prepared this Order so that implementation of provisions contained

in this Order by Permittees will meet the requirements of the federal NPDES regulations at 40 CFR 122.26.

5. The Permittees ROWD contained a proposed Storm Water Management Program and a Monitoring Program to be considered by the Regional Water Board for incorporation into an MS4 NPDES Permit as permit conditions and to demonstrate compliance with federal law.

6. To-date, the monitoring program has consisted of mass emission, receiving water (tributaries), and land-use monitoring stations, toxicity testing, special studies for bioassessment of the Ventura River and hydrology, identification of ESAs, implementation of the Storm Water Quality Urban Impact Mitigation Plan (SQUIMP), and has provided support for volunteer monitoring programs. This Order requires a monitoring program consisting of mass emission, toxicity, TMDL storm water (wet weather) MS4 water quality-based effluent limits, TMDL non-storm water (dry weather) MS4 water quality-based effluent limits, Pyrethroid assessment study, continuation of the hydromodification study, low impact development study, and participation in the Southern California Regional Bioassessment Program and Southern California Bight Project (SCBP).

7. The Principal Permittee is a member of the Southern California Coastal Water Research Project (SCCWRP) Commission. The Principal Permittee also participates in the Regional Monitoring Programs and research partnerships, such as the Southern California Storm Water Monitoring Coalition (SMC) and the Bioassessment Working Group.

D. Permit Coverage

1. The area covered by this Order includes all areas within Ventura County boundaries and all areas within each co-permittee's boundaries (see Figure 1) that drain into the MS4.

2. The Permittees covered under this Order were designated on a system-wide basis under Phase I of the CWA § 402(p)(3)(B)(i). The action of covering all Ventura County municipalities under a single MS4 permit on a system-wide basis was consistent with the provisions of 40 CFR 122.26(a)(3)(iv), which states that one permit application may be submitted for all or a portion of all municipal separate storm sewers within adjacent or interconnected large or medium municipal separate storm sewer systems; and the Regional Water Board may issue one system-wide permit covering all, or a portion of all municipal separate storm sewers in adjacent or interconnected large or medium municipal separate storm sewer systems.

3. Federal, State, Regional, or local entities within the Permittees' boundaries or in jurisdictions outside the Ventura County Watershed Protection District, and not currently named in this Order, may operate storm drain facilities and/ or discharge

storm water to storm drains and receiving waters covered by this Order. The Permittees may lack legal jurisdiction over these entities under State and Federal constitutions. The Regional Water Board will coordinate with these entities to implement programs that are consistent with the requirements of this Order. The Regional Water Board may consider such facilities for coverage under its NPDES permitting scheme pursuant to USEPA Phase II storm water regulations. Permittees have expressed their intention to work cooperatively to control the contribution of pollutants from one portion of the MS4 to another portion of the system. Permittees shall make good faith efforts to control the contribution of pollutants to the MS4 from non-permittee dischargers such as Caltrans, the U.S. Department of Defense, and other state and federal facilities.

4. TMDLs are numerical calculations of the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards, and an allocation of that amount to the pollutant's sources. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point sources (Waste Load Allocation (WLA)) and non-point sources (Load Allocation (LA)). Discharges from the MS4s are considered point sources discharges, because the MS4 is a point source.

5. This Order incorporates applicable WLAs that have been adopted by the Regional Water Board and have been approved by the Office of Administrative Law and the U.S. EPA. The TMDL WLAs in the Order are expressed as water quality-based effluent limits in a manner consistent with the assumptions and requirements of the TMDL from which they are derived.

6. The CWA and the California Water Code contain specific provisions on how wastewater discharges from point sources are to be permitted. Stormwater discharges (both dry weather and wet weather) are considered point source discharges.

7. Permittees should work cooperatively to control the contribution of pollutants from one portion of the MS4 to another portion of the system through inter-agency agreements or other formal arrangements.

E. Federal, State and Regional Regulations

1. The Water Quality Act of 1987 added § 402(p) to the CWA (33U.S.C. § 1251-1387). This section requires the U.S. EPA to establish regulations setting forth NPDES requirements for storm water discharges in 2 phases.
   (a) U.S. EPA Phase I storm water regulations were directed at MS4s serving a population of 100,000 or more, including interconnected systems and storm water discharges associated with industrial activities, including construction activities. The Phase 1 Final Rule was published on November 16, 1990 (55 Fed. Reg. 47990).
   (b) U.S. EPA Phase II storm water regulations are directed at storm water discharges not covered in Phase I, including small MS4s (population of less than 100,000),

small construction projects (less than 5 acres), municipal facilities with delayed coverage under the Intermodal Surface Transportation Efficiency Act of 1991, and other discharges for which the U.S. EPA Administrator or the State determines that the storm water discharge contributes to a violation of a water quality standard, or is a significant contributor of pollutants to waters of the U.S. The Phase II Final Rule was published on December 8, 1999 (64 Fed. Reg. 68722).

2. The U.S. EPA published an Interpretative Policy Memorandum on Reapplication Requirements for MS4 permits on August 9, 1996 (61 Fed. Reg. 41697). This policy requires that MS4 reapplication for reissuance for a subsequent five-year permit term contain certain basic information and information for proposed changes and improvements to the storm water management program and monitoring program.

3. The U.S. EPA has entered into a Memorandum of Agreement (MOA) with the U.S. Fish and Wildlife Service, and the National Marine Fisheries Service for enhancing coordination regarding the protection of endangered and threatened species under section 7 of the Endangered Species Act, and the CWA's water quality standards and NPDES programs. Among other actions, the MOA establishes a framework for coordination of actions by the U.S. EPA, the Services, and CWA delegated States on CWA permit issuance under § 402 of the CWA [66 Fed. Reg. 11202-11217].

4. The CWA allows the U.S. EPA to authorize states with an approved environmental regulatory program to administer the NPDES program in lieu of the U.S. EPA. The State of California is a delegated State. The Porter-Cologne Water Quality Control Act (California Water Code) authorizes the State Water Resources Control Board (State Water Board), through the Regional Water Boards, to regulate and control the discharge of wastes that could affect the quality of waters of the State, including waters of the United States, and tributaries thereto.

5. Under CWA § 303(d) of the CWA, States are required to identify a list of impaired water-bodies and develop and implement TMDLs for these waterbodies (33 USC § 1313 (d)(1)). The most recent 303(d) list's U.S. EPA approval date was June 28, 2007. The U.S. EPA entered into a consent decree with the Natural Resources Defense Council (NRDC), Heal the Bay, and the Santa Monica Baykeeper on March 22, 1999, under which all TMDLs for the Los Angeles Region must be adopted within 13 years from that date. This Order incorporates provisions incorporating approved WLAs for municipal storm water discharges and requires amending the SMP after subsequent pollutant loads have been allocated and approved.

6. Collectively, the restrictions contained in the TMDL Provisions for Storm Water (Wet Weather) Discharges and Non-Storm Water (Dry Weather) Discharges of this Order on individual pollutants are no more stringent than required to implement the provisions of the TMDL, which have been adopted and approved in a manner that is consistent with the CWA. Where a TMDL has been approved, NPDES permits must

contain effluent limits and conditions consistent with the assumptions and requirements of the available WLAs in TMDLs (40 CFR 122.44(d)(1)(vii)(B)).

7. This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following. This Order implements federally mandated requirements under CWA § 402, subdivision (p)(3)(B)(33 U.S.C. § 1342(p)(3)(B)) This includes federal requirements to effectively prohibit non-storm water discharges, to reduce the discharge of pollutants to the maximum extent practicable, and to include such other provisions as the Administrator or the State determines appropriate for the control of such pollutants. Federal cases have held these provisions require the development of permits and permit provisions on a case-by-case basis to satisfy federal requirements. (Natural Resources Defense Council, Inc. v. U.S. E.P.A. (9th Cir. 1992) 966 F.2d 1292, 1308, fn. 17.) The authority exercised under this Order is not reserved state authority under the Clean Water Act's savings clause (cf. Burbank v. State Water Resources Control Bd. (2005) 35 Cal.4th 613, 627-628 [relying on 33 U.S.C. § 1370, which allows a state to develop requirements which are not "less stringent" than federal requirements]), but instead, is part of a federal mandate to develop pollutant reduction requirements for municipal separate storm sewer systems. To this extent, it is entirely federal authority that forms the legal basis to establish the permit provisions. (See, City of Rancho Cucamonga v. Regional Water Quality Control Bd.-Santa Ana Region (2006) 135 Cal.App.4th 1377, 1389; Building Industry Ass'n of San Diego County v. State Water Resources Control Bd. (2004) 124 Cal.App.4th 866, 882-883.)

   Likewise, the provisions of this Order to implement TMDLs are federal mandates. The CWA requires TMDLs to be developed for waterbodies that do not meet federal water quality standards (33 U.S.C. § 1313(d)). Once the U.S. EPA or a state develops a TMDL, federal law requires that permits must contain effluent limitations consistent with the assumptions of any applicable wasteload allocation. (40 CFR 122.44(d)(1)(vii)(B)).

   Second, the local agency Permittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental dischargers who are issued NPDES permits for storm water discharges. With a few inapplicable exceptions, the Clean Water Act regulates the discharge of pollutants from point sources (33 U.S.C. § 1342) and the Porter-Cologne regulates the discharge of waste (Wat. Code, § 13263), both without regard to the source of the pollutant or waste. As a result, the "costs incurred by local agencies" to protect water quality reflect an overarching regulatory scheme that places similar requirements on governmental and nongovernmental dischargers. (See *County of Los Angeles v. State of California* (1987) 43 Cal.3d 46, 57-58 [finding comprehensive workers compensation scheme did not create a cost for local agencies that was subject to state subvention].)

The Clean Water Act and the Porter-Cologne Water Quality Control Act largely regulate storm water with an even hand, but to the extent there is any relaxation of this even-handed regulation, it is in favor of the local agencies. Generally, the Clean Water Act requires point source dischargers, including discharges of storm water associated with industrial or construction activity, to comply strictly with water quality standards. (33 U.S.C. § 1311(b)(1)(C), *Defenders of Wildlife v. Browner* (1999) 191 F.3d 1159, 1164-1165 [noting that industrial storm water discharges must strictly comply with water quality standards].) As discussed in prior State Water Resources Control Board decisions, certain provisions of this Order do not require strict compliance with water quality standards. (SWRCB Order No. WQ 2001-15, p. 7.) Therefore, certain provisions of this Order regulate the discharge of waste in municipal storm water more leniently than the discharge of waste from non-governmental sources.

Third, the local agency Permittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order subject to certain voting requirements contained in the California Constitution. (See California Constitution XIII D, section 6, subdivision (c); see also *Howard Jarvis Taxpayers Association v. City of Salinas* (2002) 98 Cal. App. 4th 1351, 1358-1359.). The fact sheet demonstrates that numerous activities contribute to the pollutant loading in the municipal separate storm sewer system. Local agencies can levy service charges, fees, or assessments on these activities, independent of real property ownership. (See, e.g., *Apartment Ass'n of Los Angeles County, Inc. v. City of Los Angeles* (2001) 24 Cal.4th 830, 842 [upholding inspection fees associated with renting property].) The ability of a local agency to defray the cost of a program without raising taxes indicates that a program does not entail a cost subject to subvention. (*County of Fresno v. State of California* (1991) 53 Cal.3d 482, 487-488.)

Fourth, the Permittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in federal Clean Water Act section 301, subdivision (a) (33 U.S.C. § 1311(a)) and in lieu of numeric restrictions on their discharges. (See finding C.5., supra.) To the extent that the local agencies have voluntarily availed themselves of the permit, the program is not a state mandate. (Accord *County of San Diego v. State of California* (1997) 15 Cal.4th 68, 107-108.) Likewise, where MS4 Permittees are regulated under a Best Management Practices (BMP) based storm water management program rather than end-of-pipe numeric limits, there exists no compulsion of a specific regulatory scheme that would violate the 10th Amendment to the United States Constitution. (See *City of Abilene v. U.S. E.P.A.* (5th Cir. 2003) 325 F.3d 657, 662-663 [noting that municipalities can choose between a management permit or a permit with numeric limits].) The local agencies' voluntary decision to file a report of waste discharge proposing a program-based permit is a voluntary decision not subject to subvention. (See *Environmental Defense Center v. USEPA* (9th Cir. 2003) 344 F.3d 832, 845-848.)

Fifth, the local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under state law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

8. Under § 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA), Coastal States with approved coastal zone management programs are required to address non-point pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point pollution: 1) agriculture; 2) silviculture; 3) urban; 4) marinas; and 5) hydromodification. This Waste Discharge Requirement addresses the management measures required for the urban category and the hydromodification category, with the exception of septic systems.

9. The Regional Water Board addresses septic systems through the administration of non-Chapter 15 regulatory programs and the implementation of Regional Water Board Order No.R4-2004-0146. Septic systems are also addressed under State Assembly Bill (AB) 885 (2000). The Regional Water Board will implement and enforce regulations issued by the State Board pursuant to AB 885. Taken together, these State and Local agency requirements when imposed on septic system operators are expected to reduce the bacterial contamination of storm water from improperly maintained septic systems.

10. The State Water Board has issued waste discharge requirements for discharges from utility vaults (CAG990002). The Regional Water Board has issued waste discharge requirements for discharges from well heads and hydrostatic pipe testing (CAG674001). These discharges to the MS4 shall be conducted under coverage of a separate NPDES permit specific to that activity.

11. On May 18, 2000, the U.S. EPA established numeric criteria for priority toxic pollutants for the State of California (California Toxics Rule (CTR) 65 Fed. Reg. 31682 (40 CFR 131.38)) for the protection of human health and aquatic life. These apply as ambient water quality criteria for inland surface waters, enclosed bays and estuaries.

12. The State Water Board adopted a revised Water Quality Control Plan for Ocean Waters of California (Ocean Plan) in 2005. The California Ocean Plan establishes water quality objectives for California's ocean waters and provides the basis for regulation of wastes discharged into the State's coastal waters. It applies to point and nonpoint source discharges. The Ocean Plan identifies the applicable beneficial uses of marine waters that include preservation and enhancement of designated Areas of Special Biological Significance (ASBS) (now called "State Water Quality Protection Areas") and establishes a set of narrative and numerical water quality objectives designed to protect beneficial uses. The SWRCB adopted the California Ocean Plan, and both the SWRCB and the six coastal Regional Water Quality Control Boards (RWQCBs) implement and interpret the California Ocean Plan.

13. This Regional Water Board adopted a revised Water Quality Control Plan (Basin Plan) for the Los Angeles Region on June 13, 1994. The Basin Plan specifies the beneficial uses of Ventura County waterbodies and their tributary streams, and contains both narrative and numerical water quality objectives for these receiving waters. The following beneficial uses identified in the Basin Plan apply to all or portions of each watershed covered by this Order:
    (a) Municipal and domestic supply
    (b) Agricultural supply
    (c) Industrial service supply
    (d) Industrial process supply
    (e) Ground water recharge
    (f) Freshwater replenishment
    (g) Navigation
    (h) Hydropower generation
    (i) Water contact recreation
    (j) Non-contact water recreation
    (k) Ocean commercial and sport fishing
    (l) Warm freshwater habitat
    (m) Cold freshwater habitat
    (n) Preservation of Areas of Special Biological Significance
    (o) Saline water habitat
    (p) Wildlife habitat
    (q) Preservation of rare and endangered species
    (r) Marine habitat
    (s) Fish migration
    (t) Fish spawning
    (u) Shellfish harvesting

14. On March 22, 1999 the Consent Decree in Heal the Bay, Inc.; Santa Monica Baykeeper, Inc. v. Browner, Case No. 98-4825 SBA was approved. Under Establishment of TMDLs- The parties understand that California has the initial opportunity pursuant to § 303(d) of the CWA to adopt and submit to U.S. EPA for approval TMDLs to be established under this Consent Decree. TMDLs developed by Regional Water Boards are generally adopted through Basin Plan amendments. Basin plan amendments adopted by the State Board pursuant to Water Code section 13246, and the regulatory portions must be approved by the Office of Administrative Law pursuant to Government Code section 11353(b). TMDLs established pursuant to CWA section 303(d)(1) must be submitted to U.S. EPA for approval pursuant to section 303(d)(2), and incorporated into the state's water quality management plan.

15. The Regional Water Board has adopted amendments to the Basin Plan, to incorporate TMDLs for the following:
    (a) The following TMDLs have been or will be incorporated into the Basin Plan within the term of the Order.

(1) Santa Clara River - Nitrogen Compounds
   (A) Regional Water Board Resolution No. 2003-011
   (B) State Water Board Resolution No. 2003-0073
   (C) OAL file No. 04-0123-35
   (D) U.S. EPA approval date March 18, 2004
   (E) Final fee exemption date March 23, 2004 (effective date).
   (F) Compliance is 1 year after effective date (March 23, 2005)

(2) Malibu Creek and Lagoon - Bacteria.
   (A) Regional Water Board Resolution No. 2004-019
   (B) State Water Board Resolution No. 2005-0072
   (C) OAL file No. 05-1018-03 S
   (D) U.S. EPA approval date January 10, 2006
   (E) Final fee exemption date January 24, 2006 (effective date)
   (F) Compliance for Summer Dry is 3 years after effective date (January 24, 2009)
   (G) Compliance for Winter Dry is 6 years after effective date (January 24, 2012)
   (H) Compliance for Wet Weather is 10 years after effective date (January 24, 2016), which is beyond the term of this Order

(3) Toxicity, Chlorpyrifos and Diazinon in the Calleguas Creek, Its Tributaries and Mugu Lagoon.
   (A) Regional Water Board Resolution No. 2005-009
   (B) State Water Board Resolution No. 2005-0067
   (C) OAL file No. 05-1110-02 S
   (D) U.S. EPA approval date March 14, 2006
   (E) Final fee exemption date March 24, 2006 (effective date)
   (F) Compliance for Toxicity and Interim WLA is effective date (March 24, 2006)
   (G) Compliance for Final WLA is 2 years after effective date (March 24, 2008)

(4) Organochlorine (OC) Pesticides, Polychlorinated Biphenyls (PCBs), and Siltation in Calleguas Creek, Its Tributaries and Mugu Lagoon.
   (A) Regional Water Board Resolution No. 2005-010
   (B) State Water Board Resolution No. 2005-0068
   (C) OAL file No. 05-1206-03 S
   (D) U.S. EPA approval date March 14, 2006
   (E) Final fee exemption date March 24, 2006 (effective date)
   (F) Compliance for Interim WLA is effective date (March 24, 2006)
   (G) Compliance for Final WLA is 20 years after effective date (March 24, 2026), which is beyond the term of this Order

(5) Calleguas Creek Watershed Metals

(A) Regional Water Board Resolution No. 2006-012
(B) State Water Board Resolution No. 2006-0078
(C) OAL file No. 06-1222-015 S
(D) U.S. EPA approval date March 26, 2007
(E) Final fee exemption date March 27, 2007 (effective date)
(F) Compliance for Interim WLA is effective date (March 27, 2007)
(G) Compliance for Final WLA is Within 15 years after the effective date (March 27, 2022), which is beyond the term of this Order

(6) Revolon Slough & Beardsley Wash Trash TMDL
(A) Regional Water Board Resolution No. 2007-007
(B) State Water Board Resolution No 2007-0076
(C) OAL file No 2007-1227-05 S
(D) U.S. EPA approval date February 27, 2008
(E) Final fee exemption date March 6, 2008 (effective date)
(F) Compliance for Trash Monitoring & Reporting Plan Submittal is 6 months from effective date (September 6, 2008)
(G) Compliance for Final WLA is 8 years from effective date (March 6, 2016)

(7) Ventura River Estuary Trash TMDL
(A) Regional Water Board Resolution No. 2007-008
(B) State Water Board Resolution No 2007-0072
(C) OAL file No 2007-1227-01 S
(D) U.S. EPA approval date February 27, 2008
(E) Final fee exemption date March 6, 2008 (effective date)
(F) Compliance for Trash Monitoring & Reporting Plan Submittal is 6 months from effective date (September 6, 2008)
(G) Compliance for Final WLA is 8 years from effective date (March 6, 2016)

(8) Harbor Beaches of Ventura County Bacteria TMDL
(A) Regional Water Board Resolution No. 2007-017
(B) State Water Board Resolution No 2008-0072
(C) OAL file No 2007-1023-01 S
(D) U.S. EPA approval date December 18, 2008
(E) Final fee exemption date January 17, 2009 (effective date)

16. The Regional Water Board adopted and approved requirements for new development and significant redevelopment projects in Ventura County to control the discharge of storm water pollutants in post-construction storm water, on January 26, 2000, in Board Resolution No. R-00-02. The Regional Water Board Executive Officer issued the approved Standard Urban Storm Water Mitigation Plans (SUSMPs) on March 8, 2000 for Los Angles County and the Cities in Los Angeles County. Since 2000, new development and redevelopment water quality criteria have been implemented by the Permittees to be consistent with SUSMP. The State Board affirmed the Regional

Water Board action and SUSMPs in State Board Order No. WQ 2000-11, issued on October 5, 2000.

(a) A statewide policy memorandum (dated December 26, 2000), which interprets the Order to provide broad discretion to Regional Water Boards and identifies potential future areas for inclusion in SUSMPs and the types of evidence and findings necessary. Such areas include ministerial projects, projects in environmentally sensitive areas, and water quality design criteria for Retail Gasoline Outlets (RGOs, see Part 6 for definition). The Regional Water Board properly justified the extensions of SUSMPs and water quality criteria to ministerial projects, projects in environmentally sensitive areas, and RGOs, during the adoption of Regional Water Board Order 01-182. The Regional Water Board's action was upheld by the County of Los Angeles Superior Court (In Re: *County of Los Angeles v. State Water Resources Control Board* (2006) 143 Cal.App.4th 985).

(b) The State Water Board's Chief Counsel interpreted the Order to encourage regional solutions and endorsed a mitigation fund or "bank" as alternatives for new development and significant redevelopment. The Regional Water Board has included provisions for regional solutions and the establishment of a mitigation bank in this Order.

17. The Regional Water Board supports Watershed Management planning to address water quality protection in the region. The objective of the Watershed Management planning is to provide a comprehensive and integrated strategy towards water resource protection, enhancement, and restoration while balancing economic and environmental impacts within a hydrologically defined drainage basin or watershed. It emphasizes cooperative relationships between regulatory agencies, the regulated community, environmental groups, and other stakeholders in the watershed to achieve the greatest environmental improvements with available resources.

18. To facilitate compliance with federal regulations, the State Water Board has issued the following 4 Statewide General NPDES Permits associated with storm water:

(a) Industrial General Permit (IASGP- Industrial Activities Storm Water General Permit), NPDES No. CAS000001, issued on November 19, 1991, reissued on September 17, 1992 and April 17, 1997, currently under review for reissuance.

(b) Construction General Permit (CASGP- Construction Activities Storm Water General Permit), NPDES No. CAS000002, issued on August 20, 1992, reissued August 19, 1999, and September 2, 2009.

(c) Small Linear Underground/ Overhead Construction Projects General Permit (small LUPs), NPDES No. CAS000005, issued on June 18, 2003.

(d) Small MS4 Permit WQ Order No. 2003-0005-DWQ, NPDES No. CAS000004, adopted on April 30, 2003.

19. Facilities discharging storm water associated with industrial activities, construction projects that disturb one or more acres of soil, or construction projects that disturb less than one acre but are part of a larger common plan of development or sale that in

total disturbs 1 or more acres, and construction activities associated with small linear underground/ overhead projects that result in land disturbances greater than one acre, but less than five acres (small LUPs), are all required to obtain individual NPDES permits for storm water discharges, or be covered by the statewide General Permits by completing and filing a Notice of Intent (NOI) with the State Board. The U.S. EPA guidance anticipates coordination of the state-administered programs for industrial and construction activities with the local agency program to reduce pollutants in storm water discharges to the MS4.

20. State Water Board Resolution No. 68-16 contains the state Antidegradation Policy, titled "Statement of Policy with Respect to Maintaining High Quality Waters in California" (Resolution 68-16), which applies to all waters of the state, including ground waters of the state, whose quality meets or exceeds (is better than) water quality objectives. Resolution No. 68-16 is considered to incorporate the federal Antidegradation Policy (40 CFR 131.12) where the federal policy applies, (State Water Board Order WQO 86-17). Administrative policies that implement both, federal and state antidegradation policies acknowledge that an activity that results in a minor water quality lowering, even if incrementally small, can result in violation of Antidegradation Policies through cumulative effects, for example, when the waste is a cumulative, persistent, or bioaccumulative pollutant.

(a) Federal Antidegradation Policy (40 CFR 131.12) states that the State shall develop and adopt a statewide antidegradation policy and identify the methods for implementing such policy pursuant to this subpart. The antidegradation policy and implementation methods shall, at a minimum, be consistent with the following:

(1) Existing instream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected.

(2) Where the quality of the waters exceed levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water, that quality shall be maintained and protected unless the State finds, after full satisfaction of the intergovernmental coordination and public participation provisions of the State's continuing planning process, that allowing lower water quality is necessary to accommodate important economic or social development in the area in which the waters are located. In allowing such degradation or lower water quality, the State shall assure water quality adequate to protect existing uses fully. Further, the State shall assure that there shall be achieved the highest statutory and regulatory requirements for all new and existing point sources and all cost-effective and reasonable best management practices for nonpoint source control.

(3) Where high quality waters constitute an outstanding National resource, such as waters of National and State parks and wildlife refuges and waters of exceptional recreational or ecological significance, that water quality shall be maintained and protected.

(4) In those cases where potential water quality impairment associated with a thermal discharge is involved, the antidegradation policy and implementing method shall be consistent with section 316 of the Act.

(b) State Water Board Resolution No. 68-16 establishes essentially a 2-step process for compliance with the policy.

(1) Step 1- if a discharge will degrade high quality water, the discharge may be allowed if any change in water quality:

(A) Will be consistent with maximum benefit to the people of the State.

(B) Will not unreasonably affect present and anticipated beneficial use of such water.

(C) Will not result in water quality less than that prescribed in state policies (e.g., water quality objectives in Water Quality Control Plans).

(2) Step 2- any activities that result in discharges to high quality waters are required to:

(A) Meet waste discharge requirements that will result in the best practicable treatment or control of the discharge necessary to avoid a pollution or nuisance.

(B) Maintain the highest water quality consistent with the maximum benefit to the people of the State.

21. The State Water Board on June 17, 1999, adopted Order No. WQ 99-05, which specifies standard receiving water limitation language to be included in all municipal storm water permits issued by the State and Regional Water Boards.

22. Cal. Water Code § 13263(a) requires that waste discharge requirements issued by Water Boards shall implement any relevant water quality control plans that have been adopted; shall take into consideration the beneficial uses to be protected and the water quality objectives reasonably required for that purpose; other waste discharges; and the need to prevent nuisance.

23. Clean Water Act section 402(p)(3)(B)(iii) requires municipal separate storm sewer system (MS4) operators to reduce the discharge of pollutants to the "maximum extent practicable" (MEP). The MEP requirement is analogous to a technology-based requirement in that it focuses upon the feasibility of pollutant reduction measures rather than achievement of water quality standards in the receiving waters to achieve improvements in the quality of the storm water that is discharged. Compliance with the MEP requirement can range from implementation of structural and nonstructural best management practices to installation of end-of-pipe treatment systems. MEP generally provides the MS4 operators the flexibility to determine what controls should be implemented through the development of a storm water management plan, subject to the Regional Water Board's approval. Nevertheless, MEP does not define the limits of pollution control measures that may be required of MS4 operators, and the requirement to implement controls that reduce pollutants to the MEP is not limited by the goal of attaining water quality standards. In some circumstances, compliance with MEP may result in controls more stringent than applicable WQS,

and in others, less stringent. The Regional Water Board may use its discretion to impose other provisions beyond MEP, as it determines appropriate for the control of pollutants, including ensuring strict compliance with water quality standards. (Defenders of Wildlife v. Browner (1999) 191 F.3d 1159, 1168.)

24. The California Supreme Court has ruled that although Water Code section 13263 requires the Water Boards to consider the factors set forth in Water Code section 13241 when issuing an NPDES permit, the Water Boards may not consider the factors to justify imposing pollutant restrictions that are less stringent than the applicable federal regulations require (City of Burbank v. State Water Resources Control Bd. (2005) 35 Cal.4th 613). However, when the pollutant restrictions in an NPDES are more stringent than federal law requires, Water Code section 13263 requires that the Water Boards consider the factors described in section 13241 as they apply to those specific restrictions.

25. The City of Burbank case related to NPDES permits for publicly owned treatment works, not permits for municipal separate storm sewer systems (MS4s). Among other requirements, federal law requires MS4 permits to include requirements to effectively prohibit non-storm water discharges into the storm sewers, in addition to requiring controls to reduce the discharge of pollutants to the maximum extent practicable. Therefore, a 13241 analysis is not required for permit requirements that implement the effective prohibition on the discharge of non-storm water into the MS4, or for practicable controls to reduce the discharge of pollutants to the maximum extent, as those requirements are mandated by federal law.

26. The requirements in this Order may be more specific or detailed than those enumerated in federal regulations under 40 CFR 122.26 or in U.S. EPA guidance. However, the requirements have been designed to be consistent with and within the federal statutory mandates described in CWA § 402(p)(3)(B)(ii) and (iii) and the related federal regulations. Consistent with federal law, all of the conditions in this permit could have been included in a permit adopted by U.S. EPA in the absence of the in lieu authority of California to issue NPDES permits.

27. The Board finds that all requirements in this order are practicable. Moreover, while commenters have alleged that the permit requirements are "beyond MEP," no commenter has presented evidence that demonstrates that any particular permit requirement is not actually practicable.

28. Notwithstanding findings 23 through 27, the Regional Water Board has developed an economic analysis of the permit's requirements, consistent with Water Code section 13241. That analysis is contained in the "Economic Considerations of the Proposed Storm Water (Wet Weather) and Non-Storm Water (Dry Weather) Discharges form the Municipal Separate Storm Sewer Systems within the Ventura County Watershed Protection District, County of Ventura and the Incorporated Cities Therein, June 2, 2008, which is contained in the administrative record for this Order. The Regional

Water Board has considered all of the evidence that has been presented regarding the 13241 factors in adopting this permit, both as contained in the economic analysis and as reflected in the fact sheet and comments (and responses thereto) submitted to the many drafts of this permit. The Regional Water Board finds that the requirements in this Order are reasonably necessary to protect beneficial uses identified in the Basin Plan, and the economic information related to costs of compliance and other 13241 factors are not sufficient to justify failing to protect those beneficial uses. Where appropriate, additional time to implement certain measures and achieve water quality objectives can be provided through the iterative storm water management plan process.

F. Implementation

1. The California Environmental Quality Act (CEQA) (Cal. Pub. Resources Code § 2100 et seq.) requires that public agencies consider the environmental impacts of the projects they approve for development. CEQA applies to projects that are considered discretionary (a governmental agency can use its judgment in deciding whether and how to carry out or approve a project, § 15357) and does not apply to ministerial projects (the law requires a governmental agency to act on a project in a set way without allowing the agency to use its own judgment, § 15369). A ministerial project may be made discretionary by adopting local ordinance provisions or imposing conditions to create decision-making discretion in approving the project. In the alternative, Permittees may establish standards and objective criteria administratively for storm water mitigation for ministerial projects. For water quality purposes regardless of whether a project is discretionary or ministerial, the Regional Water Board considers that all new development and significant redevelopment activity in specified categories, that receive approval or permits from a municipality, are subject to storm water mitigation requirements in a manner that is consistent with and complies with the provisions of CEQA.

2. The objective of this Order is to ensure that discharges from the MS4 in Ventura County comply with water quality standards, including protecting the beneficial uses of receiving waters. To meet this objective, the Order requires that Best Management Practices (BMPs) will be implemented to reduce the discharge of pollutants in storm water to the maximum extent practicable (MEP), and achieve water quality objectives and standards. The U.S. EPA envisioned that municipal storm water programs would be implemented in an iterative manner and improved with each iteration by using information and experience gained during the previous permit term (*Interpretative Policy Memorandum on Reapplication Requirements for MS4 permits* - 61 Fed. Reg. 41697). Municipalities are required to evaluate what is effective and make improvements in order to protect beneficial uses of receiving waters. This Order requires implementation of an effective combination of pollution control and pollution prevention measures, education, public outreach, planning, and implementation of source control BMPs and Structural and Treatment Control BMPs.

The better–tailored BMPs combined with the performance objectives outlined in this Order have the purpose of attaining water quality objectives and standards (*Interim Permitting Approach for Water Quality-Based Effluent Limitations in Storm Water Permits*- 61 Fed. Reg. 43761). Where WLAs have been adopted for storm water (wet weather) and non-storm water (dry weather) discharges from MS4s, this Order requires Permittees to implement controls to achieve the WLAs within the compliance schedule provided in the TMDLs.

3. The implementation of measures set forth in this Order are reasonably expected to reduce the discharge of pollutants conveyed in storm water discharges into receiving waters, and to meet the TMDL WLAs for discharges from MS4s that have been adopted by the Regional Water Board.

4. The U.S. EPA has recommended that all future TMDLs and TMDL amendments be expressed as daily increments consistent with a federal court ruling (*Friends of the Earth, Inc. v. EPA, et al.* No. 05-5015 (D.C. Cir. 2006)). However, this interpretation does not affect the discretionary authority of the Regional Water Board to express NPDES permit limits and conditions in non daily terms because there is no express or implied statutory limitation (CWA §502(11)) (*Establishing TMDL "Daily Loads" in Light of the Decision by the U.S. Court of Appeals for the D.C. Circuit in Friends of the Earth, Inc. v. EPA, et al. (April 2006) and Implications for NPDES Permits*, U.S. EPA Office of Water, memorandum, Nov 15, 2006). This Order translates MS4 TMDL WLAs adopted by the Regional Water Board into forms "consistent with the assumptions and requirements of the TMDL".

5. During the term of the Order, the Permittees shall implement all necessary control measures to reduce pollutant(s) which cause or continue to cause or contribute to water quality impairments, but for which TMDLs have not yet been developed or approved, to eliminate the water quality impairment(s). Successful efforts to reverse the wet weather impairments during the permit term for such pollutants, may avoid the need for a WLA for wet weather or the need to develop a TMDL in the future.

6. This Order promotes land development and redevelopment strategies that consider water quality and water management benefits associated with smart growth techniques. Such measures may include hydromodification mitigation requirements, minimization of effective impervious area, integrated water resources planning, and low impact development guidelines. (Reference: *Protecting Water Resources with Smart Growth*, EPA 231-R- 04-002, U.S. EPA 2004; *Using Smart Growth Techniques as Storm Water Best Management Practices*, EPA 231-B-05-002, U.S. EPA 2005; *Parking Spaces/Community Places: Finding the Balance through Smart Growth Solutions*, EPA 231-K-06-001, U.S. EPA 2006; *Protecting Water Resources with Higher-Density Development*, EPA 231-R-06-001, U.S. EPA 2006.)

7. The implementation of an effective Public Information and Participation Program is a critical component of a storm water management program. While commercial and

industrial facilities are traditionally subject to multiple environmental regulations and receive environmental protection guidance from multiple sources, the general public, in comparison, receives significantly less education in environmental protection. An effective Public Information and Participation Program is required because:

(a) Activities conducted by the public such as vehicle maintenance, improper household waste materials disposal, improper pet waste disposal and the improper application of fertilizers and pesticides have the potential to generate a significant amount of pollutants that could be discharged in storm water.

(b) An increase in public knowledge of storm water regulations, proper storage and disposal of household wastes, proper disposal of pet wastes and appropriate home vehicle maintenance practices can lead to a significant reduction of pollutants discharged in storm water.

8. This Order also provides flexibility for Permittees to seek authorization from the Regional Water Board Executive Officer to substitute a BMP under this Order with an alternative BMP, if they can provide information and documentation on the effectiveness of the alternative, equal to or greater than the prescribed BMP in meeting the objectives of this Order.

9. This Order contemplates that the Permittees are responsible for considering potential storm water impacts when making planning decisions in order to fulfill the Permittees' CWA requirement to reduce the discharge of pollutants in municipal storm water to the MEP and attain water quality objectives from new development and redevelopment activities. However, the Permittees retain authority to make the final land-use decisions and retain full statutory authority for deciding what land uses are appropriate at specific locations within each Permittee's jurisdiction. This Order and its requirements are not intended to restrict or control local land use decision-making authority.

10. The State Water Board amended the Policy for the Implementation of Toxics Standards In Inland Surface Waters, Enclosed Bays and Estuaries of California (State Implementation Policy – SIP) on February 24, 2005. The SIP does not apply directly to the stormwater discharges. However, this Order includes a Monitoring Program that incorporates Minimum Levels (MLs) established under the State Implementation Policy. The MLs represent the lowest quantifiable concentration for priority toxic pollutants that is measurable with the use of proper method-based analytical procedures and factoring out matrix interference. The SIP's MLs therefore represent the best available science for determining MLs and are appropriate for a storm water monitoring program. The use of MLs allows the detection of toxic priority pollutants at concentrations of concern using recent advances in chemical analytical methods.

11. The International Storm Water Best Management Practices (BMP) Database was established in 1996 as a cooperative initiative between the U.S. EPA and the American Society of Civil Engineers (ASCE) to provide scientifically sound information to improve the design, selection and performance of storm water BMPs.

The BMP database includes standardized BMP monitoring and reporting protocols, a storm water BMP database, BMP performance evaluation protocols, and BMP monitoring guidance. The storm water BMP database is updated approximately semi-annually to add new BMP studies and performance data. The International Storm Water Database is now maintained by the Water Environment Research Foundation (WERF).

12. This Order is not intended to prohibit the inspection for or abatement of vectors by the State Department of Public Health or local vector agencies in accordance with CA Health and Safety Code, § 116110 et seq. Certain Treatment Control BMPs if not properly designed, operated or maintained may create habitats for vectors (e.g. mosquitoes and rodents). This Order contemplates that the Permittees will closely cooperate and collaborate with local vector control agencies and the State Department of Public Health for the implementation, operation, and maintenance of Treatment Control BMPs in order to minimize the risk to public health from vector borne diseases.

13. This Order contemplates that Permittees will ensure that implemented Treatment Control BMPs will not pose a safety or health hazard to the public. This Order contemplates that Permittees will ensure that the maintenance of implemented Treatment Control BMPs will comply with all applicable health and safety regulations, such as, but not limited to requirements for worker entry into confined spaces under OSHA Safety and Training education, § 1926.21(b)(6)(i).

14. This Order incorporates presumptive BMPs to reduce pollutants in storm water discharges from construction sites to the MEP. The BMPs are identified in Table 6 (BMPs at Construction sites less than 1 acre), Table 7 (BMPs at Construction Sites 1 acre or greater but less than 5 acres), and Table 8 (BMPs at Construction sites 5 acres or greater). These BMPs include erosion control, sediment control, and construction site waste management practices. The BMPs listed in part 4.F of the Order were selected based on the Water Boards' experience of regulating such sites since 1992, and are referenced in the *California Stormwater Quality Association (CASQA) Storm Water Best Management Practice Handbook Construction (January 2003)* and from the *Stormwater Quality Handbooks, Project Planning and Design Guide, Stormwater Pollution Prevention Plan (SWPPP) and Water Pollution Control Plan (WPCP) Preparation Manual, Construction Site Best Management Practices (BMPs) Reference Manual, March 2007* (Caltrans Document Number CTSW-RT-06-171.11-1) which serve as an industry standard for California. The BMPs identified in the Tables are technically feasible, practicable, and cost-effective. Where an identified BMP may be impracticable on a particular site, this Order includes a provision to select and implement an alternative BMP, through the BMP substitution provisions in subpart 4.A.2.

15. This Order incorporates presumptive BMPs to reduce pollutants in storm water discharges from commercial and industrial sites to the MEP. The BMPs are

identified in Table 2 (BMPs at Restaurants), Table 3 (BMPs at Automotive Service Facilities), Table 4 (BMPs at Retail Gasoline Outlets), and Table 5 (BMPs at Nurseries). These BMPs include the implementation of good housekeeping practices designed to control pollutants at the source, promote the use of proper waste management practices, and implement control practices to keep pollutants away from any entrance to the storm drainage system. The BMPs listed in part 4.D of the Order were selected based on the Water Boards' experience of regulating such sites since 1992 and referenced in the California Stormwater Quality Association (CASQA) Storm Water Best Management Practice Handbook Commercial/Industrial Activity (January 2003) and from the Caltrans Storm Water Quality Handbook Maintenance Staff Guide May 2003 (Caltrans Document Number CTSW-RT-02-057), which serve as an industry standard for California. The BMPs identified in the Tables are technically feasible, practicable, and cost-effective. Where an identified BMP may be impracticable, this Order includes a provision to select and implement an alternative BMP, through the BMP substitution provisions in subpart 4.A.2.

16. This Order incorporates presumptive BMPs to reduce pollutants in storm water discharges from Public Agency Activities to the MEP. The BMPs are identified in Table 10 (BMPs at Vehicle Maintenance/ Material Storage Facilities/ Corporation Yards). These BMPs include the implementation of good housekeeping practices designed to control pollutants at the source, promote the use of proper waste management practices, implement control practices to keep pollutants away from any entrance to the storm drainage system and from being deposited or discharged directly into waters of the U.S. The BMPs listed in part 4.G of the Order were selected based on the Water Boards' experience of regulating such sites since 1990, and are referenced in the Caltrans Storm Water Quality Handbook Maintenance Staff Guide May 2003 (Caltrans Document Number CTSW-RT-02-057), which serves as a statewide standard for the California Department of Transportation (Caltrans). The BMPs identified in the Table are technically feasible, practicable, and cost-effective, and are the standard of practice for Caltrans sites statewide. Where an identified BMP may be impracticable, this Order includes a provision to select and implement an alternative BMP, through the BMP substitution provisions in subpart 4.A.2.

17. This Order incorporates BMPs to ensure that authorized Non-Storm Water Discharges are not a source of pollutants to the MS4, Table 1 (Required Conditions for Non-Storm Water Discharges). The BMPs included are for the purpose of dechlorination and/or for prevention of erosion and sediment loss, or to reduce other harmful pollutants during the discharge of authorized non-storm water discharges to the MS4. The BMPs listed in part 1.A of the Order were selected from the *American Water Works Association AWWA Guidelines For The Development Of Your Best Management Practices (BMP) Manual For Drinking Water System Releases Developed by the CA-NV AWWA Environmental Compliance Committee (2005)* which serves as an industry standard for California, from the results of studies directed by the Los Angeles Water Board, - *Evaluation of Non-Storm Water Discharges to California Storm Drains and Potential Policies for Effective*

Prohibition Methods, Final Report, University of California, Los Angeles, Contract No. 5-104-140-0 (1997), and *Water Quality Concerns and Regulatory Controls for Non Storm Water Discharges to Storm Drains*, Duke L.D. and M. Kihara, Journal of the American Water Resources Association, Vol. 34: 661-676, (1998), and from the Water Boards' experience of controlling authorized non-storm discharges to the MS4 since 1990. The BMPs identified in the Table are technically feasible, practicable, and cost-effective. Where an identified BMP may be impracticable, this Order includes a provision to select and implement an alternative BMP, through the BMP substitution provisions in subpart 4.A.2.

18. In accordance with Federal regulations at 40 CFR 124.8, a Fact Sheet has been prepared to explain the principal facts and the significant factual, legal, methodological, policy, and economic matters considered in preparing the Order. This Fact Sheet has been made a part of the Administrative Record.

19. The State Water Board adopted statewide General Waste Discharge Requirements for Sanitary Sewer Systems, (WQ Order No. 2006-0003) on May 2, 2006, to provide a consistent, statewide regulatory framework to address sanitary sewer overflows ("SSO Orders"). The SSO Order establishes requirements for public agencies that own or operate sanitary sewer systems to develop and implement sewer system management plans and to report SSOs. SSOs that enter MS4s have the potential to impair the recreational use of receiving waters, and to harm public health. This Order establishes coordination, response, and notification requirements for MS4 Permittees when SSOs result in a discharge to the MS4 system.

20. This Order takes into consideration the housing needs in the area under the Permittees' jurisdiction by balancing the implementation of Smart Growth and Low Impact Development techniques with the protection of the water resources of the region. Although not required, the Regional Water Board considered the need for housing and the appropriate techniques to allow for reasonable development while protecting the receiving waters from degradation.

21. This Order may have an effect on costs required for compliance with the provisions contained herein. Although not required, the Regional Water Board has considered costs in preparing this Order. Though also not required, the Regional Water Board has also considered the factors set forth in Water Code section 13241.

G. Public Notification

1. The issuance of waste discharge requirements pursuant to California Water Code section 13370 et seq. is exempt from the California Environmental Quality Act in accordance with California Water Code section 13389. *County of Los Angeles et al., v. California Water Boards et al.*, (2006), 143 Cal.App.4th 985.

2. The Regional Water Board has notified the Permittees, and interested agencies and persons of its intent to reconsider Order No. 09-0057 and issue waste discharge requirements for this discharge, and has provided them with an opportunity to make statements and submit their comments.

3. The Regional Water Board staff has conducted more than 35 meetings from February 9, 2007 through December 19, 2008, with Permittees, their representatives (Larry Walker Associates, and Somach, Simmons & Dunn), and various stakeholders (Building Industry Association of Southern California/Greater Los Angeles Ventura Chapter (BIA/LAV), California State Dept. of Public Health, Calleguas Municipal Water District, California Stormwater Quality Association (CASQA), City of Downey, City of Los Angeles-EMD, Coalition for Practical Regulation (CPR), Construction Industry Coalition on Water Quality (CICWQ), County of Orange, Geosyntec Consultants, Golden State, Heal the Bay; Local Government Commission, Los Angeles City; Los Angeles County Department of Public Works, Los Angeles County-SD, Los Angeles Department of Water and Power, Metropolitan Water District, Natural Resources Defense Council (NRDC), Richard Watson and Associates, San Bernardino Flood Control District, Santa Monica Bay Restoration Commission, Southern California Coastal Water Research Project, University of California Sea Grant, Ventura CoastKeeper). On April 5, 2007 and September 20, 2007, the Regional Water Board conducted workshops to discuss drafts of the NPDES Order and received input from the Permittees and the public regarding proposed changes.

4. This Order shall serve as a NPDES permit, pursuant to CWA § 402, and shall take effect on (Order adoption date) provided the Regional Administrator of the U.S. EPA has no objections.

5. Pursuant to Cal. Water Code § 13320, any aggrieved party may seek review of this Order by filing a petition with the State Board within 30 days of the date of adoption of the Order by the Regional Water Board. A petition must be sent to:

   State Water Resources Control Board
   Office of the Chief Counsel
   P.O. Box 100
   Sacramento, CA 95812-0100

6. This Order may be modified or alternatively revoked or reissued prior to its expiration date or any administrative extension thereto, in accordance with 40 CFR 122.41(f) and 122.62.

IT IS HEREBY ORDERED that the Permittees, in order to meet the provisions contained in Division 7 of the Cal. Water Code and regulations adopted thereunder, and the provisions of the CWA and regulations adopted thereunder, shall comply with the following:

PART 1 - DISCHARGE PROHIBITIONS

A. Prohibitions - Non-Storm Water Discharges

1. The Permittees shall, within their respective jurisdictions, effectively prohibit non-storm discharges into the MS4 and receiving waters, except where such discharges:
   (a) Originate from a State, Federal, or other source for which they are pre-empted from regulating by State or Federal law; or
   (b) Are covered by a separate individual or general NPDES permit, or conditional waiver for irrigated lands; or
   (c) Flows from fire fighting activities.
   (d) Fall within one of the categories below, are not a source of pollutants that exceed water quality standards, and meet all conditions where specified by the Regional Water Board Executive Officer:
      (1) Category A – Natural flows
         (A) Stream diversions authorized by the State Water Board
         (B) Natural springs and rising ground water
         (C) Uncontaminated ground water infiltration [as defined by 40 CFR 35.2005(20)][1]
         (D) Flows from riparian habitats or wetlands
      (2) Category B – Flows incidental to urban activities, providing conditions listed in table below:
         (A) Discharges from potable water sources[2]
         (B) Gravity flow from foundation, footing and crawl space drains.
         (C) Air conditioning condensate
         (D) Reclaimed and potable landscape irrigation runoff
         (E) Dechlorinated/ debrominated swimming pool discharges [see def. part 6]
         (F) Non-commercial car washing by residents or non-profit organizations
         (G) Sidewalk rinsing
         (H) Pooled non-storm water from treatment BMPs[3]

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[1] NPDES permit for ground water dewatering is required within the Los Angeles Region including Ventura County.
[2] The term applies to low volume, incidental and infrequent releases that are innocuous from a water quality perspective. Those releases for dewatering or hydro-testing or flushing of water supply and distribution mains and incidental and infrequent releases from well heads shall be allowed with the implementation of appropriate BMPs until such time as a new General Permit is adopted that addresses those types of releases. Discharges from hydrostatic pipe testing shall be subject to separate NPDES general permit coverage (CAG674001) and discharges from utility vaults shall be conducted under coverage of a separate NPDES permit specific to that activity.
[3] All storm water BMPs shall at a minimum be maintained at a frequency as specified by the manufacturer, and designed to drain within 72 hours of the end of a rain. Storm water treatment BMPs may be drained to the MS4 under this Order if the discharge is not a source of pollutants. Sediments shall be disposed of properly, in compliance with all applicable local, state, and federal policies, acts, laws, regulations, ordinances, and statutes.

Table 1 – Required Conditions for Non-Storm Water Discharges

Type of Discharges:	Conditions under which allowed:	Required conditions for discharge to occur:
Stream diversions permitted by the State Board	Authorization by the State Water Board	Permittees shall comply with all conditions in the authorization.
Natural springs and rising ground water	1. Ground water dewatering requires a separate NPDES permit. 2. Segregate flow to prevent introduction of pollutants.	Permittees shall comply with all conditions in the authorization.
Uncontaminated ground water infiltration [as defined by 40 CFR 35.2005(20)] (Utility vault dewatering requires a separate NPDES permit.)	NPDES permit for ground water dewatering is required within the Los Angeles Region including Ventura County	Permittees shall comply with all conditions in the authorization.
Flows from riparian habitats or wetlands	Provided that all necessary permits or authorizations are received prior to diverting the stream flow.	Permittees shall comply with all conditions in the authorization.
Discharges from potable water sources	See Footnote #2. Provided discharges from water lines and potable water sources shall be dechlorinated, pH adjusted if necessary, reoxygenated, and volumetrically and velocity controlled to prevent resuspension of sediments.	See Footnote #2. To be discharged, this type of water shall be dechlorinated using aeration and/ or sodium thiosulfate and/ or other appropriate means and/or be allowed to infiltrate to the ground. BMPs such as sand bags or gravel bags, or other appropriate means shall be utilized to prevent sediment transport. All sediments shall be collected and disposed of in a legal and appropriate manner.
Drains for foundation, footing and crawl drains	Dewatering requires a separate NPDES permit.	Permittees shall comply with all conditions in the authorization.
Air conditioning condensate	Segregation of flow to prevent introduction of pollutants. Percolation whenever possible.	Permittees shall comply with all conditions in the authorization.
Water from crawl space pumps	Dewatering requires a separate NPDES permit within the Los Angeles Region including Ventura County	Permittees shall comply with all conditions in the authorization.
Reclaimed and potable landscape irrigation runoff	Segregation of flow to prevent introduction of pollutants.	Implement conservation programs to minimize this type of discharge by using less water.
Dechlorinated/ debrominated	Where the discharge is not excepted by the sanitary sewer operator. Swimming pool	Pool water may be dechlorinated using time,

Type of Discharges:	Conditions under which allowed:	Required conditions for discharge to occur:
swimming pool discharges [see definition Part 6]	discharges are to be dechlorinated, pH adjusted if necessary, aerated to remove chlorine if necessary, and volumetrically and velocity controlled to prevent resuspension of sediments. Cleaning waste water and filter back wash shall not be discharged to municipal separate storm sewers. No discharges are allowed containing salts in excess of Water Quality Standards. Chlorine residual in discharge shall not exceed 0.1mg/L.	aeration, and/ or sodium thiosulfate.
Non-commercial car washing by residents or non-profit organizations	Preferably at a commercial carwash or designated area where wash water can percolate. Pumps or vacuums may be used to direct water to pervious areas.	Permittees shall comply with all conditions in the authorization.
Sidewalk rinsing	This may be undertaken only if high pressure low volume is used as described in the glossary under "Sidewalk Rinsing".	
Pooled storm water from treatment BMPs	All storm water BMPs shall at a minimum be maintained at a frequency as specified by the manufacturer. All storm water BMPs shall be designed to drain within 72 hours of the end of the rain event to avoid the breeding of vectors. Storm water treatment BMPs may be drained to the MS4 under this Order if the discharge is not a source of pollutants. The discharge shall cease before the discharge has become a source of a pollutant(s), (bottom sediment included). Sediments shall be disposed of properly, in compliance with all applicable local, state, and federal policies, acts, laws, regulations, ordinances, and statutes.	

2. If the Regional Water Board Executive Officer determines that any of the preceding categories of non-storm water discharges are a source of pollutants that exceed water quality standards, the Permittee(s) shall either:
   (a) Prohibit the discharge from entering the MS4; <u>or</u>
   (b) Authorize the discharge category and require implementation of appropriate or additional BMPs to ensure that the discharge will not be a source of pollutants; <u>or</u>
   (c) Require or obtain coverage under a separate RWQCB or SWRCB permit for discharge into the MS4.

PART 2 – RECEIVING WATER LIMITATIONS

1. Discharges from the MS4 that cause or contribute to a violation of water quality standards are prohibited.

2. Discharges from the MS4 of storm water, or non-storm water, for which a Permittee is responsible, shall not cause or contribute to a condition of nuisance.

3. The Permittee shall comply with Receiving Water Limitations 1 and 2 through timely implementation of control measures and other actions to reduce pollutants in the storm water discharges in accordance with the requirements of this Order including any modifications. The Permittees' Program shall be designed to achieve compliance with Receiving Water Limitations 1 and 2. If exceedance(s) of water quality objectives or water quality standards (collectively WQS) persist, notwithstanding implementation of this permit, the Permittees shall ensure compliance with Receiving Water Limitations 1 and 2 by complying with the following procedure:
   (a) Upon determination by either the Permittees or the Regional Water Board that discharges are causing or contributing to an exceedance of an applicable WQS, the Permittee(s) upstream of the point of discharge shall promptly notify and thereafter submit a report to the Regional Water Board Executive Officer that describes BMPs that are currently being implemented and additional BMPs that will be implemented to prevent or reduce any pollutants that are causing or contributing to the exceedance of WQSs. The report may be included with the Annual Report, unless the Regional Water Board Executive Officer directs an earlier submittal. The Regional Water Board Executive Officer may require modifications to the report.
   (b) Submit any modifications to the report required by the Regional Water Board Executive Officer within 30 days of notification.
   (c) Within 30 days following approval of the Report described above by the Regional Water Board Executive Officer, the Permittees shall revise their Program and monitoring program to incorporate the approved modified BMPs that have been and will be implemented, the implementation schedule, and any additional monitoring required.
   (d) Implement the revised Program and monitoring program according to the approved schedule.

4. Permittees shall annually report the effectiveness of BMPs in reducing exceedances of receiving water limitations. The Regional Water Board Executive Officer may direct implementation of additional BMPs if there are continuing or recurring exceedances of the same receiving water limitation.

PART 3 - STORM WATER QUALITY MANAGEMENT PROGRAM IMPLEMENTATION

A. General Requirements

1. Each Permittee shall, at a minimum, adopt and implement applicable terms of this Order within its jurisdictional boundary. The Principal Permittee shall be responsible for program coordination as described in this Order as well as compliance with applicable portions of the permit within its jurisdiction. This Order shall be implemented no later than July 8, 2010, unless a later date has been specified for a particular provision in this Order and provided the Regional Administrator of the U.S. EPA has no objections.

2. Each Permittee shall comply with the requirements of 40 CFR 122.26(d)(2) and implement programs and control measures so as to reduce the discharges of pollutants in storm water to the MEP and achieve water quality standards.

3. Each Permittee shall require that treatment control BMPs being implemented under the provisions of this Order shall be designed, at a minimum, to achieve the BMP performance criteria for storm water pollutants likely to be discharged as identified in Attachment "C", for an 85th percentile 24-hour runoff event determined as the maximized capture storm water volume for the area using a 48 to 72-hour draw down time, from the formula recommended in Urban Runoff Quality Management, WEF Manual of Practice No. 23/ASCE Manual of Practice No. 87, (1998). Expected BMP pollutant removal performance for effluent quality was developed from the WERF-ASCE/ U.S. EPA International BMP Database. Permittees shall select Treatment BMPs based on the primary class of pollutants likely to be discharged from the site/facility (e.g. metals from an auto repair shop). Permittees may develop guidance for appropriate Treatment BMPs for project type based on Attachment "C". For the treatment of pollutants causing impairments within the drainage of the impaired waterbody, permittees shall select BMPs from the top three performing BMP categories or alternative BMPs that are designed to meet or exceed the performance of the highest performing BMP for the pollutant causing impairment.

4. Each Permittee shall implement programs and measures to comply with the TMDLs' WLAs for the MS4 as specified in Part 5.

5. If TMDL requirements, including Implementation Plans and Reports, address substantially similar requirements as the MS4 permit, the Executive Officer may approve the applicable reports, plans, data or submittals under the applicable TMDL as fulfilling requirements under the MS4.

B. Legal Authority

1. Permittees shall possess the necessary legal authority to prohibit, including, but not limited to:
   (a) Illicit connections and illicit discharges, and to remove illicit connections.
   (b) The discharge of non-storm water to the MS4 from:
      (1) Washing or cleaning of gas stations, auto repair garages, or other types of automotive service facilities
      (2) Mobile auto washing, carpet cleaning, steam cleaning, sandblasting and other such mobile commercial and industrial operations
      (3) Areas where repair of machinery and equipment which are visibly leaking oil, fluid or antifreeze, is undertaken
      (4) Storage areas for materials containing grease, oil, or other hazardous substances, and uncovered receptacles containing hazardous materials
      (5) Swimming pools[1] that have a concentration greater than:
         (A) Chlorine/ bromine- 0.1mg/L
         (B) Chloride- 250mg/L
      (6) Swimming pool filter backwash
      (7) Decorative fountains and ponds
      (8) Industrial/ Commercial areas, including restaurant mats
      (9) Concrete truck cement, pumps, tools, and equipment washout
      (10) Spills, dumping, or disposal of materials other, such as:
         (A) Litter, landscape and construction debris, garbage, food, animal waste, fuel or chemical wastes, batteries, and any other materials which have the potential to adversely impact water quality; <u>and</u>
         (B) Any pesticide, fungicide or herbicide
      (11) Stationary and mobile pet grooming facilities
      (12) Trash container leachate

2. The Permittees shall possess adequate legal authority to:
   (a) Control through interagency agreement, the contribution of pollutants from one portion of the MS4 to another portion of the MS4.
   (b) Require persons within their jurisdiction to comply with conditions in the Permittees' ordinances, permits, contracts, model programs, or orders (i.e. hold dischargers to its MS4 accountable for their contributions of pollutants and flows).
   (c) Utilize enforcement measures (e.g., stop work orders, notice of violations, fines, referral to City, County, and/ or District Attorneys, referral to strikeforces, etc.) by ordinances, permits, contracts, orders, administrative authority, and civil and criminal prosecution.[2]

[1] MS4s discharging directly to the ocean are not subject to this prohibition.
[2] In the case of private responsible parties such as, HOAs, the Permittee must retain enforcement authority.

(d) Control pollutants, including potential contribution[1] in discharges of storm water runoff associated with industrial activities, including construction activities to its MS4, and control the quality of storm water runoff from industrial sites, including construction sites.
(e) Carry out all inspections, surveillance and monitoring procedures necessary to determine compliance and non-compliance with permit conditions including the prohibition on illicit discharges to the MS4.
(f) Require the use of control measures to prevent or reduce the discharge of pollutants to achieve water quality objectives.
(g) Require that Treatment Control BMPs be properly operated and maintained.

3. Each Permittee has adopted a Storm Water Quality Ordinance based upon a countywide model. Each Permittee shall ensure, no later than [two years after Order adoption date], that its Storm Water Quality Ordinance authorizes the Permittee to enforce all requirements of this Order.

4. Each Permittee shall submit no later than (two years after Order adoption date), a statement by its legal counsel that the Permittee has obtained and possesses all necessary legal authority to comply with this Order through adoption of ordinances and/ or municipal code modifications.

C. Fiscal Resources

1. The Permittees shall implement the activities required to comply with the provisions of this Order.[2] Each Permittee shall:
   (a) Submit an Annual Budget Summary that shall include:
      (1) Budgets for the upcoming report year (estimated expenditure) for the following specific categories (estimated percentages and written explanations where necessary):
         (A) Program Management Activities.
            (i) Overall Administrative costs
         (B) Program Implementation Activities (permit related activities only). Provide figures breakdown of expenditures for the categories below:
            (i) Illicit connection/ illicit discharge program.
            (ii) Development planning and approval
            (iii) Construction program including inspection activities
            (iv) Industrial/ Commercial program including inspection activities
            (v) Public Agency Activities
               (I) Maintenance and inspection of Treatment Control BMPs
               (II) Municipal Street Sweeping

[1] "Potential contributions" and "potential to discharge," means adequate legal authority to prevent an actual discharge of pollutants to the municipal separate storm sewer system.
[2] The sources of funding may be the general funds, and/or Benefit Assessment, plan review fees, permit fees, industrial/ commercial user fee, revenue bonds, grants or other similar funding mechanism.

(III) Municipal Drainage Maintenance including catch basin clean-outs
(IV) Other costs associated with storm water management (describe)
(vi) Public Information and Participation.
(vii) Monitoring Program
(viii) Miscellaneous Expenditures (describe)

D. Modifications/ Revisions

1. No later than (two years after the Order adoption date), each Permittee shall modify its storm water management programs, protocols, practices, and municipal codes to make them consistent with the requirements herein.

E. Designation and Responsibilities of the Principal Permittee

1. The Ventura County Watershed Protection District is hereby designated as the Principal Permittee. The Principal Permittee shall:
   (a) Participate in the County Environmental Crimes Task Force
   (b) Coordinate and facilitate activities necessary to comply with the requirements of this Order, but the Principal Permittee is not responsible for ensuring compliance of any other individual Permittee
   (c) Coordinate permit activities among Permittees and act as liaison between the Permittees and the Regional Water Board on permitting issues
   (d) Provide technical and administrative support for committees that will be organized to implement this Order and its requirements
   (e) Evaluate, assess, and synthesize the results of the monitoring program and the effectiveness of the implementation of BMPs
   (f) Convene the Committee Meetings constituted pursuant to subpart 4.F.1., below, upon designation of representatives
   (g) Implement the Countywide Monitoring Program required under the Order and evaluate, assess and synthesize the results of the monitoring program
   (h) Provide personnel and fiscal resources for the collection, processing and submittal to the Regional Water Board of monitoring and annual reports, and summaries of other reports required under this Order

F. Responsibilities of the Permittees

1. Each Permittee is required to comply with the requirements of this Order applicable to discharges within its boundaries (see Findings- Permit Coverage D.1 and D.2). Permittees are not responsible for the implementation of the provisions applicable to the Principal Permittee or other Permittees. Each Permittee shall:
   (a) Comply with the requirements of this Order and any modifications thereto

(b) Coordinate among its internal departments and agencies, as necessary, to facilitate the implementation of the requirements of this Order applicable to such Permittees in an efficient and cost-effective manner
(c) Participate in intra-agency coordination (e.g., Planning Department, Fire Department, Building and Safety, Code Enforcement, Public Health, Parks and Recreation, and others) necessary to successfully implement the provisions of this Order
(d) Report, in addition to the Budget Summary, any supplemental dedicated budgets for the same categories
(e) Participate in Committee Meetings, as necessary

PART 4 - SPECIAL PROVISIONS (BASELINE)

A. General Requirements

1. This Order and the provisions herein are intended to develop, achieve, and implement a timely, comprehensive, cost-effective storm water pollution control program to reduce the discharge of pollutants in storm water to the MEP and not cause or contribute to exceedances of water quality standards for the permitted areas in the County of Ventura.

2. Best Management Practice Substitution
   (a) The Regional Water Board Executive Officer may approve any site-specific BMP substitution upon written request by a Permittee(s) and after public notice, if the Permittee can document that:
      (1) The proposed alternative BMP or program will meet or exceed the objective of the original BMP or program in the reduction of storm water pollutants.
      (2) The fiscal burden of the original BMP or program is greater than the proposed alternative and does not achieve a greater improvement in storm water quality.
      (3) The proposed alternative BMP or program will be implemented within a similar period of time.
      (4) BMP substitution will be in accordance with the public review provisions of the Order (Part 7.C.1 and Part 7.C.2).

B. Watershed Initiative Participation

1. The Principal Permittee shall participate in water quality meetings for watershed management and planning, including but not limited to the following:
   (a) Southern California Stormwater Monitoring Coalition (SMC)
   (b) Other Watershed planning groups as appropriate

2. The Principal Permittee shall participate in the following regional water quality programs, and projects for watershed management and planning:

(a) SMC Regional Monitoring Programs
  (1) Southern California Regional Bioassessment
    (A) Level of effort per watershed
      (i) Probabilistic sites per watershed
        (I) Ventura River - Six
        (II) Santa Clara River - Three
        (III) Calleguas Creek - Six
      (ii) Integrator sites per watershed
        (I) Ventura River - One
        (II) Santa Clara River - One
        (III) Calleguas Creek – One
      (iii) Fixed bioassessment sites
        (I) The Permittees shall perform bioassessment at one fixed urban site in each major watershed. Site selection shall be determined by the results of the first year SMC results, as approved by the Executive Officer.

(b) Southern California Bight Projects
  (1) Regional Monitoring Survey – 2008, and successive years.

C. Public Information and Participation Program (PIPP)

1. The Principal Permittee shall implement a Public Information and Participation Program (PIPP) that includes, but is not limited to, the requirements listed in this part. The Principal Permittee shall coordinate with Permittees to implement specific PIPP requirements. The objectives of the PIPP are as follows:

   (a) To increase the knowledge of the target audience about the MS4, the adverse impacts of storm water pollution on receiving waters and potential solutions to mitigate the impacts

   (b) To change the waste disposal and storm water pollution generation behavior of target audiences by encouraging implementation of appropriate solutions

   (c) To involve and engage communities in Ventura County to participate in mitigating the impacts of storm water pollution

2. Residential Program
   (a) "No Dumping" Message
   Each Permittee shall label all storm drain inlets that they own with a legible "no dumping" message. In addition, signs with prohibitive language discouraging illegal dumping shall be posted at designated public access points to creeks, other relevant waterbodies, and channels. Signage and storm drain messages shall be legible and maintained.
   (b) Public Reporting
   Each Permittee shall identify staff who will serve as the contact person(s) for reporting clogged catch basin inlets and illicit discharges/dumping, faded or missing catch basin labels, and general storm water management information.

Permittees shall include this information, updated by July 1 of each year, in public information media such as the government pages of the telephone book, and internet web sites. The Principal Permittee shall compile a list of the general public reporting contacts submitted by all Permittees and make this information available on the web site (http://www.vcstormwater.org/contact.htm) and upon request. Each Permittee is responsible for providing current, updated information to the Principal Permittee.

(c) Outreach and Education

(1) Collaboratively, the Permittees shall implement the following activities:

(A) Conduct a Storm Water pollution prevention advertising campaign.

(B) Conduct Storm Water pollution prevention public service announcements.

(C) Distribute storm water pollution prevention public education materials no later than (365 days after Order adoption date) to:

(i) Automotive parts stores

(ii) Home improvement centers/ lumber yards/ hardware stores

(iii) Pet shops/ feed stores

(D) Public education materials shall include, but are not limited to information on the proper disposal, storage, and use of:

(i) Vehicle waste fluids

(ii) Household waste materials

(iii) Construction waste materials

(iv) Pesticides and fertilizers (including integrated pest management practices-IPM)

(v) Green waste (including lawn clippings and leaves)

(vi) Animal wastes

(E) Work with existing local watershed groups or organize watershed Citizen Advisory Groups/ Committees to develop effective methods to educate the public about storm water pollution no later than (365 days after Order adoption date).

(F) Organize events targeted to residents and population subgroups; and

(G) Maintain the Countywide storm water website (www.vcstormwater.org), which shall include educational material listed in the preceding subpart C.2(c)(1)(D).

(2) The Principal Permittee shall develop a strategy to educate ethnic communities through culturally effective methods. Details of this strategy should be incorporated into the PIPP, and implemented, no later than (365 days after Order adoption date).

(3) Each Permittee shall continue the existing outreach program to residents on the proper disposal of litter, green waste, pet waste, proper vehicle maintenance, lawn care and water conservation practices.

(4) Each Permittee shall conduct educational activities within its jurisdiction and participate in countywide events.

(5) The Permittees shall make a minimum of 5 million impressions per year to the general public related to storm water quality, with a minimum of 2.5

million impressions via newspaper, local TV access, local radio and/ or internet access.

(6) The Principal Permittee, in cooperation with the Permittees, shall provide schools within each School District in the County with materials, including, but not limited to, videos, live presentations, and other information necessary to educate a minimum of 50 percent of all school children (K-12) every 2 years on storm water pollution. Alternatively, a Permittee may submit a plan to the Regional Water Board Executive Officer for consideration no later than (90 days after Order adoption date), to provide outreach in lieu of the school curriculum. Pursuant to Water Code section 13383.6, the Permittees, in lieu of providing educational materials/ funding to School Districts in the County, may opt to provide an equivalent amount of funds or fraction thereof to the Environmental Education Account established within the State Treasury.

(7) Each Permittee shall provide the contact information for their appropriate staff responsible for storm water public education activities to the Principal Permittee and contact information changes no later than 30 days after a change occurs.

(8) The Permittees shall develop and implement a behavioral change assessment strategy no later than (365 days after Order adoption date) in order to determine whether the PIPP is demonstrably effective in changing the behavior of the public. The strategy shall be developed based on current sociological data and studies.

(d) Pollutant-Specific Outreach

The Principal Permittee, in cooperation with the Permittees, shall coordinate to develop outreach programs that focus on metals, urban pesticides, bacteria and nutrients as the pollutants of concern no later than (365 days after Order adoption date). Metals may be appropriately addressed through the Industrial/ Commercial Facilities Program (e.g. the distribution of educational materials on appropriate BMPs for metal fabrication and recycling facilities that have been identified as a potential source). Region-wide pollutants may be included in the Principal Permittee's mass media outreach program.

3. Businesses Program

(a) Corporate Outreach

(1) The Permittees shall work with other regional or statewide agencies and, associations such as the California Storm Water Quality Association (CASQA), to develop and implement a Corporate Outreach program to educate and inform corporate franchise operators and/or local facility managers about storm water regulations and BMPs. Once developed, the program shall target a minimum of four Retail Gasoline Outlets (RGO) franchisers and cover a minimum of 80% of RGO franchisees in the county, four retail automotive parts franchisers, two home improvement center franchisers and six restaurant franchisers. Corporate outreach for all target facilities shall be conducted not less than twice during the term of this

Order, with the first outreach contact to begin no later than two years after Order adoption date. At a minimum, this program shall include:

(A) Confer with franchise operators and/or local facility managers to explain storm water regulations.

(B) Distribution and discussion of educational material regarding storm water pollution and BMPs, and provide managers with recommendations to facilitate employee and facility compliance with storm water regulations.

(b) Business Assistance Program

(1) The Permittees shall implement a Business Assistance Program to provide technical information to small businesses to facilitate their efforts to reduce the discharge of pollutants in storm water. The Program shall include:

(A) On-site, telephone or e-mail consultation regarding the responsibilities of businesses to reduce the discharge of pollutants, procedural requirements, and available guidance documents.

(B) Distribution of storm water pollution prevention education materials to operators of auto repair shops, car wash facilities (including mobile car detailing), mobile carpet cleaning services, commercial pesticide applicator services and restaurants.

D. Industrial/ Commercial Facilities Program

I. Each Permittee shall require implementation of pollutant reduction and control measures, unless precluded by local ordinances, at industrial and commercial facilities, with the objective of reducing pollutants in storm water. Except where specified otherwise in this Order, pollutant reduction and control measures may be used alone or in combination, and may include Treatment Control, Source Control BMPs, and operation and maintenance procedures, which may be applied before, during, and/ or after pollutant generating activities. At a minimum, the Industrial/ Commercial Facilities Control Program shall include requirements to:

(a) Track

(b) Inspect

(c) Ensure compliance with municipal ordinances at industrial and commercial facilities that are critical sources of pollutants in storm water

1. Inventory of Critical Sources

(a) Each Permittee shall maintain a watershed-based inventory or database of all facilities within its jurisdiction that are critical sources of storm water pollution. Critical Sources to be tracked are summarized below, and specified in Attachment "D":

(1) Commercial Facilities

(A) Restaurants

(B) Automotive service facilities

(C) RGOs and automotive dealerships

(D) Nurseries and nursery centers
(2) U.S. EPA Phase I, II Facilities
(3) Other Federally-mandated Facilities [as specified in 40 CFR 122.26(d)(2)(iv)(C)]
(A) Municipal landfills
(B) Hazardous waste treatment, disposal, and recovery facilities
(C) Facilities subject to SARA Title III (also known as the Emergency Planning and Community Right-to-Know Act (EPCRA))

(b) Each Permittee shall include the following minimum fields of information for each critical source industrial and commercial facility
(1) Name of facility and name of owner/ operator.
(2) Address of facility
(3) Coverage under the IASGP or other individual or general NPDES permits or any applicable waiver issued by the Regional or State Board pertaining to runoff discharges.
(4) A narrative description including Standard Industrial Classification (SIC) System/ North American Industry Classification System (NAICS) codes that best describe the industrial activities performed and principal products used at each facility and status of exposure to storm water.

(c) The Regional Water Board recommends that Permittees include additional fields of information, such as material usage and/ or industrial output, and discrepancies between SIC System/ NAICS Code designations (as reported by facility operators) and identify the actual type of industrial activity that has the potential to pollute storm water. In addition, the Regional Water Board recommends the use of an automated database system, such as a Geographical Information System (GIS) or Internet-based system.

(d) Each Permittee shall update its inventory of critical sources at least annually. The update may be accomplished through collection of new information obtained through field activities or through other readily available inter and intra-agency informational databases (e.g. business licenses, pretreatment permits, sanitary sewer hook-up permits, and similar information).

2. Inspect Critical Sources

(a) Commercial Facilities

Permittee shall inspect all facilities identified in subpart 4.D.1. twice during the 5-year term of the Order, provided that the first inspection occurs no later than (2 years after Order adoption date). A minimum interval of 6 months between the first and the second mandatory compliance inspection is required. In addition, each Permittee shall implement the activities outlined in the following subparts. At each facility, inspectors shall verify that the operator is implementing the source control BMPs. The Permittees may require implementation of additional BMPs where storm water flows from the MS4 discharge to an environmentally sensitive area (ESA, see Part 6 for definition) or a CWA § 303(d) listed waterbody (see subpart 3(b) below).

(1) Restaurants-
Level of inspections: Each Permittee shall inspect all restaurants within its jurisdiction to confirm that storm water BMPs are being effectively implemented in compliance with State law, County and municipal ordinances. BMPs in Table 2 (BMPs at Restaurants) shall be implemented, unless the pollutant generating activity does not occur.

Table 2 - BMPs at Restaurants

Pollutant-Generating Activity	BMP Narrative Description	2003 California Stormwater BMP Handbook Industrial and Commercial BMP Identification #
Waste/ Hazardous Materials Storage, Handling and Disposal	Implementation of effective storage, handling and disposal procedures for hazardous materials.	By Municipality
Unauthorized Non-Storm Water Discharges	Effective elimination of non-storm water discharges.	SC-10
Accidental Spills/ Leaks	Implementation of effective spills/ leaks prevention and response procedures.	SC-11
Outdoor Storage of Raw Materials	Implementation of effective source control practices and structural devices.	SC-33
Storage and Handling of Solid Waste	Implementation of effective solid waste storage/ handling practices and appropriate control measures	SC-34
Parking/ Storage Area Maintenance	Implementation of effective parking/ storage area designs and housekeeping/ maintenance practices	SC-43
Storm Water Conveyance System Maintenance	Implementation of proper conveyance system operation and maintenance protocols.	SC-44

(2) Automotive Service Facilities-

Level of Inspection: Each Permittee shall confirm that BMPs are being effectively implemented at each facility within its jurisdiction, in compliance with County and municipal ordinances. The inspections shall verify that BMPs in Table 3 (BMPs at Automotive Service Facilities) are being implemented, unless the pollutant generating activity does not occur.

Table 3 - BMPs at Automotive Service Facilities

Pollutant-Generating Activity	**BMP Narrative Description**	**2003 California Stormwater BMP Handbook Industrial and Commercial BMP Identification #**
Unauthorized Non-Storm Water Discharges	Effective elimination of non-storm water discharges.	SC-10
Accidental Spills/ Leaks	Implementation of effective spills/ leaks prevention and response procedures.	SC-11
Vehicle/ Equipment Fueling	Implementation of effective fueling source control devices and practices.	SC-20
Vehicle/ Equipment Cleaning	Implementation of effective equipment/ vehicle cleaning practices and appropriate wash water management practices	SC-21
Vehicle/ Equipment Repair	Implementation of effective vehicle/ equipment repair practices and source control devices.	SC-22
Outdoor Liquid Storage	Implementation of effective outdoor liquid storage source controls and practices.	SC-31
Outdoor Storage of Raw Materials	Implementation of effective source control practices and structural devices.	SC-33
Storage and Handling of Solid Waste	Implementation of effective solid waste storage/ handling practices and appropriate control measures	SC-34
Parking/ Storage Area Maintenance	Implementation of effective parking/ storage area designs and housekeeping/ maintenance practices	SC-43
Storm Water Conveyance System Maintenance Practices	Implementation of proper conveyance system operation and maintenance protocols.	SC-44

(3) Retail Gasoline Outlets and Automotive Dealerships-
Level of Inspections: Each Permittee shall confirm that BMPs are being effectively implemented at each facility within its jurisdiction, in compliance with County and municipal ordinances. The inspections shall verify that BMPs in Table 4 (BMPs at Retail Gasoline Outlets) are being implemented, unless the pollutant generating activity does not occur.

Table 4 - BMPs at Retail Gasoline Outlets

Pollutant-Generating Activity	**BMP Narrative Description**	**2003 California Stormwater BMP Handbook Industrial and Commercial BMP Identification #**
Unauthorized Non-Storm Water Discharges	Effective elimination of non-storm water discharges.	SC-10
Accidental Spills/ Leaks	Implementation of effective spills/ leaks prevention and response procedures.	SC-11
Vehicle/ Equipment Fueling	Implementation of effective fueling source control devices and practices.	SC-20
Vehicle/ Equipment Cleaning	Implementation of effective wash water control devices.	SC-21
Outdoor Storage of Raw Materials	Implementation of effective source control practices and structural devices.	SC-33
Storage and Handling of Solid Waste	Implementation of effective solid waste storage/ handling practices and appropriate control measures	SC-34
Building and Grounds Maintenance	Implementation of effective facility maintenance practices.	SC-41
Parking/ Storage Area Maintenance	Implementation of effective parking/ storage area designs and housekeeping/ maintenance practices	SC-43

(4) Commercial Nurseries and Nursery Centers (Merchant Wholesalers, Nondurable Goods, and Retail Trade)-

Level of Inspection: Each Permittee shall confirm that BMPs are being effectively implemented at each facility within its jurisdiction, in compliance with County and municipal ordinances. The inspections shall verify that BMPs in Table 5 (BMPs at Nurseries) are being implemented, unless the pollutant generating activity does not occur.

Table 5 - BMPs at Nurseries

Pollutant-Generating Activity	BMP Narrative Description	2003 California Stormwater BMP Handbook Industrial and Commercial BMP Identification #
Unauthorized Non-Storm Water Discharges	Effective elimination of non-storm water discharges.	SC-10
Outdoor Loading/ Unloading	Implementation of effective outdoor loading/ unloading practices.	SC-30
Outdoor Liquid Storage	Implementation of effective outdoor liquid storage source controls and practices.	SC-31
Outdoor Equipment Operations	Implementation of effective outdoor equipment source control devices and practices.	SC-32
Outdoor Storage of Raw Materials	Implementation of effective source control practices and structural devices.	SC-33
Building and Grounds Maintenance	Implementation of effective facility maintenance practices.	SC-41

(b) Industrial Facilities

Each Permittee shall conduct compliance inspections as specified below.

(1) **Frequency of Inspection**

(A) Each Permittee shall perform an initial inspection at all industrial facilities identified by the U.S. EPA in 40 CFR 122.26(c) no later than (2 years after Order adoption date). After the initial inspection, all facilities determined as having exposure of industrial activities to storm water are subject to a second mandatory compliance inspection. A minimum interval of 6 months between the first and the second compliance inspection is required.

(B) Following the first mandatory compliance inspection, a Permittee shall perform a second mandatory compliance inspection yearly at a minimum of 20% of the facilities determined not to have exposure of industrial activities to storm water. The purpose of this inspection is to verify the continuity of the no exposure status. Facilities determined

as having exposure will be notified that they must obtain coverage under the IASGP. A facility need not be inspected more than twice during the term of the Order unless subject to an enforcement action. A minimum interval of 6 months in between the first and the second compliance inspection is required.

(C) Applicable to all facilities: A Permittee need not inspect facilities that have been inspected by the Regional Water Board within the previous 24 month interval. However, if the Regional Water Board performed only one inspection, the Permittee shall conduct the second required mandatory compliance inspection.

(2) **Level of Inspection:** Each Permittee shall confirm that each operator:

(A) Has a current Waste Discharge Identification (WDID) number for facilities discharging storm water associated with industrial activity, and that a Storm Water Pollution Prevention Plan (SWPPP) is available on-site.

(B) Is effectively implementing BMPs in compliance with County and municipal ordinances. Facilities must implement the source control BMPs identified in subpart 4.D.2. and Appendix D, *California Stormwater Industrial and Commercial BMP Handbook (2003)*; or

(C) Has applied and has a current No Exposure Certification (and WDID number) for facilities subject to this requirement.

3. Ensure Compliance of Critical Sources

(a) **BMP Implementation:** Facilities must implement the source control BMPs identified in Part 4.D.2. and, as applicable, Appendix D, *California Stormwater Industrial and Commercial BMP Handbook (2003)*. In the event that a Permittee determines that a BMP is infeasible at any site, the Permittee shall require implementation of similar BMPs that will achieve the equivalent reduction of pollutants in the storm water discharges. Likewise, for those BMPs that are not protective of water quality standards, Permittees may require additional site-specific controls.

(b) **Environmentally Sensitive Areas (ESAs) and Impaired Waters:** For critical sources that discharge to MS4s that directly discharge to ESAs or to CWA § 303(d) listed impaired waterbodies, the Permittees shall require operators to implement additional pollutant specific controls to reduce pollutants in storm water runoff that are causing or contributing to exceedances of water quality objectives. A Regional Water Board approved TMDL Implementation Plan for the receiving water will substitute for this requirement.

(c) **Progressive Enforcement:** Each Permittee shall implement a progressive enforcement policy to ensure that facilities are brought into compliance with all storm water requirements within a reasonable time period as specified below.

(1) In the event that a Permittee determines, based on an inspection conducted, that an operator has failed to adequately implement all necessary BMPs, that Permittee shall take progressive enforcement actions which, at a minimum,

shall include a follow-up inspection within 4 weeks from the date of the initial inspection.

(2) In the event that a Permittee determines that an operator has failed to adequately implement BMPs after a follow-up inspection, that Permittee shall take enforcement action as established through authority in its municipal code and ordinances or through the judicial system.

(3) Each Permittee shall maintain records and make them available on request to the Regional Water Board, including inspection reports, warning letters, notices of violations, and other enforcement records, demonstrating a good faith effort to bring facilities into compliance.

4. Interagency Coordination

(a) **Referral of Violations of the Municipal Storm Water Ordinances and California Water Code § 13260:** A Permittee may refer a violation(s) of § 13260 by Industrial and Commercial facilities to the Regional Water Board provided that under its municipal storm water ordinance the Permittee has made a good faith effort of progressive enforcement. At a minimum, a Permittee's good faith effort must be documented with:

(1) Two follow-up inspections
(2) Two warning letters or notices of violation

(b) **Referral of Violations of the Industrial Activities Storm Water General Permit (IASGP), including Requirements to File a Notice of Intent or No Exposure Certification:** For those facilities in violation of the municipal storm water ordinance and subject to the IASGP, Permittees may escalate referral of such violations to the Regional Water Board (electronically on a quarterly basis to the Regional Water Board's Storm Water Site at MS4stormwaterrb4@waterboards.ca.gov) after one inspection and one written notice (copied to the Regional Water Board) to the operator regarding the violation. In making such referrals, Permittees shall include, at a minimum, the following documentation:

(1) Name of the facility
(2) Operator of the facility
(3) Owner of the facility
(4) WDID Number (if applicable)
(5) Industrial activity being conducted at the facility that is subject to the IASGP
(6) Records of communication with the facility operator regarding the violation, which shall include at least an inspection report
(7) The written notice of the violation copied to the Regional Water Board

(c) **Investigation of Complaints Regarding Facilities – Transmitted by the Regional Water Board Staff:** Each Permittee shall initiate, within one business day,[1] investigation of complaints (other than non-storm water discharges) to the MS4 from facilities within its jurisdiction. The initial investigation shall include, at a minimum, a limited inspection of the facility to confirm the complaint to determine if the facility is effectively complying with the municipal storm water urban runoff ordinances and, if necessary, to oversee corrective action.

(d) **Assistance of Regional Water Board Enforcement Actions:** As directed by the Regional Water Board Executive Officer, Permittees shall assist Regional Water Board enforcement actions by: helping in identification of current owners, operators, and lessees of facilities; providing staff, when available, for joint inspections with Regional Water Board inspectors; appearing as witnesses in Regional Water Board enforcement hearings; and providing copies of inspection reports and other progressive enforcement documentation.

(e) **Participation in a Task Force:** The Permittees shall participate with the Regional Water Board, and other public agencies on an enforcement task force such as the Storm Water Task Force, to communicate concerns regarding special cases of storm water violations by industrial and commercial facilities and to develop a coordinated approach to enforcement action.

E. Planning and Land Development Program

I. Purpose

1. The Permittees shall implement a Planning and Land Development Program pursuant to part 4.E. for all New Development and Redevelopment projects subject to this Order to:
   (a) Lessen the water quality impacts of development by using smart growth practices such as compact development, directing development towards existing communities via infill or redevelopment, safeguarding of environmentally sensitive areas, mixing of land uses (e.g., homes, offices, and shops), transit accessibility, and better pedestrian and bicycle amenities.
   (b) Minimize the adverse impacts from storm water runoff on the biological integrity of Natural Drainage Systems and the beneficial uses of waterbodies in accordance with requirements under CEQA (Cal. Pub. Resources Code § 21100).
   (c) Minimize the percentage of effective impervious surfaces on land developments to mimic predevelopment water balance through infiltration, evapotranspiration and reuse.

[1] Permittees may comply with the Permit by taking initial steps (such as logging, prioritizing, and tasking) to "initiate" the investigation within that one business day. However, the Regional Water Board would expect that the initial investigation, including a site visit, to occur within four business days.

(d) Minimize pollutant loadings from impervious surfaces such as roof-tops, parking lots, and roadways through the use of properly designed, technically appropriate BMPs (including Source Control BMPs such as good housekeeping practices), Low Impact Development Strategies, and Treatment Control BMPs.
(e) Properly select, design and maintain Treatment Control BMPs and Hydromodification Control BMPs to address pollutants that are likely to be generated, assure long-term function, and to avoid the breeding of vectors.[1]
(f) Prioritize the selection of BMPs suites to remove storm water pollutants, reduce storm water runoff volume, and beneficially reuse storm water to support an integrated approach to protecting water quality and managing water resources in the following order of preference:
  (1) Infiltration BMPs
  (2) BMPs that store and reuse storm water runoff.
  (3) BMPs that incorporate vegetation to promote pollutant removal and runoff volume reduction and integrate multiple uses
  (4) BMPs which percolate runoff through engineered soil and allow it to discharge downstream slowly
  (5) Approved modular/ proprietary treatment control BMPs that are based on LID concepts and that meet pollution removal goals

II. Applicability

1. New Development Projects.
(a) Development projects subject to Permittee conditioning and approval for the design and implementation of post-construction controls to mitigate storm water pollution, prior to completion of the project(s), are:
  (1) All development projects equal to 1 acre or greater of disturbed area and adding more than 10,000 square feet of impervious surface area
  (2) Industrial park 10,000 square feet or more of surface area
  (3) Commercial strip mall 10,000 square feet or more of impervious surface area
  (4) Retail gasoline outlet 5,000 square feet or more of surface area
  (5) Restaurant (SIC 5812) 5,000 square feet or more of surface area
  (6) Parking lot 5,000 square feet or more of impervious surface area, <u>or</u> with 25 or more parking spaces
  (7) Streets, roads, highways, and freeway construction of 10,000 square feet or more of impervious surface area shall incorporate USEPA guidance regarding Managing Wet Weather with Green Infrastructure: Green Streets to the maximum extent practicable.
  (8) Automotive service facilities (SIC 5013, 5014, 5511, 5541, 7532-7534 and 7536-7539) [5,000 square feet or more of surface area]

[1] Treatment BMPs when designed to drain within 72 hours of the end of rainfall minimize the potential for the breeding of vectors.

(9) Redevelopment projects in subject categories that meet Redevelopment thresholds (identified in subpart E.II.2 below)

(10) Projects located in or directly adjacent to, or discharging directly to an Environmentally Sensitive Area (ESA), where the development will:
- (A) Discharge storm water runoff that is likely to impact a sensitive biological species or habitat; and
- (B) Create 2,500 square feet or more of impervious surface area

(11) Single-family hillside homes. To the extent that a Permittee may lawfully impose conditions, mitigation measures or other requirements on the development or construction of a single-family home in a hillside area as defined in the applicable Permittee's Code and Ordinances, each Permittee shall require that during the construction of a single-family hillside home, the following measures to be implemented:
- (A) Conserve natural areas
- (B) Protect slopes and channels
- (C) Provide storm drain system stenciling and signage
- (D) Divert roof runoff to vegetated areas before discharge unless the diversion would result in slope instability
- (E) Direct surface flow to vegetated areas before discharge unless the diversion would result in slope instability

2. Redevelopment Projects

(a) Redevelopment projects subject to Permittee conditioning and approval for the design and implementation of post-construction controls to mitigate storm water pollution, prior to completion of the project(s), are:
- (1) Land-disturbing activity that results in the creation or addition or replacement of 5,000 square feet or more of impervious surface area on an already developed site on development categories identified in subpart 4.E.III.1.
- (2) Where Redevelopment results in an alteration to more than fifty percent of impervious surfaces of a previously existing development, and the existing development was not subject to post development storm water quality control requirements, the entire project must be mitigated.
- (3) Where Redevelopment results in an alteration to less than fifty percent of impervious surfaces of a previously existing development, and the existing development was not subject to post development storm water quality control requirements, only the alteration must be mitigated, and not the entire development.

(b) Redevelopment does not include routine maintenance activities that are conducted to maintain original line and grade, hydraulic capacity, original purpose of facility or emergency redevelopment activity required to protect public health and safety. Impervious surface replacement, such as the reconstruction of parking lots and roadways which does not disturb additional area and maintains the original grade and alignment, is considered a routine maintenance activity. Redevelopment does not include the repaving of existing roads to maintain original line and grade.

(c) Existing single-family dwelling and accessory structures are exempt from the Redevelopment requirements unless such projects create, add, or replace 10,000 square feet of impervious surface area.

3. Effective Date –The New Development and Redevelopment requirements contained in Section E of the Order shall begin (90 calendar days) after Regional Water Board Executive Officer approval of the changes to the Technical Guidance Manual needed to comply with this permit. After that date all discretionary permit projects or project phases that have not been deemed complete for processing, or discretionary permit projects without vesting tentative maps that have not requested and received an extension of previously granted approvals must comply with the requirements in Section E. Projects that have been deemed complete prior to the update of the technical design manual are not subject to this section. For Permittee's projects the effective date shall be the date the governing body or their designee approves initiation of the project design.

III. New Development/ Redevelopment Performance Criteria

1. Integrated Water Quality/ Flow Reduction/Resources Management Criteria
   (a) Except as provided in subpart 4.E.III.1.(c) below, Permittees shall require all New Development and Redevelopment projects identified in subpart 4.E.II to control pollutants, pollutant loads, and runoff volume emanating from impervious surfaces through infiltration, storage for reuse, evapotranspiration, or bioretention/ biofiltration by reducing the percentage of Effective Impervious Area (EIA) to 5 percent or less of the total project area.
   (b) Impervious surfaces may be rendered "ineffective", and thus not count toward the 5 percent EIA limitation, if the stormwater runoff from those surfaces is fully retained on-site for the design storm event specified in provision (c), below. To satisfy the EIA limitation and low-impact development requirements, the permittees must require stormwater runoff to be infiltrated, reused, or evapotranspired on-site through a stormwater management technique allowed under the terms of this permit and implementing documents. If on-site retention is determined to be technically infeasible pursuant to 4.E.III.2(b), an on-site biofiltration system that achieves equivalent stormwater volume and pollutant load reduction as would have been achieved by on-site retention shall satisfy the EIA limitation. An on-site biofiltration system that releases above the design volume shall achieve 1.5 times the amount of stormwater volume and pollutant load reduction as would have been achieved by on-site retention and, thereby, shall satisfy the EIA limitation.
   (c) The permittees shall require all features constructed or otherwise utilized to render impervious surfaces "ineffective", as described in provision (b), above, to be properly sized to infiltrate, store for reuse, or evapotranspire, without any runoff at least the volume of water, or in the case of biofiltration with release above the design volume, 1.5 times the volume of water, that results from:

(1) The 85th percentile 24-hour runoff event determined as the maximized capture stormwater volume for the area using a 48 to 72-hour draw down time, from the formula recommended in Urban Runoff Quality Management, WEF Manual of Practice No. 23/ASCE Manual of Practice No. 87, (1998);
(2) The volume of annual runoff based on unit basin storage water quality volume, to achieve 80 percent or more volume treatment by the method recommended in the Ventura County Technical Guidance Manual for Storm Water Quality Control Measures (July 2002 and its revisions); or
(3) The volume of runoff produced from a 0.75 inch storm event.

(d) To address any impervious surfaces that may not be rendered "ineffective", surface discharge of stormwater runoff if any, that results from New Development and Redevelopment projects identified in subpart 4.E.II which have complied with subparts 4.E.III.1.(a)-(c), above, shall be mitigated in accordance with subpart 4.E.III.4.

2. Alternative Compliance for Technical Infeasibility

(a) To encourage smart growth and infill development of existing urban centers where on-site compliance with post-construction requirements may be technically infeasible, the permittees may allow projects that are unable to meet the Integrated Water Quality/Flow Reduction/Resources Management Criteria in subpart 4.E.III.1, above, to comply with this permit through the alternative compliance measures described in subpart 4.E.III.2.(c), below.

(b) To utilize alternative compliance measures, the project applicant must demonstrate that compliance with the applicable post-construction requirements would be technically infeasible by submitting a site-specific hydrologic and/or design analysis conducted and endorsed by a registered professional engineer, geologist, architect, and/or landscape architect. Technical infeasibility may result from conditions including the following:
(1) Locations where seasonal high groundwater is within 5 feet of the surface
(2) Locations within 100 feet of a groundwater well used for drinking water
(3) Brownfield development sites or other locations where pollutant mobilization is a documented concern
(4) Locations with potential geotechnical hazards
(5) Smart growth and infill or redevelopment locations where the density and/ or nature of the project would create significant difficulty for compliance with the on-site volume retention requirement
(6) Other site or implementation constraints identified in the LID Technical Guidance document required by subpart 4.E.IV.4.

(c) Alternative Compliance Measures. When a permittee finds that a project applicant has demonstrated technical infeasibility, the permittee shall identify alternative compliance measures that the project will need to comply with as a substitute for the otherwise applicable post-construction requirements listed in subparts 4.E.III.1.(a)-(c) of this permit. The Ventura County Technical Guidance Manual shall be revised to identify the alternative compliance measures and shall include the following requirement:

(1) Minimum on-site requirement. The project must take all feasible measures to reduce the percentage of Effective Impervious Area to no more than 30 percent of the total project area and treat all remaining runoff pursuant to the design and sizing requirements of subparts 4.E.III.1.(b)-(d).

(2) Offsite mitigation volume. The difference in volume between the amount of stormwater infiltrated, reused, and/ or evapotranspired and/or biofiltered by the project on-site and the otherwise applicable requirements of subparts 4.E.III.1.(a)-(c) (the "offsite mitigation volume'), above, must be mitigated by the project applicant either by performing offsite mitigation that is approved by the permittee or by providing sufficient funding for public or private offsite mitigation to achieve equivalent stormwater volume and pollutant load reduction through infiltration, reuse, evapotranspiration and/ or biofiltration.

- For projects with demonstrable technical infeasibility that cannot reduce the Effective Impervious Area to 5% or less of the total project, but are able to reduce the Effective Impervious Area to no more than 30 percent of the total project, mitigation or payment in lieu must be equivalent to the amount of stormwater not managed on site.
- For projects with demonstrable technical infeasibility that cannot reduce the Effective Impervious Area to 30% of the total project or less, mitigation or payment in lieu must be for 1.5 times the amount of stormwater not managed on site

(3) Location of off site mitigation. Offsite mitigation projects must be located in the same sub-watershed (defined as draining to the same hydrologic area in the Basin Plan) as the new development or redevelopment project. A list of eligible public and private offsite mitigation projects available for funding shall be identified by the Permittees and provided to the project applicant. Off site mitigation projects include green streets projects, parking lot retrofits, other site specific LID BMPs, and regional BMPs. Project applicants seeking to utilize these alternative compliance provisions may propose other offsite mitigation projects, which the Permittees may approve if they meet the requirements of this subpart.

(4) Timing and Reporting Requirements for Offsite Mitigation Projects. The Permittee(s) shall develop a schedule for the completion of offsite mitigation projects, including milestone dates to identify fund, design, and construct the projects. Offsite mitigation projects shall be completed as soon as possible, and at the latest, within 4 years of the certificate of occupancy for the first project that contributed funds toward the construction of the offsite mitigation project, unless a longer period is otherwise authorized by the Executive Officer. For public offsite mitigation projects, the permittees must provide in their annual reports a summary of total offsite mitigation funds raised to date and a description (including location, general design concept, volume of water expected to be retained, and total estimated budget) of all pending public offsite mitigation projects. Funding sufficient to address the offsite mitigation volume must be

transferred to the permittee (for public offsite mitigation projects) or to an escrow account (for private offsite mitigation projects) within one year of the initiation of construction.

(5) The project applicant must demonstrate that the EIA achieved on-site is as close to 5 percent EIA as technically feasible, given the site's constraints.

(d) Watershed equivalence. Regardless of the methods through which permittees allow project applicants to implement alternative compliance measures, the sub-watershed -wide (defined as draining to the same hydrologic area in the Basin Plan) result of all development must be at least the same level of water quality protection as would have been achieved if all projects utilizing these alternative compliance provisions had complied with subparts 4.E.III.1.(a)-(d) of the permit. The permittees shall provide in their annual report to the Regional Board a list of mitigation project descriptions and pollutant and flow reduction analyses (compiled from design specifications submitted by project applicants and approved by the permittee(s)) comparing the expected aggregate results of alternative compliance projects to the results that would otherwise have been achieved by meeting the 5 percent EIA requirement on-site.

3. Hydromodification (Flow/ Volume/ Duration) Control Criteria

(a) Each Permittee shall require all New Development and Redevelopment projects identified in subpart 4.E.II to implement hydrologic control measures, to prevent accelerated downstream erosion and to protect stream habitat in natural drainage systems. The purpose of the hydrologic controls is to minimize changes in post-development hydrologic storm water runoff discharge rates, velocities, and duration. This shall be achieved by maintaining the project's pre-project storm water runoff flow rates and durations.

(1) Description

(A) Hydromodification control in natural drainage systems shall be achieved by maintaining the Erosion Potential (E_p) in streams at a value of 1, unless an alternative value can be shown to be protective of the natural drainage systems from erosion, incision, and sedimentation that can occur as a result of flow increases from impervious surfaces and damage stream habitat (see Attachment "E" - Determination of Erosion Potential)

(B) Hydromodification control may include one, or a combination of on-site, regional subregional hydromodification control BMPs, LID strategies, or stream restoration measures, with preference given to LID strategies and hydromodification control BMPs. Any in-stream restoration measure shall not adversely affect the beneficial uses of the natural drainage systems

(C) Natural drainage systems, which include unlined or unimproved (not engineered) creeks, streams, rivers and their tributaries, are located in the following watersheds:

(i) Ventura River

(ii) Santa Clara River

(iii) Calleguas Creek
(iv) Malibu Creek
(v) Miscellaneous Ventura Coastal

(D) The Southern California Storm Water Monitoring Coalition (SMC) is developing a regional methodology to eliminate or mitigate the adverse impacts of hydromodification as a result of urbanization, including hydromodification assessment and management tools.
(i) The SMC has identified the following objectives for the Hydromodification Control Study (HCS):
(I) Establishment of a stream classification for Southern California streams
(II) Development of a deterministic or predictive relationship between changes in watershed impervious cover and stream-bed/ stream bank enlargement
(III) Development of a numeric model to predict stream-bed/ stream bank enlargement and evaluate the effectiveness of mitigation strategies

(E) The Permittees shall participate in the SMC HCS to develop:
(i) A regional stream classification system
(ii) A numerical model to predict the hydrological changes resulting from new development
(iii) A numerical model to identify effective mitigation strategies

(F) Until the completion of the SMC HCS, Permittees shall implement the Interim Hydromodification Control Criteria, described in subpart 4.E.III.3(a)(3)(A) below, to control the potential adverse impacts of changes in hydrology that may result from new development and redevelopment projects identified in subpart 4.E.II

(G) Existing single-family structures are exempt from the Hydromodification control requirements unless such projects disturb one acre or more of land or create, add, or replace 10,000 square feet or more of impervious surface area

(2) Exemptions to Hydromodification Controls. Permittees may exempt the following New Development and Redevelopment projects from implementation of Hydromodification controls where assessments of downstream channel conditions and proposed discharge hydrology indicate that adverse Hydromodification effects to present and future beneficial uses of Natural Drainage Systems are unlikely:
(A) All projects that disturb less than one acre.
(B) Projects that are replacement, maintenance or repair of a Permittee's existing flood control facility, storm drain, or transportation network.
(C) Redevelopment Projects in the Urban Core that do not increase the effective impervious area or decrease the infiltration capacity of pervious areas compared to the pre-project conditions.

(D) Projects that have any increased discharge go directly or via a storm drain to a sump, lake, area under tidal influence, into a waterway that has a 100-year peak flow (Q100) of 25,000 cfs or more, or other receiving water that is not susceptible to Hydromodification impacts;

(E) Projects that discharge directly or via a storm drain into concrete or improved (not natural) channels (e.g., rip rap, sackcrete, etc.), which, in turn, discharge into receiving water that is not susceptible to Hydromodification impacts (as in D above).

(3) Interim Hydromodification Control Criteria

(A) The Interim Hydromodification Control Criteria to protect natural drainage systems until Permittees complete Hydromodification Control Plans (HCPs), described in subpart 4.E.III.3(a)(4) below, are as follows:

(i) **Projects disturbing land area of less than fifty acres** will be subject to LID and/or source or treatment BMPs as addressed in this permit. The combined effects of LID and the treatment BMPs are considered adequate for Hydromodification control for projects that disturb less than 50 acres.

(ii) **Projects disturbing land areas of fifty acres or greater** Projects in this category shall develop and implement a Hydromodification Analysis Study (HAS) that demonstrates that post development conditions are expected to approximate the pre-project erosive effect of sediment transporting flows in receiving waters. The HAS must lead to the incorporation into the project design features intended to approximate, to the extent feasible, an Erosion Potential value of 1 or any alternative value that can be shown to be protective of the natural drainage systems from erosion, incision, and sedimentation that can occur as a result of flow increases from impervious surfaces and damage stream habitat in natural drainage systems, or

(I) Alternatively, project proponents in this category may elect to develop, in partnership with Permittees, an equivalent implementation method based on flow duration control in the form of nomographs relating planned impervious area and local soil type (infiltration rates) to determine hydromodification control BMP volume and land area requirements for the proposed project. The nomographs shall be derived from continuous simulation modeling using Ventura County specific rain gauge records and soil types, and calibrated using data from a local undeveloped watershed with similar conditions; or

(II) Alternatively, the Co-Permittees may revise the Ventura County Technical Guidance Manual for Stormwater

Quality Control Measures to address projects that disturb more than 50 acres.

(4) Final Criteria

(A) The Permittees shall develop and implement watershed specific HCPs no later than (180 days) after the completion of the SMC HCS.

(i) The HCP shall identify:

(I) Stream classifications

(II) Flow rate and duration control methods

(III) Sub-watershed mitigation strategies

(IV) Stream restoration measures, which will maintain the stream and tributary Erosion Potential at 1 unless an alternative value can be shown to be protective of the natural drainage systems from erosion, incision, and sedimentation that can occur as a result of flow increases from impervious surfaces and damage stream habitat in natural drainage system tributaries

(B) The HCP shall contain the following elements:

(i) Hydromodification Management Standards

(ii) Natural Drainage Areas and Hydromodification Management Control Areas

(iii) New Development and Redevelopment Projects subject to the HCP

(iv) Description of authorized Hydromodification Management Control BMPs

(v) Hydromodification Management Control BMP Design Criteria.

(vi) For flow duration control methods, the range of flows to control for, and goodness of fit criteria

(vii) Allowable low critical flow, Q_c, which initiates sediment transport

(viii) Description of the approved Hydromodification Model.

(ix) Any alternate Hydromodification Management Model and Design

(x) Stream Restoration Measures Design Criteria

(xi) Monitoring and Effectiveness Assessment

(xii) Record Keeping

(C) The HCP shall be deemed in effect upon Executive Officer approval.

4. Water Quality Mitigation Criteria

(a) Each Permittee shall require all New Development and Redevelopment projects identified in subpart 4.E.II to implement post-construction storm water treatment BMPs and control measures to mitigate storm water pollution as follows:

(1) Projects disturbing land areas less than 50 acres

(A) Volumetric Treatment Control BMP

(i) The 85th percentile 24-hour runoff event determined as the maximized capture storm water volume for the area using a 48 to

72-hour draw down time, from the formula recommended in *Urban Runoff Quality Management, WEF Manual of Practice No. 23/ASCE Manual of Practice No. 87, (1998)*; or

(ii) The volume of annual runoff based on unit basin storage water quality volume, to achieve 80 percent or more volume treatment by the method recommended in the Ventura County Technical Guidance Manual for Storm Water Quality Control Measures (July 2002 and its revisions); or

(iii) The volume of runoff produced from a 0.75 inch storm event, prior to its discharge to a storm water conveyance system;[1] and/ or

(B) Flow Based Treatment Control BMP

(i) The flow of runoff produced from a rain event equal to at least 0.2 inches per hour intensity; or

(ii) The flow of runoff produced from a rain event equal to at least 2 times the 85th percentile hourly rainfall intensity as determined from local rainfall records; or

(iii) Eight percent of the 50-year storm design flow rate as determined from the method recommended in the Ventura County Technical Guidance Manual for Storm Water Quality Control Measures (July 2002 and its revisions)

(2) Projects disturbing land area of 50 acres or greater

(A) Eighty percent of the average runoff volume using an appropriate public domain continuous flow model (such as Storm Water Management Model (SWMM) or Hydrologic Engineering Center – Hydrologic Simulation Program – Fortran (HEC-HSPF), using the local rainfall record and relevant BMP Performance data.

IV. Implementation

1. Maintenance Agreement and Transfer

(a) Prior to issuing approval for final occupancy each Permittee shall require that all new development and redevelopment projects subject to post-construction BMP requirements provide an operation and maintenance plan and verification of ongoing maintenance provisions for LID practices, Treatment Control BMPs, and Hydromodification Control BMPs including but not limited to: final map conditions, legal agreements, covenants, conditions or restrictions, CEQA mitigation requirements, conditional use permits, and/ or other legally binding maintenance agreements.

(1) Verification at a minimum shall include the developer's signed statement accepting responsibility for maintenance until the responsibility is legally transferred; and either

[1] This option is available only for construction projects that disturb land area less than 5 acres.

(A) A signed statement from the public entity assuming responsibility for BMP maintenance; or
(B) Written conditions in the sales or lease agreement, which require the property owner or tenant to assume responsibility for BMP maintenance and conduct a maintenance inspection at least once a year; or
(C) Written text in project covenants, conditions, and restrictions (CCRs) for residential properties assigning BMP maintenance responsibilities to the Home Owners Association (HOA); or
(D) Any other legally enforceable agreement or mechanism that assigns responsibility for the maintenance of BMPs.

(b) Each Permittee shall require all development projects subject to post-construction BMP requirements to provide a plan for the operation and maintenance of all structural and treatment controls. The Operation and Maintenance plan shall follow the Technical Guidance Manual Appendix D "Maintenance Plan Guidance" (or subsequent guidance manual) for each BMP component. The plan shall be submitted for examination of relevance to keeping the BMPs in proper working order. Where BMPs are transferred to Permittee for ownership and maintenance, the plan shall also include all relevant costs for upkeep of BMPs in the transfer. Operation and Maintenance plans for private BMPs shall be kept on-site for periodic review by Permittee inspectors.

2. Tracking, Inspection, and Enforcement of Post-Construction BMPs

(a) Each Permittee shall implement a tracking system and an inspection and enforcement program for new development and redevelopment post-construction storm water BMPs as set forth in part 4.E. no later than (one year after Order adoption date).

(1) Implement a GIS or other electronic system for tracking projects that have been conditioned for post-construction BMPs. The electronic system, at a minimum, should contain the following information:

(A) Municipal Project ID
(B) State WDID No
(C) Project Acreage
(D) BMP Type and Description
(E) BMP Location (coordinates)
(F) Date of Acceptance
(G) Date of Maintenance Agreement
(H) Maintenance Records
(I) Inspection Date and Summary
(J) Corrective Action
(K) Date Certificate of Occupancy Issued
(L) Replacement or Repair Date

(b) Inspect all development sites upon completion of construction and prior to the issuance of occupancy certificates to ensure proper installation of LID measures,

structural BMPs, treatment control BMPs and Hydromodification control BMPs. The inspection may be combined with other inspections provided it is conducted by trained personnel.

(c) Verify proper maintenance and operation of post-construction BMPs previously approved for new development and redevelopment and operated by the Permittees. The post construction BMP maintenance inspection program shall incorporate the following elements:
   (1) Post-construction BMP Maintenance Inspection checklist.
   (2) Inspection at least once every 2 years, beginning (Order adoption date), of post-construction BMPs to assess operation conditions with particular attention to:
   (3) Criteria and procedures for post construction Treatment Control and Hydromodification Control BMP repair, replacement, or re-vegetation.

(d) For post construction BMPs operated and maintained by parties other than the Permittees, the Permittees shall require annual reports by the other parties demonstrating proper maintenance and operations.

(e) Undertake enforcement as appropriate based on the results of the inspection.

3. Alternative Post Construction Storm Water Mitigation Programs

(a) A Permittee or a coalition of Permittees may apply to the Regional Water Board for approval of a Redevelopment Project Area Master Plan (RPAMP) for redevelopment projects within the Redevelopment Project Areas, in consideration of exceptional site constraints that inhibit site-by-site or project-by-project implementation of post-construction requirements.

(b) Upon review and a determination by the Regional Water Board Executive Officer that the proposal is technically valid and appropriate, the Regional Water Board may consider for approval such a program if its implementation will:
   (1) Result in equivalent or superior reduction of storm water pollutant loads in comparison to individual projects regulated by this permit.
   (2) Satisfy, on a Redevelopment Project Area-wide basis, the hydromodification criteria of this section.
   (3) Reduce the percentage of Effective Impervious Area (EIA) to a target of 5 percent or less of the Redevelopment Project Area, using properly sized storm water treatment/ collection features, as described in this Section.
   (4) Be fiscally sustainable and have secure funding; and
   (5) Be completed in four years of the adoption date of this permit.

(c) The RPAMP should prioritize the implementation of LID storm water mitigation measures, as described in this section.

(d) A Permittee or a coalition of Permittees may apply to the Regional Water Board for approval of a Redevelopment Project Area Master Plan (RPAMP) that takes into consideration the balancing of water quality protection with the needs for adequate housing, population growth, public transportation and management, land recycling, and urban revitalization.

(e) For the RPAMP to be considered, a technical panel of the Local Government Commission or an equivalent state or regional planning agency must have

reviewed and approved the proposed RPAMP, prior to its submittal to the Regional Water Board. The Regional Water Board Executive Officer may then consider the RPAMP for approval, or elect to submit it to the Regional Water Board for consideration.

(f) The RPAMP, on approval, may substitute in part or wholly for post-construction requirements.

(g) Redevelopment Project Areas include the following:
  (1) City Center areas
  (2) Historic District areas
  (3) Brownfield areas
  (4) Infill Development areas
  (5) Urban Transit Villages
  (6) Any other redevelopment area so designated by the Regional Water Board

(h) Nothing in these provisions shall be construed as to delay the implementation of post-construction control requirements, as approved in this Order.

4. Developer Technical Guidance and Information

(a) The Permittees shall update the Ventura County Technical Guidance Manual for Storm Water Quality Control Measures to include, at a minimum, the following:
  (1) Hydromodification Control criteria described in this Order, including numerical criteria.
  (2) Expected BMP pollutant removal performance including effluent quality (ASCE/ U.S. EPA International BMP Database, CASQA New Development BMP Handbook, technical reports, local data on BMP performance, and the scientific literature appropriate for southern California geography and climate).
  (3) Selection of appropriate BMPs for storm water pollutants of concern.
  (4) Data on Observed Local Effectiveness and performance of implemented BMPs.
  (5) BMP Maintenance and Cost Considerations.
  (6) Guiding principles to facilitate integrated water resources planning and management in the selection of BMPs, including water conservation, groundwater recharge, public recreation, multipurpose parks, open space preservation, and redevelopment retrofits.
  (7) LID principles and specifications, including the objectives and specifications for integration of LID strategies in the areas of:
    (A) Site Assessment.
    (B) Site Planning and Layout.
    (C) Vegetative Protection, Revegetation, and Maintenance.
    (D) Techniques to Minimize Land Disturbance.
    (E) Techniques to Implement LID Measures at Various Scales
    (F) Integrated Water Resources Management Practices.
    (G) LID Design and Flow Modeling Guidance.
    (H) Hydrologic Analysis.
    (I) LID Credits.

(b) Permittees shall update the Technical Guidance Manual within (120 days after Order adoption date).
(c) The Permittees shall facilitate implementation of LID by providing key industry, regulatory, and other stakeholders with information regarding LID objectives and specifications contained in the LID Technical Guidance Section through a training program. The LID training program will include the following:
  (1) LID targeted sessions and materials for builders, design professionals, regulators, resource agencies, and stakeholders
  (2) A combination of awareness on national efforts and local experience gained through LID pilot projects and demonstration projects
  (3) Materials and data from LID pilot projects and demonstration projects including case studies
  (4) Guidance on how to integrate LID requirements into the local regulatory program(s) and requirements
  (5) Availability of the LID Technical Guidance regarding integration of LID measures at various project scales
  (6) Guidance on the relationship among LID strategies, Source Control BMPs, Treatment Control BMPs, and Hydromodification Control requirements
(d) The Permittees shall submit revisions to the Ventura County Technical Guidance Manual to the Regional Water Board for Executive Officer approval.

5. Project Coordination
(a) Each Permittee shall facilitate a process for effective approval of post-construction storm water control measures. The process shall include:
  (1) Detailed BMP review including BMP sizing calculations, BMP pollutant removal performance, and municipal approval; and
  (2) An established structure for communication and delineated authority between and among municipal departments that have jurisdiction over project review, plan approval, and project construction through memoranda of understanding (MOU) or an equivalent agreement.

V. State Statute Conformity

1. California Environmental Quality Act (CEQA) Document Update
(a) Each Permittee shall incorporate into its CEQA process no later than (365 days after Order adoption date) those additional procedures necessary for considering potential storm water quality impacts and providing for appropriate mitigation when preparing and reviewing CEQA documents.
  (1) The procedures shall require consideration of the following:
    (A) Potential impact of project construction on storm water runoff.
    (B) Potential impact of project post-construction activity on storm water runoff.
    (C) Potential for discharge of storm water from areas from material storage, vehicle or equipment fueling, vehicle or equipment

maintenance (including washing), waste handling, hazardous materials handling or storage, delivery areas or loading docks, or other outdoor work areas.

(D) Potential for discharge of storm water to impair the beneficial uses of the receiving waters.

(E) Potential for the discharge of storm water to cause significant harm on the biological integrity of the waterways and waterbodies.

(F) Potential for significant changes in the flow velocity or volume of storm water runoff to cause harm to or impair the beneficial uses of natural drainage systems.

(G) Potential for significant increases in erosion at the project site or surrounding areas.

2. General Plan Update

(a) Each Permittee shall amend, revise or update its General Plan to include watershed and storm water quality and quantity management considerations and policies when any of the following General Plan elements are updated or amended:

(1) Land Use
(2) Housing
(3) Conservation
(4) Open Space

(b) Each Permittee shall provide the Regional Water Board with the draft amendment or revision when a listed General Plan element or General Plan is noticed for comment in accordance with Cal. Govt. Code § 65350 *et seq.*

F. Development Construction Program

(I) Each Permittee shall implement a construction program that prevents illicit construction-related discharges of pollutants into the MS4, implements and maintains structural and non-structural BMPs to reduce pollutants in stormwater runoff from construction sites, reduces construction site discharges of pollutants from the MS4 to the MEP, and prevents construction site discharges from the MS4 from causing or contributing to a violation of water quality standards.

1. BMP Implementation - Construction Sites Less Than One Acre

(a) Each Permittee shall require the implementation of an effective combination of erosion and sediment control BMPs from Table 6 to prevent erosion and sediment loss, and the discharge of construction wastes.[1]

[1] The BMPs are taken from the *California BMP Handbook, Construction, January 2003* and the *Caltrans Stormwater Quality Handbooks, Construction Site Best Management Practices (BMPs) Manual, March 2003*, and addenda.

Table 6 - BMPs at Construction sites less than 1 acre

Minimum Set of BMPs for All Construction Sites	CASQA Handbook	Caltrans Handbook
For Erosion Control		
Scheduling	EC-1	SS-1
Preservation of Existing Vegetation	EC-2	SS-2
Sediment Controls		
Silt Fence	SE-1	SC-1
Sand Bag Barrier	SE-8	SC-8
Stabilized Construction Site Entrance/Exit	TC-1	TC-1
Non-Storm Water Management		
Water Conservation Practices	NS-1	NS-1
Dewatering Operations (Groundwater dewatering only under NPDES Permit No. CAG994004).[1]	NS-2	NS-2
Waste Management		
Material Delivery and Storage	WM-1	WM-1
Stockpile Management	WM-3	WM-2
Spill Prevention and Control	WM-4	WM-4
Solid Waste Management	WM-5	WM-5
Concrete Waste Management	WM-8	WM-8
Sanitary/ Septic Waste Management	WM-9	WM-9

2. BMP Implementation - Construction Sites One Acre but Less than 5 acres.
   (a) Each Permittee shall require the implementation of an effective combination of appropriate erosion and sediment control BMPs from Table 7 in addition to the ones identified in Table 6 to prevent erosion and sediment loss, and the discharge of construction wastes:

Table 7 - BMPs at Construction sites 1 acre or greater but less than 5 acres

BMPs	CASQA Handbook	Caltrans Handbook
For Erosion Control		
Hydraulic Mulch	EC-3	SS-3
Hydroseeding	EC-4	SS-4
Soil Binders	EC-5	SS-5
Straw Mulch	EC-6	SS-6
Geotextiles and Mats	EC-7	SS-7
Wood Mulching	EC-8	SS-8
Sediment Controls		
Fiber Rolls	SE-5	SC-5
Gravel Bag Berm	SE-6	SC-6
Street Sweeping and/ or Vacuum	SE-7	SC-7
Storm Drain Inlet Protection	SE-10	SC-10
Additional Controls		
Wind Erosion Controls	WE-1	WE-1

[1] Ponded storm water may be discharged at a concentration of Total Suspended Solids (TSS) of 100mg/L or less.

BMPs	CASQA Handbook	Caltrans Handbook
Stabilized Construction Entrance/ Exit	TC-1	TC-1
Stabilized Construction Roadway	TC-2	TC-2
Entrance/ Exit Tire Wash	TC-3	TC-3
Non-Storm Water Management		
Vehicle and Equipment Washing	NS-8	NS-8
Vehicle and Equipment Fueling	NS-9	NS-9

3. BMP Implementation - Construction Sites 5 acres and Greater
   (a) Each Permittee shall require the implementation of an effective combination of the following BMPs in Table 8 (BMPs at Construction sites 5 acres or greater) in addition to the ones identified in Table 6 (BMPs at Construction sites less than 1 acre) and Table 7 (BMPs at Construction sites 1acre or greater but less than 5 acres) at all construction sites 5 acres and greater to prevent erosion and sediment loss, and the discharge of construction wastes. Erosion control BMPs shall be preferred to sediment control BMPs.

Table 8 - BMPs at Construction sites 5 acres or greater

BMPs	CASQA Handbook	Caltrans Handbook
Sediment Controls		
Sediment Basin	SE-2	SC-2
Check Dam	SE-4	SC-4
Tracking Control BMPs		
Stabilized Construction Entrance/ Exit	TR-1	TC-1
Non-Storm Water Management		
Vehicle and Equipment Maintenance	NS-10	NS-10
Waste Management		
Material Delivery and Storage	WM-1	WM-1
Spill Prevention and Control	WM-4	WM-4
Concrete Waste Management	WM-8	WM-8
Sanitary/ Septic Waste Management	WM-9	WM-9

4. Enhanced Construction BMP Implementation.
   (a) Each Permittee shall implement, or require implementation of, enhanced practices that preclude impacts to water quality posed by all construction sites on hillsides as defined in this Order and construction sites that directly discharge to a waterbody listed on the CWA § 303 (d) list for siltation or sediment, or that occur within or directly adjacent to an Environmentally Sensitive Area (ESAs). Construction sites located on hillsides, adjacent to CWA 303(d) listed waters for siltation or sediment, and directly adjacent to ESAs are termed "High risk sites."
   (b) Each Permittee shall require implementation of enhanced practices for high risk sites which shall include increased BMP inspection and maintenance requirements.
      (1) Each Permittee shall require that high risk sites shall be inspected by the project proponent's Qualified SWPPP Developer or Qualified SWPPP Practitioner or personnel or consultants who are Certified Professionals in Erosion and Sediment Control (CPESC) at the time of BMP installation, at least weekly during the wet season, and at least once each 24 hour period during a storm event that generates runoff from the site, to identify BMPs that need maintenance to operate effectively, that have failed or could fail to operate as intended.
      (2) During the wet season, the area of disturbance shall be limited to the area that can be controlled with an effective combination of erosion and sediment control BMPs. Enhanced sediment controls should be used in combination with erosion controls and should target portions of the site that cannot be effectively controlled by standard erosion controls described above. Effective sediment and erosion control BMPs proposed by the proponent shall include the BMPs listed in Table 9 below. The project proponents are responsible to implement the BMPs below unless shown unnecessary. The Permittee shall require that the project proponent retain records of the inspection and a determination and rationale of the BMPs selected to control runoff.

Table 9 - Enhanced Construction BMP Implementation.

CONSTRUCTION SITE BMPs	CASQA Handbook	Caltrans Handbook
Erosion Controls		
Scheduling	EC-1	SS-1
Preservation of Existing Vegetation	EC-2	SS-2
Hydraulic Mulch	EC-3	SS-3
Hydroseeding	EC-4	SS-4
Soil Binders	EC-5	SS-5
Straw Mulch	EC-6	SS-6
Geotextiles and Mats	EC-7	SS-7
Wood Mulching	EC-8	SS-8
Slope Drains	EC-11	SS-11
Sediment Controls		

CONSTRUCTION SITE BMPs	CASQA Handbook	Caltrans Handbook
Silt Fence	SE-1	SC-1
Fiber Rolls	SE-5	SC-5
Sediment Basin	SE-2	SC-2
Check Dam	SE-4	SC-4
Gravel Bag Berm	SE-6	SC-6
Street Sweeping and/or Vacuum	SE-7	SC-7
Sand Bag Barrier	SE-8	SC-8
Storm Drain Inlet Protection	SE-10	SC-10
Additional Controls		
Wind Erosion Controls	WE-1	WE-1
Stabilized Construction Entrance/Exit	TC-1	TC-1
Stabilized Construction Roadway	TC-2	TC-2
Entrance/Exit Tire Wash	TC-3	TC-3
Advanced Treatment Systems[1]		
Non-Storm Water Management		
Water Conservation Practices	NS-1	NS-1
Dewatering Operations (Groundwater dewatering only under NPDES Permit No. CAG994004).19	NS-2	NS-2
Vehicle and Equipment Washing	NS-8	NS-8
Vehicle and Equipment Fueling	NS-9	NS-9
Vehicle and Equipment Maintenance	NS-10	NS-10
Waste Management		
Material Delivery and Storage	WM-1	WM-1
Stockpile Management	WM-3	WM-2
Spill Prevention and Control	WM-4	WM-4
Solid Waste Management	WM-5	WM-5
Concrete Waste Management	WM-8	WM-8
Sanitary/Septic Waste Management	WM-9	WM-9

5. Local Agency Requirements
   (a) Each Permittee shall require for all construction sites 1 acre or greater, compliance with all conditions identified in the preceding subparts F.1 - F.4, and the following requirements:
      (1) Local Storm Water Pollution Prevention Plan (Local SWPPP),
         (A) Each Permittee shall require the preparation and submittal of a Local SWPPP, for the Permittee's review and written approval prior to issuance of a grading or construction permit for construction or demolition projects. The Permittees' approval signature shall be contained within the first pages of the Local SWPPP

[1] If appropriate given natural background stormwater runoff and receiving water quality conditions.

(i) The Permittee shall not approve any Local SWPPP unless it contains appropriate site-specific construction site BMPs, specific locations, and maintenance schedules.

(ii) The Local SWPPP must include the rationale used for selecting or rejecting BMPs for various construction phases and weather conditions. The project architect, or engineer of record, or authorized qualified designee, must sign a statement on the Local SWPPP to the effect:

(I) *"As the architect/ engineer of record, I have selected appropriate BMPs to effectively minimize the negative impacts of this project's construction activities on storm water quality. The project owner and contractor are aware that the selected BMPs must be installed, monitored, and maintained to ensure their effectiveness. The BMPs not selected for implementation are redundant or deemed not applicable to the proposed construction activity."*

(2) Certification Statement

(A) Each Permittee shall require that each landowner or the landowner's agent sign a statement on the Local SWPPP to the effect:

(i) *"I certify that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, to the best of my knowledge and belief, the information submitted is true, accurate, and complete. I am aware that submitting false and/ or inaccurate information, failing to update the Local SWPPP to reflect current conditions, or failing to properly and/ or adequately implement the Local SWPPP may result in revocation of grading and/ or other permits or other sanctions provided by law."*

(ii) The Local SWPPP certification shall be signed by the property owner or owner's representative/designee. If the Local SWPPP or SWPPP is being prepared by the local agency then the appropriate authority of the local agency shall sign the document.

6. Roadway Paving or Repaving Operations (For Private or Public Projects)

(a) Each Permittee shall require that for any project that includes roadbed or street paving, repaving, patching, digouts, or resurfacing roadbed surfaces, that the following BMPs be implemented for each project:

(1) Restrict paving and repaving activity to exclude periods of rainfall or predicted rainfall unless required by emergency conditions

(2) Install sand bags or gravel bags and filter fabric at all susceptible storm drain inlets and at manholes to prevent spills of paving products and tack coat

(3) Prevent the discharge of release agents including soybean oil, other oils, or diesel to the storm water drainage system or receiving waters.
(4) Minimize non storm water runoff from water use for the roller and for evaporative cooling of the asphalt
(5) Clean equipment over absorbent pads, drip pans, plastic sheeting or other material to capture all spillage and dispose of properly
(6) Collect liquid waste in a container, with a secure lid, for transport to a maintenance facility to be reused, recycled or disposed of properly
(7) Collect solid waste by vacuuming or sweeping and securing in an appropriate container for transport to a maintenance facility to be reused, recycled or disposed of properly
(8) Cover the "cold-mix" asphalt (i.e., pre-mixed aggregate and asphalt binder) with protective sheeting during a rainstorm
(9) Cover loads with tarp before haul-off to a storage site, and do not overload trucks
(10) Minimize airborne dust by using water spray during grinding
(11) Avoid stockpiling soil, sand, sediment, asphalt material and asphalt grindings materials or rubble in or near storm water drainage system or receiving waters
(12) Protect stockpiles with a cover or sediment barriers during a rain

7. Electronic Site Tracking System
(a) Each Permittee shall use an electronic system to track grading permits, encroachment permits, demolition permits, building permits, or construction permits (and any other municipal authorization to move soil and/ or construct or destruct that involves land disturbance) issued by each Permittee. To satisfy this requirement, the use of a database or GIS system is encouraged, but not required.

8. Inspections
(a) Each Permittee shall inspect all construction sites for the implementation of storm water quality controls a minimum of once during the wet season. Concurrently, each Permittee shall ensure that:
(1) The Local SWPPP is reviewed for compliance with local codes, ordinances, and permits.
(2) A follow-up inspection takes place within two weeks for inspected sites that have not adequately implemented their Local SWPPP.
(b) Each Permittee shall take additional enforcement actions to achieve compliance as specified in municipal codes, if compliance with municipal codes, ordinances, or permits has not been attained.
(c) Each Permittee can refer sites to the Regional Water Board for joint enforcement actions for violation of municipal storm water ordinances and the Construction Activities Storm Water General Permit (CASGP), or Small Linear Underground/ Overhead Construction Projects General Permit (small LUPs), after conducting a minimum of 2 site inspections and issuing a minimum of 2 written notices to the operator regarding the violation (copied to the Regional Water Board). In making

such referrals, Permittees shall include, at a minimum, the following documentation:

(1) Name of the site
(2) WDID number
(3) Site developer
(4) Site owner
(5) Records of communication with the site operator regarding the violation(s), which shall include at least an inspection report
(6) Written notice of the violation copied to the Regional Water

(d) Prior to approving and/ or signing off for occupancy and issuing the Certificate of Occupancy for all construction projects subject to post-construction controls, each Permittee shall inspect the constructed site design, source control and treatment control BMPs to verify that they have been constructed in compliance with all specifications, plans, permits, ordinances, and this Order. The initial/ acceptance BMP verification inspection does not constitute a maintenance and operation inspection, as required in the preceding subpart E.IV.2(c).

9. State Conformity Requirements

(a) Each Permittee shall ensure that no grading permit, encroachment permit, demolition permit, building permit, electrical permit, or construction permit (or any other municipal authorization to move soil and/ or construct or destruct that involves land disturbance) is issued for any project requiring coverage under the CASGP or Small LUP General Permit[1] unless:

(1) Proof of filing a Notice of Intent for coverage under a State NPDES permit is demonstrated).
(2) Demonstration or Certification that a SWPPP has been prepared by the project developer.
(3) Proof of Change of Information form (COI) and a copy of the modified SWPPP(s) at any time a transfer of ownership takes place for the entire development or portions of the common plan of development where construction activities are still on-going.

10. Interagency Coordination

(a) **Referral of Violations:**

A Permittee may refer a violator of the municipal storm water ordinance and CWC § 13260 to the Regional Water Board provided that the Permittee has made a good faith effort at progressive enforcement consistent with the preceding subpart F.8(c). At a minimum, the Permittee's good faith effort shall be documented with:

[1] NPDES Permit No. CAS000005, Waste Discharge Requirements For Discharges of Storm Water Runoff Associated with Small Linear Underground/ Overhead Construction Projects (Small LUP General Permit) for any linear land disturbing activity or activities (cumulatively) that will cause one acre or more of land disturbance but not more than 5 acres.

(1) A minimum of 2 follow-up inspection reports (inspections completed within 3 months).
(2) A minimum of two warning letters or NOVs.

(b) **Referral of Non-filers under the CASGP or the Small LUP General Permit:** Each Permittee shall refer non-filers (i.e., those projects which cannot demonstrate that they have a WDID number) under the CASGP or Small LUP General Permit, to the Regional Water Board, no later than 15 days after making a determination of failure to file. In making such referrals, Permittees shall include, at a minimum, the following documentation:
(1) Project location address
(2) Project description
(3) Developer or owners name with complete mailing address
(4) Project size
(5) Records of communication with the developer or owner regarding filing requirements

(c) **Investigation of Complaints Regarding Facilities – Transmitted by the Regional Water Board Staff:**
(1) Each Permittee shall initiate, within one business day,[1] an initial investigation of complaint(s) (other than non-storm water discharges) on the construction site(s) within its jurisdiction.
(A) The initial investigation shall include, at a minimum, an inspection on the facility and its perimeter to confirm the complaint and to determine if the site operator is effectively complying with the municipal storm water/ urban runoff ordinances, and to oversee corrective action.

(d) **Support of Regional Water Board Enforcement Actions – As directed by the Regional Water Board Executive Officer:**
(1) Each Permittee shall support Regional Water Board enforcement actions by:
(A) Assisting in identification of current owners, operators, and lessees of properties and sites.
(B) Providing staff, when available, for joint inspections with Regional Water Board inspectors.
(C) Appearing to testify as witnesses in Regional Water Board enforcement hearings.
(D) Providing copies of inspection reports and other progressive enforcement documentation.

[1] Permittees may comply with the Permit by taking initial steps (such as logging, prioritizing, and tasking) to "initiate" the investigation within that one business day. However, the Regional Water Board would expect that the initial investigation, including a site visit, to occur within four business days.

G. Public Agency Activities Program

I. Each Permittee shall implement a Public Agency Activities Program to minimize storm water pollution impacts from public agency activities. Public Agency requirements consist of:
   i. Public Construction Activities Management.
   ii. Vehicle Maintenance/ Material Storage Facilities/ Corporation Yards Management/ Municipal Operations.
   iii. Vehicle and Equipment Wash Areas
   iv. Landscape and Recreational Facilities Management
   v. Storm Drain Operation and Management
   vi. Streets and Roads Maintenance
   vii. Public Industrial Activities Management
   viii. Emergency Procedures
   ix. Employee Training
   x. Infrastructure Maintenance

1. Public Construction Activities Management
   (a) Each Permittee shall implement and comply with the Planning and Land Development Program requirements in part 4.E. of this Order at Permittee owned or operated public construction projects for project types identified in part 4.E of this Order.
   (b) Each Permittee shall implement and comply with the appropriate Development Construction Program requirements in part 4.F. of this Order at Permittee owned or operated construction projects as applicable.
   (c) For public projects including those under a Capital Improvement Project Plan that disturb less than one acre of soil the Permittees shall require the development and implementation of a Storm Water Pollution Control Plan. The SWPCP shall include BMPs as identified in Table 6.
2. Vehicle Maintenance/ Material Storage Facilities/ Corporation Yards Management/ Long Term Maintenance Programs
   (a) Each Permittee shall implement the activity specific BMPs[1] listed in Table 10 when such activities occur at Permittee owned/leased facilities and job sites including but not limited to vehicle/ equipment maintenance facilities, material storage facilities, and corporation yards, and at any area that includes the activities as described in the following Tables. Additionally, for any activity or area described in the footnote below,[2] each Permittee shall also implement the BMPs in the Caltrans Storm Water Quality Handbook Maintenance Staff Guide

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[1] These BMPs are identified in Appendix B of the *Caltrans Storm Water Quality Handbook Maintenance Staff Guide, May 2003*, and its addenda. Other BMPs may be substituted upon approval by the Executive Officer.
[2] Scheduling and Planning; Spill Prevention and Control; Sanitary/ Septic Waste Management; Material Use; Safer Alternative Products; Vehicle/ Equipment Cleaning, Fueling, and Maintenance; Illicit Connections Detection, Reporting and Removal; Illegal Spill / Discharge Control and Maintenance Facility Housekeeping Practices.

described as B-4 in Table 10 (BMPs at Vehicle Maintenance/ Material Storage Facilities/ Corporation Yards).

Table 10 - BMPs at Vehicle Maintenance/ Material Storage Facilities/ Corporation Yards
From the Caltrans Storm Water Quality Handbook Maintenance Staff Guide **Appendix B**

Activity Specific BMPs	**Page**
General BMPs	B-4
Flexible Pavement	B-9
Asphalt Cement Crack and Joint Grinding/ Sealing	B-9
Asphalt Paving	B-10
Structural Pavement Failure (Digouts) Pavement Grinding and Paving	B-11
Emergency Pothole Repairs	B-13
Sealing Operations	B-14
Rigid Pavement	B-15
Portland Cement Crack and Joint Sealing	B-15
Mudjacking and Drilling	B-16
Concrete Slab and Spall Repair	B-17
Slope/ Drains/ Vegetation	B-19
Shoulder Grading	B-19
Nonlandscaped Chemical Vegetation Control	B-21
Nonlandscaped Mechanical Vegetation Control/ Mowing	B-23
Nonlandscaped Tree and Shrub Pruning, Brush Chipping, Tree and Shrub Removal	B-24
Fence Repair	B-25
Drainage Ditch and Channel Maintenance	B-26
Drain and Culvert Maintenance	B-28
Curb and Sidewalk Repair	B-30
Litter/ Debris/ Graffiti	B-32
Sweeping Operations	B-32
Litter and Debris Removal	B-33
Emergency Response and Cleanup Practices	B-34
Graffiti Removal	B-36
Landscaping	B-37
Chemical Vegetation Control	B-37
Manual Vegetation Control	B-39
Landscaped Mechanical Vegetation Control/ Mowing	B-40
Landscaped Tree and Shrub Pruning, Brush Chipping, Tree and Shrub Removal	B-41
Irrigation Line Repairs	B-42
Irrigation (Watering), Potable and Nonpotable	B-43
Environmental	B-44
Storm Drain Stenciling	B-44
Roadside Slope Inspection	B-45
Roadside Stabilization	B-46
Storm Water Treatment Devices	B-48
Traction Sand Trap Devices	B-49
Public Facilities	B-50
Public Facilities	B-50
Bridges	B-52
Welding and Grinding	B-52
Sandblasting, Wet Blast with Sand Injection and Hydroblasting	B-54
Painting	B-56
Bridge Repairs	B-57

Activity Specific BMPs	Page
Other Structures	B-59
Pump Station Cleaning	B-59
Tube and Tunnel Maintenance and Repair	B-61
Tow Truck Operations	B-63
Toll Booth Lane Scrubbing Operations	B-64
Electrical	B-65
Sawcutting for Loop Installation	B-65
Traffic Guidance	B-67
Thermoplastic Striping and Marking	B-67
Paint Striping and Marking	B-68
Raised/ Recessed Pavement Marker Application and Removal	B-70
Sign Repair and Maintenance	B-71
Median Barrier and Guard Rail Repair	B-73
Emergency Vehicle Energy Attenuation Repair	B-75
Snow and Ice Control	B-76
Snow Removal	B-76
Ice Control	B-77
Storm Maintenance	B-78
Minor Slides and Slipouts Cleanup/ Repair	B-78
Management and Support	B-80
Building and Grounds Maintenance	B-80
Storage of Hazardous Materials (Working Stock)	B-82
Material Storage Control (Hazardous Waste)	B-84
Outdoor Storage of Raw Materials	B-85
Vehicle and Equipment Fueling	B-86
Vehicle and Equipment Cleaning	B-87
Vehicle and Equipment Maintenance and Repair	B-88
Aboveground and Underground Tank Leak and Spill Control	B-90

3. Vehicle and Equipment Wash Areas
   (a) Each Permittee shall eliminate discharges of wash waters from vehicle and equipment washing no later than (365 days after Order adoption date) by implementing any of the following measures at existing facilities with vehicle or equipment wash areas:
      (1) Self-contain, and haul off for disposal
      (2) Equip with a clarifier
      (3) Equip with an alternative pre-treatment device; <u>or</u>
      (4) Plumb to the sanitary sewer
   (b) Each Permittee shall ensure that any municipal facilities constructed, redeveloped, or replaced has all vehicle and equipment wash areas plumbed to the sanitary sewer or be self contained and all wastewater/ washwater hauled for legal disposal.

4. Landscape, Park, and Recreational Facilities Management
   (a) Integrated Pest Management (IPM)
   IPM is an ecosystem-based strategy that focuses on long-term prevention of pests or their damage through a combination of techniques such as biological control,

habitat manipulation, modification of cultural practices, and use of resistant varieties. Each Permittee shall implement an IPM program within (365 days after Order adoption date) that includes the following:

(1) Pesticides are used only if monitoring indicates they are needed according to established guidelines.
(2) Treatments are made with the goal of removing only the target organism.
(3) Pest controls are selected and applied in a manner that minimizes risks to human health, beneficial, non-target organisms, and the environment.
(4) Its use of pesticides, including Organophosphates and Pyrethroids do not threaten water quality.
(5) Partner with other agencies and organizations to encourage the use of IPM.
(6) Adopt and verifiably implement policies, procedures, and/ or ordinances requiring the minimization of pesticide use and encouraging the use of IPM techniques (including beneficial insects) in the Permittees' overall operations and on municipal property.
(7) Policies, procedures, and ordinances shall include commitments and timelines to reduce the use of pesticides that cause impairment of surface waters by implementing the following procedures:
    (A) Quantify pesticide use by its staff and hired contractors.
    (B) Prepare and annually update an inventory of pesticides used by all internal departments, divisions, and other operational units.
    (C) Demonstrate reductions in pesticide use.

(b) Each Permittee shall implement the following requirements no later than (180 days after Order adoption date):

(1) Use a standardized protocol for the routine and non-routine application of pesticides (including pre-emergents), and fertilizers.
(2) Ensure no application of pesticides or fertilizers are applied to an area immediately prior to, during, or immediately after a rain event, or when water is flowing off the area.
(3) Ensure that no banned or unregistered pesticides are stored or applied.
(4) Ensure that all staff applying pesticides are certified in the appropriate category by the California Department of Pesticide Regulation, or are under the direct supervision of a pesticide applicator certified in the appropriate category.
(5) Implement procedures to encourage the retention and planting of native vegetation to reduce water, pesticide and fertilizer needs; and
(6) Store pesticides and fertilizers indoors or under cover on paved surfaces or use secondary containment.
    (A) Reduce the use, storage, and handling of hazardous materials to reduce the potential for spills.
    (B) Regularly inspect storage areas.
(7) Comply with the provisions and the monitoring requirements for application of aquatic pesticides to surface waters (WQ Order No. 2004-0008-DWQ) (Vector Control) and Order No. 2004-0009-DWQ (Weed Control).

5. Storm Drain Operation and Management
   (a) Catch Basin Cleaning
      (1) Each Permittee shall designate catch basin inlets within its jurisdiction as one of the following:
         Priority A: Catch basins that are designated as consistently generating the highest volumes of trash.
         Priority B: Catch basins that are designated as consistently generating moderate volumes of trash.
         Priority C: Catch basins that are designated as generating low volumes of trash.
         Within one year of Order adoption (July 8, 2011), Permittees shall submit a map or list of Catch Basins with their GPS coordinates and their designations. The map or list shall contain the rationale or data to support designations.
      (2) Each Permittee shall inspect catch basins according to the following schedule:
         Priority A: A minimum of 3 times during the wet season and once during the dry season every year.
         Priority B: A minimum of once during the wet season and once during the dry season every year.
         Priority C: A minimum of once per year.
         Catch basins shall be cleaned as necessary on the basis of inspections. Permittees shall maintain inspection records for Regional Water Board review.
      (3) In addition to the preceding schedule, Permittees shall ensure that any catch basin that is determined to be at least 25% full of trash shall be cleaned out.

   (b) Trash Management at Public Events
      (1) Each Permittee shall require for any event in the public right of way or wherever it is foreseeable that substantial quantities of trash and litter may be generated, the following measures:
         (A) Proper management of trash and litter generated; and
         (B) Arrangement for temporary screens to be placed on catch basins; or
         (C) Provide clean out of catch basins, trash receptacles, and grounds in the event area within 24 hours subsequent to the event.
   (c) Trash Receptacles
      (1) Each Permittee shall install trash receptacles, or equivalent trash capturing devices in areas subject to high trash generation within its jurisdiction no later than one year after Order adoption date (July 8, 2011).
      (2) Each Permittee shall ensure that all trash receptacles are cleaned out and maintained as necessary to prevent trash overflow.
   (d) Catch Basin Labels
      (1) Each Permittee shall inspect the legibility of the catch basin stencil or label nearest each catch basin and inlet before the wet season begins.

(2) Each Permittee shall record and re-stencil or re-label within 15 days of inspection, catch basins with illegible stencils.

(e) Additional Trash Management Practices

(1) Each Permittee shall install trash excluders, or equivalent devices on or in catch basins or outfalls to prevent the discharge of trash to the storm drain system or receiving water no later than two years after Order adoption date in areas defined as Priority A (subpart 5.(a)(1)) except in sites where the application of such BMP(s) alone will cause flooding. Lack of maintenance that causes flooding is not an acceptable exception to the requirement to install BMPs. Alternatively the Permittee may implement alternative or enhanced BMPs beyond the provisions of this permit (such as but not limited to increased street sweeping, adding trash cans near trash generation sites, prompt enforcement of trash accumulation, increased trash collection on public property, increased litter prevention messages or trash nets within the MS4) that provide substantially equivalent removal of trash. Permittees shall demonstrate that BMPs, which substituted for trash excluders provide equivalent trash removal performance as excluders. When outfall trash capture is provided, revision of the schedule for inspection and cleanout of catch basins in task 5.(a)(2) may be proposed by the Permittee for approval by the Executive Officer.

(f) Storm Drain Maintenance

(1) Each Permittee shall implement a program for Storm Drain Maintenance no later than 90 days after Order adoption (October 6, 2010) that includes the following:

(A) Visual monitoring of Permittee-owned open channels and other drainage structures for debris at least annually.

(B) Remove trash and debris from open channel storm drains a minimum of once per year before the wet season.

(C) Eliminate the discharge of contaminants during MS4 maintenance and clean outs.

(D) Quantify the amount of materials removed using techniques appropriate for quantifying solid waste and ensure the materials are properly disposed of.

(g) Spill Response Plan

(1) Each Permittee shall implement a response plan for spills to the MS4 within their respective jurisdiction. The response Plan shall clearly identify agencies responsible and telephone numbers and e-mail address for contact and shall contain at a minimum the following:

(A) Investigation of all complaints received within 24 hours of the incident report.

(B) Response within 2 hours to spills for containment upon notification, except where such overflows occur on private property, in which case the response should be within 2 hours of gaining legal access to the property.

(C) Notification to appropriate public health agencies and the Office of Emergency Services (OES).

(h) Permittee Owned Treatment Control BMPs

(1) Each Permittee shall implement an inspection and maintenance program for all Permittee owned treatment control BMPs, including post-construction treatment control BMPs.

(2) Each Permittee shall ensure proper operation of all treatment control BMPs and maintain them as necessary for proper operation, including all post-construction treatment control BMPs.

(3) Any residual water produced by a treatment control BMP and not being internal to the BMP performance when being maintained shall be:

(A) Hauled away and legally disposed of; or

(B) Applied to the land without runoff; or

(C) Discharged to the sanitary sewer system (with permits or authorization); or

(D) Treated or filtered to remove bacteria, sediments, nutrients, and meet the limitations set in Table 11 (Discharge Limitations for Dewatering Treatment BMPs) prior to discharge to the MS4.

Table 11 - Discharge Limitations for Dewatering Treatment BMPs[1]

Parameter	Units	Limitation
Total Suspended Solids	mg/L	100
Turbidity	NTU	50
Oil and Grease	mg/L	10

6. Streets and Roads Maintenance

(a) Maintenance

(1) Each Permittee shall perform street sweeping of curbed streets in commercial areas and areas subject to high trash generation to control trash and debris at least two times per month.

(b) Road Reconstruction

(1) Each Permittee shall require that for any project that includes roadbed or street paving, repaving, patching, digouts, or resurfacing roadbed surfaces, that the following BMPs be implemented for each project.

(A) Restrict paving and repaving activity to exclude periods of rainfall or predicted rainfall[2] unless required by emergency conditions.

(B) Install sand bags or gravel bags and filter fabric at all susceptible storm drain inlets and at manholes to prevent spills of paving products and tack coat;

(C) Prevent the discharge of release agents including soybean oil, other oils, or diesel to the storm water drainage system or receiving waters.

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[1] Technology based effluent limits.

[2] A probability of precipitation (POP) of 50% is required.

(D) Minimize non storm water runoff from water use for the roller and for evaporative cooling of the asphalt.
(E) Clean equipment over absorbent pads, drip pans, plastic sheeting or other material to capture all spillage and dispose of properly.
(F) Collect liquid waste in a container, with a secure lid, for transport to a maintenance facility to be reused, recycled or disposed of properly.
(G) Collect solid waste by vacuuming or sweeping and securing in an appropriate container for transport to a maintenance facility to be reused, recycled or disposed of properly.
(H) Cover the "cold-mix" asphalt (i.e., pre-mixed aggregate and asphalt binder) with protective sheeting during a rainstorm.
(I) Cover loads with tarp before haul-off to a storage site, and do not overload trucks.
(J) Minimize airborne dust by using water spray during grinding.
(K) Avoid stockpiling soil, sand, sediment, asphalt material and asphalt grindings materials or rubble in or near storm water drainage system or receiving waters.
(L) Protect stockpiles with a cover or sediment barriers during a rain.

7. Emergency Procedures
   (a) Each Permittee may conduct repairs of essential public service systems and infrastructure in emergency situations with a self-waiver of the provisions of this Order.
      (1) Where the self-waiver has been invoked, the Permittee shall submit to the Regional Water Board Executive Officer a statement of the occurrence of the emergency, an explanation of the circumstances, and the measures that were implemented to reduce the threat to water quality, no later than 30 business days after the situation of emergency has passed.
      (2) Minor repairs of essential public service systems and infrastructure in emergency situations (can be completed in less than one day) are not subject to the notification provisions. Appropriate BMPs to reduce the threat to water quality shall be implemented.

8. Municipal Employee and Municipal Contractor Training
   (a) Each Permittee shall, no later than one year after Order adoption (July 8, 2011) and annually thereafter before June 30, train all of their employees and contractors in targeted positions (whose interactions, jobs, and activities affect storm water quality) on the requirements of the overall storm water management program to:
      (1) Promote a clear understanding of the potential for activities to pollute storm water.
      (2) Identify opportunities to require, implement, and maintain appropriate BMPs in their line of work.
   (b) Each Permittee shall, no later than one year after Order adoption (July 8, 2011) and annually thereafter before June 30, train all of their employees and

contractors who use or have the potential to use pesticides or fertilizers (whether or not they normally apply these as part of their work). Training programs shall address:

(1) The potential for pesticide-related surface water toxicity.
(2) Proper use, handling, and disposal of pesticides.
(3) Least toxic methods of pest prevention and control, including IPM.
(4) Reduction of pesticide use.

(c) Each Permittee shall, no later than one year after Order adoption (July 8, 2011) and annually thereafter before June 30, train all of their employees and contractors who are responsible for illicit connections and illicit/ illegal discharges. Training programs shall address:

(1) Identification
(2) Investigation
(3) Termination
(4) Cleanup
(5) Reporting of Incidents
(6) Documentation of Incidents

H. Illicit Connections and Illicit Discharges Elimination Program

I. Each Permittee shall implement an Illicit Connections and Illicit Discharges (IC/ IDs) program to eliminate IC/IDs to the storm drain system, and shall document, track, and report all such cases in accordance with the elements and performance measures specified in the following subsections.

1. General

(a) Implementation - Each Permittee shall implement an IC/ ID Program. The IC/ ID procedures shall be documented and made available for public review.

(b) Tracking - All Permittees shall, no later than May 7, 2012, map at a scale and in a format specified by the Principal Permittee all known connections to their storm drain system. All Permittees shall map at a scale and in a format specified by the Principal Permittee incidents of illicit connections and discharges since January 2009 on their baseline maps, and shall transmit this information to the Principal Permittee no later than May 7, 2012. Permittees shall use this information to identify priority areas for further investigation and elimination of IC/ ID.

2. Public Reporting

(a) Permittees shall establish and maintain a phone hotline and internet site to receive all reports of IC/ ID complaints.

(b) Permittees shall document the location of the reported IC/ ID and the actions undertaken in response to all IC/ ID complaints.

3. Illicit Connections

(a) <u>Screening for Illicit Connections</u>

(1) Each Permittee shall submit to the Principal Permittee:

(A) A map at a scale and in a format specified by the Principal Permittee showing the location and length of underground pipes 18 inches and greater in diameter, and channels within their permitted area and operated by the Permittee in accordance with the following schedule:
  (i) All channeled portions of the storm drain system no later than 90 days after Order adoption date (October 6, 2010).
  (ii) All portions of the storm drain system consisting of storm drain pipes 36 inches in diameter or greater, no later than May 7, 2012.
  (iii) All portions of the storm drain system consisting of storm drain pipes 18 inches in diameter or greater, no later than May 7, 2014.
(B) The status of suspected, confirmed, and terminated illicit connections.

(2) Permittees shall conduct field screening of their storm drain systems in accordance with screening procedures described in the Illicit Discharge Detection and Elimination, A Guidance Manual for Program Development and Technical Assessments (2004)[1] or other equally effective alternative methods not listed in the manual. Permittees shall conduct field screening of their storm drain system that has not been previously screened and reported to the Regional Water Board, for illicit connections in accordance with the following schedule:
  (A) All portions of the storm drain system consisting of storm drain pipes 36 inches in diameter or greater, no later than May 7, 2012.
  (B) High priority areas identified during the mapping of illicit connections and discharges, no later than May 7, 2012.
  (C) All portions of storm drain systems 50 years or older in age, no later than May 7, 2012.

(3) Each Permittee shall maintain a list containing all connections under investigation for possible illicit connection and their status.

(b) Response to Illicit Connections

(1) Investigation -
Each Permittee, upon discovery or upon receiving a report of a suspected illicit connection, shall complete an investigation within 21 days, to determine the following:
  (A) Source of the connection.
  (B) Nature and volume of discharge through the connection.
  (C) Responsible party for the connection.

(2) Termination -
Each Permittee, upon confirmation of an illicit storm drain connection, shall ensure the following:
  (A) Termination of the connection within 180 days of completion of the investigation, using formal enforcement authority to eliminate the illicit connection.

(3) Documentation -

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[1] *Illicit Discharge Detection and Elimination, A Guidance Manual for Program Development and Technical Assessments*. The Center for Watershed Protection, Pitt R., October 2004. Chapter 13, 13.1,13.2, 13.3, 13.4

Each Permittee shall keep records of all illicit connection investigations and the formal enforcement taken to eliminate all illicit connections.

4. Illicit Discharges
   (a) Investigation -
   Each Permittee shall investigate an illicit/ illegal discharge during or immediately following containment and cleanup activities, and shall take appropriate enforcement action to eliminate the illegal discharge.
   (b) Abatement and Cleanup -
   Each Permittee shall respond, within 1 business day of discovery or a report of a suspected illicit/ illegal discharge, with actions to abate, contain, and/or clean up all illegal discharges, including hazardous waste.
   (c) Documentation -
   Each Permittee shall maintain records of all illicit/ illegal discharge discoveries, reports of suspected illicit/ illegal discharges, their response to the illicit/ illegal discharges and suspected illicit/ illegal discharges, and the formal enforcement taken to eliminate all illicit/ illegal discharges.

I. REPORTING PROGRAM

1. The Principal Permittee in consultation with the Permittees and Regional Water Board staff shall convene an adhoc working group to develop an Electronic Reporting Program, the basis of which shall be the requirements in this Order. The Committee shall no later than one year after Order adoption date (July 8, 2011) submit the electronic reporting form in each subsequent year.

2. Each Permittee shall submit information required in the Reporting Program in a method as appropriate to the format approved by the Regional Water Board Executive Officer.

3. The Principal Permittee shall submit by December 15th of each year, an Annual Report to the Regional Water Board Executive Officer in the form one hard copy and three compact disk (CD) copies (or an electronic equivalent).

4. The Annual Report shall document the status of the Municipal Storm Water Program, an integrated summary of the results of analyses from:
   (a) The monitoring program described under Part 1- Monitoring Report.
   (b) The requirements described under Part 2- Program Report.

5. Plans shall be submitted to the Regional Water Board Executive Officer in the form of one hard copy and three compact disk (CD) copies (or an electronic equivalent).

6. Study Reports shall be submitted to the Regional Water Board Executive Officer in the form of one hard copy and three compact disk (CD) copies (or an electronic equivalent).

7. Progress Reports shall be submitted to the Regional Water Board Executive Officer in the form of one hard copy and three compact disk (CD) copies (or an electronic equivalent).

PART 5 - TOTAL MAXIMUM DAILY LOAD PROVISIONS

I. Part 5 of this Order incorporates provisions to assure that Ventura County MS4 Permittees comply with WLAs and other requirements of TMDLs covering impaired waters impacted by the Permittees' discharges.

II. Each Permittee shall attain the storm water WLAs incorporated into this Order by implementing BMPs in accordance with the TMDL Technical Reports, Implementation Plans, or as identified as a result of TMDL special studies specified in the Basin Plan Amendment.

III. The Permittees shall comply with the following Wasteload Allocations, consistent with the assumptions and requirements of the Wasteload Allocations documented in the Implementation Plans, including compliance schedules, associated with the State adoption and approval of the TMDL at compliance monitoring points established in each TMDL (40 CFR 122.44(d)(1)(vii)(B).

IV. TMDLs in effect and covered in this Order are the following:
1. TMDL for Nutrients for Malibu Creek Watershed (Effective date: March 21, 2003)
2. TMDL for Nitrogen Compounds and Related Effects in Calleguas Creek (Effective date: July 16, 2003)
3. TMDL for Nitrogen Compounds for the Santa Clara River (Effective date: March 23, 2004).
4. TMDL for Chloride in Santa Clara River, Reach 3 (Effective date: June 18, 2003)
5. TMDL for Chloride in Upper Santa Clara River (Effective date: May 4, 2005)
6. TMDL for Toxicity, Chlorpyrifos and Diazinon in the Calleguas Creek, its Tributaries and Mugu Lagoon - (Effective date: March 24, 2006).
7. TMDL for Organochlorine Pesticides, Polychlorinated Biphenyls, and Siltation in Calleguas Creek, its Tributaries and Mugu Lagoon (Effective date: March 24, 2006).
8. TMDL for Bacteria in Malibu Creek and Lagoon (Effective date: January 24, 2006).
9. TMDL for Metals and Selenium in the Calleguas Creek, its Tributaries and Mugu Lagoon (Effective date: March 26, 2007)
10. TMDL for Trash in Revolon Slough and Beardsley Wash (Effective date: March 6, 2008).
11. TMDL for Boron, Chloride, Sulfate, and TDS in Calleguas Creek Watershed (Effective date: December 2, 2008)

12. TMDL for Trash in the Ventura River Estuary (Effective date: March 6, 2008).
13. TMDL for Bacteria in Harbor Beaches of Ventura County (Effective date: September 23, 2008).

V. TMDL Interim WLAs incorporated into this Order due to compliance dates which exceed the term of this Order are the following:

1. Final Wet Weather Bacteria WLAs for Malibu Creek and Lagoon – (Compliance date: January 24, 2016).
2. Final Chloride WLAs for Upper Santa Clara River – (Compliance date: May 4, 2016)
3. Final Organochlorine Pesticides, Polychlorinated Biphenyls, and Siltation WLAs for Calleguas Creek, its Tributaries and Mugu Lagoon – (Compliance date: March 24, 2026).
4. Final Metals and Selenium WLAs for Calleguas Creek, its Tributaries and Mugu Lagoon (Compliance date: March 26, 2022)
5. Final Boron, Chloride, Sulfate, and TDS WLAs for Calleguas Creek watershed (Compliance date: December 2, 2023)

VI. TMDL WLAs and Other TMDL Provisions Incorporated into this Order are as follows:

1. TMDL for Nutrients for Malibu Creek Watershed

(a) Summer Load Allocations

	Nitrogen (lbs/day)	Phosphorus (lbs/day)
- Runoff from developed areas	26	2.6
- Golf Course Fertilization	37	6.6
- Dry Weather Urban Runoff	52	4.6
- Other	56	4.1

(b) Winter concentration-based Load Allocations

	Nitrogen (Nitrate-N + Nitrite-N) (mg/L)
- Runoff from Developed Areas	8
- Golf Course Fertilization	8
- Dry Weather Urban Runoff	8
- Other	8

(c) Compliance Monitoring:
This TMDL was established and approved by U.S. EPA and did not include an implementation plan.

(d) Actions and Special Studies required for Malibu Creek MS4 permittees
(1) Extent of algal impairment. EPA recommends studies to investigate the current extent of impairment due to excessive algal growth in the creek by

surveying algal biomass and species composition at multiple sites within the creek.
(2) Limiting factor analysis. EPA recommends further study to assess whether total nitrogen or total phosphorus or other parameters such as flow and light limit algal growth in the Malibu Creek watershed.
(3) Fate of nutrients in Malibu Lagoon. EPA recommends this special study to determine if the expected upstream reductions in nutrient loadings would result in desired improvements in water quality in the lagoon.

2. TMDL for Nitrogen Compounds and Related Effects in Calleguas Creek Watershed

The stormwater permitted discharges were considered minor sources of nitrogen to the Calleguas Creek. Therefore, WLAs are not assigned to storm water permitted discharges. The monitoring program of this TMDL includes data collection to quantify loadings and associated WLAs from these sources.

3. TMDL for Nitrogen Compounds in the Santa Clara River

(a) Waste Load Allocations:
(1) The Ventura County MS4 permittees discharging to the Santa Clara River (the cities of Fillmore and Santa Paula) ("Santa Clara MS4 permittees") shall implement BMPs to achieve the following MS4 wasteload allocations applicable to River Reach 3:

Ammonia nitrogen 30-day average	2.0 mg/L
Ammonia nitrogen 1-hour average	4.2 mg/L
Nitrate + Nitrite nitrogen 30-day average	8.1 mg/L

(b) Compliance Monitoring:
(1) Compliance with the WLAs is to be determined through receiving water monitoring conducted in accordance with the Santa Clara River Nitrogen TMDL Monitoring Program approved by the Executive Officer.
(2) If any WLA is exceeded at a compliance monitoring site, permittees shall implement BMPs in accordance with the TMDL Technical Reports, Implementation Plans or as identified as a result of TMDL special studies identified in the Basin Plan Amendment. Following these actions, Regional Water Board staff will evaluate the need for enforcement action.
(c) Actions and Special Studies required of Santa Clara MS4 permittees:
(1) Annual Progress Reports. Santa Clara River MS4 permittees, either independently or in conjunction with other stakeholders, shall submit an annual progress report with respect to achievement of the WLAs.

4. TMDL for Chloride in Santa Clara River, Reach 3

(a) Waste Load Allocation:
MS4 permittees discharging to Santa Clara River, Reach 3 shall implement BMPs to achieve the following MS4 WLAs:

Chloride (mg/L) 80

(b) Compliance Monitoring: This TMDL was established and approved by U.S. EPA and did not include an implementation plan.

(c) Actions and Special Studies required of Santa Clara MS4 permittees:

(1) Annual Progress Reports. Santa Clara River MS4 permittees, either independently or in conjunction with other stakeholders, shall submit an annual progress report with respect to achievement of the WLAs.

5. TMDL for Chloride in Upper Santa Clara River

(a) Waste Load Allocation:
MS4 permittees discharging to Upper Santa Clara River shall implement BMPs to achieve the following WLAs
Chloride (mg/L) 100

(b) Compliance monitoring:

(1) Compliance with the WLAs is to be determined through receiving water monitoring conducted in accordance with the Santa Clara River Chloride TMDL Monitoring Program approved by the Executive Officer.

(2) If any WLA is exceeded at a compliance monitoring site, permittees shall implement BMPs in accordance with the TMDL Technical Reports and Implementation Plans. Following these actions, Regional Water Board staff will evaluate the need for enforcement action.

(c) Actions and Special Studies required of Santa Clara MS4 permittees:

(1) Annual Progress Reports. Santa Clara River MS4 permittees, either independently or in conjunction with other stakeholders, shall submit an annual progress report with respect to achievement of the WLAs.

6. TMDL for Toxicity, Chlorpyrifos, and Diazinon in the Calleguas Creek, its Tributaries and Mugu Lagoon.

(a) Waste Load Allocations:

(1) MS4 permittees discharging to Calleguas Creek, its tributaries and Mugu Lagoon (Ventura County Watershed Protection District, County of Ventura and the cities of Camarillo, Moorpark, Oxnard, Simi Valley and Thousand Oaks) ("Calleguas MS4 permittees") shall implement BMPs to achieve the following MS4 WLAs:

Toxicity WLA	1.0 TUc
Chlorpyrifos WLA	0.014 ug/L
Diazinon WLA	0.10 ug/L

(2) Pursuant to the TMDL, the final storm water WLAs for Toxicity, Chlorpyrifos and Diazinon, listed above, are receiving water concentrations measured in-stream at the base of each subwatershed within the Calleguas Creek watershed.

(b) Compliance Monitoring:

(1) Compliance with the WLAs is to be determined through the measurement of in-stream water quality at the base of each of the Calleguas Creek subwatersheds, in accordance with the Calleguas Creek Watershed TMDL Monitoring Program approved by the Executive Officer.

(2) If any WLA is exceeded at a compliance monitoring site, permittees shall implement BMPs in accordance with the TMDL Technical Reports, Implementation Plans or as identified as a result of TMDL special studies identified in the Basin Plan Amendment. Following these actions, Regional Water Board staff will evaluate the need for enforcement action.

(3) If as a result of compliance monitoring and subsequent investigations it is determined that a Calleguas MS4 permittee is responsible for exceedance of the in-stream Toxicity WLA, that permittee shall initiate the TRE/TIE process as outlined in U.S. EPA's "Understanding and Accounting for Method Variability in Whole Effluent Toxicity Applications Under the National Pollutant Discharge Elimination System Program" (2000) or the approved Toxicity TMDL monitoring plan, and take appropriate action to eliminate the identified source of the toxicity.

(c) Actions and Special Studies required of Calleguas MS4 permittees:

(1) Special Study #1. Together with Calleguas POTW permittees, investigate the pesticides that will replace diazinon and chlorpyrifos in the urban environment, their potential impact on receiving waters and potential control measures. Special Study #1 was completed by March 24, 2008.

(2) Special Study #2. Together with Calleguas Agricultural Dischargers, consider results of monitoring of sediment concentrations by source/land use type through the special study required in the Calleguas OC Pesticide, PCB and Siltation TMDL Implementation Plan. Complete within 6 months of completion of the OCs TMDL special study #1.

(3) Pesticide Collection Program. Together with Calleguas POTW permittees, develop and implement a collection program for diazinon and chlorpyrifos and an educational program. Collection and education could occur through existing programs such as household hazardous waste collection events. The Pesticide Collection Program is to be implemented by March 24, 2009.

(4) Special Study #3. Together with Calleguas Agricultural Dischargers, consider the findings of transport rates developed through the OC Pesticide, PCB and Siltation TMDL Implementation Plan. Complete within 6 months of completion of the OCs TMDL special study #1.

7. TMDL for Organochlorine (OC) Pesticides, Polychlorinated Biphenyls (PCBs) and Siltation in the Calleguas Creek, its Tributaries and Mugu Lagoon.

(a) Waste Load Allocations:

(1) MS4 permittees discharging to Calleguas Creek, its tributaries or Mugu Lagoon (Ventura County Watershed Protection District, County of Ventura and the cities of Camarillo, Moorpark, and Simi Valley) ("Calleguas MS4 permittees") shall implement BMPs to achieve the interim WLAs listed in Table 12.

Table 12 - Interim Sediment Concentration WLAs (ng/g)

Constituent	Subwatershed					
	Mugu Lagoon	Calleguas Creek	Revolon Slough	Arroyo Las Posas	Arroyo Simi	Conejo Creek
Chlordane	25	17	48	3.3	3.3	3.4
4,4-DDD	69	66	400	290	14.0	5.3
4,4-DDE	300	470	1600	950	170	20
4.4-DDT	39	110	690	670	25	2
Dieldrin	19	3	5.7	1.1	1.1	3
PCBs	180	3800	7600	25700	25700	3800
Toxaphene	22900	260	790	230	230	260

(2) Pursuant to the TMDL, the interim storm water WLAs for OC Pesticides, PCBs and Siltation, listed above, are annual average, sediment-based concentrations measured in surface waters at the base of each subwatershed within the Calleguas Creek watershed.

(b) Compliance Monitoring:

(1) Compliance with the WLAs is to be determined through the measurement of in-stream water quality at the base of each of the Calleguas Creek subwatersheds, in accordance with the Calleguas Creek Watershed TMDL Monitoring Program approved by the Executive Officer.

(2) If any WLA is exceeded at a compliance monitoring site, permittees shall implement BMPs in accordance with the TMDL Technical Reports, Implementation Plans or as identified as a result of TMDL special studies identified in the Basin Plan Amendment. Following these actions, Regional Water Board staff will evaluate the need for enforcement action.

(c) Actions and Special Studies required of Calleguas MS4 permittees:

(1) Pesticide Collection Program. Together with Calleguas POTW permittees, implement a collection program and source control measures pursuant to a work plan approved by the Executive Officer. The Pesticide Collection Program is to be implemented by March 24, 2011.

(2) Special Study #1. Together with Calleguas POTW permittees, Calleguas Agricultural Dischargers, and the Point Mugu Naval Base, submit a work plan to quantify sedimentation in the Calleguas Creek Watershed, evaluate management methods to control siltation and contaminated sediment transport to Calleguas Creek, identify appropriate BMPs to reduce sediment loadings and evaluate the effect of sediment on habitat preservation in Mugu Lagoon for approval by the Executive Officer. This special study is also to evaluate the concentration of OC pesticides and PCBs in sediments from various sources/land use types. Special Study #1 is to be completed by March 24, 2014.

(3) Special Study #2. Together with Calleguas Agricultural Dischargers, identify areas of high OC concentrations and evaluate the effects of watershed protection and land use practices on water quality. Such practices

include but are not limited to management of sediment reduction practices and structures, streambank stabilization, and other projects related to stormwater conveyance and flood control improvements in the Calleguas Creek watershed. Special Study #2 is to be completed based on the schedule provided in the workplan, submitted in March, 2007

(4) Special Study #3 – Together with Calleguas POTW permittees, Calleguas Agricultural Dischargers, and the Point Mugu Naval Base, evaluate natural attenuation rates and evaluate methods to accelerate organochlorine pesticide and polychlorinated biphenyl attenuation and examine the attainability of wasteload and load allocations in the Calleguas Creek Watershed. Special Study #3 is to be completed by March 24, 2016.

8. TMDL for Metals and Selenium in the Calleguas Creek, its Tributaries and Mugu Lagoon.

(a) Waste Load Allocations:

(1) MS4 permittees discharging to Calleguas Creek, its tributaries or Mugu Lagoon (Ventura County Watershed Protection District, County of Ventura and the cities of Camarillo, Moorpark, Oxnard, Simi Valley and Thousand Oaks) ("Calleguas MS4 permittees") shall implement BMPs to achieve the interim WLAs listed in Table 13 and Table 14.

Table 13 - Interim WLAs for Copper, Nickel and Selenium (ug/L)

Constituent	Calleguas and Conejo Creek (a)			Revolon Slough		
	Dry Daily Maximum (ug/L)	Dry Monthly Average (ug/L)	Daily Maximum (ug/L)	Dry Daily Maximum (ug/L)	Dry Monthly Average (ug/L	Daily Maximum (ug/L)
Copper	23	19	204	23	19	204
Nickel	15	13	(a)	15	13	(a)
Selenium	(b)	(b)	(b)	14(c)	13(c)	(a)

(A) The current loads do not exceed the TMDL under wet conditions, interim limits are not required

(B) Selenium allocations have not been developed for this reach as it is not on the 303(d) list

(C) Attainment of interim limits will be evaluated in consideration of background loading data, if available

(2) Pursuant to the TMDL, the interim storm water WLAs for copper, nickel, and selenium are receiving water concentrations measured in-stream at the base of Calleguas Creek and Revolon Slough and in Mugu Lagoon.

Table 14 – Interim Mass-based WLAs for mercury

Annual Cumulative Flow (million gallons per year)	Calleguas Creek (lbs/yr)	Revolon Slough (lbs/yr)
0-15,000	3.3	1.7
15,000-25,000	10.5	4
Above 25,000	64.6	10.2

(3) Pursuant to the TMDL, the interim storm water WLAs for mercury are suspended sediment loads measured in-stream at the base of Calleguas Creek and Revolon Slough and in Mugu Lagoon.

(4) Determination of the applicable interim WLA will be determined by calculating the total annual flow (October 1-September 30) in the Calleguas Creek watershed as measured by the flow gage at CSUCI.

(b) Compliance Monitoring:

(1) Compliance with the WLAs is to be determined through the measurement of in-stream water quality and total suspended solids (TSS) at the base of Calleguas Creek, Revolon Slough and in Mugu Lagoon, in accordance with the Calleguas Creek Watershed TMDL Monitoring Program approved by the Executive Officer.

(2) If any WLA is exceeded at a compliance monitoring site, permittees shall implement BMPs in accordance with the TMDL Technical Reports, Implementation Plans or as identified as a result of TMDL special studies identified in the Basin Plan Amendment. Following these actions, Regional Water Board staff will evaluate the need for enforcement action.

(c) Actions and Special Studies required of Calleguas MS4 permittees:

(1) Conduct a source control study, develop and submit an Urban Water Quality Management Program (UWQMP) for copper, mercury, nickel, and selenium. Complete by March 26, 2009.

(2) Implement the UWQMP within one year of approval by Executive Officer.

(3) In cooperation with agricultural dischargers, evaluate the results of the OCs TMDL special study on sediment transport rates for applicability to the metals and selenium TMDL. Complete within 6 months of completion of the OCs TMDL special study #1.

(4) In cooperation with agricultural dischargers, include monitoring for copper, mercury, nickel and selenium in the OC pesticides TMDL special study – Monitoring of Sediment by Source and Land Use Type. The special study is to be completed by March 26, 2014.

(5) Evaluate the results of the OC Pesticides TMDL Special Study – Effects of BMPs on Sediment and Siltation, to determine the impacts on metals and selenium. Complete within 6 months of completion of the OC Pesticides special study #1.

(6) Evaluate the effectiveness of BMPs implemented under the UWQMP in controlling metals and selenium discharges. This is to be completed by March 26, 2013.
(7) Re-evaluate agricultural and urban waste load allocations for copper, mercury, nickel and selenium based on the evaluation of BMP effectiveness. By March 26, 2012, urban dischargers will have a required 25% reduction in the difference between the loadings at the time of the TMDL preparation and the final WLAs effective in 2022.
(8) In cooperation with POTW permittees and agricultural dischargers, conduct a study to identify selenium contaminated groundwater sources. Special Study is to be completed within one year of the approval of the workplan.
(9) In cooperation with agricultural dischargers, conduct a study to investigate metals "hot spots" and natural soils concentrations. This special study is to be completed within 2 years of the approval of the workplan.

9. TMDL for Bacteria in Malibu Creek and Lagoon
(a) Waste Load Allocations:
(1) MS4 permittees discharging to Malibu Creek or its tributaries (Ventura County Watershed Protection District, County of Ventura and the cities of Thousand Oaks and Simi Valley) ("Malibu MS4 permittees") shall achieve the WLAs identified in Resolution 2004-19. These WLAs are expressed as the number of daily or weekly sample days that may exceed the single sample limits or 30-day geometric mean bacteria targets in Resolution 2004-19.

Table 15 - Bacteria Targets

Parameters	Unit	Fresh Water Targets	
		Geometric Mean	Single Sample
E. coli	mg	126/ 100	235/ 100
Fecal coliform	mg	200/ 100	400/ 100

(2) The summer dry weather wasteload allocations are to be achieved no later than January 24, 2009. The winter dry weather wasteload allocations are to be achieved no later than January 24, 2012.
(b) Compliance Monitoring:
(1) Achievement of the WLAs is to be determined through receiving water monitoring conducted in accordance with the Malibu Creek and Lagoon Bacteria TMDL Compliance Monitoring Program approved by the Executive Officer.
(2) If any WLA is exceeded at a compliance monitoring site, permittees shall implement BMPs in accordance with the TMDL Technical Reports, Implementation Plans or as identified as a result of TMDL special studies identified in the Basin Plan Amendment. Following these actions, Regional Water Board staff will evaluate the need for enforcement action.
(c) Actions and Special Studies required of Malibu MS4 permittees:

(1) If TMDL compliance monitoring indicates that the Malibu MS4 permittees are causing or contributing to an exceedance of the WLAs in the receiving waters, the permittees shall conduct a source identification study and implement additional controls sufficient to achieve the WLAs in the receiving waters.

10. TMDL for Trash in Revolon Slough and Beardsley Wash
    (a) Wasteload Allocations
        (1) MS4 permittees discharging to Revolon Slough and Beardsley Wash (Ventura County Watershed Protection District, County of Ventura and the cities of Camarillo and Oxnard) shall implement BMPs to achieve the WLAs of zero trash.
    (b) Compliance Monitoring
        (1) Responsible jurisdictions will develop a TMRP for Executive Officer approval that describes the methodologies that will be used to assess and monitor trash in Revolon Slough and Beardsley Wash and/or within responsible jurisdiction land areas. The TMRP shall include a plan to establish the trash Baseline WLAs.
        (2) If any WLA is exceeded at a compliance monitoring site, permittees shall implement BMPs in accordance with the TMDL Technical Reports, Implementation Plans or as identified as a result of TMDL special studies identified in the Basin Plan Amendment. Following these actions, Regional Water Board staff will evaluate the need for enforcement action.
    (c) Actions and Special Studies required of Revolon Slough and Beardsley Wash MS4 permittees
        (1) Per the adopted Basin Plan Amendment, compliance with the TMDL may be either through a progressive implementation schedule of full capture devices or implementation of other measures to attain the required trash reduction.

11. TMDL for Trash in the Ventura River Estuary
    (a) Wasteload Allocations
        (1) MS4 permittees discharging to the Ventura River Estuary (Ventura County Watershed Protection District, County of Ventura and the City of Ventura) shall implement BMPs to achieve the WLAs of zero trash.
    (b) Compliance Monitoring
        (1) Responsible jurisdictions will develop a TMRP for Executive Officer approval that describes the methodologies that will be used to assess and monitor trash in the Ventura River Estuary and/or within responsible jurisdiction land areas. The TMRP shall include a plan to establish the trash Baseline WLAs.
        (2) If any WLA is exceeded at a compliance monitoring site, permittees shall implement BMPs in accordance with the TMDL Technical Reports, Implementation Plans or as identified as a result of TMDL special studies

identified in the Basin Plan Amendment. Following these actions, Regional Water Board staff will evaluate the need for enforcement action.

(c) Actions and Special Studies required of Revolon Slough and Beardsley Wash MS4 permittees

(1) Per the adopted Basin Plan Amendment, compliance with the TMDL may be either through a progressive implementation schedule of full capture devices or implementation of other measures to attain the required trash reduction.

12. TMDL for Boron, Chloride, Sulfate and TDS in Calleguas Creek Watershed

(a) Waste Load Allocation

Table 16 - Interim Dry Weather WLAs for Permitted Stormwater Dischargers

Constituent	Interim Limit 30-day average (mg/L)
Boron Total	1.3
Chloride Total	230
Sulfate Total	1289
TDS Total	1720

Table 17 - Final Dry Weather WLAs for Permitted Stormwater Dischargers

Subwatershed	Critical Condition Flow Rate (mgd)	Chloride Allocation (lb/day)	TDS Allocation (lb/day)	Sulfate Allocation (lb/day)	Boron Allocation (lb/day)
Simi	1.39	1,738	9,849	2,897	12
Las Posas	0.13	157	887	261	N/A
Conejo	1.26	1,576	8,931	2,627	N/A
Camarillo	0.06	72	406	119	N/A
Pleasant Valley (Calleguas)	0.12	150	850	250	N/A
Pleasant Valley (Revolon)	0.25	314	1,778	523	2

(b) Compliance Monitoring

(1) A monitoring plan will be submitted to the RWQCB for Executive Officer approval on June 2, 2009. Monitoring will begin one year after Executive Officer approval of the monitoring plan to allow time for the installation of automated monitoring equipment.

(2) Compliance with the WLAs is to be determined through the measurement of in-stream water quality at the base of each of the Calleguas Creek

subwatersheds, in accordance with the Calleguas Creek Watershed TMDL Monitoring Program approved by the Executive Officer.

(3) If any WLA is exceeded at a compliance monitoring site, permittees shall implement BMPs in accordance with the TMDL Technical Reports, Implementation Plans or as identified as a result of TMDL special studies identified in the Basin Plan Amendment. Following these actions, Regional Water Board staff will evaluate the need for enforcement action.

(c) Actions and Special Studies required of Calleguas Creek Watershed MS4 permittees

Responsible jurisdictions including MS4 permittees shall submit compliance monitoring plan to the Los Angeles Regional Water Board for Executive Officer approval on June 2, 2009. Monitoring shall begin as outlined in the approved monitoring plan one year after approval of the work plan.

Responsible jurisdictions including MS4 permittees shall demonstrate that implementation actions have reduced the boron, sulfate, TDS, and chloride imbalance by 20%, 40%, 70% by December 2 of 2011, 2015, and 2018 respectively. Stormwater dischargers shall achieve WLAs, which shall be expressed as NPDES mass-based limits specified in accordance with federal regulations and state policy on water quality control by December 2, 2023.

13. TMDL for Bacteria in Harbor Beaches of Ventura County

(a) Waste Load Allocations

(1) MS4 permittees discharging to the Channel Islands Harbor Beaches (the County of Ventura, the Ventura County Watershed Protection District (VCWPD) and associated Municipal Separate Storm Sewer System (MS4) permittees in the Channel Islands Harbor subwatershed, and the City of Oxnard shall implement BMPs to achieve the interim WLAs listed in Table 18. All WLAs for summer dry-weather single sample bacteria densities at the Harbor Beaches of Ventura County are zero (0) days of allowable exceedances; winter dry weather and wet weather final WLAs are listed in Table 19 below.

The Basin Plan objectives that serve as the numeric targets for this TMDL are (single sample limits):

a. Total coliform density shall not exceed 10,000/100 ml.
b. Fecal coliform density shall not exceed 400/100 ml.
c. Enterococcus density shall not exceed 104/100 ml.
d. Total coliform density shall not exceed 1,000/100ml, if the ratio of fecal-to-total coliform exceeds 0.1.

Table 18 - Interim WLAs for Single Sample Exceedance Days

Location	Summer Dry Weather		Winter Dry Weather		Wet Weather	
	Daily Sampling	Weekly Sampling	Daily Sampling	Weekly Sampling	Daily Sampling	Weekly Sampling
Kiddie Beach	54	8	23	4	32	5
Hobie Beach	40	6	25	4	38	6

Table19 - Final Allowable Exceedance Days by Location

Location	Summer Dry-weather		Winter Dry-weather		Wet-weather	
	Daily Sampling	Weekly Sampling	Daily Sampling	Weekly Sampling	Daily Sampling	Weekly Sampling
Hobie Beach	0	0	3	1	17	3
Kiddie Beach	0	0	3	1	17	3

(2) Pursuant to the TMDL, the interim storm water WLAs for bacteria are from samples taken at existing monitoring sites in ankle to knee- high depths.

(b) Compliance Monitoring

(1) Compliance and monitoring for Harbor Beaches of Ventura County is based on existing monitoring protocols and locations. Monitoring shall continue at sampling locations (VCEHD 36000 and VCEHD37000) and at the current weekly monitoring frequency, consistent with AB411 compliance monitoring. Monitoring shall be conducted on a year-round basis at the current monitoring locations including the summer months (i.e., April to October) and winter months (i.e., November to March). Bacteria sampling shall be conducted in ankle- to knee-high water, consistent with AB411. However, if additional monitoring stations are added or if changes are made to the sampling frequencies or existing monitoring locations, then submittal of a monitoring plan is required for Executive Officer approval.

(2) If any WLA is exceeded at a compliance monitoring site, permittees shall implement BMPs in accordance with the TMDL Technical Reports, Implementation Plans or as identified as a result of TMDL special studies identified in the Basin Plan Amendment. Following these actions, Regional Water Board staff will evaluate the need for enforcement action.

(c) Actions and Special Studies required of Harbor Beaches of Ventura County MS4 permittees

(1) Per the adopted Basin Plan Amendment, compliance with the TMDL may be either through structural and non-structural BMPs or implementation of other measures to attain the required source control.

(2) Special studies are not required for implementation of the TMDL though conducting special studies is within the discretion of the responsible parties.

PART 6 - DEFINITIONS

The following are definitions for terms in this Order:

Adverse Impact - means a detrimental effect upon water quality or beneficial uses caused by a discharge or loading of a pollutant or pollutants.

Agriculture - means the science, art, and business of cultivating the soil, producing crops, and raising livestock.

Antidegradation Policies - means policies which protect surface and ground waters from degradation, and federal policies, which protect high quality surface waters. In particular, this policy protects waterbodies where existing quality is higher than that necessary for the protection of beneficial uses including the protection of fish and wildlife propagation and recreation on and in the water. (*Statement of Policy with Respect to Maintaining High Quality Water in California*, State Board Resolution No. 68-16; 40 CRF 131.12).

Applicable Standards and Limitations - means all State, interstate, and Federal standards and limitations to which a "discharge" or a related activity is subject under the CWA, including effluent limitations, water quality standards, standards of performance, toxic effluent standards or prohibitions, best management practices, and pretreatment standards under § 301, § 302, § 303, § 304, § 306, § 307, § 308, § 403, and § 404 of CWA.

Areas of Special Biological Significance (ASBS) - means all those areas of this state listed as ASBS, listed specifically within the California Ocean Plan or so designated by the State Board which, among other areas, includes the area from Mugu Lagoon to Latigo Point: Ocean water within a line originating from Laguna Point at 34° 5' 40" north, 119° 6'30" west, thence southeasterly following the mean high tideline to a point at Latigo Point defined by the intersection of the mean high tide line and a line extending due south of Benchmark 24; thence due south to a distance of 1000 feet offshore or to the 100 foot isobath, whichever distance is greater; thence northwesterly following the 100 foot isobath or maintaining a 1,000-foot distance from shore, whichever maintains the greater distance from shore, to a point lying due south of Laguna Point, thence due north to Laguna Point.

Authorized Discharge - means any discharge that is authorized pursuant to an NPDES permit, waste discharge requirement, conditional waiver from waste discharge requirements, or meets the conditions set forth in this Order.

Automotive Repair Shop - means a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

Automotive Service Facilities - means a facility that is categorized in any one of the following Standard Industrial Classification (SIC) and North American Industry Classification System (NAICS) codes. For inspection purposes, Permittees need not inspect facilities with SIC codes

5013, 5014, 5541, 5511, provided that these facilities have no outside activities or materials that may be exposed to storm water.

SIC Code	Corresponding NAICS Code
5013	425120, 441310, 425110, & 423120
5014	425120, 425110, 423130, & 441320
5511	441110
5541	447110, & 447190
7532	811121
7533	811112
7534	326212, & 811198
7536	811122
7537	811113
7538	811111
7539	811198, & 811118

Bacteria Total Maximum Daily Load (TMDL) Dry Weather - defined in the Bacteria TMDLs as those days with less than 0.1 inch of rainfall and those days occurring more than 3 days after a rain.

Bacteria Total Maximum Daily Load (TMDL) Wet Weather - defined in the Bacteria TMDLs as a day with 0.1 inch or more of rain and 3 days following the rain event.

Basin Plan - means the Water Quality Control Plan, Los Angeles Region, Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties, adopted by the Regional Water Board on June 13, 1994 and subsequent amendments.

Beneficial Uses - means the existing or potential uses of receiving waters in the permit area as designated by the Regional Water Board in the Basin Plan.

Best Management Practices (BMPs) - means methods, measures, or practices designed and selected to reduce or eliminate the discharge of pollutants to surface waters from point and nonpoint source discharges including storm water. BMPs include structural and nonstructural controls, and operation and maintenance procedures, which can be applied before, during, and/or after pollution producing activities.

California Environmental Quality Act (CEQA) - means a California statute that requires state and local agencies to identify significant environmental impacts of their actions and to avoid or mitigate those impacts, if feasible (Reference: California Public Resources Code § 21000 et seq.)

Channel - means an open conduit either naturally or artificially created which periodically or continuously contains moving water, or which forms a connecting link between two waterbodies.

Chronic Toxicity - means a measurement of a sublethal effect (e.g., reduced growth, reproduction) to experimental test organisms exposed to an effluent or ambient waters compared to that of the control organisms.

Commercial Area(s) - means any geographic area of the Permittees' jurisdiction that is not heavy industrial or residential. A commercial area includes, but is not limited to areas surrounding: commercial activity, hospitals, laboratories and other medical facilities, educational institutions, recreational facilities, plant nurseries, car wash facilities, mini-malls and other business complexes, shopping malls, hotels, office buildings, public warehouses and other light industrial complexes.

Commercial Development - means any development on private land that is not heavy industrial or residential. The category includes, but is not limited to: hospitals, laboratories and other medical facilities, educational institutions, recreational facilities, plant nurseries, car wash facilities, mini-malls and other business complexes, shopping malls, hotels, office buildings, public warehouses and other light industrial complexes.

Construction - Construction activity includes any construction or demolition activity, clearing, grading, grubbing, or excavation or any other activity that results in a land disturbance. Construction does not include emergency construction activities required to immediately protect public health and safety or routine maintenance activities required to maintain the integrity of structures by performing minor repair and restoration work, maintain original line and grade, hydraulic capacity, or original purpose of the facility. See "Routine Maintenance" definition for further explanation. Where clearing, grading or excavating of underlying soil takes place during a repaving operation, State General Construction Permit coverage is required if more than one acre is disturbed or the activities are part of a larger plan.

Construction Activities Storm Water General Permit (CASGP) - means the general NPDES permit adopted by the State Board, which authorizes the discharge of storm water from construction activities under certain conditions.

Control - means to minimize, reduce, eliminate, or prohibit by technological, legal, contractual or other means, the discharge of pollutants from an activity or activities.

Critical Sources - means commercial facilities and businesses that have a potential to contribute pollutants to stormwater runoff if effective BMPs are not implemented. Attachment "D" specifies the commercial facilities and businesses that have been identified as Critical Sources.

Dechlorinated/ Debrominated Swimming Pool Discharge - means any swimming pool discharge with a residual chlorine or bromine level of 0.1mg/L or less; and does not contain any detergents, wastes, algaecides, or cyanuric acid in excess of 50 ppm, or any other chemicals including salts from pools commonly referred to as "salt water pools". The term does not include swimming pool filter backwash or swimming pool water containing bacteria.

Development - means any construction, rehabilitation, redevelopment or reconstruction of any public or private residential project (whether single-family, multi-unit or planned unit development); industrial, commercial, retail and any other non-residential projects, including public agency projects; or mass grading for future construction.

Directly Adjacent - means situated within 200 feet of the contiguous zone required for the continued maintenance, function, and structural stability of the environmentally sensitive area.

Directly Discharging - means outflow from a drainage conveyance system that is composed entirely or predominately of flows from the subject, property, development, subdivision, or industrial facility and not commingled with the flows from adjacent lands.

Discharge - means when used without qualification the "discharge of a pollutant."

Discharging Directly - means outflow from a drainage conveyance system that is composed entirely or predominantly of flows from the subject, property, development, subdivision, or industrial facility, and not commingled with the flows from adjacent lands.

Discharge of a Pollutant - means any addition of any "pollutant" or combination of pollutants to "waters of the United States" from any "point source" or, any addition of any pollutant or combination of pollutants to the waters of the "contiguous zone" or the ocean from any point source other than a vessel or other floating craft, which is being used as a means of transportation. The term discharge includes additions of pollutants into waters of the United States from: surface runoff which is collected or channeled by man; discharges through pipes, sewers, or other conveyances owned by a State, municipality, or other person which do not lead to a treatment works; and discharges through pipes, sewers, or other conveyances, leading into privately owned treatment works.

Disturbed Area - means any area that is altered as a result of land disturbance. Examples include but are not limited to: clearing, grading, grubbing, stockpiling and/ or excavation, etc...

Dry Day - means a non-wet day for Malibu Creek and Lagoon Bacteria TMDL WLA. A wet day is defined as a day with a 0.1 inch or more of rain and 3 days following the rain event.

Effect Concentration (EC) - means a point estimate of the toxicant concentration that would cause an observable adverse effect (e.g., death, immobilization, or serious incapacitation) in a given percent of the test organisms, calculated from a continuous model (e.g., Probit Model). EC_{25} is a point estimate of the toxicant concentration that would cause an observable adverse effect in 25 percent of the test organisms.

Effective Impervious Surface - means that portion of the surface area that is hydrologically connected via sheet flow over a hardened conveyance or impervious surface without any intervening medium to mitigate flow volume.

Effluent limitation - means any restriction imposed by the Permitting Authority (PA) on quantities, discharge rates, concentrations, and/ or mass loadings of "pollutants" which are "discharged" from "point sources" into "waters of the United States," the waters of the "contiguous zone," or the ocean.

Emergency - means a sudden, unexpected occurrence, involving a clear and imminent danger, demanding immediate action to prevent or mitigate loss of, or damage to, life, health, property, or essential public services. "Emergency" includes such occurrences as fire, flood, earthquake, or other soil or geologic movements, as well as such occurrences as riot, accident, or sabotage. (Reference: California Public Resources Code § 21060.3. Emergency).

End-of-Pipe - means the end of the major outfall as defined in 40 CFR 122.26 (b)(5) and 40 CFR 122.26 (b)(6).

Endpoint - means a biological measurement used to quantify the results obtained from analytical methods such as whole effluent toxicity testing [e.g., lethal concentration (LC_{50}); inhibition concentration (IC_{25}); and no observed effect concentration (NOEC)]. Such endpoints are quantitative measurements of the responses of test organisms (e.g., survival, growth, mobility, reproduction, and weight gain or loss) in response to exposure to a serial dilution of effluent.

Environment - means the physical conditions, which exist within the area and which will be affected by a proposed project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historical or aesthetic significance. The area involved shall be the area in which significant effects would occur either directly or indirectly as a result of the project. The "environment" includes both natural and man-made conditions.

Environmentally Sensitive Area (ESA) - means an area "in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which would be easily disturbed or degraded by human activities and developments" (Reference: California Public Resources Code § 30107.5). ESAs will include Clean Water Act 303d Listed Water Bodies in all reaches that are unimproved, all California Coastal Commission's Environmentally Sensitive Habitat Areas as delineated on maps in Local Coastal Plans and Regional Water Quality Control Board's Basin Plan Rare, Threatened or Endangered Species (RARE) and Preservation of Biological Habitats (BIOL) designated waterbodies. The California Department of Fish and Game's Significant Natural Areas map will be considered for inclusion as the department field verifies the designated locations. Watershed restoration projects will be considered for inclusion as the department field verifies the designated locations.

Erosivity Factor - The Erosivity Factor is a criterion that to assess the risk of erosion on disturbed land. It is described in "Predicting soil erosion by water: A guide to conservation planning with the Revised Universal Soil Loss Equation (RUSLE), Agricultural Handbook 703, USDA-ARS, U.S. Government Printing Office, Washington, D.C., 1997 by Renard, K.C., G.R. Foster, G.A. Weesies, D.K. McCool, and D.C. Yoder.

Federal Clean Water Act (CWA) - means (formerly referred to as the Federal Water Pollution Control Act or Federal Water Pollution Control Act Amendments of 1972) Public Law 92—500, as amended by Public Law 95—217, Public Law 95—576, Public Law 96—483 and Public Law 77—117, codified at 33 U.S.C. 1251 et seq.

First Storm Event - means the first storm event of the wet season that produces at least 0.25 inches of rain.

Forest Land - means land at least 10 percent stocked with live trees, or land that had this minimum tree stocking in the past and is not currently developed for nonforest use. The minimum area recognized is 1 acre.

Groundwater Dewatering - means the active practice of removing standing water from soil excavations using a pump(s) or other means.

Hillside - means property located in an area with known erosive soil conditions, where the development will result in grading on any slope that is 20% or greater or an area designated by the Municipality under a General Plan or ordinance as a "hillside area".

Horse Stables - means a property where at least one horse is stabled at least part of the year.

Hydromodification - means the alteration away from a natural state of stream flows or the beds or banks of rivers, streams, or creeks, including ephemeral washes, which results in hydrogeomorphic changes.

Illegal Discharge - means any discharge to the municipal separate storm sewer (storm drain system) that is prohibited under local, state, or federal statutes, ordinances, codes, or regulations. The term illegal discharge includes all non-storm water discharges not composed entirely of storm water except discharges pursuant to an NPDES permit, discharges that are identified in part 1, "Discharge Prohibitions" of this order, or discharges authorized by the Regional Water Board Executive Officer.

Illicit Connection - means any engineered conveyance that is connected to the storm drain system without a permit or municipal authorization. It also means any engineered conveyance through which discharges of pollutants to the separate storm drainage systems, which are not composed entirely of storm water or are not authorized by an NPDES permit, may occur.

Illicit Discharge - means any discharge to a municipal separate storm sewer (storm drain system) that is prohibited under local, state, or federal statutes, ordinances, codes, or regulations. The term illicit discharge includes all non-storm water discharges not composed entirely of storm water except discharges pursuant to a NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer) and discharges that are identified in part 1, "Discharge Prohibitions" of this order, or authorized by the Regional Water Board Executive Officer.

Illicit Disposal - means any disposal, either intentionally or unintentionally, of material(s) or waste(s) that can pollute storm water.

Industrial/ Commercial Facility - means any facility involved and/ or used in the production, manufacture, storage, transportation, distribution, exchange or sale of goods and/ or

commodities, and any facility involved and/ or used in providing professional and non-professional services. This category of facilities includes, but is not limited to, any facility defined by either the Standard Industrial Classifications (SIC) or the North American Industry Classification System (NAICS). Facility ownership (federal, state, municipal, private) and profit motive of the facility are not factors in this definition.

Industrial Activities Storm Water General Permit (IASGP) - means the general NPDES permit adopted by the State Board, which authorizes the discharge of storm water from certain industrial activities under certain conditions.

Industrial Park - means a land development that is set aside for industrial development. Industrial parks are usually located close to transport facilities, especially where more than one transport modalities coincide: highways, railroads, airports, and navigable rivers. It includes office parks, which have offices and light industry.

Inhibition Concentration (IC) - means a point estimate of the toxicant concentration that would cause a given percent reduction in a non-lethal biological measurement (e.g., reproduction or growth), calculated from a continuous model (i.e., Interpolation Method). IC25 is a point estimate of the toxic concentration that would cause a 25-percent reduction in a non-lethal biological measurement.

Inspection - means entry and the conduct of an on-site review of a facility and its operations, at reasonable times, to determine compliance with specific municipal or other legal requirements. The steps involved in performing an inspection, include, but are not limited to:

1. Pre-inspection documentation research
2. Request for entry
3. Interview of facility personnel
4. Facility walk-through
5. Visual observation of the condition of facility premises
6. Examination and copying of records as required
7. Sample collection (if necessary or required)
8. Exit conference (to discuss preliminary evaluation)
9. Report preparation, and if appropriate, recommendations for coming into compliance

Integrated Pest Management (IPM) - means a sustainable approach to managing pests by combining biological, cultural, physical and chemical tools in a way that minimizes economic, health, and environmental risks.

Large Municipal Separate Storm Sewer System (MS4) - means all MS4s that serve a population greater than 250,000 (1990 Census) as defined in 40 CFR 122.26 (b)(4). The Regional Water Board designated Ventura County as a large MS4 in 1990, based on: (i) the U.S. Census Bureau 1990 population count of 669,016 thousand, and (ii) the interconnectivity of the MS4s in the incorporated and unincorporated areas within the County.

Local SWPPP - means the Local Storm Water Pollution Prevention Plan (LSWPPP) required by the local agency for a project that disturbs one or more acres of land. Shall mean a plan identifying potential pollutant sources from a construction site and describing proposed design, placement and implementation of BMPs, to effectively prevent non-storm water discharges and reduce pollutants in storm water discharges to the storm drain system, during construction activities. Also referred as a Storm Water Pollution Control Plan (SWPCP).

Low Impact Development (LID) – means a design strategy with the goal of maintaining or replicating the pre-development hydrologic regime through the use of design techniques to create a functionally equivalent hydrologic site design. Hydrologic functions of storage, infiltration and ground water recharge, as well as the volume and frequency of discharges are maintained through the use of integrated and distributed micro-scale storm water retention and detention areas, reduction of impervious surfaces, and the lengthening of runoff flow paths and flow time. Other strategies include the preservation/protection of environmentally sensitive site features such as riparian buffers, wetlands, steep slopes, valuable (mature) trees, flood plains, woodlands, and highly permeable soils.

Major Municipal Separate Storm Sewer Outfall ("or major outfall") - means a major municipal separate storm sewer outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (discharge from a single conveyance other than circular pipe which is associated with a drainage area of more than 50 acres); or for municipal separate storm sewers that receive storm water from lands zoned for industrial activity (based on comprehensive zoning plans or the equivalent), an outfall that discharges from a single pipe with an inside diameter of 12 inches or more or from its equivalent (discharge from other than a circular pipe associated with a drainage area of 2 acres or more), as defined in 40 CFR 122.26 (b)(5).

Major Outfall - means a major municipal separate storm sewer outfall, as defined in 40 CFR 122.26 (b)(6).

Maximum Extent Practicable (MEP) – The technology-based permit requirement established by Congress in CWA section 402(p)(3)(B)(iii) that municipal dischargers of storm water must meet. Technology-based requirements, including MEP, establish a level of pollutant control that is derived from available technology or other controls. MEP requires municipal dischargers to perform at maximum level that is practicable. Compliance with MEP may be achieved by emphasizing pollution prevention and source control BMPs in combination with structural and treatment methods where appropriate. The MEP approach is an ever evolving and advancing concept, which considers technical and economic feasibility.

Method Detection Limit (MDL) - means the minimum concentration of a substance that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero, as defined in 40 CFR 136, Appendix "G" of this Order.

Minimum Level (ML) - means the concentration at which the entire analytical system must give a recognizable signal and acceptable calibration point. The ML is the concentration in a sample that is equivalent to the concentration of the lowest calibration standard analyzed by a specific analytical procedure, assuming that all the method specified sample weights, volumes, and processing steps have been followed. The ML value represents the lowest quantifiable concentration in a sample based on the proper application of all method-based analytical procedures and the absence of any matrix interferences. Assuming that all method-specific analytical steps are followed, the ML value will also represent, after the appropriate application of method-specific factors, the lowest standard in the calibration curve for that specific analytical technique.

Minimum Significant Difference (MSD) - means a measure of test sensitivity that establishes the minimum difference required between a control and a test treatment in order for that difference to be considered statistically significant.

Municipal Separate Storm Sewer System (MS4) - means a conveyance or system of conveyances (including roads w/ drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains), as defined in 40 CFR 122.26(b)(8):

1. Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under § 208 of the Federal Clean Water Act (CWA) that discharges into waters of the United States
2. Designed or used for collecting or conveying storm water
3. Which is not a combined sewer
4. Which is not part of a Publicly Owned Treatment Works (POTW), as defined in 40 CFR 122.2

NAICS - means North American Industry Classification System.

National Pollutant Discharge Elimination System (NPDES) - means the national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under CWA § 307, 402, 318, and 405.

Natural Drainage Systems - means unlined or unimproved (not engineered) creeks, streams, rivers or similar waterways.

New Development - means land disturbing activities; structural development, including construction or installation of a building or structure, creation and replacement of impervious surfaces; and land subdivision.

Non-Storm Water Discharge - means any discharge to a storm drain that is not composed entirely of storm water.

No Observed Effect Concentration (NOEC) - means the highest tested concentration of an effluent or toxicant that causes no observable adverse effect on the test organisms (i.e., the highest concentration of toxicant at which the values for the observed responses are not statistically different from the controls).

Nuisance - means anything that meets all of the following requirements: (1) is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property; (2) affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal; (3) occurs during, or as a result of, the treatment or disposal of wastes.

Nursery - means nursery operations that are generally classified under 4 broad NAICS classification sectors: (a) 111xxx - Crop Production – Agriculture; (b) 424xxx - Merchant Wholesalers, Nondurable Goods; (c) 44xxxx - Retail Trade; and (d) 454xxx - Non-store retailers. Retail nursery operations shall be covered by this Order. This Order does not cover wholesale nursery stock operations or agricultural nursery operations, unless such operations are not covered by another Regional Water Board Order.

(1) **Retail Nursery Operations** - means Nursery, Garden Center, and Farm Supply Stores typically classified under NAICS Code 444220 and non-store retailers typically classified under NAICS Code 454xxx. Retail nursery operations are primarily engaged in retailing nursery and garden products, such as trees, shrubs, plants, seeds, bulbs, floriculture products and sod, which are predominantly grown elsewhere. These establishments may sell a limited amount of a product they grow themselves.

Open Channel - means a storm drainage channel that is not a natural water course.

Parking Lot - means land area or facility for the parking or storage of motor vehicles used for businesses, commerce, industry, or personal use.

Percent Minimum Significant Difference (PMSD) - means the minimum significant difference divided by the control mean, expressed as a percent (see minimum significant difference).

Permit - means an authorization, license, or equivalent control document issued by U.S. EPA or an "approved State" to implement the requirements of 40 CFR Parts 122, 123, and 124. "Permit" includes an NPDES "general permit" (§ 122.28). Permit does not include any permit, which has not yet been the subject of final agency action, such as a "draft permit" or a "proposed permit."

Permittee(s) - means co-permittee(s) and any agency named in this Order as being responsible for permit conditions within its jurisdiction, as defined by Federal Regulation. Permittees to this Order include the Ventura Water Protection District, Ventura County, and the

cities of Camarillo, Fillmore, Moorpark, Ojai, Oxnard, Port Hueneme, San Buenaventura, Santa Paula, Simi Valley and Thousand Oaks.

Point Source - means any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged. This term does not include agricultural storm water discharges and return flows from irrigated agriculture.

Point Zero - means in the context of the TMDLs, the point at which water from the storm drain or creek initially mixes with water.

Pollutants - means those "pollutants" defined in CWA § 502(6) (33.U.S.C.§ 1362(6)), and incorporated by reference into California Water Code § 13373.

Pollutants of Concern - means constituents that have exceeded Basin Plan Objectives, and CTR- Chronic or Acute Objectives during monitoring at Mass Emission, Receiving Water, and Land Use stations.

Potable Water Sources - means the potable water system for the treatment, distribution, and provision of water for residential, commercial, industrial, or institutional use that meets all California safe drinking water regulatory standards for human consumption.

Pre-Developed Condition - means native vegetation and soils that existed at a site prior to first development. The pre-developed condition may be assumed to be an area with the typical vegetation, soil, and storm water runoff characteristics of open space areas in coastal Southern California unless reasonable historic information is provided that the area was atypical.

Priority Pollutants - means those constituents referred to in 40 CFR 401.15 and listed in the U.S. EPA NPDES Application Form 2C, pp. V-3 through V-9.

Project - means all development, redevelopment, and land disturbing activities. The term is not limited to "Project" as defined under CEQA (Reference: California Public Resources Code § 21065).

Qualified SWPPP Developer or Qualified SWPPP Practitioner – refer to State of California General Construction Stormwater Permit for definition.

Rare, Threatened, or Endangered Species (RARE) - means a beneficial use for waterbodies in the Los Angeles Region, as designated in the Basin Plan (Tables 2-1, 2-3, and 2-4), that supports habitats necessary, at least in part, for the survival and successful maintenance of plant or animal species established under state or federal law as rare, threatened, or endangered.

Redevelopment - means land-disturbing activity that results in the creation, addition, or replacement of 5,000 square feet or more of impervious surface area on an already developed

site. Redevelopment includes, but is not limited to: the expansion of a building footprint; addition or replacement of a structure; replacement of impervious surface area that is not part of a routine maintenance activity; and land disturbing activities related to structural or impervious surfaces. It does not include routine maintenance to maintain original line and grade, hydraulic capacity, or original purpose of facility, nor does it include emergency construction activities required to immediately protect public health and safety.

Regional Administrator - means the Regional Administrator of the Regional Office of the U.S. EPA or the authorized representative of the Regional Administrator.

Report of Waste Discharge (ROWD) - means an application for renewal of the NPDES Permit for Waste Discharge Requirements for Municipal Separate Storm Sewer Discharges Within the Ventura County Watershed Protection District, County of Ventura and the Incorporated Cities Therein.

Restaurant - means a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC Code 5812).

Restoration - means the reestablishment of predisturbance aquatic functions and related physical, chemical and biological characteristics (Reference: National Research Council. 1992. Restoration of Aquatic Ecosystems: Science, Technology and Public Policy. National Academy Press, Washington, D.C.).

Retail Gasoline Outlet (RGO) - means any facility engaged in selling gasoline and lubricating oils- SIC 5541 and NAICS 447110 & 447190.

1. RGOs: 447190 Other Gasoline Stations:
   This industry comprises establishments known as gasoline stations (except those with convenience stores) primarily engaged in one of the following: (1) retailing automotive fuels (e.g., diesel fuel, gasohol, gasoline) or (2) retailing these fuels in combination with activities, such as providing repair services; selling automotive oils, replacement parts, and accessories; and/ or providing food services.
2. RGOs: 447110 Gasoline Stations with Convenience Stores:
   Retailing automotive fuels in combination with a convenience store or food mart.

Routine Maintenance – Routine maintenance projects include, but are not limited to projects conducted to:

1. Maintain the original line and grade, hydraulic capacity, or original purpose of the facility.
2. Perform as needed restoration work to preserve the original design grade, integrity and hydraulic capacity of flood control facilities.
3. Includes road shoulder work, regrading dirt or gravel roadways and shoulders and performing ditch cleanouts.
4. Update existing lines* and facilities to comply with applicable codes, standards, and regulations regardless if such projects result in increased capacity.
5. Repair leaks

Routine maintenance does not include construction of new** lines or facilities resulting from compliance with applicable codes, standards and regulations.
* Update existing lines includes replacing existing lines with new materials or pipes.
** New lines are those that are not associated with existing facilities and are not part of a project to update or replace existing lines.

Screening - means using proactive methods to identify illicit connections through a continuously narrowing process. The methods may include: performing baseline monitoring of open channels, conducting special investigations using a prioritization approach, analyzing maintenance records for catch basin and storm drain cleaning and operation, and verifying all permitted connections into the storm drains. Special investigation techniques may include: dye testing, visual inspection, smoke testing, flow monitoring, infrared, aerial and thermal photography, and remote control camera operation.

Sidewalk Rinsing - means only sidewalk rinsing using high pressure and low volume of water with no additives and at an average usage of 0.006 gallons per square foot of surface area to be rinsed. Any waste generated from the activity must be collected and properly and legally disposed of. It does not mean hosing of any sidewalk or street with a garden hose with a pressure nozzle.

Site - means the land or water area where any "facility or activity" is physically located or conducted, including adjacent land used in connection with the facility or activity.

Small Construction - means any soil disturbing activities less than 5 acres.

Smart Growth - development in or near cities intended to lessen or reverse suburban sprawl, decrease the use of automobiles, and shorten daily travel. It uses compact building design to cluster together residential, shopping, and work areas and encourages walking and public transportation. Smart Growth is considered a stormwater BMP in the 2005 publication *Using Smart Growth Techniques as Stormwater Best Management Practices*, EPA 231-B-05-002.

Source Control BMP - means any schedules of activities, prohibitions of practices, maintenance procedures, managerial practices or operational practices that aim to prevent storm water pollution by reducing the potential for contamination at the source of pollution.

Southern California Stormwater Monitoring Coalition (SMC) - means the Stormwater Monitoring Coalition, which is a collaborative research/ monitoring partnership of the Southern California Water Boards, Municipal Storm Water Agencies, and municipalities to develop the methodologies and assessment tools to more effectively understand urban storm water and non-storm water (anthropogenic) impacts to receiving waters and to conduct research/ monitoring through Subsequent Research Implementation Agreements. The first original cooperative agreement was entered into on February 8, 2001.

Stream - means a body of flowing water; natural water course containing water at least part of the year. In hydrology, it is generally applied to the water flowing in a natural channel as distinct from a canal (Reference: US Geological Survey).

Strip Mall - means a commercial development that is a shopping center where the stores are arranged in a row, with a sidewalk in front. Strip malls are typically developed as a unit and have large parking lots in front. They face major traffic arterials and tend to be self-contained with few pedestrian connections to surrounding neighborhoods. It is also called a plaza.

Storm Event Monitoring - means a rainfall event that produces more than 0.25 inch of precipitation and is separated from the previous storm event by at least 1 week of dry weather, for the purpose of monitoring.

Storm Water - means storm water runoff, snow melt runoff, and surface runoff and drainage, as defined in 40 CFR 122.26(b)(13).

Storm Water Discharge Associated with Industrial Activity - means industrial discharge, as defined in 40 CFR 122.26(b)(14).

Storm Water Quality Management Program - means the Ventura Countywide Storm Water Quality Management Plan, which includes descriptions of programs, collectively developed by the Permittees in accordance with provisions of the NPDES Permit, to comply with applicable federal and state law, as the same is amended from time to time.

Structural BMP - means any structural facility designed and constructed to mitigate the adverse impacts of storm water runoff pollution (e.g. canopy, structural enclosure). The category may include both Treatment Control BMPs and Source Control BMPs.

Summer Dry Weather - means dry weather days occurring from April 1 through October 31 of each year.

t-Test (formally Student's t-test) - means a statistical analysis comparing two sets of replicate observations, in the case of WET, only two test concentrations (e.g., a control and 100% effluent). The purpose of this test is to determine if the means of the two sets of observations are different [e.g., if the 100% effluent concentration differs from the control (i.e., the test pass or fails)].

Targeted Employees - means management and staff who perform or direct activities that directly or indirectly have an effect of storm water quality. The employees generally are employed in the following areas: department of public works, engineering, sanitation, storm water maintenance, drainage and flood control, transportation, streets and roads, parks and recreation, public landscaping and corporation yards, planning or community development, code enforcement, building and safety, harbor or port departments, airports, or general services and fleet services.

Total Maximum Daily Load (TMDL) - means the sum of the individual waste load allocations for point sources and load allocations for nonpoint sources and natural background.

Toxicity Identification Evaluation (TIE) - means a set of procedures to identify the specific chemical(s) responsible for toxicity through a process of chemical/ physical manipulations of samples followed by toxicity tests. These procedures are performed in 3 phases (Phase I- Toxicity Characterization Procedure, Phase II- Toxicity Identification Procedure, and Phase III- Toxicity Confirmation Procedure) using aquatic organism toxicity tests.

Toxicity Reduction Evaluation (TRE) - means a study conducted in a step-wise process to identify the causative agents of effluent or ambient toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in toxicity.

Toxicity Test - means a procedure using living organisms to determine whether a chemical or an effluent is toxic. A toxicity test measures the degree of the effect of a specific chemical or effluent on exposed test organisms.

Toxic Unit (TU) - means a measure of toxicity in an effluent as determined by the acute toxicity units (TUa) or chronic toxicity units (TUc) measured. The larger the TU, the greater the toxicity.

Toxic Unit - Chronic (TUc) - means 100 times the reciprocal of the effluent concentration that causes no observable effect on the test organisms in a chronic toxicity test (TUc = 100/NOEC or 100/EC25) (see NOEC).

Treatment - means the application of engineered systems that use physical, chemical, or biological processes to remove pollutants. Such processes include, but are not limited to, filtration, gravity settling, media absorption, biodegradation, biological uptake, chemical oxidation and UV radiation.

Treatment Control BMP - means any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media absorption or any other physical, biological, or chemical process.

Urbanization - means the process of changing of land use and land patterns from rural characteristics to urban (city-like) characteristics. These changes include (i) the replacement of pervious surfaces with impervious surfaces such as rooftops and buildings, and impervious materials such as asphalt and concrete; and (ii) the conversion of rural land to house new residents, support new businesses, and facilitate vehicular traffic flow.

U.S. EPA Phase I Facilities - means facilities in specified industrial categories that are required to obtain an NPDES permit for storm water discharges, as required by 40 CFR 122.26(c). These categories include:

1. Facilities subject to storm water effluent limitation guidelines, new source performance standards, or toxic pollutant effluent standards (40 CFR N)
2. Manufacturing facilities

3. Oil and gas/ mining facilities
4. Hazardous waste treatment, storage, or disposal facilities
5. Landfills, land application sites, and open dumps
6. Recycling facilities
7. Steam electric power generating facilities
8. Transportation facilities
9. Sewage of wastewater treatment works
10. Light manufacturing facilities

Vehicle Maintenance/ Material Storage Facilities/ Corporation Yards - means any Permittee owned or operated facility or portion thereof that:

1. Conducts industrial activity, operates or stores equipment or materials, and provides services similar to Federal Phase I facilities;
2. Performs fleet vehicle service/ maintenance including repair, maintenance, washing, or fueling;
3. Performs maintenance and/ or repair of machinery/ equipment; or
4. Stores chemicals, raw materials, or waste materials.

Waste Load Allocations (WLAs) - means a portion of a receiving water's Total Maximum Daily Pollutant Load (TMDL) that is allocated to one of its existing or future point sources of pollution (Reference: 40 CFR 130.2(h)).

Water Quality Objectives - means water quality criteria contained in the Basin Plan, the California Ocean Plan, the National Toxics Rule, the California Toxics Rule, and other state or federally approved surface water quality plans. Such plans are used by the Regional Water Board to regulate all discharges, including storm water discharges.

Water Quality Standards - means the State Water Quality Standards, which are comprised of beneficial uses, water quality objectives and the State's Antidegradation Policy.

Waters of the State - means any surface water or groundwater, including saline waters, within boundaries of the state (Reference: California Water Code § 13050).

Waters of the United States or Waters of the US - means:

1. All waters that are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
2. All interstate waters, including interstate "wetlands";
3. All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds where the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce including any such waters:
   a. Which are or could be used by interstate or foreign travelers for recreational or other purposes
   b. From which fish or shellfish are or could be taken and sold in interstate or

foreign commerce; or

c. Which are used or could be used for industrial purposes by industries in interstate commerce

4. All impoundments of waters otherwise defined as waters of the United States under this definition;
5. Tributaries of waters identified in the preceding paragraph (1) through (4) of this definition;
6. The territorial sea; and
7. "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in the preceding paragraph (1) through (6) of this definition. (Reference: 33 CFR 328)

Watercourse - means any natural or artificial channel for passage of water, including the VCFCD jurisdictional channels included in the List of Channels within the Comprehensive Plan of the VCFCD, as approved by the Board of Supervisors of the VCFCD on October 4, 1993, and any amendments thereto.

Watershed Management - means approach for water resources protection. It is a strategy for integrating and managing resources, both human and fiscal that focuses on regulation of point sources, to a more regional approach that acknowledges environmental impacts from other activities.

Watershed Management Areas (WMA) - means the geographically-defined watershed areas where the Regional Water Board will implement the watershed approach. These generally involve a single large watershed within which exists smaller subwatersheds but in some cases may be an area that does not meet the strict hydrologic definition of a watershed e.g., several small Ventura coastal waterbodies in the region are grouped together into one WMA.

Wet Season - means the calendar period beginning October 1 through April 15.

Winter Dry Weather - means dry weather days occurring from November 1 - March 31 of each year.

Whole Effluent Toxicity - means the aggregate toxic effect of an effluent measured directly by a toxicity test.

PART 7 - STANDARD PROVISIONS

A. General Requirements

1. The Permittee shall comply with all provisions and requirements of this Order.

2. Should the Permittee discover that it failed to submit any relevant facts or that it submitted incorrect information in a report it shall promptly submit the missing or correct information.

3. The Permittee shall report all instances of non-compliance not otherwise reported at the time monitoring reports are submitted.

4. This Order includes Attachment "I", the Reporting Program, which is a part of this Order and must be complied with.

B. Regional Water Board Review

1. The Regional Water Board may review any formal determinate or approval made by the Regional Water Board Executive Officer pursuant to the provisions of this Order.
   (a) Permittee(s) or a member of the public may request such review upon petition within 30 day of the effective date of the notification of such decision to the Permittee(s) and interested parties on file at the Regional Water Board.

C. Public Review

1. All documents submitted to the Regional Water Board in compliance with the terms and conditions of this Order shall be made available to members of the public pursuant to the Freedom of Information Act (5 U.S.C. § 552), as amended, and the Public Records Act (California Government Code § 6250 et seq.).

2. All documents submitted to the Regional Water Board Executive Officer for approval shall be made available to the public for a 30-day period to allow for public comment.

D. Duty to Comply [40 CFR 122.41(a)]

1. Each Permittee must comply with all of the terms, requirements, and conditions of this Order. Any violation of this order constitutes a violation of the Clean Water Act, its regulations and the California Water Code, and is grounds for enforcement action, Order termination, Order revocation and reissuance, denial of an application for reissuance, or a combination thereof [40 CFR 122.41(a), Cal. Wat. Code § 13261, 13263, 13265, 13268, 13300, 13301, 13304, 13340, 13350].

2. A copy of these waste discharge specifications shall be maintained by each Permittee so as to be available during normal business hours to Permittee employees and members of the public.

3. Any discharge of wastes at any point(s) other than specifically described in this Order is prohibited, and constitutes a violation of the Order.

E. Duty to Mitigate [40 CFR 122.41 (d)]

1. Each Permittee shall take all reasonable steps to minimize or prevent any discharge that has a reasonable likelihood of adversely affecting human health or the environment.

F. Inspection and Entry; Investigations; Responsibilities [40 CFR 122.41(i), Cal. Water Code § 13225 and § 13267]

1. The Regional Water Board, U.S. EPA, and other authorized representatives shall be allowed:
   (a) Entry upon premises where a regulated facility is located or conducted, or where records are kept under conditions of this Order;
   (b) Access to copy any records, at reasonable times that are kept under the conditions of this Order;
   (c) To inspect at reasonable times any facility, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Order;
   (d) To photograph, sample, and monitor at reasonable times for the purpose of assuring compliance with this Order, or as otherwise authorized by the CWA and the CAL. WATER CODE;
   (e) To review any water quality control plan or waste discharge requirements, or in connection with any action relating to any plan or requirement to investigate the quality of any waters of the state within its region; and,
   (f) To require as necessary any state or local agency to investigate and report on any technical factors involved in water quality control or to obtain and submit analyses of water.

G. Proper Operation and Maintenance [40 CFR 122.41 (e), Cal. Water Code § 13263(f)]

1. The Permittees shall at all times properly operate and maintain all facilities and systems of treatment (and related appurtenances) that are installed or used by the Permittees to achieve compliance with this Order. Proper operation and maintenance includes:
   (a) Adequate laboratory controls; and
   (b) Appropriate quality assurance procedures.

2. This provision requires the operation of backup or auxiliary facilities or similar system that are installed by a Permittee only when necessary to achieve compliance with the conditions of this Order.

H. Signatory Requirements [40 CFR 122.41(k) & 122.22]

1. Except as otherwise provided in this Order, all applications, reports, or information submitted to the Regional Water Board shall be signed by the City Manager or Mayor, or authorized designee and certified as set forth in 40 CFR 122.22.

I. Reopener and Modification [40 CFR 122.41(f) & 122.62]

1. This Order may only be modified, revoked, or reissued, prior to the expiration date, by the Regional Water Board, in accordance with the procedural requirements of the Cal. Water Code and CCR Title 23 for the issuance of waste discharge requirements, 40 CFR 122.62, and upon prior notice and hearing, to:
   (a) Address changed conditions identified in the required reports or other sources deemed significant by the Regional Water Board;
   (b) Incorporate applicable requirements or statewide water quality control plans adopted by the State Board or amendments to the Basin Plan, including TMDLs;
   (c) Comply with any applicable requirements, guidelines, and/ or regulations issued or approved pursuant to CWA § 402(p); and/ or,
   (d) Consider any other federal, or state laws or regulations that became effective after adoption of this Order.

2. After notice and opportunity for a hearing, this Order may be terminated or modified for cause, including, but not limited to:
   (a) Violation of any term or condition contained in this Order;
   (b) Obtaining this Order by misrepresentation, or failure to disclose all relevant facts; or,
   (c) A change in any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge.

3. The filing of a request by the Principal Permittee or Permittees for a modification, revocation and re-issuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any condition of this Order.

4. This Order may be modified to make corrections or allowances for changes in the permitted activity listed in this section, following the procedures at 40 CFR 122.63, if processed as a minor modification. Minor modifications may only:
   (a) Correct typographical errors; or
   (b) Require more frequent monitoring or reporting by the Permittee.

J. Severability

1. The provisions of this Order are severable; and if any provision of this Order or the application of any provision of this Order to any circumstance is held invalid, the application of such provision to other circumstances and the remainder of this Order shall not be affected.

K. Duty to Provide Information [40 CFR 122.41(h)]

1. The Permittees shall furnish, within a reasonable time, any information the Regional Water Board or U.S. EPA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this Order.

2. The Permittees shall also furnish to the Regional Water Board, upon request, copies of records required to be kept by this Order.

L. Twenty-Four Hour Reporting [40 CFR 122.41(l)(6)][1]

1. The Permittees shall report to the Regional Water Board any noncompliance that may endanger health or the environment. Any information shall be provided orally within 24 hours from the time any Permittee becomes aware of the circumstances. A written submission shall also be provided within 5 days of the time the Permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times and, if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

2. The Regional Water Board may waive the required written report on a case-by-case basis.

M. Bypass [40 CFR 122.41(m)][2]

1. Bypass (the intentional diversion of waste streams from any portion of a treatment facility) is prohibited. The Regional Water Board may take enforcement action against Permittees for bypass unless:
   (a) Bypass was unavoidable to prevent loss of life, personal injury or severe property damage. (Severe property damage means substantial physical damage to property, damage to the treatment facilities that causes them to become inoperable, or substantial and permanent loss of natural resources that can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.);
   (b) There were no feasible alternatives to bypass, such as the use of auxiliary treatment facilities, retention of untreated waste, or maintenance during normal periods of equipment down time. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass that could occur during normal periods of equipment downtime or preventive maintenance;

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[1] This provision applies to incidents where effluent limitations (numerical or narrative) as provided in this Order or in the Ventura County SMP are exceeded, and which endanger public health or the environment.
[2] This provision applies to the operation and maintenance of storm water controls and BMPs as provided in this Order or in the Ventura County SMP.

(c) The Permittee submitted a notice at least ten days in advance of the need for a bypass to the Regional Water Board; or,
(d) Permittees may allow a bypass to occur that does not cause effluent limitations to be exceeded, but only if it is for essential maintenance to assure efficient operation. In such a case, the above bypass conditions are not applicable. The Permittee shall submit notice of an unanticipated bypass as required.

N. Upset [40 CFR 122.41(n)][1]

1. Upset means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.
2. A Permittee that wishes to establish the affirmative defense of an upset in an action brought for non compliance shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:
   (a) An upset occurred and that the Permittee can identify the cause(s) of the upset;
   (b) The permitted facility was being properly operated by the time of the upset;
   (c) The Permittee submitted notice of the upset as required; and,
   (d) The Permittee complied with any remedial measures required.
3. No determination made before an action for noncompliance, such as during administrative review of claims that non-compliance was caused by an upset, is final administrative action subject to judicial review.
4. In any enforcement proceeding, the Permittee seeking to establish the occurrence of an upset has the burden of proof.

O. Property Rights [40 CFR 122.41(g)]

1. This Order does not convey any property rights of any sort, or any exclusive privilege.

P. Enforcement

1. Violation of any of the provisions of the NPDES permit or any of the provisions of this Order may subject the violator to any of the penalties described herein, or any combination thereof, at the discretion of the prosecuting authority; except that only one kind of penalties may be applied for each kind of violation. The CWA provides the following:
   (a) Criminal Penalties for:

[1] This provision applies to incidents where effluent limitations (numerical or narrative) as provided in this Order or in the Ventura County SMP are exceeded, and which endanger public health or the environment.

(1) Negligent Violations [CWA § 309 (c)(1)(B)]:
The CWA provides that any person who negligently violates permit conditions implementing CWA § 301, 302, 306, 307, 308, 318, or 405 is subject to a fine of not less than $2,500 nor more than $25,000 per day for each violation, or by imprisonment for not more than 1 year, or both.

(2) Knowing Violations [CWA § 309 (c)(2)(B)]:
The CWA provides that any person who knowingly violates permit conditions implementing CWA § 301, 302, 306, 307, 308, 318, or 405 is subject to a fine of not less than $5,000 nor more than $50,000 per day of violation, or by imprisonment for not more than 3 years, or both.

(3) Knowing Endangerment [CWA § 309 (c)(3)(A)]:
The CWA provides that any person who knowingly violates permit conditions implementing CWA § 301, 302, 307, 308, 318, or 405 and who knows at that time that he is placing another person in imminent danger of death or serious bodily injury is subject to a fine of not more than $250,000, or by imprisonment for not more than 15 years, or both.

(4) False Statement [CWA § 309 (c)(4)]:
The CWA provides that any person who knowingly makes any false material statement, representation, or certification in any application, record, report, plan, or other document filed or required to be maintained under the Act or who knowingly falsifies, tampers with, or renders inaccurate, any monitoring device or method required to be maintained under the Act, shall upon conviction, be punished by a fine of not more than $10,000 or by imprisonment for not more than two years, or by both. If a conviction is for a violation committed after a first conviction of such person under this paragraph, punishment shall be by a fine of not more than $20,000 per day of violation, or by imprisonment of not more than four years, or by both.

(b) Civil Penalties [[CWA § 309 (d)]
The CWA provides that any person who violates a permit condition implementing CWA § 301, 302, 306, 307, 308, 318, or 405 is subject to a civil penalty not to exceed $27,500 per day for each violation.

2. Violation of any of the provisions of the NPDES permit or any of the provisions of this Order may subject the violator to any of the penalties described herein, or any combination thereof, at the discretion of the prosecuting authority; except that only one kind of penalties may be applied for each kind of violation. The Cal. Water Code §13885 provides the following:
   (a) Any person who violates any of the following shall be liable civilly in accordance with this section:
      (1) Section 13375 or 13376.
      (2) Any waste discharge requirements or dredged or fill material permit issued pursuant to this chapter or any water quality certification issued pursuant to Section 13160.
      (3) Any requirements established pursuant to Section 13383.

(4) Any order or prohibition issued pursuant to Section 13243 or Article 1 (commencing with Section 13300) of Chapter 5, if the activity subject to the order or prohibition is subject to regulation under this chapter.
(5) Any requirements of Section 301, 302, 306, 307, 308, 318, 401, or 405 of the Clean Water Act, as amended.
(6) Any requirement imposed in a pretreatment program approved pursuant to waste discharge requirements issued under Section 13377 or approved pursuant to a permit issued by the administrator.

Q. Need to Halt or Reduce Activity not a Defense [40 CFR 122.41(c)]

1. It shall not be a defense for a Permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this Order.

R. Termination of Board Order

1. Except for enforcement purposes, Regional Water Board Order No. 09-0057 is hereby terminated.

S. Board Order Expiration Date

1. This Order expires on July 8, 2015. The Permittees must submit a Report of Waste Discharge (ROWD) and a proposed Storm Water Quality Management Program in accordance with CCR Title 23 as application for reissuance of waste discharge requirements no later than 180 days in advance of such date.

T. MS4 Annual Reporting Program [40 CFR 122.42(c)]

1. The Annual Program Reporting shall include the following information:
   (a) *Municipal separate storm sewer systems.*
   The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the Director under 40 CFR 122.26(a)(1)(v) of this part must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report shall include:
   (1) The status of implementing the components of the storm water management program that are established as permit conditions;
   (2) Proposed changes to the storm water management programs that are established as permit condition. Such proposed changes shall be consistent with 40 CFR 122.26(d)(2)(iii) of this part;
   (3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under 40 CFR 122.26(d)(2)(iv) and (d)(2)(v) of this part;
   (4) A summary of data, including monitoring data that is accumulated throughout the reporting year;

(5) Annual expenditures and budget for year following each annual report;
(6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; and
(7) Identification of water quality improvements or degradation.

I, Samuel Unger, Interim Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an order adopted by the California Regional Water Quality Control Board, Los Angeles Region, on July 8, 2010.

Samuel Unger
Interim Executive Officer

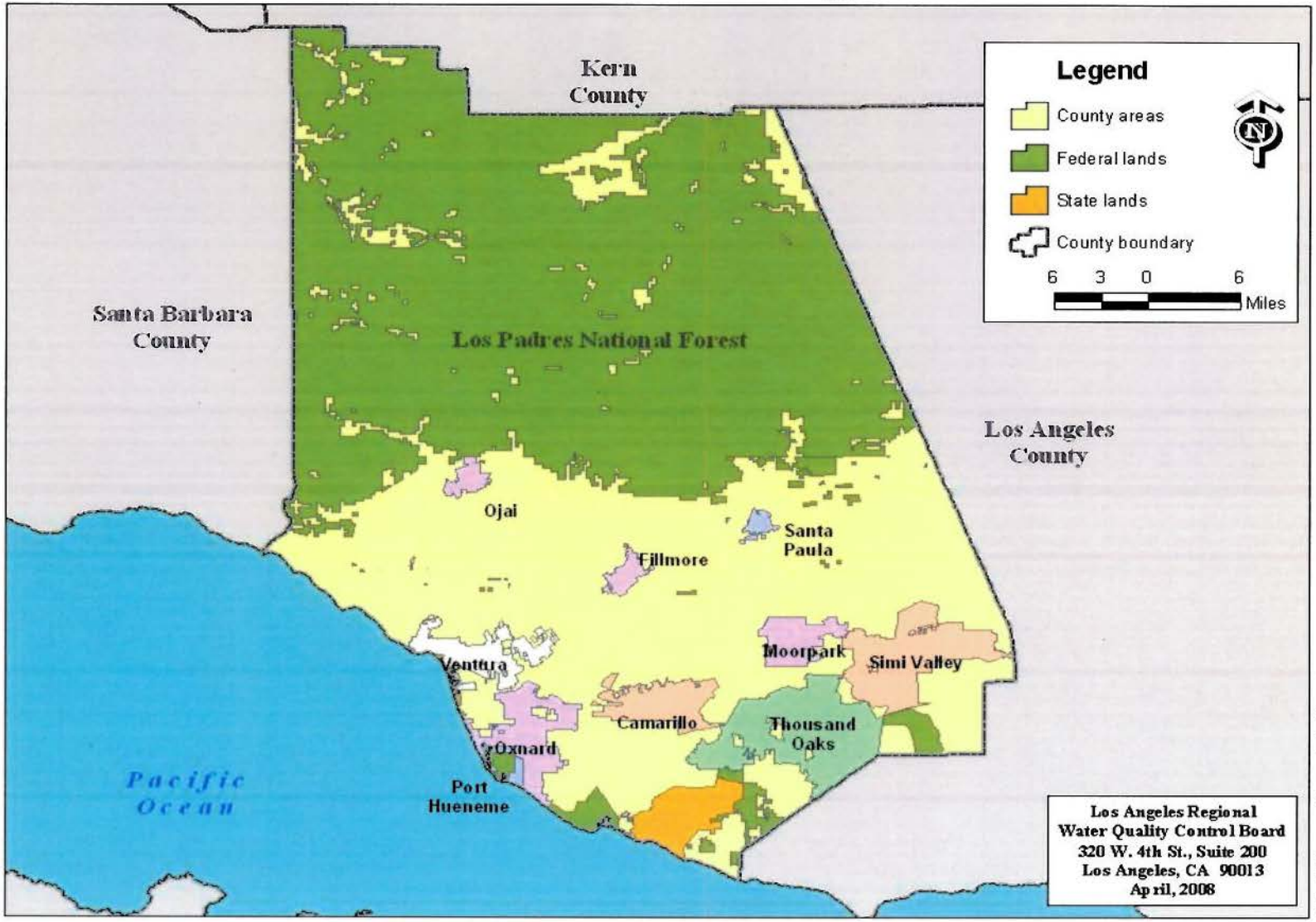
Land Jurisdictions in Ventura County, California
Kern County
Santa Barbara County
Los Angeles County
Los Padres National Forest
Legend
County areas
Federal lands
State lands
County boundary
6 3 0 6
Miles
Ojai
Fillmore
Santa Paula
Ventura
Oxnard
Port Hueneme
Camarillo
Moorpark
Simi Valley
Thousand Oaks
Pacific Ocean
Los Angeles Regional Water Quality Control Board
320 W. 4th St., Suite 200
Los Angeles, CA 90013
April, 2008
T:\S:p:/gis/arcmaps/stormwater/vcfj1.mxd

Figure 1

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD

LOS ANGELES REGION

320 W. 4th Street, Suite 200, Los Angeles, California 90013

Phone (213) 576 - 6600 • Fax (213) 576 - 6640

http://www.waterboards.ca.gov/losangeles

ORDER NO. R4-2012-0175 as amended by State Water Board Order WQ 2015-0075 NPDES PERMIT NO. CAS004001

WASTE DISCHARGE REQUIREMENTS FOR MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) DISCHARGES WITHIN THE COASTAL WATERSHEDS OF LOS ANGELES COUNTY, EXCEPT THOSE DISCHARGES ORIGINATING FROM THE CITY OF LONG BEACH MS4

The municipal discharges of storm water and non-storm water by the Los Angeles County Flood Control District, the County of Los Angeles, and 84 incorporated cities within the coastal watersheds of Los Angeles County with the exception of the City of Long Beach (hereinafter referred to separately as Permittees and jointly as the Dischargers) from the discharge points identified below are subject to waste discharge requirements as set forth in this Order.

I. FACILITY INFORMATION

Table 1. Discharger Information

Dischargers	The Los Angeles County Flood Control District, the County of Los Angeles, and 84 incorporated cities within the coastal watersheds of Los Angeles County with the exception of the City of Long Beach (See Table 4)
Name of Facility	Municipal Separate Storm Sewer Systems (MS4s) within the coastal watersheds of Los Angeles County with the exception of the City of Long Beach MS4
Facility Address	Various (see Table 2)
The U.S. Environmental Protection Agency (USEPA) and the California Regional Water Quality Control Board, Los Angeles Region (Regional Water Board) have classified the Greater Los Angeles County MS4 as a large municipal separate storm sewer system (MS4) pursuant to 40 CFR section 122.26(b)(4) and a major facility pursuant to 40 CFR section 122.2.	

Table 2. Facility Information

Permittee (WDID)	**Contact Information**	
Agoura Hills (*4B190147001*)	**Mailing Address**	30001 Ladyface Court
		Agoura Hills, CA 91301
	Facility Contact, Title, and E-mail	Ken Berkman, City Engineer kberkman@agoura-hills.ca.us

Permittee (WDID)	Contact Information	
Alhambra (*4B190148001*)	**Mailing Address**	111 South First Street
		Alhambra, CA 91801-3796
	Facility Contact and E-mail	David Dolphin ddolphin@cityofalhambra.org
Arcadia (*4B190149001*)	**Mailing Address**	11800 Goldring Road
		Arcadia, CA 91006-5879
	Facility Contact, Title, Phone, and E-mail	Vanessa Hevener, Environmental Services Officer (626) 305-5327 vhevener@ci.arcadia.ca.us
Artesia (*4B190150001*)	**Mailing Address**	18747 Clarkdale Avenue
		Artesia, CA 90701-5899
	Facility Contact, Title, and E-mail	Maria Dadian, Director of Public Works mdadian@cityofartesia.ci.us
Azusa (*4B190151001*)	**Mailing Address**	213 East Foothill Boulevard
		Azusa, CA 91702
	Facility Contact, Title, and E-mail	Carl Hassel, City Engineer chassel@ci.azusa.ca.us
Baldwin Park (*4B190152001*)	**Mailing Address**	14403 East Pacific Avenue
		Baldwin Park, CA 91706-4297
	Facility Contact, Title, and E-mail	David Lopez, Associate Engineer dlopez@baldwinpark.com
Bell (*4B190153001*)	**Mailing Address**	6330 Pine Avenue
		Bell, CA 90201-1291
	Facility Contact, Title, and E-mail	Terri Rodrigue, City Engineer trodrigue@cityofbell.org
Bell Gardens (*4B190139002*)	**Mailing Address**	7100 South Garfield Avenue
		Bell Gardens, CA 90201-3293
	Facility Contact, Title, and Phone	John Oropeza, Director of Public Works (562) 806-7700
Bellflower (*4B190154001*)	**Mailing Address**	16600 Civic Center Drive
		Bellflower, CA 90706-5494
	Facility Contact, Title, and E-mail	Bernie Iniguez, Environmental Services Manager biniguez@bellflower.org
Beverly Hills (*4B190132002*)	**Mailing Address**	455 North Rexford Drive
		Beverly Hills, CA 90210
	Facility Contact, Title, and E-mail	Vincent Chee, Project Civil Engineer kgettler@beverlyhills.org
Bradbury (*4B190155001*)	**Mailing Address**	600 Winston Avenue
		Bradbury, CA 91010-1199
	Facility Contact, Title, and E-mail	Elroy Kiepke, City Engineer mkeith@cityofbradbury.org
Burbank (*4B190101002*)	**Mailing Address**	P.O. Box 6459
		Burbank, CA 91510
	Facility Contact, Title, and E-mail	Bonnie Teaford, Public Works Director bteaford@ci.burbank.ca.us
Calabasas (*4B190157001*)	**Mailing Address**	100 Civic Center Way
		Calabasas, CA 91302-3172
	Facility Contact, Title, and E-mail	Alex Farassati, ESM afarassati@cityofcalabasas.com
Carson (*4B190158001*)	**Mailing Address**	P.O. Box 6234
		Carson, CA 90745
	Facility Contact, Title,	Patricia Elkins, Building Construction Manager

Permittee (WDID)	Contact Information	
	and E-mail	pelkins@carson.ca.us
Cerritos (*4B190159001*)	**Mailing Address**	P.O. Box 3130
		Cerritos, CA 90703-3130
	Facility Contact, Title, and E-mail	Mike O'Grady, Environmental Services mo'grady@cerritos.us
Claremont (*4B190160001*)	**Mailing Address**	207 Harvard Avenue
		Claremont, CA 91711-4719
	Facility Contact, Title, and E-mail	Craig Bradshaw, City Engineer cbradshaw@ci.claremont.ca.us
Commerce (*4B190161001*)	**Mailing Address**	2535 Commerce Way
		Commerce, CA 90040-1487
	Facility Contact and E-mail	Gina Nila gnila@ci.commerce.ca.us
Compton (*4B190162001*)	**Mailing Address**	205 South Willowbrook Avenue
		Compton, CA 90220-3190
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Duarte (*4B190168001*)	**Mailing Address**	1600 Huntington Drive
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El Monte (*4B190169001*)	**Mailing Address**	P.O. Box 6008
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	Facility Contact, Title, and Phone	James A Enriquez, Director of Public Works (626) 580-2058
El Segundo (*4B190170001*)	**Mailing Address**	350 Main Street
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Permittee (WDID)	Contact Information	
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	Facility Contact, Title, and E-mail	Maurice Oillataguerre, Senior Environmental Program Scientist moillataguerre@ci.glendale.ca.us
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Huntington Park (*4B190177001*)	**Mailing Address**	6550 Miles Avenue
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Industry (*4B190178001*)	**Mailing Address**	P.O. Box 3366
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	Facility Contact, Title, and Phone	Andre Dupret, Project Manager (323) 562-5721
Monrovia (*4B190193001*)	**Mailing Address**	415 South Ivy Avenue
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		Redondo Beach, CA 90277-0270
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		Santa Clarita, CA 91355
	Facility Contact, Title, and Phone	Travis Lange, Environmental Services Manager (661) 255-4337
Santa Fe Springs (*4B190108003*)	**Mailing Address**	P.O. Box 2120
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	Facility Contact, Title, and E-mail	Sarina Morales-Choate, Civil Engineer Assistant smorales-choate@santafesprings.org
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	Facility Contact, Phone, and E-mail	John Hunter (562) 802-7880 jhunter@jlha.net
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Permittee (WDID)	Contact Information	
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Vernon (*4B190216001*)	**Mailing Address**	4305 Santa Fe Avenue
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	Facility Contact and Phone	Claudia Arellano (323) 583-8811
Walnut (*4B190217001*)	**Mailing Address**	P.O. Box 682
		Walnut, CA 91788
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West Covina (*4B190218001*)	**Mailing Address**	P.O. Box 1440
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	Facility Contact, Title, and E-mail	David Mochizuki, Director of Public Works dmochizuki@cityofwhittier.org
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		Alhambra, CA 91803
	Facility Contact, Title, Phone, and E-mail	Gary Hildebrand, Assistant Deputy Director, Division Engineer (626) 458-4300 ghildeb@dpw.lacounty.gov
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Table 3. Discharge Location

Discharge Point	Effluent Description	Discharge Point Latitude	Discharge Point Longitude	Receiving Water
All Municipal Separate Storm Sewer System discharge points within Los Angeles County with the exception of the City of Long Beach	Storm Water and Non-Storm Water	Numerous	Numerous	Surface waters identified in Tables 2-1, 2-1a, 2-3, and 2-4, and Appendix 1, Table 1 of the *Water Quality Control Plan - Los Angeles Region* (*Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties*), and other unidentified tributaries to these surface waters within the following Watershed Management Areas: (1) Santa Clara River Watershed; (2) Santa Monica Bay Watershed Management Area, including Malibu Creek Watershed and Ballona Creek Watershed; (3) Los Angeles River Watershed; (4) Dominguez Channel and Greater Los Angeles/Long Beach Harbors Watershed Management Area; (5) Los Cerritos Channel and Alamitos Bay Watershed Management Area; (6) San Gabriel River Watershed; and (7) Santa Ana River Watershed.[1]

Table 4. Administrative Information

This Order was adopted by the California Regional Water Quality Control Board, Los Angeles Region on:	**November 8, 2012**
This Order becomes effective on:	**December 28, 2012**
This Order was amended by the State Water Resources Control Board on:	**June 16, 2015**
This Order expires on:	**December 28, 2017**
In accordance with Title 23, Division 3, Chapter 9 of the California Code of Regulations and Title 40, Part 122 of the Code of Federal Regulations, each Discharger shall file a Report of Waste Discharge as application for issuance of new waste discharge requirements no later than:	**180 days prior to the Order expiration date above**

[1] Note that the Santa Ana River Watershed lies primarily within the boundaries of the Santa Ana Regional Water Quality Control Board. However, a portion of the Chino Basin subwatershed lies within the jurisdictions of Pomona and Claremont in Los Angeles County. The primary receiving waters within the Los Angeles County portion of the Chino Basin subwatershed are San Antonio Creek and Chino Creek.

In accordance with section 2235.4 of Title 23 of the California Code of Regulations, the terms and conditions of an expired permit are automatically continued pending issuance of a new permit if all requirements of the federal NPDES regulations on continuation of expired permits are complied with. Accordingly, if a new order is not adopted by the expiration date above, then the Permittees shall continue to implement the requirements of this Order until a new one is adopted.

I, Samuel Unger, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Los Angeles Region, on November 8, 2012 and amended by the State Water Resources Control Board by Order WQ 2015-0075 on June 16, 2015.

Samuel Unger

Samuel Unger, Executive Officer

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II. FINDINGS

The California Regional Water Quality Control Board, Los Angeles Region (hereinafter Regional Water Board) finds:

A. Nature of Discharges and Sources of Pollutants

Storm water and non-storm water discharges consist of surface runoff generated from various land uses, which are conveyed via the municipal separate storm sewer system and ultimately discharged into surface waters throughout the region. Discharges of storm water and non-storm water from the Municipal Separate Storm Sewer Systems (MS4s) within the Coastal Watersheds of Los Angeles County convey pollutants to surface waters throughout the Los Angeles Region. In general, the primary pollutants of concern in these discharges identified by the Los Angeles County Flood Control District Integrated Receiving Water Impacts Report (1994-2005) are indicator bacteria, total aluminum, copper, lead, zinc, diazinon, and cyanide. Aquatic toxicity, particularly during wet weather, is also a concern based on a review of Annual Monitoring Reports from 2005-10. Storm water and non-storm water discharges of debris and trash are also a pervasive water quality problem in the Los Angeles Region though significant strides have been made by a number of Permittees in addressing this problem through the implementation of control measures to achieve wasteload allocations established in trash TMDLs.

Pollutants in storm water and non-storm water have damaging effects on both human health and aquatic ecosystems. Water quality assessments conducted by the Regional Water Board have identified impairment of beneficial uses of water bodies in the Los Angeles Region caused or contributed to by pollutant loading from municipal storm water and non-storm water discharges. As a result of these impairments, there are beach postings and closures, fish consumption advisories, local and global ecosystem and aesthetic impacts from trash and debris, reduced habitat for threatened and endangered species, among others. The Regional Water Board and USEPA have established 33 total maximum daily loads (TMDLs) that identify Los Angeles County MS4 discharges as one of the pollutant sources causing or contributing to these water quality impairments.

B. Permit History

Prior to the issuance of this Order, Regional Water Board Order No. 01-182 served as the NPDES Permit for MS4 storm water and non-storm water discharges within the Coastal Watersheds of the County of Los Angeles. The requirements of Order No. 01-182 applied to the Los Angeles County Flood Control District, the unincorporated areas of Los Angeles County under County jurisdiction, and 84 Cities within the Los Angeles County Flood Control District with the exception of the City of Long Beach. The first county-wide MS4 permit for the County of Los Angeles and the incorporated areas therein was Order No. 90-079, adopted by the Regional Water Board on June 18, 1990.

Under Order No. 01-182, the Los Angeles County Flood Control District was designated the Principal Permittee, and the County of Los Angeles and 84 incorporated Cities were each designated Permittees. The Principal Permittee coordinated and facilitated activities necessary to comply with the requirements of Order No. 01-182, but was not responsible for ensuring compliance of any of the other Permittees. The designation of a Principal Permittee has not been carried over from Order No. 01-182.

Order No. 01-182 was subsequently amended by the Regional Water Board on September 14, 2006 by Order No. R4-2006-0074 to incorporate provisions consistent with the assumptions and requirements of the Santa Monica Bay Beaches Dry Weather Bacteria TMDL (SMB Dry Weather Bacteria TMDL) waste load allocations (WLAs). As a result of a legal challenge to Order No. R4-2006-0074, the Los Angeles County Superior Court issued a peremptory writ of mandate on July 23, 2010 requiring the Regional Water Board to void and set aside the amendments adopted through Order No. R4-2006-0074 in Order No. 01-182. The Court concluded that the permit proceeding at which Order No. R4-2006-0074 was adopted was procedurally deficient. The Court did not address the substantive merits of the amendments themselves, and thus made no determination about the substantive validity of Order No. R4-2006-0074. In compliance with the writ of mandate, the Regional Water Board voided and set aside the amendments adopted through Order No. R4-2006-0074 on April 14, 2011. This Order reincorporates requirements equivalent to the 2006 provisions to implement the SMB Dry Weather Bacteria TMDL.

In addition, Order No. 01-182 was amended on August 9, 2007 by Order No. R4-2007-0042 to incorporate provisions consistent with the assumptions and requirements of the Marina del Rey Harbor Mothers' Beach and Back Basins Bacteria TMDL, and was again amended on December 10, 2009 by Order No. R4-2009-0130 to incorporate provisions consistent with the assumptions and requirements of the Los Angeles River Watershed Trash TMDL.

C. Permit Application

On June 12, 2006, prior to the expiration date of Order No. 01-182, all of the Permittees filed Reports of Waste Discharge (ROWD) applying for renewal of their waste discharge requirements that serve as an NPDES permit to discharge storm water and authorized and conditionally exempt non-storm water through their MS4 to surface waters. Specifically, the Los Angeles County Flood Control District (LACFCD) submitted an ROWD application on behalf of itself, the County of Los Angeles, and 78 other Permittees. Several Permittees under Order No. 01-182 elected to not be included as part of the Los Angeles County Flood Control District's ROWD. On June 12, 2006, the Cities of Downey and Signal Hill each submitted an individual ROWD application requesting a separate MS4 Permit; and the Upper San Gabriel River Watershed Coalition, comprised of the cities of Azusa, Claremont, Glendora, Irwindale, and Whittier also submitted an individual ROWD application requesting a separate MS4 Permit for these cities. In 2010, the LACFCD withdrew from its participation in the 2006 ROWD submitted in conjunction with the County and 78 other co-permittees, and submitted a new ROWD also requesting an individual MS4 permit. The LACFCD also requested that, if an individual MS4 permit was not issued to it, it no longer be designated as the

Principal Permittee and it be relieved of Principal Permittee responsibilities. The Regional Water Board evaluated each of the 2006 ROWDs and notified all of the Permittees that their ROWDs did not satisfy federal storm water regulations contained in the USEPA Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems; Final Rule, August 9, 1996 (61 *Fed Reg.* 41697). Because each ROWD did not satisfy federal requirements, the Regional Water Board deemed all four 2006 ROWDs incomplete. The Regional Water Board also evaluated the LACFCD's 2010 ROWD and found that it too did not satisfy federal requirements for MS4s.

Though five separate ROWDs were submitted, the Regional Water Board retains discretion as the permitting authority to determine whether to issue permits for discharges from MS4s on a system-wide or jurisdiction-wide basis (Clean Water Act (CWA) § 402(p)(3)(B)(i); 40 CFR section 122.26, subdivisions (a)(1)(v) and (a)(3)(ii)). Because of the complexity and networking of the MS4 within Los Angeles County, which often results in commingled discharges, the Regional Water Board has previously adopted a system-wide approach to permitting MS4 discharges within Los Angeles County.

In evaluating the five separate ROWDs, the Regional Water Board considered the appropriateness of permitting discharges from MS4s within Los Angeles County on a system-wide or jurisdiction-wide basis or a combination of both. Based on that evaluation, the Regional Water Board again determined that, because of the complexity and networking of the MS4 within Los Angeles County, that one system-wide permit is appropriate. In order to provide individual Permittees with more specific requirements, certain provisions of this Order are organized by watershed management area, which is appropriate given the requirements to implement 33 watershed-based TMDLs. The Regional Water Board also determined that because the LACFCD owns and operates large portions of the MS4 infrastructure, including but not limited to catch basins, storm drains, outfalls and open channels, in each coastal watershed management area within Los Angeles County, the LACFCD should remain a Permittee in the single system-wide permit; however, this Order relieves the LACFCD of its role as "Principal Permittee."

D. Permit Coverage and Facility Description

The Los Angeles County Flood Control District, the County of Los Angeles, and 84 incorporated cities within the Los Angeles County Flood Control District with the exception of the City of Long Beach (see Table 5, List of Permittees), hereinafter referred to separately as Permittees and jointly as the Dischargers, discharge storm water and non-storm water from municipal separate storm sewer systems (MS4s), also called storm drain systems. For the purposes of this Order, references to the "Discharger" or "Permittee" in applicable federal and state laws, regulations, plans, or policy are held to be equivalent to references to the Discharger, or Permittees herein.

The area covered under this Order encompasses more than 3,000 square miles. This area contains a vast drainage network that serves incorporated and unincorporated areas in every Watershed Management Area within the Los Angeles Region. Maps

depicting the major drainage infrastructure within the area covered under this Order are included in Attachment C of this Order.

Table 5. List of Permittees

Agoura Hills	Hawaiian Gardens	Pomona
Alhambra	Hawthorne	Rancho Palos Verdes
Arcadia	Hermosa Beach	Redondo Beach
Artesia	Hidden Hills	Rolling Hills
Azusa	Huntington Park	Rolling Hills Estates
Baldwin Park	Industry	Rosemead
Bell	Inglewood	San Dimas
Bell Gardens	Irwindale	San Fernando
Bellflower	La Canada Flintridge	San Gabriel
Beverly Hills	La Habra Heights	San Marino
Bradbury	La Mirada	Santa Clarita
Burbank	La Puente	Santa Fe Springs
Calabasas	La Verne	Santa Monica
Carson	Lakewood	Sierra Madre
Cerritos	Lawndale	Signal Hill
Claremont	Lomita	South El Monte
Commerce	Los Angeles	South Gate
Compton	Lynwood	South Pasadena
Covina	Malibu	Temple City
Cudahy	Manhattan Beach	Torrance
Culver City	Maywood	Vernon
Diamond Bar	Monrovia	Walnut
Downey	Montebello	West Covina
Duarte	Monterey Park	West Hollywood
El Monte	Norwalk	Westlake Village
El Segundo	Palos Verdes Estates	Whittier
Gardena	Paramount	County of Los Angeles
Glendale	Pasadena	Los Angeles County Flood Control District
Glendora	Pico Rivera	

E. Los Angeles County Flood Control District

In 1915, the California Legislature enacted the Los Angeles County Flood Control Act, establishing the Los Angeles County Flood Control District (LACFCD). The objects and purposes of the Act are to provide for the control and conservation of the flood, storm and other waste waters within the flood control district. Among its other powers, the LACFCD also has the power to preserve, enhance, and add recreational features to lands or interests in lands contiguous to its properties for the protection, preservation, and use of the scenic beauty and natural environment for the properties or the lands. The LACFCD is governed, as a separate entity, by the County of Los Angeles Board of Supervisors.

The LACFCD's system includes the majority of drainage infrastructure within incorporated and unincorporated areas in every watershed, including approximately 500 miles of open channel, 3,500 miles of underground drains, and an estimated 88,000 catch basins, and several dams. Portions of the LACFCD's current system were originally unmodified natural rivers and water courses.

The LACFCD's system conveys both storm and non-storm water throughout the Los Angeles basin. Other Permittees' MS4s connect and discharge to the LACFCD's system.

The waters and pollutants discharged from the LACFCD's system come from various sources. These sources can include storm water and non-storm water from the Permittees under this permit and other NPDES and non-NPDES Permittees discharging into the LACFCD's system, including industrial waste water dischargers, waste water treatment facilities, industrial and construction stormwater Permittees, water suppliers, government entities, CERCLA potentially responsible parties, and Caltrans. Sources can also include discharges from school districts that do not operate large or medium-sized municipal storm sewers and discharges from entities that have waste discharge requirements or waivers of waste discharge requirements.

Unlike other Permittees, including the County of Los Angeles, the LACFCD does not own or operate any municipal sanitary sewer systems, public streets, roads, or highways.

The LACFCD in contrast to the County of Los Angeles has no planning, zoning, development permitting or other land use authority over industrial or commercial facilities, new developments or re-development projects, or development construction sites located in any incorporated or unincorporated areas within its service area. The Permittees that have such land use authority are responsible for implementing a storm water management program to inspect and control pollutants from industrial and commercial facilities, new development and re-development projects, and development construction sites within their jurisdictional boundaries. Nonetheless, as an owner and operator of MS4s, the LACFCD is required by federal regulations to control pollutant discharges into and from its MS4, including the ability to control through interagency agreements among co-Permittees and other owners of a MS4 the contribution of pollutants from one portion of the MS4 to another portion of the MS4.

F. Permit Scope

This Order regulates municipal discharges of storm water and non-storm water from the Permittees' MS4s. Section 122.26(b)(8) of title 40 of the Code of Federal Regulations (CFR) defines an MS4 as "a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) [o]wned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian

tribal organization, or a designated and approved management agency under section 208 of the CWA that discharges to waters of the United States; (ii) [d]esigned or used for collecting or conveying storm water; (iii) [w]hich is not a combined sewer; and (iv) [w]hich is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.2."

Storm water discharges consist of those discharges that originate from precipitation events. Federal regulations define "storm water" as "storm water runoff, snow melt runoff, and surface runoff and drainage." (40 CFR § 122.26(b)(13).) While "surface runoff and drainage" is not defined in federal law, USEPA's preamble to its final storm water regulations demonstrates that the term is related to precipitation events such as rain and/or snowmelt. (55 *Fed. Reg.* 47990, 47995-96 (Nov. 16, 1990)).

Non-storm water discharges consist of all discharges through an MS4 that do not originate from precipitation events. Non-storm water discharges through an MS4 are prohibited unless authorized under a separate NPDES permit; authorized by USEPA pursuant to Sections 104(a) or 104(b) of the federal Comprehensive Environmental Response, Compensation and Liability Act (CERCLA); composed of natural flows; the result of emergency fire fighting activities; or conditionally exempted in this Order.

A permit issued to more than one Permittee for MS4 discharges may contain separate storm water management programs for particular Permittees or groups of Permittees. 40 CFR § 122.26(d)(2)(iv). Given the LACFCD's limited land use authority, it is appropriate for the LACFCD to have a separate and uniquely-tailored storm water management program. Accordingly, the storm water management program minimum control measures imposed on the LACFCD in Part VI.D of this Order differ in some ways from the minimum control measures imposed on other Permittees. Namely, aside from its own properties and facilities, the LACFCD is not subject to the Industrial/Commercial Facilities Program, the Planning and Land Development Program, and the Development Construction Program. However, as a discharger of storm and non-storm water, the LACFCD remains subject to the Public Information and Participation Program and the Illicit Connections and Illicit Discharges Elimination Program. Further, as the owner and operator of certain properties, facilities and infrastructure, the LACFCD remains subject to requirements of a Public Agency Activities Program.

G. Geographic Coverage and Watershed Management Areas

The municipal storm water and non-storm water discharges flow into receiving waters in the Watershed Management Areas of the Santa Clara River Watershed; Santa Monica Bay Watershed Management Area, including Malibu Creek Watershed and Ballona Creek Watershed; Los Angeles River Watershed; Dominguez Channel and Greater Los Angeles/Long Beach Harbors Watershed Management Area; Los Cerritos Channel and Alamitos Bay Watershed Management Area; San Gabriel River Watershed; and Santa Ana River Watershed.

This Order redefines Watershed Management Areas (WMAs) consistent with the delineations used in the Regional Water Board's Watershed Management Initiative. Permittees included in each of the WMAs are listed in Attachment K.

Maps depicting each WMA, its subwatersheds, and the major receiving waters therein are included in Attachment B.

Federal, state, regional or local entities in jurisdictions outside the Los Angeles County Flood Control District, and not currently named as Permittee to this Order, may operate MS4 facilities and/or discharge to the MS4 and water bodies covered by this Order. Pursuant to 40 CFR sections 122.26(d)(1)(ii) and 122.26(d)(2)(iv), each Permittee shall maintain the necessary legal authority to control the contribution of pollutants to its MS4 and shall include in its storm water management program a comprehensive planning process that includes intergovernmental coordination, where necessary.

Sources of MS4 discharges into receiving waters in the County of Los Angeles but not covered by this Order include the following:

- About 34 square miles of unincorporated area in Ventura County, which drain into Malibu Creek and then to Santa Monica Bay,
- About 9 square miles of the City of Thousand Oaks, which also drain into Malibu Creek and then to Santa Monica Bay, and
- About 86 square miles of area in Orange County, which drain into Coyote Creek and then into the San Gabriel River.

Specifically, the Orange County Flood Control District (OCFCD) owns and operates the Los Alamitos Retarding Basin and Pumping Station (Los Alamitos Retarding Basin). The Los Alamitos Retarding Basin is within the San Gabriel River Watershed, and is located adjacent to the Los Angeles and Orange County boundary. The majority of the 30-acre Los Alamitos Retarding Basin is in Orange County; however, the northwest corner of the facility is located in the County of Los Angeles. Storm water and non-storm water discharges, which drain to the Los Alamitos Retarding Basin, are pumped to the San Gabriel River Estuary (SGR Estuary) through pumps and subterranean piping. The pumps and discharge point are located in the County of Los Angeles.

The OCFCD pumps the water within the Los Alamitos Retarding Basin to the San Gabriel River Estuary through four discharge pipes, which are covered by tide gates. The discharge point is located approximately 700 feet downstream from the 2nd Street Bridge in Long Beach. The total pumping capacity of the four pumps is 800 cubic feet per second (cfs). There is also a 5 cfs sump pump that discharges nuisance flow continuously to the Estuary though a smaller diameter uncovered pipe.

The discharge from the Los Alamitos Retarding Basin is covered under the Orange County Municipal NPDES Storm Water Permit (NPDES Permit No. CAS618030, Santa Ana Regional Water Quality Control Board Order No. R8-2010-0062), which was issued to the County of Orange, Orange County Flood Control District and Incorporated Cities on May 22, 2009. The Orange County MS4 Permit references the San Gabriel River Metals and Selenium TMDL (Metals TMDL). The waste load allocations listed in the

Metals TMDL for Coyote Creek are included in the Orange County MS4 Permit. However, the Orange County MS4 Permit does not contain the dry weather copper waste load allocations assigned to the Estuary.

H. Legal Authorities

This Order is issued pursuant to CWA section 402 and implementing regulations adopted by the USEPA and chapter 5.5, division 7 of the California Water Code (commencing with section 13370). This Order serves as an NPDES permit for point source discharges from the Permittees' MS4s to surface waters. This Order also serves as waste discharge requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the California Water Code (commencing with Section 13260).

I. Municipal Separate Storm Sewer System Requirements. The 1972 Clean Water Act[2] established the NPDES Program to regulate the discharge of pollutants from point sources to waters of the United States. However, pollution from storm water and dry-weather urban runoff was largely unabated for over a decade. In response to the 1987 Amendments to the Clean Water Act, USEPA developed Phase I of the NPDES Storm Water Permitting Program in 1990, which established a framework for regulating municipal and industrial discharges of storm water and non-storm water. The Phase I program addressed sources of storm water and dry-weather urban runoff that had the greatest potential to negatively impact water quality. In particular, under Phase I, USEPA required NPDES Permit coverage for discharges from medium and large MS4 with populations of 100,000 or more. Operators of MS4s regulated under the Phase I NPDES Storm Water Program were required to obtain permit coverage for municipal discharges of storm water and non-storm water to waters of the United States

Early in the history of this MS4 Permit, the Regional Water Board designated the MS4s owned and/or operated by the incorporated cities and Los Angeles County unincorporated areas within the Coastal Watersheds of Los Angeles County as a large MS4 due to the total population of Los Angeles County, including that of unincorporated and incorporated areas, and the interrelationship between the Permittees' MS4s, pursuant to 40 CFR section 122.26(b)(4). The total population of the cities and County unincorporated areas covered by this Order was 9,519,338 in 2000 and has increased by approximately 300,000 to 9,818,605 in 2010, according to the United States Census.

This Order implements the federal Phase I NPDES Storm Water Program requirements. These requirements include three fundamental elements: (i) a requirement to effectively prohibit non-storm water discharges through the MS4, (ii) requirements to implement controls to reduce the discharge of pollutants to the maximum extent practicable, and (iii) other provisions the Regional Water Board has determined appropriate for the control of such pollutants.

J. Background and Rationale for Requirements. The Regional Water Board developed the requirements in this Order based on information submitted as part of the Permittees' applications, through monitoring and reporting programs, and other available

[2] Federal Water Pollution Control Act; 33 U.S.C. § 1251 et seq., which, as amended in 1977, is commonly known as the Clean Water Act.

information. In accordance with federal regulations at 40 CFR section 124.8, a Fact Sheet (Attachment F) has been prepared to explain the principal facts and the significant factual, legal, methodological, and policy questions considered in preparing this Order. The Fact Sheet is hereby incorporated into this Order and also constitutes part of the Findings of the Regional Water Board for this Order. Attachments A through E and G through R are also incorporated into this Order.

K. **Water Quality Control Plans.** The Clean Water Act requires the Regional Water Board to establish water quality standards for each water body in its region. Water quality standards include beneficial uses, water quality objectives and criteria that are established at levels sufficient to protect those beneficial uses, and an antidegradation policy to prevent degrading waters. The Regional Water Board adopted a *Water Quality Control Plan - Los Angeles Region* (hereinafter Basin Plan) on June 13, 1994 and has amended it on multiple occasions since 1994. The Basin Plan designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters in the Los Angeles Region. Pursuant to California Water Code section 13263(a), the requirements of this Order implement the Basin Plan. Beneficial uses applicable to the surface water bodies that receive discharges from the Los Angeles County MS4 generally include those listed below.

Table 6. Basin Plan Beneficial Uses

Discharge Point	Receiving Water Name	Beneficial Uses
All Municipal Separate Storm Sewer Systems (MS4s) discharge points within Los Angeles County coastal watersheds with the exception of the City of Long Beach	Multiple surface water bodies of the Los Angeles Region	Municipal and Domestic Supply (MUN); Agricultural Supply (AGR); Industrial Service Supply (IND); Industrial Process Supply (PROC); Ground Water Recharge (GWR); Freshwater Replenishment (FRSH); Navigation (NAV); Hydropower Generation (POW); Water Contact Recreation (REC-1); Limited Contact Recreation (LREC-1); Non-Contact Water Recreation (REC-2); Commercial and Sport Fishing (COMM); Warm Freshwater Habitat (WARM); Cold Freshwater Habitat (COLD); Preservation of Areas of Special Biological Significance (BIOL); Wildlife Habitat (WILD); Preservation of Rare and Endangered Species (RARE); Marine Habitat (MAR); Wetland Habitat (WET); Migration of Aquatic Organisms (MIGR); Spawning, Reproduction, and/or Early Development (SPWN); Shellfish Harvesting (SHELL)

1. Total Maximum Daily Loads (TMDLs)

Clean Water Act section 303(d)(1) requires each state to identify the waters within its boundaries that do not meet water quality standards. Water bodies that do not meet water quality standards are considered impaired and are placed on the state's "CWA Section 303(d) List". For each listed water body, the state is required to establish a TMDL of each pollutant impairing the water quality standards in that water body. A TMDL is a tool for implementing water quality standards and is based on the relationship between pollution sources and in-stream water quality conditions. The

TMDL establishes the allowable pollutant loadings for a water body and thereby provides the basis to establish water quality-based controls. These controls should provide the pollution reduction necessary for a water body to meet water quality standards. A TMDL is the sum of the allowable pollutant loads of a single pollutant from all contributing point sources (the waste load allocations or WLAs) and non-point sources (load allocations or LAs), plus the contribution from background sources and a margin of safety. (40 CFR section 130.2(i).) MS4 discharges are considered point source discharges.

Numerous receiving waters within Los Angeles County do not meet water quality standards or fully support beneficial uses and therefore have been classified as impaired on the State's 303(d) List. The Regional Water Board and USEPA have each established TMDLs to address many of these water quality impairments. Pursuant to CWA section 402(p)(B)(3)(iii) and 40 CFR section 122.44(d)(1)(vii)(B), this Order includes requirements that are consistent with and implement WLAs that are assigned to discharges from the Los Angeles County MS4 from 33 State-adopted and USEPA established TMDLs. This Order requires Permittees to comply with the TMDL Provisions in Part VI.E and Attachments L through R, which are consistent with the assumptions and requirements of the TMDL WLAs assigned to discharges from the Los Angeles County MS4. A comprehensive list of TMDLs by watershed management area and the Permittees subject to each TMDL is included in Attachment K.

Waste load allocations in these TMDLs are expressed in several ways depending on the nature of the pollutant and its impacts on receiving waters and beneficial uses. Bacteria WLAs assigned to MS4 discharges are expressed as the number of allowable exceedance days that a water body may exceed the Basin Plan water quality objectives for protection of the REC-1 beneficial use. Since the TMDLs and the WLAs contained therein are expressed as receiving water conditions, receiving water limitations have been included in this Order that are consistent with and implement the allowable exceedance day WLAs. Water quality-based effluent limitations are also included equivalent to the Basin Plan water quality objectives to allow the opportunity for Permittees to individually demonstrate compliance at an outfall or jurisdictional boundary, thus isolating the Permittee's pollutant contributions from those of other Permittees and from other pollutant sources to the receiving water.

WLAs for trash are expressed as progressively decreasing allowable amounts of trash discharges from a Permittee's jurisdictional area within the drainage area to the impaired water body. The Trash TMDLs require each Permittee to make annual reductions of its discharges of trash over a set period, until the numeric target of zero trash discharged from the MS4 is achieved. The Trash TMDLs specify a specific formula for calculating and allocating annual reductions in trash discharges from each jurisdictional area within a watershed. The formula results in specified annual amounts of trash that may be discharged from each jurisdiction into the receiving waters. Translation of the WLAs or compliance points described in the TMDLs into jurisdiction-specific load reductions from the baseline levels, as specified

in the TMDL, logically results in the articulation of an annual limitation on the amount of a pollutant that may be discharged. The specification of allowable annual trash discharge amounts meets the definition of an "effluent limitation", as that term is defined in subdivision (c) of section 13385.1 of the California Water Code. Specifically, the trash discharge limitations constitute a "numeric restriction … on the quantity [or] discharge rate … of a pollutant or pollutants that may be discharged from an authorized location."

TMDL WLAs for other pollutants (e.g., metals and toxics) are expressed as concentration and/or mass and water quality-based effluent limitations have been specified consistent with the expression of the WLA, including any applicable averaging periods. Some TMDLs specify that, if certain receiving water conditions are achieved, such achievement constitutes attainment of the WLA. In these cases, receiving water limitations and/or provisions outlining these alternate means of demonstrating compliance are included in the TMDL provisions in Part VI.E of this Order.

The inclusion of water quality-based effluent limitations and receiving water limitations to implement applicable WLAs provides a clear means of identifying required water quality outcomes within the permit and ensures accountability by Permittees to implement actions necessary to achieve the limitations.

A number of the TMDLs for bacteria, metals, and toxics establish WLAs that are assigned jointly to a group of Permittees whose storm water and/or non-storm water discharges are or may be commingled in the MS4 prior to discharge to the receiving water subject to the TMDL. TMDLs address commingled MS4 discharges by assigning a WLA to a group of MS4 Permittees based on co-location within the same subwatershed. Permittees with co-mingled MS4 discharges are jointly responsible for meeting the water quality-based effluent limitations and receiving water limitations assigned to MS4 discharges in this Order. "Joint responsibility" means that the Permittees that have commingled MS4 discharges are responsible for implementing programs in their respective jurisdictions, or within the MS4 for which they are an owner and/or operator, to meet the water quality-based effluent limitations and/or receiving water limitations assigned to such commingled MS4 discharges.

In these cases, federal regulations state that co-permittees need only comply with permit conditions relating to discharges from the MS4 for which they are owners or operators (40 CFR § 122.26(a)(3)(vi)). Individual co-permittees are only responsible for their contributions to the commingled MS4 discharge. This Order does not require a Permittee to individually ensure that a commingled MS4 discharge meets the applicable water quality-based effluent limitations included in this Order, unless such Permittee is shown to be solely responsible for an exceedance.

Additionally, this Order allows a Permittee to clarify and distinguish their individual contributions and demonstrate that its MS4 discharge did not cause or contribute to exceedances of applicable water quality-based effluent limitations and/or receiving

water limitations. If such a demonstration is made, though the Permittee's discharge may commingle with that of other Permittees, the Permittee would not be held jointly responsible for the exceedance of the water quality-based effluent limitation or receiving water limitation. Individual co-permittees who demonstrate compliance with the water quality-based effluent limitations will not be held responsible for violations by non-compliant co-permittees.

Given the interconnected nature of the Permittees' MS4s, however, the Regional Water Board expects Permittees to work cooperatively to control the contribution of pollutants from one portion of the MS4 to another portion of the system through inter-agency agreements or other formal arrangements.

L. **Ocean Plan.** In 1972, the State Water Resources Control Board (State Water Board) adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (hereinafter Ocean Plan). The State Water Board adopted the most recent amended Ocean Plan on September 15, 2009. The Office of Administration Law approved it on March 10, 2010. On October 8, 2010, USEPA approved the 2009 Ocean Plan. The Ocean Plan is applicable, in its entirety, to the ocean waters of the State. In order to protect beneficial uses, the Ocean Plan establishes water quality objectives and a program of implementation. Pursuant to California Water Code section 13263(a), the requirements of this Order implement the Ocean Plan. The Ocean Plan identifies beneficial uses of ocean waters of the State to be protected as summarized in the table below.

Table 7. Ocean Plan Beneficial Uses

Discharge Point	Receiving Water Name	Beneficial Uses
All Municipal Separate Storm Sewer Systems (MS4s) discharge points within Los Angeles County coastal watersheds with the exception of the City of Long Beach	Pacific Ocean	Industrial Water Supply (IND); Water Contact (REC-1) and Non-Contact Recreation (REC-2), including aesthetic enjoyment; Navigation (NAV); Commercial and Sport Fishing (COMM); Mariculture; Preservation and Enhancement of Designated Areas of Special Biological Significance (ASBS); Rare and Endangered Species (RARE); Marine Habitat (MAR); Fish Migration (MIGR); Fish Spawning (SPWN) and Shellfish Harvesting (SHELL)

M. Antidegradation Policy

40 CFR section 131.12 requires that state water quality standards include an antidegradation policy consistent with the federal antidegradation policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16 ("Statement of Policy with Respect to Maintaining the Quality of the Waters of the State"). Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. Resolution No. 68-16 requires that existing water quality be maintained unless degradation is

justified based on specific findings. The Regional Water Board's Basin Plan implements, and incorporates by reference, both the state and federal antidegradation policies. The permitted discharge is consistent with the antidegradation provision of section 131.12 and State Water Board Resolution No. 68-16 as set out in the Fact Sheet.

N. Anti-Backsliding Requirements. Section 402(o)(2) of the CWA and federal regulations at 40 CFR section 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations may be relaxed. All effluent limitations in this Order are at least as stringent as the effluent limitations in the previous permit. The Fact Sheet of this Order contains further discussion regarding anti-backsliding.

O. Endangered Species Act. This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code, §§ 2050 to 2115.5) or the Federal Endangered Species Act (16 U.S.C.A., §§ 1531 to 1544). This Order requires compliance with requirements to protect the beneficial uses of waters of the United States. Permittees are responsible for meeting all requirements of the applicable Endangered Species Act.

P. Monitoring and Reporting. Section 308(a) of the federal Clean Water Act, and 40 CFR sections 122.41(h), (j)-(l), 122.41(i), and 122.48, require that all NPDES permits specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s also specify additional monitoring and reporting requirements. (40 C.F.R. §§ 122.26(d)(2)(i)(F) & (d)(2)(iii)(D), 122.42(c).) California Water Code section 13383 authorizes the Regional Water Board to establish monitoring, inspection, entry, reporting, and recordkeeping requirements. The Monitoring and Reporting Program establishes monitoring, reporting, and recordkeeping requirements that implement the federal and State laws and/or regulations. This Monitoring and Reporting Program is provided in Attachment E.

Q. Standard and Special Provisions. Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR section 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR section 122.42, are provided in Attachment D. Dischargers must comply with all standard provisions and with those additional conditions that are applicable under 40 CFR section 122.42 provided in Attachment D. The Regional Water Board has also included in Part VI of this Order various special provisions applicable to the Dischargers. A rationale for the various special provisions contained in this Order is provided in the attached Fact Sheet (Attachment F).

R. State Mandates

Article XIII B, Section 6(a) of the California Constitution provides that whenever "any state agency mandates a new program or higher level of service on any local government, the state shall provide a subvention of funds to reimburse that local government for the costs of the program or increased level of service." The

requirements of this Order do not constitute state mandates that are subject to a subvention of funds for several reasons as described in detail in the attached Fact Sheet (Attachment F).

S. California Water Code Section 13241. The California Supreme Court has ruled that although California Water Code section 13263 requires the State and Regional Water Boards (collectively, Water Boards) to consider the factors set forth in California Water Code section 13241 when issuing an NPDES permit, the Water Boards may not consider the factors to justify imposing pollutant restriction that are less stringent than the applicable federal regulations require. (*City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 618, 626-627). However, when the pollutant restrictions in an NPDES permit are more stringent than federal law requires, California Water Code section 13263 requires that the Water Boards consider the factors described in section 13241 as they apply to those specific restrictions. As noted in the preceding finding, the Regional Water Board finds that the requirements in this permit are not more stringent than the minimum federal requirements. Therefore, a 13241 analysis is not required for permit requirements that implement the effective prohibition on the discharge of non-storm water discharges into the MS4, or for controls to reduce the discharge of pollutants in storm water to the maximum extent practicable, or other provisions that the Regional Water Board has determined appropriate to control such pollutants, as those requirements are mandated by federal law. Notwithstanding the above, the Regional Water Board has developed an economic analysis of the permit's requirements, consistent with California Water Code section 13241. That analysis is provided in the Fact Sheet (Attachment F of this Order).

T. California Environmental Quality Act (CEQA). This action to adopt an NPDES Permit is exempt from the provisions of Chapter 3 of the California Environmental Quality Act (CEQA) (Public Resources Code, § 21100, et seq.) pursuant to California Water Code section 13389. (*County of Los Angeles v. Cal. Water Boards* (2006) 143 Cal.App.4th 985.)

U. Notification of Interested Parties. In accordance with State and federal laws and regulations, the Regional Water Board has notified the Permittees and interested agencies and persons of its intent to prescribe waste discharge requirements for the discharges authorized by this Order and has provided them with an opportunity to provide written and oral comments. Details of notification, as well as the meetings and workshops held on drafts of the permit, are provided in the Fact Sheet of this Order.

V. Consideration of Public Comment. The Regional Water Board, in a public meeting, heard and considered all oral and written comments pertaining to the discharges authorized by this Order and the requirements contained herein. The Regional Water Board has prepared written responses to all timely comments, which are incorporated by reference as part of this Order.

W. This Order serves as an NPDES permit pursuant to CWA section 402 or amendments thereto, and becomes effective fifty (50) days after the date of its adoption, provided that the Regional Administrator, USEPA, Region IX, expresses no objections.

X. This Order supersedes Order No. 01-182 as amended, except for enforcement purposes.

Y. Review by the State Water Board. Any person aggrieved by this action of the Regional Water Board may petition the State Water Board to review the action in accordance with California Water Code section 13320 and California Code of Regulations, title 23, sections 2050 and following. The State Water Board must *receive* the petition by 5:00 p.m., 30 days after the Regional Water Board action, except that if the thirtieth day following the action falls on a Saturday, Sunday, or state holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

THEREFORE, IT IS HEREBY ORDERED, that the Dischargers, in order to meet the provisions contained in Division 7 of the California Water Code (commencing with section 13000), and regulations, plans, and policies adopted thereunder, and the provisions of the Clean Water Act and regulations and guidelines adopted thereunder, shall comply with the following requirements:

III. DISCHARGE PROHIBITIONS

A. Prohibitions – Non-Storm Water Discharges

1. Prohibition of Non-Storm Water Discharges. Each Permittee shall, for the portion of the MS4 for which it is an owner or operator, prohibit non-storm water discharges through the MS4 to receiving waters except where such discharges are either:

a. Authorized non-storm water discharges separately regulated by an individual or general NPDES permit;

b. Temporary non-storm water discharges authorized by USEPA[3] pursuant to sections 104(a) or 104(b) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) that either: (i) will comply with water quality standards as applicable or relevant and appropriate requirements ("ARARs") under section 121(d)(2) of CERCLA; or (ii) are subject to either (a) a written waiver of ARARs by USEPA pursuant to section 121(d)(4) of CERCLA or (b) a written determination by USEPA that compliance with ARARs is not practicable considering the exigencies of the situation pursuant to 40 CFR. section 300.415(j);

c. Authorized non-storm water discharges from emergency fire fighting activities (i.e., flows necessary for the protection of life or property)[4];

[3] These typically include short-term, high volume discharges resulting from the development or redevelopment of groundwater extraction wells, or USEPA or State-required compliance testing of potable water treatment plants, as part of a USEPA authorized groundwater remediation action under CERCLA.

[4] Discharges from vehicle washing, building fire suppression system maintenance and testing (e.g., sprinkler line flushing), fire hydrant maintenance and testing, and other routine maintenance activities are not considered emergency fire fighting activities.

d. Natural flows, including:

i. Natural springs;

ii. Flows from riparian habitats and wetlands;

iii. Diverted stream flows, authorized by the State or Regional Water Board;

iv. Uncontaminated ground water infiltration[5];

v. Rising ground waters, where ground water seepage is not otherwise covered by a NPDES permit[6]; or

e. Conditionally exempt non-storm water discharges in accordance with Parts III.A.2 and III.A.3 below.

2. **Conditional Exemptions from Non-Storm Water Discharge Prohibition.** The following categories of non-storm water discharges are conditionally exempt from the non-storm water discharge prohibition, provided they meet all required conditions specified below, or as otherwise approved by the Regional Water Board Executive Officer, in all areas regulated by this Order with the exception of direct discharges to Areas of Special Biological Significance (ASBS) within Los Angeles County. Conditional exemptions from the prohibition on non-storm water discharges through the MS4 to an ASBS are identified in Part III.A.3 below.

a. Conditionally Exempt Essential Non-Storm Water Discharges: These consist of those discharges that fall within one of the categories below; meet all required best management practices (BMPs) as specified in i. and ii. below, including those enumerated in the referenced BMP manuals; are essential public services discharge activities; and are directly or indirectly required by other state or federal statute and/or regulation:

i. Discharges from essential *non-emergency* fire fighting activities[7] provided appropriate BMPs are implemented based on the CAL FIRE, Office of the State Fire Marshal's *Water-Based Fire Protection Systems Discharge Best Management Practices Manual* (September 2011) for water-based fire protection system discharges, and based on Riverside County's *Best Management Practices Plan for Urban Runoff Management* (May 1, 2004) or equivalent BMP manual for fire training activities and post-emergency fire fighting activities;

[5] Uncontaminated ground water infiltration is water other than waste water that enters the MS4 (including foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow. (See 40 CFR § 35.2005(20).)

[6] A NPDES permit for discharges associated with ground water dewatering is required within the Los Angeles Region.

[7] This includes fire fighting training activities, which simulate emergency responses, and routine maintenance and testing activities necessary for the protection of life and property, including building fire suppression system maintenance and testing (e.g. sprinkler line flushing) and fire hydrant testing and maintenance. Discharges from vehicle washing are not considered essential and as such are not conditionally exempt from the non-storm water discharge prohibition.

ii. Discharges from drinking water supplier distribution systems, where not otherwise regulated by an individual or general NPDES permit[8], provided appropriate BMPs are implemented based on the American Water Works Association (California-Nevada Section) *Guidelines for the Development of Your Best Management Practices (BMP) Manual for Drinking Water System Releases* (2005) or equivalent industry standard BMP manual. Additionally, each Permittee shall work with drinking water suppliers that may discharge to the Permittee's MS4 to ensure for all discharges greater than 100,000 gallons: (1) notification at least 72 hours prior to a planned discharge and as soon as possible after an unplanned discharge; (2) monitoring of any pollutants of concern[9] in the drinking water supplier distribution system release; and (3) record keeping by the drinking water supplier. Permittees shall require that the following information is maintained by the drinking water supplier(s) for all discharges to the MS4 (planned and unplanned) greater than 100,000 gallons: name of discharger, date and time of notification (for planned discharges), method of notification, location of discharge, discharge pathway, receiving water, date of discharge, time of the beginning and end of the discharge, duration of the discharge, flow rate or velocity, total number of gallons discharged, type of dechlorination equipment used, type of dechlorination chemicals used, concentration of residual chlorine, type(s) of sediment controls used, pH of discharge, type(s) of volumetric and velocity controls used, and field and laboratory monitoring data. Records shall be retained for five years and made available upon request by the Permittee or Regional Water Board.

b. Those discharges that fall within one of the categories below, provided that the discharge itself is not a source of pollutants and meets all required conditions specified in Table 8 or as otherwise specified or approved by the Regional Water Board Executive Officer:

i. Dewatering of lakes[10];

ii. Landscape irrigation;

iii. Dechlorinated/debrominated swimming pool/spa discharges[11], where not otherwise regulated by a separate NPDES permit;

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[8] Drinking water supplier distribution system releases means sources of flows from drinking water storage, supply and distribution systems (including flows from system failures), pressure releases, system maintenance, distribution line testing, and flushing and dewatering of pipes, reservoirs, and vaults, and minor non-invasive well maintenance activities not involving chemical addition(s) where not otherwise regulated by NPDES Permit No. CAG674001, NPDES Permit No. CAG994005, or another separate NPDES permit.

[9] Pollutants of concern from drinking water supplier distribution system releases may include trash and debris, including organic matter, total suspended solids (TSS), residual chlorine, pH, and any pollutant for which there is a water quality-based effluent limitation (WQBEL) in Part VI.E applicable to discharges from the MS4 to the receiving water. Determination of the pollutants of concern for a particular discharge shall be based on an evaluation of the potential for the constituent(s) to be present in the discharge at levels that may cause or contribute to exceedances of applicable WQBELs or receiving water limitations.

[10] Dewatering of lakes does not include dewatering of drinking water reservoirs. Dewatering of drinking water reservoirs is addressed in Part III.A.2.a.ii.

[11] Conditionally exempt dechlorinated/debrominated swimming pool/spa discharges do not include swimming pool/spa filter backwash or swimming pool/spa water containing bacteria, detergents, wastes, or algaecides, or any other chemicals including salts from pools commonly referred to as "salt water pools" in excess of applicable water quality objectives.

iv. Dewatering of decorative fountains[12];

v. Non-commercial car washing by residents or by non-profit organizations;

vi. Street/sidewalk wash water[13].

3. **Conditional Exemptions from Non-Storm Water Discharge Prohibition within an ASBS**. The following non-storm water discharges from the MS4 directly to an ASBS are conditionally exempt pursuant to the California Ocean Plan as specified below, provided that:

a. The discharges are essential for emergency response purposes, structural stability, slope stability or occur naturally, including the following discharges:

i. Discharges associated with emergency fire fighting activities (i.e., flows necessary for the protection of life or property)[14];

ii. Foundation and footing drains;

iii. Water from crawl space or basement pumps;

iv. Hillside dewatering;

v. Naturally occurring ground water seepage via a MS4; and

vi. Non-anthropogenic flows from a naturally occurring stream via a culvert or MS4, as long as there are no contributions of anthropogenic runoff.

b. The discharges fall within one of the conditionally exempt essential non-storm water discharge categories in Part III.A.2.a. above.

c. Conditionally exempt non-storm water discharges shall not cause or contribute[15] to an exceedance of applicable receiving water limitations and/or water quality-based effluent limitations in this Order or the water quality objectives in Chapter II of the Ocean Plan, or alter natural ocean water quality in an ASBS.

4. **Permittee Requirements.** Each Permittee shall:

a. Develop and implement procedures to ensure that a discharger, if not a named Permittee in this Order, fulfills the following for non-storm water discharges to the Permittee's MS4:

[12] Conditionally exempt discharges from dewatering of decorative fountains do not include fountain water containing bacteria, detergents, wastes, or algaecides, or any other chemicals in excess of applicable water quality objectives.
[13] Conditionally exempt non-storm water discharges of street/sidewalk wash water only include those discharges resulting from use of high pressure, low volume spray washing using only potable water with no cleaning agents at an average usage of 0.006 gallons per square feet of sidewalk area in accordance with Regional Water Board Resolution No. 98-08. Conditionally exempt non-storm water discharges of street/sidewalk wash water do not include hosing of any sidewalk or street with a garden hose with a pressure nozzle.
[14] See note 4.
[15] Based on the water quality characteristics of the conditionally exempt non-storm water discharge itself.

i. Notifies the Permittee of the planned discharge in advance, consistent with requirements in Table 8 or recommendations pursuant to the applicable BMP manual;

ii. Obtains any local permits required by the MS4 owner(s) and/or operator(s);

iii. Provides documentation that it has obtained any other necessary permits or water quality certifications[16] for the discharge;

iv. Conducts monitoring of the discharge, if required by the Permittee;

v. Implements BMPs and/or control measures as specified in Table 8 or in the applicable BMP manual(s) as a condition of the approval to discharge into the Permittee's MS4; and

vi. Maintains records of its discharge to the MS4, consistent with requirements in Table 8 or recommendations pursuant to the applicable BMP manual. For lake dewatering, Permittees shall require that the following information is maintained by the lake owner / operator: name of discharger, date and time of notification, method of notification, location of discharge, discharge pathway, receiving water, date of discharge, time of the beginning and end of the discharge, duration of the discharge, flow rate or velocity, total number of gallons discharged, type(s) of sediment controls used, pH of discharge, type(s) of volumetric and velocity controls used, and field and laboratory monitoring data. Records shall be made available upon request by the Permittee or Regional Water Board.

b. Develop and implement procedures that minimize the discharge of landscape irrigation water into the MS4 by promoting conservation programs.

i. Permittees shall coordinate with the local water purveyor(s), where applicable, to promote landscape water use efficiency requirements for existing landscaping, use of drought tolerant, native vegetation, and the use of less toxic options for pest control and landscape management.

ii. Permittees shall develop and implement a coordinated outreach and education program to minimize the discharge of irrigation water and pollutants associated with irrigation water consistent with Part VI.D.4.c of this Order (Public Information and Participation Program).

c. Evaluate monitoring data collected pursuant to the Monitoring and Reporting Program (MRP) of this Order (Attachment E), and any other associated data or information, and determine whether any of the authorized or conditionally exempt non-storm water discharges identified in Parts III.A.1, III.A.2, and III.A.3 above are a source of pollutants that may be causing or contributing to an exceedance of applicable receiving water limitations in Part V and/or water

[16] Pursuant to the Federal Clean Water Act § 401.

quality-based effluent limitations in Part VI.E. To evaluate monitoring data, the Permittee shall either use applicable interim or final water quality-based effluent limitations for the pollutant or, if there are no applicable interim or final water quality-based effluent limitations for the pollutant, use applicable action levels provided in Attachment G. Based on non-storm water outfall-based monitoring as implemented through the MRP, if monitoring data show exceedances of applicable water quality-based effluent limitations or action levels, the Permittee shall take further action to determine whether the discharge is causing or contributing to exceedances of receiving water limitations in Part V.

d. If the Permittee determines that any of the conditionally exempt non-storm water discharges identified in Part III.A.2.b above is a source of pollutants that causes or contributes to an exceedance of applicable receiving water limitations and/or water quality-based effluent limitations, the Permittee(s) shall report its findings to the Regional Water Board in its annual report. Based on this determination, the Permittee(s) shall also either:

i. Effectively prohibit[17] the non-storm water discharge to the MS4; or

ii. Impose conditions in addition to those in Table 8, subject to approval by the Regional Water Board Executive Officer, on the non-storm water discharge such that it will not be a source of pollutants; or

iii. Require diversion of the non-storm water discharge to the sanitary sewer; or

iv. Require treatment of the non-storm water discharge prior to discharge to the receiving water.

e. If the Permittee determines that any of the authorized or conditionally exempt essential non-storm water discharges identified in Parts III.A.1.a through III.A.1.c, III.A.2.a, or III.A.3 above is a source of pollutants that causes or contributes to an exceedance of applicable receiving water limitations and/or water quality-based effluent limitations, the Permittee shall notify the Regional Water Board within 30 days if the non-storm water discharge is an authorized discharge with coverage under a separate NPDES permit or authorized by USEPA under CERCLA in the manner provided in Part III.A.1.b above, or a conditionally exempt essential non-storm water discharge or emergency non-storm water discharge.

f. If the Permittee prohibits the discharge from the MS4, as per Part III.A.4.d.i, then the Permittee shall implement procedures developed under Part VI.D.9 (Illicit Connections and Illicit Discharges Elimination Program) in order to eliminate the discharge to the MS4.

[17] To “effectively prohibit” means to not allow the non-storm water discharge through the MS4 unless the discharger obtains coverage under a separate NPDES permit prior to discharge to the MS4.

5. If a Permittee demonstrates that the water quality characteristics of a specific authorized or conditionally exempt essential non-storm water discharge resulted in an exceedance of applicable receiving water limitations and/or water quality-based effluent limitations during a specific sampling event, the Permittee shall not be found in violation of applicable receiving water limitations and/or water quality-based effluent limitations for that specific sampling event. Such demonstration must be based on source specific water quality monitoring data from the authorized or conditionally exempt essential non-storm water discharge or other relevant information documenting the characteristics of the specific non-storm water discharge as identified in Table 8.

6. Notwithstanding the above, the Regional Water Board Executive Officer, based on an evaluation of monitoring data and other relevant information for specific categories of non-storm water discharges, may modify a category or remove categories of conditionally exempt non-storm water discharges from Parts III.A.2 and III.A.3 above if the Executive Officer determines that a discharge category is a source of pollutants that causes or contributes to an exceedance of applicable receiving water limitations and/or water quality-based effluent limitations, or may require that a discharger obtain coverage under a separate individual or general State or Regional Water Board permit for a non-storm water discharge.

Table 8. Required Conditions for Conditionally Exempt Non-Storm Water Discharges

Discharge Category	General Conditions Under Which Discharge Through the MS4 is Allowed	Conditions/BMPs that are Required to be Implemented Prior to Discharge Through the MS4
All Discharge Categories	See discharge specific conditions below.	Ensure conditionally exempt non-storm water discharges avoid potential sources of pollutants in the flow path to prevent introduction of pollutants to the MS4 and receiving water. Whenever there is a discharge of 100,000 gallons or more into the MS4, Permittees shall require advance notification by the discharger to the potentially affected MS4 Permittees, including at a minimum the LACFCD, if applicable, and the Permittee with jurisdiction over the land area from which the discharge originates.
Dewatering of lakes	Discharge allowed only if all necessary permits/water quality certifications for dredge and fill activities, including water diversions, are obtained prior to discharge.	Ensure procedures for advanced notification by the lake owner / operator to the Permittee(s) no less than 72 hours prior to the planned discharge. Immediately prior to discharge, visible trash on the shoreline or on the surface of the lake shall be removed and disposed of in a legal manner. Immediately prior to discharge, the discharge pathway and the MS4 inlet to which the discharge is directed, shall be inspected and cleaned out. Discharges shall be volumetrically and velocity controlled to minimize resuspension of sediments. Measures shall be taken to stabilize lake bottom sediments. Ensure procedures for water quality monitoring for pollutants of concern[18] in the lake. Ensure record-keeping of lake dewatering by the lake owner / operator.

[18] Pollutants of concern include, at a minimum, trash and debris, including organic matter, TSS, and any pollutant for which there is a water quality-based effluent limitation in Part VI.E for the lake and/or receiving water.

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Landscape irrigation using potable water	Discharge allowed if runoff due to potable landscape irrigation is minimized through the implementation of an ordinance specifying water efficient landscaping standards, as well as an outreach and education program focusing on water conservation and landscape water use efficiency.	Implement BMPs to minimize runoff and prevent introduction of pollutants to the MS4 and receiving water. Implement water conservation programs to minimize discharge by using less water.
Landscape irrigation using reclaimed or recycled water	Discharge of reclaimed or recycled water runoff from landscape irrigation is allowed if the discharge is in compliance with the producer and distributor operations and management (O&M) plan, and all relevant portions thereof, including the Irrigation Management Plan.	Discharges must comply with applicable O&M Plans, and all relevant portions thereof, including the Irrigation Management Plan.

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Dechlorinated/ debrominated swimming pool/spa discharges	Discharges allowed after implementation of specified BMPs. Pool or spa water containing copper-based algaecides is not allowed to be discharged to the MS4. Discharges of cleaning waste water and filter backwash allowed only if authorized by a separate NPDES permit.	Implement BMPs and ensure discharge avoids potential sources of pollutants in the flow path to prevent introduction of pollutants prior to discharge to the MS4 and receiving water. Swimming pool water must be dechlorinated or debrominated using holding time, aeration, and/or sodium thiosulfate. Chlorine residual in the discharge shall not exceed 0.1 mg/L. Swimming pool water shall not contain any detergents, wastes, or algaecides, or any other chemicals including salts from pools commonly referred to as “salt water pools” in excess of applicable water quality objectives.[19] Swimming pool discharges are to be pH adjusted, if necessary, and be within the range of 6.5 and 8.5 standard units. Swimming pool discharges shall be volumetrically and velocity controlled to promote evaporation and/or infiltration. Ensure procedures for advanced notification by the pool owner to the Permittee(s) at least 72 hours prior to planned discharge for discharges of 100,000 gallons or more. For discharges of 100,000 gallons or more, immediately prior to discharge, the discharge pathway and the MS4 inlet to which the discharge is directed, shall be inspected and cleaned out.
Dewatering of decorative fountains	Discharges allowed after implementation of specified BMPs. Fountain water containing copper-based algaecides may not be discharged to the MS4. Fountain water containing dyes my not be discharged to the MS4.	Implement BMPs and ensure discharge avoids potential sources of pollutants in the flow path to prevent introduction of pollutants prior to discharge to the MS4 and receiving water. Fountain water must be dechlorinated or debrominated using holding time, aeration, and/or sodium thiosulfate. Chlorine residual in the discharge shall not exceed 0.1 mg/L. Fountain discharges are to be pH adjusted, if necessary, and be within the range of 6.5 and 8.5 standard units. Fountain discharges shall be volumetrically and velocity controlled to promote evaporation and/or infiltration. Ensure procedures for advanced notification by the fountain owner to the Permittee(s) at least 72 hours prior to planned discharge for discharges of 100,000 gallons or more. For discharges of 100,000 gallons or more, immediately prior to discharge, the discharge pathway and the MS4 inlet to which the discharge is directed, shall be inspected and cleaned out.
Non-commercial car washing by residents or by non-	Discharges allowed after implementation of specified BMPs.	Implement BMPs and ensure discharge avoids potential sources of pollutants in the flow path to prevent introduction of pollutants prior to discharge to the MS4 and receiving water. Minimize the amount of water used by employing water conservation practices such as turning off

[19] Applicable mineral water quality objectives for surface waters are contained in Chapter 3 of the Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties.

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profit organizations		nozzles or kinking the hose when not spraying a car, and using a low volume pressure washer. Encourage use of biodegradable, phosphate free detergents and non-toxic cleaning products. Where possible, wash cars on a permeable surface where wash water can percolate into the ground (e.g. gravel or grassy areas). Empty buckets of soapy or rinse water into the sanitary sewer system (e.g., sinks or toilets).
Street/sidewalk wash water	Discharges allowed after implementation of specified BMPs.	Sweeping should be used as an alternate BMP whenever possible and sweepings should be disposed of in the trash. BMPs shall be in accordance with Regional Water Board Resolution No. 98-08 that requires: 1) removal of trash, debris, and free standing oil/grease spills/leaks (use absorbent material if necessary) from the area before washing and 2) use of high pressure, low volume spray washing using only potable water with no cleaning agents at an average usage of 0.006 gallons per square feet of sidewalk area. In areas of unsanitary conditions (e.g., areas where the congregation of transient populations can reasonably be expected to result in a significant threat to water quality), whenever practicable, Permittees shall collect and divert street and alley wash water from the Permittee's street and sidewalk cleaning public agency activities to the sanitary sewer.

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IV. EFFLUENT LIMITATIONS AND DISCHARGE SPECIFICATIONS

A. Effluent Limitations

1. **Technology Based Effluent Limitations**: Each Permittee shall reduce pollutants in storm water discharges from the MS4 to the maximum extent practicable (MEP).

2. **Water Quality-Based Effluent Limitations (WQBELs).** This Order establishes WQBELs consistent with the assumptions and requirements of all available TMDL waste load allocations assigned to discharges from the Permittees' MS4s.

   a. Each Permittee shall comply with applicable WQBELs as set forth in Part VI.E of this Order, pursuant to applicable compliance schedules.

B. Land Discharge Specifications – Not Applicable

C. Reclamation Specifications – Not Applicable

V. RECEIVING WATER LIMITATIONS

A. Receiving Water Limitations

1. Discharges from the MS4 that cause or contribute to the violation of receiving water limitations are prohibited.

2. Discharges from the MS4 of storm water, or non-storm water, for which a Permittee is responsible[20], shall not cause or contribute to a condition of nuisance.

3. The Permittees shall comply with Parts V.A.1 and V.A.2 through timely implementation of control measures and other actions to reduce pollutants in the discharges in accordance with the storm water management program and its components and other requirements of this Order including any modifications. The storm water management program and its components shall be designed to achieve compliance with receiving water limitations. If exceedances of receiving water limitations persist, notwithstanding implementation of the storm water management program and its components and other requirements of this Order, the Permittee shall assure compliance with discharge prohibitions and receiving water limitations by complying with the following procedure:

   a. Upon a determination by either the Permittee or the Regional Water Board that discharges from the MS4 are causing or contributing to an exceedance of an applicable Receiving Water Limitation, the Permittee shall promptly notify and thereafter submit an Integrated Monitoring Compliance Report (as described in the Program Reporting Requirements, Part XVIII.A.5 of the Monitoring and Reporting Program) to the Regional Water Board for approval. The Integrated Monitoring Compliance shall describe the BMPs that are currently being

[20] Pursuant to 40 CFR § 122.26(a)(3)(vi), a Permittee is only responsible for discharges of storm water and non-storm water from the MS4 for which it is an owner or operator.

implemented by the Permittee and additional BMPs, including modifications to current BMPs that will be implemented to prevent or reduce any pollutants that are causing or contributing to the exceedances of receiving water limitations. The Integrated Monitoring Compliance Report shall include an implementation schedule. This Integrated Monitoring Compliance Report shall be incorporated in the annual Storm Water Report unless the Regional Water Board directs an earlier submittal. The Regional Water Board may require modifications to the Integrated Monitoring Compliance Report.

b. The Permittee shall submit any modifications to the Integrated Monitoring Compliance Report required by the Regional Water Board within 30 days of notification.

c. Within 30 days following the Regional Water Board Executive Officer's approval of the Integrated Monitoring Compliance Report, the Permittee shall revise the storm water management program and its components and monitoring program to incorporate the approved modified BMPs that have been and will be implemented, an implementation schedule, and any additional monitoring required.

d. The Permittee shall implement the revised storm water management program and its components and monitoring program according to the approved implementation schedule.

4. So long as the Permittee has complied with the procedures set forth in Part V.A.3. above and is implementing the revised storm water management program and its components, the Permittee does not have to repeat the same procedure for continuing or recurring exceedances of the same receiving water limitations unless directed by the Regional Water Board to modify current BMPs or develop additional BMPs.

B. Ground Water Limitations – Not Applicable

VI. PROVISIONS

A. Standard Provisions

1. Federal Standard Provisions. Each Permittee shall comply with all Standard Provisions included in Attachment D of this Order, in accordance with 40 CFR sections 122.41 and 122.42.

2. Legal Authority

a. Each Permittee must establish and maintain adequate legal authority, within its respective jurisdiction, to control pollutant discharges into and from its MS4 through ordinance, statute, permit, contract or similar means. This legal authority must, at a minimum, authorize or enable the Permittee to:

i. Control the contribution of pollutants to its MS4 from storm water discharges associated with industrial and construction activity and control the quality of storm water discharged from industrial and construction sites. This requirement applies both to industrial and construction sites with coverage under an NPDES permit, as well as to those sites that do not have coverage under an NPDES permit.

ii. Prohibit all non-storm water discharges through the MS4 to receiving waters not otherwise authorized or conditionally exempt pursuant to Part III.A;

iii. Prohibit and eliminate illicit discharges and illicit connections to the MS4;

iv. Control the discharge of spills, dumping, or disposal of materials other than storm water to its MS4;

v. Require compliance with conditions in Permittee ordinances, permits, contracts or orders (i.e., hold dischargers to its MS4 accountable for their contributions of pollutants and flows);

vi. Utilize enforcement mechanisms to require compliance with applicable ordinances, permits, contracts, or orders;

vii. Control the contribution of pollutants from one portion of the shared MS4 to another portion of the MS4 through interagency agreements among Co-permittees;

viii. Control of the contribution of pollutants from one portion of the shared MS4 to another portion of the MS4 through interagency agreements with other owners of the MS4 such as the State of California Department of Transportation;

ix. Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with applicable municipal ordinances, permits, contracts and orders, and with the provisions of this Order, including the prohibition of non-storm water discharges into the MS4 and receiving waters. This means the Permittee must have authority to enter, monitor, inspect, take measurements, review and copy records, and require regular reports from entities discharging into its MS4;

x. Require the use of control measures to prevent or reduce the discharge of pollutants to achieve water quality standards/receiving water limitations;

xi. Require that structural BMPs are properly operated and maintained; and

xii. Require documentation on the operation and maintenance of structural BMPs and their effectiveness in reducing the discharge of pollutants to the MS4.

b. Each Permittee must submit a statement certified by its chief legal counsel that the Permittee has the legal authority within its jurisdiction to implement and enforce each of the requirements contained in 40 CFR § 122.26(d)(2)(i)(A-F) and this Order. Each Permittee shall submit this certification annually as part of its Annual Report beginning with the first Annual Report required under this Order. These statements must include:

i. Citation of applicable municipal ordinances or other appropriate legal authorities and their relationship to the requirements of 40 CFR § 122.26(d)(2)(i)(A)-(F) and of this Order; and

ii. Identification of the local administrative and legal procedures available to mandate compliance with applicable municipal ordinances identified in subsection (i) above and therefore with the conditions of this Order, and a statement as to whether enforcement actions can be completed administratively or whether they must be commenced and completed in the judicial system.

3. Fiscal Resources

a. Each Permittee shall conduct a fiscal analysis of the annual capital and operation and maintenance expenditures necessary to implement the requirements of this Order.

b. Each Permittee shall also enumerate and describe in its Annual Report the source(s) of funds used in the past year, and proposed for the coming year, to meet necessary expenditures on the Permittee's storm water management program.

4. Responsibilities of the Permittees

a. Each Permittee is required to comply with the requirements of this Order applicable to discharges within its boundaries. Permittees are not responsible for the implementation of the provisions applicable to other Permittees. Each Permittee shall:

i. Comply with the requirements of this Order and any modifications thereto.

ii. Coordinate among its internal departments and agencies, as necessary, to facilitate the implementation of the requirements of this Order applicable to such Permittees in an efficient and cost-effective manner.

iii. Participate in intra-agency coordination (e.g. Planning Department, Fire Department, Building and Safety, Code Enforcement, Public Health, Parks and Recreation, and others) and inter-agency coordination (e.g. co-Permittees, other NPDES permittees) necessary to successfully implement the provisions of this Order.

5. Public Review

a. All documents submitted to the Regional Water Board in compliance with the terms and conditions of this Order shall be made available to members of the public pursuant to the Freedom of Information Act (5 U.S.C. § 552 (as amended)) and the Public Records Act (Cal. Government Code § 6250 et seq.).

b. All documents submitted to the Regional Water Board Executive Officer for approval shall be made available to the public for a 30-day period to allow for public comment.

6. Regional Water Board Review

Any formal determination or approval made by the Regional Water Board Executive Officer pursuant to the provisions of this Order may be reviewed by the Regional Water Board. A Permittee(s) or a member of the public may request such review upon petition within 30 days of the effective date of the notification of such decision to the Permittee(s) and interested parties on file at the Regional Water Board.

7. Reopener and Modification

a. This Order may be modified, revoked, reissued, or terminated in accordance with the provisions of 40 CFR sections 122.44, 122.62, 122.63, 122.64, 124.5, 125.62, and 125.64. Causes for taking such actions include, but are not limited to:

i. Endangerment to human health or the environment resulting from the permitted activity, including information that the discharge(s) regulated by this Order may have the potential to cause or contribute to adverse impacts on water quality and/or beneficial uses;

ii. Acquisition of newly-obtained information that would have justified the application of different conditions if known at the time of Order adoption;

iii. To address changed conditions identified in required reports or other sources deemed significant by the Regional Water Board;

iv. To incorporate provisions as a result of future amendments to the Basin Plan, such as a new or revised water quality objective or the adoption or reconsideration of a TMDL, including the program of implementation. Within 18 months of the effective date of a revised TMDL or as soon as practicable thereafter, where the revisions warrant a change to the provisions of this Order, the Regional Water Board may modify this Order consistent with the assumptions and requirements of the revised WLA(s), including the program of implementation;

v. To incorporate provisions as a result of new or amended statewide water quality control plans or policies adopted by the State Water Board, or in consideration of any State Water Board action regarding the precedential language of State Water Board Order WQ 99-05;

vi. To incorporate provisions as a result of the promulgation of new or amended federal or state laws or regulations, USEPA guidance concerning regulated activities, or judicial decisions that becomes effective after adoption of this Order.

vii. To incorporate effluent limitations for toxic constituents determined to be present in significant amount in the discharge through a more comprehensive monitoring program included as part of this Order and based on the results of the reasonable potential analysis;

viii. In accordance with the provisions set forth in 40 CFR Parts 122 and 124, to include requirements for the implementation of the watershed management approach or to include new Minimum Levels (MLs); and/or

ix. To include provisions or modifications to WQBELs in Part VI.E and Attachments L-R in this Order prior to the final compliance deadlines, if practicable, that would allow an action-based, BMP compliance demonstration approach with regard to final WQBELs for storm water discharges. Such modifications shall be based on the Regional Water Board's evaluation of whether Watershed Management Programs in Part VI.C. have resulted in attainment of interim WQBELs for storm water and review of relevant research, including but not limited to data and information provided by Permittees and other stakeholders, on storm water quality and the efficacy and reliability of storm water control technologies. Provisions or modifications to WQBELs in Part VI.E. shall only be included in this Order where there is evidence that storm water control technologies can reliably achieve final WQBELs.

b. After notice and opportunity for a hearing, this Order may be terminated or modified for cause, including, but not limited to:

i. Violation of any term or condition contained in this Order;

ii. Obtaining this Order by misrepresentation, or failure to disclose all relevant facts; or

iii. A change in any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge.

c. The filing of a request by a Permittee for a modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any condition of this Order.

d. This Order may be modified to make corrections or allowances for changes in the permitted activity, following the procedures at 40 CFR section 122.63, if processed as a minor modification. Minor modifications may only:

i. Correct typographical errors; or

ii. Require more frequent monitoring or reporting by a Permittee.

8. Any discharge of waste to any point(s) other than specifically described in this Order is prohibited, and constitutes a violation of this Order.

9. A copy of this Order shall be maintained by each Permittee so as to be available during normal business hours to Permittee employees responsible for implementation of the provisions of this Order and members of the public.

10. The discharge of any product registered under the Federal Insecticide, Fungicide, and Rodenticide Act to any waste stream that may ultimately be released to waters of the United States, is prohibited, unless specifically authorized elsewhere in this Order or another NPDES permit. This requirement is not applicable to products used for lawn and agricultural purposes.

11. Oil or oily material, chemicals, refuse, or other pollutionable materials shall not be stored or deposited in areas where they may be picked up by rainfall and carried off of the property and/or discharged to surface waters. Any such spill of such materials shall be contained and removed immediately.

12. If there is any storage of hazardous or toxic materials or hydrocarbons at a facility owned and/or operated by a Permittee and if the facility is not manned at all times, a 24-hour emergency response telephone number shall be prominently posted where it can easily be read from the outside.

13. Enforcement

a. Violation of any of the provisions of this Order may subject the violator to any of the penalties described herein or in Attachment D of this Order, or any combination thereof, at the discretion of the prosecuting authority; except that only one kind of penalty may be applied for each kind of violation.

b. Failure to comply with provisions or requirements of this Order, or violation of other applicable laws or regulations governing discharges through the MS4 to receiving waters, may subject a Permittee to administrative or civil liabilities, criminal penalties, and/or other enforcement remedies to ensure compliance. Additionally, certain violations may subject a Permittee to civil or criminal enforcement from appropriate local, state, or federal law enforcement entities.

c. The California Water Code provides that any person who violates a waste discharge requirement or a provision of the California Water Code is subject to civil penalties of up to $5,000 per day, $10,000 per day, or $25,000 per day of

violation, or when the violation involves the discharge of pollutants, is subject to civil penalties of up to $10 per gallon per day or $25 per gallon per day of violation; or some combination thereof, depending on the violation, or upon the combination of violations.

d. California Water Code section 13385(h)(1) requires the Regional Water Board to assess a mandatory minimum penalty of three-thousand dollars ($3,000) for each serious violation. Pursuant to California Water Code section 13385(h)(2), a "serious violation" is defined as any waste discharge that violates the effluent limitations contained in the applicable waste discharge requirements for a Group II pollutant by 20 percent or more, or for a Group I pollutant by 40 percent or more. Appendix A of 40 CFR section 123.45 specifies the Group I and II pollutants. Pursuant to California Water Code section 13385.1(a)(1), a "serious violation" is also defined as "a failure to file a discharge monitoring report required pursuant to Section 13383 for each complete period of 30 days following the deadline for submitting the report, if the report is designed to ensure compliance with limitations contained in waste discharge requirements that contain effluent limitations."

e. California Water Code section 13385(i) requires the Regional Water Board to assess a mandatory minimum penalty of three-thousand dollars ($3,000) for each violation whenever a person violates a waste discharge requirement effluent limitation in any period of six consecutive months, except that the requirement to assess the mandatory minimum penalty shall not be applicable to the first three violations within that time period.

f. Pursuant to California Water Code section 13385.1(d), for the purposes of section 13385.1 and subdivisions (h), (i), and (j) of section 13385, "effluent limitation" means a numeric restriction or a numerically expressed narrative restriction, on the quantity, discharge rate, concentration, or toxicity units of a pollutant or pollutants that may be discharged from an authorized location. An effluent limitation may be final or interim, and may be expressed as a prohibition. An effluent limitation, for these purposes, does not include a receiving water limitation, a compliance schedule, or a best management practice.

g. Unlike subdivision (c) of California Water Code section 13385, where violations of effluent limitations may be assessed administrative civil liability on a per day basis, the mandatory minimum penalties provisions identified above require the Regional Water Board to assess mandatory minimum penalties for "each violation" of an effluent limitation. Some water quality-based effluent limitations in Attachments L through R of this Order (e.g., trash, as described immediately below) are expressed as annual effluent limitations. Therefore, for such limitations, there can be no more than one violation of each interim or final effluent limitation per year.

h. Trash TMDLs.

i. Consistent with the 2009 amendments to Order No. 01-182 to incorporate the Los Angeles River Trash TMDL, the water quality-based effluent limitations in Attachments L through R of this Order for trash are expressed as annual effluent limitations. Therefore, for such limitations, there can be no more than one violation of each interim or final effluent limitation per year. Trash is considered a Group I pollutant, as specified in Appendix A to 40 CFR section 123.45. Therefore, each annual violation of a trash effluent limitation in Attachments L through R of this Order by forty percent or more would be considered a "serious violation" under California Water Code section 13385(h). With respect to the final effluent limitation of zero trash, any detectable discharge of trash necessarily is a serious violation, in accordance with the State Water Board's Enforcement Policy. Violations of the effluent limitations in Attachments L through R of this Order would not constitute "chronic" violations that would give rise to mandatory liability under California Water Code section 13385(i) because four or more violations of the effluent limitations subject to a mandatory penalty cannot occur in a period of six consecutive months.

ii. For the purposes of enforcement under California Water Code section 13385, subdivisions (a), (b), and (c), not every storm event may result in trash discharges. In trash TMDLs adopted by the Regional Water Board, the Regional Water Board states that improperly deposited trash is mobilized during storm events of greater than 0.25 inches of precipitation. Therefore, violations of the effluent limitations are limited to the days of a storm event of greater than 0.25 inches. Once a Permittee has violated the annual effluent limitation, any subsequent discharges of trash during any day of a storm event of greater than 0.25 inches during the same storm year constitutes an additional "day in which the violation [of the effluent limitation] occurs".

14. This Order does not exempt any Permittee from compliance with any other laws, regulations, or ordinances that may be applicable.

15. The provisions of this Order are severable. If any provisions of this Order or the application of any provision of this Order to any circumstance is held invalid, the application of such provision to other circumstances and the remainder of this Order shall not be affected.

B. Monitoring and Reporting Program (MRP) Requirements

1. Dischargers shall comply with the MRP and future revisions thereto, in Attachment E of this Order or may, in coordination with an approved Watershed Management Program per Part VI.C, implement a customized monitoring program that achieves the five Primary Objectives set forth in Part II.A. of Attachment E and includes the elements set forth in Part II.E. of Attachment E.

2. Compliance Determination for Commingled Discharges

a. For commingled discharges addressed by a TMDL, a Permittee shall demonstrate compliance with the requirements of Part E as specified at Part E.2.b.

b. For commingled discharges not addressed by a TMDL, a Permittee shall demonstrate compliance with the requirements of Part V.A as follows:

i. Pursuant to 40 CFR section 122.26(a)(3)(vi), each Permittee is only responsible for discharges from the MS4 for which they are owners and/or operators.

ii. Where Permittees have commingled discharges to the receiving water, or where Permittees' discharges commingle in the receiving water, compliance in the receiving water shall be determined for the group of Permittees as a whole unless an individual Permittee demonstrates that its discharge did not cause or contribute to the exceedance, pursuant to subpart iv. below.

iii. For purposes of compliance determination, each Permittee is responsible for demonstrating that its discharge did not cause or contribute to an exceedance of the receiving water limitation in the target receiving water.

iv. A Permittee may demonstrate that its discharge did not cause or contribute to an exceedance of a receiving water limitation in one of the following ways:

(1) Demonstrate that there was no discharge from the Permittee's MS4 into the applicable receiving water during the relevant time period;

(2) Demonstrate that the discharge from the Permittee's MS4 was controlled to a level that did not cause or contribute to the exceedance in the receiving water;

(3) Demonstrate that there is an alternative source of the pollutant that caused the exceedance, that the pollutant is not typically associated with MS4 discharges, and that the pollutant was not discharged from the Permittee's MS4; or

(4) Demonstrate that the Permittee is in compliance with the Watershed Management Programs provisions under VI.C.

C. Watershed Management Programs

1. General

a. The purpose of this Part VI.C is to allow Permittees the flexibility to develop Watershed Management Programs to implement the requirements of this Order

on a watershed scale through customized strategies, control measures, and BMPs.

b. Participation in a Watershed Management Program is voluntary and allows a Permittee to address the highest watershed priorities, including complying with the requirements of Part V.A. (Receiving Water Limitations), Part VI.E (Total Maximum Daily Load Provisions) and Attachments L through R, by customizing the control measures in Parts III.A.4 (Prohibitions – Non-Storm Water Discharges) and VI.D (Minimum Control Measures).

c. Customized strategies, control measures, and BMPs shall be implemented on a watershed basis, where applicable, through each Permittee's storm water management program and/or collectively by all participating Permittees through a Watershed Management Program.

d. The Watershed Management Programs shall ensure that discharges from the Permittee's MS4: (i) achieve applicable water quality-based effluent limitations in Part VI.E and Attachments L through R pursuant to the corresponding compliance schedules, (ii) do not cause or contribute to exceedances of receiving water limitations in Parts V.A and VI.E and Attachments L through R, and (iii) do not include non-storm water discharges that are effectively prohibited pursuant to Part III.A. The programs shall also ensure that controls are implemented to reduce the discharge of pollutants to the maximum extent practicable (MEP) pursuant to Part IV.A.1.

e. Watershed Management Programs shall be developed either collaboratively or individually using the Regional Water Board's Watershed Management Areas (WMAs). Where appropriate, WMAs may be separated into subwatersheds to focus water quality prioritization and implementation efforts by receiving water.

f. Each Watershed Management Program shall be consistent with Part VI.C.5-C.8 and shall:

i. Prioritize water quality issues resulting from storm water and non-storm water discharges from the MS4 to receiving waters within each WMA,

ii. Identify and implement strategies, control measures, and BMPs to achieve the outcomes specified in Part VI.C.1.d,

iii. Execute an integrated monitoring program and assessment program pursuant to Attachment E – MRP, Part IV to determine progress towards achieving applicable limitations and/or action levels in Attachment G, and

iv. Modify strategies, control measures, and BMPs as necessary based on analysis of monitoring data collected pursuant to the MRP to ensure that applicable water quality-based effluent limitations and receiving water limitations and other milestones set forth in the Watershed Management Program are achieved in the required timeframes.

v. Provide appropriate opportunity for meaningful stakeholder input, including but not limited to, a permit-wide watershed management program technical advisory committee (TAC) that will advise and participate in the development of the Watershed Management Programs and enhanced Watershed Management Programs from month 6 through the date of program approval. The composition of the TAC may include at least one Permittee representative from each Watershed Management Area for which a Watershed Management Program will be developed, and must include a minimum of one public representative from a non-governmental organization with public membership, and staff from the Regional Water Board and USEPA Region IX.

g. Permittees may elect to develop an enhanced Watershed Management Program (EWMP). An EWMP is one that comprehensively evaluates opportunities, within the participating Permittees' collective jurisdictional area in a Watershed Management Area, for collaboration among Permittees and other partners on multi-benefit regional projects that, wherever feasible, retain (i) all non-storm water runoff and (ii) all storm water runoff from the 85th percentile, 24-hour storm event for the drainage areas tributary to the projects, while also achieving other benefits including flood control and water supply, among others. In drainage areas within the EWMP area where retention of the 85th percentile, 24-hour storm event is not feasible, the EWMP shall include a Reasonable Assurance Analysis to demonstrate that applicable water quality based effluent limitations and receiving water limitations shall be achieved through implementation of other watershed control measures. An EWMP shall:

i. Be consistent with the provisions in Part VI.C.1.a.-f and VI.C.5-C.8;

ii. Incorporate applicable State agency input on priority setting and other key implementation issues;

iii. Provide for meeting water quality standards and other CWA obligations by utilizing provisions in the CWA and its implementing regulations, policies and guidance;

iv. Include multi-benefit regional projects to ensure that MS4 discharges achieve compliance with all final WQBELs set forth in Part VI.E. and do not cause or contribute to exceedances of receiving water limitations in Part V.A. by retaining through infiltration or capture and reuse the storm water volume from the 85th percentile, 24-hour storm for the drainage areas tributary to the multi-benefit regional projects.;

v. In drainage areas where retention of the storm water volume from the 85th percentile, 24-hour event is not technically feasible, include other watershed control measures to ensure that MS4 discharges achieve compliance with all interim and final WQBELs set forth in Part VI.E. with compliance deadlines occurring after approval of a EWMP and to ensure that MS4

discharges do not cause or contribute to exceedances of receiving water limitations in Part V.A.;

vi. Maximize the effectiveness of funds through analysis of alternatives and the selection and sequencing of actions needed to address human health and water quality related challenges and non-compliance;

vii. Incorporate effective innovative technologies, approaches and practices, including green infrastructure;

viii. Ensure that existing requirements to comply with technology-based effluent limitations and core requirements (e.g., including elimination of non-storm water discharges of pollutants through the MS4, and controls to reduce the discharge of pollutants in storm water to the maximum extent practicable) are not delayed;

ix. Ensure that a financial strategy is in place.

2. Compliance with Receiving Water Limitations Not Otherwise Addressed by a TMDL through a WMP or EWMP

a. For receiving water limitations in Part V.A. associated with water body-pollutant combinations not addressed through a TMDL, but which a Permittee elects to address through a Watershed Management Program or EWMP as set forth in this Part VI.C., a Permittee shall comply as follows:

i. For pollutants that are in the same class[21] as those addressed in a TMDL for the watershed and for which the water body is identified as impaired on the State's Clean Water Act Section 303(d) List as of the effective date of this Order:

(1) Permittees shall demonstrate that the Watershed Control Measures to achieve the applicable TMDL provisions identified pursuant to Part VI.C.5.b.iv.(3) will also adequately address contributions of the pollutant(s) within the same class from MS4 discharges to receiving waters, consistent with the assumptions and requirements of the corresponding TMDL provisions, including interim and final requirements and deadlines for their achievement, such that the MS4 discharges of the pollutant(s) will not cause or contribute to exceedances of receiving water limitations in Part V.A.

(2) Permittees shall include the water body-pollutant combination(s) in the Reasonable Assurance Analysis in Part VI.C.5.b.iv.(5).

(3) Permittees shall identify milestones and dates for their achievement consistent with those in the corresponding TMDL.

[21] Pollutants are considered in a similar class if they have similar fate and transport mechanisms, can be addressed via the same types of control measures, and within the same timeline already contemplated as part of the Watershed Management Program for the TMDL.

ii. For pollutants that are not in the same class as those addressed in a TMDL for the watershed, but for which the water body is identified as impaired on the State's Clean Water Act Section 303(d) List as of the effective date of this Order:

(1) Permittees shall assess contributions of the pollutant(s) from MS4 discharges to the receiving waters and sources of the pollutant(s) within the drainage area of the MS4 pursuant to Part VI.C.5.a.iii.

(2) Permittees shall identify Watershed Control Measures pursuant to Part VI.C.5.b. that will adequately address contributions of the pollutant(s) from MS4 discharges to receiving waters such that the MS4 discharges of the pollutant(s) will not cause or contribute to exceedances of receiving water limitations in Part V.A.

(3) Permittees shall include the water body-pollutant in the Reasonable Assurance Analysis in Part VI.C.5.b.iv.(5).

(4) Permittees shall identify enforceable requirements and milestones and dates for their achievement to control MS4 discharges such that they do not cause or contribute to exceedances of receiving water limitations within a timeframe(s) that is as short as possible, taking into account the technological, operation, and economic factors that affect the design, development, and implementation of the control measures that are necessary. The time between dates shall not exceed one year. Milestones shall relate to a specific water quality endpoint (e.g., x% of the MS4 drainage area is meeting the receiving water limitations) and dates shall relate either to taking a specific action or meeting a milestone.

(5) Where the final date(s) in (4) is beyond the term of this Order, the following conditions shall apply:

(a) For an EWMP, in drainage areas where retention of (i) all non-storm water runoff and (ii) all storm water runoff from the 85th percentile, 24-hour storm event will be achieved, each participating Permittee shall continue to target implementation of watershed control measures in its existing storm water management program, including watershed control measures to eliminate non-storm water discharges that are a source of pollutants to receiving waters.

(b) For a WMP and in areas of a EWMP where retention of the volume in (a) is technically infeasible and where the Regional Water Board determines that MS4 discharges cause or contribute to the water quality impairment, participating Permittees may initiate development of a stakeholder-proposed TMDL upon approval of the Watershed Management Program or EWMP. For MS4 discharges from these drainage areas to the receiving waters, any extension of

this compliance mechanism beyond the term of this Order shall be consistent with the implementation schedule in a TMDL for the waterbody pollutant combination(s) adopted by the Regional Water Board.

iii. For pollutants for which there are exceedances of receiving water limitations in Part V.A., but for which the water body is not identified as impaired on the State's Clean Water Act Section 303(d) List as of the effective date of this Order:

(1) Upon an exceedance of a receiving water limitation, based on data collected pursuant to the MRP and approved IMPs and CIMPs, Permittees shall assess contributions of the pollutant(s) from MS4 discharges to the receiving waters and sources of the pollutant(s) within the drainage area of the MS4 pursuant to Part VI.C.5.a.iii.

(2) If MS4 discharges are identified as a source of the pollutant(s) that has caused or contributed to, or has the potential to cause or contribute to, the exceedance(s) of receiving water limitations in Part V.A., Permittees shall address contributions of the pollutant(s) from MS4 discharges through modifications to the WMP or EWMP pursuant to Part VI.C.8.a.ii.

(a) In a modified WMP or EWMP, Permittees shall identify Watershed Control Measures pursuant to Part VI.C.5.b. that will adequately address contributions of the pollutant(s) from MS4 discharges to receiving waters such that the MS4 discharges of the pollutant(s) will not cause or contribute to exceedances of receiving water limitations in Part V.A.

(b) Permittees shall modify the Reasonable Assurance Analysis pursuant to Part VI.C.5.b.iv.(5) to address the pollutant(s).

(c) Permittees shall identify enforceable requirements and milestones and dates for their achievement to control MS4 discharges such that they do not cause or contribute to exceedances of receiving water limitations within a timeframe(s) that is as short as possible, taking into account the technological, operation, and economic factors that affect the design, development, and implementation of the control measures that are necessary. The time between dates shall not exceed one year. Milestones shall relate to a specific water quality endpoint (e.g., x% of the MS4 drainage area is meeting the receiving water limitations) and dates shall relate either to taking a specific action or meeting a milestone.

(d) Where the final date(s) in (4) is beyond the term of this Order, the following conditions shall apply:

(i) For an EWMP, in drainage areas where retention of (i) all non-storm water runoff and (ii) all storm water runoff from the 85th percentile, 24-hour storm event will be achieved,

each participating Permittee shall continue to target implementation of watershed control measures in its existing storm water management program, including watershed control measures to eliminate non-storm water discharges that are a source of pollutants to receiving waters.

(ii) For a WMP and in areas of a EWMP where retention of the volume in (a) is technically infeasible, for newly identified exceedances of receiving water limitations, a Permittee may request that the Regional Water Board approve a modification to its WMP or EWMP to include these additional water body-pollutant combinations.

b. A Permittee's full compliance with all requirements and dates for their achievement in an approved Watershed Management Program or EWMP shall constitute a Permittee's compliance with the receiving water limitations provisions in Part V.A. of this Order for the specific water body-pollutant combinations addressed by an approved Watershed Management Program or EWMP.

c. If a Permittee fails to meet any requirement or date for its achievement in an approved Watershed Management Program or EWMP, the Permittee shall be subject to the provisions of Part V.A. for the waterbody-pollutant combination(s) that were to be addressed by the requirement. For water body-pollutant combinations that are not addressed by a TMDL, final compliance with receiving water limitations is determined by verification through monitoring that the receiving water limitation provisions in Part V.A.1 and 2 have been achieved.

d. Upon notification of a Permittee's intent to develop a WMP or EWMP and prior to approval of its WMP or EWMP, a Permittee's full compliance with all of the following requirements shall constitute a Permittee's compliance with the receiving water limitations provisions in Part V.A. not otherwise addressed by a TMDL, if all the following requirements are met:

i. Provides timely notice of its intent to develop a WMP or EWMP,

ii. Meets all interim and final deadlines for development of a WMP or EWMP,

iii. For the area to be covered by the WMP or EWMP, targets implementation of watershed control measures in its existing storm water management program, including watershed control measures to eliminate non-storm water discharges of pollutants through the MS4 to receiving waters, to address known contributions of pollutants from MS4 discharges that cause or contribute to exceedances of receiving water limitations, and

iv. Receives final approval of its WMP or EWMP within 28 or 40 months, respectively.

3. Compliance with Receiving Water Limitations Addressed by a TMDL through a WMP or EWMP

a. A Permittee's full compliance with all requirements and dates for their achievement in an approved Watershed Management Program or EWMP shall constitute a Permittee's compliance with provisions pertaining to applicable interim water quality based effluent limitations and interim receiving water limitations in Part VI.E. and Attachments L-R for the pollutant(s) addressed by the approved Watershed Management Program or EWMP.

b. Upon notification of a Permittee's intent to develop a WMP or EWMP and prior to approval of its WMP or EWMP, a Permittee's full compliance with all of the following requirements shall constitute a Permittee's compliance with the receiving water limitations provisions in Part V.A., if all the following requirements are met:

i. Provides timely notice of its intent to develop a WMP or EWMP,

ii. Meets all interim and final deadlines for development of a WMP or EWMP,

iii. For the area to be covered by the WMP or EWMP, targets implementation of watershed control measures in its existing storm water management program, including watershed control measures to eliminate non-storm water discharges of pollutants through the MS4 to receiving waters, to address known contributions of pollutants from MS4 discharges that cause or contribute to exceedances of receiving water limitations, and

iv. Receives final approval of its WMP or EWMP within 28 or 40 months, respectively.

c. Subdivision b. does not apply to receiving water limitations corresponding to final compliance deadlines pursuant to TMDL provisions in Part VI.E. that have passed or will occur prior to approval of a WMP or EWMP.

4. Process

a. Timelines for Implementation

i. Implementation of the following requirements shall occur per the schedule specified in Table 9 below:

Table 9. Watershed Management Program Implementation Requirements

Part	Provision	Due Date
VI.C.4.b	Notify Regional Water Board of intent to develop Watershed Management Program or enhanced WMP and request submittal date for draft program plan	6 months after Order effective date
VI.C.4.c	For Permittee(s) that elect not to implement the conditions of Part VI.C.4.c.i or c.ii, submit draft plan to Regional Water Board	1 year after Order effective date
VI.C.4.c	For Permittee(s) that elect to implement the conditions of Part VI.C.4.c.i or c.ii, submit draft plan to Regional Water Board	18 months after Order effective date
VI.C.4.c.iv	For Permittees that elect to collaborate on an enhanced WMP that meets the requirements of Part VI.C.4.c.iv,submit draft plan to Regional Water Board	18 months after Order effective date, provide final work plan for development of enhanced WMP 30 months after Order effective date, submit draft plan
VI.C.4.c	Comments provided to Permittees by Regional Water Board	4 months after submittal of draft plan
VI.C.4.c	Submit final plan to Regional Water Board	3 months after receipt of Regional Water Board comments on draft plan
VI.C.4.c	Approval or denial of final plan by Regional Water Board or by the Executive Officer on behalf of the Regional Water Board	3 months after submittal of final plan
VI.C.6	Begin implementation of Watershed Management Program or EWMP	Upon approval of final plan
VI.C.8	Comprehensive evaluation of Watershed Management	Every two years from date of

	Program or EWMP and submittal of modifications to plan	approval

b. Permittees that elect to develop a Watershed Management Program or EWMP must notify the Regional Water Board no later than six months after the effective date of this Order.

i. Such notification shall specify if the Permittee(s) are requesting a 12-month or 18-month submittal date for the draft Watershed Management Program, per Part VI.C.4.c.i – ii, or if the Permittees are requesting a 18/30-month submittal date for the draft EWMP per Part VI.C.4.c.iv.

ii. As part of their notice of intent to develop a WMP or EWMP, Permittees shall identify all applicable interim and final trash WQBELs and all other final WQBELs and receiving water limitations pursuant to Part VI.E. and the applicable attachment(s) with compliance deadlines occurring prior to approval of a WMP or EWMP. Permittees shall identify watershed control measures, where possible from existing TMDL implementation plans, that will be implemented by participating Permittees concurrently with the development of a Watershed Management Program or EWMP to ensure that MS4 discharges achieve compliance with applicable interim and final trash WQBELs and all other final WQBELs and receiving water limitations set forth in Part VI.E. and the applicable attachment(s) by the applicable compliance deadlines occurring prior to approval of a WMP or EWMP.

iii. As part of their notification, Permittees electing to develop an EWMP shall submit all of the following in addition to the requirements of Part VI.C.4.b.i.-ii.:

(1) Plan concept and geographical scope,

(2) Cost estimate for plan development,

(3) Executed MOU/agreement among participating Permittees to fund plan development, or final draft MOU among participating Permittees along with a signed letter of intent from each participating City Manager or head of agency. If a final draft MOU is submitted, the MOU shall be fully executed by all participating Permittees within 12 months of the effective date of this Order.

(4) Interim milestones for plan development and deadlines for their achievement,

(5) Identification of, and commitment to fully implement, one structural BMP or a suite of BMPs at a scale that provides meaningful water quality improvement within each watershed covered by the plan within 30 months of the effective date of this Order in addition to

watershed control measures to be implemented pursuant to b.ii. above. The structural BMP or suite of BMPs shall be subject to approval by the Regional Water Board Executive Officer, and

(6) Demonstration that the requirements in Parts VI.C.4.c.iv.(1) and (2) have been met.

c. Permittees that elect to develop a Watershed Management Program shall submit a draft plan to the Regional Water Board as follows:

i. For Permittees that elect to collaborate on the development of a Watershed Management Program, Permittees shall submit the draft Watershed Management Program no later than 18 months after the effective date of this Order if the following conditions are met in greater than 50% of the land area covered by the WMP:

(1) Demonstrate that there are LID ordinances in place and/or commence development of a Low Impact Development (LID) ordinance(s) meeting the requirements of this Order's Planning and Land Development Program within 60 days of the effective date of the Order and have a draft ordinance within 6 months of the effective date of the Order, and

(2) Demonstrate that there are green streets policies in place and/or commence development of a policy(ies) that specifies the use of green street strategies for transportation corridors within 60 days of the effective date of the Order and have a draft policy within 6 months of the effective date of the Order.

(3) Demonstrate in the notification of the intent to develop a Watershed Management Program that Parts VI.C.4.c.i(1) and (2) have been met in greater than 50% of the watershed area.

ii. For a Permittee that elects to develop an individual Watershed Management Program, the Permittee shall submit the draft Watershed Management Program no later than 18 months after the effective date of this Order if the following conditions are met:

(1) Demonstrate that there is a LID ordinance in place for the Permittee's jurisdiction and/or commence development of a Low Impact Development (LID) ordinance for the Permittee's jurisdiction meeting the requirements of this Order's Planning and Land Development Program within 60 days of the effective date of the Order and have a draft ordinance within 6 months of the effective date of the Order, and

(2) Demonstrate that there is a green streets policy in place for the Permittee's jurisdiction and/or commence development of a policy

that specifies the use of green street strategies for transportation corridors within the Permittee's jurisdiction within 60 days of the effective date of the Order and have a draft policy within 6 months of the effective date of the Order.

(3) Demonstrate in the notification of the intent to develop a Watershed Management Program that Parts VI.C.4.c.ii.(1) and (2) have been met.

iii. For Permittees that elect not to implement the conditions under Part VI.C.4.c.i. or Part VI.C.4.c.ii., Permittees shall submit the draft Watershed Management Program no later than 12 months after the effective date of this Order.

iv. For Permittees that elect to collaborate on the development of an EWMP, Permittees shall submit the work plan for development of the EWMP no later than 18 months after the effective date of this Order, and shall submit the draft program no later than 30 months after the effective date of this Order if the following conditions are met in greater than 50% of the land area in the watershed:

(1) Demonstrate that there are LID ordinances in place and/or commence development of a Low Impact Development (LID) ordinance(s) meeting the requirements of this Order's Planning and Land Development Program within 60 days of the effective date of the Order and have a draft ordinance within 6 months of the effective date of the Order, and

(2) Demonstrate that there are green streets policies in place and/or commence development of a policy(ies) that specifies the use of green street strategies for transportation corridors within 60 days of the effective date of the Order and have a draft policy within 6 months of the effective date of the Order.

(3) Demonstrate in the notification of the intent to develop an EWMP that Parts VI.C.4.c.iv.(1) and (2) have been met in greater than 50% of the watershed area.

d. Until the Watershed Management Program or EWMP is approved by the Regional Water Board or by the Executive Officer on behalf of the Regional Water Board, Permittees that elect to develop a Watershed Management Program or EWMP shall:

i. Continue to implement watershed control measures in their existing storm water management programs, including actions within each of the six categories of minimum control measures consistent with 40 CFR section 122.26(d)(2)(iv),

ii. Continue to implement watershed control measures to eliminate non-storm water discharges through the MS4 that are a source of pollutants to receiving waters consistent with CWA section 402(p)(3)(B)(ii), and

iii. Implement watershed control measures, where possible from existing TMDL implementation plans, to ensure that MS4 discharges achieve compliance with interim and final trash WQBELs and all other final WQBELs and receiving water limitations pursuant to Part VI.E. and set forth in Attachments L through R by the applicable compliance deadlines occurring prior to approval of a WMP or EWMP.

e. Permittees that do not elect to develop a Watershed Management Program or EWMP, or that do not have an approved WMP or EWMP within 28 or 40 months, respectively, of the effective date of this Order, shall be subject to the baseline requirements in Part VI.D and shall demonstrate compliance with receiving water limitations pursuant to Part V.A. and with applicable interim water quality-based effluent limitations in Part VI.E pursuant to subparts VI.E.2.d.i.(1)-(3).

f. Permittees subject to the Middle Santa Ana River Watershed Bacteria Indicator TMDL shall submit a Comprehensive Bacteria Reduction Plan (CBRP) for dry weather to the Regional Water Board Executive Officer no later than nine months after the effective date of this Order. The CBRP shall describe, in detail, the specific actions that have been taken or will be taken to achieve compliance with the dry weather water quality-based effluent limitations and the receiving water limitations for the Middle Santa Ana River Watershed Bacteria Indicator TMDL by December 31, 2015. The CBRP shall also establish a schedule for developing a CBRP to comply with the water quality-based effluent limitations and the receiving water limitations for the Middle Santa Ana River Bacteria TMDL during wet weather by December 31, 2025. The CBRP may be developed in lieu of the Watershed Management Program for MS4 discharges of bacteria within the Middle Santa Ana River Watershed.

g. Permittees may request an extension of the deadlines for notification of intent to develop a Watershed Management Program or EWMP, submission of a draft plan, and submission of a final plan. The extension is subject to approval by the Regional Water Board or the Executive Officer. Permittees that are granted an extension for any deadlines for development of the WMP/EWMP shall be subject to the baseline requirements in Part VI.D and shall demonstrate compliance with receiving water limitations pursuant to Part V.A. and with applicable interim water quality-based effluent limitations in Part VI.E pursuant to subparts VI.E.2.d.i.(1)-(3) until the Permittee has an approved WMP/EWMP in place.

5. Program Development

a. Identification of Water Quality Priorities

Permittees shall identify the water quality priorities within each WMA that will be addressed by the Watershed Management Program. At a minimum, these priorities shall include achieving applicable water quality-based effluent limitations and/or receiving water limitations established pursuant to TMDLs, as set forth in Part VI.E and Attachments L through R of this Order.

i. Water Quality Characterization. Each plan shall include an evaluation of existing water quality conditions, including characterization of storm water and non-storm water discharges from the MS4 and receiving water quality, to support identification and prioritization/sequencing of management actions.

ii. Water Body-Pollutant Classification. On the basis of the evaluation of existing water quality conditions, water body-pollutant combinations shall be classified into one of the following three categories:

(1) Category 1 (Highest Priority): Water body-pollutant combinations for which water quality-based effluent limitations and/or receiving water limitations are established in Part VI.E and Attachments L through R of this Order.

(2) Category 2 (High Priority): Pollutants for which data indicate water quality impairment in the receiving water according to the State's Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List (State Listing Policy) and for which MS4 discharges may be causing or contributing to the impairment.

(3) Category 3 (Medium Priority): Pollutants for which there are insufficient data to indicate water quality impairment in the receiving water according to the State's Listing Policy, but which exceed applicable receiving water limitations contained in this Order and for which MS4 discharges may be causing or contributing to the exceedance.

iii. Source Assessment. Utilizing existing information, potential sources within the watershed for the water body-pollutant combinations in Categories 1 - 3 shall be identified.

(1) Permittees shall identify known and suspected storm water and non-storm water pollutant sources in discharges to the MS4 and from the MS4 to receiving waters and any other stressors related to MS4 discharges causing or contributing to the water quality priorities. The identification of known and suspected sources of the highest water quality priorities shall consider the following:

(a) Review of available data, including but not limited to:

(i) Findings from the Permittees' Illicit Connections and Illicit Discharge Elimination Programs;

(ii) Findings from the Permittees' Industrial/Commercial Facilities Programs;

(iii) Findings from the Permittees' Development Construction Programs;

(iv) Findings from the Permittees' Public Agency Activities Programs;

(v) TMDL source investigations;

(vi) Watershed model results;

(vii) Findings from the Permittees' monitoring programs, including but not limited to TMDL compliance monitoring and receiving water monitoring; and

(viii) Any other pertinent data, information, or studies related to pollutant sources and conditions that contribute to the highest water quality priorities.

(b) Locations of the Permittees' MS4s, including, at a minimum, all MS4 major outfalls and major structural controls for storm water and non-storm water that discharge to receiving waters.

(c) Other known and suspected sources of pollutants in non-storm water or storm water discharges from the MS4 to receiving waters within the WMA.

iv. Prioritization. Based on the findings of the source assessment, the issues within each watershed shall be prioritized and sequenced. Watershed priorities shall include at a minimum:

(1) TMDLs

(a) Controlling pollutants for which there are water quality-based effluent limitations and/or receiving water limitations with interim or final compliance deadlines within the permit term, or TMDL compliance deadlines that have already passed and limitations have not been achieved.

(b) Controlling pollutants for which there are water quality-based effluent limitations and/or receiving water limitations with interim or final compliance deadlines between September 6, 2012 and October 25, 2017.

(2) Other Receiving Water Considerations

(a) Controlling pollutants for which data indicate impairment or exceedances of receiving water limitations in the receiving water and the findings from the source assessment implicates discharges from the MS4 shall be considered the second highest priority.

b. Selection of Watershed Control Measures

i. Permittees shall identify strategies, control measures, and BMPs to implement through their individual storm water management programs, and collectively on a watershed scale, with the goal of creating an efficient program to focus individual and collective resources on watershed priorities.

ii. The objectives of the Watershed Control Measures shall include:

(1) Prevent or eliminate non-storm water discharges to the MS4 that are a source of pollutants from the MS4 to receiving waters.

(2) Implement pollutant controls necessary to achieve all applicable interim and final water quality-based effluent limitations and/or receiving water limitations pursuant to corresponding compliance schedules.

(3) Ensure that discharges from the MS4 do not cause or contribute to exceedances of receiving water limitations.

iii. Watershed Control Measures may include:

(1) Structural and/or non-structural controls and operation and maintenance procedures that are designed to achieve applicable water quality-based effluent limitations, receiving water limitations in Part VI.E and/or Attachments L through R;

(2) Retrofitting areas of existing development known or suspected to contribute to the highest water quality priorities with regional or sub-regional controls or management measures; and

(3) Stream and/or habitat rehabilitation or restoration projects where stream and/or habitat rehabilitation or restoration are necessary for, or will contribute to demonstrable improvements in the physical, chemical, and biological receiving water conditions and restoration and/or protection of water quality standards in receiving waters.

iv. The following provisions of this Order shall be incorporated as part of the Watershed Management Program:

(1) Minimum Control Measures.

(a) Permittees shall assess the minimum control measures (MCMs) as defined in Part VI.D.4 to Part VI.D.10 of this Order to identify opportunities for focusing resources on the high priority issues in each watershed. For each of the following minimum control measures, Permittees shall identify potential modifications that will address watershed priorities:

(i) Development Construction Program

(ii) Industrial/Commercial Facilities Program

(iii) Illicit Connection and Illicit Discharges Detection and Elimination Program

(iv) Public Agency Activities Program

(v) Public Information and Participation Program

(b) At a minimum, the Watershed Management Program shall include management programs consistent with 40 CFR section 122.26(d)(2)(iv)(A)-(D).

(c) If the Permittee(s) elects to eliminate a control measure identified in Parts VI.D.4, VI.D.5, VI.D.6 and VI.D.8 to VI.D.10 because that specific control measure is not applicable to the Permittee(s), the Permittee(s) shall provide a justification for its elimination. The Planning and Land Development Program is not eligible for elimination.

(d) Such customized actions, once approved as part of the Watershed Management Program, shall replace in part or in whole the requirements in Parts VI.D.4, VI.D.5, VI.D.6 and VI.D.8 to VI.D.10 for participating Permittees.

(2) Non-Storm Water Discharge Measures. Where Permittees identify non-storm water discharges from the MS4 as a source of pollutants that cause or contribute to exceedance of receiving water limitations, the Watershed Control Measures shall include strategies, control measures, and/or BMPs that must be implemented to effectively eliminate the source of pollutants consistent with Parts III.A and VI.D.10. These may include measures to prohibit the non-storm water discharge to the MS4, additional BMPs to reduce pollutants in the non-storm water discharge or conveyed by the non-storm water discharge,

diversion to a sanitary sewer for treatment, or strategies to require the non-storm water discharge to be separately regulated under a general NPDES permit.

(3) TMDL Control Measures. Permittees shall compile control measures that have been identified in TMDLs and corresponding implementation plans. Permittees shall identify those control measures to be modified, if any, to most effectively address TMDL requirements within the watershed. If not sufficiently identified in previous documents, or if implementation plans have not yet been developed (e.g., USEPA established TMDLs), the Permittees shall evaluate and identify control measures to achieve water quality-based effluent limitations and/or receiving water limitations established in this Order pursuant to these TMDLs.

(a) TMDL control measures shall include where necessary control measures to address both storm water and non-storm water discharges from the MS4.

(b) TMDL control measures may include baseline or customized activities covered under the general MCM categories in Part VI.D as well as BMPs and other control measures covered under the non-storm water discharge provisions of Part III.A of this Order.

(c) The WMP shall include, at a minimum, those actions that will be implemented during the permit term to achieve interim and/or final water quality-based effluent limitations and/or receiving water limitations with compliance deadlines within the permit term.

(4) Each plan shall include the following components:

(a) Identification of specific structural controls and non-structural best management practices, including operational source control and pollution prevention, and any other actions or programs to achieve all water quality-based effluent limitations and receiving water limitations contained in this Part VI.E and Attachments L through R to which the Permittee(s) is subject;

(b) For each structural control and non-structural best management practice, the number, type, and location(s) and/or frequency of implementation;

(c) For any pollution prevention measures, the nature, scope, and timing of implementation;

(d) For each structural control and non-structural best management practice, interim milestones and dates for achievement to ensure that TMDL compliance deadlines will be met; and

(e) The plan shall clearly identify the responsibilities of each participating Permittee for implementation of watershed control measures.

(5) Permittees shall conduct a Reasonable Assurance Analysis for each water body-pollutant combination addressed by the Watershed Management Program. A Reasonable Assurance Analysis (RAA) shall be quantitative and performed using a peer-reviewed model in the public domain. Models to be considered for the RAA, without exclusion, are the Watershed Management Modeling System (WMMS), Hydrologic Simulation Program-FORTRAN (HSPF), and the Structural BMP Prioritization and Analysis Tool (SBPAT). The RAA shall commence with assembly of all available, relevant subwatershed data collected within the last 10 years, including land use and pollutant loading data, establishment of quality assurance/quality control (QA/QC) criteria, QA/QC checks of the data, and identification of the data set meeting the criteria for use in the analysis. Data on performance of watershed control measures needed as model input shall be drawn only from peer-reviewed sources. These data shall be statistically analyzed to determine the best estimate of performance and the confidence limits on that estimate for the pollutants to be evaluated. The objective of the RAA shall be to demonstrate the ability of Watershed Management Programs and EWMPs to ensure that Permittees' MS4 discharges achieve applicable water quality based effluent limitations and do not cause or contribute to exceedances of receiving water limitations.

(a) Permittees shall demonstrate using the RAA that the activities and control measures identified in the Watershed Control Measures will achieve applicable water quality-based effluent limitations and/or receiving water limitations in Attachments L through R with compliance deadlines during the permit term.

(b) Where the TMDL Provisions in Part VI.E and Attachments L through R do not include interim or final water quality-based effluent limitations and/or receiving water limitations with compliance deadlines during the permit term, Permittees shall identify interim milestones and dates for their achievement to ensure adequate progress toward achieving interim and final water quality-based effluent limitations and/or receiving water limitations with deadlines beyond the permit term.

(c) For water body-pollutant combinations not addressed by TMDLs, Permittees shall demonstrate using the RAA that the activities and control measures identified in the Watershed Control Measures will achieve applicable receiving water limitations as soon as possible.

(6) Permittees shall provide documentation that they have the necessary legal authority to implement the Watershed Control Measures identified in the plan, or that other legal authority exists to compel implementation of the Watershed Control Measures.

c. Compliance Schedules

Permittees shall incorporate compliance schedules in Attachments L through R into the plan and, where necessary develop interim milestones and dates for their achievement. Compliance schedules and interim milestones and dates for their achievement shall be used to measure progress towards addressing the highest water quality priorities and achieving applicable water quality-based effluent limitations and/or receiving water limitations.

i. Schedules must be adequate for measuring progress on a watershed scale once every two years.

ii. Schedules must be developed for both the strategies, control measures and BMPs implemented by each Permittee within its jurisdiction and for those that will be implemented by multiple Permittees on a watershed scale.

iii. Schedules shall incorporate the following:

(1) Compliance deadlines occurring within the permit term for all applicable interim and/or final water quality-based effluent limitations and/or receiving water limitations in Part VI.E and Attachments L through R of this Order,

(2) Interim milestones and dates for their achievement within the permit term for any applicable final water quality-based effluent limitation and/or receiving water limitation in Part VI.E and Attachments L through R, where deadlines within the permit term are not otherwise specified.

(3) For watershed priorities related to addressing exceedances of receiving water limitations in Part V.A and not otherwise addressed by Part VI.E:

(a) Milestones based on measureable criteria or indicators, to be achieved in the receiving waters and/or MS4 discharges,

(b) A schedule with dates for achieving the milestones, and

(c) A final date for achieving the receiving water limitations as soon as possible, consistent with Parts VI.C.2.a.ii.(4) & VI.C.2.a.iii.(2)(c).

(d) The milestones and implementation schedule in (a)-(c) fulfill the requirements in Part V.A.3.a to prepare an Integrated Monitoring Compliance Report.

6. Watershed Management Program Implementation

Each Permittee shall begin implementing the Watershed Management Program or EWMP immediately upon approval of the plan by the Regional Water Board or the Executive Officer on behalf of the Regional Water Board.

a. Permittees may request an extension of deadlines for achievement of interim milestones and final compliance deadlines established pursuant to Part VI.C.5.c.iii., with the exception of those final compliance deadlines established in a TMDL. Permittees shall provide requests in writing at least 90 days prior to the deadline and shall include in the request the justification for the extension. Extensions must be affirmatively approved by the Regional Water Board Executive Officer, notwithstanding Part VI.C.8.a.iii.

b. Where a Permittee believes that additional time to comply with a final receiving water limitation compliance deadline set within a WMP/EWMP is necessary, and the Permittee fails to timely request or is not granted an extension by the Executive Officer, a Permittee may, no less than 90 days prior to the final compliance deadline, request a time schedule order pursuant to California Water Code section 13300 for the Regional Water Board's consideration.

7. Integrated Watershed Monitoring and Assessment

Permittees in each WMA shall develop an integrated monitoring program as set forth in Part IV of the MRP (Attachment E) or implement a customized monitoring program with the primary objective of allowing for the customization of the outfall monitoring program (Parts VIII and IX) in conjunction with an approved Watershed Management Program or EWMP, as defined below. Each monitoring program shall assess progress toward achieving the water quality-based effluent limitations and/or receiving water limitations per the compliance schedules, and progress toward addressing the water quality priorities for each WMA. The customized monitoring program shall be submitted as part of the Watershed Management Program, or where Permittees elect to develop an EWMP, shall be submitted within 18 months of the effective date of this Order. If pursuing a customized monitoring program, the Permittee(s) shall provide sufficient justification for each element of the program that differs from the monitoring program requirements as set forth in Attachment E. Monitoring programs shall be subject to approval by the Executive Officer following a public comment period. The customized monitoring program shall be designed to address the Primary Objectives detailed in Attachment E, Part II.A and shall include the following program elements:

- Receiving Water Monitoring
- Storm Water Outfall Monitoring
- Non-Storm Water Outfall Monitoring
- New Development/Re-Development Effectiveness Tracking
- Regional Studies

8. Adaptive Management Process

a. Watershed Management Program Adaptive Management Process

i. Permittees in each WMA shall implement an adaptive management process, every two years from the date of program approval, adapting the Watershed Management Program or EWMP to become more effective, based on, but not limited to a consideration of the following:

(1) Progress toward achieving interim and/or final water quality-based effluent limitations and/or receiving water limitations in Part VI.E and Attachments L through R, according to established compliance schedules;

(2) Progress toward achieving improved water quality in MS4 discharges and achieving receiving water limitations through implementation of the watershed control measures based on an evaluation of outfall-based monitoring data and receiving water monitoring data;

(3) Achievement of interim milestones;

(4) Re-evaluation of the water quality priorities identified for the WMA based on more recent water quality data for discharges from the MS4 and the receiving water(s) and a reassessment of sources of pollutants in MS4 discharges;

(5) Availability of new information and data from sources other than the Permittees' monitoring program(s) within the WMA that informs the effectiveness of the actions implemented by the Permittees;

(6) Regional Water Board recommendations; and

(7) Recommendations for modifications to the Watershed Management Program solicited through a public participation process.

ii. Based on the results of the adaptive management process, Permittees shall report any modifications, including where appropriate new compliance deadlines and interim milestones, with the exception of those compliance deadlines established in a TMDL, necessary to improve the effectiveness of

the Watershed Management Program or EWMP in the Annual Report, as required pursuant to Part XVIII.A.6 of the MRP (Attachment E), and as part of the Report of Waste Discharge (ROWD) required pursuant to Part II.B of Attachment D – Standard Provisions.

(1) The adaptive management process fulfills the requirements in Part V.A.4 to address continuing exceedances of receiving water limitations.

iii. Permittees shall implement any modifications to the Watershed Management Program or EWMP upon approval by the Regional Water Board Executive Officer or within 60 days of submittal if the Regional Water Board Executive Officer expresses no objections.

iv. Permittees shall report the following information to the Regional Water Board concurrently with the reporting for the adaptive management process:

(1) On-the-ground structural control measures completed;

(2) Non-structural control measures completed;

(3) Monitoring data that evaluates the effectiveness of implemented control measures in improving water quality;

(4) Comparison of the effectiveness of the control measures to the results projected by the RAA;

(5) Comparison of control measures completed to date with control measures projected to be completed to date pursuant to the Watershed Management Program or EWMP;

(6) Control measures proposed to be completed in the next two years pursuant to the Watershed Management Program or EWMP and the schedule for completion of those control measures;

(7) Status of funding and implementation for control measures proposed to be completed in the next two years.

b. Watershed Management Program Resubmittal Process

i. In addition to adapting the Watershed Management Program or EWMP every two years as described in Part VI.C.8.a., Permittees must submit an updated Watershed Management Program or EWMP with an updated Reasonable Assurance Analysis by June 30, 2021, or sooner as directed by the Regional Water Board Executive Officer or as deemed necessary by Permittees through the Adaptive Management Process, for review and approval by the Regional Water Board Executive Officer. The updated Reasonable Assurance Analysis must incorporate both water quality data and control measure performance data, and any other information informing the two-year adaptive management process, gathered through December 31, 2020. As appropriate,

the Permittees must consider any new numeric analyses or other methods developed for the reasonable assurance analysis. The updated Watershed Management Program or EWMP must comply with all provisions in Part VI.C. The Regional Water Board Executive Officer will allow a 60-day public review and comment period with an option to request a hearing. The Regional Water Board Executive Officer must approve or disapprove the updated Watershed Management Program or EWMP by June 30, 2022. The Executive Officer may waive the requirement of this provision, following a 60-day public review and comment period, if a Permittee demonstrates through water quality monitoring data that the approved Watershed Management Program or EWMP is meeting appropriate water quality targets in accordance with established deadlines.

D. Storm Water Management Program Minimum Control Measures

1. General Requirements

a. Each Permittee shall implement the requirements in Parts VI.D.4 through VI.D.10 below, or may in lieu of the requirements in Parts VI.D.4 through VI.D.10 implement customized actions within each of these general categories of control measures as set forth in an approved Watershed Management Program per Part VI.C. Implementation shall be consistent with the requirements of 40 CFR § 122.26(d)(2)(iv).

b. Timelines for Implementation

i. Unless otherwise noted in Part VI.D, each Permittee that does not elect to develop a Watershed Management Program or EWMP per Part VI.C shall implement the requirements contained in Part VI.D within 6 months after the effective date of this Order. In the interim, a Permittee shall continue to implement its existing storm water management program, including actions within each of the six categories of minimum control measures consistent with 40 CFR section 122.26(d)(2)(iv).

ii. Permittees that elect to develop a Watershed Management Program or EWMP shall continue to implement their existing storm water management programs, including actions within each of the six categories of minimum control measures consistent with 40 CFR section 122.26(d)(2)(iv) until the Watershed Management Program or EWMP is approved by the Regional Water Board Executive Officer.

2. Progressive Enforcement and Interagency Coordination

a. Each Permittee shall develop and implement a Progressive Enforcement Policy to ensure that (1) regulated Industrial/Commercial facilities, (2) construction sites, (3) development and redevelopment sites with post-construction controls, and (4)

illicit discharges are each brought into compliance with all storm water and non-storm water requirements within a reasonable time period as specified below.

i. Follow-up Inspections

In the event that a Permittee determines, based on an inspection or illicit discharge investigation conducted, that a facility or site operator has failed to adequately implement all necessary BMPs, that Permittee shall take progressive enforcement actions which, at a minimum, shall include a follow-up inspection within 4 weeks from the date of the initial inspection and/or investigation.

ii. Enforcement Action

In the event that a Permittee determines that a facility or site operator has failed to adequately implement BMPs after a follow-up inspection, that Permittee shall take enforcement action as established through authority in its municipal code and ordinances, through the judicial system, or refer the case to the Regional Water Board, per the Interagency Coordination provisions below.

iii. Records Retention

Each Permittee shall maintain records, per their existing record retention policies, and make them available on request to the Regional Water Board, including inspection reports, warning letters, notices of violations, and other enforcement records, demonstrating a good faith effort to bring facilities into compliance.

iv. Referral of Violations of Municipal Ordinances and California Water Code § 13260

A Permittee may refer a violation(s) of its municipal storm water ordinances and/or California Water Code section 13260 by Industrial and Commercial facilities and construction site operators to the Regional Water Board provided that the Permittee has made a good faith effort of applying its Progressive Enforcement Policy to achieve compliance with its own ordinances. At a minimum, a Permittee's good faith effort must be documented with:

(1) Two follow-up inspections, and

(2) Two warning letters or notices of violation.

v. Referral of Violations of the Industrial and Construction General Permits, including Requirements to File a Notice of Intent or No Exposure Certification

For those facilities or site operators in violation of municipal storm water ordinances and subject to the Industrial and/or Construction General Permits, Permittees may escalate referral of such violations to the Regional Water Board (promptly via telephone or electronically) after one inspection and one written notice of violation (copied to the Regional Water Board) to the facility

or site operator regarding the violation. In making such referrals, Permittees shall include, at a minimum, the following documentation:

(1) Name of the facility or site,

(2) Operator of the facility or site,

(3) Owner of the facility or site,

(4) WDID Number (if applicable),

(5) Records of communication with the facility/site operator regarding the violation, which shall include at least one inspection report,

(6) The written notice of violation (copied to the Regional Water Board),

(7) For industrial sites, the industrial activity being conducted at the facility that is subject to the Industrial General Permit, and

(8) For construction sites, site acreage and Risk Factor rating.

b. Investigation of Complaints Transmitted by the Regional Water Board Staff

Each Permittee shall initiate, within one business day,[22] investigation of complaints from facilities within its jurisdiction. The initial investigation shall include, at a minimum, a limited inspection of the facility to confirm validity of the complaint and to determine if the facility is in compliance with municipal storm water ordinances and, if necessary, to oversee corrective action.

c. Assistance with Regional Water Board Enforcement Actions

As directed by the Regional Water Board Executive Officer, Permittees shall assist Regional Water Board enforcement actions by:

i. Assisting in identification of current owners, operators, and lessees of properties and sites.

ii. Providing staff, when available, for joint inspections with Regional Water Board inspectors.

iii. Appearing to testify as witnesses in Regional Water Board enforcement hearings.

iv. Providing copies of inspection reports and documentation demonstrating application of its Progressive Enforcement Policy.

3. Modifications/Revisions

a. Each Permittee shall modify its storm water management programs, protocols, practices, and municipal codes to make them consistent with the requirements in this Order.

[22] Permittees may comply with the Permit by taking initial steps (such as logging, prioritizing, and tasking) to "initiate" the investigation within that one business day. However, the Regional Water Board would expect that the initial investigation, including a site visit, to occur within four business days.

4. Requirements Applicable to the Los Angeles County Flood Control District

a. Public Information and Participation Program (PIPP)

i. General

(1) The LACFCD shall participate in a regional Public Information and Participation Program (PIPP) or alternatively, shall implement its own PIPP that includes the requirements listed in this part. The LACFCD shall collaborate, as necessary, with other Permittees to implement PIPP requirements. The objectives of the PIPP are as follows:

(a) To measurably increase the knowledge of the target audience about the MS4, the adverse impacts of storm water pollution on receiving waters and potential solutions to mitigate the impacts.

(b) To measurably change the waste disposal and storm water pollution generation behavior of target audiences by encouraging the implementation of appropriate alternatives by providing information to the public.

(c) To involve and engage a diversity of socio-economic groups and ethnic communities in Los Angeles County to participate in mitigating the impacts of stormwater pollution.

ii. PIPP Implementation

(1) The LACFCD shall implement the PIPP requirements listed in this Part VI.D.5 using one or more of the following approaches:

(a) By participating in a collaborative PIPP covering the entire service area of the Los Angeles County Flood Control District,

(b) By participating in one or more Watershed Group sponsored PIPPs, and/or

(c) Individually within the service area of the Los Angeles County Flood Control District.

(2) If the LACFCD participates in a collaborative District-wide or Watershed Group PIPP, the LACFCD shall provide the contact information for their appropriate staff responsible for storm water public education activities to the designated PIPP coordinator and contact information changes no later than 30 days after a change occurs.

iii. Public Participation

(1) The LACFCD, in collaboration with the County of Los Angeles, shall continue to maintain the countywide hotline (888-CLEAN-LA) for public reporting of clogged catch basin inlets and illicit discharges/dumping, faded or missing catch basin labels, and general storm water management information.

(a) The LACFCD shall include the reporting information, updated when necessary, in public information, and the government pages of the telephone book, as they are developed or published.

(b) The LACFCD, in collaboration with the County of Los Angeles, shall continue to maintain the www.888cleanla.com website.

iv. Residential Outreach Program

(1) Working in conjunction with a District-wide or Watershed Group sponsored PIPP or individually, the LACFCD shall implement the following activities:

(a) Conduct storm water pollution prevention public service announcements and advertising campaigns

(b) Facilitate the dissemination of public education materials including, at a minimum, information on the proper handling (i.e., disposal, storage and/or use) of:

(i) Vehicle waste fluids

(ii) Household waste materials (i.e., trash and household hazardous waste)

(iii) Construction waste materials

(iv) Pesticides and fertilizers (including integrated pest management practices [IPM] to promote reduced use of pesticides),

(v) Green waste (including lawn clippings and leaves)

(vi) Animal wastes

(c) Facilitate the dissemination of activity-specific storm water pollution prevention public education materials, at a minimum, for the following points of purchase:

(i) Automotive parts stores

(ii) Home improvement centers / lumber yards / hardware stores / paint stores

(iii) Landscaping / gardening centers

(iv) Pet shops / feed stores

(d) Maintain a storm water website, which shall include educational material and opportunities for the public to participate in storm water pollution prevention and clean-up activities listed in Part VI.D.5.

(e) When implementing activities in (a)-(d), the LACFCD shall use effective strategies to educate and involve ethnic communities in storm water pollution prevention through culturally effective methods.

b. Industrial/Commercial Facilities Program

If the LACFCD operates, or has authority over, any facility(ies) identified in Part VI.D.6.b, LACFCD shall comply with the requirements in Part VI.D.6 for those facilities.

c. Public Agency Activities Program

i. General

(1) The LACFCD shall implement a Public Agency Activities Program to minimize storm water pollution impacts from LACFCD-owned or operated facilities and activities. Requirements for Public Agency Facilities and Activities consist of the following components:

(a) Public Construction Activities Management.

(b) Public Facility Inventory

(c) Public Facility and Activity Management

(d) Vehicle and Equipment Washing

(e) Landscape and Recreational Facilities Management

(f) Storm Drain Operation and Maintenance

(g) Parking Facilities Management

(h) Emergency Procedures

(i) Employee and Contractor Training

ii. Public Construction Activities Management

(1) The LACFCD shall implement and comply with the Planning and Land Development Program requirements in Part VI.D.7 of this Order at LACFCD-owned or operated public construction projects that are categorized under the project types identified in Part VI.D.7 of this Order.

(2) The LACFCD shall implement and comply with the appropriate Development Construction Program requirements in Part VI.D.8 of this Order at LACFCD-owned or operated construction projects as applicable.

(3) For LACFCD-owned or operated projects that disturb less than one acre of soil, the LACFCD shall require the implementation of an effective combination of erosion and sediment control BMPs from Table 13 (see Construction Development Program).

(4) The LACFCD shall obtain separate coverage under the Construction General Permit for all LACFCD-owned or operated construction sites that require coverage.

iii. Public Facility Inventory

(1) The LACFCD shall maintain an updated watershed-based inventory and map of all LACFCD-owned or operated facilities that are potential sources of storm water pollution. The incorporation of facility information into a GIS is recommended. Sources to be tracked include but are not limited to the following:

(a) Chemical storage facilities

(b) Equipment storage and maintenance facilities (including landscape maintenance-related operations)

(c) Fueling or fuel storage facilities

(d) Materials storage yards

(e) Pesticide storage facilities

(f) LACFCD buildings

(g) LACFCD vehicle storage and maintenance yards

(h) All other LACFCD-owned or operated facilities or activities that the LACFCD determines may contribute a substantial pollutant load to the MS4.

(2) The LACFCD shall include the following minimum fields of information for each LACFCD-owned or operated facility in its watershed-based inventory and map.

(a) Name of facility

(b) Name of facility manager and contact information

(c) Address of facility (physical and mailing)

(d) A narrative description of activities performed and principal products used at each facility and status of exposure to storm water.

(e) Coverage under the Industrial General Permit or other individual or general NPDES permits or any applicable waiver issued by the Regional or State Water Board pertaining to storm water discharges.

(3) The LACFCD shall update its inventory and map once during the Permit term. The update shall be accomplished through a collection of new information obtained through field activities.

iv. Public Agency Facility and Activity Management

(1) The LACFCD shall obtain separate coverage under the Industrial General Permit for all LACFCD-owned or operated facilities where industrial activities are conducted that require coverage under the Industrial General Permit.

(2) The LACFCD shall implement the following measures for flood management projects:

(a) Develop procedures to assess the impacts of flood management projects on the water quality of receiving waterbodies; and

(b) Evaluate existing structural flood control facilities during the planning phases of major maintenance or rehabilitation projects to determine if retrofitting the facility to provide additional pollutant removal from storm water is feasible.

(3) The LACFCD shall implement and maintain the general and activity-specific BMPs listed in Table 18 (BMPs for Public Agency Facilities and Activities) or an equivalent set of BMPs when such activities occur at LACFCD-owned or operated facilities and field activities (e.g., project sites) including but not limited to the facility types listed in Part VI.D.9.c above, and at any area that includes the activities described in Table 18, or that have the potential to discharge pollutants in storm water.

(4) Any contractors hired by the LACFCD to conduct Public Agency Activities shall be contractually required to implement and maintain the general and activity specific BMPs listed in Table 18 or an equivalent set of BMPs. The LACFCD shall conduct oversight of contractor activities to ensure these BMPs are implemented and maintained.

(5) Effective source control BMPs for the activities listed in Table 18 shall be implemented at LACFCD-owned or operated facilities, unless the pollutant generating activity does not occur. The LACFCD shall require implementation of additional BMPs where storm water from the MS4 discharges to a significant ecological area (SEA, see Attachment A for definition), a water body subject to TMDL Provisions in Part VI.E, or a CWA section 303(d) listed water body (see Part VI.E below). Likewise, for those BMPs that are not adequately protective of water quality standards, the LACFCD shall implement additional site-specific controls.

v. Vehicle and Equipment Washing

(1) The LACFCD shall implement and maintain the activity specific BMPs listed in Table 18 (BMPs for Public Agency Facilities and Activities) or an equivalent set of BMPs for all fixed vehicle and equipment washing areas;

(2) The LACFCD shall prevent discharges of wash waters from vehicle and equipment washing to the MS4 by implementing any of the following measures at existing facilities with vehicle or equipment wash areas:

(a) Self-contain, and haul off for disposal; or

(b) Equip with a clarifier or an alternative pre-treatment device and plumb to the sanitary sewer in accordance with applicable waste water provider regulations

(3) The LACFCD shall ensure that any LACFCD facilities constructed, redeveloped, or replaced shall not discharge wastewater from vehicle and equipment wash areas to the MS4 by plumbing all areas to the sanitary sewer in accordance with applicable waste water provider regulations, or self-containing all waste water/ wash water and hauling to a point of legal disposal.

vi. Landscape and Recreational Facilities Management

(1) The LACFCD shall implement and maintain the activity specific BMPs listed in Table 18 (BMPs for Public Agency Facilities and Activities) or an equivalent set of BMPs for all its public right-of-ways, flood control facilities and open channels and reservoirs, and landscape and recreational facilities and activities.

(2) The LACFCD shall implement an IPM program that includes the following:

(a) Pesticides are used only if monitoring indicates they are needed, and pesticides are applied according to applicable permits and established guidelines.

(b) Treatments are made with the goal of removing only the target organism.

(c) Pest controls are selected and applied in a manner that minimizes risks to human health, beneficial non-target organisms, and the environment.

(d) The use of pesticides, including Organophosphates and Pyrethroids, does not threaten water quality.

(e) Partner, as appropriate, with other agencies and organizations to encourage the use of IPM.

(f) Adopt and verifiably implement policies, procedures, and/ or ordinances requiring the minimization of pesticide use and encouraging the use of IPM techniques (including beneficial insects) for Public Agency Facilities and Activities.

(g) Policies, procedures, and ordinances shall include a schedule to reduce the use of pesticides that cause impairment of surface waters by implementing the following procedures:

(i) Prepare and annually update an inventory of pesticides used by all internal departments, divisions, and other operational units.

(ii) Quantify pesticide use by staff and hired contractors.

(iii) Demonstrate implementation of IPM alternatives where feasible to reduce pesticide use.

(3) The LACFCD shall implement the following requirements:

(a) Use a standardized protocol for the routine and non-routine application of pesticides (including pre-emergents), and fertilizers.

(b) Ensure there is no application of pesticides or fertilizers (1) when two or more consecutive days with greater than 50% chance of rainfall are predicted by NOAA, (2) within 48 hours of a ½-inch rain event, or (3) when water is flowing off the area where the application is to occur. This requirement does not apply to the application of aquatic pesticides or pesticides which require water for activation.

(c) Ensure that no banned or unregistered pesticides are stored or applied.

(d) Ensure that all staff applying pesticides are certified in the appropriate category by the California Department of Pesticide Regulation, or are under the direct supervision of a pesticide applicator certified in the appropriate category.

(e) Implement procedures to encourage the retention and planting of native vegetation to reduce water, pesticide and fertilizer needs; and

(f) Store pesticides and fertilizers indoors or under cover on paved surfaces, or use secondary containment.

(i) Reduce the use, storage, and handling of hazardous materials to reduce the potential for spills.

(ii) Regularly inspect storage areas.

vii. Storm Drain Operation and Management

(1) The LACFCD shall implement and maintain the activity specific BMPs listed in Table 18 or equivalent set of BMPs for storm drain operation and maintenance.

(2) Ensure that all the material removed from the MS4 does not reenter the system. Solid material shall be dewatered in a contained area and liquid material shall be disposed in accordance with any of the following measures:

(a) Self-contain, and haul off for legal disposal; or

(b) Equip with a clarifier or an alternative pre-treatment device; and plumb to the sanitary sewer in accordance with applicable waste water provider regulations.

(3) Catch Basin Cleaning

(a) In areas that are not subject to a trash TMDL, the LACFCD shall determine priority areas and shall update its map or list of catch basins with their GPS coordinates and priority:

Priority A: Catch basins that are designated as consistently generating the highest volumes of trash and/or debris.

Priority B: Catch basins that are designated as consistently generating moderate volumes of trash and/or debris.

Priority C: Catch basins that are designated as generating low volumes of trash and/or debris.

The map or list shall contain the rationale or data to support priority designations.

(b) In areas not subject to a trash TMDL, the LACFCD shall inspect its catch basins according to the following schedule:

Priority A: A minimum of 3 times during the wet season (October 1 through April 15) and once during the dry season every year.

Priority B: A minimum of once during the wet season and once during the dry season every year.

Priority C: A minimum of once per year.

Catch basins shall be cleaned as necessary on the basis of inspections. At a minimum, LACFCD shall ensure that any catch basin that is determined to be at least 25% full of trash shall be cleaned out. LACFCD shall maintain inspection and cleaning records for Regional Water Board review.

(c) In areas that are subject to a trash TMDL, the subject Permittees shall implement the applicable provisions in Part VI.E.

(4) Catch Basin Labels and Open Channel Signage

(a) LACFCD shall label all catch basin inlets that they own with a legible “no dumping” message.

(b) The LACFCD shall inspect the legibility of the catch basin stencil or label nearest the inlet prior to the wet season every year.

(c) The LACFCD shall record all catch basins with illegible stencils and re-stencil or re-label within 180 days of inspection.

(d) The LACFCD shall post signs, referencing local code(s) that prohibit littering and illegal dumping, at designated public access points to open channels, creeks, urban lakes, and other relevant waterbodies.

(5) Open Channel Maintenance

The LACFCD shall implement a program for Open Channel Maintenance that includes the following:

(a) Visual monitoring of LACFCD owned open channels and other drainage structures for trash and debris at least annually;

(b) Removal of trash and debris from open channels a minimum of once per year before the wet season;

(c) Elimination of the discharge of contaminants produced by storm drain maintenance and clean outs; and

(d) Proper disposal of debris and trash removed during open channel maintenance.

(6) Infiltration from Sanitary Sewer to MS4/Preventive Maintenance

(a) The LACFCD shall implement controls and measures to prevent and eliminate infiltration of seepage from sanitary sewers to its MS4 thorough routine preventive maintenance of its MS4.

(b) The LACFCD shall implement controls to limit infiltration of seepage from sanitary sewers to its MS4 where necessary. Such controls must include:

(i) Adequate plan checking for construction and new development;

(ii) Incident response training for its employees that identify sanitary sewer spills;

(iii) Code enforcement inspections;

(iv) MS4 maintenance and inspections;

(v) Interagency coordination with sewer agencies; and

(vi) Proper education of its staff and contractors conducting field operations on its MS4.

(7) LACFCD-Owned Treatment Control BMPs

(a) The LACFCD shall implement an inspection and maintenance program for all LACFCD-owned treatment control BMPs, including post-construction treatment control BMPs.

(b) The LACFCD shall ensure proper operation of all its treatment control BMPs and maintain them as necessary for proper operation, including all post-construction treatment control BMPs.

(c) Any residual water produced by a treatment control BMP and not being internal to the BMP performance when being maintained shall be:

(i) Hauled away and legally disposed of; or

(ii) Applied to the land without runoff; or

(iii) Discharged to the sanitary sewer system (with permits or authorization); or

(iv) Treated or filtered to remove bacteria, sediments, nutrients, and meet the limitations set in Table 19 (Discharge Limitations for Dewatering Treatment BMPs), prior to discharge to the MS4.

viii. Parking Facilities Management

LACFCD-owned parking lots exposed to storm water shall be kept clear of debris and excessive oil buildup and cleaned no less than 2 times per month and/or inspected no less than 2 times per month to determine if cleaning is necessary. In no case shall a LACFCD-owned parking lot be cleaned less than once a month.

ix. Emergency Procedures

The LACFCD may conduct repairs and rehabilitation of essential public service systems and infrastructure in emergency situations with a self-waiver of the provisions of this Order as follows:

(1) The LACFCD shall abide by all other regulatory requirements, including notification to other agencies as appropriate.

(2) Where the self-waiver has been invoked, the LACFCD shall notify the Regional Water Board Executive Officer of the occurrence of the emergency no later than 30 business days after the situation of emergency has passed.

(3) Minor repairs of essential public service systems and infrastructure in emergency situations (that can be completed in less than one week) are not subject to the notification provisions. Appropriate BMPs to reduce the threat to water quality shall be implemented.

x. Employee and Contractor Training

(1) The LACFCD shall, no later than one year after Order adoption and annually thereafter before June 30, train all of their employees and contractors in targeted positions (whose interactions, jobs, and activities affect storm water quality) on the requirements of the overall storm water management program to:

(a) Promote a clear understanding of the potential for activities to pollute storm water.

(b) Identify opportunities to require, implement, and maintain appropriate BMPs in their line of work.

(2) The LACFCD shall, no later than one year after Order adoption and annually thereafter before June 30, train all of their employees and contractors who use or have the potential to use pesticides or fertilizers (whether or not they normally apply these as part of their work). Outside contractors can self-certify, providing they certify they have received all applicable training required in the Order and have documentation to that effect. Training programs shall address:

(a) The potential for pesticide-related surface water toxicity.

(b) Proper use, handling, and disposal of pesticides.

(c) Least toxic methods of pest prevention and control, including IPM.

(d) Reduction of pesticide use.

(3) The LACFCD shall require appropriate training of contractor employees in targeted positions as described above.

d. Illicit Connections and Illicit Discharge Elimination Program

i. General

(1) The LACFCD shall continue to implement an Illicit Connection and Illicit Discharge (IC/ID) Program to detect, investigate, and eliminate IC/IDs to its MS4. The IC/ID Program must be implemented in accordance with the requirements and performance measures specified in the following subsections.

(2) As stated in Part VI.A.2 of this Order, each Permittee must have adequate legal authority to prohibit IC/IDs to the MS4 and enable enforcement capabilities to eliminate the source of IC/IDs.

(3) The LACFCD's IC/ID Program shall consist of at least the following major program components:

(a) An up-to-date map of LACFCD's MS4

(b) Procedures for conducting source investigations for IC/IDs

(c) Procedures for eliminating the source of IC/IDs

(d) Procedures for public reporting of illicit discharges

(e) Spill response plan

(f) IC/IDs education and training for LACFCD staff

ii. MS4 Mapping

(1) The LACFCD shall maintain an up-to-date and accurate electronic map of its MS4. If possible, the map should be maintained within a GIS. The map must show the following, at a minimum:

(a) Within one year of Permit adoption, the location of outfalls owned and maintained by the LACFCD. Each outfall shall be given an alphanumeric identifier, which must be noted on the map. Each mapped outfall shall be located using a geographic positioning system (GPS). Photographs of the major outfalls shall be taken to provide baseline information to track operation and maintenance needs over time.

(b) The location and length of open channels and underground storm drain pipes with a diameter of 36 inches or greater that are owned and operated by the LACFCD.

(c) The location and name of all waterbodies receiving discharges from those MS4 major outfalls identified in (a).

(d) All LACFCD's dry weather diversions installed within the MS4 to direct flows from the MS4 to the sanitary sewer system, including the owner and operator of each diversion.

(e) By the end of the Permit term, map all known permitted and documented connections to its MS4 system.

(2) The MS4 map shall be updated as necessary.

iii. Illicit Discharge Source Investigation and Elimination

(1) The LACFCD shall develop written procedures for conducting investigations to prioritize and identify the source of all illicit discharges to its MS4, including procedures to eliminate the discharge once the source is located.

(2) At a minimum, the LACFCD shall initiate[23] an investigation(s) to identify and locate the source within one business day of becoming aware of the illicit discharge.

(3) When conducting investigations, the LACFCD shall comply with the following:

(a) Illicit discharges suspected of being sanitary sewage and/or significantly contaminated shall be investigated first.

(b) The LACFCD shall track all investigations to document, at a minimum, the date(s) the illicit discharge was observed; the results

[23] Permittees may comply with the Permit by taking initial steps (such as logging, prioritizing, and tasking) to "initiate" the investigation within one business day. However, the Regional Water Board would expect that the initial investigation, including a site visit, occur within two business days of becoming aware of the illicit discharge.

of the investigation; any follow-up of the investigation; and the date the investigation was closed.

(c) The LACFCD shall prioritize and investigate the source of all observed illicit discharges to its MS4.

(d) If the source of the illicit discharge is found to be a discharge authorized under an NPDES permit, the LACFCD shall document the source and report to the Regional Water Board within 30 days of determination. No further action is required.

(e) If the source of the illicit discharge has been determined to originate from within the jurisdiction of other Permittee(s) with land use authority over the suspected responsible party/parties, the LACFCD shall immediately alert the appropriate Permittee(s) of the problem for further action by the Permittee(s).

(4) When taking corrective action to eliminate illicit discharges, the LACFCD shall comply with the following:

(a) If the source of the illicit discharge has been determined or suspected by the LACFCD to originate within an upstream jurisdiction(s), the LACFCD shall immediately notify the upstream jurisdiction(s), and notify the Regional Water Board within 30 days of such determination and provide all the information collected and efforts taken.

(b) Once the Permittee with land use authority over the suspected responsible party/parties has been alerted, the LACFCD may continue to work in cooperation with the Permittee(s) to notify the responsible party/parties of the problem, and require the responsible party/parties to immediately initiate necessary corrective actions to eliminate the illicit discharge. Upon being notified that the discharge has been eliminated, the LACFCD may, in conjunction with the Permittee(s) conduct a follow-up investigation to verify that the discharge has been eliminated and cleaned up to the satisfaction of the LACFCD. The LACFCD shall document its follow-up investigation. The LACFCD may seek recovery and remediation costs from responsible parties or require compensation for the cost of all inspection and investigation activities. Resulting enforcement actions shall follow the program's Progressive Enforcement Policy.

(c) If the source of the illicit discharge cannot be traced to a suspected responsible party, the LACFCD, in conjunction with other affected Permittees, shall continue implementing the illicit discharge/spill response plan.

(5) In the event the LACFCD and/or other Permittees are unable to eliminate an ongoing illicit discharge following full execution of its legal authority and in accordance with its Progressive Enforcement Policy, including the inability to find the responsible party/parties, or other circumstances prevent the full elimination of an ongoing illicit discharge, the LACFCD and/or other Permittees shall notify the Regional Water Board within 30 days of such determination and provide available information to the Regional Water Board.

iv. Identification and Response to Illicit Connections

(1) Investigation

The LACFCD, upon discovery or upon receiving a report of a suspected illicit connection, shall initiate an investigation within 21 days, to determine the following: (1) source of the connection, (2) nature and volume of discharge through the connection, and (3) responsible party for the connection.

(2) Elimination

The LACFCD, upon confirmation of an illicit connection to its MS4, shall ensure that the connection is:

(a) Permitted or documented, provided the connection will only discharge storm water and non-storm water allowable under this Order or other individual or general NPDES Permits/WDRs, or

(b) Eliminated within 180 days of completion of the investigation, using its formal enforcement authority, if necessary, to eliminate the illicit connection.

(3) Documentation

Formal records must be maintained for all illicit connection investigations and the formal enforcement taken to eliminate illicit connections.

v. Public Reporting of Non-Stormwater Discharges and Spills

(1) The LACFCD shall, in collaboration with the County, continue to maintain the 888-CLEAN-LA hotline and corresponding internet site at www.888cleanla.org to promote, publicize, and facilitate public reporting of illicit discharges or water quality impacts associated with discharges into or from MS4s.

(2) The LACFCD shall include information regarding public reporting of illicit discharges or improper disposal on the signage adjacent to open channels as required in Part VI.D.9.h.vi.(4).

(3) The LACFCD shall develop and maintain written procedures that document how complaint calls and internet submissions are received, documented, and tracked to ensure that all complaints are adequately addressed. The procedures shall be evaluated annually to determine whether changes or updates are needed to ensure that the procedures accurately document the methods employed by the LACFCD. Any identified changes shall be made to the procedures subsequent to the annual evaluation.

(4) The LACFCD shall maintain documentation of the complaint calls and internet submissions and record the location of the reported spill or IC/ ID and the actions undertaken, including referrals to other agencies, in response to all IC/ID complaints.

vi. Illicit Discharge and Spill Response Plan

(1) The LACFCD shall implement an ID and spill response plan for all spills that may discharge into its system. The ID and spill response plan shall clearly identify agencies responsible for ID and spill response and cleanup, contact information, and shall contain at a minimum the following requirements:

(a) Coordination with spill response teams throughout all appropriate departments, programs and agencies so that maximum water quality protection is provided.

(b) Initiation of investigation of all public and employee ID and spill complaints within one business day of receiving the complaint to assess validity.

(c) Response to ID and spills within 4 hours of becoming aware of the ID or spill, except where such IDs or spills occur on private property, in which case the response should be within 2 hours of gaining legal access to the property.

(d) IDs or spills that may endanger health or the environment shall be reported to appropriate public health agencies and the Office of Emergency Services (OES).

vii. Illicit Connection and Illicit Discharge Education and Training

(1) The LACFCD must continue to implement a training program regarding the identification of IC/IDs for all LACFCD field staff, who, as part of their normal job responsibilities (e.g., storm drain inspection and maintenance), may come into contact with or otherwise observe an illicit discharge or illicit connection to its MS4. Contact information, including the procedure for reporting an illicit discharge, must be included in the LACFCD's fleet vehicles that are used by field staff. Training program documents must be available for review by the Regional Water Board.

(2) The LACFCD's training program should address, at a minimum, the following:

(a) IC/ID identification, including definitions and examples,

(b) investigation,

(c) elimination,

(d) cleanup,

(e) reporting, and

(f) documentation.

(3) The LACFCD must create a list of applicable positions which require IC/ID training and ensure that training is provided at least twice during the term of this Order. The LACFCD must maintain documentation of the training activities.

(4) New LACFCD staff members must be provided with IC/ID training within 180 days of starting employment.

(5) The LACFCD shall require its contractors to train their employees in targeted positions as described above.

5. Public Information and Participation Program

a. General

i. Each Permittee shall implement a Public Information and Participation Program (PIPP) that includes the requirements listed in this Part VI.D.5. Each Permittee shall be responsible for developing and implementing the PIPP and implementing specific PIPP requirements. The objectives of the PIPP are as follows:

(1) To measurably increase the knowledge of the target audiences about the MS4, the adverse impacts of storm water pollution on receiving waters and potential solutions to mitigate the impacts.

(2) To measurably change the waste disposal and storm water pollution generation behavior of target audiences by developing and encouraging the implementation of appropriate alternatives.

(3) To involve and engage a diversity of socio-economic groups and ethnic communities in Los Angeles County to participate in mitigating the impacts of storm water pollution.

b. PIPP Implementation

i. Each Permittee shall implement the PIPP requirements listed in this Part VI.D.4 using one or more of the following approaches:

(1) By participating in a County-wide PIPP,

(2) By participating in one or more Watershed Group sponsored PIPPs, and/or

(3) Or individually within its jurisdiction.

ii. If a Permittee participates in a County-wide or Watershed Group PIPP, the Permittee shall provide the contact information for their appropriate staff responsible for storm water public education activities to the designated PIPP coordinator and contact information changes no later than 30 days after a change occurs.

c. Public Participation

i. Each Permittee, whether participating in a County-wide or Watershed Group sponsored PIPP, or acting individually, shall provide a means for public reporting of clogged catch basin inlets and illicit discharges/dumping, faded or missing catch basin labels, and general storm water and non-storm water pollution prevention information.

(1) Permittees may elect to use the 888-CLEAN-LA hotline as the general public reporting contact or each Permittee or Watershed Group may establish its own hotline, if preferred.

(2) Each Permittee shall include the reporting information, updated when necessary, in public information, and the government pages of the telephone book, as they are developed or published.

(3) Each Permittee shall identify staff or departments who will serve as the contact person(s) and shall make this information available on its website.

(4) Each Permittee is responsible for providing current, updated hotline contact information to the general public within its jurisdiction.

ii. Organize events targeted to residents and population subgroups to educate and involve the community in storm water and non-storm water pollution prevention and clean-up (e.g., education seminars, clean-ups, and community catch basin stenciling).

d. Residential Outreach Program

i. Working in conjunction with a County-wide or Watershed Group sponsored PIPP or individually, each Permittee shall implement the following activities:

(1) Conduct storm water pollution prevention public service announcements and advertising campaigns

(2) Public education materials shall include but are not limited to information on the proper handling (i.e., disposal, storage and/or use) of:

(a) Vehicle waste fluids

(b) Household waste materials (i.e., trash and household hazardous waste, including personal care products and pharmaceuticals)

(c) Construction waste materials

(d) Pesticides and fertilizers (including integrated pest management practices [IPM] to promote reduced use of pesticides)

(e) Green waste (including lawn clippings and leaves)

(f) Animal wastes

(3) Distribute activity specific storm water pollution prevention public education materials at, but not limited to, the following points of purchase:

(a) Automotive parts stores

(b) Home improvement centers / lumber yards / hardware stores/paint stores

(c) Landscaping / gardening centers

(d) Pet shops / feed stores

(4) Maintain storm water websites or provide links to storm water websites via the Permittee's website, which shall include educational material and opportunities for the public to participate in storm water pollution prevention and clean-up activities listed in Part VI.D.4.

(5) Provide independent, parochial, and public schools within in each Permittee's jurisdiction with materials to educate school children (K-12) on storm water pollution. Material may include videos, live presentations, and other information. Permittees are encouraged to work with, or leverage, materials produced by other statewide agencies and associations such as the State Water Board's "Erase the Waste" educational program and the California Environmental Education Interagency Network (CEEIN) to implement this requirement.

(6) When implementing activities in subsections (1)-(5), Permittees shall use effective strategies to educate and involve ethnic communities in storm water pollution prevention through culturally effective methods.

6. Industrial/Commercial Facilities Program

a. General

i. Each Permittee shall implement an Industrial / Commercial Facilities Program that meets the requirements of this Part VI.D.6. The Industrial / Commercial

Facilities Program shall be designed to prevent illicit discharges into the MS4 and receiving waters, reduce industrial / commercial discharges of storm water to the maximum extent practicable, and prevent industrial / commercial discharges from the MS4 from causing or contributing to a violation of receiving water limitations. At a minimum, the Industrial / Commercial Facilities Program shall be implemented in accordance with the requirements listed in this Part VI.D.6, or as approved in a Watershed Management Program per Part VI.C. Minimum program components shall include the following components:

(1) Track

(2) Educate

(3) Inspect

(4) Ensure compliance with municipal ordinances at industrial and commercial facilities that are critical sources of pollutants in storm water

b. Track Critical Industrial / Commercial Sources

i. Each Permittee shall maintain an updated watershed-based inventory or database containing the latitude / longitude coordinates of all industrial and commercial facilities within its jurisdiction that are critical sources of storm water pollution. The inventory or database shall be maintained in electronic format and incorporation of facility information into a Geographical Information System (GIS) is recommended. Critical Sources to be tracked are summarized below:

(1) Commercial Facilities

(a) Restaurants

(b) Automotive service facilities (including those located at automotive dealerships)

(c) Retail Gasoline Outlets

(d) Nurseries and Nursery Centers (Merchant Wholesalers, Nondurable Goods, and Retail Trade)

(2) USEPA “Phase I” Facilities [as specified in 40 CFR §122.26(b)(14)(i)-(xi)]

(3) Other federally-mandated facilities [as specified in 40 CFR §122.26(d)(2)(iv)(C)]

(a) Municipal landfills

(b) Hazardous waste treatment, disposal, and recovery facilities

(c) Industrial facilities subject to section 313 “Toxic Release Inventory” reporting requirements of the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) [42 U.S.C. § 11023]

(4) All other commercial or industrial facilities that the Permittee determines may contribute a substantial pollutant load to the MS4.

ii. Each Permittee shall include the following minimum fields of information for each critical source industrial and commercial facility identified in its watershed-based inventory or database:

(1) Name of facility

(2) Name of owner/ operator and contact information

(3) Address of facility (physical and mailing)

(4) North American Industry Classification System (NAICS) code

(5) Standard Industrial Classification (SIC) code

(6) A narrative description of the activities performed and/or principal products produced

(7) Status of exposure of materials to storm water

(8) Name of receiving water

(9) Identification of whether the facility is tributary to a CWA § 303(d) listed water body segment or water body segment subject to a TMDL, where the facility generates pollutants for which the water body segment is impaired.

(10) Ability to denote if the facility is known to maintain coverage under the State Water Board's General NPDES Permit for the Discharge of Stormwater Associated with Industrial Activities (Industrial General Permit) or other individual or general NPDES permits or any applicable waiver issued by the Regional or State Water Board pertaining to storm water discharges.

(11) Ability to denote if the facility has filed a No Exposure Certification with the State Water Board.

iii. Each Permittee shall update its inventory of critical sources at least annually. The update shall be accomplished through collection of new information obtained through field activities or through other readily available inter- and intra-agency informational databases (e.g., business licenses, pretreatment permits, sanitary sewer connection permits, and similar information).

c. Educate Industrial / Commercial Sources

i. At least once during the five-year period of this Order, each Permittee shall notify the owner/operator of each of its inventoried commercial and industrial sites identified in Part VI.D.6.b of the BMP requirements applicable to the site/source.

ii. Business Assistance Program

(1) Each Permittee shall implement a Business Assistance Program to provide technical information to businesses to facilitate their efforts to reduce the discharge of pollutants in storm water. Assistance shall be targeted to select business sectors or small businesses upon a determination that their activities may be contributing substantial pollutant

loads to the MS4 or receiving water. Assistance may include technical guidance and provision of educational materials. The Program may include:

(a) On-site technical assistance, telephone, or e-mail consultation regarding the responsibilities of business to reduce the discharge of pollutants, procedural requirements, and available guidance documents.

(b) Distribution of storm water pollution prevention educational materials to operators of auto repair shops; car wash facilities; restaurants and mobile sources including automobile/equipment repair, washing, or detailing; power washing services; mobile carpet, drape, or upholstery cleaning services; swimming pool, water softener, and spa services; portable sanitary services; and commercial applicators and distributors of pesticides, herbicides and fertilizers, if present.

d. Inspect Critical Commercial Sources

i. Frequency of Mandatory Commercial Facility Inspections

Each Permittee shall inspect all commercial facilities identified in Part VI.D.6.b twice during the 5-year term of the Order, provided that the first mandatory compliance inspection occurs no later than 2 years after the effective date of this Order. A minimum interval of 6 months between the first and the second mandatory compliance inspection is required. In addition, each Permittee shall implement the activities outlined in the following subparts.

ii. Scope of Mandatory Commercial Facility Inspections

Each Permittee shall inspect all commercial facilities to confirm that storm water and non-storm water BMPs are being effectively implemented in compliance with municipal ordinances. At each facility, inspectors shall verify that the operator is implementing effective source control BMPs for each corresponding activity. Each Permittee shall require implementation of additional BMPs where storm water from the MS4 discharges to a significant ecological area (SEA), a water body subject to TMDL provisions in Part VI.E, or a CWA § 303(d) listed impaired water body. Likewise, for those BMPs that are not adequately protective of water quality standards, a Permittee may require additional site-specific controls.

e. Inspect Critical Industrial Sources

Each Permittee shall conduct industrial facility compliance inspections as specified below.

i. Frequency of Mandatory Industrial Facility Compliance Inspections

(1) Minimum Inspection Frequency

Each Permittee shall perform an initial mandatory compliance inspection at all industrial facilities identified in Part VI.D.6.b no later than 2 years after the effective date of this Order. After the initial inspection, all

facilities that have not filed a No Exposure Certification with the State Water Board are subject to a second mandatory compliance inspection. A minimum interval of 6 months between the first and the second mandatory compliance inspection is required. A facility need not be inspected more than twice during the term of the Order unless subject to an enforcement action as specified in Part VI.D.6.h below.

(2) Exclusion of Facilities Previously Inspected by the Regional Water Board

Each Permittee shall review the State Water Board's Storm Water Multiple Application and Report Tracking System (SMARTS) database[24] at defined intervals to determine if an industrial facility has recently been inspected by the Regional Water Board. The first interval shall occur approximately 2 years after the effective date of the Order. The Permittee does not need to inspect the facility if it is determined that the Regional Water Board conducted an inspection of the facility within the prior 24 month period. The second interval shall occur approximately 4 years after the effective date of the Order. Likewise, the Permittee does not need to inspect the facility if it is determined that the Regional Water Board conducted an inspection of the facility within the prior 24 month period.

(3) No Exposure Verification

As a component of the first mandatory inspection, each Permittee shall identify those facilities that have filed a No Exposure Certification with the State Water Board. Approximately 3 to 4 years after the effective date of the Order, each Permittee shall evaluate its inventory of industrial facilities and perform a second mandatory compliance inspection at a minimum of 25% of the facilities identified to have filed a No Exposure Certification. The purpose of this inspection is to verify the continuity of the no exposure status.

(4) Exclusion Based on Watershed Management Program

A Permittee is exempt from the mandatory inspection frequencies listed above if it is implementing industrial inspections in accordance with an approved Watershed Management Program per Part VI.C.

ii. Scope of Mandatory Industrial Facility Inspections

Each Permittee shall confirm that each industrial facility:

(1) Has a current Waste Discharge Identification (WDID) number for coverage under the Industrial General Permit, and that a Storm Water Pollution Prevention Plan (SWPPP) is available on-site; *or*

(2) Has applied for, and has received a current No Exposure Certification for facilities subject to this requirement;

(3) Is effectively implementing BMPs in compliance with municipal ordinances. Facilities must implement the source control BMPs identified

[24] SMARTS is accessible at https://smarts.waterboards.ca.gov/smarts/faces/SwSmartsLogin.jsp

in Table 10, unless the pollutant generating activity does not occur. The Permittees shall require implementation of additional BMPs where storm water from the MS4 discharges to a water body subject to TMDL Provisions in Part VI.E, or a CWA § 303(d) listed impaired water body. Likewise, if the specified BMPs are not adequately protective of water quality standards, a Permittee may require additional site-specific controls. For critical sources that discharge to MS4s that discharge to SEAs, each Permittee shall require operators to implement additional pollutant-specific controls to reduce pollutants in storm water runoff that are causing or contributing to exceedances of water quality standards.

(4) Applicable industrial facilities identified as not having either a current WDID or No Exposure Certification shall be notified that they must obtain coverage under the Industrial General Permit and shall be referred to the Regional Water Board per the Progressive Enforcement Policy procedures identified in Part VI.D.2.

f. Source Control BMPs for Commercial and Industrial Facilities

Effective source control BMPs for the activities listed in Table 10 shall be implemented at commercial and industrial facilities, unless the pollutant generating activity does not occur:

Table 10. Source Control BMPs at Commercial and Industrial Facilities

Pollutant-Generating Activity	BMP Narrative Description
Unauthorized Non-Storm water Discharges	Effective elimination of non-storm water discharges
Accidental Spills/ Leaks	Implementation of effective spills/ leaks prevention and response procedures
Vehicle/ Equipment Fueling	Implementation of effective fueling source control devices and practices
Vehicle/ Equipment Cleaning	Implementation of effective equipment/ vehicle cleaning practices and appropriate wash water management practices
Vehicle/ Equipment Repair	Implementation of effective vehicle/ equipment repair practices and source control devices
Outdoor Liquid Storage	Implementation of effective outdoor liquid storage source controls and practices
Outdoor Equipment Operations	Implementation of effective outdoor equipment source control devices and practices
Outdoor Storage of Raw Materials	Implementation of effective source control practices and structural devices
Storage and Handling of Solid Waste	Implementation of effective solid waste storage/ handling practices and appropriate control measures
Building and Grounds Maintenance	Implementation of effective facility maintenance practices

Pollutant-Generating Activity	BMP Narrative Description
Parking/ Storage Area Maintenance	Implementation of effective parking/ storage area designs and housekeeping/ maintenance practices
Storm water Conveyance System Maintenance Practices	Implementation of proper conveyance system operation and maintenance protocols
Pollutant-Generating Activity	**BMP Narrative Description from Regional Water Board Resolution No. 98-08**
Sidewalk Washing	**1.** Remove trash, debris, and free standing oil/grease spills/leaks (use absorbent material, if necessary) from the area before washing; and **2.** Use high pressure, low volume spray washing using only potable water with no cleaning agents at an average usage of 0.006 gallons per square feet of sidewalk area.
Street Washing	Collect and divert wash water to the sanitary sewer – publically owned treatment works (POTW). Note: POTW approval may be needed.

g. Significant Ecological Areas (SEAs)

See VI.D.6.e.ii.3.

h. Progressive Enforcement

Each Permittee shall implement its Progressive Enforcement Policy to ensure that Industrial / Commercial facilities are brought into compliance with all storm water requirements within a reasonable time period. See Part VI.D.2 for requirements for the development and implementation of a Progressive Enforcement Policy.

7. Planning and Land Development Program

a. Purpose

i. Each Permittee shall implement a Planning and Land Development Program pursuant to Part VI.D.7.b for all New Development and Redevelopment projects subject to this Order to:

(1) Lessen the water quality impacts of development by using smart growth practices such as compact development, directing development towards existing communities via infill or redevelopment, and safeguarding of environmentally sensitive areas.

(2) Minimize the adverse impacts from storm water runoff on the biological integrity of Natural Drainage Systems and the beneficial uses of water

bodies in accordance with requirements under CEQA (Cal. Pub. Resources Code § 21000 et seq.).

(3) Minimize the percentage of impervious surfaces on land developments by minimizing soil compaction during construction, designing projects to minimize the impervious area footprint, and employing Low Impact Development (LID) design principles to mimic predevelopment hydrology through infiltration, evapotranspiration and rainfall harvest and use.

(4) Maintain existing riparian buffers and enhance riparian buffers when possible.

(5) Minimize pollutant loadings from impervious surfaces such as roof tops, parking lots, and roadways through the use of properly designed, technically appropriate BMPs (including Source Control BMPs such as good housekeeping practices), LID Strategies, and Treatment Control BMPs.

(6) Properly select, design and maintain LID and Hydromodification Control BMPs to address pollutants that are likely to be generated, reduce changes to pre-development hydrology, assure long-term function, and avoid the breeding of vectors[25].

(7) Prioritize the selection of BMPs to remove storm water pollutants, reduce storm water runoff volume, and beneficially use storm water to support an integrated approach to protecting water quality and managing water resources in the following order of preference:

(a) On-site infiltration, bioretention and/or rainfall harvest and use.

(b) On-site biofiltration, off-site ground water replenishment, and/or off-site retrofit.

b. Applicability

i. New Development Projects

(1) Development projects subject to Permittee conditioning and approval for the design and implementation of post-construction controls to mitigate storm water pollution, prior to completion of the project(s), are:

(a) All development projects equal to 1 acre or greater of disturbed area and adding more than 10,000 square feet of impervious surface area

(b) Industrial parks 10,000 square feet or more of surface area

(c) Commercial malls 10,000 square feet or more surface area

(d) Retail gasoline outlets 5,000 square feet or more of surface area

(e) Restaurants (SIC 5812) 5,000 square feet or more of surface area

[25] Treatment BMPs when designed to drain within 96 hours of the end of rainfall minimize the potential for the breeding of vectors. See California Department of Public Health *Best Management Practices for Mosquito Control in California* (2012) at http://www.westnile.ca.gov/resources.php

(f) Parking lots 5,000 square feet or more of impervious surface area, or with 25 or more parking spaces

(g) Street and road construction of 10,000 square feet or more of impervious surface area shall follow USEPA guidance regarding Managing Wet Weather with Green Infrastructure: Green Streets[26] (December 2008 EPA-833-F-08-009) to the maximum extent practicable. Street and road construction applies to standalone streets, roads, highways, and freeway projects, and also applies to streets within larger projects.

(h) Automotive service facilities (SIC 5013, 5014, 5511, 5541, 7532-7534 and 7536-7539) 5,000 square feet or more of surface area

(i) Redevelopment projects in subject categories that meet Redevelopment thresholds identified in Part VI.D.6.b.ii (Redevelopment Projects) below

(j) Projects located in or directly adjacent to, or discharging directly to a Significant Ecological Area (SEA), where the development will:

(i) Discharge storm water runoff that is likely to impact a sensitive biological species or habitat; and

(ii) Create 2,500 square feet or more of impervious surface area

(k) Single-family hillside homes. To the extent that a Permittee may lawfully impose conditions, mitigation measures or other requirements on the development or construction of a single-family home in a hillside area as defined in the applicable Permittee's Code and Ordinances, each Permittee shall require that during the construction of a single-family hillside home, the following measures are implemented:

(i) Conserve natural areas

(ii) Protect slopes and channels

(iii) Provide storm drain system stenciling and signage

(iv) Divert roof runoff to vegetated areas before discharge unless the diversion would result in slope instability

(v) Direct surface flow to vegetated areas before discharge unless the diversion would result in slope instability.

ii. Redevelopment Projects

(1) Redevelopment projects subject to Permittee conditioning and approval for the design and implementation of post-construction controls to mitigate storm water pollution, prior to completion of the project(s), are:

(a) Land-disturbing activity that results in the creation or addition or replacement of 5,000 square feet or more of impervious surface area

[26] http://water.epa.gov/infrastructure/greeninfrastructure/index.cfm

on an already developed site on development categories identified in Part VI.D.6.c. (New Development/Redevelopment Performance Criteria).

(b) Where Redevelopment results in an alteration to more than fifty percent of impervious surfaces of a previously existing development, and the existing development was not subject to post-construction storm water quality control requirements, the entire project must be mitigated.

(c) Where Redevelopment results in an alteration of less than fifty percent of impervious surfaces of a previously existing development, and the existing development was not subject to post-construction storm water quality control requirements, only the alteration must be mitigated, and not the entire development.

(i) Redevelopment does not include routine maintenance activities that are conducted to maintain original line and grade, hydraulic capacity, original purpose of facility or emergency redevelopment activity required to protect public health and safety. Impervious surface replacement, such as the reconstruction of parking lots and roadways which does not disturb additional area and maintains the original grade and alignment, is considered a routine maintenance activity. Redevelopment does not include the repaving of existing roads to maintain original line and grade.

(ii) Existing single-family dwelling and accessory structures are exempt from the Redevelopment requirements unless such projects create, add, or replace 10,000 square feet of impervious surface area.

(d) In this section, Existing Development or Redevelopment projects shall mean all discretionary permit projects or project phases that have not been deemed complete for processing, or discretionary permit projects without vesting tentative maps that have not requested and received an extension of previously granted approvals within 90 days of adoption of the Order. Projects that have been deemed complete within 90 days of adoption of the Order are not subject to the requirements Section 7.c. For Permittee's projects the effective date shall be the date the governing body or their designee approves initiation of the project design.

(e) Specifically, the Newhall Ranch Project Phases I and II (a.k.a. the Landmark and Mission Village projects) are deemed to be an existing development that will at a minimum, be designed to comply with the Specific LID Performance Standards attached to the Waste Discharge Requirements (Order No. R4-2012-0139). All subsequent phases of the Newhall Ranch Project constructed during the term of this Order shall be subject to the requirements of this Order.

c. New Development/ Redevelopment Project Performance Criteria

i. Integrated Water Quality/Flow Reduction/Resources Management Criteria

(1) Each Permittee shall require all New Development and Redevelopment projects (referred to hereinafter as "new projects") identified in Part VI.D.7.b to control pollutants, pollutant loads, and runoff volume emanating from the project site by: (1) minimizing the impervious surface area and (2) controlling runoff from impervious surfaces through infiltration, bioretention and/or rainfall harvest and use.

(2) Except as provided in Part VI.D.7.c.ii. (Technical Infeasibility or Opportunity for Regional Ground Water Replenishment), Part VI.D.7.d.i (Local Ordinance Equivalence), or Part VI.D.7.c.v (Hydromodification), below, each Permittee shall require the project to retain on-site the Stormwater Quality Design Volume (SWQDv) defined as the runoff from:

(a) The 0.75-inch, 24-hour rain event or

(b) The 85th percentile, 24-hour rain event, as determined from the Los Angeles County 85th percentile precipitation isohyetal map, *whichever is greater*.

(3) Bioretention and biofiltration systems shall meet the design specifications provided in Attachment H to this Order unless otherwise approved by the Regional Water Board Executive Officer.

(4) When evaluating the potential for on-site retention, each Permittee shall consider the maximum potential for evapotranspiration from green roofs and rainfall harvest and use.

ii. Alternative Compliance for Technical Infeasibility or Opportunity for Regional Ground Water Replenishment

(1) In instances of technical infeasibility or where a project has been determined to provide an opportunity to replenish regional ground water supplies at an offsite location, each Permittee may allow projects to comply with this Order through the alternative compliance measures as described in Part VI.D.7.c.iii.

(2) To demonstrate technical infeasibility, the project applicant must demonstrate that the project cannot reliably retain 100 percent of the SWQDv on-site, even with the maximum application of green roofs and rainwater harvest and use, and that compliance with the applicable post-construction requirements would be technically infeasible by submitting a site-specific hydrologic and/or design analysis conducted and endorsed by a registered professional engineer, geologist, architect, and/or landscape architect. Technical infeasibility may result from conditions including the following:

(a) The infiltration rate of saturated in-situ soils is less than 0.3 inch per hour and it is not technically feasible to amend the in-situ soils to attain an infiltration rate necessary to achieve reliable performance of infiltration or bioretention BMPs in retaining the SWQDv on-site.

(b) Locations where seasonal high ground water is within 5 to 10 feet of the surface,

(c) Locations within 100 feet of a ground water well used for drinking water,

(d) Brownfield development sites where infiltration poses a risk of causing pollutant mobilization,

(e) Other locations where pollutant mobilization is a documented concern[27],

(f) Locations with potential geotechnical hazards, or

(g) Smart growth and infill or redevelopment locations where the density and/ or nature of the project would create significant difficulty for compliance with the on-site volume retention requirement.

(3) To utilize alternative compliance measures to replenish ground water at an offsite location, the project applicant shall demonstrate *(i)* why it is not advantageous to replenish ground water at the project site, *(ii)* that ground water can be used for beneficial purposes at the offsite location, and *(iii)* that the alternative measures shall also provide equal or greater water quality benefits to the receiving surface water than the Water Quality/Flow Reduction/Resource Management Criteria in Part VI.7.D.c.i.

iii. Alternative Compliance Measures

When a Permittee determines a project applicant has demonstrated that it is technically infeasible to retain 100 percent of the SWQDv on-site, or is proposing an alternative offsite project to replenish regional ground water supplies, the Permittee shall require one of the following mitigation options:

(1) On-site Biofiltration

(a) If using biofiltration due to demonstrated technical infeasibility, then the new project must biofiltrate 1.5 times the portion of the SWQDv that is not reliably retained on-site, as calculated by Equation 1 below.

Equation 1:

$$Bv = 1.5 * [SWQDv - Rv]$$

[27] Pollutant mobilization is considered a documented concern at or near properties that are contaminated or store hazardous substances underground.

Where:

Bv = biofiltration volume

SWQDv = the storm water runoff from a 0.75 inch, 24-hour storm or the 85th percentile storm, *whichever is greater*.

Rv = volume reliably retained on-site

(b) Conditions for On-site Biofiltration

(i) Biofiltration systems shall meet the design specifications provided in Attachment H to this Order unless otherwise approved by the Regional Water Board Executive Officer.

(ii) Biofiltration systems discharging to a receiving water that is included on the Clean Water Act section 303(d) list of impaired water quality-limited water bodies due to nitrogen compounds or related effects shall be designed and maintained to achieve enhanced nitrogen removal capability. See Attachment H for design criteria for underdrain placement to achieve enhanced nitrogen removal.

(2) Offsite Infiltration

(a) Use infiltration or bioretention BMPs to intercept a volume of storm water runoff equal to the SWQDv, less the volume of storm water runoff reliably retained on-site, at an approved offsite project, and

(b) Provide pollutant reduction (treatment) of the storm water runoff discharged from the project site in accordance with the Water Quality Mitigation Criteria provided in Part VI.D.7.c.iv.

(c) The required offsite mitigation volume shall be calculated by Equation 2 below and equal to:

Equation 2:

$$Mv = 1.0 * [SWQDv - Rv]$$

Where:

Mv = mitigation volume

SWQDv = runoff from the 0.75 inch, 24-hour storm event or the 85th percentile storm, *whichever is greater*

Rv = the volume of storm water runoff reliably retained on-site.

(3) Ground Water Replenishment Projects

Permittees may propose, in their Watershed Management Program or EWMP, regional projects to replenish regional ground water supplies at offsite locations, provided the groundwater supply has a designated beneficial use in the Basin Plan.

(a) Regional groundwater replenishment projects must use infiltration, ground water replenishment, or bioretention BMPs to intercept a volume of storm water runoff equal to the SWQDv for new development and redevelopment projects, subject to Permittee conditioning and approval for the design and implementation of post-construction controls, within the approved project area, and

(b) Provide pollutant reduction (treatment) of the storm water runoff discharged from development projects, within the project area, subject to Permittee conditioning and approval for the design and implementation of post-construction controls to mitigate storm water pollution in accordance with the Water Quality Mitigation Criteria provided in Part VI.D.7.c.iv.

(c) Permittees implementing a regional ground water replenishment project in lieu of onsite controls shall ensure the volume of runoff captured by the project shall be equal to:

Equation 2:

$$Mv = 1.0 * [SWQDv - Rv]$$

Where:

Mv = mitigation volume

SWQDv = runoff from the 0.75 inch, 24-hour storm event or the 85th percentile storm, whichever is greater

Rv = the volume of storm water runoff reliably retained on-site.

(d) Regional groundwater replenishment projects shall be located in the same sub-watershed (defined as draining to the same HUC-12 hydrologic area in the Basin Plan) as the new development or redevelopment projects which did not implement on site retention BMPs . Each Permittee may consider locations outside of the HUC-12 but within the HUC-10 subwatershed area if there are no opportunities within the HUC-12 subwatershed or if greater pollutant reductions and/or ground water replenishment can be achieved at a location within the expanded HUC-10 subwatershed. The use of a mitigation, ground water replenishment, or retrofit project outside of the HUC-12 subwatershed is subject to the approval of the Executive Officer of the Regional Water Board.

(4) Offsite Project - Retrofit Existing Development

Use infiltration, bioretention, rainfall harvest and use and/or biofiltration BMPs to retrofit an existing development, with similar land uses as the new development or land uses associated with comparable or higher storm water runoff event mean concentrations (EMCs) than the new development. Comparison of EMCs for different land uses shall be based on published data from studies performed in southern California. The retrofit plan shall be designed and constructed to:

(a) Intercept a volume of storm water runoff equal to the mitigation volume (Mv) as described above in Equation 2, except biofiltration BMPs shall be designed to meet the biofiltration volume as described in Equation 1 and

(b) Provide pollutant reduction (treatment) of the storm water runoff from the project site as described in the Water Quality Mitigation Criteria provided in Part VI.D.7.c.iv.

(5) Conditions for Offsite Projects

(a) Project applicants seeking to utilize these alternative compliance provisions may propose other offsite projects, which the Permittees may approve if they meet the requirements of this subpart.

(b) Location of offsite projects. Offsite projects shall be located in the same sub-watershed (defined as draining to the same HUC-12 hydrologic area in the Basin Plan) as the new development or redevelopment project. Each Permittee may consider locations outside of the HUC-12 but within the HUC-10 subwatershed area if there are no opportunities within the HUC-12 subwatershed or if greater pollutant reductions and/or ground water replenishment can be achieved at a location within the expanded HUC-10 subwatershed. The use of a mitigation, ground water replenishment, or retrofit project outside of the HUC-12 subwatershed is subject to the approval of the Executive Officer of the Regional Water Board.

(c) Project applicant must demonstrate that equal benefits to ground water recharge cannot be met on the project site.

(d) Each Permittee shall develop a prioritized list of offsite mitigation, ground water replenishment and/or retrofit projects, and when feasible, the mitigation must be directed to the highest priority project within the same HUC-12 or if approved by the Regional Water Board Executive Officer, the HUC-10 drainage area, as the new development project.

(e) Infiltration/bioretention shall be the preferred LID BMP for offsite mitigation or ground water replenishment projects. Offsite retrofit projects may include green streets, parking lot retrofits, green roofs, and rainfall harvest and use. Biofiltration BMPs may be considered for retrofit projects when infiltration, bioretention or rainfall harvest and use is technically infeasible.

(f) Each Permittee shall develop a schedule for the completion of offsite projects, including milestone dates to identify, fund, design, and construct the projects. Offsite projects shall be completed as soon as possible, and at the latest, within 4 years of the certificate of occupancy for the first project that contributed funds toward the construction of the offsite project, unless a longer period is otherwise authorized by the Executive Officer of the Regional Water Board. For public offsite projects, each Permittee must provide in their annual reports a summary of total offsite project funds raised to date and a description (including location, general design concept, volume of water expected to be retained, and total estimated budget) of all pending public offsite projects. Funding sufficient to address the offsite volume must be transferred to the Permittee (for public offsite mitigation projects) or to an escrow account (for private offsite mitigation projects) within one year of the initiation of construction.

(g) Offsite projects must be approved by the Permittee and may be subject to approval by the Regional Water Board Executive Officer, if a third-party petitions the Executive Officer to review the project. Offsite projects will be publicly noticed on the Regional Water Board's website for 30 days prior to approval.

(h) The project applicant must perform the offsite projects as approved by either the Permittee or the Regional Water Board Executive Officer or provide sufficient funding for public or private offsite projects to achieve the equivalent mitigation storm water volume.

(6) Regional Storm Water Mitigation Program

A Permittee or Permittee group may apply to the Regional Water Board for approval of a regional or sub-regional storm water mitigation program to substitute in part or wholly for New and Redevelopment requirements for the area covered by the regional or sub-regional storm water mitigation program. Upon review and a determination by the Regional Water Board Executive Officer that the proposal is technically valid and appropriate, the Regional Water Board may consider for approval such a program if its implementation meets all of the following requirements:

(a) Retains the runoff from the 85th percentile, 24-hour rain event or the 0.75 inch, 24-hour rain event, whichever is greater;
(b) Results in improved storm water quality;
(c) Protects stream habitat;
(d) Promotes cooperative problem solving by diverse interests;
(e) Is fiscally sustainable and has secure funding; and
(f) Is completed in five years including the construction and start-up of treatment facilities.

(g) Nothing in this provision shall be construed as to delay the implementation of requirements for new and redevelopment, as approved in this Order.

(7) Water Quality Mitigation Criteria

(a) Each Permittee shall require all New Development and Redevelopment projects that have been approved for offsite mitigation or ground water replenishment projects as defined in Part VI.D.7.c.ii-iii to also provide treatment of storm water runoff from the project site. Each Permittee shall require these projects to design and implement post-construction storm water BMPs and control measures to reduce pollutant loading as necessary to:

(i) Meet the pollutant specific benchmarks listed in Table 11 at the treatment systems outlet or prior to the discharge to the MS4, and

(ii) Ensure that the discharge does not cause or contribute to an exceedance of water quality standards at the Permittee's downstream MS4 outfall.

(b) Each Permittee may allow the project proponent to install flow-through modular treatment systems including sand filters, or other proprietary BMP treatment systems with a demonstrated efficiency at least equivalent to a sand filter. The sizing of the flow through treatment device shall be based on a rainfall intensity of:

(i) 0.2 inches per hour, or

(ii) The one year, one-hour rainfall intensity as determined from the most recent Los Angeles County isohyetal map, *whichever is greater*.

Table 11. Benchmarks Applicable to New Development Treatment BMPs[28]

Conventional Pollutants

Pollutant	Suspended Solids mg/L	Total P mg/L	Total N mg/L	TKN mg/L
Effluent Concentration	14	0.13	1.28	1.09

[28] The treatment control BMP performance benchmarks were developed from the median effluent water quality values of the six highest performing BMPs, per pollutant, in the storm water BMP database (http://www.bmpdatabase.org/, last visited September 25, 2012).

Metals

Pollutant	Total Cd µg/L	Total Cu µg/L	Total Cr µg/L	Total Pb µg/L	Total Zn µg/L
Effluent Concentration	0.3	6	2.8	2.5	23

(c) In addition to the requirements for controlling pollutant discharges as described in Part VI.D.7.c.iii. and the treatment benchmarks described above, each Permittee shall ensure that the new development or redevelopment will not cause or contribute to an exceedance of applicable water quality-based effluent limitations established in Part VI.E pursuant to Total Maximum Daily Loads (TMDLs).

iv. Hydromodification (Flow/ Volume/ Duration) Control Criteria

Each Permittee shall require all New Development and Redevelopment projects located within natural drainage systems as described in Part VI.D.7.c.iv.(1)(a)(iii) to implement hydrologic control measures, to prevent accelerated downstream erosion and to protect stream habitat in natural drainage systems. The purpose of the hydrologic controls is to minimize changes in post-development hydrologic storm water runoff discharge rates, velocities, and duration. This shall be achieved by maintaining the project's pre-project storm water runoff flow rates and durations.

(1) Description

(a) Hydromodification control in natural drainage systems shall be achieved by maintaining the Erosion Potential (Ep) in streams at a value of 1, unless an alternative value can be shown to be protective of the natural drainage systems from erosion, incision, and sedimentation that can occur as a result of flow increases from impervious surfaces and prevent damage to stream habitat in natural drainage system tributaries (see Attachment J - Determination of Erosion Potential).

(ii) Hydromodification control may include one, or a combination of on-site, regional or sub-regional hydromodification control BMPs, LID strategies, or stream and riparian buffer restoration measures. Any in-stream restoration measure shall not adversely affect the beneficial uses of the natural drainage systems.

(iii) Natural drainage systems that are subject to the hydromodification assessments and controls as described in this Part of the Order, include all drainages that have not been improved (e.g., channelized or armored with concrete, shotcrete, or rip-rap) or drainage systems that are tributary to a natural drainage system, except as provided in Part VI.D.7c.iv.(1)(b)--Exemptions to

Hydromodification Controls [see below]. The clearing or dredging of a natural drainage system does not constitute an "improvement."

(iv) Until the State Water Board or the Regional Water Board adopts a final Hydromodification Policy or criteria, Permittees shall implement the Hydromodification Control Criteria described in Part VI.D.7.c.iv.(1)(c) to control the potential adverse impacts of changes in hydrology that may result from new development and redevelopment projects located within natural drainage systems as described in Part VI.D.7.c.iv.(1)(a)(iii).

(b) Exemptions to Hydromodification Controls. Permittees may exempt the following New Development and Redevelopment projects from implementation of hydromodification controls where assessments of downstream channel conditions and proposed discharge hydrology indicate that adverse hydromodification effects to beneficial uses of Natural Drainage Systems are unlikely:

(i) Projects that are replacement, maintenance or repair of a Permittee's existing flood control facility, storm drain, or transportation network.

(ii) Redevelopment Projects in the Urban Core that do not increase the effective impervious area or decrease the infiltration capacity of pervious areas compared to the pre-project conditions.

(iii) Projects that have any increased discharge directly or via a storm drain to a sump, lake, area under tidal influence, into a waterway that has a 100-year peak flow (Q100) of 25,000 cfs or more, or other receiving water that is not susceptible to hydromodification impacts.

(iv) Projects that discharge directly or via a storm drain into concrete or otherwise engineered (not natural) channels (e.g., channelized or armored with rip rap, shotcrete, etc.), which, in turn, discharge into receiving water that is not susceptible to hydromodification impacts (as in Parts VI.D.7.c.iv.(1)(b)(i)-(iii) above).

(v) LID BMPs implemented on single family homes are sufficient to comply with Hydromodification criteria.

(c) Hydromodification Control Criteria. The Hydromodification Control Criteria to protect natural drainage systems are as follows:

(i) Except as provided for in Part VI.D.7.c.iv.(1)(b), projects disturbing an area greater than 1 acre but less than 50 acres within natural drainage systems will be presumed to meet pre-development hydrology if one of the following demonstrations is made:

1. The project is designed to retain on-site, through infiltration, evapotranspiration, and/or harvest and use, the storm water volume from the runoff of the 95th percentile, 24-hour storm, or
2. The runoff flow rate, volume, velocity, and duration for the post-development condition do not exceed the pre-development condition for the 2-year, 24-hour rainfall event. This condition may be substantiated by simple screening models, including those described in *Hydromodification Effects on Flow Peaks and Durations in Southern California Urbanizing Watersheds* (Hawley et al., 2011) or other models acceptable to the Executive Officer of the Regional Water Board, or
3. The Erosion Potential (Ep) in the receiving water channel will approximate 1, as determined by a Hydromodification Analysis Study and the equation presented in Attachment J. Alternatively, Permittees can opt to use other work equations to calculate Erosion Potential with Executive Officer approval.

(ii) Projects disturbing 50 acres or more within natural drainage systems will be presumed to meet pre-development hydrology based on the successful demonstration of one of the following conditions:

1. The site infiltrates on-site at least the runoff from a 2-year, 24-hour storm event, or
2. The runoff flow rate, volume, velocity, and duration for the post-development condition does not exceed the pre-development condition for the 2-year, 24-hour rainfall events. These conditions must be substantiated by hydrologic modeling acceptable to the Regional Water Board Executive Officer, or
3. The Erosion Potential (Ep) in the receiving water channel will approximate 1, as determined by a Hydromodification Analysis Study and the equation presented in Attachment J.

(c) Alternative Hydromodification Criteria

(i) Permittees may satisfy the requirement for Hydromodification Controls by implementing the hydromodification requirements in the County of Los Angeles Low Impact Development Manual (2009) for all projects disturbing an area greater than 1 acre within natural drainage systems.

(ii) Each Permittee may alternatively develop and implement watershed specific Hydromodification Control Plans (HCPs). Such plans shall be developed no later than one year after the effective date of this Order.

(iii) The HCP shall identify:

1. Stream classifications
2. Flow rate and duration control methods
3. Sub-watershed mitigation strategies
4. Stream and/or riparian buffer restoration measures, which will maintain the stream and tributary Erosion Potential at 1 unless an alternative value can be shown to be protective of the natural drainage systems from erosion, incision, and sedimentation that can occur as a result of flow increases from impervious surfaces and prevent damage to stream habitat in natural drainage system tributaries.

(iv) The HCP shall contain the following elements:

1. Hydromodification Management Standards
2. Natural Drainage Areas and Hydromodification Management Control Areas
3. New Development and Redevelopment Projects subject to the HCP
4. Description of authorized Hydromodification Management Control BMPs
5. Hydromodification Management Control BMP Design Criteria
6. For flow duration control methods, the range of flows to control for, and goodness of fit criteria
7. Allowable low critical flow, Qc, which initiates sediment transport
8. Description of the approved Hydromodification Model
9. Any alternate Hydromodification Management Model and Design
10. Stream Restoration Measures Design Criteria
11. Monitoring and Effectiveness Assessment
12. Record Keeping
13. The HCP shall be deemed in effect upon Executive Officer approval.

v. Watershed Equivalence.

Regardless of the methods through which Permittees allow project applicants to implement alternative compliance measures, the subwatershed-wide (defined as draining to the same HUC-12 hydrologic area in the Basin Plan) result of all development must be at least the same level of water quality protection as would have been achieved if all projects utilizing these alternative

compliance provisions had complied with Part VI.D.7.c.i (Integrated Water Quality/Flow Reduction/Resource Management Criteria).

vi. Annual Report

Each Permittee shall provide in their annual report to the Regional Water Board a list of mitigation project descriptions and estimated pollutant and flow reduction analyses (compiled from design specifications submitted by project applicants and approved by the Permittee(s)). Within 4 years of Order adoption, Permittees must submit in their Annual Report, a comparison of the expected aggregate results of alternative compliance projects to the results that would otherwise have been achieved by retaining on site the SWQDv.

d. Implementation

i. Local Ordinance Equivalence

A Permittee that has adopted a local LID ordinance prior to the adoption of this Order, and which includes a retention requirement numerically equal to the 0.75-inch, 24-hour rain event or the 85th percentile, 24-hour rain event, whichever is greater, may submit documentation to the Regional Water Board that the alternative requirements in the local ordinance will provide equal or greater reduction in storm water discharge pollutant loading and volume as would have been obtained through strict conformance with Part VI.D.7.c.i. (Integrated Water Quality/Flow Reduction Resources Management Criteria) or Part VI.D.7.c.ii. (Alternative Compliance Measures for Technical Infeasibility or Opportunity for Regional Ground water Replenishment) of this Order and, if applicable, Part VI.D.7.c.iv. (Hydromodification (Flow/Volume Duration) Control Criteria).

(1) Documentation shall be submitted within 180 days after the effective date of this Order.

(2) The Regional Water Board shall provide public notice of the proposed equivalency determination and a minimum 30-day period for public comment. After review and consideration of public comments, the Regional Water Board Executive Officer will determine whether implementation of the local ordinance provides equivalent pollutant control to the applicable provisions of this Order. Local ordinances that do not strictly conform to the provisions of this Order must be approved by the Regional Water Board Executive Officer as being “equivalent” in effect to the applicable provisions of this Order in order to substitute for the requirements in Parts VI.D.7.c.i and, where applicable, VI.D.7.c.iv.

(3) Where the Regional Water Board Executive Officer determines that a Permittee’s local LID ordinance does not provide equivalent pollutant control, the Permittee shall either

(a) Require conformance with Parts VI.D.7.c.i and, where applicable, VI.D.7.c.iv, or

(b) Update its local ordinance to conform to the requirements herein within two years of the effective date of this Order.

ii. Project Coordination

(1) Each Permittee shall facilitate a process for effective approval of post-construction storm water control measures. The process shall include:

(a) Detailed LID site design and BMP review including BMP sizing calculations, BMP pollutant removal performance, and municipal approval; and

(b) An established structure for communication and delineated authority between and among municipal departments that have jurisdiction over project review, plan approval, and project construction through memoranda of understanding or an equivalent agreement.

iii. Maintenance Agreement and Transfer

(1) Prior to issuing approval for final occupancy, each Permittee shall require that all new development and redevelopment projects subject to post-construction BMP requirements, with the exception of simple LID BMPs implemented on single family residences, provide an operation and maintenance plan, monitoring plan, where required, and verification of ongoing maintenance provisions for LID practices, Treatment Control BMPs, and Hydromodification Control BMPs including but not limited to: final map conditions, legal agreements, covenants, conditions or restrictions, CEQA mitigation requirements, conditional use permits, and/or other legally binding maintenance agreements. Permittees shall require maintenance records be kept on site for treatment BMPs implemented on single family residences.

(a) Verification at a minimum shall include the developer's signed statement accepting responsibility for maintenance until the responsibility is legally transferred; and either:

(i) A signed statement from the public entity assuming responsibility for BMP maintenance; or

(ii) Written conditions in the sales or lease agreement, which require the property owner or tenant to assume responsibility for BMP maintenance and conduct a maintenance inspection at least once a year; or

(iii) Written text in project covenants, conditions, and restrictions (CCRs) for residential properties assigning BMP maintenance responsibilities to the Home Owners Association; or

(iv) Any other legally enforceable agreement or mechanism that assigns responsibility for the maintenance of BMPs.

(b) Each Permittee shall require all development projects subject to post-construction BMP requirements to provide a plan for the operation and maintenance of all structural and treatment controls. The plan shall be submitted for examination of relevance to keeping the BMPs in proper working order. Where BMPs are transferred to Permittee for ownership and maintenance, the plan shall also include all relevant costs for upkeep of BMPs in the transfer. Operation and Maintenance plans for private BMPs shall be kept on-site for periodic review by Permittee inspectors.

iv. Tracking, Inspection, and Enforcement of Post-Construction BMPs

(1) Each Permittee shall implement a tracking system and an inspection and enforcement program for new development and redevelopment post-construction storm water no later than 60 days after Order adoption date.

(a) Implement a GIS or other electronic system for tracking projects that have been conditioned for post-construction BMPs. The electronic system, at a minimum, should contain the following information:

(i) Municipal Project ID

(ii) State WDID No.

(iii) Project Acreage

(iv) BMP Type and Description

(v) BMP Location (coordinates)

(vi) Date of Acceptance

(vii) Date of Maintenance Agreement

(viii) Maintenance Records

(ix) Inspection Date and Summary

(x) Corrective Action

(xi) Date Certificate of Occupancy Issued

(xii) Replacement or Repair Date

(b) Inspect all development sites upon completion of construction and prior to the issuance of occupancy certificates to ensure proper installation of LID measures, structural BMPs, treatment control BMPs and hydromodification control BMPs. The inspection may be combined with other inspections provided it is conducted by trained personnel.

(c) Verify proper maintenance and operation of post-construction BMPs previously approved for new development and redevelopment and operated by the Permittee. The post-construction BMP maintenance inspection program shall incorporate the following elements:

(i) The development of a Post-construction BMP Maintenance Inspection checklist

(ii) Inspection at least once every 2 years after project completion, of post-construction BMPs to assess operation conditions with particular attention to criteria and procedures for post-construction

treatment control and hydromodification control BMP repair, replacement, or re-vegetation.

(d) For post-construction BMPs operated and maintained by parties other than the Permittee, the Permittee shall require the other parties to document proper maintenance and operations.

(e) Undertake enforcement action per the established Progressive Enforcement Policy as appropriate based on the results of the inspection. See Part VI.D.2 for requirements for the development and implementation of a Progressive Enforcement Policy.

8. Development Construction Program

a. Each Permittee shall develop, implement, and enforce a construction program that:

i. Prevents illicit construction-related discharges of pollutants into the MS4 and receiving waters.

ii. Implements and maintains structural and non-structural BMPs to reduce pollutants in storm water runoff from construction sites.

iii. Reduces construction site discharges of pollutants to the MS4 to the MEP.

iv. Prevents construction site discharges to the MS4 from causing or contributing to a violation of water quality standards.

b. Each Permittee shall establish for its jurisdiction an enforceable erosion and sediment control ordinance for all construction sites that disturb soil.

c. Applicability

The provisions contained in Part VI.D.8.d below apply exclusively to construction sites less than 1 acre. Provisions contained in Part VI.D.8.e – j, apply exclusively to construction sites 1 acre or greater. The requirements contained in this part apply to all activities involving soil disturbance with the exception of agricultural activities. Activities covered by this permit include but are not limited to grading, vegetation clearing, soil compaction, paving, re-paving and linear underground/overhead projects (LUPs).

d. Requirements for Construction Sites Less than One Acre

i. For construction sites less than 1 acre, each Permittee shall:

(1) Through the use of the Permittee's erosion and sediment control ordinance or and/or building permit, require the implementation of an effective combination of erosion and sediment control BMPs from Table 12 to prevent erosion and sediment loss, and the discharge of construction wastes.

Table 12. Applicable Set of BMPs for All Construction Sites

Erosion Controls	Scheduling
	Preservation of Existing Vegetation
Sediment Controls	Silt Fence
	Sand Bag Barrier
	Stabilized Construction Site Entrance/Exit
Non-Storm Water Management	Water Conservation Practices
	Dewatering Operations
Waste Management	Material Delivery and Storage
	Stockpile Management
	Spill Prevention and Control
	Solid Waste Management
	Concrete Waste Management
	Sanitary/Septic Waste Management

(2) Possess the ability to identify all construction sites with soil disturbing activities that require a permit, regardless of size, and shall be able to provide a list of permitted sites upon request of the Regional Water Board. Permittees may use existing permit databases or other tracking systems to comply with these requirements.

(3) Inspect construction sites on as needed based on the evaluation of the factors that are a threat to water quality. In evaluating the threat to water quality, the following factors shall be considered: soil erosion potential; site slope; project size and type; sensitivity of receiving water bodies; proximity to receiving water bodies; non-storm water discharges; past record of non-compliance by the operators of the construction site; and any water quality issues relevant to the particular MS4.

(4) Implement the Permittee's Progressive Enforcement Policy to ensure that construction sites are brought into compliance with the erosion and sediment control ordinance within a reasonable time period. See Part VI.D.2 for requirements for the development and implementation of a Progressive Enforcement Policy.

e. Each Permittee shall require operators of public and private construction sites within its jurisdiction to select, install, implement, and maintain BMPs that comply with its erosion and sediment control ordinance.

f. The requirements contained in this part apply to all activities involving soil disturbance with the exception of agricultural activities. Activities covered by this permit include but are not limited to grading, vegetation clearing, soil compaction, paving, re-paving and linear underground/overhead projects (LUPs).

g. Construction Site Inventory / Electronic Tracking System

i. Each Permittee shall use an electronic system to inventory grading permits, encroachment permits, demolition permits, building permits, or construction permits (and any other municipal authorization to move soil and/ or construct or destruct that involves land disturbance) issued by the Permittee. To satisfy this requirement, the use of a database or GIS system is recommended.

ii. Each Permittee shall complete an inventory and continuously update as new sites are permitted and sites are completed. The inventory / tracking system shall contain, at a minimum:

(1) Relevant contact information for each project (e.g., name, address, phone, email, etc. for the owner and contractor.

(2) The basic site information including location, status, size of the project and area of disturbance.

(3) The proximity all water bodies, water bodies listed as impaired by sediment-related pollutants, and water bodies for which a sediment-related TMDL has been adopted and approved by USEPA.

(4) Significant threat to water quality status, based on consideration of factors listed in Appendix 1 to the Statewide General Permit for Discharges of Storm Water Associated with Construction Activity (Construction General Permit).

(5) Current construction phase where feasible.

(6) The required inspection frequency.

(7) The project start date and anticipated completion date.

(8) Whether the project has submitted a Notice of Intent and obtained coverage under the Construction General Permit.

(9) The date the Permittee approved the Erosion and Sediment Control Plan (ESCP).

(10) Post-Construction Structural BMPs subject to Operation and Maintenance Requirements.

h. Construction Plan Review and Approval Procedures

i. Each Permittee shall develop procedures to review and approve relevant construction plan documents.

ii. The review procedures shall be developed and implemented such that the following minimum requirements are met:

(1) Prior to issuing a grading or building permit, each Permittee shall require each operator of a construction activity within its jurisdiction to prepare and submit an ESCP prior to the disturbance of land for the Permittee's review and written approval. The construction site operator shall be prohibited from commencing construction activity prior to receipt of written

approval by the Permittee. Each Permittee shall not approve any ESCP unless it contains appropriate site-specific construction site BMPs that meet the minimum requirements of a Permittee's erosion and sediment control ordinance.

(2) ESCPs must include the elements of a Storm Water Pollution Prevention Plan (SWPPP). SWPPPs prepared in accordance with the requirements of the Construction General Permit can be accepted as ESCPs.

(3) At a minimum, the ESCP must address the following elements:

(a) Methods to minimize the footprint of the disturbed area and to prevent soil compaction outside of the disturbed area.

(b) Methods used to protect native vegetation and trees.

(c) Sediment/Erosion Control.

(d) Controls to prevent tracking on and off the site.

(e) Non-storm water controls (e.g., vehicle washing, dewatering, etc.).

(f) Materials Management (delivery and storage).

(g) Spill Prevention and Control.

(h) Waste Management (e.g., concrete washout/waste management; sanitary waste management).

(i) Identification of site Risk Level as identified per the requirements in Appendix 1 of the Construction General Permit.

(4) The ESCP must include the rationale for the selection and design of the proposed BMPs, including quantifying the expected soil loss from different BMPs.

(5) Each Permittee shall require that the ESCP is developed and certified by a Qualified SWPPP Developer (QSD).

(6) Each Permittee shall require that all structural BMPs be designed by a licensed California Engineer.

(7) Each Permittee shall require that for all sites, the landowner or the landowner's agent sign a statement on the ESCP as follows:

(a) "I certify that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, to the best of my knowledge and belief, the information submitted is true, accurate, and complete. I am aware that submitting false and/ or inaccurate information, failing to update the ESCP to reflect current conditions, or failing to properly and/ or adequately implement the ESCP may result in revocation of grading and/ or other permits or other sanctions provided by law."

(8) Prior to issuing a grading or building permit, each Permittee must verify that the construction site operators have existing coverage under applicable permits, including, but not limited to the State Water Board's Construction General Permit, and State Water Board 401 Water Quality Certification.

(9) Each Permittee shall develop and implement a checklist to be used to conduct and document review of each ESCP.

i. BMP Implementation Level

i. Each Permittee shall implement technical standards for the selection, installation and maintenance of construction BMPs for all construction sites within its jurisdiction.

ii. The BMP technical standards shall require:

(1) The use of BMPs that are tailored to the risks posed by the project. Sites are to be ranked from Low Risk (Risk 1) to High Risk (Risk 3). Project risks are to be calculated based on the potential for erosion from the site and the sensitivity of the receiving water body. Receiving water bodies that are listed on the Clean Water Act (CWA) Section 303(d) list for sediment or siltation are considered High Risk. Likewise, water bodies with designated beneficial uses of SPWN, COLD, and MIGR are also considered to be High Risk. The combined (sediment/receiving water) site risk shall be calculated using the methods provided in Appendix 1 of the Construction General Permit. At a minimum, the BMP technical standards shall include requirements for High Risk sites as defined in Table 15.

(2) The use of BMPs for all construction sites, sites equal or greater to 1 acre, and for paving projects per Tables 14 and 16 of this Order.

(3) Detailed installation designs and cut sheets for use within ESCPs.

(4) Maintenance expectations for each BMP, or category of BMPs, as appropriate.

iii. Permittees are encouraged to adopt respective BMPs from latest versions of the *California BMP Handbook, Construction* or *Caltrans Stormwater Quality Handbooks, Construction Site Best Management Practices (BMPs) Manual* and addenda. Alternatively, Permittees are authorized to develop or adopt equivalent BMP standards consistent for Southern California and for the range of activities presented below in Tables 13 through 16.

iv. The local BMP technical standards shall be readily available to the development community and shall be clearly referenced within each Permittee's storm water or development services website, ordinance, permit approval process and/or ESCP review forms. The local BMP technical standards shall also be readily available to the Regional Water Board upon request.

v. Local BMP technical standards shall be available for the following:

Table 13. Minimum Set of BMPs for All Construction Sites

Erosion Controls	Scheduling
	Preservation of Existing Vegetation
Sediment Controls	Silt Fence
	Sand Bag Barrier
	Stabilized Construction Site Entrance/Exit
Non-Storm water Management	Water Conservation Practices
	Dewatering Operations
Waste Management	Material Delivery and Storage
	Stockpile Management
	Spill Prevention and Control
	Solid Waste Management
	Concrete Waste Management
	Sanitary/Septic Waste Management

Table 14. Additional BMPs Applicable to Construction Sites Disturbing 1 Acre or More

Erosion Controls	Hydraulic Mulch
	Hydroseeding
	Soil Binders
	Straw Mulch
	Geotextiles and Mats
	Wood Mulching
Sediment Controls	Fiber Rolls
	Gravel Bag Berm
	Street Sweeping and/ or Vacuum
	Storm Drain Inlet Protection
	Scheduling
	Check Dam
Additional Controls	Wind Erosion Controls
	Stabilized Construction Entrance/ Exit
	Stabilized Construction Roadway
	Entrance/ Exit Tire Wash
Non-Storm water Management	Vehicle and Equipment Washing
	Vehicle and Equipment Fueling
	Vehicle and Equipment Maintenance
Waste Management	Material Delivery and Storage
	Spill Prevention and Control

Table 15. Additional Enhanced BMPs for High Risk Sites

Erosion Controls	Hydraulic Mulch
	Hydroseeding
	Soil Binders
	Straw Mulch

	Geotextiles and Mats
	Wood Mulching
	Slope Drains
Sediment Controls	Silt Fence
	Fiber Rolls
	Sediment Basin
	Check Dam
	Gravel Bag Berm
	Street Sweeping and/or Vacuum
	Sand Bag Barrier
	Storm Drain Inlet Protection
Additional Controls	Wind Erosion Controls
	Stabilized Construction Entrance/Exit
	Stabilized Construction Roadway
	Entrance/Exit Tire Wash
	Advanced Treatment Systems*
Non-Storm water Management	Water Conservation Practices
	Dewatering Operations (Ground water dewatering only under NPDES Permit No. CAG994004)
	Vehicle and Equipment Washing
	Vehicle and Equipment Fueling
	Vehicle and Equipment Maintenance
Waste Management	Material Delivery and Storage
	Stockpile Management
	Spill Prevention and Control
	Solid Waste Management

* Applies to public roadway projects.

Table 16. Minimum Required BMPs for Roadway Paving or Repair Operation (For Private or Public Projects)

1.	Restrict paving and repaving activity to exclude periods of rainfall or predicted rainfall unless required by emergency conditions.
2.	Install gravel bags and filter fabric or other equivalent inlet protection at all susceptible storm drain inlets and at manholes to prevent spills of paving products and tack coat.
3.	Prevent the discharge of release agents including soybean oil, other oils, or diesel to the storm water drainage system or receiving waters.
4.	Minimize non storm water runoff from water use for the roller and for evaporative cooling of the asphalt.
5.	Clean equipment over absorbent pads, drip pans, plastic sheeting or other material to capture all spillage and dispose of properly.
6.	Collect liquid waste in a container, with a secure lid, for transport to a maintenance facility to be reused, recycled or disposed of properly.
7.	Collect solid waste by vacuuming or sweeping and securing in an

	appropriate container for transport to a maintenance facility to be reused, recycled or disposed of properly.
8.	Cover the "cold-mix" asphalt (i.e., pre-mixed aggregate and asphalt binder) with protective sheeting during a rainstorm.
9.	Cover loads with tarp before haul-off to a storage site, and do not overload trucks.
10.	Minimize airborne dust by using water spray or other approved dust suppressant during grinding.
11.	Avoid stockpiling soil, sand, sediment, asphalt material and asphalt grindings materials or rubble in or near storm water drainage system or receiving waters.
12.	Protect stockpiles with a cover or sediment barriers during a rain.

j. Construction Site Inspection

i. Each Permittee shall use its legal authority to implement procedures for inspecting public and private construction sites.

ii. The inspection procedures shall be implemented as follows:

(1) Inspect the public and private construction sites as specified in Table 17 below:

Table 17. Inspection Frequencies for Sites One Acre or Greater

Site	Inspection Frequency Shall Occur
a. All sites 1 acre or larger that discharge to a tributary listed by the state as an impaired water for sediment or turbidity under the CWA § 303(d)	(1) when two or more consecutive days with greater than 50% chance of rainfall are predicted by NOAA[29], (2) within 48 hours of a ½-inch rain event and at (3) least once every two weeks
b. Other sites 1 acre or more determined to be a significant threat to water quality[30]	
c. All other construction sites with 1 acre or more of soil disturbance not meeting the criteria above	At least monthly

(2) Each Permittee shall inspect all phases of construction as follows:

(a) Prior to Land Disturbance

Prior to allowing an operator to commence land disturbance, each Permittee shall perform an inspection to ensure all necessary erosion

[29] www.srh.noaa.gov/forecast

[30] In evaluating the threat to water quality, the following factors shall be considered: soil erosion potential; site slope; project size and type; sensitivity of receiving water bodies; proximity to receiving water bodies; non-storm water discharges; past record of non-compliance by the operators of the construction site; and any water quality issues relevant to the particular MS4.

and sediment structural and non-structural BMP materials and procedures are available per the erosion and sediment control plan.

(b) During Active Construction, including Land Development[31] and Vertical Construction[32]

In accordance with the frequencies specified in Part VI.D.8.j and Table 17 of this Order, each Permittee shall perform an inspection to ensure all necessary erosion and sediment structural and non-structural BMP materials and procedures are available per the erosion and sediment control plan throughout the construction process.

(c) Final Landscaping / Site Stabilization[33]

At the conclusion of the project and as a condition of approving and/or issuing a Certificate of Occupancy, each Permittee shall inspect the constructed site to ensure that all graded areas have reached final stabilization and that all trash, debris, and construction materials, and temporary erosion and sediment BMPs are removed.

(3) Based on the required frequencies above, each construction project shall be inspected a minimum of three times.

(4) Inspection Standard Operating Procedures

Each Permittee shall develop, implement, and revise as necessary, standard operating procedures that identify the inspection procedures each Permittee will follow. Inspections of construction sites, and the standard operating procedures, shall include, but are not limited to:

(a) Verification of active coverage under the Construction General Permit for sites disturbing 1 acre or more, or that are part of a planned development that will disturb 1 acre or more and a process for referring non-filers to the Regional Water Board.

(b) Review of the applicable ESCP and inspection of the construction site to determine whether all BMPs have been selected, installed, implemented, and maintained according to the approved plan and subsequent approved revisions.

(c) Assessment of the appropriateness of the planned and installed BMPs and their effectiveness.

(d) Visual observation and record keeping of non-storm water discharges, potential illicit discharges and connections, and potential discharge of pollutants in storm water runoff.

(e) Development of a written or electronic inspection report generated from an inspection checklist used in the field.

[31] Activities include cuts and fills, rough and finished grading; alluvium removals; canyon cleanouts; rock undercuts; keyway excavations; stockpiling of select material for capping operations; and excavation and street paving, lot grading, curbs, gutters and sidewalks, public utilities, public water facilities including fire hydrants, public sanitary sewer systems, storm sewer system and/or other drainage improvement.

[32] The build out of structures from foundations to roofing, including rough landscaping.

[33] All soil disturbing activities at each individual parcel within the site have been completed.

(f) Tracking of the number of inspections for the inventoried construction sites throughout the reporting period to verify that the sites are inspected at the minimum frequencies required in Table 17 of this Order.

k. Enforcement

Each Permittee shall implement its Progressive Enforcement Policy to ensure that construction sites are brought into compliance with all storm water requirements within a reasonable time period. See Part VI.D.2 for requirements for the development and implementation of a Progressive Enforcement Policy.

l. Permittee Staff Training

i. Each Permittee shall ensure that all staff whose primary job duties are related to implementing the construction storm water program are adequately trained.

ii. Each Permittee may conduct in-house training or contract with consultants. Training shall be provided to the following staff positions of the MS4:

(1) Plan Reviewers and Permitting Staff

Ensure staff and consultants are trained as qualified individuals, knowledgeable in the technical review of local erosion and sediment control ordinance, local BMP technical standards, ESCP requirements, and the key objectives of the State Water Board QSD program. Permittees may provide internal training to staff or require staff to obtain QSD certification.

(2) Erosion Sediment Control/Storm Water Inspectors

Each Permittee shall ensure that its inspectors are knowledgeable in inspection procedures consistent with the State Water Board sponsored program QSD or a Qualified SWPPP Practitioner (QSP) or that a designated person on staff who has been trained in the key objectives of the QSD/QSP programs supervises inspection operations. Each Permittee may provide internal training to staff or require staff to obtain QSD/QSP certification. Each inspector must be knowledgeable of the local BMP technical standards and ESCP requirements.

(3) Third-Party Plan Reviewers, Permitting Staff, and Inspectors

If the Permittee utilizes outside parties to conduct inspections and/or review plans, each Permittee shall ensure these staff are trained per the requirements listed above. Outside contractors can self-certify, providing they certify they have received all applicable training required in the Permit and have documentation to that effect.

9. Public Agency Activities Program

a. Each Permittee shall implement a Public Agency Activities Program to minimize storm water pollution impacts from Permittee-owned or operated facilities and activities and to identify opportunities to reduce storm water pollution impacts

from areas of existing development. Requirements for Public Agency Facilities and Activities consist of the following components:

i. Public Construction Activities Management

ii. Public Facility Inventory

iii. Inventory of Existing Development for Retrofitting Opportunities

iv. Public Facility and Activity Management

v. Vehicle and Equipment Wash Areas

vi. Landscape, Park, and Recreational Facilities Management

vii. Storm Drain Operation and Maintenance

viii. Streets, Roads, and Parking Facilities Maintenance

ix. Emergency Procedures

x. Municipal Employee and Contractor Training

b. Public Construction Activities Management

i. Each Permittee shall implement and comply with the Planning and Land Development Program requirements in Part VI.D.7 of this Order at Permittee-owned or operated (i.e., public or Permittee sponsored) construction projects that are categorized under the project types identified in Part VI.D.7.b of this Order.

ii. Each Permittee shall implement and comply with the appropriate Development Construction Program requirements in Part VI.D.8 of this Order at Permittee-owned or operated construction projects as applicable.

iii. For Permittee-owned or operated projects (including those under a capital improvement project plan) that disturb less than one acre of soil, each Permittee shall require an effective combination of erosion and sediment control BMPs from Table 13 (see Construction Development Program, minimum BMPs).

iv. Each Permittee shall obtain separate coverage under the Construction General Permit for all Permittee-owned or operated construction sites that require coverage.

c. Public Facility Inventory

i. Each Permittee shall maintain an updated inventory of all Permittee-owned or operated (i.e., public) facilities within its jurisdiction that are potential sources of storm water pollution. The incorporation of facility information into a GIS is recommended. Sources to be tracked include but are not limited to the following:

(1) Animal control facilities

(2) Chemical storage facilities

(3) Composting facilities

(4) Equipment storage and maintenance facilities (including landscape maintenance-related operations)

(5) Fueling or fuel storage facilities (including municipal airports)

(6) Hazardous waste disposal facilities

(7) Hazardous waste handling and transfer facilities

(8) Incinerators

(9) Landfills

(10) Materials storage yards

(11) Pesticide storage facilities

(12) Fire stations

(13) Public restrooms

(14) Public parking lots

(15) Public golf courses

(16) Public swimming pools

(17) Public parks

(18) Public works yards

(19) Public marinas

(20) Recycling facilities

(21) Solid waste handling and transfer facilities

(22) Vehicle storage and maintenance yards

(23) Storm water management facilities (e.g., detention basins)

(24) All other Permittee-owned or operated facilities or activities that each Permittee determines may contribute a substantial pollutant load to the MS4.

ii. Each Permittee shall include the following minimum fields of information for each Permittee-owned or operated facility in its inventory.

(1) Name of facility

(2) Name of facility manager and contact information

(3) Address of facility (physical and mailing)

(4) A narrative description of activities performed and potential pollution sources.

(5) Coverage under the Industrial General Permit or other individual or general NPDES permits or any applicable waiver issued by the Regional or State Water Board pertaining to storm water discharges.

iii. Each Permittee shall update its inventory at least once during the 5-year term of the Order. The update shall be accomplished through collection of new information obtained through field activities or through other readily available inter and intra-agency informational databases (e.g., property management, land-use approvals, accounting and depreciation ledger account, and similar information).

d. Inventory of Existing Development for Retrofitting Opportunities

i. Each Permittee shall develop an inventory of retrofitting opportunities that meets the requirements of this Part VI.9.d. Retrofit opportunities shall be identified within the public right-of-way or in coordination with a TMDL implementation plan(s). The goals of the existing development retrofitting inventory are to address the impacts of existing development through regional or sub-regional retrofit projects that reduce the discharges of storm water pollutants into the MS4 and prevent discharges from the MS4 from causing or contributing to a violation of water quality standards as defined in Part V.A, Receiving Water Limitations.

ii. Each Permittee shall screen existing areas of development to identify candidate areas for retrofitting using watershed models or other screening level tools.

iii. Each Permittee shall evaluate and rank the areas of existing development identified in the screening to prioritize retrofitting candidates. Criteria for evaluation may include but are not limited to:

(1) Feasibility, including general private and public land availability;

(2) Cost effectiveness;

(3) Pollutant removal effectiveness;

(4) Tributary area potentially treated;

(5) Maintenance requirements;

(6) Landowner cooperation;

(7) Neighborhood acceptance;

(8) Aesthetic qualities;

(9) Efficacy at addressing concern; and

(10) Potential improvements to public health and safety.

iv. Each Permittee shall consider the results of the evaluation in the following programs:

(1) The Permittee's storm water management program: Highly feasible projects expected to benefit water quality should be given a high priority to implement source control and treatment control BMPs in a Permittee's SWMP.

(2) Off-site mitigation for New Development and Redevelopment: Each Permittee shall consider high priority retrofit projects as candidates for off-site mitigation projects per Part VI.D.7.c.iii.(4).(d).

(3) Where feasible, at the discretion of the Permittee, the existing development retrofitting program may be coordinated with flood control projects and other infrastructure improvement programs per Part VI.D.9.e.ii.(2) below.

v. Each Permittee shall cooperate with private landowners to encourage site specific retrofitting projects. Each Permittee shall consider the following practices in cooperating with private landowners to retrofit existing development:

(1) Demonstration retrofit projects;

(2) Retrofits on public land and easements that treat runoff from private developments;

(3) Education and outreach;

(4) Subsidies for retrofit projects;

(5) Requiring retrofit projects as enforcement, mitigation or ordinance compliance;

(6) Public and private partnerships;

(7) Fees for existing discharges to the MS4 and reduction of fees for retrofit implementation.

e. Public Agency Facility and Activity Management

i. Each Permittee shall obtain separate coverage under the Industrial General Permit for all Permittee-owned or operated facilities where industrial activities are conducted that require coverage under the Industrial General Permit.

ii. Each Permittee shall implement the following measures for Permittee- owned and operated flood management projects:

(1) Develop procedures to assess the impacts of flood management projects on the water quality of receiving water bodies; and

(2) Evaluate existing structural flood control facilities to determine if retrofitting the facility to provide additional pollutant removal from storm water is feasible.

iii. Each Permittee shall ensure the implementation and maintenance of activity specific BMPs listed in Table 18 (BMPs for Public Agency Facilities and Activities) or an equivalent set of BMPs when such activities occur at Permittee-owned or operated facilities and field activities (e.g., project sites) including but not limited to the facility types listed in Part VI.D.9.c above, and at any area that includes the activities described in Table 18, or that have the potential to discharge pollutants in storm water.

iv. Any contractors hired by the Permittee to conduct Public Agency Activities including, but not limited to, storm and/or sanitary sewer system inspection and repair, street sweeping, trash pick-up and disposal, and street and right-of-way construction and repair shall be contractually required to implement and maintain the activity specific BMPs listed in Table 18. Each Permittee shall conduct oversight of contractor activities to ensure these BMPs are implemented and maintained.

v. Permittee-owned or operated facilities that have obtained coverage under the Industrial General Permit shall implement and maintain BMPs consistent with the associated SWPPP and are therefore not required to implement and maintain the activity specific BMPs listed in Table 18.

vi. Effective source control BMPs for the activities listed in Table 18 shall be implemented at Permittee-owned or operated facilities, unless the pollutant generating activity does not occur. Each Permittee shall require implementation of additional BMPs where storm water from the MS4 discharges to a significant ecological area (SEA, see Attachment A for definition), a water body subject to TMDL provisions in Part VI.E., or a CWA § 303(d) listed water body (see Part VI.E below). Likewise, for those BMPs that are not adequately protective of water quality standards, a Permittee may require additional site-specific controls.

Table 18. BMPs for Public Agency Facilities and Activities

General and Activity Specific BMPs	
General BMPs	Scheduling and Planning
	Spill Prevention and Control
	Sanitary/Septic Waste Management
	Material Use
	Safer Alternative Products
	Vehicle/Equipment Cleaning, Fueling and Maintenance
	Illicit Connection Detection, Reporting and Removal
	Illegal Spill Discharge Control
	Maintenance Facility Housekeeping Practices
Flexible Pavement	Asphalt Cement Crack and Joint Grinding/ Sealing
	Asphalt Paving
	Structural Pavement Failure (Digouts) Pavement Grinding and Paving
	Emergency Pothole Repairs
	Sealing Operations
Rigid Pavement	Portland Cement Crack and Joint Sealing
	Mudjacking and Drilling
	Concrete Slab and Spall Repair
Slope/ Drains/ Vegetation	Shoulder Grading
	Nonlandscaped Chemical Vegetation Control
	Nonlandscaped Mechanical Vegetation Control/

General and Activity Specific BMPs	
	Mowing
	Nonlandscaped Tree and Shrub Pruning, Brush Chipping, Tree and Shrub Removal
	Fence Repair
	Drainage Ditch and Channel Maintenance
	Drain and Culvert Maintenance
	Curb and Sidewalk Repair
Litter/ Debris/ Graffiti	Sweeping Operations
	Litter and Debris Removal
	Emergency Response and Cleanup Practices
	Graffiti Removal
Landscaping	Chemical Vegetation Control
	Manual Vegetation Control
	Landscaped Mechanical Vegetation Control/ Mowing
	Landscaped Tree and Shrub Pruning, Brush Chipping, Tree and Shrub Removal
	Irrigation Line Repairs
	Irrigation (Watering), Potable and Nonpotable
Environmental	Storm Drain Stenciling
	Roadside Slope Inspection
	Roadside Stabilization
	Stormwater Treatment Devices
	Traction Sand Trap Devices
Bridges	Welding and Grinding
	Sandblasting, Wet Blast with Sand Injection and Hydroblasting
	Painting
	Bridge Repairs
Other Structures	Pump Station Cleaning
	Tube and Tunnel Maintenance and Repair
	Tow Truck Operations
	Toll Booth Lane Scrubbing Operations
Electrical	Sawcutting for Loop Installation
Traffic Guidance	Thermoplastic Striping and Marking
	Paint Striping and Marking
	Raised/ Recessed Pavement Marker Application and Removal
	Sign Repair and Maintenance
	Median Barrier and Guard Rail Repair
	Emergency Vehicle Energy Attenuation Repair
Storm Maintenance	Minor Slides and Slipouts Cleanup/ Repair
Management and Support	Building and Grounds Maintenance
	Storage of Hazardous Materials (Working Stock)
	Material Storage Control (Hazardous Waste)

General and Activity Specific BMPs	
	Outdoor Storage of Raw Materials
	Vehicle and Equipment Fueling
	Vehicle and Equipment Cleaning
	Vehicle and Equipment Maintenance and Repair
	Aboveground and Underground Tank Leak and Spill Control

f. Vehicle and Equipment Washing

i. Each Permittee shall implement and maintain the activity specific BMPs listed in Table 18 (BMPs for Public Agency Facilities and Activities) for all fixed vehicle and equipment washing; including fire fighting and emergency response vehicles.

ii. Each Permittee shall prevent discharges of wash waters from vehicle and equipment washing to the MS4 by implementing any of the following measures at existing facilities with vehicle or equipment wash areas:

(1) Self-contain, and haul off for disposal; or

(2) Equip with a clarifier or an alternative pre-treatment device and plumb to the sanitary sewer in accordance with applicable waste water provider regulations.

iii. Each Permittee shall ensure that any municipal facilities constructed, redeveloped, or replaced shall not discharge wastewater from vehicle and equipment wash areas to the MS4 by plumbing all areas to the sanitary sewer in accordance with applicable waste water provider regulations, or self-containing all waste water/ wash water and hauling to a point of legal disposal.

g. Landscape, Park, and Recreational Facilities Management

i. Each Permittee shall implement and maintain the activity specific BMPs listed in Table 18 for all public right-of-ways, flood control facilities and open channels, lakes and reservoirs, and landscape, park, and recreational facilities and activities.

ii. Each Permittee shall implement an IPM program that includes the following:

(1) Pesticides are used only if monitoring indicates they are needed, and pesticides are applied according to applicable permits and established guidelines.

(2) Treatments are made with the goal of removing only the target organism.

(3) Pest controls are selected and applied in a manner that minimizes risks to human health, beneficial non-target organisms, and the environment.

(4) The use of pesticides, including Organophosphates and Pyrethroids, does not threaten water quality.

(5) Partner with other agencies and organizations to encourage the use of IPM.

(6) Adopt and verifiably implement policies, procedures, and/ or ordinances requiring the minimization of pesticide use and encouraging the use of IPM techniques (including beneficial insects) for Public Agency Facilities and Activities.

(7) Policies, procedures, and ordinances shall include commitments and a schedule to reduce the use of pesticides that cause impairment of surface waters by implementing the following procedures:

(a) Prepare and annually update an inventory of pesticides used by all internal departments, divisions, and other operational units.

(b) Quantify pesticide use by staff and hired contractors.

(c) Demonstrate implementation of IPM alternatives where feasible to reduce pesticide use.

iii. Each Permittee shall implement the following requirements:

(1) Use a standardized protocol for the routine and non-routine application of pesticides (including pre-emergents), and fertilizers.

(2) Ensure there is no application of pesticides or fertilizers (1) when two or more consecutive days with greater than 50% chance of rainfall are predicted by NOAA[34], (2) within 48 hours of a ½-inch rain event, or (3) when water is flowing off the area where the application is to occur. This requirement does not apply to the application of aquatic pesticides described in Part VI.D.9.g.iii.(1) above or pesticides which require water for activation.

(3) Ensure that no banned or unregistered pesticides are stored or applied.

(4) Ensure that all staff applying pesticides are certified in the appropriate category by the California Department of Pesticide Regulation, or are under the direct supervision of a pesticide applicator certified in the appropriate category.

(5) Implement procedures to encourage the retention and planting of native vegetation to reduce water, pesticide and fertilizer needs; and

(6) Store pesticides and fertilizers indoors or under cover on paved surfaces, or use secondary containment.

(a) Reduce the use, storage, and handling of hazardous materials to reduce the potential for spills.

(b) Regularly inspect storage areas.

[34] www.srh.noaa.gov/forecast

h. Storm Drain Operation and Maintenance

i. Each Permittee shall implement and maintain the activity specific BMPs listed in Table 18 for storm drain operation and maintenance.

ii. Ensure that all material removed from the MS4 does not reenter the system. Solid material shall be dewatered in a contained area and liquid material shall be disposed in accordance with any of the following measures:

(1) Self-contain, and haul off for legal disposal; or

(2) Applied to the land without runoff; or

(3) Equip with a clarifier or an alternative pre-treatment device; and plumb to the sanitary sewer in accordance with applicable waste water provider regulations.

iii. Catch Basin Cleaning

(1) In areas that are not subject to a trash TMDL, each Permittee shall determine priority areas and shall update its map or list of Catch Basins with their GPS coordinates and priority:

Priority A: Catch basins that are designated as consistently generating the highest volumes of trash and/or debris.

Priority B: Catch basins that are designated as consistently generating moderate volumes of trash and/or debris.

Priority C: Catch basins that are designated as generating low volumes of trash and/or debris.

The map or list shall contain the rationale or data to support priority designations.

(2) In areas that are not subject to a trash TMDL, each Permittee shall inspect catch basins according to the following schedule:

Priority A: A minimum of 3 times during the wet season (October 1 through April 15) and once during the dry season every year.

Priority B: A minimum of once during the wet season and once during the dry season every year.

Priority C: A minimum of once per year.

Catch basins shall be cleaned as necessary on the basis of inspections. At a minimum, Permittees shall ensure that any catch basin that is determined to be at least 25% full of trash shall be cleaned out. Permittees shall maintain inspection and cleaning records for Regional Water Board review.

(3) In areas that are subject to a trash TMDL, the subject Permittees shall implement the applicable provisions in Part VI.E.

iv. Trash Management at Public Events

(1) Each Permittee shall require the following measures for any event in the public right of way or wherever it is foreseeable that substantial quantities of trash and litter may be generated, including events located in areas that are subject to a trash TMDL:

(a) Proper management of trash and litter generated; and

(b) Arrangement for temporary screens to be placed on catch basins; or

(c) Provide clean out of catch basins, trash receptacles, and grounds in the event area within one business day subsequent to the event.

v. Trash Receptacles

(1) Each Permittee shall ensure trash receptacles, or equivalent trash capturing devices, are covered in areas newly identified as high trash generation areas within its jurisdiction.

(2) Each Permittee shall ensure that all trash receptacles are cleaned out and maintained as necessary to prevent trash overflow.

vi. Catch Basin Labels and Open Channel Signage

(1) Each Permittee shall label all storm drain inlets that they own with a legible “no dumping” message.

(2) Each Permittee shall inspect the legibility of the stencil or label nearest each inlet prior to the wet season every year.

(3) Each Permittee shall record all catch basins with illegible stencils and re-stencil or re-label within 180 days of inspection.

(4) Each Permittee shall post signs, referencing local code(s) that prohibit littering and illegal dumping, at designated public access points to open channels, creeks, urban lakes, and other relevant water bodies.

vii. Additional Trash Management Practices

(1) In areas that are not subject to a trash TMDL, each Permittee shall install trash excluders, or equivalent devices, on or in catch basins or outfalls to prevent the discharge of trash to the MS4 or receiving water no later than four years after the effective date of this Order in areas defined as Priority A (Part VI.D.9.h.iii.(1)) except at sites where the application of such BMP(s) alone will cause flooding. Lack of maintenance that causes flooding is not an acceptable exception to the requirement to install BMPs. Alternatively, each Permittee may implement alternative or enhanced BMPs beyond the provisions of this Order (such as but not limited to increased street sweeping, adding trash cans near trash generation sites, prompt enforcement of trash accumulation, increased trash collection on public property, increased litter prevention messages or trash nets within the MS4) that provide substantially equivalent removal of trash. Each Permittee shall demonstrate that BMPs, which substituted for trash excluders, provide equivalent trash removal performance as excluders.

When outfall trash capture is provided, revision of the schedule for inspection and cleanout of catch basins in Part VI.D.9.h.iii.(2) shall be reported in the next year's annual report.

viii. Storm Drain Maintenance

Each Permittee shall implement a program for Storm Drain Maintenance that includes the following:

(1) Visual monitoring of Permittee-owned open channels and other drainage structures for trash and debris at least annually.

(2) Removal of trash and debris from open channels a minimum of once per year before the wet season.

(3) Elimination of the discharge of contaminants during MS4 maintenance and clean outs.

(4) Proper disposal of debris and trash removed during storm drain maintenance.

ix. Infiltration from Sanitary Sewer to MS4/Preventive Maintenance

(1) Each Permittee shall implement controls and measures to prevent and eliminate infiltration of seepage from sanitary sewers to MS4s through thorough, routine preventive maintenance of the MS4.

(2) Each Permittee that operates both a municipal sanitary sewer system and a MS4 must implement controls and measures to prevent and eliminate infiltration of seepage from the sanitary sewers to the MS4s that must include overall sanitary sewer and MS4 surveys and thorough, routine preventive maintenance of both. Implementation of a Sewer System Management Plan in accordance with the Statewide General Waste Discharge Requirements for Sanitary Sewer Systems, may be used to fulfill this requirement.

(3) Each Permittee shall implement controls to limit infiltration of seepage from sanitary sewers to the MS4 where necessary. Such controls must include:

(a) Adequate plan checking for construction and new development;

(b) Incident response training for its municipal employees that identify sanitary sewer spills;

(c) Code enforcement inspections;

(d) MS4 maintenance and inspections;

(e) Interagency coordination with sewer agencies; and

(f) Proper education of its municipal staff and contractors conducting field operations on the MS4 or its municipal sanitary sewer (if applicable).

x. Permittee Owned Treatment Control BMPs

(1) Each Permittee shall implement an inspection and maintenance program for all Permittee owned treatment control BMPs, including post-construction treatment control BMPs.

(2) Each Permittee shall ensure proper operation of all treatment control BMPs and maintain them as necessary for proper operation, including all post-construction treatment control BMPs.

(3) Any residual water[35] produced by a treatment control BMP and not being internal to the BMP performance when being maintained shall be:

(a) Hauled away and legally disposed of; or

(b) Applied to the land without runoff; or

(c) Discharged to the sanitary sewer system (with permits or authorization); or

(d) Treated or filtered to remove bacteria, sediments, nutrients, and meet the limitations set in Table 19 (Discharge Limitations for Dewatering Treatment BMPs), prior to discharge to the MS4.

Table 19. Discharge Limitations for Dewatering Treatment BMPs[36]

Parameter	Units	Limitation
Total Suspended Solids	mg/L	100
Turbidity	NTU	50
Oil and Grease	mg/L	10

i. Streets, Roads, and Parking Facilities Maintenance

i. Each Permittee shall designate streets and/or street segments within its jurisdiction as one of the following:

Priority A: Streets and/or street segments that are designated as consistently generating the highest volumes of trash and/or debris.

Priority B: Streets and/or street segments that are designated as consistently generating moderate volumes of trash and/or debris.

Priority C: Streets and/or street segments that are designated as generating low volumes of trash and/or debris.

ii. Each Permittee shall perform street sweeping of curbed streets according to the following schedule:

Priority A: Streets and/or street segments that are designated as Priority A shall be swept at least two times per month.

[35] See Attachment A.
[36] Technology based effluent limitations.

Priority B: Streets and/or street segments that are designated as Priority B shall be swept at least once per month.

Priority C: Streets and/or street segments that are designated as Priority C shall be swept as necessary but in no case less than once per year.

iii. Road Reconstruction

Each Permittee shall require that for any project that includes roadbed or street paving, repaving, patching, digouts, or resurfacing roadbed surfaces, that the following BMPs be implemented for each project.

(1) Restrict paving and repaving activity to exclude periods of rainfall or predicted rainfall[37] unless required by emergency conditions.

(2) Install sand bags or gravel bags and filter fabric at all susceptible storm drain inlets and at manholes to prevent spills of paving products and tack coat;

(3) Prevent the discharge of release agents including soybean oil, other oils, or diesel into the MS4 or receiving waters.

(4) Prevent non-storm water runoff from water use for the roller and for evaporative cooling of the asphalt.

(5) Clean equipment over absorbent pads, drip pans, plastic sheeting or other material to capture all spillage and dispose of properly.

(6) Collect liquid waste in a container, with a secure lid, for transport to a maintenance facility to be reused, recycled or disposed of properly.

(7) Collect solid waste by vacuuming or sweeping and securing in an appropriate container for transport to a maintenance facility to be reused, recycled or disposed of properly.

(8) Cover the “cold-mix” asphalt (i.e., pre-mixed aggregate and asphalt binder) with protective sheeting during a rainstorm.

(9) Cover loads with tarp before haul-off to a storage site, and do not overload trucks.

(10) Minimize airborne dust by using water spray during grinding.

(11) Avoid stockpiling soil, sand, sediment, asphalt material and asphalt grindings materials or rubble in or near MS4 or receiving waters.

(12) Protect stockpiles with a cover or sediment barriers during a rain.

iv. Parking Facilities Maintenance

(1) Permittee-owned parking lots exposed to storm water shall be kept clear of debris and excessive oil buildup and cleaned no less than 2 times per month and/or inspected no less than 2 times per month to determine if

[37] A probability of precipitation (POP) of 50% is required.

cleaning is necessary. In no case shall a Permittee-owned parking lot be cleaned less than once a month.

j. Emergency Procedures

i. Each Permittee may conduct repairs of essential public service systems and infrastructure in emergency situations with a self-waiver of the provisions of this Order as follows:

(1) The Permittee shall abide by all other regulatory requirements, including notification to other agencies as appropriate.

(2) Where the self-waiver has been invoked, the Permittee shall submit to the Regional Water Board Executive Officer a statement of the occurrence of the emergency, an explanation of the circumstances, and the measures that were implemented to reduce the threat to water quality, no later than 30 business days after the situation of emergency has passed.

(3) Minor repairs of essential public service systems and infrastructure in emergency situations (that can be completed in less than one week) are not subject to the notification provisions. Appropriate BMPs to reduce the threat to water quality shall be implemented.

k. Municipal Employee and Contractor Training

i. Each Permittee shall, no later than 1 year after Order adoption and annually thereafter before June 30, train all of their employees in targeted positions (whose interactions, jobs, and activities affect storm water quality) on the requirements of the overall storm water management program, or shall ensure contractors performing privatized/contracted municipal services are appropriately trained to:

(1) Promote a clear understanding of the potential for activities to pollute storm water.

(2) Identify opportunities to require, implement, and maintain appropriate BMPs in their line of work.

Outside contractors can self-certify, providing they certify they have received all applicable training required in the Permit and have documentation to that effect.

ii. Each Permittee shall, no later than 1 year after Order adoption and annually thereafter before June 30, train all of their employees and contractors who use or have the potential to use pesticides or fertilizers (whether or not they normally apply these as part of their work). Training programs shall address:

(1) The potential for pesticide-related surface water toxicity.

(2) Proper use, handling, and disposal of pesticides.

(3) Least toxic methods of pest prevention and control, including IPM.

(4) Reduction of pesticide use.

iii. Outside contractors can self-certify, providing they certify they have received all applicable training required in the Permit and have documentation to that effect.

10. Illicit Connections and Illicit Discharges Elimination Program

a. General

i. Each Permittee shall continue to implement an Illicit Connection and Illicit Discharge Elimination (IC/ID) Program to detect, investigate, and eliminate IC/IDs to the MS4. The IC/ID Program must be implemented in accordance with the requirements and performance measures specified in this Order.

ii. As stated in Part VI.A.2 of this Order, each Permittee must have adequate legal authority to prohibit IC/IDs to the MS4 and enable enforcement capabilities to eliminate the source of IC/IDs.

iii. Each Permittee's IC/ID Program shall consist of at least the following major program components:

(1) Procedures for conducting source investigations for IC/IDs

(2) Procedures for eliminating the source of IC/IDs

(3) Procedures for public reporting of illicit discharges

(4) Spill response plan

(5) IC/IDs education and training for Permittee staff

b. Illicit Discharge Source Investigation and Elimination

i. Each Permittee shall develop written procedures for conducting investigations to identify the source of all suspected illicit discharges, including procedures to eliminate the discharge once the source is located.

ii. At a minimum, each Permittee shall initiate an investigation(s) to identify and locate the source within 72 hours of becoming aware of the illicit discharge.

iii. When conducting investigations, each Permittee shall comply with the following:

(1) Illicit discharges suspected of being sanitary sewage and/or significantly contaminated shall be investigated first.

(2) Each Permittee shall track all investigations to document at a minimum the date(s) the illicit discharge was observed; the results of the investigation; any follow-up of the investigation; and the date the investigation was closed.

(3) Each Permittee shall investigate the source of all observed illicit discharges.

iv. When taking corrective action to eliminate illicit discharges, each Permittee shall comply with the following:

(1) If the source of the illicit discharge has been determined to originate within the Permittee's jurisdiction, the Permittee shall immediately notify the responsible party/parties of the problem, and require the responsible party to initiate all necessary corrective actions to eliminate the illicit discharge. Upon being notified that the discharge has been eliminated, the Permittee shall conduct a follow-up investigation to verify that the discharge has been eliminated and cleaned-up to the satisfaction of the Permittee(s). Each Permittee shall document its follow-up investigation. Each Permittee may seek recovery and remediation costs from responsible parties or require compensation for the cost of all inspection, investigation, cleanup and oversight activities. Resulting enforcement actions shall follow the program's Progressive Enforcement Policy, per Part VI.D.2.

(2) If the source of the illicit discharge has been determined to originate within an upstream jurisdiction, the Permittee shall notify the upstream jurisdiction and the Regional Water Board within 30 days of such determination and provide all of the information collected regarding efforts to identify its source. Each Permittee may seek recovery and remediation costs from responsible parties or require compensation for the cost of all inspection, investigation, cleanup and oversight activities. Resulting enforcement actions shall follow the program's Progressive Enforcement Policy, per Part VI.D.2.

(3) If the source of the illicit discharge cannot be traced to a suspected responsible party, affected Permittees shall implement its spill response plan and then initiate a permanent solution as described in section 10.b.v below.

v. In the event the Permittee is unable to eliminate an ongoing illicit discharge following full execution of its legal authority and in accordance with its Progressive Enforcement Policy, or other circumstances prevent the full elimination of an ongoing illicit discharge, including the inability to find the responsible party/parties, the Permittee shall provide for diversion of the entire flow to the sanitary sewer or provide treatment. In either instance, the Permittee shall notify the Regional Water Board in writing within 30 days of such determination and shall provide a written plan for review and comment that describes the efforts that have been undertaken to eliminate the illicit discharge, a description of the actions to be undertaken, anticipated costs, and a schedule for completion.

c. Identification and Response to Illicit Connections

i. Investigation

Each Permittee, upon discovery or upon receiving a report of a suspected illicit connection, shall initiate an investigation within 21 days, to determine the following: (1) source of the connection, (2) nature and volume of discharge through the connection, and (3) responsible party for the connection.

ii. Elimination

Each Permittee, upon confirmation of an illicit MS4 connection, shall ensure that the connection is:

(1) Permitted or documented, provided the connection will only discharge storm water and non-storm water allowed under this Order or other individual or general NPDES Permits/WDRs, or
(2) Eliminated within 180 days of completion of the investigation, using its formal enforcement authority, if necessary, to eliminate the illicit connection.

iii. Documentation

Formal records must be maintained for all illicit connection investigations and the formal enforcement taken to eliminate illicit connections.

d. Public Reporting of Non-Storm Water Discharges and Spills

i. Each Permittee shall promote, publicize, and facilitate public reporting of illicit discharges or water quality impacts associated with discharges into or from MS4s through a central contact point, including phone numbers and an internet site for complaints and spill reporting. Each Permittee shall also provide the reporting hotline to Permittee staff to leverage the field staff that has direct contact with the MS4 in detecting and eliminating illicit discharges.

ii. Each Permittee shall implement the central point of contact and reporting hotline requirements listed in this part in one or more of the following methods:

(1) By participating in a County-wide sponsored hotline

(2) By participating in one or more Watershed Group sponsored hotlines

(3) Or individually within its own jurisdiction

(4) The LACFCD shall, in collaboration with the County, continue to maintain the 888-CLEAN-LA hotline and internet site to promote, publicize, and facilitate public reporting of illicit discharges or water quality impacts associated with discharges into or from MS4s.

iii. Each Permittee shall ensure that signage adjacent to open channels, as required in Part F.8.h.vi, includes information regarding dumping prohibitions and public reporting of illicit discharges.

iv. Each Permittee shall develop and maintain written procedures that document how complaint calls are received, documented, and tracked to ensure that all complaints are adequately addressed. The procedures shall be evaluated to determine whether changes or updates are needed to ensure that the procedures accurately document the methods employed by the Permittee. Any identified changes shall be made to the procedures subsequent to the evaluation.

v. Each Permittee shall maintain documentation of the complaint calls and record the location of the reported spill or IC/ ID and the actions undertaken in response to all IC/ID complaints, including referrals to other agencies.

e. Spill Response Plan

i. Each Permittee shall implement a spill response plan for all sewage and other spills that may discharge into its MS4. The spill response plan shall clearly identify agencies responsible for spill response and cleanup, telephone numbers and e-mail address for contacts, and shall contain at a minimum the following requirements:

(1) Coordination with spill response teams throughout all appropriate departments, programs and agencies so that maximum water quality protection is provided.

(2) Initiate investigation of all public and employee spill complaints within one business day of receiving the complaint to assess validity.

(3) Response to spills for containment within 4 hours of becoming aware of the spill, except where such spills occur on private property, in which case the response should be within 2 hours of gaining legal access to the property.

(4) Spills that may endanger health or the environment shall be reported to appropriate public health agencies and the Office of Emergency Services (OES).

f. Illicit Connection and Illicit Discharge Education and Training

i. Each Permittee must continue to implement a training program regarding the identification of IC/IDs for all municipal field staff, who, as part of their normal job responsibilities (e.g., street sweeping, storm drain maintenance, collection system maintenance, road maintenance), may come into contact with or otherwise observe an illicit discharge or illicit connection to the MS4. Contact information, including the procedure for reporting an illicit discharge, must be readily available to field staff. Training program documents must be available for review by the permitting authority.

ii. Each Permittee shall ensure contractors performing privatized/contracted municipal services such as, but not limited to, storm and/or sanitary sewer system inspection and repair, street sweeping, trash pick-up and disposal, and street and right-of-way construction and repair are trained regarding IC/ID identification and reporting. Permittees may provide training or include contractual requirements for IC/ID identification and reporting training. Outside contractors can self-certify, providing they certify they have received all applicable training required in the Permit and have documentation to that effect.

iii. Each Permittee's training program should address, at a minimum, the following:

(1) IC/ID identification, including definitions and examples,

(2) investigation,

(3) elimination,

(4) cleanup,

(5) reporting, and

(6) documentation.

iv. Each Permittee must create a list of applicable positions and contractors which require IC/ID training and ensure that training is provided at least twice during the term of the Order. Each Permittee must maintain documentation of the training activities.

v. New Permittee staff members must be provided with IC/ID training within 180 days of starting employment.

E. Total Maximum Daily Load Provisions

1. The provisions of this Part VI.E. implement and are consistent with the assumptions and requirements of all waste load allocations (WLAs) established in TMDLs for which some or all of the Permittees in this Order are responsible.

a. Part VI.E of this Order includes provisions that are designed to assure that Permittees achieve WLAs and meet other requirements of TMDLs covering receiving waters impacted by the Permittees' MS4 discharges. TMDL provisions are grouped by WMA (WMA) in Attachments L through R.

b. The Permittees subject to each TMDL are identified in Attachment K.

c. The Permittees shall comply with the applicable water quality-based effluent limitations and/or receiving water limitations contained in Attachments L through R, consistent with the assumptions and requirements of the WLAs established in the TMDLs, including implementation plans and schedules, where provided for in the State adoption and approval of the TMDL (40 CFR §122.44(d)(1)(vii)(B); Cal. Wat. Code §13263(a)).

d. A Permittee may comply with water quality-based effluent limitations and receiving water limitations in Attachments L through R using any lawful means.

2. Compliance Determination

a. General

i. A Permittee shall demonstrate compliance at compliance monitoring points established in each TMDL or, if not specified in the TMDL, at locations identified in an approved TMDL monitoring plan or in accordance with an approved integrated monitoring program per Attachment E, Part VI.C.5 (Integrated Watershed Monitoring and Assessment).

ii. Compliance with water quality-based effluent limitations shall be determined as described in Parts VI.E.2.d and VI.E.2.e, or for trash water quality-based effluent limitations as described in Part VI.E.5.b, or as otherwise set forth in TMDL specific provisions in Attachments L through R.

iii. Pursuant to Part VI.C, a Permittee may, individually or as part of a watershed-based group, develop and submit for approval by the Regional Water Board Executive Officer a Watershed Management Program that addresses all water quality-based effluent limitations and receiving water limitations to which the Permittee is subject pursuant to established TMDLs.

b. Commingled Discharges

i. A number of the TMDLs establish WLAs that are assigned jointly to a group of Permittees whose storm water and/or non-storm water discharges are or may be commingled in the MS4 prior to discharge to the receiving water subject to the TMDL.

ii. In these cases, pursuant to 40 CFR section 122.26(a)(3)(vi), each Permittee is only responsible for discharges from the MS4 for which they are owners and/or operators.

iii. Where Permittees have commingled discharges to the receiving water, compliance at the outfall to the receiving water or in the receiving water shall be determined for the group of Permittees as a whole unless an individual Permittee demonstrates that its discharge did not cause or contribute to the exceedance, pursuant to subpart v. below.

iv. For purposes of compliance determination, each Permittee is responsible for demonstrating that its discharge did not cause or contribute to an exceedance of an applicable water quality-based effluent limitation(s) at the outfall or receiving water limitation(s) in the target receiving water.

v. A Permittee may demonstrate that its discharge did not cause or contribute to an exceedance of an applicable water quality-based effluent limitation or receiving water limitation in any of the following ways:

(1) Demonstrate that there is no discharge from the Permittee's MS4 into the applicable receiving water during the time period subject to the water quality-based effluent limitation and/or receiving water limitation; or

(2) Demonstrate that the discharge from the Permittee's MS4 is controlled to a level that does not exceed the applicable water quality-based effluent limitation; or

(3) For exceedances of bacteria receiving water limitations or water quality-based effluent limitations, demonstrate through a source investigation pursuant to protocols established under California Water Code section

13178 or for exceedances of other receiving water limitations or water quality-based effluent limitations, demonstrate using other accepted source identification protocols, that pollutant sources within the jurisdiction of the Permittee or the Permittee's MS4 have not caused or contributed to the exceedance of the Receiving Water Limitation(s).

c. Receiving Water Limitations Addressed by a TMDL

i. For receiving water limitations in Part V.A. associated with water body-pollutant combinations addressed in a TMDL, Permittees shall achieve compliance with the receiving water limitations in Part V.A. as outlined in this Part VI.E. and Attachments L through R of this Order.

ii. A Permittee's full compliance with the applicable TMDL requirement(s), including compliance schedules, of this Part VI.E. and Attachments L through R constitutes compliance with Part V.A. of this Order for the specific pollutant addressed in the TMDL.

iii. As long as a Permittee is in compliance with the applicable TMDL requirements in a time schedule order (TSO) issued by the Regional Water Board pursuant to California Water Code sections 13300 and 13385(j)(3), it is not the Regional Water Board's intention to take an enforcement action for violations of Part V.A. of this Order for the specific pollutant(s) addressed in the TSO.

d. Interim Water Quality-Based Effluent Limitations and Receiving Water Limitations

i. A Permittee shall be considered in compliance with an applicable interim water quality-based effluent limitation and interim receiving water limitation for a pollutant associated with a specific TMDL if any of the following is demonstrated:

(1) There are no violations of the interim water quality-based effluent limitation for the pollutant associated with a specific TMDL at the Permittee's applicable MS4 outfall(s),[38] including an outfall to the receiving water that collects discharges from multiple Permittees' jurisdictions;

(2) There are no exceedances of the applicable receiving water limitation for the pollutant associated with a specific TMDL in the receiving water(s) at, or downstream of, the Permittee's outfall(s);

(3) There is no direct or indirect discharge from the Permittee's MS4 to the receiving water during the time period subject to the water quality-based effluent limitation and/or receiving water limitation for the pollutant associated with a specific TMDL; or

[38] An outfall may include a manhole or other point of access to the MS4 at the Permittee's jurisdictional boundary.

(4) The Permittee has submitted and is fully implementing an approved Watershed Management Program or EWMP pursuant to Part VI.C.

(a) To be considered fully implementing an approved Watershed Management Program or EWMP, a Permittee must be implementing all actions consistent with the approved program and applicable compliance schedules, including structural BMPs.

(b) Structural storm water BMPs or systems of BMPs should be designed and maintained to treat storm water runoff from the 85th percentile, 24-hour storm, where feasible and necessary to achieve applicable WQBELs and receiving water limitations, and maintenance records must be up-to-date and available for inspection by the Regional Water Board.

(c) A Permittee that does not implement the Watershed Management Program in accordance with the milestones and compliance schedules shall demonstrate compliance with its interim water quality-based effluent limitations and/or receiving water limitations pursuant to Part VI.E.2.d.i.(1)-(3), above.

(d) Upon notification of a Permittee's intent to develop a WMP or EWMP and prior to approval of its WMP or EWMP, a Permittee's full compliance with all of the following requirements shall constitute a Permittee's compliance with provisions pertaining to interim WQBELs with compliance deadlines occurring prior to approval of a WMP or EWMP. This subdivision (d) shall not apply to interim trash WQBELs.

(1) Provides timely notice of its intent to develop a WMP or EWMP,

(2) Meets all interim and final deadlines for development of a WMP or EWMP,

(3) For the area to be covered by the WMP or EWMP, targets implementation of watershed control measures in its existing storm water management program, including watershed control measures to eliminate non-storm water discharges of pollutants through the MS4 to receiving waters, to address known contributions of pollutants from MS4 discharges that cause or contribute to the impairment(s) addressed by the TMDL(s), and

(4) Receives final approval of its WMP or EWMP within 28 or 40 months, respectively.

e. Final Water Quality-based Effluent Limitations and/or Receiving Water Limitations

i. A Permittee shall be deemed in compliance with an applicable final water quality-based effluent limitation and final receiving water limitation for the pollutant(s) associated with a specific TMDL if any of the following is demonstrated:

(1) There are no violations of the final water quality-based effluent limitation for the specific pollutant at the Permittee's applicable MS4 outfall(s)[39];

(2) There are no exceedances of applicable receiving water limitation for the specific pollutant in the receiving water(s) at, or downstream of, the Permittee's outfall(s);

(3) There is no direct or indirect discharge from the Permittee's MS4 to the receiving water during the time period subject to the water quality-based effluent limitation and/or receiving water limitation for the pollutant(s) associated with a specific TMDL; or

(4) In drainage areas where Permittees are implementing an EWMP, (i) all non-storm water and (ii) all storm water runoff up to and including the volume equivalent to the 85th percentile, 24-hour event is retained for the drainage area tributary to the applicable receiving water, and the Permittee is implementing all requirements of the EWMP, including, but not limited to, Parts VI.C.7 and VI.C.8 of this Order. This provision (4) shall not apply to final trash WQBELs.

3. USEPA Established TMDLs

TMDLs established by the USEPA, to which Permittees are subject, do not contain an implementation plan adopted pursuant to California Water Code section 13242. However, USEPA has included implementation recommendations as part of these TMDLs. In lieu of inclusion of numeric water quality based effluent limitations at this time, this Order requires Permittees subject to WLAs in USEPA established TMDLs to propose and implement best management practices (BMPs) that will be effective in achieving compliance with USEPA established numeric WLAs. The Regional Water Board may, at its discretion, revisit this decision within the term of this Order or in a future permit, as more information is developed to support the inclusion of numeric water quality based effluent limitations.

a. Each Permittee shall propose BMPs to achieve the WLAs contained in the applicable USEPA established TMDL(s), and a schedule for implementing the BMPs that is as short as possible, in a Watershed Management Program or EWMP.

[39] Ibid.

b. Each Permittee may either individually submit a Watershed Management Program, or may jointly submit a WMP or EWMP with other Permittees subject to the WLAs contained in the USEPA established TMDL.

c. At a minimum, each Permittee shall include the following information in its Watershed Management Program or EWMP, relevant to each applicable USEPA established TMDL:

i. Available data demonstrating the current quality of the Permittee's MS4 discharge(s) in terms of concentration and/or load of the target pollutant(s) to the receiving waters subject to the TMDL;

ii. A detailed description of BMPs that have been implemented, and/or are currently being implemented by the Permittee to achieve the WLA(s), if any;

iii. A detailed time schedule of specific actions the Permittee will take in order to achieve compliance with the applicable WLA(s);

iv. A demonstration that the time schedule requested is as short as possible, taking into account the time since USEPA establishment of the TMDL, and technological, operation, and economic factors that affect the design, development, and implementation of the control measures that are necessary to comply with the WLA(s);

(1) For the Malibu Creek Nutrient TMDL established by USEPA in 2003, in no case shall the time schedule to achieve the final numeric WLAs exceed five years from the effective date of this Order; and

v. If the requested time schedule exceeds one year, the proposed schedule shall include interim requirements and numeric milestones and the date(s) for their achievement.

d. Each Permittee subject to a WLA in a TMDL established by USEPA shall submit a draft of a Watershed Management Program or EWMP to the Regional Water Board Executive Officer for approval per the schedule Part VI.C.4.

e. If a Permittee does not submit a Watershed Management Program, or the plan is determined to be inadequate by the Regional Water Board Executive Officer and the Permittee does not make the necessary revisions within 90 days of written notification that plan is inadequate, the Permittee shall be required to demonstrate compliance with the numeric WLAs immediately based on monitoring data collected under the MRP (Attachment E) for this Order.

4. State Adopted TMDLs where Final Compliance Deadlines have Passed

a. Permittees shall comply immediately with water quality-based effluent limitations and/or receiving water limitations to implement WLAs in state-adopted TMDLs for which final compliance deadlines have passed pursuant to the TMDL implementation schedule.

b. Where a Permittee believes that additional time to comply with the final water quality-based effluent limitations and/or receiving water limitations is necessary, a Permittee may within 45 days of Order adoption, or no less than 90 days prior to the final compliance deadline if after adoption of the Order, request a time schedule order pursuant to California Water Code section 13300 for the Regional Water Board's consideration.

c. Permittees may either individually request a TSO, or may jointly request a TSO with all Permittees subject to the water quality-based effluent limitations and/or receiving water limitations, to implement the WLAs in the state-adopted TMDL.

d. At a minimum, a request for a time schedule order shall include the following:

i. Data demonstrating the current quality of the MS4 discharge(s) in terms of concentration and/or load of the target pollutant(s) to the receiving waters subject to the TMDL;

ii. A detailed description and chronology of structural controls and source control efforts, since the effective date of the TMDL, to reduce the pollutant load in the MS4 discharges to the receiving waters subject to the TMDL;

iii. Justification of the need for additional time to achieve the water quality-based effluent limitations and/or receiving water limitations;

iv. A detailed time schedule of specific actions the Permittee will take in order to achieve the water quality-based effluent limitations and/or receiving water limitations;

v. A demonstration that the time schedule requested is as short as possible, taking into account the technological, operation, and economic factors that affect the design, development, and implementation of the control measures that are necessary to comply with the effluent limitation(s); and

vi. If the requested time schedule exceeds one year, the proposed schedule shall include interim requirements and the date(s) for their achievement. The interim requirements shall include both of the following:

(1) Effluent limitation(s) for the pollutant(s) of concern; and

(2) Actions and milestones leading to compliance with the effluent limitation(s).

5. Water Quality-Based Effluent Limitations for Trash

Permittees assigned a Waste Load Allocation in a trash TMDL shall comply as set forth below.

a. Effluent Limitations: Permittees shall comply with the interim and final water quality-based effluent limitations for trash set forth in Attachments L through R for the following Trash TMDLs:

i. Lake Elizabeth Trash TMDL (Attachment L)

ii. Santa Monica Bay Nearshore and Offshore Debris TMDL (Attachment M)

iii. Malibu Creek Watershed Trash TMDL (Attachment M)

iv. Ballona Creek Trash TMDL (Attachment M)

v. Machado Lake Trash TMDL (Attachment N)

vi. Los Angeles River Trash TMDL (Attachment O)

vii. Peck Road Park Lake Trash TMDL (Attachment O)

viii. Echo Park Lake Trash TMDL (Attachment O)

ix. Legg Lake Trash TMDL (Attachment O)

b. Compliance

i. Pursuant to California Water Code section 13360(a), Permittees may comply with the trash effluent limitations using any lawful means. Such compliance options are broadly classified as *full capture*, *partial capture, institutional controls,* or *minimum frequency of assessment and collection,* as described below, and any combination of these may be employed to achieve compliance:

(1) Full Capture Systems:

(a) The Basin Plan authorizes the Regional Water Board Executive Officer to certify *full capture systems*, which are systems that meet the operating and performance requirements as described in this Order, and the procedures identified in "Procedures and Requirements for Certification of a Best Management Practice for Trash Control as a Full Capture System."[40]

(b) Permittees are authorized to comply with their effluent limitations through certified *full capture systems* provided the requirements of

[40] The Regional Water Board currently recognizes eight *full capture systems*. These are: Vortex Separation Systems (VSS) and seven other Executive Officer certified *full capture systems*, including specific types or designs of trash nets; two gross solids removal devices (GSRDs); catch basin brush inserts and mesh screens; vertical and horizontal trash capture screen inserts; and a connector pipe screen device. See August 3, 2004 Los Angeles Regional Water Quality Control Board Memorandum titled "Procedures and Requirements for Certification of a Best Management Practice for Trash Control as a Full Capture System.

paragraph (c), immediately below, and any conditions in the certification, continue to be met.

(c) Permittees may comply with their effluent limitations through progressive installation of *full capture systems* throughout their jurisdictional areas until all areas draining to Lake Elizabeth, Santa Monica Bay, Malibu Creek, Ballona Creek, Machado Lake, the Los Angeles River system, Legg Lake, Peck Road Park Lake, and/or Echo Park Lake are addressed. For purposes of this Order, attainment of the effluent limitations shall be conclusively presumed for any drainage area to Lake Elizabeth, Santa Monica Bay, Malibu Creek (and its tributaries), Ballona Creek (and its tributaries), Machado Lake, the Los Angeles River (and its tributaries), Legg Lake, Peck Road Park Lake, and/or Echo Park Lake where certified *full capture systems* treat all drainage from the area, provided that the *full capture systems* are adequately sized and maintained, and that maintenance records are up-to-date and available for inspection by the Regional Water Board.

(i) A Permittee shall be deemed in compliance with its final effluent limitation if it demonstrates that all drainage areas under its jurisdiction and/or authority are serviced by appropriate certified *full capture systems* as described in paragraph (1)(c).

(ii) A Permittee shall be deemed in compliance with its interim effluent limitations, where applicable:

1. By demonstrating that *full capture systems* treat the percentage of drainage areas in the watershed that corresponds to the required trash abatement.

2. Alternatively, a Permittee may propose a schedule for installation of *full capture systems* in areas under its jurisdiction and/or authority within a given watershed, targeting first the areas of greatest trash generation, for the Executive Officer's approval. The Executive Officer shall not approve any such schedule that does not result in timely compliance with the final effluent limitations, consistent with the established TMDL implementation schedule and applicable State policies. A Permittee shall be deemed in compliance with its interim effluent limitations provided it is fully in compliance with any such approved schedule.

(2) Partial Capture Devices and Institutional Controls: Permittees may comply with their interim and final effluent limitations through the installation of *partial capture devices* and the application of *institutional controls*.[41]

(a) Trash discharges from areas serviced solely by *partial capture devices* may be estimated based on demonstrated performance of the

[41] While interim effluent limitations may be complied with using *partial capture devices*, compliance with final effluent limitations cannot be achieved with the exclusive use of *partial capture devices*.

device(s) in the implementing area.[42] That is, trash reduction is equivalent to the *partial capture devices'* trash removal efficiency multiplied by the percentage of drainage area serviced by the devices.

(b) Except as provided in subdivision (c), immediately below, trash discharges from areas addressed by *institutional controls* and/or *partial capture devices* (where site-specific performance data is not available) shall be calculated using a mass balance approach, based on the daily generation rate (DGR) for a representative area.[43] The DGR shall be determined from direct measurement of trash deposited in the drainage area during any thirty-day period between June 22nd and September 22nd exclusive of rain events[44], and shall be re-calculated every year thereafter unless a less frequent period for recalculation is approved by the Regional Water Board Executive Officer. The DGR shall be calculated as the total amount of trash collected during this period divided by the length of the collection period.

DGR = (Amount of trash collected during a 30-day collection period[45] / (30 days)

The DGR for the applicable area under the Permittees' jurisdiction and/or authority shall be extrapolated from that of the representative drainage area(s). A mass balance equation shall be used to estimate the amount of trash discharged during a storm event.[46] The *Storm Event Trash Discharge* for a given rain event in the Permittee's drainage area shall be calculated by multiplying the number of days since the last street sweeping by the DGR and subtracting the amount of any trash recovered in the catch basins.[47] For each day of a storm event that generates precipitation greater than 0.25 inch, the Permittee shall calculate a *Storm Event Trash Discharge*.

Storm Event Trash Discharge = [(Days since last street sweeping*DGR)] – [Amount of trash recovered from catch basins][48]

The sum of the *Storm Event Trash Discharges* for the storm year shall be the Permittee's calculated annual trash discharge.

Total Storm Year Trash Discharge = ∑Storm Event Trash Discharges from Drainage Area

[42] Performance shall be demonstrated under different conditions (e.g. low to high trash loading).
[43] The area(s) should be representative of the land uses and activities within the Permittees' authority and shall be approved by the Executive Officer prior to the 30-day collection period.
[44] Provided no special events are scheduled that may affect the representative nature of that collection period.
[45] Between June 22nd and September 22nd
[46] Amount of trash shall refer to the uncompressed volume (in gallons) or drip-dry weight (in pounds) of trash collected.
[47] Any negative values shall be considered to represent a zero discharge.
[48] When more than one storm event occurs prior to the next street sweeping the discharge shall be calculated from the date of the last assessment.

(c) The Executive Officer may approve alternative compliance monitoring approaches for calculating total storm year trash discharge, upon finding that the program will provide a scientifically-based estimate of the amount of trash discharged from the Permittee's MS4.

(3) Combined Compliance Approaches:

Permittees may comply with their interim and final effluent limitations through a combination of *full capture systems*, *partial capture devices*, and *institutional controls*. Where a Permittee relies on a combination of approaches, it shall demonstrate compliance with the interim and final effluent limitations as specified in (1)(c) in areas where *full capture systems* are installed and as specified in (2)(a) or (2)(b), as appropriate, in areas where *partial capture devices* and *institutional controls* are applied.

(4) Minimum Frequency of Assessment and Collection Approach:

If allowed in a trash TMDL and approved by the Executive Officer, a Permittee may alternatively comply with its final effluent limitations by implementing a program for *minimum frequency of assessment and collection* (MFAC) in conjunction with BMPs. To the satisfaction of the Executive Officer, the MFAC/BMP program must meet the following criteria:

(a) The MFAC/BMP Program includes an initial minimum frequency of trash assessment and collection and suite of structural and/or nonstructural BMPs. The MFAC/BMP program shall include collection and disposal of all trash found in the receiving water and shoreline. Permittees shall implement an initial suite of BMPs based on current trash management practices in land areas that are found to be sources of trash to the water body. The initial minimum frequency of trash assessment and collection shall be set as specified in the following TMDLs:

(i) Malibu Creek Watershed Trash TMDL

(ii) Machado Lake Trash TMDL

(iii) Legg Lake Trash TMDL

(b) The MFAC/BMP Program includes reasonable assurances that it will be implemented by the responsible Permittees.

(c) MFAC protocols may be based on SWAMP protocols for rapid trash assessment, or alternative protocols proposed by Permittees and approved by the Regional Water Board Executive Officer.

(d) Implementation of the MFAC/BMP program should include a Health and Safety Program to protect personnel. The MFAC/BMP program shall not require Permittees to access and collect trash from areas where personnel are prohibited.

(e) The Regional Water Board Executive Officer may approve or require a revised assessment and collection frequency and definition of the critical conditions under the MFAC:

(i) To prevent trash from accumulating in deleterious amounts that cause nuisance or adversely affect beneficial uses between collections;

(ii) To reflect the results of trash assessment and collection;

(iii) If the amount of trash collected does not show a decreasing trend, where necessary, such that a shorter interval between collections is warranted; or

(iv) If the amount of trash collected is decreasing such that a longer interval between collections is warranted.

(f) At the end of the implementation period, a revised MFAC/BMP program may be required if the Regional Water Board Executive Officer determines that the amount of trash accumulating between collections is causing nuisance or otherwise adversely affecting beneficial uses.

(g) With regard to (4)(e)(i), (4)(e)(ii), or (4)(e)(iii), above, the Regional Water Board Executive Officer is authorized to allow responsible Permittees to implement additional structural or non-structural BMPs in lieu of modifying the monitoring frequency.

ii. If a Permittee is not in compliance with its applicable interim and/or final effluent limitation as identified in Attachments L through R, then it shall be in violation of this Order.

(1) A Permittee relying on *partial capture devices* and/or *institutional controls* that has violated its interim and/or final effluent limitation(s) shall be presumed to have violated the applicable limitation for each day of each storm event that generated precipitation greater than 0.25 inch during the applicable storm year, except those storm days on which it establishes that its cumulative Storm Event Trash Discharges has not exceeded the applicable effluent limitation.

(2) If a Permittee relying on *full capture systems* has failed to demonstrate that the *full capture systems* for any drainage area are adequately sized and maintained, and that maintenance records are up-to-date and available for inspection by the Regional Water Board, and that it is in compliance with any conditions of its certification, shall be presumed to have discharged trash in an amount that corresponds to the percentage of the baseline waste load allocation represented by the drainage area in question.

(a) A Permittee may overcome this presumption by demonstrating (using any of the methods authorized in Part VI.E.5.b) that the actual or

calculated discharge for that drainage area is in compliance with the applicable interim or final effluent limitation.

iii. Each Permittee shall be held liable for violations of the effluent limitations assigned to their area. If a Permittee's compliance strategy includes *full* or *partial capture devices* and it chooses to install a full or partial capture device in the MS4 physical infrastructure of another public entity, it is responsible for obtaining all necessary permits to do so. If a Permittee believes it is unable to obtain the permits needed to install a full capture or partial capture device within another Permittee's MS4 physical infrastructure, either Permittee may request the Executive Officer to hold a conference with the Permittees. Nothing in this Order shall affect the right of that public entity or a Permittee to seek indemnity or other recourse from the other as they deem appropriate. Nothing in this subsection shall be construed as relieving a Permittee of any liability that the Permittee would otherwise have under this Order.

c. Monitoring and Reporting Requirements (pursuant to California Water Code section 13383)

i. Each Permittee shall submit a TMDL Compliance Report as part of its Annual Report detailing compliance with the applicable interim and/or final effluent limitations. Reporting shall include the information specified below. The report shall be submitted on the reporting form specified by the Regional Water Board Executive Officer. The report shall be signed under penalty of perjury by the Permittee's principal executive officer or ranking elected official or duly authorized representative of the officer, consistent with Part V.B of Attachment D (Standard Provisions), who is responsible for ensuring compliance with this Order. Each Permittee shall be charged with and shall demonstrate compliance with its applicable effluent limitations beginning with its December 15, 2013, TMDL Compliance Report.

(1) <u>Reporting Compliance based on Full Capture Systems</u>: Permittees shall provide information on the number and location of full capture installations, the sizing of each full capture installation, the drainage areas addressed by these installations, and compliance with the applicable interim or final effluent limitation, in its TMDL Compliance Report. The Los Angeles Water Board will periodically audit sizing, performance, and other data to validate that a system satisfies the criteria established for a *full capture system* and any conditions established by the Regional Water Board Executive Officer in the certification.

(2) <u>Reporting Compliance based on Partial Capture Systems and/or Institutional Controls</u>:

(a) Using Performance Data Specific to the Permittee's Area: In its TMDL Compliance Report, a Permittee shall provide: (i) site-specific performance data for the applicable device(s); (ii) information on the number and location of such installations, and the drainage areas

addressed by these installations; and (iii) calculated compliance with the applicable effluent limitations.

(b) Using Direct Measurement of Trash Discharge: Permittees shall provide an accounting of DGR and trash removal via street sweeping, catch basin clean outs, etc., in a database to facilitate the calculation of discharge for each rain event. The database shall be maintained and provided to the Regional Water Board for inspection upon request. In its TMDL Compliance Report, a Permittee shall provide information on its annual DGR, calculated storm year discharge, and compliance with the applicable effluent limitation.

(3) Reporting Compliance based on Combined Compliance Approaches:

Permittees shall provide the information specified in Part VI.E.5.c.i(1) for areas where *full capture systems* are installed and that are specified in Part VI.E.5.c.i(2)(a) or (b), as appropriate, for areas where *partial capture devices* and *institutional controls* are applied. In its TMDL Compliance Report, a Permittee shall also provide information on compliance with the applicable effluent limitation based on the combined compliance approaches.

(4) Reporting Compliance based on an MFAC/BMP Approach:

The MFAC/BMP Program includes a Trash Monitoring and Reporting Plan, and a requirement that the responsible Permittees will self-report any non-compliance with its provisions. The results and report of the Trash Monitoring and Reporting Plan must be submitted to Regional Water Board with the Permittee's Annual Report.

ii. Violation of the reporting requirements of this Part shall be punishable pursuant to, inter alia, California Water Code section 13385, subdivisions (a)(3) and (h)(1), and/or section 13385.1.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD

LOS ANGELES REGION

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ATTACHMENT F – FACT SHEET

FOR

ORDER R4-2012-0175
(as amended by Order WQ 2015-0075)**
NPDES PERMIT NO. CAS004001

WASTE DISCHARGE REQUIREMENTS FOR MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) DISCHARGES WITHIN THE COASTAL WATERSHEDS OF LOS ANGELES COUNTY, EXCEPT THOSE DISCHARGES ORIGINATING FROM THE CITY OF LONG BEACH MS4

November 8, 2012

(amended on June 16, 2015)

**Note that conforming changes per State Water Board Order WQ 2015-0075 are shown in underlined text.

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As described in Part II of this Order, this Fact Sheet sets forth the significant factual, legal, methodological, and policy rationale that serve as the basis for the requirements of this Order.

This Order has been prepared under a standardized format to accommodate a broad range of discharge requirements for dischargers in California.

I. PERMIT INFORMATION

The following table summarizes administrative information related to the facility and the Dischargers.

Table F-1. Facility and Discharger Information

WDID	Various (See Table 4 of Order)
Dischargers	The Los Angeles County Flood Control District, the County of Los Angeles, and 84 incorporated cities within the coastal watersheds of Los Angeles County with the exception of the City of Long Beach (See Table 4 of Order)
Name of Facility	Municipal Separate Storm Sewer Systems (MS4s) within the Coastal Watersheds of Los Angeles County with the exception of the City of Long Beach MS4
Facility Address	Various
Facility Contact, Title and Phone	Various (See Table 4 of Order)
Mailing Address	Various (See Table 4 of Order)
Billing Address	Same as above
Type of Facility	Large Municipal Separate Storm Sewer System (MS4)[1]
Major or Minor Facility	Major
Watersheds	(1) Santa Clara River Watershed; (2) Santa Monica Bay Watershed Management Area, including Malibu Creek Watershed and Ballona Creek Watershed; (3) Los Angeles River Watershed; (4) Dominguez Channel and Greater Los Angeles/Long Beach Harbors Watershed Management Area; (5) Los Cerritos Channel and Alamitos Bay Watershed Management Area;(6) San Gabriel River Watershed; and (7) Santa Ana River Watershed

[1] According to 40 CFR § 122.26(b)(8), "[a] municipal separate storm sewer system (MS4) means a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains):
(i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the CWA that discharges to waters of the United States;
(ii) Designed or used for collecting or conveying storm water;
(iii) Which is not a combined sewer; and
(iv) Which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.2."

Receiving Water	Surface waters identified in Tables 2-1, 2-1a, 2-3, and 2-4, and Appendix 1, Table 1 of the Water Quality Control Plan - Los Angeles Region (Basin Plan), and other unidentified tributaries to these surface waters within the following Watershed Management Areas: (1) Santa Clara River Watershed; (2) Santa Monica Bay Watershed Management Area, including Malibu Creek Watershed and Ballona Creek Watershed; (3) Los Angeles River Watershed; (4) Dominguez Channel and Greater Los Angeles/Long Beach Harbors Watershed Management Area; (5) Los Cerritos Channel and Alamitos Bay Watershed Management Area; (6) San Gabriel River Watershed; and (7) Santa Ana River Watershed[2].
Receiving Water Type	Inland surface waters, estuarine waters, and marine waters, including wetlands, lakes, rivers, estuaries, lagoons, harbors, bays, and beaches

The Los Angeles County Flood Control District, Los Angeles County, and the 84 municipalities listed in Table F-2 above are the owners and/or operators[3] of Municipal Separate Storm Sewer Systems within the Coastal Watersheds of Los Angeles County (hereinafter Facility).

For the purposes of this Order, the entities listed in Table 4 of the Order are hereinafter referred to separately as “Permittees” and jointly as the “Dischargers.” References to “discharger” or “permittee” or “co-permittee” or “municipality” in applicable federal and state laws, regulations, plans, or policy are held to be equivalent to references to the Dischargers or Permittees herein.

II. FACILITY DESCRIPTION

A. Description of the Permittees’ MS4s

The Permittees’ MS4s, like many MS4s in the nation, are based on regional floodwater management systems that use both natural and altered water bodies to achieve flood management goals. The Permittees’ MS4s comprise a large interconnected system, controlled in large part by the Los Angeles County Flood Control District (LACFCD), among others, and used by multiple cities along with Los Angeles County. This extensive system conveys storm water and non-storm water across municipal boundaries where it is commingled within the MS4 and then discharged to receiving water bodies.

[2] Note that the Santa Ana River Watershed lies primarily within the boundaries of the Santa Ana Regional Water Quality Control Board. However, a portion of the Chino Basin subwatershed lies within the jurisdictions of Pomona and Claremont in Los Angeles County. The primary receiving water within the Los Angeles County portion of the Chino Basin subwatershed are San Antonio Creek and Chino Creek.

[3] Owner or operator means the owner or operator of any facility or activity subject to regulation under the NPDES program (40 CFR § 122.2).

In 1915, the California Legislature enacted the Los Angeles County Flood Control Act, establishing the Los Angeles County Flood Control District (LACFCD). The objects and purposes of the Act are to provide for the control and conservation of the flood, storm and other waste waters within the flood control district. Among its other powers, the LACFCD also has the power to preserve, enhance, and add recreational features to lands or interests in lands contiguous to its properties for the protection, preservation, and use of the scenic beauty and natural environment for the properties or the lands. The LACFCD is governed, as a separate entity, by the County of Los Angeles Board of Supervisors.

The area covered under this Order encompasses more than 3,000 square miles. This area contains a vast drainage network that serves incorporated and unincorporated areas in every Watershed Management Area within the Los Angeles Region. Maps depicting the major drainage infrastructure within the area covered under this Order are included in Attachment C of this Order.

The total length of the Permittees' MS4s, and the locations of all storm drain connections, are not known exactly, as a comprehensive map for the MS4 does not exist. Rough estimates, based on information from the LACFCD and large municipalities (population > 100,000), indicate that the length exceeds 4,300 miles, as shown below. The LACFCD's system includes the majority of drainage infrastructure within incorporated and unincorporated areas in every watershed, including approximately 500 miles of open channel, 3,500 miles of underground drains, and an estimated 88,000 catch basins, and several dams. Portions of the LACFCD's current system were originally unmodified natural rivers and water courses.

Table F-2. Extent of Select Permittees' MS4s

Permittee	Area (Square Miles)	Catch Basins	Storm Drain Length	Open Channel Length
LACFCD/ LA County	3,100	88,000	3,500 miles	500 miles
City of LA	469	30,000	1,600 miles	31 miles
El Monte	10	316	11 miles	0.4 mile
Glendale	30.6	1,100	Unknown	Unknown
Inglewood	9	1,157	12 miles	Unknown
Pasadena	26	1,050	30	Unknown
Santa Monica	8.3	850	Unknown	Unknown
Torrance	20	2,000	20 miles	3 miles
TOTAL	**approx. 3,672.9**	**approx. 109,473**	**approx. 4,323**	**approx. 484.4**

Unlike other Permittees, the LACFCD does not own or operate any municipal sanitary sewer systems, public streets, roads, or highways, and has no planning, zoning, development permitting or other land use authority over industrial or commercial facilities, new developments or re-development projects, or development construction sites located in any incorporated or unincorporated areas within its service area. Nonetheless, as an owner and operator of MS4s, the LACFCD is required by federal regulations to control pollutant discharges into and from its MS4, including the ability to control through interagency agreements among co-permittees and other owners of a MS4 the contribution of pollutants from one portion of the MS4 to another portion of the MS4. Additionally, the Los Angeles County Flood Control District does own the County of Los Angeles Department of Public Works headquarters building and Los Angeles County Flood Control District maintenance yards to support its field operations.

Storm water and non-storm water are conveyed through the MS4s and ultimately discharged into receiving waters of the Los Angeles Region. MS4s subject to this Order receive storm water and non-storm water flows from various sources. These flows come from MS4s owned by the Permittees covered by this Order and other public agencies, NPDES permitted discharges, discharges authorized by the USEPA (including discharges subject to a decision document approved pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)), groundwater, and natural flows.

The requirements contained in this Order apply to the Los Angeles County Flood Control District, 84 cities within the coastal watersheds of Los Angeles County, and the unincorporated areas of Los Angeles County under County jurisdiction, with the exception of the City of Long Beach. Under the previous Order, Order No. 01-182, the Los Angeles County Flood Control District was designated the Principal Permittee, and the County of Los Angeles and the 84 incorporated cities were designated co-Permittees. However, in this Order, the role of Principal Permittee has been eliminated. This Order divides Los Angeles County into seven Watershed Management Areas (WMAs).

B. The Need to Regulate Discharges from MS4s

The quality of storm water and non-storm water discharges from MS4s is fundamentally important to the health of the environment and the quality of life in Southern California. Polluted storm water and non-storm water discharges from MS4s are a leading cause of water quality impairment in the Los Angeles Region. Storm water and non-storm water discharges are often contaminated with pesticides, fertilizers, fecal indicator bacteria and associated pathogens, trash, automotive byproducts, and many other toxic substances generated by activities in the urban environment. Water that flows over streets, parking lots, construction sites, and industrial, commercial, residential, and municipal areas carries these untreated pollutants through the MS4 directly into the receiving waters of the Region. The water quality impacts, ecosystem impacts, and increased public health risks from MS4 discharges that affect receiving waters nationwide and throughout Los Angeles County, including its coastline, are well documented.

The National Urban Runoff Program (NURP) Study (USEPA 1983) showed that MS4 discharges draining from residential, commercial, and light industrial areas contain significant loadings of total suspended solids and other pollutants. Many studies continue to support the conclusions of the NURP Study. The NURP Study also found that pollutant levels from illicit discharges were high enough to significantly degrade receiving water quality, and threaten aquatic life, wildlife, and human health. The general findings and conclusions of the NURP Study are reiterated in the more recent 2008 National Research Council report "Urban Runoff Management in the United States" as well as in a regional study, "Sources, Patterns and Mechanisms of storm Water Pollutant Loading from Watersheds and Land Uses of the Greater Los Angeles Area, California," SCCWRP Technical Report 510 (2007), funded in large part by the Regional Water Board.

Some of the conclusions of the 2007 regional study were as follows.

Storm water runoff from watershed and land use based sources is a significant contributor of pollutant loading and often exceeds water quality standards. High pollutant concentrations were observed throughout the study at both mass emission (ME) and land use (LU) sites. Pollutant concentrations frequently exceeded water quality standards.

Storm water Event Mean Concentrations (EMCs), fluxes and loads were substantially lower from undeveloped open space areas when compared to developed urbanized watersheds. Storms sampled from less developed watersheds produced pollutant EMCs and fluxes that were one to two orders of magnitude lower than comparably sized storms in urbanized watersheds. Furthermore, the higher fluxes from developed watersheds were generated by substantially less rainfall than the lower fluxes from the undeveloped watersheds, presumably due to increased impervious surface area in developed watersheds.

The Los Angeles region contributed a similar range of storm water runoff pollutant loads as that of other regions of the United States. Comparison of constituent concentrations in storm water runoff from land use sites from this study reveal median EMCs that are comparable to U.S. averages reported in the National Storm water Quality Database (NSQD; Pitt et al., 2003). Comparison to the NSQD data set provides insight to spatial and temporal patterns in constituent concentrations in urban systems. Similarities between levels reported in the NSQD and this study suggest that land-based concentrations in southern California storm water are generally comparable to those in other parts of the country.

Peak concentrations for all constituents were observed during the early part of the storm. Constituent concentrations varied with time over the course of storm events. For all storms sampled, the highest constituent concentrations occurred during the early phases of storm water runoff with peak concentrations usually preceding peak flow. Although the pattern of an early peak in concentration was comparable in both large and small developed watersheds, the peak concentration tended to occur later in the storm and persist for a longer duration in the smaller developed watersheds. Therefore monitoring programs must capture the early portion of storms and account for intra-

storm variability in concentration in order to generate accurate estimates of EMC and contaminant loading. Programs that do not initiate sampling until a flow threshold has been surpassed may severely underestimate storm EMCs.

Highest constituent loading was observed early in the storm season with intra-annual variability driven more by antecedent dry period than amount of rainfall. Seasonal differences in constituent EMCs and loads were consistently observed at both ME and LU sites. In general, early season storms (October – December) produce significantly higher constituent EMCs and loads than late season storms (April-May), even when rainfall quantity was similar. This suggests that the magnitude of constituent load associated with storm water runoff depends, at least in part, on the amount of time available for pollutant build-up on land surfaces. The extended dry period that typically occurs in arid climates such as southern California maximizes the time for constituents to build-up on land surfaces, resulting in proportionally higher concentrations and loads during initial storms of the season.

The 1992, 1994, and 1996 National Water Quality Inventory Reports to Congress prepared by USEPA showed a trend of impairment in the Nation's waters from contaminated storm water and dry weather urban runoff. The 2004 National Water Quality Inventory (305(b) Report) showed that urban runoff/storm water discharges contribute to the impairment of 22,559 miles of streams, the impairment of 701,024 acres of lakes, and the impairment of 867 square miles of estuaries in the United States. The Natural Resources Defense Council (NRDC) 1999 Report, "Stormwater Strategies, Community Responses to Runoff Pollution" identifies two main causes of the storm water pollution problem in urban areas. Both causes are directly related to development in urban and urbanizing areas:

Increased volume and velocity of surface runoff. There are three types of human-made impervious covers that increase the volume and velocity of runoff: (i) rooftop, (ii) transportation imperviousness, and (iii) non-porous (impervious) surfaces. As these impervious surfaces increase, infiltration will decrease, forcing more water to run off the surface, picking up speed and pollutants.

The concentration of pollutants in the runoff. Certain activities, such as those from industrial sites, are large contributors of pollutant concentrations to the MS4.

The report also identified several activities causing storm water pollution from urban areas, including practices of homeowners, businesses, and government agencies.

Studies conducted by the United States Geological Survey (USGS) confirm the link between urbanization and water quality impairments in urban watersheds due to contaminated storm water runoff.

Furthermore, the water quality impacts of urbanization and urban storm water discharges have been summarized by several other recent USEPA reports. Urbanization causes changes in hydrology and increases pollutant loads which adversely impact water quality and impair the beneficial uses of receiving waters.

Increases in population density and imperviousness result in changes to stream hydrology including:

- increased peak discharges compared to predevelopment levels;
- increased volume of storm water runoff with each storm compared to pre-development levels;
- decreased travel time to reach receiving water;
- increased frequency and severity of floods;
- reduced stream flow during prolonged periods of dry weather due to reduced levels of infiltration;
- increased runoff velocity during storms due to a combination of effects of higher discharge peaks, rapid time of concentration, and smoother hydraulic surfaces from channelization; and
- decreased infiltration and diminished groundwater recharge.

The Los Angeles County MS4 program has conducted monitoring to:

- quantify mass emissions for pollutants;
- identify critical sources for pollutants of concern in storm water;
- evaluate BMP effectiveness; and
- evaluate receiving water impacts, including impacts to tributaries.

The monitoring indicates that instream concentrations of pathogen indicators (fecal coliform and streptococcus), heavy metals (such as Pb, Cu, Zn) and pesticides (such as diazinon) exceed water quality standards. The mass emissions of pollutants to the ocean are significant from the urban WMAs such as the Los Angeles River WMA, Ballona Creek WMA, and Coyote Creek WMA, with the Los Angeles River WMA providing more than seventy percent of the loadings. Critical source data for facilities (such as auto-salvage yards, primary metal facilities, and automotive repair shops) show that total and dissolved heavy metals (Pb, Cu, Zn, and Cd), and total suspended solids (TSS) exceeded water quality standards by as much as two orders of magnitude. The results are consistent with a limited term study conducted by the Regional Water Board to characterize storm water runoff in the Los Angeles region in 1988 before the issuance of first MS4 permit. Storm water runoff data from predominant land uses in Los Angeles County showed similar patterns. Light industrial, commercial and transportation land uses showed the highest range of exceedances. A pesticide (diazinon) was detected in higher concentrations from residential land use. The data for polycyclic aromatic hydrocarbons (PAHs), a known pollutant of concern in urban storm water runoff, is inconclusive but improved analytical methods may yield more definitive results in the future. Receiving water impacts studies found that storm water discharges from urban watersheds exhibit toxicity attributable to heavy metals. Bioassessments of the benthic communities showed bioaccumulation of toxicants. Sediment analysis showed higher concentrations of pollutants, such as Pb and PAHs, in urban watersheds than in rural watersheds (2 to 4 times higher). In addition, toxicity of dry weather flows was observed with the cause of toxicity undetermined. Other studies have documented concentrations of pollutants that exceed water quality standards in storm drains flowing to the ocean during dry weather, and adverse health impacts from swimming near flowing storm drains.

Trash is also a serious and pervasive water quality problem in Los Angeles County. The Regional Water Board has determined that current levels of trash exceed the existing water quality objectives contained in the Basin Plan that are necessary to protect the beneficial uses of many surface waters. Regional Water Board staff regularly observes trash in surface waters throughout the Los Angeles region. Non-profit organizations such as Heal the Bay, Friends of the Los Angeles River (FoLAR) and others organize volunteer clean-ups periodically, and document the amount of trash collected. Trash in waterways causes significant water quality problems. Small and large floatables inhibit the growth of aquatic vegetation, decreasing habitat and spawning areas for fish and other living organisms. Wildlife living in rivers and in riparian areas can be harmed by ingesting or becoming entangled in floating trash. Except for large items, settleables are not always obvious to the eye. They include glass, cigarette butts, rubber, and construction debris, among other things. Settleables can be a problem for bottom feeders and can contribute to sediment contamination. Some debris (e.g. diapers, medical and household waste, and chemicals) are a source of bacteria and toxic substances. Floating debris that is not trapped and removed will eventually end up on the beaches or in the open ocean, keeping visitors away from our beaches and degrading coastal waters. Significant strides have been made by a number of Permittees in addressing this problem through the implementation of control measures to achieve wasteload allocations established in trash TMDLs.

C. Summary of Existing Requirements and Self-Monitoring Report (SMR) Data

The Los Angeles County MS4 Permit was last reissued in 2001 as Order No.01-182. Order No. 01-182 expired in 2006, but has been administratively extended pursuant to federal regulations. Order No. 01-182 was reopened by the Regional Water Board in 2006, 2007 and 2009 to incorporate provisions to implement three TMDLs. It was further amended in 2010 and 2011 pursuant to a peremptory writ of mandate issued by the Los Angeles County Superior Court.

Order No. 01-182 is organized under the following seven parts and includes several attachments. The description below summarizes key permit parts and attachments in Order No. 01-182:

<u>Part 1 – Discharge Prohibitions</u>
As required by section 402(p)(3)(B)(ii) of the Clean Water Act, Part 1 requires permittees to “effectively prohibit non-storm water discharges into the MS4 and watercourses, except where such discharges” are covered by a separate NPDES permit or fall within one of thirteen categories of flows that are conditionally exempted from the discharge prohibition. These exempted flows fall under the general categories of natural flows, fire fighting flows, and flows incidental to urban activities (i.e. landscape irrigation, sidewalk rinsing). These non-storm water flows may be exempted so long as: (i) they are not a source of pollutants, (ii) their effective prohibition is not necessary to comply with TMDL provisions, and (iii) they do not violate antidegradation policies. Part 1 also authorizes the Regional Water Board Executive Officer to impose conditions on these types of discharges and to add or remove categories of conditionally exempted non-storm water discharges based on their potential to contribute pollutants to receiving waters.

Part 2 – Receiving Water Limitations

Part 2 prohibits discharges from the MS4 that cause or contribute to the violation of water quality standards. In addition, discharges from the MS4 of storm water or non-storm water, for which a Permittee is responsible, may not cause or contribute to a condition of nuisance. Part 2.3 states that permittees shall comply with these prohibitions "through timely implementation of control measures and other actions to reduce pollutants in the discharges in accordance with [the Los Angeles Stormwater Quality Management Program (SQMP)] and its components and other requirements of [the LA County MS4 Permit]." Part 2.3 establishes an "iterative process" whereby certain actions are required when exceedances of water quality standards or objectives occur. This iterative process includes submitting a Receiving Water Limitations Compliance Report; revising the SQMP and its components to include modified BMPs, an implementation schedule and additional monitoring to address the exceedances; and implementing the revised SQMP. These provisions are consistent with the receiving water limitations language required by State Water Board Order WQ 99-05.

Part 2 also includes provisions implementing the Marina del Rey Harbor Mothers' Beach and Back Basins Bacteria TMDL (summer dry weather provisions only). During summer dry weather, Part 2.6 prohibits discharges of bacteria from MS4s into Marina del Rey Harbor Basins D, E, or F, including Mothers' Beach that cause or contribute to exceedance of the applicable bacteria water quality objectives.

Part 2 also included similar TMDL provisions relating to the Santa Monica Bay summer dry weather bacteria TMDL. However, as a result of a legal challenge by Los Angeles County and the LACFCD, the Regional Water Board was required to void and set aside those provisions, which the Regional Water Board did in 2011.

Part 3 – Stormwater Quality Management Program (SQMP) Implementation

Under Part 3, each Permittee shall, at a minimum, implement the SQMP, which is an enforceable element of the Los Angeles County MS4 Permit. The SQMP, at a minimum, shall also comply with the applicable storm water program requirements of 40 CFR section 122.26(d)(2). The SQMP and its components shall be implemented so as to reduce the discharges of pollutants in storm water to the maximum extent practicable (MEP) and effectively prohibit non-storm water discharges to the MS4. Each Permittee shall also implement additional controls, where necessary, to reduce the discharge of pollutants from the MS4.

Part 3 also sets forth specific responsibilities of the Principal Permittee, which under Order No. 01-182 is the LACFCD, and co-permittees. In addition, Part 3 sets forth requirements for Watershed Management Committees (WMCs) which, among other tasks, prioritize pollution control efforts and evaluate the effectiveness of and recommend changes to the SQMP and its components. Each Permittee must also have the necessary legal authority to prohibit non-storm water discharges to the MS4, as well as possess adequate legal authority to develop and enforce storm water and non-storm water ordinances for its jurisdiction.

Part 4 – Special Provisions

Part 4 sets forth provisions for public information and participation, industrial/commercial facilities control program, development planning, development construction, public agency activities, and illicit connections and illicit discharges elimination. These programs are termed "minimum control measures" and have been in place since the inception of the MS4 NPDES permitting program, as required by federal regulations.

Part 5 – Definitions

Part 5 includes definitions for terms used within Order No. 01-182.

Part 6 – Standard Provisions

Part 6 includes standard provisions relating to implementation of the programs required by the permit. Such provisions include, but are not limited to, the duty to comply, the duty to mitigate, inspection and entry requirements, proper operation and maintenance requirements, monitoring and reporting requirements, and the duty to provide information. Most of these provisions are required by 40 CFR sections 122.41 or 122.42 and apply to all NPDES permits.

Part 7 – TMDL Provisions

In 2009, Order No. 01-182 was amended to include provisions that are consistent with the assumptions and requirements of waste load allocations from the Los Angeles River Trash TMDL. Appendix 7-1 identifies the permittees subject to the Los Angeles River Trash TMDL and sets forth the interim and final numeric effluent limitations for trash that the permittees must comply with. Part 7 also sets forth how permittees can demonstrate compliance with the numeric effluent limitations. Permittees have the option to employ three general compliance strategies to achieve the numeric effluent limitations. Depending on the strategy selected, the Permittee may demonstrate compliance either by documenting the percentage of its area addressed by full capture systems ("action-based" demonstration) or by calculating its annual trash discharge to the MS4 and comparing that to its effluent limitation. This approach allows the Permittee the flexibility to comply with the numeric effluent limitations using any lawful means, and establishes appropriate and enforceable compliance metrics depending on the method of compliance and level of assurance provided by the Permittee that the selected method will achieve the numeric effluent limitations derived from the TMDL WLAs.

Attachment U – Monitoring and Reporting Program

Order No. 01-182 has both self-monitoring and public reporting requirements, which include: (1) monitoring of "mass emissions" at seven mass emission monitoring stations; (2) Water Column Toxicity Monitoring; (3) Tributary Monitoring; (4) Shoreline Monitoring; (5) Trash Monitoring; (6) Estuary Sampling; (7) Bioassessment; and (8) Special Studies. The purpose of mass emissions monitoring is to: (1) estimate the mass emissions from the MS4; (2) assess trends in the mass emissions over time; and (3) determine if the MS4 is contributing to exceedances of water quality standards by comparing results to the applicable standards in the Basin Plan. Order No. 01-182 established that the Principal Permittee shall monitor the mass emissions stations. The permit required mass emission sampling five times per year.

III. APPLICABLE STATUTES, REGULATIONS, PLANS, AND POLICIES

The provisions contained in this Order are based on the requirements and authorities described below.

A. Legal Authorities – Federal Clean Water Act and California Water Code

This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations adopted by the USEPA and chapter 5.5, division 7 of the California Water Code (commencing with section 13370). It serves as an NPDES permit for point source discharges from this facility to surface waters. This Order also serves as Waste Discharge Requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the California Water Code (commencing with section 13260).

B. Federal and California Endangered Species Acts

This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code, §§ 2050 to 2115.5) or the Federal Endangered Species Act (16 U.S.C.A., §§ 1531 to 1544). This Order requires compliance with requirements to protect the beneficial uses of waters of the United States. Permittees are responsible for meeting all requirements of the applicable Endangered Species Act.

C. California Environmental Quality Act (CEQA)

This action to adopt an NPDES Permit is exempt from the provisions of Chapter 3 of the California Environmental Quality Act (CEQA) (Public Resources Code, § 21100, et seq.) pursuant to California Water Code section 13389. (*County of Los Angeles v. Cal. Water Boards* (2006) 143 Cal.App.4th 985.)

D. State and Federal Regulations, Policies, and Plans

1. **Water Quality Control Plans.** The CWA requires the Regional Water Board to establish water quality standards for each water body in its region. Water quality standards include beneficial uses, water quality objectives and criteria that are established at levels sufficient to protect those beneficial uses, and an antidegradation policy to prevent degrading waters. On June 13, 1994, the Regional Water Board adopted a *Water Quality Control Plan for the Coastal Watersheds of Los Angeles and Ventura Counties* (hereinafter Basin Plan). The Basin Plan designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters in the Los Angeles Region. The Regional Water Board has amended the Basin Plan on multiple occasions since 1994. In addition, the Basin Plan implements State Water Resources Control Board (State Water Board) Resolution No. 88-63, which established state policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply. Beneficial uses applicable to the surface water bodies that receive discharges from the Los Angeles County MS4 generally include those listed below:

Table F-3. Basin Plan Beneficial Uses

Discharge Point	Receiving Water Name	Beneficial Use(s)
All Municipal Separate Storm Sewer Systems (MS4s) discharge points within the coastal watersheds of Los Angeles County with the exception of those originating in the City of Long Beach	Multiple surface water bodies of the Los Angeles Region	Municipal and Domestic Supply (MUN); Agricultural Supply (AGR); Industrial Service Supply (IND); Industrial Process Supply (PROC); Ground Water Recharge (GWR); Freshwater Replenishment (FRSH); Navigation (NAV); Hydropower Generation (POW); Water Contact Recreation (REC-1); Limited Contact Recreation (LREC-1); Non-Contact Water Recreation (REC-2); Commercial and Sport Fishing (COMM); Warm Freshwater Habitat (WARM); Cold Freshwater Habitat (COLD); Preservation of Areas of Special Biological Significance (BIOL); Wildlife Habitat (WILD); Preservation of Rare and Endangered Species (RARE); Marine Habitat (MAR); Wetland Habitat (WET); Migration of Aquatic Organisms (MIGR); Spawning, Reproduction, and/or Early Development (SPWN); Shellfish Harvesting (SHELL)

Pursuant to California Water Code sections 13263(a) and 13377, the requirements of this Order implement the Basin Plan.

a. Permit Structure: Watershed Management Approach and Total Maximum Daily Load (TMDL) Implementation

One of the fundamental issues for this Order was a reconsideration of the basic permit structure. The previous Order, Order No. 01-182, was structured as a single permit whereby all 86 Permittees were assigned uniform requirements, with additional requirements for the Principal Permittee. Through Order No. 01-182, the Regional Water Board began to implement a Watershed Management Approach to address water quality protection in the region. The Watershed Management Approach intended to provide a comprehensive and integrated strategy toward water resource protection, enhancement, and restoration while considering economic and environmental impacts within a hydrologically defined drainage basin or watershed.

On June 12, 2006, prior to the expiration date of Order No. 01-182, all of the Permittees filed Reports of Waste Discharge (ROWD) applying for renewal of their waste discharge requirements. Specifically, the Los Angeles County Flood Control District submitted an ROWD application on behalf of itself, the County of Los Angeles, and 78 other Permittees. Several Permittees under Order No. 01-182 elected to not be included as part of the Los Angeles County Flood Control District's ROWD. On June 12, 2006, the cities of Downey and Signal Hill each submitted an individual ROWD application requesting an individual MS4 permit; and the Upper San Gabriel River Watershed Coalition (comprised of the cities of Azusa, Claremont, Glendora, Irwindale, and Whittier) also submitted an individual ROWD application requesting a separate MS4 permit for these cities. In 2010, the LACFCD withdrew from its 2006 ROWD and submitted a new ROWD also

requesting an individual MS4 permit. The LACFCD also requested that it no longer be designated as the Principal Permittee and that it is relieved of Principal Permittee responsibilities.

The Regional Water Board evaluated each of the 2006 ROWDs and notified all of the Permittees that their ROWDs did not satisfy federal storm water regulations contained in the USEPA Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems; Final Rule, August 9, 1996 (61 *Fed Reg.* 41697). The Regional Water Board also found that the information presented in the ROWDs did not reflect the current status of program elements for MS4 permits developed over the past decade or the new information specific to this MS4. Because each ROWD did not satisfy federal requirements, the Regional Water Board deemed all four 2006 ROWDs incomplete. The Regional Water Board also evaluated the LACFCD's 2010 ROWD and found that it too did not satisfy federal requirements nor reflect the current status for MS4s.

Though five separate ROWDs were submitted, the Regional Water Board retains the discretion as the permitting authority to determine whether to issue permits for discharges from MS4s on a system-wide or jurisdiction-wide basis. Clean Water Act section 402(p)(3)(B)(i) and implementing regulations at 40 CFR section 122.26, subdivisions (a)(1)(v), (a)(3)(ii), and (a)(3)(iv) allow the permitting authority to issue permits for MS4 discharges on a system-wide or jurisdiction-wide basis taking into consideration a variety of factors. Such factors include the location of the discharge with respect to waters of the United States, the size of the discharge, the quantity and nature of the pollutants discharged to waters of the United States, and other relevant factors. Federal regulations at 40 CFR section 122.26(a)(3)(ii) identify a variety of possible permitting structures, including one system-wide permit covering all MS4 discharges or distinct permits for appropriate categories of MS4 discharges including, but not limited to, all discharges owned or operated by the same municipality, located within the same jurisdiction, all discharges within a system that discharge to the same watershed, discharges within a MS4 that are similar in nature, or for individual discharges from MS4s.

In evaluating the five separate ROWDs and the structure for this Order, the Regional Water Board considered a number of factors:

i. The nature of the Permittees' MS4s, which comprise a large interconnected system, controlled in large part by the Los Angeles County Flood Control District, among others, and used by multiple cities along with Los Angeles County. The discharges from these entities frequently commingle in the MS4 prior to discharge to receiving waters.

ii. The requirement to implement 33 largely watershed-based TMDLs in this Order. A number of Permittees have already established jurisdictional groups on a watershed or subwatershed basis for TMDL implementation. (See Attachment K of this Order for a matrix of these TMDLs and Permittees by

Watershed Management Area (WMA)). Many of the TMDLs apply to multiple watersheds and the jurisdictional areas of multiple Permittees. Having separate permits would make implementation of the TMDLs more cumbersome.

iii. The passage of Assembly Bill 2554 in 2010, which amended the Los Angeles County Flood Control Act. This statute allows the LACFCD to assess a property-related fee or charge for storm water and clean water programs. Funding is subject to voter approval in accordance with Proposition 218. Fifty percent of funding is allocated to nine "watershed authority groups" to implement collaborative water quality improvement plans. (See Attachments B and C of this Order for maps of WMAs.)

iv. Results of the on-line survey administered to Permittees by Regional Water Board staff regarding permit structure. The results indicated that a majority of Permittees support a single MS4 permit for Los Angeles County. A significant minority support multiple watershed-based permits. Overall, 85 percent of the permittees that responded to the on-line survey support either a single MS4 permit or several individual watershed-based permits. A small number of permittees support alternative groupings of adjacent municipalities instead of watershed-based groupings. Only four permittees expressed a preference for individual MS4 permits.

v. The 2006 and 2010 ROWDs. Eight Permittees submitted individual or small group ROWDs, including the cities of Signal Hill and Downey; five cities in the upper San Gabriel River watershed; and the Los Angeles County Flood Control District. The LACFCD has also requested that it is no longer designated as Principal Permittee and relieved of Principal Permittee responsibilities.

Based on an evaluation of these factors, the Regional Water Board again determined that, because of the complexity and networking of the MS4 within Los Angeles County, that one system-wide permit is appropriate. In order to provide individual Permittees with more specific requirements, this Order regulates the MS4 discharges of 86 Permittees with some sections devoted to universal requirements for all Permittees and others devoted to requirements specific to each Watershed Management Area (WMA), including TMDL implementation provisions. This structure is supported by section 402(p) of the Clean Water Act and 40 CFR sections 122.26, subdivisions (a)(1)(v), (a)(3)(ii), and (a)(3)(iv). A single permit will ensure consistency and equitability in regulatory requirements within Los Angeles County, while watershed-based sections within the single permit will provide flexibility to tailor permit provisions to address distinct watershed characteristics and water quality issues. Additionally, an internal watershed-based structure comports with the Regional Water Board's Watershed Management Initiative, its watershed-based TMDL requirements, and the LACFCD's funding initiative passed in Assembly Bill 2554. Watershed-based sections will help promote watershed-wide solutions to address water quality problems, which in many cases are the most efficient and cost-effective means to address storm water and urban runoff pollution. Further, watershed-based

sections may encourage collaboration among permittees to implement regional integrated water resources approaches such as storm water capture and re-use to achieve multiple benefits.

The Regional Water Board determined that the cities of Signal Hill and Downey, the five upper San Gabriel River cities, and the LACFCD are included as Permittees in this Order. In making that determination, the Regional Water Board distinguished between the permitting status of those cities and the permitting status of the City of Long Beach at this time because the City of Long Beach has a proven track record in implementing an individual permit and developing a robust monitoring program under that individual permit, as well as in cooperation with other MS4 dischargers on watershed based implementation. While all other incorporated cities with discharges within the coastal watersheds of Los Angeles County, as well as Los Angeles County and the Los Angeles County Flood Control District, are permitted under this Order, individually tailored permittee requirements are provided in this Order, where appropriate.

The Regional Water Board also determined that because the LACFCD owns and operates large portions of the MS4 infrastructure, including but not limited to catch basins, storm drains, outfalls and open channels, in each coastal watershed management area within Los Angeles County, the LACFCD should remain a Permittee in the single-system wide permit; however, this Order relieves LACFCD of its role and responsibilities as Principal Permittee. Additionally, given the LACFCD's limited land use authority, it is appropriate for the LACFCD to have a separate and uniquely-tailored storm water management program. Accordingly, the storm water management program minimum control measures imposed on the LACFCD in Part VI.D of this Order differ in some ways from the minimum control measures imposed on other Permittees. Namely, aside from its own properties and facilities, the LACFCD is not subject to the Industrial/Commercial Facilities Program, the Planning and Land Development Program, and the Development Construction Program. However, as a discharger of storm and non-storm water, the LACFCD remains subject to the Public Information and Participation Program and the Illicit Connections and Illicit Discharges Elimination Program. Further, as the owner and operator of certain properties, facilities and infrastructure, the LACFCD remains subject to requirements of a Public Agency Activities Program.

2. **Ocean Plan.** In 1972, the State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (hereinafter Ocean Plan). The State Water Board adopted the most recent amended Ocean Plan on September 15, 2009. The Office of Administration Law approved it on March 10, 2010. On October 8, 2010, USEPA approved the 2009 Ocean Plan. The Ocean Plan is applicable, in its entirety, to ocean waters of the State. In order to protect beneficial uses, the Ocean Plan establishes water quality objectives and a program of implementation. Pursuant to California Water Code sections 13263(a) and 13377, the requirements of this Order implement the Ocean Plan. The Ocean Plan identifies beneficial uses of ocean waters of the State to be protected as summarized below:

Table F-3B. Ocean Plan Beneficial Uses

Discharge Point	Receiving Water Name	Beneficial Use(s)
All Municipal Separate Storm Sewer Systems (MS4s) discharge points within the coastal watersheds of Los Angeles County with the exception of those originating within the City of Long Beach	Pacific Ocean	Industrial Water Supply (IND); Water Contact (REC-1) and Non-Contact Recreation (REC-2), including aesthetic enjoyment; Navigation (NAV); Commercial and Sport Fishing (COMM); Mariculture; Preservation and Enhancement of Designated Areas of Special Biological Significance (ASBS); Rare and Endangered Species (RARE); Marine Habitat (MAR); Fish Migration (MIGR); Fish Spawning (SPWN) and Shellfish Harvesting (SHELL)

3. **Antidegradation Policy.** 40 CFR section 131.12[4] requires that the state water quality standards include an antidegradation policy consistent with the federal antidegradation policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16 ("Statement of Policy with Respect to Maintaining the Quality of the Waters of the State"). Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. The Regional Water Board's Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies. Resolution No. 68-16 and 40 CFR section 131.12 require the Regional Water Board to maintain high quality waters of the State unless degradation is justified based on specific findings. First, the Board must ensure that "existing instream uses and the level of water quality necessary to protect the existing uses" are maintained and protected. Second, if the baseline quality of a water body for a given constituent exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water, that quality shall be maintained and protected through the requirements of the Order unless the Board makes findings that (1) any lowering of the water quality is necessary to accommodate important economic or social development in the area in which the waters are located; (2) water quality adequate to protect existing uses fully is assured; and (3) the highest statutory and regulatory requirements for all new and existing point sources and all cost-effective and reasonable best management practices for nonpoint source control are achieved. The Board must also comply with any requirements of State Water Board Resolution No. 68-16 beyond those imposed through incorporation of the federal antidegradation policy. In particular, the Board must find that not only present, but also anticipated future uses of water are protected, and must ensure best practicable treatment or control of the discharges. The baseline quality considered in making the appropriate findings is the best quality of the water since 1968, the year of the adoption of Resolution No. 68-16, or a lower

[4] All further statutory references are to title 40 of the Code of Federal Regulations unless otherwise indicated.

level if that lower level was allowed through a permitting action that was consistent with the federal and state antidegradation policies.

The discharges permitted in this Order are consistent with the antidegradation provisions of 40 CFR section 131.12 and Resolution 68-16 as set out in the Findings below:

a. Many of the waters within the area covered by this Order are impaired for multiple pollutants discharged through MS4s and are not high quality waters with regard to these pollutants. In most cases, there is insufficient data to determine whether these water bodies were impaired as early as 1968, but the limited available data shows impairment dating back for more than two decades. Many such water bodies are listed on the State's CWA Section 303(d) List and either the Regional Water Board or USEPA has established TMDLs to address the impairments. This Order ensures that existing instream (beneficial) water uses and the level of water quality necessary to protect the existing uses is maintained and protected. This Order requires the Permittees to comply with permit provisions to implement the WLAs set forth in the TMDLs in order to restore the beneficial uses of the impaired water bodies consistent with the assumptions and requirements of the TMDLs. This Order further requires compliance with receiving water limitations to meet water quality standards in the receiving water either by demonstrating compliance pursuant to Part V.A and the Permittee's monitoring and reporting program pursuant to Part VI.B or by implementing Watershed Management Programs/EWMPs with a compliance schedule. This Order includes requirements to develop and implement storm water management programs, achieve water quality-based effluent limitations, and effectively prohibit non-storm water discharges through the MS4.

b. To the extent that some of the water bodies within the jurisdiction are high quality waters with regard to some constituents, this Order finds as follows:

    i. Allowing limited degradation of high quality water bodies through MS4 discharges is necessary to accommodate important economic or social development in the area and is consistent with the maximum benefit to the people of the state. The discharge of storm water in certain circumstances is to the maximum benefit to the people of the state because it can assist with maintaining instream flows that support beneficial uses, may spur the development of multiple-benefit projects, and may be necessary for flood control, and public safety as well as to accommodate development in the area. The alternative – capturing all storm water from all storm events – would be an enormous opportunity cost that would preclude MS4 permittees from spending substantial funds on other important social needs. The Order ensures that any limited degradation does not affect existing and anticipated future uses of the water and does not result in water quality less than established standards. The Order requires compliance with receiving water limitations that act as a floor to any limited degradation.

ii. The Order requires the highest statutory and regulatory requirements and requires that the Permittees meet best practicable treatment or control. The Order prohibits all non-storm water discharges, with a few enumerated exceptions, through the MS4 to the receiving waters. As required by 40 CFR section 122.44(a), the Permittees must comply with the "maximum extent practicable" technology-based standard set forth in CWA section 402(p), and implement extensive minimum control measures in a storm water management program. Recognizing that best practicable treatment or control may evolve over time, the Order includes new and more specific requirements as compared to Order No. 01-182. The Order incorporates options to implement Watershed Management Programs or EWMPs that must specify concrete and detailed structural and non-structural storm water controls that must be implemented in accordance with an approved time schedule. The Order contains provisions to encourage, wherever feasible, retention of the storm water from the 85th percentile 24-hour storm event.

4. **Anti-Backsliding Requirements.** Sections 402(o)(2) and 303(d)(4) of the CWA and federal regulations at 40 CFR section 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations may be relaxed. While this Order allows implementation of Watershed Management Plans/EWMPs to constitute compliance with receiving water limitations under certain circumstances, the availability of that alternative and the corresponding availability of additional time to come into compliance with receiving water limitations, does not violate the anti-backsliding provisions. The receiving water limitations provisions of this Order are imposed under section 402(p)(3)(B) of the Clean Water Act rather than based on best professional judgment, or based on section 301(b)(1)(C) or sections 303(d) or (e), and are accordingly not subject to the anti-backsliding requirements of section 402(o). Although the non-applicability is less clear with respect to the regulatory anti-backsliding provisions in 40 Code of Federal Regulations section 122.44(l), the regulatory history suggests that USEPA's intent was to establish the anti-backsliding regulations with respect to evolving technology standards for traditional point sources. (See, e.g., 44 Fed.Reg. 32854, 32864 (Jun. 7, 1979)). It is unnecessary, however, to resolve the ultimate applicability of the regulatory anti-backsliding provisions, because the WMP/EWMP provisions qualify for an exception to backsliding as based on new information. The Watershed Management Plan/EWMP provisions of this Order were informed by new information available to the Board from experience and knowledge gained through the process of developing 33 watershed-based TMDLs and implementing several of the TMDLs since the adoption of the previous permit. In particular, the Board recognized the significance of allowing time to plan, design, fund, operate and maintain watershed-based BMPs necessary to attain water quality improvements and additionally recognized the potential for municipal storm water to benefit water supply. Thus, even if the

receiving water limitations are subject to anti-backsliding requirements, they were revised based on new information that would support an exception to the anti-backsliding provisions. (33 U.S.C. § 1342(o)(2)(B)(i); 40 C.F.R. § 122.44(l)(1); 40 C.F.R. §122.44(l)(2)(i)(B)(1)).

E. Impaired Water Bodies on CWA section 303(d) List

Section 303(d)(1) of the CWA requires each state to identify specific water bodies within its boundaries where water quality standards are not being met or are not expected to be met after implementation of technology-based effluent limitations on point sources. Water bodies that do not meet water quality standards are considered impaired and are placed on the state's "303(d) List". Periodically, USEPA approves the State's 303(d) List. Most recently, USEPA approved the State's 2010 303(d) List of impaired water bodies on October 11, 2011, which includes certain receiving waters in the Los Angeles region. For each listed water body, the state or USEPA is required to establish a total maximum daily load (TMDL) of each pollutant impairing the water quality standards in that water body. A TMDL is a tool for implementing water quality standards and is based on the relationship between pollution sources and in-stream water quality conditions. The TMDL establishes the allowable pollutant loadings for a water body and thereby provides the basis to establish water quality-based controls. These controls should provide the pollution reduction necessary for a water body to meet water quality standards. A TMDL is the sum of the allowable pollutant loads of a single pollutant from all contributing point sources (the waste load allocations or WLAs) and non-point sources (load allocations or LAs), plus the contribution from background sources and a margin of safety. (40 CFR section 130.2(i).) MS4 discharges are considered point source discharges. For 303(d)-listed water bodies and pollutants in the Los Angeles Region, the Regional Water Board or USEPA develops and adopts TMDLs that specify these requirements.

Over the last decade, the Regional Water Board and USEPA have established 33 TMDLs to remedy water quality impairments in various water bodies within Los Angeles County. (See Attachment K of this Order for a list of TMDLs by Watershed Management Area for Los Angeles County.) These TMDLs identify MS4 discharges as a source of pollutants to these water bodies and, as required, establish WLAs for MS4 discharges to reduce the amount of pollutants discharged to receiving waters. Section 402(p)(3)(B)(iii) of the Clean Water Act requires the Regional Water Board to impose permit conditions, including: "management practices, control techniques and system, design and engineering methods, and *such other provisions as the Administrator of the State determines appropriate for the control of such pollutants*." (emphasis added.) Section 402(a)(1) of the Clean Water Act also requires states to issue permits with conditions necessary to carry out the provisions of the Clean Water Act. Federal regulations also require that NPDES permits contain effluent limits consistent with the assumptions and requirements of all available WLAs (40 CFR § 122.44(d)(1)(vii)(B)). California Water Code section 13377 also requires that NPDES permits include limitations necessary to implement water quality control plans. Therefore, this Order includes effluent limitations and other provisions to implement the TMDL WLAs assigned to permittees regulated by the LA County MS4 Permit.

The Regional Water Board has previously established numeric effluent limitations to implement TMDL WLAs when it reopened Order No. 01-182 in 2009 to incorporate permit provisions to implement the Los Angeles River Watershed Trash TMDL WLAs. In that case, Permittees have the option to employ three general compliance strategies to achieve the numeric effluent limitations. Depending on the strategy selected, the Permittee may demonstrate compliance either by documenting the percentage of its area addressed by full capture systems ("action-based" demonstration) or by calculating its annual trash discharge to the MS4 and comparing that to its effluent limitation. This approach allows the Permittee the flexibility to comply with the numeric effluent limitations using any lawful means, and establishes appropriate and enforceable compliance metrics depending on the method of compliance and level of assurance provided by the Permittee that the selected method will achieve the numeric effluent limitations derived from the TMDL WLAs. A similar approach is used for the 32 other TMDLs incorporated into this Order, where appropriate.

F. Other Plans, Policies and Regulations

This Order implements all other applicable federal regulations and State plans, policies and regulations, including the California Toxics Rule at 40 CFR section 131.38.

IV. RATIONALE FOR DISCHARGE SPECIFICATIONS

A. Discharge Prohibitions – Non-Storm Water Discharges

1. Regulatory Background

The CWA employs the strategy of prohibiting the discharge of any pollutant from a point source into waters of the United States unless the discharger of the pollutant(s) obtains an NPDES permit pursuant to CWA section 402. The 1987 amendment to the CWA included section 402(p) that specifically addresses NPDES permitting requirements for municipal discharges from MS4s. Section 402(p) prohibits the discharge of pollutants from specified MS4s to waters of the United States except as authorized by an NPDES permit and identifies the substantive standards for MS4 permits. MS4 permits (1) "shall include a requirement to effectively prohibit non-stormwater discharges into the storm sewers[ ]" and (2) "shall require [i] controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and [ii] such other provisions as the Administrator or the State determines appropriate for the control of such pollutants." (CWA § 402(p)(3)(B)(ii-iii).)

On November 16, 1990, USEPA published regulations to implement the 1987 amendments to the CWA. (55 Fed.Reg. 47990 et seq. (Nov. 16, 1990)). The regulations establish minimum requirements for MS4 permits. The regulations address both storm water and non-storm water discharges from MS4s; however, the minimum requirements for each are significantly different. This is evident from USEPA's preamble to the storm water regulations, which states that "Section 402(p)(B)(3) [of the CWA] requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal storm sewer … Ultimately, such non-storm

water discharges through a municipal separate storm sewer system must either be removed from the system or become subject to an NPDES permit." (55 Fed.Reg. 47990, 47995 (Nov. 16, 1990).[5] USEPA states that MS4 Permittees are to begin to fulfill the "effective prohibition of non-storm water discharges" requirement by: (1) conducting a screening analysis of the MS4 to provide information to develop priorities for a program to detect and remove illicit discharges, (2) implementing a program to detect and remove illicit discharges, or ensure they are covered by a separate NPDES permit, and (3) to control improper disposal into the storm sewer. (40 CFR § 122.26(d)(2)(iv)(B).) These non-storm water discharges therefore are not subject to the MEP standard.

"Illicit discharges" defined in the regulations is the most closely applicable definition of "non-storm water" contained in federal law and the terms are often used interchangeably. In fact, "illicit discharge" is defined by USEPA in its 1990 rulemaking, as "any discharge through a municipal separate storm sewer that is not composed entirely of storm water and that is not covered by an NPDES permit [other than the permit for the discharge from the MS4]." (55 Fed.Reg. 47990, 47995).

2. Definition of Storm Water and Non-Storm Water

Federal regulations define "storm water" as "storm water runoff, snow melt runoff, and surface runoff and drainage." (40 C.F.R. § 122.26(b)(13).) While "surface runoff and drainage" is not defined in federal law, USEPA's preamble to the federal regulations demonstrates that the term is related to precipitation events such as rain and/or snowmelt. (55 Fed.Reg. 47990, 47995-96 (Nov. 16, 1990)). For example, USEPA states:

> In response to the comments [on the proposed rule] which requested EPA to define the term 'storm water' broadly to include a number of classes of discharges which are not in any way related to precipitation events, EPA believes that this rulemaking is not an appropriate forum for addressing the appropriate regulation under the NPDES program of such non-storm water discharges . . . . Consequently, the final definition of storm water has not been expanded from what was proposed.

(*Ibid.*) The storm water regulations themselves identify numerous categories of discharges including landscape irrigation, diverted stream flows, discharges from drinking water supplier sources, foundation drains, air conditioning condensation, irrigation water, springs, water from crawl space pumps, footing drains, lawn watering, individual residential car washing, and street wash water as "non-storm water." While these types of discharges may be regulated under storm water permits, they are not considered storm water discharges. (40 CFR § 122.26(d)(2)(iv)(B)). USEPA states that, "in general, municipalities will not be held responsible for prohibiting some specific components of discharges or flows … through their municipal separate storm sewer system, *even though such components may be considered non-storm water discharges*…" (emphasis added). However, where certain categories of non-storm water discharges are identified by

[5] USEPA further states that, "[p]ermits for such [non-storm water] discharges must meet applicable technology-based and water-quality based requirements of Sections 402 and 301 of the CWA." (55 Fed. Reg. 47990, 48037 (Nov. 16, 1990)).

the Permittee (or the Regional Water Board) as needing to be addressed, they are no longer exempt and become subject to the effective prohibition requirement in CWA section 402(p)(3)(B)(ii). This review of the storm water regulations and USEPA's discussion of the definition of storm water in its preamble to these regulations strongly supports the interpretation that storm water includes only precipitation-related discharges. Therefore, non-precipitation related discharges are not storm water discharges and, therefore, are not subject to the MEP standard in CWA section 402(p)(3)(B)(iii). Rather, non-storm water discharges shall be effectively prohibited pursuant to CWA section 402(p)(3)(B)(ii).

3. Non-Storm Water Regulation

Non-storm water discharges from the MS4 that are not authorized by separate NPDES permits, nor specifically exempted, are subject to requirements under the NPDES program, including discharge prohibitions, technology-based effluent limitations and water quality-based effluent limitations (40 CFR § 122.44). USEPA's preamble to the storm water regulations also supports the interpretation that regulation of non-storm water discharges through an MS4 is not limited to the MEP standard in CWA section 402(p)(3)(B)(iii):

"*Today's rule defines the term "illicit discharge" to describe any discharge through a municipal separate storm sewer system that is not composed entirely of storm water and that is not covered by an NPDES permit. Such illicit discharges are not authorized under the Clean Water Act. Section 402(p(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer…Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit.*" (55 Fed.Reg. 47990, 47995.)

In its 1990 rulemaking, USEPA explained that the illicit discharge detection and elimination program requirement was intended to begin to implement the Clean Water Act's provision requiring permits to "effectively prohibit non-storm water discharges." (55 Fed.Reg. 47990, 47995.)

4. Authorized and Conditionally Exempt Non-Storm Water Discharges

The previous permit, Order No. 01-182, contained provisions exempting several categories of non-storm water discharges from the discharge prohibition, including discharges covered by a separate individual or general NPDES permit for non-storm water discharges, natural flows, flows from emergency fire fighting activity, and flows incidental to urban activities. This Order retains these same categories, but with several enhancements. Natural flows specified in this Order include natural springs and rising ground water; flows from riparian habitats and wetlands; diverted stream flows authorized by the State or Regional Water Board; and uncontaminated ground water infiltration. Flows incidental to urban activities specified in this Order include landscape irrigation; dechlorinated/debrominated swimming pool discharges; dewatering of lakes and decorative fountains; non-commercial car washing by

residents or by non-profit organizations; and street/sidewalk washwater. This Order separately identifies flows from non-emergency fire fighting activities and discharges from drinking water supplier distribution systems as “essential” non-storm water discharges rather than combining them into the same category as the other non-storm water discharges incidental to urban activities. In doing so, the Regional Water Board recognizes that these discharges are essential public service discharge activities and are directly or indirectly required by other state or federal statute and/or regulation. This Order continues to unconditionally exempt emergency fire fighting discharges from the discharge prohibition.

Like Order No. 01-182, this Order contains a provision that the Regional Water Board Executive Officer may add or remove categories of exempt non-storm water discharges. In addition, in the event that any of the categories of non-storm water discharges are determined to be a source of pollutants by the Executive Officer then the discharges will no longer be exempt unless the Permittee implements conditions approved by the Executive Officer to ensure that the discharge is not a source of pollutants. Also the Executive Officer may impose additional prohibitions of non-storm water discharges in consideration of antidegradation policies and TMDLs.

5. BMPs for Non-Storm Water Discharges

In this Order, no changes have been made to the types of non-storm water discharges included in the non-storm water discharge prohibition exemptions, with one exception related to temporary discharges authorized by USEPA pursuant to sections 104(a) or 104(b) of CERCLA. However, the non-storm water discharge provisions in this Order have been reworded to clarify the requirements for addressing authorized and conditionally exempt non-storm water discharges that are not prohibited. In particular, language has been added to explicitly identify State and Regional Water Board permits that are applicable to some of the exempted non-storm water discharges. The State and Regional Water Board general permits referenced in this Order and their applicability to the different types of non-storm water discharges that are routinely discharged through the MS4 is contained in Table F-4 below.

Table F-4. State and Regional Water Board General Permits Referenced in this Permit

Order/NPDES Permit No.	Applicable Types of Discharges
NPDES Permit No. CAG994003 – Discharges of Nonprocess Wastewater to Surface Waters in Coastal Watersheds of Los Angeles and Ventura Counties	• Ground water seepage • Uncontaminated pumped ground water • Gravity flow from foundation drains, footing drains, and crawl space pumps • Air conditioning condensate • Discharges of cleaning wastewater and filter backwash

Order/NPDES Permit No.	Applicable Types of Discharges
NPDES Permit No. CAG994004 – Discharges of Groundwater from Construction and Project Dewatering to Surface Waters in Coastal Watersheds of Los Angeles and Ventura Counties	• Uncontaminated pumped ground water • Discharges from activities that occur at wellheads, such as well construction, well development (e.g., aquifer pumping tests, well purging), or major well maintenance • Gravity flow from foundation drains, footing drains, and crawl space pumps • Discharges of ground water from construction and project dewatering[6]
NPDES Permit No. CAG990002 – Discharges from Utility Vaults and Underground Structures to Surface Waters	• Uncontaminated pumped ground water • Gravity flow from foundation drains, footing drains, and crawl space pumps
NPDES Permit No. CAG674001 – Discharges From Hydrostatic Test Water to Surface Waters in Coastal Watersheds of Los Angeles and Ventura Counties	• Discharges of low threat hydrostatic test water[7]
NPDES Permit No. CAG914001 – Discharges of Treated Groundwater from Investigation and/or Cleanup of Volatile Organic Compounds Contaminated-Sites to Surface Waters in Coastal Watersheds of Los Angeles and Ventura Counties	• Discharges of treated ground water from investigation and/or cleanup of volatile organic compound (VOC) contaminated sites
NPDES Permit No. CAG994005 – Discharges of Ground Water from Water Supply Wells to Surface Waters in Los Angeles and Ventura Counties	• Discharges of ground water from potable water supply wells[8]

[6] Discharges of ground water from construction and project dewatering include treated or untreated wastewater from permanent or temporary construction dewatering operations; ground water pumped as an aid in the containment and/or cleanup of a contaminant plume; ground water extracted during short-term and long-term pumping/aquifer tests; ground water generated from well drilling, construction or development and purging of wells; equipment decontamination water; subterranean seepage dewatering; incidental collected storm water from basements; and other process and non-process wastewater discharges that meet the eligibility criteria and could not be covered under another specific general NPDES permit.

[7] Low threat hydrostatic test water means discharges resulting from the hydrostatic testing or structural integrity testing of pipes, tanks, or any storage vessels using domestic water or from the repair and maintenance of pipes, tanks, or reservoirs.

[8] Discharges covered by this permit include ground water from potable water supply wells generated during the following activities: ground water generated during well purging for data collection purposes; ground water extracted from major well rehabilitation and redevelopment activities; and ground water generated from well drilling, construction, and development.

Order/NPDES Permit No.	Applicable Types of Discharges
NPDES Permit No. CAG834001 – Waste Discharge Requirements for Treated Groundwater and Other Wastewaters from Investigation and/or Cleanup of Petroleum Fuel-Contaminated Sites to Surface Waters in Coastal Watersheds of Los Angeles and Ventura Counties	• Discharges of treated ground water and other waste waters from investigation and/or cleanup of petroleum fuel contaminated sites

This Order explicitly adds another category of authorized non-storm water discharge for discharges authorized by USEPA pursuant to sections 104(a) or 104(b) of the federal Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). These discharges typically consist of short-term, high volume discharges resulting from the development or redevelopment of groundwater extraction wells, or USEPA or State-required compliance testing of potable water treatment plants, as part of a USEPA authorized groundwater remediation action under CERCLA. These discharges through the MS4 are only authorized if: (i) the discharge will comply with water quality standards identified as applicable or relevant and appropriate requirements ("ARARs") under section 121(d)(2) of CERCLA; or (ii) the discharge is subject to either (a) a written waiver of ARARs by USEPA pursuant to section 121(d)(4) of CERCLA or (b) a written determination by USEPA that compliance with ARARs is not practicable considering the exigencies of the situation, pursuant to 40 CFR section 300.415(j). Additionally, a decision to authorize a discharge through the MS4 to surface waters will not be made by USEPA without first conducting a comprehensive evaluation of containment, treatment, reinjection, or re-use options for the water generated from the subject wells. If a decision to discharge through the MS4 is made, USEPA's authorization of the discharge under CERCLA will require that the discharger shall:

(1) Implement BMPs to minimize the rate and duration of the discharge and remove excessive solids, and implement other on-site physical treatment where feasible.

(2) Promote infiltration of discharged water in locations that will prevent or minimize degradation of groundwater quality.

(3) Notify the affected MS4 Permittees, including the LACFCD and the MS4 Permittee with land use authority over the discharge location, and the Regional Water Board at least one week prior to a planned discharge (unless USEPA determines in writing that exigent circumstances require a shorter notice period) and as soon as possible (but no later than 24 hours after the discharge has occurred) for unplanned discharges;

(4) Monitor any pollutants of concern in the discharge[9]; and

(5) Maintain records for all discharges greater than 100,000 gallons.[10]

In addition to requiring NPDES permit coverage for applicable categories of non-storm water discharges, this Order contains language that specifies certain conditions, including implementation of BMPs, for each category of conditionally exempt non-storm water discharge that must be met in order for the non-storm water discharge to be exempted from the non-storm water prohibition and thus allowed through the MS4.

The California Recycled Water Policy, adopted by the State Water Board in Resolution No. 2009-0011, calls for an increase in the use of recycled water from municipal wastewater sources that meet the definition in California Water Code section 13050(n), in a manner that implements state and federal water quality laws. In support of the California Recycled Water Policy, a provision has been added requiring that alternative means of disposal or opportunities for capture, reclamation, and reuse must be evaluated prior to discharging any of the non-storm water discharge categories to the MS4. In addition, to ensure the protection of receiving water quality all non-storm water discharges must be segregated from potential sources of pollutants to prevent the introduction of pollutants to the discharge.

In establishing provisions specific to different non-storm water discharge types, the Regional Water Board reviewed non-storm water discharge provisions and BMPS included in other area MS4 permits. MS4 permits reviewed included the Ventura County MS4 permit (R4-2009-0057), the Orange County MS4 permit (Order No. R9-2009-0002), the Riverside County MS4 permit (R9-2010-0016), and the San Diego County MS4 permit (R9-2007-0001). Conditions established in this permit for each of the non-storm water discharge categories ensure the protection of receiving water quality and are considered common practices.

Dischargers permitted under NPDES Permit No. CAG990002 are required to contact the appropriate Permittee(s) with jurisdiction over the MS4, including but not limited to the Los Angeles County Flood Control District, within 24 hours, whenever there is a discharge of 50,000 gallons or more from utility vaults and underground structures to the MS4.

The conditions for landscape irrigation have been split into potable and reclaimed landscape irrigation categories. As identified in the Orange County MS4 permit

[9] Pollutants of concern include, at a minimum, trash and debris, including organic matter, TSS, any pollutant being addressed by the groundwater remediation action under CERCLA, and any pollutant for which there is a Water Quality Based Effluent Limitation in Part VI.E applicable to discharges from the MS4 to the receiving water.

[10] Records shall be maintained, as appropriate, on the: name of CERCLA authorized discharger, date and time of notification (for planned discharges), method of notification, location of discharge, discharge pathway, receiving water, date of discharge, time of the beginning and end of the discharge, duration of the discharge, flow rate or velocity, estimated total number of gallons discharged, type of pollutant removal equipment used, type of dechlorination equipment used if applicable, type of dechlorination chemicals used if applicable, concentration of residual chlorine if applicable, type(s) of sediment controls used, and field and laboratory monitoring data. Records shall be retained for three years, unless the Regional Water Board requests a longer record retention period and shall be made available upon request by the MS4 Permittee or the Regional Water Board.

incidental runoff from landscape irrigation projects including over irrigation and overspray have the potential to contribute landscape derived pollutants such as bacteria, nutrients, and pesticides to receiving waters. In addition, the California Recycled Water Policy identifies the need for control of incidental runoff from landscape irrigation projects, particularly as it relates to recycled water use. The BMPs incorporated into the permit for potable landscape irrigation ensure that water is conserved, overspray and over irrigation causing incidental runoff is minimized, and exposure to landscape related pollutants is minimized.

State Water Board Water Quality Order No. 2009-0006-DWQ, General Waste Discharge Requirements for Landscape Irrigation Uses of Municipal Recycled Water, is a general permit for producers and distributors of recycled water for landscape irrigation uses. As part of this general permit, the producers and distributors of recycled water for landscape irrigation are required to develop an Operations and Maintenance Plan (O&M Plan) that includes an Operations Plan and an Irrigation Management Plan. Therefore, any reclaimed landscape irrigation discharges to the MS4 must comply with the relevant portion of the O&M Plan including the Irrigation Management Plan. By explicitly referencing the O&M requirement in this permit, it centralizes the requirements for reclaimed landscape irrigation and helps to ensure that procedures are in place for conserving water, minimizing incidental runoff, and minimizing exposure to landscape related pollutants.

Non-storm water discharge provisions have been added for the dewatering of lakes to the MS4. The provisions for the dewatering of lakes including removing and legally disposing of all visible trash on the shoreline or on the surface of the lake and the cleaning of the MS4 inlet and outlet where the water will be discharged to the receiving water have been consistently incorporated into Regional Water Board authorizations to discharge non-storm water from lakes, reservoirs, and ponds. In addition provisions for volumetrically and velocity controlling discharges as well as taking measurements to stabilize lake bottom sediments are incorporated into the provisions of this Order to ensure that turbidity in receiving waters are maintained at an acceptable level. The permit provisions for the dewatering of lakes ensure the protection of receiving water quality.

Basin plan requirements for residual chlorine have been explicitly included in the conditions for drinking water supplier distribution system releases, dechlorinated/debrominated swimming pool/spa discharges, and dewatering of decorative fountains. Related to swimming pool discharges, discharges of cleaning wastewater and filter backwash are specifically mentioned as being allowed only if authorized under a separate NPDES permit. The Regional Water Board has a general permit for discharges of nonprocess wastewater to surface waters in coastal watersheds of Los Angeles and Ventura counties (NPDES Permit No. CAG994003) that may address discharges of cleaning wastewater and filter backwash.

Specific BMPs for discharges of swimming pools/spas and the dewatering of decorative fountains have been added to this Order including prohibiting the dewatering of swimming pools/spas or decorative fountains containing copper-based

algaecides and requiring the implementation of controls to prevent introduction of pollutants prior to discharge. Swimming pool/spa discharges and decorative fountain water must be dechlorinated or debrominated using holding time, aeration, and/or sodium thiosulfate and if necessary shall be pH adjusted to within the range of 6.5 and 8.5. The MS4 inlet and outlet must be inspected and cleaned out immediately prior to discharge to protect receiving water quality. In addition provisions for volumetrically and velocity controlling discharges are incorporated into the provisions of this Order to ensure that turbidity in receiving waters are maintained at an acceptable level.

In addition to the specific inclusion of Basin Plan water quality objectives for residual chlorine, this Order allows discharges of drinking water supplier distribution system releases as long as specified BMPs are implemented. BMPs must be implemented to prevent introduction of pollutants to drinking water supplier distribution system releases prior to discharge to the receiving water. BMPs must be consistent with the American Water Works Association (California – Nevada Section) BMP Manual for Drinking Water System Releases and other applicable guidelines. Similar to discharges of swimming pools/spas and dewatering of decorative fountains, drinking water supplier distribution system releases must be dechlorinated or debrominated using holding time, aeration, and/or sodium thiosulfate and if necessary shall be pH adjusted to within the range of 6.5 and 8.5. The MS4 inlet and outlet must be inspected and cleaned out immediately prior to discharge to protect receiving water quality. BMPs such as sand bags or gravel bags, or other appropriate means shall be utilized to prevent sediment transport and all sediment shall be collected and disposed of in a legal and appropriate manner. In addition provisions for volumetrically and velocity controlling discharges are incorporated into the provisions of this Order to ensure that turbidity in receiving waters are maintained at an acceptable level.

The permit provisions for drinking water supply and distribution system releases, dechlorinated/debrominated swimming pool/spa discharges, and dewatering of decorative fountains ensures the protection of receiving water quality.

The Regional Water Board evaluated and established a list of approved BMPs for various programs and activities through Regional Water Board Resolution 98-08 that serves as appropriate BMPs for inclusion in the Discharger and Permittees' regulatory programs. Requirements for street/sidewalk wash water contained in Resolution 98-08 have also been explicitly incorporated into this Order. The inclusion of the requirements contained in Resolution 98-08 helps to ensure that Permittees are aware of the requirements and ensures the protection of receiving water quality.

Specific BMPs for discharges from non-commercial car washing have been incorporated into this Order to prevent the introduction of pollutants prior to discharge. BMPs that must be implemented for the discharge of non-commercial vehicle wash water include minimizing the amount of water used by turning off nozzles or kinking the hose when not spraying a vehicle and by using a pressure washer; using biodegradable, phosphate free detergents and non-toxic cleaning

products; where possible, washing vehicles on permeable surfaces where wash water can percolate into the ground; creating a temporary berm or block off the storm drains; using pumps or vacuums to direct water to pervious areas; and emptying buckets of soapy water or rinse water into the sanitary sewer system. These BMPs are common practice and ensure the protection of receiving water quality.

The inclusion of conditions for flows related to non-emergency fire-fighting activities is new to this iteration of the permit. Conditions for discharges related to fire fighting activities have been incorporated into other MS4 permits including both Orange County and Riverside County. Flows resulting from emergency fire fighting activities necessary for the protection of life or property do not require implementation of specific BMPs.

The specific BMPs for discharges associated with non-emergency fire fighting activities that have been incorporated into this Order have been incorporated into other California MS4 permits. Both the Riverside County and Orange County MS4 permits require the development and implementation of a program to address pollutants from non-emergency fire fighting flows. Rather than develop a program to address non-emergency fire fighting flows, common BMPs used in association with non-emergency fire fighting discharges have been incorporated into this Order. Guidance on BMPs contained in this Order for non-emergency fire fighting activities is available in the Best Management Practices Plan for Urban Runoff Management for Participating Riverside County Fire Fighting Agencies.

The inclusion of specific conditions for exempted non-storm water discharges in this Order centralizes the requirements for non-storm water discharges. Conditions established in this permit for each of the conditionally exempt non-storm water discharge categories are common practice and have been incorporated into other area MS4 permits.

6. Permittee Requirements for Non-Storm Water Discharges

This Order includes specific requirements for Permittees related to more targeted screening of MS4 outfalls for non-storm water discharges, and monitoring and evaluation of significant non-storm water discharges. Permittees are required to develop and implement procedures to ensure that all conditions required for conditionally exempt non-storm water discharges are being implemented. These requirements also help to clarify the responsibilities of the Permittees versus the responsibilities of the non-MS4 Permittee dischargers to the MS4. The development and implementation of these procedures helps to ensure compliance with the non-storm water discharge prohibition and ensure that the non-storm water discharges are not sources of pollutants.

B. Technology-Based Effluent Limitations

Section 301(b)(1)(A) of the CWA and 40 CFR section 122.44(a) require that NPDES permits include technology based effluent limitations.[11] In 1987, the CWA was amended to require that municipal storm water discharges "reduce the discharge of pollutants to the maximum extent practicable." (CWA § 402(p)(3)(B)(iii).) The "maximum extent practicable" (MEP) standard is the applicable federal technology based standard that MS4 owners and operators must attain to comply with their NPDES permits.[12] The corresponding regulatory provisions that further detail the MEP standard can be found in 40 CFR sections 122.26(d)(2)(iv) and 122.44(k)(2).

Neither Congress nor the USEPA has specifically defined the term "maximum extent practicable." Rather, the MEP standard is a flexible and evolving standard. Congress established this flexible MEP standard so that administrative bodies would have "the tools to meet the fundamental goals of the Clean Water Act in the context of storm water pollution."[13] This standard was designed to allow permit writers flexibility to tailor permits to the site-specific nature of MS4s and to use a combination of pollution controls that may be different in different permits.[14] The MEP standard is also expected to evolve in light of programmatic improvements, new source control initiatives, and technological advances that serve to improve the overall effectiveness of storm water management programs in reducing pollutant loading to receiving waters. This is consistent with USEPA's interpretation of storm water management programs. As explained by USEPA in its 1990 rulemaking, "EPA anticipates that storm water management programs will evolve and mature over time" (55 Fed.Reg. 47990, 48052 (Nov. 16, 1990)). There is ample evidence of this evolution in storm water management. Two local examples include the development of full capture trash control devices in response to the Los Angeles Region Trash TMDLs, and the development of innovative media filters for use in outfalls at the Boeing Santa Susana Field Laboratory that have potential municipal applications.

To provide clarification to the Regional Water Boards, the State Water Board's Office of Chief Counsel issued a memorandum dated February 11, 1993 regarding the "Definition of 'Maximum Extent Practicable'". In the memorandum, the State Water Board interpreted the MEP standard to entail "a serious attempt to comply," and that under the MEP standard, "practical solutions may not be lightly rejected." The memorandum states, "[i]n selecting BMPs which will achieve MEP, it is important to remember that municipalities will be responsible to reduce the discharge of pollutants in storm water to *the maximum extent practicable*. This means choosing effective BMPs, and rejecting applicable BMPs only where other effective BMPs will serve the same purpose, the BMPs would not be technically feasible, or the cost would be prohibitive." The memorandum further states that, "[a]fter selecting a menu of BMPs, it is of course the responsibility of the discharger to insure that all BMPs are implemented."

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[11] A technology based effluent limitation is based on the capability of a model treatment method to reduce a pollutant to a certain concentration (NPDES Permit Writer's Manual, Appendix A). Technology based requirements represent the minimum level of control that must be imposed in a permit issued under CWA § 402.

[12] Note that the MEP standard only applies to storm water discharges from the MS4. Non-storm water discharges are subject to a different standard – specifically, non-storm water discharges through the MS4 must be effectively prohibited.

[13] Building Industry Ass'n of San Diego County v. State Water Resources Control Board (2004) 124 Cal.App.4th 866, 884.

[14] In re City of Irving, Texas, Municipal Storm Sewer System, (July 16, 2001), 10 E.A.D. 111 (E.P.A.), *6.

This Order includes programmatic requirements in six areas pursuant to 40 CFR section 122.26(d)(2)(iv) as well as numeric design standards for storm water runoff from new development and redevelopment consistent with the federal MEP standard (see State Water Board Order WQ 2000-11, the "LA SUSMP Order"). This Order also includes protocols for periodically evaluating and modifying or adding control measures, consistent with the concept that MEP is an evolving and flexible standard.

This Order also provides for the use of municipal action levels ("MALs") derived from the National Stormwater Quality Database (NSQD), as a means of evaluating the overall effectiveness of a Permittee's storm water management program in reducing pollutant loads from a particular drainage area and in order to assess compliance with the MEP standard. Finally, this Order includes BMP Performance Standards derived from the International BMP Database as a guide for BMP selection and design, and as a tool for evaluating the effectiveness of individual post-construction BMPs in reducing pollutant loads and assessing compliance with the MEP standard. USEPA recommends the use of numeric benchmarks for BMPs to estimate BMP effectiveness and as triggers for taking additional actions such as evaluating the effectiveness of individual BMPs, implementing and/or modifying BMPs, or providing additional measures to protect water quality.[15]

C. Water Quality-Based Effluent Limitations (WQBELs)

In addition to requiring that MS4 permits include technology based requirements consistent with the MEP standard, section 402(p)(3)(B)(iii) of the CWA authorizes the inclusion of "such other provisions as the Administrator or the State determines appropriate for the control of [] pollutants."[16] This requirement gives USEPA or the State permitting authority discretion to determine what permit conditions are necessary to control pollutants. Generally, permit requirements designed to achieve water quality standards are referred to as water quality based effluent limitations (WQBELs). A WQBEL is a restriction on the quantity or concentration of a pollutant that may be discharged from a point source into a receiving water that is necessary to achieve an applicable water quality standard in the receiving water.[17] WQBELs may be expressed narratively or numerically.

In its Phase I Stormwater Regulations, Final Rule, USEPA elaborated on these requirements, stating that, "permits for discharges from municipal separate storm sewer systems must require controls to reduce the discharge of pollutants to the maximum extent practicable, and where necessary water quality-based controls" (see 55 Fed.Reg.

[15] See USEPA November 22, 2002 memorandum, "Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs."

[16] The first and second iterations of the Los Angeles County MS4 Permit relied solely upon requirements consistent with the MEP standard to work toward achieving water quality standards. Note that the MEP standard is distinct from a water quality based standard; each has a different basis. Therefore, while from a practical point of view, the goal of all MS4 permit conditions is to control pollutants in discharges to ultimately achieve certain water quality outcomes, water quality based standards are directly derived from this desired outcome, while the MEP standard is anticipated to be a way of working toward the desired outcome, but is not directly derived from it.

[17] See 40 CFR § 122.2; NPDES Permit Writer's Manual, Appendix A. A WQBEL is distinguished from a technology based effluent limitation (TBEL) in that the basis for the WQBEL is the applicable water quality standard for the receiving water, while the basis for the TBEL is generally the performance of the best available technology.

47990, 47994 (Nov. 16, 1990). In December 1999, USEPA reiterated in its Phase II Stormwater Regulations, Final Rule that MS4 "permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL."[18] The State Water Board has affirmed that MS4 permits must include requirements necessary to achieve compliance with the applicable technology based standard of MEP and to achieve water quality standards.[19]

WQBELs are required for point source discharges that have the reasonable potential to cause or contribute to an excursion of water quality standards and technology based effluent limitations or standards are not sufficient to achieve water quality standards.[20]

The State Water Board has previously concluded that sole reliance in MS4 permits on BMP based requirements is not sufficient to ensure attainment of water quality standards. (See State Water Board Order 2001-015). The Regional Water Board concurs with this conclusion. This conclusion is amply supported by Regional Water Board and USEPA established TMDLs for impaired waters in the Los Angeles Region, indicating that MS4 discharges are a continuing source of pollutants to the impaired receiving waters notwithstanding the implementation of storm water management programs that have been driven by the MEP standard by Permittees for the last two decades.

In this Order, WQBELs are included where the Regional Water Board has determined that discharges from the MS4 have the reasonable potential to cause or contribute to an excursion above water quality standards.[21] Reasonable potential can be demonstrated in several ways, one of which is through the TMDL development process. Where a point source is assigned a WLA in a TMDL, the analysis conducted in the development of the TMDL provides the basis for the Regional Water Board's determination that the discharge has the reasonable potential to cause or contribute to an exceedance of water quality standards in the receiving water. This approach is affirmed in USEPA's Permit Writer's Manual, which states, "[w]here there is a pollutant with a WLA from a TMDL, a permit writer must develop WQBELs." Therefore, WQBELs are included in this Order for all pollutants for which a WLA is assigned to MS4 discharges.

Federal regulations further require that, "when developing water quality-based effluent limits…the permitting authority shall ensure that effluent limits … are consistent with the assumptions and requirements of any available wasteload allocation for the discharge…" (40 CFR § 122.44(d)(1)(vii)(B)).

The Regional Water Board interprets this to mean that the final WQBEL must be expressed in similar terms as the underlying WLA; for example, where a TMDL includes WLAs for MS4 discharges that provide numeric pollutant load objectives, the WLA should be translated into numeric WQBELs in the permit, and at a level to achieve the same expected water quality outcome. USEPA also recommends the use of numeric WQBELs to meet water quality standards where MS4 discharges have the reasonable

[18] *See, e.g.,* Phase II Stormwater Regulations, Final Rule, 64 Fed. Reg. 68722, 68737.
[19] See, e.g., State Water Board Orders WQ 99-05 and 2001-15.
[20] 40 CFR §§ 122.44(d)(1)(i); 122.44(d)(1)(iii)
[21] 40 CFR §§ 122.44(d)(1)(i)-(iii); 122.44(d)(1)(vii)(B)

potential to cause or contribute to a water quality standard excursion. Numeric WQBELs will help clarify MS4 permit requirements and improve accountability in this permit term.

While BMPs[22] are central to MS4 permits, permit requirements may only rely upon BMP based limitations in lieu of water quality based effluent limitations if: (1) the BMPs are adequate to achieve water quality standards, and (2) numeric effluent limitations are infeasible.[23] As discussed earlier, the State and Regional Water Boards have concluded that sole reliance on MEP based permit requirements is not sufficient to ensure the achievement of water quality standards. Further, there is insufficient data and information available at this time on the prospective implementation of BMPs throughout Los Angeles County to provide the Regional Water Board reasonable assurance that the BMPs would be sufficient to achieve the WQBELs.[24]

Regarding the feasibility of numeric effluent limitations, the Regional Water Board concludes that numeric WQBELs are feasible. While a lack of data may have hampered the development of numeric effluent limitations for MS4 discharges in earlier permit cycles, in the last decade, 33 TMDLs have been developed for water bodies in Los Angeles County in which WLAs are assigned to MS4 discharges. In each case, part of the development process entailed analyzing pollutant sources and allocating loads using empirical relationships or modeling approaches. As a result, it is possible to use these numeric WLAs to derive numeric WQBELs for MS4 discharges. USEPA has also acknowledged that its expectations regarding the application of numeric WQBELs to municipal storm water discharges have changed as the storm water permit program has continued to mature over the last decade.[25]

The inclusion of numeric WQBELs is also consistent with the Ninth Circuit Court of Appeal's ruling in *Defenders of Wildlife v. Browner* (191 F.3d 1159, 1166 (1999)) that the permitting authority has discretion regarding the nature and timing of requirements that it includes as MS4 permit conditions to attain water quality standards, and that these requirements may include numeric effluent limitations.

Further, given the variability in implementation of storm water management programs across Permittees, numeric WQBELs create an objective, equitable and accountable means of controlling MS4 discharges, while providing the flexibility for Permittees to comply with the WQBELs in any lawful manner.

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[22] Note that best management practices and effluent limitations are two different types of permit requirements (see 40 CFR §§ 122.2; 122.44(k), which distinguish the two terms and describe their relationship to each other).

[23] 40 CFR §§ 122.44(d)(1); 122.44(k)(3); see also State Water Board Order 91-03; Memorandum from Elizabeth Miller Jennings, Office of Chief Counsel to Bruce Fujimoto, Division of Water Quality, "Municipal Storm Water Permits: Compliance with Water Quality Objectives," October 3, 1995.

[24] USEPA states in its 2002 memorandum, "Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs" that, "[w]hen a non-numeric water quality-based effluent limit is imposed, the permit's administrative record, including the fact sheet when one is required, needs to support that the BMPs are expected to be sufficient to implement the WLA in the TMDL," citing 40 CFR §§ 124.8, 124.9, and 124.18. See also USEPA's 2010 memorandum revising the 2002 memorandum.

[25] See USEPA 2010 memorandum, "Revisions to the November 22, 2002 Memorandum 'Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs'" in which USEPA states, "where the NPDES permitting authority determines that MS4 discharges…have the reasonable potential to cause or contribute to water quality standards excursions, permit for MS4s…should contain numeric effluent limitations where feasible to do so." USEPA further states, "[w]here the TMDL includes WLAs for stormwater sources that provide numeric pollutant load…objectives, the WLA should, where feasible, be translated into numeric WQBELs in the applicable stormwater permits."

D. Final Effluent Limitations

Final WQBELs are included in this Order based on the final WLAs assigned to discharges from the Los Angeles County MS4 in all available TMDLs.

MS4 permits can include compliance schedules for achieving final WQBELs derived from TMDL WLAs, so long as the compliance schedule is consistent with a TMDL implementation plan adopted by the Regional Water Board and approved through the State's basin plan amendment process. If a compliance schedule exceeds one year, it must include interim requirements pursuant to 40 CFR section 122.47.

Section 402(o) of the CWA and 40 CFR section 122.44(l) require that effluent limitations in reissued orders be at least as stringent as those in the existing order. This Order carries over the final receiving water limitations and WQBELs that were included to implement the Marina del Rey Harbor Back Basins and Mothers' Beach Bacteria TMDL and the Los Angeles River Trash TMDL, respectively, in the 2007 and 2009 amendments to Order No. 01-182.

E. Interim Effluent Limitations

Where there is a TMDL implementation plan adopted by the Regional Water Board and approved through the State's basin plan amendment process, interim WQBELs are included in this Order based on interim WLAs established for MS4 discharges.

V. RATIONALE FOR RECEIVING WATER LIMITATIONS

A. Receiving Water Limitations

Receiving water limitations are included in all NPDES permits issued pursuant to CWA section 402. Section 402(p)(3)(B)(iii) of the CWA authorizes the inclusion of "such other provisions as the Administrator or the State determines appropriate for the control of [] pollutants." This requirement gives USEPA or the State permitting authority discretion to determine what permit conditions are necessary to control pollutants. In its Phase I Stormwater Regulations, Final Rule, USEPA elaborated on these requirements, stating that, "permits for discharges from municipal separate storm sewer systems must require controls to reduce the discharge of pollutants to the maximum extent practicable, and where necessary water quality-based controls" (see 55 Fed. Reg. 47990, 47994 (Nov. 16, 1990)). USEPA reiterated in its Phase II Stormwater Regulations, Final Rule, that MS4 "permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL."[26] USEPA Region IX has also affirmed the agency's position that MS4 discharges must meet water quality standards in a series of comment letters on MS4 permits issued by various California regional water boards.[27] California Water Code section 13377 also requires that NPDES permits include limitations necessary to implement water quality control plans. Both the State Water Board and Regional Water Board have previously concluded that

[26] *See, e.g.,* Phase II Stormwater Regulations, Final Rule, 64 Fed. Reg. 68722, 68737.
[27] See, e.g., letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.

discharges from the MS4 contain pollutants that have the reasonable potential to cause or contribute to excursion above water quality standards. As such, inclusion of receiving water limitations is appropriate to control MS4 discharges.

The inclusion of receiving water limitations is also consistent with the Ninth Circuit Court of Appeal's ruling in *Defenders of Wildlife v. Browner* (191 F.3d 1159, 1166 (1999)) that the permitting authority has discretion regarding the nature and timing of requirements that it includes as MS4 permit conditions to attain water quality standards.

The Ninth Circuit Court of Appeals recently explained that, "[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels" (*NRDC v. County of Los Angeles* (2011) 673 F.3d 880, 886). Receiving water limitations are included in this Order to ensure that individual and collective discharges from the MS4 do not cause or contribute to exceedances of water quality standards necessary to protect the beneficial uses of the receiving waters.

The receiving water limitations in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations to implement the applicable water quality objectives or criteria, for receiving waters as contained in Chapters 3 and 7 of the Basin Plan, or in water quality control plans or policies adopted by the State Water Resources Control Board, including Resolution No. 68-16, or in federal regulations, including but not limited to, 40 CFR sections 131.12 and 131.38. The water quality objectives in the Basin Plan and other State Water Board plans and policies have been approved by USEPA and combined with the designated beneficial uses constitute the water quality standards required under federal law.

The receiving water limitations provisions in this Order are the same as those included in the previous Los Angeles County MS4 Permit provisions, and are based on precedential State Water Board Orders WQ 98-01 and WQ 99-05. This Order includes three main provisions related to receiving water limitations. First, consistent with CWA section 402(p)(B)(3)(iii) and 40 CFR section 122.44(d)(1), it includes a provision stating that discharges from the MS4 that cause or contribute to an exceedance of receiving water limitations are prohibited. This is also in accord with the State Water Board's finding in Order WQ 98-01 ("The [State Water Board] agrees that the NPDES permit must prohibit discharges that "cause" or "contribute" to violations of water quality standards."). Second, it includes a provision stating that discharges from the MS4 of stormwater or non-stormwater, for which a Permittee is responsible, shall not cause or contribute to a condition of nuisance.[28]

Third, it includes a provision that states that Permittees shall achieve these two prohibitions "through timely implementation of control measures and other actions to reduce pollutants in the discharges in accordance with the storm water management program and its components and other requirements of this Order including any

[28] Wat. Code, § 13377 ("the state board or the regional boards shall . . . issue waste discharge requirements and dredged or fill material permits which apply and ensure compliance with all applicable provisions of the [CWA], thereto, together with any more stringent effluent standards or limitations necessary to implement waste quality control plans, or for the protection of beneficial uses, or to prevent nuisance").

modifications." This third provision elucidates the process by which Permittees are expected to achieve the first two provisions and then outlines the so-called "iterative process" whereby certain actions are required when exceedances of receiving water limitations occur and discharges from the MS4 are implicated. This iterative process includes submitting a Receiving Water Limitations Compliance Report; revising the storm water management program and its components to include additional BMPs, an implementation schedule and additional monitoring to address the exceedances; and implementing the revised storm water management program. The inclusion of this protocol for estimating BMP effectiveness and taking additional actions such as implementing additional BMPs and/or modifying BMPs to improve their effectiveness when monitoring demonstrates that they are necessary to protect water quality is consistent with USEPA's expectations for MS4 permits.[29]

The State and Regional Water Boards have stated that each of the three provisions are independently applicable, meaning that compliance with one provision does not provide a "safe harbor" where there is non-compliance with another provision (i.e., compliance with the third provision does not shield a Permittee who may have violated the first or second provision from an enforcement action). Rather, the third provision is intended to ensure that the necessary storm water management programs and controls are in place, and that they are modified by Permittees in a timely fashion when necessary, so that the first two provisions are achieved as soon as possible. USEPA expressed the importance of this independent applicability in a series of comment letters on MS4 permits proposed by various regional water boards. At that time, USEPA expressly objected to certain MS4 permits that included language stating, "permittees will not be in violation of this [receiving water limitation] provision …" (if certain steps are taken to evaluate and improve the effectiveness of the Drainage Area Management Plan (DAMP)), concluding that this phrase would not comply with the CWA.[30]

The Receiving Water Limitations provisions of Order No. 01-182 have been litigated twice, and in both cases the courts have upheld the language and the State and Regional Water Board's interpretation of it. Both courts ruled that the first two provisions are independently applicable from the third provision that establishes the "iterative process" requirements and no "safe harbor" exists.

The provisions were first litigated in 2005 where the Los Angeles County Superior Court stated, "In sum, the Regional [Water] Board acted within its authority when it included Parts 2.1 and 2.2 in the Permit without a 'safe harbor,' whether or not compliance therewith requires efforts that exceed the 'MEP' standard." (*In re L.A. Cnty. Mun. Storm Water Permit Litig.* (L.A. Super. Ct., No. BS 080548, Mar. 24, 2005) Statement of Decision from Phase I Trial on Petitions for Writ of Mandate, pp. 4-5, 7.).

The provisions were again litigated in 2011. In that case, the Ninth Circuit Court of Appeal in *NRDC v. County of Los Angeles* (673 F.3d 880, 886) affirmed that the iterative process (in Part 2.3 of the 2001 Order) does not "forgive" violations of the discharge prohibitions (in Parts 2.1 and 2.2 of the 2001 Order). The court acknowledged

[29] See, e.g., USEPA 2002 memorandum, "Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs."
[30] See note 20.

that Part 2.3 clarifies that Parts 2 and 3 interact, but the court concluded that Part 2.3 "offers no textual support for the proposition that compliance with certain provisions shall forgive non-compliance with the discharge prohibitions." The Ninth Circuit further concluded that, "[a]s opposed to absolving noncompliance or exclusively adopting the MEP standard, the iterative process ensures that if water quality standards 'persist,' despite prior abatement efforts, a process will commence whereby a responsible Permittee amends its SQMP. Given that Part 3 of the [2001] Permit states that SQMP implementation is the 'minimum' required of each Permittee, the discharge prohibitions serve as additional requirements that operate as enforceable water-quality-based performance standards required by the Regional Board."

Nonetheless, the Regional Water Board is in a unique position to be able to offer multiple paths to compliance with receiving water limitations in this MS4 permit. The Regional Board has worked closely with the US EPA in implementing the requirements of the 1999 consent decree between EPA and the environmental groups. The requirements of the consent decree are nearly complete and 33 of these TMDLs addressing hundreds of waterbody-pollutant combinations covering every coastal watershed in Los Angeles County will be implemented in this Order. The number of TMDLs, and hundreds of water quality issues that the TMDLs address, is unprecedented anywhere else in California. These extensive and enforceable implementation programs for addressing myriad water quality issues throughout the County, coupled with more robust core provision requirements, and commitments to implement watershed solutions to address all impairments in regional waters, allows this Board to consider the compliance mechanisms described below. These compliance mechanisms provide an incentive and robust framework for Permittees to craft comprehensive pathways to achieve compliance with receiving water limitations – both those addressed by TMDLs and those not addressed by TMDLs. This compliance mechanism is contingent upon participating Permittees being in full compliance with all requirements articulated in the permit and approved Watershed Management Program or EWMP in order to take advantage of these provisions.

This Order includes requirements in Part VI.E of this Order to implement WLAs assigned to MS4 discharges from 33 TMDLs. Those TMDLs adopted through the State's basin planning process include programs of implementation pursuant to California Water Code section 13242, including implementation schedules, for attaining water quality standards. The TMDL provisions in Part VI.E and attachments include compliance schedules for TMDLs adopted by the Regional Water Board consistent with the TMDL implementation schedule to achieve the final receiving water limitations. The Regional Water Board recognizes that, in the case of impaired waters subject to a TMDL, the permit's receiving water limitations for the pollutants addressed by the TMDL may be exceeded during the period of TMDL implementation. Therefore, this Order provides, in Part VI.E.2.c, that a Permittee's full compliance with the applicable TMDL requirements pursuant to the compliance schedules in this Order constitutes a Permittee's compliance with the receiving water limitations provisions in Part V.A. of this Order for the particular pollutant addressed by the TMDL.

For water body-pollutant combinations not addressed by a TMDL, the Regional Water Board has included provisions in Part VI.C. to allow Permittees to develop a Watershed

Management Program or EWMP to address receiving water limitations not otherwise addressed by a TMDL. The Watershed Management Program must include a Reasonable Assurance Analysis (RAA) that is quantitative and performed using a peer-reviewed model in the public domain. Models to be considered for the RAA, without exclusion, are the Watershed Management Modeling System (WMMS), Hydrologic Simulation Program-FORTRAN (HSPF), and the Structural BMP Prioritization and Analysis Tool (SBPAT). The RAA shall commence with assembly of all available, relevant subwatershed data collected within the last 10 years, including land use and pollutant loading data, establishment of quality assurance/quality control (QA/QC) criteria, QA/QC checks of the data, and identification of the data set meeting the criteria for use in the analysis. Data on performance of watershed control measures needed as model input shall be drawn only from peer-reviewed sources. These data shall be statistically analyzed to determine the best estimate of performance and the confidence limits on that estimate for the pollutants to be evaluated. The objective of the RAA shall be to demonstrate the ability of Watershed Management Programs and enhanced Watershed Management Programs (where retention of the 85th percentile, 24-hour event is not technically feasible) to ensure that Permittees' MS4 discharges achieve applicable water quality based effluent limitations and do not cause or contribute to exceedances of receiving water limitations.

A Permittee's full compliance with all requirements and dates for their achievement in an approved Watershed Management Program or enhanced Watershed Management Program constitutes compliance with the receiving water limitations provisions in Part V.A. of the Order for the specific water body-pollutant combinations addressed by an approved Watershed Management Program or enhanced Watershed Management Program. However, if a Permittee fails to meet any requirement or date for its achievement beginning with notification of a Permittee's intent to develop a Watershed Management Program or EWMP, and continuing with implementation of an approved Watershed Management Program or enhanced Watershed Management Program, the Permittee is subject to the provisions of Part V.A. for the waterbody-pollutant combination(s) that were to be addressed by the requirement. Permittees that do not elect to develop a Watershed Management Program or EWMP are required to demonstrate compliance with receiving water limitations pursuant to Part V.A. For water body-pollutant combinations that are not addressed by a TMDL, final compliance with receiving water limitations is determined by verification through monitoring that the receiving water limitation provisions in Part V.A.1 and 2 have been achieved.

VI. RATIONALE FOR PROVISIONS

A. Standard Provisions

Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR section 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR section 122.42, are provided in Attachment D. Dischargers must comply with all standard provisions and with those additional conditions that are applicable under 40 CFR section 122.42.

B. Watershed Management Programs

The purpose of the Watershed Management Programs is to provide a framework for Permittees to implement the requirements of this Order in an integrated and collaborative fashion to address water quality priorities on a watershed scale, including complying with the requirements of Part V.A. (Receiving Water Limitations), Part VI.E (Total Maximum Daily Load Provisions) and Attachments L through R, by customizing the control measures in Parts III.A.4 (Prohibitions – Non-Storm Water Discharges) and VI.D (Minimum Control Measures). This watershed management paradigm is consistent with federal regulations that support the development of permit conditions, as well as the implementation of storm water management programs, at a watershed scale (40 CFR §§ 122.26(a)(3)(ii), 122.26(a)(3)(v), and 122.26(d)(2)(iv)). USEPA later issued a Watershed-Based NPDES Permitting Policy Statement (USEPA, 2003) that defines watershed-based permitting as an approach that produces NPDES permits that are issued to point sources on a geographic or watershed basis. In this policy statement, USEPA explains that, "[t]he utility of this tool relies heavily on a detailed, integrated, and inclusive watershed planning process." USEPA identifies a number of important benefits of watershed permitting, including more environmentally effective results; the ability to emphasize measuring the effectiveness of targeted actions on improvements in water quality; reduced cost of improving the quality of the nation's waters; and more effective implementation of watershed plans, including TMDLs, among others.

There are several reasons for this shift in emphasis from Order No. 01-182. A watershed based structure for permit implementation is consistent with TMDLs developed by the Los Angeles Water Board and USEPA, which are established at a watershed or subwatershed scale and are a prominent new part of this Order. Many of the Permittees regulated by this Order have already begun collaborating on a watershed scale to develop monitoring and implementation plans required by TMDLs. Additionally, a watershed based structure comports with the recent amendment to the Los Angeles County Flood Control Act (Assembly Bill 2554 in 2010), which allows the LACFCD to assess a parcel tax for storm water and clean water programs. Funding is subject to voter approval in accordance with Proposition 218. Fifty percent of funding is allocated to nine "watershed authority groups" to implement collaborative water quality improvement plans.

An emphasis on watersheds is appropriate at this stage in the region's MS4 program to shift the focus of the Permittees from rote program development and implementation to more targeted, water quality driven planning and implementation. Addressing MS4 discharges on a watershed scale focuses on water quality results by emphasizing the receiving waters within the watershed. The conditions of the receiving waters drive management actions, which in turn focus on the measures to address pollutant contributions from MS4 discharges.

The ultimate goal of the Watershed Management Programs is to ensure that discharges from the Los Angeles County MS4: (i) achieve applicable WQBELs that implement TMDLs, (ii) do not cause or contribute to exceedances of receiving water limitations, and (iii) for non-storm water discharges from the MS4, are not a source of pollutants to receiving waters.

After more than 20 years of program implementation, it is critical that the Permittees design and implement their programs based on their improved knowledge of storm water and its impacts on local receiving waters and by employing BMPs and other control measures that have been developed and refined over the past two decades. The Watershed Management Programs are driven by strategic planning and implementation, which will ultimately result in more cost effective implementation. The Watershed Management Programs will provide permittees with the flexibility to prioritize and customize control measures to address the water quality issues specific to the watershed management area (WMA), consistent with federal regulations (40 CFR § 122.26(d)(2)(iv)).

Focusing on watershed implementation does not mean that the Permittees must expend funds outside of their jurisdictions. Rather, the Permittees within each watershed are expected to collaborate to develop a watershed strategy to address the high priority water quality problems within each watershed. They have the option of implementing the strategy in the manner they find to be most effective. Each Permittee can implement the strategy individually within its jurisdiction, or the Permittees can group together to implement the strategy throughout the watershed.

While this Order includes a new emphasis on addressing MS4 discharges on a watershed basis, this Order includes recognition of the importance of continued program implementation on jurisdictional levels. This Order also acknowledges that jurisdictional and watershed efforts may be integrated to achieve water quality outcomes.

In this Order, the watershed requirements serve as the mechanism for this program integration. Since jurisdictional activities also serve watershed purposes, such activities can be integrated into the Permittees' watershed management programs. Such opportunities for program integration inherently provide flexibility to the Permittees in implementing their programs. Program integration can be expanded or minimized as the Permittees see fit. Some Permittees may opt to continue jurisdiction-specific implementation for certain programs, while for other program areas more collaborative watershed scale implementation may be more effective. Permittees identify individual roles and responsibilities as part of the Watershed Management Program Plan.

Permittees can customize the BMPs to be implemented, or required to be implemented, for development, construction, and existing development areas. Flexibility to determine which industrial or commercial sites are to be inspected is also provided to the Permittees. Educational approaches are also to be determined by the Permittees under this Order. Significant leeway is also provided to the Permittees in using methods to assess the effectiveness of their various runoff management programs. This flexibility is further extended to the monitoring program requirements, which allow the Permittees to develop monitoring approaches to several aspects of the monitoring program.

The challenge in drafting this Order is to provide the flexibility described above, while ensuring that this Order provides baseline requirements and is still enforceable. To achieve this, this Order frequently prescribes baseline or default requirements, such as

for each of the six "minimum control measures" within a Permittee's baseline storm water management program, while providing the Permittees with flexibility to propose customized actions as part of their watershed management program.

Permittees that elect to develop a Watershed Management Program must submit a "Notice of Intent" to the Regional Water Board no later than six months after the effective date of this Order. The Notice of Intent must be signed by all Permittees electing to participate in the Watershed Management Program for the Watershed Management Area. Permittees that do not elect to develop a Watershed Management Program are subject to the baseline storm water management program requirements in this Order and must demonstrate compliance with applicable WQBELs through monitoring data collected from the Permittee's outfall(s).

Permittees electing to develop a Watershed Management Program must submit a draft plan for approval by the Regional Water Board or by the Executive Officer on behalf of the Regional Water Board no later than one year after the effective date of the Order, or if certain conditions are met, no later than 18 months or 30 months after the effective date of the Order. To encourage stakeholder involvement in the development of the Watershed Management Programs, the Order requires that the Permittees form a permit-wide technical advisory committee (TAC) that will advise and participate in the development of the Watershed Management Programs. The TAC must include at least one public representative from a non-governmental organization with public membership. Additionally, the Order requires that the draft Watershed Management Programs are made available for public review prior to approval by the Regional Water Board or Executive Officer on behalf of the Regional Water Board.

Permittees may request an extension of the deadlines for notification of intent to develop a Watershed Management Program or EWMP, submission of a draft plan, and submission of a final plan. The extension is subject to approval by the Regional Water Board or the Executive Officer. Permittees that are granted an extension for any deadlines for development of the WMP/EWMP shall be subject to the baseline requirements in Part VI.D and shall demonstrate compliance with receiving water limitations pursuant to Part V.A. and with applicable interim water quality-based effluent limitations in Part VI.E pursuant to subparts VI.E.2.d.i.(1)-(3) until the Permittee has an approved WMP/EWMP in place.

Each Watershed Management Program must:

1. Prioritize water quality issues resulting from storm water and non-storm water discharges to the MS4 and from the MS4 to receiving waters within each Watershed Management Area,
2. Identify and implement strategies, control measures, and BMPs to achieve applicable water quality based effluent limitations and/or receiving water limitations, consistent with applicable compliance schedules in this Order,
3. Execute an integrated monitoring and assessment program to determine progress towards achieving applicable limitations, and
4. Modify strategies, control measures, and BMPs as necessary based on analysis of monitoring data collected pursuant to the MRP to ensure that applicable water

quality-based effluent limitations and receiving water limitations and other milestones set forth in the Watershed Management Program will be achieved.

Watershed Management Programs must be developed using the Regional Water Board's Watershed Management Areas (see Attachments B and C of this Order). Where appropriate, Watershed Management Areas may be separated into subwatersheds to focus water quality prioritization and implementation efforts by receiving water, or to align Permittee groups with "watershed authority groups" designated in the Los Angeles County Flood Control Act, so long as the Permittees implement all TMDL provisions for which they are identified as a responsible Permittee.

Permittees must identify the water quality priorities within each Watershed Management Area that will be addressed by the Watershed Management Program consistent with 40 CFR section 122.26(d)(2)(iv). At a minimum, these priorities must include achieving applicable water quality based effluent limitations and/or receiving water limitations established pursuant to TMDLs and included in this Order.

Each plan must include an evaluation of existing water quality conditions, including characterization of storm water and non-storm water discharges from the MS4 and receiving water quality, consistent with 40 CFR §§ 122.26(d)(1)(iv) and 122.26(d)(2)(iii), to support identification and prioritization/sequencing of management actions.

On the basis of the evaluation of existing water quality conditions, water body-pollutant combinations must be classified into one of the following three categories:

- Category 1 (Highest Priority): Water body-pollutant combinations for which water quality based effluent limitations and/or receiving water limitations are included in this Order to implement TMDLs.
- Category 2 (High Priority): Pollutants for which data indicate water quality impairment in the receiving water according to the State's Listing Policy and for which MS4 discharges may be causing or contributing to the impairment.
- Category 3 (Medium Priority): Pollutants for which there are insufficient data to indicate water quality impairment in the receiving water according to the State's Listing Policy, but which exceed applicable receiving water limitations contained in this Order and for which MS4 discharges may be causing or contributing to the exceedance.

Utilizing existing information, potential sources within the watershed for the pollutants in Categories 1 and 2 must be identified, consistent with 40 CFR sections 122.26(d)(1)(iii) and 122.26(d)(2)(ii). Permittees must identify known and suspected storm water and non-storm water pollutant sources in discharges to the MS4 and from the MS4 to receiving waters and any other stressors related to MS4 discharges causing or contributing to the highest water quality priorities (Categories 1 and 2).

Based on the findings of the source assessment, the issues within each watershed must be prioritized and sequenced. Factors that must be considered in establishing watershed priorities include:

1. Pollutants for which there are water quality based effluent limitations and/or receiving water limitations with interim or final compliance deadlines within the permit term.
2. Pollutants for which there are water quality based effluent limitations and/or receiving water limitations with interim or final compliance deadlines between October 26, 2012 and October 25, 2017.
3. Pollutants for which data indicate impairment in the receiving water and the findings from the source assessment implicates discharges from the MS4, but no TMDL has been developed.

Permittees must identify strategies, control measures, and BMPs to implement through their jurisdictional storm water management programs, or collectively on a watershed scale, with the goal of creating an efficient program to focus individual and collective resources on watershed priorities.

The following provisions of this Order may be part of the Watershed Control Measures within a Watershed Management Program:

1. Minimum Control Measures. Permittees may assess the minimum control measures (MCMs) as defined in this Order to identify opportunities for focusing resources on the high priority issues in each watershed. For each of the following minimum control measures, Permittees may propose modifications that will achieve equivalent pollutant control given watershed priorities:

   a. Development Construction Program
   b. Industrial/Commercial Program
   c. Illicit Connection/Illicit Discharge Detection and Elimination Program
   d. Public Agency Activities Program
   e. Public Information and Participation Program

2. Non-Storm Water Discharge Measures. Where Permittees identify non-storm water discharges from the MS4 as a source of pollutants in the source assessment, the Watershed Control Measures must include strategies, control measures, and/or BMPs that will be implemented to effectively eliminate the source of pollutants. These may include measures to prohibit the non-storm water discharge to the MS4, additional BMPs to reduce pollutants in the non-storm water discharge or conveyed by the non-storm water discharge, or strategies to require the non-storm water discharge to be separately regulated under a general NPDES permit.

3. TMDL Control Measures. Permittees must compile control measures that have been identified in TMDLs and corresponding implementation plans. If not sufficiently identified in previous documents, or if implementation plans have not yet been developed (e.g., EPA promulgated TMDLs), the Permittees must evaluate and identify control measures to achieve water quality based effluent limitations and/or receiving water limitations established in this Order pursuant to these TMDLs.

   a. TMDL control measures must include, where necessary, control measures to address both storm water and non-storm water discharges from the MS4.

b. TMDL control measures may include activities covered under the MCMs as well as BMPs and other control measures covered under the non-stormwater discharge provisions of this Order.

c. TMDL control measures must include, at a minimum, those actions that will be implemented during the permit term to achieve interim and/or final water quality based effluent limitations and/or receiving water limitations with compliance deadlines within the permit term.

Pursuant to 40 CFR sections 124.8, 124.9, and 124.18, as part of the Watershed Management Program plan, Permittees must conduct a Reasonable Assurance Analysis for each TMDL that consists of an assessment (through quantitative analysis or modeling) to demonstrate that the activities and control measures (i.e. BMPs) identified in the Watershed Control Measures will achieve applicable water quality based effluent limitations and/or receiving water limitations with compliance deadlines during the permit term.

Permittees must incorporate and, where necessary develop, numeric milestones and compliance schedules into the plan consistent with 40 CFR section 122.47(a). Numeric milestones and schedules shall be used to measure progress towards addressing the highest water quality priorities and achieving applicable water quality based effluent limitations and/or receiving water limitations. Where the TMDL Provisions do not include interim or final water quality based effluent limitations and/or receiving water limitations with compliance deadlines during the permit term, Permittees must identify interim numeric milestones and compliance schedules to ensure significant progress toward achieving interim and final water quality based effluent limitations and/or receiving water limitations with deadlines beyond the permit term (40 CFR § 122.47(a)(3)).

Schedules must be developed for both the strategies, control measures and BMPs to be implemented by each individual Permittee within its jurisdiction and for those that will be implemented by multiple Permittees on a watershed scale. Schedules must be adequate for measuring progress at least twice during the permit term. Schedules must incorporate the following:

1. Compliance deadlines occurring within the permit term for all applicable interim and/or final water quality based effluent limitations and/or receiving water limitations to implement TMDLs,

2. Interim deadlines and numeric milestones within the permit term for any applicable final water quality based effluent limitation and/or receiving water limitation to implement TMDLs, where deadlines within the permit term are not otherwise specified,

3. For watershed priorities related to addressing exceedances of receiving water limitations in Part V.A and not otherwise addressed by Part VI.E:

a. Numeric milestones based on measureable criteria or indicators, to be achieved in the receiving waters and/or MS4 discharges,

b. A schedule with interim and final dates for achieving the numeric milestones, and
c. Final dates for achieving the receiving water limitations as soon as possible, consistent with Parts VI.C.2.a.ii.(4) & VI.C.2.a.iii.(2)(c).

Each Permittee must implement the Watershed Management Program immediately after determination by the Regional Water Board Executive Officer that the Watershed Management Program meets the requirements of this Order.

Permittees may request an extension of deadlines for achievement of interim milestones and final compliance deadlines established pursuant to Part VI.C.45.c.iii.(3) only, with the exception of those final compliance deadlines established in a TMDL. Permittees shall provide requests in writing at least 90 days prior to the deadline and shall include in the request the justification for the extension. Extensions shall be subject to approval by must be affirmatively approved by the Regional Water Board Executive Officer, notwithstanding Part VI.C.8.a.iii.

Where a Permittee believes that additional time to comply with a final receiving water limitation compliance deadline set within a WMP/EWMP is necessary, and the Permittee fails to timely request or is not granted an extension by the Executive Officer, a Permittee may, no less than 90 days prior to the final compliance deadline, request a time schedule order pursuant to California Water Code section 13300 for the Regional Water Board's consideration.

Clean Water Act section 402(a)(2) requires the permitting authority to prescribe conditions for MS4 permits to assure compliance, including conditions on data and information collection, reporting, and such other requirements as appropriate. Consistent with this requirement, Permittees in each Watershed Management Area must develop an integrated program to assess the progress toward achieving the water quality based effluent limitations and/or receiving water limitations per the compliance schedules, and the progress toward addressing the highest water quality priorities for each Watershed Management Area. The integrated watershed monitoring and assessment program may be customized, but must contain the basic elements (receiving water monitoring, storm water outfall monitoring, non-storm water outfall monitoring, new development/re-development effectiveness tracking and regional studies), and achieve the objectives of, the Monitoring and Reporting Program (MRP) (Attachment E of this Order).

Permittees in each Watershed Management Area must implement an adaptive management process, at least twice during the permit term, adapting the Watershed Management Program to become more effective, based on, but not limited to the following:

1. Progress toward achieving the outcome of improved water quality in MS4 discharges and receiving waters through implementation of the watershed control measures;

2. Progress toward achieving interim and/or final water quality based effluent limitations and/or receiving water limitations, or other numeric milestones where specified, according to established compliance schedules;

3. Re-evaluation of the highest water quality priorities identified for the Watershed Management Area based on more recent water quality data for discharges from the MS4 and the receiving water(s) and a reassessment of sources of pollutants in MS4 discharges;

4. Availability of new information and data from sources other than the Permittees' monitoring program(s) within the Watershed Management Area that informs the effectiveness of the actions implemented by the Permittees;

5. Regional Water Board recommendations; and

6. Recommendations for modifications to the Watershed Management Program solicited through a public participation process, consistent with 40 CFR section 122.26(d)(2)(iv).

Based on the results of the iterative process, Permittees are required to report any modifications necessary to improve the effectiveness of the Watershed Management Program in the Annual Report, and as part of the Report of Waste Discharge (ROWD). Permittees must implement any modifications to the Watershed Management Program upon acceptance by the Regional Water Board Executive Officer.

Permittees shall report the following information to the Regional Water Board concurrently with the reporting for the adaptive management process:

a. On-the-ground structural control measures completed;
b. Non-structural control measures completed;
c. Monitoring data that evaluates the effectiveness of implemented control measures in improving water quality;
d. Comparison of the effectiveness of the control measures to the results projected by the RAA;
e. Comparison of control measures completed to date with control measures projected to be completed to date pursuant to the Watershed Management Program or EWMP;
f. Control measures proposed to be completed in the next two years pursuant to the Watershed Management Program or EWMP and the schedule for completion of those control measures;
g. Status of funding and implementation for control measures proposed to be completed in the next two years.

Watershed Management Program Resubmittal Process

In addition to adapting the Watershed Management Program or EWMP every two years as described in Part VI.C.8.a., Permittees must submit an updated Watershed Management Program or EWMP with an updated Reasonable Assurance Analysis by June 30, 2021, or sooner as directed by the Regional Water Board Executive Officer or as deemed necessary by Permittees through the Adaptive Management Process, for review and approval by the Regional Water Board Executive Officer.

The updated Reasonable Assurance Analysis must incorporate both water quality data and control measure performance data, and any other information informing the two-year adaptive management process, gathered through December 31, 2020. As appropriate, the Permittees must consider any new numeric analyses or other methods developed for the reasonable assurance analysis. The updated Watershed Management Program or EWMP must comply with all provisions in Part VI.C. The Regional Water Board Executive Officer will allow a 60-day public review and comment period with an option to request a hearing. The Regional Water Board Executive Officer must approve or disapprove the updated Watershed Management Program or EWMP by June 30, 2022. The Executive Officer may waive the requirement of this provision, following a 60-day public review and comment period, if a Permittee demonstrates through water quality monitoring data that the approved Watershed Management Program or EWMP is meeting appropriate water quality targets in accordance with established deadlines.

C. Storm Water Management Program Minimum Control Measures (MCMs)

1. General Requirements

a. Basis for MCMs. 40 CFR section 122.26(d)(2)(iv) establishes required elements of the Permittees' storm water management program. The previous permit, Order No. 01-182, included six categories of minimum control measures that are considered to be baseline or default requirements for meeting the requirements of 40 CFR section 122.26(d)(2)(iv). These requirements were determined appropriate within Order No. 01-182 and again appropriate for this Order. The minimum control measures require Permittees to implement BMPs that are considered necessary to reduce pollutants in storm water to the MEP and to effectively prohibit non-storm water discharges. In lieu of implementing the MCMs as described in Part VI of this Order, this Order allows for Permittees to develop alternative BMPs to comply with 40 CFR section 122.26(d)(2)(iv), when implemented through a Watershed Management Program approved by the Executive Officer of the Regional Water Board.

b. Timelines for Implementation

The timelines for implementation of most MCMs contained in Part VI.D of this Order is provided in Table F-5 below. Where implementation dates for minimum control measures are not provided in the Table, Part VI.D.1.b requires implementation within 6 months of the effective date this Order. Unless otherwise noted in Part VI.D of the Order, each Permittee that does not elect to develop a Watershed Management Program or enhanced Watershed Management Program per Part VI.C must implement the requirements contained in Part VI.D within 6 months after the effective date of this Order. In the interim, a Permittee shall continue to implement its existing storm water management program, including actions within each of the six categories of minimum control measures consistent with 40 CFR section 122.26(d)(2)(iv).

Permittees that elect to develop a Watershed Management Program or enhanced Watershed Management Program shall continue to implement their existing storm water management programs, including actions within each of the six categories of minimum control measures consistent with 40 CFR section 122.26(d)(2)(iv) until the Watershed Management Program or enhanced Watershed Management Program is approved by the Regional Water Board Executive Officer. The Table below denotes the timeframe for requirements as well as the basis of those timeframes. The majority of the timeframes are consistent with Order No. 01-182 as well as other area permits including the Ventura County MS4 Permit and the State Water Board's Construction General NPDES Permit. The timeframe for notifications, submittals, and attaining compliance with permit requirements are determined to be the earliest practicable periods and ensure timely measures for protection of water quality.

Table F-5. Timeline for the Implementation of Permit Requirements

Part Number	Requirement Summary	Timeframe	Basis for Timeframe
Discharge Prohibitions			
III.A.2.a.ii	Drinking water suppliers must notify MS4 Permittee if intend to discharge to the Permittee's MS4.	At least 72 hours prior to a planned discharge and as soon as possible after an unplanned discharge.	Allows for advanced notice and sampling, if warranted.
III.A.4.e	If the Permittee determines that any of the authorized or conditionally exempt essential non-storm water discharges identified in Parts III.A.1.a through III.A.1.c, III.A.2.a or III.A.3 is a source of pollutants, notify the Regional Water Board if the non-storm water discharge has coverage under a separate NPDES permit or subject to a Record of Decision (ROD) approved under section 121 of CERCLA, or a conditionally exempt essential non-storm water discharge or emergency non-storm water discharge.	Within 30 days of determination.	The language in the previous LA MS4 permit, Order No. 01-182, states "promptly." The specification of a 30 day deadline is considered reasonable and the earliest practicable deadline to ensure the protection of water quality.
Table III.A	Dewatering of Lakes – Ensure procedures for advanced notification by the lake owner/operator to the Permittee(s).	At least 72 hours in advance of discharge.	Allows for advanced notice and sampling, if warranted.
Table III.A	Dechlorinated/debrominated swimming pool/spa discharges – Ensure procedures for advanced notification by the pool owner to the Permittee(s) prior to planned discharges of 100,000 gallons or more.	At least 72 hours in advance of discharge.	Allows for advanced notice and sampling, if warranted.
Table III.A	Dewatering of decorative fountains – Ensure procedures for advanced notification by the fountain owner to the Permittee(s) prior to planned discharges of 100,000 gallons or more.	At least 72 hours in advance of discharge.	Allows for advanced notice and sampling, if warranted.

Part Number	Requirement Summary	Timeframe	Basis for Timeframe
Receiving Water Limitations			
V.A.3.a	Upon determination by either the Permittee or the Regional Water Board that discharges from the MS4 are causing or contributing to an exceedance of an applicable Receiving Water Limitation, the Permittee shall notify the Regional Water Board within 30 days of analytical results and thereafter submit an Integrated Monitoring Compliance Report within the next Annual Report.	Within 30 days of receipt of analytical results from the sampling event.	The language in the current LA MS4 permit reads "promptly." The specification of a 30 day deadline is considered reasonable and the earliest practicable deadline to ensure the protection of water quality.
V.A.3.b	Submit any modifications to the Integrated Monitoring Compliance Report required by the Regional Water Board	Within 30 days notification from the Regional Water Board.	This is consistent with Order No. 01-182
V.A.3.c	Permittee shall revise its control measures and monitoring program to incorporate the improved modified BMPs that will be implemented, an implementation schedule, and any additional monitoring required.	Within 30 days following Regional Water Board Executive Officer's approval of the Integrated Monitoring Report.	Allows for adequate time to make modifications.
Provisions			
VI.A.2.j	Discharger shall file with the Regional Water Board a report of waste discharge before making any material change or proposed change in the character, location, or volume of the discharge.	At least 120 days prior to any change.	Standard language.
Special Provisions: Watershed Management Programs			
VI.C.2.b	Permittees that elect to develop a Watershed Management Program must notify the Regional Water Board.	No later than 6 months after the date this Order is adopted.	This provides a reasonable amount of time to determine participation in a WMP, but also ensure adequate time for implementation of watershed scale control measures during the term of this Order.
VI.C.2.c	Permittees that elect to develop a Watershed Management Program shall submit a draft plan to the Regional Water Board Executive Officer.	No later than 18 months after the date this Order is adopted.	This provides a reasonable amount of time to complete the plan but also ensure effective monitoring during the term of this Order.
VI.C.6.a.i	Permittees in each Watershed Management Area shall implement an adaptive management process adapting the Watershed Management Program to become more effective.	At least twice during the permit term.	This encourages application of the iterative approach.
VI.C.6.b.i	Permittees in the Watershed Management Area shall implement the adaptive management process	At least annually.	This encourages application of the iterative approach.

Part Number	Requirement Summary	Timeframe	Basis for Timeframe
	with regard to its jurisdictional storm water management program to improve its effectiveness.		
Special Provisions: Minimum Control Measures			
VI.D.2.a.i	Progressive Enforcement and Interagency Coordination – In the event that a Permittee determines that a facility or site operator has failed to adequately implement all necessary BMPs, that Permittee shall take progressive enforcement which shall include a follow-up inspection.	Follow-up inspection within 4 weeks from the date of the initial inspection and/or investigation.	This is consistent with the current LA MS4 permit.
VI.D.2.b	Progressive Enforcement and interagency Coordination – Each Permittee shall initiate investigation of complaints from facilities within its jurisdiction.	Initiate investigation within one business day of complaint.	This is consistent with Order No. 01-182.
VI.D.5.b.ii	Public Information and Participation Program – If participating in a County-wide or Watershed Group PIPP, provide contact information for their appropriate staff responsible for storm water public education activities to the designated PIPP coordinator and contact information changes.	No later than 30 days after a change occurs.	This is consistent with Order No. 01-182 for contact changes, which directs contact changes be sent to Los Angeles County by May 1, 2002. However, with the elimination of the Principal Permittee in this Order, it is more appropriate to direct any contact information changes directly to the PIPP coordinator.
VI.D.6.b.iii	Industrial/Commercial Business Program – Each Permittee shall update its inventory of critical sources.	Update at least annually.	Business turn-over can be significant thus an active inventory is required.
VI.D.6.c.i	Industrial/Commercial Business Program – Each Permittee shall notify the owner/operator of each of its inventoried commercial and industrial sites identified in Part VI.D.5.b of this Order of the BMP requirements applicable.	Notify at least once during the five-year period of this Order.	This is required so that the owner/operator remains informed and vigilant about BMP implementation.
VI.D.6.d.i	Industrial/Commercial Business Program – Each Permittee shall inspect all commercial facilities identified in Part VI.D.5.b of this Order twice during the 5-year term of this Order with a minimum interval of 6 months between the first and second mandatory compliance inspection required.	Provided that the first mandatory compliance inspection occurs no later than 2 years after the date this Order is adopted.	Order No. 01-182 required initial implementation by August 2004 (or a little over 2.5 years), however the 2 year requirement contained in this Order is considered reasonable and the earliest practicable deadline to ensure the protection of water quality.
VI.D.6.e.i.(1)	Industrial/Commercial Business Program – Each Permittee shall perform an initial compliance inspection of all industrial facilities	No later than 2 years after the date this Order is adopted.	Order No. 01-182 required initial implementation by August 2004 (or a little over 2.5 years). However,

Part Number	Requirement Summary	Timeframe	Basis for Timeframe
	identified in Part VI.D.5.b.of this Order		the 2 year requirement contained in this Order is considered reasonable and the earliest practicable deadline to ensure the protection of water quality.
VI.D.6.e.i.(2)	Industrial/Commercial Business Program – Each Permittee shall review the State Water Board's Storm Water Multiple Application and Report Tracking System (SMARTS) database at defined intervals to determine if an industrial facility has been recently inspected by the Regional Water Board. The Permittee does not need to inspect the facility if it is determined that the Regional Water Board conducted an inspection of the facility within the prior 24 month period.	The first interval shall occur approximately 2 years after the date this Order is adopted. The second interval shall occur approximately 4 years after the date this Order is adopted.	This specific requirement for inspecting facilities within certain intervals is a new requirement, but is considered consistent with Order No. 01-182.
VI.D.6.e.i.(3)	Industrial/Commercial Business Program – Each Permittee shall evaluate its inventory of industrial facilities and perform a second mandatory compliance inspection at a minimum of 25% of the facilities identified to have filed a No Exposure Certification.	Approximately 3 to 4 years after the date this Order is adopted.	This is consistent Order No. 01-182.
VI.D.7.c.iii.(5).(f)	Planning and Land Development Program – Each Permittee shall develop a schedule for the completion of offsite projects, including milestone dates to identify, fund, design, and construct the projects.	Offsite projects shall be completed as soon as possible, and at the latest within 4 years of the certificate of occupancy for the first project that contributed funds toward the construction of the offsite project.	This requirement is consistent with the provisions contained in the Ventura County Redevelopment Project Area Master Plan (RPAMP).
VI.D.7.d.iv.(1).(c)	Planning and Land Development Program – Each Permittee shall maintain a database providing key information for each new development/re-development subject to the requirements of Part VI.D.6 of this Order.	Each Permittee shall implement a tracking system and an inspection and enforcement program for new development and redevelopment post-construction storm water no later than 60 days after Order adoption date.	Effectiveness tracking of the treatment system is warranted and will also help to ensure adequate maintenance.
VI.D.7.d.i	Planning and Land Development Program – A local LID ordinance that fully incorporated the applicable requirements of this Order shall be submitted to the Executive Officer of the Regional Water Board for approval.	Within 180 days after the date this Order is adopted.	The requirement is deemed acceptable due to the large number of existing LID ordinances within the Permittees and the varied number of templates available nationally.
VI.D.7.d.iii.(1).(a).(ii)	Planning and Land Development Program – Written conditions in the	At least once a year.	This is consistent with the current Ventura County

Part Number	Requirement Summary	Timeframe	Basis for Timeframe
	sales or lease agreement, which require the property owner or tenant to assume responsibility for BMP maintenance and conduct a maintenance inspection.		MS4 permit.
VI.D.7.d.iv	Planning and Land Development Program – Each Permittee shall implement a tracking system and an inspection and enforcement program from new development and redevelopment post-construction storm water BMPs.	No later than 60 days after the date this Order is adopted.	A tracking system is deemed critical to the success of this MCM. Additionally, a tracking system need not be complex and can, and has, been developed using spreadsheets or equivalent.
VI.D.7.d.iv.(1).(c).(ii)	Planning and Land Development Program – Inspection of post-construction BMPs to assess operation conditions with particular attention to criteria and procedures for post-construction treatment control and hydromodification control BMP repair, replacement, or re-vegetation.	Inspection at least once every 2 years after project completion.	This is consistent with the current Ventura County MS4 permit.
VI.D.8.j.ii.(1)	Development Construction Program – Inspect public and private construction sites 1 acre or larger that discharge to a tributary listed by the state as an impaired water for sediment or turbidity under CWA § 303(d).	When two or more consecutive days with greater than 50% chance of rainfall are predicted by NOAA, within 48 hours of a ½-inch rain event, and at least once every two weeks.	This requirement is consistent with the current State Water Board's General NPDES Construction Permit Requirements.
VI.D.8.j.ii.(1)	Development Construction Program – Inspect public and private construction sites 1 acre or larger determined to be a significant threat to water quality.	When two or more consecutive days with greater than 50% chance of rainfall are predicted by NOAA, within 48 hours of a ½-inch rain event, and at least once every two weeks.	This requirement is consistent with the current State Water Board's General NPDES Construction Permit Requirements.
VI.D.8.j.ii.(1)	Development Construction Program – Inspect public and private construction sites 1 acre or larger that do not meet other criteria in Part VI.D.7.j.ii.(1) of this Order.	At least monthly.	This requirement is consistent with the current General Construction Permit Requirements.
VI.D.9.c.iii	Public Agency Activities Program – Each Permittee shall update its facility inventory.	At least once during the term of this Order.	This requirement is deemed reasonable because site conditions can change at existing facilities.
VI.D.9.h.iii.(2)	Public Agency Activities Program – In areas that are not subject to a trash TMDL, each Permittee shall inspect Priority A catch basins.	A minimum of 3 times during the wet season (October 1 through April 15) and once during the dry season every year.	This is consistent with Order No. 01-182.
VI.D.9.h.iii.(2)	Public Agency Activities Program – In areas that are not subject to a	A minimum of once during the wet season	This is consistent with Order No. 01-182.

Part Number	Requirement Summary	Timeframe	Basis for Timeframe
	trash TMDL, each Permittee shall inspect Priority B catch basins.	and once during the dry season every year.	
VI.D.9.h.iii.(2)	Public Agency Activities Program – In areas that are not subject to a trash TMDL, each Permittee shall inspect Priority C catch basins.	A minimum of once per year.	This is consistent with Order No. 01-182.
VI.D.9.h.iv.(1).(c)	Public Agency Activities Program – Provide clean out of catch basins, trash receptacles, and grounds in the event area.	Within one business day subsequent to the event.	This is consistent with the current Ventura County MS4 permit.
VI.D.8.h.vi.(2)	Public Agency Activities Program – Each Permittee shall inspect the legibility of the stencil or label nearest each inlet.	Prior to the wet season every year.	This is consistent with Order No. 01-182.
VI.D.9.h.vi.(3)	Public Agency Activities Program – Each Permittee shall record all catch basins with illegible stencils and re-stencil or re-label.	Within 180 days of inspection.	This is consistent with Order No. 01-182.
VI.D.9.h.vii.(1)	Public Agency Activities Program – In areas that are not subject to a trash TMDL, each Permittee shall install trash excluders, or equivalent devices, on or in catch basins or outfalls, except at sites where the application of such BMPs alone will cause flooding.	No later than 4 years after the date this Order is adopted in areas specified as Priority A.	This is based on the current Ventura County MS4 permit, but due to the significant number of catch basins in Los Angeles County compared to Ventura County the time frame was lengthened.
VI.D.9.h.viii.(1)	Public Agency Activities Program – Visual monitoring of Permittee-owned open channels and other drainage structures, including debris basins, for debris.	At least annually.	This is consistent with Order No. 01-182.
VI.D.9.h.viii.(2)	Public Agency Activities Program – Removal of trash and debris from open channels.	A minimum of once per year before the wet season.	This is consistent with Order No. 01-182.
VI.D.9.i.ii	Public Agency Activities Program – Each Permittee shall perform street sweeping of curbed streets for Priority A areas.	Swept at least two times per month.	This is consistent with Order No. 01-182.
VI.D.9.i.ii	Public Agency Activities Program – Each Permittee shall perform street sweeping of curbed streets for Priority B areas.	Swept at least once per month.	This is consistent with Order No. 01-182.
VI.D.9.i.ii	Public Agency Activities Program – Each Permittee shall perform street sweeping of curbed streets for Priority C areas.	Swept as necessary but in no case less than once per year.	This is consistent with Order No. 01-182.
VI.D.9.i.iv.(1)	Public Agency Activities Program – Permittee-owned parking lots exposed to storm water shall be kept clear of debris and excessive oil buildup and cleaned.	No less than 2 times per month and/or inspected no less than 2 times per month to determine if cleaning is necessary. In no case shall a Permittee-owned parking lot be cleaned less than once a month.	This is consistent with Order No. 01-182.
VI.D.9.j.i.(2)	Public Agency Activities Program –	No later than 30 business	This is consistent with the

Part Number	Requirement Summary	Timeframe	Basis for Timeframe
	Where the self-waiver has been invoked, the Permittee shall submit to the Regional Water Board Executive Officer a statement of the occurrence of the emergency, an explanation of the circumstances, and the measures that were implemented to reduce the threat to water quality.	days after the situation of emergency has passed.	current Ventura County MS4 permit.
VI.D.9.k.i	Public Agency Activities Program – Each Permittee shall train or ensure training of all of their employees and contractors in targeted positions on the requirements of the overall storm water management program.	No later than 1 year after the date this Order is adopted and annually thereafter before June 30.	Order No. 01-182 allowed for this to be initially completed by August 2002. However, since this implementation of this requirement is continuing from the previous LA MS4 permit, implementation within a year is considered reasonable and the earliest practicable period for implementation. This is consistent with Order No. 01-182 and the current Ventura County MS4 permit.
VI.D.9.k.ii	Public Agency Activities Program – Each Permittee shall train all of their employees and contractors or ensure training for all who use or have the potential to use pesticides or fertilizers.	No later than 1 year after the date this Order is adopted and annually thereafter before June 30.	This is consistent with the current Ventura County MS4 permit.
VI.D.10.b.ii	Illicit Connections and Illicit Discharges Elimination Program – Each Permittee shall initiate investigation(s) to identify and locate the source of an illicit discharge.	Within 72 hours of becoming aware of the illicit discharge.	Order No. 01-182 and the current Ventura County MS4 permit require illicit discharge investigations be initiated within 1 business day. However, the 72 hour requirement takes into account the possibility of weekend spills.
VI.D.10.b.iv.(2)	Illicit Connections and Illicit Discharges Elimination Program – If the source of the illicit discharge has been determined to originate within an upstream jurisdiction, the Permittee shall notify the upstream jurisdiction and the Regional Water Board.	Within 30 days of such determination.	This ensures the ID is addressed in a reasonable period of time by the upstream jurisdiction.
VI.D.10.b.v	Illicit Connections and Illicit Discharges Elimination Program – In the event the Permittee is unable to eliminate an ongoing illicit discharge following full execution of its legal authority and in accordance with its Progressive Enforcement	Notify the Regional Water Board within 30 days of such determination and provide a written plan for review and comment.	This ensures the Regional Water Board is effectively engaged in the ultimate disposition of ongoing illicit discharges.

Part Number	Requirement Summary	Timeframe	Basis for Timeframe
	Policy, or other circumstances prevent the full elimination of an ongoing illicit discharge, the Permittee shall work with the Regional Water Board to provide a diversion of the entire flow to the sanitary sewer or provide treatment.		
VI.D.10.c.ii	Illicit Connections and Illicit Discharges Elimination Program – Each Permittee, upon discovery or upon receiving a report of a suspected illicit connection, shall initiate an investigation.	Initiate investigation within 21 days of discovery.	This is consistent with Order No. 01-182 and the current Ventura County MS4 permit.
VI.D.10.c.iii.(2)	Illicit Connections and Illicit Discharges Elimination Program – Each Permittee, upon confirmation of an illicit MS4 connection, shall ensure that the connection is eliminated.	Within 180 days of completion of the investigation.	This is consistent with Order No. 01-182 and the current Ventura County MS4 permit.
VI.D.10.e.i.(2)	Illicit Connections and Illicit Discharges Elimination Program – Initiate investigation of all public and employee illicit discharge and spill complaints.	Within 1 business day of receiving the complaint.	This is consistent with Order No. 01-182 and the current Ventura County MS4 permit.
VI.D.10.e.i.(3)	Illicit Connections and Illicit Discharges Elimination Program – Response to spills for containment.	Within 4 hours of becoming aware of the spill, except where such spills occur on private property, in which case should be within 2 hours of gaining legal access to the property.	The requirement that spills be responded to within 4 hours of becoming aware of the spill, except where such spills occur on private property, in which case should be within 2 hours of gaining legal access to the property is the earliest practicable period for implementation and ensures the protection of water quality.
VI.D.10.f.iv	Illicit Connections and Illicit Discharges Elimination Program – Each Permittee must create a list of applicable staff and contractors which require IC/ID training and ensure that training is provided.	At least twice during the term of this Order.	This requirement is new and twice during the term of this Order is considered reasonable and the earliest practicable period for implementation.
VI.D.10.f.v	Illicit Connections and Illicit Discharges Elimination Program – New Permittee staff members must be provided with IC/ID training.	Within 180 days of starting employment.	The current Ventura MS4 permit specifies that within 1 year all employees must be trained. However, the requirement that employees be trained within 180 days of starting employment is the earliest practicable period for implementation and ensures the protection of water quality.

2. Progressive Enforcement

Progressive enforcement is a series of defined and reproducible enforcement actions whereby consequences of non-compliance increase with each incremental enforcement steps. Progressive enforcement includes procedures to coordinate enforcement between the Regional Water Board and Permittees. As the Regional Water Board is the agency responsible for implementing the NPDES program, it has the authority to step in when enforcement actions of Permittee are unsuccessful in bringing dischargers into compliance with the permit. As such, progressive enforcement is an effective strategy to achieve timely compliance with permit requirements. Order No. 01-182 included requirements for a progressive enforcement strategy that are carried over to this Order, with some modifications. This Order includes supplemental documentation requirements for site acreage and Risk Factor rating, when making a referral to the Regional Water Board for MS4 permit non-compliance of a discharger under the construction general permit. This requirement is necessary information for the Regional Water Board consideration. Moreover, this Order eliminates the provision within Order No. 01-182 that allows the Regional Water Board and Permittees to form a storm water task force. This provision was removed because the ability for coordinated enforcement between the Regional Water Board and Permittees is adequately established through remaining provisions within Part VI.D.2 of this Order.

3. Modifications/Revisions

This Order requires each Permittee to modify its storm water management programs, protocols, practices, and municipal codes to be consistent with this Order. This provision is necessary to ensure that each Permittee takes all the steps necessary to update the core and ancillary programs that are required to ensure compliance with this Order. A significant change from Order No. 01-182 is that this obligation now rests with each individual Permittee rather than the Principal Permittee.

4. Public Information and Participation Program

a. Legal Authority

NPDES regulation 40 CFR section 122.26(d)(2)(iv)(A)(6) provides that the proposed management program include "A description of a program to reduce to the maximum extent practicable, pollutants in discharges from MS4s associated with the application of pesticides, herbicides, and fertilizer which will include, as appropriate, controls such as educational activities, permits, certifications, and other measures for commercial applicators and distributors, and controls for application in public right-of-ways and at municipal facilities."

NPDES regulation 40 CFR section 122.26(d)(2)(iv)(B)(6) provides that the proposed management program include " A description of education activities, public information activities, and other appropriate activities to facilitate the proper management and disposal of used oil and toxic materials."

To satisfy the Public Education and Outreach minimum control measure, the Permittees need to implement a Public Information and Participation Program (PIPP) that has the following objectives: (1) measurably increase the knowledge of the target audiences about the MS4, the adverse impacts of storm water pollution of receiving waters and potential solutions to mitigate the impacts, (2) measurably change the waste disposal and storm water pollution generation behavior of target audiences by developing and encouraging implementation of appropriate activities, and (3) involve and engage a diversity of socio-economic groups and ethnic communities in Los Angeles County to participate in mitigating the impacts of storm water pollution.

b. Background

Implementation of a PIPP is a critical BMP and a necessary component of a storm water management program. The State Water Board Technical Advisory Committee "recognizes that education with an emphasis on pollution prevention is the fundamental basis for solving nonpoint source pollution problems." The USEPA Phase II Fact Sheet 2.3 (Fact Sheet 2.3) finds that "An informed and knowledgeable community is critical to the success of a storm water management program since it helps insure the following: (i) greater support for the program as the public gains a greater understanding of the reasons why it is necessary and important, and (ii) greater compliance with the program as the public becomes aware of the personal responsibilities expected of them and others in the community, including the individual actions they can take to protect or improve the quality of area waters."[31]

Furthermore, the public can provide valuable input and assistance to a municipal storm water management program and, therefore, should play an active role in the development and implementation of the program. An active and involved community is essential to the success of a storm water management program because it allows for:

- Broader public support since residents who participate in the development and decision making process are partially responsible for the program and, therefore, are more likely to take an active role in its implementation;
- Shorter implementation schedules due to fewer obstacles in the form of public and legal challenges and increased sources in the form of residents volunteers;
- A broader base of expertise and economic benefits since the community can be a valuable, and free, intellectual resource; and
- A conduit to other programs as residents involved in the storm water program development process make important cross-connections and relationships with other community and government programs. This benefit is particularly valuable when trying to implement a storm water program on a watershed basis.

[31] Storm Water Phase II Final Rule - Public Education and Outreach Minimum Control Measure. USEPA Fact Sheet 2.3, January 2000.

c. PIPP Implementation

It is generally more cost-effective to have numerous operators coordinate to use an existing program than each developing its own local programs. Therefore, Permittees are encouraged to participate in a County-wide PIPP or in one or more Watershed Group sponsored PIPPs supplemented with additional information specific to local needs.

Permittees are required to: (a) conduct storm water pollution prevention public service announcements and advertising campaigns; (b) provide public education materials on the proper handling or potential storm water pollutants; (c) distribute activity specific storm water pollution prevention public education materials to points of purchase; (d) maintain storm water websites or provide links to storm water websites via the Permittees website, which contain educational material and opportunities for the public to participate in storm water pollution prevention and clean-up activities; and (e) provide independent, parochial, and public schools within each Permittee's jurisdiction with materials, including, but not limited to videos, live presentations, and other information. Permittees are required to use effective strategies to educate and involve ethnic communities using culturally effective methods.

The intent of these changes is to provide an increase in public knowledge of storm water pollution prevention practices in an effective and cost efficient manner, while still providing flexibility for the Permittees to implement the requirements on a watershed group basis.

The Order requires outreach to ethnically diverse communities using culturally effective strategies. The USEPA, Tailoring Outreach Programs to Minority and Disadvantaged Communities and Children Fact Sheet finds that, "many residents of ethnically and culturally diverse communities don't speak English. English messages contained in public education outreach materials may not be effectively reaching a significant portion of some communities. The intent of this provision is to encourage behavior changes that reduce pollutants in storm water to a portion of the population who might otherwise be overlooked.

5. Industrial/Commercial Business Program

a. Legal Authority

The Phase I regulations require, in part, that the applicant: (i) develop adequate legal authority, (ii) perform a source identification, and (iii) develop a management program to reduce the discharge of pollutants to the MEP using management practices, control techniques and system design and engineering methods, and such other provisions which are appropriate. Specifically, with regards to industrial controls, the management plan shall include the following.

"A description of a program to monitor and control pollutants in storm water discharges to municipal systems from municipal landfills, hazardous waste treatment, disposal and recovery facilities, industrial facilities that are subject to section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA), and industrial facilities that the municipal permit applicant determines are contributing a substantial pollutant loading to the municipal storm sewer system. The program shall:

i. Identify priorities and procedures for inspections and establishing and implementing control measures for such discharges.
ii. Describe a monitoring program for storm water discharges associated with industrial facilities […]"

(40 CFR section 122.26(d)(2)(iv)(C))

The provisions contained in this Order pertaining to the inspection and facility control program requirements for industrial and commercial facilities, as well as construction sites (as discussed below in Part VI.7.b.) are also based on the requirements found in the previous permit, Order No. 01-182. Those requirements, among others, were the subject of litigation between several permittees and the Regional Water Board. In that case, the Los Angeles County Superior Court upheld the inspection and facility control program requirements for industrial/commercial facilities and construction sites in Order No. 01-182. The Court determined that "[t]he Permit contains reasonable inspection requirements for these types of facilities. [Citation.] The Permit requires each permittees to confirm that operators of these facilities have a current waste discharge identification number and is effectively implementing Best Management Practices (BMPs) in compliance with County and municipal ordinances, Regional Board Resolution 90-08 and the Stormwater Quality Management Plans (SQMPs). [Citation.] Addressing pollution after it has entered the storm sewer system is not working to meet legislative goals. More work is required at the source of pollution, and that is partially the basis on which this Court finds that the Permit's inspection requirements are reasonable, and not onerous and burdensome." (*In re L.A. Cnty. Mun. Storm Water Permit Litig. (*(L.A. Super. Ct., No. BS 080548, Mar. 24, 2005), Statement of Decision from Phase II Trial on Petitions for Writ of Mandate, p. 17.)

The Court also addressed the permittees' claims that the requirements in Order No. 01-182 shifted the Regional Water Board's inspection responsibility under State Water Board issued general NPDES permits for these types of facilities onto the local agencies. The Court disagreed, stating: "The Court agrees with [the Regional Water Board] and Intervenors that the United States EPA considered obligations under state-issued general permits to be separate and distinct. Despite the similarity between the general permits and the local storm water ordinances, both must be enforced. [Citations.] EPA requires permittees to conduct inspections of commercial and industrial facilities, as well as of construction sites. [Citation.]…..This Court finds that the state-issued general permits do not preempt local enforcement of local storm water ordinances. (See

State Board Order No. 99-08, [citation].) [¶] Therefore, this Court finds that requiring permittees to inspect commercial and industrial facilities and construction sites is authorized under the Clean Water Act, and both the Regional Board and the municipal permittees or the local government entities have concurrent roles in enforcing the industrial, construction and municipal permits. The Court finds that the Regional Board did not shift its inspection responsibilities to Petitioners. [¶] … The Court further notes that the Permit issued to local entities, who are Petitioners here, does not refer to any inspection obligations related to state-issued permits. [Citation.] There is no duplication of efforts and no shifting of inspection responsibility in derogation of the Regional Board's responsibility here. The Regional Board is not giving up its won responsibilities, and there is nothing arbitrary or capricious about the Permit's inspection provisions." (*Id*. at 17-18.)

It is also important to note that similar controls for industrial/commercial facilities and constriction sites, including inspection activities, required by this Order were also required in the 2002 San Bernardino County MS4 permit issued by the Santa Ana Regional Water Quality Control Board (Santa Ana Regional Water Board). Like Order No. 01-182, that permit was also subject to litigation. In that case, the City of Rancho Cucamonga claimed that the Santa Ana Regional Water Board improperly delegated to it and other permittees the inspection duties of the State and Regional Water Boards and that it was being required to conduct inspections for facilities covered by other state-issued general NPDES permits. (*City of Rancho Cucamonga v. Regional Water Quality Control Board- Santa Ana Region* (2006) 135 Cal.App.4th 1377, 1389.) Like the Los Angeles County Superior Court, the California Court of Appeal rejected this argument. The Court of Appeal upheld the Santa Ana Regional Water Board's requirements, finding that "Rancho Cucamonga and the other permittees are responsible for inspecting construction and industrial sites and commercial facilities within their jurisdiction for compliance with and enforcement of local municipal ordinances and permits. But the Regional Board continues to be responsible under the 2002 NPDES permit for inspections under the general permits. The Regional Board may conduct its own inspections but permittees must still enforce their own laws at these sites. (40 C.F.R. § 122.26, subd. (d)(2) (2005).)" (*Id*. at 1390.)

b. Background

Municipalities are required to control the storm water discharges associated with industrial activities and other commercial facilities identified as significant contributors of pollutants through the implementation of a mandatory baseline minimum set of source control BMPs; performance of an inspection program to verify the adequacy of BMPs implementation in the field and compliance with the municipal ordinances; and assist the Regional Water Board in ensuring that industrial activities subject to regulations are covered by the general industrial stormwater permit. Regional Water Board will also assist the municipalities in case of instances of egregious non-compliance with the municipal ordinances and state and federal laws and regulations.

The municipality is ultimately responsible for discharges from the MS4. Because industrial awareness of the program may not be complete, there may be facilities within the MS4 area that should be permitted under an industrial storm water permit but are not (non-filers). In addition, the Phase I regulations that require industries to obtain permit coverage for storm water discharges is largely based on Standard Industry Classification (SIC) Code. This has been shown to be incomplete in identifying industries that may be significant sources of storm water pollution ("industries" includes commercial businesses). The word "industries" is used in a broad sense. Another concern is that the permitting authority may not have adequate resources to provide the necessary oversight of permitted facilities. Therefore, it is in the municipality's best interest to assess the specific situation and implement an industrial/commercial inspection/site visit and enforcement program to control the contribution of pollutants to the MS4 from all high risk sources.

In the preamble to the 1990 regulations, USEPA clearly states the intended strategy for discharges of storm water associated with industrial activity:

"…Municipal operators of large and medium municipal separate storm sewer systems are responsible for obtaining system-wide or area permits for their system's discharges. These permits are expected to require that controls be placed on storm water discharges associated with industrial activity which discharge through the municipal system." The USEPA also notes in the preamble that "… municipalities will be required to meet the terms of their permits related to industrial dischargers."

Similarly, in the USEPA's Guidance Manual (Chapter 3.0), USEPA specified that MS4 applicants must demonstrate that they possess adequate legal authority to:

i. Control construction site and other industrial discharges to MS4s;
ii. Prohibit illicit discharges and control spills and dumping;
iii. Carry out inspection, surveillance, and monitoring procedures.

The document goes on to explain that "control," in this context means not only to require disclosure of information, but also to limit, discourage, or terminate a storm water discharge to the MS4. Further, to satisfy its permit conditions, a municipality may need to impose additional requirements on discharges from permitted industrial facilities, as well as discharges from industrial facilities and construction sites not required to obtain permits.

In the same Guidance Manual (Chapter 6.3.3), USEPA states that the municipality is ultimately responsible for discharges from their MS4. Consequently, the MS4 applicant must describe how the municipality will help the USEPA and authorized NPDES States to:

i. Identify priority industries discharging to their systems;

ii. Review and evaluate storm water pollution prevention plans (SWPPPs) and other procedures that industrial facilities must develop under general or individual permits;

iii. Establish and implement BMPs to reduce pollutants from these industrial facilities (or require industry to implement them); and

iv. Inspect and monitor industrial facilities discharging storm water to the municipal systems to ensure these facilities are in compliance with their NPDES storm water permit, if required.

c. Industrial/Commercial Business Program Implementation

The requirements in this Order clarify the scope and frequency of inspections. For commercial facilities, in general, frequencies have been modified to require inspections of a facility twice during the five year permit tem provided that the first mandatory compliance inspection takes place no later than two years after the date this Order is adopted with a minimum interval of six months between the first and second inspection. The scope of the inspections for each of the facility types was clarified by specifying in tables what BMPs should be implemented at that facility to ensure that pollutant generating activity does not occur. The tables include a range of BMPs that are anticipated to be needed at select industrial and commercial facilities. The BMP categories are based on BMPs identified in the 2003 California Stormwater BMP Handbook, Industrial and Commercial as well as BMPs identified in Regional Water Board Resolution No. 98-08.

For industrial facilities, an initial mandatory compliance inspection must be completed at all industrial facilities no later than 2 years after the date this Order is adopted. If after the initial inspection, the facility was determined to as having exposure of industrial activities to storm water then the permit requires a second mandatory compliance inspection with a minimum interval of 6 months between the first and second mandatory compliance inspection. For facilities determined not to have exposure of industrial activities to storm water during the initial inspection, Permittees must conduct second compliance inspections yearly at a minimum of 20% of the facilities.

A provision was added to the Order relieving Permittees of the responsibility to inspect industrial facilities that the Regional Water Board has inspected within the previous 24 months.

In regards to the level of inspection, this Order clarifies that the Permittees are expected to check during inspections for a current Waste Discharge Identification (WDID) number for facilities discharging storm water associated with industrial activity, and that a SWPPP is available on site or that the owner/operator of the facility has applied for and has a current No Exposure Certification (and WDID number). In addition Permittees are expected to check during inspections for compliance with the implementation of minimum BMPs, as previously approved by Board Order 98-08, and compliance with the local storm water ordinances.

The inspection requirements in this Order provide greater clarification concerning the scope of enforcement. A progressive enforcement procedure was outlined including minimum steps that Permittees must take in their program to enforce their municipalities' storm water requirements. In recognition of some of the Permittees concerns regarding the resource intensive efforts needed to elevate enforcement actions, a mechanism was provided through which Permittees can refer cases to the Regional Water Board, and for violations of the State Water Board's General Industrial Activities Storm Water NPDES permit, the referral can be expedited, referral can occur after a single inspection and one written notice rather than referral after two inspections and two written notices.

6. Planning and Land Development Program

a. Legal Authority

The permit application requirements described in 40 CFR section 122.26(d) have formed the basis for MS4 permits and remain applicable as elements in a storm water management program. Section 122.26(d)(2)(iv) requires in part, that the large and medium MS4 applicant develop a management program. Specifically, with regards to planning and land development and post-construction controls, the management program shall include the following:

"(A) A description of structural and source control measures to reduce pollutants from runoff from commercial and residential areas that are discharged from the municipal storm sewer system that are to be implemented during the life of the permit, accompanied with an estimate of the expected reduction of pollutant loads and a proposed schedule for implementing such controls. At a minimum, the description shall include:

(1) A description of maintenance activities and a maintenance schedule for structural controls to reduce pollutants (including floatables) in discharges from municipal separate storm sewers;

(2) A description of planning procedures including a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal separate storm sewers which receive discharges from areas of new development and significant redevelopment. Such plan shall address controls to reduce pollutants in discharges from municipal separate storm sewers after construction is completed.

(3) A description of practices for operating and maintaining public streets, roads and highways and procedures for reducing the impact on receiving waters of discharges from municipal storm sewer systems

(4) A description of procedures to assure that flood management projects assess the impacts on the water quality of receiving water bodies and that existing structural flood control devices have been evaluated to determine if retrofitting the device to provide additional pollutant removal from storm water is feasible."

b. Background

Land development and urbanization have been linked to the impairment of aquatic life beneficial uses in numerous studies. Poorly planned new developments and re-development have the potential to impact the hydrology of the watershed and the water quality of the surface waters. Development without proper controls, often result in increased soil compaction, changes in vegetation and increased impervious surfaces. These conditions may lead to a reduction in groundwater recharge and changes in the flow regime of the surface water drainages. Historically, urban development has resulted in increased peak stream flows and flow duration, reduced base flows, and increased water temperatures. Pollutant loading in storm water runoff often increases due to post-construction use and because the storm water runoff is directly connected to the storm drain system or to the surface water body, without the benefit of filtration through soil and vegetation.

In a natural water body (i.e., a water body that has not been armored for flood control or channel stability), increased peak flows and flow duration can cause stream bank erosion, changes in channel geomorphology and bed sediment composition and stability.

When development infringes upon natural riparian buffers, the additional impacts may include further stream bank instability, increased nitrogen loadings to the water body—which would have been intercepted by native riparian vegetation, loss of shading resulting in further increase in water temperature, and a loss of woody debris and leaf litter, which provide food and habitat for some aquatic species.

Low Impact Development (LID) strategies are designed to retain storm water runoff on-site by minimizing soil compaction and impervious surfaces, and by disconnecting storm water runoff from conveyances to the storm drain system. This Order establishes criteria for the volume of storm water to be retained on-site as required to meet water quality goals and to preserve pre-development hydrology in natural drainage systems.

Monitoring studies conducted by the California Department of Public Health (CDPH) have documented that mosquitoes opportunistically breed in structural storm water Best Management Practices (BMPs), particularly those that hold standing water for over 96 hours. Certain Low Impact Development (LID) site design measures that hold standing water such as rainwater capture systems may similarly produce mosquitoes. BMPs and LID design features should incorporate design, construction, and maintenance principles to promote drainage within 96 hours to minimize standing water available to mosquitoes. This Order requires regulated MS4 Permittees to coordinate with other agencies necessary to successfully implement the provisions of this Order. These agencies may include CDPH and local mosquito and vector control agencies on vector-related issues surrounding implementation of post-construction BMPs.

This Order is not intended to prohibit the inspection for or abatement of vectors by the State Department of Public Health or local vector agencies in accordance with CA Health and Safety Code, § 116110 et seq. and Water Quality Order No. 2012-0003-DWQ.

In California, hydromodification studies have focused on the erosive effects of storm water runoff flows and the resulting changes in geomorphology and bed sediment. As described in Hawley (2011), southern California streams may be especially susceptible to geomorphic changes due to steep topography, flashy flow regimes, high sediment loads and largely non-resistant stream bed material.[32] This recent study assessed the impact of urbanization on peak flow and the duration of lower flows capable of moving bed sediment. The results of the study showed that, urbanization resulted in proportionally-longer durations of all geomorphically-effective flows, with a more pronounced effect on the durations of low to moderate flows.

A study performed by United States Geological Survey (USGS) researchers at nine different metropolitan areas within the United States, found that adverse impacts to macroinvertebrate benthic communities were observed in drainages with 5 percent impervious area.[33] The authors concluded that there appears to be no percent impervious area threshold below which benthic communities are not adversely impacted

The Grand River (lower) Surrogate Flow Regime Total Maximum Daily Load (TMDL), prepared for the Ohio Environmental Protection Agency (OEPA), examined the impacts of impervious cover and flow regime changes on aquatic life beneficial uses.[34] The TMDL was approved by USEPA on April 12, 2012. The TMDL analysis showed that aquatic community health (as measured by biological indices) decreased as impervious cover increased. Flow alteration and impervious cover were determined to be the stressors impairing aquatic life. Riparian buffers were identified as a mitigating factor. Peak flow, runoff volume, and flashiness were considered as surrogates. However, for this watershed, flow regime was selected because it addresses the full spectrum of flow conditions (i.e., peak flow and flow duration and base flow). In this watershed, low flow and increased water temperature presented a threat to cold-water fish species. Increased peak flow and flow duration were linked to impairment of aquatic life beneficial uses due to increased pollutant loading and the impact of channel scouring. A flow duration curve was developed for a reference watershed, based on unit area to allow for comparison of varying-sized streams. The criteria for selecting the reference watershed were: (1) the water body was fully supporting aquatic life beneficial uses, (2) location (ecoregion), (3) size (4) land cover (5) riparian buffer and (6) soils. The flow regime TMDL compares flow duration curves for the impaired stream and the reference stream. The TMDL is expressed as the difference between the impaired stream's flow and the

[32] Hawley, Robert J. 2011. The effects of urbanization on the hydrologic stability of small streams in southern California.
[33] Cuffney, T.F., Brightbill, R.A., May, J.T., and Waite, I.R. 2010. Responses of benthic macroinvertebrates to environmental changes associated with urbanization in nine metropolitan areas. *Ecological Applications* 20(5):1384-1401.
[34] Ohio Environmental Protection Agency. Total Maximum Daily Loads for the Grand River (lower) Watershed. Draft Report. October 12, 2011.

reference stream's flow during all flow conditions. The TMDL report recommends protection strategy numeric targets of no more than 6 percent EIA with a forested (70 percent coverage) riparian buffer of 100 feet from the top of each stream bank (200 feet total).

In Los Angeles County, development has infringed upon or eliminated natural riparian buffers and existing development exceeds recommended percent impervious area in many watersheds. In addition, many water bodies have been armored or converted to engineered channels to manage flood hazards. Because of the hydrologic differences between engineered channels and natural water bodies, the Regional Water Board approaches each situation differently. Where development occurs in drainages to water bodies that have been converted to engineered channels, the Regional Water Board's regulatory approach is designed to reduce storm water runoff -- the most effective method for reducing pollutant loading. Alternatively, where development occurs in drainages to natural water bodies, the Regional Water Board regulatory approach aims to reduce pollutant loading conveyed by storm water runoff and to preserve or restore the pre-development hydrology. As a result of past development, it is likely that retrofitting of existing development will be necessary to restore watershed hydrology to pre-development conditions.

c. Applicability

New development and re-development projects subject to these requirements are described in Part VI.D.7.b. of this Order. Although not defined for large and medium MS4s, 40 CFR section 122.34 requires programs for small MS4s to include all projects that disturb an area equal to or greater than 1 acre of land and add more than 10,000 square feet of impervious surface area. The list of new development projects subject to requirements, specified in this Order in Parts VI.D.1.c.i(1)(a) through (k) were either carried over from Order No. 01-182 or were developed for the Ventura County MS4 and are appropriate for defining new developments and redevelopments in this Order. Clarification is provided for developments in progress during formulation of this Order (Part VI.D.c.i(1)(4)).

New development/re-development projects are subject to either the Water Quality/Flow Reduction Resource Management Criteria in Part VI.D.7.c.i or potentially more stringent Hydromodification (Flow/ Volume/ Duration) Control Criteria. Note that hydromodification controls apply only to projects that drain to a natural water body that is a stream, creek or a river. Hydromodification controls do not apply to discharges to lakes, estuaries, or to the ocean, which are not susceptible to channel erosion.

i. **Integrated Water Quality/ Flow Reduction /Resources Management Criteria (Part VI.D.7.c.i).** Projects located in drainages to water bodies that are now engineered channels are subject to Integrated Water Quality/Flow Reduction/Resources Management Criteria. These projects must be designed to minimize the footprint of the impervious area and to use low impact development (LID) strategies to disconnect the runoff from impervious area. The project must be designed to retain on-site the storm water runoff equal to

the storm water quality design volume (SWQDv), unless it is determined that it is technically infeasible or there is an opportunity to contribute to an off-site regional ground water replenishment project.

The SWQDv is defined as the storm water runoff resulting from either:

- the 0.75 inch per 24 hour storm or
- the 85th percentile storm as defined in the Los Angeles County 85th percentile, 24-hour storm isohyetal map, whichever is greater.

This Order establishes a minimum design volume based on the 0.75 inch, 24-hour storm event as defined in the previous Los Angeles County MS4 permit (Order No. 01-182). This requirement is to prevent backsliding from the previous Order. The 85th percentile storm is the design storm used throughout most of the State of California for storm water treatment and LID BMPs designed for water quality protection.

Using detailed local rainfall data, the County of Los Angeles Hydrologist has developed the 85th percentile storm event isohyetal map, which exhibits the size of the 85th percentile storm event throughout Los Angeles County. Since this map uses detailed local rainfall data, it is more accurate for calculating the 85th percentile storm event than other methods which were included in Order No. 01-182. The other methods found in Order No. 01-182 were included as options to be used in the event that detailed accurate rainfall data did not exist for various locations within Los Angeles County. Therefore, they have not been carried over into this Order.

Storm water runoff may be retained on-site by methods designed to intercept rain water via infiltration, bioretention, and harvest and use. Examples of LID Best Management Practices (BMPs) that may be employed to meet the storm water retention requirements include rain gardens, bioswales, pervious pavement, green roofs, and rainwater harvesting for use in landscape irrigation.

ii. **Alternative Compliance for Technical Infeasibility or Opportunity for Regional Ground Water Replenishment (Part VI.D.7.c.ii).** This Order defines conditions that may make on-site retention of the SWQDv technically infeasible. These conditions include measures to:

- Ensure that on-site soils (*in-situ* or amended) have adequate infiltration rates for successful operation of infiltration BMPs,
- Protect groundwater and drinking water wells from contamination,
- Prevent infiltration that might exacerbate potential geotechnical hazards,
- Accommodate smart growth and infill or redevelopment.

A determination that compliance with the Integrated Water Quality/Flow Reduction/Resources Management Criteria is technically infeasible at the

New Development/Re-development project site must be based on a site-specific hydrologic assessment or design analysis conducted and endorsed by a registered professional engineer, geologist, architect or landscape architect. This requirement is the same as contained in the Ventura County MS4 permit, and is necessary to ensure that a competent determination is conducted.

The criteria for technical infeasibility contained in Part VI.D.7.c.ii(2)(a) is necessary to ensure that the *in-situ* soil has adequate permeability to accommodate infiltration, and to ensure against premature failure of infiltration BMPs. A minimum infiltration rate of 0.3 inches per hour under saturated conditions is specified for infiltration BMPs (e.g., dry well, pervious pavement). Infiltration BMPs are restricted to Hydrologic Soil Groups A and B, by other California storm water regulatory agencies. For example, the Contra Costa County Program's Stormwater LID Design Guidebook prohibits routing storm water runoff to a dry (infiltration) well, developed in Hydrologic Soil Groups C and D[35]. Infiltration rates for the lower permeability B soil group ranges between 0.30 and 0.15 inches per hour (USEPA, 2009, Appendix A)[36]. This criterion is specified to ensure the viability of infiltration systems, which may be depended upon to meet the storm water design volume criteria.

Infiltration BMPs are distinguished from bioretention BMPs, which may be implemented in all soils types. Bioretention BMPs are constructed using a manufactured/imported media that must meet strict specifications. The media specification for bioretention facilities is the same as specified for biofiltration systems. The difference between bioretention and biofiltration is that biofiltration systems are designed with an underdrain, which may allow for the discharge of a significant portion of the design storm volume, as described below under Alternative Compliance Measures. Bioretention BMPs may not include an underdrain.

The criteria for determining Technical Infeasibility described in Part VI.D.7.c.ii.(2)(b)-(f) are the same as contained in the Ventura County MS4 permit , except that (2)(b) "locations where seasonal high ground water is *within 5 feet of the surface*", was expanded to "5 to 10 feet" of the surface, to be consistent with local LID Manuals developed by the City of Santa Monica and the City of Los Angeles.

iii. **Alternative Compliance Measures (Part VI.D.7.c.iii.).** This Order provides equally weighted alternatives to on-site retention of the SWQDv. One alternative is to employ infiltration at off-site locations, including regional groundwater replenishment projects. The Regional Water Board has included the alternative for regional ground water replenishment in

[35] Contra Costa County Clean Water Program. 2010. Stormwater C.3 Guidebook, Stormwater Quality Requirements for Development Applications. Fifth Ed. October 20, 2010. p. 18. < www.cccleanwater.org>.

[36] USEPA. 2009. (United States Environmental Protection Agency). Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects under Section 438 of the Energy and Independence and Security Act. Office of Water. December 2009.

recognition of the multiple benefits it can provide. In addition to providing similar water quality benefits as compared to on-site retention, analysis by NRDC and UCSB found that implementing low impact development practices that emphasize retention at new and redeveloped residential and commercial properties in the urbanized areas of southern California and limited portions of the San Francisco Bay area has the potential to increase local water supplies by up to 405,000 acre-feet of water per year by 2030. This volume represents roughly two-thirds of the volume of water used by the entire City of Los Angeles each year. In addition, the same study notes potential energy savings and reductions in CO_2 emissions.[37]

In an effort to promote retrofitting of existing development, alternative compliance measures may include the use of infiltration, bioretention, rainfall harvest and/or biofiltration at an existing development with similar land uses and where storm water runoff is expected to exhibit pollutant event mean concentrations (EMCs) that are comparable to or higher than the proposed new development re-development project. As another alternative the project proponent may comply with the Integrated Water Quality/Flow Reduction/Resources Management Criteria using biofiltration on the project site. The volume of storm water to be treated with biofiltration is 1.5 times the difference between the SWQDv and the volume of storm water runoff that can be reliably retained on the project site. The 1.5 multiplier is based on the finding in the *Ventura County Technical Guidance Manual* that biofiltration of 1.5 times the design volume will provide approximately the same pollutant removal as retention of the design volume on an annual basis.[38]

The volume of storm water runoff to be intercepted at an off-site mitigation project is equal to the difference between the SWQDv and the volume of storm water runoff that can be *reliably retained* on the project site. The estimate of the volume that can be reliably retained on-site shall be based on conservative assumptions including permeability of soils under saturated conditions. When rainfall harvest and use is linked to irrigation demand, the demand shall be estimated based on conditions that exist during the wet weather, winter season.

Mitigation at off-site projects shall be designed to provide equal or greater water quality protection to the surface waters within the same subwatershed as the proposed project. Preferably, the mitigation site will be located within the same Hydrologic Unit Code (HUC)-12 drainage area as the proposed new development or re-development. However, the mitigation project may be located within the expanded HUC-10 drainage area, if approved by the Executive Officer of the Regional Water Board.

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[37] NRDC Technical Report. A Clear Blue Future: How Greening California Cities Can Address Water Resources and Climate Change in the 21st Century. August 2009.

[38] Ventura Countywide Stormwater Management Program. 2011. Ventura Technical Guidance Manual, Manual Update, 2011. Appendix D. July 13, 2011.

As described in the *Ventura County Technical Guidance Manual*, a biofiltration system as defined in this Order, including Attachment H, allows for incidental interception of approximately 40 percent of the treatment volume and treatment of the remaining volume through filtration, and aerobic and anaerobic degradation. The effectiveness of the biofiltration system is greatly impacted by the volume of storm water runoff that is intercepted through incidental infiltration. For this reason, biofiltration as defined in this Order, does not include flow-through planter box or vault type systems with impervious bottom layers, unless Executive Officer approval is obtained. In addition, biofiltration systems as defined in this Order, must meet the specifications for drain placement and planting media provided in Attachment L if they are to be credited as meeting the water quality/flow reduction requirements of the Alternative Compliance Measures of this Order, unless Executive Officer approval is obtained. Attachment H provides a compilation of recent information contained in the Contra Costa County C3 Guidebook and Order R2-2011-083, adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on November 28, 2011. These specifications are based on experiences in the San Francisco Bay Region and are designed to ensure optimum pollutant removal and to prevent premature failure of infiltration components of the biofiltration system.

iv. **Water Quality Mitigation Criteria (Part VI.D.7.c.iii.(7).)** When off-site mitigation is performed, the storm water runoff from the project site must be treated prior to discharge. Volume-based treatment BMPs are to be sized to treat the runoff from the 85th percentile, 24-hour storm event, as described above for storm water retention BMPs. Flow through treatment BMPs are to be sized based on a rainfall intensity of 0.2 inches per hour or the one year, one-hour rainfall intensity as determined from the Los Angeles County isohyetal map, whichever is greater. A minimum flow design of 0.2 inches per hour is consistent with Order No. 01-182 and is included to prevent back sliding. The one year, one-hour rainfall intensity is the flow requirement specified in the Los Angeles River Trash Total Maximum Daily Loads (TMDL) and other Trash TMDLs established in the Region. The Los Angeles County isohyetal map of the one-year, one-hour storm intensity provides an accurate measure of variable storm intensity throughout the County. The one-year, one-hour rain intensity within the County ranges from approximately 0.2 inch/hour to 1.1 inches per hour.

v. **Hydromodification (Flow/ Volume/ Duration Control Criteria (Part VI.D.7.iv.).** New development/re-development projects located in a drainage to a natural stream/creek/river water body shall be required to meet the water quality/flow reduction criteria and/or hydromodification control criteria, whichever are more stringent. (Hydromodification controls do not apply to discharges to lakes, estuaries or to the Pacific Ocean as these types of water bodies are not susceptible to hydromodification

impacts.) This Order provides Hydromodification Control Criteria to be employed. The purpose of the hydromodification controls is to preserve or restore pre-development hydrology.

Part VI.D.7.iv.(b) of this Order describes New Development/Re-development projects that are exempted from hydromodification controls. These projects include maintenance and replacement activities and other projects that do not increase EIA within the subwatershed and therefore are not expected to add to the hydromodification effects. Also exempted are projects located within drainages to waterbodies that are not susceptible to channel erosion or other hydromodification effects.

This Order offers four options for meeting the hydromodification controls for projects that will disturb greater than 1 acre but less than 50 acres:

- The project is designed to retain the storm water runoff from the 95th percentile, 24-hour-hour storm. This criterion is based on the recommendations from the USEPA's *Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act* (USEPA, 2009).
- The runoff flow rate, volume, velocity and duration does not exceed the pre-development condition for the 2-year, 24-hour rainfall event. Research has determined that the maximum point of the effective work curve occurs in the 1 to 2-year frequency (Leopold, 1964, as cited in the South Orange County Hydromodification Plan, 2011)[39]. Furthermore, the effects of development are greatest during smaller storm events. Under natural conditions, the storm water runoff from smaller storms would have been largely intercepted by vegetation, canopy, infiltration and/or evapotranspiration. During large storms, the soils become saturated and runoff occurs even under natural conditions.
- The Erosion Potential (Ep) in the receiving water channel will approximate 1, as determined by the Hydromodification Analysis Study and the Equation presented in Attachment J. This provision is the same as the requirement in the Ventura County MS4 permit (Order No. R4-2010-0108). By maintaining an Ep of approximately 1, the bed sediment of the channel is in an equilibrium state. Alternatively, Permittees can opt to use other work equations to calculate Erosion Potential with Executive Officer approval.
    - Permittees may also satisfy the requirement for Hydromodification Controls by implementing the hydromodification requirements in the

[39] South Orange County. 2011. South Orange County Hydromodification Management Plan. < http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/docs/oc_permit/updates_031212/South_Orange_County%20HMP.pdf > Accessed April 25, 2012.

County of Los Angeles Low Impact Development Manual (2009) for all projects disturbing an area greater than 1 acre within natural drainage systems.

For projects disturbing more than 50 acres, compliance with the controls may be achieved by similar means. However, the plans must be supported by more comprehensive hydrologic modeling. The final Subwatershed Hydromodification Plan must be completed within one year after the effective date of the Order.

The elements of the Subwatershed Hydromodification Plan are:

- Screening to assess which subwatersheds exhibit changes in geomorphology.
- Identify natural drainage systems within the subwatershed that are susceptible to hydromodification impacts,
- Identify areas critical to the hydrology (e.g., groundwater recharge areas, riparian buffers and wetlands) of the subwatershed and identify potential protection strategies for such areas,
- Conduct or access bioassessment monitoring data to assess whether aquatic life uses are being fully supported,
- Prepare preliminary protection strategies for subwatersheds that are fully supporting aquatic life beneficial uses,
- Prepare preliminary retrofit strategies for subwatersheds that exhibit the effects of hydromodification and are not fully supporting aquatic life beneficial uses,
- Identify candidate reference sub-watersheds that are supporting aquatic life beneficial uses and develop a flow duration curve that may serve as a standard for flow duration controls in water bodies that have aquatic life impairments linked to changes in the flow regime. This approach is as described in the recently approved OEPA, Grand River (lower) Flow Regime TMDL.

7. Development and Construction Program

a. Introduction

Soil disturbing activities during construction and demolition exacerbate sediment losses. Sediment is a primary pollutant impacting beneficial uses of watercourses. Sediments, and other construction activity pollutants must be properly controlled to reduce or eliminate adverse impacts.

b. Legal Authority

40 CFR section 122.34(b)(4) states that with respect to construction site storm water runoff control for small MS4s, which is analogous to that for large MS4s:

> "(i) [the permittee] must develop, implement, and enforce a program to reduce pollutants in any storm water runoff to your small MS4 from construction activities that result in a land disturbance of greater than or equal to one acre. Reduction of storm water discharges from construction activity disturbing less than one acre must be included in your program if that construction activity is part of a larger common plan of development or sale that would disturb one acre or more. If the NPDES permitting authority waives requirements for storm water discharges associated with small construction activity in accordance with § 122.26(b)(15)(i), you are not required to develop, implement, and/or enforce a program to reduce pollutant discharges from such sites. (ii) Your program must include the development and implementation of, at a minimum: (A) An ordinance or other regulatory mechanism to require erosion and sediment controls, as well as sanctions to ensure compliance, to the extent allowable under State, Tribal, or local law; (B) Requirements for construction site operators to implement appropriate erosion and sediment control best management practices; (C) Requirements for construction site operators to control waste such as discarded building materials, concrete truck washout, chemicals, litter, and sanitary waste at the construction site that may cause adverse impacts to water quality; (D) Procedures for site plan review which incorporate consideration of potential water quality impacts; (E) Procedures for receipt and consideration of information submitted by the public, and (F) Procedures for site inspection and enforcement of control measures."

The inspection requirements for construction sites contained in this Order are also based on the requirements found in Order No. 01-182. As noted above in Part VI.C.5.a, the inspection requirements contained in Order No. 01-182 for construction sites were the subject of litigation between several permittees and the Regional Water Board. As provided in more detail above, the Los Angeles County Superior Court upheld the inspection requirements for industrial/commercial facilities and construction sites in Order No. 01-182, finding that the "[t]he Permit contains reasonable inspection requirements for these types of facilities." (*In re L.A. Cnty. Mun. Storm Water Permit Litig.* (L.A. Super. Ct., No. BS 080548, Mar. 24, 2005), Statement of Decision from Phase II Trial on Petitions for Writ of Mandate, p. 17.) As also noted above, the Superior Court also rejected the permittees' claims that the requirements in Order No. 01-182 shifted the Regional Water Board's inspection responsibility under State Water Board issued general NPDES permits for these types of facilities onto the local agencies, finding that "[r]equiring permittees to inspect commercial and industrial facilities and construction sites is authorized under the Clean Water Act, and both the Regional Board and the municipal permittees or the local government entities have concurrent roles in enforcing the industrial, construction and municipal permits. The Court finds that the Regional Board did not shift its inspection responsibilities to Petitioners." (*Id*. at 17-18.)

As previously noted for inspections of commercial/industrial facilities, the California Court of Appeal also rejected arguments pertaining to similar inspection requirements for construction sites prescribed by the Santa Ana Regional Water Board. (*City of Rancho Cucamonga v. Regional Water Quality Control Board- Santa Ana Region* (2006) 135 Cal.App.4th 1377, 1389.) In that case, the City of Rancho Cucamonga claimed that the Santa Ana Regional Water Board improperly delegated to it and other permittees the inspection duties of the State and Regional Water Boards and that it was being required to conduct inspections for facilities covered by other state-issued general NPDES permits. The Court of Appeal upheld the Santa Ana Regional Water Board's requirements, finding that "Rancho Cucamonga and the other permittees are responsible for inspecting construction and industrial sites and commercial facilities within their jurisdiction for compliance with and enforcement of local municipal ordinances and permits. But the Regional Board continues to be responsible under the 2002 NPDES permit for inspections under the general permits. The Regional Board may conduct its own inspections but permittees must still enforce their own laws at these sites. (40 C.F.R. § 122.26, subd. (d)(2) (2005).)" (*Id*. at 1390.)

c. Construction Activity Applicability

Any construction or demolition activity, including, but not limited to, clearing, grading, grubbing, or excavation, or any other activity that results in a land disturbance of equal to or greater than one acre.

Construction activity that results in land surface disturbances of less than one acre if the construction activity is part of a larger common plan of development or sale of one or more acres of disturbed land surface.

Construction activity related to residential, commercial, or industrial development on lands currently used for agriculture including, but not limited to, the construction of buildings related to agriculture that are considered industrial pursuant to USEPA regulations, such as dairy barns or food processing facilities.

Construction activity associated with linear underground/overhead project (LUPs) including, but not limited to, those activities necessary for the installation of underground and overhead linear facilities (e.g., conduits, substructures, pipelines, towers, poles, cables, wires, connectors, switching, regulating and transforming equipment and associated ancillary facilities) and include, but are not limited to, underground utility mark-out, potholing, concrete and asphalt cutting and removal, trenching, excavation, boring and drilling, access road and pole/tower pad and cable/wire pull station, substation construction, substructure installation, construction of tower footings and/or foundations, pole and tower installations, pipeline installations, welding, concrete and/or pavement repair or replacement, and stockpile/borrow locations.

Discharges of sediment from construction activities associated with oil and gas exploration, production, processing, or treatment operations or transmission facilities.

Storm water discharges from dredge spoil placement that occur outside of U.S. Army Corps of Engineers jurisdiction[40] (upland sites) and that disturb one or more acres of land surface from construction activity are covered by this General Permit. Construction projects that intend to disturb one or more acres of land within the jurisdictional boundaries of a CWA section 404 permit should contact the appropriate Regional Water Board to determine whether this permit applies to the project.

d. Development Construction Program Implementation

Permittees must implement a construction program that applies to all activities involving soil disturbance with the exception of agricultural activities. Minimum requirements have been established for construction activity less than one acre and for those activities equal or greater than one acre. Activities covered by the permit include but are not limited to grading, vegetation clearing, soil compaction, paving, re-paving, and LUPs. The construction program should be designed to: (1) prevent illicit construction-related discharges of pollutants into the MS4 and receiving waters; (2) implement and maintain structural and non-structural BMPs to reduce pollutants in storm water runoff from construction sites; (3) reduce construction site discharges of pollutants to the MS4 to the MEP; and (4) prevent construction site discharges to the MS4 from causing or contributing to a violation of water quality standards.

Each permittee shall use an site system to track grading permits, encroachment permits, demolition permits, building permits, or construction permits (and any other municipal authorization to move soil and/ or construct or destruct that involves land disturbance) issued by each permittee. To satisfy this requirement, the use of a database or GIS system is recommended.

For construction activity equal or greater than one acre, the Permittee must establish review procedures for construction site plans to determine potential water quality impacts and ensure the proposed controls are adequate. These procedures should include the preparation and submission of an Erosion and Sediment Control Plan (ESCP) containing elements of a Storm Water Pollution Prevention Plan (SWPPP) prior to issuance of a grading or building permit as well as a review of individual pre-construction site plans to ensure consistency with local sediment and erosion control requirements. The requirement that ESCP/SWPPPs must be developed by a Qualified SWPPP Developer (QSD) is new for this iteration of the permit. This requirement ensures the development of high quality ESCP/SWPPPs that protect water quality to the MEP.

A ESCP/SWPPP must be appropriate for the type and complexity of a project and will be developed and implemented to address project specific conditions. Some projects may have similarities or complexities, yet each project is unique in its progressive state that requires specific description and selection of BMPs

[40] A construction site that includes a dredge and/or fill discharge to any water of the United States (e.g., wetland, channel, pond, or marine water) requires a permit from the U.S. Army Corps of Engineers pursuant to CWA section 404 and a Water Quality Certification from the Regional Water Board or State Water Board pursuant to CWA section 401.

needed to address all possible generated pollutants. The Permittee must ensure that construction site operators select and implement appropriate erosion and sediment control measures to reduce or eliminate the impacts to receiving waters. To help guide their Construction Program and ensure consistency regarding BMP selection, the Permit requires the Permittee to develop or adopt BMP standards for a range of construction related activities. The list of activities is based on California Stormwater Quality Association's (CASQA) Construction BMP handbook. The ESCP/SWPPP must include the rationale used for selecting or rejecting BMPs. The project architect, or engineer of record, or authorized qualified designee, must sign a statement on the ESCP/SWPPP to the effect:

"As the architect/ engineer of record, I have selected, appropriate BMPs to effectively minimize the negative impact of the project's construction activities on storm water quality. The project owner and contractor are aware that the selected BMPs must be installed, monitored, and maintained to ensure their effectiveness. The BMPs not selected for implementation are redundant or deemed not applicable to the proposed construction activity."

The Permittee is responsible for conducting inspection and enforcement of erosion and sediment control measures at specified times and frequencies during construction including prior to land disturbance, during grading and land development, during streets and utilities activities, during vertical construction, and during final landscaping and site stabilization. The Permittees' Municipal Inspectors must be adequately trained and Permittees are encouraged to offer opportunities for inspectors to enroll in the State Water Board sponsored Qualified Storm Water Pollution Prevention Plan (SWPPP) Practitioner (QSP) certification program. A progressive enforcement policy has been integrated into this iteration of the permit to ensure that adequate penalties are in place and to ensure the protection of receiving water quality.

Prior to approving and/ or signing off for occupancy and issuing the Certificate of Occupancy for all construction projects subject to post-construction controls, each permittee shall inspect the constructed site design, source control and treatment control BMPs to verify that they have been constructed in compliance with all specifications, plans, permits, ordinances, and this Order. The initial/ acceptance BMP verification inspection does not constitute a maintenance and operation inspection.

The Permittee must ensure that staff has proper training. In addition, the Permittee must develop and distribute training and educational material and conduct outreach to the development community. To ensure that the construction program is followed, construction operators must be educated about site requirements for control measures, local storm water requirements, enforcement activities, and penalties for non-compliance.

8. Public Agency Activities Program

a. Background

Publically-owned or operated facilities serve as hubs of activity for a variety of municipal staff from many different departments. Some municipalities will have one property at which all activities take place (e.g., the municipal maintenance yard), whereas others will have several specialized facilities such as animal control facilities, chemical storage facilities, composting facilities, equipment storage and maintenance facilities, fueling facilities, hazardous waste disposal facilities, incinerators, landfills, materials storage yards, pesticide storage facilities, public buildings, public parking lots, public golf courses, public swimming pools, public parks, public marinas, recycling facilities, solid waste handling and transfer facilities, and flood control facilities.

b. Program Implementation

i. Public Construction Activities Management

The Permittee is required to implement BMPs and comply with the Planning and Land Development Program requirements in Part VI.D.6 of this Order and the Development Construction Program requirements in Part VI.D.7 of this Order at applicable Permittee-owned or operated (i.e., public or Permittee sponsored) construction projects. These requirements ensure that Permittee-owned or operated construction and development occurs in an equally protective manner as private development. The Permittee is also required to implement an effective combination of erosion and sediment control BMPs from Table 13 (see Construction Development Program, minimum BMPs) at those public sites that disturb less than one acre of soil. Last, the Permittee is required to obtain separate coverage under the State Water Board's Construction General NPDES Permit for all Permittee-owned or operated construction sites that require coverage.

ii. Public Facility Inventory

A comprehensive list of publically-owned or operated facilities will help staff responsible for storm water compliance build a better awareness of their locations within the MS4 service area and their potential to contribute storm water pollutants. The inventory should include information on the location, contact person at the facility, activities performed at the facility, and whether the facility is covered under an industrial general storm water permit or other individual or general NPDES permit, or any applicable waivers issued by the Regional or State Water Board pertaining to storm water discharges. Incorporation of GIS into the inventory is encouraged. The facility inventory should be updated at least twice during the permit term and will serve as a basis for setting up periodic facility assessments and developing, where necessary, facility storm water pollution prevention plans. By developing an inventory of Permittee-owned facilities that are potential sources of storm water pollution helps to ensure that these facilities are monitored and receiving water quality is protected.

iii. Inventory of Existing Development for Retrofitting Opportunities

Each Permittee is required to maintain an updated inventory of all Permittee-owned or operated (i.e., public) facilities within its jurisdiction that are potential sources of storm water pollution. This requirement is similar to the requirement of Order No. 01-182. In this Order, the incorporation of facility information into a GIS is recommended as this has been proven effective for effectively inventory and management of facilities and associated BMPs. Given that facility operation, condition, and practices can change over a five year period, the Permittees are required to update its inventory at least twice during the term of this Order.

In addition to developing an inventory of publically-owned or operated facilities, in this Order, Permittees are required to develop an inventory of existing development for retrofitting opportunities. The intention of adding this requirement to the permit is to encourage the use of retrofit projects that reduce storm water pollutants into the MS4 that are a result of impacts from existing development. Permittees are also required to evaluate and rank these retrofitting opportunities.

iv. Public Agency Facility and Activity Management

Each Permittee is required to manage its facilities in accordance with the State Water Board's Industrial General NPDES Permit, where applicable, and shall ensure the implementation and maintenance of appropriate BMPs at all facilities with a potential to pollute stormwater. Therefore, Permittees shall obtain separate coverage under the State Water Board's Industrial General NPDES Permit for all Permittee-owned or operated facilities where industrial activities are conducted that require coverage under the Industrial General NPDES Permit and shall implement and maintain activity specific BMPs listed in Table 19 (BMPs for Public Agency Facilities and Activities).

Many municipalities use third-party contractors to conduct municipal maintenance activities in lieu of using municipal employees. Contractors performing activities that can affect storm water quality must be held to the same standards as the Permittee. Not only must these expectations be defined in contracts between the Permittee and its contractors, but the Permittee is responsible for ensuring, through contractually-required documentation or periodic site visits, that contractors are using storm water controls and following standard operating procedures. Therefore, the Permittee shall ensure all contractors hired by the Permittee to conduct Public Agency Activities including, but not limited to, storm and/or sanitary sewer system inspection and repair, street sweeping, trash pick-up and disposal, and street and right-of-way construction and repair shall be contractually required to implement and maintain the activity specific BMPs listed in Table 18.

v. Vehicle and Equipment Washing

Specific BMPs for all fixed vehicle and equipment washing; including fire fighting and emergency response vehicles have been incorporated into this

Order and must be implemented. In addition, specific BMPs for wash waters from vehicle and equipment washing. These requirements effectively prohibit the occurrence of illicit discharges resulting from unauthorized washing activities.

vi. Landscape, Park, and Recreational Facilities Management

Specific BMPs for public right-of-ways, flood control facilities and open channels, lakes and reservoirs, and landscape, park, and recreation facilities and activities have been included this Order, similar to those in Order No. 01-182 and the more recently adopted Ventura County MS4 Permit, and must be implemented. These requirements are reflective of current environmentally responsible practices.

vii. Storm Drain Operation and Maintenance

Specific BMPs for storm drain operations and maintenance have been carried over from Order No. 01-182 into this Order.

Permittees must prioritize catch basins for cleaning activities based on the volume of trash or debris.

The materials removed from catch basins may not reenter the MS4. The material must be dewatered in a contained area and the water treated with an appropriate and approved control measure or discharged to the sanitary sewer. The solid material will need to be stored and disposed of properly to avoid discharge during a storm event. Some materials removed from storm drains and open channels may require special handling and disposal, and may not be authorized to be disposed of in a landfill.

viii. Streets, Roads, and Parking Facilities Maintenance

Permittees must prioritize streets and/or street segments for sweeping activities based on the volume of trash generated on the street or street segments. Based on these established priorities, Permittees must conduct street sweeping twice per month on the highest priority streets (Priority A), once per month on the medium priority streets (Priority B), and as needed but not less than once per year on the lowest priority streets (Priority C). In addition parking facilities must be cleaned using street sweeping equipment no less than two times per month and inspect no less than two times per month to determine if cleaning is necessary.

Specific BMPs for road reconstruction have been incorporated into this Order and must be followed during road repaving activities.

ix. Emergency Procedures

Permittees are required to conduct repairs of essential public service systems and infrastructure in emergency situations. These requirements ensure the protection of water quality. BMPs must be implemented to reduce the threat to water quality and the Regional Water Board must be notified of the occurrence, an explanation of the circumstances and measures taken to reduce the threat to water quality within 30 business days after the emergency has passed.

x. Municipal Employee and Contractor Training

Permittees are required to ensure that training is provided for employees and contractors that have job duties or participate in activities that have the potential to affect storm water quality. The training should promote a general understanding of the potential for activities to pollute storm water and include information on the identification of opportunities to require, implement, and maintain BMPs associated with the activities they perform. In addition training specific to employees or contractors that use or have the potential to use pesticides or fertilizers should be provided. This training should instruct employees and contractors on the potential for pesticide-related surface water toxicity, the proper use, handling and disposal of pesticides, the least toxic methods of pest prevention and control, and the overall reduction of pesticide use.

Many municipalities use third-party contractors to conduct municipal maintenance activities in lieu of using municipal employees. Contractors performing activities that can affect storm water quality must be held to the same standards as the Permittee. Not only must these expectations be defined in contracts between the Permittee and its contractors, but the Permittee is responsible for ensuring, through contractually-required documentation or periodic site visits, that contractors are using storm water controls and following standard operating procedures.

9. Illicit Connection and Illicit Discharge Elimination Program

a. Legal Authority

A proposed management program “shall be based on a description of a program, including a schedule, to detect and remove (or require the discharger to the municipal storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer,” per 40 CFR section 122.26(d)(2)(iv)(B). A Permittee must include in its proposed management program “a program, including inspections, to implement and enforce an ordinance, orders or similar means to prevent illicit discharges to the municipal storm sewer system,” per subsection (1) of the above federal regulation.

USEPA stormwater regulations define "illicit discharge" as "any discharge to a municipal separate storm sewer that is not composed entirely of stormwater" except discharges resulting from fire fighting activities and discharges from NPDES permitted sources (see 40 CFR section 122.26(b)(2)). The applicable

regulations state that the following non-stormwater discharges may be allowed if they are not determined to be a significant source of pollutants to the MS4: water line flushing, landscape irrigation, diverted stream flows, rising ground waters, uncontaminated ground water infiltration (as defined at 40 CFR section 35.2005(20)), uncontaminated pumped ground water, discharges from drinking water supplier distribution systems, foundation drains, air conditioning condensation, irrigation water, springs, water from crawl space pumps, footing drains, lawn watering, individual residential car washing, flows from riparian habitats and wetlands, dechlorinated swimming pool discharges, and street wash water. If, however, these discharges are determined to be a significant source of pollution then they must be prohibited.

Examples of common sources of illicit discharges in urban areas include apartments and homes, car washes, restaurants, airports, landfills, and gas stations. These so called "generating sites" discharge sanitary wastewater, septic system effluent, vehicle wash water, washdown from grease traps, motor oil, antifreeze, gasoline and fuel spills, among other substances. Although these illicit discharges can enter the storm drain system in various ways, they generally result from either direct connections (e.g., wastewater piping either mistakenly or deliberately connected to the storm drains) or indirect connections (e.g., infiltration into the storm drain system, spills, or "midnight dumping"). Illicit discharges can be further divided into those discharging continuously and those discharging intermittently.

b. Illicit Discharge Source Investigation and Elimination

Section 402(p)(3)(B)(ii) of the CWA requires MS4 permits to “effectively prohibit non-stormwater discharges into the storm sewers.” The permit implements this requirement, in part by requiring the development of procedures to investigate and eliminate illicit discharges. The permittee must develop a clear, step-by-step procedure for conducting the investigation of illicit discharges. The procedure must include an investigation protocol that clearly defines what constitutes an illicit discharge and what steps shall be taken to identify and eliminate its source. In many circumstances, sources of intermittent, illicit discharges are very difficult to locate, and these cases may remain unresolved. The permit requires that each case be conducted in accordance with the procedures developed to locate the source and conclude the investigation, after which the case may be considered closed. These procedures should be completed per the Progressive Enforcement Policy identified in Part VI.D.2 of this Order and should include enforcement as necessary to ensure the elimination of the illicit discharge/connection.

Illicit discharges may also originate in upstream jurisdictions and therefore this Order establishes procedures for communicating with upstream entities and providing information that may prove helpful in their investigation of its source(s).

If a Permittee is unable to eliminate an ongoing illicit discharge following full execution of its legal authority and in accordance with its Progressive Enforcement Policy, or other circumstances prevent the full elimination of an

ongoing illicit discharge, including the inability to find the responsible party/parties, the Permittee shall require diversion of the entire flow to the sanitary sewer or treatment. In either instance, the Permittee shall notify the Regional Water Board in writing within 30 days of such determination and shall provide a written plan for review and comment that describes the efforts that have been undertaken to eliminate the illicit discharge, a description of the actions to be undertaken, anticipated costs, and a schedule for completion. The goal of these requirements is to provide a permanent solution for ongoing illicit discharges.

c. Identification and Response to Illicit Connections

Illicit connections to the MS4 can lead to the direct discharge or infiltration of sewage or other prohibited discharges into the MS4. Permittees have been conducting illicit connection screening throughout the term of Order No. 01-182 and this Order requires a continuation of response efforts once an illicit connection is identified. This Order establishes unique obligations for the LACFCD and for the individual Permittees. The requirements for LACFCD are based on the unique obligations and infrastructure of a regional flood control district. Requirements for the individual Permittees require the investigation and follow-up of all illicit connections within 21 days of identification and elimination within 180 days.

d. Public Reporting of Non-Storm Water Discharges and Spills

Each Permittee needs to promote a program to help in the identification and termination of illicit discharges. This Order establishes requirements for the Permittees, individually or as a group, to develop public education campaigns and reporting numbers which are intended to promote public reporting of illicit discharges. Specifically, a stormwater hotline can be used to help permittees become aware of and mitigate spills or dumping incidents. Spills can include everything from an overturned gasoline tanker to sediment leaving a construction site to a sanitary sewer overflow entering into a storm drain. Permittees must set up a hotline consisting of any of the following (or combination thereof): a dedicated or non-dedicated phone line, E-mail address, or website.

This Order also requires development of written procedures for receiving and responding to calls from the public and for maintaining documentation about reported illicit discharges and spills and their investigation and remedy. These requirements are intended to ensure that reliable and consistent practices are deployed to address this persistent problem.

e. Spill Response Plan

Spills, leaks, sanitary sewer overflows, and illicit dumping or discharges can introduce a range of stormwater pollutants into the storm system. Prompt response to these occurrences is the best way to prevent or reduce negative impacts to waterbodies. The permittee must develop a spill response plan that includes an investigation procedure similar to or in conjunction with the

investigation procedures developed for illicit discharges in general. Often, a different entity might be responsible for spill response in a community (i.e. fire department), therefore, it is imperative that adequate communication exists between stormwater and spill response staff to ensure that spills are documented and investigated in a timely manner.

f. Illicit Connection and Illicit Discharge Education and Training

The permit requires each Permittee to train field staff, who may come into contact or observe illicit discharges, on the identification and proper procedures for reporting illicit discharges. Field staff to be trained may include, but are not limited to, municipal maintenance staff, inspectors, and other staff whose job responsibilities regularly take them out of the office and into areas within the MS4 area. Permittee field staff are out in the community every day and are in the best position to locate and report spills, illicit discharges, and potentially polluting activities. With proper training and information on reporting illicit discharges easily accessible, these field staff can greatly expand the reach of the IDDE program.

10. Los Angeles County Flood Control District Section

Due to the unique characteristics of the Los Angeles County Flood Control District, a Minimum Control Measure Section unique to the Los Angeles County Flood Control District was included in the Order. Unlike other Permittees, the LACFCD does not own or operate any municipal sanitary sewer systems, public streets, roads, or highways. Additionally, The LACFCD has no planning, zoning, development permitting or other land use authority over industrial or commercial facilities, new developments or re-development projects, or development construction sites located in any incorporated or unincorporated areas within its service area. The Permittees that have such land use authority are responsible for implementing a storm water management program to inspect and control pollutants from industrial and commercial facilities, new development and re-development projects, and development construction sites within their jurisdictional boundaries. The requirements included in the Section are the same as those for other Permittees, but requirements that are not applicable due to the unique characteristic of the Los Angeles County Flood Control District were eliminated.

D. Total Maximum Daily Load Provisions

Clean Water Act section 303(d)(1)(A) requires each State to conduct a biennial assessment of its waters, and identify those waters that are not achieving water quality standards. These waters are identified as impaired on the State's Clean Water Act section "303(d) List" of water quality limited segments. The Clean Water Act also requires States to establish a priority ranking for waters on the 303(d) List and to develop and implement Total Maximum Daily Loads (TMDLs) for these waters. A TMDL specifies the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards, and allocates the acceptable pollutant load to point

and nonpoint sources. The elements of a TMDL are described in 40 CFR sections 130.2 and 130.7. A TMDL is defined as "the sum of the individual waste load allocations for point sources and load allocations for nonpoint sources and natural background" (40 CFR § 130.2). Regulations further require that TMDLs must be set at "levels necessary to attain and maintain the applicable narrative and numeric water quality standards with seasonal variations and a margin of safety that takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality" (40 CFR section 130.7(c)(1)). The regulations at 40 CFR section 130.7 also state that TMDLs shall take into account critical conditions for stream flow, loading and water quality parameters. Essentially, TMDLs serve as a backstop provision of the CWA designed to implement water quality standards when other provisions have failed to achieve water quality standards.

Upon establishment of TMDLs by the State or the USEPA, the State is required to incorporate, or reference, the TMDLs in the State Water Quality Management Plan (40 CFR sections 130.6(c)(1) and 130.7). The Regional Water Board's Basin Plan, and applicable statewide plans, serves as the State Water Quality Management Plan governing the watersheds under the jurisdiction of the Regional Water Board. When adopting TMDLs as part of its Basin Plan, the Regional Water Board includes, as part of the TMDL, a program for implementation of the WLAs for point sources and load allocations (LAs) for nonpoint sources.

TMDLs are not self-executing, but instead rely upon further Board orders to impose pollutant restrictions on discharges to achieve the TMDL's WLAs. Section 402(p)(3)(B)(iii) of the Clean Water Act requires the Regional Water Board to impose permit conditions, including: "management practices, control techniques and system, design and engineering methods, and *such other provisions as the Administrator of the State determines appropriate for the control of such pollutants*." (emphasis added.) Section 402(a)(1) of the Clean Water Act also requires states to issue permits with conditions necessary to carry out the provisions of the Clean Water Act. Federal regulations also require that NPDES permits must include conditions consistent with the assumptions and requirements of any available waste load allocation (40 CFR section 122.44(d)(1)(vii)(B)). Similarly, state law requires both that the Regional Water Board implement its Basin Plan when adopting waste discharge requirements (WDRs) and that NPDES permits apply "any more stringent effluent standards or limitations necessary to implement water quality control plans…" (Cal. Wat. Code §§ 13263, 13377).

An NPDES permit should incorporate the WLAs as numeric WQBELs, where feasible. Where a non-numeric permit limitation is selected, such as BMPs, the permit's administrative record must support the expectation that the BMPs are sufficient to achieve the WLAs. (40 CFR §§ 124.8, 124.9, and 124.18.) The USEPA has published guidance for establishing WLAs for storm water discharges in TMDLs and their incorporation as numeric WQBELs in MS4 permits.[41]

[41] USEPA (2010) "Revisions to the November 22, 2002 Memorandum 'Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those TMDLs'." Issued by James A. Hanlon, Director, Office of Wastewater Management and Denise Keehner, Director, Office of Wetlands, Oceans and Watersheds. November 12, 2010.

As required, permit conditions are included in this Order consistent with the assumptions and requirements of the available WLAs assigned to MS4 discharges, which have been established in thirty-three TMDLs. The Regional Water Board adopted twenty-five (25) TMDLs and USEPA established seven (7) TMDLs that assign WLAs to MS4 Permittees within the County of Los Angeles. In addition, the Santa Ana Regional Water Board adopted a TMDL that assigns WLAs to the Cities of Pomona and Claremont. The TMDLs included in this Order along with the adoption and approval dates are listed in the table below. Permit conditions for two of these TMDLs – the Marina del Rey Harbor Bacteria TMDL and the Los Angeles River Watershed Trash TMDL – were previously incorporated into Order No. 01-182 during re-openers in 2007 and 2009, respectively (Orders R4-2007-0042 and R4-2009-0130). TMDLs are typically developed on a watershed or subwatershed basis, which facilitates a more accurate assessment of cumulative impacts of pollutants from all sources. An overview of each Watershed Management Area, including the TMDLs applicable to it, is provided below.

TMDLs with Resolution Numbers, Adoption Dates and Effective Dates

TOTAL MAXIMUM DAILY LOAD	RESOLUTION NUMBER	ADOPTION DATE	STATE BOARD RESOLUTION NUMBER	STATE BOARD APPROVAL DATE	OAL APPROVAL DATE	EPA APPROVAL DATE	EFFECTIVE DATE
Santa Clara River Watershed Management Area							
Santa Clara River Nitrogen Compounds TMDL	2003-011	8/7/2003	2003-0073	11/19/2003	2/27/2004	3/18/2004	3/23/2004
Upper Santa Clara River Chloride TMDL	2008-012	12/11/2008	2009-0077	10/20/2009	1/26/2010	4/6/2010	4/6/2010
Lake Elizabeth, Munz Lake, and Lake Hughes Trash TMDL (Lake Elizabeth only)	2007-009	6/7/2007	2007-0073	12/4/2007	2/8/2008	2/27/2008	3/6/2008
Santa Clara River Estuary and Reaches 3, 5, 6, and 7 Indicator Bacteria TMDL	R10-006	7/8/2010	2011-0048	10/4/2011	12/19/2011	1/13/2012	3/21/2012
Santa Monica Bay Watershed Management Area							
Santa Monica Bay Beaches Bacteria TMDL (Dry Weather)	2002-004	1/24/2002	2002-0149	9/19/2002	12/9/2002	6/19/2003	7/15/2003
Santa Monica Bay Beaches Bacteria TMDL (Wet Weather)	2002-022	12/12/2002	2003-0022	3/19/2003	5/20/2003	6/19/2003	7/15/2003
Santa Monica Bay Nearshore and Offshore Debris TMDL	R10-010	11/4/2010	2011-0064	12/6/2011	3/15/2012	3/20/2012	3/20/2012
Santa Monica Bay TMDL for DDTs and PCBs (USEPA established)	N/A	N/A	N/A	N/A	N/A	3/26/2012	N/A
Malibu Creek Subwatershed							
Malibu Creek and Lagoon Bacteria TMDL	2004-019R	12/13/2004	2005-0072	9/22/2005	12/1/2005	1/10/2006	1/24/2006
Malibu Creek Watershed Trash TMDL	2008-007	5/1/2008	2009-0029	3/17/2009	6/16/2009	6/26/2009	7/7/2009
Malibu Creek Watershed Nutrients TMDL (USEPA established)	N/A	N/A	N/A	N/A	N/A	3/21/2003	N/A
Ballona Creek Subwatershed							
Ballona Creek Trash TMDL	2004-023	3/4/2004	2004-0059	9/30/2004	2/8/2005	N/A	8/11/2005
Ballona Creek Estuary Toxic Pollutants TMDL	2005-008	7/7/2005	2005-0076	10/20/2005	12/15/2005	12/22/2005	1/11/2006
Ballona Creek, Ballona Estuary and	2006-011	6/8/2006	2006-0092	11/15/2006	2/20/2007	3/26/2007	4/27/2007

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TOTAL MAXIMUM DAILY LOAD	RESOLUTION NUMBER	ADOPTION DATE	STATE BOARD RESOLUTION NUMBER	STATE BOARD APPROVAL DATE	OAL APPROVAL DATE	EPA APPROVAL DATE	EFFECTIVE DATE
Sepulveda Channel Bacteria TMDL							
Ballona Creek Metals TMDL	2007-015	9/6/2007	2008-0045	6/17/2008	10/6/2008	10/29/2008	10/29/2008
Ballona Creek Wetlands TMDL for Sediment and Invasive Exotic Vegetation (USEPA established)	N/A	N/A	N/A	N/A	N/A	3/26/2012	N/A
Marina del Rey Subwatershed							
Marina del Rey Harbor Mothers' Beach and Back Basins Bacteria TMDL	2003-012	8/7/2003	2003-0072	11/19/2003	1/30/2004	3/18/2004	3/18/2004
Marina del Rey Harbor Toxic Pollutants TMDL	2005-012	10/6/2005	2006-0006	1/13/2006	3/13/2006	3/16/2006	3/22/2006
Dominguez Channel and Greater Harbors Waters Watershed Management Area							
Los Angeles Harbor Bacteria TMDL (Inner Cabrillo Beach and Main Ship Channel)	2004-011	7/1/2004	2004-0071	10/21/2004	1/5/2005	3/1/2005	3/10/2005
Machado Lake Trash TMDL	2007-006	6/7/2007	2007-0075	12/4/2007	2/8/2008	2/27/2008	3/6/2008
Machado Lake Nutrient TMDL	2008-006	5/1/2008	2008-0089	12/2/2008	2/19/2009	3/11/2009	3/11/2009
Machado Lake Pesticides and PCBs TMDL	R10-008	9/2/2010	2011-0065	12/6/2011	2/29/2012	3/20/2012	3/20/2012
Dominguez Channel and Greater Los Angeles and Long Beach Harbor Waters Toxic Pollutants TMDL	R11-008	5/5/2011	2012-0008	2/7/2012	3/21/2012	3/23/2012	3/23/2012
Los Angeles River Watershed Management Area							
Los Angeles River Watershed Trash TMDL	2007-012	8/9/2007	2008-0024	4/15/2008	7/1/2008	7/24/2008	9/23/2008
Los Angeles River Nitrogen Compounds and Related Effects TMDL	2003-016	12/4/2003	2004-0014	3/24/2004	9/27/2004	N/A	9/27/2004
Los Angeles River and Tributaries Metals TMDL	R10-003	5/6/2010	2011-0021	4/19/2011	7/28/2011	11/3/2011	11/3/2011
Los Angeles River Bacteria TMDL	R10-007	7/9/2010	2011-0056	11/1/2011	3/21/2012	3/23/2012	3/23/2012
Legg Lake Trash TMDL	2007-010	6/7/2007	2007-0074	12/4/2007	2/5/2008	2/27/2008	3/6/2008

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TOTAL MAXIMUM DAILY LOAD	RESOLUTION NUMBER	ADOPTION DATE	STATE BOARD RESOLUTION NUMBER	STATE BOARD APPROVAL DATE	OAL APPROVAL DATE	EPA APPROVAL DATE	EFFECTIVE DATE
Long Beach City Beaches and Los Angeles River Estuary Bacteria TMDL (USEPA established)	N/A	N/A	N/A	N/A	N/A	3/26/2012	N/A
Los Angeles Area Lakes TMDLs (USEPA established for Lake Calabasas, Echo Park Lake, Legg Lake and Peck Road Park Lake)	N/A	N/A	N/A	N/A	N/A	3/26/2012	N/A
San Gabriel River Watershed Management Area							
San Gabriel River and Impaired Tributaries Metals and Selenium TMDL (USEPA established)	N/A	N/A	N/A	N/A	N/A	3/26/2007	N/A
Los Angeles Area Lakes TMDLs (USEPA established for Puddingstone Reservoir)	N/A	N/A	N/A	N/A	N/A	3/26/2012	N/A
Los Cerritos Channel and Alamitos Bay Watershed Management Area							
Los Cerritos Channel Metals TMDL (USEPA established)	N/A	N/A	N/A	N/A	N/A	3/17/2010	N/A
Colorado Lagoon OC Pesticides, PCBs, Sediment Toxicity, PAHs, and Metals TMDL	R09-005	10/1/2009	2010-0056	11/16/2010	5/6/2011	6/14/2011	7/28/2011
Middle Santa Ana River Watershed Management Area (Santa Ana Region TMDL)							
Middle Santa Ana River Watershed Bacterial Indicator TMDLs	R8-2005-0001	8/26/2005	2006-0030	5/15/2006	9/1/2006	5/16/2007	5/16/2007

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Santa Clara River Watershed Management Area. The Santa Clara River and its tributaries drain a watershed area of 1,634 square miles (sq. miles) (Figure B-1). Santa Clara River Reaches 1, 2, 3, 4A, 4B and major tributaries Santa Paula, Sespe and Piru Creeks are in Ventura County. Santa Clara River Reaches 5, 6, 7, 8 and major tributaries Castaic, San Francisquito, and Bouquet Canyon Creeks are in Los Angeles County. About 40% of the watershed, the Upper Santa Clara River, is located in County of Los Angeles. Approximately, 75% of the Upper Santa Clara River watershed is open space used for recreation in the Angeles National Forest. The remainder of the upper portion of the watershed is characterized by a mixture of residential, mixed urban, and industrial land uses with low density residential more common in the uppermost areas of the watershed, while high density residential is more prevalent in the City of Santa Clarita.

Various reaches of the Santa Clara River are on the 2010 CWA Section 303(d) List of impaired water bodies for nitrogen, bacteria, chloride, and trash (in lakes), among other pollutants. The excess nitrogen compounds are causing impairments to the WARM, WILD, and GWR designated beneficial uses of the Santa Clara River in Reaches 3, 7 and 8. The elevated bacterial indicator densities are causing impairment of the REC-1 and REC-2 designated beneficial uses for the Santa Clara River Estuary and Reaches 3, 5, 6, and 7. The excessive levels of chloride are impairing the AGR and GWR designated beneficial uses of the Upper Santa Clara River Reaches 4A, 4B, 5 and 6. The trash in Lake Elizabeth is causing impairments to the WARM, WILD, RARE, REC-1 and REC-2 designated beneficial uses.

TMDLs have been adopted by the Regional Water Board to address the impairments due to nitrogen, bacteria and chloride in the Upper Santa Clara River Watershed and for trash in Lake Elizabeth. Each of these TMDLs identifies MS4 discharges as a source of pollutants and assigns allocations to MS4 discharges. In the nitrogen compounds TMDL, storm water discharges were identified as potentially contributing nitrogen loads. Data from land use monitoring conducting under the LA County MS4 Permit from 1994-1999 indicate some concentrations of ammonia from commercial land uses in excess of the 30-day average concentration based WLA of 1.75 mg/l, and potential concentrations of nitrate-N and nitrite-N from residential land uses in excess of the WLA of 6.8 mg/l. Recent data from the 2010-11 annual monitoring report indicate low levels of ammonia and nitrite at the mass emissions station (S29) in the Santa Clara River, and concentrations of nitrate-N ranging from 1.38-1.66 mg/l in dry weather and 0.015-1.86 mg/l in wet weather. In the chloride TMDL, major point sources are assigned a WLA of 100 mg/l. Data from land use monitoring conducted under the LA County MS4 Permit from 1994-99 indicate chloride concentrations ranging from 3.2-48 mg/l, while more recent data from the mass emissions station (S29) indicate concentrations ranging from 116-126 mg/l in dry weather, and 25.1-96.3 mg/l in wet weather. For the bacteria TMDL, the Regional Water Board found that the significant contributors of bacteria loading to the Santa Clara River are discharges of storm water and non-storm water from the MS4. For the trash TMDL, discharges from the MS4 are sources of trash discharged to Lake Elizabeth.

Santa Monica Bay Watershed Management Area. The Santa Monica Bay Watershed Management Area (WMA) encompasses an area of 414 sq. miles (Figure B-2). Its

borders reach from the crest of the Santa Monica Mountains on the north and from the Ventura-Los Angeles County line to downtown Los Angeles. From there it extends south and west across the Los Angeles plain to include the area east of Ballona Creek and north of the Baldwin Hills. A narrow strip of land between Playa del Rey and Palos Verdes drains to the Bay south of Ballona Creek. The WMA includes several subwatersheds, the two largest being Malibu Creek to the north (west) and Ballona Creek to the south. SCAG land use data from 2005 shows 62% of the area is open space, high density residential is 17% of the area, and low density residential is 2.3% of the area. Commercial and industrial land uses total 6% of the area and are found in all but a handful of the subwatersheds.

Many of the Santa Monica Bay beaches were identified on the 1998 CWA Section 303(d) List of impaired water bodies for high coliform counts and beach closures. Santa Monica Bay offshore and nearshore is on the 2010 CWA Section 303(d) List of impaired water bodies for debris, DDTs, PCBs and sediment toxicity. The elevated bacterial indicator densities during both dry and wet weather are causing impairments of the REC-1 and REC-2 designated beneficial uses of the Santa Monica Bay beaches. The debris and elevated concentrations of DDT and PCBs are causing impairments to the IND, NAV, REC-1, REC-2, COMM, EST, MAR, BIOL, MIGR, WILD, RARE, SPWN, SHELL, and WET designated beneficial uses of the Santa Monica Bay.

TMDLs have been adopted by the Regional Water Board and USEPA for bacteria at Santa Monica Bay Beaches, and for debris, DDTs, PCBs and sediment toxicity in Santa Monica Bay. In the bacteria TMDL, the Regional Water Board determined that discharges of storm water and non-storm water from the MS4 are the primary source of elevated bacterial indicator densities to Santa Monica Bay beaches during dry and wet weather. In the debris TMDL, the Regional Water Board determined that most of the land-based debris is discharged to the marine environment through the MS4. In the DDT and PCBs TMDL, USEPA determined that although DDT is no longer used, it persists in the environment, adhering strongly to soil particles. The manufacture of PCBs is no longer legal, but PCBs also persist in the environment and are inadvertently produced as a result of some manufacturing processes. Both DDT and PCBs are transported in contaminated sediments via urban runoff through the MS4 to Santa Monica Bay.

The Malibu Creek subwatershed drains an area of about 109 square miles (Figure B-2a). Approximately two-thirds of this subwatershed lies in Los Angeles County and the remaining third in Ventura County. Much of the land is part of the Santa Monica Mountains National Recreation Area and is under the purview of the National Parks Service. The watershed borders the eastern portion of Ventura County to the west and north and Los Angeles River watershed to the east. Major tributaries include Cold Creek, Lindero Creek, Las Virgenes Creek, Medea Creek, and Triunfo Creek. Located at the end of and receiving flows from Malibu Creek is the 40-acre Malibu Lagoon. The Malibu Creek subwatershed land uses are 88% open space, 3% commercial/light industry, 9% residential and less than 1% public.

The Malibu Creek Watershed is on the 2010 CWA Section 303(d) List of impaired water bodies for bacteria, nutrients, and trash. Elevated bacterial indicator densities are

causing impairment of the REC-1 and REC-2 designated beneficial uses of Malibu Creek, Malibu Lagoon, and the adjacent beaches. Excess nutrients are causing impairments to the REC-1, REC-2, WARM, COLD, EST, MAR, WILD, RARE, MIGR, and SPWN designated beneficial uses of waterbodies in the Malibu Creek Watershed. Trash is causing impairments to the MUN, GWR, REC-1, REC-2, WARM, COLD, MIGR, WILD, RARE, SPWN, and WET designated beneficial uses of the waterbodies in the Malibu Creek Watershed.

TMDLs have been adopted by the Regional Water Board for bacteria and trash in Malibu Creek. USEPA established a TMDL for nutrients in Malibu Creek. Fecal coliform bacteria may be introduced from a variety of sources including storm water and non-storm water discharges from the MS4. USEPA determined that high nitrogen and phosphorus loadings are associated with storm water discharges from commercial and residential land uses and also from undeveloped areas. During the summer non-storm water discharges add a significant portion of the load. The Regional Water Board determined in the trash TMDL that discharges from the MS4 are a source of trash to waterbodies in the Malibu Creek Watershed.

Ballona Creek and its tributaries drain a subwatershed of about 127 square miles (Figure B-2b). The watershed boundary extends in the east from the crest of the Santa Monica Mountains southward and westward to the vicinity of central Los Angeles and thence to Baldwin Hills. Tributaries of Ballona Creek include Centinela Creek, Sepulveda Canyon Channel, Benedict Canyon Channel, and numerous other storm drains. Ballona Creek is concrete lined upstream of Centinela Boulevard. All of its tributaries are either concrete channels or covered culverts. The channel downstream of Centinela Boulevard is trapezoidal composed of grouted rip-rap side slopes and an earth bottom. The urbanized areas of Ballona Creek, which consists of residential and commercial properties, accounts for 80% of the watershed; the partially developed foothill and mountains make up the other 20%.

Ballona Creek and Ballona Creek Estuary is on the 2010 CWA Section 303(d) List for trash, toxicity, bacteria, and metals. The Ballona Creek Wetlands is on the 2010 CWA Section 303(d) List for trash, exotic vegetation, habitat alterations and hydromodification. Trash is causing impairments to the REC-1, REC-2, WARM, WILD, EST, MAR, RARE, MIGR, SPWN, COMM, WET, and COLD designated beneficial uses of Ballona Creek. A suite of toxic pollutants, including cadmium, copper, lead, silver, zinc, chlordane, DDT, PCBs, and PAHs in sediments and dissolved copper, dissolved lead, total selenium, and dissolved zinc, are causing impairments to the REC-1, REC-2, EST, MAR, WILD, RARE, MIGR, SPWN, COMM, and SHELL designated beneficial uses of Ballona Creek Estuary and Ballona Creek and Sepulveda Channel, respectively. The elevated bacterial indicator densities are causing impairment of the REC-1, LREC-1, and REC-2 designated beneficial uses of Ballona Creek and Ballona Estuary. The excess sediment and invasive exotic vegetation is causing impairments to the EST, MIGR, RARE, REC-1, REC-2, SPWN, WET, and WILD designated beneficial uses of the Ballona Creek Wetlands.

TMDLs have been adopted by the Regional Water Board for trash, metals and toxic pollutants in Ballona Creek and Estuary, and bacteria. USEPA established a TMDL for

Sediment and Invasive Exotic Vegetation in the Ballona Creek Wetlands. Stormwater discharge is the major source of trash in Ballona Creek. Urban storm water has been recognized as a substantial source of metals. Storm drains convey a large percentage of the metals loadings during dry weather because although their flows are typically low, concentrations of metals in urban runoff may be quite high. Because metals are typically associated with fine particles in storm water runoff, they have the potential to accumulate in estuarine sediments where they may pose a risk of toxicity. Similar to metals, the majority of organic constituents in storm water are associated with particulates. There is toxicity associated with suspended solids in urban runoff discharged from Ballona Creek, as well as with the receiving water sediments. This toxicity is likely attributed to metals and organics associated with the suspended sediments. The major contributors of flows and associated bacteria loading to Ballona Creek and Ballona Estuary are storm water and non-storm water discharges from the MS4. The potential for sediment loading into the Ballona Creek Wetlands is associated with the flow coming down the watershed. Sediment moves from the watershed through the MS4 as a result of storms, wind and land based runoff. Major storms usually take place in winter and are responsible for major movements of sediment down the watershed into Ballona Creek and Ballona Wetland towards the coastal waterbodies. These activities can lead to discharge of large quantities of sediments in runoff.

The Marina del Rey subwatershed is approximately 2.9 square miles located adjacent to the mouth of Ballona Creek. The Marina del Rey subwatershed is highly developed at 80%, the remaining 20% is split between water and open/recreation land uses.

Marina del Rey is on the 2010 CWA Section 303(d) List for bacteria and sediment concentrations of copper, lead, zinc, DDT, PCBs, chlordane, and sediment toxicity. The elevated bacterial indicator densities are causing impairment of the REC-1 and REC-2 designated beneficial uses at Marina del Rey Harbor Mothers' Beach and back basins. The toxic pollutants are causing impairments to the REC-1, MAR, WILD, COMM, and SHELL designated beneficial uses of the Marina del Rey Harbor.

TMDLs have been adopted by the Regional Water Board for bacteria and toxic pollutants. Non-storm water and storm water discharges from the MS4 are the primary sources of elevated bacterial indicator densities to Marina del Rey Harbor Mothers' Beach and back basins during dry and wet weather. Urban storm water has been recognized as a substantial source of metals. Numerous researchers have documented that the most prevalent metals in urban storm water (i.e., copper, lead, and zinc) are consistently associated with suspended solids. Because metals are typically associated with fine particles in storm water runoff, they have the potential to accumulate in marine sediments where they may pose a risk of toxicity. Similar to metals, the majority of organic constituents in storm water are associated with particulates.

On June 7, 2012, the Regional Water Board adopted revised Basin Plan Amendments (BPAs) for the Santa Monica Bay Beaches Bacteria TMDL; the Malibu Creek and Lagoon Bacteria TMDL; the Ballona Creek, Ballona Estuary, and Sepulveda Channel Bacteria TMDL; and the Marina del Rey Harbor Mothers' Beach and Back Basins Bacteria TMDL. In the revised TMDLs the method of calculating the geometric mean was changed from the existing methods in the current Bacteria TMDLs and the

allowable winter dry weather exceedance days was redefined. Although, the revised BPAs are not in effect until approved by the State Board, OAL and USEPA these changes have been included in the Permit and will become effective upon the effective dates of the revised Bacteria TMDLs.

Dominguez Channel and Greater Harbor Waters Watershed Management Area. The Dominguez Channel and Los Angeles/Long Beach Harbors Watershed Management Area (Dominguez WMA) is located in the southern portion of the Los Angeles Basin (Figure B-3). Los Angeles Harbor is 7,500 acres and the Long Beach Harbor is 7,600 acres; together they have an open water area of approximately 8,128 acres. The 15 mile-long Dominguez Channel drains a densely urbanized area to Inner Los Angeles Harbor. Near the end of the 19th century and during the beginning of the next century, channels were dredged, marshes were filled, wharves were constructed, the Los Angeles River was diverted, and breakwaters were constructed in order to allow deep draft ships to be directly offloaded at the docks. The Dominguez Slough was completely channelized and became the drainage endpoint for runoff from a highly industrialized area. Eventually, the greater San Pedro Bay was enclosed by two more breakwaters and deep entrance channels were dredged to allow for entry of ships.

Various reaches of the Dominguez WMA are on the 2010 CWA Section 303(d) List of impaired water bodies for metals, DDT, PCBs, PAHs, historic pesticides, coliform, and sediment toxicity. The elevated bacteria indicator densities is causing impairments to the SHELL, REC-1, and REC-2 designated beneficial uses of Los Angeles Harbor. The elevated levels of metals and organics are causing impairments to beneficial uses designated in these waters to protect aquatic life, including MAR and RARE. In addition, the elevated levels are causing impairments in the estuaries, which are designated with SPWN, MIGR, and WILD beneficial uses. Dominguez Channel also has an existing designated use of WARM and the Los Angeles River Estuary has the designated use of WET. Beneficial uses associated with human use of these waters that are impaired due to the elevated concentrations of metals and organics include REC-1, REC-2, IND, NAV, COMM, and SHELL.

TMDLs have been adopted by the Regional Water Board for toxic pollutants in the Dominguez WMA and for bacteria at Inner Cabrillo Beach and the Main Ship Channel. Discharges from the MS4 are a source of elevated bacterial indicator densities to Inner Cabrillo Beach and the Main Ship Channel during dry and wet weather. The major point sources of organochlorine pesticides, PCBs, and metals into Dominguez Channel are storm water and non-storm water discharges. The contaminated sediments are a reservoir of historically deposited pollutants. Storm water runoff from manufacturing, military facilities, fish processing plants, wastewater treatment plants, oil production facilities, and shipbuilding or repair yards in both Ports have discharged untreated or partially treated wastes into Harbor waters. Current activities also contribute pollutants to Harbor sediments, in particular, storm water runoff.

On June 7, 2012, the Regional Water Board adopted a revised Basin Plan Amendment (BPA) for the Los Angeles Harbor Inner Cabrillo Beach and Main Ship Channel Bacteria TMDL. In the revised TMDL the method of calculating the geometric mean was changed from the existing methods in the current Bacteria TMDL and the allowable

winter dry weather exceedance days was redefined. Although, the revised BPA is not in effect until approved by the State Board, OAL and USEPA these changes have been included in the Permit and will become effective upon the effective date of the revised Bacteria TMDL.

Machado Lake is listed for trash, nutrients, PCBs and historic pesticides. Trash, nutrients and toxic pollutants are causing impairments to the WARM, WET, RARE, WILD, REC-1 and REC-2 designated beneficial uses of Machado Lake. TMDLs have been adopted by the Regional Water Board for trash, nutrients, PCBs and pesticides for Machado Lake. The point sources of trash and nutrients into Machado Lake are storm water and non-storm water discharges from the MS4. Storm water discharges occur through the following sub-drainage systems: Drain 553, Wilmington Drain, Project 77/510, and Walteria Lake.

Los Angeles River Watershed Management Area. The Los Angeles River Watershed Management Area (LAR WMA) drains a watershed of 824 square miles (Figure B-4). The LAR WMA is one of the largest in the Region and is also one of the most diverse in terms of land use patterns. Approximately 324 square miles of the watershed are covered by forest or open space land including the area near the headwaters, which originate in the Santa Monica, Santa Susana, and San Gabriel Mountains. The remainder of the watershed is highly developed. The river flows through the San Fernando Valley past heavily developed residential and commercial areas. From the Arroyo Seco, north of downtown Los Angeles, to the confluence with the Rio Hondo, the river flows through industrial and commercial areas and is bordered by rail yards, freeways, and major commercial and government buildings. From the Rio Hondo to the Pacific Ocean, the river flows through industrial, residential, and commercial areas, including major refineries and petroleum products storage facilities, major freeways, rail lines, and rail yards serving the Ports of Los Angeles and Long Beach. Due to major flood events at the beginning of the century, by the 1950s most of the LA River was lined with concrete. In the San Fernando Valley, there is a section of the river with a soft bottom at the Sepulveda Flood Control Basin. At the eastern end of the San Fernando Valley, the river bends around the Hollywood Hills and flows through Griffith and Elysian Parks, in an area known as the Glendale Narrows. Since the water table was too high to allow laying of concrete, the river in this area has a rocky, unlined bottom with concrete-lined or rip-rap sides. South of the Glendale Narrows, the river is contained in a concrete-lined channel down to Willow Street in Long Beach. The LA River tidal prism/estuary begins in Long Beach at Willow Street and runs approximately three miles before joining with Queensway Bay. The channel has a soft bottom in this reach with concrete-lined sides. A number of lakes are also part of the LAR WMA, including Legg Lake, Peck Road Park, Belvedere Park, Hollenbeck Park, Lincoln Park, and Echo Park Lakes as well as Lake Calabasas.

Various reaches and lakes within the LAR WMA are on the 2010 CWA Section 303(d) List of impaired water bodies for trash, nitrogen compounds and related effects (ammonia, nitrate, nitrite, algae, pH, odor, and scum), metals (copper, cadmium, lead, zinc, aluminum and selenium), bacteria, and historic pesticides. Beneficial uses impaired by trash in the Los Angeles River are REC-1, REC-2, WARM, WILD, EST, MAR, RARE, MIGR, SPWN, COMM, WET and COLD. The excess nitrogen compounds

are causing impairments to the WARM and WILD designated beneficial uses of Los Angeles River. Excess metals are causing impairments to the WILD, RARE, WARM, WET, and GWR designated beneficial uses of the Los Angeles River and its tributaries. Elevated indicator bacteria densities are causing impairments to the REC-1 and REC-2 designated beneficial uses of Los Angeles River and the Los Angeles River Estuary. Beneficial uses impaired by trash in Legg Lake include REC1, REC2, and WILD.

TMDLs have been adopted by the Regional Water Board for trash, nitrogen, metals, and bacteria in the Los Angeles River. USEPA established TMDLs for bacteria in the Los Angeles River Estuary and for various pollutants in Los Angeles Area Lakes. The Los Angeles River Watershed Trash TMDL identifies discharges from the municipal separate storm sewer system as the principal source of trash to the Los Angeles River and its tributaries. The Regional Water Board determined that urban runoff and storm water may contribute to nitrate loads. Discharges from the MS4 contribute a large percentage of the metals loadings during dry weather because although non-storm water flows from the MS4 are typically low relative to other discharges during dry weather, concentrations of metals in urban runoff may be quite high. During wet weather, most of the metals loadings are in the particulate form and are associated with wet-weather storm water flow. On an annual basis, storm water discharges from the MS4 contribute about 40% of the cadmium loading, 80% of the copper loading, 95% of the lead loading, and 90% of the zinc loading. Discharges from the MS4 are the principal source of bacteria to the Los Angeles River, its tributaries and the Los Angeles River Estuary in both dry weather and wet weather.

A TMDL has been adopted by the Regional Water Board for trash in Legg Lake. The Legg Lake Trash TMDL identifies MS4 storm drains as the principal point source for trash discharged to Legg Lake.

The Los Angeles Water Board identified 10 lakes in the Los Angeles region as impaired by algae, ammonia, chlordane, copper, DDT, eutrophication, lead, organic enrichment/low dissolved oxygen, mercury, odor, PCBs, pH and/or trash and placed them on California's 303(d) list of impaired waters. For several lakes, USEPA concluded that ammonia, pH, copper and/or lead are currently meeting water quality standards and TMDLs are not required at this time. In other lakes, recent chlordane and dieldrin data indicate additional impairment. Associated with this WMA are: Lake Calabasas TMDLs for total nitrogen and total phosphorus; Echo Park Lake TMDLs for nutrients (total nitrogen and total phosphorus), total chlordane, dieldrin, total PCBs, and trash; Legg Lake TMDLs for total nitrogen and total phosphorus; and Peck Road Park Lake TMDLs for nutrients (total nitrogen and total phosphorus), total chlordane, total DDT, dieldrin, total PCBs, and trash.

In Lake Calabasas beneficial uses impaired by elevated levels of nutrients include REC1, REC2, and WARM. At high enough concentrations, WILD and MUN uses could also become impaired. MS4 discharges from the surrounding watershed to Lake Calabasas during dry and wet weather contributes 97.7 percent of the total phosphorus load and 74.4 percent of the total nitrogen load.

In Echo Park Lake beneficial uses impaired by elevated levels of nutrients, PCBs, chlordane, and dieldrin are currently impairing the REC1, REC2, and WARM uses. At high enough concentrations WILD and MUN uses could also become impaired. Beneficial uses impaired by trash in Echo Park Lake include REC1, REC2, WARM and WILD. The Echo Park Lake nutrient TMDL found that MS4 discharges from the northern and southern watershed to Echo Lake contribute 29 percent of the total phosphorus load and 28 percent of the total nitrogen load during wet weather with dry weather loading data unavailable due to the majority of runoff being diverted downstream of the lake. PCBs, chlordane, and dieldrin in Echo Park Lake are primarily due to historical loading and storage within the lake sediments, with some ongoing contribution by watershed wet weather loads. Dry weather loading is assumed to be negligible because hydrophobic contaminants primarily move with particulate matter that is mobilized by higher flows. Storm water loads from the watershed were estimated based on simulated sediment load and observed pollutant concentrations on sediment near inflows to the lake. MS4 discharges via storm drains are the principal point source for trash in Echo Park Lake.

In Legg Lake beneficial uses impaired due to elevated nutrient levels include REC1, REC2, WARM and COLD. At high enough concentrations the WILD, MUN, and GWR uses could also become impaired. The Legg Lake nutrient TMDL found that MS4 discharges from the surrounding watershed to Legg Lake during dry and wet weather contributes 69.1 percent of the total phosphorus load and 36 percent of the total nitrogen load.

In Peck Road Park Lake beneficial uses impaired by elevated levels of nutrients, PCBs, chlordane, DDT, dieldrin, and trash are currently impairing the REC1, REC2, and WARM uses. At high enough concentrations WILD and MUN uses could also become impaired. The Peck Road Park Lake nutrient TMDL found that MS4 discharges from the surrounding watershed including both wet and dry weather contribute 80.2 percent of the total phosphorus load and 55.5 percent of the total nitrogen load. PCBs, chlordane, DDT, and dieldrin in Peck Road Park Lake loads are primarily due to historical loading and storage within the lake sediments, with some ongoing contribution by watershed wet weather loads. Dry weather loading is assumed to be negligible because hydrophobic contaminants primarily move with particulate matter that is mobilized by higher flows. Stormwater loads from the watershed were estimated based on simulated sediment load and observed pollutant concentrations on sediment near inflows to the lake. MS4 discharges via storm drains are the principal point source for trash in Peck Road Park Lake.

San Gabriel River Watershed Management Area. The San Gabriel River Watershed (SGR WMA) receives drainage from a 689-square mile area of eastern Los Angeles County (Figure B-5). The main channel of the San Gabriel River is approximately 58 miles long. Its headwaters originate in the San Gabriel Mountains with the East, West, and North Forks. The river empties to the Pacific Ocean at the Los Angeles and Orange Counties boundary in Long Beach. The main tributaries of the river are Big and Little Dalton Wash, San Dimas Wash, Walnut Creek, San Jose Creek, Fullerton Creek, and Coyote Creek. Part of the Coyote Creek subwatershed is in Orange County and is under the authority of the Santa Ana Water Board. A number of lakes and reservoirs

are also part of the SGR WMA, including Puddingstone Reservoir. Land use in the watershed is diverse and ranges from predominantly open space in the upper watershed to urban land uses in the middle and lower parts of the watershed.

Various reaches of the SGR WMA are on the 2010 CWA Section 303(d) List of impaired water bodies due to trash, nitrogen, phosphorus, and metals (copper, lead, selenium, and zinc). USEPA established TMDLs for metals and selenium in the San Gabriel River and various pollutants in Los Angeles Area Lakes. Segments of the San Gabriel River and its tributaries exceed water quality objectives for copper, lead, selenium, and zinc. Metals loadings to San Gabriel River are causing impairments of the WILD, WARM, COLD, RARE, EST, MAR, MIGR, SPWN, WET, MUN, IND, AGR, GWR, and PROC beneficial uses. The San Gabriel River metals and selenium TMDL found that the MS4 contributes a large percentage of the metals loadings during dry weather because although their flows are typically low, concentrations of metals in urban runoff may be quite high. During wet weather, most of the metals loadings are in the particulate form and are associated with wet-weather storm water flow.

The Regional Water Board identified 10 lakes in the Los Angeles Region as impaired by algae, ammonia, chlordane, copper, DDT, eutrophication, lead, organic enrichment/low dissolved oxygen, mercury, odor, PCBs, pH and/or trash and placed them on California's 303(d) list of impaired waters. For several lakes, USEPA concluded that ammonia, pH, copper and/or lead are currently meeting water quality standards and TMDLs are not required at this time. In other lakes, recent chlordane and dieldrin data indicate additional impairment. Associated with this WMA is: Puddingstone Reservoir TMDLs for total nitrogen, total phosphorus, total chlordane, total DDT, total PCBs, total mercury, and dieldrin.

In Puddingstone Reservoir beneficial uses impaired due to elevated nutrient, mercury, PCBs, chlordane, dieldrin, and DDT levels include REC1, REC2, WARM, and COLD. At high enough concentrations the WILD, MUN, GWR, and RARE uses could also become impaired. The Puddingstone Reservoir nutrients TMDL found that MS4 discharges from the surrounding watershed to Puddingstone Reservoir during dry and wet weather contributes 79.8 percent of the total phosphorus and 74.1 percent of the total nitrogen load. Mercury, PCBs, chlordane, dieldrin, and DDT in Puddingstone Reservoir loads are primarily due to historical loading and storage within the lake sediments, with some ongoing contribution by watershed wet weather loads. Dry weather loading is assumed to be negligible because hydrophobic contaminants primarily move with particulate matter that is mobilized by higher flows. Stormwater loads from the watershed were estimated based on simulated sediment load and observed pollutant concentrations on sediment near inflows to the lake.

Los Cerritos Channel and Alamitos Bay Watershed Management Area. The Los Cerritos Channel is concrete-lined above the tidal prism and drains a small but densely urbanized area of east Long Beach (Figure B-6). The channel's tidal prism starts at Anaheim Road and connects with Alamitos Bay through the Marine Stadium; the wetlands connect to the Channel a short distance from the lower end of the Channel. Alamitos Bay is composed of the Marine Stadium, a recreation facility built in 1932; Long Beach Marina; a variety of public and private berths; and the Bay proper. A small

bathing lagoon, Colorado Lagoon located entirely in Long Beach, has a tidal connection with the Bay. The majority of land use in this WMA is high density residential.

Los Cerritos Channel is on the 2010 CWA Section 303(d) List of impaired water bodies for metals (copper, zinc, and lead). Beneficial uses impaired by metals in the Los Cerritos Channel include WILD, REC2 and WARM. USEPA established a TMDL for various metals in Los Cerritos Channel. The TMDL for metals in Los Cerritos Channel found that the MS4 contributes a large percentage of the metals loadings during dry weather because although their flows are typically low, concentrations of metals in urban runoff may be quite high. During wet weather, most of the metals loadings are in the particulate form and are associated with wet-weather storm water flow.

Middle Santa Ana River Watershed Management Area. The Middle Santa Ana River Watershed Management Area (MSAR WMA) covers approximately 488 square miles (mi^2) and lies mostly in San Bernardino and Riverside Counties; however, a small part of Los Angeles County is also included. The area of Los Angeles County, which lays in the MSAR WMA, includes portions of the Cities of Pomona (12.3 mi^2), Claremont (8.4 mi^2), and Diamond Bar (0.7 mi^2) and unincorporated Los Angeles County (12.3 mi^2) (Figure B-7). The MSAR WMA is comprised of three subwatersheds. The subwatershed that includes portions of Pomona and Claremont is the Chino Basin Subwatershed. Surface drainage from Pomona and Claremont is generally southward toward San Antonio Creek, which is tributary to Chino Creek, which feeds into the Prado Flood Control Basin.

Various reaches of the MSAR WMA, including Chino Creek, are listed on 2010 CWA Section 303(d) List for bacteria. Elevated bacterial indicator densities are causing impairments of the REC-1 and REC-2 designated beneficial for the Santa Ana River Reach 3; Chino Creek Reaches 1 and 2; Mill Creek (Prado Area); Cucamonga Creek Reach 1; and Prado Park Lake.

The Santa Ana Water Board adopted TMDLs for bacteria for the Middle Santa Ana River Watershed. The Basin Plan amendment incorporating the Middle Santa Ana River Watershed Bacterial Indicator TMDLs was approved by the Santa Ana Water Board on August 26, 2005 (Resolution No. R8-2005-0001), by the State Water Board on May 15, 2006, by the Office of Administrative Law on September 1, 2006, and by the USEPA on May 16, 2007. The TMDL was effective on May 16, 2007. The Santa Ana Water Board concluded based upon data and information collected in 1993, 1996-1998 and in 2002-2004, that urban runoff from the MS4 is a significant source of bacterial indicators year round to the Middle Santa Ana River and its tributaries (Rice, 2005). The TMDL specifies both dry weather and wet weather WLAs, with distinct implementation schedules. Compliance with the summer dry (April 1st through October 31st) WLAs is to be achieved as soon as possible, but no later than December 31, 2015. In recognition of the difficulties associated with the control of storm water discharges, compliance with the winter wet (November 1st through March 31st) WLAs is to be achieved as soon as possible, but no later than December 31, 2025. The MS4 permit allows for discharges of bacteria from the MS4s of the Cities of Claremont and Pomona to be regulated to ensure compliance with the wasteload allocations set forth in the Middle Santa Ana Bacterial Indicator TMDL and with the corresponding receiving water limitations by the

terms of an NPDES permit issued by the Santa Ana Regional Water Quality Control Board that is applicable to such MS4 discharges. The NPDES permit must be issued pursuant to a designation agreement between the Los Angeles and Santa Ana Regional Boards under Water Code § 13228. In the absence of such an NPDES permit, the MS4 permit includes specific provisions in Attachment R that are consistent with the assumptions and requirements of the wasteload allocations applicable to MS4 discharges as set forth in the Middle Santa Ana Bacterial Indicator TMDL.

Calleguas Creek Watershed Management Area. Calleguas Creek and its tributaries drain a watershed area of 343 square miles (sq. miles) in southern Ventura County and a small portion of western Los Angeles County. Approximately, 4.16 sq. miles of Los Angeles County is part of the Calleguas Creek Watershed. The land use of the 4.15 sq. miles is open space and recreation. The land use of the remaining 0.01 sq. miles is divided between low density residential, industrial, and agriculture (Southern California Association of Governments, 2008). Six TMDLs have been adopted and are in effect for the Calleguas Creek Watershed. None of the TMDLs assign waste load allocations to the Los Angeles County Flood Control District, County of Los Angeles or any incorporated city within Los Angeles County. Therefore, no water quality based effluent limitations were incorporated in this Order for TMDLs in the Calleguas Creek Watershed.

Manner of Incorporation of TMDL WLAs. The description of the permit conditions and the basis for the manner for incorporating requirements to implement the TMDLs' WLAs is discussed below.

WLAs may be expressed in different ways in a TMDL. In general, a WLA is expressed as a discharge condition that must be achieved in order to ensure that water quality standards are attained in the receiving water. The discharge condition may be expressed in terms of mass or concentration of a pollutant. However, in some cases, a WLA may be expressed as a receiving water condition such as an allowable number of exceedance days of the bacteria objectives.

In this Order, in most cases, TMDL WLAs have been translated into numeric WQBELs and, where consistent with the expression of the WLA in the TMDL, also as receiving water limitations. For each TMDL included in this Order, the WLA were translated into numeric WQBELs, which were based on the WLAs in terms of the numeric value and averaging period. For those TMDLs where the averaging period was not specific for the WLA, the averaging period was based on the averaging period for the numeric target.

For the bacteria TMDLs, where the WLA are expressed as an allowable number of exceedance days in the water body, the WLAs were translated into receiving water limitations. In addition to the receiving water limitations, WQBELs were established based on the bacteria water quality objectives. In the bacteria TMDLs, the numeric targets are based on the multi-part bacteriological water quality objectives; therefore, this approach is consistent with the assumptions of the bacteria TMDLs.

In the Ballona Creek Trash TMDL, the default baseline WLA for the MS4 Permittees is equal to 640 gallons (86 cubic feet) of uncompressed trash per square mile per year.

No differentiation is applied for different land uses in the default baseline WLA. The default baseline WLAs for the Permittees has been refined based on results from the baseline monitoring conducted by the City of Los Angeles. The City of Los Angeles provided trash generation flux data for five land uses: commercial, industrial, high density residential, low density residential and open space and recreation. The Baseline WLA for any single city is the sum of the products of each land use area multiplied by the WLA for the land use area, as shown below:

WLA = ∑ for each city (area by land uses x allocations for this land use)

The baseline was calculated using the City of Los Angeles trash generation flux data provided for the 2003-04 and 2004-05 storm years averaged for pounds of trash per acre and the 2003-04 storm year for gallons of trash per acre. The urban portion of the Ballona Creek watershed was divided into twelve types of land uses for every city and unincorporated area in the watershed. The land use categories are: (1) high density residential, (2) low density residential, (3) commercial and services, (4) industrial, (5) public facilities, (6) educational institutions, (7) military installations, (8) transportation, (9) mixed urban, (10) open space and recreation, (11) agriculture, and (12) water. The land use data used in the calculation is based on the Southern California Association of Governments 2005 data.

1. Compliance Determination

For TMDLs that establish individual mass-based WLAs or a concentration-based WLA such as the Trash TMDLs, Nitrogen TMDLs, and Chloride TMDL, this Order requires Permittees to demonstrate compliance with their assigned WQBELs individually.

A number of the TMDLs for Bacteria, Metals and Toxics establish WLAs that are assigned jointly to a group of Permittees whose storm water and/or non-storm water discharges are or may be commingled in the MS4 prior to discharge to the receiving water subject to the TMDL. TMDLs address commingled MS4 discharges by assigning a WLA to a group of MS4 Permittees based on co-location within the same subwatershed. Permittees with co-mingled storm water are jointly responsible for meeting the WQBELs and receiving water limitations assigned to MS4 discharges in this Order. "Joint responsibility" means that the Permittees that have commingled MS4 discharges are responsible for implementing programs in their respective jurisdictions, or within the MS4 for which they are an owner or operator, to meet the WQBELs and/or receiving water limitations assigned to such commingled MS4 discharges.

In these cases, federal regulations state that co-permittees need only comply with permit conditions relating to discharges from the MS4 for which they are owners or operators. (40 CFR § 122.26(a)(3)(vi).) Individual co-permittees are only responsible for their contributions to the commingled discharge. This Order does not require a Permittee to individually ensure that a commingled MS4 discharge meets the applicable WQBELs included in this Order, unless such Permittee is shown to be solely responsible for the exceedances.

Additionally, this Order allows a Permittee to clarify and distinguish their individual contributions and demonstrate that its MS4 discharge did not cause or contribute to exceedances of applicable WQBELs and/or receiving water limitations. In this case, though the Permittee's discharge may commingle with that of other Permittees, the Permittee would not be held jointly responsible for the exceedance of the WQBELs or receiving water limitation.

Individual co-permittees who demonstrate compliance with the WQBELs will not be held responsible for violations by non-compliant co-permittees.

Demonstrating Compliance with Interim Limitations. This Order provides Permittees with several means of demonstrating compliance with applicable interim WQBELs and interim receiving water limitations for the pollutant(s) associated with a specific TMDL. These include any of the following:

a. There are no violations of the interim WQBELs for the pollutant(s) associated with a specific TMDL at the Permittee's applicable MS4 outfall(s) or access points,[42] including an outfall to the receiving water that collects discharges from multiple Permittees' jurisdictions;

b. There are no exceedances of the applicable receiving water limitation for the pollutant(s) associated with a specific TMDL in the receiving water(s) at, or downstream of, the Permittee's outfall(s);

c. There is no direct or indirect discharge from the Permittee's MS4 to the receiving water during the time period subject to the WQBEL and/or receiving water limitation for the pollutant(s) associated with a specific TMDL; or

d. The Permittee has submitted and is fully implementing an approved Watershed Management Program or Enhanced Watershed Management Program (EWMP), which includes analyses that provide the Regional Water Board with reasonable assurance that the watershed control measures proposed will achieve the applicable WQBELs and receiving water limitations consistent with relevant compliance schedules.

Demonstrating Compliance with Final Limitations. This Order provides Permittees with three general means of demonstrating compliance with an applicable *final* WQBEL and *final* receiving water limitation for the pollutant(s) associated with a specific TMDL.

These include any of the following:

a. There are no violations of the final WQBEL for the specific pollutant at the Permittee's applicable MS4 outfall(s)[43];

[42] An access point may include a manhole or other point of access to the MS4 at the Permittee's jurisdictional boundary.
[43] Ibid.

b. There are no exceedances of applicable receiving water limitation for the specific pollutant in the receiving water(s) at, or downstream of, the Permittee's outfall(s);

c. There is no direct or indirect discharge from the Permittee's MS4 to the receiving water during the time period subject to the WQBEL and/or receiving water limitation for the pollutant(s) associated with a specific TMDL; or

d. In drainage areas where Permittees are implementing an EWMP, (i) all non-storm water and (ii) all storm water runoff up to and including the volume equivalent to the 85th percentile, 24-hour event is retained for the drainage area tributary to the applicable receiving water, and the Permittee is implementing all requirements of the EWMP, including, but not limited to, Parts VI.C.7 and VI.C.8 of this Order. This compliance mechanism does not apply to final trash WQBELs.

This Order provides the opportunity for Permittees to demonstrate compliance with *interim* effluent limitations through development and implementation of a Watershed Management Program or EWMP, where Permittees have provided a reasonable demonstration through quantitative analysis (i.e., modeling or other approach) that the control measures/BMPs to be implemented will achieve the interim effluent limitations in accordance with the schedule provided in this Order. It is premature to consider application of this action based compliance demonstration option to the final effluent limitations and final receiving water limitations that have deadlines outside the term of this Order. More data is needed to validate assumptions and model results regarding the linkage among BMP implementation, the quality of MS4 discharges, and receiving water quality.

During the term of this Order, there are very few deadlines for compliance with final effluent limitations applicable to storm water, or final receiving water limitations applicable during wet weather conditions. Most deadlines during the term of this Order are for interim effluent limitations applicable to storm water, or for final effluent limitations applicable to non-storm water discharges and final dry weather receiving water limitations.

There are only five State-adopted TMDLs for which the compliance deadlines for final water quality-based effluent limitations applicable to storm water occur during the term of this Order. These include: Santa Clara River Chloride TMDL, Santa Clara River Nitrogen TMDL, Los Angeles River Nitrogen TMDL, Marina del Rey Harbor Toxics TMDL, and LA Harbor Bacteria TMDL. In most of these five TMDLs, compliance with the final water quality-based effluent limitations assigned to MS4 discharges is expected to be achieved (e.g., Santa Clara River Chloride TMDL[44]), or a mechanism is in place to potentially allow additional time to come into compliance (e.g. reconsideration of the Marina del Rey Harbor Toxics TMDL implementation schedule).

[44] Data from land use monitoring conducted under the LA County MS4 Permit from 1994-99 indicate chloride concentrations ranging from 3.2-48 mg/L, while more recent data from the mass emissions station in the Santa Clara River (S29) indicate concentrations ranging from 116-126 mg/l in dry weather, and 25.1-96.3 mg/l in wet weather, suggesting that storm water has a diluting effect on chloride concentrations in the receiving water.

The Regional Water Board will evaluate the effectiveness of this action-based compliance determination approach in ensuring that interim effluent limitations for storm water are achieved during this permit term. If this approach is effective in achieving compliance with interim effluent limitations for storm water during this permit term, the Regional Water Board will consider during the next permit cycle whether it would be appropriate to allow a similar approach for demonstrating compliance with final water quality-based effluent limitations applicable to storm water. The Order includes a specific provision to support reopening the permit to include provisions or modifications to WQBELs in Part VI.E and Attachments L-R in this Order prior to the final compliance deadlines, if practicable, that would allow an action-based, BMP compliance demonstration approach with regard to final WQBELs for storm water discharges based on the Regional Board's review of relevant research, including but not limited to data and information provided by Permittees, on storm water quality and control technologies

2. Compliance Schedules for Achieving TMDL Requirements

A Regional Water Board may include a compliance schedule in an NPDES permit when the state's water quality standards or regulations include a provision that authorizes such schedules in NPDES permits.[45] In California, TMDL implementation plans[46] are typically adopted through Basin Plan Amendments. The TMDL implementation plan, which is part of the Basin Plan Amendment, becomes a regulation upon approval by the State of California Office of Administrative Law (OAL).[47] Pursuant to California Water Code sections 13240 and 13242, TMDL implementation plans adopted by the Regional Water Board "shall include … a time schedule for the actions to be taken [for achieving water quality objectives]," which allows for compliance schedules in future permits. This Basin Plan Amendment becomes the applicable regulation that authorizes an MS4 permit to include a compliance schedule to achieve effluent limitations derived from wasteload allocations.

Where a TMDL implementation schedule has been established through a Basin Plan Amendment, it is incorporated into this Order as a compliance schedule to achieve interim and final WQBELs and corresponding receiving water limitations, in accordance with 40 CFR section 122.47. WQBELs must be consistent with the assumptions and requirements of any WLA, which includes applicable implementation schedules.[48] California Water Code sections 13263 and 13377 state that waste discharge requirements must implement the Basin Plan.[49] Therefore,

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[45] See *In re Star-Kist Caribe, Inc.*, (Apr. 16, 1990) 3 E.A.D. 172, 175, modification denied, 4 E.A.D. 33, 34 (EAB 1992).

[46] TMDL implementation plans consist of those measures, along with a schedule for their implementation, that the Water Boards determine are necessary to correct an impairment. The NPDES implementation measures are thus required by sections 303(d) and 402(p)(3)(B)(iii) of the CWA. State law also requires the Water Boards to implement basin plan requirements. (See Wat. Code §§ 13263, 13377; *State Water Resources Control Board Cases* (2006) 136 Cal.App.4th 189.)

[47] See Gov. Code, § 11353, subd. (b). Every amendment to a Basin Plan, such as a TMDL and its implementation plan, requires approval by the State Water Board and OAL. When the TMDL and implementation plan is approved by OAL, it becomes a state regulation.

[48] See 40 C.F.R. § 122.44(d)(1)(vii)(B).

[49] Cal. Wat. Code, § 13263, subd. (a) ("requirements shall implement any relevant water quality control plans that have been adopted"); Cal. Wat. Code, § 13377 ("the state board or the regional boards shall . . . issue waste discharge requirements and dredged or fill material permits which apply and ensure compliance with all applicable provisions of the [CWA], thereto,

compliance schedules for attaining WQBELs derived from WLAs must be based on a state-adopted TMDL implementation plan and cannot exceed the maximum time that the implementation plan allows.

In determining the compliance schedules, the Regional Water Board considered numerous factors to ensure that the schedules are as short as possible. Factors examined include, but are not limited to, the size and complexity of the watershed; the pollutants being addressed; the number of responsible agencies involved; time for Co-Permittees to negotiate memorandum of agreements; development of water quality management plans; identification of funding sources; determination of an implementation strategy based on the recommendations of water quality management plans and/or special studies; and time for the implementation strategies to yield measurable results. Compliance schedules may be altered based on the monitoring and reporting results as set forth in the individual TMDLs.

In many ways, the incorporation of interim and final WQBELs and associated compliance schedules is consistent with the iterative process of implementing BMPs that has been employed in the previous Los Angeles County MS4 Permits in that progress toward compliance with the final effluent limitations may occur over the course of many years. However, because the waterbodies in Los Angeles County are impaired due to MS4 discharges, it is necessary to establish more specific provisions in order to: (i) ensure measurable reductions in pollutant discharges from the MS4, resulting in progressive water quality improvements during the iterative process, and (ii) establish a final date for completing implementation of BMPs and, ultimately, achieving effluent limitations and water quality standards.

The compliance schedules established in this Order are consistent with the implementation plans established in the individual TMDLs. The compliance dates for meeting the final WQBELs and receiving water limitations for each TMDL are listed below in Table F-7.

together with any more stringent effluent standards or limitations necessary to implement waste quality control plans, or for the protection of beneficial uses, or to prevent nuisance"); *see also, State Water Resources Control Board Cases* (2006) 136 Cal.App.4th 189.

Table F-7. Compliance Schedule for final compliance dates.

TOTAL MAXIMUM DAILY LOADS (TMDL)	Final Compliance date has Passed	Final Compliance date within 5 years (2012-2017)	Final Compliance date between 5 and 10 years (2018-2022)	Final Compliance date after 10 years (2023)
Santa Clara River Nitrogen Compounds TMDL	March 23, 2004			
Upper Santa Clara River Chloride TMDL	April 6, 2010			
Lake Elizabeth, Munz Lake, and Lake Hughes Trash TMDL (Lake Elizabeth only)		March 6, 2016		
Santa Clara River Estuary and Reaches 3, 5, 6, and 7 Indicator Bacteria TMDL				
Dry Weather				March 21, 2023
Wet Weather				March 21, 2029
Santa Monica Bay Beaches Bacteria TMDL				
Summer Dry Weather	July 15, 2006			
Winter Dry Weather	July 15, 2009			
Wet Weather			July 15, 2021	
Santa Monica Bay Nearshore and Offshore Debris TMDL			March 20, 2020	
Santa Monica Bay TMDL for DDTs and PCBs (USEPA established)		March 26, 2012		
Malibu Creek and Lagoon Bacteria TMDL				
Summer Dry Weather	January 24, 2009			
Winter Dry Weather	January 24, 2012			
Wet Weather			July 15, 2021	
Malibu Creek Watershed Trash TMDL		July 7, 2017		
Malibu Creek Watershed Nutrients TMDL (USEPA established)	March 21, 2003			
Ballona Creek Trash TMDL		September 30, 2015		
Ballona Creek Estuary Toxic Pollutants TMDL			January 11, 2021	
Ballona Creek, Ballona Estuary and Sepulveda Channel Bacteria TMDL				
Dry Weather		April 27, 2013		
Wet Weather			July 15, 2021	
Ballona Creek Metals TMDL				

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TOTAL MAXIMUM DAILY LOADS (TMDL)	Final Compliance date has Passed	Final Compliance date within 5 years (2012-2017)	Final Compliance date between 5 and 10 years (2018-2022)	Final Compliance date after 10 years (2023)
Dry Weather		January 11, 2016		
Wet Weather			January 11, 2021	
Ballona Creek Wetlands TMDL for Sediment and Invasive Exotic Vegetation (USEPA established)		March 26, 2012		
Marina del Rey Harbor Mothers' Beach and Back Basins Bacteria TMDL				
Dry Weather	March 18, 2007			
Wet Weather			July 15, 2021	
Marina del Rey Harbor Toxic Pollutants TMDL		March 22, 2016	March 22, 2021*	
Los Angeles Harbor Bacteria TMDL	March 10, 2010			
Machado Lake Trash TMDL		March 6, 2016		
Machado Lake Nutrient TMDL			September 11, 2018	
Machado Lake Pesticides and PCBs TMDL			September 30, 2019	
Dominguez Channel and Greater LA and LB Harbor Waters Toxic Pollutants TMDL				March 23, 2032
Los Angeles River Watershed Trash TMDL		September 30, 2016		
Los Angeles River Nitrogen Compounds and Related Effects TMDL	March 23, 2004			
Los Angeles River and Tributaries Metals TMDL				
Dry Weather				January 11, 2024
Wet Weather				January 11, 2028
Los Angeles River Watershed Bacteria TMDL				
Dry Weather (Compliance dates range from 10 to 25 years)			March 23, 2022	March 23, 2037
Wet Weather				March 23, 2037
Legg Lake Trash TMDL		March 6, 2016		
Long Beach City Beaches and Los Angeles River Estuary Bacteria TMDL (USEPA established)		March 26, 2012		

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TOTAL MAXIMUM DAILY LOADS (TMDL)	Final Compliance date has Passed	Final Compliance date within 5 years (2012-2017)	Final Compliance date between 5 and 10 years (2018-2022)	Final Compliance date after 10 years (2023)
Los Angeles Area Lakes TMDLs (USEPA established)		March 26, 2012		
San Gabriel River and Impaired Tributaries Metals and Selenium TMDL (USEPA established)	March 26, 2007			
Los Cerritos Channel Metals TMDL (USEPA established)	March 17, 2010			
Colorado Lagoon OC Pesticides, PCBs, Sediment Toxicity, PAHs, and Metals TMDL			July 28, 2018	
Middle Santa Ana River Watershed Bacterial Indicator TMDLs				
Dry Weather		December 31, 2015		
Wet Weather				December 31, 2025

* If an Integrated Water Resources Approach is approved and implemented then Permittees have an extended compliance deadline.

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3. State Adopted TMDLs with Past Final Compliance Deadlines

In accordance with federal regulations, this Order includes WQBELs necessary to achieve applicable wasteload allocations assigned to MS4 discharges. In some cases, the deadline specified in the TMDL implementation plan for achieving the final wasteload allocation has passed. (See Table F-8) This Order requires that Permittees comply immediately with WQBELs and/or receiving water limitations for which final compliance deadlines have passed.

Table F-8. State-Adopted TMDLs with Past Final Implementation Deadlines

TOTAL MAXIMUM DAILY LOADS (TMDL)	Final Compliance date has Passed
Santa Clara River Nitrogen Compounds TMDL	March 23, 2004
Upper Santa Clara River Chloride TMDL	April 6, 2010
Santa Monica Bay Beaches Bacteria TMDL *Summer Dry Weather only*	July 15, 2006
Santa Monica Bay Beaches Bacteria TMDL *Winter Dry Weather only*	July 15, 2009
Malibu Creek and Lagoon Bacteria TMDL *Summer Dry Weather only*	January 24, 2009
Malibu Creek and Lagoon Bacteria TMDL *Winter Dry Weather only*	January 24, 2012
Marina del Rey Harbor Mothers' Beach and Back Basins Bacteria TMDL *Dry Weather Year-round only*	March 18, 2007
Los Angeles Harbor Bacteria TMDL	March 10, 2010
Los Angeles River Nitrogen Compounds and Related Effects TMDL	March 23, 2004

Where a Permittee determines that its MS4 discharge may not meet the final WQBELs for the TMDLs in Table F-8 upon adoption of this Order, the Permittee may request a time schedule order (TSO) from the Regional Water Board. TSOs are issued pursuant to California Water Code section 13300, whenever a Water Board "finds that a discharge of waste is taking place or threatening to take place that violates or will violate [Regional Water Board] requirements." Permittees may individually request a TSO, or may jointly request a TSO with all Permittees subject to the WQBELs and/or receiving water limitations. Permittees must request a TSO to achieve WQBELs for the TMDLs in Table F-8 no later than 45 days after the date this Order is adopted, or no less than 90 days prior to the final compliance deadline if after adoption of the Order.

In the request, the Permittee(s) must include, at a minimum, the following:

a. Location specific data demonstrating the current quality of the MS4 discharge(s) in terms of concentration and/or load of the target pollutant(s) to the receiving waters subject to the TMDL;
b. A detailed description and chronology of structural controls and source control efforts, including location(s) of implementation, since the effective date of the TMDL, to reduce the pollutant load in the MS4 discharges to the receiving waters subject to the TMDL;
c. A list of discharge locations for which additional time is needed to achieve the water quality based effluent limitations and/or receiving water limitations;
d. Justification of the need for additional time to achieve the water quality-based effluent limitations and/or receiving water limitations for each location identified in Part VI.E.3.c, above;

e. A detailed time schedule of specific actions the Permittee will take in order to achieve the water quality-based effluent limitations and/or receiving water limitations at each location identified in Part VI.E.3.c, above;

f. A demonstration that the time schedule requested is as short as possible, consistent with California Water Code section 13385(j)(3)(C)(i), taking into account the technological, operation, and economic factors that affect the design, development, and implementation of the control measures that are necessary to comply with the effluent limitation(s); and

g. If the requested time schedule exceeds one year, the proposed schedule shall include interim requirements and the date(s) for their achievement. The interim requirements shall include both of the following:

i. Effluent limitation(s) for the pollutant(s) of concern; and

ii. Actions and milestones leading to compliance with the effluent limitation(s).

The Regional Water Board does not intend to take enforcement action against a Permittee for violations of specific WQBELs and corresponding receiving water limitations for which the final compliance deadline has passed if a Permittee is fully complying with the requirements of a TSO to resolve exceedances of the WQBELs for the specific pollutant(s) in the MS4 discharge.

4. USEPA Established TMDLs

USEPA has established seven TMDLs that include wasteload allocations for MS4 discharges covered by this Order (See Table F-9). Five TMDLs were established since 2010, one in 2007, and one in 2003.

Table F-9. USEPA Established TMDLs with WLAs Assigned to MS4 Discharges

TOTAL MAXIMUM DAILY LOADS (TMDL)	Effective Date
Santa Monica Bay TMDL for DDTs and PCBs (USEPA established)	March 26, 2012
Ballona Creek Wetlands TMDL for Sediment and Invasive Exotic Vegetation (USEPA established)	March 26, 2012
Long Beach City Beaches and Los Angeles River Estuary Bacteria TMDL (USEPA established)	March 26, 2012
Los Angeles Area Lakes TMDLs (USEPA established)	March 26, 2012
Los Cerritos Channel Metals TMDL (USEPA established)	March 17, 2010
San Gabriel River and Impaired Tributaries Metals and Selenium TMDL (USEPA established)	March 26, 2007
Malibu Creek Watershed Nutrients TMDL (USEPA established)	March 21, 2003

In contrast to State-adopted TMDLs, USEPA established TMDLs do not contain an implementation plan or schedule. The Clean Water Act does not allow USEPA to either adopt implementation plans or establish compliance schedules for TMDLs that is establishes. Such decisions are generally left with the States. The Regional Water Board could either (1) adopt a separate implementation plan as a Basin Plan Amendment for each USEPA established TMDL, which would allow inclusion of compliance schedules in the permit where applicable, or (2) issue a Permittee a schedule leading to full compliance in a separate enforcement order (such as a Time Schedule Order or a Cease and Desist Order). To date, the Board has not adopted a

separate implementation plan or enforcement order for any of these TMDLs. As such, the final WLAs in the seven USEPA established TMDLs identified above become effective immediately upon establishment by USEPA and placement in a NPDES permit.

The Regional Water Board's decision as to how to express permit conditions for USEPA established TMDLs is based on an analysis of several specific facts and circumstances surrounding these TMDLs and their incorporation into this Order. First, since these TMDLs do not include implementation plans, none of these TMDLs have undergone a comprehensive evaluation of implementation strategies or an evaluation of the time required to fully implement control measures to achieve the final WLAs. Second, given the lack of an evaluation, the Regional Water Board is not able to adequately assess whether Permittees will be able to immediately comply with the WLAs at this time. Third, the majority of these TMDLs were established by USEPA recently (i.e., since 2010) and permittees have had limited time to plan for and implement control measures to achieve compliance with the WLAs. Lastly, while federal regulations do not allow USEPA to establish implementation plans and schedules for achieving these WLAs, USEPA has nevertheless included implementation recommendations regarding MS4 discharges as part of six of the seven of these TMDLs. The Regional Water Board needs time to adequately evaluate USEPA's recommendations. For the reasons above, the Regional Water Board has determined that numeric water quality based effluent limitations for these USEPA established TMDLs are infeasible at the present time. The Regional Water Board may at its discretion revisit this decision within the term of the Order or in a future permit, as more information is developed to support the inclusion of numeric water quality based effluent limitations.

In lieu of inclusion of numeric water quality based effluent limitations at this time, this Order requires Permittees subject to WLAs in USEPA established TMDLs to propose and implement best management practices (BMPs) that will be effective in achieving the numeric WLAs. Permittees will propose these BMPs to the Regional Water Board in a Watershed Management Program Plan, which is subject to Regional Water Board Executive Officer approval. As part of this Plan, Permittees are also required to propose a schedule for implementing the BMPs that is as short as possible. The Regional Water Board finds that, at this time, it is reasonable to include permit conditions that require Permittees to develop specific Watershed Management Program plans that include interim milestones and schedules for actions to achieve the WLAs. These plans will facilitate a comprehensive planning process, including coordination among co-permittees where necessary, on a watershed basis to identify the most effective watershed control measures and implementation strategies to achieve the WLAs.

At a minimum, the Watershed Management Program Plan must include the following data and information relevant to the USEPA established TMDL:

i. Available data demonstrating the current quality of the MS4 discharge(s) in terms of concentration and/or load of the target pollutant(s) to the receiving waters subject to the TMDL;

ii. A detailed time schedule of specific actions the Permittee will take in order to achieve the WLA(s);

iii. A demonstration that the time schedule requested is as short as possible, taking into account the time since USEPA establishment of the TMDL, and technological, operation, and economic factors that affect the design, development, and implementation of the control measures that are necessary to comply with the WLA(s);

a. For the Malibu Creek Nutrient TMDL established by USEPA in 2003, in no case shall the time schedule to achieve the final numeric WLAs exceed five years from the effective date of this Order; and

iv. If the requested time schedule exceeds one year, the proposed schedule shall include interim requirements, including numeric milestones, and the date(s) for their achievement.

Each Permittee subject to a WLA in a TMDL established by USEPA must submit a draft of a Watershed Management Program Plan to the Regional Water Board Executive Officer per the timelines outlined for submittal of a Watershed Management Program or EWMP.

Based on the nature and timing of the proposed watershed control measures, the Regional Water Board will consider appropriate actions on its part, which may include: (1) no action and continued reliance on permit conditions that require implementation of the approved watershed control measures throughout the permit term; (2) adopting an implementation plan and corresponding schedule through the Basin Plan Amendment process and then incorporating water quality based effluent limitations and a compliance schedule into this Order consistent with the State-adopted implementation plan; or (3) issuing a time schedule order to provide the necessary time to fully implement the watershed control measures to achieve the WLAs.

If a Permittee chooses not to submit a Watershed Management Program Plan, or the plan is determined to be inadequate by the Regional Water Board Executive Officer and necessary revisions are not made within 90 days of written notification to the Permittee that that plan is inadequate, the Permittee will be required to demonstrate compliance with the numeric WLAs immediately based on monitoring data collected under the MRP (Attachment E) for this Order.

The Regional Water Board does not intend to take enforcement action against a Permittee for violations of specific WLAs and corresponding receiving water limitations for USEPA established TMDLs if a Permittee has developed and is implementing an approved Watershed Management Program to achieve the WLAs in the USEPA TMDL and the associated receiving water limitations.

E. Other Provisions

1. Legal Authority

Adequate legal authority is required to implement and enforce most parts of the Minimum Control Measures and all equivalent actions if implemented with a Watershed Management Program (See 40 CFR section 122.26(d)(2)(i)(A)-(F) and 40 CFR section 122.26(d)(2)(iv). Without adequate legal authority the MS4 would be unable to perform many vital functions such as performing inspections, requiring remedies, and requiring installation of control measures. In addition, the Permittee would not be able to penalize and/or attain remediation costs from violators.

2. Fiscal Resources

The annual fiscal analysis will show the allocated resources, expenditures, and staff resources necessary to comply with the permit, and implement and enforce the Permittee's Watershed Management Program (See 40 CFR section 122.26(d)(2)(vi). The annual analysis is necessary to show that the Permittee has adequate resources to meet all Permit Requirements. The analysis can also show year-to-year changes in funding for the storm water program. A summary of the annual analysis must be reported in the annual report. This report will help the Permitting Authority understand the resources that are dedicated to compliance with this permit, and to implementation and enforcement of the Watershed Management Program, and track how this changes over time. Furthermore, the inclusion of the requirement to perform a fiscal analysis annually is similar to requirements included in Order No. 01-182 permit as well as the current Ventura County MS4 permit.

3. Responsibilities of the Permittees

Because of the complexity and networking of the storm drain system and drainage facilities within and tributary to the LA MS4, the Regional Water Board adopted an area-wide approach in permitting storm water and urban runoff discharges. Order No. 01-182 was structured as a single permit whereby individual Permittees were assigned uniform requirements and additional requirements were assigned to the Principal Permittee (Los Angeles County Flood Control District). This permit does not designate a principal Permittee and as such requires each Permittee to implement provisions as a separate entity. Furthermore it does not hold a Permittee responsible for implementation of provisions applicable to other Permittees.

Part VI.A.4.a requires inter and intra-agency coordination to facilitate implementation of this Order. This requirement is based on 40 CFR section 122.26(d)(2)(iv) which requires "a comprehensive planning process which public participation and where necessary intergovernmental coordination, to reduce the discharge of pollutants to the maximum extent practicable […]."

4. Reopener and Modification Provisions

These provisions are based on 40 CFR sections 122.44, 122.62, 122.63, 122.64, 124.5, 125.62, and 125.64, and are also consistent with Order No. 01-182. The Regional Water Board may reopen the permit to modify permit conditions and requirements, as well as revoke, reissue, or terminate in accordance with federal regulations. Causes for such actions include, but are not limited to, endangerment to human health or the environment; acquisition of newly-obtained information that would have justified the application of different conditions if known at the time of Order adoption; to incorporate provisions as a result of new federal or state laws, regulations, plans, or policies (including TMDLs and other Basin Plan amendments); modification in toxicity requirements; violation of any term or condition in this Order; and/or minor modifications to correct typographical errors or require more frequent monitoring or reporting by a Permittee. The Order also includes additional causes including: within 18 months of the effective date of a revised TMDL or as soon as practicable thereafter, where the revisions warrant a change to the provisions of this Order, the Regional Water Board may modify this Order consistent with the assumptions and requirements of the revised WLA(s), including the program of implementation; in consideration of any State Water Board action regarding the precedential language of State Water Board Order WQ 99-05; and to include provisions or modifications to WQBELs in Part VI.E and Attachments L-R in this Order prior to the final compliance deadlines, if practicable, that would allow an action-based, BMP compliance demonstration approach with regard to final WQBELs for storm water discharges based on the Regional Board's evaluation of whether Watershed Management Programs in Part VI.C. of the Order have resulted in attainment of interim WQBELs for storm water and review of relevant research, including but not limited to data and information provided by Permittees and other stakeholders, on storm water quality and the efficacy and reliability of control technologies.

VII. RATIONALE FOR MONITORING AND REPORTING REQUIREMENTS

Section 308(a) of the federal Clean Water Act, and sections 122.41(h), (j)-(l), 122.44(i), and 122.48 of Title 40 of the Code of Federal Regulations requires that all NPDES permits specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s also specify additional monitoring and reporting requirements. (40 C.F.R. §§ 122.26(d)(2)(i)(F) & (d)(2)(iii)(D), 122.42(c).) California Water Code section 13383 further authorizes the Regional Water Board to establish monitoring, inspection, entry, reporting, and recordkeeping requirements. The MRP (Attachment E of this Order) establishes monitoring, reporting, and recordkeeping requirements that implement the federal and state laws and/or regulations. The following provides the rationale for the monitoring and reporting requirements contained in the MRP for this Order.

A. Integrated Monitoring Plans

1. Integrated Monitoring Program and Coordinated Integrated Monitoring Program

As discussed in Part VI.B of this Fact Sheet, the purpose of the Watershed Management Programs is to provide a framework for Permittees to implement the requirements of this Order in an integrated and collaborative fashion and to address water quality priorities on a watershed scale. Additionally, the Watershed Management Programs are to be designed to ensure that discharges from the Los Angeles County MS4: (i) achieve applicable water quality based effluent limitations that implement TMDLs, (ii) do not cause or contribute to exceedances of receiving water limitations, and (iii) for non-storm water discharges from the MS4, are not a source of pollutants to receiving waters. This Order allows Permittees in coordination with an approved Watershed Management Program per Part VI.C, to implement a customized monitoring program with the primary objective of allowing for the customization of the outfall monitoring programs and that achieves the five Primary Objectives set forth in Part II.A. of Attachment E and includes the elements set forth in Part II.E. of Attachment E. If pursuing a customized monitoring program, the Permittees must provide sufficient justification for each element of the program that differs from the monitoring program as set forth in Attachment E of the Order. This Order provides options for each Permittee to individually develop and implement an Integrated Monitoring Program (IMP), or alternatively, Permittees may cooperate with other Permittees to develop a Coordinated Integrated Monitoring Program (CIMP). Both the IMP and CIMP are intended to facilitate the effective and collaborative monitoring of receiving waters, storm water, and non-storm water discharges and to report the results of monitoring to the Regional Water Board.

The key requirements for Watershed Management Programs are included in Part VI.C of this Order. The IMP and CIMP requirements within the MRP largely summarize the requirements and reinforce that, at a minimum, the IMP or CIMP must address all TMDL and Non-TMDL monitoring requirements of this Order, including receiving water monitoring, storm water outfall based monitoring, non-storm water outfall based monitoring, and regional water monitoring studies.

Both the IMP and CIMP approach provides opportunities to increase the cost efficiency and effectiveness of the Permittees monitoring program as monitoring can be designed, prioritized and implemented on a watershed basis. The IMP/CIMP approach allows the Permittees to prioritize monitoring resources between watersheds based on TMDL Implementation and Monitoring Plan schedules, coordinate outfall based monitoring programs and implement regional studies. Cost savings can also occur when Permittees coordinate their monitoring programs with other Permittees.

B. TMDL Monitoring Plans

Monitoring requirements established in TMDL Monitoring Plans, presented in Table E-1. Approved TMDL Monitoring Plans by Watershed Management Area, were approved by

the Executive Officer of the Regional Water Board prior to the effective date of this Order are incorporated into this Order by reference.

C. Receiving Water Monitoring

The purposes of receiving water monitoring are to measure the effects of storm water and non-storm water discharges from the MS4 to the receiving water, to identify water quality exceedances, to evaluate compliance with TMDL WLAs and receiving water limitations, and to evaluate whether water quality is improving, staying the same or declining.

1. Receiving Water Monitoring Stations

Receiving water monitoring is linked to outfall based monitoring in order to gauge the effects of MS4 discharges on receiving water. Receiving water monitoring stations must be downstream of outfall monitoring stations.

The IMP, CIMP or stand-alone receiving monitoring plan (in the case of jurisdictional monitoring) must include a map identifying proposed wet weather and dry weather monitoring stations. Receiving water monitoring stations may include historical mass emission stations, TMDL compliance monitoring stations, and other selected stations. The Permittee must describe how monitoring at the proposed locations will accurately characterize the effects of the discharges from the MS4 on the receiving water, and meet other stated objectives. The plan must also state whether historical mass emission stations will continue to be monitored, and if not, provide sufficient justification for discontinuation of monitoring at the historical mass emissions stations, and describe the value of past receiving water monitoring data in performing trends analysis to assess whether water quality if improving, staying the same or declining.

2. Minimum Monitoring Requirements

Receiving water is to be monitored during both dry and wet weather conditions to assess the impact of non-storm water and storm water discharges. Wet weather and dry weather are defined in each watershed, consistent with the definitions in TMDLs approved within the watershed. Monitoring is to commence as soon as possible after linked outfall monitoring in order to be reflective of potential impacts from MS4 discharges. At a minimum, the parameters to be monitored and the monitoring frequency are the same as those required for the linked outfalls.

D. Outfall Based Monitoring

The MRP requires Permittees to conduct outfall monitoring, linked with receiving water monitoring, bioassessment monitoring and TMDL special studies. The MRP allows the Permittees flexibility to integrate the minimum requirements of this Order, applicable TMDL monitoring plans and other regional monitoring obligations into a single IMP or within a CIMP.

Per Part VII.A of the MRP, the Permittee must establish a map or geographic database of storm drains, channels and outfalls to aid in the development of the outfall monitoring plan and to assist the Regional Water Board in reviewing the logic and adequacy of the number and location of outfalls selected for monitoring. The map/database must include the storm drain network, receiving waters, other surface waters that may impact hydrology, including dams and dry weather diversions. In addition, the map must identify the location and identifying code for each major outfall within the Permittee's jurisdiction. The map must include overlays including jurisdictional boundaries, subwatershed boundaries and storm drain outfall catchment boundaries. The map must distinguish between storm drain catchment drainage areas and subwatershed drainage areas, as these may differ. In addition, the map must include overlays displaying land use, impervious area and effective impervious area (if available). To the extent known, outfalls that convey significant non-stormwater discharges (see Part I.F to this Fact Sheet), must also be identified on the map, and the map must be updated annually to include the total list of known outfalls conveying significant flow of non-storm water discharge.

E. Storm Water Outfall Based Monitoring

The purpose of the outfall monitoring plan is to characterize the storm water discharges from each Permittee's drainages within each subwatershed. Outfall based monitoring is also conducted to assess compliance with WQBELs. Unless Permittees have proposed and received approval for a customized monitoring program as previously discussed, each Permittee must identify at least one outfall within each subwatershed (HUC 12) within its jurisdictional boundary to monitor storm water discharges. The selected outfall(s) should receive drainage from an area representative of the land uses within the portion of its jurisdiction that drains to the subwatershed, and not be unduly influenced by storm water discharges from upstream jurisdictions or other NPDES discharges. It is assumed that storm water runoff quality will be similar for similar land use areas, and therefore runoff from a representative area will provide sufficient characterization of the entire drainage area. Factors that may impact storm water runoff quality include the land use (industrial, residential, commercial) and the control measures that are applied. Factors that may impact storm water runoff volume include percent effective impervious cover (connected to the storm drain system), vegetation type, soil compaction and soil permeability.

Storm water outfall monitoring is linked to receiving water monitoring (see above). Monitoring must be conducted at least three times per year during qualifying rain events, including the first rain event of the year and conducted approximately concurrently (within 6 hours) before the commencement of the downstream receiving water monitoring.

Monitoring is conducted for pollutants of concern including all pollutants with assigned WQBELs. Parameters to be monitored during wet weather include: flow, pollutants subject to a TMDL applicable to the receiving water, pollutants listed on the Clean Water Act Section 303(d) list for the receiving water or a downstream receiving water. Flow is necessary to calculate pollutant loading. Sampling requirements, including

methods for collecting flow-weighted composite samples, are consistent with the Ventura County Monitoring program (Order No. C17388).

For water bodies listed on the Clean Water Act section 303(d) list as being impaired due to sedimentation, siltation or turbidity, total suspended solids (TSS) and suspended sediment concentration (SSC) must be analyzed. TSS is the parameter most often required in NPDES permits to measure suspended solids. However, studies conducted by the United States Geological Survey (USGS) have found that the TSS procedure may not capture the full range of sediment particle sizes contributing to sediment impairments . Therefore both TSS and SSC are required in this Order.

For freshwater, the following field measurements are also required: hardness, pH, dissolved oxygen, temperature, and specific conductivity. Hardness, pH and temperature are parameters impacting the effect of pollutants in freshwater (i.e., metals water quality standards are dependent on hardness, ammonia toxicity is dependent on pH and temperature. Temperature and dissolved oxygen are interdependent and fundamental to supporting aquatic life beneficial uses. Specific conductivity is a parameter important to assessing potential threats to MUN and freshwater aquatic life beneficial uses.

Aquatic toxicity monitoring is required in the receiving water twice per year during wet weather conditions. Aquatic toxicity is a direct measure of toxicity and integrates the effects of multiple synergistic effects of known and unidentified pollutants. When samples are found to be toxic, a Toxicity Identification Evaluation must be performed in an attempt to identify the pollutants causing toxicity. Aquatic toxicity is required to be monitored in the receiving water twice per year during wet-weather rather than three times per year due to the expense of the procedure.

The monitoring data is to be accompanied by rainfall data and hydrographs, and a narrative description of the storm event, consistent with the requirements in the Ventura County MS4 (Monitoring Program No. CI 7388). This information will allow the Permittee and the Regional Water Board staff to evaluate the effects of differing storm events in terms of storm water runoff volume and duration and in-stream effects.

F. Non-Stormwater Outfall-Based Screening and Monitoring Program

The non-storm water outfall screening and monitoring program is intended to build off of Permittees prior efforts under Order No. 01-182 to screen all outfalls within their MS4 to identify illicit connections and discharges. Under this Order, the Permittees will use the following step-wise method to assess non-storm water discharges.

- Develop criteria or other means to ensure that all outfalls with significant non-storm water discharges are identified and assessed during the term of this Order.
- For outfalls determined to have significant non-storm water flow, determine whether flows are the result of illicit connections/illicit discharges (IC/IDs), authorized or conditionally exempt non-storm water flows, or from unknown sources.
- Refer information related to identified IC/IDs to the IC/ID Elimination Program (Part VI.D.10 of this Order) for appropriate action.

- Based on existing screening or monitoring data or other institutional knowledge, assess the impact of non-storm water discharges (other than identified IC/IDs) on the receiving water.
- Prioritize monitoring of outfalls considering the potential threat to the receiving water and applicable TMDL compliance schedules.
- Conduct monitoring or assess existing monitoring data to determine the impact of non-storm water discharges on the receiving water.
- Conduct monitoring or other investigations to identify the source of pollutants in non-storm water discharges.
- Use results of the screening process to evaluate the conditionally exempt non-storm water discharges identified in Part III.A.2 and III.A.3 in this Order and take appropriate actions pursuant to Part III.A.4.d of this Order for those discharges that have been found to be a source of pollutants. Any future reclassification shall occur per the conditions in Parts III.A.2 or III.A.6 of this Order.

The screening and monitoring program is intended to maximize the use of Permittee resources by integrating the screening and monitoring process into existing or planned IMP/CIMP efforts. It is also intended to rely on the illicit discharge source investigation and elimination requirements in Part VI.D.10 of this Order and the MS4 Mapping requirements in Part VII.A of the MRP.

The screening and source identification component of the program is used to identify the source(s) and point(s) of origin of the non-storm water discharge. The Permittee is required to develop a source identification schedule based on the prioritized list of outfalls exhibiting significant non-storm water discharges. The schedule shall ensure that source investigations are to be conducted for no less than 25% of the outfalls in the inventory within three years of the effective date of this Order and 100% of the outfalls within 5 years of the effective date of this Order. This will ensure that all outfalls with significant non-storm water discharges will be assessed within the term of this Order.

Additional requirements have been included to require the Permittee to develop a map and database of all outfalls with known non-storm water discharges. The database and map are to be updated throughout the term of this Order. If the source of the non-storm water discharge is determined to be an NPDES permitted discharge, a discharge subject to a Record of Decision approved by USEPA pursuant to section 121 of CERCLA, a conditionally exempt essential non-storm water discharge, or entirely comprised of natural flows as defined at Part III.A.d of this Order, the Permittee need only document the source and report to the Regional Water Board within 30 days of determination and in the next annual report. Likewise, if the discharge is determined to originate in an upstream jurisdiction, the Permittee is to provide notice and all characterization data to the upstream jurisdiction within 30 days of determination.

However, if the source is either unknown or a conditionally exempt non-essential non-storm water discharge, each Permittee shall conduct monitoring required in Part IX.F of the MRP. Special provisions are also provided if the discharge is found to result from multiple sources.

The parameters to be monitored include flow rate, pollutants assigned a WQBEL or receiving water limitation to implement TMDL provisions for the respective receiving water, as identified in Attachments L - R of this Order, non-storm water action levels as identified in Attachment G of this Order, and CWA Section 303(d) listed pollutants for the respective receiving water. Aquatic Toxicity required only when receiving water monitoring indicates aquatic toxicity and the TIE conducted in the receiving water is inconclusive.

In an effort to provide flexibility and allow the Permittee to prioritize its monitoring efforts, the outfall based monitoring can be integrated within an IMP/CIMP. For outfalls subject to a dry weather TMDL, monitoring frequency is established per the approved TMDL Monitoring Program.

Unless specified in an approved IMP/CIMP, outfalls not subject to dry weather TMDLs must be monitored at least four times during the first year of monitoring. The four times per year monitoring is reflective of the potential for high variability in the quality and volume of non-storm water discharges and duration as opposed to storm water discharges.

Collected monitoring data is to be compared against applicable receiving water limitations, water quality based effluent limitations, non-storm water action levels, or exhibited Aquatic Toxicity as defined in the Parts XII.F and G of the MRP and all exceedances are to be reported in the Integrated Monitoring Compliance Report required in Part XIX.A.5 of the MRP.

After the first year, monitoring for specific pollutants may be reduced to once per year, if the values reported in the first year do not exceed applicable non-storm water WQBELs, non-storm water action levels, or a water quality standard applicable to the receiving water.

After one year of monitoring, the Permittee may submit a written request to the Executive Officer of the Regional Water Board requesting to eliminate monitoring for specific pollutants based on an analysis demonstrating that there is no reasonable potential for the pollutant to exist in the discharge at a concentration exceeding applicable water quality standards.

1. Dry Weather Screening Monitoring

a. Background

Clean Water Act section 402(p) regulates discharges from municipal separate storm sewer systems (MS4s). Clean Water Act section 402(p)(3)(B)(ii) requires the Permittees to effectively prohibit non-storm water from entering the MS4.

Non-exempted, non-storm water discharges are to be effectively prohibited from entering the MS4 or become subject to another NPDES permit (55 Fed.Reg. 47990, 47995 (Nov.16, 1990)). Conveyances which continue to accept non-

exempt, non-storm water discharges do not meet the definition of MS4 and are not subject to Clean Water Act section 402(p)(3)(B) unless the discharges are issued separate NPDES permits. Instead, conveyances that continue to accept non-exempt, non-storm water discharges that do not have a separate NPDES permit are subject to sections 301 and 402 of the CWA (55 Fed.Reg. 47990, 48037 (Nov. 16, 1990)).

In part, to implement these statutory provisions, Order No. 01-182 included non-storm water discharge prohibitions. Several categories of non-storm water discharges are specifically identified as authorized or conditionally exempt non-storm water discharges, including:

i. Discharges covered under an NPDES permit

ii. Discharges authorized by USEPA under CERCLA

iii. Discharges resulting from natural flows

iv. Discharges from emergency fire fighting activity

v. Some Categories of Discharges incidental to urban activities

Further, as another mechanism to effectively prohibit non-storm water discharges into the MS4, Order No. 01-182 also requires the Los Angeles County MS4 Co-Permittees to implement an illicit connections and illicit discharges elimination program as part of their storm water management program pursuant to 40 CFR section 122.26(d)(2)(iv)(B).

Finally, Monitoring and Reporting Program CI 6948, a part of Order No. 01-182, required dry weather monitoring at the Mass Emissions Stations (MES) to estimate pollutant contributions and determine if the MS4 is contributing to exceedances of applicable water quality standards during dry weather.

b. Evaluation of Dry Weather Data

40 CFR section 122.44(d)(1)(i) mandates that permits include effluent limitations for all pollutants that are or may be discharged at levels that have the reasonable potential to cause or contribute to an exceedance of a water quality standard. The process for determining reasonable potential and calculating WQBELs when necessary is intended to protect the designated uses of the receiving water as specified in the Basin Plan, and achieve applicable water quality objectives and criteria that are contained in the Basin Plan and other state plans and policies, or any applicable water quality criteria contained in the California Toxics Rule (CTR) and National Toxics Rule (NTR).

In an effort to evaluate the Discharger's program to effectively prohibit non-storm water discharges into the MS4, as well as to determine whether MS4 discharges are potentially contributing to exceedances of water quality standards, the Reasonable Potential Analysis (RPA) process was used as a screening tool. In doing so, dry weather monitoring data submitted by the Discharger was evaluated to identify where non-storm water discharges may impact beneficial

uses and where additional monitoring and/or investigations of non-storm water discharges should be focused.

Order No. 01-182 and Monitoring and Reporting Program No. 6948 required the Discharger to implement core monitoring at seven mass emission stations:

- Ballona Creek
- Malibu Creek
- Los Angeles River
- San Gabriel River (representing the upper portion of the San Gabriel River Watershed Management Area)
- Coyote Creek (representing the lower portion of the San Gabriel River Watershed Management Area)
- Dominguez Channel
- Santa Clara River

In addition to wet weather monitoring requirements at each of the mass emission stations, a minimum of two dry weather samples were required each year. Monitoring was required for conventional pollutants (BOD, TSS, pH, fecal coliform, oil and grease), priority pollutants, and a variety of other nonconventional pollutants (e.g., nutrients, dissolved oxygen, salinity/conductivity).

Dry weather monitoring data were compiled from Annual Stormwater Monitoring Reports submitted by the Los Angeles County Department of Public Works for the period from 2005 to 2011 to reflect the most recent data. The Annual Stormwater Monitoring Reports include the results for dry weather samples that were collected from 2005 to 2011 on 15 different dates.

For each monitored parameter, the most stringent applicable water quality objective/criterion was identified from the Basin Plan and the CTR at 40 CFR section 131.38. The following assumptions were made when conducting the analysis:

- The mass emissions stations represented only freshwater segments. Accordingly, CTR criteria for the protection of freshwater aquatic life were selected for comparison to monitoring results.
- For hardness-dependent metals, criteria were derived by using the lowest reported dry-weather hardness value for each mass emission station for the period of 2005 to 2011.
- For screening purposes the criteria associated with the most protective beneficial use for any segment within the watershed was selected for comparison to monitoring results.
- Basin Plan surface water quality objectives for minerals (i.e., total dissolved solids, sulfate, and chloride) apply to specific stream reaches within each watershed and are provided in Chapter 3 of the Basin Plan. Where no specific objectives are identified, footnote f to Table 3-8 provides guidelines

for protection of various beneficial uses. When guidelines were presented as a range, the most protective (low end of range) value was selected and applied according to beneficial uses in the watershed.

- With the exception of bacteria, the water quality objectives used for the analysis are the most current in effect. Since adoption of Order No. 01-182 in 2001, some Basin Plan objectives and CTR criteria have been amended. As a result, the pollutants monitored under the MRP for Order No. 01-182 may not necessarily reflect current objectives.
- *E coli* bacteria was not required as part of the MRP to Order No. 01-182, thus screening for bacteria was based solely on fecal coliform. Monitoring results for fecal coliform were compared to the Basin Plan fecal coliform objective in effect during the monitoring period. The Basin Plan objective for bacteria was amended in December 2011 to omit fecal coliform as a fresh water objective. The existing numeric bacteria objective for freshwater is limited to *E. coli*. The Basin Plan bacteria objectives are expressed as a single sample maximum and a geometric mean. In this screening, limited data precluded calculation of geometric means, therefore, the geometric mean objective was treated as a "not-to-exceed" criterion for screening purposes. The geometric mean objective for fecal coliform is 200/100 ml (the Basin Plan objective to protect primary contact recreation beneficial use (REC-1) uses in freshwaters).
- Within a given watershed, where the Basin Plan designates a "Potential" beneficial use of MUN, drinking water maximum contaminant levels (MCLs) were not applied as the most stringent objectives. Within a given watershed, where the Basin Plan designates "Potential" or "Intermittent" for beneficial uses other than MUN, the appropriate protective objectives were used for screening. This is consistent with Basin Plan requirements and existing permitting procedures.

The maximum reported pollutant concentration was compared to the most stringent applicable water quality objective to determine if there was potential for receiving water concentrations to exceed water quality objectives.

Table F-10 summarizes the results of the RPA analysis based on evaluation of the 15 sets of data for the period of 2005 to 2011 for each of the mass emission stations. Generally, all priority pollutant organic parameters were reported as below detection levels at practical quantitation levels (PQLs) consistent with the minimum levels (MLs) listed in the SIP. The most prevalent pollutants of concern among the mass emission stations include fecal coliform bacteria, cyanide, mercury, chloride, sulfate, total dissolved solids, copper, and selenium. Reported fecal coliform bacteria, cyanide, copper, and selenium concentrations appear to consistently exceed objectives/criteria in all watersheds at relatively high levels. For watersheds where objectives apply for sulfate and total dissolved solids, the receiving water concentrations consistently exceeded the objectives. The incidences where exceedances are indicated for mercury are largely due to analytical detection levels that were higher than the applicable criterion.

Table F-10. Summary of LA County Watersheds and Frequency of Receiving Water Exceeding Criteria - 2005 to 2011- Dry Season Data Analysis[1]

Parameter	Santa Clara River	Los Angeles River	Dominguez Channel	Ballona Creek	Malibu Creek	San Gabriel River	
						Upper Portion	Lower Portion
pH	0/15	7/15	5/15	3/15	0/15	1/14	2/15
Total Coliform	No FW Objective	No FW Objective)	No FW Objective	No FW Objective	No FW Objective	No FW Objective	No FW Objective
Fecal Coliform	4/15	4/15	10/15	13/15	6/15	11/14	13/15
Enterococcus	No FW Objective	No FW Objective	No FW Objective	No FW Objective	No FW Objective	No FW Objective	No FW Objective
Chloride	15/15	15/15	No Objective	0/15	0/15	14/14	15/15
Dissolved Oxygen	1/15	0/15	0/15	0/15	0/15	√1/14	0/15
Nitrate-N	0/15	0/15	No Objective	No Objective	0/15	7/14	No Objective
Nitrite-N	0/15	3/15	No Objective	No Objective	0/15	0/15	No Objective
Methylene Blue Active Substances	4/15	0/15	No Objective	No Objective	0/15	0/14	No Objective
Sulfate	15/15	15/15	No Objective	No Objective	15/15	14/14	15/15
Total Dissolved Solids	15/15	15/15	No Objective	No Objective	13/15	14/14	15/15
Turbidity[2]	0/15	2/15	No Objective	No Objective	0/15	0/15	0/15
Cyanide	11/15	14/15	4/15	15/15	3/15	14/14	15/15
Total Aluminum	1/15	2/15	No Objective	No Objective	0/15	1/14	No Objective
Dissolved Copper	0/15	0/15	5/15	0/15	0/15	13/14	0/15
Total Copper	1/15	6/15	11/15	3/15	0/15	13/14	2/15
Dissolved Lead	0/15	0/15	0/15	0/15	0/15	1/14	0/15
Total Lead	0/15	0/15	1/15	1/15	0/15	13/14	0/15
Total Mercury	1515	14/15	14/15	15/15	15/15	14/14	15/15
Dissolved Mercury	15/15	15/15	15/15	15/15	15/15	14/14	14/14
Total Nickel	0/15	0/15	0/15	0/15	0/15	1/14	0/15
Dissolved Selenium	2/15	2/15	1/15	2/15	6/15	1/15	10/11
Total Selenium	2/15	2/15	1/15	2/15	6/15	1/15	10/11
Dissolved Zinc	0/15	0/15	0/15	0/15	0/15	7/10	0/15
Total Zinc	0/15	0/15	0/1)	0/15	0/15	10/10	0/15

1. Frequency of exceedance is denoted as number of exceedances/number of dry weather samples evaluated. For example, "2/15" indicates 2 of the 15 samples had analytical results that exceeded the water quality objective for a given parameter.

2. The Basin Plan objective for turbidity for the protection of MUN is the secondary MCL of 5 NTU. The Basin Plan contains additional turbidity objectives expressed as incremental changes over natural conditions. Since inadequate data were available to assess criteria expressed as incremental changes, only the MCL was considered in the analysis.

c. Requirements for Controlling Non-Storm Water Discharges

The USEPA's approach for non-storm water discharges from MS4s is to regulate these discharges under the existing CWA section 402 NPDES framework for discharges to surface waters. The NPDES program (40 CFR section 122.44(d)) utilizes discharge prohibitions and effluent limitations as regulatory mechanisms to regulate non-storm water discharges, including the use of technology- and water quality-based effluent limitations. Non-numerical controls, such as BMPs for non-storm water discharges may only be authorized where numerical effluent limitations are infeasible.

As described in Table F-10 above, there were a number of pollutants for which it was determined that receiving water concentrations at the mass emission

stations indicate possible exceedances of water quality standards within the watershed. However, for waterbody-pollutant combinations not subject to a TMDL, there is uncertainty regarding whether exceedances occurred within specific segments where standards apply; the extent to which non-storm water discharges from the MS4 have caused or contributed to any exceedances; and whether the exceedances are attributable to any one or more specific MS4 outfalls within the watershed management area.

Given the need for additional data on non-stormwater discharges from the MS4 where a TMDL has not been developed, USEPA and the State have used action levels as a means to gauge potential impact to water quality and to identify the potential need for additional controls for non-stormwater discharges in the future. If these action levels are exceeded, then additional requirements (e.g., numeric effluent limitations, increased monitoring, special studies, additional BMPs) are typically used to address the potential impacts. In this case, non-storm water action levels are applicable to non-storm water discharges from that MS4 outfall. Non-storm water discharges from the MS4 are those which occur during dry weather conditions. These action levels are not applied to storm water discharges, as defined within this Order. Storm water discharges regulated by this Order are required to meet the MEP standard and other provisions determined necessary by the State to control pollutants and have separate requirements under this Order.

The use of action levels in this Order does not restrict the Regional Water Boards ability to modify this Order in accordance with 40 CFR section 122.62 to include numeric effluent limitations should monitoring data indicate that controls beyond action levels are necessary to ensure that non-storm water discharges do not cause or contribute to exceedances of water quality standards.

i. Approach for Deriving Action Levels

Where exceedances are indicated in Table F-10 and where a TMDL has not been developed, action levels are applied as a screening tool to indicate where non-storm water discharges, including exempted flows and illicit connections may be causing or contributing to exceedances of water quality objectives. Action levels in this Order are based upon numeric or narrative water quality objectives and criteria as defined in the Basin Plan, the Water Quality Control Plan for Ocean Waters of California (Ocean Plan), and the CTR.

(1) Discharges to Inland Surface Waters, Enclosed Bays, and Estuaries

Priority Pollutants Subject to the CTR

Priority pollutant water quality criteria in the CTR are applicable to all inland surface waters, enclosed bays, and estuaries. The CTR contains both saltwater and freshwater criteria. Because a distinct separation generally does not exist between freshwater and saltwater aquatic communities, the following apply, in accordance with Section 131.38(c)(3):

- For waters in which the salinity is equal to or less than 1 part per thousand (ppt), the freshwater criteria apply.
- For waters in which the salinity is greater than 10 ppt 95 percent or more of the time, the saltwater criteria apply.
- For waters in which the salinity is between 1 ppt and 10 ppt, the more stringent of the freshwater or saltwater criteria apply.

For continuous discharges, 40 CFR section 122.45(d)(1) specifies daily maximum and average monthly effluent limitations. Because of the uncertainty regarding the frequency of occurrence and duration of non-storm water discharges through the MS4, average monthly action levels (AMALs) and maximum daily action levels (MDALs) were calculated following the procedure based on the steady-state model, available in Section 1.4 of the SIP. The SIP procedures were used to calculate action levels for CTR priority pollutants and other constituents for which the Basin Plan contains numeric objectives.

Since many of the streams in the Region have minimal upstream flows, mixing zones and dilution credits are usually not appropriate. Therefore, in this Order, no dilution credit is being allowed.

40 CFR section 122.45(c) requires that effluent limitations for metals be expressed as total recoverable concentration; therefore it is appropriate to include action levels also as a total recoverable concentration. The SIP requires that if it is necessary to express a dissolved metal value as a total recoverable and a site-specific translator has not yet been developed, the Regional Water Board shall use the applicable conversion factor contained in the 40 CFR section 131.38.

Using nickel as an example, and assuming application of saltwater criteria (e.g., a situation where an MS4 outfall discharges to an estuary), the following demonstrates how action levels were established for this Order. The tables in Attachment H provide the action levels for each watershed management area addressed by this Order using the process described below.

The process for developing these limits is in accordance with Section 1.4 of the SIP. Two sets of AMAL and MDAL values are calculated separately, one set for the protection of aquatic life and the other for the protection of human health (consumption of organisms only). The AMALs and MDALs for aquatic life and human health are compared, and the most restrictive AMAL and the most restrictive MDAL are selected as the action level.

Step 1: For each constituent requiring an action level, identify the applicable water quality criteria or objective. For each criterion, determine

the effluent concentration allowance (ECA) using the following steady state mass balance equation:

$ECA = C + D(C-B)$ when $C > B$, and
$ECA = C$ when $C \leq B$,

Where:

C = The priority pollutant criterion/objective, adjusted if necessary for hardness, pH and translators (criteria for saltwater are independent of hardness and pH).
D = The dilution credit, and
B = The ambient background concentration

As discussed above, for this Order, dilution was not allowed; therefore:

$ECA = C$

For nickel the applicable ECAs are:

ECA_{acute} = 75 µg/L

$ECA_{chronic}$= 8.3 µg/L

Step 2: For each ECA based on aquatic life criterion/objective, determine the long-term average discharge condition (LTA) by multiplying the ECA by a factor (multiplier). The multiplier is a statistically based factor that adjusts the ECA to account for effluent variability. The value of the multiplier varies depending on the coefficient of variation (CV) of the data set and whether it is an acute or chronic criterion/objective. Table 1 of the SIP provides pre-calculated values for the multipliers based on the value of the CV. Equations to develop the multipliers in place of using values in the tables are provided in Section 1.4, Step 3 of the SIP and will not be repeated here.

$LTA_{acute} = ECA_{acute} \times Multiplier_{acute\ 99}$

$LTA_{chronic} = ECA_{chronic} \times Multiplier_{chronic\ 99}$

The CV for the data set must be determined before the multipliers can be selected and will vary depending on the number of samples and the standard deviation of a data set. If the data set is less than 10 samples, or at least 80% of the samples in the data set are reported as non-detect, the CV shall be set equal to 0.6. For nickel, a CV of 0.6 was assumed.

For nickel, the following data were used to develop the acute and chronic LTA using equations provided in Section 1.4, Step 3 of the SIP (Table 1 of the SIP also provides this data up to three decimals):

CV	ECA Multiplier$_{acute}$	ECA Multiplier$_{chronic}$
0.6	0.32	0.53

LTA_{acute} = 75 µg/L x 0.32 = 24 µg/L

$LTA_{chronic}$ = 8.3 µg/L x 0.53 = 4.4 µg/L

Step 3: Select the most limiting (lowest) of the LTA.

LTA = most limiting of LTA_{acute} or $LTA_{chronic}$

For nickel, the most limiting LTA was the $LTA_{chronic}$

LTA_{nickel}= $LTA_{chronic}$ = 4.4 µg/L

Step 4: Calculate the action levels by multiplying the LTA by a factor (multiplier). Action levels are expressed as AMAL and MDAL. The multiplier is a statistically based factor that adjusts the LTA for the averaging periods and exceedance frequencies of the criteria/objectives and the action levels. The value of the multiplier varies depending on the probability basis, the CV of the data set, the number of samples (for AMAL) and whether it is a monthly or daily limit. Table 2 of the SIP provides pre-calculated values for the multipliers based on the value of the CV and the number of samples. Equations to develop the multipliers in place of using values in the tables are provided in Section 1.4, Step 5 of the SIP and will not be repeated here.

$AMAL_{aquatic\ life}$ = LTA x $AMAL_{multiplier\ 95}$

$MDAL_{aquatic\ life}$ = LTA x $MDAL_{multiplier\ 99}$

AMAL multipliers are based on a 95th percentile occurrence probability, and the MDAL multipliers are based on the 99th percentile occurrence probability. If the number of samples is less than four (4), the default number of samples to be used is four (4).

For nickel, the following data were used to develop the AMAL and MDAL for action levels using equations provided in Section 1.4, Step 5 of the SIP (Table 2 of the SIP also provides this data up to two decimals):

No. of Samples Per Month	CV	Multiplier$_{MDAL\ 99}$	Multiplier$_{AMAL\ 95}$
4	0.6	3.11	1.55

Therefore:

AMAL = 4.4 µg/L x 1.55 = 6.8 µg/L

MDAL= 4.4 µg/L x 3.11 = 14 µg/L

Step 5: For the ECA based on human health, set the AMAL equal to the $ECA_{human\ health}$

$AMAL_{human\ health} = ECA_{human\ health}$

For nickel:

$AMAL_{human\ health}$ = 4,600 µg/L

Step 6: Calculate the MDAL for human health by multiplying the AMAL by the ratio of the $Multiplier_{MDAL}$ to the $Multiplier_{AMAL}$. Table 2 of the SIP provides pre-calculated ratios to be used in this calculation based on the CV and the number of samples.

$MDAL_{human\ health} = AMAL_{human\ health}$ x ($Multiplier_{MDAL}$ / $Multiplier_{AMAL}$)

For nickel, the following data were used to develop the $MDAL_{human\ health}$:

No. of Samples Per Month	CV	$Multiplier_{MDAL\ 99}$	$Multiplier_{AMAL\ 95}$	Ratio
4	0.6	3.11	1.55	2.0

For nickel:

$MDAL_{human\ health}$= 4,600 µg/L x 2 = 9,200 µg/L

Step 7: Select the lower of the AMAL and MDAL based on aquatic life and human health as the non-storm water action level for this Order.

$AMAL_{aquatic\ life}$	$MDAL_{aquatic\ life}$	$AMAL_{human\ health}$	$MDAL_{human\ health}$
6.8	14	4,600	9,200

For nickel, the lowest (most restrictive) levels are based on aquatic toxicity and serve as the basis for non-storm water action levels included in this Order.

Table F-11: Calculations of Freshwater Action Levels[1]

Parameter	Units	CV	Aquatic Life Criteria[2]		Human Health Criteria	HH Calculations			Aquatic Life Calculations									Final Action Levels	
			C acute = CMC tot	C chronic = CCC tot	HH-Organisms only	ECA_{HH} = $AMAL_{HH}$	AMAL/MDAL Multiplier$_{HH}$	$MDAL_{HH}$	ECA Multiplier$_{acute}$	LTA_{acute}	ECA Multiplier$_{chronic}$	$LTA_{chronic}$	Lowest LTA	AMAL Multiplier$_{95}$	$AMAL_{AL}$	MDAL Multiplier$_{99}$	$MDAL_{AL}$	Lowest AMAL	Lowest MDAL
Cadmium	µg/L	0.6	4.52	2.46	N		2.01		0.321	1.45	0.527	1.30	1.30	1.55	2.02	3.11	4.0	2.0	4.0
Copper	µg/L	0.6	14.00	9.33			2.01		0.321	4.49	0.527	4.92	4.49	1.55	6.98	3.11	14	7.0	14
Lead	µg/L	0.6	81.65	3.18	N		2.01		0.321	26.21	0.527	1.68	1.68	1.55	2.61	3.11	5.2	2.6	5.2
Mercury	µg/L	0.6	R	R	0.051	0.051	2.01	0.1023										0.051	0.10
Nickel	µg/L	0.6	469.17	52.16	4600	4600	2.01	9228	0.321	150.6	0.527	27.51	27.51	1.55	42.71	3.11	86	43	86
Selenium	µg/L	0.6	20.00	5.00	N		2.01		0.321	6.42	0.527	2.64	2.64	1.55	4.09	3.11	8.2	4.1	8.2
Silver	µg/L	0.6	4.06				2.01		0.321	1.30	0.527		1.30	1.55	2.02	3.11	4.1	2.0	4.1
Zinc	µg/L	0.6	119.82	119.82			2.01		0.321	38.47	0.527	63.20	38.47	1.55	59.72	3.11	120	60	120
Cyanide	µg/L	0.6	22.00	5.20	22,0000	22,0000	2.01	44,1362	0.321	7.06	0.527	2.74	2.74	1.55	4.26	3.11	8.5	4.3	8.5

R = Reserved
N = Narrative
[1] Calculations include rounded results. Final AMALs/MDALs are rounded to 2 significant digits.
[2] Where criteria are based on hardness, a value of 100 mg/L CaCO3 was used for these sample calculations.

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Table F-12: Calculations of Saltwater Action Levels

Parameter	Units	CV	Aquatic Life Criteria		Human Health Criteria	HH Calculations			Aquatic Life Calculations									Final Action Levels	
			C acute = CMC tot	C chronic = CCC tot	HH-Organisms only	ECA_{HH} = $AMAL_{HH}$	AMAL/MDAL Multiplier$_{HH}$	$MDAL_{HH}$	ECA Multiplier$_{acute}$	LTA_{acute}	ECA Multiplier$_{chronic}$	$LTA_{chronic}$	Lowest LTA	AMAL Multiplier$_{95}$	$AMAL_{AL}$	MDAL Multiplier$_{99}$	$MDAL_{AL}$	Lowest AMAL	Lowest MDAL
Cadmium	µg/L	0.6	42.25	9.36	N		2.01		0.321	13.57	0.527	4.93	4.93	1.55	7.66	3.11	15.4	7.7	15
Copper	µg/L	0.6	5.78	3.73			2.01		0.321	1.86	0.527	1.97	1.86	1.55	2.88	3.11	5.8	2.9	5.8
Lead	µg/L	0.6	220.82	8.52	N		2.01		0.321	70.90	0.527	4.49	4.49	1.55	6.97	3.11	14	7.0	14
Mercury	µg/L	0.6	R	R	0.051	0.051	2.01	0.1023										0.051	0.10
Nickel	µg/L	0.6	74.75	8.28	4600	4600	2.01	9228	0.321	24.00	0.527	4.37	4.37	1.55	6.78	3.11	14	6.8	14
Selenium	µg/L	0.6	290.58	71.14	N		2.01		0.321	93.30	0.527	37.52	37.52	1.55	58.25	3.11	117	58	117
Silver	µg/L	0.6	2.24				2.01		0.321	0.72	0.527		0.72	1.55	1.11	3.11	2.2	1.1	2.2
Zinc	µg/L	0.6	95.14	85.62			2.01		0.321	30.55	0.527	45.16	30.55	1.55	47.42	3.11	95	47	95
Cyanide	µg/L	0.6	1.00	1.00	22,0000	22,0000	2.01	44,1362	0.321	0.32	0.527	0.53	0.32	1.55	0.50	3.11	1.0	0.50	1.0

R = Reserved
N = Narrative
[1] Calculations include rounded results. Final AMALs/MDALs are rounded to 2 significant digits.

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Basin Plan Requirements for Other Pollutants

A number of pollutants were identified that exceed applicable Basin Plan objectives. These objectives however, are not amenable to the SIP process for developing action levels.

Resolution No. 01-018, Amendment to the Water Quality Control Plan for the Los Angeles Region to Update the Bacteria Objectives for Water Bodies Designated for Water Contact Recreation, adopted by the Regional Water Board on October 25, 2001, served as the basis for the action levels for bacteria. Subsequently, the Basin Plan was amended through Order No. R10-005 (effective on December 5, 2011) to remove the freshwater fecal coliform numeric objective while retaining the freshwater objective for *E. coli*. The dry-weather evaluation conducted for fecal coliform indicates of a need for a bacteria action level. Since the Basin Plan no longer contains freshwater objectives for fecal coliform, action levels have been developed for *E. coli* in freshwater. The current bacteria objectives (saltwater and freshwater) are applied directly to the MS4 outfalls discharging to freshwaters to serve as action levels.

The Basin Plan, in Tables 3-5 through 3-7, include chemical constituents objectives based on the incorporation of Title 22, Drinking Water Standards, by reference, to protect the surface water MUN beneficial use. The Basin Plan in Tables 3-8 and 3-10 also includes mineral quality objectives that apply to specific watersheds and stream reaches and where indicated by the beneficial use of ground water recharge (GWR). These objectives contained in the Basin Plan are listed as not-to-exceed values. Consistent with the approach used by the Regional Water Board in other Orders for dry weather discharges, these not-to-exceed values will be applied as AMALs in this Order.

(2) Discharges to the Surf Zone

From the Table B water quality objectives of the Ocean Plan, action levels are calculated according to Equation 1 of the Ocean Plan for all pollutants:

$$Ce = Co + Dm(Co-Cs)$$

Where:

Ce = the Action Level (µg/L)
Co = the water quality objective to be met at the completion of initial dilution (µg/L)
Cs = background seawater concentration (µg/L)
Dm = minimum probable initial dilution expressed as parts seawater per part wastewater

The Dm is based on observed waste flow characteristics, receiving water density structure, and the assumption that no currents of sufficient strength to influence the initial dilution process flow across the discharge structure. Initial dilution is the process that results in the rapid and irreversible turbulent mixing of wastewater with ocean water around the point of discharge. It is conservatively assumed that when non-storm water discharges to the surf zone occur, that conditions are such that no rapid mixing would occur. Therefore, an initial dilution is not allowed and the formula above reduces to:

Ce = Co

The following demonstrates how the action levels for copper are established.

Copper
Ce = 3 µg/L (6-Month Median)
Ce = 12 µg/L (Daily Maximum)
Ce = 30 µg/L (Instantaneous Maximum)

ii. Applicability of Action Levels

The action levels included in this Order apply to pollutants in non-storm water discharges from the MS4 to receiving waters that are not already subject to WQBELs to implement TMDL wasteload allocations applicable during dry weather.

This Order requires outfall-based monitoring throughout each Watershed Management Area, including monitoring during dry weather. The dry weather monitoring data will be evaluated by the Permittee(s) in comparison to all applicable action levels.

iii. Requirements When Action Levels are Exceeded

When monitoring data indicates an action level is exceeded for one or more pollutants, then the Permittee will be required to implement actions to identify the source of the non-storm water discharge, and depending on the identified source, implement an appropriate response. With respect to action levels, the Permittee will have identified appropriate procedures within the Watershed Management Program (Part VI.C) and the Illicit Connection and Illicit Discharge Elimination Program (Part VI.D.9).

G. New Development/Re-Development Tracking

This Order requires the use of Low Impact Development (LID) designs to reduce storm water runoff (and pollutant discharges) from new development or re-development projects. In areas that drain to water bodies that have been armored or are not natural drainages, the goal of this requirement is to protect water quality by retaining on-site the

storm water runoff from the 85th percentile storm event. This is the design storm used throughout most of California for water quality protection. If it is not technically feasible due to site constraints (e.g., close proximity to a drinking water supply, slope instability) or if instead the project proponent is proposing to supplement a groundwater replenishment project, the project proponent may provide treatment BMPs to reduce pollutant loading in storm water runoff from the project site. Flow through treatment BMPs are less effective in reducing pollutant loadings than on-site retention for the design storm. Therefore the project proponent must mitigate the impacts further by providing for LID designs at retrofit projects or other off-site locations within the same subwatershed. The effectiveness monitoring is designed to assess and track whether post construction operation of the LID designs are effective in retaining the design storm runoff volume.

For projects located in natural drainages, the goal of the LID design is to retain the pre-development hydrology, unless a water body is not susceptible to hydromodification effects (e.g., estuaries or the ocean). Smaller projects that will disturb less than 50 acres of land are presumed to meet the criteria if the project retains the storm water runoff from the 95th percentile storm. The effectiveness monitoring in this situation should be design to confirm that storm water runoff is not occurring for any storm at or less than the 95th percentile storm. Projects may also demonstrate compliance by showing that the erosion potential will be approximately 1 as described in Attachment J of this Order. For larger projects, the project proponent may be required to conduct modeling to demonstrate compliance by comparing the hydrographs of a two-year storm for the pre-development and post-development conditions, or by comparing the flow duration curves for a reference watershed and the post project condition. Flow monitoring will be required to substantiate the simulated hydrographs or flow duration curves.

Monitoring studies conducted by the California Department of Public Health (CDPH) have documented that mosquitoes opportunistically breed in structural storm water Best Management Practices (BMPs), particularly those that hold standing water for over 96 hours. Certain Low Impact Development (LID) site design measures that hold standing water such as rainwater capture systems may similarly produce mosquitoes. BMPs and LID design features should incorporate design, construction, and maintenance principles to promote drainage within 96 hours to minimize standing water available to mosquitoes. This Order requires regulated MS4 Permittees to coordinate with other agencies necessary to successfully implement the provisions of this Order. These agencies may include CDPH and local mosquito and vector control agencies on vector-related issues surrounding implementation of post-construction BMPs.

This Order is not intended to prohibit the inspection for or abatement of vectors by the State Department of Public Health or local vector agencies in accordance with CA Health and Safety Code, § 116110 et seq. and Water Quality Order No. 2012-0003-DWQ.

H. Regional Studies

1. Southern California Stormwater Monitoring Coalition Watershed Monitoring Program

As a condition to this Order, Permittees must participate in the bioassessment studies conducted under the Southern California Stormwater Monitoring Coalition Watershed Monitoring Program. Bioassessment provides a direct measure of whether aquatic life beneficial uses are fully supported and integrates the effects of multiple factors including pollutant discharges, changes in hydrology, geomorphology, and riparian buffers.

I. Aquatic Toxicity Monitoring Methods

Based on the stated goals of the CWA, the USEPA and individual states implement three approaches to monitoring water quality. These approaches include chemical-specific monitoring, toxicity testing, and bioassessments (USEPA 1991a). Each of the three approaches has distinct advantages and all three work together to ensure that the physical, chemical and biological integrity of our waters are protected. Water quality objectives have been developed for only a limited universe of chemicals. For mixtures of chemicals with unknown interactions or for chemicals having no chemical-specific objectives, the sole use of chemical-specific objectives to safeguard aquatic resources would not ensure adequate protection. Aquatic life in southern California coastal watersheds are often exposed to nearly 100% effluent from wastewater treatment plants, urban runoff, or storm water; therefore, toxicity testing and bioassessments are also critical components for monitoring programs as they offer a more direct and thorough confirmation of biological impacts. The primary advantage of using the toxicity testing approach is that this tool can be used to assess toxic effects (acute and chronic) of all the chemicals in aqueous samples of effluent, receiving water, or storm water. This allows the cumulative effect of the aqueous mixture to be evaluated, rather than the toxic responses to individual chemicals (USEPA, EPA Regions 8, 9, and 10 Toxicity Training Tool, January 2010).

Based on available data from the LA County MS4 Permit Annual Monitoring Reports, samples collected at mass emissions stations during both wet weather and dry weather have been found to be toxic in the San Gabriel River, Coyote Creek, the Los Angeles River, Dominguez Channel, Ballona Creek, Malibu Creek, and the Santa Clara River, demonstrating the need for this toxicity monitoring requirement (see Table below).

Summary of Toxicity by Watershed							
Source and Season	San Gabriel River	Coyote Creek	Los Angeles River	Dominguez Channel	Ballona Creek	Malibu Creek	Santa Clara River
Integrated Receiving Water Impacts Report (1994-2005)							
Wet Weather	-	CDS, CDR, SUF	CDS, SUF	CDS, CDR, SUF	CDR, SUF	CDR	CDS
Dry Weather	-	SUF	SUF	SUF	SUF	-	-

Annual Monitoring Reports (2005-2010)							
Wet Weather							
2005-06	-	-	SUF	CDS, CDR, SUF	SUF	-	-
2006-07	SUF	SUF	SUF	SUF	SUF	SUF	SUF
2007-08	SUF	-	-	SUF	-	CDS,CDR,SUF	SUF
2008-09	-	SUF	SUF	-	SUF	CDS,CDR,SUF	-
2009-10	-	-	-	-	-	-	-
Dry Weather							
2005-06	-	-	-	-	-	CDS,CDR	-
2006-07	-	-	-	-	SUF	-	-
2007-08	-	-	CDS,CDR	-	SUF	-	-
2008-09	-	-	SUF	-	-	-	-
2009-10	-	-	-	-	-	-	-

Notes:
CDS= Ceriodaphnia survival toxicity
SUF= Sea Urchin fertilization toxicity
CDR= Ceriodaphnia reproduction toxicity

This Order requires Permittee(s) to conduct chronic toxicity tests on water samples, by methods specified in *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms* (EPA/821/R-02/013, 2002; Table IA, 40 CFR Part 136) or a more recent edition.

To determine the most sensitive test species, the Permittee(s) shall conduct two wet weather and two dry weather toxicity tests with a vertebrate, an invertebrate, and a plant. After this screening period, subsequent monitoring shall be conducted using the most sensitive test species. Alternatively, if a sensitive test species has already been determined, or if there is prior knowledge of potential toxicant(s) and a test species is sensitive to such toxicant(s), then monitoring shall be conducted using only that test species. Sensitive test species determinations shall also consider the most sensitive test species used for proximal receiving water monitoring. After the screening period, subsequent monitoring shall be conducted using the most sensitive test species. Rescreening shall occur in the fourth year of the permit term.

For brackish water, this Order requires the Permittee(s) to conduct the chronic toxicity test in accordance with USEPA's Short-Term Methods for Estimating the Chronic Toxicity of Effluent and Receiving Waters to West Coast Marine and Estuarine Organisms, First Edition, August 1995, (EPA/600/R-95/136), or Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms, Third Edition, October 2002, (EPA/821-R-02-014), or a more recent edition.

Furthermore, the toxicity component of the Monitoring Program includes toxicity identification procedures so that pollutants that are causing or contributing to acute or

chronic effects in aquatic life exposed to these waters can be identified and others can be discounted. TIEs are needed to identify the culprit constituents to be used to prioritize management actions. Where toxicants are identified in a MS4 discharge, the Order requires a Toxicity Reduction Plan (TRE).

TRE development and implementation is directly tied to the integrated monitoring programs and watershed management program, to ensure that management actions and follow-up monitoring are implemented when problems are identified. Permittees are encouraged to coordinate TREs with concurrent TMDLs where overlap exists. If a TMDL is being developed or implemented for an identified toxic pollutant, much of the work necessary to meet the objectives of a TRE may already be underway, and information and implementation measures should be shared.

Overall, the toxicity monitoring program will assess the impact of storm water and non-storm water discharges on the overall quality of aquatic fauna and flora and implement measures to ensure that those impacts are eliminated or reduced. As stated previously, chemical monitoring does not necessarily reveal the totality of impacts of storm water on aquatic life and habitat-related beneficial uses of water bodies. Therefore, toxicity requirements are a necessary component of the MS4 monitoring program.

J. Special Studies

Requirements to conduct special studies as described in TMDL Implementation Plans that were approved by the Executive Officer of the Regional Water Board prior to the effective date of this Order are incorporated into this Order by reference.

K. Annual Reporting

The Annual Reporting requirement was also required in Order No. 01-182 and provides summary information to the Regional Water Board on each Permittee's participation in one or more Watershed Management Programs; the impact of each Permittee(s) storm water and non-storm water discharges on the receiving water; each Permittee's compliance with receiving water limitations, numeric water quality based effluent limitations, and non-storm water action levels; and the effectiveness of each Permittee(s) control measures in reducing discharges of pollutants from the MS4 to receiving waters. In addition the Annual Report allows the Regional Water Board to assess whether the quality of MS4 discharges and the health of receiving waters is improving, staying the same, or declining as a result watershed management program efforts, and/or TMDL implementation measures, or other Control Measures and whether changes in water quality can be attributed to pollutant controls imposed on new development, re-development, or retrofit projects. The Annual Report provides the Permittee(s) a forum to discuss the effectiveness of its past and ongoing control measure efforts and to convey its plans for future control measures as well as a way to present data and conclusions in a transparent manner so as to allow review and understanding by the general public. Overall the Annual Report allows Permittee's to focus reporting efforts on watershed condition, water quality assessment, and an evaluation of the effectiveness of control measures.

L. Watershed Summary Information, Organization and Content

As a means to establish a baseline and then identify changes or trends, for each watershed, each Permittee shall provide the information on its watershed management area, subwatershed area, and drainage areas within the subwatershed area in its odd year Annual Report (e.g., Year 1, 3, 5). The requested information should be provided for each watershed within the Permittee's jurisdiction. Alternatively, permittees participating in a Watershed Management Program may provide the requested information through the development and submission of a Watershed Management Program report or within a TMDL Implementation Plan Annual Report. However, in either case, the Permittee shall bear responsibility for the completeness and accuracy of the referenced information. This reporting requirement helps to ensure that both the Permittee and the Regional Water Board have up to date information on the status of each of their watersheds and subwatersheds.

M. Jurisdictional Assessment and Reporting

The requested information shall be provided for each watershed within the Permittee's jurisdiction. Annual Reports submitted on behalf of a group of Watershed Permittees shall clearly identify all data collected and strategies, control measures, and assessments implemented by each Permittee within its jurisdiction as well as those implemented by multiple Permittees on a watershed scale. Permittees must provide information on storm water control measures, an effectiveness assessment of storm water control measures, information on non-storm water control measures, an effectiveness assessment of non-storm water control measures, an integrated monitoring compliance report, information on adaptive management strategies, and supporting data and information. The addition of this reporting requirement serves as a mechanism to evaluate and ensure the protection of receiving water quality on a watershed scale. If Permittees do not elect to develop a Watershed Management Program, all required information shall be provided by the Permittee for its jurisdiction.

N. TMDL Reporting

Reporting requirements included in this Order and Attachment E (MRP) were established during the TMDL development process for each individual TMDL. These reporting requirements have incorporated into this Order to implement TMDL requirements.

VIII. CALIFORNIA WATER CODE SECTION 13241

California Water Code section 13241 requires the Regional Water Board to consider certain factors, including economic considerations, in the adoption of water quality objectives. California Water Code section 13263 requires the Board to take into consideration the provisions of section 13241 in adopting waste discharge requirements. In *City of Burbank v. State Water Resources Control Board* (2005) 35 Cal.4th 613, the California Supreme Court considered whether regional water boards must comply with section 13241 when issuing waste discharge requirements under section 13263(a) by taking into account the costs a

permittee will incur in complying with the permit requirements. The Court concluded that whether it is necessary to consider such cost information "depends on whether those restrictions meet or exceed the requirements of the federal Clean Water Act." (*Id.* at p. 627.) The Court ruled that regional water boards may not consider the factors in section 13241, including economics, to justify imposing pollutant restriction that are less stringent than the applicable federal law requires. (*Id.* at pp. 618, 626-627 ["[Water Code s]ection 13377 specifies that [] discharge permits issued by California's regional boards must meet the federal standards set by federal law. In effect, section 13377 forbids a regional board's consideration of any economic hardship on the part of the permit holder if doing so would result in the dilution of the requirements set by Congress in the Clean Water Act…Because section 13263 cannot authorize what federal law forbids, it cannot authorize a regional board, when issuing a [] discharge permit, to use compliance costs to justify pollutant restrictions that do not comply with federal clean water standards"].) However, when the pollutant restrictions in an NPDES permit are more stringent than federal law requires, California Water Code section 13263 requires that the Water Boards consider the factors described in section 13241 as they apply to those specific restrictions.

The Regional Water Board finds that the requirements in this Order are not more stringent than the minimum federal requirements. Among other requirements, federal law requires MS4 permits to include requirements to effectively prohibit non-storm water discharges into the storm sewers, in addition to requiring controls to reduce the discharge of pollutants in storm water to the maximum extent practicable and other provisions that the agency determines are necessary for the control of pollutants in MS4 discharges. The requirements in this Order may be more specific or detailed than those enumerated in federal regulations under 40 CFR § 122.26 or in USEPA guidance. However, the requirements have been designed to be consistent with and within the federal statutory mandates described in Clean Water Act section 402(p)(3)(B)(ii) and (iii) and the related federal regulations and guidance. Consistent with federal law, all of the conditions in this Order could have been included in a permit adopted by USEPA in the absence of the in lieu authority of California to issue NPDES permits. Moreover, the inclusion of numeric WQBELs in this Order does not cause the permit to be more stringent than current federal law. Federal law authorizes both narrative and numeric effluent limitations to meet state water quality standards. The inclusion of WQBELs as discharge specifications in an NPDES permit in order to achieve compliance with water quality standards is not a more stringent requirement than the inclusion of BMP based permit limitations to achieve water quality standards. (State Water Board Order No. WQ 2006-0012 (*Boeing*).) Therefore, consideration of the factors set forth in section 13241 is not required for permit requirements that implement the effective prohibition on the discharge of non-storm water discharges into the MS4, or for controls to reduce the discharge of pollutants in storm water to the maximum extent practicable, or other provisions that the Regional Water Board has determined appropriate to control such pollutants, as those requirements are mandated by federal law..

Notwithstanding the above, the Regional Water Board has considered the factors set forth in California Water Code section 13241 in issuing this Order. That analysis is provided below. The Regional Water Board has also considered all of the evidence that has been presented to the Board regarding the section 13241 factors in adopting this Order. The Regional Water Board finds that the requirements in this Order are reasonably necessary to protect beneficial uses identified in the Basin Plan, and the economic information related

to costs of compliance and other section 13241 factors are not sufficient to justify failing to protect those beneficial uses. Where appropriate, the Regional Water Board has provided Permittees with additional time to implement control measures to achieve final WQBELs and/or water quality standards.

A. *Past, present and probable future beneficial uses of water.*

Chapter 2 of the Basin Plan identifies designated beneficial uses for water bodies in the Los Angeles Region, which are the receiving waters for MS4 discharges. Beneficial uses are also identified in the findings of this Order and further discussed relative to TMDLs in section VI.D of this Fact Sheet.

B. *Environmental characteristics of the hydrographic unit under consideration, including the quality of water available thereto.*

Environmental characteristics of each of the Watershed Management Areas covered by this Order, including the quality of water, are discussed in the Region's Watershed Management Initiative Chapter as well as available in State of the Watershed reports and the State's CWA Section 303(d) List of impaired waters.

- Santa Clara River Watershed Management Area
  www.waterboards.ca.gov/losangeles/water_issues/programs/regional_program/wmi/santa_clara_river_watershed/santa_clara_river_watershed.doc
- Santa Monica Bay Watershed Management Area
  www.waterboards.ca.gov/losangeles/water_issues/programs/regional_program/wmi/santa_monica_bayWMA/santa_monica_bayWMA.doc
- Dominguez Channel Watershed Management Area
  www.waterboards.ca.gov/losangeles/water_issues/programs/regional_program/wmi/dominguez_channelWMA/dominguez_channelWMA.doc
- Los Angeles River Watershed Management Area
  www.waterboards.ca.gov/losangeles/water_issues/programs/regional_program/wmi/los_angeles_river_watershed/los_angeles_river_watershed.doc
- San Gabriel River Watershed Management Area
  www.waterboards.ca.gov/losangeles/water_issues/programs/regional_program/wmi/san_gabriel_river_watershed/san_gabriel_river_watershed.doc
- Los Cerritos Channel and Alamitos Bay Watershed Management Area
  www.waterboards.ca.gov/losangeles/water_issues/programs/regional_program/wmi/los_cerritos_channelWMA/los_cerritos_channelWMA.doc
- Middle Santa Ana River Watershed Management Area
  http://www.waterboards.ca.gov/santaana/water_issues/programs/wmi/index.shtml
  http://www.sawpa.org/watershedinfo.html

The quality of water in receiving waters for MS4 discharges has been routinely monitored by Permittees through the Monitoring and Reporting Program under Order No. 01-182. Below are summaries of water quality exceedances reported for the 2010-2011 reporting year.

Summary of Constituents that Did Not Meet Water Quality Objectives at Mass Emission Stations during 2010-2011 for One or More Events

Mass Emission/Watershed	Wet	Dry
Ballona Creek (S01)[1]	Fecal coliforms[2] pH[3] Dissolved zinc	pH[3]
Malibu Creek (S02)	Fecal coliforms Cyanide pH[3] Sulfate	Fecal coliforms Sulfate
Los Angeles River (S10)[1]	Fecal coliforms[2] pH[3] Dissolved zinc Cyanide	Fecal coliforms pH[3]
Coyote Creek (S13)	Fecal coliforms[2] pH[3] Dissolved zinc	Fecal coliforms
San Gabriel River (S14)	Fecal coliforms[2] pH[3]	
Dominguez Channel (S28)[1]	Fecal coliforms[2] Dissolved copper Dissolved zinc	Fecal coliforms pH[3]
Santa Clara River (S29)	Fecal coliforms pH[3] Dissolved zinc	

[1] More urbanized watersheds.
[2] Subject to the fecal coliform water quality objective high-flow suspension (LARWQCB, 2003).
[3] pH was evaluated outside of holding time.

The following table summarizes the results of an analysis based on evaluation of the 15 sets of dry weather data for the period of 2005 to 2011 for each of the mass emission stations. The most prevalent pollutants of concern among the mass emission stations include fecal coliform bacteria, cyanide, mercury, chloride, sulfate, total dissolved solids, copper, and selenium. Reported results for fecal coliform bacteria, cyanide, copper, and

selenium concentrations consistently exceeded water quality objectives in all watersheds. For watersheds where objectives apply for sulfate and total dissolved solids, the receiving water concentrations consistently exceeded the objectives. The incidences where exceedances are indicated for mercury are largely due to analytical detection levels that were higher than the applicable objective.

Summary of LA County Watersheds and Frequency of Receiving Water Exceeding Water Quality Objectives (2005 to 2011 - Dry Season Data Analysis)[1]

Parameter	Santa Clara River	Los Angeles River	Dominguez Channel	Ballona Creek	Malibu Creek	San Gabriel River	
						Upper Portion	Lower Portion
pH	0/15	7/15	5/15	3/15	0/15	1/14	2/15
Total Coliform	No FW[3] Objective	No FW[3] Objective	No FW[3] Objective	No FW[3] Objective	No FW[3] Objective	No FW[3] Objective	No FW[3] Objective
Fecal Coliform	4/15	4/15	10/15	13/15	6/15	11/14	13/15
Enterococcus	No FW[3] Objective	No FW[3] Objective	No FW[3] Objective	No FW[3] Objective	No FW[3] Objective	No FW[3] Objective	No FW[3] Objective
Chloride	15/15	15/15	No Objective	0/15	0/15	14/14	15/15
Dissolved Oxygen	1/15	0/15	0/15	0/15	0/15	1/14	0/15
Nitrate-N	0/15	0/15	No Objective	No Objective	0/15	7/14	No Objective
Nitrite-N	0/15	3/15	No Objective	No Objective	0/15	0/15	No Objective
Methylene Blue Active Substances	4/15	0/15	No Objective	No Objective	0/15	0/14	No Objective
Sulfate	15/15	15/15	No Objective	No Objective	15/15	14/14	15/15
Total Dissolved Solids	15/15	15/15	No Objective	No Objective	13/15	14/14	15/15
Turbidity[2]	0/15	2/15	No Objective	No Objective	0/15	0/15	0/15
Cyanide	11/15	14/15	4/15	15/15	3/15	14/14	15/15
Total Aluminum	1/15	2/15	No Objective	No Objective	0/15	1/14	No Objective
Dissolved Copper	0/15	0/15	5/15	0/15	0/15	13/14	0/15
Total Copper	1/15	6/15	11/15	3/15	0/15	13/14	2/15
Dissolved Lead	0/15	0/15	0/15	0/15	0/15	1/14	0/15
Total Lead	0/15	0/15	1/15	1/15	0/15	13/14	0/15
Total Mercury	1515	14/15	14/15	15/15	15/15	14/14	15/15
Dissolved Mercury	15/15	15/15	15/15	15/15	15/15	14/14	14/14
Total Nickel	0/15	0/15	0/15	0/15	0/15	1/14	0/15
Dissolved Selenium	2/15	2/15	1/15	2/15	6/15	1/15	10/11
Total Selenium	2/15	2/15	1/15	2/15	6/15	1/15	10/11
Dissolved Zinc	0/15	0/15	0/15	0/15	0/15	7/10	0/15
Total Zinc	0/15	0/15	0/1)	0/15	0/15	10/10	0/15

[1] Frequency of exceedance is denoted as number of exceedances/number of dry weather samples evaluated. For example, “2/15” indicates 2 of the 15 samples had analytical results that exceeded the water quality objective for a given parameter.

[2] The Basin Plan water quality objective for turbidity for the protection of MUN is the secondary MCL of 5 NTU. The Basin Plan contains additional turbidity objectives expressed as incremental changes over natural conditions. Since inadequate data were available to assess criteria expressed as incremental changes, only the MCL was considered in the analysis.

[3] FW means freshwater

C. *Water quality conditions that could reasonably be achieved through the coordinated control of all factors which affect water quality in the area.*

Since 2001, municipalities both locally and nationally have gained considerable experience in the management of municipal storm water and non-storm water discharges. The technical capacity to monitor storm water and its impacts on water quality has also increased. In many areas, monitoring of the impacts of storm water on water quality has become more sophisticated and widespread. Better information on the effectiveness of storm water controls to reduce pollutant loadings and address water quality impairments is now available. The International Stormwater BMP Database (http://www.bmpdatabase.org/) provides extensive information of the performance capabilities of storm water controls. Additionally, the County of Los Angeles conducted a BMP effectiveness study as a requirement of Order No. 01-182.[50]

Generally, improvements in the quality of receiving waters impacted by MS4 discharges can be achieved by reducing the volume of storm water or non-storm water discharged through the MS4 to receiving waters; reducing pollutant loads to storm water and non-storm water through source control/pollution prevention, including operational source control such as street sweeping, public education, and product or materials elimination or substitution; and removing pollutants that have been loaded into storm water or non-storm water before they enter receiving waters, through treatment or diversion to a sanitary sewer. The following factors are generally accepted to affect pollutant concentrations in MS4 discharges[51]:

- Land use
- Climatic conditions
- Season (i.e. for southern California, dry season and winter wet season)
- Percentage imperviousness (in particular, “effective impervious area” or “EIA”)
- Rainfall amount and intensity (including seasonal “first-flush” effects)
- Runoff amount
- Watershed size
- Motor vehicle operation
- Aerial deposition

In their 2010-2011 Annual Report, Permittees identified the following storm water and non-storm water pollutant control measures as particularly effective:

- Street sweeping;
- Catch basin cleaning;
- Catch basin inserts
- Trash bins;
- End-of-pipe controls such as low-flow diversions;
- Infiltration controls;
- Erosion controls; and

[50] County of Los Angeles Department of Public Works. “Los Angeles County BMP Effectiveness Study,” August 2005.
[51] Maestre, Alexander and Robert Pitt. “Identification of Significant Factors Affecting Stormwater Quality Using the NSQD” (draft monograph, 2005).

- Public education and outreach, including multi-lingual strategies.

Permittees summarized the most-used BMPs and most popular BMPs (according to the number of Permittees using a particular BMP) in their 2010-2011 Annual Report. An itemization of all BMPs installed and maintained during the 2010-11 reporting period is provided in Appendices B and C of the Permittees' Annual Report.

Most installed BMPs County-wide During 2010-11

BMP Type	Total Number Installed
Catch Basin Connector Pipe Full Capture (CPS)	6377
Fossil Filter Catch Basin Insert	5968
Automatic Retractable Catch Basin Trash Screen (ARS)	3870
Clean Screen Catch Basin Insert	3767
Extra Trash Can	3681
Covered Trash Bin	3119
Signage and Stenciling	1884
Drain Pac Catch Basin Insert	1625
CulTec Infiltration Systems	1296
Infiltration Trenches	963
Infiltration Pit	958
Abtech Ultra Urban Catch Basin Insert	748
CDS Gross Pollutant Separator	438
United Storm Water Catch Basin Scree Inserts	403
Restaurants Vent Traps	258
Stormceptor Gross Pollutant Separators	211

Most Used Proprietary and Non-Proprietary BMPs During 2010-11

Types of Nonproprietary BMPs Used By Most Permittees		**Types Proprietary BMPs Used By Most Permittees**	
BMP Type	**No. of Cities**	**BMP Type**	**No. of Cities**
Infiltration Trenches	40	Fossil Filter Catch Basin Inserts	46
Covered Trash Bins	32	CDS Gross Pollutant Separator	36
Extra Trash Cans	31	Drain Pac Catch Basin Insert	21
Enhanced Street Sweeping	26	Clean Screen Catch Basin Insert	21

Dog Parks	23	Stormceptor Gross Pollutant Separator	19

Some of the many advances in how to effectively control storm water and pollutants in storm water have occurred locally within the Los Angeles Region and include the development of cost effective trash full capture devices, storm water diversion, treatment and beneficial use facilities such as SMURRF and storm water capture, storage, and reuse facilities such as Sun Valley, low impact development/site design practices, and innovative/opportunistic culvert inlet multi-media filters. There are many other case studies of municipalities that have implemented innovative and effective storm water management measures (e.g., Portland, OR).

This Order is designed to reduce pollutant loading to waterbodies within Los Angeles County from discharges to and from the Los Angeles County MS4 through the implementation of multi-faceted storm water management programs at the municipal and watershed levels. Overall improvements in MS4 discharge quality are expected to occur over time with ongoing implementation of the Los Angeles County MS4 Permit. However, currently little information on the quality of storm water in the region and the water quality that can be achieved with the coordinated control of all MS4 discharges through full implementation of all storm water management measures by individual municipalities and collectively by all Permittees within a watershed is available. This Order, however, is designed to effectively focus and broaden monitoring requirements with the addition of outfall monitoring and monitoring associated with the 33 TMDLs being incorporated, so pollutant loading from the MS4 can be better quantified and improvements in water quality resulting from implementation of storm water management measures can be tracked.

D. *Economic considerations.*

The Regional Water Board recognizes that Permittees will incur costs in implementing this Order above and beyond the costs from the Permittees' prior permit. Such costs will be incurred in complying with the post-construction, hydromodification, Low Impact Development, TMDL, and monitoring and reporting requirements of this Order. The Regional Water Board also recognizes that, due to California's current economic condition, many Permittees currently have limited staff and resources to implement actions to address its MS4 discharges. Based on the economic considerations below, the Board has provided permittees a significant amount of flexibility to choose how to implement the permit. This Order allows Permittees the flexibility to address critical water quality priorities, namely discharges to waters subject to TMDLs, but aims to do so in a focused and cost-effective manner while maintaining the level of water quality protection mandated by the Clean Water Act and other applicable requirements. For example, the inclusion of a watershed management program option allows Permittees to submit a plan, either individually or in collaboration with other Permittees, for Regional Water Board Executive Officer approval that would allow for actions to be prioritized based on specific watershed needs. The Order also allows Permittees to customize monitoring requirements, which they may do individually, or in collaboration with other Permittees. In the end, it is up to the permittees to determine the effective BMPs and measures needed to comply with this Order. Permittees

can choose to implement the least expensive measures that are effective in meeting the requirements of this Order. This Order also does not require permittees to fully implement all requirements within a single permit term. Where appropriate, the Board has provided permittees with additional time outside of the permit term to implement control measures to achieve final WQBELs and/or water quality standards. Lastly, this Order includes several reopener provisions whereby the Board can modify this Order based on new information gleaned during the term of this Order.

Before discussing the economics associated with regulating MS4 discharges, it should be noted that there are instances outside of this Order where the Board previously considered economics. First, when the Board adopted the water quality objectives that serve as the basis for several requirements in this Order, it took economic considerations into account. (See *In re Los Angeles County Municipal Storm Water Permit Litigation* (Sup. Ct. Los Angeles County, March 24, 2005, Case No. BS 080548), Statement of Decision from Phase II Trial on Petitions for Writ of Mandate, p. 21.) Second, the cost of complying with TMDL wasteload allocations has been previously considered during the adoption of each TMDL. The costs of complying with the water quality based effluent limitations and receiving water limitations derived from the 33 TMDLs, which are incorporated into this Order, are not additive. For example, the costs estimated for compliance with a TMDL for one pollutant in a watershed, such as metals, can be applied to the costs to achieve compliance with a TMDL for another pollutant in the same watershed, such as pesticides, because the same implementation strategies can be used for both pollutants. Several MS4 permittees have recognized this opportunity in the multi-pollutant TMDL implementation plans they have submitted (e.g. Ballona Creek Metals/Bacteria TMDLs and Machado Lake Pesticides/Nutrients TMDLs). In other words, the estimated cost of complying with the Ballona Creek Metals TMDL can apply to metals, pesticides, PCBs, and bacteria. The costs for complying with trash TMDLs are based on different implementation strategies (e.g., full capture devices), but those strategies are effective at removing metals and toxic pollutants as well. Thus, the costs estimated for each TMDL should not be added to determine the cost of compliance with all TMDLs. The staff reports for the various TMDLs include this disclaimer, and also discuss the cost efficiencies that can be achieved by treating multiple pollutants. Further, the Board's considerations of economics in developing each TMDL have often resulted in lengthy implementation schedules to achieve water quality standards. Where appropriate, these implementation schedules have been used to justify compliance schedules in this Order.

<u>Economic Considerations of Regulating MS4 Discharges</u>

It is very difficult to determine the true cost of implementing storm water and urban runoff management programs because of highly variable factors and unknown level of implementation among different municipalities and inconsistencies in reporting by Permittees. In addition, it is difficult to isolate program costs attributable to permit compliance. Reported costs of compliance for the same program element can vary widely from Permittee to Permittee, often by a very wide margin that is not easily explained. Despite these problems, efforts have been made to identify storm water and urban runoff

management program costs, which can be helpful in understanding the costs of program implementation.

Economic considerations of implementing this Order were examined by primarily utilizing the data that are self-reported by the Permittees in their annual reports and a State Water Board funded study, which examined the costs of municipal MS4 programs statewide.[52] The economic impact to public agencies was tabulated based on the reported costs of implementing the six minimum control measures (Public Information and Participation, Industrial/Commercial Facilities Control, Development Planning, Development Construction, Public Agency Activities, and Illicit Connections and Illicit Discharges Elimination) required by 40 CFR section 122.26(d)(2)(iv) as well as costs associated with program management, monitoring programs, and a category described as other. As noted above, Permittees report wide variability in the cost of compliance, which is not easily explained. Based on reported values, the average annual cost to the Permittees in 2010-11 was $4,090,876 with a median cost of $687,633.

It is important to note that reported program costs are not all solely attributable to compliance with requirements of the LA County MS4 Permit. Many program components, and their associated costs, existed before the first LA County MS4 Permit was issued in 1990. For example, storm drain maintenance, street sweeping and trash/litter collection costs are not solely or even principally attributable to MS4 permit compliance, since these practices have long been implemented by municipalities. Therefore, the true program cost related to complying with MS4 permit requirements is some fraction of the total reported costs. For example, after adjusting the total reported costs by subtracting out the costs for street sweeping and trash collection, the average annual cost to the Permittees was $2,397,315 with a median cost of $290,000.

These results are consistent with the State Water Board funded study ("State Water Board Study") that surveyed the costs to develop, implement, maintain and monitor municipal separate storm sewer system management and control programs in 2004.[53] The objectives of the study were to: 1) document stormwater program costs and 2) assess alternative approaches to MS4 quality control. The six cities selected for the study were judged by State Water Board staff as having good MS4 management programs, adequate accounting systems, and represented a variety of geographic locations, hydrologic areas, populations and incomes. The cities selected were Corona, Encinitas, Fremont, Fresno-Clovis Metropolitan Area, Sacramento and Santa Clarita. The results found that the annual total cost per household ranged from $18 to $46. The average cost was found to be $35 and the median, $36. The true mean, which is derived by dividing the total sample costs by the total sample number of households, is $29 in 2002 dollars. This study was further examined and applied to the Ventura County MS4 Permit in "*Economic Considerations of the Proposed (February 25, 2008) State of California Regional Water Quality Control Board Los Angeles Region, Order 08-xxx, NPDES Permit No. CAS004002, Waste Discharge*

[52] Data from NPDES Stormwater Cost Survey, prepared by the Office of Water Programs, California State University, Sacramento (January 2005) and the Los Angeles County Municipal Storm Water Permit (Order No. 01-182), Unified Annual Stormwater Report, 2010 – 2011, http://ladpw.org/wmd/npdesrsa/annualreport/

[53] Currier, Brian K., Joseph M. Jones, Glenn L. Moeller. "NPDES Stormwater Cost Survey, Final Report", Prepared for California State Water Resources Control Board, California State University Sacramento, Office of Water Programs, January, 2005.

Requirements for Stormwater (Wet Weather) and Non-Stormwater (Dry Weather) Discharges from the Municipal Separate Storm Sewer Systems within the Ventura County Watershed Protection District, County of Ventura and the Incorporated Cities Therein," and found that when adjusted for inflation, the total annual cost to the MS4 Permittees ranged from $7.15 to $10.9 million, depending on the averaging method applied.

The State Water Board Study noted inherent limitations in the cost data quality. The most significant data quality limitation cited is that the costs provided by the municipalities were not sufficiently detailed or referenced to provide opportunity for independent review of the accuracy and completeness of the cost data. Similarly, the costs presented in the Los Angeles County Unified Annual Report ("Unified Annual Report") are not presented with supporting data or references so that they can be independently reviewed. Some of the limitations of the reported cost data are illustrated by a comparison of monitoring costs in different sections of the Unified Annual Report. In the monitoring costs section, the total costs for monitoring, including sample collection, analytical results, and sampling station maintenance was $713,409 for 2010-2011. In contrast, the same report showed the monitoring costs of $9,008,460 in the Unified Cost Table. Absent further explanation in the Unified Annual Report, this suggests that the reported costs may not be reliable.

The State Water Board Study also found that certain stormwater implementation costs included activities that provide separate and additional municipal benefits such as street sweeping and storm drain and channel cleaning. The State Water Board Study indicated that the inclusion of these costs as stormwater implementation costs is not uniform across different municipalities. In order to assess the variability of costs reported by different municipalities under the same permit and determine if Los Angeles County MS4 Permittees are reporting costs for activities that provide municipal benefits beyond storm water management and permit compliance, Regional Water Board staff reviewed costs reported by Los Angeles County MS4 Permittees in the Unified Annual Report. The reported storm water costs range from $11.45 to $928.10 per household per year. The average reported cost was $120.04 per household per year and the median cost was $57.31 per household per year. The wide spread of annual costs and the significant difference between the mean and median costs indicate that the LA County MS4 Permittees are not reporting costs in a uniform manner.

Board staff also reviewed available cost data in the Unified Annual Report for Permittees that provided separate costs regarding street sweeping and trash collection. Staff adjusted the total costs so that the costs for these multi-benefit municipal programs were not included in the storm water cost and found that the adjusted storm water costs were greatly reduced by excluding these activities. These adjusted costs ranged from $0.00 per household per year to $903.10 per household per year. The mean adjusted rate is $42.57 per household per year and the median adjusted rate is $17.89 per household per year. Clearly, a significant portion (greater than 50%) of the costs attributed to storm water compliance activities also provide additional municipal benefits. (In the case of the Los Angeles County MS4 Permittees, some municipalities reported costs for trash collection; these costs were not reported by municipalities in the State Water Board Study.)

Finally, Board staff reviewed the cost breakdowns reported in the State Water Board Study and the Unified Annual Report for Los Angeles County MS4 Permittees. The following table summarizes the results:

Cost Category	State Water Board Study	Los Angeles County (2010-2011)
Watershed Management	6%	5%
Construction	11%	1%
Illicit Discharge	4%	2%
Industrial and Commercial	8%	1%
Overall Management	37%	5%
Pollution Prevention	2%	2%
Post Construction	3%	
Public Education	13%	2%
Monitoring	16%	3%
BMP Maintenance	Not Reported	2%
Development	Not Reported	1%
Other	Not reported	76%

The reported costs show differences between the MS4 Permittees surveyed in the State Water Board Study and the Los Angeles County MS4 Permittee costs in the following categories: construction, industrial and commercial activities, public education and monitoring. These categories all show greater proportional statewide cost allocations relative to the cost allocations by the Los Angeles County MS4 Permittees. The Los Angeles County MS4 Permittees report a cost category of BMP maintenance, which is not defined in the State Water Board Study. The management costs in the State Water Board Study were greater than the management costs reported by the Los Angeles County MS4 Permittees, but the Los Angeles County MS4 Permittees also reported a category of "Other" that accounted for a large proportion of costs, which is not defined in the Unified Annual Report.

The State Water Board Study found that cost information is crucial in making management decisions regarding storm water requirements. The report also recommends that annual reports required under MS4 permits throughout the State follow a standard format for cost reporting and that costs for all MS4 program activities (per program area) should be identified as existing, enhanced or new according to the extent that the activity was required under the previous permit, is enhanced by the permit, or is exclusively a result of compliance efforts with new provisions of the MS4 permit.

Further, there is an element of cost consideration inherent in the maximum extent practicable (MEP) standard. While the term "maximum extent practicable" is not specifically defined in the Clean Water Act or its implementing regulations, USEPA, courts, and the State Water Board have addressed what constitutes MEP. MEP is not a one-size fits all approach. Rather, MEP is an evolving, flexible, and advancing concept, which considers practicability. This includes technical and economic practicability. Compliance with the MEP standard involves applying BMPs that are effective in reducing or eliminating the discharge

of pollutants in storm water to receiving waters. BMP development is a dynamic process, and the menu of BMPs may require changes over time as experience is gained and/or the state of the science and art progresses. MEP is the cumulative effect of implementing, evaluating, and making corresponding changes to a variety of technically appropriate and economically practicable BMPs, ensuring that the most appropriate controls are implemented in the most effective manner. The State Water Board has held that "MEP requires permittees to choose effective BMPs, and to reject applicable BMPs only where other effective BMPs will serve the same purpose, the BMPs would not be technically feasible, or the costs would be prohibitive." (State Water Board Order WQ 2000-11.)

In addition to considering the costs of storm water management, it is important to consider the benefits of storm water and urban runoff management programs. A recent study conducted by USC/UCLA assessed the costs and benefits of implementing various approaches for achieving compliance with the MS4 permits in the Los Angeles Region. The study found that non-structural systems would cost $2.8 billion but provide $5.6 billion in benefit. If structural systems were determined to be needed, the study found that total costs would be $5.7 to $7.4 billion, while benefits could reach $18 billion.[54] Costs are anticipated to be borne over many years. As can be seen, the benefits of the programs are expected to considerably exceed their costs. Such findings are corroborated by USEPA, which found that the benefits of implementation of its Phase II storm water rule would also outweigh the costs.[55]

Economic Considerations of Not Regulating MS4 Discharges

Economic discussions of storm water and urban runoff management programs tend to focus on costs incurred by municipalities in developing and implementing the programs. This is appropriate, and these costs are significant and a major issue for the Permittees. However, in adopting Order WQ 2000-11, the State Water Board further found that in considering the cost of compliance, it is also important to consider the costs of impairment; that is, the negative impact of pollution on the economy and the positive impact of improved water quality. For example, economic benefits may result through program implementation, and alternative costs (as well as environmental impacts) may be incurred by not fully implementing the program. So, while it is appropriate and necessary to consider the cost of compliance, it is also important to consider the alternative costs incurred by not fully implementing the programs, as well as the benefits which result from program implementation.

The benefits of implementation of the Los Angeles County MS4 Permit include improvements in water quality, enhancement of beneficial uses, and increased employment, income and satisfaction from environmental amenities. Most of the benefits of this permit can be identified and, in some cases, quantified in monetary terms. Others cannot be expressed in dollar terms and can only be described. For example, household willingness to pay for improvements in fresh water quality for fishing and boating has been estimated by USEPA[56] to be $158-210.62. This estimate can be considered conservative, since it does not include important considerations such as marine waters benefits, wildlife

[54] LARWQCB, 2004. Alternative Approaches to Stormwater Control.
[55] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791.
[56] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68793.

benefits, or flood control benefits. The California State University, Sacramento study corroborates USEPA's estimates, reporting annual household willingness to pay for statewide clean water to be $180.63.[57] When viewed in comparison to household costs of existing urban runoff management programs, these household willingness to pay estimates exhibit that per household costs incurred by Permittees to implement their urban runoff management programs remain reasonable.

Not regulating discharges from the Los Angeles County MS4 will result in greater pollution of rivers, streams, lakes, reservoirs, bays, harbors, estuaries, groundwater, coastal shorelines and wetlands. Urban runoff in southern California has been found to cause illness in people bathing near storm drains.[58] A study of south Huntington Beach and north Newport Beach found that an illness rate of about 0.8% among bathers at those beaches resulted in about $3 million annually in health-related expenses.[59] In addition, poor beach water quality negatively affects tourism, which in turn reduces revenues to local businesses.

Funding Sources.

Public agencies (both federal and state) recognize the importance of storm water improvement projects and have provided significant sources of funding through grants, bonds, and fee collections to help offset the costs of storm water management in Los Angeles County. The table below summarizes the funds that have been allocated to storm water management in Los Angeles County, to date.

Source of Money	Dollars	% of total costs funded by State (only for those projects which included State funding)
Only State Board-awarded funding (Propositions 12, 13, 40, 50, and 84; and federal money, 319h, 205j, ARRA)	$49,143,132	47%
Only State money from any State agency (propositions only, no federal); includes State Board, DWR, Coastal Conservancy, Fish & Game	$67,461,699	58%
Total costs (approx.) for projects involving State money	$114,703,731	N/A
Prop A	$4,981,772	N/A
Prop O	$508,678,258	N/A
Measure V	$9,107,959	N/A
Total Public Funds (federal,	$645,389,932	N/A (information not

[57] State Water Board, 2005. NPDES Stormwater Cost Survey. P. iv.
[58] Haile, R.W., et al, 1996. An Epidemiological Study of Possible Adverse Health Effects of Swimming in Santa Monica Bay. Santa Monica Bay Restoration Project.
[59] Los Angeles Times, May 2, 2005. Here's What Ocean Germs Cost You: A UC Irvine Study Tallies the Cost of Treatment and Lost Wages for Beachgoers Who Get Sick.

State, local bonds and measures) expended on stormwater control projects		available for projects funded by local bonds and measures)

In addition to current funding options, future funding options continue to be created. Assembly Bill 2554, known as the Los Angeles County Flood Control District's Water Quality Funding Initiative, is currently under consideration by the LACFCD's Board of Supervisors. If the Board of Supervisors approve the fee proposal and no majority protest is received, then it will be submitted for voter approval and could create an estimated annual revenue of $300 million to be utilized for various storm water projects including but not limited to:

- New and Existing Water Quality Projects and Programs
- Maintenance of Existing Facilities
- TMDL and MS4 Permit Implementation

Of the annual revenue, forty percent would be returned to the municipalities to create new local projects and programs and maintenance. Below are the estimated revenues that would be allocated to certain municipalities based on the estimated annual revenue of $300 million.

Municipalities	Estimated Annual Revenue
City of Los Angeles	$37 million
City of Santa Monica	$1 million
El Segundo	$600,000
Manhattan Beach	$300,000
Redondo Beach	$750,000
Unincorporated Areas on Los Angeles County	$15 million

Fifty percent of the annual revenue would be spread across nine watershed authority groups (WAGs) to develop Water Quality Improvement Plans and implement regional projects and programs. Some examples of the possible annual revenues available to the WAGs are provided below:

WAG	Estimated Revenue
Santa Monica Bay	$12 million
Upper Los Angeles River	$36 million
Lower Los Angeles River	$15 million
Upper San Gabriel River	$17 million

The remaining ten percent of the annual revenues would be allocated to the Los Angeles County Flood Control District for administration of the program and other district water quality projects and programs.

E. *Need for developing housing within the region.*

For over 100 years, this region has relied on imported water to meet many of our water resource needs. Imported water makes up approximately 70 to 75% of the Southern California region's water supply, with local groundwater, local surface water, and reclaimed water making up the remaining 25 to 30%.[60] The area encompassed by this Order imports approximately 50% of its water supply. The Los Angeles County MS4 permit helps address the need for housing by controlling pollutants in MS4 discharges, which will improve the quality of water available for recycling and re-use. This in turn may reduce the demand for imported water thereby increasing the region's capacity to support continued housing development.

A reliable water supply for future housing development is required by law, and with less imported water available to guarantee this reliability, an increase in local supply is necessary.

In this Order, the Regional Water Board supports integrated water resources approaches. An integrated water resources approach manages water resources by integrating wastewater, stormwater, recycled water, and potable water planning through the capture and beneficial use of stormwater. An integrated approach can preserve local groundwater resources and reduce imported water needs. Thus, complying with this Order can positively affect the need for developing housing in the region. Furthermore, the low impact development (LID) requirements of this MS4 permit emphasize the necessity to balance growth with the protection of water quality. LID emphasizes cost effective, lot-level strategies that replicate the natural hydrology of the site and reduces the negative impacts of development. By avoiding the installation of more costly conventional storm water management strategies and harnessing runoff at the source, LID practices enhance the environment while providing cost savings to both developers and local governments.

F. *Need to develop and use recycled water.*

Storm water runoff that travels across the urban landscape quickly becomes contaminated with the wastes inherent from urban living. This polluted water is then discharged to the surface waters and eventually the ocean where it wreaks havoc on the natural coastal ecosystem and impacts human health. If the storm water is captured and treated (or captured prior to contamination) a new resource could be added to local water supplies. If this water is more effectively harnessed and recycled, numerous benefits could be achieved. These include:

- Regional reduction on imported water;
- Aid in the restoration of area aquifers;
- Reduction in the need for extensive public works projects; and
- Improvement in the quality of impaired water bodies.

[60] Southern California Association of Governments. The State of the Region 2007 Measuring Regional Progress (Housing, Environment). December 6, 2007. http://www.scag.ca.gov/publications/index.htm.

The exact volume of storm water available for capture is dependent on the intensity and duration of storm events. Looking at land uses across the region and applying land use-specific runoff coefficients, the annual average runoff in the Los Angeles subarea is 450,000 acre-feet/year (with an average annual rainfall of 15.5 inches). The Los Angeles and San Gabriel Rivers Watershed Council estimates that, on average, about 550,000 acre-feet/year of runoff are discharged from Los Angeles area to the ocean.[61]

It is not possible to capture all MS4 discharges; however, a significant portion could be put to beneficial use. Potentially, in Los Angeles, "[i]f we could capture 80% of the rainfall that falls on just a quarter of the urban area-15% of the total watershed-we would be reducing total runoff by approximately 30%. That translates into a diversion of 43 billion gallons of water per year (132,000 acre-feet) or enough to supply 800,000 people for a year."[62] That water capture would render a savings of almost sixty million dollars of imported State Water Project water. Capturing storm water from a larger portion of the watershed could increase the volume of this "new" water even further. Unlike traditional recycled water that requires the installation of dual plumbing and intensive infrastructure, much of the storm water capture could be done with minimal infrastructure retrofits in established communities.

Larger projects (and the corresponding savings) are also possible. The County of Los Angeles recharges storm water already. While the scale of these recharge activities is limited compared to the volume of water potentially available to recharge, the value of the process is significant. For example, in 2000 "County conservation efforts captured 220,000 acre-feet of local storm water runoff that was valued at $80 million dollars."[63]

The unknown effects of infiltrating stormwater to recharge ground water have created some concern that such activities could introduce pollutants to the water supply. However, the U.S. Bureau of Reclamation has found[64]:

"Based on the findings of the WAS research, decentralized stormwater management would provide a local and reliable supply of water that would not negatively impact groundwater quality. A decentralized approach could contribute up to 384,000 acre-feet of additional groundwater recharge annually if the first ¾" of each storm is infiltrated on all parcels, enough to provide water annually to approximately 1.5 million people. The value of this new water supply would be approximately $311 million, using the MWD Tier 2 rate for 2010."

Recent studies in the Los Angeles area have also shown that in the process of infiltration through the soil, many contaminants are removed with no immediate impacts, and no apparent trends to indicate that storm water infiltration will negatively impact groundwater.[65]. In areas with groundwater contamination issues, utilizing recycled storm water to recharge the aquifers may actually aid in the dilution of the buildup of salts. The value of this is hard to quantify but is an additional benefit. The use of recycled water can be accomplished in direct (such as irrigation projects or dual plumbing fixtures) or indirect

[61] http://www.lasgrwc.org/WAS/WASflyer_web.pdf
[62] Los Angeles and San Gabriel River Watershed Council. 1999. *Stormwater: asset not liability*.
[63] Los Angeles County Department of Regional Planning. 2008. 2008 Draft General Plan-Planning Tomorrow's Great Places.
[64] Los Angeles and San Gabriel River Watershed Council. 2010. Water Augmentation Study: Research, Strategy, and Implementation Report.
[65] Los Angeles and San Gabriel River Watershed Council. 2005. Los Angeles Basin Water Augmentation Study Phase II Final Report.

(such as infiltration) ways. Both direct and indirect methods can be completed on a variety of different scales. To maximize the benefits available from using recycled water, the direct and indirect projects will need to be completed on household, neighborhood, watershed and regional scales. Currently there are a limited (but growing) number of projects in the region that can serve as examples of what may be accomplished through the development and implementation of recycled water projects. The Los Angeles County MS4 permit addresses the need for recycled water by controlling pollutants in storm water, which will result in water of improved quality with a greater potential for recycling or beneficial use. State law and policy advocates greatly expanding the use of recycled water to help meet local demand and reduce the volumes of water that are imported from other regions. Increased utilization of recycled water will require looking beyond the traditional reclaimed wastewater and will require utilizing storm water that is wasted by conveyance in the MS4 and dumping into the ocean. Storm water capture and use has not traditionally been included in the discussion of water recycling, but the process meets the definitional constraints and is bound by the same limitations and boundaries.

In addition, there are a number of Total Maximum Daily Loads (TMDLs) developed by the Regional Water Board that incorporate recycled water programs as potential implementation actions to meet TMDL requirements. These potential actions focus on both traditional water recycling and the newer storm water recycling approaches. Such recycled water programs could also reduce reliance on potable water supplies by expanding water recycling and aiding in the reclamation of poor quality, unconfined groundwater supplies. The capture, treatment and use of stormwater could augment these techniques as well. On-site capture of storm water helps prevent the water from being contaminated by urban by-products to begin with and the use of this high quality resource could reduce the unnecessary use of potable water for non-potable needs.

Some great examples of onsite capture are being demonstrated by TreePeople[66] who have demonstration projects ranging from small scale rainwater harvesting at the single family home locations, to large scale watershed projects at Tuxedo Green in Sun Valley where the project redesigned the intersection with a flood control system that conveys most stormwater under, instead of into, the busy intersection. The water is stored in a 45,000-gallon cistern to be used for irrigating the landscaping at the new pocket park, which is planted with native and drought-tolerant species.

Another state of the art project was implemented by the City of Santa Monica called the Santa Monica Urban Runoff Recycling Facility (SMURRF).[67] The project harnesses the urban runoff (primarily during the dry season) and treats it for various pollutants to create a source of high quality water for reuse in landscape irrigation. Because the facility captures the dry weather runoff before it reaches the Santa Monica Bay it decreases a significant amount of pollutants from negatively impacting the Bay and associated beaches. The SMURRF is also open to the public and has several exhibits to raise public awareness of Santa Monica Bay pollution and the role of each individual in the watershed's health.

[66] www.treepeople.org
[67] http://c0133251.cdn.cloudfiles.rackspacecloud.com/Case%20Study%20-%20Santa%20Monica%20Urban%20Runoff%20Recycling%20Facility%20SMURFF.pdf

The County of Los Angeles Department of Public Works, Watershed Management Division has targeted the Sun Valley Watershed "…to solve the local flooding problem while retaining all storm water runoff from the watershed, increasing water conservation, recreational opportunities, wildlife habitat, and reducing stormwater pollution."68 This aggressive plan involves several stakeholders and has implemented a variety of on-site BMPs as well as storm water infiltration retrofits and diversions.

IX. STATE MANDATES

Article XIII B, Section 6(a) of the California Constitution provides that whenever "any state agency mandates a new program or higher level of service on any local government, the state shall provide a subvention of funds to reimburse that local government for the costs of the program or increased level of service." The requirements of this Order do not constitute state mandates that are subject to a subvention of funds for several reasons, including, but not limited to, the following.

First, the requirements of this Order do not constitute a new program or a higher level of service as compared to the requirements contained in the previous permit, Order No. 01-182 (as amended). The overarching requirement to impose controls to reduce the pollutants in discharges from MS4s is dictated by the Clean Water Act and is not new to this permit cycle. (33 U.S.C. §1342(p)(3)(B).) The inclusion of new and advanced measures as the MS4 programs evolve and mature over time is anticipated under the Clean Water Act (55 Fed.Reg. 47990, 48052 (Nov. 16, 1990)), and these new and advanced measures do not constitute a new program or higher level of service.

Second, and more broadly, mandates imposed by federal law, rather than by a state agency, are exempt from the requirement that the local agency's expenditures be reimbursed. (Cal. Const., art. XIII B, §9, subd. (b).) This Order implements federally mandated requirements under the Clean Water Act and its requirements are therefore not subject to subvention of funds. This includes federal requirements to effectively prohibit non-storm water discharges, to reduce the discharge of pollutants to the maximum extent practicable, and to include such other provisions as the Administrator or the State determines appropriate for the control of such pollutants. (30 U.S.C. §1342(p)(3)(B).) Federal cases have held these provisions require the development of permits and permit provisions on a case-by-case basis to satisfy federal requirements. (*Natural Resources Defense Council, Inc. v. U.S. E.P.A*. (9th Cir. 1992) 966 F.2d 1292, 1308, fn. 17.) The authority exercised under this Order is not reserved state authority under the Clean Water Act's savings clause (cf. *Burbank v. State Water Resources Control Bd*. (2005) 35 Cal.4th 613, 627-628 [relying on 33 U.S.C. § 1370, which allows a state to develop requirements which are not "less stringent" than federal requirements]), but instead is part of a federal mandate to develop pollutant reduction requirements for municipal separate storm sewer systems. To this extent, it is entirely federal authority that forms the legal basis to establish the permit provisions. (See, *City of Rancho Cucamonga v. Regional Water Quality Control Bd.-Santa Ana Region* (2006) 135 Cal.App.4th 1377, 1389; *Building Industry Ass'n of San Diego County v. State Water Resources Control Bd*. (2004) 124 Cal.App.4th 866, 882-883.)

68 http://www.sunvalleywatershed.org/watershed_management_plan/wmp-0ES.pdf

The maximum extent practicable standard is a flexible standard that balances a number of considerations, including technical feasibility, cost, public acceptance, regulatory compliance, and effectiveness. (*Building Ind. Asso., supra,* 124 Cal. App.4th at pp. 873, 874, 889.) Such considerations change over time with advances in technology and with experience gained in storm water management. (55 Fed.Reg. 47990, 48052 (Nov. 16, 1990).) Accordingly, a determination of whether the conditions contained in this Order exceed the requirements of federal law cannot be based on a point by point comparison of the permit conditions and the six minimum control measures that are required "at a minimum" to reduce pollutants to the maximum extent practicable and to protect water quality (40 CFR § 122.34). Rather, the appropriate focus is whether the permit conditions, as a whole, exceed the maximum extent practicable standard. In recent months, the County of Los Angeles and County of Sacramento Superior Courts have granted writs setting aside decisions of the Commission on State Mandates that held that certain requirements in Phase I permits constituted unfunded mandates. In both cases, the courts found that the correct analysis in determining whether a MS4 permit constituted a state mandate was to evaluate whether the permit as a whole -- and not a specific permit provision -- exceeds the maximum extent practicable standard. (*State of Cal. v. Comm. on State Mandates* (Super. Ct. Sacramento County, 2012, No. 34-2010-80000604), *State of Cal. v. County of Los Angeles* (Super. Ct. Los Angeles County, 2011, No. BS130730.)

The requirements of the Order, taken as a whole rather than individually, are necessary to reduce the discharge of pollutants to the maximum extent practicable and to protect water quality. The Regional Water Board finds that the requirements of the Order are practicable, do not exceed federal law, and thus do not constitute an unfunded mandate. These findings are the expert conclusions of the principal state agency charged with implementing the NPDES program in California. (Cal. Wat. Code, §§ 13001, 13370.)

It should also be noted that the provisions in this Order to effectively prohibit non-storm water discharges are also mandated by the Clean Water Act. (33 U.S.C. § 1342(p)(3)(B)(ii).) Likewise, the provisions of this Order to implement total maximum daily loads (TMDLs) are federal mandates. The Clean Water Act requires TMDLs to be developed for water bodies that do not meet federal water quality standards. (33 U.S.C. § 1313(d).) Once the USEPA or a state establishes or adopts a TMDL, federal law requires that permits must contain effluent limitations consistent with the assumptions and requirements of any applicable waste load allocation in a TMDL. (40 CFR § 122.44(d)(1)(vii)(B).)

Third, the local agency Permittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental dischargers who are issued NPDES permits for storm water discharges. With a few inapplicable exceptions, the Clean Water Act regulates the discharge of pollutants from point sources (33 U.S.C. § 1342) and the Porter-Cologne Water Quality Control Act (Porter-Cologne Act) regulates the discharge of waste (Cal. Wat. Code, § 13263), both without regard to the source of the pollutant or waste. As a result, the "costs incurred by local agencies" to protect water quality reflect an overarching regulatory scheme that places similar requirements on governmental and non-governmental dischargers. (See *County of Los Angeles v. State of California* (1987) 43 Cal.3d 46, 57-58 [finding comprehensive workers compensation scheme did not create a cost for local agencies that was subject to state subvention].)

The Clean Water Act and the Porter-Cologne Act largely regulate storm water with an even hand, but to the extent there is any relaxation of this even-handed regulation, it is in favor of the local agencies. Generally, the Clean Water Act requires point source dischargers, including discharges of storm water associated with industrial or construction activity, to comply strictly with water quality standards. (33 U.S.C. § 1311(b)(1)(C), *Defenders of Wildlife v. Browner* (1999) 191 F.3d 1159, 1164-1165 [noting that industrial storm water discharges must strictly comply with water quality standards].) As discussed in prior State Water Resources Control Board decisions, certain provisions of this Order do not require strict compliance with water quality standards. (SWRCB Order No. WQ 2001-15, p. 7.) Those provisions of this Order regulate the discharge of waste in municipal storm water under the Clean Water Act MEP standard, not the BAT/BCT standard that applies to other types of discharges. These provisions, therefore, regulate the discharge of waste in municipal storm water more leniently than the discharge of waste from non-governmental sources.

Fourth, the Permittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in Clean Water Act section 301, subdivision (a) (33 U.S.C. § 1311(a)). To the extent that the local agencies have voluntarily availed themselves of the permit, the program is not a state mandate. (Accord *County of San Diego v. State of California* (1997) 15 Cal.4th 68, 107-108.)

Fifth, the local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under state law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

Finally, even if any of the permit provisions could be considered unfunded mandates, under Government Code section 17556, subdivision (d), a state mandate is not subject to reimbursement if the local agency has the authority to charge a fee. The local agency Permittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order subject to certain voting requirements contained in the California Constitution. (See California Constitution XIII D, section 6, subdivision (c); see also *Howard Jarvis Taxpayers Association v. City of Salinas* (2002) 98 Cal. App. 4th 1351, 1358-1359.). Additional fee authority has recently been established through amendments to the Los Angeles County Flood Control Act (Chapter 755 of the Statutes of 1915, as amended by Assembly Bill 2554 (2010)) to provide funding for municipalities, watershed authority groups, and the LACFCD to initiate, plan, design, construct, implement, operate, maintain, and sustain projects and services to improve surface water quality and reduce storm water and non-storm water pollution in the LACFCD, which may directly support Permittees' implementation of the requirements in this Order. The Fact Sheet demonstrates that numerous activities contribute to the pollutant loading in the municipal separate storm sewer system. Local agencies can levy service charges, fees, or assessments on these activities, independent of real property ownership. (See, e.g., *Apartment Ass'n of Los Angeles County, Inc. v. City of Los Angeles* (2001) 24 Cal.4th 830, 842 [upholding inspection fees associated with renting property].) The authority and ability of a local agency to defray the cost of a program without raising taxes indicates that a program does not entail a cost subject to subvention. (*Clovis Unified School Dist. v. Chiang* (2010) 188

Cal. App.4th 794, 812, quoting *Connell v. Superior Court* (1997) 59 Cal.App.4th 382, 401; *County of Fresno v. State of California* (1991) 53 Cal.3d 482, 487-488.)

X. PUBLIC PARTICIPATION

Regional Water Board staff held a kick-off meeting on May 25, 2011 to discuss the preliminary schedule for permit development; identify potential alternative permit structures; and outline some of the major technical and policy aspects of permit development. All LA County MS4 Permittees, as well as other known interested stakeholders, were invited to attend. Ninety-five individuals attended the meeting, representing most of the permittees as well as environmental organizations. After a presentation by Board staff, Permittees and interested persons had an initial opportunity to ask questions of staff, raise concerns, and provide feedback.

At the May 25, 2011 kick-off meeting, Board staff requested input from the attendees on various permit structures. In order to solicit more focused input from permittees on alternative permit structures, and per suggestions at the kick-off meeting, Board staff developed and distributed an on-line survey to permittees using the on-line survey tool, SurveyMonkey®. The survey was distributed to all Los Angeles County MS4 Permittees on June 14, 2011 and responses were requested within two weeks. Fifty-two permittees responded using the on-line survey tool. The on-line survey sought input on several options for permit structure, including an individual permit for each municipality, a single permit for all permittees (i.e., the existing permit structure), and a single or multiple watershed-based permits.

Regional Water Board staff also held three topical workshops on December 15, 2011, January 23, 2012, and March 1, 2012. At the December 2011 workshop, staff discussed and invited feedback on: tentative permit requirements for the “minimum control measures” that comprise Permittees core storm water management program, approaches to addressing non-storm water MS4 discharges, and options for flexibility in permit requirements to address watershed priorities. At the January 2012 workshop, staff discussed and invited feedback on: tentative permit requirements to implement TMDL waste load allocations assigned to MS4 discharges and monitoring and reporting requirements for this Order. At the March 2012 workshop, staff discussed the use of water quality-based effluent limitations in this Order, discussed a revised proposal for monitoring requirements based on comments from the January 2012 workshop, and provided additional detail on proposed minimum control measure requirements.

Three Regional Water Board workshops were held during regularly scheduled Board meetings on November 10, 2011, April 5, 2012, and May 3, 2012. At the November 2011 Board workshop, staff discussed the objectives for the new permit, the status and schedule for permit development, alternatives for permit structure, provisions to implement TMDL WLAs, and provisions for minimum control measures, and identified preliminary considerations related to provisions for non-storm water discharges, receiving water limitations, water quality-based effluent limitations, and requirements for monitoring and reporting.

Prior to the April 5, 2012 Board workshop, staff released complete working proposals of the permit provisions related to two key parts of this Order: the storm water management

program "minimum control measures" and the non-storm water MS4 discharge prohibitions on March 21, 2012 and March 28, 2012, respectively. Staff provided Permittees and interested persons the opportunity to submit written and oral comments over a period of three weeks for early consideration by staff prior to the release of the tentative Order. At the April 2012 Board workshop, staff presented the working proposals and the Board invited public comments. Detailed comments were made on both working proposals, and in particular, comments were made on how to address "essential" non-storm water discharges from drinking water supplier distribution systems and fire fighting activities in this Order.

Prior to the May 3, 2012 Board workshop, staff released complete working proposals of the permit provisions related to three other key parts of this Order: provisions for watershed management programs, TMDL-related requirements, and receiving water limitations language. Staff provided Permittees and interested persons the opportunity to submit written and oral comments over a period of three weeks for early consideration by staff prior to the release of the tentative Order. At the May 2012 Board workshop, staff presented the three working proposals and the Board invited public comments. Staff answered extensive questions from Board members following public comments.

In addition to staff and Board workshops, Regional Water Board staff met regularly with Permittees, including the LA Permit Group (a coalition of 62 of the 86 Permittees covered by this Order), the Los Angeles County Flood Control District and the County of Los Angeles, the City of Los Angeles, and interested environmental organizations including Heal the Bay, Santa Monica Baykeeper, and the Natural Resources Defense Council (NRDC). Staff also met on several occasions with other affected agencies including large public water suppliers (Los Angeles Department of Water and Power and Metropolitan Water District), small community water suppliers, and local fire departments.

Finally, staff hosted several "joint" meetings to bring together key leaders among the Permittees and environmental organizations to discuss significant issues and work towards consensus on these issues where possible. The first two of these were held on May 17, 2012 and May 31, 2012, during which the group discussed permit requirements for USEPA established TMDLs. Staff prepared a working proposal based on the areas of agreement from the May 17th joint meeting, and distributed the proposal for review prior to the second meeting on May 31st. The proposal was discussed and refined at the second meeting. A third meeting was held on June 14, 2012.

Prior to the Board's consideration of this Order, the Regional Water Board notified the Permittees and all interested agencies and persons of its intent to hold a hearing to issue an NPDES permit for discharges from the Los Angeles County MS4 and provided them with an opportunity to submit written comments over a 45-day period. The procedures followed for submission of written comments are described in the Notice of Hearing and Opportunity to Comment published for this Order. Notification was provided through the Regional Water Board's website, the Regional Water Board's e-mail subscription service, and the LA Times. After releasing the tentative permit for public review, the Regional Water Board held a staff level workshop on July 9, 2012 to answer questions regarding the tentative permit. A Board member field tour of portions of the MS4 in the San Gabriel Valley was held on July 31, 2012.

The Regional Water Board held a public hearing on the tentative Order during its regular Board meeting on October 4-5, 2012. The Regional Water Board continued the public hearing at its next regular Board meeting on November 8, 2012. Permittees and interested persons were invited to attend. At the public hearing, the Regional Water Board heard testimony and comments pertinent to the discharge and this Order. The hearing procedures followed by the Regional Water Board are described in the Notice of Hearing and Opportunity to Comment published for this Order.

State of California
California Regional Water Quality Control Board
Santa Ana Region

ORDER NO. R8-2009-0030
NPDES No. CAS618030

As amended by Order No. R8-2010-0062

Waste Discharge Requirements
for
The County of Orange, Orange County Flood Control District
and
The Incorporated Cities of Orange County within the Santa Ana Region
Areawide Urban Storm Water Runoff
Orange County

FINDINGS

The California Regional Water Quality Control Board, Santa Ana Region (hereinafter Regional Board) finds that:

A. REGULATORY BASIS

1. The 1987 amendments to the Clean Water Act (CWA) added Section 402(p) (USC §1342(p)) establishing a framework for regulating municipal and industrial (including construction) storm water discharges under the National Pollutant Discharge Elimination System (NPDES) permit. Section 402(p) of the CWA requires NPDES permits for storm water discharges from municipal separate storm sewer systems[1] (storm drains or MS4s) as well as other designated storm water discharges that are considered significant contributors of pollutants to waters of the United States (waters of the US). On November 16, 1990, the United States Environmental Protection Agency (hereinafter EPA) amended its NPDES permit regulations to include permit application requirements for storm water discharges. These regulations are codified in Code of Federal Regulations, Title 40, Parts 122, 123 and 124 (40 CFR Parts 122, 123 & 124).

2. This order is based on Section 402(p) of the CWA; 40 CFR Parts 122, 123, and 124; Porter-Cologne Water Quality Control Act (Division 7 of the California Water Code or CWC, commencing with Section 13000); all applicable provisions of statewide Water Quality Control Plans and Policies adopted by the State Water Resources Control Board (State Board); the Water Quality Control Plan for the Santa Ana River Basin (Basin Plan); the California Toxics Rule (CTR); and the California Toxics Rule Implementation Plan. A revised Basin Plan was adopted by the Regional Board and became effective on January 24, 1995. The Basin Plan contains water quality objectives and beneficial uses for water bodies in the Santa

[1] A municipal separate storm sewer **system** (MS4) is any conveyance or a system of conveyances designed to collect and/or transport storm water, such as, storm drains, manmade channels, ditches, roads w/drainage systems, catch basins, curbs, gutters, etc., which is not part of a Publicly Owned Treatment Works (i.e., not a combined sewer).

Ana Region. Under the CWA, the beneficial uses and the water quality objectives to protect those beneficial uses are collectively referred to as water quality standards. The Basin Plan also incorporates by reference all State Board water quality control plans and policies, including the 1990 Water Quality Control Plan for Ocean Waters of California (Ocean Plan).

3. The requirements contained in this order are necessary to protect water quality standards of the receiving waters and to implement the plans and policies described in the above finding. These plans and policies contain numeric and narrative water quality standards for the water bodies in this Region. In accordance with Section 402(p)(2)(B)(iii) of CWA and its implementing regulations, this order requires the permittees to develop and implement programs and policies necessary to reduce the discharge of pollutants in urban storm water runoff to waters of the US to the maximum extent practicable (MEP)[2]. The legislative history and the preamble to the federal storm water regulations (40 CFR Parts 122, 123 and 124) indicate that the Congress and the EPA were aware of the difficulties in regulating urban storm water runoff solely through traditional end-of-pipe treatment. Consistent with the CWA, it is the Regional Board's intent that this order require the implementation of best management practices (BMPs)[3] to reduce to the maximum extent practicable, the discharge of pollutants in urban storm water from the MS4s in order to support attainment of water quality standards. This order, therefore, includes Receiving Water Limitations[4] based upon water quality objectives, and requires implementation of control measures to protect the beneficial uses. It also prohibits the creation of nuisance and requires the reduction of water quality impairment in receiving waters with an ultimate goal of achieving water quality objectives of the receiving waters.

4. This order is consistent with recent court decisions and precedential orders adopted by the State Board related to municipal storm water NPDES permits. These precedential State Board orders include: Orders No. 99-05, WQ 2001-15 and WQO 2002-0014.

5. This order does not constitute an unfunded mandate subject to subvention under Article XIII.B, Section (6) of the California Constitution for several reasons, including the following:

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[2] MEP is not defined in the CWA; it refers to management practices, control techniques, and system, design and engineering methods for the control of pollutants taking into account considerations of synergistic, additive, and competing factors, including, but not limited to, gravity of the problem, technical feasibility, fiscal feasibility, public health risks, societal concerns, and social benefits.

[3] Best Management Practices (BMPs) are programs and policies, including structural controls where appropriate, that are implemented to control the discharge of pollutants.

[4] Receiving Water Limitations are requirements included in the orders issued by the Regional Board to assure that the regulated discharge does not violate water quality standards established in the Basin Plan at the point of discharge to waters of the US or the State.

a) This order implements federally mandated requirements under Clean Water Act Section 402(p)(3)(B). (33 USC § 1342(p)(3)(B)).
b) The permittees' obligation under this order are similar to, and in many respects less stringent than, the obligations of non-governmental dischargers who are issued NPDES permits for storm water discharges.

c) The permittees have the authority to levy service charges, fees, or assessments to pay for compliance with this order, where voter approval is needed, the permittees should strive to gain voter approval[5].

d) The permittees requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in federal Clean Water Act Section 301, subdivision (a). (33 USC § 1311(a)).

B. REGULATED ENTITIES (PERMITTEES OR DISCHARGERS)

6. On July 22, 2006, the County of Orange, Orange County Flood Control District (OCFCD) and the incorporated cities of Anaheim, Brea, Buena Park, Costa Mesa, Cypress, Fountain Valley, Fullerton, Garden Grove, Huntington Beach, Irvine, Laguna Hills, Laguna Woods, La Habra, La Palma, Lake Forest, Los Alamitos, Newport Beach, Orange, Placentia, Santa Ana, Seal Beach, Stanton, Tustin, Villa Park, Westminster, and Yorba Linda (hereinafter collectively referred to as permittees or dischargers), submitted NPDES Application No. CAS618030 and a Report of Waste Discharge for reissuance of their areawide urban storm water permit. In order to more effectively carry out the requirements of this order, the permittees have agreed that the County of Orange will continue as principal permittee and the OCFCD and the incorporated cities will continue as co-permittees. Certain portions of the cities of Laguna Hills, Laguna Woods and Lake Forest are within the San Diego Regional Board's jurisdiction. As such, these cities are also regulated under urban storm water permit issued by the San Diego Regional Board.

7. The permittees fall into one of the following categories: (1) a medium or large municipality that services a population of greater than 100,000 or 250,000 respectively; or, (2) a small municipality that is interrelated to a medium or large municipality. Under Section 402(p) of the Clean Water Act, these dischargers (permittees) are required to obtain coverage under an NPDES permit for storm water runoff from their jurisdictions.

C. REGULATED DISCHARGES

8. This order is intended to regulate the discharge of pollutants in urban storm water runoff from anthropogenic (generated from human activities) sources and/or activities within the jurisdiction and control of the permittees and is not intended to address background or naturally occurring pollutants or flows.

9. The permittees own and operate storm drains, including flood control facilities. Some of the natural channels, streambeds and other drainage facilities that are

generally considered as waters of the US have been converted to flood control facilities. The permittees have established legal authority to control discharges into these systems that they own, operate and/or regulate. As owners and/or operators of the MS4 systems, the permittees are responsible for discharges into their systems that they do not prohibit or control (except where they lack jurisdiction; see A.10 below). The discharge of pollutants into the MS4s may cause or contribute to, or threaten to cause or contribute to, a condition of pollution in receiving waters. Federal regulations, 40 CFR 122.26(d)(2)(i), require the permittees to control the discharge of pollutants into the MS4s to the maximum extent practicable.

10. The permittees may lack legal jurisdiction over urban runoff into their systems from some state and federal facilities, utilities and special districts, Native American tribal lands, waste water management agencies and other point and non-point source discharges otherwise permitted by the Regional Board. The Regional Board recognizes that the permittees should not be held responsible for such facilities and/or discharges. Similarly, certain activities that generate pollutants present in urban runoff may be beyond the ability of the permittees to eliminate. Examples of these include operation of internal combustion engines, atmospheric deposition, brake pad wear, tire wear and leaching of naturally occurring minerals from local geography.

11. This order regulates storm water runoff and certain types of de-minimus discharges specifically authorized under Section III of this order (collectively referred to as urban runoff) from areas under the jurisdiction of the permittees. For purposes of this order, urban runoff includes storm water and authorized non-storm water (see Section III) discharges from residential, commercial, industrial and construction areas within the permitted area and excludes discharges from feedlots, dairies, and farms. Urban runoff consists of surface runoff generated from various land uses in all the hydrologic drainage areas that discharge into waters of the US. The quality of these discharges varies considerably and is affected by land use activities, basin hydrology and geology, season, the frequency and duration of storm events, and the presence of illicit discharge[6] practices and illicit[7] connections.

12. The permittees have the authority to approve plans for residential, commercial, and industrial developments. If not properly controlled and managed, urbanization could result in the discharge of pollutants in urban runoff[8]. "America's Clean Water-The

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[5] For example, the City of Santa Cruz voted to raise property taxes to fund the storm water program at the November 4, 2008 election (see: http://www.santacruzsentinel.com/localnews/ci_10904561).

[6] Illicit discharge means any disposal, either intentionally or unintentionally, of material or waste that can pollute urban runoff or create a nuisance.

[7] Illicit connections are those which are not properly authorized or permitted by the municipality or the owner/operator of the conveyance system.

[8] U.S. EPA. 1983. Results of the Nationwide Urban Runoff Program, Vol. 1, Final report. NTIS PB84-185552.

States' Nonpoint Source Assessment, 1985" and the Biennial National Water Quality Inventory Reports to Congress cite urban runoff as a major source of beneficial use impairment. Urban area runoff may contain[9] elevated levels of pathogens (e.g., bacteria, protozoa, viruses), sediment, trash, fertilizers (nutrients, compounds of nitrogen and phosphorus), pesticides (e.g., DDT, Chlordane, Diazinon, Chlorpyrifos), heavy metals (e.g., cadmium, chromium, copper, lead, zinc), and petroleum products (e.g., oil, grease, petroleum hydrocarbons, polycyclic aromatic hydrocarbons). Urban runoff can carry these pollutants to rivers, streams, lakes, bays and the ocean (receiving waters[10]). In addition, increased flows due to urbanization may increase erosion of stream banks and channels and cause stream channel alterations and impact aquatic resources. This order regulates the discharge of pollutants to waters of the US, to protect beneficial uses of the receiving waters.

13. Urban activities also generate non-storm water discharges such as air conditioning condensate, irrigation runoff, individual residential car washing, etc., generally referred to as de minimus type of discharges. If properly managed, these types of discharges may not contain significant amount of pollutants. Some of these de minimus types of discharges are currently being regulated under separate orders issued by the Regional Board, and some of the specific types of de minimus discharges are authorized under this order (see Section III of this order). Orders No. R8-2003-0061 (NPDES No CAG998001), R8-2004-0021 (NPDES No. CAG998002) and R8-2007-0041 (NPDES No. CAG918002) issued by the Regional Board regulate de-minimus types of discharges.

D. HISTORY OF ORANGE COUNTY MUNICIPAL STORM WATER PERMIT

14. Prior to EPA's promulgation of the storm water permit regulations, the three counties (Orange, Riverside, and San Bernardino) and the incorporated cities within the jurisdiction of the Santa Ana Regional Board requested areawide NPDES permits for urban runoff. On July 13, 1990, the Regional Board adopted Order No. 90-71 for urban storm water runoff from urban areas in Orange County within the Santa Ana Region (first term Permit). Orders No. 96-31 (second term Permit) and R8-2002-0010 (third term Permit), issued by the Regional Board on March 8, 1996 and January 18, 2002, respectively, renewed the Orange County MS4 permit.

15. Order No. R8-2002-0010 expired on January 19, 2007. On July 22, 2006, the permittees submitted a Report of Waste Discharge for renewal of the Permit. On February 20, 2007, Order No. 2002-0010, NPDES No. CAS618030, was administratively extended in accordance with Title 23, Division 3, Chapter 9, §2235.4 of the California Code of Regulations.

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[9] Makepeace, D.K., D.W. Smith, and S.J. Stanley. 1995. Urban stormwater quality: summary of contaminant data. Critical Reviews in Environmental Science and Technology 25(2):93-139.

[10] Receiving waters are waters of the U.S. (and their tributaries) which are identified in the Basin Plan as having certain beneficial uses (see Finding 19, below, for a list of these waters).

E. PERMIT RENEWAL APPLICATION AND RELATED DOCUMENTS

16. The Report of Waste Discharge (the permit renewal application) included the following major documents/information:

    a) A summary of status of current Storm Water Management Program;

    b) A Proposed Plan of Storm Water Quality Management Activities for 2007-20012, as outlined in the Draft 2007 Drainage Area Management Plan (DAMP). The 2007 DAMP includes all the activities the permittees propose to undertake during the next permit term, goals and objectives of such activities, and an evaluation of the need for additional source control and/or structural and non-structural BMPs and proposed pilot studies;

    c) The permittees have developed Local Implementation Plans (LIPs); established a formal training program; and developed a program effectiveness assessment strategy and Watershed Action Plans;

    d) A Performance Commitment that includes new and existing program elements and compliance schedules necessary to implement controls to reduce pollutants to the maximum extent practicable;

    e) A summary of procedures implemented to detect illicit discharges and illicit connection practices;

    f) A summary of enforcement procedures and actions taken to require storm water discharges to comply with the approved Storm Water Management Program;

    g) A summary of public agency activities, results of monitoring program, and program effectiveness assessment; and,

    h) A fiscal analysis.

17. The documents referenced in Finding E.16, above, are hereby incorporated as enforceable elements of this order.

F. PERMITTED AREA

18. The permitted area is shown on Attachment A. It includes the northern portions of Orange County, including the 26 incorporated cities listed under Finding 6, above. The permittees serve a population of approximately 3.1 million, occupying an area of approximately 789 square miles (including unincorporated areas and the limits of 34 cities, 26 of which are within the jurisdiction of this Regional Board; three of the cities, Laguna Hills, Laguna Woods and Lake Forest, are within both the San Diego and Santa Ana Regional Boards' jurisdictions). The permittees have jurisdiction over and/or maintenance responsibility for storm water conveyance systems within Orange County. The County Flood Control system includes an estimated 740 miles of storm drains. A major portion of the urbanized areas of Orange County drains into waterbodies within this Regional Board's jurisdiction. In certain cases, where a natural streambed is modified to convey storm water flows, the conveyance system becomes both a storm drain and a receiving water. The major storm drain systems and drainage areas in Orange County, which are within this Region, are shown on

Attachment B. A portion of the Orange County drainage area is within the jurisdiction of the San Diego Regional Board and is regulated under an order issued by that Board.

G. RECEIVING WATERS AND BENEFICIAL USES

19. Storm water runoff from the MS4s in Orange County enter, or are tributary to, various water bodies of the Region. The permitted area can be subdivided into five tributary watersheds: the San Gabriel River drainage area, the Huntington Harbour and Bolsa Bay drainage area, the Santa Ana River drainage area, the Newport Bay drainage area, and the Irvine and Newport Coast Areas of Special Biological Significance (see Attachment B). These watersheds are tributary to the Pacific Ocean. The surface water bodies in Orange County that could be impacted by urban runoff include:

<u>Inland Surface Streams</u>

Santa Ana River, Reaches 1 and 2

Aliso Creek (tributary to Santa Ana River)

Carbon Canyon Creek (tributary to Santa Ana River)

Santiago Creek, Reaches 1, 2, 3, and 4 (tributary to the Santa Ana River)

Silverado Creek (tributary to Santiago Creek)

Black Star Creek (tributary to Santiago Creek)

Ladd Creek (tributary to Santiago Creek)

San Diego Creek, Reaches 1 and 2 (tributary to Newport Bay)

San Joaquin Freshwater Marsh (tributary to San Diego Creek)

Other tributaries to San Diego Creek: Bonita Creek, Serrano Creek, Peters Canyon Wash, Hicks Canyon Wash, Bee Canyon Wash, Borrego Canyon Wash, Agua Chinon Wash, Laguna Canyon Wash, Rattlesnake Canyon Wash, and Sand Canyon Wash

Santa Ana Delhi Channel (tributary to Newport Bay)

Big Canyon Wash (tributary to Newport Bay)

Buck Gully

Los Trancos Creek

Coyote Creek (tributary to San Gabriel River)

Other tributaries to the above listed rivers, creeks and channels

<u>Bays, Estuaries, and Tidal Prisms</u>

Anaheim Bay and Seal Beach National Wildlife Refuge

Sunset Bay

Bolsa Bay and Bolsa Chica Ecological Reserve

Upper and Lower Newport Bay

Tidal Prism of Santa Ana River (to within 1000 feet of Victoria Street) and Newport Slough, Santa Ana Salt Marsh

Tidal Prism of San Gabriel River (River Mouth to Marina Drive)

Tidal Prisms of Flood Control Channels Discharging to Coastal or Bay Waters (e.g. Huntington Harbour)

Ocean Water

Nearshore Zone

San Gabriel River to Poppy Street in Corona Del Mar

Poppy Street to Southeast Regional Boundary

Offshore Zone

Waters between Nearshore Zone and limit of State Waters

Lakes and Reservoirs

Anaheim Lake

Irvine Lake (Santiago Reservoir)

Laguna, Lambert, Peters Canyon, Rattlesnake, Sand Canyon and Siphon Reservoirs

20. The beneficial uses of these water bodies include: municipal and domestic supply, agricultural supply, industrial service and process supply, groundwater recharge, navigation, hydropower generation, water contact recreation, non-contact water recreation, commercial and sport fishing, warm freshwater and limited warm freshwater habitats, cold freshwater habitat, preservation of biological habitats of special significance, wildlife habitat, preservation of rare, threatened or endangered species, marine habitat, shellfish harvesting, spawning, reproduction and development of aquatic habitats, and estuarine habitat. The ultimate goal of this storm water management program is to achieve water quality objectives in the receiving waters, thereby protecting their beneficial uses.

21. Federal regulations, 40 CFR 131.10(a), prohibits the states from designating a water body for waste transport or waste assimilation. This order prohibits the construction of treatment BMPs within waters of the US. However, if the discharges are sufficiently treated to protect the beneficial uses of the receiving waters, further polishing of the discharge within waters of the US may be considered on a case-by-case basis. Federal authorization under Section 404 and Water Quality Standards Certification under Section 401 of the Clean Water Act may be required for waste treatment or conveyance within waters of the US. Pursuant to Water Code Section 13260, Waste Discharge Requirements may be required for such facilities within waters of the State. Under certain conditions, stream flows may be diverted for treatment (see Section III for conditions on return flows from facilities that extract, treat and return flows from the waters of the US).

H. INTERRELATED WATERSHEDS AND STORM WATER PERMITS

22. The Santa Ana River Basin is the major watershed within the jurisdiction of the Regional Board. The lower Santa Ana River Basin (downstream from Prado Basin) includes the Orange County drainage areas, and the Upper Santa Ana River Basin includes the San Bernardino County and the Riverside County drainage areas. Generally, the San Bernardino County drainage areas drain to the Riverside County drainage areas, and Riverside County drainage areas discharge to Orange County.

23. Within the Region, runoff from the San Bernardino County areas is generally conveyed to the Riverside County areas through the Santa Ana River or other drainage channels tributary to the Santa Ana River. These flows are then discharged to Reach 2 of the Santa Ana River through Prado Basin (Reach 3 of the Santa Ana River). During dry weather conditions, most of the flow in Reach 2 is recharged in Orange County. During wet weather, some of the flow is discharged to the Pacific Ocean through Reach 1 of the Santa Ana River.

24. The three county areas within this Region are regulated under three areawide permits for urban storm water runoff. These areawide NPDES permits are:

    Orange County, NPDES No. CAS618030;

    Riverside County, NPDES No. CAS618033; and,

    San Bernardino County, NPDES No. CAS618036.

    For an effective watershed management program, cooperation and coordination among the regulators, the municipal permittees, the public, and other entities are essential.

25. Studies conducted by the USEPA, the states, flood control districts and other entities indicate the following major sources for urban storm water pollution nationwide:

    Industrial sites where appropriate pollution control and BMPs are not implemented;

    Construction sites where erosion and siltation controls and other BMPs are not implemented; and,

    Urban runoff where the drainage area is not properly managed.

26. A number of permits have been adopted to address pollution from the sources identified in Finding 25, above. The State Board issued three statewide general NPDES permits: one for storm water runoff from industrial activities (NPDES No. CAS000001, General Industrial Activities Storm Water Permit), a second permit for storm water runoff from construction activities (NPDES No. CAS000002, General Construction Activity Storm Water Permit) and a third permit for Storm Water Runoff Associated with Small Linear Underground/Overhead Construction Projects (CAS000005). Industrial activities (as identified in 40 CFR 122.26(b)(14)) and construction sites of one acre or more, are required to obtain coverage under these statewide general permits. The permittees have developed project conditions of approval requiring coverage under the State's General Permits for new

developments to be implemented at the time of grading or building permit issuance for construction sites on one acre or more and at the time of local permit issuance for industrial facilities.

27. The State Board also adopted NPDES No. CAS000003 for storm water runoff from facilities (including freeways and highways) owned and/or operated by California Department of Transportation (Caltrans) and NPDES No. CAS000004, for Storm Water Discharges from Small Municipal Separate Storm Sewer Systems. The Regional Board adopted Order No. R8-2007-0001, NPDES No. CAG018001, for concentrated animal feeding operations, including dairies. The Regional Board also issues individual storm water permits for certain industrial facilities within the Region. Currently there are two facilities located within Orange County. Additionally, for a number of facilities that discharge process wastewater and storm water, storm water discharge requirements are included with the facilities' NPDES permit for process wastewater.

28. In most cases, the industries and construction sites covered under the Statewide General Industrial and Construction Permits discharge into storm drains and/or flood control facilities owned and operated by the permittees. These industries and construction sites are also regulated under local laws and regulations. Federal regulations, 40 CFR Part 122.26(d)(2)(iv)(C), also require the permittees to develop and implement programs to control the discharge of pollutants from these sites. A coordinated effort between the permittees and Regional Board staff is critical to avoid duplicative and overlapping efforts when overseeing the compliance of dischargers covered under the Statewide General Permits. As part of this coordination, the permittees have been notifying Regional Board staff when they observe conditions that pose a threat or potential threat to water quality, or when an industrial facility or construction activity has failed to obtain required coverage under the appropriate general storm water permit.

29. Each watershed has unique receiving water issues, land uses, topography, soils and stream stability and habitat issues. The Regional Board and the permittees recognize the importance of integrated watershed management initiatives and regional planning and coordination in the development and implementation of programs and policies related to water quality protection. A number of such efforts are underway in which the permittees are active participants (e.g., Orange County Flood Control Master Plan, Irvine Ranch Water District Natural Treatment System Master Plan, Orange County Watershed Plans, Nutrient and Selenium Management Program, etc.). As recommended in the 2008 National Academy of Sciences Report on Urban Stormwater Management, this order provides an option for the permittees to develop and implement watershed master plans integrating water quality, hydromodification, water supply and habitat protection issues. The Regional Board recognizes that a watershed master plan should integrate all other related programs, including the storm water program and TMDL processes. Consistent with this approach, some of the municipal storm water monitoring programs have already been integrated into a regional monitoring program. The Regional Board also recognizes that, in certain cases, diversion of funds targeted for certain monitoring programs to regional monitoring programs may be necessary. The

Executive Officer is authorized to approve, after proper public notification and consideration of all comments received, the integrated watershed management initiatives and regional planning and coordination programs and regional monitoring programs. The permittees are required to submit all documents, where appropriate, in an electronic format. All such documents will be posted at the Regional Board's website and all interested parties will be notified. In addition, the website will include the administrative and civil procedures for appealing any decision made by the Executive Officer. Some urban runoff issues, such as monitoring, public education and training can be more effectively addressed on a regional or statewide basis, thereby increasing program consistency and efficiency. This order encourages continued participation in such programs and policies.

30. The permittees are required to conduct inspections (40 CFR Part 122.26(d)(2)(iv)(C)(2)) of construction sites, industrial facilities and commercial establishments. Inspection requirements, including criteria for prioritization of facilities for the inspection, were included in the third term permit. The construction and industrial inspection programs in the third term permit had established criteria/examples. However, the commercial inspection program only included a preliminary list of types of facilities to be inspected. Further refinements to the commercial inspection program are included in this order and these include: moving mobile businesses into their own program; including eating establishments (previously their own pilot program); and the addition of some key categories, not included on the 3rd term permit list. It should also be noted that some of these additional categories are directly related to current categories or identified in the Model Urban Runoff Program[11] and all of the additional categories are proposed for inclusion in other Southern California MS4 permits. To avoid duplicative efforts, the permittees need not inspect facilities that have been inspected by Regional Board staff, if the inspection was conducted during the specified time period. It is anticipated that many of the inspections required under this order can and will be carried out by inspectors currently conducting other types of inspections for the permittees (i.e., grading, building, code enforcement, etc.), during their normal duties. It is critical that these inspectors be properly trained in storm water pollution prevention and related issues.

I. POTENTIAL POLLUTANTS IN STORM WATER RUNOFF/IMPACTS ON BENEFICIAL USES

31. The permittees have conducted urban runoff and receiving water monitoring as required under the first, second and third term permits. The third term permit required monitoring using a wider array of methods to assess impacts caused by pollutants in urban runoff. In addition to monitoring the water column under wet and dry weather conditions, the permittees were required to monitor: water column toxicity, mass emission rates, estuary/wetlands including sediment and benthic monitoring, bacteriological/pathogen concentrations and bioassessment analysis. These monitoring programs indicate exceedances of Basin Plan, CTR and/or AB

[11] Model Urban Runoff Program, prepared by the City of Monterey, California Coastal Commission, et. al., revised February 2002 by California Coastal Commission.

411 objectives for a number of constituents. The Report of Waste Discharge identifies copper and zinc, trash and debris, pesticide toxicity and pathogens as the major pollutants of concern. Monitoring data indicate that storm water and dry weather urban runoff continue to have pollutants at levels that could cause or contribute to exceedances of water quality objectives in the receiving waters. The permittees are proposing to conduct special studies to address these pollutants of concern during the fourth term permit.

32. The annual reports submitted by the permittees indicate that urban runoff is still causing or contributing to water quality standards violations. Some of the samples collected during both dry and wet weather exceeded the water quality standards. However, the exceedances during wet weather were more widespread compared to dry weather runoff. The monitoring reports indicate that there is some reduction in the mass loading rates for some of the metals, such as copper and zinc.

33. The results from the monitoring programs did not establish a clear correlation between pollutants in dry or wet weather runoff and impacts on beneficial uses in the receiving waters. However, exceedances of water quality objectives, including exceedances of AB411 standards, were reported for a number of monitoring locations by the permittees. Shoreline monitoring data indicate that AB411 exceedances are higher during the summer months (AB411 season) compared to the winter months. For the interior channels, AB411 exceedances were higher than shoreline, but were not significantly different for summer and winter months[12.] The index of biotic integrity rating is generally poor for most urban streams. The monitoring data also indicated sporadic exceedances of water quality objectives for dissolved oxygen, pH, turbidity, ammonia-nitrogen, surfactants, and some of the metals[13.]

34. During the summers of 1999 and 2000, a number of locations along the Orange County coast exhibited elevated bacterial levels. Since then a number of studies have been conducted that indicate that urban runoff, especially dry weather runoff, is a major contributing factor to the Orange County coastal bacterial contamination problems. To address this bacterial problem, the permittees currently divert dry weather low flows from some of these areas to the sanitary sewer. With the diversion of dry weather flows to the sanitary sewer, there have been significant improvements in the beach water quality. A number of studies have been conducted to determine the source of this microbial contamination and to develop permanent remedial measures. These studies have not conclusively determined the sources or solutions to this problem.

35. Monitoring results have indicated the presence of elevated concentrations of pesticides in storm water runoff from urban areas. The permittees have developed and implemented a model plan entitled, “Management Guidelines for Use of Fertilizers and Pesticides”. The Report of Waste Discharge indicates that through implementation of this program, the municipalities have reduced the use of fertilizers

[12] Unified Annual Progress Report, 2005-2006, Page C-11-31.

[13] Unified Annual Progress Report, 2005-2006, Attachment C-11-VII.

and pesticides. The permittees are required to review this plan to make any needed changes. TMDLs are being developed for some of the pesticides for the Newport Bay watershed. This order may be reopened to include any TMDL requirements.

36. Pollutants in urban runoff can impact the beneficial uses of the receiving waters and can cause or threaten to cause a condition of pollution or nuisance. Pathogens, such as bacteria, viruses, protozoa, (from sanitary sewer overflows, septic system leaks, spills and leaks from portable toilets, pets, wildlife and human activities) can impact water contact recreation, non-contact water recreation and shellfish harvesting. Microbial contamination of the beaches from urban runoff and other sources has resulted in a number of health advisories issued by the Orange County Health Officer. Oil and grease (from automobiles, industrial sites, etc.) can coat birds and aquatic organisms, adversely affecting respiration and/or thermoregulation. Other petroleum hydrocarbon components can cause toxicity to aquatic organisms and can impact human health. Suspended and settleable solids (from sediment, trash, and industrial activities) can be deleterious to benthic organisms and may cause anaerobic conditions. Sediments and other suspended particulates (from construction sites, erosion due to hydromodification, etc.) can cause turbidity, clog fish gills and interfere with respiration in aquatic fauna. These pollutants can also screen out light, hindering photosynthesis and normal aquatic plant growth and development. Toxic substances (from pesticides, herbicides, petroleum products, metals) can cause acute and/or chronic toxicity, and can bioaccumulate in organisms to levels that may be harmful to human health. Nutrients (from fertilizers, confined animal feeding operations, wildlife, pets and birds) can cause excessive algal blooms. These blooms can lead to problems with taste, odor, color and increased turbidity, and can depress the dissolved oxygen content, leading to fish kills. Stagnant water trapped in trash and debris creates breeding conditions for disease vectors (e.g., mosquitoes). Trash and debris, in particular plastics, have long been recognized as both aesthetic nuisances and as threats to freshwater and marine environments. Plastic debris, in the form of broken-down packaging and pre-production plastic pellets or 'nurdles', harms hundreds of wildlife species through ingestion, entanglement and entrapment. These plastic nurdles have the capability of absorbing pollutants, such as PCBs, and when ingested by wildlife, expose those animals to pollutant concentrations that are orders of magnitude higher than the surrounding water. Water Code Section 13367 requires the State Board and the regional boards to implement a program to control discharges of preproduction plastic from point and nonpoint sources. In collaboration with the permittees, Regional Board staff is currently trying to address this problem through the State's General Storm Water Permit for Industrial Activities and local controls.

37. Pollutants in urban runoff could adversely impact human health and the environment. Human illnesses have been linked to recreational activities in coastal waters especially near storm drain outlets[14]. Bioaccumulation of pollutants, present

[14] The Santa Monica Bay Restoration Project, Epidemiology Study, 1996.

in urban runoff, can occur in fish and other aquatic organisms. These organisms may be consumed by birds and humans. Pollutants in urban runoff can also cause mortality, impair growth and reproduction anomalies in aquatic organisms. If not properly designed and maintained, urban storm water treatment systems could provide breeding areas for disease vectors, such as mosquitoes, which are a public health concern (e.g., West Nile Virus).

38. It is important to control litter in order to eliminate trash and other materials in storm water runoff. In addition to the municipal ordinances prohibiting litter, the permittees participate or organize a number of other programs such as "Coastal Cleanup Day", "Pride Days", "Volunteer Collection Day", etc. The permittees also organize solid waste collection programs, household hazardous waste collections, and recycling programs to reduce litter and illicit discharges. Additionally, the permittees have installed debris booms at a number of locations to capture trash and debris preventing it from depositing on beaches.

39. The pollutants from urbanized areas are also a significant threat to environmentally sensitive areas, such as waterbodies designated as supporting a RARE beneficial use (supporting rare, threatened or endangered species), areas of special biological significance (ASBSs) and Clean Water Act Section 303(d) listed impaired waterbodies. The State Board is developing Special Protections for Storm Water and Non-point Source Discharges to ASBSs. Where applicable, the permittees are expected to comply with these Special Protection requirements for the ASBSs.

J. CWA SECTION 303(d) LISTED WATERBODIES AND TMDLS

40. Water quality assessments conducted by Regional Board staff have identified a number of water quality standards impairments due, in part, to urban runoff. Section 305(b) of the CWA requires each of the regional boards to routinely monitor and assess the quality of waters of the region. If this assessment indicates that beneficial uses and/or water quality objectives are not being met, then that waterbody must be listed under Section 303(d) of the CWA as an impaired waterbody. The 2006 State water quality assessment listed a number of water bodies within the Region under Section 303(d) as impaired waterbodies. For many of these impaired waterbodies, one of the listed causes of impairment is urban runoff. In the Orange County area, these include:

    San Diego Creek, Reach 1 (listed for toxaphene, selenium, fecal coliform, nutrients, pesticides, sediment/siltation);

    San Diego Creek, Reach 2 (listed for metals, nutrients, sediment/siltation, unknown toxicity);

    Upper Newport Bay Ecological Reserve (listed for sediment toxicity, metals, copper, chlordane, PCBs, DDT, nutrients, pathogens, pesticides, sediment/siltation);

    Lower Newport Bay (listed for chlordane, copper, DDT, sediment toxicity, PCBs, nutrients, pathogens, pesticides);

    Anaheim Bay (listed for nickel, dieldrin, sediment toxicity, PCBs);

Huntington Harbour (listed for copper, lead, nickel, chlordane, pathogens, PCBs, sediment toxicity);

Santiago Creek, Reach 4 (listed for salinity, TDS, chlorides);

Seal Beach (listed for enteroccocus, PCBs);

Silverado Creek (listed for pathogens, salinity, TDS, chlorides);

Rhine Channel (listed for copper, lead, mercury, zinc, sediment toxicity, PCBs);

Peters Canyon Channel (listed for DDT, toxaphene);

Los Trancos Creek (Crystal Cove Creek) (listed for total and fecal coliform);

Huntington Beach State Park (listed for enteroccocus, indicator bacteria, PCBs);

Bolsa Chica State Beach (listed for copper and nickel);

Buck Gully Creek (listed for total and fecal coliform); and

Balboa Beach (listed for dieldrin, DDT, PCBs).

41. Federal regulations require that a total maximum daily load (TMDL) be established for each 303(d) listed waterbody for each of the pollutants causing impairment. The TMDL is the total amount of the pollutant that can be discharged while water quality standards in the receiving water are attained, i.e., water quality objectives are met and the beneficial uses are protected. A TMDL is the sum of the individual wasteload allocations (WLA) for point source inputs, load allocations (LA) for non-point source inputs and natural background, plus a margin of safety. TMDLs are one of the bases for limitations established in waste discharge requirements.

42. For 303(d) listed waterbodies without a TMDL, the permittees are required to provide special protections through development and implementation of Watershed Action Plans or other focused control measures that would address the pollutant of concern. If a TMDL has been developed and an implementation plan is yet to be developed, the permittees are required to develop constituent specific source control measures, conduct additional monitoring and/or cooperate with the development of an implementation plan.

43. TMDLs have been established by the Regional Board for sediment, fecal coliform, diazinon, chlorpyrifos and nutrients for the Newport Bay watershed. Organochlorine compounds TMDLs were adopted by the Regional Board on September 7, 2007. In addition, toxics TMDLs were promulgated by USEPA on June 14, 2002, including TMDLs for metals and selenium, and a TMDL specific to the Rhine Channel located in Lower Newport Bay.

44. TMDLs for diazinon and chlorpyrifos in San Diego Creek, and for chlorpyrifos in Upper Newport Bay, were adopted by the Regional Board on April 4, 2003, and subsequently approved by the State Board, State Office of Administrative Law, and EPA. The diazinon and chlorpyrifos TMDLs require all MS4 permittees in the

Newport Bay Watershed to develop and implement monitoring programs for diazinon and chlorpyrifos. The TMDLs also impose limits on the discharge of these compounds. This order incorporates these requirements.

45. The fecal coliform TMDL specifies WLAs for urban runoff to protect water contact recreation and shellfish harvesting beneficial uses. The implementation plan for the fecal coliform TMDL requires that monitoring and certain investigations be conducted, including a source identification and characterization investigation of urban runoff. An updated TMDL report is to be prepared based on the data and information collected, and the TMDL is to be adjusted, as necessary, based on the updated TMDL report. This order may be reopened to incorporate additional requirements based on findings in the source identification and characterization plan that is expected to be completed in 2009. This order may be reopened to incorporate additional or revised requirements based on the updated TMDL report and/or approved changes to the TMDL.

46. As indicated above, nutrient (nitrogen and phosphorus) TMDLs have been established by the Regional Board for the Newport Bay watershed. The current and future (year 2012) targets for the nutrient TMDLs are already being met. However, Board staff is currently reevaluating the nutrient TMDLs in light of evidence that there remains impairment of these waters due to eutrophication. The EPA promulgated TMDLs for selenium but, an implementation plan is yet to be developed. The Regional Board adopted Orders No. R8-2004-021 and R8-2007-0041 as interim control measures to address nitrogen and selenium in groundwater-related discharges to the Newport Bay watershed. In response to Order No. R8-2004-0021, stakeholders established a Nitrogen Selenium Management Program (NSMP) Working Group. The Working Group is implementing an approved workplan that is expected to identify comprehensive management plans for both selenium and nitrogen in groundwater in the Newport Bay watershed. Board staff is currently developing selenium TMDLs that will update and revise those established by EPA and that will include an implementation plan. The implementation plan will rely heavily on the findings and recommendations made by the NSMP Working Group. It is expected that the implementation plan will include the opportunity for an adaptive, collaborative approach by stakeholders in the watershed to address selenium and nitrogen in comprehensive and efficient fashion. This approach may be implemented through a cooperative agreement or, alternatively, through waste discharge requirements or a conditional waiver of waste discharge requirements.

47. In support of the nutrient TMDLs implementation plan, a regional monitoring program (RMP) was developed to monitor nutrients in San Diego Creek and Newport Bay. This order requires the permittees listed under the RMP to continue their participation in the RMP program.

48. On September 7, 2007, the Regional Board adopted TMDLs for organochlorine compounds (OCs) that specify WLAs for urban runoff for DDT and toxaphene in San Diego Creek, and DDT, chlordane, and PCBs in Upper and Lower Newport Bay. The OCs TMDLs also specify informational TMDLs with informational urban

runoff WLAs for chlordane and PCBs in San Diego Creek. The OCs TMDLs require approval from the State Board, the State Office of Administrative Law, and EPA. The implementation plan for the OCs TMDLs includes monitoring and, where necessary, enhanced implementation of best management practices (BMPs) to reduce erosion and sediment transport as organochlorine compounds tend to adhere to fine sediment. In addition, the OCs TMDL implementation plan provides an opportunity for dischargers to participate in the development and implementation of a comprehensive Work Plan that would address the OCs and other sources of toxicity in the San Diego Creek and Newport Bay watersheds. Once a Work Plan is developed, it is required to be approved by the Regional Board at a public hearing. Participation by the permittees in this process will obviate the need for individual actions on the tasks in Table NB-OCs-13[15] by members of the Working Group. The County of Orange and Newport Bay watershed MS4 permittees have initiated efforts to develop a Work Plan. MS4 permittees not electing to participate in the Work Plan approach will be required to implement the tasks shown in Table NB-OCs-13, as appropriate.

49. The State Board awarded a grant to the South Coast Resource Conservation and Development Council in partnership with the University of California Cooperative Extension to investigate and demonstrate strategies to reduce pesticide runoff from urban areas. A pesticide management plan for the Newport Bay watershed has been developed under this program[16].

50. If the TMDL implementation plans include compliance schedules beyond the permit term, monitoring and other requirements are being included in this order to monitor progress towards achieving future compliance.

51. Certain portions of the San Gabriel River watershed are under the Los Angeles Regional Board's jurisdiction. Urban runoff from cities and county areas within the northwestern portions of Orange County discharge into the San Gabriel River and/or its tributaries. On July 13, 2006, the Los Angeles Regional Board adopted TMDLs for metals in the San Gabriel River watershed. However, because of the state's inability to meet the March 2007 deadline for an approved TMDL prescribed in a consent decree (Heal the Bay Inc., et al. v. Browner C98-4825 SBA), on March 26, 2007, the EPA promulgated TMDLs for metals and selenium for the San Gabriel River. The upper portions of Coyote Creek flow through Orange County to join the San Gabriel River above the tidal prism. Other unnamed tributaries located in northwestern Orange County also discharge into the San Gabriel River estuary. The EPA promulgated TMDLs include wet weather wasteload allocations for Coyote Creek for copper, lead and zinc and dry weather wasteload allocations for copper for Coyote Creek. The permittees are expected to implement programs and policies consistent with the metals and selenium TMDLs for the San Gabriel River watershed. This includes constituent-specific source control programs or other equally effective programs to control

[15] Attachment 2 to Resolution No. R8-2007-0024.

[16] Darren L. Haver and John N. Kabashima, June 30, 2008, Pesticide Runoff Management Plan, Newport Bay Watershed.

the discharge of copper, lead and zinc into Coyote Creek and other tributaries in Orange County that discharge into the San Gabriel River.

52. This order requires permittees to comply with established TMDL wasteload allocations specified for urban runoff and/or storm water by implementing the necessary BMPs. NPDES regulations at 40 CFR 122.44(d)(vii)(B) require that permits be consistent with wasteload allocations approved by U. S. EPA. This order requires the permittees to comply with the urban runoff/storm water wasteload allocations specified in (1) Regional Board-adopted and USEPA approved TMDLs (including TMDLs for nutrients, fecal coliform, diazinon and chlorpyrifos); (2) Regional Board-adopted TMDLs that are approved by the State Board and State Office of Administrative Law and that are thereby effective (approval of organochlorine compounds TMDLs by the State is pending); and, (3) USEPA-promulgated TMDLs (including toxics TMDLs for the Newport watershed). Continuation of water quality/biota monitoring and analysis of the data are essential to better understand the impacts of storm water discharges on the water quality of the receiving waters, impairment caused by urban runoff, compliance with the wasteload allocations and for assessing the effectiveness of control measures.

53. Permittees will be required to comply with established TMDLs and other water quality standards or discharge requirements that may be imposed by the EPA or the State prior to the expiration of this order. This order may be reopened to address established or revised TMDLs and/or other requirements developed and adopted by the Regional Board, EPA or the State Board.

K. DRAINAGE AREA MANAGEMENT PLAN (DAMP)

54. Urban development increases population density and pollutant sources[17] such as construction activities, industrial facilities, auto emissions, wastes related to automobile maintenance activities, sanitary wastes, pesticides, pet wastes, household hazardous wastes and trash[18]. If appropriate BMPs are not implemented, retail gasoline outlets and automobile service stations could be significant sources of pollutants in urban runoff including petroleum hydrocarbons, oil and grease, metals and solvents[19].

55. The local agencies (the permittees) are the owners and operators of the storm water conveyance systems and have established appropriate legal authority to control discharge of pollutants to the MS4s. The permittees have adopted grading and erosion control ordinances and guidelines for the implementation of best management practices (BMPs) for municipal, commercial, and industrial activities.

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[17] U.S. EPA (1992). *Environmental Impacts of Storm Water Discharges: A National Profile,* EPA 841-R-92-001; Office of Water, Washington, DC.

[18] National Management Measures to Control Nonpoint Source Pollution from Urban Areas. USEPA Publication No. EPA 841-B-05-004, November 2005.

[19] Retail Gasoline Outlet and Commercial Parking Lot Storm Water Runoff Study, Western States. Petroleum Association and American Petroleum Institute (1994) at p 13. The study concludes that pollutant concentrations in storm water discharges from properly managed RGOs are similar to concentrations from commercial parking lots and diffuse urban runoff.

The permittees must exercise a combination of these programs, policies, and legal authority to ensure that pollutant loads resulting from urbanization are properly controlled and managed.

56. One of the major tools that the permittees use for urban runoff pollution prevention is the development and implementation of an appropriate DAMP, including best management practices (BMPs). The ultimate goal of the urban storm water management program is to support attainment of water quality objectives for the receiving waters and to protect beneficial uses through the implementation of the DAMP. The permittees developed and submitted a revised draft 2007 DAMP.

57. The DAMP is a dynamic document and the permittees have implemented, or are in the process of implementing, various elements of the DAMP. This order requires the permittees to continue to implement the BMPs listed in the revised DAMP; update or modify the DAMP, when appropriate, consistent with the MEP and other applicable standards; and to effectively prohibit illicit discharges to the storm drain system.

58. The Orange County DAMP defined: (1) a management structure for the permittees' compliance effort; (2) a formal agreement to underpin cooperation; and (3) a detailed municipal effort to develop, implement, and evaluate various BMPs or control programs in the areas of public agency activities, public information, new development and construction, public works construction, industrial discharger identification, and illicit discharger/connection identification and elimination.

59. In order to meet DAMP requirements and characterize and manage pollutant sources on a local level, the permittees developed LIPs. Each jurisdiction has developed its own LIP and is implementing the LIP to properly manage, reduce and mitigate potential and actual pollution sources within the boundaries of each permittee's jurisdiction.

L. NEW DEVELOPMENT/SIGNIFICANT REDEVELOPMENT – WQMP/LIP/LID

60. A major portion of Orange County is urbanized with residential, commercial and industrial developments. Urban development increases impervious surfaces and storm water runoff volume and velocity and decreases vegetated, pervious surface areas available for infiltration and evapotranspiration of storm water. Increase in runoff volume and velocity can cause scour, erosion (sheet, rill and/or gully), aggradation (raising of a streambed from sediment deposition) and can change fluvial geomorphology, hydrology and aquatic ecosystems. This order includes requirements to address increases in imperviousness and changes in water quality and quantity, including hydrologic conditions of concern.

61. Recent studies have indicated that low impact development[20] (LID) BMPs are effective storm water management tools that minimize adverse impacts on storm water runoff quality and quantity resulting from urban developments. The Southern

[20] Low impact development is an approach to land development (or re-development) that works with nature to manage storm water as close to its source as possible by using structural and non-structural best management practices to reduce environmental impacts.

California Monitoring Coalition (SMC), including the project lead agency, the San Bernardino County Flood Control District, in collaboration with SMC member Southern California Coastal Water Research Project (SCCWRP) and the California Storm Water Quality Association (CASQA), with funding from the State Water Resources Control Board and CASQA, is developing a Low Impact Development Manual for Southern California. A preliminary draft of this manual indicates that effective implementation of site design LID BMPs should occur during the earliest stages of planning such as site assessment, environment review and site planning. This manual will be incorporated into the CASQA BMP Handbooks. The permittees are encouraged to utilize the manual as a resource to implement LID techniques. This order requires the project proponents to first consider preventative and conservation techniques (e.g., preserve and protect natural features to the maximum extent practicable) prior to considering mitigative techniques (structural treatment, such as infiltration systems). The mitigative measures should be prioritized with the highest priority for BMPs that remove storm water pollutants and reduce runoff volume, such as infiltration, then other BMPs, such as harvesting and re-use, evapotranspiration and bio-treatment should be considered. These LID BMPs must be implemented at the project site in a manner consistent with the maximum extent practicable standard. Where LID BMPs are not feasible at the project site, more traditional, but equally effective control measures should be implemented.

62. The USEPA has determined that LID/green infrastructure can be a cost-effective and environmentally preferable approach for the control of storm water pollution and will minimize downstream impacts by limiting the effective impervious area of development. LID and the reduction of impervious areas may achieve multiple environmental and economic benefits in addition to reducing downstream water quality impacts, such as enhanced water supplies, cleaner air, reduced urban temperatures, increased energy efficiency and other community benefits, such as aesthetics, recreation, and wildlife areas. USEPA has reviewed studies[21] that have evaluated the percent EIA[22] concept (also see the SCCWRP study[23]). The limited study conducted by Dr. Richard Horner[24] concluded that a 3% EIA standard for development is feasible in Ventura County. EPA believes that EIA is a reasonable metric for incorporating LID principles into storm water permits and EPA supports

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[21] See for example the analysis prepared by Dr. Richard Horner entitled, "Investigation of the Feasibility and Benefits of Low-Impact Site Design Practices ("LID") for Ventura County" submitted to the Los Angeles Regional Board by NRDC.

[22] EIA=effective impervious area. These are areas where little or no infiltration of storm water occur, such as paved areas.

[23] Studies conducted by Southern California Coastal Water Research Project (SCCWRP) and others indicate that environmental impacts from developments could be minimized by limiting the effective impervious area.

[24] Dr. Richard Horner, Investigation of the Feasibility and Benefits of Low-Impact Site Design Practices ("LID") for Ventura County, Development (undated).

other equally effective metrics for compliance determination. A review of the analysis of the LID metrics in storm water permitting[25]and its critique[26] indicates that there are certain shortcomings in specifying a percentage EIA as a metric. A series of stakeholder meetings[27] conducted after issuance of the first draft of this order concluded that other equally effective metrics could be used to quantify implementation of LID. It was generally agreed by the stakeholders that a numeric metric, such as a metric based on a specified volume capture may be an equally effective metric. A 5% EIA metric was included in the first draft of this order. The second draft replaces the 5% EIA metric with a volume capture metric based on the design volume specified in the WQMP.

63. On October 5, 2000, the State Board adopted Order No. WQ-2000-11, which is a precedential order. Order No. WQ-2000-11 required that urban runoff generated by 85th percentile storm events from specific types of development categories should be infiltrated, filtered or treated. The essential elements of this precedential order were incorporated into the Region 8 Orange County third term permit. In accordance with the requirements specified in the third term permit, the permittees developed a model Water Quality Management Plan (WQMP) by amending their Drainage Area Management Plan (DAMP). The model WQMP provides a framework to incorporate watershed protection principles into the permittees planning, construction and post-construction phases of defined new and redevelopment projects. The model WQMP includes site design, source control and treatment control elements to reduce the discharge of pollutants in urban runoff. On September 26, 2003, the Regional Board approved the model WQMP. The permittees have incorporated provisions of the model WQMP into their LIPs. The permittees are requiring new developments and significant redevelopments to develop and implement appropriate project WQMPs. This order requires continued implementation of structural and non-structural BMPs for new developments and significant redevelopments as per the approved model WQMP, and the priority project threshold for commercial/industrial developments has been changed to 10,000 square feet, making it consistent with the threshold for residential subdivisions. However, with the implementation of LID techniques, some of the structural treatment control BMPs may not be necessary. The project WQMPs are required to include a discussion on how LID principles are incorporated into the project. Section 7.II-3.2.4 of the WQMP requires identification of hydrologic conditions of concern (HCOC). An HCOC exists when a site's hydrologic regime is

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[25] Low Impact Development Metrics in Stormwater Permitting, Prepared for the Ventura Countywide Stormwater Quality Management Program and the Orange County Stormwater Program by Geosyntec Consultants and Larry Walker Associates with Assistance from Hawks and Associates (January 2009).

[26] Critique of Certain Elements of "Low Impact Development Metrics in Stormwater Permitting" by Dr. Richard Horner (undated, submitted by NRDC on February 13, 2009).

[27] The stakeholder group included representatives from Permittees, NRDC, Orange County Coastkeeper, BIA/CICWQ, The Irvine Company, Regional Board staff, USEPA and a number of consultants and attorneys.

altered and there are significant impacts on downstream channels and aquatic habitats, alone or in conjunction with impacts of other projects. Currently, new development and significant re-development projects are required to perform this assessment and incorporate appropriate BMPs to ensure existing hydrologic conditions are maintained. Certain jurisdictions have employed HCOC mapping efforts to assist developers in identifying areas where HCOC conditions exist. Within six months of adoption of this order, the permittees are required to conduct an HCOC mapping to identify HCOC areas in the permitted area.

64. The Region 8 Orange County third term permit required the permittees to review their planning (CEQA, General Plan, etc.) and approval processes to determine the need to revise those processes to address appropriate storm water protection principles. The model WQMP provides a framework for addressing these issues. However, Regional Board staff's audit of the permittees MS4 program indicated that all the permittees had not fully implemented the program. This order requires the permittees to reevaluate and to revise the current program implementation processes. Pollution prevention techniques, appropriate planning processes and early identification of potential storm water impacts and mitigation measures can significantly reduce storm water pollution problems. The permittees shall consider these impacts and appropriate mitigation measures during the planning and approval processes.

65. The intent of the WQMP, SWPPP and other programs and policies incorporated into this order is to minimize the impact from the project on water quality and the environment. However, compliance with this order and the DAMP does not necessarily constitute mitigation that is sufficiently specific to satisfy the requirements of CEQA with regards to projects.

66. Treatment control BMPs include vortex systems, catch basin inserts, detention basins, infiltrations areas (including LID-based), retention basins, regional treatment systems, constructed wetlands, various types of storm water filters, etc. If not properly designed and managed, these systems could be sources of pollutants and could become a nuisance and/or cause the spreading of surface water pollution, and those treatment systems with a hydraulic connection to groundwater (e.g., detention basins, infiltration systems, constructed wetlands, etc.) could be sources of groundwater pollution. Restrictions placed on urban runoff infiltration in this order (Section XII.B.5.) are based on recommendations provided by the U.S. EPA Risk Reduction Laboratory. The requirements specified in this order include identification of responsible agencies for maintaining the systems and for providing funding for operation and maintenance.

67. If not properly designed and maintained, the BMPs identified in Finding 66 could create a nuisance and/or habitat for vectors[28] (e.g., mosquitoes and rodents). Third term permit required the permittees to closely collaborate with the Orange County

[28] Managing Mosquitoes in Stormwater Treatment Devices, Marco E. Metzger, University of California Davis, Division of Agriculture and Natural Resources, Publication 8125.

Vector Control District during the development and implementation of such treatment systems. The permittees should continue these collaborative efforts with the Vector Control District to ensure that treatment control systems do not become a nuisance or a potential source of pollutants. There are other site conditions that limit the applicability of infiltration, including site soils, contaminant plumes, potential mobilization of naturally occurring contaminants such as selenium, high groundwater levels, etc. Such factors should be considered in the design and implementation of storm water control measures.

M. NON-STORM WATER/DE-MINIMUS DISCHARGES

68. The MS4s generally contain non-storm water flows such as irrigation runoff, runoff from non-commercial car washes, runoff from miscellaneous washing and cleaning operations, and other nuisance flows generally referred to as de-minimus discharges. Federal regulations, 40 CFR Part 122.26(d)(2)(i)(B), prohibit the discharge of non-storm water containing pollutants into the MS4s and to waters of the U.S. unless they are regulated under a separate NPDES permit, or are exempt, as indicated in Discharge Prohibitions, Section III.3 of this order. The Regional Board adopted a number of NPDES permits[29] to address de-minimus type of pollutant discharges. However, the permittees need not get coverage under the de-minimus permits for the types of discharges listed under Section III.3, except for discharges to the Newport Bay watershed (where coverage under the Newport Bay watershed-specific de-minimus permit is required, see Finding 69), as long as they are in compliance with the conditions specified under Section III of this order.

69. Many areas of the San Diego Creek/Newport Bay watershed have high nitrate and/or selenium levels in the soils and/or groundwater. Dewatering operations, construction activities and agricultural and other operations could mobilize these pollutants and carry them into San Diego Creek and Newport Bay. The Regional Board has adopted a General Permit, Order No. R8-2007-0041, to regulate dewatering wastes into the San Diego Creek/Newport Bay watershed. In addition, stakeholders in the watershed are in the process of developing a comprehensive nitrogen/selenium management plan to address the nitrogen/selenium issues.

N. PERMIT REQUIREMENTS AND NUMERIC EFFLUENT LIMITS

70. The first term permit required the permittees to: (1) develop and implement the DAMP and a storm water and receiving water monitoring plan; (2) eliminate illicit discharges[30] to the MS4s; and (3) enact the necessary legal authority to effectively

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[29] E.g., R8-2003-0061,as amended by R8-2004-0021.

[30] Illicit Discharge means any discharge to the municipal separate storm system that is prohibited under local, state, or federal statutes, ordinances, codes, or regulations. The term illicit discharge includes all discharges that contain non storm-water discharges except discharges pursuant to an NPDES permit, discharges that are identified in Section III, Discharge Limitations/Prohibitions, of this order, and discharges authorized by the Regional Board Executive Officer.

prohibit such discharges. The overall goal of these requirements was to reduce pollutant loadings to surface waters from urban runoff to the MEP. The second term permit required continued implementation of the DAMP and the monitoring plan, and required the permittees to focus on those areas that threaten beneficial uses. The third term permit required the permittees to inspect construction sites and industrial and commercial facilities. The permittees were also required to develop and implement a model WQMP to address runoff from new development and significant redevelopment projects. The principal permittee, in co-operation with the co-permittees, developed administrative strategies and implementation procedures for each program element. Each permittee incorporated these tools into its LIP. The permittees are required to continue to implement each of these program elements and to aggressively pursue implementation of LID techniques during the fourth term permit. As required under the third term permit, the principal permittee, in collaboration with the co-permittees, evaluated the effectiveness of the overall program during the permit term. The permittees, in consultation with Regional Board staff, evaluated each program element and proposed new and improved program commitments in their 2006 Report of Waste Discharge. Regional Board staff audited each of the permittee programs during the third term permit and determined that some of the permittees had significant violations with respect to implementation of certain program elements. Enforcement actions were taken to bring these permittees into compliance. The permittees were required to address problems identified during the audit. Some of the permittees were to amend their LIPs to address deficiencies noted during the audit.

71. Based on the results of the audits performed during the 3rd term permit, a number of permit requirements have been incorporated into the current permit. While the 2001 DAMP listed criteria by which co-permittees were to assess the priority ranking of commercial sites, a number of co-permittees had interpreted those criteria in such a manner as to ensure that only a very small number of sites would be ranked 'High' and in some cases, all commercial sites within a municipality were ranked 'Low,' resulting in the least number of inspections possible. To address this situation, commercial site ranking now requires that a minimum 10% of the sites with the highest potential for pollutant discharge, be ranked 'High' and next 40% of highest potential sites be ranked 'Medium,' for inspection purposes.

72. The Report of Waste Discharge proposes to enhance implementation of various program elements through the development of performance indicators and auditable systems, and by focusing on addressing problems on a watershed-specific basis. To improve program management efficiencies, the permittees are proposing to define expertise and competencies for program managers and inspectors, and to develop and implement an effective training program for them. The principal permittee in collaboration with the co-permittees is required to develop guidelines for defining the expertise and competencies for various positions and training programs and schedules for training for these positions. In the event that co-permittees want to design their own training program, it should be prepared in collaboration with the principal permittee, and at a minimum, should contain all information present in the principal permittee-prepared training program. The permittees are required to document procedures used to determine the defined

competencies for each storm water position (this may be accomplished through a test at the end of the training program or through an on-the-job testing procedure).

73. This order includes wasteload allocations for those constituents for which either the U.S. EPA has promulgated or the Regional Board has established TMDLs. Federal regulations (40 CFR 122.44(d)(vii)(B)) require that the Permits be consistent with the applicable wasteload allocations in the TMDLs. Consistent with the federal storm water laws and regulations, the order does not include numeric effluent limits for other potential pollutants. Federal Clean Water Act requires the permittees to have appropriate controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and systems, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants (33 USC 1342(p)(3)(B)). MEP is a dynamic performance standard and it evolves as our knowledge of urban runoff control measures increases.

74. On June 17, 1999, the State Board adopted Water Quality Order No. 99-05. This is a precedential order that incorporates the receiving water limitations language recommended by the USEPA. Consistent with the State Board's order, this order requires the permittees to comply with the applicable water quality standards, which is to be achieved through an iterative approach requiring the implementation of increasingly more effective BMPs. This approach is consistent with most of the municipal storm water permits issued in California that specify certain minimum control measures and incorporate an iterative process that requires increasingly more effective control measures if the water quality objectives are not met.

O. MUNICIPAL FACILITIES AND ACTIVITIES

75. The permittees own and operate MS4s and appurtenances, build and maintain roads and other transportation facilities, sanitary waste collection and conveyance systems, recreational facilities such as parks, hiking trails, etc., and other infrastructures of the urban environment. This order requires the permittees to consider water quality impacts during the planning stages of these projects, during construction and post-construction use, and during operation and maintenance of these facilities. This order includes requirements for the control of trash and debris, for street sweeping, and for drainage facilities maintenance. The permittees have already installed eleven trash and debris booms in flood control channels and harbors to recover floatable material. The permittees have promoted a number of public awareness and volunteer cleanup programs. The Orange County Integrated Waste Management Board administers the household hazardous waste collection program. Most of the permittees, in collaboration with the Orange County Health Care Agency, implement the oil recycling program.

76. The permittees own and/or operate facilities where industrial or related activities take place that may have an impact on storm water quality. Some of the permittees also enter into contracts with outside parties to carry out municipal related activities that may also have an impact on storm water quality. The permittees have developed and are implementing a Model Municipal Activities Program that

established a framework for conducting a systematic program of evaluation and BMP implementation for fixed facilities, field operations and drainage facilities. Non-storm water discharges from these facilities and/or activities could also affect water quality. This order prohibits non-storm water discharges from public facilities, unless the discharges are exempt under Section III, Discharge Limitations, of this order, or are permitted by the Regional Board under an individual NPDES permit or the de-minimus permits.

77. Successful implementation of the provisions and limitations in this order will require the cooperation of public agency organizations within Orange County having programs/activities that have an impact on storm water quality. A list of these organizations is included in Attachment C. As such, these organizations should actively participate in implementing the Orange County NPDES Storm Water Program. The Regional Board has the discretion and authority to require certain non-cooperating entities to participate in this areawide permit or obtain individual storm water discharge permits, pursuant to 40 CFR 122.26(a). The permittees have developed a Storm Water Implementation Agreement among the County, the cities and the Orange County Flood Control District. The Implementation Agreement establishes the responsibilities of each party, a funding mechanism for the shared costs, and recognizes the Technical Advisory Committee (TAC).

78. The permittees have developed and implemented programs and policies to address fixed facilities, fertilizer and pesticide use, employee training, storm drain inspection and maintenance activities, and other related planning, inspection and maintenance programs. This order requires the permittees to continue these programs and propose any needed changes to these programs.

79. Some of the permittees own and operate sewage collection systems. Sanitary sewer overflows (SSOs) have been a significant source of water quality impairments and beach closures in Orange County. On May 2, 2006, the State Board adopted Water Quality Order No. 2006-0003 to provide a consistent statewide regulatory approach to address SSOs. In addition, the principal permittee, in collaboration with the Orange County Sanitation District and a number of the co-permittees, has developed the Countywide Area Spill Control Program to address SSOs in certain areas of Orange County. These two programs are expected to address issues related to SSOs.

P. PUBLIC EDUCATION/PARTICIPATION

80. Urban runoff contains pollutants from privately owned and operated facilities, such as residences, businesses, private and/or public institutions, and commercial establishments. Therefore, a successful storm water management plan should include the participation and cooperation of the public, businesses, the permittees and the regulators. The DAMP has a strong emphasis on public education. Public education includes education of the public at large, commercial establishments, industrial facilities and developers. It also includes proper training for municipal planning, inspection and maintenance activities. The permittees have developed

inter-departmental training programs and have made commitments to conduct a certain number of these training programs during the term of this permit.

81. Public education is an important part of storm water pollution prevention. The permittees have employed a variety of means to educate the public, business and commercial establishments, industrial facilities and construction sites, and in 1999 developed a long term public education strategy. In 2002, the permittees created a public and business outreach strategy and developed the "Orange County Stormwater Public Education Program Recommendations." This strategy was updated in 2004 and established a long-term cost-effective approach to educate the public and targeted businesses about the effects of storm water pollution and encourages their participation in protecting water quality. In accordance with this strategy the permittees conducted a public awareness survey and translated relevant public education materials into Spanish and Vietnamese. The permittees employed a variety of media, including newspapers, radio, television, movie theaters, advertisements on public transportation vehicles, schools and printed brochures to provide information regarding storm water pollution and the public's role in controlling it. In addition to the multi-media approach, the permittees have started to work with business establishments such as Home Depot and PetsMart, utilities such as Waste Management and Southern California Edison, organizations such as Chamber of Commerce and Welcome Express, and a number of other organizations and establishments. The permittees also established a countywide 24-hour, bilingual, hotline for reporting illegal activities that could impact water quality. This order requires implementation of LID techniques. If not properly designed and maintained, some of the LID BMPs could provide breeding areas for vectors. Public education and outreach materials should include a discussion on the association between disease vectors, urban runoff, storm water treatment control and LID BMPs.

82. The storm water regulations require public participation in the development and implementation of the storm water management program. As such, the permittees are required to solicit and consider all comments received from the public and submit copies of the comments to the Executive Officer of the Regional Board with the annual reports due on November 15 of each year. It is expected that the permittees would include comments received on any significant revisions to the Monitoring Plan, LIPs and WQMPs. In response to public comments, the permittees may modify reports, plans, or schedules prior to submittal to the Executive Officer.

Q. MONITORING AND REPORTING PROGRAM AND EFFECTIVENESS ASSESSMENT

83. In order to characterize storm water discharges, to identify problem areas, to determine the impact of urban runoff on receiving waters, and to determine the effectiveness of the various BMPs, an effective monitoring program is critical. The principal permittee administers the monitoring program for the permittees. During the previous permit term, the permittees completed the 99-04 Monitoring Plan. This plan included storm water monitoring, receiving water monitoring, dry weather

monitoring and sediment monitoring in previously identified critical aquatic resources areas, as well as, mass emissions monitoring of both wet and dry season flows. On July 1, 2003, the permittees submitted the Third Term Monitoring Plan. This plan was approved by the Executive Officer on July 15, 2005. Monitoring under this plan was expanded to cover monitoring requirements for the development and implementation of TMDLs for impaired waters in Orange County. The Monitoring Plan approved in 2005, included mass emissions monitoring, estuary/wetlands monitoring, bacteriological/pathogen monitoring, bioassessment monitoring, illicit discharge reconnaissance monitoring, and land use correlations. Three different approaches were used for these monitoring programs: core monitoring, regional monitoring, and special studies. The permittees are required to review the monitoring program on an annual basis to determine the need for any revisions. The monitoring program may have to be revised to meet TMDL and ASBS monitoring requirements and/or to make the program consistent with any statewide or regional monitoring guidance developed either by the State Board or the Stormwater Monitoring Coalition.

R. ILLICIT DISCHARGES, ILLICIT CONNECTIONS AND LEGAL AUTHORITY

84. Illicit discharges to the storm drains can contribute to storm water and surface water contamination. A reconnaissance survey of the municipal storm drain systems (open channels and underground storm drains) was completed by the permittees during the third term permit, the permittees significantly enhanced the programmatic framework for detecting and quickly controlling discharges into the MS4s. The permittees have initiated a dry weather monitoring program that is based on statistically derived benchmarks to detect illicit discharges and illicit connections. The program also facilitates public reporting of illicit discharges by providing 24-hour access to a toll free hotline. The program has a number of mechanisms in place to identify and eliminate illicit discharges to the MS4s, including: construction, commercial and industrial facility inspections, drainage facility inspections, water quality monitoring programs, and public education including a 24-hour hotline. The permittees developed a ten module training program for training municipal staff to identify and eliminate illicit discharges to the MS4s and to take appropriate enforcement actions.

85. In order to insure countywide consistency and to provide a legal underpinning to the entire Orange County storm water program, a model water quality ordinance was completed on August 15, 1994 and has been adopted by all the permittees. A countywide Enforcement Consistency Guide was established by the permittees in 1995. These documents establish legal authority for enforcing storm water ordinances and countywide uniformity in the enforcement actions. The permittees have the authority to control pollutants into the MS4s, to prohibit illicit connections and illicit discharges, to control spills, to require compliance with local water quality ordinances and to carry out inspections of the storm drain systems within their jurisdictions.

86. During the third term permit, the principal permittees in collaboration with the Orange County Sanitation District developed and implemented a coordinated sewage spill prevention and response demonstration project. This program is being evaluated for implementation throughout the Orange County Sanitation District's service area.

87. There may be discharges that are not within the permittees jurisdiction. The permittees may petition the Regional Board to issue a separate NPDES permit to any discharger of non-storm water into storm drain systems that they own or operate.

S. COMPLIANCE WITH CZARA, CEQA AND THE ANTI-DEGRADATION POLICY

88. The Coastal Zone Act Reauthorization Amendments of 1990 (CZARA), Section 6217(g), requires coastal states with approved coastal zone management programs to address non-point source pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point pollution: agriculture, silviculture, urban, marinas, and hydromodification. This order addresses the management measures required for the urban category, with the exception of septic systems. Compliance with requirements specified in this order relieves the permittees for developing a non-point source plan, for the urban category, under CZARA. The Regional Board addresses septic systems through the administration other programs.

89. In accordance with California Water Code Section 13389, the issuance of waste discharge requirements for this discharge is exempt from those provisions of the California Environmental Quality Act contained in Chapter 3 (commencing with Section 21100), Division 13 of the Public Resources Code.

90. The permitted discharge is consistent with the anti-degradation provisions of 40 CFR 131.12 and the State Board Resolution 68-16. This order requires implementation of programs (i.e., BMPs) to reduce the level of pollutants in the storm water discharges. The combination of programs and policies required to be implemented under this order for new and existing developments are designed to improve urban storm water quality.

T. PUBLIC COMMENTS AND PUBLIC HEARING

91. The Regional Board has notified the permittees and interested parties of its intent to issue waste discharge requirements for this discharge and has provided them with an opportunity to submit their written views and recommendations.

92. The Regional Board, in a public hearing, heard and considered all comments pertaining to the discharge and to the tentative requirements.

PERMIT REQUIREMENTS:

IT IS HEREBY ORDERED that the permittees, in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted thereunder, and the provisions of the Clean Water Act, as amended, and regulations and guidelines adopted thereunder, shall comply with the following:

I. RESPONSIBILITIES OF PRINCIPAL PERMITTEE

A. The principal permittee shall be responsible for the overall program management and shall:

1. Conduct chemical and biological water quality monitoring, as required by this order and any additional monitoring as directed by the Executive Officer.
2. Conduct inspections and maintain the storm drain systems within its jurisdiction.
3. Review and revise, if necessary, policies/ordinances necessary to establish legal authority as required by the Federal Storm Water Regulations.
4. Respond and/or arrange for responding to emergency situations, such as accidental spills, leaks, illicit discharges and illicit connections, etc., to prevent or reduce the discharge of pollutants to storm drain systems and waters of the US within its jurisdiction.
5. Take appropriate enforcement actions for illicit discharges to the MS4 systems owned or controlled by the principal permittee.
6. Prepare and submit to the Executive Officer of the Regional Board unified reports, plans, and programs as required by this order, including the annual report.

B. The activities of the principal permittee shall include, but not be limited to, the following:

1. Coordinate and conduct Management Committee meetings on an as needed basis. The principal permittee will take the lead role in initiating and developing areawide programs and activities necessary to comply with this order.
2. Coordinate permit activities and participate in any subcommittees formed as necessary to coordinate compliance activities with this order.
3. Provide technical and administrative support and inform the co-permittees of the progress of other pertinent municipal programs, pilot projects, research studies, etc.
4. Coordinate the implementation of areawide storm water quality management activities such as public education, pollution prevention, household hazardous waste collection, etc.
5. Develop and implement mechanisms, performance standards, etc., to promote uniform and consistent implementation of BMPs among the permittees.
6. Pursue enforcement actions as necessary within its jurisdiction to ensure compliance with storm water management programs, ordinances and implementation plans, including physical elimination of undocumented connections and illicit discharges.

7. In conjunction with the other permittees, implement the BMPs listed in the DAMP, and take such other actions as may be necessary to meet the MEP standard.
8. Monitor the implementation of the plans and programs required by this order and determine their effectiveness in protecting beneficial uses.
9. Coordinate all the activities with the Regional Board, including the submittal of all reports, plans, and programs, as required under this order.
10. Obtain public input for any proposed management and implementation plans, such as Monitoring Plans, Local Implementation Plans and significant changes to Water Quality Management Plans.
11. Cooperate in watershed management programs and regional and/or statewide monitoring programs.
12. In collaboration with the co-permittees, develop guidelines for defining expertise and competencies of storm water program managers and inspectors and develop and submit for approval a training program for various positions in accordance with these guidelines.

II. RESPONSIBILITIES OF THE CO-PERMITTEES

A. The co-permittees shall be responsible for the management of storm drain systems within their jurisdictions and shall:

1. Implement management programs, monitoring programs, implementation plans and all BMPs outlined in the DAMP/LIP within each respective jurisdiction, and take any other actions as may be necessary to meet the MEP standard.
2. Coordinate among their internal departments and agencies, as appropriate, to facilitate the implementation of this order and the DAMP/LIP.
3. Establish and maintain adequate legal authority, as required by the Federal Storm Water Regulations.
4. Conduct storm drain system inspections and maintenance in accordance with the criteria developed by the principal permittee.
5. Take appropriate enforcement actions for illicit discharges to the MS4 systems owned or controlled by the co-permittee.

B. The co-permittees' activities shall include, but not be limited to, the following:

1. Participate in the Management Committee comprised of the principal permittee and one representative of each co-permittee. The principal permittee will take the lead role in initiating and developing areawide programs and activities necessary to comply with this order. The Committee will meet on a regular basis (at least six times per year). Each permittee shall designate one official representative to the Management Committee and attend at least 75% of the meetings each calendar year.

2. Review, approve, implement, and comment on all plans, strategies, management programs, and monitoring programs, as developed by the principal permittee or any permittee subcommittee to comply with this order.
3. Pursue enforcement actions as necessary to ensure compliance with the storm water management programs, ordinances and implementation plans, including physical elimination of undocumented connections and illicit discharges to drainage systems owned or controlled by the co-permittees.
4. Conduct and coordinate with the principal permittee any surveys and characterizations needed to identify pollutant sources and drainage areas.
5. Submit storm drain system maps, including any periodic revisions, with each annual report.
6. Respond to emergency situations, such as accidental spills, leaks, illicit discharges, illicit connections, etc., to prevent or reduce the discharge of pollutants to storm drain systems and waters of the US.
7. Prepare and submit all required reports to the principal permittee in a timely manner.

III. DISCHARGE LIMITATIONS/PROHIBITIONS

1. In accordance with the requirements of 40 CFR 122.26(d)(2)(i)(B) and 40 CFR 122.26(d)(2)(i)(F), the permittees shall prohibit illicit/illegal discharges (non-storm water) from entering into the municipal separate storm sewer systems unless such discharges are either authorized by a NPDES permit, or not prohibited in accordance with Section III.3, below.
2. The discharge of storm water from the MS4s to waters of the US containing pollutants that have not been reduced to the maximum extent practicable is prohibited.
3. The permittees shall effectively prohibit the discharge of non-storm water into the MS4s, unless such discharges are authorized by a separate NPDES permit or as otherwise specified in this provision. For purposes of this order, a discharge may include storm water or other types of discharges identified below.
   i. The discharges identified below need not be prohibited by the permittees unless such discharges are identified either by the permittees or by the Executive Officer as a significant source of pollutants. The DAMP shall include public education and outreach activities directed at reducing these discharges even if they are not substantial contributors of pollutants to the MS4s.
      a) Discharges composed entirely of storm water;
      b) Air conditioning condensate;
      c) Irrigation water;
      d) Passive foundation drains;
      e) Passive footing drains;

f) Water from crawl space pumps;

g) Non-commercial vehicle washing;

h) Dechlorinated swimming pool discharges (Cleaning wastewater and filter backwash shall not be discharged to the MS4).

i) Diverted stream flows;

j) Rising ground waters and natural springs;

k) Ground water infiltration as defined in 40 CFR 35.2005 (20) and uncontaminated pumped groundwater;

l) Flows from riparian habitats and wetlands;

m) Emergency fire fighting flows (i.e., flows necessary for the protection of life and property) do not require BMPs and need not be prohibited. However, where possible, when not interfering with health and safety issues, BMPs should be implemented (also see Section XXI, Provision 5);

n) Waters not otherwise containing wastes as defined in California Water Code Section 13050 (d); and

o) Other types of discharges identified and recommended by the permittees and approved by the Regional Board.

ii. The permittees shall prohibit the following categories of non-storm water discharges from permittee owned and/or operated facilities and activities unless the stated conditions are met:

a) For discharges outside the Newport Bay watershed the de minimus types of discharges listed in the Regional Board's General De Minimus Permit for Discharges to Surface Waters, Order No. R8-2009-0003, NPDES No. CAG 998001 (General De Minimus Permit), shall be in compliance with the terms and conditions of the General De Minimus Permit. Separate coverage under the General De Minimus Permit is not required. For discharges within the Newport Bay watershed, separate permit authorization for these de minimus discharges will be required when the discharges contain selenium, nitrogen or other pollutants at levels of concern.

b) Discharges from potable water sources, including water line flushing, superchlorinated water line flushing, fire hydrant system flushing, and pipeline hydrostatic test water: Planned discharges shall be dechlorinated to a concentration of 0.1 ppm[31] or less, pH adjusted if necessary, and volumetrically and velocity controlled to prevent causing hydrologic conditions of concern in receiving waters.

[31] Total residual chlorine = 0.1 mg/l or parts per million (ppm) or less; compliance determination shall be at a point before the discharge mixes with any receiving water.

c) Discharges from lawn, greenbelt and median watering and other irrigation runoff from non-agricultural operations[32]: These discharges shall be minimized through a Model Municipal Activity Maintenance Program designed to control irrigation runoff.

d) Dechlorinated swimming pool discharges: Dechlorinated to a concentration of 0.1 ppm[33] or less, pH adjusted and reoxygenated if necessary, and volumetrically and velocity controlled to prevent causing hydrologic conditions of concern in receiving waters. Swimming pool cleaning wastewater and filter backwash shall not be discharged to the MS4s.

e) Construction dewatering wastes: The maximum daily concentration limit for total suspended solids shall not exceed 75mg/l, sulfides 0.4mg/l, oil and grease15mg/l, total petroleum hydrocarbons 0.1mg/l.

f) Discharges from facilities that extract, treat and discharge water diverted from waters of the US: These discharges shall meet the following conditions: (1) The discharges to waters of the US must not contain pollutants added by the treatment process or pollutants in greater concentration than the influent; (2) The discharge must not cause or contribute to a condition of erosion; (3) The extraction and treatment must be in compliance with Section 404 of the Clean Water Act; and (4) Conduct monitoring in accordance with Monitoring and Reporting Program attached to this order.

The Regional Board may add categories of non-storm water discharges that are not significant sources of pollutants or remove categories of non-storm water discharges listed above based upon a finding that the discharges are a significant source of pollutants.

4. Non-storm water discharges from public agency activities into waters of the US are prohibited unless the non-storm water discharges are permitted by an NPDES permit or are included in Section III.3.

5. The permittees shall reduce the discharge of pollutants, including trash and debris, from the storm water conveyance systems to the maximum extent practicable (also see Section VII).

6. Discharges from the MS4s shall be in compliance with the applicable discharge prohibitions contained in Chapter 5 of the Basin Plan.

7. Discharges from the MS4s of storm water or non-storm water, as defined in Section III.3, shall not cause or contribute to a condition of pollution, contamination or nuisance, as those terms are defined in Section 13050 of the Water Code.

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[32] Non-agricultural irrigation using recycled water must comply with the statewide permit for Landscape Irrigation Using Recycled Water and the State Department Health guidelines.

[33] See previous footnote.

8. All discharges to Areas of Special Biological Significance shall be consistent with the Special Protections/Exceptions granted by the State Board, or waste discharges shall be prohibited in accordance with the Ocean Plan.

IV. RECEIVING WATER LIMITATIONS

1. Discharges from the MS4s shall not cause or contribute to exceedances of receiving water quality standards (designated beneficial uses and water quality objectives) for surface waters or groundwaters.
2. The DAMP and its components shall be designed to achieve compliance with receiving water limitations. It is expected that compliance with receiving water limitations will be achieved through an iterative process and the application of increasingly more effective BMPs. The permittees shall comply with Sections III.2 and IV.1 of this order through timely implementation of control measures and other actions to reduce pollutants in urban runoff in accordance with the DAMP and other requirements of this order, including any modifications thereto.
3. If exceedance of water quality standards persist, notwithstanding implementation of the DAMP and other requirements of this order, the permittees shall assure compliance with Sections III.2 and IV.1 of this order by complying with the following procedure:

   a) Upon a determination by either the permittees or the Executive Officer that the discharges from the MS4 systems are causing or contributing to an exceedance of an applicable water quality standard, the permittees shall promptly notify and thereafter submit a report to the Executive Officer that describes BMPs that are currently being implemented and additional BMPs that will be implemented to prevent or reduce any pollutants that are causing or contributing to the exceedance of water quality standards. The report may be incorporated in the annual update to the DAMP, unless the Executive Officer directs an earlier submittal. The report shall include an implementation schedule. The Executive Officer may require modifications to the report;

   b) Submit any modifications to the report required by the Executive Officer within 30 days of notification;

   c) Within 30 days following approval by the Executive Officer of the report described above, the permittees shall revise the DAMP and monitoring program to incorporate the approved modified BMPs that have been and will be implemented, the implementation schedule, and any additional monitoring required; and,

   d) Implement the revised DAMP and monitoring program in accordance with the approved schedule.

   So long as the permittees have complied with the procedures set forth above and are implementing the revised DAMP, the permittees do not have to repeat the same procedure for continuing or recurring exceedances of the same receiving water

limitations unless the Executive Officer determines it is necessary to develop additional BMPs.

4. Nothing in Section IV.3 must prevent the Regional Board from enforcing any provision of this order while the permittee prepares and implements the above programs.

V. IMPLEMENTATION AGREEMENT

1. Within 6 months of adoption of this order, the existing Implementation Agreement shall be reviewed and revised, if necessary, to include any cities that were not signatories to this agreement. A copy of the signature page and any revisions to the Agreement shall be included in the annual report.
2. Within 6 months of adoption of this order and annually thereafter, the permittees shall evaluate the storm water management structure and the Implementation Agreement and determine the need for any revisions. The corresponding annual report shall include the findings of this review and a schedule for any needed revisions.

VI. LEGAL AUTHORITY/ENFORCEMENT

1. The permittees shall maintain adequate legal authority to control the discharge of pollutants to the MS4s from urban runoff and enforce those authorities. This may be accomplished through ordinance, statute, permit, contract or similar means. Such legal authority must address all illicit connections and illicit discharges into the MS4s, including those from all industrial and construction sites. The permittees may use the Enforcement Consistency Guide or develop its own enforcement program and shall incorporate the enforcement program into their Local Implementation Plan.

2. The permittees shall carry out inspections, surveillance, and monitoring necessary to determine compliance with their ordinances and permits. The Permittees' ordinance must include adequate legal authority, to the extent permitted by California and Federal Law and subject to the limitations on municipal action under the constitutions of California and the United States, to enter, inspect and gather evidence (pictures, videos, samples, documents, etc.) from industrial, construction and commercial establishments. The permittees shall progressively and decisively take enforcement actions against any violators of their Water Quality Ordinance. These enforcement actions must, at a minimum, meet the guidelines and procedures listed in the Enforcement Consistency Guide.
3. Permittees' ordinances or other local regulatory mechanisms shall include sanctions and follow up inspection milestones to ensure compliance. Sanctions shall include, but are not limited to: monetary penalties, non-monetary penalties, bonding requirements, and/or permit denials/revocations/stays for non-compliance. Follow up inspection milestones shall be consistent with applicable sections of this order. Permittees' ordinances shall have a provision for civil or criminal penalties for violations of their water quality ordinances. These penalties shall be issued in a

decisive manner within a predetermined timeframe, from the time of the violation's occurrence and/or respective follow-up inspection.

4. Within one year of the adoption of this order, each permittee shall submit a statement, signed by legal counsel, that the permittee has obtained all necessary legal authority in accordance with 40 CFR 122.26(d)(2)(i)(A-F) and to comply with this order through adoption of ordinances and/or municipal code modifications.

5. If necessary, the permittees shall revise their LIPs to include citations of appropriate local ordinances, identification of departmental jurisdictions in the implementation and enforcement of these ordinances, and key personnel. The LIP shall include procedures and timeframes for progressive enforcement actions.

6. The permittees shall continue to provide notification to Regional Board staff regarding storm water related information gathered during site inspections of industrial and construction sites regulated by the Statewide General Storm Water Permits and at sites that should be regulated under those Statewide General Permits. The notification shall be provided on a quarterly basis[34] and shall include any observed violations, or threat of potential violations of the General Permits (e.g., problematic housekeeping issues) prior history of violations, any enforcement actions taken by the permittee, and any other relevant information. (Also see notification requirements under Sections VIII, IX, and X of this Order.)

7. The permittees shall annually review their water quality ordinances and provide findings within the annual report each year on the effectiveness of these ordinances and associated enforcement programs, in prohibiting the following types of discharges to the MS4s (the permittees may propose appropriate control measures in lieu of prohibiting these discharges, where the permittees are responsible for ensuring that dischargers adequately maintain those control measures):

   a) Sewage (also prohibited under the Statewide SSO order[35]);

   b) Wash water resulting from the hosing or cleaning of gas stations, auto repair garages, and other types of automobile service stations;

   c) Discharges resulting from the cleaning, repair, or maintenance of any type of equipment, machinery, or facility, including motor vehicles, concrete mixing equipment, portable toilet servicing, etc.;

   d) Wash water from mobile auto detailing and washing, steam and pressure cleaning, carpet/upholstery cleaning, pool cleaning and other such mobile commercial and industrial activities;

   e) Water from cleaning of municipal, industrial, and commercial sites, including parking lots, streets, sidewalks, driveways, patios, plazas, work yards and outdoor eating or drinking areas, etc.;

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[34] The reporting schedule may be revised with the approval of the Executive Officer.

[35] State Board WQO No. 2006-0003.

f) Runoff from material storage areas or uncovered receptacles that contain chemicals, fuels, grease, oil, or other hazardous materials[36];

g) Discharges of runoff from the washing of toxic materials[37] from paved or unpaved areas;

h) Discharges of pool or fountain water containing chlorine, biocides, or other chemicals; pool filter backwash containing debris and chlorine;

i) Pet waste, yard waste, litter, debris, sediment, etc.; and,

j) Restaurant or food processing facility wastes such as grease, floor mat and trash bin wash water, food waste, etc.

8. The permittees are encouraged to enter into interagency agreements with owners of other MS4 systems, such as Caltrans, school and college districts, universities, Department of Defense, Native American Tribes, etc., to control the contribution of pollutants from one portion of the MS4s to another portion. The Regional Board will continue to notify the owner/operator of the MS4 systems and the local municipality if the Board issues a permit for discharges into the MS4 systems.

VII. ILLICIT DISCHARGES/ILLICIT CONNECTIONS; LITTER, DEBRIS AND TRASH CONTROL

1. The permittees shall continue to prohibit all illicit connections to the MS4s through their ordinances, inspections, monitoring programs, and enforcement actions. The permittees shall conduct inspections for illicit connections and illicit discharges during routine maintenance of all MS4 facilities. If routine inspections or dry weather screening and/or monitoring indicate any illicit connections, they shall be investigated and eliminated or permitted within 120 days of discovery and identification.

2. The permittees shall control the discharge of spills, leaks, or dumping of any materials other than storm water and authorized non-storm water per Section III, above, into the MS4s. All reports of spills, leaks, and/or illegal dumping shall be promptly investigated and reported as specified under Section XVII.

3. Within six months of adoption of this order, the permittees shall evaluate the current Illicit Discharges/Illicit Connections Training Program. If necessary, the program shall be revised to meet the expected expertise and competencies of the municipal inspectors.

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[36] Hazardous material is defined as any substance that poses a threat to human health or the environment due to its toxicity, corrosiveness, ignitability, explosive nature or chemical reactivity. These also include materials named by EPA to be reported if a designed quantity of the material is spilled into the waters of the United States or emitted into the environment.

[37] Toxic material is a chemical or a mixture that may present an unreasonable risk of injury to health or the environment.

4. The permittees shall continue to implement appropriate control measures to reduce and/or to eliminate the discharge of trash and debris to waters of the US. These control measures shall be reported in the annual report.
5. By July 1st of each year the permittees shall review their litter/trash control ordinances to determine the need for any revision. At least once during the permit term, the principal permittee shall characterize trash, determine its main source(s) and develop and implement appropriate BMPs to control trash in urban runoff. The findings of this review shall be included in the annual report.
6. The permittees shall determine the need for any additional debris control measures. The findings shall be included in each annual report.
7. The permittees who are regulated under State Board's Water Quality Order No. 2006-0003 shall continue to comply with that order to control sanitary system overflows. The principal permittee shall continue to evaluate the applicability of the "Countywide Area Spill Control Program (CASC)" to all areas within the Santa Ana Regional Board's jurisdiction to control and mitigate sanitary sewer overflows. This evaluation shall be included in the first annual report due after adoption of this order. Within 12 months of adoption of this order, the principal permittee in collaboration with the Orange County Sanitation District, Irvine Ranch Water District and the co-permittees shall implement essential elements of the CASC or other equally effective programs (such as the Statewide SSO order) to control and mitigate sanitary sewer overflows in Orange County areas that are within the Region.

VIII. MUNICIPAL INSPECTIONS OF CONSTRUCTION SITES

1. Each permittee shall ensure that all construction activities within its jurisdiction are consistent with the Model Construction Program developed by the permittees.
2. Each permittee shall continue to maintain and update (at least on a biannual basis, once in September and the second update in May) an inventory of all construction sites within its jurisdiction for which building or grading permits have been issued and where activities at the site include: soil movement; uncovered storage of materials or wastes, such as dirt, sand or fertilizer; or exterior mixing of cementaceous products, such as concrete, mortar or stucco. All construction sites, as described above, shall be included regardless of whether the construction site is subject to the General Construction Permit or other individual NPDES permit. This inventory shall be maintained in the 2002 Spreadsheet developed by the permittees or a similar computer-based database system and shall include relevant information on site ownership, General Construction Permit WDID number (if any), size, location (latitude/longitude [in decimals] or NAD83/WGS84[38] compatible formatting), inspection data, etc.
3. The permittees shall continue to prioritize construction sites within their jurisdictions as a high, medium or low threat to water quality. Evaluation of construction sites

[38] NAD83/WGS84=North American Datum of 1983 and World Geodetic System of 1984 are systems to define three-dimensional coordinates of a single physical point.

shall be based on factors, which shall include, but not be limited to: soil erosion potential, project size, site slope, proximity to and sensitivity of receiving waters and any other relevant factors. At a minimum, high priority construction sites shall include: sites 20 acres and larger; sites over 1 acre that are tributary to Clean Water Act Section 303(d) waters listed for sediment or turbidity impairments; and sites that are tributary to and within 500 feet of an area defined by the Ocean Plan as an Area of Special Biological Significance (ASBS). At a minimum, medium priority construction sites shall include sites between 5 to 20 acres of disturbed soil.

4. Each permittee shall conduct construction site inspections, subject to limitations on municipal action under the constitutions of California and the United States, for compliance with its ordinances (grading, Water Quality Management Plans, etc.), local permits (construction, grading, etc.), the Model Construction Program and the Construction Runoff Guidance Manual, both developed by the permittees. The permittees must develop a checklist for conducting construction site inspections. Inspections of construction sites shall include, but not be limited to:

   a) Verification of coverage under the General Construction Permit (Notice of Intent or Waste Discharge Identification Number, WDID Number) during the initial inspection;

   b) A documented review of the Erosion and Sediment Control Plan (ESCP) to ensure that the BMPs to be implemented on-site are consistent with the appropriate phase of construction (Preliminary Stage, Mass Grading Stage, Streets and Utilities Stage, etc.);

   c) Visual observation for non-storm water discharges and potential pollutant sources;

   d) Determination of compliance with local ordinances, permits, Water Quality Management Plans, Construction Runoff Guidance Manual and other relevant requirements including the implementation and maintenance of BMPs required under local requirements; and,

   e) An assessment of the effectiveness of BMPs implemented at the site and the need for any additional BMPs.

5. At a minimum, the inspection frequency shall include the following:

   a) During the dry season (i.e., May 1 through September 30 of each year), all construction sites shall be inspected at a frequency sufficient to ensure that sediment and other pollutants are properly controlled and that unauthorized, non-storm water discharges are prevented.

   b) During the wet season (i.e., October 1 through April 30 of each year), all high priority sites are to be inspected, in their entirety, once a month. All medium priority sites are to be inspected at least twice during the wet season. All low priority sites are to be inspected at least once during the wet season. When BMPs or BMP maintenance is deemed inadequate or out of compliance, an

inspection frequency of once every week will be maintained until BMPs and BMP maintenance are brought into compliance.

6. To establish a consistent enforcement program for non-compliant construction sites, the permittees shall enforce their ordinances and permits at all construction sites in a fair, firm and consistent manner. If necessary, the permittees shall revise their LIPs within 12 months of adoption of this order to include a mechanism to notify and to establish a clear and coordinated enforcement linkage for further enforcement action with Regional Board staff. Sanctions for non-compliance must include: a written enforcement order at the time of inspection and other appropriate actions, such as Administrative Compliance Orders, Cease and Desist Orders, Stop Work Orders, Misdemeanor/Infractions, monetary penalties, bonding requirements and/or permit denial or administrative termination.
7. All violations shall be notified as per Section XVII.
8. Each permittee shall respond to complaints received from third parties in a timely manner to ensure that the construction sites are not a source of pollutants in the MS4s and the receiving waters.
9. All construction site inspectors shall be trained in accordance with Section XVI.

IX. MUNICIPAL INSPECTIONS OF INDUSTRIAL FACILTIES

1. Each permittee shall continue to maintain an inventory of industrial facilities within its jurisdiction. All sites that have the potential to discharge pollutants to the MS4 should be included in this inventory regardless of whether the facility is subject to business permits, licensing, the State's General Industrial Permit or other individual NPDES permit. This database must be updated on an annual basis. This inventory must be maintained in a computer-based database system and must include relevant information on ownership, SIC code(s), General Industrial Permit WDID # (if any), size, location, etc. Inclusion of a Geographical Information System (GIS) is required, with latitude/longitude (in decimals) or NAD83/WGS84[39] compatible formatting.
2. To establish priorities for inspection requirements under this order, the permittees shall continue to prioritize industrial facilities within their jurisdiction as a high, medium or low threat to water quality. Continuous evaluation of these facilities should be based on such factors as type of industrial activities (SIC codes), materials or wastes used or stored outside, pollutant discharge potential, facility size, proximity and sensitivity of receiving waters and any other relevant factors. At a minimum, a high priority shall be assigned to: facilities subject to section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA); facilities requiring coverage under the General Industrial Permit; facilities with a high potential for, or history of, unauthorized, non-storm water discharges; and facilities that are tributary to, and within 500 feet of, an area defined by the Ocean Plan as an Area of Special Biological Significance.

[39] See Footnote 38.

3. Each permittee shall conduct industrial facility inspections, subject to limitations on municipal action under the constitutions of California and the United States, for compliance with its ordinances, permits and this order. Inspections shall include a review of material and waste handling and storage practices, written documentation of pollutant control BMP implementation and maintenance procedures and digital photographic documentation for any water quality violations, as well as, evidence of past or present unauthorized, non-storm water discharges and enforcement actions issued at the time of inspection. All high priority facilities identified in Section IX.2 shall be inspected at least once a year and a report on these inspections shall be submitted in the annual report for each year.
4. All medium priority sites are to be inspected at least once every two years; and all low priority sites are to be inspected at least once per permit cycle. In the event that inappropriate material or waste handling or storage practices are observed, or there is evidence of past or present unauthorized, non-storm water discharges, an enforcement order shall be issued and a re-inspection frequency schedule adequate to bring the site into compliance, must be maintained (at a minimum, once a month). Once compliance is achieved, a minimum inspection frequency of once every six months will be maintained for the next calendar year.
5. Each permittee shall continually identify any industrial facilities within their jurisdiction and shall add them to the database, as identified in Section IX.1. Additionally, each facility shall be listed with its respective prioritization in accordance with the specifications identified in Section IX.2, within 15 days from the initial date of discovery of the facility.
6. Information including, at a minimum, inspection dates, inspectors present, the photographic and written results of the inspection and any enforcement actions taken must be maintained in the database identified in Section IX.1 or must be linked to that database. A copy of this database must be provided to the Regional Board with each annual report.
7. Each permittee shall enforce its ordinances and permits at all industrial facilities in accordance with the Enforcement Consistency Guide to maintain compliance with this order. At a minimum, each facility shall be required to implement source control and pollution prevention measures consistent with the BMP Fact Sheets developed by the permittees. Sanctions for non-compliance shall be adequate to bring the site into compliance and must include: an oral or written warning for minor violations at the time of inspection, a written enforcement order for violations that pose a threat to water quality that should include consideration of monetary penalties, bonding requirements and/or permit denial or revocation depending on the severity of the violation and in accordance with the Enforcement Consistency Guide.
8. Regional Board shall be notified of all violations in accordance with Section XVII.
9. Industrial site inspectors shall be trained as stipulated in Section XVI.

10. The permittees need not inspect facilities already inspected by Regional Board staff, if the inspection was conducted within the specified time period[40].

X. MUNICIPAL INSPECTIONS OF COMMERCIAL FACILITIES

1. Each permittee shall continue to maintain and update quarterly an inventory of the types of commercial facilities/businesses listed below within its jurisdiction[41]. As required under the third term permit, this inventory must be maintained in a computer-based database system (Commercial Database) and must include relevant information on ownership, size, location, etc. For fixed facilities, inclusion of a Geographical Information System (GIS), with latitude/longitude (in decimals) or NAD83/WGS84[42] compatible formatting is required. For water quality planning purposes, the permittees should consider using a parcel-level GIS that contains an inventory of the types of facilities/discharges listed below.

   Commercial facilities may include, but may not be limited to[43]:

   a) Transport, storage or transfer of pre-production plastic pellets.
   b) Automobile mechanical repair, maintenance, fueling or cleaning;
   c) Airplane maintenance, fueling or cleaning;
   d) Marinas and boat maintenance, fueling or cleaning;
   e) Equipment repair, maintenance, fueling or cleaning;
   f) Automobile impound and storage facilities;
   g) Pest control service facilities;
   h) Eating or drinking establishments, including food markets and restaurants;
   i) Automobile and other vehicle body repair or painting;
   j) Building materials retail and storage facilities;
   k) Portable sanitary service facilities;
   l) Painting and coating;
   m) Animal facilities such as petting zoos and boarding and training facilities;
   n) Nurseries and greenhouses;
   o) Landscape and hardscape installation;
   p) Pool, lake and fountain cleaning;
   q) Golf courses;
   r) Other commercial sites/sources that the permittee determines may contribute a significant pollutant load to the MS4; and,
   s) Any commercial sites or sources that are tributary to and within 500 feet of an area defined by the Ocean Plan as an Area of Special Biological Significance.

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[40] An appropriate framework for inspection coordination will be developed by Regional Board staff and the permittees.

[41] The inventory update schedule may be revised with the approval of the Executive Officer.

[42] See Footnote 38.

[43] Mobile cleaning services are addressed in X.8, below.

2. Each permittee shall conduct, or require to be completed, inspections of its commercial facilities as indicated below and subject to limitations on municipal action under the constitutions of California and the United States. To establish priorities for inspection, the permittees shall continue to prioritize commercial facilities/businesses within their jurisdiction as a high, medium or low threat to water quality based on such factors as the type, magnitude and location of the commercial activity, potential for discharge of pollutants to the MS4, any history of unauthorized, non-storm water discharges, proximity and sensitivity of receiving waters, material used and wastes generated at the site. Within 12 months of adoption of this order, the permittees shall develop a prioritization and inspection schedule for the commercial facilities in Section X.1 for review and approval by the Executive Officer. Until that plan is approved, the following minimum criteria must be met for prioritization of commercial sites for inspections: 10% of commercial sites (not including restaurants/food markets) must be ranked 'high' and these represent the greatest threat to water quality[44]; 20% of commercial sites (not including restaurants/food markets) must be ranked 'medium'; and, the remainder may be ranked 'low'.
3. Each permittee shall conduct, or require to be completed, commercial facility inspections, at frequencies as determined by the threat to water quality prioritization, for compliance with its ordinances, permits and this order. All high priority sites shall be inspected at least once a year; all medium priority sites shall be inspected at least every two years; and all low priority sites shall be inspected at least once per permit cycle. At a minimum, each facility shall be required to implement source control and pollution prevention measures consistent with the BMP Fact Sheets developed by the permittees. Inspections should include a review of control measures implemented, their effectiveness and maintenance; written and photographic documentation of materials and waste handling and storage practices; evidence of past or present unauthorized, non-storm water discharges; and an assessment of management/employees awareness of storm water pollution prevention measures.
4. In the event that inappropriate material or waste handling or storage practices are observed, or there is evidence of past or present unauthorized, non-storm water discharges, a written enforcement order shall be issued, at the time of inspection, to bring the site into compliance.
5. Information, including inspection dates, inspectors present, the written and photographic documentation results of the inspection and any enforcement actions including mitigative compliance orders must be maintained in the Commercial Database or must be linked to that database. A copy of this database must be provided to the Regional Board with each annual report.
6. Each permittee shall enforce its ordinances and permits at commercial facilities. Sanctions for non-compliance must include: enforcement orders issued at the time of inspections, monetary penalties, bonding requirements and/or permit denial or

[44] Where there are less than 100 commercial sites within a municipality, at least 10 sites must be ranked 'High'.

revocation. Sanctions shall be consistent with methods and protocols established in the Enforcement Consistency Guide.

7. All violations shall be notified as specified in Section XVII.
8. Within 12 months of adoption of this order, the permittees shall develop a mobile business pilot program. The pilot program shall address one category of mobile business from the following list: mobile auto washing/detailing; equipment washing/cleaning; carpet, drape and furniture cleaning; mobile high pressure or steam cleaning. The pilot program shall include at least two notifications of the individual businesses operating within the County regarding the minimum source control and pollution prevention measures that the business must implement. The pilot program shall include outreach materials for the business and an enforcement strategy to address mobile businesses. The permittees shall also develop and distribute the BMP Fact Sheets for the selected mobile businesses. At a minimum, the mobile business Fact Sheets should include: laws and regulations dealing with urban runoff and discharges to storm drains; appropriate BMPs and proper procedure for disposing of wastes generated.
9. The principal permittee shall continue to maintain a restaurant inspection program, or coordinate and collaborate with the Orange County Health Care Agency's restaurant inspection program. The restaurant inspection program shall, at a minimum, continue to conduct annual inspections that address:

   a) Oil and grease disposal to verify that these wastes are not poured onto a parking lot, street or adjacent catch basin;

   b) Trash bin areas to verify that these areas are clean, the bin lids are closed, the bins are not filled with liquid and the bins have not been washed out;

   c) Parking lot, alley, sidewalk and street areas to verify that floor mats, mops, filters and garbage containers are not washed in those areas and that no washwater is poured in those areas or discharged to the MS4;

   d) Parking lot areas to verify that they are cleaned by sweeping, not by hosing down and that the facility operator uses dry methods for spill cleanup; and,

   e) Inspection of existing devices designed to separate grease from wastewater (e.g., grease traps or interceptors) to ensure adequate capacity and proper maintenance is currently performed under the Fats, Oils and Grease (FOG) program (the FOG inspections conducted under the Statewide SSO order (Water Quality Order No. 2006-0003) could be substituted for this inspection).

   All violations of the Water Quality Ordinance should be enforced by the permittees and all violations of the Health and Safety Code should be enforced by the Health Care Agency.

10. All commercial site inspectors shall be trained as specified in Section XVI.

11. The permittees need not inspect facilities already inspected by Regional Board staff if the inspection was conducted within the specified time period[45].

XI. RESIDENTIAL PROGRAM

1. Each permittee shall develop and implement a residential program to reduce the discharge of pollutants from residential facilities to the MS4s consistent with the maximum extent practicable standard so as to prevent discharges from the MS4s from causing or contributing to a violation of water quality standards in the receiving waters.
2. The permittees should identify residential areas and activities that are potential sources of pollutants and develop Fact Sheets/BMPs. At a minimum, this should include: residential auto washing and maintenance activities; use and disposal of pesticides, herbicides, fertilizers and household cleaners; and collection and disposal of pet wastes. The permittees shall encourage residents to implement pollution prevention measures. The permittees should work with sub-watershed groups (e.g., the Serrano Creek Conservancy) to disseminate latest research information, such as the UC Master Gardeners Program[46] and USDA's Backyard Conservation Program[47].
3. The permittees, collectively or individually, shall facilitate the proper collection and management of used oil, toxic and hazardous materials, and other household wastes. Such facilitation should include educational activities, public information activities, and establishment of curbside or special collection sites managed by the permittees or private entities, such as solid waste haulers.
4. Within 18 months of adoption of this order, the permittees shall develop a pilot program to control pollutant discharges from common interest areas and areas managed by homeowner associations or management companies. The permittees should evaluate the applicability of programs such as the Landscape

[45] An appropriate framework for inspection coordination will be developed by Regional Board staff and the permittees.

[46] The UC Master Gardener volunteer program provides gardening and horticulture information to the residents of Orange County through trained volunteers who disseminate University research based scientific information.

[47] Backyard Conservation, Bringing Conservation from the Countryside to Your Backyard, USDA Natural Resources Conservation Service, National Association of Conservation Districts, Wildlife Habitat Council and National Audubon Society.

Performance Certification Program[48] to encourage efficient water use and to minimize runoff[49].

5. The permittees shall enforce their Water Quality Ordinance for all residential areas and activities. The permittees should encourage new developments to use weather-based evapotranspiration (ET) irrigation controllers[50].
6. Each permittee shall include an evaluation of its Residential Program in the annual report starting with the first annual report after adoption of this order.

XII. NEW DEVELOPMENT (INCLUDING SIGNIFICANT RE-DEVELOPMENT)

A. GENERAL REQUIREMENTS:

1. The permittees shall continue to maintain a computerized database to ensure (prior to issuance of any local permits or other approvals) that all construction sites that are required to obtain coverage under the State's General Construction Permit have filed with the State Board a Notice of Intent for coverage under the General Permit.
2. Within 12 months of adoption of this order, the principal permittee, in collaboration with the co-permittees, shall develop a guidance document for the preparation of conceptual or preliminary WQMPs to more effectively ensure that water quality protection, including LID principles, is considered in the earliest phases of a project. Within 90 days of approval of the guidance document, each permittee shall revise its LIP to be consistent with the guidance. The permittees are encouraged to require submission of a conceptual WQMP as early in the planning process as possible.
3. Each permittee shall minimize the short and long-term impacts on receiving water quality from new developments and significant re-developments, as required in Section XII.B.2., below, by requiring the submittal of a WQMP, emphasizing implementation of LID principles and addressing hydrologic conditions of concern, prior to issuance of any grading or building permits and/or prior to recordation of any subdivision maps.
4. In the first annual report following adoption of this permit, the permittees shall include a summary of their review of the watershed protection principles and policies in their General Plan and related documents (such as Development Standards, Zoning Codes, Conditions of Approval, Development Project Guidance, Local Coastal Plan, etc.) to ensure that these principles and policies,

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[48] For example, see the Metropolitan Water District of Orange County's Evaluation of the Landscape Performance Certification Program, January 2004.

[49] The Residential Runoff Reduction Study, Municipal Water District of Orange County, Irvine Ranch Water District and Metropolitan Water District of Southern California, July 2004.

[50] Westpark Study, Municipal Water District of Orange County, Irvine Ranch Water District and Metropolitan Water District of Southern California, 2001.

including LID principles, are properly considered and are incorporated into these documents. These principles and policies should include, but not be limited to, LID principles discussed in Section XII. C and hydrologic conditions of concern discussed in Section XII. D. Within 6 months of adoption of this order, the principal permittee shall facilitate the formation of a technical advisory committee (TAC) consisting of the Community Development/Planning Department directors of the co-permittees to effectively incorporate watershed protection principles (including LID) and policies during the early stages of a project. The TAC shall meet at least on an annual basis to develop common development standards, zoning codes, conditions of approval and other principles and policies necessary for water quality protection. Each annual report shall include a brief summary of the TAC meetings including its recommendations.

5. Each permittee shall provide the Regional Board with the draft amendment or revision when a pertinent General Plan element or the General Plan is noticed for comment in accordance with Govt. Code § 65350 et seq.

6. The permittees shall review their planning procedures and CEQA document preparation processes at the time of DAMP finalization and no later than 24 months after adoption of this order, to ensure that urban runoff-related issues are properly considered and addressed. If necessary, these processes shall be revised to consider and mitigate impacts to storm water quality. Should findings of the review result in changes to the above processes, the permittee shall include these changes in the LIP and submit a revised copy of the LIP to the Regional Board with the next annual report. The permittees shall ensure that the following potential impacts are considered during CEQA reviews:

   a) Potential impact of project construction on storm water runoff;

   b) Potential impact of project's post-construction activity on storm water runoff;

   c) Potential for discharge of storm water pollutants from areas of material storage, vehicle or equipment fueling, vehicle or equipment maintenance (including washing), waste handling, hazardous materials handling or storage, delivery areas. loading docks or other outdoor work areas;

   d) Potential for discharge of storm water to affect the beneficial uses of the receiving waters;

   e) Potential for significant changes in the flow velocity or volume of storm water runoff to cause environmental harm; and,

   f) Potential for significant increases in erosion of the project site or surrounding areas.

   g) Potential decreases in quality and quantity of recharge to groundwater.

   h) Potential impact of pollutants in storm water runoff from the project site on any 303(d) listed waterbodies.

7. The permittees shall modify the project approval process in conjunction with preparation of the DAMP finalization, consistent with the guidance for conceptual

or preliminary WQMP, to ensure that proper conditions of approval, design specifications and tracking mechanisms are included.

8. The permittees shall train their employees involved with the preparation and/or review of CEQA documents as specified in Section XVI.

B. WATER QUALITY MANAGEMENT PLAN (WQMP) FOR URBAN RUNOFF (FOR NEW DEVELOPMENT/SIGNIFICANT REDEVELOPMENT):

1. The permittees shall annually review the existing structural treatment control and other BMPs for New Developments and submit any changes for review and approval by the Executive Officer. Within 12 months of adoption of this order, the principal permittee shall revise the appropriate tables in the Water Quality Management Plan with the latest information on BMPs and provide additional clarification regarding their effectiveness and applicability.

2. Each permittee shall ensure that an appropriate WQMP is prepared for the following categories of new development/significant redevelopment projects (priority development projects). The WQMP shall be developed in accordance with the approved Model WQMP and shall incorporate LID principles in the WQMP.

   a. All significant redevelopment projects, where significant redevelopment is defined as projects that include the addition or replacement of 5,000 square feet or more of impervious surface on a developed site. Redevelopment does not include routine maintenance activities that are conducted to maintain original line and grade, hydraulic capacity, original purpose of the facility, or emergency redevelopment activity required to protect public health and safety. Where redevelopment results in the addition or replacement of less than fifty percent of the impervious surfaces of a previously existing developed site, and the existing development was not subject to WQMP requirements, the numeric sizing criteria discussed below applies only to the addition or replacement, and not to the entire developed site. Where redevelopment results in the addition or replacement of more than fifty percent of the impervious surfaces of a previously existing developed site, the numeric sizing criteria applies to the entire development.

   b. New development projects that create 10,000 square feet or more of impervious surface (collectively over the entire project site) including commercial, industrial, residential housing subdivisions (i.e., detached single family home subdivisions, multi-family attached subdivisions (town homes), condominiums, apartments, etc.), mixed-use, and public projects. This category includes development projects on public or private land, which fall under the planning and building authority of the permittees.

   c. Automotive repair shops (with SIC codes 5013, 5014, 5541, 7532-7534, 7536-7539).

   d. Restaurants where the land area of development is 5,000 square feet or more.

e. All hillside developments on 5,000 square feet or more, which are located on areas with known erosive soil conditions or where the natural slope is twenty-five percent or more.

f. Developments of 2,500 square feet of impervious surface or more, adjacent to (within 200 feet) or discharging directly[51] into environmentally sensitive areas, such as areas designated in the Ocean Plan as Areas of Special Biological Significance or waterbodies listed on the CWA Section 303(d) list of impaired waters.

g. Parking lots of 5,000 square feet or more of impervious surface exposed to storm water. Parking lot is defined as a land area or facility for the temporary storage of motor vehicles.

h. Streets, roads, highways and freeways of 5,000 square feet or more of paved surface shall incorporate USEPA guidance, "Managing Wet Weather with Green Infrastructure: Green Streets" in a manner consistent with the maximum extent practicable standard. This category includes any paved surface used for the transportation of automobiles, trucks, motorcycles and other vehicles and excludes any routine road maintenance activities where the footprint is not changed.

i. Retail gasoline outlets of 5,000 or more square feet with a projected average daily traffic of 100 or more vehicles per day.

j. Emergency and public safety projects in any of the above-listed categories may be excluded if the delay caused due the requirement for a WQMP compromises public safety, public health and/or environmental protection.

3. WQMPs shall include BMPs for source control, pollution prevention, site design, LID implementation (see Section C., below) and structural treatment control BMPs. For all structural treatment controls, WQMPs shall identify the responsible party for maintenance of the treatment system, vector minimization and control measures, and a funding source or sources for its operation and maintenance. WQMPs shall include control measures for any listed pollutant[52] to an impaired waterbody on the 303(d) list such that the discharge shall not cause or contribute to an exceedance of receiving water quality objectives. The permittees shall require the following source control BMPs for each priority development project, unless formally substantiated as unwarranted in a written submittal to the permittee:

   a) Minimize contaminated runoff, including irrigation runoff, from entering the MS4s;

[51] Discharging directly means a drainage or conveyance which carries flows entirely from the subject development and not commingled with any other flows.

[52] For a waterbody listed under Section 303(d) of the Clean Water Act, the pollutant that is causing the impairment is the "listed pollutant".

b) Provide appropriate secondary containment and/or proper covers or lids for materials storage, trash bins, and outdoor processing and work areas;

c) Minimize storm water contact with pollutant sources;

d) Provide community car wash and equipment wash areas that discharge to sanitary sewers;

e) Minimize trash and debris in storm water runoff through regular street sweeping and through litter control ordinances.

f) The pollutants in post-development runoff shall be reduced using controls that utilize best management practices, as described in the California Stormwater Quality Handbooks, Caltrans Storm Water Quality Handbook or other reliable sources.

4. At a minimum, structural BMPs shall be designed and built in accordance with the approved model WQMP and must be sized to comply with one of the following numeric sizing criteria:

A. Volume

Volume–based BMPs shall be designed to infiltrate, filter, or treat either:

1) The volume of runoff produced from a 24-hour, 85th percentile storm event, as determined from the County of Orange's 85th Percentile Precipitation Isopluvial Map[53]; or,

2) The volume of annual runoff produced by the 85th percentile, 24-hour rainfall event, determined as the maximized capture storm water volume for the area, from the formula recommended in Urban Runoff Quality Management, WEF Manual of Practice No. 23/ASCE Manual of Practice No. 87 (1998); or,

3) The volume of annual runoff based on unit basin storage volume, to achieve 80% or more volume treatment by the method recommended in California Stormwater Best Management Practices Handbook – Industrial/Commercial; or,

4) The volume of runoff, as determined from the local historical rainfall record, that achieves approximately the same reduction in pollutant loads and flows as achieved by mitigation of the 85th percentile, 24-hour runoff event;

OR

B. Flow

Flow-based BMPs shall be designed to infiltrate, filter, or treat either:

1) The maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event; or,

[53] The isopluvial map is available from: http://www.ocwatersheds.com/StormWater/PDFs/2003 DAMP Section 7 New Development Significant Redevelopment.pdf.

2) The maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity, as determined from the local historical rainfall record, multiplied by a factor of two; or,

3) The maximum flow rate of runoff, as determined from the local historical rainfall record, which achieves approximately the same reduction in pollutant loads and flows as achieved by mitigation of the 85th percentile hourly rainfall intensity multiplied by a factor of two.

5. To protect ground water resources any structural infiltration BMPs shall meet the following minimum requirements:

   a) Use of structural infiltration treatment BMPs shall not cause or contribute to an exceedance of groundwater water quality objectives.

   b) Source control and pollution prevention control BMPs shall be implemented in conjunction with structural infiltration BMPs to protect groundwater quality. The need for sedimentation or filtration should be evaluated prior to infiltration.

   c) Structural infiltration treatment BMPs shall not cause a nuisance or pollution, as defined in Water Code Section 13050.

   d) The vertical distance from the bottom of the infiltration system to the seasonal high groundwater must be at least 10 feet. Where the groundwater basins do not support beneficial uses, this vertical distance criteria may be reduced, provided groundwater quality is maintained.

   e) The infiltration systems must be located at least 100 feet horizontally from any water supply wells.

   f) Infiltration systems must not be used for areas of industrial or light industrial activity; areas subject to high vehicular traffic (25,000 or more daily traffic) automotive repair shops; car washes; fleet storage areas; nurseries; or any other high threat to water quality land uses or activities[54].

   g) Within 18 months of adoption of this order, the principal permittee shall develop a pilot program to monitor the impact of groundwater infiltration systems on the quality of groundwater. This monitoring program may be conducted by: (1) analyzing the quality of the runoff prior to infiltration; (2) by monitoring the quality of the infiltrate through the vadose zone; or (3) by monitoring groundwater quality upstream and downstream of the infiltration systems. The results of the pilot study shall be submitted with the next annual report.

6. By November 22, 2010, the principal permittee shall develop recommendations for streamlining regulatory agency approval of regional treatment control BMPs.

[54] This restriction applies only to sites that are known to have soil and/or groundwater water contamination. Recent studies by the Los Angeles and San Gabriel Watershed Council of Storm Water Recharge has shown that there is no statistically significant degradation of groundwater quality from the infiltration of storm water-borne constituents.

The recommendations should include information needed to be submitted to the Regional Board for consideration of regional treatment control BMPs. At a minimum, it should include: BMP location; type and effectiveness in removing pollutants of concern; projects tributary to the regional treatment system; engineering design details; funding sources for construction, operation and maintenance; and parties responsible for monitoring effectiveness, operation and maintenance.

7. The permittees shall require non-priority development projects to document, via a WQMP or similar mechanism, site design, source control and any other BMPS which may or may not include treatment control BMPs.

C. LOW IMPACT DEVELOPMENT TO CONTROL POLLUTANTS IN URBAN RUNOFF FROM NEW DEVELOPMENT/SIGNIFICANT REDEVELOPMENT:

1. Within 12 months of adoption of this order, the permittees shall update the model WQMP to incorporate LID principles (as per Section XII.C) and to address the impact of urbanization on downstream hydrology (as per Section XII.D) and a copy of the updated model WQMP shall be submitted for review and approval by the Executive Officer[55]. As provided in Section XII.J, 90 days after approval of the revised model WQMP, priority development projects shall implement LID principles described in this section, Section XII.C. To the extent that the Executive Officer has not approved the feasibility criteria by May 22, 2011, as provided in Section XII.E.1, the infeasibility of implementing LID BMPs shall be determined through project specific analyses, each of which shall be submitted to the Executive Officer, 30 days prior to permittee approval.
2. The permittees shall reflect in the WQMP and otherwise require that each priority development project infiltrate, harvest and re-use, evapotranspire, or bio-treat[56] the 85th percentile storm event ("design capture volume"), as specified in Section XII.B.4.A.1, above. Any portion of the design capture volume that is not infiltrated, harvested and re-used, evapotranspired or bio-treated[57] onsite by LID BMPs shall be treated and discharged in accordance with the requirements set forth in Section XII.C.7 and/or Section XII.E, below.

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[55] The Executive Officer shall provide members of the public with notice and at least a 30-day comment opportunity for all documents submitted in accordance with this order. If the Executive Officer, after considering timely submitted comments, concludes that the document is adequate or adequate with specified changes, the Executive Officer may approve the document or present it to the Board for its consideration at a regularly scheduled and noticed meeting. If there are significant issues that cannot be resolved by the Executive Officer, the document will be presented to the Board for its consideration at a regularly scheduled meeting.

[56] A properly engineered and maintained bio-treatment system may be considered only if infiltration, harvesting and reuse and evapotranspiration cannot be feasibly implemented at a project site (feasibility criteria will be established in the model WQMP [Section XII.C.1] and the technically-based feasibility criteria [Section XII.E.1]). Specific design, operation and maintenance criteria for bio-treatment systems shall be part of the model WQMP that will be produced by the permittees.

[57] For all references to bio-treat/bio-treatment, see footnote 56.

3. The permittees shall incorporate LID site design principles to reduce runoff to a level consistent with the maximum extent practicable standard during each phase of priority development projects. The permittees shall require that each priority development project include site design BMPs during development of the preliminary and final WQMPs. The design goal shall be to maintain or replicate the pre-development hydrologic regime through the use of design techniques that create a functionally equivalent post-development hydrologic regime through site preservation techniques and the use of integrated and distributed micro-scale storm water infiltration, retention, detention, evapotranspiration, filtration and treatment systems as close as feasible to the source of runoff. Site design considerations shall include, but not be limited to:

   a) Limit disturbance of natural water bodies and drainage systems; conserve natural areas; preserve trees; minimize compaction of highly permeable soils; protect slopes and channels; and minimize impacts from storm water and urban runoff on the biological integrity of natural drainage systems and water bodies;

   b) Minimize changes in hydrology and pollutant loading; require incorporation of controls, including structural and non-structural BMPs, to mitigate the projected increases in pollutant loads and flows; ensure that post-development runoff durations and volumes from a site have no significant adverse impact on downstream erosion and stream habitat; minimize the quantity of storm water directed to impermeable surfaces and the MS4s; minimize paving, minimize runoff by disconnecting roof leader and other impervious areas and directing the runoff to pervious and/or landscaped areas, minimize directly connected impervious areas; design impervious areas to drain to pervious areas; consider construction of parking lots, walkways, etc., with permeable materials; minimize pipes, culverts and engineered systems for storm water conveyance thereby minimizing changes to time of concentration on site; utilize rain barrels and cisterns to collect and re-use rainwater; maximize the use of rain gardens and sidewalk storage; and maximize the percentage of permeable surfaces distributed throughout the site's landscape to allow more percolation of storm water into the ground;

   c) Preserve wetlands, riparian corridors, vegetated buffer zones and establish reasonable limits on the clearing of vegetation from the project site;

   d) Use properly designed and well maintained water quality wetlands, bio-retention areas, filter strips and bio-filtration swales; consider replacing curbs gutters and conventional storm water conveyance systems with bio-treatment systems, where such measures are likely to be effective and technically and economically feasible;

   e) Provide for appropriate permanent measures to reduce storm water pollutant loads in storm water from the development site;

   f) Establish development guidelines for areas particularly susceptible to erosion and sediment loss;

g) Implement effective education programs to educate property owners to use pollution prevention measures and to maintain on-site hydrologically functional landscape controls; and

h) During the early planning stages of a project, the LID principles shall be considered to address pollutants of concern identified in the Watershed Action Plans and TMDL Implementation Plans, and the LID BMPs shall be incorporated into the sites conceptual WQMP.

4. The selection of LID principles shall be prioritized in the following manner (from highest to the lowest priority): (1) Preventative measures (these are mostly non-structural measures, e.g., preservation of natural features to a level consistent with the maximum extent practicable standard; minimization of runoff through clustering, reducing impervious areas, etc.) and (2) Mitigation (these are structural measures, such as, infiltration, harvesting and reuse, bio-treatment, etc. The mitigation or structural site design BMPs shall also be prioritized (from highest to lowest priority): (1) Infiltration (examples include permeable pavement with infiltration beds, dry wells, infiltration trenches, surface and sub-surface infiltration basins. All infiltration activities should be coordinated with the groundwater management agencies, such as the Orange County Water District); (2) Harvesting and Re-use (e.g., cisterns and rain barrels); and (3) Bio-treatment such as bio-filtration/bio-retention.

5. Even though the LID principles are universally applicable, there could be constraining factors, such as: soil conditions, including soil compaction, saturation (e.g., hydric soils) and permeability, groundwater levels, soil and/or groundwater contaminants (Brownfield developments), space restrictions (in-fill projects, redevelopment projects, high density development, transit-oriented developments), naturally occurring contaminants (e.g., selenium in the soil and the groundwater in the Newport Bay Watershed), etc. In such cases, the LID principles could be integrated into other programs, such as: Smart Growth[58], New Urbanism[59] or regional or sub-watershed management approaches. Also see Section E, below, for alternatives and in-lieu programs.

6. The LID BMPs shall be designed to mimic pre-development site hydrology through technically and economically feasible preventive and mitigative site design techniques. LID combines hydrologically functional site design with pollution prevention methods to compensate for land development impact on hydrology and water quality.

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[58] Smart Growth refers to the use of creative strategies to develop ways that preserve natural lands and critical environmental areas, protect water and air quality, and reuse already-developed land.

[59] New Urbanism is somewhat similar to Smart Growth and is based on principles of planning and architecture that work together to create human-scale, walkable communities that preserve natural resources.

7. If site conditions do not permit infiltration, harvesting and re-use, and/or evapotranspiration, and/or bio-treatment of the design capture volume at the project site as close to the source as possible, the alternatives discussed below should be considered and the credits and in-lieu programs discussed under Section E, below, may be considered:

    a. Implement LID principles at the project site. This is the preferred approach. For example, in a single family residential development: connect roof drains to a landscaped area, divert driveway runoff to a vegetated strip and minimize any excess runoff generated from the development. The pervious areas to which the runoff from the impervious areas are connected should have the capacity to infiltrate, harvest, evapotranspire and/or bio-treat and re-use at least the design capture volume.

    b. Implement as many LID principles as possible at the project site close to the point of storm water generation and infiltrate and/or harvest and re-use at least the design capture volume through designated infiltration/treatment areas elsewhere within the project site. For example, at a condominium development: connect the roof drains to landscaped areas, construct common parking areas with pervious asphalt with a sub-base of rocks or other materials to facilitate percolation of storm water, direct road runoff to curbless, vegetated sidewalks. The pervious areas which receive runoff from impervious areas should have the capacity to infiltrate, harvest and re-use, evapotranspire and/or bio-treat at least the design capture volume.

    c. Implement LID on a sub-regional basis. For example, at a 100 unit high density housing unit with a small strip mall and a school: connect all roof drains to vegetated areas (if there are any vegetated areas, otherwise storm water storage and reuse may be considered or else divert to the local storm water conveyance system, to be conveyed to the local treatment system), construct a storm water infiltration gallery below the school playground to infiltrate and/or harvest and re-use the design capture volume. The pervious areas to which the runoff from the impervious areas are connected should have the capacity to infiltrate, harvest and re-use, evapotranspire and/or bio-treat at least the design capture volume. (Also see discussion on hydrologic conditions of concern, below.)

    d. Implement LID on a regional basis. For example, several developments could propose a regional system to address storm water runoff from all the participating developments. The pervious areas to which the runoff from the impervious areas are connected should have the capacity to infiltrate, harvest and re-use, evapotranspire and/or bio-treat at least the design capture volume from the entire tributary area. (Also see discussion on hydrologic conditions of concern, below.)

D. HYDROLOGIC CONDITIONS OF CONCERN (HYDROMODIFICATION[60])

1. Each priority development project shall be required to ascertain the impact of the development on the site's hydrologic regime and include the findings in the WQMP, including the following for a two-year frequency storm event:

   a) Increases in runoff volume;

   b) Decreases in infiltration;

   c) Changes in time of concentration;

   d) Potential for increases in post development downstream erosion; and,

   e) Potential for adverse downstream impacts on physical structure, aquatic and riparian habitat.

2. The project does not have a hydrologic condition of concern if any one of the following conditions is met:

   a) The volumes and the time of concentration of storm water runoff for the post-development condition do not significantly exceed those of the pre-development condition for a two-year frequency storm event (a difference of 5% or less is considered insignificant). This may be achieved through site design and source control BMPs.

   b) All downstream conveyance channels that will receive runoff from the project are engineered, hardened and regularly maintained to ensure design flow capacity, and no sensitive stream habitat areas will be affected.

   c) The site infiltrates at least the runoff from a two-year storm event. The permittees may request for a variance from these criteria, based on studies conducted by the Storm Water Monitoring Coalition, Southern California Coastal Water Research Project, or other regional studies. Requests for consideration of any variances should be submitted to the Executive Officer.

3. If a hydrologic condition of concern exists, then the WQMP shall include an evaluation of whether the project will adversely impact downstream erosion, sedimentation or stream habitat. This evaluation should include a hydrograph with pre- and post-development time of concentration for a 2-year frequency storm event. If the evaluation determines adverse impacts are likely to occur, the project proponent shall implement additional site design controls, on-site management controls, structural treatment controls and/or in-stream controls to mitigate the impacts. The project proponent should first consider site design controls and on-site controls prior to proposing in-stream controls; in-stream controls must not adversely impact beneficial uses or result in sustained degradation of water quality of the receiving waters.

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[60] Hydromodification is the alteration of natural flow characteristics.

4. The project proponent may also address hydrologic conditions of concern by mimicking the pre-development hydrograph with the post-development hydrograph, for a two year return frequency storm. Generally, the hydrologic conditions of concern are not significant, if the post-development hydrograph is no more than 10% greater than pre-development hydrograph. In cases where excess volume cannot be infiltrated or captured and reused, discharge from the site must be limited to a flow rate no greater than 110% of the pre-development 2-year peak flow.

5. The permittees shall address the hydrologic conditions of concern on a watershed basis by preparing a Watershed Master Plan as described below:

   The Watershed Master Plans shall integrate water quality, hydromodification, water supply, and habitat for the following watersheds: Coyote Creek-San Gabriel River; Anaheim Bay-Huntington Harbour; Santa Ana River; and Newport Bay-Newport Coast. Components of the Plan shall include: (1) maps to identify areas susceptible to hydromodification including downstream erosion, impacts on physical structure, impacts on riparian and aquatic habitats and areas where storm water and urban runoff infiltration is possible and appropriate; and, (2) a hydromodification model to make available as a tool to enable proponents of land development projects to readily select storm water preventive and mitigative site BMP measures.

   The maps and a model Plan for one watershed shall be prepared by May 22, 2011. The model Plan should specify hydromodification management standards for each sub-watershed and provide assessment tools. In the preparation of the model Plan, the permittees are encouraged to use currently available information from other sources such as: (1) Orange County Flood Control Master Plan; (2) Irvine Ranch Water District's Natural Treatment System Master Plan; (3) Orange County Watershed Plans; (4) Nutrient and Selenium Management Program; (5) TMDL and 303(d) Listing information from the U.S. EPA and/or the Regional Board, and (6) and water districts.

   The model Watershed Master Plan shall be submitted to the Executive Officer for approval. Watershed Master Plans shall be completed for all watersheds 24 months after approval of the model Watershed Master Plan.

   The Watershed Master Plans shall be designed to meet applicable water quality standards and the Federal Clean Water Act.

E. ALTERNATIVES AND IN-LIEU PROGRAMS

1. Within 12 months of adoption of this order, the principal permittee, in collaboration with the co-permittees, shall develop technically-based feasibility criteria for project evaluation to determine the feasibility of implementing LID BMPs (feasibility to be based in part, on the issues identified in Section XII.C). This plan shall be submitted to the Executive Officer for approval. Only those projects that have completed a vigorous feasibility analysis as per the criteria developed by the permittees and approved by the Executive Officer should be considered for alternatives and in-lieu programs. If a particular BMP is not technically feasible, other BMPs should be implemented to achieve the same level of compliance, or if the cost of BMP implementation greatly outweighs the

pollution control benefits, a waiver of the BMPs may be granted. All requests for waivers, along with feasibility analysis including waiver justification documentation, must be submitted to the Executive Officer in writing, 30 days prior to permittee approval.

2. The permittees may collectively or individually propose to establish an urban runoff fund to be used for urban water quality improvement projects within the same watershed that is funded by contributions from developers granted waivers. The contributions should be at least equivalent to the cost savings for waived projects and the urban runoff fund shall be expended for water quality improvement or other related projects approved by the Executive Officer within two years of receipt of the funds. If a waiver is granted and an urban runoff fund is established, the annual report for the year should include the following information with respect to the urban runoff fund:

   a) Total amount deposited into the funds and the party responsible for managing the urban runoff fund;

   b) Projects funded or proposed to be funded with monies from the urban runoff fund;

   c) Party or parties responsible for design, construction, operation and maintenance of urban runoff funded projects; and

   d) Current status and a schedule for project completion.

3. The obligation to install structural treatment control BMPs at a new development is met if, for a common plan of development, BMPs are constructed with the requisite capacity to serve the entire common project, even if certain phases of the common project may not have BMP capacity located on that phase in accordance with the requirements specified above. The goal of the WQMP is to develop and implement practicable programs and policies to minimize the effects of urbanization on site hydrology, urban runoff flow rates, velocities and pollutant loads. This goal may be achieved through watershed-based structural treatment controls, in combination with site-specific BMPs. All treatment control BMPs should be located as close as possible to the pollutant sources, should not be located within waters of the US, and pollutant removal should be accomplished prior to discharge to waters of the US. Regional treatment control BMPs shall be operational prior to occupation of any of the priority project sites tributary to the regional treatment BMP.

4. The permittees may establish a water quality credit system for alternatives to infiltration, harvesting and reuse, evapotranspiration, and other LID BMPs and hydromodification requirements specified above. A summary of any waivers of LID, hydromodification and treatment control BMPs should be included in the annual report for each year. Any credit system that the permittees establish should be submitted to the Executive Officer for review and approval. The following types of projects may be considered for the credit system:

a) Redevelopment projects that reduce the overall impervious footprint

b) Brownfield redevelopment

c) High density developments (>7 units per acre)

d) Mixed use and transit-oriented development (within ½ mile of transit)

e) Dedication of undeveloped portions of the project to parks, preservation areas and other pervious uses

f) Regional treatment systems with a capacity to treat flows from all upstream developments

g) Contribution to an urban runoff fund (see 1, above)

h) Offsite mitigation or dedications within the same watershed

i) City Center area

j) Historic Districts and Historic Preservation areas

k) Live-work developments

l) In-fill projects

F. APPROVAL OF WQMPs

1. The permittees shall utilize a mechanism for review and approval of WQMPs, including a checklist that incorporates the minimum requirements from the model WQMP.
2. The permittees shall maintain a database to track all structural treatment control BMPs, including the location of BMPs, parties responsible for construction, operation and maintenance (also see I.3, below).
3. The permittees shall train those involved with WQMP reviews in accordance with Section XVI, Training Requirements.

G. FIELD VERIFICATION OF BMPS

1. The permittees shall establish and implement a mechanism (a checklist or other tools) to verify that treatment control BMPs are designed and constructed in accordance with the approved WQMP.
2. Prior to occupancy of each priority development project, the permittees shall field verify that the site design, source control and treatment control BMPs have been implemented in accordance with the approved WQMP.
3. Prior to occupancy, the permittees shall verify through visual observation, that the BMPs are operating and functional.
4. The permittees may accept self-certification or third-party certification of BMPs from State licensed professional engineers.

H. CHANGE OF OWNERSHIP AND RECORDATION

1. The permittees shall establish a mechanism not only to track treatment control BMPs, but also to ensure that appropriate easements and ownerships are properly recorded in public records at the County and/or the city and the information is conveyed to all appropriate parties when there is a change in project or site ownership.

I. OPERATION AND MAINTENANCE OF POST-CONSTRUCTION BMPS

1. The permittees shall ensure that all structural treatment control BMPs are designed and implemented with control measures necessary to effectively minimize the creation of nuisance or pollution associated with vectors, such as mosquitoes, rodents, flies, etc. The permittees should consult the Orange County Vector Control District to ensure that structural treatment control systems are designed to minimize the potential for vector breeding. The operation and maintenance plans for all post-construction structural treatment controls should include specific vector control mitigation measures to avoid and/or minimize vector breeding.
2. The permittees shall specify conditions of approval that require proper maintenance and operation of all structural treatment control BMPs installed in new developments, including requirements for vector control. The parties responsible for the long-term maintenance and operation of the structural treatment control BMPs for the life of the project and a funding mechanism for operation and maintenance, shall be identified prior to approval of the WQMP.
3. The permittees shall develop a database with information regarding each structural treatment control BMP installed after adoption of this order. At a minimum, it should include: type of BMP, watershed where it is located, date of construction, party responsible for maintenance, source of funding for operation and maintenance, maintenance verification, and any problems identified during inspections including any vector or nuisance problems. If vector or nuisance problems are identified, the site should be referred to the Orange County Vector Control District. The permittees should work with the Vector Control District to remedy the problems associated with vectors.
4. The annual report shall include a list of all structural treatment control BMPs approved, constructed and/or operating within each permittee's jurisdiction.
5. Within 12 months of adoption of this order and annually thereafter, all public agency structural treatment control BMPs, and at least 25% of priority development project structural treatment control BMPs, shall be inspected prior to the rainy season. All structural treatment control BMPs shall be inspected within every four year period. The permittees shall ensure that the BMPs are operating and are maintained properly and all control measures are working effectively to remove pollutants in runoff from the site. All inspections shall be documented and kept as permittee record. The permittees may accept inspections conducted and certified by state licensed professional engineers in lieu of permittee inspections.

J. PRE-APPROVED PROJECTS

1. The above provisions for LID and hydrologic conditions of concern are not applicable to projects that have an approved Water Quality Management Plan. The above provisions shall be implemented in a manner consistent with the maximum extent practicable standard for all other projects 90 days from the date of approval of the revised model WQMP (per Section XII.C.1). The Regional Board recognizes that full implementation may not be feasible for certain projects which have received tentative tract or parcel map or other discretionary approvals.

XIII. PUBLIC EDUCATION AND OUTREACH

1. The permittees shall continue to implement the public education efforts already underway and shall implement the most effective elements of the comprehensive public and business education strategy contained in the Report of Waste Discharge/DAMP. By July 1, 2012, the permittees shall complete a public awareness survey to determine the effectiveness of the current public and business education strategy and any need for changes to the current multimedia public education efforts. The findings of the survey and any proposed changes to the current program shall be included in the annual report for 2011-2012.
2. The permittees shall sponsor or staff a storm water table or booth at community, regional, and/or countywide events to distribute public education materials to the public. Each permittee shall participate in at least one event per year.
3. The permittees shall continue to participate in the Public Education Committee to review and update existing guidance for the implementation of the public education program. The Public Education Committee shall meet at least twice per year. The Public Education Committee shall continue to make recommendations for any changes to the public and business education program including: how to make the multimedia efforts more effective; a reevaluation of audiences and key messages for targeted behaviors; and opportunities for participation in regional and statewide public education efforts. The goal of the public and business education program shall be to target 100% of the residents, including businesses, commercial and industrial establishments. Through use of local print, radio and television, the permittees must ensure that the public and business education program makes a minimum of 10 million impressions per year and that those impressions measurably increase the knowledge and measurably change the behavior of the targeted groups.
4. The permittees shall continue their outreach and other public education activities. Each permittee should try to reach the following sectors: manufacturing facilities; mobile service industry; commercial, distribution and retail sales industry; residential/commercial landscape construction and services industry; residential and commercial construction industry; and residential and community activities. Individual workshops (or regional workshops) for each of the aforementioned elements shall be administered by each permittee (or on a countywide basis) by July 1, 2010 and on an annual basis thereafter. Commercial and industrial facility inspectors shall distribute developed educational information (Fact Sheets) to these facilities during inspections. Further, for restaurant, automotive service centers and gasoline service station corporate chains, new information or that which has been previously developed shall

be provided to corporate environmental managers during outreach visits that should take place twice during the permit term. Some of these outreach activities could be conducted through the chamber of commerce or other similar establishments. The outcomes from all outreach requirements contained herein shall be reported in the applicable annual reports.

5. The permittees shall further develop and maintain public education materials to encourage the public to report illegal dumping and unauthorized, non-storm water discharges from residential, industrial, construction and commercial sites into public streets, storm drains and to surface waterbodies and their tributaries; clogged storm drains; faded or missing catch basin stencils and general storm water and BMP information. Hotline and web site information shall be included in the public and business education program and shall be listed in the governmental pages of all regional phone books and on the permittees' website.

6. Within 12 months from the date of adoption of this order, the permittees shall further develop and maintain BMP guidance for the control of those potentially polluting activities identified during the previous permit cycle, which are not otherwise regulated by any agency, including guidelines for the household use of fertilizers, pesticides, herbicides and other chemicals, and guidance for mobile vehicle maintenance, carpet cleaners, commercial landscape maintenance, and pavement cutting. These guidance documents shall be distributed to the public, trade associations, etc., through participation in community events, trade association meetings and/or by mail.

7. The principal permittee, in collaboration with the co-permittees, shall develop and implement a mechanism for public participation in the updating and implementation of the Drainage Area Management Plans, monitoring plans, Water Quality Management Plan guidance and Fact Sheets for various activities. The public shall be informed of the availability of these documents through public notices in local newspapers, County and/or city websites, local libraries/city halls and/or courthouses.

XIV. MUNICIPAL FACILITIES/ACTIVITIES

1. The permittees shall continue to implement the Model Municipal Activities Program developed by the permittees for fixed facilities, field operations and drainage facilities to ensure that public agency facilities and activities do not cause or contribute to a pollution or nuisance in receiving waters. By July 1 of each year, the permittees shall review all their activities and facilities to determine the need for any revisions to the facility inventories, prioritization, and maintenance programs. The annual report shall include the findings of this review and a schedule for any needed revisions. All revisions should consider a pollution prevention strategy to ensure that the public agency facilities and/or activities that are currently not required to obtain coverage under the State's general storm water permits reduce the discharge of pollutants into waters of the US to the maximum extent practicable.

2. The permittees shall continue to implement BMPs as per the Fact Sheets developed by the permittees for fixed facilities, field programs and drainage facilities for public agency and contract field operations and maintenance staff. A reporting of these activities shall be included in each annual report.

3. The permittees shall conduct inspections of open channel systems at least on an annual basis and record the findings in the inspection forms developed by the permittees. At a minimum the following municipal areas should be inspected:
   a) Parking facilities;
   b) Flood management and storm water conveyance systems (open channels);
   c) Areas or facilities discharging directly to lagoons, the ocean, or environmentally sensitive areas such as 303(d) listed waterbodies and Areas of Special Biological Significance; and
   d) Municipal landfills, solid waste transfer facilities, land application sites, corporate yards, sewage collection and treatment facilities, parks and recreation facilities including golf courses, and airfields.
4. All applicable public agency staff shall be trained as specified under Section XVI.
5. In collaboration with the University of California Cooperative Extension and consistent with the Model Integrated Pest Management, Pesticide and Fertilizer Management Guidelines, the permittees shall:
   a) Conduct annual integrated pest management self-audits;
   b) Implement the Model Integrated Pest Management, Pesticide and Fertilizer Guidelines;
   c) Provide proper training to municipal and contract staff involved in the above activities;
   d) Within one year of adoption of this order, revise the LIP to include an integrated pest management program.
6. The permittees shall evaluate the need for any revisions to the Integrated Pest Management, Pesticide and Fertilizer Management Guidelines and determine the need for developing pesticide use indicators.
7. Within one year of adoption of this order, the principal permittee shall evaluate the effectiveness of debris booms and determine if additional debris booms are needed to address floatables in inland streams. This evaluation should also include an evaluation of other control measures such as more effective street sweeping program, litter control measures, and drain inlet screens and /or other inlet controls.
8. Within twelve months of adoption of this order, the principal permittee shall develop an intragency agreement with the County Integrated Waste Management Department to ensure that household solid and hazardous waste collection, transfer and disposal practices do not cause or contribute to a water quality problem.
9. The permittees shall ensure that their flood management processes and projects do not contribute pollutants to receiving waters to the MEP.
10. Each permittee shall examine opportunities to retrofit existing storm water conveyance systems and parks and other recreational areas with water quality protection measures, where feasible. The 2005 RBF Retrofit Study may be used by the principal permittee for a system-wide evaluation in lieu of each permittee conducting its own evaluation. Within 12 months of adoption of this order, the principal permittee shall submit a proposal for additional retrofit studies that incorporates opportunities for addressing any applicable TMDL implementation plans.

11. The permittees shall continue to implement the established model maintenance procedure for drainage facilities (catch basins, storm drains inlets, open channels, etc.). Each permittee shall clean and maintain at least 80% of its drainage facilities on an annual basis, with 100% of the facilities included in a two-year period, using the model maintenance procedures developed by the permittees. Each permittee shall keep a record of its inspections, maintenance and cleaning activities, and overall quantity of waste removed. This record shall be included in the annual report.
12. The permittees shall determine whether a more aggressive maintenance frequency is necessary for the cleaning of drainage facilities, including catch basins, based on the data generated by the historic and ongoing inspections of these facilities. This program shall be based on a list of drainage facilities and prioritized on such factors as: proximity to receiving waters, receiving water beneficial uses and impairments of beneficial uses, historical pollutant types and loads from past inspections/cleanings and the presence of downstream regional facilities that would remove the types of pollutants found in the drainage facility. Using this list, the permittees shall revise clean out schedules and frequency and provide justification for any proposed clean out frequency that is less than once a year. This information shall be included in the annual report.
13. Within six months of adoption of this order, the permittees shall evaluate the applicability of the Model Municipal Activities Program to municipal maintenance contracts, contracts for field maintenance operations, and leases. The findings from the evaluation shall be included in the next annual report.
14. Each permittee shall implement control measures necessary to minimize infiltration of seepage from sanitary sewers to the storm drain systems through routine preventive maintenance of the storm drain system. The permittees who are also owners and/or operators of sewage collection systems shall also implement a routine maintenance program for the sewage collection systems in accordance with the State Board's Water Quality Order No. 2006-0003. Each permittee shall cooperate and coordinate with the sewage collection/treatment agencies (Orange County Sanitation District and/or Irvine Ranch Water District) to swiftly respond to and contain any sewage spills.

XV. MUNICIPAL CONSTRUCTION PROJECTS/ACTIVITIES

1. This order authorizes the discharge of storm water runoff from construction projects that may result in land disturbance of one (1) acre or more (or less than one acre, if it is part of a larger common plan of development or sale which is one acre or more) that are under ownership and/or direct responsibility of any of the permittees. All permittee construction activities shall be in accordance with DAMP Sections 7 and 8.
2. All construction activities shall be in compliance with the latest version of State's General Permit for Storm Water Discharges Associated with Construction Activities except that an NOI need not be filed with the State Board.
3. Prior to commencement of construction activities, the permittees shall notify the Executive Officer of the Regional Board concerning the proposed construction project. Upon completion of the construction project, the Executive Officer shall be notified of the completion of the project.
4. The permittees shall develop and implement a storm water pollution prevention plan (SWPPP) and a monitoring program that is specific for the construction project greater

than one acre, prior to the commencement of any of the construction activities, except for routine maintenance activities. The SWPPP shall be kept at the construction site and released to the public and/or Regional Board staff upon request.

5. The SWPPP (and any other plans and programs required under the General Permit) and the monitoring program for the construction projects shall be consistent with the requirements of the latest version of the State's General Construction Permit.

6. The permittees shall give advance notice to the Executive Officer of the Regional Board concerning any planned changes in the construction activity, which may result in non-compliance with the latest version of the State's General Construction Permit.

XVI. TRAINING PROGRAM FOR STORM WATER MANAGERS, PLANNERS, INSPECTORS AND MUNICIPAL CONTRACTORS

1. Within 12 months from the date of adoption of this order, the principal permittee, in coordination with the co-permittees, shall develop a training program including a training schedule, curriculum content, and defined expertise and competencies for storm water managers, inspectors, maintenance crew, those involved in the review and approval of WQMPs, public works employees, community planners and for those preparing and/or reviewing CEQA documentation and for municipal contractors.

2. The curriculum content should include: federal, state and local water quality laws and regulations as they apply to construction and grading activities, industrial and commercial activities; the potential effects of construction, industrial and commercial activities and urbanization on water quality; implementation and maintenance of erosion control and pollution prevention measures and sediment control BMPs; the proper use and maintenance of erosion and sediment controls; the enforcement protocols and methods established in the Drainage Area Management Plan, Local Implementation Plan, the Construction Runoff Guidance Manual, Enforcement Consistency Guide and Illicit Discharge/Illegal Connection Training Program. Each permittee may develop its own training program curriculum consistent with the general principles discussed in this and the next paragraph. The training program should be coordinated with the Orange County Vector Control District to insure that vector control issues related to post-construction BMPs are incorporated into the training curriculum.

3. The training modules for each category of trainees (managers, inspectors, planners, contractors, public works crew, etc.) should define the required competencies, outline the curriculum, a testing or other procedure at the end of the training program to determine that the trainees have acquired the requisite knowledge in the storm water program to carry out their duties and proof of completion of training, such as Certificate of Completion, attendance sheets or other proof that training has been completed. .

4. At least every two years, the principal permittee shall provide and document training to applicable public agency staff on Fixed Facility Model Maintenance Procedure, Field Program Model Training and Drainage Facility Model Maintenance Training. The field program training should include Model Integrated Pest Management, Pesticide and Fertilizer Guidelines. Each permittee shall attend at least three of these training sessions during the term of this permit. The training sessions may be conducted in classrooms or using videos, DVDs, or other multimedia with appropriate documentation and a final test to verify that the material has been properly reviewed and understood.

The permittees have the option to develop and conduct their own training program as indicated in Paragraph 2, above.

5. The principal permittee shall conduct and document public employee training for model environmental review, and on how to conduct public/business education for preparation of environmental documents. The permittees have the option to develop and conduct their own training program as indicated in Paragraph 2, above.
6. The principal permittee shall provide BMP and training information to municipal contractors to assist the contractors in training their staff. In instances where applicable municipal operations are performed by contract staff, the permittees shall require evidence that contract staff have received a level of training equivalent to that listed above. The permittees have the option to develop and conduct their own training program as indicated in Paragraph 2, above.
7. The principal permittee shall notify designated Regional Board staff via e-mail at least 30 days prior to conducting any of these training sessions.
8. Each permittee shall have adequately trained all its staff involved with storm water related projects within 60 days from being assigned these duties and on an annual basis thereafter, prior to the rainy season.
9. Each permittee shall maintain a written record of all training provided to its storm water and related program staff.

XVII. NOTIFICATION REQUIREMENTS

1. Within 24 hours of discovery, each permittee shall provide oral or e-mail notification to Regional Board staff of non-compliant sites within its jurisdiction that are determined to pose imminent threat to human health or the environment (e.g., sewage spills that could impact water contact recreation, an oil spill that could impact wildlife, a hazardous substance spill where residents are evacuated, etc.). Following oral or email notification, a written report must be submitted to the Regional Board office within 5 business days, detailing the nature of the non-compliance, any corrective action taken by the site owner, other relevant information (e.g., past history of non-compliance, environmental damage resulting from the non-compliance, site owner responsiveness) and the type of enforcement that will be carried out by the permittee. Further, incidences of non-compliance shall be recorded along with the information noted in the written report and the final outcome/enforcement for the incident in the databases for construction, industrial and commercial inspections[61].
2. At a minimum, all sewage spills above 1,000 gallons and all reportable quantities of hazardous waste spills as per 40CFR 117 and 302 shall be reported within 24 hours. All spill incidents shall be also included in the annual report. The permittees may propose a reporting program, including reportable incidents and quantities, jointly with other agencies, such as the County Health Care Agency, for approval by the Executive Officer.

[61] The reporting schedule may be revised with the approval of the Executive Officer.

XVIII. WATERSHED ACTION PLANS AND TMDL IMPLEMENTATION

A. IMPAIRED WATERBODIES WITH NO TMDLS

1. The principal permittee, in collaboration with the co-permittees, shall develop Watershed Action Plans for areas where such a Plan has not been developed. Existing Watershed Action Plans and those under development shall be updated as new TMDLs are approved by the Regional Board.
2. Each Watershed Action Plan shall identify impaired waters [CWA § 303(d) listed], pollutants causing impairment, monitoring programs for these pollutants, control measures, including any BMPs that the permittees are currently implementing, and any BMPs that the permittees are proposing to implement. All construction sites that are adjacent to (within 200 feet) or discharging directly to a waterbody listed for sediments or turbidity shall be treated as high priority sites. In selecting control measures, the listed pollutants shall be treated as primary pollutants of concern and these pollutants shall be addressed through source control, site design, pollution prevention and structural treatment control BMPs.

B. WATERBODIES WITH TECHNICAL TMDLS (NO IMPLEMENTATION PLANS)

1. As required under a consent decree, in 2002, the EPA promulgated technical TMDLs for toxic pollutants in San Diego Creek and Newport Bay, including metals, organochlorine compounds, selenium and organophosphate pesticides. EPA and the Los Angeles Regional Water Quality Control Board established technical TMDLs for metals in Coyote Creek. Technical TMDLs do not include implementation plans or compliance schedules.
2. In collaboration with stakeholders, Regional Board staff are developing revised TMDLs that are expected to supplant the toxics TMDLs promulgated by EPA for the Newport watershed. The TMDLs will include implementation plans and compliance schedules. Implementation plans for the Coyote Creek TMDLs are also being developed.
3. In summary, work related to the following established TMDLs is ongoing:
   a) Metals (San Diego Creek and Newport Bay (including Rhine Channel))
   b) Metals (Mercury, Chromium) (Rhine Channel)
   c) Organochlorine compounds (San Diego Creek and Newport Bay; also see Paragraphs 5 and 6, below)
   d) Selenium (San Diego Creek and Newport Bay)
   e) Copper, lead and zinc (Coyote Creek, TMDL developed by the EPA and the Los Angeles Regional Water Quality Control Board for wet weather)
   f) Copper (Coyote Creek, TMDL developed by the EPA and the Los Angeles Regional Water Quality Control Board for dry weather)
4. The permittees in the Newport Watershed shall comply with the wasteload allocations specified in the established TMDLs and shown in Tables 1 A/B/C, 2 A/B/C/D and 3. These wasteload allocations shall remain in effect unless and

until alternative wasteload allocations are established in TMDLs approved by the Regional Board, State Board, Office of Administrative Law and EPA.

Tables 1 A/B/C/D – Urban Runoff Waste Load Allocations for Metals (TMDLs promulgated by U.S. EPA)[62]

A- San Diego Creek and Tributaries – Concentration based TMDL

	Base flows (<20 cfs) Hardness- 400 mg/L		Small flows (21-181 cfs) Hardness- 322 mg/L		Med. flows (182-815 cfs) Hardness- 236 mg/L		Large Flows (>815 cfs) Hardness- 197 mg/L
	Acute	Chronic	Acute	Chronic	Acute	Chronic	Acute
Cd (ug/L)	19.1	6.2	15.1	5.3	10.8	4.2	8.9
Cu (ug/L)	50	29.3	40	24.3	30.2	18.7	25.5
Pb (ug/L)	281	10.9	224	8.8	162	6.3	134
Zn (ug/L)	379	382	316	318	243	244	208

B- Newport Bay

Cd *	Cu	Pb	Zn
9,589 lbs/yr	3,403 lbs/yr	17,638 lbs/yr	174,057 lbs/yr

* (Applies to Upper Bay only, estimated as 40% of Newport Bay volume)

C- Rhine Channel

Mercury (Hg)	Chromium (Cr)
0.0171 kg/yr	5.66 kg/yr

D- Concentration-based Dissolved Metal TMDLs, WLAs and LAs for Newport Bay

	Dissolved saltwater TMDLs and allocations which apply to direct discharges to the bay, including storm drains/channels and metals loading associated with boats	
	Acute	Chronic
Cd* (ug/L)	42	9.3
Cu (ug/L)	4.8	3.1
Pb (ug/L)	210	8.1
Zn (ug/L)	90	81

* (Applies to Upper Bay only, estimated as 40% of Newport Bay volume).

[62] From Total Maximum Daily Loads For Toxic Pollutants San Diego Creek and Newport Bay, California, U.S. EPA – Region 9, established June 14, 2002.

Tables 2 A/B/C/D – Urban Runoff Waste Load Allocations for Organochlorine Compounds (TMDLs promulgated by U.S. EPA)[63]

A- San Diego Creek and Tributaries

Total DDT	Chlordane	Dieldrin	PCBs	Toxaphene
302.8 g/yr	220.3 g/yr	183.4 g/yr	177.7 g/yr	6.2 g/yr

B- Upper Newport Bay

Total DDT	Chlordane	PCBs
207.4 g/yr	120.5 g/yr	609.7 g/yr

C – Lower Newport Bay

Total DDT	Chlordane	Dieldrin	PCBs
76.3 g/yr	12.6 g/yr	4.45 g/yr	303.3 g/yr

D – Rhine Channel

	Total DDT	Chlordane	Dieldrin	PCBs
WLA	0.7 g/yr	0.1 g/yr	0.13 g/yr	4.1 g/yr

Table 3 – Urban Runoff Waste Load Allocation for Selenium – San Diego Creek and Tributaries (TMDL promulgated by U.S. EPA)[64]

Base flows (<20 cfs)	Small flows (21-181 cfs)	Med. flows (182–814 cfs)	Large Flows (>814 cfs)
0.4 lbs/yr	1.0 lbs/yr	1.0 lbs/yr	5.3 lbs/yr

5. The Regional Board adopted TMDLs, including an implementation plan, for organochlorine compounds in September 2007. These TMDLs must be submitted for approval by the State Board, Office of Administrative Law and EPA. These TMDLs have not yet been submitted to the State Board for its approval. However, stakeholders in the watershed are already taking steps to implement the TMDLs through a Toxicity Reduction and Investigation Program (TRIP) that will address the organochlorine compounds and other toxic pollutants, including metals, in the Newport Bay watershed. These TMDLs will become effective upon approval by the State Board and Office of Administrative

[63] From Total Maximum Daily Loads For Toxic Pollutants San Diego Creek and Newport Bay, California, U.S. EPA – Region 9, established June 14, 2002.

[64] From Total Maximum Daily Loads For Toxic Pollutants San Diego Creek and Newport Bay, California, U.S. EPA – Region 9, established June 14, 2002.

Law but will not supplant the EPA organochlorine compounds TMDLs until they are approved by EPA. Accordingly, upon approval of the Regional Board-adopted organochlorine compounds TMDLs by the State Board and the Office of Administrative Law, the permittees shall comply with both the EPA and Regional Board wasteload allocations specified in Tables 2 A/B/C/D and Table 4, respectively. In accordance with the Regional Board TMDLs, compliance with the allocations specified in Table 4 shall be achieved as soon as possible but no later than December 31, 2015. Upon approval of the Regional Board-approved organochlorine compounds TMDLs by EPA, the applicable wasteload allocations shall be those specified in Table 4.

Table 4 – Urban Runoff Waste Load Allocations for Organochlorine Compounds (TMDLs approved by Santa Ana Regional Water Quality Control Board)[65]

	Total DDT	**Chlordane**	**Total PCBs**	**Toxaphene**
San Diego Creek	128.3 g/yr			1.9 g/yr
Upper Newport Bay	51.8 g/yr	30.1 g/yr	29.8 g/yr	
Lower Newport Bay	19.1 g/yr	11.0 g/yr	78.1 g/yr	

6. The organochlorine compounds are carried by fine sediment into the water column. Since the use of organochlorine pesticides has been banned, the levels of these compounds have been steadily decreasing in the watershed. The implementation plan requires monitoring to verify the decreasing trend and strict controls on sediment discharges. The stakeholders in the San Diego Creek/Newport Bay watershed have an established Regional Monitoring Program (RMP), and in early 2008, initiated the Toxicity Reduction and Investigation Program (TRIP) consistent with the Regional Board-approved implementation plan for the organochlorine compounds TMDLs. Recognizing the difficulties inherent in measuring the allocations presented in Table 4, the permittees shall evaluate the monitoring results with the targets shown in Tables 5A/B and determine the need for any additional control measures to achieve the targets. Monitoring shall be conducted at representative locations within San Diego Creek and Newport Bay and include water column, sediment and fish tissue monitoring. The permittees may use current monitoring locations.

[65] From Resolution No. R8-2007-0024, Table NB-OCs-10.

Tables 5 A /B - Water Column Targets for Protection of Aquatic Life, Wildlife & Human Health[66]

A - San Diego Creek and Tributaries

	Total DDT	Toxaphene
Acute Criterion	1.1 µg/l	0.73 µg/l
Chronic Criterion	0.001 µg/l	0.0002 µg/l
Human Health Criterion	0.00059 µg/l	0.00075 µg/l

B - Upper and Lower Newport Bay

	Total DDT	Chlordane	Total PCBs
Acute Criterion	0.13 µg/l	0.09 µg/l	
Chronic Criterion	0.001 µg/l	0.0004 µg/l	0.03 µg/l
Human Health Criterion	0.00059 µg/l	0.00059 µg/l	0.00017 µg/l

7. Regional Board staff, in collaboration with the stakeholders, is developing TMDLs for metals and selenium that will include implementation plans and monitoring programs and that are intended to replace the EPA TMDLs. The permittees within the Newport Bay watershed shall continue to participate in the development and implementation of these TMDLs. This Order will be reopened to incorporate revised allocations based upon TMDLs, including implementation plans, for metals and selenium approved by the Regional Board, State Board and Office of Administrative Law. As for the organochlorine compounds, the EPA promulgated allocations for these constituents will also remain in effect unless and until EPA approves the Regional Board's TMDLs for these constituents.

8. Selenium is a naturally occurring element in the soil but its presence in surface waters in the Newport Bay watershed is largely the result of changes in the hydrologic regime as the result of extensive drainage modifications. Selenium-laden shallow and rising groundwater enters the storm water conveyance systems and flows into San Diego Creek and its tributaries. Groundwater inputs are the major source of selenium in San Diego Creek and Newport Bay. Currently, there are no economically and technically feasible treatment techniques to remove selenium from the water column.

[66] From Resolution No. R8-2007-0024, Table NB-OCs-4.

The stakeholders have initiated pilot studies to determine the most efficient methods for treatment and removal of selenium. Through the Nitrogen and Selenium Management Program, the watershed stakeholders are developing comprehensive selenium (and nitrogen) management plans, which are expected to form the basis, at least in part, for the selenium implementation plan (and a revised nutrient TMDL implementation plan). A collaborative watershed approach to implement the nitrogen and selenium TMDLs for San Diego Creek and Newport Bay is expected. A proposed Cooperative Watershed Program that will fulfill applicable requirements of the selenium TMDL implementation plan must be submitted by the stakeholders covered by this order within 24 months of adoption of this order, or one month after approval of the selenium TMDLs by OAL, whichever is later. The Program must be implemented upon Regional Board approval. As long as the stakeholders are participating in and implementing the approved Cooperative Watershed Program, they will not be in violation of this order with respect to the nitrogen and selenium TMDLs for San Diego Creek and Newport Bay. In the event that any of the stakeholders does not participate, or if the collaborative approach is not approved or fails to achieve the TMDLs, the Regional Board will exercise its option to issue individual waste discharge requirements or waivers of waste discharge requirements.

9. The permittees with discharges tributary to Coyote Creek or the San Gabriel River shall develop and implement a constituent-specific source control plan for copper, lead and zinc until a TMDL implementation plan is developed. The source control plan shall include a monitoring program and shall be completed within 12 months from the date of adoption of this order. The source control plan shall be designed to ensure compliance with the following wasteload allocations:

Table 6 – Municipal Storm Water Wasteload Allocations - Coyote Creek

	Copper	Lead	Zinc
Dry Weather	0.941 kg/day		
Wet Weather	9.41 kg/day	36.9 kg/day	55.0 kg/day

10. Within 12 months of adoption of this order, the principal permittee, in collaboration with the co-permittees with discharges to the San Gabriel River/Coyote Creek and/or their tributaries, shall develop a monitoring program to monitor dry weather (for copper) and wet weather (for copper,

lead and zinc) flows in Coyote Creek. The monitoring results shall be evaluated against the following numeric targets:

Table 7 – Numeric Targets - Coyote Creek
(total recoverable metals)

	Copper	Lead	Zinc
Dry Weather[67]	3.7 µg/l		
Wet Weather	27 µg/l	106 µg/l	158 µg/l

C. WATERBODIES WITH TMDL IMPLEMENTATION PLANS AND COMPLIANCE SCHEDULES BEYOND THE PERMIT TERM

1. The Regional Board adopted a TMDL implementation plan for fecal coliform bacteria in Newport Bay that included a compliance date for water contact recreation standards no later than December 30, 2013 (within the permit term), and with shellfish standards no later than December 30, 2019. The allocations are shown in the tables below.

Table 8A – Fecal Coliform TMDL and Allocations for Newport Bay
To be achieved no later than December 30, 2013

Urban Runoff Waste Load Allocation for Fecal Coliform	As soon as possible, but no later than December 30, 2013	5-Sample/30-days Geometric Mean less than 200 organisms/100 mL, and not more than 10% of the samples exceed 400 organisms/100 mL for any 30- day period.
Total Maximum Daily Load for Fecal Coliform		5-Sample/30-days Geometric Mean less than 200 organisms/100 mL, and not more than 10% of the samples exceed 400 organisms/100 mL for any 30-day period.
Load Allocations for Fecal Coliform in Agricultural Runoff, including stormwater, Discharges		5-Sample/30-days Geometric Mean less than 200 organisms/ 100 mL, and not more than 10% of the samples exceed 400 organisms/100 mL for any 30-day period.
Load Allocations for Fecal Coliform from Natural Sources in all Discharges	In effect	5-Sample/30-days Geometric Mean less than 200 organisms/100 mL, and not more than 10% of the samples exceed 400 organisms/100 mL for any 30-day period.
Allocations for Vessel Waste		0 MPN/100 mL - No discharge.

[67] Based on saltwater CTR criterion in San Gabriel River estuary.

Table 8B – Fecal Coliform TMDL and Allocations for Newport Bay

Before December 30, 2019

Urban Runoff Waste Load Allocation for Fecal Coliform	As soon as possible, but no later than December 30, 2019	Monthly Median less than 14 MPN/100 mL, and not more than 10% of the samples exceed 43 MPN/100 mL.
Total Maximum Daily Load for Fecal Coliform		Monthly Median less than 14 MPN/100 mL, and not more than 10% of the samples exceed 43 MPN/100 mL.
Load Allocations for Fecal Coliform in Agricultural Runoff, including stormwater, Discharges		Monthly Median less than 14 MPN/100 mL, and not more than 10% of the samples exceed 43 MPN/100 mL.
Load Allocations for Fecal Coliform from Natural Sources in all Discharges		Monthly Median less than 14 MPN/100 mL, and not more than 10% of the samples exceed 43 MPN/100 mL.
Allocations for Vessel Waste	In effect	0 MPN/100 mL - No discharge.

The permittees shall comply with the wasteload allocations for urban runoff in Tables 8A and 8B in accordance with the deadlines in Tables 8A and 8B. Compliance determination for fecal coliform shall be based on monitoring conducted at representative sampling locations within San Diego Creek and Newport Bay. (The permittees may use the current sampling locations for compliance determination.)

2. The fecal coliform TMDL implementation plan includes a number of studies that are expected to inform possible revision of the TMDL, including the wasteload allocations for urban runoff and the implementation plan. The permittees shall revise the Watershed Action Plans to include implementation measures and schedules for further studies related to the TMDL for fecal coliform in Newport Bay, as set forth in the January 2000, March 2000 and April 2000 Newport Bay Fecal Coliform TMDL Technical Reports submitted by the permittees. The permittees within this watershed shall complete the ongoing source identification and characterization plan for urban runoff by December 31, 2009 and continue their participation in the studies and monitoring programs as specified in the implementation plan. Recommendations for an updated TMDL report and revisions to the fecal coliform TMDL shall be provided within twelve months of completion of the Source Identification and Characterization Investigation and Report submittal, as specified in the implementation plan.

3. The fecal coliform TMDL includes waste load allocations for storm water in urban runoff and load allocations in agricultural runoff. The University of California Cooperative Extension and Orange County Coastkeeper are working with the agricultural operators in the area to reduce runoff from their operations.

D. WATERBODIES WITH TMDL IMPLEMENTATION PLANS AND COMPLIANCE SCHEDULES WITHIN THE PERMIT TERM

1. The Regional Board/EPA developed TMDLs for diazinon and chlorpyrifos in San Diego Creek and for chlorpyrifos in Newport Bay. The following allocations are included in the TMDLs (Tables 9A and 9B are extracted from the Implementation Plan[68]). The permittees in the Newport Bay Watershed shall comply with the allocations in Tables 9 A and B.

Table 9A

Diazinon and Chlorpyrifos Allocations for San Diego Creek*

Category	Diazinon (ng/l)		Chlorpyrifos (ng/l)	
	Acute	Chronic	Acute	Chronic
Wasteload Allocation	72	45	18	12.6

Chronic means 4-consecutive day average

* Pursuant to the TMDLs, compliance with these allocations was achieved no later than December 1, 2007

Table 9B

Chlorpyrifos Allocations for Upper Newport Bay*

Category	Acute (ng/l)	Chronic (ng/)
Wasteload allocation	18	8.1

Chronic means 4-consecutive day average

* Pursuant to the TMDLs, compliance with these allocations was achieved no later than December 1, 2007

The Regional Board adopted an implementation plan for these TMDLs. In accordance with the implementation plan, the Regional Monitoring Program was modified to include analysis for organophosphate pesticides and toxicity. The Regional Board also performed simulation studies to predict contaminant concentrations in the Bay. Based on the results of these studies, the Regional Board will reevaluate the TMDLs every three years. The permittees shall continue to participate in any additional monitoring that is needed to confirm that the permittees are in compliance with the allocations.

Compliance determination for diazinon and chlorpyrifos for San Diego Creek shall be based on monitoring conducted at representative monitoring locations within San Diego Creek (the permittees may use current monitoring locations for this purpose).

Compliance determination for chlorpyrifos for Upper Newport Bay shall be based on monitoring conducted at representative monitoring locations within Upper Newport Bay (the permittees may use current monitoring locations for this purpose).

[68] Attachment to Resolution No. R8-2003-0039.

2. The waste load allocations established in the nutrient TMDLs adopted by the Regional Board in 1998 for Newport Bay included 5, 10 and 15 year allocations. The overall allocations for 2012 have been met.

Table 10 - Seasonal Load Allocations of Total Nitrogen for the Newport Bay Watershed (Urban Runoff)[69]

Nutrient TMDL	1990-1997 Loading	2002 Summer Allocation (Apr-Sept)[70]	2007 Summer Allocation (Apr-Sept)[71]	2012 Winter Allocation (Oct-Mar)[72]
Newport Bay Watershed	lbs/year TN[73,74]	lbs/season TN	lbs/season TN	lbs/season TN
Urban runoff	277,131[75]	20,785	16,628	55,442
		5 year target	10 year target	15 year target

Table 11 - Annual Total Nitrogen Load Allocations for San Diego Creek, Reach 2 During Non-Storm Conditions.[76]

	2012 Allocation lbs/day TN[77]
TMDL	14 lbs/day (TN)
Waste Load Allocation (Urban runoff)	5.5 lbs/day (TN)

3. The permittees shall verify, through monitoring or other mechanisms, that they have met the following load allocations for phosphorous for urban runoff (recent

[69] From Attachment to Resolution No. 98-9 as amended by Resolution No. 98-100, Table 5-9b.Compliance dates are as soon as possible but no later than December 31 of the years specified (Table 5-9a of Resolution No. 98-9, as amended).

[70] Compliance to be achieved no later than this date. The Regional Board may require earlier compliance with these targets when it is feasible and reasonable.

[71] See previous footnote.

[72] Total nitrogen winter loading limit applies between October 1 and March 31 when the mean daily flow rate at San Diego Creek at Campus Drive is below 50 cubic feet per second (cfs), and when the mean daily flow rate in San Diego Creek at Campus Drive is above 50 cubic feet per second (cfs), but not as the result of precipitation. Compliance to be achieved no later than this date. The Regional Board may require earlier compliance with these targets when it is feasible and reasonable. Assumes 67 non-storm days.

[73] TIN = (NO3+NH3).

[74] TN = (TIN + Organic N).

[75] Estimated annual average (summer and winter loading).

[76] From Attachment to Resolution No. 98-9 as amended by Resolution No. 98-100, Table 5-9d. Total nitrogen loading limit applies when the mean daily flow rate at San Diego Creek at Culver Drive is below 25 cubic feet per second (cfs), and when the mean daily flow rate in San Diego Creek at Culver Drive is above 25 cubic feet per second (cfs), but not as the result of precipitation.

[77] Compliance to be achieved no later than December 31, 2012. The Regional Board may require earlier compliance with these targets when it is feasible and reasonable.

monitoring data indicate that these target load allocations have been already met).

Table 12 - Annual Total Phosphorous Load Allocations

For The Newport Bay Watershed[78]

	2002 Allocation lbs/year TP[79]	2007 Allocation lbs/year TP[80]
TMDL	86,912	62,080
Urban areas	4,102	2,960

The permittees shall comply with the waste load allocations for urban runoff in Tables 10, 11 and 12 in accordance with the schedules in Tables 10, 11 and 12. Compliance determination for nutrients in San Diego Creek and Newport Bay shall be based on monitoring conducted at representative monitoring locations within San Diego Creek and Newport Bay.

4. The permittees shall meet the following target load allocations for sediment in urban runoff by implementing the BMPs contained in Sections 7 and 8 of the DAMP and the "March 1999 Technical Report on the Implementation of the TMDL for Sediment in the Newport Bay Watershed, the October 1999 Preliminary Sediment Load Allocation Analysis for San Diego Creek and Newport Bay, and the February 2000 Sediment Yield and Transport Investigation for San Diego Creek and Newport Bay".

   a) The load allocations for sediment discharges to Newport Bay from urban areas shall not exceed 2,500 tons per year, implemented as a 10-year running annual average.

   b) The load allocations for sediment discharges to San Diego Creek and its tributaries from urban areas shall not exceed 2,500 tons per year, implemented as a 10-year running annual average.

   Compliance determination for sediment in San Diego Creek and Newport Bay shall be based on monitoring conducted at San Diego Creek at Campus, starting from year 2000 and based on a 10-year running average. The data from this monitoring is to be submitted annually on February 27.

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[78] From Attachment to Resolution No. 98-9 as amended by Resolution No. 98-100, Table 5-9c. Compliance dates are as soon as possible but no later than December 31 of the years specified (Table 5-9a of Resolution No. 98-9, as amended).

[79] Compliance to be achieved no later than this date. The Regional Board may require earlier compliance with these targets when it is feasible and reasonable.

[80] See previous footnote.

5. This order may be reopened to include additional requirements based on new or revised TMDLs.

E. COMPLIANCE DETERMINATION WITH TMDLs AND BMP IMPLEMENTATION

1. Except for sediment TMDLs in San Diego Creek and Newport Bay, compliance determinations shall be based on monitoring within the receiving waters. For sediment TMDLs, compliance determination shall be based on monitoring in the Creek.
2. Based on the TMDLs, effluent limits have been specified to ensure consistency with the wasteload allocations. If the monitoring results indicate an exceedance of the wasteload allocations, the permittees shall reevaluate the current control measures and propose additional BMPs/control measures. This reevaluation and proposal for revisions to the current BMPs/control measures (revised plan) shall be submitted to the Executive Officer within 12 months of determining that an exceedance has occurred. Upon approval, the permittees shall immediately start implementation of the revised plan.

XIX. PROGRAM MANAGEMENT/DAMP REVIEW

1. By July 1 of each year, the permittees shall evaluate the DAMP to determine whether any revisions are necessary in order to reduce pollutants in MS4 discharges to the maximum extent practicable. In addition, the first annual review after adoption of this order shall include the following:
   a) Review of the formal training needs of municipal employees
   b) Review of coordinating meeting/training for the designated NPDES inspectors.
2. The annual report shall include the findings of this review and a schedule for any needed revisions or a copy of the amended DAMP with the proposed changes.
3. Upon the effective date of this Order, the permittees shall start implementing the 2007 DAMP. If modifications to the 2007 DAMP are determined to be necessary, the permittees shall prepare and submit DAMP modifications to the Regional Board Executive Officer, for consideration by the Regional Board at a public hearing. Such modifications may include regional and watershed-specific requirements and/or waste load allocations developed and approved pursuant to the TMDL process.
4. The Management Committee shall meet at least six times a year to discuss issues related to permit implementation and regional and statewide issues. Each permittee's designated representative or a designated alternate should attend at least 75% of these meetings.

XX. FISCAL ANALYSIS

1. Each permittee shall secure the resources necessary to meet all requirements of this order.

2. The permittees shall prepare and submit a unified fiscal accountability analysis to the Executive Officer of the Regional Board. The fiscal analysis shall be submitted with the annual report shall, at a minimum, include the following:
   a) Each permittee's expenditures for the previous fiscal year,
   b) Each permittee's budget for the current fiscal year,
   c) A description of the source of funds, and
   d) Each permittee's estimated budget for the next fiscal year.

XXI. PROVISIONS

1. All reports submitted by the permittees as per the requirements in this order for the approval of the Executive Officer shall be publicly noticed and made available on the Regional Board's website, or through other means, for public review and comments. The Executive Officer shall consider all comments received prior to approval of the reports. Any unresolved significant issues shall be scheduled for a public hearing at a Regional Board meeting prior to approval by the Executive Officer.
2. Permittees shall demonstrate compliance with all the requirements in this order and specifically with Section III.2 Discharge Limitations and Section IV. Receiving Water Limitations, through timely implementation of their DAMP and any modifications, revisions, or amendments developed pursuant to this order approved by the Executive Officer or determined by the permittee to be necessary to meet the requirements of this order.
3. The permittees shall, at a minimum, implement all elements of the DAMP. Where the dates in the DAMP are different than those of this order, the dates in this order shall prevail. Any proposed revisions to the DAMP shall be submitted with the annual report to the Executive Officer of the Regional Board for review and approval. All approved revisions to the DAMP shall be implemented as per the time schedules approved by the Executive Officer. In addition to those specific controls and actions required by (1) the terms of this order and (2) the DAMP, each permittee shall implement additional controls, if any are necessary, to reduce the discharge of pollutants in storm water to the maximum extent practicable, as required by this order.
4. The permittees shall comply with Monitoring and Reporting Program NO. R8-2008-0030, and any revisions thereto, which is hereby made a part of this order. The Executive Officer is authorized to revise the Monitoring and Reporting Program to allow the permittees to participate in regional, statewide, national or other monitoring programs in lieu of or in addition to Monitoring and Reporting Program No. R8-2008-0030.
5. Within one year of adoption of this order, the permittees, in coordination with the Orange County Fire Chiefs Association, shall develop a list of appropriate BMPs to be implemented to reduce pollutants from training activities, fire hydrant/sprinkler testing or flushing, non-emergency fire fighting and any BMPs feasible for emergency fire fighting flows.

6. Upon approval by the Executive Officer of the Regional Board, all plans, reports and subsequent amendments required by this order shall be implemented and shall become an enforceable part of this order. Prior to approval by the Executive Officer, these plans, reports and amendments shall not be considered as an enforceable part of this order.
7. The permittees shall report to the Executive Officer of the Regional Board:
   a) Any enforcement actions and discharges of storm or non-storm water, known to the permittees, which may have an impact on human health or the environment,
   b) Any suspected or reported activities on federal, state, or other entity's land or facilities, where the permittees do not have any jurisdiction, and where the suspected or reported activities may be contributing pollutants to waters of the US.

   (Also see reporting requirements in Monitoring and Reporting Program No. R8-2008-0030)
8. The permit application package and special NPDES program requirements contained in 40 CFR 122.21 (a), (b), (d)(2), (f), (p); 122.41 (a), (b), (c), (d), (e), (f), (g), (h), (i), (j), (k), (l); and 122.42 (c) are incorporated into this order by reference.

XXII. PERMIT MODIFICATION

1. In accordance with 40 CFR 122.41(f), this order may be modified, revoked or reissued prior to its expiration date for the following reasons:
   a) To address significant changes in conditions identified in the technical reports required by the Regional Board which were unknown at the time of the issuance of this order;
   b) To incorporate applicable requirements of statewide water quality control plans adopted by the State Water Resources Control Board or any amendments to the Basin Plan approved by the Regional Board, the State Board and, if necessary, by the Office of Administrative Law;
   c) To comply with any applicable requirements, guidelines, or regulations issued or approved under the Clean Water Act, if the requirements, guidelines, or regulations contain different conditions or additional requirements than those included in this order; or,
   d) To incorporate any requirements imposed upon the permittees through the TMDL process.
2. The filing of a request by the permittees for modification, revocation and re-issuance, or termination or a notification of planned changes or anticipated noncompliance does not stay any conditions of this order.

XXIII. PERMIT EXPIRATION AND RENEWAL

1. This order expires on April 1, 2014 and the permittees must file a Report of Waste Discharge (permit application) no later than 180 days in advance of such expiration date as application for issuance of new waste discharge requirements (40 CFR

122.41(b)). The Report of Waste Discharge shall, at a minimum, include the following:

a) Any revisions to the Drainage Area Management Plan including, but not limited to, all the activities the permittees propose to undertake during the next permit term, goals and objectives of such activities, an evaluation of the need for additional source control and/or structural BMPs, any proposed pilot studies, etc.;

b) Changes in land use and/or population including land use map updates;

c) Any significant changes to the storm drain systems, outfalls, detention or retention basins or dams and other controls including map updates of the storm drain systems; and,

d) Any new or revised program elements and compliance schedule(s) necessary to comply with Section IV of this order.

2. All permit applications (Report of Waste Discharge), annual reports and other information submitted under this order shall be signed by either a principal executive officer or a ranking elected official (40 CFR 122.22(a)(3)) or a duly authorized representative as per 40 CFR 122.22(b).

3. This order shall serve as a National Pollutant Discharge Elimination System (NPDES) Permit pursuant to Section 402(p) of the Clean Water Act, or amendments thereto, and shall become effective ten days after the date of its adoption, provided the Regional Administrator of the EPA has no objections. If the Regional Administrator objects to its issuance, the permit shall not become effective until such objection is withdrawn.

4. Order No. R8-2002-0010 is hereby rescinded.

I, Gerard Thibeault, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an order adopted by the California Regional Water Quality Control Board, Santa Ana Region, on May 22, 2009.

Gerard J. Thibeault
Executive Officer

Order No. R8-2009-0030 (NPDES No. CAS618030) – as amended by Order No. R8-2010-0062
The County of Orange, OCFCD, and Incorporated Cities **Attachment "A"**
Area wide Urban Storm Water Runoff

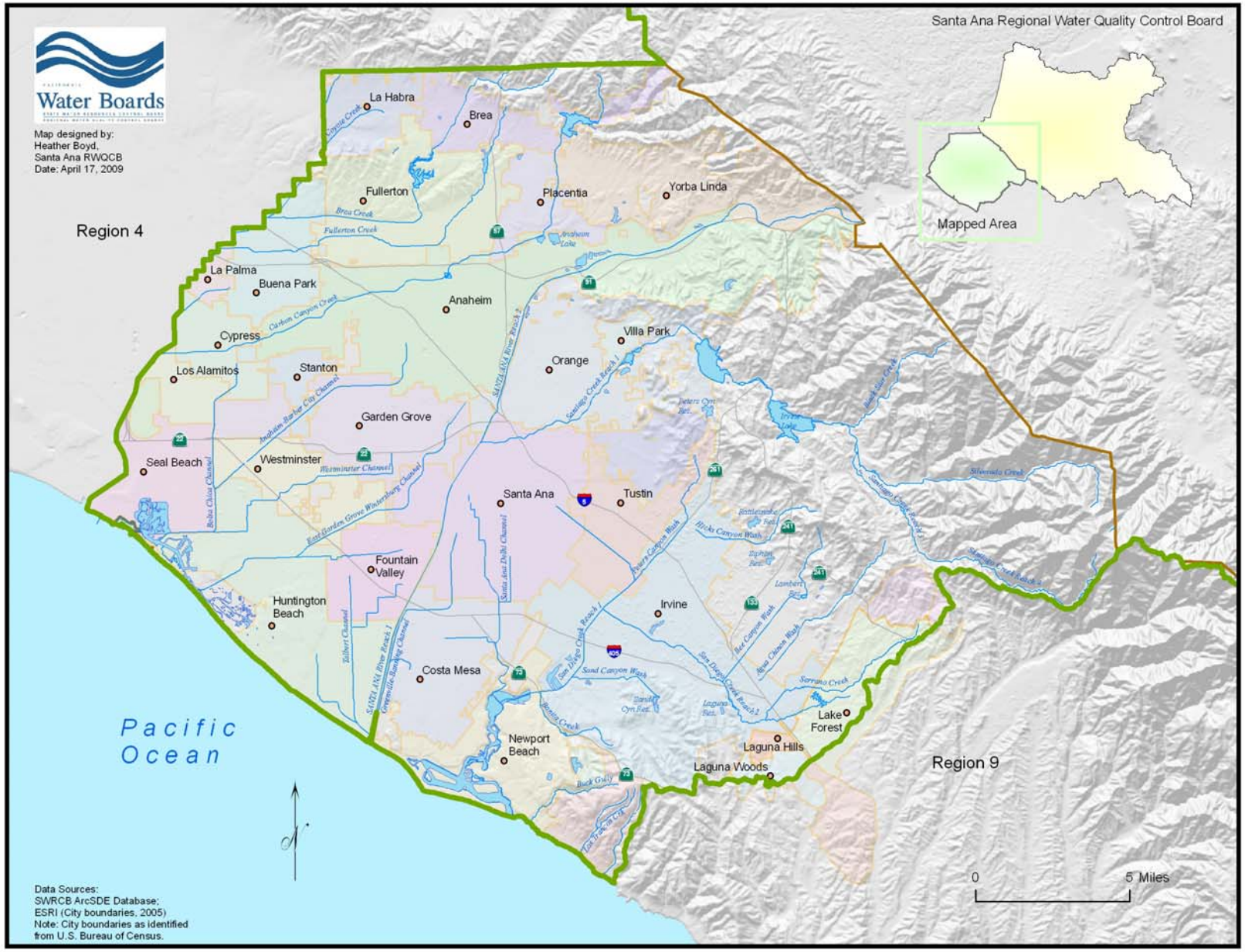

Order No. R8-2009-0030 (NPDES No. CAS618030) – as amended by Order No. R8-2010-0062
The County of Orange, OCFCD, and Incorporated Cities **Attachment "B"**
Area wide Urban Storm Water Runoff

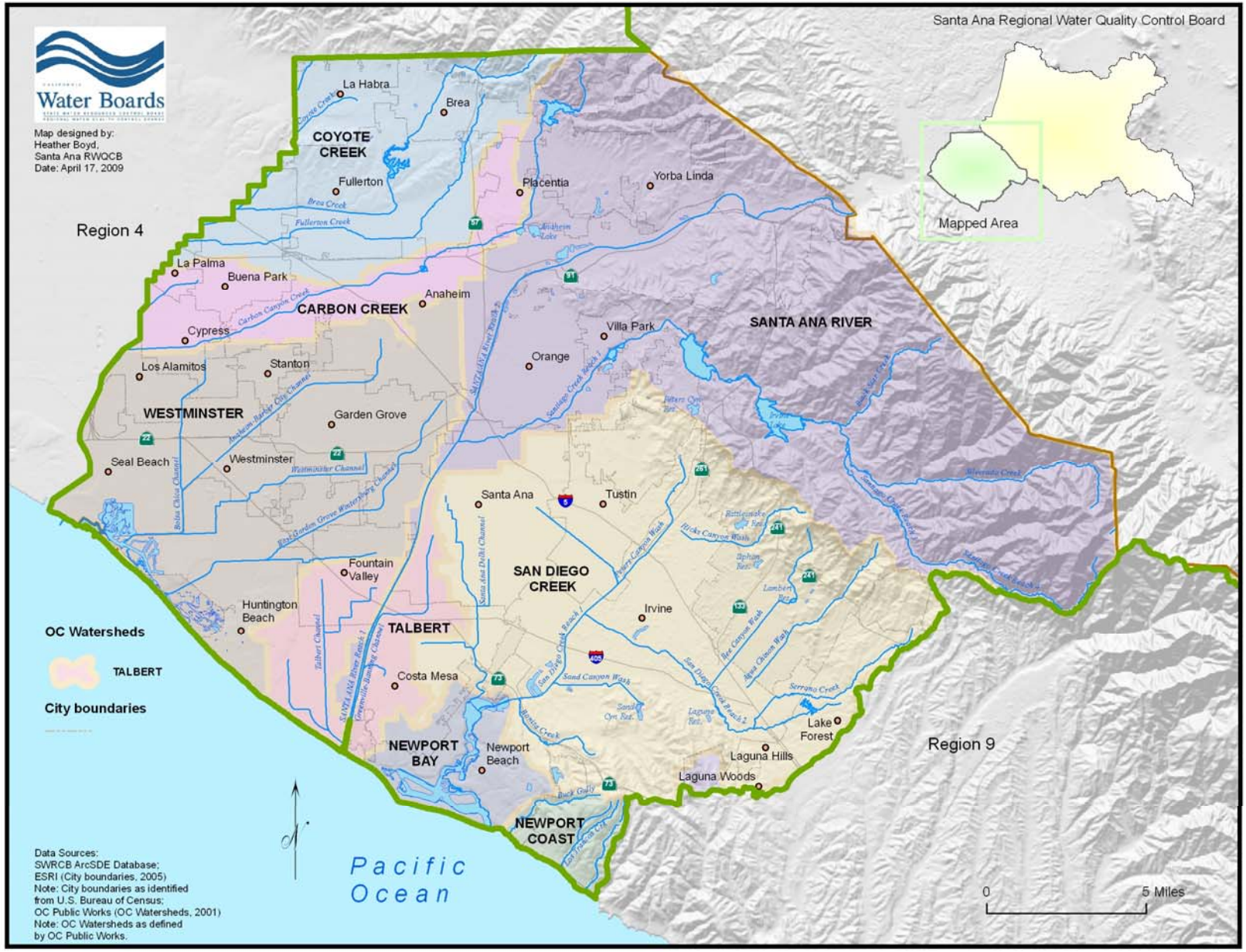

Order No. R8-2009-0030
Attachment "C"
LIST OF OTHER ENTITIES WITH THE POTENTIAL TO DISCHARGE POLLUTANTS TO THE ORANGE COUNTY STORM WATER SYSTEM

California Department of Transportation (Caltrans), District 12
Southern Pacific Railroad
Atchison, Topeka & Santa Fe Railway Company
Seal Beach Naval Weapons Station
Seal Beach Naval Reserve Center, Los Alamitos
National Forest Service

Universities and Colleges

University of California, Irvine
California State University, Fullerton
Chapman College
Coastline College
Cypress College
Fullerton College
Irvine Valley College
Golden West College
Orange Coast College
Rancho Santiago College

School Districts

Anaheim Elementary School District
Anaheim Union High School District
Brea-Olinda Unified School District
Buena Park Joint Union High School District
Centralia Elementary School District
Cypress Elementary School District
Fountain Valley Union High School District
Fullerton Joint Union High School District
Garden Grove Unified School District
Huntington Beach Elementary School District
Huntington Beach Union High School District
Irvine Unified Union High School District
La Habra Joint Union High School District
Los Alamitos Unified School District
Lowell Joint Union High School District
Magnolia Elementary School District
Newport-Mesa Unified School District
Ocean View Union High School District
Orange Unified School District

Placentia Unified School District
Saddleback Unified School District
Santa Ana Unified School District
Savanna Union High School District
Tustin Unified School District
Westminster Union High School District
Yorba Linda Joint Union High School District

Hospitals

Anaheim General Hospital
Brea Community Hospital
Chapman General Hospital
Children's Hospital of Orange County, Orange
Coastal Communities Hospital, Santa Ana
Fairview Hospital
FHP Hospital, Fountain Valley
Fountain Valley Regional Hospital and Medical Center
Hoag Hospital, Newport Beach
Kaiser Foundation Hospital, Anaheim
Orange County Community Hospital, Buena Park
Pacifica Community Hospital, Huntington Beach
Placentia Linda Community Hospital
Santa Ana Hospital and Medical Center
St. Joseph's Hospital, Orange
U.C. Irvine Medical Center
Vencor Hospital of Orange County, Westminster
Whittier Hospital and Medical Center, Buena Park

Water/Wastewater Agencies

Santa Ana Watershed Project Authority
Irvine Ranch Water District
Los Aliso Water District
El Toro Water District
Mesa Consolidated Water District
San Bernardino County Flood Control District
Riverside County Flood Control & Water Conservation District
L.A. County Department of Public Works
County Sanitation Districts of Orange County
Costa Mesa Sanitary District
Orange County Water District
Metropolitan Water District

State of California
California Regional Water Quality Control Board
Santa Ana Region

Monitoring and Reporting Program No. R8-2009-0030
NPDES No. CAS618030

for
the County of Orange, Orange County Flood Control District,
and
Incorporated Cities of Orange County within the Santa Ana Region
Areawide Urban Storm Water Runoff

I. GENERAL

1. Revisions of the monitoring and reporting program are appropriate to ensure that the permittees are in compliance with requirements and provisions contained in this order. Revisions may be made under the direction of the Executive Officer at any time during the term, and may include a reduction or increase in the number of parameters to be monitored, the frequency of monitoring, or the number and size of samples collected.
2. The Executive Officer is authorized to allow the permittees to participate in statewide, national, or other monitoring programs in lieu of or in addition to this monitoring program.
3. All sample collection, handling, storage, and analysis shall be in accordance with 40 CFR Part 136 or other methods approved by the Executive Officer.
4. The permittees are authorized to complement their monitoring data with other monitoring sources, provided the monitoring conditions and sources are similar to those in the Santa Ana Watershed.
5. Any proposals for revisions to the 2003 Monitoring Plan shall be accompanied by a Quality Assurance Project Plan.

II. OBJECTIVES

The Orange County monitoring program was initiated in the mid 1970s with the goal of protecting key environmental resources. Successive iterations of the Orange County MS4 permit required the permittees to develop and implement comprehensive monitoring programs. During the first part of the third term permit, the permittees continued to implement the 1999 Water Quality Monitoring program. In August 2005, the Executive Officer approved the 2003 Monitoring Program that was developed in accordance with the requirements specified in the third term permit. The 2003 Monitoring Program was based on “The Model Monitoring Program for Municipal Separate Strom Sewer Systems in Southern California” developed by the Southern California Monitoring Coalition. The permittees also participate in the Regional Monitoring Program for San Diego Creek Nutrient TMDL, Southern California Bight Regional Monitoring Program, Southern California Stormwater Monitoring/Research Cooperative Program and other regional monitoring programs. The overall goal of these monitoring programs is to develop and

support an effective watershed and key environmental resources management program. The following are the major objectives:

1. To develop and support an effective municipal urban runoff pollutant source control program.
2. To define water quality status, trends, and pollutants of concern associated with urban runoff and their impact on the beneficial uses of the receiving waters.
3. To characterize pollutants associated with urban runoff and to assess the influence of urban land uses on water quality and the beneficial uses of receiving waters.
4. To identify significant water quality problems related to urban runoff.
5. To identify other sources of pollutants in urban runoff to the maximum extent possible (e.g., atmospheric deposition, contaminated sediments, other non-point sources, etc.)
6. To identify and prohibit illicit discharges.
7. To identify those waters, which without additional action to control pollution from urban storm water discharges, cannot reasonably be expected to attain or maintain applicable water quality standards required to sustain the beneficial uses in the Basin Plan (TMDL monitoring).
8. To determine unit loading rates from different urban land use categories.
9. To determine reference loads and concentrations from unimpacted areas of Orange County including sediment loads from open spaces at the foothills.
10. To determine runoff concentrations and loads as close as possible to the source (e.g., golf courses, restaurants, etc.)
11. To evaluate the effectiveness of existing urban runoff water quality management programs, including an estimate of pollutant reductions achieved by the structural and nonstructural BMPs implemented by the permittees. This should also include a determination of concentrations and unit loads that are achievable upon BMP implementation.
12. To evaluate costs and benefits of proposed municipal storm water quality control programs to the stakeholders, including the public.

The Regional Board recognizes that program modifications may be necessary to attain these objectives and authorizes the Executive Officer to evaluate and to determine adequate progress toward meeting each objective and the need for any modifications to the monitoring and reporting program.

III. MONITORING PROGRAM REQUIREMENTS

1. The permittees shall continue to implement the 2003 Monitoring Program. The permittees shall review the 2003 Monitoring Program on an annual basis and

determine the need for any modifications to the program. Each of the following elements of the program shall be evaluated:

a) Mass Emissions Monitoring. Currently the principal permittee monitors 11 mass emissions stations to estimate the total mass emissions from the MS4; assess trends in mass emissions over time; and to determine if the MS4 is contributing to exceedances of water quality objectives or beneficial uses, by comparing results to the California Toxics Rule (CTR), Basin Plan, Ocean Plan and/or other relevant standards. Samples are collected from the first storm event and two more storm events during the rainy season. A minimum of three dry-weather samples are also collected. Samples from the first rain event each year are analyzed for the entire suite of priority pollutants. All samples are analyzed for metals, pH, TSS, TOC, pesticides/herbicides, and constituents which are known to have contributed to impairment of local receiving waters. An additional 4 mass emissions stations are utilized only for nutrient analysis for TMDL requirements. Dry weather samples are also analyzed for oil and grease. Sediments associated with mass emissions are analyzed for constituents of concern.

b) Estuary/Wetlands Monitoring: Currently the permittees monitor 20 sites in Upper Newport estuary, Talbert Marsh, and Bolsa Chica wetlands areas to determine the effects of storm water and non-storm water runoff associated with increased urbanization on these systems. These monitoring locations include representative areas surrounding channel outfalls and areas away from channel outfalls to enable the determination of storm water and non-storm water effects on sediment chemistry, toxicity, benthic communities, nutrient status, and spatial extent of sediment fate within the estuarine environment.

c) Water Column Toxicity Monitoring: The current monitoring program analyses for toxicity to freshwater and marine species on mass emissions samples to determine the impacts of storm water and non-storm water runoff on toxicity of receiving waters.

d) Sediment: The permittees monitor sediment toxicity at seven stations in Newport Bay and seven stations along Huntington Harbour/Talbert Marsh areas.

e) Bacteriological/Pathogen Monitoring: The permittees currently monitor 9 representative areas along the Orange County coastline and six inland water bodies/channels, for total coliform, fecal coliform, and enterococcus in order to determine the impacts of storm water and non-storm water runoff on loss of beneficial uses to receiving waters. Currently weekly channel monitoring is conducted in San Diego Creek and Santa Ana-Delhi channels by both Orange County Environmental Health and the Orange County monitoring program. The Executive Officer is authorized to allow the permittees to integrate their monitoring efforts with other bacteriological/pathogen monitoring programs.

f) Bioassessment: The permittees currently monitor 12 stations in cooperation with the Southern California Coastal Water Research Project (SCCWRP) in efforts to evaluate the biological index approach for Southern California and to design a research project for developing an Index of Biological Integrity (IBI) for the region. The Executive Officer is authorized to allow the permittees to integrate this element of the monitoring program with the regional bioassessment monitoring initiative being coordinated by the Southern California Monitoring Coalition.

g) Reconnaissance: The permittees are currently conducting dry and wet weather reconnaissance surveys to identify and prohibit illicit discharges.

2. TMDL/303(d) Listed Waterbody Monitoring: The Permittees shall continue to participate in the Regional Monitoring Programs for the San Diego Creek Nutrient TMDL and the Toxics TMDL.

3. In addition, strategies must be revised/developed to evaluate the impacts of storm water or non-storm water runoff on all impairments within the Newport Bay watershed and other 303(d) listed waterbodies. Since the 303(d) listing is dynamic, with new waterbodies and new impairments being identified over time, the permittees shall revise their monitoring plan to incorporate new information as it becomes available.

IV. PROGRAM EFFECTIVENESS ASSESSMENT AND REPORTING

1. All progress reports and proposed strategies and plans required by this order shall be signed by the principal permittee, and copies shall be submitted to the Executive Officer of the Regional Board under penalty of perjury.

2. The permittees shall submit an ANNUAL PROGRESS REPORT to the Executive Officer of the Regional Board and to the Regional Administrator of the U.S. EPA, Region 9, no later than November 15th, of each year. This progress report may be submitted in a mutually agreeable electronic format. At a minimum, annual progress report shall include the following:

   a) A review of the status of program implementation and compliance (or non-compliance) with the schedules contained in this order;

   b) An assessment of the effectiveness of control measures established under the illicit discharge elimination program and the Drainage Area Management Plan. The effectiveness may be measured in terms of how successful the program has been in eliminating illicit/illegal discharges and reducing pollutant loads in storm water discharges;

c) As assessment of control measures and their effectiveness in addressing pollutants causing or contributing to an exceedance of water quality objectives in receiving waters that are on the 303(d) list of impaired waters.

d) The annual report shall include an overall program assessment. The permittees may use the "Municipal Stormwater Program Effectiveness Assessment Guidance" developed by the California Stormwater Quality Association in May 2007 as guidance for assessing program activities at the various outcome levels. The assessment should include each program element required under this order, the expected outcome and the measures used to assess the outcome. The permittees may propose any other methodology for program assessment using measurable targeted outcomes.

e) Each permittee shall develop and implement a plan and schedule to address program modifications and improvements identified during the program assessment.

f) A summary and analysis of monitoring results from the previous year and any changes to the monitoring program for the following year;

g) A unified fiscal accountability analysis, as described in Section XX., Provision, 2, of this order;

h) A draft workplan which describes the proposed implementation of the DAMP for next fiscal year. The workplan shall include clearly defined tasks, responsibilities, and schedules for implementation of the storm water program and each permittee actions for the next fiscal year;

i) Major changes in any previously submitted plans/policies; and

j) An assessment of the permittees compliance status with the Receiving Water Limitations, Section IV of the Order, including any proposed modifications to the DAMP if the Receiving Water Limitations are not fully achieved.

3. The permittees shall be responsible for the submittal to the principal permittee of all required information/materials needed to comply with this order in a timely manner. All such submittals shall be signed by a duly authorized representative of the permittee under penalty of perjury.

4. The data transmittals to the Regional Board shall be in the form developed by the Stormwater Monitoring Coalition (SMC) and approved by the State Water Resources Control Board in the document entitled "Standardized Data Exchange Formats." This document was developed in order to provide a standard format for all data transfer so that data can universally be shared and evaluated from various programs.

V. REPORTING SCHEDULE

All reports required by this order shall be submitted to the Executive Officer of the Regional Board in accordance with the following schedule:

ITEM	COMPLETION DATE	REPORT DUE DATE
Review planning procedures and CEQA document preparation processes	Within 24 months of adoption	Annual Report
Public Education Committee Meetings	Twice/year	Annual Report
Review DAMP	Annually	Annual Report
Public education workshops	Annually	Annual Report
Update inventory of construction sites and prioritize for inspections	Twice/year	Annual Report
Inspect municipal facilities	Annually	Annual Report
Maintain drainage facilities	80% annually/100% in every two years	Annual Report
Review/revise Implementation Agreement	Within 6 months of adoption	Annual Report
Review/revise Illegal Discharge/Illicit Connection Training Program	Within 6 months of adoption	Annual Report
Evaluate the need for additional debris control measures	Within 12 months of adoption	Annual Report
Complete Public Awareness Survey	July 1, 2012	Annual Report
Review Monitoring Program	Annually	Annual Report
Update industrial site database, including prioritization for inspection	Annually	Annual Report
Update the commercial site database, including prioritization for inspection	Quarterly	Annual Report
Develop a mobile business pilot program	Within 12 months of adoption	Annual Report
Residential common interest area/HOA pilot program	Within 18 months of adoption	Annual Report

Develop a guidance document for preparing conceptual WQMP	Within twelve months of adoption	Annual Report
Review planning documents to ensure water quality protection	Within 24 months of adoption	Annual Report
Report of Waste Discharge	180 days before permit expires	Six months prior to expiration
Annual Report/Fiscal Analysis	November 15th of each year	November 15
Provide training to public agency staff and to contract field operations staff	Once in two years/3 per permit term	November 15
Re-evaluate monitoring program priorities based on previous year's data	Annually	November 15
Evaluate the DAMP	Annually	November 15
Permittee Committee meetings to discuss permit implementation and regional and state-wide issues	Held at least 6 times each year	November 15

Ordered by_____

Gerard J. Thibeault
Executive Officer

STATE OF CALIFORNIA
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SANTA ANA REGION

ORDER NO. R8-2010-0033
NPDES NO. CAS 618033

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR THE RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT, THE COUNTY OF RIVERSIDE, AND THE INCORPORATED CITIES OF RIVERSIDE COUNTY WITHIN THE SANTA ANA REGION

AREA-WIDE URBAN RUNOFF MANAGEMENT PROGRAM

The following Discharger(s) are subject to waste discharge requirements as set forth in this Order:

Table 1. Municipal Permittees (Dischargers)

Principal Permittee	Riverside County Flood Control and Water Conservation District (RCFC&WCD)*	
Co–Permittees	1. Beaumont	9. Moreno Valley
	2. Calimesa	10. Murrieta
	3. Canyon Lake	11. Norco
	4. Corona	12. Perris
	5. County of Riverside (County)	13. Riverside
	6. Hemet	14. San Jacinto
	7. Lake Elsinore	15. Wildomar
	8. Menifee	

The Principal Permittee and the Co-Permittees are collectively referred to as the Permittees or the Dischargers.

Table 2. - Administrative Information

This Order was adopted by the Regional Water Board on:	**January 29, 2010**
This Order will become effective on:	**January 29, 2010**
This Order will expire on:	**January 29, 2015**
The U.S. Environmental Protection Agency (USEPA) and the California Regional Water Quality Control Board have classified this discharge as a major discharge.	
The Discharger must file a Report of Waste Discharge in accordance with Title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than 180 days in advance of the Order expiration date.	

IT IS HEREBY ORDERED, that this Order supersedes Order No. R8-2002-0011 except for enforcement purposes, and, in order to meet the provisions contained in Division 7 of the California Water Code (CWC) and regulations adopted there under, and the provisions of the federal Clean Water Act (CWA), and regulations and guidelines adopted there under, the Permittees must comply with the requirements in this Order.

I, Gerard J. Thibeault, Executive Officer, do hereby certify that this Order No. R8-2010-0033 with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Santa Ana Region, on January 29, 2010.

Gerard J. Thibeault, Executive Officer

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6	Fact Sheet
7	Notice of Intent and Notice of Termination for De-Minimus Discharges

I. FACILITY INFORMATION

A. Each of the municipalities listed in Table 1, above, hereinafter called Permittees, owns and/or operates portions of the municipal separate storm sewer system (MS4[1]), through which Urban Runoff is discharged into Waters of the United States (Waters of the US) that are located within the jurisdiction of the Santa Ana Regional Water Quality Control Board (Santa Ana Region). The MS4 falls into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) an MS4 which contributes to a violation of a Water Quality Standard; or (3) an MS4 which is a significant contributor of Pollutants to Waters of the US; or (4) an MS4 owned and/or operated by a small municipality that is interrelated to a medium or large municipality. Section 402(p) of the CWA requires that discharges of Urban Runoff from MS4 be regulated under a National Pollutant Discharge Elimination System (NPDES) permit.

B. This Order regulates the discharge of Pollutants in Urban Runoff from non-agricultural Anthropogenic sources from the MS4 that is owned and/or operated by the Permittees. The Permittees lack legal jurisdiction over discharges into their MS4 facilities from agricultural activities, State and federal facilities, public schools and hospitals, utilities, railroads, and special districts, Native American tribal lands, wastewater management agencies and other point and non-point source discharges otherwise permitted by the Regional Board. The Regional Board recognizes that the Permittees should not be held responsible for discharges from such facilities or Pollutants in those discharges. However, to the extent that the Permittees authorize the connection of these discharges into their MS4s, this Order requires the Permittees to provide written notification of Water Quality Management Plan (WQMP) requirements for post-construction best management practices (BMPs) and/or other applicable requirements of this Order. A WQMP approved by the Permittee who owns the MS4 may constitute compliance with the General Construction Permit post construction Standards[2] for the Permit Area.

C. The Co-Permittees have established legal authority to control discharges into the MS4 facilities that they own and/or operate. As owners and/or operators of the MS4, the Permittees are responsible for discharges into their MS4 facilities to the extent of their legal authority. The discharge of Pollutants into the MS4 may cause or contribute to, or threaten to cause or contribute to, a condition of Pollution in Receiving Waters. Federal regulations, 40 CFR 122.26(d)(2)(i), require the Permittees to control the discharge of Pollutants into the MS4 to the maximum extent practicable (MEP).

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1 Note: Acronyms and capitalized terms used in this document are defined in Appendix 4.
[2] The State General Construction Permit Section Order No. 2009-0009-DWQ XIII

Certain activities and sources that generate Pollutants present in Urban Runoff may be beyond the ability of Permittees to prevent or eliminate. Examples of these activities and sources include, but are not limited to: emissions from internal combustion engines, brake pad wear and tear, atmospheric deposition, bacteria and wildlife (including feral cats and dogs) and leaching of naturally occurring nutrients and minerals from local soils. This Order is not intended to address background or naturally occurring Pollutants or flows.

D. The Permittees have identified Major Outfalls and have submitted maps of existing MS4 facilities. The Co-Permittees reported having approximately 269 miles of underground storm drains, and 95 miles of channels[3]. The RCFC&WCD reported having 75 miles in underground storm drains and 59 miles of channels in the Permit Area.

E. On February 5, 2008 Wildomar residents voted for cityhood and the city incorporated on July 1, 2008. Menifee residents voted for cityhood on June 3, 2008 and the city incorporated on October 1, 2008. Both cities in letters dated May 5 and May 6, 2009, respectively, have expressed their intent to be a Co-Permittee in this Order and for the purposes of this Order shall be considered as such. Urban Runoff from the cities of Menifee, Murrieta and Wildomar discharges into watersheds within the Santa Ana Regional Board and the San Diego Regional Board jurisdictions. Therefore, these cities are regulated by MS4 permits issued by both Regional Boards. Urban Runoff from the County of Riverside and RCFC&WCD discharge into watersheds within the Santa Ana, San Diego and Colorado River Region Regional Board jurisdictions. Therefore, these entities are regulated by MS4 permits issued by three Regional Boards.

F. The Permit Area contains 1,396 square miles or 19.1% of the 7,300 square miles within Riverside County and includes 15 of the 26 municipalities within Riverside County. The more densely populated areas of Riverside County are located within the Santa Ana Regional Board's jurisdiction. The population of the Permit Area was estimated at 1,237,388 as of January 1, 2006[4]. The California Department of Finance estimates that as of January 1, 2009, the population of Riverside County was 2,107,653[5]. Other portions of Riverside County are regulated by the San Diego and the Colorado River Basin Regional Boards.

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[3] 2008-2009 Permittee Santa Ana NPDES MS4 Annual Report.
[4] Section 3.3.1 of the 2007 ROWD (Western Riverside Council of Governments (WRCOG), Sub-regional Growth Forecast, Riverside County Projection (Revised Draft), November 22, 2006.)
[5] E-1 report dated April 30, 2009 (http://www.dof.ca.gov/research/demographic/reports/estimates/e-1/2008-09/documents/E-1_2009%20Press%20Release.pdf).

II. FINDINGS

The California Regional Water Quality Control Board, Santa Ana Region (hereinafter the "Regional Board") finds that:

A. BACKGROUND

1. The Co-Permittees own and operate flood control facilities. Some of the natural channels, streambeds and other drainage facilities that are generally considered as Waters of the U.S. have been converted to flood control facilities. In such cases, where a natural streambed is modified to convey storm water flows, the conveyance system becomes both a MS4 and a Water of the US.

2. The Permittees are currently discharging from the MS4 pursuant to Order No. R8-2002-0011, NPDES Permit No. CAS 618033. This Order renews Order No. R8-2002-0011 and regulates discharges of Urban Runoff from the MS4 within Riverside County.

3. On April 27, 2007, the RCFC&WCD, in cooperation with the County of Riverside, (the "County") and the incorporated cities of Beaumont, Calimesa, Canyon Lake, Corona, Hemet, Lake Elsinore, Moreno Valley, Murrieta, Norco, Perris, Riverside, and San Jacinto, jointly submitted a permit renewal application, a Report of Waste Discharge (the "2007 ROWD"), to renew the NPDES permit for discharges of Urban Runoff from the MS4 in the Permit Area. Subsequently, the cities of Menifee and Wildomar also signed letters of intent to include discharges from their MS4 facilities under this MS4 Permit. The County and incorporated cities are hereinafter the "Co-Permittees", and collectively with the Principal Permittee referred to as the "Permittees". The Permit Area is shown in Appendix 1 and includes the urban areas and those portions of agriculture and open space as shown on Appendix 1 that may convert to industrial, commercial, or residential use during the term of this Order.

4. To more effectively carry out the requirements of this Order, the Permittees have agreed that the RCFC&WCD will continue as the Principal Permittee and the County and the incorporated cities within the Permit Area will continue as the Co-Permittees.

5. The Permittees submitted a revised Drainage Area Management Plan ("2007 DAMP") as contained in Appendix B of the 2007 ROWD. The proposed DAMP identifies programs and policies, including best management practices (BMPs), to achieve Water Quality Standards in the Receiving Waters. These BMPs can be organized into two categories: BMPs for existing facilities and BMPs for New Development and Significant Redevelopment. Both categories include regulatory activities, public education programs, waste management, and operations and

maintenance activities. The Permittees currently implement the 2006 DAMP. With the adoption of this Order, the Permittees are required to implement the 2007 DAMP. The DAMP is a dynamic document that defines the MEP standard (see discussion of this term in the Glossary, Appendix 4) for the Permittee activities and is incorporated by reference as an enforceable element of this Order.

6. This Order requires the Permittees to revise the DAMP and associated documents to incorporate new MS4 Permit requirements which include recommendations from the 2007 ROWD. Future modifications of the DAMP, once approved by the Regional Board Executive Officer[6], are also enforceable elements of this Order.

7. During the Third Term Permit, Regional Board staff conducted an evaluation of each of the Permittees' Urban Runoff programs. This evaluation indicated that most of the Permittees lacked proper documentation of procedures and policies for implementation of various elements of their Urban Runoff program. This Order requires each Permittee to develop a Local Implementation Plan (LIP) that documents its internal procedures for implementation of the various program elements described in the DAMP and this Order.

8. On July 13, 1990, the Regional Board adopted the first term Riverside County MS4 permit, Order No. 90-104 (NPDES No. CA 8000192). On March 8, 1996, the Regional Board renewed Order No. 90-104 by adopting the second term Riverside County MS4 permit, Order No. 96-30 (NPDES No. CAS618033). On October 25, 2002, the Regional Board renewed Order No. 96-30 by adopting the third term MS4 permit, Order No. R8-2002-0011(NPDES No. CAS618033).

9. This Order renews Order No. R8-2002-0011 (NPDES No. CAS618033), and regulates discharges of Urban Runoff from the MS4 within the Permit Area in Riverside County. This Order is the fourth term permit and is intended to regulate the discharge of Pollutants in Urban Runoff from non-agricultural Anthropogenic activities and sources under the jurisdiction of and/or maintenance responsibility of the Permittees and is not intended to address background or naturally occurring Pollutants or flows.

10. The Santa Ana River Basin is the major watershed within the Santa Ana Region. The Regional Board and the Permittees recognize the importance of watershed

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[6] The Executive Officer shall provide members of the public with notice and at least a 30-day comment opportunity for all documents submitted in accordance with this Order. If the Executive Officer, after considering timely submitted comments, concludes that the document is adequate or adequate with specified changes, the Executive Officer may approve the document or present it to the Board for its consideration at a regularly scheduled and noticed meeting. If there are significant issues that cannot be resolved by the Executive Officer, the document will be presented to the Board for its consideration at a regularly scheduled meeting.

management initiatives and regional planning and coordination in the development and implementation of programs and policies related to water quality protection.

11. It is recognized that in some cases MS4 facilities are used to convey Urban Runoff to sub-regional or regional Treatment Control BMPs or may incorporate regional BMPs directly. The Regional Board recognizes this appropriate strategy for treatment provided that Waters of the US are not used to convey Pollutants. Further, such BMPs are not considered MS4 or Waters of the US.

12. A number of regional and watershed-wide efforts are underway in which the Permittees are active participants. The Regional Board also recognizes that, in certain cases, diversion of funds targeted for certain monitoring programs to regional monitoring programs may be necessary. The Executive Officer is authorized to approve, after proper public notification and consideration of all comments received, reallocation of resources to the watershed management initiatives and regional planning and coordination programs and regional monitoring programs.

13. The Permittees are required to submit all documents, where appropriate, to the Regional Board in an electronic format. All such documents will be posted at the Regional Board's website and all interested parties will be notified. In addition, the website will include the administrative and civil procedures for appealing any decision made by the Executive Officer. Some Urban Runoff issues, such as monitoring, public education, and training can be more effectively addressed on a regional or statewide basis thereby increasing program consistency and efficiency. This Order encourages continued participation in such programs and policies.

B. LEGAL AUTHORITIES

1. This Order Is issued pursuant to Section 402 of the CWA, the Porter-Cologne Water Quality Control Act (Division 7 of the Water Code, commencing with Section 13000), applicable State and federal regulations, all applicable provisions of statewide Water Quality Control Plans and Policies adopted by the State Water Resources Control Board (State Board), the Water Quality Control Plan for the Santa Ana River Basin adopted by the Regional Board (Basin Plan), the California Toxics Rule (CTR), and the California Toxics Rule Implementation Plan. This Order also serves as Waste Discharge Requirements (WDRs) pursuant to Article 4, Chapter 4, Division 7 of the Water Code (commencing with Section 13260).

2. This Order is consistent with the following precedential Orders adopted by the State Board addressing municipal storm water NPDES Permits: Order 99-05-DWQ (Petition of Environmental Health Coalition/Receiving Water Limitation Language for Municipal Storm Water Permits), Order WQ-2000-11 (Petitions Bellflower, City of Arcadia, Western States Petroleum Association, Review of RWQCB and Its

Executive Officer Pursuant to Order 96-054, Permit for Municipal Storm Water and Urban Run-Off Discharges within Los Angeles County), Order WQ 2001-15 (In the Matter of the Petitions of Building Industry Association of San Diego County and Western States Petroleum Association), and Order WQO 2002-0014 (Petitions of Aliso Viejo, et al/Order to stay provision F.5.f of the permit and part of last sentence of Finding 26, permit issued by San Diego Regional Water Quality Control Board).

3. Consistent with the State Board's orders, this Order requires the Permittees to comply with the applicable Water Quality Standards, which is to be achieved through an iterative approach requiring the implementation of increasingly more effective BMPs until Water Quality Standards are not impaired by Urban Runoff. All MS4 permits issued in California specify certain minimum BMPs and incorporate an iterative process that requires increasingly more effective BMPs if the Water Quality Standards are not met.

4. The federal Clean Water Act established a national policy designed to help maintain and restore the physical, chemical and biological integrity of the nation's waters. In 1972, the CWA established the NPDES permit program to regulate the discharge of Pollutants from Point Sources to Receiving Waters. From 1972 to 1987, the main focus of the NPDES program was to regulate conventional Pollutant sources such as sewage treatment plants and industrial facilities. As a result, on a nationwide basis, non-point sources, including agricultural runoff and Urban Runoff, now contribute a larger portion of many kinds of Pollutants than the more thoroughly regulated sewage treatment plants and industrial facilities.

5. Studies conducted by the USEPA, the states, counties, cities, flood control districts and other entities dealing with Urban Runoff indicate that the following are major sources of Urban Runoff Pollution nationwide:

   a. Industrial Facilities where appropriate Pollution Prevention and BMPs are not implemented;

   b. Construction Sites where erosion and sediment controls and BMPs are not implemented; and,

   c. Runoff from urbanized areas.

6. The 1987 amendments to the CWA added Section 402(p) that required the USEPA to develop permitting regulations for storm water discharges from MS4 and from Industrial Facilities, including construction sites. The USEPA promulgated the final Phase I storm water regulations on November 16, 1990. Neither the 1987 amendments to the CWA nor the Phase I storm water regulations (40 CFR Part 122) have been amended since their effective dates.

7. Prior to the USEPA's promulgation of the final storm water regulations, three counties (Orange, Riverside, and San Bernardino) and their incorporated cities located within the Regional Board's jurisdiction requested area-wide NPDES MS4 permits. These area-wide MS4 NPDES permits are:

   a. Orange County, NPDES No. CAS 618030

   b. Riverside County, NPDES No. CAS 618033

   c. San Bernardino County, NPDES No. CAS 618036

8. Consistent with the CWA and the USEPA regulations promulgated pursuant thereto, the State Board and the Regional Board have adopted a number of permits to address Pollution from the sources identified in Finding 5, above. Industrial activities (as defined in 40 CFR 122.26(b)(14)) including construction activities on one or more acres are to be covered under one of the following permits and those individuals or entities that engage in such activities are required to secure permission to engage in such identified activities pursuant to the provisions of one of the following permits:

   a. State Board Order No. 97-03-DWQ, for storm water runoff from industrial activities (NPDES No. CAS000001), (the "General Industrial Activities Storm Water Permit").

   b. State Board Order No. 99-08-DWQ, for storm water runoff from construction activities (NPDES No. CAS000002), (the "General Construction Activity Storm Water Permit"). Order No. 99-08- DWQ was amended by State Board Resolution No. 2001-046 on April 26, 2001, to incorporate monitoring provisions as directed by the Superior Court, County of Sacramento. This Order was renewed on September 2, 2009 by State Board Order No. 2009-0009-DWQ. The requirements of Order No. 2009-0009-DWQ will be effective July 1, 2010.

   c. State Board Order No. 99-06-DWQ (NPDES No. CAS000003) for storm water runoff from facilities (including freeways and highways) owned and/or operated by the California Department of Transportation ("Caltrans").

   d. State Board Order No. 2003-0007-DWQ, for discharges of storm water runoff associated with small linear underground/overhead construction projects (NPDES No. CAS000005), (the "General Permit-Small Linear Underground Projects). After July 1, 2010, most linear construction projects will be regulated under State Board Order No. 2009-0009-DWQ.

   e. The Regional Board also issues individual storm water NPDES permits for certain Industrial Facilities within the Santa Ana River watershed. Currently

there is only one individual storm water NPDES permit that has been issued by the Regional Board for an Industrial Facility (March Air Reserve Base) located within the Permit Area. Additionally, the Regional Board has issued NPDES permits for a number of facilities that discharge process wastewater and storm water; storm water discharge requirements are included in such a facility's NPDES permit.

9. Section 402(p) of the CWA establishes two different performance standards for storm water discharges. NPDES MS4 permits require controls to reduce the discharge of Pollutants to the MEP. NPDES permits issued for industrial storm water discharges (including construction activities) must meet Best Available Technology (BAT) and Best Conventional Pollutant Control Technology (BCT) standards. The CWA and the USEPA regulations allow each state the flexibility to decide what constitutes the MEP.

10. This Order does not constitute an unfunded mandate subject to subvention under Article XIII.B, Section (6) of the California Constitution for several reasons, including the following:

    a. This Order implements federally mandated requirements under CWA Section 402(p)(3)(B). (33 USC § 1342(p)(3)(B)).

    b. The Permittees' obligation under this order are similar to, and in many respects less stringent than, the obligations of non-governmental dischargers who are issued NPDES permits for storm water discharges.

    c. The Permittees have the authority to levy service charges, fees, or assessments to pay for compliance with this Order[7].

    d. The Permittees requested permit coverage in lieu of compliance with the complete prohibition against the discharge of Pollutants contained in federal Clean Water Act Section 301, subdivision (a). (33 USC § 1311(a)).

11. Section 13225 of the CWC identifies the Regional Board as being the enforcement authority for NPDES permits, including the Industrial General Permit, and the Construction General Permit which are collectively referred to as the "General Stormwater Permits." However, in many areas, the Industrial Facilities and Construction Sites discharge directly into MS4 facilities owned and operated by the Permittees. These Industrial Facilities and Construction Sites are also regulated under local ordinances and regulations. The Permittees and Regional Board staff work together to avoid duplicative efforts in regulating these facilities. As part of

[7] Voter approval may be required for new tax levies.

this coordination, the Permittees have been notifying Regional Board staff when they observe, during their routine activities, conditions that result in a threat or potential threat to water quality, or when a required Industrial Facility or Construction Site fails to obtain coverage under the appropriate General Stormwater Permit.

12. This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code Sections 2050 to 2097) or the Federal Endangered Species Act (16 U.S.C.A. Sections 1531 to 1544). This Order requires compliance with Effluent Limits, Receiving Water Limits, and other requirements to protect the Beneficial Uses of Waters of the US. The Permittees are responsible for meeting all requirements of the applicable Endangered Species Act.

13. The Permittees may petition the Regional Board to issue a separate NPDES permit to any discharger of Non-storm Water into MS4 facilities that they own or operate.

14. The Regional Board has considered anti-degradation requirements, pursuant to 40 CFR 131.12 and State Board Resolution No. 68-16, for this discharge. The Regional Board finds that the Urban Runoff regulated under this Order is consistent with the federal and state anti-degradation requirements and a complete anti-degradation analysis is not necessary. This Order requires the continued implementation of programs and policies to reduce the discharge of Pollutants in Urban Runoff. This Order includes additional requirements to control the discharge of Pollutants in Urban Runoff from “Significant Redevelopment,” and “New Development,” as defined in Finding II.G. and Section XII of this Order.

C. RATIONALE FOR REQUIREMENTS

1. The Regional Board developed the requirements in this Order based on information submitted as part of the 2007 ROWD (including the 2007 DAMP), monitoring and reporting data, program audits, and other available information and consistent with the CWA, CWC and regulations adopted thereunder.

2. The Fact Sheet (Appendix 6) which contains additional background information and rationale for requirements specified in this Order is hereby incorporated into this Order and constitutes part of the Findings for this Order. Appendices 1 through 5 and 7 are also incorporated into this Order.

D. CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

1. Under Water Code Section 13389, this action to adopt an NPDES permit is exempt from the provisions of CEQA, Public Resources Code Sections 21100 -21177 (*County of Los Angeles v. California State Water Resources Control Board* [2006] 142 Cal Appl. 4th 985, mod. [Nov. 6, 2006, B184034] 50 Cal. Rptr 3rd 619, 632-636). This action also involves the re-issuance of WDRs for existing facilities and as such, is exempt from the provisions of CEQA (commencing with Section 21100) in that the activity is exempt pursuant to Title 14 of the California Code of Regulations Section 15301.

2. Compliance with this Order and the DAMP does not necessarily constitute mitigation that is sufficiently specific to satisfy the requirements of CEQA with regards to projects. The intent of the DAMP, WQMP, Storm Water Pollution Prevention Plan (SWPPP) and other programs and policies incorporated into this order is to minimize the impacts from a specific project to a level that is below significance as defined in CEQA.

E. DISCHARGE CHARACTERISTICS

1. This Order regulates Urban Runoff from areas under the jurisdiction of the Permittees. The term Urban Runoff as used in this Order includes storm water runoff, snowmelt runoff and surface runoff and drainage as defined in Appendix 4.
2. Pollutants in Urban Runoff can threaten and adversely affect human health and the environment. Human illnesses have been clearly linked to recreating near storm drains flowing into coastal waters[8]. Also, Pollutants in Urban Runoff can bioaccumulate in receiving waters in the tissues of invertebrates and fish and eventually consumed by humans and other animals.
3. Urban Runoff can carry Pollutants described in the Fact Sheet to rivers, streams, and lakes within the Permit Area (collectively the “Receiving Waters”). In addition, although infrequently, Urban Runoff from the Permit Area can carry these Pollutants to other receiving waters such as the Pacific Ocean.
4. Management of Dry Weather discharges resulting from urbanization provides an opportunity to promote water conservation as well as address water quality.
5. The Co-Permittees discharge Urban Runoff into lakes, drinking water reservoirs, rivers, streams, creeks, and tributaries thereto within the Upper Santa Ana River, Middle Santa Ana River, and San Jacinto hydrologic units within the Santa Ana Region, as shown in Tables 3a and 3b. Some of the Receiving Waters have been designated as Impaired by the Regional Board and the USEPA pursuant to CWA Section 303(d).

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[8] The Santa Monica Bay Restoration Project, Epidemiology Study, 1996.

Table 3a – Receiving Waterbodies and Municipal Dischargers:

	Upper Santa Ana									San Jacinto								
Municipality	**Mill Creek Prado Area**	**Chino Creek, Reach 1A**	**Chino Creek, Reach 1B**	**Temescal Creek**	**San Timoteo Wash**	**Little San Gorgonio**	**Santa Ana River, Reach 3**	**Santa Ana River, Reach 4**	**Cucamonga Creek**	**San Jacinto River reaches 1-4**	**Lake Elsinore**	**Canyon Lake**	**Strawberry Creek**	**Lake Hemet**	**Salt Creek**	**Poppet Creek**	**Indian Creek**	**Bautista Creek**
RCFC&WCD				◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
Beaumont					◆	◆	⌘	⌘		◆	⌘		◆					
Calimesa					◆	⌘	⌘	⌘		◆	⌘	◆	◆					
Canyon Lake				⌘			⌘			⌘	⌘	◆						
Corona				◆			⌘											
County of Riverside (County)	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
Hemet				⌘			⌘			⌘	⌘	⌘			⌘			
Lake Elsinore				◆			⌘			⌘	◆							
Menifee				⌘			⌘			⌘	⌘	⌘			⌘			
Moreno Valley				⌘			⌘			⌘	⌘	⌘						
Murrieta				⌘			⌘				⌘							
Norco				⌘			◆											
Perris				⌘			⌘			◆	⌘	⌘			⌘			
Riverside				⌘			◆	◆			⌘							
San Jacinto										◆	⌘	⌘						
Wildomar				⌘			⌘				⌘							

◆ Direct Discharge of MS4 to Receiving Water
⌘ Tributary to Receiving Water

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Table 3b. Beneficial Uses and 2006 CWA Section 303(d) Impaired Waters

Watershed Management Areas in Riverside County	**Hydraulic Unit**	**Beneficial Uses**
Upper Santa Ana River		
Santa Ana River, Reach 3,	801.21, 801.25, 801.27,	AGR, GWR, REC1, REC2, WARM, WILD, RARE, SPWN
Santa Ana River, Reach 4	801.27, 801.44	GWR, REC1, REC2, WARM, WILD, SPWN
Temescal Creek – Reach 1	801.25	REC1, REC2, WARM, WILD
Temescal Creek – Reach 2	801.32, 801.25	INTERMITTENT - AGR, IND, GWR, REC1, REC2, LWARM
Temescal Creek – Reach 3 **See Lee Lake**		
Temescal Creek – Reach 4	801.34	RARE, INTERMITTENT - AGR, GWR, REC1, REC2, WARM, WILD
Temescal Creek – Reach 5	801.35	AGR, GWR, REC1, REC2, WARM, WILD, RARE
Temescal Creek – Reach 6	801.35	INTERMITTENT - GWR, REC1, REC2, WARM, WILD
Coldwater Canyon Creek	801.32	MUN, AGR, GWR, REC1, REC2, WARM, WILD
Bedford Canyon Creek	801.32	INTERMITTENT - GWR, REC1, REC2, WARM, WILD
Dawson Canyon Creek	801.32	MUN, GWR, REC1, REC2, WARM, WILD
Day Creek	801.21	MUN,PROC, GWR, REC1, REC2, COLD, WILD
San Sevaine Creek	801.21	INTERMITTENT - MUN, GWR, REC1, REC2, COLD, WILD
San Timoteo Wash Reach 3	801.62	IGWR, REC1, REC2, WARM, WILD, RARE
Little San Gorgonio Creek & Tributaries	801.62, 801.63, 801.69	MUN, GWR, REC1, REC2, COLD, WILD
Sunnyslope Channel	801.27,	MUN, REC1, REC2, WARM, WILD, SPWN
Tequesquite Arroyo (Sycamore Creek)	801.27,	GWR, REC1, REC2, WARM, WILD, SPWN
Chino Basin/ Middle Santa Ana		
Chino Creek, Reach 1A	801.21	REC1, REC2, WARM, WILD, RARE
Chino Creek, Reach 1B	801.21	REC1, REC2, WARM, WILD, RARE
Mill Creek (Prado Area)	801.25	REC1, REC2, WARM, WILD, RARE
Cucamonga Creek – Reach 1	801.21	GWR, REC1, REC2, LWARM, WILD

Watershed Management Areas in Riverside County	**Hydraulic Unit**	**Beneficial Uses**
San Jacinto San Jacinto River reaches 1 and 6	802.31, 802.32 & 802.21	INTERMITTENT - MUN, AGR, GWR, REC1, REC2, WARM, WILD
San Jacinto San Jacinto River reaches 3-5	802.11, 802.14, 802.21,	INTERMITTENT - AGR, GWR, REC1, REC2, WARM, WILD
San Jacinto San Jacinto River reach 2 **See Canyon Lake**		
San Jacinto San Jacinto River reach 7	802.21	MUN, AGR, GWR, REC1, REC2, COLD, WILD
- Bautista Creek	802.21, 802.23	MUN, AGR, GWR, REC1, REC2, COLD, WILD
Strawberry Creek	802.21	MUN, AGR, GWR, REC1, REC2, COLD, WILD
Fuller Mill Creek	802.22	MUN, AGR, GWR, REC1, REC2, COLD, WILD
Stone Creek	802.21	MUN, AGR, GWR, REC1, REC2, COLD, W ILD
Salt Creek	802.12	INTERMITTENT - REC1, REC2, WARM, WILD
Logan, Black Mtn, Juaro Canyon, Indian, Hurkey, Poppet and Protrero Creeks, and other Tributaries to these Creeks	802.21, 802.22	INTERMITTENT - MUN, AGR, GWR, REC1, REC2, WARM, WILD
Lakes		
Lake Elsinore	802.31	REC1, REC2, WARM, WILD
Canyon Lake	802.11	MUN, AGR, GWR, REC1, REC2, WARM, WILD
Lake Hemet	802.22	MUN, AGR, GWR, POW, REC1, REC2, WARM, COLD, WILD, SPWN
Lake Fulmor	802.21	MUN, AGR, REC1, REC2, WARM, COLD, WILD
Lake Perris	802.11	MUN, AGR, IND, PROC, GWR, REC1, REC2, COMM, WARM, COLD, WILD
Lake Evans	801.27	REC1, REC2, WARM, COLD, WILD
Lake Mathews	801.33	MUN, AGR, IND, PROC, GWR, REC1, REC2, WARM, WILD, RARE
Lee Lake	801.34	AGR, IND, GWR, REC1, REC2, WARM, WILD
Mockingbird Reservoir	801.26	AGR, REC1, REC2, WARM, WILD

AGR: Agricultural Supply; MUN: Municipal and Domestic Supply; GWR: Groundwater Recharge; IND – Industrial Service Supply, POW – Hydropower generation, REC1: Water Contact Recreation; REC2: Non-Contact Water Recreation; WARM: Warm Freshwater Habitat; LWARM: Limited Warm Freshwater Habitat, COLD - Cold freshwater habitat, WILD: Wildlife Habitat, RARE – Rare threatened or endangered species. SPWN – Spawning, reproduction and development waters.

6. Urban Runoff is defined in the Glossary (Appendix 4). It includes those discharges from residential, commercial, industrial, and construction areas within the Permit Area and excludes discharges from Open Space[9], feedlots, dairies, farms and agricultural fields. Urban Runoff consists of storm water and "authorized non-storm water" (see Section VI) surface runoff from drainage sub-areas with various, often mixed, land uses within all of the hydrologic drainage areas that discharge into the Receiving Waters. In addition to Urban Runoff, the MS4 regulated by this Order receives flows from Open Space, agricultural activities, state and federal properties and other non-urban land uses not under the control of the Permittees. The quality of the discharges from the MS4 varies considerably and is affected by, among other things, past and present land use activities, basin hydrology, geography and geology, season, the frequency and duration of storm events, and the presence of past or present illegal and allowed disposal practices and Illicit Connections.

7. Pathogens (from sanitary sewer overflows, septic system leaks, and spills and leaks from portable toilets, pets, wildlife, and human activities) can impact water contact recreation and non-contact water recreation. Floatables (from trash) are an aesthetic nuisance and can be a substrate for algae and insect vectors. Oil and grease can coat birds and aquatic organisms, adversely affecting respiration and/or thermoregulation. Other petroleum hydrocarbon components may cause Toxicity to aquatic organisms and may impact human health. Suspended and settleable solids (from sediment, trash, and industrial activities) may be deleterious to benthic organisms and may cause anaerobic conditions to form. Sediments and other suspended particulates may cause turbidity, clog fish gills and interfere with respiration in aquatic fauna. They may also screen out light, hindering photosynthesis and normal aquatic plant growth and development. However, it is recognized that storm flows from non-urbanized areas such as national forest, state parks, wilderness, and agriculture, as shown on Appendix 1, naturally exhibit high levels of suspended solids due to climate, hydrology, geology and geography.[10] Toxic Substances from pesticides, petroleum products, metals, and industrial wastes can cause acute and/or chronic Toxicity, and can bioaccumulate in organisms to levels that may be harmful to human health. Nutrients (from fertilizer use, fire fighting chemicals, decaying plants, confined animal facilities, pets, and wildlife) may cause excessive algal blooms. These blooms may lead to problems with taste, odor, color and increased turbidity, and may depress the dissolved oxygen content, leading to fish kills.

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[9] Only includes Open Space in strictly unurbanized areas. See Glossary definition of Urban Runoff.
[10] Riverside County Flood Control and Water Conservation District's "Hydrology Manual," dated April 1978 and page II-4 of "Santa Ana River, Design Memorandum No. 1, Phase II GDM on the Santa Ana River Mainstem, including Santiago Creek, Volume 2, Prado Dam." dated August 1988 and D.I. Inman & S.A. Jenkins "Climate Change and the Episodicity of Sediment Flux in Small California Rivers," Journal of Geology, Volume 107, pp. 251-270, 1999.

8. Bacteria and nutrients are the Pollutants of Concern for a majority of the inland waters that are listed under the 303(d) list of Impaired Waterbodies or an adopted Total Maximum Daily Load (TMDL). This Order requires the Permittees to identify sources of bacteria and nutrients in Urban Runoff to their MS4 and to control those Pollutant sources.

9. Recent information[11] shows that plastic wastes and materials released to surface water bodies can harm aquatic species by entanglement or ingestion. This Order requires the Permittees to consider facilities that handle nurdles[12] as a high priority site for inspection, and outreach. Nurdles are a major contributor to marine debris. During a three month study of Orange County researchers found them to be the most common beach contaminant[13]. Nurdles comprised roughly 98% of the beach debris collected in a 2001 Orange County study.

10. The Permittees' water quality monitoring data submitted to date document a number of exceedances of Water Quality Objectives for various Urban Runoff-related Pollutants (fecal coliform bacteria, nutrients, total suspended solids, turbidity, metals, etc.) at various watershed monitoring stations.

11. This Order includes requirements for control of Dry Weather flows from Permittee activities that may cause an exceedance of Water Quality Objectives in Receiving Waters for Total Dissolved Solids (TDS) or total inorganic nitrogen (TIN). Storm water was considered to be an insignificant source for nitrogen/TDS in groundwater.

12. The Permittees' 2003-2004, 2004-2005, 2005-2006, 2006-2007 and 2007-2008 Annual Reports indicate exceedances of Water Quality Objectives for each core MS4 monitoring station discussed in a through g, below. The Permittees have identified nutrients and bacteria as priority constituents for initial corrective actions.

    a. Corona Storm Drain (40) - Six samples were collected and analyzed for fecal coliforms. Three samples were collected in the Dry Season and three during Wet Weather events. All samples analyzed exceeded bacteria (as fecal coliform) Water Quality Objectives with a maximum value of 160,000 MPN fecal coliforms. Boron analyses exceeded Water Quality Objectives of 0.75 mg/L in

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[11] http://www.bestlifeonline.com/cms/publish/health-fitness/Our_oceans_are_turning_into_plastic_are_we_2_printer.shtml, (alternative reference: http://rstb.royalsocietypublishing.org/search?fulltext=entanglement+and+ingestion&sortspec=date&submit=Submit&andorexactfulltext=phrase)

[12] A nurdle is a plastic pellet, also known as pre-production plastic pellet or plastic resin pellet.

[13] Moore, Charles (2002). "A comparison of neustonic plastic and zooplankton abundance in Southern California's coastal waters and elsewhere in the North Pacific". *Algalita Marine Research Foundation*. http://www.mindfully.org/Plastic/Ocean/Marine-Debris-Panel30oct02.htm.

one out of eighteen samples collected (0.78 mg/L). Six samples were collected and analyzed for Total Dissolved Solids (TDS) in 2003-2004. All samples were below the Temescal Creek and Santa Ana River Reach 3 Water Quality Objectives of 800 mg/L/700 mg/L TDS (respectively) and only one (11 mg/L) of ten samples (2005-2008) exceeded the 10 mg/L total nitrogen objective.

b. Sunnymead Channel (316) - Three samples were collected during Wet Weather events and analyzed for fecal coliforms in this time frame. All samples were greater than 5000 MPN and exceeded bacteria Water Quality Objectives of 200 or 400 MPN fecal coliforms. Two samples were collected during Wet Weather events and analyzed for TDS and were below the Water Quality Objective of 700 mg/L for Canyon Lake. Total nitrogen values in all ten samples collected during Wet Weather events were below the Water Quality Objective of 8 mg/L.

c. Hemet Channel (318) - All four Wet Weather samples were detected at greater than 7000 MPN and exceeded the bacteria Water Quality Objective of 200 or 400 MPN for fecal coliforms. As Salt Creek does not have numeric objectives for TDS, the Receiving Water for Salt Creek is Canyon Lake with an objective of 700 mg/L TDS. All eighteen samples collected during Wet Weather events and analyzed for TDS were below the Canyon Lake Water Quality Objective. Total nitrogen values in all nine samples collected during Wet Weather events were below the Water Quality Objective of 8 mg/L.

d. Magnolia Center (364) – Eleven out of thirteen samples (3-Wet Weather samples [>160000 MPN maximum concentration] and 10 dry [5000 MPN maximum]) collected exceeded the Water Quality Objective for fecal coliform (200 or 400 MPN MPN). Two (both collected during Wet Weather events) out of thirty-four samples identified total nitrogen concentrations in excess of the 10 mg/L Water Quality Objective. The maximum concentration measured was 13 mg/L. Water Quality Objective of 700 mg/L TDS were exceeded in three out of eight samples analyzed. The maximum TDS concentration was 930 mg/L TDS.

e. University Wash Channel (702) – All three samples were detected at greater than 5000 MPN concentration and exceeded the fecal coliform Water Quality Objectives of 200 or 400 MPN. The maximum concentration was 13,000 MPN. One (11 mg/L) out of sixteen samples analyzed for total nitrogen was above the Santa Ana River Reach 4 Water Quality Objective of 10 mg/L. Ten samples analyzed for TDS were below Water Quality Objective of 550 mg/L.

f. North Norco Channel (707) – Three out of four samples (>16000 MPN maximum) analyzed for fecal coliform exceeded bacteria Water Quality Objective of 200 or 400 MPN fecal coliform. Three (1300 mg/L maximum concentration dry, 900 mg/L wet) out of four samples analyzed for TDS were above the Santa Ana River-Reach 3 Water Quality Objective of 700 mg/L. Two

samples were Dry Weather and two samples were Wet Weather. One out of ten samples analyzed for total nitrogen exceeded the Water Quality Objective of 10 mg/L for total nitrogen.

g. Perris Line J Channel (752) – All four Wet Weather samples analyzed exceeded bacterial indicator Water Quality Objective the highest value was 13,000 MPN fecal coliform. Two of four samples analyzed for TDS exceeded the Water Quality Objective of 700 mg/L for Canyon Lake. One out of twelve samples analyzed exceeded the Water Quality Objective of 8 mg/L for total nitrogen.

13. The Permittees are participating in several studies in conjunction with the Storm Water Monitoring Coalition (SMC), Storm Water Quality Standards Task Force, the Lake Elsinore and Canyon Lake TMDL Task Force, the Middle Santa Ana River TMDL Task Force and Southern California Coastal Water Research Project (SCCWRP) to address the elevated fecal bacterial indicator levels. Also, the Permittees are anticipating that the use of fecal bacterial indicator will be changed to E. coli and the reclassification of REC uses for several MS4 facilities in the near future. However, E. coli data still indicates Water Quality Objective exceedances that will need to be addressed as part of the TMDL.

14. The above monitoring results, the 303(d) list of Impaired Waterbodies and the approved TMDLs indicate that bacterial contamination is one of the persistent problems in Urban Runoff. TMDL Implementation Plans including Urban Runoff Waste Load Allocations (WLAs) have been adopted by the Regional Board for the Middle Santa Ana River to address this problem. It should be noted, however, that the work of the Storm Water Quality Standards Task Force is likely to result in changes to Recreational Water Quality Objectives and implementation measures, including the suspension of recreational standards during high flow events. Further, some MS4 facilities may be recategorized as REC 2 or REC X (REC 1 nor REC 2) pursuant to Use Attainability Analyses (UAAs). These changes will likely allow the Permittees to focus their TMDL compliance resources on bacterial contamination that is affecting recreational swimming areas used during the Dry Season as the highest priority.

15. The Santa Ana River is the major Receiving Water in the Permit Area. During non-storm periods the flow in the River is dominated by effluent from POTW discharges. POTW discharges are regulated under NPDES permits issued by the Regional Board. In addition, the quality of the Santa Ana River within the Upper Santa Ana sub-watershed is greatly influenced by runoff from agricultural activities. Urban Runoff from the Permit Area constitutes a minor component of the Dry Weather flow in the Upper Santa Ana and San Jacinto sub-watersheds of the Santa Ana River. However, Urban Runoff may be more polluted than POTW discharges and therefore a more significant concern based on monitoring results identified in the Annual Reports.

F. CWA SECTION 303(D) LISTED WATERBODIES AND TMDLS (ALSO SEE SECTION K)

1. Water quality assessment conducted by Regional Board staff has identified a number of Beneficial Use Impairments due, in part, to Urban Runoff. Section 305(b) of the CWA requires the USEPA and each state that has been delegated NPDES permitting authority to routinely monitor and assess the quality of waters of their respective regions. If this assessment indicates that Beneficial Uses are not met, then that waterbody must be listed under Section 303(d) of the CWA as an Impaired Waterbody.
2. Based on the Regional Board's 2006[14] water quality assessment a number of water bodies within the Permit Area are listed (see Table 4, below) as Impaired pursuant to Section 303(d).

Table 4 - Impaired Waterbodies

Waterbody	Pollutant	Potential Sources	Proposed TMDL Completion
Santa Ana River, Reach 3,	Pathogens	Dairies	Approved 2007
Canyon Lake	Nutrients	Non-point Source	Approved 2005
	Pathogens	Non-point Source	Listing under evaluation
Lake Elsinore	Nutrients	Non-point Source	Approved 2005
	Unknown Toxicity PCBs	Unknown Unknown Non-point Source	2021 2019
Lake Fulmor	Pathogens	Unknown Non-point Source	2019
Santa Ana River, Reach 4	Pathogens	Non-point Source	2019

3. Federal regulations require that a total maximum daily load (TMDL) be established for each 303(d) listed waterbody for each of the Pollutants causing Impairment. The TMDL is the total amount of a Pollutant that can be discharged to a subject waterbody, while still enabling the waterbody to attain Water Quality Standards in

[14] On April 24, 2009, the Regional Board adopted Resolution No. R8-2009-0032 approving the CWA Section 305(b) Integrated Report/CWA Section 303(d) List of Impaired Waterbodies. Minor additional modifications were approved by the Regional Board on October 23, 2009. When the revised list is approved by the State Board and the USEPA, the 2006 list will be updated.

the receiving water. Attaining Water Quality Standards means that the receiving waterbody's Water Quality Objectives are met and its Beneficial Uses are protected. The TMDL is the sum of the individual WLAs for point source inputs, Load Allocations (LAs) for Non-Point Source inputs and natural background, and a margin of safety. The TMDLs are one of the bases for limitations established in Waste Discharge Requirements.

4. The Basin Plan amendment incorporating the Middle Santa Ana River Watershed Bacterial Indicator TMDLs (MSAR TMDL) was approved by the Regional Board on August 26, 2005 (Resolution No. R8-2005-0001), by the State Board on May 15, 2006, by the state's Office of Administrative Law on September 1, 2006, and by the USEPA on May 16, 2007.

5. The MSAR TMDL established limits for Bacterial source Indicators for Santa Ana River (Reach 3), Chino Creek (Reaches 1 and 2), Prado Park Lake, Mill Creek (Prado Area), and Cucamonga Creek (Reach 1). The MSAR TMDLs Implementation Plan identifies three sub-watersheds in Riverside County that drain to the Santa Ana River, Reach 3: 1) Riverside Watershed - Contributes surface drainage generally westward from the City of Riverside to the Santa Ana River; 2) Temescal Canyon watershed - Contributes surface drainage generally northward to Temescal Creek and then to the Santa Ana River; and 3) Chino Basin - The southeastern portion of the Chino Basin drains generally south to the Santa Ana River in Riverside County.

6. The MSAR TMDLs specifies WLAs for Urban Runoff, and discharges from concentrated animal feeding operations. LAs are specified for runoff from other types of agriculture and from natural sources (open space/undeveloped forest land). WLAs and LAs are specified for both Dry Season discharges and Wet Season discharges, with separate compliance dates. To protect REC1 Beneficial uses, the TMDL has WLAs for fecal coliform and *E. coli*. The Basin Plan currently does not have an established Water Quality Objective for *E. coli*. Stakeholders in the Santa Ana Region have formed the Storm Water Quality Standards Task Force (SWQSTF) to evaluate USEPA's bacterial indicator recommendations and appropriate recreational beneficial use designations for waterbodies throughout the Region. The SWQSTF is expected to make recommendations for the adoption of alternative bacterial indicators such as *E.coli,* based on USEPA's "Ambient Water Quality Criteria for Bacteria - 1986". These and other recommendations of the SWQSTF are likely to result in changes to recreational Water Quality Objectives.

7. The MSAR TMDL Implementation Plan assigns responsibilities to specific MS4 dischargers to identify sources of impairment, to propose BMPs to address those sources, and to monitor, evaluate, and revise BMPs as needed, based on the effectiveness of the BMP implementation program. These are generally considered as the short-term solutions. The MSAR Permittees are required to develop and

implement a long-term solution (a Comprehensive Bacteria Reduction Plan (CBRP)) designed to achieve compliance with the WLAs by the dates specified in the TMDLs. Specific Implementation Plan tasks are described in Chapter 5 of the Basin Plan and are assigned to one or more of the Permittees. Requirements of the TMDL Implementation Plan tasks are incorporated into this Order. A number of these Implementation Plan tasks are also jointly assigned to non-Permittee stakeholders. The stakeholders have established TMDL task forces to jointly implement and coordinate the TMDL Implementation Plan tasks.

8. The MSAR TMDL Task Force members are listed in Table 5.

Table 5 - Middle Santa Ana River Bacterial Indicator TMDL Task Force

MS4 Permittees	Non-MS4 Permittees
Corona, City of	Santa Ana Watershed Project Authority
Norco, City of	US Department of Agriculture, Forest Service
Riverside, City of	Ag Pool, Milk Producers Council
Riverside, County of	Region 4 MS4 Permittees - Claremont and Pomona (pending formal agreement)
RCFC&WCD	Regional Board
San Bernardino County Flood Control District (representing the County of San Bernardino and the municipalities named in the TMDL)[(San Bernardino County, and the Cities of Chino, Chino Hills, Fontana, Montclair, Ontario, Rancho Cucamonga, Rialto and Upland)]	

9. Pursuant to Task 3 of the MSAR TMDL, on June 29, 2007, the Regional Board approved the monitoring program (Resolution No. R8-2007-0046) proposed by the TMDL Task Force. Pursuant to Task 4 of the MSAR TMDL, on April 18, 2008, the Regional Board approved the Urban Source Evaluation Plan (USEP) that included a BMP effectiveness study (Resolution No. R8-2008-0044) proposed by the TMDL Task Force. This Order requires the Permittees on the Task Force to continue to implement the approved monitoring program and the USEP.

10. A BMP effectiveness study was completed as part of the MSAR Watershed–Wide and BMP effectiveness components of the Middle Santa Ana River Water Quality Monitoring Plan (dated April 3, 2008). The results of this study will be incorporated into a BMP selection criteria that will be used as a guide to address bacterial indicator sources within the MSAR watershed. The Principal Permittee plans to conduct a phase 2 study at its Low Impact Development (LID) testing facility to evaluate the effectiveness of several LID-based BMPs, which will further guide BMP selection in the MSAR watershed.

11. As part of Task 4.1, the MSAR Permittees completed the first phase of the approved USEP (Resolution No. R8-2008-0044) and the report is currently under review by Regional Board staff. Several discrete sources of bacterial indicator were identified, controlled, or eliminated as a result of this effort. Based on the outfall monitoring data collected to date, additional sites are identified, monitored and prioritized yearly for further evaluation in the next phases of the USEP. The next phase of the USEP that will focus on an implementation plan to retrofit BMPs to address elevated bacterial indicators from urban drainage areas flowing into Mill Creek and Cucamonga Creek in San Bernardino County is currently being evaluated.

12. Consistent with Task 4.3, this Order requires the Permittees to revise the DAMP to incorporate the results of the USEP and/or other studies. The DAMP revisions shall include schedules for meeting the bacterial indicator WLAs based on the schedule established in the MSAR TMDLs and the results of the USEP and/or other studies. These revisions shall also provide a proposal and schedule for 1) evaluating the effectiveness of BMPs and other control actions implemented and 2) evaluating compliance with the bacterial indicator WLAs for Urban Runoff by initiating a WLA pre-compliance evaluation monitoring program[15].

13. Pursuant to Task 4.5, the Permittees are required to revise the Water Quality Management Plan to incorporate BMPs as per the USEP, Task 4.1, for New Development and Significant Redevelopment Projects.

14. The Permittees are required to develop a CBRP to achieve compliance with the WLAs by the compliance dates. Periodic evaluation and update of the CBRP may be necessary based on a BMP effectiveness analysis to ensure compliance with the WLAs by the compliance dates.

15. Within the Permit Area, there are two watershed-wide MSAR TMDL monitoring stations (WW-S1 Santa Ana River Reach 3 at MWD Crossing and WW-S4 Santa Ana River Reach 3 at Pedley Avenue). The MSAR Permittees are required to comply with the numeric Bacterial Indicator targets at these monitoring locations by December 31, 2015 for the Dry Weather conditions (April 1 through October 31, as defined in the TMDL) and by December 31, 2025 for the Wet Weather conditions (November 1 through March 31, as defined by the TMDL).

16. In the absence of an approved CBRP, the WLAs become the final numeric WQBEL that must be achieved by the compliance dates.

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[15] Pre-compliance evaluation monitoring is monitoring conducted prior to the TMDL compliance date to assess the effectiveness of BMPs implemented in reducing pollutant(s) of concern by the compliance date.

17. On December 20, 2004, the Regional Board adopted Resolution R8-2004-0037 amending the Basin Plan to incorporate the Lake Elsinore and Canyon Lake Nutrient TMDLs. These TMDLs were subsequently approved by the State Board on May 19, 2005, by the Office of Administrative Law on July 26, 2005 and by the USEPA on September 30, 2005. These TMDLs include urban WLAs that are now incorporated into Chapter 5 of the Basin Plan. For both Canyon Lake and Lake Elsinore, the TMDLs specify causal numeric targets (nitrogen and phosphorus) and response numeric targets (chlorophyll *a*, dissolved oxygen and un-ionized ammonia). The TMDLs also specify nitrogen and phosphorus WLAs (point source discharges) and LAs (nonpoint source discharges) for each lake. Compliance with interim dissolved oxygen and chlorophyll a numeric targets is to be achieved by December 31, 2015. Compliance with the final numeric targets and WLAs and LAs is to be achieved by December 31, 2020. The LAs and WLAs are specified as 10-year running average.

18. The nitrogen and phosphorus WLAs and LAs for Canyon Lake are applicable to those discharges tributary to Canyon Lake. The nitrogen and phosphorus WLAs and LAs for Lake Elsinore apply to those areas downstream of Canyon Lake and to overflows from Canyon Lake.

19. TMDL Implementation Plans for each TMDL assign responsibilities to specific MS4 dischargers/stakeholders to identify sources of Impairment, to propose BMPs to address those sources, and to monitor, evaluate and revise BMPs based on monitoring results. Specific TMDL Implementation Plan tasks associated with Urban Runoff are described in Chapter 5 of the Basin Plan and are assigned to one or more of the Permittees. Requirements of the TMDL implementation plan tasks are incorporated into this Order and were proposed for inclusion in Chapter 13 of the DAMP (see 2007 ROWD). Several of these tasks are also jointly assigned to non-Permittee stakeholders. The Permittees have established TMDL Task Forces to jointly implement and coordinate those tasks.

20. To evaluate compliance with TMDL WLAs as per the Implementation Plans, the Permittees proposed to submit a Comprehensive Nutrient Reduction Plan to:

    a. Evaluate the effectiveness of BMPs and other control actions implemented; and

    b. Evaluate the progress towards compliance with the nutrient WLA for Urban Runoff.

21. The Canyon Lake and Lake Elsinore Nutrient TMDL Task Force (also referred to as the San Jacinto Watershed Urban Dischargers) members are tabulated below:

Table 6 - Canyon Lake and Lake Elsinore Nutrient TMDL Task Force

Riverside MS4 Permittees	Non-Permittees
Beaumont, City of	California Department of Fish and Game
Canyon Lake, City of	California Department of Transportation (Caltrans),
Hemet, City of	Eastern Municipal Water District
Lake Elsinore, City of	Elsinore Valley Municipal Water District
Moreno Valley, City of	U.S. Air Force (March Air Reserve Base), March Joint Powers Authority,
Murrieta, City of	U.S. Forest Service
Perris, City of	Western Riverside County Agricultural Coalition
San Jacinto, City of	
Riverside, City of	
Riverside, County of	
RCFC&WCD	

22. The cities of Menifee and Wildomar were recently incorporated and are responsible for compliance with the Canyon Lake and Lake Elsinore Nutrient TMDL requirements. They have the option to participate in the TMDL Task Force or comply with the TMDL requirements on their own.

23. Interim compliance (compliance determination prior to the final WLA compliance dates) determination with the WLAs in the TMDLs will be based on the Lake Elsinore and Canyon Lake (LE/CL) Permittees progress towards implementing the various TMDL Implementation Plan tasks as per the resultant studies and plans approved by the Regional Board. The CL/LE Permittees are required to develop a Comprehensive Nutrient Reduction Plan (CNRP) designed to achieve compliance with the WLAs by the final compliance date for approval of the Regional Board. In the absence of an approved CNRP, the WLAs specified in the approved Canyon Lake/Lake Elsinore Nutrient TMDL will constitute the final numeric WQBELs.

G. NEW DEVELOPMENT/SIGNIFICANT REDEVELOPMENT – WQMP /LID

1. The California Constitution and Government Code provide the Co-Permittees planning policy powers that mandate that the Co-Permittees review and condition New Development consistent with the Subdivision Map Act, CEQA, and their respective general plans, ordinances, and resolutions to ensure the general public's health and safety. If these constitutional and statutory mandates are not properly implemented and local ordinances and resolutions are not properly enforced, there is a creditable potential that New Development could result in the discharge of Pollutants via Urban Runoff to the Waters of the U.S within the Permit Area.

2. Significant development has taken place in Riverside County in the last decade. These developments have resulted in the urbanization of many areas. Urbanization generally increases Urban Runoff volume and velocity of runoff and the amount of Pollutants in the runoff. As development occurs, natural vegetated

pervious ground cover is converted to impervious surfaces such as highways, streets, rooftops and parking lots. Natural vegetated soil can both absorb rainwater and remove Pollutants providing an effective natural purification process. In contrast, impervious surfaces can neither absorb water nor remove Pollutants, and the natural purification characteristics are lost. Additionally, urban development can significantly increase Pollutant loads as the increased population density causes proportionately higher levels of vehicle emissions, vehicle maintenance wastes, municipal sewage wastes, pesticide, household hazardous wastes, pet wastes, trash, and other Anthropogenic Pollutants.

3. Urbanization can especially threaten environmentally sensitive areas (ESAs) and stream geomorphology. ESAs typically have a much lower capacity to withstand Pollutant loads. In essence, development that is ordinarily insignificant in its impact on the environment may in a particular sensitive environment become significant. Designated ESAs are defined in the Glossary (Appendix 4).

4. Unmitigated high volumes and velocities of discharges from MS4 facilities associated with new development (which may include non-Urban Runoff) into natural watercourses can alter the natural rate of change of a stream and adversely impact aquatic ecosystems and stream habitat and cause stream bank erosion and physical modifications. These changes are the result of Hydromodification. Typically, Hydromodification especially impacts those natural streams in the developing foothills and in other urbanizing fringe portions of the Permit Area.

5. On October 5, 2000, the State Board adopted Order No. WQ-2000-11, which is a precedential order. Order No. WQ-2000-11 required that Urban Runoff generated by 85th percentile storm events from specific types of development categories be infiltrated, filtered or treated. The essential elements of this precedential order were incorporated into the 2002 MS4 Permit and are incorporated herein. In accordance with the requirements specified in the 2002 MS4 Permit, the Permittees developed a model WQMP and Template.

6. The WQMP and Template provide a framework to incorporate some of the watershed protection principles into the Co-Permittees' planning, construction and post-construction phases of New Development and Significant Redevelopment projects. The WQMP includes site design (including, where feasible, LID principles), Source Control and Treatment Control elements to reduce the discharge of Pollutants in Urban Runoff. On September 17, 2004, the Regional Board approved the WQMP. The Co-Permittees are requiring proponents of New Developments and Significant Redevelopments to develop and implement site-specific WQMPs. This Order requires Co-Permittees to continue requiring preliminary project-specific WQMPs as early as possible during the environmental review or planning phase (land use entitlement) and to review and approve final project-specific WQMP that is in substantial conformance with the preliminary

project-specific WQMP prior to the issuance of any building or grading permit. This Order also requires Co-Permittees to verify functionality of post-construction BMPs prior to issuance of certificate of occupancy and to track and ensure long term operation and maintenance of those BMPs as per the approved project-specific WQMPs.

7. An audit of each of the Pemittees' Urban Runoff management programs during the term of the 2002 MS4 Permit indicated no clear nexus between the watershed protection principles, including LID techniques specified in the WQMP and the Permittees' General Plan or related documents such as Development Standards, Zoning Codes, Conditions of Approval and Project Development Guidance. Existing procedures, ordinances, local codes, and development standards may be barriers to implementation of LID practices. This Order requires the Permittees to evaluate their General Plans, comprehensive or master plans, zoning codes, subdivision ordinances, project development standards, conditions of approval or related documents to determine whether the removal of any barriers, within their control, is feasible for implementation of LID techniques and other requirements of this Order. Where feasible, the Co-Permittees will make appropriate changes to remove barriers to implement LID techniques and other requirements of this Order.

8. This Order also requires the Permittees to review and enforce covenants, conditions and restrictions (CC&R) or develop other mechanisms to ensure proper long term operation and maintenance of post-construction BMPs.

9. In addition to addressing post-development water quality, the WQMP includes requirements to protect ESAs and address potential Hydromodification issues. Section 4.4 of the WQMP requires identification of Hydrologic Conditions of Concern (HCOC). An HCOC exists when a site's hydrologic regime is altered and there are significant impacts on downstream channels and aquatic habitats, alone or in conjunction with impacts of other projects. Currently, New Development and Significant Re-development projects are required to perform this assessment and incorporate appropriate BMPs to ensure existing hydrologic conditions are maintained. This Order requires the Permittees to implement LID techniques to minimize HCOC.

10. Management of the impacts of urbanization on water quality and stream stability in the Permit Area is more effective if the techniques are implemented at the project site, within the neighborhood and within each Co-Permittee's jurisdiction based on an overall watershed plan. The Permittees have identified Major Outfalls and have submitted maps of existing MS4 facilities. This Order requires the Permittees to expand upon the existing maps to include a map of its lined and unlined channels and streams within the Permit Area with the goal of identifying, prioritizing, and developing specific action plans for protecting those segments of streams that are vulnerable to development impacts.

11. This Order further requires the Permittees to develop a Watershed Action Plan that would address TMDL Implementation Plan BMP strategies and provide regional tools to address Hydromodification. The Permittees may choose to implement a single Watershed Action Plan for the entire Permit Area, or subdivide the Permit Area into sub-watersheds as appropriate to cost-effectively address TMDL requirements. The Watershed Action Plan integrates existing watershed based planning efforts and incorporates watershed tools to manage cumulative impacts of development on vulnerable streams, preserve structure and function of streams, and protect source, surface and groundwater quality and water supply in the permitted area. The Watershed Action Plan should integrate Hydromodification and water quality management strategies with land use planning policies, ordinances, and plans within each jurisdiction. Existing Permittee watershed planning efforts include the Western Riverside County Multiple Species Habitat Conservation Plan, Special Area Management Plan, Santa Ana and San Jacinto Integrated Regional Watershed Management Plans, Lake Elsinore and Canyon Lake and Middle Santa Ana River TMDL Task Forces, SCCWRP Hydromodification sensitivity mapping project, and various regional BMP evaluations being conducted by the Principal Permittee in conjunction with various water districts should be evaluated and incorporated into the Watershed Action Plan as necessary to address TMDL Implementation Plan requirements and Hydromodification. The regional efforts should be evaluated, and if necessary, enhanced to provide Permittees with the tools to integrate Hydromodification and TMDL management strategies with Permittee MS4 Permit compliance programs and land use planning policies, ordinances, and plans within appropriate Permittee jurisdictions within the Permit Area.

12. Pending completion of a Watershed Action Plan and implementing tools, management of the impacts of urbanization shall be accomplished on a per project and per jurisdiction basis through jurisdictional implementation of the watershed tools incorporated into the local general plans, ordinances and other requirements and the project-specific WQMPs.

13. The SMC in collaboration with SCCWRP and the California Storm Water Quality Association (CASQA) with funding from the State Water Resources Control Board and CASQA is developing a LID manual for Southern California. This manual will be incorporated into the CASQA BMP Handbooks. The Permittees are encouraged to utilize the LID manual as a resource to implement LID techniques once completed.

14. This Order requires the project proponents to first consider preventative and conservation techniques (e.g., preserve and protect natural features to the MEP) prior to considering mitigative techniques (Structural BMPs such as infiltration systems, or other Treatment Control BMPs). The mitigative measures should be

prioritized with the highest priority for BMPs that remove Pollutants in Urban Runoff and reduce the volume of Urban Runoff, such as infiltration, then other BMPs, such as harvesting and use, evapotranspiration and bio-treatment should be considered. Consistent with the MEP standard, these LID BMPs must be implemented at the project site. Consideration of "highest and best use" of the discharge should also be considered. For example, Lake Elsinore is evaporating faster than runoff from natural precipitation can recharge it. Requiring infiltration of 85% of runoff events for projects tributary to Lake Elsinore would only exacerbate current water quality problems associated with Pollutant concentration due to lake water evaporation. In cases where rainfall events have low potential to recharge Lake Elsinore (i.e. no hydraulic connection between groundwater to Lake Elsinore, or other factors), requiring infiltration of Urban Runoff from projects is counterproductive to the overall watershed goals. Project proponents, in these cases, would be allowed to discharge Urban Runoff, provided they used equally effective filtration-based BMPs. The Regional Board also recognizes that site conditions, including site soils, contaminant plumes, high groundwater levels, etc., could limit the applicability of infiltration and other LID BMPs at certain project sites. Where LID BMPs are not feasible or appropriate at the project site, more traditional, but equally effective BMPs (proprietary or non-proprietary) should be implemented. This Order provides for alternatives and in-lieu programs where preferred LID BMPs are infeasible or inappropriate. In addition, extra diligence should also be performed when proposing infiltration BMPs in areas where the proposed land use is often associated with soil and groundwater contamination. Pre-treatment of the water prior to infiltration is necessary in most cases. Proprietary treatment devices may be utilized when it is demonstrated that they meet or exceed the MEP standard.

15. The USEPA has determined that LID/green infrastructure can be a cost-effective and environmentally preferable approach for the control of storm water pollution and to minimize downstream impacts by mimicking pre-development hydrology. LID techniques promote the reduction of impervious areas which may achieve multiple environmental and economic benefits in addition to enhanced water quality and supply, stream and habitat protection, cleaner air, reduced urban temperature, increased energy efficiency and other community benefits such as aesthetics recreation, and wildlife areas. This Order incorporates a volume capture metric based on the design volume specified in the WQMP.

16. If not properly designed and maintained, Treatment Control BMPs could create a nuisance and/or habitat for vectors[16] (e.g., mosquitoes and rodents). The 2002 MS4 Permit required the Permittees to closely collaborate with the local vector

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[16] Managing Mosquitoes in Storm water Treatment Devices, Marco E. Metzger, University of California Davis, Division of Agriculture and Natural Resources, Publication 8125.

control agencies during the development and implementation of such Treatment Control BMPs. The Permittees should continue these collaborative efforts with the vector control agencies to ensure that Treatment Control BMPs do not become a Nuisance or a potential source of Pollutants. The requirements specified in this Order include identification of responsible agencies for maintaining the Treatment Control BMPs and for providing funding for operation and maintenance.

17. If not properly designed and maintained, groundwater infiltration systems may adversely impact groundwater quality. Restrictions placed on Urban Runoff infiltration in this Order (Section XI.D.8) are based on recommendations provided by the USEPA Risk Reduction Laboratory. The Permittees should work closely with the water districts and water conservation districts to insure groundwater protection.

18. This Order incorporates new project categories and revised thresholds for several categories of new development and redevelopment projects that trigger the requirement for a WQMP. The 2008 National Research Council (NRC) report[17] indicates that roads and parking lots constitute as much as 70% of total impervious cover in ultra-urban landscape, and as much as 80% of the directly connected impervious cover. Roads tend to capture and export more storm water Pollutants than other impervious covers. As such, roads are included as a priority development category for which WQMPs are required. Private New Development and Significant Redevelopment projects incorporating roads typically allow road runoff to be addressed as part of the overall water quality strategy for the larger common plans of development. Permittee streets, roads and highways capital projects have special limitations. For example, the footprint of street, road and highway capital projects is often limited and may have hydraulic constraints due to lack of underground storm drain systems that would otherwise be necessary to hydraulically facilitate treatment of runoff. There are also limitations specified in state and federal design and code specifications that may limit or prohibit certain BMPs. Permittees may also be subject to flow diversion liability and limited road maintenance budgets and equipment. Street, road and highway projects that function as part of the MS4 also receive runoff and associated Pollutants from both existing urban areas and other external sources, including-adjacent land use activities, aerial deposition, brake pad and tire wear and other sources that may be outside the Co-Permittee's authority to regulate and/or economic or technological ability to control. These offsite flows can overwhelm Treatment Control BMPs designed to address the footprint (consistent with the typical requirements for a WQMP) of street, road or highway capital projects incorporating curb and gutter as part of its storm water conveyance function. Despite these limitations, the Regional Board finds that Permittee construction of streets, roads and highway capital

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[17] National Research Council Report (2008), http://www.nap.edu/catalog.php?record_id=12465

projects may provide an opportunity to address Pollutant loads from existing urban areas. However, due to the nature of the facilities and projects, it would be unduly burdensome for the Co-Permittees to maintain WQMP documents for transportation projects (in addition to Facility Pollution Prevention Plans and other overlapping requirements of this Order). The Permittees are therefore not required to prepare WQMP documents for street, road and highway capital projects, but instead are required to develop functionally equivalent documents that include site specific consideration utilizing BMP guidance to address street, roads and highway capital project runoff to the MEP.

19. The NRC report also indicates that there is a direct relationship between impervious cover and the biological condition of downstream receiving waters. The Permittees are required to address HCOC from New Development and Significant Redevelopment projects to minimize downstream impacts.

H. CO-PERMITTEE INSPECTION PROGRAMS

1. Each Co-Permittee conducts inspections of those Construction Sites for which it has issued either a grading or building permit to determine compliance with its ordinances, regulations, and codes, including its Storm Water Ordinance. Each Co-Permittee, consistent with its ordinances, rules and regulations, inspects each site for compliance with the conditions of approval governing the grading or building permit. These inspections have been expanded by the Co-Permittees to determine that sites requiring coverage under the General Construction Activity Storm Water Permit have obtained permit coverage by verifying that a Waste Discharge Identification (WDID) number has been issued by the State Board..

2. The DAMP addresses compliance strategies with regard to industrial and commercial facilities. As part of their Urban Runoff management activities, the Principal Permittee and the County entered into an agreement, dated August 10, 1999 by which they have developed and funded, in cooperation with the Riverside County Environmental Health Department, the "Compliance Assistance Program" (CAP) which includes a storm water survey component as part of existing inspections of hazardous material handlers and retail food service activities. The CAP consists of educational outreach to the inspected facilities and detailed storm water compliance surveys for each facility that must secure a hazardous materials permit for either storing, handling or generating such materials (there are approximately 5,500 facilities of which approximately 2,300 are inspected annually, and all facilities are inspected at least once during a two year cycle) and retail food facilities (there are approximately 6,750 facilities, all of which are inspected 1 to 3 times annually). Storm Water Compliance Surveys are conducted with each inspection of hazardous materials facilities, and at least once during the MS4 Permit term for restaurants. Restaurant inspectors are authorized to conduct

additional surveys if they observe an IC/ID or ordinance violation. The type of industrial/commercial establishment that is inspected includes, but is not limited to, automobile mechanical repair, maintenance, fueling, or cleaning operation, automobile or other vehicle body repair or painting operations, and painting or coating operations. Completed surveys that indicate non-compliance are forwarded to the appropriate Co-Permittee's enforcement division for follow up action. In addition, the cities of Corona and Riverside, which operate publicly owned treatment works (POTW), conduct annually on average, approximately 4,400 wastewater pre-treatment inspections, on a variety of industrial and commercial establishments within their respective jurisdictions, including, but not limited to, retail food establishments, car washes, and carpet, drape & furniture cleaning establishments. The Permittees have agreed to notify Regional Board staff when conditions are observed during such inspections that appear to be in violation of either the Storm Water General Permits or a permit issued by the Regional Board.

3. An evaluation of the Permittees' inspection programs during the 2002 MS4 Permit indicated a wide range of compliance and non-compliance with the Construction Cite and Industrial and Commercial Facilities inspection requirements. In many instances, the Construction Site and Facilities' return to compliance was not properly documented. This Order includes requirements for a more effective inspection program and includes a performance measure, time to return to compliance, as a metric for program effectiveness.

I. ILLICIT CONNECTIONS/ ILLEGAL DISCHARGES (IC/ID)

1. Illegal Discharges to the MS4 can contribute to contamination of Urban Runoff and other surface waters. During the term of the 1990 MS4 Permit, the underground MS4 facilities were inspected and only one Illicit Connection was identified. Open channels and other aboveground elements of the MS4 are inspected for evidence of Illegal Discharges as an element of routine maintenance by the Permittees. The Permittees also developed a program to prohibit IC/IDs to their MS4 facilities. Continued surveillance and enforcement of these programs are required to eliminate IC/IDs. The Permittees have a number of procedures in place to eliminate IC/IDs to the MS4, including Construction Site and Commercial, and Industrial Facility inspections, MS4 facility inspections, water quality monitoring and reporting programs, and public education.

2. The Permittees have the authority to control Pollutants in Urban Runoff, to prohibit IC/ID, to control spills, and to require compliance and carry out inspections of the MS4 facilities within their respective jurisdictions. The Co-Permittees have been extended necessary legal authority through California

statutes and local charters. Consistent with this statutory authority, each of the Co-Permittees have adopted their respective Storm Water Ordinances.

3. Even though the Permittees have established the authority and the procedures to detect and eliminate IC/IDs, audits conducted during the term of the 2002 MS4 Permit indicated that this program element is generally carried out passively through complaint response. IC/IDs are also detected through inspection programs and maintenance activities. Reports from maintenance inspectors are also typically logged as complaints. This Order requires each Permittee to revise this program element based on the Center for Watershed Protection's Illegal Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessments, or equivalent program.

J. TECHNOLOGY-BASED EFFLUENT LIMITATIONS (Not Applicable)

K. WATER QUALITY-BASED EFFLUENT LIMITATIONS (WQBELs) AND TMDL WLA

1. 40 CFR 122.44(d) requires that NPDES permits include WQBELs to attain and maintain applicable numeric and narrative water quality criteria to protect the Beneficial Uses of the Receiving Water. Where numeric water quality criteria have not been established, 40 CFR 122.44(d) specifies that WQBELs may be established using USEPA criteria guidance under CWA section 304(a), proposed State criteria or a State policy interpreting narrative criteria supplemented with other relevant information, or an indicator parameter. In *Defenders of Wildlife, et al* v. *Browner,* No. 98–71080 (9th Cir, October 1999), the Court held that the CWA does not require strict compliance with State Water Quality Standards for MS4 permits under section 301(b)(1)(C), but that at the same time, the CWA does give the permitting authority the discretion to incorporate appropriate WQBEL under another provision, CWA Section 402(p)(3)(B)(iii). The use of BMPs to control or abate the discharge of Pollutants is allowed by 40 CFR 122.44(k)(3) when Numeric Effluent Limitations are infeasible or when practices are reasonably necessary to achieve Effluent Limitations and standards or to carry out the purposes and intent of the CWA. The legislative history and the preamble to the federal storm water regulations indicate that the Congress and the USEPA were aware of the difficulties in regulating Urban Runoff solely through traditional end-of-pipe treatment. It is the Regional Board's intent to require the Permittees to implement BMPs consistent with the MEP standard in order to support attainment of Water Quality Standards. This Order includes Receiving Water Limitations based on Water Quality Objectives; it prohibits the creation of Nuisance and requires the reduction of Water Quality Standards Impairment in Receiving Waters. The Permit includes a procedure for determining whether Urban Runoff is causing or contributing to exceedances of Receiving Water Limitations and for evaluating whether the DAMP must be revised to include additional or more effective BMPs designed to meet

Water Quality Standards. The Order establishes an iterative process to determine compliance with the Receiving Water Limitations.

2. To support attainment of Water Quality Standards, consistent with the MEP standards, this Order aims to reduce the discharge of Pollutants in Urban Runoff from the MS4 by requiring Permittees to:
   a. Implement BMPs at Permittee facilities and activities,
   b. Require BMPs, including where appropriate, LID techniques, to be implemented at New Development and Significant Redevelopment project sites prior to accepting discharges into their MS4 facilities, where feasible,
   c. Implement and annually evaluate the DAMP and each Permittee's LIP for effectiveness in reducing Pollutants in Urban Runoff, and
   d. Determine if Urban Runoff is contributing to exceedances of Water Quality Objectives or Beneficial Uses in Receiving Waters by comparing outfall and receiving water monitoring results to: (1) Water Quality Objectives (WQOs), (2) California Toxic Rule (CTR), (3) USEPA Multi-Sector Permit Parameter Benchmark Values and (4) other appropriate data identified by the Permittees. The Permittees should also evaluate the Regional Monitoring reports prepared by SCCWRP to assess trends in Urban Runoff and Receiving Water quality within the Permit Area.
3. Federal regulations (40 CFR 122.44(d)(1)(vii)(B) require inclusion of Effluent Limits that are "consistent with the assumptions and requirements of any available WLA for the discharge prepared by the State and approved by USEPA." Consistent with this requirement, this Order includes interim effluent limits and a process for developing a BMP-based approach which, if adopted by the Regional Board prior to the compliance dates(s) specified in the associated comprehensive plan, shall become the final WQBEL(s). The Permittees are required to submit a comprehensive plan describing the proposed BMPs and the documentation demonstrating that the BMPs are expected to attain the WLAs by the compliance dates when implemented. If the Regional Board approves this comprehensive plan, this Order will be amended to include the comprehensive plan as the final WQBEL(s). If the Regional Board does not approve the comprehensive plan prior to the compliance date; the WLAs will become the final WQBEL(s) on the applicable compliance date and will remain in effect until a comprehensive plan is approved by the Regional Board. The comprehensive plan will be updated, as necessary, to reflect evaluations of the effectiveness of the BMPs, including evaluations presented in the annual reports.

4. These WQBELs are consistent with the assumptions and requirements identified in the TMDL Implementation Plans adopted with the TMDLs because the WQBELs are expected to be sufficient to meet the WLAs by the compliance dates. The

TMDLs within the Permit Area are described in Section F, above. These include the following:

a. MSAR Bacterial Indicator TMDL

i. The TMDL relies on this Order to implement the WLAs for Urban Runoff from the MSAR Permittees.

ii. This Order requires the MSAR Permittees to fully comply with the TMDL Implementation Plan. The TMDL Implementation Plan includes requirements for monitoring, and submittal of plans and schedules to implement short term solutions and develop long-term solutions to achieve TMDL compliance by the specified compliance dates.

iii. There are two components in the MSAR TMDL (fecal coliform and *E. coli*). The Basin Plan currently does not have an established objective for *E. coli*. The work that is currently being done by SWQSTF is expected to make recommendations for the adoption of *E. coli* objectives and revised WLAs based on *E.coli*. This Order incorporates the current WLAs as WQBELs. If the WLAs are revised, this Order will be reopened to incorporate the new WLAs.

iv. Upon adoption of this Order, the tasks identified in the MSAR TMDL Implementation Plan that have been developed by the MSAR Permittees and approved by the Regional Board become the interim Effluent Limits.

v. The MSAR Permittees are required to develop a Comprehensive Bacteria Reduction Plan(CBRP) designed to achieve WLAs by the compliance date. Once approved by the Regional Board, the CBRP becomes the final Effluent Limit. In the absence of an approved CBRP, the WLAs become the final numeric WQBEL by the compliance date specified in the TMDL.

b. Canyon Lake and Lake Elsinore Nutrient TMDLs

i. This Order is consistent with the Urban WLAs specified in the Canyon Lake and Lake Elsinore Nutrient TMDLs.

ii. Consistent with the TMDL Implementation Plan, this Order requires the LE/CL Permittees to identify sources of Impairment, propose BMPs to address those sources, and to monitor, evaluate and revise BMPs based on the monitoring results. Specific TMDL Implementation Plan tasks are described in Chapter 5 of the Basin Plan and are assigned to one or more of

the Permittees. Requirements of the TMDL Implementation Plan tasks are incorporated into this Order and Chapter 13 of the 2007 DAMP.

iii. In Chapter 13 of the 2007 DAMP submitted with the ROWD, the LE/CL Permittees have proposed BMP programs, consistent with the aforementioned TMDL Implementation Plan tasks.

iv. This Order also requires the LE/CL Permittees to monitor at representative Urban Runoff monitoring locations defined in the Consolidated Program for Water Quality Monitoring (CMP), (Phase 2 TMDL Monitoring is specified in the Lake Elsinore and Canyon Lake Nutrient TMDL Monitoring Plan dated February 15, 2006) and TMDL Implementation Plan and to evaluate the effectiveness of BMPs implemented in the Permit Area in reducing Pollutants of Concern in Urban Runoff to determine progress towards attainment of WLAs by the specified compliance date.

v. The Regional Board recognizes that additional research is needed to determine the most appropriate control mechanism to attain Water Quality Standards for nutrients in these two lakes. This Order provides the LE/CL Permittees the flexibility to meet the WLAs through a variety of techniques. Even though, the WLAs for the Canyon Lake and Lake Elsinore Nutrient TMDLs are expressed as WQBELs, if Water Quality Standards in the Lakes are met through biological or other in-Lake control mechanisms, the LE/CL Permittees' obligation to meet the WLAs is satisfied. as the impairment for which the TMDLs were developed would not exist anymore. The Permittees in the affected watersheds are required to develop a CNRP designed to achieve the WLAs by the compliance dates specified in the TMDL. In the absence of an approved CNRP, the WLAs become the final numeric WQBELs for nutrients.

L. WATER QUALITY CONTROL PLAN (BASIN PLAN)

1. The Regional Board adopted a revised Water Quality Control Plan for the Santa Ana River Basin (hereinafter Basin Plan) that became effective on January 24, 1995. The Basin Plan designates Beneficial Uses, establishes Water Quality Objectives, and contains implementation programs and policies to achieve those Water Quality Objectives for all waters in the Santa Ana Region addressed through the Basin Plan.

2. More recently, the Basin Plan was significantly amended to incorporate revised boundaries for groundwater subbasins, now termed "management zones", new nitrate-nitrogen and TDS objectives for the new management zones, and new nitrogen and TDS management strategies applicable to both surface and ground

waters. This Basin Plan Amendment was adopted by the Regional Board on January 22, 2004. The State Board and the Office of Administrative Law (OAL) approved the amendment on September 30, 2004 and December 23, 2004, respectively. The USEPA approved the surface water standard and related provisions of the amendment on June 20, 2007.

3. TDS and TIN limitations in Table 4-1 of the Basin Plan are specified in this Order for Permittees' discharges subject to the De Minimus Permit. Where Dry Season flows are identified as part of the IC/ID program element, this Order also requires Permittees to establish their baseline discharge concentration for Dry Season conditions.

4. As discussed in Section K, WQBELs, and TMDL WLA, the Basin Plan has been amended to incorporate several TMDLs and TMDL Implementation Plans adopted for waterbodies within the Permit Area. In addition, the Basin Plan implements State Board Resolution 88-63, which established a state policy that all waters, with certain exceptions, are suitable or potentially suitable for municipal or domestic water supply. Thus, as discussed in detail in the Fact Sheet, Beneficial Uses recognized in the Basin Plan for Receiving Waters in the Permit Area are as follows:

   a. Municipal and Domestic Supply,
   b. Agricultural Supply,
   c. Industrial Service Supply,
   d. Industrial Process Supply,
   e. Groundwater Recharge,
   f. Hydropower Generation,
   g. Water Contact Recreation,
   h. Non-contact Water Recreation,
   i. Warm Freshwater Habitat,
   j. Limited Warm Freshwater Habitat,
   k. Cold Freshwater Habitat,
   l. Preservation of Biological Habitats of Special Significance,
   m. Wildlife Habitat,
   n. Rare, Threatened or Endangered Species, and
   o. Spawning, Reproduction, and Development

5. The existing and potential Beneficial Uses of groundwater that could be impaired by the discharge of Urban Runoff within the Permit Area include one or more of the following:

   a. Municipal and Domestic Supply,
   b. Agricultural Supply,
   c. Industrial Service Supply, and

d. Industrial Process Supply

6. The Basin Plan also incorporates by reference all State Board water quality control plans and policies including the 1990 Water Quality Control Plan for Ocean Waters of California (Ocean Plan) and the 1974 Water Quality Control Policy for Enclosed Bays and Estuaries of California (Enclosed Bays and Estuaries Policy). Water Quality Objectives specified in the Basin Plan are local numeric and narrative objectives that may be more stringent than the national or statewide water quality criteria.

M. NATIONAL TOXICS RULE (NTR) AND CALIFORNIA TOXICS RULE (CTR)

NTR and CTR are blanket water quality criteria that apply to all surface water discharges. However, the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* states that the Policy does not apply to regulation of storm water discharges. Regional Board believes that compliance with Water Quality Standards through implementation of BMPs is appropriate for regulating Urban Runoff. The USEPA articulated this position on the use of BMPs in storm water permits in the policy memorandum entitled, ‘‘Interim Permitting Approach for Water Quality-Based Effluent Limitations in Storm Water Permits’’ (61 FR 43761, August 9, 1996).[18]

N. STATE IMPLEMENTATION POLICY (SIP)

See Section M, above.

O. COMPLIANCE SCHEDULES AND INTERIM REQUIREMENTS

The Basin Plan contains schedules for achieving compliance with WLAs for Bacterial Indicators in the MSAR watershed and nutrients in the San Jacinto watershed (Canyon Lake/Lake Elsinore). It is appropriate to require the CL/LE Permittees to comply with those time schedules for various deliverables as specified in the approved TMDL Implementation Plans. Consistent with the State Board’s Compliance Schedule Policy (Resolution No. 2008-0025), this Order incorporates interim and final Effluent Limits, where applicable. Additionally, since the TMDL compliance dates are outside the term of this MS4 Permit, it is also appropriate to require the Permittees to monitor and report the effectiveness of BMPs implemented in the Permit Area to evaluate progress towards attainment of WLAs by the time schedules specified in the adopted TMDLs. This Order includes the schedules for deliverables as part of the TMDL Implementation Plans as well as a requirement to monitor the effectiveness of BMPs in the Permit

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[18] See discussions on Wet Weather Flows in the Federal Register/Vol. 65, No. 97/Thursday, May 18, 2000/Rules and Regulations

Area in reducing Pollutant discharges and to report progress towards compliance with the TMDL WLAs by the compliance dates.

P. ANTIDEGRADATION POLICY

40 CFR 131.12 requires that State Water Quality Standards include an antidegradation policy consistent with the federal policy. The State Board established California's antidegradation policy in Resolution No. 68-16. Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The Regional Board's Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies. As discussed in detail in the Fact Sheet (see sections IV and V), the permitted discharges are consistent with the antidegradation provisions of 40 CFR 131.12 and State Board Resolution No. 68-16.

Q. ANTI-BACKSLIDING

Sections 402(o)(2) and 303(d)(4) of the CWA and federal regulations at 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require Effluent Limitations in a reissued NPDES permit to be as stringent as those in the previous permit, with some exceptions where Effluent Limitations may be relaxed. All Effluent Limitations in this Order are at least as stringent as the Effluent Limitations in the 2002 Order.

R. PUBLIC EDUCATION/PARTICIPATION

1. Public participation during the development of Urban Runoff management programs and implementation plans is necessary to ensure that all stakeholder interests and a variety of creative solutions are considered. In addition, the federal storm water regulations require public participation in the development and implementation of the Urban Runoff management program. As such, the Permittees are required to solicit and consider all comments received from the public and submit copies of the comments to the Executive Officer of the Regional Board with the Annual Reports. In response to public comments, the Permittees may modify reports, plans, or schedules prior to submittal to the Executive Officer.

2. There are Pollutants in Urban Runoff from privately owned and operated facilities such as residences, businesses and commercial establishments and public and private institutions. A successful NPDES MS4 permit program should include the participation and cooperation of public entities, private businesses, and public and private institutions. Therefore, public education is a critical element of the DAMP. As the population increases in the Permit Area, it will be even more important to

continue to educate the public regarding the impact of human activities on the quality of Urban Runoff.

3. In addition to the Regional Board, a number of other stakeholders are involved in the management of the water resources of the Region. These include, but are not limited to, the incorporated cities in the Region, POTWs, the three counties, and the Santa Ana Watershed Project Authority and its member agencies. The entities listed in Appendix 2 are considered as potential dischargers of Urban Runoff in the Permit Area. It is expected that these entities will also work cooperatively with the Permittees to manage Urban Runoff. The Regional Board, pursuant to 40 CFR 122.26(a), has the discretion and authority to require non-cooperating entities to participate in this Order or to issue individual MS4 permits. The Permittees may request the Regional Board to issue a separate NPDES Permit to any discharger into MS4 facilities they own or operate.

4. Cooperation and coordination among the stakeholders (regulators, Permittees, the public, and other entities) are critical to optimize the use of finite public resources and ensure economical management of water quality in the Region. Recognizing this fact, this Order focuses on integrated watershed management and seeks to integrate the programs of the stakeholders, especially the holders of the three MS4 permits within the Regional Board's jurisdiction.

5. Education is an important aspect of every effective Urban Runoff management program and the basis for changes in behavior at a societal level. Education of municipal planning, inspection, and maintenance department staff is especially critical to ensure that in-house staff understand how their activities impact water quality, how to accomplish their jobs while protecting water quality, and their specific roles and responsibilities for compliance with this Order. Public education, designed to target various urban land users and other audiences, is also essential to inform the public of how individual actions affect Receiving Water quality and how adverse effects can be minimized.

6. Some Urban Runoff issues, such as public education and training, can be effectively addressed on a regional or statewide basis. Regional approaches to Urban Runoff management can improve program consistency and promote sharing of resources, which can result in implementation of more efficient programs. In particular the counties of San Bernardino and Riverside and their collective municipalities are encouraged to cooperatively work together and generate a unified education and training program.

S. PERMITTEE FACILITIES AND ACTIVITIES

1. The Permittees own/operate facilities where industrial or related activities take place that may have an impact on Urban Runoff quality. Some of the Permittees

enter into contracts with outside parties to carry out activities that may also have an impact on Urban Runoff quality. These facilities and related activities include, but are not limited to, street sweeping, catch basin cleaning, maintenance yards, vehicle and equipment maintenance areas, waste transfer stations, corporation and storage yards, parks and recreational facilities, landscape and swimming pool maintenance activities, MS4 maintenance activities and the application of herbicides, algaecides and pesticides.

2. This Order requires continued implementation of BMPs intended to reduce Pollutant discharges from those Permittee activities/facilities that are found to be significant sources of Pollutants in Urban Runoff. This Order prohibits non-storm water discharges from facilities owned or operated by the Permittees unless the discharges are exempt under Section VI of this Order or are permitted by the Regional Board under an individual NPDES permit.

3. Program evaluations conducted during the term of the 2002 MS4 Permit indicated varying degrees of compliance/noncompliance at Permittee facilities and activities. This Order requires each Permittee to review its inventory of fixed facilities, field operations and drainage facilities to ensure that Permittee facilities do not cause or contribute to a Pollution or Nuisance in Receiving Waters. Permittee fixed public facilities and field operations are to be inspected annually.

T. MUNICIPAL CONSTRUCTION PROJECTS

1. The 2002 MS4 Permit authorized the discharge of storm water from construction activities on an acre or more, that are under ownership or direct responsibility of the Permittees. Permittees were required to notify the Regional Board prior to commencement of construction activities, and to comply with the latest Statewide General Construction Permit. Permittees were also required to develop a SWPPP and monitoring program specific to the Construction Site. Program evaluations conducted during the term of the 2002 MS4 Permit indicated that some Permittees were not submitting or were not aware of the requirement to submit a NOI and subsequent Notice of Termination (NOT) for Permittee Construction Sites. This Order continues the notification requirement.
2. This Order builds upon the requirement of the 2002 MS4 Permit by requiring Permittees to include post-construction BMP information for Permittee Construction Sites meeting WQMP and General Construction Permit criteria along with the NOT submitted to the Executive Officer upon completion of the construction activity. The NOT must include photographs of the completed project, a site map including structural post-construction BMP locations, long term operation and maintenance responsibility information, field verification report and copies of the final field verification reports required under Section XII.I. Permittees are required to develop

a database of post-construction BMPs per Section XII.K.4. for which they are responsible and reference this database in the LIPs.

3. Emergency Permittee public works projects required to protect public health and safety are exempted from these requirements, until the emergency ends, at which time they need to comply with the requirements.

U. MONITORING AND REPORTING

1. 40 CFR 122.48 requires that all NPDES permits specify requirements for monitoring and reporting. Sections 13267 and 13383 of the CWC authorize the Regional Board to require technical and monitoring reports. The Monitoring and Reporting Program, Attachment 3, establishes monitoring and reporting requirements to implement federal and State requirements.

2. An effective monitoring program characterizes Urban Runoff, identifies problem areas, and determines the impact of Urban Runoff on receiving waters and the effectiveness of BMPs. The Principal Permittee administers the CMP for the Permittees. The CMP includes Wet and Dry Season monitoring of MS4 Outfalls and Receiving Waters throughout Riverside County.

3. The Regional Board recognizes the importance of watershed management efforts and regional planning and coordination in the development and implementation of programs and policies related to Receiving Water quality protection, including the Urban Runoff program and TMDL processes. In light of recent TMDLs that have been developed and the expectation of future TMDLs, this Order allows the Permittees to develop a Coordinated Watershed Monitoring Plan that shows the nexus among various Urban Runoff related monitoring programs that the Permittees are participating and the MS4 permit requirements including but not limited to WLA pre-compliance, BMP effectiveness, urban source and trend evaluation, Receiving Water quality and Hydromodification effects monitoring as part of the requirements of the Monitoring and Reporting Program.

4. Multiple entities, such as POTWs, MS4, CAFOs, and other permitted and non-permitted dischargers, discharge into the same water bodies. The discharges from these various sources could potentially affect the water quality of these water bodies even when these dischargers are complying with their discharge permits. Monitoring the Receiving Waters where these multiple types of discharges take place is necessary to determine these water bodies' compliance with Water Quality Objectives and their attainment of Beneficial Uses.

5. In the past, multiple entities have individually monitored the water bodies receiving their discharges to determine impacts to these waters from their discharges. The

monitoring has resulted in fragmented data that is inconsistent in quality, and that has potentially resulted in duplication of resources.

6. The SMC's "Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California", August 2004 Technical Report #419 indicated that "…the lack of mass emissions stations in the inland counties hampers their ability to estimate the proportional contribution of these inland areas to cumulative loads downstream." The SMC consists of representatives from the Counties of Ventura, Los Angeles, Orange, San Bernardino, Riverside, and San Diego and the City of Long Beach. Consistent with this coordinated effort, this Order includes requirements for mass emissions monitoring.
7. Every two years, the Regional Board will assess readily available data to determine if the water bodies within its jurisdiction comply with the Water Quality Objectives and attain the assigned Beneficial Uses. The data reviewed for the assessment comes from sources such as municipalities, POTWs, individual public submittals, TMDL monitoring, and special studies. The data necessary for the assessment is of known and documented quality and generated under the auspices of a Quality Assurance Project Plan (QAPP). The data also is required to be statistically sufficient to assess if the water body is meeting Water Quality Objectives and to determine if water quality is declining over time.
8. A coordinated monitoring effort is needed for each sub-watershed in the Santa Ana Region that will provide statistically sufficient data. These data should be collected with appropriate quality control and quality assurance programs and should be made available in an electronic format to meet assessment objectives.
9. The Regional Board has identified sub-watersheds in the Santa Ana Region where potential duplication of effort is taking place. These sub-watersheds include: the Upper Santa Ana River watershed, MSAR watershed, Lower Santa Ana River watershed, and the San Jacinto River watershed.
10. Regional Board staff proposes to require the various entities discharging into the waterbodies in these sub-watersheds to coordinate monitoring efforts, prepare, submit for approval, and implement a watershed monitoring plan; a QAPP, and a data management, validation, verification mechanism in order to meet the assessment objectives.
11. Under the direction of the MS4 permittees, SCCWRP is coordinating a watershed monitoring effort in Southern California. The Santa Ana Region is included in their monitoring effort. This effort will potentially produce data that will meet the needs of the Regional Board in assessing water quality. This Order requires the Permittees to continue their participation in this regional effort.

V. STANDARD AND SPECIAL PROVISIONS

The dischargers must comply with all standard provisions and with those additional conditions that are applicable under Federal NPDES Regulations 40 CFR122.41 and 40 CFR 122.42.

W. NOTIFICATION OF INTERESTED PARTIES

The Regional Board has notified the dischargers and interested agencies and persons of its intent to prescribe WDRs for the discharge and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet for this Order.

X. CONSIDERATION OF PUBLIC COMMENT

The Regional Board has notified the Permittees, all known interested parties, and the public of its intent to issue WDRs for this discharge and has provided them with an opportunity to submit their written views and recommendations.

The Regional Board, in a public meeting, heard and considered all comments pertaining to the discharge and the requirements of this Order. Details of the Public Hearing are provided in the Fact Sheet for this Order.

Y. ALASKA RULE

On March 30, 2000, USEPA revised its regulation that specifies when new and revised State and Tribal Water Quality Standards become effective for CWA purposes (40 CFR 131.21, 65 FR 24641, April 27, 2000). Under the revised regulation (also known as the Alaska rule), USEPA must approve new and revised Water Quality Standards submitted to USEPA after May 30, 2000 before being used for CWA purposes. The final rule also provides that standards already in effect and submitted to USEPA by May 30, 2000 may be used for CWA purposes, whether or not approved by USEPA.

Z. COMPLIANCE WITH CZARA

The Coastal Zone Act Reauthorization Amendments of 1990 (CZARA), Section 6217(g), requires coastal states with approved coastal zone management programs to address Non-Point Source Pollution impacting or threatening coastal water quality. The CZARA addresses five sources of non-point pollution: agriculture, silviculture, urban, marinas, and Hydromodification. This Order addresses the management measures required for the urban category. Compliance with requirements specified in this Order relieves the Permittees for developing a Non-Point Source Plan, for the urban category, under CZARA.

AA. NON-POINT SOURCE DISCHARGES

Consistent with the State Board's 2004 "Policy for the Implementation and

Enforcement of the Nonpoint Source Pollution Control Program," the Regional Board may issue WDRs for Non-Point Source (NPS) Pollutant discharges, such as agricultural irrigation runoff or return flows that are not subject to NPDES requirements, if identified as a significant source of Pollutants. In addition, if the water quality significance of Non-Point Source discharges is not clearly understood, the Regional Board may issue conditional waivers of WDRs to Non-Point Source dischargers, and require monitoring to gather the information necessary to effectively manage these discharges.

BB. STRINGENCY REQUIREMENTS FOR INDIVIDUAL POLLUTANTS. (N/A)

CC. FISCAL RESOURCES

California is experiencing a fiscal crisis unprecedented since the Great Depression. The November 2009 unemployment rate is 12.2 percent in California and 14.7 percent in Riverside County.[19] The seasonally adjusted national unemployment rate in November 2009 is at a 26-year high of 10.2 percent. The Federal Reserve projected that the national unemployment rate, currently at a 26-year high of 9.4 percent, will pass 10 percent by the end of the year. Most federal policymakers said it could take "five or six years" for the economy and the labor market to get back on a path of long-term health.[20] State and local governments are experiencing significant budgetary shortfalls and are reducing staffing and programs across the board. Given this economic environment, priority will be given to preserving the most essential elements of existing Urban Runoff programs and identifying and implementing strategies to improve the efficiency of existing programs in protecting Receiving Waters.

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[19] Employment Development Department, State of California, December 18, 2009. http://www.calmis.ca.gov/file/lfmonth/rive$pds.pdf
[20] http://www.msnbc.msn.com/id/31963779/ns/business-stocks_and_economy/

PERMIT REQUIREMENTS:

IT IS HEREBY ORDERED that the Riverside County Flood Control and Water Conservation District, the County of Riverside, and the incorporated cities of Beaumont, Calimesa, Canyon Lake, Corona, Hemet, Lake Elsinore, Menifee, Moreno Valley, Murrieta, Norco, Perris, Riverside, San Jacinto, and Wildomar, in order to meet the provisions contained in Division 7 of the Water Code and regulations adopted thereunder, and the provisions of the CWA, as amended, and the regulations and guidelines adopted there under, must comply with the following:

III. PERMITTEE RESPONSIBILITIES:

A. RESPONSIBILITIES OF THE PRINCIPAL PERMITTEE:

1. The Principal Permittee shall be responsible for managing the overall Urban Runoff program and shall:

    a. Coordinate revisions to the DAMP.

    b. Implement area-wide management programs, monitoring and reporting programs, and related plans as required by this Order.

    c. Coordinate chemical and biological water quality monitoring and any other monitoring as required by the Executive Officer.

    d. Prepare, coordinate the preparation of, and submit to the Executive Officer, those reports and programs necessary to comply with this Order.

    e. Provide staff support to the Management Steering Committee (Appendix 4, Glossary) to address Urban Runoff management policies for the Permit Area and coordinate the review, and necessary revisions to the DAMP and Implementation Agreement. The Management Steering Committee will continue to meet consistent with the requirements of Section XVII.D of this Order.

    f. Coordinate and conduct Technical Committee (Appendix 4) meetings consistent with the requirements of Section XVII.D of this Order. The Technical Committee will continue to direct the development of the DAMP and coordinate the implementation of the overall Urban Runoff program.

    g. Take the lead role in initiating and developing area-wide programs and activities necessary to comply with this Order.

h. Coordinate activities and participate in committees/subcommittees formed to comply with this Order.

i. Coordinate the implementation of this Order with the Regional Board and Co-Permittees, including the submittal of joint reports, plans, and programs as required under this Order.

j. Provide technical and administrative support to the Co-Permittees, including informing them of the status of known pertinent municipal programs, pilot projects, and research studies.

k. Coordinate with the Co-Permittees the implementation and necessary updates to Urban Runoff quality management programs, monitoring and reporting programs, implementation plans, public education, other Pollution Prevention measures, household Hazardous Waste collection, and BMPs outlined in the DAMP and take other actions consistent with the MEP standard.

l. Gather and disseminate information on the status of statewide Urban Runoff programs and evaluate the information for potential use in the execution of this Order. Hold workshops focused on Urban Runoff regulatory requirements, BMPs, and other related topics.

m. Compile information provided by the Co-Permittees and determine the effectiveness of the overall Urban Runoff program in attaining Receiving Water Quality Standards. This determination must include a comparative analysis of monitoring data to the applicable Water Quality Objectives for Receiving Waters as specified in Chapter 4 of the Basin Plan.

n. Solicit and coordinate public input for major changes to the Urban Runoff management programs and the implementation thereof.

o. Coordinate the development and implementation of procedures and performance standards, to assist in the consistent implementation of BMPs consistent with the MEP standard, as well as Urban Runoff management programs, among the Co-Permittees.

p. Participate in watershed management programs and regional and/or statewide monitoring and reporting programs.

q. In collaboration with the Co-Permittees, other MS4 Programs and/or CASQA, develop guidelines for defining expertise and competencies of storm water program managers and inspectors and develop and submit for approval a training program for various positions in accordance with these guidelines and Section XV of this Order.

r. Within 6 months of adoption of this Order, the Principal Permittee shall develop a library of BMP performance reports, and revise the library annually thereafter. At a minimum, obsolete performance reports should be removed and updated reports from the Permittees, CalTrans, CASQA, American Society of Civil Engineers or other appropriate sources that include more effective and proven BMPs should be added. The library may use national, statewide or regional reports. The purpose of this library is to facilitate the Permittees approval of BMPs, review and approval of WQMPs, etc.

s. Within 6 months of adoption of this Order, the Principal Permittee shall coordinate a review of the DAMP with the Co-Permittees to determine the need for update or revisions to ensure compliance with the requirements of this Order and establish a schedule for those revisions.

2. The activities of the Principal Permittee shall also include, but not be limited to, the following for MS4 owned or operated by the Principal Permittee:

   a. To cause appropriate enforcement actions as necessary against IC/IDs to its MS4 to ensure compliance with Urban Runoff management programs, ordinances and implementation plans, including physical removal of Illicit Connections and prohibition of Illegal Discharges.

   b. Ensure that applicants for encroachment permits for permanent connection to its MS4 facilities are notified in writing of their obligations to comply with Storm Water Ordinances, WQMP, and General Stormwater Permit requirements. The Principal Permittee shall make sure that encroachment activities within the limits of its rights-of-way comply with the General Construction Permit post construction standards. An encroachment project with a WQMP reviewed and approved by the Co-Permittee with jurisdictional authority may constitute compliance with the General Construction Permit post construction standards[21].

   c. Conduct inspections and maintain the MS4 facilities over which it has jurisdiction.

   d. Review and revise, if necessary, those agreements to which it is a party and those regulations and policies it deems necessary to provide adequate legal authority to maintain the MS4 facilities for which it has jurisdiction and to take those actions required of it by this Order and the federal Storm Water Regulations (see Section VIII);

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[21] The State General Construction Permit Order No. 2009-0009-DWQ, Section XII

e. Monitor, document, and report that appropriate enforcement actions against Illegal Discharges to the MS4 facilities for which it has jurisdiction are taken and pursued as necessary to ensure compliance with Urban Runoff management programs, implementation plans, and regulations and policies, including physical elimination of IC/IDs (see Section IX);

f. Continue to respond or cause the appropriate entity or agency to respond to emergency situations such as accidental spills, leaks, and IC/IDs to prevent or reduce the discharge of Pollutants to its MS4 facilities and to the Receiving Waters (see Section XVI).

g. Track, monitor, and keep training records of all personnel involved in the implementation of the Principal Permittee's Urban Runoff management program.

B. RESPONSIBILITIES OF THE CO-PERMITTEES:

1. Each Co-Permittee shall complete a LIP, in conformance with Section IV of this Order and the approved LIP template.

2. Each Co-Permittee shall be responsible for managing the Urban Runoff program within its jurisdiction and shall:

   a. Maintain adequate legal authority to control the contribution of Pollutants to the MS4 and enforce those authorities.

   b. Conduct inspections of and maintain its MS4 facilities in accordance with the criteria developed pursuant to Section XIV.

   c. Continue to implement management programs, monitoring and reporting programs, appropriate BMPs listed in the DAMP and LIP, and related plans as required by this Order and take such other actions consistent with the MEP standard.

   d. Continue to seek sufficient funding for the area-wide Urban Runoff management plan, local Urban Runoff program management, Urban Runoff enforcement, public outreach and education activities and other Urban Runoff related program implementation.

   e. Continue to coordinate with other public agencies as appropriate, to facilitate the implementation of this Order and the DAMP/LIP.

   f. Ensure that applicants for encroachment permits for permanent connection to Permittee MS4 facilities are notified of their obligations to comply with Storm

Water Ordinances, WQMP, and the State General Construction Permit post construction standards. The Permittees shall enforce their Storm Water Ordinances to the extent of their legal authority. An encroachment project with a WQMP reviewed and approved by the Co-Permittee who owns the MS4 may constitute compliance with the General Construction Permit post construction standards[22].

g. Maintain up-to-date MS4 facility maps. Annually review these maps and if necessary, submit revised maps to the Principal Permittee with the information required for preparation of the Annual Report.

h. Prepare and submit to the Principal Permittee in a timely manner specific reports/information, related to the Co-Permittees' Urban Runoff management program, necessary to develop an Annual Report for submittal to the Executive Officer.

3. The Co-Permittees' activities shall include, but not be limited to, the following:

a. Participate in the Management Steering Committee and the Technical Committee meetings consistent with the requirements of Section XVII.D of this Order.

b. Conduct and coordinate with the Principal Permittee surveys and monitoring needed to identify Pollutant sources and drainage area characteristics within its jurisdiction. Where an Illegal Discharge crosses jurisdictional boundaries, to the extent feasible coordinate with neighboring jurisdictions to locate and end the Illegal Discharge.

c. Prepare and submit reports to the Principal Permittee to facilitate compilation of joint reports to the Regional Board in compliance with submittal deadlines.

d. Participate in the development and implementation of plans, strategies, management programs, monitoring and reporting programs that are proposed by the Principal Permittee, Technical Committee, or the Management Steering Committee to comply with this Order.

e. Participate in subcommittees formed by the Principal Permittee, Technical Committee, or the Management Steering Committee to comply with this Order.

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[22] The State General Construction Permit Section XIII

f. Respond to or arrange for the appropriate entity or agency to respond to Emergency Situations such as accidental spills, leaks, IC/IDs, etc., to prevent or reduce the discharge of Pollutants to their MS4 facilities and the Receiving Waters.

g. Continue to pursue enforcement actions as necessary within its jurisdiction for violations of Storm Water Ordinances, and other elements of its Urban Runoff management program.

C. IMPLEMENTATION AGREEMENT

The Permittees shall allow any cities that were not signatories to the original Implementation Agreement but have been subsequently added to this Order to participate in the Implementation Agreement. The Permittees must annually review their Implementation Agreement and determine the need, if any, for additional revision. Beginning with the first Annual Report after adoption of this Order the Permittees must include the findings of this review and a schedule for any necessary revision(s) to the Implementation Agreement, if any. A copy of the signature page and any revisions to the Agreement shall be included in the Annual Report.

IV. LOCAL IMPLEMENTATION PLAN:

A. Within 6 months of adoption of this Order, the Permittees shall develop and submit for approval of the Executive Officer a LIP template. The LIP template shall be amended as the provisions of the DAMP are amended to address the requirements of this Order. The LIP template shall facilitate a description of the Co-Permittee's individual programs to implement the DAMP, including the organizational units responsible for implementation and identify positions responsible for Urban Runoff program implementation. The description shall specifically address:

1. Overall program management, including internal reporting requirements and procedures for communication and accountability;

   a. Interagency or interdepartmental agreements necessary to implement the Permittee's Urban Runoff program

   b. A summary of fiscal resources available to implement the Urban Runoff program;

   c. The ordinances, agreements, plans, policies, procedures and tools (e.g. checklists, forms, educational materials, etc.) used to execute the DAMP, including legal authorities and enforcement tools.

   d. Summarize procedures for maintaining databases required by the Permit;

   e. Describe internal procedures to ensure and promote accountability;

2. WQBELs to implement the TMDLs (Section VI.D);
3. Receiving Water Limitations (Section VII.D).
4. Legal authority/enforcement (Section VIII)
   a. Identify enforcement procedures, and
   b. Identify actions and procedures for tracking return to compliance;
5. Illicit Connections/Illegal Discharges (IC/ID); Litter, Debris and Trash Control (Section IX).

   The procedures and the staff positions responsible for different components of their IC/ID and Illegal Discharge Detection and Elimination (IDDE) Programs.
6. Sewage Spills, Infiltration into the MS4 Systems from Leaking Sanitary Sewer Lines, Septic System Failures, and Portable Toilet Discharges (Section X)

   A description of the interagency or interdepartmental sewer spill response coordination within each Permittee's jurisdiction.
7. Co-Permittee inspection programs(Section XI),
   a. Maintenance of Construction, Industrial, Commercial, and Post-Construction BMP databases;
   b. Procedures for incorporating erosion and sediment control BMPs into the permitting of Construction Sites (Section XI.B)
   c. Implementation of the Residential Program (Section XI.E.)
   d. Specify the verification procedure(s) and any tools utilized to verify that coverage under the General Construction Permit;
8. New Development (Including Significant Redevelopment) (Section XII)
   a. A list of discretionary maps and permits over which the Permittee has the authority to require WQMPs;
   b. Permittee procedures to implement the Hydromodification Management Plan.
   c. Permittee procedures and tools to implement the WQMP.(Sections XII.H, XII.I & XII.K)
   d. Permittee procedures for Municipal Road Projects (Section XII.F).
   e. A description of the credits programs or other in-lieu programs implemented (Section XII.G).
9. Public education and outreach (Section XIII)
10. Permittee Facilities and Activities (Section XIV)
    a. A description of the Permittee's MS4 facilities;
    b. At a minimum a list of facilities that include the following:

i. Parking facilities;

ii. Fire fighting training facilities;

iii. Facilities and activities discharging directly to environmentally sensitive areas such as 303(d) listed waterbodies or those with a RARE beneficial use designation;

iv. POTWs (including water and wastewater treatment plants) and sanitary sewage collection systems;

v. Solid waste transfer facilities;

vi. Land application sites;

vii. Corporate yards including maintenance and storage yards for materials, waste, equipment and vehicles;

viii. Household hazardous waste collection facilities;

ix. Municipal airfields;

x. Maintenance Facilities serving parks and recreation facilities;

xi. Special event venues following special events (festivals, sporting events);

xii. Other municipal areas and activities that the Permittee determines to be a potential source of Pollutants.

11. Compliance of Permittee Facilities and Activities with the General Construction Permit and De-Minimus Permit (Section XIV.G).

12. Training Program for Storm Water Managers, Planners, Inspectors and Municipal Contractors (Section XV);

    a. Training log forms

    b. Identify departments and positions requiring training

B. Within 12 months of approval of the LIP template, and amendments thereof, by the Executive Officer, each Permittee shall complete a LIP[23], in conformance with the LIP template. The LIP shall be signed by the principal executive officer or ranking elected official or their duly authorized representative pursuant to Section XX.M of this Order.

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[23] As the Principal Permittee is not a general purpose government, some portions of the NPDES MS4 Program may not be applicable to it. The Principal Permittee should identify the basis for its exclusion from the applicable program elements in the appropriate LIP section.

C. Each Permittee shall annually review and evaluate the effectiveness of its Urban Runoff programs to determine the need for revisions to its LIP as necessary in compliance with Section VIII.H of this Order, and document revisions in the Annual Report.

V. DISCHARGE PROHIBITIONS:

A. In accordance with the requirements of 40 CFR 122.26(d)(2)(i)B) and 40 CFR 122.26(d)(2)(i)(F), the Permittees shall prohibit IC/IDs (see Appendix 4) from entering the MS4.

B. The discharge of Urban Runoff from the MS4 to Receiving Waters containing Pollutants, including trash and debris, that have not been reduced consistent with the MEP standard is prohibited.

C. Non-storm Water discharges from public agency activities into Waters of the US are prohibited unless the Non-storm Water discharges are permitted by a NPDES permit, granted a waiver, or as otherwise specified in Section VI, below.

D. Discharges from the MS4 shall be in compliance with the discharge prohibitions contained in Chapter 5 of the Basin Plan.

E. Discharges of Urban Runoff from the Permittee's MS4 shall not cause or contribute to a condition of Pollution, Contamination, or Nuisance (as defined in CWC Section 13050).

F. The discharge of any substances in concentrations toxic to animal or plant life is prohibited.

VI. EFFLUENT LIMITATIONS, DISCHARGE SPECIFICATIONS AND OTHER TMDL RELATED REQUIREMENTS

For purposes of this Order, a discharge may include storm water or other types of discharges identified below.

A. ALLOWED DISCHARGES:

The discharges identified need not be prohibited by the Permittees unless identified by the Permittees or the Executive Officer as a significant source of Pollutants. The DAMP shall include public education and outreach activities directed at reducing these discharges even if they are not substantial contributors of Pollutants to the MS4.

1. Discharges composed entirely of storm water;

2. Air conditioning condensate;
3. Irrigation water from agricultural sources ;
4. Discharges covered by a NPDES Permit, WDRs, or waivers issued by the Regional Board or State Board.
5. Discharges from landscape irrigation, lawn/garden watering and other irrigation waters. These shall be minimized through public education and water conservation efforts, as prescribed under this Order Section XI.E. Residential Program.
6. Passive foundation drains[24];
7. Passive footing drains[25];
8. Water from crawl space pumps[26];
9. Non-commercial vehicle washing,(e.g. residential car washing (excluding engine degreasing) and car washing fundraisers by non-profit organization);
10. Dechlorinated swimming pool discharges (cleaning wastewater and filter backwash shall not be discharged into the MS4 or to Waters of the US)
11. Diverted stream flows[27];
12. Rising ground waters[28] and natural springs;
13. Uncontaminated ground water infiltration as defined in 40 CFR 35.2005 (20) and uncontaminated pumped groundwater (as defined in Appendix 4, glossary),
14. Flows from riparian habitats and wetlands;
15. Emergency fire fighting flows (i.e., flows necessary for the protection of life and property do not require BMPs and need not be prohibited. However, appropriate BMPs to reduce the discharge of Pollutants to the MEP must be implemented when they do not interfere with health and safety issues [see also Appendix K of the DAMP]).
16. Waters not otherwise containing Wastes as defined in California Water Code Section 13050 (d), and
17. Other types of discharges identified and recommended by the Permittees and approved by the Regional Board.

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[24] Allowed discharges only if the source water drained from the foundation is storm water or uncontaminated groundwater. Discharges from contaminated groundwater may require coverage under the De Minimus Permit (Order No. R8-2009-0003, NPDES No. CAG998001) or General Groundwater Cleanup Permit (Order No. R8-2007-0008, NPDES Permit No CAG918001) or its latest version.

[25] See footnote 24, above.

[26] Allowed discharges only if the discharge is uncontaminated, otherwise permit coverage under the De Minimus Permit or Order No. 2006-0008-DWQ (NPDES No. CAG990002), General NPDES Permit for Discharges from Utility Vaults and Underground Structures to Surface Waters (General Permit-Utility Vaults).

[27] Diversion of stream flows that encroach into Waters of the US requires a 404 permit from the US Army Corps of Engineers and a 401 Water Quality Certification from the Regional Board. Stream diversion that requires active pumping also requires coverage under the De Minimus Permit, Order No. R8-2009-0003.

[28] Discharge of rising ground water and natural springs into surface water is only allowed if groundwater is uncontaminated. Otherwise, coverage under the General Groundwater Cleanup Permit, Order No. R8-2007-0008 may be required.

When types of discharges listed above are identified as a significant source of Pollutants to Waters of the US, a Permittee must either: prohibit the discharge category from entering the MS4 or ensure that Source Control BMPs and Treatment Control BMPs are implemented to reduce or eliminate Pollutants resulting from the discharge. The Permittees shall evaluate the permitted discharges, as listed above to determine if any are a significant source of Pollutants to the MS4 and notify the Executive Officer if any are a significant source of Pollutants to the MS4.

B. DISCHARGE SPECIFICATIONS FOR DISCHARGES FROM PERMITTEE OWNED AND/OR OPERATED FACILITIES AND ACTIVITIES - DE-MINIMUS DISCHARGES[29] :

The following types of discharges from Permittee owned and/or operated facilities and activities are authorized by this Order provided they are in compliance with the terms and conditions of the General De Minimus Permit except that separate coverage under that permit is not required.

1. *Discharges from potable water sources, including water line flushing, superchlorinated water line flushing, fire hydrant system flushing, and hydrostatic test water from pipelines, tanks and vessels*: These discharges shall be dechlorinated to a concentration of 0.1 ppm[30] or less, pH adjusted if necessary, and volumetrically and velocity controlled to prevent re-suspension of sediments.

2. *Discharges from lawn, greenbelt and median watering and other irrigation runoff[31] from non-agricultural operations*: These discharges shall be minimized through requirements consistent with Section 5.3 of the DAMP and Section XIV of this Order.

3. *Dechlorinated swimming pool discharges:* Dechlorinated to a concentration of 0.1 ppm[32] or less, pH adjusted and reoxygenated if necessary, and volumetrically and velocity controlled to prevent resuspension of sediments. Swimming pool cleaning wastewater and filter backwash shall not be discharged to the MS4.

4. *Discharges from facilities that extract, treat and discharge water diverted from Waters of the US*: These discharges shall meet the following conditions:

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[29] General De Minimus Permit for Discharges to Surface Waters, Order NO. R8-2009-0003, NPDES No. CAG 998001 (General De Minimus Permit).

[30] Total residual chlorine = 0.1 mg/l or parts per million (ppm) or less; compliance determination shall be at a point before the discharge mixes with any Receiving Water.

[31] Non-agricultural irrigation using recycled water must comply with the statewide permit for Landscape Irrigation Using Recycled Water and the State Department Health guidelines.

[32] See footnote 30.

a. The discharges to Waters of the US must not contain Pollutants added by the treatment process or Pollutants in greater concentration than the influent;

b. The discharge must not cause or contribute to a condition of erosion;

c. Be in compliance with Section 401 of the CWA; and

d. Conduct monitoring in accordance with Section XIX of this Order.

5. *Construction dewatering wastes:* The maximum daily concentration limit for Total Suspended Solids (TSS) shall not exceed 75 mg/L; sulfides shall not exceed 0.4 mg/L; total petroleum hydrocarbons shall not exceed 0.1 mg/L; and oil and grease shall not exceed 15 mg/L.

6. *For all de-minimus type of discharges:* The pH of the discharge shall be within 6.5 to 8.5 pH units and there shall be no visible oil and grease in the discharge.

7. Table 4-1 of the Basin Plan incorporates TDS/TIN objectives for groundwater and surface waters within the Santa Ana Region. Permittees discharging to those Receiving Waters shall ensure compliance with the following for Dry Season conditions:

   a. For discharges to surface waters where groundwater will not be affected by the discharge, the maximum daily concentration (mg/L) of TDS and/or TIN of the effluent shall not exceed the Water Quality Objectives for the Receiving Water where the effluent is discharged, as specified in Table 4-1 of the Basin Plan[33].

   b. For discharges to surface waters where the groundwater will be affected by the discharge, the TDS and/or TIN concentrations of the effluent shall not exceed the Water Quality Objectives for the surface water where the effluent is discharged and the affected groundwater management zone, as specified in Table 4-1 of the Basin Plan. The more restrictive Water Quality Objectives shall govern. However, treated effluent exceeding the groundwater management zone Water Quality Objectives may be returned to the same management zone from which it was extracted without reduction of the TDS or TIN concentrations so long as the concentrations of those constituents are no greater than when the groundwater was first extracted. Incidental increases in the TDS and TIN concentrations (such as may occur during air stripping) of treated effluent will not be considered increases for the purposes of determining compliance with this discharge specification.

8. The Regional Board may add categories of Non-storm Water discharges that are not significant sources of Pollutants or remove categories of Non-storm Water discharges

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[33] Resolution No. R8-2004-0001

listed above based upon a finding that the discharges are a significant source of Pollutants.

C. NON-POINT SOURCE (NPS) DISCHARGES:

The NPS discharges are being addressed through the Non-Point Source Program.

D. WATER QUALITY BASED EFFLUENT LIMITATIONS TO IMPLEMENT THE TOTAL MAXIMUM DAILY LOADS (TMDLs)

1. The MIDDLE SANTA ANA RIVER (MSAR) WATERSHED BACTERIA INDICATOR TMDL

Interim WQBELs (effective upon adoption of this Order)

a. The MSAR Permittees[34] as part of the MSAR Task Force (Table 5) shall:

i. Continue to implement the watershed-wide water quality monitoring program (including any future amendments thereto) approved by the Regional Board (Resolution No. R8-2007-0046) as per Task 3 of the MSAR TMDL Implementation Plan.

ii. Submit reports summarizing all relevant data from the MSAR watershed-wide water quality monitoring program. Beginning in 2010, the cool (or wet) season report is due to the Executive Officer by May 31st of each year (for monitoring conducted from November 1st through March 31st) and the warm (dry) season report is due to the Executive Officer by December 31st of each year (for monitoring conducted from April 1st through October 31st).

iii. Submit comprehensive reports every three years summarizing the data collected for the preceding 3 year period and evaluating progress towards achieving the Urban WLA by the dates specified in the TMDL. The first report is due to the Executive Officer on February 15, 2010.

iv. Continue to implement the approved (Regional Board Resolution No. R8-2008-0044) USEP developed as per Task 4.1 of the MSAR TMDL Implementation Plan. The USEP must describe the specific methods that will be used to identify urban sources, strategies, and BMPs to address

[34] Riverside County MS4 Permittees in the MSAR watershed (County of Riverside, and the Cities of Corona, Norco, Riverside are collectively referred to as the "MSAR Permittees")

those sources. Submit semi-annual reports on January 31st and July 31st of each year as required under the approved USEP, and any amendments thereto. In years where the comprehensive report referenced in VI.D.1.a.iii above is due on February 15, the comprehensive report, Dry Season report (Due December 31st) and the January 31st USEP reports may be combined into a single submittal due February 15th

v. Revise the DAMP as specified in Task 4.3 of the MSAR-TMDL Implementation Plan. Summarize any such revisions in the annual report due to the Executive Officer by November 30 of each year.

vi. Revise the WQMP as specified in Task 4.5 of the MSAR TMDL Implementation Plan. Summarize any such revisions in the Annual Report due to the Executive Officer by November 30 of each year.

vii. Amend the LIP to be consistent with the revised DAMP and WQMPs within 90 days after said revisions are approved by the Regional Board. Summarize any such LIP amendments in the Annual Report due to the Executive Officer by November 30 of each year.

Final WQBELs for MSAR Bacterial Indicator TMDL under Dry Season Conditions

b. The final WQBELs for Bacterial Indicators during the Dry Season shall be achieved by December 31, 2015. These final Effluent Limits shall be considered effective for enforcement purposes on January 1, 2016.

c. The Final WQBELs for MSAR Bacterial Indicator TMDL during the Dry Season shall be developed and implemented in the following manner:

i. The MSAR Permittees shall prepare for approval by the Regional Board a Comprehensive Bacteria Reduction Plan (CBRP) describing, in detail, the specific actions that have been taken or will be taken to achieve compliance with the Urban WLA during the Dry Season (April 1st through October 31st) by December 31, 2015. The CBRP must include:

(1) The specific ordinance(s) adopted to reduce the concentration of Bacterial Indicator in urban sources.

(2) The specific BMPs implemented to reduce the concentration of Bacterial Indicator from urban sources and the water quality improvements expected to result from these BMPs.

(3) The specific inspection criteria used to identify and manage the urban sources most likely causing exceedances of Water Quality Objectives for Bacterial Indicators.

(4) The specific regional treatment facilities and the locations where such facilities will be built to reduce the levels of Bacterial Indicator discharged from urban sources and the expected water quality improvements to result when the facilities are complete.

(5) The scientific and technical documentation used to conclude that the CBRP, once fully implemented, is expected to achieve compliance with the Urban WLA for Bacterial Indicator by December 31, 2015.

(6) A detailed schedule for implementing the CBRP. The schedule must identify discrete milestones to assess satisfactory progress toward meeting the Urban WLA during the Dry Season by December 31, 2015. The schedule must also indicate which agency or agencies are responsible for meeting each milestone.

(7) The specific metric(s) that will be established to demonstrate the effectiveness of the CBRP and acceptable progress toward meeting the Urban WLA for Bacterial Indicator by December 31, 2015.

(8) The DAMP, WQMP and LIPs shall be revised consistent with the CBRP no more than 180 days after the CBRP is approved by the Regional Board.

(9) Detailed descriptions of any additional BMPs planned, and the time required to implement those BMPs, in the event that data from the watershed-wide water quality monitoring program indicate that Water Quality Objectives for Bacterial Indicator are still being exceeded after the CBRP is fully implemented.

(10) A schedule for developing a CBRP needed to comply with the Urban WLA for Bacterial Indicator during the Wet Season (November 1st thru March 31st) to achieve compliance by December 31, 2025.

ii. The draft CBRP must be submitted to the Regional Board by December 31, 2010. The Permittees may submit the plan individually, jointly or through a collaborative effort with other urban dischargers such as the existing MSAR-TMDL Task Force. Regional Board staff will review the draft CBRP and recommend necessary revisions no more than 90 days after receiving the draft CBRP. The MSAR Permittees must submit the final version of the CBRP no more than 90 days after receiving the comments from Regional

Board staff. The Regional Board will schedule a public hearing to consider approving the CBRP, as a final WQBEL for the Dry Season Urban WLA, no more than 120 days after the final plan is submitted by the MSAR Permittees. In approving the CBRP as the final WQBELs, the Regional Board shall find that the CBRP, when fully implemented, shall achieve the Urban WLA for Bacterial Indicator by December 31, 2015.

iii. Once approved by the Regional Board, the CBRP shall be incorporated into this Order as the final WQBELs for Bacterial Indicator for the Dry Season. Based on BMP effectiveness analysis, the CBRP shall be updated, if necessary. The updated CBRP shall be implemented upon approval by the Regional Board.

d. Should the process set forth in Section VI.D.1.c, above not be completed by January 1, 2016, then the Urban WLA for the Dry Season specified in the MSAR-TMDL shall become the final numeric WQBELs for Bacterial Indicator in the Dry Season as follows:

i. WLA for Fecal Coliform from Urban Sources for the Dry Season (April 1st through October 31st)[35]
5-sample/30-day logarithmic mean less than 180 organisms/100mL and not more than 10% of the samples exceed 360 organisms/100mL for any 30-day period.

ii. WLA for *E. Coli* from Urban Sources for the Dry Season (April 1st through October 31st)[36]
5-sample/30-day logarithmic mean less than 113 organisms/100 mL and not more than 10% of the samples exceed 212 organisms/100mL for any 30-day period.

<u>Final WQBELs for Bacterial Indicator during the Wet Season (effective Jan. 1, 2026)</u>

In the event this Order is still in effect on December 31, 2025, and the Regional Board has not adopted alternative final WQBEL during the Wet Season by that date, then the Urban WLAs specified in the MSAR TMDL for the Wet Season

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[35] 5-sample/30-day logarithmic mean less than 180 organisms/100mL and not more than 10% of the samples exceed 360 organisms/100mL for any 30-day period.

[36] 5-sample/30-day logarithmic mean less than 113 organisms/100 mL and not more than 10% of the samples exceed 212 organisms/100mL for any 30-day period.

(November 1st through March 31st) will automatically become the final numeric WQBEL for the MSAR Permittees on January 1, 2026.

2. **LAKE ELSINORE/CANYON LAKE (SAN JACINTO WATERSHED) NUTRIENT TMDLS**

Interim WQBELS:

a. *Lake Elsinore In-Lake Sediment Nutrient Reduction Plan:* Pursuant to Resolution No. R8-2007-0083, or as amended by subsequent adopted Regional Board resolutions, each LE/CL Permittee shall continue to implement the approved strategy for reducing in-lake sediment nutrient loads as summarized in Table 7, below:

Table 7 - Lake Elsinore In-lake Sediment Nutrient Reduction Strategy

Lake Elsinore In-lake Sediment Reduction Strategy Task	Due Date
Submit Phase 2 Alternatives	December 31, 2010*
Submit O&M Agreement for Fishery Management Program	December 31, 2010*
Submit O&M Agreement for Aeration and Mixing Systems	December 31, 2010*
Submit Phase 2 Projects Plans	June 30, 2011*
Complete Phase 2 Project Implementation	December 31, 2014
Implement in-lake and watershed monitoring programs	Annual reports due August 31 every year.

*Within 60 days of receipt of comments from Regional Board staff, Permittees shall submit a final revised plan that will be acceptable for adoption by the Regional Board, unless otherwise directed by the Executive Officer.

b. Lake Elsinore/Canyon Lake Model Update Plan*:* Pursuant to Resolution No. R8-2007-0083, or as amended by subsequent adopted Regional Board resolutions, each LE/CL Permittee shall continue to implement the Model Update Plan as per the schedule summarized Table 8 below: The Model Update Plan shall specify how the Permittees will determine compliance with the WLAs.

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Table 8 - Lake Elsinore/Canyon Lake Model Update Plan

Model Update Task	Due Date
Linkage Analysis Study	August 31, 2010
Watershed Source Loading Study	August 31, 2010
Model Evaluation	December 31, 2010
Construct/Calibrate Model	June 30, 2011
Conduct Model Scenarios	August 31, 2011
Model Update Final Report	November 30, 2011

c. Revise the DAMP, WQMP and LIPs as necessary to implement the interim WQBEL compliance plans submitted pursuant to paragraph a and b of this section and summarize all such revisions in the Annual Report.

Final WQBELs (Effective December 31, 2020)

d. To achieve compliance with TMDL WLAs as per the TMDL Implementation Plans, the LE/CL Permittees shall submit a Comprehensive Nutrient Reduction Plan (CNRP) by December 31, 2011 describing, in detail, the specific actions that have been taken or will be taken to achieve compliance with the urban WLA by December 31, 2020. The CNRP must include the following:

i. Evaluation of the effectiveness of BMPs and other control actions implemented. This evaluation shall include the following:

(a) The specific ordinance(s) adopted or proposed for adoption to reduce the concentration of nutrient in urban sources.

(b) The specific BMPs implemented to reduce the concentration of urban nutrient sources and the water quality improvements expected to result from these BMPs.

(c) The specific inspection criteria used to identify and manage the urban sources most likely causing exceedances of water quality objectives for nutrients.

(d) The specific regional treatment facilities and the locations where such facilities will be built to reduce the concentration of nutrient discharged from urban sources and the expected water quality improvements to result when the facilities are complete.

and

ii. Proposed method for evaluating progress towards compliance with the nutrient WLA for Urban Runoff. The progress evaluation shall include:

(a) The scientific and technical documentation used to conclude that the CNRP, once fully implemented, is expected to achieve compliance with the urban waste load allocation for nutrient by December 31, 2020.

(b) A detailed schedule for implementing the CNRP. The schedule must identify discrete milestones decision points and alternative analyses necessary to assess satisfactory progress toward meeting the urban waste load allocations for nutrient by December 31, 2020. The schedule must also indicate which agency or agencies are responsible for meeting each milestone.

(c) The specific metric(s) that will be established to demonstrate the effectiveness of the CNRP and acceptable progress toward meeting the urban waste load allocations for nutrient by December 31, 2020.

(d) The DAMP, WQMP and LIPs shall be revised consistent with the CNRP no more than 180 days after the CNRP is approved by the Regional Board.

(e) Detailed descriptions of any additional BMPs planned, and the time required to implement those BMPs, in the event that data from the watershed-wide water quality monitoring program indicate that water quality objectives for nutrient are still being exceeded after the CNRP is fully implemented.

e. The draft CNRP must be submitted to the Regional Board by December 31, 2011. The LE/CL Permittees may submit the plan individually, jointly or through a collaborative effort with other urban dischargers such as the existing LE/CLTMDL Task Force. Regional Board staff will review the document and recommend necessary revisions no more than 90 days after receiving the draft plan. The LE/CL Permittees must submit the final version of the plan no more than 90 days after receiving the comments from Regional Board staff. The Regional Board will schedule a public hearing to consider approving the CNRP, as a final water quality-based effluent limitation for the Nutrient WLA, no more than 90 days after the final plan is submitted by the LE/CL Permittees. In approving the CNRP as the final WQBELs, the Regional Board shall make a finding that the CNRP, when fully implemented, shall achieve the urban WLA for nutrient by December 31, 2020; and,

f. Once approved by the Regional Board, the CNRP shall be incorporated into this Order as the final WQBELs for LE/CL Nutrient TMDL. Based on BMP effectiveness analysis, the CNRP shall be updated, if necessary. The updated CNRP shall be implemented upon approval by the Regional Board.

g. Compliance with the WLA is based on a 10-year running average. Hence, data collection consistent with the approved Phase 2 LE/CL TMDL monitoring program required in the Monitoring and Reporting Program must commence by December 31, 2010[37].

h. A summary of all relevant data from water quality monitoring programs shall be submitted in the Annual Report. This will include an evaluation of compliance with the LE/CL TMDL by reporting the effectiveness of the BMPs implemented in the watershed to control nutrient inputs into the lake from Urban Runoff pursuant to Regional Board Resolution No. R8-2006-0031 and R8-2007-0083, or as amended by subsequent Regional Board adopted resolutions.

i. The DAMP, WQMP and LIPs shall be revised as necessary to implement the plans submitted pursuant to paragraph a through h of this section and summarize all such revisions in the Annual Report.

j. In the event that the Regional Board has not adopted alternative final WQBELs, in accordance with Section VI.D.2.d., above, by December 31, 2020, the Urban WLAs specified in Tables 9 and 10, below, shall automatically become the final numeric WQBELs for the LE/CL Permittees to be achieved by December 31, 2020. These final Effluent Limits shall be considered effective for enforcement purposes on January 1, 2021.

Table 9 - Canyon Lake Nitrogen and Phosphorus Waste Load and Load Allocations[a]

Canyon Lake Nutrient TMDL	Final Total Phosphorus Waste Load Allocation (kg/yr)[b, c]	Final TN Waste Load Allocation (kg/yr) [b, c]
Urban	306 (675 lbs/yr)	3,974 (8763 lbs/yr)
Septic systems	139 (306 lbs/yr)	4,850 (10692 lbs/yr)

[a] The WLAs for Canyon Lake apply to those land uses located upstream of Canyon Lake.
[b] Final WLA compliance to be achieved by December 31, 2020.
[c] TMDL and WLA specified as 10-year running average.

Table 10 - Lake Elsinore Nitrogen and Phosphorus Waste Load and Load Allocations[a]

[37] Resolution No. R8-2004-0037 requires initiation of the Phase 2 watershed-wide Wet Season monitoring upon completion of the Phase 1 in-lake monitoring program. Regional Board staff is currently in discussion with LE/CL TMDL Task Force regarding this transition and are expected to identify reductions in Phase 1 monitoring program that will offset the costs of the enhanced Phase 2 program.

Lake Elsinore Nutrient TMDL	Final Total Phosphorus WLA (kg/yr)[b, c]	Final TN WLA (kg/yr)[c, d]
Urban	124 (273.3 lbs/yr)	349 (769.4 lbs/yr)
Septic systems	69 (152 lbs/yr)	608 (1340 lbs/yr)

[a] The Lake Elsinore TMDL WLAs for septic systems only apply to those land uses located downstream of Canyon Lake.

[b] Final compliance to be achieved by December 31, 2020.

[c] TMDL and WLA specified as 10-year running average.

[d] WLA for supplemental water should be met as a 5 year running average by December 31, 2020.

[e] WLA for Canyon Lake overflows

k. The LE/CL Permittees may demonstrate compliance with the WLAs using either of the following two methods:

   i. Directly, using relevant monitoring data and approved and approved modeling procedures to estimate actual nitrogen and phosphorus loads being discharged to the lakes, or,

   ii. Indirectly, using water quality monitoring data and other biological metrics approved by the Regional Board, to show Water Quality Standards are being consistently attained (as measured by the response targets identified in the LE/CL TMDL).

l. The TMDLs explicitly support the trading of pollutant allocations among sources to the extent that such allocation tradeoffs optimize point and non-point source control strategies to achieve the WQBELs in the most efficient manner.

VII. RECEIVING WATER LIMITATIONS

A. Urban Runoff discharges from the Permittees' MS4 shall not cause or contribute to exceedances of Receiving Water Quality Standards (as defined by Beneficial Uses and Water Quality Objectives in Chapter 4 of the Basin Plan) for surface waters or ground waters.

B. The DAMP and its components, including the LIPs, must be designed to achieve compliance with Receiving Water Limitations associated with discharges of Urban Runoff to the MEP. It is expected that compliance with Receiving Water Limitations will be achieved through an iterative process and the application of increasingly more effective BMPs.

C. The Permittees shall comply with Section V.B and VII.A of this Order, through timely implementation of control measures and other actions to reduce Pollutants in Urban Runoff in accordance with the DAMP and other requirements of this Order, including modifications thereto.

D. If exceedances of Water Quality Standards persist notwithstanding implementation of the DAMP and other requirements of this Order, the Permittees shall assure compliance with Sections V.B and VII.A of this Order, by complying with the following procedure:

1. Upon a determination by either the Permittees or the Executive Officer that the discharges from the MS4 are causing or contributing to an exceedance of an applicable Water Quality Standard, the Permittees shall:

    a. Promptly, within two (2) working days, provide oral or e-mail and thereafter submit a report to the Executive Officer that describes the BMPs that are currently being implemented and the additional BMPs that will be implemented to prevent or reduce those Pollutants that are causing or contributing to the exceedance of the applicable Receiving Water Quality Standards.

    b. The report may be incorporated in the annual update to the DAMP, unless the Executive Officer directs an earlier submittal.

    c. The report shall include an implementation schedule.

    d. The Executive Officer may require modifications to the report.

    e. Submit any modifications to the report required by the Executive Officer within 30 days of notification;

2. Within 30 days following approval by the Executive Officer of the report described above, the Permittees shall revise the DAMP, applicable LIPs, and monitoring program to incorporate the approved modified BMPs that have been and will be implemented, the implementation schedule, and any additional monitoring required;

3. Implement the revised DAMP, applicable LIPs and monitoring program in accordance with the approved schedule.

4. If the exceedance is solely due to discharges to the MS4 from activities or areas outside the Permittees jurisdiction or control, the Permittees must, within two (2) working days of becoming aware of the situation, provide oral or e-mail notice to the Executive Officer of the determination of the exceedance and provide written documentation of these discharges to the Executive Officer within ten (10) calendar days of becoming aware of the situation.

5. So long as the Permittees have complied with the procedures set forth above and are implementing the revised LIP, DAMP, and monitoring program, the Permittees do not have to repeat the same procedure for continuing or recurring exceedances of the same Receiving Water Limitation unless the Executive Officer determines it is necessary to develop additional BMPs

6. Nothing in Section VII.D prevents the Regional Board from enforcing any provision of this Order while the Permittee prepares and implements the above report.

VIII. LEGAL AUTHORITY/ENFORCEMENT

A. The Permittees shall maintain adequate legal authority to control the discharge of Pollutants to the MS4 from Urban Runoff and enforce those authorities. This may be accomplished through ordinance, statute, permit, contract or similar means. Such legal authority must address all IC/IDs into the MS4, including those from residential, commercial, industrial and construction sites. The Permittees shall use the enforcement guidelines developed in Section 3.4 and 4.5 of the DAMP or develop their own enforcement program and shall incorporate the enforcement program into their LIP. Such legal authority must also at a minimum include and authorize the Permittees to:

1. Carry out all inspections, surveillance, and monitoring necessary to determine compliance and noncompliance with their ordinances and permits. The Permittee must have authority, to the extent permitted by California and federal Law and subject to the limitations on municipal action under the constitutions of California and the United States, to enter, monitor, inspect, and gather evidence (pictures, videos, samples, documents, etc.) from residential, industrial, commercial, and construction sites discharging into the MS4 within the limits of its statutory authority. The Permittees shall progressively and decisively take enforcement actions against any violators of the Storm Water Ordinance. These enforcement actions must, at minimum, meet the guidelines and procedures listed in Sections 3.4 and 4.5 of the DAMP.

2. Control the contribution of Pollutants to the MS4;

3. Stop Pollutant discharge or threat of discharge if a discharger is unable or unwilling to correct significant non-compliance where there is a serious threat to public health or the environment;

4. Require the use of BMPs to prevent or reduce the discharge of Pollutants into MS4 consistent with the MEP standard.

5. Require documentation on the effectiveness of BMPs implemented to reduce the discharge of Pollutants to the MS4; and

6. The Co-Permittees' Storm Water Ordinances or other local regulatory mechanisms shall include sanctions to ensure compliance. Sanctions shall include but are not limited to: oral and/or written warnings, notice of violation or non-compliance, administrative compliance orders, stop work or cease and desist order, a civil citation or injunction, the imposition of monetary penalties or criminal prosecution (infraction or misdemeanor). These sanctions shall be issued in a decisive manner within a predetermined timeframe, from the time of the violation's occurrence and/or follow-up inspection.

B. The Co-Permittees shall take progressive and decisive enforcement actions against violators of their Storm Water Codes and Ordinances, in accordance with the federal storm water regulations (40CFR, Part 122.26(d)(2)(I)(A-F)), and adopted/established guidelines and procedures as described in Section 3.4 of the DAMP. The Co-Permittees shall consider the time to return to compliance as one measure of effectiveness of their Storm Water Ordinances or enforcement response procedure. The Co-Permittees shall document these actions in their records (including electronic databases as outlined in the DAMP) and Annual Reports. The Co-Permittees shall use their authority to bring dischargers into immediate compliance with enforcement actions.

C. Within three (3) years of adoption of this Order, the Co-Permittees shall promulgate and implement ordinances that would control known pathogen or Bacterial Indicator sources such as animal wastes, if necessary.

D. The Co-Permittees shall continue to provide notification to the Executive Officer of storm water related information obtained during site inspections of construction and industrial sites regulated by the General Storm Water Permits and of sites that should be regulated under the General Storm Water Permits. The notification should include perceived violations of the General Storm Water Permits or local requirements, prior history of violations of the Permittee's Storm Water Ordinance, enforcement actions related to the Storm Water Ordinance taken by the Permittee, and other relevant information. In addition, Sections XVI.B of this Order addresses additional notification requirements for construction, industrial and commercial sites not covered under the General Storm Water Permits. Notification shall not prevent or delay the Co-Permittees from independently taking appropriate actions to bring Construction Sites and Industrial Facilities into compliance with their local ordinances, rules, regulations and WQMP.

E. The Permittees are encouraged to enter into interagency agreements with owners of other MS4, such as CalTrans, school and college districts, universities, Department of Defense, Native American Tribes, etc., to control the contribution of Pollutants into their

MS4 from the non-Permittee MS4. The Regional Board will continue to notify the owner/operator of the MS4 systems and the Permittee if the Board issues a permit for discharges into the MS4.

F. The Co-Permittees shall annually review their Storm Water Ordinances and provide findings within the Annual Report on the effectiveness of these ordinances and enforcement programs in prohibiting the following types of discharges to the MS4 (the Co-Permittees may propose appropriate BMPs in lieu of prohibiting these discharges, where the Co-Permittees are responsible for ensuring that dischargers adequately maintain those BMPs):

1. Sewage, where a Co-Permittee operates the sewage collection system (also prohibited under the Statewide SSO Order[38]);
2. Wash water resulting from the hosing or cleaning of gas stations, auto repair garages, and other types of automobile service stations;
3. Discharges resulting from the cleaning, repair, or maintenance of any type of equipment, machinery, or facility, including motor vehicles, concrete mixing equipment, portable toilet servicing, etc.;
4. Wash water from mobile auto detailing and washing, steam and pressure cleaning, carpet/upholstery cleaning, pool cleaning and other such mobile commercial and industrial activities;
5. Water from cleaning of municipal, industrial, and commercial sites, including parking lots, streets, sidewalks, driveways, patios, plazas, work yards and outdoor eating or drinking areas, etc.;
6. Runoff from material storage areas or uncovered receptacles that contain chemicals, fuels, grease, oil, or other Hazardous Materials[39];
7. Discharges of runoff from the washing of hazardous material from paved or unpaved areas;
8. Discharges of pool or fountain water containing chlorine, biocides, or other chemicals; pool filter backwash containing debris and chlorine;
9. Pet waste, yard waste, litter, debris, sediment, etc.; and,
10. Restaurant or food processing facility wastes such as grease, floor mat and trash bin wash water, food waste, etc.

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[38] State Board WQO No. 2006-0003.
[39] Hazardous material is defined as any substrate that poses a threat to human health or the environment due to its toxicity, corrosiveness, ignitability, explosive nature or chemical reactivity. These also include materials named by EPA to be reported if a designed quantity of the material is spilled into the waters of the United States or emitted into the environment.

G. Within 24 months after Order adoption, each Co-Permittee shall submit a certification statement, signed by its legal counsel, that the Co-Permittee has obtained all necessary legal authority in accordance with 40 CFR 122.26(d)(2)(i) (A-F) and to comply with this Order through adoption of ordinances and/or municipal code modifications. A copy of the certification shall also be placed in the LIP.

H. Annually thereafter, Permittees shall evaluate the effectiveness of implementation and enforcement response procedures with respect to the above items. The findings of these reviews, along with recommended corrective actions, where appropriate, and schedules shall be submitted as part of the Annual Report for the corresponding reporting period. The LIP shall be updated accordingly.

IX. ILLICIT CONNECTIONS/ILLEGAL DISCHARGES (IC/ID); LITTER, DEBRIS AND TRASH CONTROL

A. Consistent with each Co-Permittees statutory authority, the Co-Permittees have adopted Storm Water Ordinances. The Co-Permittees must continue to prohibit IC/IDs to the MS4 through their Storm Water Ordinances and the Principal Permittee must do so through its statutory authority. In addition, the Permittees must continue to implement and improve routine inspection and monitoring and reporting programs for their MS4 facilities. If routine inspections or Dry Season monitoring indicate IC/IDs, they must be investigated and eliminated or permitted within sixty (60) calendar days of receipt of notice by its staff or from a third party.

B. The Permittees upon being put on notice by staff or a third party must immediately (within 24 hours of receipt of notice by its staff or from a third Party) investigate all spills, leaks, and/or other illegal discharges to the MS4. Based upon their assessment and as specified below, the Permittees must provide notifications and reporting as described in Section 4 of the DAMP and Section XVI of this Order.

C. The Permittees shall control Illegal Dumping that may result in a discharge of Pollutants to the MS4 to the MEP. The Permittees shall describe their procedures and authorities for managing Illegal Dumping in their LIP.

D. Within 18 months of adoption of this Order, the Permittees shall review and revise their IC/ID program to include a pro-active IDDE using the Guidance Manual for Illicit Discharge, Detection, and Elimination by the Center for Watershed Protection[40] or any

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[40] USEPA (Illicit Discharge Detection and Elimination - A Guidance Manual for Program Development and Technical Assessments) by the Center for Watershed Protection and Robert Pitt, University of Alabama, October 2004, updated 2005).

other equivalent program consistent with Section IX.E below. The result of this review shall be reported in the Annual Report and include a description of the Permittees' revised pro-active program, procedures and schedules. The LIP shall be updated accordingly.

E. The Permittees' revised IC/ID programs shall specify an IDDE program for each Co-Permittee to individually, or in combination:

   a. Develop an inventory and map of Permittee MS4 facilities and Outfalls to Receiving Waters.

   b. Develop a schedule to be submitted within 18 months to conduct and implement systematic investigations of MS4 open channels and Major Outfalls.

   c. Use field indicators to identify potential Illegal Discharges, if applicable;

   d. Track Illegal Discharges to their sources[41] where feasible; and

   e. Educate the public about Illegal Discharges and Pollution Prevention where problems are found.

F. The Permittees shall continue to integrate IC/ID detection and elimination into their inspection programs, training of Permittee staff, and monitoring data collection and other indicator data.

G. The Permittees shall annually review and evaluate their IC/ID program, including litter/trash BMPs, to determine if the program needs to be adjusted. Findings of the review and evaluation shall be submitted with the Annual Report.

H. The Permittees shall maintain a database summarizing IC/ID incident response (including IC/IDs detected as part of field monitoring activities). This information shall be updated on an ongoing basis and submitted with the Annual Report.

I. The Permittees shall control, consistent with the MEP standard, Illegal Discharges (including the discharge of spills, leaks, or dumping of any materials other than storm water and authorized non-storm water) into the MS4. All reports of Illegal Discharge shall be promptly investigated and reported as specified in Section XVI (Notification Requirements).

J. In the 2004-2005 Annual Report, the Permittees characterized trash, determined its main source(s) and developed and implemented appropriate BMPs to reduce and/or to eliminate the discharge of trash and debris to Waters of the US to the MEP. The BMPs should be continued and their effectiveness must be reported in the Annual Report.

K. Where non-jurisdictional IC/IDs within a Permittees jurisdiction are identified, the Permittees will notify the responsible party and the Executive Officer of the discharge.

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[41] Table 2: Land uses, Generating Sites and Activities that Produce Indirect Discharges from IDDE, A Guidance Manual for Program Development and Technical Assessments, October 2004 CWP.

X. SEWAGE SPILLS, INFILTRATION INTO THE MS4 SYSTEMS FROM LEAKING SANITARY SEWER LINES, SEPTIC SYSTEM FAILURES, AND PORTABLE TOILET DISCHARGES

A. The Permittees shall continue to provide local sanitation districts 24-hour access to the MS4 to address sewage spills. The Permittees shall continue to work cooperatively with the local sewer agencies to determine and control the impact of infiltration from leaking sanitary sewer systems on Urban Runoff quality. Each Permittee shall implement control measures necessary to minimize infiltration of seepage from sanitary sewers to the MS4 through routine preventative maintenance of the MS4.

B. Each Permittee shall continue to cooperate and coordinate with the sewage collection/treatment agencies as described in Appendix I of the DAMP to swiftly respond to and contain sewage spills that may discharge into its MS4. Management and/or preventive measures shall continue to be implemented for sources including portable toilets, failing septic systems, and failing private laterals that may cause or contribute to Urban Runoff Pollution problems in Permittee jurisdictions.

C. Permittees who are regulated under the SSO Order No. 2006-0003-DWQ, shall continue to comply with that Order to control sanitary system overflows.

D. Permittees with septic systems in their jurisdiction shall maintain the inventory of septic systems within its jurisdiction completed in 2008. Updates to the inventory will be maintained by County Environmental Health via a database of new septic systems approved since 2008.

XI. CO-PERMITTEE INSPECTION PROGRAMS

The Permittee inspection programs are outlined in Sections 7 and 8 of the DAMP and describe some of the minimum inspection and enforcement procedures utilizing existing inspection programs, provides criteria for characterizing the significance of violations, criteria for prioritizing violations, appropriate response actions corresponding to the priority of violations and identifies the hierarchy of enforcement/compliance responses. Section 3.4 of the DAMP provides a framework to standardize the implementation and enforcement by the Co-Permittees of their respective Storm Water Ordinances. The Co-Permittees shall continue to enforce their respective Storm Water Ordinances consistent with the DAMP and this Order.

A. GENERAL REQUIREMENTS

1. The Co-Permittees shall continue to maintain and update a database inventory of all active Construction Sites, and Industrial and Commercial Facilities within their jurisdiction consistent with the database requirements of Section 7 and 8 of the DAMP. Construction Sites and Industrial and Commercial Facilities shall be

included in the database inventories regardless of whether the Construction Sites or Commercial and Industrial Facilities are subject to the General Construction Permit or the General Industrial Permit or other individual NPDES permit or WDRs.

2. The Co-Permittee inspection database inventory described in Section XI.A.1 shall be maintained in an electronic database format that may be made available to the Regional Board upon request (e.g. request via phone call, e-mail, letter, etc,). The database inventory must be consistent with the requirements of Sections 7 and 8 of the DAMP. Supporting paper (or electronic) files shall also be maintained and made available upon Regional Board request. Supporting files should include a record of inspection dates, the results of each inspection, photographs (if any), video (if any) and a summary of any enforcement actions taken. The inventory databases shall be updated on an annual basis and an electronic copy shall be provided with each Annual Report.
3. The Co-Permittee shall not issue an occupancy permit to an Industrial Facility or other license authorizing the facility to operate, unless the applicant is informed of the General Industrial Permit and that it may have to secure coverage under the General Industrial Permit. The Co-Permittees shall verify during Industrial Facility inspections whether a site has obtained necessary permit coverage under the General Industrial Permit.
4. If the Industrial Facility's SIC code falls under the mandatory category the Co-Permittee shall notify the Regional Board and the applicant that they may be required to obtain coverage under the General Industrial Permit.
5. Permits for Construction Sites shall not be granted until appropriate coverage under the General Construction Permit (s) is verified.
6. Perceived Non-filers for the General Storm Water Permits shall be reported consistent with Section XVI.E.
7. If a Co-Permittee receives notice by its staff or from a third party of a non-Emergency Situation representing a possible violation of the General Storm Water Permit or other permit issued by the State or Regional Board to an Industrial Facility or Construction Site, the Co-Permittee shall, within two (2) working days, provide oral or e-mail notice to Regional Board staff of the location within its jurisdiction where the incident occurred and describe the nature of the incident. After notifying the Regional Board, no further action is necessary regarding the General Storm Water Permits. However, each Co-Permittee shall take appropriate actions to bring an Industrial Facility or Construction Site into compliance with its Storm Water Ordinances.
8. The Co-Permittees need not inspect facilities already inspected by Regional Board staff if the inspection was conducted within the specified time period. Regional

Board staff inspection information is available at www.ciwqs.ca.gov[42].

9. Each Co-Permittee shall respond to complaints received from third parties regarding Construction Sites and Industrial and Commercial Facilities in a timely manner to ensure that the sites are not a source of Pollutants to the MS4 and the Receiving Waters.
10. The Co-Permittees shall enforce their Storm Water Ordinances and permits at all Construction Sites and Industrial, and Commercial Facilities in a fair, firm and consistent manner. Sanctions for non-compliance as required under Section VIII (Legal Authority/Enforcement) shall be deemed adequate to bring the site into compliance with their Storm Water Ordinances and permits.
11. Each Co-Permittee shall document, evaluate and annually report the effectiveness of its enforcement procedures in achieving prompt and timely compliance with inspection programs. Sanctions for non-compliance shall be adequate to bring the site into compliance and to stop the Pollutant discharge consistent with the requirements of Section VIII of this Order.
12. The Principal Permittee and the County have implemented the CAP. Through the Riverside County Department of Environmental Health, the CAP addresses storm water compliance issues at restaurant facilities and businesses that must have a hazardous material permit for either storing, handling or generating hazardous materials. As described in Section 8 of the DAMP, the Permittees must either participate in the CAP or implement an equivalent inspection program. The cities of Corona and Riverside maintain such programs through their respective POTW pre-treatment programs that may be supplemented by the activities of the Department of Environmental Health during routine inspections. The County is establishing a stand-alone NPDES Storm water Compliance Inspection and Enforcement Program (CIEP) for Industrial and Commercial Facilities in the unincorporated areas of the County.
13. Where inspections and/or enforcement required by this Order are carried out on behalf of the Co-Permittee by other agencies or departments such as the County Department of Environmental Health, county and local fire departments, hazardous materials programs, code enforcement, industrial pretreatment, and building and safety, the Co-Permittee shall monitor and annually evaluate and report adequacy of program coverage and enforcement response in complying with this Order.
14. All inspectors shall be trained in accordance with Section XV.

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[42] To obtain access to the State database, registration at the following link is necessary: http://www.waterboards.ca.gov/water_issues/programs/ciwqs/chc_npdes.shtml. Contact information is available at http://www.waterboards.ca.gov/water_issues/programs/ciwqs/contactus.shtml.

B. CONSTRUCTION SITES

1. Each Co-Permittee shall include in the electronic database identified in Section XI.A.2 an inventory of all Construction Sites within its jurisdiction for which building or grading permits have been issued and activities at the site include: soil movement; uncovered storage of materials or wastes, such as dirt, sand or fertilizer; or exterior mixing of cementaceous products, such as concrete, mortar or stucco.

2. Each Permittee shall continue to prioritize Construction Sites within its jurisdiction as a high, medium or low threat to water quality. Evaluation of construction sites shall be based on factors, which shall include but not be limited to: soil erosion potential, project size, proximity and sensitivity of Receiving Waters and any other relevant factors. At a minimum, high priority Construction Sites shall include: sites disturbing 50 acres and greater; sites disturbing over 1 acre with Direct Discharge to Receiving Waters with CWA Section 303(d) listed waters for sediment or turbidity impairments; site specific characteristics[43] ; and any other relevant factor. At a minimum, medium priority construction sites shall include: sites disturbing between 10 to less than 50 acres of disturbed soil.

3. Each Permittee shall conduct Construction Site inspections for compliance with its ordinances (grading, WQMPs, etc.) and local permits (building, grading, etc.). The Permittees shall develop a checklist for conducting Construction Site inspections. Inspections of Construction Sites shall include, but not be limited to:

   a. Verification of coverage under the General Construction Permit (PRDs or Waste Discharge Identification Number [WDID]) during the initial inspection. As Permittees become aware of changes in ownership, they shall notify Regional Board staff.
   b. Ensure that the BMPs implemented on-site are effective for the appropriate phase of construction (preliminary stage, mass grading stage, streets and utilities stage etc.).
   c. Visual observations for Illegal Discharges, potential Illicit Connections, and potential Pollutant sources.
   d. Implementation and maintenance of BMPs required under local requirements.
   e. An assessment of the effectiveness of BMPs implemented at the site and the need for any additional BMPs.

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[43] The recently adopted General Construction Permit Order No. 2009-0009-DWQ includes risk-based characterization of construction sites based on site-specific conditions.

4. At a minimum, the inspection frequency shall include the following:
   a. During the Wet Season (October 1 through May 31 of each year), all high priority Construction Sites are to be inspected, in their entirety, once a month. All medium priority Construction Sites are to be inspected at least twice during the Wet Season. All low priority Construction Sites are to be inspected at least once during the Wet Season. Construction Sites that disturb less than one acre may be inspected on an as needed basis. When BMPs or BMP maintenance is deemed inadequate or out of compliance, an inspection frequency of at least once per week should be maintained until BMPs and BMP maintenance are brought into compliance.
   b. During the Dry Season (June 1 through September 30 of each year), all Construction Sites shall be inspected at a frequency sufficient to ensure that sediment and other Pollutants are properly controlled and that unauthorized, Non-storm Water discharges are prevented.

C. INDUSTRIAL FACILITIES

1. To establish priorities for inspection, the Permittees shall continue to prioritize Industrial Facilities within their jurisdiction as a high, medium, or low threat to water quality. Continual evaluation of these Industrial Facilities should be based on such factors as type of industrial activities (i.e., SIC codes), materials or wastes used or stored outside, Pollutant discharge potential, compliance history, facility size, proximity and sensitivity of Receiving Waters and any other relevant factors described in Section 8 of the DAMP. At a minimum, a high priority shall be assigned to: Industrial Facilities subject to section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA); Industrial Facilities that handle or generate Pollutants for which the receiving water is impaired, facilities that have a significant potential to release pre-production plastics or nurdles into the environment, and Industrial Facilities with a high potential for or history of unauthorized, Non-storm Water discharges.
2. Each Co-Permittee shall conduct Industrial Facility inspections for compliance with its ordinances, permits and this Order. Industrial Facility inspections shall be consistent with Section 8 of the DAMP. If an inspection indicates the need for follow-up, Co-Permittee follow-up inspections shall include a review of the Industrial Facility's material and waste handling and storage practices, written documentation of Pollutant control BMP implementation and maintenance procedures, digital photographic documentation of water quality violations as well as evidence of past or present unauthorized, Non-storm Water discharges and enforcement actions issued at the time of the Co-Permittee inspection. Report of inspections shall be included in the Annual Report and shall provide the basis for downgrading or upgrading priority ranking of Industrial Facilities.

3. All high priority Industrial Facilities are to be inspected at least once a year; all medium priority Industrial Facilities are to be inspected at least once every two years; and all low priority Industrial Facilities are to be inspected at least once during the term of this Order. In the event that inappropriate material or waste handling or storage practices are observed, or unauthorized, non-storm water discharges are observed, an enforcement order shall be issued and a re-inspection frequency adequate to bring the Industrial Facility into compliance must be maintained (at a minimum, once a month or within the compliance schedule prescribed by the Co-Permittee in a written notice to the discharger). Once compliance is achieved, a minimum inspection frequency of once every six months should be maintained for the annual reporting period.
4. Each Co-Permittee shall continually identify undocumented Industrial Facilities within its jurisdiction and shall add them to the database, as identified in Section XI.A.2. Additionally, each Industrial Facility shall be listed as per the criteria in specified in Section XI.C.1 within 15 days from the initial date of discovery of the Industrial Facility.
5. Each Permittee shall require Industrial Facilities to implement source control and pollution prevention measures consistent with the requirements of Section 8.of the DAMP.

D. COMMERCIAL FACILITIES

1. Each Permittee shall continue to implement the CAP or equivalent, pursuant to Section 8. of the DAMP and Section XI.A.9 (complaints) of this Order; Section 8 shall be modified to clarify the types of facilities specifically addressed by the CAP. Within 18 months, the Co-Permittees shall also identify any facilities that transport, store or transfer pre-production plastic pellets and managed turf facilities (e.g. private golf courses, athletic fields, cemeteries, and private parks) within their jurisdiction and determine if these facilities warrant additional inspection to protect water quality.
2. The Permittees shall continue to develop BMPs applicable for each of the Commercial Facilities described in Section 8 of the DAMP.
3. The Co-Permittees shall continue to prioritize Commercial Facilities within their jurisdiction as a high, medium, or low threat to water quality based on such factors as the type, magnitude, and location of the commercial activity, proximity and sensitivity of Receiving Waters, potential for discharge of Pollutants to the MS4, Commercial Facilities that handle or generate Pollutants for which the Receiving Water is Impaired, frequency of inspections and facilities with a high potential for or history of unauthorized, Non-storm Water discharges.
4. All high priority Commercial Facilities shall be inspected at least once per year; all medium priority Commercial Facilities shall be inspected at least every two years; and all low priority Commercial Facilities shall be inspected at least once during the

term of this Order. At a minimum, each Commercial Facility shall be required to implement source control and pollution prevention BMPs consistent with the requirements of Section 8 of the DAMP. Co-Permittee follow-up inspections should include a review of BMPs implemented, their effectiveness and maintenance; written and photographic documentation of materials and waste handling and storage practices; evidence of past or present unauthorized, Non-storm Water discharges; and an assessment of management/employees awareness of storm water pollution prevention measures.

5. In the event that inappropriate material or waste handling or storage practices are observed, or there is evidence of past or present unauthorized, Non-storm Water discharges, a written enforcement order shall be issued at the time of the initial inspection for CAP equivalent inspection programs or at the time of the CAP follow-up inspection, to bring the Commercial Facility into compliance.
6. Within 18 months of adoption of this Order, the Co-Permittee shall notify all mobile businesses based within their jurisdiction concerning the minimum Source Control and Pollution Prevention BMPs that they must develop and implement. For purposes of this Order, mobile businesses include: mobile auto washing/detailing; equipment washing/cleaning; carpet, drape, furniture cleaning; and mobile high pressure or steam cleaning activities that are based out of a Co-Permittee's jurisdiction. The mobile businesses shall be required to implement appropriate BMPs within 3 months of being notified by the Co-Permittees. The Co-Permittees shall also notify mobile businesses discovered operating within their jurisdiction.
7. Within 24 months of adoption of this Order, the Co-Permittees shall develop an enforcement strategy to address mobile businesses.
8. The Co-Permittees should continue to maintain the CAP restaurant inspection program, or equivalent. Inspections for Commercial Facilities with restaurants shall, at a minimum, address:
    a. Oil and grease disposal to verify that these wastes are not poured onto a parking lots, streets or adjacent catch basins;
    b. Trash bin areas, to verify that these areas are clean, the bin lids are closed, the bins are not used for liquid waste disposal and wash water from the bins is not disposed of into the MS4;
    c. Parking lot, alley, sidewalk and street areas to verify that floor mats, filters and garbage containers are not washed in those areas and that no wash water is disposed of in those areas;
    d. Parking lot areas to verify that they are cleaned by sweeping, not by hosing down, and that the facility operator uses dry methods for spill cleanup; and,
    e. Violations of the Storm Water Ordinance shall be enforced by the jurisdictional Co-Permittee.

E. RESIDENTIAL PROGRAM

1. Within 18 months of adoption of this Order, each Co-Permittee shall develop and implement a residential program consistent with these requirements to reduce the discharge of Pollutants from residential activities to the MS4, consistent with the MEP standard.
2. The Co-Permittees shall identify residential activities that are potential sources of Pollutants and develop and/or enhance Fact Sheets/BMPs as appropriate. At a minimum, this should include: residential auto washing and maintenance activities; use and disposal of pesticides, herbicides, fertilizers and household cleaners; and collection and disposal of pet wastes. The Permittees shall distribute the Fact Sheets/BMPs and appropriate information from organizations such as the Riverside-Corona Resource Conservation District[44] and USDA's Backyard Conservation Program[45] to the residents to ensure that discharges from the residential areas are not causing or contributing to a violation of Water Quality Standards in the Receiving Waters.
3. The Co-Permittees, collectively or individually, shall facilitate the proper collection and management of used oil, toxic and hazardous materials, and other household wastes. The Permittees should continue distribution of information regarding the dates and locations of temporary and permanent household hazardous waste and antifreeze, oil, battery and paint collection events and facilities, and financial support of household hazardous waste and antifreeze, oil, battery and paint collection facilities and events or curbside or special collection sites managed by the Co-Permittees or private entities, such as solid waste haulers.
4. The Regional Board recommends continuation of Co-Permittee efforts to coordinate with local water purveyors and other stakeholders to encourage efficient irrigation and minimize runoff from residential areas.
5. The Co-Permittees shall enforce their Storm Water Ordinance as appropriate to control the discharge of Pollutants associated with residential activities.
6. Each Co-Permittee shall include an evaluation of its residential program in the Annual Report starting with the second Annual Report after adoption of this Order.

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[44] The Riverside-Corona Resource Conservation District (RCRCD) provides gardening and horticulture information appropriate for the area including native plant selection, backyard management, alternatives to pesticide, irrigation scheduling and composting. The RCRCD is sponsored by the cities and county of Riverside Only Rain Down the Storm Drain Pollution Prevention Program.

[45] Backyard Conservation, Bringing Conservation from the Countryside to Your Backyard, USDA Natural Resources Conservation Service, National Association of Conservation Districts, Wildlife Habitat Council and National Audubon Society.

XII. NEW DEVELOPMENT (INCLUDING SIGNIFICANT REDEVELOPMENT)

A. GENERAL REQUIREMENTS:

1. Each Co-Permittee, consistent with the DAMP, and requirements of this Order, when considering any map or permit for a New Development or Significant Redevelopment project for which discretionary approval is sought, must continue to require such map or permit to obtain coverage under the General Construction Permit, where applicable, prior to the issuance of grading or construction permits. Each Co-Permittee shall specify its verification procedure and any tools utilized for this purpose in its LIP.

2. Each Co-Permittee must continue to implement those BMPs identified in Section 7.1 of the DAMP. Each Permittee shall ensure that the erosion and sediment control plans it approves include appropriate erosion and sediment control BMPs (i.e., erosion measures for slopes greater than a certain length or hill-side developments, ingress/egress controls, perimeter controls, run-on diversion, if significant) such that a distinct and effective combination of BMPs consistent with site risk is implemented through all phases of construction.

3. The land use approval process of each Co-Permittee must continue to require post-construction BMPs, Source Control BMPs and Treatment Control BMPs and identify their locations and long-term maintenance responsibilities consistent with the requirements of this Order.

4. Each Permittee shall ensure, consistent with the MEP standard and within the limits of its legal authority, that runoff from New Development and Significant Redevelopment projects not regulated under this Order but that require encroachment permits for connections to the MS4 regulated under this Order are consistent with the requirements of this Order including the model WQMP for the Permit Area.
5. Each Permittee shall ensure that appropriate BMPs to reduce erosion and mitigate Hydromodification are included in the design for replacement of existing culverts or construction of new culverts and/or bridge crossings to the MEP[46].
6. Each Permittee shall ensure, consistent with the MEP standard, that runoff from development projects it approves, does not cause nuisance to adjoining downstream properties and stream channels.
7. Each Permittee shall ensure to the MEP that MS4s[47] are appropriately maintained consistent with Section XIV of this Order or are adequately maintained by a legally responsible party.

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[46] This type of project may require a CWA Section 404 Permit.

8. Each Permittee shall require applicants to minimize the short and long-term adverse impacts on Receiving Water quality from New Development and Significant Redevelopment maps or permits where discretionary approval is sought, as required in Section XII.D below, by: (1) continuing to review, approve, and verify implementation of project-specific WQMPs, implementation of LID principles, where feasible; (2) addressing HCOCs; and (3) ensuring that long term BMP operation and maintenance mechanisms are in place prior to project closure or issuance of certificates of occupancy.

9. The requirements of Section XII.D below shall apply to Permittee projects that meet the New Development and Significant Redevelopment criteria.

10. Each Permittee shall participate in the development of a Watershed Action Plan, described in Section XII.B, below, to integrate water quality, stream protection and storm water management and use within the Permit Area with land use planning policies, ordinances, and plans.

B. WATERSHED ACTION PLAN

1. An integrated watershed management approach may facilitate integration of planning and project approval processes with water quality and quantity control measures. Management of the impacts of Permit Area urbanization on water quality and stream stability is more effectively done on a per-site, neighborhood and municipal basis based on an overall watershed plan. Pending completion of the Watershed Action Plan consistent with this section, management of the impacts of urbanization shall be accomplished using existing programs. The Permittees shall develop a Watershed Action Plan to address the entire Permit Area. The Permittees may choose to develop sub-watershed action plans based on the overall Watershed Action Plan in the future based on new 303(d) impairments, TMDL requirements, or other factors.

2. The Permittees shall develop and submit to the Executive Officer for approval a Watershed Action Plan that describes and implements the Permittees' approach to coordinated watershed management. The objective of the Watershed Action Plan is to address watershed scale water quality impacts of urbanization in the Permit Area associated with Urban TMDL WLAs, stream system vulnerability to Hydromodification from Urban Runoff, cumulative impacts of development on

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[47] Urban runoff conveyance systems created or resulting from development projects approved by Permittees.

vulnerable streams, preservation of Beneficial Uses of streams in the Permit Area, and protection of water resources, including groundwater recharge areas.

3. Within three years of Permit adoption, the Co-Permittees shall develop the Watershed Action Plan and implementation tools to address impacts of urbanization in a holistic manner. At a minimum, the Watershed Action Plan shall include the following:
   a. Describe proposed Regional BMP approaches that will be used to address Urban TMDL WLAs.
   b. Develop recommendations for specific retrofit studies of MS4, parks and recreational areas that incorporate opportunities for addressing TMDL Implementation Plans, Hydromodification from Urban Runoff and LID implementation.
   c. Description of regional efforts that benefit water quality (e.g. Western Riverside County Multiple Species Habitat Conservation Plan, TMDL Task Forces, Water Conservation Task Forces, Integrated Regional Watershed Management Plans) and their role in the Watershed Action Plan. The Permittees shall describe how these efforts link to their Urban Runoff Programs and identify any further coordination that should be promoted to address Urban WLA or Hydromodification from Urban Runoff to the MEP.
4. Within two years of adoption of this Order, the Permittees shall delineate existing unarmored or soft-armored stream channels in the Permit Area that are vulnerable to Hydromodification from New Development and Significant Redevelopment projects.
5. Within two years of completion of the delineation in Section XII,B.4 above, develop a Hydromodification management plan (HMP) describing how the delineation will be used on a per project, sub-watershed, and watershed basis to manage Hydromodification caused by urban runoff. The HMP shall prioritize actions based on drainage feature/susceptibility/risk assessments and opportunities for restoration.
   a. The HMP shall identify potential causes of identified stream degradation including a consideration of sediment yield and balance on a watershed or sub-watershed basis.
   b. Develop and implement a HMP to evaluate Hydromodification impacts for the drainage channels deemed most susceptible to degradation. The HMP will identify sites to be monitored, include an assessment methodology, and required follow-up actions based on monitoring results. Where applicable, monitoring sites may be used to evaluate the effectiveness of BMPs in preventing or reducing impacts from Hydromodification.

6. Identify Impaired Waters [CWA § 303(d) listed] with identified Urban Runoff Pollutant sources causing impairment, existing monitoring programs addressing those Pollutants, any BMPs that the Permittees are currently implementing, and any BMPs the Permittees are proposing to implement consistent with the other requirements of this Order. Upon completion of XII.B.4, develop a schedule to implement an integrated, world-wide-web available, regional geodatabase of the impaired waters [CWA § 303(d) listed], MS4 facilities, critical habitat preserves defined in the Multiple Species Habitat Conservation Plan and stream channels in the Permit Area that are vulnerable to Hydromodification from Urban Runoff.

7. Develop a schedule to maintain the geodatabase required in Section XII.B.4 and other available and relevant regulatory and technical documents associated with the Watershed Action Plan.

8. Within three years of adoption of this Order, the Watershed Action Plan shall be submitted to the Executive Officer for approval and incorporation into the DAMP. Within six months of approval, each Permittee shall implement applicable provisions of the approved revised DAMP and incorporate applicable provisions of the revised DAMP into the LIPs for watershed wide coordination of the Watershed Action Plan.

9. The Permittees shall also incorporate Watershed Action Plan training, as appropriate, including training for upper-level managers and directors into the training programs described in Section XV. The Co-Permittees shall also provide outreach and education to the development community regarding the availability and function of appropriate web-enabled components of the Watershed Action Plan.

10. Invite participation and comments from resource conservation districts, water and utility agencies, state and federal agencies, non-governmental agencies and other interested parties in the development and use of the Watershed Geodatabase;

C. INCORPORATION OF WATERSHED PROTECTION PRINCIPLES INTO PLANNING PROCESSES

1. Within 24 months of adoption of this Order, each Co-Permittee shall review its General Plan and related documents including, but not limited to its development standards, zoning codes, conditions of approval and development project guidance to eliminate any barriers to implementation of the LID principles and HCOC discussed in Section XII.E of this Order. The results of this review along with any proposed action plans and schedules shall be reported in the Annual Report for the corresponding reporting year. Any changes to the project approval process or procedures shall be reflected in the LIP.

2. The Co-Permittees shall continue to ensure that their General Plan and related land use ordinances and land use approval processes (including, but not limited to, its approved development standards, zoning ordinances, standard conditions of approval, or project development guidelines) ensure the principles and policies enumerated below are properly considered and are incorporated, as appropriate, into the land use approval process to the MEP:
   a. Limit disturbance of natural water bodies and drainage systems; conserve natural areas; protect slopes and channels; minimize significant adverse impacts from Urban Runoff on the biological integrity of natural drainage systems and water bodies;
   b. Minimize changes in hydrology and Pollutant loading; require incorporation of controls including Source Control and Treatment Control BMPs to mitigate any projected increases in Pollutant loads and flows; ensure that post-development runoff rates and velocities from a site do not adversely impact downstream erosion and stream habitat; minimize the quantity of Urban Runoff directed to impermeable surfaces and the MS4; and maximize the percentage of permeable surfaces to allow more percolation of Urban Runoff into the ground;
   c. Preserve wetlands, riparian corridors, and buffer zones that provide important water quality benefits; establish reasonable limits on the clearing of vegetation from the project site;
   d. Encourage the use of BMPs to manage Urban Runoff quantity and quality, consistent with XII.C.1 above;
   e. Provide for appropriate permanent measures to reduce Pollutant loads in Urban Runoff from the development site; and
   f. Establish development guidelines for areas particularly susceptible to erosion and sediment loss.

3. The Co-Permittees, when acting as a CEQA Lead Agency for a project requiring a CEQA document, must identify at the earliest possible time in the CEQA process resources under the jurisdiction by law of the Regional Board which may be affected by the project. The preliminary WQMP should identify the need for any CWA Section 401 certification. The Co-Permitees should coordinate project review with Regional Board staff pursuant to the requirements of CEQA. Upon request by Regional Board staff, this coordination shall include the timely provision of the discharger's identity and their contact information and the facilitation of early-consultation meetings.

4. The following potential impacts shall be considered during CEQA review:
   a. Potential impact of project construction on Urban Runoff.
   b. Potential impact of project's post-construction activity on Urban Runoff.

c. Potential for discharge of Pollutants from areas of material storage, vehicle or equipment fueling, vehicle or equipment maintenance (including washing), waste handling, hazardous materials handling or storage, delivery areas or loading docks, or other outdoor areas.

d. Potential for discharge of Urban Runoff to affect Beneficial Uses of the Receiving Waters.

e. Potential for significant changes in the flow velocity and/or volume of Urban Runoff that could cause environmental harm.

f. Potential for significant increases in erosion of the project site or surrounding areas.

5. Each Permittee shall provide the Regional Board with the draft amendment or revision when a pertinent General Plan element or the General Plan is noticed for comment in accordance with Govt. Code § 65350 et seq.

D. WATER QUALITY MANAGEMENT PLAN (WQMP) FOR URBAN RUNOFF (FOR NEW DEVELOPMENT/ SIGNIFICANT REDEVELOPMENT):

1. Each Permittee shall continue to require project-specific WQMPs for those maps and permits described below for which discretionary approval is sought and as further described in Section 6 and Appendix O of the DAMP. Within 18 months of adoption of this Order, the Permittees shall submit a revised WQMP to incorporate new elements required in this Order. The primary objective of the WQMP, by addressing Site Design, Source Control and Treatment Control BMPs applied on a regional, sub-regional or site specific basis, is to ensure that the land use approval process of each Co-Permittee will minimize Pollutant loads in Urban Runoff from maps or permits for which discretionary approval is given.

2. Each Co-Permittee shall ensure that an appropriate WQMP is prepared for the following categories of New Development and Significant Redevelopment projects for which a map or permit for discretionary approval is sought:

   a. *All significant re-development projects:* Significant re-development is defined as the addition or replacement of 5,000 or more square feet of impervious surface on an already developed site. Significant Redevelopment does not include routine maintenance activities that are conducted to maintain original line and grade, hydraulic capacity, original purpose of the facility, or emergency redevelopment activity required to protect public health and safety. Where redevelopment results in an increase of less than fifty percent of the impervious surfaces of a previously existing developed site, and the existing development was not subject to WQMP requirements, the numeric sizing criteria discussed below applies only to the addition or replacement, and not to the entire developed site.

Where redevelopment results in an increase of fifty percent or more of the impervious surfaces of a previously existing developed site, the numeric sizing criteria applies to the entire development.

b. For purposes of this Order, the categories of development identified below, shall be collectively referred to as "New Development".

   i. New developments that create 10,000 square feet or more of impervious surface (collectively over the entire project site) including commercial and industrial projects and residential housing subdivisions requiring a Final Map. (i.e., detached single family home subdivisions, multi-family attached subdivisions, condominiums, apartments, etc.); mixed use and public projects (excluding Permittee road projects). This category includes development projects on public and private land, which fall under the planning and building authority of the Co-Permittees.

   ii. Automotive repair shops (with SIC codes 5013, 5014, 5541, 7532-7534, 7536-7539).

   iii. Restaurants (with SIC code 5812) where the land area of development is 5,000 square feet or more.

   iv. Hillside developments disturbing 5,000 square feet or more which are located on areas with known erosive soil conditions or where the natural slope is twenty-five percent or more.

   v. Developments of 2,500 square feet of impervious surface or more adjacent to (within 200 feet) or discharging directly into ESAs.

   vi. Parking lots of 5,000 square feet or more exposed to storm water. Parking lot is defined as land area or facility for the temporary parking or storage of motor vehicles.

   vii. Retail Gasoline Outlets (RGOs) that are either 5,000 square feet or more with a projected average daily traffic of 100 or more vehicles per day.

   viii. Emergency public safety projects in any of the above-listed categories may be excluded if the delay caused due the requirement for a WQMP compromises public safety, public health and/or environmental protection.

3. WQMPs shall include BMPs (on-site and/or watershed-based), for the discharge of any urban sourced 303(d) listed Pollutant to an Impaired Waterbody on the 303(d) list such that the discharge shall not cause or contribute to an exceedance of Receiving Water Quality Objectives.

4. Treatment Control BMPs shall be in accordance with the approved WQMP and must be sized to comply with one of the following numeric sizing criteria:

a. VOLUME - Volume–based Treatment Control BMPs shall be designed to infiltrate, filter, or treat either:

   i. The volume of runoff produced from a 24-hour, 85th percentile storm event, as determined from the County of Riverside's 85th Percentile Precipitation Isopluvial Map; or,

   ii. The volume of annual runoff produced by the 85th percentile, 24-hour rainfall event determined as the maximized capture storm water volume for the area, from the formula recommended in Urban Runoff Quality Management, WEF Manual of Practice No. 23/ASCE Manual of Practice No. 87 (1998); or,

   iii. The volume of annual runoff based on unit basin storage volume, to achieve 80% or more volume treatment by the method recommended in California Storm Water Best Management Practices Handbook – Industrial/Commercial (1993); or,

   iv. The volume of runoff, as determined from the local historical rainfall record, that achieves approximately the same reduction in Pollutant loads and flows as achieved by mitigation of the 85th percentile, 24-hour runoff event;

OR

b. FLOW - Flow-based BMPs shall be designed to infiltrate, filter, or treat either:

   i. The maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour; or,

   ii. The maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity, as determined from the local historical rainfall record, multiplied by a factor of two; or,

   iii. The maximum flow rate of runoff, as determined from the local historical rainfall record that achieves approximately the same reduction in Pollutant loads and flows as achieved by mitigation of the 85th percentile hourly rainfall intensity multiplied by a factor of two.

5. Within 24 months of adoption of this Order, the Permittees shall develop a procedure for streamlining regulatory agency approval of regional Treatment Control BMPs. The recommendations should include information needed to be submitted to Regional Board for consideration of regional Treatment Control BMPs. At a minimum, it should include: BMP location; type and effectiveness in removing Pollutants of Concern; projects tributary to the regional treatment system; engineering design details; funding sources for construction, operation and maintenance; and parties responsible for monitoring effectiveness, operation and maintenance.

6. The Permittees shall continue to require other development projects for which a map or permit for discretionary approval is sought (projects that are not New Developments or Significant Re-developments required to develop project-specific

WQMPs) to incorporate conditions of approval, to require appropriate Site Design, Source Control and any other BMPs which may or may not include Treatment Control BMPs.

7. The Permittees shall ensure that the revised WQMP addresses:
   a. A review and update of Source Control BMPs required for New Development and Significant Redevelopment.
   b. Update of the list of Treatment Control BMPs, including an evaluation of their effectiveness based on national, statewide or regional studies.
8. Groundwater Protection:

   Treatment Control BMPs utilizing infiltration [exclusive of incidental infiltration and BMPs not designed to primarily function as infiltration devices (such as grassy swales, detention basins, vegetated buffer strips, constructed wetlands, etc.)] must comply with the following minimum requirements to protect groundwater:

   a. Use of structural infiltration Treatment Control BMPs shall not cause or contribute to an exceedance of groundwater Water Quality Objectives.
   b. Use of structural infiltration Treatment Control BMPs shall not cause a Nuisance or pollution as defined in Water Code Section 13050.
   c. Use of structural infiltration Treatment Control BMPs shall not be used in areas of known soil or groundwater contamination[48], without written authorization from the Regional Board Executive Officer.
   d. Located at least 100 feet horizontally from any water supply well.
   e. The vertical distance from the bottom of any infiltration structural Treatment Control BMP to the historic high groundwater mark shall be at least 10 feet. Where the groundwater basins do not support Beneficial Uses, this vertical distance criteria may be reduced, provided groundwater quality is maintained.
   f. Source Control and Pollution Prevention BMPs shall be implemented to protect groundwater quality.
   g. Adequate pretreatment of runoff prior to infiltration shall be required in gas stations and large commercial parking lots.
   h. Unless adequate pre-treatment of runoff is provided prior to infiltration, structural infiltration Treatment Control BMPs must not be used for areas of industrial or light industrial activity, such as: areas subject to high vehicular traffic (25,000 or more daily traffic), car washes; nurseries; or any other high threat to water quality land uses or activities.

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[48] Extra diligence should also be performed when proposing infiltration BMPs in areas where the proposed land use is often associated with soil and groundwater contamination.

i. Class V injection wells or dry wells must not be placed in areas subject to vehicular[49] repair or maintenance activities[50], such as an auto body repair shop, automotive repair shop, new and used car dealership, specialty repair shop (e.g., transmission and muffler repair shop), or any facility that does any vehicular repair work.

E. LOW IMPACT DEVELOPMENT (LID) AND HYDROMODIFICATION MANAGEMENT TO MINIMIZE IMPACTS FROM NEW DEVELOPMENT/SIGNIFICANT REDEVELOPMENT PROJECTS:

1. Within 18 months of adoption of this Order, the Permittees shall update the WQMP to address LID principles and HCOC consistent with the MEP standard. A copy of the updated WQMP shall be submitted to the Executive Officer for approval. Within six months of approval, each Permittee shall implement the updated WQMP. Onsite LID principles as close to Pollution sources as possible shall be given preference, however, project site, sub-regional or regional LID principles may also be applied.

2. The Permittees shall require those projects identified in Section XII.D.2. to infiltrate, harvest and use, evapotranspire and/or bio-treat[51] the 85th percentile storm event ("Design Capture Volume"). The Design Capture Volume should be calculated as specified in Section XII.D.4.a, above. It is recognized that LID principles are not universally applicable and they are dependent on factors such as: soil conditions including soil compaction and permeability, groundwater levels, soil contaminants (Brownfield development), space restrictions (in-fill projects, redevelopment projects, high density development, transit-oriented developments), highest and best use of Urban Runoff (to support downstream uses), etc. Any portion of this volume that is not infiltrated, harvested and used, evapotranspired, and/or bio-treated shall be treated and discharged in accordance with the requirements set forth in Section XII.G, below.

3. The Permittees shall incorporate LID site design principles into the revised WQMP to reduce runoff to a level consistent with the MEP standard. The Co-Permittees

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[49] Vehicles include automobiles; motor vehicles include trucks, trains, boats, motor cycles, farm machineries, airplanes, and recreation vehicles such as snow mobiles, all terrain vehicles, and jet skis.
[50] United States Environmental Protection Agency, Office of Water, EPA 816-R-00-008, September 2000 *State Implementation Guidance - Revisions to the UIC Regulations for Class V Injection Wells and* "Class V Rule" (*Revisions to the Underground Injection Control Regulations for Class V Injection Wells*, 64 FR 68546) *indicate that these activities are prohibited from Class V injection wells.*

[51] A properly engineered and maintained bio-treatment system may be considered only if infiltration, harvesting and use and evapotranspiration cannot be feasibly implemented at a project site (feasibility criteria will be established in the WQMP [Section XII.G.1]. Specific design, operation and maintenance criteria for bio-treatment systems shall be part of the WQMP that will be produced by the Permittees.

shall require that New Development and Significant Redevelopment projects include Site Design BMPs during the development of the project-specific WQMP. The design goal shall be to maintain or replicate the pre-development hydrologic regime through the use of design techniques that create a functionally equivalent post-development hydrologic regime through site preservation techniques and the use of integrated and distributed infiltration, retention, detention, evapotranspiration, filtration and treatment systems. The revised WQMP should continue to consider Site Design BMPs described in Appendix O of the DAMP and LID principles described in the pending Southern California Stormwater Monitoring Coalition/CASQA *LID Guidance Manual for Southern California*.

4. Within 18 months of adoption of this Order, each Permittee shall revise, where feasible its ordinances, codes, building and landscape design standards to promote green infrastructure/LID techniques including, but not limited to, the following:

   a. Landscaping designs that promote longer water retention and evapotranspiration such as 1 foot depth of compost/top soil in commercial and residential areas on top of 1 foot of non-compacted subsoil, concave landscape grading to allow runoff from impervious surfaces, and water conservation by selection of water efficient native plants, weather-based irrigation controllers, etc.

   b. Allow permeable surface designs in low traffic roads and parking lots. This may require land use/building code amendment.

   c. Allow natural drainage systems for street construction and catchments (with no drainage pipes) and allow vegetated ditches and swales where feasible.

   d. Require landscape in parking lots to provide treatment, retention or infiltration.

   e. Reduce curb requirements where adequate drainage, conveyance, treatment and storage are available.

   f. Amend land use/building codes to allow no curbs, curb cuts and/or stop blocks in parking areas and residential streets with low traffic.

   g. Use of green roof, rain garden, and other green infrastructure in urban/suburban area.

   h. Allow rainwater harvesting and use.

   i. Narrow streets provide alternatives to minimum parking requirements, etc. to facilitate LID where acceptable to public safety departments.

j. Consider vegetated landscape for storm water treatment as an integral element of streets, parking lots, playground and buildings.

k. Consider and facilitate application of landform grading techniques[52] and revegetation as an alternative to traditional approaches, particularly in areas susceptible to erosion and sediment loss such as hillside development projects,

l. Other site design BMPs identified in the WQMP not included above.

5. Consistent with the requirements of AB 1881, each Co-Permittee is mandated to update its landscape ordinance. The bill requires the local agencies to adopt the State Model Water Efficient Landscape Ordinance[53] or prepare one that is "at least as effective" as the State Model by January 2010. The proposed state model ordinance applies to landscape requiring a building or landscape permit, plan check or design review. Each Permittee shall provide the Regional Board a copy of its report to Department of Water Resources (DWR).

6. Each Permittee shall implement effective education programs to educate property owners to use Pollution Prevention BMPs and to maintain on-site hydrologically functional landscape controls.

7. To reduce Pollutants in Urban Runoff, address Hydromodification, and manage Urban Runoff as a resource to the MEP, the revised WQMP shall specify preferential use of Site Design BMPs that incorporate LID techniques, where feasible, in the following manner (from highest to the lowest priority):

   a. Preventative measures (these are mostly non-structural measures, e.g., preservation of natural features to a level consistent with the MEP standard; minimization of Urban Runoff through clustering, reducing impervious areas, etc.) and

   b. Mitigation measures (these are structural measures, such as, infiltration, harvesting and use, bio-treatment, etc.).

8. The mitigation or structural Site Design BMPs shall also be prioritized (from highest to lowest priority):

   a. Infiltration BMPs (examples include permeable pavement with infiltration beds, dry wells, infiltration trenches, surface and sub-surface infiltration basins. The Permittees should work with local groundwater management agencies to ensure that infiltration Treatment Control BMPs are designed appropriately;

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[52] http://www.epa.gov/Region3/mtntop/pdf/appendices/d/aquatic-ecosystem-enhanc-symp/symposiumfinal.pdf

[53] http://www.owue.water.ca.gov/docs/final_reg_text.pdf

b. BMPs that harvest and use (e.g., cisterns and rain barrels); and

c. Vegetated BMPs that promote infiltration and evapotranspiration including bioretention, biofiltration and bio-treatment. Upon the Permittees' determination of LID infeasibility per Section XII.G, design capture volume specified in Section XII.D.4, that is not addressed by onsite or offsite LID *Site Design BMPs* as listed above shall be treated using *Treatment Control BMPs* as described in Section XII.G.

9. Hydrologic Condition of Concern (HCOC):

a. The Permittees shall continue to ensure, consistent with the MEP standard, through their review and approval of project-specific WQMPs that New Development and Significant Redevelopment projects do not pose a HCOC due to increased runoff volumes and velocities.

b. A New Development and Significant Redevelopment project does not cause a HCOC if any one of the following conditions is met:

i) The project disturbs less than one acre and is not part of a common plan of development.

ii) The volume and the time of concentration[54] of storm water runoff for the post-development condition is not significantly different from pre-development condition for a 2-year return frequency storms (a difference of 5% or less is considered insignificant). This may be achieved through Site Design and Treatment Control BMPs.

iii) All downstream conveyance channels to an adequate sump (e.g. Prado Dam, Lake Elsinore, Canyon Lake, Santa Ana River or other lake, reservoir or natural resistant feature) that will receive runoff from the project are engineered and regularly maintained to ensure design flow capacity, and no sensitive stream habitat areas will be affected; or not identified in the Permittees Hydromodification sensitivity maps required in Section XII.B.3, and no sensitive stream habitat areas will be affected.

iv) The Permittees may request a variance from these criteria based on studies conducted by the Southern California SMC, SCCWRP, CASQA, or other regional studies. Requests for consideration of any variances should be submitted to the Executive Officer.

c. If a HCOC exists, the WQMP shall include an evaluation of whether the project will adversely impact downstream erosion, sedimentation or stream habitat. This evaluation should include consideration of pre- and post-development hydrograph volumes, time of concentration and peak discharge velocities for a

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[54] Time of concentration is defined as the time after the beginning of rainfall when all portions of the drainage basin are contributing simultaneously to flow at the outlet.

2-year storm event, construction of sediment budgets, and a sediment transport analysis. If the evaluation determines adverse impacts are likely to occur, the project proponent shall implement additional Site Design BMPs, on-site BMPs, Treatment Control BMPs and/or in-stream BMPs[55] to mitigate the impacts. The project proponent should first consider Site Design BMPs and on-site BMPs prior to proposing in-stream BMPs; in-stream BMPs must not adversely impact Beneficial Uses or result in sustained degradation of Receiving Water quality and shall require all necessary regulatory approvals[56]:

d. HCOC are considered mitigated if they meet one of the following conditions:

   i. Require additional onsite or offsite mitigation to address potential erosion or habitat impact using LID BMPs.

   ii. The project is developed consistent with an approved Watershed Action Plan that addresses HCOC for the downstream Receiving Waters.

   iii. Mimicking the pre-development hydrograph with the post-development hydrograph, for a 2-year return frequency storm. Generally, the hydrologic conditions of concern are not significant, if the post-development hydrograph is no more than 10% greater than pre-development hydrograph. In cases where excess volume cannot be infiltrated or captured and reused, discharge from the site must be limited to a flow rate no greater than 110% of the pre-development 2-year peak flow.

e. If site conditions do not permit items i, through iv, above, the alternatives and in-lieu programs discussed under Section XII.G, below, may be considered.

F. ROAD PROJECTS

1. Within 24 months of adoption of this Order, the Co-Permittees shall develop standard design and post-development BMP guidance to be incorporated into projects for streets, roads, highways, and freeway improvements, under the jurisdiction of the Co-Permittees to reduce the discharge of Pollutants from the projects to the MEP. The draft guidance shall be submitted to the Executive Officer for review and approval and shall meet the performance standards for site design/LID BMPs, Source Control and Treatment Control BMPs as well as the

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[55] In-stream measures involve modifying the receiving stream channel slope and geometry so that the stream can convey the new flow regime without increasing the potential for erosion and aggradation. In-stream measures are intended to improve long-term channel stability and prevent erosion by reducing the erosive forces imposed on the channel boundary.

[56] In-stream control projects require a Stream Alteration Agreement from the California Department of Fish & Game, a CWA section 404 permit from the U.S. Army Corps of Engineers, and a section 401 certification from the Water Board. Early discussions with these agencies on the acceptability of an in-stream modification are necessary to avoid project delays or redesign.

HCOC criteria. The guidance and BMPs shall address streets, roads or highways under the jurisdiction of the Co-Permittees used for transportation of automobiles, trucks, motorcycles, and other vehicles, and excludes routine road maintenance activities where the surface footprint is not increased. The guidance shall incorporate principles contained in the USEPA guidance, "Managing Wet Weather with Green Infrastructure: Green Streets" to the MEP and at a minimum shall include the following:

a. Guidance specific to new road projects;

b. Guidance specific to projects for existing roads;

c. Size or impervious area criteria that trigger project coverage;

d. Preference for green infrastructure approaches wherever feasible;

e. Criteria for design and BMP feasibility analyses on a project-specific basis.

2. Within six months of approval by the Executive Officer, the Permittees shall implement the standard design and post-development BMP guidance for all road projects. Pending approval of the standard design and post-development BMP guidance, site specific WQMPs for streets road and highway projects shall be required pursuant to Section XII.D.2.

G. ALTERNATIVES AND IN-LIEU PROGRAMS

1. Within 18 months of adoption of this Order, the Permittees shall develop technically-based feasibility criteria for project evaluation to determine the feasibility of implementing LID BMPs which may include factors such as a groundwater protection assessment to determine if infiltration BMPs are appropriate for the site[57]. These criteria shall be submitted to the Executive Officer for approval. Only those projects that have completed a feasibility analysis as per the approved criteria should be considered for alternatives and in-lieu programs. If a particular BMP is not technically feasible, other BMPs should be implemented to achieve the same level of compliance, or if the cost of BMP implementation greatly outweighs the Pollution control benefits, the Co-Permittees may grant a waiver of the BMPs. All waivers, along with waiver justification documentation, must be submitted to the Executive Officer for approval in writing within 30 days prior to Permittee approval.

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[57] Such feasibility determinations may be based on regional analyses conducted by the Permittees (see finding G-14) or on site specific conditions. Site specific determinations shall be certified by a Professional Civil Engineer registered in the State of California, and will be documented in the project WQMP, which shall be approved by the Permittee prior to submittal to the Executive Officer. Within 30 days of submittal to the Executive Officer, the Permittee will be notified if the Executive Officer intends to take any action.

If a waiver is granted, the Permittees shall ensure that project proponents participate in one of the in-lieu programs discussed in this section.

2. The Permittees may collectively or individually propose to establish an Urban Runoff fund to be used for urban water quality improvement projects within the same watershed that is funded by contributions from developers granted waivers. The contributions should be at least equivalent to the cost savings for waived projects and the urban runoff funds shall be expended for projects that provide at least an equivalent amount of water quality improvement (there shall be no net impact on water quality due to a waived project). If a waiver is granted and an Urban Runoff fund is established, the Annual Report for the year should include:
   a. Total amount deposited into the funds; and
   b. The party responsible for managing the Urban Runoff fund;
   c. Projects funded or proposed to be funded with monies from the urban runoff fund with details on expected water quality improvement;
   d. Party or parties responsible for designing, construction, operation and maintenance of urban runoff funded projects, and
   e. Current status and a schedule for project completion.

3. The obligation to install Treatment Control BMPs at a New Development or Significant Redevelopment project is met if, for a common plan of development, BMPs are constructed with the requisite capacity to serve the entire common project, even if certain phases of the common project may not have BMP capacity located on that phase in accordance with the requirements specified above. The goal of the WQMP is to develop and implement practicable programs and policies to minimize the effects of urbanization on site hydrology, Urban Runoff flow rates, velocities, duration and time of concentration and Pollutant loads. This goal may be achieved through watershed-based Treatment Control BMPs, in combination with site-specific BMPs. All Treatment Control BMPs should be located as close as possible to the Pollutant sources, should not be located within Waters of the US, and Pollutant removal should be accomplished prior to discharge to Waters of the US. Regional Treatment Control BMPs shall be operational prior to occupation of any of the New Development or Significant Redevelopment project sites tributary to the regional Treatment Control BMP.

4. The Permittees may establish, where feasible and practicable, a water quality credit system for alternatives to infiltration, harvesting and use, evapotranspiration and other LID and Hydromodification requirements specified above. The following types of projects may be included in this credit system:
   a. Redevelopment projects that reduces the overall impervious area
   b. Brownfield redevelopment

c. High density developments (>7 units per acre)
d. Mixed use and transit-oriented development (within ½ mile of transit)
e. Dedication of undeveloped portions of the project site to parks, preservation areas and other pervious uses
f. Regional treatment systems with a capacity to treat flows from all upstream developments
g. Offsite mitigation or dedicated mitigation areas within the same watershed
h. Highly urbanized areas such as city center area
i. Historic Districts and Historic Preservation areas
j. Live-work developments
k. In-fill projects
l. Projects that enhance the transport of coarse sediment to the coast for beach replenishment.

5. The water quality credit system should not result in a net impact on water quality.

6. A summary of waivers of LID (along with a short description of the Section XII.G.2 through XII.G4 In-Lieu program selected), Hydromodification and Treatment Control BMPs along with any water quality credit granted, in-lieu projects, or urban runoff fund contribution required by each Co-Permittee shall be included in the Annual Report.

H. APPROVAL OF WQMP

Within 18 months of adoption of this Order, each Permittee shall develop and implement standard procedures and tools and include in its LIP the following:

1. The Permittees shall utilize a mechanism for review and approval of WQMPs, including a checklist that incorporates the minimum requirements of the model WQMP. The process for review and approval shall be described in the Permittees LIP.
2. The Co-Permittees shall maintain a database to track structural post-construction BMPs (consistent with XII.K.4 below).
3. Continue to ensure that the entity(ies) responsible for BMP maintenance and the mechanism for BMP funding is identified prior to WQMP approval.
4. The Permittees shall train those involved with WQMP reviews in accordance with Section XV, Training Requirements.

I. FIELD VERIFICATION OF BMPS

1. The Co-Permittees' permit close-out procedures shall include field verification that structural Site Design, Source Control and Treatment Control BMPs are designed, constructed and functional in accordance with the approved WQMP.
2. Prior to occupancy, the Co-Permittees shall verify through visual observation that the BMPs are working and functional.
3. The Co-Permittees may accept self-certification or third-party certification of BMPs from State-licensed professional engineers.

J. CHANGE OF OWNERSHIP AND RECORDATION

The Co-Permittees shall establish a mechanism to ensure that appropriate easements and ownerships are properly recorded in public records at the County and/or the city and the information is conveyed to all appropriate parties when there is a change in project or site ownership.

K. OPERATION AND MAINTENANCE OF POST-CONSTRUCTION BMPS

1. The Co-Permittees shall ensure that structural post construction BMPs are designed and implemented with control measures necessary to effectively minimize the creation of Nuisance or Pollution associated with vectors, such as mosquitoes, rodents, flies, etc. The Co-Permittee should work with the local vector agencies to ensure that structural post construction BMPs are designed to minimize the potential for vector breeding during operation and maintenance.
2. The Co-Permittees shall specify conditions of approval and as built inspections ensure that require proper maintenance and operation of any structural post construction BMPs including requirements for vector control.
3. The parties responsible for the maintenance and operation of the structural post construction BMPs, and a funding mechanism for operation and maintenance of structural post construction BMPs for the life of the project shall be identified prior to issuance of occupancy permits. Design of these structures shall allow adequate access for maintenance.
4. Each Co-Permittee shall maintain a database to track the operation and maintenance of the structural post construction BMPs installed after adoption of this Order. The database shall include: type of BMP; watershed where it is located; date of certification; party responsible for maintenance and any problems identified during inspection including any vector or nuisance problems.
5. Within 18 months of adoption of this order and annually thereafter, all Permittee-owned structural post construction BMPs installed after the date of this Order shall be inspected prior to the Rainy Season. The Co-Permittees shall also develop an

inspection frequency for New Development and Significant Redevelopment projects, based on the project type and the type of structural post construction BMPs deployed. Pursuant to XII.K.4, all New Development and Significant Redevelopment, structural post construction BMPs shall be inspected within the five-year Permit Term. The Co-Permittees shall ensure that the BMPs are operating and are maintained properly and all BMPs are working effectively to remove Pollutants in runoff from the site. If vector problems are identified, the Co-Permittees should work with the vector control agencies to remedy vector control problems. All inspections shall be documented and kept as Permittee record. The Co-Permittees may accept inspection reports conducted and certified by state licensed professional engineers in lieu of Co-Permittee inspections.

6. The Annual Report shall include a list of all structural post construction BMPs approved contained in the database required in XII.K.4 above.

L. PRE-APPROVED PROJECTS

The above provisions for LID and HCOC are not applicable to projects that have an approved WQMP as of the date of approval of the revised WQMP. The above provisions shall be implemented in a manner consistent with the MEP standard for all other projects 45 days from the date of approval of the revised WQMP. The Regional Board recognizes that full implementation may not be feasible for certain projects which have received tentative tract or parcel map or other discretionary approvals.

XIII. PUBLIC EDUCATION AND OUTREACH

A. The Permittees shall continue to implement the public education efforts already underway and shall continue to promote the most effective elements of the comprehensive public and business education strategy contained in the ROWD and Section 10 of the DAMP. As part of the Annual Report, the Permittees shall review their public education and outreach efforts and revise their activities to adapt to the needs identified in the annual reassessment of program priorities with particular emphasis on addressing the Pollutants of Concern. Results of this review shall direct the focus of its public education effort and cause recommendations for any changes to the public and business education program including: (1) how to make the multimedia efforts more effective; (2) a reevaluation of audiences and key messages for targeted behaviors; and (3) opportunities for participation in regional and statewide public education efforts. The goal of the public and business education program shall be to target 100% of the residents, including businesses, commercial and industrial establishments.

B. A status report on the requirements of this section and any changes to the on-going public education program shall be described in the Annual Report.

C. The Permittees shall implement an assessment program to measurably increase public knowledge of its communities regarding MS4 and impacts of Urban Runoff on Receiving Waters. The Permittees shall implement programs that can measure the change in behavior of its target communities to reduce Pollutant releases to the MS4 and the environment. A description of the program tasks, schedule and measurable goals shall be included in the first Annual Report due after adoption of this Order.

D. When feasible, the Permittees shall participate in joint outreach programs with other agencies including, but not limited to, the Santa Ana Watershed Project Authority, Caltrans, and other county and municipal storm water programs to ensure that a consistent message on storm water pollution prevention is disseminated to the public.

E. The Permittees shall continue to ensure that appropriate outreach materials are available for construction, industrial and commercial inspection programs. Outreach materials should be provided to Permittee inspectors for distribution to inspected facilities.

F. Within 18 months from the date of adoption of this Order, the Permittees shall ensure that they have developed, maintained and distributed BMP guidance for the control of those potentially polluting activities identified during the term of the 2002 MS4 Permit, which are not otherwise regulated by any agency, including guidelines for the household use of fertilizers, pesticides, herbicides and other chemicals, and guidance for mobile vehicle maintenance, carpet cleaners, commercial landscape maintenance, and pavement cutting. These guidance documents shall be distributed to the public, trade associations, etc., through participation in community events, trade association meetings and/or by mail.

G. The Permittees shall ensure that appropriate educational materials, including the BMP brochures, are provided to all new industrial and commercial enterprises within their jurisdiction at the time appropriate permits (e.g. business licenses or occupancy permits) are issued.

H. The Permittees shall continue to maintain, and if necessary enhance, public education materials to encourage the public to report: Illegal Dumping and unauthorized, non-storm water discharges from residential, industrial, construction and commercial sites into public streets, storm drains and to surface waterbodies and their tributaries; clogged storm drains; and faded stencils or missing catch basin markers. The Principal Permittee's hotline and web site shall provide guidance regarding where to locate information regarding general Urban Runoff pollution control measures. The hotline and website information shall be included in outreach materials and shall be listed in the governmental pages of prominent regional phone books and on the Co-Permittees' website.

I. The Permittees shall maintain a Public Education Committee to provide oversight and guidance for the implementation of the public education program. The Permittees shall

continue to participate in the Public Education Committee to review and update existing guidance for the implementation of the public education program. One of the functions of the Public Education Committee shall be to review outreach materials for construction, industrial and commercial inspection programs and residential outreach to ensure they appropriately address common violations observed during inspections. Once deficiencies are identified, alternative text to address the deficiency shall be developed within 6 months and reported in the Annual Report. The Public Education Committee shall meet at least twice per year.

J. The Permittees shall continue to sponsor or staff a table or booth at community, regional, and/or countywide events to distribute public education materials related to Urban Runoff pollution prevention to the public. Each Permittee shall participate in at least one event per year.

K. Successful implementation of the provisions and limitations in this Order will require the cooperation of all the public agency organizations within Riverside County having programs/activities that have an impact on Urban Runoff quality. This may include, but not be limited to, those listed in Appendix 2. As such, the Permittees should coordinate their efforts with those organizations where feasible and appropriate to ensure participation in implementing the requirements of this Order. The Permittees should notify the Regional Board where assistance is needed improving local cooperation.

L. Within 18 months of adoption of this Order, each Permittee shall develop BMP Fact Sheets for mobile businesses for distribution consistent with the requirements of Section XI.D.6. At a minimum, the mobile business Fact Sheets/training program should include: laws and regulations dealing with Urban Runoff and discharges to MS4; appropriate BMPs and proper procedures for disposing of Wastes generated from each mobile business category.

M. The Principal Permittee shall continue to develop and distribute BMP guidance for Permittee and contract field operations and maintenance staff to provide guidance in appropriate Pollution Prevention measures, how to respond to spills and reports of Illegal Discharges, etc.

XIV. PERMITTEE FACILITIES AND ACTIVITIES

A. Each Permittee shall continue to implement measures to ensure that their facilities and activities do not cause or contribute to a Pollution or Nuisance in Receiving Waters, as defined in Section 13050 of the Water Code. The Permittees must annually review their activities and facilities to determine the need for revisions to Section 5 of the DAMP and to their LIP. The Annual Report shall include the findings of this review and a schedule for any needed revisions. The Permittees should continue to use Facility Pollution Prevention Plans as noted in Chapter 5 of the DAMP to ensure that the Permittee facilities are not sources of Pollutants to the Waters of the US to the MEP.

B. Within 12 months of adoption of this Order, each Permittee shall review its inventory of fixed facilities listed in the DAMP, its field operations and MS4 facilities to ensure that Permittee facilities and activities are addressed by Facility Pollution Prevention Plans consistent with Chapter 5 of the DAMP and do not cause or contribute to a Pollution or Nuisance in Receiving Waters. Existing Facility Pollution Prevention Plans shall be reviewed to insure proper BMPs for these facilities. For Permittee facilities and/or activities tributary to CWA Section 303(d) Impaired Water Bodies that generate Pollutants for which the water body is Impaired, additional Pollutant-specific Source Control BMPs to target that Pollutant shall be identified and implemented in the Facility Pollution Prevention Plan to the MEP.

C. Each Permittee shall conduct inspections of its fixed facilities and field operations identified in Chapter 5 of the DAMP annually to ensure that they do not contribute Pollutants to Receiving Waters. The Permittees shall record the findings in the inspection forms developed by the Permittees. Each Permittee shall implement BMPs to manage the application, storage, and disposal of pesticides, herbicides, and fertilizers associated with their facilities and activities. At a minimum, the Facility Pollution Prevention Plans for these facilities and activities shall:

   1. Ensure that Permittee applicators (including contractors) and distributors have appropriate training, permits, and certifications;
   2. Utilize integrated pest management measures that rely on non-chemical solutions, to the extent practicable;
   3. Promote the use of native vegetation into facility landscaping;
   4. Include schedules for irrigation and chemical application to the extent feasible; and
   5. Collect and properly dispose of unused pesticides, herbicides, and fertilizers.
   6. The following BMP fact sheets are identified as minimum BMPs::
      i. SC-35/SC-61, Safer Alternative Products
      ii. SC-41, Building & Grounds Maintenance
      iii. SC-60, Housekeeping Practices
      iv. SC-73, Landscape Maintenance

D. Each Permittee shall review, update, and implement the individual clean out schedules and frequency for its MS4, including open channels, catch basins, retention/detention facilities and wetlands created for Urban Runoff treatment during the Wet and Dry Season to protect Receiving Water quality consistent with the MEP standard. The inspection and cleaning frequency for all portions of the specified MS4 shall be included in each Permittee's LIP and shall be evaluated annually to determine the need for adjusting the inspection and cleaning frequency. Each Permittee must clean those MS4 facilities where there is evidence of Illegal Discharge. In addition, each Permittee must clean those retention/detention basins and MS4 where the inspection reveals that the storage

volume is about 25% full or if accumulated sediment or debris impairs the hydraulic capacity of the facility.

E. Unless otherwise supported by field information, each Permittee shall at a minimum inspect, clean, and maintain at least 80% of its open channels, catch basins, retention/detention basins, and wetlands created for Urban Runoff treatment on an annual basis, with 100% of the facilities in a two year period. The MS4 clean out schedule shall continue to be included in the Annual Report.

F. Each Permittee shall examine opportunities to retrofit existing MS4 facilities with water quality protection measures, where feasible.

G. PERMITTEE COMPLIANCE WITH GENERAL PERMITS

1. GENERAL CONSTRUCTION PERMIT

a. All Permittee Construction Sites shall be in compliance with the latest adopted version of the General Construction Permit.

b. This Order authorizes the discharge of storm water runoff from Permittee Construction Sites that may result in land disturbance consistent with the acreage criteria of the General Construction Permit.

c. Prior to commencement of construction activities, the Permittees shall notify the Executive Officer of the proposed Construction Site by submitting a NOI, or Permit Registration Documents (PRDs) as provided in Attachment 5, and a location map depicting the Construction Site location. The filing fees for these NOIs/PRDs are waived for the Permittees.

d. Upon completion of the construction project, the Executive Officer shall be notified of the completion of the project by submitting (1) A Notice of Termination (NOT), provided in Attachment 5. (2) Photographs of the completed project; (3) A site map (depicting the project location and the locations of structural post-construction BMPs, including the latitude and longitude if appropriate); and (4) copies of the final field verification reports required under Section XII.I.

e. The Permittees shall develop, approve, and implement a WQMP for Permittee projects that meet the requirements of Section XII.D. of this Order.

f. The Permittees shall develop and implement a SWPPP and the monitoring and reporting program for their construction projects that meet the requirements of the latest version of the General Construction Permit. The Permittee must review and approve SWPPPs prepared by their contractors.

g. The Permittees shall give advance notice to the Executive Officer of planned changes in the construction activity, which may result in non-compliance with the latest version of the General Construction Permit.

h. Emergency Permittee projects required to protect public health and safety are exempted from compliance with the requirements of this subsection until the emergency ends, at which time they need to comply with the requirements of this section.

2. GENERAL DE-MINIMUS PERMIT DISCHARGES

a. The Permittees are authorized to discharge de-minimus types of discharges listed under the latest adopted version of the Regional Board's General De Minimus Discharge Permit, currently Order No. R8-2009-0003. The de-minimus discharges from Permittee owned and/or operated facilities and/or activities shall be in compliance with Order No. R8-2009-0003 except that the Permittees need not pay the filing fee.

b. The Permittees shall notify the Executive Officer of the proposed discharge at least 15 days prior to start of the discharge, by submitting a NOI and supporting documents, as provided in Attachment 7.

c. For existing Permittee Dischargers (authorized to discharge under Order No. R8-2009-003 prior to the adoption date of this Order), discharges will continue to be regulated under the terms and conditions of Order No. R8-2003-0003 until a new discharge authorization is issued, provided that the Discharger submits, by June 10, 2010, an updated NOI, a copy of the current Monitoring & Reporting Program previously issued to the Discharger, and proposed treatment modifications (if any). If no application for continued discharges are submitted by that date, the Discharger shall do one of the following:

i. Cease discharge and submit a letter informing the Regional Board that coverage under Order R8-2009-003 is no longer needed; or

ii. Apply for new discharge authorization as a new de-minimus discharge, under this Order.

XV. TRAINING PROGRAM FOR STORM WATER MANAGERS, PLANNERS, INSPECTORS AND MUNICIPAL CONTRACTORS

A. Within 24 months of adoption of this Order, the DAMP and each Permittee's LIP shall be updated to include a program to provide formal and where necessary, informal training to Permittee staff that implement the provisions of this Order. Formal training must be implemented as described herein and may consist of regional training provided by the Permittees or individual Co-Permittee training provided in-lieu of Principal Permittee training. Informal training (i.e. tailgate training) shall be implemented by each Permittee on an as-needed basis to supplement the formal

training. Each Permittee shall maintain a written and/or electronic record of stormwater training provided to its storm water and related program staff.

B. The training programs should be coordinated with the local Vector Control District to ensure that vector control issues related to post-construction BMPs maintenance and operation are incorporated into the training curriculum.

C. **Formal Training**: The formal training programs shall educate Permittee employees responsible for implementing requirements of this Order, by providing training on the following Permittee activities: construction site inspection, WQMP review, residential/industrial/commercial site inspection, and Permittee facility maintenance. Formal training may be conducted in classrooms or using videos, DVDs or other multimedia. The program shall consider all applicable Permittee staff such as storm water program managers, construction/industrial/ commercial/residential inspectors, planners, engineers, public works crew, etc. and shall: define the required knowledge and competencies for each Permittee compliance activity, outline the curriculum, include testing or other procedures to determine that the trainees have acquired the requisite knowledge to carry out their duties, and provide proof of completion of training such as Certificate of Completion, and/or attendance sheets. The formal training curriculum shall:

1. Highlight the potential effects that Permittee or Public activities related to their job duties can have on water quality.
2. Overview the principal applicable water quality laws and regulations that are the basis for the requirements in the DAMP.
3. Discuss the provisions of the DAMP that relate to the duties of the target audience, including but not limited to:
   a. The requirements of the DAMP regarding Storm Water Ordinances, resolutions, codes, and standards that relate to the duties of the target audience, including enforcement thereof;
   b. Overview of CEQA requirements contained in Section XII.C of this Order.
   c. Implementation and assessment of SWPPPs and Facility Pollution Prevention Plans relative to the duties of the target audience;
   d. Selection, implementation and maintenance of appropriate BMPs relative to the duties of the target audience;
   e. Tools, checklists and procedures included in the DAMP to assist in implementing the requirements of this Order relative to the duties of the target audience.

D. **Informal Training:** The informal training shall ensure that staff have the requisite knowledge to implement the applicable provisions in the Permittee's LIP, such as (but not limited to):

1. The requirements of local Storm Water Ordinances, resolutions, codes, and standards that relate to the duties of the target audience;
2. Local tools, checklists and/or procedures to implement the requirements of this Order relative to the duties of the target audience.
3. The proper use and maintenance of erosion and sediment controls;
4. Vector control issues related to storm water pollution control BMPs.

E. **Reporting**: Formal training shall be summarized and documented in the Annual Reports.

F. **Schedule**: At a minimum, the training schedule should include the following:

1. New Permittee employees responsible for implementing requirements of this Order must receive informal training within six months of hire and formal training within one year of hire.
2. Permittee facility maintenance staff must receive formal training at least once every two years.
3. Permittee inspection and code enforcement (if applicable) employees must receive formal or informal refresher training focused on appropriate BMP implementation at least once a year prior to the rainy season.
4. Other existing Permittee employees responsible for implementing the requirements of this Order must receive formal training at least once during the term of this Order.
5. The start date for training programs described in this Section shall be included in the schedule required in Section III.A.1.q, but shall be no later than six months after Executive Officer approval of DAMP updates applicable to the Permittee activities described in Section XIV.

G. The Permittees shall require verification of BMP training from contract staff where applicable.

H. The Permittee(s) shall include designated Regional Board staff on training notification e-mails announcing upcoming formal training sessions.

XVI. NOTIFICATION REQUIREMENTS

A. Within 24 hours of discovery, the Permittees shall provide oral or email notification to Regional Board staff of events within its jurisdiction that are determined to be an Emergency Situation. Following oral notification, a written report must be submitted within 10 days of receipt of notice of the Emergency Situation, detailing the nature of the non-compliance, any corrective action taken by the site/facility owner, other relevant information (e.g., past history of the Emergency Situation, environmental damage resulting from the Emergency Situation, site/facility owner responsiveness) and the type of enforcement, consistent with Section 4 of the DAMP, that will be carried out by the Co-Permittee. Further, incidences of noncompliance shall be

recorded along with the information noted in the written report and the final outcome/enforcement for the incident in the databases for Construction Sites, and Industrial or Commercial Facility inspections, as appropriate.

B. Notification requirements for non-Emergency Situations that are discovered during the course of Construction Site and Industrial Facility inspections that may be a violation of the General Stormwater Permits are addressed in Sections XI.A.7 of this Order.

C. Sewage spill notification shall be consistent with the timelines specified in the Statewide General Waste Discharge Requirements for Sanitary Sewer Systems, Water Quality Order No. 2006-0003-DWQ.

D. All reportable quantities of Hazardous Waste spills as per 40CFR 117 and 302 shall be reported within 24 hours. All spill incidents shall be also included in the Annual Report. These requirements are consistent with the Notification requirements for IC/IDs that are addressed in Section IX.B of this Order.

E. Enforcement requirements for Construction Sites and Industrial Facilities operating without an applicable General Stormwater Permit are specified in Section XI.A.7. These Sites and Facilities shall be reported within 14 calendar days to Regional Board staff by electronic mail or other written means. Permittees' notifications of facilities' failure to obtain required coverage under the General Construction Permit, or General Industrial Permit, including requirements to file PRDs. A PRD, NOI, No Exposure Certification, Notice of Non-applicability, and/or 401 Certification must include, at a minimum, the following documentation:

   1. Name of the Site or Facility
   2. Operator of the Site or Facility
   3. Owner of the Site or Facility
   4. Construction or Commercial/Industrial activity being conducted at the Site or Facility that is subject to the General Construction Permit, General Industrial Permit or 401 Certification
   5. Records of communication with the facility operator regarding the violation, which must include at least an inspection report.

F. The Permittees shall report to the Executive Officer:

   1. Any enforcement actions and known discharges of Urban Runoff to MS4 facilities, known to the Permittees, which may have an impact on human health or the environment consistent with Sections XI.A and XI.B above; if the discharge is to Canyon Lake or any tributary to Canyon Lake, Elsinore Valley Municipal Water District shall also be notified immediately; and
   2. Any suspected or reported activities on federal, state, or other entity's land or facilities, where the Permittees do not have any jurisdiction, and where the suspected or reported activities may be contributing Pollutants to Waters of the US

XVII. PROGRAM MANAGEMENT ASSESSMENT/DAMP REVIEW

A. By November 30 of each year, the Permittees shall evaluate the effectiveness of the Urban Runoff management program described in the DAMP to determine the need for any revisions in order to reduce Pollutants in MS4 discharges consistent with the MEP standard consistent with the reporting requirements in Appendix 3, Section IV.B. In addition, the first Annual Report (November 2010) after adoption of this Order shall include the following:

1. Review of the formal training needs of Permittee employees.
2. Review of coordination meeting/training for the designated NPDES inspectors.
3. Proposal for assessment of Urban Runoff management program effectiveness on an area wide as well as jurisdiction-specific basis. Permittees shall utilize the CASQA Guidance[58] for developing these assessment measures at the six outcome levels. The assessment measures must target both water quality outcomes and the results of municipal enforcement activities consistent with the requirements of Appendix 3, Section IV.B.

B. The Annual Report shall include the findings of this review and a schedule to address necessary revisions, or a copy of the amended DAMP with the proposed changes. Replacement pages are acceptable if modifications are not extensive. Annual Reports shall also be submitted in electronic format.

C. Upon the effective date of this Order, the Permittees shall implement the 2007 DAMP and modify it to be consistent with the requirements of this Order and the schedules contained herein.

D. Each Permittee shall designate at least one representative to the Management Steering Committee and Technical Committee. The Principal Permittee shall be notified immediately, in writing, of changes to the designated representative to either Committee. The designated representative for each Committee shall attend that Committee's meeting as follows: at least one (1) out of two (2) Management Steering Committee meetings and eight (8) out of ten (10) Technical Committee meetings per year to discuss issues related to permit implementation and regional and statewide issues.

E. The Permittees shall continue to implement all elements of the approved DAMP. Program elements revised in compliance with the requirements of this Order must be implemented in conformance with the schedules specified in this Order following approval of the Executive Officer.

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[58] CASQA, May 2007. Municipal Storm Water Program Effectiveness Assessment Guidance.

XVIII. FISCAL RESOURCES

A. Each Permittee shall exercise its full authority to secure the resources necessary to meet the requirements of this Order. This Order may be revised to adjust time schedules to accommodate prioritization of available resources.

B. The Permittees shall prepare and submit a financial summary to the Executive Officer. The financial summary shall be submitted with the Annual Report each year and shall, at a minimum, include the following:

1. Each Permittee's MS4 Permit compliance expenditures for the previous fiscal year;
2. Fiscal developments that may impact availability of funding for MS4 Permit compliance program implementation and to achieve the required implementation schedule;
3. Each Permittee's MS4 Permit compliance program budget for the current fiscal year;
4. A description of the source of funds to implement the MS4 Permit compliance program, and;
5. Each Permittee's estimated budget to implement the MS4 Permit compliance program for the next fiscal year.

XIX. MONITORING AND REPORTING PROGRAM

The Permittees must comply with Monitoring and Reporting Program No. R8-2010-0033, Appendix 3, and any revisions thereto, which are hereby made a part of this Order. The Executive Officer is hereby authorized to revise the Monitoring and Reporting Program in a manner consistent with this Order to allow the Permittees to participate in regional, statewide, national or other monitoring and reporting programs in lieu of or in addition to Monitoring and Reporting Program No. R8-2010-0033. In addition, dates for completion and implementation of certain program elements and reporting requirements are outlined in the Monitoring and Reporting Program.

XX. PROVISIONS

A. All reports submitted by the Permittees as per the requirements in this Order for the approval of the Executive Officer shall be publicly noticed and made available on the Regional Board's website, or through other means, for public review and comments. The Executive Officer shall consider all comments received prior to approval of the reports. Any unresolved significant issues shall be scheduled for a public hearing at a Regional Board meeting prior to approval by the Executive Officer.

B. Permittees shall demonstrate compliance with all the requirements in this Order and shall implement the DAMP and any modifications, revisions, or amendments thereto, which are developed pursuant to this Order or determined by the Permittees to be necessary to

meet the requirements of this Order. The DAMP, including any approved amendments thereto is hereby made an enforceable component of this Order.

C. The Permittees shall implement all elements of the DAMP and its components. Where the dates in the DAMP are different from the corresponding dates in this Order, the dates in this Order shall prevail. Any proposed revisions to the DAMP shall be submitted with the Annual Report for review and approval by the Executive Officer. All approved revisions to the DAMP shall be implemented as per the time schedules approved by the Executive Officer. In addition to those specific controls and actions required by: (1) the terms of this Order and (2) the DAMP and its components, each Permittee shall implement additional controls, if any are necessary, to reduce the discharge of Pollutants in Urban Runoff consistent with the MEP standard.

D. Certain BMPs implemented or required by the Permittees for Urban Runoff management may create habitat for vectors (e.g., mosquitoes and rodents) if not properly designed and maintained. Close collaboration and cooperative effort between the Permittees and local vector control agencies and the State Department of Health Services are necessary to minimize potential vector habitat and public health impacts resulting from vector breeding. Nothing in this Order is intended to prohibit inspection or abatement of vectors by the State or local vector control agencies in accordance with the respective Health and Safety Code.

E. Upon approval by the Executive Officer all plans, reports and subsequent amendments required by this Order shall be implemented and shall become an enforceable part of this Order. Prior to approval by the Executive Officer, these plans, reports and amendments shall not be considered as an enforceable part of this Order.

F. The MS4 permit application and special NPDES program requirements are contained in 40 CFR 122.21 (a), (b), (d)(2), (f), (p); 122.41 (a), (b), (c), (d), (e), (f), (g), (h), (i), (j), (k), (l); and 122.42 (c), and are incorporated into this Order by reference.

G. The Permittees must comply with all terms, requirements, and conditions of this Order. Any violation of this Order constitutes a violation of the CWA, its regulations and the California Water Code, and is grounds for enforcement action, Order termination, Order revocation and re-issuance, denial of an application for re-issuance, Order revisions, or a combination thereof.

H. Permittees must continue to take reasonable steps to minimize or prevent any discharge to the MS4 that has a reasonable likelihood of adversely affecting human health or the environment.

I. Regional Board staff, USEPA, and other authorized representatives must be allowed to:

1. Inspect Permittee records associated with compliance of this Order.

2. Access and copy records that are kept under the conditions of this Order.

3. Photograph and inspect any facilities or equipment (including monitoring and control equipment) that are related to or may impact storm water discharge or authorized Non-storm Water discharge.

4. Conduct sampling, and monitoring activities for the purpose of assuring compliance with this Order, or as otherwise authorized by the CWA and/or the Water Code.

5. Review the Permittee's programs and request the Regional Board to authorize modification to Permittee programs to comply with the requirements of this Order.

6. Request copies of data, monitoring reports, and sampling data and copies of the Permittee's conclusions and evaluations of the data.

J. This Order does not convey any property rights or any exclusive privileges.

K. The issuance of this Order does not authorize any injury to persons or property or invasion of other private rights, or any infringement of State or local law or regulations.

L. When Permittees become aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Regional Water Board, State Board, or USEPA, the Permitttees must promptly submit such facts or information.

M. All applications, reports, or information submitted to the Regional Board, State Board, and/or USEPA are to be signed and certified by either:

1. A principal executive officer or ranking elected official. For purposes of this provision, a principal executive officer of a federal agency includes: (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrators of USEPA)

2. A duly authorized representative of the person in 1, above. A person is a duly authorized representative only if the authorization is made in writing by a person described above;

3. The authorization specified either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company (A duly authorized representative may thus be either a named individual or any individual occupying a named position.); and

4. The written authorization is submitted to the Executive Officer.

5. If an authorization described above is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization must be submitted to the Executive Officer prior to or together with any reports, information, or applications, to be signed by an authorized representative.

6. Any person signing a document described above must make the following certification:

   "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations".

XXI. PERMIT MODIFICATION

A. Following appropriate public notice, and in accordance with 40 CFR 122.41(f), this Order may be modified, revoked or reissued prior to its expiration date for the following reasons:
   1. To address significant changes in conditions identified in the technical reports required by the Regional Board which were unknown at the time of the issuance of this Order;
   2. To incorporate applicable requirements of statewide water quality control plans adopted by the State Water Resources Control Board or any amendments to the Basin Plan (including TMDLS) approved by the Regional Board, the State Board and, if necessary, by the Office of Administrative Law and the USEPA;
   3. To comply with any applicable requirements, guidelines, or regulations issued or approved under the Clean Water Act, if the requirements, guidelines, or regulations contain different conditions or additional requirements than those included in this Order; or,
   4. To incorporate new or revised program elements and compliance schedule(s) necessary to comply with this Order;

B. The filing of a request by the Permittees for modification, revocation and re-issuance, or termination or a notification of planned changes or anticipated noncompliance does not stay any conditions of this Order.

C. Pursuant to Section 13228 of the Water Code, the Regional Board may exercise its option for allowing the portion of the City of Murrieta located within the Santa Ana Region to be regulated by the San Diego Regional Water Quality Control Board under its Riverside County MS4 Permit. Similarly, if the San Diego Regional Water Quality Control Board authorizes this Regional Board to exercise authority over the City of Menifee within the

portions of the City regulated by the San Diego Regional Water Quality Control Board, this Regional Board will exercise its authority under this Order in those Regions.

XXII. PERMIT EXPIRATION AND RENEWAL

A. This Order expires on January 29, 2015, and the Permittees must file a ROWD no later than 180 days in advance of such expiration date as application for issuance of new waste discharge requirements. The ROWD shall, at a minimum, include the following:

1. Names and mailing address(es) of the primary administrative and technical contacts for the Permittees that operate the MS4;
2. Any revisions to the DAMP including, but not limited to, all the activities the Permittees propose to undertake during the next permit term, goals and objectives of such activities, an evaluation of the need for additional source control and/or structural BMPs, any proposed pilot studies, etc.;
3. Changes in land use and/or population including map updates;
4. Any significant changes to the MS4 including map updates of the MS4; and
5. An assessment of the overall Urban Runoff management program and its effectiveness in meeting Water Quality Standards. If Water Quality Standards are not being met, the ROWD shall include new or revised program elements and compliance schedule(s) necessary to comply with Section VI of this Order.

B. The ROWD, Annual Reports and other information submitted under this Order shall be signed by either a principal executive officer or a ranking elected official (40 CFR 122.22(a)(3)) or a duly authorized representative as per 40 CFR 122.22(b).

C. This Order shall serve as an NPDES Permit pursuant to Section 402(p) of the Clean Water Act, or amendments thereto, and shall become effective ten days after the date of its adoption provided the Regional Administrator of the USEPA has no objections. If the Regional Administrator objects to its issuance, the Permit shall not become effective until such objection is withdrawn.

D. The Regional Board is authorized to enforce the terms of this permit under several provisions of the CWC, including, but not limited to, sections 13385, 13386, and 13387.

E. Order No. R8-2002-0011 is hereby rescinded.

I, Gerard J. Thibeault, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Santa Ana Region, on January 29, 2010**.**

Gerard J. Thibeault
Executive Officer

APPENDIX 1

PERMIT AREA

ORDER NO. R8-2010-0033

ORDER NO. R8-2010-0033 (NPDES NO. CAS618003)
RIVERSIDE COUNTY AREA-WIDE URBAN RUNOFF MANAGEMENT PLAN

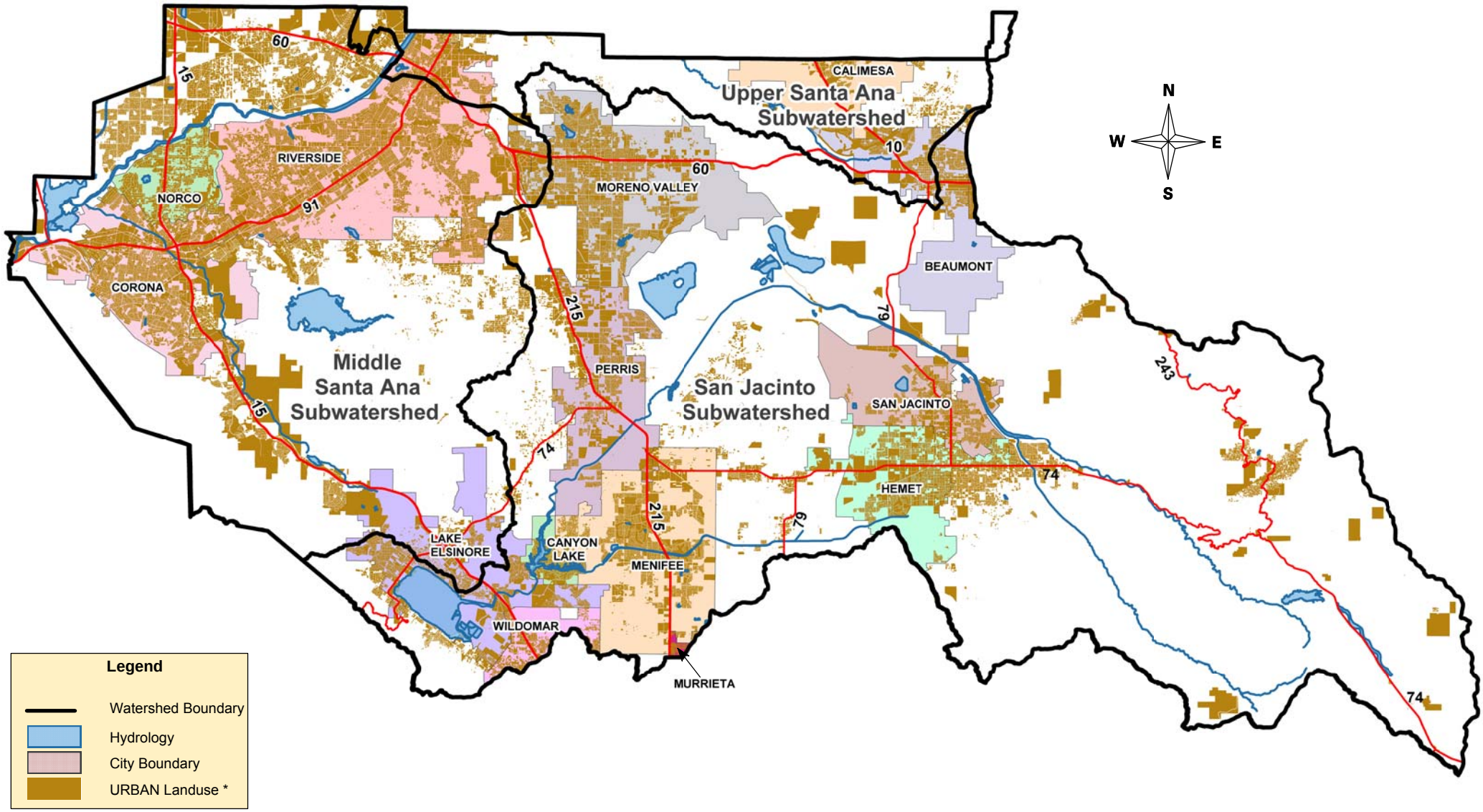

*** Areas not in URBAN: Agricultural, State, Federal, Tribal, Preserves & Open Space, Rural-Residential, Highways/Freeways**

APPENDIX 1

APPENDIX 2

OTHER ENTITIES THAT MAY DISCHARGE POLLUTANTS TO THE MS4

ORDER NO. R8-2010-0033

Appendix 2

OTHER POTENTIAL DISCHARGERS TO THE MS4s

Government Agencies

Department of the Air Force,
March Air Force Base – Special Districts (regulated under an individual NPDES permit)
State Parks
U.S. Army Corps of Engineers
Caltrans (regulated under a state-wide NPDES permit)
Department of Corrections
U.S. Forest Service
U.S. Department of the Interior – Bureau of Land Management

Hospitals

Corona Community Hospital
Hemet Valley Medical Center
Kaiser Foundation Hospital – Riverside
Loma Linda Hospital (Sun City)
Parkview Memorial Hospital
Riverside Community Hospital
Riverside County Regional Medical Center
Riverside General Hospital

Railroads

AT&SF Railway Company
Burlington Northern Railroad Company
Southern Pacific Railroad Company
Union Pacific Railroad

Special Districts/ Wastewater Agencies

Edgemont Community Services District
Jurupa Community Services District
Santa Ana Watershed Project Authority
Rubidoux Community Services District
Valley Wide Park and Recreation District

School Districts

Alvord Unified School District
Corona – Norco Unified School District
Hemet Unified School District
Lake Elsinore Unified School District
Menifee Union School District
Moreno Valley Unified School District
Nuview Union School District
Perris Elementary School District
Perris Union High School District
Riverside Unified School District
Romoland School District
San Jacinto Unified School District
Val Verde School District

Universities and Colleges

California Baptist University
La Sierra University
Mt. San Jacinto College
Riverside Community College
University of California, Riverside
California School for the Deaf, Riverside

Water Districts

Eastern Municipal Water District
Elsinore Valley Municipal Water District
Lake Hemet Municipal Water District
Lee Lake Water District
Metropolitan Water District
Western Municipal Water District

Tribal Lands

Soboba Band of Luiseno Indians
Morongo Band of Mission Indians

APPENDIX 3

MONITORING AND REPORTING PROGRAM

ORDER NO. R8-2010-0033

State of California
California Regional Water Quality Control Board
Santa Ana Region

Monitoring and Reporting Program No. R8-2010-0033
NPDES No. CAS618033

for
Riverside County Flood Control and Water Conservation District,
The County of Riverside and the Cities of Riverside County
Within the Santa Ana Region
AREA-WIDE URBAN STORM WATER RUNOFF MANAGEMENT PROGRAM

I. OBJECTIVES

The overall goal of the Urban Runoff monitoring program is to support the development of an effective Urban Runoff management program. The following are the major objectives:

A. To identify those Receiving Waters, which, without additional action to control pollution from urban storm water runoff, cannot reasonably be expected to achieve or maintain applicable Water Quality Standards required to sustain the designated beneficial uses, the goals, and the objectives of the Basin Plan.

B. To develop and support an effective Urban Runoff management program.

C. To identify significant water quality problems, related to discharges of Urban Runoff within the Permit Area.

D. To determine water quality status, trends, and Pollutants of concern associated with Urban Runoff and their impact on the Beneficial Uses of the Receiving Waters.

E. To analyze and interpret the collected data to determine the impact of Urban Runoff and/or validate relevant water quality models.

F. To characterize Pollutants associated with Urban Runoff, and to assess the influence of urban land uses on Receiving Water quality and associated Beneficial Uses.

G. To identify other sources of Pollutants in Urban Run off to the maximum extent possible (e.g., including, but not limited to, atmospheric deposition, contaminated sediments, other non-point sources, etc.)

H. To identify and permit or prohibit Illicit Connections.

I. To identify, verify and prohibit Illegal Discharges.

J. To verify and to identify sources of Pollutants in Urban Runoff.

K. To evaluate the effectiveness of the DAMP and WQMPs, including an estimate of Pollutant reductions achieved by the Site Design (Low Impact Development [LID], Treatment Control and Source Control BMPs implemented by the Permittees.

L. To evaluate the effectiveness of proposed Urban Runoff management programs to protect Receiving Water quality.

II. GENERAL MONITORING PROVISIONS

A. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity [40 CFR 122.41(j)].

1. This includes any unusual discharge or discharge condition, including bypasses, upsets, and maintenance-related conditions affecting effluent quality in the case of storm channels and flow quality in the case of streams and lakes

2. All sample collection, handling, storage, and analysis shall be in accordance with test procedures under 40 CFR Part 136 (latest edition) "*Guidelines Establishing Test Procedures for the Analysis of Pollutants*," promulgated by the USEPA, the guidance being developed by the State Board pursuant to Water Code Section 13383.5, or other methods which are more sensitive than those specified in 40 CFR 136 and approved by the Executive Officer.

3. For priority Toxic Pollutants that are identified in the California Toxics Rule (CTR) (65 Fed. Reg. 31682), the Minimum Levels (MLs) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP) shall be used for all analyses, unless otherwise specified.

4. For priority Toxic Pollutants, if the Permittee can demonstrate that a particular ML is not attainable, in accordance with procedures set forth in 40 CFR 136, the lowest quantifiable concentration of the lowest calibration standard analyzed by a specific analytical procedure (assuming that all the method specified sample weights, volumes, and processing steps have been followed) may be used instead of the ML listed in Appendix 4 of the SIP. The Principal Permittee must submit documentation from the laboratory to the Regional Board Executive Officer for approval prior to raising the ML for any constituent.

B. All chemical, bacteriological, and Toxicity analyses shall be conducted at a laboratory certified for such analyses by an appropriate governmental regulatory agency.

C. Analytical methods, target reporting limits and data reporting formats shall be compatible with California's Surface Water Ambient Monitoring Program (SWAMP) Quality Assurance Management Plan and with SWAMP's Procedures for Conducting Routine Field Measurement unless otherwise specified in this Monitoring and Reporting Program (MRP).

D. Revisions of this MRP are appropriate to ensure that the Permittees are in compliance with requirements and provisions contained in this Order. Revisions may be made under the direction of the Executive Officer at any time during the term of the Order, and may include redistribution of monitoring resources to address TMDL needs, a reduction or increase in the number of parameters to be monitored, the frequency of monitoring, or the number and size of samples collected.

E. The Executive Officer is authorized to allow the Permittees to participate in regional, statewide, national, or other monitoring programs in addition to or as part of this Urban Runoff monitoring program. Also, the Permittees are authorized to complement their Urban Runoff monitoring data with data from other monitoring sources, provided the monitoring conditions and sources are similar to those in the Santa Ana River watershed.

F. The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this Order shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than two years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than four years, or both [40 CFR 122.41(j)(5)].

III. MONITORING PROGRAM

A. The Principal Permittee has been monitoring Urban Runoff and Receiving Waters since the first MS4 permit term. The Principal Permittee currently implements the Consolidated Monitoring Program (CMP) and participates in a number of other storm water or TMDL related monitoring programs such as: TMDL Bacterial and Nutrient Monitoring, WLA Compliance, BMP Effectiveness, Urban Source and Trend Evaluation, Receiving Water Quality, Hydromodification and Bioassessment. The Principal Permittee shall continue to implement the CMP and continue to participate in other related monitoring programs.

B. The Principal Permittee, on behalf of the Co-Permittees, participates (through a memorandum of understanding and cooperative agreements) with the 16 member agencies of the Storm Water Monitoring Coalition (SMC). The Permittees shall continue to cooperate with other MS4 permittees (including

Orange County and San Bernardino County), Southern California Coastal Water Research Project (SCCWRP), POTW operators, the dairy industry, the Santa Ana Watershed Project Authority (SAWPA), and other public and private organizations in the watershed to develop coordinated surface water quality monitoring programs, databases, and special studies as appropriate. The Regional Board supports continued coordination with SCCWRP and the SMC to facilitate and implement coordinated watershed based monitoring programs. The Permittees may use coordinated monitoring efforts such as the Middle Santa Ana River (MSAR) and Lake Elsinore/Canyon Lake (LE/CL) TMDL Task Forces, SCCWRP and SMC regional monitoring programs to address partially, or in full, the requirements of this MRP. A proposed coordinated monitoring program shall result in the development and implementation of a monitoring plan that:

1. Fully addresses the requirements of this MRP;

2. Describes how the external monitoring programs address the requirements of the MRP;

3. Include a quality assurance plan, including data management, validation, verification mechanism for the portions of the monitoring directly conducted by the Permittees;

4. Reference the locations of the quality assurance plans for regional components; and

5. Result in a coordinated Annual Report summarizing the pertinent Urban Runoff data from the coordinated programs necessary to address this MRP.

C. Within 12 months of adoption of this Order, the Permittees shall review the CMP, Regional and TMDL related monitoring programs that they conduct or participate to determine their effectiveness in achieving the Urban Runoff assessment requirements contained in Section IV.B, below. If this review indicates any data gaps, the Principal Permittee shall submit a revised CMP, or coordinate revisions to other regional programs for approval of the Executive Officer to ensure that the combined efforts adequately address the requirements of Section IV.B. The revised CMP, including a description of how other regional efforts combine with the CMP to address requirements of Section IV.B shall be submitted within 16 months of adoption of this Order and shall be implemented within six months of its approval by the Executive Officer. Pending approval of the revised CMP, current monitoring efforts will continue to be implemented.

D. <u>TMDL/303(d) Listed Waterbody Monitoring</u>: The Permittees identified as dischargers in adopted TMDLs shall continue to participate in TMDL monitoring programs as required by TMDL Implementation Plans. The compliance schedules for the two approved TMDLs within the Permit Area are beyond the five year MS4 Permit term. This Order requires Permittees identified as

dischargers in their respective TDMLs to conduct monitoring required by the TMDL Implementation Plans to determine the effectiveness of the BMPs implemented in reducing Pollutant loads and eventually to attain WLA by the deadlines specified in the respective TMDL Implementation Plans.

1. MSAR Bacteria WLA TMDL USEP monitoring

    a. On June 14, 2007, the TMDL task force members submitted a source evaluation plan and a monitoring plan. The Regional Board approved these plans on June 29, 2007, Resolution No. R8-2007-0046. A revised monitoring plan and an urban Bacterial Indicator source evaluation plan were approved by the Regional Board on April 18, 2008, Resolution No. R8-2008-0044. The MSAR Permittees within the MSAR watershed shall continue to conduct monitoring and source evaluations in accordance with the approved plans and report the findings in accordance with the schedules specified in the approved plans or as updated by subsequent Regional Board approved revisions.

    b. In conformance with Task 3 of the TMDL Implementation Plan contained in Resolution R8-2005-0001, the Permittees shall individually, or in conjunction with the MSAR TMDL Task Force, prepare a triennial report summarizing the data collected for the preceding 3 year period and evaluating compliance with the WLAs. The first report shall be due February 15, 2010.

    c. The Permittees shall conduct monitoring and reporting consistent with Section VI.D. of this Order to evaluate the effectiveness of the BMPs implemented in the watershed and determine their progress towards attaining compliance with the interim WQBELs, and final BMP-based WQBELS, if approved, or the final numeric WQBELS/WLAs.

2. Lake Elsinore/Canyon Lake Nutrient TMDL

    a. Monitor and report the effectiveness of the BMPs implemented in the watershed to control nutrient inputs into the lakes from Urban Runoff. Submit an Annual Report summarizing all relevant data from water quality monitoring programs and evaluating compliance with the LE/CL TMDL by reporting the effectiveness of the BMPs implemented in the watershed to control nutrient inputs into the lake from Urban Runoff pursuant to Regional Board Resolution No. R8-2006-0031 and R8-2007-0083, or as amended by subsequent Regional Board adopted resolutions.

    b. The Permittees shall conduct monitoring and reporting consistent with Section VI.D. of this Order to evaluate the effectiveness of the BMPs implemented in the watershed and determine their progress towards attaining compliance with the interim WQBELs, and final BMP-based WQBELS, if approved, or the final numeric WQBELS/WLAs.

E. In addition, any requirements developed by the State Board in accordance with Water Code Section 13383.5 shall be considered during any revision of the CMP. The revised CMP shall, at a minimum, include the following:

1. Mass Emissions Monitoring – Core Stations:

a. An estimate of flow in cubic feet per second (cfs) from the Outfall/stream at the time of sampling.

b. Monitor mass emissions in Urban Runoff to:

i) Estimate the total mass emissions from the MS4s to Receiving Waters.

ii) Assess trends in mass emissions associated with specific urban storm water discharges from the MS4 over time.

iii) Determine if Urban Runoff may be contributing to exceedances of Water Quality Objectives or Beneficial Uses in Receiving Waters by comparing water quality data from Outfall and Receiving Water results to: (1) Water quality Objectives (WQOs); (2) California Toxic Rule (CTR) (3) USEPA Multi-Sector Permit Parameter Benchmark Values and (4) other MS4 discharger's monitoring data or other appropriate data identified by the Permittees. The Permittees should also evaluate the Regional Monitoring reports prepared by SCCWRP to assess trends in Urban Runoff and Receiving Water quality within the Permit Area.

iv) Representative samples from the first sampleable storm event (based on mobilization criteria to be established in the CMP) of the Wet Season (October 1 to May 31) and two more storm events shall be collected during the Wet Season. A minimum of two Dry Weather samples shall also be collected. Samples from the first sampleable storm event each year shall be analyzed for constituents according to the list provided in the 2007-2008 Santa Ana Region Monitoring Annual Report, Attachment A. This list includes 40 CFR 122 Appendix D Tables II and III, and Tables IV and V if expected to be present, and additional constituents. All samples shall be analyzed for *E. coli*, nutrients (Nitrates + Nitrites, potassium, and phosphorous), hardness[1], metals, pH, TSS, TOC, pesticides/herbicides, and Pollutants/stressors for 303(d) listed Receiving Waters. Dry Weather samples should also include analyses for TPH (8015M – direct injection) and oil and grease. The analyte list will be reviewed annually. Constituents may be added to the list for a selected monitoring station if they are expected to be present, and removed from the list if three consecutive samples from the station have not had detectable concentrations of the constituent.

[1] Hardness is necessary to evaluate some metal Water Quality Objectives in receiving waters.

v) Monitoring locations shall be integrated into a GIS database system. All monitoring data shall continue to be placed in an electronic database.

2. Water Column Toxicity Monitoring: Analyses for Toxicity to aquatic species shall be performed on receiving water samples to determine if there may be impacts of Urban Runoff on Toxicity of Receiving Waters. The *Ceriodaphnia dubia* survival (acute), Fathead Minnow larval survival (acute), and Selenastrum Capricornutum growth (chronic) tests shall be used to evaluate Toxicity on the sample from the first sampleable storm event, plus one other Wet Season storm event sample. Where applicable, two Dry Weather samples shall also be collected or equivalent procedures shall be proposed in the CMP. In addition, criteria shall be identified which will trigger the initiation of Toxicity Identification Evaluations (TIEs) and Toxicity Reduction Evaluations (TREs).

   To the extent that the Toxicity testing developed as part of the Regional Bioassessment Monitoring described in item 5 and Section D below, or other standardized Toxicity testing protocols developed by the State Board, Regional Board, SMC or SCCWRP, satisfies the objective of determining the impact of Urban Runoff on Toxicity of Receiving Waters, the Permittees may satisfy this requirement by participating in the regional bioassessment effort or conducting Toxicity testing consistent with the standardized protocols.

3. Illicit Connection/Illegal Discharge (IC/ID) Monitoring: The Permittees shall review and update their Dry Weather and Wet Weather reconnaissance strategies to identify and eliminate IC/IDs using the Guidance Manual for Illicit Discharge, Detection, and Elimination developed by the Center for Watershed Protection[2] or any other equivalent program. Where possible, the use of GIS to identify geographic areas with a high density of industries associated with gross Pollution (e.g. electroplating industries, auto dismantlers) and/or locations subject to maximum sediment loss (e.g. New Development) may be used to determine areas for intensive monitoring efforts. The Dry Weather monitoring for nitrogen and total dissolved solids shall be used to establish a baseline dry weather flow concentration for TDS and TIN at each Core monitoring location.

4. Sources of Data: Where possible and applicable, water quality data shall be obtained from monitoring efforts of other public or private agencies/entities (e.g., Caltrans).

5. Bioassessment: In lieu of developing an independent bioassessment program as required in the prior term permit, the Principal Permittee, on behalf of the Co-Permittees, participates (through a memorandum of understanding and cooperative agreements) with the 16 member agencies of the SMC. The SMC's Bioassessment Working Group conducts bioassessments on a regional basis. The Principal Permittee in coordination with SCCWRP shall ensure that

[2] USEPA (Illicit Discharge Detection and Elimination - A Guidance Manual for Program Development and Technical Assessments) by the Center for Watershed Protection and Robert Pitt, University of Alabama, October 2004, updated 2005).

a sufficient number of monitoring stations are selected for this program from locations within the Permit Area.

a. The Principal Permittee, in collaboration with the SMC, shall conduct sampling, analysis, and reporting of specified in-stream biological and habitat data within the 5-year permit cycle according to the protocols specified in the SCCWRP Tech Report No. 539.

b. Within Riverside County, the bioassessment project area consists of the lower half of the MSAR watershed, the San Jacinto watershed, and the northern Santa Margarita watershed (northern San Diego) for a total of 1.5 watershed units, a minimum of 9 samples shall be collected per year[3]. Within Riverside County's Santa Ana and San Jacinto Watersheds, which are in the Permit Area, the Permittees shall sample 5 sites per year. SWAMP samples 2 sites per year.

c. For long-term trend monitoring, the Principal Permittee shall collect a minimum of 1 sample per year during the dry weather index period, as noted in the SCCWRP Tech Report No. 539. Additional samples may be collected to improve data quality for trend analysis. At a minimum, chemistry and aquatic Toxicity should be used as indicators for trend analysis.

d. Any baseline and historic information on stream geomorphology and ecological health, including aquatic habitats, in the Receiving Waters and the findings from the trend analysis shall be used to evaluate the effectiveness of Urban Runoff management program, including the requirements specified in the Order.

6. A Quality Assurance Program Plan (QAPP) within the CMP that describes how data will be collected and analyzed to ensure that data is consistent with State and Regional Board monitoring programs and is of high quality. Dischargers shall develop a QAPP that is compatible with the State's Surface Water Ambient Monitoring Program (SWAMP) QAPP and approved by the Regional Board's Quality Assurance Officer. A QAPP template is available, upon request, through the State Board's SWAMP website (http://www.waterboards.ca.gov/water_issues/programs/swamp/qapp.shtml). All analytical methods, target reporting limits, and data reporting formats should be SWAMP compatible unless otherwise specified in this MRP. The QAPP will include location of sample site(s), description of analytical techniques, data quality objectives, and other standard quality assurance information.

[3] See Table 4 page 15 of Technical Report No.539.

7. A procedure for the collection, analysis, and interpretation of existing data from local, regional or national monitoring programs. These data sources may be utilized to:
   a. Characterize different sources of Pollutants discharged to the MS4;
   b. Determine pollutant generation, transport and fate;
   c. Develop a relationship between land use, development size, storm size and the event mean concentration of Pollutants;
   d. Determine spatial and temporal variances in Urban Runoff quality and seasonal and other bias in the collected data; and
   e. Identify any unique features of the permitted area.
   f. The Permittees are encouraged to use water quality data from similar studies, if available.

8. The CMP update shall include descriptions of:
   a. The number of monitoring stations;
   b. Monitoring locations within MS4s, Major Outfalls, and Receiving Waters; environmental indicators (e.g., ecosystem, flow, biological, habitat, chemical, sediment, stream health, etc.) chosen for monitoring; The initial update shall at least contain the sampling stations listed in Table 1, below:

Table 1 Current Core Monitoring Stations

Station Number	Class	Station Description	Latitude	Longitude
40	Outfall	Corona Storm Drain – Line K Harrison & Sheridan St.	33.885	-117.568611
316	Outfall	Sunnymead Chanel – Line B Alessandro & Heacock	33.917778	-117.242222
318	Outfall	Hemet Channel @ Sanderson Ave.	33.734167	-117.005556
364	Outfall	Magnolia Center – SD @ Santa Ana River	33.964722	-117.414444
702	Outfall	University Wash – Market & Bowling Green	33.9975	-117.370833
707	Outfall	North Norco Channel @ Country Club Lane	33.907778	-117.583889
752	Outfall	Perris Line J - Sunset Ave below Murrieta Rd.	33.803333	-117.2075

   c. Total number of samples to be collected from each station, frequency of sampling during Wet Weather and Dry Weather, short duration or long duration storm events, type of samples (grab, 24-hour composite, etc.), justification for composite versus discrete sampling, type of sampling equipment, quality assurance/quality control procedures followed during sampling and analysis, analysis protocols to be followed (including sample preparation and maximum reporting limits), and qualifications of laboratories performing analyses;

d. A procedure for analyzing the collected data and interpreting the results. This procedure shall include the evaluation of the effectiveness of the BMPs, a comparative analysis of the Permittees' monitoring data to the USEPA Multi-Sector Permit Parameter Benchmark Values and applicable Water Quality Objectives specified in Chapter 4 of the Basin Plan, and the need for any refinement of the WQMPs, the DAMP and or/the LIPs.

e. Parameters selected for field screening and for laboratory work; and

f. A description of the responsibilities of all the participants in this program, including cost sharing.

g. Receiving Water Monitoring:

   Permittees shall select at least one representative receiving water location within each of the San Jacinto River and Santa Ana River watersheds. These locations should be close Major Outfalls, coordinated with other regional monitoring programs to the extent feasible, include locations where chronic and/or persistent water quality problems associated with Urban Runoff have been identified, and should be selected so as to be useful to determine if Urban Runoff is causing or contributing to violations of Water Quality Standards in the Receiving Waters.

h. Monitoring within MS4s:
   Permittees shall evaluate their current CMP MS4 monitoring locations (identified in Table 1, above) to ensure that they are representative of urban runoff. The objective of this monitoring element is to determine the pollutant loads from the MS4s and to determine their trend. This monitoring requirement may be incorporated into the mass emissions monitoring described in III.E.1, above.

F. REGIONAL WATERSHED MONITORING

1. The objectives of the Regional Watershed Monitoring Program overseen by the SWAMP and the SMC and coordinated by SCCWRP are:

   a. To assess the current status of streams in Southern California.

   b. To identify major stressors to aquatic life.

   c. To monitor the trend in water quality in Southern California streams.

2. The bioassessment discussed above, should provide information about the biological, chemical and toxicological integrity of Receiving Waters. Baseline and trend monitoring information on the biotic and geomorphological condition of the Receiving Waters should be used to evaluate the effectiveness of the Urban Runoff pollution control measures.

3. The Riverside County Regional Watershed monitoring area is within the lower half of the MSAR watershed, the San Jacinto watershed, and the northern Santa Margarita watershed (northern San Diego) for a total of 1.5 watershed units[4]. Within Riverside County's Santa Ana and San Jacinto watersheds, the Permittees sample 5 sites per year. SWAMP samples 2 sites per year.

4. The sampling sites in each watershed unit were determined according to distribution or abundance of the three land uses: urban, agriculture, or open. The sampling grid includes 15 watershed units located from Ventura to San Diego and as far east as San Bernardino and Riverside Counties. A total of 450 samples in the 15 watershed units will be collected within a five year period to assess the spatial extent of impacts to streams within the area. Samples will be collected at sites representing each of the three land use types. Each site will be sampled only once during an index period and not all sites need to be sampled during the same year. One-fifth of the samples (90 samples) will be collected each year for the 15 watersheds. Sampling events shall be conducted between 4 to 12 weeks following the last significant rainfall. No sampling shall occur within 72 hours of any measurable rainfall. The default index period will be from May 15 to July 15. The specifics and details of the Regional Watershed Program are discussed in "The Regional Monitoring of Southern California's Watershed SMC Bioassessment Working Group", SCCWRP, Technical Report No. 539, December 2007 (The Tech Report).

5. Any baseline and historic information on stream geomorphology and ecological health, including aquatic habitats, in the Receiving Waters and the findings from the trend analysis shall be used to evaluate the effectiveness of Urban Runoff management program, including the requirements specified in the Order.

G. HYDROMODIFICATION MONITORING PROGRAM

This Order requires development and implementation of a Hydromodification Monitoring Plan as part of the Watershed Action Plan (WAP) to evaluate the effectiveness of hydromodification controls implemented within the Permit Area (Some or all of the following requirements may be satisfied by the Permittees participation in the "Development of Tools for Hydromodification Assessment and Management' Project" undertaken by the SMC and coordinated by SCCWRP and follow on efforts to develop Hydromodification monitoring guidance).

1. The Order requires the Permittees to revise the DAMP to incorporate Watershed Action Plan principles within three years of adoption of the Order. The hydromodification requirements require the Permittees to identify

[4] See Table 4 page 15 of Technical Report No.539.

vulnerable streams and possible BMPs to minimize HCOCs and tools to measure any impacts on geomorphology and aquatic resources.

2. The Hydromodification monitoring program shall:

   a. Assess the effectiveness of Hydromodification management within the Permit Area.

   b. Predict the effects of urbanization on stream stability within the Permit Area.

H. LOW IMPACT DEVELOPMENT BMP MONITORING

The Principal Permittee shall continue to participate in data collection and monitoring to assess the effectiveness of LID techniques in semi-arid climate as part of the SMC project titled, "Quantifying the Effectiveness of Site Design/ Low Impact Development Best Management Practices in Southern California". The Principal Permittee is also developing a regional LID BMP testing and demonstration facility at the main office that meets the intent of this requirement (currently the facility data is intended to be integrated into the SMC project).

IV. RECORD KEEPING REQUIREMENTS

A. All monitoring activities shall meet the following requirements:

1. The Permittees shall retain records of all monitoring information, including all calibration and maintenance of monitoring instrumentation, copies of all reports prepared as per this MRP and records of all data used to complete the Report of Waste Discharge and Annual Reports for a period of at least five years from the date of the sample, measurement, report, or application. This period may be extended by request of the Regional Board or USEPA at any time and shall be extended during the course of any unresolved litigation regarding this discharge [40 CFR 122.41(j)(2), CWC section 13383(a)].

2. Records of monitoring information shall include [40 CFR 122.41(j)(3)]:

   a. The date, exact place, and time of sampling or measurements;

   b. The individual(s) who performed the sampling or measurements;

   c. The date(s) analyses were performed;

   d. The individual(s) who performed the analyses;

   e. The analytical techniques or methods used; and

   f. The results of such analyses.

3. Calculations for all Effluent Limitations which require averaging of measurements shall utilize an arithmetic mean unless otherwise specified in this MRP [40 CFR 122.41(l)(4)(iii)].

B. PROGRAM EFFECTIVENESS ASSESSMENT AND REPORTING

1. All progress reports and proposed strategies and plans required by this Order shall be signed by the Principal Permittee, and copies shall be submitted to the Executive Officer under penalty of perjury.

2. The Permittees shall submit an Annual Report to the Executive Officer and to the Regional Administrator of the USEPA, Region 9, no later than November 30th, of each year. This progress report shall also be submitted in a mutually agreeable electronic format that is text searchable. Any monitoring data shall also be submitted electronically in the form outlined in Section IV.B.4 of this MRP. At a minimum, the Annual Report shall include the following:

   a. A review of the status of program implementation and compliance (or non-compliance) with the schedules contained in this Order;

   b. An assessment of the effectiveness of BMPs established under the IC/ID program and the DAMP. The effectiveness may be measured in terms of how successful the program has been in eliminating IC/IDs and/or reducing pollutant loads in urban storm water runoff, including summaries of Permittee actions to investigate and eliminate or permit IC/IDs and measures to reduce and/or eliminate the discharge of Pollutants, including trash and debris

   c. As assessment of BMPs and their effectiveness in addressing Pollutants causing or contributing to an exceedance of water quality objectives in Receiving Waters that are on the 303(d) list of impaired waters. The effectiveness evaluation shall consider changes in land use and population on the quality of Receiving Waters and the impact of development on sediment loading within sediment impaired Receiving Waters and recommend necessary changes to program implementation and monitoring needs.

   d. An assessment of the Permittees compliance status with the Receiving Waters Limitations, Section VII of this Order, including any proposed modifications to the DAMP if the Receiving Water Limitations are not fully achieved.

   e. An overall program assessment. The Permittees are encouraged to use the program assessment methodology described in the 2007 ROWD. The Permittees should determine, to the extent practicable, water quality

improvements and Pollutant load reductions resulting from implementation of various program elements. The Permittees may also use the "Municipal Storm Water Program Effectiveness Assessment Guidance" developed by CASQA in May 2007 as guidance for assessing program effectiveness at various outcome levels. The assessment should include each program element required under this Order, the expected outcome and the measures used to assess the outcome. The Permittees may propose any other methodology for program assessment using measurable targeted outcomes.

f. Description of program modifications and improvements identified during the program assessment above along with implementation schedule for incorporation of revisions into the Local Implementation Plans (LIPs).

g. An assessment of any modifications to the WQMPs, or the DAMP made to comply with CWA requirements to reduce the discharge of Pollutants to the MEP;

h. A summary, evaluation, and discussion of monitoring results from the previous year and any changes to the monitoring program to be made the following year;

i. A fiscal resources analysis progress report as described in Section XVIII.B of Order No. R8-2010-0033 including:

   i. Each Permittee's expenditures for the previous fiscal year;

   ii. Each Permittee's budget for the current fiscal year; and

   iii. A description of the source of funds.

j. A draft work plan that describes the proposed implementation of the LIPs and DAMP for next fiscal year. The work plan shall include clearly defined tasks, responsibilities, and schedules for implementation of the storm water program and each Permittee's actions for the next fiscal year;

k. Major changes in any previously submitted plans/policies;

l. If the Implementation Agreement is revised, a copy of the signature page and revisions to the Implementation Agreement.

m. A review of each Permittee's Storm Water Ordinances and their enforcement practices to assess their effectiveness in prohibiting non-exempt, Non-storm Water discharges to the MS4 (The Permittees may propose appropriate BMPs in lieu of prohibiting these discharges, where the Permittees are responsible for ensuring that dischargers adequately maintain those BMPs).

3. The Co-Permittees shall be responsible for the submittal of all required information/materials needed to comply with this order in a timely manner to the Principal Permittee. A duly authorized representative of the Co-Permittee shall sign all such submittals under penalty of perjury.

4. The monitoring data transmittals to the Regional Board shall be in the form developed by the SMC and approved by the State Board in the document entitled "Standardized Data Exchange Formats". This document was developed in order to provide a standard format for all data transfers so that data can be universally shared and evaluated from various programs.

V. REPORTING SCHEDULE

All reports required by this Order shall be submitted to the Executive Officer in accordance with the following schedule:

Reference		Item	Completion Time after Permit Adoption or Frequency	Report Due Date
Permit	**DAMP[(a)]**			
III.A.1.e III.B.3.a,d,e & XVII.D.		Management Steering Committee meetings to discuss MS4 Permit implementation	Held at least twice per year.	Annual Report
III.A.1.f III.B.3.a,d,e & XVII.D.		Permittee Technical Committee meetings to discuss permit implementation	Held at least 10 times each year	Annual Report
III.B.3.a,d,e & XVII.D.		Co-Permittees participate in Management Steering and Technical Committee meetings to discuss MS4 Permit implementation	Attend at least 1 out of 2 Management and 8 out of 10 Technical meetings each year	Annual Report
III.A.1.r		The Principal Permittee shall develop a library of BMP performance reports, and revise the BMP performance report annually thereafter.	Within 6 months of permit adoption	
III.A.1.s		The Principal Permittee shall coordinate a review of the DAMP with the Co-Permittees to determine the need for update or revisions and establish a schedule for those revisions.	Within 6 months of permit adoption	
III.B.2.g		Submit up-to-date MS4 facility maps	Annually to Principal Permittee	Annual Report

Reference		Item	Completion Time after Permit Adoption or Frequency	Report Due Date
Permit	**DAMP[(a)]**			
III.B.2.h		Submit reports & information for Annual Report	Annually to Principal Permittee	Annual Report
III.C.		Evaluate Implementation Agreement annually to determine need for revision.	Annually	Report findings and schedule for revisions to the Implementation Agreement in 2009-2010 Annual Report.
III.C.		Allow new permittees to join MS4 permit	Per schedule required in Section III.A.1.s	Report findings and schedule for revisions to the Implementation Agreement in 2009-2010 Annual report.
IV.A.		Permittees shall develop and submit for approval a LIP Template	Within 6 months of adoption of Order	
IV.B.		Complete a Co-Permittee specific LIP	Within 12 months of approval of the Template	Within 12 months of approval of the Template
VI.D.1.a.ii		Submit reports summarizing all relevant data from the watershed-wide water quality monitoring program.	Beginning in 2010 Cool (or wet) weather Warm (or dry) weather	 May 31st December 31st.
VI.D.1.a.iii		Submit comprehensive reports every three years summarizing the data collected for the preceding 3 year period and evaluating progress towards achieving the urban waste load allocation by the dates specified in the TMDL.	Beginning in 2010 every three years	February 15, 2010.
VI.D.1.a.iv		Submit semi-annual reports each year as required under the approved USEP, and any amendments thereto.	The Dec 31st report (VI.D.1.a.ii) and the Jan 31st report (VI.D.1.a.iv) may be incorporated into the (VI.D.1.a.ii) report for the years the tri-annual report is generated.	Semi-annually on January 31st and July 31st

Reference		Item	Completion Time after Permit Adoption or Frequency	Report Due Date
Permit	**DAMP[(a)]**			
VI.D.1.a.v		Revise the DAMP as specified in Task 4.2 of the MSAR-TMDL Implementation Plan.	Sumarize data in Annual Report.	Annual Report
VI.D.1.a.vi		Revise the Water Quality Management Plan (WQMP)	As specified in Task 4.4 of the MSAR-TMDL Implementation Plan.	Annual Report
VI.D.1.a.vii		Amend the Local Implementation Plans (LIP) to be consistent with the revised DAMP and WQMPs within 90 days after said revisions are approved by the Regional Board. Summarize any such LIP amendments in the annual report		Annual Report
VI.D.1.b. & VI.D.1.c.		The MSAR Permittees shall submit a Comprehensive Bacteria Reduction Plan (CBRP) to achieve the final WQBELs for bacterial indicators during the Dry Season by December 31, 2015. Enforcement starts no sooner than January 1, 2016		Draft by December 31, 2010 Final by Dec 31, 2015.
VI.D.1.c.i.(8)		Revise the DAMP, WQMP, & LIPs	Within 180 days of CBRP approval.	
VI.D.2.a.		Submit Phase 2 Alternatives	December 31, 2010	
		Submit O&M for Agreement for Fishery Management Program	December 31, 2010	
		Submit O&M for Agreement for Aeration and Mixing Systems	December 31, 2010	
		Submit Phase 2 Projects Plans	June 30, 2011	
		Complete Phase 2 Project Implementation	December 31, 2014	
		Implement in-lake and watershed monitoring programs	Annual Reports due August 31 every year.	
VI.D.2.b.		Linkage Analysis Study	August 31, 2010	
		Watershed Source Loading Study	August 31, 2010	

Reference		Item	Completion Time after Permit Adoption or Frequency	Report Due Date
Permit	**DAMP[a]**			
		Model Evaluation	December 31, 2010	
		Construct/Calibrate Model	June 30, 2011	
		Conduct Model Scenarios	August 31, 2011	
		Model Update Final Report	November 30, 2011	
VI.D.2.c.		Revise DAMP, WQMP, & LIPs to incorporate the compliance plans required above.		Annual Report
VI.D.2.h.		Summarize all relevant data from water quality monitoring programs and evaluate compliance with the LE/CL TMDL	Annually	Annual Report
VI.D.2. d. & VI.D.2. e.		Submit CNRP	December 31, 2011	December 31, 2020.
VI.D.2.a.		Initiate Phase 2 LE/CL TMDL data collection.	December 31, 2010	
VI.D.2.j.		Tables 9 & 10 become WQBELs if CNRP is not adopted by Regional Board	December 31, 2020	
VII.D.1		Report upon determination that discharges from the MS4 are causing or contributing to an exceedance of an applicable WQS	Within two (2) working days	Within Annual update of DAMP
VII.D.2		Modify DAMP, LIP, and MRP to address Receiving Water Limit Violations and implementation schedule.	---	30 days after approval of Subsection VI.D. report by Executive Officer
VII.D.4		Report any exceedance solely due to discharges outside the Permittees jurisdiction.		Within two (2) working days of becoming aware of the situation, provide oral or e-mail notice and provide written documentation within ten (10) calendar days of becoming aware of the situation.
VIII.C.		Promulgate ordinances that would control for known pathogen or Bacterial Indicator sources	Within 3 years of adoption	Annual Report

Reference		Item	Completion Time after Permit Adoption or Frequency	Report Due Date
Permit	**DAMP[(a)]**			
VIII.F.		Review Storm Water Ordinances for effectiveness in prohibiting discharges to the MS4	Annual Report	
VIII. G.		Certification statement, signed by the Chief legal counsel, that the Permittee has obtained all necessary legal authority	Within 24 months of Order adoption.	Annual Report
VIII.H.		Permittees shall effectiveness of, implementation and enforcement response procedures.	Annually	Annual Report
IX. A.		Eliminate or permit IC/IDs		60 calendar days from receipt of notice from a third party.
IX.D.		Review and revise IC/ID program	18 months after Order adoption	Annual Report
IX.G.		Annually review and evaluate their IC/ID or IDDE program to determine if the program needs to be adjusted.	Annually	Annually
IX.H.		Maintain database summarizing IC/ID incident response	Annually	Annual Report
X.D.		Maintain inventory of septic systems within its jurisdiction completed in 2008.	Ongoing	Annual Report.
XI.A.11.		Each Permittee shall document, evaluate and annually report the effectiveness of its enforcement procedures in achieving prompt and timely compliance.	Annually	Annual Report
XI.A.13.		Permittees to evaluate and report adequacy of inspection programs conducted by other agencies on behalf of Permittee.	Annually	Annual Report

Reference		Item	Completion Time after Permit Adoption or Frequency	Report Due Date
Permit	**DAMP[(a)]**			
XI.B.4.		An inventory and inspection frequency of: Wet Season(Oct 1 – May 31): High = 1/mo., Med = 2/season, low = 1/season Dry Season: All construction sites shall be inspected at a frequency sufficient to ensure that sediment and other Pollutants are properly controlled and that unauthorized, Non-Storm Water discharges are prevented		Annual Report
XI.C.3		All high priority industrial facilities are to be inspected at least once a year; all medium priority sites are to be inspected at least once every two years; and all low priority sites are to be inspected at least once per permit cycle.		Annual Report
XI.D.4		All high priority sites shall be inspected at least once a year; all medium priority sites shall be inspected at least every two years; and all low priority sites shall be inspected at least once per MS4 Permit cycle.		Annual Report
XI.D.6		Notify all mobile businesses operating within the County concerning the minimum source control and pollution prevention measures that they must develop and implement.	Within 18 months of adoption of this Order	Annually
XI.D.7		The Principal Permittee shall develop an enforcement strategy to address mobile businesses.	Within 24 months of adoption of this Order	Annually

Reference		Item	Completion Time after Permit Adoption or Frequency	Report Due Date
Permit	**DAMP[(a)]**			
XI.E.1		Each Permittee shall develop and implement a residential program to reduce the discharge of Pollutants from residences to the MS4s to the MEP.	Within 18 months of adoption of this Order	Annually
XI.E.6.		Co-Permittees to provide an evaluation of its residential program	Annually starting with the second Annual Report following MS4 Permit adoption	Annually starting with the third Annual Report following MS4 Permit adoption
XII.B.3 & B8.		The Co-Permittees shall submit to the Regional Board a Watershed Action Plan	Within three years of adoption of MS4 Permit.	Annual Report
XII.B.5		Develop HMP	Submit within 4 years of adoption	
XII.C.1.		Each Permittee shall review the watershed protection principles and policies in its General Plan and related documents to eliminate barriers to LID.	Within 24 months of adoption of this Order	Annually
XII.D.1.		Each Permittee to submit a revised WQMP to incorporate new elements required in the Order	Within 18 months of adoption of this Order	Annual Report
XII.D.5.		Principal Permittee to develop recommendations for streamlining regulatory agency approval of regional Treatment Control BMPs.	Within 24 months of adoption of this Order	Annually
XII.E.1		Permittees shall update the WQMP to incorporate LID principles,	18 months of Order adoption	
XII.E.4.		Revise Ordinances to promote Green Infilstructure	18 months of Order adoption. Implement within 6 months of EO approval.	
XII.E.5.		Each Permittee to update its landscape ordinance consistent with requirements of AB 1881 and annually evaluate effectiveness with respect to water efficiency and water conservation goals	January 31, 2010	2011-2012 Annual Report

Reference		Item	Completion Time after Permit Adoption or Frequency	Report Due Date
Permit	**DAMP[(a)]**			
XII. F.		Develop standard design and post-development BMP guidance for streets, roads etc. projects.	Within 24 months of adoption of this Order, Implement within 6 months of EO approval.	
XII.G1.		Permittees shall establish technically-based feasibility criteria for project evaluation to determine feasibility of implementing LID	Within 18 months of MS4 Permit adoption	No reporting specified
XII.H.		Each Permittee shall develop and implement standard procedures and tools, and include in its LIP.	Within 18 months of adoption of this Order	Annually
XII.K.4.		The Permittees shall maintain a database to track operation and maintenance of post-construction BMPs.		Annually
XII.K.5		Public Agency Treatment Control BMPs, shall be inspected prior to the Wet Season.	Within18 months of Order adoption and within the 5 year permit term.	Annually
		New Development (Redevelopment) Treatment Control BMPs, shall be inspected prior to the Wet Season.	Based on schedule submitted but at least once within the 5 year permit term.	Annually
XII.K.6.		Provide list of all post-construction Treatment Control BMPs approved, constructed and/or operating	Annually	Annual Report
XII.L.		Provisions for LID and HCOC included in WQMP.	Within 45 days of approval of WQMP.	
XIII.A.		Review public education and outreach efforts and revise their activities to adapt to the needs identified in the annual reassessment.		Annual Report
XIII.B.		Status report on Public Education and Outreach requirements and changes to the ongoing program	Annually	Annual Report

Reference		Item	Completion Time after Permit Adoption or Frequency	Report Due Date
Permit	**DAMP[(a)]**			
XIII.C.		Implement assessment program to measure increases in public knowledge of impacts of Urban Runoff on Receiving Waters	First Annual Report following MS4 Permit adoption	
XIII.F.		The Permittees shall develop, maintain and distribute BMP guidance for the control of those potentially polluting activities identified during the previous permit cycle, which are not otherwise regulated by any agency, including guidelines for the household use of fertilizers, pesticides, herbicides and other chemicals, and guidance for mobile vehicle maintenance, carpet cleaners, commercial landscape maintenance, and pavement cutting.	Within 18 months of adoption of this Order	Annual Report
XIII.I.		The Public Education Committee shall meet at least twice per year.		Annual Report
XIII.J.		Sponsor or staff an Urban Runoff table or booth at community, regional, and/or countywide events to distribute public education materials to the public.	Each Permittee shall participate in at least one event per year.	Annually
XIII.K.		Involve public agency organizations, listed in Appendix 2, in Urban Runoff program. Notify the Regional Board where assistance is needed in improving local cooperation.		Annual Report
XIII.L		Develop and distribute BMP Fact Sheets for mobile businesses	Within 18 months of adoption of this Order	
XIV.A.		Review activities and facilities to determine the need for revisions to Section 5 of the DAMP and LIP.	Annually	Annual Report

Reference		Item	Completion Time after Permit Adoption or Frequency	Report Due Date
Permit	**DAMP[(a)]**			
XIV.B.		Each Permittee shall review its inventory of fixed facilities listed in the DAMP, its field operations and MS4 facilities to ensure that public agency facilities and activities do not cause or contribute to a Pollution or nuisance in Receiving Waters.	Within 12 months of adoption of this Order	Annual Report
XIV.C.		Conduct inspections of its fixed facilities and field operations.	Annually	Annual Report
XIV. D.		Evaluate cleaning schedule.	Annually	Annual Report
XIV.E.		Unless otherwise determined, each Permittee shall inspect, clean & maintain at least 80% of it's open channels, catch basins, retention/detention basins, and wetlands created for Urban Runoff treatment.	Annually	Annual Report
XIV.G1.c.		Notify the Executive Officer of the proposed construction project by electronically submitting Permit Registration Documents (PRDs).	Prior to commencement of each construction project.	
XIV.G1.d.		the Executive Officer shall be notified of the completion of the project by submitting a Notice of Termination (NOT).	Upon completion of each construction project.	
XIV.G2.b.		Notify the Executive Officer of each proposed deminimus discharge at least 15 days prior to start of the discharge	At least 15 days prior to discharge.	At least 15 days prior to discharge.
XV.A		DAMP and each Permittee's LIP shall be updated to include a program to provide formal and where necessary, informal training to Permittee staff that implement the provisions of this Order	Within 24 months of adoption of Order	DAMP will be updated within 24 months of adoption of Order. LIP will be updated within 12 months of approval of LIP template by EO

Reference		Item	Completion Time after Permit Adoption or Frequency	Report Due Date
Permit	**DAMP[(a)]**			
XV.A., XV.E. .		Each Permitee's LIP shall describe a program to provide formal and informal training to Permittee staff and contractors that implement the provisions of this Order. Provide the specified training.	Within 24 months of adoption of this Order and annually thereafter.	LIP will be updated within 24 months of order adoption.
XV.F.		Principal Permittee shall provide and document training to applicable Permittee staff on area wide procedures such as the DAMP, and any other applicable guidance and procedures developed by the Permittees to address activities in fixed facilities as well as field operations, including MS4 maintenance.	Within 12 months of adoption of this Order, within 12 months of hire and every two years, thereafter.	Bi-annually
XV.H*		Principal Permittee shall notify Regional Board staff		When notifying Permittees of training session.
XVI.A.		Notify of emergency events..		Within 24 hours of discovery
XVI.C		Sewage spill notification shall be consistent with the timelines specified in the Statewide General Waste Discharge Requirements for Sanitary Sewer Systems, Water Quality Order No. 2006-0003-DWQ.		Consistent with 2006-003-DWQ.
XVI.D.		Hazardous Waste Spills	Notify within 24 hours.	
XVI.E.		Facilities operating without an applicable General permit.		Reported within 14 calendar days
XVII.A.		Evaluate the effectiveness of the Urban Runoff management program.	By November 30 of each year.	Annually by November 30.
XVII.B.		Amended DAMP pages.		Annual Report
XVIII.B.		Financial analysis report		Annual Report
XXII.A.		Report of Waste Discharge	180 days before permit expires	Jan 29, 2015

Reference		Item	Completion Time after Permit Adoption or Frequency	Report Due Date
Permit	**DAMP[a]**			
Appendix 3, III.C.		Review CMP to determine their effectiveness in Urban Runoff program assessment	Within 12 months of adoption of this Order	N/A
		Submit Revised CMP	Within 16 months of adoption of this Order and implement within 6 months of approval.	
Appendix 3, III.D.1.b.		Prepare a triennial report summarizing the data collected for the preceding 3 year period and evaluating compliance with the WLAs.	Every three years	The first report shall be due February 15, 2010.
Appendix 3, III.D.2		Submit an annual report summarizing all relevant data from water quality monitoring programs and evaluating compliance with the LE/CL TMDL by reporting the effectiveness of the BMPs implemented in the watershed to control nutrient inputs into the lake from Urban Runoff pursuant to Regional Board Resolution No. R8-2006-0031 and R8-2007-0083, or as amended by subsequent Regional Board adopted resolutions.	Annually	Annual Report
Appendix 3, IV.B.2.		Annual Report	Annually	November 30th

(a) This column to be completed by Permittees.

Date: 1-29-10

Ordered by

Gerard J. Thibeault
Executive Officer

APPENDIX 4

GLOSSARY

ORDER NO. R8-2010-0033

Appendix 4, GLOSSARY

40 CFR – Code of Federal Regulations Title 40: Protection of the Environment.

Annual Report – Report summarizing compliance information required to be submitted annually to the Regional Board on or before each November 30th.

Anthropogenic – Generated from human activities

APN – Assessor's parcel number

Basin Plan – Water Quality Control Plan developed by the Regional Board for the Santa Ana River watershed.

BAT [Best Available Technology] – Technology-based standard established by Congress in CWA Section 402(p)(3)(A) for industrial dischargers of storm water. Technology-based standards establish the level of Pollutant reductions that dischargers must achieve, typically by treatment or by a combination of Source Controls and Structural BMPs. BAT generally emphasizes treatment methods first and Pollution Prevention and Source Control BMPs secondarily. The best economically achievable technology that will result in reasonable further progress toward the national goal of eliminating the discharge of all Pollutants is determined in accordance with regulations issued by the USEPA Administrator. Factors relating to the assessment of BAT shall take into account the age of equipment and facilities involved, the process employed, the engineering aspects of the application of various types of control techniques, process changes, the cost of achieving such effluent reduction, non-water quality environmental impact (including energy requirements), and such other factors as the permitting authority deems appropriate.

BCT [Best Conventional Technology] – Treatment techniques, processes, and procedure innovations, and operating methods that eliminate or reduce chemical, physical, and biological Pollutant constituents.

Beneficial Use – Uses of water necessary for the survival or well being of man, plants, and wildlife. These uses of water serve to promote the tangible and intangible economic, social, and environmental goals. “Beneficial Uses” that may be protected include, but are not limited to: domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. Existing Beneficial Uses are those that were attained in the surface or ground water on or after November 28, 1975; and potential Beneficial Uses are those that would probably develop in future years through the implementation of various control measures. “Beneficial Uses” are equivalent to “Designated Uses” under federal law. [California

Water Code Section 13050(f)] Beneficial Uses for the Receiving Waters are identified in the Basin Plan.

Biological Integrity – Defined in Karr J.R. and D.R. Dudley. 1981. Ecological perspective on water quality goals. Environmental Management 5:55-68 as: "A balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitat of the region." Also referred to as ecosystem health.

BMP [Best Management Practices] – Defined in 40 CFR 122.2 as schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the Pollution of Waters of the U.S. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. In the case of MS4 permits, BMPs are typically used in place of Numeric Effluent Limits.

CAFO – Concentrated animal feeding operation.

Caltrans – California Department of Transportation.

CAP – The Commercial and Industrial Compliance Assistance Program is a Riverside County Environmental Health Department program that includes a storm water survey and educational outreach as part of existing inspections of Hazardous Material handlers and retail food service activities. Hazardous Waste handling facilities are inspected at least once during a two-year cycle. Restaurants are inspected at least once during the MS4 Permit cycle. Any completed surveys that indicate non-compliance are forwarded to the appropriate jurisdiction's code enforcement division. The Permittees notify Regional Board staff when conditions are observed during such inspections that appear to violate the General Storm Water Permits or a permit issued by the Regional Board.

CEQA – California Environmental Quality Act (Section 21000 et seq. of the California Public Resources Code).

CIEP – Compliance Inspection and Enforcement Program

Cleaning – Removal of litter or debris that can impact Receiving Waters.

CMP – Consolidated Program for Water Quality Monitoring, Riverside County Flood Control and Water Conservation District, October 2008.

Commercial Facilities – Businesses that have the potential to discharge Pollutants to the MS4 not otherwise covered by the General Industrial Permit that are described in Section 8.1 of the DAMP. These businesses are inspected as part of the CAP or equivalent as described in Section 8.1 of the DAMP. Commercial Facilities include businesses based in a Permittee's jurisdiction that perform mobile carpet, drape or

furniture cleaning; mobile automobile or other vehicle washing and mobile high pressure or steam cleaning.

Comprehensive TMDL Plan – A plan presenting a long-term solution designed to achieve compliance with the WLAs by the dates specified in the TMDLs. This plan includes a description of the proposed BMPs and the documentation demonstrating that the BMPs are expected to attain the WLAs by the compliance dates when implemented.

Conditions of Concern – Scour, erosion (sheet, rill and/or gully), aggradation (raising of a streambed from sediment deposition), and changes in fluvial geomorphology, hydrology or the aquatic ecosystem.

Construction Site – A site with activities for which building or grading permits have been issued and activities at the site include: soil movement; uncovered storage of materials or wastes, such as dirt, sand or fertilizer; or exterior mixing of cementaceous products, such as concrete, mortar or stucco.

Contamination – As defined in the Porter-Cologne Water Quality Control Act, contamination is "an Impairment of the quality of waters of the State by Waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease." Contamination includes any equivalent effect resulting from the disposal of Waste whether or not Waters of the U.S. are affected.

Co-Permittees – County of Riverside and the cities of Beaumont, Calimesa, Canyon Lake, Corona, Hemet, Lake Elsinore, Menifee, Murrieta, Moreno Valley, Norco, Perris, Riverside, San Jacinto and Wildomar.

County – County of Riverside, a legal subdivision of the State of California.

CSA 152 – County Service Area 152

CWA – Federal Clean Water Act

CZARA – Coastal Zone Act Reauthorization Amendments of 1990

DAMP [Drainage Area Management Plan] – The DAMP is a programmatic document developed by the Permittees and approved by the Executive Officer that outlines the major programs and policies that the Permittees individually and/or collectively implement to manage Urban Runoff in the Permit Area.

DDT – Dichlorodiphenyltrichloroethane – An insecticide first used in 1939. Most uses of DDT were banned in 1972, with limited exception for public health purposes.

De Minimus Permit – General De Minimus Permit for Discharges to Surface Waters, Order NO. R8-2009-0003, NPDES No. CAG 998001

Design Capture Volume – (See Permit, XII.E.2)

Discretionary Project – Per Section 15357 of the Guidelines for CEQA "Discretionary Project" means a project which requires the exercise of judgment or deliberation when the public agency or body decides to approve or disapprove a particular activity, as distinguished from situations where the public agency or body merely has to determine whether there has been conformity with applicable statutes, ordinances, or regulations. A timber harvesting plan submitted to the State Forester for approval under the requirements of the Z'berg-Nejedly Forest Practice Act of 1973 (Pub. Res. Code Sections 4511 et seq.) constitutes a discretionary project within the meaning of the California Environmental Quality Act. Section 21065(c).

Direct Discharge (Table 3a) – A discharge directly from an MS4 to a receiving water such that the MS4 discharge does not first co-mingle with waters from another receiving water or conveyance.

Dry Season/Dry Weather - The season excluding the Wet Season. Generally it will be June 1 through September 30 of each year, unless specifically defined otherwise in a applicable TMDL Implementation Plan.

Effective Impervious Area (EIA) – EIA is the portion of the total impervious area that is directly connected to the drainage collection system. EIA includes street surfaces, paved driveways connecting to the street, rooftops which are hydraulically connected to the curb or storm sewer system, and paved parking lots that drain to a storm sewer system.

Impervious area such as rooftops, streets, sidewalks, and parking areas do not allow water to drain into the soil. Impervious area that collects and drains the water directly to a stream or wetland system via pipes or sheet flow is considered “effective impervious area” because it effectively drains the landscape. Impervious area that drains to landscaped areas, swales, parks and other impervious areas is considered “ineffective” because the water is allowed to infiltrate through the soil and into ground water, without a direct connection to the stream or wetland.

Reducing effective impervious area is defined as disconnecting impervious surfaces such as sidewalks, rooftops, parking areas, and streets, from the drainage system so that runoff percolates into the soil and does not flow directly to streams. Disconnecting the stormwater system allows the watersheds’ hydrologic cycle to respond in a manner that more closely reflects pre-disturbed conditions. EIA reduction can occur as part of new development, redevelopment, or be part of a retrofit design. The level of benefit is determined by how well the practices minimize runoff in small to mid size storm events.

Effectiveness Assessment Outcome Level 1 - Compliance with Activity-based Permit Requirements – Level 1 outcomes are those directly related to the implementation of specific activities prescribed by this Order or established pursuant to it.

Effectiveness Assessment Outcome Level 2 - Changes in Attitudes, Knowledge, and Awareness – Level 2 outcomes are measured as increases in knowledge and awareness among target audiences such as residents, businesses, and municipal employees.

Effectiveness Assessment Outcome Level 3 - Behavioral Change and BMP Implementation – Level 3 outcomes measure the effectiveness of activities in affecting behavioral change and BMP implementation.

Effectiveness Assessment Outcome Level 4 - Load Reductions – Level 4 outcomes measure load reductions which quantify changes in the amounts of pollutants associated with specific sources before and after a BMP or other control measure is employed.

Effectiveness Assessment Outcome Level 5 - Changes in Urban Runoff and Discharge Quality – Level 5 outcomes are measured as changes in one or more specific constituents or stressors in discharges into or from MS4s.

Effectiveness Assessment Outcome Level 6 - Changes in Receiving Water Quality – Level 6 outcomes measure changes to receiving water quality resulting from discharges into and from MS4s, and may be expressed through a variety of means such as compliance with water quality objectives or other regulatory benchmarks, protection of biological integrity, or beneficial use attainment.

Effluent Limitations – means any restriction on quantities, discharge rates, and concentrations of Pollutants which are discharged from Point Sources into Waters of the U.S., waters of the “contiguous zone,” or the ocean (40 CFR 122.2).

Emergency Situation – At a minimum, sewage spills that could impact water contact recreation, all sewage spills above 1,000 gallons, an oil spill that could impact wildlife, a Hazardous Material spill where residents are evacuated, all reportable quantities of Hazardous Waste spills as per 40CFR 117 and 302, and any incident reportable to the OES (1-800-852-7550).

Erosion and Sediment Control Plan (ESCP) – These are water quality protection plans that include control measures for erosion prevention and sediment controls that would minimize the mobilization of sediment from the project site.

ESA – Environmentally Sensitive Area - An area “in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in

an ecosystem and which would be easily disturbed or degraded by human activities and developments" (Reference: California Public Resources Code § 30107.5).

ESAs subject to storm water mitigation requirements are:

1. Areas adjacent to Receiving Waters designated as "Preservation of Biological Habitats of Special Significance (BIOL)", "Spawning, Reproduction, and Development (SPWN)" or "Rare, Threatened, or Endangered Species (RARE)" Beneficial Uses in the Basin Plan;

2. Areas within the MSHCP that contain rare or especially valuable plant or animal life or their habitat. These areas are considered mitigated as the MSHCP contains substantive alternatives analysis for any proposed development that has the potential to impact resources.

3. Areas adjacent to CWA 303(d) Listed Water Bodies or adopted TMDLs with implementation plans that have yet to achieve the Urban WLA or LA goals; and

4. Any other equivalent environmentally sensitive areas which the Permittees have defined.

Executive Officer - The Executive Officer of the Regional Board.

General Construction Permit – State Board Order No. 2009-0009 DWQ (NPDES No. CAS000002) or the most recent draft of the General Construction Permit issued by the State Board subsequent to issuance of this Order.

General Dairy Permit – Regional Board Order No. R8-2007-0001 (NPDES No. CAG018001) for CAFOs.

General De Minimus Discharges Permit – Regional Board Order No. R8-2009-0003.

General Industrial Permit – State Board Order No. 97-03 DWQ (NPDES No. CAS000001) or the most recent General Permit for Storm Water Discharges Associated with Industrial Activities issued by the State Board subsequent to issuance of this Order.

General Storm Water Permits – General Industrial Permit (State Board Order No. 97-03 DWQ, NPDES No. CAS000001) and General Construction Permit (State Board Order No. 2009-0009-DWQ NPDES No. CAS000002), or the most recent applicable General Permit issued by the State Board subsequent to the issuance of this Order.

General Utility Vaults Permit-– State Board Order No. 2006-0008-DWQ, NPDES No. CAG990002.

GIS – Geographical Information System.

Green Infrastructure – Generally refers to technologically feasible and cost-effective systems and practices that use or mimic natural processes to infiltrate, evapotranspirate, or reuse stormwater or runoff on the site where it is generated. This is a concept that highlights the importance of the natural environment in decisions about land use planning. In particular there is an emphasis on the "life support" functions provided by a network of natural ecosystems, with an emphasis on connectivity to support long term sustainability. (Also see Low Impact Development.)

Hazardous Material – Any substance that poses a threat to human health or the environment due to its toxicity, corrosiveness, ignitability, explosive nature or chemical reactivity. These also include materials named by the USEPA to be reported if a designated quantity of the material is spilled into the Waters of the U.S. or emitted into the environment.

Hazardous Waste – defined as "any waste, which, under Section 600 of Title 22 of this code, is required to be managed according to Chapter 30 of Division 4.5 of Title 22 of this code." [CCR Title 22, Division 4.5, Chapter 11, Article1]

HCOC – Hydrologic Condition of Concern - An HCOC exists when a site's hydrologic regime is altered and there are significant impacts on downstream channels and aquatic habitats, alone or in conjunction with impacts of other projects.

Hydromodification - the "alteration of the hydrologic characteristics of coastal and non-coastal waters, which in turn could cause degradation of water resources."[1] (USEPA 2007)

IC/ID – Illicit Connection/Illegal Discharge

IDDE - Illicit Discharge Detection and Elimination Program

Illegal Discharge –Defined at 40 CFR 122.26(b)(2) as any discharge to the MS4 that is not composed entirely of storm water, except discharges pursuant to an NPDES permit, discharges that are identified in Section VI.A. of this Order, and discharges authorized by the Executive Officer.

Illicit Connection – Any connection to the MS4 that is prohibited under local, state, or federal statutes, ordinances, codes, or regulations. The term Illicit Connection includes all non storm-water discharges and connections except discharges pursuant to an NPDES permit, discharges that are identified in Section V, Effluent Limitations and

[1] USEPA. 2007. *National Management Measures to Control Nonpoint Source Pollution from Hydromodification.* EPA 841-B-07-002. U.S. Environmental Protection Agency, Office of Water, Washington DC

Discharge Specifications, of this Order, and discharges authorized by the Executive Officer.

Impaired – Relates to waterbodies where it is presumed Beneficial Uses are not attained.

Impaired Waterbody / **Impaired Waters** – Section 303(b) of the CWA requires each of California's Regional Water Quality Control Boards to routinely monitor and assess the quality of waters of their respective regions. If this assessment indicates that Beneficial Uses are not met, then that waterbody must be listed under Section 303(d) of the CWA as an Impaired Waterbody. The 2006 water quality assessment found a number of water bodies within the Permit Area as Impaired pursuant to Section 303(d). In the Permit Area, these include: Canyon Lake (for pathogens); Lake Elsinore (for PCBs and unknown toxicity); Lake Fulmor (for pathogens); Santa Ana River, Reach 3 (pathogens); and Santa Ana River, Reach 4 (for pathogens).

Impairment – A waterbody condition where Beneficial Uses are not attained.

Implementation Agreement – The Implementation Agreement establishes the responsibilities of each Permittee and a procedure for funding the shared costs.

Impressions – The most common measure is "gross impressions" that includes repetitions. This means if the same person sees an advertisement or hears a radio or sees a TV advertisement a thousand times, that will be counted as 1000 Impressions.

Industrial Facility – Facilities defined in Attachment 1 of the General Industrial Permit. These facilities are also addressed by the CAP or equivalent as described in Section 8.1 of the DAMP.

LA – [Load Allocations] – Distribution or assignment of TMDL Pollutant loads to entities or sources for existing and future Non-Point Sources, including background loads.

Land Disturbance – The clearing, grading, excavation, stockpiling, or other construction activity that result in the possible mobilization of soils or other Pollutants into the MS4. This specifically does not include routine maintenance activity to maintain the original line and grade, hydraulic capacity, or original purpose of the facility. This also does not include emergency construction activities required to protect public health and safety. The Permittees should first confirm with Regional Board staff if they believe that a particular routine maintenance activity is exempt under this definition from the General Construction Permit or other Orders issued by the Regional Board.

Local Implementation Plan (LIP) – Document describing an individual Permittee's procedures, ordinances, databases, plans, and reporting materials for compliance with the MS4 Permit.

Low Impact Development (LID) – Comprises a set of technologically feasible and cost-effective approaches to storm water management and land development that combines a hydrologically functional site design with Pollution Prevention measures to compensate for land development impacts on hydrology and water quality. LID techniques mimic the site's predevelopment hydrology by using site design techniques that store, infiltrate, evapotranspire, bio-treat, bio-filter, bio-retain or detain runoff close to its source.

Major Outfall – Outfalls with a pipe diameter of 36 inches or greater or drainage areas draining 50 acres or more.

Management Steering Committee – Committee to address Urban Runoff management policies for the Permit Area and coordinate the review and necessary revisions of the DAMP and Implementation Agreement. The Management Steering Committee consists of one or more city manager or equivalent representatives from each Permittee.

MEP [Maximum Extent Practicable] MEP is an acronym for "Maximum Extent Practicable" and refers to the standard for implementation of storm water management programs.
Section 402(p)(3)(B)(iii) of the Clean Water Act requires that municipal storm water permits "shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques, and system design and engineering
methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants."

In practice, compliance with the MEP standard is evaluated by how well the Permittees implement the "minimum measures" identified by EPA, including: (1)Public education and outreach on storm water impacts; (2) Public involvement/participation; (3) Illicit discharge detection and elimination; (4) Construction site storm water runoff control; (5) Post-construction storm water management in new development and redevelopment; and (6) Pollution prevention/good housekeeping for municipal operations. Collectively, these minimum measures are often referred to as "Best Management Practices" or BMPs. The MEP standard does not require Permittees to reduce pollutant concentrations below natural background levels, nor does it require further reductions where pollutant concentrations in the receiving water already meet water quality objectives. In implementing the MEP standard, it is appropriate for Permittees to prioritize their resource allocation to address the storm water pollution problems that pose the greatest and most immediate threat to human health or the environment.

MEP is a technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP

generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) in combination with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than BAT. A definition for MEP is not provided either in the statute or in the regulations. Instead the definition of MEP is dynamic and will be defined by the following process over time: municipalities propose their definition of MEP by way of their urban runoff management programs. Their total collective and individual activities conducted pursuant to the urban runoff management programs becomes their proposal for MEP as it applies both to their overall effort, as well as to specific activities (e.g., MEP for street sweeping, or MEP for MS4 maintenance). In the absence of a proposal acceptable to the Regional Board, the Regional Board defines MEP.

In a memo dated February 11, 1993, entitled "Definition of Maximum Extent Practicable," Elizabeth Jennings, Senior Staff Counsel, SWRCB addressed the achievement of the MEP standard as follows:

“To achieve the MEP standard, municipalities must employ whatever Best management Practices (BMPs) are technically feasible (i.e., are likely to be effective) and are not cost prohibitive. The major emphasis is on technical feasibility. Reducing pollutants to the MEP means choosing effective BMPs, and rejecting applicable BMPS only where other effective BMPS will serve the same purpose or the BMPS would not be technically feasible, or the cost would be prohibitive. In selecting BMPS to achieve the MEP standard, the following factors may e useful to consider:

a. Effectiveness: Will the BMPS address a pollutant (or pollutant source) of concern?

b. Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?

c. Public Acceptance: Does the BMP have public support?

d. Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?

e. Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc?

The final determination regarding whether a municipality has reduced pollutants to the maximum extent practicable can only be made by the Regional or State Water Boards, and not by the municipal discharger. If a municipality reviews a lengthy menu of BMPS and chooses to select only a few of the least expensive, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPS except those where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit derived, it would have met the standard. Where a choice may be made between two BMPS that should provide generally comparable

effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPS that would address a pollutant source, or to pick a BMP base solely on cost, which would be clearly less effective. In selecting BMPS the municipality must make a serious attempt to comply and practical solutions may not be lightly rejected. In any case, the burden would be on the municipal discharger to show compliance with its permit. After selecting a menu of BMPS, it is the responsibility of the discharger to ensure that all BMPS are implemented."

Ministerial – Per Section 15369 of the CEQA Guidelines, Ministerial describes a governmental decision involving little or no personal judgment by the public official as to the wisdom or manner of carrying out the project. The public official merely applies the law to the facts as presented but uses no special discretion or judgment in reaching a decision. A ministerial decision involves only the use of fixed standards or objective measurements, and the public official cannot use personal, subjective judgment in deciding whether or how the project should be carried out. Common examples of ministerial permits include automobile registrations, dog licenses, and marriage licenses. A building permit is ministerial if the ordinance requiring the permit limits the public official to determining whether the zoning allows the structure to be built in the requested location, the structure would meet the strength requirements in the Uniform Building Code, and the applicant has paid his fee.

MSAR – Middle Santa Ana River

MSHCP – Western Riverside County Multiple Species Habitat Conservation Plan

MS4 – **[Municipal Separate Storm Sewer System]** – A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, natural drainage features or channels, modified natural channels, man-made channels, or storm drains): (i) Owned or operated by a State, city town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or designated and approved management agency under section 208 of the CWA that discharges to Waters of the U.S.; (ii) Designated or used for collecting of conveying storm water; (iii) Which is not a combined sewer; (iv) Which is not part of the POTW as defined at 40 CFR 122.2.

New Development – The categories of development identified in Section XI.D of this Order. New Development does not include routine maintenance to maintain original line and grade, hydraulic capacity, or original purpose of a facility, nor does it include emergency New Development required to protect public health and safety. Dischargers should confirm with Regional Board staff whether or not a particular routine maintenance activity is subject to this Order.

New Urbanism – New Urbanism refers to the use of creative strategies to develop ways that preserve natural lands and critical environmental areas, protect water and air quality, and reuse already-developed land. This is based on principles of planning and architecture that work together to create human-scale, walkable communities that preserve natural resources.

NOI [Notice of Intent] – A NOI is an application for coverage under the General Storm Water Permits.

Non-Point Source – Refers to diffuse, widespread sources of Pollution. These sources may be large or small, but are generally numerous throughout a watershed. Non-Point Sources, include but are not limited to urban, agricultural or industrial area, roads, highways, construction sites, communities served by septic systems, recreational boating activities, timber harvesting, mining, livestock grazing, as well as physical changes to stream channels, and habitat degradation. Non-Point Source Pollution can occur year round any time rainfall, snowmelt, irrigation, or any other source of water runs over land or through the ground, picks up Pollutants from these numerous, diffuse sources and deposits them into rivers, lakes and coastal waters or introduces them into groundwater.

Non-storm Water – All discharges to and from a MS4 that do not originate from precipitation events (i.e., all discharges to a MS4 other than storm water). Non-storm Water includes Illicit Discharges, non-prohibited discharges and NPDES permitted discharges.

NOT - Notice of Termination – Formal notice to the Regional Board of intent to terminate water discharge for projects covered under a General Stormwater Permit.

NPDES [National Pollutant Discharge Elimination System] – Permits issued under Section 402(p) of the CWA for regulating discharge of Pollutants to Waters of the U.S.

Nuisance – As defined in the Porter-Cologne Water Quality Control Act a Nuisance is "anything which meets all of the following requirements: 1) Is injurious to health, or is indecent, or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. 2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. 3) Occurs during, or as a result of, the treatment or disposal of Wastes."

Numeric Effluent Limitations – A quantitative limitation on Pollutant concentrations or levels to protect Beneficial Uses and Water Quality Objectives of a water body. When Numeric Effluent Limits are met at the "end-of-pipe," the effluent discharge generally will not cause Water Quality Standards to be exceeded in the receiving waters (i.e., Water Quality Standards will also be met).

Nurdles – A plastic pellet, also known as pre-production plastic pellet or plastic resin pellet.

NURP - National Urban Runoff Program

OES – The Governor's Office of Emergency Services, an agency of the State of California.

"Only Rain Down The Storm Drain" Pollution Prevention Program – County Urban Runoff public education program.

Open Space – Any parcel or area of land or water that is essentially unimproved or devoted to an open-space use for the purposes of (1) the preservation of natural resources, (2) the managed production of resources, (3) outdoor recreation, or (4) public health and safety. [Riverside County General Plan, adopted October 7, 2003. Technical Appendix A , Glossary]

Order – Order No. R8-2010-0033 (NPDES No. CAS618033)

Outfall – Means a Point Source as defined by 40 CFR 122.2 a, the point where a municipal separate storm sewer discharges to Waters of the U.S. and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels, or other conveyances which connect segments of the same stream or other Waters of the U.S. and are used to convey Waters of the U.S.. [40 CFR 122.26 (b)(9)]

PAHs – Polycyclic aromatic hydrocarbons. PAHs occur in oil, coal, and tar deposits, and are produced as byproducts of fuel burning (whether fossil fuel or biomass). As a Pollutant, they are of concern because some compounds have been identified as carcinogenic, mutagenic, and teratogenic. PAHs are also found in foods.

Party – Defined as an individual, association, partnership, corporation, municipality, state or federal agency, or an agent or employee thereof. [40 CFR 122.2]

PCBs – Polychlorinated biphenyls. Due to PCB's toxicity and classification as persistent organic Pollutants, PCB production was banned by the United States Congress in 1976 and by the Stockholm Convention on Persistent Organic Pollutants in 2001.

Permit Area – In the Santa Ana Region, the portion of the Santa Ana River watershed that is within the County and regulated under the MS4 Permit. The Permit Area is identified on Appendix 1 as "Permittee Urban Area" and those areas under the Permittee's jurisdictions designated as "Agriculture" and "Open Space" on Appendix 1 that will convert to Permittee Urban Area when developed to industrial, commercial, or residential use during the term of the Order.

Permittees – Co-Permittees and the Principal Permittee

Point Source – Any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, landfill leachate collection systems, vessel, or other floating craft from which pollutants are or may be discharged.

Pollutant – Broadly defined as any agent that may cause or contribute to the degradation of water quality such that a condition of Pollution or Contamination is created or aggravated.

Pollutants of Concern –Pollutants expected to be present on the project site. In developing this list, consideration should be given to the chemicals and potential Pollutants available for storm water to pick-up or transport to Receiving Waters and legacy Pollutants at the project site. Pollutants of Concern for New Development and Significant Redevelopment projects are those Pollutants identified above for which a downstream water body is also listed as Impaired under the CWA Section 303(d) list or by a TMDL.

Pollution – As defined in the Porter-Cologne Water Quality Control Act, Pollution is the alteration of the quality of the Waters of the U.S. by Waste, to a degree that unreasonably affects either of the following: A) the waters for Beneficial Uses (i.e., when the Water Quality Objectives have been violated); or B) facilities that serve these Beneficial Uses. Pollution may include Contamination.

Pollution Prevention –Defined as practices and processes that reduce or eliminate the generation of Pollutants, in contrast to Source Control, Pollution Control, Treatment Control BMPs, or disposal.

Post-Construction BMPs – A subset of BMPs including Site Design, Source Control, and Treatment Control BMPs which detain, retain, filter or educate to prevent the release of Pollutants to surface waters during the final functional life of development.

POTW – [Publicly Owned Treatment Works] – Wastewater treatment facilities owned by a public agency.

Principal Permittee – Riverside County Flood Control and Water Conservation District [RCFC&WCD].

Public Education Committee – Committee established by the Permittees to provide oversight and guidance for the implementation of the public education program.

QAPP - Quality Assurance Project Plan

Rainy Season – See Wet Season.

RCFC&WCD – Riverside County Flood Control and Water Conservation District

REC – Recreational Beneficial Use.

Receiving Water(s) – Waters of the U.S.within the Permit Area.

Receiving Water Limitations – Requirements included in the Orders issued by the Regional Boards to assure that the regulated discharges do not violate Water Quality Standards established in the Basin Plan at the point of discharge to Waters of the U.S. Receiving Water Limitations are used to implement the requirement of CWA section 301(b)(1)(C) that NPDES permits must include any more stringent limitations necessary to meet Water Quality Standards.

Receiving Water Quality Objectives – Water Quality Objectives specified in the Basin Plan for Receiving Waters.

Region – The portion of the Santa Ana River watershed within Riverside County.

Regional Board – California Regional Water Quality Control Board, Santa Ana Region.

RGO – Retail gasoline outlet

Riverside County – Territory within the geographical boundaries of the County.

ROWD [Report of Waste Discharge] – Application for issuance or re-issuance of WDRs.

Sanitary Sewer Overflow (SSO) – Any overflow, spill, release, discharge or diversion of untreated or partially treated wastewater from a sanitary sewer system.

Santa Ana Region – Area under the jurisdiction of the Regional Board.

SARA – Superfund Amendments and Reauthorization Act. SARA amended the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) on October 17, 1986. SARA reflected USEPA's experience in administering the complex Superfund program during its first six years and made several important changes and additions to the program. SARA:

- stressed the importance of permanent remedies and innovative treatment technologies in cleaning up Hazardous Waste sites;
- required Superfund actions to consider the standards and requirements found in other State and Federal environmental laws and regulations;
- provided new enforcement authorities and settlement tools;

- increased State involvement in every phase of the Superfund program;
- increased the focus on human health problems posed by Hazardous Waste sites;
- encouraged greater citizen participation in making decisions on how sites should be cleaned up; and
- increased the size of the trust fund to $8.5 billion.

SARA also required USEPA to revise the Hazard Ranking System (HRS) to ensure that it accurately assessed the relative degree of risk to human health and the environment posed by uncontrolled Hazardous Waste sites that may be placed on the National Priorities List (NPL).

SAWBAA – Santa Ana Watershed Benefit Assessment Area

SCCWRP – Southern California Coastal Water Research Project

Sediment – Soil, sand, and minerals washed from land into water. Sediment resulting from anthropogenic sources (i.e. human induced land disturbance activities) is considered a Pollutant. This Order regulates only the discharges of Sediment from anthropogenic sources and does not regulate naturally occurring sources of Sediment. Sediment may destroy fish-nesting areas, clog animal habitats, and cloud waters so that sunlight does not reach aquatic plants.

SIC [Standard Industrial Classification] – Four digit industry code, as defined by the US Department of Labor, Occupational Safety and Health Administration. The SIC Code is used to identify if a facility requires coverage under the General Industrial Activities Storm Water Permit.

Significant Redevelopment – As defined in Section XI.D.3.a.

SIP - Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California

Site Design BMPs – Any project design feature that reduces the creation or severity of potential pollutant sources or reduces the alteration of the project site's natural flow regime. Redevelopment projects that are undertaken to remove Pollutant sources (such as existing surface parking lots and other impervious surfaces) or to reduce the need for new roads and other impervious surfaces (as compared to conventional or low-density New Development) by incorporating higher densities and/or mixed land uses into the project design, are also considered site design BMPs

Smart Growth Principles – Smart Growth refers to the use of creative strategies to develop ways that preserve natural lands and critical environmental areas, protect water and air quality, and reuse already-developed land.

SMC - Storm Water Monitoring Coalition

Source Control BMPs – In general, activities or programs to educate the public or provide low cost non-physical solutions, as well as facility design or practices aimed to limit the contact between Pollutant sources and storm water or authorized Non-Storm Water. Examples include: activity schedules, prohibitions of practices, street sweeping, facility maintenance, detection and elimination of IC/IDs, and other non-structural measures. Facility design (structural) examples include providing attached lids to trash containers, canopies for fueling islands, secondary containment, or roof or awning over material and trash storage areas to prevent direct contact between water and Pollutants.

Southern California Monitoring Coalition (SMC) - A regional group working to improve monitoring program design, parameter test methods, calibrate labs, evaluate the effectiveness of BMPs, and/or advance the science and understanding of Urban Runoff impacts on Receiving Waters.

SSMP – Sewer System Management Plan

SSO Order – Statewide General Waste Discharge Requirements for Sanitary Sewer Systems, Water Quality Order No. 2006-0003-DWQ.

State Board – California State Water Resources Control Board

Storm Water – Storm water runoff and snow melt runoff from urban, open space, and agricultural areas consisting only of those discharges that originate from precipitation events. Storm water is that portion of precipitation that flows across a surface to the MS4 or receiving waters. Examples of this phenomenon include: the water that flows off a building's roof when it rains (runoff from an impervious surface); the water that flows into streams when snow on the ground begins to melt (runoff from a semi-pervious surface); and the water that flows from a vegetated surface when rainfall is in excess of the rate at which it can infiltrate into the underlying soil (runoff from a pervious surface). When all other factors are equal, runoff increases as the perviousness of a surface decreases. During precipitation events in urban areas, rain water may pick up and transports Pollutants through storm water conveyance systems, and ultimately to Waters of the U.S.

Storm Water Ordinance – The Storm Water/Urban Runoff Management and Discharge Control Ordinances and ordinances addressing grading and erosion control adopted by each of the Co-Permittees.

Structural BMPs – Physical facilities or controls that may include secondary containment, treatment measures, (e.g. first flush diversion, detention/retention basins, and oil/grease separators), run-off controls (e.g., grass swales, infiltration trenches/basins, etc.), and engineering and design modification of existing structures.

Subdivision Map Act - Section 65000 et seq. of the California Government Code

SWAMP - Surface Water Ambient Monitoring Program

SWPPP [Storm Water Pollution Prevention Plan] – Plan required by the General Construction Permit to minimize and manage Pollutants to minimize Pollution from entering the MS4, identifying all potential sources of Pollution and describing planned practices to reduce Pollutants from discharging off the site.

SWQSTF – Storm Water Quality Standards Task Force

TDS – Total dissolved solids.

Technical Committee – A committee consisting of one or more representatives from each Permittee that provides technical direction on the development of the DAMP and the implementation of the overall Urban Runoff program.

Technology-Based Effluent Limitations – A permit limit for a Pollutant that is based on the capability of a treatment method to reduce the Pollutant to a certain concentration.

TIN – Total Inorganic Nitrogen

TMDL [Total Maximum Daily Load] – Maximum amount of a Pollutant that can be discharged into a water body from all sources (point and non-point) and still maintain Water Quality Standards. Under CWA Section 303(d), TMDLs must be developed for all water bodies that do not meet Water Quality Standards after application of technology-based controls.

TMDL Implementation Plan – Component of a TMDL that describes actions, including monitoring, needed to reduce Pollutant loadings and a timeline for implementation. TMDL Implementation Plans can include a monitoring or modeling plan and milestones for measuring progress, plans for revising the TMDL if progress toward cleaning up the waters is not made, and the date by which Water Quality Standards will be met (USEPA Final TMDL Rule: Fulfilling the Goals of the CWA, EPA 841-F-00-008, July 2000).

Toxic Substance – A substance that can cause Toxicity.

Toxicity – Adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies.

Treatment Control BMPs – Any engineered system designed and constructed to remove Pollutants from Urban Runoff. Pollutant removal is achieved by simple gravity

settling of particulate Pollutants, filtration, biological uptake, media adsorption or any other physical, biological, or chemical process.

Tributary – a stream, river, or MS4 which flows into downstream receiving water, MS4 or BMP.

TSS – Total suspended solids.

Uncontaminated Pumped Groundwater – Groundwater that meets the surface Water Quality Objectives specified in the Basin Plan to which it is proposed to be discharged.

Urban Runoff – Urban Runoff includes those discharges from residential, commercial, industrial, and construction areas within the Permit Area and excludes discharges from Open Space[2], feedlots, dairies, farms and agricultural fields. Urban Runoff discharges consist of storm water and non-storm water surface runoff from drainage sub-areas with various, often mixed, land uses within all of the hydrologic drainage areas that discharge into the Waters of the U.S. In addition to Urban Runoff, the MS4s regulated by this Order receive flows from Open Space, agricultural activities, agricultural fields state and federal properties and other non-urban land uses not under the control of the Permittees. The quality of the discharges from the MS4s varies considerably and is affected by, among other things, past and present land use activities, basin hydrology, geography and geology, season, the frequency and duration of storm events, and the presence of past or present illegal and allowed disposal practices and Illicit Connections.

The Permittees lack legal jurisdiction over storm water discharges into their respective MS4 facilities from agricultural activities, California and federal facilities, utilities and special districts, Native American tribal lands, wastewater management agencies and other point and non-point source discharges otherwise permitted by or under the jurisdiction of the Regional Board. The Regional Board recognizes that the Permittees should not be held responsible for such facilities and/or discharges. Similarly, certain activities that generate Pollutants present in Urban Runoff are beyond the ability of the Permittees to eliminate. Examples of these include operation of internal combustion engines, atmospheric deposition, brake pad wear, tire wear, residues from lawful application of pesticides, nutrient runoff from agricultural activities, leaching of naturally occurring minerals from local geography. Urban Runoff does not include background Pollutant loads or naturally occurring flows.

USEP – Urban Source Evaluation Plan for the MSAR TMDL.

USEPA – United States Environmental Protection Agency.

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[2] This use of Open Space excludes Open Space integrated into urbanized areas such as pocket parks, landscaped medians, walking trails, etc. Open Space is intended to address essentially unimproved areas in strictly unurbanized settings.

Waste – As defined in Water Code Section 13050(d), "Waste includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal." Article 2 of CCR Title 23, Chapter 15 (Chapter 15) contains a waste classification system that applies to solid and semi-solid waste that cannot be discharged directly or indirectly to waters of the state and which therefore must be discharged to land for treatment, storage, or disposal in accordance with Chapter 15. There are four classifications of waste (listed in order of highest to lowest threat to water quality): hazardous waste, designated waste, non-hazardous solid waste, and inert waste.

Waste Discharge Requirements (WDRs) – As defined in Section 13374 of the California Water Code, the term "Waste Discharge Requirements" is the equivalent of the term "permits" as used in the Federal Water Pollution Control Act, as amended. The Regional Board usually reserves reference to the term "permit" to Waste Discharge Requirements for discharges to surface Waters of the U.S.

Waste Load Allocations (WLAs)– Maximum quantity of Pollutants a discharger of waste is allowed to release into a particular waterway, as set by a regulatory authority. Discharge limits usually are required for each specific water quality criterion being, or expected to be, violated. Distribution or assignment of TMDL Pollutant loads to entities or sources for existing and future Point Sources.

WQBEL – Water Quality Based Effluent Limitations

Water Code – California Water Code

Waters of the U.S. – Waters of the U.S. can be broadly defined as navigable surface waters and all tributary surface waters to navigable surface waters. Groundwater is not considered to be a Waters of the U.S. As defined in 40 CFR 122.2, the Waters of the U.S. are defined as: (a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate "wetlands;" (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters otherwise defined as Waters of the U.S. under this definition; (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial seas; and (g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a)

through (f) of this definition. Waters of the U.S. do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the CWA, the final authority regarding CWA jurisdiction remains with the USEPA.

Water Quality Objectives – Means the numeric or narrative limits or levels of water quality constituents or characteristics which are established for the reasonable protection of Beneficial Uses of water or the prevention of Nuisance within a specific area. [California Water Code Section 13050(h)]

Water Quality Standards –The water quality goals of a waterbody (or a portion of the waterbody) designating Beneficial Uses to be made of the water and the Water Quality Objectives or criteria necessary to protect those uses. These standards also include California's anti-degradation policy.

Watershed – That geographical area which drains to a specified point on a watercourse, usually a confluence of streams or rivers (also known as drainage area, catchments, or river basin).

Watershed Action Plan (WAP) – Integrated plans for managing a watershed that include consideration of water quality, Hydromodification, water supply and habitat protection. The Watershed Action Plan integrates existing watershed based planning efforts and incorporates watershed tools to manage cumulative impacts of development on vulnerable streams, preserve structure and function of streams, and protect source, surface and groundwater quality and water supply in the Permit Area. The Watershed Action Plan should integrate Hydromodification and water quality management strategies with land use planning policies, ordinances, and plans within each jurisdiction.

WDID [Waste Discharge Identification] – Identification number provided by the State when a Notice of Intent is filed.

Wet Season/Wet Weather – October 1 through May 31st of each year unless defined otherwise in the specific applicable TMDL implementation plan. The Middle Santa Ana River TMDL defines the wet season as November 1 through March 31st and the Canyon Lake/Lake Elsinore TMDL monitoring defines it as October 1st through May 31st.

WQMP – Water Quality Management Plan as discussed in Section 6 of the DAMP.

WRCOG - Western Riverside Council of Governments

APPENDIX 5

NOTICE OF INTENT AND NOTICE OF TERMINATION FOR MUNICIPAL CONSTRUCTION ACTIVITIES

ORDER NO. R8-2010-0033

048116

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD – SANTA ANA REGION

NOTICE OF INTENT

TO COMPLY WITH THE TERMS OF THE RIVERSIDE COUNTY MUNICIPAL STORMWATER PERMIT FOR STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITIES

ORDER No. R8-2010-0033 (NPDES No. CAS618033)

MARK ONLY ONE ITEM 1. ☐ New Construction/Reconstruction 2. ☐ Change of Information for WDID# _____

I. OWNER

Name	Contact Person		
Mailing Address	Title		
City	State **CA**	Zip	Phone ( ) – Fax ( ) – Email :

II. CONTRACTOR INFORMATION

Name	Contact Person		
Local Mailing Address	Title		
City	State	Zip	Phone ( ) – Fax ( ) – Email:

III. SITE INFORMATION

A. Project Title	Site Address		
City/Unincorporated Area	State **CA**	Zip	Contact Person Phone ( ) –
B. Construction commencement date: (Month / Day / Year)	C. Projected construction completion date: (Month / Day / Year)		

D. Type of Work: ☐ Utility ☐ Flood Control ☐ Transportation ☐ Other (Specify) Description of Work: _____	E. Total size of project/construction site: ____Acres Total size of area to be disturbed:_ ____Acres.

IV. RECEIVING WATER INFORMATION

A. Does the storm water runoff from the construction site discharge to (check all that apply):

1. ☐ Indirectly to Waters of the U.S.
2. ☐ MS4 Facility - Enter owner's name:_____
3. ☐ Directly to Waters of U.S. (e.g. , river, lake, creek, stream, or to a pipe/channel that flows without inflow from other sources between site and water body etc.)

V. IMPLEMENTATION OF NPDES PERMIT REQUIREMENTS

A. STORM WATER POLLUTION PREVENTION PLAN (SWPPP) (mark one) ☐ A SWPPP has been prepared for this project and is available for review ☐ A SWPPP will be prepared and ready for review by (date): ___/___/___ B. Date WQMP approved by MS4 Permittee: ___/___/___ ☐ Not Applicable.	C. MONITORING PROGRAM (MP) (mark one) ☐ A MP has been prepared for this facility and is available for review ☐ A MP will be prepared and ready for review by (date): ___/___/___

VI. CERTIFICATIONS

"I certify under penalty of law that this document and all attachments were prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine or imprisonment. In addition, I certify that Order No. R8-2010-0033; (specifically Sections XII.F., XIV, XVI, and XX), including the development and implementation of a Storm Water Pollution Prevention Plan and a Monitoring Program Plan, will be complied with."

Printed Name: _____ **Title:** _____

Signature: _____ **Date:** _____

048117

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD – SANTA ANA REGION

NOTICE OF TERMINATION

OF COVERAGE UNDER THE RIVERSIDE COUNTY MUNICIPAL STORMWATER PERMIT
FOR STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY

ORDER No. R8-2010-0033 (NPDES No. CAS618033)

I. WDID No. _____

II. OWNER

Name	Contact Person		
Mailing Address	Title		
City	State	Zip	Phone ( ) – Fax ( ) – Email:

III. SITE INFORMATION

A. Original Project Title	Site Address			
City/Unincorporated Area	State CA	Zip	Site Contact Person	
B. Contractor Name	Phone ( ) – Fax ( ) – Email:		Title	
Local Mailing Address	City		State	Zip
Qualified SWPPP Practitioner	Phone ( ) – Fax ( ) – Email:			

IV. BASIS OF TERMINATION

___ 1. The construction project is completed and the following conditions have been met.

- ☐ All elements of the Storm Water Pollution Prevention Plan have been completed.
- ☐ Construction materials and waste have been disposed of properly.
- ☐ The site is in compliance with all local storm water management requirements.
- ☐ A post-construction storm water operation and management plan is in place (Attach a description of the post construction BMPs, the location (Latitude /Longitude), and a map of the locations of the post construction BMPs).
- ☐ Date field verification inspection performed and include a copy of the field verification report. ___/___/___

___ 2. Construction activities have been suspended; either temporarily ____ or indefinitely ___ and the following conditions have been met.

- All elements of the Storm Water Pollution Prevention Plan have been completed.
- ☐ Construction materials and waste have been disposed of properly.
- ☐ The site is permanently stabilized (greater than 3 years without maintenance).
- ☐ The site is in compliance with all local storm water management requirements.

Date of suspension ____ / ____ / ____ Expected start up date ____ / ____ / ____

V. CERTIFICATION

I certify under penalty of law that all storm water discharges associated with construction activity from the identified site that are authorized by NPDES General Permit No. CAS000002 have been eliminated or that I am no longer the owner of the site. I understand that by submitting this Notice of Termination, I am no longer authorized to discharge storm water associated with construction activity under the General Permit, and that discharging pollutants in storm water associated with construction activity to Waters of the United States is unlawful under the Clean Water Act where the discharge is not authorized by a NPDES permit. I also understand that the submittal of this Notice of Termination does not release an owner of liability for any violation of the General Permit or the Clean Water Act.

Printed Name: _____ **Title:** _____

Signature: _____ **Date:** _____

APPENDIX 6

FACT SHEET

ORDER NO. R8-2010-0033

State of California

California Regional Water Quality Control Board

Santa Ana Region

3737 Main Street, Suite 500

Riverside, CA 92501- 3348

FACT SHEET

January 29, 2010

ITEM: 09

SUBJECT: Waste Discharge Requirements for the Riverside County Flood Control and Water Conservation District, the County of Riverside, and the Incorporated Cities of Riverside County within the Santa Ana Region, Urban Runoff Management Program, Order No. R8-2010-0033 (NPDES No. CAS 618033)

I. INTRODUCTION

A. PROJECT

The attached pages contain information concerning an application for renewal of Waste Discharge Requirements and a National Pollutant Discharge Elimination System (NPDES) permit, Order No. R8-2010-0033 (Order), NPDES No. CAS 618033, which prescribes Waste Discharge Requirements for Urban Runoff (as defined in Appendix 4) from the cities and the unincorporated areas in Riverside County within the jurisdiction of the Santa Ana Regional Board Water Quality Control Board (Regional Board). This Order regulates discharges of Urban Runoff from the Permit Area, as defined in Order No. R8-2010-0033 and shown in Appendix 1.

If appropriate Pollution control measures are not implemented, Urban Runoff, (as defined in Appendix 4 – Glossary), may contain pathogens (bacteria, protozoa, viruses), sediment, trash, fertilizers (nutrients, mostly nitrogen and phosphorus compounds), oxygen-demanding substances (decaying matter), pesticides (DDT, chlordane, diazinon, chlorpyrifos), heavy metals (cadmium, chromium, copper, lead, zinc), and petroleum products (oil & grease, PAHs, petroleum hydrocarbons).

If not properly managed and controlled, urbanization may change the stream hydrology and increase Pollutant loading to Receiving Waters. As a watershed undergoes urbanization, pervious surface area decreases, runoff volume and velocity may increase, riparian habitats and wetland habitats decrease, the frequency and severity of flooding may increase, and Pollutant loading may increase. Most of these impacts occur due to human activities (Anthropogenic) that occur during and/or after urbanization. The Pollutants and hydrologic changes may

cause declines in aquatic resources, cause toxicity to aquatic organisms, and impact human health and the environment. Based on information provided in Section D of the Riverside County Flood Control and Water Conservation District's (RCFC&WCD or the Principal Permittee as context indicates) Hydrology Manual, it is feasible that, in semi-arid regions, development may result in the creation of a net increase in absorption.

Properly planned high-density development may reduce urban sprawl and problems associated with sprawl. Urban in-fill and high-density development are elements of smart growth, which creates the opportunity to maintain relatively natural open space elsewhere in the Permit Area (see Appendix 4). The goal of Low Impact Development (LID) is to mimic pre-development runoff quality and quantity.

On April 27, 2007, The RCFC&WCD in cooperation with the County of Riverside (the County) and the incorporated cities of Beaumont, Calimesa, Canyon Lake, Corona, Hemet, Lake Elsinore, Moreno Valley, Murrieta, Norco, Perris, Riverside, and San Jacinto jointly submitted a NPDES Application No. CAS 618033, a Report of Waste Discharge (the ROWD) and a revised Drainage Area Management Plan (DAMP) to renew the Municipal Separate Storm Sewer System (MS4) NPDES permit for the Santa Ana River watershed (the Permit Area) within Riverside County. This Order renews the NPDES permit authorizing Urban Runoff in the Permit Area (see Appendix 1, "urban area" includes those portions of "agriculture" and "open space" that convert to industrial, commercial, or residential use during the term of this Order). To more effectively carry out the requirements of this Order, the Permittees have agreed that the RCFC&WCD will continue as the Principal Permittee and the County and the incorporated cities will continue as the Co-Permittees.

On February 5, 2008 Wildomar residents voted for cityhood and the City incorporated on July 1, 2008. Menifee residents voted for cityhood on June 3, 2008 and the City incorporated on October 1, 2008. On May 6, 2009, the City of Menifee and on May 5, 2009, the City of Wildomar submitted Letters of Intent to be a Co-Permittee in this Order and for the purposes of this Order shall be considered as such. The cities in the Permit Area, along with the County, are collectively referred to as the Co-Permittees, and collectively, with the Principal Permittee, the Permittees.

B. PROJECT AREA

The Permit Area contains 1,396 square miles or 19.1% of the 7,300 square miles within Riverside County and includes 15 of the 26 municipalities within Riverside County. The California Department of Finance estimates that as of January 1,

2006, the population of Riverside County is 1,953,330 of which 1,237,388[1] reside within the Permit Area. The California Department of Finance estimates that as of January 1, 2009, the population of Riverside County was 2,107,653[2]. Beaumont, Calimesa, and Canyon Lake have populations of 25,000 or less. The County, Corona, Moreno Valley and Riverside have populations of 100,000 or more. The Southern California Association of Governments estimates that the County of Riverside will grow by 16% between 2006 and 2010 (2008 RTP Growth Forecast by City). The most significant percentage growth in population between 2006 and 2010 occurred in the Cities of Beaumont, Calimesa, and San Jacinto.

Land uses in Riverside County within the Santa Ana River Region include open space, residential, commercial, light industrial, heavy industrial, and agriculture. The agricultural land uses include row crops, nurseries, citrus groves and vineyards, dairies, ranches, poultry and hog farms, and other agricultural related uses with one single-family residence allowed per 10 acres (County of Riverside General Plan, Land Use Element 2003). The conversion of agricultural lands and open space to other "developed" land uses has been ongoing and will continue. Based on Riverside County Assessor's Parcel Data as of February 2006, the land use mix of the County area within the Santa Ana Region was: 29,441 acres used or zoned for commercial/industrial purposes (3.3%), 70,499 acres for residential purposes (7.9%), 11,798 acres utilized for improved streets and roads (1.3%), 9,872 acres are used for parks and recreational facilities (1.1%), 70,164 acres are used for rural residential (7.9%), 453,976 acres are utilized for open space (50.8%), and 48,627 acres are used for agricultural purposes (5.4%). The federal, state, tribal, and non-Permittee jurisdictional lands within the portion of Riverside County within the Santa Ana Region total 199,064 acres (22.3%).

Less than one fifth (1/5) of Riverside County is within the Permit Area. The Permit Area includes the "urban area" as shown in Appendix 1 and those portions of "agriculture" and "open space" as shown on Appendix 1 that do convert to industrial, commercial or residential use during the term of this Order. The Permit Area is delineated by the San Bernardino-Riverside County boundary line on the north and northwest, the Orange-Riverside County boundary line on the west, the Santa Ana-San Diego Regional Board boundary line on the south, and the Santa Ana-Colorado River Basin Regional Board boundary line on the east. Sixty-seven percent of Riverside County's population resides within the Regional Board's jurisdiction. The San Diego and the Colorado River Basin Regional Water Quality Control Boards regulate Urban Runoff from those portions of Riverside County outside of the Permit Area shown in Appendix 1.

[1] As per Section 3.3.1 of the 2007 ROWD, (Western Riverside Council of Governments (WRCOG), excluding the cities of Menifee and Wildomar

[2] E-1 report dated April 30, 2009 (http://www.dof.ca.gov/research/demographic/reports/estimates/e-1/2008-09/documents/E-1_2009%20Press%20Release.pdf).

C. CLEAN WATER ACT REQUIREMENTS

The federal Clean Water Act (the "CWA") established a national policy designed to help maintain and restore the physical, chemical and biological integrity of the nation's waters. In 1972, the CWA established the NPDES permit program to regulate the discharge of Pollutants from Point Sources to "Waters of the U.S.". From 1972 to 1987, the main focus of the NPDES program was to regulate conventional Pollutant sources such as sewage treatment plants and industrial facilities. As a result, on a nationwide basis, non-point sources, including agricultural runoff and Urban Runoff, now contribute a larger portion of many kinds of Pollutants than the more thoroughly regulated sewage treatment plants and industrial facilities.

The National Urban Runoff Program (NURP) final report to the Congress (USEPA, 1983) concluded that the goals of the CWA could not be achieved without addressing Urban Runoff discharges. The 1987 CWA amendments established a framework for regulating Urban Runoff. Pursuant to these amendments, the Santa Ana Regional Board began regulating discharges from MS4s in 1990.

II. REGULATORY BACKGROUND AND CLEAN WATER ACT REQUIREMENTS

As water flows over streets, parking lots, construction sites, and industrial, commercial, residential, and municipal areas, it may intercept Pollutants from these areas and transport them to Waters of the U.S.. As indicated in I.A, above, Urban Runoff may contain pathogens, sediment, trash, fertilizers, oxygen-demanding substances, pesticides, heavy metals, and petroleum products. If not properly managed and controlled, urbanization may adversely impact water quality and quantity in the receiving waters.

However, urban development projects that incorporate LID concepts may reduce the impact of urban development on runoff water quality and quantity.

Studies[3] conducted in the Southern California area have established storm water runoff from urban areas as significant sources of Pollutants in surface waters. The Santa Ana River is impacted by agricultural, other discharges and Urban Runoff as it flows through the San Bernardino County and Riverside County areas prior to flowing through Orange County and into the Pacific Ocean.

If not properly controlled, Urban Runoff could be a significant source of Pollutants in the Waters of the U.S. Table 1 includes a list of Pollutants, potential sources, and some of the adverse environmental consequences mostly resulting from urbanization.

[3] Bay, S., Jones, B. H. and Schiff, K, 1999, Study of the Impact of Stormwater Discharge on Santa Monica Bay. Sea Grant Program, University of Southern California; and Haile, R.W., et al., 1996, An Epidemiological Study of Possible Adverse Health Effects of Swimming in Santa Monica Bay. Southern California Coastal Water Research Project (1992), Surface Runoff to the Southern California Bight.

Table 1[4]
Pollutant Sources and Impacts of a Number of Pollutants On Waters of the U.S.

Pollutants	Sources	Effects and Trends
Toxins (e.g., biocides, PCBs, trace metals, heavy metals)	Industrial and municipal wastewater; runoff from farms, forests, urban areas, and landfills; erosion of contaminated soils and sediments; vessels; atmospheric deposition	Poison and cause disease and reproductive failure; fat-soluble toxins may bioconcentrate, particularly in birds and mammals, and pose human health risks. Inputs into Waters of the U.S. have declined, but remaining inputs and contaminated sediments in urban and industrial areas pose threats to living resources.
Pesticides (DDT, diazinon, chlorpyrifos)	Urban Runoff, agricultural runoff, commercial, industrial, residential and farm use	The use of legacy pesticides (DDT, chlordane, dieldrin) has been banned or restricted; still persists in the environment; some of the other pesticide uses are curtailed or restricted.
Biostimulants (organic wastes, plant nutrients)	Sewage and industrial wastes; runoff from farms and urban areas; nitrogen from combustion of fossil fuels	Organic wastes overload bottom habitats and deplete oxygen; nutrient inputs stimulate algal blooms (some harmful), which reduce water clarity, and alter food chains supporting fisheries. While organic waste loading has decreased, nutrient loading has increased (NRC, 1993a, 2000a).
Petroleum products (oil, grease, petroleum hydrocarbons, PAHs)	Urban Runoff and atmospheric deposition from land activities; accidental spills; oil & gas production activities; natural seepage; and PAHs from internal combustion engines	Petroleum hydrocarbons can affect bottom organisms and larvae; spills affect birds, mammals and aquatic life. While oil Pollution from accidental spills and production activities has decreased, diffuse inputs from land-based activities have not (NRC, 1985).
Radioactive isotopes	Atmospheric fallout, industrial and military activities	Bioaccumulation may pose human health risks where contamination is heavy.
Sediments	Erosion from farming, construction activities, forestry, mining, development; river diversions; coastal dredging and mining	Reduce water clarity and change bottom habitats; carry toxins and nutrients; clog fish gills and interfere with respiration in aquatic fauna. Sediment delivery by many rivers has decreased, but sedimentation poses problems in some areas.
Plastics and other debris	Ships, boats, fishing nets, containers, trash, Urban Runoff	Entangles aquatic life or is ingested; degrades, beaches, lake shores, near shore habitats, and wetland habitats. Floatables (from trash) are an aesthetic Nuisance and can be a substrate for algae and insect vectors.
Thermal	Cooling water from power plants and industry, urban run off from impervious surfaces	Kills some temperature-sensitive species; and displaces others. Generally, less a risk to marine life than thought 20 years ago.
Noise	Vessel propulsion, sonar, seismic prospecting, low-frequency sound used in defense and research	May disturb marine mammals and other organisms that use sound for communication.
Pathogens (bacteria, protozoa, viruses)	Sewage, Urban Runoff, livestock, wildlife, and discharges from boats and cruise ships.	Pose health risks to swimmers and consumers of aquatic life. Sanitation has improved, but standards have been raised (NRC 1999a).
Alien species	Ships and ballast water, fishery stocking, aquarists	Displace native species, introduce new diseases; growing worldwide problem (NRC 1996).

[4] Adapted from "Marine Pollution in the United States" prepared for the Pew Oceans Commission, 2001.

The CWA prohibits the discharge of any Pollutant to navigable waters from a Point Source unless an NPDES permit authorizes the discharge. Efforts to improve water quality under the NPDES program traditionally and primarily focused on reducing Pollutants in discharges of industrial process wastewater and municipal sewage. The 1987 amendments to the CWA required MS4s and industrial facilities, including construction sites, to obtain NPDES permits for storm water runoff from their facilities. On November 16, 1990, the USEPA promulgated the final NPDES Phase I storm water regulations. The storm water regulations are contained in 40 CFR Parts 122, 123 and 124.This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for several reasons, including, but not limited to, the following. First, this Order implements federally mandated requirements under federal Clean Water Act section 402, subdivision (p)(3)(B). (33 U.S.C. § 1342(p)(3)(B).) This includes federal requirements to effectively prohibit non-storm water discharges, to reduce the discharge of pollutants to the maximum extent practicable, and to include such other provisions as the Administrator or the State determines appropriate for the control of such pollutants. Federal cases have held these provisions require the development of permits and permit provisions on a case-by-case basis to satisfy federal requirements. (*Natural Resources Defense Council, Inc. v. U.S.E.P.A.* (9th Cir. 1992) 966 F.2d 1292, 1308, fn.17). The authority exercised under this Order is not reserved state authority under the Clean Water Act's savings clause (*cf. Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 627-628 [relying on 33 U.S.C. § 1370, which allows a state to develop requirements which are not "less stringent" than federal requirements]), but instead, is part of a federal mandate to develop pollutant reduction requirements for municipal separate storm sewer systems. To this extent, it is entirely federal authority that forms the legal basis to establish the permit provisions. (See, *City of Rancho Cucamonga v. Regional Water Quality Control Bd.-Santa Ana Region* (2006) 135 Cal.App.4th 1377, 1389; *Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 882-883.)

Likewise, the provisions of this Order to implement total maximum daily loads (TMDLs) are federal mandates. The federal Clean Water Act requires TMDLs to be developed for water bodies that do not meet federal water quality standards. (33 U.S.C. § 1313(d).) Once the U.S. Environmental Protection Agency or a state develops a TMDL, federal law requires that permits must contain effluent limitations consistent with the assumptions of any applicable wasteload allocation. (40 C.F.R. § 122.44(d)(1)(vii)(B).)

Second, the local agency permittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental dischargers who are issued NPDES permits for storm water discharges. With a few inapplicable exceptions, the Clean Water Act regulates the discharge of pollutants from point sources (33 U.S.C. § 1342) and the Porter-Cologne regulates the

discharge of waste (Wat. Code, § 13263), both without regard to the source of the pollutant or waste. As a result, the "costs incurred by local agencies" to protect water quality reflect an overarching regulatory scheme that places similar requirements on governmental and nongovernmental dischargers. (See *County of Los Angeles v. State of California* (1987) 43 Cal.3d 46, 57-58 [finding comprehensive workers compensation scheme did not create a cost for local agencies that was subject to state subvention].)

The Clean Water Act and the Porter-Cologne Water Quality Control Act largely regulate storm water with an even hand, but to the extent there is any relaxation of this even-handed regulation, it is in favor of the local agencies. Except for municipal separate storm sewer systems, the Clean Water Act requires point source dischargers, including discharges of storm water associated with industrial or construction activity, to comply strictly with water quality standards. (33 U.S.C. § 1311(b)(1)(C), *Defenders of Wildlife v. Browner* (1999) 191 F.3d 1159, 1164-1165 [noting that industrial storm water discharges must strictly comply with water quality standards].) As discussed in prior State Water Resources Control Board decisions, this Order does not require strict compliance with water quality standards. (SWRCB Order No. WQ 2001-15, p. 7.) The Order, therefore, regulates the discharge of waste in municipal storm water more leniently than the discharge of waste from non-governmental sources.

Third, the local agency permittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order. The fact sheet demonstrates that numerous activities contribute to the pollutant loading in the municipal separate storm sewer system. Local agencies can levy service charges, fees, or assessments on these activities, independent of real property ownership. (See, e.g., *Apartment Ass'n of Los Angeles County, Inc. v. City of Los Angeles* (2001) 24 Cal.4th 830, 842 [upholding inspection fees associated with renting property].) The ability of a local agency to defray the cost of a program without raising taxes indicates that a program does not entail a cost subject to subvention. (*County of Fresno v. State of California* (1991) 53 Cal.3d 482, 487-488.)

Fourth, the Permittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in federal Clean Water Act section 301, subdivision (a) (33 U.S.C. § 1311(a)) and in lieu of numeric restrictions on their discharges. To the extent, the local agencies have voluntarily availed themselves of the permit, the program is not a state mandate. (Accord *County of San Diego v. State of California* (1997) 15 Cal.4th 68, 107-108.) Likewise, the Permittees have voluntarily sought a program-based municipal storm water permit in lieu of a numeric limits approach. (See *City of Abilene v. U.S. E.P.A.* (5th Cir. 2003) 325 F.3d 657, 662-663 [noting that municipalities can choose between a management permit or a permit with numeric limits].) The local agencies' voluntary decision to file a report of waste discharge proposing a program-based

permit is a voluntary decision not subject to subvention. (See *Environmental Defense Center v. USEPA* (9th Cir. 2003) 344 F.3d 832, 845-848.)

Fifth, the local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under state law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

On July 13, 1990, the Regional Board adopted the first term Riverside County Area-wide MS4 Permit, Order No. 90-104 (NPDES No. CA 8000192), for Urban Runoff from areas in Riverside County within the Permit Area. On March 8, 1996, the Regional Board renewed Order No. 90-104 by adopting the second term area-wide MS4 Permit, Order No. 96-30, (NPDES No. CAS618033). On October 25, 2002, the Regional Board renewed Order No. 96-30 by adopting the third term area-wide MS4 Permit, Order No. R8-2002-0011.

This Order renews the area-wide NPDES MS4 Permit for the Permit Area for the fourth-term, in accordance with Section 402 (p) of the CWA and all requirements applicable to an NPDES permit issued under the issuing authority's discretionary authority. The requirements included in this Order are consistent with the CWA, the federal regulations governing urban storm water discharges, the Water Quality Control Plan for the Santa Ana River Basin (Basin Plan), the California Water Code, and the State Water Resources Control Board's (State Board) Plans and Policies.

The Basin Plan is the basis for the Regional Board's regulatory programs. The Basin Plan was developed and is periodically reviewed and updated in accordance with relevant federal and state law and regulation, including the CWA and the California Water Code. As required, the Basin Plan designates the Beneficial Uses of the waters of the Region and specifies Water Quality Objectives intended to protect those uses. (Beneficial Uses and Water Quality Objectives, together with an anti-degradation policy, comprise federal "Water Quality Standard"). The Basin Plan also specifies an implementation plan, which includes certain discharge prohibitions. In general, the Basin Plan makes no distinctions between wet and dry weather conditions in designating Beneficial Uses and setting Water Quality Objectives, i.e., the Beneficial Uses, and correspondingly, the Water Quality Objectives are assumed to apply year-round. (Note: In some cases, Beneficial Uses for certain surface waters are designated as "I", or intermittent, in recognition of the fact that surface flows (and Beneficial Uses) may be present only during wet weather.) Most Beneficial Uses and Water Quality Objectives were established in the 1971, 1975, 1983, and 1995 Basin Plans. The 1995 Basin Plan was updated in February 2008[5]. Amendments to the Basin Plan included new nitrate-nitrogen and TDS objectives for specified

[5] http://www.waterboards.ca.gov/santaana/water_issues/programs/basin_plan/index.shtml

management zones, new nitrogen and TDS management strategies applicable to both surface and ground waters and various Total Maximum Daily Loads (TMDLs) and TMDL Implementation Plans that had been adopted for Impaired Waterbodies within the region.

Water Code Section 13241 requires that certain factors must be considered when Water Quality Objectives are established. These factors include economics and the need for developing housing in the Region. During the 2002 MS4 Permit development process, the Permittees raised an issue regarding compliance with Section 13241 of the California Water Code with respect to Water Quality Objectives for wet weather conditions, specifically the cost of achieving compliance during wet weather conditions and the need for developing housing within the Region and its impact on Urban Runoff. During the 2006 review of the Basin Plan, this matter was incorporated on the triennial review list. To begin addressing this issue, Regional Board staff, in collaboration with the MS4 Permittees in the Santa Ana River watershed, has organized a Storm Water Quality Standards Task Force (SWQSTF).

The SWQSTF is analyzing, monitoring and documenting actual and potential Beneficial Uses of surface waters within the Santa Ana River watershed. Based on the findings, the SWQSTF plans to recommend changes to the current Beneficial Use designations and Water Quality Objectives specified in the Basin Plan. This Order may be reopened to incorporate any changes to the Water Quality Standards. The SWQSTF is currently focusing on Recreational Beneficial Uses. In the meantime, the provisions of this Order will result in reasonable further progress towards the attainment of the existing Water Quality Objectives, in accordance with the discretion in the permitting authority recognized by the United States Court of Appeals for the Ninth Circuit in Defenders of Wildlife vs. Browner, 191 F.3d 1159, 1164 (9th Cir. 1999).

III. EXCLUSIONS TO THE PERMIT AREA

Areas of the County not addressed or which are excluded by the storm water regulations and areas not under the jurisdiction of the Permittees were excluded from the area requested for coverage under the ROWD. These include the following areas and activities:

- Federal lands and State properties, including, but not limited to, military bases, national forests, hospitals, colleges and universities, and highways;
- Native American tribal lands;
- Open space and rural (non-urbanized) areas;

- Agricultural lands (return flows from irrigated agriculture and nonpoint source agricultural activities are exempted under the CWA); and

- Utilities, railroads, and special districts (including school districts, park districts, publicly owned treatment works (POTWs) and water utilities, etc.).

These areas in the Permit Area for which coverage under a NPDES MS4 permit is excluded, are shown in Appendix 1. The Regional Board will coordinate with these entities to implement programs that are consistent with the requirements of this Order. The Regional Board, pursuant to 40 CFR 122.26(a), has the discretion and authority to require non-cooperating entities to participate in this Order. The Regional Board may also consider such facilities for coverage under its NPDES permitting scheme pursuant to USEPA Phase II stormwater regulations.

The Regional Board recognizes that the Permittees should not be held responsible for discharges from such facilities or Pollutants in those discharges. However, to the extent that the Permittees authorize the connection of the discharges from these facilities into their MS4, this Order requires the Permittees to notify these facilities, in writing, of the state and local post-construction standards and/or other applicable requirements of this Order.

IV. BENEFICIAL USES

Stormwater flows discharged to MS4s in the Permit Area are tributary to various waterbodies (inland surface streams, lakes and reservoirs) of the State. The Beneficial Uses of these waterbodies may include municipal and domestic supply, agricultural supply, industrial service and process supply, groundwater recharge, water contact recreation, non-contact water recreation, and sport fishing, warm freshwater habitat, cold freshwater habitat, preservation of biological habitats of special significance, wildlife habitat and preservation of rare, threatened or endangered species. The ultimate goal of this Order is to protect the Beneficial Uses and quality of the Receiving Waters.

To protect the Beneficial Uses of the Receiving Waters, the Pollutants from all sources, including Urban Runoff, need to be controlled. Recognizing this, and the fact that Urban Runoff contains Pollutants, an area-wide MS4 permit is the most effective way to develop and implement a comprehensive Urban Runoff management program in a timely manner. This area-wide MS4 permit contains requirements with time schedules that will allow the Permittees to continue to address water quality problems caused by Urban Runoff through their management programs to reduce Pollutants in Urban Runoff discharges consistent with the MEP standard [See Appendix 4, Glossary].

V. WATERSHED MANAGEMENT IN THE UPPER SANTA ANA RIVER BASIN

A. Management Approach

To regulate and control Urban Runoff from the Permit Area to the MS4, an area-wide approach is expected to be most effective. The entire MS4 is not controlled by a single entity; the RCFC&WCD, the County, several cities, the State Department of Transportation (Caltrans), and the U.S. Army Corps of Engineers, in addition to other smaller entities, manage portions of the MS4. In addition to the cities, the County and the RCFC&WCD, there are a number of other significant contributors of Urban Runoff to the MS4. These include: large institutions such as the State university system, prisons, schools, hospitals, etc.; federal facilities such as military sites, etc.; State agencies, such as Caltrans; water and wastewater management agencies such as Eastern and Western Municipal Water District; the National Forest Service and State parks. The State Board has issued a separate NPDES MS4 permit to Caltrans. In addition, Caltrans, and the other contributors identified, are not under the jurisdiction of the Permittees. The management and control of the entire MS4 cannot be effectively carried out without the cooperation and efforts of all these entities. Also, it would not be effective to issue a separate MS4 permit to each of the entities within the Permit Area whose land/facilities drain into the MS4 facilities operated by the Permittees and ultimately to Waters of the U.S.. The Regional Board has concluded that the best management option for the Permit Area is to issue an area-wide NPDES MS4 permit to the Permittees.

Although, the Urban Runoff from the Permit Area drains to the Prado Basin, and ultimately into Orange County, Urban Runoff from Orange County areas are regulated under NPDES No. CAS 618030. Some areas within Riverside County are within the Colorado River Basin and San Diego Regional Boards' jurisdictions. Permit requirements for Urban Runoff from the drainage areas of Riverside County within the jurisdiction of the San Diego and Colorado River Basin Regional Boards are addressed by those Regional Boards.

In developing Urban Runoff management and monitoring programs, consultation/coordination with other drainage management entities and other Regional Boards is essential. Common programs, reports, implementation schedules and efforts are desirable and will be utilized to the MEP.

Cooperation and coordination among all the stakeholders are essential for efficient and economical management of the Santa Ana River watershed. It is also critical to manage Non-point Sources at a level consistent with the management of Urban Runoff in a watershed in order to successfully prevent or remedy water quality Impairment. Regional Board staff will facilitate coordination of monitoring and management programs among the various stakeholders.

An integrated watershed management approach for Urban Runoff in the Santa Ana River watershed is consistent with the Strategic Plan (2008-2012[6]) and Initiatives for the State and Regional Boards and the draft California Water Plan Update[7]. A watershed wide approach is also necessary for implementation of the Load Allocations (LAs) and Waste Load Allocations (WLAs) developed under the TMDL process. The Permittees and all the affected entities are encouraged to participate in regional or watershed solutions, instead of project-specific and fragmented solutions.

The Pollutants in Urban Runoff originate from multiple sources and effective control of these Pollutants requires a cooperative effort of all the stakeholders and many regulatory agencies. Every stage of urbanization should be considered in developing appropriate Urban Runoff Pollution control methodologies. The program's success depends upon consideration of Pollution control techniques during planning, construction and post-construction operations. At each stage, appropriate Pollution Prevention , Site Design , Source Control, and, if necessary, Treatment Control BMPs should be considered.

B. SUB-WATERSHEDS AND MAJOR CHALLENGES

The Santa Ana River watershed is the major watershed within the Santa Ana Region. This watershed is divided into three sub-watersheds: the Lower Santa Ana, Upper Santa Ana, and San Jacinto.

1. The lower Santa Ana River sub-watershed (downstream from Prado Basin) includes the north half of Orange County. The Upper Santa Ana River sub-watershed includes the southwestern corner of San Bernardino County and the northwestern corner of Riverside County. The San Jacinto sub-watershed includes the northwest corner of Riverside County south of the Upper Santa Ana River sub-watershed within the Santa Ana Region.

   Generally, the San Bernardino County drainage areas drain to the Riverside County drainage areas, and Riverside County drainage areas discharge to Orange County through Prado Dam on the Santa Ana River. Most of the flow in the Santa Ana River is recharged into the groundwater in San Bernardino, Riverside, and Orange counties but infrequently some of the flow may be discharged to the Pacific Ocean as a result of heavy storm events.

   Water from rainfall and snow melt runoff, and surfacing ground water from various areas either discharge directly to the Santa Ana River or to watercourses tributary to the Santa Ana River. Other major rivers in the Permit Area include the San Jacinto River and Temescal Creek. The San

[6] State Water Resources Control Board, Strategic Plan Update, 2008-2012, September 2, 2008
[7] http://www.waterplan.water.ca.gov/docs/cwpu2009/1208prd/vol2/UrbanRunoff_PRD_09.pdf

Jacinto Mountain areas drain into the San Jacinto River, which discharges into Canyon Lake and then to Lake Elsinore. The San Jacinto River is ephemeral. Smaller storms tend to be fully captured by Canyon Lake, which the San Jacinto River drains into, with discharges from Canyon Lake to Lake Elsinore only occurring in larger events or wetter years. Any overflow from Lake Elsinore is tributary to Temescal Creek, which flows into the Santa Ana River at the Prado Flood Control Basin. Overflow from Lake Elsinore occurs infrequently, only once every 12 to 15 years.

2. Upper Santa Ana River Sub-watershed:

   a. Reach 3 of the Santa Ana River (Prado Dam to Mission Boulevard in Riverside): Pathogens are the Pollutant of Concern for Reach 3 based on adopted TMDLs and the 2006 303(d) list . With the adoption of the TMDL for Bacterial Indicators, the Basin Plan now contains schedules for achieving compliance with WLAs for Bacterial Indicators in the Middle Santa Ana River (MSAR) subwatershed.

   b. Reach 4 of the Santa Ana River: Reach 4 of the Santa Ana River is the portion of the River from Mission Boulevard Bridge in Riverside to the San Jacinto fault (Bunker Hill Dike) in San Bernardino. Reach 4 is also listed in the CWA Section 303(d) as an Impaired Waterbody. Most of Reach 4 of the River is in San Bernardino County. Pathogens are the Pollutant of Concern for Reach 4and a TMDL is scheduled for completion in 2019.

   c. Other water quality problems along this reach of the River include the buildup of total dissolved solids (TDS, dissolved salts or minerals) and nitrogen, largely in nitrate form. The buildup of TDS and nitrates can impact downstream Beneficial Uses, including groundwater recharge. The buildup of TDS and nitrate is mostly due to agricultural uses, including dairies and the application of fertilizers, municipal and industrial wastewater discharges, and reuse and recycling operations. A complex set of programs and policies are included in the Basin Plan to address this problem, including a water supply plan, a wastewater management plan, and a groundwater management plan. Other elements of the Basin Plan include the Non-point Source program and the storm water program. The Basin Plan identifies the Statewide General Permits and the MS4 permits as the regulatory tools for storm water management in the Basin. In light of the recently adopted Nitrogen-TDS objectives for certain management zones, this Order requires the Permittees to determine baseline concentration of these constituents in dry weather runoff, if any, from significant Outfall locations. The Order also includes Effluent Limitations for TDS and nitrates under dry weather conditions.

d. San Jacinto Sub-watershed: Canyon Lake and Lake Elsinore are in this watershed and are listed on the 2006 303(d) list for pathogens (Canyon Lake) and PCBs and unknown Toxicity (Lake Elsinore). Nutrient TMDLs have been developed for both Canyon Lake and Lake Elsinore. The Basin Plan contains schedules for achieving compliance with WLAs for nutrients in the San Jacinto sub-watershed (Canyon Lake/Lake Elsinore).

C. CWA SECTION 303(d) LIST AND TMDLS:

Pursuant to Section 303(b) of the CWA, the 2006 water quality assessment conducted by the Regional Board listed a number of waterbodies within the Region under Section 303(d) of the CWA as Impaired Waterbodies. These are waterbodies where Water Quality Objectives are being violated and it is presumed that the designated Beneficial Uses are not met. The sources of the Impairments include POTW discharges, and runoff from agricultural, open space and urban land uses. The Impaired Waterbodies in Riverside County within the Santa Ana Regional Board's jurisdiction are listed in Table 2. In addition, CWA Section 303(d) requires states to develop and submit to USEPA for approval a list of waterbodies that are not meeting Water Quality Standards and are not expected to attain these standards even with technology based controls. CWA Section 305(b) requires States to biennially prepare and submit to the USEPA for approval a report assessing statewide surface water quality.

Regional Board staff have reviewed and reevaluated all water quality monitoring and information, combined the CWA Section 305(b) Report with the Section 303(d) List of Impaired Waters and introduced the Proposed 2008 303(d)-305(b) Integrated Report that was adopted by the Regional Board on April 24, 2009. The additional Impaired Waterbodies that are on this list are also identified in Table 2. The Proposed 2008 303(d)-305(b) Integrated Report will not be effective until it has been approved by the State Board or the USEPA.

Federal regulations require that a TMDL be established for each 303(d) listed waterbody for each of the Pollutants causing Impairment. The TMDL is the total amount of the Pollutant that can be discharged without Impairing Water Quality Standards in the Receiving Water, i.e., Water Quality Objectives are met and the Beneficial Uses are protected. It is the sum of the individual WLAs for point source inputs, and LAs for Non-point Source inputs and natural background, with a margin of safety. The TMDLs are the basis for limitations established in Waste Discharge Requirements. TMDLs are being developed for all Pollutants identified in Table 2. The Permittees are required to revise their DAMP, at the direction of the Executive Officer, to incorporate TMDL Program Implementation Plans developed and approved pursuant to the process for the designation and implementation of TMDLs for Impaired Waterbodies.

For 303(d) listed waterbodies identified as potentially Impaired by Urban Runoff and without a TMDL, the Permittees are required to provide special protections such as requiring effective post-construction BMPs, enhanced training programs and developing targeted public outreach that would address the Pollutants of Concern.

This Order incorporates TMDLs that have been adopted for Bacterial Indicator in the MSAR watershed and for nutrients in the Lake Elsinore and Canyon Lake watersheds. On August 26, 2005, the Regional Board adopted Resolution No. R8-2005-001 amending the Basin Plan to incorporate Bacterial Indicator TMDL for MSAR watershed. On December 20, 2004, the Regional Board adopted resolution R8-2004-0037 amending the Basin Plan to incorporate the Lake Elsinore and Canyon Lake nutrient TMDLs. The stakeholders in these watersheds, including applicable Permittees, are collaborating in the development and implementation of the TMDLs.

This Order includes conditions necessary to implement the TMDLs already approved by the Regional Board as required by federal regulations at 40 CFR 122.44(d)(vii)(B). This Order incorporates the WLAs as Water Quality-Based Effluent Limitations (WQBEL) and requires Permittees to achieve the WLA for Urban Runoff through an iterative process of implementing BMPs. Failure to submit a TMDL Implementation Plan to the Regional Board or failure to implement the approved plan in a timely manner will be deemed to violate the conditions of this Order. The CWA requires the Permittees to have appropriate controls to reduce the discharge of Pollutants to the MEP, including management practices, control techniques and systems, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such Pollutants (33 USC 1342(p)(3)(B)). MEP is a dynamic performance standard and it evolves as the knowledge of Urban Runoff control measures increases. Permittees are required to monitor and report effectiveness of their BMPs with respect to Pollutant reduction goal(s) as one measure of progress toward reducing Pollutant loads from urban sources in accordance with the compliance schedules specified in the TMDL Implementation Plans. If on-going monitoring indicates that implemented BMPs are insufficient to assure compliance with the relevant Water Quality Standard(s), then the Permittees are required to develop and implement more effective BMPs for the controllable urban sources within their jurisdiction to the MEP. In addition, the Permittees are required to submit a revised Comprehensive TMDL Plan documenting the completion schedule for any additional and/or more effective BMPs and must execute the plan upon approval by the Executive Officer. Taken together, these permit conditions are consistent with the facts and assumptions specified in the TMDLs, including the TMDL Implementation Plans, and are expected to achieve compliance with the related WLAs.

Discharge specifications are included for de-minimus types of discharges from Permittee-owned or Permittee-operated facilities and activities and for TDS and total inorganic nitrogen for dry weather discharges.

Table 2

2006 CWA Section 303(d) Listed Waterbodies and April 24, 2009 Proposed 2008 Integrated Report of 305(b) and 303(d) List of Water Quality Limited Segments

WATERBODY	HYDRO UNIT	POLLUTANT/ STRESSOR	SOURCE	SIZE AFFECTED
Canyon Lake	802.120	Pathogens	Nonpoint Source	453 Acres
Lake Elsinore	802.310	Unknown Toxicity	Unknown Nonpoint Source	2431 Acres
		PCB's.	Unknown Nonpoint Source	2431 Acres
		Proposed for 2008 Sediment Toxicity	Unknown Point and/or Nonpoint Sources	2431 Acres
Lake Fulmor	802.210	Pathogens	Unknown Nonpoint Source	4.2 Acres
Santa Ana River, Reach 3	801.200	Pathogens	Unknownn Nonpoint Source	3 miles
		Proposed for 2008 Copper – Wet Season	Unknown Nonpoint Source	3 Miles
Temescal Creek Reach 1		Proposed for 2008 pH	Unknown	Unknown

VI. FIRST, SECOND, AND THIRD TERM PERMITS

1. STORM WATER POLLUTION CONTROL PROGRAMS AND POLICIES

1. Prior to USEPA's promulgation of the final regulations implementing the storm water requirements of the 1987 CWA amendments, the counties of Orange, Riverside and San Bernardino requested an area-wide NPDES permit for storm

water runoff for each of the county areas within the Regional Board's jurisdiction. On July 13, 1990, the Regional Board issued Order No. 90-104 to the Permittees (first term MS4 Permit). In 1996, the Regional Board adopted Order No. 96-30 for the Riverside County Permit Area (second term permit). On October 24, 2002, the Regional Board adopted Order No. R8-2002-0011 for the Riverside County Permit Area (third term MS4 Permit). These MS4 Permits included the following requirements:

a. Prohibited Non-storm Water discharges to the MS4s with certain exceptions.
b. Required the Permittees to develop and implement a DAMP to reduce Pollutants in Urban Runoff to the MEP.
c. Required the discharges from the MS4 to meet in Receiving Waters.
d. Required the Permittees to identify and eliminate IC/IDs to the MS4.
e. Required the Permittees to establish legal authority to enforce Storm Water Ordinances.
f. Required monitoring of dry weather flows, storm flows, and Receiving Water quality, and program assessment.
g. Required the Permittees to inventory, prioritize and inspect construction sites and industrial and commercial facilities based on threat to water quality.
h. Required the Permittees to develop a restaurant inspection program to address practices that may impact Urban Runoff quality such as oil and grease disposal, trash bin area management, parking lot cleaning, spill clean-up, and inspection of grease traps or interceptors to ensure adequate capacity and proper maintenance.
i. Required the Permittees to review and approve Water Quality Management Plans (WQMPs) for categories of New Development and Significant Redevelopment projects to address post-development Urban Runoff water quality and Hydromodification.
j. Required the Permittees to develop a unified response plan to respond to sewage spills that may impact Receiving Water quality.

2. During the first term MS4 Permit, the Permittees developed a DAMP that was approved by the Executive Officer on January 18, 1994. The DAMP included five BMP groups: environmental education activities, solid waste activities, road drainage system operations and maintenance, regulatory and enforcement activities, and structural controls. The DAMP was updated as part of the second and third-term MS4 Permits. The Permittees submitted a revised DAMP with the ROWD for the fourth term MS4 Permit renewal.

3. The RCFC&WCD performs water quality monitoring activities in support of three separate area-wide NPDES MS4 Permits (Santa Ana, San Diego and Colorado River Basin) under the Consolidated Monitoring Program (CMP). The CMP

contains a combined 132 historical, active, and special project sampling locations in the three MS4 Permit regions. Within the Permit Area, water column samples and/or sediment samples have been collected at a total of 93 locations over the last nineteen years. These 93 locations are comprised of 45 MS4 outfalls, 43 Receiving Water, 8 sediment, and 2 special interest sampling locations. In addition, the Permittees participate in a number of sub-regional and regional monitoring programs and special studies.

4. During the third term MS4 Permit, the Executive Officer approved the delay in implementing the bioassessment requirement to allow the development of indices of biological integrity applicable to inland waters. Subsequently, a regional bioassessment monitoring was initiated by the Surface Water Ambient Monitoring Program (SWAMP) to determine the conditions of the receiving waters in a more holistic way. The Southern California Watershed Research Project (SCCWRP), in conjunction with the southern California MS4 Permit programs, has developed a regional bioassessment monitoring program in which the Permittees participating. This Order requires the Permittees to continue to participate in the regional bioassessment monitoring program. It is expected that these regional monitoring stations combined with other Permittee and regional monitoring efforts will be used to identify water quality problem areas and to re-evaluate the monitoring program and the effectiveness of the DAMP. The future direction of some of the DAMP program elements will depend upon the results of the ongoing studies and a holistic approach to watershed management.

5. Other elements of the Urban Runoff management program included identification and elimination of IC/IDs and establishment of adequate legal authority to control Pollutants in Urban Runoff discharges. The Permittees have completed a survey of their MS4 to identify IC/IDs and have adopted appropriate ordinances to establish legal authority. Some of the more specific achievements during the second and third term MS4 Permits are as follows:

   a. During the second term MS4 Permit, the Permittees operated under an Implementation Agreement that sets forth the responsibilities of the Permittees as defined in the 1996 MS4 Permit. The Permittees update this agreement during each MS4 Permit term. The Permittees have adopted Storm Water Ordinances regarding the management of Urban Runoff. The Storm Water Ordinances provide the Permittees with the legal authority to implement the requirements of the MS4 Permit and the key regulatory requirements contained in 40 CFR Section 122.26(d)(2)(I)(A-F).

   b. Revised DAMP: Includes 28 Construction Site and 36 Municipal and Industrial Source Control BMPs that are to be implemented by the Permittees for purposes of controlling Pollutants associated with Urban Runoff to the MEP. The Permittees also strengthened enforcement and compliance elements of the DAMP. Enhanced the Construction Site

inspections, the Industrial and Commercial Facility inspections, New Development review requirements, and the Permittee facilities and activities program.

c. Cooperated in the establishment of TMDL Task Forces and workgroups for Lake Elsinore, Canyon Lake and the MSAR.

d. Assisted in development and implementation of the TMDLs for Canyon Lake, Lake Elsinore and the MSAR.

e. Developed and updated methods to track program effectiveness such as resident surveys, tracking hotline inquiries, and web counters.

f. In August 1999 the RCFC&WCD and the County's Environmental Health Department executed an agreement that provides the framework for an area-wide Commercial and Industrial Compliance Assistance Program (CAP).

g. The Permittees have participated in the CMP.

h. The Permittees administered area-wide programs including: Hazardous Materials emergency response, household hazardous waste collection, industrial/commercial CAP and public education and outreach. Some of these programs were coordinated with Caltrans and local agencies.

i. A Municipal Facilities Strategy was established then later incorporated into the DAMP, the Supplement "A" New Development Guidelines were amended to require compliance with the Riverside County WQMP for specific categories of New Development and Significant Redevelopment projects.

j. The Riverside County WQMP was developed in 2004. The Model WQMP is a post-construction planning tool to address Urban Runoff from New Development and Significant Redevelopment. The WQMP is implemented on a watershed-specific level, and provides guidance for project specific post-construction BMPs to address the quantity and quality of Urban Runoff from New Development and Significant Redevelopment projects. Any New Development or Significant Redevelopment project that requires discretionary approval must submit a project-specific WQMP to the appropriate Permittee. The project-specific WQMP ensures that management of Urban Runoff to protect Receiving Water quality is considered a priority during project design and operation.

k. Established the Management Steering Committee that brings together the city managers in the Permit Area promoting consensus and communication on a regional basis.

l. Formation of sub-committees to guide and develop specific program elements (Construction Activities, Industrial/Commercial Activities, New Development/ Significant Redevelopment, Public Education, Permittee Facilities & Activities, Monitoring, & Finance).

m. Evaluated and revised ordinances, regulations, rules, and codes to ensure appropriate level of legal authority.

n. A Technical Advisory Committee for overall program development and implementation was established.

o. Program Review: A number of existing programs were reviewed to determine their effectiveness in combating Urban Runoff Pollution and to recommend alternatives and or improvements, including Permittee activities and facilities, IC/IDs to the MS4 systems, and existing monitoring programs.

p. Enhanced Public Education program through development of new outreach materials and programs.

q. Public Education: A number of steps were taken to educate the public, businesses, industries, and commercial establishments regarding their role in implementing Urban Runoff Pollution controls. The Industrial Facility dischargers were notified of the Urban Runoff regulatory requirements. For a number of unregulated activities, BMP guidance documents were developed and a toll free hotline was established for reporting any suspected water quality problems.

r. The Permittee's website hosted by RCFC&WCD, including the "Only Rain Down the Storm Drain" public information page, was developed and is continually enhanced. It contains resources for residential facilities, businesses, developers and contractors. The website is accessible from the RCFC&WCD home page. The website offers free brochures that all web site visitors can print in quantities or can order including:

   i. *After the Storm* – a citizen's guide to understanding MS4 Pollution in your neighborhood or when performing daily activities.

   ii. *Automotive Maintenance & Car Care* – guidelines for keeping your auto shop or retail fuel facility in environmental shape.

   iii. *Outdoor Cleaning Activities* – guideline for outdoor cleaning activities and wastewater disposal.

   iv. *Pools, Spas and Fountains* –Environmental maintenance suggestions for pool, spa, and fountain owners.

   v. *What's the Scoop* – tips for a healthy pet and a healthier environment.

   vi. *Household Hazardous Waste (HHW)* – A schedule of collection locations for proper disposal of HHW.

   vii. *Storm Water Pollution Found in Your Neighborhood* – door hanger.

s. In addition to the information provided on the Only Rain Down the Storm Drain website, the Public Education and Outreach Program has:

i. Tested and/or implemented several new Public Education and Outreach Program effectiveness tracking mechanisms including call tracking, web counters, testing, and surveys.

ii. Conducted a review of the efficacy of Permittee employee training programs.

iii. Enhanced the toll free storm water Pollution reporting hot line to include public education information and support for the public and other interested stakeholders.

iv. Enhanced on-line registration access for NPDES training to help facilitate training of appropriate Permittee employees.

v. Worked with the Riverside-Corona Resource Conservation District to develop home garden workshops and presentations to elementary and middle schools and staff to raise public awareness of Urban Runoff management issues and Source Control BMPs and to encourage volunteers, partners, and groups to gather annually for a trash and debris clean-up day along the Santa Ana River.

vi. Developed special newspaper and billing inserts, fliers and advertisements to raise public awareness of Urban Runoff management issues and Source Control BMPs. A radio advertising campaign was also developed and implemented for a limited time.

vii. Developed and presented workshops regarding household hazardous waste use and proper disposal at major home improvement stores throughout Riverside County.

viii. Placed numerous advertisements in the Penny Saver and Bargain Bulletin to raise public awareness of Urban Runoff management.

ix. In cooperation with certain County Service Areas and other programs, pet waste signs with bag dispensers have been installed at various parks to help encourage the proper disposal of animal waste.

x. Coordinated with County-wide Animal Control Facilities, as well as city-owned animal control facilities and Humane Societies, to distribute specific materials to the County Agricultural inspectors as well as Regional Board inspectors for use during facility inspections.

xi. Distributed educational and outreach materials to the County Agricultural inspectors as well as Santa Ana Regional Board staff inspectors for use during facility inspections.

xii. Cooperated with the Western Riverside Council of Government (WRCOG) in the Used Oil Block Cycle Grant that decreases the amount of illegally dumped motor oil by promoting the addition of new Certified Oil Collection Centers.

xiii. Participated in WRCOG's "Cleanest County in the West" program to address issues relating to litter and illegal dumping which targeted both students and adults.

xiv. Supplemental Environmental Projects: As a result of an environmental enforcement case settlement brought by the County Department of Environmental Health, Conoco Phillips and Downs Energy developed two posters and a billboard, respectively. These items were designed to increase the awareness of appropriate BMPs for retail fuel businesses.

t. Permittee Training: Training was provided to Permittee employees to implement New Development Guidelines and Public Works BMPs. The fourth-term MS4 Permit specifies additional training requirements to focus on necessary competencies for storm water program managers, Permittee planners and inspection staff. This was added following information collected during Regional Board staff audits of Permittees' storm water management programs, which found that a number of the Permittees' staff and/or contractors were not adequately trained to properly implement the required program elements contained within the third term MS4 Permit and/or training programs were not properly documented.

u. Related Activities: Modified MS4s by channel stabilization and creation of sediment basins; eliminated or permitted and documented Illicit Connections to the MS4s.

v. Pursued and received Proposition 50 Planning Grant to develop an Integrated Regional Watershed Management Plan for the San Jacinto watershed and to facilitate implementation of the Canyon Lake/Lake Elsinore Nutrient TMDL.

w. Pursued and received two Proposition 40 Integrated Regional Watershed Management Plan implementation grants to facilitate the MSAR TMDL and LE/CL TMDLs.

x. Co-Permittees developed and maintain an inventory database (or databases) of Construction Sites 1-acre or larger for which they have issued a building or grading permit. For each Construction Site/project included in a Co-Permittee's inventory, the Co-Permittees have assigned a priority of "high," "medium," or "low" to reflect the Construction Site's potential for Impairing Receiving Water quality.

y. Created databases for the Commercial and Industrial Facilities within each jurisdiction.

z. Developed a GIS Web Browser to assist developers and Permittees in identifying pertinent water quality information for proposed New Development projects.

aa. Developed Planning Application forms for Permittee use to ensure that the need for a project-specific WQMP was properly identified for New Development and Significant Redevelopment projects early in the planning process.

bb. Developed a FAQ and watershed Impairment maps to assist Permittees and developers with preparing and reviewing project-specific WQMPs.

cc. Enhanced online watershed maps to assist developers and the public with identifying areas tributary to Impaired Waterbodies.

dd. Developed a BMP design handbook to standardize BMP selection and design in Riverside County.

ee. Initiated development of an enhanced BMP Design Handbook to provide additional guidance for LID and post-construction BMP design.

ff. Participation in the Storm Water Monitoring Coalition (SMC) efforts to evaluate LID options and establish guidance for BMP implementation for Southern California areas.

gg. Participation in SCCWRP's Hydromodification studies to develop scientifically based design guidance for Southern California.

hh. Initiated cooperative program with County Environmental Health to promote environmental enhancement projects in lieu of fines for violations of environmental laws. This initiative resulted in the billboard advertising campaign to promote appropriate BMPs for gas stations and garages.

ii. Prepared a one-year evaluation of litter management BMPs. This evaluation assessed the relative efficiency and cost effectiveness of Anthropogenic litter management BMPs including: street sweeping, catch basin cleaning, deployment of trash receptacles, public education, and MS4 maintenance. As a result, a Litter Removal Inspection Form was developed that assisted the Permittees in identifying and prioritizing areas with litter problems. The Permittees augmented the litter management programs including employee/contractor training, Industrial and Commercial Facility inspections, recycling programs including bulk-item collection, participation in watershed clean-up efforts, and illegal dumping retrieval.

jj. The RCFC&WCD coordinated GIS-based maps for Permittee MS4 facilities. The MS4 maps are updated annually with new information provided by the Permittees as part of the Annual Reporting process. The GIS layers are also now available on the RCFC&WCD's website through an internet GIS browser.

kk. Updated Model Facilities Pollution Prevention Plan for Permittee facilities not requiring coverage under the General Permit for Storm Water Discharges Associated with Industrial Activities (General Industrial Permit).

ll. The Permittees completed a MS4 assessment in 2004 to identify opportunities for incorporation of regional BMP retrofits within the limits of existing infrastructure.

mm. Pursued a Proposition 13 Grant, through the Santa Ana Watershed Project Authority, to develop a LID BMP Demonstration and Testing Facility. RCFC&WCD has continued to develop this project and plans to start construction this winter despite the current freeze on new grant projects.

B. PRIOR TERM PERMITS - WATER QUALITY IMPROVEMENTS

An accurate and quantifiable measurement of the impact of the above stated Urban Runoff management programs is difficult, due to a variety of reasons, such as the variability in chemical water quality data, the incremental nature of BMP implementation, lack of baseline monitoring data, and the existence of some of the programs and policies prior to initiation of formal Urban Runoff management programs. There are generally two accepted methodologies for assessing water quality improvements: (1) conventional monitoring such as chemical-specific water quality monitoring; and (2) non-conventional monitoring, such as monitoring of the amount of HHW collected and disposed off at appropriate disposal sites, the amount of used oil collected, and the amount of Anthropogenic debris removed from the MS4, etc.

The Permittees' water quality monitoring data submitted to date document a number of exceedances of Basin Plan Water Quality Objectives for various Urban Runoff-related Pollutants; the most notable among these excceedances was fecal coliform bacteria. Where these exceedances have resulted in the development of TMDLs for the MSAR, this Order requires the Permittees named in the TMDL: to comply with the WLAs for Bacterial Indicators consistent with the Implementation Plan requirements defined in the MSAR Bacterial Indicator TMDL.

During the prior MS4 Permit terms, there was an increased focus on watershed management initiatives and coordination among the MS4 permittees in Orange, Riverside and San Bernardino Counties. These efforts resulted in a number of regional monitoring programs and other coordinated program and policy developments. The Principal Permittee continues to be an active participant in the SWQSTF, the Canyon Lake/Lake Elsinore nutrient TMDL, the MSAR Bacterial Indicator TMDL, and the SMC studies. In addition to the TMDL implementation and monitoring activities, the Permittees participate in the Regional Integrated Freshwater Bioassessment Monitoring Program, the BMP Effectiveness Project assessing the effectiveness of LID techniques. Riverside and San Bernardino MS4 Programs are also coordinating on the development of several outreach programs.

It is anticipated that with continued implementation of the revised DAMP, the programs proposed in the ROWD incorporated into this Order and other

requirements specified in this Order, the goals and objectives of the storm water regulations will be met, including protection of the Beneficial Uses of all Receiving Waters.

VII. FUTURE DIRECTION/2007 ROWD

A. Recognizing the significant resources utilized in developing the 2002 MS4 Permit and the significant commitment the Permittees are making to address water quality Impairments, including those identified in the 2006 303(d) List as high priority for establishment of TMDLs, the Permittees proposed in the 2007 ROWD to maintain the fundamental structure and content of the 2002 MS4 Permit and the 2005 DAMP with modifications to reflect:

1. Removed descriptions of studies that have been completed;
2. Updated references to related orders by the Regional Board and State Board;
3. Adoption of TMDL requirements;
4. Evolution of compliance programs;
5. Further standardization and definition of terms;
6. Consolidation of similar compliance requirements [training requirements, reporting requirements, IC/ID requirements] to simplify the Order, increase readability and prevent the need for duplicative language;
7. Deletion of requirements in the 2002 MS4 Permit that described the development of compliance program elements which were incorporated into the 2005 DAMP;
8. Development of LIPs by the Permittees during the fourth term Order;
9. Addition of Permittee coverage under the Small Linear Underground Projects (State Board Order No. 2003-0007-DWQ, NPDES No. CAS000005) and Utility Vaults (State Board Order No. 2006-0008-DWQ, NPDES No. CAG990002) General Permits;
10. Recognition that the Municipal Facilities Strategy and Enforcement Compliance Strategies have been incorporated into the DAMP; and
11. Regional Board staff comments received by the Permittees during the third term permit, including comments received during the January 22, 2007 ROWD kick-off meeting regarding topics such as LID, Hydromodification, LIPs, etc.

B. In addition, the 2007 ROWD proposed continuing with the 2005 DAMP with some revisions. Based on an effectiveness assessment analysis, the following significant changes were incorporated into the Permittees 2007 draft DAMP compliance programs:

1. The Permittees proposed to complete preparation of LIPs within 12 months of Order adoption. The Permittees propose to develop LIPs that will:
   a. Specify how each program element of the DAMP shall be implemented;
   b. Describe the ordinances, plans, policies, procedures, and tools (e.g., checklists, forms, educational materials, etc.) used to execute the DAMP;
   c. Identify the organizational units responsible for implementation of each program element;
   d. Establish internal reporting requirements to ensure and promote accountability; and
   e. Describe an adaptive method of evaluation and assessment of program effectiveness for the purpose of identifying program improvements.

2. The final report "BMP Siting Study for the Santa Ana Permit Area" was released in May 2005. The sites identified in this study are likely to be further evaluated for opportunities to implement Regional BMPs necessary to comply with existing and future TMDLs.

3. Proposed revisions to the 2002 MS4 Permit provisions to reflect the unified IC/ID reporting procedures currently contained within the DAMP for simplicity and clarity.

C. Regional Board Approach to Consolidation of Overlapping NPDES Permit Requirements

1. During the third term MS4 Permit, the Permittees reviewed the applicability of the General Permit-Small Linear Underground Projects (State Board Order No. 2003-0007-DWQ, NPDES No. CAS000005), the General Permit-De Minimus Discharges (Order No. R8-2003-0061 as amended by Order Nos. R8-2005-0041 and R8-2006-0004), and the General Permit-Utility Vaults (Order No. 2006-0008-DWQ, NPDES No. CAG990002) to their activities such as hydrant flushing, maintenance on potable water supply system(s), construction dewatering, and the short-term and intermittent discharges from the de-watering of utility vaults and underground structures. Since the DAMP incorporates BMPs for the activities covered by these general permits, the Permittees recommended separate coverage under the Small Linear Underground Projects, De Minimus Discharges, or Utility Vaults General Permits was not necessary. This Order now includes coverage for De Minimus discharges from Permittee-owned facilities and activities specifically excluded from coverage under the General Waste Discharge Requirements for Discharges to Surface Waters that Pose an Insignificant (De Minimus) Threat to Water Quality, NPDES NO. CAG998001, Order No. R8-2009-0003. Permittees shall continue to obtain separate coverage for activities covered

by the Small Linear Underground Projects and Utility Vaults General Permits, unless these permits are incorporated into the General Construction Permit.

2. Specific identification of the types of discharges that must have coverage under the General De Minimus Permit and the General Construction Permit, is included in Section 5 of the 2007 DAMP. This Order requires the Permittees to include a description of those de minimus discharges into the Permittees' LIP, including a Regional Board notification process.
3. Prioritized inspections and monitoring based on sampling and monitoring results and other metrics to help target activities that present the highest risk to water quality.

D. During the fourth term Order, the following revisions to the Public Education and Outreach Program will be priorities:

1. Continue coordination of public education outreach with adjacent MS4s.
2. Continue to evaluate and enhance outreach materials for IC/IDs, nutrients, fertilizers, and pesticides.
3. Continue to focus the Public Education and Outreach Program on the Pollutants causing the greatest impacts to water quality, determined by the monitoring results and the list of Impaired Waterbodies [303(d) list].

The Permittees have already taken several steps in this direction. For example, the Permittees have provided spray bottles with environmentally friendly pesticide recipes printed on the side to residents at community fairs; the Permittees have developed or are in the process of developing brochures for septic system management, landscape management, and gardening; the Riverside and San Bernardino County Permittees are coordinating on a Curiosity Quest Episode (KVCR Family Show) to promote BMPs for nutrients, fertilizers and pesticides and the Permittees place information in hardware and gardening stores regarding pesticide and fertilizer management. The Permittees also incorporate other materials to address general Pollutants of Concern.

E. As a result of continued program effectiveness assessment the Permittees propose to update Annual Reporting forms to incorporate specific reporting requirements for all effectiveness assessment metrics.

F. Enhanced online watershed maps to assist developers and the public with identifying areas tributary to Impaired Waterbodies.

G. WQMP

1. The Permittees committed to maintain the "Frequently Asked Questions" information sheet for New Development and Significant Redevelopment projects to assist with the development and implementation of the revised WQMP.

2. The Permittees committed to update the Riverside County Storm Water Quality Best Management Practice Design Handbook to (1) better incorporate LID design concepts, (2) incorporate guidance to describe how developments can offset Hydromodification impacts with LID and (3) incorporate additional design guidance to ensure maintainability and functionality of BMPs, throughout the life of the development. This Order further requires the Permittees to revise the WQMP consistent with the requirements of the Order.
3. The Permittees committed to maintain the WQMP template to assist developers with developing a project-specific WQMP.
4. An audit of each of the Permittees' Urban Runoff management programs during the third term MS4 Permit indicated no clear nexus between the watershed protection principles, including LID techniques, specified in the WQMP and the Permittees' General Plan or related documents such as Development Standards, Zoning Codes, Conditions of Approval, Project Development Guidance, etc.. It appears that many of the existing procedures, Development Standards, Ordinances and Municipal Codes may be barriers to implement LID BMPs. This Order requires the Permittees to facilitate LID techniques specified in this Order.

H. The Regional Board has proposed a revised Notice of Intent and Notice of Termination for Permittee construction projects to assist Regional Board staff with identifying locations and owners of Permittee projects.

I. The Permittees have committed to annual updates to Sanitary Sewer Overflow Procedures to ensure proper contact information for Permittee and outside agencies.

J. WATERSHED APPROACH

1. TMDL for Bacterial Indicator in the MSAR subwatershed and nutrients in the Canyon Lake and Lake Elsinore subwatershed are incorporated into this Order (See Section V.C). The Permittees support TMDL implementation and agreed to participate in a comprehensive water quality monitoring program to ensure that Urban Runoff meets the Water Quality Objectives identified in the Basin Plan and are consistent with the WLAs specified in the TMDLs. This Order requires that, consistent with the requirements of the respective TMDL Implementation Plans, the Permittees use the water quality monitoring of Urban Runoff to evaluate the effectiveness of the BMP programs.

2. The USEPA has recommended a shift to watershed-based NPDES permitting[8] and watershed approach[9] to CWA programs, including NPDES programs. The Permittees and the Regional Board also recognize that a watershed-based approach is expected to be effective in controlling Pollutants in Urban Runoff. Consistent with this approach, this Order requires the Permittees to develop and implement programs that integrate Hydromodification and water quality management strategies with land use planning policies, ordinances, and plans within each jurisdiction. A *watershed approach* considers the diverse Pollutant sources and stressors and watershed goals within a defined geographic area (i.e., watershed boundaries). A watershed approach has three basic components:

   a. *Geographic Focus*: Watersheds are nature's boundaries. They are the land areas that drain to surface waterbodies, and they generally include lakes, rivers, estuaries, wetlands, streams, and the surrounding landscape. Groundwater recharge areas are also considered.

   b. *Sound Management Techniques Based on Strong Science and Data*: Sound scientific data, tools, and techniques are critical to evaluate the process. Actions taken include characterizing priority watershed water quality problems and solutions, developing and implementing action plans, and evaluating their effectiveness within the watershed.

   c. *Partnerships/Stakeholder Involvement*: Watersheds transcend political, social, and economic boundaries. Therefore, it is important to involve all the affected interests in designing and implementing goals for the watershed. Watershed teams may include representatives from all levels of government, public interest groups, industry, academic institutions, private landowners, concerned citizens, and others.

There are two major sub-watersheds in Riverside County within the Permit Area – the MSAR subwatershed, consisting of the portions of the Permit Area that drain to Reaches 3 and 4 of the Santa Ana River, and the San Jacinto River sub-watershed, which consists of the portions of the Permit Area that drain to Lake Elsinore. The Permittees participate in the MSAR TMDL Task Force and the Lake Elsinore and Canyon Lake TMDL Task Forces, which are stakeholder driven, watershed-based efforts to address Pollutants of Concern in the respective sub-watersheds. The Permittees have also implemented several stakeholder driven, watershed-based conservation programs such as the Special Area Management

[8] USEPA: Watershed-based NPDES permitting is a process that emphasizes addressing all stressors within a hydrologically-defined drainage basin, rather than addressing individual Pollutant sources on a discharge-by-discharge basis.

[9] USEPA (1996a): "The watershed approach is a coordinating framework for environmental management that focuses public and private sector efforts to address the highest priority problems within hydrologically defined geographic areas, taking into consideration both ground and surface water flow."

Plan, the Western Riverside County Multiple Species Conservation Plan, the San Jacinto River Integrated Watershed Management Plan and the Santa Ana Watershed Project Authority One Water One Watershed Plan.

These efforts are also addressed and discussed in the DAMP, which integrates these efforts into a coherent and uniform compliance program to protect Receiving Waters. Due to economies of scale and the fact that many of the Permittees have jurisdiction in both sub-watersheds, the Permittees have opted to continue to implement uniform MS4 Permit compliance programs across the entire Permit Area (for example Permittee training programs educate inspectors about the impacts and sources of pathogens and nutrients as opposed to offering separate sub-watershed specific training programs for the San Jacinto and MSAR sub-watersheds). The Permittees have indicated that as source assessments and monitoring data results from the aforementioned watershed efforts produce findings regarding potential urban sources of Pollutants of Concern that they may opt, in the future, to develop specific action plans for the MSAR and San Jacinto River sub-watersheds, or potentially even tributaries there-of. If so, the DAMP will be appropriately modified to clarify the sub-watershed specific components.

The Permittees also currently implement interim Hydromodification criteria and have committed to revising their Hydromodification management programs based on studies currently being conducted by the SCCWRP. This Order requires the Permittees to continue to pursue these watershed planning efforts and enhance them as appropriate to address Pollutants of Concern.

J. To promote program transparency, each Permittee proposed to develop its own LIP that:

   a. Specifies how each program element of the DAMP shall be implemented;
   b. Describes the ordinances, plans, policies, procedures, and tools (e.g., checklists, forms, educational materials, etc.) used to execute the DAMP;
   c. Identifies the organizational units responsible for implementation of each program element;
   d. Establishes internal reporting requirements to ensure and promote accountability; and
   e. Describes an adaptive method of evaluation and assessment of program effectiveness for the purpose of identifying program improvements.

K. The audits conducted by Regional Board staff have also shown a significant deficiency in measuring program effectiveness. This Order requires quantifiable measures for evaluating program effectiveness.

L. The above-mentioned strategies for the fourth-term Order build upon and continue the programs and policies developed by the Permittees during the prior MS4 Permit terms as described in Sections VI and VII above.

M. A combination of these programs and policies and the requirements specified in this Order should ensure control of Pollutants in Urban Runoff from the MS4 owned and/or controlled by the Permittees.

VIII. ORDER REQUIREMENTS AND PROVISIONS

The legislative history of storm water statutes (1987 CWA Amendments), USEPA regulations (40CFR Parts 122, 123, and 124), and clarifications issued by the State Board (State Board Orders No. WQ 91-03 and WQ 92-04) indicate that a non-traditional NPDES permitting strategy was anticipated for regulating Urban Runoff. Due to the economic and technical infeasibility of full-scale end-of-pipe treatments and the complexity of Urban Runoff quality and quantity, MS4 permits generally include narrative requirements for the implementation of BMPs in place of Numeric Effluent Limits.

The requirements included in this Order are meant to specify those management practices, control techniques and system design and engineering methods that will result in protection of the Beneficial Uses of the Receiving Waters consistent with the MEP standard. State Board (Orders No. WQ 98-01 and WQ 99-05) concluded that MS4s must meet the technology-based MEP standard and Water Quality Standards. The U.S. Court of Appeals for the Ninth Circuit subsequently held that strict compliance with Water Quality Standards in MS4 permits is at the discretion of the local permitting agency.

The ROWD included a discussion of the current status of Riverside County's Urban Runoff management program and the proposed programs and policies for the next five years (fourth-term Order). This Order incorporates these documents and specifies performance commitments for specific elements of the Permittees Urban Runoff management program.

This Order recognizes the significant progress made by the Permittees during the first three MS4 Permit terms in implementing the storm water regulations. This Order also recognizes regional and innovative solutions to such a complex problem, addresses deficiencies in the Permittees' Urban Runoff programs observed during the audits conducted by Regional Board staff, and considers comments by the USEPA on other draft MS4 Permits. This Order specifies quantifiable performance measures to determine compliance and assess the effectiveness of the Urban Runoff programs. This Order incorporates an integrated watershed approach in solving water quality and Hydromodification impacts resulting from urbanization and aims to promote LID techniques as a key element to mitigate impacts from New Development and Significant Redevelopment projects. The proposed Order also requires the Permittees

to implement TMDL WLA through iterative BMP programs as required in the respective approved TMDL Implementation Plans (See Section V.C). The goal of these programs and policies that are included in this Order is to achieve and maintain Water Quality Standards in the Receiving Waters.

The essential components of the Urban Runoff management program, as established by federal regulations [40 CFR 122.26(d)] are: (i) Adequate Legal Authority, (ii) Fiscal Resources, (iii) Storm Water Quality Management Program (SQMP) - (Public Information and Participation Program, Industrial/Commercial Facilities Program, Development Planning Program, Development Construction Program, Public Agency Activities Program, IC/IDs Elimination Program), and (iv) Monitoring and Reporting Program. The major sections of the requirements in this Order include: I. Facility Information, II. Findings, III. Permittee Responsibilities, IV. Local Implementation Plan, V. Discharge Prohibitions, VI. Effluent Limitations, Discharge Specifications and Other TMDL Related Requirements, VII. Receiving Water Limitations, VIII. Legal Authority/Enforcement, IX. Illicit Connections/Illegal Discharges; Litter, Debris and Trash Control, X. Sewage Spills, Infiltration into MS4 Systems from Leaking Sanitary Sewer Lines, Septic System Failures, and Portable Toilet Discharges, XI. Co-Permittee Inspection Programs, XII. New Development (including Significant Redevelopment), XIII. Public Education and Outreach, XIV. Permittee Facilities and Activities, XV. Training Program For Storm Water Managers, Planners, Inspectors And Municipal Contractors, XVI. Notification Requirements, XVII. Program Management/DAMP Review, XVIII. Fiscal Resources, XIX. Monitoring and Reporting Program, XX. Provisions, XXI Permit Modification, and XXII. Permit Expiration and Renewal.

These programs and policies are intended to improve Urban Runoff quality and protect the Beneficial Uses of Receiving Waters of the Permit Area.

A. RESPONSIBILITIES

The responsibilities of the Principal Permittee are to coordinate the overall Urban Runoff management program and the Co-Permittees are responsible for managing the Urban Runoff program within their jurisdictions as detailed in the ROWD and the proposed Order, Order No. R8-2010-0033.

The existing Implementation Agreement needs to be revised to include the cities that were not signatories to this Agreement. The Order requires that a copy of the signature page and any revisions to the Agreement be included in the specified Annual Report.

B. DISCHARGE PROHIBITIONS

In accordance with CWA Section 402(p)(3)(B)(ii), this Order prohibits the discharge of Non-storm Water to the MS4s, with a few exceptions. The specified exceptions are consistent with 40 CFR 122.26(d)(2)(iv)(B)(1). If the Permittees or the

Executive Officer determines that any of the exempted Non-storm Water discharges is a significant source of Pollutants, a separate NPDES permit or coverage under the Regional Board's De Minimus Permit will be required.

C. EFFLUENT LIMITATIONS AND DISCHARGE SPECIFICATIONS, INCLUDING WASTE LOAD ALLOCATIONS FOR DISCHARGES TO 303(d) LISTED WATERBODIES WITH ADOPTED TMDLS

The Order clarifies allowed discharges and those discharges (only from Permittee owned or operated facilities and activities) allowed only if certain discharge specifications are met, such as those covered under the De Minimus Permit. These discharges should be consistent with the Regional Board's General De Minimus Permit for Discharges to Surface Waters, Order No. R8-2009-0003, NPDES No. CAG 998001. Permittees' de minimus discharges covered under this Order include: 1) dewatering wastes from subterranean seepage, except for discharges from utility vaults; 2) discharges resulting from hydrostatic testing of vessels, pipelines, tanks, etc.; 3) discharges resulting from the maintenance of potable water supply pipelines, tanks, reservoirs, etc.; 4) discharges resulting from the disinfection of potable water supply pipelines, tanks, reservoirs, etc.; 5) discharges from potable water supply systems resulting from initial system startup, routine startup, sampling of influent flow, system failures, pressure releases, etc.; 6) discharges from fire hydrant testing or flushing; 7) air conditioning condensate; 8) swimming pool discharges; 9) discharges resulting from diverted stream flows; and 10) construction dewatering wastes. The DAMP and the LIP are required to be revised to incorporate information regarding Permittees' de minimus discharges.

This Order requires Permittees to implement established TMDL WLAs specified for Urban Runoff through an iterative BMP approach (see Section V.C above).

D. RECEIVING WATER LIMITATIONS

Receiving Water Limitations are included to ensure that discharges of Urban Runoff from MS4s do not cause or contribute to violations of applicable Water Quality Standards in Receiving Waters. The compliance strategy for Receiving Water Limitations is consistent with the USEPA and State Board guidance and recognizes the complexity of Urban Runoff management.

This Order requires the Permittees to meet Water Quality Standards in Receiving Waters in accordance with USEPA requirements, as specified in State Board Order No. WQ 99-05. If Water Quality Standards are not met through implementation of certain BMPs, the Permittees are required to re-evaluate the programs and policies and to propose additional BMPs. Compliance determination will be based on this iterative BMP implementation process.

E. LEGAL AUTHORITY/ENFORCEMENT

Each Permittee has adopted ordinances, municipal codes, and other regulations to establish legal authority to control discharges to the MS4s and to enforce these regulations as specified in 40 CFR 122.26(d)(2)(I)(B, C, E, and F). The Permittees are required to enforce these ordinances and to take enforcement actions against violators (40 CFR 122.26(d)(2)(iv)(A-D)).

The enforcement activities undertaken by a majority of the Permittees have consisted primarily of Notices of Violation, which act to educate the public on the environmental consequences of Illegal Discharges. In the case of the County, additional action has sometimes included recovery of investigation and clean-up costs from the responsible parties. In the event of egregious or repeated violations, the option exists for a referral to the County District Attorney for possible prosecution or to the Regional Board for enforcement under the California Water Code or the CWA. In order to eliminate unauthorized, Non-storm Water discharges, reduce the amount of Pollutants commingling with Urban Runoff and thereby protect water quality, an additional level of enforcement is required between Notices of Violation and District Attorney referrals.

The third term MS4 Permit required the Permittees to establish the authority and resources to administer either civil or criminal fines and/or penalties for violations of their Storm Water Ordinances. The Permittees now have this authority for penalties. Within the fourth term Order, Permittees are required to exercise this authority by developing an enforcement program to be administered within the industrial, commercial and construction elements of their Urban Runoff management programs. The enforcement program has been required to be included as an update to each Permittee's LIP. The effectiveness of this program must be documented in the Annual Reports submitted by the Permittees. However, it is acknowledged that once cases have been referred to the District Attorney or Environmental Crimes Task Force, etc. for prosecution, case details are confidential.

The fourth term Order further requires the Permittees to document and implement progressive and decisive enforcement actions, evaluate the effectiveness of their enforcement program and sanctions by tracking compliance and evaluating the amount of time to return to compliance.

This Order requires the Permittees to include in the LIP their legal authority and mechanisms to implement the various program elements required by this Order to properly manage, reduce, and mitigate potential Pollutant sources within each Permittee's jurisdiction. The LIP shall include citations of appropriate local ordinances, identification of departmental jurisdictions and key personnel in the implementation and enforcement of those ordinances. The LIP shall include

procedures, tools and timeframes for progressive enforcement actions and procedures for tracking compliance.

F. ILLICIT CONNECTIONS/ILLEGAL DISCHARGES; LITTER, DEBRIS AND TRASH CONTROL

Federal regulation, 40 CFR 122.26(d)(2(iv)(B), requires the Permittees to eliminate illicit discharges to the MS4s. The Permittees have completed a survey of the MS4 and eliminated or permitted all identified Illicit Connections. The Permittees have also established a program to address Illegal Discharges and a mechanism to respond to spills and leaks and other incidents of discharges to the MS4.

The Permittees currently have several programs to address IC/IDs:

1. The Permittees operate a toll free phone line, provide e-mail access for filing complaints and take direct calls regarding IC/ID reports from third parties. These reports are investigated by Permittee staff and reported in IC/ID investigation forms. All Permittee public education outreach materials promote the use of these reporting mechanisms.
2. Permittee staff receive training on identification and reporting of IC/IDs to appropriate Permittee staff. These reports are investigated and reported in IC/ID reporting forms.
3. The Permittees conduct Industrial and Commercial Facility and Construction Site inspections to identify potential IC/IDs. The outcomes of these inspections are reported in inspection reporting databases.
4. The Permittees contribute funds to the County Hazardous Materials Response Team to train and educate them to handle Illegal Discharges or accidental hazardous waste discharges so as to prevent IC/IDs. A summary of HAZMAT activities is provided in the Annual Reports.
5. The RCFC&WCD monitors Office of Emergency Service reports for potential IC/ID incidents and investigates them as appropriate. Results are reported in the RCFC&WCD complaint call database and reported to the Permittees as appropriate.
6. The RCFC&WCD has developed an online GIS tool that identifies the location of District and Permittee MS4 facilities to facilitate IC/ID investigations and response.
7. The Permittees have developed a Sanitary Sewer Overflow Procedure to limit the potential for sewage spills to the MS4.
8. RCFC&WCD, as Principal Permittee, has dedicated staff that conducts dry weather monitoring and also evaluates RCFC&WCD MS4 facilities for maintenance problems and/or IC/IDs. Detected IC/IDs from monitoring data or field inspections are reported to the District's NPDES section, logged into

RCFC&WCDs complaint database, and reported to the appropriate Permittee for follow up action.

However, with a few exceptions, program evaluations conducted during the third term MS4 Permit showed that this program element is primarily complaint driven or an incidental component of municipal inspections or MS4 inspections for a number of Permittees. This Order requires the Permittees to ensure their LIPs describe each Permittee's plan for focused, systematic IC/ID investigations, outfall reconnaissance surveys, indicator monitoring, and track their sources[10]. A proactive Illicit Discharge Detection and Elimination (IDDE) program should be integrated with other LIP program elements as appropriate including: mapping of the Permittees' MS4 to track sources, aerial photography, Permittee inspection programs for construction, industrial, commercial, MS4, Permittee facilities, etc., watershed monitoring, public education and outreach, Pollution Prevention, and rapid assessment of stream corridors to identify dry weather flows and illegal dumping.

G. SEWAGE SPILLS, INFILTRATION INTO MS4 SYSTEMS FROM LEAKING SANITARY SEWER LINES, SEPTIC SYSTEM FAILURES, AND PORTABLE TOILET DISCHARGES

Federal regulation, 40 CFR 122.26(d)(2)(iv)(B)(4), requires the Permittees to develop procedures to prevent, contain, and respond to spills that may discharge into the MS4s. The Permittees have already developed a program to address various types of spills to the MS4s. This Order requires the Permittees to continue to implement the unified sewer response plans in collaboration with the local sanitary sewer system operators. To facilitate swift response actions, the Permittees are required to provide 24-hour access to MS4s to the sanitary sewer system operators. The Permittees should also work cooperatively with the sanitary sewer system operators to determine if exfiltration from leaking sanitary sewer lines is causing or contributing to Urban Runoff Pollution problems. In addition, the Permittees are required to control infiltration or seepage from sanitary sewers to the MS4s through routine preventive maintenance of the MS4 (40 CFR 122.26(d)(2)(iv)(B)(7)). This Order also requires the Permittees to implement control measures and procedures to prevent, respond to, contain and clean up all sewage and other spills from sources such as portable toilets and septic systems.

On May 2, 2006, the State Board issued the Statewide General Waste Discharge Requirements for Sanitary Sewer Systems, Water Quality Order No. 2006-0003-DWQ (SSO Order) to address proper management and operation of sewer collection systems and to control sanitary sewer overflows. It requires dischargers/enrollees to develop and implement a written Sewer System Management Plan (SSMP) approved by the discharger's governing board and

[10] Table 2: Land uses, Generating Sites and Activities that Produce Indirect Discharges from IDDE, A Guidance Manual for Program Development and Technical Assessments, October 2004 CWP.

report sewer spills through an on-line reporting system. This Order requires the Permittees have reviewed the unified sewage spill response plan developed during the third term MS4 Permit with the local sewering agencies and determined that it is consistent with the requirements of the SSO Order. This Order also requires each Permittee to include in its LIP the interagency or interdepartmental sewer spill response coordination and responsibilities.

The MS4 program audits indicated that a majority of the Permittees with septic systems have inadequate information with regard to the number and location of those systems within their jurisdiction. This Order requires the Permittees with septic systems to develop within 2 years of adoption of this Order, an inventory of septic systems within its jurisdiction and establish a program to ensure that failure rates are minimized.

H. CO-PERMITTEE INSPECTION PROGRAM;

Federal regulations, 40 CFR 122.26(d)(2)(iv)(A-D), require the Permittees to inventory, prioritize and inspect Industrial and Commercial Facilities and Construction Sites. This Order requires the Co-Permittees to continue inspections of Industrial and Commercial Facilities and Construction Sites within their jurisdiction in order to control the Pollutants entering the MS4. The Co-Permittees will continue to maintain the inventory of Industrial and Commercial Facilities and Construction Sites in the above categories, prioritize these facilities based on threat to water quality, and perform regular inspections to insure compliance with local ordinances. While initial observations of non-compliance may result in 'educational' type enforcement, repeated non-compliance will result in more disciplinary forms of enforcement, such as monetary penalties, stop work orders or permit revocation.

An evaluation of Permittee inspection programs during the third term MS4 permit indicated certain deficiencies in the Industrial and Commercial Facility and Construction Site inspection programs of some of the Permittees. In many instances, program documentation of progressive enforcement and facilities' return to compliance were not properly documented. This Order requires Permittees to document inspections and enforcement and evaluate the effectiveness of their inspection and enforcement program by tracking the time for facilities or sites to return to compliance. The Permittees who do not have an internet accessible database are required to initiate quarterly reporting and update of the inventory, inspection and enforcement database for facilities within their jurisdiction.

In order to address discharges to the MS4 from residential sources, the fourth term MS4 Permit requires the Permittees to develop and implement a residential program to prevent residential discharges from causing or contributing to a violation of Water Quality Standards in the Receiving Waters (40 CFR 122.26(d)(2)(iv)(A)).

I. NEW DEVELOPMENT (INCLUDING SIGNIFICANT REDEVELOPMENT)

Federal regulation, 40 CFR 122.26(d)(2)(iv)(A)(2), requires the Permittees to develop a comprehensive master plan to address discharges from New Development and Significant Redevelopment projects. During the third term MS4 Permit, the Permittees revised their New Development guidelines to address water quality and Hydromodification impacts resulting from urbanization. A WQMP for Urban Runoff was approved by the Regional Board in 2004 and became effective in 2005. This Order requires the Permittees to continue to work towards the goal of restoring and preserving the natural hydrologic cycles in proposed urban developments by reviewing and approving project-specific WQMPs to address post-construction impacts. The WQMP should be designed to address water quality impacts, including Hydrologic Conditions of Concern (HCOC), from New Development and Significant Redevelopment projects through: (1) Site Design BMPs, including LID techniques; (2) Source Control BMPs; and (3) Treatment Control BMPs. This Order recognizes the importance of LID techniques to minimize the impact of urbanization on water quality. This Order requires the project proponents to infiltrate, harvest and reuse, evapotranspirate, or bio-treat the volume of runoff from a 24-hour, 85th percentile storm event where feasible. The Order also provides alternatives and in-lieu programs for project sites where infiltration, harvesting and re-use, evapotranspiration and bio-treatment are not feasible.

Program evaluations conducted during the third term MS4 Permit indicated a need for establishing a clear nexus between the watershed protection principles (including LID) and the planning and approval processes of the Permittees. This Order requires the Permittees to review and revise their Development Standards, Zoning Codes, Conditions of Approval, Development Project Guidance, ordinances, and other related documents to identify and eliminate barriers to incorporate watershed protection principles.

The SMC, including project lead agency, the San Bernardino County Flood Control District, in collaboration with SMC member, SCCWRP and the California Storm Water Quality Association (CASQA), is developing a LID Manual for Southern California with funding from the State Board, CASQA and other sources. This manual will be incorporated into the CASQA BMP Handbooks. The Permittees are encouraged to utilize the manual as a resource for proper LID design and implementation techniques.

Program evaluations have also suggested a need for improvement in the Permittees' inspection, and tracking of post-construction BMPs. This Order requires the Permittees to revise their close-out procedures to include field

verification that Site Design, Source Control and Treatment Control BMPs are operational and consistent with the approved WQMP.

This Order incorporates new project categories and revised thresholds for several categories of New Development and Significant Redevelopment projects that trigger the requirement for a WQMP. New project categories include streets, roads and highways of 5,000 square feet or more of paved surface and retail gasoline outlets (RGOs) with 5,000 square feet or more with 100 or more average daily vehicle traffic. The threshold criteria that trigger the WQMP requirement for non-residential commercial/industrial construction projects have been reduced from 100,000 square feet to 10,000 square feet or more of impervious surface. The threshold for residential subdivision projects has also been revised from 10 units or more to a threshold of 10,000 square feet or more of impervious surface.

This Order incorporates new project categories and revised thresholds for several categories of New Development and Significant Redevelopment projects that trigger the requirement for a WQMP. The 2008 National Research Council (NRC) report[11] indicates that roads and parking lots constitute as much as 70% of total impervious cover in ultra-urban landscape, and as much as 80% of the directly connected impervious cover. Roads tend to capture and export more storm water Pollutants than other impervious covers. As such, roads are included as a priority development category for which WQMPs are required. The NRC report also indicates that there is a direct relationship between impervious cover and the biological condition of downstream receiving waters. The Permittees are required to address HCOC from New Development and Significant Redevelopment projects to minimize downstream impacts. Private New Development and Significant Redevelopment projects incorporating roads typically allow road runoff to be addressed as part of the overall water quality strategy for the larger common plans of development. Permittee streets, roads and highways capital projects have special limitations. For example, the footprint of street, road and highway capital projects is often limited and may have hydraulic constraints due to lack of underground storm drain systems that would otherwise be necessary to hydraulically facilitate treatment of runoff. There are also limitations specified in state and federal design and code specifications that may limit or prohibit BMPs. Permittees may also be subject to flow diversion liability and limited road maintenance budgets and equipment. Street, road and highway projects that function as part of the MS4 also receive runoff and associated Pollutants from both existing urban areas and other external sources, including adjacent land use activities, aerial deposition, brake pad and tire wear and other sources that may be outside the Co-Permittee's authority to regulate and/or economic or technological ability to control. These offsite flows can overwhelm Treatment Control BMPs designed to address the footprint (consistent with the typical requirements for a WQMP) of street, road or highway capital projects incorporating curb and gutter as part of its stormwater conveyance function. Despite these limitations, the Regional

[11] National Research Council Report (2008), http://www.nap.edu/catalog.php?record_id=12465

Board finds that Permittee construction of streets, roads and highway capital projects may provide an opportunity to address Pollutant loads from existing urban areas. However, due to the nature of the facilities and projects, it would be unduly burdensome for the Co-Permittees to maintain WQMP documents for transportation projects (in addition to Facility Pollution Prevention Plans and other overlapping requirements of this Order). The Permittees are therefore not required to prepare WQMP documents for street, road and highway capital projects, but instead are required to develop equivalent documents that include site specific consideration utilizing BMP guidance to address street, roads and highway capital project runoff to the MEP.

As public works, streets, roads and highway projects are the only facilities typically captured by the new WQMP category, and these projects typically have unique constraints that make them difficult to address through the WQMP process, a separate set of requirements has been established for addressing this category of development. Roads that are typically constructed as part of a development are typically incorporated into the broader WQMP for the development activity, providing more options for mitigation via the WQMP process.

Consistent with a long term holistic approach to address water quality and Hydromodification impacts resulting from urbanization, this Order requires Permittees to continue to develop tools that facilitate integration, to the extent practicable, of water quality, stream protection, storm water management and re-use strategies with land use planning policies, ordinances, and plans within each jurisdiction. These tools should address cumulative impacts of development on vulnerable streams, preserve or restore, consistent with the MEP standard, the structure and function of streams, and protect surface and groundwater quality. For 303(d) listed waterbodies with Urban Runoff Pollutant sources and without a TMDL, the Permittees are required to provide special protections such as requiring more effective post-construction BMPs focus training programs and develop targeted public outreach that would address the urban source of the Pollutant of Concern. The Permittees are also required to participate in the TMDL development and implementation.

J. PUBLIC EDUCATION AND OUTREACH;

Federal regulation, 40 CFR 122.26(d)(iv), requires the Permittees to develop a comprehensive storm water management plan with public participation and 40 CFR 122.26(d)(iv)(B)(6) requires the Permittees to engage in outreach activities to facilitate the proper management of Pollutants. Public outreach is an important element of the overall urban Pollution Prevention program. The Permittees have committed to implement a strategic and comprehensive public education program to maintain the integrity of the Receiving Waters and their ability to sustain Beneficial Uses. The Principal Permittee has taken the lead role in the outreach programs and has targeted various groups including businesses, industry, development, utilities, environmental groups, institutions, homeowners, school

children, and the general public. The Permittees have developed a number of educational materials, have established a storm water Pollution Prevention hotline, started an advertising and educational campaign, and distributed public education materials at a number of public events. The Permittees are required to continue these efforts and to expand public participation and education programs.

The Permittees have already developed BMP fact sheets to address sources from residential activities such as auto washing and maintenance activities; use and disposal of pesticides, herbicides, fertilizers and household cleaners; and collection and disposal of pet wastes.

This Order requires the Permittees to annually review their public education and outreach efforts and revise their activities, if necessary, to address public outreach needs fed back from other Urban Runoff program elements. Federal regulation, 40 CFR 122.26(d)(v), requires the Permittees to conduct a program assessment to determine the reduction in Pollutant loadings due to Urban Runoff management programs. Each Permittee is required to implement an assessment program, guided by the CASQA Guidance manual or equivalent alternative, to measure the change in behavior of its target communities to reduce discharge of Pollutants to the MS4 and the environment.

K. PERMITTEE FACILITIES AND ACTIVITIES;

Federal regulation, 40 CFR 122.26(d)(iv)(A), requires the Permittees to ensure that their activities and facilities do not cause or contribute to violations of Water Quality Standards in receiving waters. Education of Permittee planning, inspection, and maintenance staff is critical to ensure that Permittee facilities and activities do not cause or contribute to an exceedance of Receiving Water Quality Standards. The 2002 MS4 Permit also specified minimum requirements for street sweeping and inspection and maintenance of drainage facilities. The Permittees were also required to develop and distribute BMP fact sheets for various Permittee activities. Permittee as well as contract staff that perform Permittee activities were required to be properly trained. The second and third term MS4 Permits required the Permittees to prepare a Municipal Facilities Strategy (MFS) to ensure that Permittee facilities and activities do not contribute Pollutants to Receiving Waters. The MFS was incorporated into Section 5 of the DAMP during the third term MS4 Permit. Each year, by August 1st, the Permittees are required to review their activities and facilities to determine the need for revisions to Section 5 of the DAMP.

This Order continues and builds upon the requirement of the third term MS4 Permit by requiring Permittees to include structural post-construction BMP information for certain Permittee projects along with the Notice of Termination submitted to the Executive Officer upon completion of the construction activity. The Notice of Termination must include photographs of the completed project, a location map, and for public works projects subject to a WQMP, structural post-

construction BMP location, field verification report and identify long term operation and maintenance responsibility. Permittees are required to develop a database of post-construction BMPs for which the Permittees are responsible and shall reference this database in the LIP.

Program evaluations conducted during the third term MS4 Permit indicated varying degrees of compliance at Permittee facilities and activities. This Order requires each Permittee to inventory its fixed facilities, field operations and MS4 facilities to ensure that Permittee facilities do not cause or contribute to a Pollution or Nuisance in Receiving Waters. These facilities and field operations are to be prioritized for inspection according to threat to water quality.

Fixed Permittee facilities and field operations include, but are not limited to fire training facilities, corporate yards, maintenance and storage yards, animal shelters, water treatment facilities, swimming pools, warehouses, and hazardous materials storage facilities, and recreation facilities. The Permittees are required to include in their LIP procedures and schedules for inspections and maintenance of Permittee facilities and activities. Urban Runoff from other Permittee facilities, such as airports, wastewater treatment plants and landfills, is regulated under the General Industrial Permit.

L. PERMITTEE CONSTRUCTION PROJECTS

The third term MS4 Permit authorized the discharge of storm water from Construction Sites on one acre or more that are under ownership or direct responsibility of the Permittees. The Permittees were required to notify the Executive Officer prior to commencement of construction activities, and to comply with the substantive requirements of the latest Statewide General Construction Activities Storm Water Permit.

Program evaluations conducted during the third term MS4 Permit indicated that some of the Permittees were not submitting or were not aware of the requirement to submit a Notice of Intent and a Notice of Completion for Permittee construction projects.

M. TRAINING PROGRAM FOR STORM WATER MANAGERS, PLANNERS, INSPECTORS AND MUNICIPAL CONTRACTORS

Education of Permittee planning, inspection, and maintenance staff is important to ensure that land use decisions, local permit approvals and Permittee facilities and activities do not cause or contribute to an exceedance of Receiving Water Quality Standards. During the term of the 2002 MS4 Permit, the Permittees attended training classes specific to major Urban Runoff program elements including New Development/Significant Redevelopment, Construction Site and Industrial Facility inspections, and Permittee activities.

This Order requires the Permittees, in conjunction with a broader array of MS4 Programs or CASQA, to define the program implementation training needs for Urban Runoff program staff, including contractors, managers and inspectors. The training curriculum must be designed for Permittee facilities and field operations staff, Permittee inspection staff, Urban Runoff program managers and those involved in the review and approval of WQMPs and CEQA documents, including Permittee contractors. The audits of the Permittees indicated the need for better inter-departmental collaboration and communication in the local Urban Runoff program implementation. This Order requires LIPs to develop and document processes and procedures for coordination between planners, plan reviewers, engineers and inspectors to ensure that appropriate post-construction BMPs are approved, installed, and are operational.

N. NOTIFICATION REQUIREMENTS

Most of the notification requirements that were spread throughout the third term MS4 Permit were consolidated into one section.

O. PROGRAM MANAGEMENT ASSESSMENT/DAMP REVIEW

The DAMP is a management document that needs to be updated with the new requirements of this Order.

P. FISCAL RESOURCES

Each Permittee is expected to exercise its full authority to secure the resources necessary to meet all requirements of this Order. See Section IX for existing funding mechanisms and potential limitations to Permittee funding.

Q. MONITORING AND REPORTING REQUIREMENTS

During the first term MS4 Permit and part of the second term MS4 Permit, the Permittees conducted monitoring of the Urban Runoff flows, Receiving Water quality, and sediment quality. The Santa Ana Phase I NPDES Monitoring Program began in November 1991 with 27 monitoring sites. The program has been reduced in phases to more specifically address Urban Runoff program needs and to redirect monitoring resources to TMDL-related activities. There was a time where samples were collected on a rotational basis with no consistent monitoring from year to year. On April 14, 2003, with the submittal of an Interim Monitoring Program, monitoring at seven core sampling locations (Sampling Stations 040, 316, 318, 364, 702, 707, and 752) was established that provided representative and consistent monitoring results for the Permit Area.

The Riverside County monitoring programs, as well as other monitoring programs nationwide, have shown that there is a high degree of uncertainty in

the quality of Urban Runoff and that there are significant variations in the quality of Urban Runoff spatially and temporally. However, most of the monitoring programs to date have indicated that there are a number of Pollutants in Urban Runoff. A link between Pollutants in Urban Runoff and Beneficial Use Impairments has been established in a few studies.

This Order requires the Permittees identified as TMDL stakeholders in an approved TMDL to continue to comply with applicable TMDL Implementation Plan requirements, including monitoring requirements, and to implement Urban TMDL WLAs through an iterative BMP approach (see Section V.C above).

Wet and Dry Seasons are defined differently by the various monitoring programs included in this Order. The Middle Santa Ana TMDL defines the Wet Season as November 1 through March 31st and the Canyon Lake/Lake Elsinore TMDL monitoring defines it as October 1st through May 31st. The Monitoring and Reporting Program for this Order generally defines the Wet Season as October 1st through May 31st. Monitoring required under this Order is expected to be conducted consistent with the applicable seasonal definitions.

The MSAR Bacterial Indicator TMDL and Canyon Lake/Lake Elsinore Nutrient TMDL requires the Permittees to comply with TMDL Implementation Plan requirements to revise the DAMP to incorporate BMPs in the Permittees Urban Runoff programs. This Order requires the Permittees to evaluate the effectiveness of the BMPs implemented as part of the DAMP in conformance with the TMDL Implementation Plan requirements.

This MS4 monitoring program includes sampling Urban Runoff at a variety of sites located throughout the Permit Area for three storm events per year. Urban Runoff samples will be collected and analyzed for a variety of constituents. In addition to these efforts, the Permittees are reevaluating their overall Urban Runoff monitoring program to determine its effectiveness in meeting the following objectives:

1. Assess rates of mass loading
2. Assess influence of land use on water quality
3. Assess compliance with Water Quality Objectives
4. Assess effectiveness of water quality controls
5. Detect IC/IDs
6. Identify problem areas and/or trends
7. Identify Pollutants of Concern
8. Identify baseline conditions
9. Establish/maintain a water quality database

To accomplish these goals, the following activities are conducted:

1. Collect water quality data
2. Collect rainfall/runoff data
3. Establish quality assurance/control procedures
4. Conduct data analysis and archiving
5. Install and maintain appropriate equipment
6. Prepare an Annual Report

RCFC&WCD, in its role as Principal Permittee, participates in the SMC and other task forces. The goal of the SMC is to develop the technical information necessary to better understand storm water mechanisms and impacts, and then develop the tools that will effectively and efficiently improve storm water decision-making. Some of the cooperative monitoring efforts conducted through the SMC and other task forces include Comparative Evaluation of Microbial Source Tracking Techniques, Model Monitoring Program Guidance, Peak Flow Study, and Laboratory Inter-Calibration Studies. Under the auspices of the SMC, SCCWRP prepared "Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California", August 2004 Technical Report No. 419. This report noted, "...the lack of mass emissions stations in the inland counties hampers their ability to estimate the proportional contribution of these inland areas to cumulative loads downstream". The SMC consists of representatives from the Counties of Ventura, Los Angeles, Orange, San Bernardino, Riverside, and San Diego and the Cities of Long Beach, and Los Angeles, the Los Angeles, Santa Ana and San Diego Regional Boards, the State Board, SCCWRP, Caltrans, and the USEPA. This Order requires the Permittees to continue mass emissions monitoring to determine Pollutant loading.

During the second and third term MS4 Permits, there was an increased focus on watershed management initiatives and coordination among the MS4 permittees in Orange, Riverside and San Bernardino Counties. The MS4 permittees participated in a number of regional monitoring programs and other coordinated program and policy developments, such as the Regional Integrated Freshwater Bioassessment Monitoring Program, and the BMP Effectiveness Assessment. The Principal Permittee continues to be an active participant in the SWQSTF, MSAR Bacterial Indicator TMDL, Canyon Lake/Lake Elsinore (San Jacinto) Nutrient TMDL and the SMC. This Order recommends that the Permittees continue their participation in these types of watershed coordination efforts and provides them with opportunities to use these efforts to comply with applicable requirements of the Permit.

The third term MS4 Permit required the Permittees to initiate bioassessment monitoring. To allow for a holistic approach, this Order requires the Permittees to participate in the Regional Integrated Freshwater Bioassessment Monitoring

Program in lieu of a separate bioassessment monitoring program for the Permit Area.

This Order requires the Permittees to re-evaluate their CMP and submit a revised plan for approval. The revised CMP should integrate the goals and objectives of the Watershed Action Plan and rectify data gaps from previous monitoring efforts.

R. PROVISIONS – Standard Language per NPDES regulations.

S. PERMIT MODIFICATION– Standard Language per NPDES regulations.

T. PERMIT EXPIRATION AND RENEWAL– Standard Language per NPDES regulations.

IX. WATER QUALITY BENEFITS, COST ANALYSIS, AND FISCAL ANALYSIS

There are direct and indirect benefits from clean lakes and beaches, clean water, and a clean environment. It is difficult to assign a dollar value to the benefits the public derives from fishable and swimmable waters. In 1972, at the start of the NPDES program, only 1/3 of the U.S. waters were swimmable and fishable. In 2008, more than 2/3 of the U.S. waters met these criteria. In the 1999 "*Money"* magazine survey of the "Best Places to Live", clean water and air ranked as two of the most important factors in choosing a place to live. Thus environmental quality has a definite link to property values.

The true magnitude of the Urban Runoff problem is still elusive and any cost estimate for cleaning up Urban Runoff would be premature short of end-of-pipe treatments. For Urban Runoff, end-of-pipe treatments are cost prohibitive and are not generally considered as a technologically feasible option. Over the last decade, the Permittees have attempted to define the problem and implemented BMPs to the MEP to combat the problem.

The costs incurred by the Permittees in implementing these programs and policies can be divided into three broad categories:

A. Shared costs: These are costs that fund activities performed mostly by the Principal Permittee under the Implementation Agreement. These activities include overall storm water program coordination; intergovernmental agreements; representation at the SWQSTF, Regional Board/State Board meetings and other public forums; preparation and submittal of compliance reports and other reports required under the NPDES permits, responding to Water Code Section 13267 requests, budget and other program documentation; coordination of consultant studies, Co-Permittee meetings, and training seminars.

B. Individual Costs for DAMP Implementation: These are costs incurred by each Permittee for implementing the BMPs (drainage facility inspections for Illicit Connections, drain inlet/catch basin stenciling, public education, etc.) included in the DAMP. A number of programs and policies for Non-Point and Urban Runoff Pollution controls existed prior to the MS4 permit program. However, the DAMP that was developed and implemented in response to the MS4 Permits required additional programs and policies for Urban Runoff Pollution control.

C. Individual Costs of Pre-Existing Programs: These are costs incurred by each Permittee for water Pollution control measures which were already in existence prior to the MS4 permit program. These programs included recycling, litter control, street sweeping, drainage facility maintenance, and emergency spill response.

Historically, the Permittees have employed four distinct funding methods to finance their NPDES Activities. Many Permittees utilize a combination of these funding sources. The different methods include:

A. Santa Ana Watershed Benefit Assessment Area

In 1991, the RCFC&WCD established the Santa Ana Watershed Benefit Assessment Area (SAWBAA) to fund its NPDES activities. Currently, SAWBAA revenues fund both area-wide NPDES program activities and the RCFC&WCD's individual MS4 permit compliance activities.

B. County Service Area 152

In December 1991, the County of Riverside formed County Service Area 152 (CSA 152) to provide funding for compliance activities associated with its NPDES permit activities. Under the laws that govern CSAs, sub-areas may be established within the overall CSA area with different assessment rates set within each sub-area. The cities of Corona, Moreno Valley, Norco, Riverside, Lake Elsinore and San Jacinto elected to participate in CSA 152.

C. Utility Charge

The City of Hemet funds a portion of its NPDES program activities through a utility charge.

D. General Fund /Other Revenues

Permittees also utilize general fund revenue to finance their NPDES activities. Several Permittees also report using general fund and other revenue sources (e.g., gas taxes, developer fees, etc.) to fund a portion of their Urban Runoff management activities.

The Annual Report provides the most recent budgets and expenditure projections available for the costs incurred by the Permittees in implementing these programs and policies. The following information, in parenthesis, on the current economic conditions was provided by the Permittees.

{Current Economic Conditions
The following information was provided by the Permittees and does not constitute a finding by the Regional Board:

Historically, the Permittees have employed several funding methods to finance their MS4 Permit compliance activities. Unfortunately, the mortgage crisis, collapse of the housing market and the economic recession has resulted in the cessation of virtually all development activity and has significantly reduced sales tax revenue in the Santa Ana Region. Property tax revenues have been reduced by the high level of foreclosure activity and reduced property values. Property tax revenues have been further reduced by homeowner requests for reassessments to reflect the reduced property values. The impact of these economic conditions on the Permittees in the Santa Ana Region has been particularly severe. As a result, funds typically provided by these funding methods has been severely reduced, and it is anticipated that this condition will continue for an indefinite period. The funding methods historically used and the effects of the economic situation on the availability of funds through these sources are summarized as follows:

- Santa Ana Watershed Benefit Assessment Area. In 1991, the District established the Santa Ana Watershed Benefit Assessment Area to fund its MS4 Permit compliance activities. Currently, the Benefit Assessment revenues fund the District's share of the area-wide MS4 Permit program activities and the District's individual compliance activities as a Permittee. Under the Benefit Assessment each parcel is taxed based on the impervious area of each parcel at a set rate established through Proposition 218. This rate has not been increased since 1991 and increases in revenues have resulted from increases in the number of contributing parcels resulting from New Development. In 2007/08 the Santa Ana Watershed Benefit Assessment generated approximately $2,030,000 in revenue. These revenues are used to fund the District's compliance activities and the bulk of the administrative costs associated with the District's duties as Principal Permittee.

  Outlook: The District expects at best to maintain, if not see temporary reductions in Benefit Assessment revenues due to the significant number of homes that are not paying property tax due to foreclosure. An increase in the established Benefit Assessment rate to compensate for these reductions would require approval of 2/3 of the voters or 50% of the property owners and is unlikely, especially in the current economic climate. An increase in the number of contributing parcels will not occur until the development industry recovers.

- General Fund/Other Revenues. The County and the Cities utilize general fund revenue to finance most of their MS4 Permit compliance activities. General fund revenue is generated by property tax, sales tax, and auto license taxes.

  Outlook: The Permittees expect a continued reduction in the funds available through General Fund/Other Revenues through at least FY 2010/2011. Historically, the Permittees have investigated other funding sources, including a phone survey conducted by LESJWA with support from the District and the County of Riverside to evaluate the possibility of passing a new assessment to fund water quality improvements benefiting Lake Elsinore. The results of the survey found insufficient voter support for water quality-related issues to move forward with a special election. The Permittees have also formed a finance committee which has met several times to obtain information about actions that they can take to maximize revenues and potential alternative funding sources. These efforts met with some success, particularly in relation to maximizing fees for service; however significant new funding sources were not identified or available to the Permittees even during the more favorable economic conditions experienced during the term of the 2002 Riverside County MS4 Permit.

- Fees. Several Permittees charge fees for services such as inspections, plan check and other recoverable costs related to compliance with the 2002 Riverside County MS4 Permit. These fees cover both the direct and indirect costs associated with conducting these inspections/reviews including associated compliance tracking and reporting.

  Outlook: It is notable that, with the virtual collapse of the development industry in the Santa Ana Region, the fees received by the Permittees for review of New Developments and Construction Site inspections have been significantly reduced. With this reduced level of fee-based income, maintenance of the existing inspection and plan review programs will place a burden on overall funding of the compliance programs. The Permittees do not expect revenues from fees to recover until the development industry recovers. Even with recovery of the development industry, it is anticipated that revenues from fees will be reduced for the majority of the Cities within the Santa Ana Region and the County due to the reduced area remaining for development in their jurisdictions.

- Grants. The Permittees have actively pursued and, as available, used grants to fund compliance programs.

  Outlook: In December the State's budget crisis resulted in a directive to State agencies from the Department of Finance to halt projects that rely on bond funds, including those funded by Proposition 40, Proposition 50 or Proposition 84. The State of California is the primary source of grant funding for water

quality projects. Future availability of funds to resume compliance projects funded by grants is uncertain.

It is clear that the current economic climate and that of the foreseeable future is creating a significant burden upon the Permittees that will make the continuance of all existing MS4 Permit compliance programs difficult. If new funding sources or alternative combinations of funding sources cannot be identified, it is likely that compliance program funding will be further impacted.

Economic Projections

According to Chicago Title, Southwest Riverside County has experienced a very significant increase in supply of single-family residential units on the market. As a result, housing price indicators are very negative. In the majority of the Southwest Riverside submarket, the pending price is less than closing price that suggests the weakness of the market. The October 2008 count of bank owned (REO) properties for Riverside County as a whole was 12,078. The number of foreclosures was 23,480. The presence of high levels of REO properties will continue to negatively affect the price line. In addition, the level of foreclosures is increasing. At the end of January 2009, 68% of the homes listed for sale are foreclosures or short sales[12].

With regard to other sectors of the economy, Riverside County has taken a serious turn for the worse in 2008, with projections indicating that the severe downturn will continue through 2009 at the very least. The economic difficulties being faced in the Southwest Riverside submarket is the result of the dramatic downturn in the housing market in this area, the national financial turmoil, the worldwide credit crisis, and the increasing consumer debt crisis. According to Beacon Economics, a respected economics consulting firm in Los Angeles, Inland Southern California is clearly at the epicenter of this economic turmoil, with extremely high rates of unemployment at present. Unemployment rates in Inland Southern California are expected to reach 12.4% (Riverside County beat that – unemployment was 14.6% in November 2009 – California Employment Development Department) before this deep recession is over. Housing prices are expected to continue their precipitous decline from their peak levels in the two Inland Southern California counties through at least 2011. According to Dataquick, median home prices in Riverside County peaked at $415,000 in January 2007. At the end of this cycle, the median home price in Riverside County is expected to be $198,000. Figure 1 depicts the median housing price in Riverside County over the period 1990 to August 2008.

[12] Orange County Register, January 27, 2009, p. 11.

Figure 1. Riverside County Median Housing Price (1990 – August 2008)

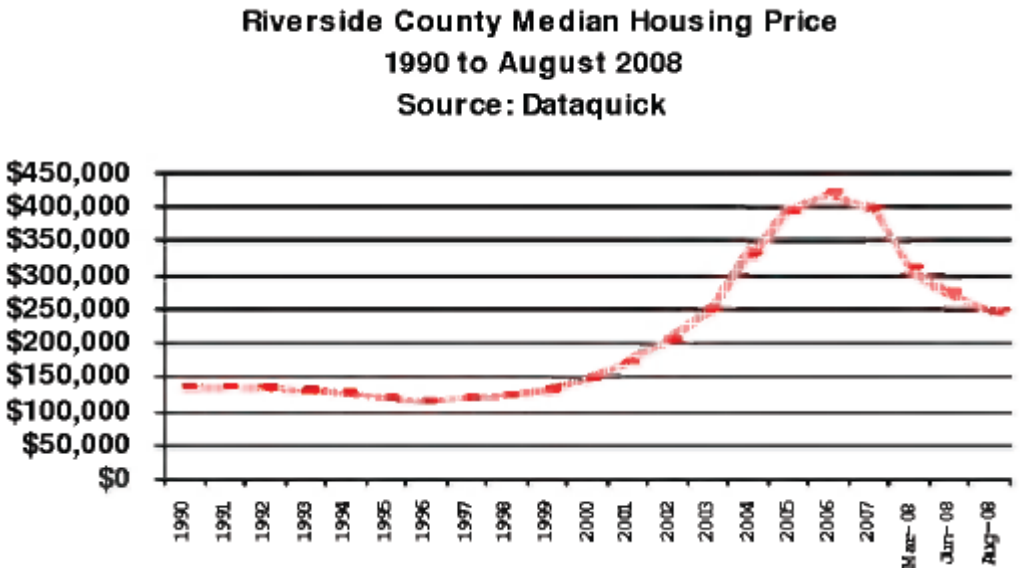

Source: Riverside County Center for Demographic Research. 2008. Riverside County Progress Report, pg 14.

Local Government sales tax revenues remained fairly stagnant through 2006 and began to decline in early 2007, according to Beacon. By the second quarter of 2008, the taxable sales in Riverside County declined by 7.7%. This will continue with taxable sales possibly bottoming out by 2010. These shocks are expected to continue and accelerate within the southwest Riverside County economy.

As a direct outcome of the current economy and the economic outlook into the term of the 2009 Riverside County MS4 Permit, the number of New Development proposals has plummeted and any significant rebound is not forecast. New and redevelopment projects will likely remain minimal. As shown in Figure 2, the number of housing units being added each year has dropped below the levels seen at any point in time during the 2002 Riverside County MS4 Permit. These numbers will likely continue to decrease for a significant portion of the new 2010 Riverside County MS4 Permit term.

Figure 2. Riverside County Housing Units Added (1990 – 2008)

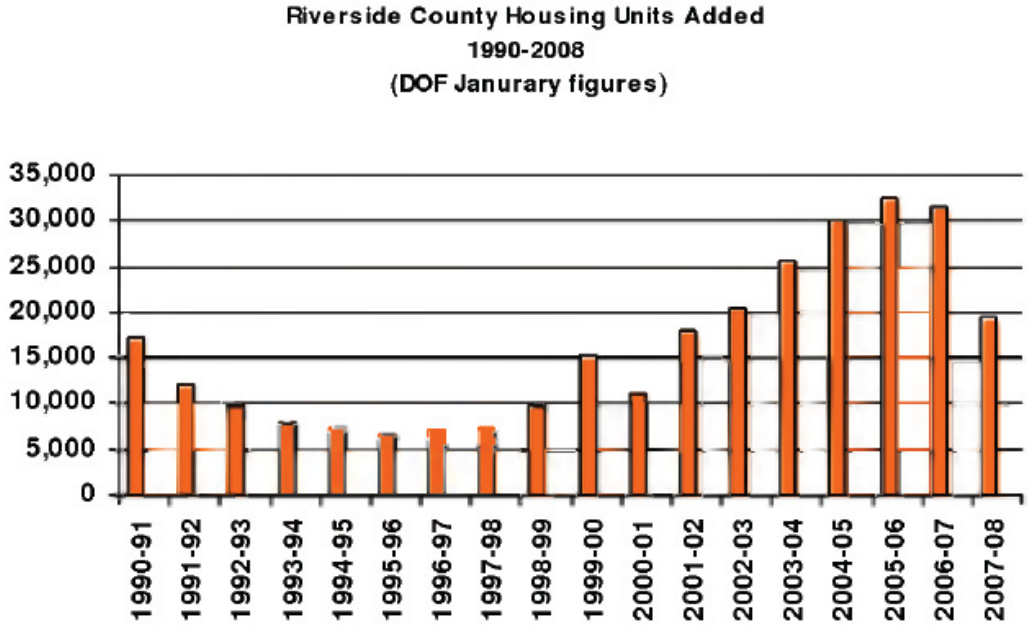

Source: Riverside County Center for Demographic Research. 2008. Riverside County Progress Report, pg 12.

These economic issues and projections directly affect and limit both:

- The need for including enhanced New Development and Significant Redevelopment requirements in the 2010 Riverside County MS4 Permit, and

- The Permittees ability to fund, and even seek new funding sources for additional MS4 Permit requirements for New Development and Significant Redevelopment projects.

Permittee specific projections are as follows:

County of Riverside

The County is operating with a structural deficit of $12 million and plans a 25% budget reduction from FY 2008/2009 through FY 2011/2012. The County's current budget of $4.7 billion represents a 5% reduction from the previous year and next year's budget is expected to be cut by 10%. These cuts are directly associated with the decline in property values caused by the high number of foreclosures. There are concerns about having to use discretionary funds to meet State mental health and social service mandates. In addition, the County is dependent on funds from Federal and State sources. If during this time of economic crisis Federal and State funding sources are reduced or eliminated, any unfunded programs will be terminated. Only core County programs will continue.

The primary source of general fund revenue is from property taxes and sales tax. With the unprecedented number of foreclosures, reduced property values, and declining sales, general fund revenue is in a downward spiral. Another source of funding is through the Solid Waste Tipping Fees paid at the County landfills. Volume is down 15% since 2006 with anticipated downward trend to 40% reduction in solid waste through 2014. Programs that are partially funded through tipping fee allotments will be impacted. Due to the declining economy the recycling market has collapsed. Virtually no recyclable materials are being shipped for reprocessing. This loss of revenue and increased disposal costs is further impacting the general fund.

Cuts of 25% for all Net County Cost general fund programs will translate into reduction of County services and elimination of unfunded State and Federal programs. Only core value programs will be provided (including public safety and fee programs).

The County has instituted a hiring freeze and required each department to create a report outlining the projected effects of the budget cuts. The County currently employs over 20,000 people, and layoffs are expected to result from the findings of these departmental reports. It is anticipated that this will impact program delivery for stormwater related activities. No County department will be able to sustain current staffing levels as they try to meet the 25% budget reduction strategy.[13] [14]

City of Menifee

The newly incorporated City of Menifee FY 2008/2009 initial budget was estimated from their comprehensive fiscal analysis that was submitted to the Local Agency Formation Commission during the incorporation process. Because of the economic uncertainty, and the fact that the City is only now beginning to staff positions, it is unknown what the immediate impact of the fiscal crisis will be. The County is responsible for assisting the City in meeting its MS4 Permit compliance requirements during the first year of incorporation which expires October 1, 2009. Currently, the level of property tax revenue that will be available to the City is uncertain. Funding for MS4 Permit compliance requirements was not explicitly budgeted. A financial hardship currently exists because of the costs associated with incorporation.

City of Murrieta

The City of Murrieta's FY 2008/2009 budget did not increase compared to FY 2007/2008. The City has identified a $3.3 million budget shortfall for the current fiscal year ending on June 30, 2009. This represents approximately 8.2% of the City's projected revenue which must be absorbed in five months.

[13] "The Realities of Recession in California: A Statewide Report by U.S. Senator Barbara Boxer, December, 2008, p. 18.
[14] Riverside County Executive Office, January, 2008.

The shortfalls are primarily due to reduced sales tax and property tax revenues. Department heads are currently working on revised budgets to adjust for the loss in revenue.

Additional, budget cuts are anticipated for FY 2009/2010 because the immediate economic outlook is not good. There have been approximately 2,000 home foreclosures within the City. Sales tax revenue is estimated to drop 12.5%, property tax revenue will drop, and the State took approximately $525,000 out of redevelopment funds. Murrieta did not receive any vehicle licensing fees from the State and it appears likely that the State will take more revenue from the cities to solve its budget problems. New NPDES requirements that increase compliance costs will create a financial hardship for the City.

City of Riverside

The City of Riverside has seen declining general fund revenue over the last two fiscal years in virtually all categories. The City's most recent projection indicates that total general fund revenues for the current fiscal year will be under $200 million, down from a budget of $215 million as adopted, and $226.5 million in the prior fiscal year. This represents a decline over two fiscal years of approximately 12%. Specifically, property tax and sales tax revenue continue their decline, which is primarily attributable to decreased residential construction activity and in the case of sales tax declining automobile sales.

The decline in revenue has resulted in a corresponding reduction to general fund expenditures. Specifically, approximately 12% of the positions authorized for the general fund have been vacated and unfunded, either through transferring staff to other funds, attrition or limited layoffs of temporary and contract staff. Additionally, the level of service provided to the community in virtually all City departments has been reduced through funding reductions to items such as street maintenance, recreation programs and libraries, though great care has been taken to minimize the impact of cuts to the public. It is anticipated that in the near term the economic situation will not improve, and staff is preparing a budget for the upcoming fiscal year that anticipates further decreases in revenue.

City of Wildomar

The newly incorporated City of Wildomar FY 2008/2009 initial budget was estimated from their comprehensive fiscal analysis that was submitted to the Local Agency Formation Commission during the incorporation process. Because of the economic uncertainty, and the fact that the City is only now beginning to staff positions, it is unknown what the immediate impact of the fiscal crisis will be. The County is responsible for assisting the City in meeting its MS4 Permit compliance requirements the first year of incorporation that expires July 1, 2009. Currently, the level of property tax revenue that will be

available to the City is uncertain. Funding for MS4 Permit compliance requirements was not explicitly budgeted. A financial hardship currently exists because of the costs associated with incorporation.}

X. ANTIDEGRADATION ANALYSIS

The Regional Board has considered whether a complete antidegradation analysis, pursuant to 40 CFR 131.12 and State Board Resolution No. 68-16, is required for these Urban Runoff discharges. The Regional Board finds that the Pollutant loading rates to the Receiving Waters will be reduced with the implementation of the requirements in this Order. As a result, the quality of Urban Runoff discharges and Receiving Waters will be improved, thereby improving protection for the Beneficial Uses of Waters of the U.S.. Since this Order will not result in a lowering of water quality, a complete antidegradation analysis is not necessary, consistent with the federal and state antidegradation requirements.

XI. ANTI-BACKSLIDING

Sections 402(o)(2) and 303(d)(4) of the CWA and federal regulations at 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require Effluent Limitations in a reissued NPDES permit to be as stringent as those in the previous permit, with some exceptions where Effluent Limitations may be relaxed. All Effluent Limitations in this Order are at least as stringent as the Effluent Limitations in the 2002 Order.

XII. PUBLIC WORKSHOP AND PUBLIC HEARING

Regional Board conducted a public workshop regarding the proposed Order on August 3, 2009 at the City of Loma Linda, Council Chambers, 25541 Barton Road, Loma Linda, CA. Based on the comments received, a second draft was released for public review and comments on October 22, 2009. The third draft, issued on December 15, 2009, will be considered for adoption at a public hearing as follows:

Date and time: January 29, 2010; meeting starts at 9:00 a.m.
Location: City of Loma Linda, Council Chambers
25541 Barton Road
Loma Linda, CA

A Notice of Public Hearing and Hearing Procedure is posted on the Regional Board's website indicated below. An agenda for the public hearing to consider adoption of the proposed Order will be posted on the Regional Board's website approximately 10 days prior to the meeting date at:

http://www.waterboards.ca.gov/santaana/water_issues/programs/stormwater/riverside_permit.shtml

This information may be also obtained by calling the Regional Board office at 951-782-4130.

The Regional Board recognizes the significance of Riverside County's Storm Water/Clean Water Protection Program and will conduct, participate, and/or assist with any workshop during the term of this Order to promote and discuss the requirements of this Order and the progress of the Urban Runoff management program. The details of the public workshops will be posted on the Regional Board's website indicated above. Persons wishing to be included in the mailing list for any of the items related to this permit may register their name, mailing address and phone number with the Regional Board office at the address given below.

XIII. PUBLIC HEARING

The Regional Board will hold a public hearing regarding the proposed waste discharge requirements. A Notice of Public Hearing was published in the Legal Notices section of the Press Enterprise, a local newspaper, on November 13, 2009. The public hearing on this item is scheduled as indicated above in Section XI. Additional information regarding the public hearing will also be posted on the website indicated above. Further information regarding the conduct and nature of the public hearing concerning these waste discharge requirements may be obtained by writing or visiting the Santa Ana Regional Board office, 3737 Main Street, Suite 500, Riverside, CA 92501. This and other information are also available at the website at: www.waterboards.ca.gov/santaana.

XIV. INFORMATION AND COPYING

Persons wishing further information may write to the above address or call Keith Elliott at (951) 782-4925. Copies of the application, proposed waste discharge requirements, and other documents (other than those which the Executive Officer maintains as confidential) are available at the Regional Board office for inspection and copying by appointment scheduled between the hours of 8:30 a.m. and 4:00 p.m., Monday through Friday (excluding holidays, and furlough days).

XV. REGISTER OF INTERESTED PERSONS

Any person interested in a particular application or group for applications may leave his name, address and phone number as part of the file for an application. Copies of tentative waste discharge requirements will be available on the web for all interested parties to download.

E-mail registration:
http://www.waterboards.ca.gov/resources/email_subscriptions/reg8_subscribe.shtml

XVI. RECOMMENDATION

Staff recommendation is to adopt the tentative Order, Order No. R8-2010-0033, as presented.

APPENDIX 7

NOTICE OF INTENT AND NOTICE OF TERMINATION FOR DE-MINIMUS DISCHARGES

048177

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SANTA ANA REGION
NOTICE OF INTENT
TO COMPLY WITH THE TERMS AND CONDITIONS OF THE

☐ **Riverside County MS4 Permit**
ORDER NO. R8-2010-0033
NPDES NO. CAS 618033

☐ **San Bernardino County MS4 Permit**
ORDER NO.R8-2010-0036
NPDES NO. CAS618036

GENERAL WASTE DISCHARGE REQUIREMENTS FOR DISCHARGE TO SURFACE WATERS THAT POSE INSIGNIFICANT (DE MINIMUS) THREAT TO WATER QUALITY

I. PERMITTEE (*Person/Agency Responsible for the Discharge*)
Agency/Company
Name:_____
Address/*Street* _____
City _____State _____ZIP_____ Contact Person: _____
Phone: (_____) _____; Email: _____

II. FACILITY
Name:_____
Address/Street _____
City _____State _____ZIP_____ Contact Person:_____
Phone: (_____) _____; Email: _____

a. Projected Flow Rate (gpd):_____,
b. Receiving Water (identify):_____

III. INDICATE EXISTING PERMIT NUMBER: (*if applicable*)
a. Individual Permit Order No. _____ NPDES No. _____
b. General Permit Order No. R8-2010-003-_____
c. Others (specify) _____

IV. CERTIFICATION:

I certify under penalty of law that I am an authorized representative of the permittee and that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. In addition, I certify that the permittee will comply with the terms and conditions stipulated in Orders No. R8-2009-0003 and (R8-2010-0033 or R8-2010-0036, as applicable) including the monitoring and reporting program issued by the Executive Officer of the Regional Board.

Name: _____Title:_____
(type or print)

Signature: _____ Date: _____

Email: _____

Remarks: If changes to facility ownership and/or treatment processes were made after the issuance of the existing permit, please provide a description of such changes on another sheet and submit it with this Notice of Intent.

V. OTHER REQUIRED INFORMATION - FOR NEW DISCHARGERS AND FOR NEW DISCHARGES AND LOCATIONS NOT PREVIOUSLY REPORTED BY EXISTING DISCHARGERS.

Please provide a COMPLETE characterization of your discharge. A complete characterization includes, but is not limited to:

a. A list of constituents and the discharge concentration of each constituent;

b. The estimated average and maximum daily flow rates at unit of gallons per day(gpd); the frequency and duration of the discharge and the date(s) when discharge will start;

c. The proposed discharge location(s) as latitude and longitude for each discharge point;

d. A description of the proposed treatment system (if appropriate);

e. The affected receiving water; the receiving water(s) shall be
   1) receiving storm drain/creek, and/or
   2) the ultimate receiving water, such as Santa Ana River, San Jacinto River, Lake Elsinore, Prado Park Lake, etc.;

f. A map showing the path from the point of initial discharge to the ultimate receiving water. Please try to limit your maps to size of 8.5” X 11”.

g. A list of known or suspected leaking underground tanks and other facilities or operations that have, or may have impacted the quality of the underlying groundwater within 200 feet of the site property lines for projects with expected discharge flow rates of less than 100,000 gallons per day and within 500 feet of the site property lines for projects with expected discharge flow rates of greater than 100,000 gallons per day.

h. Any other information deemed necessary by the Executive Officer.

VI. OTHER

Attach additional sheets to explain any responses which need clarification. List attachments with titles and dates below:

You will be notified by a representative of the RWQCB within 30 days of receipt of your application. The notice will state if your application is complete or if there is additional information you must submit to complete your application, pursuant to Division 7, Section 13260 of the California Water Code.

STATE OF CALIFORNIA
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD SANTA ANA REGION

3737 Main Street, Suite 500, Riverside, CA 92501-3348
(951) 782-4130 • Fax (951) 781-6288
http://www.waterboards.ca.gov/santaana

ORDER NO. R8-2015-0001
NPDES PERMIT NO. CAS 618030

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM ("NPDES") PERMIT AND WASTE DISCHARGE REQUIREMENTS

Orange County Flood Control District, the County of Orange
And
The Incorporated Cities therein within the Santa Ana Region

Area-wide Urban Runoff, Santa Ana Region

The following Co-permittees, listed in Table 1, are subject to waste discharge requirements as set forth in this Order (or Permit):

Table 1: List of Entities Subject to the Requirements of this Order

County of Orange	
Orange County Flood Control District	City of La Palma
City of Anaheim	City of Lake Forest[1]
City of Brea	City of Los Alamitos
City of Buena Park	City of Newport Beach
City of Costa Mesa	City of Orange
City of Cypress	City of Placentia
City of Fountain Valley	City of Santa Ana
City of Fullerton	City of Seal Beach
City of Garden Grove	City of Stanton
City of Huntington Beach	City of Tustin
City of Irvine	City of Villa Park
City of La Habra	City of Westminster
	City of Yorba Linda

[1] This Order regulates discharges of urban runoff from the entire jurisdiction of the City of Lake Forest, including those discharges into the San Diego Region.

ADMINISTRATIVE INFORMATION

This Order was adopted by the Santa Ana Regional Water Quality Control Board ("Regional Board") on:	Month day, 2015
This Order shall become effective on:	Month day, 2015
This Order shall expire on:	Month day, 2020
The U.S. Environmental Protection Agency ("USEPA") and the Regional Board have classified the discharges from the Co-permittees' municipal separate storm sewer systems ("MS4s") as a "large municipal separate storm sewer system" pursuant to 40 CFR 122.26(b)(4).	

IT IS HEREBY ORDERED that the Co-permittees[2] subject to this Permit, in order to meet the provisions contained in division 7 of the California Water Code (commencing with section 13000) and the provisions of the federal Clean Water Act ("CWA") and regulations and guidelines adopted thereunder, shall comply with the requirements of this Permit.

I, Kurt V. Berchtold, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Santa Ana Region, on MONTH DAY, 2015.

Kurt V. Berchtold
Executive Officer

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[2] This Order refers to all of the Co-permittees collectively as "Co-Permittees", including the Principal Permittee.

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Appendix A: Applicability of TMDL requirements to Co-permittees

Appendix B: Water Quality-Based Effluent Limits for Nutrients in Newport Bay

Appendix C: Water Quality-Based Effluent Limits for Fecal Coliform in Newport Bay

Appendix D: Water Quality-Based Effluent Limits for Sediment in Upper Newport Bay

Appendix E: Water Quality-Based Effluent Limits for Organochlorine Compounds in Newport Bay and San Diego Creek

Appendix F: Water Quality-Based Effluent Limits for the Diazinon and Chlorpyrifos TMDL for Upper Newport Bay and San Diego Creek

Appendix G: Water Quality-Based Effluent Limits for Toxic Pollutants (Metals and Selenium) into San Diego Creek and Newport Bay

Appendix H: Water Quality-Based Effluent Limits for Coyote Creek

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FINDINGS

The California Regional Water Quality Control Board, Santa Ana Region (hereinafter Regional Board) finds that:

A. JURISDICTION

1. **MS4 Ownership or Operation**. Each of the Co-permittees owns or operates a municipal separate storm sewer system ("MS4), through which it discharges storm water and non-storm water (collectively "urban runoff") into waters of the U.S. within the Santa Ana Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the U.S.

2. **Designation of Board**. The City of Laguna Hills and the City of Laguna Woods are partly located within the Santa Ana Region but are excluded from Table 1 above. California Water Code section 13228 authorizes the Executive Officer of a regional board to grant a written request, made by an entity that is subject to regulation by more than one regional board, that one regional board be designated to regulate the matter. Written requests for designation have been received from the City of Laguna Hills, the City of Laguna Woods and the City of Lake Forest. The discharges of urban runoff from the respective watersheds of each of these cities are regulated by the San Diego Regional Water Quality Control Board and the Santa Ana Regional Water Quality Control Board. In letters respectively dated March 12, 2014 and September 8, 2014, the cities of Laguna Hills and Laguna Woods requested designation to the San Diego Regional Water Quality Control Board. In letters dated January 14, 2014 and April 4, 2014, the City of Lake Forest requested designation to the Santa Ana Regional Water Quality Control Board. These requests for designation were granted by the respective Executive Officers in separate Designation Agreement letters both dated February 10, 2015. Consequently, the Santa Ana Regional Water Quality Control Board is designated to regulate discharges of urban runoff from the entire jurisdiction of the City of Lake Forest, including those discharges into the San Diego Region. Likewise, the San Diego Regional Water Quality Control Board is designated to regulate discharges of urban runoff from the entire jurisdictions of the City of Laguna Hills and the City of Laguna Woods, including those discharges into the Santa Ana Region. These designations commence with the effective dates of those MS4 Permits adopted by the regional boards with terms and conditions that effectuate the Designation Agreements. For the Santa Ana Region, the designations commence with the

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effective date of this Order.

3. **Regulated Sources and Activities**. This Order regulates the discharge of pollutants from anthropogenic sources in urban runoff from MS4s or activities within the jurisdiction and control of the Co-permittees. Except as noted in Finding 9 below, this Order authorizes discharges of urban runoff from MS4s subject to the conditions and provisions herein. This Order is not intended to obligate the Co-permittees to address background, naturally-occurring or non-anthropogenic pollutants or flows in receiving waters.

4. **Legal and Regulatory Authority**. This Order is issued pursuant to section 402 of the federal Clean Water Act ("CWA") and implementing regulations (Code of Federal Regulations [CFR] Title 40, Part 122 [40 CFR 122]) adopted by the United States Environmental Protection Agency ("USEPA"), and chapter 5.5, division 7 of the California Water Code ("CWC") (commencing with section13370). This Order serves as a National Pollutant Discharge Elimination System ("NPDES") permit for discharges of urban runoff from MS4s to waters of the U.S. This Order also serves as waste discharge requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260). The Regional Board has the legal authority to issue a system-wide MS4 permit pursuant to its authority under CWA section 402(p)(3)(B) and 40 CFR 122.26(a)(1)(v). The USEPA has established that the permitting authority, in this case the Regional Board, has the flexibility to establish system- or region-wide permits affecting multiple Co-permittees (40 CFR 122.26(a)(3)(ii)). The system-wide nature of this Order will ensure consistency of regulation within watersheds and is expected to result in overall cost savings for the Co-permittees and the Regional Board. The federal regulations make it clear that the Co-permittees need only comply with permit conditions relating to discharges from the MS4s for which they are operators (40 CFR 122.26(a)(3)(vi)). This Order does not require the Co-permittees to manage storm water that originated outside of their jurisdictional boundaries, but rather to work collectively to improve storm water management within the Permit area.

5. **CWA NPDES Permit Conditions**. Pursuant to CWA section 402(p)(3)(B), NPDES permits for discharges from MS4s must include: (1) requirements to effectively prohibit non-storm water discharges into MS4s; (2) controls to reduce the discharge of pollutants to the maximum extent practicable ("MEP"), including management practices, control techniques, and system, design and engineering methods; and such other provisions as the Regional Board determines appropriate for the control of such pollutants. This Order prescribes conditions to comply with the CWA requirements for owners and operators of MS4s to effectively prohibit non-storm water discharges into the MS4s. This Order requires controls to reduce the discharge of pollutants in urban runoff from the MS4s to the MEP; including such other provisions that the Regional Board has determined are appropriate to control pollutants.

6. **CWA and CWC Monitoring Requirements**. CWA section 308(a) and 40 CFR

122.41(h),(j)-(l) and 122.48 require that NPDES permits specify monitoring and reporting requirements. Federal regulations applicable to large and medium MS4s also specify additional monitoring and reporting requirements in 40 CFR 122.26(d)(1)(iv)(D), 122.26(d)(1)(v)(B), 122.26(d)(2)(i)(F), 122.26(d)(2)(iii)(D),122.26(d)(2)(iv)(B)(2) and 122.42(c). CWC section 13383 authorizes the Regional Board to establish monitoring, inspection, entry, reporting and recordkeeping requirements. This Order establishes monitoring and reporting requirements to implement federal and State requirements.

7. **Total Maximum Daily Loads**. CWA section 303(d)(1)(A) requires that each state "shall identify those waters within its boundaries for which the effluent limitations…are not stringent enough to implement any water quality standard applicable to such waters." The CWA also requires states to establish a priority ranking of impaired water bodies known as Water Quality Limited Segments and to establish Total Maximum Daily Loads ("TMDLs") for such waters. This priority list of impaired water bodies is called the Clean Water Act Section 303(d) List of Water Quality Limited Segments, commonly referred to as the "303(d) List". The CWA requires the 303(d) List to be updated every two years.

   TMDLs are numerical calculations of the maximum amount of a pollutant that a water body can assimilate and still meet water quality standards. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point sources (waste load allocations or "WLAs") and non-point sources (load allocations or "LAs"), background contribution, plus a margin of safety. Discharges from MS4s are point source discharges.

   The federal regulations (40 CFR 122.44(d)(1)(vii)(B)) require that NPDES permits incorporate water quality based effluent limitations ("WQBELs") developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, are consistent with the assumptions and requirements of any available WLA for the discharge. Consistent with this requirement, this Order includes an iterative approach for developing BMPs through a Watershed Management Plan, subject to the approval of the Regional Board. The Watershed Management Plan must include BMPs selected to achieve water quality standards and waste load allocations. The Watershed Management Plan will be amended according to the results of evaluations of the effectiveness of the BMPs.

   This Order implements TMDLs that have been adopted by the Regional Board and approved by USEPA as of the time this Order is issued. This Order also implements TMDLs that have been promulgated by the USEPA. This Order establishes WQBELs consistent with the assumptions and requirements of TMDL implementation requirements and WLAs assigned to discharges from the Permittees' MS4s. The WQBELs are expected to be sufficient to cause the responsible Co-permittees to meet the WLAs by the compliance dates specified in their respective TMDLs and shown in Appendices B through H.

8. **Permit Modification.** In accordance with 40 CFR 122.41(f), this Order may be

modified, revoked or reissued prior to its expiration date for cause. This includes the following reasons:

a. To address significant changes in conditions identified in the technical reports required by the Regional Board which were unknown at the time of the issuance of this Order;
b. To incorporate applicable requirements of state-wide water quality control plans adopted by the State Water Resources Control Board or any amendments to the Basin Plan approved by the Regional Board, the State Board, and, if necessary, by the Office of Administrative Law;
c. To incorporate changes needed for consistency with standard provisions and precedential Orders adopted by the State Water Resources Control Board.
d. To incorporate changes needed for consistency with standard provisions and precedential Orders adopted by the State Water Resourced Control Board;
e. To comply with any applicable requirements, guidelines, or regulations issued or approved under the Clean Water Act, if the requirements, guidelines, or regulations contain different conditions or additional requirements than those included in this Order;
f. Or to incorporate any requirements imposed upon the Co-permittees through the TMDL process.

9. **Non-Storm Water and Storm Water Discharges**. The discharge of pollutants from the MS4 is subject to the MEP standard and other provisions necessary to reduce pollutants whether the pollutants are transported by storm water or non-storm water. This Order requires each Co- Permittee to effectively prohibit discharges of non-storm water into its MS4 unless such discharges are authorized by an NPDES permit. The MS4s generally contain non-storm water flows such as wastewater from non-commercial car washing, wastewater from miscellaneous washing and cleaning operations, and other nuisance flows generally referred to as *de minimis* discharges. Federal regulations, 40 CFR122.26(d)(2)(i)(B), prohibit the discharge of non-storm water containing pollutants into the MS4s and to waters of the U.S. unless they are regulated under a separate NPDES permit, or are exempt, as indicated in Section III, Discharge Prohibitions, of this Order.

Certain non-storm water discharges may be permitted under various NPDES permits adopted by the Regional Board and the State Water Resources Control Board. These permits include NPDES Permit No. CAG998001 (commonly known as the *De Minimis* Permit); NPDES Permit No. CAG990002, Discharges from Utility Vaults and Underground Structures to Surface Waters; NPDES Permit No. CAG140001 for drinking water system discharges; and NPDES Permit No. CAG918002, for discharges to surface waters of certain groundwater at sites within the San Diego Creek/Newport Bay watersheds. Non-storm water discharges permitted under these and other NPDES permits do not need to be prohibited by the Co- Permittees.

This Order authorizes the Co-permittees to discharge urban runoff from their'

MS4s. Certain authorized non-storm water discharges are subject to requirements in Attachment A of this Order. These discharges would have otherwise been subject to the requirements of NPDES Permit Nos. CAG998001,the *De Minimis* Permit, or CAG140001 for drinking water system discharges. This Order does not authorize the Co-permittees' non-storm water discharges that are subject to NPDES Permit No. CAG918002. Authorization for such discharges must be obtained through the process described in NPDES Permit No. CAG918002.

Monitoring conducted by the Permittees, as well as the 303(d) List, have identified dry weather, non-storm water discharges from the MS4s as a source of pollutants causing or contributing to receiving water quality impairments in the Santa Ana Region. The federal regulations (40 CFR 122.26(d)(2)(iv)(B)(1)) require Co-permittees to have a program to prevent illicit discharges to the MS4. The federal regulations, however, allow specific categories of unpermitted non-storm water discharges or flows to be regarded as illicit discharges only where such discharges are identified as sources of pollutants to waters of the U.S. Such un-permitted non-storm water discharges are listed in this Order in Section III. However, this list of discharges is subject to modification during the term of this Order.

10. **Limits of Co-permittees' Jurisdiction over Urban Runoff.** The Co-permittees may lack or have limited legal jurisdiction over urban runoff into their MS4s from some state and federal facilities, Native American tribal lands, utilities, special districts, and other entities. The Regional Board recognizes that the Co-permittees can only be held responsible for discharges of pollutants from such entities to the extent that the Co-permittees have the authority to eliminate or control the pollutants. Recognizing these limitations, the Co-permittees are expected to control pollutants in discharges into their MS4s from such entities according to CWA Section 402(p)(3)(B).

11. **In-Stream Structural Treatment Control BMPs**. Pursuant to federal regulations (40 CFR 131.10(a)), in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S. Authorizing the construction of a structural treatment control BMP within a water of the U.S., or using the water body itself as a structural treatment control BMP or for conveyance to such a facility, would be tantamount to accepting waste assimilation as an appropriate use for that water body. Waters of the U.S. should not be converted into structural treatment control best management practices ("BMPs", a.k.a. storm water control measures or "SMCs"). However, this exclusion does not preclude stream restoration or rehabilitation projects; constructed wetlands; or regional BMPs that have been properly permitted and maintained; and whose water quality impacts have been fully mitigated. Construction, operation, and maintenance of a structural treatment control facility in a water body can otherwise negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body.

B. DISCHARGE CHARACTERISTICS AND RUNOFF MANAGEMENT

12. **Potential Beneficial Use Impairment**. The discharge of pollutants from MS4s may cause or threaten to cause the concentration of pollutants in receiving waters to exceed applicable water quality standards. Discharges from MS4s may result in alterations to the hydrology of receiving waters that negatively impact their physical integrity. These conditions may impair or threaten to impair designated beneficial uses resulting in a condition of pollution, contamination, or nuisance.

13. **Pollutants Generated by Land Development**. Land development has created, and threatens to create, new sources of non-storm water discharges and pollutants in storm water discharges as human population density increases. This brings higher levels of automobile emissions, automobile maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash. Development typically converts natural ground cover to impervious surfaces such as paved highways, streets, rooftops, and parking lots. Pollutants deposited on these surfaces are dumped or washed off by non-storm water or storm water flows into and from the MS4s. As a result of the increased imperviousness in urban areas, less rain water can infiltrate through and flow over vegetated soil where physical, chemical, and biological processes can remove pollutants. Therefore, runoff leaving a developed area can contain greater pollutant loads and have significantly greater runoff volume, velocity, and peak flow rate than pre-development runoff conditions from the same area. Certain best management practices can minimize these impacts to water quality.

14. **Runoff Discharges to Receiving Waters**. The MS4s discharge runoff into lakes, reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within the Santa Ana Region. Development generally makes use of natural drainage patterns and features to convey runoff. Rivers, streams and creeks in developed areas used as conveyances of storm water and owned or operated by any of the Permittees are part of MS4s regardless of whether they are natural, anthropogenic, or partially-modified features. In these cases, the rivers, streams and creeks in the developed areas of the Permittees' jurisdictions may be both an MS4 and receiving water. Discharges of runoff from MS4s must occur through outfalls (point sources) into waters of the U.S. Outfalls do not include open conveyances connecting two municipal separate storm sewers. Outfalls also do not include pipes, tunnels, or other conveyances which connect segments of the same stream or other waters of the U.S. and are used to convey waters of the U.S. (40 CFR 122.26(b)(9))

15. **Pollutants in Urban Runoff**. The most common pollutants in urban runoff include total suspended solids, sediment, pathogens (e.g., bacteria, viruses, protozoa), heavy metals (e.g., cadmium, copper, lead, and zinc), petroleum products and polynuclear aromatic hydrocarbons, synthetic organics (e.g., pesticides, herbicides, and PCBs), nutrients (e.g., nitrogen and phosphorus), oxygen-demanding substances (e.g., decaying vegetation, animal waste), detergents, and trash. Pollutants in urban runoff are typically generated by persons or activities

over which the Co-permittees typically have the authority to enact measures to control those pollutants. The Regional Board recognizes that the Co-permittees' authority is not equal for all persons or activities in their jurisdictions. The limits of the Co-permittees' authority over some persons, such as school districts, are not clear. Nonetheless, the Co-permittees are required to exercise their authority consistent with the requirements of the Clean Water Act and this Order.

16. **Human Health and Aquatic Life Impairment**. Pollutants in runoff discharged from the MS4s may adversely affect human health and/or aquatic organisms. Adverse human health effects include gastrointestinal diseases and infections. Adverse physiological responses to pollutants in runoff include impaired reproduction, growth anomalies and mortality in aquatic organisms. These responses may be the result of different mechanisms, including bioaccumulation of toxicants. During bioaccumulation, toxicants carry up the food chain and may affect both aquatic and non-aquatic organisms, including human health. Increased volume, velocity, rate, and duration of storm water runoff greatly accelerate the erosion of downstream natural channels. This alters stream channels and habitats and can adversely affect aquatic and terrestrial organisms.

17. **Best Management Practices**. Wastes which are deposited and accumulate in MS4 drainage structures will be discharged from these structures to waters of the U.S. unless they are removed. These discharges may cause or contribute to a condition of pollution in receiving waters. For this reason, pollutants in storm water discharges from the MS4s must be effectively reduced in runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Pollution prevention BMPs are practices that prevent or reduce the generation of potential pollutants, typically at their source. Pollution prevention is the "first line of defense". Source control BMPs (both structural and non-structural) eliminate or minimize the contact between potential pollutants and urban runoff, therefore preventing the transport of pollutants to receiving waters. Treatment control BMPs remove pollutants that have entered into urban runoff.

    Certain structural treatment control BMPs, such as constructed wetlands, are or will be waters of the state, and may support beneficial uses. The operation and maintenance of these BMPs may impact the beneficial uses of those waters. Section III of this Order contains provisions to minimize impacts to those beneficial uses as the result of operating and maintaining structural treatment control BMPs. However, it is not the intent of the Regional Board to regulate discharges *within* structural treatment control BMPs in a way that interferes with efforts to comply with the requirements of this Order.

18. **BMP Implementation**. To reduce the discharge of storm water pollutants, to effectively prohibit non-storm water discharges, and to protect receiving waters, the water quality impacts of development need to be addressed during the three major phases of planning, construction, and use. Development which is not guided by water quality planning policies and principles can result in increased

pollutant load discharges, flow rates, and flow durations which can negatively affect receiving water beneficial uses. Construction sites without adequate BMP implementation may result in sediment or runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and potentially impairing the beneficial uses of the receiving waters. In addition, existing development can generate substantial pollutant loads which are discharged in runoff to receiving waters. Retrofitting areas of existing development with storm water pollutant control and hydro-modification management BMPs is necessary to address discharges of urban runoff that may cause or contribute to a condition of pollution or a violation of water quality standards.

19. **Water Quality Improvements**. Since 1990, the Permittees have been developing and implementing programs and BMPs intended to effectively prohibit non-storm water discharges into the MS4s and control pollutants in discharges from the MS4s to the MEP. As a result, beach closures have been significantly reduced, public awareness of water quality issues has increased, and several water body / pollutant combinations are being considered for removal from the CWA Section 303(d) List. The Permittees have been able to achieve improvements in water quality in some respects, but significant improvements to the quality of receiving waters and discharges from the MS4s are still necessary to meet the requirements and objectives of the CWA.

20. **Long Term Planning and Implementation**. Federal regulations require municipal storm water permits to expire 5 years from adoption, after which the permit must be renewed and reissued. The Regional Board recognizes that water quality degradation and impacts to beneficial uses in the Santa Ana Region occurred over several decades and will not be undone easily.

21. "**Iterative Process"**. This Order is based on an iterative approach that, in summary, is comprised of planning, implementing, evaluating, and improving BMPs carried out as part of the Co-permittees' storm water programs. Multiple iterations will occur during this permit term, and are likely to occur over multiple permit terms, to achieve water quality standards. To fully effectuate the "iterative process", this Order includes requirements for conducting program effectiveness assessments ("PEAs"). PEAs are a necessary component of the "iterative process". As part of carrying out PEAs, Co-permittees must compare the outcomes of program activities to the requirements of this Order and to objective performance standards developed by the Co-permittees. The purposes of conducting PEAs include:

    a. assessing compliance with the requirements of this Order;
    b. tracking progress towards meeting performance standards and/or water quality standards;
    c. justifying the Permittees' commitment of resources, including the cessation of ineffective management practices;
    d. providing feedback to Permittees' program managers, in part, to identify the "best" or most effective management practices undertaken; and

e. assessing reductions in pollutant loads to receiving waters and any relationship to management practices.

It is not the intent of the Regional Board that objective performance standards, which are developed exclusively by the Permittees as part of PEAs, be used as the basis for enforcement action against any of the Permittees for failure to satisfy those standards. The intent of the Regional Board is that the Permittees constructively use those performance standards, and the related monitoring, to iteratively improve the performance of their storm water programs in a timely way to remove pollutants in urban runoff to the maximum extent practicable. Permittees are also required to periodically evaluate the validity of their performance standards and methods of measurement and make modifications accordingly.

C. WATER QUALITY STANDARDS

21. **Basin Plan**. The Regional Board adopted the *Water Quality Control Plan for the Santa Ana River Basin* (Basin Plan) on January 24, 1995. The Basin Plan designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for receiving waters addressed through the plan. Subsequent revisions to the Basin Plan have also been adopted by the Regional Board and approved by the State Water Board, the Office of Administrative Law, and where appropriate, the USEPA. The requirements of this Order implement the Basin Plan.

    The Basin Plan identifies the following existing and potential beneficial uses for surface waters in the Santa Ana Region: Municipal and Domestic Supply (MUN); Agricultural Supply (AGR); Industrial Process Supply (PROC); Industrial Service Supply (IND); Ground Water Recharge (GWR); Navigation (NAV); Hydropower Generation (POW); Water Contact Recreation (REC1); Non-contact Recreation (REC2); Commercial and Sport Fishing (COMM); Warm Freshwater Habitat (WARM); Limited Warm Freshwater Habitats (LWRM); Cold Freshwater Habitat (COLD); Preservation of Biological Habitats of Special Significance (BIOL); Wildlife Habitat (WILD); Rare, Threatened, or Endangered Species (RARE); Spawning, Reproduction, and Development (SPWN); Marine Habitat (MAR); Shellfish Harvesting (SHELL); and Estuarine Habitat (EST).

22. **Ocean Plan**. The State Water Board adopted the *Water Quality Control Plan for Ocean Waters of California, California Ocean Plan* (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, 2005, and 2009. The State Water Board adopted the latest amendment on October 16, 2012 and it became effective on August 19, 2013. The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean. The requirements of this Order implement the Ocean Plan. The Ocean Plan identifies the following beneficial uses of ocean waters of the state to be protected: Industrial water supply; water contact and non-

contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture; preservation and enhancement of designated Areas of Special Biological Significance; rare and endangered species; marine habitat; fish spawning and shellfish harvesting.

23. **Sediment Quality Control Plan**. On September 16, 2008, the State Water Board adopted the *Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality* (Sediment Quality Control Plan). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes: 1) narrative sediment quality objectives for benthic community protection from exposure to contaminants in sediment and to protect human health, and 2) a program of implementation using a multiple lines of evidence approach to interpret the narrative sediment quality objectives. Requirements of this Order implement the Sediment Quality Control Plan.

24. **National Toxics Rule and California Toxics Rule**. USEPA adopted the National Toxics Rule (NTR) on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About forty criteria in the NTR applied in California. On May 18, 2000, USEPA adopted the California Toxics Rule (CTR). The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. The CTR and NTR contain water quality criteria for priority pollutants in discharges to surface water. However, the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* states that the Policy does not apply to regulation of storm water discharges. The Regional Board believes that compliance with Water Quality Standards through implementation of BMPs is appropriate for regulating urban runoff. The USEPA articulated this position on the use of BMPs in storm water permits in the policy memorandum entitled, ‘‘Interim Permitting Approach for Water Quality-Based Effluent Limitations in Storm Water Permits’’ (61 FR 43761, August 9, 1996). The USEPA also has articulated this position with respect to implementing TMDLs in their policy memorandum entitled *Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on those WLAs*, November 22, 2002.

25. **Anti-degradation Policy**. Federal anti-degradation policy is applicable to all NPDES permits. 40 CFR 131.12 requires that State water quality standards include an anti-degradation policy consistent with the federal policy. The State Water Resources Control Board established California's anti-degradation policy in State Board Resolution No. 68-16. Resolution No. 68-16 incorporates the federal anti-degradation policy where the federal policy applies under federal law. Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The Santa Ana Water Board's Basin Plan implements, and incorporates by reference, both the State and federal anti-degradation policies. This Order requires the Co-permittees to implement programs and policies necessary to improve water quality; the Order

does not allow any degradation of existing water quality. Therefore, this Order is consistent with the anti-degradation provisions of 40 CFR 131.12 and State Board Resolution No. 68-16 as discussed further in the Technical Report.

26. **Anti-Backsliding Requirements**. Section 402(o)(2) of the CWA and federal regulations at 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations may be relaxed. All effluent limitations in this Order are at least as stringent as effluent limitations in the previous permits. Further discussion regarding anti-backsliding is in the Technical Report to this Order.

D. CONSIDERATIONS UNDER FEDERAL AND STATE LAW

27. **Coastal Zone Act Reauthorization Amendments**. Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) requires coastal states with approved coastal zone management programs to address non-point source pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point source pollution: agriculture, silviculture, urban, marinas, and hydro-modification. This Order addresses the management measures required by CZARA for the urban category, with the exception of septic systems. The programs developed pursuant to this Order fulfill the need for coastal cities to develop a runoff non-point source plan identified in the Non-Point Source Program Strategy and Implementation Plan. The Regional Board addresses septic systems through the administration of other programs.

28. **Endangered Species Act**. This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 USC sections 1531 to 1544). This Order requires compliance with receiving water limits, and other requirements to protect the beneficial uses of waters of the State. The Permittees are responsible for meeting all requirements of the applicable Endangered Species Act.

29. **Report of Waste Discharge Process**. The waste discharge requirements set forth in this Order are based upon the Report of Waste Discharge submitted by the Orange County Permittees prior to the expiration of Order No. R8-2009-0030 (NPDES No. CAS618030). The federal regulations (40 CFR 122.21(d)(2)) and CWC section 13376 impose a duty on the Permittees to reapply for continued coverage through submittal of a Report of Waste Discharge no later than 180 days prior to expiration of a currently-effective permit. This requirement is set forth in Provision XXIII.1. of Order No. R8-2009-0030. Order No. R8-2009-0030 (NPDES No. CAS618030) expired on May 22, 2014 but was administratively extended pursuant to 40 CFR 122.6(d). Once adopted and in effect, this Order supersedes

Order No. R8-2009-0030, except for purposes of enforcement, and is subject to any necessary revisions to its requirements made after the Regional Board considers the Report of Waste Discharge through the public process provided in 40 CFR Part 124.

30. **Integrated Report and Clean Water Act Section 303(d) List**. The Santa Ana Regional Water Quality Control Board and the State Water Resources Control Board submit an Integrated Report to USEPA to comply with the reporting requirements of CWA sections 303(d), 305(b) and 314, which lists the attainment status of water quality standards for water bodies in the Santa Ana Region. USEPA issued its Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act on July 29, 2005, which advocates the use of a five-category approach for classifying the attainment status of water quality standards for water bodies in the Integrated Report. Water bodies included in Category 5 in the Integrated Report indicate at least one beneficial use is not being supported or is threatened, and a TMDL is required. Water bodies included in Category 5 in the Integrated Report are placed on the 303(d) List. The most recent 303(d) List was issued in 2010.

    Surface water bodies may be included in Category 4 of the Integrated Report if a TMDL has been adopted and approved by the USEPA for all identified pollutants or impairments (Category 4a); if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time (Category 4b); or, if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution (Category 4c). According to the 2010 Integrated Report, no water bodies in the Santa Ana Region are identified in Category 4.

    Information acquired as part of implementing this Order may be used by the Regional Board to include surface waters impaired by discharges from the Permittees' MS4s in Category 4and Category 5 in the Integrated Report. The inclusion of those waters will allow for their consideration during the next 303(d) List submittal by the State to USEPA.

31. **Economic Considerations**. The California Supreme Court has ruled that, although CWC section 13263 requires the State and Regional Water Boards (collectively Water Boards) to consider factors set forth in CWC section 13241 when issuing an NPDES permit, the Water Board may not consider the factors to justify imposing pollutant restrictions that are less stringent than the applicable federal regulations require. (City of Burbank v. State Water Resources Control Bd. (2005) 35 Cal.4th 613, 618, 626-627.) However, when pollutant restrictions in an NPDES permit are more stringent than federal law requires, CWC section 13263 requires that the Water Boards consider the factors described in CWC section 13241 as they apply to those specific restrictions.

    As noted in the following finding, the Regional Board finds that the requirements in

this Order are not more stringent than the minimum federal requirements. The minimum federal requirements include: (1) the effective prohibition of non-storm water discharges into the MS4; and (2) controls to reduce the discharge of pollutants in storm water to the MEP, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Regional Board determines appropriate for the control of such pollutants. The minimum federal requirements also include requirements for limitations consistent with any applicable waste load allocation. Therefore, considerations pursuant to CWC section 13241 are not required. Notwithstanding the above, the Regional Board has taken into account economic considerations pertaining to the requirements in this Order, consistent with requirements in section 13241. The economic consideration is described in the accompanying Technical Report.

32. **Unfunded Mandates**. This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, Section (6) of the California Constitution for reasons detailed in the accompanying Technical Report.

33. **California Environmental Quality Act**. The issuance of this NPDES permit for the discharge of runoff from MS4s to waters of the U.S. is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, section 21000 *et seq*.) in accordance with CWC section 13389.

E. STATE WATER RESOURCES CONTROL BOARD DECISIONS

34. **Compliance with Prohibitions and Limitations**. The receiving water limitation language specified in this Order is consistent with language recommended by the USEPA and established in State Water Board Order WQ 99-05 (amending WQ 98-01), Own Motion Review of the Petition of Environmental Health Coalition to Review Waste Discharge Requirements Order No. 96-03, NPDES Permit No. CAS0108740, adopted by the State Water Board on June 17, 1999.

35. **Special Conditions for Areas of Special Biological Significance**. On March20, 2012, the State Water Board approved Resolution No. 2012-0012 approving an exception to the Ocean Plan prohibition against discharges to Areas of Special Biological Significance ("ASBS") for certain nonpoint source discharges and NPDES permitted municipal storm water discharges. State Water Board Resolution No. 2012-0012 requires monitoring and testing of marine aquatic life and water quality in several ASBS to protect California's coastline during storms when rain water overflows into coastal waters. Specific terms, prohibitions, and special conditions were adopted to provide special protections for marine aquatic life and natural water quality in ASBS. The Special Protections contained in Attachment B to Resolution No. 2012-0012, applicable to discharges to ASBS', are hereby incorporated into this Order as if fully set forth herein (See Provision IV.H.).

F. ADMINISTRATIVE FINDINGS

38. **Executive Officer Delegation of Authority**. The Regional Board by prior resolution has delegated all matters that may legally be delegated to its Executive Officer to act on its behalf pursuant to CWC section 13223. Therefore, the Executive Officer is authorized to act on the Regional Board's behalf on any matter within this Order unless such delegation is unlawful under CWC section 13223 or this Order explicitly states otherwise.

39. **Standard Provisions**. Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR 122.42, are provided in this Order.

40. **Fact Sheet/Technical Report**. The Technical Report for this Order contains background information, regulatory and legal citations, references and additional explanatory information and data in support of the requirements of this Order. The Technical Report serves as a fact sheet described in Parts 124.8 and 124.56 of the Code of Federal Regulations. The Technical Report is hereby incorporated into this Order and constitutes part of the Findings of this Order.

41. **Public Notice**. In accordance with State and federal laws and regulations, the Regional Board notified the Co-permittees, and interested agencies and persons of its intent to prescribe waste discharge requirements for the control of discharges into and from the MS4s to waters of the U.S. and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Technical Report.

42. **Public Hearing**. The Regional Board held a public hearing on MONTH(S), DATE(S) 2015, and heard and considered all comments pertaining to the terms and conditions of this Order. Details of the public hearing are provided in the Technical Report.

43. **Effective Date**. This Order serves as an NPDES permit pursuant to CWA section 402 or amendments thereto, and becomes effective fifty (50) days after the date of its adoption, provided that the Regional Administrator, USEPA, Region IX, does not object to this Order.

44. **Review by the State Water Board**. Any person aggrieved by this action of the Regional Board may petition the State Water Board to review the action in accordance with CWC section 13320 and California Code of Regulations, title 23, sections 2050, *et seq*. The State Water Board must receive the petition by 5:00 p.m., 30 days after the Regional Board action, except that if the thirtieth day following the action falls on a Saturday, Sunday or State holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next

business day. Copies of the law and regulations applicable to filing petitions will be provided upon request or may be found on the Internet at:

http://www.waterboards.ca.gov/public_notices/petitions/water_quality

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PERMIT REQUIREMENTS

IT IS HEREBY ORDERED that the Co-permittees[3], in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted thereunder, and the provisions of the Clean Water Act, as amended, and regulations and guidelines adopted thereunder, must comply with the following:

I. GENERAL RESPONSIBILITIES OF THE CO-PERMITTEES

A. The Co-permittees (inclusive of the Principal Permittee), shall be responsible for the management of storm drain systems within their jurisdictions. To carry out the requirements of this Order, the Co-permittees must:
   1. Accurately document and effectively implement best management practices, including programs, policies, and procedures, within each of their respective jurisdictions.
   2. Develop and apply valid objective performance measures to track and assess the effectiveness of individual best management practices or systems of best management practices and execute timely program improvements necessary to improve the effectiveness of those practices.
   3. Annually evaluate the validity of performance measures and the validity of those methods used to measure achievement of performance measures.
   4. Participate with one another in the development of necessary programs, plans, procedures, strategies, and reports that are of mutual interest.
   5. Coordinate the relevant plans, policies, procedures, and standards of their internal agencies, departments, and divisions.
   6. Develop and execute necessary interagency agreements.
   7. Establish and maintain adequate legal authority, as required by the Federal Storm Water Regulations.
   8. Maintain records and submit reports that are adequate to determine compliance with the requirements of this Order.
   9. Monitor and report the progress of any plans, projects, and programs implemented to control the discharge of pollutants in urban runoff to their MS4s. Reports must include comparisons of outcomes to objectives, performance measures, or milestones prescribed by this Order or developed individually or collectively by Co-permittees pursuant to Provision I.A.2..

II. GENERAL RESPONSIBILITIES OF THE PRINCIPAL PERMITTEE

A. In addition to the General Responsibilities in Section I above, the Principal Permittee (County of Orange) is responsible for the overall management of the

[3] As described in the Glossary of this Order, the term "Co-permittees" includes the Principal Permittee.

storm water program. To carry out the requirements of this Order, the Principal Permittee must:

1. Coordinate the planning and execution of necessary common programs, plans, policies, procedures, strategies, and improvements thereof among the Co-permittees.
2. Monitor and report the progress of any plans, projects, and programs of mutual interest to the Co-permittees.
3. Conduct chemical and biological water quality monitoring and conduct any additional monitoring as directed by the Executive Officer and authorized by this Order.
4. Coordinate the preparation of written reports, programs, plans, and procedures, including the Annual Progress Report, and their submittal to the Executive Officer.

III. DISCHARGE PROHIBITIONS AND LIMITATIONS

A. Prohibitions

1. In accordance with the requirements of 40 CFR § 122.26(d)(2)(i)(B) and (F), the Co-permittees must effectively prohibit illicit/illegal discharges from entering into the municipal separate storm sewer system ("MS4") unless such discharges are authorized by an NPDES permit or are not prohibited according to Provision III.A.2., below.
2. The non-storm water discharges in Table 2 below do not need to be prohibited by the Co-permittees unless such discharges are identified by the Co-permittee(s) or the Executive Officer as a significant source of pollutants[4].
3. Except for those discharges described in Table 2 below, non-storm water discharges from Co-permittees' activities into waters of the U.S. are prohibited unless the discharge is authorized under an NPDES Permit.
4. With the recommendation of the Co-permittees or based on Substantial Evidence, the Executive Officer is authorized to add other types of discharges to Table 2 below, by way of written notice to the Co-permittees and after providing a minimum of 30 days for public comment.
5. Discharges of urban runoff from MS4s owned or operated by the Co-Permittees must be in compliance with the applicable discharge prohibitions contained the Ocean Plan and in Chapter 5 of the Basin Plan.
6. Discharges of urban runoff into waters of the U.S. from MS4s owned or operated by the Co-permittees which cause or contribute to a condition of pollution, contamination, or nuisance (see CWC Section 13050) are prohibited.
7. The discharge to waters of the U.S. of any substance(s) in concentrations

[4] Note that this Order now requires the effective prohibition of irrigation runoff into the MS4.

that are toxic to animal or plant life is prohibited.

8. The discharge to waters of the U.S. of any radiological, chemical, or biological warfare agent, or high-level radiological waste, is prohibited.

Table 2: Types of non-storm water discharges presumed to not be a significant source of pollutants

Air conditioning condensate
Passive foundation or footing drains
Water from crawl space pumps
Individual residential car washing and charity car washing events conducted by non-profit 501(c)organizations
De-chlorinated water from swimming pools (except cleaning wastewater and filter backwash)
Diverted stream flow
Rising ground water and natural springs
Uncontaminated ground water infiltration (as defined in 40 CFR § 35.2005(20) to MS4s
Uncontaminated pumped groundwater
Flow from riparian habitats and wetlands
Temporary non-storm water discharges authorized by USEPA pursuant to Sections 104(a) or 104(b) of the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA")[5]
Emergency firefighting flows necessary for the protection of life and property
Water not otherwise containing "waste", as defined in CWC Section 13050(d)

B. Limitations

1. The Co-permittees must implement an effective public education and outreach program for the purpose of reducing the volume of the anthropogenic non-storm water discharges to the MS4s..
2. With the exception of discharges subject to NPDES Permit No. CAG918002, as amended or revised, non-storm water discharges from facilities or activities owned or controlled by Co-permittees, and which are authorized by this Order, must be in compliance with the conditions and provisions in Attachment B to this Order.

[5] These discharges must comply with water quality standards as applicable or relevant and appropriate requirements ("ARARs") under Section 121(d)(2) of CERCLA; or must be subject to either a written waiver of ARARs by USEPA pursuant to Section 121(d)(4) of CERCLA, or a written determination by USEPA that compliance with ARARs is not practicable considering the exigencies of the situation pursuant to 40CFR300.415(j).

a.

IV. RECEIVING WATER LIMITATIONS

A. Discharges of urban runoff from the Co-permittees' MS4s must not cause or contribute to a condition of nuisance or exceedances of water quality standards for surface waters and groundwaters.
B. Discharges of urban runoff from the Co-permittees' MS4s must comply with Provision IV.A. through timely implementation of best management practices (BMPs) and other actions to reduce pollutants in discharges according to the conditions and provisions of this Order. If exceedances of receiving waters limitations persist, notwithstanding implementation of BMPs and other actions, the responsible Co-permittees must achieve compliance with prohibitions and receiving waters limitations according to Subsection IV.D. below.
C. Determinations that discharges are causing or contributing to exceedances of water quality standards will be based, in part, on assessments of water quality data which are performed according to scheduled cycles of monitoring, analysis, and reporting required in attached Monitoring and Reporting Program No. R8-2015-0001 (Attachment A).
D. Except for discharges of pollutants addressed by a WQBEL, where discharges from multiple Co-permittees are comingled , a Co-permittee shall demonstrate compliance with Provision IV.A. as follows:
    1. Pursuant to 40 CFR 122.26(a)(3)(vi), each Co-permittee is only responsible for discharges from the MS4 for with they are the owner or operator.
    2. Where Co-permittees have comingled discharges to the receiving water, or where Co-permittees ' discharges comingle in the receiving water, compliance in the receiving water shall be determined for the contributing Co-permittees as a whole unless an individual Co-permittee can demonstrate that its discharge did not cause or contribute to the exceedance as follows:
        a. Demonstrate that there was no discharge from the Co-permittee's MS4 into the applicable receiving water during the relevant time period;
        b. (2) Demonstrate that the discharge from the Co-permittee's MS4 was controlled to a level that did not cause or contribute to the exceedance in the receiving water;
        c. (3) Demonstrate that there is an alternative source of the pollutant that caused the exceedance, that the pollutant is not typically associated with MS4 discharges, and that the pollutant was not discharged from the Co-permittee's MS4; or
        d. (4) Demonstrate that the Co-permittee is in compliance with the Watershed Management Plan provisions under Section XI.
E. Where a Co-permittee determines that a discharge of urban runoff is causing or contributing to the exceedance of an applicable water quality standard, the responsible Co-permittee(s) must, within 60-days of making the determination,

either:

1. Provide objective evidence, acceptable to the Executive Officer, that there is a trend indicating that relevant pollutant loads or concentrations are decreasing and that the applicable water quality standard(s) are expected to be satisfied without further intervention;
2. Provide evidence, acceptable to the Executive Officer that the source of pollution is background, naturally-occurring, or non-anthropogenic; or that the cause of pollution is not within the jurisdiction or control of the responsible Co-permittees; OR
3. Provide notice to the Executive Officer of their intent to develop a Watershed Management Plan for the affected watershed according to the requirements of Section XI.

F. Prior to accepting evidence or approving plans submitted pursuant to Provision IV.D., the Executive Officer shall provide a 30-day public review period.

G. Where the Executive Officer determines that a discharge of urban runoff is causing or contributing to the exceedance of an applicable water quality standard, the Executive Officer will notify the potentially-responsible Co-permittees of this in writing. The potentially-responsible Co-permittees must respond to the notice, using the options specified in Provision IV.D., by a date specified therein. If cycles of monitoring, analysis, and reporting continue to result in determinations that there are continuing or recurring exceedances of water quality standards caused or contributed to by discharges from the Co-permittees' MS4s, the Co-permittees must reinitiate the procedure in this Section. Nothing in this Section shall prevent the Regional Board from enforcing any provision of this Order while the Co-permittees prepare and implement plans to achieve water quality standards or WQBELs.

H. The Special Protections contained in Attachment B to Resolution No. 2012-0012, as amended or reauthorized by the State Water Resources Control Board, are hereby incorporated into this Order as if fully set forth herein. The Special Protections are specifically applicable to discharges of urban runoff from the City of Newport Beach's MS4 to Newport Coast and Crystal Cove (ASBS 32 and ASBS 33, respectively) which are authorized by this Order. Where there are conflicts between this Order and the Special Protections, the most protective requirements, as determined by the Executive Officer, shall prevail. The Special Protections are accessible at:

http://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2012/rs2012_0012.pdf

V. IMPLEMENTATION AGREEMENT

The Co-permittees must execute inter-agency and inter-Co-permittee agreements necessary to satisfy the requirements of this Order.

VI. LEGAL AUTHORITY/ENFORCEMENT

A. Each Co-permittee must secure and maintain legal authority adequate to control the discharge of pollutants in urban runoff to their MS4s pursuant to the requirements of this Order.
B. Each Co-permittee must track and evaluate challenges to their authority to control the discharge of pollutants in urban runoff to their MS4s.
    1. Where a formal or informal challenge indicates a weakness in the Co-Permittees' authority, the Co-permittee must act in good faith and in a timely manner to make their authority adequate.
    2. The Co-permittees must report any confirmed weaknesses in their legal authority in their Program Effectiveness Assessment. The report must include a plan, with a schedule of action(s), to make their authority adequate.
C. Each Co-permittee must secure and maintain legal authority that is adequate to enter, inspect, and gather evidence (including pictures, video, samples, statements, and documents) from industrial, construction, and commercial establishments to determine compliance with ordinances, permits, conditions, and other requirements of the Co-permittees related to the control of discharges of pollutants to their MS4s.
D. Each Co-permittee must maintain adequate legal authority to impose a series of effective, progressive sanctions to compel compliance with their regulatory requirements related to the control of discharges of pollutants to their MS4s.
E. Within 90-days of the effective date of this Order, each Co-permittee must develop a formal, written program, which describes supporting policies and procedures that effectively promote the consistent and decisive use of their actions (inclusive of sanctions), and describes performance measures to track and objectively evaluate the actions' effectiveness.

VII. ILLICIT DISCHARGES, ILLICIT CONNECTIONS, AND ILLEGAL DUMPING; LITTER DEBRIS AND TRASH CONTROL

A. Each Co-permittee must effectively prohibit illicit discharges and illicit connections to their respective MS4s through their ordinances and other appropriate mechanisms.
B. Each Co-permittee must employ an effective mechanism for the public to report known or suspected illicit discharges, illicit connections, and illegal dumping. The reporting mechanism must be continuously advertised to the public by each Co-Permittee using a minimum of two media outlets (i.e. newsprint, internet, telephone directory, etc.).
C. Each Co-permittee must advertise the availability of mechanisms for residents to dispose of wastes that have the potential to be discharged to their MS4s.
D. The Co-permittees must implement an effective program to detect illicit discharges and illicit connections; to abate illegal dumping that has the potential to result in a discharge of pollutants to their MS4s; to trace the source of illicit discharges and connections; and to eliminate or permit such discharges and

connections. The Co-permittees' program must be fully described in written processes and procedures. Sanitary Sewer Overflows shall be treated as a sub-class of illicit discharges subject to additional requirements of Subsection VII.F.

1. Co-permittees must provide mutual assistance to one another in detecting known or suspected illicit discharges, illicit connections, and illegal dumping.
2. Each Co-permittee must maintain an electronic database that tracks instances of known or suspected illicit discharges, illicit connections, and illegal dumping within their respective jurisdictions.
    a. The database must be designed and used to track compliance with the requirements of this Section (Subsection VII.D.).
    b. The database must be designed and used to guide the Co-Permittees' most effective use of resources towards satisfying the requirements of this Section.
3. Each Co-permittee must identify the personnel or staff positions that are responsible for satisfying the requirements of Subsection VII.D. of this Order in their written program.
4. The Co-permittees must maintain maps of their respective MS4s that contain information of sufficient detail and quality to trace the source of suspected illicit discharges in a timely manner.
    a. The maps must be distributed in a format that is readily available to personnel responsible for satisfying the requirements of Subsection VII.D. of this Order.
    b. The maps must be reviewed and updated annually.
5. The Co-permittee that is the local jurisdiction must initiate (or cause to be initiated) a source investigation where bacterial monitoring (see Monitoring and Reporting Program No. R8-2015-0001) indicates AB411 receiving water standards are exceeded in ocean outfalls/tributaries and in the nearby surf zone.
6. A source investigation must occur in substantial conformance with a common set of written techniques and procedures developed by the Permittees as part of the written program described in Provision VII.D.
    a. When the source of an illicit discharge or illicit connection is discovered, the Co-permittee(s) must take immediate action to eliminate the discharge or connection or require that it be subject to appropriate NPDES permit(s) within 120 calendar days of discovery.

E. Each Co-permittees must implement an effective program to reduce and/or eliminate the discharge of trash and debris to waters of the U.S.
    1. Measures employed for the control of trash and debris must be reported and reviewed annually by the Co-permittees to objectively evaluate the measures' effectiveness. The results of the reviews must be provided annually in the Annual Progress Report.
    2. The principle Co-permittee must demonstrate that the Co-permittees have formally evaluated new technologies for the control of trash and debris, as they become aware of them, and report the findings in the Annual Progress Report.

3. Co-permittees may discontinue control measures for trash and debris that they deem to pose an unmitigatable hazard or to be ineffective provided that the measure is replaced by an equal or more-effective measure.
    a. The permanent substitution of control measures must be reported in the Annual Progress Report and approved by the Executive Officer. The proposed substitution must be supported by substantial objective evidence. This applies to program-level changes and not to the day-to-day operation of control measures.
    b. Co-permittees must satisfy any conditions imposed by the Executive Officer as part of the approval of any substitution.

F. For those Co-permittees that own or operate sanitary sewer systems over one mile in length, the State Board has established minimum requirements to prevent and mitigate sanitary sewer overflows ("SSOs") in Order No. 2006-0003-DWQ, "Statewide General Waste Discharge Requirements for Wastewater Collection Agencies". The Co-permittees that are not subject to the requirements of Order No. 2006-0003-DWQ, or subsequent renewals, must implement an effective program to detect and mitigate SSOs as follows[6]:
    1. The Co-permittees' SSO program(s) must be comprised of the following elements:
        a. Procedures for responding to SSOs.
        b. A hands-on field training program for Co-permittees' staff responsible for responding to SSOs.
        c. An awareness-level training program for Co-permittees' field staff most likely to initially detect SSOs.
        d. If necessary, executed Memorandum/Memoranda of Understanding ("MOU") for delineating jurisdictional and financial responsibilities for the program.
    2. Co-permittees must respond to SSOs according to the formal written response procedures unless there is cause to believe that such a response would not be most effective under the circumstances.
    3. Co-permittees must maintain records adequate to demonstrate that they implemented the SSO program and its elements; records must be maintained for a minimum of five (5) years.
    4. The Principal Permittee is responsible for developing a model SSO program and its elements; and for documenting and reporting the program(s') outcomes in the Annual Progress Report.

VIII. MUNICIPAL INSPECTIONS OF CONSTRUCTION SITES

A. Each Co-permittee must maintain an inventory of all construction sites within its jurisdiction.
    1. The construction sites inventory must include sites where building or

[6] This program is expected to be initially based on the Countywide Area Spill Control Program (CASC) as amended or revised to satisfy the requirements of this Order.

grading permits are applicable and where activities at the site include the following:

a. Soil movement;
b. Uncovered storage of materials or wastes, such as dirt, sand, fertilizer, or landscaping materials; OR
c. Exterior mixing of cementitious products (i.e. concrete, mortar, or stucco).

2. All construction sites shall be included in the Co-permittees' inventory regardless of whether the site is subject to the Statewide General Construction Permit or an individual NPDES permit.
3. The inventory of construction sites must be updated, at a minimum:
   a. Twice during the dry season.
   b. Once per month during the wet season.
4. Each Co-permittees' inventory of construction sites must be maintained in an electronic-format database. The database records must include information on site/project ownership, project area, General Construction Permits WDID (if any), and location (latitude/longitude in decimal-degrees or NAD83/WGS84 format).

B. Each Co-permittee must inspect construction sites in their inventory which have an expected or actual duration of more than two weeks. Each Co-permittee must have written policies and procedures that describe how inspections and related enforcement actions are carried out. Inspections and related enforcement actions must be carried out in a manner that enforces compliance with applicable ordinance(s), plans, permits, or other requirements related to the control of discharges of pollutants to their MS4s.

1. Co-permittees must categorize all construction sites in their inventory as either "high-priority", "medium-priority", or "low-priority". Construction sites with an expected or actual duration of more than two weeks must be inspected according to the following schedule:
   a. May 1st through September 30th of each year (dry season): all construction sites must be inspected at a frequency where sediment and other pollutants are properly controlled and that unauthorized, non-storm water discharges are prevented.
   b. October 1st through April 30th of each year (wet season):
      i. High-priority sites must be inspected once every two (2) months in their entirety.
      ii. Medium-priority sites must be inspected twice during the wet season.
      iii. Low-priority sites must be inspected once during the wet season.
   c. Where a Co-permittee determines that BMPs or their maintenance are inadequate or out of compliance, the site must be inspected once per month until the deficiency is corrected.
2. A construction site must be considered "high priority" if it meets any of the following minimum criteria:
   a. The site is 20-acres or larger;
   b. The site is over one acre and tributary to a water body listed

according to Clean Water Act Section 303(d), as being impaired by sediment or turbidity; OR

c. The site is tributary to, and within 500-feet of, an area defined by the Ocean Plan as an Area of Special Biological Significance ("ASBS").

3. A construction site must be considered "medium-priority" if it consists of between 5 and 20 acres of disturbed soil and is not otherwise a high-priority site. All other sites may be considered "low-priority".
4. Co-permittees must consider other factors or circumstances that could cause a construction site to fall into a higher priority. These factors include, but are not limited to, soil erosion potential, site slope, proximity to a receiving water, and the sensitivity of the receiving water to potential pollutants from the site.
5. Any Co-permittee may propose an alternative priority category distribution of their commercial sites and implement the related inspection schedule within their jurisdiction subject to the written approval of the Executive Officer.
   a. The approved alternative distribution and schedule must be implemented in lieu of the distribution and inspection schedule prescribed in this Section subject to any conditions of approval established by the Executive Officer.
   b. The Executive Officer may rescind that approval for cause with written notification to the Co-permittee(s).
6. Co-permittees must inspect construction sites according to a checklist. The checklist must document, at a minimum, that the inspector:
   a. Verified that the site has been covered by the General Construction Permit, if applicable, during the initial inspection;
   b. Reviewed an Erosion and Sediment Control Plan, to verify that the BMPs on the site are appropriate for the phase of construction;
   c. Identified, through visual observation, any non-storm water discharges and potential pollutant sources;
   d. Assessed the effectiveness of BMPs implemented at the site; and
   e. Identified and communicated to the site representative non-compliance with requirements related to the control of discharges of pollutants to the Permittee's MS4s.
7. Co-permittees must address non-compliance with applicable ordinance(s), plans, permits, or other requirements related to the control of discharges of pollutants to their MS4s with a series of effective, progressive actions in order to compel compliance.
8. Completed inspections must be recorded in an electronic-format database. The database must be organized in a manner that is adequate to determine compliance with the requirements of this Order. Inspection records must be maintained a minimum of three (3) years from the date of the project's completion.
9. Construction site inspectors must be trained according to Section XVI of

this Order; inspectors must undergo training once per year.

10. The Executive Officer must be notified of any known, suspected, or threatened violation of applicable waste discharge requirements (i.e. State-wide General Construction Permit, etc.), discovered during inspections of construction sites according to Section XVII.C. of this Order. Such violations include, but are not limited to:
    a. Failure to obtain coverage under the applicable waste discharge requirements.
    b. Unauthorized discharges.
11. Except as provided for in Section XVII of this Order, Co-permittees must investigate complaints regarding potential or alleged discharge(s) of pollutants from construction sites, received by internal departments or divisions, external agencies, or the public, within three (3) business days of the complaint being brought to their attention.

IX. MUNICIPAL INSPECTIONS OF INDUSTRIAL SITES

A. Each Co-permittee must maintain an inventory of all industrial sites with the potential to discharge pollutants to the MS4 within its jurisdiction.
    1. Industrial sites shall be included in the Co-permittees' inventory regardless of whether the site is subject to the Statewide Industrial General Permit or other NPDES permit.
    2. The inventory of industrial sites must be updated through multiple mechanisms. The inventory must be updated yearly through reconciliation with other database inventories of businesses in each Co-permittee's jurisdiction. From all other sources, the inventory must be updated within 15 business days of the Co-permittee first becoming aware of the presence of a new site.
    3. Each Co-permittees' inventory of industrial sites must be maintained in an electronic-format database. The database records must include information on site/project ownership, project area, Industrial General Permits WDID (if any), and location (latitude/longitude in decimal-degrees or NAD83/WGS84 format).

B. Each Co-permittee must inspect industrial sites in their inventory. Each Co-permittee must have written policies and procedures that describe how inspections and related enforcement actions are carried out. Inspections and related enforcement actions must be carried out in a manner that consistently enforces compliance with applicable ordinance(s), plans, permits, or other requirements related to the control of discharges of pollutants to their MS4s.
    1. Co-permittees must categorize all industrial sites in their inventory as either "high-priority", "medium-priority", or "low-priority". Industrial sites must be inspected according to the following schedule:
        a. High-priority sites must be inspected once per year in their entirety.
        b. Medium-priority sites must be inspected once every two years.
        c. Low-priority sites must be inspected once every five years.

d. An inspection of an industrial site that is covered by the General Industrial Permit or other NPDES storm water permit and performed by Regional Board staff may be substituted for any one of the above-required inspections for the same site.
e. Where a Co-permittee determines that a site is out of compliance with requirements, the industrial site must be inspected, at a minimum, once per month until the site is in compliance.

2. An industrial site must be prioritized as high priority if the site meets any of the following criteria:
   a. The site is subject to Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 ("SARA");
   b. The site requires coverage under the General Industrial Permit (except for sites regulated according to "No Exposure Certification"-related requirements) or has coverage under an individual NPDES storm water permit;
   c. The site has a history of unauthorized non-storm water discharges;
   d. The site is tributary to, and within 500-feet of, an area defined by the Ocean Plan as an Area of Special Biological Significance ("ASBS").
3. Co-permittees must consider additional site- specific risk factors that could cause an industrial site to be categorized into a higher priority. These risk factors include, but are not limited to:
   a. quantity of materials or wastes used or stored outside;
   b. the potential for pollutants to be mobilized by storm water;
   c. facility size;
   d. proximity to a receiving water;
   e. the presence of an infiltration LID BMP that accepts "storm water associated with industrial activity"[7];
   f. the sensitivity of the receiving water to potential pollutants from the site (e.g. water bodies listed on the 303(d) List); AND
   g. any other relevant factors.
4. Any Co-permittee may propose an alternative priority category distribution of their industrial sites and implement the related inspection schedule within their jurisdiction subject to the written approval of the Executive Officer.
   a. The approved alternative distribution and schedule must be implemented in lieu of the distribution and inspection schedule prescribed in this Section subject to any conditions of approval established by the Executive Officer.
   b. The Executive Officer may rescind that approval for cause with written notification to the Co-permittee(s).
5. Co-permittees must conduct inspections of industrial sites according to a checklist. The checklist must document, at a minimum, that:
   a. During the initial inspection, the inspector verified that the site has been covered by the General Industrial Permit, if applicable;

[7] See the Industrial General Permit for a detailed definition of "storm water associated with industrial activity".

b. The inspector identified, through visual observation, any non-storm water discharges and potential pollutant sources;
c. The inspector assessed the effectiveness of BMPs implemented at the site;
d. The inspector documents evidence of non-compliance or threatened non-compliance with requirements related to the control of discharges of pollutants to the Co-permittee's MS4s.

6. Industrial site inspections must be recorded in an electronic-format database in a manner that is adequate to determine compliance with the requirements of this Order. Inspection records for a facility operator must be maintained for a minimum of five (5) years while in business and three (3) years following termination of business at the site.
7. Co-permittees must address instances of non-compliance with a series of effective, progressive actions to ultimately compel compliance.
8. Industrial site inspectors must be trained according to Provision XVI of this Order; inspectors must undergo training once per year.
9. The Executive Officer must be notified of any known, suspected, or threatened violation of applicable waste discharge requirements (i.e. State-wide General Industrial or Construction Permits, etc.), discovered during inspections of industrial sites according to Provision XVII.C. of this Order. Such violations include, but are not limited to:
   a. Failure to obtain coverage under the applicable waste discharge requirements.
   b. Unauthorized discharges.
10. Except as provided for in Provision XVII of this Order, Co-permittees must investigate complaints regarding potential or alleged discharges of pollutants from industrial sites, received by internal staff, external public agency staff, or the public, within three (3) business days of the complaint being brought to their attention.

X. MUNICIPAL INSPECTIONS OF COMMERCIAL SITES

A. Each Co-permittee must maintain an inventory of commercial sites listed in Subsection X.A.3 below within its jurisdiction.
   1. The inventory of commercial sites must be updated through multiple mechanisms. The inventory must be updated yearly through reconciliation with other database inventories of businesses in each Co-permittee's jurisdiction. From all other sources, the inventory must be updated within 15 business days of the Co-permittee first becoming aware of the presence of a new site.
   2. Each Co-permittees' inventory of commercial sites must be maintained in an electronic-format database. The database records must include information on the following attributes:
      a. site/business ownership;
      b. site area;
      c. any related approved Water Quality Management Plans and

associated structural treatment control BMPs; AND
d. location (latitude/longitude in decimal-degrees or NAD83/WGS84 format).

3. Commercial sites include, but are not limited to those engaged in the following:
   a. Aircraft maintenance, fueling, or cleaning;
   b. Animal care facilities such as petting zoos and boarding and training facilities;
   c. Automobile and other motor vehicle body repair or painting;
   d. Automobile impound and storage facilities;
   e. Automobile mechanical repair, maintenance, fueling, or cleaning;
   f. Botanical or zoological gardens;
   g. Building material retail and storage facilities;
   h. Cemeteries;
   i. Eating or drinking establishments, including food markets and restaurants;
   j. Golf courses, parks, and other recreational areas or facilities;
   k. Landscape and hardscape installation;
   l. Machinery and equipment repair, maintenance, fueling, or cleaning;
   m. Marina operations;
   n. Nurseries and greenhouses;
   o. Painting and coating;
   p. Pest control service facilities;
   q. Pool, lake and fountain cleaning;
   r. Portable sanitary service facilities;
   s. Transportation services for passengers, parcels or freight;
   t. Watercraft maintenance, fueling, or cleaning;
   u. Any commercial sites that is tributary to, and within 500-feet of, an area defined by the Ocean Plan as an Area of Special Biological Significance; AND
   v. Other commercial sites that the Co-permittee determines may be a significant contributor of pollutants to the MS4.

B. Each Co-permittee must inspect commercial sites in their inventory. Inspections must occur according to written processes and procedures, and in a manner to enforce compliance with ordinance(s), plans, permits, WQMPs, or other requirements related to the control of discharges of pollutants to their MS4s.
   1. Co-permittees must prioritize all commercial sites (except for eating or drinking establishments, see Subsection X.C. below) in their inventory as either “high-priority”, “medium-priority” or “low-priority”.
   2. Each Co-permittee must categorize a minimum of 5% of their inventoried commercial sites as “high-priority”; a minimum of 15% of their inventoried commercial sites as “medium-priority”; and the remainder as “low-priority”.
   3. Prioritized commercial sites must be inspected according to the following schedule:
      a. High-priority sites must be inspected once per year in their entirety.
      b. Medium-priority sites must be inspected once every two years.
      c. Low-priority sites must be inspected once every five (5) years.

4. Any Co-permittee may propose an alternative priority category distribution of their commercial sites and implement the related inspection schedule within their jurisdiction subject to the written approval of the Executive Officer.
    a. The approved alternative distribution and schedule must be implemented in lieu of the distribution and inspection schedule prescribed in this Section subject to any conditions of approval established by the Executive Officer.
    b. The Executive Officer may rescind that approval for cause with written notification to the Co-permittee(s).
5. Where a Co-permittee determines that BMPs or their maintenance is inadequate or out of compliance, the commercial site must be re-inspected within two weeks until BMPs and their maintenance is adequate or in compliance.
6. If Regional Board staff inspects a commercial site, the Co-permittee may substitute Regional Board staff's inspection for an inspection required under this Order for the same site.
7. Co-permittees must exercise their discretion and consider site-specific factors that could cause a commercial site to be categorized into a higher priority. These factors include, but are not limited to, soil erosion potential, site slope, proximity to a receiving water, and the sensitivity of the receiving water to potential pollutants from the site.
8. Co-permittees must conduct inspections of commercial sites according to a checklist. The Co-permittees must use the checklist to document, at a minimum, that:
    a. The inspector identified, through visual observation, any non-storm water discharges, evidence of non-storm water discharges, and potential pollutant sources;
    b. The inspector assessed the effectiveness of BMPs implemented at the site;
    c. The inspector documented evidence of non-compliance or threatened non-compliance;
    d. If the inspector identifies non-compliance or a threat of non-compliance with relevant requirements, or determines that BMPs are ineffective; the inspector notified the site operator and provided the applicable BMP Fact Sheet(s) and any other relevant published educational materials.
9. Commercial site inspections must be recorded in an electronic-format database in a manner that is adequate to determine compliance with the requirements of this Order. Inspection records for a site operator must be maintained for a minimum of five (5) years while in business and three (3) years following the termination of business at the site.
10. Co-permittees must address non-compliance with a series of effective, progressive actions to ultimately compel compliance.
11. Commercial site inspectors must be trained according to Provision XVI of this Order; inspectors must undergo training once per year.
12. The Executive Officer must be notified of any known, suspected, or

threatened violation of applicable waste discharge requirements (i.e. State-wide Construction Permit, etc.), discovered during inspections of commercial sites according to Provision XVII of this Order.

13. Except as provided for in Provision XVII of this Order, Co-permittees must investigate complaints regarding potential or alleged discharges of pollutants from commercial sites, received by internal departments or divisions, external agencies, or the public, within three (3) business days of the complaint being brought to their attention.

C. The Co-permittees must inspect eating or drinking establishments annually or cause such inspections to occur on their behalf by another party. These third-party inspections are anticipated to occur as part of the Orange County Health Care Agency ("HCA") restaurant inspection program.

1. The inspections must occur, in part, to enforce the local Co-permittee's requirements related to the control of discharges of pollutants to their MS4s (See Section III).
2. Where the inspecting agency staff observes known or suspected violations of a local Co-permittee's requirements related to the control of discharges of pollutants to their MS4s, the known or suspected violation must be referred to the Co-permittee within two (2) business days of the inspection date.
3. Co-permittees must respond to referrals from the HCA or other third-party within three (3) business days of the matter being brought to their attention.

D. **Mobile Businesses:** The Co-permittees must implement an enforcement and outreach program for the following mobile businesses operating in the permit area: automobile wash/detail services, carpet cleaners, and pet services. The purpose of the program must be to identify potential dischargers and eliminate illicit non-storm water discharges into the MS4.

XI. WATERSHED MANAGEMENT PLANS

In response to determinations that a discharge of urban runoff is causing or contributing to an exceedance of water quality standards or to exceedances of a WQBEL, the responsible Co-permittees may develop and fully implement plans to address these exceedances according to the requirements of this Section XI. The development and implementation of these plans will serve as a means to comply with receiving water limitations in Section IV (*Receiving Water Limitations*) and with WQBELs whose final deadlines have not yet passed in Section XVIII (*Total Maximum Daily Load Implementation*). Co-permittees may also develop plans without waiting for the results of water quality monitoring, analysis, and reporting to indicate that urban runoff is causing or contributing to exceedances of water quality standards or exceeding WQBELs. Whether a plan is initiated reactively or proactively, the responsible Co-permittees' full compliance with the following requirements will constitute compliance with receiving water limitations in Section IV and with those WQBELs that implement WLAs whose final deadlines have not yet passed in Appendices B through H according to the procedures in Section XVIII.

A. The responsible Co-permittees must provide written notice to the Executive Officer of their intent to develop a Watershed Management Plan (WMP) to achieve water quality standards and/or WQBELs within a watershed according to the following requirements:
    1. The notice must include a schedule for the development of the draft WMP.
        a. The schedule must include a work breakdown structure for the completion of discrete tasks and the achievement of specific milestones in the development of the draft plan. The plan development schedule must identify a minimum of three (3) critical milestones. The schedule must be sufficiently detailed to allow early detection of variances that may cause the Co-permittees to miss critical milestones or the final deadline. Deadlines may be either fixed dates or floating deadlines (e.g. “thirty days from”).
        b. The plan development schedule must be as short as practical, but the date for submitting a final draft WMP must not have a deadline that exceeds 12-months from the date of the notice. The Regional Board and the Executive Officer may approve extensions of time for meeting critical milestones and the final deadline. The Executive Officer may not approve extensions that exceed 6 months in total. For the duration of the extension period, the responsible Co-permittees must demonstrate compliance with receiving water limitations in Section IV and with applicable WQBELs according to Section XVIII.
        c. All deadlines must be part of a measurable and verifiable schedule.
        d. The development schedule is subject to the approval of the Executive Officer. The Executive Officer is authorized to approve subject to conditions. Upon approval, the responsible Co-permitttees must implement the development schedule according to the critical milestones and final submittal deadline.
    2. The notice must also:
        a. Identify the responsible Co-permittees who will be participating in the development of the WMP.
        b. Include copies of executed or draft agreements that are necessary to fund the development of the WMP.
        c. Provide the contact information for representatives for each of the responsible Co-permittees.
        d. Describe the management area (watershed or sub-watershed) over which the plan will apply.
        e. Describe any models or similar analyses that may be used to prepare the draft WMP according to Provision XI.E.8. below.
B. The responsible Co-permittees must implement the development schedule for the draft WMP according to the critical milestones and final deadline provided in their notice except as follows:
        a. Any changes to the critical milestones and final deadline must be requested in writing and are subject to the approval of the Executive Officer or the Regional Board. The Executive Officer may approve extensions of time not to exceed 6 months in total. For the duration

where the extension period causes them to deviate from the original development schedule, the responsible Co-permittees must demonstrate compliance with receiving water limitations in Section IV and with applicable WQBELs according to Section XVIII.

b. Any written request for a change in the development schedule must include a statement of the purpose and need for the change.
c. The Executive Officer will provide a minimum of 10 days for public review of a request for a change prior to approving the request. Written requests must be received not less than 10-days prior to the affected scheduled deadline.

C. WMPs may be developed for more than one pollutant or for similar classes of pollutants.
D. The responsible Co-permittees must describe programs and projects in their Watershed Management Plan(s) which prioritize pollutants which are most likely to cause or contribute, or are known or suspected of causing or contributing to exceedances of water quality standards and WQBELs. The projects and programs must be designed to be carried out to reduce those pollutants in urban runoff according to a measurable and verifiable schedule. The responsible Co-permittees will prioritize pollutants based on any available information that is relevant to actual or probable exceedances of water quality standards and WQBELs, including, but not limited to the following:
    1. Water quality information collected as part of efforts to detect illicit discharges and illicit connections;
    2. Information collected as part of inspections of industrial, commercial, and construction sites;
    3. Reports regarding pollutant source investigations;
    4. The results of watershed modeling studies; and
    5. Analyses of outfall monitoring data or receiving water monitoring data.
    6. The status of the receiving water on the Clean Water Act Section 303(d) list of impaired waters.

E. The plan's projects and programs must be designed by the responsible Co-permittees to cause discharges of urban runoff from their MS4s to comply with relevant water quality standards and WQBELs. The WMP contents must include the following:
    1. A description of the pollutant(s) that are most likely to cause or contribute, or are known or suspected of causing or contributing to exceedance(s) of water quality standards and/or WQBELs and a description of the supporting information and rationale used to identify the pollutant(s).
    2. A description of the persons or activities known or suspected of being the source of the pollutant(s); a description of other potential sources which were considered and excluded; and a description of the supporting information and rationale.
    3. A description of the BMPs that were being employed to control the pollutant(s). The description must be adequate to fully characterize the

baseline conditions under which exceedances have occurred or may occur.

4. A description of any proposed new BMPs or modifications of currently-employed BMPs. BMPs may include:
    a. Execution of studies or pilot programs that fill information gaps in storm water pollution control science and support the effective employment of BMPs.
    b. Modification or substitution of procedures or practices at facilities owned or controlled by the responsible Co-permittees.
    c. Modifications of the messages and target audiences of public education campaigns.
    d. Adoption and enforcement of ordinances or standards designed to reduce certain pollutants.
    e. Incentive programs designed to discourage, substitute, or preempt certain polluting practices.
    f. Incentive programs designed to encourage source control, site design, and structural treatment control BMPs in existing development (retrofit programs).
    g. Planning and execution of stream or habitat restoration or rehabilitation projects that provide or contribute to demonstrable improvements in the physical, chemical, and biological integrity of and to achievement of water quality standards in receiving waters.
    h. Planning and implementation of regional or sub-regional structural treatment control BMPs.
    i. Adoption and pursuit of land-use or transportation planning goals and objectives that implement and support LID.
5. A time schedule for the implementation of new BMPs or modifications of currently-employed BMPs, to prevent or reduce the pollutant(s). The description must be adequate to measure and verify progress towards implementation and implementation of the BMPs by the responsible parties[8]. BMPs that are required by a WQBEL must be carried out according to the schedule specified in the related TMDL.
6. A final date by which the responsible Co-permittees expect to cause discharges to comply with WQBELS or when water quality standards are expected to be met. The final date must be as short as practicable, taking into account the technological, operation, and economic factors that affect the design, development, and implementation of BMPs; or otherwise must not exceed any applicable final deadline for WQBELs in Appendices B through H.
7. A detailed strategy for financing implementation of the plan. The strategy must be completed by qualified persons using suitable standard practices (e.g. discounting, sensitivity analysis, disclosure of assumptions and limitations, etc.).
8. An objective analysis which provides a reasonable assurance that the new or modified BMPs can be expected to cause discharges to achieve

[8] Also known as a Work Breakdown Structure (WBS).

the applicable WQBELS or water quality standards are expected to be met.

a. The analysis must be supported, in part, by peer-reviewed models that are in the public domain unless a determination can be made, to the satisfaction of the Executive Officer, that an appropriate model and/or a suitable dataset for use in a model are not available.
b. The analysis must include an assessment of the internal strengths and weaknesses of the plan, including entities responsible for its implementation, and the external opportunities and threats which may affect the likelihood of successfully achieving and/or maintaining compliance with water quality standards and WQBELs.
c. The analysis must be in substantial conformance with written guidance developed or referenced by Regional Board staff.

9. Proposed revisions to the Monitoring and Reporting Program designed to evaluate the effect of implementing the Watershed Management Plan on receiving water quality.

F. The draft WMP is subject to review and approval by the Executive Officer. The Executive Officer is authorized to approve the draft plan, subject to conditions. The Executive Officer may also elect to seek consideration by the Regional Board of the draft plan.
G. The Executive Officer will provide at least a 30-day public review period prior to consideration by the Executive Officer or Regional Board of any draft WMP or any proposed amendments to an already-approved (final) WMP.
H. The draft WMP becomes a final plan upon approval by the Executive Officer or the Regional Board and must be fully implemented by the responsible Co-permittees according to critical performance measures identified in the plan or by the Executive Officer as part of conditions of approval.
I. The responsible Co-permittees must provide any information that is missing from their draft WMP, and/or submit changes to the draft plan pursuant to a written request by the Executive Officer by a date specified in the request.
J. The development, review and approval process of a WMP will occur according to the schedule shown in Table 3 below:

Table 3: Schedule for the Development, Review, and Approval of Watershed Management Plans

Step	Deadline
The responsible Co-permittees submit notice of intent to develop a plan to comply with water quality standards and/or WQBELs.	No deadline.

Initial draft is submitted to the Executive Officer.	Not more than one year from the date the Regional Board receives the written notice of intent to prepare a WMP.
The Executive Officer completes the initial review of the draft plan, determines if the initial draft is complete according to the required contents, and notifies the responsible Co-permittees of any missing information or any instructions for amendments in writing.	Within 60-days of receipt of the initial draft WMP.
The responsible Co-permittees provide any missing information to complete the initial draft plan and/or provide a second draft amended according to the Executive Officer's written instructions.	Within 60-days of receipt of the Executive Officer's written notice.
The Executive Officer provides draft conditions of approval for the draft plan, if any, to the responsible Co-permittees.	Within 60-days of receipt of a complete draft WMP which has been amended according to the Executive Officer's instructions.
The Executive Officer provides the complete, amended draft plan and any proposed conditions of approval for public notice.	Not less than 30-days prior to the expected date of approval of the draft plan.

K. The responsible Co-permittees must make the final WMP, as later amended or revised, accessible to the public by posting the plan to their web site(s), the Principal Permittee's web site, or another method acceptable to the Executive Officer.
L. Except for non-substantive grammatical or technical corrections, the final WMP may be amended by the Co-permittees only with the approval of the Executive Officer.
M. Plan amendments must be requested in writing and are subject to the approval of the Executive Officer. All proposed amendments must include an explanation of the purpose and need for the amendments. The Executive Officer will respond to requests for amendments within 60-days of receipt of the request. The Executive Officer may either: (1) request additional information, (2) approve the proposed amendments as is, (3) approve, subject to conditions, or (4) reject the proposed amendments.
N. In carrying out approved WMPs, the responsible Co-permittees are subject to all of the relevant management requirements of this Order. This includes, but is

not limited to requirements related to legal authority to carry out the approved WMP; execution of inter-agency and inter-Co-permittee agreements; execution of the "iterative process"; the performance of program effectiveness assessments using valid performance measures; and the collection and use of monitoring data to evaluate and improve the effectiveness of projects and programs described in the WMP.

O. The effective requirements of the approved WMPs shall supplement and complement the requirements of this Order, unless provisions of this Order allow otherwise.

P. Performance measures (inclusive of non-critical milestones) developed by the responsible Co-permittees for the BMPs in the WMPs will not be regarded as enforceable unless specified otherwise in the WMP or as part of the Executive Officer's conditions of approval (critical performance measures). However, as with any performance measure, the responsible Co-permittees must use them constructively to improve projects and programs in order to achieve or maintain water quality standards or WQBELs according to the requirements of this Order.

Q. Where regional and sub-regional structural treatment control BMPs are proposed in the WMPs and such facilities are not subject to requirements pertaining to project WQMPs, the Executive Officer and the responsible Co-permittees must provide that regional and sub-regional structural treatment control BMPs comply with the requirements of Section XII.D. (*General Requirements for Structural Treatment Control BMPs*) of this Order and, if applicable, Sections XII.K. (*Specific Requirements for Infiltration LID BMPs*) and XII.L. (*Specific Requirements for Harvest and Use LID BMPs*).

R. If, despite the implementation of the final approved WMP, cycles of monitoring, analysis, and reporting continue to result in determinations that there are continuing or recurring exceedances of water quality standards or WQBELs that are caused or contributed to by discharges of urban runoff, the responsible Co-permittees must reinitiate the planning procedures in this Section. Successive iterations must include in the new draft WMP, in summary:
    1. Revised compliance schedule;
    2. an updated objective analysis which provides reasonable assurance that relevant RWLs or WQBELS will be met ;
    3. modifications to BMPs;
    4. additional BMPs; and
    5. if appropriate, changes to the monitoring program.

S. Compliance Determination
    1. A submitted notice to prepare a draft WMP, compliance with the critical milestones and final deadline in a draft WMP development schedule, or implementation of an approved final WMP according to the requirements of this Order will serve as a mechanism to comply with receiving water limitations in Section IV (*Receiving Water Limitations*) and with WQBELs whose final deadlines have not yet passed in Section XVIII (*Total Maximum Daily Load Implementation*).
    2. In the absence of a submitted notice to prepare a draft WMP, compliance with the critical milestones and final deadline in a development schedule for a draft WMP, or implementation of an approved final WMP according

to the requirements of this Order, the responsible Co-permittee must comply directly with the receiving water limitations in Section IV and achieve the WQBELs in Appendices B through H according to the requirements of Section XVIII; compliance will be verified through a process developed for this purpose in the Water Quality Monitoring Plan.

3. In the event that the Executive Officer determines that the Co-permittees have failed comply with any of the provisions in this Section related to developing a draft plan, or to fully implementing a final plan, the Executive Officer may provide written Notice to the responsible Co-permittees and provide not more than 90-days from the date of the Notice to correct the deficiencies.
    a. If, after issuance of written Notices, a Co-permittee repeatedly fails to come into compliance with the requirements of this Section XI, either through performance of the requirement or by pursuing an acceptable amendment of the WMP, the Executive Officer may conclude that the Co-permittee has constructively abandoned development or implementation of the WMP.
    b. Upon concluding that the WMP has been constructively abandoned, the Executive officer will provide written notice to the responsible Co-permittee that they have been relieved of responsibility for developing a draft WMP or implementing the approved final WMP and direct the responsible Co-permittee to immediately comply with the receiving water limitations and WQBELs.
    c. Once the Executive Officer has issued any written Notice to the responsible Co-permittee, any action taken by the responsible Co-permittee(s) as a means to come back into compliance does not preclude any additional enforcement action by the Executive Officer or the Regional Board for violations of the requirement(s) in effect at the time of the Notice. The Executive Officer will make Notices issued according to this Subsection XI.S. available for public review.
4. Where the responsible Co-permittee(s) believe that additional time is necessary to comply with an interim milestone or final deadline identified in a WMP with the exception of those final compliance dates established in a TMDL, the Co-permittee(s) may request an extension by way of amending the WMP, subject to public review. The requested extension must be provided to the Executive Officer and for public review not less than 30 days prior to the milestone or deadline and shall include the purpose and need for the extension. Extensions approved by the Executive Officer may not cause or allow a Co-permittee to exceed a final compliance date established in a TMDL.
5. If, during the development phase for a WMP, the responsible Co-permittees are granted an extension of time to meet critical milestones or the final deadline for the submission of a draft WMP, the responsible Co-permittees must demonstrate compliance with receiving water limitations

in Section IV and with those WQBELs that implement WLAs whose final deadlines have not yet passed in Appendices B through H during the period where the extension causes them to deviate from the original development schedule.

6. Where the responsible Co-permittee(s) believe that additional time is necessary to comply with a final deadline for a WQBEL, the Co-permittee(s) may request a time schedule order pursuant to California Water Code Section 13300. The request must be in writing and received by the Regional Board not less than 180-days before the final deadline.

XII. NEW DEVELOPMENT (INCLUDING SIGNIFICANT REDEVELOPMENT)

A. Planning Requirements

1. Each Co-permittee must adopt and implement policies and procedures that are effective at integrating source control, site design and structural treatment control BMPs as early in the land-use planning and development process as practicable.
2. The Executive Officer or his designee, must be given the appropriate notices where a Co-permittee initiates an amendment or update of their General Plan which may directly, indirectly, or cumulatively impact beneficial uses, consistent with the requirements of Government Code Section 65350 *et seq*. This requirement does not diminish any other obligations of the Co-permittees' to provide notice to the Regional Board as a Responsible Agency pursuant to CEQA.
3. Within 12-months of the effective date of this Order, the Principal Permittee must review, update and submit to the Executive Officer any studies performed to examine feasible opportunities to retrofit existing storm water conveyance systems, parks, and other recreational areas with regional or sub-regional structural treatment control BMPs. The update shall expand the scope of the examination to include areas owned or controlled by the Co-permittees. If necessary, work necessary to complete only the expanded scope may be phased, but all phases must be completed no later than 36-months from the effective date of this Order.
4. Within 12 months of the effective date of this Order, the Principal Permittee must, in coordination with the groundwater management agencies, develop a water quality monitoring project to assess the potential impacts of storm water infiltration on groundwater quality. The project shall consider other similar studies that have been conducted to ensure that this project will complement those studies and add new data and/or information. The monitoring project may be conducted by: (1) analyzing the quality of the runoff prior to infiltration; (2) by monitoring the quality of the infiltrate through the vadose zone; and/or (3) by monitoring groundwater quality upstream and downstream of the infiltration systems. The project shall be implemented over the permit term and reported on

within the Annual Progress Report.

B. Classifying and Processing Priority and Non-priority Projects

1. The requirements of Section XII.B., and subsequent sub-sections of Section XII., apply to initial project applications received by the Co-Permittees beginning 90-days after the effective date of this Order (50-days following adoption) and thereafter. For projects initiated by the Co-permittees, the requirements apply to projects where design has been initiated 90-days after the effective date of this Order and thereafter. In the interim, the relevant requirements of Order No. R8-2009-0030 shall apply.
2. Each Co-permittee must classify development and redevelopment projects over which they have approval authority as "priority projects" (see Subsection XII.B.5. below) or "non-priority projects". Non-priority projects may be further subdivided by the Co-permittees into those requiring Non-priority Project Plans and those that do not, as described in Subsection XII.M.
3. Each Co-permittee must employ a standardized form, checklist, or similar mechanism to document the basis for classifying a project as a priority project or a non-priority project.
    a. Each Co-permittee is responsible for ensuring the accuracy of information relied on in support of the Co-permittee's classification.
    b. The Co-permittees must maintain records of the basis for classification for a minimum of five years following the completion of the project.
4. Co-permittees must consider the whole of the project in classifying a project; the Co-permittees must not piecemeal a project.
5. Each Co-permittee must regard projects that fit any of the following categories of projects as priority projects; all other projects may be regarded as non-priority projects:
    a. <u>Significant redevelopment projects</u> that include the addition or replacement of 5,000 square feet or more of impervious surfaces on a developed site.
        i. Redevelopment projects do not include those areas where impervious surfaces are replaced as part of routine maintenance activities, or as part of activities that are conducted to maintain the original line and grade, hydraulic capacity, or original purpose of a facility.
        ii. Redevelopment projects do not include those areas where impervious surfaces are replaced as part of the replacement, upgrade, or installation of dry utilities (e.g. gas, electric, and telecommunications), sanitary sewer, petroleum pipelines, or water distribution lines in existing rights of way.
        iii. Where a redevelopment project results in the addition or replacement of 50% or less of the impervious surfaces of an existing developed site, and the existing development was not subjected to a properly-implemented and properly-

approved WQMP, the numeric sizing requirements for structural treatment control BMPs apply only to runoff from the impervious areas added or replaced and not from the entire developed site.

iv. Where a redevelopment project results in the addition or replacement of more than 50% of the impervious surfaces of an existing developed site, the numeric sizing requirements must be applied to runoff from the entire development.

b. New developments that create a total of 10,000 square feet or more of impervious surfaces, including commercial, industrial, and mixed-use developments; public and private capital improvement projects; and subdivisions for single and multi-family dwelling units. This category includes public or private land development projects subject to the planning and building authorities of the Co-permittees.

c. New automotive repair shops that engage in activities described by Standard Industrial Classification ("SIC") codes 5013, 5014, 5541, 7532 through 7534, and 7536 through 7539.

d. Restaurants where the area of land development is 5,000 square feet or more.

e. Hillside developments affecting 5,000 square feet or more, in areas with known erosive soil conditions or where the natural slope is 25% or more.

f. Development that includes the construction of 2,500 square feet or more of impervious surface that is located within 200 feet of, or which discharges the site's runoff into an Environmentally Sensitive Area where the discharge is not commingled with discharges from other sites.

g. Parking lots, or other land areas or facilities for the temporary storage of motor vehicles, that includes the construction of 5,000 square feet or more of impervious surface exposed to storm water.

h. Street, road, highway and freeway improvement or construction projects affecting 5,000 square feet or more of paved surface used for the transportation of vehicles.

i. This category excludes routine maintenance to restore or preserve the surface type and line and grade.

ii. Project WQMPs for this category must be consistent with the USEPA's *Managing Wet Weather with Green Infrastructure Municipal Handbook: Green Streets*[9].

i. New retail gasoline outlets of 5,000 square feet or more and with a projected average daily traffic of 100 or more vehicles per day.

6. Each Co-permittee must require a preliminary WQMP or a non-priority project plan, where such plans apply, as part of a complete application for a

[9] Lukes, Robb and Kloss, Christopher, *Managing Wet Weather with Green Infrastructure Municipal Handbook: Green Streets*, USEPA, Low Impact Development Center, EPA-833-F-08-009, December 2008. Available at: http://water.epa.gov/infrastructure/greeninfrastructure/upload/gi_munichandbook_green_streets.pdf

project. Both the preliminary WQMP and non-priority project plan must be subject to the Co-permittee's approval. A preliminary WQMP must be approved prior to the project's approval by the Co-permittee's decision-making body (e.g. staff, city council, Board of Supervisors, etc.).

7. A WQMP or Non-Priority Project Plan is not required for a project which, in its entirety, is necessary to mitigate an emergency.
8. The Co-permittees' staff, contractors, or vendors responsible for preparing, reviewing or approving WQMPs or non-priority project plans or for enforcing their implementation must be trained according to Section XVI of this Order.
9. Each Co-permittee must employ an effective mechanism to inform potential project applicants of the need for a preliminary WQMP or a non- priority project plan as part of a complete application prior to the submittal of an application.
10. A Co-permittee must not allow precise grading or final construction work to proceed on the subject phase of a project prior to approval of a final project WQMP or non-priority project plan for that phase.
11. Each Co-permittee must have an effective process that enforces substantial conformance between relevant project plans (i.e. grading plans, drainage plans, landscaping plans, etc.) and the approved preliminary and final project WQMP or non-priority project plans.
12. Each project WQMP or non-priority project plan approved by the Co-Permittees must contain sufficient information to demonstrate that the final WQMP or non-priority project plan was approved according to the requirements of this Order.
13. Each Co-permittee must have effective standard processes to ensure that the final project WQMP and non-priority project plan is internally consistent and free of material contradictions.
14. As part of the project approval process, each Co-permittee must apply standard conditions of approval, or some other effective measure(s), that requires the proper operation and maintenance of all source control, site design, and structural treatment control BMPs by the project applicant, their successors and assigns over the life of the project according to the final approved project WQMP or non-priority project plan. Each Co-permittee must effectively enforce the measure(s) accordingly.
15. Each Co-permittee must implement an effective program to identify and correct missing, damaged, or deficient source control, site design, and structural treatment control BMPs during the construction or development of priority and non-priority projects.
16. In addition to using published and generally-accepted engineering design criteria (see Subsection D below), each Co-permittee must develop, publish, and apply guidelines developed for the purpose of providing that site design and structural treatment control BMPs be readily inspected and maintainable and generally of a quality that is satisfactory to the Co-permittee.
17. Co-permittees are prohibited from permitting final occupancy or otherwise effectively issuing final approval of a priority or non-priority project site

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which requires a project WQMP or a Non-Priority Project Plan until all source control, site design, and, where applicable, structural treatment control BMPs are constructed, serviceable, and satisfactory to the Co-permittee or otherwise certified as such by a licensed professional engineer and by the project applicant.

a. Serviceable facilities must be in working order and operate as intended; where the Co- Permittee is unable to conclusively determine that a facility is serviceable, the Co-permittee must require that the project applicant conduct and document a satisfactory field demonstration.
b. Where deficiencies exist, the Co-permittee may permit final occupancy or issue final approval only if written enforcement action is taken and a time schedule to bring the site into compliance with its WQMP or non-priority project plan has been approved by the Co-permittee.
c. Co-permittees must require that certifications by the licensed professional engineer be affixed with said engineer's stamp and maintained as part of the WQMP or non-priority project plan.

18. Each Co-permittee must have effective standard processes that provide the following:
    a. Approved final project WQMPs and non-priority project plans are retained using a system that allows for their ready retrieval for the life of the project.
    b. The Co-permittee is able to validate the authenticity of approved final project WQMPs and non-priority project plans.
    c. Approved final WQMPs and non-priority project plans are protected by the Co-permittee's standard record protection practices in the event of fire, information system failure or attack, or other loss or damage.
    d. Documentation of a written acknowledgement of the obligations on the project proponent as established in the final project WQMP and the related municipal ordinance(s),

C. General Requirements for Priority Projects

1. Co-permittees must require priority projects to use source control, site design, and structural treatment control BMPs to remove pollutants in urban runoff [10]. These BMPs and other information necessary to demonstrate compliance with this Order must be documented in a project WQMP.
2. Source control, site design, and structural treatment control BMPs must be designed to maximize retention of the site's design capture volume unless such measures pose an unmitigatable environmental hazard.
3. Project WQMPs must be prepared in substantial conformance with uniform written technical guidance[11]. The technical guidance must implement the

[10] See Glossary for the meaning of "structural treatment control BMP".
[11] This guidance is anticipated to consist of the 2011 Model Water Quality Management Plan and its accompanying

requirements of this Order for the benefit of persons responsible for preparing, reviewing and approving, enforcing, and implementing WQMPs.

4. Project WQMPs must be prepared by or under the supervision of a registered civil engineer or licensed landscape architect (See Provision XII.D.9. below).
5. Final project WQMPs must be approved by or under the supervision of a registered civil engineer acting on behalf, and with the expressed permission, of the Co-permittee.
6. Each Co-permittee must employ effective, uniform mechanisms to provide efficiency and consistency in their WQMP-approval process. The mechanisms must be subject to a bi-annual review by the Co- Permittees for the purpose of promoting the mechanisms' continual improvement. Such mechanisms may include the following:
    a. Use of written standard instructions, processes, procedures, and methods.
    b. Use of standardized paper forms, checklists, and worksheets.
    c. Use of model language for project WQMPs or categories of project WQMPs.
    d. Use of standardized models, spreadsheets, web-based tools, and other software.
    e. Prepared maps, tables and other sources of information necessary for preparers and reviewers to evaluate the feasibility of structural treatment control BMPs.
7. The Co-permittees must provide and promote a mechanism for stakeholder input in the continual improvement process for the preparation, review, enforcement, and implementation of WQMPs.
8. Co-permittees must require project proponents to identify, in each approved project WQMP, a source of available funding and a party that will be legally responsible for the long-term performance, operation, and maintenance of source control, site design, and on-site or off-site structural treatment control BMPs over the life of the project.
9. Co-permittees must provide that approved WQMPs are maintained in public records in a manner that allows for their discovery by interested parties and facilitates the transfer of responsibility in the event of the sale, lease, or other transfer of ownership or control of the affected site.
10. Co-permittees must provide that any covenants, conditions, and restrictions, easements or other similar mechanisms necessary for the implementation of an approved WQMP are properly maintained in public records with the County and/or the relevant city.
11. Co-permittees must maintain an electronic database adequate to identify sites affected by an approved WQMP.
    a. The database must be established within 6-months of the effective

date of this Order. The database must include records identifying all structural treatment control BMPs installed after May 22, 2009 and their following attributes:

i. Type of structural treatment control. If a 'type' does not comply with Provision XII.C.5., the facility must be identified as "undetermined".
ii. For infiltration LID BMPs: depth of invert and screen interval, if applicable.
iii. Standards applied to the design of the facility.
iv. Location by watershed and by a scale sufficient for location in the field.
v. Date of construction or date first placed in service.
vi. Identifying information for the party responsible for maintenance and their contact information, including emergency contact information.
vii. Actual or alleged performance, maintenance, or nuisance problems identified during any site inspections by the Co-Permittees or brought to their attention.

b. Information regarding WQMPs that were approved prior to May 22, 2009 must populate the database on an opportunistic basis.
c. Sites that are part of the Co-permittees' industrial and commercial inspection program inventories and which are subject to any approved WQMPs must have their information populated in the database no later than 60 months from the effective date of this Order.

12. Co-permittees must refer nuisance problems associated with structural treatment control BMPs to the Orange County Vector Control District within 5 business days of the problem becoming known. The Co-Permittees must cooperate in good faith with the Orange County Vector Control District to remedy any confirmed nuisance problems.

D. General Requirements for Structural Treatment Control BMPs

1. Structural treatment control BMPs must be sized to infiltrate, filter, or remove pollutants from the design capture volume or design capture flow from their respective tributary areas as required by this Subsection (Subsection XII.D.).
2. The Co-permittees must have effective processes and policies in their written technical guidance that provide that the selection of structural treatment control BMPs conforms to the requirements of Subsections XII.E. through M. and XII.P. of this Order (See also ProvisionXII.C.3.).
3. A singular or set of structural treatment control BMPs that are <u>volume-</u>based must be sized to infiltrate, filter, or remove pollutants from any of the following design capture volumes from their tributary area:
    a. The volume of runoff produced by a 24-hour, 85th percentile storm event. The volume must be calculated using the County of

Orange's 85th Percentile Precipitation Isopluvial map.

b. The volume of annual runoff produced by the 85th percentile, 24-hour rainfall event, determined as the maximized capture storm water volume for the area, from the formula recommended in Urban Runoff Quality Management, WEF Manual of Practice No. 23/American Society of Civil Engineers Manual of Practice No. 87 (1998).
b. 80% or more of the annual runoff volume, based on published and generally accepted methods (e.g. *California Stormwater Best Management Practices Handbook – Industrial/Commercial*).
c. The volume of runoff, as determined from the local historical rainfall record, that achieves approximately the same reduction in pollutant loads and flows as would be achieved by treatment of the volume of runoff produced by an 85th percentile, 24-hour rain event.

4. A singular or set of structural treatment control BMPs that are flow-based must be sized to infiltrate, filter, or remove pollutants from any of the following design flows from their tributary area:
   a. The maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour, for each hour of a storm event.
   b. The maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity, as determined from the local historical rainfall record, multiplied by a factor of two.
   c. The maximum flow rate of runoff, as determined from the local historical rainfall record, which achieves approximately the same reduction in pollutant loads and flows as would be achieved by treatment of the flow produced by the 85th percentile hourly rainfall intensity multiplied by a factor of two.
5. Structural treatment control BMPs intended to retain the design capture volume must be designed to infiltrate, evaporate, evapotranspire, or use the volume over a period not to exceed 48-hours; this drawdown period may be extended or shortened provided that the combination of design capture volume and drawdown time achieve retention of 80% or more of the average annual storm water runoff. Any remaining volume must be passed on to another structural treatment control BMP selected according to the requirements of this Order.
6. The design capture volume or flow may be treated by routing the runoff through multiple structural treatment control BMPs organized in series or parallel. Co-permittees must require that the design capture volume or flow be calculated for each area tributary to a structural treatment control or group of structural treatment control BMPs.
7. Co-permittees must require practical and durable mechanisms designed to indicate the need for maintenance of structural treatment control BMPs for the benefit of the party responsible for long-term maintenance. The mechanism(s) must be readily identifiable and located on, within, or in close proximity to structural treatment control BMPs; such mechanisms must be documented in the related approved project WQMP.

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8. Prior to approval, Co-permittees must identify a party that will be responsible for the long-term operation and maintenance of structural treatment control BMPs.
9. Structural treatment control BMPs must be sized and designed by, or under the direction of, a registered civil engineer.
10. Structural treatment control BMPs must incorporate design features to minimize the entrainment and bypass of captured pollutants in the course of routine maintenance, normal operation, or overflow.
11. Where a structural treatment control BMP satisfies all requirements of this Order except that it is undersized relative to the volume or flow that it accepts from its tributary area, Co-permittees must require that the WQMP disclose any unconventional operation and maintenance requirements for the facility that are necessary to maintain the performance of the facility or to address unusual hazards.
12. Co-permittees must conduct inspections of all approved structural treatment control BMPs according to the following schedule:
    a. All privately-owned or operated structural treatment control BMPs, must be inspected a minimum of once every 5 years[12].
    b. All Co-permittee-owned or operated structural treatment control BMPs must be inspected annually prior to the wet season (October 1st).
13. Structural treatment control BMPs must not cause a condition of nuisance or pollution, as defined in CWC Section 13050.
14. Structural treatment control BMPs must not cause or contribute to an exceedance of groundwater quality objectives.
15. Structural treatment control BMPs must not be approved in a final WQMP if they are located within waters of the U.S. unless the related discharges have been authorized pursuant to a Clean Water Act Section 401 Water Quality Standards Certification, waste discharge requirements, or waiver thereof.
16. Except as permitted by Subsection XII.E, below, structural treatment control BMPs must:
    a. Be identified using standard nomenclature; AND
    b. Must be sized and designed in substantial conformance with non-proprietary standards and methods found in published and generally-accepted engineering design manuals; unnecessary deviations from those standards and methods are prohibited. Where those manuals conflict with the requirements of this Order, this Order shall prevail; Or
    c. Have had their expected performance substantiated by qualified independent third parties in field tests using published and recognized protocols.
17. All requirements in this Order for the design of structural treatment control

[12]Structural treatment controls that are part of sites in the Co-permittees' industrial and commercial inventories are required to be inspected as part of the requirements of Sections IX and X of this Order. This requirement does not supersede the inspection schedules in those Sections.

BMPs apply to both on-site and off-site facilities.

18. Where the tributary area to an on-site facility includes areas outside of the project boundary, the facility does not need to be sized to treat the design capture volume or flow from outside the project boundary unless appropriate agreements are in place for that facility to function as a regional or sub-regional facility according to Subsection XII.M.

E. Nonconforming Structural Treatment Control BMPs: Demonstration Facilities

1. The Co-permittees are prohibited from approving or allowing to be placed into service structural treatment control BMPs which do not substantially conform to published and generally-accepted engineering design criteria or whose expected performance has not been substantiated in field tests by qualified independent third parties using published and recognized protocols (nonconforming structural treatment control) unless the following requirements are satisfied:
    a. The design of the nonconforming structural treatment control BMP must be based on sound principles of operation and pollutant-removal mechanisms exhibited by similar conforming structural treatment control BMPs.
    b. The tributary area of any single nonconforming structural treatment control BMP is three (3) acres or less.
    c. The Co-permittees approve no more than ten (10) nonconforming structural treatment control BMPs in total during the term of this Order.
    d. Each nonconforming structural treatment control BMP must be must be subject to a performance monitoring plan designed and carried out to substantiate the expected performance of the facility using published and recognized protocols. The results must be evaluated by a qualified independent third party.
    e. The results of the performance monitoring plan must be submitted to the Executive Officer if the responsible Co-permittee concludes that the expected performance of the facility is similar or better as compared to the most similar conforming structural treatment control BMP.
    f. The nonconforming structural treatment control BMP is subject to all other requirements of this Order.
2. The responsible Co-permittees must provide that a non-conforming structural treatment control BMP be replaced with a conforming BMP in the event that the facility fails to perform in a similar or better manner as compared to the most similar conforming BMP or that the facility fails to perform to the Co-permittee's satisfaction. The Co-permittee must require financial assurance instruments that are adequate to carry out the replacement.
3. Co-permittees must report both the application for approval and approval of any nonconforming structural treatment control BMPs within their jurisdiction

to the Principal Permittee in writing.

4. The Principal Permittee is responsible for coordinating the Co-permittees in complying with the requirements of this Subsection.

F. First Priority Consideration of Retention LID BMPs in WQMPs

1. The Co-permittees must require that low impact development ("LID") controls that employ harvest and use, evaporation/transpiration, infiltration (collectively "retention LID BMPs") , or any combination thereof, of the entire design capture volume be given preference and first consideration in all WQMPs. That consideration must be demonstrated in the approved final WQMP in substantial conformance with uniform written technical guidance (see Provision XII.C.2.).
2. The Co-permittees must require retention LID BMPs for the design capture volume, or the maximum portion thereof, unless such controls are:
    a. Technically infeasible;
    b. Economically infeasible; OR
    c. Where environmental and public health hazards cannot be mitigated to an acceptable level.
3. Co-permittees must document the specific basis for their rejection of retention LID BMPs in the approved final WQMP. The rejection of retention LID BMPs must be supported with Substantial Evidence[13].
4. The Co-permittees must require project applicants to mitigate the environmental and public health hazards of retention LID BMPs to an acceptable level where the absence of such mitigation would, by itself, make the use of retention LID BMPs infeasible. Mitigation is limited to activities that may be reasonably undertaken as part of the development project and are within the authority of the Co-permittees to mandate. Mitigation is not necessary if the costs disproportionately outweigh the pollution control benefits; any such finding must be documented in the final WQMP and be supported with Substantial Evidence.

G. Second Priority Consideration of Biotreatment Control BMPs in WQMPs

1. The Co-permittees must require that structural treatment control BMPs that employ biological uptake, transformation, or degradation of pollutants and incidental infiltration and evapotranspiration ("biotreatment control BMPs") be given secondary consideration in the project final WQMP, when, based on Substantial Evidence, any of the following conditions exist:
    a. Retention LID BMPs have been demonstrated to be technically or economically infeasible;
    b. The hazards of using retention LID BMPs cannot be mitigated to an acceptable level; OR

[13] See Glossary.

c. A retention LID BMP is proposed but cannot be sized to treat the tributary area's entire design capture volume and a complementing biotreatment control BMP can be designed to treat the remainder of the design capture volume or flow or a portion thereof.

2. The Co-permittees must ensure that the final approved project WQMP demonstrates preferential consideration of biotreatment control BMPs over non-LID BMPs.
3. When retention LID BMPs are demonstrated to be infeasible according to Section XII.G.1. above, the Co-permittees must require biotreatment control BMPs unless such controls are:
   a. Technically infeasible;
   b. economically infeasible; OR
   c. where the environmental and public health hazards cannot be mitigated to an acceptable level.
4. Where biotreatment control BMPs cannot meet the above criteria, the Co-Permittees must document the specific basis for their rejection in the approved final WQMP. The rejection of biotreatment control BMPs must be based on Substantial Evidence.
5. The Co-permittees must mitigate the environmental and public health hazards of biotreatment control BMPs to an acceptable level where the absence of such mitigation would, by itself, make the use of biotreatment control BMPs infeasible. Mitigation is not necessary if the costs disproportionately outweigh the pollution control benefits; any such finding must be documented in the final WQMP and be supported with Substantial Evidence.
6. Biotreatment control BMPs must be designed to maximize the infiltration of the design capture volume or flow.
7. Biotreatment control BMPs must be sized and designed to treat 1.5 times the design capture volume not retained or using an alternative sizing factor acceptable to the Executive Officer.

H. Third Priority Consideration of All Other Structural Treatment Control BMPs: Non-LID BMPs

1. The Co-permittees must maintain and employ a common schedule which rates the expected performance of specific structural treatment control BMPs, or categories of structural treatment control BMPs.
   a. Any category of structural treatment control BMPs must include only those controls that employ the same principal of operation; use similar treatment mechanisms, and which can reasonably be expected to exhibit similar performance in the removal of pollutants.
   b. The performance of structural treatment control BMPs must be rated based on the reasonably-expected level of removal of categories of pollutants. The performance ratings must be classified as "high", "medium", and "low" level of removal. These ratings must be distinguished by fixed numeric thresholds.

c. The Co-permittees' assignment of the expected level of performance for the structural treatment control BMPs must be based on the best available objective evidence. The evidence must include field performance test data specific to the BMP and the data must have been collected according to published and recognized protocols and evaluated by a qualified independent third party.
d. The categorizations of structural treatment control BMPs and their performance ratings must be reviewed and updated within 12-months of the effective date of this Order so that they are supported by the best available information.

2. Structural treatment control BMPs, which are not LID BMPs ("non-LID BMPs") may be necessary to complement LID BMPs. Non-LID BMPs must not be accepted in an approved project WQMP in lieu of LID BMPs unless LID BMPs cannot be employed pursuant to Sections XII.F. and XII.G. above.
3. The Co-permittees must maintain and employ a common schedule of project categories and a corresponding common list of pollutants which can reasonably be expected to be found in urban runoff from those project categories.
4. If non-LID BMPs, or systems of non-LID BMPs, are the only type of structural treatment control BMP employed to treat the design capture volume or flow from a tributary area of a project, the Co- Permittees must only accept the use of non-LID BMPs, or systems of non-LID BMPs, that provide either a "medium" or "high" level of treatment for the expected pollutants.
    a. The Co-permittees must use the performance rating schedule in Provision XII.H.1. above and the project category schedule in Provision XII.H.3. above to identify acceptable non-LID BMPs for a project.
    b. Approved WQMPs must reflect the use of this prescribed methodology.
5. If a regional or sub-regional off-site LID BMP, that meets the requirements in Section XII.M. below, is planned to serve the project, the Co-permittees may allow the use of the regional or sub-regional facility in lieu of on-site LID BMPs and subject to the requirements in Subsection XII.M. The Co-permittees must require any BMPs that are needed to satisfy pre-treatment requirements for that facility where applicable.

I. Fourth Priority Consideration of Offsets through Retrofit of Existing Development

2. Co-permittees must require that project proponents give fourth priority consideration to offsetting all or any portion of the untreated design capture volume or flow with treatment of the same or greater design capture volume or flow using structural treatment controls (according to Subsections XII.F.

XII.G. and XII.H. above) through retrofits of existing development at an off-site location.

3. The retrofit site must be located within the same watershed of the nearest receiving waters of the U.S.
4. The off-site location must not have a pending or submitted development application which would produce similar structural treatment controls on its own.
5. The structural treatment control(s) selection process at the off-site location must be subject to the requirements of Section XII as applicable.
6. The operator of the structural treatment control(s) at the retrofit site must be subject to requirements in the project WQMP or another equally-effective mechanism that provides for its proper operation and maintenance.
7. Future redevelopment projects on either the retrofit site or the project site using the retrofit option must consider incorporation of structural treatment controls according to the requirements of the Order in effect at the time.

J. Waiver of Structural Treatment Control BMPs

1. Co-permittees are authorized to waive their requirement to provide structural treatment control BMPs (see Provision XII.C.1 above) to remove pollutants and subsequently approve a WQMP if all of the following conditions are met:
   a. Employing structural treatment control BMPs has been demonstrated in the project WQMP to be technically and economically infeasible; or there is no structural treatment control BMP available for which the environmental and public health impacts can be mitigated to an acceptable level;
   b. No feasible opportunities are available to retrofit existing development to treat the untreated design capture volume or flow;
   c. Source and site design BMPs have been incorporated to maximize the infiltration of urban runoff;
   d. If a schedule has been designed to mitigate the water quality impacts of the untreated design capture volume or flow and the schedule has been approved by the Executive Officer, the Co-permittee has collected the related impact fees or services from the project proponent;
   e. The Executive Officer has been provided written notice of the Co-Permittee's intent to issue the waiver, along with adequate supporting documentation, at least 30-days prior to issuance by the Co-permittee; AND
   f. The Executive Officer approves the proposed waiver or 30-days has elapsed without action by the Executive Officer on the proposed waiver, whereby it is "deemed approved".

K. Specific Requirements for Infiltration LID BMPs

1. The requirements of this Section apply to retention LID BMPs that are intended to infiltrate the entire design capture volume or a portion thereof (infiltration LID BMPs). The requirements of this Section are not intended to apply to bio-treatment control or other structural treatment control BMPs that incidentally infiltrate a portion of the design capture volume or flow.
2. Co-permittees must provide the local groundwater management agency with an opportunity for consultation on the potential impacts of any proposed infiltration LID BMPs that (1) utilizes a pipe or conveyance to direct flow to a subsurface system, such as a dry well, vault, or infiltration trench, (2) is comprised of surface infiltration with a cumulative tributary area that exceeds 5,000 square feet, or (3) is proposed to be located over known soil or groundwater contamination, prior to the approval of the final WQMP.
3. The vertical separation from the bottom of the infiltration LID BMPs to the seasonal high groundwater must be a distance of 10-feet or more unless the facility is known to pose a low risk of contaminating groundwater; if the facility is low risk, the vertical separation may be reduced to 5 feet according to criteria established in the Co-permittees' written technical guidance. Where the groundwater does not support, or does not have the potential to support, beneficial uses, the Co-permittee may approve infiltration LID BMPs with less vertical separation, provided that groundwater quality is maintained and that other potential hazards presented by such facilities can be mitigated to an acceptable level.
4. The approval of any infiltration LID BMP with a vertical separation from the bottom of the facility to groundwater that is less than 10-feet must be based on site-specific information on groundwater depth wherever available.
5. Infiltration LID BMPs must be located a minimum horizontal distance of 100-feet from any water supply wells.
6. The construction method must not result in the compaction of the subgrade of infiltration LID BMPs.
7. Infiltration LID BMPs must not be designed to infiltrate the design capture volume outside of minimum or maximum rates recommended in published and generally-accepted engineering design manuals. This provision does not prohibit the use of engineered infiltration substrate or other methods used to bring the infiltration rate within the recommended design parameters[14].
8. Infiltration LID BMPs which are proposed to be located over known soil or groundwater contamination must not be approved without substantial evidence that the facility will not adversely impact groundwater conditions.
9. Infiltration LID BMPs must not be used to treat storm water runoff associated with industrial activity[15], storm water runoff from highways

[14] This does not permit the designer to install a flow restrictor on some vessel to meet design parameters: the flow rate from the vessel to the infiltrated substrate is not the same as the infiltration rate through the substrate.
[15] This does not exclude areas of an industrial site where no industrial activity occurs, such as a roof which has no

subject to motorized vehicular traffic of 25,000 average annual daily traffic, automotive repair shops, car washes, motorized fleet vehicle storage, nurseries, or other land uses or activities that pose a high-threat to ground water quality.

10. Infiltration LID BMPs must incorporate one or more practical mechanisms to allow verification of the loss rate of the design capture volume. The mechanisms must be durable and useful over the life of the project and designed for the benefit of the party responsible for the operation of the facility.
11. Infiltration LID BMPs which constitute Class V Injection Wells must comply with all applicable County and municipal well construction or destruction ordinances and standards, and USEPA's Class V Rule, as amended or revised[16].
12. Structural treatment control BMPs must be provided to pre-treat and remove pollutants that could unreasonably diminish the performance of the infiltration LID BMP for the duration of the project unless pre-treatment mechanisms are incorporated into the facility design itself.
13. The Co-permittees must develop, publish, and employ a common factor(s) of safety in their written technical guidance that must be used to size infiltration facilities. The factor(s) of safety must be based on those recommended in published and generally- accepted engineering design manuals.
14. The Co-permittees must develop, publish, and employ a uniform protocol in their written technical guidance for estimating the loss or draw-down rate used for designing LID BMPs that infiltrate.
    a. The protocol must be consistent with those used in published and generally-accepted engineering design manuals.
    b. The protocol must employ the best available information for estimating the loss rate.
    c. The Co-permittees must require that the following categories of projects use relevant site-specific methods to estimate soil infiltration rates:
        i. Residential projects affecting more than 10-acres or greater than 30 dwelling units.
        ii. Commercial or institutional projects affecting more than 5-acres or greater than 50,000 square feet of floor space.
        iii. Industrial projects affecting more than 2-acres or greater than 20,000 square feet of floor space.

L. Specific Requirements for Harvest and Use LID BMPs

1. The Co-permittees must not accept insufficient demand for harvested storm

roof-mounted industrial equipment or exhausts from industrial equipment which may emit potential storm water pollutants.

[16] USEPA, Office of Water, "Revisions to the Underground Injection Control Regulations for Class V Wells", 64 FR 68545-68573, December 7, 1999 (or as amended or revised)

water as the sole basis for rejecting harvest and use LID BMPs unless the basis is supported by water demand calculations. Calculated estimates must demonstrate that the expected wet season water demand is insufficient to use the harvested design capture volume within a 48-hour period according to the following:

a. The Co-permittees must publish and employ tables of daily average wet-season (October 1st through April 30th) demand rates and objective project characteristics necessary to provide sufficient demand for harvested storm water. The demand rates must be used for estimating anticipated non-potable uses of harvested storm water.
    i. The rates and thresholds must be based on published and generally accepted rates or methods for calculating average daily demand of harvested storm water for non-potable uses such as toilet and urinal flushing, landscape irrigation, industrial process supply, evaporative cooling, and vehicle washing.
    ii. The rates and thresholds must account for the off-setting effects of rainfall, reclaimed water, water conservation or the inconsistent nature of demand.
    iii. Reclaimed water supplies must be based on available supplies, not speculative supplies.
b. Where demand rates are dependent upon variable site occupancy, average daily occupancy during the wet season must be used.

M. Off-Site Structural Treatment Control BMPs: Regional and Sub-Regional Facilities

1. Co-permittees must require that structural treatment control BMPs be located on the project site except under the following conditions:
    a. A regional or sub-regional structural treatment control BMP has been planned as part of a WQMP for a Specific Plan, parcel map, master tract map, master plan of drainage, or similar larger plan of development that was approved prior to the effective date of this Order and all of the following requirements will be met:
        i. The project and the regional or sub-regional structural treatment control BMP are both located within the approved Specific Plan, parcel map, or similar larger plan of development.
        ii. The WQMP for the larger plan of development has been prepared and approved according to the requirements of this Order, Order No. R8-2009-0030 or Order No. R8-2002-0010, whichever was in effect at the time.
        iii. The WQMP for the project complies with all other requirements of this Order to the extent that those requirements do not conflict with this Subsection (Subsection XII.M.).

iv. The regional or sub-regional facility is constructed, serviceable, and satisfactory to the Co-permittee prior to final occupancy or use of the project site(s) in its tributary area.

b. A regional or sub-regional retention LID BMP has been planned and approved by the Co-permittees' land-use authority, another public agency, or other legal entity and the following requirements will be met:
   i. Site design and source control BMPs have been provided in the project WQMP.
   ii. Any structural treatment control BMPs deemed necessary by the party responsible for the facility's performance ("Operator") to pre-treat and remove pollutants that could unreasonably diminish the performance of the facility or cause or contribute to a condition of nuisance over its service life have been provided in the project WQMP.
   iii. An Operator will maintain ownership or control over the facility over the life of projects located within the facility's tributary area.
   iv. The facility complies with, and/or is subject to, the requirements in Section XII.D. and, if applicable, Sections XII.K. or XII.L. above.
   v. The regional or sub-regional facility is constructed, serviceable, and satisfactory to the Co-permittee prior to final occupancy of the project site(s) in its tributary area.
   vi. The project WQMP is prepared according to the requirements of this Order.

c. A regional or sub-regional biotreatment control BMP has been planned and approved by the Co-permittees' land-use authority, another public agency, or other legal entity and the following requirements will be met:
   i. Retention of the design capture volume has been maximized on the project site using site design and source control BMPs.
   ii. The requirements in Section XII.M.1.b. (for regional or sub-regional retention LID BMPs above) have been or will be met as appropriate.

d. There is an infiltration LID BMP located offsite for which the Co-permittees' approval for use would not otherwise cause the Co-permittee to violate any provision of this Order[17]. The requirements include, but are not limited to, the requirements to:
   i. maximize retention of the site's design capture volume ;
   ii. demonstrate the capacity of the off-site facility to remove

[17] In other words, the Co-permittee is faced with the choice of approving a WQMP where either a retention LID control could be located on-site or off-site, or where an eligible biotreatment control could be located on-site or off-site. Except for the facility's location, the approval would not violate the requirements of this Order

pollutants from the design capture volume or flow discharged from the project;

iii. demonstrate adequate funding for the off-site facility's construction, and operation and maintenance for the life of the project; AND

iv. place the facility in service prior to final occupancy or use of the project site.

2. Where a structural treatment control BMP has been approved or constructed according to a final project WQMP, the Co-permittees are authorized to amend the relevant project WQMP(s) to replace the facility and, if applicable, decommission the facility, only if:
   a. The facility's design capture volume or flow will be treated by an off-site facility that satisfies the provisions in Subsection XII.M.1. above;
   b. The expected performance of the off-site facility in removing pollutants from its effluent is equal or better than the combined expected performance of the facilities that it will replace; and
   c. Co-permittees employ decommissioning standards and conditions which effectively address the water quality hazards that the decommissioned facility may pose.

N. Credit Programs

1. Co-permittees are authorized to allow the transfer of design capture volume or flow "credits" to priority projects. These credits may be used by a priority project to satisfying requirements in this Order to treat the design capture volume or flow from the project using structural treatment controls subject to the following limitations:
   a. The "credit" shall only be generated when a structural treatment control LID BMP has been designed to treat the design capture volume or flow from a tributary area that does not include the area of a proposed project. The "credit", as a unit of trade, must be directly related to a unit of design capture volume or flow treated by the structural treatment control LID BMP (e.g. acre-foot, cfs, etc.).
   b. Credits may only be generated based on the design capture volume or flow produced by the area tributary to, and treated by, the structural treatment control LID BMP – upsizing a facility to treat the design capture volume or flow from a fictitious area is not allowed. The installation of the structural treatment control LID BMP may occur independent of a development project; in this case, the entire design capture volume or flow may be traded. If the facility is installed in association with a priority project, only the design capture volume or flow from that area outside of the project boundary may be traded.
   c. The credit must be generated by a structural treatment control LID BMP that is located on property which is owned or controlled by the

proposed project proponent. The property on which the facility is located and the property where the project is located need not be contiguous. However, credits must not be allowed to be applied to projects outside of the watershed of the nearest receiving water of the U.S. in which the structural treatment control LID BMP is located.

d. The selection process for the structural treatment control LID BMP must give first priority consideration to retention LID BMPs according to the criteria in Subsection XII.F. The basis for selection must be documented in a plan accordingly, but not necessarily in a project WQMP. The plan must be subject to the same requirements in this Order related to providing that the plan is authentic, readily discoverable by interested parties, and protected over the life of the related projects.
e. The structural treatment control LID BMP must be subject to applicable provisions of Subsections XII,D., XII.F., XII.G., XII.K., and XII.L. of this Order. Where there is a conflict, the provisions of this subsection prevail.
f. The structural treatment control LID BMP must be constructed, serviceable, and satisfactory to the responsible Co-permittee prior to final occupancy or use of the first project that is entitled to use the credit generated by the facility.
g. Prior to allowing credit trading, the Co-permittee(s) within whose jurisdiction(s) the affected projects are located must have and employ an effective system of accounting and controls to provide that credits are sold and used once, to relate all uses of credits to the originating structural treatment control LID BMP, to track the ownership and use of credits, and to protect against fraud and abuse.

O. General Requirements for Non-Priority Projects

1. Where a non-priority project includes modifications or improvements that are, or affect areas that are exposed to storm water and which may be sources of pollution in urban runoff, Co-permittees must require such projects (see Section XII.B.) to implement source control and site design BMPs to remove pollutants in urban runoff consistent with the maximum extent practicable standard[18].
    a. Each Co-permittee must develop policies and procedures to identify non-priority projects that include modifications or improvements that are, or affect areas that are, exposed to storm water and which may be sources of pollution in urban runoff.
    b. Each Co-permittee must report the policies and procedures used to comply with this Subsection in the first Annual Report due not less

[18] This requirement must not be construed to mean that structural treatment control BMPs are not required for non- priority projects; only that there is no presumption requiring rebuttal that treatment control BMPs are economically or technically feasible.

than 6-months from the effective date of this Order. Updates must be reported in subsequent Annual Reports thereafter.

2. BMPs for non-priority projects identified in Section XII.O.1.a. must be documented in a Non-Priority Project Plan. The Non- Priority Project Plan must include a summary rationale for BMP selection.
4. Source and site design BMPs must generally conform to published and generally-accepted designs or methods.
5. Non-priority Project Plans must be prepared by persons with qualifications and competencies that are commensurate with the complexity of the project and plan.
6. Non-priority Project Plans must be approved by the responsible Co-permittee by a person with qualifications and competencies that are commensurate with the complexity of the plan.

P. Hydrologic Conditions of Concern

1. Co-permittees must address the changes in a priority project site's hydrology in the project WQMP according to the requirements of this Section except under any of the following conditions:
    a. The runoff volume and time of concentration for the two-year frequency, 24-hour storm event are not significantly affected by the project. A significant effect must be deemed to occur only where:
        i. The calculated runoff volume from the site increases by 5% or more over the pre-project condition and/or
        ii. The calculated time of concentration for runoff from the site decreases by 5% or more over the pre-project condition.
    b. All downstream conveyance channels that will receive runoff from the project are engineered and regularly maintained to accommodate the necessary design flow capacity as dictated by the latest version of the Orange County Hydrology Manual, and no sensitive stream habitat areas have the potential to be adversely affected by discrete or cumulative changes in hydrology.
    c. The project has the demonstrated capacity to infiltrate, harvest and use, evaporate, or evapotranspire the volume of runoff produced by a two-year storm event within a 48-hour period.
    d. The Executive Officer grants an individual or general variance in writing to the Permittee(s).
        i. The granting of such variances must be supported by objective and relevant studies.
        ii. The Co-permittees must comply with any conditions placed on the issuance of the variance by the Executive Officer.
        iii. The Executive Officer and the requesting Co-permittee(s) must provide the public an opportunity to comment on the proposed variance for a period of not less than 30-days prior

to its issuance.

2. For those priority projects that do not meet the conditions in Subsection XII.P.1. above, the Co-permittees must apply the following conditions:
    a. The project WQMP must include a hydrology study that quantifies the pre- and post-project runoff volumes, peak flow rates, and times of concentration for a 2-year, 24-hour storm event.
    b. Except as provided in Section XII.P.2.c.,the project WQMP must provide BMPs that modify runoff volumes and times from the project site for the 2-year, 24-hour storm event such that:
        ii. Post-project runoff volumes for the 2-year, 24-hour storm event do not increase by more than 10% compared to the pre-project runoff volumes for the 2-year, 24-hour storm event; AND
        iii. Post-project times of concentration for the 2-year, 24-hour storm event do not decrease by more than 10% compared to the pre-project times of concentration for the 2-year, 24-hour storm event.
    c. The provisions of Section XII.P.2.b. above apply unless any of the following have occurred:
        i. A Clean Water Act Section 401 Water Quality Standards Certification has been issued authorizing discharges of fill associated with channel modifications that would accommodate the project's changes in hydrology while protecting beneficial uses.
        ii. Site design and/or structural treatment control BMPs proposed for the site to reduce pollutants in urban runoff already effectively modify runoff volumes and times of concentration such that they satisfy Provision XII.P.2.b. above.
        iii. The proponent has demonstrated in the project WQMP that it is infeasible to satisfy the criteria of Provision XII.P.2.b. above and there are site design, structural treatment control, and/or flow-control BMPs such that the post-project peak runoff flow rates for the 2-year, 24-hour storm event are not increased by more than 10% compared to the pre-project peak runoff flow rates for the 2-year, 24-hour storm event.
3. Co-permittees must prepare a set of watershed maps that identify management areas tributary to drainages that have not been engineered and regularly maintained to accommodate the design flow capacity for the planned build-out of the tributary area, as dictated by the latest version of the Orange County Hydrology Manual, and management areas that are tributary to sensitive stream habitat areas have the potential to be adversely affected by discrete or cumulative changes in hydrology (see Provision XII.P.1.b. above).
    a. The Co-permittees must submit the watershed maps in draft form to the Executive Officer for approval no later than 6 months following

the effective date of this Order.

b. The Co-permittees must make changes requested by the Executive Officer within 30-days of receipt of the request. The Executive Officer is authorized to approve the watershed maps conditioned upon completion of the changes.

c. Upon approval by the Executive Officer, the Co-permittees must consistently use the applicable maps to identify projects that will be subject to the limitations on changes in runoff volumes, peak flow rates, and times of concentration provided in this Section (Section XII.P.).

XIII. PUBLIC EDUCATION AND OUTREACH

A. The Co-permittees must implement an effective public education program that is designed to raise awareness of pollution-prevention best practices and cause the audience to take action to reduce pollution of urban runoff. The program must include a general audience, consisting of residents of school age and older and commercial and industrial establishments, and a target audience selected from the general audience to address high- priority urban runoff pollution issues identified by the Co-permittees.

B. The public education program must be described in a written plan. The Co-permittees must:
   1. Make a minimum of 10 Million annual impressions on the general audience using educational content in multiple media to raise awareness of pollution in urban runoff;
   2. Identify goals and related measurable objectives that address a minimum of three high-priority urban runoff pollution issues over the term of this Order. Issues must be identified for the entire permit area, for each watershed, or for each city;
   3. Identify and analyze target behaviors and target audiences to address the selected high-priority urban runoff pollution issues;
   4. Create specific messages that are appropriate to the target audiences and to specific sub-groups within the general audience;
   5. Develop educational content for media with the most potential to appeal to the audiences;
   6. Determine the methods and processes of distributing the educational content;
   7. Objectively evaluate the effectiveness of the program; AND
   8. Provide opportunities for public input, and demonstrate consideration of that input, in the development of the program.

C. The Co-permittees must provide a rationale in a written plan to justify the selected high-priority urban runoff issues and related target audiences.

D. During the term of this Order, the Co-permittees must distribute the educational content, using one or more of the selected methods and procedures determined most appropriate by the Co-permittees. The content must be distributed in a manner that is designed to communicate the program's

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messages to the general and target audiences annually, beginning with the next full monitoring and reporting period after the effective date of this Order.

E. The Co-permittees must implement an effective program to measure the achievement of the objectives and requirements in this Section XIII.
   1. The program must include an annual assessment of progress towards meeting the goals and objectives of the education program.
   2. The Co-permittees must adapt their educational program in response to any shortcomings found as a result of the annual assessment.
   3. The program must include a statistically valid survey to measure:
      a. the general audiences' knowledge regarding the sources of urban runoff pollution;
      b. the general audiences' knowledge of the impacts of the pollutant(s) on the environment; awareness of what the general audience can do to help prevent urban runoff pollution; AND
      c. specific changes in the general audiences' behavior(s) to prevent urban runoff pollution.
   4. The survey must be completed no later than 60 months from the effective date of this Order.
   5. The survey results must be made available to the public through a press-release, web site, or similar method acceptable to the Executive Officer.

XIV. MUNICIPAL FACILITIES/ACTIVITIES

A. Each Co-permittee must implement an effective program for maintenance activities for fixed facilities, field operations, and drainage facilities for the purpose of ensuring that such activities do not adversely impact water quality.

B. Each Co-permittee must maintain an inventory of fixed facilities, owned or controlled by the Co-permittee, that have the potential to discharge pollutants in urban runoff.
   1. The inventory must include the following:
      a. Catch basins, storm drain inlets, and open channels;
      b. Municipal landfills;
      c. Waste incinerators;
      d. Solid waste transfer facilities;
      e. Land application sites;
      f. Sewage collection and treatment facilities;
      g. Potable water distribution facilities;
      h. Hazardous waste treatment, disposal, and recovery facilities;
      i. Corporation, maintenance, and storage yards;
      j. Airfields;
      k. Parks, golf courses, and recreation areas;
      l. Cemeteries;
      m. Public buildings (police and fire stations and training facilities, libraries, etc.)
      n. Stadiums and other special event venues;
      o. Equestrian facilities;

p. Animal shelters and kennels;
q. Boat yards and marinas;
r. Public parking facilities; and
s. Areas or facilities that discharge directly to lagoons, the ocean, or Environmentally Sensitive Areas.

C. Each Co-permittee must maintain an inventory of fixed facilities under their ownership or control which may discharge subject to the provisions in Attachment B of this Order.

D. Each Co-permittee must report their inventory of fixed facilities with the exception of catch basins, storm drain inlets, and open channels. The initial report must be provided within 90-days of the effective date of this Order in an electronic format consistent with guidance provided by the Executive Officer. Subsequent updates must be reported bi-annually thereafter no later than November 15th of the year that the update is required.

E. The Principal Permittee may propose a schedule for visual inspection and mechanical or physical cleaning of catch basins, storm drain inlets, and open channels (collectively referred to as "systems" in this Section) under the Co- Permittees' control. The proposed schedule is subject to the approval of the Executive Officer. If approved, the schedule will serve as an alternative to the schedule prescribed by Subsection XIV.F. below.

F. Each Co-permittee must visually inspect a minimum of 80% of catch basins, storm drain inlets, and open channels under their control annually. 100% of the systems must be inspected every two years. Each Co-permittee must prepare a written inspection and maintenance schedule for all facilities that are subject to this requirement.

1. Trash and debris must be physically removed from the systems in a timely manner when found.
2. Where other agencies' authorization is required to remove trash and debris from the systems (i.e. CWA Section 404 permit), the Co-permittee must make a good faith effort to secure the necessary authorizations and remove the accumulated trash and debris in a timely manner.
3. Co-permittees must exercise their discretion and increase the inspection and cleaning frequency as necessary for those portions of the systems which accumulate "unusually large quantities" of trash and debris.
4. Each Co-permittee must establish objective thresholds to define "unusually large quantities" of trash and debris in systems that they own or control.
5. Each Co-permittee must implement an effective management system to identify portions of the systems which accumulate unusually large quantities of trash and debris and remove them.
6. Each Co-permittee must implement an effective program to detect and eliminate or minimize the seepage of wastewater from sanitary sewers to the storm drain system.

G. Except for catch basins, storm drain inlets, and open channels, each Co-Permittee must categorize fixed facilities that they own or control into "high-priority", "medium-priority", and "low-priority" sites.

1. The Co-permittee must inspect each fixed facility according to the

following schedule:
   a. High-priority sites must be inspected once per year.
   b. Medium-priority sites must be inspected once every two years.
   c. Low-priority sites must be inspected once every five years.
2. The following fixed facilities must be categorized as "high-priority" sites:
   a. Municipal landfills
   b. Publicly-owned treatment works
   c. Waste incinerators
   d. Solid waste transfer facilities
   e. Land application sites
   f. Corporation, maintenance, and storage yards
   g. Hazardous waste treatment, disposal , and recovery facilities
   h. Land-side areas of airfields
   i. Facilities that are located adjacent or within an Environmentally Sensitive Area or that discharge directly to an Environmentally Sensitive Area.
3. Co-permittees must categorize all other fixed facilities according to a uniform objective ranking system developed by the Principal Permittee. The ranking system must be based on the following factors:
   a. The degree to which potentially polluting activities occur in areas exposed to storm water.
   b. The quantity of potentially-polluting materials used or stored at the facility.
   c. Whether or not the activities at a site could produce pollutants that cause or contribute to the impairment of a water body listed according to CWA Section 303(d).
   d. The risk of a release of a pollutant.
   e. The occurrence of known or suspected non-storm water discharges.
   f. The size of a facility, the number of employees assigned to the facility, and the number of visitors.
4. Co-permittees must carry out inspections of fixed facilities to: identify and correct observed violations of the municipal ordinance or other requirements related to the control of pollutants to the MS4; identify and correct unnecessary deviations from standard operating procedures (see Section XIV.H. below); internally enforce relevant discharge requirements; and identify and eliminate known or suspected unauthorized non-storm water discharges.

H. Co-permittees must implement an effective program to prevent the discharge of pollutants from Co-permittees' field activities and fixed facilities.
   1. The program must include the imposition of written standard requirements on the person(s) performing field activities on behalf of Co-permittees. The requirements must direct the person(s) to effectively employ BMPs that are specific and relevant to the activity to prevent the discharge of pollutants in urban runoff.
   2. The program must include written standard operating procedures for Co-Permittees' staff who engage in field activities and activities at fixed facilities that have the potential to discharge pollutants in urban runoff.

a. The standard operating procedures must incorporate BMPs to prevent or minimize such discharges of pollutants.
b. The standard operating procedures must be written in plain, straightforward language, avoiding technical terms as much as possible, and using a coherent and easily readable style.
c. The standard operating procedures must be subject to an annual review to verify their relevance and effectiveness. Each standard operating procedure must display the date of the last review, the identity of the reviewing personnel, and the due date for the next review.

3. The program must include a training program to provide Co-permittees' staff with an awareness of the responsibilities described in standard operating procedures relevant to their duties (See Section XVI below).
4. The program must include an inspection program for field activities to: identify and correct observed violations of the municipal code or ordinance related to protecting water quality; identify and correct unnecessary deviations from standard operating procedures; internally enforce compliance with relevant waste discharge requirements; and identify and eliminate or minimize known or suspected non-storm water discharges.

I. Each Co-permittee must implement an effective program: to reduce the use of unwarranted or excessive applications of pesticide and fertilizer at facilities that they own or control; to ensure that pests are controlled using the best available methods while protecting water quality; and to ensure that pesticides are used according to with Federal, State, and local laws and regulations[19].
1. Each Co-permittee must develop and implement Integrated Pest Management, Pesticide and Fertilizer Guidelines.
2. Each Co-permittee must conduct annual integrated pest management audits for chemicals known or suspected of impairing water quality to enforce the use Integrated Pest Management Strategies that reduce their potential entry into MS4s.
3. Each Co-permittee must conduct annual fertilizer use audits to verify that application rates do not exceed those recommended by University of California Integrated Pest Management Research, or similarly qualified organizations, and to enforce fertilizer application methods that eliminate or minimize fertilizer entry into MS4s.

XV. MUNICIPAL CONSTRUCTION PROJECTS AND ACTIVITIES

A. This Order authorizes the discharge of storm water runoff from construction projects that are under the ownership or direct responsibility of any of the Co-Permittees and that may result in land disturbance of one acre or more; or less than one acre if the project is part of a larger common plan of development or sale which is one acre or more.

[19] The term "pesticide" includes herbicides, rodenticides, insecticides, etc., consistent with the common meaning of the term.

B. All construction activities must be in compliance with the conditions and provisions of the latest version of the State Board's General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (NPDES Permit No. CAS000002) as amended or revised with the following exceptions:
    1. A Notice of Intent must be submitted in an electronic format acceptable to the Executive Officer.
    2. No additional fees are necessary to authorize discharges associated with construction and land disturbance activities.
    3. The conditions and provisions in this Order pertaining to post-construction BMPs prevail.

XVI. TRAINING PROGRAMS

A. Each Co-permittee must have an effective training program for their staff, contractors and vendors whose duties or responsibilities directly or indirectly affect the Co-permittee's capacity to satisfy the requirements of this Order (collectively, "personnel").
    1. Those personnel include, but are not limited to, the following:
        a. Storm water program managers;
        b. CEQA practitioners;
        c. Inspectors;
        d. Maintenance personnel;
        e. Plan checkers;
        f. Planners;
        g. The division heads of all of the above staff;
        h. Contractors and vendors who perform duties similar to the above staff.
    2. Each Co-permittee must maintain a roster of personnel or staff positions whose duties or responsibilities directly or indirectly affect the Co-Permittee's capacity to satisfy the requirements of this Order.
    3. Except for industrial, commercial, and construction site inspectors, personnel must undergo training a minimum of once every two years. New hires must receive their initial training within 6 months of their initial hire date.
    4. The training program must be subjected to an annual review, for the purpose of achieving continual improvement of its effectiveness, and must be updated accordingly.
    5. Training materials must be written in plain, straightforward language, avoiding technical terms as much as possible, and using a coherent and easily readable style.
    6. The Co-permittees must employ a method that objectively demonstrates that personnel individually have the necessary level of expertise and competence commensurate with their duties and responsibilities.
    7. The Co-permittees must maintain records demonstrating that personnel have satisfied the requirements of the training program; records must be maintained for a minimum of three (3) years.

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8. Training records must be maintained for staff and contract and vendor records, as part of a region-wide training registry, or through another mechanism acceptable to the Executive Officer.

B. The Principal Permittee must establish a written training curriculum for use by the Co-permittees. The contents of the curriculum must be commensurate with the duties and responsibilities of the affected personnel.
   1. Affected personnel must be able to demonstrate proficient knowledge of the following subject matter:
      a. An overview of Federal, state and local water quality laws and regulations pertaining to urban runoff.
      b. The potential direct and indirect impacts of urban runoff on receiving waters.
      c. Current water quality impairments.
      d. The potential sources of pollutants in urban runoff.
      e. Specific actions that personnel are obligated to take to reduce pollutants in urban runoff.
   2. At a minimum, personnel who are responsible for inspecting construction sites must be trained in the following subject matter:
      a. Federal, state and local water quality laws and regulations pertaining to construction and grading activities.
      b. The potential effects of construction and grading activities and urbanization on water quality.
      c. The proper application and use of erosion and sediment control BMPs.
      d. The Co-permittee's enforcement tools and procedures.
   3. At a minimum, personnel responsible for inspecting commercial and industrial sites must able to demonstrate proficient knowledge of the following subject matter:
      a. Federal, state and local water quality laws and regulations pertaining to commercial and industrial activities.
      b. The potential effects of commercial and industrial activities and urbanization on water quality.
      c. The proper application and use of non-structural and structural treatment control BMPs.
      d. Methods for affecting compliance, including enforcement tools and procedures.
   4. At a minimum, personnel responsible for inspecting restaurants must be able to demonstrate proficient knowledge of the following subject matter:
      a. Proper oil and grease disposal.
      b. Proper housekeeping of trash bins and trash bin enclosures.
      c. Proper cleaning of floor mats, mops, filters, and garbage containers and proper disposal of related waste water.
      d. Proper methods of cleaning parking lot areas.
      b. Proper spill clean-up methods.
      c. Proper operation and maintenance of devices designed to separate fat, oil, and grease from wastewater.
      d. Methods for affecting compliance, including enforcement tools and

procedures.

5. At a minimum, personnel responsible for investigating, eliminating or permitting illicit discharges and illicit connections must be able to demonstrate proficient knowledge of the following subject matter:
    a. The potential effects of illicit discharges and illicit connections on water quality.
    b. SSO and general spill response and coordination procedures.
    c. Investigation techniques and procedures.
    b. Methods for affecting compliance, including enforcement tools and procedures.
6. At a minimum, personnel responsible for preparing, reviewing or approving Water Quality Management Plans or non-priority project plans or for ensuring their implementation must be able to demonstrate proficient knowledge of the following subject matter:
    a. The requirements found in Section XII of this Order.
    b. The related written processes, procedures, and methods for selecting, sizing, and designing source control, site design, and structural treatment control BMPs.
    c. Investigation techniques and procedures.
    d. The Co-permittee's enforcement tools and procedures.

XVII. NOTIFICATION REQUIREMENTS

A. When Co-permittees become aware of a site or incident within their jurisdiction that poses an imminent threat to human health or the environment, the Co-Permittee(s) must take the following actions:
    1. Provide oral or electronic mail notification to Regional Board staff of the imminent threat within 24 hours of becoming aware.
    2. Submit a written report within five (5) business days following the initial notification to Regional Board staff. The report must provide the following information:
        a. Details of the location, nature and circumstances of the threat to human health or the environment.
        b. Details of any corrective action(s) taken or planned to mitigate the threat and prevent its reoccurrence.
        c. Identity of the responsible parties.
        d. Describe any enforcement actions taken or planned by the Co-Permittee.
    3. Record incidences and the related report in the applicable construction, industrial or commercial site database.
B. For the purposes of this Section, sewage spills in excess of 1,000 gallons and all reportable quantities of hazardous waste spills, as per 40 CFR § 117 and 40CFR § 302, constitute imminent threats to human health or the environment.
C. If, during the course of a site inspection or complaint investigation, Co-permittees or their representatives become aware of a known, suspected, or threatened violation of applicable waste discharge requirements (i.e. State-wide General

Industrial or Construction Permits, etc.), the Permittee must provide written notice to the Executive Officer.

1. Where circumstances do not pose an imminent threat to human health or the environment, the written notice must be provided on a quarterly basis. For the purposes of this Provision, each calendar quarter of the monitoring and reporting period constitutes a reporting period, with the notice due within 30-days of the end of each period.
2. The notice must include the location, nature and circumstance of the known, suspected, or threatened violation(s); prior history of any relevant violations of state and local requirements; and action(s) taken or planned by the Co-permittee(s) to bring the site operator into compliance.

XVIII. TOTAL MAXIMUM DAILY LOAD IMPLEMENTATION

The provisions in this section require compliance with water quality-based effluent limits ("WQBELs") that implement waste load allocations ("WLAs"). The WLAs have been established in Total Daily Maximum Loads ("TMDLs") that have been adopted and approved by the Regional Board or promulgated by USEPA. The Co-permittees that are subject to each TMDL are shown in Appendix A. The applicable WQBELs are specified in Appendices B through H.

A. General TMDL Provisions

1. The responsible Co-permittees identified in Appendix A must comply with the applicable WQBELs shown in Appendices B through H according to the methods described in this Section (Section XVIII). Additionally, the City of Lake Forest must comply with any conditions or provisions within the Phase 1 MS4 Permit issued by the San Diego Regional Water Quality Control Board that are associated with any TMDL.
2. Unless a future deadline to comply with a WQBEL is shown in Appendices B through H, Co-permittees responsible for complying with the WQBELs must either: (1) demonstrate that the applicable WQBELs have been achieved by the effective date of this Order; OR (2) demonstrate compliance through any one of the means identified in Subsections XVIII.B. through XVIII.D. below
3. A Co-permittee may comply with WQBELs through any lawful means.
4. In cases where a WQBEL is assigned jointly to a group of Co-permittees or other parties whose discharges are, or may be comingled prior to entering the receiving water, pursuant to 40 CFR122.26(a)(3)(vi), each Co-permittee is only responsible for discharges from the MS4 for which they are owners or operators.
5. Where Co-permittees have comingled discharges to the receiving water, compliance at the outfall or in the receiving water shall be determined for the group of Co-permittees as a whole unless an individual Co-permittee

demonstrates that its discharge did not cause or contribute to the exceedance. A Co-permittee may demonstrate compliance with WQBELs using monitoring data to:

a. Demonstrate that there are no violations of receiving water limitations using monitoring data that has been collected and analyzed pursuant to an approved TMDL monitoring plan; OR
b. Demonstrate that there are no exceedances of WQBELs at monitoring locations which have been designated pursuant to the requirements of Monitoring and Reporting Program R8-2015-0001; OR
c. Demonstrate that there is no discharge from the responsible Co-permittees' MS4(s) to the receiving water during the time period subject to the WQBEL.
d. For exceedances of WQBELs for pathogens, demonstrate through the use of generally-accepted source-identification protocols, or, if applicable, through protocols established under California Water Code Section 13178, that sources within the Co-permittee's jurisdiction or MS4 have not caused or contributed to the exceedance.

6. A Watershed Management Plan may be developed separately for a specific WQBEL or a group of WQBELs may be combined and addressed in one plan, subject to the discretion of the Regional Board.
7. For water body-pollutant combinations subject to an adopted TMDL, full compliance with the TMDL, as incorporated in this Order, will be regarded as compliance with the receiving water limitations for the water body-pollutant combination.
8. The responsible Co-permittees must submit reports which are consistent with the requirements of the TMDL.

B. Provisions for WLAs in State-Adopted TMDLs Where Final Compliance Deadlines Have Passed

1. Appendices B, C, D and F include WQBELs where the final compliance deadline established by the underlying TMDL has passed[20]. The responsible Co-permittees must comply immediately with these final WQBELs. Compliance with final WQBELs shall be determined using one of the following methods:
   a. The responsible Co-permittees may demonstrate compliance with final WQBELs using monitoring data according to Subsection XVIII.A.5. above.
   b. Co-permittee(s) may fully implement a Time Schedule Order ("TSO)" issued by the Regional Board pursuant to California Water Code Section 13300. The responsible Co-permittees may

[20] Appendix C contains compliance dates where some have passed and others have not. Consequently, Appendix C appears in both Subsections XVIII.B. and XVIII.C.

request a TSO if they believe that additional time to comply with final WQBELs is necessary.

C. Provisions for WLAs in State-Adopted TMDLs Where Final Compliance Deadlines Have Not Passed

1. WQBELs set forth in Appendices C and E are based on TMDLs where the final compliance deadlines have not passed[20]. The responsible Co-permittees must achieve compliance with the WQBELs by the final compliance dates set forth in Appendices C and E by one of the following methods:
    a. The responsible Co-permittees may demonstrate compliance with applicable WQBELs using monitoring data according to Subsection XVIII.A.5. above.
    b. The responsible Co-permittees may initiate development of and implement a Watershed Management Plan according to the requirements of Section XI and the following:
        i. For WQBELs where the related TMDL has an implementation plan that includes a requirement that the Co-permittees develop a compliance plan, the draft Watershed Management Plan must be submitted consistent with the schedule specified in the implementation plan.
        ii. For WQBELs where a plan has already been developed for the related TMDL and is currently being implemented, the responsible Co-permittees may request in their written notification that the Executive Officer approve the plan as satisfying the requirements of Section XI.
        iii. Where monitoring data indicates that discharges of urban runoff are not achieving applicable WQBELs, submit a notice of their intent to develop and implement a Watershed Management Plan according to the requirements of Section XI within 60-days of becoming aware of the situation.

D. Provisions for TMDLs Established by USEPA

1. WQBELs in Appendices G and H are based on TMDLs promulgated by USEPA. These TMDLs do not include an implementation plan adopted pursuant to California Water Code Section 13242. However, USEPA has included recommendations for implementation as part of the TMDLs. The responsible Co-permittees, subject to the WQBELs in Appendices G and H must achieve compliance with these WQBELs by one of the following methods:

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a. The responsible Co-permittees may demonstrate compliance with applicable WQBELs using monitoring data as follows:
   i. Demonstrating that there are no exceedances of receiving water limitations using monitoring data that has been collected and analyzed pursuant to an approved TMDL monitoring plan; OR
   ii. Demonstrating that there are no exceedances of WLAs at MS4 outfalls which have been designated pursuant to the requirements of Monitoring and Reporting Program R8-2015-0001; OR
   iii. There is no discharge from the responsible Co-permittees' MS4(s) to the receiving water during the time period subject to the WLA.

2. The responsible Co-permittees may initiate development of and fully implement a Watershed Management Plan according to the requirements of Section XI and the following:
   i. For WQBELs where a plan has already been developed for the related TMDL and is currently being implemented, the responsible Co-permittees may request in their written notification that the Executive Officer approve the plan as satisfying the requirements of Section XI.

XIX. PROGRAM EFFECTIVENESS ASSESSMENTS

A. Each Co-permittee must have a program in place to objectively assess the effectiveness of best management practices or groups of best management practices employed in each of the elements of their storm water program and any Watershed Management Plan which has been approved by the Executive Officer or the Regional Board. The assessment program must be documented in writing.
B. The Principal Permittee must develop a model program effectiveness assessment. The model assessment must address storm water program elements that are common to all or a majority of the Co-permittees and that are necessary to compile information on the overall performance of the Co-Permittees' collective efforts.
C. Methods used to monitor and measure program activities must be carried out in a manner that is representative of the monitored activity.
D. Each Co-permittees' assessment program must be comprised of the following elements:
   1. Conceptual generalized model(s) of how each pollutant, or functionally similar group of pollutants, are released to the environment and transported to the receiving water(s) (pollution process).
   2. A description of each of the best management practices (interventions) in the pollution process and where in the process they are intended to be applied.
   3. A system to objectively measure the performance of each intervention or

group of interventions. The system must include valid performance metrics (or measures), the method(s) to measure and analyze the metrics, and a method to track and document outcomes.

4. Annual evaluation of the validity of the program; how effective the interventions are in achieving the desired outcomes; if the performance metrics and the method(s) for measuring outcomes are valid; and any changes found necessary to improve the effectiveness of the interventions or the overall process.

E. Each Co-permittee must perform assessments of their best management practices annually. The results must be included in the Annual Progress Report (see Monitoring and Reporting Program No. R8-2015-0001). Reported outcomes must be expressly compared to the objective requirements of this Order (prescribed performance standards or measures) where they are provided or where they have been established in a Watershed Management Plan which has been approved by the Executive Officer or the Regional Board. The Principal Permittee is responsible for compiling and analyzing information where necessary to demonstrate compliance with the requirements of this Order.

F. Where a Watershed Management Plan has been approved, the responsible Co-permittees' report must include:

i. The status of completion of proposed structural treatment control BMPs.
ii. The status of implementation of non-structural BMPs.
iii. Information related to the validity of the reasonable assurance analysis performed in support of the Watershed Management Plan and any underlying assumptions and risks.
iv. The results of any monitoring undertaken to evaluate the impact of implementation of the Watershed Management Plan on receiving water quality.

G. Each Co-permittee must have an effective mechanism that solicits input from stakeholders in the development and implementation of the program effectiveness assessments.

XX. FISCAL ANALYSIS

A. The Co-permittees must prepare and submit a unified fiscal analysis to the Executive Officer of the Regional Board. The analysis must conform to fiscal reporting guidance issued by USEPA when available. The analysis must be submitted with the Annual Progress Report (see Monitoring and Reporting Program No. R8-2015-0001) and, at a minimum, include:

1. An accounting of each Co-permittee's expenditures for the previous fiscal year;
2. An accounting of each Co-permittee's budget for the current fiscal year;
3. A description of the source of funds; AND
4. Each Co-permittee's estimated budget for the next fiscal year.

XXI. PROVISIONS

A. All reports that are submitted by the Co-permittees according to the requirements of this Order and which are subject to the approval of the Executive Officer will be publicly-noticed and made available at the Regional Board's web site or through other means. Noticed reports will be subject to public review and comment. The Executive Officer will consider all comments received prior to approval of the reports. Any unresolved, significant issues will be scheduled for a public hearing at a Regional Board meeting prior to approval by the Executive Officer.

B. The Co-permittees must comply with the requirements of Monitoring and Reporting Program No. R8-2015-0001 ("MRP"), as amended or revised during the term of this Order. The MRP is hereby made a part of this Order. The requirements of the MRP are subject to revision under the direction of the Executive Officer.
    1. Any proposed revisions to the MRP must be submitted in writing to the Executive Officer for approval.
    2. The Principal Permittee must provide public notice of any proposed revisions. The public notice must include direct notice given to potential and known interested stakeholders.
    3. The Executive Officer will provide a minimum of 30-days to interested parties to comment before approving any revisions.
    2. The Co-permittees must make available to the public the results of field and laboratory analyses performed on all samples collected pursuant to the MRP.

C. The NPDES program requirements contained in 40CFR§122.21(a), (b), (d)(2), (f), (p), (h), (i), (j), (k), and (l); and 40CFR§122.42(c) are incorporated into this order by reference.

D. The Co-permittees must report to the Executive Officer of the Regional Board any known discharges of storm water or non-storm water which may have an impact on human health or the environment.

E. The Co-permittees must report to the Executive Officer any suspected or known activities on federal, state, or other entity's land or facilities where the Co-Permittees do not have jurisdiction, where the activities may be contributing pollutants to waters of the U.S.

XXII. PERMIT MODIFICATION

A. In accordance with 40CFR§122.41(f), this Order may be modified, revoked or reissued prior to its expiration date for the following reasons:
    1. To address significant changes in conditions identified in the technical

reports required by the Regional Board which were unknown at the time of the issuance of this Order;

2. To incorporate applicable requirements of state-wide water quality control plans adopted by the State Water Resources Control Board or any amendments to the Basin Plan approved by the Regional Board, the State Board, and, if necessary, by the Office of Administrative Law;
3. To incorporate changes needed for consistency with standard provisions and precedential Orders adopted by the State Water Resources Control Board.
4. To comply with any applicable requirements, guidelines, or regulations issued or approved under the Clean Water Act, if the requirements, guidelines, or regulations contain different conditions or additional requirements than those included in this Order; OR
5. To incorporate any requirements imposed upon the Co-permittees through the TMDL process.

B. The filing of a request by the Co-permittees for modification, revocation, and reissuance or termination or a notification of planned changes or anticipated noncompliance does not stay any conditions of this Order.

XXIII. PERMIT EXPIRATION AND RENEWAL

A. This Order will expire on MONTH DAY, 2019. The Co-permittees must file a report of waste discharge (permit application) no later than 180 days in advance of the expiration of this Order after which this Order may be administratively extended (40 CFR §122.6). The submittal of a report of waste discharge will constitute an application for issuance of new waste discharge requirements (40 CFR § 122.41(b)).
B. All permit applications (reports of waste discharge), Annual Progress Reports, and other information submitted under this Order must be signed by either a principal executive officer or a ranking elected official (40 CFR § 122.22(a)(3)) or a duly-authorized representative as per 40 CFR § 122.22(b).
C. This Order shall serve as a National Pollutant Discharge Elimination System (NPDES) Permit pursuant to Section 402(p) of the Clean Water Act, or amendments thereto. This Order shall become effective ninety (90) days after the date of its adoption, provided that the Regional Administrator of the USEPA has no objections. If the Regional Administrator objects to its issuance, this Order shall not become effective until such objection is withdrawn.
D. Except for enforcement purposes, Order No. R8-2009-0030 is hereby withdrawn upon the effective date of this Order.

XXIV. STANDARD PROVISIONS

A. Duty to Comply
   1. The Co-permittee(s) must comply with all of the conditions and provisions of this Order. Any noncompliance with the requirements of this Order constitutes a violation of the CWA and the CWC. Noncompliance is grounds for enforcement action and/or removal from Permit coverage.
   2. Any failure to take appropriate corrective action(s) as specified in this Order or as directed by the Executive Officer is also a violation of this Order.
   3. The Co-permittee(s) must comply with effluent standards or prohibitions established under section 307(a) of the CWA for toxic pollutants. Compliance must be achieved within the time provided in the regulations that establish these standards or prohibitions, even if this Permit has not yet been modified to incorporate the requirement.

B. General Permit Actions

   If any toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under section 307(a) of the CWA for a toxic pollutant which is present in the discharge and that standards or prohibition is more stringent than any limitation on the pollutant in this Permit, this Permit shall be modified or revoked and reissued to conform to the toxic effluent standard or prohibition and the Co-permittees so notified.

C. Need to Halt or Reduce Activity Not a Defense

   It shall not be a defense for a Co-permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this Permit.

D. Duty to Mitigate

   The Co-permittee(s) must take all responsible steps to minimize or prevent any discharge which has a reasonable likelihood of adversely affecting human health or the environment.

E. Proper Operation and Maintenance

   The Co-permittees must at all times properly operate and maintain any facilities and systems of treatment and control (and related equipment and apparatuses) which are installed or used by the Co-permittee to achieve compliance with the conditions of this Permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. Proper operation and maintenance may require the operation of back-up or auxiliary facilities or similar systems installed by a Co-permittee when necessary to achieve compliance with the conditions of this Permit.

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F. Property Rights

This Permit does not convey any property rights or any sort of exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor does it authorize any infringement of Federal, State, or local laws or regulations.

G. Duty to Provide Information

The Co-permittees must provide to the Regional Board, State Board, or USEPA, within a reasonable time, any requested information to determine compliance with this Permit. The Co-permittees must also furnish, upon request, copies of records that are required to be kept by this Permit.

H. Inspection and Entry

1. The Co-permittees must allow Regional Board staff, State Board staff USEPA staff, or an authorized representative of the municipal operator of the MS4 receiving the discharge, upon the presentation of credentials and other documents as may be required by law, to:
    a. Enter upon the Co-permittees premises at reasonable times where a regulated activity is being conducted or where records must be kept under the conditions of this Order;
    b. Access and copy at reasonable times any records that must be kept under the conditions of this Order.
    c. Inspect and photograph, at reasonable times, any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Order; AND
    d. Sample or monitor, at reasonable times, for the purpose of assuring compliance with this Order or as otherwise authorized by the Clean Water Act or the Water Code, any substances or parameters at any location.

I. Monitoring and Records

1. Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity.
2. Records of monitoring must include:
    a. The date, exact place, and time of sampling or measurements;
    b. The date(s) analyses were performed;
    c. The individual(s) who performed the analyses;
    d. The analytical techniques or methods used; AND
    e. The results of such analysis.
3. The Co-permittees must maintain a paper or electronic copy of all storm water monitoring information, copies of all reports (including the Annual Progress Reports), SWPPPs, and all other required records, including a copy of this Permit, for a period of at least five (5) years from the date generated or date submitted, whichever is later.

J. Electronic Signature and Certification Requirements

All Annual Progress Reports or other information required by this Permit or requested by the Regional Board, State Board, USEPA, or local storm water management agency must be certified and submitted by the Legally Responsible Person ("LRP") or the Duly Authorized Representative ("DAR").

K. Certification

Any person signing documents under Section XXIV.J. above, must make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for information submitted is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

L. Anticipated Noncompliance

The Co-permittee(s) must give notice to the Regional Board and local storm water management agency of any planned changes in any municipal activity which may result in noncompliance with this Permit's requirements.

M. Penalties for Falsification of Reports

Section 309(4) of the CWA provides that any person who knowingly makes a false material statement, representation, or certification in any record or other document submitted or required to be maintained under this Permit, including reports of compliance or noncompliance shall, upon conviction, be punished by a fine of not more than $10,000 or by imprisonment for not more than two years, or by both.

N. Oil and Hazardous Substance Liability

Nothing in this Permit shall be construed to preclude the institution of any legal action or relieve the Co-permittee(s) from any responsibilities, liabilities, or penalties to which the Co-permittee(s) is or may be subject to under Section 311 of the CWA.

O. Severability

The provisions of this Permit are severable; and, if any provision of this Permit or the application of any provision of this Permit to any circumstance is held invalid, the application of such provision to other circumstances and the remainder of this Permit shall not be affected thereby.

P. Penalties for Violations of Permit Conditions

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Section 309 of the CWA provided significant penalties for any person who violated a permit condition the implements Sections 301, 302, 306, 307, 308, 318, or 405 of the CWA or any permit condition or limitation implementing any such section in a permit issued under section 401. Any person who violated any permit condition of this Permit is subject to civil penalty not to exceed $37,500 per calendar day of such violation, as well as any other appropriate sanction provided by Section 309 of the CWA. The Porter-Cologne Water Quality Control Act also provides for civil and criminal penalties, which in some cases are greater than those under the CWA

Q. Transfers (not applicable)

R. Continuation of Expired Permit

1. This Permit continues in full force and effect until a new Permit is issued or the Regional Board rescinds this Permit.
2. Only those Co-permittees authorized to discharge under the expiring Permit are covered by the continued Permit.

S. Other Federal Requirements

All other requirements of 40 CFR § 122.41 and 40 CFR § 122.42 are incorporated into this Permit by reference.

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ACRONYMS

ASBS Areas of Special Biological Significance

BMPs Best Management Practices

CCC Criterion Continuous Concentration

CCR California Code of Regulations (State Water Board regulations are in Title 23)

CEQA California Environmental Quality Act

CFR Code of Federal Regulations

CMC Criterion Maximum Concentration

CTR California Toxics Rule

CWA Clean Water Act

CWC California Water Code

DAMP Drainage Area Management Plan

DAR Duly Authorized Representative

DDT Dichlorodiphenyltrichloroethane

HCA Health Care Agency

LA Load Allocation

LID Low Impact Development

LIP Local Implementation Plan

LRP Legally Responsible Person

MOU Memorandum of Understanding

MPN Most Probable Number

MRP Monitoring and Reporting Program, R8-2015-0001

MS4 Municipal Separate Storm Sewer System

NPDES National Pollutant Discharge Elimination System

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PCB Polychlorinated Biphenyl

PEA Program Effectiveness Assessment

POTW Publicly-Owned Treatment Works

QAPP Quality Assurance Project Plan

SARA Superfund Amendments and Reauthorization Act of 1986

SIC Standard Industrial Classification

SIP State Implementation Plan or, more formally, Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California

SSO Sanitary Sewer Overflow

SWAMP Surface Water Ambient Monitoring Program

SWRCB State Water Resources Control Board

TDS Total Dissolved Solids

TMDL Total Maximum Daily Load

USEPA United States Environmental Protection Agency

WEF Water Environment Federation

WDID Waste Discharger Identification

WDR Waste Discharge Requirements

WLA Waste Load Allocation

WQBEL water quality-based effluent limit

WQMP Water Quality Management Plan

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GLOSSARY

This Glossary has been prepared for the convenience of the reader. This Glossary is not an exhaustive catalog of terminology used in this Order. Additional terminology is defined in the Clean Water Act, USEPA regulations, and the California Water Code; all such terms not appearing below are incorporated into this Permit by reference.

Authorized non-Storm Water Discharges – Non-storm water discharges authorized pursuant to an NPDES permit. Authorized non-storm water includes: uncontaminated condensate from air conditioners, coolers, and compressors and from the outside storage of refrigerated gases or liquids; flows from riparian habitats and wetlands; passive footing and foundation drains or crawlspace pumps; non-commercial vehicle washing; de-chlorinated water from swimming pools; diverted stream flows; uncontaminated groundwater or spring water; discharges from emergency fire-fighting activities; and waters otherwise not containing waste.

Basin Plan – The Water Quality Control Plan for the Santa Ana River Basin (1995) and subsequent amendments.

Beneficial Uses – The uses of water necessary for the survival or well-being of man, plants, and wildlife. These uses of water serve to promote the tangible and intangible economic, social, and environmental goals. “Beneficial Uses” that may be protected against include, but are not limited to: domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. Existing beneficial uses are uses that were attained in the surface or groundwater on or after November 28, 1975; and potential beneficial uses are uses that would probably develop in future years through the implementation of various control measures. “Beneficial Uses” are equivalent to “Designated Uses” under federal law (California Water Code Section 13050(f). Beneficial Uses for the Receiving Waters are identified in the Basin Plan.

Best Management Practices (“BMPs”) – Also known as storm water control measures. Schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage (40 CFR § 122.2).

Bioaccumulate – The progressive accumulation of contaminants in the tissues of organisms to a higher concentration than in the surrounding environment. Bioaccumulation may occur through any route, including respiration, ingestion, or direct contact with contaminated water, sediment, pore water, or dredged material. Bioaccumulation occurs with exposure and is independent of the trophic level of the organism.

Bioassessment – The use of biological community information to evaluate the biological integrity of a water body and its watershed. With respect to aquatic ecosystems, bio-assessment is the collection and analysis of samples of the benthic macro invertebrate community together with physical/habitat quality measurements associated with the sampling site and the watershed to evaluate the biological condition (i.e. biological integrity) of a water body.

Biological Integrity – Defined in Karr J.R. and D.R. Dudley. 1981. Ecological perspective on water quality goals. Environmental Management 5:55-68 as: "A balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitat of the region." Also referred to as 'ecosystem health'.

Biotreatment Control BMP – A sub-category of structural treatment control BMPs that employ biological uptake, transformation, or degradation of pollutants as their principal mechanism(s) of pollutant removal. Although a significant portion of the design capture volume or flow will incidentally infiltrate, evaporate, or evapotranspire, the principal of operation involves the discharge of the treated storm water after detention in a densely-vegetated basin and after passing through porous, biologically-active medium, dense vegetation or both.

California Toxics Rule – Numeric water quality criteria for certain Priority Toxic Pollutants and other water quality standards provisions promulgated by the USEPA for waters in the state of California. The California Toxics Rule is found in 40 CFR § 131.

Clean Water Act Section 402(p) – The federal statute, codified at 33 USC 1342(p), requiring municipal and industrial Co-permittees to obtain NPDES permits for their discharges of storm water.

Clean Water Act Section 303(d)-Listed Water Body – An impaired water body; a water body in which water quality does not meet applicable water quality standards and/or is not expected to meet water quality standards, even after the application of technology-based pollution controls required by the CWA.

Construction Site – Any project, including projects requiring coverage under the General Construction Permit, that involves soil disturbing activities including, but not limited to, clearing, grading, disturbances to ground such as stockpiling, and excavation.

Contamination – An impairment of the quality of waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. "Contamination" includes any equivalent effect resulting from the disposal of waste whether or not waters of the State (inclusive of waters of the U.S.) are affected. (California Water Code Section 13050(k))

Co-permittee(s) – Entities regulated under Order No. R8-2015-0001, inclusive of the Principle Co-permittee.

Criteria – The numeric values and the narrative standards that represent contaminant concentrations that are not to be exceeded in the receiving environmental media (surface water, groundwater, sediment) to protect beneficial uses.

Debris – Debris is defined as the remains of anything destroyed or broken, or accumulated loose fragments of rock.

Design Capture Flow – The calculated flow rate of storm water runoff, typically expressed as cubic feet per second ("cfs"), that must be treated in one or more structural treatment control BMPs according to the requirements of this Order.

Design Capture Volume – The calculated volume of storm water runoff, typically expressed in gallons or cubic feet, that must be treated in one or more structural treatment control BMPs according to the requirements of this Order.

Dry Weather – Weather in which there is no precipitation.

Duly Authorized Representative – All reports required by this permit, and other information by the Executive Officer shall be signed by the legally responsible party ("LRP") or by a duly authorized representative of that person. A person is a duly authorized representative only if:

- The authorization is made electronically submitted by either a principal executive officer or ranking elected official;
- The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated activity such as a position of plant manager, superintendent, position of equal responsibility, or

an individual or position having overall responsibility for environmental matters for the municipality (A duly authorized representative may thus be either a named individual or any individual occupying a named position); and

- The written authorization is submitted to the Executive Officer.

Effluent – Any discharge of water either to the receiving water or beyond the property boundary controlled by the discharger.

Effluent Limit/Limitation – Means any restriction on quantities, discharge rates, and concentrations of pollutants which are discharged from point sources into Waters of the United States, waters of the "contiguous zone," or the ocean. (40 CFR §122.2)

Emergency – A sudden, unexpected occurrence, involving a clear and imminent danger, demanding immediate action to prevent or mitigate loss of, or damage to, life, health, property, or essential public services (Public Resources Code Section 21060.3).

Environmentally Sensitive Area ("ESA") – An area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which would be easily disturbed or degraded by human activities and developments (Public Resources Code Section 30107.5). These areas include, but are not limited to: water bodies designated with the RARE beneficial use in the Basin Plan (Water Quality Control Plan for the Santa Ana River Basin [1995] and amendments); an area designated in the Ocean Plan as an Area of Special Biological Significance; Marine Protected Areas designated as such pursuant to the Marine Life Protection Act; a water body listed as being impaired pursuant to CWA Section 303(d); areas designated as preserves or their equivalent under the Natural Communities Conservation Program (Multiple Species Habitat Conservation Plan, "MSHCP") within the Cities and Counties of Orange, Riverside and San Bernardino; or any area designated as such by a public agency with designation powers.

Erosion – The process whereby material (such as sediment) is detached and entrained in water or air and can be transported to a different location. Chemical erosion involves materials that are dissolved and removed and transported.

Executive Officer – The Executive Officer of the Santa Ana Regional Water Quality Control Board or delegated staff.

Grading – The cutting and/or filling of the land surface to a desired slope or elevation.

Harvest and Use Low-Impact Development Best Management Practice ("Harvest

and Use LID BMP") – A sub-category of retention LID BMPs that uses harvest and use of the design capture volume or quantified portion thereof. The captured volume is typically used for non-potable uses such as toilet-flushing, industrial process supply, and landscape irrigation.

Hazardous Substance – Any substance that poses a threat to human health or the environment due to its toxicity, corrosiveness, ignitability, explosive nature or chemical reactivity; any substance designated under 40 CFR §116 pursuant to Section 311(b)(2) of the Clean Water Act (40 CFR § 122.2).

Hydrologic Condition of Concern ("HCOC") – A condition of a stream or channel, or some reach thereof; or a condition of some other water body (e.g. a vernal pool), where its hydrology is, or is proposed to be, altered by past or future development such that there has been, or could be, cumulatively significant adverse impacts to the physical or biological integrity of the water body. A condition where a proposed development site discharges directly or indirectly to a water body where such conditions are known or suspected to exist based on Substantial Evidence.

Illicit Discharge – Any discharge to a municipal separate storm sewer that is not composed entirely of storm water. This does not include discharges that occur pursuant to an NPDES permit, other than the MS4 Permit, and discharges resulting from fire-fighting activities (40 CFR § 122.26(b)(2)).

Impaired Water Body – Section 303(b) of the CWA requires each of California's Regional Water Quality Control Boards to routinely monitor and assess the quality of waters of their respective regions. If this assessment indicates that Beneficial Uses are not met, then that water body must be listed under Section 303(d) of the CWA as an Impaired Water Body.

Impervious Surface – That part of a developed parcel that has been modified to reduce the land's natural ability to absorb and hold rainfall. It includes hard surfaces which cause water to run off the surface in greater quantities or at an increased rate of flow from the flow that existed under natural conditions prior to development. For example, common impervious surfaces include, but are not limited to, rooftops, walkways, patios, courtyards, driveways, parking lots, storage areas, concrete or asphalt paving, gravel roads, or any cleared, graded, graveled, paved, or compacted surfaces, or other surfaces which similarly impede the natural infiltration of surface water into the soil.

Infiltration – The flow of water into the soil by crossing the soil surface.

Infiltration Low-Impact Development Best Management Practice ("Infiltration LID BMP") – A type of retention LID BMP that employs infiltration at the principal mechanism for the loss of the design capture volume or quantified portion thereof.

Isopluvia – A line on a map drawn through geographical points having the same pluvial (rain, precipitation) index.

Land Disturbance – The clearing, grading, excavation, stockpiling, or other construction activity that results in the possible mobilization of soils or other pollutants into the MS4. This specifically does not include routine maintenance activity to maintain the original line and grade, hydraulic capacity, or original purpose of the facility. This also does not include emergency construction activities required to protect public health and safety.

Legally Responsible Person ("LRP") –For a municipality: a principal executive officer or ranking elected official. The LRP designates the duly authorized representative.

Load Allocations ("LA") – Distribution or assignment of TMDL pollutant loads to entities or sources for existing and future nonpoint sources, including background loads.

Low-Impact Development ("LID") – A storm water management and land development strategy that combines a hydrologically functional site design with pollution prevention measures to compensate for land development impacts on hydrology and water quality. LID techniques mimic the site's predevelopment hydrology by using site design techniques that store, infiltrate, evapotranspire, bio-filter or detain runoff close to its source.

Maximum Extent Practicable ("MEP") - refers to a standard for implementation of storm water management programs. Section 402(p)(3)(B)(iii) of the Clean Water Act requires that municipal storm water permits "shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques, and system design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants."

In practice, compliance with the MEP standard is evaluated by how well the Co-Permittees implement the "minimum measures" identified by EPA, including: (1) Public education and outreach on storm water impacts; (2) Public involvement/participation; (3) Illicit discharge detection and elimination; (4) Construction site storm water runoff control; (5) Post-construction storm water management in new development and redevelopment; and (6) Pollution prevention/good housekeeping for municipal operations. Collectively, these minimum measures are often referred to as "Best Management Practices" or BMPs. The MEP standard does not require Co-permittees to reduce pollutant concentrations below natural background levels, nor does it require further reductions where pollutant concentrations in the receiving water already meet water quality objectives.

MEP is a technology-based standard established by Congress in CWA section 402(p)(3)(B)(iii) that operators of MS4s must meet. Technology-based standards establish the level of pollutant reductions that dischargers must achieve, typically by

treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) in combination with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than BAT.

A definition for MEP is not provided either in the statute or in the regulations. Instead the definition of MEP is dynamic and will be defined by the following process over time: municipalities propose their definition of MEP by way of their urban runoff management programs. Their total collective and individual activities conducted pursuant to the urban runoff management programs becomes their proposal for MEP as it applies both to their overall effort, as well as to specific activities (e.g., MEP for street sweeping, or MEP for MS4 maintenance). In the absence of a proposal acceptable to the Regional Board, the Regional Board defines MEP.

In a memo dated February 11, 1993, entitled "Definition of Maximum Extent Practicable," Elizabeth Jennings, Senior Staff Counsel, SWRCB addressed the achievement of the MEP standard as follows:

> "To achieve the MEP standard, municipalities must employ whatever Best management Practices (BMPs) are technically feasible (i.e., are likely to be effective) and are not cost prohibitive. The major emphasis is on technical feasibility. Reducing pollutants to the MEP means choosing effective BMPs, and rejecting applicable BMPS only where other effective BMPS will serve the same purpose or the BMPS would not be technically feasible, or the cost would be prohibitive. In selecting BMPS to achieve the MEP standard, the following factors may be useful to consider:
>
> a. Effectiveness: Will the BMPS address a pollutant (or pollutant source) of concern?
> b. Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?
> c. Public Acceptance: Does the BMP have public support?
> d. Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?
> e. Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc?
>
> The final determination regarding whether a municipality has reduced pollutants to the maximum extent practicable can only be made by the Regional or State Water Boards, and not by the municipal discharger. If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those where it can show that they are not

technically feasible in the locality, or whose cost would exceed any benefit derived, it would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs that would address a pollutant source, or to pick a BMP based solely on cost, which would be clearly less effective. In selecting BMPs the municipality must make a serious attempt to comply and practical solutions may not be lightly rejected. In any case, the burden would be on the municipal discharger to show compliance with its permit. After selecting a menu of BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented."

Monitoring and Reporting Period – For purposes of this Order, the monitoring and reporting period is July 1 to June 30 with a reporting deadline of the following November 15th of each year for Annual Progress Reports.

Municipal Storm Water Conveyance System – (See Municipal Separate Storm Sewer System or MS4).

Municipal Separate Storm Sewer System ("MS4") – A conveyance or system of conveyances designed to collect and/or transport urban runoff (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a State, city town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes; (ii) Designated or used for collecting of conveying storm water; (iii) Which is not a combined sewer; (iv) Which is not part of the Publicly Owned Treatment Works (POTW) as defined at 40 CFR § 122.2 (40 CFR § 126.26(b)(8)).

Most Probable Number ("MPN") – The most probable number (MPN) of coliform or fecal coliform bacteria per unit volume of a sample. It is expressed as the number of organisms which are most likely to have produced the laboratory results noted in a particular test.

National Pollutant Discharge Elimination System ("NPDES") Permit – A national program under section 402 of the Clean Water Act for regulation of discharges of pollutants from point sources to waters of the United States. Discharges of pollutants are prohibited unless specifically exempted or authorized by an NPDES permit.

Non-Storm Water – Non-storm water consists of all discharges to and from a storm water conveyance system that do not originate from precipitation events (i.e., all discharges from a conveyance system other than storm water). Non-storm water includes illicit discharges, prohibited discharges, and NPDES permitted discharges.

Nuisance – anything which meets all of the following requirements: 1) Is injurious to health, or is indecent, or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. 2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. 3) Occurs during, or as a result of, the treatment or disposal of wastes (CWC Section 13050(m)).

Outfall - A *point source*, as defined by 40 CFR 122.2, at the point where an MS4 discharges to waters of the United States. An outfall does not include open conveyances connecting two municipal separate storm sewers. An outfall does not include pipes, tunnels, or other conveyances which connect segments of the same stream or other waters of the U.S. and are used to convey waters of the U.S. (40 CFR 122.26(b)(9)).

Party – Defined as an individual, association, partnership, corporation, municipality, state or federal agency, or an agent or employee thereof (40 CFR § 122.2).

Permit Area – Areas that are under the jurisdiction of the Santa Ana Regional Water Quality Control Board. These include north and northwestern portions of Orange County, north and western portions of Riverside County and western portions of San Bernardino County. See the Basin Plan for a detailed description of the Regional Board boundaries.

Permit Registration Documents ("PRDs") – Include the Notice of Intent, Storm Water Pollution Prevention Plan, Site Map and the appropriate filing fee necessary to authorize a discharge under general waste discharge requirements.

Person – A person is defined as an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof (40 CFR § 122.2).

pH - An indicator of the acidity or alkalinity of water.

Point Source – Any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, runoff from concentrated animal feeding operations, landfill leachate collection systems, vessel, or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

Pollutant – Any agent that may cause or contribute to the degradation of water quality such that a condition of pollution or contamination is created or aggravated. It includes any type of industrial, municipal, and agricultural waste discharged into water. The term "pollutant" is defined in section 502(6) of the Clean Water Act as follows: "The term 'pollutant' means dredged spoil, solid waste, incinerator residue, sewage, garbage,

sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water." It has also been interpreted to include water characteristics such as toxicity or acidity.

Pollution – The alteration of the quality of the Waters of the U.S. by waste, to a degree that unreasonably affects either of the following: 1) The waters for beneficial uses; or 2) Facilities that serve these beneficial uses. Pollution may include contamination (CWC Section 13050(l)).

Pollution Prevention – Practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control, treatment, or disposal.

Principal Permittee – The County of Orange

Priority Toxic Pollutant – A pollutant identified in the California Toxics Rule.

Receiving Waters – Waters of the United States within the Permit area.

Receiving Water Limitations – Waste discharge requirements issued by the Regional Board typically include both: (1) "Effluent Limitations" (or "Discharge Limitations") that specify the technology-based or water-quality-based effluent limitations; and (2) "Receiving Water Limitations" that specify the water quality objectives in the Basin Plan as well as any other limitations necessary to attain those objectives. In summary, the "Receiving Water Limitations" provision is the provision used to implement the requirement of CWA SECTION 301(b)(1)(C) that NPDES permits must include any more stringent limitations necessary to meet water quality standards.

Retention Low-Impact Development Best Management Practice ("Retention LID BMP") – A sub-category of structural treatment control BMPs that employ retention of the design capture volume or a quantified portion thereof. The retained volume is infiltrated, evaporated, evapotranspired, or used (typically for non-potable uses).

Sediment – Soil, sand, and minerals washed from land into water. Sediment resulting from anthropogenic sources (i.e. human-induced land disturbance activities) is considered a pollutant. This Order regulates only the discharges of sediment from anthropogenic sources and does not regulate naturally-occurring sources of sediment. Sediment can destroy fish-nesting areas, clog animal habitats, and cloud waters so that sunlight does not reach aquatic

plants.

Source Control and Site Design BMPs – In general, activities or programs to educate the public or provide low-cost non-physical solutions, as well as facility design or practices aimed to limit the contact between pollutant sources and storm water or authorized non-storm water. Examples include: activity schedules, prohibitions of practices, industrial area sweeping, facility maintenance, detection and elimination of illegal and unauthorized discharges, and other non-structural measures. Facility design (structural) examples include providing attached lids to trash containers, canopies for fueling islands, secondary containment, or roof or awning over material and trash storage areas to prevent direct contact between storm water and pollutants

Standard Industrial Classification ("SIC") Code – Four digit industry code, as defined by the US Department of Labor, Occupational Safety and Health Administration. The SIC Code is used to identify if a facility requires coverage under the Industrial Activities Storm Water Permits.

State Implementation Plan ("SIP") – Formally known as the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California. The SIP implements the California Toxics Rule.

State Board – California State Water Resources Control Board

Storm Water – Storm water runoff, snowmelt runoff and surface runoff and drainage (40 CFR § 122.26(b)(13)).

Storm Water General Permits – General Permit-Industrial (State Board Order No. 97-03 DWQ, NPDES No. CAS000001), and General Permit-Construction (State Board Order No. 2009-0009-DWQ, NPDES No. CAS000002).

Structural treatment control BMPs – Any system designed and constructed according to published and generally-accepted engineering criteria to remove pollutants from urban runoff. Pollutants are removed by simple gravity settling of particulate pollutants, filtration, biological uptake, media adsorption or any other physical, biological, or chemical process. In this Order, structural treatment control BMPs treat the design capture volume or flow or a portion thereof. They are classified as LID BMPs and non-LID BMPs. LID BMPs are further sub-classified into Retention LID BMPs and Biotreatment Control BMPs. All of these classes of structural treatment control BMPs are subject to general and specific requirements in this Order.

Substantial Evidence – Facts, reasonable assumptions predicated on facts, or expert opinion supported by facts. Substantial Evidence does not include argument, speculation,

unsubstantiated opinion or narrative, or evidence which is clearly erroneous or inaccurate (Public Resources Code Section 21080(e)).

Storm Water Pollution Prevention Plan ("SWPPP") – A plan developed to minimize and control the discharge of pollutants from the industrial site to storm water conveyance systems. The plan shall identify pollutant sources, control measures for each pollutant source, good housekeeping practices and employee training programs.

Total Dissolved Solids ("TDS") – A measure of the total dissolved minerals in the water; the total dissolved (filterable) solids as determined by use of the method specified in 40 CFR § 136 (40 CFR § 122.2)

Total Maximum Daily Load ("TMDL") – The maximum amount of a pollutant that can be discharged into a water body from all sources (point and non-point) and still maintain water quality standards. Under Clean Water Act § 303(d), TMDLs must be developed for all water bodies that do not meet water quality standards after application of technology-based controls.

TMDL Implementation Plan – Component of a TMDL that describes actions, including monitoring, needed to reduce pollutant loadings and a timeline for implementation. TMDL implementation plans can include a monitoring or modeling plan and milestones for measuring progress, plans for revising the TMDL if progress toward cleaning up the waters is not made, and the date by which water quality standards will be met (USEPA Final TMDL Rule: Fulfilling the Goals of the CWA, EPA 841-F-00-008, July 2000).

Toxicity – Adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies.

Turbidity – The cloudiness of water quantified by the degree to which light traveling through a water column is scattered by the suspended organic and inorganic particles it contains. The turbidity test is reported in Nephelometric Turbidity Units (NTU) or Jackson Turbidity Units (JTU)

Uncontaminated Groundwater – Groundwater that is not impaired by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease

Urban Runoff – Urban runoff is defined as all flows in a storm water conveyance system from urban areas which include residential, commercial, industrial, and

construction areas. Urban runoff consists of the following components: (1) storm water runoff and (2) authorized non-storm water discharges (See Section III of this Order). Urban runoff does not include runoff from undeveloped open space, feedlots, dairies, farms, and agricultural fields.

Waste – Waste includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal (CWC Section 13050(d)). Article 2 of CCR Title 23, Chapter 15 (Chapter 15) contains a waste classification system which applies to solid and semi-solid waste which cannot be discharged directly or indirectly to water of the state and which therefore must be discharged to land for treatment, storage, or disposal in accordance with Chapter 15. There are four classifications of waste (listed in order of highest to lowest threat to water quality): hazardous waste, designated waste, nonhazardous solid waste, and inert waste.

Waste Discharge Requirements ("WDR") – As defined in section 13374 of the California Water Code, the term "Waste Discharge Requirements" is the equivalent of the term "permits" as used in the Federal Water Pollution Control Act, as amended. The Regional Board usually uses the terms "permit" and "Order" to refer to Waste Discharge Requirements for discharges to Waters of the U.S.

Waste Load Allocations ("WLA") – WLA is the distribution or assignment of pollutant loads to entities or sources for existing and future point sources according to a TMDL; the maximum quantity of pollutants a discharger is allowed to release into a particular waterway, as set by a regulatory authority. Discharge limits usually are required for each specific water quality criterion being, or expected to be, violated.

Water Quality Assessment – An assessment conducted to evaluate the condition of water bodies which receive process wastewater, storm water and non-storm water discharges.

Water Quality Objective – The limits or levels of water quality constituents or characteristics which are established for the reasonable protection of beneficial uses of water or the prevention of nuisance within a specific area [California Water Code Section 13050(h)).

Water Quality Standards – Consist of beneficial uses, water quality objectives to protect those uses, an anti-degradation policy, and policies for implementation. Water quality standards are found in Regional Water Quality Control Plans and statewide

water quality control plans. The USEPA has also adopted water quality criteria (the same as objectives) for California in the National Toxics Rule and California Toxics Rule.

Waters of the State – Any surface water or groundwater, including saline waters, within the boundaries of the State (California Water Code Section 13050(e)). Waters of the State includes waters of the United States.

Waters of the United States – Waters of the United States can be broadly defined as navigable surface waters and tributaries thereto. Groundwater is not considered to be Waters of the United States. As defined in 40 CFR § 122.2, the Waters of the U.S. are defined as: (a) All waters, which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate "wetlands;" (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sand flats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters otherwise defined as waters of the United States under this definition: (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial seas; and (g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA.

Watershed – That geographical area which drains to a specified point on a water course, usually a confluence of streams or rivers; a drainage area, catchment, or river basin.

Wet Season – The period of October 1st through May 31st of each year, except where specifically defined otherwise in an approved TMDL Implementation Plan.

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Appendix A

Table A-1: Applicability of TMDL requirements to Co-permittees[1]

	San Diego Creek and Newport Bay Watershed TMDLs						San Gabriel River TMDL
Co-permittee	Nutrient TMDL	Fecal Coliform TMDL	Organochlorine Compounds TMDL	Diazinon & Chlorpyrifos TMDL	Toxics TMDL	Sediment TMDL	Coyote Creek Metals TMDL
County of Orange	X	X	X	X	X	X	X
Orange County Flood Control District	X	X	X	X	X	X	X
City of Anaheim							X
City of Brea							X
City of Buena Park							X
City of Costa Mesa	X	X	X	X	X	X	
City of Cypress							X
City of Fountain Valley							
City of Fullerton							X
City of Garden Grove							X
City of Irvine	X	X	X	X	X	X	
City of Laguna Hills[2]	X		X	X	X		
City of Laguna Woods[2]	X		X	X	X		
City of La Habra							X
City of La Palma							X
City of Lake Forest	X	X	X	X	X	X	
City of Los Alamitos							X
City of Newport Beach	X	X	X	X	X	X	
City of Orange	X	X	X	X	X		
City of Placentia							X
City of Santa Ana	X	X	X	X	X	X	
City of Seal Beach							X
City of Stanton							X
City of Tustin	X	X	X	X	X	X	
City of Yorba Linda							X[3]

[1] Table A-1 excludes the cities of Fountain Valley, Garden Grove, Huntington Beach, Villa Park, and Westminster; these Co-permittees do not discharge to waters for which there is an adopted TMDL.
[2] The TMDLs requirements will be enforced through the San Diego Regional Water Quality Control Board's MS4 permit.
[3] Only if the City of Yorba Linda discharges into Coyote Creek. See the Technical Report for further information.

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Appendix B

Water Quality-Based Effluent Limits for Nutrients in Newport Bay

The following water quality-based effluent limits ("WQBELs") apply to discharges of urban runoff from MS4s owned or controlled by those Co-permitees discharging into Newport Bay as indicated in Appendix A. The WQBELs in this Appendix are based on the waste load allocations ("WLAs") in the Nutrient TMDL. Compliance with the WQBELs in this Appendix will be determined according to methods described in Section XVIII of Order No. R8-2015-0001.

The Nutrient TMDL has been approved by Santa Ana Regional Water Quality Control Board, the State Water Resources Control Board, the Office of Administrative Law ("OAL") and USEPA. The Nutrient TMDL was adopted by the Santa Ana Regional Water Quality Control Board in Resolution No. 98-9 (amended by Resolution No. 98-100). The TMDL was approved by the Office of Administrative Law on February 10, 1999 and April 16, 1999. The compliance deadlines that were adopted as part of this TMDL have passed and the following WQBELs are effective on the effective date of this Order.

I. Final WQBELs

The responsible Co-permittees must comply with the methods described in Section XVIII of Order No. R8-2015-0001 to demonstrate compliance with the following final WQBELs:

A. Reach 1, San Diego Creek

Table B-1: Final Nutrient WQBELs for Reach 1 of San Diego Creek

Total Nitrogen[1] – Summer[2] (pounds/season)	Total Nitrogen[1] – Winter[3, 4, 5] (pounds/season)	Total Phosphorous – Annual (pounds/year)
16,628	55,442	2,960

Table B-1 Notes:

1. Total Nitrogen = NO_3 + NH_3 + organic N
2. Summer season: April through September
3. Winter season: October through March
4. The WQBEL for winter Total Nitrogen applies between October 1 and March 31 when the mean daily flow rate in San Diego Creek at Campus Drive is less than 50 cubic feet per second ("cfs") and

when the mean daily flow rate in San Diego Creek at Campus Drive is above 50 cfs but not as the result of precipitation.

5. Assumes 67 non-storm days.

B. Reach 2, San Diego Creek: 5.5 pounds per day Total Nitrogen

1. This WQBEL for Total Nitrogen applies when the mean daily flow rate in San Diego Creek at Culver Drive is below 25-cfs and when the mean daily flow rate in San Diego Creek at Culver Drive is above 25-cfs but not as the result of precipitation.

Appendix C

Water Quality-Based Effluent Limits for Fecal Coliform in Newport Bay

The following water quality-based effluent limits ("WQBELs") apply to discharges of urban runoff from MS4s owned or controlled by those Co-permitees discharging into Newport Bay as indicated in Appendix A. The WQBELs in this Appendix are based on the waste load allocations in the Fecal Coliform TMDL. Compliance with the WQBELs in this Appendix will be determined according to methods described in Section XVIII of Order No. R8-2015-0001.

The Fecal Coliform TMDL has been approved by Santa Ana Regional Water Quality Control Board, the State Water Resources Control Board, the Office of Administrative Law ("OAL") and USEPA. The Fecal Coliform TMDL was adopted by the Santa Ana Regional Water Quality Control Board in Resolution No. 99-10 The TMDL was approved by OAL on December 24, 1999 and February 28, 2000. Unless indicated otherwise below, the compliance deadlines that were adopted as part of this TMDL have passed and the following WQBELs are effective on the effective date of this Order.

I. Final WQBELs

A. The responsible Co-permittees must comply with the methods described in Section XVIII of Order No. R8-2015-0001 to demonstrate compliance with the following final WQBEL to protect the shell fish harvesting (SHEL) beneficial use:

Table C-1: Final WQBEL to protect SHEL

WQBEL to protect REC-1	Compliance Date
Monthly median less than 14 MPN/100mL and not more than 10% of the samples exceed 43 MPN/100mL	As soon as possible but no later than December 30, 2019.

B. The responsible Co-permittees must provide an updated TMDL report for both the final WQBELs to protect SHEL no later than 60-days from the effective date of this Order. The TMDL report must:

1. Integrate and evaluate the results of the relevant studies performed as part of Tasks 1 through 7 of the Fecal Coliform TMDL implementation plan (Table 5-9g of the Basin Plan);
2. Include recommendations for revisions to the TMDL if appropriate; and
3. Include recommendations for interim WQBELs and related compliance schedules.

Appendix D

Water Quality-Based Effluent Limits for Sediment in Upper Newport Bay

The following water quality-based effluent limits ("WQBELs") apply to discharges of urban runoff from MS4s owned or controlled by those Co-permitees discharging into Upper Newport Bay as indicated in Appendix A. The WQBELs in this Appendix are based on the requirements in the Sediment TMDL, exclusive of the load allocations. Compliance with the WQBELs in this Appendix will be determined according to methods described in Section XVIII of Order No. R8-2015-0001.

The Sediment TMDL has been approved by Santa Ana Regional Water Quality Control Board, the State Water Resources Control Board, the Office of Administrative Law ("OAL") and USEPA. The Sediment TMDL was adopted by the Santa Ana Regional Water Quality Control Board in Resolution No. 98-101. The TMDL was approved by OAL on February 2, 1999 and April 16, 1999. The compliance deadlines that were adopted as part of this TMDL have passed and the following WQBELs are effective on the effective date of this Order.

I. Final WQBELs

The responsible Co-permittees must comply with the methods described in Section XVIII of Order No. R8-2015-0001 to demonstrate compliance with the following final WQBELs:

A. Discharges of urban runoff must not transport more than 2,500 tons of sediment per year, calculated as a 10-year running average, into Newport Bay from urban areas.

B. Discharges of urban runoff must not transport more than 2,500 tons of sediment per year, calculated as a 10-year running average, into San Diego Creek and its tributaries.

C. Sediment in discharges of urban runoff must not alter the distribution of habitat types in the 700-acre Upper Newport Bay Ecological Reserve, in Table D-1 below or as revised by the Department of Fish and Wildlife, by more than 1%.

Table D-1: Baseline Distribution of Habitat Types in the Upper Newport Bay Ecological Reserve

Habitat Type	Acres	Permissible Change (acres)
Marine aquatic	210	2.1
Mudflat	214	2.1
Salt marsh	277	2.8
Riparian	31	3.1

D. The depths of the Unit 1 and 2 Sediment Basins (a.k.a. Unit I/III and Unit II) must be maintained at a minimum of 7-feet below mean sea level.

E. Bathymetric and vegetation surveys must be performed no less than once every five years, or as agreed to by the Executive Officer, in a manner to determine compliance with the above requirements for sediment[1].
   1. Bathymetric and vegetation surveys must be performed within one year following any monitoring period in which monitoring at San Diego Creek at Jamboree Boulevard and Campus Drive (Site ID: SDMF05) shows that more than 250,000 tons of sediment were discharged into Newport Bay.
   2. Bathymetric and vegetation surveys must be conducted by July 1st of each year that they are performed, and must be submitted by December 31 of the same year.

F. All in-channel and foothill sediment-control basins tributary to Newport Bay must have an available sediment capacity that is 50% or more of each facilities' design capacity prior to November 15th of each year.

[1] The Basin Plan calls for a 3-year survey period. The period was amended pursuant to an approval granted by the Executive Officer in a letter dated February 14, 2014.

Appendix E

Water Quality-Based Effluent Limits for Organochlorine Compounds in Newport Bay and San Diego Creek

The following water quality-based effluent limits ("WQBELs") apply to discharges of urban runoff from MS4s owned or controlled by those Co-permitees discharging into Newport Bay and San Diego Creek as indicated in Appendix A. The WQBELs in this Appendix are based on the waste load allocations ("WLAs") in the Organochlorine Compound TMDL. Compliance with the WQBELs in this Appendix will be determined according to methods described in Section XVIII of Order No. R8-2015-0001. The compliance deadlines for these WQBELs have not yet passed.

The Organochlorine Compound TMDL that the following WQBELs are based on has been approved by Santa Ana Regional Water Quality Control Board, the State Water Resources Control Board, the Office of Administrative Law ("OAL") and USEPA. The Organochlorine Compound TMDL was adopted by the Santa Ana Regional Water Quality Control Board in Resolution No. R8-2011-0037 (modifying Resolution No. R8-2007-0024). The TMDL was approved by OAL on July 26, 2013 and by USEPA on November 12, 2013. Chlordane, dieldrin, DDT and PCBs are part of the earlier USEPA-promulgated TMDL whose WLAs were superseded by the Regional Board's TMDL. As a result, the pollutant-water body WLAs established by USEPA's TMDL do not appear below and are not in effect.

I. The responsible Co-permittees must comply with the methods described in Section XVIII of Order No. R8-2015-0001 to demonstrate compliance with the final WQBELs in Table E-1. These WQBELs must be met as soon as possible but not later than December 31, 2020:

Table E-1: WQBELs by Receiving Water for Organochlorine Compounds

	Water Quality-Based Effluent Limit (g/year)			
Receiving Water	Total DDT	Chlordane	Total PCB	Toxaphene
San Diego Creek	128.3	--	--	1.9
Upper Newport Bay	51.8	30.1	29.8	--
Lower Newport Bay	19.1	11.0	78.1	--

Appendix F

Water Quality-Based Effluent Limits for the Diazinon & Chlorpyrifos TMDL for Upper Newport Bay and San Diego Creek

The following water quality-based effluent limits ("WQBELs") apply to discharges of urban runoff from MS4s owned or controlled by those Co-permitees discharging into Upper Newport Bay or San Diego Creek as indicated in Appendix A. The WQBELs in this Appendix are based on the waste load allocations in the Diazinon & Chlorpyrifos TMDL. Compliance with the WQBELs in this Appendix will be determined according to methods described in Section XVIII or Order No. R8-2015-0001.

The Diazinon & Chlorpyrifos TMDL has been approved by Santa Ana Regional Water Quality Control Board, the State Water Resources Control Board, the Office of Administrative Law ("OAL") and USEPA. The Diazinon & Chlorpyrifos TMDL was adopted by the Santa Ana Regional Water Quality Control Board in Resolution No. R8-2003-0039. The TMDL was approved by OAL on January 5, 2004 and February 13, 2004. The compliance deadline that was adopted as part of this TMDL has passed and the following WQBELs are effective on the effective date of this Order.

I. The responsible Co-permittees must comply with the methods described in Section XVIII of Order No. R8-2015-0001 to demonstrate compliance with the final WQBELs in Table F-1:

Table F-1: WQBELs for Chlorpyrifos and Diazinon in Upper Newport Bay and San Diego Creek

	Chlorpyrifos (ng/L)		Diazinon (ng/L)	
Receiving Water	Acute Concentration (24-hour average)	Chronic Concentration (4-consequtive day average)	Acute Concentration (24-hour average)	Chronic Concentration (4-consequtive day average)
Upper Newport Bay	18	8.1	--	--
San Diego Creek	18	12.6	72	45

Appendix G

Water Quality-Based Effluent Limits for Toxic Pollutants (Metals and Selenium) into San Diego Creek and Newport Bay

The following water quality-based effluent limits ("WQBELs") apply to discharges of urban runoff from MS4s owned or controlled by those Co-permitees discharging into San Diego Creek and Newport Bay as indicated in Appendix A.

The WQBELs in this Appendix are based on the waste load allocations in the Toxic Pollutants (Metals and Selenium) TMDL. The TMDL was promulgated by USEPA on June 17, 2002. Pollutant-water body combinations for diazinon, chlorpyrifos, and organochlorinated compounds have been superseded by Basin Plan Amendments by the Regional Board. Therefore, the waste load allocations for these compounds have not been incorporated into this Appendix as WQBELs and are not in effect.

Compliance with the WQBELs in this Appendix will be determined according to methods developed pursuant to Section XVIII or Order No. R8-2015-0001. Compliance deadlines for the WBELs in this Appendix were not established; these WQBELs are effective on the effective date of this Order.

I. The responsible Co-permittees must comply with the methods described in Section XVIII of Order No. R8-2015-0001 to demonstrate compliance with the final WQBELs in the following Tables G-1, G-2, G-3, and G-4:

Table G-1: Concentration-based WQBELs for Metals in San Diego Creek at Campus Drive

	Base Flow (flow < 20-cfs; hardness = 400 mg/L)		Small Flows (21 ≤ flow ≤ 181-cfs; hardness = 322 mg/L)		Medium Flows (182 ≤ flow ≤ 815-cfs; hardness = 236 mg/L)		Large Flows (flow >815- cfs; hardness = 197 mg/L)
	Acute (µg/L)	Chronic (µg/L)	Acute (µg/L)	Chronic (µg/L)	Acute (µg/L)	Chronic (mg/L)	Acute (µg/L)
Cadmium, dissolved	19.1	6.2	15.1	5.3	10.8	14.2	8.9
Copper, dissolved	50	29.3	40	24.3	30.2	18.7	25.5
Lead, dissolved	281	10.9	224	8.8	162	6.3	134

Zinc, dissolved	379	382	316	318	243	224	208

Table G-2: WQBELs for Discharges of Metals into Newport Bay

	Acute Concentrations (24-hour average) (µg/L)	Chronic Concentrations (4 consecutive day/96-hour average) (µg/L)	Mass-based Loads (pounds/year)[2]
Cadmium, dissolved[1]	42	9.3	9,589
Copper, dissolved	4.8	3.1	3,043
Lead, dissolved	210	8.1	17,638
Zinc, dissolved	90	81	174,057

Notes for Table G-2:
1. Values for dissolved cadmium apply only to discharges to Upper Newport Bay
2. Mass-based loads are measured in the Newport Bay water column according to the Basin Plan.

Table G-3: WQBELs for Discharges into the Rhine Channel

Mercury (kg/year)	Chromium (kg/year)
0.0171	5.66

Table G-4: WQBELs for Discharges of Selenium in San Diego Creek at Campus Drive

	Base Flows Flow < 20-cfs	Small Flows (21 ≤ flow ≤ 18- cfs)	Medium Flows 182 ≤ flow ≤ 814-cfs)	Large Flows (flow > 814-cfs)	Annual Total
Maximum Permissible Annual Load (pounds/year)	0.4	1.0	1.0	5.3	7.6

Appendix H

Water Quality-Based Effluent Limits for Coyote Creek

The following water quality-based effluent limitations ("WQBELs") apply to discharges of urban runoff from MS4's owned or controlled by those Co-permitees discharging into Coyote Creek as indicated in Appendix A. These WQBELs are based on the waste load allocations and requirements in the San Gabriel River Metals TMDL promulgated by the USEPA on March 26, 2007. Compliance with the WQBELs in this Appendix will be determined according to methods developed pursuant to Section XVIII or Order No. R8-2015-0001. Compliance deadlines for the WBELs in this Appendix were not established; unless noted otherwise, these WQBELs are effective on the effective date of this Order.

I. The responsible Co-permittees must comply with the methods described in Section XVIII of Order No. R8-2015-0001 to demonstrate compliance with the final WQBELs in the following Tables:

Table H-1: WQBELS for Discharges in Coyote Creek

	Copper, total recoverable (kg/day)	Lead, total recoverable (kg/day)	Zinc, total recoverable (kg/day)
Dry Weather[1]	0.941	--	--
Wet Weather[2]	24.71 µg/L x daily storm volume in liters	96.99 µg/L x daily storm volume in liters	144.57 µg/L x daily storm volume in liters

Noted for Table H-1:

1. These WLA are calculated based on the median flow at the U.S. Army Corps of Engineers' stream gauge station F-354-R of 19-cfs multiplied by the target concentration of 20 µg/L, minus direct air deposition of 0.002 kg/day.
2. Wet weather WQBELs apply when the maximum daily flow in the creek is equal or greater than 156-cfs, as measured F-354-R below Spring Street in the City of Long Beach.

II. Specific Monitoring Requirements

A. Runoff samples and flow volumes must be taken at the Los Angeles County Department of Public Work's storm water mass emission station at Coyote Creek (Monitoring Station S13)[2].

B. The daily storm volume to be sampled must be generated by a rain event that produces a peak flow that is equal to or greater than 156-cfs.

C. Responsible Co-permittees will develop a plan for sampling, analysis, and reporting whether or not discharges are exceeding the Waste Load Allocations in this Appendix according to Subsection II.B.2. of Monitoring and Reporting Program R8-2015-0001.

[2] Coyote Creek Monitoring Station S13 is located at the U.S. Army Corps of Engineers stream gauge station F-354-R below Spring Street in Long Beach.

Attachment A

Provisions for Certain Non-Storm Water Discharges from Sources Owned or Operated by Co-permittees

I. Applicability

The provisions contained in this Attachment B apply to the control of wastes in certain non-storm water discharges into municipal separate storm sewer systems (MS4s) which are conveyed to waters of the U.S. from sources that are owned or operated by the Co-permittees. The provisions in this Attachment are based on those found in Regional Board Order No. R8-2015-0004, NPDES Permit No. CAG998001 and State Board Order WQ 2014-0194-DWQ, General Order No. CAG140001. Discharges that are not required to obtain an NPDES permit under federal law are not subject to these provisions. Co-permittees may discharge wastes related to the operation of drinking water systems either pursuant to the provisions in this Attachment B or they may obtain coverage under CAG140001 at their discretion. These provisions supplement and do not supersede those in Regional Board Order No. R8-2015-0001.

The non-storm water discharges regulated by the provisions in this Attachment B are listed below:

A. Discharges related to operating drinking water systems and which would otherwise be authorized under CAG140001, including, but not limited to:

    1. Groundwater supply well flushing or pump-to-waste
    2. Groundwater well development, rehabilitation, and testing
    3. Groundwater monitoring for purpose of supply well development, rehabilitation and testing
    4. Trench dewatering of drinking water during planned repairs
    5. Transmission system installation, cleaning, and testing
    6. Water treatment plant operations (excluding un-decanted filter backwash that is discharged to a water of the U.S.)
    7. Distribution system storage tank or reservoir releases
    8. Distribution system dewatering flushing, and pressure testing
    9. Fire flow/fire hydrant testing
    10. Meter testing
    11. Automated water quality analyzer operation
    12. Pressure relief valves
    13. Unscheduled activities that must be undertaken to comply with mandates of the Federal Drinking Water Act and California Health and Safety Code
    14. Emergency discharges due to: (1) system failures; (2) operation errors; or (3) catastrophic events.

B. Other types of discharges deemed to contain wastes that pose an insignificant threat to water quality which would otherwise be authorized under NPDES Permit No. CAG998001:

15. Dewatering wastes from subterranean seepage, except for discharges from utility vaults and discharges in the Newport Bay Watershed containing nutrients, selenium, and other pollutants of concern at levels that pose a threat to water quality[1].
16. Air conditioning condensate
17. Swimming pool discharge
18. Discharges resulting from diverted stream flows
19. Wastewater which has been subjected to decantation from filter backwashing and filtrate wastewater from sludge dewatering at water treatment facilities.
20. Construction dewatering wastes that are not subject to the state-wide Construction General Permit, NPDES Permit No. CAS000002, as amended or revised.
21. Discharges from decorative ponds and golf course lakes.

C. Co-permittee's non-storm water discharges that are <u>not</u> authorized under this Order are as follows:

1. Non-storm water discharges that are not described in Table 2 of this Order and Sections I.A. and I.B. of this Attachment.
2. Groundwater-related discharges from within the San Diego Creek/Newport Bay Watershed which contain nutrients, selenium, and other TMDL-related contaminants at levels that may pose a threat to water quality.
3. Non-storm water discharges to a water of the U.S. for which a Total Maximum Daily Load (TMDL) has been adopted that prescribes a waste load allocation to a water purveyor and where the Executive Officer determines that the requirements of this Order are not consistent with the assumptions and requirements of the TMDL; thus, compliance with this Order is not sufficient for the discharger to comply with the waste load allocation or related water quality-based effluent limit(s).
4. Discharges from new drinking water systems (not an expansion of an existing system) into a water body that is listed, pursuant to Clean Water Act Section 303(d), as impaired by a constituent that exists in the new discharge at a concentration or load greater than the criteria used to establish the impairment of the water body and for which a the Regional Board has issued an individual permit that addresses the TMDL.
5. Wastewater discharged from hydro-testing of contaminated pipes, vessels, or tanks.
6. Wastewater discharges containing pollutants of concern except for those pollutants for which effluent discharges are specified in this Attachment.

[1] Discharges from utility vaults are regulated under State Board Order No. 2006-0008-DWQ, NPDES Permit No. CAG990002, as amended or revised.

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II. Discharge Prohibitions

A. The discharge of oil, trash, industrial waste sludge, or other solid waste directly to waters of the U.S. in this region or in any manner that will ultimately affect such waters in this region is prohibited.

B. The discharge of any substances in concentrations toxic to aquatic life, animal life, or plant life is prohibited.

C. The discharge of wastes to property not owned or controlled by the responsible Co-permittee is prohibited.

D. Odors, vectors, and other nuisances of waste origin are prohibited beyond the limits of the responsible Co-permittee's facility.

E. The addition of chemicals to extracted water, with the exception of chlorine used to control biofouling in treatment systems, is prohibited without written approval from the Executive Officer.

III. Effluent Limitations and Discharge Specifications

The effluent limitations in this Section apply at the point of discharge into the receiving water. The responsible Co-permittee's discharge must comply with the effluent limitations prior to entry into waters of the U.S. The responsible Co-permittee may demonstrate compliance through monitoring at any accessible point between the discharge and the receiving water.

A. The pH of the discharge must be within 6.5 and 8.5 pH units (see also Section IV.B.8. below).

B. The discharge must exhibit no visible oil and grease.

C. Where the discharge is composed of water from decorative ponds and golf course lakes, the responsible Co-permittee must demonstrate that the discharge does not contain pollutants according to the following:

1. The operator of such facilities must fully characterize the discharge with respect to priority toxic pollutants; pesticides, inclusive of insecticides and biocides; and other chemicals that may be present in the discharge under representative conditions.
2. The discharge must be re-characterized when there has been a change in operating procedures or other circumstances that may reasonably affect the quality of the discharge.

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D. Where the discharge is composed of decanted filter backwash wastewater or sludge dewatering filtrate water from water treatment facilities, the maximum daily concentration of total suspended solids must not exceed 30 mg/L.

E. Where a discharge from a drinking water system into inland surface waters, enclosed bays and estuaries contains residual chlorine equal or greater than the action level of 0.019 mg/L, the responsible Co-permittee must take corrective action to reduce residual chlorine concentrations until the concentration is less than the action level.

F. Where a discharge related to groundwater supply well development or operations to inland waters contains turbidity that is greater than the action level of 100 Nephelometric Turbidity Units (NTUs), the responsible Co-permittee must take corrective action to reduce turbidity until it is equal or less than the action level.

G. The turbidity of discharges related to drinking water systems directly into or within 300-feet of ocean waters must not exceed 225 NTUs at any time.

H. The discharge of wastewater containing constituent concentrations in excess of the effluent limitations shown in Table 1 below is prohibited.

Table 1: Effluent Limits Applicable to All Receiving Waters

Constituent	Maximum Daily Concentration Limit (mg/L)
Total Petroleum Hydrocarbons	0.1
Total Residual Chlorine	0.1
Suspended Solids	75
Sulfides	0.4

IV. Receiving Water Limitations

A. The discharge of wastes must not cause a violation of any applicable water quality standard for receiving waters adopted by the Regional Board or the State Board as required by the Clean Water Act and regulations adopted thereunder.

B. Authorized discharges of the types of wastewater described in Section I. above must not cause any of the following:

1. Coloration of the receiving water that causes a nuisance or adversely affects beneficial uses. The natural color of fish, shellfish, or other inland,

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bay and estuarine resources used for human consumption shall not be impaired.

2. Deposition of oil, grease, wax or other materials in the receiving waters in concentrations that result in a visible film or coating of objects in the water, or which cause a nuisance or adversely affect beneficial uses.
3. An increase in the amount of suspended or settleable solids in the receiving waters that will cause a nuisance or adversely affect beneficial uses as a result of controllable water quality factors.
4. Taste or odor-producing substances in the receiving waters at concentrations that cause a nuisance or adversely affect beneficial uses.
5. The presence of radioactive materials in concentrations that are deleterious to human, plant, or animal life.
6. The depletion of the dissolved oxygen concentrations below 5.0 mg/L.
7. The temperature of the receiving water to be raised above 90° Fahrenheit (32° Celsius) during the period of June through October, or above 78° Fahrenheit (26° Celsius) during the rest of the year.
8. A change in the ambient pH of more than 0.5 pH units.
9. The concentration of pollutants in the water column, sediments, or biota to adversely affect the beneficial uses of the receiving water. The discharge must not result in the degradation of inland surface water communities and populations, including vertebrate, invertebrate, and plant species.
10. Bioaccumulation of pollutants in aquatic resources at levels which are harmful to human health or animal life.
11. Erosion of conveyance pathways or erosion or other adverse modification of the physical characteristics of the receiving waters.

V. Monitoring Requirements

A. The responsible Co-permittee must implement a monitoring and reporting program that is adequate to determine compliance with the requirements of this Attachment B in a timely manner. The monitoring and reporting program must be fully documented in writing.

B. The responsible Co-permittees must carry out effluent monitoring according to the requirements in Section VII below.

C. The responsible Co-permittee must monitor the discharge volume from their drinking water system. The monitoring effort must produce a count of the number of events where a volume exceeding 50,000 gallons was discharged directly into waters of the U.S. The effort must also produce a reasonable estimate of the total volume discharged from the drinking water system during a calendar year; the total volume discharged from the system that reached waters of the U.S. during a calendar year; and the balance, if any, of which was directed to a beneficial use (e.g. dust suppression, industrial process supply, irrigation, groundwater recharge, etc.).

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D. The responsible Co-permittee must carry out visual monitoring of the receiving water at least once during the discharge and weekly thereafter for the duration of the discharge. For discharges from drinking water systems, visual monitoring must be performed when non-compliance with the provisions of Section III above are known or suspected.

E. Monitoring personnel must maintain written or photographic records of their visual monitoring observations in a log, to include: visible oil sheen or coloration of the receiving waters, evidence of toxicity, and other observations that may indicate an impact on the beneficial uses of the receiving water.

F. The Executive Officer is authorized to require revisions to the responsible Co-permittee's monitoring and reporting program at any time during the term of this Order. These revisions may include alteration of sampling protocols, requiring a reduction or increase in the number of constituents to be monitored, the frequency of monitoring, the number and size of samples collected, and the frequency of report submittal.

G. The responsible Co-permittee must establish monitoring locations that are adequate to demonstrate compliance with the requirements of this Attachment B; the locations must be where representative samples of the discharge can be obtained and prior to where the discharge flow joins or is diluted by any other flow or body of water.

H. Samples and measurements taken for the purpose of monitoring must be representative of the monitored activity.

I. The responsible Co-permittee must develop and implement a written quality assurance plan for laboratory analyses. The plan must include the performance of duplicate analyses on a minimum of ten percent (10%) of samples, or at least two samples each month, whichever is greater. Spiked samples must be analyzed at a similar frequency.

J. Upon request by the Regional Board or the USEPA, the responsible Co-permittee(s) will participate in the NPDES discharging monitoring report quality assurance study.

K. Monitoring results must be obtained according to test procedures under 40 CFR § 136 unless otherwise specified otherwise in 40 CFR § 503, or unless other test procedures have been specified in this Order.

L. All sampling and sample preservation must occur according to the current edition of *Standard Methods for the Examination of Water and Wastewater* (American Public Health Association).

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M. All laboratory analyses must be performed according to test procedures in 40 CFR § 136, *Guidelines Establishing Test Procedures for the Analysis of Pollutants*, unless specified otherwise in this Attachment B. The Executive Officer or the USEPA may specify test methods that are more sensitive than those specified in 40 CFR § 136.

N. Chemical, bacteriological, and bioassay analyses must be:

1. Conducted at a laboratory certified for such analyses by the California Department of Public Health in accordance with California Water Code Section 13176;
2. Conducted at a laboratory certified for such analyses by the USEPA; or
3. Conducted at a laboratory approved by the Executive Officer.

VI. Reporting Requirements

A. When initiating a planned discharge of one acre-foot or more of wastewater from a drinking water system, the responsible Co-permittee must provide written notice of the anticipated discharge to the Regional Board not less than three (3) days prior to initiating the discharge. If the discharge is urgent and must occur within a shorter period, the responsible Co-permittee must provide written notice as soon as possible, but not less than 24-hours after the discharge is initiated.

B. Any toxic chemical release data related to discharges from drinking water systems that is reported to the State Emergency Response Commission pursuant to Section 313 of the "Emergency Planning and Community Right to Know Act" of 1986 must also be reported to the State Board within 15 days of the report to the Commission at the address shown below[2].

C. My March 1 of every year, the responsible Co-permittee must submit a report (annual report) to the State Board describing discharges related to drinking water systems during the previous calendar year (January 1 through December 31).

1. The annual report must disclose all discharges from drinking water systems which did not comply with the relevant effluent limitations, discharge specifications and receiving water limitations in Sections III and IV above.
2. The annual report must report the results of monitoring of the discharge volume from the drinking water system.
3. The annual report must identify the limitation or specification that was exceeded; the known or suspected cause(s) of the exceedance; and any corrective action taken.
4. For instances where the discharge was transient and no effective action could be taken (including preventing the discharge from entering the

[2] Provisions XXIV.J. and XXIV.K. of this Order require reports to be signed and certified.

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receiving water), the annual report must describe actions taken or planned to cause future similar discharges to comply.

5. Where corrective action is planned, the annual report must include a time schedule to carry out the corrective action(s).
6. Annual reports must be submitted to the address below[2]:

State Water Resources Control Board
Division of Water Quality
NPDES Permitting Unit
1001 "I" Street, 15th Floor
Sacramento, CA 95814

D. The responsible Co-permittee must submit to the Regional Board a report describing all discharges regulated by the provisions of this Attachment B once each quarter (quarterly report).

1. For purposes of this Provision IV.D., each calendar quarter constitutes a monitoring period, with the reports due within 30-days of the end of each period.
2. If no discharge occurs during the monitoring period, the responsible Co-permittee must submit a notification to that effect *in lieu* of a monitoring report.
3. Each quarterly report must be submitted in an electronic format acceptable to the Executive Officer.
4. Each quarterly report must include the nature, location and estimated and measured daily flow data from all sources of discharges regulated by the provisions of this Attachment B which occurred during the reporting period.
5. Each quarterly report must include the results of all physical and chemical analyses for the discharge(s) that occurred during the reporting period; and a copy of the observation logs and related photos of the respective receiving waters (see Provision V.E. above.).

E. The responsible Co-permittee must report with each sample result:

1. The reporting level achieved by the testing laboratory; and
2. The laboratory's current Method Detection Limit (MDL), as determined by the procedure in 40 CFR § 136 as amended or revised.

F. The responsible Co-permittee must report the results of sample analyses according to the following:

1. Sample results which are greater than or equal to the reported Minimum Level (ML) must be reported as measured by the laboratory.
2. Sample results which are less than the reported ML, but greater than the laboratory's current MDL must be reported as "Detected, but Not

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Quantified" or "DNQ". The estimated chemical concentration of the sample must also be reported.

3. Contaminants not detected above the laboratory's MDL must be reported as "not detected" or "ND".

G. If the responsible Co-permittee monitors any contaminant more frequently than is required by this Attachment B, the results of that monitoring must be included in the analyses and reporting submitted to the Regional Board.

H. At any time during the term of this Order, the Regional Board or the State Board may require the responsible Co-permittee to electronically submit Self-Monitoring Reports (SMRs) using the State Board's *California Integrated Water Quality System* program web site address shown below:

https://ciwqs.waterboards.ca.gov/

I. The responsible Co-permittee must maintain records of all monitoring information in a readily-accessible manner for a period of at least five (5) years from the date of the sample, report, or application, whichever is longer. This retention period must be extended during the course of any unresolved litigation regarding a related discharge or according to a request by the Regional Board at any time.

J. Records of monitoring information must include:

1. The date, exact place, and time of sampling or measurements;
2. The identities of individuals who performed the sampling or measurements;
3. The laboratory which performed the analyses;
4. The date(s) analyses were performed;
5. The identities of individuals who performed the analyses;
6. The analytical techniques or methods used, including modifications if any;
7. All monitoring equipment and calibration and maintenance records;
8. All original strip charts from continuous monitoring devices, if used;
9. Copies of all reports required by the provisions of this Attachment B;
10. Electronic data and information generated by Supervisory Control and Data Acquisition system(s), if used;
11. The results of all sampling and analysis, including:
    a. Units of measurement used;
    b. Minimum reporting level for the analysis (minimum level);
    c. Results less than the reporting level but above the method detection limit (MDL);
    d. Data qualifiers and a description of the qualifiers;
    e. Quality control test results and a written copy of the laboratory quality assurance plan;
    f. Dilution factors if used; and

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g. Sample matrix type.

VII. Effluent Monitoring Requirements

A. The effluent monitoring requirements of this Section VII. do not apply to discharges from drinking water systems.

B. For purposes of this Section, a "grab" sample is defined as any individual sample collected in less than 15 minutes.

C. Effluent monitoring must occur according to Table 2, below:

Table 2: Standard Effluent Monitoring Program

Parameter	Unit	Sample type	Minimum sample frequency
Flow	Gallons per day	Estimate	Each discharge event or daily if continuous
Total petroleum hydrocarbons	µg/L	Grab	During the first 30-minutes of each discharge; weekly thereafter; or as directed by the Executive Officer
Total residual chlorine[3]	mg/L	Grab	During the first 30-minutes of each discharge; weekly thereafter; or as directed by the Executive Officer
Total suspended solids	mg/L	Grab	During the first 30-minutes of each discharge; weekly thereafter; or as directed by the Executive Officer
Sulfides	mg/L	Grab	During the first 30-minutes of each discharge; weekly thereafter; or as directed by the Executive Officer
pH	Standard units	Grab	During the first 30-minutes of each discharge; weekly thereafter; or as directed by the Executive Officer

VIII. Effluent Monitoring Requirements for Discharges Related to Drinking Water Systems

For purposes of this Section, discharges related to drinking water systems are divided into two groups. The first group includes superchlorinated discharges; all discharges from well development and well rehabilitation activities; and all other

[3] Unless it is known that chlorine is not in the discharge.

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individual discharges greater than one acre-foot (325,850 gallons). The second group includes all other drinking water system discharges. The two groups are subject to different monitoring requirements described below.

A. The effluent monitoring requirements of this Section VIII. do not apply to discharges related to drinking water systems which occur under emergency circumstances.

B. For purposes of this Section, a "grab" sample is defined as any individual sample collected in less than 15 minutes.

C. Discharges related to drinking water systems must be sampled annually except for superchlorinated discharges; all discharges from well development and well rehabilitation activities; and individual discharges greater than one acre-foot (325,850 gallons). The annual samples must be representative of discharges of a similar nature, from the same general water source, subject to the same water treatment and/or BMPs, and are consequently reasonably expected to have the same water quality. This monitoring must occur according to Table 3 and Table 5 below.

Table 3: Effluent Monitoring Requirements for Representative Annual Samples

Parameter	**Unit**	**Sample type**
Volume	Total gallons per day	Measured if read meter data is available; otherwise, estimated
Total residual chlorine[3]	mg/L	Grab
Turbidity	NTU	Visual Estimate

D. The responsible Co-permittee must monitor all discharge events involving superchlorinated discharges; all discharges from well development and well rehabilitation activities; and individual discharges greater than one acre-foot (325,850 gallons) according to Table 4 and Table 5 below for each discharge event.

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Table 4: Effluent Monitoring Requirements for All Discharge Events Involving Superchlorinated Discharges; Well Development and Rehabilitation Activities; and All Other Individual Discharges Greater than One Acre-Foot

Parameter	**Unit**	**Sample type**
Volume	Total gallons per day	Measured if read meter data is available; otherwise, estimated
Total residual chlorine[3]	mg/L	Grab
pH (for superchlorinated discharges only)	Standard units	Grab
Turbidity	NTU	Visual Estimate
Turbidity (for well development and rehabilitation activities only)	NTU	Grab

Table 5: Sampling Frequency for Each Event for Discharges Related to Drinking Water Systems

Duration of Discharge	**Sampling Frequency**
Less than 20 minutes	Once during first 10-minutes of each discharge event (one sample/event)
20 minutes to 60-minutes	Once during the first 10-minutes and again within the last 10-minutes of each discharge event (two samples/event).
Greater than 60-minutes	Once during the first 10-minutes; again within the next 50-minutes; and again during the last 10-minutes of each discharge event (three samples/event).

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Attachment B

STATE OF CALIFORNIA
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SANTA ANA REGION

3737 Main Street, Suite 500, Riverside, CA 92501-3348
(951) 782-4130 ● Fax (951) 781-6288
http://www.waterboards.ca.gov/santaana

MONITORING AND REPORTING PROGRAM NO. R8-2015-0001

for

Order No. R8-2015-0001
NPDES Permit No. CAS618030

Orange County Flood Control District, the County of Orange
And
The Incorporated Cities therein within the Santa Ana Region

Area-wide Urban Storm Water Runoff

May XX, 2015

Revision No.	Date Requested	Approval Date

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I. General

A. The requirements of this Monitoring and Reporting Program ("MRP"), as presented or later amended, may be met through the Co-permittees' participation in state-wide, national, regional or local monitoring programs, subject to the discretion of the Executive Officer.
B. The Executive Officer is authorized to review and approve proposed changes to this MRP. The Executive Officer will provide a minimum of 30-days for public review prior to approving any proposed changes.
C. To avoid duplication of effort, monitoring work performed by parties other than the Co-permittees or work carried out by the Co-permittees in support of other programs may be substituted for work described in the MRP provided that the work meets the requirements of the MRP and Order No. R8-2015-0001.
D. The Co-permittees may supplement monitoring data that is required to be collected by this MRP and subsequent amendments with other valid data sources for the purpose of improving any related analysis.
E. Except for Priority Toxic Pollutants identified in the California Toxics Rule, all sample collection, handling, storage, and analysis must be completed in conformance with 40 CFR Part 136; with adopted guidance developed by the State Water Resources Control Board pursuant to California Water Code Section 13383.5; or with other methods satisfactory to the Executive Officer.
F. Unless otherwise specified differently, the Minimum Levels ("MLs") published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries if California (State Implementation Plan or "SIP") must be used for the analyses of all samples.
G. The term "acute", as used in Order No R8-2015-0001 and the MRP, shall have the same meaning as "criterion maximum concentration" or "CMC" (24-hour average concentration) unless specified otherwise.
H. The term "chronic", as used in Order No R8-2015-0001 and the MRP, shall have the same meaning as "criterion continuous concentration" or "CCC" (4-day or 96-hour average concentration) unless specified otherwise.
I. Each Co-permittee is responsible for the accuracy and completeness of the monitoring program(s) and related products for the watershed(s) to which the Co-permittee discharges. However, the Principal Permittee may develop and implement those programs and submit related work products on behalf of the Co-permittees.
J. All reports submitted to the Regional Board pursuant to the requirements of Order No. R8-2015-0001 must include a statement identifying the provision(s) for which the report is intended to comply with.
K. Unless paper copies are expressly requested by Regional Board staff, all reports and submittals must be provided in an electronic format consistent with written guidance provided by the Executive Officer.

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II. Water Quality Monitoring

A. Goals

The Co-permittees must develop and implement an effective water quality monitoring program to achieve the following goals:

1. To develop useful information in support an effective program to control the discharge of pollutants in urban runoff.
2. To characterize the condition of water quality in receiving waters with respect to water quality standards; identify trends; and identify pollutants found in urban runoff that may cause or contribute to impairments, exceedances of water quality standards or adversely affect the beneficial uses of the receiving waters.
3. To characterize pollutant loads or concentrations in discharges from the MS4s relative to water quality-based effluent limits (WQBELs) and identify and quantify significant water quality problems related to urban runoff.
4. To identify and quantify other sources of pollutants to the maximum extent possible (e.g. atmospheric deposition, legacy pollutants, etc.) that may adversely affect the beneficial uses of the receiving waters.
5. To identify the sources of, and to prohibit illicit discharges.
6. To identify those waters, which without additional action to control pollution from urban runoff, cannot reasonably be expected to attain or maintain applicable water quality standards necessary to sustain the beneficial uses designated in the Basin Plan.
7. To objectively evaluate the effectiveness of BMPs implemented according to the Co-permittees' related programs, including, to the extent possible, quantifying the reasonably achievable reductions of pollutants in discharges or in the receiving waters that are attributable to the BMP(s).
8. To evaluate and describe the costs and benefits of BMPs, implemented according to the Co-permittees' related programs, to the public and stakeholders.

B. Water Quality Monitoring Plan Development

1. The Co-permittees must prepare a draft Water Quality Monitoring Plan (Plan) according to the goals, requirements, and specifications described in this Section (Section II.), State Board Resolution No. 2012-0012, and Order No. R8-2015-0001. To the extent practical, the Plan should be comprised of a single document, however, it may be composed of different components subject to the Co-permittees' discretion.
    a. The initial draft Plan must be submitted for approval to the Executive Officer within 6 months of the adoption of Order No. R8-2015-0001.
    b. The Executive Officer will provide a minimum public review period of 30-days prior to approving the Plan.

2. The Water Quality Monitoring Plan must be designed to objectively evaluate the effectiveness of the best management practices being implemented in the watersheds to meet the respective water quality standards or WQBELs.
3. The Water Quality Monitoring Plan must describe processes and a schedule for determining and reporting attainment of the Water Quality-Based Effluent Limits ("WQBELs") and requirements in Appendices B through H of Order No. R8-2015-0001 and for identifying and reporting exceedances of applicable water quality standards. The Plan must include cycles of monitoring, analysis, and reporting for all of the WQBELs and applicable water quality standards.
    a. A complete cycle must be as short as practicable, comply with applicable TMDL deadlines and assessment periods found in Chapter 5 of the Basin Plan, and must not exceed once every 5 years.
    b. A complete cycle should consider the availability of data and a reasonable period after which BMPs may affect water quality.
    c. Any required data collection and analyses must comply with those specified in the relevant TMDL, including averaging and assessment periods, found in Chapter 5 of the Basin Plan
4. The Water Quality Monitoring Plan must also include, at a minimum, descriptions of the locations of ID/IC; receiving and outfall monitoring locations; an explanation for the locations' selection; the sampling frequencies; parameters to be sampled; descriptions of sampling methods; and the data analysis and reporting schedule (see Subsection K below).
5. The Water Quality Monitoring Plan must be written in an instructive manner for the benefit of persons responsible for its implementation.
6. The Water Quality Monitoring Plan must include a quality assurance program plan ("QAPP").
    a. The QAPP must be prepared by qualified persons in conformance with the State's SWAMP Quality Assurance Program Plan[1], as amended or revised, and with USEPA's *Guidance for Quality Assurance Project Plans*[2] and *Requirements for Quality Assurance Project Plans*[3] as appropriate.
    b. Data collected according to the QAPP, including laboratory and quality control results, must be delivered using California Environmental Data Exchange Network ("CEDEN") data templates[4].
    c. The QAPP must include quality control and sample handling guidelines against which collected data must be verified; where the

[1] Available at: http://www.waterboards.ca.gov/water_issues/programs/swamp/tools.shtml#qa
[2] USEPA, *Guidance for Quality Assurance Project Plans*, EPA QA/G-5, December 2002.
[3] USEPA, *Requirements for Quality Assurance Project Plans*, EPA QA/R-5, March 2001.
[4] CEDEN data templates and documentation are available at : http://ceden.org

guidelines are not met, the affected data must be identified as such using appropriate verification codes.

7. Until the draft Water Quality Monitoring Plan is approved, the Co-permittees must continue monitoring as described in the 2013-2014 Annual Progress Report. Changes to the monitoring are prohibited except with the approval of the Executive Officer.
8. The Co-permittees must evaluate the Water Quality Monitoring Plan and propose changes, as needed annually. Proposed changes must be submitted by August 1 of each year following the approval of the initial Water Quality Monitoring Plan. The proposed changes to the Plan must be approved by the Executive Officer[5]. If no changes are proposed, the Executive Officer must be notified so in writing.
9. Except for inconsequential grammatical or technical corrections, the Water Quality Monitoring Plan may be amended by the Co-permittees only with the approval of the Executive Officer.
10. The Co-permittees must fully implement the Water Quality Monitoring Plan and any subsequent changes as approved by the Executive Officer.
11. The Executive Officer will allow a minimum of 30-days for public review and comment before approving a Water Quality Monitoring Plan or any proposed changes.
12. The approved Water Quality Monitoring Plan, as amended, must be posted for public access at ocwatersheds.com or using other media acceptable to the Executive Officer. The posted Plan must be full, true, and accurate.

C. General Water Quality Monitoring Requirements

1. The sampling method and practice must minimize bias.
3. Water quality parameters that are tested using valid field instruments are not required to be analyzed by a laboratory.
4. The Co-permittees must employ sample collection methods that support regional comparisons of data, unless site conditions make alternate methods necessary.
5. For each monitoring location and event, the Co-permittees must record observed conditions or circumstances that may influence monitoring results or affect conclusions made from the monitoring data.
6. Wet-weather sampling events must be separated by a minimum of two (2) days of dry weather (no precipitation).
7. Locations and frequencies of monitoring performed to determine achievement of the WQBELs in Appendices B through H of Order No. R8-2015-0001 must be consistent with the requirements specified in the relevant TMDL.

[5] The Co-permittees are not prohibited from proposing changes earlier or more frequently than required particularly where approval is needed to coincide with upcoming monitoring efforts.

D. Outfall Monitoring Requirements

The water quality monitoring program must include representative monitoring of urban runoff from MS4 outfalls under storm and dry-weather conditions.

1. The Co-permittees must identify representative outfall monitoring locations in the permit area.
2. Each outfall monitoring location must be sampled every two years on an alternating basis; some sites may be sampled every odd year while the remainder will be sampled every even year. The nature, number and distribution of samples are described below in this Section.
3. Stream gauges, or equally-effective methods, must be deployed during sampling events for the purpose of estimating mass loading of pollutants at each of the monitoring locations and for calculating flow-weighted event mean concentrations.
4. The Co-permittees must sample urban runoff produced by three separate storm events ("wet-weather sample") per season at each outfall monitoring location. The Executive Officer may allow exceptions to sampling three storm events when climatic conditions create good cause.
    a. The Co-permittees must make a reasonable effort so that one of the three sampled storm events is of the first storm water runoff of each season from each outfall monitoring location which is designated to be sampled during the applicable even or odd monitoring year.
        i. A sample for this event must be collected which is representative of the "first flush" of the storm and consists of a composite of discrete samples collected during the first hour of the storm.
        ii. A subsequent composite sample for this event must be collected after the storm's first hour, starting two hours after completion of the first flush sampling; this sample must consist of a composite of discrete storm water samples collected every two (2) hours during a 96-hour period or until storm flow is insufficient to allow continued sampling.
        iii.
    b. For storm events occurring after the first storm event of the season, composite samples must be collected at each outfall monitoring location during the applicable even or odd monitoring year as follows:
        i. A first flush sample must be collected during the first hour of the storm consisting of a composite of discrete samples.
        ii. A second sample must consist of a composite of discrete samples collected every two hours during a 24-hour period or until flow is insufficient to allow continued sampling.
        iii. The 24-hour period must begin two hours after the "first flush" sampling period is completed.

iv.

c. The Co-permittees must document the date and duration of the storm event(s) sampled, rainfall estimates of the storm event which generated the sampled discharge, and the duration between the storm event sampled and the end of the previous measurable storm event.

5. The Co-permittees must sample outfalls under dry-weather conditions ("dry-weather sample") at each outfall monitoring location during the applicable even or odd monitoring years as follow:
   i. Twice each year (2 times per year) on samples taken from monitoring locations during the applicable even or odd year in Carbon Creek, Coyote Creek, East Garden Grove-Wintersburg Channel, Bolsa Chica Channel, Fullerton Creek, Central Irvine Channel, and Costa Mesa Channel.
   ii. Four times per year, on a quarterly basis, during the even or odd monitoring year, on samples taken from monitoring locations in Peters Canyon Wash, San Diego Creek at Campus Drive and Harvard Avenue, and Santa Ana Delhi Channel.
6. All wet-weather and dry-weather samples must be tested for the parameters indicated in Table 1 below. Each sample must consist of a composite of discrete samples collected hourly during a 24-hour period.
7. In addition to the parameters indicated in Table 1, samples must be tested in the manner as follows:
   a. Diazinon, chlorpyrifos, malathion, and dimethoate must be tested for in dry-weather samples that must be taken monthly from outfall monitoring locations discharging into Newport Bay according to applicable TMDL requirements.
   b. A Priority Pollutant scan must be completed on wet-weather samples taken of runoff from the first storm of the season each year.
   c. Glyphosate must be tested for in dry-weather samples taken from monitoring sites that are outfalls dominated by urban runoff, as opposed to rising groundwater.
   d. Additional parameters that are known or suspected to contribute to the impairment of the beneficial uses of the receiving waters must also be tested for at the direction of the Executive Officer.
   e. The list of parameters in Table 1 are subject to change, subject to the approval of the Executive Officer and a demonstration of good cause by the Co-permitees. The list of parameters in Table 1 may be modified for individual monitoring sites for either wet-weather or dry-weather sampling, subject to the approval of the Executive Officer.

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Table 1: Initial Outfall Monitoring Parameters

Parameter		Wet-weather samples	Dry-weather samples	Sediment samples
Nutrients	Nitrate plus nitrite	X	X	
	Total ammonia	X	X	
	Total Kjeldahl nitrogen	X	X	
	Total phosphate	X	X	
	Orthophosphate	X	X	
Dissolved organic carbon		X		
Total organic carbon		X	X	X
Total suspended solids		X	X	
Volatile suspended solids		X	X	
Chloride		X	X	
Sulfate		X	X	
Turbidity		X	X	
pH		X	X	X
Oil and grease			X	
Temperature		X	X	
Dissolved oxygen		X	X	
Electrical conductivity		X	X	
Hardness		X	X	
Particle size distribution				X
Pyrethroids		X	X	X
Neonicotinoids		X	X	X
Total and dissolved heavy metals	Cadmium	X	X	X
	Chromium	X	X	X
	Copper	X	X	X
	Lead	X	X	X
	Mercury	X	X	X
	Nickel	X	X	X
	Selenium	X	X	X
	Silver	X	X	X
	Zinc	X	X	X
no-phosphate pesti	Chlorpyrifos	X		

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	Diazinon	X		
	Dimethoate	X		
	Malathion	X		
Bacterial indicators	Total coliform	X	X	
	Fecal coliform	X	X	
	Enterococcus	X	X	

E. Receiving Waters Monitoring Requirements

The Water Quality Monitoring Program must include monitoring in the receiving waters to which the outfalls, that are monitored according to Section II.C. (above), discharge.

1. Each receiving water monitoring location must be sampled every two years on an alternating basis; some sites may be sampled every odd year while the remainder will be sampled every even year. The nature, number and distribution of samples are described below .
    i. Monitoring locations in Huntington Harbor, East Garden Grove-Wintersburg Tide Gate, Bolsa Chica and Talbert Marsh stations must be sampled twice each year during the applicable even or odd years.
    ii. Monitoring locations in Upper and Lower Newport Bay must be sampled four times per year, on a quarterly basis during the applicable even or odd years.
2. The Co-permittees must sample sediment under dry-weather conditions (“sediment sample”) at the same frequencies included in Provision II.E.1 above during sampling years at receiving water monitoring locations to be specified in the Water Quality Monitoring Plan.
3. All sediment samples must be tested for the parameters indicated in Table 2 above.
4. In addition to the parameters indicated in Table 2, samples must be tested in the manner as follows:
    a. Sediment samples taken from Newport Bay must be tested for Total DDT, Dieldrin, Chlordane, PCBs, and Toxaphene.
    b. Additional parameters that are known or suspected to contribute to the impairment of the beneficial uses of the receiving waters must also be tested for at the direction of the Executive Officer.
5. Samples taken for receiving water monitoring must be tested for the parameters shown in Table 2 below and in the following manner:
    a. Measurements of specific conductance, pH, temperature, and dissolved oxygen must be taken of the water column’s profile at

one-meter increments, from the water surface to the bottom of each monitoring location.

b. Water samples that are tested for nutrients must be collected near the surface of the water at the monitoring location.

c. Water samples that are tested for metals, pesticides, total and dissolved organic carbon, and toxicity must consist of a composite of samples collected at the monitoring location in a manner that represents the average concentrations in the water column.

d. The list of parameters in Table 2 are subject to change, subject to the approval of the Exective Officer and a demonstration of good cause by the Co-permitees. The list of parameters in Table 2 may be modified for individual monitoring sites for either wet-weather or dry-weather sampling, subject to the approval of the Executive Officer.

6. Wet-weather, dry-weather, and sediment samples taken from Upper Newport Bay must also be tested for selenium.
7. Sediment samples taken from representative receiving water monitoring locations must also be tested once each year for benthic infauna using methods in the Region 8 Storm Water Ambient Monitoring Program (“SWAMP”) Field Operations Manual.
8. Sediment samples taken from monitoring locations in Upper Newport Bay must also be tested for organochlorine pesticides and PCBs.
9. Additional parameters that are known to contribute to the impairment of the beneficial uses of the receiving waters must also be tested for at the direction of the Executive Officer.

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Table 2: Initial Parameters for receiving water monitoring

Parameter		Wet-weather samples	Dry-weather samples	Sediment samples
Nutrients	Nitrate plus nitrite	X	X	
	Total ammonia	X	X	
	Total Kjeldahl nitrogen	X	X	
	Total phosphate	X	X	
	Orthophosphate	X	X	
Dissolved organic carbon			X	
Total organic carbon		X	X	X
Total suspended solids		X	X	
Volatile suspended solids		X	X	
Turbidity		X	X	
pH		X	X	X
Oil and grease			X	
Temperature		X	X	
Dissolved oxygen		X	X	
Electrical conductivity		X	X	
Hardness		X	X	
Particle size distribution				X
Pyrethroids		X	X	X
Total and dissolved heavy metals	Cadmium	X	X	X
	Chromium	X	X	X
	Copper	X	X	X
	Lead	X	X	X
	Mercury	X	X	X
	Nickel	X	X	X
	Silver	X	X	X
	Zinc	X	X	X
Organo-phosphate pesticides	Chlorpyrifos		X	X
	Diazinon		X	X
Bacterial indicators	Total *coliform*	X	X	
	Fecal *coliform*	X	X	
	Enterococcus	X	X	
Glyphosate		X	X	

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F. Toxicity Testing

The water quality monitoring program must include toxicity testing, analyzed using USEPA's Test of Significant Toxicity approach[6].

1. Toxicity testing must be performed twice per season on *wet-weather samples* taken from representative outfall monitoring locations during the applicable even or odd monitoring year, using *Ceriodaphnia*, sea urchin fertilization, and mysid survival and growth as follows:
    a. Toxicity testing must be performed on *wet-weather samples* representing the "first-flush" of the first storm of the season (See Provision II.D.4.a.i. above).
    b. Toxicity testing must also be performed on *wet-weather samples* taken from the second and third sampling events that represent the 24-hour period following the "first-flush" (See Provision II.D.4.b. above).
2. Toxicity testing must be performed twice per season on *wet-weather samples* taken from receiving water monitoring locations during the applicable even or odd monitoring year, using sea urchin fertilization and mysid survival and growth.
3. Toxicity testing must be performed on *dry-weather samples* using *Ceriodaphnia*, *Selanastrum*, and *Hyalella azteca* as follows:
    a. Twice each year on samples taken from monitoring locations during the applicable even or odd monitoring year in Carbon Creek Coyote Creek East Garden Grove-Wintersburg Channel, Bolsa Chica Channel, and Fullerton Creek.
    b. Four times per year, on a quarterly basis during the even or odd monitorin year, on samples taken from monitoring locations in Peters Canyon Wash, San Diego Creek at Campus Drive and Harvard Avenue, and Santa Ana Delhi Channel.
4. Toxicity testing must be performed on representative *dry-weather* samples at the applicable even and odd year receiving water monitoring stations using sea urchin fertilization and/or mysid survival and growth. The sampling frequency must be consistent with Provision II.E.1. above.
5. Toxicity tests must be performed once annually on *sediment samples* collected from the applicable even- and odd-year receiving water monitoring sites. The Toxicity tests must be performed using a 10-day amphipod (*Eohaustorius estuaries*) survival test in solid-phase sediment and a 48-hour bivalve (*Mytilus galloprovincialis*) embryo development test at the sediment-water interface.
6. If Toxicity tests of *sediment samples* collected in two consecutive monitoring years (even or odd years) indicate zero percent survival of the test organisms within the first hour, Toxicity Identification Evaluations must

[6] USEPA. 2010. *National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document*. EPA 833-R-10-003. US Environmental Protection Agency, Office of Wastewater Management, Washington D.C.

be performed on samples taken from those same locations during the third consecutive monitoring year of sampling.

a. Toxicity Identification Evaluations must be performed in substantial conformance with published and generally-accepted methods[7].

G. Benthic Invertebrate Taxonomy

1. The water quality monitoring program for harbors and estuaries must include annual identification (one time per year) of the taxonomy of benthic invertebrate communities. Taxonomy must be identified in those sediment samples taken from monitoring locations in waters of the U.S. during their scheduled even or odd sample years consistent with the receiving water monitoring requirements.

H. Illicit Discharges and Illicit Connections

The Water Quality Monitoring Plan must include monitoring to detect illicit discharges and illicit connections.

1. The Co-permittees must monitor a minimum of 30 monitoring stations annually during the dry season (May 1 through September 30).
2. Monitoring to detect illicit discharges and illicit connections must occur at the locations and frequencies specified in the Water Quality Monitoring Plan. Monitoring locations and frequencies are subject to change according to Provision II.B.6. above.
3. For each monitoring station, the Co-permittees must characterize the base line hydrology of the dry-weather discharges and the water quality parameters of the discharge. Based on this information, the Co-permittees must employ statistical process control methods to establish flow and water quality parameter thresholds that indicate when an illicit discharge may have occurred or when an illicit connection may exist. The Co-permittees must also use odor, color, clarity, unusual wildlife morbidity or mortality, sheen, staining, corrosion, unnatural deposits, and other subjective indicators to identify suspected illicit discharges or illicit connections
4. The Co-permittee that is the local jurisdiction must initiate (or cause to be initiated) an investigation to identify the known or most likely source(s) of the suspected illicit discharge or illicit connection (source investigation) where indicators developed pursuant to Provision II.H.3. above are found.
5. When dry-weather discharges are found at the monitoring locations, the discharge must be tested for the parameters specified in Table 3 below using the test method type(s) indicated.
6. A source investigation must occur in substantial conformance with a common set of written techniques and procedures developed by the Co-

[7] E.g. U.S. EPA. 2007. Sediment Toxicity Identification Evaluation (TIE) Phases I, II, and III Guidance Document EPA/600/R-07/080, Office of Research and Development. Washington, DC. Available at: http://www.epa.gov/nheerl/publications/files/Sediment TIE Guidance Document.pdf

permittees as part of the written program describe in Provision VII.D. of Order No. R8-2015-0001.

a. Except as provided for in Section XVII, indications of a potential illicit discharge or connection must be investigated within three (3) business days of the Co-permittee (including the Principal Permittee) becoming aware of it.
b. A source investigation may only be regarded as concluded after the cause(s) of the illicit discharge has been identified or additional monitoring fails to detect a subsequent exceedance of the same parameter(s) after 180 days. In the interim, the Co-permittee that is the local jurisdiction must put forth a good faith effort to identify the source(s) of a suspected illicit discharge or illicit connection.

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Table 3: Parameters for Illicit Discharge and Illicit Connection Discharge Monitoring

Parameter			Test Method Type	
			Field	Laboratory
Ammonia			X	
Nitrate			X	
Soluble phosphorus			X	
Total organic carbon ("TOC")				X
pH			X	
Oil and grease (if oil sheen is present) or Total petroleum hydrocarbons				X
Temperature			X	
Dissolved oxygen			X	
Electrical conductivity			X	
Hardness			X	
Dissolved Heavy Metals	Arsenic			X
	Cadmium			X
	Hexavalent chromium		X	
	Total chromium			X
	Copper		X	X
	Lead			X
	Mercury			X
	Nickel			X
	Selenium			X
	Silver			X
	Zinc			X
Organophosphate Pesticides		Diazinon		X
		Chlorpyrifos		X
		Malathion		X
		Dimethoate		X
Bacterial Indicators		Total coliform		X
		Fecal coliform		X
		Enterococcus		X
MBAS			X	

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I. Bacterial Indicators

The Water Quality Monitoring Plan must include an effective monitoring program for bacterial indicators.

1. The Co-permittees must sample discharges from the outfalls/tributaries and ocean water in the surf zone 25-yards up-coast and 25-yards down-coast from those discharges on a weekly basis.
    a. Samples must be measured for total coliform, fecal coliform, and *Enterococcus*.
    b. At the time of sample collection, the Co-permittees must estimate the flow rate of the discharge from the respective outfall/tributary and measure and record the temperature of the discharge and of the surf zone down-coast from the outfall/tributary.
    c. If no hydrologic connection exists between the outfall and the surf zone, only a down-coast sample is needed.
2. The Co-permittees must sample dry-weather discharges at representative monitoring locations.
    a. Samples must be measured for total coliform, fecal coliform, and *Enterococcus*.
    b. Sample events must be coordinated with the Orange County Health Care Agency and the Orange County Sanitation District or their successors in order to augment their monitoring program and improve the collective data's ability to resolve trends, comparisons, and correlations within and between the sites.

J. Bioassessment Monitoring

1. The Co-permittees must conduct bioassessment monitoring in conformance with the Surface Water Ambient Monitoring Program ("SWAMP").
2. Bioassessment monitoring must be completed at the monitoring locations specified by the most recent Stormwater Monitoring Coalition ("SMC") monitoring plan. The monitoring locations and parameters may be adjusted during the monitoring year according to recommendations from the SMC so that they are consistent with the SMC monitoring plan.
3. Co-permittees must perform a minimum of one Causal Assessment during the term of Order No. R8-2015-0001 to identify the likely causes of the biological condition at the monitoring locations.
4. Causal Assessments must be conducted according to the USEPA Stressor Identification Guidance Document (2000) or an equivalent guidance acceptable to the Executive Officer.
5. The bioassessments must include monitoring of urban runoff for the parameters shown in Table 4 below.

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6. Toxicity tests which produce a zero percent survival of the test organisms within the first hour must be evaluated using Toxicity Identification Evaluations.

Table 4: Bioassessment water quality test parameters

Nutrients	Nitrate plus nitrite	Hardness	
	Total ammonia	Total and dissolved heavy metals	Arsenic
	Total Kjeldahl nitrogen		Cadmium
	Total phosphorus		Chromium
	Orthophosphate		Copper
Total organic carbon			Lead
Total suspended solids			Mercury
Chloride			Nickel
Sulfate			Selenium
Turbidity			Silver
pH			Zinc
Oil and grease (if sheen is present)		Organophosphate pesticides	Diazinon
Temperature			Chlorpyrifos
Dissolved oxygen			Malathion
Electrical conductivity			Dimethoate

K. Data Analyses

1. The Water Quality Monitoring Plan must include a schedule of statistically-valid analyses that will be performed on collected data.
2. The schedule of analyses must include a description of the statistical analyses that will be performed, the purpose of each analysis, the data sets and sub-sets that will be analyzed, and the time periods or thresholds at which each analysis will be performed.
3. The schedule of analyses must satisfy schedules specified in this MRP, established in relevant adopted TMDLs, and this Order.
4. The Water Quality Monitoring Plan must include the supporting rationale for the schedule of analyses.
5. The applicable schedule of analyses and the results of the performed analyses must be reported in the Annual Progress Report.

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L. Special Studies

1. The water quality monitoring program must include the performance of special studies. The special studies must be carried out for those purposes in Section II.A. above, where other elements of the monitoring program are insufficient.
2. The Co-permittees must provide documentation of any special studies to be performed in support of their storm water program. The documentation must be provided annually via the Annual Progress Report or an alternate reporting mechanism acceptable to the Executive Officer (e.g. as a stand-alone report or other annually-required report). The documentation must include a schedule of proposed actions, a description work products to be completed, and the achievement of milestones along with any changes or updates for any special studies big carried out.

III. Program Effectiveness Assessments and Reporting

A. All reports and plans required by this Order must be signed by a duly authorized representative and submitted to the Executive Officer of the Regional Board under penalty of perjury.
B. Each Co-permittee must submit all information and materials necessary to comply with, or demonstrate compliance with, the requirements of this Order to the Principal Permittee in a timely manner. All submittals by the Co-permittees must be signed by a duly authorized representative for the respective Co-permittee under penalty of perjury.
C. Data transmittals to the Regional Board must be in the form developed by the Stormwater Monitoring Coalition ("SMC") and approved by the State Water Resources Control Board in the document entitled "Standardized Data Exchange Formats" for the purpose of providing a standard format for all data transfers and allow data to be universally shared and evaluated as part of various programs.
D. The Co-permittees must submit an Annual Progress Report to the Executive Officer of the Regional Board and to the Regional Administrator of the USEPA – Region 9 no later than November 15th of each year. The Executive Officer may grant an extension of up to 90-days with cause upon the receipt of a written request from the Principal Permittee. The reporting period must address actions taken to comply with the requirements of Order No. R8-2015-0001 and this MRP through June 1 of the reporting year. The Annual Progress Report must include the following:
    1. A schedule of all actions required by Order No. R8-2015-0001 during the reporting period, any outstanding actions required by Order No. R8-2015-0001 and Order No. R8-2009-0030, and the status of efforts to carry out the scheduled actions and satisfy the related requirements.
    2. The results of each Co-permittees' program effectiveness assessment. These results must be submitted by each Co-permittee directly to the Regional Board.

3. Tthe results of the Principal Permittee's overall evaluation of the results of the program effectiveness assessments which are of mutual interest to the Co-permittees.
4. The results of water quality monitoring; the results of scheduled analyses of the water quality monitoring data; and any related conclusions reached by the Co-permittees.
5. The status of special studies carried out according to the previous reporting period's work plan and the work plan for the upcoming reporting period (See Section II.K. above)
6. The status of efforts to reduce and/or eliminate the discharge of trash and debris (See Subsection VII.D. of Order No. R8-2015-0001).
7. The status of efforts to detect and mitigate SSOs (See Subsection VII.E. of Order No. R8-2015-0001).
8. The unified fiscal analysis (See Section XX of Order No. R8-2015-0001).

IV. Reporting Schedule Summary

Table 5, below, summarizes information that must be reported to the Executive Officer and the items' deadlines. Deliverables are in the order in which they appear in Order No. R8-2015-0001. The table is provided for the convenience of the reader and should not be used as a substitute for reviewing the contents of Order No. R8-2015-0001, this MRP, or the Technical Report.

A. With the exception of deliverables with capitalized titles, Order No. R8-2015-0001, this MRP, and this summary do not establish formal nomenclature. Deliverables with no formal nomenclature may be identified in a manner suitable to the Co-permittees, but they must be identified by a written statement of purpose, declaring which Provision(s) they are intended to comply with.

B. Deliverables that are submitted with the Annual Progress Report do not need to consist of separate documents; they may be incorporated into the Annual Progress Report. But they must be readily-identifiable, denoted elements (e.g. separate chapters) and include a statement of purpose as described above.

C. The Co-permittees must submit deliverables in an electronic format. To preserve their authenticity, all deliverables submitted in an electronic format must not be readily-alterable. All deliverables must be in a format that is viewable using widely-available software.

Table 5: Reporting Schedule Summary

Deliverable	Source Provision(s)	Deadline
Draft plan	IV.C.1.	Varies, but generally triggered by water quality monitoring results and analyses. Due within 6 months of the Co-permittees becoming aware of an exceedance of water quality standards. If requested in writing by the Executive Officer, due as specified in the written request.
Legal authority assessment report	VI.B.	Reported as needed as part of Annual Progress Report.
Trash and debris BMP report	VII.E.1.	Reported as part of Annual Progress Report.
Trash and debris technology evaluation report	VII.E.2.	Reported as part of Annual Progress Report.
BMP retrofit study updates	XII.A.8.	12 months from date of adoption.
Structural treatment control BMP waiver notice	XII.L.	30-days prior to Co-permittee's issuance of the waiver.
Draft watershed maps	XII.N.3.	6 months from date of adoption.
General audience survey	XIII.E.1.b.	60 months from the date of adoption.
Initial imminent threat notice	XVII.A.1.	24 hours of Co-permittees becoming aware.
Imminent threat report	XVII.A.2.	5 business days after initial imminent threat notice.
Known/suspected WDR violations report	XVII.C.	30-days following the end of each calendar quarter: January 30th, April 30th, July 30th, and October 30th of each year.
Program Effectiveness Assessment	XIX.D.	Reported as part of the Annual Progress Report
Unified fiscal analysis	XX.A.	Reported as part of the Annual Progress Report
Report of Waste Discharge	XXIII.A.	180-days before expiration of this Order.
Water Quality Monitoring Plan	XXIV.I.,MRP II.B.1. and MRP II.B.6.	6 months from date of adoption; proposed revisions due August 1, each year
Annual Progress Report	XXIV.I. and MRP III.D.	Annually by November 15th of each year.

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Ordered by:

Kurt V. Berchtold
Executive Officer

Date

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Attachment C

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD

SANTA ANA REGION

3737 Main Street, Suite 500, Riverside, CA 92501-3348
(951) 782-4130 Fax (951) 781-6288
http://www.waterboards.ca.gov/santaana

DRAFT TECHNICAL REPORT

FOR

ORDER NO. R8-2015-0001
NPDES PERMIT NO. CAS618030

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM ("NPDES") PERMIT
AND
WASTE DISCHARGE REQUIREMENTS

For

The County of Orange, Orange County Flood Control District
And
The Incorporated Cities of Orange County within the Santa Ana Region

Area-wide Urban Storm Water Runoff

October 16, 2015

I. PURPOSE

The purpose of this Technical Report is to describe the principal facts, the methodology, and the significant legal and policy matters considered by Santa Ana Regional Water Quality Control Board staff ("Regional Board staff") in preparing Order No. R8-2015-0001 ("Order"). This Technical Report also serves as a fact sheet and contains some subheadings and content which generally follow the information described in 40 CFR Parts 124.8 and 124.56.

II. CONTACT INFORMATION

Order No. R8-2015-0001 and other related documents are available at the Santa Ana Regional Water Quality Control Board's ("Regional Board") web site at:

http://www.waterboards.ca.gov/santaana/water_issues/programs/stormwater/oc_permit.shtml

The documents referenced in this Technical Report and in the Order are also available for public review at the Regional Board office at the address below. These and other public records are available for inspection during regular business hours from 8:00 am to 5:00 pm Monday through Friday, except for State Holidays.

The Regional Board office address is:

3737 Main Street, Suite 500
Riverside CA 92501-3348

Persons interested in reviewing or obtaining copies of public records are encouraged to do so by appointment. An appointment can be made by e-mail, facsimile, telephone, or in person. Requests by mail should be made to the attention of "File Review Request" at the Regional Board office address shown above. Contact information for other means of communication is as follows:

Phone: (951) 782-4499
Facsimile: (951) 781-6288
E-mail: FileReview8@waterboards.ca.gov

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Appointments are not mandatory, but they will help Regional Board staff fulfill requests efficiently and prevent delays while records are being located, retrieved, and reviewed, if necessary.

The following are the contact information for Regional Board staff involved in the preparation of Order No. R8-2015-0001:

Michelle Beckwith Senior Environmental Scientist Coastal Section Chief michelle.beckwith@waterboards.ca.gov (951) 782-4433	Adam Fischer, MESM (principal author) Environmental Scientist adam.fischer@waterboards.ca.gov (951) 320-6363
Hope Smythe Environmental Program Manager Division Chief Hope.smythe@waterboards.ca.gov (951) 782-4493	Joanne Schneider (TMDLs) Environmental Program Manager Division Chief Joanne.schneider@waterboards.ca.gov

III. BACKGROUND

In 1987, the Clean Water Act was amended to include Section 402(p) which established a framework for regulating municipal and industrial storm water discharges under the National Pollutant Elimination Discharge System ("NPDES"). Section 402(p) requires owners and operators of municipal separate storm sewer systems ("MS4s") to have NPDES permits for discharges of storm water to waters of the U.S. On November 16, 1990, the United States Environmental Protection Agency ("USEPA") amended its NPDES permit regulations to include requirements for storm water discharges. These regulations are codified in the Code of Federal Regulations, Title 40, Parts 122, 123, and 124 (40CFR Parts 122, 123, and 124). Section 402(p) and 40 CFR Parts 122, 123, and 124. As detailed in this Technical Report, these regulations, along with other statutes, plans, and policies, form the basis for the requirements in Order No. R8-2015-0001.

On July 13, 1990, the Regional Board adopted Order No. 90-71 (NPDES Permit No. CA 8000180). This was the first version of NPDES Permit No. CAS618030, implementing USEPA's new NPDES permit regulations for discharges from MS4s. Since then, the Regional Board has adopted three other versions of

NPDES Permit No. CAS618030: Order No. 96-31, Order No. R8-2002-0010, and Order No. R8-2009-0030. Order No. R8-2015-0001 is a fifth version ("fifth-term") of NPDES Permit No. CAS618030.

IV. PERMITTED ENTITIES

The Co-permittees whose discharges of urban runoff to waters of the U.S. are authorized by this Order are as follows:

County of Orange
Orange County Flood Control District
City of Anaheim
City of Brea
City of Costa Mesa
City of Cypress
City of Fountain Valley
City of Fullerton
City of Garden Grove
City of Huntington Beach
City of Irvine
City of La Habra
City of La Palma
City of Lake Forest
City of Los Alamitos
City of Newport Beach
City of Orange
City of Placentia
City of Santa Ana
City of Seal Beach
City of Stanton
City of Tustin
City of Villa Park
City of Westminster
City of Yorba Linda

The County of Orange includes a total of 34 cities, including the Co-permittees listed above. The remaining unlisted cities lie entirely within the San Diego Region. Because the boundaries of the Santa Ana Region are largely defined by watershed boundaries and often cross political boundaries, three of the cities discharge into both the Santa Ana Region and the San Diego Region. These cities are Laguna Hills, Laguna Woods, and Lake Forest.

The City of Laguna Hills and the City of Laguna Woods are partly located within the Santa Ana Region but are excluded from Table 1 above. California Water Code section 13228 authorizes the executive officer of a regional board to grant a written request, made by an entity that is subject to regulation by more than one regional board, that one regional board be designated to regulate the matter. Written requests for designation have been received from the City of Laguna Hills, the City of Laguna Woods and the City of Lake Forest.

In letters respectively dated March 12, 2014 and September 8, 2014, the cities of Laguna Hills and Laguna Woods requested designation to the San Diego Regional Water Quality Control Board. In letters dated January 14, 2014 and April 4, 2014, the City of Lake Forest requested designation to the Santa Ana

Regional Water Quality Control Board. These requests for designation were granted by the respective executive officers in separate Designation Agreement letters both dated February 10, 2015.

Consequently, the Santa Ana Regional Water Quality Control Board is designated to regulate discharges of urban runoff from the entire jurisdiction of the City of Lake Forest, including those discharges into the San Diego Region. Likewise, the San Diego Regional Water Quality Control Board is designated to regulate discharges of urban runoff from the entire jurisdictions of the City of Laguna Hills and the City of Laguna Woods, including those discharges into the Santa Ana Region. These designations commence with the effective dates of those MS4 Permits adopted by the regional boards with terms and conditions that effectuate the Designation Agreements. For the Santa Ana Region, the designations commence with the effective date of this Order.

The bases for approving the designation requests are set forth in the February 10, 2015 Designation Agreements which essentially mirror one another. In summary, the cities have reported that variations between the regional boards' MS4 permits create significant administrative and financial burdens that do not contribute to greater overall water quality improvements in either region. The regional boards may terminate or modify the Designation Agreements. Each regional board also reserves the right to take enforcement action for any violation of the applicable MS4 permit which affects that regional board pursuant to California Water Code Section 13228(b).

All of the Co-permittees listed in Table 1 fall into one of two categories. They are either a medium or large municipality that respectively services a population of greater than 100,000 or 250,000 people, or they are a small municipality that is interrelated to a medium or large municipality. Section 402(p) of the Clean Water Act requires that both of these categories of dischargers obtain an NPDES permit.

All of the above Co-permittees in this Order have individual and shared responsibilities to comply with the requirements of this Order. The County of Orange continues to be the Principal Permittee and, as such, has certain other responsibilities in addition to those as a Co-permittee. In order to emphasize these overlapping responsibilities, this Order refers to all of the Co-permittees collectively as "Co-permittees", including the Principal Permittee. When a requirement references the Principal Permittee alone, that requirement of is the responsibility of the County of Orange.

V. PERMITTED DISCHARGES

Order No. R8-2015-0001 regulates the discharge of urban runoff into waters of the U.S. from MS4s operated by the Co-permittees listed in Section IV above. The term "urban runoff" is not defined in the Code of Federal Regulations or in the Federal Register. For the purposes of the Order, urban runoff is defined as the combination of storm water runoff and authorized non-storm water runoff from residential, commercial, industrial, and construction areas within the permitted area. "Urban runoff" excludes unauthorized non-storm water runoff. Discharges of urban runoff often contain wastes, as defined in California Water Code, and pollutants, as defined in the Clean Water Act. Wastes may, and pollutants will by definition, adversely affect the quality of the receiving waters.

This Order authorizes the discharge of urban runoff from the Co-permittees' MS4s. This includes authorization for certain non-storm water discharges. Authorized non-storm water discharges are subject to both the requirements herein and the requirements of the "De Minimus" NPDES Permit No. CAG99801.

This Order does not authorize the Co-permittees' non-storm water discharges that are subject to NPDES Permit No. CAG918002, for discharges to surface waters of certain groundwater at sites within the San Diego Creek/Newport Bay watersheds. Authorization for such discharges must be obtained through the process described in NPDES Permit No. CAG918002. The purpose of excluding discharges subject to NPDES Permit No. CAG918002 is to avoid regulatory overlap that could potentially create cross-purposes and confusion.

In summary, MS4s are defined in 40CFR122.26(b)(8) as "a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains)…designed or used for collecting or conveying storm water". Due to the broad meaning of "conveyance", portions of MS4s in the permit area will include open channels that may also be waters of the U.S.

Clean Water Act Section 502 defines a "discharge of a pollutant" and the term "discharge of pollutants" as "any addition of any pollutant to navigable waters from any point source" and "any addition of any pollutant to waters of the contiguous zone or the ocean from any point source other than a vessel or floating craft". The term "discharge", as used in this Order, means the discharge of a pollutant. Discharges regulated by this Order occur through "outfalls" which are a point source at the point where a MS4 discharges to waters of the U.S. An

outfall does not include open conveyances connecting two municipal separate storm sewers. An outfall does not include pipes, tunnels, or other conveyances which connect segments of the same stream or other waters of the U.S. and are used to convey waters of the U.S. (40CFR122.26(b)(9))

VI. APPLICABLE STATUTES, REGULATIONS, PLANS, AND POLICIES

A. Legal Authorities – Federal Clean Water Act and California Water Code

Order No. R8-2015-0001 is issued pursuant to Section 402 of the Clean Water Act and implementing regulations adopted by the USEPA, and pursuant to Chapter 5.5, Division 7 of the California Water Code (commencing with Section 13370).

The objective of the Clean Water Act is "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." To carry out this objective, the Clean Water Act requires permit programs to regulate the discharge of pollutants and dredge or fill material to the navigable waters of the U.S. and to regulate the use and disposal of sewage sludge. Section 402 of the Clean Water Act provides the legal authority to issue NPDES permits for the discharge of pollutants to waters of the U.S. NPDES permits may be issued by states which have been authorized to implement certain provisions of the Clean Water Act. The USEPA authorized the state of California to implement the NPDES permit program on May 14, 1973.

The Porter-Cologne Water Quality Control Act (California Water Code section 13000 *et seq.*) established the State Water Resources Control Board and the nine regional water quality control boards. The boards are the principal state agencies with primary responsibility for the coordination and control of water quality. The Santa Ana Regional Water Quality Control Board has the primary responsibility for the coordination and control of water quality in the Santa Ana Region.

The regional water quality control boards implement the Clean Water Act through Chapter 5.5 of the California Water Code, commencing with Section 13370. Section 13377, in part, provides the regional water quality control boards with the authority to issue waste discharge requirements to ensure compliance with all applicable provisions of the Clean Water Act.

Clean Water Act Section 402(p) requires the USEPA, or authorized states, to issue NPDES permits for storm water discharges from municipal separate storm sewer systems ("MS4s") to water of the U.S. Clean Water Act Section 402(p)(3)(B) allows such NPDES permits to be issued on a system-wide or jurisdiction-wide basis. Section 402(p)(3)(B)(ii) requires that these NPDES permits "effectively prohibit non-storm water discharges" into the MS4s. Section 402(p)(3)(B)(iii) requires these NPDES permits to "require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants."

B. Federal and California Endangered Species Acts

This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is prohibited, or becomes prohibited in the future under either the California Endangered Species Act (Fish and Game Code Sections 2050 to 2115.5) or the Federal Endangered Species Act (16 United States Code Sections 1531 to 1544). This Order requires compliance with requirements to protect the beneficial uses of waters of the U.S. The Co-permittees are responsible for meeting the requirements of the applicable Endangered Species Acts.

C. California Environmental Quality Act

The action to adopt an NPDES Permit is exempt from the provisions of Chapter 3 of the California Environmental Quality Act ("CEQA") (Public Resources Code Section 21100 *et seq.*) pursuant to CWC Section 13389. (*County of Los Angeles v. Cal. Water Boards* (2006) 143 Cal. App. 4th 985.)

D. State and Federal Regulations, Plans and Policies

1. Water Quality Control Plan for the Santa Ana River Basin

The Clean Water Act requires the regional boards to establish water quality standards for each water body in their region. The requirements of this Order are designed to attain and maintain water quality standards. Water quality standards include beneficial uses, water quality objectives and criteria that are established

at levels that protect beneficial uses, and a policy to prevent degrading of waters ("anti-degradation policy").

On January 24, 1995, the Santa Ana Regional Water Quality Control Board adopted the *Water Quality Control Plan for the Santa Ana River Basin* ("Basin Plan"). The Santa Ana Regional Water Quality Control Board has amended the Basin Plan on multiple occasions since 1995. The Basin Plan designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters in the Santa Ana Region. The Basin Plan identifies the following existing and potential beneficial uses for surface waters in the Santa Ana Region:

- Municipal and domestic supply
- Agricultural supply
- Industrial service and process supply
- Groundwater recharge
- Navigation
- Hydropower generation
- Water contact recreation
- Non-contact water recreation
- Commercial and sport fishing
- Warm freshwater and limited warm freshwater habitats
- Cold freshwater habitat
- Preservation of biological habitats of special significance
- Wildlife habitat
- Preservation of rare, threatened or endangered species
- Marine habitat
- Shellfish harvesting
- Spawning, reproduction and development of aquatic habitats
- Estuarine habitat

2. Water Quality Control Plan for Ocean Waters of California

In 1972, the State Water Resources Control Board ("State Board") adopted the *Water Quality Control Plan for Ocean Waters of California* ("Ocean Plan"). The State Board adopted the most-recent amended Ocean Plan on September 15, 2009. The Office of Administrative Law approved it on March 10, 2010 and USEPA approved it on October 8, 2010.

The Ocean Plan is applicable in its entirety to ocean waters of the State. In order to protect beneficial uses, the Ocean Plan establishes water quality objectives and a program of implementation. Pursuant to California Water Code Sections 13263 and 13377, the requirements of this Order implement the Ocean Plan.

The Ocean Plan identifies the beneficial uses of ocean waters of the State as summarized below:

- Industrial water supply
- Water contact and non-contact recreation
- Navigation
- Commercial and sport fishing
- Mariculture
- Preservation and enhancement of designated Areas of Special Biological Significance
- Rare and endangered species
- Marine habitat
- Fish spawning and shellfish harvesting

The Santa Ana Region includes two Areas of Special Biological Significance ("ASBS"), the Robert B. Badham and Irvine Coast ASBS'. In the Ocean Plan, these are known as ASBS 32 and ASBS 33 respectively. Locally, these ASBS' are known as 'Newport Coast' and 'Crystal Cove', respectively. Both of these areas were designated as ASBS' by the State Board on April 18, 1974.

The Ocean Plan prohibits the discharge of waste to designated Areas of Biological Significance unless an exception to Ocean Plan requirements is issued by the State Board. On March 20, 2012, the State Board approved Resolution No. 2012-0012, which includes exceptions to the Ocean Plan prohibition for certain discharges to various ASBS'. Resolution No. 2012-0012 includes exceptions for discharges from the City of Newport Beach' MS4 to Newport Coast and Crystal Cove and from The Irvine Company, the California Department of Parks and Recreation and the California Department of Transportation to Crystal Cove.

Specific terms, prohibitions, and special conditions were adopted in Attachment "B" to Resolution No. 2012-0012 to provide protections for ASBS'. Resolution No. 2012-0012 grants *exceptions* for the City of Newport Beach and others, but does not authorize discharges to ASBS'. This Order grants the actual *authorization* to discharge to ASBS' only to the City of Newport Beach. The other

dischargers identified in the Resolution are not Co-permittees under this Order. The protections in Attachment "B" to Resolution No. 2012-0012 have been incorporated into this Order as if fully set forth herein and are applicable to discharges from MS4s owned and operated by the City of Newport Beach.

3. Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality

   On September 16, 2008, the State Board adopted the *Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality* ("Sediment Quality Control Plan"). The Sediment Quality Control Plan became effective on August 25, 2009. The Sediment Quality Control Plan establishes: 1) narrative sediment quality objectives to protect benthic communities from exposure to contaminants in sediment and to protect human health; and 2) a program of implementation using a 'multiple lines of evidence' approach to interpret the narrative sediment quality objectives. The requirements of this Order implement the Sediment Quality Control Plan.

4. Anti-degradation Policy

   Federal regulations (40CFR131.12) require that the state water quality standards include an anti-degradation policy consistent with the Federal Anti-degradation Policy. The State Board established California's anti-degradation policy in State Board Resolution No. 68-16, "Statement of Policy with Respect to Maintaining the Quality of the Waters of the State". State Board Resolution No. 68-16 incorporates the Federal Anti-degradation Policy where the federal policy applies under federal law.

   The Santa Ana Regional Water Quality Control Board's Basin Plan implements and incorporates by reference both the State and Federal Anti-degradation Policies. State Board Resolution No. 68-16 and 40 CFR131.12 require that the Santa Ana Regional Water Quality Control Board maintain high quality waters of the State unless degradation is justified based on specific findings.

   The Regional Board must ensure that "existing in-stream uses and the level of water quality necessary to protect the existing uses" are maintained and protected. If the baseline quality of a water body, for a given constituent exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water, that quality shall be maintained and protected

through the requirements of the Order unless the Regional Board makes findings that (1) any lowering of the water quality is necessary to accommodate important economic or social development in the area in which the waters are located; (2) water quality adequate to protect existing uses fully is assured; and 3) the highest statutory and regulatory requirements for all new and existing point sources and all cost-effective and reasonable best management practices for non-point source control are achieved.

The Regional Board must also comply with any requirements of State Water Board Resolution No. 68-16 beyond those imposed through incorporation of the federal antidegradation policy. In particular, the Regional Board must find that not only present, but also anticipated future uses of water are protected. The Regional Board must also ensure best practicable treatment or control of the discharges. The baseline quality that is considered in making the appropriate findings is the best quality of the water since 1968, the year of the adoption of State Board Resolution No. 68-16, or a lower level if that lower level was allowed through a permitting action that was consistent with the federal and state anti-degradation policies.

The discharges authorized by this Order are consistent with the anti-degradation provisions of 40CFR131.12 and State Board Resolution No. 68-16 as set out in the Findings below:

a. Many of the waters within the area covered by this Order are impaired for multiple pollutants discharged through MS4s and are not high quality waters with regard to these pollutants. In most cases, there is insufficient data to determine whether these water bodies were impaired as early as 1968, but the limited available data shows impairment in certain water bodies dating back for more than two decades. Many such water bodies are listed on the State's Clean Water Act Section 303(d) List. Either the Regional Board or USEPA has established TMDLs to address some of the impairments.
b. This Order ensures that existing in stream (beneficial) water uses and the level of water quality necessary to protect the existing uses is maintained and protected. This Order requires the Co-permittees to comply with permit provisions to implement the WLAs set forth in the TMDLs to restore the beneficial uses of the impaired water bodies consistent with the assumptions and requirements of the TMDLs. Water quality-based effluent limits (WQBELs) include the WLAs and requirements to perform certain actions anticipated in the TMDL. This Order further requires compliance with receiving water limitations to meet water quality standards in the receiving

water either by showing compliance or by implementing Watershed Management Plans that include an implementation schedule. This Order includes requirements to document and effectively implement best management practices; achieve water quality-based effluent limitations, and effectively prohibit non-storm water discharges into the MS4.

To the extent that some of the water bodies in the permit area are high-quality waters with regard to some constituents, the Regional Board finds as follows:

a. Allowing limited degradation of high-quality water bodies through MS4 discharges is necessary to accommodate important economic or social development in the area and is consistent with the maximum benefit to the people of the State. In some circumstance, the discharge of storm water is to the maximum benefit to the people of the state because it can assist with maintaining instream flows that support beneficial uses, may spur the development of multiple-benefit project and may be necessary for flood control and public safety as well as to accommodate development in the area. The alternative – capturing all storm water from all storm events – would be an enormous cost that would preclude Co-permittees from spending funds on other important social needs. This Order ensures that any limited degradation does not affect existing and anticipated future uses of the water and does not result in water quality less than established standards. This Order requires compliance with receiving water limitations that act as a floor to any limited degradation.
b. This Order requires the highest statutory and regulatory requirements and requires that the Co-permittees meet best practicable treatment or control. This Order prohibits all non-storm water discharges, with a few specified exceptions, into the MS4 to the receiving waters. As required by 40 CFR 122.44(a), the Co-permittees must comply with the “maximum extent practicable” technology-based standard set forth in Clean Water Act section 402(p) and implement minimum control measures as part of their storm water programs. Recognizing that best practicable treatment or control may evolve over time, this Order includes new and more specific requirements as compared to Order No. R8-2009-0030. This Order includes options to implement Watershed Management Plans that must specify BMPs that must be implemented in accordance with an approved time schedule

5. Anti-backsliding Requirements

Clean Water Act Sections 402(o) and 303(d)(4) and 40CFR122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations may be relaxed.

While this Order allows the implementation of Watershed Management Plans to constitute compliance with receiving water limitations under certain circumstances, the availability of that alternative and the corresponding additional time to come into compliance with receiving water limitations does not violate anti-backsliding provisions. The receiving water limitations provisions of this Order are imposed under section 402(p)(3)(B) of the Clean Water Act, rather than based on best professional judgment, or are based on section 301(b)(1)(C) or sections 303(d) or (e). Accordingly, they are not subject to the anti-backsliding requirements of section 402(o).

Although the non-applicability is less clear with respect to the regulatory anti-backsliding provisions in 40 CFR 122.44(l), the regulatory history suggests that USEPA's intent was to establish the anti-backsliding regulations with respect to evolving technology standards for traditional sources[1]. It is unnecessary to resolve the ultimate applicability of the regulatory backsliding provisions because the provisions relating to the Watershed Management Plans qualify for an exception to backsliding. This exception is based on new information obtained through the process of developing and implementing watershed TMDLs since the adoption of the previous MS4 Permit. This information has caused the Regional Board to recognize the importance of allowing time to fund, plan, design, construct, and operate and maintain watershed-based BMPs. Furthermore, the Regional Board recognizes the potential benefits of storm water runoff to augment water supplies. Thus, even if the receiving water limitations are subject to anti-backsliding provisions, the Order's requirements have been revised based on new information that would support an exception to the provisions. (33 USC 1342(o)(2)(B)(i); 40 CFR 122.44(l)(1); 40 CFR 122.44(l)(2)(i)(B)(1))

6. Clean Water Act Section 303(d) List

Clean Water Act Section 303(d)(1) requires each state to identify specific water bodies within its boundaries where water quality standards are not being met or are not expected to be met after technology-based effluent limitations on point sources of pollutants have been complied with. Water bodies that do not meet

[1] See, e.g. 440 Fed. Reg. 32854, 32864 (June 7, 1979).

water quality standards are considered impaired and are placed on the state's "303(d) List". For each listed water body, the state or USEPA is required to establish a TMDL for each pollutant that is impairing the water quality standards in that water body. Periodically, the USEPA approves the state's 303(d) List.

A TMDL is the sum of the allowable pollutant loads of a single pollutant from all contributing point sources (waste load allocations), non-point sources (load allocations), the contribution from background sources, and a margin of safety (40 CFR 130.2(i)). MS4 discharges are considered point source discharges and are assigned waste load allocations. A TMDL is a tool for implementing water quality standards and is based on the relationship between pollution sources and in-stream water quality conditions. The TMDL establishes the allowable pollutant loads from various sources to a water body and thereby provides the basis to establish water quality-based controls. By implementing these controls, the Co-permittees should provide the pollutant load reduction needed for a water body to meet water quality standards.

Most recently, the USEPA approved the state of California's 2010 303(d) List of impaired water bodies on October 11, 2011. The 2010 303(d) List includes certain receiving waters in the Santa Ana Region. Since 2002, USEPA and the Santa Ana Regional Water Quality Control Board have established TMDLs to address water quality impairments. These TMDLs establish waste load allocations ("WLAs") for discharges from MS4s.

Clean Water Act Section 402(p)(3)(B)(iii) requires the Santa Ana Regional Water Quality Control Board to require Co-permittees to employ "management practices, control techniques and system, design, and engineering methods and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants." Clean Water Act Section 402(a)(1) also requires states to issue permits with conditions necessary to carry out the provisions of the Clean Water Act. Federal regulations also require that NPDES permits contain WQBELs consistent with the assumptions and requirements of all available WLAs (40CFR122.44(d)(1)(vii)(B)). California Water Code requires that NPDES permits include limitations necessary to implement water quality control plans. Therefore, this Order includes WQBELs and other provisions to implement the TMDL WLAs for discharges from MS4s.

7. Other Regulations, Plans, and Policies

This Order implements all other applicable federal regulations and State regulations, plans and policies, including 40CFR131.38 (Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California), also known as the California Toxics Rule or "CTR"; the *State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California*, also known as the State Implementation Policy or "SIP".

E. Unfunded Mandates

Article XIII B, Section 6(a) of the California Constitution provides that whenever "any state agency mandates a new program or higher level of service on any local government, the state shall provide a subvention of funds to reimburse that local government for the costs of the program or increased level of service." The requirements of this Order do not constitute state mandates that are subject to a subvention of funds for several reasons, including, but not limited to, the following.

First, the requirements of this Order do not constitute a new program or a higher level of service as compared to the requirements contained in the previous Fourth Term Permits. The overarching requirement to impose controls to reduce the pollutants in discharges from MS4s is dictated by the Clean Water Act and is not new to this permit cycle (33 USC section 1342(p)(3)(B)). The inclusion of new and advanced measures as the MS4 programs evolve and mature over time is anticipated under the Clean Water Act (55 CFR 47990, 48052 (Nov. 16, 1990)) and, to the extent requirements in this Order are interpreted as new advanced measures, they do not constitute a new program or higher level of service.

Second, and more broadly, mandates that are imposed by federal law are exempt from the requirement that the local agency's expenditures be reimbursed (Cal. Const., art. XIII B, section 9, subd. (b)). This Order implements federally-mandated requirements under the Clean Water Act and its requirements are therefore not subject to subvention of funds. This includes federal requirements to effectively prohibit non-storm water discharges, to reduce the discharge of pollutants in storm water to the MEP, and to include such other provisions as the Administrator or the State determines appropriate for the control of such pollutants (33 USC section 1342(p)(3)(B)). Federal cases have held these provisions require the development of permits and permit provisions on a case-

by-case basis to satisfy federal requirements. (*Natural Resources Defense Council, Inc., v. USEPA* (9th Cir. 1992) 966 F.2d 1292, 1308, fn. 17.)

The authority exercised under this Order is not reserved state authority under the CWA's savings clause (cf. *Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 627-628 [relying on 33 USC section 1370. The savings clause allows a state to develop requirements which are not "less stringent" than federal requirements]). Instead, the authority under this Order is part of a federal mandate to develop pollutant reduction requirements for municipal separate storm sewer systems. To this extent, it is entirely federal authority that forms the legal basis to establish the permit provisions. (See *City of Rancho Cucamonga v. Regional Water Quality Control Board, Santa Ana Region* (2006) 135 Cal.App.4th 1377, 1389; *Building Industry Ass'n of San Diego Co. v. State Water Resources Control Bd*. (2004) 124 Cal.App.4th 866, 882-883.)

The MEP standard is a flexible standard that balances a number of considerations, including technical feasibility, cost, public acceptance, regulatory compliance, and effectiveness. (*Building Ind. Ass'n, supra*, 124 Cal.App.4th at pp. 873-874, 889.) Such considerations change over time with advances in technology and with experience gained in storm water management (55 FR 47990, 48052 (Nov. 16, 1990)). Accordingly, a determination of whether the conditions contained in this Order exceed the requirements of federal law cannot be based on a point by point comparison of the permit conditions and the minimum control measures that are required "at a minimum" to reduce pollutants to the maximum extent practicable and to protect water quality (40 CFR 122.34). Rather, the appropriate focus is whether the permit conditions, as a whole, exceed federal requirements.

The requirements of the Order, taken as a whole rather than individually, are necessary to reduce the discharge of pollutants to the MEP and to protect water quality. The Santa Ana Regional Water Quality Control Board finds that the requirements of the Order are practicable, do not exceed federal law, and thus do not constitute an unfunded mandate. These findings are the expert conclusions of the principal state agency charged with implementing the NPDES program in California (CWC sections 13001, 13370).

It should also be noted that the provisions in this Order to effectively prohibit non-storm water discharges are also mandated by the CWA (33 USC section 1342(p)(3)(B)(ii)). Likewise, the provisions of this Order to implement TMDLs are federal mandates. The Clean Water Act requires TMDLs to be developed for

water bodies that do not meet federal water quality standards (33 USC section 1313(d)). Once the USEPA or a state establishes or adopts a TMDL, federal law requires that permits must contain effluent limitations consistent with the assumptions and requirements of any applicable waste load allocation in a TMDL (40 CFR 122.44(d)(1)(vii)(B)).

Third, the Co-permittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-municipal dischargers who are issued NPDES permits for storm water discharges. With a few inapplicable exceptions, the Clean Water Act regulates the discharge of pollutants from point sources (33 USC section 1342) and the Porter-Cologne Water Quality Control Act regulates the discharge of waste (CWC section 13263), both without regard to the source of the pollutant or waste. As a result, the "costs incurred by local agencies" to protect water quality reflect an overarching regulatory scheme that places similar requirements on governmental and non-governmental dischargers. (See *County of Los Angeles v. State of California* (1987) 43 Cal.3d 46, 57-58 [finding comprehensive workers' compensation scheme did not create a cost for local agencies that was subject to state subvention].)

The Clean Water Act and the Porter-Cologne Water Quality Control Act largely regulate storm water with an even hand, but to the extent there is any relaxation of this even-handed regulation, it is in favor of the local agencies. Generally, the Clean Water Act requires point-source dischargers, including dischargers of storm water associated with industrial or construction activity, to comply strictly with water quality standards (33 USC section 1311(b)(1)(C); *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159, 1164-1165 [noting that industrial discharges must strictly comply with water quality standards]). As discussed in prior State Water Board decisions, certain provisions of this Order do not require strict compliance with water quality standards (State Water Board Order No. WQ 2001-0015, p. 7). Those provisions of this Order regulate the discharge of waste in municipal storm water under the Clean Water Act's MEP standard, as opposed to the BAT/BCT standard that applies to other types of discharges. These provisions, therefore, regulate the discharge of waste in municipal storm water more leniently than the discharge of waste from non-governmental sources.

Fourth, the Co-permittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in Clean Water Act section 301(a) (33 USC section 1311(a)). To the extent that the Co-permittees have voluntarily availed themselves of the permit, the program is

not a state mandate. (Accord, *County of San Diego v. State of California* (1997) 15 Cal.4th 68, 107-108.)

Fifth, the local agency Co-permittees' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under state law predates the enactment of Article XIIIB, Section (6) of the California Constitution.

Finally, even if any of the permit provisions could be considered unfunded mandates, under Government Code section 17556, subdivision (d), a state mandate is not subject to reimbursement if the local agency has the authority to charge a fee. The Co-permittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order, subject to certain voting requirements contained in the California Constitution. (See Cal. Const., Art. XIII D, section 6, subd. (c); see also *Howard Jarvis Taxpayers Ass'n v. City of Salinas* (2002) 98 Cal.App.4th 1351, 1358-1359.) Numerous activities contribute to the pollutant loading in the MS4. Local agencies can levy service charges, fees, or assessments on these activities, independent of real property ownership. (See, e.g., *Apartment Ass'n of Los Angeles County, Inc., v. City of Los Angeles* (2001) 24 Cal.4th 830, 842 [upholding inspection fees associated with renting property].) The authority and ability of a local agency to defray the cost of a program without raising taxes indicates that a program does not entail a cost subject to subvention. (*Clovis Unified School Dist. V. Chiang* (2010) 188 Cal.App.4th 794, 812, citing Connell v. Sup. Ct. (1997) 59 Cal.App.4th 382, 401; *County of Fresno v. State of California* (1991) 53 Cal. 3d. 482, 487-488.)

VII. REGULATORY BASIS FOR PERMIT REQUIREMENTS

Order No. R8-2015-0001 is based on Section 402(p) of the Clean Water Act; 40CFR Parts 122, 123, and 124; and the Porter-Cologne Water Quality Control Act (Division 7 of the California Water Code, Section 13000 *et seq*.). This Order is also based on the *Water Quality Control Plan for the Santa Ana River Basin* ("Basin Plan"); all applicable provisions of state-wide water quality control plans and policies adopted by the State Water Resources Control Board ("State Board"); the California Toxics Rule ("CTR"); and the CTR Implementation Plan.

The Basin Plan was revised and adopted by the Regional Board and it became effective on January 24, 1995. Since then, the Basin Plan has been amended to incorporate requirements related to Total Maximum Daily Loads ("TMDLs", discussed later in this Section). The Basin Plan contains water quality objectives

and beneficial uses for water bodies in the Santa Ana Region. Under the Clean Water Act, both beneficial uses and the water quality objectives to protect them are collectively referred to as "water quality standards". The Basin Plan also incorporates by reference all State Board water quality control plans and policies, including the 1990 *Water Quality Control Plan for Ocean Waters*, known as the "Ocean Plan".

VIII. CONSIDERATIONS IN THE DEVELOPMENT OF ORDER NO. R8-2015-0001

A. Results of Audits

During the term of Order No. R8-2009-0030, Regional Board staff performed over 20 audits of 12 of the Co-permittees. The audits were performed on one or more elements of the Co-permittees' storm water programs and included reviews of the target Co-permittee's Program Effectiveness Assessments ("PEAs"). Audits were largely carried out using process mapping techniques in addition to comparisons of actual program outcomes with permit requirements.

Regional Board staff review has found that the "iterative process" has been hampered by the disuse of performance metrics. In most cases, the Co-permittees tracked and reported outcomes of program activities in their PEAs without any performance metrics to provide context. This renders the information of limited use. For example, Co-permittees commonly report on the number of curb-miles swept as part of street-sweeping programs. This reporting approach does not allow evaluation of the data by comparing it to the target number of curb-miles that were supposed to be swept or inter-annual comparisons.

Regional Board staff highlighted this issue with an audit performed on the City of Santa Ana's Program Management, Public Education, and Existing Development elements of their storm water program in 2010. This audit focused on Section C of the City's 2008-2009 PEA, which contains the outcomes from these program elements. Because the format used by the City was one used by the Co-permittees, the conclusions of that audit also generally apply to the other Co-permittee's PEAs. In Section C, the City tracked and reported 21 objective outcomes from implementing their program. Of those, 19 outcomes were reported without comparison to a performance metric, even when a performance metric was prescribed in the Permit. Consequently, City staff was collecting data on 19 outcomes but was not using the information in a constructive manner in

their PEA. In some cases, the data was not used to overtly evaluate compliance with performance metrics in the Permit.

Fundamentally, the permit describes activities that the Co-permittees must carry out to comply with the permit, but more importantly, to reduce pollutants in urban runoff. The permit describes these activities with different levels of detail. As a result, the Co-permittees often must better define these activities in a practical way in their program planning documents, such as the Drainage Area Management Plan or Local Implementation Plans, to describe how they will comply.

The actions prescribed in the permit and related planning documents are required with a presumption that their execution will improve water quality. However, the degree of effectiveness, or correlation between specific actions and improvements in water quality, is not known. For example, the current state of knowledge does not allow an incremental improvement in water quality to be attributed to a particular public education campaign. This dilemma is the basis for accepting the "iterative process" to reducing pollutants to ultimately achieve water quality objectives. The "iterative process" allows for a large degree of experimentation by the Co-permittees and Regional Board staff to discover the most effective combination of actions. On the basis of objective information, the "iterative process" allows Co-permittees to amend their program planning documents to improve their programs. The "iterative process" also informs the permit process, allowing the Regional Board to also make improvements in the permit as part of subsequent re-authorizations.

The "iterative process" is described best in the Receiving Water Limitations language in the Order. This language was generally originated by the USEPA and communicated by the State Water Resources Control Board ("State Board") in Order WQ 99-05 and generally reaffirmed in WQO 2015-0075. The State Board's language has been modified in this Order but its purposes have not been altered. The "iterative process" is also referenced in the findings of the past two versions of NPDES Permit No. CAS618030.

No time schedule is prescribed in the Receiving Water Limitations language over which to execute the "iterative process". The key step to trigger the process is a "determination…that a discharge is causing or contributing to the exceedance of an applicable water quality standard" described in Subsection IV.C. of the Order. Because of the variance in storm water quality and the infrequency of storm events, the time period may be on the order of years to make the determination

and to initiate the "iterative process" described by Order WQ 99-05. In fact, the "iterative process" in Order WQ 99-05 has never been initiated before in the Santa Ana Region in spite of the Co-permittees' collection of substantial water quality data. This is largely attributed to a poorly-defined trigger to initiate the "iterative process".

The "iterative process" as a whole relies on some form of feedback to evaluate program performance and identify the need for improvements if necessary. Ideally, this feedback would occur through direct measurements of changes in effluent concentrations and receiving water quality. In this case, numeric water quality standards would serve as performance metrics where a causal relationship has been established with specific storm water program activities. However, the causal relationship between water quality and program activities is often not established.

Feedback can also be obtained by monitoring outcomes from individual or groups of program activities and comparing them to performance metrics which have less direct, but logical relationships to changes in effluent concentrations or receiving water quality. An example of this would be changes in public behavior which reduce pollutants in storm water runoff. Although it may be difficult to correlate changes in receiving water quality with a public education program, it may be easier to establish correlations between the program and reported changes in behavior.

The Co-permittees have spent significant resources to implement their storm water programs and to track and report program outcomes. This partly fulfills the iterative process. But the Co-permittees have not consistently placed much of the data in context by comparing it to objective metrics to evaluate performance. The result is that there has been no comprehensive effort to assess the effectiveness of the Co-permittees' program activities.

Requirements for reports on program effectiveness first appeared in the fourth-term permit, Order No. R8-2009-0030, as Program Effectiveness Assessments ("PEAs"). However, the requirements stopped short of mandating that the Assessments rely on the use of objective performance metrics or standards for various program elements. Although discussed, the use of objective performance metrics or standards was phrased as a recommendation in the fourth-term permit.

There is a definite need for the Co-permittees to use indicators of the performance of their programs' activities. Water quality data can be collected to assess the *overall* performance of the Co-permittees' storm water programs. But sufficient water quality data may not always be available to evaluate the effectiveness of *specific* program activities or even of combinations of program activities. A large amount of water quality data may have to be collected over extended periods of time to establish correlations between program activities and incremental improvements in water quality. During this time, the different Co-permittees may adopt new activities, change levels of effort for activities, and/or abandoned others. This continual evolution of the Co-permittees' program activities during a monitoring period can confound the effort to establish correlations. Other types of performance metrics are needed.

Performance metrics include water quality standards and measurable and verifiable permit requirements; but these do not comprehensively address all of the Co-permittees' program activities. Additional performance metrics need to be established by the Co-permittees to carry out a comprehensive assessment of program activities. For example, some cities have established agronomic fertilizer rates as a performance metric for applying fertilizer to turf grass in public parks and properties. This metric is related to a goal of reducing wasted fertilizer and the transport of the waste to receiving waters. In this example, the performance metric has a clear relationship to a goal that, if achieved, is reasonably likely to improve receiving water quality. The performance metric also provides more useful and frequent feedback to the Co-permittees.

The structure and language of the past permit has been improved in this Order to promote the "iterative process". Interviews with Co-permittees' staff as part of audits, inspections, and other encounters revealed that their focus is on permit compliance. This appears to have caused the Co-permittees to comply with the letter of the permit with less emphasis on the intended "iterative process". Where the permit provides specific direction, the Co-permittees generally make an effort to comply using available resources. Since the past permits did not detail how to assess program effectiveness in a meaningful way, the result has been insufficient incentive for Co-permittees to fully apply the iterative process. The requirements of this Order attempt to address this apparent disconnect between "compliance" and "program performance" by better defining the "iterative process" and mandating its practice.

The past practice of incorporating by reference best management practices in the Drainage Area Management Plan and the Local Implementation Plan also does

not appear to promote the "iterative process". Past versions of NPDES Permit No. 618030 relied on the development of the Drainage Area Management Plan ("DAMP") by the Co-permittees[2]. The DAMP and its companion plans and programs describe the storm water management controls that the Co-permittees would carry out in order to comply with the permit. The permit then required that the Co-permittees implement the DAMP. The more recent fourth-term permit expanded this requirement to include Local Implementation Plans developed by each Co-permittee for their respective jurisdiction.

The strategy of 'incorporating by reference' best management practices in the Drainage Area Management Plan and the Local Implementation Plan effectively made many of the practices described in those Plans mandatory. Failure to perform commitments in those Plans could cause the Co-permittees to be out of compliance with the permit and subject them to civil liability.

The ability of the Regional Board to enforce the DAMP or LIPs depends on how objectively the program activities are described or whether or not the activities can be measured or verified. Of the DAMP and the LIPs, only the DAMP's content was controlled by a process for approval by the Executive Officer. The content of the LIPs was not controlled through approval by the Executive Officer. The result was a logical effort by at least a few Co-permittees to amend their Local Implementation Plans to remove any objective enforceable requirements and subsequent potential liabilities. Best management practices typically became "opportunities" that the Co-permittee might or might not follow through on. Without any commitment for their implementation or any way to measure and verify the performance of those commitments, missed "opportunities" are not enforceable.

The fear of being subject to enforcement may discourage the Co-permittees from documenting innovations that could potentially improve the Co-permittees storm water programs and the permit. Evidently, left to their discretion, the relationship motivates the Co-permittees to eliminate any concrete commitments that might cause them to be out of compliance.

This is not to assert that the Co-permittees have not made innovations in their storm water programs or carried out best management practices to reduce pollutants in urban runoff. During many of the audits, Regional Board staff discovered that many Co-permittees were essentially running at least some part

[2] For purposes of discussion, DAMP and LIP generally refer to companion plans and programs such as the 2011 Model Water Quality Management Plan and the Technical Guidance Document.

of their storm water programs off-the-books. Innovations and best management practices were occurring, but they were not described in the Drainage Area Management Plan or the Local Implementation Plan or their Program Effectiveness Assessments. By keeping these efforts out of the DAMP or LIPs, the Co-permittees prevent them from becoming permit requirements and thus liabilities. But, by not including these efforts in the Program Effectiveness Assessments, the Co-permittees have not comprehensively evaluated the effectiveness of their programs to improve. The result is that the *documented* elements of the storm water program have become stagnant even as innovations have occurred undocumented.

In summary, the Co-permittees have not taken full advantage of the "iterative process" to improve their storm water programs. The 'incorporation by reference' relationship between the permit and the DAMP and LIPs is likely a significant factor that discourages the Co-permittees from making changes to the plans that might become enforcement liabilities. Where allowed, the Co-permittees have managed potential enforcement liabilities by eliminating objective commitments from the plans. Where innovative strategies are employed, they are generally not documented in the plans or evaluated as part of Program Effectiveness Assessments.

It is likely that other factors, such as organization size (the Co-permittees collectively) and related span of control, disproportionate influence among larger and smaller cities, and differing levels of interest among Co-permittees also significantly affect the management of the storm water program. But these are matters that are not easily addressed by this Order.

Therefore, this Order refocuses the Co-permittees' efforts on the "iterative process" to improve their storm water programs and ultimately achieve water quality objectives. To do so, it is necessary to establish a working model of what the "iterative process" is. The "iterative process" is not defined specifically by USEPA, the State Water Resources Control Board, or the Regional Water Quality control Board. In business, the "iterative process" is an objective process improvement technique for arriving at a decision or objective by repeating rounds of analysis or a system of actions. The process involves subsequent evaluation and improvement with each cycle. Performed well, the "iterative process" is a cost control method that can save the Co-permittees money.

In business, the purpose of the "iterative process" is ultimately to arrive at some decision or desired outcome. The "iterative process" is typically applied in

circumstances where there is great uncertainty; where costs of errors are high; or where a full commitment of resources to achieve a risky outcome is undesirable. This process is known by many other names such as a "Plan-Do-Check-Act Cycle" ("PDCA Cycle"), Deming Cycle, and Shewart Cycle.

Objective process improvement techniques have been in practice in business and, later government for over half a century and have been gradually finding their way into storm water regulation. The techniques were introduced into widespread use in Japan in the 1950's by W. Edwards Deming and are generally regarded as being instrumental in transforming the post-war Japanese economy. USEPA prescribes objective process improvement techniques ("measurable goals") in their Storm Water Phase II Rule, promulgated in 1999, for small MS4s. In 2008, USEPA published *Evaluating the Effectiveness of Municipal Stormwater Programs*, describing the "iterative process" as a process improvement technique.

Co-permittees under the NPDES program have also begun developing process improvement techniques. With the participation of the Co-permittees, the California Stormwater Quality Association published the Draft *Municipal Stormwater Program Effectiveness Assessment Guide* in 2007 ("Draft 2007 Guide")[3]. This document describes an objective process for developing a system of measuring the performance of the Co-permittees' storm water programs. Although the Draft 2007 Guide was referenced in the fourth-term permit in regards to performing Program Effectiveness Assessments, the process was not fully put into practice by the Co-permittees. Gradual efforts were made, but the process has not been fully implemented.

In storm water regulation, the "iterative process" serves multiple purposes. First, it allows the Co-permittees, regulatory staff, and the public to assess compliance with the requirements of this Order. It tracks progress towards meeting water quality objectives. It justifies the Co-permittees' commitment of resources, including the cessation of ineffective program activities. It provides feedback to storm water program managers, in part, to identify the most effective program activities. Last, it may establish correlations between reductions in pollutant loads into receiving waters and program activities.

To refocus the Co-permittees, this Order partly de-couples the DAMP and LIP from the permit requirements. Planning documents are still required, but their purpose is principally to maintain transparency of the Co-permittees' storm water

[3] Available for a fee at www.casqa.org

programs. To do so, the planning documents must fully and accurately reflect the Co-permittees' storm water programs.

This Order continues virtually all of the objective requirements of the fourth-term permit, such as commercial and industrial inspections. But this Order also requires that the Co-permittees have certain effective processes (or mechanisms) instead of prescribing specific objective outcomes. To complement all processes and objective requirements, the Co-permittees must also develop and apply objective performance measures to assess the programs' effectiveness.

Program activities and their related performance measures will necessarily include the objective requirements of the permit, such as requisite numbers of inspections. But not all of the Co-permittees' program activities are mandated directly by a permit requirement. Under the fourth-term permit, these program activities are described in the DAMP or LIP. They were therefore mandated by way of being incorporated by reference in the permit.

Now, program activities that are only described in the DAMP or LIP have been incorporated into this Order. However, program activities have been generally synthesized rather than copied over directly. The Order describes these program activities more generally as required programs, processes, or mechanisms. These mandated programs, processes, or mechanisms are intended to accomplish the same purposes as the specific program activities described in the DAMP or LIP. The purpose of using general descriptions, instead of mandating specific program activities in the DAMP or LIP, is to allow the Co-permittees greater flexibility to add or discontinue specific program activities or to modify their level of effort.

This flexibility is tempered in four ways. First, the Co-permittees must continue to meet the objective requirements of this Order where prescribed. Second, the Co-permittees must perform program activities that satisfy the general goals prescribed by this Order. Third, program changes must be guided by the iterative process. Last, the Co-permittees must satisfy the requirements of this Order and the Clean Water Act.

Although some modifications may be needed, the Co-permittees' storm water program is initially generally-presumed to satisfy the requirements of this Order and the Clean Water Act without the need for wholesale changes. Therefore, unless specified otherwise in this Order, it must be generally continued unless

the Co-permittees can provide objective evidence that the program must be modified. This evidence is provided by the performance of Program Effectiveness Assessments. Co-permittees may modify program activities, but the program as a whole must work to achieve the general goals prescribed by this Order. Those general goals appear in this Order along with expressed requirements to have effective mechanisms or processes to achieve those goals. "Effectiveness" must be measured using the objective requirements prescribed by this Order or, where not prescribed, developed by the Co-permittees.

Consequently, there will be two kinds of objective performance metrics: those described in the language of this Order and those developed by the Co-permittees. Failure to achieve the objective requirements of this Order will be regarded as violations of this Order. However, failure to achieve objective performance metrics developed by the Co-permittees is not a violation of this Order.

In the absence of objective requirements prescribed in the Order for specific program activities, program activities will be evaluated: 1) by determining which prescribed general goal(s) that an activity is intended to achieve; 2) if there is (are) one or more objective performance metrics being used to assess the performance of the activity; 3) if the performance metric(s) is (are) valid; and 4) if the affected Co-permittees are responsive to information on the effectiveness of the program or the validity of the performance metric. A program activity that lacks any of these evaluative elements will be in violation of this Order.

B. Report of Waste Discharge

The Co-permittees' Report of Waste Discharge (ROWD) for the fifth-term MS4 Permit was received on October 3, 2013. The ROWD outlined various accomplishments by the Co-permittees and other parties and related them to improvements in receiving water quality. The ROWD also included a general assessment of the "State of the Environment" with regards to bacteria, nutrients, and toxicity. The Co-permittees reported that these three categories of pollutants should be priorities in the next MS4 Permit.

C. The "Iterative Process"

Essentially, this Order requires more explicitly that the Co-permittees engage in an "iterative process" for their program activities. This process is outlined in the

conceptual model below (Figure 1). The process shown is adapted from W. Edwards Deming's PDCA Cycle. The conceptual model provides a working basis for the "iterative process". The general provisions in Section I of the Order have been designed to enforce each of the steps of the "iterative process" as shown. The "iterative process" is further reinforced by other provisions throughout the Order.

Figure 1: Conceptual Model of the "Iterative Process"

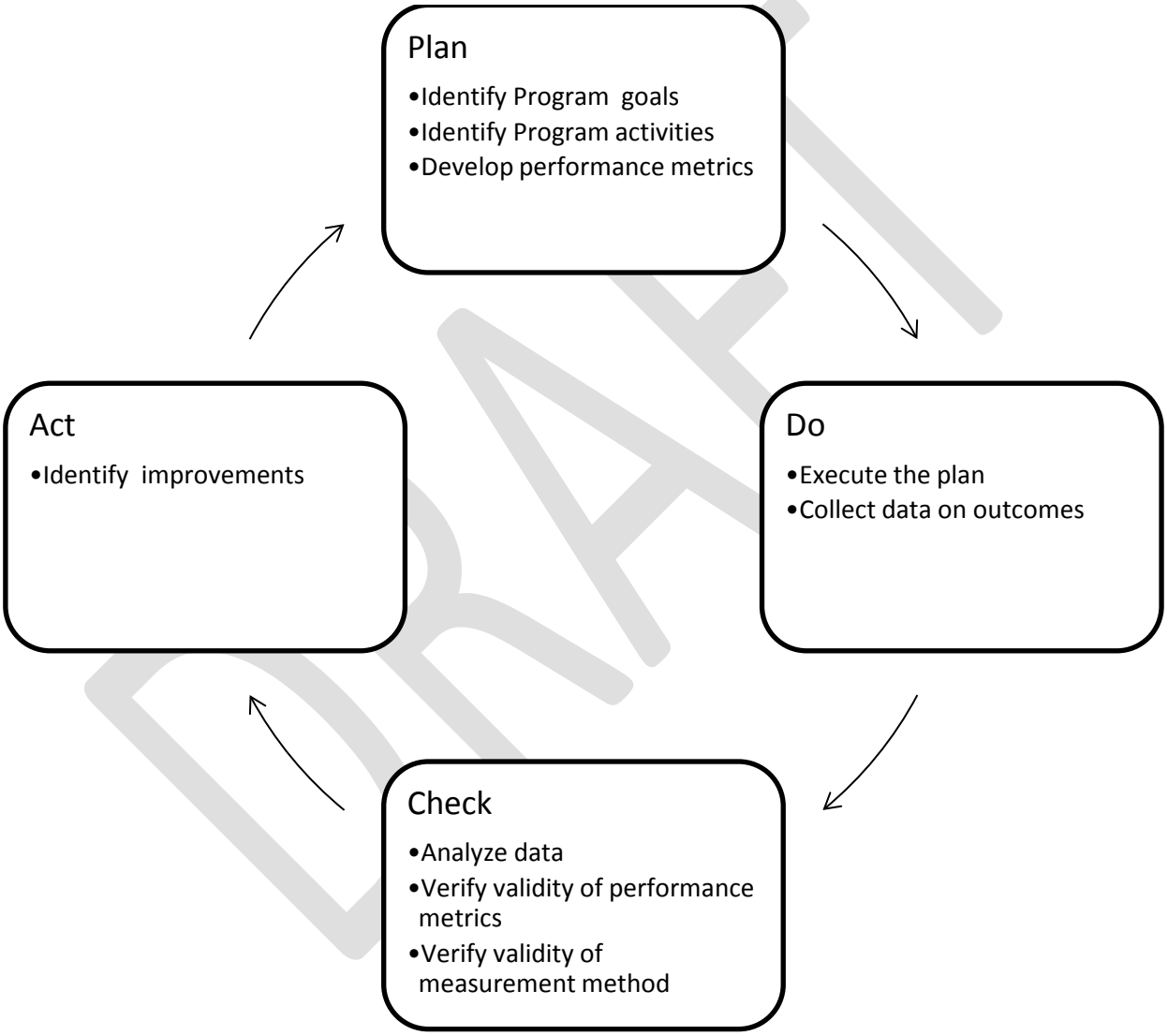

The "iterative process" can inform both the Co-permittees' development and execution of their storm water programs and influence the development of future reauthorizations of NPDES Permit No. CAS618030. The "iterative process" can

be used at multiple time scales, from days to decades. There is an expectation that the program activities prescribed in the permit and developed by the Co-permittees will ultimately improve receiving water quality and that the choice and method of measuring program outcomes are valid. However, deficiencies may be discovered as programs are evaluated and performance metrics and their methods of measurement are developed and scrutinized. Consequently, adaptive measures may be necessary to improve the effectiveness of the program activities or to improve the methods of measuring effectiveness.

Within this Order, the "iterative process" cycle is driven by several mechanisms. First, Section IV's receiving water limitations language necessarily requires the Co-permittees to use receiving water quality monitoring data to evaluate if water quality standards are being met. Receiving water quality monitoring data is generated through the Monitoring and Reporting Program and the data is analyzed based on a schedule developed by the Co-permittees but subject to the approval of the Executive Officer.

The "iterative process" is also driven by water quality-based effluent limitations developed as part of TMDLs. The water quality-based effluent limitations are described in Appendices B through H of this Order. The methods for complying with the water quality-based effluent limitations are described in Section XVIII of this Order. Many water quality-based effluent limits are waste load allocations that may be numeric effluent limits, where TMDL compliance dates have passed. They may alternately be interim goals, where compliance dates have not passed. Both are kinds of water quality-based effluent limits and are shown in Appendices B through H. Waste load allocations and their related requirements are the vehicle for meeting water quality standards for those waters listed pursuant to Clean Water Act Section 303(d).

The "iterative process" is lastly driven by the Co-permittees' performance of annual Program Effectiveness Assessments described in Section XIX of this Order. Each Co-permittees is required to use measurable and verifiable (objective) performance standards or metrics to evaluate the effectiveness of their BMPs. Where appropriate, the Principal Permittee should strive to harmonize the Co-permittees' performance metrics so that a meaningful assessment of the overall effectiveness of common program elements can be performed. Certain performance standards are found within this Order as desired measurable and verifiable program outcomes, but they are purposefully incomplete in order to provide the Co-permittees flexibility. Additional performance standards will need to be developed by the Co-permittees to

evaluate BMPs that are not specifically prescribed directly by this Order but which are performed to achieve permit goals.

The performance standards that are not specified in this Order are not enforceable on the Co-permittees; in these cases, the "iterative process" itself is enforced by this Order, rather than the outcome. Unlike water quality standards and waste load allocations, these performance standards are typically not direct measures of BMPs' effects on receiving water quality. But they are important to measure the effectiveness of BMPs in achieving goals, such as those related to public education and personnel training, whose purpose is to indirectly improve water quality.

This Order has also been written with the purpose of limiting the number of planning documents necessary to implement the storm water programs. With the exception of the Watershed Management Plans in Sections IV and XVIII and detailed in Section XI, this Order does not require new planning documents. The Co-permittees' best management practices are applied at three spatial scales; at the permit-area scale, at the watershed scale, and at the local jurisdiction scale. All of these scales are collectively addressed in the DAMP, LIPs, and the TMDL-related planning documents. Any changes to the storm water programs can be represented in any of these documents without the need to develop additional, separate plans. This Order also does not mandate any particular spatial scale for the Co-permittees' planning documents; instead the circumstances will dictate.

The Co-permittees must continue to use the planning documents already prepared to the extent that the plans fully document their program activities, including best management practices. It will be necessary to review and amend those planning documents to add activities not already documented, to develop performance metrics and methods for measuring those metrics, to consolidate and possibly abandon some plans, and to generally update the Co-permittees' storm water programs to comply with this Order. The Co-permittees can re-write their planning documents if they choose to. But this is a matter for the Co-permittees' editorial discretion and is not required by this Order.

D. <u>Regional and Sub-regional Structural Treatment Control BMPs</u>

The Provisions of Section XII of this Order take a more neutral position with respect to the use of on-site or off-site structural treatment control BMPs. An off-site facility generally will serve more than one project or property owner and are generally regional or sub-regional facilities. Instead, preference is given in this

Order to LID BMPs, with less regard to their location. This represents a significant shift from Order No. R8-2009-0030, which required a demonstration that on-site facilities were infeasible before allowing the use of an off-site facility. This Order requires that source control and site design BMPs be located on-site under any circumstance.

This shift in regard to the location of structural treatment controls has been made in consideration of the benefits of centralizing these BMPs. In comparison with de-centralized structural treatment control BMPs, centralized facilities consolidate the responsibility for their operation and maintenance into a single entity such as a property owner's or homeowner's association, a community facilities district, or public agency. This allows for the facility to be professionally managed and maintained which may allow the facility to perform more reliably with less risk of premature failure. Centralized facilities also consolidate the costs of construction, operation and maintenance and may result in efficiencies of scale. Centralized facilities are more likely to collect runoff from roadways and other public rights of way whose runoff might be treated using less effective BMPs. Centralized facilities may also be at a scale that they provide other community benefits, such as open space.

Alternately, difficulties in developing regional and sub-regional structural treatment control BMPs largely stem from the need for significant up-front capital investment for planning, design, and construction. The return on that investment may be unreliable depending on the circumstances in the facility's drainage or service area. In master-planned communities, regional and sub-regional facilities have been successful partly because planners were largely able to control the organization of funding mechanisms and the return on the investment could be realized through the sale of completed or partly-completed development projects located in the facilities' tributary area . The regional or sub-regional facility, along with other planned or existing infrastructure or improvements, increased the value of the project or its parts whose sale provided the return on the investment in the facility.

In a built-out, urbanized drainage area, the development of a potential regional or sub-regional structural treatment control BMP is likely to require the cooperation of multiple property or project owners with fundamentally different economic interests. The parties are likely to value the investment in the facility at significantly different magnitudes. As the result, they are not equally motivated to fund the planning, design, or construction of the facility or to cooperate to form funding mechanisms for the facility's maintenance.

These circumstances greatly complicate efforts to develop regional or sub-regional structural treatment control BMPs in already-urbanized areas. A Co-permittee or another public entity may need to organize and coordinate the facility. The Co-permittee may face serious challenges to gain support from the different individuals to fund the necessary up-front planning, design and

construction, and to organize long-term funding mechanisms for operation and maintenance. The challenges may be insurmountable and on-site facilities may be the only practical solution[4].

As explained further in Section XII below, this Order changes the requirements for New Development so that there is no preference to the use of structural treatment control BMPs either on or off-site. This Order does make it easier for a project proponent to use an off-site structural treatment control where it is available. This is accomplished principally by not requiring that on-site structural treatment control BMPs be demonstrated to be infeasible before allowing the use of an off-site facility.

E. Alternatives and *In Lieu* Programs

The previous Permit allowed for the Co-permittees to organize urban runoff funds to pay for "urban water quality improvement projects within the same watershed that is funded by contributions from developers granted waivers" in Provision XII.E.2. No urban runoff fund was ever reported established for "urban water quality improvement projects" and no waivers were known to have been issued during the previous Permit's term. If a waiver was issued under the previous Permit, Co-permittees were not required to develop funds and collect monies. Because obtaining a waiver poses little relative cost versus a contribution to a fund, it is not surprising that the Co-permittees chose not to impose the financial burden of a runoff fund on the development community. Nonetheless, at the urging of USEPA, this Order continues to allow the Co-permittees to exact funds from projects which are granted waivers.

The previous Permit also allowed the Co-permittees to "establish a water quality credit system for alternatives to infiltration, harvesting and reuse, evapotranspiration, and other LID BMPs and hydromodification requirements" in Provision XII.E.4. However, the Provision further describes projects that would be eligible for credit. The projects listed there are generally regarded as low-impact development, suggesting that the purpose of the credit system was to encourage these types of development.

In response, the Co-permittees proposed a credit system in the 2011 Model Water Quality Management Plan and Technical Guidance Document. This credit system provided discounts on the design capture volume that needed to be treated for certain types of projects generally regarded as LID. The Executive

[4] Detailed perspectives on regional and sub-regional structural treatment control BMP may be found in Podolsky, Laura. *Barriers to Low Impact Development*, Local Government Commission, September 2012. Available at: http://www.socalsmc.org/Docs/FINAL_BarrierstoLID_LGC.pdf

Officer approved this credit system on the basis that LID includes land use strategies to reduce water quality impacts and that the credit would provide an incentive to practice LID. However, this program does not appear to have been effective.

Development patterns are influenced by the preferences of residents, physical and institutional infrastructure constraints, regional distribution of housing needs, compatibility with other land uses in the vicinity, seismic and geotechnical issues, and many other factors. To be effective, the discounts on the design capture volume would have to influence a project proponent to change a non-LID project to a LID project or to essentially propose a project that otherwise would not have been proposed in the face of constraining factors. To do so, the savings realized from the discount on the design capture volume would have to exceed the costs of overcoming any of the factors that limit LID. In some cases, this may be costly, involve changing zoning, overcoming local opposition to certain forms of development, mitigating traffic impacts, or providing funding for more police and fire services[5].

The Co-permittees have not reported and Regional Board staff is unaware of any evidence that those discounts have been effective at motivating the Co-permittees or the development community to alter development patterns in Orange County or to produce more LID projects than would have been produced without the discounts. Because of this, the discounts have been an unnecessary compromise on the protection of water quality. Therefore, this Order no longer allows the Co-permittees to provide discounts on the design capture volume. This Order does not require the Co-permittees to take back any discounts granted before the effective date of the Order.

This Order authorizes the Co-permittees to establish a water quality credit system but in a different form than the previous Permit. This Order essentially allows an entity to construct a LID BMP that treats runoff from a drainage area that does not necessarily include the area of a project. The entity or project proponent is then allowed to trade the treatment capacity with projects in the same drainage area of the same receiving water (water of the U.S.) subject to certain conditions. The 'excess' capacity is the design capture volume or flow that the facility treats minus the volume or flow generated by a related project, if any. This excess capacity is a "credit" that serves as a unit of trade between

[5] For a detailed discussion on barriers to LID see McConnel, Virginia and Wiley, Keith. *Infill Development: Perspectives and Evidence from Economics and Planning*, RFF DP 10-13, May 2010. Available at: http://www.rff.org/rff/documents/RFF-DP-10-13.pdf

projects. This market-based feature of the permit is designed to encourage early investments in LID BMP infrastructure for large or multi-property property owners This Order does not regulate the manner of the transaction between projects. But the structural treatment control employed to produce the credit must be a LID BMP.

Credit trading is permitted between projects, but the project owners must be the same. This is a limitation on the size of the trading market. This limitation is necessary at this time because permitting a larger trading market would require a more complex system of accounting and controls. Few Co-permittees may be prepared to effectively manage the credit trading. An expansion of the trading market to allow trading between different project owners in the same watershed may be considered as part of future permits.

F. Plain Language

California Government Code Section 6219(a) states that "Each department, commission, office, or other administrative agency of state government shall write each document that it produces in plain, straightforward language, avoiding technical terms as much as possible, and using a coherent and easily readable style." This requirement is more commonly known as the State's "plain language requirement". Order No. R8-2015-0001 and this Technical Report have been prepared with careful consideration of the plain language requirement.

There are a variety of indicators for measuring the 'readability' of a document. These indicators include the Flesch Kincaid Reading Ease, Flesch Kincaid Grade Level, and the Gunning Fog Score. These first two indicators are widely available in common word-processing software and were applied to the Order and Technical Report. The results indicate that a person that has achieved a college junior level of education should be able to readily understand these documents. Given the technical and legal subject matter, the readability of the Order and this Technical Report is appropriate and satisfies the State plain language requirement.

G. Internet References

This Order includes numerous references to web pages in order to save paper and simplify the presentation of the permit and related documents. In an electronic format, the permit and related documents may contain live links to web

sites. These links and web site addresses may become broken or outdated during the term of this Order. Consequently, these references have been provided for the convenience of the reader. Regional Board staff will make every effort to update broken or outdated internet references in electronic versions of this Order posted at the Regional Board's web site. Readers who become aware of broken or outdated reference or links are asked to contact Regional Board staff in the Contact Information (Section II) above to assist in this effort.

IX. PUBLIC PROCESS AND NOTIFICATION

On October 3, 2013, the County of Orange ("County"), acting on behalf of the Co-permittees, submitted the Report of Waste Discharge ("ROWD") for the fifth-term NPDES Permit No. CAS618030 ("Permit"). At the recommendation of Regional Board staff, the ROWD emphasized changes that the Co-permittees were requesting in the new permit. The requested changes included changes to the requirements of NDPES Permit No. CAS618030 and to the accompanying Monitoring and Reporting Program.

On October 30, 2013, Regional Board staff sent the County of Orange a Notice of Incomplete Report of Waste Discharge ("Incomplete Notice"). The Incomplete Notice consisted of a cover letter and a table of responses to each of the requested changes described in the Co-permittees' ROWD. The responses largely were requests for additional information to justify the requested changes, requests for more detailed recommendations, and requests for descriptions of how the changes would improve the Co-permittees' storm water program and how the improvement would be measured. In the Incomplete Notice, Regional Board staff requested that the County respond by November 30, 2013.

On October 30, 2013, County staff requested an extension of time to respond to the Incomplete Notice. The request was granted orally and confirmed in a letter dated November 7, 2013. The new deadline was December 18, 2013.

The November 7, 2013 letter included a request to meet and confer on the County's anticipated response. County staff was advised that their requested changes to the Monitoring and Reporting Program could be addressed after the adoption of the fifth-term Permit. In that event, Regional Board staff could withdraw requests for information in the Incomplete Notice related to changes to the Monitoring and Reporting Program. This way, efforts to change the fifth-term Permit could proceed separately from efforts to change the Monitoring and Reporting Program.

On December 11, 2013, Regional Board staff met with County staff and other representatives of the Co-permittees. During that meeting Regional Board staff agreed to limit the scope of the October 30, 2013 Incomplete Notice to exclude matters related to the Monitoring and Reporting Program. County staff also outlined their anticipated response to the Incomplete Notice. Subsequent to that meeting, Regional Board staff amended the Incomplete Notice to limit the scope accordingly in a letter dated December 12, 2013.

On April 28, 2014, Administrative Draft Order No. R8-2014-0002 was released to the Co-permittees for review. Comments were received which resulted in changes to the draft document before its public release. On May 2, 2014 Draft Order No. R8-2014-0002 was released for public comment. Complete public notice was not provided until May 7, 2014. Consequently, the public comment period was extended until June 20, 2014.

As part of the comment period for Draft Order No. R8-2014-0002, Regional Board staff held a Public Workshop on May 19, 2014 at the Orange County Water District offices in Fountain Valley. A second workshop was held during a scheduled Board Meeting on June 13, 2014 at the same location. During these workshops, oral comments were heard and questions were answered. Attendees were given an opportunity to submit written comments.

As an outgrowth of the May 19, 2014 Public Workshop, Regional Board staff met with County staff and the principal authors of the 2011 Model WQMP and Technical Guidance Document on July 23, 2014. The focus of this meeting was to address unintended changes to the requirements of Section XII. Teleconferences were also held with USEPA staff on July 16, 2014 and with both USEPA staff and staff of the San Diego Regional Water Quality Control Board on July 23, 2014. Other communications with the public occurred. These include a meeting held with Orange County Coastkeeper on June 5, 2014; a teleconference with The Irvine Company representatives on May 27, 2014; and a teleconference with representatives of The Disney Resort on July 1, 2014.

On December 18, 2014, Draft Order No. R8-2014-0002 was re-released to the public for comment as Draft Order No. R8-2015-0001 in anticipation of adoption in early 2015. A second public workshop was held during a scheduled Board meeting on January 31, 2015 to discuss the second Draft. Attendees were given an opportunity to submit oral and written comments. The comment period closed

on February 13, 2015. Another meeting was held with staff of the County of Orange on March 9, 2015.

X. ECONOMIC CONSIDERATIONS

California Water Code Section 13241 requires the Santa Ana Regional Water Quality Control Board to consider certain factors, including economic considerations, in the adoption of water quality objectives. California Water Code Section 13263 requires the Santa Ana Regional Water Quality Control Board to take into consideration the provisions of California Water Code Section 13241 in adopting waste discharge requirements.

In *City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal. 4th 613, the California Supreme Court considered whether regional boards must comply with California Water Code Section 13241 when issuing waste discharge requirements under California Water Code Section 13263(a) by taking into account the costs a Co-permittee will incur in complying with the permit's requirements. The Court concluded that whether it is necessary to consider such cost information depends on whether those restrictions meet or exceed the requirements of the federal Clean Water Act. The Court ruled that regional boards may not consider the factors in California Water Code Section 13241, including economics, to justify imposing pollutant restrictions that are less stringent than applicable federal law requires.

California Water Code Section 13377 specifies that discharge permits issued by regional boards must meet the federal standards set by federal law. In effect, Section 13377 forbids a regional board from considering any economic hardship on the part of the permit holder if doing so would result in the dilution of the requirements set by Congress in the Clean Water Act. Similarly, Section 13263 cannot authorize what federal law forbids and cannot authorize a regional board to use compliance costs to justify pollutant restrictions that do not comply with the Clean Water Act. However, when conditions or provisions in an NPDES permit are more stringent than federal law requires, California Water Code Section 13263 requires that the regional board consider the factors described in California Water Code Section 13241 as they apply to those specific conditions or provisions.

As described in Section VI.E. above, the Regional Board finds that the conditions and provisions of this Order are not more stringent than the minimum federal requirements. Clean Water Act sections 402(p)(3)(B)(ii) and (iii) require MS4

permits to include requirements to effectively prohibit non-storm water discharges into the MS4s; to require controls to reduce the discharge of pollutants in in storm water to the maximum extent practicable; and such other provisions as the USEPA or the State determines appropriate.

The requirements in this Order may be more specific and detailed than those in the federal regulations under 40CFR122.26 or in USEPA guidance, but they are not more stringent. The requirements have been designed to be consistent with and within the federal statutory requirements in Clean Water Act sections 402(p)(3)(B)(ii) and (iii) and the related federal regulations and guidance. Consistent with federal law, all of the conditions and provisions in this Order could have been included in a permit adopted by USEPA in lieu of a permit issued by the State through the regional boards.

The inclusion of numeric Water Quality-Based Effluent Limits in this Order (e.g. WLAs and related TMDL requirements) does not cause this Order to be more stringent than federal law. Federal law authorizes both narrative and numeric effluent limitations to meet state water quality standards. Both are equally allowable and the inclusion of either or both best management practice-based or water quality-based effluent Limits does not make an NPDES permit more stringent. Therefore, the Regional Board is not required to consider the factors set forth in California Water Code Section 13241.

Similarly, the Regional Board is not required to consider the factors in California Water Code Section 13241 to adopt permit requirements for the effective prohibition on the discharge of non-storm water discharges into the MS4; or for controls to reduce the discharge of pollutants in storm water to the MEP; or other provisions that the Regional Board has determined appropriate. These general requirements are mandated by federal law.

This Order includes monitoring and reporting requirements that are designed to demonstrate that the Co-permittees are complying with the municipal storm water requirements of the Clean Water Act. Clean Water Act Section 308(a) and 40CFR122.41(h), (j) through (l); 122.44(i); and 122.48 require that NPDES permits specify monitoring and reporting requirements. Monitoring and reporting requirements are also required by 40CFR122.26(d)(1)(iv)(D); 122.26(d)(1)(v)(B); 122.26(d)(2)(i)(F); 122.26(d)(2)(iii)(D); 122.26(d)(2)(iv)(B)(2); and 122.42(c). The Regional Board is also authorized by California Water Code Section 13383 to establish monitoring, reporting, and recordkeeping requirements that implement federal and state laws and regulations through NPDES permits.

Notwithstanding the above, the Regional Board has taken into account economic considerations. In doing so, however, it is not necessary for the Regional Board to perform a Cost-Benefit analysis or other formal economic analyses. Because of the lack of comprehensive or sufficiently-reliable economic data on both costs and benefits, performing a formal economic analysis is not practical at this time. However, the Regional Board will consider what limited economic information is available.

The USEPA, the State Water Resources Control Board, and the regional boards have attempted to evaluate the costs and benefits of municipal storm water programs. The resulting studies show a large variability in reported costs and that there is difficulty in obtaining reliable cost information.

In 1999, the USEPA summarized the conclusions of multiple studies performed to determine the cost of storm water management programs as part of its Phase II expansion of the NPDES storm water program[6]. The USEPA determined that the range of benefits from its Phase II expansion exceeds the range of regulatory costs. As part of their analysis, the USEPA reported that, based on appropriate cost data provided by 26 MS4 operators subject to Phase I, the average annual program costs were $9.08 per household (1998 dollars)[7]. The USEPA also reported that the average annual Phase II program costs were $9.16 per household (1998 dollars), comparable to the per-household costs of the Phase I program.

In 2003, staff of the Los Angeles Regional Water Quality Control Board performed a study of Phase I MS4 program costs[8]. Self-reported cost data provided in the MS4 operators' annual reports was used. The average annual cost in Los Angeles County was estimated to be $12.50 per household (2002 dollars)

In 2005, the State Water Resources Control Board commissioned a study by the California State University, Sacramento to assess costs of the Phase I MS4 program throughout the state[9]. The annual cost ranged from $18 to $46 per

[6] Federal Register/Vol. 64 No. 235/Wednesday, December 8, 1999/Rules and Regulations. P. 68791-68792.
[7] USEPA's cost estimates should be regarded as gross indicators of compliance costs, not actual compliance costs. See Government Accountability Office, May 2007. Further Implementation and Better Cost Data Needed to Determine Impact of EPA's Storm Water Program on Communities. GAO-07-479.
[8] Los Angeles Water Quality Control Board, 2005. Review and Analysis of Budget Data Submitted by the Permitees for Fiscal Years 2000-2003. P. 2.
[9] State Water Resources Control Board, 2005. NPDES Stormwater Cost Survey. P. ii.

household (2005 dollars). The Fresno-Clovis Metropolitan Area represented the lower end of the range and the city of Encinitas represented the upper end.

For comparison purposes, the per-household cost information above has been adjusted for inflation using the average Consumer Price Index. All values were adjusted to 2013 dollars. The results are summarized in Table TR-1 below.

Table TR-1: Comparison of estimates ofAnnual MS4 program costs (per household)

Study	Reported Value(s)	Inflation-Adjusted Value (2013 dollars)
USEPA, 1999	$9.08 (Phase I) $9.16 (Phase II)	$12.98 (Phase I) $13.10 (Phase II)
Los Angeles Regional Water Quality Control Board, 2003	$12.50	$16.19
State Water Resources Control Board, 2005	$18 to $46	$21.48 to $54.90

A proper economic analysis of the cost of the Phase I program would involve a comparison of the MS4 operators' costs with and without the Phase I program. The result would be the marginal cost. Many of the reported Phase I program costs are not attributed solely to the program. In many cases, program elements such as street sweeping and litter control in general, are services that have been performed by the MS4 operators long before they were required by any Clean Water Act permit.

Therefore, the actual costs of the Phase I program for a Co-permittee is some portion of the reported costs. The State Water Resources Control Board's 2005 study, discussed earlier, estimated that 38% of the reported program costs could be fully attributed to the MS4 permits. The remainder was attributed to the costs of pre-existing services provided by the Co-permittees[10]. Similarly, in their 2000

[10] *Ibid*, P. 58.

Annual Progress Report, the County of Orange reported that 20% of the program costs could be fully attributed to the MS4 permit[11, 12].

California Water Code Section 13241 includes the need to consider "economic considerations" under certain circumstances. Economic considerations include both the costs of compliance and also the economic benefit of protecting the beneficial uses of waters of the state. There is some information available to estimate the costs of MS4 permits. However, this is often not the same for estimating the benefits of protecting beneficial uses. Some beneficial uses, such as Industrial Process Supply for example, may have their value more readily monetized because there is a well-established market for the resource.

For other beneficial uses, monetizing their value is much more difficult largely because the benefits are intangible. Certain techniques, such as Willingness to Pay and Travel Cost Analysis, have been employed by the USEPA at a national scale and in local studies in the Santa Ana Region, to value such things as beach recreation (a proxy for Water Contact and Non-Water Contact Recreation beneficial uses). But these techniques are more costly, typically requiring surveys of users or potential users. As the result, they are infrequently employed. However, two studies are useful in this report.

As part of their Phase II expansion of the NPDES program, the USEPA estimated that willingness to pay for improvements in freshwater quality for fishing and boating is approximately $158 to $210 per household (1998 dollars)[13]. Another study, conducted by California State University, Sacramento, reported that the annual household willingness to pay for state-wide clean water is approximately $180 per household (2005 dollars)[14].

Both of the above studies represent efforts to estimate the benefits of protecting beneficial uses. Both of these estimates considerably exceed the annual per-household costs of the MS4 programs summarized in Table TR-1 above for roughly the same years (1998 and 2005)[15].

[11] County of Orange, 2000, 2000 Annual Progress Report, P. 60.
[12] More recent data from the County of Orange is not available because the County no longer reports it.
[13] *Ibid*. P. 68793.
[14] State Water Resources Control Board, 2005. NPDES Storm Water Cost Survey. P. iv.
[15] It is not necessary to adjust these figures for inflation because they can be appropriately compared to costs that occur in the same years (1998 and 2005 respectively).

XI. GENERAL EXPLANATION OF PERMIT REQUIREMENTS

A. Basis in Federal Regulations

This Order is fundamentally based, in part, on the standard described in Clean Water Act Section 402(p)(3)(B)(iii), requiring "controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design, and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants." Further details on the basis of this Order are provided elsewhere in this Technical Report.

The "maximum extent practicable" ("MEP") standard is the federal technology-based standard that MS4 owners and operators must satisfy to comply with this Order. The regulatory provisions that further detail the MEP standard are found in 40CFR Sections 122.26(d)(2)(iv) and 122.44(k)(2). Section XII of this Technical Report further explains the requirements of this Order which implement the more detailed regulatory provisions.

Section 301(b)(1)(A) of the Clean Water Act and 40CFR Section 122.44(a) require that NPDES permits include technology-based effluent limitations. A technology-based effluent limitation is based on the capability of a model treatment method to reduce a pollutant to a certain concentration. Technology-based effluent limitations, in this case the MEP standard, represent the minimum level of control that must be imposed in a permit issued pursuant to Clean Water Act Section 402.

Neither Congress nor the USEPA has specifically defined the term "maximum extent practicable". Rather, the MEP standard is a flexible and evolving standard. Congress established the MEP standard so that administrative bodies would have "the tools to meet the fundamental goals of the Clean Water Act in the context of storm water pollution"[16]. The standard allows permit writers flexibility to tailor permits to the site-specific nature of MS4s and to require a combination of pollution controls that differ in different permits[17].

To provide clarification to the regional water quality control boards, the State Water Resources Control Board's Office of Chief Counsel issued a memorandum

[16] Building Industry Ass'n of San Diego County v. State Water Resources Control Board (2004) 124 Cal.App.4th 866, 884.
[17] In re City of Irving, Texas, Municipal Storm Sewer System, (July 16, 2001), 10 E.A.D. 111 (E.P.A.), *6.

dated February 11, 1993 regarding the definition of "maximum extent practicable". In the memorandum, the Office of Chief Counsel interpreted the MEP standard to entail a "serious attempt to comply" and that "practical solutions may not be lightly rejected". The memorandum states, "[in] selecting BMPs which will achieve MEP, it is important to remember that municipalities will be responsible to reduce the discharge of pollutants in storm water to *the maximum extent practicable*. This means choosing effective BMPs, and rejecting applicable BMPs only where other effective BMPs will serve the same purpose, the BMPs would not be technically feasible, or the cost would be prohibitive." The memorandum further states that, "[after] selecting a menu of BMPs, it is of course the responsibilities of the discharger to insure that all BMPs are implemented."

B. Use of Existing Storm Water Program Planning Documents

This Order includes requirements for the implementation of programs in accordance with 40CFR Sections 122.26(d)(2)(iv)(A) through (D). In summary, these requirements are intended to implement:

1) control measures to reduce pollutants in runoff from commercial and residential areas;
2) programs to detect and remove illicit discharges and improper disposal into the MS4;
3) programs monitor and control pollutants from certain industrial facilities; and
4) programs to implement and maintain structural and non-structural BMPs to reduce pollutants in storm water runoff from construction sites.

All of these programs have been detailed in the Co-permittees' 2003 DAMP and related planning documents. The essential elements of the programs have been synthesized from those documents and incorporated into the requirements of this Order.

This Order also includes more specific requirements for carrying out the "iterative process" of periodically evaluating and modifying or adding BMPs. A working model of the "iterative process" is described in Section VIII.B. of this Technical Report. The general provisions in Section I of the Order have been designed to enforce each of the steps of the "iterative process". The "iterative process" is

further reinforced by other provisions throughout the Order. These requirements support the MEP standard's evolving and flexible nature.

The Order uses the language "each Co-permittee" or "a Co-permittee" in many provisions to require performance of specific tasks, to accomplish a goal, or to have certain processes or mechanisms. This language is intended to clearly indicate the responsible party for satisfying the provision. The language is not intended to dictate the specific manner in which the provision must be satisfied. The use of "a Co-permittee" or the "Principal Permittee" in a provision does not prohibit a Co-permittee from performing actions on behalf of the Principal Permittee or vice versa to comply with the provision.

For example, each Co-permittee may adopt its own specific mechanisms to satisfy a permit requirement or the Co-permittees may collectively develop a uniform mechanism that is adopted by each of them. In the event that a required mechanism is not adopted, this language makes it clear that the Co-permittee who lacks the mechanism is responsible for the violation and not the Principal Permittee or the Co-permittees collectively.

The Order has been written to include virtually all of the requirements of the fourth-term permit. As explained above, the Order also incorporates key elements of the 2003 DAMP and its companion documents. In particular, the Order incorporates elements of the 2011 Model Water Quality Management Plan and the Technical Guidance Document. However, the elements are not incorporated verbatim or incorporated by reference. Instead, the Order generally requires that the Co-permittees have effective processes or mechanisms to accomplish various purposes. In most cases, this Order does not dictate an outcome. Where specific outcomes are dictated (e.g. 10 Million "impressions"), they are typically carried over from the previous permit.

The processes and mechanisms required by this Order are based on those described or inferred from the Co-permittees' existing program. The Co-permittees' program is largely found in the 2003 DAMP and its companion documents and the LIPs. As explained earlier, Regional Board staff has found that the program, as practiced, is not always documented. In addition, Regional Board staff found through audits that certain important processes or mechanisms were absent from the Co-permittees' planning documents, were not in place, or were deficient. This Order includes requirements for processes and mechanisms that represent an attempt to more fully flesh out the Co-permittees' programs and address these issues.

C. Minimal Reference to Existing Storm Water Program Planning Documents

The Co-permittees have various plans and programs whose development predate this Order. This Order avoids describing these plans and programs by their names in the requirements as a means of compliance. This approach has been taken in order to:

1) avoid the appearance that the contents of those preexisting plans and programs supersede the requirements of this Order;
2) avoid the appearance that the implementation of those preexisting plans and programs is presumed to fully comply with the requirements of this Order;
3) maintain the impartiality of the Regional Board by avoiding the suggestion that the Regional Board endorses those plans or programs;
4) avoid suggesting that implementing them provides assurance of compliance with the Permit; and
5) prevent confusion in the event that the Co-permittees update, re-name, or re-organize the plans or programs.

Instead, this Order requires that the Co-permittees have written plans and programs, and then describes their required elements. Although many plans and programs certainly exist, they must ultimately comply with this Order. In some cases, this may mean that those plans and programs will need to be reviewed and updated in order for the Co-permittees to comply with this Order.

The federal NPDES regulations require applicants for MS4 permits to develop a proposed management program (40CFR Section 122.26(d)(2)(iv)). The management program must include a “comprehensive planning process” and, where necessary, “intergovernmental coordination” for the “duration of the permit”. The continued requirement for written plans and programs satisfies the federal requirement for a “proposed management program”.

XII. EXPLANATION OF SPECIFIC PERMIT REQUIREMENTS

A. Sections I and II: General Responsibilities

Sections I and II establish the basic responsibilities of all of the Co-permittees, including the Principal Permittee. These Sections are designed to require implementation of the "iterative process". This process includes planning and documentation of program activities, execution, tracking of outcomes, and evaluation through comparison with performance metrics. These requirements are included in this Order pursuant to Clean Water Act Section 402(p)(3)(B)(iii) which, in part, allows the state to include provisions appropriate for the control of pollutants.

These Sections also describe the basic responsibilities for internal and external coordination within and among the Co-permittees respectively according to 40CFR122.26(d)(2)(i)(D) and (d)(2)(iv). These Sections require maintenance of records and the submission of reports that are adequate to determine compliance. Finally, these Sections require that the Co-permittees establish and maintain adequate legal authority to carry out the responsibilities necessary to comply with this Order according to 40CFR122.26(d)(2)(i).

B. Section III: Discharge Limitations/Prohibitions

Section III emphasizes the Co-permittees' responsibility to effectively prohibit the discharge of illicit/illegal discharges into their MS4s, unless authorized by a separate NPDES permit, or not otherwise prohibited as described. Clean Water Act Section 402(p) and 40CFR122.26(2)(iv)(B)(1) form the basis of the requirements of this Section. MS4 permits (1) "shall include a requirement to effectively prohibit non-storm water discharges into the storm sewers" and (2) "shall require [i] controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and [ii] such other provisions as the Administrator or the State determines appropriate for the control of such pollutants." (CWA § 402(p)(3)(B)(ii-iii)).

To satisfy these requirements, Section III expressly requires the Co-permittees to effectively prohibit discharges into the MS4 unless authorized by an NPDES permit. This section also prohibits discharges where pollutants have not been reduced to the MEP, with some exceptions. Section III includes provisions that prescribe programs to reduce allowable non-storm water discharges from both private and public property.

Discharges that are not prohibited are described in Table 2 and are exempt from the non-storm water discharge prohibition. These discharges have been continued from the previous permit with changes. Many of the discharges in

Table 2 are listed in 40 CFR122.26(d)(2)(iv)(B)(1) as being exempt unless "such discharges or flows are identified as significant sources of pollutants" to waters of the U.S.

1. Effective Prohibition of Irrigation Water

At the urging of USEPA, Table 2 now includes discharges authorized by USEPA pursuant to Sections 104(a) or 104(b) of the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA"). These discharges typically consist of short-term, high-volume discharges from groundwater extraction well development or redevelopment or from state-required testing of potable water treatment plants, and occur as part of USEPA-authorized groundwater remediation action under CERCLA.

Additionally, at the urging of USEPA, Table 2 now excludes irrigation water. This type of non-storm water discharge must now be effectively prohibited by the Co-permittees because the Regional Board has found that it is a significant source of pollutants. Irrigation water is often a vehicle for transporting other pollutants, such as metals, that are deposited in MS4s from other sources, but it is more often a source of nutrients, pathogens, and pesticides. These three pollutants are of particular concern because many of the receiving waters in the permitted area have been listed pursuant to Clean Water Act Section 303(d) as being impaired by these or closely-related pollutants. Furthermore, the Co-permittees have identifies nutrients, pathogens, and toxicity (for which pesticides are believed to be the cause) as water quality priorities.[18]

The 2010 303(d) List of Impaired Water Bodies includes Upper and Lower Newport Bay, impaired, in part, by indicator bacteria, nutrients, pesticides, and toxicity. The List also includes Santa Ana River Reach 2, impaired in part by indicator bacteria; Anaheim Bay, impaired in part by sediment toxicity; Bolsa Chica Channel, impaired in part by unionized ammonia and indicator bacteria; Huntington Harbor, impaired in part by pathogens and sediment toxicity; and the East Garden Grove-Wintersburg Channel, impaired by unionized ammonia. While irrigation runoff may convey these and other pollutants, irrigation runoff has been a recognized source of indicator bacteria, nutrients, and pesticides from the irrigated site.

In the San Diego Creek watershed, the Co-permittees observed that irrigation overspray and lawn drainage was the most frequent runoff-generating activity

[18] County of Orange 2015. Attachment A to Comments on Draft Order No. R8-2015-0001, NPDES Permit No. CAS618030, p. 2 of 35, February 12, 2015

and represented the highest collective amount of runoff volume[19]. Irrigation has also been identified as playing a key role in mobilizing pollutants such as pesticides[20]. Pesticides are suspected of being responsible for most of the toxicity observed as part of the Newport Bay Watershed Toxicity Study[21]. Researchers have concluded that strategies to address pesticides in surface runoff must address both storm and irrigation runoff to successfully reduce aquatic toxicity from pesticides[22]. In the San Diego Creek watershed, dry-weather runoff from urban areas accounts for 20 to 25% of the annual total nitrogen load[23]. In other watersheds where load contributions from contaminated groundwater are lower, this proportion is likely to be higher. Urban dry-weather runoff is suspected of being a likely contributing factor to dry-weather exceedances of the Newport Bay Watershed *Fecal Coliform* TMDL[24] [25]. Additionally, the Co-permittees have observed that the occurrence of flow from nearby storm drains may contribute to the frequency of exceedances of Enterococcus standards[26]. Reducing residential irrigation runoff will reduce waste loads to receiving waters through reductions in discharge volumes. In addition, practices to reduce irrigation runoff may reduce concentrations of some wastes in dry weather runoff[27].

The Co-permittees' effective prohibition on irrigation runoff incidentally supports the Governor's Proclamation No. 1-17-2014, declaring a State of Emergency due to severe drought conditions and the Governor's related April 25, 2014 Executive Order. The effective prohibition will also incidentally support State Water Resources Control Board Resolution No. 2014-0038 and subsequent emergency water conservation regulations in California Code of Regulations,

[19] Orange County Resources Development and Management Department, Watershed & Coastal Resources Division, Urban Nutrient Source Characterization, Final Report, SWRCB Agreement No. 02-165-258-0-Task 5.8, April 28, 2006.
[20] Haver, Darren L. and Fox, Angelia, March 2008. Mitigating Pesticide Runoff in Urbanized Environments, Final Report, SWRCB Agreement No. 04-013-558-0.
[21] Bailey, Howard C., *et al*., June 10, 1993. Newport Bay Watershed Toxicity Study, University of California, Davis, Dept. of Medicine, School of Veterinary Medicine, Interagency Agreement No. 1-146-258-0.
[22] Haver, Darren L. and Fox, Angelia, March 2008. Mitigating Pesticide Runoff in Urbanized Environments, Final Report, SWRCB Agreement No. 04-013-558-0.
[23] Irvine Ranch Water District and Municipal Water District of Orange County, "The Residential Runoff Reduction Study", July 2004.
[24] Ibid.
[25] Grant, Stanley G., *et al*. July 26m, 2009. Newport Bay Fecal Indicator Bacteria Source Identification Project, Henry Samueli School of Engineering, University of California – Irvine and Orange County Public Health, SWRCB Agreement No. 04-198-558-2.
[26] Orange County Public Works Department, OC Stormwater Program, 2011-2012 Unified Annual Progress Report, Section C-11.0, December 6, 2012.
[27] Irvine Ranch Water District and Municipal Water District of Orange County, "The Residential Runoff Reduction Study", July 2004.

title 23, Sections 863, 864, and 865. The removal of irrigation water from the types of non-storm water discharges that do not have to be effectively prohibited by the Co-permittees is consistent with similar actions taken by the San Diego and Los Angeles Regional Water Quality Control Boards.

2. Effective Prohibition of Street Wash Water

During the comment period for Draft Order No. R8-2015-0001, the Co-permittees noted that street wash water is included in 40 CFR122.26(d)(2)(iv)(B)(1) among those discharges that are exempt from the requirement to be effectively prohibited. Regional Board staff noted that street wash water was not included in Order No. R8-2009-0030 or the previous Order No. R8-2002-0010. In Order No. R8-2002-0010, street wash water is expressly subject to an effective prohibition in Provision VI.6.e. However, street wash water was included in Order No. 96-31 and in Order No. 90-71. Considering that street wash water was initially excluded from being effectively prohibited almost 13 years ago and that the Co-permittees have raised the issue, it is appropriate to refresh the rationale here.

In 1997, the City of Los Angeles submitted a report to the Los Angeles Regional Water Quality Control Board entitled, *A Study of Pollutants Entering Storm Drains from Street and Sidewalk Washing Operations in Los Angeles, California*[28]. The City reported that street washing occurred in conjunction with general street and alleyway cleaning operations. These operations involve manual trash and debris removal and street sweeping as well as washing with a disinfecting solution. The operations are “essential to maintain public health and control nuisance odors caused by deposition of human waste” related to homeless encampments. The operation objectives are “to remove trash, disinfect, and deodorize targeted streets, alleys, and sidewalks.”

The City of Los Angeles documented that street wash water contained fecal indicator bacteria at levels that were comparable to raw sewage. In some locations, the biological chemical demand of the wash water was up to 6 times higher than raw sewage. The wash solution was also found to be highly toxic and that the toxicity decreased with time or distance after the solution was applied to the street.

The wash water also contained highly-varied concentrations of metals. While many metals were found in trace amounts, others, such as zinc, were found in

[28] City of Los Angeles, Department of Public Works. A Study of Pollutants Entering Storm Drains from Street and Sidewalk Washing Operations in Los Angeles, California, July 1997.

concentrations that averaged 6,478 µg/L, with a maximum of 18,700 µg/L. For comparison, the USEPA benchmark value for zinc is 100 µg/L. A benchmark value is a value above which the pollutant presents a level that could potentially impair water quality.

The findings in the 1997 report indicate that street wash water is a source of pollutants to waters of the U.S. In accordance with 40 CFR122.26(d)(2)(iv)(B)(1), subsequent authorizations of the MS4 permits for Orange County, Riverside County, and San Bernardino County excluded street wash water from the list of discharge types not subject to an effective prohibition by the Co-permittees. Similar actions on street wash water have been taken by the Los Angeles and San Diego Regional Water Quality Control Boards. This Order continues the exclusion.

This exclusion should not be interpreted as a prohibition on street washing. This exclusion means that, if a Co-permittee performs street washing, best management practices must be in place to prevent the wastewater from discharging into the MS4. Because streets include gutters that constitute conveyances under the definition of “MS4”, street washing means that wash solutions will be directly discharged into the MS4 as part of the process. The wastewater from the washing activities must not be allowed to enter the MS4. For practical purposes, this will typically be at the nearest receiving storm drain inlet.

3. *De Minimis* and Drinking Water System Discharges

This Order authorizes the Co-permittees to discharge certain non-storm water subject to limitations and prohibitions. *De Minimis* discharges and most discharges from potable water systems are authorized by this Order, subject to the requirements found in Attachment B of the Order. The requirements in Attachment B are based on those found in Regional Board Order No. R8-2015-0004, NPDES Permit No. CAG998001 and State Board Order WQ 2014-0194-DWQ, General Order No. CAG140001.

Additional non-storm water discharges that are not authorized by separate NPDES permits or exempted in Table 2 are authorized by this Order. These include discharges from swimming pools and diversions from waters of the U.S. This Section also includes various limitations and prohibitions which are permitted by 40CFR Section 122.44. 40CFR Section 122.44 allows the use of discharge prohibitions, technology-based effluent limitations, and water quality-based effluent limitations. All of the limitations and prohibitions in this Order are

continued from the previous Permit and are derived from the Basin Plan or existing NPDES permits.

C. Section IV: Receiving Water Limitations

Section IV has been modified to more closely align with the State Water Resources Control Board's precedential orders described in Section VII of this Technical Report. The language of this Section was modified particularly to align with language found in Order No. 99-05 and with the State Board's decision in WQP 2015-0075.

Receiving water limitations are included in all NPDES permits issued pursuant to CWA section 402. Section 402(p)(3)(B)(iii) of the CWA authorizes the inclusion of "such other provisions as the Administrator or the State determines appropriate for the control of [] pollutants." This requirement gives USEPA or the State permitting authority discretion to determine what permit conditions are necessary to control pollutants. In its Phase I Storm Water Regulations, Final Rule, USEPA elaborated on these requirements, stating that, "permits for discharges from municipal separate storm sewer systems must require controls to reduce the discharge of pollutants to the maximum extent practicable, and where necessary water quality-based controls" (see 55 Fed. Reg. 47990, 47994 (Nov. 16, 1990)). USEPA reiterated in its Phase II Stormwater Regulations, Final Rule, that MS4 "permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL."[29] USEPA Region IX has also affirmed the agency's position that MS4 discharges must meet water quality standards in a series of comment letters on MS4 permits issued by various California regional water boards[30].

California Water Code section 13377 requires that NPDES permits include limitations necessary to implement water quality control plans. Both the State Water Board and Regional Water Board have previously concluded that discharges from the MS4 contain pollutants that have the reasonable potential to cause or contribute to excursion above water quality standards. As such, inclusion of receiving water limitations is appropriate to control MS4 discharges.

[29] See, e.g., Phase II Stormwater Regulations, Final Rule, 64 Fed. Reg. 68722, 68737.
[30] See, e.g., letter from Alexis Strauss, Acting Director, Water Division, USEPA Region IX, to Walt Pettit, Executive Director, State Water Board, re: SWRCB/OCC File A-1041 for Orange County, dated January 21, 1998.

The inclusion of receiving water limitations is also consistent with the Ninth Circuit Court of Appeal's ruling in *Defenders of Wildlife v. Browner* (191 F.3d 1159, 1166 (1999)). This ruling shows that the permitting authority has discretion regarding the nature and timing of requirements that it includes as MS4 permit conditions to attain water quality standards.

The Ninth Circuit Court of Appeals recently explained that, "[w]ater quality standards are used as a supplementary basis for effluent limitations [guidelines] so that numerous dischargers, despite their individual compliance with technology based effluent limitations, can be regulated to prevent water quality from falling below acceptable levels" (*NRDC v. County of Los Angeles* (2011) 673 F.3d 880, 886). Receiving water limitations are necessary to protect the beneficial uses of the receiving waters and are included in this Order to ensure that individual and collective discharges from the MS4 do not cause or contribute to exceedances of water quality standards.

The receiving water limitations in this Order consist of all applicable numeric or narrative water quality objectives or criteria, or limitations to implement the applicable water quality objectives or criteria for receiving waters contained in Chapter 4 of the Basin Plan, or in water quality control plans or policies adopted by the State Water Resources Control Board ("State Board"). These include Resolution No. 68-16. Or in federal regulations, these water quality objectives or criteria include, but are not limited to, 40CFR 131.12 and 131.38. The water quality objectives in the Basin Plan and other State Board plans and policies have been approved by USEPA. Combined with the designated beneficial uses, the water quality objectives constitute the water quality standards required under federal law.

The receiving water limitations language in this Order is based on precedential State Board Orders WQ 98-01 and WQ 99-05. This Order includes three main provisions related to receiving water limitations. First, consistent with CWA Section 402(p)(B)(3)(iii) and 40CFR section 122.44(d)(1), it includes a provision stating that discharges from the MS4 that cause or contribute to an exceedance of receiving water limitations are prohibited. This is also in accord with the State Water Board's finding in Order WQ 98-01 ("The [State Board] agrees that the NPDES permit must prohibit discharges that "cause" or "contribute" to violations of water quality standards."). Second, it includes a provision stating that

discharges from the MS4 of stormwater or non-stormwater, for which a Permittee is responsible, shall not cause or contribute to a condition of nuisance[31].

Third, it includes a provision that states that Permittees shall achieve these two prohibitions "through timely implementation of control measures and other actions to reduce pollutants in the discharges in accordance with the storm water management program and its components and other requirements of this Order including any modifications." This third provision elucidates the process by which Permittees are expected to achieve the first two provisions and then outlines the "iterative process" whereby certain actions are required when exceedances of receiving water limitations occur and discharges from the MS4 are implicated.

To implement this "iterative process", Section IV of this Order requires the responsible Co-permittees to notify the Executive Officer of their intent to develop a Watershed Management Plan to comply with receiving water limitations if a determination is made that urban runoff is causing or contributing to an exceedance of water quality standards. A Watershed Management Plan may be developed preemptively before such a determination is made. A Watershed Management Plan may also be developed as a mechanism to comply with WQBELs in Appendices B through H so long as final compliance deadlines in have not passed.

The development of a plan involves revising the storm water management program and its components to include additional BMPs; an implementation schedule and additional monitoring to address the exceedances; and implementing the revised storm water management program. The Watershed Management Plan must also include a 'reasonable assurance' that proposed actions will achieve water quality standards as soon as possible.

An analysis that provides 'reasonable assurance' is not expected to provide absolute assurance, but nevertheless, a high level of assurance. A reasonable assurance is expected to be supported by evidence that provides a reasonable basis to conclude that the Co-permittees' actions will achieve final WQBELs and that the evidence does not support alternative, conflicting conclusions. Staff at

[31] Wat. Code, § 13377 ("the state board or the regional boards shall . . . issue waste discharge requirements and dredged or fill material permits which apply and ensure compliance with all applicable provisions of the [CWA], thereto, together with any more stringent effluent standards or limitations necessary to implement waste quality control plans, or for the protection of beneficial uses, or to prevent nuisance").

the Los Angeles Reqional Water Quality Control Board have developed several resources for preparing a reasonable assurance analysis[32].

In addition, this protocol for implementing the "iterative process" includes assessing the effectiveness of BMPs based in part on monitoring results; and, based on the results of the assessment, taking additional actions such as implementing additional BMPs and/or modifying BMPs to improve their effectiveness. This protocol must be repeated until water quality standards are met. This protocol is consistent with USEPA's expectations for MS4 permits[33].

The "iterative process", as described above and in the Order is driven by a cycle of monitoring, analysis, and reporting that is required in Subsection II.B.3. of the Monitoring and Reporting Program. The timing of cycles for each pollutant are not expected to be uniform but are not permitted to exceed once every 5 years. If, at the conclusion of a cycle, water quality standards continue to not be met, the "iterative process" must be repeated. This will include updating the reasonable assurance analysis and changes to the responsible Co-permittees' storm water programs.

D. Section V: Implementation Agreement

Section V requires that the Co-permittees have inter-agency and inter-Co-permittee agreements that are necessary to satisfy the requirements of the Order. Various agreements have been reported to exist to carry out certain programs, such as the Sanitary Sewer Overflow program. Some agreements may need to be reviewed and updated in order to comply with the Order. Section V is supported by 40CFR Section 122.26(d)(2)(i) which recognizes that a "series of contracts" may be necessary to comply with an MS4 permit; and by 40CFR Section 122.26(d)(2)(i)(D), which requires "interagency agreements among coapplicants" for MS4 permit coverage.

E. Section VI: Legal Authority/Enforcement

Section VI largely continues requirements that the Co-permittees secure and maintain the legal authority to control the discharge of pollutants according to the

[32] E.g. Los Angeles Regional Water Quality Control Board, "Guidelines for Conducting Reasonable Assurance Analysis in a Watershed Management Program, Including an Enhanced Watershed Management Program", March 25, 2014.

[33] See, e.g., USEPA 2014 memorandum, "Revisions to the November 22, 2002 Memorandum 'Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs.'"

requirements of this Order. In summary, 40CFR122.26(d)(2)(i) requires applicants for MS4 discharges to demonstrate adequate legal authority that enables them to: control the contribution of pollutants from industrial activity; prohibit illicit discharges; control spills, dumping, or disposal of materials other than storm water; control the contribution of pollutants between MS4s through interagency agreements; require compliance with ordinances, permits, contracts, or orders; and carry out inspection, surveillance, and monitoring procedures necessary to determine compliance. Section VI is intended to support the requirements of 40CFR122.26(d)(2)(i).

This Order describes requirements but does not grant the Co-permittees any authorities that may be necessary to comply. The Co-permittees typically secure this authority through their municipal ordinances. All of the Co-permittees are reported to have adopted model water quality ordinances to comply with past versions of this Order. These water quality ordinances include measures to enforce compliance through inspections and sanctions if necessary.

This Order, and past versions, requires the Co-permittees to impose a series of effective, progressive actions to compel compliance with regulatory requirements related the control of discharges of pollutants to their MS4s. This Order adds new requirements for the Co-permittees to track and evaluate challenges to their authority. Where a valid challenge is discovered, the Co-permittees must report it along with a plan to make their authority adequate.

F. <u>Section VII: Illicit Discharges, Illicit Connections, and Illegal Dumping; Litter, Debris and Trash Control</u>

Section VII includes requirements intended to cause the Co-permittees to effectively prohibit illicit discharges and illicit connections ("ID/IC") and to detect and remove improper disposal to MS4s in accordance with 40CFR40CFR122.26(d)(2)(iv)(B). Illicit discharges are defined in the Glossary of this Order. Discharges that are authorized under an NPDES permit are not illicit discharges. As noted there, the definition provided in the Glossary comes from 40CFR40CFR122.26(b)(2).

In its 1990 rulemaking, USEPA explained that the illicit discharge detection and elimination program requirement was intended to begin to implement the Clean Water Act's provision requiring permits to "effectively prohibit non-storm water discharges." (55 Fed.Reg. 47990, 47995.) Discharges in Table 2 of this Order are not illicit discharges. Illicit connections are not defined in this Order but are conveyances for illicit discharges.

Section VII clarifies the Co-permittees' responsibilities with respect to illegal dumping (or improper disposal), which was described briefly in the previous permit. The Co-permittees' responsibility is limited to illegally dumped material that has the potential to result in a discharge of pollutants to an MS4. This Order also clarifies that Sanitary Sewer Overflows ("SSOs") are a sub-class of illicit discharges consistent with 40CFR122.26(d)(2)(iv)(B)(4) and (7).

Section VII describes requirements for programs to address illicit discharges, illicit connections, and illegal dumping. These requirements are based on the Co-permittees' current ID/IC program, the "Countywide Area Spill Control Program", and State Water Resources Control Board Order No. 2006-0003-DWQ, "Statewide General Waste Discharge Requirements for Wastewater Collection Agencies" (Order No. 2006-0003-DWQ).

Except for general requirements for IDICs as a whole, this Order does not create new SSO requirements for Co-permittees already subject to Order No. 2006-0003-DWQ. This Order includes requirements for the purpose of causing Co-permittees to cooperate in efforts to eliminate SSOs. SSOs are prohibited by Order No. 2006-0003-DWQ (Provision C.1.) and are a form of illicit discharge which the Co-permittees must effectively prohibit. This Order does not require that Co-permittees who do not operate wastewater collection systems take on any responsibilities or liabilities of system operators. The exact nature of the cooperative relationship between wastewater collection system operators and non-operator Co-permittees is left to the Co-permittees' discretion but it must be consistent with a genuine effort to effectively prohibit SSOs.

Section VII requires that the Co-permittees initiate source investigations based on objective and subjective dry-season monitoring results. Source investigations are triggered by subjective observations and statistical thresholds for hydrology and pollutant parameters. The thresholds are established for each monitoring station based on ongoing collections of data. According to the Co-permittees, these statistical thresholds have been developed based on control charts, which are used to identify extreme outliers in a collection of monitoring data. Extreme outliers are monitoring results that fall outside an established number of standard deviations for the data set. These extreme values may indicate the occurrence of an illicit discharge or illicit connection. Their occurrence is a trigger for source investigations. Consequently, they function as numeric action levels.

The approach required by Section VII and practiced by the Co-permittees during the previous permit term to triggering source investigations represents an

application of statistical theories for quality control[34]. According to theories of quality control, the variation in pollutant concentrations in water quality data sets is attributed to "common causes" and "special causes". Applied to runoff quality control, special causes are identifiable, discrete events that can be corrected to improve water quality. Common causes are essentially random noise where there are no specific events that can be identified and addressed to improve water quality. Source investigations may be useful for addressing special causes, but are unlikely to be effective at addressing common causes.

In practice, control charts and similar statistical tools identify extreme outliers that may be well above water quality standards. These extreme outliers trigger source investigations that are performed to identify and eliminate their special causes. As special causes are eliminated, the variation in water quality should lessen over time. New extreme outliers can then be identified and investigated. Each successive round of investigations should eliminate more special causes, reduce variation, and improve water quality. At some point though, source investigators may not be able to identify special causes even though pollutant levels continue to exceed water quality standards. At that point, exceedances may be the result of common causes and require a different approach.

Examples where this pollutant behavior could occur are where pollutants are from ubiquitous sources, such as pathogens, nutrients, or litter. For such pollutants, source investigations would be useful to resolve discrete events, such as sewage spills, regular fertilization work by a single or group of influential dischargers such as nurseries or golf courses, or litter from scheduled festivals or other public gatherings. But source investigations would not be useful to address more random events such as pathogen, nutrient, or litter pollution caused by the collective actions of numerous independent individuals within a monitored watershed. Other more preventative BMPs, such as public education, might be more effective for common causes.

The use of control charts and similar statistical tools allows the permittees to methodically use source investigations to identify and eliminate special causes of water quality standard exceedances. At the same time, the Co-permittees can avoid using source investigations on common causes, which may be more effectively addressed with more general, preventative BMPs.

Section VII also includes specific requirements for a program to reduce and/or eliminate the discharge of trash and debris to waters of the U.S. The program

[34] E.g. Deming, W.E. (1975) On probability as a basis for action, *The American Statistician*, 29(40, p. 146-152; Wheeler, D. J. & Chambers, D. S. (1992*) Understanding Statistical Process Control*, ISBN 0-945320-13-2

must include an objective evaluation of measures employed for this purpose. Those measures include 'soft measures' such as public education and litter collection, and 'hard measures' such as trash booms and structural controls. The Co-permittees are not expected to evaluate each measure individually unless doing so would be practical and would provide useful information.

Section VII includes new requirements that effectively require that the Co-permittees formally evaluate new technologies for the control of trash and debris. The Principal Permittee is also now required to demonstrate that the Co-permittees are formally evaluating new technologies. An evaluation is not necessarily required to be objective. Subjective factors, such as public safety and a structural control's ease of accessibility and maintenance, may also be considered, consistent with the MEP standard. The Principal Permittee must demonstrate that formal evaluations are occurring, and report them in the Annual Progress Report. This requirement is intended to cause the Co-permittees to actively consider new technologies, share information on those technologies, and in some situations, to provide a means for feedback to vendors to improve products. This requirement is not intended to cause the Co-permittees to develop formal standards or processes by which vendors must demonstrate the efficacy of their products; the Co-permittees may rely on other objective third-party sources of information or use the relevant results of established programs elsewhere if available.

Subsection VII.E. also requires program-level oversight of the trash and debris control program by the Executive Officer. Control measures must be objectively evaluated. Permanently discontinued or substituted measures are subject to approval by the Executive Officer. These requirements do not govern the day-to-day operation of the program.

G. <u>Sections VIII, IX, and X: Municipal Inspections of Construction, Industrial, and Commercial Sites</u>

Sections VIII, IX, and X continue previous Permits' requirements for inspections of construction, industrial and commercial sites within each Co-permittees' jurisdiction with some modifications. The requirements of these Sections are supported by 40CFR Sections 40CFR Section 122.26(d)(2)(iv)(A), 122.26(d)(2)(iv)(C), and 122.26(d)(2)(iv)(D), which generally require programs to implement control measures for pollutants in runoff from construction, industrial, and commercial sites respectively. Certain other relevant control measures for these sites (e.g. public education) are described in other Sections of this Order.

The scope of what constitutes a construction site has not been changed in Section VIII. However, Co-permittees are now only required to inspect construction sites whose actual or expected duration exceeds two weeks. This modification has been made recognizing that many construction projects may begin and conclude without being subject to a rain event and before Co-permittees' staff can inspect them. This modification is intended to allow Co-permittees to prioritize projects that have a longer duration. The Co-permittees must necessarily track all construction sites in order to identify projects whose duration exceeds two weeks and consequently require inspection.

Sections IX and X both require that the Co-permittees maintain inventories of industrial and commercial sites. This, and past versions of NPDES Permit No. CAS618030 do not provide narrative definitions to distinguish between "industrial" and "commercial" businesses. However, there is a need to provide some guidance to the Co-permittees on how to classify businesses in their jurisdictions.

Some common definitions describe "industrial" as referring to a business involved in the manufacture of goods whereas "commercial" is a term referring to a business whose sole motivation is gaining profit. In this sense, "industrial" is a sub-category of "commercial" sites. Other common definitions cast "industrial" and "commercial" as similarly overlapping categories: "industrial" businesses engage in manufacturing goods (for sale) while "commercial" businesses engage in the sale or trade of goods. For the purposes of this Order, these common definitions are workable and there is no need for the creation of regulatory definitions in this Order.

In keeping with common definitions of "industrial" and "commercial" businesses, the list of activities that guide the Co-permittees' development of their commercial business inventory has been modified. The list has been placed in alphabetical order. "Transportation, storage, or transfer of pre-production plastic pellets, powders, or grindings" has been replaced with "Transportation services for passengers, parcels, or freight". This category excludes business that manufacture products from plastic pellets, powders, or grindings and properly places them in the Co-permittees' industrial inventory. The new category will also include transportation services for passengers and a wide variety of goods, including plastics.

Mobile businesses have been excluded from the industrial and commercial business inventories. Instead, these businesses are addressed through the Co-permittees' illicit discharge/illicit connection and public education programs. The reason for their exclusion is because it is impractical to impose a regular

inspection program on the Co-permittees for businesses whose locations are irregular. Public golf courses, swimming pools, and special event venues are typically part of parks and, if not, are within the meaning of "fixed facilities" subject to Section XIV. However, for the sake of clarity and to ensure that all scenarios are addressed, these facilities have been added to the inventory of commercial sites.

This Order continues requirements for industrial and commercial facilities to be classified into three categories: "high-priority", "medium-priority", and "low-priority". For both industrial and commercial sites, "high-priority" sites must be inspected once per year; "medium-priority" sites must be inspected once every two years; and "low-priority" sites must be inspected once per permit term (5 years). This Order continues the previous permit's criteria for distributing the Co-permittees' inventory of sites among these categories with some modifications.

The previous permit provided criteria for categorizing some industrial sites in the "high-priority" category but otherwise left the Co-permittees' significant discretion. The Co-permittees developed further guidance in the 2003 DAMP. The permit criteria and the 2003 DAMP guidance determined the distribution of industrial sites among the priority categories; this subsequently determined the industrial inspection burden each Co-permittee bears.

For commercial sites, the previous permit prescribed a minimum priority distribution: 10% were to be "high-priority; 20% were to be "medium-priority"; and the remainder was, by default, "low-priority". Additional criteria was described that would cause some sites to be moved into higher priority categories. This prescriptiveness was triggered by the findings of audits during the third-term permit where certain Co-permittees were found to be exercising their discretion to minimize their inspection burden in violation of the MEP standard. The basis of the prescribed distribution was the "best professional judgment" of Regional Board staff who were also experienced site inspectors.

In their Report of Waste Discharge, the Co-permittees have requested changes to the priority distributions for both industrial and commercial sites. The principal basis of this request was analyses of self-reported inspection outcomes. The Co-permittees' analyses conclude that their inspections are "demonstrating consistent high levels of compliance from year to year".

For construction sites, the Co-permittees reported in their Report of Waste Discharge that the percentage of inspections resulting in their staff finding a violation has been consistently less than 10%. For industrial and commercial sites, "consistent high levels of compliance" means 78% to 89% compliance on

an annual basis since 2008-2009. The Co-permittees give some credit to their inspection programs, but also credit new requirements in the Construction General Permit, adopted during the previous permit term, and published guidance from CASQA.

The Co-permittees have implicitly established site "compliance" as a performance indicator for their inspection programs. This performance indicator is flawed. First, inspectors cannot detect "compliance" with great certainty; they can only detect "noncompliance" with certainty. Assuming that an inspector could determine that a site is in compliance overstates the inspector's ability to detect non-compliance. An inspector can know what violations are discovered; but they cannot know what violations they have not. Inspectors are unlikely to discover every instance of noncompliance in a single inspection. Inspections are observations that amount to a snapshot in time of a site's condition. Even if an inspector could conclude that a site is in absolute compliance during a single inspection, site conditions can change and that conclusion may be short-lived.

Second, the Co-permittees' reported outcomes do not represent the full range of outcomes that the Co-permittees report in their Annual Progress Reports. In their 2012-2013 Annual Progress Reports, the Co-permittee reported the number of facilities out of compliance; those with "fully-implemented BMPs", "partly-implemented BMPs", and "no BMPs". In addition, the Co-permitees reported actions taken as the result of the inspections: the number of verbal warnings, recommendations, educational letters, notices of noncompliance, administrative citations, cease-and-desist orders, and misdemeanor/infractions.

For the 2012-2013 reporting period, the Co-permittees reported 168 sites out of compliance out of 5,178 construction inspections; 78 industrial facilities out of compliance out of 2,038 inspections; and no commercial sites out of compliance out of 2,724 inspections. However, for construction sites, 322 actions were reported, including 256 verbal warnings and 47 notices of noncompliance. These outcomes are twice the number of construction sites reported out of compliance for the same reporting period.

For industrial sites, there were 257 actions reported, including 124 education letters and 74 notices of noncompliance. These outcomes are almost three times the number of industrial sites reported out of compliance for the reporting period. For commercial sites, 391 actions were taken, including 160 education letters and 127 notices of noncompliance, although no facilities were reported to be out of compliance. For all three categories of inspections, the number of actions taken significantly outnumbers the number of sites found out of compliance.

It is possible for several actions to be taken in response to a single instance of non-compliance. However, it is also inefficient and unlikely that most or all instances of non-compliance would be met with multiple actions. It should also not be the case that numerous actions occur when no violations are reported, as is the case for commercial sites. This suggests that, while inspectors are willing to take effective action on a facility to improve water quality, there may be a reluctance to declare the precipitating circumstances to be a violation.

Inspection outcomes can be influenced by the manner in which sites are selected, in how the inspection is carried out, and how it is recorded. This influence can go either way in terms of how it affects "levels of compliance". Inspections are not completely unbiased activities and rates of compliance or non-compliance are not the best indicator of the effectiveness of an inspection program.

Evidence of inspection bias can be found by looking at the variability in the rates of non-compliance between Co-permittees. In the 2012-2013 Annual Progress Report, the average rate of non-compliance for construction site inspections for all Co-permittees is 6.2%. But the variability is high, with one Co-permittee finding non-compliance in one third of their inspections. Another Co-permittee found non-compliance in almost 23% of their construction inspections. In contrast, seven Co-permittees detected no instances of non-compliance, although they each performed over 200 inspections. This level of variability suggests that there are significant differences in how Co-permittees manage their inspection programs which introduces bias in reported inspection outcomes.

There are several ways that inspections are biased. First, the site selection may be purposefully biased to increase or decrease the chance of discovering violations. For example, the criteria in the permit is intended to prioritize sites that are expected to pose a greater threat to water quality, possibly due to a greater likelihood of having violations. Second, the manner of the inspection can introduce bias. Whether or not Co-permittees choose to provide prior notice to the site operators will increase or decrease the likelihood of discovering violations. Additionally, how the inspection is documented will also introduce bias. An inspector may choose to not record a discovered violation if it was quickly remedied during the inspection. Or, when entered into the Co-permittees database, either the discovery of the short-lived violation or the outcome of compliance may be recorded, thereby affecting the overall program outcomes.

These and other factors negatively influence the validity and reliability of the Co-permittees' stated measure of effectiveness (percent compliance/non-compliance) for their overall inspection programs. Nonetheless, this Order

provides some relief for the Co-permittees' inspection burden, but not on the basis provided by the Co-permittees.

The regulatory burden that this Order places on the Co-permittees is not fully described by 'inspection frequencies' or even the total number of inspections. The regulatory burden is better described by the total expected number of inspections over the permit term *and* the level of effort needed for each inspection.

The total expected number of inspections is calculated using the inspection frequencies, the total number of facilities, and how facilities are distributed among the priority categories (high, medium, and low). The level of effort is not easily measured, but can be characterized by the type of inspection. For the sake of discussion, there are two types: "inspection from vehicle" and "personal visit". Inspections from vehicles are essentially patrols that typically take significantly less time and effort than personal visits.

The previous permit did not dictate the type of inspection directly. The type of inspection was dictated indirectly by the DAMP. The DAMP describes the inspection protocols and those protocols became mandatory through their incorporation by reference in the previous permit. The DAMP protocols indicate that all inspections were to be by personal visits.

As with the previous permit, this Order does not dictate the type of inspection. But it also does not incorporate the DAMP protocol. The result is that this Order gives the Co-permittees substantial discretion to amend their protocol and select the type of inspection that is suitable to the individual characteristics of a site.

The Co-permittees have recommended that the type of inspection be dictated by the site's priority ranking. This is inappropriate. A site's priority ranking does not necessarily indicate if the site has characteristics that make it suitable for an inspection from a vehicle. Additionally, all sites benefit from the deterrent and education effects of a personal visit, but a cursory and incomplete inspection of even a low-priority site by any method has little value. Alternately, a site that invites access, is easily visible from a vehicle, and has no observed violations is generally suitable for an inspection from a vehicle.

The regulatory relief that this Order provides for both industrial and commercial site inspections is reasonable and proportional to the degree of compliance reported by the Co-permittees in the Annual Progress Reports. According to the Report of Waste Discharge, the Co-permittees performed 25,622 commercial and 10,937 industrial site inspections over the permit term. As shown in Table TR-2 below, the previous permit required that the Co-permittees should have

performed an expected 22,810 commercial and 9,486 industrial inspections[35]. The actual number of inspections performed over the past permit term exceeds the expected number.

This accomplishment indicates that the Co-permittees *collectively* have the resources to comply with the previous permit in both terms of number of inspections and level of effort. However, collective effort is not the measure used to determine compliance. Audits and reviews of individual Co-permittees and their reports show that a few have not complied either with the number of inspections, their distribution among the priority categories, or both. In cases where inspections were not correctly distributed among the priority categories, the principal cause appeared to be insufficient information management systems to direct inspection resources; not insufficient personnel or attention. This suggests that the inspection burden is problematic for some Co-permittees. However, evidence of widespread hardship on the Co-permittees has not been provided. Therefore only a moderate amount of regulatory relief is appropriate.

This Order changes the previous permit's commercial site distribution from 10% high-priority, 20% medium-priority, and 70% low-priority to one that more closely resembles a Pareto distribution or, more commonly the "80-20 rule". This distribution applies to many situations and was roughly approximated by the previous permit's distribution. A precise application of a Pareto distribution over three categories results in a 4%, 16%, and 80% distribution. This Order adjusts this distribution slightly for ease of use and requires commercial sites to be distributed as 5% high-priority, 15% medium-priority, and 80% low-priority[36]. This Order also adjusts the number of high-priority construction site inspections by requiring these sites to be inspected twice per season instead of three times. This adjustment is made after consultation with the most-experienced members of Regional Board staff and is based on best professional judgment.

To demonstrate the regulatory relief from industrial and commercial facility inspections that this Order provides, Regional Board staff compared the expected number of inspections that would be required under the requirements of this Order and Co-permittee's proposed Options 1 and 2. The related requirements were applied to the last permit term's reported industrial and commercial inventory to calculate the expected number of inspections that would have been required over the previous 5-year term. This allows a comparison of the inspection burden produced by the requirements of this Order and the Co-

[35] The term "expected number of inspections", like with any "expected" value described in this Order, is used as a measure of predicting the anticipated inspection burden. The calculation of an "expected" value is a planning tool that describes outcomes under different circumstances; it is not a technique for measuring compliance.
[36] This adjustment increases the number of expected inspections by 2% versus without the adjustment.

permittees' Options 1 and 2. This is a backwards-looking comparison and does not predict the inspection burden in the future. But it is useful to illustrate the degree of regulatory relief each scenario could provide.

The comparison is shown in Table TR-2 below in terms of numbers of inspections. The comparison does not take into consideration the reduction in level of effort caused by allowing some inspections to occur from a vehicle. This cannot be calculated without knowing which sites have the characteristics appropriate for an inspection from a vehicle. The grey columns in Table TR-2 also show the percent change relative to the expected total inspections that were necessary to comply during the previous permit.

Table TR- 2: Comparison of the number of Expected Inspections

Site Type	Reported inspections over 5-years (2008-2013)	Expected inspections over 5-years (per previous permit's requirements)	Expected inspections over 5-years (per this Order's requirements)	Expected inspections over 5 years (Option 1[37])	Expected inspections over 5 years (Option 2[38])
Commercial	25,622	22,810	19,120 (16% decrease)	15,251 (51% decrease)	13,418 (57% decrease)
Industrial	10,937	9,486	9,486 (no change)	1,036 (89% decrease)	5,181 (45% decrease)
Total	36,559	32,296	28,606 (11% decrease)	16,287 (50% decrease)	18,599 (42% decrease)

Table TR-2 shows that, based on the annual inventory reported over the previous permit's term, Option 1 requires the least number of total expected commercial and industrial site inspections, reducing them by 50% over the previous permit. Option 1 proposes that many lower-priority sites would be inspected on an as-needed basis. Since the number of 'as-needed' inspections is not known, the

[37] As proposed from the 2013 Report of Waste Discharge.
[38] Ibid.

total number of expected inspections over the permit term cannot be reliably estimated under Option 1. However, the *minimum* number of total expected inspections under Option 1 would be 16,287. Option 2 reduces the number of expected inspections by 42% over the previous permit. In comparison, this Order reduces the number of expected inspections by 11% for commercial and industrial facilities and by 16% for construction sites.

Additional reductions in the regulatory burden under this Order and Options 1 and 2 are achieved by allowing the Co-permittees to perform inspections by vehicle, reducing the level of effort. Reductions in the regulatory burden caused by this improved flexibility cannot be reliably measured but are likely to be significant.

The degree of compliance that the Co-permittees have achieved over the past permit term does not demonstrate widespread hardship that deserves the relief that either Option 1 or Option 2 would provide. This Order provides a reasonable degree of regulatory relief by decreasing the number of expected inspections by approximately 11% for commercial and industrial facilities and by 16% for construction sites, and by allowing inspections from vehicles.

For construction sites, this Order also provides regulatory relief by limiting inspections to those construction sites that have an expected or actual duration of two weeks. As with commercial and industrial sites, this Order now also allows inspections of construction sites from vehicles where appropriate. Although difficult to measure, both of these permit modifications allow regulatory relief that is proportional to the Co-permittees' apparent ability to comply.

H. Section XI: Watershed Management Plans

In the previous Order No. 2009-0030, Section XI contained requirements for a Residential Program. 40CFR Section 122.26(d)(2)(iv)(A) requires, in part, that applicants for MS4 permits employ structural and source control measures to reduce pollutants from residential areas. The previous permit describes a separate public education and enforcement program for residential areas. The requirements largely overlapped with requirements in public education and illicit discharges/illicit connections. Residential areas will continue to be addressed in this Order through more general requirements in Public Education and elsewhere. Specific requirements have been removed in this Order so that the Co-permittees can prioritize water quality issues based on feedback gained through the iterative process.

The Residential Program in Section XI has been replaced by requirements for the development and implementation of Watershed Management Plans (WMP). WMPs are plans to comply with receiving water limitations in Section IV, certain water quality based effluent limits (WQBELs) in Appendices B though H according to Section XVIII, or both. WMPs are a compliance option if a determination is made that discharges of urban runoff are causing or contributing to exceedances of water quality standards or waste load allocations represented as WQBELs. Such determinations are the result of the monitoring, analysis, and reporting cycles required in the Monitoring and Reporting Program. However, Co-permittees may elect to initiate preparation of WMPs before a cycle is complete and a determination is made. Therefore the basis for prioritizing the preparation of WMPs may rest with the risk of a determination being made rather than an actual determination.

Section XI provides that responsible Co-permittees will be regarded as being in compliance with the receiving water limitations in Section IV and/or with certain waste load allocations so long as WMPs are being prepared in according to the requirements of Section XI. Once a final WMP is approved, responsible Co-permittees will be regarded as being in compliance so long as the final WMP is being fully implemented subject to any conditions of approval imposed by the Executive Officer.

Section XI effectively establishes a mechanism by which responsible Co-permittees can plan and implement BMPs which have a reasonable assurance of causing discharges of urban runoff to discontinue causing or contributing to exceedances of water quality standards and/or to meet waste load allocations. This has been popularly called an “alternative to receiving water limitations” in State Board Water Quality Order 2015-0075. Absent compliance with the requirements of Section XI, responsible Co-permittees must comply with receiving water limitations in Section IV and achieve the WQBELs.

The Executive Officer may make a determination that the responsible Co-permittee has constructively abandoned a WMP if any commitment has not been met and after multiple Notices have been issued. Because the issuance of such Notices may have the same effect as granting an extension, Notices will be available for public review. If repeated Notices do not cause the responsible Co-permittee to comply with the requirements of Section XI, then the Executive Officer may conclude that the WMP has been abandoned and subsequently issue a Notice relieving the Co-permittee(s) of responsibilities to develop or implement the WMP and direct them to immediately comply with receiving water limitations and WQBELs.

A responsible Co-permittee may respond to a Notice by either performing the required commitment in the WMP or by requesting an amendment to the WMP. A Notice may be accompanied by an enforcement action. Requests for extensions of time will be treated in the same manner as a request for an amendment and be subject to public review. The Executive Officer is limited on the individual or cumulative length of time that is allowed by an approved extension. Requests that exceed these limits will be considered by the Regional Board.

The development and implementation of a WMP is not a remedy for failing to meet all of the WQBELs in Appendices B through H. Appendices B through H include waste load allocations that must be met according to final deadlines established in related TMDLs. Once the final deadline has passed, the waste load allocation is effectively a numeric effluent limit. WMPs cannot be used to comply with such limits if cycles of monitoring, analysis, and reporting conclude that the limit is being exceeded. The remedy in these cases includes the issuance of a Time Schedule Order by the Regional Board.

Section XI requires that the responsible Co-permittees define a measureable and verifiable schedule for the completion of discrete tasks in the final approved WMP. Failure to meet the schedule may subject the responsible Co-permittees to enforcement action. The responsible Co-permittees will also include in the WMPs performance measures for the BMPs. Unless specified otherwise by the Executive Officer in conditions of approval, a failure to meet performance measures, generally will not subject a Co-permittee to enforcement action. The purpose is to allow the Co-permittees the maximum latitude to practice the "iterative process" to improve their storm water programs.

WMPs should not be used to supercede the requirements of this Order. The WMP should be used to complement the requirements of this Order. WMPs are subject to all of the relevant management requirements of this Order. This includes, but is not limited to requirements related to legal authority to carry out the approved WMP; execution of inter-agency and inter-Co-permittee agreements; execution of the "iterative process"; the performance of program effectiveness assessments using valid performance measures; and the collection and use of monitoring data to evaluate and improve the effectiveness of projects and programs described in the WMP

On June 16, 2015, the State Water Resource Control Board adopted WQ 2015-0075 in response to petitions on Los Angeles Regional Water Quality Control Board Order No. R4-2012-0175. The State Board's Order constitutes a precedential order affecting this Order. Regional Board staff has a detailed

assessment of how the requirements of Section XI, in combination with other supporting requirements in this Order, satisfy the State Board's precedential order.

I. Section XII: New Development (Including Significant Redevelopment)

The requirements of Section XII are based on 40CFR Section 122.26(d)(2)(iv)(A)(2) to reduce the discharge of pollutants from areas of new development and significant redevelopment. Section XII also includes a requirement that is intended to advance work to retrofit existing flood control facilities to remove pollutants as required by 40CFR Section 122.26(d)(2)(iv)(A)(4). 40CFR Section 122.26(d)(2)(iv)(A) requires, in part, the applicants for MS4 permits provide both "structural and source control measures to reduce pollutants from runoff from commercial and residential areas".

Section XII has been expanded to incorporate synthesized elements of the 2011 Model Water Quality Management Plan and its accompanying Technical Guidance Document. Requirements regarding the sizing of structural treatment controls, LID prioritization, Hydrologic Conditions of Concern, and classification of "priority projects", which require project Water Quality Management Plans ("WQMPs"), and "non-priority projects" have been retained in this Order with modifications.

40CFR40CFR40CFR1The Co-permittees have broad authority to regulate activities within their communities. The scope of regulated activities and the manner in which they are regulated can vary among Co-permittees. The intent of Section XII in this Order and in the past Orders has been to cause the Co-permittees to exercise their authority so that the potential water quality impacts of past and future urban development are minimized. The challenge has been how to best identify that subset of projects, from the varied universe of projects that each Co-permittee regulates, which have a significant potential to impact water quality, and to develop a process that efficiently and effectively addresses those impacts.

In order to better address the challenge of identifying appropriate projects, clarifying language has been added to Section XII.

- Subsection XII.B. makes it clear that Co-permittees must consider the whole of the project in classifying a project as a priority or non-priority project. This is not intended to cause the Co-permittees to require WQMPs or non-priority project plans for projects for which there is insufficient detail to meaningfully develop those plans (e.g. simple lot line

adjustments without further development details). The intent is to cause as early consideration of BMPs as practicable and to prevent piece mealing projects.

- In Subsection XII.B.5., projects consisting of the replacement, upgrade, or installation of dry utilities, sanitary sewer, petroleum pipelines, or water supply distribution lines in existing rights of way have been excluded from "redevelopment projects" that are priority projects. This exclusion does not apply to related surface improvements. The reason for this exclusion is because the scope of such projects is too narrow to afford opportunities to include structural treatment control BMPs. Additionally, the post-construction water quality impacts may not be related to the work completed underground.
- The language of Subsection XII.B.5. has been modified to allow a Co-permittee to permit the continued use of structural treatment controls installed as part of a previously-approved WQMP when a portion of the site is redeveloped. This allowance does not apply if the old WQMP was not properly approved or implemented, regardless of whether or not any enforcement action was taken by the Regional Board.
- In Subsection XII.M., language has been included to allow Co-permittees to exclude projects that do not affect areas that are exposed to storm water, or which are not sources of urban runoff, from being considered non-priority projects.

This Order requires expansion of the electronic database for tracking sites affected by an approved WQMP in Subsection XII.C.10. A similar requirement is in the previous permit (Provision XII.F.2.) but the previous Permit specifically required tracking of structural treatment controls. Structural treatment controls installed prior to Order No. R8-2009-0030 were not required to be tracked in an electronic database. However, structural treatment controls were being installed under Order No. R8-2002-0010, over a decade ago. The performance of these older facilities is also of interest to the storm water program and may provide practical insights to the Co-permittees and the Regional Board. Consequently, Subsection XII.C.10. requires that these older facilities be tracked as they are discovered through the Co-permittees' inspection programs or with other opportunities.

The previous permit defines categories of projects for which the Co-permittees' approval requires the preparation of a project WQMP. The Co-permittees have sought to limit this requirement to projects that are subject to "discretionary approval". This term has not been defined by the Co-permittees but is presumed to have the same meaning as "discretionary action" under CEQA. The strict

application of the term under CEQA would essentially allow one Co-permittee to permit a project without a WQMP, whereas the same project in another city would require a WQMP due to local preferences and permitting idiosyncrasies[39]. Whatever the meaning, the Co-permittees' application of the term must not be used to undermine the MEP standard and other requirements of this Order. As such, the term "discretionary" has been omitted with respect to new development projects in this Order.

Section XII of this Order requires new developments that are regulated by the Co-permittees to employ source-control, site-design and structural treatment controls to remove pollutants from urban runoff. This Order is intended to provide the Co-permittees with a method to address the water quality impacts of new development consistent with the requirements of 40CFR Section 122.26(d)(2)(iv)(A). These requirements are intended to address projects that may have an impact on water quality.

Consistent with the previous Permit, new development projects are classified into two types: priority and non-priority projects. Priority projects must employ source-control, site-design, and structural treatment controls. Certain non-priority projects must employ source-control and site-design controls, but do not have to employ structural treatment controls unless practicable. However, non-priority projects may employ source and site design BMPs that rely on the same or similar set of treatment mechanisms used by structural treatment control BMPs, such as infiltration and harvest and use. In many cases, such controls may resemble structural treatment control BMPs but be substantially deficient relative to sizing and design criteria. These deficiencies may be the only characteristic which distinguishes source and site design BMPs from structural treatment control BMPs.

This Order includes numeric design standards for storm water runoff from new development and redevelopment. The inclusion of these numeric design standards is supported by State Water Resources Control Board Order WQ 2000-11. Order WQ 2000-11 established that numeric design standards for BMPs are not separate BMPs or water quality standards. They are a more detailed description of the "maximum extent practicable" standard.

When practical, Co-permittees should pursue opportunities in good faith to have proposed source control and site design BMPs for non-priority projects modified so that they meet the relevant sizing requirements of this Order (see

[39] Leon, Jorge, July 7, 2000. Post-Hearing Brief, The Cities of Bellflower, Burbank, et al. v. California Regional Water Quality Control Board et al., File Nos. A-1280; A1280(a); A-1280(b), State Water Resources Control Board.

SectionXII.D.); substantially conform to published and generally-accepted engineering design criteria; and become acceptable structural treatment control BMPs. A non-priority project may be required to use off-site structural treatment controls if available. Priority projects are differentiated from non-priority projects by the categories shown in Subsection XII.B.5. of this Order.

For priority projects, Co-permittees must have a Water Quality Management Plan ("WQMP") prepared. The project WQMP is intended to accomplish several purposes. First, the project WQMP documents the rationale behind the selection of structural treatment controls. Second the WQMP functions as an enforcement mechanism to provide for the proper construction, operation and maintenance of structural treatment controls for both the project proponent and their successors and assigns over the life of the project. Last, for some larger projects, the project WQMP can serve as a planning document for the design, construction, and funding of regional and sub-regional structural treatment controls. As such, it is important that subsequent WQMPs and non-priority project plans be consistent with the larger project WQMP. It is also important that project WQMPs be protected against loss or damage in a manner that is commensurate with the expected duration of the project.

This Order promotes regional and sub-regional structural treatment controls essentially by permitting their use where they have been planned for according to the requirements of this Order. This Order is largely silent on the mechanism(s) which lead to the planning and construction of regional and sub-regional structural treatment controls. Cities already have different proven mechanisms at their disposal to finance and construct other forms of infrastructure such as streets, lighting, traffic controls, and storm drains; these mechanisms may be utilized for regional and sub-regional structural treatment controls. Past versions of this Order have discussed *in lieu* fees, credits, and other mechanisms. None of these have been successfully employed to construct regional and sub-regional structural treatment controls serving multiple projects with multiple proponents or land owners. Such suggestions in past permits have not been shown to be helpful and so they have been omitted in this Order.

In the absence of a planned or proposed structural treatment control facility, structural treatment controls must be on-site for a project. Regardless of the location of the structural treatment controls, all priority projects must have source and site-design controls. Even when there is an offsite structural treatment control available for a project, that project may be required to employ certain pretreatment controls in order to protect the offsite facility from requiring an unusual level of maintenance or from experiencing premature failure. This order

anticipates that the operator of the offsite facility will establish pretreatment criteria for new developments that discharge into the facility.

This order requires the Co-permittees to establish a program for the improvement of project WQMPs. The Co-permittees must have written technical guidance for the preparation of project WQMPs. The 2011 Model WQMP and its accompanying Technical Guidance Document are generally expected to serve this purpose. These documents may require some modifications in order to comply with this Order. However, since this Order no longer incorporates the documents by reference, the Co-permittees may make the necessary changes independently, without the Executive Officer's approval. In a similar way, resulting project WQMP process improvements may also be made independently. However, all changes are governed by the requirements of this Order.

1. Hierarchy for Structural Treatment Controls

This Order maintains the hierarchy for the selection of structural treatment controls for priority projects that was prescribed in the previous permit with some modifications. USEPA has urged the Regional Board to allow certain project proponents to offset untreated design capture volumes by treating off-site in existing developments that are retrofit by the proponent. This allowance would apply where the project proponent cannot provide structural treatment control BMPs on site. In order to incorporate this option, it appears in the hierarchy so that a project cannot be eligible for a waiver until this and all other options are determined to be infeasible.

In order to communicate the heirarchy clearly, this Order establishes terminology for categories and subcategories of structural treatment controls. This terminology is defined in the Glossary of the Order and is explained below.

In summary, the hierarchy places greatest preference on retention LID best management practices, second preference is for bio-treatment control BMPs, and third preference for non-LID BMPs. A fourth preference has been added for off-site retrofits of existing development to accommodate USEPA's request.

Retention LID BMPs and bio-treatment control BMPs are subcategories of LID BMPs. LID BMPs also include certain source control and site design BMPs that attempt to mimic the site's predevelopment hydrology by using techniques that retain runoff close to its source. Although this Order does not require that structural treatment control LID BMPs be located on site, site design and source control LID BMPs must be on site consistent with LID principles.

The effectiveness of LID BMPs has been demonstrated in various studies. Dr. Richard Horner demonstrated that LID BMPs achieved significant reductions in pollutant loading and runoff volume and enhanced recharge rates compared to developments with no BMPs and those with basic treatment BMPs.[40,41] Consequently, this Order emphasizes the use of LID BMPs. Retention LID BMPs generally employ infiltration or some other loss of the design capture volume and as such, is generally a more reliable way of preventing the discharge of pollutants in storm water. Consequently, retention LID BMPs are given the greatest degree of preference in the hiearchy.

Retention LID BMPs are a subcategory of LID BMPs where the design capture volume is either infiltrated into the ground; used for irrigation, process water, or other purposes; or is evaporated or evapotranspirated. Co-permittees are responsible for demonstrating in the project WQMP that retention LID BMPs, located either on or off-site, are given priority consideration according to this Order's requirements, before considering any of the subsequent categories of structural treatment controls in the hierarchy.

The second category of structural treatment controls that must be considered are biotreatment control BMPs. As indicated by the name, biotreatment control BMPs are a subcategory of LID BMPs that principally remove pollutants through a combination of infiltration, evapotranspiration, biological uptake or transformations, or degradation. While a significant portion of the design capture volume is typically infiltrated or evapotranspirated, this is incidental and no particular portion must be treated in either manner. After passing through a biotreatment control BMP and partly evaportranspiring and infiltrating, the remaining portion of the design capture volume is typically discharged from the site. Where retention LID BMPs are infeasible, biotreatment control BMPs must be used where feasible.

This Order requires that biotreatment control BMPs be designed to treat 1.5 times the design capture volume. This requirement is based on the findings of Appendix D, *BMP Performance Guidance*, to the *Ventura County Technical Guidance Manual for Storm Water Quality Control Measures* (Manual Update 2011)[42]. In summary, the Ventura County Technical Guidance Manual found that

[40] Horner, Richard R. Investigation of the Feasibility and Benefits of Low-Impact Site Design Practices ("LID") for San Diego, University of Washington, 2006.
[41] Horner, Richard R. Investigation of the Feasibility and Benefits of Low-Impact Site Design Practices ("LID") for Ventura County, University of Washington, 2007.
[42] Available at: www.waterboards.ca.gov/losangeles/water_issues/programs/stormwater/municipal/ventura_ms4/VenturaTGM/Ventura%20Stormwater%20TGM%20Final%207-13-11.pdf

biotreatment control BMPs that were sized to treat 1.5 times the design capture volume could provide equivalent or better reductions in loads compared to retention LID BMPs for all pollutants of concern. The Regional Board recognizes that the Ventura County study was based on local hydrologic and soil conditions. The Co-permittees are allowed in the Order to estimate a similar alternative factor using local conditions for biotreatment control BMPs in Orange County.

Structural treatment controls that employ retention as a treatment mechanism rank the highest in the hierarchy established by this Order and the previous permit. In a well-designed and properly-operating facility, pollutants in storm water are not discharged into surface waters, making retention the most reliable treatment mechanism among those used in structural treatment controls. Since retention LID BMPs employ retention as the sole mechanism for pollutant removal, they are given the highest priority in the hierarchy. Biotreatment control BMPs employ retention on an incidental basis. By using the 1.5 factor, the reductions in pollutant loads may be comparable to that of retention LID BMPs. Consequently, biotreatment control BMPs are ranked second in the hierarchy.

The last category of structural treatment controls in this Order's hierarchy are non-LID BMPs. These structural treatment controls principally use filter media such as perlite, zeolite, sand, or some proprietary or non-proprietary media to physically remove pollutants in storm water. The media may develop microbial communities in biofilms that coat portions of the media. Biofilms can assist in removing pollutants through biological uptake and transformation, but these are incidental mechanisms and the biofilm may even adversely affect the hydraulic performance of the facility and harbor potential pollutants.

This Order does not require that a single structural treatment control BMP be used to treat the design capture volume for a drainage area on a priority project site. A series of structural treatment controls may be used if necessary. The selection and sizing of controls must correspond with this Order's hierarchy. For example, if a retention LID BMP cannot treat the entire design capture volume, the remaining portion may be treated in a biotreatment control BMP. If is infeasible for both the retention LID and biotreatment control BMP to treat the entire design capture volume, then a non-LID BMP may be employed to treat the remaining portion. Under extremely limited circumstance should a site treat the design capture volume or any portion thereof using a non-LID BMP without having demonstrated in the WQMP that the volume could not have been treated using a BMP higher up on the hierarchy. The only circumstance where this could occur is where an off-site LID BMP will be used.

Subsection XII.H. of this Order establishes a specific protocol for selecting non-LID BMPs. This protocol largely carries over from the previous permit. It requires that the Co-permittees categorize non-LID BMPs by type and then assign a performance rating of “high”, “medium”, and “low” to each category relevant to a variety of expected pollutants. As the result of Regional Board staff observations during audits of convenient mis-categorizations, this Order requires that BMP categories include only those controls that employ the same principal of operation; use similar treatment mechanisms; and which can reasonably be expected to exhibit generally similar performance in the removal of pollutants. The rating must be based on the best available, objective evidence. The evidence must include field performance test data that is specific to the BMP and that has been collected according to published and recognized protocols.

The non-LID BMP selection protocol also requires that project types be related to various pollutants which can be reasonable expected to be found in urban runoff from those project types. Co-permittees must select non-LID BMPs that provide for either a “medium” or “high” level of treatment for those projects. Numeric performance thresholds must be used to distinguish the levels of treatment. The performance ratings for Non-LID BMPs must be reviewed bi-annually so that they are supported by the best available information.

Structural treatment control BMPs are storm water infrastructure. Like other infrastructure, these facilities may pose environmental hazards such as flooding, providing habitat for disease vectors, creating nuisances such as odors or midges, adversely affecting groundwater or soil remediation efforts, or presenting physical hazards to people, nearby structures, or traffic. This Order establishes an obligation on the Co-permittees to mitigate these potential environmental hazards to an acceptable level consistent with the requirements of CEQA.

This Order also requires that structural treatment controls substantially conform to published and generally-accepted engineering design criteria or have had their expected performance substantiated in field tests using published and recognized protocols. These requirements are related to hazard mitigation because, in many cases, engineering design criteria have been established to address potential environmental hazards. Minor deviation from published design criteria is generally acceptable and may be done to accommodate LID BMPs at a project site. However, unnecessary deviation is not acceptable.

2. Integration of Project WQMPs into the Development Application Process
   This Order establishes a procedure for the integration of project WQMPs into the development application process. This procedure is derived from the 2011 Model WQMP and furthers the effort to "develop, implement, and enforce controls to reduce the discharge of pollutants from [MS4s] which receive discharges from areas of new development and significant redevelopment" down to the project-level according to 40CFR40CFR122.26(d)(2)(iv)(A)(2).

   This Order requires that project WQMPs be developed in two phases. In the first phase, a preliminary project WQMP must be prepared prior to a project's development application being regarded as complete according to the Permit Streamlining Act. The preliminary project WQMP must be approved before the project is approved by the Co-permittees' decision-making body.

   The purpose of preparing a preliminary project WQMP prior to the development application being complete is to promote consideration of structural treatment controls as early in the development approval process as possible. Structural treatment controls often compete for space with other structural elements of a project such as building footprints, utilities, and landscaping. As such, they should be given equal consideration so that they can be integrated into a site in the most economical manner possible. The preliminary project WQMP should be sufficiently detailed to demonstrate that adequate consideration has been given to the sizing, location, type of structural treatment control and the related BMP hierarchy, such that it can be reasonably expected to be constructible and to operate as intended.

   Once the development application is complete, a project is typically approved after environmental review occurs under CEQA. It is important that structural treatment controls be described in the circulated CEQA document. This circulation helps to educate the public on how the Co-permittee addresses the potential water quality impacts of the project and how the potential environmental hazards of structural treatment controls are addressed. For this purpose, the Co-permittees are encouraged to also describe their related inspection and enforcement programs. Where applicable, the circulated document is a useful compliance monitoring tool for the Regional Board and other interested agencies such as the California Coastal Commission and the Department of Fish and Wildlife.

   The second phase of WQMP development begins after project approval. During this phase, additional project details are developed, including details on source-control, site-design, and structural treatment controls. Because multiple departments can be working on developing separate aspects of a project, there

is potential for inconsistencies to develop between different project plans and the preliminary project WQMP. This has the potential to affect BMP selection, the likelihood that a structural treatment control will be built, or the likelihood that it will function as intended. This Order requires that the Co-permittees enforce substantial conformance between project plans and preliminary and final project WQMPs. At the end of the second phase, a final project WQMP is approved and the project is approved to initiate construction.

3. Non-Priority Projects

This Order identifies all other projects as “non-priority projects”. Certain non-priority projects must employ source control and site design BMPs. The approach to defining non-priority projects which require BMPs is narrower than the previous permit. The previous permit required source control and site design BMPs regardless of the risk of storm water pollution. Due to the broad range of projects subject to the Co-permittees’ approval, this inclusive approach encompassed projects that would occur entirely indoors or whose scope was too narrow to offer opportunities to incorporate the required BMPs in a practicable way. As part of the preparation of the 2011 Model WQMP and Technical Guidance Document, the Co-permittees narrowed down the number of non-priority projects requiring a plan by re-defining a non-priority project. Regional board staff did not object to this because it was recognized that the term "non-priority" project was exceptionally inclusive.

Since then, Regional Board staff have realized that the Co-permittees' approach is overly-narrow and leaves out projects that could apply source control and site design BMPs, in conflict with the requirements of Clean Water Act Section 402(p)(2)(B)(iii). In order to attempt to strike a better balance, this Order establishes a goal of incorporating source control and site design BMPs into non-priority projects consistent with the Clean Water Act. Because the universe of projects requiring permits varies among the Co-permittees, the task of evaluating each Co-permittee’s permitting program to determine which projects should prepare a plan is daunting. Instead, each Co-permittee will evaluate their own permitting program and must develop and report policies and procedures to identify non-priority projects that may employ source control and site design BMPs.

This Order does not require non-priority projects to employ structural treatment controls. But some kinds of site design BMPs bear a strong resemblance to structural treatment controls. In some cases, they could be modified in a practicable way to substantially conform to published and generally-accepted

engineering design criteria. Where such opportunities occur, this Order requires that the Co-permittee pursue them.

As indicated earlier, a non-priority project may be required to use an off-site structural treatment control BMP where it is available. This may occur in situations where the non-priority project lies within a larger plan of development that was subject to a project WQMP. This may also occur where a city or other public entity has constructed or plans to construct a regional or sub-regional structural treatment control. It may be necessary for all properties within the tributary area of a regional or subregional facility to participate in funding the construction and operation of the facility to make that facility successful.

J. Section XIII: Public Education

Section XIV of the Order requires that the Co-permittees implement an effective public education program. The requirements of Section XIV are based on 40CFR Sections 122.26(d)(2)(iv)(A)(6), (B)(6), and (D)(4). The public education program, as currently practiced, has been a core element of the Co-permittees' storm water program for over a decade.

Section XIV is intended to raise public awareness of pollution in urban runoff and to take action to reduce that pollution. The changes to the requirements in this Order have been largely influenced by USEPA's document "Getting in Step: A Guide for Conducting Watershed Outreach Campaigns"[43]. Changes were also made to generally support the effective execution of public education campaigns described in the Co-permittee's report of waste discharge received on October 4, 2013.

This Order retains the objective requirement for the Co-permittees to achieve 10 Million impressions annually. This objective has been carried over in different iterations since Order No. R8-2002-0010. The subject audience has been refined. The subject audience is now termed the "general audience" which is defined as residents that are school age and up[44], and commercial and industrial establishments. The Co-permittees are required to create specific messages for sub-groups within the general audience. The Co-permittees are required to perform a statistically valid survey on the general audience to evaluate how well the purposes of the program have been achieved.

[43] USEPA. 2003. Getting in Step: A Guide for Conducting Watershed Outreach Campaigns. EPA 841-B-03-002. [http://www.epa.gov/owow/watershed/outreach/documents /getnstep.pdf [PDF - 3.27 MB - 136 pp]]. U.S. Environmental Protection Agency, Office of Water, Washington, DC

[44] The previous Permit included "100% of the residents" inadvertently capturing babies and infants.

In addition, this Order now requires that the Co-permittees initiate public education campaigns that address a minimum of three high-priority pollution issues during the term of the permit. This Order does not dictate when a campaign must end. A campaign may carry over into another permit term. Other than to initiate campaigns on three issues, this Order does not specify any particular milestones or other performance metrics for those campaigns. Instead, the Co-permittees must identify goals and performance metrics. The Co-permittees must permit public input on the overall campaigns, including the goals and performance metrics.

The scale of the three issues (permit area, watershed, or city) has been left to the discretion of the Co-permittees. Each scale does not necessarily have to involve the same set of issues. In the most complex form, each city could elect to focus on a unique set of issues, resulting in over 75 different public education campaigns. In its simplest form, the Co-permittees would initiate three campaigns over the entire permit area.

This Order defines “target audiences” for addressing the three high-priority pollution issues. The target audience includes persons believed to have the greatest influence on the selected pollution issues. The Co-permittees have the discretion to select both the pollution issues and the target audiences but must document their rationale for their selections in a written plan for the public education program.

K. Section XIV: Municipal Facilities

Section XIV has been rewritten to incorporate key elements of Section 5 of the 2003 DAMP. This includes the development of an inspection program for fixed facilities and field activities, following Integrated Pest Management, Pesticide, and Fertilizer Guidelines, and staff training. Objective requirements found in Section XIV of the previous permit have also been largely retained. The language identifying drainage facilities subject to inspection and cleaning has been modified to be more specific in response to commenters. The programs described in Section XIV are required by 40CFR40CFR122.26(d)(2)(iv)(A)(3), (A)(4) [retrofit], (A)(5) and (A)(6).

L. Section XV: Municipal Construction Projects and Activities

Section XV retains all of the requirements of the previous permit to comply with the requirements of the Construction General Permit (NPDES Permit No. CAS000002). In the absence of Section XV, the Co-permittees would still be required to comply with the Construction General Permit. The inclusion of storm water runoff from construction sites in this Order consolidates permitting efforts for construction sites and discharges of urban runoff from MS4s. The language of Section XV has been modified to minimize conflicts with the requirements of the Construction General Permit regarding the submittal of a report of waste discharge to obtain coverage, and notices to terminate coverage. Language has been added to emphasize that the post-construction BMP requirements of this Order prevail over those in the Construction General Permit.

M. Section XVI: Training Programs

Section XVI largely reorganizes the requirements of the previous permit with some modifications. The requirements of Section XVI are based in part on 40CFR40CFR122.26(d)(2)(iv) which requires, in part, that applicants for MS4 permits describe staff available to implement their storm water program and on certain required training and education programs in 40CFR122.26(d)(2)(iv)(A)(6), (B)(6), and (D)(4), .

In order for staff to be effective in implementing the Co-permittees' storm water programs, staff need to be aware of their employer's obligation to reduce the discharge of pollutants and their duties to help fulfill that obligation. Section XVI contains requirements appropriate to this need. These requirements are also included in this Order according to Clean Water Act Section 402(p)(3)(B)(iii) and 40CFR122.26(d)(2)(iv) which, in part, establishes the MEP standard and allows the state to include provisions appropriate for the control of pollutants.

Section XVI describes personnel that must receive training and a minimum training curriculum for certain groups of personnel. Refresher training must be given once every two years instead of once each year; initial training for new employees must still be given within 6 months of hire. Refresher training frequencies have been reduced because existing employees have accumulated training and experience during the past few permit terms. A significant body of institutional knowledge has likely been developed to informally reinforce the storm water programs and to justify reducing the intensity of the training program.

The scope of personnel requiring training has been expanded to more generally include "staff, contractors, and vendors whose duties or responsibilities directly or indirectly affect the Co-permittees' capacity to satisfy the requirements of this

Order". For some Co-permittees, this may mean that additional personnel will require training. Subsection XVI.B. establishes a minimum baseline of subject matter proficiency for all affected personnel and additional subject matter for certain personnel. But generally, the training "must be commensurate with the duties and responsibilities of the affected personnel".

Section XVI also now requires that the Co-permittees employ objective methods to individually evaluate trained personnel. It also now requires that training records be maintained for a minimum of three years. A registry or similar mechanism is also required largely to facilitate tracking and reporting for the Principal Permittee and to permit training records to follow staff that change employment between different Co-permittees. The training program must be reviewed and updated annually to achieve continual improvement. The Co-permittees may implement a single training program, individual programs, or some hybrid of the two. Therefore, the review and update may occur collectively, coordinated by the Principal Permittee, or be performed individually by each Co-permittee according to how the training program is implemented.

N. Section XVII: Notification Requirements

Section XVII continues the previous permit's requirements for the Co-permittees to report, within 24-hours, sites or incidents that pose an imminent threat to human health or the environment. The initial report must be followed by a written report in 5 business days. Section XVII clarifies that the written report is to be submitted 5 business days after the initial report. These requirements are based on 40CFR122.41(l)(6).

Section XVII now incorporates quarterly reporting requirements that were located in Section VI of the previous permit. This move consolidates these more-frequent reporting requirements, relative to the Annual Progress Report, and is intended to make them easier to locate for the reader.

O. Section XVIII: Total Maximum Daily Load Implementation

Federal regulations require that NPDES permits contain WQBELs consistent with the assumptions and requirements of all available WLAs (40CFR Section 122.44(d)(1)(vii)(B)). The waste load allocations ("WLAs") and related requirements for adopted and approved TMDLs have been included in this Order and are identified as WQBELS in Appendices B through H. These WQBELs are included in this Order according to the related implementation plans, where those plans are provided in the Basin Plan. In the event that implementation plans are

adopted or amended during the term of this Order, the Order may be re-opened and revised accordingly. The WQBELs shown in Appendices B through H are expected to be sufficient to cause the responsible Co-permittees to meet the WLAs by the compliance dates specified in their respective TMDLs and repeated in the Appendices. The Co-permittees responsible for complying with the WQBELs are listed according to the related TMDLs in Appendix A.

Since they do not provide a complete method for determining compliance, the WQBELs shown in Appendices B through H are not intended to function as stand-alone requirements. The methods for complying with the WQBELs are described in Section XVIII of the Order.

The methods for complying with the WQBELs in Appendices B through H are generally grouped according to the status of the compliance deadlines established in the underlying TMDLs. In some cases, the compliance deadlines have passed, others are in the future, and, for some pollutants, no compliance deadline was established in the TMDL. Appendix C is an exception to this grouping because it contains dates that have passed and others that have not yet passed. Appendices B through H only show dates for WQBELs where the compliance deadlines have not yet passed—if a date is not shown, the deadline in the TMDL has passed.

For any pollutant, the responsible Co-permittees may demonstrate compliance with the related WQBELs using monitoring data. The monitoring data may include data which demonstrates that there has been no discharge from an MS4 to the receiving waters. Monitoring data must be collected, analyzed, and the results reported based on an enforceable schedule. The schedule will be developed according to the requirements Subsection II.B. of Monitoring and Reporting Program R8-2015-0001. The analyses and reporting frequencies in the schedule do not need to be uniform across all pollutants. The reporting process constitutes the notification that discharges from an MS4 are causing or contributing to an exceedance of a water quality standard and WQBEL.

WQBELs for pollutants that have no compliance deadlines specified in Appendices B through H have either had a deadline established by the underlying TMDL and it has passed, or no deadlines were established by the underlying TMDL. The circumstances of the WQBELs are described in the explanatory text preceding the WQBELs in each of the Appendices. In these cases, the WQBEL is effective on the effective date of the Order. However, the methods available to the Co-permittees to comply depend on if the deadline was established and has passed or, as is the case for EPA-promulgated TMDLs, if no deadline had been established.

Appendices B through D and F contain WQBELs where their compliance deadline was established in the underlying TMDL and the deadline has passed. In these cases, the Co-permittees may comply with the related WQBEL(s) according to Subsection XVIII.B. by either: (1) making a demonstration using monitoring data as described earlier; or (2) the Co-permittees may fully implement a Time Schedule Order ("TSO") issued by the Regional Board pursuant to California Water Code Section 13300.

Appendices C and E include WQBELs where a compliance deadline was established in the underlying TMDL but the deadline has not passed. In these cases, the responsible Co-permittees may comply with those WQBELs according to Subsection XVIII.C. by either: (1) making a demonstration using monitoring data; (2) notifying the Executive Officer of their intent to develop a Watershed Management Plan and thereafter implementing an approved plan that is designed to comply with final WQBELs by the final compliance dates in Appendices C and E; or (3) the Co-permittees may fully implement a TSO. If a Watershed Management Plan is used, the plan itself is the final WQBEL and the lack of action by the responsible Co-permittees to implement the plan will constitute a violation of the WQBEL and a violation of this Order.

Appendices C, G, and H contain WQBELs where no compliance deadline was established in the underlying TMDL. In these cases, the responsible Co-permittees may comply with those WQBELs according to Subsection XVIII.D. by either: (1) making a demonstration using monitoring data; or (2) notifying the Executive Officer of their intent to develop a Watershed Management Plan and that is designed to comply with final WQBELs in Appendices C, G and H ("WQBEL compliance plan"). In the latter case, the lack of action by the responsible Co-permittees to implement the plan will constitute a violation of this Order.

The Co-permittees may request a TSO individually, or two or more Co-permittees may request a TSO jointly for the same WQBEL(s). If responsible Co-permittees request the Regional Board for a TSO, Regional Board staff will, at a minimum, require the following information:

1. Data which demonstrates the current quality of the relevant MS4 discharge(s) to the receiving waters in terms of concentration and/or load;
2. A detailed description and chronology of structural controls and source controls employed to reduce the pollutant load in the MS4 discharge(s) since the effective date of the TMDL;
3. Justification for the additional time desired to achieve the final WQBEL(s);

4. A detailed time schedule of specific actions that the Co-permittee(s) will take to achieve the final WQBEL(s);
5. An analysis that provides reasonable assurance that the proposed actions will achieve the final WQBEL(s) within the requisite time period. The analysis must be supported, in part, by peer-reviewed models that are in the public domain where such models are available and appropriate. (The analysis can include trend analyses that demonstrate that no additional actions are necessary to achieve the WQBEL(s) within the term of the requested TSO.);
6. A demonstration that the requested time schedule is as short as possible, taking into account the technological, operational, and economic factors that affect the design, development, and implementation of the control measures that are necessary to comply with the final WQBEL(s); and
7. If the term of the requested TSO exceeds one year, the request must also include proposed interim requirements and a time schedule for their achievement. The proposed interim requirements will include: (1) effluent limitation(s) for the pollutant(s) of concern; and (2) a detailed time schedule of specific actions the Co-permittee(s) will take to achieve the effluent limitations.

WQBEL compliance plans and requests for TSOs must include a 'reasonable assurance' that proposed actions will achieve final WQBELs within required time periods. An analysis that provides 'reasonable assurance' is not expected to provide absolute assurance, but nevertheless, a high level of assurance. A reasonable assurance is expected to be supported by evidence that provides a reasonable basis to conclude that the Co-permittees' actions will achieve final WQBELs and that the evidence does not support alternative, conflicting conclusions.

The USEPA Toxics TMDLs also include TMDLs for chlordane, dieldrin, DDT and PCBs in the Rhine Channel (in Lower Newport Bay). The Regional Board-approved TMDLs do not include Rhine Channel-specific TMDLs since the constituents of concern were addressed by dredging in the Channel[45]. Although they have not been formally withdrawn by USEPA, the related WLAs have been

[45] Anghera, Shelly and Cappellino, Steve, December 17, 2013. "Re: Post-Dredge Confirmatory Sampling Results and Environmental Benefits of Dredging for the Rhine Channel Contaminated Sediment Cleanup Project". Anchor QEA LLC Technical Memorandum, Project 130243-00.03.

superseded by the Regional Board-adopted TMDLs and no longer appear in this Order[46].

WLAs are essentially mechanisms to attain water quality standards and to avoid causing or contributing to exceedances of water quality standards. Consequently, the process to meet the WLAs or develop plans to meet the WLAs is intended to also satisfy the process to comply with water quality standards. However, meeting the WLAs and complying with water quality standards are independent requirements that are not equal. Provisions in Subsection IV.D. . are included in this Order to establish the relationship between the two processes; compliance with the process in Section XVIII. satisfies the process in Subsection IV.D.

If discharges from the responsible Co-permittees' MS4s meet the WLAs, the responsible Co-permittees must continue implementing their storm water programs in order to maintain attainment of the WLAs. The provisions in Section I of the Order require that the program be documented. The responsible Co-permittees must also implement a monitoring program that must be developed according to MRP R8-2015-0001. The monitoring program must necessarily include efforts to establish whether or not discharges from MS4s continue to meet WLAs. The "iterative process" must continue to be implemented, however, so long as WLAs and water quality standards are met, the process is expected to focus on improving the effectiveness of the Co-permittees' efforts to comply.

All Watershed Management Plans (WMP) are subject to the "iterative process". This process allows the Co-permittees to improve the effectiveness of BMPs based on water quality monitoring data analysis and objective performance metrics, including the WLAs. If, despite compliance with the WMP, discharges continue to exceed WLAs, the "iterative process" requires improvements to the plan according to Section I of the Order. Improvements may also be made in the interest of cost-effectiveness provided that water quality will not be compromised. The content of the plans is controlled and, except for inconsequential grammatical and technical changes, is subject to the approval of the Executive Officer.

The Regional Board submits an Integrated Report to the USEPA to comply with the reporting requirements of CWA Sections 303(d), 305(b), and 314. The Integrated Report list the attainment status of water bodies relative to water quality standards. According to USEPA guidance, water bodies are placed in

[46] Based on electronic communication with Janet Hashimoto, Chief, Water Quality Assessment Section, USEPA Region 9, November 21, 2014.

one of five categories of "attainment status" in the Integrated Report[47]. Water bodies in Category 5 indicate that at least one beneficial use is not being supported or is threatened and a TMDL is required. These water bodies are placed in on the 303(d) list.

Water bodies in Category 4 indicate that at least one beneficial use is not being supported or is threatened but a TMDL is not needed. Impaired water bodies may be placed in Category 4a if a TMDL has been adopted and approved. Impaired water bodies may be placed in Category 4b if other pollution control requirements required by a local, state or federal authority are stringent enough to implement applicable water quality standards within a reasonable period of time. Water bodies may be placed in Category 4c if the failure to meet an applicable water quality standard is not caused by a pollutant, but caused by other types of pollution.

Impaired water bodies can be included in Category 4b if there are acceptable "pollution control requirements" required by a local, state or federal authority stringent enough to implement applicable water quality standards within a reasonable period of time (e.g. a compliance date is set). When evaluating whether a particular set of pollution controls are "requirements", the USEPA considers a number of factors. These include:

1) The authority (local, state, federal) under which the controls are required and will be implemented with respect to sources contributing to the water quality impairment (examples may include: self-executing state or local regulations, permits, and contracts and grant/funding agreements that require implementation of necessary controls);
2) Existing commitments made by the sources and completion or soon-to-be-completed implementation of the controls (including an analysis of the amount of actual implementation that has already occurred);
3) The certainty of the dedicated funding for the implementation of the controls; and
4) Other relevant factors as determined by USEPA depending on case-specific circumstances.[47]

Impaired water bodies can be included in Category 4c if the failure to meet an applicable water quality standard is not caused by a pollutant, but is caused by

[47] USEPA, 2005. Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act.

other types of pollution. Pollution is defined in the Clean Water Act as "the mad-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of water". (Clean Water Act Section 502(19) In some cases, pollution does not result from a pollutant and a TMDL is not required. These causes may include segments impaired solely due to lack of adequate flow, stream channelization or hydro-modification. In these situations, there may be water quality management actions that can address the causes of the impairment, but a TMDL may not be required for their implementation.

In specific cases, implementation of plans to comply with WLAs and other TMDL requirements may demonstrate that TMDLs are not necessary for impaired water bodies. This conclusion must be supported by analytical documentation that demonstrates that technology-based effluent limitations required by the Clean Water Act; more stringent effluent limitations required by state, local, or federal authority; and/or other pollution control requirements required by local, state, or federal authority are stringent enough to satisfy water quality standards within a reasonable period of time. This would change the attainment status to Category 4b or 4c.

The water bodies placed in Category 4b or 4c of the Integrated Report must show a record that they are attaining water quality standards or supporting the identified beneficial uses, or will attain water quality standards or support identified beneficial uses in a reasonable period of time. This will allow the water bodies to be appropriately removed from the 303(d) List.

P. Section XIX: Program Effectiveness Assessments

Section XIX of the previous permit contained provisions that allowed revisions to the DAMP and controlled its content. Because the DAMP is no longer incorporated by reference into this Order and the Co-permittees can generally amend the DAMP and other related planning documents, the previous permit's requirements in Section XIX are not necessary. The previous content of Section XIX has been replaced with requirements for the performance of Program Effectiveness Assessments. The rationale for this change has been provided earlier in this Technical Report in Section VIII.C. above.

Section XIX requires that each Co-permittee have a program in place to objectively assess the effectiveness of best management practices employed in each of the elements of their storm water programs. Each Co-permittee's program must be documented in writing. The Principal Permittee is tasked with developing a model program effectiveness assessment. These requirements set

the expectation that common features of each of the Co-permittees' programs will generally be assessed in a similar way, but that there is no requirement that a completely uniform set of methods will be applied across each program. Each of the Co-permittees' programs must have the elements described in Section XIX.C.

The first required element are conceptual generalized models of pollution process(es). The development of conceptual models is the first step in developing more detailed quantitative models and eventually to developing solutions. They establish and communicate a baseline of understanding of a process. They can help identify parts of a process that are not well understood. And they can help identify opportunities where interventions or best management practices may be effective in getting a desired outcome[48].

A conceptual generalized model may be a graphical representation, but simple models may be expressed as written narratives. The Co-permittees have expressed simple models in written narratives in their Annual Progress Reports. For example, the Co-permittees have generally outlined the pollution processes for copper and certain pesticides and concluded that at least portions of the process are outside of their control. This model forms the basis for certain aspects of their storm water programs.

The required second element is an inventory of best management practices and where in the pollution process they are applied. This establishes a baseline condition and sets the context for monitoring and reporting results. Placing best management practices in relation to the pollution process can help identify imbalances and gaps. An imbalance may occur where BMPs disproportionately focus on prevention OR treatment of pollution. A gap may occur where there is a missed opportunity to implement a BMP in the pollution process.

The third element is a system to objectively measure the performance of the best management practices or groups of practices. This will include using performance measures prescribed by this Order and measures that will need to be developed by the Co-permittees. While the performance measures prescribed by this Order are enforceable if not achieved, performance measures developed by the Co-permittees will not be enforceable. However, failure to

[48] For an example of a model of littering behavior, see Sibley, Chris and Liu, James. *Differentiating Active and Passive Littering: A Two-Stage Process Model of Littering Behavior in Public Spaces*, available at: http://trashethnography.wikispaces.com/file/view/Differentiating+active+and+passive+littering--+a+two+stage+process+model+of+littering+behaviour+in+public+spaces.pdf

implement the "iterative process" when voluntary performance measures are not achieved will subject the Co-permittees to enforcement.

The final element is to evaluate the validity of the program. This element involves considering if the performance measures are genuinely relevant to what they are intended to measure. It also involves evaluating if the method used to measure outcomes is also valid. As part of this element, Co-permittees are encouraged to develop "S.M.A.R.T." goals. S.M.A.R.T. goals are performance measures that are Specific, Measurable, Attainable, Realistic, and Timely.

There are various resources which are widely available that describe how to develop S.M.A.R.T. goals. S.M.A.R.T. goals are known by other names, including, measurable goals, performance metrics, performance standards, targets and objectives. Performance measures, the term used most widely in this document, should align with more general goals found in this Order or, otherwise developed by the Co-permittees to be valid.Valid performance measures should have certain basic characteristics. The performance measure should:

- Have a need or purpose.
- Provide useful information.
- Focus toward a target or objective.
- Be measurable with reasonable accuracy and verifiable.
- Reflect the true status of the activity or project.
- Not be subject to alternative conflicting interpretation.
- Support proactive and adaptive management.
- Assist in evaluating the likelihood of success or failure.
- Be accepted by internal and external stakeholders as a tool for informed decision-making[49].

An example of a general goal established in the Order is Provision VII.E. Provision VII.E. describes a mandatory goal to "implement an effective program to reduce and/or eliminate the discharge of trash and debris to waters of the U.S." The Co-permittees would establish one or more performance measures to evaluate how they are achieving the mandatory goal and to demonstrate the effectiveness of their supporting activities (BMPs).

For example, the Co-permittees could establish the following performance measure: *Annually increase the proportion of new volunteers for coastal clean-*

[49] Adapted from Kerzner, H. (2013). *Project management: A systems approach to planning, scheduling, and controlling* (11th ed.). Wiley, Hoboken NJ.

up events. This example performance measure is aligned with permit-required goals to "raise awareness" and cause an audience "to take action to reduce pollution of urban runoff" in Provision XIII.1. and to "reduce and/or eliminate the discharge of trash and debris" in Provision VII.E. This performance measure is a S.M.A.R.T. goal because it specifically relates to a target audience and events; with baseline data, it can be measured; it is realistic; and can be measured annually.

The example performance measure will logically require a combination of tactics to be achieved, such as social media targeted at past participants and their friends and associates, along with traditional media favored by target demographics. But, where established by Co-permittees, the performance measure permits broad experimentation without the threat of enforcement action if it is not achieved. One outcome of pursuing the performance measure is that Co-permittees will develop an understanding of what combination of tactics are most effective to meet the Permit goals.

Q. Section XX: Fiscal Analysis

Section XX continues all of the requirements of the previous permit unchanged in substance with one modification. It has been re-written in a manner designed to make it clear that three fiscal years must be reported: the previous, current, and future years. A requirement has been added so that fiscal reports conform to USEPA reporting guidance if such guidance becomes available.

R. Section XXI : Provisions

Section XXI establishes procedures for public review and comment on any reports that are submitted according to this Order's requirements and which are subject to the Executive Officer's approval. Section XXI grants the Executive Officer the authority to review and approve changes to the Monitoring and Reporting Program, subject to public review and comment.

Section XXI had been modified from the previous Permit to no longer require that the Co-permittees implement the DAMP or other related, previously-approved plans or reports, except for those that are described as needing approval from the Executive Officer elsewhere in this Order. As discussed earlier, the DAMP and other previously-approved plans or reports, constitute all or a large part of written plans, procedures, or programs required elsewhere in this Order. They

are still necessary to demonstrate compliance with various requirements, although they may need to be updated or revised.

Section XXI continues the previous permit's requirements to report enforcement actions or discharges that may have an impact on human health and the environment and certain activities on land or facilities outside of the Co-permittees' jurisdiction that may be contributing pollutants to waters of the U.S.

S. Section XXII: Permit Modification

No changes have been made to the language of Section XXII.

T. Section XXIII: Permit Expiration and Renewal

Section XXIII establishes the expiration date of this Order. However, Provision XXIV.R. establishes that this Order will continue in full force and effect past its expiration date until a new permit is issued or the Regional Board rescinds this Order. Section XIII states that this Order is effective 50-days after the date of its adoption except where the Regional Administrator of the USEPA has objections. The previous Order is also withdrawn at that time. However, the Regional Board retains the authority to enforce the previous Order for any violations of its provisions or conditions at the time it was in effect.

U. Section XXIV: Standard Provisions

Section XXIV has been modified to incorporate standard provisions consistent with State Board policies regarding the preparation of NPDES permits. Standard Provisions apply to all NPDES permits according to 40CFR Section 122.41. Dischargers must comply with all standard provisions and with those additional conditions that are applicable under 40CFR Section 122.42.

V. Appendix A

Appendix A is a table showing which Co-permittees discharge into watersheds for which TMDLs have been adopted. Many Co-permittees discharge into more than one watershed. The table does not identify what portions of what cities drain into the watersheds. For some cities, their entire area may drain into a single watershed. For others, only a small portion may drain into another watershed.

This apportioning affects the level of responsibility (e.g. cost sharing) that each Co-permittee may assume for compliance with WLAs and other TMDL requirements. However, this apportioning is a matter that is addressed among the Co-permittees. The inclusion of the table in Appendix A is intended to identify the respective responsibilities of the Co-permittees to comply with WLAs and other TMDL requirements. It is not intended to indicate their level of responsibility.

The cities of Fountain Valley, Garden Grove, Huntington Beach, Villa Park, and Westminster are not shown in Appendix A. These Co-permittees do not discharge to waters for which there is an adopted TMDL.

Appendix A makes certain clarifications regarding the Newport Bay Watershed Nutrient TMDL, *Fecal Coliform* TMDL, and the Coyote Creek Metals TMDL. Appendix A shows that the cities of Laguna Hills and Laguna Woods contribute discharges for which pollutants are controlled by the Nutrient TMDL and the *Fecal Coliform* TMDL. These cities were not noted in these TMDLs at the time of their adoption. This is because the City of Laguna Woods was incorporated in 1999, at about the same time that these TMDLs were adopted in 1999 and 2000 respectively. In the case of the City of Laguna Hills, the City annexed its portion located in the Santa Ana Region in 2000. As the result of this timing, both cities were omitted from the Nutrient and *Fecal Coliform* TMDLs. Prior to incorporation or annexation, the areas of both cities were under the control of the County and still discharged into the Newport Bay watershed. Appendix A recognizes that the responsible parties have changed and clarifies that the responsible parties for these discharges are the cities of Laguna Hills and Laguna Woods.

For the Coyote Creek Metals TMDL, the table in Appendix A differs from the USEPA's TMDL[50]. This TMDL includes Table 7-1 which lists the cities in the San Gabriel Watershed by watershed sub-basin, including the Coyote Creek watershed. Appendix A reiterates that list but adds the City of Stanton and removes the City of Garden Grove. The City of Yorba Linda is shown in Appendix A conditionally.

[50] The Coyote Creek Metals TMDL is formally known as the "Total Maximum Daily Loads for Metals and Selenium: San Gabriel River and Impaired Tributaries" and is available at: http://www.waterboards.ca.gov/losangeles/water_issues/programs/tmdl/Established/San%20Gabriel%20River%20Metals%20TMDL/final_sangabriel_metalstmdl_3-27-07.pdf

The City of Stanton has been added because a review of County watershed maps shows that a small portion at its northern edge, bound by Beach Boulevard, Starr Street, and Fern Avenue (estimated at less than one acre) drains into the Coyote Creek watershed[51]. The same watershed maps show that the City of Garden Grove does not drain into the Coyote Creek watershed.

The City of Yorba Linda drains partly towards the Coyote Creek watershed. However, Orange County staff has reported that Orange County Water District has reported that this flow is diverted away from the Coyote Creek watershed and to the Santa Ana River by a gate located in the forebay to Miller Retarding Basin. The Basin is located at the southwest corner of the intersection of East Orangethorpe Avenue and North Miller Street. When open, the gate allows flow to continue down Carbon Creek where it may enter Coyote Creek. Although the City of Yorba Linda is shown in Appendix A, the City is only subject to the Coyote Creek Metals TMDL requirements if flows are allowed to enter Coyote Creek.

W. Appendices B through H

Appendices B through H contains water quality-based effluent limits ("WQBELs") that are based on WLAs and other requirements from 6 TMDLs that are applicable to the permit area. The WQBELs have been selected from the adopted TMDLs based on their applicability to the Co-permittees and their appropriateness to the Co-permittees' discharges.

Appendices B through H do not provide instruction on *how* the WQBELs will be complied with. That instruction is located in Section XVIII of the Order and Section II.B. of the Monitoring and Reporting Program. Appendices B through H are references containing *what* must be complied with.

Appendices B through H are subject to change during the term of this Order. In order to make changes, this Order may be modified, revoked, or reissued as described in Finding 7 and Subsection XXII.A. of the Order. Appendices B through H in particular may be amended in order to incorporate any requirements imposed upon the Co-permittees though the TMDL process. This process may result in new TMDLs or modifications to existing TMDLs.

Appendix C contains limited WQBELs for the *Fecal Coliform* TMDL for Newport Bay. While the WQBELs shown address objectives specified in the Basin Plan to protect shellfish harvesting (SHEL), none have been included which would apply

[51] The County's watershed map is available at:
http://ocwatersheds.com/civicax/filebank/blobdload.aspx?BlobID=10612

to objectives for water contact recreation (REC1). This is because the best available science no longer supports the use of *fecal coliform* as a reliable and appropriate indicator of the presence of pathogens and public health risk associated with water contact recreation. USEPA now recommends the use of an alternative bacteria indicator, *enterococcus*, in marine and estuarine waters.[52] Given this, implementing the REC1 objectives in the Basin Plan is no longer scientifically justified and enforcing related WQBELs in this Order would be an ineffective use of the Regional Board's resources.

XIII. Monitoring and Reporting Program

Monitoring and Reporting Program ("MRP") No. R8-2015-0001 is an attachment to Order No. R8-2015-0001. It contains requirements for both water quality monitoring, annual reporting, and for program effectiveness assessments. The requirements of the MRP are incorporated by reference into Order No. R8-2015-0001 and are enforceable. The MRP was written on the basis of the requirements of federal regulation and the Santa Ana Region Water Quality Monitoring Program developed by the Co-permittees as part of the 2003 DAMP (Exhibit 11.II).

The MRP contains requirements for both dry-weather and wet-weather monitoring as part of a Water Quality Monitoring Plan. The dry-weather monitoring requirements are based on the requirements of 40CFR40CFR122.26(d)(1)(iv)(D), (d)(1)(v)(B), and (d)(2)(iv)(B). The wet-weather monitoring requirements are based on the requirements of 40CFR40CFR122.269d)(2)(iii), (d)(2)(iii)(A) and (d)(2)(iii)(A)(1) through (4); and 40CFR40CFR122.21(g)(7)(i) through (ii). Requirements related to monitoring and reporting pollutant loads are consistent with 40CFR40CFR122.26(d)(2)(iii)(B) and (d)(2)(v). Requirements for receiving water monitoring are consistent with federal requirements to report "water quality improvements or degradation" according to 40CFR122.42(c)(7). Annual reporting requirements are consistent with 40CFR122.42(c).

The water quality monitoring requirements include requirements for the development of a Water Quality Monitoring Plan. The Water Quality Monitoring Plan must address monitoring to address illicit discharges/illicit connections, water quality standards attainment or non-attainment; and compliance with waste load allocations which are expressed as water quality-based effluent limits in Appendices B through H.

[52] USEPA, 2012 *Recreational Water Quality Criteria*, Office of Water, 820-F-12-058.

The Co-permittees have been implementing a water quality monitoring program for several decades. This program, in one form or another, has served multiple purposes beyond compliance with MS4 Permits requirements. This Order essentially requires re-documentation of the current program and provides the Co-permittees with an opportunity to make improvements in the process. The MRP is purposefully written without some of the detail found in the Co-permittees' Santa Ana Region Water Quality Monitoring Program to provide flexibility to the Co-permittees as they prepare a new Water Quality Monitoring Plan. The requirements in the MRP establish certain limitations to those improvements. The water quality monitoring requirements of the MRP will be consistent with the monitoring requirements in adopted TMDLs. The Executive Officer is authorized to amend the MRP, particularly if important program improvements are hindered by the MRP. The newly-documented program will be subject to public review and the review and approval of the Executive Officer.

The requirements in this Order and the MRP for effectiveness assessments are consistent with 40CFR40CFR122.42(c)(1), which requires reports of the "status of implementing the components of the storm water management program that are established as permit conditions." This includes use of the "iterative process" as well as other "management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants" as described in Clean Water Act Section 402(p)(3)(B)(iii).

The MRP requirements allow the Co-permittees to use monitoring work performed by others to substitute for work required by the MRP. The MRP requirements also allow the Co-permittees to supplement their own monitoring work with work performed by others to improve any related analyses. The substituted or supplemental monitoring work must meet the requirements of the MRP in order to be valid. The MRP has been written with the intent of encouraging the Co-permittees' participation in state-wide, national, regional, or local monitoring programs in order to avoid duplication of work, improve related analyses of monitoring results, promote cooperation among other NPDES permittees and other institutions interested in water quality, and generally strengthen the body of scientific and technical knowledge of water quality. In this spirit, Provision XXI.B.2. of the Order requires the Co-permittees to make the results of field and laboratory analyses available to the public.

The State Water Resources Control Board ("State Board") adopted Resolution No. 2012-0012, which approves exceptions to the California Ocean Plan for certain discharges into Areas of Special Biological Significance ("ASBS'"). Resolution No.

2012-0012 became effective on March 20, 2012. Attachment B to the Resolution established limitations on point source storm water discharges to ASBSs'. Among the Co-permittees, the City of Newport Beach is affected by Resolution No. 2012-0012. This Order requires the City of Newport Beach to comply with the Resolution, including monitoring of its discharge. The Monitoring and Reporting Plan must incorporate this monitoring effort.

The State Board has also adopted the Water Quality control Plan for Enclosed Bays and Estuaries of California – Part 1 Sediment Quality. This Plan became effective on August 25, 2009. The MRP includes requirements for the Co-permittees to monitor sediments in enclosed bays or estuary receiving waters consistent with this Plan.

DRAFT

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federal register

Friday
November 16, 1990

Part II

Environmental Protection Agency

40 CFR Parts 122, 123, and 124

National Pollutant Discharge Elimination System Permit Application Regulations for Storm Water Discharges; Final Rule

Printed on Recycled Paper

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 122, 123, and 124

[FRL-3834-7]

RIN 2040-AA79

National Pollutant Discharge Elimination System Permit Application Regulations for Storm Water Discharges

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: Today's final rule begins to implement section 402(p) of the Clean Water Act (CWA) (added by section 405 of the Water Quality Act of 1987 (WQA)), which requires the Environmental Protection Agency (EPA) to establish regulations setting forth National Pollutant Discharge Elimination System (NPDES) permit application requirements for: storm water discharges associated with industrial activity; discharges from a municipal separate storm sewer system serving a population of 250,000 or more; and discharges from municipal separate storm sewer systems serving a population of 100,000 or more, but less than 250,000.

Today's rule also clarifies the requirements of section 401 of the WQA, which amended CWA section 402(1)(2) to provide that NPDES permits shall not be required for discharges of storm water runoff from mining operations or oil and gas exploration, production, processing, or treatment operations or transmission facilities, composed entirely of flows which are from conveyances (including but not limited to pipes, conduits, ditches, and channels) used for collecting and conveying precipitation runoff and which are not contaminated by contact with, or do not come into contact with, any overburden, raw material, intermediate product, finished product, byproduct, or waste product located on the site of such operations. This rule sets forth NPDES permit application requirements addressing storm water discharges associated with industrial activity and storm water discharges from large and medium municipal separate storm sewer systems.

DATES: This final rule becomes effective December 17, 1990. In accordance with 40 CFR 23.2, this rule shall be considered final for purposes of judicial review on November 30, 1990, at 1 p.m. eastern daylight time. The public record is located at EPA Headquarters, EPA Public Information Reference Unit, room 2402, 401 M Street SW., Washington DC 20460. A reasonable fee may be charged for copying.

FOR FURTHER INFORMATION CONTACT: For further information on the rule contact: Thomas J. Seaton, Kevin Weiss, or Michael Mitchell Office of Water Enforcement and Permits (EN-336), United States Environmental Protection Agency, 401 M Street SW., Washington, DC 20460, (202) 475-9518.

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SUPPLEMENTARY INFORMATION:

I. Background and Water Quality Concerns

The 1972 amendments to the Federal Water Pollution Control Act (referred to as the Clean Water Act or CWA), prohibit the discharge of any pollutant to navigable waters from a point source unless the discharge is authorized by an NPDES permit. Efforts to improve water quality under the NPDES program traditionally and primarily focused on reducing pollutants in discharges of industrial process wastewater and municipal sewage. This program emphasis developed for a number of reasons. At the onset of the program in 1972, many sources of industrial process wastewater and municipal sewage were not adequately controlled and represented pressing environmental problems. In addition, sewage outfalls and industrial process discharges were easily identified as responsible for poor, often drastically degraded, water quality conditions. However, as pollution control measures were initially

developed for these discharges, it became evident that more diffuse sources (occurring over a wide area) of water pollution, such as agricultural and urban runoff were also major causes of water quality problems. Some diffuse sources of water pollution, such as agricultural storm water discharges and irrigation return flows, are statutorily exempted from the NPDES program.

Since enactment of the 1972 amendments to the CWA, considering the rise of economic activity and population, significant progress in controlling water pollution has been made, particularly with regard to industrial process wastewater and municipal sewage. Expenditures by EPA, the States, and local governments to construct and upgrade sewage treatment facilities have substantially increased the population served by higher levels of treatment. Backlogs of expired permits for industrial process wastewater discharges have been reduced. Continued improvements are expected for these discharges as the NPDES program continues to place increasing emphasis on water quality-based pollution controls, especially for toxic pollutants.

Although assessments of water quality are difficult to perform and verify, several national assessments of water quality are available. For the purpose of these assessments, urban runoff was considered to be a diffuse source or nonpoint source pollution. From a legal standpoint, however, most urban runoff is discharged through conveyances such as separate storm sewers or other conveyances which are point sources under the CWA. These discharges are subject to the NPDES program. The "National Water Quality Inventory, 1988 Report to Congress" provides a general assessment of water quality based on biennial reports submitted by the States under section 305(b) of the CWA. In preparing the section 305(b) Reports, the States were asked to indicate the fraction of the States' waters that were assessed, as well as the fraction of the States' waters that were fully supporting, partly supporting, or not supporting designated uses. The Report indicates that of the rivers, lakes, and estuaries that were assessed by States (approximately one-fifth of stream miles, one-third of lake acres and one-half of estuarine waters), roughly 70% to 75% are supporting the uses for which they are designated. For waters with use impairments, States were asked to determine impacts due to diffuse sources (agricultural and urban runoff and other sources), municipal sewage, industrial process wastewaters, combined sewer overflows, and natural and other sources, then combine impacts to arrive at estimates of the relative percentage of State waters affected by each source. In this manner, the relative importance of the various sources of pollution that are causing use impairments was assessed and weighted national averages were calculated. Based on 37 States that provided information on sources of pollution, industrial process wastewaters were cited as the cause of nonsupport for 7.5% of rivers and streams, 10% of lakes, and 6% of estuaries. Municipal sewage was the cause of nonsupport for 13% of rivers and streams, 5% lakes, 48% estuaries, 41% of the Great Lake shoreline, and 11% of coastal waters. The Assessment concluded that pollution from diffuse sources, such as runoff from agricultural, urban areas, construction sites, land disposal and resource extraction, is cited by the States as the leading cause of water quality impairment. These sources appear to be increasingly important contributors of use impairment as discharges of industrial process wastewaters and municipal sewage plants come under increased control and as intensified data collection efforts provide additional information. Some examples of diffuse sources cited as causing use impairment are: for rivers and streams, 9% from separate storm sewers, 6% from construction and 13% from resource extraction; for lakes, 28% from separate storm sewers and 26% from land disposal; for the Great Lakes shoreline, 10% from separate storm sewers, 34% from resource extraction, and 82% from land disposal; for estuaries, 28% from separate storm sewers and 27% from land disposal; and for coastal areas, 20% from separate storm sewers and 29% from land disposal.

The States conducted a more comprehensive study of diffuse pollution sources under the sponsorship of the Association of State and Interstate Water Pollution Control Administrators (ASIWPCA) and EPA. The study resulted in the report "America's Clean Water—The States' Nonpoint Source Assessment, 1985" which indicated that 38 States reported urban runoff as a major cause of beneficial use impairment. In addition, 21 States reported construction site runoff as a major cause of use impairment.

To provide a better understanding of the nature of urban runoff from commercial and residential areas, from 1978 through 1983, EPA provided funding and guidance to the Nationwide Urban Runoff Program (NURP). The NURP included 28 projects across the Nation, conducted separately at the local level but centrally reviewed, coordinated, and guided.

One focus of the NURP was to characterize the water quality of discharges from separate storm sewers which drain residential, commercial, and light industrial (industrial parks) sites. The majority of samples collected in the study were analyzed for eight conventional pollutants and three metals. Data collected under the NURP indicated that on an annual loading basis, suspended solids in discharges from separate storm sewers draining runoff from residential, commercial and light industrial areas are around an order of magnitude greater than solids in discharges from municipal secondary sewage treatment plants. In addition, the study indicated that annual loadings of chemical oxygen demand (COD) are comparable in magnitude to effluent from secondary sewage treatment plants. When analyzing annual loadings associated with urban runoff, it is important to recognize that discharges of urban runoff are highly intermittent, and that the short-term loadings associated with individual events will be high and may have shockloading effects on receiving water, such as low dissolved oxygen levels. NURP data also showed that fecal coliform counts in urban runoff are typically in the tens to hundreds of thousands per 100 ml of runoff during warm weather conditions, although the study suggested that fecal coliform may not be the most appropriate indicator organism for identifying potential health risks in storm water runoff. Although NURP did not evaluate oil and grease, other studies have demonstrated that urban runoff is an extremely important source of oil pollution to receiving waters, with hydrocarbon levels in urban runoff typically being reported at a range of 2 to 15 mg/l. These hydrocarbons tend to accumulate in bottom sediments where they may persist for long periods of time and exert adverse impacts on benthic organisms.

A portion of the NURP study involved monitoring 120 priority pollutants in storm water discharges from lands used for residential, commercial and light industrial activities. Seventy-seven priority pollutants were detected in samples of storm water discharges from residential, commercial and light industrial lands taken during the NURP study, including 14 inorganic and 63 organic pollutants. Table A-1 shows the priority pollutants which were detected in at least ten percent of the discharge samples which were sampled for priority pollutants.

TABLE A-1.— PRIORITY POLLUTANTS DETECTED IN AT LEAST 10% OF NURP SAMPLES

[In percent]

	Frequency of detection
Metals and inorganics:	
Antimony	13
Arsenic	52
Beryllium	12
Cadmium	48
Chromium	58
Copper	91
Cyanides	23
Lead	94
Nickel	43
Selenium	11
Zinc	94
Pesticides:	
Alpha-hexachlorocyclohexane	20
Alpha-endosulfan	19
Chlordane	17
Lindane	15
Halogenated aliphatics:	
Methane, dichloro-	11
Phenols and cresols:	
Phenol	14
Phenol, pentachloro-	19
Phenol, 4-nitro	10
Phthalate esters:	
Phthalate, bis(2-ethylhexyl)	22
Polycyclic aromatic hydrocarbons:	
Chrysene	10
Fluoranthene	16
Phenanthrene	12
Pyrene	15

The NURP data also showed a significant number of these samples exceeded various EPA freshwater water quality criteria.

The NURP study provides insight on what can be considered background levels of pollutants for urban runoff, as the study focused primarily on monitoring runoff from residential, commercial and light industrial areas. However, NURP concluded that the quality of urban runoff can be adversely impacted by several sources of pollutants that were not directly evaluated in the study and are generally not reflected in the NURP data, including illicit connections, construction site runoff, industrial site runoff and illegal dumping.

Other studies have shown that many storm sewers contain illicit discharges of non-storm water and that large amounts of wastes, particularly used oils, are improperly disposed in storm sewers. Removal of these discharges present opportunities for dramatic improvements in the quality of storm water discharges. Storm water discharges from industrial facilities may contain toxics and conventional pollutants when material management practices allow exposure to storm water, in addition to wastes from illicit connections and improperly disposed wastes.

In some municipalities, illicit connections of sanitary, commercial and industrial discharges to storm sewer systems have had a significant impact on the water quality of receiving waters. Although the NURP study did not emphasize the identification of illicit connections to storm sewers (other than to assure that monitoring sites used in the study were free from sanitary sewage contamination), the study concluded that illicit connections can result in high bacterial counts and dangers to public health. The study also noted that removing such discharges presented opportunities for dramatic improvements in the quality of urban storm water discharges.

Studies have shown that illicit connections to storm sewers can create severe, wide-spread contamination problems. For example, the Huron River Pollution Abatement Program inspected 660 businesses, homes and other buildings located in Washtenaw County, Michigan and identified 14% of the buildings as having improper storm drain connections. Illicit discharges were detected at a higher rate of 60% for automobile related businesses, including service stations, automobile dealerships, car washes, body shops and light industrial facilities. While some of the problems discovered in this study were the result of improper plumbing or illegal connections, a majority were approved connections at the time they were built.

Intensive construction activities may result in severe localized impacts on water quality because of high unit loads of pollutants, primarily sediments. Construction sites can also generate other pollutants such as phosphorus and nitrogen from fertilizer, pesticides, petroleum products, construction chemicals and solid wastes. These materials can be toxic to aquatic organisms and degrade water for drinking and water-contact recreation. Sediment loadings rates from construction sites are typically 10 to 20 times that of agricultural lands, with runoff rates as high as 100 times that of agricultural lands, and typically 1,000 to 2,000 times that of forest lands. Even a small amount of construction may have a significant negative impact on water quality in localized areas. Over a short period of time, construction sites can contribute more sediment to streams than was previously deposited over several decades.

II. Water Quality Act of 1987

The WQA contains three provisions which specifically address storm water discharges. The central WQA provision governing storm water discharges is section 405, which adds section 402(p) to the CWA. Section 402(p)(1) provides that EPA or NPDES States cannot require a permit for certain storm water discharges until October 1, 1992, except: for storm water discharges listed under section 402(p)(2). Section 402(p)(2) lists five types of storm water discharges which are required to obtain a permit prior to October 1, 1992:

(A) A discharge with respect to which a permit has been issued prior to February 4, 1987;

(B) A discharge associated with industrial activity;

(C) A discharge from a municipal separate storm sewer system serving a population of 250,000 or more;

(D) A discharge from a municipal separate storm sewer system serving a population of 100,000 or more, but less than 250,000; or

(E) A discharge for which the Administrator or the State, as the case may be, determines that the storm water discharge contributes to a violation of a water quality standard or is a significant contributor of pollutants to the waters of the United States.

Section 402(p)(4)(A) requires EPA to promulgate final regulations governing storm water permit application requirements for storm water discharges associated with industrial activity and discharges from large municipal separate storm sewer systems (systems serving a population of 250,000 or more), "no later than two years" after the date of enactment (*i.e.*, no later than February 4, 1989). Section 402(p)(4)(B) also requires EPA to promulgate final regulations governing storm water permit application requirements for discharges from medium municipal separate storm sewer systems (systems serving a population of 100,000 or more but less than 250,000) "no later than four years" after enactment (*i.e.*, no later than February 4, 1991).

In addition, section 402(p)(4) provides that permit applications for storm water discharges associated with industrial activity and discharges from large municipal separate storm sewer systems "shall be filed no later than three years" after the date of enactment of the WQA (*i.e.*, no later than February 4, 1990). Permit applications for discharges from medium municipal systems must be filed "no later than five years" after enactment (*i.e.*, no later than February 4, 1992).

The WQA clarified and amended the requirements for permits for storm water discharges in the new CWA section 402(p)(3). The Act clarified that permits for discharges associated with industrial activity must meet all of the applicable provisions of section 402 and section 301

including technology and water quality based standards. However, the new Act makes significant changes to the permit standards for discharges from municipal storm sewers. Section 402(p)(3)(B) provides that permits for such discharges:

(i) May be issued on a system- or jurisdiction-wide basis;

(ii) Shall include a requirement to effectively prohibit non-storm water discharges into the storm sewers; and

(iii) Shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants.

These changes are discussed in more detail later in today's rule.

The EPA, in consultation with the States, is required to conduct two studies on storm water discharges that are in the class of discharges for which EPA and NPDES States cannot require permits prior to October 1, 1992. The first study will identify those storm water discharges or classes of storm water discharges for which permits are not required prior to October 1, 1992, and determine, to the maximum extent practicable, the nature and extent of pollutants in such discharges. The second study is for the purpose of establishing procedures and methods to control storm water discharges to the extent necessary to mitigate impacts on water quality. Based on the two studies the EPA, in consultation with State and local officials, is required to issue regulations no later than October 1, 1992, which designate additional storm water discharges to be regulated to protect water quality and establish a comprehensive program to regulate such designated sources. This program must, at a minimum, (A) Establish priorities, (B) establish requirements for State storm water management programs, and (C) establish expeditious deadlines. The program may include performance standards, guidelines, guidance, and management practices and treatment requirements, as appropriate.

Section 401 of the WQA amends section 402(1)(2) of the CWA to provide that the EPA shall not require a permit for discharges of storm water runoff from mining operations or oil and gas exploration, production, processing, or treatment operations or transmission facilities if the storm water discharge is not contaminated by contact with, or does not come into contact with, any overburden, raw material, intermediate product, finished product, byproduct, or waste product located on the site of such operations.

Section 503 of the WQA amends section 502(14) of the CWA to exclude agricultural storm water discharges from the definition of point source.

III. Remand of 1984 Regulations

On December 4, 1987, the United States Court of Appeals for the District of Columbia Circuit vacated 40 CFR 122.26, (as promulgated on September 26, 1984, 49 FR 37998, September 26, 1984), and remanded the regulations to EPA for further rulemaking (*NRDC* v. *EPA*, No. 80–1607). EPA had requested the remand because of significant changes made by the storm water provisions of the WQA. The effect of the decision was to invalidate the storm water discharge regulations then found at § 122.26.

Storm water discharges which had been issued an NPDES permit prior to February 4, 1987, were not affected by the Court remand or the February 12, 1988, rule implementing the court order (53 FR 4157). (*See* section 402(p)(2)(A) of the CWA.) Similarly, the remand did not affect the authority of EPA or an NPDES State to require a permit for any storm water discharge (except an agricultural storm water discharge) designated under section 402(p)(2)(E) of the CWA. The notice of the remand clarified that such designated discharges meet the regulatory definition of point source found at 40 CFR 122.2 and that EPA or an NPDES State can rely on the statutory authority and require the filing of an application (Form 1 and Form 2C) for an NPDES permit with respect to such discharges on a case-by-case basis.

IV. Codification Rule and Case-by-Case Designations

Codification Rule

On January 4, 1989, (54 FR 255), EPA published a final rule which codified numerous provisions of the WQA into EPA regulations. The codification rule included several provisions dealing with storm water discharges. The codification rule promulgated the language found at section 402(p) (1) and (2) of the amended Clean Water Act at 40 CFR 122.26(a)(1). In addition, the codification rule promulgated the language of Section 503 of the WQA which exempted agricultural storm water discharges from the definition of point source at 40 CFR 122.2, and section 401 of the WQA addressing uncontaminated storm water discharges from mining or oil and gas operations at 40 CFR 122.26(a)(2).

EPA also codified the statutory authority of section 402(p)(2)(E) of the CWA for the Administrator or the State Director, as the case may be, to designate storm water discharges for a permit on a case-by-case basis at 40 CFR 122.26(a)(1)(v).

Case by Case Designations

Section 402(p)(2)(E) of the CWA authorizes case-by-case designations of storm water discharges for immediate permitting if the Administrator or the State Director determines that the storm water discharge contributes to a violation of a water quality standard or is a significant contributor of pollutants to waters of the United States.

In determining that a storm water discharge contributes to a violation of a water quality standard or is a significant contributor of pollutants to waters of the United States for the purpose of a designation under section 402(p)(2)(E), the legislative history for the provision provides that "EPA or the State should use any available water quality or sampling data to determine whether the latter two criteria (contributes to a violation of a water quality standard or is a significant contributor of pollutants to waters of the United States) are met, and should require additional sampling as necessary to determine whether or not these criteria are met." Conference Report, *Cong. Rec.* S16443 (daily ed. October 16, 1986). In accordance with this legislative history, today's rule promulgates permit application requirements for certain storm water discharges, including discharges designated on a case-by-case basis. EPA will consider a number of factors when determining whether a storm water discharge is a significant contributor of pollution to the waters of the United States. These factors include: the location of the discharge with respect to waters of the United States; the size of the discharge; the quantity and nature of the pollutants reaching waters of the United States; and any other relevant factors. Today's rule incorporates these factors at 40 CFR 122.26(a)(1)(v).

Under today's rule, case-by-case designations are made under regulatory procedures found at 40 CFR 124.52. The procedures at 40 CFR 124.52 require that whenever the Director decides that an individual permit is required, the Director shall notify the discharger in writing that the discharge requires a permit and the reasons for the decision. In addition, an application form is sent with the notice. Section 124.52 provides a 60 day period from the date of notice for submitting a permit application. Although this 60 day period may be appropriate for many designated storm water discharges, site specific factors may dictate that the Director provide

additional time for submitting a permit application. For example, due to the complexities associated with designation of a municipal separate storm sewer system for a system- or jurisdiction-wide permit, the Director may provide the applicant with additional time to submit relevant information or may require that information be submitted in several phases.

V. Consent Decree of October 20, 1989

On April 20, 1989, EPA was served notice of intent to sue by Kathy Williams *et al*, because of the Agency's failure to promulgate final storm regulations on February 4, 1989, pursuant to Section 402(p)(4) of the CWA. A suit was filed by the same party on July 20, 1989, alleging the same cause of action, to wit: the Agency's failure to promulgate regulations under section 402(p)(4) of the CWA. On October 20, 1989, EPA entered into a consent decree with Kathy Williams *et al*, wherein the Federal District Court, District of Oregon, Southern Division, decreed that the Agency promulgate final regulations for storm water discharges identified in sections 402(p)(2) (B) and (C) of the CWA no later than July 20, 1990. *Kathy Williams et al.*, v. *William K. Reilly, Administrator, et al.*, No. 89-6265-E (D-Ore.) In July 1990, the consent degree was amended to provide for a promulgation date of October 31. Today's rule is promulgated in compliance with the terms of the consent decree as amended.

VI. Today's Final Rule and Response to Comments

A. Overview

Section 405 of the WQA alters the regulatory approach to control pollutants in storm water discharges by adopting a phased and tiered approach. The new provision phases in permit application requirements, permit issuance deadlines and compliance with permit conditions for different categories of storm water discharges. The approach is tiered in that storm water discharges associated with industrial activity must comply with sections 301 and 402 of the CWA (requiring control of the discharge of pollutants that utilize the Best Available Technology (BAT) and the Best Conventional Pollutant Control Technology (BCT) and where necessary, water quality-based controls), but permits for discharges from municipal separate storm sewer systems must require controls to reduce the discharge of pollutants to the maximum extent practicable, and where necessary water quality-based controls, and must include a requirement to effectively prohibit non-storm water discharges into the storm sewers. Furthermore, EPA in consultation with State and local officials must develop a comprehensive program to designate and regulate other storm water discharges to protect water quality.

This final regulation establishes requirements for the storm water permit application process. It also sets forth the required components of municipal storm water quality management plans, as well as a preliminary permitting strategy for industrial activities. In implementing these regulations, EPA and the States will strive to achieve environmental results in a cost effective manner by placing high priority on pollution prevention activities, and by targeting activities based on reducing risk from particularly harmful pollutants and/or from discharges to high value waters. EPA and the States will also work with applicants to avoid cross media transfers of storm water contaminants, especially through injection to shallow wells in the Class V Underground Injection Control Program.

In addition, EPA recognizes that problems associated with storm water, combined sewer overflows (CSOs) and infiltration and inflow (I&I) are all inter-related even though they are treated somewhat differently under the law. EPA believes that it is important to begin linking these programs and activities and, because of the potential cost to local governments, to investigate the use of innovative, non-traditional approaches to reducing or preventing contamination of storm water.

The application process for developing municipal storm water management plans provides an ideal opportunity between steps 1 and 2 for considering the full range of nontraditional, preventive approaches, including municipalities, public awareness/education programs, use of vegetation and/or land conservancy practices, alternative paving materials, creative ways to eliminate I&I and illegal hook-ups, and potentials for water reuse. EPA has already announced its plans to present an award for the best creative, cost effective approaches to storm water and CSOs beginning in 1991.

This rulemaking establishes permit application requirements for classes of storm water discharges that were specifically identified in section 402(p)(2). These priority storm water discharges include storm water discharges associated with industrial activity and discharges from a municipal separate storm sewer serving a population of 100,000 or more.

This rulemaking was developed after careful consideration of 450 sets of comments, comprising over 3200 pages, that were received from a variety of industries, trade associations, municipalities, State and Federal Agencies, environmental groups, and private citizens. These comments were received during a 90-day comment period which extended from December 7, 1988, to March 7, 1989. EPA received several requests for an extension of the comment period from 30-days up to 90-days. Many arguments were advanced for an extension including: the extent and complexity of the proposal, the existence of other concurrent EPA proposals, and the need for technical evaluations of the proposal. EPA considered these comments as they were received, but declined to extend the comment period beyond 90 days. The standard comment period on proposals normally range from 30 to 60 days. In light of the statutory deadline of February 4, 1989, additional time for the comment period beyond what was already a substantially lengthened comment period would have been inappropriate. The number and extent of the comments received on this proposal indicated that interested parties had substantially adequate time to review and comment on the regulation. Furthermore, the public was invited to attend six public meetings in Washington DC, Chicago, Dallas, Oakland, Jacksonville, and Boston to present questions and comments. EPA is convinced that substantial and adequate public participation was sought and received by the Agency.

Numerous commenters have also requested that the rule be reproposed due to the extent of the proposal and the number of options and issues upon which the Agency requested comments. EPA has decided against a reproposal. The December 7, 1988, notice of proposed rulemaking was extremely detailed and thoroughly identified major issues in such a manner as to allow the public clear opportunities to comment. The comments that were received were extensive, and many provided valuable information and ideas that have been incorporated into the regulation. Accordingly, the Agency is confident it has produced a workable and rational approach to the initial regulation of storm water discharges and a regulation that reflects the experience and knowledge of the public as provided in the comments, and which was developed in accordance with the

procedural requirements of the Administrative Procedures Act (APA). EPA believes that while the number of issues raised by the proposal was extensive, the number of detailed comments indicates that the public was able to understand the issues in order to comment adequately. Thus, a reproposal is unnecessary.

B. Definition of Storm Water

The December 7, 1988, notice requested comment on defining storm water as storm water runoff, surface runoff, street wash waters related to street cleaning or maintenance, infiltration (other than infiltration contaminated by seepage from sanitary sewers or by other discharges) and drainage related to storm events or snow melt. This definition is consistent with the regulatory definition of "storm sewer" at 40 CFR 35.2005(b)(47) which is used in the context of grants for construction of treatment works. This definition aids in distinguishing separate storm water sewers from sanitary sewers, combined sewers, process discharge outfalls and non-storm water, non-process discharge outfalls.

The definition of "storm water" has an important bearing on the NPDES permitting scheme under the CWA. The following discusses the interrelationship of NPDES permitting requirements for storm water discharges addressed by this rule and NPDES permitting requirements for other non-storm water discharges which may be discharged via the storm sewer as a storm water discharge. Today's rule addresses permit application requirements for storm water discharges associated with industrial activity and for discharges from municipal separate storm sewer systems serving a population of 100,000 or more. Storm water discharges associated with industrial activity are to be covered by permits which contain technology-based controls based on BAT/BCT considerations or water quality-based controls, if necessary. A permit for storm water discharges from an industrial facility may also cover other non-storm water discharges from the facility. Today's rule establishes individual (Form 1 and Form 2F) and group application requirements for storm water discharges associated with industrial activity. In addition, EPA or authorized NPDES States with authorized general permit programs may issue general permits which establish alternative application or notification requirements for storm water discharges covered by the general permit(s). Where a storm water discharge associated with industrial activity is mixed with a non-storm water discharge, both discharges must be covered by an NPDES permit (this can be in the same permit or with multiple permits). Permit application requirements for these "combination" discharges are discussed later in today's notice.

Today's rule also addresses permit application requirements for discharges from municipal separate storm sewer systems serving a population of 100,000 or more. Under today's rule, appropriate municipal owners or operators of these systems must obtain NPDES permits for discharges from these systems. These permits are to establish controls to the maximum extent practicable (MEP), effectively prohibit non-storm water discharges to the municipal separate storm sewer system and, where necessary, contain applicable water quality-based controls. Where non-storm water discharges or storm water discharges associated with industrial activity discharge through a municipal separate storm sewer system (including systems serving a population of 100,000 or more as well as other systems), which ultimately discharges to a waters of the United States, such discharges through a municipal storm sewer need to be covered by an NPDES permit that is independent of the permit issued for discharges from the municipal separate storm sewer system. Today's rule defines the term "illicit discharge" to describe any discharge through a municipal separate storm sewer that is not composed entirely of storm water and that is not covered by an NPDES permit. Such illicit discharges are not authorized under the CWA. Section 402(p)(3)(B) of the CWA requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-storm water discharges from the municipal separate storm sewer. As discussed in more detail below, today's rule begins to implement the "effective prohibition" by requiring municipal operators of municipal separate storm sewer systems serving a population of 100,000 or more to submit a description of a program to detect and control certain non-storm water discharges to their municipal system. Ultimately, such non-storm water discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit (other than the permit for the discharge from the municipal separate storm sewer). For reasons discussed in more detail below, in general, municipalities will not be held responsible for prohibiting some specific components of discharges or flows listed below through their municipal separate storm sewer system, even though such components may be considered non-storm water discharges, unless such discharges are specifically identified on a case-by-case basis as needing to be addressed. However, operators of such non-storm water discharges need to obtain NPDES permits for these discharges under the present framework of the CWA (rather than the municipal operator of the municipal separate storm sewer system). (Note that section 516 of the Water Quality Act of 1987 requires EPA to conduct a study of de minimis discharges of pollutants to waters of the United States and to determine the most effective and appropriate methods of regulating any such discharges.)

EPA received numerous comments on the proposed regulatory definition of storm water, many of which proposed exclusions or additions to the definition. Several commenters suggested that the definition should include or not include detention and retention reservoir releases, water line flushing, fire hydrant flushing, runoff from fire fighting, swimming pool drainage and discharge, landscape irrigation, diverted stream flows, uncontaminated pumped ground water, rising ground waters, discharges from potable water sources, uncontaminated waters from cooling towers, foundation drains, non-contact cooling water (such as HVAC or heating, ventilation and air conditioning condensation water that POTWs require to be discharged to separate storm sewers rather than sanitary sewers), irrigation water, springs, roof drains, water from crawl space pumps, footing drains, lawn watering, individual car washing, flows from riparian habitats and wetlands. Most of these comments were made with regard to the concern that these were commonly occurring discharges which did not pose significant environmental problems. It was also noted that, unless these flows are classified as storm water, permits would be required for these discharges.

In response to the comments which requested EPA to define the term "storm water" broadly to include a number of classes of discharges which are not in any way related to precipitation events, EPA believes that this rulemaking is not an appropriate forum for addressing the appropriate regulation under the NPDES program of such non-storm water discharges, even though some classes of non-storm water discharges may typically contain only minimal amounts of pollutants. Congress did not intend that the term storm water be used to describe any discharge that has a de minimis amount of pollutants, nor did it intend for section 402(p) to be used to

provide a moratorium from permitting other non-storm water discharges. Consequently, the final definition of storm water has not been expanded from what was proposed. However, as discussed in more detail later in today's notice, municipal operators of municipal separate storm sewer systems will generally not be held responsible for "effectively prohibiting" limited classes of these discharges through their municipal separate storm sewer systems.

The proposed rule included infiltration in the definition of storm water. In this context one commenter suggested that the term infiltration be defined. Infiltration is defined at 40 CFR 35.2005(b)(20) as water other than wastewater that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections or manholes. Infiltration does not include, and is distinguished from, inflow. Another commenter urged that ground water infiltration not be classified as storm water because the chemical characteristics and contaminants of ground water will differ from surface storm water because of a longer contact period with materials in the soil and because ground water quality will not reflect current practices at the site. In today's rule, the definition of storm water excludes infiltration since pollutants in these flows will depend on a large number of factors, including interactions with soil and past land use practices at a given site. Further infiltration flows can be contaminated by sources that are not related to precipitation events, such as seepage from sanitary sewers. Accordingly the final regulatory language does not include infiltration in the definition of storm water. Such flows may be subject to appropriate permit conditions in industrial permits. As discussed in more detail below, municipal management programs must address infiltration where identified as a source of pollutants to waters of the United States.

One commenter questioned the status of discharges from detention and retention basins used to collect storm water. This regulation covers discharges of storm water associated with industrial activity and discharges from municipal separate storm sewer systems serving a population of 100,000 or more into waters of the United States. Therefore, discharges from basins that are part of a conveyance system for a storm water discharge associated with industrial activity or part of a municipal separate storm sewer system serving a population of 100,000 or more are covered by this regulation. Flows which are channeled into basins and which do not discharge into waters of the United States are not addressed by today's rule.

Several commenters requested that the term illicit connection be replaced with a term that does not connote illegal discharges or activity, because many discharges of non-storm water to municipal separate storm sewer systems occurred prior to the establishment of the NPDES program and in accordance with local or State requirements at the time of the connection. EPA disagrees that there should be a change in this terminology. The fact that these connections were at one time legal does not confer such status now. The CWA prohibits the point source discharge of non-storm water not subject to an NPDES permit through municipal separate storm sewers to waters of the United States. Thus, classifying such discharges as illicit properly identifies such discharges as being illegal.

A commenter wanted clarification of the terms "other discharges" and "drainage" that are used in the definition of "storm water." As noted above, today's rule clarifies that infiltration is not considered storm water. Thus the portion of the definition of storm water that refers to "other discharges" has also been removed. However, the term drainage has been retained. "Drainage" does not take on any meaning other than the flow of runoff into a conveyance, as the word is commonly understood.

One commenter stated that irrigation flows combined with storm water discharges should be excluded from consideration in the storm water program. The Agency would note that irrigation return flows are excluded from regulation under the NPDES program. Section 402(l)(1) states that the Administrator or the State shall not require permits for discharges composed entirely of return flows from irrigated agriculture. The legislative history of the 1977 Clean Water Act, which enacted this language, states that the word "entirely" was intended to limit the exception to only those flows which do not contain additional discharges from activities unrelated to crop production. Congressional Record Vol. 123 (1977), pg. 4360, Senate Report No. 95–370. Accordingly, a storm water discharge component, from an industrial facility for example, included in such "joint" discharges may be regulated pursuant to an NPDES permit either at the point at which the storm water flow enters or joins the irrigation flow, or where the combined flow enters waters of the United States or a municipal separate storm sewer.

Some commenters expressed concern about including street wash waters as storm water. One commenter argued including street wash waters in the definition of storm water should not be construed to eliminate the need for management practices relating to construction activities where sediment may simply wash into storm drains. EPA agrees with these points and the concerns that storm sewers may receive material that pose environmental problems if street wash waters are included in the definition. Accordingly, such discharges are no longer in the definition as proposed, and must be addressed by municipal management programs as part of the prohibition on non-storm water discharges through municipal separate storm sewer systems.

Several commenters requested that the terms discharge and point source, in the context of permits for storm water discharge, be clarified. Several commenters stated that the EPA should clarify that storm water discharge does not include "sheet flow" off of an industrial facility. EPA interprets this as request for clarification on the status of the terms "point source" and "discharge" under these regulations. In response, this rulemaking only covers storm water discharges from point sources. A point source is defined at 40 CFR 122.2 as "any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff." EPA agrees with one commenter that this definition is adequate for defining what discharges of storm water are covered by this rulemaking. EPA notes that this definition would encompass municipal separate storm sewers. In view of this comprehensive definition of point source, EPA need clarify in this rulemaking only that a storm water discharge subject to NPDES regulation does not include storm water that enters the waters of the United States via means other than a "point source." As further discussed below, storm water from an industrial facility which enters and is subsequently discharged through a municipal separate storm sewer is a "discharge associated with industrial

activity" which must be covered by an individual or general permit pursuant to today's rule.

EPA would also note that individual facilities have the burden of determining whether a permit application should be submitted to address a point source discharge. Those unsure of the classification of storm water flow from a facility, should file permit applications addressing the flow, or prior to submitting the application consult permitting authorities for clarification.

One commenter stated that "point source" for this rulemaking should be defined, for the purposes of achieving better water quality, as those areas where "discharges leave the municipal [separate storm sewer] system." EPA notes in response that "point source" as currently defined will address such discharges, while keeping the definition of discharge and point source within the framework of the NPDES program, and without adding potentially confusing and ambiguous additional definitions to the regulation. If this comment is asserting that the term point source should not include discharges from sources through the municipal system, EPA disagrees. As discussed in detail below, discharges through municipal separate storm sewer systems which are not connected to an operable treatment works are discharges subject to NPDES permit requirements at (40 CFR 122.3(c)), and may properly be deemed point sources.

One industry argued that the definition of "point source" should be modified for storm water discharges so as to exclude discharges from land that is not artificially graded and which has a propensity to form channels where precipitation runs off. EPA intends to embrace the broadest possible definition of point source consistent with the legislative intent of the CWA and court interpretations to include any identifiable conveyance from which pollutants might enter the waters of the United States. In most court cases interpreting the term "point source", the term has been interpreted broadly. For example, the holding in *Sierra Club* v. *Abston Construction Co., Inc.*, 620 F.2d 41 (5th Cir. 1980) indicates that changing the surface of land or establishing grading patterns on land will result in a point source where the runoff from the site is ultimately discharged to waters of the United States:

> Simple erosion over the material surface, resulting in the discharge of water and other materials into navigable waters, does not constitute a point source discharge, absent some effort to *change the surface*, to *direct* the water flow or otherwise impede its progress * * * Gravity flow, resulting in a discharge into a navigable body of water, may be part of a point source discharge if the (discharger) at least initially collected or channeled the water and other materials. A point source of pollution may also be present where (dischargers) design spoil piles from discarded overburden such that, during periods of precipitation, erosion of spoil pile walls results in discharges into a navigable body of water by means of ditches, gullies and similar conveyances, even if the (dischargers) have done nothing beyond the mere collection of rock and other materials * * * Nothing in the Act relieves (dischargers) from liability simply because the operators did not actually construct those conveyances, so long as they are reasonably likely to be the means by which pollutants are ultimately deposited into a navigable body of water. Conveyances of pollution formed either as a result of natural erosion or by material means, and which constitute a component of a * * * drainage system, may fit the statutory definition and thereby subject the operators to liability under the Act." 620 F.2d at 45 (emphasis added).

Under this approach, point source discharges of storm water result from structures which increase the imperviousness of the ground which acts to collect runoff, with runoff being conveyed along the resulting drainage or grading patterns.

The entire thrust of today's regulation is to control pollutants that enter receiving water from storm water conveyances. It is these conveyances that will carry the largest volume of water and higher levels of pollutants. The storm water permit application process and permit conditions will address circumstances and discharges peculiar to individual facilities.

One industry commented that the definition of waters of the State under some State NPDES programs included municipal storm sewer systems. The commenter was concerned that certain industrial facilities discharging through municipal storm sewers in these states would be required to obtain an NPDES permit, despite EPA's proposal not to require permits from such facilities generally. In response, EPA notes that section 510 of the CWA, approved States are able to have stricter requirements in their NPDES program. In approved NPDES States, the definition of waters of the State controls with regard to what constitutes a discharge to a water body. However, EPA believes that this will have little impact, since, as discussed below, all industrial dischargers, including those discharging through municipal separate storm sewer systems, will be subject to general or individual NPDES permits, regardless of any additional State requirements.

One municipality commented that neither the term "point source" nor "discharge" should be used in conjunction with industrial releases into urban storm water systems because that gives the impression that such systems are navigable waters. EPA disagrees that any confusion should result from the use of these terms in this context. In this rulemaking, EPA always addresses such discharges as "discharges through municipal separate storm sewer systems" as opposed to "discharges to waters of the United States." Nonetheless, such industrial discharges through municipal storm sewer systems are subject to the requirements of today's rule, as discussed elsewhere.

One commenter desired clarification with regard to what constituted an outfall, and if an outfall could be a pipe that connected two storm water conveyances. This rulemaking defines outfall as a point of discharge into the waters of the United States, and not a conveyance which connects to Sections of municipal separate storm sewer. In response to another comment, this rulemaking only addresses discharges to waters of United States, consequently discharges to ground waters are not covered by this rulemaking (unless there is a hydrological connection between the ground water and a nearby surface water body. *See, e.g., Exxon Corp.* v. *Train*, 554 F.2d 1310, 1312 n.1 (5th Cir. 1977); *McClellan Ecological Seepage Situation* v. *Weinberger*, 707 F.Supp. 1182, 1195–96 (E.D. Cal. 1988)).

In the WQA and other places, the term "storm water" is presented as a single word. Numerous comments were received by EPA as to the appropriate spelling. Many of these comments recommended that two words for storm water is appropriate. EPA has decided to use an approach consistent with the Government Printing Office's approved form where storm water appears as two words.

C. Responsibility for Storm Water Discharges Associated With Industrial Activity Through Municipal Separate Storm Sewers

The December 7, 1988, notice of proposed rulemaking requested comments on the appropriate permitting scheme for storm water discharges associated with industrial activity through municipal separate storm sewers. EPA proposed a permitting scheme that would define the requirement to obtain coverage under an NPDES permit for a storm water discharge associated with industrial activity through a municipal separate storm sewer in terms of the classification of the municipal separate storm sewer. EPA proposed holding municipal operators of large or medium

municipal separate storm sewer systems primarily responsible for applying for and obtaining an NPDES permit covering system discharges as well as storm water discharges (including storm water discharges associated with industrial activity) through the system. Under the proposed approach, operators of storm water discharges associated with industrial activity which discharge through a large or medium municipal separate storm sewer system would generally not be required to obtain permit coverage for their discharge (unless designated as a significant contributor of pollution pursuant to section 402(p)(2)(E)) provided the municipality was notified of: The name, location and type of facility and a certification that the discharge has been tested (if feasible) for non-storm water (including the results of any testing). The notification procedure also required the operator of the storm water discharge associated with industrial activity to determine that: The discharge is composed entirely of storm water; the discharge does not contain hazardous substances in excess of reporting quantities; and the facility is in compliance with applicable provisions of the NPDES permit issued to the municipality for storm water.

In the proposal, EPA also requested comments on whether a decision on regulatory requirements for storm water discharges associated with industrial activity through other municipal separate storm sewer systems (generally those serving a population of less than 100,000) should be postponed until completion of two studies of storm water discharges required under section 402(p)(5) of the CWA.

EPA favored these approaches because they appeared to reduce the potential administrative burden associated with preparing and processing the thousands of permit applications associated with the rulemaking and provide EPA additional flexibility in developing permitting requirements for storm water discharges associated with industrial activity. EPA also expressed its belief, based upon an analysis of ordinances controlling construction site runoff in place in certain cities, that municipalities generally possessed legal authority sufficient to control contributions of industrial storm water pollutants to their separate storm sewers to the degree necessary to implement the proposed rule. EPA commented that municipal controls on industrial sources implemented to comply with an NPDES permit issued to the municipality would likely result in a level of storm water pollution control very similar to that put directly on the industrial source through its own NPDES permit. This was to be accomplished by requiring municipal permitees, to the maximum extent practicable, to require industrial facilities in the municipality to develop and implement storm water controls based on a consideration of the same or similar factors as those used to make BAT/BCT determinations. (*See* 40 CFR 125.3 (d)(2) and (d)(3)).

The great majority of commenters on the December 7, 1988, notice addressed this aspect of the proposal. Based on consideration of the comments received on the notice, EPA has decided that it is appropriate to revise the approach in its proposed rule to require direct permit coverage for all storm water discharges associated with industrial activity, including those that discharge through municipal separate storm sewers. In response to this decision, EPA has continued to analyze the appropriate manner to respond to the large number of storm water discharges subject to this rulemaking. The development of EPA's policy regarding permitting these discharges is discussed in more detail in the section VI.D of today's preamble.

EPA notes that the status of discharges associated with industrial activity which pass through a municipal separate storm sewer system under section 402(p) raises difficult legal and policy questions. EPA believes that treating these discharges under permits separate from those issued to the municipality will most fully address both the legal and policy concerns raised in public comment.

Certain commenters supported EPA's proposal. Some commenters claimed that EPA lacked any authority to permit industrial discharges which were not discharged immediately to waters of the U.S. Other commenters agreed with EPA's statements in the proposal that its approach would result in a more manageable administrative burden for EPA and the NPDES states. However, numerous comments also were received which provided various arguments in support of revising the proposed approach. These comments addressed several areas including the definition of discharge under the CWA, the requirements and associated statutory time frames of section 402(p), as well as the resource and enforcement constraints of municipalities. EPA is persuaded by these comments and has modified its approach accordingly. The key comments on this issue are discussed below.

EPA disagrees with commenters who suggested that EPA lacks authority to permit separately industrial discharges through municipal sewers. The CWA prohibits the discharge of a pollutant except pursuant to an NPDES permit. Section 502(12)(A) of the CWA defines the "discharge of a pollutant" as "any addition of any pollutant to navigable waters from any point source." [1] There is no qualification in the statutory language regarding the source of the pollutants being discharged. Thus, pollutants from a remote location which are discharged through a point source conveyance controlled by a different entity (such as a municipal storm sewer) are nonetheless discharges for which a permit is required.

EPA's regulatory definition of the term "discharge" reflects this broad construction. EPA defines the term to include

> additions of pollutants into waters of the United States from: surface runoff which is collected or channelled by man; *discharges through pipes, sewers, or other conveyances owned by a State, municipality, or other person which does not lead to a treatment works;* and discharges through pipes, sewers, or other conveyances, leading into privately owned treatment works.

40 CFR § 122.2 (1989) (emphasis added). The only exception to this general rule is the one contemplated by section 307(b) of the CWA, *i.e.*, the introduction of pollutants into publicly-owned treatment works. EPA treats these as "indirect discharges," subject not to NPDES requirements, but to pretreatment standards under section 307(b).

In light of its construction of the term discharge, EPA has consistently maintained that a person who sends pollutants from a remote location through a point source into a water of the U.S. may be held liable for the unpermitted discharge of that pollutant. Thus, EPA asserts the authority to require a permit either from the operator of the point source conveyance, (such as a municipal storm sewer or a privately-owned treatment works), or from any person causing pollutants to be present in that conveyance and discharged through the point source, or both. *See Decision of the General Counsel (of EPA) No. 43* ("In re Friendswood Development Co.") (June 11, 1976) (operator of privately owned treatment work and dischargers to it are both subject to NPDES permit requirements). *See also*, 40 CFR 122.3(g), 122.44(m)

[1] Indeed, the DC Circuit has held, in the storm water context, that EPA may not exempt any point source discharges of pollutants from the requirement to obtain an NPDES permit. *NRDC* v. *Costle*, 569 F.2d 1369, 1377 (DC Cir. 1977).

(NPDES permit writer has discretion to permit contributors to a privately owned treatment works as direct dischargers). In other words, where pollutants are added by one person to a conveyance owned/operated by another person, and that conveyance discharges those pollutants through a point source, EPA may permit either person or both to ensure that the discharge is properly controlled. Pollutants from industrial sites discharged through a storm sewer to a point source are appropriately treated in this fashion.

Furthermore, EPA believes that storm water from an industrial plant which is discharged through a municipal storm sewer is a "discharge associated with industrial activity." Today's rule, as in the proposal, defines discharges associated with industrial activity solely in terms of the origin of the storm water runoff. There is no distinction for how the storm water reaches the waters of the U.S. In other words, pollutants in storm water from an industrial plant which are discharged are "associated with industrial activity," regardless of whether the industrial facility operates the conveyance discharging the storm water (or whether the storm water is ultimately discharged through a municipal storm sewer). Indeed, there is no distinction in the "industrial" nature of these two types of discharges. The pollutants of concern in an industrial storm water discharge are present when the storm water leaves the facility, either through an industrial or municipal storm water conveyance. EPA has no data to suggest that the pollutants in industrial storm water entering a municipal storm sewer are any different than those in storm water discharged immediately to a water of the U.S. Thus, industrial storm water in a municipal sewer is properly classified as "associated with industrial activity." Although EPA proposed not to cover these discharges by separate permit, the Agency believes that it is clearly not precluded from doing so.

Many comments also supported the proposed approach, noting that holding municipalities primarily responsible for obtaining a permit which covers industrial storm water discharges through municipal systems would reduce the administrative burden associated with preparing and processing thousands of permit applications—permit applications that would be submitted if each industrial discharger through a large or medium municipal separate storm sewer system had to apply individually (or as part of a group application).

EPA appreciates these concerns. Yet EPA also recognizes that there are also significant problems with putting the burden of controlling these sources on the municipalities (except for designated discharges) which must be balanced with the concerns about the permit application burden on industries. The industrial permitting strategy discussed in section VI.D below attempts to achieve this balance.

EPA also does not believe that the administrative burden will be nearly as significant as originally thought, for several reasons. First, as discussed in section VI.F.2 below and in response to significant public comment, EPA has significantly narrowed the scope of the definition of "associated with industrial activity" to focus in on those facilities which are most commonly considered "industrial" and thought to have the potential for the highest levels of pollutants in their storm water discharges. EPA believes this is a more appropriate way to ensure a manageable scope for the industrial storm water program in light of the statutory language of section 402(p), since it does not attempt to arbitrarily distinguish industrial facilities on the basis of the ownership of the conveyance through which a facility discharges its storm water. Second, EPA's industrial permitting strategy discussed in section VI.D is designed around aggressive use of general permits to cover the vast majority of industrial sources. These general permits will require industrial facilities to develop storm water control plans and practices similar to those that would have been required by the municipality. Yet, general permits will eliminate the need for thousands of individual or group permit applications, greatly reducing the burden on both industry EPA/States. Finally, even under the proposal, EPA believes that a large number of industrial dischargers would have been appropriate for designation for individual permitting under section 402(p)(2)(E), with the attendant individual application requirements. Today's approach will actually decrease the overall burden on these facilities; rather than filing an individual permit application upon designation, these facilities will generally be covered by a general permit.

By contrast, several commenters asserted that not only does EPA have the authority to cover these discharges by separate permit, it is required to by the language of section 402(p). As discussed above, storm water from an industrial plant which passes through a municipal storm sewer to a point source and is discharged to waters of the U.S. is a "discharge associated with industrial activity." Therefore, it is subject to the appropriate requirements of section 402(p). The operator of the discharge (or the industrial facility where the storm water originates) must apply for a permit within three years of the 1987 amendments (*i.e.*, Feb. 4, 1990);[2] EPA must issue a permit by one year later (Feb. 4, 1991); and the permit must require compliance within three years of permit issuance. That permit must ensure that the discharge is in compliance with all appropriate provisions of sections 301 and 402. Commenters asserted that EPA's proposal would violate these two requirements of the law. First, the statute requires all industrial storm water discharges to obtain a permit in the first round of permitting (*i.e.*, February 4, 1990). However, Congress established a different framework to address discharges from small municipal separate storm sewer systems. Section 402(p) requires EPA to complete two studies of storm water discharges, and based on those studies, promulgate additional regulations, including requirements for state storm water management programs by October 1, 1992. EPA is prohibited from issuing permits for storm water discharges from small municipal systems until October 1, 1992 unless the discharge is designated under section 402(p)(2)(E). Thus, industrial storm water discharges from these systems would not be covered by a permit until later than contemplated by statute. Second, permits for municipal storm sewer systems require controls on storm water discharges "to the maximum extent practicable," as opposed to the BAT/BCT requirements of section 301(b)(2). Yet, all industrial storm water discharges must comply with section 301(b)(2). Thus, covering industrial storm water under a municipal storm water permit will not ensure the legally-required level of control of industrial storm water discharges.

In addition to comments on the requirements of section 402(p), EPA received several comments questioning whether EPA's proposal to cover industrial pollutants in municipal separate storm sewers solely in the permit issued to the municipality would ensure adequate control of these pollutants due to both inadequate

[2] It should be noted that EPA did not promulgate the required storm water regulations by February, 1989, as contemplated by section 402(p)(4)(A). As discussed below, today's rule generally requires industrial storm water discharges to file a permit application in one year.

resources and enforcement. Some municipalities stated that the burdens of this responsibility would be too great with regard to source identification and general administration of the program. These commenters claimed they lacked the necessary technical and regulatory expertise to regulate such sources. Commenters also noted that additional resources to control these sources would be difficult to obtain given the restrictions on local taxation in many states and the fact that EPA will not be providing funding to local governments to implement their storm water programs.

Municipalities also expressed concerns regarding enforcement of EPA's proposed approach. Some municipalities remarked that they did not have appropriate legal authority to address these discharges. Several commenters also stated that requiring municipalities to be responsible for addressing storm water discharges associated with industrial activity through their municipal system would result in unequal treatment of industries nationwide because of different municipal requirements and enforcement procedures. Several municipal entities expressed concern with regard to their responsibility and liability for pollutants discharged to their municipal storm sewer system, and further asserted that it was unfair to require municipalities to bear the full cost of controlling such pollutants. Other municipalities suggested that overall municipal storm water control would be impaired, since municipalities would spend a disproportionate amount of resources trying to control industrial discharges through their sewers, rather than addressing other storm water problems. In a related vein, certain commenters suggested that, where industrial storm water was a significant problem in a municipal sewer, EPA's proposed approach would hamper enforcement at the federal/state level, since all enforcement measures could be directed only at the municipality, rather than at the most direct source of that problem.

In response to all of these concerns, EPA has decided to require storm water discharges associated with industrial activity which discharge through municipal separate storm sewers to obtain separate individual or general NPDES permits. EPA believes that this change will adequately address all of the key concerns raised by commenters.

The Agency was particularly influenced by concerns that many municipalities lacked the authority under state law to address industrial storm water practices. EPA had assumed that since several cities regulate construction site activities, that they could regulate other industrial operations in a similar manner. Several commenters suggested otherwise. In light of these concerns, EPA agrees with certain commenters that municipal controls on industrial facilities, in lieu of federal control, might not comply with section 402(p)(3)(A) for those facilities.[3] This calls into question whether EPA's proposed approach would have reasonably implemented Congressional intent to address industrial storm water early and stringently in the permitting process.

EPA also agrees with those commenters who argued that municipal controls on industrial storm water sources were not directly analogous to the pretreatment program under section 307(b), as EPA suggested in the preamble to the proposal. The authority of cities to control the type and volume of industrial pollutants into a POTW is generally unquestioned under the laws of most states, since sewage and industrial waste treatment is a service provided by the municipality. Thus, EPA has greater confidence that cities can and will adopt effective pretreatment programs. By contrast, many cities are limited in the types of controls they can impose on flows into storm sewers; cities are more often limited to regulations on quantity of industrial flows to prevent flooding the system. So too, the pretreatment program allows for federal enforcement of local pretreatment requirements. Enforcement against direct dischargers (including dischargers through municipal storm sewers) is possible only when the municipal requirements are contained in an NPDES permit.

Although today's rule will require industrial discharges through municipal storm sewers to be covered by separate permit, EPA still believes that municipal operators of large and medium municipal systems have an important role in source identification and the development of pollutant controls for industries that discharge storm water through municipal separate storm sewer systems is appropriate. Under the CWA, large and medium municipalities are responsible for reducing pollutants in discharges from municipal separate storm sewers to the maximum extent practicable. Because storm water from industrial facilities may be a major contributor of pollutants to municipal separate storm sewer systems, municipalities are obligated to develop controls for storm water discharges associated with industrial activity through their system in their storm water management program. (*See* section VI.H.7. of today's preamble.) The CWA provides that permits for municipal separate storm sewers shall require municipalities to reduce pollutants to the maximum extent practicable. Permits issued to municipalities for discharges from municipal separate storm sewers will reflect terms, specified controls, and programs that achieve that goal. As with all NPDES permits, responsibility and liability is determined by the discharger's compliance with the terms of the permit. A municipality's responsibility for industrial storm water discharged through their system is governed by the terms of the permit issued. If an industrial source discharges storm water through a municipal separate storm sewer in violation of requirements incorporated into a permit for the industrial facility's discharge, that industrial operator of the discharge may be subject to an enforcement action instituted by the Director of the NPDES program.

Today's rule also requires operators of storm water discharges associated with industrial activity through large and medium municipal systems to provide municipal entities of the name, location, and type of facility that is discharging to the municipal system. This information will provide municipalities with a base of information from which management plans can be devised and implemented. This requirement is in addition to any requirements contained in the industrial facility's permit. As in the proposal, the notification process will assist cities in development of their industrial control programs.

EPA intends for the NPDES program, through requirements in permits for storm water discharges associated with industrial activity, to work in concert with municipalities in the industrial component of their storm water management program efforts. EPA believes that permitting of municipal storm sewer systems and the industrial discharges through them will act in a complementary manner to fully control the pollutants in those sewer systems. This will fully implement the intent of

[3] EPA notes that the legal issue raised by commenters regarding whether industrial storm water would be controlled to BAT if covered by a municipal permit at the MEP level is primarily a theoretical issue. As explained above, the proposal assumed that cities would establish controls on industry very similar to those established in an NPDES permit using best professional judgment. EPA's key concern, ratner, is whether cities can, in fact, establish such controls. Thus, today's final rule should not appreciably change the requirements to be imposed on industrial sources, only how those requirements are enforced.

Congress to control industrial as well as large and medium municipal storm water discharges as expeditiously and effectively as possible. This approach will also address the concerns of municipalities that they lack sufficient authority and resources to control all industrial contributions to their storm sewers and will be liable for discharges outside of their control.

The permit application requirements for large and medium municipal separate storm sewer systems, discussed in more detail later in today's preamble, address the responsibilities of the municipal operators of these systems to identify and control pollutants in storm water discharges associated with industrial activity. Permit applications for large and medium municipal separate storm sewer systems are to identify the location of facilities which discharge storm water associated with industrial activity to the municipal system (*see* section VI.H.7. of the preamble). In addition, municipal applicants will provide a description of a proposed management program to reduce, to the maximum extent practicable, pollutants from storm water discharges associated with industrial activity which discharge to the municipal system (*see* section VI.H.7.c of this preamble). EPA notes that each municipal program will be tailored to the conditions in that city. Differences in regional weather patterns, hydrology, water quality standards, and storm sewer systems themselves dictate that storm water management practices will vary to some degree in each municipality. Accordingly, similar industrial storm water discharges may be treated differently in terms of the requirements imposed by the municipality, depending on the municipal program. Nonetheless, any individual or general permit issued to the industrial facility must comply with section 402(p)(3)(A) of the CWA.

EPA intends to provide assistance and guidance to municipalities and permitting authorities for developing storm water management programs that achieve permit requirements. EPA intends to issue a guidance document addressing municipal permit applications in the near term.

Controls developed in management plans for municipal system permits may take a variety of forms. Where necessary, municipal permittees can pursue local remedies to develop measures to reduce pollutants or halt storm water discharges with high levels of pollutants through municipal storm sewer systems. Some local entities have already implemented ordinances or laws that are designed to reduce the discharge of pollutants to municipal separate storm sewers, while other municipalities have developed a variety of techniques to control pollutants in storm water. Alternatively, where appropriate, municipal permittees may develop end-of-pipe controls to control pollutants in these discharges such as regional wet detention ponds or diverting flow to publicly owned treatment works. Finally, municipal applicants may bring individual storm water discharges, which cannot be adequately controlled by the municipal permittees or general permit coverage, to the attention of the permitting authority. Then, at the Director's discretion, appropriate additional controls can be required in the permit for the facility generating the targeted storm water discharge.

One commenter suggested that municipal operators of municipal separate storm sewers should have control over all storm water discharges from a facility that discharges both through the municipal system and to waters of the United States. In response, under this regulatory and statutory scheme, industries that discharge storm water directly into the waters of the United States, through municipal separate storm sewer systems, or both are required to obtain permit coverage for their discharges. However, municipalities are not precluded from exercising control over such facilities through their own municipal authorities.

It is important to note that EPA has established effluent guideline limitations for storm water discharges for nine subcategories of industrial dischargers (Cement Manufacturing (40 CFR part 411), Feedlots (40 CFR part 412), Fertilizer Manufacturing (40 CFR part 418), Petroleum Refining (40 CFR part 419), Phosphate Manufacturing (40 CFR part 422), Steam Electric (40 CFR part 423), Coal Mining (40 CFR part 434), Ore Mining and Dressing (40 CFR part 440) and Asphalt (40 CFR part 441)). Most of the existing facilities in these subcategories already have individual permits for their storm water discharges. Under today's rule, facilities with existing NPDES permits for storm water discharges through a municipal storm sewer will be required to maintain these permits and apply for an individual permit, under § 122.26(c), when existing permits expire. EPA received numerous comments supporting this decision because requiring facilities that have existing permits to comply with today's requirements immediately would be inefficient and not serve improved water quality.

Sections 402(p) (1) and (2) of the CWA provide that discharges from municipal separate storm sewer systems serving a population of less than 100,000 are not required to obtain a permit prior to October 1, 1992, unless designated on a case-by-case basis under section 402(p)(2)(E). However, as discussed above, storm water discharges associated with industrial activity through such municipal systems are not excluded. Thus, under today's rule, all storm water discharges associated with industrial activity that discharge through municipal separate storm sewer systems are required to obtain NPDES permit coverage, including those which discharge through systems serving populations less than 100,000. EPA believes requiring permits will address the legal concerns raised by commenters regarding these sources. In addition, it will allow for control of these significant sources of pollution while EPA continues to study under section 402(p)(6) whether to require the development of municipal storm water management plans in these municipalities. If these municipalities do ultimately obtain NPDES permits for their municipal separate storm sewer systems, early permitting of the industrial contributions may aid those cities in their storm water management efforts.

In the December 7, 1988, proposal, EPA recognized that storm water discharges associated with industrial activity from Federal facilities through municipal separate storm sewer systems may pose unique legal and administrative situations. EPA received numerous comments on this issue, with most of these comments coming from cities and counties. The comments reflected a general concern with respect to a municipality's ability to control Federal storm water discharges through municipal separate storm sewer systems. Most municipalities stated that they do not have the legal authority to adequately enforce against problem storm water discharges from Federal facilities and that these facilities should be required to obtain separate storm water permits. Some commenters stated that they have no Constitutional authority to regulate Federal facilities or establish regulation for such facilities. Some commenters indicated that Federal facilities could not be inspected, monitored, or subjected to enforcement for national security and other jurisdictional reasons. Some commenters argued that without clearly stated legal authority for the municipality, such dischargers should be required to obtain permits. One

municipality pointed out that Federal facilities within city limits are exempted from their Erosion and Sediment Control Act and that permits for these facilities should be required.

Under today's rule, Federal facilities which discharge storm water associated with industrial activity through municipal separate storm sewer systems will be required to obtain NPDES permit coverage under Federal or State law. EPA believes this will cure the legal authority problems at the local level raised by the commenters. EPA notes that this requirement is consistent with section 313(a) of the CWA.

D. Preliminary Permitting Strategy for Storm Water Discharges Associated With Industrial Activity

Many of the comments received on the December 7, 1988, proposal focused on the difficulties that EPA Regions and authorized NPDES States, with their finite resources, will have in implementing an effective permitting program for the large number of storm water discharges associated with industrial activity. Many commenters noted that problems with implementing permit programs are caused not only by the large number of industrial facilities subject to the program, but by the difficulties associated with identifying appropriate technologies for controlling storm water at various sites and the differences in the nature and extent of storm water discharges from different types of industrial facilities.

EPA recognizes these concerns; and based on a consideration of comments from authorized NPDES States, municipalities, industrial facilities and environmental groups on the permitting framework and permit application requirements for storm water discharges associated with industrial activity, EPA is in the process of developing a preliminary strategy for permitting storm water discharges associated with industrial activity. In developing this strategy, EPA recognizes that the CWA provides flexibility in the manner in which NPDES permits are issued.[4] EPA intends to use this flexibility in designing a workable and reasonable permitting system. In accordance with these considerations, EPA intends to publish in the near future a discussion of its preliminary permitting strategy for implementing the NPDES storm water program.

The preliminary strategy is intended to establish a framework for developing permitting priorities, and includes a four tier set of priorities for issuing permits to be implemented over time:

- *Tier I—baseline permitting:* One or more general permits will be developed to initially cover the majority of storm water discharges associated with industrial activity;
- *Tier II—watershed permitting:* Facilities within watersheds shown to be adversely impacted by storm water discharges associated with industrial activity will be targeted for permitting.
- *Tier III—industry specific permitting:* Specific industry categories will be targeted for individual or industry-specific permits; and
- *Tier IV—facility specific permitting:* A variety of factors will be used to target specific facilities for individual permits.

Tier I—Baseline Permitting

EPA intends to issue general permits that initially cover the majority of storm water discharges associated with industrial activity in States without authorized NPDES programs. These permits will also serve as models for States with authorized NPDES programs.

The consolidation of many sources under one permit will greatly reduce the otherwise overwhelming administrative burden associated with permitting storm water discharges associated with industrial activity. This approach has a number of additional advantages, including:

- Requirements will be established for discharges covered by the permit;
- Facilities whose discharges are covered by the permit will have an opportunity for substantial compliance with the CWA;
- The public, including municipal operators of municipal separate storm sewers which may receive storm water discharges associated with industrial activity, will have access under section 308(b) of the CWA to monitoring data and certain other information developed by the permittee;
- EPA will have the opportunity to begin to collect and review data on storm water discharges from priority industries, thereby supporting the development of subsequent permitting activities;
- Applicable requirements of municipal storm water management programs established in permits for discharges from municipal separate storm sewer systems will be enforceable directly against non-complying industrial facilities that generate the discharges;
- The public will be given an opportunity to comment on permitting activities;
- The baseline permits will provide a basis for bringing selected enforcement actions by eliminating many issues which might otherwise arise in an enforcement proceeding; and
- Finally, the baseline permits will provide a focus for public comment on the development of subsequent phases of the permitting strategy for storm water discharges, including the development of priorities for State storm water management programs developed under section 402(p)(6) of the CWA.

Initially, the coverage of the baseline permits will be broad, but the coverage is intended to shrink as other permits are issued for storm water discharges associated with industrial activities pursuant to Tier II through IV activities.

2. Tier II—Watershed Permitting

Facilities within watersheds shown to be adversely impacted by storm water discharges associated with industrial activity will be targeted for individual and general permitting. This process can be initiated by identifying receiving waters (or segments of receiving waters) where storm water discharges associated with industrial activity have been identified as a source of use impairment or are suspected to be contributing to use impairment.

3. Tier III—Industry Specific Permitting

Specific industry categories will be targeted for individual or industry-specific general permits. These permits will allow permitting authorities to focus attention and resources on industry categories of particular concern and/or industry categories where tailored requirements are appropriate. EPA will work with the States to coordinate the development of model permits for selected classes of industrial storm water discharges. EPA is also working to identify priority industrial categories in the two reports to Congress required under section 402(p)(5) of the CWA. In addition, group applications that are received can be used to develop model permits for the appropriate industries

[4] The courts in *NRDC* v. *Train*, 396 F.Supp. 1393 (D.D.C. 1975) *aff'd*, *NRDC* v. *Costle*, 568 F.2d 1369 (DC Cir. 1977), have acknowledged the administrative burden placed on the Agency by requiring individual permits for a large number of storm water discharges. These courts have recognized EPA's discretion to use certain administrative devices, such as area permits or general permits to help manage its workload. In addition, the courts have recognized flexibility in the type of permit conditions that are established, including requirements for best management practices.

4. Tier IV—Facility Specific Permitting

Individual permits will be appropriate for some storm water discharges in addition to those identified under Tier II and III activities. Individual permits should be issued where warranted by: the pollution potential of the discharge; the need for individual control mechanisms; and in cases where reduced administrative burdens exist. For example, individual NPDES permits for facilities with process discharges should be expanded during the normal process of permit reissuance to cover storm water discharges from the facility.

5. Relationship of Strategy to Permit Applications Requirements

The preliminary long-term permitting strategy described above identifies several permit schemes that EPA anticipates will be used in addressing storm water discharges associated with industrial activity. One issue that arises with this strategy is determining the appropriate information needed to develop and issue permits for these discharges. The NPDES regulatory scheme provides three major options for obtaining permit coverage for storm water discharges associated with industrial activity: (1) Individual permit applications; (2) group applications; and (3) case-by-case requirements developed for general permit coverage.

a. *Individual permit application requirements.* Today's notice establishes requirements for individual permit applications for storm water discharges associated with industrial activity. These application requirements are applicable for all storm water discharges associated with industrial activity, except where the operator of the discharge is participating in a group application or a general permit is issued to cover the discharge and the general permit provides alternative means to obtain permit coverage. Information in individual applications is intended to be used in developing the site-specific conditions generally associated with individual permits.

Individual permit applications are expected to play an important role in all tiers of the Strategy, even where general permits are used. Although general permits may provide for notification requirements that operate in lieu of the requirement to submit individual permit applications, the individual permit applications may be needed under several circumstances. Examples include: where a general permit requires the submission of a permit application as the notice of intent to be covered by the permit; where the owner or operator authorized by a general permit requests to be excluded from the coverage of the general permit by applying for a permit (*see* 40 CFR 122.28(b)(2)(iii) for EPA issued general permits); and where the Director requires an owner or operator authorized by a general permit to apply for an individual permit (*see* 40 CFR 122.28(b)(2)(ii) for EPA issued general permits).

b. *Group applications.* Today's rule also promulgates requirements for group applications for storm water discharges associated with industrial activity. These applications provide participants of groups with sufficiently similar storm water discharges an alternative mechanism for applying for permit coverage.

The group application requirements are primarily intended to provide information for developing industry specific general permits. (Group applications can also be used to issue individual permits in authorized NPDES States without general permit authority or where otherwise appropriate). As such, group application requirements correlate well with the Tier III permitting activities identified in the long-term permitting Strategy.

c. *Case-by-case requirements.* 40 CFR 122.21(a) excludes persons covered by general permits from requirements to submit individual permit applications. Further, the general permit regulations at 40 CFR 122.28 do not address the issue of how a potential permittee is to apply to be covered under a general permit. Rather, conditions for notification of intent (NOI) to be covered by the general permit are established in the permits on a case-by-case basis, and operate in lieu of permit application requirements. Requirements for submitting NOIs to be covered by a general permit can range from full applications (this would be Form 1 and Form 2F for most discharges composed entirely of storm water discharges associated with industrial activity), to no notice. EPA recommends that the NOI requirements established in a general permit for storm water discharges associated with industrial activity be commensurate with the needs of the permit writer in establishing the permit and the permit program. The baseline general permit described in Tier I is intended to support the development of controls for storm water discharges associated with industrial activity that can be supported by the limited resources of the permitting Agency. In this regard, the burdens of receiving and reviewing NOI's from the large number of facilities covered by the permit should also be considered when developing NOI requirements. In addition, NOI requirements should be developed in conjunction with permit conditions establishing reporting requirements during the term of the permit.

NOI requirements in general permits can establish a mechanism which can be used to establish a clear accounting of the number of permittees covered by the general permit, the nature of operations at the facility generating the discharge, their identity and location. The NOI can be used as an initial screening tool to determine discharges where individual permits are appropriate. Also, the NOI can be used to identify classes of discharges appropriate for more specific general permits, as well as provide information needed to notify such dischargers of the issuance of a more specific general permit. In addition, the NOI can provide for the identification of the permittee to provide a basis for enforcement and compliance monitoring strategies. EPA will further address this issue in the context of specific general permits it plans to issue in the near future.

Today's rule requires that individual permit applications for storm water discharges associated with industrial activity be submitted within one year from the date of publication of this notice. EPA is considering issuing general permits for the majority of storm water discharges associated with industrial activity in those States and territories that do not have authorized State NPDES programs (MA, ME, NH, FL, LA, TX, OK, NM, SD, AZ, AK, ID, District of Columbia, the Commonwealth of Puerto Rico, Guam, American Samoa, the Commonwealth of the Northern Mariana Islands, and the Trust Territory of the Pacific Islands) before that date to enable industrial dischargers of storm water to ascertain whether they are eligible for coverage under a general permit (and subject to any alternative notification requirements established by the general permit in lieu of the individual permit application requirements of today's rule) or whether they must submit an individual permit application (or participate in a group application) before the regulatory deadlines for submitting these applications passes. Storm water application deadlines are discussed in further detail below.

E. Storm Water Discharge Sampling

Storm water discharges are intermittent by their nature, and pollutant concentrations in storm water discharges will be highly variable. Not only will variability arise between given events, but the flow and pollutant

concentrations of such discharges will vary with time during an event. This variability raises two technical problems: how best to characterize the discharge associated with a single storm event; and how best to characterize the variability between discharges of different events that may be caused by seasonal changes and changes in material management practices, for example.

Prior to today's rulemaking, 40 CFR 122.21(g)(7) required that applicants for NPDES permits submit quantitative data based on one grab sample taken every hour of the discharge for the first four hours of discharge. EPA has modified this requirement such that, instead of collecting and analyzing four grab samples individually, applicants for permits addressing storm water discharges associated with industrial activity will provide data as indicators of two sets of conditions: data collected during the first 30 minutes of discharge and flow-weighted average storm event concentrations. Large and medium municipalities will provide data on flow-weighted average storm event concentrations only.

Data describing pollutants in a grab sample taken during the first few minutes of the discharge can often be used as a screen for non-storm water discharges to separate storm sewers because such pollutants may be flushed out of the system during the initial portion of the discharge. In addition, data from the first few minutes of a discharge are useful because much of the traditional structural technology used to control storm water discharges, including detention and retention devices, may only provide controls for the first portion of the discharge, with relatively little or no control for the remainder of the discharge. Data from the first portion of the discharge will give an indication of the potential usefulness of these techniques to reduce pollutants in storm water discharges. Also, such discharges may be primarily responsible for pollutant shocks to the ecosystem in receiving waters.

Studies such as NURP have shown that flow-weighted average concentrations of storm water discharges are useful for estimating pollutant loads and for evaluating certain concentration-based water quality impacts. The use of flow-weighted composite samples are also consistent with comments raised by various industry representatives during previous Agency rulemakings that continuous monitoring of discharges from storm events is necessary to adequately characterize such discharges.

EPA requested comment on the feasibility of the proposed modification of sampling procedures at § 122.21(g)(7) and the ability to characterize pollutants in storm water discharges with an average concentration from the first portion of the discharge compared to collecting and separately analyzing four grab samples. It was proposed that an event composite sample be collected, as well as a grab sample collected during the first 20 minutes of runoff. Comments were solicited as to whether or not this sampling method would provide better definition of the storm load for runoff characterization than would the requirement to collect and separately analyze four grab samples.

Many commenters questioned the ability to obtain a 20 minute sample in the absence of automatic samplers. Some believed that pollutants measured by such a sample can be accounted for in the event composite sample. Others argued that this is an unwarranted sampling effort if municipal storm water management plans are to be geared to achieving annual pollutant load reductions. Many commenters advised that problems accessing sampling stations and mobilizing sampling crews, particularly after working hours, made sampling during the first 20 minutes impractical. These comments were made particularly with respect to municipalities, where the geographical areas could encompass several hundred square miles. Several alternatives were suggested including: the collection of a sample in the first hour, and representative grab sampling in the next three hours, one per hour; or perform time proportioned sampling for up to four hours.

Because of the logistical problems associated with collecting samples during the first few minutes of discharge from municipal systems, EPA will only require such sampling from industrial facilities. Municipal systems will be spread out over many square miles with sampling locations potentially several miles from public works departments or other responsible government agencies. Reaching such locations in order to obtain samples during the first few minutes of a storm event may prove impossible. For essentially the same reasons, the requirement has been modified to encompass the first 30 minutes of the discharge, instead of 20 minutes, for industrial discharges. The rule also clarifies that the sample should be taken during the first 30 minutes or as soon thereafter as practicable. Where appropriate, characterization of this portion of the discharge from selected outfalls or sampling points may be a condition to permits issued to municipalities. With regard to protocols for the collection of sample aliquots for flow-weighted composite samples, § 122.21(g)(7) provides that municipal applicants may collect flow-weighted composite samples using different protocols with respect to the time duration between the collection of sample aliquots, subject to the approval of the Director or Regional Administrator. In other words, the period may be extended from 15 minutes to 20 or 25 minutes between sample aliquots, or decreased from 15 to 10 or 5 minutes.

Other comments raised issues that apply both to the impact of runoff characterization and the first discharge representation. These primarily pertained to regions that have well defined wet and dry seasons. Comments questioned whether or not it is fair to assume that the initial storm or two of a wet season, which will have very high pollutant concentrations, are actually representative of the runoff concentrations for the area.

In response, EPA believes that it is important to represent the first part of the discharge either separately or as a part of the event composite samples. This loading is made up primarily of the mass of unattached fine particulates and readily soluble surface load that accumulates between storms. This load washes off of the basin's directly connected paved surfaces when the runoff velocities reach the level required for entrainment of the particulate load into the surface flow. It should be noted that for very fine particulates and solubles, this can occur very soon after the storm begins and much sooner than the peak flow. The first few minutes of discharge represents a shock load to the receiving water, in terms of concentration of pollutants, because for many constituents the highest concentrations of the event will occur during this initial period. Due to the need to properly quantify this load, it is not necessary to represent the first discharge from the upper reaches of the outfall's tributary area. In runoff characterization basins, the assumption is that the land use in the basin is homogeneous, or nearly so, and that the first discharge from the lower reaches for all intents and purposes is representative of the entire basin. If a sample is taken during the first 30 minutes of the runoff, it will be composed primarily of first discharge. If the sample is taken at the outfall an hour into the event, it may contain

discharge from the remote portions of the basin. It will not be representative of the discharge because it will also contain later washoff from the lower reaches of the basin, resulting in a low estimation of the first discharge load of most constituents. Conversely, larger suspended particulates that normally are not present in first discharge due to inadequate velocities will appear in this later sampling scenario because of the influence of higher runoff rates in the lower basin. Many commonly used management practices are designed based on their ability to treat a volume of water defined by the first discharge phenomenon. It is important to characterize the first discharge load because most management practices effectively treat only, or primarily, this load.

It should be noted that first discharge runoff is sometimes contaminated by non-storm water related pollutants. In many urban catchments, contaminants that result from illicit connections and illegal dumping may be stored in the system until "flushed" during the initial storm period. This does not negate the need for information on the characteristic first discharge load, but does indicate that the first phase field screen results for illicit connections should be used to help define those outfalls where this problem might exist.

Several methods can be used to develop an event average concentration. Either automatic or manual sampling techniques can be used that sample the entire hydrograph, or at least the first four hours of it, that will result in several discrete samples and associated flow rates that represent the various flow regimes of an event. These procedures have the potential for providing either an event average concentration, an event mean concentration, or discrete definition of the washoff process. Automatic sampling procedures are also available that collect a single composite sample, either on a time-proportioned or flow proportioned basis.

When discrete samples are collected, an event average composite sample can be produced by the manual composite of the discrete samples in equal volumes. Laboratory analysis of time proportioned composite samples will directly yield the event average concentration. Mathematical averaging of discrete sample analysis results will yield an event average concentration.

When discrete samples are collected, a flow-weighted composite sample can be produced based on the discharge record. This is done by manually flow proportioning the volumes of the individual samples. Laboratory analysis of flow weighted composite samples will directly yield an event mean concentration. Mathematical integration of the change in concentrations and mass flux of the discharge for discrete sample data can produce an event mean concentration. This procedure was used during the NURP program.

EPA wishes to emphasize that the reason for sampling the type of storm event identified in § 122.21(g)(7) is to provide information that represents local conditions that will be used to create sound storm water management plans. Based on the method to be used to generate system-wide estimates of pollutant loads, either method, discrete or event average concentrations, may be preferable to the other. If simulation models will be used to generate loading estimates, analysis of discrete samples will be more valuable so that calibration of water quality and hydrology may be performed. On the other hand, simple estimation methods based on event average or event mean concentrations may not justify the additional cost of discrete sample analysis.

EPA believes that the first discharge loading should be represented in the permit application from industrial facilities and, if appropriate, permitting authorities may require the same in the discharge characterization component of permits issued to municipalities. The first discharge load should also be represented as part of an event composite sample. This requirement will assist industries in the development of effective storm water management plans.

EPA requested comments on the appropriateness of the proposed rules and of proposed amendments to the rules regarding discharge sampling. Comments were received which addressed the appropriateness of imposing uniform national guidelines. Several commenters are concerned that uniform national guidelines may not be appropriate due to the geographic variations in meteorology, topography, and pollutant sources. While some assert that a uniform guideline will provide consistency of the sample results, others prefer a program based on regional or State guidelines that more specifically address their situation.

Several commenters, addressing industrial permit application requirements, preferred that the owner/operator be allowed to set an individual sampling protocol with approval of the permit writer. Some commenters were concerned that one event may not be sufficient to characterize runoff from a basin as this may result in gross over-estimation or underestimation of the pollutant loads. Others indicated confusion with regard to sampling procedures, lab analysis procedures, and the purpose of the program.

In response, today's regulations establish certain minimum requirements. Municipalities and industries may vary from these requirements to the extent that their implementation is at least as stringent as outlined in today's rule. EPA views today's rule as a means to provide assurance as to the quality of the data collected; and to this end, it is important that the minimum level of sampling required be well defined.

In response to EPA's proposal that the first discharge be included in "representative" storm sampling, several commenters made their concerns known about the possible equipment necessary to meet this requirement. Several commenters are concerned that in order to get a first discharge sample, automatic sampling equipment will be required. Concerns related to the need for this equipment surfaced in the comments frequently; most advised that the equipment is expensive and that the demand on sampling equipment will be too large for suppliers and manufacturers to meet. Although equipment can be leased, some commenters maintained that not enough rental equipment is available to make this a viable option in many instances.

EPA is not promoting or requiring the use of automated equipment to satisfy the sampling requirements. A community may find that in the long run it would be more convenient to have such equipment since sampling is required not only during preparation of the application, but also may be required during the term of the permit to assure that the program goals are being met. Discharge measurement is necessary in order for the sample data to have any meaning. If unattended automatic sampling is to be performed, then unattended flow measurement will be required too.

EPA realizes that equipment availability is a legitimate concern. However, there is no practical recommendation that can be made relative to the availability of equipment. If automatic sampling equipment is not available, manual sampling is an appropriate alternative.

F. Storm Water Discharges Associated With Industrial Activity

1. Permit Applicability

a. *Storm water discharges associated with industrial activity to waters of the United States.* Under today's rule dischargers of storm water associated

with industrial activity are required to apply for an NPDES permit. Permits are to be applied for in one of three ways depending on the type of facility: Through the individual permit application process; through the group application process; or through a notice of intent to be covered by general permit.

Storm water discharges associated with the industrial activities identified under § 122.26(b)(14) of today's rule may avail themselves of general permits that EPA intends to propose and promulgate in the near future. The general permit will be available to be promulgated in each non-NPDES State, following State certification, and as a model for use by NPDES States with general permit authority. It is envisioned that these general permits will provide baseline storm water management practices. For certain categories of industries, specific management practices will be prescribed in addition to the baseline management practices. As information on specific types of industrial activities is developed, other, more industry-specific general permits will be developed.

Today's rule requires facilities with existing NPDES permits for storm water discharges to apply for individual permits under the individual permit application requirements found at 122.26(c) 180 days before their current permit expires. Facilities not eligible for coverage under a general permit are required to file an individual or group permit application in accordance with today's rule. The general permits to be proposed and promulgated will indicate what facilities are eligible for coverage by the general permit.

b. *Storm water discharges through municipal storm sewers.* As discussed above, many operators of storm water discharges associated with industrial activity are not required to apply for an individual permit or participate in a group application under § 122.26(c) of today's rule if covered by a general permit. Under the December 7, 1988, proposal, dischargers through large and medium municipal separate storm sewer systems were not required, as a general rule, to apply for an individual permit or as a group applicant. Today's rule is a departure from that proposal. Today's rule requires all dischargers through municipal separate storm sewer systems to apply for an individual permit, apply as part of a group application, or seek coverage under a promulgated general permit for storm water discharges associated with industrial activity.

Municipal operators of large and medium municipal separate storm sewer systems are responsible for obtaining system-wide or area permits for their system's discharges. These permits are expected to require that controls be placed on storm water discharges associated with industrial activity which discharge through the municipal system. It is anticipated that general or individual permits covering industrial storm water dischargers to these municipal separate storm sewer systems will require industries to comply with the terms of the permit issued to the municipality, as well other terms specific to the permittee.

c. *Storm water discharges through non-municipal storm sewers.* Under today's rulemaking all operators of storm water discharges associated with industrial activity that discharge into a privately or Federally owned storm water conveyance (a storm water conveyance that is not a municipal separate storm sewer) will be required to be covered by an NPDES permit (*e.g.* an individual permit, general permit, or as a co-permittee to a permit issued to the operator of the portion of the system that directly discharges to waters of the United States). This is a departure from the "either/or" approach that EPA requested comments on in the December 7, 1988, notice. The "either/or" approach would have allowed either the system discharges to be covered by a permit issued to the owner/operator of the system segment that discharged to waters of the United States, or by an individual permit issued to each contributor to the non-municipal conveyance.

EPA requested comments on the advantages and disadvantages of retaining the "either/or" approach for non-municipal storm sewers. An abundance of comment was received by EPA on this particular part of the program. A number of industrial commenters and a smaller number of municipalities favored retaining the "either/or" approach as proposed, while most municipal entities, one industry, and one trade association favored requiring permits for each discharger.

Two commenters stated that private owners of conveyances may not have the legal authority to implement controls on discharges through their system and would not want to be held responsible for such controls. EPA agrees that this is a potential problem. Therefore, today's rule will require permit coverage for each storm water discharge associated with industrial activity.

One commenter supported the concept of requiring all the facilities that discharge to a non-municipal conveyance to be co-permittees. EPA agrees that this type of permitting scheme, along with other permit schemes such as area or general permits, is appropriate for discharges from non-municipal sewers, as long as each storm water discharge through the system is associated with industrial activity and thus currently subject to NPDES permit coverage.

One State agency commented that in the interest of uniformity, all industries that discharge to non-municipal conveyances should be required to conform to the application requirements. One industry stated that the rules must provide a way for the last discharger before the waters of the U.S. to require permits for facilities discharging into the upper portions of the system. EPA agrees with these comments. Today's rule provides that each discharger may be covered under individual permits, as co-permittees to a single permit, or by general permit rather than holding the last discharger to the waters of the United States solely responsible.

In response to one commenter, the term "non-municipal" has been clarified to explain that the term refers to non-publicly owned or Federally-owned storm sewer systems.

Some commenters supporting the approach as proposed, noted that industrial storm water dischargers into such systems can take advantage of the group application process. EPA agrees that in appropriate circumstances, such as when industrial facilities discharging storm water to the same system are sufficiently similar, group applications can be used for discharges to non-municipal conveyances. However, EPA believes that it would be inappropriate to approve group applications for those facilities whose only similarity is that they discharge storm water into the same private conveyance system. The efficacy of the group application procedures is predicated on the similarity of operations and other factors. The fact that several industries discharge storm water to the same non-municipal sewer system alone may not make these discharges sufficiently similar for group application approval.

One commenter suggested that EPA has not established any deadlines for submission of permit applications for storm water discharges associated with industrial activity through non-municipal separate storm sewer systems. EPA wants to clarify that industrial storm water dischargers into privately owned or Federally owned storm water conveyances are required to apply for permits in the same time frame as individual or group applicants (or as otherwise provided for in a general permit).

One commenter stated that the operator of the conveyance that accepts discharges into its system has control and police power over those that discharge into the system by virtue of the ability to restrict discharges into the system. This commenter stated that these facilities should be the entity required to obtain the permit in all cases. Assuming that this statement is true in all respects, the larger problem is that one's theoretical ability to restrict discharges is not necessarily tied to the reality of enforcing those restrictions or even detecting problem discharges when they exist. In a similar vein one commenter urged that a private operator will not be in any worse a position than a municipal entity to determine who is the source of pollution up-stream. EPA agrees that from a hydrological standpoint this may be true. However, from the standpoint of detection resources, police powers, enforcement remedies, and other facets of municipal power that may be brought to bear upon problem dischargers, private systems are in a far more precarious position with respect to controlling discharges from other private sources.

In light of the comments received, EPA has decided that the either/or approach as proposed is inappropriate. Operators of non-municipal systems will generally be in a poorer position to gain knowledge of pollutants in storm water discharges and to impose controls on storm water discharges from other facilities than will municipal system operators. In addition, best management practices and other site-specific controls are often most appropriate for reducing pollutants in storm water discharges associated with industrial activity and can often only be effectively addressed in a regulatory scheme that holds each industrial facility operator directly responsible. The either/or approach as proposed is not conducive to establishing these types of practices unless each discharger is discharging under a permit. Also, some non-municipal operators of storm water conveyances, which receive storm water runoff from industrial facilities, may not be generating storm water discharges associated with industrial activity themselves and, therefore, they would otherwise not need to obtain a permit prior to October 1, 1992, unless specifically designated under section 402(p)(2)(E). Accordingly, EPA disagrees with comments that dischargers to non-municipal conveyances should have the flexibility to be covered by their permit or covered by the permit issued to the operator of the outfall to waters to the United States.

2. Scope of "Associated with Industrial Activity"

The September 26, 1984, final regulation divided those discharges that met the regulatory definition of storm water point source into two groups. The term Group I storm water discharges was defined in an attempt to identify those storm water discharges which had a higher potential to contribute significantly to environmental impacts. Group I included those discharges that contained storm water drained from an industrial plant or plant associated areas. Other storm water discharges (such as those from parking lots and administrative buildings) located on lands used for industrial activity were classified as Group II discharges. The regulations defined the term "plant associated areas" by listing several examples of areas that would be associated with industrial activities. However, the resulting definition led to confusion among the regulated community regarding the distinctions between the Group I and Group II classifications.

In amending the CWA in 1987, Congress did not explicitly adopt EPA's regulatory classification of Group I and Group II discharges. Rather, Congress required EPA to address "storm water discharges associated with industrial activity" in the first round of storm water permitting. In light of the adoption of the term "associated with industrial activity" in the CWA, and the ongoing confusion surrounding the previous regulatory definition, EPA has eliminated the regulatory terms "Group I storm water discharge" and "Group II storm water discharge" pursuant to the December 7, 1987, Court remand and has not revived it. In addition, today's notice promulgates a definition of the term "storm water discharge associated with industrial activity" at § 122.26(b)(14) and clarified the scope of the term.

In describing the scope of the term "associated with industrial activity", several members of Congress explained in the legislative history that the term applied if a discharge was "directly related to manufacturing, processing or raw materials storage areas at an industrial plant." (Vol. 132 Cong. Rec. H10932, H10936 (daily ed. October 15, 1986); Vol. 133 Cong. Rec. H176 (daily ed. January 6, 1987)). Several commenters cited this language in arguing for a more expansive or less expansive definition of "associated with industrial activity." EPA believes that the legislative history supports the decision to exclude from the definition of industrial activity, at § 122.26(b)(14) of today's rule, those facilities that are generally classified under the Office of Management and Budget Standard Industrial Classifications (SIC) as wholesale, retail, service, or commercial activities.

Two commenters recommended that all commercial enterprises should be required to obtain a permit under this regulation. Another commenter recommended that all the facilities listed in the December 7, 1988, proposal, including those listed in paragraphs (xi) through (xvi) on page 49432 of the December 7, 1988, proposal, should be included. EPA disagrees since the intent of Congress was to establish a phased and tiered approach to storm water permits, and that only those facilities having discharges associated with industrial activity should be included initially. The studies to be conducted pursuant to section 402(p)(5) will examine sources of pollutants associated with commercial, retail, and other light business activity. If appropriate, additional regulations addressing these sources can be developed under section 402(p)(6) of the CWA. As further discussed below, EPA believes that the facilities identified in paragraphs (xi) through (xvi) are more properly characterized as commercial or retail facilities, rather than indutrial facilities.

Today's rule clarifies the regulatory definition of "associated with industrial activity" by adopting the language used in the legislative history and supplementing it with a description of various types of areas that are directly related to an industrial process (*e.g.*, industrial plant yards, immediate access roads and rail lines, drainage ponds, material handling sites, sites used for the application or disposal of process waters, sites used for the storage and maintenance of material handling equipment, and known sites that are presently or have been used in the past for residual treatment, storage or disposal). The agency has also incorporated some of the suggestions offered by the public in comments.

Three commenters suggested that the permit application should focus only on storm water with the potential to come into contact with industrial-related pollutant sources, rather than focusing on how plant areas are utilized. These commenters suggested that facilities that are wholly enclosed or have their operations entirely protected from the elements should not be subject to permit requirements under today's rule. EPA agrees that these comments have merit with regard to certain types of facilities. Today's rule defines the term "storm water discharge associated with

industrial activity" to include storm water discharges from facilities identified in today's rule at 40 CFR 122.21(b)(I4)(xi) (facilities classified as Standard Industrial Classifications 20, 21, 22, 23, 2434, 25, 265, 267, 27, 283, 285, 30, 31 (except 311), 323, 34 (except 3441), 35, 36, 37 (except 373), 38, 39, 4221-25) only if:

areas where material handling equipment or activities, raw materials, intermediate products, final products, waste materials, by-products, or industrial machinery at these facilities are exposed to storm water. Such areas include: material handling sites; refuse sites; sites used for the application or disposal of process waste waters (as defined at 40 CFR 401); sites used for the storage and maintenance of material handling equipment; sites used for residual treatment; storage or disposal; shipping and receiving areas; manufacturing buildings; material storage areas for raw materials, and intermediate and finished products; and areas where industrial activity has taken place in the past and significant materials remain and are exposed to storm water.

The critical distinction between the facilities identified at 40 CFR 122.26(b)(14)(xi) and the facilities identified at 40 CFR 122.26(b)(14)(i)-(x) is that the former are not classified as having "storm water discharges associated with industrial activity" unless certain materials or activities are exposed to storm water. Storm water discharges from the latter set of facilities are considered to be "associated with industrial activity" regardless of the actual exposure of these same materials or activities to storm water.

EPA believes this distinction is appropriate because, when considered as a class, most of the activity at the facilities in § 122.26(b)(14)(xi) is undertaken in buildings; emissions from stacks will be minimal or non-existent; the use of unhoused manufacturing and heavy industrial equipment will be minimal; outside material storage, disposal or handling generally will not be a part of the manufacturing process; and generating significant dust or particulates would be atypical. As such, these industries are more akin or comparable to businesses, such as retail, commercial, or service industries, which Congress did not contemplate regulating before October 1, 1992, and storm water discharges from these facilities are not "associated with industrial activity." Thus, these industries will be required to obtain a permit under today's rule only when the manufacturing processes undertaken at such facilities would result in storm water contact with industrial materials associated with the facility.

Industrial categories in § 122.26(b)(14)(xi) all tend to engage in production activities in the manner described in the paragraph above. Facilities under SIC 20 process foods including meats, dairy food, fruit, and flour. Facilities classified under SIC 21 make cigarettes, cigars, chewing tobacco and related products. Under SIC 22, facilities produce yarn, etc., and/or dye and finish fabrics. Facilities under SIC 23 are in the business of producing clothing by cutting and sewing purchased woven or knitted textile products. Facilities under SIC 2434 and 25 are establishments engaged in furniture making. SIC 265 and 267 address facilities that manufacture paper board products. Facilities under SIC 27 perform services such as bookbinding, plate making, and printing. Facilities under SIC 283 manufacture pharmaceuticals and facilities under 285 manufacture paints, varnishes, lacquers, enamels, and allied products. Under SIC 30 establishments manufacture products from plastics and rubber. Those facilities under SIC 31 (except 311), 323, 34 (except 3441), 35, 36, and 37 (except 373) manufacture industrial and commercial metal products, machinery, equipment, computers, electrical equipment, and transportation equipment, and glass products made of purchased glass. Facilities under SIC 38 manufacture scientific and electrical instruments and optical equipment. Those under SIC 39 manufacture a variety of items such as jewelry, silverware, musical instruments, dolls, toys, and athletic goods. SIC 4221-25 are warehousing and storage activities.

In contrast, the facilities identified by SIC 24 (except and 2434), 26 (except 265 and 267), 28 (except 283 and 285), 29, 311, 32 (except 323), 33, 3441, 373 when taken as a group, are expected to have one or many of the following activities, processes occurring on-site: storing raw materials, intermediate products, final products, by-products, waste products, or chemicals outside; smelting; refining; producing significant emissions from stacks or air exhaust systems; loading or unloading chemical or hazardous substances; the use of unhoused manufacturing and heavy industrial equipment; and generating significant dust or particulates. Accordingly, these are classes of facilities which can be viewed as generating storm water discharges associated with industrial activity requiring a permit. Establishments identified under SIC 24 (except 2434) are engaged in operating sawmills, planing mills and other mills engaged in producing lumber and wood basic materials. SIC 26 facilities are paper mills. Under SIC 28, facilities produce basic chemical products by predominantly chemical processes. SIC 29 describes facilities that are engaged in the petroleum industry. Under SIC 311, facilities are engaged in tanning, currying, and finishing hides and skins. Such processes use chemicals such as sulfuric acid and sodium dichromate, and detergents, and a variety of raw and intermediate materials. SIC 32 manufacture glass, clay, stone and concrete products form raw materials in the form quarried and mined stone, clay, and sand. SIC 33 identifies facilities that smelt, refine ferrous and nonferrous metals from ore, pig or scrap, and manufacturing related products. SIC 3441 identifies facilities manufacturing fabricated structural metal. Facilities under SIC 373 engage in ship building and repairing. The permit application requirements for storm water discharges from facilities in these categories are unchanged from the proposal.

Today's rule clarifies that the requirement to apply for a permit applies to storm water discharges from plant areas that are no longer used for industrial activities (if significant materials remain and are exposed to storm water) as well as areas that are currently being used for industrial activities. EPA would also clarify that all discharges from these areas including those that discharge through municipal separate storm sewers are addressed by this rulemaking.

One commenter questioned the use of the word "or" instead of the word "and" to describe storm water "which is located at an industrial plant 'or' directly related to manufacturing, processing, or raw material storage areas at an industrial plant." The comment expressed the concern that discharges from areas not located at an industrial plant would be subject to permitting by this language and questioned whether this was EPA's intent. EPA agrees that this is a potential source of confusion and has modified this language to reflect the conjunctive instead of the alternative. This change has been made to provide consistency in the rule whereby some areas at industrial plants, such as administrative parking lots which do not have storm water discharges commingled with discharges from manufacturing areas, are not included under this rulemaking.

Two commenters wanted clarification of the term "or process water," in the definition of discharge associated with industrial activity at § 122.26(b)(14). This rulemaking replaces this term with the term "process waste water" which is defined at 40 CFR part 401.

One commenter took issue with the decision to include drainage ponds, refuse sites, sites for residual treatment, storage, or disposal, as areas associated with industrial activity, because it was the commenter's view that such areas are unconnected with industrial activity. EPA disagrees with this comment. If refuse and other sites are used in conjunction with manufacturing or the by-products of manufacturing they are clearly associated with industrial activity. As noted above, Congress intended to include discharges directly related to manufacturing and processing at industrial plants. EPA is convinced that wastes, refuse, and residuals are the direct result or consequence of manufacturing and processing and, when located or stored at the plant that produces them, are directly related to manufacturing and processing at that plant. Storm water drainage from such areas, especially those areas exposed to the elements (*e.g.* rainfall) has a high potential for containing pollutants from materials that were used in the manufacturing process at that facility. One commenter supported the inclusion of these areas since many toxins degrade very slowly and the mere passage of time will not eliminate their effects. EPA agrees and finalizes this part of the definition as proposed. One commenter requested clarification of the term "residual" as used in this context. Residual can generally be defined to include material that is remaining subsequent to completion of an industrial process. One commenter noted that the current owner of a facility may not know what areas or sites at a facility were used in this manner in the past. EPA has clarified the definition of discharge associated with industrial activity to include areas where industrial activity has taken place in the past and significant materials remain and are exposed to storm water. The Agency believes that the current owner will be in a position to establish these facts.

One commenter suggested including material shipping and receiving areas, waste storage and processing areas, manufacturing buildings, storage areas for raw materials, supplies, intermediates, and finished products, and material handling facilities as additional areas "associated with industrial activity." EPA agrees that this would add clarification to the definition, and has incorporated these areas into the definition at § 122.26(b)(14).

One commenter stated that the language "point source located at an industrial plant" would include outfalls located at the facility that are not owned or operated by the facility, but which are municipal storm sewers on easements granted to a municipality for the conveyance of storm water. EPA agrees that if the industry does not operate the point source then that facility is not required to obtain a permit for that discharge. A point source is a conveyance that discharges pollutants into the waters of the United States. If a facility does not operate that point source, then it would be the responsibility of the municipality to cover it under a permit issued to them. However, if contaminated storm water associated with industrial activity were introduced into that conveyance by that facility, the facility would be subject to permit application requirements as is all industrial storm water discharged through municipal sewers.

EPA disagrees with several comments that road drainage or railroad drainage within a facility should not be covered by the definition. Access roads and rail lines (even those not used for loading and unloading) are areas that are likely to accumulate extraneous material from raw materials, intermediate products and finished products that are used or transported within, or to and from, the facility. These areas will also be repositories for pollutants such as oil and grease from machinery or vehicles using these areas. As such they are related to the industrial activity at facilities. However, the language describing these areas of industrial activity has been clarified to include those access roads and rail lines that are "used or traveled by carriers of raw materials, manufactured products, waste material, or by-products used or created by the facility." For the same reasons haul roads (roads dedicated to transportation of industrial products at facilities) and similar extensions are required to be addressed in permit applications. Two industries stated that haul roads and similar extensions should be covered by permits by rule. EPA is not considering the use of a permit by rule mechanism under this regulation, however this issue will be addressed in the section 402(p)(5) reports to Congress and in general permits to be proposed and promulgated in the near future. EPA would note however that facilities with similar operations and storm water concerns that desire to limit administrative burdens associated with permit applications and obtaining permits may want to avail themselves of the group application and/or general permits.

In response to comments, EPA would also like to clarify that it intends the language "immediate access roads" (including haul roads) to refer to roads which are exclusively or primarily dedicated for use by the industrial facility. EPA does not expect facilities to submit permit applications for discharges from public access roads such as state, county, or federal roads such as highways or BLM roads which happen to be used by the facility. Also, some access roads are used to transport bulk samples of raw materials or products (such as prospecting samples from potential mines) in small-scale prior to industrial production. EPA does not intend to require permit applications for access roads to operations which are not yet industrial activities.

EPA does agree with comments made by several industries that undeveloped areas, or areas that do not encompass those described above, should generally not be addressed in the permit application, or a storm water permit, as long as the storm water discharge from these areas is segregated from the storm water discharge associated with the industrial activity at the facility.

Numerous commenters stated that maintenance facilities, if covered, should not be included in the definition. EPA disagrees with this comment. Maintenance facilities will invariably have points of access and egress, and frequently will have outside areas where parts are stored or disposed of. Such areas are locations where oil, grease, solvents and other materials associated with maintenance activities will accumulate. In response to one commenter, such areas are only regulated in the context of those facilities enumerated in the definition at § 122.26(b)(14), and not similar areas of retail or commercial facilities.

Another commenter requested that "storage areas" be more clearly defined. EPA disagrees that this term needs further clarification in the context of this section of the rule. However, in response to one comment, tank farms at industrial facilities are included. Tank farms are in existence to store products and materials created or used by the facility. Accordingly they are directly related to manufacturing processes.

Regarding storage areas, one commenter stated that the regulations should emphasize that only facilities that are not totally enclosed are required to submit permit applications. EPA does not agree with this interpretation since use of the generic term storage area indicates no exceptions for certain physical characteristics. Thus discharges from enclosed storage areas are also covered by today's rule (except as discussed above). EPA also disagrees with one

comment asserting that small outside storage areas of finished products at industrial facilities should be excluded under the definition of associated with industrial activity. EPA believes that such areas are areas associated with industrial activity which Congress intended to be regulated under the CWA. As noted above, the legislative history refers to storage areas, without reference to whether they are covered or uncovered, or of a certain size.

The same language, in the legislative history cited above, was careful to state that the term "associated with industrial activity" does not include storm water "discharges associated with parking lots and administrative and employee buildings." To accommodate legislative intent, segregated storm water discharges from these areas will not be required to obtain a permit prior to October 1, 1992. Many commenters stated that this was an appropriate method in which to limit the scope of "associated with industrial activity." However, if a storm water discharge from a parking lot at an industrial facility is mixed with a storm water discharge "associated with industrial activity," the combined discharge is subject to permit application requirements for storm water discharges associated with industrial activity. EPA disagrees with some commenters who urged that office buildings and administrative parking lots should be covered if they are located at the plant site. EPA agrees with one commenter that inclusion of storm water discharge from these areas would be overstepping Congressional intent unless such are commingled with storm water discharges from the plant site. Several commenters requested that language be incorporated into the rule which establishes that storm water discharges from parking lots and administrative areas not be included in the definition of associated with industrial activity. EPA agrees and has retained language used in the proposal which addresses this distinction.

Storm water discharges from parking lots and administrative buildings along with other discharges from industrial lands that do not meet the regulatory definition of "associated with industrial activity" and that are segregated from such discharges may be required to obtain an NPDES permit prior to October 1, 1992, under certain conditions. For example, large parking facilities, due to their impervious nature may generate large amounts of runoff which may contain significant amounts of oil and grease and heavy metals which may have adverse impacts on receiving waters. The Administrator or NPDES State has the authority under section 402(p)(2)(E) of the amended CWA to require a permit prior to October 1, 1992, by designating storm water discharges such as those from parking lots that are significant contributors of pollutants or contribute to a water quality standard violation. EPA will address storm water discharges from lands used for industrial activity which do not meet the regulatory definition of "associated with industrial activity" in the section 402(p)(5) study to determine the appropriate manner to regulate such discharges.

Several commenters requested clarification that the definition does not include sheet flow or discharged storm water from upstream adjacent facilities that enters the land or comingles with discharge from a facility submitting a permit application. EPA wishes to clarify that operators of facilities are generally responsible for its discharge in its entirety regardless of the initial source of discharge. However, where an upstream source can be identified and permitted, the liability of a downstream facility for other storm water entering that facility may be minimized. Facilities in such circumstances may be required to develop management practices or other run-on/run-off controls, which segregates or otherwise prevents outside runoff from comingling with its storm water discharge. Some commenters expressed concern about other pollutants which may arrive on a facility's premises from rainfall. This comment was made in reference to runoff with a high or low pH. If an applicant has reason to believe that pollutants in its storm water discharge are from such sources, then that needs to be addressed in the permit application and brought to the attention of the permitting authority, which can draft appropriate permit conditions to reflect these circumstances.

EPA requested comments on clarifying the types of facilities that involve industrial activities and generate storm water. EPA preferred basing the clarification, in part, on the use of Standard Industrial Classification (SIC) codes, which have been suggested in comments to prior storm water rulemakings because they are commonly used and accepted and would provide definitions of facilities involved in industrial activity. Several commenters supported the use by EPA of Standard Industrial Classifications for the same reasons identified by EPA as a generally used and understood form of classification. It was also noted that using such a classification would allow targeting for special notification and educational mailings. Three municipalities and three State authorities commented that SICs were appropriate and endorsed their use as a sound basis for determining which industries are covered.

One municipality questioned how SIC classifications will be assigned to particular industries. SICs have descriptions of the type of industrial activity that is engaged in by facilities. Industries will need to assess for themselves whether they are covered by a listed SIC and submit an application accordingly. Another commenter questioned if Federal facilities that do not have an SIC code identification are required to file a permit application. Federal facilities will be required to submit a permit application if they are engaged in an industrial activity that is described under § 122.26(b)(14). The definition of industrial activity incorporates language that requires Federal facilities to submit permit applications in such circumstances. The language has been further clarified to include State and municipal facilities.

EPA requested comments on the scope of the definition (types of facilities addressed) as well as the clarity of regulation. EPA identified the following types of facilities in the proposed regulation as those facilities that would be required to obtain permits for storm water discharges associated with industrial activity:

(i) Facilities subject to storm water effluent limitations guidelines, new source performance standards, or toxic pollutant effluent standards under 40 CFR subchapter N (except facilities with toxic pollutant effluent standards which are also identified under category (xi) of this paragraph). One commenter (a municipality) agreed with EPA that these industries should be addressed in this rulemaking. No other comments were received on this category. EPA agrees with this comment since these facilities are those that Congress has required EPA to examine and regulate under the CWA with respect to process water discharges. The industries in these categories have generally been identified by EPA as the most significant dischargers of process wastewaters in the country. As such, these facilities are likely to have storm water discharges associated with industrial activity for which permit applications should be required.

One commenter stated that because oil and gas producers are subject to effluent guidelines, EPA is disregarding the intent of Congress to exclude

facilities pursuant to section 402(1). EPA disagrees with this comment. EPA is not prohibited from requiring permit applications from industries with storm water discharge associated with industrial activity. EPA is prohibited only from requiring a permit for oil and gas exploration, production, processing, or treatment operations, or transmission facilities that discharge storm water that is not contaminated by contact with or has not come into contact with, any overburden, raw material, intermediate products, finished products, byproducts or waste products located on the site of such operations such discharges. In keeping with this requirement, EPA is requiring permit applications from oil and gas exploration, production, processing, or treatment operations, or transmission facilities that fall into a class of dischargers as described in § 122.26(c)(iii).

(ii) Facilities classified as Standard Industrial Classifications 24 (except 2434), 26 (except 265 and 267), 28 (except 283 and 285), 29, 311, 32 (except 323), 33, 3411, 373 and *(xi). Facilities classified as Standard Industrial Classifications 20, 21, 22, 23, 2434, 25, 265, 267, 27, 283, 285, 30, 31 (except 311), 323, 34 (except 3441), 35, 36, 37 (except 373), 38, 39, 4221–25.* One large municipality and one industry agreed with EPA that facilities covered by these SICs should be covered by this rulemaking. Many commenters, however, took exception to including all or some of these industries. However as noted elsewhere these facilities are appropriate for permit applications.

One commenter stated that within certain SICs industries, such as textile manufacturers use few chemicals and that there is little chance of pollutants in their storm water discharge. EPA agrees that some industries in this category are less likely than others to have storm water discharges that pose significant risks to receiving water quality. However, there are many other activities that are undertaken at these facilities that may result in polluted storm water. Further, the CWA is clear in its mandate to require permit applications for discharges associated with industrial activity. Excluding any of the facilities under these categories, except where the facility manufacturing plant more closely resembles a commercial or retail outlet would be contrary to Congressional intent.

One State questioned the inclusion of facilities identified in SIC codes 20–39 because of their temporary and transient nature or ownership. Agency disagrees that simply because a facility may transfer ownership that storm water quality concerns should be ignored. If constant ownership was a condition precedent to applying for and obtaining a permit, few if any facilities would be subject to this rulemaking.

One State estimated that the proposed definition would lead to permits for 18,000 facilities in its State. Consequently this commenter recommended that the facilities under SIC 20–39 should be limited to those facilities that have to report under section 313 of title III, Superfund Amendments and Reauthorization Act. However, as noted by another commenter, limiting permit requirements to these facilities would be contrary to Congressional intent. While use of chemicals at a facility may be a source of pollution in storm water discharges, other every day activities at an industrial site and associated pollutants such as oil and grease, also contribute to the discharge of pollutants that are to be addressed by the CWA and these regulations. While the number of permit applications may number in the thousands, EPA intends for group applications and general permits to be employed to reduce the administrative burdens as greatly as possible.

Two commenters felt the permit applications should be limited to all entities under SIC 20–39. EPA disagrees that all the industrial activities that need to be addressed fall within these SICs. Discharges from facilities under paragraphs (i) through (xi) such as POTWs, transportation facilities, and hazardous waste facilities, are of an industrial nature and clearly were intended to be addressed before October 1, 1992.

Two commenters stated that SIC 241 should be excluded in that logging is a transitory operation which may occur on a site for only 2–3 weeks once in a 20–30 year period. It was perceived that delays in obtaining permits for such operations could create problems in harvest schedule and mill demand. This commenter stated that runoff from such operations should be controlled by BMPs in effect for such industries and that such a permit would not be practical and would be cost prohibitive.

EPA agrees with the commenter that this provision needs clarification. The existing regulations at 40 CFR 122.27 currently define the scope of the NPDES program with regard to silvicultural activities. 40 CFR 122.27(b)(1) defines the term "silvicultural point source" to mean any discrete conveyance related to rock crushing, gravel washing, log sorting, or log storage facilities which are operated in connection with silvicultural activities and from which pollutants are discharged into waters of the United States. Section 122.27(b)(1) also excludes certain sources. The definition of discharge associated with industrial activity does not include activities or facilities that are currently exempt from permitting under NPDES. EPA does not intend to change the scope of 40 CFR 122.27 in this rulemaking. Accordingly, the definition of "storm water discharge associated with industrial activity" does not include sources that may be included under SIC 24, but which are excluded under 40 CFR 122.27. Further, EPA intends to examine the scope of the NPDES silvicultural regulations at 40 CFR 122.27 as it relates to storm water discharges in the course of two studies of storm water discharges required under section 402(p)(5) of the CWA.

In response to one comment, EPA intends that the list of applicable SICs will define and identify what industrial facilities are required to apply. Facilities that warehouse finished products under the same code at a different facility from the site of manufacturing are not required to file a permit application, unless otherwise covered by this rulemaking.

(iii) Facilities classified as Standard Industrial Classifications 10 through 14 (mineral industry) including active or inactive mining operations (except for areas of coal mining operations no longer meeting the definition of a reclamation area under 40 CFR 434.11(l) because the performance bond issued to the facility by the appropriate SMCRA authority has been released, or except for areas of non-coal mining operations which have been released from applicable State or Federal reclamation requirements after December 17, 1990 and oil and gas exploration, production, processing, or treatment operations, or transmission facilities that discharge storm water contaminated by contact with or that has come into contact with, any overburden, raw material, intermediate products, finished products, byproducts or waste products located on the site of such operations. Several commenters urged that Congress intended to require permits or permit applications only for the manufacturing sector of the oil and gas industry (or those activities that designated in SIC 20 through 39). EPA disagrees with this argument. The fact that Congress used the language cited above and not the appropriate the SIC definition explicitly does not indicate that a broader definition or less exclusive definition was contemplated. According to these comments, all storm water discharges from oil and gas

exploration and production facilities would be exempt from regulation. However, EPA is convinced that a facility that is engaged in finding and extracting crude oil and natural gas from subsurface formations, separating the oil and gas from formation water, and preparing that crude oil for transportation to a refinery for manufacturing and processing into refined products, will have discharges directly relating to the processing or raw material storage at an industrial plant and are therefore discharges associated with industrial activity.

For further clarification EPA is intending to focus only on those facilities that are in SIC 10–14. Furthermore, in response to several comments, this rulemaking will require permit applications for storm water discharges from currently inactive petroleum related facilities within SIC codes 10–14, if discharges from such facilities meet the requirements as described in section VI.F.7.a. and § 122.26(c)(1)(iii). Inactive facilities will have storm water associated with industrial activity irrespective of whether the activity is ongoing. Congress drew no distinction between active and inactive facilities in the statute or in the legislative history.

(iv) Hazardous waste treatment, storage, or disposal facilities that are operating under interim status or a permit under Subtitle C of the Resource, Conservation and Recovery Act. One commenter believed that all RCRA and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) facilities should be specifically identified using SIC codes for further clarification. EPA considers this to be unnecessarily redundant, since the RCRA/CERCLA identification is sufficient.

Several industries asserted that storm water discharge from landfills, dumps, and land application sites, properly closed or otherwise subject to corrective or remedial actions under RCRA, should not be included in the definition. One commenter noted that the runoff from these areas is like runoff from undeveloped areas. One commenter also concluded that landfills, dumps, and land application sites should also be excluded if they are properly maintained under RCRA.

One commenter also rejected the idea of requiring permits from all active and inactive landfills and open dumps that have received any industrial wastes, and subtitle C facilities. This commenter felt that these facilities were already adequately covered under RCRA.

Two industry commenters felt that it would be redundant to have hazardous waste facilities regulated by RCRA and the NPDES storm water program. One felt this was especially so if there are current pretreatment standards.

The Agency disagrees that all activities that may contribute to storm water discharges at RCRA subtitle C facilities are being fully controlled and that requiring NPDES permits for storm water discharges at RCRA subtitle C facilities is redundant. First, the vast majority of permitted hazardous waste management facilities are industrial facilities involved in the manufacture or processing of products for distribution in commerce. Their hazardous waste management activities are incidental to the production-related activities. While RCRA subtitle C regulations impose controls in storm water runoff from hazardous waste management units and require cleanup of releases of hazardous wastes, they generally do not control non-systematic spills or process. These releases, from the process itself or the storage of raw materials or finished products are a potential source of storm water contamination. In addition, RCRA subtitle C (except via corrective action authority) does not address management of "non hazardous" industrial wastes, which nevertheless could also potentially contaminate storm water runoff.

Second, at commercial hazardous waste management facilities, the RCRA subtitle C permitting requirements and management standards do not control all releases of potentially toxic materials. For example, some permitted commercial treatment facilities may store and use chemicals in the treatment of RCRA hazardous wastes. Releases of these treatment chemicals from storage areas are a potential source of storm water contamination.

Finally, many RCRA subtitle C facilities have inactive Solid Waste Management Units (SWMU's) on the facility property. These SWMU's may contain areas on the land surface that are contaminated with hazardous constituents. RCRA requires that hazardous waste management facilities must investigate these areas of potential contamination, and then perform corrective action to remediate any SWMU's that are of concern. However, the corrective action process at these facilities will not be completed for a number of years due to the complexity of the cleanup decisions, and due to the fact that many hazardous waste management facilities do not yet have RCRA permits. Until corrective action has been completed at all such subtitle C facilities, SWMU's are a potential source of storm water contamination that should be addressed under the NPDES program. Finally, under section 1004(27) of RCRA, all point source discharges, including those at RCRA regulated facilities, are to be regulated by the NPDES program. Thus, there is no concern of regulatory overlap, and to the extent that the storm water regulations are effectively implemented, it will help address these units in a way that alleviates the need for expensive corrective action in the future.

(v) Landfills, land application sites, and open dumps that receive or have received industrial wastes and that are subject to regulation under subtitle D of RCRA. EPA received numerous comments supporting the regulation of municipal landfills which receive industrial waste and are subject to regulation under subtitle D of RCRA. EPA agrees with these comments. These industries have significant potential for storm water discharges that can adversely affect receiving water.

Two States argued that landfills should be addressed under the non-point source program. EPA disagrees that the non-point source program is sufficient for addressing these facilities. Further, addressing a class of facilities under the non-point source program does not exempt storm water discharges from these facilities from regulation under NPDES. The CWA requires EPA to promulgate regulations for controlling point source discharges of storm water from industrial facilities. Point sources from landfills consisting of storm water are such discharges requiring an NPDES permit. Several commenters argued that these discharges are adequately addressed by RCRA and that regulating them under this storm water rule would be redundant. However, as discussed above, RCRA expressly does not regulate point source discharges subject to NPDES permits. Given the nature of these facilities and of the material stored or disposed, EPA believes storm water permits are necessary. Similarly EPA rejects the comment that storm water discharges from these facilities are already adequately regulated by State authority. Congress has mandated that storm water discharges associated with industrial activity have an NPDES permit.

One commenter wanted EPA to define by size what landfills are covered. In response, it is the intent of these regulations to require permit applications from all landfills that receive industrial waste. Storm water discharges from such facilities are addressed because of the nature of the material with which the storm water comes in contact. The size of facility

will not dictate what type of waste is exposed to the elements.

One commenter requested that the definition of industrial wastes be clarified. For the purpose of this rule, industrial waste consists of materials delivered to the landfill for disposal and whose origin is any of the facilities described under § 122.26(b)(14) of this regulation.

(vi) Facilities involved in the recycling of materials, including metal scrapyards, battery reclaimers, salvage yards, and automobile junkyards, including but limited to those classified as Standard Industrial Classification 5015 and 5093. One commenter suggested that the recycling of materials such as paper, glass, plastics, etc., should not be classified as an industrial activity. EPA disagrees that such facilities should be excluded on that basis. These facilities may be considered industrial, as are facilities that manufacture such products absent recycling.

Other facilities exhibit traits that indicate industrial activity. In junkyards, the condition of materials and junked vehicles and the activities occurring on the yard frequently result in significant losses of fluids, which are sources of toxic metals, oil and grease and polychlorinated aromatic hydrocarbons. Weathering of plated and non-plated metal surfaces may result in contributions of toxic metals to storm water. Clearly such facilities cannot be classified as commercial or retail.

One municipality felt that "significant recycling" should be defined or clarified. EPA agrees that the proposed language is ambiguous. It has been clarified to require permit applications from facilities involved in the recycling of materials, including metal scrapyards, battery reclaimers, salvage yards, and automobile junkyards, including but limited to those classified as Standard Industrial Classification 5015 and 5093. These SIC codes describe facilities engaged in dismantling, breaking up, sorting, and wholesale distribution of motor vehicles and parts and a variety of other materials. The Agency believes these SIC codes clarify the term significant recycling.

One municipality stated that regulation of these facilities under NPDES would be duplicative if they are publicly owned facilities. One State expressed the view that automobile junkyards, salvage yards could not legitimately be considered industrial activity. As noted above, EPA disagrees with these comments. Facilities that are actively engaged in the storage and recycling of products including metals, oil, rubber, and synthetics are in the business of storing and recycling materials associated with or once used in industrial activity. These activities are not commercial or retail because they are engaged in the dismantling of motors for distribution in wholesale or retail, and the assembling, breaking up, sorting, and wholesale distribution of scrap and waste materials, which EPA views as industrial activity. Further, being a publicly owned facility does not confer non-industrial status.

(vii) Steam electric power generating facilities, including coal handling sites, and onsite and offsite ancillary transformer storage areas. Most of the comments were against requiring permit applications for onsite and offsite ancillary transformer facilities. One commenter stated that these transformers did not leak in storage and if there were leakage problems in handling transformers, such leaks were subject to Federal and State spill clean-up procedures. The same commenter suggested that if EPA required applications from such facilities that it exclude those that have regular inspections, management practices in place, or those that store 50 transformers at any one time.

EPA agrees that such facilities should not be covered by today's rule. As one commenter noted, the Toxic Substances Control Act (TSCA) addresses pollutants associated with transformers that may enter receiving water through storm water discharges. EPA has examined regulations under TSCA and agrees that regulation of storm water discharges from these facilities should be the subject of the studies being performed under section 402(p)(5), rather than regulations established by today's rule. Under TSCA, transformers are required to be stored in a manner that prevents rain water from reaching the stored PCBs or PCB items. 40 CFR 761.65(b)(1)(i). EPA considers transformer storage to be more akin to retail or other light commercial activities, where items are inventoried in buildings for prolonged periods for use or sale at some point in the future, and where there is no ongoing manufacturing or other industrial activity within the structure.

One commenter stated that this category of industries should be loosened so that all steam electric facilities are addressed—oil fired and nuclear. EPA believes that the language as proposed broadly defines the type of industrial activity addressed without specifying each mode of steam electric production. One commenter noted that the EPA has no authority under the CWA (*Train* v. *CPIR, Inc.*, 426 U.S. 1 (1976) to regulate the discharge of source, special nuclear and by-product materials which are regulated under the Atomic Energy Act. EPA agrees permit applications may not address those aspects of such facilities, however the facility in its entirety may not necessarily be exempt. A permit application will be appropriate for discharges from non-exempt categories.

(viii) Transportation facilities classified as Standard Industrial Classifications 40, 41, 42 (except 4221–25), 43, 44, 45, and 5171 which have vehicle maintenance shops, material handling facilities, equipment cleaning operations or airport deicing operations. Only those portions of the facility that are either involved in vehicle maintenance (including vehicle rehabilitation, mechanical repairs, painting, fueling, and lubrication), equipment cleaning operations, or which are identified in another subcategory of facilities under EPA's definition of storm water discharges associated with industrial activity. One commenter requested clarification of the terms "vehicle maintenance." Vehicle maintenance refers to the rehabilitation, mechanical repairing, painting, fueling, and lubricating of instrumentalities of transportation located at the described facilities. EPA is declining to write this definition into the regulation however since "vehicle maintenance" should not cause confusion as a descriptive term. One commenter wanted railroad tracks where rail cars are set aside for minor repairs excluded from regulation. In response, if the activity involves any of the above activities then a permit application is required. Train yards where repairs are undertaken are associated with industrial activity. Train yards generally have trains which, in and of themselves, can be classified as heavy industrial equipment. Trains, concentrated in train yards, are diesel fueled, lubricated, and repaired in volumes that connote industrial activity, rather than retail or commercial activity.

One commenter argued that if gasoline stations are not considered for permitting, then all transportation facilities should be exempt. EPA disagrees with the thrust of this comment. Transportation facilities such as bus depots, train yards, taxi stations, and airports are generally larger than individual repair shops, and generally engage in heavier more expansive forms of industrial activity. In keeping with Congressional intent to cover all industrial facilities, permit applications from such facilities are appropriate. In contrast, EPA views gas stations as retail commercial facilities not covered

by this regulation. It should be noted that SIC classifies gas stations as retail.

(ix) POTW lands used for land application treatment technology/ sludge disposal, handling or processing areas, and chemical handling and storage areas. One commenter wanted more clarification of the term POTW lands. Another commenter requested clarification of the terms sludge disposal, sludge handling areas, and sludge processing areas. One State recommended that a broader term than POTW should be used. EPA notes that on May 2, 1989, it promulgated NPDES Sewage Sludge Permit Regulations; State Sludge Management Program Requirements at 40 CFR part 501. This regulation identified those facilities that are subject to section 405(f) of the CWA as "treatment works treating domestic sewage."

In response to the above comments, EPA has decided to use this language to define what facilities are required to apply for a storm water permit. Under this rulemaking "treatment works treating domestic sewage," or any other sewage sludge or wastewater treatment device or system used in the storage treatment, recycling, and reclamation of municipal or domestic sewage, including land dedicated to the disposal of sewage sludge, with a design flow of 1.0 mgd or more, or facilities required to have an approved pretreatment program under 40 CFR part 403, will be required to apply for a storm water permit. However, permit applications will not be required to address land where sludge is beneficially reused such as farm lands and home gardens or lands used for sludge management that are not physically located within the confines (offsite facility) of the facility or where sludge is beneficially reused in compliance with section 405 of the Clean Water Act (proposed rules were published on February 6, 1989, at 54 FR 5746). EPA believes that such activity is not "industrial" since it is agricultural or domestic application (non-industrial) unconnected to the facility generating the material.

EPA received many comments on the necessity and appropriateness of requiring permit applications for storm water discharges from POTW lands. It was anticipated by numerous commenters that the above cited sludge regulations would adequately address storm water discharges from lands where sludge is applied. However, the sewage sludge regulations do not directly address NPDES permit requirements for storm water discharges from POTW lands and related areas to the extent required by today's rulemaking; the regulations cover only permits for use or disposal of sludge. Also, the regulations proposed on February 4, 1989, cover primarily the technical standards for the composition of sewage sludge which is to be used or disposed. They do not include detailed permitting requirements for discharges of storm water from lands where sludge has been applied to the land. To that extent, EPA is not persuaded by these commenters that POTWs and POTW lands should be excluded from these storm water permit application requirements.

Two commenters noted that some States already regulate sludge use or disposal activities substantially and that EPA should refrain from further regulation. EPA disagrees that this is a basis for excluding facilities from Federal requirements. Notwithstanding regulations in existence under State law, EPA is required by the CWA to promulgate regulations for permit application for storm water associated with industrial activity. Under the NPDES program, States are able to promulgate more rigorous requirements. However a minimum level of control is required under Federal law. One commenter also indicated that a State's sludge land application sites must follow a well defined plan to ensure there is no sludge related runoff. Notwithstanding that a State may require storm water controls for sludge land applications, as noted above, EPA is required to promulgate regulations requiring permit applications from appropriate facilities. EPA views facilities such as waste treatment plants that engage in on-site sludge composting, storage of chemicals such as ferric chloride, alum, polymers, and chlorine, and which may experience spills and bubbleovers are suitable candidates for storm water permits. Facilities using such materials are not characteristic of commercial or retail activities. Use and storage of chemicals and the production of material such as sludge, with attendant heavy metals and organics, is activity that is industrial in nature. The size and scope of activities at the facility will determine the extent to which such activities are undertaken and such materials used and produced at the facility. Accordingly, EPA believes limiting the facilities covered under this category to those of 1.0 mgd and those covered under the industrial pretreatment program is appropriate.

To the extent that permit applicants are already required to employ certain management practices regarding storm water, these may be incorporated into permits and permit conditions issued by Federal and State permitting authorities. EPA has selected facilities identified under 40 CFR part 501 (*i.e.* those with a design flow of 1.0 mgd or more or those required to have an approved pretreatment program) since these facilities will have largest contribution of industrial process discharges. Sludge from such facilities will contain higher concentrations of heavy metal and organic pollutants.

One commenter stated that sludge disposal is a public activity that should be addressed in a public facility's storm water management program under a municipal storm water management program. EPA disagrees. Industrial facilities, whether publicly owned or not, are required to apply for and obtain permits when they are designated as industrial activity.

Another comment stated that a permit should not be required for facilities that collect all runoff on site and treat it at the same POTW. EPA believes that a permit application should be required from such facilities. However, the above practice can be incorporated as a permit condition for such a facility. One commenter stated storm water from sludge and chemical handling areas can be routed through the headworks of the POTW. The agency agrees that this may be an appropriate management practice for POTWs as long as other NPDES regulatory requirements are fulfilled with regard to POTWs.

(x) Construction activities, including clearing, grading and excavation activities except operations that result in the disturbance of less than five acre total land area which are not part of a larger common plan of development or sale. EPA addresses whether these facilities should be covered by today's rule in section VI.F.8.

The December 7, 1988, proposal also requested comments on including the following other categories of discharges in the definition of industrial activities: (xii) Automotive repair shops classified as Standard Industrial Classification 751 or 753; (xiii) Gasoline service stations classified as Standard Industrial Code 5541; (xiv) Lands other than POTW lands (offsite facilities) used for sludge management; (xv) Lumber and building materials retail facilities classified as Standard Industrial Classification 5211; (xvi) Landfills, land application sites, and open dumps that do not receive industrial wastes and that are subject to regulation under subtitle D of RCRA; (xvii) Facilities classified as Standard Industrial Classification 46 (pipelines, except natural gas), and 492 (gas production and distribution); (xviii) Major electrical powerline corridors.

EPA received numerous comments on whether to require permit applications for these particular facilities. The December 7, 1988, proposal reflected EPA's intent not to require permits for these facilities, but rather to address these facilities in the two studies required by CWA sections 402(p)(5) and (6). After reviewing the comments on this issue, EPA believes that these facilities should be addressed under these sections of the CWA. Most of these facilities are classified as light commercial and retail business establishments, agricultural, facilities where residential or domestic waste is received, or land use activities where there is no manufacturing. It should be noted that although EPA is not requiring the facilities identified as categories (xii) to (xviii), in the December 7, 1988, proposal to apply for a permit application under this rulemaking, such facilities may be designated under section 402(p)(2)(E) of the CWA.

Three commenters recommended that EPA clarify that non-exempt Department of Energy and Department of Defense facilities should be covered by the storm water regulation. The regulation clearly states that Federal Facilities that are engaged in industrial activity (*i.e.* those activities in § 122.26(b)(14)(i)–(xi)) are required to submit permit applications. Those applying for permits covering Federal facilities should consult the Standard Industrial Classifications for further clarification.

One commenter questioned how EPA intended to regulate municipal facilities engaged in industrial activities. Municipal facilities that are engaged in the type of industrial activity described above and which discharge into waters of the United States or municipal separate storm sewer systems are required to apply for permits. These facilities will be covered in the same manner as other industrial facilities. The fact that they are municipally owned does not in any way exclude them from needing permit applications under this rulemaking.

One commenter suggested exempting those facilities that have total annual sales less than five million dollars or occupy less than five acres of land. Another commenter thought that all minor permittees should be exempt. EPA believes that the quality of storm water and the extent to which discharges impact receiving water is not necessarily related to the size of the facility or the dollar value of its business. What is important in this regard, is the extent to which steps are taken at facilities to curb the quantity and type of material that may pollute storm water discharges from these facilities. Therefore EPA has not excluded facilities from permitting on such a basis. This same commenter stated that the proposed rules should not address facilities with multiple functions (industrial and retail). EPA disagrees. If a facility engages in activity that is defined in paragraphs (i) through (xi) above, it is required to apply for a permit regardless of the fact that it also has a retail element. Such facilities need only submit a permit application for the industrial portion of the facility (as long as storm water from the non-industrial portion is segregated, as discussed above). This commenter also felt that more studies needed to be undertaken to determine the best way to regulate industries. EPA agrees that storm water problems need further study and for that reason EPA has devoted substantial manpower and resources to complete comprehensive studies under section 402(p)(5), while also addressing industrial sources that need immediate attention under this rulemaking.

One commenter requested that EPA give examples of storm water discharges from each of the facilities that have been designated for submitting permit applications. Agency believes that this is unnecessary and impractical since every facility, regardless of the type of industry, will have different terrain, hydrology, weather patterns, management practices and control techniques. However, EPA intends to issue guidance on filing permit applications for storm water discharges from industrial facilities which details how an industry goes about filing an industrial permit and dealing with storm water discharges.

Today's rulemaking for storm water discharges associated with industrial activity at § 122.26(c)(1)(i) includes special conditions for storm water discharges originating from mining operations, oil or gas operations (§ 122.26(c)(1)(iii)), and from the construction operations listed above (§ 122.26(c)(1)(ii)). These requirements are discussed in more detail in section VI.F.7 and section VI.F.9 of today's notice.

3. Individual Application Requirements

Today's rule establishes individual and group permit application requirements for storm water discharges associated with industrial activity. These requirements will address facilities precluded from coverage under the general permits to be proposed and promulgated by EPA in the near future. EPA considers it necessary to obtain the information required in individual permit applications from certain facilities because of the nature of their industrial activity and because of existing institutional mechanisms for issuing and tracking NPDES permits. Furthermore, some States will not have general permitting authority. Facilities located in such States will be required to submit individual applications or participate in a group application. The following response to comments received on these requirements pertains to these facilities.

Under the September 26, 1984, regulation operators of Group I storm water discharges were required to submit NPDES Form 1 and Form 2C permit applications. In response to post-regulation comments received on that rule, EPA proposed new permit application requirements (March 7, 1985, (50 FR 9362) and August 12, 1985, (50 FR 32548)) which would have decreased the analytical sampling requirements of the Form 2C and provided procedures for group applications. Passage of the WQA in 1987 gave the EPA additional time to consider the appropriate permit application requirements for storm water discharges. On December 7, 1988, application requirements were proposed and numerous comments were received. Based upon these comments, modifications and refinements have been made to the industrial storm water permit application.

Some commenters expressed the view that the permit application requirements are too burdensome, require too much paperwork, are of dubious utility, and focus too greatly on the collection of quantitative data. EPA disagrees. In comparison to prior approaches for permitting storm water discharges and other existing permitting programs, EPA has streamlined the permit application process, limited the quantitative data requirements, and required narrative information that will be used to determine permit conditions that relate to the quality of storm water discharge. To the extent that EPA needs non-quantitative information to develop appropriate permit conditions, EPA disagrees with the view of some commenters that the information required is excessive. In response to comments on earlier rulemakings and a comment received on the December 7, 1988, proposal (stressing that the emphasis should be on site management, rather than monitoring, sampling, and reporting) EPA has shifted the emphasis of the permit application requirements for storm water discharges associated with industrial activity from the existing requirements for collection of

quantitative data (sampling data) in Form 2C towards collection of less quantitative data supplemented by additional information needed for evaluation of the nature of the storm water discharges.

The permit application requirements proposed for storm water discharges reduce the amount of quantitative data required in the permit application and exempt discharges which contain entirely storm water (*i.e.* contain no other discharge that, without the storm water component, would require an NPDES permit), from certain reporting requirements of Form 2C. The proposed modifications also would exempt applicants for discharges which contain entirely storm water from several non-quantitative information collection provisions currently required in the Form 2C. The proposed modifications would rely more on descriptive information for assessing impacts of the storm water discharge. One commenter proposed that information that the applicant has submitted for other permits be incorporated by reference into the storm water permit application. EPA disagrees that incorporation by reference is appropriate. The permitting authority will need to have this information readily available for evaluating permit application and permit conditions. Furthermore, EPA feels that the applicant is in the best position to provide the information and verify its accuracy. However, if the applicant has such information and it accurately reflects current circumstances, then the applicant can rely on the information for meeting the information requirements of the application. Another commenter suggested that EPA should only require the information in § 122.26(c)(1) (A) and (B) (*i.e.*, the requirement for a topographic map indicating drainage areas and estimate of impervious areas and material management practices). As explained in greater detail below, EPA is convinced that some quantitative data and the other narrative requirements are necessary for developing appropriate permit conditions.

Form 2F addressing permit applications for storm water discharges associated with industrial activity is included in today's final rule. A complete permit application for discharges composed entirely of storm water, will be comprised of Form 2F and Form 1. Operators of discharges which are composed of both storm water and non-storm water will submit, where required, a Form 1, an entire Form 2C (or Form 2D) and Form 2F when applying. In this case, the applicant will provide quantitative data describing the discharge during a storm event in Form 2F and quantitative data describing the discharge during non-storm events in Form 2C. Non-quantitative information reported in the Form 2C will not have to be reported again in the Form 2F.

Under today's rule, Form 2F for storm water discharges associated with industrial activity would not require the submittal of all of the quantitative information required in Form 2C, but would require that quantitative data be submitted for:

- Any pollutant limited in an effluent guideline for an industrial applicant's subcategory;
- Any pollutant listed in the facility's NPDES permit for its process wastewater;
- Oil and grease, TSS, COD, pH, BOD5, total phosphorus, total Kjeldahl nitrogen; nitrate plus nitrite nitrogen; and
- Any information on the discharge required under 40 CFR 122.21(g)(7) (iii) and (iv).

In order to characterize the discharge(s) sampled, applicants need to submit information regarding the storm event(s) that generated the sampled discharge, including the date(s) the sample was taken, flow measurements or estimates of the duration of the storm event(s) sampled, rainfall measurements or estimates from the storm event(s) which generated the sampled runoff, and the duration between the storm event sampled and the end of the previous storm event. Information regarding the storm event(s) sampled is necessary to evaluate whether the discharge(s) sampled was generally representative of other discharges expected to occur during storm events and to characterize the amount and nature of runoff discharges from the site.

One commenter stated that the quantitative information should be limited to those pollutants that are expected to be known to the applicant. EPA believes this would be inappropriate since there will be no way of determining initially whether these pollutants are present despite the expectations of the applicant. Once the data is provided, permits can be drafted which address specific pollutants. This rulemaking requires that the applicant test for oil and grease, COD, pH, BOD5, TSS, total Kjeldahl nitrogen, nitrate plus nitrite nitrogen and total phosphorus. Oil and grease and TSS are a common component of storm water and can have serious impacts on receiving waters. Oxygen demand (COD and BOD5) will help the permitting authority evaluate the oxygen depletion potential of the discharge. BOD5 is the most commonly used indicator of potential oxygen demand. COD is considered a more inclusive indicator of oxygen demand, especially where metals interfere with the BOD5 test. The pH will provide the permitting authority with important information on the potential availability of metals to the receiving flora, fauna and sediment. Total Kjeldahl nitrogen, nitrate plus nitrite nitrogen and total phosphorus are measures of nutrients which can impact water quality. Because this data is useful in developing appropriate permit conditions, EPA disagrees with the argument made by one commenter that quantitative data requirements should be a permit condition and not part of the application process.

In the proposed rule, the Agency used total nitrogen as a parameter. This has been changed to total Kjeldahl nitrogen and nitrate plus nitrite nitrogen for clarity.

Today's rule defines sampling at industrial sites in terms of sampling for those parameters that have effluent limits in existing NPDES permits, as well as for any other conventional or nonconventional parameter that might be expected to be found at the outfall. Comments on the appropriateness of the defined parameters were solicited by the proposal. Numerous commenters maintained that either the parameter list be made industry specific, or that pollutant categories not detected in the initial screen be exempted from further testing. Some suggested that only conventional pollutants, inorganics, and metals be sampled unless reason for others is found.

In terms of specific water quality parameters, it was recommended that surfactants not be tested for unless foam is visible. One commenter also suggested that fecal coliform sampling is inappropriate for industrial permits applications. One commenter favored testing for TOC instead of VOC. In response, VOC has been eliminated from the list of parameters because it will not yield specific usable data. VOC is not specifically required in any sampling in today's rule, except where priority pollutant scans are required.

Some recommended that procedures be modified to facilitate quicker, less expensive lab analyses. Concern was also raised that industry might be required to collect its own rainfall data if there is no nearby observation station. Some commenters stated that EPA should not allow automatic sampling for either biological or oil and grease sampling due to the potential for contamination in sampling equipment.

In response, EPA believes that the sampling requirements for industry in today's rule are reasonable and not burdensome. These requirements address parameters that have effluent limits in existing NPDES permits, as well as for any other conventional or nonconventional parameter that might be expected to be found at the applicants outfall. Under this procedure both industry-specific and site-specific contaminants are already identified in the existing permit. Whether all these parameters need to be made a part of any discharge characterization plans, under the terms of the permit, will be a case-by-case determination for the permitting authority. EPA maintains that the test for surfactants (if in effluent guidelines or in the facility's NPDES permit for process water) is justifiable even when a foam is not obvious at the outfall. The presence of detergents in storm water may be indicated by foam, but the absence of foam does not indicate that detergents are not present.

EPA requested comments on fecal coliform as a parameter. Fecal coliform was included on the list as an indicator of the presence of sanitary sewage. In large concentrations, fecal coliform may be an effective indicator of sanitary sewage as opposed to other animal wastes. EPA believes that sanitary cross connections will also be found at industrial facilities. Furthermore, the test for fecal coliform is an inexpensive test and its inclusion or exclusion should make little impact financially on the individual application costs. Sampling for volatile organic carbon shall be accomplished when required, as it is an appropriate indicator of industrial solvents and organic wastes.

In response to comments, EPA acknowledges that there are certain pollutants that are capable of leaving residues in automatic sampling devices that will potentially contaminate subsequent samples. In these cases, such as for biological monitoring, if such a problem is perceived to exist and it is expected that the contaminant will render the subsequent samples unusable, manual grab samples may be needed. This would include grab samples for pH, temperature, cyanide, total phenols, residual chlorine, oil and grease, fecal coliform, and fecal streptococcus. EPA is not disallowing the use of automatic sampling because of possible contamination, as this type of sampling may be the best method for obtaining the necessary samples from a selected storm events.

In addition to the conventional pollutants listed above, this final rule requires applicants, when appropriate, to sample other pollutants based on a consideration of site-specific factors. These parameters account for pollutants associated with materials used for production and maintenance, finished products, waste products and non-process materials such as fertilizers and pesticides that may be present at a facility. Applicants must sample for any pollutant limited in an effluent guideline applicable to the facility or limited in the facility's NPDES permit. These pollutants will generally be associated with the facility's manufacturing process or wastes. Other process and non-process related pollutants, will be addressed by complying with the requirements of 40 CFR 122.21(g)(7) (iii) and (iv).

Section 122.21(g)(7)(iii) requires applicants to indicate whether they know or have reason to believe that any pollutant listed in Table IV (conventional and nonconventional pollutants) of appendix D to 40 CFR part 122 is discharged. If such a pollutant is either directly limited or indirectly limited by the terms of the applicant's existing NPDES permit through limitations on an indicator parameter, the applicant must report quantitative data. For pollutants that are not contained in an effluent limitations guideline, the applicant must either report quantitative data or describe the reasons the pollutant is expected to be discharged. With regard to pollutants listed in Table II (organic pollutants) or Table III (metals, cyanide and total phenol) of appendix D, the applicant must indicate whether they know or have reason to believe such pollutants are discharged from each outfall and, if they are discharged in amounts greater than 10 parts per billion (ppb), the applicant must report quantitative data. An applicant qualifying as a small business under 40 CFR 122.21(g)(8), (*e.g.*, coal mines with a probable total annual production of less than 100,000 tons per year or, for all other applicants, gross total annual sales averaging less than $100,000 per year (in second quarter 1980 dollars)), is not required to analyze for pollutants listed in Table II of appendix D (the organic toxic pollutants).

Section 122.21(g)(7)(iv) requires applicants to indicate whether they know or have reason to believe that any pollutant in Table V of appendix D to 40 CFR part 122 (certain hazardous substances) is discharged. For every pollutant expected to be discharged, the applicant must briefly describe the reasons the pollutant is expected to be discharged and report any existing quantitative data it has for the pollutant.

When collecting data for permit applications, applicants may make use of 40 CFR 122.21(g)(7), which provides that "when an applicant has two or more outfalls with substantially identical effluents, the Director may allow the applicant to test only one outfall and report that the quantitative data also applies to the substantially identical outfalls." Where the facility has availed itself of this provision, an explanation of why the untested outfalls are "substantially identical" to tested outfalls must be provided in the application. Where the amount of flow associated with the outfalls with substantially identical effluent differs, measurements or estimates of the total flow of each of the outfalls must be provided. Several commenters stated that the time and expense associated with sampling and analysis would be saved if the applicant was able to pick substantially identical outfalls without prior approval of the permitting authority. EPA disagrees that this would be an appropriate devolution of authority to the permit applicant. The permitting authority needs to ensure that these outfalls have been grouped according to appropriate criteria (for example do the outfalls serve similar drainage areas at the facility). Furthermore, EPA is not requiring that the permit applicant engage in sampling to demonstrate that the outfalls are indeed substantially identical, because that would of course defeat the purpose of § 122.21(g)(7). The procedure for establishing identical outfalls is not that onerous and provides a means for industry to save substantially on time and resources for sampling.

EPA proposed and requested comment on a requirement that the facility must sample a storm event that is typical for the area in terms of duration and severity The storm event must be greater than 0.1 inches and must be at least 96 hours from the previously measurable (greater than 0.1 inch rainfall) storm event. In general, variance of the parameters (such as the duration of the event and the total rainfall of the event) should not exceed 50 percent from the parameters of the average rainfall event in that area. EPA also requested comments on addressing snow melt events under this definition.

Commenters stated that: median or average rainfall is not an acceptable approach; the minimum depth and duration of rainfall must be specified; the allowable 50% variation is questionable; the total depth of the storm is irrelevant; and the storm should be viewed based on the average intensity of the storm. One commenter

suggested that using the median rainfall event would be a better approach than the average rainfall event.

Others insisted that "representative" or typical storms do not exist in semi-arid climates and that representative rainfall must be site-specific (regional) and seasonal. Several commenters contended that the requirement for 96 dry hours between events is not acceptable, with 48 and 72 hours identified as possible alternatives.

One commenter believed that a typical standard design storm, such as the 1-year, 24-hour, or 10-year, 1-hour, would be preferable. Another commenter felt that the storm event should be based on the rainfall required to generate a minimum discharge level. One commenter questioned whether the storm is to be sampled at all sites simultaneously.

To clarify its decision on what storm event should be sampled, EPA notes that its selection of the storm event considers both regional and seasonal variation of precipitation. This is evidenced in the rule with regard to sites in the municipal application (three events sampled), and in the requirements for industrial group applications (a minimum of two applicants, or one applicant in groups of less than 10, to be represented in each precipitation zone (*see* section VI.F.4 below).

The definition of a 0.1 inch minimum was determined by NURP and other studies to be the minimum rainfall depth capable of producing the rainfall/runoff characteristics necessary to generate a sufficient volume of runoff for meaningful sample analysis. EPA believes by requiring the average storm to be used as the basis for sampling that depth, duration, and therefore average rainfall intensity are being regionally defined. The Agency has also added the option of using the median rainfall event instead of the average. The potential for monitoring events that may not meet this specification should be minimized by allowing the proposed 50 percent variation in rainfall depth and/or duration from event statistics. However, the 50 percent variation need only be met when possible. Further, there is flexibility in the rule where the Director may allow or establish site specific requirements such as the minimum duration between the previous measurable storm event and the storm event sampled, the amount of precipitation from the storm event to be sampled, and the form of precipitation sampled (snowmelt or rainfall). If data is obtained from a rain event that does not meet the criteria above, the Director has the discretion to accept the data as valid.

The December 7, 1988, proposal called for a 96-hour period between events of measurable rainfall, here defined as 0.1 inch, which provided a four day minimum for the accumulation of pollutants on the surface of the outfalls' tributary areas. The key word in the definition is "measurable", which means that the 96-hour period did not necessarily have to be dry, only that no cleansing rainfall (*i.e.* 0.1 inch rain event) has occurred. However, after reviewing comments on this issue EPA has decided to change the period to 72 hours. Many commenters indicated that 96 hours is too restrictive and that securing a sample under such circumstances would be unnecessarily difficult. EPA agrees that the quality or representativeness of the sample would not be adversely affected by this change.

EPA does not agree with comments that the requirement of a particular "design" storm would be appropriate. Many commenters have expressed concern that they might sample an event not meeting the requirements for industrial group applications as defined. Because there is no way to know with sufficient certainty beforehand that an upcoming event will approximate a one-year, twenty-four hour storm, many events would be unnecessarily sampled before this event is realized.

EPA does not intend that a municipality or industry be required to sample all required outfalls for a single storm. This would represent a unmanageable investment in equipment and manpower In some areas, it may be necessary to sample multiple sites for a single event due to the irregularity of rainfall, but not all sites.

EPA described parameters for selecting storm events for sampling of municipal and industrial outfalls in the December 7, 1988, proposal. EPA has received several comments regarding the problems that rainfall measurement in general presents. A recurring comment relative to reporting rainfall, and in verifying that the storm itself is representative, deals with the spatial distribution of rainfall. The rainfall measured at an airport does not always represent rainfall at the site, particularly in summer months when thunderstorms are prevalent. One commenter stated that it would be easier to base the selected storm on either a minimum discharge, or on a discharge duration other than on the total precipitation, because these parameters are easily measured at the site and are not dependent on the airport gauges receiving the same rainfall as the site. A few commenters questioned how to determine typical storm characteristics. One commenter advised that NOAA rainfall reporting stations provide data that represent only daily rainfall totals, not storm event data. One commenter pointed out that the time frame of the sampling requirement does not consider that a particular region may be in the midst of a multi-year drought cycle, and that what little rainfall occurs may have uncharacteristically high levels of pollutants.

The type of rain event sampled is an important parameter in any attempt to characterize system-wide loads based on the sampling results. Rainfall gauges that report only event total depth will provide the information necessary to characterize most events, provided that a reasonable estimate of the event duration can be made. If simulation models are to be used in estimating system-wide loads, rainfall measurement based on time and depth of rainfall will be needed. If the recording stations are not believed to accurately reflect this distribution, then the data will need to be collected by the applicant at a location central to the tributary area of the outfall.

The rainfall data collected by NOAA are in most cases available in the form of hourly rainfall depths. This information can be analyzed to develop characteristic storm depths and durations. In some cases, this information has already been analyzed for many long term reporting stations by various municipalities, states, and universities. The results of these investigations should be available to the applicants.

EPA realizes that prolonged rainless periods occur for both semi-arid areas and areas experiencing droughts and that the first storm after a prolonged dry period may well not be representative of "normal" runoff conditions. In order for the appropriate system-wide characterization of loads to be made, data must be collected. With regard to the municipal permit application, today's rule states that runoff characterization data will be collected during three events at from five to ten sites. The rule gives the Director the flexibility of modifying these requirements.

EPA has defined the parameters for selecting the storm event to be sampled such that at the discretion of the Director, seasonal, including winter, sampling might be required. EPA has received several comments regarding the problems that snowmelt sampling may present. Several commenters are

opposed to monitoring of snowmelt events. The reasons cited include equipment problems and the unreasonableness of expecting this sampling, because of temperatures and the time required for personnel to be waiting for events. A few comments addressed the issues of snow pack depth, ambient temperature, and solar radiation levels, and that the snow pack may filter suspended solids or refreeze such that final melting is uncharacteristically over-polluted relative to normal conditions. Another commenter contended that it is impossible to manage the melting process and therefore unreasonable to expect controls to be implemented relative to snowmelt. In essence, it is contended that there is no first discharge unless the snow pack depth is low and melts quickly.

A few commenters favor monitoring snowmelt, for precisely the same reason that most oppose it: that the runoff from snowmelt is the most polluted runoff generated in some areas on an annual basis. Where this is the case, sampling snowmelt should be undertaken in order to accurately assess impacts to receiving streams. EPA is confident that in areas where automated sampling cannot be relied upon, grab sampling can probably be performed because the nature of the snowmelt process tends to make the timing of samples less of a problem when compared to typical rainfall events. EPA disagrees that management practices, either at industrial facilities or with regard to municipalities, cannot address snowmelt. Some areas may need to reassess their salt application procedures. In addition retention and detention devices may address snowmelt, as well as erosion controls at construction sites. Thus, obtaining samples of snowmelt is appropriate to allow development of such permit conditions.

Today's rule also modifies the Form 2C requirements by exempting applicants from the requirements at § 122.21(g)(2) (line drawings), (g)(4) (intermittent flows), (g)(7) (i), (ii), and (v) (various sampling requirements to characterize discharges) if the discharge covered by the application is composed entirely of storm water. Permit applications for discharges containing storm water associated with industrial activity would require applicants to provide other non-quantitative information which will aid permit writers to identify which storm water discharges are associated with industrial activity and to characterize the nature of the discharge.

Numerous comments were received regarding the requirement to submit a topographic map and site drainage map. Many of these comments offered alternatives to EPA's proposal. Two commenters suggested that a simple sketch of the site would be sufficient. Two commenters stated that one or the other should be adequate. One commenter believed that the drainage map was a good idea, but that the topographic map should be optional. Several commenters submitted that a topographic map was sufficient and that only SPCC plans or SARA submittals should supplement that. Another commenter argued that information relating to the location of the nearest surface water or drinking wells would be sufficient. Other commenters believed that a drainage map alone would indicate all relevant site specific information. Numerous commenters expressed concern that the drainage area map would be too detailed and that one which depicts the general direction of flow should be sufficient. Clarification was requested on whether the final rule would require the location of any drinking water wells. One commenter stated that a U.S.G.S. 7.5 quadrangle map will not illustrate drainage systems in all cases, and that therefore the requirement should be optional.

Several commenters agreed with EPA's proposal. One commenter maintained that drainage maps should be required from developments greater than three acres and from all individual applicants. Several commenters agreed with EPA's proposal that both maps should be provided, with arrows indicating site drainage and entering and leaving points. It was advised that drainage maps are useful in locating sources of storm water contamination, and it is useful to identify areas and activities which require source controls or remedial action. One commenter recommended that the map should extend far enough offsite to demonstrate how the privately owned system connects to the publicly owned system.

After considering the merits of all the comments and the reasons supporting EPA's proposal, EPA is convinced that a topographic map and a site drainage map are necessary components of the industrial application. Existing permit application regulations at 40 CFR 122.21(f)(7) require all permit applicants to submit as part of Form 1 a topographic map extending one mile beyond the property boundaries of the source depicting: the facility and each intake and discharge structure; each hazardous waste treatment, storage, or disposal facility; each well where fluids from the facility are injected underground; and those wells, springs, other surface water bodies, and drinking water wells listed in the map area in public records or otherwise known to the applicant within one-quarter mile of the facility property boundary. (*See* 47 FR 15304, April 8, 1982.) However, as indicated by the comments the information provided under § 122.21(f)(7) is generally not sufficient by itself for evaluating the nature of storm water discharges associated with industrial activity.

As stated in comments, a drainage map can provide more important site specific information for evaluating the nature of the storm water discharge in comparison to existing requirements, which require a larger map with only general information. The volume of storm water discharge and the pollutants associated with it will depend on the configuration and activities occurring at the industrial site. One commenter suggested that it would be appropriate to submit an aerial photograph of the site with all the topographic and drainage information superimposed on the photograph. EPA agrees that this may be an appropriate method of providing this information. EPA is not requiring a specific format for submitting this information.

EPA is also requiring that a narrative description be submitted to accompany the drainage map. The narrative will provide a description of on-site features including: existing structures (buildings which cover materials and other material covers; dikes; diversion ditches, etc.) and non-structural controls (employee training, visual inspections, preventive maintenance, and housekeeping measures) that are used to prevent or minimize the potential for release of toxic and hazardous pollutants; a description of significant materials that are currently or in the past have been treated, stored or disposed outside; and the method of treatment, storage or disposal used. The narrative will also include: a description of activities at materials loading and unloading areas; the location, manner and frequency in which pesticides, herbicides, soil conditioners and fertilizers are applied; a description of the soil; and a description of the areas which are predominately responsible for first flush runoff. This requirement is unchanged from the proposal.

Some commenters believed that information on pesticides, herbicides, and fertilizers and similar products is irrelevant, incidental to the facility's production activities, and should not be

addressed by this rulemaking. EPA disagrees. As these materials are applied outside and hence subject to storm events, they are significant sources of pollutants in storm water discharges whether applied in residential or industrial settings. By providing this information in the permit application the permit writer will be able to determine whether such activity is associated with industrial activity and the subject of appropriate permit conditions. Nominal or incidental application of these materials at industrial facilities and non-detects in sampling of storm water discharges for the permit application will result, in most cases, in these materials not being addressed specifically in storm water permits.

Today's rule also requires that permit applicants for storm water discharges associated with industrial activity certify that all of the outfalls covered in the permit application have been tested or evaluated for non-storm water discharges which are not covered by an NPDES permit. (The applicant need not test for nonstorm water if the certification of the plant storm water discharges can be evaluated through the use of schematics or other adequate method). Section 405 of the WQA added section 402(p)(3)(B)(ii) to the CWA to require that permits for municipal separate storm sewers effectively prohibit non-storm water discharges to the storm sewer system. As discussed in part VI.F.7.b of today's preamble, untreated non-storm water discharges to storm sewers can create severe, wide-spread contamination problems and removing such discharges presents opportunities for dramatic improvements in the quality of such discharges. Although section 402(p)(3)(B)(ii) specifically addresses municipal separate storm sewers, EPA believes that illicit non-storm water discharges are as likely to be mixed with storm water at a facility that discharges directly to the waters of the United States as it is at a facility that discharges to a municipal storm sewer. Accordingly, EPA feels that it is appropriate to consider potential non-storm water discharges in permit applications for storm water discharges associated with industrial activity. The certification requirement would not apply to outfalls where storm water is intentionally mixed with process waste water streams which are already identified in and covered by a permit.

This rulemaking requires applicants for individual permits to submit known information regarding the history of significant spills at the facility. Several commenters indicated that the extent to which this information is required should be modified. One commenter stated that the requirement should be limited to those spills that resulted in a complaint or enforcement action. EPA disagrees. EPA believes that significant spills at a facility should generally include releases of oil or hazardous substances in excess of reportable quantities under section 311 of the Clean Water Act (*see* 40 CFR 110.10 and 40 CFR 117.21) or section 102 of CERCLA (*see* 40 CFR 302.4). Such a requirement is consistent with these regulations and the perception that such spills are significant enough to mandate the reporting of their occurrence. Some commenters stated that industries have already submitted this information in other contexts and should not be required to have to do it again. For the same reason another commenter felt that submittal of this information represents a waste of manpower and resources. EPA disagrees that requiring this information is unduly burdensome. If this information has already been provided for another purpose it follows that it is readily available to the industrial applicant. Thus, the burden of providing this information cannot be considered undue. Furthermore, the permit authority will need to have this available in order to determine which drainage areas are likely to generate storm water discharges associated with industrial activity, evaluate pollutants of concern, and develop appropriate permit conditions. However, to keep this information requirement within reasonable limits and limited to information already available to individual facilities, EPA has declined to expand the reporting requirements to spills of other materials, such as food as one commenter has suggested. However, EPA has decided to add raw materials used in food processing or production to the list of significant materials. Materials such as these may find their way into storm water discharges in such quantities that serious water quality impacts occur. These materials may find there way into storm water from transportation vehicles carrying materials into the facility, loading docks, processing areas, storage areas, and disposal sites.

One commenter urged that any information requested should be limited to a period of three years, which is the general NPDES records retention requirement under 40 CFR 122.21(p) and 40 CFR 112.7(d)(8). EPA agrees with this comment and has limited historical information requirements to the 3 years prior to the date the application is submitted. In this manner this regulation will be consistent with records keeping practices under the NPDES and Oil Spill Prevention programs, except sludge programs.

The December 7, 1988, proposal required the applicant to submit a description of each past or present area used for outdoor storage or disposal of significant materials. One commenter felt that the definition of significant material was too imprecise. EPA disagrees that the language should be made more precise by delineating every conceivable material that may add pollutants to storm water. Rather the definition is broad, to encourage permit applicants to list those materials that have the potential to cause water quality impacts. Stating what materials are addressed in meticulous detail may result in potentially harmful materials remaining unconsidered in permits. However, EPA has decided to add "fertilizers, pesticides, and raw materials used in the production or processing of food" to the definition in response to the comment of one State authority that such materials need to be accounted for due to their potential danger to storm water discharge quality. This same commenter recommended that "hazardous chemicals" should be added. EPA agrees, and will delineate those chemicals as "hazardous substances" which are designated under section 101(14) of CERCLA. Further clarification has been added by requiring the listing of any chemical the facility is required to report pursuant to section 313 of title III of SARA.

Another commenter felt that EPA should not require information of past storage of significant materials. EPA agrees that this proposed requirement is overbroad and has limited the time frame to those materials that were stored in areas 3 years or fewer from the date of the permit application. The 3-year limit is consistent with other Agency reporting requirements as discussed above.

One commenter questioned EPA's proposal not to provide for a waiver from the requirement to submit quantitative data if the applicant can demonstrate that it is unnecessary for permit issuance. Another commenter said that a waiver is inappropriate. EPA believes relevant quantitative data are essential to the process, but in this rulemaking the number of pollutants that must be sampled and analyzed is reduced compared to previous regulations. The proposed requirements for quantitative data are limited to pollutants that are appropriate for given

site-specific operations, thereby making a waiver unnecessary.

Although the concept of a waiver is attractive because of the perceived potential reduction in burdens for applicants, EPA believes that because the storm water discharge testing requirements have already been streamlined, a waiver would not in practice provide significant reductions in burden for either applicants or permit issuing authorities. Requirements to provide and verify data demonstrating that a waiver is appropriate for a storm water discharge may prove to be more of a burden to the applicant and the permitting authorities. Establishing such a waiver procedure would be administratively complex and time-consuming for both EPA and the applicants, without any justifiable benefit. Therefore, this rulemaking does not include a waiver provision.

In response to one commenter, EPA wishes to emphasize that if a facility has zero storm water discharge because it is discharging to a detention pond only, a permit application is not required. Only those discharges to the waters of the United States or municipal systems need submit notifications, individual or group permit applications, or notices of intent where applicable. However, if the detention pond overflows or the discharger anticipates that it may overflow, then a permit application should be submitted.

Two commenters agreed with EPA's proposed requirement to have a description of past and present material management practices and controls. EPA believes that this is important information directly relating to the quality of storm water that can be expected at a particular facility and this requirement is retained in today's rule. However, as with other historical information requirements, EPA is limiting past practices to those that occurred within three years of the date that the application is submitted. One commenter argued that past practices should not be considered unless there is evidence that past practices cause current storm water quality problems. EPA anticipates that the information submitted by the applicant will be used to make this determination and that appropriate permit conditions can be developed accordingly.

One commenter requested clarification on the certification requirement that the data and information in the application is true and complete to the best of the certifying officer's knowledge. This is a fundamental and integral part of all NPDES permit applications. It essentially requires the signatory to assure the permit writer, based upon his or her personal knowledge, that the information has been submitted without a negligent, reckless, or purposeful misrepresentation. EPA intends to interpret this requirement in the same manner for storm water applications as other applications.

4. Group Applications

Today's final rule provides some industries with the option of participating in a group application, in lieu of submitting individual permits. There are several reasons for the group application. First, the group application procedure provides adequate information for issuing permits for certain classes of storm water discharges associated with industrial activity. Second, numerous commenters supported the concept of the group application as a way to reduce the costs and administrative burdens associated with storm water permit applications. Third, group applications will reduce the burden on the regulated community by requiring the submission of quantitative data from only selected members of the group. Fourth, the group application process will reduce the burden on the permit issuing authority by consolidating information for reviewing permit applications and for developing general permits suited to certain industrial groups. Where general permits are not appropriate or cannot be issued, a group application can be used to develop model individual permits, which can significantly reduce the burden of preparing individual permits.

As noted above in today's preamble, EPA intends to promulgate a general permit that will cover many types of industrial activity. Industrial dischargers eligible for such permits will generally be required to seek coverage by submittal of a notice of intent. Facilities that are ineligible for coverage under the general permit will be required to submit an individual permit application or submit a group application. The group application process promulgated today will serve as an important component to implement Tier III of EPA's industrial storm water permitting strategy discussed above. The general permit which EPA intends to promulgate in the near future shall set forth what types of facilities are eligible for coverage.

Some commenters criticized the group application procedure as an abdication of EPA's responsibility to effectively deal with pollutants in storm water discharges. One commenter stated that every facility subject to these regulations should be required to submit quantitative data. In response EPA believes, as do numerous commenters, that the group application procedure is a legitimate and effective way of dealing with a large volume of currently uncontrolled discharges. The only difference between the group application procedure and issuing individual permits based on individual applications is that the quantitative data requirements from individual facilities will be less if certain procedures are followed. EPA is convinced that marked improvements in the process of issuing permits will be achieved when these procedures are followed. Where the storm water discharge from a particular facility is identified as posing a special environmental risk, it can be required to submit individual applications and therefore separate quantitative data. It should also be noted that submittal of a group application does not exempt a facility from submitting quantitative data on its storm water discharge during the term of the permit.

The final rule refines and clarifies some of the requirements of the group application approach set forth in the December 7, 1988 proposal. Several commenters requested that EPA add a provision which would allow a facility that becomes subject to the regulations to "add on" to a group application after that group application has already been submitted. One commenter indicated that some trade associations are prohibited from engaging in an activity which would not apply to all its members, and that an "add on" provision was needed in the event such a prohibition was invoked. Another commenter noted that where a group is particularly large, for example one that consists of several thousand members, that it would be a logistical feat to ensure that all facilities eligible as members of the group are properly identified and listed on the application within the 120 day deadline for submitting part 1A of the application.

EPA believes that a group applicant should have a limited ability to add facilities to the group after part 1A has been submitted and that a provision which allows a group or group representative an unbridled ability to "add on" is impractical for a number of reasons. First, 10% of the facilities must submit quantitative data. Adding facilities after the group has been formed and approved would change the number of facilities that have to submit quantitative data on behalf of the group. This would result in an unwarranted administrative burden on the reviewing authority, which is in the position of having to examine the quantitative data and determine the appropriateness of group members (and those that are

required to submit quantitative data) within 2 months of receiving part 1 of the group application. Further, during the permit application process permitting authorities will be developing permit conditions for an identified and pre-determined group of facilities. Allowing potentially significant numbers of permit applicants to suddenly inject themselves into a group application could unnecessarily hamper or disrupt the timely development of general and model permits. In addition, if a facility were "added on" the number of facilities having to submit quantitative data may drop below 10%. Thus the facility desiring to "add on" may be put in the position of having to submit the quantitative data themselves, which would clearly defeat the purpose of being a part of the group application.

Nevertheless, EPA has added a provision to 122.26(e) which enables facilities to add on to a group application at the discretion of the EPA's Office of Water Enforcement and Permits, and upon a showing of good cause by the group applicant. For the reasons noted above, EPA anticipates this provision will be invoked only in limited cases where good cause is shown. Facilities not properly identified in the group application, and which cannot meet the good cause test will be required to submit individual permit applications. EPA will advise such facilities within 30 days of receiving the request as to whether the facility may add on.

However, the "add on" facility must meet the following requirements: The application for the additional facility is made within 15 months of the final rule; and the addition of the facility does not reduce the percentage of the facilities that are required to submit quantitative data to below 10% unless there are over 100 facilities that are submitting quantitative data. Approval to become part of a group application is obtained from the group or the trade association and is certified by a representative of the group; approval for adding on to a group is obtained from the Office of Water Enforcement and Permits.

Several commenters stated that the application requirements for groups are so burdensome that the advantages of the process are undermined. These concerns are addressed in greater detail below. Among the requirements which commenters objected are the requirements to list every group member's company by name and address. EPA is convinced that a condition precedent to approving a group application is at least identifying the members of the group. Without such information it would be impossible to determine if all the facilities are sufficiently similar. EPA disagrees that industries will be dissuaded from using the group application process because the advantages of the process are undermined. Although commenters perceived many burdens associated with individual permit applications, by far the most significant burden identified by the comments is the requirement for obtaining and submitting quantitative data. The group application significantly reduces this burden by requiring only10% of the facilities to submit quantitative data if the number in the group is over 100. If the number in the group is over 1000, then only 100 of the facilities need submit quantitative information. If group applicants develop cost sharing procedures to reduce the financial and administrative burdens of submitting quantitative data, it is evident that utilizing the group application could save industries as much as 90% on the most economically burdensome aspect of the application.

Several commenters perceived that the group application procedure did not offer them significant savings because under the proposal their particular industry would only be required to test for COD, BOD5, pH, TSS, oil and grease, nitrogen, and phosphorous. These commenters stated that sampling for these pollutants is not particularly expensive. EPA believes that even if a group is required only to submit minimal quantitative data on particular pollutants, substantial savings can accrue to a particular industry if the group has many members. This is particularly true when the number of outfalls to be sampled, the information on storm events, and flow measurements are factored into the cost analysis. An additional benefit for members of the group as well as for permit issuing agencies is that the process of developing a permit, including drafting and responding to public comments on the permit, is consolidated by the group application process. Accordingly, it is less resource intensive for the group to work with permit issuance authorities to develop well founded permit conditions.

One commenter raised a concern about the situation where one of the facilities that is designated for submitting quantitative data drops out of the group. If this happened, then another facility would have to submit quantitative data. In response, EPA notes that one approach would be for the group to have one or two more facilities submit quantitative data than needed to avoid problems from such a departure or to account for new additions to the group. Certainly this issue goes directly to the facility selection process which is a critical component of the group application; the facilities need to be carefully selected and reviewed by the group to prevent such difficulties.

Several comments indicated a confusion over what facilities are eligible to take advantage of the group application procedure. Any industry or facility that is required to submit a storm water permit application under these regulations is eligible to participate in a group application. However, whether a facility can obtain a storm water permit under a group application procedure will depend upon whether that facility is a member of the same effluent guideline subcategory, or is sufficiently similar to other members of the group to be appropriate for a general permit or individual permit issued pursuant to the group application. Accordingly, group applications are not limited to national trade associations. The agency believes that the language in § 122.26(c)(2) adequately addresses these concerns. The process does not prohibit a particular company with multiple facilities from filing a group application as long as those facilities are sufficiently similar.

One commenter expressed concern that a single company would not be able to take advantage of the group application benefits unless the company had more than ten facilities. Under such circumstances the company would have to become integrated with a larger group of facilities owned by other companies in order to take advantage of the benefits afforded by the group application procedure. In response, the Agency is providing for a group application of between four and ten members, however at least half the facilities must submit data. One commenter stated that the number of facilities required to submit quantitative data should be determined on a case by case basis. EPA believes that 10 percent for groups with over ten members will be easiest to implement for both industry and EPA, and will ensure that adequate representative quantitative data are obtained so that meaningful determinations of facility similarity can be made and appropriate permit conditions in general or model permits can be developed.

Another commenter suggested that one facility with a multitude of storm water discharge points should be able to use the group permit application to reduce the amount of quantitative data

that it is required to submit. This is an accurate observation but only to the extent that the facility combines with several other facilities to form a group, in which case only 10% of the facilities need submit quantitative data. The group application procedure in today's rule is designed for use by multiple facilities only. However, if an individual facility has 10 outfalls with ten substantially identical effluents the discharger may petition the Director to sample only one of the outfalls, with that data applying to the remaining outfalls. See § 122.21(g)(7). Thus, existing authority already allows for a "group-like" process for sampling a subset of storm water outfalls at a single facility.

Concern was expressed that the spill reporting requirement from each facility in part 1B would preclude any group from demonstrating that the facilities sampled are "representative," because the incidence of past spills is very site-specific. EPA notes that since it has dropped the part 1B requirements for other reasons discussed below, this comment is now moot.

Numerous commenters noted that if a facility is part of a group application and is subsequently rejected as a group applicant, such an entity would not have a full year to submit an individual permit application. EPA agrees that this is a significant concern. Accordingly, those facilities that apply as a member of a group application will be afforded a full year from the time they are notified of their rejection as a member of the group to file an individual application. EPA notes that it intends to act on group application requests within 60 days of receipt; thus this approach will only provide facilities that are rejected from a group application a short extension of the deadline for other individual applications.

One commenter complained that the cost of defending a group's choice of representative facilities may exceed the cost of submitting an individual permit application, thereby reducing the incentive to apply as group. The agency anticipates that the selection process will be one open to negotiation between the affected parties and one that will end in a mutually satisfactory group of facilities. It is the intent of EPA to reduce the costs of submitting a permit application as much as possible, while providing adequate information to support permitting activities.

Another commenter argued that the use of model permits will create a disincentive for participating in a group because model permits may be used by the permit issuing authority to issue individual permits for discharges from similar facilities that did not participate in the group application. EPA does not agree. The benefit of applying as a group applicant is to take advantage of reduced representative quantitative data requirements. This incentive will exist regardless of whether or how model permits are used. Further, technology transfer can occur during the development of permits based on individual applications as well as those based on group applications.

One commenter suggested moving some of the facility specific information requirements of part 1 of the group application to part 2 of the group application in order to provide more incentive to apply as a group. EPA has considered this and believes such a change would be inappropriate. Part 1 information will be used to make an informed decision about whether individual facilities are appropriate as group members and appropriate for submitting representative quantitative data. Furthermore, information burdens from providing site specific factors in part 1 is relatively minimal, and the information requirements in the proposed part 1B application have been eliminated.

One commenter suggested that trade associations develop model permits since they have the most knowledge about the characteristics of the industries they represent. As noted above, EPA expects that the industries and trade associations will have input, through the permit application process, as to how permit conditions for storm water discharges are developed. While the applicant can submit proposed permit conditions with any type of application, EPA however cannot delegate the drafting of model permits to the permittees. EPA is developing and publishing guidance in conjunction with this rulemaking for developing permit conditions.

One commenter suggested that new dischargers should be able to take advantage of general permits developed pursuant to group applications. As with other general permits, EPA anticipates that such discharges will be able to fall within the scope of a general permit based on a group application where appropriate.

One commenter stated that the group application does not benefit municipalities since there is no requirement for industrial discharges through municipal sewers to apply for a permit. As noted in a previous discussion, industrial discharges through municipal sewers must be covered by an NPDES permit. Such facilities may avail themselves of the group application procedure. Also, municipalities are not precluded from developing a group application procedure under their management plan for industries that discharge into their municipal system, in order to streamline developing controls for such industries.

One industry wanted clarification that facilities located within a municipality would be eligible to participate in a group application. All industrial activities required to submit an individual permit are entitled to submit as part of group application, except those with existing NPDES permits covering storm water. Those facilities that discharge through a municipal separate storm sewer systems required to submit an individual application (because they do not fall within a general permit) are not precluded from using the group application procedure if appropriate.

Other municipalities expressed confusion over the industrial group application concept. The following responds to these comments. First, municipalities are not eligible for participation in a group application because the group application process is designed for industrial activities. Sampling requirements for municipal permit applications are already limited to a small subset of the outfalls from the system, as discussed below. Furthermore, permits for municipal separate storm sewer systems will be issued on a system-wide or jurisdiction-wide basis, rather than individually for each outfall. Thus, today's regulation already incorporates a "grouplike" permit application process for municipalities. Furthermore, it is highly unlikely that various municipal storm sewer systems would be "substantially similar" enough to justify group treatment in the same way as industrial facilities. In response to another comment, this regulation does not directly give the municipality enforcement power over members of an industrial group who may be discharging through its system. Only the permitting authority and private citizens and organizations (including the municipality acting in such a capacity) will have enforcement power over members of the group once permits are issued to those members.

One commenter believed that the States with authorized NPDES programs rather than EPA should establish permit terms for permits based on group applications. In response to this comment, EPA wishes to clarify its role in the group application process. Group applications will be submitted to EPA headquarters where they will be reviewed and summarized. The

summaries of the group application will be distributed to authorized NPDES States. EPA wishes to emphasize that NPDES States are not bound by draft model permits developed by EPA. States may adopt model permits for use in their particular area, making adjustments for local water quality standards and other regional characteristics. Where general permit coverage is believed to be inappropriate, facilities may be required to apply for individual permits. One commenter objected to the group application procedure because it is not consistent with existing Federal permitting procedures, which will lead to confusion in the regulated community. The agency disagrees with this assessment. The group application is a departure from established NPDES program procedures. However, the comments, when viewed in their entirety, reflect widespread support from the regulated community for a group application procedure. Further, the comments reflect that those affected by this rulemaking understand the components of the group application and the procedures under which permits will be obtained pursuant to the group application.

One commenter expressed concern regarding how BAT limits for groups of similar industries will be developed. Technology based limits will be developed based on the information received from the group applicants. If the group applicants possess similar characteristics in terms of their discharge, BAT/BCT limitations and controls will be developed accordingly for those members of the group. If the discharge characteristics are not similar then applying industries are not appropriate for the group.

One commenter has suggested that the proposed group application is too complex with regard to the part 1A, part 1B, and part 2 group application requirements and that EPA should repropose these provisions. As discussed below, EPA has simplified the industrial group application requirements by eliminating the part 1B application. Thus, reproposal is unnecessary.

One commenter criticized the group application concept as not achieving any type of reduction in administrative burden for NPDES States. EPA disagrees with this assessment. If industries take advantage of the group application procedure, EPA will have an opportunity to review information describing a large number of dischargers in an organized manner. EPA will perform much of the initial review and analysis of the group application, and provide NPDES States with summaries of the applications thereby reducing the burden on the States. Furthermore, the procedure encourages a potentially large number of facilities to be covered by a general permit, which will clearly reduce the administrative burden of issuing individual permits.

The final rule establishes a regulatory procedure whereby a representative entity, such as a trade association, may submit a group application to the Office of Water Enforcement and Permits (OWEP) at EPA headquarters, in which quantitative data from certain representative members of a group of industrial facilities is supplied. Information received in the group application will be used by EPA headquarters to develop models for individual permits or general permits. These model permits are not issued permits, but rather they will be used by EPA Regions and the NPDES States to issue individual or general permits for participating facilities in the State. In developing such permits, the Region or NPDES State will, where necessary, adapt the model permits to take into account the hydrological conditions and receiving water quality in their area. One commenter expressed the view that having this procedure managed by EPA headquarters would cause delays and it should be delegated to the States and Regions. EPA disagrees that delay will ensue using this procedure. Furthermore, consistency in development of model and general permits can be achieved if application review is coordinated at EPA headquarters.

a. Facilities Covered. Under this rule the group application is submitted for only the facilities specifically listed in the application and not necessarily for an entire industry. The facilities in the group application selected to do sampling must be representative of the group, not necessarily of the industry.

Facilities that are sufficiently similar to those covered in a general permit (issued pursuant to a group application) that commence discharging after the general permit has been issued, must refer to the provisions of that general permit to determine if they are eligible for coverage. Facilities that have already been issued an individual permit for storm water discharges will not be eligible for participation in a group application. Several commenters believed that this restriction is inequitable since they have experienced the administrative burden of submitting a permit application. EPA disagrees. Industries that have already obtained a permit for storm water discharges have developed a storm water management program, engaged in the collection of quantitative data, and possess familiarity and experience with submitting storm water permit applications. The Agency sees no point to instituting an entirely new permit application process for facilities that have storm water permits issued individually. It makes little sense for these industries to be involved with submitting another permit application before their current permit expires.

As noted above, once a general permit has been issued to a group of dischargers, a new facility may request that they be covered by the general permit. The permitting authority can then examine the request in light of the general permit applicability requirements and determine whether the facility is suitable or not.

b. Scope of Group Applications. Numerous comments were received on how facilities should be evaluated as members of a group application. Several commenters stated that effluent limitation guideline subcategories are not relevant to pollutants found in storm water, but rather to the facility's everyday activities, and therefore similarity should be based on each facility's discharge or the similarity of pollutants expected to be found in a facility's discharge. Other commenters felt that similarity of operations at facilities should be the criteria. Others, believed that an examination of the facility's impact on storm water quality should be the applied criteria. Other commenters suggested that EPA provide more guidance as to how broadly groups can be defined and that a failure to do so would discourage facilities from going to the trouble and expense of entering into the group application process. Some commenters were concerned that facilities would be rejected as a group because of variations in processes and process wastewater characteristics.

EPA does not agree that effluent limitation guideline subcategories are inappropriate as a method for determining group applications. EPA guideline subcategories are functional classifications, breaking down facilities into groups, for purposes of setting effluent limitations guidelines. The use of EPA subcategories will save time for both applicants and permitting authorities in determining whether a particular group is appropriate for a group application. Furthermore, EPA believes that this method of grouping provides adequate guidance for determining what facilities are grouped together. Establishing groups on the extent to which a facility's discharge

affects storm water quality would not provide applicants with sufficient guidance as to the appropriateness of individual industries for group applications and would not provide information needed to draft appropriate model permit conditions for potentially different types of industries, industrial processes, and material management practices.

However, EPA recognizes that the subcategory designations may not always be available or an effective methodology for grouping applicants. Also, there are situations where processes that are subject to different subcategories are combined. EPA agrees that the group application option should be flexible enough to allow groups to be created where subcategories are too rigid or otherwise inappropriate for developing group applications or where facilities are integrated or overlap into other subcategories. For these reasons, this rulemaking does not limit the submission to EPA subcategories alone, but rather allows groups to be formed where facilities are similar enough to be appropriate for general permit coverage.

In determining whether a group is appropriate for general permit coverage, EPA intends that the group applicant use the factors set forth in 40 CFR 122.28(a)(2)(ii), the current regulations governing general permits, as a guide. If facilities all involve the same or similar types of operations, discharge the same types of wastes, have the same effluent limitation and same or similar monitoring requirements, where applicable, they would probably be appropriate for a group application. To that extent, facilities that attempt to form groups where the constituent makeup of its process wastewater is dissimilar may run the risk of not being accepted for purposes of a group application.

Some commenters expressed the view that categories formed using general permit factors are too broad or that the language is too vague. One commenter expressed the view that the standard is too subjective and that permit writers will be evaluating the similarity of discharge too subjectively, while other commenters felt that the criteria should be broad and flexible. Other commenters stated that the effluent guideline subcategory or general permit coverage factors are not related to storm water discharges, because much of the criteria are based upon what is occurring inside the plant, rather than activities outside of the plant. EPA believes that these criteria are reasonable for defining the scope of a group application. EPA disagrees that the procedure, which is adequate for the issuance of general permits, is inadequate for the development of a group application. EPA believes that the activities inside a facility will generally correspond to activities outside of the plant that are exposed to storm events, including stack emissions, material storage, and waste products. Furthermore, if facilities are able to demonstrate their storm water discharge has similar characteristics, that is one element in the analysis needed for establishing that the group is appropriate. EPA disagrees that the criteria are too vague. If facilities are concerned that general permit criteria is insufficient guidance, then subcategories under 40 CFR subchapter N should be used. EPA believes that the program will function best if flexibility for creating groups is maintained.

If a NPDES approved State feels that a tighter grouping of applicants is appropriate individual permit applications can be requested from those permit applicants. One commenter indicated that it was not clear whether the group application procedure could be used for all NPDES requirements. EPA would clarify that the group application is designed only to cover storm water discharges from the industrial facilities identified in § 122.26(b)(14).

As noted above, EPA wishes to clarify that facilities with existing individual NPDES permits for storm water are not eligible to participate in the group application process. From an administrative standpoint EPA is not prepared to create an entirely different mechanism for permitting industries which already have such permits.

c. Group Application Requirements. The group application, as proposed, included the following requirements in three separate parts. Part 1A of a group application included: (A) Identification of the participants in the group application by name and location; (B) a narrative description summarizing the industrial activities of participants; (C) a list of significant materials stored outside by participants; and (D) identification of 10 percent of the dischargers participating in the group application for submitting quantitative data. A proposed part 1B of the group application included the following information from each participant in the group application: (A) A site map showing topography (or indicating the outline of drainage areas served by the outfall(s) and related information; (B) an estimate of the area of impervious surfaces (including paved areas and building roofs) and the total area drained by each outfall and a narrative description of significant materials; (C) a certification that all outfalls that should contain storm water discharges associated with industrial activity have been tested for the presence of non-storm water discharges; (D) existing information regarding significant leaks or spills of toxic or hazardous pollutants at the facility; (E) a narrative description of industrial activities at the facility that are different from or that are in addition to the activities described under part 1A; and (F) a list of all constituents that are addressed in a NPDES permit issued to the facility for any of non-storm water discharge. Part 2 of a group application required quantitative data from 10 percent of the facilities identified.

Some commenters felt that spill histories, drainage maps, material management practices, and information on significant materials stored outside are too burdensome or meaningless for evaluating similarity of discharges among group applicants. Several commenters stated that such requirements where the group may consist of several thousand facilities were impractical and would not assist EPA in developing model permits. Many commenters insisted that the requirements imposed in part 1B would effectively discourage use of the group application procedure. EPA agrees in large part with these comments. After reevaluating the components of part 1B, and the entire rationale for instituting the group application procedure, EPA has decided to excise part 1B from the requirements, and rely on part 1A and part 2 for developing appropriate permit condition. Where appropriate, EPA may require facilities to submit the information, formerly in part 1B, during the term of the permit. In other cases, EPA will establish which facilities must submit individual permit applications where more site specific permits are appropriate.

Under the revised part 1 and part 2, EPA will receive information pertaining to the types of industrial activity engaged in by the group, materials used by the facilities, and representative quantitative data. EPA can use such information to develop management practices that address pollutants in storm water discharges from such facilities. For most facilities, general good housekeeping or management practices will eliminate pollutants in storm water. Such requirements can be further refined by determining the nature of a group's industrial activity and by obtaining information on material used at the facility and representative quantitative data from a

percentage of the facilities. Thus, EPA is confident that model permits and general permits can be developed from the information to be submitted under part 1 and part 2.

One commenter felt that more guidance on what makes a facility representative for sampling as part of a group is needed. In response, the Agency believes the rule as currently drafted provides adequate notice.

Another commenter asked how much sampling needed to be done and how much monitoring will transpire over the life of the permit for members of a group. This will vary from permit to permit and will be determined in permit proceedings. This rulemaking only covers the quantitative data that is to be submitted in the context of the group permit application.

One commenter indicated that because of the amount of diversity in the operations of a particular industry, obtaining a sample that could be considered representative would be extremely difficult. EPA recognizes that obtaining representative quantitative data through the group application process will prove to be difficult; however, EPA has sought to minimize these perceived problems. Under the group application concept, industries must be sufficiently similar to qualify. Industries which have significantly different operations from the rest of the group that affects the quality of their storm water discharge may be required to obtain an individual permit. Use of the nine precipitation zones will enable the data in the permit application to be more easily analyzed and patterns observed on the basis of hydrology and other regional factors. How EPA will evaluate the representativeness of the sample is discussed below.

Several commenters asked why the precipitation zone of group members is relevant to the application. The need to identify precipitation zones arises because the amount of rainfall is likely to have a significant impact on the quality of the receiving water. According to an EPA study (Methodology for Analysis of Detention Basins for Control of Urban Runoff Quality; Office of Water, Nonpoint Source Branch, Sept. 1986) the United States can be divided into nine general precipitation zones. These zones are characterized by differences in precipitation volume, precipitation intensity, precipitation duration, and precipitation intervals. Industrial facilities that seek general permits via the group application option may show significantly different loading rates as a result of these regional precipitation differences. As an example, precipitation in Seattle, Washington, located in Zone 7, approaches the mean annual storm intensity of .024 inches/hour with a mean annual storm duration of 20 hours for that Zone. In contrast, precipitation in Atlanta, Georgia, located in Zone 3 approaches the mean annual storm intensity of .102 inches/hour and a mean storm duration of 6.2 hours for that Zone. Atlanta, receives on the average four times more precipitation per hour with storms lasting one-third as long. As a result of these differences, if identical facilities within a group application were situated in each of these areas, their storm water discharges would likely exhibit different pollutant characteristics. Accordingly, data should be submitted from facilities in each zone.

One commenter felt that the EPA should abandon or modify its rainfall zone concept, because storm water quality will depend more on what materials are used at the facility than rainfall. EPA disagrees. Because storm water loading rates may differ significantly as a result of regional precipitation differences, it is necessary that for each precipitation zone containing representatives of a group application, the group must provide samples from some of those representatives. In comments to previous rulemakings it was argued that the amount of rainfall will affect the degree of impact a storm water discharge may have on the receiving stream.

One commenter stated that the precipitation zones illustrated in appendix E of the proposed rulemaking do not adequately reflect regional differences in precipitation and that in some cases the zones cut through cities where there are concentrations of industries without differences in their precipitation patterns. The rainfall zone map is a general guide to determining what areas of the country need to be addressed when determining representative rainfall events and quantitative data. When dealing with rainfall on a national scale, it is near impossible to make generalized statements with a great deal of accuracy. In the case of rainfall zones, rainfall patterns may be similar for facilities in close proximity to each other but none the less in different rainfall zones. In response, EPA has created these zones to reflect regional rainfall patterns as accurately as possible. Because of the variable nature of rainfall such circumstances are sure to arise. However, in order to obtain a degree of representativeness EPA is convinced that the use of these rainfall zones as described is appropriate for the submittal of group applications and the quantitative data therein.

The second and third requirements of part 1 of the group application instruct the applicant to describe the industrial activity (processes) and the significant materials used by the group. For the significant materials listed, the applicant is to discuss the materials management practices employed by members of the group. For example, the applicant should identify whether such materials are commonly covered, contained, or enclosed, and whether storm water runoff from materials storage areas is collected in settling ponds prior to discharge or diverted away from such areas to minimize the likelihood of contamination. Also, the approximate percentage of facilities in the group with no practices in place to minimize materials stored outside is to be identified.

EPA considers that the processes and materials used at a particular facility may have a bearing on the quality of the storm water. Thus, if there are different processes and materials used by members of the group, the application must identify those facilities utilizing the different processes and materials, with an explanation as to why these facilities should still be considered similar.

One commenter felt that a facility should be able to describe in its permit application the possibility of individual materials entering receiving waters. EPA supports the applicant adding site specific information which will assist the permit writer making an informed decision about the nature of the facility, the quality of its storm water discharge, and appropriate permit conditions.

The fourth element of part 1 of the group application is a commitment to submit quantitative data from ten percent of the facilities listed. EPA proposed that there must be a minimum of ten and a maximum of one hundred facilities within a group that submit data. Comments reflected some dissatisfaction with this requirement. Some commenters asserted that ten percent was too high a number and would discourage group applications, while one commenter suggested a lesser percentage would be appropriate where the group can certify that facilities are representative. One commenter suggested that EPA have the discretion to allow for a smaller percentage. Several commenters argued that EPA should be satisfied with fewer than ten percent because EPA often relies on data from less than ten percent of the plants in a subcategory when promulgating effuent guidelines and that EPA should rely on data collection goals

with affected groups as was done in the 1985 storm water proposal. Other commenters pointed out that an anomalous situation could arise where the group was small and facilities were scattered throughout the precipitation zones. For example, if a group consisted of 20 members where a minimum of ten facilities had to submit samples, and two or more members were in each precipitation zone; a total of 18 facilities (90% of the group) would have to submit quantitative data. EPA believes that there must be a sufficient number of facilities submitting data for any patterns and trends to be detectable. However, in light of these comments EPA has decided to modify the language in § 122.26(c) to allow 1 discharger in each precipitation zone to submit quantitative data where 10 or fewer of the group members are located in a particular precipitation zone. EPA believes, however, that one hundred facilities would in most cases be sufficient to characterize the nature of the runoff and thus 100 should remain the maximum. If the data are insufficient, EPA has the authority to request more sampling under section 308 of the CWA.

One commenter suggested that the ten facility cutoff was unreasonable, and that instead of cutting off the group at ten, allow a smaller number in the group and allow the facilities to sample ten percent of their outfalls instead. EPA agrees, in part, and will allow groups of between four and ten to submit a group application. However, the ten percent rule would not be effective in such cases. Therefore, at least half the facilities in a group of four to ten will be required to provide quantitative data from at least one outfall, with each precipitation zone represented by at least one facility.

For any group application, in addition to selecting a sufficient number of facilities from each precipitation zone, facilities selected to do the sampling should be representative of the group as a whole in terms of those characteristics identifying the group which were described in the narrative, i.e., number and range of facilities, types of processes used, and any other relevant factors. If there is some variation in the processes used by the group (40 percent of the group of food processors are canners and 60 percent are canners and freezers, for example), the different processes are to be represented. Also, samples are to be provided from facilities utilizing the materials management practices identified, including those facilities which use no materials management practices. The representation of these different factors, to the extent feasible, is to be roughly equivalent to their proportion in the group.

EPA wishes to emphasize that the provision that ten percent of the facilities need to submit quantitative data only applies to the permit application process. The general or individual permit itself may require quantitative data from each facility.

Submittal of Part 2 of the Group Application. As with part 1, part 2 of the Group Application would be submitted to the Office of Water Enforcement and Permits, in Washington, DC. If the information is incomplete, or simply is found to be an inadequate basis for establishing model permit limits, EPA has the authority under section 308 of the Clean Water Act to require that more information be submitted, which may include sampling from facilities that were part of the group application but did not provide data with the initial submission. If the group application is used by a Region or NPDES State to issue a general permit, the general permit should specify procedures for additional coverage under the permit.

If a part 2 is unacceptable or insufficient, EPA has the option to request additional information or to require that the facilities that participated in the group application submit complete individual applications (e.g. facilities that have submitted Form 1 with the group application may be required to submit Form 2F, or facilities which have submitted complete Form 1 and Form 2F information in the group application generally would not have to submit additional information).

Once the group applications are reviewed and accepted, EPA will use the information to establish draft permit terms and conditions for models for individual and general permits. NPDES approved States and EPA regional offices will continue to be the permit-issuing authority for storm water discharges. The NPDES approved States accepting the group application approach and the EPA Regions may then take the model permits and adapt them for their particular area, making adjustments for local water quality standards and other localized characteristics, and making determinations as to the need for an individual storm water permit where general permit coverage is felt to be inappropriate. Permits would be proposed by the Region or NPDES approved State in accordance with current regulations for public comment before becoming final. In NPDES States without general permit authority, or where an individual permit is deemed appropriate, the model permit can serve as the basis for issuing an individual permit.

The group application is an NPDES permit application just like any other and, as such, would be handled through normal permitting procedures, subject to the regulatory provisions applicable to permit issuance. Incomplete or otherwise inadequate submissions would be handled in the same manner as any other inadequate permit application. The permit issuing authority would retain the right to require submission of Form 1, Form 2C and Form 2F from any individual discharger it designates.

Some commenters offered other procedures for developing a group application procedure; however, these were frequently entirely different approaches or so novel that a reproposal would be required. One commenter suggested that those industries that are identified as being likely to pollute should be required to submit quantitative data. Numerous commenters contended that a generic approach for meeting the required information requirements for group applications would allow EPA to develop adequate general permits. EPA does not view these approaches as appropriate.

5. Group Application: Applicability in NPDES States

Many commenters expressed concern about how the group application procedure will work within the framework of an NPDES approved State. The relationship between EPA and the States that are authorized to administer the NPDES program, including implementation of the storm water program, is a complicated aspect of this rulemaking. Approved States (there are 38 States and one territory so approved) must have requirements that are at least as stringent as the Federal program; they may be more stringent if they choose. Authority to issue general permits is optional with NPDES States.

EPA has determined that ten percent of the facilities must provide quantitative data in the permit application as noted above. Furthermore, these applications are submitted to EPA headquarters. Consequently States, whether NPDES approved or not, are not in a position to reject or modify this requirement. Such States may determine the amount of sampling to be done pursuant to permit conditions. If they choose to issue general permits they may include such authority in their NPDES program and,

upon approval of the program by EPA, may then issue general permits. Within the context of the NPDES provisions of the CWA, if States do not have general permitting authority, then general permits are not available in those States.

In response to one comment, EPA does not have authority to issue general or individual permits to facilities in NPDES approved states. Today's rule provides a means for affected industries to be covered by general permits developed via the group application procedure as well as from general permits developed independently of the group application process. Accordingly, today's rule anticipates that most NPDES States will seek general permit issuance authority to implement the storm water program in the most efficient and economical way. Without general permit issuance authority NPDES States will be required to issue individual permits covering storm water discharges to potentially thousands of industrial facilities.

One commenter recommended that States with approved NPDES programs should be involved in determining what industries are representative for submitting quantitative data. EPA recognizes that States will have an interest in this determination and may possess insight as to the appropriateness of using some facilities. However, EPA may be managing hundreds of group applications and approving or disapproving them as expeditiously as possible. EPA believes that involving the States in this already administratively complex and time consuming undertaking would be counterproductive. In any event, NPDES approved States are not bound by the determinations of EPA as to the appropriateness of groups or the issuance of permits based on model permits or individual permits. However, States will be encouraged to use model permits that are developed by EPA. EPA will endeavor to design general and model permits that are effective while also adaptable to the concerns of different States. Again, States are able to develop more stringent standards where they deem it to be appropriate. There are currently seventeen States that have authority to issue general permits: Arkansas, Colorado, Illinois, Kentucky, Minnesota, Missouri, Montana, New Jersey, North Dakota, Oregon, Rhode Island, Utah, Washington, West Virginia and Wisconsin. As suggested in the comments, EPA is encouraging more States to develop general permit issuing authority in order to facilitate the permitting process.

One commenter advised that the rules should state that a NPDES approved State may accept a group application or require additional information. EPA has decided not to explicitly state this in the rule. However, this comment does raise some points that need to be addressed. Because the group application option is a modification of existing NPDES permit application requirements, the State is free to adopt this option, but is not required to. If the State chooses to adopt the group application and it does not have general permit authority, the group application can be used to issue individual permits. If an approved NPDES State chooses to not issue permits based on the group application, facilities that discharge storm water associated with industrial activity that are located in that State must submit individual applications to the State permitting authority. Before submitting a group application, facilities should ascertain from the State permitting authority whether that State intends to issue permits based upon a group application approved by EPA for the purpose of developing general permits. For facilities that discharge storm water associated with industrial activity which are named in a group application, the Director may require an individual facility to submit an individual application where he or she determines that general permit coverage would be inappropriate for the particular facility.

One commenter stressed that EPA should streamline the procedure for States desiring to obtain general permit coverage. EPA has, over the last year, streamlined this procedure and encourages States to take advantage of this procedure. EPA recommends that States consider obtaining general permit authority as a means to efficiently issue permits for storm water discharges. These States should contact the Office of Water Enforcement and Permits at EPA Headquarters as soon as possible.

6. Group Application: Procedural Concerns

One commenter claimed that the proposed group application process and procedures violated federal law. This commenter claimed that EPA was abrogating its responsibility by allowing a trade association to design a data collection plan in lieu of completing an NPDES application form designed by EPA, thus violating the Federal Advisory Committee Act. The commenter stated that EPA would be improperly influenced by special interests if trade associations were able to design their own storm water data gathering plans. The commenter further asserted that any decisions by EPA on the content of specific group applications would be rulemakings and thus subject to the provisions of the Administrative Procedure Act.

EPA disagrees with the comment that the group application violates the Federal Advisory Committee Act (FACA). FACA governs only those groups that are established or "utilized" by an agency for the purpose of obtaining "advice" or "recommendations." The group application option does not solicit or involve any "advice" or "recommendations." It simply allows submission of data by certain members of a group in accordance with specific regulatory criteria for determining which facilities are "representative" of a group. As such, the group application is merely a submission in accordance and in compliance with specific regulatory requirements and does not contain discretionary uncircumscribed "advice" or "recommendations" as to which facilities are representative of a group.

Thus, the determination of which facilities should submit testing data in accordance with regulatory criteria is little different from many other regulatory requirements where an applicant must submit information in accordance with certain criteria. For example, under 40 CFR 122.21 all outfalls must be tested except where two or more have "substantially identical" effluents. Similarly, quantitative data for certain pollutants are to be provided where the applicant knows or "has reason to believe" such pollutants are discharged. Both of these provisions allow the applicant to exercise discretion in making certain judgments but such action is circumscribed by regulatory standards. EPA further has authority to require these facilities to submit individual applications. In none of these instances are "recommendations" or "advice" involved. EPA also notes that it is questionable whether, in providing for group applications, it is "soliciting" advice or recommendations from groups or that such groups are being "utilized" by EPA as a "preferred source" of advice. See 48 FR 19324 (April 28, 1983). Furthermore, this data collection effort may be supplemented by EPA if, after review of the data, EPA determines additional data is necessary for permit issuance. Other information gathering may act as a check on the group applications received.

EPA also does not agree with this commenter's claim that the group application scheme represents an

impermissible delegation of the Administrator's function in violation of the CWA regarding data gathering. The Administrator has the broadest discretion in determining what information is needed for permit development as well as the manner in which such information will be collected. The CWA does not require every discharger required to obtain a permit to file an application. Nor does the CWA require that the Administrator obtain data on which a permit is to be based through a formal application process (see 40 CFR 122.21). For years "applications" have not been required from dischargers covered by general permits. EPA currently obtains much information beyond that provided in applications pursuant to section 308 of the CWA. This is especially true with respect to general permit and effluent limitations guidelines development. The group application option is simply another means of data gathering. The Administrator may always collect more data should he determine it necessary upon review of a groups' data submission. And, he may obtain such additional data by whatever means permissible under the Statute that he deems appropriate. Thus, it can hardly be said that by this initial data gathering effort the Administrator has delegated his data gathering responsibilities. In addition, since groups are required to select "representative" facilities, etc., in accordance with specific regulatory requirements established by the Administrator and because EPA will scrutinize part 1 of the group applications and either accept or reject the group as appropriate for a group application, no impermissible delegation has occurred. EPA will make an independent determination of the acceptability of a group application in view of the information required to be submitted by the group applicant, other information available to EPA (such as information on industrial subcategories obtained in developing effluent limitations guidelines as well as individual storm water applications received as a result of today's rule) and any further information EPA may request to supplement part 1 pursuant to section 308 of the CWA. Moreover, any concerns that a general permit may be based upon biased data can be dealt with in the public permit issuance process.

Finally, EPA also does not agree that the group application option violates the Administrative Procedures Act. Again, the group application scheme is simply a data gathering device. EPA could very well have determined to gather data informally via specific requests pursuant to section 308 of the CWA. In fact, general permit and effluent limitations guideline development proceed along these lines. It would make little sense if the latter informal data gathering process were somehow illegal simply because it is set forth in a rule that allows applicants some relief upon certain showings. In this respect, several of EPA's existing regulations similarly allow an applicant to be relieved from certain data submission requirements upon appropriate demonstrations. For example, testing for certain pollutants and or certain outfalls may be waived under certain circumstances. Most importantly, the operative action of concern that impacts on the public is individual or general permit issuance based upon data obtained. As previously stated, ample opportunity for public participation is provided in the permit issuance proceeding.

7. Permit Applicability and Applications for Oil and Gas and Mining Operations

Oil, gas and mining facilities are among those industrial sites that are likely to discharge storm water runoff that is contaminated by process wastes, toxic pollutants, hazardous substances, or oil and grease. Such contamination can include disturbed soils and process wastes containing heavy metals or suspended or dissolved solids, salts, surfactants, or solvents used or produced in oil and gas operations. Because they have the potential for serious water quality impacts, Congress recognized, throughout the development of the storm water provisions of the Water Quality Act of 1987, the need to control storm water discharges from oil, gas, and mining operations, as well as those associated with other industrial activities.

However, Congress also recognized that there are numerous situations in the mining and oil and gas industries where storm water is channeled around plants and operations through a series of ditches and other structural devices in order to prevent pollution of the storm water by harmful contaminants. From the standpoint of resource drain on both EPA as the permitting agency and potential permit applicants, the conclusion was that operators that use good management practices and make expenditures to prevent contamination must not be burdened with the requirement to obtain a permit. Hence, section 402(1)(2) creates a statutory exemption from storm water permitting requirements for uncontaminated runoff from these facilities.

To implement section 402(1)(2), EPA intends to require permits for contaminated storm water discharges from oil, gas and mining operations. Storm water discharges that are not contaminated by contact with any overburden, raw material, intermediate products, finished product, byproduct or waste products located on the site of such operations will not be required to obtain a storm water discharge permit.

The regulated discharge associated with industrial activity is the discharge from any conveyance used for collecting and conveying storm water located at an industrial plant or directly related to manufacturing, processing or raw materials storage areas at an industrial plant. Industrial plants include facilities classified as Standard Industrial Classifications (SIC) 10 through 14 (the mining industry), including oil and gas exploration, production, processing, and treatment operations, as well as transmission facilities. See 40 CFR 122.26(b)(14)(iii). This also includes plant areas that are no longer used for such activities, as well as areas that are currently being used for industrial processes.

a. Oil and Gas Operations. In determining whether storm water discharges from oil and gas facilities are "contaminated", the legislative history reflects that the EPA should consider whether oil, grease, or hazardous materials are present in storm water runoff from the sites described above in excess of reportable quantities (RQs) under section 311 of the Clean Water Act or section 102 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA). [Vol. 132 Cong. Rec. H10574 (daily ed. October 15, 1986) Conference Report].

Many of the comments received by EPA regarding this exemption focused on the concern that EPA's test for requiring a permit is and would subject an unnecessarily large number of oil and gas facilities to permit application requirements. Specific comments made in support of this concern are addressed below.

A primary issue raised by commenters centered on how to determine when a storm water discharge from an oil or gas facility is "contaminated", and therefore subject to the permitting program under section 402 of the CWA. Many of the comments received from industry representatives objected to the Agency's intent as expressed in the proposal to use past discharges as a trigger for submitting permit applications.

The proposed rule provided that the notification requirements for releases in excess of RQs established under the CWA and CERCLA would serve as a

basis for triggering the submittal of permit applications for storm water discharges from oil and gas facilities. As described in the proposal, oil and gas operations that have been required to notify authorities of the release of either oil or a hazardous substance via a storm water route would be required to submit a permit application. In other words, any facility required to provide notification of the release of an RQ of oil or a hazardous substance in storm water in the past would be required to apply for a storm water permit under the current rule. In addition, any facility required to provide notification regarding a release occurring from the effective date of today's rule forward would be required to apply for a storm water permit.

Commenters maintained that the use of historical discharges to require permit applications is inconsistent with the language and intent of section 402(1)(2) of the CWA, and relevant legislative history, both of which focus on present contamination. Requiring storm water permits based solely on the occurrence of past contaminated discharges, even where no present contamination is evident, would go beyond the statutory requirement that EPA not issue a permit absent a finding present contamination. Commenters also noted that the proposal did not take into account the fact that past problems leading to such releases may have been corrected, and that requiring an NPDES permit may no longer be necessary. The result of such a requirement, commenters maintained, would be an excessive number of unnecessary permit applications being submitted, at significant cost and minimal benefit to both regulated facilities and regulating authorities.

Commenters also indicated that using the release of reportable quantities of oil, grease or hazardous substances as a permit trigger would identify discharges of an isolated nature, rather than the continuous discharges, which should be the focus of the NPDES permit program under section 402. Such an approach, commenters maintained, is inconsistent with existing regulations under section 311 of the CWA, and would result in permit applications from facilities that are more appropriately regulated under section 311.

Despite these criticisms, many commenters recognized that the Agency is left with the task of determining when discharges from oil and gas facilities are contaminated, in order to regulate them under section 402(1)(2). It was suggested by numerous commenters that the EPA adopt an approach similar to that used under section 311 of the CWA for Spill Prevention Control and Countermeasure (SPCC) Plans. Under SPCC, facilities that are likely to discharge oil into waters of the United States are required to maintain a SPCC plan. In the event the facility has a spill of 1,000 gallons or 2 or more reportable quantities of oil in a 12 month period, the facility is required to submit its SPCC plan to the Agency. The triggering events proposed by the commenters for storm water permits for oil and gas operations are six reportable sheens or discharges of hazardous substances (other than oil) in excess of section 311 or section 102 reportable quantities via a storm water point source route over any thirty-six month period. It was suggested that if this threshold is reached, an operator would then file a permit application (or join a group application) based upon the presumption that its current storm water discharges are contaminated.

In response to these comments, the Agency believes that past releases that are reportable quantities can be a valid indicator of the potential for present contamination of discharges. The legislative history as cited above supports this conclusion. EPA would note that the existence of a RQ release would serve only as a triggering mechanism for a permit application. Under the proposed rule, evidence of past contamination would merely require submission of a permit application and would not be used as conclusive evidence of current contamination. The determination as to whether a permit would be actually required due to current contaminated discharge would be made by the permitting authority after reviewing the permit application. The fact of a past RQ release does not necessarily imply a conclusive finding of contamination, only that sufficient potential for contamination exists to warrant a permit application or the collection of other further information. Today's rule does not change the proposed approach in this respect. Thus, EPA does not believe that today's rule exceeds the authority of section 402(1)(2).

EPA believes that there is no legal impediment to using past RQ discharges as a trigger for requiring a storm water permit application. EPA notes that, as mentioned above, even those commenters who objected to the proposed test on legal authority grounds merely offered an alternate test that requires more releases to have occurred within a shorter period of time before a permit application is required.

Therefore, the only disagreement that remains is over what constitutes a reasonable test that will identify facilities with the potential for storm water contamination. EPA notes that neither the statute nor the legislative history provides any guidance on this question. Furthermore, EPA disagrees with the commenters who suggested that 6 releases in the past 3 years or 2 releases in the past year are necessarily more valid measures of the potential for current contamination than EPA's proposed test. There is no statistical or other basis for preferring one test to the other. However, EPA does agree with those commenters that suggest that a single release in the distant past may not accurately reflect current conditions and the current potential for contamination.

EPA has therefore amended today's rule to provide that only oil and gas facilities which have had a release of an RQ of oil or hazardous substances in storm water in the past three years will be required to submit a permit application. EPA believes that limiting the permit trigger to events of the past three years will address commenters' concerns regarding the use of "stale history" in determining whether an application is required. EPA notes that the three year cutoff is consistent with the requirement for industrial facilities to report significant leaks or spills at the facility in their storm water permit applications. See 40 CFR 122.26(c)(1)(i)(D).

Commenters asserted that EPA and the States must have some reasonable basis for concluding that a storm water discharge is contaminated before requiring permit applications or permits. Commenters believed that § 122.26(c)(1)(iii)(B) as proposed implied that the Agency's authority in this respect is unrestricted. In response, EPA may collect such data by whatever appropriate means the statute allows, in order to obtain information that a permit is required. Usually, the most practical tool for doing so is the permit application itself. However, if necessary to supplement the information made available to the Agency, EPA has broad authority to obtain information necessary to determine whether or not a permit is required, under section 308 of the Clean Water Act. Given the plain language of the CWA and the Congressional intent as manifested in the legislative history, the Agency is convinced that the approach described above is appropriate. Yet, as further discussed below, EPA has also deleted as redundant § 122.26(c)(1)(iii)(B).

Regarding the types of facilities included in the storm water regulation, a number of commenters suggested that the Agency has misconstrued the meaning of facilities "associated with

industrial activity", and has proposed an overly broad definition of such facilities in the oil and gas industry. Specifically, commenters suggested that only the manufacturing sector of the oil and gas industry should be subject to storm water permit application requirements, and that exploration and production activities, gas stations, terminals, and bulk plants should all be exempted from storm water permitting requirements. Commenters maintain that this broad interpretation would subject many oil and gas facilities to the storm water permit requirements, when these were not intended by Congress to be so regulated. As a second point related to this issue, some commenters felt that transmission facilities were not intended to be regulated under the storm water provisions, and should be exempted from permit requirements. This would be consistent, it was argued, with legislative history which concluded that transmission facilities do not significantly contribute to the contamination of water.

The Agency disagrees that these facilities do not fall under the storm water permitting requirements as envisioned by Congress. SIC 13, which is relied upon by EPA to identify these oil and gas operations, describes oil and gas extraction industries as including facilities related to crude oil and natural gas, natural gas liquids, drilling oil and gas wells, oil and gas exploration and field services. Moreover, legislative history as it applies to industrial activities, and thus to oil and gas (mining) operations, expressly includes exploration, production, processing, transmission, and treatment operations within the purview of storm water permitting requirements and exemptions. EPA's intent is for storm water permit requirements (and the exemption at hand) to apply to the activities listed above (exploration, production, processing, treatment, and transmission) as they relate to the categories listed in SIC 13.

Commenters requested clarification from the Agency that storm water discharges from oil and gas facilities require a permit or the filing of a permit application only when they are contaminated at the point of discharge into waters of the United States. Commenters noted that large amounts of potentially contaminated stormwater may not enter waters of the United States, or may enter at a point once the discharge is no longer "contaminated". In these cases, it should be clear that no permit or permit application is required.

EPA agrees that oil and gas exploration, production, processing, or treatment operations or transmission facilities must only obtain a storm water permit when a discharge to waters of the U.S. (including those discharges through municipal separate storm sewers) is contaminated. A permit application will be required when any discharge in the past three years or henceforth meets the test discussed above.

Under the proposed rule, the Agency stated at § 122.26(c)(1)(iii)(B) that the Director may require on a case-by-case basis the operator of an existing or new storm water discharge from an oil or gas exploration, production, processing, or treatment operation, or transmission facility to submit an individual permit application. The Agency has removed this section since CWA section 402(1)(2), as codified in 122.26(c)(1)(iii)(A), adequately addresses every situation where a permit should be required for these facilities.

b. Use of Reportable Quantities to Determine if a Storm Water Discharge from an Oil or Gas Operation is Contaminated. Section 311(b)(5) of the CWA requires reporting of certain discharges of oil or a hazardous substance into waters of the United States (see 44 FR 50766 (August 29, 1979)). Section 304(b)(4) of the Act requires that notification levels for oil and hazardous substances be set at quantities which may be harmful to the public health or welfare of the United States, including but not limited to fish, shellfish, wildlife, and public or private property, shorelines and beaches. Facilities which discharge oil or a hazardous substance in quantities equal to or in excess of an RQ, with certain exceptions, are required to notify the National Response Center (NRC).

Section 102 of CERCLA extended the reporting requirement for releases equal to or exceeding an RQ of a hazardous substance by adding chemicals to the list of hazardous substances, and by extending the reporting requirement (with certain exceptions) to any releases to the environment, not just those to waters of the United States.

Pursuant to section 311 of the CWA, EPA determined reportable quantities for discharges by correlating aquatic animal toxicity ranges with 5 reporting quantities, i.e., 1-, 10-, 100-, 1000-, and 5000- pounds per 24 hour period levels. Reportable quantity adjustments made under CERCLA rely on a different methodology. The strategy for adjusting reportable quantities begins with an evaluation of the intrinsic physical, chemical, and toxicological properties of each designated hazardous substance. The intrinsic properties examined, called "primary criteria," are aquatic toxicity, mammalian toxicity (oral, dermal, and inhalation), ignitability, reactivity, and chronic toxicity. In addition, substances that were identified as potential carcinogens have been evaluated for their relative activity as potential carcinogens. Each intrinsic property is ranked on a five-tier scale, associating a specific range of values on each scale with a particular reportable quantity value. After the primary criteria reportable quantities are assigned, the hazardous substances are further evaluated for their susceptibility to certain extrinsic degradation processes (secondary criteria). Secondary criteria consider whether a substance degrades relatively rapidly to a less harmful compound, and can be used to raise the primary criteria reportable quantity one level.

Also pursuant to section 311, EPA has developed a reportable quantity for oil and associated reporting requirements at 40 CFR part 110. These requirements, known as the oil sheen regulation, define the RQ for oil to be the amount of oil that violates applicable water quality standards or causes a film or sheen upon or discoloration of the surface of the water or adjoining shorelines or causes a sludge or emulsion to be deposited.

Reportable quantities developed under the CWA and CERCLA were not developed as effluent guideline limitations which establish allowable limits for pollutant discharges to surface waters. Rather, a major purpose of the notification requirements is to alert government officials to releases of hazardous substances that may require rapid response to protect public health, welfare, and the environment. Notification based on reportable quantities serves as a trigger for informing the government of a release so that the need for response can be evaluated and any necessary response undertaken in a timely fashion. The reportable quantities do not themselves represent any determination that releases of a particular quantity are actually harmful to public health, welfare, or the environment.

EPA requested comment on the use of RQs for determining contamination in discharges from oil and gas facilities. As noted above numerous commenters supported the concept of using reportable quantities under certain circumstances. Comments on the measurement of oil sheens for the purpose of triggering a permit application were divided. Some commented that it is much too stringent because the amount of oil creating a

sheen may be a relatively small amount. Others viewed the test as a quick, easy, practical method that has been effective in the past.

In relying on the reporting requirements associated with releases in excess of RQs for oil or hazardous substances to trigger the submittal of permit applications for oil and gas operations, the Agency believes that the use of the reporting requirements for oil will be particularly useful. The Agency believes that the release of oil to a storm water discharge in amounts that cause an oil sheen is a good indicator of the potential for water quality impacts from storm water releases from oil and gas operations. In addition, given the extremely high number of such operations (the Agency estimates that there are over 750,000 oil wells alone in the United States), relying on the oil sheen test to determine if storm water discharges from such sites are "contaminated" will be a far easier test for operators to determine whether to file a storm water permit application than a test based on sampling. The detection of a sheen does not require sophisticated instrumentation since a sheen is easily perceived by visual observation. EPA agrees with those comments calling the oil sheen test an appropriate measure for triggering a storm water permit application. In adopting this approach, EPA recognizes, as pointed out by many commenters that an oil sheen can be created with a relatively small amount of oil.

One commenter suggested that contamination must be caused by contact with on-site material before being subject to permit application requirements. The Agency agrees with this comment. Those facilities that have had releases in excess of reportable quantities will generally have contamination from contact with on-site material as described in the CWA. Thus, use of the RQ test is an appropriate trigger. As discussed above, determination of whether contamination is present to warrant issuance of a permit will be made in the context of the permit proceeding.

One commenter believed that the use of RQs is inappropriate because "the statute intended to exempt only oil and gas runoff that is not contaminated at all." The Agency wishes to clarify that reportable quantities are being used to determine what facilities need to file permit applications and to describe what is meant by the term "contaminated." The Director may require a permit for any discharges of storm water runoff contaminated by contact with any overburden, raw material, intermediate product, finished product, by product or waste product at the site of such operations. The use of RQs is solely a mechanism for identifying the facilities most likely to need a storm water permit consistent with the legislative history of section 402(l)(2).

c. Mining Operations. The December 7, 1988 proposal would establish background levels as the standard used to define when a storm water discharge from a mining operation is contaminated. When a storm water discharge from a mining site was found to contain pollutants at levels that exceed background levels, the owner or operator of the site was required to submit a permit application for that operation. The proposal was founded upon language in the legislative history stating that the determination of whether storm water is contaminated by contact with overburden, raw material, intermediate product, finished product, byproduct, or waste products "shall take into consideration whether these materials are present in such stormwater runoff . . . above natural background levels". [Vol. 132 Cong. Rec. H10574 (daily ed. Oct. 15, 1986) Conference Report].

Comments received on this component of the rule suggested that background levels of pollutants would be very difficult to calculate due to the complex topography frequently encountered in alpine mining regions. For example, if a mine is located in a mountain valley surrounded on all sides by hills, the site will have innumerable slopes feeding flow towards it. Under such circumstances, determining how the background level is set would prove impractical. Commenters indicated that it is very difficult to measure or determine background levels at sites where mining has occurred for prolonged periods. In many instances, data on original background levels may not be available due to long-term site activity. As a result, any background level established will vary based on the type and level of previous activity. In addition, mining sites typically have background levels that are naturally distinct from the surrounding areas. This is due to the geologic characteristics that makes them valuable as mining sites to begin with. This also makes it difficult to establish accurate background levels.

Because of these concerns EPA has decided to drop the use of background levels as a measure for determining whether a permit application is required. Accordingly, a permit application will be required when discharges of storm water runoff from mining operations come into contact with any overburden, raw material, intermediate product, finished product, byproduct, or waste product located on the site. Similar to the RQ test for oil and gas operations, EPA intends to use the "contact" test solely as a permit application trigger. The determination of whether a mining operation's runoff is contaminated will be made in the context of the permit issuance proceedings.

If the owner or operator determines that no storm water runoff comes into contact with overburden, raw material, intermediate product, finished product, byproduct, or waste products, then there is no obligation to file a permit application. This framework is consistent with the statutory provisions of section 402(1)(2) and is intended to encourage each mining site to adopt the best possible management controls to prevent such contact.

Several commenters stated that EPA's use of total pollutant loadings for determining permit applicability is not consistent with the general framework of the NPDES program. Their concern is that such evaluation criteria depart from how the NPDES program has been administered in the past, based on concentration limits. In addition, commenters requested that EPA clarify that information on mass loading will be used for determining the need for a permit only. Since the analysis of natural background levels as a basis for a permit application has been dropped from this rulemaking, these issues are moot.

Commenters noted that the proposed rule did not specify what impact this rulemaking has on the storm water exemptions in 40 CFR 440.131. The commenters recommended not changing any of these provisions. Some commenters indicated that mining facilities that have NPDES permits should not be subject to additional permitting under the storm water rule. EPA does not intend that today's rule have any effect on the conditional exemptions in 40 CFR 440.131. Where a facility has an overflow or excess discharge of process-related effluent due to stormwater runoff, the conditional exemptions in 40 CFR 440.131 remain available.

Several commenters note that the term overburden, as used in the context of the proposed storm water rule, is not defined and recommended that this term should be defined to delineate the scope of the regulation. EPA agrees that the term overburden should be defined to help properly define the scope the storm water rule. In today's rule, the term

overburden has been clarified to mean any material of any nature overlying a mineral deposit that is removed to gain access to that deposit, excluding topsoil or similar naturally-occurring surface materials that are not disturbed by mining operations. This definition is patterned after the overburden definition in SMCRA, and is designed to exclude undisturbed lands from permit coverage as industrial activity. However, the definition provided in this regulation may be revised at a later date, to achieve consistency with the promulgation of RCRA Subtitle D mining waste regulations in the future.

Numerous commenters raised issues pertaining to the inclusion of inactive mining areas as subject to the stormwater rule. Some commenters indicated that including inactive mine operations in the rule would create an unreasonable hardship on the industry. EPA has included inactive mining areas in today's rule because some mining sites represent a significant source of contaminated stormwater runoff. EPA has clarified that inactive mining sites are those that are no longer being actively mined, but which have an identifiable owner/operator. The rule also clarifies that active and inactive mining sites do not include sites where mining claims are being maintained prior to disturbances associated with the extraction, beneficiation, or processing of mined materials, nor sites where minimal activities required for the sole purpose of maintaining the mining claim are undertaken. The Agency would clarify that claims on land where there has been past extraction, beneficiation, or processing of mining materials, but there is currently no active mining are considered inactive sites. However, in such cases the exclusion discussed above for uncontaminated discharges will still apply.

EPA's definition of active and inactive mining operations also excludes those areas which have been reclaimed under SMCRA or, for non-coal mining operations, under similar applicable State or Federal laws. EPA believes that, as a general matter, areas which have undergone reclamation pursuant to such laws have concluded all industrial activity in such a way as to minimize contact with overburden, mine products, etc. EPA and NPDES States, of course, retain the authority to designate particular reclaimed areas for permit coverage under section 402(p)(2)(E).

The proposed rule had included an exemption for areas which have been reclaimed under SMCRA, although the language of the proposed rule inadvertently identified the wrong universe of coal mining areas. The final rule language has been revised to clarify that areas which have been reclaimed under SMCRA (and thus are no longer subject to 40 CFR part 434 subpart E) are not subject to today's rule. Today's rule thus is consistent with the coal mining effluent guideline in its treatment of areas reclaimed under SMCRA.

In response to comments, EPA has also expanded this concept to exclude from coverage as industrial activity non-coal mines which are released from similar State or Federal reclamation requirements on or after the effective date of this rule. EPA believes it is appropriate, however, to require permit coverage for contaminated runoff from inactive non-coal mines which may have been subject to reclamation regulations, but which have been released from those requirements prior to today's rule. EPA does not have sufficient evidence to suggest that each State's previous reclamation rules and/or Federal requirements, if applicable, were necessarily effective in controlling future storm water contamination.

8. Application Requirements for Construction Activities

As discussed above, EPA has included storm water discharges from activities involving construction operations that result in the disturbance of five acres total land in the regulatory definition of storm water discharges associated with industrial activity.

This is a departure from the proposed rule which required permit applications for discharges from activities involving construction operations that result in the disturbance of less than one acre total land area and (which are not part of a larger common plan of development or sale; or operations that are for single family residential projects, including duplexes, triplexes, or quadruplexes, that result in the disturbance of less than five acre total land areas and which are not part of a larger common plan of development or sale). The reasons for this change are noted below.

Many commenters representing municipalities, States, and industry requested that clearing, grading, and excavation activities not be included in the definition of storm water discharges associated with industrial activity. It was suggested that EPA delay including construction activities until after the studies mandated in section 402(p)(5) of the CWA are completed. Other commenters felt that NPDES permits are not appropriate for construction discharges due to their short term, intermediate and seasonal nature. Another commenter felt that only the construction activities on the sites of the industrial facilities identified in the other subsections of the definition of "associated with industrial activity" should be included.

EPA believes that storm water permits are appropriate for the construction industry for several reasons. Construction activity at a high level of intensity is comparable to other activity that is traditionally viewed as industrial, such as natural resource extraction. Construction that disturbs large tracts of land will involve the use of heavy equipment such as bulldozers, cranes, and dump trucks. Construction activity frequently employs dynamite and/or other equipment to eliminate trees, bedrock, rockwork, and to fill or level land. Such activities also engage in the installation of haul roads, drainage systems, and holding ponds that are typical of the industrial activity identified in § 122.26(b)(14)(i-x). EPA cannot reasonably place such activity in the same category as light commercial or retail business.

Further, the runoff generated while construction activities are occurring has potential for serious water quality impacts and reflects an activity that is industrial in nature. Where construction activities are intensive, the localized impacts of water quality may be severe because of high unit loads of pollutants, primarily sediments. Construction sites can also generate other pollutants such as phosphorus, nitrogen and nutrients from fertilizer, pesticides, petroleum products, construction chemicals and solid wastes. These materials can be toxic to aquatic organisms and degrade water for drinking and water-contact recreation. Sediment runoff rates from construction sites are typically 10 to 20 times that of agricultural lands, with runoff rates as high as 100 times that of agricultural lands, and 1,000 to 2,000 times that of forest lands. Even small construction sites may have a significant negative impact on water quality in localized areas. Over a short period of time, construction sites can contribute more sediment to streams than was previously deposited over several decades.

EPA is convinced that because of the impacts of construction discharges that are directly to waters of the United States, such discharges should be addressed by permits issued by Federal or NPDES State permitting authorities. It is evident from numerous studies and reports submitted under section 319 of the CWA that discharges from construction sites continue to be a major source of water quality problems and water quality standard violations.

Accordingly EPA is compelled to address these source under these regulations and thereby regulate these sources under a nationally consistent program with an appropriate level of enforcement and oversight.

Techniques to prevent or control pollutants in storm water discharges from construction are well developed and understood. A primary control technique is good site planning. A combination of nonstructural and structural best management practices are typically used on construction sites. Relatively inexpensive nonstructural vegetative controls, such as seeding and mulching, are effective control techniques. In some cases, more expensive structural controls may be necessary, such as detention basins or diversions. The most efficient controls result when a comprehensive storm water management system is in place. Another reason that EPA has decided to address this class of discharges is that it is part of the Agency's recent emphasis on pollution prevention. Studies such as NURP indicate that it is much more cost effective to develop measures to prevent or reduce pollutants in storm water during new development than it is to correct there problems later on. Many of these prevention and control practices, which can take the form of grading patterns as well as other controls, generally remain in place after the construction activities are completed.

a. Permit Application Requirements. In today's rulemaking, EPA has set forth distinct permit application requirements for these construction activities, at § 122.26(c)(1)(ii), to be used where general permits to be developed and promulgated by EPA are inapplicable. Such facilities will be required to provide a map indicating the site's location and the name of the receiving water and a narrative description of:

- The nature of the construction activity;
- The total area of the site and the area of the site that is expected to undergo excavation during the life of the permit;
- Proposed measures, including best management practices, to control pollutants in storm water discharges during construction, including a description of applicable Federal requirements and State or local erosion and sediment control requirements;
- Proposed measures to control pollutants in storm water discharges that will occur after construction operations have been completed, including a description of applicable State or local requirements, and
- An estimate of the runoff coefficient (fraction of total rainfall that will appear as runoff) of the site and the increase in impervious area after the construction addressed in the permit application is completed, a description of the nature of fill material and existing data describing the soil or the quality of the discharge.

Permit application requirements for construction activities do not include the submission of quantitative data. EPA believes that the changing nature of construction activities at a site to be covered by the permit application requirements generally would not be adequately described by quantitative data. The comments received by EPA support this determination. One State commented that a program they instituted has been based on quantitative data for the past 10 years and has proven to be very awkward, even unworkable.

Twenty commenters responded to the issue of appropriate construction site application deadlines including: Three towns (<100,000 population); one medium municipality; one large municipality; one agency associated with a large municipality; three agencies associated counties; three agencies associated with States; two industries; five industrial associations; and one private organization representing industry. The commenters primarily focused on actual deadlines and permitting authority response time.

Applicants for permits to discharge storm water into the waters of the United States from a construction site would normally be required to submit permits in the same time frame as new sources and new discharges. This rulemaking requires permit applications from such sources to be submitted at least 180 days prior to the date on which the discharge is to commence. Four commenters agreed with the application deadline of 180 days prior to commencement of discharge. Three commenters felt it would be difficult to apply 180 days prior to when the discharge was to begin. Three commenters recommended shortening the time period to 90 days. Numerous other commenters were concerned over delays during the permitting authority's review of the permit application. The commenters requested that a maximum response time be set in the regulation. Suggested maximum response times were 90 and 30 days.

In response to these comments, EPA has changed the application deadline for construction permits from at least 180 days prior to discharge to at least 90 days prior to the date when construction is to commence. This change reflects EPA's recognition of the nature of construction operations in that developers/builders may not be aware of projects 180 days before they are scheduled to begin.

Numerous commenters expressed concern over who should be responsible for applying for the permit. Two commenters felt the owner should be responsible so that construction bid documents can include the storm water management requirements and to avoid confusion among multiple subcontractors. One commenter thought that either the owner/developer, or general contractor should be responsible. Another commenter suggested that the designer should obtain the permit which would allow all necessary erosion controls to be part of the project plan. Several commenters requested that the responsibility simply be more clearly defined.

In response to these comments, EPA would clarify that the operator will generally be responsible for submitting the permit application. Under existing regulations at § 122.21(b), when a facility is owned by one person but operated by another, then it is the duty of the operator to apply for the permit Due to the temporary nature of construction activities, EPA believes that the operator is the most appropriate person to be responsible for both short and long term best management practices included on the site. EPA considers the term "operator" to include a general contractor, who would generally be familiar enough with the site to prepare the application or to ensure that the site would be in compliance with the permit requirements. General contractors, in many cases, will often be on site coordinating the operation among his/her staff and any subcontractors. Furthermore, the operator/general contractor would be much more familiar with construction site operations than the owner and should be involved in the site planning from its initial stages. The application requirements in today's rule are designed to provide flexibility in developing controls to reduce pollutants in storm water discharges from construction sites. A significant aspect to this is the role of State and local authorities in control of construction storm water discharges. Sixty-three commenters addressed the question of what the role of State and local authorities should be. Most of these commenters supported local government control of construction discharges and that qualified State programs should satisfy Federal requirements.

Many commenters representing municipalities, States, and industry, felt that local government should have full control over construction storm water

discharges, either under existing programs or those required by their municipal permit. EPA agrees with these comments as far as discharges through municipal storm sewers are concerned. EPA is requiring municipalities that are required to submit municipal permit applications under this regulation to describe their program for controlling storm water discharges from construction activities into their separate storm sewers. It is envisioned that municipalities will have primary responsibility over these discharges through NPDES municipal storm water permits. However, EPA also plans to cover such discharges under general permits to be promulgated in the near future.

In response to several comments that the regulation should provide flexibility for qualified State programs to satisfy Federal requirements, the application requirements recognize that many States have implemented erosion and sediment control programs. The permit application requires a brief description of these programs. This is intended to ensure consistency between NPDES permit requirements and other State controls. Permit applicants will be in the best position to pass on this site-specific information to the permitting authority. States or Federal NPDES authorities will have the ability to exercise authority over these discharges as will other State and local authorities responsible for construction. EPA envisions NPDES permitting efforts will be coordinated with any existing programs.

The proposed rule requested comments on appropriate measures to reduce pollutants in construction site runoff. Numerous commenters representing municipalities, States, and industry responded. Some commenters recommended specific best management practices (BMPs) whereas others suggested ways in which the measures should be incorporated into the program. One commenter suggested that EPA establish design and performance standards for appropriate BMPs. One State commenter recommended requiring a schedule or sequence for use of BMPs. A municipality suggested developing guidance on erosion control at construction sites and disseminating the guidance to educate contractors and construction workers in proper erosion control techniques. The Agency is continuing to review these recommendations for the purposes of permit development and issuance.

Another commenter suggested that further research be done to determine the effectiveness of particular BMPs in reducing pollutants in construction site runoff. EPA agrees that more research and studies can be undertaken to develop methodologies for more effective storm water controls and will continue to lookat these concerns pursuant to section 402(p)(5) studies. However, EPA is convinced that enough information, technology, and proven BMP's are available to address these discharges in this regulation.

Specific BMPs suggested by the commenters include: wheel washing; locked exit roadways, street cleaning methods which exclude sheet washing; clearing and grading codes; construction standards; riparian corridors; solids retention basins; soil erosion barriers; selected excavation; adequate collection systems; vegetate disturbed areas; proper application of fertilizers; proper equipment storage; use of straw bales and filter fabrics; and use of diversions to reduce effective length of slopes. EPA is continuing to evaluate these suggestions for developing appropriate permit conditions for construction activity.

b. Administrative Burdens. Many commenters representing municipalities, States, and industry commented on the administrative burdens of individually permitting each construction site discharging to waters of the United States. The extensive use of general permits for storm water discharges from construction activities that are subject to NPDES requirements is anticipated to minimize administrative delays associated with permit issuance. Many commenters strongly endorsed extensive use of general permits. In addition the Agency will provide as much assistance as possible for developing appropriate permit conditions.

Many commenters responded to the use of acreage limits in determining which construction sites are required to submit a permit application, including several cities, counties and States. Some commenters generally supported the use of an acre limit. Many commenters suggested increasing the acreage limit. Several suggested using a five acre limit for both residential and nonresidential development. Others suggested greater acreage as the cutoff. Two commenters concurred with the proposed limit of one acre/five acres and one commenter suggested lowering the residential limit to one acre.

Other factors were suggested as a means to create a cutoff for requiring permit applications. Several commenters suggested exempting construction that would be completed with a certain time frame, such as construction of less than 12 months. EPA believes that this is inappropriate because some construction can be intensive and expansive, but nonetheless take place over a short period of time, such as a parking lot. One commenter suggested basing the limit on the quantity of soil moved, i.e., cubic yards. In response, this approach would not be particularly helpful since removal of soil will not necessarily relate to the amount of land surface disturbed and exposed to the elements. Another commenter suggested that where there is single family detached housing construction that should trigger applications as well as the proposed acreage limit. This would not be appropriate since EPA is attempting to focus only on those construction activities that resemble industrial activity. After considering these and similar comments EPA has limited the definition of "storm water discharge associated with industrial activity" by exempting from the definition those construction operations that result in the disturbance of less than five acres of total land area which are not part of a larger common plan of development or sale. In considering the appropriate scope of the definition of storm water discharge associated with industrial activity as it relates to construction activities, EPA recognized that a wide variety of factors can affect the water quality impacts associated with construction site runoff, including the quality of receiving waters, the size of the area disturbed, soil conditions, seasonal rainfall patterns, the slope of area disturbed, and the intensity of construction activities. These factors will be considered by the permit writer when issuing the permit. However, as noted above, EPA views such site-specific factors to be too difficult to define in a regulatory framework that is national in scope. For example, attempting to adjust permit application triggers based upon a myriad of regional rainfall patterns is not a practical solution. However, permit conditions adjusted for specific geographical areas may be appropriate.

Under the December 7, 1988, proposal the definition of industrial activity exempted: construction operations that resulted in the disturbance of less than one acre total land area which was not part of a larger common plan of development or sale; or operations for single family residential projects, including duplexes, triplexes, or quadruplexes, that result in the disturbance of less than five acre total land areas which were not part of a larger common plan of development or sale. EPA distinguished between single family residential development and

other commercial development because other commercial development is more likely to occur in more densely developed areas. Also, it was reasoned that other commercial development provides a more complete opportunity to develop controls that remain in place after the construction activity is completed, since continued maintenance after the permit has expired, is more feasible.

However, EPA has decided to depart from the proposal and use an unqualified five acre area in today's final rule. This limit has been selected, in part, because of administrative concerns. EPA recognizes that State and local sediment and erosion controls may address construction activities disturbing less five acres for residential development; the five acre limit in today's rule is not intended to supersede more stringent State or local sediment and erosion controls. In light of the comments, EPA is convinced that the acreage limit is appropriate for identifying sites that are amount to industrial activity. Several comments suggested higher acreage limits without giving a supporting rationale except administrative concerns. Several commenters agreed that the five acre limit is suitable, but again without specifying why they agreed. EPA is convinced, however, that the acreage limits as finalized in today's rule reflect an earth disturbance and/or removal effort that is industrial in magnitude. Disturbances on large tracts of land will employ more heavy machinery and industrial equipment for removing vegetation and bedrock.

For construction facilities that are not included in the definition of storm water discharge associated with industrial activity, EPA will consider the appropriate procedures and methods to reduce pollutants in construction site runoff under the studies authorized by section 402(p)(5) of the CWA. EPA will also consider under section 402(p)(5) appropriate procedures and methods during post-construction for maintaining structural controls developed pursuant to NPDES permits issued for storm water discharges associated with industrial activity from construction sites.

Numerous commenters requested clarification as to whether permits for storm water discharges from construction activities at an industrial facility are required. EPA is requiring permits for all storm water discharges from construction activities where the land disturbed meets the requirements established in § 122.26(b)(14)(x) and which discharge into waters of the United States. The location of the construction activity or the ultimate land use at the site does not factor into the analysis.

G. Municipal Separate Storm Sewer Systems

1. Municipal Separate Storm Sewers

Today's rule defines "municipal separate storm sewer" at § 122.26(b)(8) to include any conveyance or system of conveyances that is owned or operated by a State or local government entity and is designed for collecting and conveying storm water which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.2. It is important to note that today's permit application requirements for discharges from municipal separate storm sewer systems serving a population of 100,000 or more do not apply to discharges from combined sewers (systems designed as both a sanitary sewer and a storm sewer). For purposes of calculating whether a municipal separate storm sewer system meets the large or medium population criteria, a municipality may petition to have the population served by a combined sewer deducted from the total population. Section 122.26(f) of today's rule describes this procedure.

EPA requested comments on whether different language for the definition of municipal separate storm sewer would clarify responsibility under the NPDES permit system. Comments were also requested on whether the definition needed to be clarified by explicitly stating that municipal streets and roads with drainage systems (curb and gutter, ditches, etc.) are part of the municipal storm sewer system, and that the owners or operators of such roads are responsible for such discharges. Numerous comments were received by EPA on this issue. Some commenters questioned whether road culverts and road ditches were municipal separate storm sewers, while others specifically recommended that further clarifying language should be added so that owners and operators of roads and streets understand that they are covered by this regulation. In light of these comments, EPA has clarified that municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains that discharge into the waters of the United States are municipal separate storm sewers. One commenter asked if "other wastes" in the proposed definition of municipal separate storm sewer (40 CFR 122.26 (b)(8)(i)) included storm water. In response, EPA has added "storm water" to this definition in order to clarify that the rule addresses such systems.

EPA requested comments on whether legal classifications such as "storm sewers that are not private (e.g. public, district or joint district sewers)" would provide a clearer definition of municipal separate storm sewer than an owner or operator criterion, especially for the purpose of determining responsibility under the NPDES program. Most commenters agreed that the owner/operator concept, and the additional language noted above, is sufficient for this purpose. EPA also requested comments on to what extent the owner/operator concept should apply to municipal governments with land-use authority over lands which contribute storm water runoff to the municipal storm sewer system, and how the responsibility should be clarified. In response to comments on this point, EPA has addressed these concerns in the context of clarifying what municipal entities are responsible for applying for a permit covering storm water discharges from municipal systems in section VI.H. below.

One commenter expressed a desire for clarification as to whether conveyances that were once used for the conveyance of storm water, but are no longer used in that manner, are covered by the definition. EPA emphasizes that this rulemaking only addresses conveyances that are part of a separate storm sewer system that discharges storm water into waters of the United States.

One commenter stated that if EPA intends to regulate roadside collection systems then EPA must repropose since these were not considered by the public. EPA disagrees with this comment since one of the options specifically addressed the inclusion of roadside drainage systems and roads in the definition of municipal separate storm sewer system. In addition, the public recognized the issue in comments on the proposal. EPA would note that several commenters specifically endorsed EPA's inclusion of these conveyances.

2. Effective Prohibition on Non-Storm Water Discharges

Section 402(p)(3)(B)(ii) of the amended CWA requires that permits for discharges from municipal storm sewers shall include a requirement to effectively prohibit non-storm water discharges into the storm sewers. Based on the legislative history of section 405 of the WQA, EPA does not interpret the effective prohibition on non-storm water discharges to municipal separate storm sewers to apply to discharges that are not composed entirely of storm water, as long as such discharge has been issued a separate NPDES permit. Rather,

an "effective prohibition" would require separate NPDES permits for non-storm water discharges to municipal storm sewers. In many cases in the past, applicants for NPDES permits for process wastewaters and other non-storm water discharges have been granted approval to discharge into municipal separate storm sewers, provided that the permit conditions for the discharge are met at the point where the discharge enters into the separate storm sewer. Permits for such discharges must meet applicable technology-based and water-quality based requirements of Sections 402 and 301 of the CWA. If the permit for a non-storm water discharge to a municipal separate storm sewer contains water-quality based limitations, then such limitations should generally be based on meeting applicable water quality standards at the boundary of a State established mixing zone (for States with mixing zones) located in the receiving waters of the United States.

All options will be considered when an applicant applies for a NPDES permit for a non-storm water discharge to a municipal separate storm sewer. In some cases, permits will be denied for discharges to storm sewers that are causing water quality problems in receiving waters. However, not all discharges present such problems; and in these cases EPA or State permit writers may allow such discharges to municipal separate storm sewers within appropriate permit limits.

Today's rule has two permit application requirements that are designed to begin implementation of the effective prohibition. The first requirement discussed in VI.H.6.a., below, addresses a screening analysis which is intended to provide sufficient information to develop priorities for a program to detect and remove illicit discharges. The second provision, discussed in VI.H.7.b., requires municipal applicants to develop a recommended site-specific management plan to detect and remove illicit discharges (or ensure they are covered by an NPDES permit) and to control improper disposal to municipal separate storm sewer systems.

Several commenters suggested that either the definition of "storm water" should include some additional classes of nonprecipitation sources, or that municipalities should not be held responsible for "effectively prohibiting" some classes of nonstorm water discharges into their municipal storm sewers. The various types of discharges addressed by these comments include detention and retention reservoir releases, water line flushing, fire hydrant flushing, runoff from fire fighting, swimming pool drainaqe and discharge, landscape irrigation, diverted stream flows, uncontaminated pumped ground water, rising ground water, discharges from potable water sources, uncontaminated waters from cooling towers, foundation drains, non-contact cooling water (such as heating, ventilation, air conditioning (HVAC) water that POTWs require to be discharged to separate storm sewers rather than sanitary sewers), irrigation water, springs, roofdrains, water from crawl space pumps, footing drains, lawn watering, individual car washing, flows from riparian habitats and wetlands. Most of these comments were made with regard to the concern that these were commonly occurring discharges which did not pose significant environmental problems.

EPA disagrees that the above described flows will not pose, in every case, significant environmental problems. At the same time, it is unlikely Congress intended to require municipalities to effectively prohibit individual car washing or discharges resulting from efforts to extinguish a building fire and other seemingly innocent flows that are characteristic of human existence in urban environments and which discharge to municipal separate storm sewers. It should be noted that the legislative history is essentially silent on this point. Accordingly, EPA is clarifying that section 402(p)(3)(B) of the CWA (which requires permits for municipal separate storm sewers to 'effectively' prohibit non-storm water discharges) does not require permits for municipalities to prohibit certain discharges or flows of nonstorm water to waters of the United States through municipal separate storm sewers in all cases. Accordingly, § 122.26(d)(2)(iv)(B)(1) states that the proposed management program shall include: "A description of a program, including inspections, to implement and enforce an ordinance, orders or similar means to prevent illicit discharges to the municipal separate storm sewer system; the program description shall address the following categories of non-storm water discharges or flows only where such discharges are identified by the municipality as sources of pollutants to waters of the United States: Water line flushing, landscape irrigation, diverted stream flows, rising ground waters, uncontaminated ground water infiltration (as defined at 40 CFR 35.2005(20)) to separate storm sewers, uncontaminated pumped ground water discharges from potable water sources, foundation drains, air conditioning condensation, irrigation water, springs, water from crawl space pumps, footing drains, lawn watering, individual residential car washing, flows from riparian habitats and wetlands, dechlorinated swimming pool discharges, and street wash waters. Program descriptions shall address discharges from fire fighting only where such discharges or flows are identified as significant sources of pollutants to waters of the United States."

However, the Director may include permit conditions that either require municipalities to prohibit or otherwise control any of these types of discharges where appropriate. In the case of fire fighting it is not the intention of these rules to prohibit in any circumstances the protection of life and public or private property through the use of water or other fire retardants that flow into separate storm sewers. However, there may be instances where specified management practices are appropriate where these flows do occur (controlled blazes are one example).

Conveyances which continue to accept other "non-storm water" discharges (e.g. discharges without an NPDES permit) with the exceptions noted above do not meet the definition of municipal separate storm sewer and are not subject to section 402(p)(3)(B) of the CWA unless the non-storm water discharges are issued separate NPDES permits. Instead, conveyances which continue to accept non-storm water discharges which have not been issued separate NPDES permits are subject to sections 301 and 402 of the CWA. For example, combined sewers which convey storm water and sanitary sewage are not separate storm sewers and must comply with permit application requirements at 40 CFR 122.21 as well as other regulatory criteria for combined sewers.

3. Site-Specific Storm Water Quality Management Programs for Municipal Systems

Section 402(p)(3)(iii) of the CWA mandates that permits for discharges from municipal separate storm sewers shall require controls to reduce the discharge of pollutants to the maximum extent practicable (MEP), including management practices, control techniques and systems, design and engineering methods, and such other provisions as the Director determines appropriate for the control of such pollutants.

When enacting this provision, Congress was aware of the difficulties in regulating discharges from municipal

separate storm sewers solely through traditional end-of-pipe treatment and intended for EPA and NPDES States to develop permit requirements that were much broader in nature than requirements which are traditionally found in NPDES permits for industrial process discharges or POTWs. The legislative history indicates, municipal storm sewer system "permits will not necessarily be like industrial discharge permits. Often, an end-of-the-pipe treatment technology is not appropriate for this type of discharge." [Vol. 132 Cong. Rec. S16425 (daily ed. Oct. 16, 1986)].

A shift towards comprehensive storm water quality management programs to reduce the discharge of pollutants from municipal separate storm sewer systems is appropriate for a number of reasons. First, discharges from municipal storm sewers are highly intermittent, and are usually characterized by very high flows occurring over relatively short time intervals. For this reason, municipal storm sewer systems are usually designed with an extremely high number of outfalls within a given municipality to reduce potential flooding. Traditional end-of-pipe controls are limited by the materials management problems that arise with high volume, intermittent flows occurring at a large number of outfalls. Second, the nature and extent of pollutants in discharges from municipal systems will depend on the activities occurring on the lands which contribute runoff to the system. Municipal separate storm sewers tend to discharge runoff drained from lands used for a wide variety of activities. Given the material management problems associated with end-of-pipe controls, management programs that are directed at pollutant sources are often more practical than relying solely on end-of-pipe controls.

In past rulemakings, much of the criticism of the concept of subjecting discharges from municipal separate storm sewers to the NPDES permit program focused on the perception that the rigid regulatory program applied to industrial process waters and effluents from publicly owned treatment works was not appropriate for the site-specific nature of the sources which are responsible for the discharge of pollutants from municipal storm sewers.

The water quality impacts of discharges from municipal separate storm sewer systems depend on a wide range of factors including: The magnitude and duration of rainfall events, the time period between events, soil conditions, the fraction of land that is impervious to rainfall, land use activities, the presence of illicit connections, and the ratio of the storm water discharge to receiving water flow. In enacting section 405 of the WQA, Congress recognized that permit requirements for municipal separate storm sewer systems should be developed in a flexible manner to allow site-specific permit conditions to reflect the wide range of impacts that can be associated with these discharges. The legislative history accompanying the provision explained that "[p]ermits for discharges from municipal separate stormwater systems * * * must include a requirement to effectively prohibit non-stormwater discharges into storm sewers and controls to reduce the discharge of pollutants to the maximum extent practicable, * * * These controls may be different in different permits. All types of controls listed in subsection [(p)(3)(C)] are not required to be incorporated into each permit" [Vol. 132 Cong. Rec. HI0576 (daily ed. October 15, 1986) Conference Report]. Consistent with the intent of Congress, this rule sets out permit application requirements that are sufficiently flexible to allow the development of site-specific permit conditions.

Several commenters agreed with this approach. One municipality recommended that there be as much flexibility as possible so that the permitting authority can work with each municipality in developing meaningful long-term goals with plans for improving storm water quality. This commenter noted that too many specific regulations that apply nationwide do not take into consideration the climatic and governmental differences within the States. EPA agrees that as much flexibility as possible should be incorporated into the program. However, flexibility should not be built into the program to such an extent that all municipalities do not face essentially the same responsibilities and commitment for achieving the goals of the CWA. EPA believes that these final regulations build in substantial flexibility in designing programs that meet particular needs, without abandoning a nationally consistent structure designed to create storm water control programs.

4. Large and Medium Municipal Storm Sewer Systems

During the 1987 reauthorization of the CWA, Congress established a framework for EPA to implement a permit program for municipal separate storm sewers and establishing phased deadlines for its implementation. The amended CWA establishes priorities for EPA to develop permit application requirements and issue permits for discharges from three classes of municipal separate storm sewer systems. The CWA requires that NPDES permits be issued for discharges from large municipal separate storm sewer systems (systems serving a population of more than 250,000) by no later than February 4, 1991. Permits for discharges from medium municipal separate storm sewer systems (systems serving a population of more than 100,000, but less than 250,000) must be issued by February 4, 1992. After October 1, 1992, the requirements of sections 301 and 402 of the CWA are restored for all other discharges from municipal separate storm sewers.

The priorities established in the Act are based on the size of the population served by the system. Municipal operators of these systems are generally thought to be more capable of initiating storm water programs and discharges from municipal separate storm sewers serving larger populations are thought to present a higher potential for contributing to adverse water quality impacts. NURP and other studies have verified that the event mean concentration of pollutants in urban runoff from residential and commercial areas remains relatively constant from one area to another, indicating that pollutant loads from urban runoff strongly depend on the total area and imperviousness of developed land, which in turn is related to population.

The term "municipal separate storm sewer system" is not defined by the Act. By not defining the term, Congress intended to provide EPA discretion to define the scope of municipal systems consistent with the objectives of developing site-specific management programs in NPDES permits. EPA considered two key issues in defining the scope of municipal separate storm sewer system: (1) What is a reasonable definition of the term "system," and (2) how to determine the number of people "served" by a storm sewer system. EPA found these two issues to be intertwined. Different approaches to defining the scope of a system allowed for greater or lesser certainty in deterining the population served by the system.

In the December 7, 1988, proposal, EPA described seven options for defining "municipal separate storm sewer system." In developing these options the EPA considered:

- The inter-jurisdiction complexities associated with municipal governments;
- The fact that many municipal storm water management programs have traditionally focused on water quantity

concerns, and have not evaluated water quality impacts of system discharges or developed measures to reduce pollutants in such discharges;

• The advantages of developing system-wide storm water management programs for municipal systems;

• The geographic basis necessary for planning of comprehensive management programs to reduce pollutants in discharges from municipal separate storm sewers to the maximum extent practicable;

• The geographic basis necessary to provide flexibility to target controls on areas where water quality impacts associated with discharges from municipal systems are the greatest and to provide an opportunity to develop cost effective controls;

• The need to establish a reasonable number of permits for municipal systems during the initial phases of program development that will provide an adequate basis for a storm water quality management program for over 13,000 municipalities after the October 1, 1992 general prohibition on storm water permits expires; and

• Congressional intent to allow the development of jurisdiction-wide, comprehensive storm water management programs with priorities given to the most heavily populated areas of the country.

a. Overview of Proposed Options and Comments. The December 7, 1988, proposal requested comment on seven options for defining large and medium municipal separate storm sewer system. With the addition of a watershed-based approach suggested by certain commenters, eight options or approaches were addressed by the over 200 commenters on this issue: Option 1—systems owned or operated by incorporated places augmented by integrated discharges; Option 2—systems owned or operated by incorporated places augmented with significant other municipal discharges; Option 3—systems owned or operated by counties; Option 4—systems owned and operated by States or State departments of transportation; Option 5—systems within the boundaries of an incorporated place; Option 6—systems within the boundaries of counties; Option 7—systems in census designated urbanized areas; and Option 8—systems defined by watershed boundaries.

Generally, these options can be classified into two categories. The first category of options, Options 1, 2 and 3, define municipal systems in terms of the municipal entity which owns or operates storm sewers within municipal boundaries of the requisite population. The second category of options would define municipal systems on a geographic basis. Under Options 4, 5, 6, 7 and 8 all municipal separate storm sewers within the specified geographic area would be part of the municipal system, regardless of which municipal entity owns or operates the storm sewer. EPA did not propose to define the scope of a municipal separate storm sewer system in engineering terms because of practical problems determining the boundaries of and the populations served by "systems" defined in such a manner. In addition an engineering approach based on physical interconnections of storm sewer pipes by itself does not provide a rational basis for developing a storm water program to improve water quality where a large number of individual storm water catchments are found within a municipality.

In the December 7, 1988, proposal, EPA favored those options that relied primarily on the municipal entity which owns or operates or otherwise has jurisdiction over storm sewers. These options were preferred because it was anticipated that the administrative complexities of developing the permit programs would be reduced by decreasing the number of affected municipal entities. However, most commenters were not satisfied that such an approach would reduce administrative burdens or complexities.

The diversity of arguments and rationales offered in comments justifying the selection of particular option, or combinations thereof, were generally a function of geographic, climatic, and institutional differences around the country. As such, there was little substantive agreement with how this program should be implemented as far as defining large and medium municipal separate storm sewer systems. Of all the options, Option 1 generally received the most favorable comment. However, the overwhelming majority of comments suggested different options or other alternatives. Having reviewed the comments at length, EPA is convinced that the definition of municipal separate storm sewers should possess elements of several of the options enumerated above and a mechanism that enables States or EPA Regions to define a system that best suits their various political and geographical conditions.

The following comments were the most pervasive, and represent those issues and concerns of greatest importance to the public: (1) The approach chosen initially must be realistic and achievable administratively; (2) the definition must be flexible enough to accommodate development of the program on a watershed basis, and incorporate elements of existing programs and frameworks and regional differences in climate, geography, and political institutions; (3) permittees must have legal authority and control over land use; (4) discharges from State highways, identified as a significant source of runoff and pollutants, should be included in the program and combined in some manner with one or more of the other options; (5) the definition should address how the inclusion of interrelated discharges into the municipal separate storm sewer system are timed, decided upon, dealt with, etc.; (6) any approach must address the major sources of pollutants; (7) development of co-permittee management plans must be coordinated or developed on a regional basis and in the same time frame—fragmented or balkanized programs must be avoided; (8) municipalities should be regulated as equitably as possible; (9) flood control districts should be addressed as a system or part of a system; (10) the definition must conform to the legal requirements of the Clean Water Act; and (11) the definition should limit the number of co-permittees as much as possible.

b. Definition of large and medium municipal separate storm sewer system. A combination of the options outlined in the 1988 proposal would address most of these concerns, while achieving a realistic and environmentally beneficial storm water program. Accordingly, EPA has adopted the following definition of large and medium municipal separate storm sewer systems. Large and medium separate storm sewer systems are municipal separate storm sewers that:

(i) Are located in an incorporated place with a population of 100,000 or more or 250,000 or more as determined by the latest Decennial Census by the Bureau of Census (see appendices F and G of part 122 for a list of these places based on the 1980 Census);

(ii) Are located within counties having areas that are designated as urbanized areas by latest decennial Bureau of Census estimates and where the population of such areas exceeds 100,000, after the population in the incorporated places, townships or towns within such counties is excluded (see appendices H and I for a listing of these counties based on the 1980 census) (incorporated places, towns, and townships within these counties are excluded from permit application requirements unless they fall under paragraph (i) or are designated under paragraph (iii)); or (iii) are owned or

operated by a municipality other than those described in paragraph (i) or (ii) that are designated by the Director as part of the large or medium municipal separate storm sewer system due to the interrelationship between the discharges of the designated storm sewer and the discharges from municipal separate storm sewers described under paragraphs (i) or (ii). In making this determination the Director may consider the following factors:

(A) Physical interconnections between the municipal separate storm sewers;

(B) The location of discharges from the designated municipal separate storm sewer relative to discharges from municipal separate storm sewers described in subparagraph (i);

(C) The quantity and nature of pollutants discharged to waters of the United States;

(D) The nature of the receiving waters; or

(E) Other relevant factors.

(iv) The Director may, upon petition, designate as a system, any municipal separate storm sewers located within the boundaries of a region defined by a storm water management regional authority based on a jurisdictional, watershed, or other appropriate basis that includes one or more of the systems described in paragraphs (i), (ii), and (iii).

Under today's rule at § 122.26(a)(3)(iii) the regional authority shall be responsible for submitting a permit application under the following guidelines: The regional authority together with co-applicants shall have authority over a storm water management program that is in existence, or shall be in existence at the time part 1 of the application is due; the permit applicant or co-applicants shall establish their ability to make a timely submission of part 1 and part 2 of the municipal application; each of the operators of municipal separate storm systems described in paragraphs 122.26(b)(4) (i), (ii), and (iii) and (7)(i), (ii), and (iii), that are under the purview of the designated regional authority, shall comply with the application requirements of § 122.26(d).

As noted above, the finalized definition of large and medium municipal separate storm sewer system is combination of the approaches as proposed. (In the following discussion "paragraph (i)" refers to §§ 122.26 (b)(4)(i) and (b)(7)(i); "paragraph (ii)" refers to §§ 122.26(b)(4)(ii) and (b)(7)(ii); "paragraph (iii)" refers to §§ 122.26 (b)(4)(iii) and (b)(7)(iii); and "paragraph (iv)" refers to §§ 122.26 (b)(4)(iv) and (b)(7)(iv)). Paragraph (i) originates from proposed Option 5 (boundaries of incorporated places); paragraph (ii) originates from Option 6 (boundaries of counties) and Option 7 (urbanized areas); paragraph (iii) originates from Options 1 and 5; and paragraph (iv) is an outgrowth of comments on all options, especially Option 4 (State owned systems/State highways) and Option 8 (watersheds).

This definition creates a system by virtue of the fact that storm sewers within defined geographical and political areas, and the owner/operators of separate storm sewers in those areas, are addressed or required to obtain permits. Although within these systems, different segments and discharges of storm water conveyances may be owned or operated by different public entities, EPA is convinced by comments that discharges from such conveyances are interrelated to such an extent that all of these conveyances may be properly considered a "system." These comments are identified and discussed in greater detail below.

c. Response to comments. Many commenters urged that the approach taken must be administratively achievable. Option 5 of the proposal (boundaries of incorporated places), which can be equated to paragraphs (i) and (iii) above, was identified by several commenters as the most workable of all the options. Many commenters stated that Option 1 (systems owned or operated by incorporated places) was inappropriate because of special districts and other owners of systems within the incorporated area; and although EPA proposed a designation provision for interrelated discharges in Option 1, commenters advised that it would be impossible to identify these systems, account for their discharges, and exclude or include them in a timely manner if Option 1 was selected (Option 1 only addresses those systems owned or operated by the incorporated place). The final rule would obviate these concerns, since all the publicly owned sewers within the boundaries of the municipality will be required to be covered by a permit.

Other commenters noted that cities sometimes have storm water conveyances owned or operated by numerous entities. One municipality commented that these problems could be more easily resolved using a unified permit/district wide approach, which the final approach outlined above can accomplish. One county stated that Option 1 of the proposal would result in a permanent balkanization of stormwater programs and that a regional approach focusing on the entire system should be established. Another municipality recommended that all the systems of conveyances within the incorporated city boundaries be issued a permit. In rejecting Option 1 of the proposal, one municipality stated that program inefficiencies would result from implementing a piecemeal program in a contiguous urban environment with different owners and operators. One State conveyed similar concerns. Using a geographical approach, as described in paragraph (i) of the final definition, will best address all of these concerns.

One commenter criticized proposed Option 1 as being contrary to the legal requirements of the WQA, and a further example of EPA's continuing attempt to minimize the scope of a national storm water program. It was noted that the legislative history regarding requirements for large and medium municipal separate storm sewer systems in section 402(p) of the CWA generally does not reference incorporated cities or towns. As a result, the commenter recommended that the term "municipal" in municipal separate storm sewer system refer to separate storm sewers operated by municipal entities meeting the definition of "municipality" in section 502 of the CWA and that the scope of the term "municipal separate storm sewer system" be defined as broadly as possible. This approach would result in defining large and medium municipal separate storm sewer systems to include all municipal separate storm sewers within the 410 counties with a population of 100,000 or more. EPA has adopted the commenter's recommendation to extend the scope of the program to the extent that today's rule covers all municipal separate storm sewers within certain areas rather than only those operated by an incorporated place. EPA disagrees however that it must define the term "system" to include sewers within any municipal boundary of sufficient population with reference to section 502(4). By not providing explicit definitions, section 402(p)(3)(B) of the CWA gives EPA discretion to define how municipal separate storm sewer systems are defined. There is no indication in the language of the CWA or the legislative history that Congress intended that the scope of "municipality" and the scope of "municipal separate storm sewer system" to be identical, particularly since the latter term is not defined in the statute. Furthermore, for the reasons discussed elsewhere in this section, EPA believes that today's definition is a reasonable accommodation of the many conflicting concerns surrounding the proper way to delineate the extent of a

municipal separate storm sewer system serving over 100,000 people.

Several commenters concluded that EPA should be flexible enough to allow the permitting authority broad discretion to establish system wide permits, with flood control districts and/or counties acting as co-permittees with the various incorporated cities within the district boundaries. Commenters expressed concern that Option 1 would not allow for such flexibility.

Arguments that were advanced by commenters in support of proposed Option 1 are equally applicable to paragraph (i), above. Like proposed Option 1, the approach outlined above targets major cities. However, it also has the advantage of addressing municipal separate storm sewer systems which may be interrelated to those owned by the city, a benefit recognized by one municipality that endorsed the selection of proposed Option 5. This will also give the permitting authority more discretion to establish co-permittee relationships.

Paragraph (ii) of the final definition also uses a geographical approach to the definition of municipal storm sewer systems to include municipal storm sewers within urbanized counties. Thus, it closely resembles Option 7 of the proposal. The counties identified in paragraph (ii) have, based on the 1980 Census, a population of 100,000 or more in urbanized,[5] unincorporated portions of the county. In the unincorporated areas of these counties (or in the 20 States where the Census recognizes minor civil divisions, unincorporated county areas outside of towns or townships), the county is the primary local government entity. In these cases, the county performs many of the same functions as incorporated cities with a population of 100,000, and is generally expected to have the necessary legal and land use authority in these areas to begin to implement storm water management programs. Due to the urbanized nature of their population, discharges from the municipal separate storm sewers in these counties will have many similarities to discharges from municipal systems in incorporated cities with a population of 100,000 or more. Addressing these counties in this fashion will not adversely affect small municipalities (incorporated places, towns and townships) within the county, as municipal separate storm sewers that are located in the small incorporated places, townships or towns within these counties are not automatically included as part of the system.

EPA has focused on the unincorporated areas because permit applications cannot be required from systems that serve a population less than 100,000, unless designated. EPA received the comment that if the sewers in incorporated places within such counties were included as part of the system for that county, there would be the potential for systems serving a population less than 100,000 to be improperly subject to permit requirements. EPA agrees with the comment, except that EPA reserves the authority to designate sewers in small incorporated places as part of the system subject to permitting, pursuant to paragraph (iii) of the final definition. Incorporated areas within the identified counties will be required to file permit applications if the population served by the municipal separate storm sewer system is 100,000 or more.

As one commenter noted, the counties addressed by the definition will generally be areas of high growth with a growing tax base that can finance a storm water management program. Numerous counties affected by paragraph (ii) commented on the proposal. Several of these indicated a preference for the county government as the permittee. Others indicated that their county had the ability to perform the functions of the permit applicant and permittee. One county brought to EPA's attention that the county had laid plans for a storm water utility scheduled to be in operation in 1989. Several of the counties supported the use of watersheds, or flexible regional approaches, as the basis for the definition of municipal separate storm sewer systems. The modified definition should satisfy these concerns.

EPA recognizes that some of the counties addressed by today's rule have, in addition to areas with high unincorporated urbanized populations, areas that are essentially rural or uninhabited and may not be the subject of planned development. While permits issued for these municipal systems will cover municipal system discharges in unincorporated portions of the county, it is the intent of EPA that management plans and other components of the programs focus on the urbanized and developing areas of the county. Undeveloped lands of the county are not expected to have many, if any, municipal separate storm sewers.

Paragraphs (i) and (ii) above will help resolve the problems associated with permittees not having adequate land use controls, the legal authority to implement controls, and the ownership of the conveyances. This factor was mentioned by numerous commenters on the proposed options, especially county governments. Under paragraphs (i) and (ii), all publicly owned separate storm sewers within the appropriate municipal boundaries will be defined as part of the municipal system. In many cases, a number of municipal operators of these storm sewers will be responsible for discharges from these systems. Since a number of co-permittees may be addressed in the permits for these discharges, problems associated with the ability to control pollutants that are contributed from interrelated discharges will be minimized. State highways or flood control districts, which may have no land use authority in incorporated cities, will be co-permittees with the city which does possess land use authority. EPA envisions that permit conditions for these systems will be written to establish duties that are commensurate with the legal authorities of a co-permittee. For example, under a permit, a flood control district may be responsible for the maintenance of drainage channels that they have jurisdiction over, while a city is responsible for implementing a sediment and erosion ordinance for construction sites which relates to discharges to the drainage channel. Confusion over ownership of conveyances or systems, at least for the purposes of determining whether they require a permit, will be minimized since all conveyances will be covered. Similarly, under paragraph (ii), the affected counties are expected to have the necessary legal and land use authority to implement programs and controls in unincorporated, urbanized areas because the county government is the primary political or governing entity in these geographical areas.

Many commenters from all levels of State and local government expressed concern about controlling pollutants from State highways. Paragraphs (i) and (ii) will result in discharges from separate storm sewers serving State highways and other highways through storm sewers that are located within incorporated places with the appropriate population or highways in unincorporated portions of specified counties being included as part of the large or medium municipal separate storm sewer system, since all municipal separate storm sewers within the boundaries of these political entities are included. Paragraph (iv) can facilitate

[5] The Bureau of Census defines urbanized areas to provide a description of high-density development. Urbanized areas are comprised of a central city (or cities) with a surrounding closely settled area. The population of the entire urbanized area must be greater than 50,000 persons, and the closely settled area outside of the city, the urban fringe, must generally have a population density greater than 1,000 persons per square mile (just over 1.5 persons per acre) to be included

the submission of a permit application for storm sewers operated as part of an entire State highway system. Paragraph (iv) would allow an entire system in a geographical region under the purview of a State agency (such as a State Department of Transportation) to be designated, where all the permit application requirements and requirements established under § 122.26(a)(iii)(C) can be met.

Paragraphs (i) and (ii) can effectively deal with many of the major sources of pollutants. One municipality noted that Option 5 (paragraph (i)) would require all systems in the incorporated boundaries to obtain permits and institute control measures, rather than just the few owned or operated by incorporated cities. Another municipality noted that this approach could deal with many of the regional variations in sources of pollution. Many commenters, including environmental groups, believed that proposed Option 3 (systems owned or operated by counties), Option 6 (systems within the boundaries of counties), and Option 7 (system in urbanized areas) were good approaches because more sources of pollution would be addressed. It was also maintained that Options 3, 6 and 7 could incorporate watershed planning which, in the view of some commenters, is the only effective way to address pollutants in storm water.

Commenters noted that addressing counties and urbanized areas would focus attention on developing areas which would otherwise be left out in the initial phases of permitting. One commenter noted that most new development in large urbanized areas occurs outside of core cities (incorporated cities with a population of 100,000 or more). Newly developing areas provide opportunities for installing pollutant controls cost effectively. EPA agrees with these comments and notes that paragraph (ii) addresses a significant number of counties with highly developed or developing areas.

However, EPA is convinced that addressing all counties or urbanized areas in the initial phases of the storm water program is ill-advised. Commenters noted that some counties have inappropriate or nonexistent governmental structures, and that a program that addressed all counties in the country with a population of 100,000 or more would be unmanageable, because too many municipal entities nationwide would be involved in the program initially. Commenters advised that defining municipal storm sewer systems solely in terms of the boundaries of census urbanized areas (Option 7) would result in systems which did not correspond to jurisdictions that are in a position to implement a storm water programs. Thus, EPA has modified Option 7 and combined it with Option 6 to create paragraph (ii) above.

Paragraph (iii) incorporates a designation authority such that municipalities that own or operate discharges from separate storm sewers systems other than those described in paragraph (i) or (ii) may be designated by the Director as part of the large or medium municipal separate storm sewer system due to the interrelationship between the other discharges of the designated storm sewer and the discharges from the large or medium municipal separate storm sewers. In making this determination the physical interconnections between the municipal separate storm sewers, the location of discharges from the designated municipal separate storm sewer relative to discharges from large or medium municipal separate storm sewers, the quantity and nature of pollutants discharged to waters of the United States, the nature of the receiving waters, or other relevant factors may be considered.

Comments indicated that the designation authority as proposed and described above should be retained. One State noted that this approach gives the most flexibility in making the case-by-case designations, while also delineating in sufficient detail what criteria are used to make the determination. This commenter was concerned about being able to regulate many of the interrelated discharges from counties surrounding incorporated cities.

Paragraph (iv) of the final definition allows the permitting authority, upon petition, to designate as a medium or large municipal separate storm sewer system, municipal separate storm sewers located within the boundaries of a region defined by a storm water management regional authority based on a jurisdictional, watershed, or other appropriate basis that includes one or more of the systems described in paragraphs (i), (ii), (iii).

Paragraph (iv) was added to the final definitions to respond to a variety of concerns of commenters. One of the prime concerns of commenters was that the definition of large and medium municipal separate storm sewer systems must be flexible enough to accommodate: Programs on a watershed basis, existing storm water programs and frameworks and regional differences in climate, geography, and political institutions. Some States were particularly expressive regarding this concern. One State maintained that an inflexible program could totally disrupt ongoing State efforts. Other commenters urged that the regulation encourage the establishment of regional storm water authorities or other mechanisms that can deal with storm water quality on a watershed basis. One State proposed defining the municipal separate storm sewer system to include all municipal separate storm sewers within a core incorporated place of 100,000 or more, and all surrounding incorporated places within the State defined watershed. One of the State water districts advised that the regulations should be flexible enough to allow regional water quality boards to apply the regulations geographically. One national association expressed concern that existing institutional arrangements for flood control and drainage would be ignored, while another warned against fostering a proliferation of inconsistent patchwork programs based on arbitrary definitions and jurisdictions which bear no relationship to water quality.

EPA is convinced that the mechanism described in paragraph (iv) provides a means whereby the mechanisms and concepts identified above can be utilized or created in appropriate circumstances. In addition, § 122.26(f)(4) provides a means for State or local government agencies to petition the Director for the designation of regional authorities responsible for a portion of the storm water program. For example, some States or counties may currently or in the near future have regional storm water management authorities that have the ability to apply for permits under today's rule and carry out the terms of the permit. Some of these authorities may encompass within their jurisdiction large or medium municipal separate storm sewer systems as defined in today's rule. EPA wishes to encourage such entities to assume the role as permittee under today's rule. That is the purpose of paragraph (iv). Such authorities may petition the Director to assume such a role.

Many commenters expressed the view that municipal management plans must be coordinated or developed among co-permittees on a regional basis and in the same timeframe. Paragraphs (i), (iii) and (iv) would bring in all appropriate municipal entities with jurisdiction over a specified geographical area in the same timeframe. Several commenters, including one State, noted proposed Option 1 would lead to fragmented, ill-coordinated programs. Paragraphs (i), (iii), and (iv) do not suffer this drawback

to the same extent since all the municipal separate storm sewers are addressed within the incorporated place, instead of only those owned or operated by the incorporated place.

Equal treatment of municipalities within a watershed or other specified area was a major subject of comment. Many commenters urged that a degree of fairness could be achieved by requiring permit applications, and the concomitant expenditure of municipal dollars and resources, from all municipalities within an entire urban area that contributes to storm water pollution, rather than from a discrete system within an arbitrary political boundary. Paragraph (i), especially when coupled with paragraphs (ii), (iii), and (iv), can best accomplish a more equitable approach, because all owners and operators of municipal separate storm sewers within a system have responsibilities. In addition, some of the areas outside the incorporated city limits which are engaged in expansive urban or suburban development will be brought into the program. Paragraph (iv) will provide a means for State or regional authorities to use existing or emerging mechanisms to set up storm water management programs, and would require multiple agencies either to become regional co-permittees or to be subject to a regional permit.

Paragraphs (i), (ii), (iii), and (iv) could also require flood control districts to be co-permittees, which was a major concern of counties and numerous cities. One municipality stated that the inclusion of flood control districts would greatly reduce the administrative burden required to prepare a single inter-city discharge agreement and would establish a common legal authority to implement the program. Numerous county agencies believed it imperative that flood control districts be brought into a system-wide permit strategy.

Paragraphs (i) and (iii) may not accommodate the concern of several commenters that the number of co-permittees be kept to a minimum. The fact that all the municipal separate storm sewers within the boundaries of the appropriate incorporated places will be addressed dictates that some permits will have several co-permittees. This is a major concern since it goes directly to achieving an effective initial storm water program. There is concern about being able to bring all the co-permittees together under intra-municipal agreements or contracts within regulatory deadlines. This problem would be resolved in the short term by selecting Option 1. However, Option 1 may still require inter-municipal agreements because of the designation authority under § 122.26 (b)(4)(ii) and (b)(7)(ii) of the proposal. In addition, such inter-jurisdictional problems will arise after October 1, 1992 when the moratorium on requiring NPDES permits for discharges from other municipal separate storm sewers ends. Under the permitting goals established by the CWA, multi-jurisdictional storm water programs and agreements cannot be avoided. Despite interest in limiting the number of co-permittees, EPA decided not to adopt Option 1 for the reasons already stated.

Section 402(p)(3)(B)(i) of the amended CWA provides that permits for municipal discharges from municipal storm sewers may be issued on a system-wide or jurisdiction-wide basis. This provision is an important mechanism for developing the comprehensive storm water management programs envisioned by the Act.

Under the permit application requirements of today's rule, if the appropriate co-applicants are identified, one permit application may be submitted for a large or medium municipal separate storm sewer system (see section VI.G.4 above). System-wide permit applications can in turn be used to issue system-wide permits which could cover all discharges in the system.

Where several municipal entities are responsible for obtaining a permit for various discharges within a single system, EPA will encourage system-wide permit applications involving the several municipal entities for a number of reasons. The system-wide approach not only provides an appropriate basis for planning activities and coordinating development, but also provides municipal entities participating in a system-wide application the means to spread the resource burden of monitoring, evaluating water quality impacts, and developing and implementing controls.

The system-wide approach provided in today's rule recognizes differences between individual municipalities with responsibilities for discharges from the municipal system. Today's application rule requires information to be submitted that enables the permit issuing authorities to develop tailored programs for each permittee with responsibility for certain components, segments, or portions of the municipal separate storm sewer system. The permit application requirements allow individual municipal entities, participating in system-wide applications, to submit site specific information regarding storm water quality management programs to reduce pollutants in system discharges as a whole, or from specific points within the system.

In some cases, it may be undesirable for all municipal entities with storm water responsibility within a municipal system to be co-permittees under one system-wide permit. The permit application requirements in today's rule allow individual municipal entities within the system to submit permit applications and obtain a permit for that portion of the storm sewer system for which they are responsible. Thus, several permits may be issued to cover various subdivisions of a single municipal system.

In summary, EPA believes that the definition of municipal storm sewer system adopted in today's rule has several distinct advantages that were identified in comments:

- The definition adopts features of several options;
- The definition targets areas that have the necessary police powers and land use authority to implement the program;
- The definition can utilize watersheds or accommodate existing administrative frameworks and storm water programs;
- The definition provides that all systems within a geographical area including highways and flood control districts will be covered, thereby avoiding fragmented and ill-coordinated programs;
- The definition has flexible designation authority; and
- The definition addresses major sources of pollutants without being overly broad.

H. Permit Application Requirements for Large and Medium Municipal Systems

1. Implementing the Permit Program

Given the differing nature of discharges from municipal separate storm sewer systems in different parts of the country and the varying water quality impacts of municipal storm sewer discharges on receiving waters, today's permit application requirements are designed to lead to the development of site-specific storm water management programs. In order to effectively implement this goal, EPA intends to retain the overall structure of the municipal permit application as proposed in the December 7, 1988, proposal.

2. Structure of the Permit Application

EPA proposed a two-part permit application designed to meet the goal of

developing site-specific storm water quality management programs in NPDES permits. In response to a request for comments on this aspect of the proposal, numerous comments were received. After reviewing these comments, EPA has decided to retain the two-part permit application. Many commenters agreed that the approach as proposed is appropriate for phasing in and developing site specific storm water management programs. One large municipality strongly endorsed the two-part application, stating that it would facilitate the identification of water quality problem areas and the development of priorities for control measures, thereby allowing for more cost-effective program development. Two State agencies expressed the same view, and noted that the two-part approach is reasonable and well structured for efficient development of programs. One large municipality noted it would allow the permit authority and the permit applicant the time needed to gain the knowledge and data to develop site-specific permits. A medium municipality expressed similar views.

Numerous commenters submitted endorsements of a proposal offered by one of the national municipal associations. This approach responded to EPA's request for comments on alternatives to a two-part application process. These comments recommended having permit applicants submit information regarding their existing legal authority, prepare source identification information, describe existing management plans, provide discharge characterization information based on existing data, and prepare a monitoring, characterization and illicit discharge and removal plan in a one-part application. The remaining requirements such as: implementing plans to remove illicit connections, obtaining legal authority, monitoring and characterization, plans for structural controls, preparation of control assessments, preparation of fiscal analysis, and management plan implementation would be part of the permit and take place during the compliance period of the permit. It was argued that this would result in a more orderly development of stormwater management programs while allowing for quick implementation of efforts to eliminate illicit discharges and initiate some BMPs.

After careful review and consideration of these comments, EPA is convinced that this approach would not meet the goals and requirements of section 402 of the Clean Water Act. Section 402(p)(3)(B) of the CWA requires that permits effectively prohibit non-storm water discharges into storm sewers and incorporate controls that reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques, and system design and engineering methods. The above comments suggesting an alternative for achieving this goal are not entirely compatible with these requirements. In light of the language in the statute, permit conditions should do more than plan for controls during the term of the permit. A strong effort to have the necessary police powers and controls based on pollutant data should be undertaken before permits are issued. In short, the one-part application described by these comments would result in permits that would focus too much on preparation and not enough on implementing controls for pollutants.

In comparison, EPA's approach requires municipalities to submit a two-part application over a two year period. Part one of the application would require information regarding existing programs and the means available to the municipality to control pollutants in its storm water discharges. In addition, part one would require field screening of major outfalls to detect illicit connections. Part two of the permit application would require a limited amount of representative quantitative data and a description of proposed storm water management plans. The purpose of the two-part application process is to develop information, in a reasonable time frame, that would build successful municipal storm water management programs and allow the permit writer to make informed decisions with regard to developing permit conditions. This will include initiating efforts to effectively prohibit non-storm water discharges into storm sewers, and initially implementing controls that reduce the discharge of pollutants to the maximum extent practicable, including management practices and control techniques during the term of the permit. Such an approach clearly meets the statutory mandate of section 402(p)(3)(B).

a. Part 1 Application. Part 1 of the permit application is intended to provide an adequate basis for identifying sources of pollutants to the municipal storm sewer system, to preliminarily identify discharges of storm water that are appropriate for individual permits, and to formulate a strategy for characterizing the discharges from municipal separate storm sewer systems. Several commenters supported retaining these components of the application process. The components of part 1 of the permit application include:

- General information regarding the permit applicant or co-applicants (§ 122.26(d)(1)(i));
- A description of the existing legal authority of the applicant(s) to control pollutants in storm water discharges and a plan to augment legal authority where necessary (§ 122.26(d)(1)(ii));
- Source identification information including: a topographic map, description of the historic use of ordinances or other controls which limited the discharge of non-storm water discharges to municipal separate storm sewer systems, the location of known municipal separate storm sewer outfalls, projected growth, location of structural controls, and location of waste disposal facilities (§ 122.26(d)(1)(iii));
- Information characterizing the nature of system discharges including existing quantitative data, the results of a field screening analysis to detect illicit discharges and illegal dumping to the municipal system, an identification of receiving waters with known water quality impacts associated with storm water discharges, a proposed plan to characterize discharges from the municipal storm sewer system by estimating pollutant loads and the concentration of representative discharges, and a plan to obtain representative data (§ 122.26(d)(1)(iv)); and
- A description of existing structural and non-structural controls to reduce the discharge of pollutants from the municipal storm sewer (§ 122.26(d)(1)(v)).

One commenter disagreed that source identification should be made part of the permit application process beyond the identification of major municipal storm sewer outfalls. In reply, EPA is convinced that the other elements of the source identification are critical for identifying sources of pollutants and creating a base of knowledge from which informed decisions about permit conditions and further data requirements can be determined. One county stated that it already had engaged in extensive monitoring and modeling of watersheds and that its programs should be substituted for EPA's. In response, EPA anticipates that information collected under various State, county or city programs that matches the information requirements in this rulemaking may be used by the applicants in submissions under this rulemaking where the requirements of the rule are met. However, because of the divergence in data collection techniques and information collected by

these programs, EPA disagrees that it would be appropriate to accept a substitution in its entirety without tailoring such a program to today's specific information requirements. One municipality noted that municipal systems are not well documented and responsibility for them is in question. In response, EPA notes that the source identification procedure is designed, in part, to address such shortcomings.

Several municipalities suggested that legal authority could be demonstrated by providing EPA with copies of appropriate local ordinances to demonstrate their legal authority and a statement from the city attorney. EPA agrees that these methods are appropriate for making this demonstration.

Several commenters noted that there was adequate existing municipal legal authority to carry out the program requirements or such authority could be obtained by the municipality. Other commenters stated that municipalities possess some authority over certain activities but may not have authority over discharges from roads and construction. Numerous commenters, however, claimed that certain municipalities had no existing legal authority to carry out the permit requirements and that obtaining all the necessary legal authority could take several years due to cumbersome legislative and political processes. In response, part 1 of the permit application will establish a schedule for the development of legal authority that will be needed to accomplish the goals of the permit application and permits. Some municipalities will have more advanced storm water programs with appropriate legal authority or the ability to establish necessary ordinances. Providing an appropriate schedule will not present difficulties in these circumstances. EPA also notes that the definitions of large and medium municipal separate storm sewer systems finalized in today's rule will in many cases result in a number of co-applicants participating in a system wide application. It is anticipated that the development of adequate inter-jurisdictional agreements specifying the various responsibilities of the co-permittees may in some cases be very complex, thereby justifying the development of a schedule to complete the task. For example, clarifying the authority over discharges from roads may present difficulties where a number of municipal entities operate different roads in a given jurisdiction. In other limited cases, the MEP standard for municipal permits may translate into permit conditions that extend the schedule for obtaining necessary legal authority into the term of the permit. These situations will be evaluated on a case-by-case basis by permit issuing authorities.

Numerous commenters supported the field screening analysis as proposed. Comments from three municipalities noted that it would be a cost effective means of identifying problem areas. One municipality noted that illicit connections can be reliably detected by the screening method proposed. In view of these comments EPA has decided to retain this portion of the regulation. However many commenters expressed concern over how the proposed approach would work given the particular circumstances under which some municipal storm water systems are arranged. Several commenters questioned the effectiveness of dry weather monitoring for several reasons, including the shallow depth of some cities' water tables. Accordingly, an alternative approach may be utilized by the municipal permittee, and this is discussed later in section VI.H.3.

Some comments suggested that if any field screening is required that it be done during the term of the permit. EPA believes that field screening should not be done during the term of the permit exclusively. Unless a field screening is accomplished during the permit application phase there will be scant knowledge, if any, upon which illicit connection programs can be established for the term of the permits. EPA views field screening during the application process as an appropriate means of beginning to meet the CWA's requirement of effectively prohibiting non-storm water discharges into municipal separate storm sewers.

The submittal of part 1 of the permit application will allow EPA, or approved NPDES States, to adjust part 2 permit application requirements to assure flexibility for submitting information under part 2, given the site specific characteristics of each municipal storm sewer system.

EPA agrees with the concerns of commenters regarding the estimate of the reduction of pollutant loads from existing management programs. EPA agrees that sufficient data may not be available to establish meaningful estimates. Therefore this component of the proposed part 1 is not a requirement of today's rule.

b. Part 2 Application. Part 2 of the proposed permit application is designed to supplement information found in part 1 and to provide municipalities with the opportunity of proposing a comprehensive program of structural and non-structural control measures that will control the discharge of pollutants, to the maximum extent practicable, from municipal storm sewers. The components of the proposed part 2 of the permit application included:

- A demonstration that the legal authority of the permit applicant satisfies regulatory criteria (§ 122.26(d)(2)(i));
- Supplementation of the source identification information submitted in part 1 of the application to assure the identification of all major outfalls and land use activities (§ 122.26(d)(2)(ii);
- Information to characterize discharges from the municipal system;
- A proposed management program to control the discharge of pollutants to the maximum extent practicable, from municipal storm sewers (§ 122.26(d)(2)(iv));
- Assessment of the performance of proposed controls (§ 122.26(d)(2)(v));
- A financial analysis estimating the cost of implementing the proposed management programs along with identifying sources of revenue § 122.26(d)(2)(vi);
- A description of the roles and responsibilities of co-applicants (§ 122.26(d)(2)(vii)).

One municipality agreed that the assessment of the performance of controls was a critical component of establishing a viable program and one that could be accomplished within the time frame of the permit application deadlines. One commenter suggested that the applicant describe what financial resources are currently available. In response, EPA will require applicants to describe the municipality's existing budget for storm water programs in part 1 of the permit application requirements. This information will be useful to evaluate the municipality's ability to prepare and implement management plans. In response to other comments, this information will also include an overview of the municipality's financial resources and a description of the municipality's budget, including overall indebtedness and assets.

EPA has retained the financial analysis in this portion of the rule on the advice of two municipal commenters, who agreed that this was an important component of establishing a viable program and one that could be accomplished within the time frame ot the permit application deadlines. Another commenter noted that this requirement is appropriate to justify a municipality's proposed management plan.

3. Major Outfalls

In past rulemakings, a controversial issue has been the appropriate sampling requirements for municipal separate storm sewer systems. Earlier storm water rulemakings have been based primarily on the principle that all discharges to waters of the United States from municipal separate storm sewers located in urban areas must be covered by an individual permit. This approach requires that individual permit applications contain quantitative data to be submitted for all such discharges. This approach was criticized because of a potentially unmanageable number of outfalls in some municipal separate storm sewer systems. Most incorporated cities with a population of 100,000 or more do not know the exact number of outfalls from their municipal systems; but based on the comments, the number ranges from 500 to 8,000 or more.

In light of the increased flexibility provided by the WQA and the development of EPA's system-wide approach for regulating municipal separate storm sewer discharges, today's rule will not require submittal of individual permit applications with quantitative data for each outfall of a municipal system. Rather today's rule will encourage system-wide permit applications to provide information suitable for developing effective storm water management programs. Under this approach, not all outfalls of the municipal system will be sampled, but rather more specific and accurate models for estimating pollutant loads and discharge concentrations will be used. The use of these models will require the identification of sources which are responsible for discharging pollutants into municipal separate storm sewers and will not require as much data to calibrate due to the source-specific nature of the model. A number of standard and localized models have been developed for estimating pollutant loads from storm water discharges.

Several commenters support the use of models for developing management plans and estimating pollutant loadings and concentrations. EPA encourages their use where applicable to particular systems.

By adopting an approach that incorporates source identification measures, the amount of quantitative data required to characterize discharges from the municipal system will be reduced because of the increased accuracy of the site-specific models which can be used. Consistent with a system-wide permit application approach, EPA proposed to focus source identification measures on "major outfalls." The proposed definition of major outfalls includes any municipal separate storm sewer outfall that discharges from a pipe with a diameter of more than 36 inches or its equivalent (discharges from a drainage area of more than 50 acres), or for municipal separate storm sewers that receive storm water from lands zoned for industrial activities, an outfall that discharges from a pipe with a diameter of more than 12 inches or its equivalent (discharges from a drainage area of 2 acres or more).

Numerous entities offered comments on this definition. Several commenters concurred with this proposed definition. One commenter maintained that the data collected at such outfalls would be sufficient to estimate pollutant loads as well as concentrations using well calibrated models. Another municipality stated that 50 acres was an excellent approximation for the average drainage area served by a 36-inch storm sewer. Two States and one county supported the definition as proposed. One large municipal entity supported the definition, stating that screening major outfalls could be accomplished with available staff over a three month period. In light of these comments, EPA has decided to retain, in part, the definition as proposed.

Numerous commenters suggested alternative definitions or otherwise disagreed with the proposed definition. Most of these comments expressed concern about the number of outfalls that would have to be tested or screened if the definition was retained. For this reason EPA has decided to limit the total number of major outfalls or equivalent sampling points that have to be tested to 250 or 500 for medium or large systems respectively. This change is discussed in further detail below.

The following are examples of comments that opposed the definition of a "major outfall" as proposed. Several commenters stated that, in the southwest, 6 to 12 foot outfalls are the norm, and that smaller outfalls should not be addressed unless there is a compelling reason to suspect illicit connections. One commenter suggested a size of 54 inches and 50 acres, while another commenter suggested that 48 inches would be appropriate. One commenter suggested that the diameter for industrial pipes should be 18 inches, while another commenter suggested that 50 acres should be the only criterion.

One commenter noted that pipe size will vary according to rainfall patterns and that a single approach would not work universally. This comment, and other similar points of view as noted herein, convinces that Agency that a more flexible approach is needed to identify field screening and sampling locations. However, EPA is also convinced that a universal standard is necessary for purposes of identifying drainage areas within the municipal system and discrete areas of land use that are drained by certain sized outfalls. This information is critical since these conveyances, and lands they drain, are sources of pollutants to waters of the United States from municipal systems and are properly the subject of appropriate permit conditions.

Many commenters suggested placing a limit on the number of major outfalls addressed during the field screening phase of the permit application. Two municipalities stated that the proposed definition of major outfalls in terms to the pipe diameter was too small and that too many outfalls would be covered. One municipality stated that under the proposed definition, it would have over 4700 "major outfalls," a number viewed as being unacceptably large. Several municipalities argued that they would be penalized for over-design of their storm drain system. One municipality stated field screening of outfalls should be limited to 200 for medium cities and 500 for large cities. Some commenters suggested EPA set a percentage of major outfalls for screening, because all pipes in some municipalities meet the definition of major outfall. One commenter suggested that a sliding scale be used to determine the number of outfalls tested: those with 50 test all, those with 100–200 test 50%, etc. Other commenters suggested a flat percentage of outfalls or flat number such as 100.

4. Field Screening Program

EPA also received several comments in response to the proposed field screening methodology. Among the major concerns were: End of pipe sampling may not be practical and the more appropriate and accessible location is likely to be the nearest upstream manhole; the type of discharge should be the criterion for selecting sampling points as opposed to pipe size; a system wide evaluation is more appropriate than checking each outfall; within some systems, major outfalls or pipe size will not reflect discharges from suspect or old land use areas; efforts should be focused on locations where illicit connections are expected; sites should be determined by looking at sites within drainage basin areas based on land use within those basins; land use and hydrology of the watershed should be the criteria for selecting points;

screening should be performed at locations that will allow for the location of upstream discharges; the focus should be exclusively on drainage areas rather than pipe size, since pipe size will vary with slope; a prescribed percentage of total flow may be more appropriate; state water quality standards should be utilized along with focusing on actual quality in the reaches of a stream.

EPA is convinced by these comments that today's rule should allow applicants to either field screen all major outfalls as proposed (first procedure) or use a second procedure to provide for the strategic location of sampling points to pinpoint illicit connections. EPA agrees with comments that the size of the outfall will not always reflect the chance of uncovering illicit connections or discharges, and that field screening points should be easily accessible.

This second procedure is as follows: field screening points and/or outfalls are randomly located throughout the storm sewer system by placing a grid over a drainage system map and identifying those cells of the grid which contain a major outfall or segment of the storm sewer system. The grid shall be established using the following guidelines and criteria:

(1) A grid system consisting of perpendicular north-south and east-west lines spaced 1/4 mile apart shall be overlaid on a map of the municipal storm sewer system, creating a series of cells;

(2) All cells that contain a segment of the storm sewer system shall be identified; one field screening point shall be selected in each cell; major outfalls may be used as field screening points;

(3) Field screening points or major outfalls should be located downstream of any sources of suspected illegal or illicit activity;

(4) Field screening points shall be located to the degree practicable at the farthest manhole or other accessible location downstream in the system, within each cell; however, safety of personnel and accessibility of the location should be considered in making this determination;

(5) The assessment and selection of cells shall use the following criteria: Hydrological conditions; total drainage area of the site; population density of the site; traffic density; age of the structures or buildings in the area; history of the area; land use types;

(6) For medium municipal separate storm sewer systems, no more than 250 cells need have identified field screening points; in large municipal separate storm sewer systems, no more than 500 cells need to have identified field screening points for detecting illicit connections; cells established by the grid that contain no storm sewer segments will be eliminated from consideration; if fewer than 250 cells in medium municipal sewers are created, and fewer than 500 in large systems are created by the overlay on the municipal sewer map, then all those cells which contain a segment of the sewer system shall be subject to field screening (unless access to the separate storm sewer system is impossible);

(7) Large or medium municipal separate storm sewer systems which are unable to utilize the procedures described in paragraphs (1) through (6) above, because a sufficiently detailed map of the separate storm sewer systems is unavailable, shall field screen at least 250 or 500 major outfalls respectively using the following method: the applicant shall establish a grid system consisting of north-south and east-west lines spaced 1/4 mile apart overlaid on a map of the boundaries of a large or medium municipal entity described at § 122.26(b), thereby creating a series of cells; major outfalls in as many different cells as possible shall be selected until 500 major outfalls (large municipalities) or 250 major outfalls (medium municipalities) are selected; a field screening analysis shall be undertaken at these major outfalls.

The methodology outlined above is in response to public comments which indicated that the field screening and sampling of major outfalls as proposed would lead to insurmountable logistical problems in some municipal systems. EPA believes that the above is an effective approach to pinpointing suspected problem points along a given trunkline or segment of separate storm sewer system. Jurisdictions with no extensive or previous history of monitoring, or lack of an intensive monitoring program can utilize the methods described in establishing a program. Furthermore, the approach will allow for the prioritization of outfalls, sampling points, or areas within the municipality where there are suspected illicit connections or discharges, or other circumstances creating higher concentrations and loadings of pollutants.

Paragraph (7) enables municipalities to select major outfalls without regard to the municipal sewer system map that is required for using the procedure described in paragraphs (1) through (6). However, the applicant must still select outfalls within the cells created by overlaying a 1/4 mile grid over a map of the boundaries of the large or medium municipal entity defined under § 122.26(b), and select major outfalls within as many of those cells as possible, up to 500 (large municipal systems) or 250 (medium municipal systems). In this manner, as many different areas and land uses within the municipal system will be covered by the field screening component of the municipal application.

In order to keep the costs of the program within the anticipated limits of the proposed regulation, the number of outfalls or sampling locations using the grid system is to be limited to 500 for large municipal separate storm sewer systems and 250 for medium municipal separate storm sewer systems.

In response to several comments, EPA has clarified the definition of major outfalls with regard to the words, "pipe with an inside diameter of 36 inches or more or its equivalent" and "a pipe with an inside diameter of 12 inches or more or its equivalent." This definition has been modified to specify that single pipes or single conveyances with the appropriate diameter or equivalent are covered.

EPA's proposal required municipal permit applicants to submit a fiscal analysis of expenditures that will be required in order to implement the proposed management plans required in part 2 of the application. The description of fiscal resources should include a description of the source of the funds. Some commenters felt that a fiscal analysis should only be required during the term of the permit. In response, EPA believes that during the two years of permit application development, the permit applicant should be in a position to submit information on the ability and means for financing storm water management programs during the term of the permit. EPA views this information as an important means of evaluating the scope of program and whether the permittee will be devoting adequate resources to implementing the program before that program is mapped out in the permit itself.

5. Source Identification

The identification of sources which contribute pollutants to municipal separate storm sewers is a critical step in characterizing the nature and extent of pollutants in discharges and in developing appropriate control measures. Source identification can be useful for providing an analysis of pollutant source contribution and for identifying the relationship between pollutant sources and receiving water quality problems. In cases where end-of-pipe controls alone are not practicable, it is essential to identify the source of pollutants into the municipal storm

sewer systems to support a targeted approach to control pollutant sources.

The relative contribution of pollutants from various sources will be highly site-specific. The first step in developing a targeted approach for controlling pollutants in discharges from municipal storm sewer systems is identifying the various sources in each drainage basin that will contribute pollutants to the municipal storm sewer system.

This rulemaking phases in the source identification requirements of the permit program by establishing minimum objectives in part 1 of the application and by requiring applicants to submit a source identification plan in part 2 of the application to provide additional information during the term of the permit. The minimum source identification requirements of part 1 of the application have been designed to provide sufficient information to provide an initial characterization of pollutants in the discharges from the municipal storm sewer system. EPA realizes that with many large, complex municipal storm sewer systems, it may be difficult to identify all outfalls during the permit application process. Accordingly, EPA is requiring that known outfalls be reported in part 1 of the application. Par 1 of the application will also include: A description of procedures and a proposed program to identify additional major outfalls; the identification of the drainage area associated with known outfalls; a description of major land use classifications in each drainage area, descriptions of soils, the location of industrial facilities, open dumps, landfills or RCRA hazardous waste facilities which discharge storm water to the municipal storm sewer system; and ten year projections of population growth and development activities (population data and development projections will be useful for future predictions of loadings to receiving waters from municipal storm sewer systems, and capacities required for treatment systems). In general, population projections should reflect various scenarios of development (high, medium, low relative to recent trends).

Part 2 of the application will supplement the information reported in part 1 of the application so that, at a minimum, all major outfalls are identified.

Under today's rule, municipal or public entities responsible for applying for and obtaining an NPDES permit will be required to identify the location of an open dump, sanitary landfill, municipal incinerator or hazardous waste treatment, storage, and disposal facility under RCRA which may discharge storm water to the system as well as all facilities which discharge storm water associated with industrial activity into a large or medium municipal separate storm sewer system.

Requiring these source identification measures is supported by the legislative history of section 405 of the WQA, which instructs that "[i]n writing any permit for a municipal separate storm sewer, EPA or the State should pay particular attention to the nature and uses of the drainage area and the location of any industrial facility, open dump, landfill, or hazardous waste treatment, storage, or disposal facility which may contribute pollutants to the discharge." (emphasis added) [Vol 133 Cong. Rec. S752 (daily ed. Jan. 14, 1987].

One municipality questioned the purpose of the topographic map and commented that the scale of the topographic map is too large to indicate any of the required outfall, drainage, industrial or structural control information. In response, the purpose of the topographic map is to identify receiving waters, major storm water sewer lines that contribute discharges to these waters, and potential sources of storm water pollution. EPA disagrees that a USGS 7.5 scale map is inappropriate for identifying these features within a municipal system. The scale afforded by such a map provides sufficient detail to allow specified delineation of outfalls, while not requiring an overly burdensome map in terms of size. Numerous commenters noted the value of source identification information and generally supported submitting this information in the permit application.

Many commenters questioned the value of the source identification information for the purpose of characterizing pollutant loads and concentrations. Conversely, one commenter opined that the requirement would provide sufficient information to estimate pollutant loadings from each outfall using loading models to estimate loadings by watershed. In response, the source identification information serves several purposes. It is the first step for identifying potential sources of pollutants from which more in depth analysis can be accomplished, under the discharge characterization component of the application. Also, where appropriate, it may be used in conjunction with models to estimate loadings and concentrations. EPA has also taken note of the many comments that question or dismiss the concept of determining pollutant loads and concentrations solely from source identification. Accordingly, EPA is convinced that at least some of the sampling requirements as proposed are necessary to facilitate more accurate system specific estimates of pollutant concentrations and loadings. These are discussed below, in the discharge characterization section.

One commenter suggested that aerial photos be submitted in lieu of topographic maps. EPA agrees that an aerial photograph of the appropriate scale that communicates the same information as a topographic map may be substituted. Today's final rule reflects this flexibility.

The source identification component of the municipal application also requires that municipal applicants identify the industrial activity within the drainage area associated with each major outfall. One commenter stated that where multiple storm sewers outfalls discharge to a stream reach, municipalities should be allowed to delineate a single sewer-shed for identifying sources of industrial activity. In response, the rule does not delimit an applicant's ability to identify industries in groups according to a common series of storm sewer outfalls, if that is an easier or more appropriate methodology for that particular applicant. However, EPA would view this as appropriate only where the land use is of one type, such as industrial. Where land use is mixed within the drainage area associated with each major outfall, such differences need to be identified.

In response to comments, to the extent that EPA is requesting that applicants identify the types of industrial facilities operating within the municipality, the municipality is free to use Standard Industrial Classification (SIC) or other systems which identify the principal products or services of the facility. One commenter disagreed with EPA's decision to require a list of water bodies that are listed under CWA sections 304(1), 319(a), 314(a), and 320, because the States already have this information and that requesting it from permittees could result in "omissions, misunderstandings, and mistakes." EPA believes that these waters should be identified in the application so that appropriate permit conditions can be developed that address storm water discharges that are adversely effecting such waters. EPA believes that having this information immediately at the disposal of the municipality and the permit writer will speed the process and alert the municipality of storm water discharges to listed water bodies and potentially polluted storm water discharges to those waters.

6. Characterization of Discharges

The characterization plan and data collection required in today's rule as elements of Part-one and Part-two of the municipal permit application is comprised of several major components:

- A screening analysis to provide information to develop a program for detecting and controlling illicit connections and illegal dumping to the municipal separate storm sewer system;
- Initial quantitative data to allow the development of a representative sampling program to be incorporated as a permit condition;
- System-wide estimates of annual pollutant loadings and the mean concentration of pollutants in storm water discharges, and a schedule to provide estimates during the term of the permit for each major outfall of the seasonal pollutant loadings and the event mean concentration of pollutants in storm water discharges; and
- An identification of receiving waters with known water quality impacts associated with storm water discharges.

Several commenters noted the importance of developing and targeting management programs based on discharge characterization data and monitoring. Numerous other commenters stressed the importance of a program to identify and eliminate illicit connections and improper disposal. EPA agrees that discharge characterization is an important component of developing management programs. Most of the discharge characterization components of the municipal application procedure have been retained as proposed. However some changes and clarifications have been made, and these are noted below.

a. *Screening analysis for illicit discharges (part 1 of application).* Illicit discharges (non-storm water discharges without a NPDES permit), and illegal dumping to municipal separate storm sewer systems occur in a relatively haphazard manner. Due to the unpredictability of such discharges, today's permit applications require a field analysis for the development of priorities for detecting and controlling such discharges. A field screening approach will provide a means of detecting high levels of pollutants in dry weather flows, which is one indicator of illicit connections. Results of a field test of such discharges will provide further information about the nature of the discharge to determine if further investigation is warranted. Visual observation of dry weather flows has been shown to be one the most effective means for tracking down illicit connections and improper disposal.

As discussed in greater detail in section VI.H.7.b of today's preamble, EPA is proposing to require that municipal applicants submit a comprehensive plan to develop a program to detect and control illicit connections and illegal dumping. In order to develop appropriate priorities for these programs, applicants shall submit the results of a screening analysis to be performed on major outfalls or "field screening points" in the systems to detect the presence of illicit hookups and illegal dumping. The results of the screening analysis, referred to as the field screen, would be reported in part 1 of the permit application.

Under the requirements for a field screen, the applicant or co-applicants will submit a description of observations of dry weather discharges from major outfalls or "field screening points" identified in part 1 of the application. At a minimum, the field screen would include a description of visual observations made during a dry weather period. If any flow is observed during a dry weather period, two grab samples will be collected during a 24 hour period with a minimum period of four hours between samples. For all such samples, a description of the color, odor, turbidity, the presence of an oil sheen or surface scum as well as any other relevant observation regarding the potential presence of non-storm water discharges or illegal dumping would be provided. In addition, the applicant should provide the results of a field screen which includes on-site estimates of pH, total chlorine, total copper, total phenol, detergents (or surfacants) along with a description of the flow. EPA is not requiring analytical methods approved under 40 CFR part 136 be used exclusively in the field screen. Rather, the use of inexpensive field sampling techniques such as the use of colormetric detection methods is anticipated. Where the field screen does not involve analytical methods approved under 40 CFR part 136, the applicant is required to provide a description of the method used which includes the name of the manufacturer of the test method, including the range and accuracy of the test. Appropriate field techniques for a field screen of dry weather discharges are discussed in EPA guidance for municipal storm water discharge permit applications.

It should be clarified that data from the field screen is generally not appropriate for comprehensive evaluation of water quality impacts, or estimating pollutant loadings. Rather, the information from the field screen in part 1 of the application will be used along with other information, such as the age of development and degree of industrial activity in the drainage basin, to identify areas or outfalls which are appropriate targets for management programs and for investigations directed at identifying and controlling non-storm water discharges to separate storm sewers during the term of the permit.

In the December 7, 1988, proposal, EPA proposed a second phase of the screening analysis requiring that wet-weather and dry-weather samples be collected and analyzed in accordance with analytical methods approved under 40 CFR part 136 from designated major outfalls for a larger set of pollutants identified with illicit connections. Comments essentially viewed this proposal as too ambitious for the permit application. One commenter recommended that this procedure could best be accomplished during the term of the permit. Some comments maintained that the collection of analytical samples as a follow up to an initial field screen analysis was not the most cost-effective, practicable or efficient method for pinpointing illicit connections. EPA recognizes that several municipal programs to detect and control illicit connections and other non-storm water discharges have been successfully developed and implemented without the use of extensive analytical sampling (for example, programs in Fort Worth, TX and Washtenaw County, MI). After identifying and analyzing the comments on this aspect of the proposal EPA has withdrawn this element of the proposal from today's rule. EPA believes that a follow-up phase to the initial field screening is more appropriate during the term of the permit. Thus, EPA has dropped the field screening requirement proposed for Part 2 of the application.

b. *Representative data (Part 2 of application).* The NURP study showed that pollutant concentrations in urban runoff can exhibit significant variation. Pollutant concentrations in such discharges vary during storm events and from storm event to storm event. Given the complex, variable nature of storm water discharges from municipal systems, EPA favors a permit scheme where the collection of representative data is primarily a task that will be accomplished through monitoring programs during the term of the permit. Permit writers have the necessary flexibility to develop monitoring requirements that more accurately reflect the true nature of highly variable and complex discharges.

Today's rule provides for an initial assessment of the quality of discharges from municipal separate storm sewers based primarily on source identification measures and existing information received in the permit application. This information will be used to begin to characterize system discharges. The analysis developed under this approach will not rely soley on sampling data collected during the application process, but will also incorporate existing data bases such as the one developed under the NURP study. Today's rule requires that some quantitative data will be collected to ensure the system discharges can be appropriately represented by the various existing data bases and to provide a basis for developing a monitoring plan to be implemented as a permit condition.

Today's rule requires that quantitative data be submitted for discharges from selected storm events at between 5 and 10 outfalls or field screening points. The municipality will recommend and the Director will then designate the outfalls or field screening points as representative of the commercial, residential and industrial land use activities of the drainage area contributing to the system, on the basis of information received in part 1 of the application. The applicant will be required to collect samples of a storm discharge from three storm events occurring one month apart for each designated outfall or field screening point. This is a modification to the December 7, 1988, proposal wherein only one of the 5 to 10 outfalls was to be sampled during three storm events, and the remaining sampled only once. This requirement may be modified by the Director if the type and frequency of storm events require different sampling. The Director may require samples of discharges to be collected during snow melts or during specified seasons. The Director may also require additional testing during a single event if it is unlikely that there will be three storm events suitable for sampling during the year. Furthermore, the Director may allow exemptions to the three storm event requirement when climatic conditions create good cause for such exemptions; for example, arid regions or areas experiencing drought conditions during the period when applications are developed could be exempted.

EPA has added requirements to sample more storm events in response to comments that the sampling procedure proposed would not necessarily yield representative data. Commenters indicated that: rain events of different intensity may yield different levels and types of pollutants; a rain event after a dry spell of several months will not be representative when compared to rain events occurring closer together, due to the build up of constituents; one sample may reflect short term effects such as improper disposal rather than long term effects; and that rain events are generally too variable to rely on the limited sampling as proposed. Clearly the data collected from sampling storm water discharges has a tendency to vary greatly. The more sampling that is accomplished, the greater extent to which this variability may be accounted for and appropriate management programs developed.

In selecting the amount of data to be collected during the permit application process, EPA has attempted to balance the usefulness of this data against the economic and logistical constraints in actually obtaining it. In some cases the data obtained will support initial loading and concentration estimates obtained using various modeling techniques, from which appropriate permit conditions can be developed. Data obtained may be supplemented with further data collection during the term of the permit.

EPA believes that the requirement that selected major municipal outfalls or "field screening points" be sampled for more than one event will provide verification that the characterization of discharge is valid. Where an ongoing sampling program is defined for the term of the permit, samples taken during the first few years of this period can be used to verify the application results. If a municipality or an industry questions the conclusions drawn from the characterization sampling, it may at its discretion choose to perform additional sampling to either confirm or dispel these concerns.

All samples collected will be analyzed for all pollutants listed in Table II, (organic pollutants), and Table III, (toxic metals, cyanide and total phenol) of appendix D of 40 CFR part 122, and for the pollutants listed in Table M-1 below:

Table M-1

Total suspended solids (TSS).	Total dissolved solids.
COD	BOD_5.
Oil and grease	Fecal coliform.
Fecal streptococcus	pH.
Dissolved phosphorus	
Total ammonia plus organic nitrogen.	Total phosphorus.
Total Kjeldahl nitrogen	Nitrate plus nitrite.

A portion of the NURP program involved monitoring 120 priority pollutants in storm water discharges from lands used for residential, commercial and light industrial activities. The NURP program excluded testing for asbestos and dioxin. Results for seven other organic priority pollutants were not considered valid due to changes in, or constraints on test methods. Seventy-seven priority pollutants were detected in samples of storm water discharges from lands used for residential, commercial and light industries taken during the NURP study, including 14 inorganic and 63 organic pollutants. Table M-2 shows the priority pollutants which were detected in at least ten percent of the discharge samples which were sampled for priority pollutants.

TABLE M-2.—PRIORITY POLLUTANTS DETECTED IN AT LEAST 10% OF NURP SAMPLES

[In percent]

Metals and inorganics	Frequency of detection
Antimony	13
Arsenic	52
Beryllium	12
Cadmium	48
Chromium	58
Copper	91
Cyanides	23
Lead	94
Nickel	43
Selenium	11
Zinc	94
Pesticides:	
Alpha-hexachlorocyclohexane	20
Alpha-endosulfan	19
Chlordane	17
Lindane	15
Halogenated aliphatics:	
Methane, dichloro-	11
Phenols and cresols:	
Phenol	14
Phenol, pentachloro-	19
Phenol, 4-nitro	10
Phthalate esters:	
Phthalate, bis(2-ethylhexyl)	22
Polycyclic aromatic hydrocarbons:	
Chrysene	10
Fluoranthene	16
Phenanthrene	12
Pyrene	15

The NURP data also showed a significant number of these samples exceeded various freshwater water quality criteria. The exceedence of water quality criteria does not necessarily imply that an actual violation of standards will exist in the receiving water body in question. Rather, the enumeration of exceedences serves as a screening function to identify those constituents whose presence in urban storm water runoff may warrant high priority for further evaluation.

Members of this group represent all of the major organic chemical fractions

found in Table II of appendix D of 40 CFR part 122 (volatiles, acid compounds, base/neutrals, pesticides). Today's rule requires testing for all organic constituents in Table II rather than limiting the sampling requirements to the 24 toxic constituents found in the NURP study because they will provide a better description of the discharge at essentially the same cost. (The cost of analyzing samples for organic chemicals strongly depends on the number of major organic chemical fractions tested). The NURP study focused on characterizing storm water discharges from lands used for residential, commercial and light industrial activities. In general, the NURP study did not focus on other sources of pollutants to municipal separate storm sewer systems and, therefore, does not reflect all potential pollutants that may be present in discharges from municipal separate storm sewer systems.

The sampling requirements for the permit application address a limited number of sampling locations but require analysis for a wide range of pollutants. Sampling for a wide range of pollutants as a permit application requirement should provide permit writers with appropriate data to target more specific pollutants when developing requirements for a monitoring program during the term of the permit.

Numerous commenters stated that monitoring for all priority pollutants seemed excessive. However, EPA is convinced that it is more appropriate for permit conditions to focus on and prioritize particular pollutant problems after data covering a broad spectrum of pollutants are developed. As noted above, NURP identified 77 priority pollutants in urban runoff, but only from residential, commercial, and light industrial (*e.g.* industrial parks) areas. One municipal entity stated that this approach is a reasonable and realistic means of providing some useful baseline data, while others recommended sampling a variety of parameters that are included in Tables M-1 and M-2. Another municipal entity stated that characterization of outfall discharge quality during storm events is necessary as a means of targeting source control activities.

EPA is working with the United States Geological Survey (USGS) to evaluate the availability of USGS technical assistance to municipalities through cooperative funding programs to aid in collecting representative quantitative data of storm water discharges from municipal systems.

USGS data collection programs with municipalities typically include storm water discharge samples obtained at various times during a storm hydrograph event. Various USGS field procedures can be used to obtain discharge data for pipes, culverts, etc., typically found in urban areas. Pollutant models can be calibrated with data and long-term rainfall records to simulate the quality of system discharges and compared to other storm water models.

In addition, EPA recognizes that many municipalities have participated in studies, such as NURP, that involve sampling of urban runoff as well as other components of discharges from municipal separate storm sewer systems. All existing storm water sampling data along with relevant water quality data, sediment data, fish tissue data or biosurvey data taken over the last ten years is considered relevant and, under today's rule, must be submitted with part I of the application. Sampling data that is submitted must be accompanied with a narrative description of the drainage area served by the outfall monitored, a description of the sampling and quality control program, and the location of receiving water monitoring.

EPA requested comments on the use of existing data, such as that generated under the NURP study, to satisfy the requirement of providing representative sampling data. Commenters did not agree on the value of NURP results as an indicator of representative data. Several commenters expressed the view that existing data could be used to satisfy in whole or in part the representative sampling requirements of the storm water permit application. However, commenters generally did not offer suggested criteria that could be used to verify the validity of existing data. One commenter believed that intensive sampling over a period of ten years in 12 basins, when combined with NURP data, would be adequate.

One commenter supported the use of data, such as that obtained from the NURP study, to target sampling programs. EPA supports such a methodology and has retained this portion of the proposed discharge characterization component. EPA received strong support from an environmental group for retaining this information requirement in part 1 of the application.

In light of these comments EPA believes it is appropriate to retain the representative sampling requirements without resorting to the use of existing data exclusively. Because of the inherent variability in reliability and applicability of existing data, EPA is convinced that a nationally consistent methodology for collecting data is appropriate. This data can then be used in conjunction with other existing data and models to develop appropriate site specific management programs and more generalized management program strategies. Where existing data and data collected under today's rule varies or does not match, further sampling under the term of the permit will be accomplished to more accurately assess the discharge of pollutants.

c. Loading and Concentration Estimates (part 2 of application). The assessment of the water quality impacts of discharges from municipal separate storm sewer systems on receiving waters requires the analysis of both pollutant loadings and concentrations of pollutants in discharges.

The loading and concentration estimates in today's rule will be used to evaluate two types of water quality impacts: (1) Short-term impacts; and (2) long-term impacts. Specifically, the regulation requires estimates of the annual pollutant load of the cumulative discharges to waters of the United States from municipal outfalls and the event mean concentration of the cumulative discharges to waters of the United States municipal outfalls during a storm event for BOD_5, COD, TSS, dissolved solids, total nitrogen, total ammonia plus organic nitrogen, total phosphorus, dissolved phosphorus, cadmium, copper, lead, and zinc. Estimates shall be accompanied by a description of the procedures for estimating constituent loads and concentrations, including any modelling, data analysis, and calculation methods. Municipalities have options in the use of methodologies, including those presented in NURP for calculating loads.

Short term impacts from discharges from municipal separate storm sewers involve changes in water quality that occur during and shortly after storm events. Examples of short-term impacts that can lead to impairments include periodic dissolved oxygen depression due to the oxidation of contaminants, high bacteria levels, fish kills, acute effects of toxic pollutants, contact recreation impairments and loss of submerged macrophytes. Characterization of instream pollutant concentrations based on estimated pollutant concentrations in system discharges are important for evaluating these types of impacts.

Long-term water quality impacts from discharges from municipal separate storm sewers may be caused by contaminants associated with suspended solids that settle in receiving water sediments and by nutrients which enter receiving water systems with long

retention times. Pollutant loading data are important for evaluation of impairments such as loss of storage capacity in streams, estuaries, reservoirs, lakes and bays, lake eutrophication caused by high nutrient loadings, and destruction of benthic habitat. Other examples of the long-term water quality impacts include depressed dissolved oxygen caused by the oxidation of organics in bottom sediments and biological accumulation of toxics as a result of uptake by organisms in the food chain. An estimate of annual pollutant loading associated with discharges from municipal storm water sewer systems is necessary to evaluate the magnitude and severity of the environmental impacts of such discharges and to evaluate the effectiveness of controls which are imposed at a later time.

Municipal storm water sewer systems generally handle runoff from large drainage areas and the sources of pollution are usually very diffuse. The concentrations of many pollutants in discharges from these systems are often low relative to many industrial process and POTW discharges. The water quality impacts of low concentration pollution discharges tend to be cumulative and need to be evaluated in terms of aggregate loadings as well as pollutant concentrations. A site-specific loading analysis can be used to evaluate the relative contribution of various pollutant sources.

7. Storm Water Quality Management Plans

Today's rule facilitates the development of site-specific permit conditions by requiring large and medium municipal permit applicants to submit, along with other information, a description of existing structural and non-structural prevention and control measures on discharges of pollutants from municipal storm sewers in part I of the permit application. Section 122.26(d)(2)(iv) requires the applicant to identify in part 2 of the application, to the degree necessary to meet the MEP standard, additional prevention or control measures which will be implemented during the life of the permit. Although, in many cases, it will not be possible to identify all prevention and control measures that are appropriate as permit conditions, EPA believes that the process of identifying components of a comprehensive prevention and/or control program should begin early and that applicants should be given the opportunity to identify and propose the components of the program that they believe are appropriate for first preventing or controlling discharges of pollutants.

As noted earlier, EPA recognizes that problems associated with storm water, combined sewer overflows (CSOs) and infiltration and inflow (I&I) are all interrelated even though they are treated somewhat differently under the law. EPA believes that it is important to begin linking these programs and activities and, because of the potential cost to local governments, to investigate the use of innovative, nontraditional approaches to reducing or preventing contamination of storm water. The application process for developing municipal storm water management plans provides an ideal opportunity between steps 1 and 2 for considering the full range of nontraditional, preventive approaches.

The permit application requirements in today's rule require the applicant or co-applicants to develop management programs for four types of pollutant sources which discharge to large and medium municipal storm sewer systems. Discharges from large and medium municipal storm sewer systems are usually expected to be composed primarily of: (1) Runoff from commercial and residential areas; (2) storm water runoff from industrial areas; (3) runoff from construction sites; and (4) non-storm water discharges. Part 2 of the permit application has been designed to allow the applicant the opportunity to propose MEP control measures for each of these components of the discharge. Discharges from some municipal systems may also contain pollutants from other sources, such as runoff from land disposal activities (leaking septic tanks, landfills and land application of sewage sludge). Where other sources, such as land disposal, contribute significant amounts of pollutants to a municipal storm sewer system, appropriate control measures should be included on a site-specific basis. Proposed management programs will then be evaluated in the development of permit conditions.

There is some overlap in the manner in which these pollutant sources are characterized and their sources identified. For instance, improper disposal of oil into storm drains is often associated with do-it-yourself automobile oil changes in residential areas, or improper application or over-use of herbicides and pesticides in residential areas can also occur in industrial areas. Also, some control measures will reduce pollutant loads for multiple components of the municipal storm sewer discharge. These measures should be identified under all appropriate places in the application; as discussed below, however, double counting of pollutant removal must be avoided when the total assessment of control measures is performed.

Although many land use programs have multiple purposes, including the reduction of pollutants in discharges from municipal separate storm sewer systems, the proposed management programs in today's rule are intended to address only those controls which can be implemented by the permit applicant or co-applicants. EPA cannot abrogate its responsibilities under the CWA to implement the NPDES permit program by relying on pollution control programs that are outside the NPDES program. For example, municipal permit management programs may not rely exclusively on erosion or sediment control laws for implementing that portion of management programs that address discharges from construction sites, unless such laws implement NPDES permit program requirements entirely and that such implementation is a part of the permit.

EPA anticipates that storm water management programs will evolve and mature over time. The permits for discharges from municipal separate storm sewer systems will be written to reflect changing conditions that result from program development and implementation and corresponding improvements in water quality. The proposed permit applications will require applicants to provide a description of the range of control measures considered for implementation during the term of the permit. Flexibility in developing permit conditions will be encouraged by providing applicants an opportunity to identify in the permit application priority controls appropriate for the initial implementation of management programs. Many commenters endorsed the flexible site-specific storm water program approach as proposed as a method for addressing regional water quality control programs in a cost effective manner. To this extent, EPA agrees with one municipality that management programs should focus on more serious problems and sources of pollutants identified in the municipal system. However, EPA believes that to implement section 402(p)(3), comprehensive storm water management programs which address a number of major sources of pollutants to a system are necessary. Municipal programs should not be focused solely on a single source of pollution, such as illicit connections.

One commenter maintained that management program development

should be flexible enough to allow for consideration of what is attainable based on the area's climate, vegetation, hydrology, and land uses. EPA agrees with this comment. Some strategies for reducing pollutants in the northeast will not be practical in the southwest, such as management programs for deicing activities. The permit application process will determine what strategies are appropriate in different locations.

Several commenters supported addressing storm water pollutant problems through management practices or programs rather than end of pipe controls or treatment. EPA agrees with this comment to the extent that storm water management practices are a general theme of this rulemaking with regard to municipal permits. However, there will be cases where such discharges are best addressed through technology such as retention, detention or infiltration ponds.

One commenter reacted unfavorably to the flexible site-specific management plan approach stating that there is no hard criteria upon which to judge the adequacy of programs. Another commenter felt that there should be a BAT standard for municipal permits. Another commenter stated that the rule should contain specific BMPs that the permittee must comply with. EPA disagrees with these comments. The Clean Water Act requires municipalities to apply for permits that will reduce pollutants in discharges to the maximum extent practicable and sets out the types of controls that are contemplated to deal with storm water discharges from municipalities. The language of CWA section 402(p)(3) contemplates that, because of the fundamentally different characteristics of many municipalities, municipalities will have permits tailored to meet particular geographical, hydrological, and climatic conditions. Management practices and programs may be incorporated into the terms of the permit where appropriate. Permit conditions, which require that storm water management programs be developed and implemented or require specific practices, are enforceable in accordance with the terms of the permit. EPA disagrees with the notion that this regulation, which addressed permit application requirements, should create mandatory permit requirements which may have no legitimate application to a particular municipality. The whole point of the permit scheme for these discharges is to avoid inflexibility in the types and levels of control. Further, to the degree that such mandatory requirements may be appropriate, these requirements should be established under the authority of section 402(p)(6) of the CWA and not in this rulemaking, which addresses permit application requirements.

Some commenters suggested that management programs should be developed as part of the permit conditions and not as part of the permit application. EPA agrees that management programs and their ongoing development should be part of the permit term. However, EPA is convinced, and many commenters agree, that the permit application should contain information on what the permittee has done to date and what it proposes and plans to do during the permit term based upon its discharge characterization and source identification data. This is a reasonable and logical approach and one that meets the intent and letter of section 402(p)(3) of the CWA. As stated above, this would be an appropriate method for implementing storm water management programs that should mature and evolve over time.

Applicants will propose priorities based on a consideration of appropriate controls including, but not limited to, consideration of controls that address: reducing pollutants to municipal separate storm sewer system discharges that are associated with storm water from commercial and residential areas (§ 122.26(d)(2)(iv)(A)); illicit discharges and illegal disposal (§ 122.26(d)(2)(iv)(B)); storm water from industrial areas (§ 122.26(d)(2)(iv)(C)); and runoff from construction sites (§ 122.26(d)(2)(iv)(D)). Permits for different municipalities will place different emphasis on controlling various components of discharges from municipal storm sewers. For example, the potential for cross-connections (such as municipal sewage or industrial process wastewater discharges to a municipal separate storm sewer) is generally expected to be greater in municipalities with older developed areas. On the other hand, municipalities with larger areas of new development will have a greater opportunity to focus controls to reduce pollutants in storm water generated by the area after it is developed, discharges from construction sites, and other planning activities.

EPA requested comments on the process and methods for developing appropriate priorities in management programs proposed in applications and how the development of these priorities can be coordinated with controls on other discharges to ensure the achievement of water quality standards and the goals of the CWA.

Discharges from diffuse sources in residential areas was recognized by several commenters as a significant source of pollutants. Accordingly, these elements of the management plans have been retained. In conjunction with the importance of developing programs for illicit connections, numerous commenters stated that education programs are a priority. Another commenter emphasized that ordinances prohibiting such discharges and their enforcement is a crucial means of a successful program in this regard. EPA agrees with these comments and consequently will retain those portions of management program development that include a description of a program for educational activities such as public information for the proper disposal of oil and toxic materials and the use of herbicides, pesticides and fertilizers.

Some commenters noted that discharge characterization is necessary for development of appropriate management plans. EPA agrees with these comments and has retained the discharge characterization components in this rulemaking. However, EPA disagrees that the results of all discharge characterization procedures (*i.e.*, part 1 and part 2) are necessary to describe and propose a program as required in part 2 of the application. The application of various models is available to permit applicants, where needed, to develop appropriate management programs. All available site specific discharge characterization data should be available to the permit writer to draft appropriate conditions for the term of the permit.

One commenter noted that an important aspect of developing management plans is establishing the necessary legal authority to improve water quality. EPA agrees with this comment and has retained those aspects of the regulation which call for development and attainment of adequate legal authority in both parts of the municipal application.

One commenter stated that programs should address previously identified water quality problems in other programs that are required by section 304(1) of the CWA. EPA agrees that identified water quality problems need to be addressed by management programs, and the municipal permit application will call for an identification of these waters. However, EPA does not endorse addressing these waters to the exclusion of all others within the boundaries of the municipal separate storm sewer system. Some waters may experience substantial degradation after rain events and still not be listed under

section 304(1). Further, water quality impacts in listed waters may not be related to storm water discharges, while other non-listed waters do have water quality impacts from storm water discharges. Similarly, EPA agrees with one commenter that it may be desirable to focus attention and resources on certain problem watersheds within a municipality, and controls may be imposed and programs prioritized on that basis. However, such a focus should not be to the exclusion of other waters and watersheds that have water quality problems (although less troublesome) traceable to storm water discharges. The CWA requires that permits address discharges to waters of the United States, not just waters previously targeted under special programs.

Some commenters expressed concern that the permit application requires the design of management programs before knowing what will be in the permits. EPA disagrees with the thrust of this comment, that is that the order of requirements is inappropriate. The permit applicant will have two years to develop proposed plans which can be considered by permit writers in the development of the permit. Based upon a consideration of the management program proposed by the municipality and other relevant information, permits can be tailored for individual programs. One commenter stated that the cornerstone of management programs are inspection and enforcement programs. EPA agrees that these two elements are important components. Without inspection and enforcement mechanisms the programs will undoubtedly falter. Accordingly these requirements in the description of management programs in the permit application have been retained. In a similar vein, one commenter emphasized the importance of developing legal authority, financial capability, and administrative infrastructure. EPA agrees with this comment and has retained those aspects of the regulation that call for a description of applicants plans and resources in these areas.

One commenter stressed that control of discharges into the municipal system from industries is an important goal of municipal storm water management programs. EPA agrees with this comment and has retained the proposed description of management programs to address discharges from industrial sources. Other commenters identified industries as the principal contributors of pollutants to municipal separate storm sewer systems.

In addition, EPA will continue to evaluate procedures and methods to control storm water discharges to the extent necessary to mitigate impacts on water quality in the studies required under section 402(p)(5) of the CWA. One purpose of these studies will be to evaluate the costs and water quality benefits associated with implementing these procedures and methods. This evaluation will address a number of factors which impact the implementation costs associated with these programs, such as the extent to which similar municipal ordinances are currently being implemented, the degree to which existing municipal programs (such as flood management programs or construction site inspections) can be expanded to address water quality concerns, the resource intensiveness of the control, and whether the control program will involve public or private expenditures. This information, along with information gained during permit implementation will aid in the dynamic long-term development of municipal storm water management programs.

a. *Measures to reduce pollutants in runoff from commercial and residential areas.* The NURP program evaluated runoff from lands primarily dedicated to residential and commercial activities. The areas evaluated in the study reflect some other activities, such as light industry, which are commonly dispersed among residential and commercial areas. The NURP study selected sampling locations that were thought to be relatively free of illicit discharges and storm water from heavy industrial sites including storm water runoff from heavy construction sites. Of course, in a study such as NURP it was impossible to totally isolate various contributions to the runoff. In developing the permit application requirements in today's rule EPA has, in general, relied on the NURP definition of urban runoff—runoff from lands used for residential, commercial and light industrial activities.

NURP and numerous other studies have shown that runoff from residential and commercial areas washes a number of pollutants into receiving waters. Of equal importance is the volume of storm water runoff leaving urban areas during storm events. Large intermittent volumes of runoff can destroy aquatic habitat. As the percentage of paved surfaces increases, the volume and rate of runoff and the corresponding pollutant loads also increase. Thus, the amount of storm water runoff from commercial and residential areas and the pollutant loadings associated with storm water runoff increases as development progresses; and they remain at an elevated level for the lifetime of the development.

Proposed § 122.26(d)(2)(iv)(A) requires municipal storm sewer system applicants to provide in part 2 of the application a description of a proposed management program that will describe priorities for implementing management programs based on a consideration of appropriate controls including:

- A description of maintenance activities and a maintenance schedule for structural controls;
- A description of planning procedures including a comprehensive master plan to control after construction is completed, the discharge of pollutants from municipal separate storm sewers which receive discharges from new development and significant redevelopment after construction is completed (in response to comment this contemplates an engineering policy and procedure strategy with long term planning);
- A description of practices for operating and maintaining public highways and procedures for reducing the impact on receiving waters of such discharges from municipal storm sewer system;
- A description of procedures to assure that flood management projects assess the impacts on the water quality of receiving water bodies; and
- A description of a program to reduce to the maximum extent practicable, pollutants in discharges from municipal separate storm sewers associated with the application of pesticides, herbicides and fertilizer which will include, as appropriate, controls such as educational activities and other measures for commercial applicators and distributors, and controls for application in public right-of-ways and at municipal facilities.

Water quality problems caused by municipal storm sewer discharges will generally be most acute in heavily developed areas. Prevention measures may be desirable and cost effective. However, structural control measures may also be effective, although opportunities for implementing these measures may be limited in previously developed areas. Commonly used structural technologies include a wide variety of treatment techniques, including first flush diversion systems, detention/infiltration basins, retention basins, extended detention basins, infiltration trenches, porous pavement, oil/grit separators, grass swales, and swirl concentrators. A major problem associated with sound storm water management is the need for operating

and maintaining the system for its expected life.

The unavailability of land in highly developed areas often makes the use of structural controls infeasible for modifying many existing systems. Non-structural practices can play a more important role. Non-structural practices can include erosion control, streambank management techniques, street cleaning operations, vegetation/lawn maintenance controls, debris removal, road salt application management and public awareness programs.

As noted above, the first component of the proposed program to reduce pollutants in storm water from commercial and residential areas which discharge to municipal storm sewer systems is to describe maintenance activities and schedule. The second component of the proposed program to reduce pollutants in storm water from commercial and residential areas which discharge to municipal storm sewer systems provides that applicants describe the planning procedures and a comprehensive master plan that will assure that increases of pollutant loading associated with newly developed areas are, to the maximum extent practicable, limited. These measures should address storm water from commercial and residential areas which discharge to the municipal storm sewer that occur after the construction phase of development is completed. Controls for construction activities are addressed later in today's rule. One commenter noted the feasibility of developing management plans for newly developing areas. EPA agrees with this comment and has retained that portion of the regulation that deals with a description of controls for areas of new development. Similarly, one municipality stressed the importance and achievability of addressing storm water discharges from construction sites.

As urban development occurs, the volume of storm water and its rate of discharge increases. These increases are caused when pavement and structures cover soils and destroy vegetation which otherwise would slow and absorb runoff. Development also accelerates erosion through alteration of the land surface. Areas that are in the process of development offer the greatest potential for utilizing the full range of structural and non-structural best management practices. If these measures are to provide controls to reduce pollutant discharges after the area has been developed, comprehensive planning must be used to incorporate these measures as the area is in the process of developing. These measures offer an important opportunity to limit increases in pollutant loads.

The third component of § 122.26(d)(2)(iv)(A) provides a description of practices for operating and maintaining public roads and highways and procedures for reducing the impact on receiving waters of discharges from municipal storm sewer systems. General guidelines recommended for managing highway storm water runoff include litter control, pesticide/herbicide use management, reducing direct discharges, reducing runoff velocity, grassed channels, curb elimination, catchbasin maintenance, appropriate streetcleaning, establishing and maintaining vegetation, development of management controls for salt storage facilities, education and calibration practices for deicing application, infiltration practices, and detention/retention practices.

The fourth component of § 122.26(d)(2)(iv)(A) provides that applicants identify procedures that enable flood management agencies to consider the impact of flood management projects on the water quality of receiving streams. A well-developed storm water management program can reduce the amount of pollutants in storm water discharges as well as benefit flood control objectives. As discussed above, increased development can increase both the quantity of runoff from commercial and residential areas and the pollutant load associated with such discharges. Disturbing the land cover, altering natural drainage patterns, and increasing impervious area all increase the quantity and rate of runoff, thereby increasing both erosion and flooding potential. An integrated planning approach helps planners make the best decisions to benefit both flood control and water quality objectives.

The fifth component of § 122.26(d)(2)(iv)(A) would provide that municipal applicants submit a description of a program to reduce, to the maximum extent practicable, pollutants in discharges from municipal separate storm sewers associated with the application of pesticides, herbicides and fertilizer. Such a program may include controls such as educational activities and other measures for commercial applicators and distributors and controls for application in public rights-of-way and at municipal facilities. Discharges of these materials to municipal storm sewer systems can be controlled by proper application of these materials. Some commenters noted that insecticides used in residential areas are a probable source of pollutants in storm water discharges from residential areas, as well as salting and other de-icing activities. In response to this comment, part of a community management plan may include controls or education programs to limit the impacts of these sources of pollutants. One commenter noted that many communities already have household toxic disposal programs. Where appropriate these can be incorporated into municipal management programs.

Some commenters suggested substituting the management program description for residential and commercial areas with a simple identification of applicable management practices. EPA agrees that identification of appropriate management practices is a critical component of a program description for these areas. In essence, this is what the program description is designed to achieve. However, for the reasons discussed in greater detail above, EPA is convinced that an appropriate program must address all of the components of the management program for residential and commercial areas that are outlined in today's rule. Further, for the purposes of writing a permit with enforceable conditions, the application should identify a schedule to implement management practices. The applicant should be able to estimate the reduction in pollutant loads as a result of the development of certain management practices and programs (§ 122.26(d)(2)(v). A program may also include public education programs, which are not necessarily viewed as traditional BMPs.

b. *Measures for illicit discharges and improper disposal.* The CWA requires that NPDES permits for discharges from municipal storm sewers "shall include a requirement to effectively prohibit non-stormwater discharges into the storm sewers." In today's rule, EPA will begin to implement this statutory mandate by focusing on two types of discharges to large and medium municipal separate storm sewer systems. *See* § 122.26(d)(1)(iv)(D) and (d)(2)(iv)(B). One type of non-storm water discharges are illicit discharges which are plumbed into the system or that result from leakage of sanitary sewage system. The other class of non-storm water discharges result from the improper disposal of materials such as used oil and other toxic materials.

Illicit discharges. In some municipalities, illicit connections of sanitary, commercial and industrial discharges to storm sewer systems have had a significant impact on the water quality of receiving waters Although the

NURP study did not emphasize identifying illicit connections to storm sewers other than to assure that monitoring sites used in the study were free from sanitary sewage contamination, the study concluded that illicit connections can result in high bacterial counts and dangers to public health. The study also noted that removing such discharges presented opportunities for dramatic improvements in the quality of urban storm water discharges.

Other studies have shown that illicit connections to storm sewers can create severe, wide-spread contamination problems. For example, the Huron River Pollution Abatement Program inspected 660 businesses, homes and other buildings located in Washtenaw County, Michigan and identified 14% of the buildings as having improper storm drain connections. Illicit discharges were detected at a higher rate of 60% for automobile related businesses, including service stations, automobile dealerships, car washes, body shops and light industrial facilities. While some of the problems discovered in this study were the result of improper plumbing or illegal connections, a majority were approved connections at the time they were built. Many commenters emphasized the identification and elimination of illicit connections as a priority, including leakage from sanitary sewers. EPA agrees with these comments and intends to retain this portion of the program without modification.

A wide variety of technologies exist for detecting illicit discharges. The effectiveness of these measures largely depends upon the site-specific design of the system. Under today's rule, permit applicants would develop a description of a proposed management program, including priorities for implementing the program and a schedule to implement a program to identify illicit discharges to the municipal storm sewer system. This rulemaking will require the initial priorities for analyzing various portions of the system and the appropriate detection techniques to be used.

Improper disposal. The permit application requirements for municipal storm sewer systems include a requirement that the municipal permit applicant describe a program to assist and facilitate in the proper management of used oil and toxic materials. Improper management of used oil can lead to discharges to municipal storm sewers that in turn may have a significant impact on receiving water bodies. EPA estimates that, annually, 267 million gallons of used oil, including 135 million gallons of used oil from do-it-yourself automobile oil changes, are disposed of improperly. An additional 70 million gallons of used oil, most coming from service stations and repair shops, are used for road oiling. Many commenters emphasized the elimination of discharges composed of improperly disposed of oil and toxic material. One commenter identified motor oil as the major source of oil contamination and that EPA needs to encourage proper disposal of used oil. Several other commenters emphasized the importance of recycling programs for oil. EPA agrees with these comments and intends to retain this portion of the program without modification. One commenter identified public awareness and timely reporting of illegal dumping as critical components of this portion of the program. EPA agrees with this comment and intends for management programs to deal with this problem.

c. *Measures to reduce pollutants in storm water discharges through municipal separate storm sewers from municipal landfills, hazardous waste treatment, disposal and recovery facilities that are subject to section 313 of title III of SARA.* As discussed in section VI.C of today's preamble, industrial facilities that discharge storm water through a large or medium municipal separate storm sewer system are required to apply for a permit under § 122.26(c) or seek coverage under a promulgated general permit. Today's rule also requires the municipal storm sewer permittee to describe a program to address industrial dischargers that are covered under the municipal storm sewer permit. Today's rule requires the municipal applicant to identify such discharges (*see* source identification requirements under § 122.26(d)(2)(ii)), provide a description of a program to monitor pollutants in runoff from certain industrial facilities that discharge to the municipal separate storm sewer system, identify priorities and procedures for inspections, and establish and implement control measures for such discharges. Should a municipality suspect that an individual discharger is discharging pollutants in storm water above acceptable limits, and the owner/operator of the system has no authority over the discharge, the municipality should contact the NPDES permitting authority for appropriate action. Two example of possible action are: if the facility already has an individual permit, the permit may be reopened and further controls imposed; or if the facility is covered by a promulgated general permit, then an individual site-specific permit application may be required.

In the December 7, 1988, proposal, EPA requested comments concerning what storm water discharges from industrial facilities through municipal systems should be monitored. One of the proposed approaches was to require data on portions of the municipal system which receive storm water from facilities which are listed in the proposed regulatory definition at § 122.26(b)(14) of "storm water discharge associated with industrial activity" (with the exception of construction activities and uncontaminated storm water from oil and gas operations) which discharge through the municipal system. However, given the large number of facilities meeting this definition that discharge through municipal systems, a monitoring program that requires the submission of quantitative data regarding portions of the municipal systems receiving storm water from such facilities may not be practicable. Such a requirement could, for some systems, potentially become the most resource intensive requirements in the municipal permit. Therefore, EPA proposed various ways to develop appropriate targeting for monitoring programs.

EPA requested comments on a requirement that, at a minimum, monitoring programs address discharges from municipal separate storm sewer outfalls that contain storm water discharges from municipal landfills, hazardous waste treatment, disposal and recovery facilities, and runoff from industrial facilities that are subject to section 313 of title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). Section 313 of title III requires that operators or certain facilities that manufacture, import, process, or otherwise use certain toxic chemicals report annually their releases of those chemicals to any environmental media. Section 313(b) of title III specifies that a facility is covered for the purposes of reporting if it meets all of the following criteria.

- The facility has ten or more full-time employees;
- The facility is in Standard Industrial Classification (SIC) codes 20 through 39;
- The facility manufactured (including quantities imported), processed, or otherwise used a listed chemical in amounts that exceed certain threshold quantities during the calendar year for which reporting is required.

Listed chemicals include 329 toxic chemicals listed at 40 CFR 372.45. After 1989, the threshold quantities of listed chemicals that the facility must manufacture, import or process (in order to trigger the submission of a release

report) is 25,000 pounds per year. The threshold for a use other than manufacturing, importing or processing of listed toxic chemicals is 10,000 pounds per year. EPA promulgated a final regulation clarifying these reporting requirements on February 16, 1988, (53 FR 4500).

EPA received numerous comments regarding limiting the types of facilities that are initially subject to monitoring and municipal management programs. Numerous municipalities agreed that focusing on the above facilities is an appropriate means for setting priorities for the development of control measures to eliminate or reduce pollutants associated with industrial facilities. Commenters agreed that the potential for toxic materials in discharges is high because of the high volume of such materials at these facilities and that information regarding discharges and material management practices will be available through section 313 of SARA. One commenter noted that building on an established program will contribute to establishing an effective storm water program. Accordingly, EPA has specified at § 122.26(d)(2)(ii)(C) that the municipal applicant must describe a program that identifies priorities and procedures for inspections and establishing and implementing control measures for these facilities.

Several commenters suggested that these facilities should not be singled out because the presence of the threshold amounts of SARA 313 chemicals does not indicate that significant quantities of those chemicals are likely to enter the facility's storm water runoff. Instead it was suggested that municipalities should monitor storm sewers as a whole to determine what chemicals are present and therefore what facilities are responsible. EPA disagrees with these comments. The object of these requirements is initially to set priorities for monitoring requirements. Then, if the situation requires, controls can be developed and instituted. If a facility is a member of this class of facilities and does not discharge excessive quantities of SARA 313 chemicals, then it may not be subjected to further monitoring and controls. As noted above, the selection of facilities is only a means of setting priorities for facilities for the development of municipal plans.

EPA agrees, however, that there will be other facilities that are significant sources of pollutants and should be addressed by municipalities as soon as possible under managemen programs. Accordingly, those industrial facilities that the municipal permit applicant determines to be contributing a substantial pollutant loading to the municipal storm sewer system shall be addressed in this portion of the municipal management program.

EPA also requested comments on monitoring programs for municipal discharges including the submission of quantitative data on the following constituents;

- Any pollutants limited in an effluent guidelines for the industry subcategories, where applicable;
- Any pollutant listed in a discharging facility's NPDES permits for process wastewater, where applicable;
- Oil and grease, pH, BOD5, COD, TSS, total phosphorus, total Kjeldahl nitrogen, and nitrate plus nitrite nitrogen;
- Any information on discharges required under 40 CFR 122.21(g)(7)(iii) and (iv).

These are the same constituents that are to be addressed in individual permit applicants for storm water discharges associated with industrial activity.

Several industries and municipalities submitted comments on this issue. Some commenters agreed that these are appropriate parameters. Some commenters advised that the ability of municipalities to implement this aspect of the program depended on industries submitting this data. Several industries provided comments suggesting that the approach should allow the permittee flexibility in determining which parameters are chosen because of the burdens of monitoring and the complexity of materials and flows in municipal systems.

In light of these comments, EPA has retained § 122.26(d)(2)(iv)(C) as proposed requiring municipalities to describe a monitoring program which utilizes the above parameters. Monitoring for these parameters provides consistency with the individual application requirements for industries, provides uniformity in municipal applications, and will narrow the parameters to conform to the types of industries discharging into the municipal systems. Monitoring programs may consist of programs undertaken by the municipality exclusively or requirements imposed on industry by the municipality, or a combination of approaches. Appropriate procedures are discussed in municipal permit application guidance.

EPA requested comments on appropriate means for municipalities to determine what facilities are contributing pollutants to municipal systems. Many commenters responded with numerous methodologies. Some of these have been addressed in guidance. Municipalities will have options in selecting the most appropriate methodology given their circumstances as described in their permit applications.

EPA initially favors establishing monitoring requirements to be applied to those outfalls that directly discharge to waters of the United States. EPA received one comment from a municipality with regard to this issue which agreed that this was the most logical approach. Monitoring of outfalls close to the point of discharge to waters of the United States is generally preferable when attempting to identify priorities for developing pollutant control programs. However, under certain circumstances, it may be preferable to monitor at the point where the runoff from the industrial facility discharges to the municipal system. For example, if many facilities discharge substantially similar storm water to a municipal system it may be more practicable to monitor discharges from representative facilities in order to characterize pollutants in the discharge.

As noted by numerous industries, if municipal characterization plans reveal problems from certain industrial dischargers, then such facilities may be required to provide further data from their own monitoring. As noted above, EPA envisions that this data could then be used to develop appropriate control practices or techniques and/or require individual permit applications if a general permit covering the facility proves inadequate.

Comments were also solicited as to whether end-of-pipe treatment generally was more appropriate than source controls for storm water from industrial facilities which discharge to municipal systems. Many commenters, including both municipalities and industries, stated that source controls are the only practical and feasible means of controlling pollutants in storm water runoff, and specifically opposed the concept of end-of-pipe treatment or other controls. Some commenters maintained that, from an economic and environmental standpoint, end-of-pipe treatment may be the only effective means. One advised that the prompt cleanup of spills, controlled wash down of process areas, covering of material loading areas, storm water runoff diversion, covered storage areas, detention basins or other such mechanisms would prevent storm water from mixing with pollutants and possibly discharging them into receiving waters. Another noted that in the urban areas, there is little potential for treatment; consequently, it would seem

that controls and/or retrofitting existing facilities would be necessary when violations are found and that citizens will be better served by source controls appropriate to the individual problem.

EPA agrees with these comments to the extent that source controls and management programs are the general thrust of these regulations. However, in some situations end-of-pipe treatment, such as holding ponds, may be the only reasonable alternative. EPA disagrees with one industrial commenter that the municipalities should be almost entirely responsible for treating municipal discharges at the end of-the-pipe without reliance on source controls by industrial dischargers. Municipal programs may require controls on industrial sources with demonstrated storm water discharge problems. One industrial association noted that its member companies already have incentive to properly handle their materials and facilities because of other environmental programs with spill and erosion controls.

Numerous commenters stated that the program addressing industrial dischargers through municipal systems needs to be clearly defined in order to eliminate, as much as possible, potential conflicts between the system operator and dischargers. EPA has provided a framework for development of management plans to control pollutants from these particular sources. However, because of the differences in municipal systems and hydrology nationwide, EPA is not convinced that program specificity is an appropriate approach. The concept of the management program is to provide flexibility to the permit applicants to develop regional site specific control programs.

One commenter suggested that required controls should be limited to a facility's proportional contribution (based on concentration) of pollutants. EPA disagrees. Most facilities discharging through a municipal separate storm sewer will need to be covered by a general or individual permit. These permits will control the introduction of pollutants from that facility through the municipal storm sewer to the waters of the U.S. Any additional controls placed on the facility by the municipality will be at the discretion of the municipality. EPA is not requiring municipalities to adopt a particular level of controls on industrial facilities as suggested by the commenter.

One commenter questioned how dischargers that discharged both into the waters of the United States and through a municipal system will be addressed and whether there is a potential for inconsistent requirements. Industries that discharge storm water associated with industrial activity into the waters of the United States are required to be covered by individual permits or general permits for such discharges. Dischargers of storm water associated with industrial activity through municipal separate storm sewer systems will be subject to municipal management programs that address such discharges as well as to an individual or general NPDES permit for those discharges. EPA does not believe there is a significant risk of inconsistent requirements, since each industrial facility must meet BAT/BCT-level controls in its NPDES permit. EPA doubts that municipalities will impose much more stringent controls.

Many commenters stated that if cities and municipalities are to be responsible for industrial storm water discharges through their system, then municipalities should have authority to make determinations as to what industries should be regulated, how they are regulated, and when enforcement actions are undertaken. In response, EPA notes that the proposal has been changed and that municipalities will not be solely responsible for industries discharging through their system. Nonetheless, municipalities will be required to meet the terms of their permits related to industrial dischargers. Municipalities may undertake programs that go beyond the threshold requirements of the permit. Some municipal entities stated that municipal permittees should be able to require permit applications from industries in the same manner that EPA does and also require permits. In response, if operators of large and medium municipal separate storm sewer systems wish to employ such a program, then this portion of the management program may incorporate such practices.

d. *Measures to reduce pollutants in runoff from construction sites into municipal systems.* Section VI.F.8 of today's rule discusses EPA's proposal to define the term "storm water discharge associated with industrial activity" to include runoff from construction sites, including preconstruction activities except operations that result in the disturbance of less than 5 acres total land area which are not part of a larger common plan of development or sale. Under today's rule, facilities that discharge runoff from construction sites that meet this definition will be required to submit permit applications unless they are to be covered by another individual or general NPDES permit Permit application requirements for such discharges are at 40 CFR 122.26(c)(1)(ii).

Section 122.26(d)(2)(iv)(D) of today's rule requires applicants for a permit for large or medium municipal separate storm sewer systems to submit a description of a proposed management program to control pollutants in construction site runoff that discharges to municipal systems. Under this provision, municipal applicants will submit a description of a program for implementing and maintaining structural and non-structural best management practices for controlling storm water runoff at construction sites. The program will address procedures for site planning, enforceable requirements for nonstructural and structural best management practices, procedures for inspecting sites and enforcing control measures, and educational and training measures. Generally, construction site ordinances are effective when they are implemented. However, in many areas, even though ordinances exist, they have limited effectiveness because they are not adequately implemented. Maintaining best management practices also presents problems. Retention and infiltration basins fill up and silt fences may break or be overtopped. Weak inspection and enforcement point to the need for more emphasis on training and education to complement regulatory programs. Permits issued to municipalities will address these concerns.

8. Assessment of Controls

EPA proposed that municipal applicants provide an initial assessment of the effectiveness of the control method for structural or non-structural controls which have been proposed in the management program. Some commenters stated that the assessment of controls should be left to the term of the permit because the effectiveness of controls will be hard to establish. EPA believes that an initial estimate or assessment is needed because the performance of appropriate management controls is highly dependent on site-specific factors. The assessment will be used in conjunction with the development of pollutant loading and concentration estimates (*see* VI.H.6.c) and the evaluation of water quality benefits associated with implementing controls. Such assessments do not have to be verified with quantitative data, but can be based on accepted engineering design practices. Further more precise assessments based upon quantitative data can be undertaken during the term of the permit.

I. Annual Reports

As discussed earlier in today's preamble, EPA has provided for proposed flexible permit application requirements to facilitate the development of site-specific programs to control the discharge of pollutants from large and medium municipal separate storm sewer systems. Many municipalities are in the early stages of the complex task of developing a program suitable for controlling pollutants in discharges under a NPDES permit, while other municipalities have relatively sophisticated programs in place. In order to ensure that such site-specific programs are developed in a timely manner, EPA proposed to require permittees of municipal separate storm sewer systems to submit status reports every year which reflect the development of their control programs.

The reports will be used by the permitting authority to aid in evaluating compliance with permit conditions and where necessary, modify permit conditions to address changed conditions. EPA requested comments on the appropriate content of the annual reports. Based on these comments EPA has added the following in these reports: an analysis of data, including monitoring data, that is accumulated throughout the year; new outfalls or discharges; annual expenditures; identification of water quality improvements or degradation on watershed basis; budget for year following each annual report; and administrative information including enforcement activities, inspections, and public education programs. EPA views this information as important for evaluating the municipal program. Annual monitoring data and identified water quality improvements are important for evaluating the success of management programs in reducing pollutants. If new outfalls come into existence during the term of the permit, these may be sources of pollutants and appropriate permit conditions will be developed. Annual reports should reflect the level of enforcement activity and inspections undertaken to ensure that the legal authority developed by the municipality is properly exercised. Many of the management programs depend upon an ongoing high level of public education. Accordingly, the undertaking of these programs on an annual basis should be documented.

J. Application Deadlines

The CWA provided a statutory time frame for implementing the storm water permit application process and issuance and compliance with permits.

The CWA requires EPA to promulgate permit application requirements for storm water discharges associated with industrial activity and for large municipal separate storm sewer systems by "no later than two years" after the date of enactment (*i.e.* no later than February 4, 1989). In conjunction with this requirement, the Act requires that permit applications for these classes of discharges be submitted within one year after the statutory date by which EPA is to promulgate permit application requirements by providing that such applications "shall be filed no later than three years" after the date of enactment of the WQA (*i.e.*, no later than February 4, 1990).

The CWA also requires EPA to promulgate final regulations governing storm water permit application requirements for discharges from municipal separate storm sewer systems serving a population of 100,000 or more but less than 250,000 by "no later than four years" after enactment (*i.e.* no later than February 4, 1991). Permit applications for medium municipal separate storm sewer systems "shall be filed no later than five years" after the date of enactment of the CWA (*i.e.*, no later than February 4, 1992). The CWA did not establish the time period between designation and permit application submittal for case-by-case designations under section 402(p)(2)(E).

Comments on earlier rulemakings involving storm water application deadlines have established that applicants need adequate time to obtain "representative" storm water samples. Many commenters have indicated that at least one full year is needed to obtain such samples. This is because many discharges are located in areas where testing during dry seasons or winter would not be feasible. The intermittent and unpredictable nature of storm water discharges can result in difficult and time-consuming data gathering. Moreover, some operators of municipal separate storm sewer systems have many storm water discharges associated with industrial activity, which can require considerable time to identify, analyze, and submit applications. This creates a tremendous practical problem for the extremely high number of unpermitted storm water discharges. The public's interest in a sound storm water program and the development of a useful storm water data base is best served by establishing an application deadline which will allow sufficient time to gather, analyze, and prepare meaningful applications. Based on a consideration of these factors, EPA proposed that individual permit applications for storm water discharges associated with industrial activity which currently are not covered by a permit and that are required to obtain a permit, be submitted one year after the final rule is promulgated.

EPA received numerous comments from industries on the one year requirement for submitting applications. Several commenters supported the proposed deadline as realistic, while others believed more time was needed to meet the information and quantitative requirement.

EPA rejects the assertion by some commenters that a year is too short a period of time to obtain the required quantitative data. Today's rule generally requires applications for storm water discharges associated with industrial activity to be submitted on or before November 18, 1991. Operators of storm water discharges associated with industrial activity which discharge through a municipal separate storm sewer are subject to the same application deadline as other storm water discharges associated with industrial activity. Since final regulation at § 122.21(g)(7) provides considerable latitude for selecting rain events for quantitative data, EPA is convinced that in most cases data can be obtained during the one year time frame. If data cannot be collected during the one year time frame because of anomalous weather (*e.g.* drought conditions), then permitting authorities may grant additional time for submitting that data on a case-by-case basis. *See* § 122.21(g)(7).

Operators of storm water discharges which are currently covered by a permit will not be required to submit a permit application until their existing permit expires. In recognition of the time required to collect storm water discharge data, EPA will allow facilities which currently have a NPDES permit for a storm water discharge and which must reapply for permit renewal during the first year following promulgation of today's permit application requirements the option of applying in accordance with existing Form 1 and Form 2C requirements (in lieu of applying in accordance with the revised application requirements).

As discussed in section VI.D.4 and section VI.F.6 of today's preamble, EPA has established a two part permit application both for both group applications for sufficiently similar facilities that discharge storm water associated with industrial activity and for operators of large or medium municipal separate storm sewer systems. The deadlines for submitting

permit applications in today's rule provide adequate time for: (1) Applicants to prepare Part 1 of the application; (2) EPA or an approved State to adequately review applications; and (3) applicants to prepare the contents of the part 2 application.

Part 1 of the group application for storm water discharges associated with industrial activity must be submitted within 120 days from the publication of these final permit application regulations. This time is necessary to form groups and for individual members of the group to prepare the non-quantitative information required in part 1 of the application. Part 1 of the group application will be submitted to EPA Headquarters in Washington, DC and reviewed within 60 days after being received. Part 2 of the application would then be submitted within one year after the part 1 application is approved. It should be noted that many facilities located in States in which general permits can be issued, will be eligible for coverage by a storm water general permit to be promulgated in the near future. Such facilities may either seek coverage under such general permits or participate in the group application.

Several comments were received by EPA that indicated that a period of 120 days was too short a period for groups to be formed. EPA disagrees with these comments. The information that EPA is requiring to be submitted by the group or group representative is information that is generally available such as the location of the facility, its industrial activity, and material management practices. EPA believes that 120 days is sufficient to gather and submit this information along with an identification of 10% of the facilities which will submit quantitative data. To ameliorate any difficulties for applicants, EPA has provided a means for late facilities to "add on" where appropriate, on a case-by-case basis, as discussed in section VI.F.4. above.

Several comments were received with regard to the requirement that new dischargers submit an application at least 180 days before the date on which the discharge is to commence. One commenter noted that it will be difficult for a facility to know when a storm water discharge is to commence since precipitation and runoff cannot be predicted to any degree of accuracy. In response, new dischargers must apply for a storm water permit application 180 days before that facility commences manufacturing, processing, or raw material storage operations which may result in the discharge of pollutants from storm water runoff, and 90 days for new construction sites.

For large municipal separate storm sewer systems (systems serving a population of more than 250,000), EPA proposed that part 1 of the permit application be submitted within one year of the date of the final regulations, with approval or disapproval by the permit issuing authority of the provisions of the part 1 permit application within 90 days after receiving part 1 of the application. The Part 2 portion of the application was to be submitted within two years of the date of promulgation.

For medium municipal separate storm sewer systems (systems serving a population of more than 100,000, but less than 250,000), EPA proposed that permit applications would be required nine months after the date of the final rule, with approval or disapproval of the provisions of the part 1 permit application within 90 days after receiving the part 1 application. The part 2 portion of the application would then be submitted no later than one year after the part 1 application has been approved.

Numerous comments were received by EPA from municipalities on these proposed deadlines. Many of these comments reflect the sentiment that the deadlines are too tight and that the required information would not be available for submission within the required time frame. Some commenters suggested deadlines that would add over three years to the permit application process. Other commenters suggested a revamped application process and a shorter deadline of 18 months. Some commenters explained that additional time would be needed to obtain adequate legal authority, while another stated that an inventory of outfalls required more time. One commenter maintained that intergovernmental agreements will require more time to prepare, and others expressed the view that more time was needed for the review of part 1 of the application by permitting authorities. Others felt more time was needed for collecting data, or hiring additional staff to accomplish the work. Most of these commenters did not provide specific details regarding what would be an appropriate amount of time and why.

After reviewing these comments EPA has decided to modify some of the deadlines as proposed. EPA is convinced that to properly achieve the goals of the CWA, the permit application requirements as discussed in previous sections are appropriate; but that the deadlines for medium municipal separate storm sewer systems should be adjusted so that the program's goals can be properly accomplished. After reviewing comments, EPA believes that medium municipalities will have fewer resources and existing institutional arrangements than large cities and therefore more time should be granted to these cities for submitting parts 1 and 2 of the application.

Accordingly EPA will require large municipal systems to submit part 1 of the permit application no later than November 18, 1991. Part 1 will be reviewed and approved or disapproved by the Director within 90 days. Part 2 of the application will then be submitted November 16, 1992. Medium municipal systems will submit part 1 of the application on May 18, 1992. Approval or disapproval by the Director will be accomplished within 90 days. Part 2 of the application will be submitted by May 17, 1993. These deadlines will give large systems two years to complete the application process, and medium systems 2 years and 6 months to submit applications. EPA is convinced that the permit application schedule is warranted and should provide adequate time to prepare the application.

In establishing these regulatory deadlines EPA is fully aware that they are not synchronized with the statutory deadlines as established by Congress. One commenter argued that the deadlines as proposed were contrary to the deadlines established by Congress and that EPA had no authority to extend these deadlines. (For large municipal separate storm sewer systems and storm water discharges associated with industrial activity, Congress established a deadline of February 4, 1990, for submission of permit applications; for medium municipal separate storm sewer systems, the deadline is February 4, 1992.) In response, this regulation provides certain deadlines for meeting the substantive requirements of this rulemaking—requirements which EPA is convinced are necessary for the development of enforceable and sound storm water permits. EPA believes it is important to give applicants sufficient time to reasonably comply with the permit application requirements set out today. EPA will therefore accept applications for storm water discharge permits up to the dates specified in today's rule. By establishing these regulatory deadlines, however, EPA is not attempting to waive or revoke the statutory deadlines established in Section 402(p) of the CWA and does not assert the authority to do so. The statutory permit application deadlines

continue to be enforceable requirements.

EPA was not able to promulgate the final application regulations for storm water discharges before the February 4, 1990, deadline for industrial and large municipal dischargers despite its best efforts. Further, as noted above, EPA is not able to waive the statutory deadline. Dischargers concerned with complying with the statutory deadline should submit a permit application as required under this rulemaking as expeditiously as possible.

Operators of storm water discharges that are not specifically required to file a permit application under today's rule may be required to obtain a permit for their discharge on the basis of a case-by-case designation by the Administrator or the NPDES State.

The Administrator or NPDES State may also designate storm water discharges (except agricultural storm water discharges), that contribute to a violation of a water quality standard or that are significant contributors of pollutants to waters of the United States for a permit. Prior to a case-by-case determination that an individual permit is required for a storm water discharge, the Administrator or NPDES State may require the operator of the discharge to submit a permit application. 40 CFR 124.52(c) requires the operator of designated storm water discharges to submit a permit application within 60 days of notice, unless permission for a later date is granted. The 60-day deadline is consistent with the procedures for designating other discharges for a NPDES permit on a case-by-case basis found at 40 CFR 124.52. The 60-day deadline recognizes that case-by-case designations often require an expedited response, however, flexibility exists to allow for case-by-case extensions.

The December 7, 1988, proposal also proposed Part 504 State Storm Water Management Programs. The Agency has not included this component in today's rule. The Agency believes this program element is appropriate for addressing in regulations promulgated under section 402(p)(6) of the CWA.

VII. Economic Impact

EPA has prepared an Information Collection Request for the purpose of estimating the information collection burden imposed on Federal, State and local governments and industry for revisions to NPDES permit application requirements for storm water discharges codified in 40 CFR part 122. EPA is promulgating these revisions in response to Section 402(p)(4) of the Clean Water Act, as amended by the Water Quality Act of 1987 (WQA). The revisions would apply to: Storm water discharges associated with industrial activity; discharges from municipal separate storm sewer systems serving a population of 250,000 or more and discharges from municipal separate storm sewer systems serving a population of 100,000 or more, but less than 250,000.

The estimated annual cost of applying for NPDES permits for discharges from municipal separate storm sewer systems is $4.2 million. EPA estimates that an average permit application for a large municipality will cost $76,681 and require 4,534 hours to prepare. The average application for a medium municipality will cost $49,249 (2,912 hours) to prepare. The annual respondent cost for NPDES permit applications, notices of intent, and notifications for facilities with discharges associated with industrial activity is estimated to be $9.5 million (271,248 hours). EPA estimates that the average preparation cost of an individual industrial permit application would be $1,007 (28.6 hours). Average Group application will cost $74.00 per facility (2.1 hours). The average cost of the notification and notice of intent to be covered by general permit is $17.00 (0.5 hours).

The annual cost to the Federal Government and approved States for administration of the program is estimated to be $588,603. The total cost for municipalities, industry, and State and Federal authorities is estimated to be $14.5 million annually.

In general, the cost estimates provided in the ICR focus primarily on the costs associated with developing, submitting and reviewing the permit applications associated with today's rule. EPA will continue to evaluate procedures and methods to control storm water discharges to the extent necessary to mitigate impacts on water quality in the studies required under section 402(p)(5) of the CWA. Executive Order 12291 requires EPA and other agencies to perform regulatory analyses of major regulations. Major rules are those which impose a cost on the economy of $100 million or more annually or have certain other economic impacts. Today's proposed amendments would generally make the NPDES permit application regulations more flexible and less burdensome for the regulated community. These regulations do not, satisfy any of the criteria specified in section 1(b) of the Executive Order and, as such, do not constitute a major rule. This regulation was submitted to the Office of Management and Budget (OMB) for review.

VIII. Paperwork Reduction Act

The information collection requirements in this rule have been submitted for approval to the Office of Management and Budget (OMB) under provision of the Paperwork Reduction Act, 44 U.S.C. 3501 *et seq.* and have been assigned OMB control number 2040-0086.

Public reporting burden for permit applications for storm water discharges associated with industrial activity (other than from construction facilities) is estimated to average 28.6 hours per individual permit application, 0.5 hours per notice of intent to be covered by general permit, and 2.1 hours per group applicant. The public reporting burden for permit applications for storm water discharges associated with industrial activity from construction activities submitting individual applications is estimated to average 4.5 hours per response. The public reporting burden for facilities which discharge storm water associated with industrial activity to municipal separate storm sewers serving a population over 100,000 to notify the operator of the municipal separate storm sewer system is estimated to average 0.5 hours per response.

The reporting burden for system-wide permit applications for discharges from municipal separate storm sewer systems serving a population of 250,000 or more is estimated to average 4,534 hours per response. The reporting burden for system-wide permit applications for discharges from municipal separate storm sewer systems serving a population of 100,000 or more, but less than 250,000 is estimated to average 2,912 hours per response. Estimates of reporting burden include time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

IX. Regulatory Flexibility Act

Under the Regulatory Flexibility Act, 5 U.S.C. 601 *et seq.*, EPA is required to prepare a Regulatory Flexibility Analysis to assess the impact of rules on small entities. No Regulatory Flexibility Analysis is required, however, where the head of the agency certifies that the rule will not have a significant economic impact on a substantial number of small entities.

Today's amendments to the regulations would generally make the NPDES permit applications regulations more flexible and less burdensome for permittees. Accordingly, I hereby

certify, pursuant to 5 U.S.C. 605(b), that these amendments do not, have a significant impact on a substantial number of small entities.

List of Subjects in 40 CFR Parts 122, 123, and 124

Administrative practice and procedure, Environmental protection, Reporting and recordkeeping requirements, Water pollution control.

Authority: Clean Water Act, 33 U.S.C. 1251 *et seq.*

Dated: October 31, 1990.

William K. Reilly,

Administrator.

For the reasons stated in the preamble, parts 122, 123, and 124 of title 40 of the Code of Federal Regulations are amended as follows:

PART 122—EPA ADMINISTERED PERMIT PROGRAMS; THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

Subpart B—Permit Application and Special NPDES Program Requirements

1. The authority citation for part 122 continues to read as follows:

Authority: Clean Water Act, 33 U.S.C. 1251 *et seq.*

2. Section 122.1 is amended by revising paragraph (b)(2)(iv) to read as follows:

§ 122.1 Purpose and scope.

* * * * *

(b) * * *

(2) * * *

(iv) Discharges of storm water as set forth in § 122.26; and

* * * * *

3. Section 122.21 is amended by revising paragraph (c)(1), by removing the last sentence of paragraph (f)(7), by removing paragraph (f)(9), by adding two sentences at the end of paragraph (g)(3), by revising paragraph (g)(7) introductory text, by removing and reserving paragraph (g)(10) and by revising the introductory text of paragraph (k) to read as follows:

§ 122.21 Application for a permit (applicable to State programs, see § 123.25).

* * * * *

(c) *Time to apply.* (1) Any person proposing a new discharge, shall submit an application at least 180 days before the date on which the discharge is to commence, unless permission for a later date has been granted by the Director. Facilities proposing a new discharge of storm water associated with industrial activity shall submit an application 180 days before that facility commences industrial activity which may result in a discharge of storm water associated with that industrial activity. Facilities described under § 122.26(b)(14)(x) shall submit applications at least 90 days before the date on which construction is to commence. Different submittal dates may be required under the terms of applicable general permits. Persons proposing a new discharge are encouraged to submit their applications well in advance of the 90 or 180 day requirements to avoid delay. See also paragraph (k) of this section and § 122.26 (c)(1)(i)(G) and (c)(1)(ii).

* * * * *

(g) * * *

(3) * * * The average flow of point sources composed of storm water may be estimated. The basis for the rainfall event and the method of estimation must be indicated.

* * * * *

(7) *Effluent characteristics.* Information on the discharge of pollutants specified in this paragraph (except information on storm water discharges which is to be provided as specified in § 122.26). When "quantitative data" for a pollutant are required, the applicant must collect a sample of effluent and analyze it for the pollutant in accordance with analytical methods approved under 40 CFR part 136. When no analytical method is approved the applicant may use any suitable method but must provide a description of the method. When an applicant has two or more outfalls with substantially identical effluents, the Director may allow the applicant to test only one outfall and report that the quantitative data also apply to the substantially identical outfalls. The requirements in paragraphs (g)(7) (iii) and (iv) of this section that an applicant must provide quantitative data for certain pollutants known or believed to be present do not apply to pollutants present in a discharge solely as the result of their presence in intake water; however, an applicant must report such pollutants as present. Grab samples must be used for pH, temperature, cyanide, total phenols, residual chlorine, oil and grease, fecal coliform and fecal streptococcus. For all other pollutants, 24-hour composite samples must be used. However, a minimum of one grab sample may be taken for effluents from holding ponds or other impoundments with a retention period greater than 24 hours. In addition, for discharges other than storm water discharges, the Director may waive composite sampling for any outfall for which the applicant demonstrates that the use of an automatic sampler is infeasible and that the minimum of four (4) grab samples will be a representative sample of the effluent being discharged. For storm water discharges, all samples shall be collected from the discharge resulting from a storm event that is greater than 0.1 inch and at least 72 hours from the previously measurable (greater than 0.1 inch rainfall) storm event. Where feasible, the variance in the duration of the event and the total rainfall of the event should not exceed 50 percent from the average or median rainfall event in that area. For all applicants, a flow-weighted composite shall be taken for either the entire discharge or for the first three hours of the discharge. The flow-weighted composite sample for a storm water discharge may be taken with a continuous sampler or as a combination of a minimum of three sample aliquots taken in each hour of discharge for the entire discharge or for the first three hours of the discharge, with each aliquot being separated by a minimum period of fifteen minutes (applicants submitting permit applications for storm water discharges under § 122.26(d) may collect flow weighted composite samples using different protocols with respect to the time duration between the collection of sample aliquots, subject to the approval of the Director). However, a minimum of one grab sample may be taken for storm water discharges from holding ponds or other impoundments with a retention period greater than 24 hours. For a flow-weighted composite sample, only one analysis of the composite of aliquots is required. For storm water discharge samples taken from discharges associated with industrial activities, quantitative data must be reported for the grab sample taken during the first thirty minutes (or as soon thereafter as practicable) of the discharge for all pollutants specified in § 122.26(c)(1). For all storm water permit applicants taking flow-weighted composites, quantitative data must be reported for all pollutants specified in § 122.26 except pH, temperature, cyanide, total phenols, residual chlorine, oil and grease, fecal coliform, and fecal streptococcus. The Director may allow or establish appropriate site-specific sampling procedures or requirements, including sampling locations, the season in which the sampling takes place, the minimum duration between the previous measurable storm event and the storm event sampled, the minimum or maximum level of precipitation required for an appropriate storm event, the form of precipitation sampled (snow melt or rain fall), protocols for collecting samples under 40 CFR part 136, and additional time for submitting data on a

case-by-case basis. An applicant is expected to "know or have reason to believe" that a pollutant is present in an effluent based on an evaluation of the expected use, production, or storage of the pollutant, or on any previous analyses for the pollutant. (For example, any pesticide manufactured by a facility may be expected to be present in contaminated storm water runoff from the facility.)

* * * * *

(k) *Application requirements for new sources and new discharges.* New manufacturing, commercial, mining and silvicultural dischargers applying for NPDES permits (except for new discharges of facilities subject to the requirements of paragraph (h) of this section or new discharges of storm water associated with industrial activity which are subject to the requirements of § 122.26(c)(1) and this section (except as provided by § 122.26(c)(1)(ii)) shall provide the following information to the Director, using the application forms provided by the Director:

* * * * *

4. Section 122.22(b) introductory text is revised to read as follows:

§ 122.22 Signatories to permit applications and reports (applicable to State programs, see § 123.25).

* * * * *

(b) All reports required by permits, and other information requested by the Director shall be signed by a person described in paragraph (a) of this section, or by a duly authorized representative of that person. A person is a duly authorized representative only if:

* * * * *

5. Section 122.26 is revised to read as follows:

§ 122.26 Storm water discharges (applicable to State NPDES programs, see § 123.25).

(a) *Permit requirement.* (1) Prior to October 1, 1992, discharges composed entirely of storm water shall not be required to obtain a NPDES permit except:

(i) A discharge with respect to which a permit has been issued prior to February 4, 1987;

(ii) A discharge associated with industrial activity (see § 122.26(a)(4));

(iii) A discharge from a large municipal separate storm sewer system;

(iv) A discharge from a medium municipal separate storm sewer system;

(v) A discharge which the Director, or in States with approved NPDES programs, either the Director or the EPA Regional Administrator, determines to contribute to a violation of a water quality standard or is a significant contributor of pollutants to waters of the United States. This designation may include a discharge from any conveyance or system of conveyances used for collecting and conveying storm water runoff or a system of discharges from municipal separate storm sewers, except for those discharges from conveyances which do not require a permit under paragraph (a)(2) of this section or agricultural storm water runoff which is exempted from the definition of point source at § 122.2. The Director may designate discharges from municipal separate storm sewers on a system-wide or jurisdiction-wide basis. In making this determination the Director may consider the following factors:

(A) The location of the discharge with respect to waters of the United States as defined at 40 CFR 122.2.

(B) The size of the discharge;

(C) The quantity and nature of the pollutants discharged to waters of the United States; and

(D) Other relevant factors.

(2) The Director may not require a permit for discharges of storm water runoff from mining operations or oil and gas exploration, production, processing or treatment operations or transmission facilities, composed entirely of flows which are from conveyances or systems of conveyances (including but not limited to pipes, conduits, ditches, and channels) used for collecting and conveying precipitation runoff and which are not contaminated by contact with or that has not come into contact with, any overburden, raw material, intermediate products, finished product, byproduct or waste products located on the site of such operations.

(3) *Large and medium municipal separate storm sewer systems.* (i) Permits must be obtained for all discharges from large and medium municipal separate storm sewer systems.

(ii) The Director may either issue one system-wide permit covering all discharges from municipal separate storm sewers within a large or medium municipal storm sewer system or issue distinct permits for appropriate categories of discharges within a large or medium municipal separate storm sewer system including, but not limited to: all discharges owned or operated by the same municipality; located within the same jurisdiction; all discharges within a system that discharge to the same watershed; discharges within a system that are similar in nature; or for individual discharges from municipal separate storm sewers within the system.

(iii) The operator of a discharge from a municipal separate storm sewer which is part of a large or medium municipal separate storm sewer system must either:

(A) Participate in a permit application (to be a permittee or a co-permittee) with one or more other operators of discharges from the large or medium municipal storm sewer system which covers all, or a portion of all, discharges from the municipal separate storm sewer system;

(B) Submit a distinct permit application which only covers discharges from the municipal separate storm sewers for which the operator is responsible; or

(C) A regional authority may be responsible for submitting a permit application under the following guidelines:

(*1*) The regional authority together with co-applicants shall have authority over a storm water management program that is in existence, or shall be in existence at the time part 1 of the application is due;

(*2*) The permit applicant or co-applicants shall establish their ability to make a timely submission of part 1 and part 2 of the municipal application;

(*3*) Each of the operators of municipal separate storm sewers within the systems described in paragraphs (b)(4) (i), (ii), and (iii) or (b)(7) (i), (ii), and (iii) of this section, that are under the purview of the designated regional authority, shall comply with the application requirements of paragraph (d) of this section.

(iv) One permit application may be submitted for all or a portion of all municipal separate storm sewers within adjacent or interconnected large or medium municipal separate storm sewer systems. The Director may issue one system-wide permit covering all, or a portion of all municipal separate storm sewers in adjacent or interconnected large or medium municipal separate storm sewer systems.

(v) Permits for all or a portion of all discharges from large or medium municipal separate storm sewer systems that are issued on a system-wide, jurisdiction-wide, watershed or other basis may specify different conditions relating to different discharges covered by the permit, including different management programs for different drainage areas which contribute storm water to the system.

(vi) Co-permittees need only comply with permit conditions relating to discharges from the municipal separate storm sewers for which they are operators.

(4) *Discharges through large and medium municipal separate storm sewer systems.* In addition to meeting the requirements of paragraph (c) of this section, an operator of a storm water discharge associated with industrial activity which discharges through a large or medium municipal separate storm sewer system shall submit, to the operator of the municipal separate storm sewer system receiving the discharge no later than May 15, 1991, or 180 days prior to commencing such discharge: the name of the facility; a contact person and phone number; the location of the discharge; a description, including Standard Industrial Classification, which best reflects the principal products or services provided by each facility; and any existing NPDES permit number.

(5) *Other municipal separate storm sewers.* The Director may issue permits for municipal separate storm sewers that are designated under paragraph (a)(1)(v) of this section on a system-wide basis, jurisdiction-wide basis, watershed basis or other appropriate basis, or may issue permits for individual discharges.

(6) *Non-municipal separate storm sewers.* For storm water discharges associated with industrial activity from point sources which discharge through a non-municipal or non-publicly owned separate storm sewer system, the Director, in his discretion, may issue: a single NPDES permit, with each discharger a co-permittee to a permit issued to the operator of the portion of the system that discharges into waters of the United States; or, individual permits to each discharger of storm water associated with industrial activity through the non-municipal conveyance system.

(i) All storm water discharges associated with industrial activity that discharge through a storm water discharge system that is not a municipal separate storm sewer must be covered by an individual permit, or a permit issued to the operator of the portion of the system that discharges to waters of the United States, with each discharger to the non-municipal conveyance a co-permittee to that permit.

(ii) Where there is more than one operator of a single system of such conveyances, all operators of storm water discharges associated with industrial activity must submit applications.

(iii) Any permit covering more than one operator shall identify the effluent limitations, or other permit conditions, if any, that apply to each operator.

(7) *Combined sewer systems.* Conveyances that discharge storm water runoff combined with municipal sewage are point sources that must obtain NPDES permits in accordance with the procedures of § 122.21 and are not subject to the provisions of this section.

(8) Whether a discharge from a municipal separate storm sewer is or is not subject to regulation under this section shall have no bearing on whether the owner or operator of the discharge is eligible for funding under title II, title III or title VI of the Clean Water Act. *See* 40 CFR part 35, subpart I, appendix A(b)H.2.j.

(b) *Definitions.* (1) *Co-permittee* means a permittee to a NPDES permit that is only responsible for permit conditions relating to the discharge for which it is operator.

(2) *Illicit discharge* means any discharge to a municipal separate storm sewer that is not composed entirely of storm water except discharges pursuant to a NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer) and discharges resulting from fire fighting activities.

(3) *Incorporated place* means the District of Columbia, or a city, town, township, or village that is incorporated under the laws of the State in which it is located.

(4) *Large municipal separate storm sewer system* means all municipal separate storm sewers that are either:

(i) Located in an incorporated place with a population of 250,000 or more as determined by the latest Decennial Census by the Bureau of Census (appendix F); or

(ii) Located in the counties listed in appendix H, except municipal separate storm sewers that are located in the incorporated places, townships or towns within such counties; or

(iii) Owned or operated by a municipality other than those described in paragraph (b)(4) (i) or (ii) of this section and that are designated by the Director as part of the large or medium municipal separate storm sewer system due to the interrelationship between the discharges of the designated storm sewer and the discharges from municipal separate storm sewers described under paragraph (b)(4) (i) or (ii) of this section. In making this determination the Director may consider the following factors:

(A) Physical interconnections between the municipal separate storm sewers;

(B) The location of discharges from the designated municipal separate storm sewer relative to discharges from municipal separate storm sewers described in paragraph (b)(4)(i) of this section;

(C) The quantity and nature of pollutants discharged to waters of the United States;

(D) The nature of the receiving waters; and

(E) Other relevant factors; or

(iv) The Director may, upon petition, designate as a large municipal separate storm sewer system, municipal separate storm sewers located within the boundaries of a region defined by a storm water management regional authority based on a jurisdictional, watershed, or other appropriate basis that includes one or more of the systems described in paragraph (b)(4) (i), (ii), (iii) of this section.

(5) *Major municipal separate storm sewer outfall* (or "major outfall") means a municipal separate storm sewer outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (discharge from a single conveyance other than circular pipe which is associated with a drainage area of more than 50 acres); or for municipal separate storm sewers that receive storm water from lands zoned for industrial activity (based on comprehensive zoning plans or the equivalent), an outfall that discharges from a single pipe with an inside diameter of 12 inches or more or from its equivalent (discharge from other than a circular pipe associated with a drainage area of 2 acres or more).

(6) *Major outfall* means a major municipal separate storm sewer outfall.

(7) *Medium municipal separate storm sewer system* means all municipal separate storm sewers that are either:

(i) Located in an incorporated place with a population of 100,000 or more but less than 250,000, as determined by the latest Decennial Census by the Bureau of Census (appendix G); or

(ii) Located in the counties listed in appendix I, except municipal separate storm sewers that are located in the incorporated places, townships or towns within such counties; or

(iii) Owned or operated by a municipality other than those described in paragraph (b)(4) (i) or (ii) of this section and that are designated by the Director as part of the large or medium municipal separate storm sewer system due to the interrelationship between the discharges of the designated storm sewer and the discharges from municipal separate storm sewers described under paragraph (b)(4) (i) or (ii) of this section. In making this determination the Director may consider the following factors:

(A) Physical interconnections between the municipal separate storm sewers;

(B) The location of discharges from the designated municipal separate storm sewer relative to discharges from municipal separate storm sewers described in paragraph (b)(7)(i) of this section;

(C) The quantity and nature of pollutants discharged to waters of the United States;

(D) The nature of the receiving waters; or

(E) Other relevant factors; or

(iv) The Director may, upon petition, designate as a medium municipal separate storm sewer system, municipal separate storm sewers located within the boundaries of a region defined by a storm water management regional authority based on a jurisdictional, watershed, or other appropriate basis that includes one or more of the systems described in paragraphs (b)(7) (i), (ii), (iii) of this section.

(8) *Municipal separate storm sewer* means a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains):

(i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the CWA that discharges to waters of the United States;

(ii) Designed or used for collecting or conveying storm water;

(iii) Which is not a combined sewer; and

(iv) Which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.2.

(9) *Outfall* means a *point source* as defined by 40 CFR 122.2 at the point where a municipal separate storm sewer discharges to waters of the United States and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels or other conveyances which connect segments of the same stream or other waters of the United States and are used to convey waters of the United States.

(10) *Overburden* means any material of any nature, consolidated or unconsolidated, that overlies a mineral deposit, excluding topsoil or similar naturally-occurring surface materials that are not disturbed by mining operations.

(11) *Runoff coefficient* means the fraction of total rainfall that will appear at a conveyance as runoff.

(12) *Significant materials* includes, but is not limited to: raw materials; fuels; materials such as solvents, detergents, and plastic pellets; finished materials such as metallic products; raw materials used in food processing or production; hazardous substances designated under section 101(14) of CERCLA; any chemical the facility is required to report pursuant to section 313 of title III of SARA; fertilizers; pesticides; and waste products such as ashes, slag and sludge that have the potential to be released with storm water discharges.

(13) *Storm water* means storm water runoff, snow melt runoff, and surface runoff and drainage.

(14) *Storm water discharge associated with industrial activity* means the discharge from any conveyance which is used for collecting and conveying storm water and which is directly related to manufacturing, processing or raw materials storage areas at an industrial plant. The term does not include discharges from facilities or activities excluded from the NPDES program under 40 CFR part 122. For the categories of industries identified in paragraphs (b)(14) (i) through (x) of this section, the term includes, but is not limited to, storm water discharges from industrial plant yards; immediate access roads and rail lines used or traveled by carriers of raw materials, manufactured products, waste material, or by-products used or created by the facility; material handling sites; refuse sites; sites used for the application or disposal of process waste waters (as defined at 40 CFR part 401); sites used for the storage and maintenance of material handling equipment; sites used for residual treatment, storage, or disposal; shipping and receiving areas; manufacturing buildings; storage areas (including tank farms) for raw materials, and intermediate and finished products; and areas where industrial activity has taken place in the past and significant materials remain and are exposed to storm water. For the categories of industries identified in paragraph (b)(14)(xi) of this section, the term includes only storm water discharges from all the areas (except access roads and rail lines) that are listed in the previous sentence where material handling equipment or activities, raw materials, intermediate products, final products, waste materials, by-products, or industrial machinery are exposed to storm water. For the purposes of this paragraph, material handling activities include the storage, loading and unloading, transportation, or conveyance of any raw material, intermediate product, finished product, by-product or waste product. The term excludes areas located on plant lands separate from the plant's industrial activities, such as office buildings and accompanying parking lots as long as the drainage from the excluded areas is not mixed with storm water drained from the above described areas. Industrial facilities (including industrial facilities that are Federally, State, or municipally owned or operated that meet the description of the facilities listed in this paragraph (b)(14)(i)–(xi) of this section) include those facilities designated under the provisions of paragraph (a)(1)(v) of this section. The following categories of facilities are considered to be engaging in "industrial activity" for purposes of this subsection:

(i) Facilities subject to storm water effluent limitations guidelines, new source performance standards, or toxic pollutant effluent standards under 40 CFR subchapter N (except facilities with toxic pollutant effluent standards which are exempted under category (xi) in paragraph (b)(14) of this section);

(ii) Facilities classified as Standard Industrial Classifications 24 (except 2434), 26 (except 265 and 267), 28 (except 283), 29, 311, 32 (except 323), 33, 3441, 373;

(iii) Facilities classified as Standard Industrial Classifications 10 through 14 (mineral industry) including active or inactive mining operations (except for areas of coal mining operations no longer meeting the definition of a reclamation area under 40 CFR 434.11(1) because the performance bond issued to the facility by the appropriate SMCRA authority has been released, or except for areas of non-coal mining operations which have been released from applicable State or Federal reclamation requirements after December 17, 1990) and oil and gas exploration, production, processing, or treatment operations, or transmission facilities that discharge storm water contaminated by contact with or that has come into contact with, any overburden, raw material, intermediate products, finished products, byproducts or waste products located on the site of such operations; (inactive mining operations are mining sites that are not being actively mined, but which have an identifiable owner/operator; inactive mining sites do not include sites where mining claims are being maintained prior to disturbances associated with the extraction, beneficiation, or processing of mined

materials, nor sites where minimal activities are undertaken for the sole purpose of maintaining a mining claim);

(iv) Hazardous waste treatment, storage, or disposal facilities, including those that are operating under interim status or a permit under subtitle C of RCRA;

(v) Landfills, land application sites, and open dumps that receive or have received any industrial wastes (waste that is received from any of the facilities described under this subsection) including those that are subject to regulation under subtitle D of RCRA;

(vi) Facilities involved in the recycling of materials, including metal scrapyards, battery reclaimers, salvage yards, and automobile junkyards, including but limited to those classified as Standard Industrial Classification 5015 and 5093;

(vii) Steam electric power generating facilities, including coal handling sites;

(viii) Transportation facilities classified as Standard Industrial Classifications 40, 41, 42 (except 4221–25), 43, 44, 45, and 5171 which have vehicle maintenance shops, equipment cleaning operations, or airport deicing operations. Only those portions of the facility that are either involved in vehicle maintenance (including vehicle rehabilitation, mechanical repairs, painting, fueling, and lubrication), equipment cleaning operations, airport deicing operations, or which are otherwise identified under paragraphs (b)(14) (i)–(vii) or (ix)–(xi) of this section are associated with industrial activity;

(ix) Treatment works treating domestic sewage or any other sewage sludge or wastewater treatment device or system, used in the storage treatment, recycling, and reclamation of municipal or domestic sewage, including land dedicated to the disposal of sewage sludge that are located within the confines of the facility, with a design flow of 1.0 mgd or more, or required to have an approved pretreatment program under 40 CFR part 403. Not included are farm lands, domestic gardens or lands used for sludge management where sludge is beneficially reused and which are not physically located in the confines of the facility, or areas that are in compliance with section 405 of the CWA;

(x) Construction activity including clearing, grading and excavation activities except: operations that result in the disturbance of less than five acres of total land area which are not part of a larger common plan of development or sale;

(xi) Facilities under Standard Industrial Classifications 20, 21, 22, 23, 2434, 25, 265, 267, 27, 283, 285, 30, 31 (except 311), 323, 34 (except 3441), 35, 36, 37 (except 373), 38, 39, 4221–25, (and which are not otherwise included within categories (ii)–(x));

(c) *Application requirements for storm water discharges associated with industrial activity*—(1) *Individual application.* Dischargers of storm water associated with industrial activity are required to apply for an individual permit, apply for a permit through a group application, or seek coverage under a promulgated storm water general permit. Facilities that are required to obtain an individual permit, or any discharge of storm water which the Director is evaluating for designation (*see* 40 CFR 124.52(c)) under paragraph (a)(1)(v) of this section and is not a municipal separate storm sewer, and which is not part of a group application described under paragraph (c)(2) of this section, shall submit an NPDES application in accordance with the requirements of § 122.21 as modified and supplemented by the provisions of the remainder of this paragraph. Applicants for discharges composed entirely of storm water shall submit Form 1 and Form 2F. Applicants for discharges composed of storm water and non-storm water shall submit Form 1, Form 2C, and Form 2F. Applicants for new sources or new discharges (as defined in § 122.2 of this part) composed of storm water and non-storm water shall submit Form 1, Form 2D, and Form 2F.

(i) Except as provided in § 122.26(c)(1)(ii)–(iv), the operator of a storm water discharge associated with industrial activity subject to this section shall provide:

(A) A site map showing topography (or indicating the outline of drainage areas served by the outfall(s) covered in the application if a topographic map is unavailable) of the facility including: each of its drainage and discharge structures; the drainage area of each storm water outfall; paved areas and buildings within the drainage area of each storm water outfall, each past or present area used for outdoor storage or disposal of significant materials, each existing structural control measure to reduce pollutants in storm water runoff, materials loading and access areas, areas where pesticides, herbicides, soil conditioners and fertilizers are applied, each of its hazardous waste treatment, storage or disposal facilities (including each area not required to have a RCRA permit which is used for accumulating hazardous waste under 40 CFR 262.34); each well where fluids from the facility are injected underground; springs, and other surface water bodies which receive storm water discharges from the facility;

(B) An estimate of the area of impervious surfaces (including paved areas and building roofs) and the total area drained by each outfall (within a mile radius of the facility) and a narrative description of the following: Significant materials that in the three years prior to the submittal of this application have been treated, stored or disposed in a manner to allow exposure to storm water; method of treatment, storage or disposal of such materials; materials management practices employed, in the three years prior to the submittal of this application, to minimize contact by these materials with storm water runoff; materials loading and access areas; the location, manner and frequency in which pesticides, herbicides, soil conditioners and fertilizers are applied; the location and a description of existing structural and non-structural control measures to reduce pollutants in storm water runoff; and a description of the treatment the storm water receives, including the ultimate disposal of any solid or fluid wastes other than by discharge;

(C) A certification that all outfalls that should contain storm water discharges associated with industrial activity have been tested or evaluated for the presence of non-storm water discharges which are not covered by a NPDES permit; tests for such non-storm water discharges may include smoke tests, fluorometric dye tests, analysis of accurate schematics, as well as other appropriate tests. The certification shall include a description of the method used, the date of any testing, and the on-site drainage points that were directly observed during a test;

(D) Existing information regarding significant leaks or spills of toxic or hazardous pollutants at the facility that have taken place within the three years prior to the submittal of this application;

(E) Quantitative data based on samples collected during storm events and collected in accordance with § 122.21 of this part from all outfalls containing a storm water discharge associated with industrial activity for the following parameters:

(*1*) Any pollutant limited in an effluen guideline to which the facility is subject;

(*2*) Any pollutant listed in the facility's NPDES permit for its process wastewater (if the facility is operating under an existing NPDES permit);

(*3*) Oil and grease, pH, BOD5, COD, TSS, total phosphorus, total Kjeldahl nitrogen, and nitrate plus nitrite nitrogen;

(*4*) Any information on the discharge required under paragraph § 122.21(g)(7)(iii) and (iv) of this part;

(5) Flow measurements or estimates of the flow rate, and the total amount of discharge for the storm event(s) sampled, and the method of flow measurement or estimation; and

(6) The date and duration (in hours) of the storm event(s) sampled, rainfall measurements or estimates of the storm event (in inches) which generated the sampled runoff and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event (in hours);

(F) Operators of a discharge which is composed entirely of storm water are exempt from the requirements of § 122.21 (g)(2), (g)(3), (g)(4), (g)(5), (g)(7)(i), (g)(7)(ii), and (g)(7)(v); and

(G) Operators of new sources or new discharges (as defined in § 122.2 of this part) which are composed in part or entirely of storm water must include estimates for the pollutants or parameters listed in paragraph (c)(1)(i)(E) of this section instead of actual sampling data, along with the source of each estimate. Operators of new sources or new discharges composed in part or entirely of storm water must provide quantitative data for the parameters listed in paragraph (c)(1)(i)(E) of this section within two years after commencement of discharge, unless such data has already been reported under the monitoring requirements of the NPDES permit for the discharge. Operators of a new source or new discharge which is composed entirely of storm water are exempt from the requirements of § 122.21 (k)(3)(ii), (k)(3)(iii), and (k)(5).

(ii) The operator of an existing or new storm water discharge that is associated with industrial activity solely under paragraph (b)(14)(x) of this section, is exempt from the requirements of § 122.21(g) and paragraph (c)(1)(i) of this section. Such operator shall provide a narrative description of:

(A) The location (including a map) and the nature of the construction activity;

(B) The total area of the site and the area of the site that is expected to undergo excavation during the life of the permit;

(C) Proposed measures, including best management practices, to control pollutants in storm water discharges during construction, including a brief description of applicable State and local erosion and sediment control requirements;

(D) Proposed measures to control pollutants in storm water discharges that will occur after construction ope ations have been completed, incl .ding a brief description of applicable State or local erosion and sediment control requirements;

(E) An estimate of the runoff coefficient of the site and the increase in impervious area after the construction addressed in the permit application is completed, the nature of fill material and existing data describing the soil or the quality of the discharge; and

(F) The name of the receiving water.

(iii) The operator of an existing or new discharge composed entirely of storm water from an oil or gas exploration, production, processing, or treatment operation, or transmission facility is not required to submit a permit application in accordance with paragraph (c)(1)(i) of this section, unless the facility:

(A) Has had a discharge of storm water resulting in the discharge of a reportable quantity for which notification is or was required pursuant to 40 CFR 117.21 or 40 CFR 302.6 at anytime since November 16, 1987; or

(B) Has had a discharge of storm water resulting in the discharge of a reportable quantity for which notification is or was required pursuant to 40 CFR 110.6 at any time since November 16, 1987; or

(C) Contributes to a violation of a water quality standard.

(iv) The operator of an existing or new discharge composed entirely of storm water from a mining operation is not required to submit a permit application unless the discharge has come into contact with, any overburden, raw material, intermediate products, finished product, byproduct or waste products located on the site of such operations.

(v) Applicants shall provide such other information the Director may reasonably require under § 122.21(g)(13) of this part to determine whether to issue a permit and may require any facility subject to paragraph (c)(1)(ii) of this section to comply with paragraph (c)(1)(i) of this section.

(2) *Group application for discharges associated with industrial activity.* In lieu of individual applications or notice of intent to be covered by a general permit for storm water discharges associated with industrial activity, a group application may be filed by an entity representing a group of applicants (except facilities that have existing individual NPDES permits for storm water) that are part of the same subcategory (*see* 40 CFR subchapter N, part 405 to 471) or, where such grouping is inapplicable, are sufficiently similar as to be appropriate for general permit coverage under § 122.28 of this part. The part 1 application shall be submitted to the Office of Water Enforcement and Permits, U.S. EPA, 401 M Street, SW., Washington, DC 20460 (EN-336) for approval. Once a part 1 application is approved, group applicants are to submit Part 2 of the group application to the Office of Water Enforcement and Permits. A group application shall consist of:

(i) *Part 1.* Part 1 of a group application shall:

(A) Identify the participants in the group application by name and location. Facilities participating in the group application shall be listed in nine subdivisions, based on the facility location relative to the nine precipitation zones indicated in appendix E to this part.

(B) Include a narrative description summarizing the industrial activities of participants of the group application and explaining why the participants, as a whole, are sufficiently similar to be a covered by a general permit;

(C) Include a list of significant materials stored exposed to precipitation by participants in the group application and materials management practices employed to diminish contact by these materials with precipitation and storm water runoff;

(D) Identify ten percent of the dischargers participating in the group application (with a minimum of 10 dischargers, and either a minimum of two dischargers from each precipitation zone indicated in appendix E of this part in which ten or more members of the group are located, or one discharger from each precipitation zone indicated in appendix E of this part in which nine or fewer members of the group are located) from which quantitative data will be submitted in part 2. If more than 1,000 facilities are identified in a group application, no more than 100 dischargers must submit quantitative data in Part 2. Groups of between four and ten dischargers may be formed. However, in groups of between four ana ten, at least half the facilities must submit quantitative data, and at least one facility in each precipitation zone in which members of the group are located must submit data. A description of why the facilities selected to perform sampling and analysis are representative of the group as a whole in terms of the information provided in paragraph (c)(1) (i)(B) and (i)(C) of this section, shall accompany this section. Different factors impacting the nature of the storm water discharges, such as processes used and material management, shall be represented, to the extent feasible, in a manner roughly equivalent to their proportion in the group.

(ii) *Part 2.* Part 2 of a group application shall contain quantitative

data (NPDES Form 2F), as modified by paragraph (c)(1) of this section, so that when part 1 and part 2 of the group application are taken together, a complete NPDES application (Form 1, Form 2C, and Form 2F) can be evaluated for each discharger identified in paragraph (c)(2)(i)(D) of this section.

(d) *Application requirements for large and medium municipal separate storm sewer discharges.* The operator of a discharge from a large or medium municipal separate storm sewer or a municipal separate storm sewer that is designated by the Director under paragraph (a)(1)(v) of this section, may submit a jurisdiction-wide or system-wide permit application. Where more than one public entity owns or operates a municipal separate storm sewer within a geographic area (including adjacent or interconnected municipal separate storm sewer systems), such operators may be a coapplicant to the same application. Permit applications for discharges from large and medium municipal storm sewers or municipal storm sewers designated under paragraph (a)(1)(v) of this section shall include;

(1) *Part 1.* Part 1 of the application shall consist of;

(i) *General information.* The applicants' name, address, telephone number of contact person, ownership status and status as a State or local government entity.

(ii) *Legal authority.* A description of existing legal authority to control discharges to the municipal separate storm sewer system. When existing legal authority is not sufficient to meet the criteria provided in paragraph (d)(2)(i) of this section, the description shall list additional authorities as will be necessary to meet the criteria and shall include a schedule and commitment to seek such additional authority that will be needed to meet the criteria.

(iii) *Source identification.* (A) A description of the historic use of ordinances, guidance or other controls which limited the discharge of non-storm water discharges to any Publicly Owned Treatment Works serving the same area as the municipal separate storm sewer system.

(B) A USGS 7.5 minute topographic map (or equivalent topographic map with a scale between 1:10,000 and 1:24,000 if cost effective) extending one mile beyond the service boundaries of the municipal storm sewer system covered by the permit application. The following information shall be provided:

(*1*) The location of known municipal storm sewer system outfalls discharging to waters of the United States;

(*2*) A description of the land use activities (e.g. divisions indicating undeveloped, residential, commercial, agricultural and industrial uses) accompanied with estimates of population densities and projected growth for a ten year period within the drainage area served by the separate storm sewer. For each land use type, an estimate of an average runoff coefficient shall be provided;

(*3*) The location and a description of the activities of the facility of each currently operating or closed municipal landfill or other treatment, storage or disposal facility for municipal waste;

(*4*) The location and the permit number of any known discharge to the municipal storm sewer that has been issued a NPDES permit;

(*5*) The location of major structural controls for storm water discharge (retention basins, detention basins, major infiltration devices, etc.); and

(*6*) The identification of publicly owned parks, recreational areas, and other open lands.

(iv) *Discharge characterization.* (A) Monthly mean rain and snow fall estimates (or summary of weather bureau data) and the monthly average number of storm events.

(B) Existing quantitative data describing the volume and quality of discharges from the municipal storm sewer, including a description of the outfalls sampled, sampling procedures and analytical methods used.

(C) A list of water bodies that receive discharges from the municipal separate storm sewer system, including downstream segments, lakes and estuaries, where pollutants from the system discharges may accumulate and cause water degradation and a brief description of known water quality impacts. At a minimum, the description of impacts shall include a description of whether the water bodies receiving such discharges have been:

(*1*) Assessed and reported in section 305(b) reports submitted by the State, the basis for the assessment (evaluated or monitored), a summary of designated use support and attainment of Clean Water Act (CWA) goals (fishable and swimmable waters), and causes of nonsupport of designated uses;

(*2*) Listed under section 304(l)(1)(A)(i), section 304(l)(1)(A)(ii), or section 304(l)(1)(B) of the CWA that is not expected to meet water quality standards or water quality goals;

(*3*) Listed in State Nonpoint Source Assessments required by section 319(a) of the CWA that, without additional action to control nonpoint sources of pollution, cannot reasonably be expected to attain or maintain water quality standards due to storm sewers, construction, highway maintenance and runoff from municipal landfills and municipal sludge adding significant pollution (or contributing to a violation of water quality standards);

(*4*) Identified and classified according to eutrophic condition of publicly owned lakes listed in State reports required under section 314(a) of the CWA (include the following: A description of those publicly owned lakes for which uses are known to be impaired; a description of procedures, processes and methods to control the discharge of pollutants from municipal separate storm sewers into such lakes; and a description of methods and procedures to restore the quality of such lakes);

(*5*) Areas of concern of the Great Lakes identified by the International Joint Commission;

(*6*) Designated estuaries under the National Estuary Program under section 320 of the CWA;

(*7*) Recognized by the applicant as highly valued or sensitive waters;

(*8*) Defined by the State or U.S. Fish and Wildlife Services's National Wetlands Inventory as wetlands; and

(*9*) Found to have pollutants in bottom sediments, fish tissue or biosurvey data.

(D) *Field screening.* Results of a field screening analysis for illicit connections and illegal dumping for either selected field screening points or major outfalls covered in the permit application. At a minimum, a screening analysis shall include a narrative description, for either each field screening point or major outfall, of visual observations made during dry weather periods. If any flow is observed, two grab samples shall be collected during a 24 hour period with a minimum period of four hours between samples. For all such samples, a narrative description of the color, odor, turbidity, the presence of an oil sheen or surface scum as well as any other relevant observations regarding the potential presence of non-storm water discharges or illegal dumping shall be provided. In addition, a narrative description of the results of a field analysis using suitable methods to estimate pH, total chlorine, total copper, total phenol, and detergents (or surfactants) shall be provided along with a description of the flow rate. Where the field analysis does not involve analytical methods approved under 40 CFR part 136, the applicant shall provide a description of the method used including the name of the manufacturer of the test method along with the range and accuracy of the test. Field screening points shall be either major outfalls or other outfall points (or

any other point of access such as manholes) randomly located throughout the storm sewer system by placing a grid over a drainage system map and identifying those cells of the grid which contain a segment of the storm sewer system or major outfall. The field screening points shall be established using the following guidelines and criteria:

(*1*) A grid system consisting of perpendicular north-south and east-west lines spaced ¼ mile apart shall be overlayed on a map of the municipal storm sewer system, creating a series of cells;

(*2*) All cells that contain a segment of the storm sewer system shall be identified; one field screening point shall be selected in each cell; major outfalls may be used as field screening points;

(*3*) Field screening points should be located downstream of any sources of suspected illegal or illicit activity;

(*4*) Field screening points shall be located to the degree practicable at the farthest manhole or other accessible location downstream in the system, within each cell; however, safety of personnel and accessibility of the location should be considered in making this determination;

(*5*) Hydrological conditions; total drainage area of the site; population density of the site; traffic density; age of the structures or buildings in the area; history of the area; and land use types;

(*6*) For medium municipal separate storm sewer systems, no more than 250 cells need to have identified field screening points; in large municipal separate storm sewer systems, no more than 500 cells need to have identified field screening points; cells established by the grid that contain no storm sewer segments will be eliminated from consideration; if fewer than 250 cells in medium municipal sewers are created, and fewer than 500 in large systems are created by the overlay on the municipal sewer map, then all those cells which contain a segment of the sewer system shall be subject to field screening (unless access to the separate storm sewer system is impossible); and

(*7*) Large or medium municipal separate storm sewer systems which are unable to utilize the procedures described in paragraphs (d)(1)(iv)(D) (*1*) through (*6*) of this section, because a sufficiently detailed map of the separate storm sewer systems is unavailable, shall field screen no more than 500 or 250 major outfalls respectively (or all major outfalls in the system, if less); in such circumstances, the applicant shall establish a grid system consisting of north-south and east-west lines spaced ¼ mile apart as an overlay to the boundaries of the municipal storm sewer system, thereby creating a series of cells; the applicant will then select major outfalls in as many cells as possible until at least 500 major outfalls (large municipalities) or 250 major outfalls (medium municipalities) are selected; a field screening analysis shall be undertaken at these major outfalls.

(E) *Characterization plan.* Information and a proposed program to meet the requirements of paragraph (d)(2)(iii) of this section. Such description shall include: the location of outfalls or field screening points appropriate for representative data collection under paragraph (d)(2)(iii)(A) of this section, a description of why the outfall or field screening point is representative, the seasons during which sampling is intended, a description of the sampling equipment. The proposed location of outfalls or field screening points for such sampling should reflect water quality concerns (*see* paragraph (d)(1)(iv)(C) of this section) to the extent practicable.

(v) *Management programs.* (A) A description of the existing management programs to control pollutants from the municipal separate storm sewer system. The description shall provide information on existing structural and source controls, including operation and maintenance measures for structural controls, that are currently being implemented. Such controls may include, but are not limited to: Procedures to control pollution resulting from construction activities; floodplain management controls; wetland protection measures; best management practices for new subdivisions; and emergency spill response programs. The description may address controls established under State law as well as local requirements.

(B) A description of the existing program to identify illicit connections to the municipal storm sewer system. The description should include inspection procedures and methods for detecting and preventing illicit discharges, and describe areas where this program has been implemented.

(vi) *Fiscal resources.* (A) A description of the financial resources currently available to the municipality to complete part 2 of the permit application. A description of the municipality's budget for existing storm water programs, including an overview of the municipality's financial resources and budget, including overall indebtedness and assets, and sources of funds for storm water programs.

(2) *Part 2.* Part 2 of the application shall consist of:

(i) *Adequate legal authority.* A demonstration that the applicant can operate pursuant to legal authority established by statute, ordinance or series of contracts which authorizes or enables the applicant at a minimum to:

(A) Control through ordinance, permit, contract, order or similar means, the contribution of pollutants to the municipal storm sewer by storm water discharges associated with industrial activity and the quality of storm water discharged from sites of industrial activity;

(B) Prohibit through ordinance, order or similar means, illicit discharges to the municipal separate storm sewer;

(C) Control through ordinance, order or similar means the discharge to a municipal separate storm sewer of spills, dumping or disposal of materials other than storm water;

(D) Control through interagency agreements among coapplicants the contribution of pollutants from one portion of the municipal system to another portion of the municipal system;

(E) Require compliance with conditions in ordinances, permits, contracts or orders; and

(F) Carry out all inspection, surveillance and monitoring procedures necessary to determine compliance and noncompliance with permit conditions including the prohibition on illicit discharges to the municipal separate storm sewer.

(ii) *Source identification.* The location of any major outfall that discharges to waters of the United States that was not reported under paragraph (d)(1)(iii)(B)(*1*) of this section. Provide an inventory, organized by watershed of the name and address, and a description (such as SIC codes) which best reflects the principal products or services provided by each facility which may discharge, to the municipal separate storm sewer, storm water associated with industrial activity;

(iii) *Characterization data.* When "quantitative data" for a pollutant are required under paragraph (d)(a)(iii)(A)(*3*) of this paragraph, the applicant must collect a sample of effluent in accordance with 40 CFR 122.21(g)(7) and analyze it for the pollutant in accordance with analytical methods approved under 40 CFR part 136. When no analytical method is approved the applicant may use any suitable method but must provide a description of the method. The applicant must provide information characterizing the quality and quantity of discharges covered in the permit application, including:

(A) Quantitative data from representative outfalls designated by the Director (based on information received

in part 1 of the application, the Director shall designate between five and ten outfalls or field screening points as representative of the commercial, residential and industrial land use activities of the drainage area contributing to the system or, where there are less than five outfalls covered in the application, the Director shall designate all outfalls) developed as follows:

(*1*) For each outfall or field screening point designated under this subparagraph, samples shall be collected of storm water discharges from three storm events occurring at least one month apart in accordance with the requirements at § 122.21(g)(7) (the Director may allow exemptions to sampling three storm events when climatic conditions create good cause for such exemptions);

(*2*) A narrative description shall be provided of the date and duration of the storm event(s) sampled, rainfall estimates of the storm event which generated the sampled discharge and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event;

(*3*) For samples collected and described under paragraphs (d)(2)(iii)(A)(*1*) and (A)(*2*) of this section, quantitative data shall be provided for: the organic pollutants listed in Table II; the pollutants listed in Table III (toxic metals, cyanide, and total phenols) of appendix D of 40 CFR part 122, and for the following pollutants:

Total suspended solids (TSS)
Total dissolved solids (TDS)
COD
BOD_5
Oil and grease
Fecal coliform
Fecal streptococcus
pH
Total Kjeldahl nitrogen
Nitrate plus nitrite
Dissolved phosphorus
Total ammonia plus organic nitrogen
Total phosphorus

(*4*) Additional limited quantitative data required by the Director for determining permit conditions (the Director may require that quantitative data shall be provided for additional parameters, and may establish sampling conditions such as the location, season of sample collection, form of precipitation (snow melt, rainfall) and other parameters necessary to insure representativeness);

(B) Estimates of the annual pollutant load of the cumulative discharges to waters of the United States from all identified municipal outfalls and the event mean concentration of the cumulative discharges to waters of the United States from all identified municipal outfalls during a storm event (as described under § 122.21(c)(7)) for BOD_5, COD, TSS, dissolved solids, total nitrogen, total ammonia plus organic nitrogen, total phosphorus, dissolved phosphorus, cadmium, copper, lead, and zinc. Estimates shall be accompanied by a description of the procedures for estimating constituent loads and concentrations, including any modelling, data analysis, and calculation methods;

(C) A proposed schedule to provide estimates for each major outfall identified in either paragraph (d)(2)(ii) or (d)(1)(iii)(B)(*1*) of this section of the seasonal pollutant load and of the event mean concentration of a representative storm for any constituent detected in any sample required under paragraph (d)(2)(iii)(A) of this section; and

(D) A proposed monitoring program for representative data collection for the term of the permit that describes the location of outfalls or field screening points to be sampled (or the location of instream stations), why the location is representative, the frequency of sampling, parameters to be sampled, and a description of sampling equipment.

(iv) *Proposed management program.* A proposed management program covers the duration of the permit. It shall include a comprehensive planning process which involves public participation and where necessary intergovernmental coordination, to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and such other provisions which are appropriate. The program shall also include a description of staff and equipment available to implement the program. Separate proposed programs may be submitted by each coapplicant. Proposed programs may impose controls on a systemwide basis, a watershed basis, a jurisdiction basis, or on individual outfalls. Proposed programs will be considered by the Director when developing permit conditions to reduce pollutants in discharges to the maximum extent practicable. Proposed management programs shall describe priorities for implementing controls. Such programs shall be based on:

(A) A description of structural and source control measures to reduce pollutants from runoff from commercial and residential areas that are discharged from the municipal storm sewer system that are to be implemented during the life of the permit, accompanied with an estimate of the expected reduction of pollutant loads and a proposed schedule for implementing such controls. At a minimum, the description shall include:

(*1*) A description of maintenance activities and a maintenance schedule for structural controls to reduce pollutants (including floatables) in discharges from municipal separate storm sewers;

(*2*) A description of planning procedures including a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal separate storm sewers which receive discharges from areas of new development and significant redevelopment. Such plan shall address controls to reduce pollutants in discharges from municipal separate storm sewers after construction is completed. (Controls to reduce pollutants in discharges from municipal separate storm sewers containing construction site runoff are addressed in paragraph (d)(2)(iv)(D) of this section;

(*3*) A description of practices for operating and maintaining public streets, roads and highways and procedures for reducing the impact on receiving waters of discharges from municipal storm sewer systems, including pollutants discharged as a result of deicing activities;

(*4*) A description of procedures to assure that flood management projects assess the impacts on the water quality of receiving water bodies and that existing structural flood control devices have been evaluated to determine if retrofitting the device to provide additional pollutant removal from storm water is feasible;

(*5*) A description of a program to monitor pollutants in runoff from operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste, which shall identify priorities and procedures for inspections and establishing and implementing control measures for such discharges (this program can be coordinated with the program developed under paragraph (d)(2)(iv)(C) of this section); and

(*6*) A description of a program to reduce to the maximum extent practicable, pollutants in discharges from municipal separate storm sewers associated with the application of pesticides, herbicides and fertilizer which will include, as appropriate, controls such as educational activities, permits, certifications and other measures for commercial applicators and distributors, and controls for application in public right-of-ways and at municipal facilities.

(B) A description of a program, including a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer. The proposed program shall include:

(*1*) A description of a program, including inspections, to implement and enforce an ordinance, orders or similar means to prevent illicit discharges to the municipal separate storm sewer system; this program description shall address all types of illicit discharges, however the following category of non-storm water discharges or flows shall be addressed where such discharges are identified by the municipality as sources of pollutants to waters of the United States: water line flushing, landscape irrigation, diverted stream flows, rising ground waters, uncontaminated ground water infiltration (as defined at 40 CFR 35.2005(20)) to separate storm sewers, uncomtaminated pumped ground water, discharges from potable water sources, foundation drains, air conditioning condensation, irrigation water, springs, water from crawl space pumps, footing drains, lawn watering, individual residential car washing, flows from riparian habitats and wetlands, dechlorinated swimming pool discharges, and street wash water (program descriptions shall address discharges or flows from fire fighting only where such discharges or flows are identified as significant sources of pollutants to waters of the United States);

(*2*) A description of procedures to conduct on-going field screening activities during the life of the permit, including areas or locations that will be evaluated by such field screens;

(*3*) A description of procedures to be followed to investigate portions of the separate storm sewer system that, based on the results of the field screen, or other appropriate information, indicate a reasonable potential of containing illicit discharges or other sources of non-storm water (such procedures may include: sampling procedures for constituents such as fecal coliform, fecal streptococcus, surfactants (MBAS), residual chlorine, fluorides and potassium; testing with fluorometric dyes; or conducting in storm sewer inspections where safety and other considerations allow. Such description shall include the location of storm sewers that have been identified for such evaluation);

(*4*) A description of procedures to prevent, contain, and respond to spills that may discharge into the municipal separate storm sewer;

(*5*) A description of a program to promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges from municipal separate storm sewers;

(*6*) A description of educational activities, public information activities, and other appropriate activities to facilitate the proper management and disposal of used oil and toxic materials; and

(*7*) A description of controls to limit infiltration of seepage from municipal sanitary sewers to municipal separate storm sewer systems where necessary;

(C) A description of a program to monitor and control pollutants in storm water discharges to municipal systems from municipal landfills, hazardous waste treatment, disposal and recovery facilities, industrial facilities that are subject to section 313 of title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA), and industrial facilities that the municipal permit applicant determines are contributing a substantial pollutant loading to the municipal storm sewer system. The program shall:

(*1*) Identify priorities and procedures for inspections and establishing and implementing control measures for such discharges;

(*2*) Describe a monitoring program for storm water discharges associated with the industrial facilities identified in paragraph (d)(2)(iv)(C) of this section, to be implemented during the term of the permit, including the submission of quantitative data on the following constituents: any pollutants limited in effluent guidelines subcategories, where applicable; any pollutant listed in an existing NPDES permit for a facility; oil and grease, COD, pH, BOD_5, TSS, total phosphorus, total Kjeldahl nitrogen, nitrate plus nitrite nitrogen, and any information on discharges required under 40 CFR 122.21(g)(7) (iii) and (iv).

(D) A description of a program to implement and maintain structural and non-structural best management practices to reduce pollutants in storm water runoff from construction sites to the municipal storm sewer system, which shall include:

(*1*) A description of procedures for site planning which incorporate consideration of potential water quality impacts;

(*2*) A description of requirements for nonstructural and structural best management practices;

(*3*) A description of procedures for identifying priorities for inspecting sites and enforcing control measures which consider the nature of the construction activity, topography, and the characteristics of soils and receiving water quality; and

(*4*) A description of appropriate educational and training measures for construction site operators.

(v) *Assessment of controls.* Estimated reductions in loadings of pollutants from discharges of municipal storm sewer constituents from municipal storm sewer systems expected as the result of the municipal storm water quality management program. The assessment shall also identify known impacts of storm water controls on ground water.

(vi) *Fiscal analysis.* For each fiscal year to be covered by the permit, a fiscal analysis of the necessary capital and operation and maintenance expenditures necessary to accomplish the activities of the programs under paragraphs (d)(2) (iii) and (iv) of this section. Such analysis shall include a description of the source of funds that are proposed to meet the necessary expenditures, including legal restrictions on the use of such funds.

(vii) Where more than one legal entity submits an application, the application shall contain a description of the roles and responsibilities of each legal entity and procedures to ensure effective coordination.

(viii) Where requirements under paragraph (d)(1)(iv)(E), (d)(2)(ii), (d)(2)(iii)(B) and (d)(2)(iv) of this section are not practicable or are not applicable, the Director may exclude any operator of a discharge from a municipal separate storm sewer which is designated under paragraph (a)(1)(v), (b)(4)(ii) or (b)(7)(ii) of this section from such requirements. The Director shall not exclude the operator of a discharge from a municipal separate storm sewer identified in appendix F, G, H or I of part 122, from any of the permit application requirements under this paragraph except where authorized under this section.

(e) *Application deadlines.* Any operator of a point source required to obtain a permit under paragraph (a)(1) of this section that does not have an effective NPDES permit covering its storm water outfalls shall submit an application in accordance with the following deadlines:

(1) For any storm water discharge associated with industrial activity identified in paragraph (b)(14) (i)–(xi) of this section, that is not part of a group application as described in paragraph (c)(2) of this section or which is not covered under a promulgated storm water general permit, a permit application made pursuant to paragraph (c) of this section shall be submitted to the Director by November 18, 1991;

(2) For any group application submitted in accordance with paragraph (c)(2) of this section:

(i) Part 1 of the application shall be submitted to the Director, Office of Water Enforcement and Permits by March 18, 1991;

(ii) Based on information in the part 1 application, the Director will approve or deny the members in the group application within 60 days after receiving part 1 of the group application.

(iii) Part 2 of the application shall be submitted to the Director, Office of Water Enforcement and Permits no later than 12 months after the date of approval of the part 1 application.

(iv) Facilities that are rejected as members of a group by the permitting authority shall have 12 months to file an individual permit application from the date they receive notification of their rejection.

(v) A facility listed under paragraph (b)(14) (i)–(xi) of this section may add on to a group application submitted in accordance with paragraph (e)(2)(i) of this section at the discretion of the Office of Water Enforcement and Permits, and only upon a showing of good cause by the facility and the group applicant; the request for the addition of the facility shall be made no later than February 18,1992; the addition of the facility shall not cause the percentage of the facilities that are required to submit quantitative data to be less than 10%, unless there are over 100 facilities in the group that are submitting quantitative data; approval to become part of group application must be obtained from the group or the trade association representing the individual facilities.

(3) For any discharge from a large municipal separate storm sewer system;

(i) Part 1 of the application shall be submitted to the Director by November 18, 1991;

(ii) Based on information received in the part 1 application the Director will approve or deny a sampling plan under paragraph (d)(1)(iv)(E) of this section within 90 days after receiving the part 1 application;

(iii) Part 2 of the application shall be submitted to the Director by November 16, 1992.

(4) For any discharge from a medium municipal separate storm sewer system;

(i) Part 1 of the application shall be submitted to the Director by May 18, 1992.

(ii) Based on information received in the part 1 application the Director will approve or deny a sampling plan under paragraph (d)(1)(iv)(E) of this section within 90 days after receiving the part 1 application.

(iii) Part 2 of the application shall be submitted to the Director by May 17, 1993.

(5) A permit application shall be submitted to the Director within 60 days of notice, unless permission for a later date is granted by the Director (*see* 40 CFR 124.52(c)), for:

(i) A storm water discharge which the Director, or in States with approved NPDES programs, either the Director or the EPA Regional Administrator, determines that the discharge contributes to a violation of a water quality standard or is a significant contributor of pollutants to waters of the United States (see paragraph (a)(1)(v) of this section);

(ii) A storm water discharge subject to paragraph (c)(1)(v) of this section.

(6) Facilities with existing NPDES permits for storm water discharges associated with industrial activity shall maintain existing permits. New applications shall be submitted in accordance with the requirements of 40 CFR 122.21 and 40 CFR 122.26(c) 180 days before the expiration of such permits. Facilities with expired permits or permits due to expire before May 18, 1992, shall submit applications in accordance with the deadline set forth under paragraph (e)(1) of this section.

(f) *Petitions.* (1) Any operator of a municipal separate storm sewer system may petition the Director to require a separate NPDES permit (or a permit issued under an approved NPDES State program) for any discharge into the municipal separate storm sewer system.

(2) Any person may petition the Director to require a NPDES permit for a discharge which is composed entirely of storm water which contributes to a violation of a water quality standard or is a significant contributor of pollutants to waters of the United States.

(3) The owner or operator of a municipal separate storm sewer system may petition the Director to reduce the Census estimates of the population served by such separate system to account for storm water discharged to combined sewers as defined by 40 CFR 35.2005(b)(11) that is treated in a publicly owned treatment works. In municipalities in which combined sewers are operated, the Census estimates of population may be reduced proportional to the fraction, based on estimated lengths, of the length of combined sewers over the sum of the length of combined sewers and municipal separate storm sewers where an applicant has submitted the NPDES permit number associated with each discharge point and a map indicating areas served by combined sewers and the location of any combined sewer overflow discharge point.

(4) Any person may petition the Director for the designation of a large or medium municipal separate storm sewer system as defined by paragraphs (b)(4)(iv) or (b)(7)(iv) of this section.

(5) The Director shall make a final determination on any petition received under this section within 90 days after receiving the petition.

6. Section 122.28(b)(2)(i) is revised to read as follows:

§ 122.28 General permits (applicable to State NPDES programs, see § 123.25).

* * * * *

(b) * * *

(2) *Requiring an individual permit.* (i) The Director may require any discharger authorized by a general permit to apply for and obtain an individual NPDES permit. Any interested person may petition the Director to take action under this paragraph. Cases where an individual NPDES permit may be required include the following:

(A) The discharger or "treatment works treating domestic sewage" is not in compliance with the conditions of the general NPDES permit;

(B) A change has occurred in the availability of demonstrated technology or practices for the control or abatement of pollutants applicable to the point source or treatment works treating domestic sewage;

(C) Effluent limitation guidelines are promulgated for point sources covered by the general NPDES permit;

(D) A Water Quality Management plan containing requirements applicable to such point sources is approved;

(E) Circumstances have changed since the time of the request to be covered so that the discharger is no longer appropriately controlled under the general permit, or either a temporary or permanent reduction or elimination of the authorized discharge is necessary;

(F) Standards for sewage sludge use or disposal have been promulgated for the sludge use and disposal practice covered by the general NPDES permit; or

(G) The discharge(s) is a significant contributor of pollutants. In making this determination, the Director may consider the following factors:

(*1*) The location of the discharge with respect to waters of the United States;

(*2*) The size of the discharge;

(*3*) The quantity and nature of the pollutants discharged to waters of the United States; and

(*4*) Other relevant factors;

* * * * *

7. Section 122.42 is amended by adding paragraph (c) to read as follows:

§ 122.42 Additional conditions applicable to specified categories of NPDES permits (applicable to State NPDES programs, see § 123.25).

* * * * *

(c) *Municipal separate storm sewer systems.* The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the Director under § 122.26(a)(1)(v) of this part must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report shall include:

(1) The status of implementing the components of the storm water management program that are established as permit conditions;

(2) Proposed changes to the storm water management programs that are established as permit condition. Such proposed changes shall be consistent with § 122.26(d)(2)(iii) of this part; and

(3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under § 122.26(d)(2)(iv) and (d)(2)(v) of this part;

(4) A summary of data, including monitoring data, that is accumulated throughout the reporting year;

(5) Annual expenditures and budget for year following each annual report;

(6) A summary describing the number and nature of enforcement actions, inspections, and public education programs;

(7) Identification of water quality improvements or degradation;

7a. Part 122 is amended by adding appendices E through I as follows:

Appendix E to Part 122—Rainfall Zones of the United States

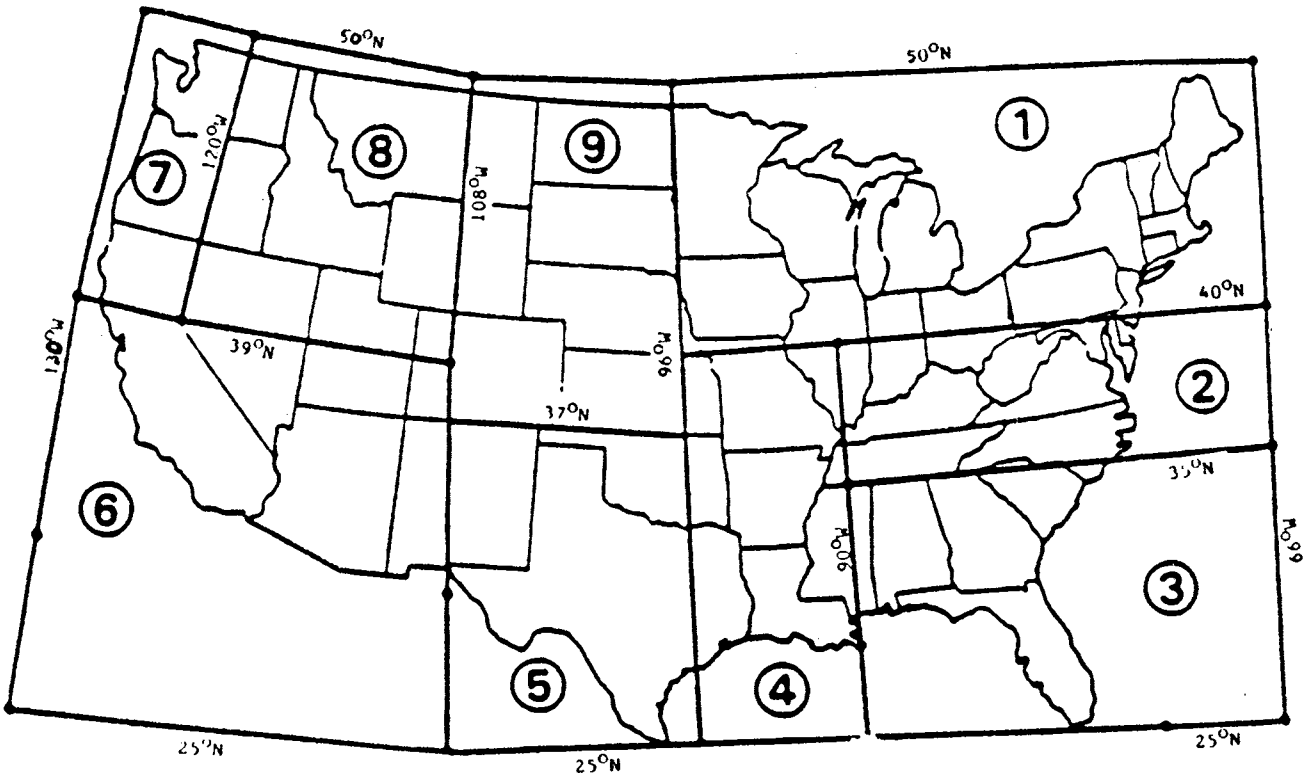

Not Shown: Alaska (Zone 7); Hawaii (Zone 7); Northern Mariana Islands (Zone 7); Guam (Zone 7); American Samoa (Zone 7); Trust Territory of the Pacific Islands (Zone 7); Puerto Rico (Zone 3) Virgin Islands (Zone 3).

Source: Methodology for Analysis of Detention Basins for Control of Urban Runoff Quality, prepared for U.S. Environmental Protection Agency, Office of Water, Nonpoint Source Division, Washington, DC, 1986.

Appendix F to Part 122—Incorporated Places With Populations Greater Than 250,000 According to Latest Decennial Census by Bureau of Census.

State	Incorporated place
Alabama	Birmingham.
Arizona	Phoenix.
	Tucson.
California	Long Beach.
	Los Angeles.
	Oakland.
	Sacramento.
	San Diego.
	San Francisco.
	San Jose.
Colorado	Denver.
District of Columbia	
Florida	Jacksonville.
	Miami.
	Tampa.
Georgia	Atlanta.
Illinois	Chicago.
Indiana	Indianapolis.
Kansas	Wichita.
Kentucky	Louisville.
Louisiana	New Orleans.
Maryland	Baltimore.
Massachusetts	Boston.
Michigan	Detroit.
Minnesota	Minneapolis
	St. Paul.

State	Incorporated place
Missouri	Kansas City.
	St. Louis.
Nebraska	Omaha.
New Jersey	Newark.
New Mexico	Albuquerque.
New York	Buffalo.
	Bronx Borough.
	Brooklyn Borough.
	Manhattan Borough.
	Queens Borough.
	Staten Island Borough.
North Carolina	Charlotte.
Ohio	Cincinnati.
	Cleveland.
	Columbus.
	Toledo.
Oklahoma	Oklahoma City.
	Tulsa.
Oregon	Portland.
Pennsylvania	Philadelphia.
	Pittsburgh.
Tennessee	Memphis.
	Nashville/Davidson.
Texas	Austin.
	Dallas.
	El Paso.
	Fort Worth.
	Houston.
	San Antonio
Virginia	Norfolk.
	Virginia Beach.
Washington	Seattle.
Wisconsin	Milwaukee.

Appendix G to Part 122—Incorporated Places With Populations Greater Than 100,000 and Less Than 250,000 According to Latest Decennial Census by Bureau of Census

State	Incorporated place
Alabama	Huntsville.
	Mobile.
	Montgomery.
Alaska	Anchorage.
Arizona	Mesa.
	Tempe.
Arkansas	Little Rock.
California	Anaheim.
	Bakersfield.
	Berkeley.
	Concord.
	Fremont.
	Fresno.
	Fullerton.
	Garden Grove
	Glendale.
	Huntington Beach.
	Modesto.
	Oxnard.
	Pasadena.
	Riverside.
	San Bernadino.
	Santa Ana.
	Stockton.
	Sunnyvale.
	Torrance.
Colorado	Aurora.
	Colorado Springs.
	Lakewood.
	Pueblo.
Connecticut	Bridgeport.
	Hartford.
	New Haven.
	Stamford.
	Waterbury.
Florida	Fort Lauderdale.
	Hialeah.
	Hollywood.
	Orlando.
	St. Petersburg.
Georgia	Columbus.
	Macon.
	Savannah.
Idaho	Boise City.
Illinois	Peoria.
	Rockford.
Indiana	Evansville.
	Fort Wayne.
	Gary.
	South Bend.
Iowa	Cedar Rapids.
	Davenport.
	Des Moines.
Kansas	Kansas City.
	Topeka.
Kentucky	Lexington-Fayette.
Louisiana	Baton Rouge.
	Shreveport.
Massachusetts	Springfield.
	Worcester.
Michigan	Ann Arbor.
	Flint.
	Grand Rapids
	Lansing.
	Livonia.
	Sterling Heights.
	Warren.
Mississippi	Jackson.
Missouri	Independence.
	Springfield.
Nebraska	Lincoln.
Nevada	Las Vegas.
	Reno.
New Jersey	Elizabeth.
	Jersey City.
	Paterson.
New York	Albany.
	Rochester.
	Syracuse.
	Yonkers.
North Carolina	Durham.
	Greensboro.
	Raleigh.
	Winston-Salem.
Ohio	Akron.
	Dayton.
	Youngstown
Oregon	Eugene.
Pennsylvania	Allentown.
	Erie.
Rhode Island	Providence.
South Carolina	Columbia.
Tennessee	Chattanooga.
	Knoxville.
Texas	Amarillo.
	Arlington.
	Beaumont.
	Corpus Christi
	Garland.
	Irving.
	Lubbock.
	Pasadena.
	Waco.
Utah	Salt Lake City.
Virginia	Alexandria.
	Chesapeake.
	Hampton.
	Newport News.
	Portsmouth.
	Richmond.
	Roanoke.
Washington	Spokane.
	Tacoma.
Wisconsin	Madison.

Appendix H to Part 122—Counties with Unincorporated Urbanized Areas With a Population of 250,000 or More According to the Latest Decennial Census by the Bureau of Census

State	County	Unincorporated urbanized population
California	Los Angeles	912,664
	Sacramento	449,056
	San Diego	304,758
Delaware	New Castle	257,184
Florida	Dade	781,949
Georgia	DeKalb	386,379
Hawaii	Honolulu	688,178
Maryland	Anne Arundel	271,458
	Baltimore	601,308
	Montgomery	447,993
	Prince George's	450,188
Texas	Harris	409,601
Utah	Salt Lake	304,632
Virginia	Fairfax	527,178
Washington	King	336,800

Appendix I to Part 122—Counties With Unincorporated Urbanized Areas Greater Than 100,000, But Less Than 250,000 According to the Latest Decennial Census by the Bureau of Census

State	County	Unincorporated urbanized population
Alabama	Jefferson	102,917
Arizona	Pima	111,479
California	Alameda	187,474
	Contra Costa	158,452
	Kern	117,231
	Orange	210,693
	Riverside	115,719
	San Bernardino	146,644
Florida	Broward	159,370
	Escambia	147,892
	Hillsborough	238,292
	Orange	245,325
	Palm Beach	167,089
	Pinellas	194,389
	Polk	104,150
	Sarasota	110,009
Georgia	Clayton	100,742
	Cobb	204,121
	Richmond	118,529
Kentucky	Jefferson	224,958
Louisiana	Jefferson	140,836
North Carolina	Cumberland	142,727
Nevada	Clark	201,775
Oregon	Multnomah	141,100
	Washington	109,348
South Carolina	Greenville	135,398
	Richland	124,684
Virginia	Arlington	152,599
	Henrico	161,204
	Chesterfield	108,348
Washington	Snohomish	103,493
	Pierce	196,113

PART 123—STATE PROGRAM REQUIREMENTS

8. The authority citation for part 123 continues to read as follows:

Authority: Clean Water Act, 33 U.S.C. 1251 *et seq.*

9. Section 123.25 is amended by revising paragraph (a)(9) to read as follows:

§ 123.25 Requirements for permitting.

(a) * * *

(9) § 122.26—(Storm water discharges);

* * * * *

PART 124—PROCEDURES FOR DECISIONMAKING

10. The authority citation for part 124 continues to read as follows:

Authority: Resource Conservation and Recovery Act, 42 U.S.C. 6901 *et seq.*; Safe Drinking Water Act, 42 U.S.C. 300f *et seq.*; Clean Water Act, 33 U.S.C. 1251 *et seq.*; and Clean Air Act, 42 U.S.C. 1857 *et seq.*

11. Section 124.52 is revised to read as follows:

§ 124.52 Permits required on a case-by-case basis.

(a) Various sections of part 122, subpart B allow the Director to determine, on a case-by-case basis, that certain concentrated animal feeding operations (§ 122.23), concentrated aquatic animal production facilities (§ 122.24), storm water discharges (§ 122.26), and certain other facilities covered by general permits (§ 122.28) that do not generally require an individual permit may be required to obtain an individual permit because of their contributions to water pollution.

(b) Whenever the Regional Administrator decides that an individual permit is required under this section, except as provided in paragraph (c) of this section, the Regional Administrator shall notify the discharger in writing of that decision and the reasons for it, and shall send an application form with the notice. The discharger must apply for a permit under § 122.21 within 60 days of notice, unless permission for a later date is granted by the Regional Administrator. The question whether the designation was proper will remain open for consideration during the public comment period under § 124.11 or § 124.118 and in any subsequent hearing.

(c) Prior to a case-by-case determination that an individual permit is required for a storm water discharge under this section (*see* 40 CFR 122.26 (a)(1)(v) and (c)(1)(v)), the Regional Administrator may require the discharger to submit a permit application or other information regarding the discharge under section 308 of the CWA. In requiring such information, the Regional Administrator shall notify the discharger in writing and shall send an application form with the notice. The discharger must apply for a permit under § 122.26 within 60 days of notice, unless permission for a later date is granted by the Regional Administrator. The question whether the initial designation was proper will remain open for consideration during the public comment period under § 124.11 or § 124.118 and in any subsequent hearing.

Note: The following form will not appear in the Code of Federal Regulations.

BILLING CODE 6560-50-M

Please print or type in the unshaded areas only

EPA ID Number (copy from Item 1 of Form 1)

Form Approved. OMB No. 2040-0086
Approval expires 5/31/92

Form 2F NPDES

EPA

United States Environmental Protection Agency
Washington, DC 20460

Application for Permit To Discharge Stormwater Discharges Associated with Industrial Activity

Paperwork Reduction Act Notice

Public reporting burden for this application is estimated to average 28.6 hours per application, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate, any other aspect of this collection of information, or suggestions for improving this form, including suggestions which may increase or reduce this burden to: Chief, Information Policy Branch, PM-223, U.S. Environmental Protection Agency, 401 M St., SW, Washington, DC 20460, or Director, Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, DC 20503.

I. Outfall Location

For each outfall, list the latitude and longitude of its location to the nearest 15 seconds and the name of the receiving water.

A. Outfall Number (list)	B. Latitude			C. Longitude			D. Receiving Water (name)

II. Improvements

A. Are you now required by any Federal, State, or local authority to meet any implementation schedule for the construction, upgrading or operation of wastewater treatment equipment or practices or any other environmental programs which may affect the discharges described in this application? This includes, but is not limited to, permit conditions, administrative or enforcement orders, enforcement compliance schedule letters, stipulations, court orders, and grant or loan conditions.

1. Identification of Conditions, Agreements, Etc.	2. Affected Outfalls		3. Brief Description of Project	4. Final Compliance Date	
	number	source of discharge		a. req.	b. proj.

B. You may attach additional sheets describing any additional water pollution (or other environmental projects which may affect your discharges) you now have under way or which you plan. Indicate whether each program is now under way or planned, and indicate your actual or planned schedules for construction.

III. Site Drainage Map

Attach a site map showing topography (or indicating the outline of drainage areas served by the outfall(s) covered in the application if a topographic map is unavailable) depicting the facility including: each of its intake and discharge structures; the drainage area of each storm water outfall; paved areas and buildings within the drainage area of each storm water outfall, each known past or present areas used for outdoor storage or disposal of significant materials, each existing structural control measure to reduce pollutants in storm water runoff, materials loading and access areas, areas where pesticides, herbicides, soil conditioners and fertilizers are applied; each of its hazardous waste treatment, storage or disposal units (including each area not required to have a RCRA permit which is used for accumulating hazardous waste under 40 CFR 262.34); each well where fluids from the facility are injected underground; springs, and other surface water bodies which receive storm water discharges from the facility.

 Continue on Page 2

Continued from the Front

IV. Narrative Description of Pollutant Sources

A. For each outfall, provide an estimate of the area (include units) of impervious surfaces (including paved areas and building roofs) drained to the outfall, and an estimate of the total surface area drained by the outfall.

Outfall Number	Area of Impervious Surface *(provide units)*	Total Area Drained *(provide units)*	Outfall Number	Area of Impervious Surface *(provide units)*	Total Area Drained *(provide units)*

B. Provide a narrative description of significant materials that are currently or in the past three years have been treated, stored or disposed in a manner to allow exposure to storm water; method of treatment, storage, or disposal; past and present materials management practices employed, in the last three years, to minimize contact by these materials with storm water runoff; materials loading and access areas; and the location, manner, and frequency in which pesticides, herbicides, soil conditioners, and fertilizers are applied.

C. For each outfall, provide the location and a description of existing structural and nonstructural control measures to reduce pollutants in storm water runoff; and a description of the treatment the storm water receives, including the schedule and type of maintenance for control and treatment measures and the ultimate disposal of any solid or fluid wastes other than by discharge.

Outfall Number	Treatment	List Codes from Table 2F-1

V. Nonstormwater Discharges

A. I certify under penalty of law that the outfall(s) covered by this application have been tested or evaluated for the presence of nonstormwater discharges, and that all nonstormwater discharges from these outfall(s) are identified in either an accompanying Form 2C or Form 2E application for the outfall.

Name and Official Title *(type or print)*	Signature	Date Signed

B. Provide a description of the method used, the date of any testing, and the onsite drainage points that were directly observed during a test.

VI. Significant Leaks or Spills

Provide existing information regarding the history of significant leaks or spills of toxic or hazardous pollutants at the facility in the last three years, including the approximate date and location of the spill or leak, and the type and amount of material released.

 Continue on Page 3

EPA ID Number *(copy from Item I of Form 1)*

Continued from Page 2

VII. Discharge Information

A,B,C, & D: See instructions before proceeding. Complete one set of tables for each outfall. Annotate the outfall number in the space provided. Tables VII-A, VII-B, and VII-C are included on separate sheets numbered VII-1 and VII-2.

E: Potential discharges not covered by analysis - Is any pollutant listed in Table 2F-2 a substance or a component of a substance which you currently use or manufacture as an intermediate or final product or byproduct?

☐ Yes *(list all such pollutants below)* ☐ No *(go to Section VIII)*

VIII. Biological Toxicity Testing Data

☐ Yes *(list results below)* ☐ No *(go to Section IX)*

IX. Contract Analysis Information

☐ Yes ☐ No *(go to Section X)*

A. Name	B. Address	C. Area Code & Phone No.	D. Pollutants Analyzed

X. Certification

A. Name & Official Title *(type or print)*	B. Area Code and Phone No.
C. Signature	D. Date Signed

EPA ID Number *(copy from Item I of Form 1)*

Form Approved. OMB No. 2040-0086
Approval expires 5/31/92

VII. Discharge Information *(Continued from page 3 of Form 2F)*

Part A - You must provide the results of **at least one** analysis **for every pollutant** in this table. Complete **one table** for each outfall. See instructions for additional details.

Pollutant and CAS Number *(if available)*	Maximum Values *(include units)*		Average Values *(include units)*		Number of Storm Events Sampled	Sources of Pollutants
	Grab Sample Taken During First 30 Minutes	Flow-weighted Composite	Grab Sample Taken During First 30 Minutes	Flow-weighted Composite		
Oil nd Grease						
Biological Oxygen Demand (BOD5)						
Chemical Oxygen Demand (COD)						
Total Suspended Solids (TSS)						
Total Kjeldahl Nitrogen						
Nitrate plus Nitrite Nitrogen						
Total Phosphorus						
pH	Minimum	Maximum	Minimum	Maximum		

Part B - List each pollutant that is limited in an effluent guideline which the facility is subject to or any pollutant listed in the facility's NPDES permit for its process wastewater (if the facility is operating under an existing NPDES permit). Complete one table for each outfall. See the instructions for additional details and requirements.

Pollutant and CAS Number *(if available)*	Maximum Values *(include units)*		Average Values *(include units)*		Number of Storm Events Sampled	Sources of Pollutants
	Grab Sample Taken During First 30 Minutes	Flow-weighted Composite	Grab Sample Taken During First 30 Minutes	Flow-weighted Composite		

Continued from the Front

Part C - List each pollutant shown in Tables 2F-2, 2F-3, and 2F-4 that you know or have reason to believe is present. See the instructions for additional details and requirements. Complete one table for each outfall.

Pollutant and CAS Number *(if available)*	Maximum Values *(include units)*		Average Values *(include units)*		Number of Storm Events Sampled	Sources of Pollutants
	Grab Sample Taken During First 30 Minutes	Flow-weighted Composite	Grab Sample Taken During First 30 Minutes	Flow-weighted Composite		

Part D - Provide data for the storm event(s) which resulted in the maximum values for the flow weighted composite sample.

1. Date of Storm Event	2. Duration of Storm *(in minutes)*	3. Total rainfall during storm event *(in inches)*	4. Number of hours between beginning of storm measured and end of previous measurable rain event	5. Maximum floe rate during rain event *(gallons/minute or specify units*	6. Total flow from rain event *(gallons or specify units)*	7. Season sample was taken	8. Form of Precipitation *(rainfall, snowmelt)*

9. Provide a description of the method of flow measurement or estimate.

Instructions - Form 2F
Application for Permit to Discharge Storm Water Associated with Industrial Activity

Who Must File Form 2F

Form 2F must be completed by operators of facilities which discharge storm water associated with industrial activity or by operators of storm water discharges that EPA is evaluating for designation as a significant contributor of pollutants to waters of the United States, or as contributing to a violation of a water quality standard.

Operators of discharges which are composed entirely of storm water must complete Form 2F (EPA Form 3510-2F) in conjunction with Form 1 (EPA Form 3510-1).

Operators of discharges of storm water which are combined with process wastewater (process wastewater is water that comes into direct contact with or results from the production or use of any raw material, intermediate product, finished product, byproduct, waste product, or wastewater) must complete and submit Form 2F, Form 1, and Form 2C (EPA Form 3510-2C).

Operators of discharges of storm water which are combined with nonprocess wastewater (nonprocess wastewater includes noncontact cooling water and sanitary wastes which are not regulated by effluent guidelines or a new source performance standard, except discharges by educational, medical, or commercial chemical laboratories) must complete Form 1, Form 2F, and Form 2E (EPA Form 3510-2E).

Operators of new sources or new discharges of storm water associated with industrial activity which will be combined with other nonstormwater new sources or new discharges must submit Form 1, Form 2F, and Form 2D (EPA Form 3510-2D).

Where to File Applications

The application forms should be sent to the EPA Regional Office which covers the State in which the facility is located. Form 2F must be used only when applying for permits in States where the NPDES permits program is administered by EPA. For facilities located in States which are approved to administer the NPDES permits program, the State environmental agency should be contacted for proper permit application forms and instructions.

Information on whether a particular program is administered by EPA or by a State agency can be obtained from your EPA Regional Office. Form 1, Table 1 of the "General Instructions" lists the addresses of EPA Regional Offices and the States within the jurisdiction of each Office.

Completeness

Your application will not be considered complete unless you answer every question on this form and on Form 1. If an item does not apply to you, enter "NA" (for not applicable) to show that you considered the question.

Public Availability of Submitted Information

You may not claim as confidential any information required by this form or Form 1, whether the information is reported on the forms or in an attachment. Section 402(j) of the Clean Water Act requires that all permit applications will be available to the public. This information will be made available to the public upon request.

Any information you submit to EPA which goes beyond that required by this form, Form 1, or Form 2C you may claim as confidential, but claims for information which are effluent data will be denied.

If you do not assert a claim of confidentiality at the time of submitting the information, EPA may make the information public without further notice to you. Claims of confidentiality will be handled in accordance with EPA's business confidentiality regulations at 40 CFR Part 2.

Definitions

All significant terms used in these instructions and in the form are defined in the glossary found in the General Instructions which accompany Form 1.

EPA ID Number

Fill in your EPA Identification Number at the top of each odd-numbered page of Form 2F. You may copy this number directly from item I of Form 1.

Item I

You may use the map you provided for item XI of Form 1 to determine the latitude and longitude of each of your outfalls and the name of the receiving water.

Item II-A

If you check "yes" to this question, complete all parts of the chart, or attach a copy of any previous submission you have made to EPA containing the same information.

Item II-B

You are not required to submit a description of future pollution control projects if you do not wish to or if none is planned.

Item III

Attach a site map showing topography (or indicating the outline of drainage areas served by the outfall(s) covered in the application if a topographic map is unavailable) depicting the facility including:

each of its drainage and discharge structures;

the drainage area of each storm water outfall;

paved areas and building within the drainage area of each storm water outfall, each known past or present areas used for outdoor storage or disposal of significant materials, each existing structural control measure to reduce pollutants in storm water runoff, materials loading and access areas, areas where pesticides, herbicides, soil conditioners and fertilizers are applied;

each of its hazardous waste treatment, storage or disposal facilities (including each area not required to have a RCRA permit which is used for accumulating hazardous waste for less than 90 days under 40 CFR 262.34);

each well where fluids from the facility are injected underground; and

springs, and other surface water bodies which receive storm water discharges from the facility;

Item IV-A

For each outfall, provide an estimate of the area drained by the outfall which is covered by impervious surfaces. For the purpose of this application, impervious surfaces are surfaces where storm water runs off at rates that are significantly higher than background rates (e.g., predevelopment levels) and include paved areas, building roofs, parking lots, and roadways. Include an estimate of the total area (including all impervious and pervious areas) drained by each outfall. The site map required under item III can be used to estimate the total area drained by each outfall.

Item IV-B

Provide a narrative description of significant materials that are currently or in the past three years have been treated, stored, or disposed in a manner to allow exposure to storm water; method of treatment, storage or disposal of these materials; past and present materials management practices employed, in the last three years, to minimize contact by these materials with storm water runoff; materials loading and access areas; and the location, manner, and frequency in which pesticides, herbicides, soil conditioners, and fertilizers are applied. Significant materials should be identified by chemical name, form (e.g., powder, liquid, etc.), and type of container or treatment unit. Indicate any materials treated, stored, or disposed of together. "Significant materials" includes, but is not limited to: raw materials; fuels; materials such as solvents, detergents, and plastic pellets; finished materials such as metallic products; raw materials used in food processing or production; hazardous substances designated under Section 101(14) of CERCLA; any chemical the facility is required to report pursuant to Section 313 of Title III of SARA; fertilizers; pesticides; and waste products such as ashes, slag and sludge that have the potential to be released with storm water discharges.

Item IV-C

For each outfall, structural controls include structures which enclose material handling or storage areas, covering materials, berms, dikes, or diversion ditches around manufacturing, production, storage or treatment units, retention ponds, etc. Nonstructural controls include practices such as spill prevention plans, employee training, visual inspections, preventive maintenance, and housekeeping measures that are used to prevent or minimize the potential for releases of pollutants.

Item V

Provide a certification that all outfalls that should contain storm water discharges associated with industrial activity have been tested or evaluated for the presence of non-storm water discharges which are not covered by an NPDES permit. Tests for such non-storm water discharges may include smoke tests, fluorometric dye tests, analysis of accurate schematics, as well as other appropriate tests. Part B must include a description of the method used, the date of any testing, and the onsite drainage points that were directly observed during a test. All non-storm water discharges must be identified in a Form 2C or Form 2E which must accompany this application (see beginning of instructions under section titled "Who Must File Form 2F" for a description of when Form 2C and Form 2E must be submitted).

Item VI

Provide a description of existing information regarding the history of significant leaks or spills of toxic or hazardous pollutants at the facility in the last three years.

Item VII-A, B, and C

These items require you to collect and report data on the pollutants discharged for each of your outfalls. Each part of this item addresses a different set of pollutants and must be completed in accordance with the specific instructions for that part. The following general instructions apply to the entire item.

General Instructions

Part A requires you to report at least one analysis for each pollutant listed. Parts B and C require you to report analytical data in two ways. For some pollutants addressed in Parts B and C, if you know or have reason to know that the pollutant is present in your discharge, you may be required to list the pollutant and test (sample and analyze) and report the levels of the pollutants in your discharge. For all other pollutants addressed in Parts B and C, you must list the pollutant if you know or have reason to know that the pollutant is present in the discharge, and either report quantitative data for the pollutant or briefly describe the reasons the pollutant is expected to be discharged. (See specific instructions on the form and below for Parts A through C.) Base your determination that a pollutant is present in or absent from your discharge on your knowledge of your raw materials, material management practices, maintenance chemicals, history of spills and releases, intermediate and final products and byproducts, and any previous analyses known to you of your effluent or similar effluent.

A. **Sampling:** The collection of the samples for the reported analyses should be supervised by a person experienced in performing sampling of industrial wastewater or storm water discharges. You may contact EPA or your State permitting authority for detailed guidance on sampling techniques and for answers to specific questions. Any specific requirements contained in the applicable analytical methods should be followed for sample containers, sample preservation, holding times, the collection of duplicate samples, etc. The time when you sample should be representative, to the extent feasible, of your treatment system operating properly with no system upsets. Samples should be collected from the center of the flow channel, where turbulence is at a maximum, at a site specified in your present permit, or at any site adequate for the collection of a representative sample.

For pH, temperature, cyanide, total phenols, residual chlorine, oil and grease, and fecal coliform, grab samples taken during the first 30 minutes (or as soon thereafter as practicable) of the discharge must be used (you are not required to analyze a flow-weighted composite for these parameters). For all other pollutants both a grab sample collected during the first 30 minutes (or as soon thereafter as practicable) of the discharge and a flow-weighted composite sample must be analyzed. However, a minimum of one grab sample may be taken for effluents from holding ponds or other impoundments with a retention period of greater than 24 hours.

All samples shall be collected from the discharge resulting from a storm event that is greater than 0.1 inches and at least 72 hours from the previously measurable (greater than 0.1 inch rainfall) storm event. Where feasible, the variance in the duration of the event and the total rainfall of the event should not exceed 50 percent from the average or median rainfall event in that area.

A grab sample shall be taken during the first thirty minutes of the discharge (or as soon thereafter as practicable), and a flow-weighted composite shall be taken for the entire event or for the first three hours of the event.

Grab and composite samples are defined as follows:

Grab sample: An individual sample of at least 100 milliliters collected during the first thirty minutes (or as soon thereafter as practicable) of the discharge. This sample is to be analyzed separately from the composite sample.

Flow-Weighted Composite sample: A flow-weighted composite sample may be taken with a continuous sampler that proportions the amount of sample collected with the flow rate or as a combination of a minimum of three sample aliquots taken in each hour of discharge for the entire event or for the first three hours of the event, with each aliquot being at least 100 milliliters and collected with a minimum period of fifteen minutes between aliquot collections. The composite must be flow proportional; either the time interval between each aliquot or the volume of each aliquot must be proportional to either the stream flow at the time of sampling or the total stream flow since the collection of the previous aliquot. Aliquots may be collected manually or automatically. Where GC/MS Volatile Organic Analysis (VOA) is required, aliquots must be combined in the laboratory immediately before analysis. Only one analysis for the composite sample is required.

Data from samples taken in the past may be used, provided that:

All data requirements are met;

Sampling was done no more than three years before submission; and

All data are representative of the present discharge.

Among the factors which would cause the data to be unrepresentative are significant changes in production level, changes in raw materials, processes, or final products, and changes in storm water treatment. When the Agency promulgates new analytical methods in 40 CFR Part 136, EPA will provide information as to when you should use the new methods to generate data on your discharges. Of course, the Director may request additional information, including current quantitative data, if they determine it to be necessary to assess your discharges. The Director may allow or establish appropriate site-specific sampling procedures or requirements, including sampling locations, the season in which the sampling takes place, the minimum duration between the previous measurable storm event and the storm event sampled, the minimum or maximum level of precipitation required for an appropriate storm event, the form of precipitation sampled (snow melt or rainfall), protocols for collecting samples under 40 CFR Part 136, and additional time for submitting data on a case-by-case basis.

B. **Reporting:** All levels must be reported as concentration and as total mass. You may report some or all of the required data by attaching separate sheets of paper instead of filling out pages VII-1 and VII-2 if the separate sheets contain all the required information in a format which is consistent with pages VII-1 and VII-2 in spacing and in identification of pollutants and columns. Use the following abbreviations in the columns headed "Units."

Concentration		Mass	
ppm	parts per million	lbs	pounds
mg/1	milligrams per liter	ton	tons (English tons)
ppb	parts per billion	mg	milligrams
ug/1	micrograms per liter	g	grams
kg	kilograms	T	tonnes (metric tons)

All reporting of values for metals must be in terms of "total recoverable metal," unless:

(1) An applicable, promulgated effluent limitation or standard specifies the limitation for the metal in dissolved, valent, or total form; or

(2) All approved analytical methods for the metal inherently measure only its dissolved form (e.g., hexavalent chromium); or

(3) The permitting authority has determined that in establishing case-by-case limitations it is necessary to express the limitations on the metal in dissolved, valent, or total form to carry out the provisions of the CWA. If you measure only one grab sample and one flow-weighted composite sample for a given outfall, complete only the "Maximum Values" columns and insert "1" into the "Number of Storm Events Sampled" column. The permitting authority may require you to conduct additional analyses to further characterize your discharges.

If you measure more than one value for a grab sample or a flow-weighted composite sample for a given outfall and those values are representative of your discharge, you must report them. You must describe your method of testing and data analysis. You also must determine the average of all values within the last year and report the concentration mass under the "Average Values" columns, and the total number of storm events sampled under the "Number of Storm Events Sampled" columns.

C. **Analysis:** You must use test methods promulgated in 40 CFR Part 136; however, if none has been promulgated for a particular pollutant, you may use any suitable method for measuring the level of the pollutant in your discharge provided that you submit a description of the method or a reference to a published method. Your description should include the sample holding time, preservation techniques, and the quality control measures which you used. If you have two or more substantially identical outfalls, you may request permission from your permitting authority to sample and analyze only one outfall and submit the results of the analysis for other substantially identical outfalls. If your request is granted by the permitting authority, on a separate sheet attached to the application form, identify which outfall you did test, and describe why the outfalls which you did not test are substantially identical to the outfall which you did test.

Part VII-A

Part VII-A must be completed by all applicants for all outfalls who must complete Form 2F.

Analyze a grab sample collected during the first thirty minutes (or as soon thereafter as practicable) of the discharge and flow-weighted composite samples for all pollutants in this Part, and report the results except use only grab samples for pH and oil and grease. See discussion in General Instructions to Item VII for definitions of grab sample collected during the first thirty minutes of discharge and flow-weighted composite sample. The "Average Values" column is not compulsory but should be filled out if data are available.

Part VII-B

List all pollutants that are limited in an effluent guideline which the facility is subject to (see 40 CFR Subchapter N to determine which pollutants are limited in effluent guidelines) or any pollutant listed in the facility's NPDES permit for its process wastewater (if the facility is operating under an existing NPDES permit). Complete one table for each outfall. See discussion in General instructions to item VII for definitions of grab sample collected during the first thirty minutes (or as soon thereafter as practicable) of discharge and flow-weighted composite sample. The "Average Values" column is not compulsory but should be filled out if data are available.

Analyze a grab sample collected during the first thirty minutes of the discharge and flow-weighted composite samples for all pollutants in this Part, and report the results, except as provided in the General Instructions.

Part VII-C

Part VII-C must be completed by all applicants for all outfalls which discharge storm water associated with industrial activity, or that EPA is evaluating for designation as a significant contributor of pollutants to waters of the United States, or as contributing to a violation of a water quality standard. Use both a grab sample and a composite sample for all pollutants you analyze for in this part except use grab samples for residual chlorine and fecal coliform. The "Average Values" column is not compulsory but should be filled out if data are available. Part C requires you to address the pollutants in Table 2F-2, 2F-3, and 2F-4 for each outfall. Pollutants in each of these Tables are addressed differently.

Table 2F-2: For each outfall, list all pollutants in Table 2F-2 that you know or have reason to believe are discharged (except pollutants previously listed in Part VII-B). If a pollutant is limited in an effluent guideline limitation which the facility is subject to (e.g., use of TSS as an indicator to control the discharge of iron and aluminum), the pollutant should be listed in Part VII-B. If a pollutant in table 2F-2 is indirectly limited by an effluent guideline limitation through an indicator, you must analyze for it and report data in Part VII-C. For other pollutants listed in Table 2F-2 (those not limited directly or indirectly by an effluent limitation guideline), that you know or have reason to believe are discharges, you must either report quantitative data or briefly describe the reasons the pollutant is expected to be discharged.

Table 2F-3: For each outfall, list all pollutants in Table 2F-3 that you know or have reason to believe are discharged. For every pollutant in Table 2F-3 expected to be discharged in concentrations of 10 ppb or greater, you must submit quantitative data. For acrolein, acrylonitrile, 2,4 dinitrophenol, and 2-methyl-4,6 dinitrophenol, you must submit quantitative data if any of these four pollutants is expected to be discharged

in concentrations of 100 ppb or greater. For every pollutant expected to be discharged in concentrations less than 10 ppb (or 100 ppb for the four pollutants listed above), then you must either submit quantitative data or briefly describe the reasons the pollutant is expected to be discharged.

Small Business Exemption - If you are a "small business," you are exempt from the reporting requirements for the organic toxic pollutants listed in Table 2F-3. There are two ways in which you can qualify as a "small business". If your facility is a coal mine, and if your probable total annual production is less than 100,000 tons per year, you may submit past production data or estimated future production (such as a schedule of estimated total production under 30 CFR 795.14(c)) instead of conducting analyses for the organic toxic pollutants. If your facility is not a coal mine, and if your gross total annual sales for the most recent three years average less than $100,000 per year (in second quarter 1980 dollars), you may submit sales data for those years instead of conducting analyses for the organic toxic pollutants. The production or sales data must be for the facility which is the source of the discharge. The data should not be limited to production or sales for the process or processes which contribute to the discharge, unless those are the only processes at your facility. For sales data, in situations involving intracorporate transfer of goods and services, the transfer price per unit should approximate market prices for those goods and services as closely as possible. Sales figures for years after 1980 should be indexed to the second quarter of 1980 by using the gross national product price deflator (second quarter of 1980=100). This index is available in National Income and Product Accounts of the United States (Department of Commerce, Bureau of Economic Analysis).

Table 2F-4: For each outfall, list any pollutant in Table 2F-4 that you know or believe to be present in the discharge and explain why you believe it to be present. No analysis is required, but if you have analytical data, you must report them. **Note:** Under 40 CFR 117.12(a)(2), certain discharges of hazardous substances (listed at 40 CFR 177.21 or 40 CFR 302.4) may be exempted from the requirements of section 311 of CWA, which establishes reporting requirements, civil penalties, and liability for cleanup costs for spills of oil and hazardous substances. A discharge of a particular substance may be exempted if the origin, source, and amount of the discharged substances are identified in the NPDES permit application or in the permit, if the permit contains a requirement for treatment of the discharge, and if the treatment is in place. To apply for an exclusion of the discharge of any hazardous substance from the requirements of section 311, attach additional sheets of paper to your form, setting forth the following information:

1. The substance and the amount of each substance which may be discharged.
2. The origin and source of the discharge of the substance.
3. The treatment which is to be provided for the discharge by:
    a. An onsite treatment system separate from any treatment system treating your normal discharge;
    b. A treatment system designed to treat your normal discharge and which is additionally capable of treating the amount of the substance identified under paragraph 1 above; or
    c. Any combination of the above.

See 40 CFR 117.12(a)(2) and (c), published on August 29, 1979, in 44 FR 50766, or contact your Regional Office (Table 1 on Form 1, Instructions), for further information on exclusions from section 311.

Part VII-D

If sampling is conducted during more than one storm event, you only need to report the information requested in Part VII-D for the storm event(s) which resulted in any maximum pollutant concentration reported in Part VII-A, VII-B, or VII-C.

Provide flow measurements or estimates of the flow rate, and the total amount of discharge for the storm event(s) sampled, the method of flow measurement, or estimation. Provide the data and duration of the storm event(s) sampled, rainfall measurements, or estimates of the storm event which generated the sampled runoff and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event.

Part VII-E

List any toxic pollutant listed in Tables 2F-2, 2F-3, or 2F-4 which you currently use or manufacture as an intermediate or final product or byproduct. In addition, if you know or have reason to believe that 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) is discharged or if you use or manufacture 2,4,5-trichlorophenoxy acetic

acid (2,4,5,-T); 2-(2,4,5-trichlorophenoxy) propanoic acid (Silvex, 2,4,5,-TP); 2-(2,4,5-trichlorophenoxy) ethyl, 2,2-dichloropropionate (Erbon); O,O-dimethyl O-(2,4,5-trichlorphenyl) phosphorothioate (Ronnel); 2,4,5-trichlorophenol (TCP); or hexachlorophene (HCP); then list TCDD. The Director may waive or modify the requirement if you demonstrate that it would be unduly burdensome to identify each toxic pollutant and the Director has adequate information to issue your permit. You may not claim this information as confidential; however, you do not have to distinguish between use or production of the pollutants or list the amounts.

Item VIII

Self explanatory. The permitting authority may ask you to provide additional details after your application is received.

Item X

The Clean Water Act provides for severe penalties for submitting false information on this application form.

Section 309(c)(4) of the Clean Water Act provides that "Any person who knowingly makes any false material statement, representation, or certification in any application, . . . shall upon conviction, be punished by a fine of not more than $10,000 or by imprisonment for not more than 2 years, or by both. If a conviction of such person is for a violation committed after a first conviction of such person under this paragraph, punishment shall be by a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or by both." 40 CFR Part 122.22 requires the certification to be signed as follows:

(A) For a corporation: by a responsible corporate official. For purposes of this section, a responsible corporate official means (i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding $25,000,000 (in second-quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

Note: EPA does not require specific assignments or delegation of authority to responsible corporate officers identified in 122.22(a)(1)(i). The Agency will presume that these responsible corporate officers have the requisite authority to sign permit applications unless the corporation has notified the Director to the contrary. Corporate procedures governing authority to sign permit applications may provide for assignment or delegation to applicable corporate position under 122.22(a)(1)(ii) rather than to specific individuals.

(B) For a partnership or sole proprietorship: by a general partner or the proprietor, respectively; or

(C) For a municipality, State, Federal, or other public agency: by either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer of a Federal agency includes (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrators of EPA).

Table 2F-1
Codes for Treatment Units

Physical Treatment Processes

1-A	Ammonia Stripping	1-M	Grit Removal
1-B	Dialysis	1-N	Microstraining
1-C	Diatomaceous Earth Filtration	1-O	Mixing
1-D	Distillation	1-P	Moving Bed Filters
1-E	Electrodialysis	1-Q	Multimedia Filtration
1-F	Evaporation	1-R	Rapid Sand Filtration
1-G	Flocculation	1-S	Reverse Osmosis (Hyperfiltration)
1-H	Flotation	1-T	Screening
1-I	Foam Fractionation	1-U	Sedimentation (Setting)
1-J	Freezing	1-V	Slow Sand Filtration
1-K	Gas-Phase Separation	1-W	Solvent Extraction
1-L	Grinding (Comminutors)	1-X	Sorption

Chemical Treatment Processes

2-A	Carbon Adsorption	2-G	Disinfection (Ozone)
2-B	Chemical Oxidation	2-H	Disinfection (Other)
2-C	Chemical Precipitation	2-I	Electrochemical Treatment
2-D	Coagulation	2-J	Ion Exchange
2-E	Dechlorination	2-K	Neutralization
2-F	Disinfection (Chlorine)	2-L	Reduction

Biological Treatment Processes

3-A	Activated Sludge	3-E	Pre-Aeration
3-B	Aerated Lagoons	3-F	Spray Irrigation/Land Application
3-C	Anaerobic Treatment	3-G	Stabilization Ponds
3-D	Nitrification-Denitrification	3-H	Trickling Filtration

Other Processes

4-A	Discharge to Surface Water	4-C	Reuse/Recycle of Treated Effluent
4-B	Ocean Discharge Through Outfall	4-D	Underground Injection

Sludge Treatment and Disposal Processes

5-A	Aerobic Digestion	5-M	Heat Drying
5-B	Anaerobic Digestion	5-N	Heat Treatment
5-C	Belt Filtration	5-O	Incineration
5-D	Centrifugation	5-P	Land Application
5-E	Chemical Conditioning	5-Q	Landfill
5-F	Chlorine Treatment	5-R	Pressure Filtration
5-G	Composting	5-S	Pyrolysis
5-H	Drying Beds	5-T	Sludge Lagoons
5-I	Elutriation	5-U	Vacuum Filtration
5-J	Flotation Thickening	5-V	Vibration
5-K	Freezing	5-W	Wet Oxidation
5-L	Gravity Thickening		

Table 2F-2

Conventional and Nonconventional Pollutants Required To Be Tested by Existing Discharger if Expected To Be Present

Bromide
Chlorine, Total Residual
Color
Fecal Coliform
Fluoride
Nitrate-Nitrite
Nitrogen, Total Kjedahl
Oil and Grease
Phosphorus, Total Radioactivity
Sulfate
Sulfide
Sulfite
Surfactants
Aluminum, Total
Barium, Total
Boron, Total
Cobalt, Total
Iron, Total
Magnesium, Total
Molybdenum, Total
Magnesium, Total
Tin, Total
Titanium, Total

Table 2F-3

Toxic pollutants required to be identified by applicant if expected to be present

Toxic Pollutants and Total Phenol

Antimony, Total	Copper, Total	Silver, Total
Arsenic, Total	Lead, Total	Thallium, Total
Beryllium, Total	Mercury, Total	Zinc, Total
Cadmium, Total	Nickel, Total	Cyanide, Total
Chromium, Total	Selenium, Total	Phenols, Total

GC/MS Fraction Volatiles Compounds

Acrolein	Dichlorobromomethane	1,1,2,2,-Tetrachloroethane
Acrylonitrile	1,1-Dichloroethane	Tetrachloroethylene
Benzene	1,2-Dichloroethane	Toluene
Bromoform	1,1-Dichloroethylene	1,2-Trans-Dichloroethylene
Carbon Tetrachloride	1,2-Dichloropropane	1,1,1-Trichloroethane
Chlorobenzene	1,3-Dichloropropylene	1,1,2-Trichloroethane
Chlorodibromomethane	Ethylbenzene	Trichloroethylene
Chloroethane	Methyl Bromide	Vinyl Chloride
2-Chloroethylvinyl Ether	Methyl Chloride	
Chloroform	Methylene Chloride	

Acid Compounds

2-Chlorophenol	2,4-Dinitrophenol	Pentachlorophenol
2,4-Dichlorophenol	2-Nitrophenol	Phenol
2,4-Dimethylphenol	4-Nitrophenol	2,4,6-Trichlorophenol
4,6-Dinitro-O-Cresol	p-Chloro-M-Cresol	

Base/Neutral

Acenaphthene	2-Chloronaphthalene	Fluroranthene
Acenaphthylene	4-Chlorophenyl Phenyl Ether	Fluorene
Anthracene	Chrysene	Hexachlorobenzene
Benzidine	Dibenzo(a,h)anthracene	Hexachlorobutadiene
Benzo(a)anthracene	1,2-Dichlorobenzene	Hexachloroethane
Benzo(a)pyrene	1,3-Dichlorobenzene	Indeno(1,2,3-cd)pyrene
3,4-Benzofluoranthene	1,4-Dichlorobenzene	Isophorone
Benzo(ghi)perylene	3,3'-Dichlorobenzidine	Napthalene
Benzo(k)fluoranthene	Diethyl Phthalate	Nitrobenzene
Bis(2-chloroethoxy)methane	Dimethyl Phthalate	N-Nitrosodimethylamine
Bis(2-chloroethyl)ether	Di-N-Butyl Phthalate	N-Nitrosodi-N-Propylamine
Bis(2-chloroisopropyl)ether	2,4-Dinitrotoluene	N-Nitrosodiphenylamine
Bis(2-ethylyhexyl)phthalate	2,6-Dinitrotoluene	Phenanthrene
4-Bromophenyl Phenyl Ether	Di-N-Octylphthalate	Pyrene
Butylbenzyl Phthalate	1,2-Diphenylhydrazine (as Azobenzene)	1,2,4-Trichlorobenzene

Pesticides

Aldrin	Dieldrin	PCB-1254
Alpha-BHC	Alpha-Endosulfan	PCB-1221
Beta-BHC	Beta-Endosulfan	PCB-1232
Gamma-BHC	Endosulfan Sulfate	PCB-1248
Delta-BHC	Endrin	PCB-1260
Chlordane	Endrin Aldehyde	PCB-1016
4,4'-DDT	Heptachlor	Toxaphene
4,4'-DDE	Heptachlor Epoxide	
4,4'-DDD	PCB-1242	

Table 2F-4

Hazardous substances required to be identified by applicant if expected to be present

Toxic Pollutant

Asbestos

Hazardous Substances

Acetaldehyde	Dinitrobenzene	Napthenic acid
Allyl alcohol	Diquat	Nitrotoluene
Allyl chloride	Disulfoton	Parathion
Amyl acetate	Diuron	Phenolsulfonate
Aniline	Epichlorohydrin	Phosgene
Benzonitrile	Ethion	Propargite
Benzyl chloride	Ethylene diamine	Propylene oxide
Butyl acetate	Ethylene dibromide	Pyrethrins
Butylamine	Formaldehyde	Quinoline
Carbaryl	Furfural	Resorcinol
Carbofuran	Guthion	Stronthium
Carbon disulfide	Isoprene	Strychnine
Chlorpyrifos	Isopropanolamine	Styrene
Coumaphos	Kelthane	2,4,5-T (2,4,5-Trichlorophenoxyacetic acid)
Cresol	Kepone	TDE (Tetrachlorodiphenyl ethane)
Crotonaldehyde	Malathion	2,4,5-TP [2-(2,4,5-Trichlorophenoxy) propanoic acid]
Cyclohexane	Mercaptodimethur	Trichlorofan
2,4-D (2,4-Dichlorophenoxyacetic acid)	Methoxychlor	Triethylamine
Diazinon	Methyl mercaptan	Trimethylamine
Dicamba	Methyl methacrylate	Uranium
Dichlobenil	Methyl parathion	Vanadium
Dichlone	Mevinphos	Vinyl acetate
2,2-Dichloropropionic acid	Mexacarbate	Xylene
Dichlorvos	Monoethyl amine	Xylenol
Diethyl amine	Monomethyl amine	Zirconium
Dimethyl amine	Naled	

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NPDES Storm Water Sampling Guidance Document

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This document was issued in support of EPA regulations and policy initiatives involving the development and implementation of a national storm water program. This document is agency guidance only. It does not establish or affect legal rights or obligations. Agency decisions in any particular case will be made applying the laws and regulations on the basis of specific facts when permits are issued or regulations promulgated. Mention of trade names or commercial products does not constitute endorsement or recommendation for use.

FOREWORD

Pollutants in storm water discharges from many sources are largely uncontrolled. The National Water Quality Inventory, 1990 Report to Congress provides a general assessment of water quality based on biennial reports submitted by the States under Section 305(b) of the Clean Water Act. The report indicates that roughly 30% of identified cases of water quality impairment reported by the States are attributable to storm water discharges.

Sampling data from storm water discharges is an important tool which provides information on the types and amounts of pollutants present. This data can then be used to identify pollutant sources and to develop storm water pollution prevention plans and best management practices priorities to control these sources.

This manual is for operators of facilities that discharge storm water associated with industrial activity and operators of large and medium municipal separate storm sewer systems. This manual describes the basic sampling requirements for NPDES storm water discharge permit applications and provides procedural guidance on how to conduct sampling. Many of the concepts in this guidance may also be applicable to sampling requirements contained in NPDES storm water permits.

This document was issued in support of EPA regulations and policy initiatives involving the development and implementation of a national storm water program. This document is agency guidance only. It does not establish or affect legal rights or obligations. Agency decisions in any particular case will be made applying the laws and regulations on the basis of specific facts when permits are issued or regulations promulgated.

This document is expected to be revised periodically to reflect advances in this rapidly evolving area. Comments from users are welcomed. Send comments to the U.S. Environmental Protection Agency, Office of Wastewater Enforcement and Compliance, 401 M Street, SW, Mailcode EN-336, Washington, DC 20460.

Michael Cook,
Director
Office of Wastewater Enforcement
and Compliance

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NPDES STORM WATER SAMPLING GUIDANCE DOCUMENT

1. INTRODUCTION

The 1972 Federal Water Pollution Control Act [(FWPCA), also referred to as the Clean Water Act (CWA)] prohibits the discharge of any pollutant to waters of the U.S. from a point source unless the discharge is authorized by a National Pollutant Discharge Elimination System (NPDES) permit. Efforts to improve water quality under the NPDES program have focused traditionally on reducing pollutants in industrial process wastewater discharges and from municipal sewage treatment plants. Past efforts to address storm water discharges, in particular through the NPDES program, have generally been limited to certain industrial categories, using effluent limitations for storm water as a permit condition.

Recognizing the need for more comprehensive control of storm waters discharges, Congress amended the CWA in 1987 and established a two-phase program. In Phase I, Congress required the U.S. Environmental Protection Agency (EPA) to establish NPDES requirements for certain classes of storm water discharges.

- A storm water discharge for which a permit has been issued prior to February 4, 1987
- A storm water discharge associated with industrial activity
- A storm water discharge from a municipal separate storm sewer system serving a population of 250,000 or more (large system)
- A storm water discharge from a municipal separate storm sewer system serving a population of 100,000 or more, but less than 250,000 (medium system)
- A discharge for which the Administrator or the State determines that the storm water discharge contributes to a violation of a water quality standard or is a significant contributor of pollutants to the waters of the United States.

To implement these requirements, EPA published on November 16, 1990 (55 Fed. Reg. 47990), permit application requirements that include storm water sampling. EPA and the States will subsequently issue NPDES storm water permits based on these applications, and many of these

permits will require storm water sampling. Congress intended for EPA to address all other point source discharges of storm water in Phase II of the program.

1.1 PURPOSE OF THIS MANUAL

This manual is for operators of facilities that discharge storm water associated with industrial activity and operators of large and medium municipal separate storm sewer systems. Storm water sampling is sometimes difficult due to the unpredictability of storm events and the variable nature of storm water discharges. This manual is primarily designed to assist operators/owners in planning for and fulfilling the NPDES storm water discharge sampling requirements for permit applications as well as for other storm water sampling needs.

It is assumed that applicants already have a basic understanding of the storm water permit application requirements. This document is designed to supplement existing storm water application guidance by focusing on the technical aspects of sampling. Since many industrial storm water permits and all municipal storm water permits will require regular storm water sampling, many of the concepts in this guidance may be applicable to sampling requirements contained in NPDES storm water permits.

The information in this manual pertains specifically to individual industrial storm water applications, group storm water applications (Part 2), and municipal Part 2 storm water permit applications for storm water discharges. For information on other storm water application requirements for industrial facilities and large and medium municipal separate storm sewer systems, see EPA's Guidance Manual for the Preparation of NPDES Permit Applications for Storm Water Discharges Associated with Industrial Activity (EPA-505/8-91-002, NTIS # PB-92-199058, April 1991), and EPA's Guidance Manual for the Preparation of Part 1 of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems (EPA-505/8-91-003A, NTIS # PB-92-114578, April 1991), respectively. These manuals can be requested by calling the National Technical Information Service (NTIS) **[(703) 487-4650]**. Additional background documents for further information are listed in Technical Appendix D.

1.2 ORGANIZATION OF THIS MANUAL

This manual explains the basic requirements of storm water sampling and provides procedural guidance on sampling for permit applications. Chapter 2 discusses background information (i.e., a

summary of permit application requirements, who must sample, when and where to sample, and staffing considerations). Chapter 3 presents the fundamentals of sampling (i.e., types of sampling, obtaining flow data, handling samples, and sending them to the laboratory). Chapter 4 presents analytical considerations, including the storm water pollutants that must be analyzed under the regulations. Chapter 5 discusses regulatory flexibility with respect to storm water sampling, and Chapter 6 includes health and safety considerations.

Technical Appendices provide information as follows:

- Technical Appendix A—Forms 2F and 1
- Technical Appendix B—NOAA Weather Radio Information
- Technical Appendix C—Required Containers, Preservation Techniques, Holding Times and 40 Code of Federal Regulations (CFR) Part 136
- Technical Appendix D—References
- Technical Appendix E—Glossary
- Technical Appendix F—Acronyms.

2. BACKGROUND FOR STORM WATER SAMPLING

This chapter presents background information, definitions, and a description of the fundamentals of sampling. Specifically, it covers the following areas:

- The benefits of sampling
- A summary of storm water application regulations
- Who must sample
- When sampling is required
- Where to sample
- Staffing considerations

In response to the 1987 Water Quality Act amendments to the CWA, EPA published the storm water final rule on November 16, 1990. In this rule, EPA established the initial scope of the storm water program by defining the phrase "storm water discharge associated with industrial activity" in terms of 11 categories of industrial activity and the phrase "large and medium municipal separate storm sewer systems" to include municipal systems serving a population greater than 100,000. These terms are discussed in greater detail in Section 2.6, "Who Must Sample."

In addition to defining the initial scope of the storm water program, the final rule established permit application requirements, including requirements for storm water sampling. Sampling data gathered for the application will be used to characterize storm water discharges, and will serve as a basis for establishing requirements in NPDES storm water permits. It is important to note that the applicant must report data that are representative of the storm water discharge, and that the intentional misrepresentation of discharge characteristics is unlawful.

2.1 BENEFITS OF SAMPLING

Data that characterize storm water discharges are valuable to permitting authorities and permittees for several reasons. First, storm water sampling provides a means for evaluating the environmental risk of the storm water discharge by identifying the types and amounts of pollutants present. Evaluating these data helps to determine the relative potential for the storm water discharge to contribute to water quality impacts or water quality standard violations. And, storm water sampling

data can be used to identify potential sources of pollutants. These sources can then be either eliminated or controlled more specifically by the permit.

2.2 INDUSTRIAL FACILITY APPLICATION REQUIREMENTS

The storm water permit application regulations provide operators of facilities (including those owned by the government) that have storm water discharges associated with industrial activity with three application options: (1) submit an individual application; (2) participate in a group application (a two-part application); or (3) submit a Notice of Intent (NOI) to be covered by a general permit where general permits are available. This guidance focuses on sampling requirements for individual applications and Part 2 of group applications. Sampling data generally will not be required for an NOI, however, the general permit may require sampling during the term of the permit. State permitting authorities may also require sampling information for an NOI at their discretion, and should, therefore, be consulted prior to submittal.

Industrial facilities submitting individual applications must submit sampling data on a completed application Form 2F (entitled "Application for Permit to Discharge Storm Water Discharges Associated with Industrial Activity"). Facilities selected to be part of the sampling subgroup for a group application must submit sampling data with Part 2 of the application. Members of the sampling subgroup must complete only the quantitative data portions of Form 2F, including Sections VII, VIII, IX, and the certification in Section X. Exhibit 2-1 details the types of information required for each section of Form 2F. Exhibit 2-2 describes what sampling information must be provided in Part 2 of the group application. It should be noted that States may require the use of different forms and submittal of additional documentation.

Form 1 must also be submitted with Form 2F by applicants submitting individual permit applications. General information about the facility is provided on Form 1 (i.e., addresses, operators, etc.); it does not request sampling data. Forms 1 and 2F are reproduced in Technical Appendix A.

Facilities with unpermitted combined discharges of storm water and process or nonprocess wastewater must submit Form 2C or 2E, respectively, in addition to Forms 1 and 2F. Facilities with storm water discharges combined with new sources or new discharges of process wastewater must submit Form 2D as well as Forms 1 and 2F.

EXHIBIT 2-1. FORM 2F APPLICATION REQUIREMENTS	
Section	**Requirement**
2F-I	Outfall location(s), including longitude and latitude and receiving water(s)
2F-II	Facility improvements which may affect the discharges described in the application
2F-III	Site drainage map
2F-IVA	Estimates of impervious area within each outfall drainage area
2F-IVB	A narrative description of pollutant sources (i.e., onsite materials which may come in contact with storm water runoff)
2F-IVC	Location and description of existing structural and nonstructural pollutant control measures
2F-VA	Certification that outfalls have been tested or evaluated for non-storm water discharges
2F-VB	Description of method used for testing/evaluating presence of non-storm water discharges
2F-VI	History of significant leaks or spills of toxic or hazardous pollutants at the facility within the last 3 years
2F-VII	Discharge characterization for all required pollutants
2F-VIII	Statement of whether biological testing for acute or chronic toxicity was performed and list of pollutants it was performed for
2F-IX	Information on contract laboratories or consulting firms
2F-X	Certification that information supplied is accurate and complete
Note: See Form 2F and the instructions for more detail on application requirements.	

2.3 MUNICIPALITIES' APPLICATION REQUIREMENTS

Operators of large and medium municipal separate storm sewer systems are required to submit a two-part application. Both parts contain sampling requirements: Part 1 requires information characterizing discharges from the separate storm sewer system, including field screening sample data for identifying illicit/illegal connections; Part 2 requires sampling at representative locations and estimates of pollutant loadings for those sites. These sampling data are to be used to design a long-term storm water monitoring plan that will be implemented during the term of the permit. The sampling data that must be submitted in Parts 1 and 2 of municipal applications are listed in Exhibit 2-3. There is no standard application form for municipalities.

EXHIBIT 2-2. PART 2 GROUP APPLICATION SAMPLING REQUIREMENTS

Quantitative Testing Data

- For groups with 4 to 20 members, 50 percent of the facilities must submit data; for groups with 21 to 99 members, a minimum of 10 dischargers must submit quantitative data; for groups with 100 to 1,000 members, a minimum of 10 percent of the facilities must submit data; for groups with greater than 1,000 members, no more than 100 facilities must submit data; there must be 2 dischargers from each precipitation zone in which 10 or more members of the group are located, or 1 discharger from each precipitation zone in which 9 or fewer members are located.

- Sampling and analysis requirements are described in 40 Code of Federal Regulations (CFR) 122.26(c)(1)(i)(E) and 40 CFR 122.21(g)(7). Pollutants to be analyzed depend on the type(s) of industries applying as a group.

- Sampling subgroup must provide all quantitative discharge information required in Form 2F Sections VII-IX plus the certification in Section X.

- The group application sampling subgroup must collect grab samples during the first 30 minutes of the storm event and flow-weighted composite samples as required in 40 CFR 122.21(g)(7).

2.4 APPLICATION SUBMITTAL DEADLINES

Deadlines for submitting permit applications and associated sampling requirements are presented in Exhibit 2-4 for individual and group industrial applications and for municipal applications.

2.5 WHERE TO SUBMIT APPLICATIONS

Storm water discharge permit applications are generally submitted directly to the permit-issuing authority. The appropriate authority is the State, where the State has been granted the authority to issue NPDES permits, or the EPA Regional office, where the State does not have NPDES authorization. Exhibit 2-5 indicates which States have approved NPDES permitting programs. It also provides contact names and addresses where applications should be submitted for each State or EPA Regional Office (depending on who the permitting authority is in each case). It should be noted, however, that both parts of a group application must instead be submitted to EPA Headquarters. Group applications must be sent to: Director, Office of Wastewater Enforcement and Compliance, Attention Mr. William Swietlik, U.S. EPA, EN-336, 401 M Street, SW, Washington, DC 20640.

EXHIBIT 2-3. MUNICIPAL APPLICATION SAMPLING REQUIREMENTS

Part 1

- Monthly mean rainfall and snowfall estimates
- Existing quantitative data on the depth and quality of storm water discharges
- A list of receiving water bodies and existing information concerning known water quality impacts
- Field screening analysis for illicit connections and illegal dumping
- Identification of representative outfalls for further sampling in Part 2

Part 2

- Quantitative data from 5 to 10 representative locations in approved sampling plans
- Estimates of the annual pollutant load and event mean concentration (EMC) of system discharges
- Proposed schedule to provide estimates of seasonal pollutant loads and the EMC for certain detected constituents in a representative storm event during the term of the permit
- Proposed monitoring program for representative data collection during the term of the permit

Applications submitted by industrial facilities must be certified by a responsible corporate officer as described in 40 CFR 122.22 (e.g., president, secretary, treasurer, vice president of the corporation in charge of a principal business function). Applications submitted by municipalities must be certified by a principal executive officer or ranking elected official as described in 40 CFR 122.22.

2.6 WHO MUST SAMPLE

Operators of facilities that have storm water discharges associated with industrial activity and operators of large and medium municipalities are required to conduct storm water sampling as part of their NPDES permit applications. Specifically, the following types of industries and municipalities must sample storm water discharges:

EXHIBIT 2-4. PERMIT APPLICATION SUBMISSION DEADLINES		
	Date	**Sampling Requirement**
Industrial		
Individual	October 1, 1992	Sampling data due
Group		
• Part 1	September 30, 1991	Sampling subgroup identified
• Part 2	October 1, 1992	Sampling data due
Municipal		
Large Municipalities		
• Part 1	November 18, 1991	Illicit connection screening due and identification of sampling points
• Part 2	November 16, 1992	Effluent characterization due Monitoring management program identified
Medium Municipalities		
• Part 1	May 18, 1992	Illicit connection screening due and identification of sampling points
• Part 2	May 17, 1993	Effluent characterization due Monitoring management program identified
*NOI under a general permit is due on October 1, 1992 or the date specified in the permit, whichever comes first.		

- Storm Water Discharges Associated With Industrial Activities - Under Phase I, the storm water permit application regulations identify, by Standard Industrial Classification (SIC) code and narrative description, 11 categories of facilities considered to be "engaging in industrial activity" for the purposes of storm water permit application requirements. Those facilities included in 40 CFR 122.26(b)(14)(i) through (xi) of the storm water permit application regulations with storm water point source discharges to waters of the U.S. or separate storm sewers and those designated under Section 402(p)(2)(E) of the CWA are required to apply for storm water permit coverage by October 1, 1992. Industrial facilities include those that are Federally, State, or municipally owned or operated. Exhibit 2-6 lists these industrial facilities. The Transportation Act of 1991 provides an exemption from storm water permitting requirements for certain industrial activities owned or operated by municipalities with a population of less than 100,000. Such municipalities must submit storm water discharge permit applications for only airports, power plants, and uncontrolled sanitary landfills that they own or operate, unless a permit is otherwise required by the permitting authority.

- Municipal Separate Storm Sewer Systems - Under Phase I, those municipalities with separate storm sewer systems serving 100,000 people or more are required to submit an application for discharges from the system. (Only the part of the population served by municipal separate storm sewers is to be included in the 100,000 count, not the part served by combined sewers.) Regulated municipalities are listed in Appendices F through I in the November 16, 1990, final rule or have been designated by their permitting authority.

EXHIBIT 2-5. NPDES STORM WATER PROGRAM PERMITTING AUTHORITIES

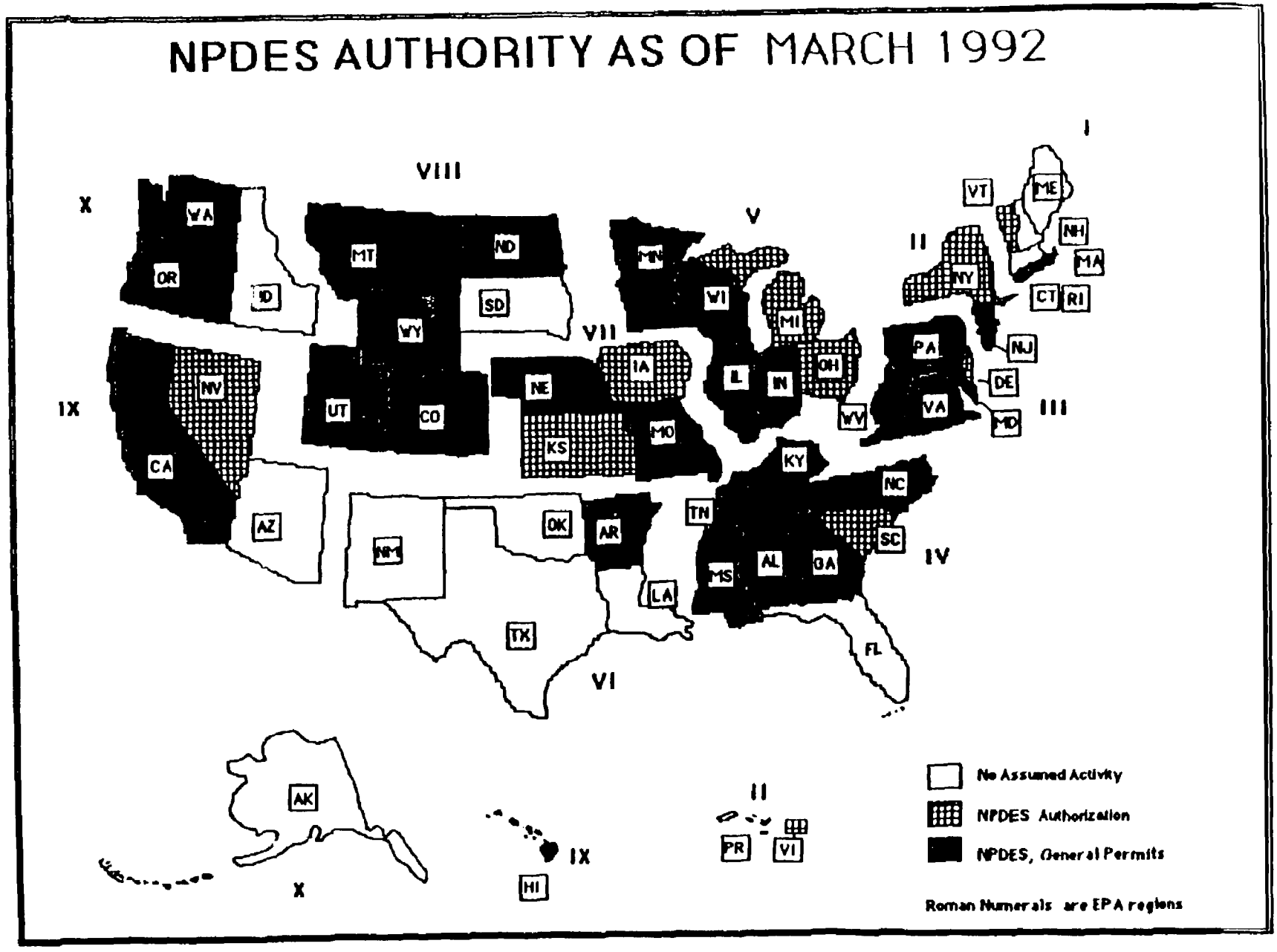

EXHIBIT 2-5. NPDES STORM WATER PROGRAM PERMITTING AUTHORITIES (Continued)

State	Permitting Authority	Contact	State	Permitting Authority	Contact
Alabama	yes	Aubrey White Water Division 1751 Dickinson Dr. Montgomery, AL 36130 (205) 271-7811	Alaska	no	Steve Bubnick U.S. EPA Region 10 1200 6th Ave. WD-134 Seattle, WA 98101 (206) 553-8399
Arizona	no	Eugene Bromley U.S. EPA Region 9 75 Hawthorne St. W-5-1 San Francisco, CA 94105 (415) 744-1906	Arkansas	yes	Marynia Jastrzebski 8001 National Dr. P.O. Box 8913 Little Rock, AR 72219-8913 (501) 562-7444
California	yes	Archie Matthews Storm Water Research Control Board Water Quality 901 P St. Sacramento, CA 95814 (916) 657-1110	Colorado	yes	Patricia Nelson Dept. of Health Water Quality Control 4210 E. 11th Ave. Denver, CO 80220 (303) 331-4590
Connecticut	yes	Dick Mason Dept. of Environmental Protection Water Management Bureau Water Discharge Management 165 Capitol Ave. Hartford, CT 06106 (203) 566-7167	Delaware	yes	Sarah Cooksey Dept. of Natural Resources Surface Water Management 89 Kings Highway P.O. Box 1401 Dover, DE 19903 (302) 739-5731
Florida	no	Chris Thomas U.S. EPA Region 4 345 Courtland St. N.E. 4WM-FP Atlanta, GA 30365 (404) 347-3633	Georgia	yes	Mike Creason Dept. of Natural Resources Environmental Protection 205 Butler St. S.E. Room 1070 Atlanta, GA 30334 (404) 656-4887
Hawaii	yes	Steve Chang Dept. of Health Clean Water Branch Five Water Front Plaza #500 Ala-Moana Blvd. Honolulu, HI 96813 (808) 586-4309	Idaho	no	Steve Bubnick U.S. EPA Region 10 1200 6th Ave. WD-134 Seattle, WA 98101 (206) 553-8399
Illinois	yes	Tim Kluge EPA Water Pollution Control 2200 Churchill Rd. P.O. Box 19276 Springfield, IL 62794-9276 (217) 782-0610	Indiana	yes	Lonnie Brumfield Dept. of Environmental Management NPDES Permits Group 105 S. Meridian St. P.O. Box 6015 Indianapolis, IN 46206 (317) 232-8705
Iowa	yes	Monica Wnuk Department of Natural Resources Wallace State Building 900 E. Grand St. Des Moines, IA 50319-0034 (515) 281-7017	Kansas	yes	Don Carlson Dept. of Environment Water Bureau Forbes Field, Building 740 Topeka, KS 66620 (913) 296-5555

EXHIBIT 2-5. NPDES STORM WATER PROGRAM PERMITTING AUTHORITIES (Continued)

State	Permitting Authority	Contact	State	Permitting Authority	Contact
Kentucky	yes	Douglas Allgeier Dept. of Environmental Protection Water Division 18 Reilly Road Frankfort, KY 40601 (502) 564-3410	Louisiana	no	Brent Larson U.S. EPA Region 6 1455 Ross Ave. 6W-PM Dallas, TX 75202 (214) 655-7175
Maine	no	Shelley Puleo U.S. EPA Region 1 U.S. EPA/JFK Building/WCP Boston, MA 02203 (617) 565-3525	Maryland	yes	Edward Gertler MD Dept. of Environment Industrial Discharge Program 2500 Broening Highway Baltimore, MD 21224 (410) 631-3323
Massachusetts	no	Shelley Puleo U.S. EPA Region 1 U.S. EPA/JFK Building/WCP Boston, MA 02203 (617) 565-3525	Michigan	yes	Gary Boersen Dept. of Natural Resources Surface Water Division P.O. Box 30028 Lansing, MI 48909 (517) 373-1982
Minnesota	yes	Scott Thompson Pollution Control Agency 520 Lafayette Rd. St. Paul, MN 55155-3898 (612) 296-7203	Mississippi	yes	Jerry Cain Dept. of Environmental Quality Office of Pollution Control Industrial Waste Water Branch P.O. Box 10385 Jackson, MS 39289-0385 (601) 961-5171
Missouri	yes	Bob Hentges Dept. of Natural Resources Water Pollution Control Program 205 Jefferson St. P.O. Box 176 Jefferson City, MO 65102 (314) 751-6825	Montana	yes	Fred Shewman Water Quality Bureau Cogswell Building Helena, MT 59620 (406) 444-2406
Nebraska	yes	Clark Smith Environmental Control Water Quality Division P.O. Box 98922 Lincoln, NE 68509 (402) 471-4239	Nevada	yes	Rob Saunders Conservation and Natural Resources Environmental Protection 123 W. Nye Lane Carson City, NV 89710 (702) 687-4670
New Hampshire	no	Shelley Puleo U.S. EPA Region 1 U.S. EPA/JFK Building/WCP Boston, MA 02203 (617) 565-3525	New Jersey	yes	Sarina Cohen NJ DEPE Office of Regulatory Policy CN029 Trenton, NJ 08625-0029 NJ Hotline: (609) 633-7021
New Mexico	no	Brent Larson U.S. EPA Region 6 1445 Ross Ave. 6W-PM Dallas, TX 75202 (214) 655-7175	New York	yes	Ken Stevens Wastewater Facilities Design NY State DEC 50 Wolf Road Albany, NY 12233 (518) 457-1157

EXHIBIT 2-5. NPDES STORM WATER PROGRAM PERMITTING AUTHORITIES (Continued)

State	Permitting Authority	Contact	State	Permitting Authority	Contact
North Carolina	yes	Coleen Sullins Environmental Management Water Quality Planning P.O. Box 29535 Raleigh, NC 27626-0535 (919) 733-5083	North Dakota	yes	Sheila McClenathan Dept. of Health Water Quality Division 1200 Missouri Ave. P.O. Box 5520 Bismarck, ND 58502-5520 (701) 221-5210
Ohio	yes	Bob Phelps OEPA Water Pollution Control P.O. Box 1049 1800 Watermark Columbus, OH 43266 (614) 644-2034	Oklahoma	no	Brent Larson U.S. EPA Region 6 1445 Ross Ave. 6W-PM Dallas, TX 75202 (214) 655-7175
Oregon	yes	Ranei Nomura DEQ-Water Quality 811 SW 6th St. Portland, OR 97204 (503) 229-5256	Pennsylvania	yes	R.B. Patel Environmental Resources Water Quality Management P.O. Box 2063 Harrisburg, PA 17120 (717) 787-8184
Puerto Rico	no	José Rivera U.S. EPA Region 2 Water Permits & Compliance Branch 26 Federal Plaza, Room 845 New York, NY 10278 (212) 264-2911	Rhode Island	yes	Angela Liberti Division of Water Resources 291 Promenade St. Providence, RI 02908 (401) 277-6519
South Carolina	yes	Birgot McDade Dept. of Health & Env. Ctrl. Industry and Agriculture Waste Water Division 2600 Bull St. Columbia, SC 29201 (803) 734-5241	South Dakota	no	Vern Berry U.S. EPA Region 8 999 18th St. 8-WM-C Denver, CO 80202-2466 (303) 293-1630
Tennessee	yes	Robert Haley Dept. of Environment Water Pollution Control 150 9th Ave. N., 4th Floor Nashville, TN 37243-1534 (615) 741-2275	Texas	no	Brent Larson U.S. EPA Region 6 1445 Ross Ave. 6W-PM Dallas, TX 75202 (214) 655-7175
Utah	yes	Harry Campbell Dept. of Environmental Quality P.O. Box 16690 Salt Lake City, UT 84116 (801) 538-6146	Vermont	yes	Brian Koiker Environmental Conservation Permits and Compliance 103 S. Main St. Annex Building Waterbury, VT 05671-0405 (802) 244-5674

EXHIBIT 2-5. NPDES STORM WATER PROGRAM PERMITTING AUTHORITIES (Continued)

State	Permitting Authority	Contact	State	Permitting Authority	Contact
Virgin Islands	yes	Marc Pacifico Dept. of Planning & Natural Resources 1118 Watergut Project Christiansted St. Croix, VI 00820-5065 (809) 773-0565	Virginia	yes	Burton Tuxford Water Control Board Permits Section P.O. Box 11143 Richmond, VA 23230-1143 (804) 527-5083
Washington	yes	Gary Kruger Dept. of Ecology Water Quality Division P.O. Box 47600 Olympia, WA 98504-7600 (206) 438-7529	Washington D.C.	no	Kevin Magerr U.S. EPA Region 3 841 Chestnut Bldg. 3WM53 Philadelphia, PA 19107 (215) 597-1651
West Virginia	yes	Jerry Ray Division of Water Resources 1201 Greenbriar St. Charleston, WV 25311 (304) 348-0375	Wisconsin	yes	Anne Maurel Dept. of Natural Resources Wastewater Management P.O. Box 7921 Madison, WI 53707 (608) 267-7364
Wyoming	yes	John Wagner Dept. of Environmental Quality Herschler Building, 4th Floor Cheyenne, WY 82002 (307) 777-7082			

2.7 WHEN SAMPLING IS REQUIRED

Industrial individual and group applicants must include sampling data from at least one representative storm event. Operators of large or medium municipal separate storm sewer systems must submit sampling data from three different representative storm events. How to determine "representativeness" and other considerations for when to sample are presented below.

2.7.1 STORM EVENT CRITERIA

Storm water discharge permit application requirements establish specific criteria for the type of storm event that must be sampled:

- The depth of the storm must be greater than 0.1 inch accumulation
- The storm must be preceded by at least 72 hours of dry weather
- Where feasible, the depth of rain and duration of the event should not vary by more than 50 percent from the average depth and duration.

EXHIBIT 2-6 INDUSTRIAL FACILITIES WHICH MUST SUBMIT APPLICATIONS FOR STORM WATER PERMITS	
40 CFR 122.26(b)(14) Subpart	**Description**
(i)	Facilities subject to storm water effluent limitations guidelines, new source performance standards, or toxic pollutants effluent standards under 40 CFR, Subchapter N [except facilities which are exempt under category (xi)].
(ii)	Facilities classified as: SIC 24 (except 2434) . . . . . Lumber and Wood Products SIC 26 (except 265 and 267) . Paper and Allied Products SIC 28 (except 283 and 285) . Chemicals and Allied Products SIC 29 . . . . . Petroleum and Coal Products SIC 311 . . . . . Leather Tanning and Finishing SIC 32 (except 323) . . . . . Stone, Clay and Glass Products SIC 33 . . . . . Primary Metal Industries SIC 3441 . . . . . Fabricated Structural Metal SIC 373 . . . . . Ship and Boat Building and Repairing
(iii)	Facilities classified as SIC 10 through 14, including active or inactive mining operations and oil and gas exploration, production, processing, or treatment operations, or transmission facilities that discharge storm water contaminated by contact with, or that has come into contact with, any overburden, raw material, intermediate products, finished products, byproducts, or waste products located on the site of such operations. SIC 10 . . . . . Metal Mining SIC 11 . . . . . Anthracite Mining SIC 12 . . . . . Coal Mining SIC 13 . . . . . Oil and Gas Extraction SIC 14 . . . . . Nonmetallic Minerals, except Fuels
(iv)	Hazardous waste treatment, storage, or disposal facilities, including those that are operating under interim status or a permit under Subtitle C of the Resource Conservation and Recovery Act (RCRA).
(v)	Landfills, land application sites, and open dumps that receive or have received any industrial wastes including those that are subject to regulation under subtitle D or RCRA.
(vi)	Facilities involved in the recycling of material, including metal scrapyards, battery reclaimers, salvage yards, and automobile junkyards, including but limited to those classified as: SIC 5015 . . . . . Motor Vehicle Parts, Used SIC 5093 . . . . . Scrap and Waste Materials
(vii)	Steam electric power generating facilities, including coal handling sites.
(viii)	Transportation facilities which have vehicle maintenance shops, equipment cleaning operations, or airport de-icing operations. Only those portions of the facility that are either involved in vehicle maintenance (including vehicle rehabilitation, mechanical repairs, painting, fuelling, and lubrication), equipment cleaning operations, or airport de-icing operations, or which are otherwise listed in another category, are included. SIC 40 . . . . . Railroad Transportation SIC 41 . . . . . Local and Suburban Transit SIC 42 (except 4221-25) . . . . Motor Freight and Warehousing SIC 43 . . . . . U.S. Postal Service SIC 44 . . . . . Water Transportation SIC 45 . . . . . Transportation by Air SIC 5171 . . . . . Petroleum Bulk Stations and Terminals

EXHIBIT 2-6. INDUSTRIAL FACILITIES WHICH MUST SUBMIT APPLICATIONS FOR STORM WATER PERMITS (Continued)

40 CFR 122.26(b)(14) Subpart	Description
(ix)	Treatment works treating domestic sewage or any other sewage sludge or wastewater treatment device or system, used in the storage, treatment, recycling, and reclamation of municipal or domestic sewage, including lands dedicated to the disposal of the sewage sludge that are located within the confines of the facility, with a design flow of 1.0 million gallons per day or more, or required to have an approved pretreatment program under 40 CFR Part 403. Not included are farm lands, domestic gardens, or lands used for sludge management where sludge is beneficially reused and which are not physically located in the confines of the facility, or areas that are in compliance with Section 405 of the CWA.
(x)	Construction activity including clearing, grading, and excavation activities except operations that result in the disturbance of less than 5 acres of total land area and those that are not part of a larger common plan of development or sale.*
(xi)	Facilities under the following SICs [which are not otherwise included in categories (ii)-(x)], including only storm water discharges where material handling equipment or activities, raw materials, intermediate products, final products, waste materials, byproducts, or industrial machinery are exposed to storm water.* SIC 20 . . . . . Food and Kindred Products SIC 21 . . . . . Tobacco Products SIC 22 . . . . . Textile Mill Products SIC 23 . . . . . Apparel and Other Textile Products SIC 2434 . . . . . Wood Kitchen Cabinets SIC 25 . . . . . Furniture and Fixtures SIC 265 . . . . . Paperboard Containers and Boxes SIC 267 . . . . . Converted Paper and Paper Board Products (except containers and boxes) SIC 27 . . . . . Printing and Publishing SIC 283 . . . . . Drugs SIC 285 . . . . . Paints, Varnishes, Lacquer, Enamels SIC 30 . . . . . Rubber and Misc. Plastics Products SIC 31 (except 311) . . . . . Leather and Leather Products SIC 323 . . . . . Products of Purchased Glass SIC 34 (except 3441) . . . . . Fabricated Metal Products SIC 35 . . . . . Industrial Machinery and Equipment, except Electrical SIC 36 . . . . . Electronic and Other Electric Equipment SIC 37 (except 373) . . . . . Transportation Equipment SIC 38 . . . . . Instruments and Related Products SIC 39 . . . . . Miscellaneous Manufacturing Industries SIC 4221 . . . . . Farm Products Warehousing and Storage SIC 4222 . . . . . Refrigerated Warehousing and Storage SIC 4225 . . . . . General Warehousing and Storage

Source: Federal Register, Vol. 55, No. 222, p. 48065, November 16, 1990.
*On June 11, 1992, the U.S. Court of Appeals for the Ninth Circuit remanded the exemption for construction sites of less than five acres in category (x) and for manufacturing facilities in category (xi) which do not have materials or activities exposed to storm water to the EPA for further rulemaking. (Nos. 90-70671 & 91-70200).

These criteria were established to: (1) ensure that adequate flow would be discharged; (2) allow some build-up of pollutants during the dry weather intervals; and (3) ensure that the storm would be "representative," (i.e., typical for the area in terms of intensity, depth, and duration).

Collection of samples during a storm event meeting these criteria ensures that the resulting data will accurately portray the most common conditions for each site. However, the permitting authority is authorized to approve modifications of this definition (especially for applicants in arid areas where there are few representative events). Section 5.1 of Chapter 5 discusses general protocol for requesting modifications to application requirements, including the definition of "representative storm."

In determining whether a storm is representative, there are two important steps to take. First, data on local weather patterns should be collected and analyzed to determine the range of representative storms for a particular area. Second, these results should be compared to measurements of duration, intensity, and depth to ensure that the storm to be sampled fits the representativeness criteria.

2.7.2 OBTAINING RAINFALL DATA

Several sources provide accurate local weather information for both: (1) determining what a representative storm event is for a particular area; and (2) assessing expected storm events to determine whether a predicted rainfall will be "representative," and thus, meet the requirements for storm water sampling. The National Oceanic and Atmospheric Administration (NOAA) National Climatic Data Center's (NCDC's) Climate Services Branch is responsible for collecting precipitation data. Data on hourly, daily, and monthly precipitation for each measuring station (with latitude and longitude) are available to the public on computer diskette, microfiche, or hard copy. Orders can be placed by calling **(704) 259-0682**, by fax at **(704) 259-0876**, or by writing to NCDC, Climate Services Branch, The Federal Building, Asheville, North Carolina 28071-2733.

The National Weather Service (NWS) of NOAA can also provide information on historic, current, and future weather conditions. Local NWS telephone numbers can be obtained from the NWS Public Affairs Office at **(301) 713-0622**. Telephone numbers are also usually in local phone directory listings under "National Weather Service" or "Weather." In addition, NOAA runs the NOAA NWS

Weather Radio, which provides continuous broadcasts of the most current weather information. This broadcast can be accessed with a radio that has a weather band feature. Approximately 90 percent of the United States population is within listening range of the 380 NWS stations. Technical Appendix B presents additional information on NOAA Weather Radio, including radio frequencies for specific locations and a listing of weather band radio manufacturers. Telephone recordings of weather conditions are also provided by most NWS offices.

Cable TV weather stations and local airports can also provide weather information. Weather information provided by the local newspaper or TV stations should be used only if more accurate data (as described above) are unavailable, since weather forecasts can change drastically within several hours.

Someone should be designated at the facility to follow current weather conditions by listening to NOAA Weather Radio, calling the local NWS offices, and watching cable TV weather news. Exhibit 2-7 presents a storm water sampling decision chart for mobilizing field personnel for a probable storm event.

Annual rainfall statistics can also be used to evaluate representativeness of storm events. For example, Exhibit 2-8 presents fifteen rain zones in the United States and related storm event statistics. (These rain zones are not those shown in 40 CFR Part 122 Appendix E.) To determine typical values of annual storm events for a particular facility, identify the zone in which the facility is located. The tabulated information lists the annual average number of storms and precipitation as well as the average duration, intensity, and depth of independent storm events for each zone. Care must be taken, however, in using annual rainfall statistics for determining representativeness of storm events, since the annual rainfall statistic may not be representative of seasonal rainfall events. If rainfall data is available at or close to a particular facility, it is preferable to use this data for determining average storm event statistics.

Rainfall data tabulated from NOAA precipitation data indicate for Alaska (not shown in Exhibit 2-8) that average storm events last from 14 to 24 hours in duration and are 0.6 to 1.05 inches in depth. Average storm event data for Hawaii are 9 to 11 hours in duration and from 0.6 to 1.6 inches in depth.

EXHIBIT 2-7. DECISION CHART FOR STORM WATER SAMPLING

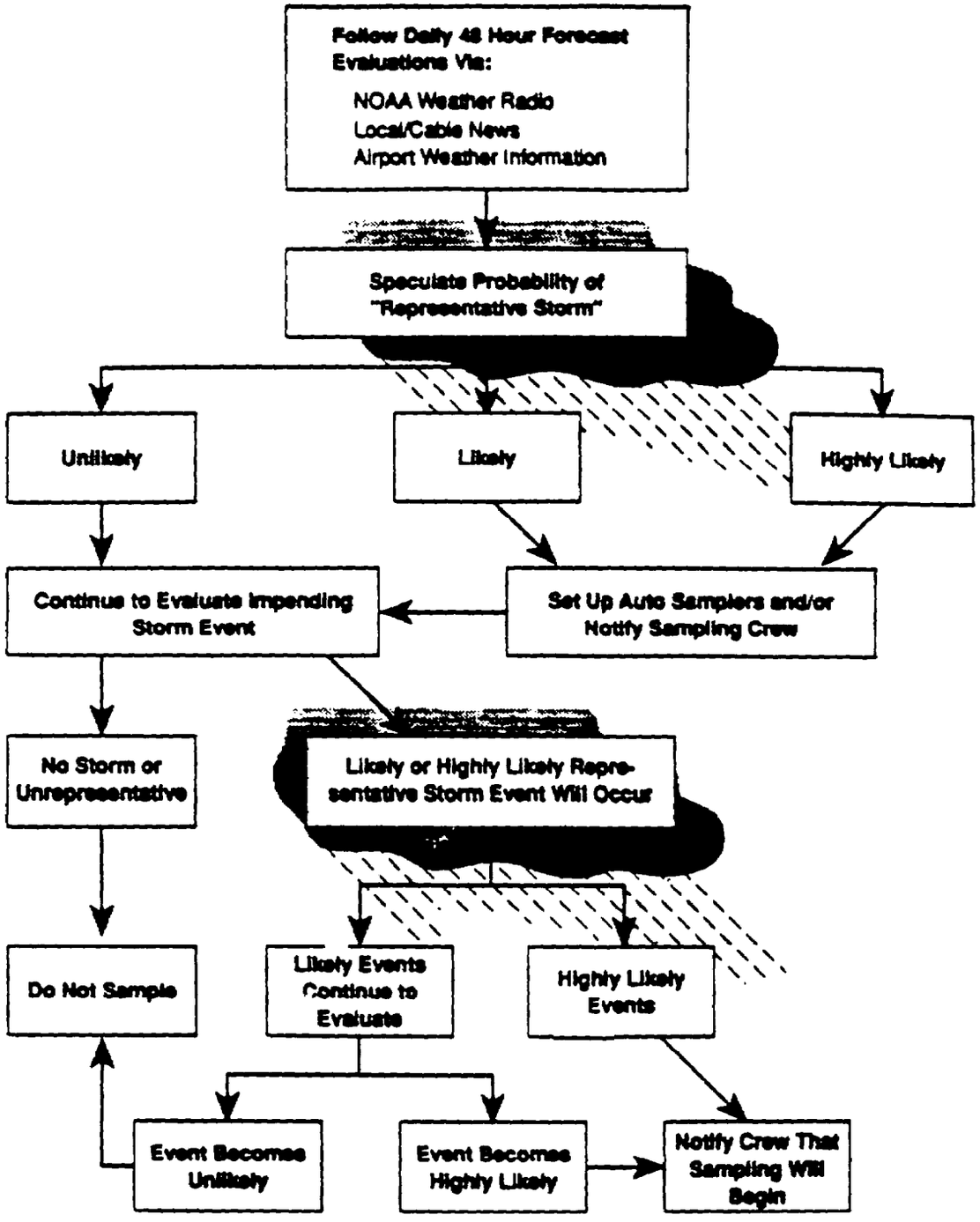

EXHIBIT 2-8. RAIN ZONES OF THE UNITED STATES

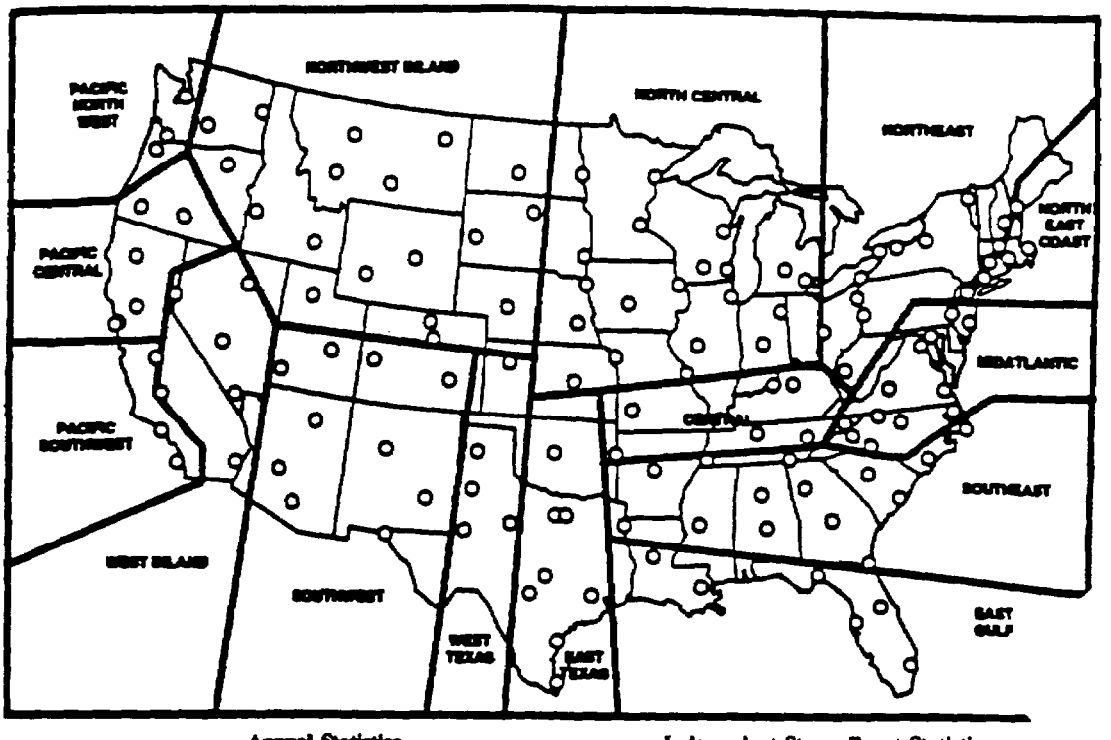

RAIN ZONE	Annual Statistics: No. of Storms Avg	No. of Storms COV	Precip. Avg (in)	Precip. COV	Independent Storm Event Statistics: Duration Avg (hr)	Duration COV	Intensity Avg (in/hr)	Intensity COV	Volume Avg (in)	Volume COV	DELTA Avg (hr)	DELTA COV
NORTH EAST	70	0.13	34.6	0.18	11.2	0.81	0.067	1.23	0.50	0.95	126	0.94
NORTH EAST—COASTAL	63	0.12	41.4	0.21	11.7	0.77	0.071	1.05	0.66	1.03	140	0.87
MIDATLANTIC	62	0.13	39.5	0.18	10.1	0.84	0.092	1.20	0.64	1.01	143	0.97
CENTRAL	68	0.14	41.9	0.19	9.2	0.85	0.097	1.09	0.62	1.00	133	0.99
NORTH CENTRAL	55	0.16	29.8	0.22	9.5	0.83	0.087	1.20	0.55	1.01	167	1.17
SOUTHEAST	65	0.15	49.0	0.20	8.7	0.92	0.122	1.09	0.75	1.10	136	1.03
EAST GULF	68	0.17	53.7	0.23	6.4	1.05	0.178	1.03	0.80	1.19	130	1.25
EAST TEXAS	41	0.22	31.2	0.29	8.0	0.97	0.137	1.08	0.76	1.18	213	1.28
WEST TEXAS	30	0.27	17.3	0.33	7.4	0.98	0.121	1.13	0.57	1.07	302	1.53
SOUTHWEST	20	0.30	7.4	0.37	7.8	0.88	0.079	1.16	0.37	0.88	473	1.46
WEST INLAND	14	0.38	4.9	0.43	9.4	0.75	0.055	1.06	0.36	0.87	786	1.54
PACIFIC SOUTH	19	0.36	10.2	0.42	11.6	0.78	0.054	0.76	0.54	0.98	476	2.09
NORTHWEST INLAND	31	0.23	11.5	0.29	10.4	0.82	0.057	1.20	0.37	0.93	304	1.43
PACIFIC CENTRAL	32	0.25	18.4	0.33	13.7	0.80	0.048	0.85	0.58	1.05	265	2.00
PACIFIC NORTHWEST	71	0.15	35.7	0.19	15.9	0.80	0.035	0.73	0.50	1.09	123	1.50

COV = Coefficient of Variation = Standard Deviation/Mean
DELTA = Interval Between Storm Midpoints
o = Rain Gauge Stations
Source: Urban Targeting and BMP Selection, U.S. EPA Region 5, November 1990.

The NWS should be consulted for proper procedures for collecting and interpolating rainfall data if the applicant elects to collect the data rather than use existing data.

2.7.3 DETERMINING REPRESENTATIVENESS

An example of how to determine whether a rainfall event varies by more than 50 percent (i.e., is not representative) is shown in Exhibit 2-9.

EXHIBIT 2-9. EXAMPLE OF 50 PERCENT VARIANCE FROM AVERAGE RAINFALL

Event Type	Duration (hrs.)	Depth (in.)
Average event	5.2	0.43
50 percent average event	2.6	0.22
150 percent average event	7.8	0.65

Once the information on an average duration and depth storm event is obtained for a specific location, multiply these numbers by 0.5 to get the 50 percent average event numbers and multiply by 1.5 to get the 150 percent average event numbers.

A representative storm in both duration and depth for a specific area will fall between the shaded numbers above (i.e., between 2.6 and 7.8 hours in duration and 0.22 and 0.65 inches in depth).

Snowmelt creates runoff which may result in point source discharges very similar to that from other storm events. Pollutants accumulate in snow, and when a thaw occurs, the pollutants will be discharged to receiving waters much like during a rain storm event. Snowmelt may be sampled as long as the applicant works closely with the permitting authority to determine the proper sampling strategy, i.e., sampling procedures, techniques, and pollutant analyses.

For snowmelt, the sampling strategy should be developed depending on the drainage area being monitored for storm flow. The strategy should consider (1) snow removal or clearing practices, e.g., direct dumping into water bodies, plowing, and the creation of snow mounds (whether in a line along a roadway or in piles on parking lots, etc.), and (2) the melting process.

It is also important to consider what happens to snowmounds as they melt and evaporate, which can alter the pollutant concentration in the resulting runoff. In addition, pollutants from the surrounding

air and pavement can build up on snow mound surfaces in a crust or cake-like manner eventually leaving a residue (including previously dissolved solids that become a remaining solids residue) which is later left to be washed off by rainfall, manual flushing or other mechanisms.

The sampling of snow mounds, undisturbed snow itself, and hard pack requires a carefully thought out strategy. Given the complexities associated with snowmelt sampling, applicants should have proposed sampling strategies reviewed by the permitting authority before attempting to conduct sampling.

2.7.4 LOGISTICAL PROBLEMS WITH WHEN TO SAMPLE

Applicants may encounter weather conditions that may not meet minimum "representative" storm criteria; these conditions may prevent adequate collection of storm water samples prior to application submission deadlines. For instance, sampling may be problematic in parts of the country that experience drought or near-drought conditions or areas that are under adverse weather conditions such as freezing and flooding. Events with false starts and events with stop/start rains can also cause problems. Solutions for sampling under these circumstances are discussed below.

Where the timing of storm event sampling poses a problem, it may be appropriate for the applicant to petition the permitting authority for a sampling protocol/procedure modification either prior to sampling or after sampling is conducted (if the storm event is not acceptable). When the applicant requests a sampling protocol/procedure modification, a narrative justification should be attached. This justification should be certified by a corporate official (for industrial facilities) or the principle executive officer or ranking official (for municipalities), as per 40 CFR 122.22. Section 5.1 of Chapter 5 discusses protocol/procedure modifications.

<u>Arid Areas</u>

For arid or drought-stricken areas where a storm event does not occur prior to the time the applicant must sample and submit data with the application form, the applicant should submit the application, complete to the extent possible, with a detailed explanation of why sampling data are not provided and an appraisal of when sampling will be conducted. This explanation must be certified by the appropriate party (as described above). The applicant should also contact the permitting authority

for further direction. Where the applicant can anticipate such problems, approval for an extension to submit sampling data should be acquired prior to the deadline.

Adverse Weather Conditions

The applicant should never conduct storm water sampling during unsafe conditions. It is likely that, in areas that experience flooding, lightening storms, high winds, etc., another representative storm event will occur for which sampling conditions will be much safer. (For further information on safety issues, see Chapter 6.) If no other storm event occurs, the applicant should submit a justification as to why the event was not sampled. This information should be certified by the appropriate official.

False Starts and Stop/Start Rains

False start and stop/start rains can also cause problems. False starts may occur when weather conditions are unpredictable and it appears that a storm event may be representative, collection begins, and then the rain stops before an adequate sample volume is obtained. (Necessary sample volumes are discussed in Section 3.6.) Some latitude may be given for the 0.1-inch rainfall requirement as long as the sample volume is adequate; the permitting authority may accept the results with applicant justification and certification. Again, see Chapter 5 for information on requesting protocol/procedure modifications to storm water sampling requirements.

During stop/start rains (those in which rainfall is intermittent), samples should be taken until an adequate sample volume is obtained. Exhibit 2-10 summarizes logistical problems of storm water sampling and presents solutions to the problems identified.

2.7.5 WHEN INDUSTRIAL FACILITIES MUST SAMPLE

Industrial applicants must generally collect two types of storm water samples: (1) grab samples collected during the first 30 minutes of discharge; and (2) flow-weighted composite samples collected during the first 3 hours of discharge (or the entire discharge, if it is less than 3 hours). Information from both types of samples is critical to fully evaluate the types and concentrations of pollutants present in the storm water discharge.

EXHIBIT 2-10. LOGISTICAL PROBLEMS OF STORM WATER SAMPLING	
Problem:	Arid/drought areas
Solution:	Submit a petition requesting a modification to the protocol if problems are anticipated and, if it is approved, submit the application without sampling data by the application due date with a certified explanation. Provide sampling data to the permitting authority as soon as possible.
Problem:	Adverse weather conditions such as freezing, flooding, winds, tornadoes, electrical storms, and gully washes
Solution:	Sample another, less hazardous event or submit a certified justification of why the event was not sampled. Provide sampling data to the permitting authority as soon as possible.
Problem:	False starts
Solution:	Discard the sample if the volume is inadequate. If the volume is adequate, submit the sampling data with a certified explanation that the sample is from a non-representative event. Continue to monitor weather conditions and attempt to resample as soon as possible.
Problem:	Stop/start rains
Solution:	Continue to sample in case the storm event turns out to be representative and adequate sample volumes are obtained. If sample volumes are inadequate, continue to monitor weather conditions and attempt to resample as soon as possible.

The grab samples taken during the first 30 minutes of a storm event will generally contain higher concentrations of pollutants, since they pick up pollutants that have accumulated on drainage surfaces since the last storm event.

Composite samples characterize the average quality of the entire storm water discharge. Flow-weighted composite samples provide for the most accurate determination of mass load. The flow-weighted composite sample must be taken for either the first 3 hours or for the entire discharge (if the event is less than 3 hours long). Additional information on how to collect grab and composite samples is presented in Sections 3.3 and 3.4, respectively.

Industrial applicants are required at a minimum to sample only one storm event. However, if samples from more than one storm are analyzed and the results are representative of the discharge, the data representing each event must be reported. The facility must provide a description of each storm event tested. The average of all values within the last year must be determined and the

concentration, mass, and total number of storm events sampled must be reported on Form 2F. Furthermore, sampling should be conducted during normal operating procedures (day or night), and, not when the facility has been closed for a period of time.

Industrial applicants must certify, as a separate requirement, that all outfalls have been tested or evaluated to determine whether non-storm water discharges are present (e.g., process wastewater, sanitary wastes, cooling water, or rinse water) or whether illegal/illicit connections are occurring in the system. This testing should be conducted during dry weather to avoid any flows of storm water through the conveyance.

A checklist that can be used to conduct dry weather evaluations is provided in Exhibit 2-11. A narrative description of the method used to conduct dry weather evaluations and the date and the drainage points must be included in Section V.A of Form 2F. This statement must be certified by the appropriate party as described in Section 2.7.4.

A dry weather visual inspection is the simplest way to screen for illicit discharges. If one or more of the items on the checklist in Exhibit 2-11 are answered affirmatively, or if there are other reasons to believe that illicit connections exist, more detailed investigations (such as dye tests, smoke tests, evaluation of piping designs, and TV line monitoring) may be necessary. Dye testing involves releasing fluorescent, nontoxic dye into the suspected source of non-storm water, (e.g., a drain, sink, toilet, or pipe) and checking to see whether the dye shows up in the storm water outfall. Smoke testing involves pumping smoke into a storm sewer and viewing the facility to see if smoke escapes through unknown openings or storm sewer inlets. The presence of smoke indicates that storm water may enter the sewer through these openings or inlets. However, smoke testing may prove ineffective at finding non-storm water discharges to separate storm sewers. Smoke passage may be blocked due to line traps that are intended to block sewer gas.

TV line monitoring is a technique whereby a small video camera is placed in the storm sewer and a video image of the sewer is viewed on a monitor at the surface to identify illicit connections. The camera can be moved through the sewer by remote control. For more information on smoke and dye testing and TV line monitoring, consult EPA's Guidance Manual for the Preparation of NPDES

EXHIBIT 2-11. CHECKLIST FOR CONDUCTING DRY WEATHER EVALUATIONS

1. Date of inspection:_____
2. Facility name and address:_____
3. Date of last rain event:_____
4. Inspector name:_____
5. Type of outfall

☐ Concrete ☐ Pipe ☐ Grassed ☐ Rock ☐ Other _____

6. Is there visible flow from the pipe? ☐ Yes ☐ No
If yes, check all that apply. If no, go to number 7.

☐ Colored water (describe)_____
☐ Odor* (describe)_____
☐ Murky
☐ Floating objects (describe)_____
☐ Absence of plant life surrounding conveyance
☐ Scum
☐ Oily sheen
☐ Sludge present
☐ Clear water
☐ Stains on conveyance
☐ Notable difference in plant life surrounding conveyance
☐ Suds ☐ Other:_____

*e.g., rotten eggs, earthy, chemical, chlorine, soap, putrescence, gasoline, musty, etc.

Estimate the flow either visually or by describing the width, height, and shape of the conveyance and the approximate percentage of the conveyance where flow is present or the approximate depth of the flow. Describe your estimate.

7. Is there standing water present? ☐ Yes ☐ No
If yes, check all that apply. If no, go to number 8.

☐ Colored water (describe)_____
☐ Odor* (describe)_____
☐ Murky
☐ Floating objects (describe)_____
☐ Absence of plant life surrounding conveyance
☐ Suds
☐ Oily sheen
☐ Sludge present
☐ Clear water
☐ Stains on conveyance
☐ Notable difference in plant life surrounding conveyance
☐ Scum ☐ Other:_____
☐ Absence of plant life surrounding conveyance

*e.g., rotten eggs, earthy, chemical, chlorine, soap, putrescence, gasoline, musty, etc.

8. From the inspection locations, can you see any unusual piping or ditches that drain to the storm water conveyance? ☐ Yes ☐ No
9. Is there any overland flow visible from the discharge location? ☐ Yes ☐ No
10. Are there dead animals present? ☐ Yes ☐ No

Signature:

Permit Applications for Storm Water Discharges Associated with Industrial Activity (EPA-505/8-91-002, April 1991).

A problem with the dry weather evaluation process is that the presence of a dry weather/non-storm water discharge may be caused by infiltration of ground or surface waters through cracks in the storm water drainage system. In this situation, all other possible sources of the non-storm water discharge should be examined and ruled out. If no sources are found, the physical structure of the conveyance system should be inspected for deterioration.

The applicant should make every attempt to halt non-storm water discharges to the storm sewer system unless the discharge is covered by an NPDES permit. If it is not feasible to halt the discharge of non-storm water to the storm sewer system, and the discharge is not authorized by a process wastewater or storm water permit, the applicant must submit either Form 2C (for a process water discharge) or Form 2E (for a nonprocess water discharge), and check with state officials to see if alternate forms are required.

2.7.6 WHEN MUNICIPAL FACILITIES MUST SAMPLE

Municipal applicants are required to conduct sampling for both Parts 1 and 2 of their applications. In Part 1, municipalities must conduct a field screening analysis to detect illicit connections and illegal dumping into their storm sewer system. Where flow is observed during dry weather, two grab samples must be collected during a 24-hour period with a minimum of 4 hours between samples. These samples must be analyzed for pH, total chlorine, total copper, total phenol, and detergents (surfactants). Note that these are dry weather samples, rather than storm water samples. EPA's Guidance Manual for the Preparation of Part 1 of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems presents a description of conducting field screening sampling and provides a data sheet.

For Part 2 of the application, municipalities must submit grab (for certain pollutants) and flow-weighted sampling data from selected sites (5 to 10 outfalls) for 3 representative storm events at least 1 month apart. The flow-weighted composite sample must be taken for either the entire discharge or the first 3 hours (if the event lasts longer than 3 hours). Municipal facilities are not required to collect grab samples within the first 30 minutes of a storm event.

In addition to submitting quantitative data for the application, municipalities must also develop programs for future sampling activities that specify sampling locations, frequency, pollutants to be analyzed, and sampling equipment. Where necessary (as determined by the municipality or if required by the permitting authority), responsibilities may also include monitoring industries connected to the municipality's storm sewers for compliance with their facility-specific NPDES permits. Refer to EPA's Guidance Manual for the Preparation of Part 1 of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems for information on how to develop municipal sampling programs.

2.7.7 USE OF HISTORICAL DATA

Data from storm water samples analyzed in the past can be submitted with applications in lieu of new sampling data if:

- All data requirements in Form 2F are met
- Sampling was performed no longer than 3 years prior to submission of the permit application
- All water quality data are representative of the present discharge.

The historical data may be unacceptable if there have been significant changes since the time of that storm event in production level, raw materials, processes, or final products. Significant changes which may also impact storm water runoff include construction or installation of treatment or sedimentation/erosion control devices, buildings, roadways, or parking lots. Applicants should assess any such changes to determine whether they altered storm water runoff since the time of the storm event chosen for use in the permit application. Historical data can be used only in applications. Historical data cannot be used for fulfilling permit requirements.

2.8 WHERE TO SAMPLE STORM WATER DISCHARGES

Storm water samples should be taken at a storm water point source. A "point source" is defined as any discernible, confined, and discrete conveyance, including (but not limited to) any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel, or other floating craft from which pollutants are or may be discharged (as per 40 CFR 122.2). Included in the definition of storm water "point

sources" is storm water from an industrial facility that enters, and is discharged through, a municipal separate storm sewer. In short, most storm water discharges can be defined as "point source" discharges, since they ultimately flow into some kind of conveyance (e.g., a channel or swale).

2.8.1 INDUSTRIAL FACILITIES

Industrial applicants submitting individual applications must collect and analyze a grab sample taken within the first 30 minutes of the storm event and flow-weighted composite samples from each of the industrial storm water "point source" outfalls identified on the site drainage map submitted for Section III of Form 2F. Applicants submitting quantitative data for Part 2 of the group application must also collect samples for each outfall discharging storm water associated with industrial activity. All outfalls should be sampled during the same representative storm event if possible. If this is not feasible, outfalls may be sampled during different representative storm events upon approval by the permitting authority. Descriptions of each storm event and which outfalls were sampled during each event must be included in the application. Storm water runoff from employee parking lots, administration buildings, and landscaped areas that is not mixed with storm water associated with industrial activity, or storm water discharges to municipal sanitary sewers, do not need to be sampled.

Outfalls With Substantially Identical Effluents—Industrial Facilities

If an applicant has two or more outfalls with "substantially identical effluents," the facility may petition the permitting authority to sample and analyze only one of the identical outfalls and submit the results as representative of the other. "Substantially identical effluents" are defined as discharges from drainage areas undergoing similar activities where the discharges are expected to be of similar quantity and quality, and indistinguishable in expected composition. Chapter 5 presents an example of a petition for substantially identical effluents and discusses this process in more detail.

2.8.2 MUNICIPALITIES

Large and medium municipalities are required to sample storm water discharges from 5 to 10 outfalls or field screening points that were proposed in Part 1 of the application. The final decision on the number and location of sampling points will be determined by the permitting authority and will

depend on site-specific conditions such as land use or drainage area and results of data collected during the field screening analysis process for Part 1 of the application.

2.8.3 LOGISTICS OF WHERE TO SAMPLE

The ideal sampling location would be the lowest point in the drainage area where a conveyance discharges storm water to waters of the U.S. or to a municipal separate storm sewer system. A sample point also should be easily accessible on foot in a location that will not cause hazardous sampling conditions. Ideally, the sampling site should be on the applicant's property or within the municipality's easement; if not, the field personnel should obtain permission from the owner of the property where the discharge outfall is located. Typical sampling locations may include the discharge at the end of a pipe, a ditch, or a channel.

However, logistical problems with sample locations may arise (e.g., nonpoint discharges, inaccessibility of discharge point, etc.). Logistical problems with sample locations and suggested solutions are described in Exhibit 2-12. In many cases, it may be necessary to locate a sampling point further upstream of the discharge point (e.g., in a manhole or inlet). If the storm water at a selected location is not representative of a facility's total runoff, the facility may have to sample at several locations to best characterize the total runoff from the site. In situations where discharge points are difficult to sample for various reasons, the applicant should take the best sample possible and explain the conditions in the application. A discussion on sampling at retention ponds appears in Section 3.1.2.

2.9 STAFFING CONSIDERATIONS

Staffing needs for sampling must be determined by the applicant. Factors in making the determination include the number of sample locations, the size of the area to be sampled, how far apart the locations are, the type of sampling required, the technique to be used, the number of samples to be taken (depending on how many parameters must be analyzed), and safety considerations.

Training sampling personnel is important to the success of storm water discharge characterization. Training can be done using this manual. Sampling conducted by untrained personnel may result in

EXHIBIT 2-12. SOLUTIONS TO SAMPLE LOCATION PROBLEMS	
Problem:	Sampling where storm water commingles with process or non-process water
Solution:	Attempt to sample the storm water discharge before it mixes with the non-storm water discharge. If this is impossible, sample the discharge both during dry and wet weather and present both sets of data to the permitting authority. This will provide an indication of the contribution of pollutants from each source.
Problem:	Numerous small point discharges
Solution:	Impound channel or join together flow by building a weir or digging a ditch to collect discharge at a low point for sampling purposes. This artificial collection point should be lined with plastic to prevent infiltration and/or high levels of sediment. Or, sample at several locations to represent total site runoff.
Problem:	Inaccessible discharge point [examples include underwater discharges or unreachable discharges (e.g., out of a cliff)]
Solution:	Go up the pipe to sample (i.e., to the nearest manhole or inspection point). If these are not available, tap into the pipe or sample at several locations to best represent total site runoff.
Problem:	Managing multiple sampling sites to collect grab samples during the first 30 minutes (industrial facilities only)
Solution:	Have a sampling crew ready for mobilization when forecasts indicate that a representative storm will occur or sample several different representative events. Also, for most parameters, automatic samplers may be used to collect samples within the first 30 minutes triggered by the amount of rainfall, the depth of flow, flow volume or time.
Problem:	Commingling of parking lot runoff with discharge associated with industrial activity
Solution:	The combined runoff must be sampled at the discharge point as near as possible to the receiving water or the parking lot drain inlet if there is one.
Problem:	Sampling in manholes
Solution:	Sample in manholes only when necessary. See Chapter 6 for safety information Sampling in manholes requires training on confined space entry.
Problem:	Runon from other property
Solution:	If possible, estimate the volume of offsite runon contributions and offsite runon sources of pollutants to perform a mass balance calculation. Include this information in the permit application. If this estimation is not possible, provide a narrative discussion of the upstream site (e.g., is it developed, if so the type of facility, the types of pollutants that may be present on the site, etc.).

data that is unrepresentative of the facility's storm water discharge. This data might be rejected by the permitting authority, who would then require another sampling effort.

3. FUNDAMENTALS OF SAMPLING

Because of the variable nature of storm water flows during a rainfall event and different analytical considerations for certain pollutants, the storm water regulations establish specific requirements for sample collection techniques. The quality of storm water discharges and logistical needs for sampling will be different for industrial applicants and municipal applicants. Therefore, specific sampling requirements vary. After a brief review of sampling fundamentals and special sampling requirements for storm water permit applications, the following sections are intended to teach applicants how to sample to meet these requirements.

The applicant should carefully plan his/her sampling strategy prior to the actual sampling event, e.g., walk the site to determine appropriate sampling locations, become familiarized with local rainfall patterns, train sampling staff in procedures and safety, consult with laboratory, and collect supplies.

3.1 TYPES AND TECHNIQUES OF SAMPLING

There are three basic aspects of sampling:

- Sample type (i.e., grab versus composite)
- Sample technique (i.e., manual versus automatic)
- Flow measurement methods.

These topics will be discussed in relation to requirements of an NPDES storm water discharge permit application. Once these aspects are addressed, step-by-step instructions on sampling procedures are presented. The sections below define and describe the types of storm water samples that must be collected and methods or techniques for collecting them. In addition, special sampling requirements for certain pollutants are discussed.

3.1.1 SAMPLE TYPE VERSUS SAMPLE TECHNIQUE

It is important to understand the difference between sample type and technique. "Sample type" refers to the kind of sample that must be collected -- either a grab or a composite. "Sample technique" refers to the method by which a grab or composite sample is actually collected -- either manually or by automatic sampler. A generalized relationship between sample type and sample technique is presented in Exhibit 3-1. Sections 3.1.2 and 3.1.3 further explain the significance of these terms as they relate to storm water sampling requirements.

EXHIBIT 3-1. SAMPLE TYPE vs. SAMPLE TECHNIQUE

Sample Type	Sample Technique
Grab	Manual Automatic sampling system
Composite	Manual with manual compositing Automatic system or automatic sampling with manual compositing

3.1.2 SAMPLE TYPE: GRAB AND COMPOSITE SAMPLES

To comply with storm water application requirements, the sample type (grab or composite) must be collected in accordance with 40 CFR 122.21(g)(7) and 40 CFR Part 136. The storm water application requirements clearly specify which pollutants must be analyzed by grab sample, and which by composite sample. Although the requirements in 40 CFR 122.21(g)(7) do not explicitly specify either manual or automatic sampling techniques, the approved analytical methods contained in 40 CFR Part 136 direct that grab samples must be collected manually for certain pollutants. Sections 3.3 and 3.4 clarify which pollutants must be grabbed, which ones must be grabbed manually, and which ones must be flow-weighted composites.

The two types of storm water samples required by the regulations, grab and composite samples, are described below.

Grab Samples

A grab sample is a discrete, individual sample taken within a short period of time (usually less than 15 minutes). Analysis of grab samples characterizes the quality of a storm water discharge at a given time of the discharge.

Composite Samples

A composite sample is a mixed or combined sample that is formed by combining a series of individual and discrete samples of specific volumes at specified intervals. Although these intervals can be time-weighted or flow-weighted, the storm water regulations require the collection of flow-weighted composite samples. This means that discrete aliquots, or samples, are collected and combined in proportion to flow rather than time. Composite samples characterize the quality of a storm water discharge over a longer period of time, such as the duration of a storm event.

Application Requirements

Both types of samples must be collected and analyzed for storm water discharge permit applications. Grab samples must be collected for the following conditions:

- For storm water discharges associated with industrial activity, a grab sample must be obtained during the first 30 minutes of a discharge. This requirement is in addition to the composite sampling requirements. These samples are intended to characterize the maximum concentration of a pollutant that may occur in the discharge and/or may indicate intermingling of non-storm water discharges.

- For storm water discharges from large and medium municipal separate storm sewers, grab samples are required for Part 1 of the application if a discharge is noted during dry weather field screening. Two grab samples must be collected during a 24-hour period with a minimum of 4 hours between samples. These samples are intended to assist in the identification of illicit connections or illegal dumping. In Part 2, grab samples may be required for the analysis of certain pollutants for which municipalities are required to sample.

Flow-weighted composite samples must be collected during the first 3 hours of discharge or the entire discharge (if it is less than 3 hours) for both industrial and municipal applicants.

Pollutant-specific Requirements

The regulations at 40 CFR 122.21(g)(7) identify certain pollutants for which grab sampling is required:

- Monitoring by grab sample must be conducted for pH, temperature, cyanide, total phenols, residual chlorine, oil and grease (O&G), fecal coliform, and fecal streptococcus. Composite samples are not appropriate for these parameters due to their tendency to transform to different substances or change in concentration after a short period of time. Such transformations may be particularly likely in the presence of other reactive pollutants.

Sampling At Retention Ponds

Retention ponds with greater than a 24-hour holding time for a representative storm event may be sampled by grab sample. Composite sampling is not necessary. The rationale for this is that, because the water is held for at least 24 hours, a thorough mixing occurs within the pond. Therefore, a single grab sample of the effluent from the discharge point of the pond accurately represents a composite of the storm water contained in the pond. If the pond does not thoroughly mix the discharge, thereby compositing the sample, then a regular grab and composite sample should be taken at the inflow to the pond. Since each pond may vary in its capability to "composite" a sample, applicants must carefully evaluate whether the pond is thoroughly mixing the discharge. Such factors as pond design and maintenance are important in making this evaluation. Poor pond design, for example, where the outfall and inflow points are too closely situated, may cause short-circuiting and inadequate mixing. In addition, poor maintenance may lead to excessive re-suspension of any deposited silt and sediment during heavy inflows. Because of factors such as these, the applicant should determine the best location to sample the pond (e.g., at the outfall, at the outfall structure, in the pond) to ensure that a representative composite sample is taken. If adequate compositing is not occurring within the pond, the applicant should conduct routine grab and flow-weighted composite sampling.

A grab sample and a flow-weighted sample must be taken for storm water discharges collected in holding ponds with less than a 24-hour retention period. The applicant must sample the discharge in the same manner as for any storm water discharge [as described in 40 CFR 122.21(g)(7)]. In

effect, the applicant must take one grab sample within the first 30 minutes of discharge, or as soon as possible. The applicant must also collect a flow-weighted composite sample for at least the first 3 hours of the discharge, or for the event's entire duration (if it is less than 3 hours). The flow-weighted composite sample may be taken using a continuous sampler or as a combination of at least three sample aliquots taken during each hour of the discharge, with a minimum of 15 minutes between each aliquot. If the applicant does not know what retention period the pond is designed for, the design engineer of the pond should be consulted.

3.1.3 SAMPLE TECHNIQUE: MANUAL VERSUS AUTOMATIC SAMPLING

As previously discussed, manual and automatic sampling techniques are methods by which both grab and composite samples can be collected. Manual samples are simply samples collected by hand. Automatic samplers are powered devices that collect samples according to preprogrammed criteria. A typical automatic sampler configuration is shown in Exhibit 3-2.

For most pollutants, either manual or automatic sample collection will conform with 40 CFR Part 136. However, one case in which automatic samplers cannot be used is for the collection of volatile organic compound (VOC) samples because VOCs will likely volatilize as a result of agitation during automatic sampler collection. Samples collected for VOC analysis should be filled until a reverse meniscus is found over the top of the collection bottle and capped immediately to leave no air space. Automatic samplers do not perform this function. Special requirements for VOC sampling are discussed in Section 3.5.2.

Although both collection techniques are available, several other pollutants may not be amenable to collection by an automatic sampler, for example fecal streptococcus, fecal coliform and chlorine have very short holding times (i.e., 6 hours), pH and temperature need to be analyzed immediately and oil and grease requires teflon coated equipment to prevent adherence to the sampling equipment.

Other restrictions on sample collection techniques (such as container type and preservation) should be determined by consulting the approved analytical methods listed in 40 CFR Part 136. Section 3.5 and Technical Appendix C provide additional information on sample handling, holding times, and preservation methods.

EXHIBIT 3-2. AUTOMATIC SAMPLER

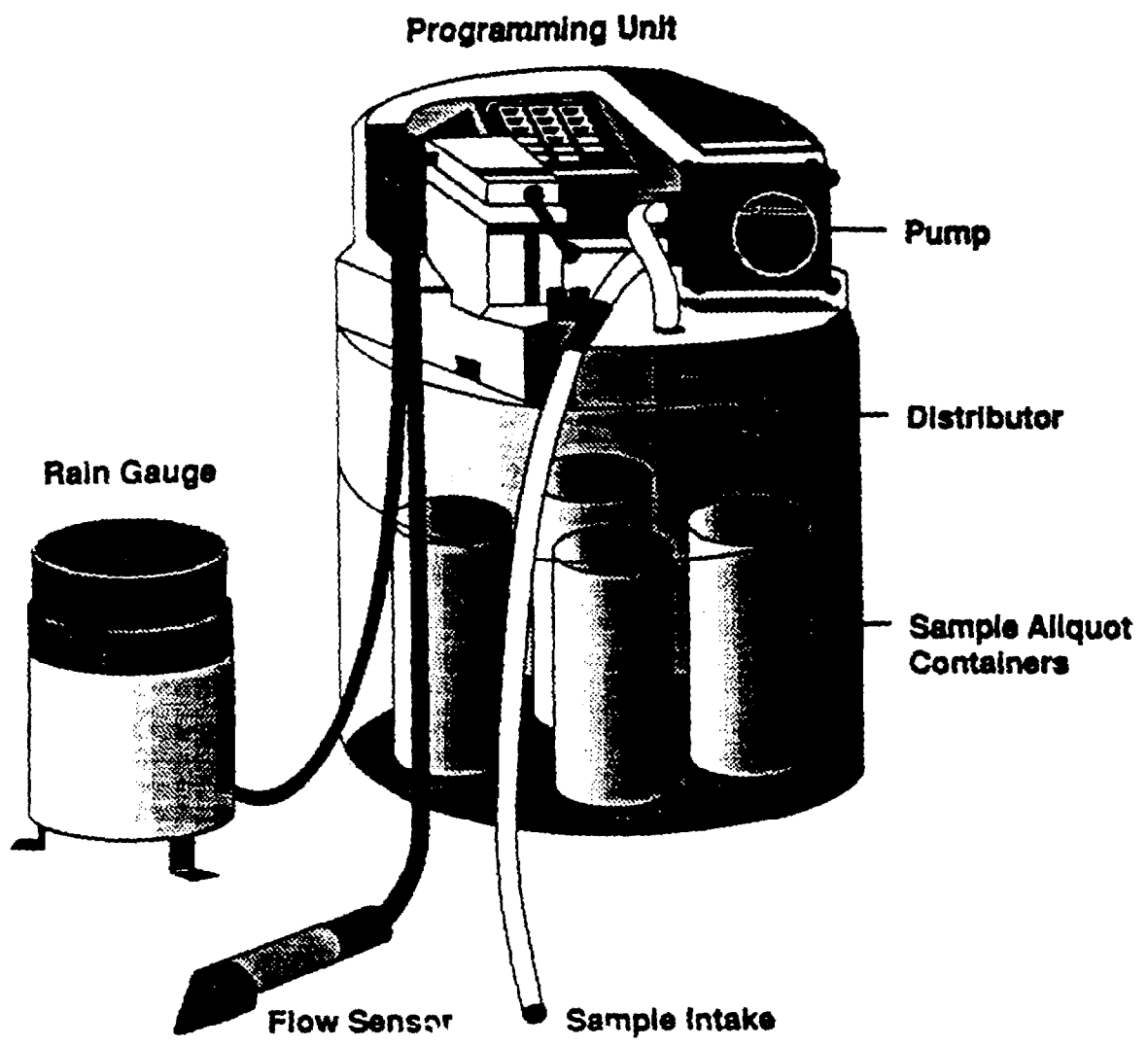

Manual and automatic techniques have advantages and disadvantages that the applicant should consider in relation to the sampling program. The main advantage of manual sampling is that it can be less costly than purchasing or renting automatic samplers. Automatic samplers, however, can be often more convenient. Exhibit 3-3 presents a matrix of advantages and disadvantages associated with each technique. Ultimately, the best technique to use will depend on each applicant's situation.

3.2 OBTAINING FLOW DATA

In addition to collecting samples of storm water discharges, applicants must collect data characterizing the flow rate and flow volume for each storm water discharge sampled. Flow rate is the quantity of storm water discharged from an outfall per unit of time. Total flow is a measure of the total volume of storm water runoff discharged during a rain event. Flow rates and volumes can either be measured specifically or can be estimated (based on rainfall measurements, velocities, and depth of flows). To collect flow-weighted composite samples, flow rate data is necessary to combine proportional volumes of individually collected aliquots. Applicants must also report the mass of pollutants contained in storm water discharges (see Section 3.2.5). To determine mass loadings of pollutants, applicants must measure both discharge flow rate and pollutant concentration. This section presents methods for obtaining flow data.

3.2.1 MEASURING FLOW RATES

Flow rates for storm water discharges are most accurately measured using either primary or secondary flow measurement devices. Facilities should use these devices to characterize their discharge as precisely as possible. Where flow measurement devices are not already installed, portable devices should be considered. There are many permanent and portable types of flow measurement devices available. This discussion is limited to the most common flow measurement devices. To purchase flow measurement devices and rain gauges, pertinent engineering journals can be consulted for equipment vendor listings. Proper analysis of site discharge conditions must be conducted prior to purchase and installment of flow measurement devices.

Primary Flow Measurement Devices

A primary flow measurement device is a man-made flow control structure which, when inserted into an open channel, creates a geometric relationship between the depth of the flow and the rate of the

EXHIBIT 3-3. COMPARISON OF MANUAL AND AUTOMATIC SAMPLING TECHNIQUES

Sample Method	Advantages	Disadvantages
Manual Grabs	• Appropriate for all pollutants • Minimum equipment required	• Labor-intensive • Environment possibly dangerous to field personnel • May be difficult to get personnel and equipment to the storm water outfall within the 30 minute requirement • Possible human error
Manual Flow-Weighted Composites (multiple grabs)	• Appropriate for all pollutants • Minimum equipment required	• Labor-intensive • Environment possibly dangerous to field personnel • Human error may have significant impact on sample representativeness • Requires flow measurements taken during sampling
Automatic Grabs	• Minimizes labor requirements • Low risk of human error • Reduced personnel exposure to unsafe conditions • Sampling may be triggered remotely or initiated according to present conditions	• Samples collected for O&G may not be representative • Automatic samplers cannot properly collect samples for VOCs analysis • Costly if numerous sampling sites require the purchase of equipment • Requires equipment installation and maintenance • Requires operator training • May not be appropriate for pH and temperature • May not be appropriate for parameters with short holding times (e.g., fecal streptococcus, fecal coliform, chlorine) • Cross-contamination of aliquot if tubing/bottles not washed
Automatic Flow-Weighted Composites	• Minimizes labor requirements • Low risk of human error • Reduced personnel exposure to unsafe conditions • May eliminate the need for manual compositing of aliquots • Sampling may be triggered remotely or initiated according to on-site conditions	• Not acceptable for VOCs sampling • Costly if numerous sampling sites require the purchase of equipment • Requires equipment installation and maintenance, may malfunction • Requires initial operator training • Requires accurate flow measurement equipment tied to sampler • Cross-contamination of aliquot if tubing/bottles not washed

flow. The depth of the flow, referred to as the head (H), can then be measured at the respective reference point/area with a ruler or other staff gauge. When substituted into a formula, which mathematically describes the relationship between depth and discharge for the primary devices, the head measurement can be used to calculate a flow rate (Q). The most common primary flow measurement devices are weirs and flumes. Weirs and flumes are flow structures designed to provide a known, repeatable relationship between flow and depth.

Weirs

Weirs consist of a crest located across the width of an open channel (at a right angle to the direction of the flow). The flow of water is impeded, causing water to overflow the crest. Diagrams and formulas of some typically found weirs are provided in Exhibit 3-4. Weirs are inexpensive and particularly valuable in measuring flow in natural or man-made swales because they are easily installed in irregularly shaped channels.

Weirs can only provide accurate flow measurements when head measurements are appropriately taken. When flow exceeds the capacity of the weir and water overtops the weir crest, flow depth actually diminishes as the water approaches the weir, as shown in Exhibit 3-5. Therefore, measuring the depth at the weir crest will result in an inaccurate measurement of the actual head. Under these circumstances, the head should be measured upstream, at a point determined by the type of weir and the estimated amount of flow. A staff gauge can be installed at a nonturbulent point upstream of the weir crest to provide accurate and convenient measurements.

Flumes

Flumes are structures which force water through a narrow channel. They consist of a converging section, a throat, and a diverging section. Exhibit 3-6 portrays the most common type of flume, the Parshall flume, and also provides formulas for calculating appropriate flow rates.

Parshall flumes have fixed specifications relating to geometric shape. They vary only in throat width. Due to these geometric constraints, Parshall flumes may be expensive to install. They are typically used in permanent flow measurement points and are most commonly placed in concrete-lined channels. However, Parshall flumes can also be used in temporary points. Parshall flumes provide accurate measurements for a relatively wide range of flow rates. The flow rate through the Parshall flume (see Exhibit 3-6) is calculated from the depth (H_a) of flow measured in the converging

EXHIBIT 3-4. WEIRS

V-Notch

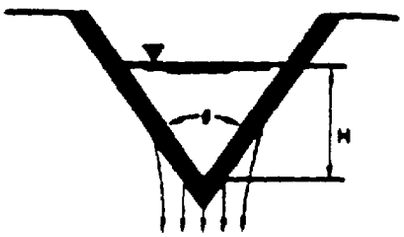

$Q = 2.5\ H^{2.5}$ (90°)
$Q = 1.443\ H^{2.5}$ (60°)
$Q = 1.035\ H^{2.5}$ (45°)
$Q = 0.676\ H^{2.5}$ (30°)
$Q = 0.497\ H^{2.5}$ (22½°)

Q = Flow Rate

H = Depth of flow (Head)

Rectangular (without contractions)

$Q = 3.33\ L\ H^{1.5}$

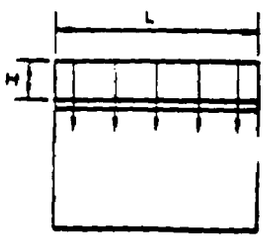

Rectangular (with contractions)

$Q = 3.33\ (L - 0.2\ H)^{1.5}$

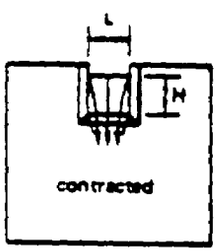

Cipolleti (trapezoidal)

$Q = 3.367\ b\ H^{1.5}$

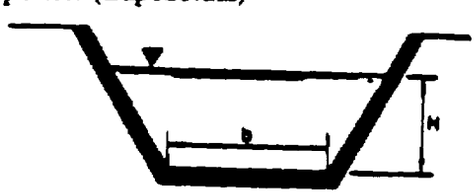

Source: Civil Engineering Reference Manual, 5th Edition, by Michael R. Lindeburg, PE, with permission from the publisher, Professional Publications, Inc., Belmont, California, 1989.

EXHIBIT 3-5. SUPPRESSED FLOW OVER THE WEIR CREST

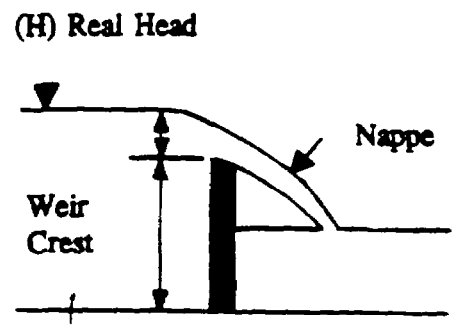

Source: Civil Engineering Reference Manual, 5th Edition, by Michael R. Lindeburg, PE, with permission from the publisher, Professional Publications, Inc., Belmont, California, 1989.

section of the flume. The exact location of the depth measurement depends on the specific design of the Parshall flume. Exhibit 3-6 indicates the equations used to calculate flow rate through a typical Parshall flume. These equations are accurate only when the submergence ratio (H_b/H_a) is greater than 0.7. The manufacturers' information should be consulted for the flow rate equation and measuring points for a specific Parshall flume.

Palmer-Bowlus flumes, shown in Exhibit 3-7, are also used at some facilities. Palmer-Bowlus flumes are designed to be installed in an existing circular channel (such as a manhole channel) and are available as portable measurement devices. While Palmer-Bowlus flumes are inexpensive, self cleaning, and easy to install, they can only measure flow rates accurately over a narrow range of flow.

The flow from a Palmer-Bowlus flume is calculated using the height between the floor of the flume portion and the water level, not the total head of the water level. Head measurements are taken at

EXHIBIT 3-6. FLUMES

Parshall Flume

$Q = 0.338\ H^{1.55}$	(1 inch)
$Q = 0.676\ H^{1.55}$	(2 inches)
$Q = 0.992\ H^{1.547}$	(3 inches)
$Q = 2.09\ H^{1.58}$	(6 inches)
$Q = 3.07\ H^{1.55}$	(9 inches)
$Q = 4\ W\ H^{1.522}\ W^{0.26}$	(1-8 feet)
$Q = (3.6875\ W + 2.5)H^{1.6}$	(10-50 feet)

Q = Flow rate

H = Depth of flow (Head)

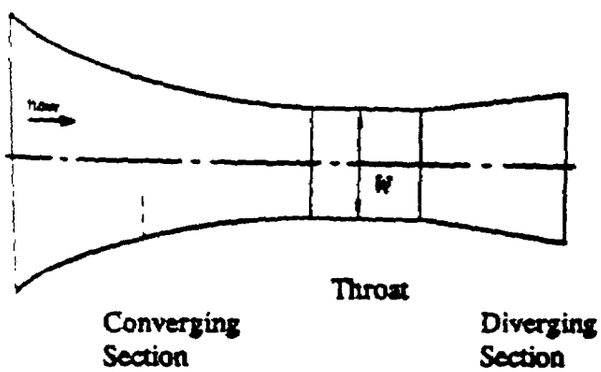

Top View

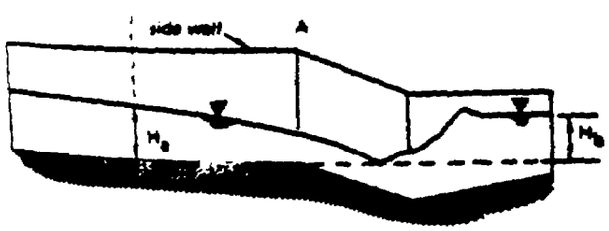

Side View

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EXHIBIT 3-7. PALMER-BOWLUS FLUME

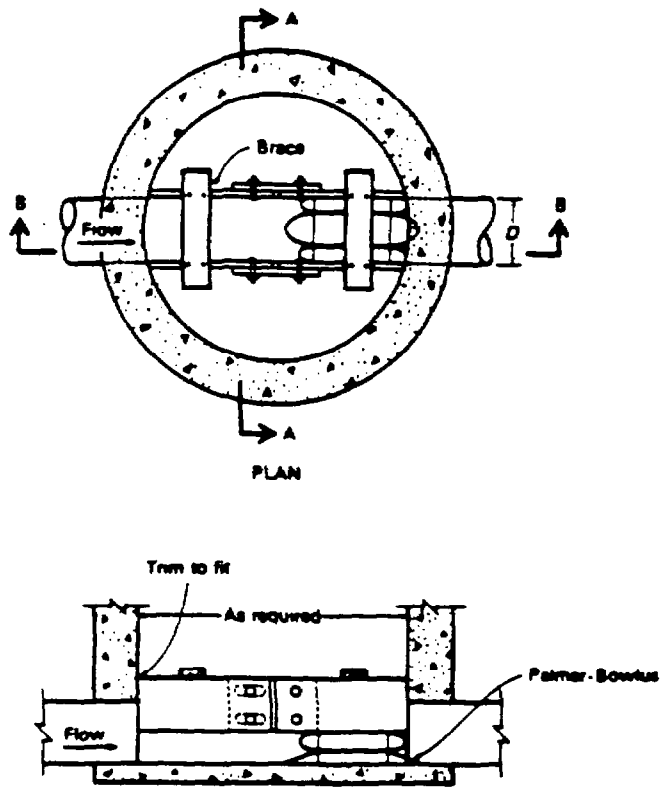

Source: Wastewater Engineering: Treatment, Disposal, Reuse, 2nd Edition, Metcalf & Eddy, Inc., with permission from the publisher, McGraw-Hill Book Co., New York, 1979.

a distance from the throat equal to one half the width of the flume. The dimensions of a Palmer-Bowlus flume have been standardized in a generic sense, but the flume shape may vary. Therefore, there are no formulas that can be applied to all Palmer-Bowlus flumes. Device-specific head-flow relationships for each device should be obtained from the manufacturer

There are a number of other, less common, flow measurement devices available which will not be discussed (see Appendix D for additional references).

Secondary Flow Measurement Devices

Secondary flow measurement devices are automated forms of flow rate and volume measurement. Typically, a secondary device is used in conjunction with a primary device to automatically measure the flow depth or head. This value is then processed, using established mathematical relationships to relate the depth measurement to a corresponding flow rate. The device also may have the capacity to convert this flow rate to a volume. Secondary flow measurement devices include floats, ultrasonic transducers, pressure transducers, and bubblers. The output of the secondary device is transmitted to a display, recorder, and/or totalizer to provide flow rate and volume information. The user manuals for these devices should be consulted for proper usage.

Evaluation of Flow Measurement Devices

To ensure accurate results, facilities should evaluate, via visual observation and routine checks, the design, installation, and operation of flow measurement devices. When evaluating design, select a device which:

- Is accurate over the entire range of expected flow rates
- Can be installed in the channel to be monitored
- Is appropriate to the sampling location (i.e., power setup, submersible, etc.).

When evaluating the installation of flow measurement devices, ensure that:

- There are no leaks and/or bypasses of flow around the measuring device
- The primary device is level and squarely installed
- The secondary device is calibrated.

When evaluating the operation of flow measurement devices, look for:

- Excessive flows which submerge the measuring device
- Flows outside the accuracy range of the device
- Leaks and/or bypasses around the measuring device

- Turbulent flow through the measuring device
- Corrosion, scaling, or solids accumulation within the measuring device
- Obstructions to the measuring device
- Use of the correct factor or formula to convert head readings to actual flow rate.

Other than ensuring appropriate design and installation, accuracy checks are difficult to accomplish for primary flow measurement devices. Secondary flow measurement devices, on the other hand, may require evaluation of design, installation, and calibration. Applicants should examine the secondary recording devices and their readouts after installation to ensure that they are operating properly. Unusual fluctuations or breaks in flow indicate operational or design flaws.

3.2.2 ESTIMATING FLOW RATES

There are a variety of techniques for estimating flow rates. These methods are not as accurate as the methods described in Section 3.2.1 above, but are suitable for those discharges where primary or secondary devices are not practical or economically feasible. Each of the following methods is suitable for certain types of flow situations, as indicated. For each, the procedure for collecting flow rate data will be given along with a sample calculation.

Float Methods

Float methods can be used for any discharge where the flow is exposed and/or easily accessible. It is particularly useful for overland flows, gutter flows, and open drain or channel flows. The flow rate is calculated in each of the float methods by estimating the velocity of the flow and the cross-sectional area of the discharge and using the standard flow rate equation:

$$\textit{Flow Rate (cfm)} = \textit{Velocity (ft/min)} \times \textit{Area (ft}^2\textit{)}$$

The velocity is estimated by measuring the time it takes a float to travel between two points (point A and point B) along the flow path. For most accurate results, the two points should be at least 5 feet apart. The cross-sectional area is estimated by measuring the depth of the water and the width of the flow, and multiplying the depth by the width. This assumes a uniform cross-section in the flow path and a geometric cross-section shape. The float method can also be used for any accessible pipe or ditch where the movement of the float can be traced downstream for at least 5 feet. Subsurface storm water flows can be measured with the float method where there are two accessible manholes.

If the flow is overland, the water will need to be directed into a narrow channel or ditch so that the measurements can be taken. The initial preparation for this method requires that a shallow channel or ditch be dug that is 6 feet long or longer and 4 to 12 inches wide. The channel or ditch should be shallow enough to easily obtain flow depths but should be deep enough to carry the flow that will be diverted to it. Boards or other barriers should be placed on the ground above the channel (so that the flow is diverted into the channel) and along the edges of the channel or ditch (flush with the ground surface so that flow does not seep under them).

The procedure for measuring the flow rate by the float method involves measuring the length of the channel between chosen points A and B (which must be 5 feet apart or more). The depth of the water at point B, in the middle of the channel, must be determined, and the width of the water flow must be measured at point B. A float is then placed in the water and timed as it moves from point A to point B. Exhibit 3-8 provides an example of estimating the flow rate using the float method.

For runoff flows from many directions into a drain in a low or flat area where ponding is evident, the float method can also be used. The total flow rate is calculated by measuring flow rates for several points into the drain and adding these values together. Exhibit 3-9 provides an example of estimating the flow rate using the float method in this situation.

Bucket and Stopwatch Method

The bucket and stopwatch method of estimating flow rate is the easiest of all the flow rate estimation procedures. However, it can only be used under certain conditions. The flow or discharge to be measured must be flowing from a small pipe or ditch, and it must be free-flowing. In other words,

EXHIBIT 3-8. EXAMPLE CALCULATION OF FLOAT METHOD FOR UNIMPEDED OPEN CHANNEL FLOW

Step 1: When each sample or aliquot is taken, record the data for the time the sample was taken and the length between points A and B (at least 5 feet apart). See columns A, B, and C.

EXAMPLE DATA:

A	B	C	D	E	F	G
Sample Number	Time in Minutes	Distance Between Points A & B (feet)	Time of Travel (A to B) (min)	Depth of Water at Point B (feet)	Width of Flow at Point B (feet)	Calculated Flow Rate (cfm)
1	0	5.0	0.17	0.12	0.5	1.8
2	20	5.0	0.18	0.25	0.5	3.5
3	40	5.0	0.20	0.29	0.5	3.6
4	60	5.0	0.21	0.33	0.5	3.9
5	80	5.0	0.18	0.29	0.5	4.0
6	100	5.0	0.17	0.25	0.5	3.7
7	120	5.0	0.17	0.12	0.5	1.8
8	140	5.0	0.16	0.12	0.5	1.9
9	160	5.0	0.18	0.12	0.5	1.7

Step 2: Place a float in the water flow at point A and time it as it moves from point A to point B. Record the time in minutes. See column D.

Step 3: Measure the depth of the water and the width of the flow at point B. See columns E and F.

Step 4: Calculate the flow rate for each sample time using the common flow rate formula. See column G.

Formulas:

$$Velocity\ (V) = \frac{Length\ from\ A\ to\ B}{Time\ of\ Travel}$$

$$Area\ (A) = Water\ Depth \times Width\ of\ Flow$$

$$Flow\ Rate\ (Q) = (V) \times (A)$$

Example: For Sample 1

$$V = \frac{5.0\ ft}{0.17\ min} = 29.4\ ft/min$$

$$A = 0.12\ ft \times 0.5\ ft = 0.06\ ft^2$$

$$Q = 29.4\ ft/min \times 0.06\ ft^2 = 1.8\ cfm$$

EXHIBIT 3-9. EXAMPLE CALCULATION OF FLOAT METHOD FOR ESTIMATING DRAIN FLOW RATES

Step 1: When each sample or aliquot is taken, record the data for the time the sample was taken. Measure the outer perimeter or edge of the drain where the water flows in. See columns B and C.

Step 2: Designate three evenly spaced points surrounding the drain approximately 3 to 5 feet from the drain. These points will be referred to as points A, B, and C. Record the distance from each point to the edge of the drain. See column D.

EXAMPLE DATA: Assume the drain dimensions are 1 ft x 1 ft square, and flow surrounds drain.

A	B	C	D			E			F			G
Sample Number	Sample Time (min)	Drainage Perimeter (feet)	Distance of Point to Drain (feet)			Time of Travel to Drain (min)			Depth of Water (feet)			Calculated Flow Rate (cfm)
			Pt. A	Pt. B	Pt. C	Pt. A	Pt. B	Pt. C	Pt. A	Pt. B	Pt. C	
1	0	4	3	4	5	0.2	0.3	0.5	0.08	0.08	0.08	4 cfm
2	20	4	3	4	5	0.3	0.4	0.5	0.11	0.12	0.14	5 cfm
3	40	4	3	4	5	0.3	0.4	0.5	0.11	0.12	0.14	5 cfm
4	60	4	3	4	5	0.4	0.5	0.6	0.16	0.17	0.20	6 cfm
5	80	4	3	4	5	0.3	0.4	0.5	0.11	0.12	0.14	5 cfm
6	100	4	3	4	5	0.3	0.4	0.5	0.11	0.12	0.14	5 cfm
7	120	4	3	4	5	0.3	0.4	0.5	0.11	0.12	0.14	5 cfm
8	140	4	3	4	5	0.3	0.4	0.5	0.11	0.12	0.14	5 cfm
9	160	4	3	4	5	0.2	0.3	0.5	0.08	0.08	0.08	4 cfm

Step 3: Place a float at each of the three points and measure the time it takes to reach the drain. Record the times in minutes. See column E.

Step 4: Determine the depth of flow at each place where the float enters the drain from points A, B, and C. Record the depth in feet. See column F.

Step 5: Calculate the flow rate by adding the individual flow rates for points A, B, and C. Record the data in column G.

Formulas:

$$Velocity\ (V) = \frac{Distance\ of\ Point\ from\ Drain}{Time\ of\ Travel}$$

$$Area\ (A) = Water\ Depth \times Drainage\ Perimeter$$

$$Flow\ Rate\ (Q) = 1/n\Sigma A_n V_n \text{ where } n \text{ equals points A, B, and C}$$

Example: For Sample 1

$$V_A = \frac{3\ Feet}{0.2\ Min} = 15\ ft/min$$

$$A_A = 0.08\ ft \times 4\ ft = 0.32\ ft^2$$

EXHIBIT 3-9. EXAMPLE CALCULATION OF FLOAT METHOD FOR ESTIMATING DRAIN FLOW RATES (Continued)

$$Q_{TOTAL} = \frac{1}{3}(V_A A_A + V_B A_B + V_C A_C)$$

$$= \frac{1}{3}[(15\ ft/min)(0.32\ ft^2) + (13\ ft/min)(0.32\ ft^2) + (10\ ft/min)(0.32\ ft^2)]$$

$$= 4\ cfm$$

the pipe or ditch must be raised above the ground. Also, the flow must be small enough to be captured by a bucket or other suitable container without overflowing. If these conditions are not present, another method must be used. The procedure involves recording the time that each sample is taken, the time it takes for the container to be filled, and the volume of discharge collected. The flow rate is then calculated in gallons per minute (gpm) or in cubic feet per minute (cfm). The basis for the bucket and stopwatch method is the collection of a measured amount of flow over a measured amount of time to determine flow per unit of time (or flow rate) as per the formula below.

$$Flow\ Rate\ Q\ (gpm) = \frac{Volume\ of\ Bucket\ (gal)}{Time\ to\ Fill\ (sec)} \times \frac{60\ sec}{1\ min}$$

Exhibit 3-10 provides an example of estimating flow rates with the bucket and stopwatch method.

Slope and Depth Method

The slope and depth method is also a relatively easy method for estimating flow rates in pipes and ditches. This procedure requires that the slope of the pipe or ditch be known. A survey or engineering design data such as sewer or grading plans may provide the slope or grade of the pipe or ditch. In addition, the flow or effluent to be measured should not fully fill the pipe or ditch from which it is flowing. To measure the depth of the flow at the center of the pipe or ditch at the outfall, the outfall should be accessible. If these conditions are not present, another method should be used. The procedure involves recording the time that each sample is taken and measuring the depth of the flow in the middle of the pipe or ditch. If the flow is coming from a pipe, the inside diameter of the pipe should be recorded. If the effluent is coming from a ditch, the width of the flow in the ditch should be measured. Also, the modified slope of the ditch should be calculated. The flow rate is calculated in cfm using the same formulas for both pipes and ditches. Exhibit 3-11 provides an example of estimating the flow rate with the slope and depth method.

EXHIBIT 3-10. EXAMPLE CALCULATION OF BUCKET AND STOPWATCH METHOD FOR ESTIMATING FLOWS

Step 1: When each sample or aliquot is taken, record the data for the time the sample was taken. See column B.

EXAMPLE DATA:

A	B	C	D	E	F
Sample Number	Time (minutes)	Time to Fill Bucket (seconds)	Volume of Bucket (gallons)	Calculated Flow Rate (gpm)	Calculated Flow Rate in (cfm)
1	0	40.0	2.0	3.0	0.4
2	20	26.0	2.0	4.6	0.6
3	40	24.0	2.0	5.0	0.7
4	60	32.0	2.0	3.7	0.5
5	80	45.0	2.0	2.7	0.4
6	100	31.0	2.0	3.9	0.5
7	120	50.0	2.0	2.4	0.3
8	140	21.0	2.0	5.7	0.8
9	160	28.0	2.0	4.3	0.6

Step 2: Put a bucket beneath the flow, while measuring with a stopwatch the time it takes to fill the bucket to a certain level. If the water spills over the sides, the process must be redone. Record the time it took to fill the volume of water. See columns C and D.

Step 3: Calculate the flow rate in gpm and cfm.

Formulas:

$$\textit{Flow Rate, } Q(gpm) = \frac{\textit{Volume of bucket (gal)}}{\textit{Time to fill (sec)}} \times \frac{60\ sec}{1\ min}$$

$$Q(cfm) = Q(gpm) \times 0.1337\ ft^3/gal$$

Example: For Sample 1

$$Q\ (gpm) = \frac{2\ gal}{40.0\ sec} \times \frac{60\ sec}{1\ min} = 3.0\ gpm$$

$$Q\ (cfm) = 3.0\ gpm \times 0.1337\ ft^3/gal = 0.4\ cfm$$

EXHIBIT 3-11. EXAMPLE CALCULATION OF SLOPE AND DEPTH METHOD FOR ESTIMATING FLOW RATES

Step 1: Obtain the pipe or ditch channel percent slope from engineering data. Determine the inside diameter if the flow is from a pipe.

EXAMPLE DATA: For purposes of this example, a ditch with a 2 percent slope is assumed.

Step 2: When each sample or aliquot is taken, record the data for the time the sample was taken. See column B.

EXAMPLE DATA:

A	B	C	D	E	F	G
Sample Number	Time (minutes)	Depth of Water (in)	Width of Flow (ditch only) (feet)	"M" Modified Slope (ditch only)	Calculated Flow Rate (cfm Pipe only)	Calculated Flow Rate (cfm ditch only)
1	0	3.6	2.2	3.7	-	246.1
2	20	6.0	3.2	3.2	-	713.6
3	40	7.2	4.0	3.3	-	1,237.3
4	60	8.4	4.2	3.0	-	1,532.9
5	80	7.2	4.0	3.3	-	1,237.3
6	100	6.0	3.2	3.2	-	713.6
7	120	6.0	3.0	3.0	-	624.2
8	140	6.0	2.9	2.9	-	581.8
9	160	4.6	2.5	3.3	-	374.1

Step 3: Measure the depth of the water in the center of the pipe or ditch. Record the data in feet. See column C.

Step 4: Measure the width of the flow only if the flow is in a ditch. Record the data in feet. See column D.

Step 5: Calculate the modified side slope only if the flow is in a ditch (leave column E blank if the flow is in a pipe).

Formula:

$$\text{Modified slope } (M) = \frac{12.0 \text{ in/ft} \times \text{flow width (ft)}}{2.0 \times \text{water depth (in)}}$$

Example: Sample 1:

$$M = \frac{12.0 \text{ in/ft} \times 2.2 \text{ ft}}{2.0 \times 3.6 \text{ in}} = 3.7$$

Step 6: For pipes, calculate the flow rate and record the data in column F.

$$\text{Flow Rate } (Q) = 0.004 \times (I.D.)^{1.67} \times D \times \sqrt{S}$$

where Q = flow rate in pipe (cfm), I.D. = inside diameter of pipe (in), D = water depth (in), S = pipe slope (%)

Step 7: For ditches or channels, calculate the flow rate in cfm. Record the flow rate in column G.

Formula:

$$\text{Flow Rate } (Q) = \frac{0.42M \times (M)^{1.67} \times (D)^{2.67} \times \sqrt{S}}{(M^2 + 1)^{0.33}}$$

where Q = flow rate in ditch (cfm), M = modified slope, D = water depth (in), S = ditch slope (%)

Example: For Sample 1:

$$Q_1 = \frac{0.42\,(3.7) \times (3.7)^{1.67} \times (3.6)^{2.67} \times \sqrt{2}}{[(3.7)^2 + 1]^{0.33}}$$

$$Q = 246.1 \text{ cfm}$$

Runoff Coefficient Methods

Runoff coefficient methods are the least accurate of all the flow rate estimation methods. These methods should only be used for composite flow-weighted samples if all of the other methods are inappropriate for the site. Although the least accurate, runoff coefficients are the simplest method of estimating runoff rates.

Runoff coefficients represent the fraction of total rainfall that will be transmitted as runoff from the drainage area that flows into the facility outfall. Runoff coefficients consider the ground surface or cover material and determine the amount of storm water flow which may infiltrate or runoff as a discharge. A simple estimate of runoff volume assumes that paved areas and other impervious structures such as roofs have a runoff coefficient of 0.90 (i.e., 90 percent of the rainfall leaves the area as runoff). For unpaved surfaces, a runoff coefficient of 0.50 is normally assumed. A more accurate estimate can be made by using more specific runoff coefficients for different areas of the facility, based on the specific type of ground cover. Commonly used runoff coefficients are listed in Exhibit 3-12.

The average runoff coefficient can be estimated for drainage areas that have both paved and unpaved areas by weighting the coefficients based on their proportion of the total area. An equation for this would be:

$$\textit{Estimated Average Runoff Coef.} = \frac{(\textit{Area A})(\textit{Runoff Coef. A}) + (\textit{Area B})(\textit{Runoff Coef. B})}{\textit{Area A} + \textit{Area B}}$$

The area of the drainage basin can generally be obtained from land surveys conducted at the time of facility purchase or site surveys taken from design documents developed as part of construction planning. If these are not available, the applicant may estimate the drainage areas from a topographic map of the area. The areas used in this calculation should include only those areas drained by the sampled outfall. When determining the basin area that drains through the outfall, some special considerations should be noted: (1) storm water from sources outside an industrial facility's property boundary may contribute to the discharge; and (2) storm water not associated with industrial activity may contribute to the flow volume. Where these conditions occur, the facility should accurately quantify and appropriately address these contributions.

EXHIBIT 3-12. TYPICAL "c" COEFFICIENTS FOR 5- TO 10-YEAR FREQUENCY DESIGN STORMS

Description of Area	Runoff Coefficients
Business	
• Downtown areas	0.70-0.95
• Neighborhood areas	0.50-0.70
Residential	
• Single-family areas	0.30-0.50
• Multiunits (detached)	0.40-0.60
• Multiunits (attached)	0.60-0.75
Residential (suburban)	0.25-0.40
Apartment dwelling areas	0.50-0.70
Industrial	
• Light areas	0.50-0.80
• Heavy areas	0.60-0.90
Parks and cemeteries	0.10-0.25
Playgrounds	0.20-0.35
Railroad yard areas	0.20-0.40
Unimproved areas	0.10-0.30
Streets	
• Asphalt	0.70-0.95
• Concrete	0.80-0.95
• Brick	0.70-0.85
Drives and walks	0.75-0.85
Roofs	0.75-0.95
Lawns - course textured soil (greater than 85 percent sand)	
• Slope: Flat (2 percent)	0.05-0.10
Average (2-7 percent)	0.10-0.15
Steep (7 percent)	0.15-0.20
Lawns - fine textured soil (greater than 40 percent clay)	
• Slope: Flat (2 percent)	0.13-0.17
Average (2-7 percent)	0.18-0.22
Steep (7 percent)	0.25-0.35

Source: *Design and Construction of Sanitary and Storm Sewers*, with permission from the publisher, American Society of Civil Engineers, *Manual of Practice*, page 37, New York, 1960.

There are two specific methods to estimate flow rate using runoff coefficients. The first method uses depth of flow in a pipe or ditch and an average runoff rate to estimate each of the sample flow rates where the slope/pitch of the pipe or ditch is unknown. Exhibit 3-13 provides an example calculation of estimating flow rates based on depth and runoff coefficients. The second method uses only rainfall accumulation and runoff coefficients to estimate a flow associated with the time the sample was taken. No actual flows or flow depths are measured. Exhibit 3-14 provides an example of estimating the flow rate based on rainfall depth and runoff coefficients.

3.2.3 MEASURING TOTAL FLOW VOLUMES FOR THE SAMPLED RAIN EVENT

Similar to measuring flow rates, flow volumes may be measured using automatic flowmeters or primary/secondary devices as discussed in Section 3.2.1. Measurement of flow volume with these devices provides a reasonably accurate determination of the total flow volume for the entire storm water discharge. In many cases, however, primary or secondary devices have not been installed for storm water flow measurement. Portable flow measurement devices are often expensive. Many of the automatic samplers that are currently on the market can measure flow volumes as well as perform sampling. Where available and when economically feasible, measuring devices should be used to generate data for calculating flow.

3.2.4 ESTIMATING TOTAL FLOW VOLUMES FOR THE SAMPLED RAIN EVENT

Since accurate measurement of total flow volumes is often impracticable due to lack of equipment, total flow volumes are more commonly estimated. The two methods provided in this section require only simple estimated measurements. The first method is based on rainfall depths and runoff coefficients and the second is based on flow rates that can be either measured or estimated.

Runoff Coefficients Methods

Discharge volumes are most easily estimated using the area of the drainage basin contributing to the outfall, the rainfall accumulation, and a runoff coefficient. The total volume of discharge can be estimated using a simple equation that relates the amount of rainfall to the volume of discharge that will leave the site as runoff. The equation is as follows:

EXHIBIT 3-13. EXAMPLE CALCULATION OF RUNOFF COEFFICIENT/FLOW DEPTH METHOD FOR ESTIMATING FLOW RATES

Step 1: Estimate the runoff coefficient for the drainage area that contributes flow to the sampled outfall (see Section 3.2.2).

EXAMPLE: Assume the drainage area to the outfall is 3 acres. Two of those acres are paved with a runoff coefficient of .90, and 1 is unpaved with a runoff coefficient of .50. Using the equation for estimated runoff coefficient from the text in Section 2.2.2.2:

$$\textit{Est. Run. Coef.} = \frac{(2\ Ac)\ (0.90) + (1\ Ac)\ (0.50)}{2\ Ac + 1\ Ac} = 0.77$$

The runoff coefficient for the entire drainage area is 0.77.

Step 2: Measure the rainfall depth. Record the total rainfall of the storm or the rainfall that occurred in the first 3 hours (if it lasted more than 3 hours). Also record the duration of the rain event.

EXAMPLE: Assume the rainfall depth to be 1.0 inches in 3 hours.

Step 3: Calculate an average runoff rate.

Formula:

$$\textit{Average Runoff Rate} = \frac{\textit{Drainage Area} \times \textit{Runoff Coef.} \times \textit{Rainfall Depth}}{\textit{Rainfall Duration}}$$

Example:

$$\textit{Average Runoff Rate} = \frac{3\ Ac \times .77 \times 1\ in}{3\ hrs} \times \frac{43{,}560\ ft^2}{Ac} \times \frac{ft}{12\ in} \times \frac{hr}{60\ min} = 47\ cfm$$

When each sample or aliquot is taken, record the data for the time the samples were taken and the depth of the water in the center of the ditch or pipe. Record the data in columns B and C.

EXAMPLE DATA:

A	B	C	D	E
Sample Numbers	Time (minutes)	Channel or Ditch Water Depth (feet)	Calculated Depth-Weighted Flow Factor	Flow Rate (cfm)
1	0	1.0	0.82	39
2	20	1.1	0.90	42
3	40	1.2	0.98	46
4	60	1.25	1.02	48
5	80	1.3	1.06	50
6	100	1.25	1.02	48
7	120	1.2	0.98	46
8	140	1.7	1.39	65
9	160	1.0	0.82	39

Step 4: Sum up all the water depths for each sample taken as indicated above in column C.

Sum = 11.0 feet

EXHIBIT 3-13. EXAMPLE CALCULATION OF RUNOFF COEFFICIENT/FLOW DEPTH METHOD FOR ESTIMATING FLOW RATES (Continued)

Step 5: Calculate a depth-weight flow factor and record the data in column D.

Formula:

$$Factor = \frac{Measured\ Water\ Depth \times Number\ of\ Flow\ Measurements}{Sum\ of\ all\ Water\ Depths}$$

Example: For Sample 1

$$Factor = \frac{(1\ ft) \times 9}{11.0} = 0.82$$

Step 6: Calculate the flow rate. Record the data in column E.

Formula:

$$Flow\ Rate,\ Q\ (cfm) = Average\ Runoff\ Rate \times Depth\ Factor$$

Example: For Sample 1

$$Q = 47\ cfm \times 0.82 = 39\ cfm$$

$$V_t = R_t \times [(A_{paved} \times C_{runoff}) + (A_{unpaved} \times C_{runoff})]$$

where: V_t = the total runoff volume in cubic feet
R_t = the total rainfall measured in feet
A_{paved} = the area (sq ft) within the drainage basin that is paved or roofed
$A_{unpaved}$ = the area (sq ft) within the drainage basin that is unpaved
C_{runoff} = a specific runoff coefficient (no units) for the drainage area ground cover

Exhibit 3-15 provides an example calculation of total runoff volume from rainfall data.

Discharge Volumes Estimated Based on Measured Flow Rates

Another method of estimating the total volume of a discharge uses a series of measured or estimated flow rates. The total volume of discharge can be estimated by first multiplying each of the flow rates by the time interval in between flow measurements. This time period represents the portion of the total storm duration that can be associated with the flow rate measurement. Adding all such partial volumes results in a total flow volume. A procedure for calculating the total runoff volume from a set of discrete measurements of flow depth and velocity in a ditch during a storm runoff event is presented in Exhibit 3-16.

EXHIBIT 3-14. EXAMPLE CALCULATION OF RUNOFF COEFFICIENT RAINFALL DEPTH METHOD FOR ESTIMATING FLOW RATES

Step 1: Estimate the runoff coefficient for the drainage area that contributes flows to the sampled outfall.

EXAMPLE: See Step 1 in Exhibit 3-14. The site for this example will be similar so a coefficient of .77 will be used for the same 3-acre drainage area.

Step 2: When each sample or aliquot is taken, record the data for the time the sample was taken. Record the data in column B.

EXAMPLE DATA:

A	B	C	D	E	F
Sample Number	Time (minutes)	Total Rainfall Depth (inches)	Time Since Last Sample	Incremental Rainfall (inches) per 20 minutes	Calculated Flow Rate (cfm)
1	0	0.0	0	0.0	–
2	20	0.2	20	0.2	84
3	40	0.3	20	0.1	42
4	60	0.5	20	0.2	84
5	80	0.6	20	0.1	42
6	100	0.8	20	0.2	84
7	120	0.9	20	0.1	42
8	140	1.0	20	0.1	42
9	160	1.1	20	0.1	42

Step 3: Using a rainfall gauge, measure the total rainfall depth (in inches) and record the data in column C.

EXAMPLE: See sample data above.

Step 4: Calculate the incremental time since the last flow measurement and record the data in column D.

EXAMPLE: Samples were taken 20 minutes apart so this increment will be 20 minutes for every sample.

Step 5: Calculate the additional or incremental rainfall that has occurred since the last measurement. Record the data in column E.

Formula:

$$\textit{Incremental Rainfall} = \textit{Total Rainfall Sample 2} - \textit{Total Rainfall Sample 1}$$

Example: For Sample 2

$$\textit{Incremental Rainfall} = .2 - 0 = .2 \textit{ inches}$$

Step 6: Calculate the flow rate. Record the data in column F

Formula:

$$\textit{Flow Rate (cfm)} = \frac{(\textit{Drainage area})(\textit{Runoff coefficient})(\textit{Incremental rainfall})}{(\textit{Incremental time})}$$

Example:

$$\textit{Flow Rate} = \frac{(3\ Ac)(0.77)(0.2\ in)}{20\ min} \times \frac{(43{,}560\ ft^2)}{Ac} \times \frac{1\ ft}{12\ in} = 84\ cfm$$

EXHIBIT 3-15. EXAMPLE CALCULATION OF TOTAL RUNOFF VOLUME FROM RAINFALL DATA

Step 1: Determine the area of drainage contributing to the runoff volume at the outfall and convert it to square feet.

Example: Using a land survey, a facility has determined its site encompasses 0.3 acres (13,068 square feet). The entire site is used for industrial activities, and therefore, any storm water discharges from the site will be associated with industrial activity. A berm surrounds the entire site limiting the drainage area to the site itself and preventing any dilution or contamination from other discharges. (Note: To convert acres to square feet, multiply the number of acres by 43,560, which is the conversion factor).

Step 2: Determine the rainfall depth during the event that was sampled to the nearest one-hundredth of an inch and convert it to feet.

Example: From the rain gauge, the rainfall accumulation is measured at 0.6 inches or 0.05 feet (ft). (Note: To convert inches to feet, divide the inches by 12, which is the conversion factor).

Step 3: Determine the runoff coefficients for each area.

Example: The facility has estimated that ⅓ of the site, or 4,356 square feet, is covered by impervious surfaces (i.e., roofs or paved roadways) and ⅔ of the site, or 8,712 square feet, is unpaved.

Step 4: Calculate the volume of flow using the following formula and convert the volume to liters.

Formula: ***Total runoff volume in cubic feet (cu ft) = total rainfall (ft) x [facility paved area (sq ft) x 0.90 + facility unpaved area (sq ft) x 0.50]***

Example: ***Total runoff volume (cu ft) = 0.05 x [4,356 x 0.90 + 8,712 x 0.50]***

Total runoff volume = 413.8 cu ft or 11,720 liters

(Note: To convert cubic feet to liters, multiply cubic feet by 28.32, which is the conversion factor).

EXHIBIT 3-16. EXAMPLE CALCULATION OF TOTAL RUNOFF VOLUME FROM FLOW RATE DATA

Step 1: Measure and tabulate flow depths and velocities every 20 minutes (at the same time that the sample is collected) during at least the first 3 hours of the runoff event.

EXAMPLE DATA:

A	B	C	D	E	F
Sample Number	**Time (minutes)**	**Flow Velocity (feet per minute)**	**Flow Depth (feet)**	**Width (feet)**	**Calculated Flow Rate (cfm)**
1	0	-	-	-	-
2	20	4	0.2	5	4
3	40	8	0.4	5	16
4	60	12	0.4	5	24
5	80	8	0.4	5	16
6	100	4	0.2	5	4
7	120	8	0.2	5	8
8	140	4	0.2	5	4
9	160	4	0.2	5	4

EXHIBIT 3-16. EXAMPLE CALCULATION OF TOTAL RUNOFF VOLUME FROM FLOW RATE DATA (Continued)

Step 2: Calculate and tabulate the cross-sectional area of flow for each of the flow depths measured. Calculate the flow rate for each discrete set of measurements.

Formula:

$$\textit{Flow Rate } Q \textit{ (cfm)} = \textit{Velocity (ft/min)} \times \textit{Area (sq ft)}$$
$$\textit{Area} = \textit{Depth} \times \textit{Width}$$

Example: For Sample 1

$$\textit{Area} = 0.2\ ft \times 5\ ft = 1\ sq\ ft$$
$$\textit{Flow Rate} = 4\ ft/min \times 1\ sq\ ft = 4\ cfm$$

Step 3: Plot the flow rate, Q, versus time. Also, assume that flow drops uniformly from the last calculated flow rate (Q_9) to zero at the time when Q_{10} would have been taken.

Example: The flow rates calculated in Step 3 are plotted against the time between samples.

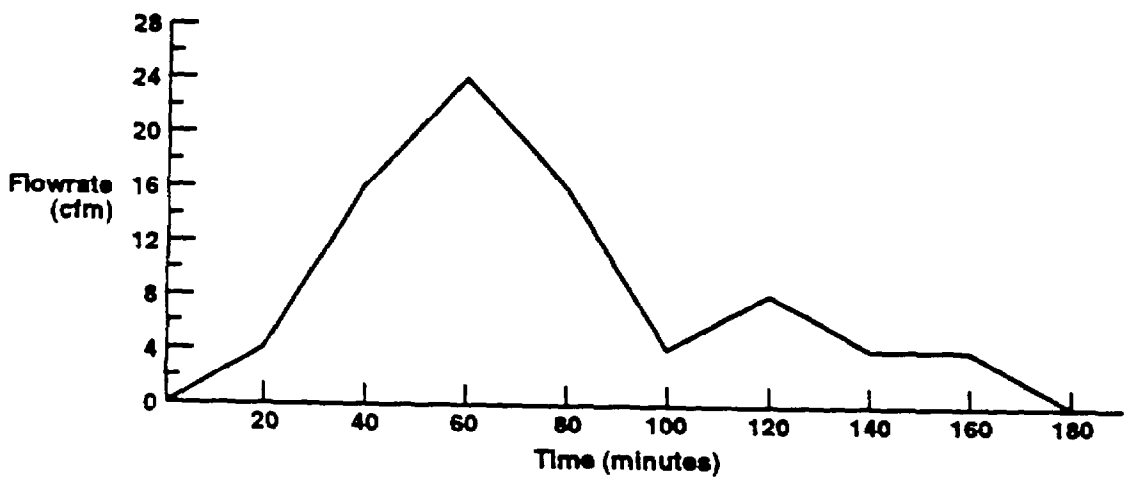

EXHIBIT 3-16. EXAMPLE CALCULATION OF TOTAL RUNOFF VOLUME FROM FLOW RATE DATA (Continued)

Step 4: The total flow volume (V_t) can be calculated by geometrically determining the area under the curve. The summation of the individual volumes per increment of time (V_1 through V_9) is the total flow volume of the event.

Example:

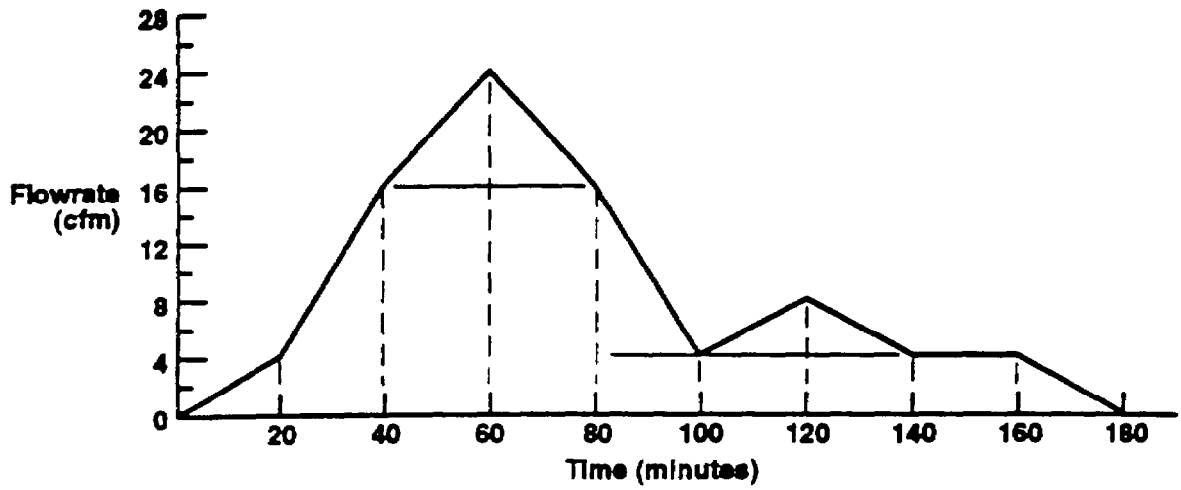

Step 5: Compute the flow volume associated with each observation (V_1, V_2, ..., V_9) by multiplying the measured flow rate by the duration (in this case, 20 minutes). Be sure the units are consistent. For example, if durations are in minutes and flow velocities are in cubic feet per second (cfs), convert the durations to seconds or the velocities to feet per minute.

Example:

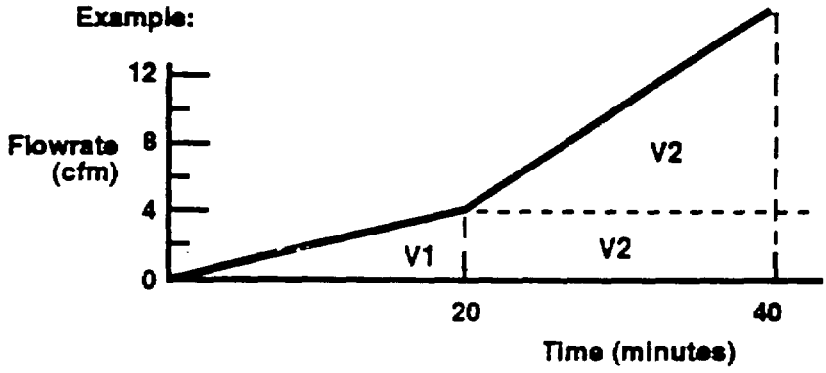

EXHIBIT 3-16. EXAMPLE CALCULATION OF TOTAL RUNOFF VOLUME FROM FLOW RATE DATA (Continued)

Formula: ***Volume (V) = Flow Rate (cfm) x Duration (minutes)***

Example:

$$V_1 = \frac{1}{2}(Q_1 - Q_0)(t_1 - t_0) = \frac{1}{2}(4-0)(20-0) = 40\ ft^3$$

$$V_2 = \frac{1}{2}(Q_2 - Q_1)(t_2 - t_1) + Q_1(t_2 - t_1)$$

$$= \frac{1}{2}(16-4)(40-20) + 4(20)$$

$$= 120 + 80 = 200\ ft^3$$

$V_1 = 40\ ft^3$
$V_2 = 200\ ft^3$
$V_3 = 400\ ft^3$
$V_4 = 400\ ft^3$
$V_5 = 200\ ft^3$
$V_6 = 120\ ft^3$
$V_7 = 120\ ft^3$
$V_8 = 80\ ft^3$
$V_9 = 40\ ft^3$

Step 6: Total the individual volumes calculated in Step 5 to obtain the total runoff volume.

Example:

Total Storm Runoff = 1,600 ft³

3.2.5 REPORTING STORM WATER DISCHARGE FLOW RATES AND VOLUMES

Form 2F requires applicants to provide quantitative data (reported both as concentration and as total mass) based on flow-weighted samples collected during storm events. In addition, applicants are required to provide flow estimates or flow measurements, as well as an estimate of the total volume of the discharge. The method of flow estimation or measurement must be described in the application. Although EPA only requires flow estimates in Form 2F, accurate flow measurement is necessary for collecting representative flow-weighted composite samples and reporting pollutant mass loadings.

3.2.6 MEASURING RAINFALL

Many types of instruments have been developed to measure the amount and intensity of precipitation. All forms of precipitation are measured on the basis of the depth of the water that would accumulate on a level surface if precipitation remained where it fell. There are two types of rain gauges -- standard and recording gauges. A standard rain gauge collects the rainfall so that the amount of rain can be easily measured. The standard gauge for the NWS has a collector which is 8 inches in diameter. Rain flows from the collector into a cylindrical measuring tube inside the overflow can. The measuring tube has a cross-sectional area one tenth the size of the collector so that 0.1 inch of rainfall will fill 1 inch of the measuring tube. While this standard gauge is both accurate and easy to use, any open receptacle with vertical sides can be an effective rain gauge. Standard rain gauges are simple and inexpensive; however, with a standard gauge, there is no way to record changes in the intensity of the rainfall without making frequent observations of the gauge during the storm.

The second type of gauge is the recording rain gauge, which provides a permanent record of the amount of rainfall which accumulates over time. Three common types of recording gauges are:

- Tipping Bucket Gauge - Water caught in a collector is funneled into a two-compartment bucket; a known quantity of rain fills one compartment, overbalancing the bucket and emptying it into a reservoir. This moves the second bucket into place beneath the funnel. The tipping of the bucket engages an electric circuit, which records the event.

- Weighing Type Gauge - Water is weighed when it falls into a bucket placed on the platform of a spring or lever balance. The weight of the contents is recorded on a chart, showing the accumulation of precipitation.

- Float Recording Gauge - Water is measured by the rise of a float that is placed in the receiver. These gauges may be self-siphoning, or may need to be emptied periodically by hand.

Recording rain gauges provide a permanent record of rainfall, and they can be used to determine variations in rainfall intensity over time without making frequent observations during the storm. But recording gauges are more complicated mechanically than standard gauges, making them more costly, less durable, and more difficult to operate.

Although all gauges are subject to error, most errors can be minimized. To minimize errors, the gauge should be placed on a level surface that is not windswept and is away from trees or buildings that might interfere with the path of rainfall. When taking measurements, other factors contributing to error should also be considered: mistakes in reading the scale, dents in the collector rim (which changes the receiving area), measuring sticks that may retain some of the water, and water lost to evaporation. In the case of tipping bucket gauges, water may not be collected while the bucket is still tipping. The most common source of inaccuracy is changes in data that are attributable to wind. It is possible to assess wind errors by comparing measurements of gauges that are protected from the wind with those that are not.

3.3 GRAB SAMPLE COLLECTION

Section 3.1.2 discussed both the parameters that must be monitored by grab sample and the conditions under which grab sampling is required. This section explains how to collect grab samples. The entire sample is collected at an uninterrupted interval (i.e., grabbed at one time). A grab sample provides information on the characterization of storm water at a given time and may be collected either manually or automatically as discussed below.

3.3.1 HOW TO MANUALLY COLLECT GRAB SAMPLES

A manual grab is collected by inserting a container under or downcurrent of a discharge with the container opening facing upstream. Generally, simplified equipment and procedures can be used. In most cases, the sample container itself may be used to collect the sample. Less accessible outfalls may require the use of poles and buckets to collect grab samples. To ensure that manual grab samples are representative of the storm water discharged, the procedures set forth in Exhibit 3-17 should be followed.

EXHIBIT 3-17. RECOMMENDED OPERATING PROCEDURES FOR TAKING GRAB SAMPLES

- Label sample containers before sampling event
- Take a cooler with ice to the sampling point
- Take the grab from the horizontal and vertical center of the channel
- Avoid stirring up bottom sediments in the channel
- Hold the container so the opening faces upstream
- Avoid touching the inside of the container to prevent contamination
- Keep the sample free from uncharacteristic floating debris
- Transfer samples into proper containers (e.g., from bucket to sample container), however, fecal coliform, fecal streptococcus, phenols and O&G should remain in original containers
- If taking numerous grabs, keep the samples separate and labelled clearly
- Use safety precautions (see Chapter 6)

Specialized equipment and procedures may be needed, particularly in situations where storm water discharges are inaccessible or where certain parameters are monitored. For example:

- When sampling for O&G and VOCs, equipment that safely and securely houses O&G bottles or VOC vials should be used. This may be necessary because: (1) O&G will adhere to containers and thus should not be transferred from one container to another; and (2) excessive aeration during sampling may result in the partial escape of VOCs.
- Since facilities sometimes use sample bottles that already contain preservatives (as provided by contract laboratories), extreme care should be taken when filling them to avoid spills, splatters, or washout of the preservatives.

All equipment and containers that come into contact with the sample must be clean to avoid contamination. Additionally, sample collection equipment and container materials should be totally unreactive to prevent leaching of pollutants. Cleaning procedures are discussed in detail in Section 3.5.

3.3.2 HOW TO COLLECT GRAB SAMPLES BY AUTOMATIC SAMPLER

Grab samples can also be collected using programmed automatic samplers. Automatic samplers come equipped with computers that can be programmed to collect grab samples. Programming for grabs is specific to the type of automatic sampler. Some samplers are portable and have been developed specifically to sample for storm water discharges. These samplers are frequently attached to a rain gauge and/or a flow sensor. Such samplers can be programmed to initiate sample collection by one or more of the following conditions: (1) depth of flow in a channel; (2) rainfall in inches; (3) flow rate; (4) time; (5) external signal; and (6) combinations of the first three conditions. For example, an automatic sampler could be used to collect a sample at 15-minute intervals after its sensors indicate that rainfall has begun.

When using an automatic sampler, planning is very important. First, all equipment must be properly cleaned, particularly the tubing and the sample containers. There are several different types of tubing available, including rubber and Tygon tubing. Tygon tubing is commonly used since it generally does not leach contaminants. Deionized water should be drawn through the sampler to remove any remaining pollutant residuals prior to taking samples. Tubing should also be replaced periodically to avoid algae or bacterial growth.

Sampling personnel should also use adequate and appropriate containers and ensure they are properly cleaned. Section 3.5 contains information on cleaning procedures which should be followed for all equipment. Additionally, the utilization of blanks (a control used to verify the accuracy of analytical results) is recommended to determine if cross-contamination of sampling equipment has occurred. Samplers should also be programmed, set up, and supplied with a source of power. Properly charged batteries should be readily available for portable samplers in advance of a storm event and, as a backup power supply in case of power failure. Finally, although automatic samplers may be useful in some situations, several parameters are not amenable to collection by automatic sampler. These pollutants include fecal streptococcus, fecal coliforms, oil and grease and VOCs which should be collected manually, not automatically, as discussed in Section 3.1.2.

3.4 FLOW-WEIGHTED COMPOSITE SAMPLE COLLECTION

Composite samples are samples simply comprised of a series of individual sample aliquots that have been combined to reflect average pollutant concentrations of the storm water discharge during the

sampling period. Composite samples can be developed based on time or flow rate. There are four different types of composite samples, as follows:

- Constant Time - Constant Volume - Samples of equal volume are taken at equal increments of time and composited to make an average sample (similar to Exhibit 3-18). This method is not acceptable for samples taken for compliance with the storm water permit application regulations.

- Constant Time - Volume Proportional to Flow Increment - Samples are taken at equal increments of time and are composited proportional to the volume of flow since the last sample was taken (see Exhibit 3-19).

- Constant Time - Volume Proportional to Flow Rate - Samples are taken at equal increments of time and are composited proportional to the flow rate at the time each sample was taken (see Exhibit 3-20).

- Constant Volume - Time Proportional to Flow Volume Increment - Samples of equal volume are taken at equal increments of flow volume and composited (see Exhibit 3-21).

Generally, flow-weighted composite samples must be collected for most parameters. The methods for generating flow-weighted composite samples are discussed in the following sections.

For storm water discharge permit applications, the aliquots for flow-weighted composite samples must be collected during a representative storm for the first 3 hours, or for the duration of the storm event if it is less than 3 hours long. The storm water application regulations allow for flow-weighted composite samples to be collected manually or automatically. For both methods, equal volume aliquots may be collected at the time of sampling and then flow-proportioned and composited in the laboratory, or the aliquot may be collected based on the flow rate at the time of sample collection and composited in the field. When composite samples are collected, the regulations require that each aliquot collection be separated by a minimum of 15 minutes and that a minimum of three sample aliquots be taken within each hour of the discharge. See Exhibit 3-22 for an example of how this requirement may be fulfilled.

The provisions set forth in 40 CFR 122.21(g)(7) for collecting flow-weighted composite samples establish specific requirements for minimum time duration between sample aliquots. Where these conditions cannot be met, the permitting authority may allow alternate protocols with respect to the time duration between sample aliquots (see Chapter 5). However, permission from the permitting

EXHIBIT 3-18. CONSTANT TIME - CONSTANT VOLUME

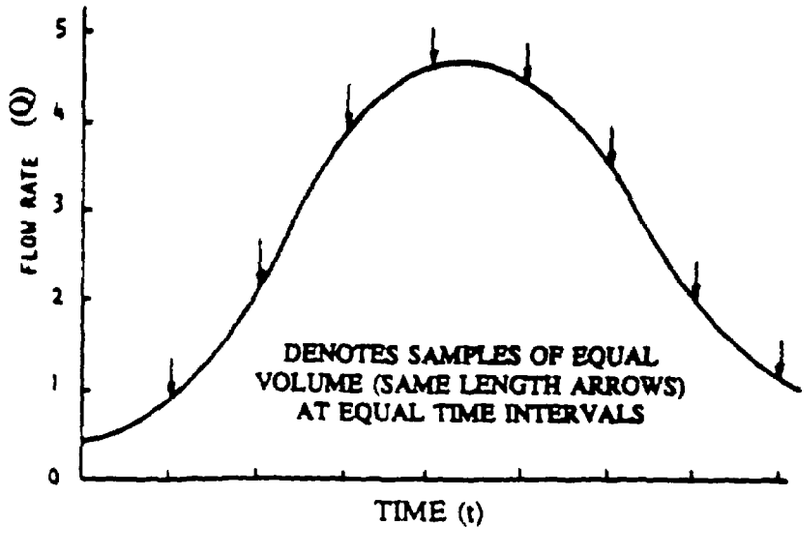

Method of compositing samples on a fixed volume-fixed time interval basis

Source: Methodology for the Study of Urban Storm Generated Pollution and Control, U.S. EPA 600/2-76-145, August 1976.

EXHIBIT 3-19. CONSTANT TIME - VOLUME PROPORTIONAL TO FLOW INCREMENT

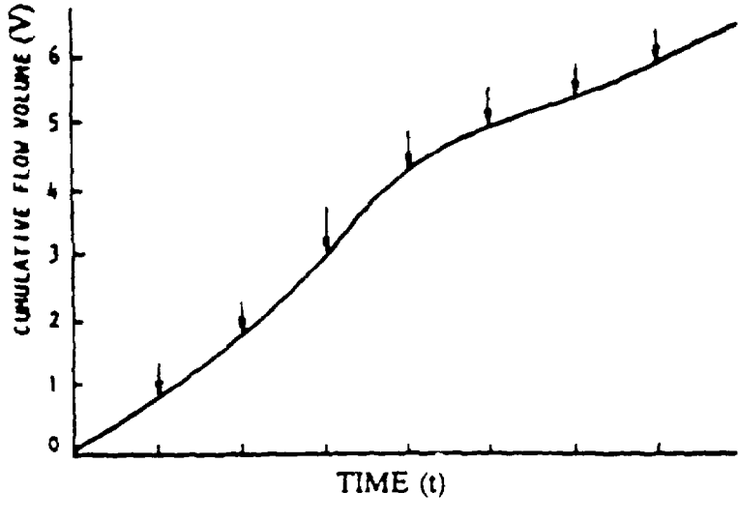

Method of compositing samples proportional to flow volume at constant time interval

Source: Methodology for the Study of Urban Storm Generated Pollution and Control, U.S. EPA 600/2-76-145, August 1976.

EXHIBIT 3-20. CONSTANT TIME - VOLUME PROPORTIONAL TO FLOW RATE

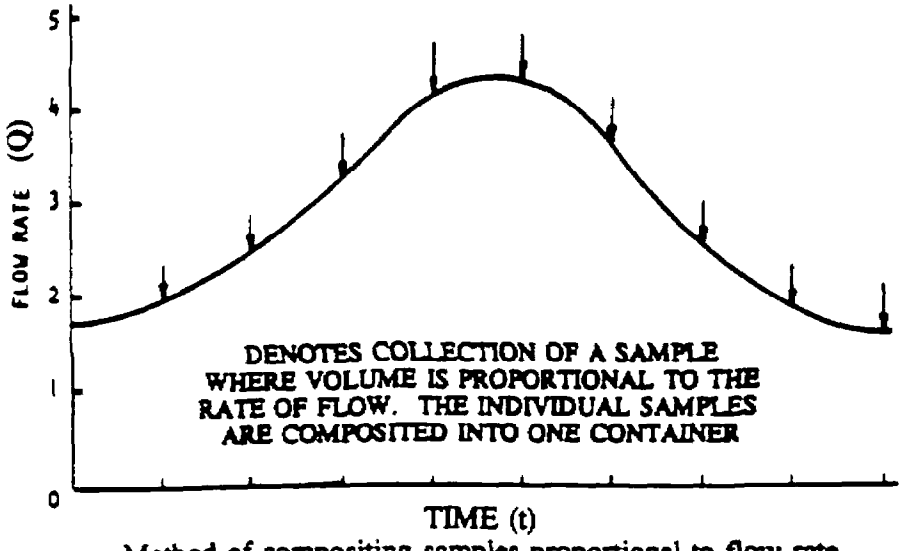

Method of compositing samples proportional to flow rate

Source: Methodology for the Study of Urban Storm Generated Pollution and Control, U.S. EPA 600/2-76-145, August 1976.

EXHIBIT 3-21. CONSTANT VOLUME - TIME PROPORTIONAL TO FLOW VOLUME INCREMENT

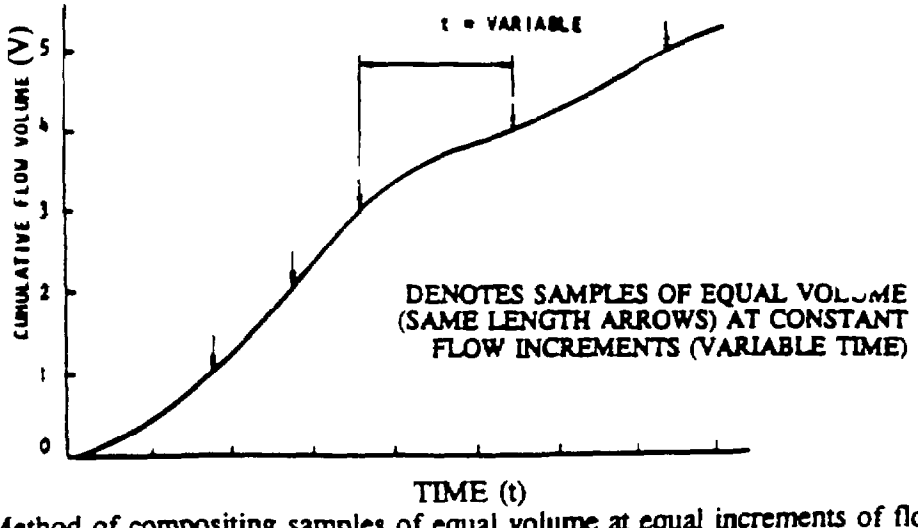

Method of compositing samples of equal volume at equal increments of flow

Source: Methodology for the Study of Urban Storm Generated Pollution and Control, U.S. EPA 600/2-76-145, August 1976.

EXHIBIT 3-22. EXAMPLE OF SAMPLING INTERVALS

Suppose that a storm water discharge began at 2:15 p.m. and lasted until 5:15 p.m. on a Friday. The field staff person wants to collect the samples at regular intervals, so s/he plans to collect an aliquot with a volume that is proportional to the flow every 20 minutes. After the third hour of collection, the field staff person must deliver the samples to the laboratory (which is 10 minutes away). The laboratory closes at 5:00 p.m. So, s/he should take the last sample at 4:45 p.m. One way of doing this would be to collect samples (in hour three) at 4:15, 4:30, and 4:45 p.m. This would comply with the three-sample minimum in hour three (4:15-5:15 p.m.) and the required 15-minute minimum interval between collections. It would also allow the field staff person to get the samples to the lab before it closes for the weekend. On the other hand, if s/he missed the sample collection at 4:15 p.m. and instead, collected the sample at 4:20 p.m., then s/he would have to collect the next sample at 4:35 p.m. and the last sample at 4:50 p.m., and the field staff person would not be able to deliver the sample until Monday (by which time the required maximum holding time would be exceeded), and the sampling would need to be repeated.

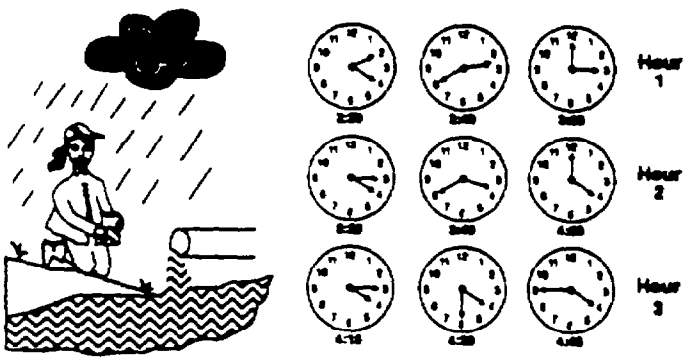

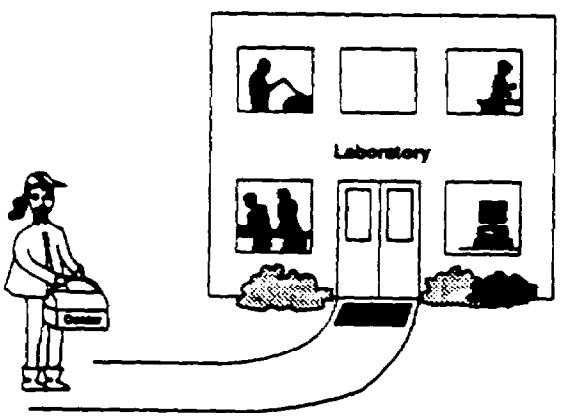

authority must be obtained before changes are initiated. Considerations applicable to the collection of flow-weighted composites by automatic and manual techniques are discussed in the following sections.

3.4.1 HOW TO MANUALLY COLLECT FLOW-WEIGHTED COMPOSITE SAMPLES

Manually collected, flow-weighted composite samples may be appropriate for a facility that prefers not to invest in automatic equipment. This technique is cost-effective for short-term monitoring programs and for facilities where few outfalls are being sampled. The fundamental requirement for facilities that use these methodologies is that they should have personnel available to perform the sampling when needed. Those facilities where VOCs analysis of storm water discharges are required should manually collect composite samples since these parameters may not be amenable to sampling by automatic samplers. Compositing of VOC samples should be conducted in the laboratory as discussed in Section 3.5.2.

The manual collection of a flow-weighted sample is performed in the same manner as taking manual grab samples (see Section 3.3.1). The only difference is that a series of samples (or aliquots) will be collected. As discussed in the previous section, there are two ways to manually collect and combine the aliquots for a flow-weighted sample:

- Collect sample aliquot volumes based on the flow at the time of sampling which can immediately be combined to make the composite sample in the field (see Exhibit 3-23)
- Collect equal volume sample aliquots at the time of sampling and then flow-proportion and composite the aliquots in the laboratory (see Exhibit 3-24).

When uniform time intervals are used between the collection of the sample aliquots, the volumes of each aliquot used in the composite sample can be determined based on either volumes of flow or the flow rate, as they will result in similar proportions. However, when there are different time intervals between the sample aliquots, the individual sample aliquot volumes should be based on the runoff volume (calculated from the individual flow rates and durations) associated with each sample aliquot.

Generally, 1,000 ml for each aliquot collected should provide enough sample volume, when composited, for pollutant analyses of the required parameters contained in Section VII.A of Form 2F (see Section 3.6). More aliquot volume may be required if sampling is conducted for additional parameters. The laboratory conducting the analyses should always be contacted prior to a sampling event to determine how much sample volume they will require.

EXHIBIT 3-23. EXAMPLE OF HOW TO COLLECT SAMPLE ALIQUOT VOLUMES BASED ON FLOW, AND PROPORTION AND COMPOSITE IN THE FIELD

Step 1: Determine the necessary volume for compositing purposes.

Example: To fulfill analyses for all parameters in Section VII.A of Form 2F for which composite samples are required [Biochemical Oxygen Demand (BOD_5), Chemical Oxygen Demand (COD), Total Suspended Solids (TSS), Total Kjeldahl Nitrogen (TKN), nitrate plus nitrite, and phosphorous] a total composite sample volume of 5,000 ml is needed by the contract laboratory.

Step 2: Determine an appropriate interval for collection of samples.

Example: Manually collected flow-weighted composite samples must consist of at least three sample aliquots collected per hour and must be gathered at least 15 minutes apart. For this example, sample aliquots will be collected exactly 20 minutes apart.

Step 3: Estimate or measure the volume of discharge for each sampling event.

Example: A discharge flow volume of 4.8 cubic feet will be used here.

Step 4: Convert the discharge flow volume to liters.

Example: To convert cubic feet to liters, use the conversion factor of 28.32 liters per 1 cubic foot as set forth in the following formula:

$$\textit{Volume (liters)} = \textit{Volume (cubic feet)} \times \frac{28.32 \text{ liters}}{1 \text{ cubic foot}}$$

$$\textit{Volume} = 4.8 \text{ cubic feet} \times \frac{28.32 \text{ liters}}{1 \text{ cubic foot}} = 136 \text{ liters}$$

Step 5: Using Steps 3 and 4, volumes that have been discharged between the collection of each aliquot can be calculated.

(Note that the discharge volumes provided for aliquot numbers 2-9 have already been given for the purposes of this exhibit.)

Example: The procedures set forth in Section 3.2 may be used to calculate discharge volumes. The following table presents aliquot numbers, time of aliquot collection, and discharge volumes.

Aliquot Number	Time of Aliquot Collection	Discharged Volume
1	2:15 p.m.	136 liters
2	2:35 p.m.	200 liters
3	2:55 p.m.	122 liters
4	3:15 p.m.	178 liters
5	3:35 p.m.	156 liters
6	3:55 p.m.	117 liters
7	4:15 p.m.	94 liters
8	4:30 p.m.	21 liters
9	4:45 p.m.	12 liters

EXHIBIT 3-23. EXAMPLE OF HOW TO COLLECT SAMPLE ALIQUOT VOLUMES BASED ON FLOW, AND PROPORTION AND COMPOSITE IN THE FIELD (Continued)

Step 6: Determine the appropriate minimum aliquot volume as the basis for collecting other aliquot samples which together will provide adequate volume to fulfill the analytic requirements.

Example: In Step 1, it was determined that at least 5,000 ml of sample were required for flow-weighted composite sample analytical testing. As discussed in Section 3.4.1, basing the sample collection on a minimum aliquot volume of 1,000 ml gathered every interval (i.e., every 15 minutes) should result in adequate sample volume.

Step 7: Calculate the volume of the sample aliquot which must be collected during each aliquot sample period using the following formula:

$$\textit{Aliquot volume (ml)} = \textit{Minimum aliquot volume (ml)} \times \frac{\textit{Aliquot's discharge volume (liters)}}{\textit{Initial discharge volume (liters)}}$$

Step 6 shows that the minimum aliquot volume is 1,000 ml.

$$\textit{Aliquot \#1 volume (ml)} = 1{,}000 \text{ ml} \times \frac{136 \text{ liters}}{136 \text{ liters}} = 1{,}000 \text{ ml}$$

$$\textit{Aliquot \#2 volume (ml)} = 1{,}000 \text{ ml} \times \frac{200 \text{ liters}}{136 \text{ liters}} = 1471 \text{ ml}$$

$$\textit{Aliquot \#3 volume (ml)} = 1{,}000 \text{ ml} \times \frac{122 \text{ liters}}{136 \text{ liters}} = 897 \text{ ml}$$

$$\textit{Aliquot \#4 volume (ml)} = 1{,}000 \text{ ml} \times \frac{178 \text{ liters}}{136 \text{ liters}} = 1{,}309 \text{ ml}$$

$$\textit{Aliquot \#5 volume (ml)} = 1{,}000 \text{ ml} \times \frac{156 \text{ liters}}{136 \text{ liters}} = 1{,}147 \text{ ml}$$

$$\textit{Aliquot \#6 volume (ml)} = 1{,}000 \text{ ml} \times \frac{117 \text{ liters}}{136 \text{ liters}} = 860 \text{ ml}$$

$$\textit{Aliquot \#7 volume (ml)} = 1{,}000 \text{ ml} \times \frac{94 \text{ liters}}{136 \text{ liters}} = 691 \text{ ml}$$

$$\textit{Aliquot \#8 volume (ml)} = 1{,}000 \text{ ml} \times \frac{21 \text{ liters}}{136 \text{ liters}} = 154 \text{ ml}$$

$$\textit{Aliquot \#9 volume (ml)} = 1{,}000 \text{ ml} \times \frac{12 \text{ liters}}{136 \text{ liters}} = 88 \text{ ml}$$

A table of these calculations follows:

Aliquot Number	Discharged Volume	Aliquot Volume
1	136 liters	1,000 ml
2	200 liters	1,471 ml
3	122 liters	897 ml
4	178 liters	1,309 ml
5	156 liters	1,147 ml
6	117 liters	860 ml
7	94 liters	691 ml
8	21 liters	154 ml
9	12 liters	88 ml

In conclusion, a combination of the above sample aliquots result in a composite of 7,617 ml.

EXHIBIT 3-24. EXAMPLE OF HOW TO MANUALLY COLLECT EQUAL SAMPLE ALIQUOTS WHICH ARE LATER FLOW-PROPORTIONED AND COMPOSITED IN THE LABORATORY

Step 1: Determine the necessary volume for compositing purposes.

Example: To fulfill analyses for all parameters in Section VII.A of Form 2F for which composite samples are required (BOD_5, COD, TSS, TKN, nitrate plus nitrite, and phosphorous) a total composite sample volume of 5,000 ml is needed by the contract laboratory.

Step 2: Determine an appropriate interval for collection of samples.

Example: Manually collected flow-weighted composite samples must consist of at least nine sample aliquots and must be gathered at least 15 minutes apart; only three or four samples per hour may be taken. For convenience, the minimum number of three is chosen. Sample aliquots will be collected every 20 minutes.

Step 3: Determine the aliquot which should be taken during each sampling event.

Example: At least 5,000 ml of sample is required for flow-weighted composite sample analytical testing. As discussed in Section 3.4.1, a minimum aliquot volume of 1,000 ml gathered every interval (i.e., every 15 minutes) should result in adequate sample volume to be used for later flow-weighted compositing.

Step 4: Estimate or measure the volume of discharge for each sampling event while collecting a discrete 1,000-ml aliquot, as discussed in Step 3, for later compositing.

Example: Section 3.2 discusses methods to calculate total discharge volumes. A discharge flow volume of 4.8 cubic feet will be used here.

Step 5: Convert the discharge flow volume to liters.

Example: To convert cubic feet to liters, use the conversion factor of 28.32 liters per 1 cubic foot as set forth in the following formula:

$$\textit{Volume (liters)} = \textit{Volume (cubic feet)} \times \frac{28.32 \text{ liters}}{1 \text{ cubic foot}}$$

$$\textit{Volume} = 4.8 \text{ cubic feet} \times \frac{28.32 \text{ liters}}{1 \text{ cubic foot}} = 136 \text{ liters}$$

EXHIBIT 3-24. EXAMPLE OF HOW TO MANUALLY COLLECT EQUAL SAMPLE ALIQUOTS WHICH ARE LATER FLOW-PROPORTIONED AND COMPOSITED IN THE LABORATORY (Continued)

Step 6: Using Steps 3 and 4, calculate the volumes that have been discharged between the collection of each aliquot.

Example: The procedures set forth in Section 3.2 may be used to calculate discharge volumes. The following table presents aliquot numbers, time of aliquot collection, and discharge volumes (note that the discharge volumes provided for aliquot numbers 2-9 were chosen for purposes of this exhibit).

Aliquot Number	Time of Aliquot Collection	Discharged Volume
1	2:15 p.m.	136 liters
2	2:35 p.m.	200 liters
3	2:55 p.m.	122 liters
4	3:15 p.m.	178 liters
5	3:35 p.m.	156 liters
6	3:55 p.m.	117 liters
7	4:15 p.m.	94 liters
8	4:30 p.m.	21 liters
9	4:45 p.m.	12 liters

Step 7: Determine the aliquot sample which is associated with the greatest discharge volume.

Example: Aliquot number 2 was taken when the volume was 200 liters. This is the largest discharge volume.

Step 8: Calculate the volume of sample aliquot which must be used subsequent to the sample event to comprise a flow-weighted composite sample. The following formula should be used:

$$\textit{Aliquot volume (ml)} = \textit{Minimum aliquot volume (ml)} \times \frac{\textit{Aliquot's discharge volume (liters)}}{\textit{Largest discharge volume (liters)}}$$

Step 3 shows that the minimum aliquot volume is 1,000 ml. Using this value and the data determined as part of Steps 6 and 7, the following can be calculated:

$$\textit{Aliquot \#1 volume (ml)} = 1{,}000 \text{ ml} \times \frac{136 \text{ liters}}{200 \text{ liters}} = 680 \text{ ml}$$

$$\textit{Aliquot \#2 volume (ml)} = 1{,}000 \text{ ml} \times \frac{200 \text{ liters}}{200 \text{ liters}} = 1{,}000 \text{ ml}$$

$$\textit{Aliquot \#3 volume (ml)} = 1{,}000 \text{ ml} \times \frac{122 \text{ liters}}{200 \text{ liters}} = 610 \text{ ml}$$

$$\textit{Aliquot \#4 volume (ml)} = 1{,}000 \text{ ml} \times \frac{178 \text{ liters}}{200 \text{ liters}} = 890 \text{ ml}$$

$$\textit{Aliquot \#5 volume (ml)} = 1{,}000 \text{ ml} \times \frac{156 \text{ liters}}{200 \text{ liters}} = 780 \text{ ml}$$

$$\textit{Aliquot \#6 volume (ml)} = 1{,}000 \text{ ml} \times \frac{117 \text{ liters}}{200 \text{ liters}} = 585 \text{ ml}$$

EXHIBIT 3-24. EXAMPLE OF HOW TO MANUALLY COLLECT EQUAL SAMPLE ALIQUOTS WHICH ARE LATER FLOW-PROPORTIONED AND COMPOSITED IN THE LABORATORY (Continued)

Aliquot #7 volume (ml) = 1,000 ml x $\frac{94 \text{ liters}}{200 \text{ liters}}$ = 470 ml

Aliquot #8 volume (ml) = 1,000 ml x $\frac{21 \text{ liters}}{200 \text{ liters}}$ = 105 ml

Aliquot #9 volume (ml) = 1,000 ml x $\frac{12 \text{ liters}}{200 \text{ liters}}$ = 60 ml

A table of these calculations follows

Aliquot Number	Discharged Volume	Aliquot Volume
1	136 liters	680 ml
2	200 liters	1,000 ml
3	122 liters	610 ml
4	178 liters	890 ml
5	156 liters	780 ml
6	117 liters	585 ml
7	94 liters	470 ml
8	21 liters	105 ml
9	12 liters	60 ml

In conclusion, a combination of the above sample aliquots results in a composite sample of **5,100 ml.**

Manually collected flow-weighted composite samples can also be prepared by collecting sample aliquots of equal volume where the collection times are related to the volume of discharge which has passed since the last sample aliquot collection. However, this method is subject to fluctuating flow rates and volumes which may dictate that samples be taken prior to the 15-minute interval required by the regulations. In that case, the alternative sampling protocol would have to be approved by the permitting authority.

3.4.2 HOW TO COLLECT FLOW-WEIGHTED COMPOSITE SAMPLES BY AUTOMATIC SAMPLER

The typical automatic sampler collects sample aliquots after a specific interval. These aliquots can be flow-weight composited by the automatic sampler; or by hand in the laboratory. The automatic

sampler may be programmed in one of three ways: (1) to collect a sample at equal time intervals and varying aliquot volumes commensurate with the flow (either rate or volume) that has passed; (2) to collect equal volume aliquots at varying time intervals commensurate with the flow volume that has passed; or (3) to collect equal volume aliquots of sample at equal time intervals.

The first two methods automatically composite the sample but require that the sampler be connected to a flow meter such that the sampler determines either the flow rate or the amount of volume that passes. Since these methods automatically composite samples, one main sample container may be used to receive all aliquots. The third method automatically collects the sample aliquots but does not automatically flow-weight composite the sample. As such, discrete sample containers must be used, and manual flow-weighted compositing must be conducted after the aliquots are collected. Exhibits 3-23 and 3-24 in Section 3.4.1 describe the manual compositing procedures that should be followed.

Manufacturers' instructions for the use of an automatic sampler provide the best explanation of programming options and should be consulted for information on programming samplers for storm water collection. Some of the points regarding automatic samplers discussed in Section 3.3.2 should also be considered.

3.5 SAMPLE HANDLING AND PRESERVATION

Samples must be handled and preserved in accordance with 40 CFR Part 136. This section describes acceptable analytical methods, including requirements regarding sample holding times, containers, sizes, and preservation requirements. For each pollutant or parameter that may have to be analyzed, 40 CFR Part 136 includes information on:

- Container types to be used to store the samples after collection
- Procedures to correctly preserve the samples
- The maximum holding time allowed for each parameter.

The following sections present a detailed discussion of preservation techniques and sample handling procedures. Technical Appendix C presents a matrix of required containers, preservation techniques,

and holding times for each parameter. Most laboratories can provide clean sample containers, preservatives, sealing, chain-of-custody forms and can advise further on sample handling and preservation.

3.5.1 DECONTAMINATION OF SAMPLE EQUIPMENT CONTAINERS

Storm water sample containers should be cleaned and prepared for field use according to the procedures set forth in 40 CFR Part 136. A summary of the procedures is presented below for plastic containers, any or all of which may be performed by the laboratory or container distributor:

- Nonphosphate detergent and tap water wash
- Tap water rinse
- 10 percent nitric acid rinse (only if the sample is to be analyzed for metals)
- Distilled/deionized water rinse
- Total air dry.

To clean glass containers, the same steps should be taken; but, after the distilled/deionized water rinse, the containers should be rinsed with solvent if appropriate prior to total air drying. After the decontamination procedures have been accomplished, the sample containers should be capped or sealed with foil, and the sampling device should be protected and kept clean. It is a good idea to label sample containers after cleaning. The laboratory should keep a record of the technician performing the cleaning procedure as well as the date and time. This begins the required chain-of-custody procedure for legal custody (see Section 3.10 for more information). A chain-of-custody record accompanies each sample to track all personnel handling the sample. This record is essential to trace the sample integrity in the event that quality control checks reveal problems. For this reason, as well as to avoid problems if contamination issues arise, it is suggested that the laboratory performing the analysis perform the cleaning.

3.5.2 SAMPLE PRESERVATION AND HOLDING TIMES

Preservation techniques ensure that the sample remains representative of the storm water discharge at the time of collection. Since many pollutants in the samples collected are unstable (at least to some extent), the sample should be analyzed immediately or preserved or fixed to minimize changes between the time of collection and analysis. Because immediate analysis is not always possible, most samples are preserved regardless of the time of analysis.

Problems may be encountered when flow-weighted composite samples are collected. Since sample deterioration can take place during the compositing process, it is necessary to preserve or stabilize the samples during compositing in addition to preserving aggregate samples before shipment to the laboratory. Preservation techniques vary depending on the pollutant parameter to be measured; therefore, familiarity with 40 CFR Part 136 (see Technical Appendix C) is essential to ensure effective preservation. It is important to verify that the preservation techniques for one parameter do not affect the analytical results of another in the same sample. If this is the case, two discrete samples should be collected and preserved accordingly.

Sample preservation techniques consist of refrigeration, pH adjustment, and chemical fixation. pH adjustment is necessary to stabilize the target analyte (e.g., addition of NaOH stabilizes cyanide); acidification of total metal samples ensures that metal salts do not precipitate. Refrigeration is the most widely used technique because it has no detrimental effect on the sample composition (i.e., it does not alter the chemistry of the sample), and it does not interfere with most analytical methods. Refrigeration requires the sample to be quickly chilled to a temperature of 4°C. This technique is used at the beginning of sample collection in the field, and is continued during sample shipment, and while the sample is in the laboratory. Even though samples taken for compositing purposes are taken over time each individual sample must be refrigerated. If taken manually, the samples can be placed in an ice box. If taken by a automatic sampler, the sampler unit should have refrigeration capabilities. The analytical laboratory may provide chemicals necessary for fixation, or may tell sampling personnel where they can be purchased.

In addition to preservation techniques, 40 CFR Part 136 indicates maximum holding times. A detailed list of holding times appears in Technical Appendix C. The holding time is the maximum

amount of time that samples may be held before analysis and still be considered valid. Samples exceeding these holding times are considered suspect and sample collection may have to be repeated.

Although Technical Appendix C provides required sample containers, preservation techniques, and holding times, some of the more commonly monitored parameters warrant additional discussion. The following provides a more detailed discussion of considerations pertaining to cyanide, VOCs, organics and pesticides, O&G, pH, total residual chlorine, fecal coliform, fecal streptococcus, and 5-day Biochemical Oxygen Demand (BOD_5).

Cyanide

Cyanide is very reactive and unstable. If the sample cannot be analyzed immediately, it must be preserved by pH adjustment after collection. However, prior to pH adjustment, procedures to eliminate residual chlorine and sulfides must be followed immediately.

Where chlorine has the possibility of being present, the sample should be tested for residual chlorine by using potassium iodide-starch test paper previously moistened with acetate buffer. If the sample contains residual chlorine (a blue color indicates the need for treatment), ascorbic acid must be added 0.6 gram (g) at a time until the tests produce a negative result; then, an additional 0.6 g of ascorbic acid should be added to the sample.

Samples containing sulfides may be removed, in which case the holding time is extended to 14 days. Sulfides must be removed as follows:

- Use lead acetate paper moistened with an acetic acid buffer solution to test for the presence of sulfide. Darkening of the lead acetate paper indicates sulfide is present in the sample.
- Add cadmium nitrate to be added to the sample in a manner similar to the ascorbic acid until the test is negative.
- Filter with a 0.45 micrometer (μm) filter and prefilter combination immediately after.

After chlorine and sulfide residuals have been eliminated, the pH must be adjusted to greater than 12.0 standard units (s.u.) and chilled to 4°C.

If cyanide is suspected to be present, the sampling personnel should bring all materials mentioned above to the sampling location.

VOCs

Sampling for VOCs requires the use of a glass vial. The vial should contain a teflon-coated septum seal. Volatiles will escape from the water to the air if any air is entrapped in the container. Therefore, the sample should be collected so that there are no air bubbles in the container after the screw cap and septum seal are applied. To ensure that air bubbles are not trapped in the vial, the following procedures should be followed:

- Fill the vial until a reverse meniscus forms above the top of the vial
- Screw on the cap (the excess sample will overflow)
- Invert the vial to check for the presence of air bubbles
- If air bubbles are observed, the vial should be opened, emptied, then completely refilled, and the first three actions should be repeated.

VOC samples should not be composited in the field. To composite a sample, the sampling personnel would have to mix it thoroughly. This mixing action would aerate the sample and cause volatiles to be lost. Therefore, VOC samples should be sent to the laboratory where they can be immediately, and carefully, composited and analyzed with minimal volatilization as per method Nos. 502.1, 502.2, 524.1, and 524.2 as described at 40 CFR 141.24(f)(14)(iv) and (v). There are two ways flow-weighted compositing of VOCs can be accomplished—mathematical compositing or procedural compositing as discussed below.

Mathematical Compositing

In this method, the grab samples are analyzed separately. The sampling personnel collect the requisite number of samples and send them to the laboratory. The laboratory performs the individual analyses on each sample. Five ml (or 25 ml if greater sensitivity is required) of each grab sample are placed into the purge vessel of the GC or GC/MS for analysis. Special precautions must be made to maintain zero headspace in the syringe used to transfer the VOC sample into the purge vessel of the GC or GC/MS. These analytical results are mathematically flow-weight composited

using the calculation in Exhibit 3-24. The concentrations (C) should be adjusted by using the following formula:

$$\textit{Adjusted Concentration} = \frac{\textit{Individual Aliquot Volume}}{\textit{Total Composite Sample}} \times C$$

Each sample concentration should be adjusted, and all adjusted concentrations added, to obtain the flow-weighted VOC composite using this method.

Procedural Compositing

For the second method, sampling personnel collect the requisite number of samples and provide the laboratory with flow-weighted values for each sample using the calculation in Exhibit 3-24. The laboratory technician then draws the necessary volume from each aliquot into an adequately sized syringe, physically combining the samples to result in a flow-weighted composite sample for VOC analysis. Necessary volumes are drawn into the syringe with a volume control fitting. The samples are thus composited directly in the syringe and then placed in the purge vessel of the GC or GC/MS. The advantage of this procedure is that only one analysis on the GC or GC/MS has to be performed.

Although the applicant is required to report only flow-weighted composite concentrations, the mathematical compositing method may provide more information, as it will indicate the concentrations of each separate grab sample. For example, if the procedural compositing method is employed and one of the samples has a high concentration and the other three have non-detectable concentrations, the result will be an average which does not represent the concentration in any of the separate grab samples. In certain cases it may be important to know the concentration of each grab as well as the composite concentration. The mathematical compositing method would be the most appropriate compositing method in these cases.

Organics and Pesticides

The procedures affecting organics and pesticides [base/neutral/acids and pesticide polychlorinated biphenyls (PCBs)] are less complex than VOC procedures. Glass containers must be used for sample collection purposes, amber glass should be used to eliminate the potential for reactivity caused by light. These samples should be maintained at 4°C during storage and shipment. A preservative in

the form of 0.008 percent sodium thiosulfate ($Na_2S_2O_3$) must be added to organic samples if residual chlorine is present. To determine if chlorine is present, a small color indicator test kit can be used. Eighty ml of $Na_2S_2O_3$ per liter of sample must then be added and mixed well until chlorine tests indicate a negative result as per methods 604 and 625 of 40 CFR Part 136 Appendix A. The pH of pesticide samples must be adjusted to between 5 and 9 s.u.

Oil and Grease

O&G tends to adhere to the surfaces that it contacts. Therefore, it should not be transferred from one container to another; rather, a 1-liter container should be used to take the sample. The container used for O&G must be made of glass. A teflon insert should be included in the glass container's lid. However, if teflon is not available, aluminum foil extending out from under the lid may be used. Samples for O&G must be preserved by adding sulfuric acid (H_2SO_4) or hydrochloric acid (HC1) to a pH of less than 2 s.u. and then stored at 4°C.

Additional Considerations

Some pollutants have specific analysis requirements due to short holding times that the applicant must consider. For example:

- Requirements to analyze immediately (pH, total residual chlorine, temperature, sulfite, and dissolved oxygen)
- Requirements to preserve immediately and analyze within 6 hours (fecal coliform and fecal streptococcus)
- Requirements to analyze within 48 hours (BOD_5).

Because of these requirements, field testing equipment may need to be purchased, borrowed, or rented for those parameters that may require field analysis. If the laboratory is located nearby, analysis in the field may not be required.

Laboratories do not always operate in the evenings or on weekends. As a result, holding times for samples taken in the late afternoon or on a Friday may be exceeded. To prevent this from occurring, close coordination with laboratories is necessary. The latest date and time of delivery should be

established to avoid taking samples, only to discover they cannot be accepted by the laboratory and analyzed in accordance with 40 CFR Part 136 requirements.

3.6 SAMPLE VOLUMES

Exhibit 3-25 presents minimal suggested sample volumes for specific parameters. This exhibit should be consulted so that the proper volume is collected for analysis of each pollutant of concern. This exhibit may not include all parameters; if a particular parameter is not listed, refer to 40 CFR Part 136.

3.7 SAMPLE DOCUMENTATION

Information should be submitted to the laboratory with the sample to ensure proper handling by the laboratory. Exhibit 3-26 is an example form which can be used to document the following information.

- Unique Sample or Log Number - All samples should be assigned a unique identification number. If there is a serial number on the transportation case, the sampling personnel should add this number to the field records.

- Date and Time of Sample Collection - Date and time of sample collection (including notation of a.m. or p.m.) must be recorded. In the case of composite samples, the sequence of times and aliquot size should be noted.

- Source of Sample, Including Facility Name and Address - Use the outfall identification number from the site map with a narrative description; a diagram referring to the particular site where the sample was taken should be included.

- Name of Sampling Personnel - The names and initials of the persons taking the sample must be indicated. For a composite sample, the names of the persons installing the sampler and the names of the persons retrieving the sample should be included.

- Sample Type - Each sample should indicate whether it is a grab or composite sample. If the sample is a composite, the volume and frequency of individual aliquots should be noted.

- Preservation Used - Any preservatives (and the amount) added to the sample should be recorded. The method of preservation (e.g., refrigeration at 4°C) should be indicated.

- Analysis Required - All parameters for which the sample must be analyzed at the laboratory should be specified.

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EXHIBIT 3-25. VOLUME OF SAMPLE REQUIRED FOR DETERMINATION OF THE VARIOUS CONSTITUENTS OF INDUSTRIAL WASTEWATER

Tests	Volume of Sample, ml*
Physical	
Color and odor**	100 to 500
Corrosivity**	flowing sample
Electrical conductivity**	100
pH, electrometric**	100
Radioactivity	100 to 1,000
Specific gravity**	100
Temperature**	flowing sample
Toxicity**	1,000 to 20,000
Turbidity**	100 to 1,000
Chemical	
VOCs	100
Dissolved Gases	
Ammonia,*** NH_3	500
Carbon Dioxide,*** free CO_2	200
Chlorine,*** free Cl_2	200
Hydrogen,*** H_2	1,000
Hydrogen sulfide,*** H_2S	500
Oxygen,*** O_2	500 to 1,000
Sulfur dioxide,*** free SO_2	100
Miscellaneous	
Acidity and alkalinity	100
Bacteria (fecal coliform)	500
Bacteria (fecal streptococcus)	100
Biochemical oxygen demand (BOD)	100 to 500
Carbon dioxide, total CO_2 (including CO_3^{--}, HCO_3^-, and free)	200
Chemical oxygen demand (dichromate)	50 to 100
Chlorine requirement	2,000 to 4,000
Chlorine, total residual Cl_2 (including OCl^-, HOCl, NH_2Cl, $NHCl_2$, and free)	200
Chloroform-extractable matter	1,000
Detergents	100 to 200
Hardness	50 to 100
Hydrazine	50 to 100

EXHIBIT 3-25. VOLUME OF SAMPLE REQUIRED FOR DETERMINATION OF THE VARIOUS CONSTITUENTS OF INDUSTRIAL WASTEWATER (Continued)

Tests	Volume of Sample, ml*
Miscellaneous (Continued)	
Micro-organisms	100 to 200
Volatile and filming amines	500 to 1,000
Oily matter	3,000 to 5,000
Organic nitrogen	500 to 1,000
Phenolic compounds	800 to 4,000
Polyphosphates	100 to 200
Silica	50 to 100
Solids, dissolved	100 to 20,000
Solids, suspended	50 to 1,000
Tannin and lignin	100 to 200
Cations	
Aluminum, Al+++	100 to 1,000
Ammonium,*** NH_4+	500
Antimony, Sb+++ to Sb+++++	100 to 1,000
Arsenic, As+++ to As+++++	100 to 1,000
Barium, Ba++	100 to 1,000
Cadmium, Cd++	100 to 1,000
Calcium, Ca++	100 to 1,000
Chromium, Cr+++ to Cr++++++	100 to 1,000
Copper, Cu++	200 to 4,000
Iron,*** Fe++ and Fe+++	100 to 1,000
Lead, Pb++	100 to 4,000
Magnesium, Mg++	100 to 1,000
Manganese, Mn++ to Mn+++++++	100 to 1,000
Mercury, Hg+ and Hg++	100 to 1,000
Potassium, Ni++	100 to 1,000
Nickel, Ni++	100 to 1,000
Silver, Ag+	100 to 1,000
Sodium, NA+	100 to 1,000
Strontium, Sr++	100 to 1,000
Tin, Sn++ and Sn++++	100 to 1,000
Zinc, Zn++	100 to 1,000

EXHIBIT 3-25. VOLUME OF SAMPLE REQUIRED FOR DETERMINATION OF THE VARIOUS CONSTITUENTS OF INDUSTRIAL WASTEWATER *(Continued)*

Tests	Volume of Sample, ml*
Anions	
Bicarbonate, HCO_3	100 to 200
Bromide, Br^-	100
Carbonate, CO_3^{--}	100 to 200
Chloride, Cl^-	25 to 100
Cyanide, Cn^-	25 to 100
Fluoride, Fl^-	200
Hydroxide, OH^-	50 to 100
Iodide, I^-	100
Nitrate, NO_3^-	10 to 100
Nitrite, NO_2^-	50 to 100
Phosphate, Ortho, PO_4^{--}, HPO_4^{--}, $H_2PO_4^-$	50 to 100
Sulfate, SO_4^{--}, HSO_4^-	100 to 1,000
Sulfide, S^{--}, HS^-	100 to 500
Sulfite, SO_3^{--}, HSO_3^-	50 to 100

*Volumes specified in this table should be considered as guides for the approximate quantity of sample necessary for a particular analysis. The exact quantity used should be consistent with the volume prescribed in the standard method of analysis, whenever a volume is specified.
**Aliquot may be used for other determinations.
***Samples for unstable constituents must be obtained in separate containers, preserved as prescribed, completely filled, and sealed against all exposure.

Source: Associated Water and Air Resource Engineers, Inc., 1973, *Handbook for Monitoring Industrial Wastewater*, EPA Technology Transfer.

- Flow - If flow is measured at the time of sampling, the measurement must be recorded and accompanied by a description of the flow measurement method and calculations.

- Date, Time, and Documentation of Sample Shipment - The shipment method (e.g., air, rail, or bus) as well as the shipping papers or manifest number should be noted.

- Comments - All relevant information pertaining to the sample or the sampling site should be recorded. Such comments could include the condition of the sample site, observed characteristics of the sample, environmental conditions that may affect the sample, and problems encountered during sampling.

EXHIBIT 3-26. FIELD SHEET FOR SAMPLE DOCUMENTATION		
Sample Source	Sample ID #	Date: XX/XX/XX
Facility Name		Time: XX:XX a.m./p.m.
Address	Person Performing Sampling	
Outfall ID #	Signature	
Description	Preservation Method	
Diagram of Site	Comments	
Flow Description	Ship Via: Stable Shipping Paper/Manifest	
Flow Calculations	Analysis Required	

3.8 SAMPLE IDENTIFICATION AND LABELING

Prior to collection of the sample, a waterproof, gummed sample identification label or tag should be attached to the sample container. This label should contain relevant information for sample analysis, such as:

- Facility name
- Name of the sample collector
- Sample identification number
- Date and time of sample collection
- Type of analysis required
- Location of sample collection
- Preservatives used
- Type of sample (grab or composite).

Sample lids should be used to protect the sample's integrity from the time it is collected to the time it is opened in the laboratory. The lid should contain the collector's name, the date and time the sample was collected, and a sample identification number. Information on the seal must be identical to the information on the label. In addition, the lid should be taped shut so that the seal must be broken to open the sample container. Caution should be taken to ensure that glue from tape and label tag wires do not contaminate samples, particularly those containing volatile organics and metals. Also, waterproof ink should be used to avoid smearing on the label from melted ice used for cooling.

3.9 SAMPLE PACKAGING AND SHIPPING

If the samples are not hand-delivered to the laboratory or analyzed in an onsite laboratory, they should be placed in a transportation case (e.g., a cooler) along with the chain-of-custody record form, pertinent field records, and analysis request forms, and shipped to the laboratory. Glass bottles should be wrapped in foam rubber, plastic bubble wrap, or other material to prevent breakage during shipment. The wrapping can be secured around the bottle with tape. The container lid should also be sealed with tape. Samples should be placed in ice or a synthetic ice substitute that

will maintain the sample temperature at 4°C throughout shipment. Ice should be placed in double-wrapped watertight bags so the water will not leak from the shipping case. Metal or heavy plastic ice chests make good sample transportation cases. Filament tape wrapped around each end of the ice chest ensures that it will not open during transport. Sampling records (preferably laminated or waterproof) can be placed in a waterproof envelope and taped to the inside of the transportation case to avoid getting them wet in case a sample container or an ice bag leaks. Shipping containers should also be sealed to prevent tampering. A copy of all sampling records should be kept onsite in case they are requested by the permitting authority.

Most samples will not require any special transportation precautions except careful packaging to prevent breakage and/or spillage. If the sample is shipped by common carrier or sent through the U.S. mail, it must comply with Department of Transportation Hazardous Materials Regulations (49 CFR Parts 171-177). Air shipment of hazardous materials samples may also be covered by requirements of the International Air Transport Association (IATA). Before shipping a sample, the facility should be aware of, and follow, any special shipping requirements. Special packing and shipping rules apply to substances considered hazardous materials as defined by IATA rules. Storm water samples are not generally considered hazardous materials, but in the event of a spill, leakage, etc., at the collection site hazardous materials may be present in the samples. Be aware, before sampling, of what hazardous materials may be in the discharge drainage area. If the presence of hazardous materials is suspected, do not sample unless properly trained.

3.10 CHAIN-OF-CUSTODY PROCEDURES

Once samples have been obtained and collection procedures are properly documented, a written record of the chain of custody of that sample should be made. This is recommended so the applicant can be confident that the samples have not been tampered with and that the sample once analyzed is representative of the storm water discharge. "Chain-of-custody" refers to the documented account of changes in possession that occur for a particular sample or set of samples. The chain-of-custody record allows an accurate step-by-step recreation of the sampling path, from origin through analysis. Information necessary in chain-of-custody is:

- Name of the persons collecting the sample
- Sample ID numbers

- Date and time of sample collection
- Location of sample collection
- Names and signatures of all persons handling the samples in the field and in the laboratory.

To ensure that all necessary information is documented, a chain-of-custody form should be developed. An example of such a form is found in Exhibit 3-27. Chain-of-custody forms should be printed on carbonless, multipart paper so all personnel handling the sample receive a copy. All sample shipments should be accompanied by the chain-of-custody record and a copy of these forms should be retained by the originator. In addition, all receipts associated with the shipment should be retained. Carriers typically will not sign for samples; therefore, seals must be used to verify that tampering has not occurred during shipment.

When transferring possession of samples, the transferee should sign and record the date and time on the chain-of-custody record. In general, custody transfers are made for each sample, although samples may be transferred as a group. Each person who takes custody should fill in the appropriate section of the chain-of-custody record.

EXHIBIT 3-27. EXAMPLE OF CHAIN-OF-CUSTODY FORM

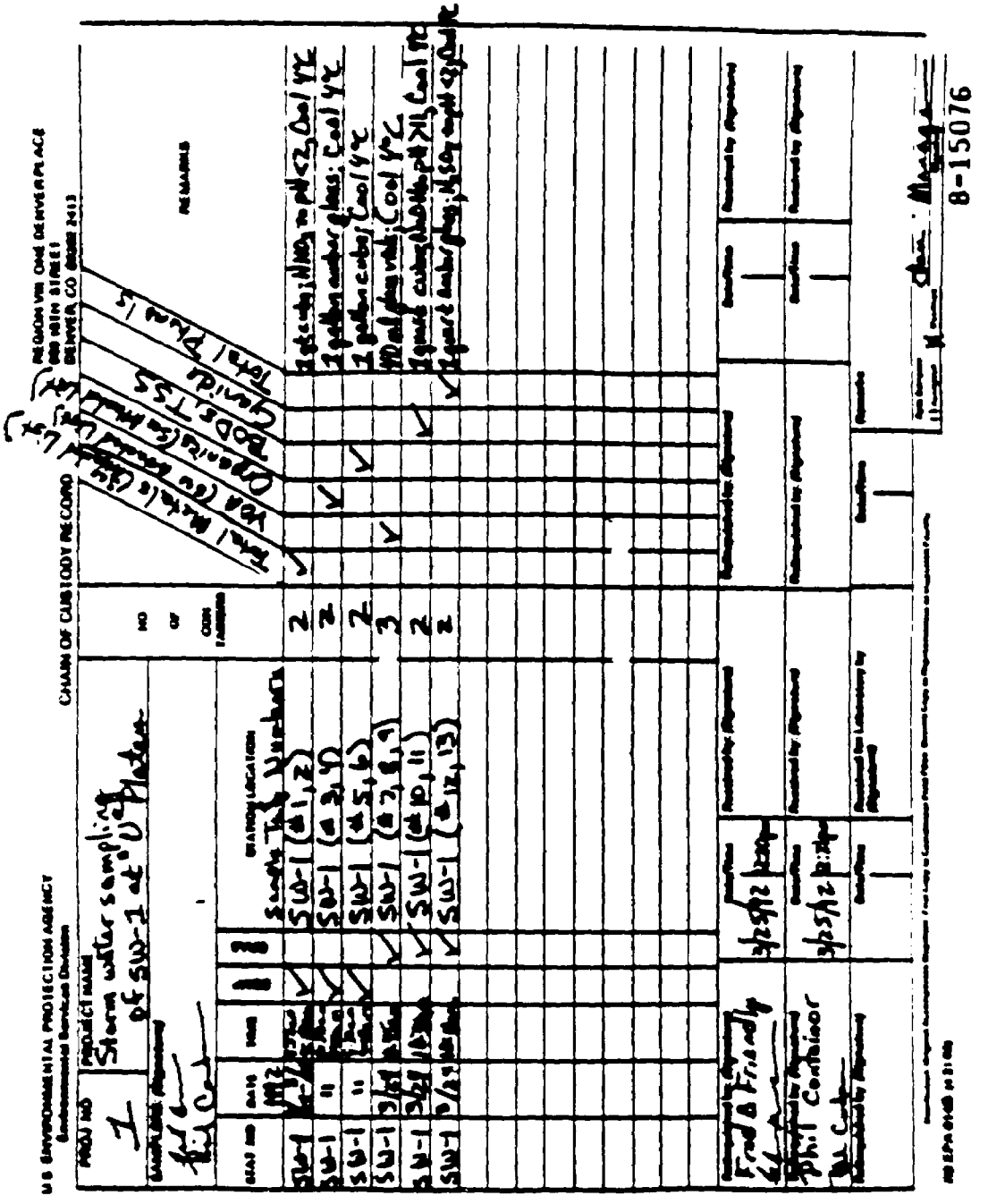

Source: U.S. EPA, Region 8

4. ANALYTICAL CONSIDERATIONS

All storm water discharges must be sampled and analyzed in accordance with the test procedures provided in 40 CFR Part 136. This section discusses pollutant parameters which must be analyzed by storm water permit applicants. If the applicant wants to use an alternative test method, the facility must apply for approval (by submitting a description of the method to the permitting authority for approval) prior to application submission [see 40 CFR 136.4(d)(3)]. Section 5.4 elaborates on how to obtain approval for an analytical method for a parameter that is not included in 40 CFR Part 136. EPA-approved analytical methods at 40 CFR 136.3, Tables IB and IC are shown in Appendix C of this document.

When choosing the appropriate 40 CFR Part 136 analytical method, the applicant should consider sample interferences and potential field sampling error. Most method detection levels are established under ideal sample conditions (e.g., with little or no sample matrix interferences or sampling error). Thus, for storm water samples, the method chosen should account for sampling error and interferences.

4.1 INDUSTRIAL REQUIREMENTS

Industrial dischargers must provide information on the following parameters, as required in 40 CFR 122.26(c)(1)(i)(E):

- Any pollutant limited in an effluent guideline to which the facility is subject
- Any pollutant listed in the facility's NPDES permit for its process wastewater (if the facility has an existing NPDES permit)
- O&G, pH, BOD_5, COD, TSS, total phosphorus, TKN, and nitrate plus nitrite nitrogen
- Any pollutant known or believed to be present [as required in 40 CFR 122.21(g)(7)]
- Flow measurements or estimates of the flow rate, the total amount of discharge for the storm events sampled, and the method of flow measurement or estimation
- The date and duration (in hours) of the storm events sampled, rainfall measurements or estimates of the storm event (in inches) which generated the sampled runoff, and the time between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event (in hours).

4.1.1 INDIVIDUAL APPLICANTS

Industrial facilities submitting an individual permit application must provide sampling data in three parts of the Form 2F application form as discussed below. (Form 2F restates requirements listed in 40 CFR 122.21 and 122.26).

Section VII.A Parameters

Section VII.A of Form 2F requires the facility to sample (grab and flow-weighted samples) for O&G, BOD_5, COD, TSS, TKN, nitrate plus nitrite nitrogen, total phosphorus, and pH. These parameters are to be monitored by every facility applying for a storm water discharge permit, regardless of the type of operations that exist at the site. Sampling for additional parameters may be required, depending on the type of facility applying for the permit or the pollutants expected to be present in the discharge. These additional requirements are discussed in detail below.

Section VII.B Parameters

Section VII-B of Form 2F requires the applicant to identify all pollutants that are limited in an effluent guideline to which the facility is subject, as well as other toxic and nonconventional pollutants listed in the facility's NPDES permit for its process wastewater. EPA interprets that for pollutants listed in NPDES process wastewater permits, at a minimum, facilities must sample their storm water discharge for those pollutants specifically limited in their process wastewater permit. States can be more stringent, however, and may interpret this requirement to mean all pollutants listed in the permit. Once these parameters are identified, the applicant will be required to sample for these parameters by both grab and flow-weighted composite samples, except for the specified pollutants which must be grab sampled only. Form 2F requires the applicant to submit maximum values. The average values column is not compulsory, but should be completed if data are available. Applicable effluent guidelines appear in 40 CFR Parts 405-471. A listing of the Subchapter N—Effluent Guidelines and Standards by which the applicant may be regulated appears in Exhibit 4-1. The applicant must refer to the effluent guidelines and standards for the particular industry, and should determine which guidelines apply and which parameters should be listed in Section VII.B of Form 2F.

EXHIBIT 4-1. SUBCHAPTER N-EFFLUENT GUIDELINES AND STANDARDS			
Part	**Effluent Guidelines and Standards**	**Part**	**Effluent Guidelines and Standards**
405	Dairy Products Processing Point Source Category	431	Builder's Paper and Board Mills Point Source Category
406	Grain Mils Point Source Category	432	Meat Products Point Source Category
407	Canned and Preserved Fruits and Vegetables Point Source Category	433	Metal Finishing Point Source Category
408	Canned and Preserved Seafood Point Source Category	434	Coal Mining Point Source Category
409	Sugar Processing Point Source Category	435	Oil and Gas Extraction Point Source Category
410	Textile Mills Point Source Category	436	Mineral Mining and Processing Point Source Category
411	Cement Manufacturing Point Source Category	439	Pharmaceutical Manufacturing Point Source Category
412	Feedlots Point Source Category	440	Ore Mining and Dressing Point Source Category
413	Electroplating Point Source Category	443	Paving and Roofing Point Source Category
414	Organic Chemicals, Plastics, and Synthetic Fibers Point Source Category	446	Paint Formulating Point Source Category
415	Inorganic Chemicals Manufacturing Point Source Category	447	Ink Formulating Point Source Category
416	(Reserved)	454	Gum and Wood Chemicals Manufacturing Point Source Category
417	Soap and Detergent Manufacturing Point Source Category	455	Pesticide Chemicals Manufacturing Point Source Category
418	Fertilizer Manufacturing Point Source Category	457	Explosives Manufacturing Point Source Category
419	Petroleum Refining Manufacturing Point Source Category	458	Carbon Black Manufacturing Point Source Category
420	Iron and Steel Manufacturing Point Source Category	459	Photographic Point Source Category
421	Nonferrous Metals Manufacturing Point Source Category	460	Hospital Point Source Category
422	Phosphate Manufacturing Point Source Category	461	Battery Manufacturing Point Source Category
423	Steam Electric Power Generating Point Source Category	463	Plastics Molding and Forming Point Source Category
424	Ferroalloy Manufacturing Point Source Category	464	Metal Molding and Casting Point Source Category
425	Leather Tanning and Finishing Point Source Category	465	Coil Coating Point Source Category
426	Glass Manufacturing Point Source Category	466	Porcelain Enameling Point Source Category
427	Asbestos Manufacturing Point Source Category	467	Aluminum Forming Point Source Category
428	Rubber Manufacturing Point Source Category	468	Copper Forming Point Source Category
429	Timber Products Processing Point Source Category	469	Electrical and Electronic Components Point Source Category
430	Pulp, Paper and Paperboard Point Source Category	471	Nonferrous Metals Forming and Metal Powders Point Source Category

Section VII.C Parameters

Section VII.C requires the applicant to list, for each outfall, each pollutant described in 40 CFR Part 122, Appendix D, Tables II, III, IV, and V (Tables 2F-2, 2F-3, and 2F-4 of application Form 2F) that it knows, or has reason to believe, may be present in the storm water discharge. These pollutants consist of conventional and nonconventional pollutants, toxic pollutants and total phenol, Gas Chromatography/Mass Spectrometry (GC/MS) fraction volatile compounds, acid compounds, base/neutral compounds, pesticides, and hazardous substances. These tables are also provided on the back of Form 2F. Tables II and III of 40 CFR Part 122 Appendix D have been combined in Table 2F-3 of application Form 2F. Table IV of 40 CFR Part 122 Appendix D is listed as Table 2F-2 of application Form 2F and Table V of 40 CFR Part 122 Appendix D is listed as Table 2F-4 of application Form 2F. There are specific requirements associated with each table. If pollutants in Table IV of 40 CFR Part 122 Appendix D (Table 2F-2 of application Form 2F), are directly or indirectly limited by an effluent guideline limitation, the applicant must analyze for it and report the data. For other pollutants listed in Table IV of 40 CFR Part 122 Appendix D (Table 2F-2 of the application form), the applicant must either report quantitative data, if available, or briefly describe the reasons the pollutant is expected to be in the discharge.

For every pollutant in Tables II and III of 40 CFR Part 122 Appendix D (Table 2F-3 of application Form 2F) expected to be discharged in concentrations of 10 parts per billion (ppb) or greater, the applicant must submit quantitative data. For acrolein, acrylonitrile, 2,4-dinitrophenol, and 2-methyl-4,6-dinitrophenol, the applicant must submit quantitative data if any of these four pollutants is expected to be discharged in concentrations of 100 ppb or greater. For every pollutant expected to be discharged with a concentration less than 10 ppb (or 100 ppb for the four parameters mentioned above), the applicant must either submit quantitative data or briefly explain why the pollutant is expected to be discharged.

For the parameters identified in Table V of 40 CFR Part 122 Appendix D (Table 2F-4 of application Form 2F) that the applicant believes to be present in the discharge, no sampling is required. If previous analyses of these parameters were conducted, the results must be reported. Otherwise, the applicant is required to explain why these pollutants are believed to be present.

Small Business Exemption

Small businesses are exempted from the reporting requirements for the organic toxic pollutants presented in 40 CFR Part 122, Table II of Appendix D. Applicants can claim a small business exemption if:

- The facility is a coal mine and the probable annual production is less than 100,000 tons per year. The applicant may submit past production data or estimate future production data instead of conducting analyses for the organic toxic pollutants listed in Table 2F-3 of application Form 2F.
- The facility is not a coal mine, and the gross total annual sales for the most recent 3 years is, on average, less than $100,000 per year (reflected in second quarter 1980 dollars). The applicant may submit sales data for those years instead of conducting analyses for the organic toxic pollutants listed in Table 2F-3 of application Form 2F.

Section VIII

Section VIII of Form 2F requires the applicant to provide biological toxicity testing data for storm water discharges associated with industrial activity. Applicants are required to perform biological toxicity testing for the storm water application if the facility's NPDES permit for its process wastewater lists biological toxicity (EPA interprets "listed" as limited). For example, if a facility's NPDES process wastewater permit has an acute toxicity limit of a lethal concentration (LC_{50}), equal to 75 percent effluent using ceriodaphnia, then that facility must also test its storm water discharges associated with industrial activity and report the results of the tests in Section VIII of Form 2F.

Until whole effluent toxicity methods are promulgated by EPA in 40 CFR Part 136, toxicity testing should be conducted using the most appropriate methods and species as determined by the permitting authority. In the absence of State acute toxicity testing protocols, EPA recommends using the methods described in Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Fresh Water and Marine Organisms. EPA/600/4-90-027 (Rev. September 1991)

4.1.2 GROUP APPLICANTS

Industrial facilities submitting a group application must also provide sampling data (from the sampling subgroup) which is required to be submitted in Sections VII, VIII, and IX along with the certification in Section X of Form 2F. At a minimum, these parameters include O&G, BOD_5, COD,

TSS, TKN, nitrate plus nitrite nitrogen, total phosphorous, and pH. Furthermore, all pollutants listed in an effluent guideline or limited in an NPDES permit applicable to the sampling facilities within the group must be sampled, as well as pollutants suspected of being present based on significant materials and industrial activities present onsite.

4.2 MUNICIPAL REQUIREMENTS

For Part 1 of the municipal permit application, municipalities must submit samples from the field screening effort for pH, total chlorine, total copper, phenol, and detergents (or surfactants). A narrative description of the color, odor, turbidity, and presence of oil sheen and surface scum must be included. For Part 2 of the permit application, municipalities must provide quantitative data for the organic pollutants listed in Table II of 40 CFR Part 122 Appendix D, and the pollutants listed in 40 CFR Part 122, Appendix D, Table III, as well as some additional pollutants. These pollutants are listed in Exhibit 4-2.

Furthermore, 40 CFR 122.26(d)(2)(iii)(A)(5) requires that estimates be provided of the annual pollutant load of the cumulative discharges to waters of the U.S. from all identified municipal outfalls, and the event mean concentration of the cumulative discharges to waters of the U.S. from all identified municipal outfalls during storm events for the parameters listed in Exhibit 4-2. Estimates of the parameters must be accompanied by a description of the procedures for estimating constituent loads and concentrations, including any modelling, data analysis, and calculation methods.

EXHIBIT 4.2. PARAMETERS WHICH MUST BE ANALYZED BY MUNICIPAL APPLICANTS

Pollutants Contained in Table III of 40 CFR Part 122, Appendix D				
Total antimony	Total cadmium	Total lead	Total selenium	Total zinc
Total arsenic	Total chromium	Total mercury	Total silver	Total cyanide
Total beryllium	Total copper	Total nickel	Total thallium	Total phenols
Pollutants Contained in Table II of 40 CFR Part 122, Appendix D				
Acrolein	Toluene	Benzo(a)pyrene	2,6-dinitrotoluene	Gamma-BHC
Acrylonitrile	1,2-trans-dichloroethylene	3,4-benzofluoranthene	Di-n-octyl phthalate	Delta-BHC
Benzene	1,1,1-trichloroethane	Benzo(ghi)perylene	1,2-diphenylhydrazine	Chlordane
Bromoform	1,1,2-trichloroethane	Benzo(k)fluoranthene	Fluoranthene	4,4'-DDT
Carbon Tetrachloride	Trichloroethylene	Bis(2-chloroethoxy)methane	Fluorene	4,4'-DDE
Chlorobenzene	Vinyl chloride	Bis(2-chloroethyl)ether	Hexachlorobenzene	4,4'-DDD
Chlorodibromo-methane	2-chlorophenol	Bis(2-chloroisopropyl)ether	Hexachlorobutadiene	Dieldrin
Chloroethane	2,4-dichlorophenol	Bis(2-ethylhexyl)phthalate	Hexachlorocyclopen-tadiene	Alpha-endosulfan
2-Chloroethylvinyl ether	2,4-dimethylphenol	4-bromophenyl phenyl ether	Hexachloroethane	Beta-endosulfan
Chloroform	4,6-dinitro-o-cresol	Butylbenzyl phthalate	Indeno(1,2,3-cd)pyrene	Endosulfan sulfate
Dichlorobromo-methane	2,4-dinitrophenol	2-chloronaphthalene	Isophorone	Endrin
1,1-dichloroethane	2-nitrophenol	4-chlorophenyl phenyl ether	Naphthalene	Endrin aldehyde
1,2-dichloroethane	4-nitrophenol	Chrysene	Nitrobenzene	Heptachlor
1,1-dichloroethylene	p-chloro-m-cresol	Dibenzo(a,h)anthracene	N-nitrosodimethylamine	Heptachlor epoxide
1,2-dichloropropane	Pentachlorophenol	1,2-dichlorobenzene	N-nitrosodi-n-propylamine	PCB-1242
1,3-dichloropropylene	Phenol	1,3-dichlorobenzene	N-nitrosodiphenylamine	PCB-1254
Ethylbenzene	2,4,6-trichlorophenol	1,4-dichlorobenzene	Phenanthrene	PCB-1221
Methyl bromide	Acenaphthene	3,3-dichlorobenzidine	Pyrene	PCB-1232
Methyl chloride	Acenaphthylene	Diethyl phthalate	1,2,4-trichlorobenzene	PCB-1248
Methylene chloride	Anthracene	Dimethyl phthalate	Aldrin	PCB-1260
1,1,2,2-tetrachloroethane	Benzidine	Di-n-butyl phthalate	Alpha-BHC	PCB-1016
Tetrachloroethylene	Benzo(a)anthracene	2,4-dinitrotoluene	Beta-BHC	Toxaphene

Additional Pollutants Which Must be Analyzed		
TSS	O&G	TKN
TDS	Fecal coliform	Nitrate plus nitrite nitrogen
COD	Fecal streptococcus	Total and dissolved phosphorus
BOD_5	pH	
	Total residual chlorine	

Source: 40 CFR Part 122, Appendix D

5. FLEXIBILITY IN SAMPLING

The requirements for storm water sampling for permit applications offer some flexibility by the permitting authority. The areas of flexibility are discussed below.

5.1 PROTOCOL MODIFICATIONS

The permitting authority may allow sampling protocol modifications for specific requirements on a case-by-case basis. For example, the permitting authority may accept application forms with incomplete sampling data if there was no rainfall at the applicant's facility prior to the submission deadline. However, the permitting authority will require that sampling data be submitted as soon as possible. The reason for not submitting data must be certified by a corporate official (for industrial facilities) or the principal executive officer or ranking official (for municipalities).

Another area where permitting authorities may allow flexibility in storm water sampling is acceptance of quantitative data from a storm event that does not meet the representative rainfall criteria of within 50 percent of the volume and duration for the average storm event for the area. The permitting authority may decide that the discharge data provided is better than no data at all.

In addition, the permitting authority may establish appropriate site-specific sampling procedures or requirements, including sampling locations; the season in which the sampling takes place; the minimum duration between the previous measurable storm event and the storm event sampled; the minimum or maximum level of precipitation required for an appropriate storm event; the form of precipitation sampled (snow melt or rainfall); protocols for collecting samples under 40 CFR Part 136; and additional time for submitting data on a case-by-case basis. The permitting authority should be contacted for preapproval of any necessary protocol modifications. In the case of group applications, EPA Headquarters should be contacted.

5.2 PETITION FOR SUBSTITUTING SUBSTANTIALLY IDENTICAL EFFLUENTS

As described at 40 CFR 122.21(g)(7), when an industrial applicant has two or more outfalls with substantially identical effluents, the permitting authority may allow the applicant to test only one outfall and to report that the quantitative data also apply to the substantially identical outfalls. In the case of group applications, the petition must be submitted to EPA Headquarters.

For facilities seeking to demonstrate that storm water outfalls are substantially identical, a variety of methods can be used as determined by the permitting authority. Three possible petition options are discussed here: (1) submission of a narrative description and a site map; (2) submission of matrices; or (3) submission of model matrices. Detailed guidance on each of the three options for demonstrating substantially identical outfalls is provided below. An owner/operator certification should be submitted with each option. See Section 5.2.3 for an example of this certification.

5.2.1 OPTION ONE: NARRATIVE DESCRIPTION/SITE MAP

Facilities demonstrating that storm water outfalls are substantially identical may submit a narrative description of the facility and a site map to the permitting authority . The narrative portion must include a description of why the outfalls are substantially identical. Petitioners may demonstrate that these outfalls contain storm water discharges associated with:

- Substantially identical industrial activities and processes;
- Substantially identical significant materials that may be exposed to storm water [including, but not limited to, raw materials, fuels, materials such as solvents, detergents, and plastic pellets; finished materials such as metallic products; raw materials used in food processing or production; hazardous substances designated under Section 101(14) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); any chemical the facility is required to report pursuant to Section 313 of Title III of the Superfund Amendments and Reauthorization Act (SARA); fertilizers; pesticides; and waste products such as ashes, slag, and sludge that have the potential to be released with storm water discharges as per 40 CFR 122.26(b)(12)];
- Substantially identical storm water management practices (such as retention ponds, enclosed areas, diversion dikes, gutters, and swales) and material management practices (such as protective coverings and secondary containment); and
- Substantially identical flows, as determined by the estimated runoff coefficient and approximate drainage area at each outfall.

The site map should include an indication of the facility's topography; each of the drainage and discharge structures; the drainage area of each storm water outfall; paved areas and buildings within the drainage area for each storm water outfall; all past or present areas used for outdoor storage or disposal of significant materials; identification of the significant materials in each drainage area; and identification of each existing structural control measures used to reduce pollutants in storm water

runoff, materials loading and access areas, and areas where pesticides, herbicides, soil conditioners, and fertilizers are applied.

Exhibit 5-1 offers an example of a narrative description/site map petition that sufficiently demonstrates identical outfalls. A demonstration of how to determine runoff coefficient estimates was presented in Section 3.2.2. Exhibit 5-2 presents an example of a site map to be included with the narrative description.

5.2.2 OPTION TWO: USE OF MATRICES TO INDICATE IDENTICAL OUTFALLS

Facilities attempting to demonstrate that storm water outfalls are substantially identical may submit matrices and an owner/operator certification describing specific information associated with each outfall to the permitting authority. Matrix information is required only for those outfalls that the permit applicant is attempting to demonstrate are identical, not for all outfalls. Petitioners must demonstrate, using the matrices, that the outfalls have storm water discharges that meet the criteria listed in Section 5.2.1. Refer to Exhibit 5-3 for examples of matrices that demonstrate substantially identical outfalls and Section 3.2.2 for guidance on determining runoff coefficient estimates.

5.2.3 OPTION THREE: MODEL MATRICES

Facilities attempting to demonstrate that storm water outfalls are substantially identical may submit model matrices and an owner/operator certification to the permitting authority. This option is particularly appropriate for facilities with a large number of storm water outfalls and the potential for numerous groupings of identical outfalls. In addition, this option may be useful in group applications that have a large sampling subgroup.

Model matrices should contain information for one grouping of substantially identical outfalls. For example, if a facility has 150 outfalls and several groupings of identical outfalls, the facility would choose one of the groupings of identical outfalls to provide information in the model matrices. The petitioner must demonstrate, using these matrices, that all outfalls within this grouping have storm water discharges that meet the criteria listed in Section 5.2.1.

The facility should provide an owner certification that all other groupings of outfalls have been examined and certified as substantially identical outfalls according to the criteria established in the

EXHIBIT 5-1. PETITION TO SAMPLE SUBSTANTIALLY IDENTICAL OUTFALLS (NARRATIVE DESCRIPTION/SITE MAP)

Examples

I. The Pepper Company of Philadelphia, Pennsylvania, is primarily engaged in manufacturing paperboard, including paperboard coated on the paperboard machine (from wood pulp and other fiber pulp). This establishment is classified under SIC code 2631. Pursuant to the November 16, 1990, NPDES storm water permit application regulations, this facility is considered to be "engaging in industrial activity" for the purposes of storm water permit application requirements in 40 CFR 122.26(b)(14)(i) and (ii).

II. "When an applicant has two or more outfalls with substantially identical effluents, the Director may allow the applicant to test only one outfall and report that the quantitative data also apply to the substantially identical outfalls." [40 CFR 122.21(g)(7)]

In accordance with 40 CFR 122.21(g)(7) of the NPDES regulations, The Pepper Company hereby petitions the State of Pennsylvania (the permitting authority) for approval to sample certain representative storm water outfalls in groupings of storm water outfalls that are substantially identical. The Pepper Company will demonstrate that of the ten (10) outfalls discharging storm water from our paperboard manufacturing plant, there are two pairs of substantially identical outfalls. Outfalls 3 and 4 are substantially identical and should be grouped together. Outfalls 8 and 9 are substantially identical and should be grouped together. Outfalls 1, 2, 5, 6, 7, and 10 have distinct characteristics and, therefore, will not be grouped together with other outfalls for the purposes of storm water discharge sampling.

III. The Pepper Company will demonstrate that the substantially identical outfalls that have been grouped together contain storm water discharges associated with: (1) substantially identical industrial activities and processes that are occurring outdoors; (2) substantially identical significant materials (including raw materials, fuels, finished materials, waste products, and material handling equipment) that may be exposed to storm water; (3) substantially identical material management practices (such as runoff diversions, gutters and swales, protective coverings, and structural enclosures); and (4) substantially identical flows, as determined by the estimated runoff coefficient and approximate drainage area at each outfall.

EXHIBIT 5-1. PETITION TO SAMPLE SUBSTANTIALLY IDENTICAL OUTFALLS (NARRATIVE DESCRIPTION/SITE MAP) (Continued)

1. Industrial Activities

A. Description of Industrial Activities at the Pepper Company

The Pepper Company receives wastepaper in bales. This baled wastepaper is sent through a hydropulper and converted to pulp. The fiber material is concentrated, stored, and then drawn through refiners to the paper machines. Wires, plastics, and miscellaneous material are removed during the pulping.

Three systems are used to produce top liner, back paper, and filler. The highest quality fiber is used for the top liner, the medium quality is used for the back paper, and the poorest quality is used for the filler paper. Wireforming or conventional boxboard processes are employed to produce clay-coated boxboard, using a water-based clay-coating material. Additional materials may be used as binders. These are stored indoors and are not exposed to precipitation. Ammonia is used in the clay-coating process. Off-grade fiber and trim material are ground up and returned to the liquid process stream. Slime control agents, consisting of bactericides, are used in association with this process. These agents are organic materials used to prevent souring of mill operations. They are received in drums and stored indoors. Empty drums are returned to the supplier to reuse. In addition, the Pepper Company operates an onsite landfill for the disposal of miscellaneous waste materials removed during pulping and paper cuttings operations.

B. Demonstration of Why Outfalls Are Substantially Identical in Terms of Industrial Activities Conducted Outdoors.

Outfalls 3 and 4

Outfalls 3 and 4 are substantially identical in terms of industrial activities conducted outdoors. Both outfalls contain storm water discharges associated with the outdoor storage of baled wastepaper. The wastepaper, which consists of old corrugated containers, mixed paper, and other types of wastepaper, is received weekly and stored for up to 3 weeks in Storage Areas #1 and #2. These uncovered storage areas are enclosed by chain-link fencing.

Outfalls 8 and 9

Outfalls 8 and 9 drain storm water runoff from areas where all industrial activities occur indoors. The industrial activities occurring under roof cover at these two outfalls include hydropulping, storage of concentrated fiber material, refining, and paperboard production. These industrial processes have no potential for contact with precipitation.

EXHIBIT 5-1 PETITION TO SAMPLE SUBSTANTIALLY IDENTICAL OUTFALLS (NARRATIVE DESCRIPTION/SITE MAP) (Continued)

2. Significant Materials

A. Description of Significant Materials at the Pepper Company

The significant materials listed below are used by the Pepper Company to manufacture paperboard. These materials are stored indoors, unless otherwise indicated.

(i) Raw materials, including baled wastepaper (off-spec damaged paper stock or recycled paper) **[wastepaper is stored outdoors at Storage Areas #1 and #2]**; clays, ammonias, sizings, and slime control agents (chlorine dioxide); caustic; ammonia, which is stored in two tanks. **[See Storage Area #3]**.

(ii) Waste Materials, including miscellaneous materials removed during pulping and paper cuttings (such as staples, rubber bands, styrofoam, etc.). These waste materials are stored indoors in open dumpsters. However, prior to disposing of the waste in the onsite landfill, these dumpsters are moved outdoors where they are potentially exposed to precipitation for 12 hours or less. **[See Storage Area #3]**.

(iii) Finished Products, including paperboard and molded fiber products. These are always stored indoors.

(iv) Others, including wood pallets (which are used to transport and haul raw materials, waste materials, and finished products) are stored both indoors and outdoors. **[See Storage Area #3]**. The Pepper Company has an above-ground fuel tank with a pump. **[See Storage Area #3]**.

B. Demonstration of Why Outfalls are Substantially Identical in Terms of Significant Materials that Potentially May be Exposed to Storm Water

Outfalls 3 and 4

Outfalls 3 and 4 are substantially identical in terms of significant materials that may be exposed to storm water. Both outfalls contain storm water discharges associated with the outdoor storage of baled wastepaper. The wastepaper, which consists of old corrugated containers, mixed paper, and other types of wastepaper, is received weekly and stored for up to 3 weeks in Storage Areas #1 and #2. These uncovered storage areas are enclosed by chain-link fencing.

Outfalls 8 and 9

Outfalls 8 and 9 are substantially identical in terms of significant materials. Both outfalls contain storm water runoff from areas that have no significant materials potentially exposed to storm water. All industrial activities occurring in the areas drained by Outfalls 8 and 9 occur completely indoors.

EXHIBIT 5-1. PETITION TO SAMPLE SUBSTANTIALLY IDENTICAL OUTFALLS (NARRATIVE DESCRIPTION/SITE MAP) (Continued)

3. Material Management Practices

A. Description of Material Management Practices at the Pepper Company

The Pepper Company uses a wide range of storm water management practices and material management practices to limit the contact of significant materials with precipitation. Non-structural storm water management practices include employee training, spill reporting and clean-up, and spill prevention techniques. Structural storm water management practices include:

(i) Diversion Devices (both above-ground trenches and subterranean drains) are used to divert surface water from entering a potentially contaminated area.

(ii) Gutters/Swales (constructed of concrete or grass) channel storm water runoff to drainage systems leading to separate storm sewers.

(iv) Overland Flow (which is the flow of storm water over vegetative areas prior to entrance into a storm water conveyance) allows much of the storm water to infiltrate into the ground. The remainder is naturally filtered prior to reaching the storm water conveyance. This is not considered sheet flow since natural drainage channels may be carved out during a heavy storm event.

B. Demonstration of Why Outfalls Are Substantially Identical in Terms of Storm Water Management Practices Used

Outfalls 3 and 4

Outfalls 3 and 4 are substantially identical in terms of storm water management practices used. Both outfalls contain storm water discharges associated with the outdoor storage of baled wastepaper, located in Storage Areas #1 and #2. Concrete gutters at both sites channel storm water away from the storage areas down to the respective outfalls.

Outfalls 8 and 9

Outfalls 8 and 9 are substantially identical in terms of storm water management practices used. Both outfalls contain storm water runoff from areas that have no significant materials potentially exposed to storm water. All industrial activities occurring in the areas drained by Outfalls 8 and 9 occur completely indoors. Both outfalls receive overland flow storm water. From roof drains, the storm water in both drainage areas is then conveyed over similarly graded vegetative areas prior to entrance into the respective outfalls.

EXHIBIT 5-1. PETITION TO SAMPLE SUBSTANTIALLY IDENTICAL OUTFALLS (NARRATIVE DESCRIPTION/SITE MAP) (Continued)

4. Flow Characteristics

A. Demonstration of Why Outfalls Are Substantially Identical in Terms of Flow, as Determined by The Estimated Runoff Coefficient and Approximate Drainage Area at Each Outfall

Outfalls 3 and 4

Outfalls 3 and 4 are substantially identical in terms of flow. Both drainage areas have a 2 to 7 percent grade and contain fine textured soil (greater than 40 percent clay) with a vegetative cover. The estimated runoff coefficient for both outfalls is .2. The approximate drainage area for each outfall is similar. Outfall 3 has an approximate drainage area of 3,500 square feet. Outfall 4 has an approximate drainage area of 2,900 square feet.

Outfalls 8 and 9

Outfalls 8 and 9 are substantially identical in terms of flow. Both drainage areas have a 2 to 7 percent grade and contain fine textured soil (greater than 40 percent clay) with a vegetative cover. The estimated runoff coefficient for both outfalls is .2. The approximate drainage area for each outfall is similar. Outfall 8 has an approximate drainage area of 7,600 square feet. Outfall 9 has an approximate drainage area of 8,700 square feet.

EXHIBIT 5-2. SITE MAP

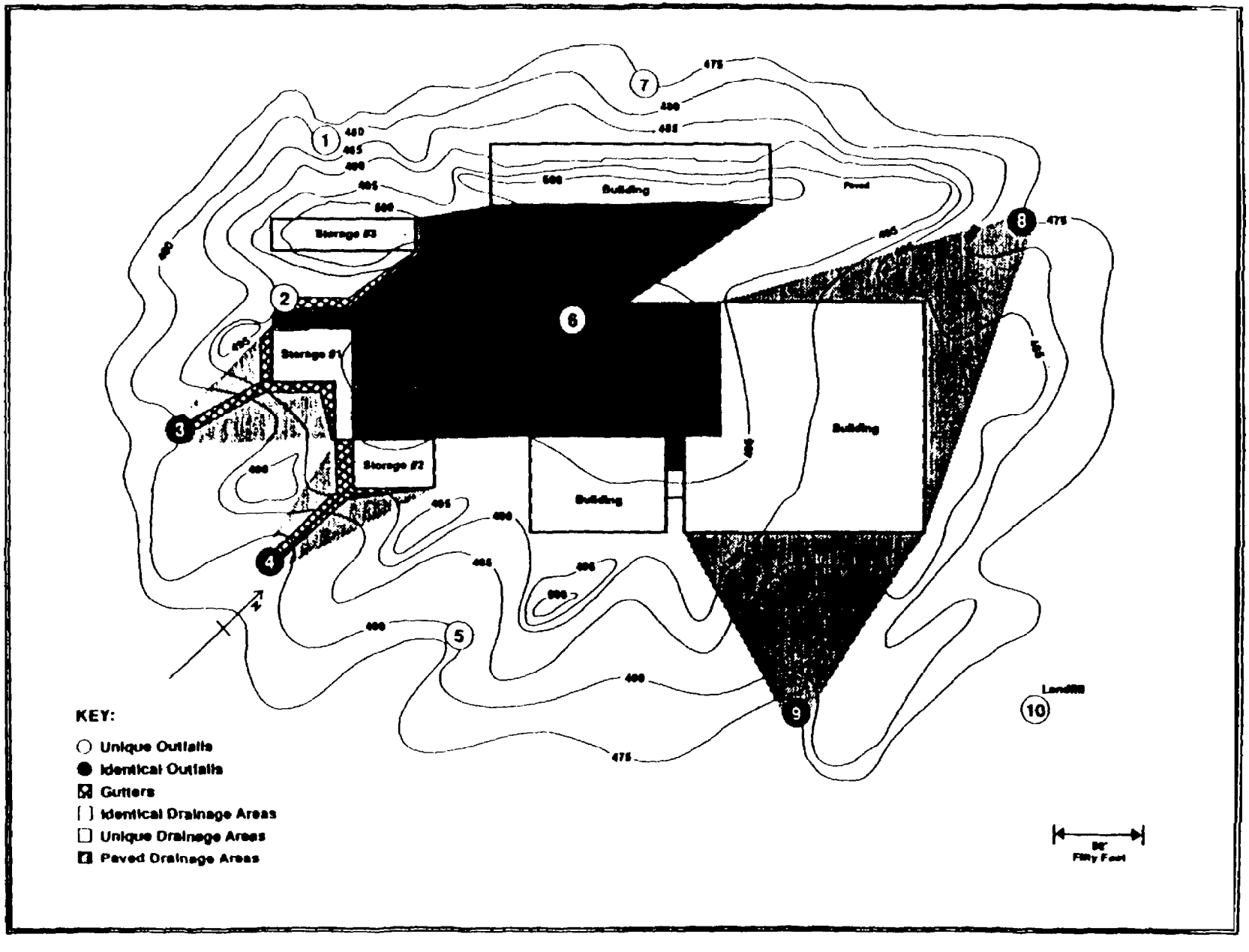

EXHIBIT 5.3 MATRICES DEMONSTRATING SUBSTANTIALLY IDENTICAL OUTFALLS

Industrial Activities

OUTFALL	A	B	C	D	E
3	X	–	–	X	–
4	X	–	–	X	–
8	–	–	–	–	–
9	–	–	–	–	–

Key:

A = Outdoor storage of raw materials and material-handling equipment
B = Fueling
C = Waste materials storage (dumpster)
D = Loading/unloading of raw materials, intermediate products, and final products
E = Landfill activity

Significant Materials That May Be Exposed to Storm Water

OUTFALL	A	B	C	D	E	F
3	-	–	–	–	X	–
4	–	–	–	–	X	–
8	–	–	–	–	–	–
9	–	–	–	–	–	–

Key:

A = Outdoor ammonia tank
B = Wood pallets
C = Above ground gas tank
D = Waste materials
E = Baled wastepaper
F = Finished products

EXHIBIT 5.3 MATRICES DEMONSTRATING SUBSTANTIALLY IDENTICAL OUTFALLS (Continued)

Storm Water Management Practices

OUTFALL	A	B	C
3	–	X	–
4	–	X	–
8	–	–	X
9	–	–	X

Key:

A = Runoff diversions
B = Gutters/swales
C = Overland flow (not sheet flow; flow through vegetative areas)

Flow Characteristics

OUTFALL	A	B
3	0.2	3,500
4	0.2	2,900
8	0.2	7,600
9	0.2	8,700

Key:

A = Estimated runoff coefficient
B = Approximate drainage area of outfall (square feet)

model matrices described in Exhibit 5-3. The owner/operator who signs documents in this section should include the following certification:

> "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations" [as per 40 CFR 122.22(d)].

5.3 ALTERNATE 40 CFR PART 136 METHOD

As required in 40 CFR 136.4, the applicant must request the approval of an alternate test procedure in writing (in triplicate) prior to testing. The request must be submitted to the Regional Administrator through the Director of the State agency responsible for issuing NPDES permits. The applicant must:

- Provide the name and address of the responsible person or firm making the discharge (if not the applicant), the applicable identification number of the existing or pending permit, the issuing agency, the type of permit for which the alternate test procedure is requested, and the discharge serial number;
- Identify the pollutant or parameter for which approval of an alternate testing procedure is being requested;
- Provide justification for using testing procedures other than those specified in 40 CFR Part 136;
- Provide a detailed description of the proposed alternate test procedure, together with references to published studies of the applicability of the alternate test procedure to the effluents in question;
- Provide comparability data (for applicants applying for nation wide approval of an alternative test procedures).

The permitting authority will notify the applicant within 90 days regarding the approval of the alternate method.

5.4 LACK OF METHOD IN 40 CFR PART 136

If a specific pollutant that must be tested does not have a corresponding analytical method listed in 40 CFR Part 136, the applicant must submit information on an appropriate method to be used. The permitting authority must approve its use prior to collection and analysis of sampling data. The laboratory should be consulted for suggestions and information about analytical methods that can be used. All information justifying the alternative method should be sent to the permitting authority prior to use.

6. HEALTH AND SAFETY

Storm water sampling activities may occur when the sampling environment and/or storm water discharges create hazardous conditions. Hazardous conditions associated with sampling include:

- Hazardous weather conditions (e.g., wind, lightning, flooding, etc.)
- Sampling in confined spaces (e.g., manholes)
- Hazards associated with chemicals
- Biological hazards (e.g., rodents and snakes)
- Physical hazards (e.g., traffic, falling objects, sharp edges, slippery footing, and the potential for lifting injuries from opening or removing access panels and manhole covers, etc.)

It is essential that sampling personnel be aware of these hazards. Sampling personnel should be trained to evaluate potentially hazardous situations and develop ways for handling them. Since sampling hazards can be life threatening, safety must be the highest priority for all personnel. This chapter outlines general health and safety issues and concerns. Additional references discussed below should be consulted for more specific guidance to avoid adverse health and safety situations.

6.1 GENERAL TRAINING REQUIREMENTS

Preparation and training of all sampling personnel should be completed before beginning any sampling task. Extreme care should be taken to allow for safety precautions including proper equipment and appropriate operational techniques, sufficient time to accomplish the task, training on potential hazards, and emergency procedures. EPA's Order 1440.2 sets out the policy, responsibilities, and mandatory requirements for the safety of personnel who are involved in sampling activities. This order, which is found within the EPA NPDES Compliance Monitoring Inspector Training: Sampling manual, provides further guidance to applicants' storm water sampling personnel. Basic emergency precautions include having access to both local emergency phone numbers and communication equipment (i.e., phones or radios), and ensuring that personnel are trained in first aid and carry first aid equipment.

6.2 NECESSARY SAFETY EQUIPMENT

Exhibit 6-1 contains a list of safety equipment that may be appropriate depending on the characteristics of the sampling site.

EXHIBIT 6-1. LIST OF SAFETY EQUIPMENT	
Flashlight	18-inch traffic cones
Meters (for oxygen, explosivity, toxic gases)	Insect/rodent repellant
Ladder	Ventilation equipment
Safety harness	50 feet of 1/2-inch nylon rope
Hard hat	Safety shoes
Safety goggles	Rain wear
Coveralls	Gloves (rubber)
Respirator	First aid kit
Reflective vests	Self-contained breathing apparatus
Source: Adapted from NPDES Compliance Monitoring Inspector Training: Sampling, U.S. EPA, August 1990.	

6.3 HAZARDOUS WEATHER CONDITIONS

Common sense should dictate whether sampling be conducted during adverse weather conditions. No sampling personnel should place themselves in danger during high winds, lightning storms, or flooding conditions which might be unsafe. Under extreme conditions, a less hazardous storm event should be sampled.

6.4 SAMPLING IN CONFINED SPACES

Confined spaces encountered by storm water sampling personnel typically include manholes and deep, unventilated ditches. A confined space is generally defined as a space that is somewhat enclosed with limited access and inadequate ventilation.

The National Institute of Occupational Safety and Health (NIOSH) has developed a manual entitled "Working in Confined Spaces" which should be consulted prior to confined space entry. Also, several States have developed specific procedures which should also be consulted. Unless they have been trained for confined space entry, sampling personnel should avoid entry under all circumstances.

6.4.1 HAZARDOUS CONDITIONS IN CONFINED SPACES

Confined spaces pose a safety threat to sampling personnel because of low oxygen, explosivity, and toxic gases. When entering a confined space, a qualified person should ensure that the atmosphere is safe by sampling to test for oxygen levels, potential flammable hazards, and toxic materials known or suspected to be present. If atmospheric conditions are detected, the confined space should be ventilated or sampling personnel should use a self-contained air supply and wear a life line. At least one person should remain outside of the confined space in the event that problems arise. If atmospheric testing has not been properly conducted, the confined space should not be entered. Manholes can also pose a threat to safety because of the small confined area, slippery surfaces, sharp objects, unsafe ladders, etc.

6.4.2 SPECIAL TRAINING REQUIREMENTS

Personnel should not enter into a confined space unless trained in confined space entry techniques. Such training covers hazard recognition, the use of respiratory equipment and atmospheric testing devices, use of special equipment and tools, and emergency and rescue procedures. In addition, at least one member of the sampling crew should be certified in basic first aid and Cardiopulmonary Resuscitation (CPR). Sampling personnel should, on an annual basis, practice confined space rescues.

6.4.3 PERMIT SYSTEM

If entry into a confined space is necessary, an entry permit system should be developed which includes a written procedure. This permit should include, at a minimum:

- Description of type of work to be done
- Hazards that may be encountered

- Location and description of the confined space
- Information on atmospheric conditions at confined space
- Personnel training and emergency procedures
- Names of sampling personnel.

The manual developed by NIOSH discusses this permit system in more detail. Furthermore, the Occupational Safety and Health Administration (OSHA) proposed a rule on June 5, 1989 (54 FR 24080) that would implement a permit system. The rule is expected to be finalized and published late in 1992.

6.5 CHEMICAL HAZARDS

Sampling personnel can also be at risk of exposure to hazardous chemicals—either chemicals in the actual storm water discharge or the chemicals that have been placed in the sample collection containers for sample preservation. Therefore, direct contact with the preservatives and the storm water (if hazardous chemicals are suspected to be present) should be avoided. Sampling personnel should wear gloves and safety glasses to avoid skin and eye exposure to harmful chemicals. Sampling personnel should be trained to avoid exposure and instructed as to what to do if exposure occurs (e.g., flush the eyes, rinse the skin, ventilate the area, etc.).

6.6 BIOLOGICAL HAZARDS

Storm water sampling personnel may also encounter biological hazards such as rodents, snakes, and insects. The sampling crew should remain alert to these hazards. As mentioned in Section 6.2, necessary sampling equipment, for certain locations, should include insect/rodent repellant and a first aid kit.

6.7 PHYSICAL HAZARDS

The sampling crew should be aware of a number of physical hazards that could cause accidents at the sampling site. These hazards include traffic hazards, sharp edges, falling objects, slippery footing, and lifting injuries from removing manhole covers. Sampling personnel should pay close attention in order to prevent these safety hazards at all times.

If the sample point is in a manhole, a street gutter, or ditch near the street, particular attention must be given to marking off the work area to warn oncoming traffic of the presence of the sampling crew. Traffic cones, warning signs, and barricades should be placed in appropriate places around the sampling point.

TECHNICAL APPENDIX A

FORMS 2F AND 1

Please print or type in the unshaded areas only

EPA ID Number (copy from item I of Form 1)

Form Approved. OMB No. 2040-0086
Approval expires 5-31-92

Form 2F NPDES

EPA

United States Environmental Protection Agency
Washington, DC 20460

Application for Permit to Discharge Storm Water Discharges Associated with Industrial Activity

Paperwork Reduction Act Notice

Public reporting burden for this application is estimated to average 26.6 hours per application, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate, any other aspect of this collection of information, or suggestions for improving this form, including suggestions which may increase or reduce this burden to: Chief, Information Policy Branch, PM-223, U.S. Environmental Protection Agency, 401 M St., SW, Washington, DC 20460, or Director, Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, DC 20503.

I. Outfall Location

For each outfall, list the latitude and longitude of its location to the nearest 15 seconds and the name of the receiving water.

A. Outfall Number (list)	B. Latitude		C. Longitude		D. Receiving Water (name)

II. Improvements

A. Are you now required by any Federal, State, or local authority to meet any implementation schedule for the construction, upgrading or operation of wastewater treatment equipment or practices or any other environmental programs which may affect the discharges described in this application? This includes, but is not limited to, permit conditions, administrative or enforcement orders, enforcement compliance schedule letters, stipulations, court orders, and grant or loan conditions.

1. Identification of Conditions, Agreements, Etc.	2. Affected Outfalls		3. Brief Description of Project	4. Final Compliance Date	
	number	source of discharge		a. req.	b. proj.

B. You may attach additional sheets describing any additional water pollution (or other environmental projects which may affect your discharges) you now have under way or which you plan. Indicate whether each program is now under way or planned, and indicate your actual or planned schedules for construction.

III. Site Drainage Map

Attach a site map showing topography (or indicating the outline of drainage areas served by the outfall(s) covered in the application if a topographic map is unavailable) depicting the facility including: each of its intake and discharge structures; the drainage area of each storm water outfall; paved areas and buildings within the drainage area of each storm water outfall, each known past or present areas used for outdoor storage or disposal of significant materials, each existing structural control measure to reduce pollutants in storm water runoff, materials loading and access areas, areas where pesticides, herbicides, soil conditioners and fertilizers are applied; each of its hazardous waste treatment, storage or disposal units (including each area not required to have a RCRA permit which is used for accumulating hazardous waste under 40 CFR 262.34); each well where fluids from the facility are injected underground, springs, and other surface water bodies which receive storm water discharges from the facility.

 Continue on Page 2

TECHNICAL APPENDIX A

Continued from the Front

IV. Narrative Description of Pollutant Sources

A. For each outfall, provide an estimate of the area (include units) of impervious surfaces (including paved areas and building roofs) drained to the outfall, and an estimate of the total surface area drained by the outfall.

Outfall Number	Area of Impervious Surface (provide units)	Total Area Drained (provide units)	Outfall Number	Area of Impervious Surface (provide units)	Total Area Drained (provide units)

B. Provide a narrative description of significant materials that are currently or in the past three years have been treated, stored or disposed in a manner to allow exposure to storm water; method of treatment, storage, or disposal; past and present materials management practices employed to minimize contact by these materials with storm water runoff; materials loading and access areas; and the location, manner, and frequency in which pesticides, herbicides, soil conditioners, and fertilizers are applied.

C. For each outfall, provide the location and a description of existing structural and nonstructural control measures to reduce pollutants in storm water runoff; and a description of the treatment the storm water receives, including the schedule and type of maintenance for control and treatment measures and the ultimate disposal of any solid or fluid wastes other than by discharge.

Outfall Number	Treatment	List Codes from Table 2F-1

V. Nonstormwater Discharges

A. I certify under penalty of law that the outfall(s) covered by this application have been tested or evaluated for the presence of nonstormwater discharges, and that all nonstormwater discharges from these outfall(s) are identified in either an accompanying Form 2C or Form 2E application for the outfall.

Name and Official Title (type or print)	Signature	Date Signed

B. Provide a description of the method used, the date of any testing, and the onsite drainage points that were directly observed during a test.

VI. Significant Leaks or Spills

Provide existing information regarding the history of significant leaks or spills of toxic or hazardous pollutants at the facility in the last three years, including the approximate date and location of the spill or leak, and the type and amount of material released.

 Continue on Page 3

EPA ID Number (copy from item I of Form 1)

Continued from Page 2

VII. Discharge Information

A,B,C, & D: See instructions before proceeding. Complete one set of tables for each outfall. Annotate the outfall number in the space provided. Tables VII-A, VII-B, and VII-C are included on separate sheets numbered VII-1 and VII-2.

E. Potential discharges not covered by analysis - is any toxic pollutant listed in table 2F-2, 2F-3 or 2F-4, a substance or a component of a substance which you currently use or manufacture as an intermediate or final product or byproduct?

☐ Yes (list all such pollutants below) ☐ No (go to Section IX)

VIII. Biological Toxicity Testing Data

Do you have any knowledge or reason to believe that any biological test for acute or chronic toxicity has been made on any of your discharges or on a receiving water in relation to your discharge within the last 3 years?

☐ Yes (list all such pollutants below) ☐ No (go to Section IX)

IX. Contract Analysis Information

Were any of the analyses reported in item VII performed by a contract laboratory or consulting firm?

☐ Yes (list the name, address, and telephone number of, and pollutants analyzed by, each such laboratory or firm below) ☐ No (go to Section X)

A. Name	B. Address	C. Area Code & Phone No.	D. Pollutants Analyzed

X. Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

A. Name & Official Title (type or print)	B. Area Code and Phone No.
C. Signature	D. Date Signed

EPA Form 3510-2F (Rev. 1-92) Page 3 of 3

EPA ID number (copy from item 1 of Form 1)

Form Approved. OMB No. 2040-0086
Approval expires 5-31-92

VII. Discharge Information (Continued from page 3 of Form 2F)

Part A - You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

Pollutant and CAS Number (if available)	Maximum Values (include units)		Average Values (include units)		Number of Storm Events Sampled	Sources of Pollutant
	Grab Samples Taken During First 30 Minutes	Flow-weighted Composite	Grab Samples Taken During First 30 Minutes	Flow-weighted Composite		
Oil and Grease						
Biological Oxygen Demand (BOD5)						
Chemical Oxygen Demand (COD)						
Total Suspended Solids (TSS)						
Total Kjeldahl Nitrogen						
Nitrate plus Nitrite Nitrogen						
Total Phosphorus						
pH	Minimum	Maximum	Minimum	Maximum		

Part B - List each pollutant that is limited in an effluent guideline which the facility is subject to or any pollutant listed in the facility's NPDES permit for its discharge wastewater or the facility is expecting under an existing NPDES permit. Complete one table for each outfall. See the instructions for additional details and recommendations.

Pollutant and CAS Number (if available)	Maximum Values (include units)		Average Values (include units)		Number of Storm Events Sampled	Sources of Pollutant
	Grab Samples Taken During First 30 Minutes	Flow-weighted Composite	Grab Samples Taken During First 30 Minutes	Flow-weighted Composite		

Continued from the Front

Part C - List each pollutant shown in Tables 2F-2, 2F-3, and 2F-4 that you know or have reason to believe is present. See the instructions for additional details and requirements. Complete one table for each outfall.

Pollutant and CAS Number (if available)	Maximum Values (include units)		Average Values (include units)		Number of Storm Events Sampled	Sources of Pollutants
	Grab Sample Taken During First 30 Minutes	Flow-weighted Composite	Grab Sample Taken During First 30 Minutes	Flow-weighted Composite		

Part D - Provide data for the storm event(s) which resulted in the maximum values for the flow weighted composite sample.

1. Date of Storm Event	2. Duration of Storm Event (in minutes)	3. Total rainfall during storm event (in inches)	4. Number of hours between beginning of storm measured and end of previous measurable rain event	5. Maximum flow rate during rain event (gallons/minute or specify units	6. Total flow from rain event (gallons or specify units)

7. Provide a description of the method of flow measurement or estimate.

Instructions - Form 2F
Application for Permit to Discharge Storm Water Associated with Industrial Activity

Who Must File Form 2F

Form 2F must be completed by operators of facilities which discharge storm water associated with industrial activity or by operators of storm water discharges that EPA is evaluating for designation as a significant contributor of pollutants to waters of the United States, or as contributing to a violation of a water quality standard.

Operators of discharges which are composed entirely of storm water must complete Form 2F (EPA Form 3510-2F) in conjunction with Form 1 (EPA Form 3510-1).

Operators of discharges of storm water which are combined with process wastewater (process wastewater is water that comes into direct contact with or results from the production or use of any raw material, intermediate product, finished product, byproduct, waste product, or wastewater) must complete and submit Form 2F, Form 1, and Form 2C (EPA Form 3510-2C).

Operators of discharges of storm water which are combined with nonprocess wastewater (nonprocess wastewater includes noncontact cooling water and sanitary wastes which are not regulated by effluent guidelines or a new source performance standard, except discharges by educational, medical, or commercial chemical laboratories) must complete Form 1, Form 2F, and Form 2E (EPA Form 3510-2E).

Operators of new sources or new discharges of storm water associated with industrial activity which will be combined with other nonstormwater new sources or new discharges must submit Form 1, Form 2F, and Form 2D (EPA Form 3510-2D).

Where to File Applications

The application forms should be sent to the EPA Regional Office which covers the State in which the facility is located. Form 2F must be used only when applying for permits in States where the NPDES permits program is administered by EPA. For facilities located in States which are approved to administer the NPDES permits program, the State environmental agency should be contacted for proper permit application forms and instructions.

Information on whether a particular program is administered by EPA or by a State agency can be obtained from your EPA Regional Office. Form 1, Table 1 of the "General Instructions" lists the addresses of EPA Regional Offices and the States within the jurisdiction of each Office.

Completeness

Your application will not be considered complete unless you answer every question on this form and on Form 1. If an item does not apply to you, enter "NA" (for not applicable) to show that you considered the question

Public Availability of Submitted Information

You may not claim as confidential any information required by this form or Form 1, whether the information is reported on the forms or in an attachment. Section 402(j) of the Clean Water Act requires that all permit applications will be available to the public. This information will be made available to the public upon request

Any information you submit to EPA which goes beyond that required by this form, Form 1, or Form 2C you may claim as confidential, but claims for information which are effluent data will be denied.

If you do not assert a claim of confidentiality at the time of submitting the information, EPA may make the information public without further notice to you. Claims of confidentiality will be handled in accordance with EPA's business confidentiality regulations at 40 CFR Part 2.

Definitions

All significant terms used in these instructions and in the form are defined in the glossary found in the General Instructions which accompany Form 1.

EPA ID Number

Fill in your EPA Identification Number at the top of each odd-numbered page of Form 2F You may copy this number directly from item I of Form 1.

Item I

You may use the map you provided for item XI of Form 1 to determine the latitude and longitude of each of your outfalls and the name of the receiving water.

Item II-A

If you check "yes" to this question, complete all parts of the chart, or attach a copy of any previous submission you have made to EPA containing the same information.

Item II-B

You are not required to submit a description of future pollution control projects if you do not wish to or if none is planned.

Item III

Attach a site map showing topography (or indicating the outline of drainage areas served by the outfall(s) covered in the application if a topographic map is unavailable) depicting the facility including:

each of its drainage and discharge structures;

the drainage area of each storm water outfall;

paved areas and building within the drainage area of each storm water outfall, each known past or present areas used for outdoor storage or disposal of significant materials, each existing structural control measure to reduce pollutants in storm water runoff, materials loading and access areas, areas where pesticides, herbicides, soil conditioners and fertilizers are applied;

each of its hazardous waste treatment, storage or disposal facilities (including each area not required to have a RCRA permit which is used for accumulating hazardous waste for less than 90 days under 40 CFR 262.34);

each well where fluids from the facility are injected underground; and

springs, and other surface water bodies which receive storm water discharges from the facility.

Item IV-A

For each outfall, provide an estimate of the area drained by the outfall which is covered by impervious surfaces. For the purpose of this application, impervious surfaces are surfaces where storm water runs off at rates that are *significantly higher than background rates (e.g., predevelopment levels)* and include paved areas, building roofs, parking lots, and roadways. Include an estimate of the total area (including all impervious and pervious areas) drained by each outfall. The site map required under item III can be used to estimate the total area drained by each outfall.

Item IV-B

Provide a narrative description of significant materials that are currently or in the past three years have been treated, stored, or disposed in a manner to allow exposure to storm water; method of treatment, storage or disposal of these materials; past and present materials management practices employed, in the last three years, to minimize contact by these materials with storm water runoff; materials loading and access areas and the location, manner, and frequency in which pesticides, herbicides, soil conditioners, and fertilizers are applied. Significant materials should be identified by chemical name; form (e.g., powder, liquid, etc.), and type of container or treatment unit. Indicate any materials treated, stored, or disposed of together. "Significant materials" includes, but is not limited to: raw materials; fuels; materials such as solvents, detergents, and plastic pellets; finished materials such as metallic products; raw materials used in food processing or production; hazardous substances designated under Section 101(14) of CERCLA; any chemical the facility is required to report pursuant to Section 313 of Title III of SARA; fertilizers; pesticides; and waste products such as ashes, slag and sludge that have the potential to be released with storm water discharges.

Item IV-C

For each outfall, structural controls include structures which enclose material handling or storage areas, covering materials, berms, dikes, or diversion ditches around manufacturing, production, storage or treatment units, retention ponds, etc. Nonstructural controls include practices such as spill prevention plans employee training, visual inspections, preventive maintenance, and housekeeping measures that are used to prevent or minimize the potential for releases of pollutants.

Item V

Provide a certification that all outfalls that should contain storm water discharges associated with industrial activity have been tested or evaluated for the presence of non-storm water discharges which are not covered by an NPDES permit. Tests for such non-storm water discharges may include smoke tests, fluorometric dye tests, analysis of accurate schematics, as well as other appropriate tests. Part B must include a description of the method used, the date of any testing, and the onsite drainage points that were directly observed during a test. All non-storm water discharges must be identified in a Form 2C or Form 2E which must accompany this application (see beginning of instructions under section titled "Who Must File Form 2F" for a description of when Form 2C and Form 2E must be submitted).

Item VI

Provide a description of existing information regarding the history of significant leaks or spills of toxic or hazardous pollutants at the facility in the last three years.

Item VII-A, B, and C

These items require you to collect and report data on the pollutants discharged for each of your outfalls. Each part of this item addresses a different set of pollutants and must be completed in accordance with the specific instructions for that part. The following general instructions apply to the entire item.

General Instructions

Part A requires you to report at least one analysis for each pollutant listed. Parts B and C require you to report analytical data in two ways. For some pollutants addressed in Parts B and C, if you know or have reason to know that the pollutant is present in your discharge, you may be required to list the pollutant and test (sample and analyze) and report the levels of the pollutants in your discharge. For all other pollutants addressed in Parts B and C, you must list the pollutant if you know or have reason to know that the pollutant is present in the discharge, and either report quantitative data for the pollutant or briefly describe the reasons the pollutant is expected to be discharged. (See specific instructions on the form and below for Parts A through C.) Base your determination that a pollutant is present in or absent from your discharge on your knowledge of your raw materials, material management practices, maintenance chemicals, history of spills and releases, intermediate and final products and byproducts, and any previous analyses known to you of your effluent or similar effluent.

A. **Sampling:** The collection of the samples for the reported analyses should be supervised by a person experienced in performing sampling of industrial wastewater or storm water discharges. You may contact EPA or your State permitting authority for detailed guidance on sampling techniques and for answers to specific questions. Any specific requirements contained in the applicable analytical methods should be followed for sample containers, sample preservation, holding times, the collection of duplicate samples, etc. The time when you sample should be representative, to the extent feasible, of your treatment system operating properly with no system upsets. Samples should be collected from the center of the flow channel, where turbulence is at a maximum, at a site specified in your present permit, or at any site adequate for the collection of a representative sample.

   For pH, temperature, cyanide, total phenols, residual chlorine, oil and grease, and fecal coliform, grab samples taken during the first 30 minutes (or as soon thereafter as practicable) of the discharge must be used (you are not required to analyze a flow-weighted composite for these parameters). For all other pollutants both a grab sample collected during the first 30 minutes (or as soon thereafter as practicable) of the discharge and a flow-weighted composite sample must be analyzed. However, a minimum of one grab sample may be taken for effluents from holding ponds or other impoundments with a retention period of greater than 24 hours.

   All samples shall be collected from the discharge resulting from a storm event that is greater than 0.1 inches and at least 72 hours from the previously measurable (greater than 0.1 inch rainfall) storm event. Where feasible, the variance in the duration of the event and the total rainfall of the event should not exceed 50 percent from the average or median rainfall event in that area.

   A grab sample shall be taken during the first thirty minutes of the discharge (or as soon thereafter as practicable), and a flow-weighted composite shall be taken for the entire event or for the first three hours of the event.

   Grab and composite samples are defined as follows:

Grab sample: An individual sample of at least 100 milliliters collected during the first thirty minutes (or as soon thereafter as practicable) of the discharge. This sample is to be analyzed separately from the composite sample.

Flow-Weighted Composite sample: A flow-weighted composite sample may be taken with a continuous sampler that proportions the amount of sample collected with the flow rate or as a combination of a minimum of three sample aliquots taken in each hour of discharge for the entire event or for the first three hours of the event, with each aliquot being at least 100 milliliters and collected with a minimum period of fifteen minutes between aliquot collections. The composite must be flow proportional; either the time interval between each aliquot or the volume of each aliquot must be proportional to either the stream flow at the time of sampling or the total stream flow since the collection of the previous aliquot. Aliquots may be collected manually or automatically. Where GC/MS Volatile Organic Analysis (VOA) is required, aliquots must be combined in the laboratory immediately before analysis. Only one analysis for the composite sample is required.

Data from samples taken in the past may be used, provided that:

All data requirements are met;

Sampling was done no more than three years before submission; and

All data are representative of the present discharge.

Among the factors which would cause the data to be unrepresentative are significant changes in production level, changes in raw materials, processes, or final products, and changes in storm water treatment. When the Agency promulgates new analytical methods in 40 CFR Part 136, EPA will provide information as to when you should use the new methods to generate data on your discharges. Of course, the Director may request additional information, including current quantitative data, if they determine it to be necessary to assess your discharges. The Director may allow or establish appropriate site-specific sampling procedures or requirements, including sampling locations, the season in which the sampling takes place, the minimum duration between the previous measurable storm event and the storm event sampled, the minimum or maximum level of precipitation required for an appropriate storm event, the form of precipitation sampled (snow melt or rainfall), protocols for collecting samples under 40 CFR Part 136, and additional time for submitting data on a case-by-case basis.

B. **Reporting:** All levels must be reported as concentration and mass (note: grab samples are reported in terms of concentration). You may report some or all of the required data by attaching separate sheets of paper instead of filling out pages VII-1 and VII-2 if the separate sheets contain all the required information in a format which is consistant with pages VII-1 and VII-2 in spacing and identification of pollutants and columns. Use the following abbreviations in the columns headed "Units."

Concentration		Mass	
ppm	parts per million	lbs	pounds
mg/1	milligrams per liter	ton	tons (English tons)
ppb	parts per billion	mg	milligrams
ug/1	micrograms per liter	g	grams
kg	kilograms	T	tonnes (metric tons)

All reporting of values for metals must be in terms of "total recoverable metal," unless:

(1) An applicable, promulgated effluent limitation or standard specifies the limitation for the metal in dissolved, valent, or total form; or

(2) All approved analytical methods for the metal inherently measure only its dissolved form (e.g., hexavalent chromium); or

(3) The permitting authority has determined that in establishing case-by-case limitations it is necessary to express the limitations on the metal in dissolved, valent, or total form to carry out the provisions of the CWA. If you measure only one grab sample and one flow-weighted composite sample for a given outfall, complete only the "Maximum Values" columns and insert "1" into the "Number of Storm Events Sampled" column. The permitting authority may require you to conduct additional analyses to further characterize your discharges.

If you measure more than one value for a grab sample or a flow-weighted composite sample for a given outfall and those values are representative of your discharge, you must report them. You must describe your method of testing and data analysis. You also must determine the average of all values within the last year and report the concentration and mass under the "Average Values" columns, and the total number of storm events sampled under the "Number of Storm Events Sampled" columns.

C. **Analysis:** You must use test methods promulgated in 40 CFR Part 136; however, if none has been promulgated for a particular pollutant, you may use any suitable method for measuring the level of the pollutant in your discharge provided that you submit a description of the method or a reference to a published method. Your description should include the sample holding time, preservation techniques, and the quality control measures which you used. If you have two or more substantially identical outfalls, you may request permission from your permitting authority to sample and analyze only one outfall and submit the results of the analysis for other substantially identical outfalls. If your request is granted by the permitting authority, on a separate sheet attached to the application form, identify which outfall you did test, and describe why the outfalls which you did not test are substantially identical to the outfall which you did test.

Part VII-A

Part VII-A must be completed by all applicants for all outfalls who must complete Form 2F.

Analyze a grab sample collected during the first thirty minutes (or as soon thereafter as practicable) of the discharge and flow-weighted composite samples for all pollutants in this Part, and report the results except use only grab samples for pH and oil and grease. See discussion in General Instructions to Item VII for definitions of grab sample collected during the first thirty minutes of discharge and flow-weighted composite sample. The "Average Values" column is not compulsory but should be filled out if data are available.

Part VII-B

List all pollutants that are limited in an effluent guideline which the facility is subject to (see 40 CFR Subchapter N to determine which pollutants are limited in effluent guidelines) or any pollutant listed in the facility's NPDES permit for its process wastewater (if the facility is operating under an existing NPDES permit). Complete one table for each outfall. See discussion in General instructions to item VII for definitions of grab sample collected during the first thirty minutes (or as soon thereafter as practicable) of discharge and flow-weighted composite sample. The "Average Values" column is not compulsory but should be filled out if data are available.

Analyze a grab sample collected during the first thirty minutes of the discharge and flow-weighted composite samples for all pollutants in this Part, and report the results, except as provided in the General Instructions

Part VII-C

Part VII-C must be completed by all applicants for all outfalls which discharge storm water associated with industrial activity, or that EPA is evaluating for designation as a significant contributor of pollutants to waters of the United States, or as contributing to a violation of a water quality standard. Use both a grab sample and a composite sample for all pollutants you analyze for in this part except use grab samples for residual chlorine and fecal coliform. The "Average Values" column is not compulsory but should be filled out if data are available. Part C requires you to address the pollutants in Table 2F-2, 2F-3, and 2F-4 for each outfall. Pollutants in each of these Tables are addressed differently.

Table 2F-2: For each outfall, list all pollutants in Table 2F-2 that you know or have reason to believe are discharged (except pollutants previously listed in Part VII-B). If a pollutant is limited in an effluent guideline limitation which the facility is subject to, the pollutant must be analyzed and reported in Part VII-B. If a pollutant in Table 2F-2 is indirectly limited by an effluent guideline limitation through an indicator (e.g., use of TSS as an indicator to control the discharge of iron and aluminum), you must analyze for it and report the data in Part VII-B. For other pollutants listed in Table 2F-2 (those not limited directly or indirectly by an effluent limitation guideline), that you know or have reason to believe are discharged, you must either report quantitative data or briefly describe the reasons the pollutant is expected to be discharged.

Table 2F-3: For each outfall, list all pollutants in Table 2F-3 that you know or have reason to believe are discharged. For every pollutant in Table 2F-3 expected to be discharged in concentrations of 10 ppb or greater, you must submit quantitative data. For acrolein, acrylonitrile, 2,4 dinitrophenol, and 2-methyl-4 6 dinitrophenol, you must submit quantitative data if any of these four pollutants is expected to be discharged

in concentrations of 100 ppb or greater. For every pollutant expected to be discharged in concentrations less than 10 ppb (or 100 ppb for the four pollutants listed above), then you must either submit quantitative data or briefly describe the reasons the pollutant is expected to be discharged.

Small Business Exemption - If you are a "small business," you are exempt from the reporting requirements for the organic toxic pollutants listed in Table 2F-3. There are two ways in which you can qualify as a "small business". If your facility is a coal mine, and if your probable total annual production is less than 100,000 tons per year, you may submit past production data or estimated future production (such as a schedule of estimated total production under 30 CFR 795.14(c)) instead of conducting analyses for the organic toxic pollutants. If your facility is not a coal mine, and if your gross total annual sales for the most recent three years average less than $100,000 per year (in second quarter 1980 dollars), you may submit sales data for those years instead of conducting analyses for the organic toxic pollutants. The production or sales data must be for the facility which is the source of the discharge. The data should not be limited to production or sales for the process or processes which contribute to the discharge, unless those are the only processes at your facility. For sales data, in situations involving intracorporate transfer of goods and services, the transfer price per unit should approximate market prices for those goods and services as closely as possible. Sales figures for years after 1980 should be indexed to the second quarter of 1980 by using the gross national product price deflator (second quarter of 1980 = 100). This index is available in National Income and Product Accounts of the United States (Department of Commerce, Bureau of Economic Analysis).

Table 2F-4: For each outfall, list any pollutant in Table 2F-4 that you know or believe to be present in the discharge and explain why you believe it to be present. No analysis is required, but if you have analytical data, you must report them. **Note:** Under 40 CFR 117.12(a)(2), certain discharges of hazardous substances (listed at 40 CFR 177.21 or 40 CFR 302.4) may be exempted from the requirements of section 311 of CWA, which establishes reporting requirements, civil penalties, and liability for cleanup costs for spills of oil and hazardous substances. A discharge of a particular substance may be exempted if the origin, source, and amount of the discharged substances are identified in the NPDES permit application or in the permit, if the permit contains a requirement for treatment of the discharge, and if the treatment is in place. To apply for an exclusion of the discharge of any hazardous substance from the requirements of section 311, attach additional sheets of paper to your form, setting forth the following information:

1. The substance and the amount of each substance which may be discharged.
2. The origin and source of the discharge of the substance.
3. The treatment which is to be provided for the discharge by:
   a. An onsite treatment system separate from any treatment system treating your normal discharge;
   b. A treatment system designed to treat your normal discharge and which is additionally capable of treating the amount of the substance identified under paragraph 1 above; or
   c. Any combination of the above.

See 40 CFR 117.12(a)(2) and (c), published on August 29, 1979, in 44 FR 50766, or contact your Regional Office (Table 1 on Form 1, Instructions), for further information on exclusions from section 311.

Part VII-D

If sampling is conducted during more than one storm event, you only need to report the information requested in Part VII-D for the storm event(s) which resulted in any maximum pollutant concentration reported in Part VII-A, VII-B, or VII-C.

Provide flow measurements or estimates of the flow rate, and the total amount of discharge for the storm event(s) sampled, the method of flow measurement, or estimation. Provide the data and duration of the storm event(s) sampled, rainfall measurements, or estimates of the storm event which generated the sampled runoff and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event.

Part VII-E

List any toxic pollutant listed in Tables 2F-2, 2F-3, or 2F-4 which you currently use or manufacture as an intermediate or final product or byproduct. In addition, if you know or have reason to believe that 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) is discharged or if you use or manufacture 2,4,5-trichlorophenoxy acetic

acid (2,4,5,-T); 2-(2,4,5-trichlorophenoxy) propanoic acid (Silvex, 2,4,5,-TP); 2-(2,4,5-trichlorophenoxy) ethyl 2,2-dichloropropionate (Erbon); O,O-dimethyl O-(2,4,5-trichlorphenyl) phosphorothioate (Ronnel); 2,4,5-trichlorophenol (TCP); or hexachlorophene (HCP); then list TCDD. The Director may waive or modify the requirement if you demonstrate that it would be unduly burdensome to identify each toxic pollutant and the Director has adequate information to issue your permit. You may not claim this information as confidential; however, you do not have to distinguish between use or production of the pollutants or list the amounts.

Item VIII

Self explanatory. The permitting authority may ask you to provide additional details after your application is received.

Item X

The Clean Water Act provides for severe penalties for submitting false information on this application form

Section 309(c)(4) of the Clean Water Act provides that "Any person who knowingly makes any false material statement, representation, or certification in any application, . . . shall upon conviction, be punished by a fine of not more than $10,000 or by imprisonment for not more than 2 years, or by both. If a conviction of such person is for a violation committed after a first conviction of such person under this paragraph, punishment shall be by a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or by both." 40 CFR Part 122.22 requires the certification to be signed as follows:

(A) **For a corporation:** by a responsible corporate official. For purposes of this section, a responsible corporate official means (i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding $25,000,000 (in second-quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

Note: EPA does not require specific assignments or delegation of authority to responsible corporate officers identified in 122.22(a)(1)(i). The Agency will presume that these responsible corporate officers have the requisite authority to sign permit applications unless the corporation has notified the Director to the contrary. Corporate procedures governing authority to sign permit applications may provide for assignment or delegation to applicable corporate position under 122.22(a)(1)(ii) rather than to specific individuals.

(B) **For a partnership or sole proprietorship:** by a general partner or the proprietor, respectively, or

(C) **For a municipality, State, Federal, or other public agency:** by either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer of a Federal agency includes (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrators of EPA).

Table 2F-1
Codes for Treatment Units

	Physical Treatment Processes		
1-A	Ammonia Stripping	1-M	Grit Removal
1-B	Dialysis	1-N	Microstraining
1-C	Diatomaceous Earth Filtration	1-O	Mixing
1-D	Distillation	1-P	Moving Bed Filters
1-E	Electrodialysis	1-Q	Multimedia Filtration
1-F	Evaporation	1-R	Rapid Sand Filtration
1-G	Flocculation	1-S	Reverse Osmosis (Hyperfiltration)
1-H	Flotation	1-T	Screening
1-I	Foam Fractionation	1-U	Sedimentation (Settling)
1-J	Freezing	1-V	Slow Sand Filtration
1-K	Gas-Phase Separation	1-W	Solvent Extraction
1-L	Grinding (Comminutors)	1-X	Sorption
	Chemical Treatment Processes		
2-A	Carbon Adsorption	2-G	Disinfection (Ozone)
2-B	Chemical Oxidation	2-H	Disinfection (Other)
2-C	Chemical Precipitation	2-I	Electrochemical Treatment
2-D	Coagulation	2-J	Ion Exchange
2-E	Dechlorination	2-K	Neutralization
2-F	Disinfection (Chlorine)	2-L	Reduction
	Biological Treatment Processes		
3-A	Activated Sludge	3-E	Pre-Aeration
3-B	Aerated Lagoons	3-F	Spray Irrigation/Land Application
3-C	Anaerobic Treatment	3-G	Stabilization Ponds
3-D	Nitrification-Denitrification	3-H	Trickling Filtration
	Other Processes		
4-A	Discharge to Surface Water	4-C	Reuse/Recycle of Treated Effluent
4-B	Ocean Discharge Through Outfall	4-D	Underground Injection
	Sludge Treatment and Disposal Processes		
5-A	Aerobic Digestion	5-M	Heat Drying
5-B	Anaerobic Digestion	5-N	Heat Treatment
5-C	Belt Filtration	5-O	Incineration
5-D	Centrifugation	5-P	Land Application
5-E	Chemical Conditioning	5-Q	Landfill
5-F	Chlorine Treatment	5-R	Pressure Filtration
5-G	Composting	5-S	Pyrolysis
5-H	Drying Beds	5-T	Sludge Lagoons
5-I	Elutriation	5-U	Vacuum Filtration
5-J	Flotation Thickening	5-V	Vibration
5-K	Freezing	5-W	Wet Oxidation
5-L	Gravity Thickening		

Table 2F-2

Conventional and Nonconventional Pollutants

Bromide
Chlorine, Total Residual
Color
Fecal Coliform
Fluoride
Nitrate-Nitrite
Nitrogen, Total Organic
Oil and Grease
Phosphorus, Total
Radioactivity
Sulfate
Sulfite
Surfactants
Aluminum, Total
Barium, Total
Boron, Total
Cobalt, Total
Iron, Total
Magnesium, Total
Molybdenum, Total
Manganese, Total
Tin, Total
Titanium, Total

Table 2F-3

Toxic Pollutants

Toxic Pollutants and Total Phenol

Antimony, Total	Copper, Total	Silver, Total
Arsenic, Total	Lead, Total	Thallium, Total
Beryllium, Total	Mercury, Total	Zinc, Total
Cadmium, Total	Nickel, Total	Cyanide, Total
Chromium, Total	Selenium, Total	Phenols, Total

GC/MS Fraction Volatiles Compounds

Acrolein	Dichlorobromomethane	1,1,2,2,-Tetrachloroethane
Acrylonitrile	1,1-Dichloroethane	Tetrachloroethylene
Benzene	1,2-Dichloroethane	Toluene
Bromoform	1,1-Dichloroethylene	1,2-Trans-Dichloroethylene
Carbon Tetrachloride	1,2-Dichloropropane	1,1,1-Trichloroethane
Chlorobenzene	1,3-Dichloropropylene	1,1,2-Trichloroethane
Chlorodibromomethane	Ethylbenzene	Trichloroethylene
Chloroethane	Methyl Bromide	Vinyl Chloride
2-Chloroethylvinyl Ether	Methyl Chloride	
Chloroform	Methylene Chloride	

Acid Compounds

2-Chlorophenol	2,4-Dinitrophenol	Pentachlorophenol
2,4-Dichlorophenol	2-Nitrophenol	Phenol
2,4-Dimethylphenol	4-Nitrophenol	2,4,6-Trichlorophenol
4,6-Dinitro-O-Cresol	p-Chloro-M-Cresol	2-methyl-4,6 dinitrophenol

Base/Neutral

Acenaphthene	2-Chloronaphthalene	Fluroranthene
Acenaphthylene	4-Chlorophenyl Phenyl Ether	Fluorene
Anthracene	Chrysene	Hexachlorobenzene
Benzidine	Dibenzo(a,h)anthracene	Hexachlorobutadiene
Benzo(a)anthracene	1,2-Dichlorobenzene	Hexachloroethane
Benzo(a)pyrene	1,3-Dichlorobenzene	Indeno(1,2,3-cd)pyrene
3,4-Benzofluoranthene	1,4-Dichlorobenzene	Isophorone
Benzo(ghi)perylene	3,3'-Dichlorobenzidine	Napthalene
Benzo(k)fluoranthene	Diethyl Phthalate	Nitrobenzene
Bis(2-chloroethoxy)methane	Dimethyl Phthalate	N-Nitrosodimethylamine
Bis(2-chloroethyl)ether	Di-N-Butyl Phthalate	N-Nitrosodi-N-Propylamine
Bis(2-chloroisopropyl)ether	2,4-Dinitrotoluene	N-Nitrosodiphenylamine
Bis(2-ethylhexyl)phthalate	2,6-Dinitrotoluene	Phenanthrene
4-Bromophenyl Phenyl Ether	Di-N-Octylphthalate	Pyrene
Butylbenzyl Phthalate	1,2-Diphenylhydrazine (as Azobenzene)	1,2,4-Trichlorobenzene

Pesticides

Aldrin	Dieldrin	PCB-1254
Alpha-BHC	Alpha-Endosulfan	PCB-1221
Beta-BHC	Beta-Endosulfan	PCB-1232
Gamma-BHC	Endosulfan Sulfate	PCB-1248
Delta-BHC	Endrin	PCB-1260
Chlordane	Endrin Aldehyde	PCB-1016
4,4'-DDT	Heptachlor	Toxaphene
4,4'-DDE	Heptachlor Epoxide	
4,4'-DDD	PCB-1242	

Table 2F-4
Hazardous Substances

Toxic Pollutant

Asbestos

Hazardous Substances

Acetaldehyde	Dinitrobenzene	Napthenic acid
Allyl alcohol	Diquat	Nitrotoluene
Allyl chloride	Disulfoton	Parathion
Amyl acetate	Diuron	Phenolsulfonate
Aniline	Epichlorohydrin	Phosgene
Benzonitrile	Ethion	Propargite
Benzyl chloride	Ethylene diamine	Propylene oxide
Butyl acetate	Ethylene dibromide	Pyrethrins
Butylamine	Formaldehyde	Quinoline
Carbaryl	Furfural	Resorcinol
Carbofuran	Guthion	Strontium
Carbon disulfide	Isoprene	Strychnine
Chlorpyrifos	Isopropanolamine	Styrene
Coumaphos	Kelthane	2,4,5-T (2,4,5-Trichlorophenoxyacetic acid)
Cresol	Kepone	TDE (Tetrachlorodiphenyl ethane)
Crotonaldehyde	Malathion	2,4,5-TP [2-(2,4,5-Trichlorophenoxy) propanoic acid]
Cyclohexane	Mercaptodimethur	Trichlorofan
2,4-D (2,4-Dichlorophenoxyacetic acid)	Methoxychlor	Triethylamine
Diazinon	Methyl mercaptan	Trimethylamine
Dicamba	Methyl methacrylate	Uranium
Dichlobenil	Methyl parathion	Vanadium
Dichlone	Mevinphos	Vinyl acetate
2,2-Dichloropropionic acid	Mexacarbate	Xylene
Dichlorvos	Monoethyl amine	Xylenol
Diethyl amine	Monomethyl amine	Zirconium
Dimethyl amine	Naled	

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Form Approved OMB No 2040-0086 Approval expires 5-31-92

FORM 1 GENERAL

EPA

U.S. ENVIRONMENTAL PROTECTION AGENCY

GENERAL INFORMATION

Consolidated Permits Program

(Read the "General Instructions" before starting.)

I. EPA I.D. NUMBER

F | D

I. EPA I.D. NUMBER

III. FACILITY NAME

V. FACILITY MAILING ADDRESS

VI. FACILITY LOCATION

PLEASE PLACE LABEL IN THIS SPACE

GENERAL INSTRUCTIONS

If a preprinted label has been provided, affix it in the designated space. Review the information carefully; if any of it is incorrect, cross through it and enter the correct data in the appropriate fill-in area below. Also, if any of the preprinted data is absent (the area to the left of the label space lists the information that should appear), please provide it in the proper fill-in areas below. If the label is complete and correct, you need not complete items I, III, V, and VI (except VI-B which must be completed regardless). Complete all items if no label has been provided. Refer to the instructions for detailed item descriptions and for the legal authorizations under which this data is collected.

II. POLLUTANT CHARACTERISTICS

INSTRUCTIONS. Complete A through J to determine whether you need to submit any permit application forms to the EPA. If you answer "yes" to any questions, you must submit this form and the supplemental form listed in the parentheses following the question. Mark "X" in the box in the third column if the supplemental form is attached. If you answer "no" to each question, you need not submit any of these forms. You may answer "no" if your activity is excluded from permit requirements; see Section C of the instructions. See also, Section D of the instructions for definitions of bold-faced terms.

SPECIFIC QUESTIONS	MARK "X" YES	NO	FORM ATTACHED
A. Is this facility a **publicly owned treatment works** which results in a **discharge** to **waters of the U.S.**? (FORM 2A)			
B. Does or will this facility (either existing or proposed) include a concentrated animal feeding operation or aquatic animal production facility which results in a discharge to waters of the U.S.? (FORM 2B)			
C. Is this a facility which currently results in discharges to waters of the U.S. other than those described in A or B above? (FORM 2C)			
D. Is this a proposed facility (other than those described in A or B above) which will result in a discharge to waters of the U.S.? (FORM 2D)			
E. Does or will this facility treat, store, or dispose of **hazardous wastes**? (FORM 3)			
F. Do you or will you inject at this facility industrial or municipal effluent below the lowermost stratum containing, within one quarter mile of the well bore, underground sources of drinking water? (FORM 4)			
G. Do you or will you inject at this facility any produced water or other fluids which are brought to the surface in connection with conventional oil or natural gas production, inject fluids used for enhanced recovery of oil or natural gas, or inject fluids for storage of liquid hydrocarbons? (FORM 4)			
H. Do you or will you inject at this facility fluids for special processes such as mining of sulfur by the Frasch process, solution mining of minerals, in situ combustion of fossil fuel, or recovery of geothermal energy? (FORM 4)			
I. Is this facility a proposed **stationary source** which is one of the 28 industrial categories listed in the instructions and which will potentially emit 100 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)			
J. Is this facility a proposed **stationary source** which is NOT one of the 28 industrial categories listed in the instructions and which will potentially emit 250 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)			

III. NAME OF FACILITY

1 SKIP

IV. FACILITY CONTACT

A. NAME & TITLE (last, first, & title) | B. PHONE (area code & no.)

2

V. FACILITY MAILING ADDRESS

A. STREET OR P.O. BOX

3

B. CITY OR TOWN | C. STATE | D. ZIP CODE

4

VI. FACILITY LOCATION

A. STREET, ROUTE NO. OR OTHER SPECIFIC IDENTIFIER

5

B. COUNTY NAME

C. CITY OR TOWN | D. STATE | E. ZIP CODE | F. COUNTY CODE (if applicable)

6

EPA Form 3510-1 (8-80)

CONTINUE ON REVERSE

CONTINUED FROM THE FRONT

VII. SIC CODES (4 digit, in order of priority)

A. FIRST | B. SECOND

C. THIRD | D. FOURTH

VIII. OPERATOR INFORMATION

A. NAME

B. Is the name listed in Item VIII-A also the owner? ☐ YES ☐ NO

C. STATUS OF OPERATOR (Enter the appropriate letter into the answer box; if "Other", specify.)
F = FEDERAL
S = STATE
P = PRIVATE
M = PUBLIC (other than federal or state)
O = OTHER (specify)

D. PHONE (area code & no.)

E. STREET OR P.O. BOX

F. CITY OR TOWN | G. STATE | H. ZIP CODE

IX. INDIAN LAND
Is the facility located on Indian lands? ☐ YES ☐ NO

X. EXISTING ENVIRONMENTAL PERMITS

A. NPDES (Discharges to Surface Water) | D. PSD (Air Emissions from Proposed Sources)

B. UIC (Underground Injection of Fluids) | E. OTHER (specify)

C. RCRA (Hazardous Wastes) | E. OTHER (specify)

XI. MAP

Attach to this application a topographic map of the area extending to at least one mile beyond property boundaries. The map must show the outline of the facility, the location of each of its existing and proposed intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all springs, rivers and other surface water bodies in the map area. See instructions for precise requirements.

XII. NATURE OF BUSINESS (provide a brief description)

XIII. CERTIFICATION (see instructions)

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME & OFFICIAL TITLE (type or print) | B. SIGNATURE | C. DATE SIGNED

COMMENTS FOR OFFICIAL USE ONLY

EPA Form 3510-1 (8-90)

APPENDIX B

NOAA WEATHER RADIO INFORMATION

NOAA WEATHER RADIO MANUFACTURERS LIST	
RADIO SHACK Weather Radio 2617 West Seventh St. Fort Worth, TX 76107 (817) 390-3011	✓ ●
GENERAL ELECTRIC Model 7-2934 (800) 626-2000	✓ ●
UNIDEN BEARCAT Bearcat Weather Alert 6345 Castleway Court Indianapolis, IN 46250 (800) 722-6637	■
ELECTROLERT Weatheralert Forecaster 4949 South 25A Tipp City, OH 45371 (513) 667-2461	✓ ● ■
SPRINGFIELD INSTRUMENTS Talking Weather Center/Station 76 Paccaic St. Wood-Ridge, NJ 07075 (201) 777-2900	■
WOODSON ELECTRONICS Plectron 505 Lincoln St. Overton, NE 68863 (308) 987-2404	X
GORMAN - REDLICH MANUFACTURING James T. Gorman 257 West Union St. Athens, OH 45701 (617) 593-3150	X

PRICE RANGE:

✓ Under $50
■ $50 to $100
X Over $100
● Features AM/FM model radios with weather band

PLEASE NOTE, THIS LIST IS NOT ALL-INCLUSIVE, AND INCLUSION ON THIS LIST DOES NOT CONSTITUTE ENDORSEMENT OF ANY COMPANY BY EPA OR THE U.S. GOVERNMENT.

TECHNICAL APPENDIX B

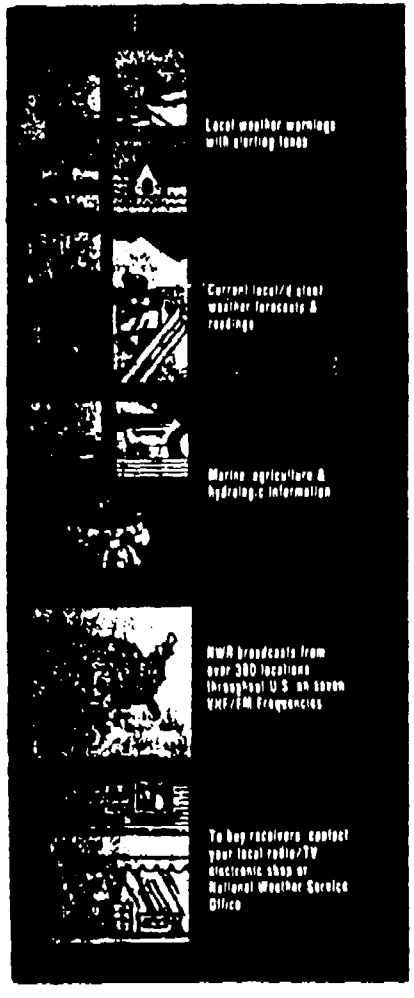

NOAA WEATHER RADIO IS A SERVICE...

of the National Oceanic and Atmospheric Administration (NOAA) of the U.S. Department of Commerce. As the "Voice of the National Weather Service," it provides continuous broadcasts of the latest weather information directly from National Weather Service offices. Taped weather messages are repeated every four to six minutes and are routinely revised every one to three hours, or more frequently if needed. Most of the stations operate 24 hours daily.

During severe weather, National Weather Service forecasters can interrupt the routine weather broadcasts and substitute special warning messages. The forecasters can also activate specially designed warning receivers. Such receivers either sound an alarm indicating that an emergency exists, alerting the listener to turn the receiver up to an audible volume, or, when operated in a muted mode, are automatically turned on so that the warning message is heard. "Warning alarm" receivers are especially valuable for schools, hospitals, public-safety agencies, and news media offices.

Under a January 1975 White House policy statement, NOAA Weather Radio was designated the sole Government-operated radio system to provide direct warnings into private homes for both natural disasters and nuclear attack. This capability is to supplement warnings by sirens and by commercial radio and TV.

The broadcasts are tailored to weather information needs of people within the receiving area. For example, stations along the sea coasts and Great Lakes provide weather information for boaters, fishers, and others engaged in marine activities as well as general weather information.

NOAA Weather Radio broadcasts are made on one of seven high-band FM frequencies ranging from 162.40 to 162.55 megahertz (MHz). These frequencies are not found on the average home radio now in use. However, a number of radio manufacturers offer special weather radios to operate on these frequencies, with or without the emergency warning alarm. Also, there are now many radios on the market which offer standard AM/FM frequencies plus the so-called "weather band" as an added feature.

NOAA Weather Radio broadcasts can usually be heard as far as 40 miles from the antenna site, sometimes more. The effective range depends on many factors, particularly the height of the broadcasting antenna, terrain, quality of the receiver, and type of receiving antenna. As a general rule, listeners close to or perhaps beyond the 40 mile range should have a good quality receiver system if they expect reliable reception. Also, an outside antenna may be required in these fringe areas. If practicable, a receiver should be tried at its place of intended use before making a final purchase.

The National Weather Service operates about 380 stations. Approximately 80 percent of the Nation's population is within listening range of a NOAA Weather Radio broadcast.

A similar network of about 15 stations using the same frequencies broadcasts continuous weather information across much of southern Canada.

If you have a question concerning NOAA Weather Radio or wish to receive a listing of NOAA Weather Radio receiver manufacturers, please contact your nearest National Weather Service Office, or write to National Weather Service (Attn: W/OM11), National Oceanic and Atmospheric Administration, Silver Spring, MD. 20910.

NOAA/PA 78015
Rev. July 1980

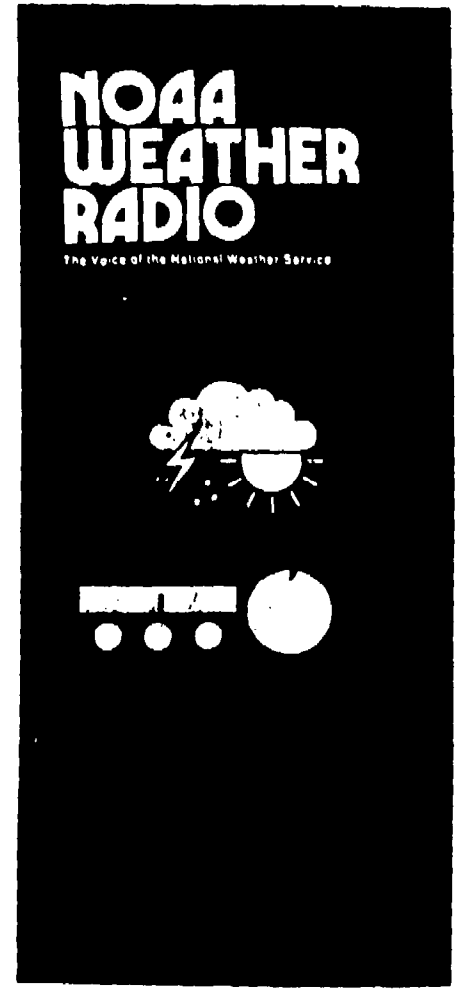

NOAA WEATHER RADIO NETWORK

Legend: Frequencies are identified as follows:

1) 162.400 MHz
2) 162.425 MHz
3) 162.475 MHz
4) 162.450 MHz
5) 162.400 MHz
6) 162.500 MHz
7) 162.550 MHz

Location	Frequency
Alabama	
Anniston	3
Birmingham	1
Dothan	3
Decatur	1
Florence	3
Huntsville	2
Louisville	3
Mobile	1
Montgomery	2
Tuscaloosa	2
Alaska	
Anchorage	1
Cordova	1
Fairbanks	1
Homer	2
Juneau	1
Ketchikan	1
Kodiak	1
Nome	1
Haines	1
Seward	1
Sitka	1
Valdez	1
Wrangell	2
Yakutat	2
Arizona	
Flagstaff	2
Lake Powell	1
Phoenix	1
Tucson	2
Yuma	1
Arkansas	
Fayetteville	3
Fort Smith	2
Gurdon	3
Jonesboro	1
Little Rock	1
Mountain Home	2
Pine Bluff	2
Texarkana	1
California	
Bakersfield (P)	1
Coachella (P)	2
Eureka	2
Fresno	2
Los Angeles	1
Lindsay	6
California (continued)	
Monterey	2
Point Arena	1
Redding (P)	1
Sacramento	1
San Diego	2
San Francisco	2
San Luis Obispo	1
Santa Barbara	2
Colorado	
Alamosa (P)	3
Colorado Springs	3
Denver	1
Fort Collins	6
Grand Junction	1
Greeley	3
Longmont	1
Pueblo	2
Sterling	2
Connecticut	
Hartford	3
Meriden	2
New London	1
Delaware	
Lewes	1
District of Columbia	
Washington, D.C.	1
Florida	
Bell Glade	2
Daytona Beach	2
Fort Myers	3
Gainesville	3
Jacksonville	1
Key West	2
Melbourne	1
Miami	1
Orlando	3
Panama City	1
Pensacola	2
Tallahassee	2
Tampa	1
West Palm Beach	3
Georgia	
Athens	2
Atlanta	1
Augusta	1
Bailey	7
Georgia (continued)	
Chatsworth	2
Columbus	2
Macon	3
Pelham	1
Savannah	2
Valdosta	6
Waycross	3
Waynesboro	4
Hawaii	
Hilo	1
Honolulu	1
Kailua	2
Mt. Haleakala	2
Waimanalo (P)	2
Idaho	
Boise	1
Lewiston (P)	1
Pocatello	1
Twin Falls	2
Illinois	
Champaign	1
Chicago	1
Marion	2
Moline	1
Peoria	3
Rockford	3
Springfield	2
Indiana	
Bloomington	3
Evansville	1
Fort Wayne	1
Indianapolis	1
Lafayette	3
Marion	6
South Bend	2
Terre Haute	2
Iowa	
Cedar Rapids	3
Des Moines	1
Dubuque (P)	2
Sioux City	2
Waterloo	1
Kansas	
Chanute	2
Colby	3
Concordia	1
Kansas (continued)	
Dodge City	3
Ellsworth	2
Topeka	3
Wichita	1
Kentucky	
Ashland	1
Bowling Green	2
Covington	1
Elizabethtown (P)	2
Hazard	2
Lexington	2
Louisville	3
Mayfield	3
Pikeville (P)	2
Somerset	1
Louisiana	
Alexandria	3
Baton Rouge	2
Bunkie	3
Lafayette	1
Lake Charles	2
Monroe	3
Morgan City	2
New Orleans	3
Shreveport	2
Maine	
Caribou	1
Houlton	3
Ellsworth	2
Portland	1
Maryland	
Baltimore	2
Hagerstown	3
Salisbury	2
Massachusetts	
Boston	3
Hyannis	1
Worcester	1
Michigan	
Alpena	1
Detroit	1
Flint	2
Grand Rapids	1
Houghton	2
Marquette	1
Michigan (continued)	
Muskegon	2
Oscoda	1
Saint Ignace	1
Traverse City	2
Minnesota	
Detroit Lakes	3
Duluth	1
International Falls	1
Mankato	2
Minneapolis	1
Rochester	3
Saint Cloud (P)	3
Thief River Falls	1
Willmar (P)	2
Mississippi	
Aberdeen	3
Brookhaven	1
Biloxi	1
Columbia (P)	2
Gulfport	2
Hattiesburg	3
Greenville	1
Jackson	1
Meridian	1
Oxford	2
Missouri	
Columbia	2
Cameron	1
Hannibal	3
Harrisburg	6
Joplin/Carthage	1
Kansas City	1
St. Joseph	2
St. Louis	1
Sikeston	2
Springfield	2
Montana	
Billings	1
Butte	1
Glasgow	1
Great Falls	1
Havre (P)	2
Helena	2
Kalispell	1
Miles City	2
Missoula	2
Nebraska	
Bassett	2
Grand Island	2
Holdrege	3
Lincoln	3
Morrillton	2
Norfolk	1
North Platte	1
Omaha	2
Scottsbluff	1
Nevada	
Elko	1
Ely	2
Las Vegas	1
Reno	1
Winnemucca	2
New Hampshire	
Concord	2
New Jersey	
Atlantic City	2
New Mexico	
Albuquerque	2
Clovis	3
New Mexico (continued)	
Deming	2
Farmington	2
Hobbs	2
Las Cruces	2
Pueblo	1
Santa Fe	1
New York	
Albany	1
Binghamton	3
Buffalo	1
Elmira	2
Kingston	3
New York City	1
Plattsburgh	3
Rochester	2
Syracuse	1
North Carolina	
Asheville	2
Cape Hatteras	3
Charlotte	3
Fayetteville	3
New Bern	2
Raleigh/Durham	1
Rocky Mount	2
Wilmington	1
Winston-Salem	2
North Dakota	
Bismarck	2
Dickinson	2
Fargo	2
Jamestown	2
Minot	2
Petersburg	2
Williston	2
Ohio	
Akron	2
Cambridge	3
Cleveland	1
Columbus	1
Dayton	3
Lima	2
Sandusky	2
Toledo	1
Oklahoma	
Clinton	3
Enid	3
Lawton	2
McAlester	3
Oklahoma City	2
Tulsa	1
Oregon	
Astoria	2
Brookings	2
Coos Bay	2
Eugene	2
Klamath Falls	1
Medford	2
Newport	2
Pendleton	2
Portland	1
Roseburg	2
Salem	3
Pennsylvania	
Allentown	2
Oberlin	2
Erie	2
Harrisburg	1
Johnstown	2
Pennsylvania (continued)	
Philadelphia	3
Pittsburgh	1
Santa Catharina	3
Towanda	3
Wellsboro	1
Wilkes-Barre	2
Williamsport	1
Puerto Rico	
Mayaguez	1
San Juan	2
Rhode Island	
Providence	2
South Carolina	
Beaufort	3
Charleston	1
Columbia	3
Greer	3
Florence	1
Greenville	2
Myrtle Beach	2
Sumter (P)	3
South Dakota	
Aberdeen	3
Huron	1
Pierre	2
Rapid City	1
Sioux Falls	2
Tennessee	
Bristol	1
Chattanooga	1
Crossville	2
Jackson	2
Knoxville	1
Memphis	3
Nashville	2
Shelbyville	6
Winchester	2
Texas	
Abilene	2
Amarillo	2
Austin	2
Beaumont	3
Big Spring	2
Brownsville	1
Bryan	1
Corpus Christi	1
Dallas	2
Del Rio (P)	2
El Paso	3
Fort Worth	1
Galveston	1
Houston	3
Laredo	1
Lubbock	2
Lufkin	1
Midland	2
Texas (continued)	
Paris	1
Pecos	1
San Angelo	1
San Antonio	1
Sherman	2
Tyler	2
Victoria	2
Waco	2
Wichita Falls	2
U.S. Virgin Islands	
St. Thomas	2
Utah	
Logan	2
Cedar City	2
Vernal	2
Salt Lake City	1
Vermont	
Burlington	2
Marlboro	2
Windsor	2
Virginia	
Charlottesville	2
Lynchburg	1
Norfolk	2
Richmond	2
Roanoke	2
Washington	
Walla Walla	2
Olympia	2
Seattle	1
Spokane	2
Wenatchee	2
Yakima	1
West Virginia	
Beckley	6
Charleston	2
Clarksburg	1
Gilbert	2
Hinton	2
Moundsville	1
Spencer	6
Sutton	6
Wisconsin	
La Crosse (P)	1
Green Bay	1
Madison	2
Manitowoc	2
Milwaukee	2
Park Falls	6
Wausau	3
Wyoming	
Casper	1
Cheyenne	3
Lander	3
Sheridan (P)	3

Notes: 1. Stations marked with an asterisk (*) are located in private internal groups.
2. Stations marked (P) are non-presidential repeaters stations serving a very limited area.
3. Stations marked (P) operate less than 24 hours/day. Hours are extended when possible during national emergencies.
4. Occasionally the frequency of an existing or planned station must be changed because of unexpected radio frequency interference with adjacent NOAA Weather Radio stations or with other government or commercial operations within the area.

TECHNICAL APPENDIX C

REQUIRED CONTAINERS, PRESERVATION TECHNIQUES, HOLDING TIMES AND 40 CODE OF FEDERAL REGULATIONS (CFR) PART 136

REQUIRED CONTAINERS, PRESERVATION TECHNIQUES, AND HOLDING TIMES			
Parameter	**Container(1)**	**Preservative (2), (3)**	**Maximum Holding Time (4)**
Bacterial Tests			
Coliform, fecal and total	P, G	Cool, 4°C 0.008% $Na_2S_2O_3$ (5)	6 hours
Fecal streptococci	P, G	Cool, 4°C 0.008% $Na_2S_2O_3$ (5)	6 hours
Inorganic Tests			
Acidity	P, G	Cool, 4°C	14 days
Alkalinity	P, G	Cool, 4°C	14 days
Ammonia	P, G	Cool, 4°C H_2SO_4 to pH<2	28 days
Biochemical oxygen demand	P, G	Cool, 4°C	48 hours
Biochemical oxygen demand, carbonaceous	P, G	Cool, 4°C	48 hours
Bromide	P, G	None required	28 days
Chemical oxygen demand	P, G	Cool, 4°C H_2SO_4 to pH<2	28 days
Chloride	P, G	None required	28 days
Chlorine, total residual	P, G	None required	Analyze immediately
Color	P, G	Cool, 4°C	48 hours
Cyanide, total and amenable to chlorination	P, G	Cool, 4°C NaOH to pH>12 0.6g ascorbic acid (5)	14 days (6)
Fluoride	P	None required	28 days
Hardness	P, G	HNO_3 to pH<2 H_2SO_4 to pH<2	6 months
Hydrogen ion (pH)	P, G	None required	Analyze immediately
Kjeldahl and organic Nitrogen	P, G	Cool, 4°C H_2SO_4 to pH<2	28 days
Metals (7)			
Chromium VI	P, G	Cool, 4°C	28 hours
Mercury	P, G	HNO_3 to pH<2	28 hours
Metals, except above	P, G	HNO_3 to pH<2	6 months
Nitrate	P, G	Cool, 4°C	48 hours

REQUIRED CONTAINERS, PRESERVATION TECHNIQUES, AND HOLDING TIMES			
Parameter	**Container(1)**	**Preservative (2), (3)**	**Maximum Holding Time (4)**
Nitrate-nitrite	P, G	Cool, 4°C H_2SO_4 to pH<2	28 days
Nitrite	P, G	Cool, 4°C	48 hours
O&G	G	Cool, 4°C H_2SO_4 or HCl to pH<2	28 days
Organic carbon	P, G	Cool, 4°C HCl or H_2SO_4 to pH<2	28 days
Orthophosphate	P, G	Filter immediately Cool, 4°C	48 hours
Oxygen, Dissolved Probe	G bottle and top	None required	Analyze immediately
Dissolved oxygen, Winkler method	G bottle and top	Fix on site and store in dark	8 hours
Phenols	G only	Cool, 4°C H_2SO_4 to pH<2	28 days
Phosphorus (elemental)	G	Cool, 4°C	48 hours
Phosphorus, total	P, G	Cool, 4°C H_2SO_4 to pH<2	28 days
Residue, total	P, G	Cool, 4°C	7 days
Residue, filterable	P, G	Cool, 4°C	7 days
Residue, nonfilterable (TSS)	P, G	Cool, 4°C	7 days
Residue, settleable	P, G	Cool, 4°C	48 hours
Residue, volatile	P, G	Cool, 4°C	7 days
Silica	P	Cool, 4°C	28 days
Specific conductance	P, G	Cool, 4°C	28 days
Sulfate	P, G	Cool, 4°C	28 days
Sulfide	P, G	Cool, 4°C, add zinc acetate plus sodium hydroxide to pH>9	7 days
Sulfite	P, G	None required	Analyze immediately
Surfactants	P, G	Cool, 4°C	48 hours
Temperature	P, G	None required	Analyze
Turbidity	P, G	Cool, 4°C	48 hours

REQUIRED CONTAINERS, PRESERVATION TECHNIQUES, AND HOLDING TIMES			
Parameter	**Container(1)**	**Preservative (2), (3)**	**Maximum Holding Time (4)**
Organic Tests (8)			
Purgeable halocarbons	G, Teflon-lined septum	Cool, 4°C 0.008% $Na_2S_2O_3$ (5)	14 days
Purgeable aromatics	G, Teflon-lined septum	Cool, 4°C 0.008% $Na_2S_2O_3$ (5) HCl to pH<2 (9)	14 days
Acrolein and acrylonitrile	G, Teflon-lined septum	Cool, 4°C 0.008% $Na_2S_2O_3$ (5) Adjust pH to 4-5 (10)	14 days
Phenols (11)	G, Teflon-lined cap	Cool, 4°C 0.008% $Na_2S_2O_3$ (5)	7 days until extraction, 40 days after extraction
Benzidines (11)	G, Teflon-lined cap	Cool, 4°C 0.008% $Na_2S_2O_3$ (5)	7 days until extraction (13)
Phthalate esters (11)	G, Teflon-lined cap	Cool, 4°C	7 days until extraction, 40 days after extraction
Nitrosamines (11), (14)	G, Teflon-lined cap	Cool, 4°C store in dark 0.008% $Na_2S_2O_3$	7 days until extraction, 40 days after extraction
PCBs (11) acrylonitrite	G, Teflon-lined cap	Cool, 4°C	7 days until extraction, 40 days after extraction
Nitroaromatics and isophorone (11)	G, Teflon-lined cap	Cool, 4°C store in dark 0.008% $NA_2S_2O_3$ (5)	7 days until extraction, 40 days after extraction
Polynuclear aromatic hydrocarbons (11)	G, Teflon-lined cap	Cool, 4°C store in dark 0.008% $Na_2S_2O_3$ (5)	7 days until extraction, 40 days after extraction
Haloethers (11)	G, Teflon-lined cap	Cool, 4°C 0.008% $Na_2S_2O_3$ (5)	7 days until extraction, 40 days after extraction
Chlorinated hydrocarbons (11)	G, Teflon-lined cap	Cool, 4°C	7 days until extraction, 40 days after extraction
TCDD (11)	G, Teflon-lined cap	Cool, 4°C 0.008% $Na_2S_2O_3$ (5)	7 days until extraction, 40 days after extraction
Pesticides Tests			
Pesticides (11)	G, Teflon-lined cap	Cool, 4°C pH 5-9 (15)	7 days until extraction, 40 days after extraction
Radiological Tests			
Alpha, beta, and radium	P, G	HNO_3 to pH<2	6 months

40 CFR 136.3 TABLE II NOTES

(1) Polyethylene (P) or Glass (G).

(2) Sample preservation should be performed immediately upon sample collection. For composite chemical samples each aliquot should be preserved at the time of collection. When use of an automated sampler makes it impossible to preserve each aliquot, then chemical samples may be preserved by maintaining at 4°C until compositing and sample splitting is completed.

(3) When any sample is to be shipped by common carrier or sent through the United States Mails, it must comply with the Department of Transportation Hazardous Materials Regulations (49 CFR Part 172). The person offering such material for transportation is responsible for ensuring such compliance. For the preservation requirements of Table II, the Office of Hazardous Materials, Materials Transportation Bureau, Department of Transportation has determined that the Hazardous Materials Regulations do not apply to the following materials: Hydrochloric acid (HCl) in water solutions at concentrations of 0.04% by weight or less (pH about 1.96 or greater); Nitric acid (HNO_3) in water solutions at concentrations of 0.15% by weight or less (pH about 1.62 or greater); Sulfuric acid (H_2SO_4) in water solutions at concentrations of 0.35% by weight or less (pH about 1.15 or greater); and Sodium hydroxide (NaOH) in water solutions at concentrations of 0.080% by weights or less (pH about 12.30 or less).

(4) Samples should be analyzed as soon as possible after collection. The times listed are the maximum times that samples may be held before analysis and still be considered valid. Samples may be held for longer periods only if the permittee, or monitoring laboratory, has data on file to show that the specific types of samples under study are stable for the longer time, and has received a variance from the Regional Administrator under § 136.3(e). Some samples may not be stable for the maximum time period given in the table. A permittee, or monitoring laboratory, is obligated to hold the sample for a shorter time if knowledge exists to show that this is necessary to maintain sample stability. See § 136.3(e) for details.

(5) Should only be used in the presence of residual chlorine.

(6) Maximum holding time is 24 hours when sulfide is present. Optionally all samples may be tested with lead acetate paper before pH adjustments in order to determine if sulfide is present. If sulfide is present, it can be removed by the addition of cadmium nitrate powder until a negative spot test is obtained. The sample is filtered and then NaOH is added to pH 12.

(7) Samples should be filtered immediately on-site before adding preservative for dissolved metals.

(8) Guidance applies to samples to be analyzed by GC, LC, or GC/MS for specific compounds.

(9) Sample receiving no pH adjustment must be analyzed within seven days of sampling.

(10) The pH adjustment is not required if acrolein will not be measured. Samples for acrolein receiving no pH adjustment must be analyzed within 3 days of sampling.

40 CFR 136.3 TABLE II NOTES

(11) When the extractable analytes of concern fall within a single chemical category, the specified preservative and maximum holding times should be observed for optimum safeguard of sample integrity. When the analytes of concern fall within two or more chemical categories, the sample may be preserved by cooling to 4°C, reducing residual chlorine with 0.008% sodium thiosulfate, storing in the dark,and adjusting the pH to 6-9; samples preserved in this manner may be held for seven days before extraction and for forty days after extraction. Exceptions to this optional preservation and holding time procedure are noted in footnote 5 (re the requirement for thiosulfate reduction of residual chlorine), and footnotes 12, 13 (re the analysis of benzidine).

(12) If 1,2-diphenylhydrazine is likely to be present, adjust the pH of the sample to 4.0 $\pm$ 0.2 to prevent rearrangement to benzidine.

(13) Extracts may be stored up to 7 days before analysis if storage is conducted under an inert (oxidant-free) atmosphere.

(14) For the analysis of diphenylnitrosamine, add 0.008% $Na_2S_2O_3$ and adjust pH to 7-10 with NaOH within 24 hours of sampling.

(15) The pH adjustment may be performed upon receipt at the laboratory and may be omitted if the samples are extracted within 72 hours of collection. For the analysis of aldrin, add 0.008% $Na_2S_2O^3$.

Source: 40 CFR 136.3 Table II

TABLE IA—LIST OF APPROVED BIOLOGICAL TEST PROCEDURES

Parameter and units	Method [1]	EPA [2]	Reference (Method Number or Page)		
			Standard Methods 16th Ed.	ASTM	USGS
Bacteria:					
1. Coliform (fecal) number per 100 ml.	MPN, 5 tubes, 3 dilution; or, membrane filter (MF)[4]; single step.	Page 132.	908C		
2. Coliform (fecal) in presence of chlorine number per 100 ml.	MPN, 5 tubes, 3 dilution; or, MF [4]; single step.[4a]	p. 124	909		B-0050-77.
3. Coliform (total, number per 100 ml.	MPN, 5 tube, 3 dilution; or, MF [4] single step or two step.	p. 114	908A		
		p. 108	908A		B-0055-77.
4. Coliform (total) in presence of chlorine, number per 100 ml.	MPN, 5 tube, dilution; or MF [4] with enrichment.	p. 114	908A		
		p. 111	908 (A+A.5c)		
5. Fecal streptococci, number per 100 ml.	MPN, 5 tube, 3 dilution; MF [4]; or, plate count.	p. 139	910A		
	p. 136		910B		B0055-77.[5]
	p. 143		910C		

Table IA Notes

[1] The method used must be specified when results are reported.

[2] "Microbiological Methods for Monitoring the Environment, Water and Waste, 1978", EPA-600/8-78-017, U.S. Environmental Protection Agency.

[3] Greeson, P.E., *et al.*, "Methods for Collection and Analysis of Aquatic Biological and Microbiological Samples," U.S. Geological Survey, Techniques of Water-Resources Investigations, Book 5, Chapter A4, Laboratory Analysis, 1977.

[4] 0.45 µm membrane filter or other pore size certified by the manufacturer to fully retain organisms to be cultivated, and free of extractables which could interfere with their growth and development.

[4a] Since the membrane filter technique usually yields low and variable recovery from chlorinated wastewaters, the MPN method will be required to resolve any controversies.

[5] Approved only if dissolution of the KF Streptococcus Agar (Section 5.1, USGS Method B-0055-77) is made in a boiling water bath to avoid scorching of the medium.

TABLE IB—LIST OF APPROVED INORGANIC TEST PROCEDURES

Parameter, units and method	Reference (method No. or page)				
	EPA 1979 [24]	Std. methods 16th ED	ASTM	USGS [1]	Other
1. Acidity, as $CaCO_3$ mg/L: Electrometric end point or phenolphthalein end point.	305.1	402(4.a)	1067-82(E)		
2. Alkalinity, as $CaCO_3$ mg/L:					
Electrometric or colorimetric titration to pH 4.5, manual, or.	310.1	403	D1067-82(B)	I-1030-84	33.014[3].
Automated	310.2			I-2030-84	
3. Aluminum—Total,[6] mg/L: Digestion [5] followed by:					
AA direct aspiration	202.1	303C		I-3051-85	
AA furnace	202.2	304			
Inductively coupled plasma (ICP)					200.7.[4]
Direct current plasma (DCP) or					Note 33.
Colorimetric (Eriochrome cyanine R)		308B			
4. Ammonia (as N), mg/L: Manual distillation (at pH 9.5) [6] followed by:	350.2	417A			33.057 [3]
Nesslerization	350.2	417B	D1426-79(A)	I-3520-84	33.057 [3]
Titration	350.2	417D			
Electrode	350.3	417 E or F	D1426-79(D)		
Automated phenate or	350.1	417G	D1426-79(C)	I-4523-84	
Automated electrode					Note 6.
5. Antimony—Total [6], mg/L: Digestion [5] followed by:					
AA direct aspiration	204.1	303A			
AA furnace, or	204.2	304			
Inductively coupled plasma					200.7.[4]
6. Arsenic—Total [6], mg/L: Digestion [5] followed by	206.5				
AA gaseous hydride	206.3	303E	D2972-84(B)	I-3062-84	
AA furnace	206.2	304			
Inductively coupled plasma, or					200.7.[4]
Colorimetric (SDDC)	206.4	307B	D2972-84(A)	I-3060-84	
7. Barium—Total,[6] mg/L: Digestion [5] followed by:					
AA direct aspiration	208.1	303C		I-3084-85	
AA furnace	208.2	304			
ICP, or					200.7.[4]
DCP					Note 33.
8. Beryllium—Total,[6] mg/L: Digestion [5] followed by:					
AA direct aspiration	210.1	303C	D3645-84(A)	I-3095-85	
AA furnace	210.2	304			

TABLE IB—LIST OF APPROVED INORGANIC TEST PROCEDURES—Continued

Parameter, units and method	Reference (method No. or page)				
	EPA 1979 [44]	Std. methods 18th ED	ASTM	USGS [1]	Other
35. Mercury—Total [8], mg/L:					
Cold vapor, manual or	245.1	303F	D3223-80	I-3462-84	33.086 [1]
Automated	245.2				
36. Molybdenum—Total,[8] mg/L. Digestion [5] followed by:					
AA direct aspiration	246.1	303C		I-3490-85	
AA furnace	246.2	304			
ICP, or					200.7 [4]
DCP					Note 33.
37. Nickel—Total,[8] mg/L: Digestion [5] followed by:					
AA direct aspiration	249.1	303 A or B	D1886-84 (C or D).	I-3499-85	
AA furnace	249.2	304			
ICP					200.7 [4]
DCP, or					Note 33.
Colorimetric (Heptoxime)		321B			
38. Nitrate (as N), mg/L: Colorimetric (Brucine sulfate), or Nitrate-nitrite N minus Nitrite N (See parameters 39 and 40).	352.1		D992-71		33.083 [1], 419D [14], p. 28.[5]
39. Nitrate-nitrite (as N), mg/L: Cadmium reduction, Manual or	353.3	418C	D3867-85(B)		
Automated, or	353.2	418F	D3867-85(A)	I-4545-84	
Automated hydrazine	353.1				
40. Nitrite (as N), mg/L: Spectrophotometric:					
Manual or	354.1	419	D1254-67		Note 24.
Automated (Diazotization)				I-4540-84	
41. Oil and grease—Total recoverable, mg/L: Gravimetric (extraction).	413.1	503A			
42. Organic carbon—Total (TOC), mg/L: Combustion or oxidation.	415.1	505	D2579-85 (A or B).		33.044 [1], p. 4 [55]
43. Organic nitrogen (as N) mg/L: Total Kjeldahl N (Parameter 31) minus ammonia N (Parameter 4).					
44. Orthophosphate (as P), mg/L: Ascorbic acid method:					
Automated or	365.1	424G		I-4601-84	33.118. [5]
Manual single reagent	365.2	424F	D515-82(A)		33.111. [5]
or Manual two reagent	365.3				
45. Osmium—Total [8], mg/L: Digestion [5] followed by:					
AA direct aspiration, or	252.1	303C			
AA furnace	252.2	304			
46. Oxygen dissolved, mg/L: Winkler (Azide modification), or	360.2	421B	D888-81(C)	I-1575-78 [7]	33.028. [5]
Electrode	360.1	421F		I-1576-78 [7]	
47. Palladium—Total,[8] mg/L: Digestion [5] followed by:					
AA direct aspiration	253.1				p. 527.[5]
AA furnace	253.2				p. 528.[5]
DCP					Note 33.
48. Phenols, mg/L:					
Manual distillation [55]	420.1		D1783-80 (A or B).		Note 26.
Followed by:					
Colorimetric (4AAP) manual, or	420.1				Note 26.
Automated [19]	420.2				
49. Phosphorus (elemental) mg/L: Gas-liquid chromatography.					Note 27
50. Phosphorus—Total, mg/L: Persulfate digestion followed by	365.2	424C(III)			33.111.[5]
Manual or	365.2 or 365.3.	424F	D515-82(A)		
Automated ascorbic acid reduction, or	365.1	424G		I-4600-84	33.116.[5]
Semi-automated block digester	365.4				
51. Platinum—Total,[8] mg/L: Digestion [5] followed by:					
AA direct aspiration	255.1	303A			
AA furnace	255.2	304			
DCP					Note 33.
52. Potassium—total [8], mg/L: Digestion followed by:					
AA direct aspiration	258.1	303A		I-3630-84	33.103.[5]
Inductively coupled plasma					200.7 [4]
Flame photometric, or		322B	D1428-82(A)		
Colorimetric (Cobaltinitrite)					317B. [14]
53. Residue—Total, mg/L: Gravimetric, 103-105°C.	160.3	208A		I-3750-84	
54. Residue—filterable, mg/L: Gravimetric, 180°C.	160.1	208B		I-1750-84	
55. Residue—nonfilterable (TSS), mg/L: Gravimetric, 103-105°C post washing of residue.	160.2	208C		I-3765-84	

TABLE IB—LIST OF APPROVED INORGANIC TEST PROCEDURES—Continued

Parameter, units and method	Reference (method No. or page)				
	EPA 1978 [44]	Std. methods 16th ED	ASTM	USGS [1]	Other
56. Residue—settleable, mg/L: Volumetric, (Imhoff cone) or gravimetric.	160.5	209E		I	
57. Residue—Volatile, mg/L: Gravimetric, 550°C.	160.4	209D		I-3753-84	
58. Rhodium—Total [6], mg/L: Digestion [5] followed by:.					
AA direct aspiration, or	265.1	303A			
AA furnace	265.2	304			
59. Ruthenium—Total [6], mg/L: Digestion [5] followed by:					
AA direct aspiration, or	267.1	303A			
AA furnace	267.2	304			
60. Selenium—Total [6], mg/L: Digestion [5] followed by:					
AA furnace	270.2	304			
Inductively coupled plasma, or					200.7[4]
AA gaseous hydride	270.3	303E	D3859-84(A)	I-3667-84	
61. Silica—Dissolved, mg/L: 0.45 micron filtration followed by:					
Colorimetric, Manual or	370.1	425C	D859-80(B)	I-1700-84	
Automated (Molybdosilicate), or				I-2700-84	
Inductively coupled plasma					200.7.[4]
62. Silver—Total,[6] mg/L: Digestion [5] followed by:					
AA direct aspiration	272.1	303 A or B		I-3720-85	33.089.[3] p. 37.[9]
AA furnace	272.2	304			
Colorimetric (Dithizone)					3198.[16]
ICP, or					200.7.[4]
DCP					Note 33.
63. Sodium—Total,[6] mg/L: Digestion [5] followed by:					
AA direct aspiration	273.1	303A		I-3735-85	33.107.[3]
ICP					200.7.[4]
DCP, or					Note 33.
Flame photometric		3258	D1428-82(A)		
64. Specific conductance, micromhos/cm at 25°C. Wheatstone bridge	120.1	205	D1125-82(A)	I-1780-84	33.002.[3]
65. Sulfate (as SO_4), mg/L:					
Automated colorimetric (barium chloranilate).	375.1				
Gravimetric, or	375.3	426 A or B	D516-82(A)		33.124.[3]
Turbidimetric	375.4		D516-82(B)		428C.[10]
66. Sulfide (as S), mg/L:					
Titrimetric (iodine) or	376.1	427D		I-3640-84	228A.[10]
Colorimetric (methylene blue)	376.2	427C			
67. Sulfite (as SO_3), mg/L: Titrimetric (iodine-iodate).	377.1	428A	D1339-84(C)		
68. Surfactants, mg/L: Colorimetric (methylene blue).	425.1	512B	D2330-82(A)		
69. Temperature, °C.: Thermometric	170.1	212			Note 31.
70. Thallium—Total [6], mg/L: Digestion [5] followed by:					
AA direct aspiration	279.1	303A			
AA furnace, or	279.2	304			
Inductively coupled plasma					200.7.[4]
71. Tin—Total [6], mg/L: Digestion [5] followed by:					
AA direct aspiration, or	282.1	303A		I-3850-78 [7]	
AA furnace,	282.2	304			
72. Titanium—Total,[6] mg/L: Digestion [5] followed by:					
AA direct aspiration	283.1	303C			
AA furnace	283.2	304			
DCP					Note 33.
73. Turbidity, NTU: Nephelometric	180.1	214A	D1889-81	I-3860-84	
74. Vanadium—Total,[6] mg/L: Digestion [5] followed by:					
AA direct aspiration	286.1	303C			
AA furnace	286.2	304			
ICP					200.7.[4]
DCP, or					Note 33.
Colorimetric (Gallic acid)		3278	D3373-84(A)		
75. Zinc—Total,[6] mg/L: Digestion [5] followed by:					
AA direct aspiration	289.1	303 A or B	D1691-84 (C or D).	I-3900-85	33.089.[3] p. 37.[9]
AA furnace	289.2	304			
ICP					200.7.[4]
DCP, or					Note 33.
Colorimetric (Dithizone) or		329C			
(Zincon)					Note 32.

TABLE IB—LIST OF APPROVED INORGANIC TEST PROCEDURES—Continued

[1] "Methods for Analyses of Inorganic Substances in Water and Fluvial Sediments," U.S. Department of the Interior, U.S. Geological Survey, Open-File Report 85-495, 1986, unless otherwise stated.

[2] "Official Methods of Analyses of the Association of Official Analytical Chemists," methods manual, 14th ed. (1984).

[3] For the determination of total metals the sample is not filtered before processing. A digestion procedure is required to solubilize suspended material and to destroy possible organic-metal complexes. Two digestion procedures are given in "Methods for Chemical Analyses of Water and Wastes, 1979." One (section 4.1.3), is a vigorous digestion using nitric acid. A less vigorous digestion using nitric and hydrochloric acids (section 4.1.4) is preferred; however, the analyst should be cautioned that this mild digestion may not suffice for all sample types. Particularly, if a colorimetric procedure is to be employed, it is necessary to ensure that all organo-metallic bonds be broken so that the metal is in a reactive state. In those situations, the vigorous digestion is to be preferred making certain that at no time does the sample go to dryness. Samples containing large amounts of organic materials would also benefit by this vigorous digestion. Use of the graphite furnace technique, inductively coupled plasma, as well as determinations for certain elements such as arsenic, the noble metals, mercury, selenium, and titanium require a modified digestion and in all cases the method write-up should be consulted for specific instruction and/or cautions.

NOTE: If the digestion included in one of the other approved references is different than the above, the EPA procedure must be used.

Dissolved metals are defined as those constituents which will pass through a 0.45 micron membrane filter. Following filtration of the sample, the referenced procedure for total metals must be followed. Sample digestion for dissolved metals may be omitted for AA (direct aspiration or graphite furnace) and ICP analyses provided the sample solution to be analyzed meets the following criteria:

a. has a low COD (<20)

b. is visibly transparent with a turbidity measurement of 1 NTU or less,

c. is colorless with no perceptable odor, and

d. is of one liquid phase and free of particulate or suspended matter following acidification.

[4] The full text of Method 200.7, "Inductively Coupled Plasma Atomic Emission Spectrometric Method for Trace Element Analysis of Water and Wastes," is given at Appendix C of this Part 136.

[5] Manual distillation is not required if comparability data on representative effluent samples are on company file to show that this preliminary distillation step is not necessary; however, manual distillation will be required to resolve any controversies.

[6] Ammonia, Automated Electrode Method, Industrial Method Number 379-75 WE, dated February 19, 1976, Technicon AutoAnalyzer II, Technicon Industrial Systems, Tarrytown, NY 10591.

[7] The approved method is that cited in "Methods for Determination of Inorganic Substances in Water and Fluvial Sediments", USGS TWRI, Book 5, Chapter A1 (1979).

[8] American National Standard on Photographic Processing Effluents, Apr. 2, 1976. Available from ANSI, 1430 Broadway, New York, NY 10018.

[9] "Selected Analytical Methods Approved and Cited by the United States Environmental Protection Agency," Supplement to the Fifteenth Edition of *Standard Methods for the Examination of Water and Wastewater* (1981).

[10] The use of normal and differential pulse voltage ramps to increase sensitivity and resolution is acceptable.

[11] Carbonaceous biochemical oxygen demand ($CBOD_5$) must not be confused with the traditional BOD_5 test which measures "total BOD." The addition of the nitrification inhibitor is not a procedural option, but must be included to report the $CBOD_5$ parameter. A discharger whose permit requires reporting the traditional BOD_5 may not use a nitrification inhibitor in the procedure for reporting the results. Only when a discharger's permit specifically states $CBOD_5$ is required, can the permittee report data using the nitrification inhibitor.

[12] OIC Chemical Oxygen Demand Method, Oceanography International Corporation, 512 West Loop, P.O. Box 2980, College Station, TX 77840.

[13] Chemical Oxygen Demand, Method 8000, Hach Handbook of Water Analysis, 1979, Hach Chemical Company, P.O. Box 389, Loveland, CO 80537.

[14] The back titration method will be used to resolve controversy.

[15] Orion Research Instruction Manual, Residual Chlorine Electrode Model 97-70, 1977, Orion Research Incorporated, 840 Memorial Drive, Cambridge, MA 02139.

[16] The approved method is that cited in *Standard Methods for the Examination of Water and Wastewater*, 14th Edition, 1976.

[17] National Council of the Paper Industry for Air and Stream Improvement, (Inc.) Technical Bulletin 253, December 1971.

[18] Copper, Bicinchoninate Method, Method 8506, Hach Handbook of Water Analysis, 1979, Hach Chemical Company, P.O. Box 389, Loveland, CO 80537.

[19] After the manual distillation is completed, the autoanalyzer manifolds in EPA Methods 335.3 (cyanide) or 420.2 (phenols) are simplified by connecting the re-sample line directly to the sampler. When using the manifold setup shown in Method 335.3, the buffer 6.2 should be replaced with the buffer 7.6 found in Method 335.2.

[20] Hydrogen ion (pH) Automated Electrode Method, Industrial Method Number 378-75WA, October 1976, Technicon AutoAnalyzer II, Technicon Industrial Systems, Tarrytown, NY 10591.

[21] Iron, 1,10-Phenanthroline Method, Method 8008, 1980, Hach Chemical Company, P.O. Box 389, Loveland, CO 80537.

[22] Manganese, Periodate Oxidation Method, Method 8034, Hach Handbook of Wastewater Analysis, 1979, pages 2-113 and 2-117, Hach Chemical Company, Loveland, CO 80537.

[23] Goerlitz, D., Brown, E., "Methods for Analyses of Organic Substances in Water," U.S. Geological Survey Techniques of Water-Resources Inv., book 5, ch. A3, page 4 (1972).

[24] Nitrogen, Nitrite, Method 8507, Hach Chemical Company, P.O. Box 389, Loveland, CO 80537.

[25] Just prior to distillation, adjust the sulfuric-acid-preserved sample to pH 4 with 1 + 9 NaOH.

[26] The approved method is that cited in *Standard Methods for the Examination of Water and Wastewater*, 14th Edition. The colorimetric reaction is conducted at a pH of 10.0±0.2. The approved methods are given on pp. 576-81 of the 14th Edition: Method 510A for distillation, Method 510B for the manual colorimetric procedure, or Method 510C for the manual spectrophotometric procedure.

[27] R. F. Addison and R. G. Ackman, "Direct Determination of Elemental Phosphorus by Gas-Liquid Chromatography," *Journal of Chromatography*, vol. 47, No. 3, pp. 421-426, 1970.

[28] Approved methods for the analysis of silver in industrial wastewaters at concentrations of 1 mg/L and above are inadequate where silver exists as an inorganic halide. Silver halides such as the bromide and chloride are relatively insoluble in reagents such as nitric acid but are readily soluble in an aqueous buffer of sodium thiosulfate and sodium hydroxide to a pH of 12. Therefore, for levels of silver above 1 mg/L, 20 mL of sample should be diluted to 100 mL by adding 40 mL each of 2 M $Na_2S_2O_3$ and 2M NaOH. Standards should be prepared in the same manner. For levels of silver below 1 mg/L the approved method is satisfactory.

[29] The approved method is that cited in *Standard Methods for the Examination of Water and Wastewater*, 15th Edition.

[30] The approved method is that cited in *Standard Methods for the Examination of Water and Wastewater*, 13th Edition.

[31] Stevens, H. H., Ficke, J. F., and Smoot, G. F., "Water Temperature—Influential Factors, Field Measurement and Data Presentation," U.S. Geological Survey, Techniques of Water Resources Investigations, Book 1, Chapter D1, 1975.

[32] Zinc, Zincon Method, Method 8009, Hach Handbook of Water Analysis, 1979, pages 2-231 and 2-333, Hach Chemical Company, Loveland, CO 80537.

[33] "Direct Current Plasma (DCP) Optical Emission Spectrometric Method for Trace Elemental Analysis of Water and Wastes, Method AES0029," 1986, Applied Research Laboratories, Inc., 24911 Avenue Stanford, Valencia, CA 91355.

[34] Precision and recovery statements for the atomic absorption direct aspiration and graphite furnace methods, and for the spectrophotometric SDDC method for arsenic are provided in appendix D of this part titled, "Precision and Recovery Statements for Methods for Measuring Metals".

TABLE IC—LIST OF APPROVED TEST PROCEDURES FOR NON-PESTICIDE ORGANIC COMPOUNDS

Parameter [1]	EPA Method Number [2,3]			Other
	GC	GC/MS	HPLC	
1. Acenaphthene	610	625, 1625	610	
2. Acenaphthylene	610	625, 1625	610	
3. Acrolein	603	[4]624, 1624		

TABLE IC—LIST OF APPROVED TEST PROCEDURES FOR NON-PESTICIDE ORGANIC COMPOUNDS—Continued

Parameter [1]	EPA Method Number [2, 7]			Other
	GC	GC/MS	HPLC	
4. Acrylonitrile	603	[1]624, 1624		
5. Anthracene	610	625, 1625	610	
6. Benzene	602	624, 1624		
7. Benzidine		[1]625, 1625	605	Note 3, p. 1;
8. Benzo(a)anthracene	610	625, 1625	610	
9. Benzo(a)pyrene	610	625, 1625	610	
10. Benzo(b)fluoranthene	610	625, 1625	610	
11. Benzo(g,h,i)perylene	610	625, 1625	610	
12. Benzo(k)fluoranthene	610	625, 1625	610	
13. Benzyl chloride				Note 3, p. 130; Note 6, p. S102.
14. Benzyl butyl phthalate	606	625, 1625		
15. Bis(2-chloroethoxy) methane	611	625, 1625		
16. Bis(2-chloroethyl) ether	611	625, 1625		
17. Bis(2-ethylhexyl) phthalate	606	625, 1625		
18. Bromodichloromethane	601	624, 1624		
19. Bromoform	601	624, 1624		
20. Bromomethane	601	624, 1624		
21. 4-Bromophenylphenyl ether	611	625, 1625		
22. Carbon tetrachloride	601	624, 1624		Note 3, p. 130;
23. 4-Chloro-3-methylphenol	604	625, 1625		
24. Chlorobenzene	601, 602	624, 1624		Note 3, p. 130;
25. Chloroethane	601	624, 1624		
26. 2-Chloroethylvinyl ether	601	624, 1624		
27. Chloroform	601	624, 1624		Note 3, p. 130;
28. Chloromethane	601	624, 1624		
29. 2-Chloronaphthalene	612	625, 1625		
30. 2-Chlorophenol	604	625, 1625		
31. 4-Chlorophenylphenyl ether	611	625, 1625		
32. Chrysene	610	625, 1625	610	
33. Dibenzo(a,h)anthracene	610	625, 1625	610	
34. Dibromochloromethane	601	624, 1624		
35. 1,2-Dichlorobenzene	601, 602, 612	624, 625, 1625		
36. 1,3-Dichlorobenzene	601, 602, 612	624, 625, 1625		
37. 1,4-Dichlorobenzene	601, 602, 612	625, 1624, 1625		
38. 3,3'-Dichlorobenzidine		625, 1625	605	
39. Dichlorodifluoromethane	601			
40. 1,1-Dichloroethane	601	624, 1624		
41. 1,2-Dichloroethane	601	624, 1624		
42. 1,1-Dichloroethene	601	624, 1624		
43. trans-1,2-Dichloroethene	601	624, 1624		
44. 2,4-Dichlorophenol	604	625, 1625		
45. 1,2-Dichloropropane	601	624, 1624		
46. cis-1,3-Dichloropropene	601	624, 1624		
47. trans-1,3-Dichloropropene	601	624, 1624		
48. Diethyl phthalate	606	625, 1625		
49. 2,4-Dimethylphenol	604	625, 1625		
50. Dimethyl phthalate	606	625, 1625		
51. Di-n-butyl phthalate	606	625, 1625		
52. Di-n-octyl phthalate	606	625, 1625		
53. 2,4-Dinitrophenol	604	625, 1625		
54. 2,4-Dinitrotoluene	609	625, 1625		
55. 2,6-Dinitrotoluene	609	625, 1625		
56. Epichlorohydrin				Note 3, p. 130; Note 6, p. S102.
57. Ethylbenzene	602	624, 1624		
58. Fluoranthene	610	625, 1625	610	
59. Fluorene	610	625, 1625	610	
60. Hexachlorobenzene	612	625, 1625		
61. Hexachlorobutadiene	612	625, 1625		
62. Hexachlorocyclopentadiene	612	[1]625, 1625		
63. Hexachloroethane	612	625, 1625		
64. Indeno(1,2,3-cd)pyrene	610	625, 1625	610	
65. Isophorone	609	625, 1625		
66. Methylene chloride	601	624, 1624		Note 3, p. 130;
67. 2-Methyl-4,6-dinitrophenol	604	[illegible], 1625		
68. Naphthalene	610	625, 1625	610	
69. Nitrobenzene	609	625, 1625		
70. 2-Nitrophenol	604	625, 1625		
71. 4-Nitrophenol	604	625, 1625		
72. N-Nitrosodimethylamine	607	625, 1625		
73. N-Nitrosodi-n-propylamine	607	[1]625, 1625		
74. N-Nitrosodiphenylamine	607	[1]625, 1625		
75. 2,2'-Oxybis(1-chloropropane)	611	625, 1625		
76. PCB-1016	608	625		Note 3, p. 43;
77. PCB-1221	608	625		Note 3, p. 43;
78. PCB-1232	608	625		Note 3, p. 43;
79. PCB-1242	608	625		Note 3, p. 43;
80. PCB-1248	608	625		Note 3, p. 43;
81. PCB-1254	608	625		Note 3, p. 43;
82. PCB-1260	608	625		Note 3, p. 43;
83. Pentachlorophenol	604	625, 1625		Note 3, p. 140;
84. Phenanthrene	610	625, 1625	610	
85. Phenol	604	625, 1625		
86. Pyrene	610	625, 1625	610	

TABLE IC—LIST OF APPROVED TEST PROCEDURES FOR NON-PESTICIDE ORGANIC COMPOUNDS—Continued

Parameter [1]	EPA Method Number [2, 7]			Other
	GC	GC/MS	HPLC	
87. 2,3,7,8-Tetrachlorodibenzo-p-dioxin		[4] 613		
88. 1,1,2,2-Tetrachloroethane	601	624, 1624		Note 3, p. 130;
89. Tetrachloroethene	601	624, 1624		Note 3, p. 130;
90. Toluene	602	624, 1624		
91. 1,2,4-Trichlorobenzene	612	625, 1625		Note 3, p. 130;
92. 1,1,1-Trichloroethane	601	624, 1624		
93. 1,1,2-Trichloroethane	601	624, 1624		Note 3, p. 130;
94. Trichloroethene	601	624, 1624		
95. Trichlorofluoromethane	601	624		
96. 2,4,6-Trichlorophenol	604	625, 1625		
97. Vinyl chloride	601	624, 1624		

Table IC Notes

[1] All parameters are expressed in micrograms per liter (µg/L).

[2] The full text of Methods 601-613, 624, 625, 1624, and 1625, are given at Appendix A, "Test Procedures for Analysis of Organic Pollutants," of this Part 136. The standardized test procedure to be used to determine the method detection limit (MDL) for these test procedures is given at Appendix B, "Definition and Procedure for the Determination of the Method Detection Limit," of this Part 136.

[3] "Methods for Benzidine; Chlorinated Organic Compounds, Pentachlorophenol and Pesticides in Water and Wastewater," U.S. Environmental Protection Agency, September, 1978.

[4] Method 624 may be extended to screen samples for Acrolein and Acrylonitrile. However, when they are known to be present, the preferred method for these two compounds is Method 603 or Method 1624.

[5] Method 625 may be extended to include benzidine, hexachlorocyclopentadiene, N-nitrosodimethylamine, and N-nitrosodiphenylamine. However, when they are known to be present, Methods 605, 607, and 612, or Method 1625, are preferred methods for these compounds.

[6] 625, Screening only.

[7] "Selected Analytical Methods Approved and Cited by the United States Environmental Protection Agency," Supplement to the Fifteenth Edition of *Standard Methods for the Examination of Water and Wastewater* (1981).

[8] Each analyst must make an initial, one-time, demonstration of their ability to generate acceptable precision and accuracy with Methods 601-613, 624, 625, 1624, and 1625 (See Appendix A of this Part 136) in accordance with procedures each in section 8.2 of each of these Methods. Additionally, each laboratory, on an on-going basis must spike and analyze 10% (5% for Methods 624 and 625 and 100% for methods 1624, and 1625) of all samples to monitor and evaluate laboratory data quality in accordance with sections 8.3 and 8.4 of these Methods. When the recovery of any parameter falls outside the warning limits, the analytical results for that parameter in the unspiked sample are suspect and cannot be reported to demonstrate regulatory compliance.

NOTE: These warning limits are promulgated as an "interim final action with a request for comments."

TABLE ID—LIST OF APPROVED TEST PROCEDURES FOR PESTICIDES [1]

Parameter µg/L)	Method	EPA [2, 3]	Standard Methods 15th Ed	ASTM	Other
1. Aldrin	GC	608	508A	D3086	Note 3, p. 7; Note 4, p. 30.
	GC/MS	625			
2. Ametryn	GC				Note 3, p. 83; Note 6, p. 868.
3. Aminocarb	TLC				Note 3, p. 84; Note 6, p. 816.
4. Atrazine	GC				Note 3, p. 83; Note 6, p. 868.
5. Aziprotine	GC				Note 3, p. 83; Note 6, p. 868.
6. Azinphos methyl	GC				Note 3, p. 25; Note 6, p. 851.
7. Barban	TLC				Note 3, p. 104; Note 6, p. 864.
8. α-BHC	GC	608	508A	D3086	Note 3, p. 7.
	GC/MS	[5] 625			
9. β-BHC	GC	608		D3086	
	GC/MS	625			
10. δ-BHC	GC	608		D3086	
	GC/MS	[5] 625			
11. γ-BHC (Lindane)	GC	608	508A	D3086	Note 3, p. 7; Note 4, p. 30.
	GC/MS	625			
12. Captan	GC		508A		Note 3, p. 7.
13. Carbaryl	TLC				Note 3, p. 94; Note 6, p. 860.
14. Carbophenothion	GC				Note 4, p. 30; Note 6, p. 873.
15. Chlordane	GC	608	508A	D3086	Note 3, p. 7.
	GC-MS	625			
16. Chloroprophem	TLC				Note 3, p. 104; Note 6, p. 864.
17. 2,4-D	GC		508B		Note 3, p. 115; Note 4, p. 36.
18. 4,4'-DDD	GC	608	508A	D3086	Note 3, p. 7; Note 4, p. 30.
	GC-MS	625			
19. 4,4'-DDE	GC	608	508A	D3086	Note 3, p. 7; Note 4, p. 30.
	GC/MS	625			
20. 4,4'-DDT	GC	608	508A	D3086	Note 3, p. 7; Note 4, p. 30.
	GC/MS	625			
21. Demeton-O	GC				Note 3, p. 25; Note 6, p. 851.
22. Demeton-S	GC				Note 3, p. 25; Note 6, p. 851.
23. Diazinon	GC				Note 3, p. 25; Note 4, p 30; Note 6, p. 851.
24. Dicamba	GC				Note 3, p. 115.
25. Dichlofenthion	GC				Note 4, p. 30; Note 6, p. 873.
26. Dichloran	GC		508A		Note 3, p. 7.
27. Dicofol	GC			D3086	
28. Dieldrin	GC	608	508A		Note 3, p. 7; Note 4, p. 30.
	GC/MS	625			
29. Dimethoate	GC				Note 4, p. 30; Note 6, p. 873.
30. Dimethoate	GC				Note 3, p. ; Note 6, p. 851.
31. Diuron	TLC				Note 3, p. 104; Note 6, p. 864.
32. Endosulfan I	GC	608	508A	D3086	Note 3, p. 7.
	GC/MS	[5] 625			

TABLE ID—LIST OF APPROVED TEST PROCEDURES FOR PESTICIDES [1]—Continued

Parameter (µg/L)	Method	EPA [2,3]	Standard Methods 18th Ed	ASTM	Other
33. Endosulfan II	GC	608	509A	D3086	Note 3, p. 7.
	GC/MS	[4] 625			
34. Endosulfan sulfate	GC	608			
	GC/MS	625			
35. Endrin	GC	608	509A	D3086	Note 3, p. 7; Note 4, p. 30.
	GC/MS	[4] 625			
36. Endrin aldehyde	GC	608			
	GC/MS	625			
37. Ethion	GC				Note 4, p. 30; Note 6, p. 573.
38. Fenuron	TLC				Note 3, p. 104; Note 6, p. 564.
39. Fenuron-TCA	TLC				Note 3, p. 104; Note 6, p. 564.
40. Heptachlor	GC	608	509A	D3086	Note 3, p. 7; Note 4, p. 30.
	GC/MS	625			
41. Heptachlor epoxide	GC	608	509A	D3086	Note 3, p. 7; Note 4, p. 30; Note 6, p. 573.
	GC/MS	625			
42. Isodrin	GC				Note 4, p. 30; Note 6, p. 573.
43. Linuron	TLC				Note 3, p. 104; Note 6, p. 564.
44. Malathion	GC		509A		Note 3, p. 25; Note 4, p. 30; Note 6, p. 551.
45. Methiocarb	TLC				Note 3, p. 94; Note 6, p. 560.
46. Methoxychlor	GC		509A	D3086	Note 3, p. 7; Note 4, p. 30.
47. Mexacarbate	TLC				Note 3, p. 94; Note 6, p. 560.
48. Mirex	GC		509A		Note 3, p. 7.
49. Monuron	TLC				Note 3, p. 104; Note 6, p. 564.
50. Monuron-TCA	TLC				Note 3, p. 104; Note 6, p. 564.
51. Neburon	TLC				Note 3, p. 104; Note 6, p. 564.
52. Parathion methyl	GC		509A		Note 3, p. 25; Note 4, p. 30.
53. Parathion ethyl	GC		509A		Note 3, p. 25.
54. PCNB	GC		509A		Note 3, p. 7.
55. Perthane	GC			D3086	
56. Prometon	GC				Note 3, p. 83; Note 6, p. 569.
57. Prometryn	GC				Note 3, p. 83; Note 6, p. 569.
58. Propazine	GC				Note 3, p. 83; Note 6, p. 569.
59. Propham	TLC				Note 3, p. 104; Note 6, p. 564.
60. Propoxur	TLC				Note 3, p. 94; Note 6, p. 560.
61. Secbumeton	TLC				Note 3, p. 83; Note 6, p. 569.
62. Siduron	TLC				Note 3, p. 104; Note 6, p. 564.
63. Simazine	GC				Note 3, p. 83; Note 6, p. 569.
64. Strobane	GC		509A		Note 3, p. 7.
65. Swep	TLC				Note 3, p. 104; Note 6, p. 564.
66. 2,4,5-T	GC		509B		Note 3, p. 116; Note 4, p. 35.
67. 2,4,5-TP (Silvex)	GC		509B		Note 3, p. 116.
68. Terbuthylazine	GC				Note 3, p. 83; Note 6, p. 569.
69. Toxaphene	GC	608	509A	D3086	Note 3, p. 7; Note 4, p. 30.
	GC/MS	625			
70. Trifluralin	GC		509A		Note 3, p. 7

Table ID Notes

[1] Pesticides are listed in this table by common name for the convenience of the reader. Additional pesticides may be found under Table IC, where entries are listed by chemical name.

[2] The full text of methods 608 and 625 are given at Appendix A, "Test Procedures for Analyses of Organic Pollutants," of this Part 136. The standardized test procedure to be used to determine the method detection limit (MDL) for these test procedures is given at Appendix B, "Definition and Procedure for the Determination of the Method Detection Limit", of this Part 136.

[3] "Methods for Benzidine, Chlorinated Organic Compounds, Pentachlorophenol and Pesticides in Water and Wastewater," U.S. Environmental Protection Agency, September, 1978. This EPA publication includes thin-layer chromatography (TLC) methods.

[4] "Methods for Analysis of Organic Substances in Water," U.S. Geological Survey, Techniques of Water-Resources Investigations, Book 5, Chapter A3 (1972).

[5] The method may be extended to include α-BHC, β-BHC, endosulfan I, endosulfan II, and endrin. However, when they are known to exist, Method 608 is the preferred method.

[6] "Selected Analytical Methods Approved and Cited by the United States Environmental Protection Agency," Supplement to the Fifteenth Edition of *Standard Methods for the Examination of Water and Wastewater* (1981).

[7] Each analyst must make an initial, one-time, demonstration of their ability to generate acceptable precision and accuracy with Methods 608 and 625 (See Appendix A of this Part 136) in accordance with procedures given in section 8.2 of each of these methods. Additionally, each laboratory, on an on-going basis, must spike and analyze 10% of all samples analyzed with Method 608 or 5% of all samples analyzed with Method 625 to monitor and evaluate laboratory data quality in accordance with Sections 8.3 and 8.4 of these methods. When the recovery of any parameter falls outside the warning limits, the analytical results for that parameter in the unspiked sample are suspect and cannot be reported to demonstrate regulatory compliance.

NOTE: These warning limits are promulgated as an "interim final action with a request for comments."

TABLE IE—LIST OF APPROVED RADIOLOGICAL TEST PROCEDURES

Parameter and units	Methods	EPA [1]	Reference (method No. or page)		
			Standard methods 18th ed.	ASTM	USGS [2]
1. Alpha-Total, pCi per liter	Proportional or scintillation counter.	900.0	703	D1943-81	pp. 75 and 78. [3]
2. Alpha-Counting error, pCi per liter.	Proportional or scintillation counter.	Appendix B	703	D1943-81	p. 78.
3. Beta-Total, pCi per liter	Proportional counter	900.0	703	D1890-81	pp. 75 and 78. [3]
4. Beta-Counting error, pCi	Proportional counter	Appendix B	703	D1890-81	p. 78.
5. (a) Radium-Total, pCi per liter.	Proportional counter	903.0	705	D2460-70	
(b) ^{226}Ra, pCi per liter	Scintillation counter	903.1	706	D3454-79	p. 81.

TABLE IE NOTES:
[1] "Prescribed Procedures for Measurement of Radioactivity in Drinking Water," EPA-600/4-80-032 (1980 update), U.S. Environmental Protection Agency, August 1980.
[2] Fishman, M.J. and Brown, Eugene, "Selected Methods of the U.S. Geological Survey of Analysis of Wastewaters," U.S. Geological Survey, Open-File Report 76-177 (1976).
[3] The method found on p. 75 measures only the dissolved portion while the method on p. 78 measures only the suspended portion. Therefore, the two results must be added to obtain the "total."

TECHNICAL APPENDIX D

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U.S. EPA, "NPDES Compliance Monitoring Inspector Training: Sampling," August 1990.

U.S. EPA, Region V, "Urban Targeting and BMP Selection," November 1990.

Woodward-Clyde Consultants and Ted Friel Associates, "Guide for Industrial Storm Water Sampling," January 1992.

TECHNICAL APPENDIX E

GLOSSARY

GLOSSARY

Aliquot: A discrete sample used for analysis.

Biochemical Oxygen Demand (BOD): The quantity of oxygen consumed during the biochemical oxidation of matter over a specified period of time, usually 5 days (BOD_5).

Chain-of-Custody: Procedures used to minimize the possibility of tampering with samples.

Chemical Oxygen Demand (COD): Measurement of all the oxidizable matter found in a runoff sample, a portion of which could deplete dissolved oxygen in receiving waters.

Composite Sample: Used to determine "average" loadings or concentrations of pollutants, such samples are collected at regular time intervals, and pooled into one large sample, can be developed on time or flow rate.

Confined Space: Enclosed space that an employee can bodily enter and perform assigned work, that has limited means of exit and entry, that is not designed for continuous employee occupancy, and has one of the following characteristics:

- Contains or has a known potential to contain a hazardous atmosphere
- Contains a material with the potential for engulfment of an entrant
- Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or a floor that slopes downward and tapers to a smaller cross section
- Contains any other recognized serious safety or health hazard.

Conveyance: A channel or passage which conducts or carries water including any pipe, ditch, channel, tunnel, conduit, well, or container.

Detention Ponds: A surface water impoundment constructed to hold and manage storm water runoff.

Discharge: Any addition of any pollutant to waters of the U.S. from any conveyance.

Effluent: Any discharge flowing from a conveyance.

Flumes: A specially shaped open channel flow section providing a change in the channel area and/or slope which results in an increased velocity and change in the level of the liquid flowing through the flume. A flume normally consists of three sections: (1) a converging section; (2) a throat section; and (3) a diverging section. The flow rate through the flume is a function of the liquid level at some point in the flume.

Flow-Weighted Composite Sample: Means a composite sample consisting of a mixture of aliquots collected at a constant time interval, where the volume of each aliquot is proportional to the flow rate of the discharge.

Flow-Proportional Composite Sample: Combines discrete aliquots of a sample collected over time, based on the flow of the wastestream being sampled. There are two methods used to collect this type of sample. One collects a constant sample volume at time intervals which vary based on stream flow. The other collects aliquots at varying volumes based on stream flow, at constant time intervals.

First Flush: Individual sample taken during the first 30 minutes of a storm event. The pollutants in this sample can often be used as a screen for non-storm water discharges since such pollutants are flushed out of the system during the initial portion of the discharge.

Grab Sample: A discrete sample which is taken from a wastestream on a one-time basis with no regard to flow or time; instantaneous sample that is analyzed separately.

Head of Liquid: Depth of flow.

Illicit Discharge: Any discharge to a municipal separate storm sewer that is not composed entirely of storm water except discharges pursuant to an NPDES permit and discharges from fire fighting activities.

Materials Management Practices: Practices used to limit the contact between significant materials and precipitation. These may include structural or nonstructural controls such as dikes, berms, sedimentation ponds, vegetation strips, spill response plans, etc.

Municipal Separate Storm Sewer Systems: A conveyance or system of conveyances including roads with drainage systems, storm drains, gutters, ditches under the jurisdiction of a city, town, borough, county, parish, or other public body.

Outfall: Point source where an effluent is discharged into receiving waters.

Point Source: Any discernible, confined, and discrete conveyance from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff (see 40 CFR 122.3).

Reverse Meniscus: The curved upper surface of a liquid in a container.

Runoff Coefficient: Means the fraction of total rainfall that will appear at the conveyance as runoff.

Significant Materials: Include, but are not limited to, raw materials, fuels, solvents, detergents, metallic products, CERCLA hazardous substances, fertilizers, pesticides, and wastes such as ashes, slag, and sludge that have potential for release with storm water discharges [see 40 CFR 122.26(b)(12)].

Storm Water: Storm water runoff, snow melt runoff, and surface runoff, and drainage.

Storm Water Discharge Associated with Industrial Activity: Discharge from any conveyance which is used for collecting and conveying storm water which is directly related to manufacturing processing or raw materials storage areas at an industrial plant [see 40 CFR 122.26(b)(14)].

Time Composite Sample: Prepared by collecting fixed volume aliquots at specified time intervals and combining into a single sample for analysis.

Turbidity: Describes the capability of light to pass through water.

Weir: A device used to gauge the flow rate of liquid through a channel; is essentially a dam built across an open channel over which the liquid flows, usually through some type of notch.

TECHNICAL APPENDIX F

ACRONYMS

ACRONYMS

BOD_5	Biochemical Oxygen Demand (5-day)
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
cfm	cubic feet per minute
CFR	Code of Federal Regulations
cfs	cubic feet per second
COD	Chemical Oxygen Demand
COV	Coefficient of Variation
CPR	Cardiopulmonary Resuscitation
CWA	Clean Water Act
DOT	Department of Transportation
ECD	Electron Capture Detector
EMC	Event Mean Concentration
EPA	Environmental Protection Agency
ESE	Environmental Science & Engineering, Inc.
FWPCA	Federal Water Pollution Control Act
FID	Flame Ionization Detector
FR	Federal Register
GC/MS	Gas Chromatography/Mass Spectometry
gpm	gallons per minute
H	Head
HCl	Hydrochloric Acid
HNO_3	Nitric Acid
HPLC	High Pressure Liquid Chromatography
H_2SO_4	Sulfuric Acid
IATA	International Air Transport Association
LC_{50}	Lethal Concentration
NaOH	Sodium Hydroxide
$Na_2S_2O_3$	Sodium Thiosulfate
NCDC	National Climate Data Center
NIOSH	National Institute of Occupational Safety and Health
NOAA	National Oceanic and Atmospheric Agency
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NWS	National Weather Service
O&G	Oil and Grease
OSHA	Occupational Safety and Health Administration
PCB	Polychlorinated Biphenyl
PE	Professional Engineer
ppb	parts per billion
Q	Flow Rate
RCRA	Resource Conservation and Recovery Act
SARA	Superfund Amendments and Reauthorization Act
SIC	Standard Industrial Classification
s.u.	standard units
TKN	Total Kjeldahl Nitrogen
TSS	Total Suspended Solids
VOC	Volatile Organic Compound

United States
Environmental Protection
Agency

Office Of Water
(EN-336)

EPA 833-B-92-001
November 1992

EPA

Guidance Manual For The Preparation Of Part 2 Of The NPDES Permit Applications For Discharges From Municipal Separate Storm Sewer Systems

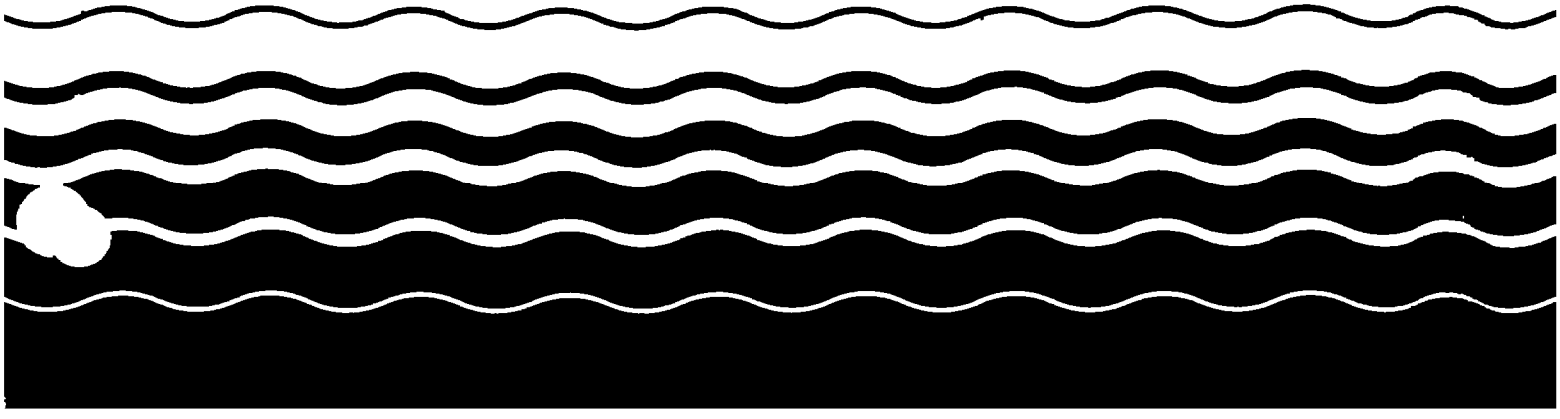

FOREWORD

This manual provides detailed guidance on the development of Part 2 permit applications for municipal separate storm sewer systems. It provides technical assistance and support for all municipal separate storm sewer systems subject to regulatory requirements under the National Pollutant Discharge Elimination System (NPDES) program for storm water point source discharges. This manual also emphasizes the application of pollution prevention measures and implementation of Best Management Practices (BMPs) to reduce pollutant loadings and improve water quality.

The control of pollution from urban and industrial storm water discharges is critical in maintaining and improving the quality of the Nation's waters. Pollutants in storm water discharges from many sources are largely uncontrolled. The *National Water Quality Inventory, 1990 Report to Congress*, provides a general assessment of water quality based on biennial reports submitted by the States under Section 305(b) of the Clean Water Act (CWA). The report indicates that roughly one third of the impairment in assessed waters is due to storm water runoff.

This document was issued in support of Environmental Protection Agency (EPA) regulations and policy initiatives involving the development and implementation of a national storm water program. This document is Agency guidance only. It does not establish or affect legal rights or obligations. Agency decisions in any particular case will be made applying the laws and regulations on the basis of specific facts when permits are issued or regulations promulgated.

This document will be revised and expanded periodically to reflect additional guidance. Comments from users are welcomed. Send comments to U.S. EPA, Office of Wastewater Enforcement and Compliance, 401 M Street, SW, Mail Code EN-336, Washington, D.C. 20460.

Michael B. Cook,
Director
Office of Wastewater Enforcement
and Compliance

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CHAPTER 1
INTRODUCTION

1.0 INTRODUCTION

1.1 OVERVIEW

Control of pollution from urban and industrial storm water discharges is an important factor in maintaining and improving the quality of the Nation's waters. To help improve the quality of storm water discharges, Congress passed the Water Quality Act (WQA) in 1987. The WQA added to the Clean Water Act (CWA) a provision [Section 402(p)] that directed the U.S. Environmental Protection Agency (EPA) to establish final regulations governing storm water discharges under the National Pollutant Discharge Elimination System (NPDES) program.

In response, EPA published regulations in the November 16, 1990, Federal Register (55 FR 47990) that established NPDES permit application requirements for storm water point source discharges As part of these regulations, municipal separate storm sewer systems (MS4s) that serve populations greater than 250,000 ("large MS4s"), MS4s that serve populations between 100,000 and 250,000 ("medium MS4s"), and other MS4s identified by the permitting authority must be covered by NPDES permits. The regulations establish a two-part application process for these MS4s In April 1991, EPA issued guidance on the preparation of Part 1 of the NPDES permit application for discharges from MS4s (EPA, 1991b). The present manual provides guidance on the preparation of Part 2 applications. The information in this manual should help municipalities focus their efforts on activities that meet the application requirements.

1.2 SUMMARY OF THE CLEAN WATER ACT REQUIREMENTS

Section 402 of the CWA prohibits the discharge of any pollutant to waters of the United States from a point source, unless that discharge is authorized by a NPDES permit. Efforts to improve water quality under the NPDES program have traditionally focused on reducing pollutants in discharges of industrial process wastewater and municipal sewage. As pollution control measures have been implemented for these discharges, it has become evident that diffuse sources of water pollution (those occurring over a wide area) are also major contributors to water quality degradation. Recent studies, including the Nationwide Urban Runoff Program (NURP) study (EPA, 1983), have shown that storm water runoff from urban and industrial areas typically contains the same general types of pollutants that are often found in wastewater in industrial discharges. Pollutants commonly found in storm water runoff include heavy metals, pesticides, herbicides, and synthetic organic compounds such as fuels, waste oils, solvents, lubricants, and grease. These compounds can have damaging effect on both human health and aquatic ecosystems. In addition to pollutants, the high volumes of storm water discharged from MS4s in areas of rapid urbanization have had significant impacts on aquatic ecosystems due to physical modifications such as bank erosion and widening of channels.

The statutory provisions governing discharges from MS4s are contained in CWA Section 402(p)(3)(B). In general, Congress provided that permits for discharges from MS4s:

- May be issued on either a system- or jurisdiction-wide basis;
- Shall effectively prohibit non-storm water discharges into the MS4, and
- Shall require controls to reduce the discharge of pollutants to the maximum extent practicable (MEP).

Under the storm water program, the initial round of NPDES permits will emphasize the use of Best Management Practices (BMPs) to reduce pollutant loadings from MS4s. These BMPs include pollution prevention measures, management practices, control techniques, and design and engineering practices. As with any discharger subject to the NPDES program, MS4s must meet technology-based requirements [in this case, the "maximum extent practicable" standard of Section 402(p)] as well as applicable water quality standards.

1.3 THE PERMIT APPLICATION PROCESS

The goal of the NPDES program for municipal storm water is the reduction and elimination of pollutants in storm water discharges from large and medium MS4s. The permit application process in 40 CFR 122.26(d) is designed to meet this goal by developing site-specific NPDES permits containing storm water management programs for individual MS4s. Site-specific permitting is crucial given the differing nature of discharges from MS4s in different parts of the country and the varying impacts of these discharges on receiving waters. To facilitate this process, the regulations specify a two-part permit application.

Part 1 of the permit application initiates the process through which municipalities began to identify sources of pollutants to the municipal storm sewer system. Part 1 also requires municipalities to propose strategies to characterize storm water discharges from their municipal separate storm sewer systems. *Guidance for the Preparation of Part 1 of The NPDES Permit Applications for Discharges From Municipal Separate Storm Sewer Systems* was issued in April 1991, and is available through EPA's Storm Water Hotline [(703) 821-4823].

The present manual describes how to meet the Part 2 permit application requirements for storm water discharges from large and medium MS4s Part 2 of the permit application builds upon the foundation established in Part 1 and provides for the development of comprehensive storm water management programs. Part 2 requires particular information that MS4s must have developed to have an effective storm water control plan. However, each applicant is given flexibility on how to present and organize this information in a way which best suits the MS4's needs and is most consistent with its overall storm water management strategy. This guidance presents examples which illustrate some alternative ways to present information that will fulfill the Part 2 permit application requirements.

1.4 WHO MUST SUBMIT A PART 2 APPLICATION

Municipalities, incorporated places, and counties with unincorporated urban areas that own or operate a large or medium MS4 that discharges to waters of the United States are required to obtain a NPDES storm water permit. In addition, small MS4s (less than 100,000) that are owned or operated by a municipality other than those identified in the NPDES regulation can be designated by the permitting authority as part of the large or medium municipal separate storm sewer system due to the interrelationship between the discharges of the designated storm sewer and the discharges from municipal separate storm sewers.

Under EPA's definition of MS4, "large" MS4s serve populations greater than 250,000, and "medium" MS4s serve populations of at least 100,000, but less than 250,000. Population is determined by the most recent Decennial Census by the Bureau of the Census. A list of large and medium municipalities identified in the November 16, 1990, rule is contained in Exhibit 1-1, in which population was based on the 1980 Census. **After the publication of the November 16, 1990, rule, the Bureau of the Census released data for 1990, and, as a result, some additional municipalities may be required to submit applications, while others may fall below 100,000. These changes are not reflected in Exhibit 1-1.**

Exhibit 1-1: Large and Medium MS4s (Based on 1980 Census Data)

Municipalities, Counties, and Incorporated Areas With Populations greater than 250,000 which Must Submit NPDES Storm Water Applications

State	Entity
Alabama	Birmingham
Arizona	Phoenix
	Tucson
California	Long Beach
	Los Angeles
	Los Angeles County
	Oakland
	Sacramento
	Sacramento County
	San Diego
	San Diego County
	San Francisco
	San Jose
Colorado	Denver
Delaware	New Castle County
District of Columbia	
Florida	Dade County
	Jacksonville
	Miami
	Tampa
Georgia	Atlanta
	DeKalb County
Hawaii	Honolulu County
Illinois	Chicago
Indiana	Indianapolis
Kansas	Wichita
Kentucky	Louisville
Louisiana	New Orleans
Maryland	Anne Arundel County
	Baltimore County
	Baltimore
	Montgomery County
	Prince George's County
Massachusetts	Boston
Michigan	Detroit
Minnesota	Minneapolis
	St Paul
Missouri	Kansas City
	St. Louis
Nebraska	Omaha
New Jersey	Newark
New Mexico	Albuquerque
New York	Buffalo
	Bronx Borough
	Brooklyn Borough
	Manhattan Borough
	Queens Borough
	Staten Island Borough
North Carolina	Charlotte
Ohio	Cincinnati
	Cleveland
	Columbus
	Toledo
Oklahoma	Oklahoma City
	Tulsa
Oregon	Portland
Pennsylvania	Philadelphia
	Pittsburgh
Tennessee	Memphis
	Nashville/Davidson
Texas	Austin
	Dallas
	El Paso
	Fort Worth
	Harris County
	Houston
	San Antonio
Utah	Salt Lake County
Virginia	Fairfax County
	Norfolk
	Virginia Beach
Washington	King County
	Seattle
Wisconsin	Milwaukee

Municipalities, Counties, and Incorporated Areas with Populations between 100,000 and 250,000 which Must Submit NPDES Storm Water Applications.

State	Entity
Alabama	Huntsville
	Jefferson County
	Mobile
	Montgomery
Alaska	Anchorage
Arizona	Mesa
	Pima County
	Tempe
Arkansas	Little Rock
California	Alameda County
	Anaheim
	Bakersfield
	Berkeley
	Concord
	Contra Costa County
	Fremont
	Fresno
	Fullerton
	Garden Grove
	Glendale
	Huntington Beach
	Kern County
	Modesto
California, cont	Orange County
	Oxnard
	Pasadena
	Riverside
	Riverside County
	San Bernardino
	San Bernardino County
	Santa Ana
	Stockton
	Sunnyvale
	Torrance
Colorado	Aurora
	Colorado Springs
	Lakewood
	Pueblo
Connecticut	Bridgeport
	Hartford
	New Haven
	Stamford
	Waterbury
Florida	Broward County
	Escambia County
	Fort Lauderdale
	Hialeah
	Hillsborough County
	Hollywood
	Orange County
	Orlando
	Palm Beach County
	Pinellas County
	Polk County
	Sarasota County
	St Petersburg
Georgia	Clayton County
	Cobb County
	Columbus
	Macon
	Richmond County
	Savannah
Idaho	Boise City
Illinois	Peoria
	Rockford
Indiana	Evansville
	Fort Wayne
	Gary
	South Bend
Iowa	Cedar Rapids
	Davenport
	Des Moines
Kansas	Kansas City
	Topeka
Kentucky	Jefferson County
	Lexington-Fayette
Louisiana	Baton Rouge
	Jefferson Parish
	Shreveport

(continued)

Exhibit 1-1: Large and Medium MS4s (cont.)
(Based on 1980 Census Data)

Massachusetts	Springfield	North Carolina	Durham	Texas, cont'd	Corpus Christi
	Worcester		Greensboro		Garland
Michigan	Ann Arbor		Raleigh		Irving
	Flint		Winston-Salem		Lubbock
	Grand Rapids		Cumberland County		Pasadena
	Lansing	Ohio	Akron		Waco
	Livonia		Dayton	Utah	Salt Lake City
	Sterling Heights		Youngstown	Virginia	Alexandria
	Warren	Oregon	Eugene		Arlington County
Mississippi	Jackson		Multnomah County		Chesapeake
Missouri	Independence		Washington County		Chesterfield County
	Springfield	Pennsylvania	Allentown		Hampton
Nebraska	Lincoln		Erie		Henrico County
Nevada	Clark County	Rhode Island	Providence		Newport News
	Las Vegas	South Carolina	Columbia		Portsmouth
	Reno		Greenville County		Richmond
New Jersey	Elizabeth		Richland County		Roanoke
	Jersey City	Tennessee	Chattanooga	Washington	Snohomish County
	Paterson		Knoxville		Spokane
New York	Albany	Texas	Amarillo		Pierce County
	Rochester		Arlington		Tacoma
	Syracuse		Beaumont	Wisconsin	Madison
	Yonkers				

Source. 55 FR 48073, November 16, 1990.

The definition of MS4 excludes those conveyances that are designed to discharge storm water runoff combined with municipal sanitary sewers ("combined sewer systems"). Therefore, municipalities that own or operate combined sewer systems may petition to have their population, based on Bureau of the Census figures, reduced by the number of people served by the combined sewer system. If the total population served by the separate storm sewer system alone is less than 100,000, the municipality may be eligible for an exemption from NPDES storm water permit requirements. Municipalities should contact their permitting authority for additional information. **Exhibit 1-1 does not reflect any modifications in the application requirements for cities with combined sewer systems.**

1.5 SUBMITTING THE PART 2 APPLICATION

Completed Part 2 applications should be submitted to the appropriate permitting authority listed in Exhibit 1-2. For municipalities in States with authorized NPDES programs, the permitting authority is the State office listed in Exhibit 1-2. Because some of these States may have application requirements in addition to EPA's, municipalities in States with authorized NPDES programs should contact their States for guidance. For municipalities in States without approved NPDES programs, the permitting authority is the EPA Regional Office listed in Exhibit 1-2.

Municipalities with populations greater than 250,000 (large MS4s) were to submit their Part 2 applications by November 16, 1992. Municipalities with populations greater than 100,000, but less than 250,000 (medium MS4s), must submit Part 2 applications by May 17, 1993. Inquiries regarding Part 2 applications or the permitting process should be directed to the appropriate permitting authority.

Exhibit 1-2: NPDES Storm Water Program Permitting Authorities

State	Permit Auth	Contact
Alabama	State	Aubrey White Water Division 1751 Dickinson Dr Montgomery, AL 36130 (205) 271-7811
Alaska	EPA	Steve Bubnick U S EPA Region 10 WD-134 1200 6th Ave. Seattle, WA 98101 (206) 553-8399
Arizona	EPA	Eugene Bromley U S EPA Region 9 W-5-1 75 Hawthorne St. San Francisco, CA 94105 (415) 744-1906
Arkansas	State	Mark Bradley Permitting Section Chief 8001 National Dr. P O Box 8913 Little Rock, AR 72219-8913
California	State	Archie Matthews Div of Water Qual Control Dept. of State Water Res Bd. Mail Code G8 901 P Street Sacramento, CA 95814 (916) 657-0525
Colorado	State	Patricia Nelson Dept. of Health Water Quality Control Div WPCD-PE-B2 4300 Cherry Drive South Denver, CO 80222-1530 (303) 692-3590
Connecticut	State	Permit Coordinator Dept of Envir Protection Water Management Bureau 165 Capitol Ave. Hartford, CT 06106 (203) 566-7167
Delaware	State	Chuck Schadel Dept of Natural Resources Surface Water Management 89 Kings Hwy, P O Box 1401 Dover, DE 19903 (302) 739-5731
District of Columbia	EPA	Kevin Magerr U S EPA Region 3 3WM53 841 Chestnut Bldg Philadelphia, PA 19107 (215) 597-1651
Florida	EPA	Chris Thomas U.S. EPA Region 4 4WM-FP 345 Courtland St. N E. Atlanta, GA 30365 (404) 347-2391
Georgia	State	Allen Hallum Municipal Permitting Prog Ga. Env Protection Div 4244 International Pkwy Suite 110 Atlanta, GA 30354 (404) 362-2680
Hawaii	State	Steve Chang Dept of Health Clean Water Branch Five Water Front Plaza #500 Ala Moana Blvd. Honolulu, HI 96813 (808) 586-4309
Idaho	EPA	Steve Bubnick U S EPA Region 10 WD-134 1200 6th Avenue Seattle, WA 98101 (206) 553-8399
Illinois	State	Sue Epperson EPA Water Poll. Control Permits Section #15 P O Box 19276 Springfield, IL 62794-9276 (217) 782-0610
Indiana	State	Catherine Hess Dept. of Env Mgmt. NPDES Permits Group Room #718 105 S Meridian St. P O Box 6015 Indianapolis, IN 46206-6015 (317) 232-8704

(Continued)

Exhibit 1-2: NPDES Storm Water Program Permitting Authorities (cont.)

State	Permit Auth	Contact
Iowa	State	Monica Wnuck Dept of Natural Resources Wallace State Building 900 E Grand Street Des Moines, IA 50319-0034 (515) 281-7017
Kansas	State	Don Carlson Dept. of Health and Env Bureau of Water Ind. or Mun. Progs. Section Forbes Field, Building 740 Topeka, KS 66620 (913) 296-5555
Kentucky	State	Douglas Allgeier Dept. of Env Protection Water Division 14 Reilly Road Frankfort, KY 40601 (502) 564-3410
Louisiana	EPA	Brent Larsen U S EPA Region 6 6W-PM 1455 Ross Ave Dallas, TX 75202 (214) 655-7175
Maine	EPA	Shelley Puleo U S EPA Region 1 JFK Building/WCP Boston, MA 02203 (617) 565-3525
Maryland	State	Brian Clevenger MD Dept. of Environment Sed. & Storm Water Admin. 2500 Broening Hwy Baltimore, MD 21224 (410) 631-3545
Mass-achusetts	EPA	Shelley Puleo U S EPA Region 1 WCP JFK Building Boston, MA 02203 (617) 565-3525
Michigan	State	Gary Boersen Dept of Natural Resources Surf Wtr Qual Div -Permits P O Box 30028 Lansing, MI 48909 (517) 373-1982
Minnesota	State	Scott Thompson Pollution Control Agency 520 Lafayette Rd St. Paul, MN 55155-3898 (612) 296-7203
Miss-issippi	State	Louis Lavalee Dept. of Env Quality Office of Pollution Control Ind. Wastewater Branch P O Box 10385 Jackson, MS 39289-0385 (601) 961-5074
Missouri	State	Karl Fett Dept. of Natural Resources Water Poll Control Program 205 Jefferson St P O Box 176 Jefferson City, MO 65102 (314) 526-2928
Montana	State	Fred Shewman Water Quality Bureau Cogswell Building Helena, MT 59620 (406) 444-2406
Nebraska	State	Clark Smith Environmental Quality P O Box 98922 Lincoln, NE 68509 (402) 471-4239
Nevada	State	Rob Saunders Conserv & Natural Res Environmental Protection 333 W Nye Lane Carson City, NV 89710 (702) 687-5870
New Hampshire	EPA	Shelley Puleo U S EPA Region 1 WCP JFK Building Boston, MA 02203 (617) 565-3525
New Jersey	State	Barry Chalofsky NJ DEPE Office of Regulatory Policy CN423 Trenton, NJ 08625-0423 (609) 633-7021

(Continued)

Exhibit 1-2: NPDES Storm Water Program Permitting Authorities (cont.)

State	Permit Auth	Contact
New Mexico	EPA	Brent Larsen U S EPA Region 6 6W-PM 1445 Ross Ave Dallas, TX 75202 (214) 655-7175
New York	State	Ken Stevens Wastewater Facilities Design NY State Dept. of Env Cons 50 Wolf Road Albany, NY 12233 (518) 457-1157
North Carolina	State	Colleen Sullins Environmental Management Water Permits & Eng P O Box 29535 Raleigh, NC 27626-0535 (919) 733-5083
North Dakota	State	Shelia McClenathan Dept of Health Water Quality Div 1200 Missouri Ave. P O Box 5520 Bismarck ND 585202-5520 (701) 221-5210
Ohio	State	John Morrison OEPA Water Pollution Control 1800 Watermark P O Box 1049 Columbus, OH 43266 (614) 644-2017
Oklahoma	EPA	Brent Larsen U S EPA Region 6 6W-PM 1445 Ross Avenue Dallas, TX 75202 (214) 655-7175
		Ted Williamson Discharge Permits Division Oklahoma Dept of Health 1000 N E. 10th Oklahoma City, OK 73117
Oregon	State	Ranei Nomura DEQ-Water Quality 811 SW 6th Ave Portland, OR 97204 (503) 229 5256
Pennsylvania	State	R B Patel Environmental Resources Water Quality Management P O Box 2063 Harrisburg, PA 17120 (717) 787-8184
Puerto Rico	EPA	Jose Rivera U S EPA Region 2 Wtr Permits & Compl. Br 26 Federal Plaza, Room 845 New York, NY 10278 (212) 264-2911
Rhode Island	State	Peter Duhamel Division of Water Resources 291 Promenade St Providence, RI 02908 (401) 277-6519
South Carolina	State	Arturo Ovalles DHEC Industry and Agriculture Wastewater Division 2600 Bull St Columbia, SC 29201 (803) 734-5241
South Dakota	EPA	Vern Berry U S EPA Region 8 8-WM-C Suite 500 999 18th St Denver, CO 80202 2466 (303) 293-1630
Tennessee	State	Robert Haley Dept of Env Wtr Poll Ctrl 401 Church St 6th Floor L & C Annex Nashville, TN 37243-1534 (615) 532 0625
Texas	EPA	Brent Larsen U S EPA Region 6 6W-PM 1445 Ross Ave. Dallas, TX 37243-1534
Utah	State	Harry Campbell Div of Water Qual P O Box 144870 Salt Lake City, UT 84114-4870 (801) 538-6146

(Continued)

Exhibit 1-2: NPDES Storm Water Program Permitting Authorities (cont.)

State	Permit Auth	Contact
Vermont	State	Brian Kooker Env Conserv Permits Compliance & Protection 103 S Main St. Annex Building Waterbury, VT 05671-0405 (802) 244-5674
Virgin Islands	State	Marc Pacifico Dept. of Planning & Nat Resources Div of Env Protection 1118 Watergut Project Box 1118 Christiansted St. Croix, VI 00820-5065 (809) 773-0565
Virginia	State	Burton Tuxford VA Water Control Board 4900 Cox Road Glen Allen, VA 23060 (804) 527-5000
Wash-ington	State	Ed O'Brien Dept. of Ecology Industrial Storm Water Unit Water Quality Div P O. Box 47696 Olympia, WA 98504-7696 (206) 438-7614
West Virginia	State	Jerry Ray Office of Water Resources 1201 Greenbriar St. Charleston, WV 25311 1088 (304) 558-0375
Wisconsin	State	Anne Manuel Dept. of Natural Resources Wastewater Management P.O Box 7921 Madison, WI 53707 (608) 267-7694
Wyoming	State	John Wagner Dept. of Envir Quality Herschler Building 4th Floor Cheyenne, WY 82002 (307) 777-7082

Source Poll of Regional and State offices

1.6 USE OF INFORMATION IN PART 1 AND PART 2 APPLICATIONS

The information submitted in the Part 1 and Part 2 permit applications provides applicants with a starting point for developing comprehensive storm water management programs. For example, the field screening data submitted with the Part 1 application provides a basis for a program to control illicit discharges. Also, the application information may assist in prioritizing controls and in long-term tracking of program effectiveness.

Permitting authorities will use the information from each municipality's Part 1 and 2 applications as the basis for establishing conditions in that municipality's NPDES storm water permit. For example, if a municipality submits a satisfactory application, all or part of its proposed storm water management program is likely to become an integral part of its permit

1.7 ORGANIZATION OF THIS MANUAL

Chapter 1, *Introduction*, provides a brief overview of the Part 2 permit application process It discusses who must submit a Part 2 application and how the information in the applications will be used It also contains a summary of the statutory and regulatory basis for the NPDES storm water program.

Chapter 2, *The Part 2 Application*, describes the statutory and regulatory requirements of municipal NPDES storm water permit applications in more detail. Chapter 2 outlines the specific requirements of the Part 1 and Part 2 applications, explains how Part 2 builds on the Part 1 application, and describes the interconnection among the various components of the Part 2 application.

Chapter 3, *Adequate Legal Authority*, describes how municipalities must demonstrate that they have adequate legal authority to carry out the program requirements [§122.26(d)(2)(i)]

Chapter 4, *Source Identification*, provides guidance on identifying major outfalls and inventorying dischargers to the MS4 [§122 26(d)(2)(ii)]

Chapter 5, *Discharge Characterization*, provides guidance for submitting quantitative data on the MS4 and developing a proposed monitoring program [§122 26(d)(2)(iii)].

Chapter 6, *Proposed Management Program*, describes the steps municipalities must take when they develop site-specific storm water management programs [§122.26(d)(2)(iv)]. These plans are the heart of the municipal permit application, and the permitting authority will probably incorporate all or part of the municipality's proposed management program into their NPDES storm water permit. In their proposed management programs, municipalities must describe management practices, control techniques and systems, design and engineering methods, and other provisions that are aimed at reducing the discharge of pollutants to the "maximum extent practicable"

Chapter 7, *Assessment of Controls*, explains how a municipality can assess the effectiveness of its storm water management program and target priorities through the use of direct and indirect measures [§122 26(d)(2)(v)]

Chapter 8, *Fiscal Analysis*, provides guidance on estimating necessary capital and operation and maintenance expenditures, and financing these expenditures [§122 26(d)(2)(vi)].

1.8 OTHER GUIDANCE AVAILABLE

Municipalities should use this guidance document together with the Part 1 guidance (EPA, 1991b). Exhibit 1-3 lists other sources of guidance available from EPA's Storm Water Hotline [(703) 821-4823] In addition, applicants may wish to obtain further information from the documents identified in the bibliography at the end of this guidance (Appendix A).

Exhibit 1-3
Documents Available from the EPA Storm Water Hotline*
[(703) 821-4823]

November 16, 1990, Federal Register - 55 FR 47990 National Pollutant Discharge Elimination System (NPDES) Permit Application Requirements for Storm Water Discharges - Final Rule

March 21, 1991, Federal Register - 56 FR 12098 Application Deadline for Group Applications Final Rule; Application Deadline for Individual Applications - Proposed Rule

August 16, 1991, Federal Register - 56 FR 40948 NPDES General Permits and Reporting Requirements for Storm Water Discharges Associated with Industrial Activity - Proposed Rule

November 5, 1991, Federal Register - 56 FR 50548 Application Deadlines, Final Rule and Proposed Rule

April 2, 1992, Federal Register - 57 FR 11394 Application Deadlines, General Permit Requirements and Reporting Requirements, Final Rule

Summary of November 16, 1990, Storm Water Application Rule

Summary of August 16, 1991, Proposed Storm Water Implementation Rule

August 16, 1991, Proposed Storm Water Implementation Rule Package Fact Sheet

April 2, 1992, Storm Water Program Rule Fact Sheet

Guidance Manual for the Preparation of NPDES Permit Applications for Storm Water Discharges Associated with Industrial Activity (EPA 505/8-91-002, April 1991)

Guidance Manual for the Preparation of Part 1 of the NPDES Permit Applications for Discharges From Municipal Separate Storm Water Systems (EPA 505/8-91-003A, April 1991)

Typical Values of Annual Storm Events Statistics for Rain Zones of the United States ("Urban Targeting and BMP Selection", EPA Region V, November 1990)

List of EPCRA (SARA Title III) Section 313 Water Priority Chemicals (Draft)

List of State and EPA Regional Storm Water Contacts

State NPDES Program Status

Question and Answer Document

List of Reportable Quantities for Hazardous Substances Under CERCLA

NPDES Storm Water Sampling Guidance Document (EPA 833-B-92-001, July 1992)

(Continued)

Exhibit 1-3
Documents Available from the Storm Water Hotline (cont.)

September 9, 1992, Federal Register - 57 FR 41176 Final NPDES General Permits for Storm Water Discharges from Construction Sites - Notice

September 9, 1992, Federal Register - 57 FR 41236 Final NPDES General Permits for Storm Water Discharges Associated with Industrial Activity - Notice

September 9, 1992 Federal Register - 57 FR 41344 National Pollutant Discharge Elimination System, Request for Comment on Alternative Approaches for Phase II Storm Water Program - Proposed Rule

* The following documents are available from the National Technical Information Service (NTIS) (1) *Storm Water Management for Industrial Activities, Developing Pollution Prevention Plans and Best Management Practices* (EPA 832-R-92-006, September 1992), (2) *Storm Water Management for Construction Activities, Developing Pollution Prevention Plans and Best Management Practices* (EPA 832-R-92-005, September 1992)

CHAPTER 2
THE PART 2 APPLICATION

2.0 THE PART 2 APPLICATION

2.1 BACKGROUND

The NPDES permit application requirements for MS4s [40 CFR 122.26(d)] establish a two-part application designed to meet the goal of developing comprehensive site-specific storm water quality management programs for MS4s.

The purpose of the two-part application process is to develop information, in a reasonable time frame, that will build successful storm water management programs and allow permitting authorities to make informed decisions about permit conditions. The application process is designed to focus the efforts of municipalities in two areas: prohibiting non-storm water discharges into storm sewers, and implementing controls that reduce the discharge of pollutants from MS4s to the maximum extent practicable.

Part 1 of the application requires information on existing programs and legal authority. In addition, Part 1 requires the results from field screening of major outfalls to detect illicit connections. The **Part 2** application requirements are intended to build upon the information submitted with the Part 1 application Each part has virtually the same major areas of concern, but the Part 2 application requires a greater level of detail. Part 2 of the permit application requires a demonstration of adequate legal authority, additional information on pollutant sources and outfalls, a limited amount of representative quantitative sampling data, a proposed monitoring program, a proposed storm water management program, an estimate of the effectiveness of storm water controls, and a fiscal analysis. The requirements for the Part 1 and Part 2 applications are summarized briefly in Exhibit 2-1, and described in more detail in Section 2 2 The storm water regulations underlying this guidance can be found in Appendix B

Before applicants proceed with the detailed development of their permit applications; they should recognize the fundamental requirements:

- Who or what are the primary contributors of pollutants in storm water discharges from MS4s?
- Where are these sources of pollutants located in relation to receiving water resources?
- What is the magnitude of these pollutant sources and their potential impact on receiving waters?
- How does the municipality plan to reduce or eliminate the contribution of pollutants in storm water discharges or prevent the damaging influences of these discharges?
- Why did the municipality select the activities or best management practices (BMPs) it proposes?
- When will the municipality implement its proposed program?
- How will the applicant assess the effectiveness of the program? What criteria or measures will apply?
- How will the municipality fund proposed program activities?

Wherever appropriate, the applicant must also show that it has adequate legal authority to implement, enforce, or mandate compliance with applicable ordinances, statutes, contracts, or other similar vehicles as required by the storm water regulation.

Exhibit 2-1: Part 1 and Part 2 Storm Water Application Requirements.

Adequate Legal Authority

Part 1
- Identify existing ordinances that control storm water discharges to the MS4.
- Determine gaps in legal authority and develop schedule

Part 2
- Demonstrate that legal authority has been obtained to control industrial discharges, illicit discharges, dumping, and the contribution of pollutants from coapplicants.
- Show that legal authorities are enforceable.

Source Identification

Part 1
- Describe historical use of legal controls
- Identify major outfalls and industrial contributors to the MS4
- Provide topographic map

Part 2
- Identify additional major outfalls.
- Identify additional industries.
- Organize industrial inventory by watershed.

Charactization Data

Part 1
- Provide rain and snowfall data. List receiving water bodies, and describe water quality impacts
- Provide results of field screening analysis, and propose representative outfalls for sampling

Part 2
- Provide results of sampling.
- Estimate annual and seasonal pollutant loadings and event mean concentrations.
- Propose monitoring program.

Proposed Management Program

Part 1
- Identify existing storm water management activities

Part 2
- Identify commercial and residential, construction, and industrial activities to be addressed in the storm water program.
- Develop appropriate control measures for commercial and residential, construction, and industrial activities.
- Design a program to prohibit illicit discharges.

Assessment of Controls

Part 2
- Estimate expected reduction in pollutant loadings.
- Describe any known impacts of storm water controls on ground water.

Fiscal Analysis

Part 1
- Describe budget for existing storm water programs and resources available to complete Part 2.

Part 2
- Estimate capital and operating costs necessary for the storm water management program.
- List available sources of funding and legal restrictions on these sources.

These questions (described above) that an applicant must address follow a natural progression or development. For example, before applicants can identify how they will reduce the contribution of pollutants in storm water discharges (the fourth bullet point above), they must identify pollutant sources and estimate the magnitude of pollutant loads (bullet points 1-3 above).

2.2 PART 1 APPLICATIONS

Sections 2.2.1 and 2 2 2 provide overviews of the regulatory requirements of §122 26(d). Section 2 2 3 describes the relationship among the various application provisions.

2.2.1 Overview of the Part 1 Application

Part 1 applications consist of the following six elements

- **General information.** The applicant's name, address, telephone number of contact person, ownership status and status as a State or local government entity

- **Legal authority.** A description of existing legal authority to control discharges to the MS4, and if this authority does not meet the required criteria, a list of additional authority needed and a schedule and commitment to seek such authority.

- **Source identification.** A description of the historic use of ordinances, guidance, or other controls that limit non-storm water discharges to any publicly owned treatment works (POTW), and a topographic map covering an area one mile beyond the service boundaries of the MS4 showing:

  - the location of known municipal sewer system outfalls;

  - a description of all land use activities;

  - the location and activities of landfills;

  - the location and permit number of any known discharge to the MS4;

  - the location of major structural controls for storm water discharges (such as retention basins, or major infiltration devices); and

  - identification of publicly owned parks, recreational areas, and other open lands.

- **Discharge characterization.** A summary of the types and characteristics of storm water discharges, including:

  - monthly mean rain and snowfall estimates and the average number of storm events per month;

  - existing quantitative data describing the volume and quality of discharges from the MS4, including a description of the outfalls and sampling methods used;

  - a list of "downstream" water bodies receiving discharge from the MS4, and a description of the impact of outfall upon them;

  - the results of field screening analysis for illicit discharges at either selected field screening points or major outfalls covered in the permit application; and

  - a proposed characterization plan for conducting sampling and obtaining the quantitative data necessary to complete Part 2 of the application.

- **Management programs.** A description of existing management programs to control pollutants from the municipal separate storm sewer system. For example, what procedures are in place to control pollution from construction activities, and how do they work? What is the program (such as investigation procedures and how they operate) for identifying illicit connections to the municipal storm sewer system?

- **Fiscal resources** A presentation of the municipality's budget for existing storm water programs and for completing Part 2 of the permit application.

2.2.2 Overview of the Part 2 Application

The Part 2 application must include the following elements:

- **Adequate legal authority.** A demonstration that the municipality can operate according to the legal authority established by ordinance, statute, or series of contracts. The municipality also must demonstrate that its authority is enforceable. A discussion of how adequate legal authority may be demonstrated appears in Chapter 3 of this guidance.

- **Source identification.** An inventory, organized by watershed, of the facilities that may discharge storm water associated with industrial activity to the MS4. The applicant also must identify the location of any major outfall that discharges to waters of the United States that was not reported in Part 1. A discussion of the information to be submitted for each such facility in the inventory appears in Chapter 4 of this guidance.

- **Characterization data.** Sampling results for 5-10 outfalls designated by the permitting authority, estimates of cumulative annual pollutant loadings and event mean concentrations, and a proposed schedule to submit estimates of seasonal pollutant loadings and event mean concentrations for each major outfall identified in the source identification sections of Part 1 and 2. The *Characterization Data* provision of the Part 2 application also requires the development of an on-going monitoring program covering the term of the permit. Procedures for meeting the requirements of this section appear in Chapter 5.

- **Proposed management program.** A program that shows the municipality's comprehensive planning process for the reduction and control of pollutants, the staff and equipment available to implement the program, and a full description of how controls will be implemented to reduce pollutants from all sources of storm water. Municipalities must also describe how the program will be implemented and maintained. The Part 2 requirements for a proposed management program are described in Chapter 6.

- **Assessment of controls.** An estimate of the projected effectiveness of the municipal storm water management program, and an identification of the known impacts of storm water controls on ground water. The assessment of controls is discussed in Chapter 7.

- **Fiscal analysis.** A fiscal analysis of the capital and operation and maintenance expenditures needed to accomplish the activities (including implementation) required by the characterization data and proposed management program sections of the Part 2 application. This fiscal analysis must include projected expenses for each fiscal year of the permit term. A discussion of the fiscal analysis is included in Chapter 8.

2.2.3 Relationship Among Application Requirements

The required elements of the Part 2 application are related to each other. As a result, this guidance addresses how the application elements are related, and how information gathered for one requirement will assist the applicant in meeting other requirements. For example, the information gathered for the *Industrial Source Identification* provision of the Part 2 application will assist the municipality in.

- Targeting monitoring goals to potential pollutant sources, which may include selecting monitoring locations and chemical specific sampling frequencies (a requirement of the *Characterization Data* provision);

- Identifying illicit discharges (a requirement of the *Proposed Management Program's* illicit connection provision);

- Identifying facilities with the greatest potential for degrading receiving water quality (a requirement of the *Proposed Management Program's* industrial program provision), and

- Targeting sites that handle, store, or transport toxic or hazardous materials for on-site inspections (another requirement of the *Proposed Management Program's* industrial program provision).

As another example, the information that the applicant must prepare for the *Characterization Data* provision (e.g., the results of the sampling requirement and the estimated event mean concentrations and annual pollutant loads) may help the municipality:

- Evaluate the contribution of pollutants in storm water discharges from individual sources and determine which sources may require inspections or controls (a requirement of the *Proposed Management Program's* industrial program provision);

- Predict the impact of storm water discharges on receiving waters known to be impacted. (In the *Proposed Management Program*, additional controls may be warranted for construction sites or other industrial activities that discharge to these waters); and

- Determine what BMPs may be appropriate for given areas (another requirement of the *Proposed Management Program*)

Exhibit 2-2 summarizes some of these key interrelationships, although many other interrelationships exist. A more detailed discussion of specific information requirements and interrelationships among provisions is provided in subsequent chapters As municipalities prepare their permit applications, they should coordinate all program requirements.

Exhibit 2-2
Examples of Relationship Among Part 2 Requirements

					Fiscal Analysis
				Assessment of Controls	Cost/benefit analysis identifies the most cost-effective BMPs
			Proposed Management Program	Estimates of reductions in pollutant loadings predicts impact of storm water management activities	Fiscal analysis considers costs of controls, maintenance, and capital improvements Management program may include feasibility analyses that consider cost.
		Characterization Data	Annual pollutant loads help prioritize areas for BMPS On-going monitoring indicates success of BMPs and need to re-prioritize	On-going monitoring program verifies program effectiveness. Instream monitoring verifies biological recovery.	Fiscal analysis considers cost of on-going monitoring
	Source Identification	Land use information and organization of industry by watershed defines representative sampling points	Inventory of industrial users helps the city target facilities for inspections and control measures	Estimates of pollutant load reductions depend on land use	Industrial inventory identifies potential sources of storm water utility fees
Adequate Legal Authority	Some sources or outfalls may be outside a city's jurisdiction. Interjurisdictional agreements may be necessary.	Authority to require sampling and obtain information for industries and dischargers outside of the MS4's jurisdiction at sampling points	Legal authority needed to implement BMPS, control and inspect industry, and prohibit dumping and illicit discharge	Need information gathering and inspection authority where it is necessary to inspect, monitor, and enter the facility or the site	Legal authority is required for some financing plans, such as a storm water utility

2.3 ADDITIONAL FACTORS TO BE CONSIDERED IN DEVELOPING THE PART 2 APPLICATION

As discussed in the previous section, the various provisions of the Part 2 application process are interconnected

All municipalities covered by §122 26(d) must submit a Part 2 permit application that meets the requirements of the storm water permit application regulations. However, each MS4 is unique, and each Part 2 submission will be different. Municipal separate storm sewer systems differ in many ways, including population served, geologic and climatologic settings, density of development, and form of government These underlying factors make each applicant unique

The major factors that applicants should consider are

- Population and projected growth rate;
- Zoning and existing land use patterns;
- Nature of watershed and receiving waters;
- Climatic conditions, soil types, and watershed delineations,
- Existing municipal functions and municipal lands,
- Other environmental impacts;
- Public involvement; and
- Intergovernmental coordination.

In addition, municipalities must implement their storm water management programs in a manner that is consistent with other applicable Federal, State, and local environmental laws.

Population and Projected Growth Rates

Some storm water BMPs are more appropriate for densely developed areas, while other methods may be more useful in developing areas Consequently, defining current population densities and projecting future areas of population growth provides the basic information that can assist in the evaluation and prioritization of appropriate storm water control strategies

Zoning and Existing Land Use Patterns

Through ordinances, permits, or contracts, municipalities may mandate storm water controls for new residential, commercial, or industrial developments in order to improve or assure maintenance of the quality of receiving waters at or near pre-development levels. The Nationwide Urban Runoff Program (NURP) study (EPA, 1983), pointed out that some of the best opportunities for implementing cost effective measures to prevent or reduce pollutants in storm water occur during new development. These measures may include structural controls, such as storm water detention basins or constructed storm water wetlands, or nonstructural alternatives such as cluster development and buffer zones Sections 122.26(d)(1)(iii)(B)(2) and 122 26(d)(2)(ii) require the municipality to establish comprehensive management plans for new development (see Chapter 6)

Nature of Watershed and Receiving Waters

The types of storm water controls appropriate for a MS4 depend on the nature of the watershed and the receiving waters. This includes geologic and hydrologic features such as slope drainage patterns and stream size For example, roadside swales may not be practical in areas with steep terrain, but can be very useful in flat areas In addition, structural BMPs or other management measures that control the volume and timing of release are appropriate where uncontrolled storm water may cause physical impacts to receiving waters (especially small streams, rivers, and wetlands).

Information on the watershed and the receiving waters is required in the Part 1 permit application [§122 26(d)(1)(iv)(C)]. In Part 1, applicants are required to list water bodies that receive discharges from the MS4. The list of water bodies includes downstream segments, lakes, and estuaries where pollutants from the system discharges may accumulate and result in non-attainment of State water quality standards Part 1 also requires a description of known water quality impacts. Applicants must include a discussion of water bodies that were cited in:

- State reports required by CWA Sections 305(b), 304(l), and 314(a);
- The State Nonpoint Source Report; and
- Other reports identifying sensitive watersheds

Part 1 applicants should also include in this discussion a description of impacts caused by dissolved oxygen depression, bioaccumulation of toxics, excessive sedimentation, hydrologic modification, habitat destruction, etc.

Municipalities are expected to give priority consideration to those classes of pollutant sources that contribute significant loadings or pose a significant impact on receiving waters. Applicants must consider control methods that address storm water discharges from commercial and residential areas; illicit discharges and illegal disposal, storm water discharges from industrial areas; and storm water runoff from construction sites. Municipalities' permits will differ substantially in the emphasis placed on controlling various sources of pollutants in discharges from the MS4. Permits for older municipalities may emphasize control of cross-connections, while permits for municipalities with large areas of new development may emphasize the installation of permanent structural controls during construction

The Part 2 storm water permit application requires descriptions of management programs to address sources of pollutants discharged to separate storm sewer systems. For management strategies to be effective, municipalities must give prior consideration to the nature (e g., physical and biological parameters) and the designated uses of receiving waters such as streams, tributaries, and natural wetlands For example, a storm water management program for a newly developing area with an existing shallow, slow-moving stream could include provisions to ensure that the post-development peak discharge flow rate for the stream is held to a certain percentage of its historical or pre-development peak discharge flow rate

Climatic Conditions, Soil Types, and Watershed Delineations

Seasonal variations in precipitation can have a significant impact on storm water quality For example, extended dry seasons in areas such as the southwestern United States result in pollutant loads distinctly higher than in other parts of the country during the first several storms of the wet season. Areas with more frequent rain and snowfall throughout the year may have more storm water discharges, but the discharges may have consistently lower pollutant concentrations than those in the Southwest. In addition, areas with significant snowfall may experience a peak in storm water discharge volume and pollutant concentration during the spring thaw.

Natural soil conditions affect the potential for storm water to recharge ground water. Porosity and permeability are properties of the soil that govern the size and number of the interstitial spaces through which water may flow. Compaction (e.g , compression of the soil by heavy machinery) will reduce the amount of void space in the soil and thereby reduce the amount of rainfall that infiltrates through the soil to ground water. Natural soil conditions are very important when siting structures designed for storm water infiltration. In addition, identifying such sites must take into consideration potential ground water impacts

that may result whenever infiltration is part of the storm water management program

Existing Municipal Functions and Municipal Lands

The Part 2 application affords municipalities the opportunity to discuss alternatives in the *Proposed Storm Water Management Program*. When considering the wide range of municipal functions, applicants need to establish which agencies will be responsible for implementing each portion of a storm water management program. (This could be outlined in the *Adequate Legal Authority* chapter of the Part 2 application, as discussed in Chapter 3 of this guidance.) Many of these agencies, will have primary missions other than dealing with storm water or water quality. Expansion of the established charter of an agency to include an element of storm water control may require legislative action, moderately expanding the scope of other municipal agencies' missions to include storm water concerns can be much more cost effective than the initiation of entirely new programs.

Applicants should identify existing municipal functions that impact the quality of storm water discharges. These functions may include snow removal activities such as road deicing, vehicle maintenance operations, and herbicide, pesticide, and fertilizer application to public lands. Municipalities can modify these activities to improve storm water quality through oversight of future land development, modifications to flood management structures, changes in materials used or in material handling or application practices, maintenance of roads, and installation of structures such as retention basins

The municipal agency (or agencies) responsible for storm water runoff control should also consider the extent to which municipal lands and activities contribute pollutants to runoff. The same BMPs recommended for private lands may also be incorporated into the development and maintenance of a municipality's own lands and activities. For example, reduced use of pesticides and fertilizers on park land and open spaces usually decreases the contribution of these contaminants to storm water runoff. Implementing BMPs on municipal lands also shows the municipality's commitment to an effective storm water management program BMPs are discussed in greater detail in Section 6.4 of this guidance.

Other Environmental Impacts

Municipalities should consider those activities that can directly or indirectly alter the natural hydrograph of a stream and potentially degrade an otherwise stable aquatic habitat. These factors are particularly important when considering impacts to wetlands, riparian areas, ground water, small rivers, and streams. In addition, the installation of detention or rapid infiltration ponds may have negative impacts on ground water. The installation of culverts or concrete drainage channels and other such structures typically increases the volume and velocity of runoff, which can lead to increased erosion, siltation, and sedimentation in receiving waters. Therefore, installation of these structures can contribute to the degradation of a neighboring habitat.

Public Involvement

Municipal applicants must ensure that they provide adequate public education and ample opportunities for public participation. Public participation should focus on spreading awareness of program objectives and components. Education and public involvement programs must be defined as part of the *Proposed Storm Water Management Program* [§122.26(d)(2)(iv)]. Generally, the public should be involved as early as possible in storm water management initiatives.

Conflict and confusion can be minimized if the program includes a schedule for initial public contact and milestones for public involvement throughout the development and implementation phases. Public education programs are expected to target specific

audiences, including those regulated or affected by the storm water management program (e.g , developers, building contractors, and industrial operators) and those that can assist with program implementation (e g., volunteers and citizens). For example, one large municipal applicant (Seattle) described an existing public participation program in its Part 1 Application submission. Elements of this program may be instructive to municipalities completing Part 2 of the application because it has generic components that are likely to be applicable to other large (and perhaps medium) municipalities. Excerpts from Seattle's public involvement program are provided in Exhibit 2-3 for reference.

Elements of this municipality's program that are particularly important to consider include of the role of an advisory and outreach group and its relationship to the entire process. Effective public participation programs clearly identify the role of the public

The potential exists for a considerable range in the level of participation the public may actually have in the decision-making process. Generally, the municipal authority is going to make the decisions. However, the authority can choose to use the "participation" process to simply inform the public of decisions, or to allow the views of the public to be registered prior to decision milestones In other cases, although uncommon, the public may have an actual voice or vote in making decisions.

The timing and frequency of meetings and the duration of the groups established for public participation will usually be dictated by the nature of the issues being addressed For example, an ad hoc group established to address a single issue may discover that the issue cannot be effectively addressed without consideration of a broader range of issues that the municipality may also be considering In this instance it may be appropriate for the group to expand its scope, hold regular meetings, and actively participate in the authority's decision making process Therefore, applicants should outline in their Part 2 applications how such coordination will be accomplished

Intergovernmental Coordination

If a number of municipal entities (e g , multiple cities or a city and a county) are participating in the permit application process as coapplicants, various mechanisms can be used to improve intergovernmental coordination to ensure that the roles and responsibilities of each entity are well defined. Each entity must fulfill its responsibilities to implement applicable program measures. Examples of some of the appropriate coordination techniques and their benefits include:

- **Memoranda of agreement · (MOA).** MOAs can define specific municipal roles, responsibilities, and points of coordination that help minimize duplication of effort and ensure accountability;

- **Cross-training of staff.** This allows for the identification of gaps in staffing (e g., neglected areas of responsibility or insufficient staff levels) as well as providing the benefits of increased versatility and opportunities for learning from others;

- **Interagency advisory committees.** Their objective is to arm decision makers with a comprehensive understanding of the implications of proposed activities or decisions; and

- **Regularly scheduled intermunicipal staff meetings.** These can facilitate an open and thorough exchange of information and solidify new lines of communication

Exhibit 2-3
Excerpts from a Public Involvement Program

The public involvement program [of the City of Seattle] has been designed to assist in developing an acceptable city-wide plan for addressing drainage and water quality problems. Acceptable is defined as a plan that is both technically sound and sensitive to the needs and interests of the citizens. The involvement program has two major elements: a Citizen Advisory Committee (CAC) and a community outreach effort The initial role of the CAC was to provide guidance to City staff and consultants preparing various sections of a Comprehensive Drainage Plan Until the adoption of the Comprehensive Drainage Plan by the City Council, the CAC provided direction on drainage policy issues, assisted with the public review of the draft plan and environmental impact statement (EIS), and helped coordinate comments sent to the city from the public during the review period. Following council adoption of the plan, the CAC was reconstituted into a Drainage and Wastewater Advisory Committee which serves as an on-going sounding board to the Drainage and Wastewater Utility, the mayor, and the City Council on both sewer and drainage matters.

The community outreach effort was established for two purposes. The first was to ensure adequate public review and support of the Comprehensive Drainage Plan and EIS Comments received during the review were used by the Drainage and Wastewater Utility, the mayor, and the City Council in making decisions about the Drainage Plan and the City's on-going drainage program. The second purpose was to begin educating residents and business people about the importance of their role in solving flooding, landslide, and water quality problems throughout the city. This community outreach/education role remains an on-going effort of the Drainage and Wastewater Utility.

Source City of Seattle, *NPDES Storm Water Permit Application, Part 1*, City of Seattle, November 1991 37

Single municipalities with separate governing functions may face the same challenges as coapplicants when they prepare their Part 2 applications. Many of the same coordination steps may be necessary within a single municipal jurisdiction. The need for *intra*governmental coordination may be most crucial in large municipalities that have functions that impact storm water quality spread throughout the organizational structure of the municipality. For example, a planning department may be in charge of implementing a stream buffer policy, while a public works department may plan, site, and construct storm water BMPs Still other agencies may be responsible for implementing erosion and sediment control requirements, and permitting and inspection functions. Storm water-related responsibilities within governmental organizations may be allocated in this manner due to the relatively recent emergence of storm water quality as an important issue. Nonetheless, effective coordination within the government of a single municipality may be as critical to the success of the storm water management program as is intergovernmental coordination for coapplicants Therefore, applicants should outline in their Part 2 applications how such coordination will be accomplished.

CHAPTER 3
ADEQUATE LEGAL AUTHORITY

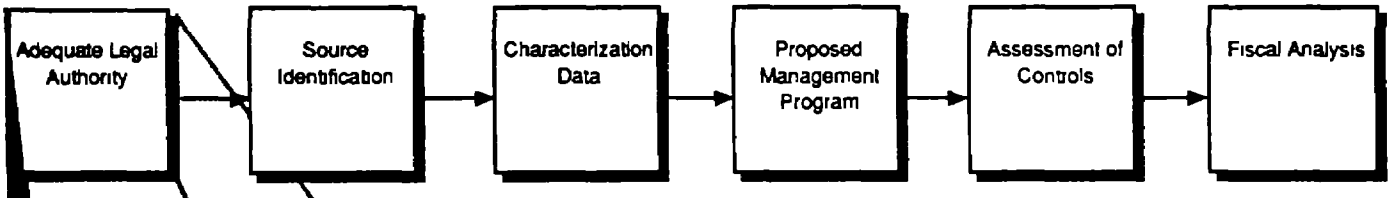

Adequate Legal Authority

Part 1

- Identify existing ordinances that control storm water discharges to the MS4
- Determine gaps in legal authority and develop schedule

Part 2

- **Demonstrate that legal authority has been obtained to control industrial discharges, illicit discharges, dumping, and contributions of pollutants from coapplicants.**
- **Show that legal authorities are enforceable.**

3.0 ADEQUATE LEGAL AUTHORITY

3.1 BACKGROUND

A crucial requirement of the NPDES storm water regulation is that a municipality must demonstrate that it has adequate legal authority to control the contribution of pollutants in storm water discharged to its MS4. This guidance manual and the storm water program emphasize development and implementation of storm water management programs as described in Chapter 6. In order to have an effective municipal storm water management program, a municipality must have adequate legal authority to control the contribution of pollutants discharged to the MS4.

Part 1 of the permit application requires applicants to describe their existing legal authority to control the discharge of pollutants from MS4s and evaluate the adequacy of these ordinances. Where existing ordinances were lacking, a proposed schedule to obtain the necessary authority was included with the Part 1 application. In Part 2 of the application, municipal applicants must demonstrate that they now possess adequate legal authority to.

- Control construction site and other industrial discharges to the MS4;
- Prohibit illicit discharges and control spills and dumping;
- Control potential sources of pollutants from discharges to or from coapplicants' MS4s, or MS4s that are interconnected or shared with other entities;
- Require compliance with all regulations and statutes, and
- Carry out inspection, surveillance, and monitoring procedures

Section 3.2 reviews each of these regulatory requirements. Section 3.3 describes specific procedures a municipality may use to demonstrate adequate legal authority.

3.2 SUMMARY OF REGULATORY REQUIREMENTS

3.2.1 Control Construction Site and Other Industrial Discharges to the MS4.

> §122.26(d)(2)(i)(A) [The applicant must demonstrate that it can control] through ordinance, permit, contract, order or similar means, the contribution of pollutants to the municipal storm sewer by storm water discharges associated with industrial activity and the quality of storm water discharged from sites of industrial activity.

The municipality, as a permittee, is responsible for compliance with its permit and must have the authority to implement the conditions in its permit. To comply with its permit, a municipality must have the authority to hold dischargers accountable for their contributions to separate storm sewers.

"Control," in this context, means not only to require disclosure of information, but also to limit, discourage, or terminate a storm water discharge to the MS4. For example, construction sites (of 5 or more acres) and other industrial activities that discharge storm water through MS4s are required to obtain individual NPDES permits or coverage under general NPDES permits from EPA or an authorized NPDES State. These permits require compliance with applicable Federal and State regulations. However a municipality, to satisfy its permit conditions may need to impose additional requirements on discharges

from permitted industrial facilities, as well as discharges from industrial facilities and construction sites not required to obtain permits. Therefore, a municipality should develop a mechanism to assure that all industrial facilities and constructions sites that discharge to the MS4 know their obligation to comply with the applicable terms of the municipality's storm water ordinances.

3.2.2 Prohibit Illicit Discharges and Control Spills and Dumping

> §122.26(d)(2)(i)(B) [The applicant must demonstrate that it can prohibit] through ordinance, order or similar means, illicit discharges to the municipal separate storm sewer
>
> §122.26(d)(2)(i)(C) [The applicant must demonstrate that it can control] through ordinance, order or similar means the discharge to a municipal separate storm sewer of spills, dumping or disposal of materials other than storm water

To demonstrate that it possesses adequate legal authority to control storm water discharges, a municipality must be able to effectively prohibit illicit discharges and illegal dumping An illicit discharge is "any discharge that is not composed entirely of storm water except discharges pursuant to a NPDES permit . . . and discharges resulting from fire fighting activities" [40 CFR 122.26(b)(2)].

3.2.3 Control Contributions of Coapplicants

> §122 26(d)(2)(i)(D) [The applicant must demonstrate that it can control] through inter-agency agreements among coapplicants the contribution of pollutants from one portion of the municipal system to another portion of the municipal system

An operator of a MS4 may participate in an application with one or more other operators, or may submit an individual application for the separate storm sewer it operates. As indicated in the box above, the operator of a discharge from a large or medium MS4 may submit, through the use of interjurisdictional agreements, a system-wide permit application. The system-wide application can accommodate existing storm water programs, on a watershed basis, as well as programs which must take into account regional differences in climate, geography, and political institutions. Such an application should cover issues of liability, financial contributions, access to records, enforcement responsibilities, and any other applicable areas of mutual concern.

When two or more municipalities submit a joint application, each coapplicant must demonstrate that it individually possesses adequate legal authority over the entire municipal system it operates or owns. A coapplicant need not fulfill every component of legal authority specified in the regulations, as long as the combined legal authority of all coapplicants satisfies the regulatory criteria for every segment of the MS4 (including authority over all sources that discharge to the MS4).

As coapplicants, for example, a county and a flood control district within that county may together possess adequate legal authority. The flood control district may have legal authority to build, operate, and maintain structures associated with major drainage channels within the county. The county itself may have legal authority to control pollutants in discharges from privately owned lands to the MS4s and legal authority to build, operate, and maintain structures associated with minor drainage channels that tie into major drainage channels. In this situation, the combined legal authority of the coapplicants may be adequate for the system, provided that the only discharge to major drainage channels comes from the county's separate storm sewer system. As another example, a department of transportation or flood control district with no land use authority could be a co-permittee with

a city that does possess land use authority over the entire jurisdiction.

Coapplicants also may use interjurisdictional agreements to show adequate legal authority and to ensure planning, coordination, and the sharing of the resource burden of permit compliance When more than one entity is submitting an application for a MS4 (either as coapplicants or as individual applicants for different parts of a system), the role of each party must be well defined. Each applicant or coapplicant must show the ability to fulfill its responsibilities, including legal authority for the separate storm sewers it owns or operates.

Applicants and coapplicants may use the procedures outlined in Section 3 3 to demonstrate adequate legal authority in their Part 2 permit applications. These procedures are guidelines, however, and are not intended to be the only possible approaches that applicants may follow.

3.2.4 Require Compliance with all Regulations and Statutes

To meet the requirements of §122 26(d)(2)(i)(E), the applicant must show that it has adequate authority to enforce its ordinances.

> §122 26(d)(2)(i)(E) [The applicant must demonstrate that it can require] compliance with conditions in ordinances, permits, contracts or orders

One acceptable way to support a declaration of adequate legal authority, including the ability to enforce appropriate ordinances, is for the municipality to provide a certification from the Municipal General Counsel or equivalent The certification should state that the applicant has the legal authority to apply and enforce the requirements of §122 26(d)(2)(i)(A)-(F) in State or local courts The certification would, therefore, cite specific ordinances and the reasons why they are enforceable. The statement should discuss what the municipality can do to ensure full compliance with §122.26(d)(2)(i).

In a Part 2 application, through a statement from the Municipal General Counsel or through some other method, a municipality should identify the administrative and legal procedures available to mandate compliance with appropriate ordinances, and, therefore, with permit conditions. Applications should contain descriptions of how ordinances are implemented and appealed In particular, a municipality should indicate if it can issue administrative orders and injunctions or if it must go through the court system for enforcement actions

3.2.5 Carry Out Inspection, Surveillance, and Monitoring Procedures

In their Part 2 applications, municipalities must propose programs to control the contributions of pollutants from industrial facilities and prohibit illicit discharges For both of these activities, municipalities must have the legal authority to carry out inspection, surveillance, and monitoring procedures necessary to determine compliance.

> §122.26(d)(2)(i)(F). [The applicant must demonstrate that it can carry] out all inspection, surveillance and monitoring procedures necessary to determine compliance and noncompliance with permit conditions including the prohibition on illicit discharges to the municipal separate storm sewer.

To meet this requirement, municipalities may wish to consider establishing ordinances that require industrial facilities to perform inspections and report the results to the city. In many municipalities, these facilities may perform similar inspections under a pretreatment program. In their Part 2 applications, municipalities should provide

documentation of their authority to enter, sample, inspect, review, and copy records, etc , as well as demonstrate their authority to require regular reports

3.3 PROCEDURES FOR DEMONSTRATING ADEQUATE LEGAL AUTHORITY

The Part 2 application requires the applicant or coapplicants to cite and describe specific ordinances currently in effect and demonstrate that the jurisdiction for these ordinances covers the entire area served by the MS4 In addition, the applicant may elect to discuss specific changes in ordinances passed since the submission of the Part 1 permit application to illustrate how legal authority has evolved to meet the regulatory requirements in §122 26(d)(2)(i) One method by which an applicant can partially demonstrate that it has adequate legal authority is to develop a matrix that compares, in a side-by-side format, the regulatory requirements in §122 26(d)(2)(i)(A)-(F) and the municipality's legal authority Once completed, the matrix would indicate whether an adequate legal framework exists to address all key regulatory requirements identified in §122 26(d)(2)(i)(A)-(F). Furthermore, the matrix could also illustrate where the authority to mandate compliance is vested.

In order to support an assertion of adequate legal authority, applicants should include the complete text of the applicable portions of the ordinances or other such provisions in the application The applicant should also provide a specific explanation of why and how the language of a particular ordinance or other authority meets Federal regulatory requirements The application should indicate to whom the ordinance applies and how it will operate to control, prevent, or stop discharges that violate permit conditions. For example, the municipality may describe and provide an excerpt from a city ordinance that prohibits non-storm water discharges to the MS4.

Appendix C illustrates one way to detail the existence of ordinances that establish the legal authority required in §122 26(d)(2)(i) A narrative discussion of the historical use of these ordinances to control pollutants in storm water discharges also may be included The example in Appendix C shows what the applicant may do to satisfy §122.26(d)(2)(i)

Substantial effort should be devoted to obtaining the necessary legal authority before the Part 2 application is submitted However, some municipalities may find that the two-year application process does not allow enough time to secure adequate legal authority as described in this section. This may be due to the need for State statutory or legislative changes In this instance, the Part 2 application must include a detailed description of what changes are needed and a schedule of when they will be accomplished. The schedule must include timetables for drafting proposed changes, public comment periods, and final authorizations

CHAPTER 4
SOURCE IDENTIFICATION

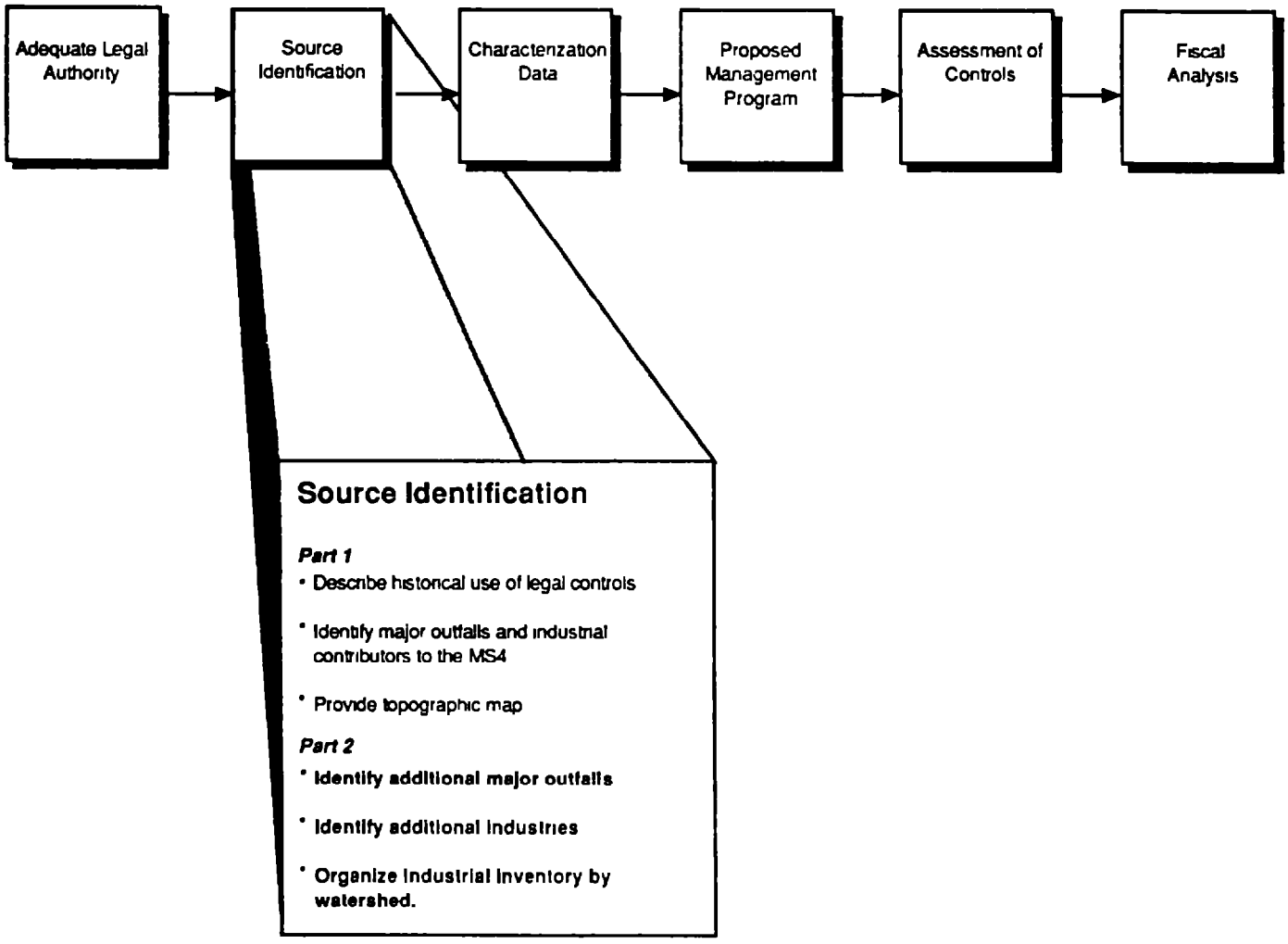

4.0 SOURCE IDENTIFICATION

4.1 BACKGROUND

In Part 1 of the NPDES storm water permit application, applicants are required to identify the location of known major outfalls discharging to waters of the United States from MS4s. Applicants also are required to provide information and data on existing land use activities. The identification of outfalls and land use activities is the first step in the process of:

- Identifying the sources of pollutants in storm water runoff;
- Linking the sources of pollutants in runoff to specific water quality impacts and other impacts that may result in degradation of aquatic resources;
- Identifying those activities or physical factors that have the most significant impact on water quality;
- Defining control measures that yield improvements in storm water quality; and
- Developing methodologies by which engineers, urban planners, and managers can make long term decisions that not only provide for economic growth, but also have discernible environmental benefits through imposed storm water controls.

The source identification requirements in the Part 2 permit application reflect three basic steps. First, municipalities must **identify any major outfalls** that were not already identified in the Part 1 application. Second, applicants must **compile an inventory** of industrial activities that may discharge storm water to a MS4 Third and finally, applicants must **organize the inventory of industrial activities on a watershed basis.**

Organizing the inventory by watershed allows the municipality to focus on activities within discrete areas that may contribute pollutants in storm water discharges to waters of the United States For example, combining outfall data with the industrial inventory organized by watershed may help the municipality to identify probable areas of illicit connections. This information will also be useful for municipalities when they develop specific strategies [e.g., best management practices (BMPs)] as part of their proposed storm water management programs The following sections discuss regulatory requirements and procedures for completing the source identification section of the Part 2 permit application. Section 4 2 provides guidance on identifying major outfalls, Section 4.3 provides guidance on compiling an inventory of industrial dischargers, and Section 4.4 provides guidance on organizing the inventory of industrial discharges by watershed

4.2 MAJOR OUTFALLS

The first portion of the Part 2 Source Identification provision states·

> **§122.26(d)(2)(ii)** *Source Identification.* [The applicant must provide the] location of any major outfall that discharges to waters of the United States that was not reported [in Part 1 of the application]

4.2.1 Definition of a Major Outfall

According to 40 CFR 122 26(b)(5), a major outfall is a MS4 outfall that discharges from a single pipe with an inside diameter of at least 36 inches The term also includes discharges from a single conveyance other than a circular pipe serving a drainage area of more than 50 acres.

For those municipal separate storm sewer systems that receive storm water runoff from lands zoned for industrial activity, major outfalls also include outfalls that discharge from a single pipe with an inside diameter of 12 inches or more, or discharge from other than a circular pipe associated with a drainage area of 2 acres or more. This definition also applies to outfalls of drainage areas that have both industrial and non-industrial activity. For example, if a three acre drainage area is zoned half woodland and half industrial, the discharges from that area would still be considered a major outfall. Because the definition of major outfall includes consideration of drainage area, municipalities may need to consider conveyances such as ditches and swales when identifying major outfalls

4.2.2 Identifying Major Outfalls

The first step in this section of the Part 2 application is the identification of major outfalls not identified in the Part 1 application [§122.26(d)(2)(ii), cited in box above]. When identifying these major outfalls, municipalities should build upon the approach used in the Part 1 application. One way to identify major outfalls is a **review of sewer system maps.** These maps can provide information on sewer system type (e g , separate storm versus combined sewer), pipe size, and outfall location However, depending upon the age of the sewer system maps, they may not provide complete information about newly developed areas or improvements to older areas Often, **interviews with sewer system maintenance personnel** can provide information on the most recent changes to the sewer system The municipality should also consider conducting field surveys (e g., visual inspection of the banks of receiving waters) to locate major outfalls

When submitting a Part 2 permit application, municipalities should include a brief description of how additional major outfalls were identified This description is not intended to be a lengthy list of each sewer system employee interviewed, but rather an outline of the methods employed

4.3 INVENTORY OF INDUSTRIAL DISCHARGERS

The second step in this portion of the Part 2 application is assembling an inventory of industrial storm water dischargers

> **§122 26(d)(2)(ii)** *Source Identification*
> Provide an inventory, organized by watershed of the name and address, and a description (such as SIC codes) which best reflects the principal products or services provided by each facility which may discharge, to the municipal separate storm sewer, storm water associated with industrial activity

This section describes how municipalities may develop the inventory of industrial facilities Section 4.4, below, provides guidance on organizing these facilities by watershed.

4.3.1 Facilities that must be Included in the Inventory

As stated above, applicants must provide an inventory of each facility that may discharge to the MS4 storm water associated with industrial activity. Industrial storm water dischargers that must be included in this inventory fall into 11 classes of industrial activities as defined in the November 1990

regulations Six of these classes were defined in a narrative format and five were defined by Standard Industrial Classification (SIC) codes. Specific categories of industries are identified in §122.26(b)(14)(i)-(xi). Exhibit 4-1 provides a list of the SIC codes and industry categories cited in the regulatory definition.

4.3.2 Identifying the Industrial Facilities

As a first step in developing a comprehensive industrial storm water inventory, the applicant must review **facility notifications**. Industrial facilities were required to notify municipalities by May 15, 1991, of their intent to discharge storm water to the municipal storm sewer system [§122.26(a)(vi)(4)]. Each facility should have submitted to the municipality information including facility name, facility location, and facility type (such as SIC code or other industry categorization).

In addition, municipalities should explore other sources of information on industrial facilities to help identify gaps in inventory. One specific source of information a municipality should review is **facility information submitted under other programs**. For example, SIC codes are often required for air pollution permit applications, hazardous materials management permits, pretreatment program applications, building permits, business licenses, or local tax rolls. A municipality may take the list of SIC codes provided in Exhibit 4-1 and compare it with existing information on SIC codes or industrial categories which has been submitted by industrial facilities under other programs.

Under 40 CFR 122.28, facilities that discharge storm water associated with industrial activity must submit an individual permit application, participate in a storm water group permit application, or file a **Notice of Intent (NOI)** to be covered by a general permit. These applications and NOIs are another source of information on industrial dischargers. For existing facilities, applications or NOIs were to be submitted by October 1, 1992; for new facilities, they must be submitted prior to the commencement of industrial activity However, in the Intermodel Surface Transportation Efficiency Act of 1991, Congress provided that permit application requirements be reserved for industrial activities owned or operated by municipalities with a population of less than 100,000, with the exception of airports, power plants, and uncontrolled sanitary landfills If EPA is the permitting authority in a State, applications and NOIs should be submitted to EPA, if a State has NPDES authority, they should be submitted to the State. Section 308 of the CWA provides the legal authority for any individual (including a municipality) to obtain information from the NPDES permitting authority. A municipality may be able to obtain a list of the facilities in its jurisdiction that have applied for coverage under a general or individual permit or that have applied for coverage as a member of a group

Additional sources of information on industrial facilities may include **zoning maps** showing industrial parks, manufacturing and industrial listings in **telephone books, trade association listings, pretreatment industrial waste surveys, the Chamber of Commerce Manufacturing Directory, and Dunn and Bradstreet.**

In the Part 2 application, a municipality should provide a brief description of the sources it reviewed in identifying the industrial dischargers. As part of the proposed storm water management program, which is described in Chapter 6, municipalities should describe a plan for collecting new or updated information on industrial dischargers throughout the life of the permit.

Exhibit 4-1
Industry Categories Cited in the
Definition of Storm Water Associated with Industrial Activity

1. Facilities subject to storm water effluent limitations guidelines, new source performance standards, or toxic pollutant effluent standards under 40 CFR Subchapter N (except facilities with toxic pollutant effluent standards which are exempted under category 11 below.

2 Facilities described by SIC 24 (except 2434), 26 (except 265 and 267), 28 (except 283), 29, 311, 32 (except 323), 33, 3441, 373 *

3. Facilities described by SIC 10 through 14 (mineral industry), including:

   - active or inactive mining operations, except for areas of coal mining operations no longer meeting the definition of a reclamation area under 40 CFR 434 11(1) because the performance bond issued to the facility by the appropriate SMCRA authority has been released, or areas of non-coal mining operations which have been released from applicable State or Federal reclamation requirements after December 17, 1990, and

   - oil and gas exploration, production, processing, or treatment operations, or transmission facilities that discharge storm water contaminated by contact with or that has come into contact with, any overburden, raw material, intermediate products, finished products, by-products, or waste products located on the site of such operations

4 Hazardous waste treatment, storage, or disposal facilities, including those that are operating under interim status or a permit under Subtitle C of RCRA.

5. Landfills, land application sites, and open dumps that receive or have received any industrial wastes (waste that is received from any of the facilities described under this subsection) including those that are subject to regulation under Subtitle D of RCRA.

6. Facilities involved in the recycling of materials (metal scrapyards, battery reclaimers, salvage yards, and automobile junkyards) including but not limited to SIC 5015 and 5093

7. Steam electric power generating facilities, including coal handling sites.

8. Transportation facilities described by SIC 40, 41, 42 (except 4221-25), 43, 44, 45, and 5171, which have vehicle maintenance shops, equipment cleaning operations, or airport deicing operations. Only those portions of the facility that are either involved in vehicle maintenance (including vehicle rehabilitation, mechanical repairs, painting, fueling, and lubrication), equipment cleaning operations, airport deicing operations, or which are otherwise identified under 1 - 7 or 9 - 11 are associated with industrial activity.

(Continued)

Exhibit 4-1 (continued)

9. Treatment works treating domestic sewage or any other sewage sludge or wastewater treatment device or system, used in the storage treatment, recycling, and reclamation of municipal or domestic sewage, including land dedicated to the disposal of sewage sludge that is located within the confines of the facility, with a design flow of 1.0 mgd or more, or required to have an approved pretreatment program under 40 CFR Part 403. Not included are farm lands, domestic gardens, or lands used for sludge management where sludge is beneficially reused and which are not located within the facility, or areas that are in compliance with Section 405 of the CWA.

10 Construction activity including clearing, grading, and excavation activities except operations that result in the disturbance of less than five acres of total land area which are not part of a larger common plan of development or sale **

11 Facilities described by SIC 20, 21, 22, 23, 2434, 25, 265, 267, 27, 283, 285, 30, 31 (except 311), 323, 34 (except 3441), 35, 36, 37 (except 373), 38, 39, 4221-25, (and which are not otherwise included within categories 2 - 10).*

Source 55 FR 48065, November 16, 1990

*Please note the SIC 285 is covered under Category 11 Also note that for the industries identified in Category 11, the term includes only storm water discharges from all areas (except access roads and rail lines) where material handling equipment or activities, raw materials, intermediate products, final products, waste materials, by-products, or industrial machinery are exposed to storm water

**On June 4, 1992, the United States Court of Appeals for the Ninth Circuit found that EPA's rationale for exempting construction sites of less than five acres and certain uncontaminated storm water discharges from Category 11 light industrial facilities from Phase I of the storm water program to be invalid and has remanded these exemptions for further proceedings (see *Natural Resources Defense Council* v *EPA* No 91-70176)

4.4 ORGANIZING THE INDUSTRIAL INVENTORY BY WATERSHED

Once the industrial inventory is complete, the applicant must organize the inventory by watershed, or drainage area. The main objective of this requirement is to associate discrete discharges with specific watersheds, which may help the municipality identify relationships between pollutant sources and receiving water quality problems To help organize the industrial inventory by watershed, municipalities should consider the long-term benefits of using automated database systems to help organize and update information on

- Locations of major outfalls or system modifications;
- Land use designations and composition;
- Dischargers of storm water associated with industrial activity,
- Other NPDES permit holders,
- Location/inventory of structural controls, and
- Locations of illicit connections

This information can help satisfy the requirement that discharges of storm water associated with industrial activity be organized by watershed Using an automated database system or the map submitted in the Part 1 application may be helpful in satisfying this requirement However, the regulations do not require Part 2 applicants to use a particular database or submit certain information, and municipalities may elect to use other methods.

The following procedure is provided as an example of one way to organize industrial dischargers by watershed:

1. Create a transparent overlay of tax maps covering the entire area served by the MS4.

2 Indicate on the maps the location of each industrial activity according to its address with an appropriate symbol or code.

3 Produce an overlay of existing watersheds from a topographical map, for example, United States Geological Survey (USGS) maps, covering the area that the MS4 supports Previously performed hydrological surveys may be helpful in delineating the boundaries of existing watersheds Municipalities may elect to sub-divide existing watersheds into smaller units if this will assist in management planning.

4 Align the tax map and watershed overlay so that industrial activity locations can be transposed to the watershed overlay.

A number of PC-based tools can be used to organize information on facilities and outfalls. For example, computer-aided design (CAD) packages, in conjunction with third-party software packages, are specifically designed to present information on separate transparent layers that can be "turned off and on" when necessary One layer could contain information on watershed topography and another could contain the locations of industrial storm water dischargers. Additional layers might contain information on the layout of the municipal system, locations of structural source controls and outfalls, and land-use patterns (both present and future)

A CAD-based system can be useful, not only in presenting information easily and graphically, but also in its ability to transfer spatial data, such as XYZ coordinates, to commonly available PC-based database applications This spatial data can be merged with other databases containing more generic information including facility name, address, and SIC codes However, one potential drawback to CAD systems is that most of them cannot store "real-world" (e g., latitude-longitude) coordinates and are not generally designed for spatial analyses

Information stored in a CAD format may also be input into a Geographic Information System (GIS) With some conversion, the CAD system coordinates may be transformed into the "real-world" coordinates typically employed by GIS GIS are integrated database management systems designed for the input, storage, retrieval, analysis, output, and display of geographically or spatially indexed data

The key attribute of GIS is the relational database capabilities that make these systems powerful tools for conducting spatial analyses. Using GIS, a municipality could overlay several layers of data and derive new information from this existing information. For example, using GIS, an applicant could overlay a map showing the 100-year flood plain with a map showing locations of industrial facilities The GIS could then calculate the amount of industrial area within the 100-year flood plain and plot this data on a new overlay This type of spatial analysis might be a powerful tool in the design of the municipality's storm water management program.

Another benefit of GIS is the ability for common data to be shared efficiently among several agencies. For example, the flood management agency, department of transportation, and storm water control agency could all contribute data to and use analyses from the same GIS. On the other hand, one potential drawback to GIS is their relatively high cost. Often, developing accurate, appropriate base maps is one of the most resource intensive parts of the system.

The techniques presented in this section to organize industrial dischargers by watershed are not the only methods that the applicant can use For example, municipalities may elect to present the information in tabular form. Using a CAD, GIS, or other automated system is entirely up to the municipality There is no requirement that municipalities use these systems in the development of either the Part 1 or Part 2 NPDES permit applications Each applicant will have to examine its existing resources (including computer systems, personnel, and budget) and projected needs before deciding which method will be the most efficient and most useful in the long term

A discussion of maintaining and/or updating the industrial inventory is provided in Section 6.3.3.2 of this guidance.

Exhibit 4-2 illustrates an example of the procedure discussed in Sections 4.3 and 4 4

Exhibit 4-2
Example of a Map Organizing Industry by Watershed

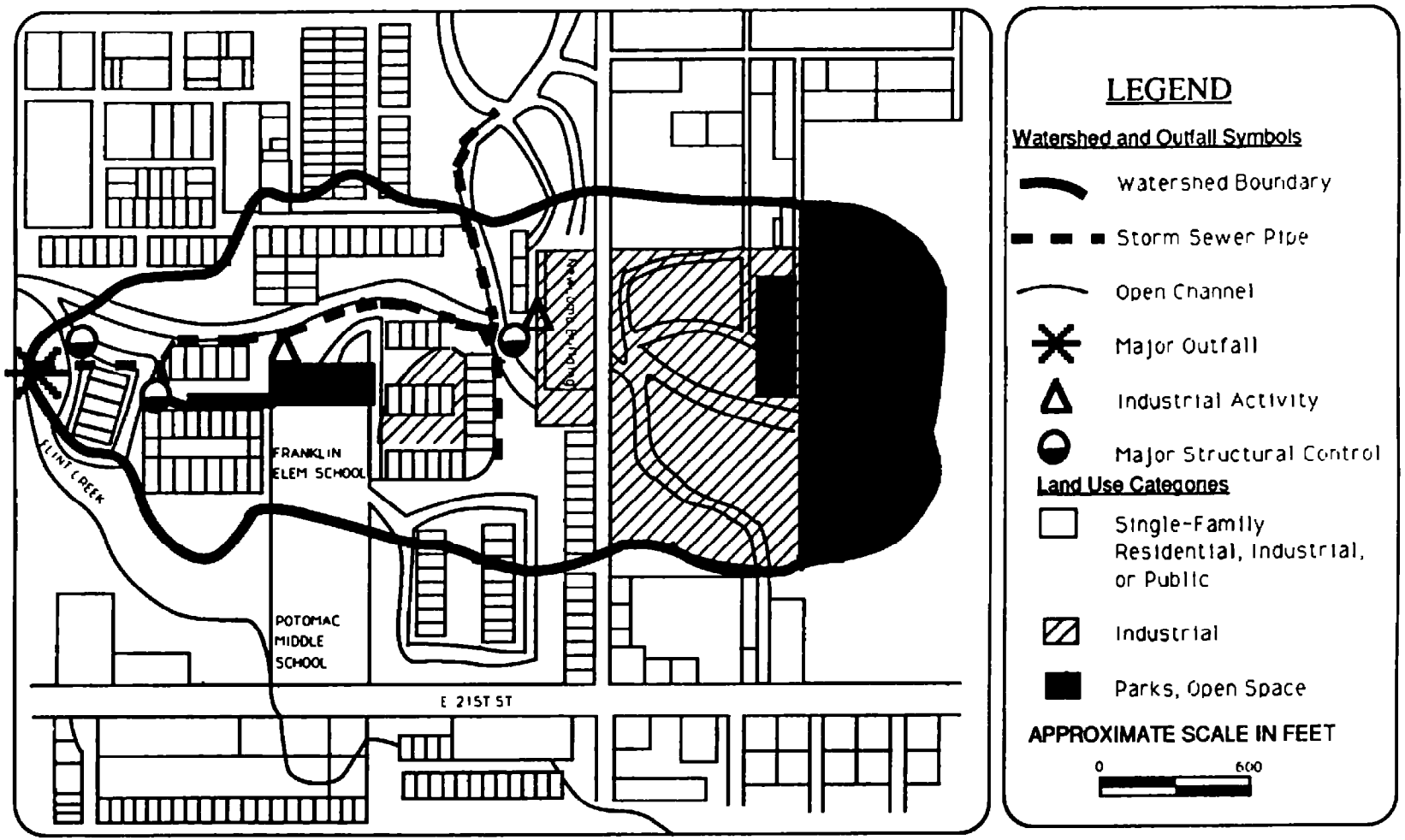

CHAPTER 5
CHARACTERIZATION DATA

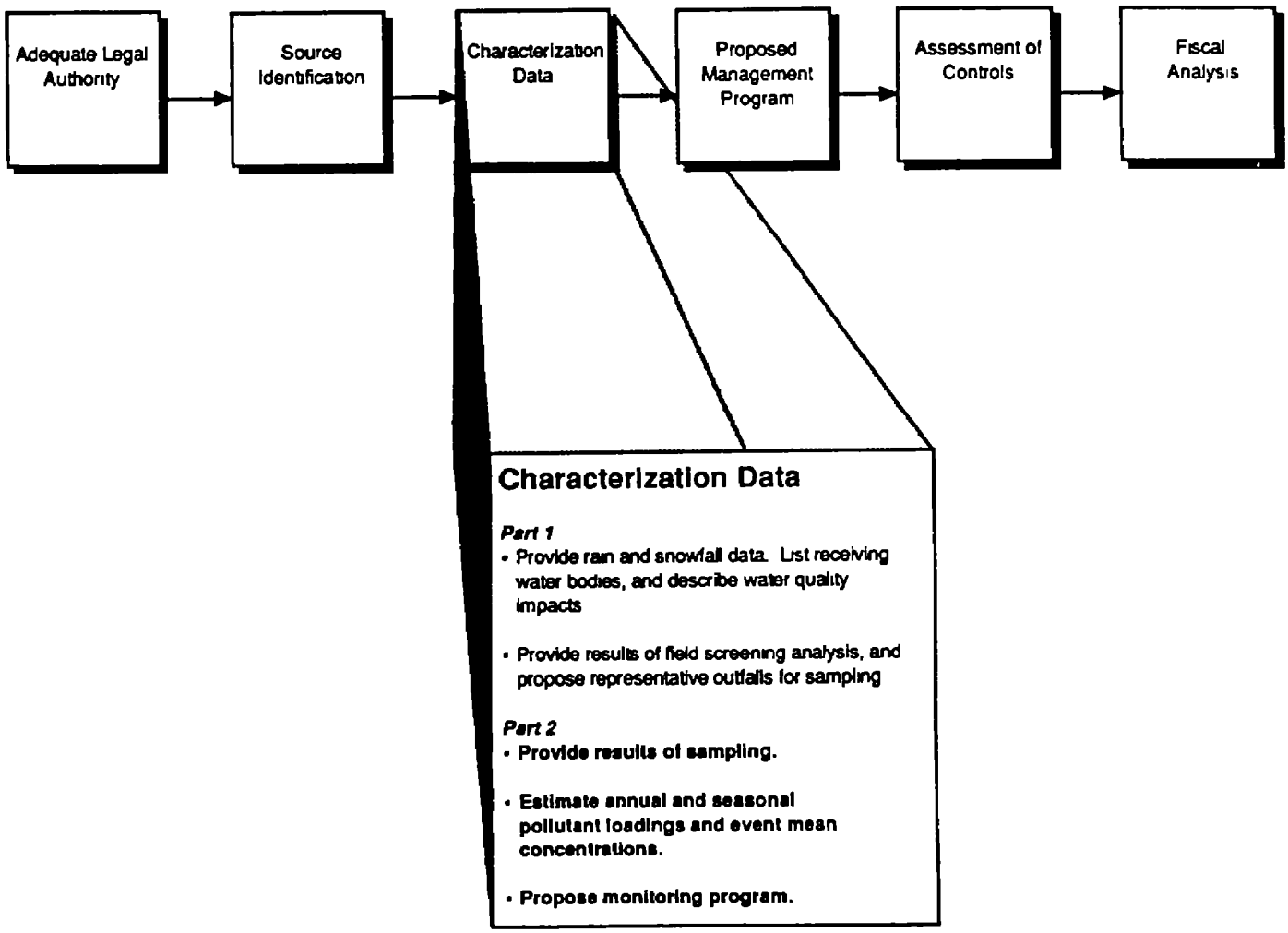

5.0 CHARACTERIZATION DATA

5.1 BACKGROUND

5.1.1 Objective of this Section

This section addresses the requirements for reporting the physical and chemical characteristics of municipal storm water runoff as specified by 40 CFR 122 26(d)(2)(iii). These requirements describe the minimum quantitative and descriptive data necessary to begin characterizing storm water discharges.

The applicant is encouraged to provide additional information, if available, which may provide a basis for a more effective storm water management program. The additional information may also help the permitting authority make more informed decisions regarding the specifications of the permit to be issued.

The NPDES permit application regulations require the applicant to identify all major outfalls that are part of the MS4 [§122.26(d)(1)(iii) and 126(d)(2)(ii)]. Part 1 requires the municipality to propose a sampling plan that identifies 5-10 outfalls that would be appropriate for representative data collection under Part 2 of the application [§122.26(d)(1)(iv)(E)]. The next step is to collect and analyze samples from these outfalls (or others designated by the permitting authority) for a variety of pollutant parameters from 3 representative storm events.

5.1.2 Potential Impacts of Storm Water Runoff

The Nationwide Urban Runoff Program (NURP) study showed that discharges from MS4s contribute to the degradation of water quality in the Nation's waters (EPA, 1983). The NURP study also concluded that the effects of urban runoff on receiving water quality are very site specific The effects depend on the types, size, and hydrology of the water body, the designated beneficial use, the pollutants which affect that use, the urban runoff quality characteristics, and the amounts of urban runoff dictated by local rainfall patterns and land use. *The National Water Quality Inventory, 1990 Report to Congress* as required by Section 305(b) of the Clean Water Act, stated that one-third of the impairment in assessed waters is due to storm water runoff (EPA, 1990d)

Quantity Impacts

Urbanization often increases the quantity and reduces the quality of storm water runoff For example, vegetated or forested areas with pervious surfaces are often replaced with impervious surfaces (e g , concrete and asphalt) that prevent or minimize the amount of rainfall available for ground water recharge This increases the volume and velocity of storm water runoff.

Vegetated areas play a crucial role in ground water recharge and in the maintenance of stream baseflow This is especially true during extended dry periods, when ground water is often the only source that preserves stream baseflow In highly urbanized areas, ground water recharge may be so severely reduced that ground water flow to perennial streams during dry periods is not sufficient. Further, the natural hydrology of a watershed is often altered by urbanization, because developing areas often provide drainage appurtenances that rapidly conduct storm water runoff away from these areas Such drainage may also affect the geometry of natural streams, especially where natural streams have been modified through the installation of man-made channels Ultimately, reduced perviousness due to urbanization increases the magnitude and the frequency of localized flooding which can have the long term effect of substantially increasing the width of natural streams through erosion and scouring

Increases in peak discharge velocity and runoff volume can also result in substantial erosion of natural streambanks and the washout of benthic habitats. Since streambeds often consist of unconsolidated silt and sediment, they may be stripped away substantially by excessive discharge velocities Increased discharge velocities can also lead to undercutting and destabilization of streambanks, which may cause erosion that extends beyond the natural boundary of the streambank

Further, silt and sediment can increase the turbidity of the receiving water, thus interfering with the growth of aquatic plants which depend on photosynthesis. Increased turbidity can also interfere with aquatic feeding, eliminate spawning areas for fish, and cause abrasion and clogging of fish gills. Also, because silt and sediment may remain in the watershed, they can blanket benthic habitats and severely reduce streamflow capacity

In the presence of excessive volumes of storm water runoff and discharge velocities, the net impact on receiving waters can be almost indistinguishable from impacts commonly associated with the discharge of toxics (e g , increased mortality, reduced biodiversity, and reduced reproduction)

Deposition and Resuspension of Toxicants

Research is currently on-going to examine the impact of the deposition and resuspension of toxicants as a result of wet weather events Questions about the survivability of benthic habitats when exposed to toxicants in deposited sediments still remain. The impact of resuspended toxicants from the sediments is not well known since toxics are often bound to sediment particles that may reduce the concentrations available for biological uptake and subsequent bioaccumulation The applicant should also be aware that different metal contaminants in sediments can exhibit different solubilities Under varying conditions of pH and temperatures, metals deposited in sediment can become soluble again and be reintroduced into the water column

Excessive Bacterial Levels

The NURP study final report concluded that "coliform bacteria are present at high levels in urban runoff and can be expected to exceed EPA water quality criteria during and immediately after storm events." This is of significant concern, particularly in swimming and shellfish areas.

Dissolved Oxygen Depression

The presence of oxygen-consuming pollutants in receiving waters can lead to severe dissolved oxygen depression Factors that can cause dissolved oxygen depression include the resuspension of biodegradable organic material (which can occur in the presence of high flow velocities) or the discharge of organic pollutants in storm water discharges. The NURP study demonstrated that storm water discharges exhibit biochemical oxygen demand (BOD) levels in excess of levels commonly associated with secondary treated effluent from publicly owned treatment works (POTWs). Severe dissolved oxygen depression could contribute to fish kills, which are one of the most readily observable impacts of pollution on receiving waters.

Eutrophication

Eutrophication, or the aging of a water body, can be accelerated by excessive nutrient loadings from storm water. Advanced stages of eutrophication are often associated with substantial variations in dissolved oxygen concentration. Nutrients of concern are nitrogen and phosphorus. Phosphorus is typically the growth-limiting nutrient for plants in fresh water systems. Storm water discharges routinely contain excess concentrations of these nutrients, which can lead to excessive algal growth, commonly referred to as algal blooms. Excessive concentrations of algae can cause odor and taste problems in drinking water and can result in aesthetically unpleasant

environments. In addition, the eventual decomposition of large concentrations of algae can depress dissolved oxygen in the water body to levels where fish kills occur. In nature, the process of eutrophication occurs over a substantial period of time, however, storm water discharges can rapidly accelerate this process.

Exceedance of Chronic Toxicity Criterion

Long-term exposure to toxics in excess of chronic toxicity criteria can cause sublethal effects on aquatic life. Indicators of chronic toxicity include reduced fertility, reproduction, and growth rates and a decline in the diversity of aquatic organisms The NURP study clearly indicated that storm water discharges contain concentrations of trace metals, such as lead, cadmium, zinc, and copper in amounts that exceed the chronic toxicity criteria. Prolonged exposure to chronic concentration levels of toxics can also be lethal to aquatic organisms, primarily from the bioaccumulation of toxics within the cell tissue of the organism over a extended period of time

Thermal Impacts

The temperature of storm water runoff may become significantly elevated via conductive and convective heat transfer with impervious, man-made surfaces In the case of contact with impervious surfaces, the resulting temperature elevation of storm water runoff can be substantial. For example, the surface temperature of parking lots during summer months may exceed 100 degrees Fahrenheit. Consequently, storm water runoff from these parking lots will be elevated in temperature. Many aquatic organisms are extremely sensitive to changes in water temperature. Increased water temperature also reduces dissolved oxygen in streams, rivers, lakes, and wetlands Therefore, significant discharges of storm water at elevated temperatures can, over the long term, lead to the alteration of aquatic populations.

5.1.3 Use of the Characterization Data

The NURP study analyzed storm water discharge from 28 sites representing 12 major river basins of the United States NURP detected 77 EPA priority pollutants present in the storm water discharges sampled, including samples with concentrations that exceeded water quality criteria for certain pollutants. Those pollutants detected in at least 10 percent of the samples studied in NURP are identified in Exhibit 5-1.

The data gathered for storm water discharge characterization can be used to create a baseline measurement of pollutant concentration and loadings The data also can be used to evaluate the effectiveness of best management practices (BMPs) as well as help identify storm water control priorities. In addition, it can be used to help identify the sources of pollutants in storm water runoff, to help establish an effective monitoring program for the life of the permit, and to help predict the impact of storm water runoff on receiving waters that are known to be impaired.

5.1.4 Storm Water Sampling and Analysis Procedures

The regulation requires that the process of collecting quantitative data for storm water characterization follow certain guidelines

> **§122.26(d)(2)(iii)** *Characterization data* When "quantitative data" for a pollutant are required under paragraph (d)(1)(iii)(A)(3) of this paragraph, the applicant must collect a sample of effluent in accordance with 40 CFR 122.21(g)(7) and analyze it for the pollutant in accordance with analytical methods approved under 40 CFR part 136 When no analytical method is approved the applicant may use any suitable method but must provide a description of the method

Exhibit 5-1. Priority Pollutants Detected in at Least 10% of NURP Samples.

PARAMETERS	FREQUENCY OF DETECTION (%)
Metals and Inorganics	
Antimony	13
Arsenic	52
Beryllium	12
Cadmium	48
Chromium	58
Copper	91
Cyanides	23
Lead	94
Nickel	43
Selenium	11
Zinc	94
Pesticides	
Alpha hexachlorocyclohexane (alpha-BHC)	20
Alpha endosulfan	19
Chlordane	17
Lindane (gamma BHC)	15
Halogenated aliphatics	
Methane, dichloro-	11
Phenols and cresols	
Phenol	14
Phenol, pentachloro-	19
Phenol, 4-nitro	10
Phthalate esters	
Phthalate, bis(2-ethylhexyl)	22
Polycyclic aromatic hydrocarbons	
Chrysene	10
Fluoranthene	16
Phenanthrene	12
Pyrene	15

Source: U.S. Environmental Protection Agency, *Results of the Nationwide Urban Runoff Program*. EPA Planning Division (National Technical Information Service (NTIS) Accession No. PB84-8552). December 1983.

The data collection procedures must follow the guidelines for storm water sampling outlined in §122 21(g)(7), *Effluent Characteristics* This portion of the NPDES regulation describes the conditions under which a storm water discharge will be sampled, and which collection procedure (grab sample versus flow-weighted composite sample) is required for the water quality parameter being analyzed. These guidelines are discussed in more detail in Sections 5.3.2 and 5.3 4 of this guidance manual In addition, EPA has available a *Storm Water Sampling Guidance Document* that describes in detail the methods used for storm water discharge sampling (EPA, 1992a).

The methods for the chemical analyses of storm water discharge samples must be conducted in accordance with 40 CFR Part 136, *Guidelines for Establishing Test Procedures for the Analysis of Pollutants* These guidelines refer the applicant to EPA-approved methods and cite the source of the approved methods (e g., Standard Methods for the Examination of Water and Wastewater, ASTM methods, etc.) Note that alternative methods (i e, those not included in Part 136) may be used under certain circumstances (see Section 5.3 4) as described in 40 CFR Part 136, and reiterated in the Characterization Data section of Part 2 of the storm water discharge NPDES permit

The specific constituent pollutants and water quality parameters that must be analyzed in the storm water samples are presented in Section 5 3 4.

5.2 SUMMARY OF REGULATORY REQUIREMENTS

The following is a summary of the characterization data requirements for the Part 2 application

- Quantitative data on physical and chemical characteristics of the discharge taken from at least 5 to 10 representative outfalls chosen by the permitting authority (Section 5 3),
- Estimates of both the annual pollutant load and event mean concentration of the cumulative discharges from all municipal outfalls during a storm event (Section 5 4),
- A proposed schedule to provide estimates for each major outfall of the seasonal pollutant load and the event mean concentration for constituents detected in required sampling (Section 5.5); and
- A proposed monitoring program for the life of the permit that meets specific requirements established in the regulations (Section 5 6).

5.3 QUANTITATIVE AND QUALITATIVE DATA REQUIREMENTS

5.3.1 Selection of Representative Sampling Sites

In the Part 1 application, the municipality is required to describe a plan for obtaining characterization data [§122.26(d)(1)(iv)(E)] The plan should reflect the requirements of §122 26(d)(2)(iii)

Different types and intensities of land use activities influence, in part, the types of pollutants and the pollutant concentrations in municipal storm water runoff. Therefore, Part 1 of the permit application [§122.26(d)(1)(iii)(B)(2)] requires the applicant to describe the land use activity within the area to be covered by the permit. In Part 1, the applicant also must select a subset of all the major outfalls (see Section 4.2.1 for definition of major outfall) identified that represented surface runoff discharge of the various land use activities described In some cases, a municipality preparing a Part 2 application may want to supplement its sampling program by collecting and analyzing samples from major outfalls that were not identified in the Part 1 application or designated by the permitting authority. This additional sampling may provide the

municipality with data that better characterizes its MS4 discharges

5.3.2 Criteria for Storm Water Discharge Sampling

Land use activities are not the only factors that affect the pollutant composition of storm water runoff Storm water composition also varies according to the nature of the storm event (e.g, duration, volume), and the composition may vary throughout the duration of a single storm event (i.e., the initial discharge, or "first flush," tends to have higher pollutant loads). In order to obtain data that represents an "average" storm event, EPA requires samples from three separate storm events to characterize the surface water runoff; however, the permitting authority may allow exemptions

> §122.26(d)(2)(iii)(A)(1) For each outfall or field screening point designated under this subparagraph, samples shall be collected of storm water discharges from three storm events occurring at least one month apart in accordance with the requirements at §122 21(g)(7) (the Director may allow exemptions to sampling three storm events when climatic conditions create good cause for such exemptions),

The criteria for sampling storm water discharge are detailed in §122.21(g)(7), *Effluent Characterization* EPA's *Storm Water Sampling Guidance Document* addresses these criteria. For the purpose of this discussion, a brief synopsis of these criteria follows:

- For each outfall or field screening point selected, samples must be collected from three separate storm events.
- The three storm events must be at least one month apart
- Each sampled storm event must have a rainfall of at least 0 1 inch in the drainage area
- There must be no storm event in excess of 0 1 inch in the drainage area for at least 72 hours prior to the sampled storm event
- The rainfall event should not vary by plus or minus 50 percent from the average or median per storm volume and duration for the region.

EPA understands that climatic conditions may make it difficult for some municipalities to sample storm events meeting these criteria. For example, storm events may be so infrequent in arid and semi-arid areas that sufficient samples cannot be obtained by the application deadline. In other areas, storms may be so frequent that it may not be possible to wait the required 72 hours between storm events. In such cases, the applicant should confer with the permitting authority in advance. In instances where representative storm events do not occur prior to the application due date, the municipality should submit its application with as much information as possible. It should include an explanation [certified by a principal executive officer or ranking elected official in accordance with §122.22(a)(3)] as to why sampling data were unavailable.

The municipality may need to perform some initial research and calculation to meet the requirements listed above In order to determine what constitutes an average storm event for the area, the applicant should contact the National Weather Service or National Oceanographic and Atmospheric Administration's National Climate Center Weather data is also available commercially and from airports. The applicant may also refer to the information provided in the *Storm Water Sampling Guidance Document*.

5.3.3 Narrative Description of Storm Event

> **§122.26(d)(2)(iii)(A)(2)** A narrative description shall be provided of the date and duration of the storm event(s) sampled, rainfall estimates of the storm event which generated the sampled discharge and the duration between the storm event sampled and the end of the previous measurable (greater than 0 1 inch rainfall) storm event;

Under §122 26(d)(2)(iii)(A)(2), the municipality must provide a narrative description of each storm that produced the discharge to be chemically and physically characterized Such a narrative description must include

- The date and duration of the rainfall event that produced the discharge sampled Measurements describing the peak intensity of the storm, if available, should also be reported,
- The amount of rainfall Rainfall conditions may vary significantly across large drainage areas, so rainfall characteristics should be spatially averaged over the drainage area, if possible If more than one rain gauge is used, averages should be reported. Rain gauges operated near the drainage area by the National Weather Service may be used, or the discharger may collect this information,
- The time elapsed since the last rainfall event greater than 0.1 inches. Historical rainfall data from rainfall gauges can be used to provide this information. If a gauge records only daily data, municipal field personnel could be asked to provide information on times during the day a rainfall event began or ended

5.3.4 Chemicals/Water Quality Parameters to be Measured

The storm water discharge samples must be analyzed for a number of pollutant parameters

> **§122.26(d)(2)(iii)(A)(3)** For samples collected and described under paragraphs (d)(2)(iii)(A)(1) and (A)(2) of this section, quantitative data shall be provided for the organic pollutants listed in Table II, the pollutants listed in Table III (toxic metals, cyanide, and total phenols) of appendix D of 40 CFR part 122, and for the following pollutants
>
> Total suspended solids (TSS)
> Total dissolved solids (TDS)
> COD
> BOD_5
> Oil and grease
> Fecal coliform
> Fecal streptococcus
> Ph
> Total Kjeldahl nitrogen
> Nitrate plus nitrite
> Dissolved phosphorus
> Total ammonia plus organic nitrogen
> Total phosphorus
>
> *[Note that total kjeldahl nitrogen is actually a substitute for total ammonia plus organic nitrogen]*

The complete list of chemicals is provided in Exhibits 5-2, 5-3, and 5-4. Exhibits 5-2 and 5-3 are derived from 40 CFR Part 122, Appendix D, Tables II and III, respectively. Exhibit 5-4 comes from the text of the regulation (see box above) The EPA-approved analysis procedure for the pollutants in Exhibits 5-2 and 5-3 can be found in 40 CFR Part 136. If a municipality is seeking approval to use an alternative method of analysis, then a request should be made according to procedures outlined in 40 CFR 136 4

Exhibit 5-2: Pollutants Listed in Table II in Appendix D of 40 CFR Part 122

Pollutant		Pollutant	
Volatiles		**Acid Compounds**	
Acrolein	1 2 Dichloropropane	2 Chlorophenol	
Acrylonitrile	1,3-Dichloropropylene	2,4-Dichlorophenol	
Benzene	Ethylbenzene	2,4-Dimethylphenol	
Bromoform	Methyl bromide	4,6-Dinitro-o-cresol	
Carbon tetrachloride	Methyl chloride	2,4-Dinitrophenol	
Chlorobenzene	Methylene chloride	2-Nitrophenol	
Chlorodibromomethane	1,1,2,2-Tetrachloroethane	4-Nitrophenol	
Chloroethane	Tetrachloroethylene	p-Chloro-m-cresol	
2 Chloroethylvinyl ether	Toluene	Pentachlorophenol	
Chloroform	1,2-trans-Dichloroethylene	Phenol	
Dichlorobromomethane	1,1,1-Trichloroethane	2,4,6-Trichlorophenol	
1,1 Dichloroethane	1,1,2-Trichloroethane		
1,2 Dichloroethane	Trichloroethylene		
1 1-Dichloroethylene	Vinyl chloride		
Base/Neutral		**Pesticides**	
Acenaphthene	Diethyl phthalate	Aldrin	Endrin
Acenaphthylene	Dimethyl phthalate	Alpha BHC	Endrin aldehyde
Anthracene	Di n-butyl phthalate	Beta BHC	Heptachlor
Benzidine	2 4-Dinitrotoluene	Gamma BHC	Heptachlor epoxide
Benzo(a)anthracene	2,6-dinitrotoluene	Delta-BHC	PCB-1242
Benzo(a)pyrene	Di-n-octyl phthalate	Chlordane	PCB-1254
3,4-benzofluoranthene	1,2-diphenylhydrazine (as azobenzene)	4 4'-DDT	PCB-1221
Benzo(ghi)perylene	Fluoranthene	4 4 DDE	PCB-1232
Benzo(k)fluoranthene	Fluorene	4,4'-DDD	PCB-1248
Bis(2 chloroethoxy)methane	Hexachlorobenzene	Dieldrin	PCB-1260
Bis(2-chloroethyl)ether	Hexachlorobutadiene	Alpha-endosulfan	PCB 1016
Bis(2-chloroisopropyl)ether	Hexachlorocyclopentadiene	Beta-endosulfan	Toxaphene
Bis(2-ethylhexyl)phthalate	Hexachloroethane	Endosulfan sulfate	
4-bromophenyl phenyl ether	Indeno(1,2,3-cd)pyrene		
Butylbenzyl phthalate	Isophorone		
2-Chloronaphthalene	Naphthalene		
4-Chlorophenyl phenyl ether	Nitrobenzene		
Chrysene	N-nitrosodimethylamine		
Dibenzo(a h)anthracene	N nitrosodi-n-propylamine		
1,2 Dichlorobenzene	N-nitrosodiphenylamine		
1,3-Dichlorobenzene	Phenanthrene		
1,4-Dichlorobenzene	Pyrene		
3,3 -Dichlorobenzidine	1,2,4-trichlorobenzene		

Source 40 CFR Part 122 Appendix D

Exhibit 5-3: Pollutants Listed in Table III in Appendix D of 40 CFR Part 122

Pollutant	Pollutant	Pollutant
Antimony, total	Copper, total	Silver, total
Arsenic, total	Lead, total	Thallium, total
Beryllium, total	Mercury, total	Zinc, total
Cadmium, total	Nickel, total	Cyanide, total
Chromium, total	Selenium, total	Phenols, total

Source 40 CFR Part 122, Appendix D

Exhibit 5-4. Conventional Pollutants Listed in Section 122.26(d)(2)(iii)(A)(3)

Pollutant	Pollutant
Total suspended solids (TSS)	pH
Total dissolved solids (TDS)	Total Kjeldahl nitrogen (TKN)*
COD	Nitrate plus nitrite
BOD_5	Dissolved phosphorus
Oil and grease	Total ammonia plus organic nitrogen
Fecal coliform	Total phosphorus
Fecal streptococcus	

* Total ammonia plus organic nitrogen is interchangeable with TKN

Source 40 CFR 122 26(d)(2)(iii)(A)(3)

Section 122 21(g)(7) specifies that certain pollutant parameters will be analyzed on grab samples taken from the outfall, whereas the remainder of the pollutant parameters require that composite samples be taken from the outfall These types of sampling procedures are differentiated as follows:

Grab samples· discrete, individual samples taken within a short period of time (usually less than 15 minutes). Analysis of grab samples characterizes the quality of a storm water discharge at a given time of the discharge. The following measurements must be made from grab samples:

- pH
- Temperature
- Cyanide
- Total phenols
- Residual chlorine
- Oil and grease
- Fecal coliform
- Fecal streptococcus

Note that measurements of temperature and pH must be taken in the field to avoid time-dependent changes that may occur between sampling time and actual analyses

Flow-weighted composite samples: single unit volumes composed of a mixture of samples collected proportional to flow throughout the entire runoff event or at least for the first three hours of the storm water event, if it lasts more than three hours. The flow-weighted composite sample must consist of at least three discrete aliquots per hour from the storm water discharge, or a continuous sampler may be used.

All parameters (see Exhibits 5-2, 5-3, 5-4) not listed under the description of grab samples above must be analyzed from flow-

weighted composite samples Details on taking flow-weighted composite samples may be found in the EPA *Storm Water Sampling Guidance Document*.

5.3.5 Additional Quantitative Data

Section 122 26(d)(2)(iii)(A) concludes with a provision that allows the permitting authority to request additional quantitative data if necessary to determine permit conditions.

> **§122 26 (d)(2)(iii)(A)(4)** Additional limited quantitative data required by the Director for determining permit conditions (the Director may require that quantitative data shall be provided for additional parameters, and may establish sampling conditions such as the location, season of sample collection, form of precipitation (snow melt, rainfall) and other parameters necessary to insure representativeness),

To ensure the storm water discharge system is accurately represented, the permitting authority may require that quantitative data include additional parameters and may establish specific sampling conditions, such as:

- Location where the sample is taken;
- Season of sample collection;
- Form of precipitation (snowmelt, rainfall);
- Evidence of impact to aquatic ecosystems, or
- Other parameters necessary to ensure the system is accurately characterized.

The data generated from the qualitative and quantitative analyses described under §122.26 (d)(2)(iii)(A) will be used to calculate the annual pollutant loads and event mean concentrations for each pollutant as described in subsequent parts of this section Estimates of annual pollutant loads and event mean concentrations would then be used to assist in establishing storm water management priorities and selecting BMPs

5.4 ESTIMATION OF SYSTEM-WIDE EVENT MEAN CONCENTRATIONS AND ANNUAL POLLUTANT LOADS

The applicant must submit estimates of the event mean concentration and annual pollutant load of the cumulative discharges to waters of the United States from all identified municipal outfalls.

> **§122.26(d)(2)(iii)(B)** Estimates of the annual pollutant load of the cumulative discharges to waters of the United States from all identified municipal outfalls and the event mean concentration of the cumulative discharges to waters of the United States from all identified municipal outfalls during a storm event (as described under §122 21(g)(7)) for BOD_5, COD, TSS, dissolved solids, total nitrogen, total ammonia plus organic nitrogen, total phosphorus, dissolved phosphorus, cadmium, copper, lead, and zinc Estimates shall be accompanied by a description of the procedures for estimating constituent loads and concentrations, including any modelling, data analysis, and calculation methods,

Estimates of annual pollutant loads will be somewhat imprecise; however, municipalities should exercise best professional judgement in deriving these estimates A description of what assumptions were made to derive pollutant loadings must be included.

Under §122.26(d)(2)(iii)(B) (see box above) applicants must provide the following:

- Estimates for the event mean concentration for pollutants listed in Exhibit 5-5 below, which can be used to estimate the annual pollutant load associated with all municipal outfalls identified under §122 26(d)(1)(iii) and (d)(2)(ii);

- A description of the procedures for estimating constituent loads and concentrations, and
- Details on data analysis, models used, and calculation methods

Data sources and procedures that municipal applicants may use to estimate event mean concentrations and annual pollutant loads of the cumulative discharges are discussed below.

The primary purpose for estimating annual pollutant loads and event mean concentrations is to assign priorities for implementing BMPs. Municipalities should consider the magnitude of individual pollutant loadings when assigning priorities to resources to reduce these loadings The areas receiving the highest priority for implementation of BMPs will be those portions of the MS4 that appear to contribute the largest load of pollutants to the system Therefore, it is the relative value of these calculations that is of importance within this regulation, not the absolute value

Over time the accuracy of the available methods to calculate loads and concentrations will improve and the use of these estimates may assume a larger role in determining permit conditions and estimating the success of the comprehensive municipal storm water management program The emphasis for now, however, is on the application of the most practicable methods to reasonably estimate annual loads and event mean concentrations.

5.4.1 Data Sources

The Part 1 application requires municipalities to submit all existing storm water sampling data, along with all relevant water quality data, sediment data, fish tissue or other biosurvey data taken over the past 10 years. All historical data must accompanied by a narrative description of the watershed served by the outfall from which the data are obtained, a description of the sampling and quality control program, and the monitoring location of the receiving water

To estimate an annual pollutant load for a given pollutant, a value must be derived for the average concentration, or event mean concentration, of that pollutant. To derive this value, applicants may use either site-specific data, or data from a national or regional study, such as NURP.

Municipalities with adequate historical data may choose to use these data to estimate annual pollutant loads in the Part 2 application. However, many applicants may not have enough site-specific data to develop valid estimates These applicants may choose to use generic data (e.g., from regional and national studies), such as the data provided in the NURP study. The NURP study's estimated range of detected concentration for specific pollutants is summarized in Exhibit 5-6.

Exhibit 5-5: Pollutants for which Event Mean Concentrations and Annual Pollutant Loads Must be Calculated

Pollutant	Pollutant
BOD_5	Total phosphorus
COD	Dissolved phosphorus
TSS	Cadmium
Dissolved solids	Copper
Total nitrogen	Lead
Total ammonia plus organic nitrogen	Zinc

Source 40 CFR 122 26(d)(2)(iii)(B) (55 FR 48070, November 16, 1990)

Exhibit 5-6. NURP Study Range of Detected Concentration for Specific Pollutants

Parameter	Concentrations µg/L
Metals and inorganics:	
Antimony	2.6 - 23
Arsenic	1 - 50.5
Beryllium	1 - 49
Cadmium	1 - 14
Chromium	1 - 90
Copper	1 - 100
Cyanides	2 - 300
Lead	4 - 23,000
Nickel	1 - 182
Selenium	0.2 - 0.8
Zinc	10 - 2400
Pesticides:	
Alpha-hexachlorocyclohexane (alpha-BHC)	0.027 - 0.10
Alpha-endosulfan	0.008 - 0.20
Chlordane	n/a
Lindane (gamma-BHC)	0.007 - 0.1
Halogenated aliphatics:	
Methane, dichloro-	5 - 14.5
Phenols and cresols:	
Phenol	1 - 13
Phenol, pentachloro-	1 - 115
Phenol, 4-nitro	1 - 37
Phthalate esters:	
Phthalate, bis(2-ethylhexyl)	4 - 62
Polycyclic aromatic hydrocarbons:	
Chrysene	0.6 - 10
Fluoranthene	0.3 - 2
Phenanthrene	0.3 - 10
Pyrene	0.3 - 16

Source. U.S. Environmental Protection Agency, *Results of the Nationwide Urban Runoff Program*, EPA Planning Division (National Technical Information Service (NTIS) Accession No. PB84-8552) December 1983

The applicant should be aware of limitations associated with data from national and regional studies before deciding on methods to estimate pollutant loadings In some cases, it may be more appropriate to use any available site-specific data rather than data from national or regional studies. For example, the NURP study did not collect pollutant concentration data from industrial areas. In this instance, even limited site specific concentration data from industrial areas may be more meaningful.

EPA encourages applicants to seek data from a variety of sources to better characterize the quality of their storm water discharges. Regardless of the data source, a description of the procedures for estimating constituent loads and concentrations, including any modeling, data analysis, and calculation methods, must be included

There will be a degree of uncertainty associated with estimating pollutant loadings in the Part 2 application The requirement to calculate pollutant loadings and concentrations is intended to be a planning and screening effort to assign program priorities, and not necessarily to determine absolute values.

5.4.2 Event Mean Concentrations

Event mean concentrations (C_i in Equation 1 on page 5-16) are determined from analyses of flow-weighted composite samples collected from each of the designated field screening points. Section 2 2 4 of the *Storm Water Sampling Guidance Document* describes procedures for collecting flow-weighted composite samples (EPA, 1992a). Concentration values must be reported in the applicant's Part 2 Permit Application for each representative storm event sampled. The applicant should report the average of these results as the event mean concentration for each parameter measured Municipalities are encouraged to present data in a tabular format However, the applicant has flexibility to present the data in other ways, provided the data is clearly presented.

As stated previously, applicants must sample storm events for at least three hours, or for the entire storm event if it lasts less than three hours If a storm event lasts more than three hours, the applicant may choose among three approaches for calculating the event mean concentration of the storm First, the applicant may report the event mean concentration for the first three hours of the event (or longer, if the applicant monitored more than three hours). Second, if the applicant has data available on the correlation between flow and concentration which allows it to be more specific about the event mean concentration, an estimation technique may be used to derive the event mean concentration. If the applicant uses such an estimation technique, the methodology must be explained Third and finally, the applicant may monitor the entire storm event and report the actual event mean concentration.

Whichever approach the applicant uses, the same method should be used to derive event mean concentrations in the future. This will assist the applicant in identifying meaningful trends in changes in event mean concentrations over time.

5.4.3 Annual Pollutant Loadings

Municipalities may choose from a variety of acceptable procedures for estimating the annual pollutant loads of the cumulative discharge. This guidance contains an example of calculating the annual pollutant loads using the "simple method," which is adapted from Schueler (1987). The guidance also discusses some dynamic models that applicants may wish to employ.

Regardless of which method applicants choose, they must describe and document the specific technique used. The description should include (but is not limited to) the key equations used to calculate reported values, such as.

- Assumptions for selecting site-specific parameters (e g., runoff coefficients),

- References to any source documentation (e g , previously completed studies or reference textbooks), and

- Justification for any assumed parameter values

The Simple Method

The following method of computing pollutant loadings is referred to as the "simple method" and is adapted from Schueler (1987). For purposes of satisfying Part 2 application requirements, the simple method provides a quick and reasonable estimate of pollutant loadings with a minimal amount of data required Although the regulations require a system wide (cumulative) annual pollutant load calculation for each of the pollutants listed in Exhibit 5-5 (above), the single pollutant load values provide limited insights into potential problem areas and what BMPs might yield the best results. Consequently, the municipality may want to consider using the simple method to estimate "individual" pollutant loadings from drainage areas The individual pollutant loadings can be aggregated to derive a cumulative annual pollutant loading for the entire MS4 In the procedure below, for example, Step 1 computes the annual loading for each outfall of the MS4 Then in Step 2, the resulting pollutant loadings are summed to derive annual pollutant loads on a per-watershed basis In Step 3, the annual pollutants loads for each watershed are summed to derive a system-wide annual pollutant load.

As stated above, this procedure is only one example of how a municipality could calculate a system-wide annual pollutant load. Estimates of annual pollutant loads for individual outfalls, watersheds, or other discrete areas are not specifically required by the regulations However, municipalities will find such estimates helpful in making relative comparisons among different areas of the MS4 Ultimately, these estimates could assist the municipality with selecting BMPs and assigning priorities to potential problem areas

Step 1: Use the Simple Method to Calculate Annual Pollutant Loads on a Per-Outfall Basis

The first step in this example is to calculate annual pollutant loads for individual outfalls. However, the applicant may choose to begin by calculating annual pollutant loads for each watershed or other discrete area. As stated above, this example uses the simple method, which is given by the following equation:

EQUATION 1:

$$L_i = \left[\frac{(P)(CF)(Rv_i)}{12}\right](C_i)(A_i)(2.72)$$

where: L_i = Annual pollutant load (lb/outfall/yr)
P = Annual precipitation (in/yr)
CF = Correction factor that adjusts for storms where no runoff occurs (a value of 0 9 is typically used)
Rv_i = Weighted-average runoff coefficient for the area served by the outfall (the calculation of runoff coefficients is discussed below)
C_i = Event mean concentration of pollutant (mg/L)
A_i = Catchment area (acres)

The numbers 12 and 2.72 are conversion factors that account for unit conversions.

Each of the parameters in Equation 1 is defined below:

- **Annual pollutant load** is the total amount of a specific pollutant discharged in pounds per time period (in this case, per year) for the particular segment of the MS4 being modeled (in this case for each outfall) Pollutant loads may also be expressed for alternative time periods, or on a system-wide or watershed basis

- **Annual precipitation** is the total inches of rainfall occurring in a single year plus the contribution of snowmelt Estimates of the annual rainfall can be based on the rainfall data provided in Part 1 of the application

- **Correction factor** is an adjustment factor for the number of storm events that do not actually produce any runoff (i.e., the percentage of storm events that have a total accumulation greater than a specific threshold value). This value will vary by region. Without this adjustment factor, the municipality would be assuming that all storm events produce runoff, which may or may not be the case. A typical value for this correction factor is 0.9 (90%). However, this value can vary between climatic regions. Municipalities should review historical rainfall data to estimate the percentage of storm events that produce runoff versus the number of storm events per year.

- **Weighted-average runoff coefficient** is a relative measure of imperviousness or the percentage of rainfall that becomes surface runoff Runoff coefficients are a function of the type of surface, intensity of the rainfall, the degree of soil saturation and storativity (storage capacity) of the soil. To determine runoff coefficients, the municipality may use Equations 2 or 3 (which follow). Alternatively, the municipality may use actual field measurements, relevant hydrologic studies, average values published in civil engineering reference manuals, or default values provided in Exhibit 3-12 of EPA's *NPDES Storm Water Sampling Guidance Document*

- **Event mean concentration of pollutant** is the event mean concentration value for the specific pollutant determined from the analysis of flow-weighted composite samples. Equation 1 requires a value for each pollutant concentration As discussed previously, the applicant may use site-specific concentration data (e g , storm water sampling data) or generic (e g , NURP) data to derive event mean concentrations In other words, the applicant should use best professional judgement to decide which of the following concentration values to use

  - a mean concentration value from the NURP study;

    OR

  - an average of all event mean concentrations from all samples over three representative storm events;

    OR

  - an event mean concentration attributable to a specific land use activity

  The applicant will have to consider the extent of the variability of the data when selecting an appropriate concentration value. NURP or other regional studies used to estimate pollutant concentrations can be compared to existing site-specific data in order to assess the uncertainty associated with generic approaches.

- **Catchment area** is the size of the drainage area for the particular segment of the MS4 being modeled (in this case, the outfall drainage area). Areas that are served by combined sewers or that are not otherwise served by the MS4 should not be included

Weighted-average runoff coefficient. Runoff coefficients can be based on flow measurements or estimated from land use characteristics. In order to determine an average runoff coefficient for an area with a diversity of land

use activities, the following equation should be used to estimate a weighted-average runoff coefficient

EQUATION 2

$$Rv_i = \frac{(\sum A_i R_v)}{\sum A_i}$$

where. Rv_i = Weighted-average runoff coefficient
A_i = Catchment area (acres)
R_v = Catchment runoff coefficient

As an alternative to Equation 2, Equation 3 can be used to estimate weighted-average runoff coefficients from percent imperviousness data (Shelley, 1986)

EQUATION 3

$$Rv_i = 0.05 + 0.009 * I$$

where. Rv_i = Weighted-average runoff coefficient
I = Percent imperviousness

The percent imperviousness can be estimated from land use data Residential land can be assumed to be 24% impervious, commercial land 75% impervious; industrial land 55% impervious; and open space 15% impervious The percent imperviousness of residential land was estimated from the following empirical equation of NURP and USGS data, which relates population density to percent imperviousness

EQUATION 4

$$I = 9 * D^{0.5}$$

where I = Percent imperviousness
D = Population density (persons/acre)

Similar to Equation 1, individual parameters for Equations 2, 3, and 4 can be used on a system-wide basis, or modified to reflect more realistic conditions within smaller or discrete segments (e g, individual watersheds or outfalls).

Step 2. Use the Per-Outfall Annual Pollutant Loads to Calculate Per-Watershed Annual Pollutant Loads

If the simple method is used to compute the annual loading on a per-outfall basis, Equation 5 may be used to estimate annual pollutant loadings on a per watershed basis. The approach of computing pollutant loadings on a watershed basis is used by some counties where larger watersheds are segregated into smaller watersheds or drainage areas on the basis of similar land use designations One county uses this method in conjunction with forecasts of future development within the county to develop preliminary estimates of future pollutant loadings This approach minimizes the possibility of computing an annual pollutant loading that is too conservative.

EQUATION 5

$$L_w = \sum L_i$$

where: L_w = Annual pollutant load for a particular watershed
$\sum L_i$ = Summation of individual annual pollutant loadings from all major outfalls within a specific watershed

Step 3: Use the Watershed-Based Annual Pollutant Loads to Calculate System-Wide Annual Pollutant Loads

To calculate the annual loadings system-wide, use the following equation

EQUATION 6

$$L_n = \sum L_w$$

where L_n = Annual pollutant load for an entire MS4

ΣL_w = Summation of individual annual pollutant loadings from all watersheds within a municipal separate storm sewer system

Dynamic Models

In instances where a municipality has a significant amount of historical data for the drainage areas serviced by storm sewer outfalls, including historical precipitation data and receiving water concentration and flow data, the MS4 may elect to use dynamic models to derive pollutant loads and to analyze the effects of MS4 discharges on receiving waters.

Dynamic models are designed to calculate a complete probability distribution for the output being modeled Therefore, dynamic models take into consideration the inherent variability of data associated with MS4 discharges, such as variations in concentration, flow rate, and runoff volume

One benefit of using a dynamic model is that the calculation of a complete probability distribution allows the modeler to consider a multitude of "what-if" scenarios. For example, when sufficient historical data is available, the modeler could consider the benefits and risks associated with alternative BMP strategies.

Dynamic models have one additional benefit over steady-state models in that dynamic models determine the entire discharge concentration frequency distribution. Consequently, this would enable the modeler to examine the effects of storm water discharges on receiving water quality in terms of the frequency by which water quality standards may be exceeded For purposes of computing pollutant loadings, a number of models are available including EPA's Stormwater Management Model (SWMM) and Hydrologic Simulation Program (HSPF), U S Army Corps of Engineers' Storage, Treatment, Overflow, Runoff Model (STORM), and Illinois State Water Survey's Model QILLUDAS (or Auto-QI).

Regardless of the method employed, the applicant must document how pollutant loadings are derived Applicants must provide estimates of annual pollutant loads and event mean concentrations for each outfall with their Part 2 applications. However, some outfalls will need to be more completely characterized, and conditions will change after the permit is approved. This is one reason why, as described in Section 5.4, data collection will continue throughout the term of the permit. Estimates of the individual contribution of pollutant loadings for each watershed or major outfall will help the applicant select priorities for specific watersheds.

5.5 PROPOSED SCHEDULE FOR SEASONAL LOADS AND REPRESENTATIVE EVENT MEAN CONCENTRATIONS OF MAJOR OUTFALLS

§122.26(d)(2)(iii)(C) A proposed schedule to provide estimates for each major outfall identified in either paragraph (d)(2)(ii) or (d)(1)(iii)(B)(1) of this section of the seasonal pollutant load and of the event mean concentration of a representative storm for any constituent detected in any sample required under paragraph (d)(2)(ii)(A) of this section;

Seasonal pollutant loads are important because they are a more accurate representation of loadings that may occur during a short time interval. To further refine the annual pollutant load estimates, Part 2 requires the applicant to propose a schedule to estimate seasonal

pollutant loadings and event mean concentrations for each major outfall

The quality of the data available when the Part 2 application is prepared will affect the accuracy and usefulness of the initial estimates of pollutant loadings and average concentrations These estimates can be improved as more site-specific data are collected during the term of the permit. A long-term site specific monitoring program will capture the variability in data that is essential to estimate more accurate pollutant loadings over time. Therefore, the impacts associated with these loadings can also be estimated with greater certainty. In addition, a site specific record collected over a longer time frame allows the effectiveness of the comprehensive municipal storm water management program to be evaluated

Estimates must be submitted for any contaminant detected in any sample required under the Part 2 sampling effort [§122.26(d)(2)(iii)(B)]. Seasonal pollutant load estimates are required for any pollutants listed in Exhibits 5-2, 5-3, and 5-4 that were detected during the sampling procedure described in Section 5 3.4. Therefore, the analyses required for seasonal pollutant loads will potentially be more comprehensive than the analyses of annual pollutant loads This results from the possibility that additional pollutants will be detected as part of the storm water characterization studies.

In some regions, precipitation patterns vary significantly from season to season, resulting in significantly different pollutant loadings throughout the year. In arid and semi-arid parts of the country, pollutants accumulate during dry spells, resulting in significantly higher pollutant concentrations in storm water discharges after extended dry weather Because of the buildup of accumulated pollutants, pollutant concentrations in discharges from MS4s are typically highest during the "first flush," or initial discharge

In other regions, pollutants that accumulate in snow may lead to high pollutant concentrations in runoff from the spring thaw Therefore, using an annual average pollutant loading might disguise the impact of shock loadings (discharges that occur within a very short time period and which often exceed acute toxicity criteria) of certain pollutants. Numerous factors contribute to the total volume of snowmelt runoff including shortwave and longwave radiation, condensation or vaporization, convected heat transfer by wind, heat content of rain water, and conductive heat transfer from the ground. Therefore, for regions with significant snowfall, pollutant loading estimates need to be adjusted to account for the additional volume of runoff attributable to snowmelt.

Since snowmelt runoff can occur in either the presence or absence of a storm event, the computation of seasonal pollutant loadings becomes significantly more complex The determination of total snowmelt runoff, however, is beyond the scope of this manual. Affected municipalities are encouraged to contact the U.S. Geological Survey or the Army Corps of Engineers for historical data on snowmelt runoff.

The effects of pollutant load can also vary by season Nutrient pollutant loads from storm water discharges can promote algal blooms in receiving waters during the spring and summer, but they may be of little consequence during winter in surface waters with good flushing characteristics. Quantifying seasonal variations in pollutant loads may aid the development of more cost-effective storm water management programs.

Pollutant loads also may vary significantly from one outfall to another. Within a drainage area, the type of land use, the percent of surface that is impervious, and the extent of exposure of storm water to contaminants affect the pollutant load from an outfall. Procedures for estimating seasonal pollutant loadings must be proposed for major outfalls only

Under §122.26(d)(2)(iii)(C) the regulation requires a schedule to provide estimates of:

- The seasonal pollutant load for each identified major outfall.
- The event mean concentration of a representative storm for any constituent detected in any sample required.

The following steps can be taken to develop a proposed schedule for estimating seasonal loadings at major outfalls:

1. Use historical or long-term hydrologic data to define seasons.
2. Describe the procedure to be used to estimate seasonal loads. This could be an adaption of the simple method or another mathematical model used for annual loads (e.g., instead of using a total annual rainfall accumulation, use an average rainfall accumulation associated with a specific season). If the simple method is used, the municipality could still use Equation 1. However, the amount of rainfall (P) would no longer be an annual value. Instead, it would be the amount of rainfall associated with a particular season defined by the municipality. In addition, the applicant may have to adjust the average runoff coefficient to reflect seasonal changes (e.g., frozen ground can behave like an impervious surface and substantially increase the amount of runoff). Lastly, substantial differences in the frequency and duration of seasonal storm events may increase or decrease the correction factor CF (e.g., during a dry season, the number of storms that actually produce runoff may be substantially lower than during a wet weather season).
3. Identify data elements that need to be refined. In cases where there is substantial seasonal variation, revised runoff coefficient values may be necessary For example, during rainy seasons, ground surfaces are more saturated than during the dry season As a result, the same amount of rainfall in the wet season will lead to a greater volume of storm water runoff than in the dry season.
4. Proposed procedures for collecting the appropriate data or otherwise improving estimates.
5. Provide an approximate time frame for data collection and submission of seasonal load estimates.

Proposed procedures for estimating seasonal pollutant loadings and event mean concentrations should explain when and how data used for the estimates will be obtained. The data can be based on site-specific information, or they can be obtained from municipal systems with similar characteristics (such as Regional NURP data).

5.6 COLLECTION OF REPRESENTATIVE DATA FOR PROPOSED MONITORING PROGRAM FOR THE TERM OF THE PERMIT

Under §122.26(d)(2)(iii)(D), applicants are given the opportunity to propose monitoring programs to be carried out during the term of the permit.

> §122.26(d)(2)(iii)(D) A proposed monitoring program for representative data collection for the term of the permit that describes the location of outfalls or field screening points to be sampled (or the location of instream stations), why the location is representative, the frequency of sampling, parameters to be sampled, and a description of sampling equipment.

Applicants should consider their specific needs and identify priorities for the proposed

monitoring program After receiving the Part 2 application, the permitting authority will review proposed monitoring programs and make appropriate adjustments when establishing permit conditions

The applicant must propose a monitoring program for representative data collection for the term of the permit that describes·

- The location of outfalls or field screening points to be sampled (or the location of instream stations);
- Why the location is representative;
- The frequency of sampling;
- Parameters to be sampled, and
- A description of sampling equipment.

Municipalities must submit sampling data over the life of a permit so that changes in storm water quality can be assessed Like initial sampling data, the data from an ongoing monitoring program can be used by the municipality to allocate resources to achieve reduction in pollutants The monitoring data will also serve as an environmental indicator of the success of the storm water management program. Many municipalities may require an extended period of time (possibly the entire permit term) and substantial data to definitively evaluate the effectiveness of a storm water management program. Therefore, a plan for data collection must be proposed by the municipality for the five-year term of the permit. During the permit term, the results of the monitoring program will be submitted in the municipality's annual report [§122.42(c)(4), discussed in Section 7.3 of this guidance].

5.6.1 Goals of a Monitoring Program

The first and most important step in developing a proposed monitoring program is to define the program's objectives as clearly as possible Development of monitoring program goals should be closely coordinated with development of the proposed storm water management program Applicants are required to propose monitoring programs as part of their proposed management programs to reduce pollutants from industrial site runoff. The monitoring plan is part of *Characterization Data* [§122 26(d)(2)(iii)]. The storm water management program is discussed in Section 6.

A comprehensive monitoring program should be designed to support specific goals, including·

- Characterizing discharges;
- Evaluating the source of specific pollutants,
- Evaluating the performance of specific source controls; and
- Identifying the full range of chemical, physical, and biological water quality impacts.

5.6.1.1 Characterizing Discharges

Monitoring pollutants in discharges from MS4s serves several purposes. Quantitative data on specific pollutants in storm water runoff can support estimates of annual and seasonal pollutant loadings and modelling efforts to identify the magnitude of water quality impacts. Over the long term, monitoring data may suggest that new outfalls should be selected for sampling As municipalities gain experience in storm water sampling, they likely will target BMPs that achieve the greatest improvements in storm water quality.

5.6.1.2 Evaluating the Source(s) of Specific Pollutants

Some sources of storm water (e.g., industrial sources that must be covered by NPDES permits, highways with heavy traffic flows, and large parking lots) are expected to generate significantly higher concentrations of pollutants than typical urban runoff. Monitoring efforts to quantify sources of

priority pollutants can provide support for resource allocations to address pollutant sources posing the greatest environmental risk How proposed monitoring efforts will be structured to identify and quantify pollutant sources should be discussed in proposed storm water management programs.

The monitoring program may also include procedures to conduct dry-weather monitoring over the term of the permit to help detect illicit discharges and improper dumping. This can include recording visual observations and odors observed in dry weather flows.

5.6.1.3 Evaluating the Performance of Specific Controls

Pollutant removal efficiencies are fairly well known for certain structural BMPs. However, sampling may still be necessary to ensure that the BMP is meeting original design expectations The expected pollutant removal efficiency for a structural control must take into account site-specific conditions For example, an infiltration basin has a certain expected pollutant removal efficiency, but actual field efficiency is affected by subsurface soil conditions and the extent and frequency of maintenance

The efficiency of a particular structural control will be affected by many factors, such as detention time. However, efforts to determine the efficiency of structural controls must include consideration of pollutant concentrations and flow volumes into and out of the control. The efficiency of nonstructural source controls can be characterized by comparing discharges at a given location before and after the control measures are implemented. Over time, sufficient monitoring data may be gathered to draw substantive conclusions about the effectiveness of certain BMPs. Alternatively, discharges from a sampling site with source controls can be compared with discharges from a similar site that lacks source controls Efforts to monitor the effectiveness of controls should be closely coordinated with the assessment of control efficiencies discussed in Chapter 7

5.6.1.4 Identifying the Full Range of Chemical, Physical, and Biological Water Quality Impacts

Characterizing the effect of storm water discharges on water quality is complicated by a number of factors. EPA recommends an integrated approach to assessing water quality impacts associated with discharges from MS4s Monitoring procedures that help assess water quality impacts include:

- Discharge and receiving water monitoring to support water quality models and to identify hydraulic impacts of increased peak flows and to identify parameters of concern, and
- In-stream monitoring of water chemistry;
- Bioassessments and biosurveys; and
- Sediment sampling

<u>Discharge and Receiving Water Monitoring to Support Water Quality Models</u>

As discussed above, when there is sufficient historical data available from monitoring, these data may be used as inputs to models that predict or validate the effects of pollutant loadings from MS4s on receiving water quality characteristics. In addition to monitoring data, data on receiving water quality characteristics are also necessary to calibrate a particular model.

Once the model has been calibrated to reflect site-specific conditions, future monitoring data could be used to validate long term reductions in pollutant loadings, the effectiveness of nonstructural BMPs, and/or pollutant removal efficiencies of existing structural controls

The information gathered from this approach may also help define those BMPs that which appear to be the most effective. For example, in developing areas, monitoring data could eventually support future planning efforts that would seek to minimize the impact of future development on local receiving waters.

In-stream Monitoring

Using models to estimate pollutant concentrations in receiving waters can be inaccurate In-stream monitoring can directly measure pollutant concentrations. General designs for in-stream monitoring are:

- **Monitoring above and below a set location** This method is generally more useful for evaluating control effectiveness than documenting the severity of a diffuse source of pollutants

- **Monitoring at different times** Monitoring at different times and seasons can provide valuable information on seasonal variations in pollutant concentrations Dry weather in-stream monitoring can be compared with in-stream monitoring during storm events

- **Paired watersheds.** Evaluating similar water bodies can document management program improvements by controlling for meteorologic and hydrologic variability. This approach can also be used to compare receiving waters to background conditions associated with undeveloped watersheds

Detailed guidance on applying these approaches is provided in the draft *Nonpoint Source Monitoring and Evaluation Guide*, February 26, 1988, Nonpoint Source Branch, U S EPA

Bioassessments and Biosurveys

A biological assessment, or "bioassessment," is an evaluation of the biological condition of a water body using biological surveys and other direct measurements of resident biota in surface waters. A biological survey or "biosurvey," consists of collecting, processing, and analyzing representative portions of a resident aquatic community to determine the community structure and function Biosurveys and bioassessments can be used directly to evaluate the overall biological integrity (structure and/or functional characteristics) of an aquatic community Deviations from the biological integrity can be measured directly using biosurveys only when the impacted community is compared against a predetermined reference condition. Without the proper reference conditions, biosurveys may underestimate the extent of impairment.

Biosurveys are useful in that they can assess or detect the aggregate effect of impacts upon an aquatic community where discharges are multiple, complex, and variable, and where point, nonpoint, and storm water discharges are all affecting the biological condition of the receiving water Because of this, biosurveys cannot measure the impacts of one particular discharge or effluent being discharged to receiving waters. Currently, biosurveys cannot be used as a predictive water quality assessment tools.

Biosurveys provide a useful monitor of both aggregate ecological impact and historical trends in the condition of an aquatic ecosystem They can also detect impacts that other assessment methods may miss. More importantly, biosurveys can detect impacts caused by habitat degradation such as channelization, sedimentation, and historical contamination that disrupt the interactive balance of the components of the aquatic community

Sediment Sampling

Pollutants, both organic and inorganic, associated with storm water discharges may become physically or chemically bound with sediment particles Depending upon the size distribution of the sediment particles, a portion of the contaminated sediment particles will settle out of the water column Consequently, the potential exists for a buildup of contaminated sediment over time. The effects of heavily contaminated sediments on both benthic habitat and water quality have been documented to the extent that EPA is developing sediment quality criteria (SQC) that will allow assessments of the toxicological effects of contaminated sediments on varying types of receiving waters.

The amount of sediment material found in storm water discharges suggests that applying sediment quality criteria could be a useful component of a monitoring program. For example, sediment quality criteria could be a valuable preventative tool to ensure that point source discharges of storm water do not cause or contribute to the contamination of sediments

In addition, a MS4 could make comparisons of field measurements to sediment quality criteria as a means of providing an early warning of a potential problem. Consequently, an early warning could provide an opportunity to take corrective action to prevent further contamination For long term planning, consideration could also be given to the feasibility of establishing target levels or goals that would ensure that point sources discharges of storm water do not contribute to sediment contamination

5.6.2 Monitoring Procedures

Monitoring procedures will depend on the objectives of the monitoring effort To a large extent, the type of receiving water will be an important factor in developing monitoring procedures and techniques. For example, grab samples may be appropriate for monitoring discharges from a retention pond, while composite samples may be appropriate for monitoring flows into the pond The following information, at a minimum, should be included for each sampling site.

- The criteria for storm selection,
- Whether grab, composite, continuous, or other sampling techniques are to be used,
- The criteria on when to begin and end sample collection;
- The basis for selecting the time interval between sequentially collected samples,
- How seasonal factors affect the selection of monitoring frequencies,
- The method of estimating rates or volumes of flow passing the sampling point, and
- The analytical methods used for analyzing pollutant parameters and their detection limits

Location of Monitoring Sites and Description of Drainage Basins

The selection of monitoring sites should depend on the goals of the monitoring program. Applicants should identify the location of each proposed monitoring site and the boundary of its drainage basin. They should describe the estimated size and land use characteristics of the drainage basin for each sampling location The applicant also should explain why the sampling sites are representative or will otherwise provide information to support a monitoring program goal. Other monitoring sites can be selected to evaluate unique conditions in the drainage area that have significant or unusual potential for generating pollutants in storm water discharges

Samples should be analyzed in accordance with the analytical methods approved under 40 CFR Part 136

Parameters to be Analyzed

The applicant must list all parameters to be analyzed, which should depend on the objective of the sampling effort. For example, it may only be necessary to monitor several indicator parameters (such as TSS, settleable solids, nutrient, and a metal) to characterize the pollutant removal efficiency of a wet pond.

Sampling Equipment

The applicant must describe the equipment to be used in the proposed sampling program. Only the primary pieces of equipment need be identified. Descriptions can be made by reference to equipment supplied by a vendor or manufacturer if distinctive enough to be readily identified.

CHAPTER 6
PROPOSED MANAGEMENT PROGRAM

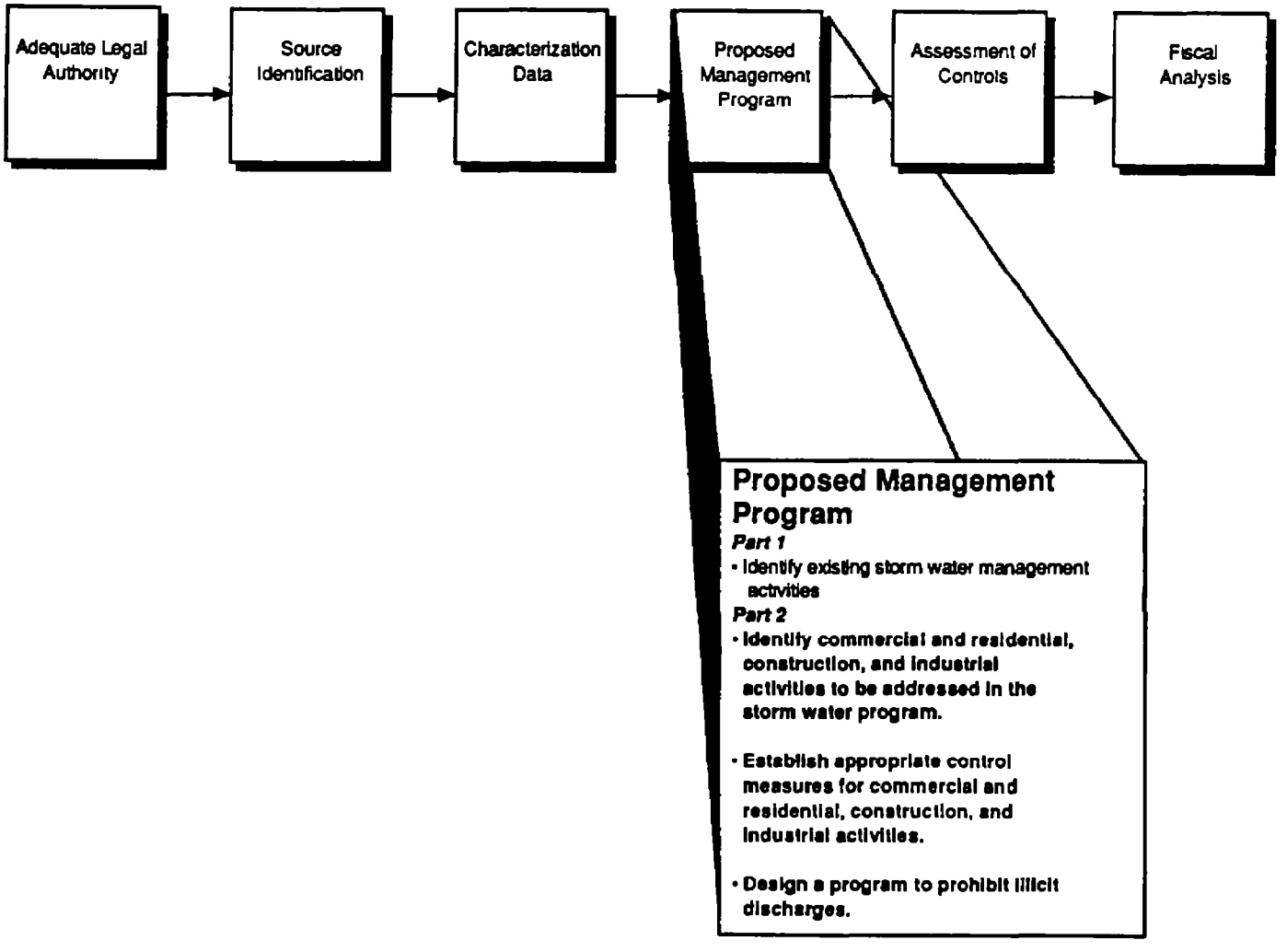

6.0 PROPOSED MANAGEMENT PROGRAM

6.1 BACKGROUND

Under the Part 2 application requirements, municipalities must propose site-specific storm water management programs. This is the most important aspect of the permit application. The Part 2 application requirements provide each MS4 with the flexibility to design a program that best suits its site-specific factors and priorities.

The regulations require the applicant to provide a description of the range of control measures considered for implementation during the term of the permit. Applicants must meet all the requirements of the Part 2 application regulation. However, flexibility in developing permit conditions is encouraged by allowing municipalities to emphasize the controls that best apply to their MS4. For example, a municipality that expects significant new development may focus more on requirements for new development and construction, while a municipality that does not expect significant new development may focus more on a program to prohibit illicit discharges or control industrial contributions. In any case, a satisfactory proposed management program will address· management practices; control techniques and systems; design and engineering methods, and other measures to ensure the reduction of pollutants to the "maximum extent practicable (MEP)."

If the municipality proposes a thorough and complete program, the permitting authority is likely to incorporate all or part of the proposed management program into the NPDES storm water permit written for that municipality Therefore, the proposed programs provide municipalities with the opportunity to have substantial input into their NPDES permit conditions.

This section of the guidance manual describes the minimum information requirements for proposed storm water management programs. Examples of how the program elements should be addressed are provided. These examples illustrate minimum information requirements for the program elements, and occasions when municipalities may opt to go beyond minimum requirements in order to meet the MEP standard

6.2 SUMMARY OF REGULATORY REQUIREMENTS

The municipality must develop and submit a proposed management program that covers the duration of the permit The program must integrate the information and actions described in the Part 1 application and portions of the Part 2 application (see Chapters 3, 4, and 5 of this guidance). The regulatory requirements for the proposed management program are in 40 CFR 122.26(d)(2)(iv)

At a minimum, the proposed management program must include:

- A comprehensive planning process that involves both public participation and intergovernmental coordination;
- A description of management practices, control techniques, and system design and engineering methods to reduce the discharge of pollutants to the MEP; and
- A description of staff and equipment available to set up and assess the storm water management program.

Additional provisions under §122 26(d)(2)(iv)(A) require applicants to include:

- Programs to control storm water runoff from commercial and residential areas, construction sites, and industrial

facilities (including waste handling sites), (Section 6 3),

- Identification of structural control measures to be included in these proposed programs, such as detention controls, infiltration controls, and filtration controls that the municipality plans to apply to the activities addressed in its storm water management program (Section 6.4); and

- Programs to detect and remove illicit discharges, and to control and prevent improper disposal into the MS4 of materials such as used oil or seepage from municipal sanitary sewers (Section 6.5).

6.3 PROGRAMS TO CONTROL STORM WATER RUNOFF FROM COMMERCIAL AND RESIDENTIAL AREAS, CONSTRUCTION SITES, AND INDUSTRIAL FACILITIES

A proposed management program must identify the activities or areas that require controls to reduce pollutants in storm water runoff Specifically, a proposed management program must address storm water runoff from **commercial and residential areas** (Section 6.3.1), **construction sites** (Section 6.3.2), and **industrial facilities** (Section 6.3 3). Also, areas where illicit connections or illegal discharges may occur must be identified (Section 6.5).

In addition to the requirements of the proposed storm water management program, other provisions of the Part 1 and Part 2 applications require information that will help enable the municipality to focus on identifying activities and areas that may need control measures Examples of these provisions include

- Identification of sources [Part 1, §122 2(d)(1)(iii)(B)(3)-(4), and Part 2, §122 26(d)(2)(ii)];

- Identification of water bodies that may be adversely affected by storm water runoff [Part 1, §122 26(d)(1)(iv)(C)],

- Organization of sources by watershed [Part 2, §122 26(d)(2)(ii)],

- Description of land use activities [Part 1, §122 26(d)(1)(iii)(B)(2)];

- Results of field screening analysis [Part 1, §122 26(d)(1)(iv)(D)];

- Results of the sampling program [Part 2, §122 26(d)(2)(iii)(A)(3)],

- Estimates of annual pollutant loads and event mean concentrations, and schedules to submit seasonal pollutant loads and event mean concentrations [Part 2, §122.26(d)(2)(iii)(B) and (C)], and

- Findings from an on-going monitoring program [Part 2, §122 26(d)(2)(iii)(D)].

6.3.1 Commercial and Residential Activities

Under §122.26(d)(2)(iv)(A), applicants must propose structural and source control measures to reduce pollutants from commercial and residential areas.

> **§122.26(d)(2)(iv)(A)** [The proposed management program must include a] description of structural and source control measures to reduce pollutants from runoff from commercial and residential areas that are discharged from the municipal storm sewer system that are to be implemented during the life of the permit, accompanied with an estimate of the expected reduction of pollutant loads and a proposed schedule for implementing such controls

To ensure that proposed control measures are effective, the applicant should study how storm water runoff from pollutant sources affects the existing municipal system, how the proposed

control measures will enhance the existing system, and what impact the proposed measures will have on receiving waters The control measures should recognize and emphasize the interaction between pollutant sources and the physical attributes of the municipal system and receiving waters.

Specific commercial and residential activities that must be addressed include maintenance activities and a maintenance schedule for structural controls to reduce pollutants in storm water runoff. This provision is discussed in Section 6.4.2. Other activities to be addressed include:

- Post-construction controls to reduce pollutants in discharges to MS4s resulting from new development and significant redevelopment (Section 6 3 1 1),
- Practices for maintaining and operating public streets, roads, and highways that will reduce the impact on receiving waters from storm water runoff discharges (Section 6 3 1 2);
- Procedures to assure that the impacts on receiving waters from flood management projects are assessed, and that existing structural control devices have been evaluated to determine if retrofit controls are feasible (Section 6 3.1.3);
- A program to monitor pollutants in runoff from operating or closed municipal landfills that identifies priorities and procedures for inspections and establishing and implementing control measures (Section 6.3 1.4); and
- A program to reduce to the maximum extent practicable, pollutants in storm water runoff associated with the application of pesticides, herbicides, and fertilizer (Section 6 3.1.5).

To reduce pollutants in storm water runoff from commercial and residential activities, a proposed management program might include the use of infiltration devices, detention and retention basins, vegetated swales, water quality inlets (which may include oil and water or oil/grit separators), screens, channel stabilization/riparian habitat enhancement efforts, wetland restoration and preservation projects, as well as various source control strategies and other nonstructural control measures

6.3.1.1 New Development and Significant Redevelopment

Summary of Regulatory Requirement

New development or redevelopment often increases impervious land surfaces, which usually leads to increased pollutant levels in storm water runoff Chemical and thermal changes in storm water runoff are commonly associated with new development and can adversely affect the quality of receiving waters In addition, urbanization results in an increase in the volume of storm water discharges.

The Nationwide Urban Runoff Program (NURP) study (EPA, 1983) and more recent investigations indicate that controlling the contribution of pollutants in storm water discharges at the onset of land development is the most cost-effective approach to storm water quality management Mitigating problems caused by pollutants after they have entered a MS4 is often more expensive and less efficient than preventing or reducing the discharge of pollutants at the source Therefore, a satisfactory proposed management program will propose structural and nonstructural measures to reduce pollutants in storm water discharges from areas of new development and redevelopment Examples of such measures are discussed below

> §122.26(d)(2)(iv)(A)(2) [The applicant must include a] description of planning procedures including a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal separate storm sewers which receive discharges from areas of new development and significant redevelopment Such plan shall address controls to reduce pollutants in discharges from municipal separate storm sewers after construction is completed

Provisions under §122.26(d)(2)(iv)(A)(2) focus on the reduction of pollutants in storm water runoff after construction in areas where new development or redevelopment is completed Controls that are required during construction are discussed in Section 6.3 2 of this guidance

Post-Construction Controls

Proposed storm water management programs should include planning procedures for both during and after construction to implement control measures to ensure that pollution is reduced to the maximum extent practicable in areas of new development and redevelopment. Design criteria and performance standards may be used to assist in meeting this objective

Further, storm water management program goals should be reviewed during planning processes that guide development to appropriate locations and steer intensive land uses away from sensitive environmental areas A municipality may, for example, include provisions in the planning process that ensure that all new development in targeted areas or zones provides for a certain percentage of undisturbed area to assist in preserving post-development runoff quality and velocity as similar as possible to pre-development conditions In its Part 2 application, a municipality should describe how it plans to implement the proposed standards (e g, through an ordinance requiring approval of storm water management programs, a review and approval process, and adequate enforcement)

The proposed storm water management program should identify and include **planning procedures and control measures** that will be used in the municipality.

Planning Procedures

Comprehensive planning procedures typically involve incorporation of land use goals and objectives into a plan document or a plan map. These plans are often called Master Plans, Comprehensive Land Use Plans, or Comprehensive Zoning Plans

Comprehensive or master plans are often non-binding. They provide support and direction to local officials that have the authority to make land use decisions

While applicants do not need to submit a complete comprehensive or master plan with the Part 2 application, they should detail the planning process employed by the municipality. They must thoroughly describe how the municipality's comprehensive plan is compatible with the storm water regulations The description should clearly

- Identify management objectives for streams, wetlands, and other receiving waters;
- Identify areas where urban development is likely to occur and areas that are sensitive to the effects of urbanization. Consideration should be given to receiving waters, topography, soil types, ground water uses and potential impacts, and other relevant factors;
- Describe standards such as design criteria and performance standards for storm water controls for new developments, such as buffer zones,

open space preservation, erosion and sediment controls, etc.;

- Describe other measures to minimize the effects of new development on storm water quality (these may include local code and ordinance requirements); and

- Identify or discuss the site development review process for the evaluation and approval of storm drainage or storm water management programs. Requirements in drainage or storm water management programs can be coordinated with review of other related plans such as those for site grading or landscaping.

There will be great variation among municipalities in their sophistication of land use planning If the municipality has recently updated its land use plan, it may detail storm water quality issues In other instances, there may be no policy to include storm water quality considerations in land use decisions. In such cases, the applicant must describe how consideration of those activities that affect storm water quality are to be incorporated into the municipality's comprehensive or master plan and its approval process for construction projects

Control Measures

Most traditional storm water control measures focus on efficient collection and conveyance of storm water runoff to an offsite location This approach can increase downstream property damage due to increased storm water runoff quantity and flow velocity. Corrective action often involves expensive public works projects, such as enlarging and reinforcing channels or constructing swales to provide an adequate outfall from affected or damaged areas The traditional approach has typically involved downstream channel stabilization projects However, these projects may also result in increased storm water runoff quantity and flow velocity.

Some recent approaches to storm water management include preserving the natural features of a watershed by maintaining vegetative cover and establishing buffer zones and open space or green areas. The benefit of employing this approach is the protection afforded to riparian areas and wetlands, as well as the preservation of a stable watershed. One additional benefit from this approach includes maintaining ground water recharge through infiltration. These approaches to storm water management minimize the impact of erosion, flooding, and other damage to natural drainage features such as streams, wetlands, and lakes. Preservation of natural habitat can be achieved through effective storm water quality control measures More recent approaches use storm water to:

- Recharge ground water sources with runoff from impervious areas;

- Preserve baseflows of surface water bodies;

- Augment water supplies used for street cleaning and other municipal functions, such as watering public lawns,

- Increase recreational opportunities including swimming, fishing, and boating; and

- Sometimes, augment drinking water supplies if it is treated and in compliance with all applicable drinking water standards.

The municipality should consider storm water controls and structural concerns in planning, zoning, and site or subdivision plan approval. An example of effective structural control is described in Exhibit 6-1. Non-structural control measures are highly recommended for new development. They can be included during the planning, site-selection, and development stages. Examples of non-structural controls include street sweeping, buffer strip preservation, and public education.

Exhibit 6-1
Storm Water Programs in Delaware and Florida

Delaware requirements for on-site measures include water quality ponds with permanent pools Ponds must be designed to release the equivalent volume of runoff from the first 1/2 inch of runoff from the site over a 24-hour period and have a storage volume designed to accommodate at least 1/2 inch of runoff from the site Water quality ponds without permanent pools may also be used in Delaware's program. These pools are to be designed to release the first inch of runoff from the site over a 24-hour period.

Developers are instructed to consider infiltration practices only after ponds are eliminated for engineering or hardship reasons. Infiltration structures must be designed to accept at least the first inch of runoff from all streets, roadways, and parking lots Other practices may be acceptable if they meet the equivalent removal efficiency of 80 percent for suspended solids. More stringent requirements may be established on a case-by-case basis.

The 80 percent removal efficiency for suspended solids that Delaware requires takes into account pollutant settling. The 24-hour detention period allows for substantial settling where most of the pollutant removal occurs. In addition, the requirement that the first inch of runoff be released over a period of no less than 24 hours reduces downstream erosion

Source Schueler, 1987

For significant redevelopment, municipalities can incorporate both structural and nonstructural storm water controls However, there are generally far more constraints and limitations on the control opportunities available at redevelopment sites One of the primary constraints is the availability of sufficient open area to accommodate structural controls such as detention ponds. In instances where redevelopment is occurring in densely urbanized areas, storm water runoff volumes may be so large that sufficient storage capacity can not be provided without further compounding problems associated with siting and retrofitting existing storm water conveyance systems In such cases, the municipality should consider nonstructural control measures such as traffic flow control, the use of porous construction materials for roads and parking lots, revisions to street sweeping or deicing policies, or public education programs

6.3.1.2 Public Streets, Roads, and Highways

Summary of Regulatory Requirement

Public streets, roads, and highways can be significant sources of pollutants in discharges from MS4s Therefore, proposed management programs must include a description of practices for operation and maintenance of public streets, roads, and highways, and procedures for reducing the impact of runoff from these areas on receiving waters.

§122.26(d)(2)(iv)(A)(3) [The application must include a] description of practices for operating and maintaining public streets, roads and highways and procedures for reducing the impact on receiving waters of discharges from municipal storm sewer systems, including pollutants discharged as a result of deicing activities

Road maintenance practices, especially **snow management** and **road repair**, and **traffic** are significant sources of pollutants in storm water discharges Measures to reduce the pollutants in storm water runoff from these sources should be addressed in the proposed management program

Snow Management

Deicing salts are the main source of pollutants in runoff of urban snowmelt. Municipalities can reduce these pollutants by calibrating equipment, educating equipment operators, using alternative deicing materials, and properly storing deicing materials. As alternatives to deicing salts, the Federal Highway Administration is considering many materials that may be less polluting. However, most of these deicers contain sodium or chloride ions that are harmful to roadside trees, shrubs, and soils. One deicer, calcium magnesium acetate (CMA) may be the best option for environmentally sensitive areas (Chollar, 1990) In salt storage facilities, salt piles should be completely covered, storage and handling areas should have impervious surfaces, and contaminated runoff should be contained

Road Repair

Road maintenance and repair activities may contribute pollutants through erosion caused by the elimination of stabilizing vegetation from roadside shoulders and ditches. Maintenance crews can decrease the potential for erosion by disturbing only the area under repair. Graded areas should also be limited in size so that repairs can be completed the same day and graded areas stabilized by the end of the workday. Other measures to reduce pollutants in storm water include scheduling potential pollutant-causing repair work during dry seasons, when possible

Municipal equipment yards and maintenance shops that support road maintenance activities can also be significant sources of pollutants Therefore, municipalities should consider instituting procedures that address spill prevention, material management practices, and good housekeeping

Traffic

Oil and grease and metals from traffic are the pollutants of most concern with respect to aquatic toxicity and their ability to "wash off" roadways and enter a MS4

In almost all instances, the pollutant concentrations in initial storm water discharge from heavily travelled streets is significant When the initial runoff reaches the velocity needed to entrain particulates, highly soluble pollutants that have accumulated between storms are transported to the storm sewer system. Therefore, shortly after a storm event begins, the pollutant loading in the initial flow to a MS4 is often the greatest

Pollutants from traffic can be minimized by using **nonstructural controls** (e.g, traffic reduction and improved traffic management), **structural controls** (e g, traditional and innovative BMPs), and **changing maintenance activities**. Traditional structural controls to reduce pollutants in road runoff include vegetated swales, infiltration devices and detention/retention basins Highways often afford opportunities for using structural controls such as detention basins on entrance or exit ramps and upstream or downstream of culvert crossings (Steward, 1992). Smaller roads may also have low-cost structural control opportunities available at culvert crossings such as vegetated swales Many structural controls can also be placed on public or private land that is outside the right-of-way, but still may be proximate enough to capture road runoff. Any time controls are placed at culvert crossings, potential wetland impacts and instream treatment issues need to be considered

Maintenance activities that can reduce pollutants in storm water discharges include catch basin cleaning, litter control, and targeted street sweeping For municipalities that have

developed transportation plans under the Clean Air Act, applicants should describe how they will review the plan, and amend it where appropriate, to address water quality concerns Potential locations for installing new structural controls to reduce pollutants from road and highway runoff should be identified by applicants.

6.3.1.3 Flood Management Projects

Summary of Regulatory Requirement

The traditional focus of storm water management in many communities has been water quantity (i e., flood) control. The proposed management program must demonstrate that flood management projects take into account the effects on the water quality of receiving water bodies, and the program must discuss whether existing structural flood control devices can be retrofitted to control water quality.

> §122.26(d)(2)(iv)(A)(4) [The application must include a] description of procedures to assure that flood management projects assess the impacts on the water quality of receiving water bodies and that existing structural flood control devices have been evaluated to determine if retrofitting the device to provide additional pollutant removal from storm water is feasible

Opportunities for pollutant reduction should be considered when determining specific controls to be proposed as the MEP standard in the storm water management program.

Control Measures

Storm water management devices and structures that focus solely on water quantity are usually not designed to remove pollutants, and may sometimes harm aquatic habitat and aesthetic values. For example, channels that are completely lined with concrete typically do not provide for aquatic habitat and tend to increase potentially erosive velocities and elevate ambient water temperatures, resulting in downstream channel enlargement and increased pollutant loadings However, this condition can be mitigated through alternative stabilization methods.

Channel management measures that can enhance streams and their ecological values include corridor preservation, biological bank treatment, and, where necessary, geomorphic restoration (Ferguson, 1991). The municipality may also install structural devices to dampen the hydraulic energy of the flow and minimize downstream erosion. As another example, willow saplings could be planted between rip-rap, timbers, and other stabilization structures that are anchored into terraces on the side of the streambank.

Flood-control projects can be built or subsequently modified to address water quantity and water quality concerns. Sometimes existing flood control structures can be retrofitted to provide water quality benefits as well as water quantity control (EPA, 1989b). Basin retrofits are a common example. For such a retrofit, dry flood control or detention basins can be converted to wet basins by modifying outlet orifices Additional storage can be obtained by raising the elevation of the basin embankment.

Dry retention basins, or extended dry or wet retention basins can be used to improve water quality. Dry retention basins are not as efficient or as effective in improving water quality as extended dry or wet retention basins, but dry retention basins are generally less costly to design and maintain. The decision to use dry retention or extended dry or wet retention basins should consider all these factors.

Optimally, such measures should be considered in the planning process (discussed previously). However, they can also be implemented later in the land development

process (e g , site review or public facilities requirements stage)

If a flood control authority is responsible for a portion of the MS4, the applicant should take the lead in coordinating efforts to incorporate pollutant reduction considerations in flood control projects EPA recommends the use of Memoranda of Agreement and Memoranda of Understanding to clarify roles and responsibilities between two or more political entities.

6.3.1.4 Municipal Waste Facilities

Applicants must describe programs that identify measures to monitor and reduce pollutants in storm water discharges from facilities that handle municipal waste, including sewage sludge.

> §122.26(d)(2)(iv)(A)(5) [The application must include a] description of a program to monitor pollutants in runoff from operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste which shall identify priorities and procedures for inspections and establishing and implementing control measures for such discharges

The first step is to identify facilities that handle municipal waste and summarize their operations The types of facilities that should be included are

- Active or closed municipal waste landfills,
- Publicly owned treatment works, including water and wastewater treatment plants,
- Incinerators,
- Municipal solid waste transfer facilities
- Land application sites,
- Uncontrolled sanitary landfills,
- Maintenance and storage yards for waste transportation fleets and equipment,
- Sites for disposing or treating sludge from municipal treatment works; and
- Other treatment, storage, or disposal facilities for municipal waste.

Applicants may combine this part of the proposed management program with the program established under §122 26(d)(2)(iv)(C), which sets standards for monitoring and controlling pollutants from similar types of solid waste facilities (e.g , those with hazardous wastes, or subject to the requirements of SARA Title III—Section 313 of the Emergency Protection and Community Right-to-Know Act). Monitoring should include all the parameters listed in §122 26(d)(2)(iv)(C) and any additional parameters listed in an effluent guideline. Procedures to evaluate, inspect, monitor, and establish control measures for municipal waste sites over the term of the NPDES permit should be described For example, after one year of monitoring each waste handling facility category listed above, the municipality may have collected enough data to decide which facilities or types of facilities should receive a higher priority for pollutant reduction More attention could then be focused on the high-priority sites

6.3.1.5 Pesticides, Herbicides, and Fertilizers

The proposed management program must include a description of procedures to reduce the contribution of pollutants associated with pesticides, herbicides, and fertilizers discharged to the MS4.

> §122 26(d)(2)(iv)(A)(6) [The application must include a] description of a program to reduce to the maximum extent practicable, pollutants in discharges from municipal separate storm sewers associated with the application of pesticides, herbicides and fertilizer which will include, as appropriate, controls such as educational activities, permits, certifications and other measures for commercial applicators and distributors, and controls for application in public right-of-ways and at municipal facilities

The proposed program should include educational measures for the public and commercial applicators, and should include integrated pest management measures that rely on non-chemical solutions to pest control. The program should also describe how educational materials will be developed and distributed Applicants are encouraged to consider providing information for the collection and proper disposal of unused pesticides, herbicides, and fertilizers, or to establish their own program An effective and safe program would include

- Development of an inventory of products that may be accepted under the program, and collection of the Material Safety Data Sheets (MSDSs) for these products,
- Identification of transportation, storage, and disposal requirements,
- A shelf-life program to dispose of expired products,
- Applicator training or certification (the pretreatment program may be helpful as a source of industry-specific information or as a model approach for obtaining and tracking information on chemical applicators and distributors), and
- Safety training

Any certification/training program for the collection and disposal of pesticides, herbicides, and fertilizers must be in compliance with Federal, State, and local laws such as the Resource Conservation and Recovery Act, the Federal Insecticide, Fungicide, and Rodenticide Act, the Department of Transportation's hazardous materials regulations, and State and local ordinances.

In addition, applicants must include a discussion of controls for the application of pesticides, herbicides, and fertilizers in public-rights-of-way and at municipal facilities Planting low-maintenance vegetation, such as perennial ground covers, reduces pesticide and herbicide use. Native vegetation is often preferable because there is less need to apply fertilizers and herbicides, and to perform other forms of maintenance, such as mowing (Horner, 1988).

If herbicides are used, a herbicide-use plan must be proposed as part of the storm water management program The plan might include

- A list of selected herbicides and their specific uses,
- Information about the formulations of various products, including how to recognize the chemical constituents from the label, and directions and precautions for applicators that explain if products should be diluted, mixed, or only used alone,
- Application methods and estimated quantities to be used,
- Equipment use and maintenance,
- Training in safe use, storage, and disposal of pesticides (safety requirements for individual products are listed on the products' MSDSs),
- Inspection and monitoring procedures, and

- Recordkeeping and public notice procedures

6.3.2 Construction Sites

As specified in §122 26(d)(2)(iv)(D), applicants must describe proposed regulatory programs to reduce pollutants in storm water runoff from construction sites to the MS4.

> **§122.26(d)(2)(iv)(D)** [The application must include a] description of a program to implement and maintain structural and nonstructural best management practices to reduce pollutants in storm water runoff from construction sites to the municipal storm sewer system

This part of the proposed management program must address

- Implementation of BMPs,
- Procedures for reviewing site plans to ensure that they are consistent with local sediment and erosion control plans,
- Inspection of construction sites; and
- Enforcement measures and educational activities for construction site developers and operators

EPA encourages municipalities to (1) coordinate requirements to reduce pollutants in construction site runoff with management programs to reduce pollutants from new development, and (2) maintain, to the degree possible, pre-construction hydrologic conditions (Section 6 3 1 1) Applicants are encouraged to describe these two proposed management program components together Implementation of this program component will rely on the establishment and maintenance of both structural and nonstructural BMPs This requirement extends to all construction activity within the municipality

All construction sites, regardless of size, must be addressed by the municipality To begin to identify these sites, the applicant should obtain lists of construction site operators that are covered by general or individual storm water NPDES permits from the NPDES permitting authority However, construction sites not covered by a storm water discharge permit also need to be addressed by the municipality. The best way to identify these construction sites and implement an effective BMP program to reduce pollutants in their runoff is through the site planning process (see Section 6.3.2.1).

The BMPs envisioned for construction site runoff are generally well established technologies and practices They rely predominantly on erosion and sediment controls and other measures applicable to construction sites (e.g , control of solid wastes, and prohibitions on discharging concrete truck washing runoff into storm drains) The technologies proposed should be referenced, and a description of when and how the controls will be used should be included Municipality-specific technical guidance for construction site operators, such as handbooks and inspection checklists, are examples of suitable reference sources If an applicant chooses to develop such handbooks and checklists, they should be referenced and described in the application

The major requirements of this program component include

- Site planning that considers the potential impacts on water quality,
- Nonstructural and structural best management practices,
- Procedures that consider physical site characteristics when identifying priorities for inspection and enforcement, and
- Educational and training measures for construction site operators

Each of these requirements, and the reasons that they are important elements of a proposed storm water management program, is described in more detail below

6.3.2.1 Site Planning

Sediment runoff rates from construction sites are typically 10 to 20 times greater than those of agricultural lands, and 1,000 to 2,000 times those of forest lands. Over a short period, construction sites can contribute more sediment to streams than had been deposited over several decades Runoff from construction sites can also include other pollutants such as phosphorus and nitrogen from fertilizer, pesticides, petroleum derivatives, construction chemicals, and solid wastes

To address these problems, the proposed management program should describe procedures for site planning that consider potential water quality impacts

> §122 26(d)(2)(iv)(D)(1) [The program for construction sites must include a] description of procedures for site planning which incorporate consideration of potential water quality impacts

The objective is for the municipality and the developer to address storm water discharges from construction activity early in the project design process so that potential water quality impacts can be eliminated or minimized and consequences to the aquatic environment assessed Nonstructural approaches to minimize the generation of runoff from the construction site will also need to be considered These measures may include phasing development to coincide with seasonal dry periods, minimizing areas that are cleared and graded to only the portion of the site that is necessary for construction, exposing areas for the briefest period possible, and stabilizing and reseeding disturbed areas rapidly after construction activity is completed

It is often easier and more effective to incorporate storm water quality controls during the site plan review process or earlier The process typically culminates with the developer of the construction site submitting detailed engineering plans to the municipality for review and approval

Upon completion of the site plan review stage, the developer and the municipality have invested considerable time and money into the project If storm water quality issues are considered only after significant detailed engineering has gone into the project, municipal site reviewers may only address minor drainage issues. In recent years, however, many municipalities have developed separate teams of site inspectors to implement erosion and sediment control measures in the field. In these municipalities, site inspectors should be part of the site review team (if they are not already) in order to incorporate their expertise on the appropriate erosion and sediment controls for the given circumstances

The above discussion reinforces the importance of site planning, as described in the section on site planning for new development (Section 6.3 1) In general, the sooner planners consider storm water quality issues, the better the opportunity for efficient and effective pollutant reduction In some cases storm water issues should be considered in the conceptual stage of planning (e g , as a planning or zoning function)

Some municipalities include a final step in the planning process that requires a developer to provide a far greater level of design detail than earlier conceptual design approvals This step may be required as a condition of the final approval for certain zoning categories Municipalities with such a step in the development process can consider potential storm water quality issues in detail at this stage Municipalities that do not currently require such detailed plans should consider adopting this procedure as part of their storm water management program

6.3.2.2 Nonstructural and Structural BMPs for Construction Activities

This component of the proposed management program should describe requirements for nonstructural and structural BMPs that operators of construction activities that discharge to MS4s must meet

> **§122.26(d)(2)(iv)(D)(2)** [The program for construction sites must include a] description of requirements for nonstructural and structural best management practices

As indicated above, applicants must propose site review and approval procedures that address sediment and erosion controls, storm water management, and other appropriate measures Approvals should be clearly tied to commitments to implement structural and nonstructural BMPs during the construction process Appropriate structural and nonstructural control requirements will vary by project Project type, size, and duration, as well as soil composition, site slope, and proximity to sensitive receiving waters will determine the appropriate structural and nonstructural BMPs Municipalities should acquire the authority to require operators to install and maintain applicable erosion and sediment control plans Exhibit 6-2 summarizes common construction-site BMPs

A description of the local erosion and sediment control law or ordinance is needed to satisfy this program requirement The description should include information that links the enforcement of the law or ordinance to the legal authority of the applicant, as discussed in Section 3 of this manual

While many municipalities have erosion and sediment control ordinances in place, their effectiveness is often limited because they are not adequately implemented and enforced Examples include silt fencing that is not maintained or excavated soils that are placed directly on top of the silt fencing Therefore, construction sites covered under NPDES permit regulations must indicate whether they are in compliance with State and local sediment and erosion control plans Site inspections are expected to be the primary enforcement mechanism by which erosion and sediment controls are maintained

To ensure that developers are in compliance with erosion and sediment control plans, applicants may wish to consider expanding the use of performance bonds. This approach might depart from a traditional site bonding approach For example, the size of bonds could be based on the amount of earth disturbed, the slope of the site, changes in grades, soil type, proximity to surface waters, sensitivity of surrounding area, and other relevant factors. In addition, the bond could clearly specify the storm water quality controls that must be included in the development. Appropriate maintenance and site cleanup could be tied to the bond-release process

6.3.2 3 Site Inspections and Enforcement of Controls For Construction Sites

Storm water BMPs associated with construction activities are highly susceptible to damage due to the intensity of activities commonly associated with construction Consequently, inspections are crucial to the effective operation of storm water BMPs Therefore, the proposed management program should describe construction site inspection and enforcement procedures The procedures should be flexible so that they can be tailored to specific construction activities and physical characteristics of the construction site

> **§122 26(d)(2)(iv)(D)(3)** [The program for construction sites must include a] description of procedures for identifying priorities for inspecting sites and enforcing control measures which consider the nature of the construction activity, topography, and the characteristics of soils and receiving water quality

Exhibit 6-2
Construction Site Controls and Their Applicability

Control Type	Slope Protection	Waterway Protection	Surface Drainage	Enclosed Drainage	Large Flat Areas	Borrow Areas	Adjacent Properties
Non-structural (cover)							
temporary seeding	●		●		●	●	●
mulching & matting	●				●	●	
plastic covering	●					●	
retain natural vegetation	●	●	●	●	●	●	●
buffer zones	●	●	●	●	●	●	●
seeding & planting	●				●	●	
sodding	●		●		●	●	●
topsoiling					●	●	
Structural-erosion control							
gravel entry/truck wash			●		●		
road stabilization			●				
dust control							
pipe slope drains					●	●	●
subsurface drains	●						
surface roughening	●				●		
gradient terraces	●					●	
bioengineered slopes	●					●	
level spreader			●				
interceptor dikes/swales	●					●	●
check dams			●				●
outlet protection		●	●				
riprap	●	●	●				
vegetative streambank stabilization		●					
bioengineered streambank stabilization		●					
structural streambank stabilization		●					
Structural-sediment retention							
filter fence		●		●			●
gravel filter berm	●	●			●		●
storm drain inlet protection	●			●			●
sediment trap or sump		●	●		●	●	●
sediment pond or basin		●	●	●	●	●	●

Source: Modified from WDOE *Public Review Draft - Stormwater Management Manual for the Puget Sound Basin*, Washington State Department of Ecology, Publication #90-73 June 1991

Effective inspection and enforcement requires adequate staff, systematic inspection procedures, penalties to deter infractions, and intervention by the municipal authority to correct violations. Enforcement mechanisms, such as the ability to require additional storm water controls, administrative penalties (e.g., stop work orders) and injunctive relief (via citizen suits) also must be described. In addition, the applicant should describe who has the authority to require compliance.

Proposed procedures for inspecting construction sites may include minimum frequencies and an inspector's checklist. For example, the State of Delaware requires a minimum of one inspection every two weeks for sites over 50,000 square feet.

The proposed program should also specify the minimum number of inspectors that will be employed during the permit term and how they will be trained. For example, some erosion and sediment control programs require that certified private inspectors be used. In such case, procedures for inspector training and certification must also be described.

In formulating procedures to identify priorities for inspecting sites and enforcing control measures, applicants are encouraged to begin early in the process (i.e., at the site planning stage, as discussed previously) and continue throughout all ground disturbing activities. Once the nature of the construction activity has been established or perhaps modified during the site plan review process, the physical site constraints can be evaluated so that effective controls can be implemented.

For example, if the controls specified in the site plan prove to be ineffective, or if changes occur that were not anticipated during the planning process, site inspection and enforcement mechanisms can be required to mitigate the potential for pollutants to enter a downstream MS4. In this instance, a perimeter barrier, such as a temporary diversion dike, could be used to divert the concentrated runoff to a pipe slope drain terminating with a level spreader. The spreader would dissipate the erosive velocity of the runoff and release it into an undisturbed area beyond the limits of the clearing and grading at the toe of the slope.

The proximity and sensitivity of the receiving water to which the construction site discharges is an important consideration. For construction sites that discharge to receiving waters that do not support their designated use or other waters of special concern, additional construction site controls are probably warranted and should be strongly considered. These receiving waters are identified in the Part 1 municipal NPDES storm water permit application [§122.26(d)(1)(i)(C)].

6.3.2.4 Educational Measures for Construction Site Operators

Construction site operators often need training and education about the sources, control, and impacts of pollutants in runoff from construction sites (see Virginia, 1988). Therefore, applicants must describe examples of informational materials and activities to be used in education programs.

> §122.26(d)(2)(iv)(D)(4). [The program for construction sites must include a] description of appropriate educational and training measures for construction site operators.

Implementation and enforcement of erosion and sediment controls have historically been major problems even with many programs that may be otherwise exemplary. Therefore, technical information on how to incorporate storm water management with erosion and sediment control and other BMP training courses are recommended for municipal employees and construction site operators. Training on the available alternatives will help operators recognize and correct problems promptly. Tools for such training include videos, workshops, seminars, and demonstrations or field trips

An acceptable program must include a training program, which should be supplemented by a certification program for all construction site operators (contractors and developers) plan reviewers, and inspectors that work on sites that discharge to a MS4 For example, one NPDES State has a certification program based on adequate training and minimum-competency level testing of all private individuals involved in the preparation and implementation of erosion and sediment control plans

6.3.3 Program to Control Pollutants in Storm Water Discharges from Waste Handling Sites and from Industrial Facilities

> §122.26(d)(2)(iv)(C) [The application must include a] description of a program to monitor and control pollutants in storm water discharges to municipal systems from municipal landfills, hazardous waste treatment, disposal and recovery facilities, industrial facilities that are subject to Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA), and industrial facilities that the municipal permit applicant determines are contributing a substantial pollutant loading to the municipal storm sewer system

The storm water regulations envision that NPDES permitting authorities and municipal operators will cooperate to develop programs to monitor and control pollutants in storm water discharges to municipal systems from various sites that handle waste and certain industrial facilities

Operators responsible for storm water discharges associated with industrial activity must obtain NPDES permits from EPA or an authorized NPDES State These industrial storm water permits will establish requirements such as controls, practices, and monitoring for storm water discharges from the industrial facilities to the MS4 The industrial storm water permits will also provide a basis for enforcement actions directly against the industrial owner or operator

NPDES permits for MS4s will establish responsibilities for municipal system operators to control pollutants from industrial storm water discharged through their system. Proposed storm water management programs must address the reduction of pollutants in storm water discharges from municipal landfills; hazardous waste treatment, storage and disposal facilities; facilities subject to SARA Title III; and other priority industrial facilities, as determined by the applicant. Municipalities should consider the information gathered for the Part 1 application and other parts of the Part 2 application (particularly the Source Identification and Characterization Data components) when prioritizing storm water discharges from these sites. In addition, Appendix B contains a list of pollutants commonly associated with various industries.

In the Part 2 application, the Source Identification component (see Section 4 of this guidance manual) requires the applicant to provide an inventory of pollutant sources, organized by watershed. This inventory identifies and describes the products and services of each industrial facility that may discharge storm water to the MS4. The *Source Identification* component suggests applicants use standard industrial classification (SIC) codes for this description. EPA strongly recommends this information be used to identify priority waste handling sites and industrial facilities. A similar technique could be developed for sites that do not meet the regulatory definition of "storm water discharge associated with industrial activity" (i.e. not included in the *Source Identification* and *Discharge Characterization* components), but are identified as a high priority under the proposed management program. Applicants can obtain information on how SIC codes are used to describe the industrial facilities located within their jurisdictions from their NPDES permitting authority

Characterization data should also be evaluated. Applicants should analyze quantitative data from representative outfalls to establish a monitoring and control program.

An integral part of this requirement is the adequacy of the applicant's legal authority. If a municipality believes that a discharge of storm water associated with industrial activity violates the industrial facility's NPDES permit limits, but the municipality does not have authority over the discharge, the municipality should contact the NPDES permitting authority for appropriate action. Examples of possible actions by the NPDES permitting authority are:

- For a facility that already has a NPDES individual permit, the permit may be reopened and further controls imposed,
- For a facility covered by a NPDES general permit, an individual site-specific permit application may be required, or
- For a facility not covered by a NPDES storm water permit, a permit may be required

The municipality is ultimately responsible for discharges from their MS4. Consequently, the proposed storm water management program should describe how the municipality will help EPA and authorized NPDES States

- Identify priority industries discharging to their systems,
- Review and evaluate storm water pollution prevention plans and other procedures that industrial facilities must develop under general or individual permits;
- Establish and implement BMPs to reduce pollutants from these industrial facilities (or require industry to implement them), and
- Inspect and monitor industrial facilities to verify that the industries discharging storm water to the municipal systems are in compliance with their NPDES storm water permit, if required

6.3.3.1 Identifying Priorities

Proposed management programs must clearly identify priority industrial facilities.

> **§122.26(d)(2)(iv)(C)(1). [The applicant must] identify priorities and procedures for inspections and establishing and implementing control measures for such discharges**

This section discusses how applicants might identify priority facilities Section 6.3.3.2 discusses how municipalities might develop procedures for inspections and implementation of control measures

At a minimum, priority facilities include:

- Operating and closed municipal landfills;
- Hazardous waste treatment, disposal or recovery facilities, and
- Facilities subject to SARA Title III

Municipalities must identify these and other priority industrial facilities and describe the criteria used to identify them For example, information from the Toxics Release Inventory is one source a municipality could use to identify industrial facilities subject to SARA Title III. Other sources may include CWA Section 205 or 208 use-attainability studies, other studies that indicate a site-specific beneficial use impairment immediately downstream of a storm water outfall, or records of industrial pretreatment programs or other permit programs that identify facilities that may be the source of a use impairment or

a major contribution of pollutants The program should also describe procedures for modifying the inventory of priority industries based on additional evaluation that occurs throughout the permit term

Applicants may initially focus their implementation efforts on known pollution sources The municipality may have previously identified these sources, or they may be identified through existing information compiled during the permit application process However, the initial management program implementation strategy should be based on information gathered while completing the *Adequate Legal Authority, Source Identification,* and *Discharge Characterization* sections of the permit application (See Chapters 3, 4, and 5, respectively)

During the term of the permit, as additional information becomes available, the municipality should target and set priorities for other program elements that emerge. For example, if the municipality has incomplete characterization data about waste handling sites identified in this program component because the inventory of dischargers to the MS4 has not been completed, the municipality could propose to direct monitoring programs to those areas Upon acquiring sufficient characterization data, the priority of the sites discharging to these portions of the MS4 can be either determined or modified

As noted above, when identifying priority sites, applicants must consider all the facilities listed in §122 26(d)(2)(iv)(C)(*1*). When municipalities develop criteria for identifying additional priority industrial facilities, they are advised to consider, at a minimum:

- The type of industrial activity (SIC codes can help characterize the type of industrial activity),
- The use and management of chemicals or raw products at the facility and the likelihood that storm water discharge from the site will be contaminated; and
- The size and location of the facility in relation to sensitive watersheds

6.3.3.2 Developing Procedures

This program component should describe the specific steps that the municipality will take if it identifies a waste handling site or priority industrial facility when preparing the Part 2 application or during the permit term [§122.26(d)(2)(iv)(C)(*1*), printed in the box above]. The proposed management program must include procedures for inspecting priority industrial sites. The results of inspection may be used as a basis for requiring storm water management controls and enhanced pollution prevention measures. It should also establish an inspection schedule for each priority facility at the time it is identified

Applicants may want to consider establishing prior notification procedures The applicant will need to evaluate the legal authority it has over priority facilities to determine if prior notification is required This is another example of how EPA expects the different components of the application process to be linked In this instance, the Adequate Legal Authority section is tied directly to the prior notification procedure of the inspection and evaluation component of the proposed management plan

Applicants also should consider developing inspection documents such as standard forms or checklists for recording observations Forms and checklists can be used to identify high risk areas of priority facilities and to make comparisons among sites When characterization data or baseline estimates are factored into the evaluation process, the effectiveness of pollution prevention activities at a particular site could be quantified and compared to similar sites Other procedures that applicants should describe to effectively incorporate inspections as well as establish and implement control measures for these types of discharges can be derived from monitoring data

Applicants also should describe a procedure for conducting follow-up inspections, where necessary, as part of this program component For example, follow-up inspections might be needed to verify the installation of a specific control or implementation of a practice specified in a negotiated agreement between the municipality and the industrial site A system-wide approach to establishing priorities for inspection procedures is recommended. The system-wide approach should begin with the evaluation of existing information, followed by the identification and evaluation of new information during the permit term. Therefore, applicants should link these procedures with information from the *Source Identification* and *Discharge Characterization* components

6.3.3.3 Establishing and Implementing Controls

A municipality must consider if it should place more stringent controls on discharges associated with industrial activity than are required in an industrial facility's existing NPDES storm water permit [§122 26(d)(2)(iv)(C)(1) printed in box above] Usually, the municipality will not need to impose controls beyond those required in the industrial facility's NPDES storm water permit (for more information on appropriate controls, refer to *Storm Water Management for Industrial Activities, Developing Pollution Prevention Plans and Best Management Practices*, EPA 832-R-92-006, September, 1992)

However, nothing in the Federal regulations would prohibit the municipality from requiring additional controls beyond the permit requirements for industrial activities For this reason, EPA recommends that municipal applicants incorporate a provision in the proposed storm water management program that allows the municipality to require priority industrial facilities to implement the controls necessary for the municipality to meet its permit responsibilities

Finally, the applicant should suggest procedures for requiring pollutant control measures in runoff from priority industrial facilities Applicants should provide information to the industrial facilities that discharge to the MS4s and industry-specific guidance on appropriate control measures that industries discharging to their systems should follow (WDOE, 1991).

Priority industrial facilities should focus on controlling activities such as the use, storage, and handling of toxic chemicals Standard methods for implementing control measures at different types of facilities should be described To facilitate this, municipalities should obtain copies of the pollution prevention plans developed by industrial permittees Control measures that the municipality may suggest include preventing exposure of pollutant sources to precipitation, on-site pretreatment, and oil/water separators Applicants should provide a schedule for setting up this program component at priority industrial facilities. The schedule should include educational services for industrial site operators and technical BMP guidance, training courses, videos, workshops, and seminars for plan reviewers, inspectors, contractors, and developers

6.3.3.4 Inspection and Monitoring

The proposed management program should describe the inspection procedures that will be followed Storm water inspections can be coupled with inspections for other purposes (e.g., pretreatment programs, fire and safety) Proposed management programs should address minimum frequency for routine inspections. For example, how often, how much of the site, and how long an inspection may take are appropriate to explain in this proposed management program component Applicants should also describe procedures for conducting inspections and provide an inspector's checklist

In addition these inspection procedures should identify the minimum number of inspectors that will be employed and describe

the programs to train them For example, if the number of inspectors is expected to increase over the term of the permit, it should be noted in the proposed management program. Also, if storm water inspections are combined with other program inspections, means of cross-training inspectors and coordinating schedules should be outlined

Municipalities are urged to evaluate pollution prevention plans and discharge monitoring data collected by the industrial facility to ensure that the facility is in compliance with its NPDES storm water permit Site inspections should include (1) an evaluation of the pollution prevention plan and any other pertinent documents, and (2) an on-site visual inspection of the facility to evaluate the potential for discharges of contaminated storm water from the site and to assess the effectiveness of the pollution prevention plan. A municipality could begin the inspection process with information from the facility's notification to the municipality, which should have been submitted by May 15, 1991. Industrial facilities must also submit an individual NPDES permit application, participate in a group storm water permit application, or file a Notice of Intent (NOI) to be covered by a general permit to the NPDES permitting authority Section 308 of the CWA provides the legal authority for any individual (including a municipality) to obtain information from the NPDES permitting authority

The proposed management program also must include a description of a monitoring program for storm water discharges associated with industrial facilities [§122.26(d)(2)(iv)(C)(2)]

The monitoring program should describe the framework and rationale for selecting monitoring sites Sites that may be appropriate for monitoring include locations with several upstream industrial facilities, industrial facilities that are representative of a significant number of similar facilities, and priority industrial sites with significant potential for high levels of pollutants in their storm water discharges The description of the proposed

> §122.26(d)(2)(iv)(C)(2) [The application must describe] a monitoring program for storm water discharges associated with the industrial facilities identified in paragraph (d)(2)(iv)(C) of this section, to be implemented during the term of the permit, including the submission of qualitative data on the following constituents any pollutants limited in effluent guidelines subcategories, where applicable; any pollutant listed in an existing NPDES permit for a facility; oil and grease, COD, pH, BOD_5, TSS, total phosphorus, total Kjeldahl nitrogen, nitrate plus nitrite nitrogen, and any information on discharges required under 40 CFR 122.21(g)(7)(iii) and (iv).

monitoring program should address how the monitoring data will be used and what the frequency of the monitoring will be.

Identifying who will actually conduct the monitoring (e g , industry or municipality) is appropriate to include in the program description. Linking this element of the monitoring program to the Adequate Legal Authority section of the permit application is vital The legal authority to require monitoring should prescribe the specific monitoring protocols required elsewhere in the regulation [§122 26(d)(2)(i)(F)]. Applicants should describe proposed procedures for monitoring industrial facilities, including methods for determining parameters to be sampled throughout the term of the permit **At a minimum, parameters that must be considered for monitoring include**

- Any pollutant limited in effluent limitations guidelines for the subcategory of industry;
- Any pollutant that is controlled in a NPDES permit for the process discharge from an industrial site,
- Oil and grease, COD, pH, BOD_5, TSS, total phosphorus, total Kjeldahl nitrogen, nitrate plus nitrite nitrogen; and

- Certain pollutant(s) known or suspected to be in the discharge, based on §122 21(g)(7)(iii) and (iv) (Section 5 3).

If a municipality believes (based on the results of monitoring and inspections) that an industrial facility is not meeting its NPDES permit requirements, the municipality should petition the NPDES authority to either require the facility to change its pollution prevention plan or institute an enforcement action. Municipalities may also file citizen suits under CWA Section 505 to enforce the conditions of the NPDES permit.

6.4 STRUCTURAL CONTROLS

6.4.1 Description of Structural Controls

Applicants are required to identify the location of major structural controls for storm water (retention basins, detention basins, major infiltration devices, etc) in Part 1 of the application [§122 26(d)(1)(iii)(B)(5)] In Part 2, applicants must describe additional controls that they plan to implement [§122 26(d)(2)(iv)] The controls must address the activities described in Section 6 3 In addition, the applicant must describe maintenance procedures [§122 26(d)(2)(iv)(A)(7), discussed in Section 6 4 2] Later, when the municipality submits its annual report, it will have to report on its progress in implementing these controls [§122 42(c)(1), discussed in Section 7.3 of this guidance]

The matrix in Exhibit 6-3 provides information on commonly used structural and source control BMPs. Structural practices to control urban storm water runoff rely on three basic mechanisms **detention, infiltration, and filtration** More detailed technical information about source controls (particularly in the selection of structural BMPs) is available in the technical BMP manuals (MWCOG, 1991, Schueler, 1987, WDOE 1991; and EPA 1990c) The following summary of structural and source control BMPs draws extensively from those manuals

Applicants should note that CWA Section 404 permits may be required for some structural controls, including any control projects that involve the discharge of dredged or fill material into waters of the United States, including wetlands. States may also require permits that address water quality and quantity. To the extent possible, municipalities should avoid locating structural controls in natural wetlands. Before considering siting of controls in a natural wetland, the municipality should demonstrate that it is not possible or practicable to construct them in sites that do not contain natural wetlands, and that the use of other nonstructural or source controls are not practicable or as effective. In addition, impacts to wetlands should be minimized by identifying those wetlands that are severely degraded or that depend on runoff as the primary water source. Moreover, natural wetlands should only be used in conjunction with other practices, so that the wetland serves a "final polishing" function (usually targeting reduction of primary nutrients and sediments). Finally, practices should be used that settle solids, regulate flow, and remove contaminants prior to discharging storm water into a wetland

Another concern for siting controls is the possible adverse effect that infiltration and detention controls may have on ground water. This issue is addressed in more detail in Section 7.2.3

Exhibit 6-3
Structural Controls Matrix

CONTROL AND MAINTENANCE REQUIREMENTS	ADVANTAGES	DISADVANTAGES
Extended Detention Dry Basin • Periodic mowing • Regular debris removal • Sediment removal annually	• Provides peak flow control • Possible to provide good particulates removal • Can serve large development • Requires less capital cost and land area when compared to wet basin • Does not usually release warmed or oxygen-depleted water downstream • Protects against downstream channel erosion • Can create valuable wetland and meadow habitat when properly landscaped	• Low removal rates for soluble pollutants • Generally not feasible for drainage areas less than 10 acres • If not adequately maintained, can become a nuisance; (becomes unsightly, breeds mosquitos, and creates undesirable odors) • Periodic mowing and maintenance can be detrimental to nesting birds or other animals inhabiting the area
Vegetative Filter Strip • Inspection • Fertilizer use if necessary to maintain stable vegetation	• Low maintenance requirements • Can be used as part of the runoff conveyance system to provide pretreatment • Can reduce particulate pollutant levels in areas where runoff velocity is low to moderate • Enhances urban wildlife habitat diversity • Economical	• May concentrate water, significantly reducing effectiveness • Soluble pollutant removal highly variable • Limited feasibility in highly urbanized areas where runoff velocities are high and flow is concentrated • Requires periodic repair, regrading, and sediment removal to prevent channelization • Maintenance can be detrimental to nesting birds or other animals inhabiting the area • Fertilizer use can lead to higher nutrient loadings in storm water runoff
Grassed Swale • Periodic mowing • Fertilizer use if necessary to maintain stable vegetation	• Requires minimal land area • Can be used as part of the runoff conveyance system to provide pretreatment • Can provide sufficient runoff control to replace curb and gutter in single-family residential subdivisions and on highway medians • Economical and aesthetically pleasing	• Low pollutant removal rates • Leaching from culverts and fertilized lawns may actually increase the presence of trace metals and nutrients • Fertilizer use can lead to higher nutrient loadings in storm water runoff

Exhibit 6-3 (continued)
Structural Controls Matrix

CONTROL AND MAINTENANCE REQUIREMENTS	ADVANTAGES	DISADVANTAGES
Porous Pavement • Routine removal of fine particles from surface • May need weight limit of traffic imposed for protection	• Provides ground water recharge • Provides water quality control without additional consumption of land • Can provide peak flow control • High removal rates for sediment, nutrients, organic matter, and trace metals • When operating properly can replicate pre-development hydrologic conditions • Eliminates the need for storm water drainage, conveyance, and treatment systems off-site	• Requires regular maintenance • Possible risks of ground water contamination • Only feasible where soil is permeable, of sufficient depth to bedrock and water table, and gentle slopes are present • Not suitable for areas with high traffic volume or heavy vehicles • Need extensive feasibility tests, inspections, and very high level of construction workmanship • High failure rate due to clogging • Not suitable to serve large offsite pervious areas • Limited use in snowy climates where sanding and salting operations occur
Concrete Grid Pavement • Periodic mowing, if planted	• Provides peak flow control • Provides ground water recharge • Provides water quality control without additional consumption of land	• Requires regular maintenance • Not suitable for area with high traffic volume • Possible risk of contaminating ground water • Only feasible where soil is permeable, of sufficient depth to bedrock and water table, and gentle slopes are present
Filtration Basin • Periodic vacuuming and power washing	• Ability to accommodate moderately large-sized development (3-80 acres) • Flexibility to provide or not provide ground water recharge • Can provide peak volume control	• Requires pretreatment of storm water through sedimentation to prevent filter media from premature clogging

Exhibit 6-3 (continued)
Structural Controls Matrix

CONTROL AND MAINTENANCE REQUIREMENTS	ADVANTAGES	DISADVANTAGES
Wet Retention Basin • Periodic dredging, preferably from forebay area, if properly designed • Mowing of impoundment to prevent successional growth	• Provides peak flow control • Can serve large developments; most effective for large, intensively developed sites • Enhances species diversity, aesthetics, and provides recreational benefits • Little ground water discharge • Permanent pool in wet ponds helps prevent scour and resuspension of sediments • Provides moderate to high removal of both particulate and soluble pollutants	• Generally not feasible for drainage area less than 10 acres • Potential for safety and liability issues if not properly built and maintained • If not adequately maintained, can become a nuisance; (becomes unsightly, breeds mosquitos, and creates undesirable odors) • Requires considerable space, which limits use in densely urbanized areas with expensive land and property values • Not suitable for hydrologic soil groups "A" and "B" (SCS classification) • Potential for thermal discharge and oxygen depletion, which may severely impact downstream aquatic life
Extended Detention Wet Basin • Periodic dredging of sediment forebay	• Provides peak flow control • Can serve large developments; most effective for large, intensively developed sites • Enhances species diversity, aesthetics, and provides recreational benefits • Permanent pool in wet ponds helps prevent scour and resuspension of sediments • Provides better nutrient removal than traditional wet basin	• Not feasible for drainage area less than 10 acres • Potential for safety and liability issues if not properly built and maintained • If not adequately maintained, can become a nuisance; (becomes unsightly, breeds mosquitoes, and creates undesirable odors) • Requires considerable space, which limits use in densely urbanized areas with expensive land and property values • Not suitable for hydrologic soil groups "A" and "B" (SCS classification) • Potential for thermal discharge and oxygen depletion, which may severely impact downstream aquatic life

Sources Modified from MWCOG, 1991, Schueler 1987, and WDOE, 1991

6.4.1.1 Detention Controls

Detention controls temporarily store storm water runoff to control peak runoff rates and provide a reduction in pollutant concentrations by the gravitational settling of suspended solids and associated contaminants Except for incidental losses due to evaporation or percolation, essentially all the detained water is subsequently discharged to a surface water conveyance (e.g., a stream or MS4). The most common examples of detention practices are extended detention basins and wet (retention) basins

Variations on these basic detention controls include constructed storm water wetlands and multiple pond systems These types of controls also rely on detaining flows (leading to sedimentation) as the primary means of pollutant removal Recent investigations suggest that wetlands vegetation within a detention control can also reduce nutrient loads and certain other pollutants by incorporating them into plant tissue

If properly designed, detention controls can protect downstream channels by reducing the frequency of bankfull flood events and associated erosion Reduction in velocity and sediment load is also important for minimizing the adverse impacts of discharges to MS4s Detention facilities also can provide terrestrial and aquatic wildlife habitat if they are landscaped and planted appropriately

When considering detention controls, the municipality should consider the potential negative effects of downstream warming that may be caused by the shallowness of the water in the control The municipality should also consider negative impacts of detention controls, such as reduced baseflow; bacterial contamination due to waterfowl, and potential impacts to wildlife from concentrated contaminants, waterfowl diseases, and maintenance practices Safety and liability issues and nuisance factors, such as mosquitoes and odor, also should be considered. Setting detention controls in sensitive floodplains or in existing wetlands should generally be avoided. The flooding effect of impounding and detaining water is a particular concern if the upstream watershed drains more than 250 acres, because the volume of runoff and required detention times can cause inundation of upstream channels to occur.

Detention controls incorporating multiple pond systems and/or constructed storm water wetlands also treat runoff through the processes of absorption, filtration, biological uptake, volatilization, precipitation, and microbial decomposition. Recent investigations by the Metropolitan Washington Council of Governments suggest that multiple pond systems, in particular, have shown potential to provide higher and more consistent levels of treatment than traditional detention controls The redundancy afforded by the multiple pond system generally increases the reliability of the control. However, the potential concerns and drawbacks affecting retention basins also apply to these systems Many of these systems are currently being designed to include vegetative buffers and deep water areas to enhance wildlife habitat and to improve the appearance of the facility If a municipality selects one of these more innovative designs, it should recognize that periodic maintenance is necessary The effectiveness of these controls, like most controls, depends on proper operation, maintenance, and monitoring of the entire system

Wet (Retention) Basins

Wet (retention) basins are designed to maintain a permanent pool of water and temporarily store storm water runoff until it is released at a controlled rate Unlike extended detention ponds, wet basins cannot detain runoff for long times, because most of their storage capacity is needed for holding the permanent pool Enhanced designs include a forebay to trap incoming sediment where it can be easily removed A fringe wetland also can be established around the perimeter of the basin Similar to detention controls, locating

retention basins in sensitive floodplains or existing wetlands should be avoided if possible

Extended Detention Basins

Extended detention basins temporarily detain a portion of storm water runoff for 24 to 48 hours after a storm, gradually releasing the stored water through a fixed opening to allow urban pollutants to settle out. The basins normally return to a "dry" condition between storm events and do not have any permanent standing water. These basins are typically composed of two stages: an upper stage, which remains dry except during larger storms, and a lower stage, which is designed for typical storms. Pollutant removal from extended detention basins can be enhanced if they are equipped with plunge pools near the inlet, a micropool at the outlet, and an adjustable reverse-sloped pipe as the extended detention control device.

Water Quality Inlets

Water quality inlets (also referred to as catch basins) are small underground systems that, like retention basins, rely on settling to remove pollutants before discharging water to the MS4. Several designs of water quality inlets exist. In their simplest form, catch basins are single-chambered storm water inlets with the bottom lowered to provide 2 to 4 feet of additional space between the outlet pipe and the bottom of the structure for collection of trash and sediment. Some water quality inlets include a second chamber with a sand filter to provide additional removal by filtration The first chamber provides effective removal of coarse particles and helps prevent premature clogging of the filter media.

Water quality inlets may include an oil/grit separator. There are 3 basic types of oil/grit separators the spill control (SC), the coalescing plate interceptor (CPI), and a design credited to the American Petroleum Institute (API). Most of the oil/grit separators that are promoted for use in reducing hydrocarbon loads in storm water are a modification of the API design, although there are appropriate applications for all three separator designs. Oil/grit separators based on the API design consist of three chambers. The first chamber removes coarse material and debris. The second chamber provides separation of oil, grease, and gasoline from the storm water runoff; and the third chamber provides a safety relief should a blockage occur.

Recent experiences have shown that, because of their volume limitations, oil/grit separators have limited pollutant removal effectiveness. They are perhaps the best example of a structural control that is only effective with frequent maintenance. Proper disposal of the standing water, trapped sediments, and floating hydrocarbons are problems in the few locations that have been studied.

Constructed Storm Water Wetlands

Constructed storm water wetlands are a hybrid, drawing on elements of detention and retention basins. Constructed storm water wetlands are shallow pools and are often designed to simulate the pollutant removal functions of natural wetlands. Enhanced designs may include a sediment forebay, carefully contoured topography, and multiple species of wetland plants. Constructed storm water wetlands, while a promising technology for pollutant removal from storm water, may not replicate all the ecological functions of natural wetlands.

6.4.1.2 Infiltration Controls

Infiltration controls rely chiefly on absorption to treat storm water discharges. In the ideal case, storm water percolates through a porous medium and into native soils where filtration and biological action remove pollutants Typical controls of this type include infiltration trenches, infiltration basins, filtration basins, porous pavement, and concrete or block pavers. Systems that rely on soil absorption work best in deep, highly permeable soils that

are at least four feet away from the seasonal ground-water table.

The Soil Conservation Service (SCS) classifies soils into four major soil groups A-D. The soil groups are as follows:

Group A: Sand, loamy sand
Group B: Sandy loam, loam
Group C: Silt loam, sandy clay loam
Group D: Clay loam, silty clay loam, sandy clay, silty clay, and clay

Soils in Group A provide the highest infiltration rate while soils in Group D provide the lowest Suitable soils for infiltration-type controls typically fall in soil groups A and B. Other types of soils may be suitable, provided the clay content does not exceed 30 percent (clay has very low hydraulic conductivity). The clay content of soil may be determined from the SCS soil textural triangle, which can be found in many civil engineering references texts

If suitable soils are available, the widespread use of infiltration in a watershed can be useful in helping to maintain, restore, or replicate pre-development hydrology. Specific benefits of infiltration often include increased dry-weather baseflow in streams and a reduction in the frequency of bankfull floods. However, infiltration systems are not recommended unless soil conditions warrant. Also, infiltration should not be used where ground water requires protection. For example, the use of infiltration-type controls may not be appropriate in areas that recharge sole source aquifers.

Infiltration Basins

Infiltration basins are areas that intercept incoming storm water runoff and temporarily store it until it gradually infiltrates into the soil surrounding the basin. Infiltration basins should be designed to control drainage areas ranging from about 5 to 50 acres. They also should drain within 48 to 72 hours to maintain aerobic conditions favoring bacteria that aid in pollutant removal, and to ensure that the basin is ready to receive the next storm The runoff entering the basin is usually pretreated to remove coarse sediment that may clog the surface soil pores on the basin floor. Concentrated runoff may flow through a sediment trap or by sheet flow (vegetative filter strip).

Infiltration Trenches

Infiltration trenches are shallow (e.g., 2 to 10 feet deep) excavated ditches or vaults that have been backfilled with a coarse stone aggregate. The aggregate forms an underground reservoir that has approximately 40 percent void space. Storm water runoff diverted into the trench gradually infiltrates from the bottom of the trench into the subsoil and eventually into the ground water. Variations in the design of infiltration trenches include dry wells and percolation pits that are designed to control small volumes of runoff, such as the runoff from a rooftop A more complex variation is the enhanced infiltration trench, which is equipped with filter fabric or a more extensive pretreatment system to remove sediment and oil. Depending on the quality of the runoff, pretreatment may be necessary to lower the failure rate of the trench. Infiltration trenches are generally best suited for drainage areas of less than 10 acres They are particularly applicable for use on residential lots, small commercial areas, down slope from parking lots, and under drainage swales.

Grassed Swales

A grassed swale is an infiltration method that is usually used as a form of pretreatment before discharging runoff to another storm water control device (e.g., a detention basin) However, the grassed swale itself is a control that can remove significant amounts of pollutants through sediment entrainment A grassed swale is a shallow, vegetated, man-made ditch with the bottom elevation above the water table to allow runoff to infiltrate into the ground water. The vegetation helps to

prevent erosion, filters sediment, and allows for some uptake of nutrients.

Porous Pavement

Porous pavement, which is basically traditional asphalt aggregate without the fine particles, is an alternative to conventional pavement. Proper design and application of this control can reduce or eliminate the need for curbs and gutters, storm drains and sewers, and offside controls. Instead, runoff is diverted through a porous asphalt layer into an underground stone reservoir. The stored runoff gradually exfiltrates out of the stone reservoir into the subsoil. Soil considerations are important when evaluating the appropriateness of this control. Generally, grades should be gentle, and subsoil should be at least 3 feet thick (to bedrock) and moderately permeable (capable of infiltrating about one half inch per hour). Because porous pavement tends to clog with fine sediments and because it loses its effectiveness under heavy loads, its application should generally be limited to low-traffic areas (e g., overflow parking areas) and areas that are not exposed to large bearing loads caused by heavy vehicles

Concrete Grid Pavement

Concrete grid pavement has concrete blocks with regularly interdispersed void areas that are filled with pervious materials, such as gravel, sand, or grass The blocks are typically placed on a sand or gravel base. They are usually designed to provide a load-bearing surface adequate for supporting vehicles, while allowing infiltration of surface water into the underlying soil

6.4.1.3 Filtration Controls

Filtration controls treat storm water flows by using vegetation or sand to filter and settle pollutants Generally, these controls are most effective before the flows become concentrated (e g sheet flow) In certain instances, infiltration and treatment in the subsoil also may occur through the processes of absorption and adsorption After passing through the filtration media, the treated water is usually directed to a stream or MS4, although it may be evaporated or percolated into the ground Filtration controls include filter strips, grass swales, and sand filters Sand filters are particularly useful for ground water protection Applicants must consider the influence of climate when they select vegetative systems

Vegetative Filter Strips

Vegetative filter strips (also called bio-filters) are vegetated sections of land designed to accept runoff as overland sheet flow from upstream development They may adopt any natural vegetated form, from grassy meadow to small forest. The dense vegetative cover facilitates sediment reduction and pollutant removal Filter strips cannot treat high-velocity flows Therefore, these strips generally have been recommended for use in agriculture and low-density development and other situations where runoff does not tend to be concentrated Unlike grassed swales, filter strips are effective only for overland sheet flow, as opposed to concentrated flow Grading and level spreaders can be used to reduce the energy of concentrated flows and distribute the runoff evenly across the filter strip Vegetative filter strips are often used as pretreatment for other structural practices, such as infiltration trenches Leaving a buffer of natural vegetation along an urban stream valley is an example of a vegetative filter strip and also an example of a nonstructural control

Filtration Basins

Filtration basins are usually small impoundments lined with filter media, such as sand or gravel Storm water drains through the filter media and perforated pipes into the subsoil For optimal pollutant removal, recommended detention times range from 24 to 48 hours with a maximum drainage area of about 50 acres Grassed swales or other structural controls can be used to filter coarse sediments and thereby minimize clogging of the filter medium

6.4.2 Maintenance Activities

After summarizing the location of major structural storm water controls, applicants must submit a description of maintenance activities and a maintenance schedule for structural controls to reduce pollutants.

> §122.26(d)(2)(iv)(A)(1) [The application must include a] description of maintenance activities and a maintenance schedule for structural controls to reduce pollutants (including floatables) in discharges from municipal separate storm sewers.

Typical maintenance requirements include:

- Inspection of basins and ponds after every major storm for the first few months after construction and annually thereafter,
- Mowing of grass filter strips and swales at the frequency necessary to prevent woody growth and promote dense vegetation,
- Regular removal of litter and debris from dry ponds, forebays, and water quality inlets,
- Periodic stabilization and revegetation of eroded areas,
- Periodic removal and replacement of filter media from infiltration trenches and filtration ponds,
- Deep tilling of infiltration basins to maintain infiltrative capability, and
- Frequent vacuuming or jet hosing of porous pavement or concrete grid pavements

Lack of maintenance often limits the effectiveness of storm water structural controls such as detention/retention basins and infiltration devices. Maintenance programs should address measures for catch basins and drainage channels in addition to major structural controls

The proposed program should provide for maintenance logs and identify specific maintenance activities for each class of control, such as removing sediment from retention ponds every five years, cleaning catch basins annually, and removing litter from channels twice a year. If maintenance activities are scheduled infrequently, inspections must be scheduled to ensure that the control is operating adequately. In cases where scheduled maintenance is not appropriate, maintenance should be based on inspections of the control structure or frequency of storm events If maintenance depends on the results of inspections or if it occurs infrequently, the applicant must provide an inspection schedule. The applicant should also identify the municipal department(s) responsible for the maintenance program.

Municipalities should use caution in adopting controls that do not have sufficient history of use for their performance characteristics and maintenance requirements to be adequately evaluated A good example is the oil/grit separator used on small commercial or retail sites Some municipalities have required the use of these technologies, but due to poor performance, municipalities have often rescinded the requirement. In these cases, it is not clear whether the control technology was ineffective or the maintenance program was flawed

Because maintenance is critical to successful program implementation, it must be considered throughout the term of the permit Applicants may wish to develop a matrix that identifies maintenance tasks on a timeline indicating criteria for inspection, repair, and replacement PERT charts, GANT charts, or other critical path analyses (available for personal computers) can help organize a maintenance program and schedule. For a summarized

listing of appropriate maintenance activities and schedules refer to the matrix in Exhibit 6-3.

6.4.3 Considerations for Planning and Siting Controls

The storm water management program should describe the criteria used to identify that a particular structural control is warranted and the circumstances under which it will be required. The possibilities for new control sites should be evaluated for their storm water quality control potential. Guidelines and performance standards that identify specific structural controls for new development should be proposed in the procedures for new development. From this evaluation, priorities based on the feasibility of implementing a particular control at a given location can be determined.

6.4.3.1 Use of Municipal Lands

Applicants should discuss existing major structural controls and sites that have the potential for new structural controls which could be installed on municipal lands and other major rights-of-way (e g, major roads and highways) Note that existing controls are identified in Part 1 applications [(§122 26(d)(1)(iii)(B)(5)] The location of publicly owned parks, recreational areas, and other open areas are also identified [§122 26(d)(1)(iii)(6)]

To determine what storm water quality controls are necessary for public lands and facilities, current activities and functions that may affect the quality of storm water discharges should be identified Such activities and functions include parks, trails, and other recreational land uses, road maintenance and snow management, and storage and repair yards/shops for municipal vehicles An inventory of public land uses may be necessary to help make determinations of what controls are needed An effective inventory should involve coordination among all of the local departments and agencies that have authority over the use of public lands and facilities

Opportunities for controlling storm water quality problems that are identified through the inventory process can be evaluated on a site-specific basis and included in the proposed management program

There are several benefits to the establishment of structural controls on municipal lands:

- Municipal lands often provide greater retrofit opportunities because they typically do not require additional property purchases;
- Municipal lands ensure opportunities to provide future maintenance and security in preservation of the retrofit control,
- Applicants may be able to adapt existing municipal functions (such as industrial pretreatment program implementation, fire-safety inspections, and flood-control activities) to address storm water quality concerns (Expanding their mission to address storm water concerns may be more cost-effective than initiating entirely new programs.),
- Applicants may be able to adapt functions of development on municipal lands (such as planning, zoning, and construction oversight functions), and
- After considering controls on municipal lands, the applicant will be in a better position to address the private land under its jurisdiction

As a precaution, however, applicants need to consider potential conflicts arising over the multiple use of public lands Criteria other than land ownership (e g, locating controls downstream of developed areas) also should be considered when deciding where to locate storm water runoff controls

6.4.3.2 Use of Private Lands

A municipality also may incorporate storm water quality controls into its land use plan to indicate controls that may be necessary for new development Some of the best opportunities to prevent pollution and to implement effective storm water quality controls occur during development Local governments typically play a strong role in overseeing new development and have, or can adapt, administrative infrastructure to address storm water quality concerns.

The storm water management process should begin with land use planning and zoning and continue through the development and redevelopment processes. Municipalities generally can obtain commitments from land developers more easily prior to relinquishing jurisdictional leverage over the parcel where the potential control is to be located Leverage can be achieved through plan approval or zoning changes The negotiation process for the dedication, condemnation, or other acquisition of land and the process for getting the land developer to construct or otherwise implement controls will vary dramatically among municipalities, particularly among those in different States

Source and structural controls are most cost-effective when development is planned with storm water quality controls in mind However, it is probably more appropriate for the municipality to propose a flexible plan that specifies a variety of program objectives through the development process rather than identifying a certain priority and rigid schedule Other benefits of early and flexible planning include ecological diversity, wetlands preservation, and the creation of controls that also function as amenities Comprehensive land use plans zoning ordinances, and subdivision ordinances are important mechanisms to implement these controls early in the development process Consideration of storm water quality during pre-development is one of the most effective ways to implement controls This is because the maximum flexibility (and opportunity) to incorporate BMPs exists prior to final land use decisions and construction activities (see Section 6.3 1 1)

6.4.3.3 Siting Considerations

Imperviousness

The degree of imperviousness affects the concentration of pollutants in storm water, which in turn affects the type of structural controls that may be necessary. As the imperviousness of an area increases, the runoff volume and the pollutant loading increase. Studies show that runoff from industrial areas, which generally have a high degree of imperviousness, can have a wider variety and greater concentration of pollutants than runoff from other land uses Recent studies also indicate that the degree of imperviousness can be inferred from the level of degradation in urban receiving streams (For example, see Schueler 1991 and Klien 1979) Population projections will not indicate the degree to which industrial land use will increase unless planning and zoning information is also considered

Soil Conditions

Controls designed to infiltrate storm water will be affected by site specific soil conditions For example, clay content of the soil and the antecedent moisture content (degree of soil saturation at the time of a given storm event) will strongly influence the effectiveness, and therefore the applicability, of infiltration controls for a given location

6.5 PROGRAM AND SCHEDULE TO DETECT AND REMOVE ILLICIT DISCHARGES AND IMPROPER DISPOSAL

NPDES permits for discharges from MS4s require effective detection and removal from the MS4 of illicit or improper discharges and disposal

> §122 26(d)(2)(iv)(B) [The application must include a] description of a program, including a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer

The NURP study concluded that the quality of urban runoff can be adversely impacted by illicit connections and illegal dumping. Often, large amounts of wastes, particularly used oils, are improperly disposed of in storm sewers. Elimination of these sources of pollutants would result in a dramatic improvement in the quality of storm water discharges from MS4s. Procedures to eliminate such discharges should be an important part of the proposed management program.

The regulatory requirement cited above is intended to directly implement the mandate of Section 402(p)(3)(B)(ii) of the CWA, which requires permits for MS4s to effectively prohibit non-storm water discharges into storm sewers In certain instances, the most appropriate action will be for the municipality to ensure that illicit discharges become covered by a NPDES permit However, in most cases, elimination of illicit discharges or improper dumping is the appropriate focus of this program component The quality of storm water runoff from inner-city core areas, particularly in older parts of the country, would benefit most from this component

The applicant should propose a schedule for implementing this program component throughout the initial permit term This schedule should reflect the priorities identified by the municipality during the application process and be based on the problems particular to the specific MS4

6.5.1 Prohibiting Illicit Discharges

The proposed management program must include a description of inspection procedures, orders, ordinances, and other legal authorities necessary to prevent illicit discharges to the MS4.

> §122.26(d)(2)(iv)(B)(1) [The application must include a] description of a program, including inspections, to implement and enforce an ordinance, orders or similar means to prevent illicit discharges to the municipal separate storm sewer system; this program description shall address all types of illicit discharges, however the following category of non-storm water discharges or flows shall be addressed where such discharges are identified by the municipality as sources of pollutants to waters of the United States . . . . *[these sources are listed in the guidance].*

This proposed management program component also should describe how the prohibition on illicit discharges will be implemented and enforced. The description should include a schedule and allocation of staff and resources A direct linkage should exist between this program component and the adequate legal authority requirements for the ordinances and orders to effectively implement the prohibition of illicit discharges

While this program component is required to prohibit all types of illicit discharges, the following categories of non-storm water discharges need only be prohibited by the MS4 when they are identified by the MS4 as sources of pollutants to waters of the United States:

- Water line flushing
- Landscape irrigation
- Diverted stream flows
- Rising ground waters
- Uncontaminated ground water infiltration [as defined at 40 CFR 35.2005(20)] to separate storm sewers
- Uncontaminated pumped ground water
- Discharges from potable water sources
- Foundation drains
- Air conditioning condensation
- Irrigation water

- Springs
- Water from crawl space pumps
- Footing drains
- Lawn watering
- Individual residential car washing
- Flows from riparian habitats and wetlands
- Dechlorinated swimming pool discharges
- Street wash water

While EPA does not consider these flows to be innocuous, they are only regulated by the storm water program to the extent that they may be identified as significant sources of pollutants to waters of the United States under certain circumstances. If an applicant knows, for example, that landscape irrigation water from a particular site flows through and picks up pesticides or excess nutrients from fertilizer applications, there may be a reasonable potential for a storm water discharge to result in a water quality impact. In such an event, the applicant should contact the NPDES permitting authority to request that the authority order the discharger to the MS4 to obtain a separate NPDES permit (or in this case, the discharge could be controlled through the storm water management program of the MS4)

The applicant should consider the specific land use, age, and stage of development in this program component. For example, one study in an established metropolitan area found that 60 percent of automobile-related businesses had improper storm drain connections. While some of the problems discovered in this study were the result of improper plumbing or illegal connections to storm drains, the majority of the connections were approved by the municipality when they were built

For problem identification and problem-solving, a municipality may elect to implement a follow-up study that traces identified pollution incidents to their source (e.g , up the system) A variety of pollutant-tracing techniques and field screening can be used to identify illicit discharges

6.5.2 Field Screening

Part 1 of the application requires applicants to submit the results of field screening studies to evaluate the possible occurrence of illicit connections and improper dumping [§122 26(d)(1)(iv)(D)]. Dry weather flows that were encountered during the initial field screening were sampled and analyzed. The analysis was intended to provide information about illicit connections and improper dumping.

In Part 2, applicants are required to propose procedures for continued field screening during the term of the permit.

> §122 26(d)(2)(iv)(B)(2) [The application must include a] description of procedures to conduct on-going field screening activities during the life of the permit, including areas or locations that will be evaluated by such field screens

Applicants can propose to use procedures similar to those used for field screening required in Part 1 of the application or they can propose alternative procedures and techniques. The Part 1 field screening requirements are found in §122.26(d)(1)(iv)(D) and are explained in the Part 1 guidance manual

The Part 2 proposed field screening program component should describe areas of the system where the continuation of the field screening program will be conducted and the rationale for selecting these areas For example, the rationale for continuing field screening at a given location might be that a wide variation in results was obtained during the initial screens In addition, the applicant should propose field screening for a portion of any recently-identified major outfalls that were not known to the applicant when it prepared its Part 1 application, provided sampling of these outfalls is safe and practicable

The potential for illicit discharges and improper disposal is generally higher for areas of older development, areas with many automobile-related industries, and areas with significant numbers of heavy industrial facilities Therefore, in most cases applicants should include these areas in the proposed field screening program.

The description of the field screening component should provide a detailed summary of the departmental responsibility for field activities, frequency of inspections, procedures and equipment to be used, and the procedures for documenting field activities, both in the field and in the office. Generally, the Part 2 field screening program should reflect a continuously narrowing process to trace illicit and improper sources.

6.5.3 Investigation of Potential Illicit Discharges

In order to submit a comprehensive proposed management program, applicants are required to describe procedures for investigating portions of the municipal system where field screening or other information indicates a reasonable potential for illicit discharges

> §122 26(d)(2)(iv)(B)(3). [The application must include a] description of procedures to be followed to investigate portions of the separate storm sewer system that, based on the results of the field screen, or other appropriate information, indicate a reasonable potential of containing illicit discharges or other sources of non-storm water (such procedures may include sampling procedures for constituents such as fecal coliform, fecal streptococcus, surfactants (MBAS), residual chlorine, fluorides and potassium, testing with fluorometric dyes, or conducting in storm sewer inspections where safety and other considerations allow Such description shall include the location of storm sewers that have been identified for such evaluation)

Applicants should propose criteria to identify portions of the system where follow-up investigations are appropriate For example, calculating a frequency distribution of dry weather flows at each screening site could aid in establishing criteria to identify where follow-up investigations are appropriate.

Procedures to investigate priority locations for illicit connections include inspection of the storm sewer system, use of remote-control cameras, on-site inspections and dye-testing at priority or suspect facilities, and additional discharge monitoring to pinpoint pollutant sources. In some cases, these investigations may be coordinated with pretreatment program inspections. Such approaches are summarized in Exhibit 6-4. Coordinating inspections can be a very effective use of resources. For example, portions of the sanitary sewer system that need evaluation to detect illicit discharge may already be undergoing inspection by operators of the municipal treatment plant.

A checklist should be developed for inspectors to use to detect illicit connections. The checklist should be structured to ensure a comprehensive evaluation of the problem and stipulate the use of the easiest and least expensive detection methods first

Regardless of the format in which information is compiled (e.g., table, list, text description), EPA suggests that the applicant prepare a map identifying the location of suspected problem areas. The map should be provided as part of the Part 2 application.

The proposed program component description should describe a step-by-step process to investigate, identify, and prohibit illicit discharges If field screening leads to positive tests of fecal coliform, fecal streptococcus, surfactants, residual chlorine, fluorides, or potassium, a municipality should reconsider whether any of the non-storm water discharges described in Section 6.5.1 are the source (see previous section)

Exhibit 6-4
Sample Illicit Discharge Investigation Procedures Options

Results of Initial Field Screen	Procedures for Detailed Analysis	Comments
Plumbing unidentifiable	Cameras	Effective for identifying deterioration
Uncertain use of facility	On-site inspections	May be combined with other inspections
Several facilities or complex plumbing	Dye-testing	Simple and accurate if system not interconnected
Unusual pollutants	Monitoring	Particularly useful for fingerprinting

6.5.4 Spill Response and Prevention

The proposed management program must describe procedures that the municipality will implement during the term of the permit to prevent contain, and respond to spills that may discharge into the MS4

> §122 26(d)(2)(iv)(B)(4) [The application must include a] description of procedures to prevent, contain, and respond to spills that may discharge into the municipal separate storm sewer

The municipality and the property owners (and/or operators) of sites where spills may occur need to implement procedures to prevent, contain and respond to spills One way to implement these procedures is to modify the land use planning process and ordinance enforcement Such modifications would require notification and emergency preparedness procedures for any land use activity that could lead to leaks and spills Another method is to coordinate with on-going programs in other regulated areas where detection of spills is important, such as pretreatment and hazardous materials management. The goal of a spill-prevention program is to reduce the frequency and extent of spills of hazardous materials, oils, and other materials which can cause water quality impairment. Spill-containment programs may establish minimum chemical storage and handling requirements, require users to submit prevention and control plans, and ensure site inspections The content of the descriptions that should be submitted with the Part 2 application for each of these program elements is discussed in more detail below

Spill-response programs are intended to reduce risk to the public and the environment Although these programs tend to focus on issues of public health and safety, such as exposure to toxic materials, fires, or explosions, spill-response teams should attempt to prevent or minimize contamination of surface water, ground water, and soil. Spill-response programs often require a coordinated response from a number of municipal departments (e.g., fire, police, health, and public works). Municipalities should describe how response procedures within these programs attempt to mitigate potential pollutant discharges to surface waters

For example, some industrial pretreatment programs specifically require that leaks or spills be routed to the storm sewer rather than the sanitary sewer generally to protect worker health and safety and to protect biological treatment capabilities This issue serves to reinforce the need for coordination between the various municipal programs that are related in some way to storm water.

The proposed program should identify the municipal departments responsible for implementing the program, and also should address employee training, reporting procedures, containment of spills, storage and disposal activities, documentation, and follow-up procedures Generally, the proposed program for spill response and prevention should focus on good housekeeping and materials management practices, which are discussed in more detail below.

One of the initial elements in the development of a successful spill response and prevention program is to assess the potential of various sources at a particular property to contribute pollutants to the storm water discharges from the site This assessment should inventory the land use, types of materials handled, and the location and types of materials management activities. Factors to consider when evaluating the pollution potential of runoff from various portions of a site include those that are likely to lead to the identification of specific structural or nonstructural controls to address problems

Other factors to consider are the toxicity and quantity of any chemicals used, produced, stored, or discharged from the site, the history of any NPDES permit violations from a site, history of significant leaks or spills of toxic or hazardous pollutants, and the designated uses of the receiving waters

This program element should also include a description of storm water management controls that are appropriate for the site that would control or allow for the mitigation of any leak or spill and a proposal to implement such controls. The priorities developed in the implementation proposal should reflect the nature of identified sources of pollutants at the site

The description of spill response and prevention activities should include the steps a municipality will take to prevent, and when necessary, adequately respond to spills discharged to its MS4. The MS4 might identify special training requirements for municipal employees in order to respond to spills of hazardous chemicals from a particular facility into the storm sewer system.

Sources with the greatest potential for spills to occur (or cause the most severe damage) should be identified in the proposed storm water management program If appropriate, specific materials handling procedures and storage requirements should be identified for these sources Requirements for these sources could be modeled after the Spill Prevention, Control, and Countermeasure (SPCC) Plans that are required for certain facilities under Section 311 of the CWA

Under the SPCC program, for example, personnel are trained and given responsibility for inspecting the facility for leaks and spills. These inspections include equipment and materials handling areas, which need to be investigated for evidence of, or the potential for, pollutants entering the drainage system Procedures to ensure the availability of appropriate personnel and equipment for cleaning up spills must be identified A system to ensure that appropriate corrective action has occurred in response to inadequacies identified during the inspection is also established under the program.

Not all of the SPCC program elements may be necessary for municipal applicants However, EPA recommends that the proposed storm water management program describe how the records of inspections will be maintained and made available for investigations of causal factors and program effectiveness Incidents of leaks, spills, and

improper dumping, along with other information describing the quality and quantity of storm water discharges should be included in the records Inspections and maintenance activities, such as containment berm integrity testing or the cleaning of oil/water separators should be documented and recorded in a maintenance log

6.5.5 Public Awareness and Reporting Program

Applicants must propose a management program component that promotes, publicizes, and facilitates public reporting of illicit discharges or water quality impacts associated with discharges from MS4s

> §122 26(d)(2)(iv)(B)(5) [The application must include a] description of a program to promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges from municipal separate storm sewers

Timely reporting by the public of improper disposal and illicit discharges are critical components of programs to control such sources.

To enhance public awareness, programs may include setting up a public information hotline number, educating school students, establishing community and volunteer "watchdog" groups (e g , "Adopt-a-Stream Program"), using inserts into utility bills; and newspaper, television and radio announcements to inform the public about what to look for and how to report incidents The public awareness efforts should clarify to the public that they are the ultimate beneficiaries of a successful storm water management program

6.5.6 Proper Management of Used Oil and Toxics

EPA estimates that annually, 267 million gallons of used oil, including 135 million gallons of used oil from do-it-yourself automobile oil changes, are disposed of improperly An additional 70 million gallons of used oil, most coming from service stations and repair shops, are used for road oiling (55 FR 48056, November 16, 1990). If private individuals find the proper disposal of used oil or toxic materials difficult, incidents of improper disposal increase For example, when a large fraction of service stations do not accept do-it-yourself used oil, improper disposal into the municipal storm sewer rises. Therefore, applicants are required to propose a program component that will facilitate the proper disposal of used oil and toxics from households by establishing municipally operated collection sites, or ensuring that privately-operated collection sites are available.

> §122.26(d)(2)(iv)(B)(6) [The application must include a] description of educational activities, public information activities, and other appropriate activities to facilitate the proper management and disposal of used oil and toxic materials

The proposed program should describe outreach plans to handlers of used oil and to the public, and operating plans for oil and household waste collection programs.

Examples of effective public outreach for these types of programs include dedicated municipal phone numbers (e.g , a used oil/toxic materials hotline), pamphlets, and requirements that oil retailers post the location of the nearest used oil collection facility. Programs can also inform the public about alternatives to toxic materials. Catch basin/storm sewer inlet stenciling programs can also be proposed as part of the program to increase public awareness of the connection between storm sewers and local water resources

6.5.7 Infiltration of Seepage

In order to effectively complete this portion of a proposed management plan, the applicant must describe controls to limit infiltration of seepage from municipal sanitary sewers to MS4s, if necessary.

> §122.26(d)(2)(iv)(B)(7). [The application must include a] description of controls to limit infiltration of seepage from municipal sanitary sewers to municipal separate storm sewer systems where necessary.

Raw sewage can seep from sanitary sewage collection systems through leaks and cracks in aging pipes, poorly constructed manholes and joints, and main breaks. Sewage from a leaky sanitary system can flow to storm sewers or contaminate ground water supplies. Interaction between sanitary sewers and separate storm sewers may occur at manholes and where sanitary sewer laterals and storm sewer trenches cross. Separate storm sewers and sanitary sewers may share the same trench, which is generally filled with very porous material such as gravel.

One indication of seepage from a sewage collection system may be infiltration of water. Often, the rate of exfiltration (seepage) from sanitary collection systems is significantly greater than the rate of infiltration into the system. An EPA study on sewer exfiltration found significant ratios of the rate of exfiltration of sewage to the rate of infiltration of ground water or storm water into sanitary sewers. Field and laboratory results found this ratio to vary between 1.5 to 1 and 14 to 1.

In some cases, preventive maintenance surveys or on-going infiltration and inflow (I&I) programs to determine where water is entering a sanitary sewer system may be modified to locate the source and fate of exfiltration from the system

Identifying infiltration of seepage into a MS4 is a good example of the need for various municipal functions to be effectively coordinated. Proposed storm water management programs might discuss how personnel responsible for inspections of the sanitary sewer system could inspect for sources of exfiltration during I&I inspections, and pass any findings to personnel responsible for maintaining the MS4. If seepage is believed to be a problem, a coordinated effort with the maintenance department of the municipal sanitary sewer system is recommended.

The proposed storm water management program also should include provisions to address the discovery of previously unknown problems. There should be procedures to enact a coordinated program between the operators of the storm sewer and sanitary sewer (which in many cases will be within the same municipal agency or department).

EPA recommends that the proposed storm water management program describe controls that will be used to address seepage from malfunctioning septic systems in areas not served by a sewage treatment works. Malfunctioning septic systems may lead to more significant surface runoff pollution problems than ground water problems. A malfunctioning septic system is less likely to cause ground water contamination where an impervious bacterial mat in the soil retards the downward movement of wastewater. (Poorly located septic systems that are operating properly are the greatest threat to ground water).

Surface malfunctions of septic systems are caused by clogged or impermeable soils, or when stopped up or collapsed pipes force untreated wastewater to the surface. Surface malfunctions can vary in degree from occasional damp patches on the surface to constant pooling or runoff of wastewater to a storm sewer. An improper remedy for a surface malfunction is to install a pipe or trench over soil absorption systems to route untreated overflow away from the septic

system. This results in direct discharges to drainage ditches, empty lots, or surface waters

Proper controls range from prescribing maximum intervals between tank pump-out to the installation of sand filters. Discharge from sand filters to surface waters may require a separate NPDES permit, because such discharge is not storm water.

Additional information about the most appropriate controls for use in correcting malfunctioning septic systems is probably best obtained from local or regional sources. Organizations such as extension services, soil and water conservation districts, and planning agencies may be good sources of information about methods that have been successful (and also those that have failed).

By obtaining this type of information, the applicant can determine what control techniques have been successful in correcting malfunctioning septic systems in similar types of soils The value of this approach is that the applicant will know that a certain control technique has been used to correct a malfunctioning septic system in the same types of soils that occur in the municipality. Where only part of the MS4 drainage area is served by septic systems, proposed programs should address setting and maintenance of septic systems, including draft requirements and implementation procedures.

6.6 SIGNATORY AND CERTIFICATION REQUIREMENTS

Under the Federal NPDES regulations [§122 22(a)], all NPDES permit applications (including municipal storm water permit applications) must be signed by an authorized person, as defined in the regulations Permit applications submitted by a municipality, State, Federal, or other public agency must be signed by either a principal executive officer or ranking elected official [§122 22(a)(3)] To fulfill the signatory requirements, the person signing the municipal application must provide his or her name (printed or typed), title, and date signed In addition, the applicant should provide the name, address, and telephone number of the person signing the application or another point of contact that can answer questions about the application.

In addition, §122.22(d) states that any person signing a permit application must make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations"

6.7 IMPLEMENTATION OF THE STORM WATER PROGRAM

EPA anticipates that municipal storm water management programs will mature over time to reflect advances in technology, additional data collection, changing conditions, program development, stage of implementation, and improvements in water quality. Therefore, applicants may emphasize different program components to reflect implementation priorities. The proposed management program should clearly identify each of the program components and include a schedule for implementation. Each component of the Part 2 application should be classified as: full implementation, phased implementation, pilot study, or feasibility analysis In annual reports on the progress of storm water management programs, municipalities must report on the status of implementing program provisions [§122 42(c)(1), or Section 7.3 of the guidance].

- **Full Implementation.** Fully implemented components should be proposed when the municipality is

prepared to begin or continue full implementation after its permit is issued and it expects to continue the component throughout the life of the permit. Full implementation of a program component is generally the preferred way of demonstrating the required level of control.

- **Phased Implementation.** Phased implementation should be proposed when the level of effort to implement the component will vary during the term of the permit. Phased implementation may be appropriate when additional data must be collected or technical guidance, training materials, or appropriate ordinances must be developed prior to full implementation. A schedule that includes milestones should be part of the description.

- **Pilot Studies.** Although the municipality must implement and comply with *each* provision of the municipal storm water permit, the municipality may choose to carry out pilot studies that involve limited experimental implementation of a program component. In some cases, pilot studies may be authorized by the permit. Used to evaluate the effectiveness of a program component, pilot studies may be appropriate when a technology is unproven or when data must be collected to develop operating standards or procedures. A schedule including milestones should be included in the description of a pilot study. This schedule should provide options for phased implementation of the program component, showing alternatives based on various possible results of the pilot study.

CHAPTER 7
ASSESSMENT OF CONTROLS

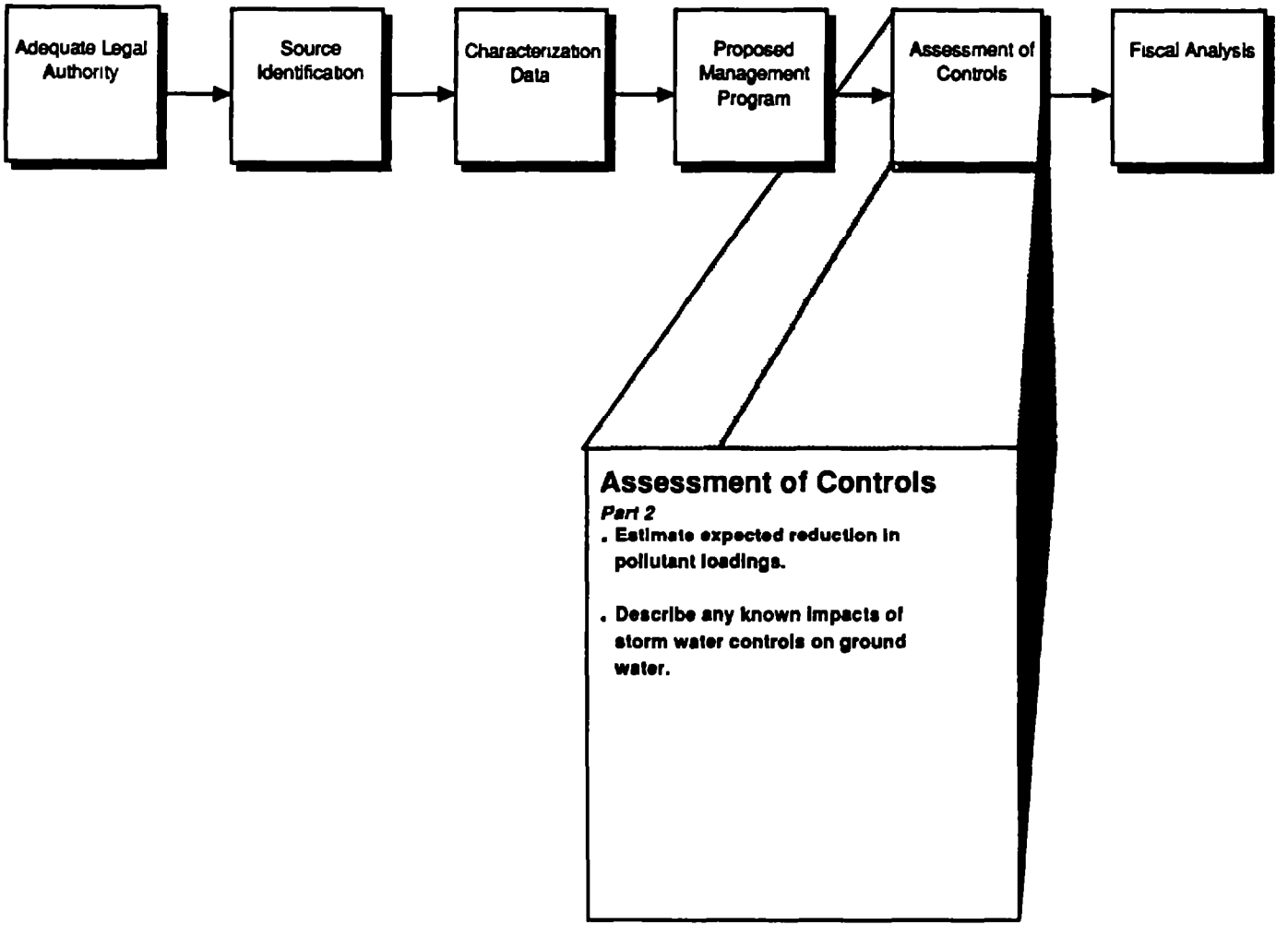

7.0 ASSESSMENT OF CONTROLS

7.1 BACKGROUND

Part 2 applications require that municipalities estimate the effectiveness of their proposed storm water quality management programs The regulations require an initial estimate or assessment because the performance of appropriate management controls is highly dependent on site-specific factors Program effectiveness can be estimated through both direct measurements (such as reductions in annual pollutant loads) and indirect measurements (such as measurements that demonstrate increased public awareness of storm water quality issues) At a minimum, applicants must submit estimated reductions in pollutant loads expected to result from implemented controls and describe known impacts of storm water controls on ground water

> 122 26(d)(2)(v) *Assessment of controls* [The application must include] estimated reductions in loadings of pollutants for discharges of municipal storm sewer constituents from municipal storm sewer systems expected as the result of the municipal storm water quality management program The assessment shall also identify known impacts of storm water controls on ground water

Reductions in pollutant loads due to the implementation and maintenance of structural controls provide direct measurements of the effectiveness of the storm water management program In addition, EPA encourages applicants to go beyond the minimum requirement and assess the effectiveness of their storm water management program through other direct measurements as well as indirect measurements As discussed below, indirect measurements provide surrogate estimates of qualitative factors, such as increased public awareness of storm water quality issues

Estimates of the effectiveness of the storm water management program will assist the municipality and the permit writer in:

- Determining whether the most cost-effective best management practices (BMPs) are included in the storm water management program;
- Ensuring that the storm water management program includes adequate public participation programs and intergovernmental coordination,
- Establishing on-going monitoring inspection and surveillance programs that help refine estimates of program effectiveness, and
- Developing a strategy to evaluate progress toward achieving water quality goals

7.2 ASSESSMENT OF STORM WATER MANAGEMENT PROGRAM

For some components of a proposed storm water management program, such as structural controls (e g , vegetative streambank stabilization, sediment pond or basin, etc.), the effect on pollution in storm water runoff is observable, and pollutant removal efficiencies can be estimated directly For other components, pollutant reductions may be difficult to quantify Applicants may need to use indirect estimates. For example, a program component may address source controls such as changing the behavior of citizens in the community, or improving the municipal control of industrial or commercial runoff For

components of the proposed management program where pollutant removal efficiency cannot be reasonably estimated, applicants are strongly encouraged to identify some indirect measurement that can be used to evaluate the success of the practice

7.2.1 Direct Measurements of Program Effectiveness

As discussed above, 40 CFR 122.26(d)(2)(v) requires that applicants submit estimates of expected pollutant load reductions with their Part 2 applications To supplement these estimates, applicants could provide estimates of other direct measurements of program effectiveness including

- Removal efficiencies of BMPs that control storm water quality,
- Reductions in the volume of storm water discharged,
- Reductions in event mean concentrations or
- Reductions in seasonal pollutant loadings

Such direct estimates do not have to be verified with quantitative data, but can be based on accepted engineering design practices However the applicant should describe its procedures for estimating the effectiveness of the control Applicants should present estimates of pollutant load reductions or other measurements separately for each component of the proposed management program Applicants should provide estimated reductions on a watershed basis and system-wide basis

Reductions in pollutant loadings can be estimated by first estimating the pollutant loading (based on concentrations and flows) that would result without the control measure The value should then be multiplied by the efficiency of the control expressed in terms of a fraction or percentage. Estimated control efficiencies can be obtained from published sources, such as Schueler (1987) (see bibliography in Appendix A) Note that for most control measures, the pollutant removal efficiency differs for different classes of pollutants

After the municipality's storm water management program is implemented, the municipality can work to refine its initial assessment of the program. For example, the permit will require applicants to submit estimates of event mean concentrations and estimates of annual pollutant loadings for each outfall in the system [§122.26(d)(2)(iii)(C), discussed in Section 5.5 of this guidance]. These estimates can be compared with the applicant's initial estimates

In addition, the estimated removal efficiencies can be refined through the monitoring program required by §122.26(d)(2)(iii)(D) (discussed in Section 5.6 of this guidance) To refine these estimates, the monitoring program should include measurements at the inflow and outflow points of the control Throughout the permit term, the municipality must submit refinements to its assessment or additional direct measurements of program effectiveness in its annual report (Section 7 3)

The applicant should use direct measurements of program effectiveness as it begins to assess its long-term progress in improving water quality through storm water management practices Direct measurements of program effectiveness may not provide meaningful conclusions on trends in water quality improvements for a couple of permit terms. However, applicants are encouraged to use direct measurements of program effectiveness, such as annual pollutant loads, event mean concentrations, and seasonal pollutant loadings, to begin to estimate long-term trends Several statistical methods that rely on linear regression have been developed

to model these measurements to determine if trends exist

7.2.2 Indirect Measurements of Program Effectiveness

When pollutant reductions cannot be estimated through direct measurement, appropriate indirect measurements may be used. These may include the estimated level of increased enforcement activity, increased public awareness, or reduction in number of illegal dumping incidents For example, a field screening program to identify illicit connections and improper dumping in Fort Worth, Texas, used reductions in observations of indicator pollutants as a measure of the success of the program (Fort Worth, 1988).

Other possible indirect measurements include.

- Gallons of used oil recycled,
- Amount of household hazardous waste collected,
- Number of educational brochures on storm water quality distributed;
- Number of public hearings on storm water and attendance at these hearings,
- Circulation of an annual report or periodic newsletters on progress in meeting storm water quality goals,
- Number of reports of illicit discharges or illegal dumping
- Number of spill clean-ups,
- Number of sewer inlets stenciled,
- Acres of open space,
- Number of construction and erosion and sediment control plans submitted and approved

Many of these indirect measurements will help to indicate whether the storm water management program includes adequate public participation and intergovernmental coordination.

7.2.3 Impacts of Storm Water Controls on Ground Water

Structural BMPs may have an impact on other media. Therefore, the Part 2 application requires that applicants discuss known impacts of storm water controls on ground water. Impacts should be identified separately for each component of the proposed management program. These controls may increase the quantity of ground water (such as infiltration leading to recharge), but degrade the quality of the ground water For example, in and parts of the Southwest, imported water is often used for irrigation. This increases the quantity of ground water, but, because of high levels of nutrients and total suspended and dissolved solids in the irrigation water, also results in impacts on ground water quality

In addition, the applicant should evaluate whether structural controls for storm water impact other media, such as wetlands

7.3. ANNUAL REPORTS ON THE EFFECTIVENESS OF THE STORM WATER MANAGEMENT PROGRAM

Under §122.42(c), applicants must provide annual reports on the progress of their storm water management programs. These reports, which are due on the anniversaries of permit issuance, must include

- The status of implementing the components of the storm water management program that are required by the permit,
- Proposed changes to the storm water management programs that are established as permit conditions,

- Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application;
- Summary of data, including monitoring data, that are accumulated throughout the reporting year,
- Projected annual expenditures and budget for the year following each annual report;
- A summary describing the number and nature of enforcement actions, inspections, and public education programs; and
- Identification of water quality improvements or degradation

Applicants should refer to the specific regulatory language in §122 42(c) for a more complete discussion of annual reporting requirements

Although the Part 2 application requirements do not specifically address annual reporting requirements, applicants should consider their strategy for preparing annual reports when they complete their Part 2 applications. A municipality may develop a strategy to assess the progress of its storm water management program throughout the term of the permit in addition to providing a baseline assessment of its program. To develop the strategy, applicants should

- Identify the direct or indirect measurements that will be used to track the long-term progress of the applicant's program towards achieving improvements in storm water quality (the results of this assessment would appear in the municipality's annual report);
- Discuss the role of monitoring data in substantiating or refining their assessment of the progress of their program towards established objectives and goals; and
- Discuss how future additions or revisions to the assessment measurements or strategy will be implemented by the municipality (e.g, what roles and responsibilities will participating municipal agencies and/or organizations have in this area)

It is anticipated that many municipalities will use the same criteria or measurements that were used in the baseline assessment to develop their long-term assessment strategy. This is an acceptable approach provided that the municipality delineates how their program provides for a longer term assessment of the progress of their storm water management program The municipality is encouraged to consider in advance the information requirements for annual reporting that are identified above when developing their long-term assessment strategy

CHAPTER 8
FISCAL ANALYSIS

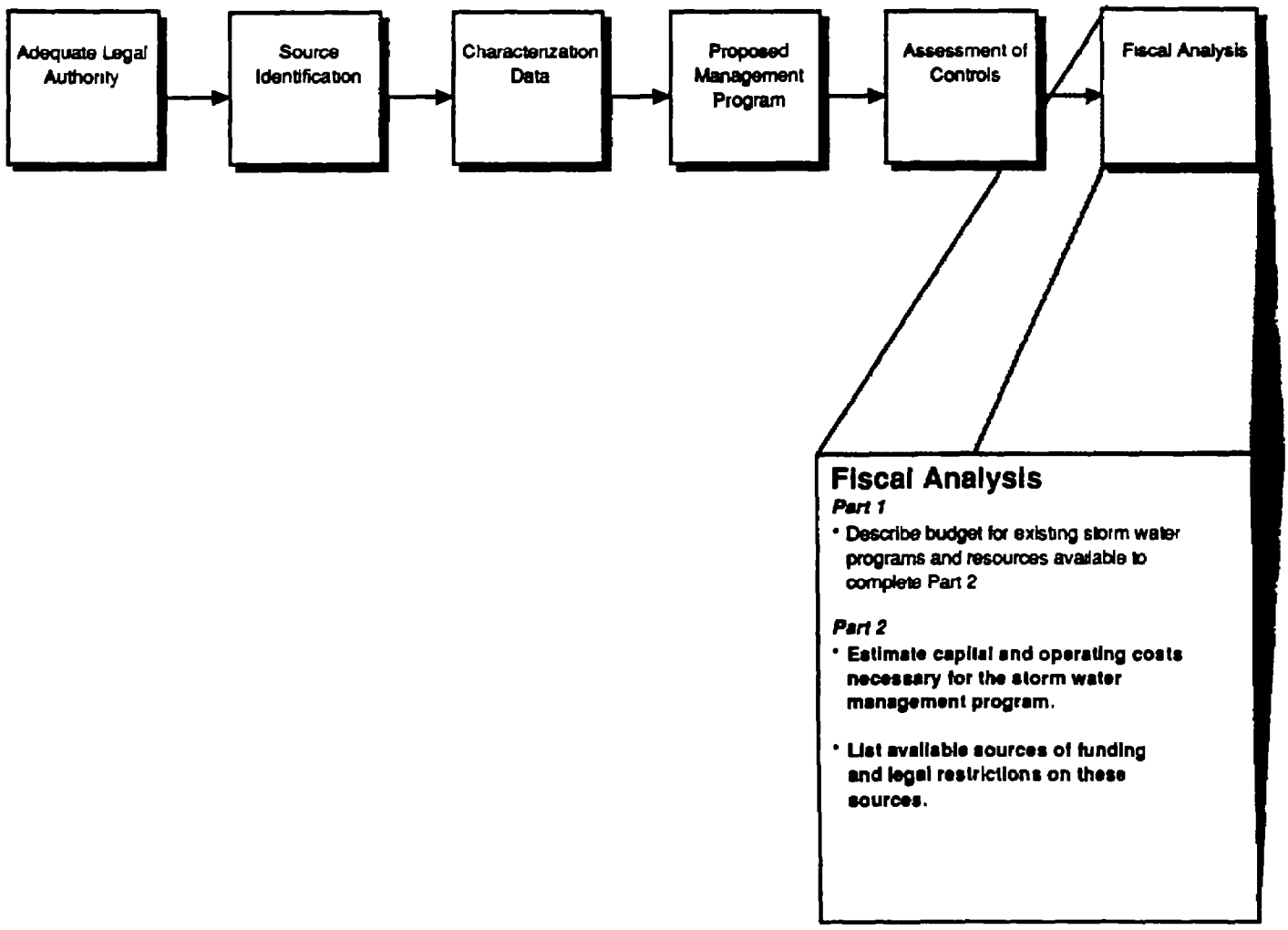

8.0 FISCAL ANALYSIS

8.1 BACKGROUND

NPDES permits for discharges from MS4s will require municipal permittees to implement management programs, conduct long term storm water monitoring, and provide other information Because these activities will result in expense to the municipality, a fiscal analysis is required in the Part 2 application

Applicants must provide yearly cost estimates for these programs. Applicants also must provide a schedule indicating when funds will be available Examining the levels of proposed spending and funding allows the permitting authority to gauge the ability of the applicant to implement the program and predict its effectiveness The fiscal analysis also will help the permit writer determine whether the applicant has met the statutory requirement of reducing the discharge of pollutant to the MS4 to the maximum extent practicable Finally, the estimates help the applicant evaluate the feasibility and cost-effectiveness of its program A municipality must update its fiscal analysis each year for the annual report on the progress in implementing their storm water management program [40 CFR 122 42(c)(3) and (5), discussed in Section 7.3 of this guidance]

8.2 PROCEDURE FOR CONDUCTING A FISCAL ANALYSIS

Under §122 26(d)(2)(vi), each applicant must demonstrate sufficient financial resources to implement the conditions of the permit

Adequate resources may be demonstrated by performing a fiscal analysis of the estimated capital and operation and maintenance expenditures required to complete the activities required by the regulations This fiscal analysis must be performed for each fiscal year to be covered by the permit (5 years, in most cases). The analysis must describe the source of the funds used to meet the necessary expenditures, including any legal restrictions on the appropriated funds

> **§122.26(d)(2)(vi)** [The application must include] for each fiscal year to be covered by the permit, a fiscal analysis of the necessary capital and operation and maintenance expenditures necessary to accomplish the activities of the programs under paragraphs (d)(2)(iii) and (iv) of this section. Such analysis shall include a description of the source of funds that are proposed to meet the necessary expenditures, including legal restrictions on the use of such funds

The following procedure is an example of a method of conducting the necessary fiscal analysis

Step 1. Identify the major tasks for each component covered by this application requirement, including

- Elements of the proposed management program,
- Estimates of seasonal loads and event mean concentrations for each major outfall covered by the permit, and
- Proposed monitoring program.

Step 2. Develop a schedule outlining when each of the tasks identified in Step 1 will be undertaken Some tasks may be performed just once, others may be on-going For example, the schedule should include, among other things·

- The installation of any new control measures identified in the proposed

management program [§122 26(d)(2)(iv), discussed in Section 6 4],

- A maintenance schedule for structural best management practices (BMPs) [§122 26(d)(2)(iv)(A)(1), discussed in Section 6 4.3];

- Development of seasonal pollutant loadings and event mean concentrations of a representative storm [§122.26(d)(2)(iii)(C), discussed in Section 5.5];

- Monitoring program for representative data collection for the term of the permit [§122.26(d)(2)(iii)(D), discussed in Section 5 6],

- Monitoring program for industrial facilities [§122 26(d)(2)(iv)(C)(2), discussed in Section 6.3.3];

- On-going field screening program for illicit discharges [§122.26(d)(2)(iv)(B), discussed in Section 6 5],

- Development of certification programs for construction workers or pesticide applicators, if appropriate [§122 26(d)(2)(iv), discussed in Sections 6.3.1 and 6 3 2], and

- Implementation schedules for other components of the storm water application that have not been fully implemented at the time of application, such as additional legal authority or comprehensive development plans

Step 3. Estimate the capital expenses necessary to accomplish the tasks identified in Step 1 and determine a schedule for purchase Applicants may elect to define categories of capital expenditures such as "monitoring equipment," "miscellaneous monitoring supplies," "personal protective equipment," etc

Step 4. Estimate other non-capital costs to implement the tasks identified in Step 1. Use the schedule developed in Step 2 to spread costs over the term of the permit Costs should be presented as a total annual cost for each proposed program component In addition, estimates of the total annual costs and annual per capita costs should be provided. Per capita costs can be compared with the per capita costs of other programs, such as sewage treatment programs.

These costs may include items such as :

- Newspaper ads announcing new programs or recycling centers;

- Holding public meetings or hearings, and

- Labor for department personnel to speak to citizens groups

Step 5. Identify funding to be applied. Applicants must describe the sources of funding and any legal restrictions on that funding Sources may include general revenues, storm water utilities, plan review fees, permit fees, industrial/commercial user fees, special assessment district funds, and revenue bonds Some funding sources, such as general revenues based on property taxes, are generally unrestricted, but can be allocated by local officials annually In a few cases, a local property tax may be dedicated to finance a storm water management program For example, one county finances its storm water management program through a dedicated property tax of $0.135 per $100 assessed valuation Other municipalities add special assessments to property tax bills.

A storm water utility is another source of funding dedicated to financing storm water management activities The storm water utility offers the advantage of a stable and predictable source of funds. Other advantages of storm water utilities over general revenues are that utility charges can be more equitably based on

the user's contribution to local storm water problems, and a utility provides a mechanism to incorporate incentives for on-site storm water management

In many cases, municipalities will evaluate sources of funds that are not currently available, such as a new storm water utility. In these cases, applicants must include a schedule of when funds will be available. For example, it usually takes a municipality 18 to 24 months of planning before local elected officials authorize a storm water utility, and another 6 to 12 months to implement the utility (Lindsey, 1988) Key milestones for planning and implementing the funding mechanism must be identified in the schedule The following components have been found to be important in establishing storm water utilities

- Determining the most appropriate administrative structure for implementing a storm water management program,
- Adopting a storm water utility ordinance,
- Estimating revenue needs and planning for cost recovery,
- Establishing a utility rate structure and billing system,
- Establishing a system for developer contributions, and
- Implementing a public information program

Step 6. Compare the funding sources with the funding needs. As a last step in this process, the municipality must ensure that adequate funding is available to cover the cost of implementing the storm water management program If adequate funding is not available, the municipality must consider alternate sources of funding such as a storm water utility

APPENDIX A: BIBLIOGRAPHY

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* For additional sources of information, applicants may wish to consult the documents listed in the bibliography of Urban Drainage & Flood Control District, *Urban Storm Drainage Criteria Manual, Vol III*, Urban Drainage and Flood Control District, Denver CO September 1, 1992

APPENDIX B:
PART 2 APPLICATION REQUIREMENTS

certify, pursuant to 5 U S.C 605(b) that these amendments do not, have a significant impact on a substantial number of small entities.

List of Subjects in 40 CFR Parts 122, 123, and 124

Administrative practice and procedure Environmental protection, Reporting and recordkeeping requirements, Water pollution control

Authority: Clean Water Act, 33 U S C 1251 *et seq*

Dated October 31, 1990

William K. Reilly,

Administrator

For the reasons stated in the preamble, parts 122, 123, and 124 of title 40 of the Code of Federal Regulations are amended as follows

PART 122—EPA ADMINISTERED PERMIT PROGRAMS; THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

Subpart B—Permit Application and Special NPDES Program Requirements

1 The authority citation for part 122 continues to read as follows

Authority Clean Water Act 33 U S C 1251 *et seq*

2 Section 122 1 is amended by revising paragraph (b)(2)(iv) to read as follows

§ 122.1 Purpose and scope

* * * * *

(b) * * *

(2) * * *

(iv) Discharges of storm water as set forth in § 122 26, and

* * * * *

3 Section 122 21 is amended by revising paragraph (c)(1) by removing the last sentence of paragraph (f)(7), by removing paragraph (f)(9) by adding two sentences at the end of paragraph (g)(3) by revising paragraph (g)(7) introductory text by removing and reserving paragraph (g)(10) and by revising the introductory text of paragraph (k) to read as follows

§ 122 21 Application for a permit (applicable to State programs, see § 123 25)

* * * * *

(c) *Time to apply* (1) Any person proposing a new discharge, shall submit an application at least 180 days before the date on which the discharge is to commence unless permission for a later date has been granted by the Director Facilities proposing a new discharge of storm water associated with industrial activity shall submit an application 180 days before that facility commences industrial activity which may result in a discharge of storm water associated with that industrial activity Facilities described under § 122.26(b)(14)(x) shall submit applications at least 90 days before the date on which construction is to commence. Different submittal dates may be required under the terms of applicable general permits Persons proposing a new discharge are encouraged to submit their applications well in advance of the 90 or 180 day requirements to avoid delay. See also paragraph (k) of this section and § 122.26 (c)(1)(i)(G) and (c)(1)(ii).

* * * * *

(g) * * *

(3) * * * The average flow of point sources composed of storm water may be estimated. The basis for the rainfall event and the method of estimation must be indicated.

* * * * *

(7) *Effluent characteristics.* Information on the discharge of pollutants specified in this paragraph (except information on storm water discharges which is to be provided as specified in § 122 26) When "quantitative data" for a pollutant are required, the applicant must collect a sample of effluent and analyze it for the pollutant in accordance with analytical methods approved under 40 CFR part 136 When no analytical method is approved the applicant may use any suitable method but must provide a description of the method When an applicant has two or more outfalls with substantially identical effluents the Director may allow the applicant to test only one outfall and report that the quantitative data also apply to the substantially identical outfalls The requirements in paragraphs (g)(7) (iii) and (iv) of this section that an applicant must provide quantitative data for certain pollutants known or believed to be present do not apply to pollutants present in a discharge solely as the result of their presence in intake water, however, an applicant must report such pollutants as present Grab samples must be used for pH, temperature, cyanide total phenols, residual chlorine, oil and grease, fecal coliform and fecal streptococcus For all other pollutants 24-hour composite samples must be used However, a minimum of one grab sample may be taken for effluents from holding ponds or other impoundments with a retention period greater than 24 hours In addition, for discharges other than storm water discharges, the Director may waive composite sampling for any outfall for which the applicant demonstrates that the use of an automatic sampler is infeasible and that the minimum of four (4) grab samples will be a representative sample of the effluent being discharged For storm water discharges, all samples shall be collected from the discharge resulting from a storm event that is greater than 0 1 inch and at least 72 hours from the previously measurable (greater than 0.1 inch rainfall) storm event Where feasible, the variance in the duration of the event and the total rainfall of the event should not exceed 50 percent from the average or median rainfall event in that area For all applicants, a flow-weighted composite shall be taken for either the entire discharge or for the first three hours of the discharge. The flow-weighted composite sample for a storm water discharge may be taken with a continuous sampler or as a combination of a minimum of three sample aliquots taken in each hour of discharge for the entire discharge or for the first three hours of the discharge, with each aliquot being separated by a minimum period of fifteen minutes (applicants submitting permit applications for storm water discharges under § 122 26(d) may collect flow weighted composite samples using different protocols with respect to the time duration between the collection of sample aliquots, subject to the approval of the Director) However, a minimum of one grab sample may be taken for storm water discharges from holding ponds or other impoundments with a retention period greater than 24 hours For a flow-weighted composite sample, only one analysis of the composite of aliquots is required For storm water discharge samples taken from discharges associated with industrial activities, quantitative data must be reported for the grab sample taken during the first thirty minutes (or as soon thereafter as practicable) of the discharge for all pollutants specified in § 122 26(c)(1) For all storm water permit applicants taking flow-weighted composites quantitative data must be reported for all pollutants specified in § 122 26 except pH temperature, cyanide total phenols residual chlorine, oil and grease fecal coliform, and fecal streptococcus, The Director may allow or establish appropriate site-specific sampling procedures or requirements including sampling locations, the season in which the sampling takes place the minimum duration between the previous measurable storm event and the storm event sampled the minimum or maximum level of precipitation required for an appropriate storm event, the form of precipitation sampled (snow melt or rain fall) protocols for collecting samples under 40 CFR part 136 and additional time for submitting data on a

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case-by-case basis. An applicant is expected to "know or have reason to believe" that a pollutant is present in an effluent based on an evaluation of the expected use, production, or storage of the pollutant, or on any previous analyses for the pollutant. (For example, any pesticide manufactured by a facility may be expected to be present in contaminated storm water runoff from the facility.)

* * * * *

(k) *Application requirements for new sources and new discharges.* New manufacturing, commercial, mining and silvicultural dischargers applying for NPDES permits (except for new discharges of facilities subject to the requirements of paragraph (h) of this section or new discharges of storm water associated with industrial activity which are subject to the requirements of § 122.26(c)(1) and this section (except as provided by § 122.26(c)(1)(ii)) shall provide the following information to the Director, using the application forms provided by the Director:

* * * * *

4 Section 122.22(b) introductory text is revised to read as follows

§ 122.22 Signatories to permit applications and reports (applicable to State programs, see § 123.25).

* * * * *

(b) All reports required by permits, and other information requested by the Director shall be signed by a person described in paragraph (a) of this section, or by a duly authorized representative of that person. A person is a duly authorized representative only if

* * * * *

5 Section 122.26 is revised to read as follows

§ 122.26 Storm water discharges (applicable to State NPDES programs, see § 123.25)

(a) *Permit requirement.* (1) Prior to October 1, 1992, discharges composed entirely of storm water shall not be required to obtain a NPDES permit except:

(i) A discharge with respect to which a permit has been issued prior to February 4, 1987;

(ii) A discharge associated with industrial activity (see § 122.26(a)(4)).

(iii) A discharge from a large municipal separate storm sewer system;

(iv) A discharge from a medium municipal separate storm sewer system;

(v) A discharge which the Director, or in States with approved NPDES programs either the Director or the EPA Regional Administrator, determines to contribute to a violation of a water quality standard or is a significant contributor of pollutants to waters of the United States. This designation may include a discharge from any conveyance or system of conveyances used for collecting and conveying storm water runoff or a system of discharges from municipal separate storm sewers, except for those discharges from conveyances which do not require a permit under paragraph (a)(2) of this section or agricultural storm water runoff which is exempted from the definition of point source at § 122.2. The Director may designate discharges from municipal separate storm sewers on a system-wide or jurisdiction-wide basis. In making this determination the Director may consider the following factors:

(A) The location of the discharge with respect to waters of the United States as defined at 40 CFR 122.2;

(B) The size of the discharge;

(C) The quantity and nature of the pollutants discharged to waters of the United States; and

(D) Other relevant factors.

(2) The Director may not require a permit for discharges of storm water runoff from mining operations or oil and gas exploration, production, processing or treatment operations or transmission facilities, composed entirely of flows which are from conveyances or systems of conveyances (including but not limited to pipes, conduits, ditches, and channels) used for collecting and conveying precipitation runoff and which are not contaminated by contact with or that has not come into contact with, any overburden, raw material, intermediate products, finished product, byproduct or waste products located on the site of such operations.

(3) *Large and medium municipal separate storm sewer systems.* (i) Permits must be obtained for all discharges from large and medium municipal separate storm sewer systems.

(ii) The Director may either issue one system-wide permit covering all discharges from municipal separate storm sewers within a large or medium municipal storm sewer system or issue distinct permits for appropriate categories of discharges within a large or medium municipal separate storm sewer system including, but not limited to: all discharges owned or operated by the same municipality, located within the same jurisdiction; all discharges within a system that discharge to the same watershed; discharges within a system that are similar in nature, or for individual discharges from municipal separate storm sewers within the system.

(iii) The operator of a discharge from a municipal separate storm sewer which is part of a large or medium municipal separate storm sewer system must either:

(A) Participate in a permit application (to be a permittee or a co-permittee) with one or more other operators of discharges from the large or medium municipal storm sewer system which covers all, or a portion of all, discharges from the municipal separate storm sewer system;

(B) Submit a distinct permit application which only covers discharges from the municipal separate storm sewers for which the operator is responsible, or

(C) A regional authority may be responsible for submitting a permit application under the following guidelines:

(1) The regional authority together with co-applicants shall have authority over a storm water management program that is in existence, or shall be in existence at the time part 1 of the application is due;

(2) The permit applicant or co-applicants shall establish their ability to make a timely submission of part 1 and part 2 of the municipal application;

(3) Each of the operators of municipal separate storm sewers within the systems described in paragraphs (b)(4)(i), (ii), and (iii) or (b)(7)(i), (ii), and (iii) of this section, that are under the purview of the designated regional authority, shall comply with the application requirements of paragraph (d) of this section.

(iv) One permit application may be submitted for all or a portion of all municipal separate storm sewers within adjacent or interconnected large or medium municipal separate storm sewer systems. The Director may issue one system-wide permit covering all or a portion of all municipal separate storm sewers in adjacent or interconnected large or medium municipal separate storm sewer systems.

(v) Permits for all or a portion of all discharges from large or medium municipal separate storm sewer systems that are issued on a system-wide, jurisdiction-wide, watershed or other basis may specify different conditions relating to different discharges covered by the permit, including different management programs for different drainage areas which contribute storm water to the system.

(vi) Co-permittees need only comply with permit conditions relating to discharges from the municipal separate storm sewers for which they are operators.

(4) *Discharges through large and medium municipal separate storm sewer systems* In addition to meeting the requirements of paragraph (c) of this section, an operator of a storm water discharge associated with industrial activity which discharges through a large or medium municipal separate storm sewer system shall submit, to the operator of the municipal separate storm sewer system receiving the discharge no later than May 15, 1991, or 180 days prior to commencing such discharge: the name of the facility; a contact person and phone number; the location of the discharge; a description, including Standard Industrial Classification, which best reflects the principal products or services provided by each facility; and any existing NPDES permit number.

(5) *Other municipal separate storm sewers.* The Director may issue permits for municipal separate storm sewers that are designated under paragraph (a)(1)(v) of this section on a system-wide basis, jurisdiction-wide basis, watershed basis or other appropriate basis, or may issue permits for individual discharges

(6) *Non-municipal separate storm sewers* For storm water discharges associated with industrial activity from point sources which discharge through a non-municipal or non-publicly owned separate storm sewer system, the Director, in his discretion, may issue a single NPDES permit, with each discharger a co-permittee to a permit issued to the operator of the portion of the system that discharges into waters of the United States; or, individual permits to each discharger of storm water associated with industrial activity through the non-municipal conveyance system

(i) All storm water discharges associated with industrial activity that discharge through a storm water discharge system that is not a municipal separate storm sewer must be covered by an individual permit, or a permit issued to the operator of the portion of the system that discharges to waters of the United States, with each discharger to the non-municipal conveyance a co-permittee to that permit

(ii) Where there is more than one operator of a single system of such conveyances, all operators of storm water discharges associated with industrial activity must submit applications

(iii) Any permit covering more than one operator shall identify the effluent limitations or other permit conditions, if any that apply to each operator

(7) *Combined sewer systems* Conveyances that discharge storm water runoff combined with municipal sewage are point sources that must obtain NPDES permits in accordance with the procedures of § 122.21 and are not subject to the provisions of this section.

(8) Whether a discharge from a municipal separate storm sewer is or is not subject to regulation under this section shall have no bearing on whether the owner or operator of the discharge is eligible for funding under title II, title III or title VI of the Clean Water Act. *See* 40 CFR part 35, subpart I, appendix A(b)H.2.j.

(b) *Definitions.* (1) *Co-permittee* means a permittee to a NPDES permit that is only responsible for permit conditions relating to the discharge for which it is operator.

(2) *Illicit discharge* means any discharge to a municipal separate storm sewer that is not composed entirely of storm water except discharges pursuant to a NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer) and discharges resulting from fire fighting activities.

(3) *Incorporated place* means the District of Columbia, or a city, town, township, or village that is incorporated under the laws of the State in which it is located.

(4) *Large municipal separate storm sewer system* means all municipal separate storm sewers that are either:

(i) Located in an incorporated place with a population of 250,000 or more as determined by the latest Decennial Census by the Bureau of Census (appendix F); or

(ii) Located in the counties listed in appendix H, except municipal separate storm sewers that are located in the incorporated places, townships or towns within such counties; or

(iii) Owned or operated by a municipality other than those described in paragraph (b)(4) (i) or (ii) of this section and that are designated by the Director as part of the large or medium municipal separate storm sewer system due to the interrelationship between the discharges of the designated storm sewer and the discharges from municipal separate storm sewers described under paragraph (b)(4) (i) or (ii) of this section. In making this determination the Director may consider the following factors:

(A) Physical interconnections between the municipal separate storm sewers.

(B) The location of discharges from the designated municipal separate storm sewer relative to discharges from municipal separate storm sewers described in paragraph (b)(4)(i) of th section;

(C) The quantity and nature of pollutants discharged to waters of the United States;

(D) The nature of the receiving waters, and

(E) Other relevant factors, or

(iv) The Director may, upon petition, designate as a large municipal separate storm sewer system, municipal separate storm sewers located within the boundaries of a region defined by a storm water management regional authority based on a jurisdictional, watershed, or other appropriate basis that includes one or more of the systems described in paragraph (b)(4) (i), (ii), (iii) of this section.

(5) *Major municipal separate storm sewer outfall* (or "major outfall") means a municipal separate storm sewer outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (discharge from a single conveyance other than circular pipe which is associated with a drainage area of more than 50 acres), or for municipal separate storm sewers that receive storm water from lands zoned for industrial activity (based on comprehensive zoning plans or the equivalent), an outfall that discharge from a single pipe with an inside diameter of 12 inches or more or from its equivalent (discharge from other than a circular pipe associated with a drainage area of 2 acres or more)

(6) *Major outfall* means a major municipal separate storm sewer outfall.

(7) *Medium municipal separate storm sewer system* means all municipal separate storm sewers that are either:

(i) Located in an incorporated place with a population of 100,000 or more but less than 250,000, as determined by the latest Decennial Census by the Bureau of Census (appendix G), or

(ii) Located in the counties listed in appendix I, except municipal separate storm sewers that are located in the incorporated places, townships or towns within such counties, or

(iii) Owned or operated by a municipality other than those described in paragraph (b)(4) (i) or (ii) of this section and that are designated by the Director as part of the large or medium municipal separate storm sewer system due to the interrelationship between the discharges of the designated storm sewer and the discharges from municipal separate storm sewers described under paragraph (b)(4) (i) or (ii) of this section In making this determination the Director may cons the following factors

(A) Physical interconnections between the municipal separate storm sewers;

(B) The location of discharges from the designated municipal separate storm sewer relative to discharges from municipal separate storm sewers described in paragraph (b)(7)(i) of this section;

(C) The quantity and nature of pollutants discharged to waters of the United States;

(D) The nature of the receiving waters, or

(E) Other relevant factors; or

(iv) The Director may, upon petition, designate as a medium municipal separate storm sewer system, municipal separate storm sewers located within the boundaries of a region defined by a storm water management regional authority based on a jurisdictional, watershed, or other appropriate basis that includes one or more of the systems described in paragraphs (b)(7) (i), (ii), (iii) of this section.

(8) *Municipal separate storm sewer* means a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains)

(i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the CWA that discharges to waters of the United States,

(ii) Designed or used for collecting or conveying storm water;

(iii) Which is not a combined sewer; and

(iv) Which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122 2

(9) *Outfall* means a *point source* as defined by 40 CFR 122 2 at the point where a municipal separate storm sewer discharges to waters of the United States and does not include open conveyances connecting two municipal separate storm sewers or pipes, tunnels or other conveyances which connect segments of the same stream or other waters of the United States and are used to convey waters of the United States.

(10) *Overburden* means any material of any nature, consolidated or inconsolidated, that overlies a mineral deposit, excluding topsoil or similar naturally-occurring surface materials that are not disturbed by mining operations.

(11) *Runoff coefficient* means the fraction of total rainfall that will appear at a conveyance as runoff.

(12) *Significant materials* includes, but is not limited to: raw materials; fuels, materials such as solvents, detergents, and plastic pellets; finished materials such as metallic products; raw materials used in food processing or production; hazardous substances designated under section 101(14) of CERCLA; any chemical the facility is required to report pursuant to section 313 of title III of SARA; fertilizers; pesticides; and waste products such as ashes, slag and sludge that have the potential to be released with storm water discharges.

(13) *Storm water* means storm water runoff, snow melt runoff, and surface runoff and drainage.

(14) *Storm water discharge associated with industrial activity* means the discharge from any conveyance which is used for collecting and conveying storm water and which is directly related to manufacturing, processing or raw materials storage areas at an industrial plant. The term does not include discharges from facilities or activities excluded from the NPDES program under 40 CFR part 122. For the categories of industries identified in paragraphs (b)(14) (i) through (x) of this section, the term includes, but is not limited to, storm water discharges from industrial plant yards; immediate access roads and rail lines used or traveled by carriers of raw materials, manufactured products, waste material, or by-products used or created by the facility; material handling sites; refuse sites; sites used for the application or disposal of process waste waters (as defined at 40 CFR part 401); sites used for the storage and maintenance of material handling equipment, sites used for residual treatment, storage, or disposal; shipping and receiving areas; manufacturing buildings; storage areas (including tank farms) for raw materials, and intermediate and finished products; and areas where industrial activity has taken place in the past and significant materials remain and are exposed to storm water For the categories of industries identified in paragraph (b)(14)(xi) of this section, the term includes only storm water discharges from all the areas (except access roads and rail lines) that are listed in the previous sentence where material handling equipment or activities, raw materials, intermediate products, final products, waste materials, by-products, or industrial machinery are exposed to storm water. For the purposes of this paragraph, material handling activities include the storage, loading and unloading, transportation, or conveyance of any raw material, intermediate product, finished product, by-product or waste product. The term excludes areas located on plant lands separate from the plant's industrial activities, such as office buildings and accompanying parking lots as long as the drainage from the excluded areas is not mixed with storm water drained from the above described areas. Industrial facilities (including industrial facilities that are Federally, State, or municipally owned or operated that meet the description of the facilities listed in this paragraph (b)(14)(i)–(xi) of this section) include those facilities designated under the provisions of paragraph (a)(1)(v) of this section. The following categories of facilities are considered to be engaging in "industrial activity" for purposes of this subsection.

(i) Facilities subject to storm water effluent limitations guidelines, new source performance standards, or toxic pollutant effluent standards under 40 CFR subchapter N (except facilities with toxic pollutant effluent standards which are exempted under category (xi) in paragraph (b)(14) of this section);

(ii) Facilities classified as Standard Industrial Classifications 24 (except 2434), 26 (except 265 and 267), 28 (except 283), 29, 311, 32 (except 323), 33, 3441, 373;

(iii) Facilities classified as Standard Industrial Classifications 10 through 14 (mineral industry) including active or inactive mining operations (except for areas of coal mining operations no longer meeting the definition of a reclamation area under 40 CFR 434 11(1) because the performance bond issued to the facility by the appropriate SMCRA authority has been released, or except for areas of non-coal mining operations which have been released from applicable State or Federal reclamation requirements after December 17, 1990) and oil and gas exploration, production, processing, or treatment operations, or transmission facilities that discharge storm water contaminated by contact with or that has come into contact with, any overburden, raw material, intermediate products, finished products, byproducts or waste products located on the site of such operations. (inactive mining operations are mining sites that are not being actively mined but which have an identifiable owner/operator; inactive mining sites do not include sites where mining claims are being maintained prior to disturbances associated with the extraction, beneficiation, or processing of mined

materials, nor sites where minimal activities are undertaken for the sole purpose of maintaining a mining claim);

(iv) Hazardous waste treatment, storage, or disposal facilities, including those that are operating under interim status or a permit under subtitle C of RCRA;

(v) Landfills, land application sites, and open dumps that receive or have received any industrial wastes (waste that is received from any of the facilities described under this subsection) including those that are subject to regulation under subtitle D of RCRA;

(vi) Facilities involved in the recycling of materials, including metal scrapyards, battery reclaimers, salvage yards, and automobile junkyards, including but limited to those classified as Standard Industrial Classification 5015 and 5093;

(vii) Steam electric power generating facilities, including coal handling sites;

(viii) Transportation facilities classified as Standard Industrial Classifications 40, 41, 42 (except 4221-25), 43, 44, 45, and 5171 which have vehicle maintenance shops, equipment cleaning operations, or airport deicing operations. Only those portions of the facility that are either involved in vehicle maintenance (including vehicle rehabilitation, mechanical repairs, painting, fueling, and lubrication), equipment cleaning operations, airport deicing operations, or which are otherwise identified under paragraphs (b)(14) (i)-(vii) or (ix)-(xi) of this section are associated with industrial activity;

(ix) Treatment works treating domestic sewage or any other sewage sludge or wastewater treatment device or system, used in the storage treatment, recycling and reclamation of municipal or domestic sewage (including land dedicated to the disposal of sewage sludge that are located within the confines of the facility, with a design flow of 1.0 mgd or more, or required to have an approved pretreatment program under 40 CFR part 403. Not included are farm lands, domestic gardens or lands used for sludge management where sludge is beneficially reused and which are not physically located in the confines of the facility, or areas that are in compliance with section 405 of the CWA;

(x) Construction activity including clearing, grading and excavation activities except operations that result in the disturbance of less than five acres of total land area which are not part of a larger common plan of development or sale;

(xi) Facilities under Standard Industrial Classifications 20, 21, 22, 23, 2434, 25, 265, 267, 27, 283, 285, 30, 31 (except 311), 323, 34 (except 3441), 35, 36, 37 (except 373), 38, 39, 4221-25, (and which are not otherwise included within categories (ii)-(x)).

(c) *Application requirements for storm water discharges associated with industrial activity*—(1) *Individual application.* Dischargers of storm water associated with industrial activity are required to apply for an individual permit, apply for a permit through a group application, or seek coverage under a promulgated storm water general permit. Facilities that are required to obtain an individual permit, or any discharge of storm water which the Director is evaluating for designation (*see* 40 CFR 124.52(c)) under paragraph (a)(1)(v) of this section and is not a municipal separate storm sewer, and which is not part of a group application described under paragraph (c)(2) of this section, shall submit an NPDES application in accordance with the requirements of § 122.21 as modified and supplemented by the provisions of the remainder of this paragraph. Applicants for discharges composed entirely of storm water shall submit Form 1 and Form 2F. Applicants for discharges composed of storm water and non-storm water shall submit Form 1, Form 2C, and Form 2F. Applicants for new sources or new discharges (as defined in § 122.2 of this part) composed of storm water and non-storm water shall submit Form 1, Form 2D, and Form 2F.

(i) Except as provided in § 122.26(c)(1)(ii)-(iv), the operator of a storm water discharge associated with industrial activity subject to this section shall provide:

(A) A site map showing topography (or indicating the outline of drainage areas served by the outfall(s) covered in the application if a topographic map is unavailable) of the facility including each of its drainage and discharge structures, the drainage area of each storm water outfall, paved areas and buildings within the drainage area of each storm water outfall, each past or present area used for outdoor storage or disposal of significant materials, each existing structural control measure to reduce pollutants in storm water runoff, materials loading and access areas, areas where pesticides, herbicides, soil conditioners and fertilizers are applied, each of its hazardous waste treatment, storage or disposal facilities (including each area not required to have a RCRA permit which is used for accumulating hazardous waste under 40 CFR 262.34), each well where fluids from the facility are injected underground; springs, and other surface water bodies which receive storm water discharges from the facility;

(B) An estimate of the area of impervious surfaces (including paved areas and building roofs) and the total area drained by each outfall (within a mile radius of the facility) and a narrative description of the following: Significant materials that in the three years prior to the submittal of this application have been treated, stored or disposed in a manner to allow exposure to storm water; method of treatment, storage or disposal of such materials; materials management practices employed, in the three years prior to the submittal of this application, to minimize contact by these materials with storm water runoff; materials loading and access areas; the location, manner and frequency in which pesticides, herbicides, soil conditioners and fertilizers are applied; the location and a description of existing structural and non-structural control measures to reduce pollutants in storm water runoff and a description of the treatment the storm water receives, including the ultimate disposal of any solid or fluid wastes other than by discharge;

(C) A certification that all outfalls that should contain storm water discharges associated with industrial activity have been tested or evaluated for the presence of non-storm water discharges which are not covered by a NPDES permit; tests for such non-storm water discharges may include smoke tests, fluorometric dye tests, analysis of accurate schematics, as well as other appropriate tests. The certification shall include a description of the method used, the date of any testing, and the on-site drainage points that were directly observed during a test;

(D) Existing information regarding significant leaks or spills of toxic or hazardous pollutants at the facility that have taken place within the three years prior to the submittal of this application;

(E) Quantitative data based on samples collected during storm events and collected in accordance with § 122.21 of this part from all outfalls containing a storm water discharge associated with industrial activity for the following parameters:

(1) Any pollutant limited in an effluent guideline to which the facility is subject;

(2) Any pollutant listed in the facility's NPDES permit for its process wastewater (if the facility is operating under an existing NPDES permit);

(3) Oil and grease, pH, BOD5, COD, TSS, total phosphorus, total Kjeldahl nitrogen, and nitrate plus nitrite nitrogen;

(4) Any information on the discharge required under paragraph § 122.21(g)(7)(iii) and (iv) of this part;

(5) Flow measurements or estimates of the flow rate and the total amount of discharge for the storm event(s) sampled, and the method of flow measurement or estimation; and

(6) The date and duration (in hours) of the storm event(s) sampled, rainfall measurements or estimates of the storm event (in inches) which generated the sampled runoff and the duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event (in hours);

(F) Operators of a discharge which is composed entirely of storm water are exempt from the requirements of § 122.21 (g)(2), (g)(3), (g)(4), (g)(5), (g)(7)(i), (g)(7)(ii), and (g)(7)(v); and

(G) Operators of new sources or new discharges (as defined in § 122.2 of this part) which are composed in part or entirely of storm water must include estimates for the pollutants or parameters listed in paragraph (c)(1)(i)(E) of this section instead of actual sampling data, along with the source of each estimate. Operators of new sources or new discharges composed in part or entirely of storm water must provide quantitative data for the parameters listed in paragraph (c)(1)(i)(E) of this section within two years after commencement of discharge, unless such data has already been reported under the monitoring requirements of the NPDES permit for the discharge. Operators of a new source or new discharge which is composed entirely of storm water are exempt from the requirements of § 122.21 (k)(3)(ii), (k)(3)(iii), and (k)(5).

(ii) The operator of an existing or new storm water discharge that is associated with industrial activity solely under paragraph (b)(14)(x) of this section, is exempt from the requirements of § 122.21(g) and paragraph (c)(1)(i) of this section. Such operator shall provide a narrative description of:

(A) The location (including a map) and the nature of the construction activity;

(B) The total area of the site and the area of the site that is expected to undergo excavation during the life of the permit;

(C) Proposed measures, including best management practices, to control pollutants in storm water discharges during construction, including a brief description of applicable State and local erosion and sediment control requirements;

(D) Proposed measures to control pollutants in storm water discharges that will occur after construction operations have been completed, including a brief description of applicable State or local erosion and sediment control requirements;

(E) An estimate of the runoff coefficient of the site and the increase in impervious area after the construction addressed in the permit application is completed, the nature of fill material and existing data describing the soil or the quality of the discharge, and

(F) The name of the receiving water.

(iii) The operator of an existing or new discharge composed entirely of storm water from an oil or gas exploration, production, processing, or treatment operation, or transmission facility is not required to submit a permit application in accordance with paragraph (c)(1)(i) of this section, unless the facility:

(A) Has had a discharge of storm water resulting in the discharge of a reportable quantity for which notification is or was required pursuant to 40 CFR 117.21 or 40 CFR 302.6 at anytime since November 16, 1987, or

(B) Has had a discharge of storm water resulting in the discharge of a reportable quantity for which notification is or was required pursuant to 40 CFR 110.6 at any time since November 16, 1987; or

(C) Contributes to a violation of a water quality standard.

(iv) The operator of an existing or new discharge composed entirely of storm water from a mining operation is not required to submit a permit application unless the discharge has come into contact with, any overburden, raw material, intermediate products, finished product, byproduct or waste products located on the site of such operations.

(v) Applicants shall provide such other information the Director may reasonably require under § 122.21(g)(13) of this part to determine whether to issue a permit and may require any facility subject to paragraph (c)(1)(ii) of this section to comply with paragraph (c)(1)(i) of this section.

(2) *Group application for discharges associated with industrial activity.* In lieu of individual applications or notice of intent to be covered by a general permit for storm water discharges associated with industrial activity, a group application may be filed by an entity representing a group of applicants (except facilities that have existing individual NPDES permits for storm water) that are part of the same subcategory (*see* 40 CFR subchapter N, part 405 to 471) or, where such grouping is inapplicable, are sufficiently similar as to be appropriate for general permit coverage under § 122.28 of this part. The part 1 application shall be submitted to the Office of Water Enforcement and Permits, U.S. EPA, 401 M Street, SW., Washington, DC 20460 (EN-336) for approval. Once a part 1 application is approved, group applicants are to submit Part 2 of the group application to the Office of Water Enforcement and Permits. A group application shall consist of:

(i) *Part 1.* Part 1 of a group application shall:

(A) Identify the participants in the group application by name and location. Facilities participating in the group application shall be listed in nine subdivisions, based on the facility location relative to the nine precipitation zones indicated in appendix E to this part.

(B) Include a narrative description summarizing the industrial activities of participants of the group application and explaining why the participants, as a whole, are sufficiently similar to be a covered by a general permit.

(C) Include a list of significant materials stored exposed to precipitation by participants in the group application and materials management practices employed to diminish contact by these materials with precipitation and storm water runoff.

(D) Identify ten percent of the dischargers participating in the group application (with a minimum of 10 dischargers, and either a minimum of two dischargers from each precipitation zone indicated in appendix E of this part in which ten or more members of the group are located, or one discharger from each precipitation zone indicated in appendix E of this part in which nine or fewer members of the group are located) from which quantitative data will be submitted in part 2. If more than 1,000 facilities are identified in a group application, no more than 100 dischargers must submit quantitative data in Part 2. Groups of between four and ten dischargers may be formed. However, in groups of between four and ten, at least half the facilities must submit quantitative data and at least one facility in each precipitation zone in which members of the group are located must submit data. A description of why the facilities selected to perform sampling and analysis are representative of the group as a whole in terms of the information provided in paragraph (c)(1)(i)(B) and (i)(C) of this section, shall accompany this section. Different factors impacting the nature of the storm water discharges such as processes used and material management shall be represented to the extent feasible in a manner roughly equivalent to their proportion in the group.

(ii) *Part 2.* Part 2 of a group application shall contain quantitative

data (NPDES Form 2F), as modified by paragraph (c)(1) of this section, so that when part 1 and part 2 of the group application are taken together, a complete NPDES application (Form 1, Form 2C, and Form 2F) can be evaluated for each discharger identified in paragraph (c)(2)(i)(D) of this section.

(d) *Application requirements for large and medium municipal separate storm sewer discharges.* The operator of a discharge from a large or medium municipal separate storm sewer or a municipal separate storm sewer that is designated by the Director under paragraph (a)(1)(v) of this section, may submit a jurisdiction-wide or system-wide permit application. Where more than one public entity owns or operates a municipal separate storm sewer within a geographic area (including adjacent or interconnected municipal separate storm sewer systems), such operators may be a coapplicant to the same application. Permit applications for discharges from large and medium municipal storm sewers or municipal storm sewers designated under paragraph (a)(1)(v) of this section shall include.

(1) *Part 1* Part 1 of the application shall consist of.

(i) *General information* The applicants' name, address, telephone number of contact person, ownership status and status as a State or local government entity.

(ii) *Legal authority* A description of existing legal authority to control discharges to the municipal separate storm sewer system. When existing legal authority is not sufficient to meet the criteria provided in paragraph (d)(2)(i) of this section, the description shall list additional authorities as will be necessary to meet the criteria and shall include a schedule and commitment to seek such additional authority that will be needed to meet the criteria

(iii) *Source identification* (A) A description of the historic use of ordinances, guidance or other controls which limited the discharge of non-storm water discharges to any Publicly Owned Treatment Works serving the same area as the municipal separate storm sewer system.

(B) A USGS 7.5 minute topographic map (or equivalent topographic map with a scale between 1 10,000 and 1 24,000 if cost effective) extending one mile beyond the service boundaries of the municipal storm sewer system covered by the permit application. The following information shall be provided:

(1) The location of known municipal storm sewer system outfalls discharging to waters of the United States;

(2) A description of the land use activities (e.g divisions indicating undeveloped, residential, commercial, agricultural and industrial uses) accompanied with estimates of population densities and projected growth for a ten year period within the drainage area served by the separate storm sewer. For each land use type, an estimate of an average runoff coefficient shall be provided;

(3) The location and a description of the activities of the facility of each currently operating or closed municipal landfill or other treatment, storage or disposal facility for municipal waste;

(4) The location and the permit number of any known discharge to the municipal storm sewer that has been issued a NPDES permit;

(5) The location of major structural controls for storm water discharge (retention basins, detention basins, major infiltration devices, etc.); and

(6) The identification of publicly owned parks, recreational areas, and other open lands.

(iv) *Discharge characterization* (A) Monthly mean rain and snow fall estimates (or summary of weather bureau data) and the monthly average number of storm events

(B) Existing quantitative data describing the volume and quality of discharges from the municipal storm sewer, including a description of the outfalls sampled, sampling procedures and analytical methods used.

(C) A list of water bodies that receive discharges from the municipal separate storm sewer system, including downstream segments, lakes and estuaries, where pollutants from the system discharges may accumulate and cause water degradation and a brief description of known water quality impacts At a minimum, the description of impacts shall include a description of whether the water bodies receiving such discharges have been:

(1) Assessed and reported in section 305(b) reports submitted by the State, the basis for the assessment (evaluated or monitored), a summary of designated use support and attainment of Clean Water Act (CWA) goals (fishable and swimmable waters), and causes of nonsupport of designated uses.

(2) Listed under section 304(l)(1)(A)(i), section 304(l)(1)(A)(ii), or section 304(l)(1)(B) of the CWA that is not expected to meet water quality standards or water quality goals.

(3) Listed in State Nonpoint Source Assessments required by section 319(a) of the CWA that, without additional action to control nonpoint sources of pollution, cannot reasonably be expected to attain or maintain water quality standards due to storm sewer construction, highway maintenance and runoff from municipal landfills and municipal sludge adding significant pollution (or contributing to a violation of water quality standards);

(4) Identified and classified according to eutrophic condition of publicly owned lakes listed in State reports required under section 314(a) of the CWA (include the following: A description of those publicly owned lakes for which uses are known to be impaired; a description of procedures, processes and methods to control the discharge of pollutants from municipal separate storm sewers into such lakes; and a description of methods and procedures to restore the quality of such lakes);

(5) Areas of concern of the Great Lakes identified by the International Joint Commission;

(6) Designated estuaries under the National Estuary Program under section 320 of the CWA;

(7) Recognized by the applicant as highly valued or sensitive waters;

(8) Defined by the State or U.S. Fish and Wildlife Services's National Wetlands Inventory as wetlands; and

(9) Found to have pollutants in bottom sediments, fish tissue or biosurvey data.

(D) *Field screening.* Results of a fie screening analysis for illicit connect and illegal dumping for either selecte field screening points or major outfalls covered in the permit application. At a minimum, a screening analysis shall include a narrative description, for either each field screening point or major outfall, of visual observations made during dry weather periods. If any flow is observed, two grab samples shall be collected during a 24 hour period with a minimum period of four hours between samples. For all such samples, a narrative description of the color, odor, turbidity, the presence of an oil sheen or surface scum as well as any other relevant observations regarding the potential presence of non-storm water discharges or illegal dumping shall be provided In addition, a narrative description of the results of a field analysis using suitable methods to estimate pH, total chlorine, total copper, total phenol, and detergents (or surfactants) shall be provided along with a description of the flow rate. Where the field analysis does not involve analytical methods approved under 40 CFR part 136, the applicant shall provide a description of the method used including the name of the manufacturer of the test method alone with the range and accuracy of the Field screening points shall be eithe major outfalls or other outfall points (or

any other point of access such as manholes) randomly located throughout the storm sewer system by placing a grid over a drainage system map and identifying those cells of the grid which contain a segment of the storm sewer system or major outfall. The field screening points shall be established using the following guidelines and criteria:

(1) A grid system consisting of perpendicular north-south and east-west lines spaced ¼ mile apart shall be overlayed on a map of the municipal storm sewer system, creating a series of cells;

(2) All cells that contain a segment of the storm sewer system shall be identified; one field screening point shall be selected in each cell; major outfalls may be used as field screening points;

(3) Field screening points should be located downstream of any sources of suspected illegal or illicit activity;

(4) Field screening points shall be located to the degree practicable at the farthest manhole or other accessible location downstream in the system, within each cell, however, safety of personnel and accessibility of the location should be considered in making this determination;

(5) Hydrological conditions; total drainage area of the site; population density of the site, traffic density; age of the structures or buildings in the area; history of the area; and land use types;

(6) For medium municipal separate storm sewer systems, no more than 250 cells need to have identified field screening points, in large municipal separate storm sewer systems, no more than 500 cells need to have identified field screening points, cells established by the grid that contain no storm sewer segments will be eliminated from consideration, if fewer than 250 cells in medium municipal sewers are created, and fewer than 500 in large systems are created by the overlay on the municipal sewer map then all those cells which contain a segment of the sewer system shall be subject to field screening (unless access to the separate storm sewer system is impossible), and

(7) Large or medium municipal separate storm sewer systems which are unable to utilize the procedures described in paragraphs (d)(1)(iv)(D) (1) through (6) of this section, because a sufficiently detailed map of the separate storm sewer systems is unavailable, shall field screen no more than 500 or 250 major outfalls respectively (or all major outfalls in the system, if less). In such circumstances, the applicant shall establish a grid system consisting of north-south and east-west lines spaced ¼ mile apart as an overlay to the boundaries of the municipal storm sewer system, thereby creating a series of cells; the applicant will then select major outfalls in as many cells as possible until at least 500 major outfalls (large municipalities) or 250 major outfalls (medium municipalities) are selected; a field screening analysis shall be undertaken at these major outfalls.

(E) *Characterization plan.* Information and a proposed program to meet the requirements of paragraph (d)(2)(iii) of this section. Such description shall include: the location of outfalls or field screening points appropriate for representative data collection under paragraph (d)(2)(iii)(A) of this section, a description of why the outfall or field screening point is representative, the seasons during which sampling is intended, a description of the sampling equipment. The proposed location of outfalls or field screening points for such sampling should reflect water quality concerns (*see* paragraph (d)(1)(iv)(C) of this section) to the extent practicable.

(v) *Management programs.* (A) A description of the existing management programs to control pollutants from the municipal separate storm sewer system. The description shall provide information on existing structural and source controls, including operation and maintenance measures for structural controls, that are currently being implemented. Such controls may include, but are not limited to. Procedures to control pollution resulting from construction activities; floodplain management controls; wetland protection measures; best management practices for new subdivisions, and emergency spill response programs. The description may address controls established under State law as well as local requirements.

(B) A description of the existing program to identify illicit connections to the municipal storm sewer system. The description should include inspection procedures and methods for detecting and preventing illicit discharges, and describe areas where this program has been implemented.

(vi) *Fiscal resources.* (A) A description of the financial resources currently available to the municipality to complete part 2 of the permit application. A description of the municipality's budget for existing storm water programs, including an overview of the municipality's financial resources and budget, including overall indebtedness and assets, and sources of funds for storm water programs.

(2) *Part 2.* Part 2 of the application shall consist of.

(i) *Adequate legal authority.* A demonstration that the applicant can operate pursuant to legal authority established by statute, ordinance or series of contracts which authorizes or enables the applicant at a minimum to.

(A) Control through ordinance, permit, contract, order or similar means, the contribution of pollutants to the municipal storm sewer by storm water discharges associated with industrial activity and the quality of storm water discharged from sites of industrial activity;

(B) Prohibit through ordinance, order or similar means, illicit discharges to the municipal separate storm sewer;

(C) Control through ordinance, order or similar means the discharge to a municipal separate storm sewer of spills, dumping or disposal of materials other than storm water;

(D) Control through interagency agreements among coapplicants the contribution of pollutants from one portion of the municipal system to another portion of the municipal system:

(E) Require compliance with conditions in ordinances, permits, contracts or orders; and

(F) Carry out all inspection, surveillance and monitoring procedures necessary to determine compliance and noncompliance with permit conditions including the prohibition on illicit discharges to the municipal separate storm sewer.

(ii) *Source identification* The location of any major outfall that discharges to waters of the United States that was not reported under paragraph (d)(1)(iii)(B)(1) of this section Provide an inventory, organized by watershed of the name and address, and a description (such as SIC codes) which best reflects the principal products or services provided by each facility which may discharge, to the municipal separate storm sewer, storm water associated with industrial activity;

(iii) *Characterization data* When "quantitative data" for a pollutant are required under paragraph (d)(a)(iii)(A)(3) of this paragraph, the applicant must collect a sample of effluent in accordance with 40 CFR 122.21(g)(7) and analyze it for the pollutant in accordance with analytical methods approved under 40 CFR part 136. When no analytical method is approved the applicant may use any suitable method but must provide a description of the method. The applicant must provide information characterizing the quality and quantity of discharges covered in the permit application, including·

(A) Quantitative data from representative outfalls designated by the Director (based on information received

in part 1 of the application, the Director shall designate between five and ten outfalls or field screening points as representative of the commercial, residential and industrial land use activities of the drainage area contributing to the system or, where there are less than five outfalls covered in the application, the Director shall designate all outfalls) developed as follows

(*1*) For each outfall or field screening point designated under this subparagraph, samples shall be collected of storm water discharges from three storm events occurring at least one month apart in accordance with the requirements at § 122.21(g)(7) (the Director may allow exemptions to sampling three storm events when climatic conditions create good cause for such exemptions),

(*2*) A narrative description shall be provided of the date and duration of the storm event(s) sampled, rainfall estimates of the storm event which generated the sampled discharge and the duration between the storm event sampled and the end of the previous measurable (greater than 0 1 inch rainfall) storm event,

(*3*) For samples collected and described under paragraphs (d)(2)(iii)(A)(*1*) and (A)(*2*) of this section, quantitative data shall be provided for the organic pollutants listed in Table II, the pollutants listed in Table III (toxic metals, cyanide and total phenols) of appendix D of 40 CFR part 122, and for the following pollutants

Total suspended solids (TSS)
Total dissolved solids (TDS)
COD
BOD_5
Oil and grease
Fecal coliform
Fecal streptococcus
pH
Total Kjeldahl nitrogen
Nitrate plus nitrite
Dissolved phosphorus
Total ammonia plus organic nitrogen
Total phosphorus

(*4*) Additional limited quantitative data required by the Director for determining permit conditions (the Director may require that quantitative data shall be provided for additional parameters, and may establish sampling conditions such as the location, season of sample collection, form of precipitation (snow melt, rainfall) and other parameters necessary to insure representativeness)

(B) Estimates of the annual pollutant load of the cumulative discharges to waters of the United States from all identified municipal outfalls and the event mean concentration of the cumulative discharges to waters of the United States from all identified municipal outfalls during a storm event (as described under § 122.21(c)(7)) for BOD_5, COD, TSS, dissolved solids, total nitrogen, total ammonia plus organic nitrogen, total phosphorus, dissolved phosphorus, cadmium, copper, lead, and zinc. Estimates shall be accompanied by a description of the procedures for estimating constituent loads and concentrations, including any modelling, data analysis, and calculation methods;

(C) A proposed schedule to provide estimates for each major outfall identified in either paragraph (d)(2)(ii) or (d)(1)(iii)(B)(*1*) of this section of the seasonal pollutant load and of the event mean concentration of a representative storm for any constituent detected in any sample required under paragraph (d)(2)(iii)(A) of this section; and

(D) A proposed monitoring program for representative data collection for the term of the permit that describes the location of outfalls or field screening points to be sampled (or the location of instream stations), why the location is representative, the frequency of sampling, parameters to be sampled, and a description of sampling equipment

(iv) *Proposed management program* A proposed management program covers the duration of the permit It shall include a comprehensive planning process which involves public participation and where necessary intergovernmental coordination, to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and such other provisions which are appropriate. The program shall also include a description of staff and equipment available to implement the program Separate proposed programs may be submitted by each coapplicant. Proposed programs may impose controls on a systemwide basis, a watershed basis, a jurisdiction basis, or on individual outfalls. Proposed programs will be considered by the Director when developing permit conditions to reduce pollutants in discharges to the maximum extent practicable Proposed management programs shall describe priorities for implementing controls Such programs shall be based on.

(A) A description of structural and source control measures to reduce pollutants from runoff from commercial and residential areas that are discharged from the municipal storm sewer system that are to be implemented during the life of the permit accompanied with an estimate of the expected reduction of pollutant loads and a proposed schedule for implementing such controls At a minimum, the description shall include.

(*1*) A description of maintenance activities and a maintenance schedule for structural controls to reduce pollutants (including floatables) in discharges from municipal separate storm sewers;

(*2*) A description of planning procedures including a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal separate storm sewers which receive discharges from areas of new development and significant redevelopment. Such plan shall address controls to reduce pollutants in discharges from municipal separate storm sewers after construction is completed. (Controls to reduce pollutants in discharges from municipal separate storm sewers containing construction site runoff are addressed in paragraph (d)(2)(iv)(D) of this section.

(*3*) A description of practices for operating and maintaining public streets, roads and highways and procedures for reducing the impact on receiving waters of discharges from municipal storm sewer systems, including pollutants discharged as a result of deicing activities.

(*4*) A description of procedures to assure that flood management projects assess the impacts on the water quality of receiving water bodies and that existing structural flood control devices have been evaluated to determine if retrofitting the device to provide additional pollutant removal from storm water is feasible.

(*5*) A description of a program to monitor pollutants in runoff from operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste, which shall identify priorities and procedures for inspections and establishing and implementing control measures for such discharges (this program can be coordinated with the program developed under paragraph (d)(2)(iv)(C) of this section), and

(*6*) A description of a program to reduce to the maximum extent practicable, pollutants in discharges from municipal separate storm sewers associated with the application of pesticides, herbicides and fertilizer which will include, as appropriate, controls such as educational activities, permits, certifications and other measures for commercial applicators and distributors, and controls for application in public right-of-ways and at municipal facilities

(B) A description of a program, including a schedule, to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer. The proposed program shall include:

(1) A description of a program, including inspections, to implement and enforce an ordinance, orders or similar means to prevent illicit discharges to the municipal separate storm sewer system; this program description shall address all types of illicit discharges, however the following category of non-storm water discharges or flows shall be addressed where such discharges are identified by the municipality as sources of pollutants to waters of the United States: water line flushing, landscape irrigation, diverted stream flows, rising ground waters, uncontaminated ground water infiltration (as defined at 40 CFR 35.2005(20)) to separate storm sewers, uncontaminated pumped ground water, discharges from potable water sources, foundation drains, air conditioning condensation, irrigation water, springs, water from crawl space pumps, footing drains, lawn watering, individual residential car washing, flows from riparian habitats and wetlands, dechlorinated swimming pool discharges, and street wash water (program descriptions shall address discharges or flows from fire fighting only where such discharges or flows are identified as significant sources of pollutants to waters of the United States).

(2) A description of procedures to conduct on-going field screening activities during the life of the permit, including areas or locations that will be evaluated by such field screens.

(3) A description of procedures to be followed to investigate portions of the separate storm sewer system that, based on the results of the field screen, or other appropriate information, indicate a reasonable potential of containing illicit discharges or other sources of non-storm water (such procedures may include sampling procedures for constituents such as fecal coliform, fecal streptococcus, surfactants (MBAS), residual chlorine, fluorides and potassium, testing with fluorometric dyes, or conducting in storm sewer inspections where safety and other considerations allow. Such description shall include the location of storm sewers that have been identified for such evaluation).

(4) A description of procedures to prevent contain, and respond to spills that may discharge into the municipal separate storm sewer;

(5) A description of a program to promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges from municipal separate storm sewers;

(6) A description of educational activities, public information activities, and other appropriate activities to facilitate the proper management and disposal of used oil and toxic materials; and

(7) A description of controls to limit infiltration of seepage from municipal sanitary sewers to municipal separate storm sewer systems where necessary;

(C) A description of a program to monitor and control pollutants in storm water discharges to municipal systems from municipal landfills, hazardous waste treatment, disposal and recovery facilities, industrial facilities that are subject to section 313 of title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA), and industrial facilities that the municipal permit applicant determines are contributing a substantial pollutant loading to the municipal storm sewer system. The program shall:

(1) Identify priorities and procedures for inspections and establishing and implementing control measures for such discharges;

(2) Describe a monitoring program for storm water discharges associated with the industrial facilities identified in paragraph (d)(2)(iv)(C) of this section, to be implemented during the term of the permit, including the submission of quantitative data on the following constituents: any pollutants limited in effluent guidelines subcategories, where applicable; any pollutant listed in an existing NPDES permit for a facility; oil and grease, COD, pH, BOD_5, TSS, total phosphorus, total Kjeldahl nitrogen, nitrate plus nitrite nitrogen, and any information on discharges required under 40 CFR 122.21(g)(7) (iii) and (iv)

(D) A description of a program to implement and maintain structural and non-structural best management practices to reduce pollutants in storm water runoff from construction sites to the municipal storm sewer system, which shall include:

(1) A description of procedures for site planning which incorporate consideration of potential water quality impacts;

(2) A description of requirements for nonstructural and structural best management practices;

(3) A description of procedures for identifying priorities for inspecting sites and enforcing control measures which consider the nature of the construction activity, topography, and the characteristics of soils and receiving water quality; and

(4) A description of appropriate educational and training measures for construction site operators.

(v) *Assessment of controls.* Estimated reductions in loadings of pollutants from discharges of municipal storm sewer constituents from municipal storm sewer systems expected as the result of the municipal storm water quality management program. The assessment shall also identify known impacts of storm water controls on ground water.

(vi) *Fiscal analysis.* For each fiscal year to be covered by the permit, a fiscal analysis of the necessary capital and operation and maintenance expenditures necessary to accomplish the activities of the programs under paragraphs (d)(2) (iii) and (iv) of this section. Such analysis shall include a description of the source of funds that are proposed to meet the necessary expenditures, including legal restrictions on the use of such funds.

(vii) Where more than one legal entity submits an application, the application shall contain a description of the roles and responsibilities of each legal entity and procedures to ensure effective coordination.

(viii) Where requirements under paragraph (d)(1)(iv)(E), (d)(2)(ii), (d)(2)(iii)(B) and (d)(2)(iv) of this section are not practicable or are not applicable, the Director may exclude any operator of a discharge from a municipal separate storm sewer which is designated under paragraph (a)(1)(v), (b)(4)(ii) or (b)(7)(ii) of this section from such requirements. The Director shall not exclude the operator of a discharge from a municipal separate storm sewer identified in appendix F, G, H or I of part 122, from any of the permit application requirements under this paragraph except where authorized under this section

(e) *Application deadlines* Any operator of a point source required to obtain a permit under paragraph (a)(1) of this section that does not have an effective NPDES permit covering its storm water outfalls shall submit an application in accordance with the following deadlines

(1) For any storm water discharge associated with industrial activity identified in paragraph (b)(14) (i)–(xi) of this section, that is not part of a group application as described in paragraph (c)(2) of this section or which is not covered under a promulgated storm water general permit, a permit application made pursuant to paragraph (c) of this section shall be submitted to the Director by November 18, 1991.

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(2) For any group application submitted in accordance with paragraph (c)(2) of this section:

(i) Part 1 of the application shall be submitted to the Director, Office of Water Enforcement and Permits by March 18, 1991;

(ii) Based on information in the part 1 application, the Director will approve or deny the members in the group application within 60 days after receiving part 1 of the group application.

(iii) Part 2 of the application shall be submitted to the Director, Office of Water Enforcement and Permits no later than 12 months after the date of approval of the part 1 application.

(iv) Facilities that are rejected as members of a group by the permitting authority shall have 12 months to file an individual permit application from the date they receive notification of their rejection

(v) A facility listed under paragraph (b)(14) (i)–(xi) of this section may add on to a group application submitted in accordance with paragraph (e)(2)(i) of this section at the discretion of the Office of Water Enforcement and Permits, and only upon a showing of good cause by the facility and the group applicant, the request for the addition of the facility shall be made no later than February 18,1992; the addition of the facility shall not cause the percentage of the facilities that are required to submit quantitative data to be less than 10%, unless there are over 100 facilities in the group that are submitting quantitative data. approval to become part of group application must be obtained from the group or the trade association representing the individual facilities.

(3) For any discharge from a large municipal separate storm sewer system:

(i) Part 1 of the application shall be submitted to the Director by November 18, 1991.

(ii) Based on information received in the part 1 application the Director will approve or deny a sampling plan under paragraph (d)(1)(iv)(E) of this section within 90 days after receiving the part 1 application.

(iii) Part 2 of the application shall be submitted to the Director by November 16, 1992.

(4) For any discharge from a medium municipal separate storm sewer system.

(i) Part 1 of the application shall be submitted to the Director by May 18, 1992

(ii) Based on information received in the part 1 application the Director will approve or deny a sampling plan under paragraph (d)(1)(iv)(E) of this section within 90 days after receiving the part 1 application

(iii) Part 2 of the application shall be submitted to the Director by May 17, 1993.

(5) A permit application shall be submitted to the Director within 60 days of notice, unless permission for a later date is granted by the Director (*see* 40 CFR 124.52(c)), for:

(i) A storm water discharge which the Director, or in States with approved NPDES programs, either the Director or the EPA Regional Administrator, determines that the discharge contributes to a violation of a water quality standard or is a significant contributor of pollutants to waters of the United States (see paragraph (a)(1)(v) of this section);

(ii) A storm water discharge subject to paragraph (c)(1)(v) of this section.

(6) Facilities with existing NPDES permits for storm water discharges associated with industrial activity shall maintain existing permits. New applications shall be submitted in accordance with the requirements of 40 CFR 122.21 and 40 CFR 122.26(c) 180 days before the expiration of such permits. Facilities with expired permits or permits due to expire before May 18, 1992, shall submit applications in accordance with the deadline set forth under paragraph (c)(1) of this section.

(f) *Petitions.* (1) Any operator of a municipal separate storm sewer system may petition the Director to require a separate NPDES permit (or a permit issued under an approved NPDES State program) for any discharge into the municipal separate storm sewer system.

(2) Any person may petition the Director to require a NPDES permit for a discharge which is composed entirely of storm water which contributes to a violation of a water quality standard or is a significant contributor of pollutants to waters of the United States.

(3) The owner or operator of a municipal separate storm sewer system may petition the Director to reduce the Census estimates of the population served by such separate system to account for storm water discharged to combined sewers as defined by 40 CFR 35 2005(b)(11) that is treated in a publicly owned treatment works In municipalities in which combined sewers are operated, the Census estimates of population may be reduced proportional to the fraction, based on estimated lengths, of the length of combined sewers over the sum of the length of combined sewers and municipal separate storm sewers where an applicant has submitted the NPDES permit number associated with each discharge point and a map indicating areas served by combined sewers and the location of any combined sewer overflow discharge point.

(4) Any person may petition the Director for the designation of a large or medium municipal separate storm sewer system as defined by paragraphs (b)(4)(iv) or (b)(7)(iv) of this section.

(5) The Director shall make a final determination on any petition received under this section within 90 days after receiving the petition.

6. Section 122.28(b)(2)(i) is revised to read as follows:

§ 122.28 General permits (applicable to State NPDES programs, see § 123.25).

* * * * *

(b) * * *

(2) *Requiring an individual permit.* (i) The Director may require any discharger authorized by a general permit to apply for and obtain an individual NPDES permit. Any interested person may petition the Director to take action under this paragraph. Cases where an individual NPDES permit may be required include the following:

(A) The discharger or "treatment works treating domestic sewage" is not in compliance with the conditions of the general NPDES permit.

(B) A change has occurred in the availability of demonstrated techno or practices for the control or abate of pollutants applicable to the point source or treatment works treating domestic sewage.

(C) Effluent limitation guidelines are promulgated for point sources covered by the general NPDES permit,

(D) A Water Quality Management plan containing requirements applicable to such point sources is approved.

(E) Circumstances have changed since the time of the request to be covered so that the discharger is no longer appropriately controlled under the general permit, or either a temporary or permanent reduction or elimination of the authorized discharge is necessary;

(F) Standards for sewage sludge use or disposal have been promulgated for the sludge use and disposal practice covered by the general NPDES permit, or

(G) The discharge(s) is a significant contributor of pollutants. In making this determination, the Director may consider the following factors:

(*1*) The location of the discharge with respect to waters of the United States,

(*2*) The size of the discharge;

(*3*) The quantity and nature of the pollutants discharged to waters of the United States, and

(*4*) Other relevant factors.

* * * * *

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7. Section 122.42 is amended by adding paragraph (c) to read as follows.

§ 122.42 Additional conditions applicable to specified categories of NPDES permits (applicable to State NPDES programs, see § 123.25).

* * * * *

(c) *Municipal separate storm sewer systems.* The operator of a large or medium municipal separate storm sewer system or a municipal separate storm sewer that has been designated by the Director under § 122.26(a)(1)(v) of this part must submit an annual report by the anniversary of the date of the issuance of the permit for such system. The report shall include:

(1) The status of implementing the components of the storm water management program that are established as permit conditions.

(2) Proposed changes to the storm water management programs that are established as permit condition. Such proposed changes shall be consistent with § 122.26(d)(2)(iii) of this part; and

(3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under § 122.26(d)(2)(iv) and (d)(2)(v) of this part.

(4) A summary of data, including monitoring data, that is accumulated throughout the reporting year;

(5) Annual expenditures and budget for year following each annual report;

(6) A summary describing the number and nature of enforcement actions, inspections, and public education programs;

(7) Identification of water quality improvements or degradation;

7a. Part 122 is amended by adding appendices E through I as follows:

Appendix E to Part 122—Rainfall Zones of the United States

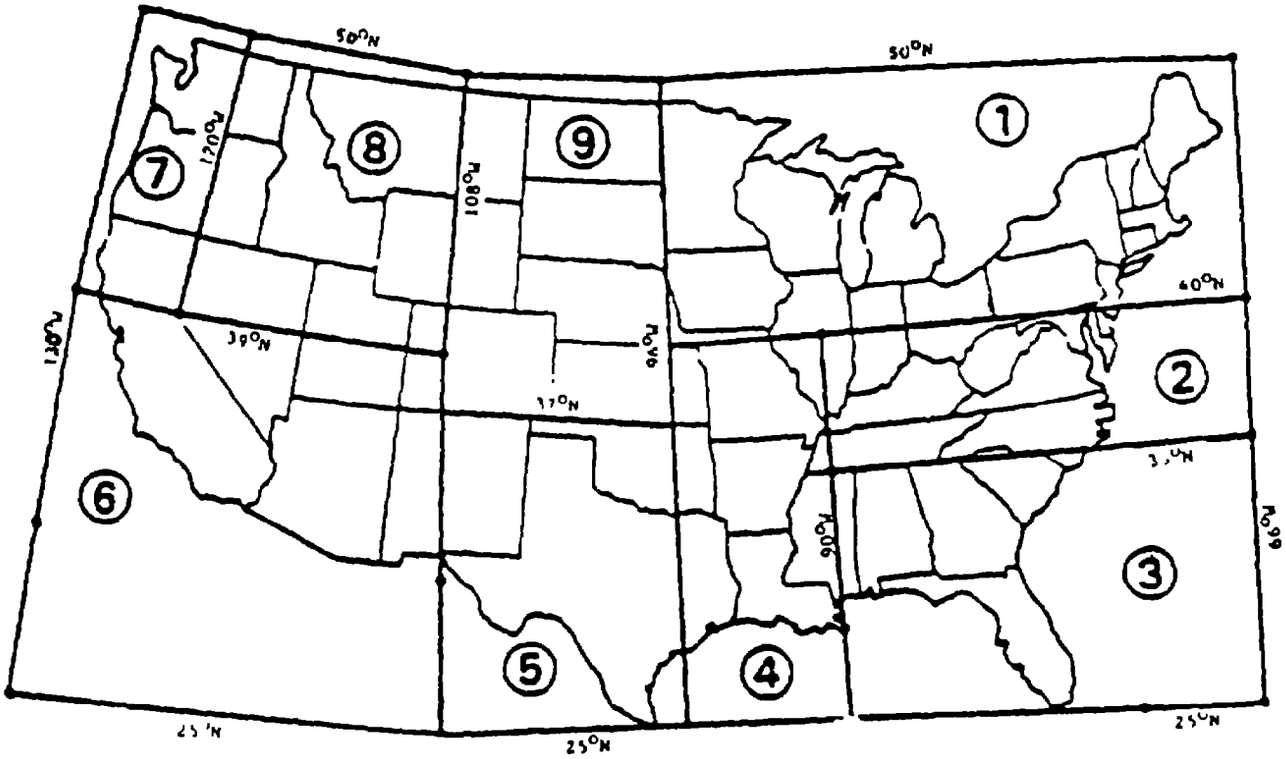

Not Shown: Alaska (Zone 7), Hawaii (Zone 7), Northern Mariana Islands (Zone 7), Guam (Zone 7), American Samoa (Zone 7), Trust Territory of the Pacific Islands (Zone 7), Puerto Rico (Zone 3), Virgin Islands (Zone 3).

Source: Methodology for Analysis of Detention Basins for Control of Urban Runoff Quality, prepared for U.S. Environmental Protection Agency, Office of Water, Nonpoint Source Division, Washington, DC, 1986.

Appendix F to Part 122—Incorporated Places With Populations Greater Than 250,000 According to Latest Decennial Census by Bureau of Census.

State	Incorporated place
Alabama	Birmingham.
Arizona	Phoenix.
	Tucson.
California	Long Beach.
	Los Angeles.
	Oakland.
	Sacramento.
	San Diego.
	San Francisco.
	San Jose.
Colorado	Denver.
District of Columbia	
Florida	Jacksonville.
	Miami.
	Tampa.
Georgia	Atlanta.
Illinois	Chicago.
Indiana	Indianapolis.
Kansas	Wichita.
Kentucky	Louisville.
Louisiana	New Orleans.
Maryland	Baltimore.
Massachusetts	Boston.
Michigan	Detroit.
Minnesota	Minneapolis.
	St. Paul.

State	Incorporated place
Missouri	Kansas City
	St. Louis
Nebraska	Omaha
New Jersey	Newark
New Mexico	Albuquerque
New York	Buffalo
	Bronx Borough
	Brooklyn Borough
	Manhattan Borough
	Queens Borough
	Staten Island Borough
North Carolina	Charlotte
Ohio	Cincinnati
	Cleveland
	Columbus
	Toledo
Oklahoma	Oklahoma City
	Tulsa
Oregon	Portland
Pennsylvania	Philadelphia
	Pittsburgh
Tennessee	Memphis
	Nashville/Davidson
Texas	Austin
	Dallas
	El Paso
	Fort Worth
	Houston
	San Antonio
Virginia	Norfolk
	Virginia Beach
Washington	Seattle
Wisconsin	Milwaukee

Appendix G to Part 122—Incorporated Places With Populations Greater Than 100,000 and Less Than 250,000 According to Latest Decennial Census by Bureau of Census

State	Incorporated place
Alabama	Huntsville
	Mobile
	Montgomery
Alaska	Anchorage
Arizona	Mesa
	Tempe
Arkansas	Little Rock
California	Anaheim
	Bakersfield
	Berkeley
	Concord
	Fremont
	Fresno
	Fullerton
	Garden Grove
	Glendale
	Huntington Beach
	Modesto
	Oxnard
	Pasadena
	Riverside
	San Bernadino
	Santa Ana
	Stockton
	Sunnyvale
	Torrance
Colorado	Aurora
	Colorado Springs
	Lakewood
	Pueblo
Connecticut	Bridgeport
	Hartford
	New Haven
	Stamford
	Waterbury
Florida	Fort Lauderdale
	Hialeah
	Hollywood
	Orlando
	St. Petersburg
Georgia	Columbus
	Macon
	Savannah
Idaho	Boise City
Illinois	Peoria
	Rockford
Indiana	Evansville
	Fort Wayne
	Gary
	South Bend
Iowa	Cedar Rapids
	Davenport
	Des Moines
Kansas	Kansas City
	Topeka
Kentucky	Lexington-Fayette
Louisiana	Baton Rouge
	Shreveport
Massachusetts	Springfield
	Worcester
Michigan	Ann Arbor
	Flint
	Grand Rapids
	Lansing
	Livonia
	Sterling Heights
	Warren
Mississippi	Jackson
Missouri	Independence
	Springfield
Nebraska	Lincoln
Nevada	Las Vegas
	Reno
New Jersey	Elizabeth
	Jersey City
	Paterson
New York	Albany
	Rochester
	Syracuse
	Yonkers
North Carolina	Durham
	Greensboro
	Raleigh
	Winston-Salem
Ohio	Akron
	Dayton
	Youngstown
Oregon	Eugene
Pennsylvania	Allentown
	Erie
Rhode Island	Providence
South Carolina	Columbia
Tennessee	Chattanooga
	Knoxville
Texas	Amarillo
	Arlington
	Beaumont
	Corpus Christi
	Garland
	Irving
	Lubbock
	Pasadena
	Waco
Utah	Salt Lake City
Virginia	Alexandria
	Chesapeake
	Hampton
	Newport News
	Portsmouth
	Richmond
	Roanoke
Washington	Spokane
	Tacoma
Wisconsin	Madison

Appendix H to Part 122—Counties with Unincorporated Urbanized Areas With a *Population of 250,000 or More According* to the Latest Decennial Census by the Bureau of Census

State	County	Unincorporated urbanized population
California	Los Angeles	812,884
	Sacramento	449,856
	San Diego	304,758
Delaware	New Castle	257,184
Florida	Dade	781,949
Georgia	DeKalb	386,379
Hawaii	Honolulu	688,178
Maryland	Anne Arundel	271,458
	Baltimore	801,308
	Montgomery	447,993
	Prince George's	450,188
Texas	Harris	409,801
Utah	Salt Lake	304,832
Virginia	Fairfax	527,178
Washington	King	336,800

Appendix I to Part 122—Counties With Unincorporated Urbanized Areas Greater Than 100,000, But Less Than 250,000 According to the Latest Decennial Census by the Bureau of Census

State	County	Unincorporated urbanized population
Alabama	Jefferson	102,917
Arizona	Pima	111,479
California	Alameda	187,474
	Contra Costa	158,452
	Kern	117,231
	Orange	210,893
	Riverside	115,719
	San Bernardino	148,844
Florida	Broward	150,370
	Escambia	147,292
	Hillsborough	238,292
	Orange	245,325
	Palm Beach	167,089
	Pinellas	194,389
	Polk	104,150
	Sarasota	110,009
Georgia	Clayton	100,742
	Cobb	204,121
	Richmond	118,529
Kentucky	Jefferson	224,958
Louisiana	Jefferson	140,836
North Carolina	Cumberland	142,727
Nevada	Clark	201,775
Oregon	Multnomah	141,100
	Washington	109,348
South Carolina	Greenville	135,396
	Richland	124,684
Virginia	Arlington	152,599
	Hanover	161,204
	Chesterfield	108,348
Washington	Snohomish	103,493
	Pierce	186,113

PART 123—STATE PROGRAM REQUIREMENTS

8. The authority citation for part 123 continues to read as follows

Authority: Clean Water Act, 33 U.S.C. 1251 *et seq.*

9. Section 123.25 is amended by revising paragraph (a)(9) to read as follows:

§ 123.25 Requirements for permitting.

(a) * * *

(9) § 122.26—(Storm water discharges);

* * * * *

PART 124—PROCEDURES FOR DECISIONMAKING

10. The authority citation for part 124 continues to read as follows:

Authority: Resource Conservation and Recovery Act, 42 U.S.C. 6901 *et seq.*; Safe Drinking Water Act, 42 U.S.C. 300f *et seq.*, Clean Water Act, 33 U.S.C. 1251 *et seq.*; and Clean Air Act, 42 U.S.C. 1857 *et seq.*

11. Section 124.52 is revised to read as follows.

§ 124.52 Permits required on a case-by-case basis.

(a) Various sections of part 122, subpart B allow the Director to determine, on a case-by-case basis, that certain concentrated animal feeding operations (§ 122.23), concentrated aquatic animal production facilities (§ 122.24), storm water discharges (§ 122.26), and certain other facilities covered by general permits (§ 122.28) that do not generally require an individual permit may be required to obtain an individual permit because of their contributions to water pollution.

(b) Whenever the Regional Administrator decides that an individual permit is required under this section, except as provided in paragraph (c) of this section, the Regional Administrator shall notify the discharger in writing of that decision and the reasons for it, and shall send an application form with the notice. The discharger must apply for a permit under § 122.21 within 60 days of notice, unless permission for a later date is granted by the Regional Administrator. The question whether the designation was proper will remain open for consideration during the public comment period under § 124.11 or § 124.118 and in any subsequent hearing.

(c) Prior to a case-by-case determination that an individual permit is required for a storm water discharge under this section (*see* 40 CFR 122.26 (a)(1)(v) and (c)(1)(v)), the Regional Administrator may require the discharger to submit a permit application or other information regarding the discharge under section 308 of the CWA. In requiring such information, the Regional Administrator shall notify the discharger in writing and shall send an application form with the notice. The discharger must apply for a permit under § 122.26 within 60 days of notice, unless permission for a later date is granted by the Regional Administrator. The question whether the initial designation was proper will remain open for consideration during the public comment period under § 124.11 or § 124.118 and in any subsequent hearing.

Note: The following form will not appear in the Code of Federal Regulations.

BILLING CODE 6560-50-M

APPENDIX C: ADEQUATE LEGAL AUTHORITY

contrivance for the elimination or destruction of human waste, within those portions of the watershed of the city contiguous to the intake of the city's water supply, as hereinafter described, or by placing any foul or putrescible substance, whether solid or liquid, and whether the same be buried or not, within the limits of the portion of the watershed so described.

Sec. 49-6. Application for permit.

(a) Any person who desires to use or develop any vegetated wetland and on and after January 1, 1983, any nonvegetated wetland, within this city, other than for those activities specified in section 49-3 above, shall first file an application for a permit with the wetlands board.

Sec. 49-22. Application for permit.

(a) Any person who desires to use or alter any coastal primary sand dune within this city, other than for those activities specified in section 49-20 above, shall first file an application for a permit with the wetlands board.

1.6 Authority to Meet Part 2 Permit Requirements

The NPDES stormwater permit application regulations require an assessment of whether existing legal authority is sufficient to meet the criteria for Part 2 of the permit application provided in *40 CFR 122.26(d)(2)(i)* as follows:

40 CFR 122.26(d)(2)(i)

A demonstration that the applicant can operate pursuant to legal authority established by statute, ordinance or series of contracts which authorizes or enables the applicant at a minimum to:

(A) Control through ordinance, permit, contract, order or similar means, the contribution of pollutants to the municipal storm sewer system by storm water discharges associated with industrial activity and the quality of storm water discharged from sites of industrial activity;

(B) Prohibit through ordinance, order or similar means, illicit discharges to the municipal separate storm sewer;

(C) Control through ordinance, order or similar means the discharge to a municipal separate storm sewer of spills, dumping or disposal of materials other than storm water;

(D) Control through interagency agreements among coapplicants the contribution of pollutants from one portion of the municipal system to another portion of the municipal system;

(E) Require compliance with conditions in ordinances, permits, contracts or order; and

(F) Carry out all inspection, surveillance and monitoring procedures necessary to determine compliance and noncompliance with permit conditions including the prohibition on illicit discharges to the municipal separate storm sewer.

The City Code sections identified above are referenced in an assessment of the individual Part 2 legal authority criteria.

(A) Control through ordinance, permit, contract, order or similar means, the contribution of pollutants to the municipal storm sewer system by storm water discharges associated with industrial activity and the quality of storm water discharged from sites of industrial activity. Section 39.1-19 of the City Code prohibits the discharge of sanitary sewer flow to the storm sewer system. Section 39.2-5 of the City Code prohibits the discharge of any sewage from a private sewage disposal facility on any public or private property in the City. Section 41.1-4 of the City Code prohibits pollutants to be discharged to the storm sewer system including the discharge of industrial process water, wash water, or other unpermitted industrial discharges in Section 41.1-4(c). Section 41.1-5 of the City Code provides the City with authority to order the correction of drainage problems on any site in the City. Sections 9-10, 30-69, 41-16, and 41-17 of the City Code prohibit pollution of waters of the City and littering. Sections 42-20.1 and 42-20.2 of the City Code prohibit the obstruction of drains or drainage areas. Sections 42-24, 42-25, and 42-46 of the City Code establish regulations for protecting the City from spills or deposits of liquid wastes. Section 46-28 of the City Code prohibits pollution of the City's water supply.

For development or redevelopment of industrial sites, the City's Zoning Ordinance establishes lot size, yard size, and maximum lot coverage requirements for industrial activity. Chapter 15 of the City Code establishes erosion and sedimentation control regulations If development or redevelopment of industrial sites occurs within a Chesapeake Bay Preservation Area, Section 494 of the City's Zoning Ordinance and Chapter 32.2 of the City Code establish stringent criteria for stormwater management, protection of water quality, and use of Best Management Practices. Chapter 49 of the City Code protects development within wetlands or coastal primary sand dunes by requiring a permit application with the wetlands board.

Enforcement provisions and penalties for violations of the referenced sections of City Code are also provided in specific chapters. Chapter 27 of the City Code provides additional authority for the abatement of nuisances.

(B) Prohibit through ordinance, order or similar means, illicit discharges to the municipal separate storm sewer. Section 39.1-19 of the City Code prohibits the discharge of sanitary sewer flow to the storm sewer system. Section 39.2-5 of the City Code prohibits the discharge of any sewage from a private sewage disposal facility on any public or private property in the City. Section 41.1-4 of the City Code prohibits pollutants to be discharged to the storm sewer system. Section 41.1-5 of the City Code provides the City with authority to order the correction of drainage problems on any site in the City. Sections 9-10, 30-69, 41-16, and 41-17 of the City Code prohibit pollution of waters of the City and littering. Sections 42-20.1 and 42-20.2 of the City Code prohibit the obstruction of drains or drainage areas. Sections 42-24, 42-25, and 42-46 of the City Code establish regulations for protecting the City from spills or deposits of liquid wastes. Section 46-28 of the City Code prohibits pollution of the City's water supply.

Enforcement provisions and penalties for violations of the referenced sections of City Code are also provided in specific chapters. Chapter 27 of the City Code provides additional authority for the abatement of nuisances.

(C) Control through ordinance, order or similar means the discharge to a municipal separate storm sewer of spills, dumping or disposal of materials other than storm water. Section 39.1-19 of the City Code prohibits the discharge of sanitary sewer flow to the storm sewer system. Section 39.2-5 of the City Code prohibits the discharge of any sewage from a private sewage disposal facility on any public or private property in the City. Section 41.1-4 of the City Code prohibits pollutants to be discharged to the storm sewer system. Sections 9-10, 30-69, 41-16, and 41-17 of the City Code prohibit pollution of waters of the City and littering. Sections 42-24, 42-25, and 42-46 of the City Code establish regulations for protecting the City from spills or deposits of liquid wastes. Section 46-28 of the City Code prohibits pollution of the City's water supply.

Enforcement provisions and penalties for violations of the referenced sections of City Code are also provided in specific chapters. Chapter 27 of the City Code provides additional authority for the abatement of nuisances.

(D) Control through interagency agreements among coapplicants the contribution of pollutants from one portion of the municipal system to another portion of the municipal system. The City of Norfolk owns the entire separate storm water system and is an individual NPDES permit applicant.

The City of Norfolk relies on its In-Town Reservoir System as a vital part of the water supply system. To protect water quality within the In-Town Reservoir System, the City of Norfolk will seek an intermunicipal agreement with the City of Virginia Beach to control nonpoint source pollution for the areas of the In-Town Reservoir System bordering and located within the jurisdiction of the City of Virginia Beach. After approval of Part 1 of the application by the EPA, the City of Norfolk will meet with the City of Virginia Beach to discuss the development of an agreement before submittal of Part 2 of the application on November 16, 1992.

(E) Require compliance with conditions in ordinances, permits, contracts or order. Enforcement provisions and penalties for violations of the referenced sections of City Code are provided in specific chapters. Chapter 27 of the City Codes provides additional authority for the abatement of nuisances.

(F) Carry out all inspection, surveillance and monitoring procedures necessary to determine compliance and noncompliance with permit conditions including the prohibition on illicit discharges to the municipal separate storm sewer. Chapter 41.1, entitled "Storm Water Management", provides authority for the City's Director of Public Works to establish procedures and enforce regulations pertaining to the storm water system in Section 41.1-3. Authority to prohibit and inspect for illicit connections to the storm sewer system is provided to the Department of City Planning and Codes Administration in Section 39.1-19. Authority to enforce violations of private sewage disposal regulations is provided to the Department of Health in Section 39.2-1 of the City Code. For development and redevelopment, the Department of City Planning and Codes Administration has authority over erosion and sediment control plans, the site review process, and stormwater management regulations required for activity within the Chesapeake Bay Preservation Area. Additional authority for enforcement of erosion and sediment control regulations and stormwater management is being established for the Department of Public Works in an ordinance currently under review by the state. Authority to enforce regulations and permits of the City's Tree Ordinance is provided in Section 30-23 of the City Code

1.7 Legal Authority Overview

Overall, the City of Norfolk has the existing legal authority, or is in the process of modifying existing City Code with ordinances, to control discharges to the municipal storm sewer system and meet the legal authority requirements of *40 CFR 122 26(d)(2)(i)*.

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EPA/600/R-95-136
August 1995

SHORT-TERM METHODS FOR ESTIMATING THE CHRONIC TOXICITY OF EFFLUENTS AND RECEIVING WATERS TO WEST COAST MARINE AND ESTUARINE ORGANISMS

(First Edition)

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DISCLAIMER

This document has been reviewed by the National Exposure Research Laboratory-Cincinnati (NERL-Cincinnati), U. S. Environmental Protection Agency (USEPA), and approved for publication. The mention of trade names or commercial products does not constitute endorsement or recommendation for use. The results of data analyses by computer programs described in the section on data analysis were verified using data commonly obtained from effluent toxicity tests. However, these computer programs may not be applicable to all data, and the USEPA assumes no responsibility for their use.

FOREWORD

Environmental measurements are required to determine the quality of ambient waters and the character of waste effluent. The National Exposure Research Laboratory-Cincinnati (NERL-Cincinnati) conducts research to:

- Develop and evaluate analytical methods to identify and measure the concentration of chemical pollutants in drinking waters, surface waters, groundwaters, wastewaters, sediments, sludges, and solid wastes.

- Investigate methods for the identification and measurement of viruses, bacteria and other microbiological organisms in aqueous samples and to determine the responses of aquatic organisms to water quality.

- Develop and operate a quality assurance program to support the achievement of data quality objectives in measurements of pollutants in drinking water, surface water, groundwater, wastewater, sediment and solid waste.

- Develop methods and models to detect and quantify responses in aquatic and terrestrial organisms exposed to environmental stressors and to correlate the exposure with effects on chemical and biological indicators.

The Federal Water Pollution Control Act Amendments of 1972 (PL 92-500), the Clean Water Act (CWA) of 1977 (PL 95-217) and the Water Quality Act of 1987 (PL 100-4) explicitly state that it is the national policy that the discharge of toxic substances in toxic amounts be prohibited. Thus, the detection of chronically toxic effluents plays an important role in identifying and controlling toxic discharges to surface waters. This manual is the first edition of the west coast marine and estuarine chronic toxicity test manual for effluents. It provides standardized methods for estimating the chronic toxicity of effluents and receiving waters to estuarine and marine organisms for use by the USEPA regional programs, the state programs, and the National Pollutant Discharge Elimination System (NPDES) permittees.

PREFACE

This manual contains whole effluent toxicity (WET) test methods considered by USEPA's Office of Research and Development (ORD) to have the necessary characteristics for use in the NPDES program and other USEPA monitoring activities, in Pacific coastal waters, for estimating the chronic toxicity of effluents and receiving waters. All the species included in this report are currently specified in NPDES permits in one or more of the west coast states. The methods will likely be revised to some extent, especially if they are proposed in the Federal Register as 304(h) methods. Revisions would be made based upon comments received as a result of the proposed rule public comment period.

With one exception, other than changes necessary to identify the test species used in these methods and corrections of an editorial nature, the first ten sections of this document are identical to the first ten sections of the "Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Estuarine and Marine Organisms, (Second Edition)." The exception occurs in chapter 7 where the use of synthetic (standard) dilution water for NPDES permit-related toxicity testing is not required. Validation and precision tests with natural seawater and HSB prepared from natural seawater (plus reagent water as necessary) have been acceptable, and synthetic waters have shown mixed results in limited testing.

The marine toxicity test procedures in this manual have been developed or refined by EPA and the states of California and Washington over a period of years. A significant number of organizations and individuals have contributed to this effort. A list of contributors is provided in the acknowledgements section. Among the major efforts that contributed critical data and critical analysis of the methods in this manual the following were vital:

1) The California Marine Bioassay Project (MBP). In 1984, the California State Water Resources Control Board initiated the MBP to develop sensitive methods for testing the toxicity of discharges to California marine waters. The MBP was funded wholly or in part by the USEPA using Section 205(j) grant funds. The MBP developed the tests with abalone (*Haliotis rufescens*),

topsmelt (*Atherinops affinis*), giant kelp (*Macrocystis pyrifera*), and mysid (*Holmesimysis costata*).

2) The EPA West Coast Marine Complex Effluent Program. Started in 1985, this program provided preliminary work for the topsmelt (*Atherinops affinis*), revision of methods for echinoid sperm with the purple sea urchin (*Strongylocentrotus purpuratus*) and the sand dollar (*Dendraster excentricus*), preparation of all methods into a standardized format, coordination of efforts among the various states and EPA regions 9 and 10, and development of yet unadopted test methods with the mysid (*Mysidopsis intii*) and the kelp (*Laminaria saccharina*).

3) The Protocol Review Committee (PRC) for the Triennial Review of the Marine Toxicity Test Protocols for the California Ocean Plan. In 1994 this committee reviewed a number of proposed test methods for inclusion in the California Ocean Plan. The methods included in this report are those recommended by the Protocol Review Committee. The *Mysidopsis intii* method developed by EPA was excluded from the recommended procedures because it was considered redundant with the *Holmesimysis costata* procedure. It was excluded from this report because its inclusion was also considered unneccesary by EPA region 10. The *Laminaria saccharina* test was excluded from the California recommendations because it was considered redundant with the *Macrocystis pyrifera* test. It was excluded from this report because the results from the West Coast Marine Species Chronic Protocol Variability Study indicated that more experience with the method was needed to produce acceptable precision.

4) West Coast Marine Species Chronic Protocol Variability Study. This study was a result of a 1991 settlement agreement among the Northwest Pulp and Paper Association, the Washington Dept. of Ecology, Puget Sound Water Quality Authority, and Tulalip Tribes of Washington. The year-long study in 1993-94 included monthly or quarterly interlaboratory toxicity test evaluation of tests with bivalve molluscs (*Crassostrea gigas*) and mussels (*Mytilus sp.*), echinoid sperm tests with purple sea urchins (*S. purpuratus*) and sand dollar (*D. excetricus*), sexual reproduction of kelp (*L. saccharina*), and the topsmelt (*A. affinis*).

Following review and recommendations by the PRC to the State of California for use of the procedures in this report, EPA (OR&D

and Region 9) modified the format for all methods to provide consistency among the methods as well as consistency with existing EPA Whole Effluent Toxicity Testing Manuals.

Review of the results from tests using the methods in this report indicated that they are analogous to, and as sensitive as, the methods previously proposed for estimating the chronic toxicity of effluents and receiving waters to marine and estuarine organisms (U.S. EPA 1994). The primary exception is the suite of invertebrate embryo-larval tests contained in this manual. These tests have been in regulatory and monitoring use on the west coast, some for many years. They tend to be more sensitive test organisms to many chemicals and the tests are more robust statistically. They have no analog in the previous EPA methods manuals, although a similar test has been proposed by the EPA laboratory in Narragansett for use in monitoring sediment-associated contaminants with the bivalve *Mulinia lateralis*.

ABSTRACT

This manual describes six short-term (forty minutes to seven days) estuarine and marine methods for measuring the chronic toxicity of effluents and receiving waters to eight species: the topsmelt, *Atherinops affinis*; the mysid, *Holmesimysis costata*; the sea urchin, *Strongylocentrotus purpuratus* and sand dollar *Dendraster excentricus*; the red abalone *Haliotis rufescens*; the bivalves *Crassostrea gigas* and mussel *Mytilus spp.* and the giant kelp, *Macrocystis pyrifera*. The methods include single and multiple concentration static renewal and static nonrenewal toxicity tests for effluents and receiving waters. Also included are guidelines on laboratory safety, quality assurance, facilities, and equipment and supplies; dilution water; effluent and receiving water sample collection, preservation, shipping, and holding; test conditions; toxicity test data analysis; report preparation; and organism culturing, holding, and handling. Examples of computer input and output for Dunnett's Procedure, Probit Analysis, Trimmed Speaman-Karber Method, and the Linear Interpolation Method are provided in the Appendices.

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SECTION 1

INTRODUCTION

1.1 This manual describes chronic toxicity tests for use in the National Pollutant Discharge Elimination System (NPDES) Permits Program to identify effluents and receiving waters containing toxic materials in chronically toxic concentrations. The test methods are also suitable for determining the toxicity of specific compounds contained in discharges. The tests may be conducted in a central laboratory or on-site, by the regulatory agency or the permittee.

1.2 The data are used for NPDES permits development and to determine compliance with permit toxicity limits. Data can also be used to predict potential acute and chronic toxicity in the receiving water, based on hypothesis testing or point estimate techniques (see Section 9, Chronic Toxicity Test Endpoints And Data Analysis) and appropriate dilution, application, and persistence factors. The tests are performed as a part of self-monitoring permit requirements, compliance biomonitoring inspections, toxics sampling inspections, and special investigations. Data from chronic toxicity tests performed as part of permit requirements are evaluated during compliance evaluation inspections and performance audit inspections.

1.3 Modifications of these tests are also used in toxicity reduction evaluations and toxicity identification evaluations to identify the toxic components of an effluent, to aid in the development and implementation of toxicity reduction plans, and to compare and control the effectiveness of various treatment technologies for a given type of industry, irrespective of the receiving water (USEPA, 1988c; USEPA, 1989b; USEPA, 1989c; USEPA, 1989d; USEPA, 1989e; USEPA, 1991a; USEPA, 1991b; USEPA, 1992).

1.4 This methods manual serves as a companion to the acute toxicity test methods for freshwater and marine organisms (USEPA, 1993a), the short-term chronic toxicity test methods for freshwater organisms (USEPA, 1993b), the short-term chronic toxicity test methods for east coast organisms (USEPA, 1994), and the manual for evaluation of laboratories performing aquatic toxicity tests (1991c).

1.5 Guidance for the implementation of toxicity tests in the NPDES program is provided in the Technical Support Document for Water Quality-Based Toxics Control (USEPA, l991a).

1.6 These marine and estuarine short-term toxicity tests are similar to those developed for the freshwater organisms and east coast marine organisms to evaluate the toxicity of effluents discharged to estuarine and coastal marine waters under the NPDES permit program. Methods are presented in this manual for ten species from six phylogenetic groups. The red abalone larval development test method, the giant kelp germination and germ-tube length test method, the mysid survival and growth test method and the topsmelt survival and growth test method were developed and extensively field tested by University of California, Santa Cruz through the California State Water Resources Control Board's Marine Bioassay Project. The purple urchin and sand dollar fertilization test method was developed by U.S. Environmental Research Laboratory-Newport, Oregon. The purple urchin and sand dollar development test method was developed by the Southern California Coastal Water Research Project. The Pacific oyster and mussel survival and larval development test method was modified from ASTM 1989 by the Washington Department of Ecology and the USEPA. The methods vary in duration from 40 minutes to seven days.

1.7 The ten species for which toxicity test methods provided are: the topsmelt, *Atherinops affinis*, the red abalone, *Haliotis rufescens*; the Pacific oyster, *Crassostrea gigas*, mussel *Mytilus spp.*; the mysid, *Holmesimysis costata*; the sea urchin, *Strongylocentrotus purpuratus*, the sand dollar, *Dendraster excentricus*; and the giant kelp, *Macroystis pyrifera*.

1.7.1 Many of the tests included in this document are based on the following:

1. "Marine Bioassay Project Seventh Reports (Reports 1-7)" by Brian S. Anderson, John W. Hunt, and Hilary R. McNulty, University of California, Santa Cruz; Mark D. Stephenson, California Department of Fish and Game; and Francis H. Palmer, Debra L. Denton, and Matthew Reeve, State Water Resources Control Board.

2. "Procedures Manual for Conducting Toxicity Tests Developed by the Marine Bioassay Project by Brian S. Anderson, John W. Hunt, Shiela L. Turpen, A.R. Coulon, University of California, Santa Cruz; Mike Martin, California of Department of Fish and Game; Debra L. Denton and Frank H. Palmer, State Water Resources Control Board, 90-10WQ, 112 pp.

3. "Standard Practice for Conducting Static Acute Toxicity Tests with Larvae of Four Species of Bivalve Molluscs. ASTM 1989.

1.7.2 Three of the methods incorporate the chronic endpoints of growth or development (or both) in addition to lethality. The sea urchin sperm cell test uses fertilization as an endpoint and has the advantage of an extremely short exposure period (40 minutes).

1.8 The validity of similar marine/estuarine methods in predicting adverse ecological impacts of toxic discharges was demonstrated in field studies (USEPA, 1986d).

1.9 The use of any marine or estuarine test species or test conditions other than those described in the methods summary tables in this manual or in the east coast marine manual (USEPA/600/4-91/003) shall be subject to application and approval of alternate test procedures under 40 CFR 136.4 and 40 CFR 136.5.

1.10 These methods are restricted to use by or under the supervision of analysts experienced in the use or conduct of aquatic toxicity testing and the interpretation of data from aquatic toxicity testing. Each analyst must demonstrate the ability to generate acceptable test results with these methods using the procedures described in this methods manual.

1.11 The manual was prepared in the established NERL-Cincinnati format (USEPA, 1983).

SECTION 2

SHORT-TERM METHODS FOR ESTIMATING CHRONIC TOXICITY

2.1 INTRODUCTION

2.1.1 The objective of aquatic toxicity tests with effluents or pure compounds is to estimate the "safe" or "no-effect" concentration of these substances, which is defined as the concentration which will permit normal propagation of fish and other aquatic life in the receiving waters. The endpoints that have been considered in tests to determine the adverse effects of toxicants include death and survival, decreased reproduction and growth, locomotor activity, gill ventilation rate, heart rate, blood chemistry, histopathology, enzyme activity, olfactory function, and terata. Since it is not feasible to detect and/or measure all of these (and other possible) effects of toxic substances on a routine basis, observations in toxicity tests generally have been limited to only a few effects, such as mortality, growth, and reproduction.

2.1.2 Acute lethality is an obvious and easily observed effect which accounts for its wide use in the early period of evaluation of the toxicity of pure compounds and complex effluents. The results of these tests were usually expressed as the concentration lethal to 50% of the test organisms (LC50) over relatively short exposure periods (one-to-four days).

2.1.3 As exposure periods of acute tests were lengthened, the LC50 and lethal threshold concentration were observed to decline for many compounds. By lengthening the tests to include one or more complete life cycles and observing the more subtle effects of the toxicants, such as a reduction in growth and reproduction, more accurate, direct, estimates of the threshold or safe concentration of the toxicant could be obtained. However, laboratory life cycle tests may not accurately estimate the "safe" concentration of toxicants because they are conducted with a limited number of species under highly controlled, steady state conditions, and the results do not include the effects of the stresses to which the organisms would ordinarily be exposed in the natural environment.

2.1.4 An early published account of a full life cycle, fish toxicity test was that of Mount and Stephan (1967). In this study, fathead minnows, *Pimephales promelas*, were exposed to a graded series of pesticide concentrations throughout their life cycle, and the effects of the toxicant on survival, growth, and

reproduction were measured and evaluated. This work was soon followed by full life cycle tests using other toxicants and fish species.

2.1.5 McKim (1977) evaluated the data from 56 full life cycle tests, 32 of which used the fathead minnow, *Pimephales promelas*, and concluded that the embryo-larval and early juvenile life stages were the most sensitive stages. He proposed the use of partial life cycle toxicity tests with the early life stages (ELS) of fish to establish water quality criteria.

2.1.6 Macek and Sleight (1977) found that exposure of critical life stages of fish to toxicants provides estimates of chronically safe concentrations remarkably similar to those derived from full life cycle toxicity tests. They reported that "for a great majority of toxicants, the concentration which will not be acutely toxic to the most sensitive life stages is the chronically safe concentration for fish, and that the most sensitive life stages are the embryos and fry." Critical life stage exposure was considered to be exposure of the embryos during most, preferably all, of the embryogenic (incubation) period, and exposure of the fry for 30 days post-hatch for warm water fish with embryogenic periods ranging from one-to-fourteen days, and for 60 days post-hatch for fish with longer embryogenic periods. They concluded that in the majority of cases, the maximum acceptable toxicant concentration (MATC) could be estimated from the results of exposure of the embryos during incubation, and the larvae for 30 days post-hatch.

2.1.7 Because of the high cost of full life-cycle fish toxicity tests and the emerging consensus that the ELS test data usually would be adequate for estimating chronically safe concentrations, there was a rapid shift by aquatic toxicologists to 30- to 90-day ELS toxicity tests for estimating chronically safe concentrations in the late 1970s. In 1980, USEPA adopted the policy that ELS test data could be used in establishing water quality criteria if data from full life-cycle tests were not available (USEPA, 1980a).

2.1.8 Published reports of the results of ELS tests indicate that the relative sensitivity of growth and survival as endpoints may be species dependent, toxicant dependent, or both. Ward and Parrish (1980) examined the literature on ELS tests that used embryos and juveniles of the sheepshead minnow, *Cyprinodon variegatus*, and found that growth was not a statistically sensitive indicator of toxicity in 16 of 18 tests. They suggested that the ELS tests be shortened to 14 days posthatch and that growth be eliminated as an indicator of toxic effects.

2.1.9 In a review of the literature on 173 fish full life-cycle and ELS tests performed to determine the chronically safe concentrations of a wide variety of toxicants, such as metals, pesticides, organics, inorganics, detergents, and complex effluents, Woltering (1984) found that at the lowest effect concentration, significant reductions were observed in fry survival in 57%, fry growth in 36%, and egg hatchability in 19% of the tests. He also found that fry survival and growth were very often equally sensitive, and concluded that the growth response could be deleted from routine application of the ELS tests. The net result would be a significant reduction in the duration and cost of screening tests with no appreciable impact on estimating MATCs for chemical hazard assessments. Benoit et al. (1982), however, found larval growth to be the most significant measure of effect and survival to be equally or less sensitive than growth in early life-stage tests with four organic chemicals.

2.1.10 Efforts to further reduce the length of partial life-cycle toxicity tests for fish without compromising their predictive value have resulted in the development of an eight-day, embryo-larval survival and teratogenicity test for fish and other aquatic vertebrates (USEPA, 1981; Birge et al., 1985), and a seven-day larval survival and growth test (Norberg and Mount, 1985).

2.1.11 The similarity of estimates of chronically safe concentrations of toxicants derived from short-term, embryo-larval survival and teratogenicity tests to those derived from full life-cycle tests has been demonstrated by Birge et al. (1981), Birge and Cassidy (1983), and Birge et al. (1985).

2.1.12 Use of a seven-day, fathead minnow, *Pimephales promelas*, larval survival and growth test was first proposed by Norberg and Mount at the 1983 annual meeting of the Society for Environmental Toxicology and Chemistry (Norberg and Mount, 1983). This test was subsequently used by Mount and associates in field demonstrations at Lima, Ohio (USEPA, 1984), and at many other locations (USEPA, 1985c, USEPA, 1985d; USEPA, 1985e; USEPA, 1986a; USEPA, 1986b; USEPA, 1986c; USEPA, 1986d). Growth was frequently found to be more sensitive than survival in determining the effects of complex effluents.

2.1.13 Norberg and Mount (1985) performed three single toxicant fathead minnow larval growth tests with zinc, copper, and DURSBAN®, using dilution water from Lake Superior. The results

were comparable to, and had confidence intervals that overlapped with, chronic values reported in the literature for both ELS and full life-cycle tests.

2.1.14 USEPA (1987b) and USEPA (1987c) adapted the fathead minnow larval growth and survival test for use with the sheepshead minnow and the inland silverside, respectively. When daily renewal 7-day sheepshead minnow larval growth and survival tests and 28-day ELS tests were performed with industrial and municipal effluents, growth was more sensitive than survival in seven out of 12 larval growth and survival tests, equally sensitive in four tests, and less sensitive in only one test. In four cases, the ELS test may have been three to 10 times more sensitive to effluents than the larval growth and survival test. In tests using copper, the No Observable Effect Concentrations (NOECs) were the same for both types of test, and growth was the most sensitive endpoint for both. In a four laboratory comparison, six of seven tests produced identical NOECs for survival and growth (USEPA, 1987a). Data indicate that the inland silverside is at least equally sensitive or more sensitive to effluents and single compounds than the sheepshead minnow, and can be tested over a wider salinity range, 5-30‰ (USEPA, 1987a).

2.1.15 Lussier et al. (1985) and USEPA (1987e) determined that survival and growth are often as sensitive as reproduction in 28-day life-cycle tests with the mysid, *Mysidopsis bahia*.

2.1.16 Nacci and Jackim (1985) and USEPA (1987g) compared the results from the sea urchin fertilization test, using organic compounds, with results from acute toxicity tests using the freshwater organisms, fathead minnows, *Pimphales promelas*, and *Daphnia magna*. The test was also compared to acute toxicity tests using Atlantic silverside, *Menidia menidia*, and the mysid, *Mysidopsis bahia*, and five metals. For six of the eight organic compounds, the results of the fertilization test and the acute toxicity test correlated well ($r^2 = 0.85$). However, the results of the fertilization test with the five metals did not correlate well with the results from the acute tests.

2.1.17 USEPA (1987f) evaluated two industrial effluents containing heavy metals, five industrial effluents containing organic chemicals (including dyes and pesticides), and 15 domestic wastewaters using the two-day red macroalga, *Champia parvula*, sexual reproduction test. Nine single compounds were used to compare the effects on sexual reproduction using a

two-week exposure and a two-day exposure. For six of the nine compounds tested, the chronic values were the same for both tests.

2.1.18 The use of short-term toxicity tests in the NPDES Program is especially attractive because they provide a more direct estimate of the safe concentrations of effluents in receiving waters than was provided by acute toxicity tests, at an only slightly increased level of effort, compared to the fish full life-cycle chronic and 28-day ELS tests and the 28-day mysid life-cycle test.

2.2 **TYPES OF TESTS**

2.2.1 The selection of the test type will depend on the NPDES permit requirements, the objectives of the test, the available resources, the requirements of the test organisms, and effluent characteristics such as fluctuations in effluent toxicity.

2.2.2 Effluent chronic toxicity is generally measured using a multi-concentration, or definitive test, consisting of a control and a minimum of five effluent concentrations. The tests are designed to provide dose-response information, expressed as the percent effluent concentration that affects the survival, fertilization, growth, and/or development within the prescribed period of time (40 minutes to seven days). The results of the tests are expressed in terms of either the highest concentration that has no statistically significant observed effect on those responses when compared to the controls or the estimated concentration that causes a specified percent reduction in responses versus the controls.

2.2.3 Use of pass/fail tests consisting of a single effluent concentration (e.g., the receiving water concentration or RWC) and a control **is not recommended**. If the NPDES permit has a whole effluent toxicity limit for acute toxicity at the RWC, it is prudent to use that permit limit as the midpoint of a series of five effluent concentrations. This will ensure that there is sufficient information on the dose-response relationship. For example, if the RWC is >25% then, the effluent concentrations utilized in a test may be: (1) 100% effluent, (2) (RWC + 100)/2, (3) RWC, (4) RWC/2, and (5) RWC/4. More specifically, if the RWC = 50%, the effluent concentrations used in the toxicity test would be 100%, 75%, 50%, 25%, and 12.5%. If the RWC is <25% effluent the concentrations may be: (1) 4 times the RWC, (2) 2 times the RWC, (3) RWC, (4) RWC/2, and (5) RWC/4.

2.2.4 Receiving (ambient) water toxicity tests commonly employ two treatments, a control and the undiluted receiving water, but may also consist of a series of receiving water dilutions.

2.2.5 A negative result from a chronic toxicity test does not preclude the presence of toxicity. Also, because of the potential temporal variability in the toxicity of effluents, a negative test result with a particular sample does not preclude the possibility that samples collected at some other time might exhibit chronic toxicity.

2.2.6 The frequency with which chronic toxicity tests are conducted under a given NPDES permit is determined by the regulatory agency on the basis of factors such as the variability and degree of toxicity of the waste, production schedules, and process changes.

2.2.7 Tests recommended for use in this methods manual may be static non-renewal or static renewal. Individual methods specify which type of test is to be conducted.

2.3 **STATIC TESTS**

2.3.1 Static non-renewal tests - The test organisms are exposed to the same test solution for the duration of the test.

2.3.2 Static-renewal tests - The test organisms are exposed to a fresh solution of the same concentration of sample every 24 h or other prescribed interval, either by transferring the test organisms from one test chamber to another, or by replacing all or a portion of solution in the test chambers.

2.4 **ADVANTAGES AND DISADVANTAGES OF TOXICITY TEST TYPES**

2.4.1 STATIC NON-RENEWAL, SHORT-TERM TOXICITY TESTS:

Advantages:

1. Simple and inexpensive.
2. More cost effective in determining compliance with permit conditions.
3. Limited resources (space, manpower, equipment) required; would permit staff to perform more tests in the same amount of time.
4. Smaller volume of effluent required than for static renewal or flow-through tests.

Disadvantages:

1. Dissolved oxygen (DO) depletion may result from high chemical oxygen demand (COD), biological oxygen demand (BOD), or metabolic wastes.
2. Possible loss of toxicants through volatilization and/or adsorption to the exposure vessels.
3. Generally less sensitive than renewal because the toxic substances may degrade or be adsorbed, thereby reducing the apparent toxicity. Also, there is less chance of detecting slugs of toxic wastes, or other temporal variations in waste properties.

2.4.2 STATIC RENEWAL, SHORT-TERM TOXICITY TESTS:

Advantages:

1. Reduced possibility of DO depletion from high COD and/or BOD, or ill effects from metabolic wastes from organisms in the test solutions.
2. Reduced possibility of loss of toxicants through volatilization and/or adsorption to the exposure vessels.
3. Test organisms that rapidly deplete energy reserves are fed when the test solutions are renewed, and are maintained in a healthier state.

Disadvantages:

1. Require greater volume of effluent than non-renewal tests.
2. Generally less chance of temporal variations in waste properties.

SECTION 3

HEALTH AND SAFETY

3.1 GENERAL PRECAUTIONS

3.1.1 Each laboratory should develop and maintain an effective health and safety program, requiring an ongoing commitment by the laboratory management and includes: (1) a safety officer with the responsibility and authority to develop and maintain a safety program; (2) the preparation of a formal, written, health and safety plan, which is provided to the laboratory staff; (3) an ongoing training program on laboratory safety; and (4) regularly scheduled, documented, safety inspections.

3.1.2 Collection and use of effluents in toxicity tests may involve significant risks to personal safety and health. Personnel collecting effluent samples and conducting toxicity tests should take all safety precautions necessary for the prevention of bodily injury and illness which might result from ingestion or invasion of infectious agents, inhalation or absorption of corrosive or toxic substances through skin contact, and asphyxiation due to a lack of oxygen or the presence of noxious gases.

3.1.3 Prior to sample collection and laboratory work, personnel should determine that all necessary safety equipment and materials have been obtained and are in good condition.

3.1.4 Guidelines for the handling and disposal of hazardous materials must be strictly followed.

3.2 SAFETY EQUIPMENT

3.2.1 PERSONAL SAFETY GEAR

3.2.1.1 Personnel must use safety equipment, as required, such as rubber aprons, laboratory coats, respirators, gloves, safety glasses, hard hats, and safety shoes. Plastic netting on glass beakers, flasks and other glassware minimizes breakage and subsequent shattering of the glass.

3.2.2 LABORATORY SAFETY EQUIPMENT

3.2.2.1 Each laboratory (including mobile laboratories) should be provided with safety equipment such as first aid kits, fire extinguishers, fire blankets, emergency showers, chemical spill clean-up kits, and eye fountains.

3.2.2.2 Mobile laboratories should be equipped with a telephone to enable personnel to summon help in case of emergency.

3.3 GENERAL LABORATORY AND FIELD OPERATIONS

3.3.1 Work with effluents should be performed in compliance with accepted rules pertaining to the handling of hazardous materials (see safety manuals listed in Section 3, Health and Safety, Subsection 3.5). It is recommended that personnel collecting samples and performing toxicity tests should not work alone.

3.3.2 Because the chemical composition of effluents is usually only poorly known, they should be considered as potential health hazards, and exposure to them should be minimized. Fume and canopy hoods over the toxicity test areas must be used whenever possible.

3.3.3 It is advisable to cleanse exposed parts of the body immediately after collecting effluent samples.

3.3.4 All containers should be adequately labeled to indicate their contents.

3.3.5 Staff should be familiar with safety guidelines on Material Safety Data Sheets for reagents and other chemicals purchased from suppliers. Incompatible materials should not be stored together. Good housekeeping contributes to safety and reliable results.

3.3.6 Strong acids and volatile organic solvents employed in glassware cleaning must be used in a fume hood or under an exhaust canopy over the work area.

3.3.7 Electrical equipment or extension cords not bearing the approval of Underwriter Laboratories must not be used. Ground-fault interrupters must be installed in all "wet" laboratories where electrical equipment is used.

3.3.8 Mobile laboratories should be properly grounded to protect against electrical shock.

3.4 DISEASE PREVENTION

3.4.1 Personnel handling samples which are known or suspected to contain human wastes should be immunized against tetanus, typhoid fever, polio, and hepatitis B.

3.5 **SAFETY MANUALS**

3.5.1 For further guidance on safe practices when collecting effluent samples and conducting toxicity tests, check with the permittee and consult general safety manuals, including USEPA (1986e), and Walters and Jameson (1984).

3.6 **WASTE DISPOSAL**

3.6.1 Wastes generated during toxicity testing must be properly handled and disposed of in an appropriate manner. Each testing facility will have its own waste disposal requirements based on local, state and Federal rules and regulations. It is extremely important that these rules and regulations be known, understood, and complied with by all persons responsible for, or otherwise involved in, performing toxicity testing activities. Local fire officials should be notified of any potentially hazardous conditions.

SECTION 4

QUALITY ASSURANCE

4.1 INTRODUCTION

4.1.1 Development and maintenance of a toxicity test laboratory quality assurance (QA) program (USEPA, 1991b) requires an ongoing commitment by laboratory management. Each toxicity test laboratory should (1) appoint a quality assurance officer with the responsibility and authority to develop and maintain a QA program, (2) prepare a quality assurance plan with stated data quality objectives (DQOs), (3) prepare written descriptions of laboratory standard operating procedures (SOPs) for culturing, toxicity testing, instrument calibration, sample chain-of-custody procedures, laboratory sample tracking system, glassware cleaning, etc., and (4) provide an adequate, qualified technical staff for culturing and toxicity testing the organisms, and suitable space and equipment to assure reliable data.

4.1.2 QA practices for toxicity testing laboratories must address all activities that affect the quality of the final effluent toxicity data, such as: (1) effluent sampling and handling; (2) the source and condition of the test organisms; (3) condition of equipment; (4) test conditions; (5) instrument calibration; (6) replication; (7) use of reference toxicants; (8) record keeping; and (9) data evaluation.

4.1.3 Quality control practices, on the other hand, consist of the more focused, routine, day-to-day activities carried out within the scope of the overall QA program. For more detailed discussion of quality assurance and general guidance on good laboratory practices and laboratory evaluation related to toxicity testing, see FDA (1978); USEPA (1979d); USEPA (1980b); USEPA (1980c); USEPA (1991c); DeWoskin (1984); and Taylor (1987).

4.1.4 Guidelines for the evaluation of laboratory performing toxicity tests and laboratory evaluation criteria are found in USEPA (1991c).

4.2 FACILITIES, EQUIPMENT, AND TEST CHAMBERS

4.2.1 Separate test organism culturing and toxicity testing areas should be provided to avoid possible loss of cultures due to cross-contamination. Ventilation systems should be designed and operated to prevent recirculation or leakage of air from chemical analysis laboratories or sample storage and preparation

areas into organism culturing or testing areas, and from testing and sample preparation areas into culture rooms.

4.2.2 Laboratory and toxicity test temperature control equipment must be adequate to maintain recommended test water temperatures. Recommended materials must be used in the fabrication of the test equipment which comes in contact with the effluent (see Section 5, Facilities, Equipment, and Supplies; and specific toxicity test method).

4.3 **TEST ORGANISMS**

4.3.1 The test organisms used in the procedures described in this manual are the red abalone, *Haliotis rufescens*; the Pacific oyster, *Crassostrea gigas*, and mussel, *Mytilus spp.*; the topsmelt, *Atherinops affinis*; the mysid, *Holmesimysis costata*; the sea urchin, *Strongylocentrotus purpuratus*, and the sand dollar *Denstraster excentricus*; and the giant kelp, *Macrocystis pyrifera*. The organisms used should be disease-free and appear healthy, behave normally, feed well, and have low mortality in cultures, during holding, and in test control. Test organisms should be positively identified to species (see Section 6, Test Organisms).

4.4 **LABORATORY WATER USED FOR CULTURING AND TEST DILUTION WATER**

4.4.1 The quality of water used for test organism culturing and for dilution water used in toxicity tests is extremely important. Water for these two uses should come from the same source. The dilution water used in effluent toxicity tests will depend on the objectives of the study and logistical constraints, as discussed in Section 7, Dilution Water. The dilution water used in the toxicity tests may be natural seawater, hypersaline brine (100‰) prepared from natural seawater, or artificial seawater prepared from commercial sea salts, such as FORTY FATHOMS® or HW MARINEMIX®, if recommended in the method. GP2 synthetic seawater, made from reagent grade chemical salts in conjunction with natural seawater, may also be used if recommended. Types of water are discussed in Section 5, Facilities, Equipment, and Supplies. Water used for culturing and test dilution water should be analyzed for toxic metals and organics at least annually or whenever difficulty is encountered in meeting minimum acceptability criteria for control survival and reproduction or growth. The concentration of the metals, Al, As, Cr, Co, Cu, Fe, Pb, Ni, Zn, expressed as total metal, should not exceed 1 µg/L each, and Cd, Hg, and Ag, expressed as total metal, should not exceed 100 ng/L each. Total organochlorine pesticides plus PCBs should be less than 50 ng/L (APHA, 1992). Pesticide

concentrations should not exceed USEPA's National Ambient Water Quality chronic criteria values where available.

4.5 EFFLUENT AND RECEIVING WATER SAMPLING AND HANDLING

4.5.1 Sample holding times and temperatures of effluent samples collected for on-site and off-site testing must conform to conditions described in Section 8, Effluent and Receiving Water Sampling, Sample Handling, and Sample Preparation for Toxicity Tests.

4.6 TEST CONDITIONS

4.6.1 Water temperature and salinity must be maintained within the limits specified for each test. The temperature of test solutions must be measured by placing the thermometer or probe directly into the test solutions, or by placing the thermometer in equivalent volumes of water in surrogate vessels positioned at appropriate locations among the test vessels. Temperature should be recorded continuously in at least one vessel during the duration of each test. Test solution temperatures must be maintained within the limits specified for each test. DO concentrations and pH should be checked as specified in each test method.

4.7 QUALITY OF TEST ORGANISMS

4.7.1 If the laboratory performs short-term chronic toxicity tests routinely but does not have an ongoing test organism culturing program and must obtain the test organisms from an outside source, the sensitivity of a batch of test organisms must be determined with a reference toxicant in a short-term chronic toxicity test performed monthly (see Section 4, Quality Assurance, Subsections 4.14, 4.15, 4.16, and 4.17). Where acute or short-term chronic toxicity tests are performed with effluents or receiving waters using test organisms obtained from outside the test laboratory, concurrent toxicity tests of the same type must be performed with a reference toxicant, unless the test organism supplier provides control chart data from at least the last five monthly short-term chronic toxicity tests using the same reference toxicants and test conditions (see Section 6, Test Organisms).

4.7.2 The supplier should certify the species identification of the test organisms, and provide the taxonomic reference (citation and page) or name(s) of the taxonomic expert(s) consulted.

4.7.3 If the laboratory maintains breeding cultures, the sensitivity of the offspring should be determined in a short-term chronic toxicity test performed with a reference toxicant at least once each month (see Section 4, Quality Assurance, Subsection 4.14, 4.15, 4.16, and 4.17). If preferred, this reference toxicant test may be performed concurrently with an effluent toxicity test. However, if a given species of test organism produced by inhouse cultures is used only monthly, or less frequently in toxicity tests, a reference toxicant test must be performed concurrently with each short-term chronic effluent and/or receiving water toxicity test.

4.7.4 If a routine reference toxicant test fails to meet acceptability criteria, the test must be immediately repeated. If the failed reference toxicant test was being performed concurrently with an effluent or receiving water toxicity test, both tests must be repeated (For exception, see Section 4, Quality Assurance, Subsection 4.16.5).

4.8 **FOOD QUALITY**

4.8.1 The nutritional quality of the food used in culturing and testing fish and invertebrates is an important factor in the quality of the toxicity test data. This is especially true for the unsaturated fatty acid content of brine shrimp nauplii, *Artemia*. Problems with the nutritional suitability of the food will be reflected in the survival, growth, and reproduction of the test organisms in cultures and toxicity tests. *Artemia* cysts and other foods must be obtained as described in Section 5, Facilities, Equipment, and Supplies.

4.8.2 Problems with the nutritional suitability of food will be reflected in the survival, growth, development and reproduction of the test organisms in cultures and toxicity tests. If a batch of food is suspected to be defective, the performance of organisms fed with the new food can be compared with the performance of organisms fed with a food of known quality in side-by-side tests. If the food is used for culturing, its suitability should be determined using a short-term chronic test which will determine the affect of food quality on growth or reproduction of each of the relevant test species in culture, using four replicates with each food source. Where applicable, foods used only in chronic toxicity tests can be compared with a food of known quality in side-by-side, multi-concentration chronic tests, using the reference toxicant regularly employed in the laboratory QA program. For list of commercial sources of *Artemia* cysts, see Table 2 of Section 5, Facilities, Equipment, and Supplies.

4.8.3 New batches of food used in culturing and testing should be analyzed for toxic organics and metals or whenever difficulty is encountered in meeting minimum acceptability criteria for control survival, reproduction, development or growth. If the concentration of total organochlorine pesticides exceeds 0.15 µg/g wet weight, or the concentration of total organochlorine pesticides plus PCBs exceeds 0.30 µg/g wet weight, or toxic metals (Al, As, C, Co, Cu, Pb, Ni, Zn, expressed as total metal) exceed 20 µg/g wet weight, the food should not be used (for analytical methods, see AOAC, 1990; and USDA, 1989). For foods (e.g., YCT) which are used to culture and test organisms, the quality of the food should meet the requirements for the laboratory water used for culturing and test dilution water as described in Section 4.4 above.

4.9 ACCEPTABILITY OF CHRONIC TOXICITY TESTS

4.9.1 Each test method contain specific test acceptability criteria defining minimum acceptable control performance for each endpoint (e.g., the mean larval development must be at least 80% in the controls), statistical resolution (e.g., minimum significant difference), and test conditions (e.g., salinity 34 ± 2‰). If these criteria are not met, the test must be repeated. Test acceptability criteria are used to demonstrate the sensitivity of the test organisms and the laboratory performance with a routinue reference toxicant.

4.9.2 An individual test may be conditionally acceptable if temperature, DO, and other specified conditions fall outside specifications, depending on the degree of the departure and the objectives of the tests (see test conditions and test acceptability criteria summaries). The acceptability of the test will depend on the experience and professional judgment of the laboratory investigator and the reviewing staff of the regulatory authority. Any deviation from test specifications must be noted when reporting data from a test.

4.10 ANALYTICAL METHODS

4.10.1 Routine chemical and physical analyses for culture and dilution water, food, and test solutions must include established quality assurance practices outlined in USEPA methods manuals (USEPA, 1979a and USEPA, 1979b).

4.10.2 Reagent containers should be dated and catalogued when received from the supplier, and the shelf life should not be exceeded. Also, working solutions should be dated when prepared, and the recommended shelf life should be observed.

4.11 CALIBRATION AND STANDARDIZATION

4.11.1 Instruments used for routine measurements of chemical and physical parameters, such as pH, DO, temperature, conductivity, and salinity, must be calibrated and standardized according to instrument manufacturers procedures as indicated in the general section on quality assurance (see USEPA Methods 150.1, 360.1, 170.1, and 120.1 in USEPA, 1979b). Calibration data are recorded in a permanent log book.

4.11.2 Wet chemical methods used to measure hardness, alkalinity, and total residual chlorine, must be standardized prior to use each day according to the procedures for those specific USEPA methods (see USEPA Methods 130.2 and 310.1 in USEPA, 1979b).

4.12 REPLICATION AND TEST SENSITIVITY

4.12.1 The sensitivity of the tests will depend in part on the number of replicates per concentration, the significance level selected, and the type of statistical analysis. If the variability remains constant, the sensitivity of the test will increase as the number of replicates is increased. The minimum recommended number of replicates varies with the objectives of the test and the statistical method used for analysis of the data.

4.13 VARIABILITY IN TOXICITY TEST RESULTS

4.13.1 Factors which can affect test success and precision include: (1) the experience and skill of the laboratory analyst; (2) test organism age, condition, and sensitivity; (3) dilution water quality; (4) temperature control; (5) and the quality and quantity of food provided. The results will depend upon the species used and the strain or source of the test organisms, and test conditions, such as temperature, DO, food, and water quality. The repeatability or precision of toxicity tests is also a function of the number of test organisms used at each toxicant concentration. Jensen (1972) discussed the relationship between sample size (number of fish) and the standard error of the test, and considered 20 fish per concentration as optimum for Probit Analysis.

4.14 **TEST PRECISION**

4.14.1 The ability of the laboratory personnel to obtain consistent, precise results must be demonstrated with reference toxicants before they attempt to measure effluent toxicity. The single-laboratory precision of each type of test to be used in a laboratory should be determined by performing at least five or more tests with a reference toxicant.

4.14.2 Test precision can be estimated by using the same strain of organisms under the same test conditions, and employing a known toxicant, such as a reference toxicant.

4.14.3 Precision data for each of the tests described in this manual are presented in the sections describing the individual test methods.

4.14.4 Additional information on toxicity test precision is provided in the Technical Support Document for Water Quality-based Toxic Control (see pp. 2-4, and pp. 11-15 in USEPA, 1991a).

4.14.5 In cases where the test data are used in Probit Analysis or other point estimation techniques (see Section 9, Chronic Toxicity Test Endpoints and Data Analysis), precision can be described by the mean, standard deviation, and relative standard deviation (percent coefficient of variation, or CV) of the calculated endpoints from the replicated tests. In cases where the test data are used in the Linear Interpolation Method, precision can be estimated by empirical confidence intervals derived by using the ICPIN Method (see Section 9, Chronic Toxicity Test Endpoints and Data Analysis). However, in cases where the results are reported in terms of the No-Observed-Effect-Concentration (NOEC) and Lowest-Observed-Effect-Concentration (LOEC) (see Section 9, Chronic Toxicity Test Endpoints and Data Analysis), precision can only be described by listing the NOEC-LOEC interval for each test. It is not possible to express precision in terms of a commonly used statistic. However, when all tests of the same toxicant yield the same NOEC-LOEC interval, maximum precision has been attained. The "true" no effect concentration could fall anywhere within the interval, NOEC ± (LOEC minus NOEC).

4.14.6 It should be noted here that the dilution factor selected for a test determines the width of the NOEC-LOEC interval and the inherent maximum precision of the test. As the absolute value of the dilution factor decreases, the width of the NOEC-LOEC interval increases, and the inherent maximum precision of the test decreases. When a dilution factor of 0.3 is used, the NOEC

could be considered to have a relative uncertainty as high as ± 300%. With a dilution factor of 0.5, the NOEC could be considered to have a relative variability of ± 100%. As a result of the variability of different dilution factors, **USEPA recommends the use of a •0.5 dilution factor**. Other factors which can affect test precision include: test organism age, condition, and sensitivity; temperature control; and feeding.

4.15 DEMONSTRATING ACCEPTABLE LABORATORY PERFORMANCE

4.15.1 It is a laboratory's responsibility to demonstrate its ability to obtain consistent, precise results with reference toxicants before it performs toxicity tests with effluents for permit compliance purposes. To meet this requirement, the intralaboratory precision, expressed as percent coefficient of variation (CV%), of each type of test to be used in a laboratory should be determined by performing five or more tests with different batches of test organisms, using the same reference toxicant, at the same concentrations, with the same test conditions (i.e., the same test duration, type of dilution water, age of test organisms, feeding, etc.), and same data analysis methods. A reference toxicant concentration series (0.5 or higher) should be selected that will consistently provide partial mortalities at two or more concentrations.

4.16 DOCUMENTING ONGOING LABORATORY PERFORMANCE

4.16.1 Satisfactory laboratory performance is demonstrated by performing at least one acceptable test per month with a reference toxicant for each toxicity test method commonly used in the laboratory. For a given test method, successive tests must be performed with the same reference toxicant, at the same concentrations, in the same dilution water, using the same data analysis methods. Precision may vary with the test species, reference toxicant, and type of test.

4.16.2 A control chart should be prepared for each combination of reference toxicant, test species, test conditions, and endpoints. Toxicity endpoints from five or six tests are adequate for establishing the control charts. Successive toxicity endpoints (NOECs, IC25s, LC50s, etc.) should be plotted and examined to determine if the results (X_1) are within prescribed limits (Figure 1). The types of control charts illustrated (see USEPA, 1979a) are used to evaluate the cumulative trend of results from a series of samples. For endpoints that are point estimates (LC50s and IC25s), the cumulative mean (X) and upper and lower control limits (±2S) are re-calculated with each successive test result. Endpoints from

hypothesis tests (NOEC, NOAEC) from each test are plotted directly on the control chart. The control limits would consist of one concentration interval above and below the concentration representing the central tendency. After two years of data collection, or a minimum of 20 data points, the control (cusum) chart should be maintained using only the 20 most recent data points.

4.16.3 The outliers, which are values falling outside the upper and lower control limits, and trends of increasing or decreasing sensitivity, are readily identified. In the case of endpoints that are point estimates (LC50s and IC25s), at the P = 0.05 probability level, one in 20 tests would be expected to fall outside of the control limits by chance alone. If more than one out of 20 reference toxicant tests fall outside the control limits, the effluent toxicity tests conducted during the month in which the second reference toxicant test failed are suspect, and should be considered as provisional and subject to careful review. Control limits for the NOECs will also be exceeded occasionally, regardless of how well a laboratory performs.

4.16.4 If the toxicity value from a given test with a reference toxicant fall <u>well</u> outside the expected range for the test organisms when using the standard dilution water and other test conditions, the sensitivity of the organisms and the overall credibility of the test system are suspect. In this case, the test procedure should be examined for defects and should be repeated with a different batch of test organisms.

4.16.5 Performance should improve with experience, and the control limits for endpoints that are point estimates should gradually narrow. However, control limits of ±2S will be exceeded 5% of the time by chance alone, regardless of how well a laboratory performs. Highly proficient laboratories which develop very narrow control limits may be unfairly penalized if a test result which falls just outside the control limits is rejected *de facto*. For this reason, the width of the control limits should be considered by the permitting authority in determining whether the outliers should be rejected.

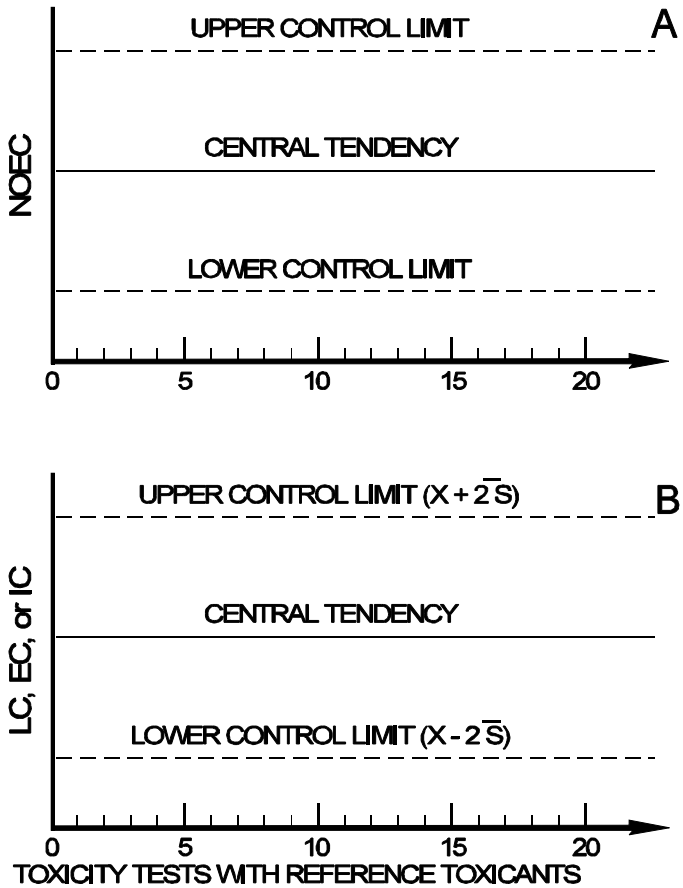

$$\bar{X} = \frac{\sum_{i=1}^{n} X_i}{n}$$

$$S = \sqrt{\frac{\sum_{i=1}^{n} X_i^2 - \frac{\left(\sum_{i=1}^{n} X_i\right)^2}{n}}{n-1}}$$

Where: X_i = Successive toxicity values from toxicity tests.
n = Number of tests.
$\bar{X}$ = Mean toxicity value.
S = Standard deviation.

Figure 1. Control (cusum) charts. (A) hypothesis testing results; (B) point estimates (LC, EC, or IC).

4.17 REFERENCE TOXICANTS

4.17.1 Reference toxicants such as zinc sulfate ($ZnSO_4$), cadmium chloride ($CdCl_2$), copper sulfate ($CuSO_4$), and copper chloride ($CuCl_2$), are suitable for use in the NPDES Program and other Agency programs requiring aquatic toxicity tests. NERL-Cincinnati plans to release USEPA-certified solutions of cadmium and copper for use as reference toxicants, through cooperative research and development agreements with commercial suppliers, and will continue to develop additional reference toxicants for future release. Interested parties can determine the availability of "EPA Certified" reference toxicants by checking the NERL-Cincinnati electronic bulletin board, using a modem to access the following telephone number: 513-569-7610. Standard reference materials also can be obtained from commercial supply houses, or can be prepared inhouse using reagent grade chemicals. The regulatory agency should be consulted before reference toxicant(s) are selected and used.

4.18 RECORD KEEPING

4.18.1 Proper record keeping is important. A complete file must be maintained for each individual toxicity test or group of tests on closely related samples. This file must contain a record of the sample chain-of-custody; a copy of the sample log sheet; the original bench sheets for the test organism responses during the toxicity test(s); chemical analysis data on the sample(s); detailed records of the test organisms used in the test(s), such as species, source, age, date of receipt, and other pertinent information relating to their history and health; information on the calibration of equipment and instruments; test conditions employed; and results of reference toxicant tests. Laboratory data should be recorded on a real-time basis to prevent the loss of information or inadvertent introduction of errors into the record. Original data sheets should be signed and dated by the laboratory personnel performing the tests.

4.18.2 The regulatory authority should retain records pertaining to discharge permits. Permittees are required to retain records pertaining to permit applications and compliance for a minimum of 3 years [40 CFR 122.41(j)(2)].

SECTION 5

FACILITIES, EQUIPMENT, AND SUPPLIES

5.1 GENERAL REQUIREMENTS

5.1.1 Effluent toxicity tests may be performed in a fixed or mobile laboratory. Facilities must include equipment for rearing and/or holding organisms. Culturing facilities for test organisms may be desirable in fixed laboratories which perform large numbers of tests. Temperature control can be achieved using circulating water baths, heat exchangers, or environmental chambers. Water used for rearing, holding, acclimating, and testing organisms may be natural seawater or water made up from hypersaline brine derived from natural seawater, or water made up from reagent grade chemicals (GP2) or commercial (FORTY FATHOMS® or HW MARINEMIX®) artificial sea salts when specifically recommended in the method. Air used for aeration must be free of oil and toxic vapors. Oil-free air pumps should be used where possible. Particulates can be removed from the air using BALSTON® Grade BX or equivalent filters (Balston, Inc., Lexington, Massachusetts), and oil and other organic vapors can be removed using activated carbon filters (BALSTON®, C-1 filter, or equivalent).

5.1.2 The facilities must be well ventilated and free of fumes. Laboratory ventilation systems should be checked to ensure that return air from chemistry laboratories and/or sample handling areas is not circulated to test organism culture rooms or toxicity test rooms, or that air from toxicity test rooms does not contaminate culture areas. Sample preparation, culturing, and toxicity testing areas should be separated to avoid cross-contamination of cultures or toxicity test solutions with toxic fumes. Air pressure differentials between such rooms should not result in a net flow of potentially contaminated air to sensitive areas through open or loosely-fitting doors. Organisms should be shielded from external disturbances.

5.1.3 Materials used for exposure chambers, tubing, etc., which come in contact with the effluent and dilution water, should be carefully chosen. Tempered glass and perfluorocarbon plastics (TEFLON®) should be used whenever possible to minimize sorption and leaching of toxic substances. These materials may be reused following decontamination. Containers made of plastics, such as polyethylene, polypropylene, polyvinyl chloride, TYGON®, etc., may be used as test chambers or to ship, store, and transfer effluents and receiving waters, but they should not be reused unless absolutely necessary, because they might carry over

adsorbed toxicants from one test to another, if reused. However, these containers may be repeatedly reused for storing uncontaminated waters such as deionized or laboratory-prepared dilution waters and receiving waters. Glass or disposable polystyrene containers can be used as test chambers. The use of large (• 20 L) glass carboys is discouraged for safety reasons.

5.1.4 New plastic products of a type not previously used should be tested for toxicity before initial use by exposing the test organisms in the test system where the material is used. Equipment (pumps, valves, etc.) which cannot be discarded after each use because of cost, must be decontaminated according to the cleaning procedures listed below (see Section 5, Facilities, Equipment, and Supplies, Subsection 5.3.2). Fiberglass, in addition to the previously mentioned materials, can be used for holding, acclimating, and dilution water storage tanks, and in the water delivery system, but once contaminated with pollutants the fiberglass should not be reused. All material should be flushed or rinsed thoroughly with the test media before using in the test.

5.1.5 Copper, galvanized material, rubber, brass, and lead must not come in contact with culturing, holding, acclimation, or dilution water, or with effluent samples and test solutions. Some materials, such as several types of neoprene rubber (commonly used for stoppers) may be toxic and should be tested before use.

5.1.6 Silicone adhesive used to construct glass test chambers absorbs some organochlorine and organophosphorus pesticides, which are difficult to remove. Therefore, as little of the adhesive as possible should be in contact with water. Extra beads of adhesive inside the containers should be removed.

5.2 **TEST CHAMBERS**

5.2.1 Test chamber size and shape are varied according to size of the test organism. Requirements are specified in each toxicity test method.

5.3 **CLEANING TEST CHAMBERS AND LABORATORY APPARATUS**

5.3.1 New plasticware used for sample collection or organism exposure vessels generally does not require thorough cleaning before use. It is sufficient to rinse new sample containers once with dilution water before use. New, disposable, plastic test chambers may have to be rinsed with dilution water before use. New glassware must be soaked overnight in 10% acid (see below) and also be rinsed well in deionized water and seawater.

5.3.2 All non-disposable sample containers, test vessels, pumps, tanks, and other equipment that has come in contact with effluent must be washed after use to remove surface contaminants, as described below.

1. Soak 15 minutes in tap water and scrub with detergent, or clean in an automatic dishwasher.
2. Rinse twice with tap water.
3. Carefully rinse once with fresh dilute (10% V:V) hydrochloric acid or nitric acid to remove scale, metals and bases. To prepare a 10% solution of acid, add 10 mL of concentrated acid to 90 mL of deionized water.
4. Rinse twice with deionized water.
5. Rinse once with full-strength, pesticide-grade acetone to remove organic compounds (use a fume hood or canopy).
6. Rinse three times with deionized water.

5.3.3 All test chambers and equipment must be thoroughly rinsed with the dilution water immediately prior to use in each test.

5.4 **APPARATUS AND EQUIPMENT FOR CULTURING AND TOXICITY TESTS**

5.4.1 Apparatus and equipment requirements for culturing and toxicity tests are specified in each toxicity test method. Also, see USEPA, 1993a.

5.4.2 WATER PURIFICATION SYSTEM

5.4.2.1 A good quality deionized water, providing 18 mega-ohm, laboratory grade water, should be available in the laboratory and with sufficient capacity for laboratory needs. Deionized water may be obtained from MILLIPORE® MILLI-Q®, MILLIPORE® QPAK™$_2$ or equivalent system. If large quantities of high quality deionized water are needed, it may be advisable to supply the laboratory grade water deionizer with preconditioned water from a Culligen®, Continental®, or equivalent.

5.5 **REAGENTS AND CONSUMABLE MATERIALS**

5.5.1 SOURCES OF FOOD FOR CULTURE AND TOXICITY TESTS

1. Brine Shrimp, *Artemia* sp. cysts -- A list of commercial sources is provided in Table 1.

TABLE 1. COMMERCIAL SUPPLIERS OF BRINE SHRIMP(*ARTEMIA*) CYSTS[1,2]

Aquafauna Biomarine P.O. Box 5 Hawthorne, CA 90250 Tel. (213) 973-5275 Fax. (213) 676-9387 (Great Salt Lake North Arm, San Francisco Bay)	Aquarium Products 180L Penrod Court Glen Burnie, MD 21061 Tel. (800) 368-2507 Tel. (301) 761-2100 (Columbia)
Argent Chemical 8702 152nd Ave. NE Redmond, WA 98052 Tel. (800) 426-6258 Tel. (206) 855-3777 Fax. (206) 885-2112 (Platinum Label - San Francisco Bay; Label - San Francisco Bay, Gold Brazil; Silver Label - Great Australia; Bronze Label - China, Canada, other)	Artemia Systems Wiedauwkaai 79 B-9000 Ghent, Belgium Tel. 011-32-91-534142 Fax. 011-32-91-536893 (For marine species - AF grade)[small nauplii], UL grade [large nauplii], for freshwater species Salt Lake, -HI grade [small nauplii], EG [large nauplii]
Bonneville Artemia International, Inc. P.O. Box 511113 Salt Lake City, UT 84151-1113 Tel. (801) 972-4704 Fax. (801) 972-4795	Golden West Artemia 411 East 100 South Salt Lake City, UT 84111 Tel. (801) 532-1400 Fax. (801) 531-8160
Ocean Star International P.O. Box 643 Snowville, UT 84336 Tel. (801) 872-8217 Fax (801) 872-8272 (Great Salt Lake)	Pennsylvania Pet Products Box 191 Spring City, PA 19475 Tel. Not listed. (Great Salt Lake)
Sanders Brine Shrimp Co. 3850 South 540 West Ogden, UT 84405 Tel. (801) 393-5027 (Great Salt Lake)	San Francisco Bay Brand 8239 Enterprise Drive Newark, CA 94560 Tel. (415) 792-7200 (Great Salt Lake, San Francisco Bay)
Sea Critters Inc. P.O. Box 1508 Tavernier, FL 33070 Tel. (305) 367-2672	Western Brine Shrimp 957 West South Temple Salt Lake City, UT 84104 Tel. (801) 364-3642 Fax. (801) 534-0211 (Great Salt Lake)

[1]List from David A. Bengtson, University of Rhode Island, Narragansett, RI.

[2]The geographic sources from which the vendors obtain the brine shrimp cysts are shown in parentheses.

2. Feeding requirements and other specific foods are indicated in the specific toxicity test method.

5.5.1.1 All food should be tested for nutritional suitability and chemically analyzed for organochlorine pesticides, PCBs, and toxic metals (see Section 4, Quality Assurance).

5.5.2 Reagents and consumable materials are specified in each toxicity test method. Also, see Section 4, Quality Assurance.

5.6 **TEST ORGANISMS**

5.6.1 Test organisms are obtained from inhouse cultures or commercial suppliers (see specific toxicity test method; Sections 4, Quality Assurance and 6, Test Organisms).

5.7 **SUPPLIES**

5.7.1 See toxicity test methods (see Sections 11-16) for specific supplies.

SECTION 6

TEST ORGANISMS

6.1 TEST SPECIES

6.1.1 The species used in characterizing the chronic toxicity of effluents and/or receiving waters will depend on the requirements of the regulatory authority and the objectives of the test. It is desirable that good quality test organisms be readily available throughout the year from inhouse or commercial sources to meet NPDES monitoring requirements. The organisms used in toxicity tests must be identified to species. If there is any doubt as to the identity of the test organisms, representative specimens should be sent to a taxonomic expert to confirm the identification.

6.1.2 Toxicity test conditions and culture methods for the species listed in Subsection 6.1.3 are provided in this manual (also, see USEPA, 1993c).

6.1.3 The organisms used in the short-term tests described in this manual are the topsmelt, *Atherinops affinis*, the red abalone, *Haliotis rufescens*; the Pacific oyster, *Crassostrea gigas* and mussel, *Mytilus spp.*; the mysid, *Holmesimysis costata*; the sea urchin, *Strongylocentrotus purpuratus* and the sand dollar, *Dendraster excentricus*; and the giant kelp, *Macrocystis pyrifera*.

6.1.4 Some states have developed culturing and testing methods for indigenous species that may be as sensitive or more sensitive, than the species recommended in Subsection 6.1.3. However, USEPA allows the use of indigenous species only where state regulations require their use or prohibit importation of the species in Section 6, Facilities, Equipment, and Supplies, Subsection 6.1.3. Where state regulations prohibit importation of non-native fishes or use of the recommended test species, permission must be requested from the appropriate state agency prior to their use.

6.1.5 Where states have developed culturing and testing methods for indigenous species other than those recommended in this manual, data comparing the sensitivity of the substitute species and one or more of the recommended species must be obtained in side-by-side toxicity tests with reference toxicants and/or effluents to ensure that the species selected are at least as sensitive as the recommended species. These data must be submitted to the permitting authority (State or Region) if required. USEPA acknowledges that reference toxicants prepared from pure chemicals may not always be representative of

effluents. However, because of the observed and/or potential variability in the quality and toxicity of effluents, it is not possible to specify a representative effluent.

6.1.6 Guidance for the selection of test organisms where the salinity of the effluent and/or receiving water requires special consideration is provided in the Technical Support Document for Water Quality-based Toxics Control (USEPA, 1991a).

1. Where the salinity of the receiving water is < 1‰, freshwater organisms are used regardless of the salinity of the effluent.
2. Where the salinity of the receiving water is • 1‰, the choice of organisms depends on state water quality standards and/or permit requirements.

6.2 SOURCES OF TEST ORGANISMS

6.2.1 Some of the test organisms recommended in this manual can be obtained from broodstock cultured in the laboratory using culturing and handling methods for each organism described in the respective test method sections.

6.2.2 Inhouse broodstock cultures should be established wherever it is cost effective. If inhouse cultures cannot be maintained or it is not cost effective, test organisms should be purchased from experienced commercial suppliers.

6.2.3 Red abalone, oyster, mussels, topsmelt, mysids, sea urchins, sand dollars, and giant kelp blades may be purchased from commercial suppliers. However, some of these organisms (e.g., adult mysids or adult topsmelt) may not always be available from commercial suppliers and may have to be collected in the field and brought back to the laboratory for release of larvae or mysids.

6.2.4 If, because of their source, there is any uncertainty concerning the identity of the organisms, it is advisable to have them examined by a taxonomic specialist to confirm their identification. For guidance on identification, see the individual toxicity test methods.

6.2.5 FERAL (NATURAL OCCURRING, WILD CAUGHT) ORGANISMS

6.2.5.1 The use of test species taken from the receiving water has strong appeal, and would seem to be the logical approach. However, it is generally impractical and not recommended for the following reasons:

1. Sensitive species may not be present in the receiving water because of previous exposure to the effluent or other pollutants.
2. It is often difficult to collect organisms of the required age and quality from the receiving water.
3. Most states require collection permits, which may be difficult to obtain. Therefore, it is usually more cost effective to culture the organisms in the laboratory or obtain them from private, state, or Federal sources.
4. The required QA/QC records, such as the single-laboratory precision data, would not be available for non standardized test species.
5. Since it is mandatory that the identity of test organisms is known to the species level, it would be necessary to examine each organism caught in the wild to confirm its identity, which would usually be impractical or, at the least, very stressful to the organisms.
6. Test organisms obtained from the wild must be observed in the laboratory for a minimum of one week prior to use, to ensure that they are free of signs of parasitic or bacterial infections and other adverse effects. Fish captured by electroshocking must not be used in toxicity testing.

6.2.5.2 Guidelines for collection of naturally occurring organisms are provided in USEPA, (1973); USEPA, (1990a) and USEPA, (1993a).

6.2.5.3 Regardless of their source, test organisms and broodstock should be carefully observed to ensure that they are free of signs of stress and disease, and in good physical condition. Some species of test organisms, such as trout, can be obtained from stocks certified as "disease-free."

6.3 **LIFE STAGE**

6.3.1 Young organisms are often more sensitive to toxicants than are adults. For this reason, the use of early life stages, such as juvenile mysids and larval fish, is required for all tests. There may be special cases, however, where the limited availability of organisms will require some deviation from the recommended life stage. In a given test, all organisms should be approximately the same age and should be taken from the same source. Since age may affect the results of the tests, it would enhance the value and comparability of the data if the same species in the same life stages were used throughout a monitoring program at a given facility.

6.4 **LABORATORY CULTURING**

6.4.1 Instructions for culturing, holding and/or handling the recommended test organisms and broodstock are included in specified test methods.

6.5 **HOLDING AND HANDLING TEST ORGANISMS**

6.5.1 Test organisms should not be subjected to changes of more than 3•C in water temperature or 3‰ in salinity in any 12 h period.

6.5.2 Organisms should be handled as little as possible. When handling is necessary, it should be done as gently, carefully, and quickly as possible to minimize stress. Organisms that are dropped or touch dry surfaces or are injured during handling must be discarded. Dipnets are best for handling larger organisms. These nets are commercially available or can be made from small-mesh nylon netting, silk bolting cloth, plankton netting, or similar material. Wide-bore, smooth glass tubes (4 to 8 mm ID) with rubber bulbs or pipettors (such as a PROPIPETTE® or other pipettor) should be used for transferring smaller organisms such as mysids, and larval fish.

6.5.3 Holding tanks for broodstock are usually supplied with a good quality water (see Section 5, Facilities, Equipment, and Supplies) with a flow-through rate of at least two tank-volumes per day. Otherwise, use a recirculation system where the water flows through an activated carbon or undergravel filter to remove dissolved metabolites. Culture water can also be piped through high intensity ultraviolet light sources for disinfection, and to photo-degrade dissolved organics.

6.5.4 Crowding should be avoided because it will stress the organisms and lower the DO concentrations to unacceptable levels. The DO must be maintained at a minimum of 4.0 mg/L. The solubility of oxygen depends on temperature, salinity, and altitude. Aerate gently if necessary.

6.5.5 The organisms should be observed carefully each day for signs of disease, stress, physical damage, or mortality. Dead and abnormal organisms should be removed as soon as observed. It is not uncommon for some larval fish and mysid mortality (5-10%) to occur during the first 48 h in a holding tank because of individuals that failed to feed and die of starvation.

6.5.6 Organisms in the holding tanks should generally be fed as in the cultures (see culturing methods in the respective methods).

6.5.7 Broodstock and test organisms should be observed carefully each day for signs of disease, stress, physical damage, and mortality. Dead and abnormal specimens should be removed as soon as observed.

6.5.8 A daily record of feeding, behavioral observations, and mortality should be maintained.

6.6 **TRANSPORTATION TO THE TEST SITE**

6.6.1 Test organisms and broodstock are transported from the base or supply laboratory to a remote test site (see the appropriate test method). Adequate DO is maintained by replacing the air above the water in the bags with oxygen from a compressed gas cylinder, and sealing the bags. Another method commonly used to maintain sufficient DO during shipment is to aerate with an airstone which is supplied from a portable pump. The DO concentration must not fall below 4.0 mg/L.

6.6.2 Upon arrival at the test site, organisms are transferred to receiving water if receiving water is to be used as the test dilution water. All but a small volume of the holding water (approximately 5%) is removed by siphoning, and replaced slowly over a 10 to 15 minute period with dilution water. If receiving water is used as dilution water, caution must be exercised in exposing the test organisms to it, because of the possibility that it might be toxic. For this reason, it is recommended that only approximately 10% of the test organisms be exposed initially to the dilution water. If this group does not show excessive mortality or obvious signs of stress in a few hours, the remainder of the test organisms are transferred to the dilution water.

6.6.3 A group of organisms must not be used for a test if they appear to be unhealthy, discolored, or otherwise stressed, or if mortality appears to exceed 10% preceding the test. If the organisms fail to meet these criteria, the entire group must be discarded and a new group obtained. The mortality may be due to the presence of toxicity, if receiving water is used as dilution water, rather than a diseased condition of the test organisms. If the acclimation process is repeated with a new group of test organisms and excessive mortality occurs, it is recommended that an alternative source of dilution water be used.

6.6.4 The marine organisms may be used at all concentrations of effluent by adjusting the salinity of the effluent to salinities specified for the appropriate species test condition or to the salinity approximating that of the receiving water, by adding sufficient dry ocean salts, such as FORTY FATHOMS®, or equivalent, GP2, or hypersaline brine.

6.6.5 Saline dilution water can be prepared with deionized water or a freshwater such as well water or a suitable surface water. If dry ocean salts are used, care must be taken to ensure that the added salts are completely dissolved and the solution is aerated 24 h before the test organisms are placed in the solutions. The test organisms should be acclimated in synthetic saline water prepared with the dry salts. **Caution**: addition of dry ocean salts to dilution water may result in an increase in pH. (The pH of estuarine and coastal saline waters is normally 7.5-8.3).

6.6.6 All effluent concentrations and the control(s) used in a test should have the same salinity. The change in salinity upon acclimation at the desired test dilution should not exceed 6‰. The required salinities for culturing and toxicity tests with estuarine and marine species are listed in the test method sections.

6.7 TEST ORGANISM DISPOSAL

6.7.1 When the toxicity test(s) is concluded, all test organisms (including controls) should be humanely destroyed and disposed of in an appropriate manner.

SECTION 7

DILUTION WATER

7.1 TYPES OF DILUTION WATER

7.1.1 The type of dilution water used in effluent toxicity tests will depend largely on the objectives of the study.

7.1.1.1 If the objective of the test is to estimate the chronic toxicity of the effluent, which is a primary objective of NPDES permit-related toxicity testing, a standard dilution water defined in each test method is used. If the test organisms have been cultured in water which is different from the test dilution water, a second set of controls, using culture water, should be included in the test.

7.1.1.2 If the objective of the test is to estimate the chronic toxicity of the effluent in uncontaminated natural seawater (receiving water), or with other uncontaminated natural seawater. Seasonal variations in the quality of receiving waters may affect effluent toxicity. Therefore, the salinity of saline receiving water samples should be determined before each use. If the test organisms have been cultured in water which is different from the test dilution water, a second set of controls, using culture water, should be included in the test.

7.1.1.3 If the objective of the test is to determine the additive or mitigating effects of the discharge on already contaminated receiving water, the test is performed using dilution water consisting of receiving water collected outside the influence of the outfall. A second set of controls, using culture water, should be included in the test.

7.2 STANDARD, SYNTHETIC DILUTION WATER

7.2.1 Standard, synthetic, dilution water is prepared with reagent water and reagent grade chemicals (GP2) or commercial sea salts (FORTY FATHOMS®, HW MARINEMIX®) (Table 3). The source water for the deionizer can be ground water or tap water. This synthetic water should be used only if specified in the test method. These salts may be directly added to effluents to achieve appropriate salinities for testing high effluent concentration (e.g., greater than 60% effluent) where the use of hypersaline brine is insufficient to obtain test salinities.

7.2.2 REAGENT WATER USED TO PREPARE STANDARD, SYNTHETIC, DILUTION WATER

7.2.2.1 Reagent water is defined as distilled or deionized water that does not contain substances which are toxic to the test organisms. Deionized water is obtained from a MILLIPORE MILLI-Q®, MILLIPORE® QPAK™$_2$ or equivalent system. It is advisable to provide a preconditioned (deionized) feed water by using a Culligan®, Continental®, or equivalent system in front of the MILLI-Q® System to extend the life of the MILLI-Q® cartridges (see Section 5, Facilities, Equipment, and Supplies).

7.2.2.2 The recommended order of the cartridges in a four-cartridge deionizer (i.e., MILLI-Q® System or equivalent) is: (1) ion exchange, (2) ion exchange, (3) carbon, and (4) organic cleanup (such as ORGANEX-Q®, or equivalent), followed by a final bacteria filter. The QPAK™$_2$ water system is a sealed system which does not allow for the rearranging of the cartridges. However, the final cartridge is an ORGANEX-Q® filter, followed by a final bacteria filter. Commercial laboratories using this system have not experienced any difficulty in using the water for culturing or testing. Reference to the MILLI-Q® systems throughout the remainder of the manual includes all MILLIPORE® or equivalent systems.

7.2.3 STANDARD, SYNTHETIC SEAWATER

7.2.3.1 To prepare 20 L of a standard, synthetic, reconstituted seawater (modified GP2), using reagent grade chemicals (Table 2), with a salinity of 31‰, follow the instructions below. Other salinities can be prepared by making the appropriate dilutions. Larger or smaller volumes of modified GP2 can be prepared by using proportionately larger or smaller amounts of salts and dilution water.

1. Place 20 L of MILLI-Q® or equivalent deionized water in a properly cleaned plastic carboy.
2. Weigh reagent grade salts listed in Table 2 and add, one at a time, to the deionized water. Stir well after adding each salt.
3. Aerate the final solution at a rate of 1 L/h for 24 h.
4. Check the pH and salinity.

7.2.3.2 Synthetic seawater can also be prepared by adding commercial sea salts, such as FORTY FATHOMS®, HW MARINEMIX®, or equivalent, to deionized water. For example, thirty-one parts per thousand (31‰) FORTY FATHOMS® can be prepared by dissolving 31 g of sea salts per liter of deionized water. The salinity of the resulting solutions should be checked with a refractometer.

TABLE 2. PREPARATION OF GP2 ARTIFICIAL SEAWATER USING REAGENT GRADE CHEMICALS[1,2,3]

Compound	Concentration (g/L)	Amount (g) Required for 20 L
NaCl	21.03	420.6
Na_2SO_4	3.52	70.4
KCl	0.61	12.2
KBr	0.088	1.76
$Na_2B_4O_7 \cdot 10\ H_2O$	0.034	0.68
$MgCl_2 \cdot 6\ H_2O$	9.50	190.0
$CaCl_2 \cdot 2\ H_2O$	1.32	26.4
$SrCl_2 \cdot 6\ H_2O$	0.02	0.400
$NaHCO_3$	0.17	3.40

[1] Modified GP2 from Spotte et al. (1984).
[2] The constituent salts and concentrations were taken from USEPA (1993a). The salinity is 30.89 g/L.
[3] GP2 can be diluted with deionized (DI) water to the desired test salinity.

7.2.4 Artificial seawater is to be used only if specified in the method. The suitability of GP2 as a medium for culturing organisms has not been determined.

7.3 USE OF RECEIVING WATER AS DILUTION WATER

7.3.1 If the objectives of the test require the use of uncontaminated receiving water as dilution water, and the receiving water is uncontaminated, it may be possible to collect a sample of the receiving water close to the outfall, but away

from or beyond the influence of the effluent. However, if the receiving water is contaminated, it may be necessary to collect the sample in an area "remote" from the discharge site, matching as closely as possible the physical and chemical characteristics of the receiving water near the outfall.

7.3.2 The sample should be collected immediately prior to the test, but never more than 96 h before the test begins. Except where it is used within 24 h, or in the case where large volumes are required for flow through tests, the sample should be chilled to 4•C during or immediately following collection, and maintained at that temperature prior to use in the test.

7.3.3 The investigator should collect uncontaminated water having a salinity as near as possible to the salinity of the receiving water at the discharge site. Water should be collected at slack high tide, or within one hour after high tide. If there is reason to suspect contamination of the water in the estuary, it is advisable to collect uncontaminated water from an adjacent estuary. At times it may be necessary to collect water at a location closer to the open sea, where the salinity is relatively high. In such cases, deionized water or uncontaminated freshwater is added to the saline water to dilute it to the required test salinity. Where necessary, the salinity of a surface water can be increased by the addition of artificial sea salts, such as FORTY FATHOMS®, HW MARINEMIX®, or equivalent, GP2, a natural seawater of higher salinity, or hypersaline brine. Instructions for the preparation of hypersaline brine by concentrating natural seawater are provided below.

7.3.4 Receiving water containing debris or indigenous organisms, that may be confused with or attack the test organisms, should be filtered through a sieve having 60 µm mesh openings prior to use.

7.3.5 HYPERSALINE BRINE

7.3.5.1 Most industrial and sewage treatment effluents entering marine and estuarine systems have little measurable salinity. Exposure of larvae to these effluents will usually require increasing the salinity of the test solutions. It is important to maintain an essentially constant salinity across all treatments. In some applications it may be desirable to match the test salinity with that of the receiving water (See Section 7.1). Two salt sources are available to adjust salinities -- artificial sea salts and hypersaline brine (HSB) derived from natural seawater. Use of artificial sea salts is necessary only when high effluent concentrations preclude salinity adjustment by HSB alone.

7.3.5.2 Hypersaline brine (HSB) can be made by concentrating natural seawater by freezing or evaporation. HSB should be made from high quality, filtered seawater, and can be added to the effluent or to reagent water to increase salinity. HSB has several desirable characteristics for use in effluent toxicity testing. Brine derived from natural seawater contains the necessary trace metals, biogenic colloids, and some of the microbial components necessary for adequate growth, survival, and/or reproduction of marine and estuarine organisms, and it can be stored for prolonged periods without any apparent degradation. However, even if the maximum salinity HSB (100‰) is used as a diluent, the maximum concentration of effluent (0‰) that can be tested is 66% effluent at 34‰ salinity.

7.3.5.3 High quality (and preferably high salinity) seawater should be filtered to at least 10 µm before placing into the freezer or the brine generator. Water should be collected on an incoming tide to minimize the possibility of contamination.

7.3.5.4 Freeze Preparation of Brine

7.3.5.4.1 A convenient container for making HSB by freezing is one that has a bottom drain. One liter of brine can be made from four liters of seawater. Brine may be collected by partially freezing seawater at -10 to -20•C until the remaining liquid has reached the target salinity. Freeze for approximately six hours, then separate the ice (composed mainly of fresh water) from the remaining liquid (which has now become hypersaline).

7.3.5.4.2 It is preferable to monitor the water until the target salinity is achieved rather than allowing total freezing followed by partial thawing. Brine salinity should never exceed 100‰. It is advisable not to exceed about 70‰ brine salinity unless it is necessary to test effluent concentrations greater than 50%.

7.3.5.4.3 After the required salinity is attained, the HSB should be filtered through a 1 µm filter and poured directly into portable containers (20-L cubitainers or polycarbonate water cooler jugs are suitable). The brine storage containers should be capped and labelled with the salinity and the date the brine was generated. Containers of HSB should be stored in the dark at 4•C (even room temperature has been acceptable). HSB is usually of acceptable quality even after several months in storage.

7.3.5.5 Heat Preparation of Brine

7.3.5.5.1 The ideal container for making brine using heat-assisted evaporation of natural seawater is one that (1) has a high surface to volume ratio, (2) is made of a non-corrosive material, and (3) is easily cleaned (fiberglass containers are ideal). Special care should be used to prevent any toxic

materials from coming in contact with the seawater being used to generate the brine. If a heater is immersed directly into the seawater, ensure that the heater materials do not corrode or leach any substances that would contaminate the brine. One successful method is to use a thermostatically controlled heat exchanger made from fiberglass. If aeration is needed, use only oil-free air compressors to prevent contamination.

7.3.5.5.2 Before adding seawater to the brine generator, thoroughly clean the generator, aeration supply tube, heater, and any other materials that will be in direct contact with the brine. A good quality biodegradable detergent should be used, followed by several (at least three) thorough reagent water rinses.

7.3.5.5.3 Seawater should be filtered to at least 10 µm before being put into the brine generator. The temperature of the seawater is increased slowly to 40•C. The water should be aerated to prevent temperature stratification and to increase water evaporation. The brine should be checked daily (depending on the volume being generated) to ensure that the salinity does not exceed 100‰ and that the temperature does not exceed 40•C. Additional seawater may be added to the brine to obtain the volume of brine required.

7.3.5.5.4 After the required salinity is attained, the HSB should be filtered through a 1 µm filter and poured directly into portable containers (20-L cubitainers or polycarbonate water cooler jugs are suitable). The brine storage containers should be capped and labelled with the salinity and the date the brine was generated. Containers of HSB should be stored in the dark at 4•C (even room temperature has been acceptable). HSB is usually of acceptable quality even after several months in storage.

7.3.5.6 Divide the salinity of the HSB by the expected test salinity to determine the proportion of reagent water to brine. For example, if the salinity of the brine is 100‰ and the test is to be conducted at 34‰, 100‰ divided by 34‰ = 2.94. Thus, the proportion is one part brine plus 1.94 reagent water.

7.3.5.8 To make 1 L of seawater at 34‰ salinity from a hypersaline brine of 100‰, 340 mL of brine and 660 mL of reagent water are required.

7.4 **USE OF TAP WATER AS DILUTION WATER**

7.4.1 The use of tap water in the reconstituting of synthetic (artificial) seawater as dilution water is discouraged unless it is dechlorinated and fully treated. Tap water can be dechlorinated by deionization, carbon filtration, or the use of

sodium thiosulfate. Use of 3.6 mg/L (anhydrous) sodium thiosulfate will reduce 1.0 mg chlorine/L (APHA, 1992). Following dechlorination, total residual chlorine should not exceed 0.01 mg/L. Because of the possible toxicity of thiosulfate to test organisms, a control lacking thiosulfate should be included in toxicity tests utilizing thiosulfate-dechlorinated water.

7.4.2 To be adequate for general laboratory use following dechlorination, the tap water is passed through a deionizer and carbon filter to remove toxic metals and organics, and to control hardness and alkalinity.

7.5 **DILUTION WATER HOLDING**

7.5.1 A given batch of dilution water should not be used for more than 14 days following preparation because of the possible build up of bacterial, fungal, or algal slime growth and the problems associated with it. The container should be kept covered and the contents should be protected from light.

SECTION 8

EFFLUENT AND RECEIVING WATER SAMPLING, SAMPLE HANDLING, AND SAMPLE PREPARATION FOR TOXICITY TESTS

8.1 EFFLUENT SAMPLING

8.1.1 The effluent sampling point should be the same as that specified in the NPDES discharge permit (USEPA, l988b). Conditions for exception would be: (l) better access to a sampling point between the final treatment and the discharge outfall; (2) if the processed waste is chlorinated prior to discharge, it may also be desirable to take samples prior to contact with the chlorine to determine toxicity of the unchlorinated effluent; or (3) in the event there is a desire to evaluate the toxicity of the influent to municipal waste treatment plants or separate wastewater streams in industrial facilities prior to their being combined with other wastewater streams or non-contact cooling water, additional sampling points may be chosen.

8.1.2 The decision on whether to collect grab or composite samples is based on the objectives of the test and an understanding of the short and long-term operations and schedules of the discharger. If the effluent quality varies considerably with time, which can occur where holding times are short, grab samples may seem preferable because of the ease of collection and the potential of observing peaks (spikes) in toxicity. However, the sampling duration of a grab sample is so short that full characterization of an effluent over a 24-h period would require a prohibitively large number of separate samples and tests. Collection of a 24-h composite sample, however, may dilute toxicity spikes, and average the quality of the effluent over the sampling period. Sampling recommendations are provided below (also see USEPA, 1993a).

8.1.3 Aeration during collection and transfer of effluents should be minimized to reduce the loss of volatile chemicals.

8.1.4 Details of date, time, location, duration, and procedures used for effluent sample and dilution water collection should be recorded.

8.2 EFFLUENT SAMPLE TYPES

8.2.1 The advantages and disadvantages of effluent grab and composite samples are listed below:

8.2.1.1 GRAB SAMPLES

Advantages:

1. Easy to collect; require a minimum of equipment and on-site time.
2. Provide a measure of instantaneous toxicity. Toxicity spikes are not masked by dilution.

Disadvantages:

1. Samples are collected over a very short period of time and on a relatively infrequent basis. The chances of detecting a spike in toxicity would depend on the frequency of sampling, and the probability of missing spikes is high.

8.2.1.2 COMPOSITE SAMPLES:

Advantages:

1. A single effluent sample is collected over a 24-h period.
2. The sample is collected over a much longer period of time than grab samples and contains all toxicity spikes.

Disadvantages:

1. Sampling equipment is more sophisticated and expensive, and must be placed on-site for at least 24 h.
2. Toxicity spikes may not be detected because they are masked by dilution with less toxic wastes.

8.3 **EFFLUENT SAMPLING RECOMMENDATIONS**

8.3.1 When tests are conducted on-site, test solutions can be renewed daily with freshly collected samples.

8.3.2 When 7-day tests are conducted off-site, a minimum of three samples are collected. If these samples are collected on Test Days 1, 3, and 5, the first sample would be used for test initiation, and for test solution renewal on Day 2. The second sample would be used for test solution renewal on Days 3 and 4. The third sample would be used for test solution renewal on Days 5, 6, and 7.

8.3.3 Sufficient sample must be collected to perform the required toxicity and chemical tests. A 4-L (1-gal) CUBITAINER® will provide sufficient sample volume for most tests.

8.3.4 THE FOLLOWING EFFLUENT SAMPLING METHODS ARE RECOMMENDED:

8.3.4.1 Continuous Discharges

1. If the facility discharge is continuous, but the calculated retention time of the continuously discharged effluent is less than 14 days and the variability of the effluent toxicity is unknown, at a minimum, four grab samples or four composite samples are collected over a 24-h period. For example, a grab sample is taken every 6 h (total of four samples) and each sample is used for a separate toxicity test, or four successive 6-h composite samples are taken and each is used in a separate test.
2. If the calculated retention time of a continuously discharged effluent is greater than 14 days, or if it can be demonstrated that the wastewater does not vary more than 10% in toxicity over a 24-h period, regardless of retention time, a single grab sample is collected for a single toxicity test.
3. The retention time of the effluent in the wastewater treatment facility may be estimated from calculations based on the volume of the retention basin and rate of wastewater inflow. However, the calculated retention time may be much greater than the actual time because of short-circuiting in the holding basin. Where short-circuiting is suspected, or sedimentation may have reduced holding basin capacity, a more accurate estimate of the retention time can be obtained by carrying out a dye study.

8.3.4.2 Intermittent Discharges

8.3.4.2.1 If the facility discharge is intermittent, a grab sample is collected midway during each discharge period. Examples of intermittent discharges are:

1. When the effluent is continuously discharged during a single 8-h work shift (one sample is collected), or two successive 8-h work shifts (two samples are collected).
2. When the facility retains the wastewater during an 8-h work shift, and then treats and releases the wastewater as a batch discharge (one sample is collected).
3. When the facility discharges wastewater to an estuary only during an outgoing tide, usually during the 4 h following slack high tide (one sample is collected).
4. At the end of a shift, clean up activities may result in the discharge of a slug of toxic waste (one sample is collected).

8.4 RECEIVING WATER SAMPLING

8.4.1 Logistical problems and difficulty in securing sampling equipment generally preclude the collection of composite receiving water samples for toxicity tests. Therefore, based on the requirements of the test, a single grab sample or series of daily grab samples of receiving water is collected for use in the test.

8.4.2 The sampling point is determined by the objectives of the test. At estuarine and marine sites, samples should be collected at mid-depth.

8.4.3 To determine the extent of the zone of toxicity in the receiving water at estuarine and marine effluent sites, receiving water samples are collected at several distances away from the discharge. The time required for the effluent-receiving-water mixture to travel to sampling points away from the point of discharge, and the rate and degree of mixing, may be difficult to ascertain. Therefore, it may not be possible to correlate receiving water toxicity with effluent toxicity at the discharge point unless a dye study is performed. The toxicity of receiving water samples from five stations in the discharge plume can be evaluated using the same number of test vessels and test organisms as used in one effluent toxicity test with five effluent dilutions.

8.5 EFFLUENT AND RECEIVING WATER SAMPLE HANDLING, PRESERVATION, AND SHIPPING

8.5.1 Unless the samples are used in an on-site toxicity test the day of collection, it is recommended that they be held at approximately 4•C until used to inhibit microbial degradation, chemical transformations, and loss of highly volatile toxic substances.

8.5.2 Composite samples should be chilled as they are collected. Grab samples should be chilled immediately following collection.

8.5.3 If the effluent has been chlorinated, total residual chlorine must be measured immediately following sample collection.

8.5.4 Sample holding time begins when the last grab sample in a series is taken (i.e., when a series of four grab samples are taken over a 24-h period), or when a 24-h composite sampling period is completed. If the data from the samples are to be acceptable for use in the NPDES Program, the elapsed time (holding time) from sample collection to first use of the sample in test initiation must not exceed 36 h. EPA believes that 36 h

is adequate time to deliver the sample to the laboratories performing the test in most cases. In the isolated cases, where the permittee can document that this delivery time cannot be met, the permitting authority can allow an option for on-site testing or a variance for an extension of shipped sample holding time. The request for a variance in sample holding time, directed to the USEPA Regional Administrator under 40 CFR 136.3(e), must include supportive data which show that the toxicity of the effluent sample is not reduced (e.g., because of volatilization and/or sorption of toxics on the sample container surfaces) by extending the holding time beyond 36 h. However, in no case should more than 72 h elapse between collection and first use of the sample. In static-renewal tests, the original sample may also be used to prepare test solutions for renewal at 24 h and 48 h after test initiation, if stored at 4•C, with minimum head space, as described in Paragraph 8.5. Guidance for determining the persistence of the sample is provided in Subsection 8.7.

8.5.5 To minimize the loss of toxicity due to volatilization of toxic constituents, all sample containers should be "completely" filled, leaving no air space between the contents and the lid.

8.5.6 SAMPLES USED IN ON-SITE TESTS

8.5.6.1 Samples collected for on-site tests should be used within 24 h.

8.5.7 SAMPLES SHIPPED TO OFF SITE FACILITIES

8.5.7.1 Samples collected for off site toxicity testing are to be chilled to 4•C during or immediately after collection, and shipped iced to the performing laboratory. Sufficient ice should be placed with the sample in the shipping container to ensure that ice will still be present when the sample arrives at the laboratory and is unpacked. Insulating material must not be placed between the ice and the sample in the shipping container.

8.5.7.2 Samples may be shipped in one or more 4-L (l-gal) CUBITAINERS® or new plastic "milk" jugs. All sample containers should be rinsed with dilution water before being filled with sample. After use with receiving water or effluents, CUBITAINERS® and plastic jugs are punctured to prevent reuse.

8.5.7.3 Several sample shipping options are available, including Express Mail, air express, bus, and courier service. Express Mail is delivered seven days a week. Saturday and Sunday shipping and receiving schedules of private carriers vary with the carrier.

8.6 SAMPLE RECEIVING

8.6.1 Upon arrival at the laboratory, samples are logged in and the temperature is measured and recorded. If the samples are not immediately prepared for testing, they are stored at approximately 4•C until used.

8.6.2 Every effort must be made to initiate the test with an effluent sample on the day of arrival in the laboratory, and the sample holding time should not exceed 36 h unless a variance has been granted by the NPDES permitting authority.

8.7 PERSISTENCE OF EFFLUENT TOXICITY DURING SAMPLE SHIPMENT AND HOLDING

8.7.1 The persistence of the toxicity of an effluent prior to its use in a toxicity test is of interest in assessing the validity of toxicity test data, and in determining the possible effects of allowing an extension of the holding time. Where a variance in holding time (>36 h, but •72 h) is requested by a permittee (See subsection 8.5.4), information on the effects of the extension in holding time on the toxicity of the samples must be obtained by comparing the results of multi-concentration chronic toxicity tests performed on effluent samples held 36 h with toxicity test results using the same samples after they were held for the requested, longer period. The portion of the sample set aside for the second test must be held under the same conditions as during shipment and holding.

8.8 PREPARATION OF EFFLUENT AND RECEIVING WATER SAMPLES FOR TOXICITY TESTS

8.8.1 Adjust the sample salinity to the level appropriate for objectives of the study using hypersaline brine or artificial sea salts.

8.8.2 When aliquots are removed from the sample container, the head space above the remaining sample should be held to a minimum. Air which enters a container upon removal of sample should be expelled by compressing the container before reclosing, if possible (i.e., where a CUBITAINER® used), or by using an appropriate discharge valve (spigot).

8.8.3 It may be necessary to first coarse-filter samples through a NYLON® sieve having 2 to 4 mm mesh openings to remove debris and/or break up large floating or suspended solids. If samples contain indigenous organisms that may attack or be confused with the test organisms, the samples must be filtered through a sieve with 60 µm mesh openings. Since filtering may increase the dissolved oxygen (DO) in an effluent, the DO should be determined prior to

filtering. Low dissolved oxygen concentrations will indicate a potential problem in performing the test. **Caution**: filtration may remove some toxicity.

8.8.4 If the samples must be warmed to bring them to the prescribed test temperature, supersaturation of the dissolved oxygen and nitrogen may become a problem. To avoid this problem, the effluent and dilution water are checked with a DO probe after reaching test temperature and, if the DO is greater than 100% saturation or lower than 4.0 mg/L, based on temperature and salinity, the solutions are aerated moderately (approximately 500 mL/min) for a few minutes, using an airstone, until the DO is lowered to 100% saturation (Table 3) or until the DO is within the prescribed range (•4.0 mg/L). **Caution**: avoid excessive aeration.

8.8.4.1 Aeration during the test may alter the results and should be used only as a last resort to maintain the required DO. Aeration can reduce the apparent toxicity of the test solutions by stripping them of highly volatile toxic substances, or change the toxicity by altering the pH. However, the DO in the test solution must not be permitted to fall below 4.0 mg/L.

8.8.4.2 In static tests (non-renewal or renewal) low DOs may commonly occur in the higher concentrations of wastewater. Aeration is accomplished by bubbling air through a pipet at the rate of 100 bubbles/min. If aeration is necessary, all test solutions must be aerated. It is advisable to monitor the DO closely during the first few hours of the test. Samples with a potential DO problem generally show a downward trend in DO within 4 to 8 h after the test is started. Unless aeration is initiated during the first 8 h of the test, the DO may be exhausted during an unattended period, thereby invalidating the test.

8.8.5 At a minimum, pH, or salinity, and total residual chlorine are measured in the undiluted effluent or receiving water, and pH and salinity are measured in the dilution water.

8.8.6 Total ammonia is measured in effluent and receiving water samples where toxicity may be contributed by unionized ammonia (i.e., where total ammonia •5 mg/L). The concentration (mg/L) of unionized (free) ammonia in a sample is a function of temperature and pH, and is calculated using the percentage value obtained from Table 4,

TABLE 3. OXYGEN SOLUBILITY (MG/L) IN WATER AT EQUILIBRIUM WITH AIR AT 760 MM HG (AFTER RICHARDS AND CORWIN, 1956)

TEMP	SALINITY (‰)									
(C•)	0	5	10	15	20	25	30	35	40	43
0	14.2	13.8	13.4	12.9	12.5	12.1	11.7	11.2	10.8	10.6
1	13.8	13.4	13.0	12.6	12.2	11.8	11.4	11.0	10.6	10.3
2	13.4	13.0	12.6	12.2	11.9	11.5	11.1	10.7	10.3	10.0
3	13.1	12.7	12.3	11.9	11.6	11.2	10.8	10.4	10.0	9.8
4	12.7	12.3	12.0	11.6	11.3	10.9	10.5	10.1	9.8	9.5
5	12.4	12.0	11.7	11.3	11.0	10.6	10.2	9.8	9.5	9.3
6	12.1	11.7	11.4	11.0	10.7	10.3	10.0	9.6	9.3	9.1
8	11.5	11.2	10.8	10.5	10.2	9.8	9.5	9.2	8.9	8.7
10	10.9	10.7	10.3	10.0	9.7	9.4	9.1	8.8	8.5	8.3
12	10.5	10.2	9.9	9.6	9.3	9.0	8.7	8.4	8.1	7.9
14	10.0	9.7	9.5	9.2	8.9	8.6	8.3	8.1	7.8	7.6
16	9.6	9.3	9.1	8.8	8.5	8.3	8.0	7.7	7.5	7.3
18	9.2	9.0	8.7	8.5	8.2	8.0	7.7	7.5	7.2	7.1
20	8.9	8.6	8.4	8.1	7.9	7.7	7.4	7.2	6.9	6.8
22	8.6	8.4	8.1	7.9	7.6	7.4	7.2	6.9	6.7	6.6
24	8.3	8.1	7.8	7.6	7.4	7.2	6.9	6.7	6.5	6.4
26	8.1	7.8	7.6	7.4	7.2	7.0	6.7	6.5	6.3	6.1
28	7.8	7.6	7.4	7.2	7.0	6.8	6.5	6.3	6.1	6.0
30	7.6	7.4	7.1	6.9	6.7	6.5	6.3	6.1	5.9	5.8
32	7.3	7.1	6.9	6.7	6.5	6.3	6.1	5.9	5.7	5.6

TABLE 4. PERCENT UNIONIZED NH_3 IN AQUEOUS AMMONIA SOLUTIONS: TEMPERATURE 15-26•C AND pH 6.0-8.9[1]

pH	TEMPERATURE (•C)											
	15	16	17	18	19	20	21	22	23	24	25	26
6.0	0.0274	0.0295	0.0318	0.0343	0.0369	0.0397	0.0427	0.0459	0.0493	0.0530	0.0568	0.0610
6.1	0.0345	0.0372	0.0400	0.0431	0.0464	0.0500	0.0537	0.0578	0.0621	0.0667	0.0716	0.0768
6.2	0.0434	0.0468	0.0504	0.0543	0.0584	0.0629	0.0676	0.0727	0.0781	0.0901	0.0901	0.0966
6.3	0.0546	0.0589	0.0634	0.0683	0.0736	0.0792	0.0851	0.0915	0.0983	0.1134	0.1134	0.1216
6.4	0.0687	0.0741	0.0799	0.0860	0.0926	0.0996	0.107	0.115	0.124	0.133	0.143	0.153
6.5	0.0865	0.0933	0.1005	0.1083	0.1166	0.1254	0.135	0.145	0.156	0.167	0.180	0.193
6.6	0.109	0.117	0.127	0.136	0.147	0.158	0.170	0.182	0.196	0.210	0.226	0.242
6.7	0.137	0.148	0.159	0.171	0.185	0.199	0.214	0.230	0.247	0.265	0.284	0.305
6.8	0.172	0.186	0.200	0.216	0.232	0.250	0.269	0.289	0.310	0.333	0.358	0.384
6.9	0.217	0.234	0.252	0.271	0.292	0.314	0.338	0.363	0.390	0.419	0.450	0.482
7.0	0.273	0.294	0.317	0.342	0.368	0.396	0.425	0.457	0.491	0.527	0.566	0.607
7.1	0.343	0.370	0.399	0.430	0.462	0.497	0.535	0.575	0.617	0.663	0.711	0.762
7.2	0.432	0.466	0.502	0.540	0.581	0.625	0.672	0.722	0.776	0.833	0.893	0.958
7.3	0.543	0.586	0.631	0.679	0.731	0.786	0.845	0.908	0.975	1.05	1.12	1.20
7.4	0.683	0.736	0.793	0.854	0.918	0.988	1.061	1.140	1.224	1.31	1.41	1.51
7.5	0.858	0.925	0.996	1.07	1.15	1.24	1.33	1.43	1.54	1.65	1.77	1.89
7.6	1.08	1.16	1.25	1.35	1.45	1.56	1.67	1.80	1.93	2.07	2.21	2.37
7.7	1.35	1.46	1.57	1.69	1.82	1.95	2.10	2.25	2.41	2.59	2.77	2.97
7.8	1.70	1.83	1.97	2.12	2.28	2.44	2.62	2.82	3.02	3.24	3.46	3.71
7.9	2.13	2.29	2.46	2.65	2.85	3.06	3.28	3.52	3.77	4.04	4.32	4.62
8.0	2.66	2.87	3.08	3.31	3.56	3.82	4.10	4.39	4.70	5.03	5.38	5.75
8.1	3.33	3.58	3.85	4.14	4.44	4.76	5.10	5.46	5.85	6.25	6.68	7.14
8.2	4.16	4.47	4.80	5.15	5.52	5.92	6.34	6.78	7.25	7.75	8.27	8.82
8.3	5.18	5.56	5.97	6.40	6.86	7.34	7.85	8.39	8.96	9.56	10.2	10.9
8.4	6.43	6.90	7.40	7.93	8.48	9.07	9.69	10.3	11.0	11.7	12.5	13.3
8.5	7.97	8.54	9.14	9.78	10.45	11.16	11.90	12.7	13.5	14.4	15.2	16.2
8.6	9.83	10.5	11.2	12.0	12.8	13.6	14.5	15.5	16.4	17.4	18.5	19.5
8.7	12.07	12.9	13.8	14.7	15.6	16.6	17.6	18.7	19.8	21.0	22.2	23.4
8.8	14.7	15.7	16.7	17.8	18.9	20.0	21.2	22.5	23.7	25.1	26.4	27.8
8.9	17.9	19.0	20.2	21.4	22.7	24.0	25.3	26.7	28.2	29.6	31.1	32.6

[1]Table provided by Teresa Norberg-King, Environmental Research Laboratory, Duluth, Minnesota. Also see Emerson et al. (1975), Thurston et al. (1974), and USEPA (1985a).

under the appropriate pH and temperature, and multiplying it by the concentration (mg/L) of total ammonia in the sample.

8.8.7 Effluents and receiving waters can be dechlorinated using 6.7 mg/L anhydrous sodium thiosulfate to reduce 1 mg/L chlorine (APHA, 1992). Note that the amount of thiosulfate required to dechlorinate effluents is greater than the amount needed to dechlorinate tap water, (see Section 7, Dilution Water). Since thiosulfate may contribute to sample toxicity, a thiosulfate control should be used in the test in addition to the normal dilution water control.

8.8.8 The DO concentration in the samples should be near saturation prior to use. Aeration will bring the DO and other gases into equilibrium with air, minimize oxygen demand, and stabilize the pH. However, aeration during collection, transfer, and preparation of samples should be minimized to reduce the loss of volatile chemicals.

8.8.9 Mortality or impairment of growth or reproduction due to pH alone may occur if the pH of the receiving water sample falls outside the range of 7.5 - 8.5 for marine. Thus, the presence of other forms of toxicity (metals and organics) in the sample may be masked by the toxic effects of low or high pH. The question about the presence of other toxicants can be answered only by performing two parallel tests, one with an adjusted pH, and one without an adjusted pH. Freshwater samples are adjusted to pH 7.0, and marine samples are adjusted to pH 8.0, by adding 1N NaOH or 1N HCl dropwise, as required, being careful to avoid overadjustment.

8.9 **PRELIMINARY TOXICITY RANGE-FINDING TESTS**

8.9.1 USEPA Regional and State personnel generally have observed that it is not necessary to conduct a toxicity range-finding test prior to initiating a static, chronic, definitive toxicity test. However, when preparing to perform a static test with a sample of completely unknown quality, or before initiating a flow-through test, it is advisable to conduct a preliminary toxicity range-finding test.

8.9.2 A toxicity range-finding test ordinarily consists of a down-scaled, abbreviated static acute test in which groups of five organisms are exposed to several widely-spaced sample dilutions in a logarithmic series, such as 100%, 10.0%, 1.00%, and 0.100%, and a control, for 8-24 h. **Caution**: if the sample must also be used for the full-scale definitive test, the 36-h limit on holding time (see Subsection 8.5.4) must not be exceeded before the definitive test is initiated.

8.9.3 It should be noted that the toxicity of a sample observed in a range-finding test may be significantly different from the toxicity observed in the follow-up, chronic, definitive test because: (1) the definitive test may be longer; and (2) the test may be performed with a sample collected at a different time, and possibly differing significantly in the level of toxicity.

8.10 MULTICONCENTRATION (DEFINITIVE) EFFLUENT TOXICITY TESTS

8.10.1 The tests recommended for use in determining discharge permit compliance in the NPDES program are multiconcentration or definitive tests. These tests provide a statistical measure of effluent toxicity, defined as mortality, fertilization, growth, and/or development. The tests may be static-renewal or static non-renewal.

8.10.2 The tests consist of a control and a minimum of five effluent concentrations commonly selected to approximate a geometric series, such as 60%, 30%, 15%, 7.5%, and 3.75%, using a •0.5 dilution series.

8.10.3 These tests are also to be used in determining compliance with permit limits on the mortality of the receiving water concentration (RWC) of effluents by bracketing the RWC with effluent concentrations in the following manner. For example, if the RWC is >25% then, the effluent concentrations utilized in a test may be: (1) 100% effluent, (2) (RWC + 100)/2, (3) RWC, (4) RWC/2, and (5) RWC/4. More specifically, if the RWC = 50%, the effluent concentrations used in the toxicity test would be 100%, 75%, 50%, 25%, and 12.5%. If the RWC is <25% effluent the concentrations may be: (1) 4 times the RWC, (2) 2 times the RWC, (3) RWC/2, and (4) RWC/4.

8.10.4 If acute/chronic ratios are to be determined by simultaneous acute and short-term chronic tests with a single species, using the same sample, both types of tests must use the same test conditions, i.e., pH, temperature, salinity, etc.

8.11 RECEIVING WATER TESTS

8.11.1 Receiving water toxicity tests generally consist of 100% receiving water and a control. The salinity of the control should be comparable to the receiving water.

8.11.2 The data from the two treatments are analyzed by hypothesis testing to determine if test organism survival, fertilization, growth or development in the receiving water differs significantly from the control. Four replicates and 10 organisms per replicate are required for each treatment (see Summary of Test Conditions and Test Acceptability Criteria in the specific test method).

8.11.3 In cases where the objective of the test is to estimate the degree of toxicity of the receiving water, a definitive, multiconcentration test is performed by preparing dilutions of the receiving water, using a • 0.5 dilution series, with a suitable control water.

SECTION 9

CHRONIC TOXICITY TEST ENDPOINTS AND DATA ANALYSIS

9.1 **ENDPOINTS**

9.1.1 The objective of chronic aquatic toxicity tests with effluents and pure compounds is to estimate the highest "safe" or "no-effect concentration" of these substances. For practical reasons, the responses observed in these tests are usually limited to survival, fertilization, germination, growth and larval development and the results of the tests are usually expressed in terms of the highest toxicant concentration that has no statistically significant observed effect on these responses, when compared to the controls. The terms currently used to define the endpoints employed in the rapid, chronic and sub-chronic toxicity tests have been derived from the terms previously used for full life-cycle tests. As shorter chronic tests were developed, it became common practice to apply the same terminology to the endpoints. The terms used in this manual are as follows:

9.1.1.1 Safe Concentration - The highest concentration of toxicant that will ermit normal propagation of fish and other aquatic life in receiving waters. The concept of a "safe concentration" is a biological concept, whereas the "no-observed-effect concentration" (below) is a statistically defined concentration.

9.1.1.2 No-Observed-Effect-Concentration (NOEC) - The highest concentration of toxicant to which organisms are exposed in a full life-cycle or partial life-cycle (short-term) test, that causes no observable adverse effects on the test organisms (i.e., the highest concentration of toxicant in which the values for the observed responses are not statistically significantly different from the controls). This value is used, along with other factors, to determine toxicity limits in permits.

9.1.1.3 Lowest-Observed-Effect-Concentration (LOEC) - The lowest concentration of toxicant to which organisms are exposed in a life-cycle or
partial life-cycle (short-term) test, which causes adverse effects on the test organisms (i.e., where the values for the observed responses are statistically significantly different from the controls).

9.1.1.4 Effective Concentration (EC) - A point estimate of the toxicant concentration that would cause an observable adverse affect on a quantal, "all or nothing," response (such as death, fertilization, germination or, development) in a given percent of the test organisms, calculated by point estimation techniques. If

the observable effect is death or immobility, the term, Lethal Concentration (LC), should be used (see Subsection 9.1.1.5). A certain EC or LC value might be judged from a biological standpoint to represent a threshold concentration, or lowest concentration that would cause an adverse effect on the observed response.

9.1.1.5 Lethal Concentration (LC) - The toxicant concentration that would cause death in a given percent of the test population. Identical to EC when the observable adverse effect is death. For example, the LC50 is the concentration of toxicant that would cause death in 50% of the test population.

9.1.1.6 Inhibition Concentration (IC) - The toxicant concentration that would cause a given percent reduction in a nonquantal biological measurement for the test population. For example, the IC25 is the concentration of toxicant that would cause a 25% reduction in growth for the test population, and the IC50 is the concentration of toxicant that would cause a 50% reduction.

9.2 RELATIONSHIP BETWEEN ENDPOINTS DETERMINED BY HYPOTHESIS TESTING AND POINT ESTIMATION TECHNIQUES

9.2.1 If the objective of chronic aquatic toxicity tests with effluents and pure compounds is to estimate the highest "safe or no-effect concentration" ofthese substances, it is imperative to understand how the statistical endpoints of these tests are related to the "safe" or "no-effect" concentration. NOECs and LOECs are determined by hypothesis testing (Dunnett's Test, a t test with the Bonferroni adjustment, Steel's Many-One Rank Test, or the Wilcoxon Rank Sum Test), whereas LCs, ICs, and ECs are determined by point estimation techniques (Probit Analysis, the Spearman-Karber Method, the Trimmed Spearman-Karber Method, the Graphical Method or Linear Interpolation Method). There are inherent differences between the use of a NOEC or LOEC derived from hypothesis testing to estimate a "safe" concentration, and the use of a LC, IC, EC, or other point estimates derived from curve fitting, interpolation, etc.

9.2.2 Most point estimates, such as the LC, IC, or EC are derived from a mathematical model that assumes a continuous dose-response relationship. By definition, any LC, IC, or EC value is an estimate of some amount of adverse effect. Thus the assessment of a "safe" concentration must be made from a biological standpoint rather than with a statistical test. In this instance, the biologist must determine some amount of adverse effect that is deemed to be "safe," in the sense that from a practical biological viewpoint it will not affect the normal propagation of fish and other aquatic life in receiving waters.

9.2.3 The use of NOECs and LOECs, on the other hand, assumes either (1) a continuous dose-response relationship, or (2) a non-continuous (threshold) model of the dose-response relationship.

9.2.3.1 In the case of a continuous dose-response relationship, it is also assumed that adverse effects that are not "statistically observable" are also not important from a biological standpoint, since they are not pronounced enough to test as statistically significant against some measure of the natural variability of the responses.

9.2.3.2 In the case of non-continuous dose-response relationships, it is assumed that there exists a true threshold, or concentration below which there is no adverse effect on aquatic life, and above which there is an adverse effect. The purpose of the statistical analysis in this case is to estimate as closely as possible where that threshold lies.

9.2.3.3 In either case, it is important to realize that the amount of adverse effect that is statistically observable (LOEC) or not observable (NOEC) is highly dependent on all aspects of the experimental design, such as the number of concentrations of toxicant, number of replicates per concentration, number of organisms per replicate, and use of randomization. Other factors that affect the sensitivity of the test include the choice of statistical analysis, the choice of an alpha level, and the amount of variability between responses at a given concentration.

9.2.3.4 Where the assumption of a continuous dose-response relationship is made, by definition some amount of adverse effect might be present at the NOEC, but is not great enough to be detected by hypothesis testing.

9.2.3.5 Where the assumption of a noncontinuous dose-response relationship is made, the NOEC would indeed be an estimate of a "safe" or "no-effect" concentration if the amount of adverse effect that appears at the threshold is great enough to test as statistically significantly different from the controls in the face of all aspects of the experimental design mentioned above. If, however, the amount of adverse effect at the threshold were not great enough to test as statistically different, some amount of adverse effect might be present at the NOEC. In any case, the estimate of the NOEC with hypothesis testing is always dependent on the aspects of the experimental design mentioned above. For this reason, the reporting and examination of some measure of the sensitivity of the test (either the minimum significant difference or the percent change from the control that this minimum difference represents) is extremely important.

9.2.4 In summary, the assessment of a "safe" or "no-effect" concentration cannot be made from the results of statistical

analysis alone, unless (1) the assumptions of a strict threshold model are accepted, and (2) it is assumed that the amount of adverse effect present at the threshold is statistically detectable by hypothesis testing. In this case, estimates obtained from a statistical analysis are indeed estimates of a "no-effect" concentration. If the assumptions are not deemed tenable, then estimates from a statistical analysis can only be used in conjunction with an assessment from a biological standpoint of what magnitude of adverse effect constitutes a "safe" concentration. In this instance, a "safe" concentration is not necessarily a truly "no-effect" concentration, but rather a concentration at which the effects are judged to be of no biological significance.

9.2.5 A better understanding of the relationship between endpoints derived by hypothesis testing (NOECs) and point estimation techniques (LCs, ICs, and ECs) would be very helpful in choosing methods of data analysis. Norberg-King (1991) reported that the IC25s were comparable to the NOECs for 23 effluent and reference toxicant data sets analyzed. The data sets included short-term chronic toxicity tests for the sea urchin, *Arbacia punctulata*, the sheepshead minnow, *Cyprinodon variegatus*, and the red macroalga, *Champia parvula*. Birge et al. (1985) reported that LC1s derived from Probit Analyses of data from short-term embryo-larval tests with reference toxicants were comparable to NOECs for several organisms. Similarly, USEPA (1988d) reported that the IC25s were comparable to the NOECs for a set of daphnia, *Ceriodaphnia dubia* chronic tests with a single reference toxicant. However, the scope of these comparisons was very limited, and sufficient information is not yet available to establish an overall relationship between these two types of endpoints, especially when derived from effluent toxicity test data.

9.3 **PRECISION**

9.3.1 HYPOTHESIS TESTS

9.3.1.1 When hypothesis tests are used to analyze toxicity test data, it is not possible to express precision in terms of a commonly used statistic. The results of the test are given in terms of two endpoints, the No-Observed-Effect Concentration (NOEC) and the Lowest-Observed-Effect Concentration (LOEC). The NOEC and LOEC are limited to the concentrations selected for the test. The width of the NOEC-LOEC interval is a function of the dilution series, and differs greatly depending on whether a dilution factor of 0.3 or 0.5 is used in the test design. Therefore, **USEPA recommends the use of the •0.5 dilution factor** (see Section 4, Quality Assurance). It is not possible to place confidence limits on the NOEC and LOEC derived from a given test, and it is difficult to quantify the precision of the NOEC-LOEC endpoints between tests. If the data from a series of tests performed with the same

toxicant, toxicant concentrations, and test species, were analyzed with hypothesis tests, precision could only be assessed by a qualitative comparison of the NOEC-LOEC intervals, with the understanding that maximum precision would be attained if all tests yielded the same NOEC-LOEC interval. In practice, the precision of results of repetitive chronic tests is considered acceptable if the NOECs vary by no more than one concentration interval above or below a central tendency. Using these guidelines, the "normal" range of NOECs from toxicity tests using a 0.5 dilution factor (two-fold difference between adjacent concentrations), would be four-fold.

9.3.2 POINT ESTIMATION TECHNIQUES

9.3.2.1 Point estimation techniques have the advantage of providing a point estimate of the toxicant concentration causing a given amount of adverse (inhibiting) effect, the precision of which can be quantitatively assessed (1) within tests by calculation of 95% confidence limits, and (2) across tests by calculating a standard deviation and coefficient of variation.

9.4 **DATA ANALYSIS**

9.4.1 ROLE OF THE STATISTICIAN

9.4.1.1 The use of the statistical methods described in this manual for routine data analysis does not require the assistance of a statistician. However, the interpretation of the results of the analysis of the data from any of the toxicity tests described in this manual can become problematic because of the inherent variability and sometimes unavoidable anomalies in biological data. If the data appear unusual in any way, or fail to meet the necessary assumptions, a statistician should be consulted. Analysts who are not proficient in statistics are strongly advised to seek the assistance of a statistician before selecting the method of analysis and using any of the results.

9.4.1.2 The statistical methods recommended in this manual are not the only possible methods of statistical analysis. Many other methods have been proposed and considered. Certainly there are other reasonable and defensible methods of statistical analysis for this kind of toxicity data. Among alternative hypothesis tests some, like Williams' Test, require additional assumptions, while others, like the bootstrap methods, require computer-intensive computations. Alternative point estimation approaches most probably would require the services of a statistician to determine the appropriateness of the model (goodness of fit), higher order linear or nonlinear models, confidence intervals for estimates generated by inverse regression, etc. In addition, point estimation or regression approaches would require the specification

by biologists or toxicologists of some low level of adverse effect that would be deemed acceptable or safe. The statistical methods contained in this manual have been chosen because they are (1) applicable to most of the different toxicity test data sets for which they are recommended, (2) powerful statistical tests, (3) hopefully "easily" understood by nonstatisticians, and (4) amenable to use without a computer, if necessary.

9.4.2 PLOTTING THE DATA

9.4.2.1 The data should be plotted, both as a preliminary step to help detect problems and unsuspected trends or patterns in the responses, and as an aid in interpretation of the results. Further discussion and plotted sets of data are included in the methods and the Appendices.

9.4.3 DATA TRANSFORMATIONS

9.4.3.1 Transformations of the data, (e.g., arc sine square root and logs), are used where necessary to meet assumptions of the proposed analyses, such as the requirement for normally distributed data.

9.4.4 INDEPENDENCE, RANDOMIZATION, AND OUTLIERS

9.4.4.1 Statistical independence among observations is a critical assumption in all statistical analysis of toxicity data. One of the best ways to ensure independence is to properly follow rigorous randomization procedures. Randomization techniques should be employed at the start of the test, including the randomization of the placement of test organisms in the test chambers and randomization of the test chamber location within the array of chambers. Discussions of statistical independence, outliers and randomization, and a sample randomization scheme, are included in Appendix A.

9.4.5 REPLICATION AND SENSITIVITY

9.4.5.1 The number of replicates employed for each toxicant concentration is an important factor in determining the sensitivity of chronic toxicity tests. Test sensitivity generally increases as the number of replicates is increased, but the point of diminishing returns in sensitivity may be reached rather quickly. The level of sensitivity required by a hypothesis test or the confidence interval for a point estimate will determine the number of replicates, and should be based on the objectives for obtaining the toxicity data.

9.4.5.2 In a statistical analysis of toxicity data, the choice of a particular analysis and the ability to detect departures from the assumptions of the analysis, such as the normal distribution of the

data and homogeneity of variance, is also dependent on the number of replicates. More than the minimum number of replicates may be required in situations where it is imperative to obtain optimal statistical results, such as with tests used in enforcement cases or when it is not possible to repeat the tests. For example, when the data are analyzed by hypothesis testing, the nonparametric alternatives cannot be used unless there are at least four replicates at each toxicant concentration.

9.4.6 RECOMMENDED ALPHA LEVELS

9.4.6.1 The data analysis examples included in the manual specify an alpha level of 0.01 for testing the assumptions of hypothesis tests and an alpha level of 0.05 for the hypothesis tests themselves. These levels are common and well accepted levels for this type of analysis and are presented as a recommended minimum significance level for toxicity data analysis.

9.5 **CHOICE OF ANALYSIS**

9.5.1 The recommended statistical analysis of most data from chronic toxicity tests with aquatic organisms follows a decision process illustrated in the flowchart in Figure 2. An initial decision is made to use point estimation techniques (Probit Analysis, the Spearman-Karber Method, the Trimmed Spearman-Karber, the Graphical Method or Linear Interpolation Method) and/or to use hypothesis testing (Dunnett's Test, the t test with the Bonferroni adjustment, Steel's Many-one Rank Test, or Wilcoxon Rank Sum Test). If hypothesis testing is chosen, subsequent decisions are made on the appropriate procedure for a given set of data, depending on the results of tests of assumptions, as illustrated in the flowchart. A specific flow chart is included in the analysis section for each test.

9.5.2 Since a single chronic toxicity test might yield information on more than one parameter (such as survival, growth, and development), the lowest estimate of a "no-observed-effect concentration" from any of the responses would be used as the "no-observed-effect concentration" for each test. It follows logically that in the statistical analysis of the data, concentrations that had a significant toxic effect on one of the observed responses would not be subsequently tested for an effect on some other response. This is one reason for excluding concentrations that have shown a statistically significant reduction in survival from a subsequent hypothesis test for effects on another parameter such as growth. A second reason is that the exclusion of such concentrations usually results in a more powerful and appropriate statistical analysis. In performing the point estimation techniques recommended in this manual, an all-data

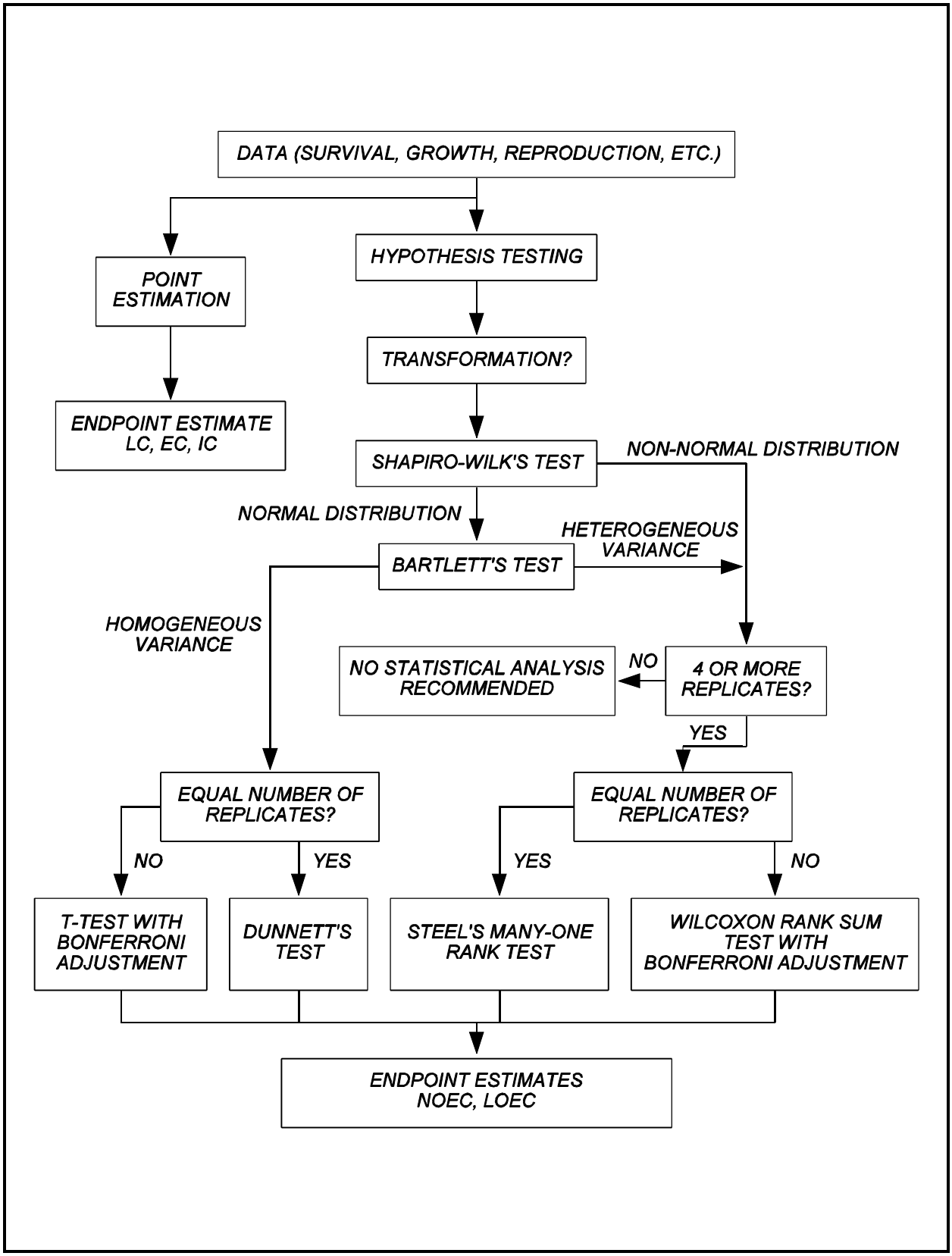

Figure 2. Flowchart for statistical analysis of test data.

approach is used. For example, data from concentrations above the NOEC for survival are included in determining ICp estimates usingthe Linear Interpolation Method.

9.5.3 ANALYSIS OF GROWTH DATA

9.5.3.1 Growth data from the topsmelt, *Atherinops affinis*, mysid, *Holmesimysis costata*, survival and growth tests, and the giant kelp, *Macrocystis pyriferia*, germination and germ-tube length test, are analyzed using hypothesis testing according to the flowchart in Figure 2. The above mentioned growth data may also be analyzed by generating a point estimate with the Linear Interpolation Method. Data from effluent concentrations that have tested significantly different from the control for survival are excluded from further hypothesis tests concerning growth effects. Growth is defined as the change in dry weight of the orginal number of test organisms when group weights are obtained. When analyzing the data using point estimating techniques, data from all concentrations are included in the analysis.

9.5.4 ANALYSIS OF FERTILIZATION, GERMINATION AND DEVELOPMENT DATA

9.5.4.1 Data from the purple urchin, *Strongylocentrotus purpuratus* and the sand dollar, *Denstraster excentricus*, fertilization test and development test; the red abalone *Haliotis rufescens*, the Pacific oyster, *Crassostrea gigas*, and mussel, *Mytilus spp.*, larval development tests; and the giant kelp, *Macrocystis pyrifera*, germination test may be analyzed by hypothesis testing after an arc sine transformation according to the flowchart in Figure 2. The fertilization, larval development or germination data may also be analyzed by generating a point estimate with the Linear Interpolation Method.

9.5.5 ANALYSIS OF MORTALITY DATA

9.5.5.1 Mortality data are analyzed by Probit Analysis, if appropriate, or other point estimation techniques, (i.e., the Spearman-Karber Method, the Trimmed Spearman-Karber Method, or the Graphical Method) (see Appendices G-I) (see discussion below). The mortality data can also be analyzed by hypothesis testing, after an arc sine square root transformation (see Appendices B-F), according to the flowchart in Figure 2.

9.6 **HYPOTHESIS TESTS**

9.6.1 DUNNETT'S PROCEDURE

9.6.1.1 Dunnett's Procedure is used to determine the NOEC. The procedure consists of an analysis of variance (ANOVA) to determine the error term, which is then used in a multiple comparison

procedure for comparing each of the treatment means with the control mean, in a series of paired tests (see Appendix C). Use of Dunnett's Procedure requires at least three replicates per treatment to check the assumptions of the test. In cases where the numbers of data points (replicates) for each concentration are not equal, a t test may be performed with Bonferroni's adjustment for multiple comparisons (see Appendix D), instead of using Dunnett's Procedure.

9.6.1.2 The assumptions upon which the use of Dunnett's Procedure is contingent are that the observations within treatments are normally distributed, with homogeneity of variance. Before analyzing the data, these assumptions must be tested using the procedures provided in Appendix B.

9.6.1.3 If, after suitable transformations have been carried out, the normality assumptions have not been met, Steel's Many-one Rank Test should be used if there are four or more data points (replicates) per toxicant concentration. If the numbers of data points for each toxicant concentration are not equal, the Wilcoxon Rank Sum Test with Bonferroni's adjustment should be used (see Appendix F).

9.6.1.4 Some indication of the sensitivity of the analysis should be provided by calculating (1) the minimum difference between means that can be detected as statistically significant, and (2) the percent change from the control mean that this minimum difference represents for a given test.

9.6.1.5 A step-by-step example of the use of Dunnett's Procedure is provided in Appendix C.

9.6.2 T TEST WITH THE BONFERRONI ADJUSTMENT

9.6.2.1 The t test with the Bonferroni adjustment is used as an alternative to Dunnett's Procedure when the number of replicates is not the same for all concentrations. This test sets an upper bound of alpha on the overall error rate, in contrast to Dunnett's Procedure, for which the overall error rate is fixed at alpha. Thus, Dunnett's Procedure is a more powerful test.

9.6.2.2 The assumptions upon which the use of the t test with the Bonferroni adjustment is contingent are that the observations within treatments are normally distributed, with homogeneity of variance. These assumptions must be tested using the procedures provided in Appendix B.

9.6.2.3 The estimate of the safe concentration derived from this test is reported in terms of the NOEC. A step-by-step example of the use of a t-test with the Bonferroni adjustment is provided in

Appendix D.

9.6.3 STEEL'S MANY-ONE RANK TEST

9.6.3.1 Steel's Many-one Rank Test is a multiple comparison procedure for comparing several treatments with a control. This method is similar to Dunnett's procedure, except that it is not necessary to meet the assumption of normality. The data are ranked, and the analysis is performed on the ranks rather than on the data themselves. If the data are normally or nearly normally distributed, Dunnett's Procedure would be more sensitive (would detect smaller differences between the treatments and control). For data that are not normally distributed, Steel's Many-one Rank Test can be much more efficient (Hodges and Lehmann, 1956).

9.6.3.2 It is necessary to have at least four replicates per toxicant concentration to use Steel's test. Unlike Dunnett's procedure, the sensitivity of this test cannot be stated in terms of the minimum difference between treatment means and the control mean that can be detected as statistically significant.

9.6.3.3 The estimate of the safe concentration is reported as the NOEC. A step-by-step example of the use of Steel's Many-One Rank Test is provided in Appendix E.

9.6.4 WILCOXON RANK SUM TEST

9.6.4.1 The Wilcoxon Rank Sum Test is a nonparametric test for comparing a treatment with a control. The data are ranked and the analysis proceeds exactly as in Steel's Test except that Bonferroni's adjustment for multiple comparisons is used instead of Steel's tables. When Steel's test can be used (i.e., when there are equal numbers of data points per toxicant concentration), it will be more powerful (able to detect smaller differences as statistically significant) than the Wilcoxon Rank Sum Test with Bonferroni's adjustment.

9.6.4.2 The estimate of the safe concentration is reported as the NOEC. A step-by-step example of the use of the Wilcoxon Rank Sum Test is provided in Appendix F.

9.6.5 A CAUTION IN THE USE OF HYPOTHESIS TESTING

9.6.5.1 If in the calculation of an NOEC by hypothesis testing, two tested concentrations cause statistically significant adverse effects, but an intermediate concentration did not cause statistically significant effects, the results should be used with extreme caution.

9.7 **POINT ESTIMATION TECHNIQUES**

9.7.1 PROBIT ANALYSIS

9.7.1.1 Probit Analysis is used to estimate an LC or EC value and the associated 95% confidence interval. The analysis consists of adjusting the data for mortality in the control, and then using a maximum likelihood technique to estimate the parameters of the underlying log tolerance distribution, which is assumed to have a particular shape.

9.7.1.2 The assumption upon which the use of Probit Analysis is contingent is a normal distribution of log tolerances. If the normality assumption is not met, and at least two partial mortalities are not obtained, Probit Analysis should not be used. It is important to check the results of Probit Analysis to determine if use of the analysis is appropriate. The chi-square test for heterogeneity provides a good test of appropriateness of the analysis. The computer program (see discussion, Appendix H) checks the chi-square statistic calculated for the data set against the tabular value, and provides an error message if the calculated value exceeds the tabular value.

9.7.1.3 A discussion of Probit Analysis, and examples of computer program input and output, are found in Appendix H.

9.7.1.4 In cases where Probit Analysis is not appropriate, the LC50 and confidence interval may be estimated by the Spearman-Karber Method (Appendix I) or the trimmed Spearman-Karber Method (Appendix J). If a test results in 100% survival and 100% mortality in adjacent treatments (all or nothing effect), the LC50 may be estimated using the Graphical Method (Appendix K).

9.7.2 LINEAR INTERPOLATION METHOD

9.7.2.1 The Linear Interpolation Method (see Appendix L) is a procedure to calculate a point estimate of the effluent or other toxicant concentration [Inhibition Concentration, (IC)] that causes a given percent reduction (e.g., 25%, 50%, etc.) in the reproduction or growth of the test organisms. The procedure was designed for general applicability in the analysis of data from short-term chronic toxicity tests.

9.7.2.2 Use of the Linear Interpolation Method is based on the assumptions that the responses (1) are monotonically non-increasing (the mean response for each higher concentration is less than or equal to the mean response for the previous concentration), (2) follow a piece-wise linear response function, and (3) are from a random, independent, and representative sample of test data. The assumption for piece-wise linear response cannot be tested

statistically, and no defined statistical procedure is provided to test the assumption for monotonicity. Where the observed means are not strictly monotonic by examination, they are adjusted by smoothing. In cases where the responses at the low toxicant concentrations are much higher than in the controls, the smoothing process may result in a large upward adjustment in the control mean.

9.7.2.3 The inability to test the monotonicity and piece wise linear response assumptions for this method makes it difficult to assess when the method is, or is not, producing reliable results. Therefore, the method should be used with caution when the results of a toxicity test approach an "all or nothing" response from one concentration to the next in the concentration series, and when it appears that there is a large deviation from monotonicity. See Appendix L for a more detailed discussion of the use of this method and a computer program available for performing calculations.

SECTION 10

REPORT PREPARATION

The toxicity data are reported, together with other appropriate data. The following general format and content are recommended for the report:

10.1 INTRODUCTION

1. Permit number
2. Toxicity testing requirements of permit
3. Plant location
4. Name of receiving water body
5. Contract Laboratory (if the test was performed under contract)
   a. Name of firm
   b. Phone number
   c. Address

10.2 PLANT OPERATIONS

1. Product(s)
2. Raw materials
3. Operating schedule
4. Description of waste treatment
5. Schematic of waste treatment
6. Retention time (if applicable)
7. Volume of waste flow (MGD, CFS, GPM)
8. Design flow of treatment facility at time of sampling

10.3 SOURCE OF EFFLUENT, RECEIVING WATER, AND DILUTION WATER

1. Effluent Samples
   a. Sampling point
   b. Collection dates and times
   c. Sample collection method
   d. Physical and chemical data
   e. Mean daily discharge on sample collection date
   f. Elapsed time from sample collection to delivery
   g. Sample temperature when received at the laboratory

2. Receiving Water Samples
   a. Sampling point
   b. Collection dates and times
   c. Sample collection method
   d. Physical and chemical data
   e. Tide stages
   f. Sample temperature when received at the laboratory
   g. Elapsed time from sample collection to delivery

3. Dilution Water Samples
   a. Source
   b. Collection date and time
   c. Pretreatment
   d. Physical and chemical characteristics

10.4 TEST METHODS

1. Toxicity test method used (title, number, source)
2. Endpoint(s) of test
3. Deviation(s) from reference method, if any, and the reason(s)
4. Date and time test started
5. Date and time test terminated
6. Type of volume and test chambers
7. Volume of solution used per chamber
8. Number of organisms used per test chamber
9. Number of replicate test chambers per treatment
10. Acclimation of test organisms (temperature and salinity mean and range)
11. Test temperature (mean and range)
12. Specify if aeration was needed
13. Feeding frequency, and amount and type of food
14. Test salinity (mean and range)

10.5 TEST ORGANISMS

1. Scientific name and how determined
2. Age
3. Life stage
4. Mean length and weight (where applicable)
5. Source
6. Diseases and treatment (where applicable)
7. Taxonomic key used for species identification

10.6 QUALITY ASSURANCE

1. Reference toxicant used routinely; source
2. Date and time of most recent reference toxicant test; test results and current control (cusum) chart
3. Dilution water used in reference toxicant test
4. Results (NOEC or, where applicable, LOEC, LC50, IC or EC value)
5. Physical and chemical methods used

10.7 RESULTS

1. Provide raw toxicity data in tabular form, including daily records of affected organisms in each concentration (including controls), and plots of toxicity data
2. Provide table of the statistical endpoints; LC50s, NOECs, EC or IC value, etc.
3. Indicate statistical methods used to calculate endpoints
4. Provide summary table of physical and chemical data
5. Tabulate QA data

10.8 CONCLUSIONS AND RECOMMENDATIONS

1. Relationship between test endpoints and permit limits.
2. Action to be taken.

SECTION 11

TOPSMELT, *Atherinops affinis*
7-DAY LARVAL GROWTH AND SURVIVAL TEST METHOD

Adapted from a method developed by
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Appendix I Step-by Step Summary

SECTION 11

TOPSMELT, *ATHERINOPS AFFINIS* LARVAL SURVIVAL AND GROWTH TEST

11.1 SCOPE AND APPLICATION

11.1.1 This method estimates the chronic toxicity of effluents and receiving waters to the topsmelt, *Atherinops affinis*, using nine-to-fifteen day old larvae in a seven-day, static-renewal exposure test. The effects include the synergistic, antagonistic, and additive effects of all chemical, physical, and biological components which adversely affect the physiological an biochemical functions of the test organisms.

11.1.2 Daily observations of mortality make it possible to also calculate acute toxicity for desired exposure periods (i.e., 24-h, 48-h, 96-h LC50s).

11.1.3 Detection limits of the toxicity of an effluent or chemical substance are organism dependent.

11.1.4 Brief excursions in toxicity may not be detected using 24-h composite samples. Also, because of the long sample collection period involved in composite sampling and because the test chambers are not sealed, highly volatile and highly degradable toxicants in the source may not be detected in the test.

11.1.5 This method is commonly used in one of two forms: (1) a definitive test, consisting of a minimum of five effluent concentrations and a control, and (2) a receiving water test(s), consisting of one or more receiving water concentrations and a control.

11.1.6 This method should be restricted to use by, or under the supervision of, professionals experienced in aquatic toxicity testing. Specific experience with any toxicity test is usually needed before acceptable results become routine.

11.2 SUMMARY OF METHOD

11.2.1 This method provides step-by-step instructions for performing a 7-day static-renewal toxicity test using survival and growth of topsmelt larval fish to determine the toxicity of substances in marine and estuarine waters. The test endpoints are survival and growth.

1.3 **INTERFERENCES**

11.3.1 Toxic substances may be introduced by contaminants in dilution water, glassware, sample hardware, and testing equipment (see Section 5, Facilities, Equipment, and Supplies).

11.3.2 Improper effluent sampling and handling may adversely affect test results (see Section 8, Effluent and Receiving Water Sampling and Sample Handling, and Sample Preparation for Toxicity Tests).

11.3.3 Pathogenic and/or predatory organisms in the dilution water and effluent may affect test organism survival, and confound test results.

11.3.4 Food added during the test may sequester metals and other toxic substances and confound test results.

11.4 **SAFETY**

11.4.1 See Section 3, Health and Safety.

11.5 **APPARATUS AND EQUIPMENT**

11.5.1 Tanks, trays, or aquaria -- for holding and acclimating topsmelt, e.g., standard salt water aquarium or Instant Ocean Aquarium (capable of maintaining seawater at 10-20•C), with appropriate filtration and aeration system. (See Anderson et al., 1994, Middaugh and Anderson, 1993).

11.5.2 Air pump, air lines, and air stones -- for aerating water containing broodstock or for supplying air to test solutions with low dissolved oxygen.

11.5.3 Constant temperature chambers or water baths -- for maintaining test solution temperature and keeping dilution water supply, and larvae at test temperature (20•C) prior to the test.

11.5.4 Water purification system -- Millipore Super-Q, Deionized water (DI) or equivalent.

11.5.5 Refractometer -- for determining salinity.

11.5.6 Hydrometer(s) -- for calibrating refractometer.

11.5.7 Thermometers, glass or electronic, laboratory grade -- for measuring water temperatures.

11.5.8 Thermometer, National Bureau of Standards Certified (see USEPA METHOD l70.l, USEPA, l979) -- to calibrate laboratory thermometers.

11.5.9 pH and DO meters -- for routine physical and chemical measurements.

11.5.10 Standard or micro-Winkler apparatus -- for determining DO (optional) and calibrating the DO meter.

11.5.11 Winkler bottles -- for dissolved oxygen determinations.

11.5.12 Balance -- Analytical, capable of accurately weighing to 0.00001 g.

11.5.13 Fume hood -- to protect the analyst from effluent or formaldehyde fumes.

11.5.14 Glass stirring rods -- for mixing test solutions.

11.5.15 Graduated cylinders -- Class A, borosilicate glass or non-toxic plastic labware, 50-l000 mL for making test solutions. (Note: not to be used interchangeably for gametes or embryos and test solutions).

11.5.16 Volumetric flasks -- Class A, borosilicate glass or non-toxic plastic labware, 10-1000 mL for making test solutions.

11.5.17 Pipets, automatic -- adjustable, to cover a range of delivery volumes from 0.010 to 1.000 mL.

11.5.18 Pipet bulbs and fillers -- PROPIPET® or equivalent.

11.5.19 Wash bottles -- for reagent water, for topping off graduated cylinders, for rinsing small glassware and instrument electrodes and probes.

11.5.20 Wash bottles -- for dilution water.

11.5.21 20-liter cubitainers or polycarbonate water cooler jugs -- for making hypersaline brine.

11.5.22 Cubitainers, beakers, or similar chambers of non-toxic composition for holding, mixing, and dispensing dilution water and other general non-effluent, non-toxicant contact uses. These should be clearly labeled and not used for other purposes.

11.5.23 Beakers -- six Class A, borosilicate glass or non-toxic plasticware, 1000 mL for making test solutions.

11.5.24 Brine shrimp, *Artemia*, culture unit -- see Subsection 11.6.25 and Section 4, Quality Assurance.

11.5.25 Separatory funnels, 2-L -- two-four for culturing *Artemia*.

11.5.26 Siphon tubes (fire polished glass) -- for solution renewals and handling larval fish.

11.5.27 Droppers, and glass tubing with fire polished edges, 4 mm ID -- for transferring larvae.

11.5.28 Siphon with bulb and clamp -- for cleaning test chambers.

11.5.29 Light box -- for counting and observing larvae.

11.5.30 White plastic tray -- for collecting larvae during cleaning of the test chambers.

11.5.31 Forceps -- for transferring dried larvae to weighing pans.

11.5.32 Desiccator -- for holding dried larvae.

11.5.33 Drying oven -- 50-105•C range, for drying larvae.

11.5.34 NITEX® mesh screen tubes - (•150 µm, 500 µm, 3 to 5 mm) -- for collecting *Artemia* nauplii and fish larvae. (NITEX® is available from Sterling Marine Products, 18 Label Street, Montclair, NJ 07042; 201-783-9800).

11.5.35 60 µm Nitex® filter -- for filtering receiving water.

11.6 **REAGENTS AND SUPPLIES**

11.6.1 Sample containers -- for sample shipment and storage (see Section 8, Effluent and Receiving Water Sampling, and Sample Handling, and Sample Preparation for Toxicity Tests).

11.6.2 Data sheets (one set per test) -- for data recording (Figures 1 and 2).

11.6.3 Tape, colored -- for labelling test chambers and containers.

11.6.4 Markers, water-proof -- for marking containers, etc.

11.6.5 Parafilm -- to cover graduated cylinders and vessels.

11.6.6 Gloves, disposable -- for personal protection from contamination.

11.6.7 Pipets, serological -- l-l0 mL, graduated.

11.6.8 Pipet tips -- for automatic pipets.

11.6.9 Coverslips -- for microscope slides.

11.6.10 Lens paper -- for cleaning microscope optics.

11.6.11 Laboratory tissue wipes -- for cleaning and drying electrodes, microscope slides, etc.

11.6.12 Disposable countertop covering -- for protection of work surfaces and minimizing spills and contamination.

11.6.13 pH buffers 4, 7, and l0 (or as per instructions of instrument manufacturer) -- for standards and calibration check (see USEPA Method l50.l, USEPA, l979).

11.6.14 Membranes and filling solutions -- for dissolved oxygen probe (see USEPA Method 360.l, USEPA, l979), or reagents for modified Winkler analysis.

11.6.15 Laboratory quality assurance samples and standards -- for the above methods.

11.6.16 Test chambers -- 600 mL, five chambers per concentration. The chambers should be borosilicate glass (for effluents) or nontoxic disposable plastic labware (for reference toxicants). To avoid contamination from the air and excessive evaporation of test solutions during the test, the chambers should be covered during the test with safety glass plates or a plastic sheet (6 mm thick).

11.6.17 Ethanol (70%) or formalin (4%) -- for preserving the larvae.

11.6.18 *Artemia* nauplii -- for feeding test organisms.

11.6.19 Weigh boats or weighing paper -- for weighing reference toxicants.

11.6.20 Reference toxicant solutions (see Subsection 11.10.2.4 and see Section 4, Quality Assurance).

11.6.21 Reagent water -- defined as distilled or deionized water that does not contain substances which are toxic to the test organisms (see Section 5, Facilities, Equipment, and Supplies and Section 7, Dilution Water).

11.6.22 Effluent and receiving water -- see Section 8, Effluent and Surface Water Sampling, and Sample Handling, and Sample Preparation for Toxicity Tests.

11.6.23 Dilution water and hypersaline brine -- see Section 7, Dilution Water and Section 11.6.24, Hypersaline Brines. The dilution water should be uncontaminated 1-µm-filtered natural seawater. Hypersaline brine should be prepared from dilution water.

11.6.24 HYPERSALINE BRINES

11.6.24.1 Most industrial and sewage treatment effluents entering marine and estuarine systems have little measurable salinity. Exposure of larvae to these effluents will usually require increasing the salinity of the test solutions. It is important to maintain an essentially constant salinity across all treatments. In some applications it may be desirable to match the test salinity with that of the receiving water (See Section 7.1). Two salt sources are available to adjust salinities -- artificial sea salts and hypersaline brine (HSB) derived from natural seawater. Use of artificial sea salts is necessary only when high effluent concentrations preclude salinity adjustment by HSB alone.

11.6.24.2 Hypersaline brine (HSB) can be made by concentrating natural seawater by freezing or evaporation. HSB should be made from high quality, filtered seawater, and can be added to the effluent or to reagent water to increase salinity. HSB has several desirable characteristics for use in effluent toxicity testing. Brine derived from natural seawater contains the necessary trace metals, biogenic colloids, and some of the microbial components necessary for adequate growth, survival, and/or reproduction of marine and estuarine organisms, and it can be stored for prolonged periods without any apparent degradation. However, even if the maximum salinity HSB (100‰) is used as a diluent, the maximum concentration of effluent (0‰) that can be tested is 66% effluent at 34‰ salinity (see Table 1).

11.6.24.3 High quality (and preferably high salinity) seawater should be filtered to at least 10 µm before placing into the freezer or the brine generator. Water should be collected on an incoming tide to minimize the possibility of contamination.

11.6.24.4 Freeze Preparation of Brine

11.6.24.4.1 A convenient container for making HSB by freezing is one that has a bottom drain. One liter of brine can be made from four liters of seawater. Brine may be collected by partially freezing seawater at -10 to -20•C until the remaining liquid has reached the target salinity. Freeze for approximately six hours, then separate the ice (composed mainly of fresh water) from the remaining liquid (which has now become hypersaline).

11.6.24.4.2 It is preferable to monitor the water until the target salinity is achieved rather than allowing total freezing followed by partial thawing. Brine salinity should never exceed 100‰. It is advisable not to exceed about 70‰ brine salinity unless it is necessary to test effluent concentrations greater than 50%.

11.6.24.4.3 After the required salinity is attained, the HSB should be filtered through a 1 µm filter and poured directly into portable containers (20-L cubitainers or polycarbonate water cooler jugs are suitable). The brine storage containers should be capped and labelled with the salinity and the date the brine was generated. Containers of HSB should be stored in the dark at 4•C (even room temperature has been acceptable). HSB is usually of acceptable quality even after several months in storage.

11.6.24.5 Heat Preparation of Brine

11.6.24.5.1 The ideal container for making brine using heat-assisted evaporation of natural seawater is one that (1) has a high surface to volume ratio, (2) is made of a non-corrosive material, and (3) is easily cleaned (fiberglass containers are ideal). Special care should be used to prevent any toxic materials from coming in contact with the seawater being used to generate the brine. If a heater is immersed directly into the seawater, ensure that the heater materials do not corrode or leach any substances that would contaminate the brine. One successful method is to use a thermostatically controlled heat exchanger made from fiberglass. If aeration is needed, use only oil-free air compressors to prevent contamination.

11.6.24.5.2 Before adding seawater to the brine generator, thoroughly clean the generator, aeration supply tube, heater, and any other materials that will be in direct contact with the brine. A good quality biodegradable detergent should be used,

followed by several (at least three) thorough reagent water rinses.

11.6.24.5.3 Seawater should be filtered to at least 10 µm before being put into the brine generator. The temperature of the seawater is increased slowly to 40•C. The water should be aerated to prevent temperature stratification and to increase water evaporation. The brine should be checked daily (depending on the volume being generated) to ensure that the salinity does not exceed 100‰ and that the temperature does not exceed 40•C. Additional seawater may be added to the brine to obtain the volume of brine required.

TABLE 1. MAXIMUM EFFLUENT CONCENTRATION (%) THAT CAN BE TESTED AT 34‰ WITHOUT THE ADDITION OF DRY SALTS GIVEN THE INDICATED EFFLUENT AND BRINE SALINITIES.

Effluent Salinity ‰	Brine 60 ‰	Brine 70 ‰	Brine 80 ‰	Brine 90 ‰	Brine 100 ‰
0	43.33	51.43	57.50	62.22	66.00
1	44.07	52.17	58.23	62.92	66.67
2	44.83	52.94	58.97	63.64	67.35
3	45.61	53.73	59.74	64.37	68.04
4	46.43	54.55	60.53	65.12	68.75
5	47.27	55.38	61.33	65.88	69.47
10	52.00	60.00	65.71	70.00	73.33
15	57.78	65.45	70.77	74.67	77.65
20	65.00	72.00	76.67	80.00	82.50
25	74.29	80.00	83.64	86.15	88.00

11.6.24.5.4 After the required salinity is attained, the HSB should be filtered through a 1 µm filter and poured directly into portable containers (20-L cubitainers or polycarbonate water

cooler jugs are suitable). The brine storage containers should be capped and labelled with the salinity and the date the brine was generated. Containers of HSB should be stored in the dark at 4•C (even room temperature has been acceptable). HSB is usually of acceptable quality even after several months in storage.

11.6.24.6 Artificial Sea Salts

11.6.24.6.1 No data from topsmelt larval tests using sea salts or artificial seawater (e.g., GP2) are available for evaluation at this time, and their use must be considered provisional.

11.6.24.7 Dilution Water Preparation from Brine

11.6.24.7.1 Although salinity adjustment with brine is the preferred method, the use of high salinity brines and/or reagent water has sometimes been associated with discernible adverse effects on test organisms. For this reason, it is recommended that only the minimum necessary volume of brine and reagent water be used to offset the low salinity of the effluent, and that brine controls be included in the test. The remaining dilution water should be natural seawater. Salinity may be adjusted in one of two ways. First, the salinity of the highest effluent test concentration may be adjusted to an acceptable salinity, and then serially diluted. Alternatively, each effluent concentration can be prepared individually with appropriate volumes of effluent and brine.

11.6.24.7.2 When HSB and reagent water are used, thoroughly mix together the reagent water and HSB before mixing in the effluent. Divide the salinity of the HSB by the expected test salinity to determine the proportion of reagent water to brine. For example, if the salinity of the brine is 100‰ and the test is to be conducted at 34‰, 100‰ divided by 34‰ = 2.94. The proportion of brine is 1 part plus 1.94 reagent water. To make 1 L of dilution water at 34‰ salinity from a HSB of 100‰, 340 mL of brine and 660 mL of reagent water are required. Verify the salinity of the resulting mixture using a refractometer.

11.6.24.8 Test Solution Salinity Adjustment

11.6.24.8.1 Table 2 illustrates the preparation of test solutions (up to 50% effluent) at 34‰ by combining effluent, HSB,

and dilution water. Note: if the highest effluent concentration does not exceed 50% effluent, it is convenient to prepare brine so that the sum of the effluent salinity and brine salinity equals 68‰; the required brine volume is then always equal to the effluent volume needed for each effluent concentration as in the example in Table 2.

11.6.24.8.2 Check the pH of all brine mixtures and adjust to within 0.2 units of dilution water pH by adding, dropwise, dilute hydrochloric acid or sodium hydroxide (see subsection 8.8.9, Effluent and Receiving Water Sampling, Sampling Handling, and Sample Preparation for Toxicity Tests).

11.6.24.8.3 To calculate the amount of brine to add to each effluent dilution, determine the following quantities: salinity of the brine (SB, in ‰), the salinity of the effluent (SE, in ‰), and volume of the effluent to be added (VE, in mL). Then use the following formula to calculate the volume of brine (VB, in mL) to be added:

$$VB = VE \times (34 - SE)/(SB - 34)$$

11.6.24.8.4 This calculation assumes that dilution water salinity is 34 ± 2‰.

11.6.24.9 Preparing Test Solutions

11.6.24.9.1 Two hundred mL of test solution are needed for each test chamber. To prepare test solutions at low effluent concentrations (<6%), effluents may be added directly to dilution water. For example, to prepare 1% effluent, add 10 mL of effluent to a 1-liter volumetric flask using a volumetric pipet or calibrated automatic pipet. Fill the volumetric flask to the 1-liter mark with dilution water, stopper it, and shake to mix. Distribute equal volumes into the replicate test chambers.

11.6.24.9.2 To prepare a test solution at higher effluent concentrations, hypersaline brine must usually be used. For example, to prepare 40% effluent, add 400 mL of effluent to a

TABLE 2. EXAMPLES OF EFFLUENT DILUTION SHOWING VOLUMES OF EFFLUENT (x‰), BRINE, AND DILUTION WATER NEEDED FOR ONE LITER OF EACH TEST SOLUTION.

FIRST STEP: Combine brine with reagent water or natural seawater to achieve a brine of 68-x‰ and, unless natural seawater is used for dilution water, also a brine-based dilution water of 34‰.

SERIAL DILUTION:

Step 1. Prepare the highest effluent concentration to be tested by adding equal volumes of effluent and brine to the appropriate volume of dilution water. An example using 40% is shown.

Effluent Conc. (%)	Effluent x‰	Brine (68-x)‰	Dilution Water* 34‰
40	800 mL	800 mL	400 mL

Step 2. Use either serially prepared dilutions of the highest test concentration or individual dilutions of 100% effluent.

Effluent Conc. (%)	Effluent Source	Dilution Water* (34‰)
20	1000 mL of 40%	1000 mL
10	1000 mL of 20%	1000 mL
5	1000 mL of 10%	1000 mL
2.5	1000 mL of 5%	1000 mL
Control	none	1000 mL

INDIVIDUAL PREPARATION

Effluent Conc. (%)	Effluent x‰	Brine(68-x)‰	Dilution Water* 34‰
40	400 mL	400 mL	200 mL
20	200 mL	200 mL	600 mL
10	100 mL	100 mL	800 mL
5	50 mL	50 mL	900 mL
2.5	25 mL	25 mL	950 mL
Control	none	none	1000 mL

*May be natural seawater or brine-reagent water equivalent.

1-liter volumetric flask. Then, assuming an effluent salinity of 2‰ and a brine salinity of 66‰, add 400 mL of brine (see equation above and Table 2) and top off the flask with dilution water. Stopper the flask and shake well. Pour into a (100-250 mL) beaker and stir. Distribute equal volumes into the replicate test chambers. The remaining test solution can be used for chemistry.

11.6.24.10 Brine Controls

11.6.24.10.1 Use brine controls in all tests where brine is used. Brine controls contain the same volume of brine as does the highest effluent concentration using brine, plus the volume of reagent water needed to reproduce the hyposalinity of the effluent in the highest concentration, plus dilution water. Calculate the amount of reagent water to add to brine controls by rearranging the above equation, (See SubSection, 11.6.24.8.3) setting SE = 0, and solving for VE.

$$VE = VB \times (SB - 34)/(34 - SE)$$

11.6.25 BRINE SHRIMP, *ARTEMIA SP*., NAUPLII -- for feeding cultures and test organisms.

11.6.25.1 Newly hatched *Artemia* sp. nauplii are used for food for the test organisms. Although there are many commercial sources of brine shrimp cysts, the Brazilian or Colombian strains are preferred because the supplies examined have had low concentrations of chemical residues and produce nauplii of suitably small size. (One source that has been found to be acceptable is Aquarium Products, 180L Penrod Ct., Glen Burnie, Maryland 21061). For commercial sources of brine shrimp, *Artemia*, cysts, see Table 2 of Section 5, Facilities, Equipment, and Supplies); and Section 4, Quality Assurance.

11.6.25.2 Each new batch of *Artemia* cysts must be evaluated for size (Vanhaecke and Sorgeloos, 1980, and Vanhaecke et al., 1980) and nutritional suitability (Leger, et al., 1985, Leger, et al., 1986) against known suitable reference cysts by performing a side-by-side larval growth test using the "new" and "reference" cysts. The "reference" cysts used in the suitability test may be a previously tested and acceptable batch of cysts, or may be obtained from the Quality Assurance Research Division, EMSL,

Cincinnati, OH 45268, 513-569-7325. A sample of newly-hatched *Artemia* nauplii from each new batch of cysts should be chemically analyzed. The *Artemia* cysts should not be used if the concentration of total organochlorine pesticides 0.15 ug/g wet weight or that the total concentration of organochlorine pesticides plus PCBs exceeds 0.30 µg/g wet weight (For analytical methods see USEPA, 1982).

11.6.25.3 *Artemia* nauplii are obtained as follows:

1. Add 1 L of seawater, or an aqueous unionized salt (NaCl) solution prepared with 35 g salt or artificial sea salts per liter, to a 2-L separatory funnel, or equivalent.
2. Add 10 mL *Artemia* cysts to the separatory funnel and aerate for 24 h at 27•C. Hatching time varies with incubation temperature and the geographic strain of *Artemia* used (see USEPA, 1985a; USEPA, 1993a; ASTM, 1993).
3. After 24 h, cut off the air supply in the separatory funnel. *Artemia* nauplii are phototactic, and will concentrate at the bottom of the funnel if it is covered for 5-10 minutes with a dark cloth or paper towel. To prevent mortality, do not leave the concentrated nauplii at the bottom of the funnel more than 10 min without aeration.
4. Drain the nauplii into a funnel fitted with a •150 µm NITEX® or stainless steel screen, and rinse with seawater or equivalent before use.

11.6.25.4 Testing *Artemia* nauplii as food for toxicity test organisms.

11.6.25.4.1 The primary criteria for acceptability of each new supply of brine shrimp cysts is adequate survival, and growth of the larvae. The larvae used to evaluate the acceptability of the brine shrimp nauplii must be the same geographical origin and stage of development (9 to 15 days old) as those used routinely in the toxicity tests. Two 7-day chronic tests are performed side-by-side, each consisting of five replicate test vessels containing five larvae (25 organisms per test, total of 50 organisms). The juveniles in one set of test chambers is fed

reference (acceptable) nauplii and the other set is fed nauplii from the "new" source of *Artemia* cysts.

11.6.25.4.2 The feeding rate and frequency, test vessels, volume of control water, duration of the tests, and age of the *Artemia* nauplii at the start of the test, should be the same as used for the routine toxicity tests.

11.6.25.4.3 Results of the brine shrimp, *Artemia*, nauplii nutrition assay, where there are only two treatments, can be evaluated statistically by use of a t test. The "new" food is acceptable if there are no statistically significant differences in the survival or growth of the mysids fed the two sources of nauplii.

11.6.26 TEST ORGANISMS

11.6.26.1 The test organisms for test method are larvae of the topsmelt, *Atherinops affinis*. Topsmelt occur from the Gulf of California to Vancouver Island, British Columbia (Miller and Lea, 1972). It is often among the most abundant fish species in central and southern California estuaries (Allen and Horn, 1975; Horn, 1979; Allen, 1982). Topsmelt reproduce from May through August, depositing eggs on benthic algae in the upper ends of estuaries and bays (Croaker, 1934; Fronk, 1969). Off-season spawning of *Atherinops affinis* has been successful in a laboratory-held population (Anderson et al., 1994). Their embryonic development is similar to that of other atherinids used widely in toxicity testing (eg, *Menidia* species, Borthwick et al.,1985; Middaugh et al., 1987; Middaugh and Shenker, 1988), and methods to assess sublethal effects with these species have proven to be adaptable for topsmelt (Anderson et al., 1991, Middaugh and Anderson, 1993, McNulty et al., 1994).

11.6.26.2 Species Identification

11.6.26.2.1 Topsmelt often co-occur with jacksmelt, *Atherinopsis californiensis*. The two species can be distinguished based on several key characteristics. Jacksmelt have 10-12 scales between their two dorsal fins; topsmelt have 5-8 scales between the two fins. Jacksmelt teeth are arranged in several bands on each jaw and the teeth are not forked; topsmelt teeth are arranged in one band and the teeth are forked. In jacksmelt, the insertion of

the first dorsal fin occurs well in advance of the origin of the anal fin. In topsmelt, the origin of the anal fin is under the insertion of the first dorsal fin. Consult Miller and Lea (1972) for a guide to the taxonomy of these two fishes.

11.6.26.3 Obtaining Broodstock

11.6.26.3.1 In California, adult topsmelt can be seined from sandy beaches in sloughs and estuaries from April through August. The size of the seine used depends on the number of people deploying it and the habitat being sampled. Larger seines can be used in open sandy areas, smaller seines are used in smaller areas with rocky outcroppings. Five or six people are an adequate number to set and haul a 100-ft beach seine. The seine is set on an ebbing tide using a small motor skiff with one person driving and a second deploying the net from the bow. The net is set parallel to shore then hauled in evenly from the wings. The net mesh diameter should be small enough to prevent the fish from damaging themselves; a one-centimeter diameter mesh in the middle panel and one-and-a-half-centimeter diameter mesh in the wing panel is adequate. As the net is pulled onto the shore, the adult topsmelt are sorted into five-liter plastic buckets, then immediately transferred to 100-liter transport tanks.

11.6.26.3.2 State collection permits are usually required for collection of topsmelt. Collection is prohibited or restricted in some areas. Collection of topsmelt is regulated by California law. Collectors must obtain a scientific collector's permit from the California Department of Fish and Game and observe any regulations regarding collection, transfer, and maintenance of fish broodstock.

11.6.26.3.3 Various containers can be used to transport fish; 100-liter covered plastic trash cans have been used successfully to transport topsmelt. New plastic containers should be leached in seawater for 96 hours prior to transporting fish. Each container can maintain approximately 20 adult fish for six to eight hours if adequate aeration is provided. Use compressed oxygen or air to supply aeration to the tanks during transport.

11.6.26.4 Broodstock Culture and Handling

11.6.26.4.1 Once in the laboratory the fish should be treated for 2 days with a general antibiotic in a separate tank (eg., Prefuran® as per label instructions), then divided among 1000-liter holding tanks. No more than 30 adult fish should be placed in each tank. Tank temperature should be maintained at 18•C using a 1500-watt immersion heater. To conserve heated seawater, the seawater in the tanks can be recirculated using the system similar to that described by Middaugh and Hemmer (1984). A one-thirtieth (1/30)-hp electric pump is used to circulate water (10 liters/minute) from the tanks through vertical, biologically activated nylon filter elements located in a separate reservoir, then back into the tanks. Fresh seawater should be constantly provided to the system at 0.5 liters/minute to supplement the recirculated seawater. The tanks are insulated with one inch thick closed cell foam to conserve heat. Dissolved oxygen levels should be maintained at greater than 6.0 mg/liter using aeration. Salinity should be checked periodically using a refractometer accurate to the nearest 0.5‰; tank salinity should be 34 ± 2‰.

11.6.26.4.2 Adult topsmelt in each tank are fed twice daily (at 0900 and 1500 hrs) approximately 0.3g of Tetramin™ flake food. Supplemental feedings of krill or chopped squid are recommended. Tanks are siphoned clean once weekly.

11.6.26.4.3 Dyeless yarn spawning substrates are attached to the surface of plastic grids cut from light diffuser panel (7 cm x 10 cm x 1 cm) and weighted to the bottom of each tank. Substrates are checked daily for the presence of eggs.

11.6.26.4.4 Spawning is induced by a combination of three environmental cues: lighting, 'tidal' cycle, and temperature. The photoperiod is 14 hours of light followed by 10 hours of darkness (14L:10D) with lights on at 0600 and off at 2000 hours. Use two cool white 40-watt fluorescent lamps suspended 1.25 meters above the surface of each tank to provide illumination. Light levels at the surface of the tanks should be 12 to 21 $\mu E/m^2/s$.

11.6.26.4.5 A 'tidal signal' of reduced current velocity is produced once daily in each tank, from 2400 to 0200 hrs, by turning off the circulating pump (Middaugh and Hemmer, 1984). A 1500-watt immersion heater is used to maintain constant temperature at 18•C and to provide temperature spikes. For

spiking, the temperature is raised from 18•C to 21•C over a 12 h period, then allowed to return to 18•C overnight. The temperature should be checked to the nearest 0.1•C at 1 to 4 hour intervals on days when the temperature spikes are introduced. It is common for the fish to appear stressed during the temperature increase and one or two fish may die. If significant mortality begins to occur, the temperature should be lowered immediately. Significant egg production usually begins within five days of the temperature spike (Middaugh, et al., 1992).

11.6.26.5 Culture Materials

11.6.26.5.1 See Section 5, Facilities and Equipment, for a discussion of suitable materials to be used in laboratory culture of topsmelt. Be sure all new materials are properly leached in seawater before use. After use, all culture materials should be washed in soap and water, then rinsed with seawater before re-use.

11.6.26.6 Test Organisms

11.6.26.6.1. Newly fertilized embryos should be placed in screen tubes set in aquaria and equipped with gently flowing seawater at 20 ± 1•C. The embryos can be left attached to the spawning substrates but care should be taken to ensure the substrates are relatively clean and free of food; strands of embryos should not overlap each other on the substrates, and gentle aeration must be provided. Beginning about day 9, check the screen tubes daily for the presence of larvae. Isolate newly-hatched larvae into a separate screen-tube at 21•C by slow siphoning. Provide larvae with newly-hatched *Artemia* nauplii (in excess) at 24-h post-hatch; supply gently flowing seawater, and aeration. Larvae aged 9 to 15 days are used in toxicity tests (McNulty et al., 1994). For information regarding topsmelt larva suppliers call the Marine Pollution Studies Laboratory (408) 624-0947.

11.6.26.6.2 Larvae can be transported in 1-liter ziplock plastic bags (double-bagged). No more than approximately 100 larvae should be transported in any one bag; do not include food. The seawater in the bags should be aerated with pure oxygen for 30 seconds prior to introduction of the larvae. The bag should be packed in an ice chest with one or two blue ice blocks (insulated by newspaper) for transport. The temperature during transport

should be held between 15 and 18•C. Larvae should be shipped via air-express overnight couriers.

11.6.26.6.3 Topsmelt larvae can tolerate a relatively wide range of salinities (5 to •35‰) if adequate acclimation is provided (Anderson, et al., In Press). In situations where the test salinity is significantly lower than the salinity at which the larvae were cultured, it may be necessary to acclimate the larvae to the test salinity.

11.7 EFFLUENTS AND RECEIVING WATER COLLECTION, PRESERVATION, AND STORAGE

11.7.1 See Section 8, Effluent and Receiving Water Sampling, Sample Handling, and Sample Preparation for Toxicity Tests.

11.8 CALIBRATION AND STANDARDIZATION

11.8.1 See Section 4, Quality Assurance

11.9 QUALITY CONTROL

11.9.1 See Section 4, Quality Assurance

11.10 TEST PROCEDURES

11.10.1 TEST DESIGN

11.10.1.1 The test consists of at least five effluent concentrations plus a dilution water control. Tests that use brine to adjust salinity must also contain five replicates of a brine control.

11.10.1.2 Effluent concentrations are expressed as percent effluent.

11.10.2 TEST SOLUTIONS

11.10.2.1 Receiving waters

11.10.2.1.1 The sampling point is determined by the objectives of the test. At estuarine and marine sites, samples are usually collected at mid-depth. Receiving water toxicity is determined

with samples used directly as collected or with samples passed through a 60 µm NITEX® filter and compared without dilution, against a control. Using five replicate chambers per test, each containing 200 mL would require approximately 1 L of sample per test per day.

11.10.2.2 Effluents

11.10.2.2.1 The selection of the effluent test concentrations should be based on the objectives of the study. A dilution factor of at least 0.5 is commonly used. A dilution factor of 0.5 provides hypothesis test discrimination of ± 100%, and testing of a 16 fold range of concentrations. Hypothesis test discrimination shows little improvement as dilution factors are increased beyond 0.5 and declines rapidly if smaller dilution factors are used. **USEPA recommends that one of the five effluent treatments must be a concentration of effluent mixed with dilution water which corresponds to the permittee's instream waste concentration (IWC).** At least two of the effluent treatments must be of lesser effluent concentration than the IWC, with one being at least one-half the concentration of the IWC. If 100‰ HSB is used as a diluent, the maximum concentration of effluent that can be tested will be 66% at 34‰ salinity.

11.10.2.2.2 If the effluent is known or suspected to be highly toxic, a lower range of effluent concentrations should be used (such as 25%, 12.5%, 6.25%, 3.12% and 1.56%).

11.10.2.2.3 The volume in each test chamber is 200 mL.

11.10.2.2.4 Effluent dilutions should be prepared for all replicates in each treatment in one container to minimize variability among the replicates. Dispense into the appropriate effluent test chambers.

11.10.2.3 Dilution Water

11.10.2.3.1 Dilution water should be uncontaminated 1-µm-filtered natural seawater or hypersaline brine prepared from uncontaminated natural seawater plus reagent water (see Section 7, Dilution Water). Natural seawater may be uncontaminated receiving water. This water is used in all dilution steps and as the control water.

11.10.2.4 Reference Toxicant Test

11.10.2.4.1 Reference toxicant tests should be conducted as described in Quality Assurance (see Section 4.7).

11.10.2.4.2 The preferred reference toxicant for topsmelt is copper chloride ($CuCl_2 \circ 2H_2O$). Reference toxicant tests provide an indication of the sensitivity of the test organisms and the suitability of the testing laboratory (see Section 4 Quality Assurance). Another toxicant may be specified by the appropriate regulatory agency. Prepare a 10,000 µg/L copper stock solution by adding 0.0268 g of copper chloride ($CuCl_2 \circ 2H_2O$) to one liter of reagent water in a polyethylene volumetric flask. Alternatively, certified standard solutions can be ordered from commercial companies.

11.10.2.4.3 Reference toxicant solutions should be five replicates each of 0 (control), 56, 100, 180, and 320 µg/L total copper. Prepare one liter of each concentration by adding 0, 5.6, 10.0, 18.0, and 32.0 mL of stock solution, respectively, to one-liter volumetric flasks and fill with dilution water. Start with control solutions and progress to the highest concentration to minimize contamination.

11.10.2.4.4 If the effluent and reference toxicant tests are to be run concurrently, then the tests must use embryos from the same spawn. The tests must be handled in the same way and test solutions delivered to the test chambers at the same time. Reference toxicant tests must be conducted at 34 ± 2‰.

11.10.3 START OF THE TEST

11.10.3.1 Prior to Beginning the Test

11.10.3.1.1 The test should begin as soon as possible, preferably within 24 h of sample collection. The maximum holding time following retrieval of the sample from the sampling device should not exceed 36 h for off-site toxicity tests unless permission is granted by the permitting authority. In no case should the sample be used in a test more than 72 h after sample collection (see Section, 8 Effluent and Receiving Water Sampling, Sample Handling, and Sample Preparation for Toxicity Test).

11.10.3.1.2 Just prior to test initiation (approximately 1 h), the temperature of a sufficient quantity of the sample to make the test solutions should be adjusted to the test temperature (20 ± 1•C) and maintained at that temperature during the addition of dilution water.

11.10.3.1.3 Increase the temperature of the water bath, room, or incubator to the required test temperature (20 ± 1•C).

11.10.3.1.4 Randomize the placement of test chambers in the temperature-controlled water bath, room, or incubator at the beginning of the test, using a position chart. Assign numbers for the position of each test chamber using a random numbers or similar process (see Appendix A, for an example of randomization). Maintain the chambers in this configuration throughout the test, using a position chart. Record these numbers on a separate data sheet together with the concentration and replicate numbers to which they correspond. Identify this sheet with the date, test organism, test number, laboratory, and investigator's name, and safely store it away until after the larvae have been examined at the end of the test.

11.10.3.1.5 Note: Loss of the randomization sheet would invalidate the test by making it impossible to analyze the data afterwards. Make a copy of the randomization sheet and store separately. Take care to follow the numbering system exactly while filling chambers with the test solutions.

11.10.3.1.6 Arrange the test chambers randomly in the water bath or controlled temperature room. Once chambers have been labeled randomly, they can be arranged in numerical order for convenience, since this will also ensure random placement of treatments.

11.10.3.2 Randomized Placement of Larvae into Test Chambers

11.10.3.2.1 Larvae must be randomized before placing them into the test chambers. Pool all of the test larvae into a 1-liter beaker by slow siphoning from the screen-tube. The larvae in the screen-tube can be concentrated into the bottom by lifting the tube during siphoning. Using a fire-polished glass tube, place one larva into as many plastic cups as there are test chambers (including reference toxicant chambers). These cups should

contain enough reference seawater to maintain water quality and temperature during the transfer process (approx. 50 mL). When each of the cups contains one larva, repeat the process, adding one larva at a time until each cup contains 5 animals.

11.10.3.2.2 Carefully pour or pipet off excess water in the cups, leaving less than 5 mL with the test larvae. If more than 5 mLs of water are added to the test solution with the juveniles, report the amount on the data sheet. Carefully transfer the larvae into the test chambers immediately after reducing the water volume. Again, make note of any excess dilution of the test solution. Because of the small volumes involved in the transfer process, this is best accomplished in a constant temperature room. Be sure that all water used in culture, transfer, and test solutions is within 1•C of the test temperature.

11.10.3.2.3 Verify that all five animals are transferred by counting the number in each chamber after transfer. This initial count is important because larvae unaccounted for at the end of the test are assumed to be dead.

11.10.4 LIGHT, PHOTOPERIOD, SALINITY AND TEMPERATURE

11.10.4.1 The light quality and intensity should be at ambient laboratory conditions are generally adequate. Light intensity should be 10-20 $\mu E/m^2/s$, or 50 to 100 foot candles (ft-c), with a 16 h light and 8 h dark cycle.

11.10.4.2 The water temperature in the test chambers should be maintained at 20 ± 1•C. If a water bath is used to maintain the test temperature, the water depth surrounding the test cups should be as deep as possible without floating the chambers.

15.10.4.3 The test salinity should be in the range of 5 to 34‰, and the salinity should not vary by more than ± 2‰ among the chambers on a given day. The salinity should vary by no more than ±2‰ among the chambers on a given day. If effluent and receiving water tests are conducted concurrently, the salinities of these tests should be similar.

15.10.4.4 Rooms or incubators with high volume ventilation should be used with caution because the volatilization of the

test solutions and evaporation of dilution water may cause wide fluctuations in salinity. Covering the test chambers with clean polyethylene plastic may help prevent volatilization and evaporation of the test solutions.

11.10.5 DISSOLVED OXYGEN (DO) CONCENTRATION

11.10.5.1 Aeration may affect the toxicity of effluent and should be used only as a last resort to maintain a satisfactory DO. The DO concentration should be measured on new solutions at the start of the test (Day 0). The DO should not fall below 4.0 mg/L (see Section 8, Effluent and Receiving Water Sampling, Sample Handling, and Sample Preparation for Toxicity Tests). If it is necessary to aerate, all treatments and the control should be aerated. The aeration rate should not exceed that necessary to maintain a minimum acceptable DO and under no circumstances should it exceed 100 bubbles/minute, using a pipet with a 1-2 mm orifice, such as a 1 mL KIMAX® serological pipet No. 37033, or equivalent. Care should be taken to ensure that turbulence resulting from aeration does not cause undue stress to the fish.

11.10.6 FEEDING

11.10.6.1 *Artemia* nauplii are prepared as described below.

11.10.6.2 The test larvae are fed newly-hatched (less than 24-h-old) *Artemia* nauplii once a day from Day 0 through Day 6; larvae are not fed on Day 7. Equal amounts of *Artemia* nauplii must be fed to each replicate test chamber to minimize the variability of larval weight. Add 40 newly hatched *Artemia* nauplii per larva twice daily: once in the morning and once in the afternoon. The density of *Artemia* may be determined by pipetting a known volume of nauplii onto a piece of filter paper and counting the number using a dissecting microscope. Feeding excessive amounts of *Artemia* nauplii will result in a depletion in DO to below an acceptable level. Siphon as much of the uneaten *Artemia* nauplii as possible from each chamber daily to ensure that the larvae principally eat newly hatched nauplii.

11.10.7 DAILY CLEANING OF TEST CHAMBERS

11.10.7.1 Before the daily renewal of test solutions, uneaten and dead brine shrimp, dead larvae, and other debris are removed

from the bottom of the test chambers with a siphon hose. Because of their small size during the first few days of the test, larvae are easily drawn into a siphon tube when cleaning the test chambers. By placing the test chambers on a light box, inadvertent removal of larvae can be greatly reduced because they can be more easily seen. If the water siphoned from the test chambers is collected in a white plastic tray, the live larvae caught up in the siphon can be retrieved, and returned by pipette to the appropriate test chamber and noted on the data sheet.

11.10.8 OBSERVATIONS DURING THE TEST

11.10.8.1 Routine Chemical and Physical Observations

11.10.8.1.1 DO is measured at the beginning of the exposure period in one test chamber at each test concentration and in the control.

11.10.8.1.2 Temperature, pH, and salinity are measured at the beginning of the exposure period in one test chamber at each concentration and in the control. Temperature should also be monitored continuously or observed and recorded daily for at least two locations in the environmental control system or the samples. Temperature should be measured in a sufficient number of test chambers at the end of the test to determine temperature variation in the environmental chamber.

11.10.8.1.3 Record all the measurements on the data sheet.

11.10.8.2 Routine Biological Observations

11.10.8.2.1 The number of live larvae in each test chamber are recorded daily and the dead larvae are discarded. These data provide daily mortality rates which may be used to calculate 24, 48, and 96-h LC50s.

11.10.8.2.2 Protect the larvae from unnecessary disturbances during the test by carrying out the daily test observations, solution renewals, and removal of dead larvae, carefully. Make sure the larvae remain immersed at all times during the performance of the above operations.

11.10.9 TEST SOLUTION RENEWAL

11.10.9.1 The test solutions are renewed daily using freshly prepared solutions, immediately after cleaning the test chambers. The old solution is carefully siphoned out, leaving enough water so that all of the larvae can still swim freely (approximately 50 mL). Siphon from the bottom of the test chambers so that dead *Artemia* nauplii are removed with the old test solution. It is convenient to siphon old solutions into a small (~500 mL) container in order to ensure that no larvae have been inadvertently removed during solution renewals. If a larva is siphoned, return it to the test chamber and note it on the data sheet.

11.10.9.2 New solution is siphoned into the test chambers using a U-shaped glass tube attached to plastic tubing to minimize disturbance to the larvae.

11.10.9.3 The effluent or receiving water used in the test is stored in an incubator or refrigerator at 4•C. Plastic containers such as 8-20 L cubitainers have proven suitable for effluent collection and storage. For on-site toxicity studies no more than 24 h should elapse between collection of the effluent and use in a toxicity test (see Section 8, Effluent and Receiving Water Sampling, Sample Handling, and Sample Preparation for Toxicity Tests).

11.10.9.4 Approximately 1 h before test initiation, a sufficient quantity of effluent or receiving water sample is warmed to 20 ± 1•C to prepare the test solutions. A sufficient quantity of effluent should be warmed to make daily test solutions.

11.10.10 TERMINATION OF THE TEST

11.10.10.1 Ending the Test

11.10.10.1.1 Record the time the test is terminated.

11.10.10.1.2 Temperature, pH, dissolved oxygen, and salinity are measured at the end of the exposure period in one test chamber at each concentration and in the control.

11.10.10.2 Sample Preservation

11.10.10.2.1 The surviving larvae in each test chamber (replicate) are counted, and immediately prepared as a group for dry weight determination, or are preserved in 4% formalin then 70% ethanol. Preserved organisms are dried and weighed within 7 d. For safety, formalin should be used under a hood. Note: Death is defined as lack of response to stimulus such as prodding with a glass rod; dead larvae are generally opaque and curled.

11.10.10.3 Weighing

11.10.10.3.1 For immediate drying and weighing, siphon or pour live larvae onto a 500 µm mesh screen in a large beaker to retain the larvae and allow *Artemia* to be rinsed away. Rinse the larvae with reagent water to remove salts that might contribute to the dry weight. Sacrifice the larvae in an ice bath of reagent water.

11.10.10.3.2 Small aluminum weighing pans can be used to dry and weigh larvae. An appropriate number of aluminum weigh pans (one per replicate) are marked for identification and weighed to 0.01 mg, and the weights are recorded on the data sheets.

11.10.10.3.3 Immediately prior to drying, the preserved larvae are in reagent water. The rinsed larvae from each test chamber are transferred, using forceps, to a tared weighing pans and dried at 60•C for 24 h, or at 105•C for a minimum of 6 h. Immediately upon removal from the drying oven, the weighing pans are placed in a desiccator to cool and to prevent the adsorption of moisture from the air until weighed. Weigh all weighing pans containing the dried larvae to 0.01 mg, subtract the tare weight to determine dry weight of larvae in each replicate. Record the weights.

11.10.10.4 Endpoints

11.10.10.4.1 Divide the dry weight by the number of original larvae (5) per replicate to determine the average dry weight, and record on the data sheets. For the controls, also calculate the mean weight per surviving fish in the test chamber to evaluate if weights met test acceptability criteria (see Subsection 11.11). Complete the summary data sheet after calculating the average measurements and statistically analyzing the dry weights and

percent survival for the entire test. Average weights should be expressed to the nearest 0.01 mg.

11.11 SUMMARY OF TEST CONDITIONS AND TEST ACCEPTABILITY CRITERIA

11.11.1 A summary of test conditions and test acceptability criteria is listed in Table 3.

TABLE 3. SUMMARY OF TEST CONDITIONS AND TEST ACCEPTABILITY CRITERIA FOR THE TOPSMELT, *ATHERINOPS AFFINIS*, LARVAL SURVIVAL AND GROWTH TEST WITH EFFLUENTS AND RECEIVING WATERS

1. Test type:	Static-renewal
2. Salinity:	5 to 34‰ (± 2‰ of the selected test salinity)
3. Temperature:	20 ± 1•C
4. Light quality:	Ambient laboratory illumination
5. Light intensity:	10-20 µE/m^2/s (Ambient laboratory levels)
6. Photoperiod:	16 h light, 8 h darkness
7. Test chamber size:	600 mL
8. Test solution volume:	200 mL/replicate
9. Renewal of test solutions:	Daily
10. Age of test organisms:	9-15 days post-hatch
11. No. larvae per test chamber:	5
12. No. replicate chambers per concentration:	5
13. Source of food:	Newly hatched *Artemia* nauplii
14. Feeding regime:	Feed 40 nauplii per larvae twice daily (morning and night)

15. Cleaning:	Siphon daily, immediately before test solution renewal and feeding
16. Aeration:	None, unless DO concentration falls below 4.0 mg/L, then aerate all chambers. Rate should be less than 100 bubbles/min.
17. Dilution water:	Uncontaminated 1-µm-filtered natural seawater or hypersaline brine prepared from natural seawater
18. Test concentrations:	Effluent: Minimum of 5 and a control Receiving waters: 100% receiving water and a control
19. Dilution factor:	Effluents: •0.5 Receiving waters: None, or •0.5
20. Test duration:	7 days
21. Endpoints:	Survival and growth (weight)
22. Test acceptability criteria:	•80% survival in controls, 0.85 mg average weight of control larvae (9 day old), LC50 with copper must be •205 µg/L, <25% MSD for survival and <50% MSD for growth

23. Sampling requirement:	For on-site tests, samples collected daily, and used within 24 h of the time they are removed from the sampling device. For off-site tests, a minimum of three samples are collected on days one, three, and five with a maximum holding time of 36 h before first use (see Section 8, Effluent and Receiving Water Sampling, Sample Handling, and Sample Preparation for Toxicity Tests)
24. Sample volume required:	2 L per day

11.12 ACCEPTABILITY OF TEST RESULTS

11.12.1 Tests results are acceptable only if all the following requirements are met:

(1) The mean survival of larvae must be at least 80% in the controls.

(2) If the test starts with 9 day old larvae, the mean weight per larva must exceed 0.85 mg in the reference and brine controls; the mean weight of preserved larvae must exceed 0.72 mg.

(3) The LC50 for survival must be within two standard deviations of the control chart mean for the laboratory. The LC50 for survival with copper must be <205 µg/L.

(4) The minimum significant difference (%MSD) of <25% relative to the control for survival for the reference toxicant test. The (%MSD) of <50% relative to the control for growth for the reference toxicant test.

11.13 DATA ANALYSIS

11.13.1 GENERAL

11.13.1.1 Tabulate and summarize the data. A sample set of survival and growth response data is listed in Table 4.

11.13.1.2 The endpoints of toxicity tests using the topsmelt larvae are based on the adverse effects on survival and growth. The LC50 and the IC25 are calculated using point estimation techniques (see Section 9, Chronic Toxicity Test Endpoints and Data Analysis). LOEC and NOEC values, for survival and growth, are obtained using a hypothesis testing approach such as Dunnett's Procedure (Dunnett, 1955) or Steel's Many-one Rank Test (Steel, 1959; Miller, 1981)(see Section 9). Separate analyses are performed for the estimation of the LOEC and NOEC endpoints and for the estimation of the LC50 and IC25. Concentrations at which there is no survival in any of the test chambers are excluded from the statistical analysis of the NOEC and LOEC for survival and growth, but included in the estimation of the LC50 and IC25. See the Appendices for examples of the manual computations and examples of data input and program output.

11.13.1.3 The statistical tests described here must be used with a knowledge of the assumptions upon which the tests are contingent. Tests for normality and homogeneity of variance are included in Appendix B. The assistance of a statistician is recommended for analysts who are not proficient in statistics.

11.13.2 EXAMPLE OF ANALYSIS OF TOPSMELT, *ATHERINOPS AFFINIS* SURVIVAL DATA

11.13.2.1 Formal statistical analysis of the survival data is outlined in Figures 1 and 2. The response used in the analysis is the proportion of animals surviving in each test or control chamber. Separate analyses are performed for the estimation of the NOEC and LOEC endpoints and for the estimation of the LC50 endpoint. Concentrations at which there is no survival in any of the test chambers are excluded from statistical analysis of the NOEC and LOEC, but included in the estimation of the IC, EC, and LC endpoints.

11.13.2.2 For the case of equal numbers of replicates across all concentrations and the control, the evaluation of the NOEC and LOEC endpoints is made via a parametric test, Dunnett's

Procedure, or a nonparametric test, Steel's Many-one Rank Test, on the arc sine square root transformed data. Underlying assumptions of Dunnett's Procedure, normality and homogeneity of variance, are formally tested. The test for normality is the Shapiro-Wilk's Test, and Bartlett's Test is used to test for homogeneity of variance. If either of these tests fails, the nonparametric test, Steel's Many-one Rank Test, is used to determine the NOEC and LOEC endpoints. If the assumptions of Dunnett's Procedure are met, the endpoints are estimated by the parametric procedure.

11.13.2.3 If unequal numbers of replicates occur among the concentration levels tested, there are parametric and nonparametric alternative analyses. The parametric analysis is a *t* test with the Bonferroni adjustment (see Appendix D). The Wilcoxon Rank Sum Test with the Bonferroni adjustment is the nonparametric alternative.

11.13.2.4 Probit Analysis (Finney, 1971; see Appendix H) is used to estimate the concentration that causes a specified percent decrease in survival from the control. In this analysis, the total mortality data from all test replicates at a given concentration are combined. If the data do not fit the Probit Analysis, the Spearman-Karber Method, the Trimmed Spearman-Karber Method, or the Graphical Method may be used to estimate the LC50 (see Appendices H-K).

11.13.2.5 Example of Analysis of Survival Data

11.13.2.5.1 This example uses the survival data from the Topsmelt Larval Survival and Growth Test. The proportion surviving in each replicate must first be transformed by the arc sine square root transformation procedure described in Appendix . The raw and transformed data, means and variances of the transformed observations at each copper concentration and control are listed in Table 5. A plot of the survival proportions is provided in Figure 5. Since there was 100% mortality in all five replicates for the 100 µg/L and 180 µg/L concentrations, they are not included in the statistical analysis and are considered qualitative mortality effects.

TABLE 4. SUMMARY OF SURVIVAL AND GROWTH DATA FOR TOPSMELT, *ATHERINOPS AFFINIS*, LARVAE EXPOSED TO COPPER FOR SEVEN DAYS[1]

Copper Conc. (µg/L)	Replicate Survival Proportions					Mean Proportion Survival
	A	B	C	D	E	
0.0	1.0	0.8	1.0	1.0	1.0	0.96
32.0	1.0	1.0	1.0	1.0	1.0	1.00
56.0	0.0	0.6	0.2	1.0	0.6	0.48
100.0	0.0	0.0	0.0	0.0	0.0	0.00
180.0	0.0	0.0	0.0	0.0	0.0	0.00

Conc. (µg/L)	Replicate Average Dry Weights (mg)					Mean Dry Wgt (mg)
	A	B	C	D	E	
0.0	0.00134	0.00153	0.00134	0.00146	0.00144	0.00142
32.0	0.00146	0.00142	0.00150	0.00138	0.00128	0.00141
56.0	--	0.00147	0.00170	0.00124	0.00130	0.00114
100.0	--	--	--	--	--	--
180.0	--	--	--	--	--	--

[1]Five replicates of 5 larvae each.

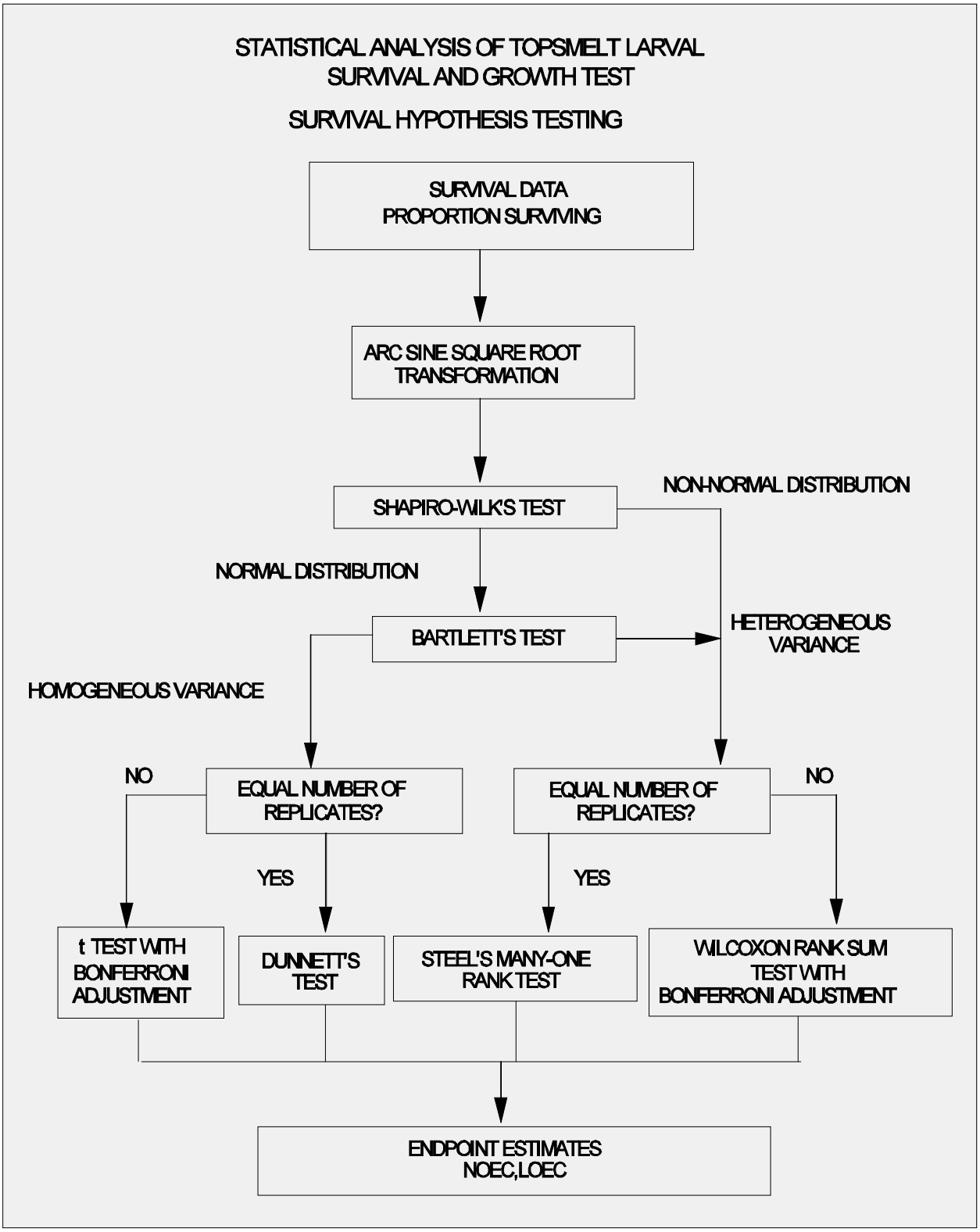

Figure 1. Flowchart for statistical analysis of the topsmelt, *Atherinis affinis*, larval survival data by hypothesis testing.

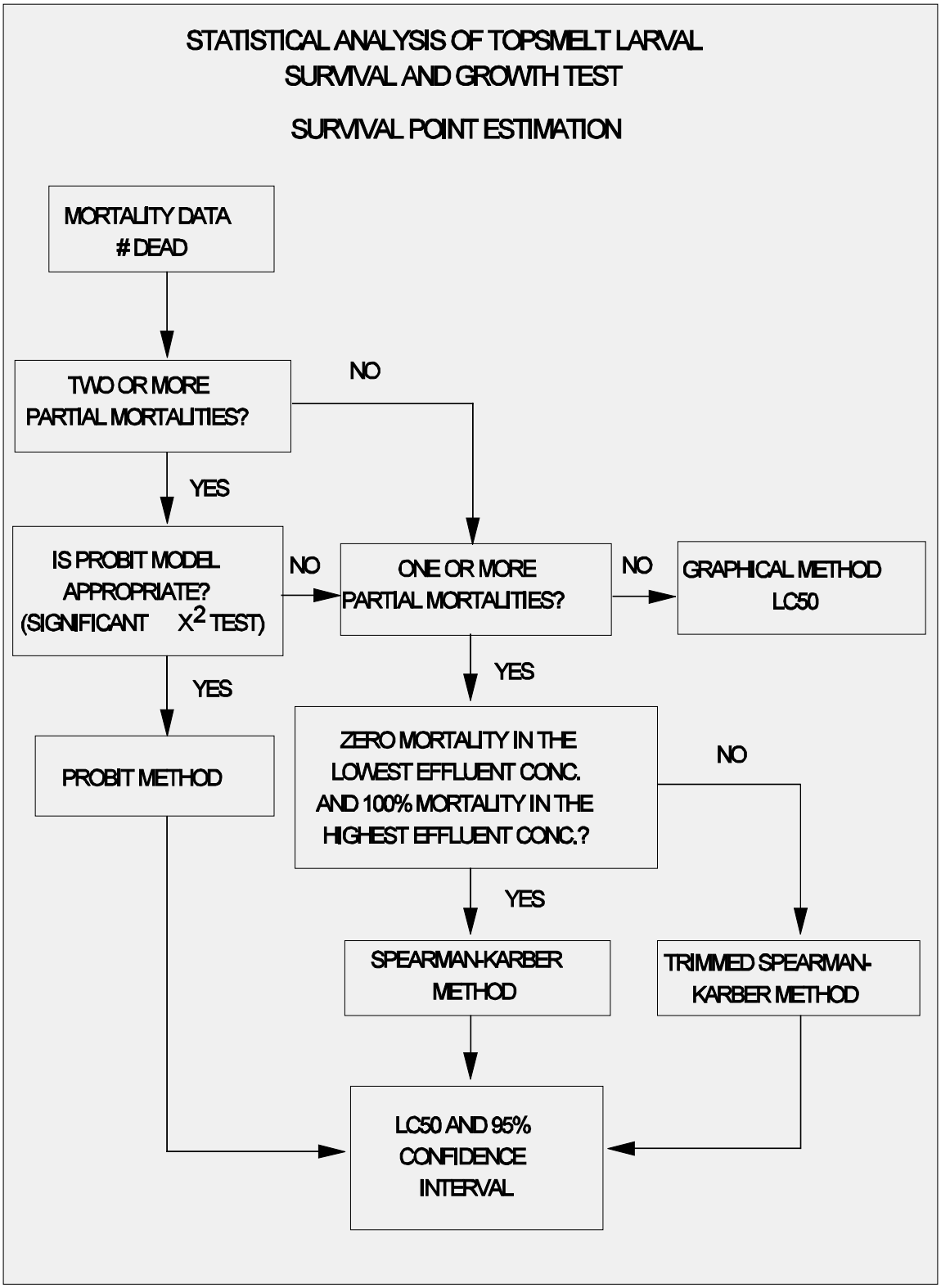

Figure 2. Flowchart for statistical analysis of the topsmelt, *Atherinis affinis*, larval survival data by point estimation.

TABLE 5. TOPSMELT, *ATHERINOPS AFFINIS*, SURVIVAL DATA

			Copper Concentration (µg/L)	
	Replicate	Control	32.0	56.0
RAW	A	1.0	1.0	0.0
	B	0.8	1.0	0.6
	C	1.0	1.0	0.2
	D	1.0	1.0	1.0
	E	1.0	1.0	0.6
ARC SINE SQUARE ROOT TRANSFORMED	A	1.345	1.345	0.225
	B	1.107	1.345	0.886
	C	1.345	1.345	0.464
	D	1.345	1.345	1.345
	E	1.345	1.345	0.886
Mean ($\overline{Y}_i$)		1.297	1.345	0.761
S^2		0.0113	0.000	0.187
i^i		1	2	3

11.13.2.6 Test for Normality

11.13.2.6.1 The first step of the test for normality is to center the observations by subtracting the mean of all observations within a concentration from each observation in that concentration. The centered observations are summarized in Table 6.

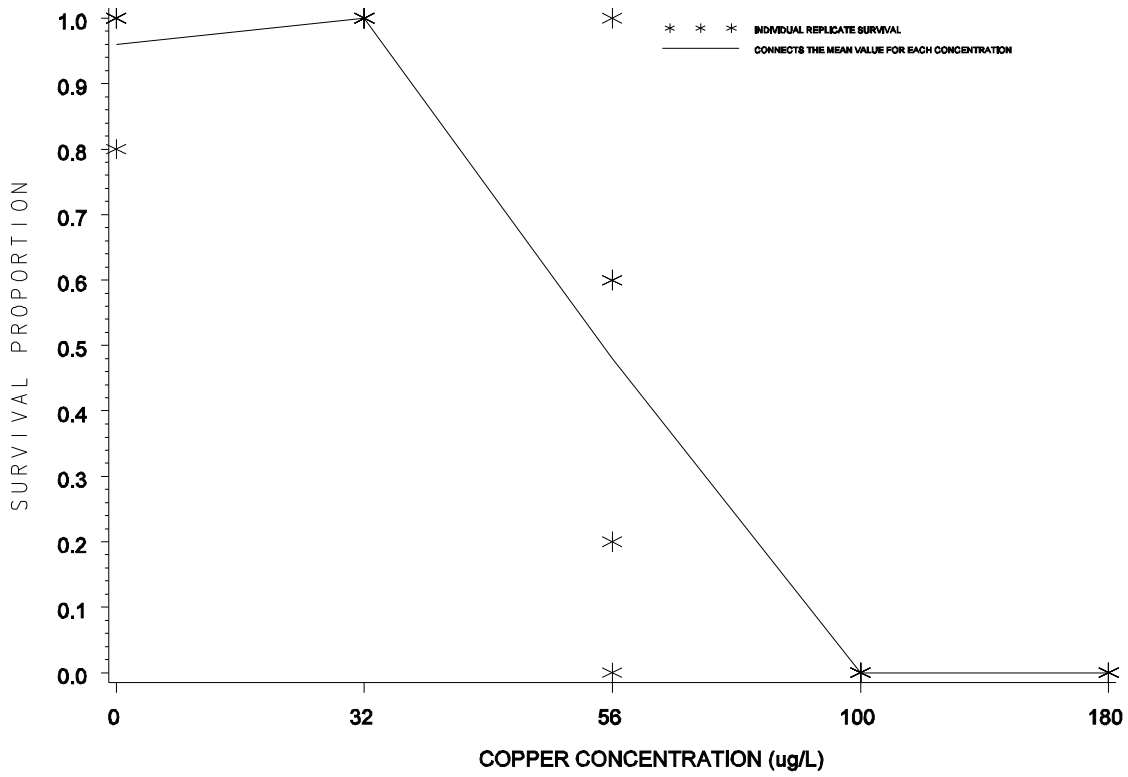

Figure 3 Plot of mean survival proportion data in Table 5.

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TABLE 6. CENTERED OBSERVATIONS FOR SHAPIRO-WILK'S EXAMPLE

Replicate	Control	Copper Concentration (µg/L)	
		32.0	56.0
A	0.048	0.000	-0.536
B	-0.190	0.000	0.125
C	0.048	0.000	-0.297
D	0.048	0.000	0.584
E	0.048	0.000	0.125

11.13.2.6.2 Calculate the denominator, D, of the statistic:

$$D = \sum_{i=1}^{n} (X_i - \bar{X})^2$$

Where: X_i = the ith centered observation

$\bar{X}$ = the overall mean of the centered observations

n = the total number of centered observations

11.13.2.6.3 For this set of data,

$$n = 15$$

$$\bar{X} = \frac{1}{15}(0.003) = 0.000$$

$$D = 0.793$$

11.13.2.6.4 Order the centered observations from smallest to largest

$$X^{(1)} \le X^{(2)} \le \ldots \le X^{(n)}$$

where $X^{(i)}$ denotes the ith ordered observation. The ordered observations for this example are listed in Table 7.

TABLE 7. ORDERED CENTERED OBSERVATIONS FOR THE SHAPIRO-WILK'S EXAMPLE

i	$X^{(i)}$	i	$X^{(i)}$
1	-0.536	9	0.048
2	-0.297	10	0.048
3	-0.190	11	0.048
4	0.000	12	0.048
5	0.000	13	0.125
6	0.000	14	0.125
7	0.000	15	0.584
8	0.000		

11.13.2.6.5 From Table 4, Appendix B, for the number of observations, n, obtain the coefficients a_1, a_2, ... a_k where k is n/2 if n is even and (n-1)/2 if n is odd. For the data in this example, n = 15 and k = 7. The a_i values are listed in Table 8.

11.13.2.6.6 Compute the test statistic, W, as follows:

$$W = \frac{1}{D}\left[\sum_{i=1}^{k} a_i\left(X^{(n-i+1)} - X^{(i)}\right)\right]^2$$

The differences $X^{(n-i+1)} - X^{(i)}$ are listed in Table 7. For the data in this example,

$$W = \frac{1}{0.793}(0.817)^2 = 0.842$$

11.13.2.6.7 The decision rule for this test is to compare W as calculated in Subsection 11.13.2.6.6 to a critical value found in Table 6, Appendix B. If the computed W is less than the critical value, conclude that the data are not normally distributed. For the data in this example, the critical value at a significance

level of 0.01 and n = 15 observations is 0.835. Since W = 0.842 is greater than the critical value, conclude that the data are normally distributed.

11.13.2.6.8 Since the variance of the lowest copper concentration group is zero, Bartlett's test statistic can not be calculated. Therefore, the survival data variances are considered to be heterogeneous.

11.13.2.6.9 Since the data do not meet the assumption of homogeneity of variance, Steel's Many-one Rank Test will be used

TABLE 8. COEFFICIENTS AND DIFFERENCES FOR SHAPIRO-WILK'S EXAMPLE

i	a_i	$X^{(n-i+1)} - X^{(i)}$	
1	0.5150	1.120	$X^{(15)} - X^{(1)}$
2	0.3306	0.422	$X^{(14)} - X^{(2)}$
3	0.2495	0.315	$X^{(13)} - X^{(3)}$
4	0.1878	0.048	$X^{(12)} - X^{(4)}$
5	0.1353	0.048	$X^{(11)} - X^{(5)}$
6	0.0880	0.048	$X^{(10)} - X^{(6)}$
7	0.0433	0.048	$X^{(9)} - X^{(7)}$

to analyze the survival data.

11.13.2.7 Steel's Many-one Rank Test

11.13.2.7.1 For each control and concentration combination, combine the data and arrange the observations in order of size from smallest to largest. Assign the ranks (1, 2, ..., 10) to the ordered observations with a rank of 1 assigned to the smallest observation, rank of 2 assigned to the next larger observation, etc. If ties occur when ranking, assign the average rank to each tied observation.

11.13.2.7.2 An example of assigning ranks to the combined data for the control and 32.0 µg/L copper concentration is given in Table 9. This ranking procedure is repeated for each control/concentration combination. The complete set of rankings is summarized in Table 10. The ranks are next summed for each copper concentration, as shown in Table 11.

11.13.2.7.3 For this example, determine if the survival in any of the copper concentrations is significantly lower than the survival in the control. If this occurs, the rank sum at that concentration would be significantly lower than the rank sum of the control. Thus, compare the rank sums for the survival at each of the various copper concentrations with some "minimum" or critical rank sum, at or below which the survival would be considered significantly lower than the control. At a significance level of 0.05, the minimum rank sum in a test with two concentrations (excluding the control) and five replicates is 18 (see Table 5, Appendix E).

11.13.2.7.4 Since the rank sum for the 56.0 µg/L copper concentration is equal to the critical value, the proportion surviving in the 56.0 µg/L concentration is considered significantly less than that in the control. Since the other rank sum is not less than or equal to the critical value, it is not considered to have a significantly lower proportion surviving than the control. Hence, the NOEC and the LOEC are the 32.0 µg/L and 56.0 µg/L concentrations, respectively.

11.13.2.8 Calculation of the LC50

11.13.2.8.1 The data used for the calculation of the LC50 is summarized in Table 12. For estimating the LC50, the data for the 100 µg/L and 180 µg/L copper concentrations with 100% mortality are included.

TABLE 9. ASSIGNING RANKS TO THE CONTROL AND 32.0 µg/L COPPER CONCENTRATION FOR STEEL'S MANY-ONE RANK TEST

Rank	Transformed Proportion Surviving	Copper Concentration (µg/L)
1	1.107	Control
6	1.345	32.0
6	1.345	32.0
6	1.345	32.0
6	1.345	32.0
6	1.345	32.0
6	1.345	Control
6	1.345	Control
6	1.345	Control
6	1.345	Control

TABLE 10. TABLE OF RANKS

Replicate	Control	Copper Concentration (µg/L) 32.0	56.0
A	1.345 (6, 8)	1.345 (6)	0.225 (1)
B	1.107 (1, 5)	1.345 (6)	0.886 (3.5)
C	1.345 (6, 8)	1.345 (6)	0.464 (2)
D	1.345 (6, 8)	1.345 (6)	1.345 (8)
E	1.345 (6, 8)	1.345 (6)	0.886 (3.5)

TABLE 11. RANK SUMS

Copper Concentration (µg/L)	Rank Sum
32.0	30
56.0	18

11.13.2.8.2 Because there are is only one partial mortality in the set of copper concentration responses, Probit Analysis is not appropriate to calculate the LC50 and 95% confidence interval for this set of test data. Inspection of the data reveals that, once the data is smoothed and adjusted, the proportion mortality in the lowest effluent concentration will be zero and the proportion mortality in the highest effluent concentration will be one. Therefore, the Spearman-Karber Method is appropriate for this data.

11.13.2.8.3 Before the LC50 can be calculated the data must be smoothed and adjusted. For the data in this example, because the observed proportion mortality for the 32.0 µg/L copper concentration is less than the observed response proportion for the control, the observed responses for the control and this group must be averaged:

$$p_0^s \cdot p_1^s \cdot \frac{0.040 \cdot 0.000}{2} \cdot 0.020$$

Where: p_i^s = the smoothed observed mortality proportion for effluent concentration i.

11.13.2.8.3.1 Because the rest of the responses are monotonic, additional smoothing is not necessary. The smoothed observed proportion mortalities are shown in Table 12.

11.13.2.8.4 Because the smoothed observed proportion mortality for the control is now greater than zero, the data in each effluent concentration must be adjusted using Abbott's formula

(Finney, 1971). The adjustment takes the form:

$$p_i^a = (p_i^s - p_0^s) / (1 - p_0^s)$$

Where: p_0^s = the smoothed observed proportion mortality for the control

p_i^s = the smoothed observed proportion mortality for effluent concentration i

11.13.2.8.4.1 For the data in this example, the data for each effluent concentration must be adjusted for control mortality using Abbott's formula, as follows:

$$p_0^a = p_1^a = \frac{p_1^s - p_0^s}{1 - p_0^s} = \frac{0.020 - 0.020}{1 - 0.020} = \frac{0.000}{0.980} = 0.0$$

$$p_2^a = \frac{p_2^s - p_0^s}{1 - p_0^s} = \frac{0.520 - 0.020}{1 - 0.020} = \frac{0.500}{0.980} = 0.510$$

$$p_3^a = p_4^a = \frac{p_3^s - p_0^s}{1 - p_0^s} = \frac{1.000 - 0.020}{1 - 0.020} = \frac{0.980}{0.980} = 1.000$$

The smoothed, adjusted response proportions for the effluent concentrations are shown in Table 12.

11.13.2.8.5 Calculate the $\log_{10}$ of the estimated LC50, m, as follows:

$$m = \sum_{i=1}^{k-1} \frac{(p_{i+1}^a - p_i)(X_i + X_{i+1})}{2}$$

Where: p_i^a = the smoothed adjusted proportion mortality at concentration i

X_i = the $\log_{10}$ of concentration i

k = the number of effluent concentrations tested, not including the control

TABLE 13. TOPSMELT, *ATHERINOPS AFFINIS*, GROWTH DATA

Replicate	Control	Copper Concentration (µg/L) 32.0	56.0	100.0	180.0
A	0.00134	0.00146	-	-	-
B	0.00153	0.00142	-	-	-
C	0.00134	0.00150	-	-	-
D	0.00146	0.00128	-	-	-
E	0.00144	0.00141	-	-	-
Mean(Y_i)	0.00142	0.00141	-	-	-
S_i^2	0.000000006	0.000000007	-	-	-
i	1	2	3	4	5

11.13.2.8.5.1 For this example, the $\log_{10}$ of the estimated LC50, m, is calculated as follows:

$$m = [(0.510 - 0.000)\ (1.5051 + 1.7482)]/2 + [(1.000 - 0.510)\ (1.7482 + 2.0000)]/2 + [(1.000 - 1.000)\ (2.0000 + 2.2553)]/2 +$$

$$= 1.7479$$

11.13.2.8.6 Calculate the estimated variance of m as follows:

$$V(m) = \sum_{i=2}^{k-1} \frac{p_i^a(1-p_i^a)(X_{i-1}-X_{i-1})^2}{4(n_i-1)}$$

Where: X_i = the $\log_{10}$ of concentration i

n_i = the number of organisms tested at effluent concentration i

p_i^a = the smoothed adjusted observed proportion mortality at effluent concentration i

k = the number of effluent concentrations tested, not including the control

11.13.2.8.6.1 For this example, the estimated variance of m, V(m), is calculated as follows:

$$V(m) = (0.510)(0.490)(2.0000 - 1.5051)^2/4(24) + (1.000)(0.000)(2.2553 - 1.7482)^2/4(24)$$

$$= 0.0006376$$

11.13.2.8.7 Calculate the 95% confidence interval for m: $m \pm 2.0 \cdot \sqrt{V(m)}$

11.13.2.8.7.1 For this example, the 95% confidence interval for m is calculated as follows:

$$1.7479 \pm 2\sqrt{0.0006376} \cdot (1.6974, 1.7984)$$

11.13.2.8.8 The estimated LC50 and a 95% confidence interval for the estimated LC50 can be found by taking $base_{10}$ antilogs of the above values.

11.13.2.8.8.1 For this example, the estimated LC50 is calculated as follows:

LC50 = antilog(m) = antilog(1.7479) = 56.0 µg/L.

11.13.2.8.8.2 The limits of the 95% confidence interval for the estimated LC50 are calculated by taking the antilogs of the upper and lower limits of the 95% confidence interval for m as follows:

lower limit: antilog(1.6974) = 49.8 µg/L

upper limit: antilog(1.7984) = 62.9 µg/L

11.13.3 EXAMPLE OF ANALYSIS OF TOPSMELT, *ATHERINOPS AFFINIS*, GROWTH DATA

11.13.3.1 Formal statistical analysis of the growth data is outlined in Figure 4.

The response used in the statistical analysis is mean weight per surviving organism for each replicate. The IC25 can be calculated for the growth data via a point estimation technique (see Section 9, Chronic Toxicity Test Endpoints and Data Analysis). Hypothesis testing can be used to obtain an NOEC and LOEC for growth. Concentrations above the NOEC for survival are excluded from the hypothesis test for growth effects.

11.13.3.2 The statistical analysis using hypothesis testing consists of a parametric test, Dunnett's Procedure, and a nonparametric test, Steel's Many-one Rank Test. The underlying assumptions of the Dunnett's Procedure, normality and homogeneity of variance, are formally tested. The test for normality is the Shapiro-Wilk's Test and Bartlett's Test is used to test for homogeneity of variance. If either of these tests fails, the nonparametric test, Steels' Many-one Rank Test, is used to determine the NOEC and LOEC endpoints. If the assumptions of Dunnett's Procedure are met, the endpoints are determined by the parametric test.

11.13.3.3 Additionally, if unequal numbers of replicates occur among the concentration levels tested there are parametric and nonparametric alternative analyses. The parametric analysis is a *t* test with the Bonferroni adjustment. The Wilcoxon Rank Sum Test with the Bonferroni adjustment is the nonparametric alternative. For detailed information on the Bonferroni adjustment, see Appendix D.

11.13.3.4 The data, mean and variance of the observations at each concentration including the control are listed in Table 13. A plot of the mean weights for each treatment is provided in Figure 5. Since there is no survival in the 100 µg/L and 180 µg/L copper concentrations, they are not considered in the growth analysis. Additionally, since there is significant mortality in the 56.0 µg/L concentration, its effect on growth is not considered.

11.13.3.5 Test for Normality

11.13.3.5.1 The first step of the test for normality is to center the observations by subtracting the mean of all the observations within a concentration from each observation in that concentration. The centered observations are summarized in Table 14.

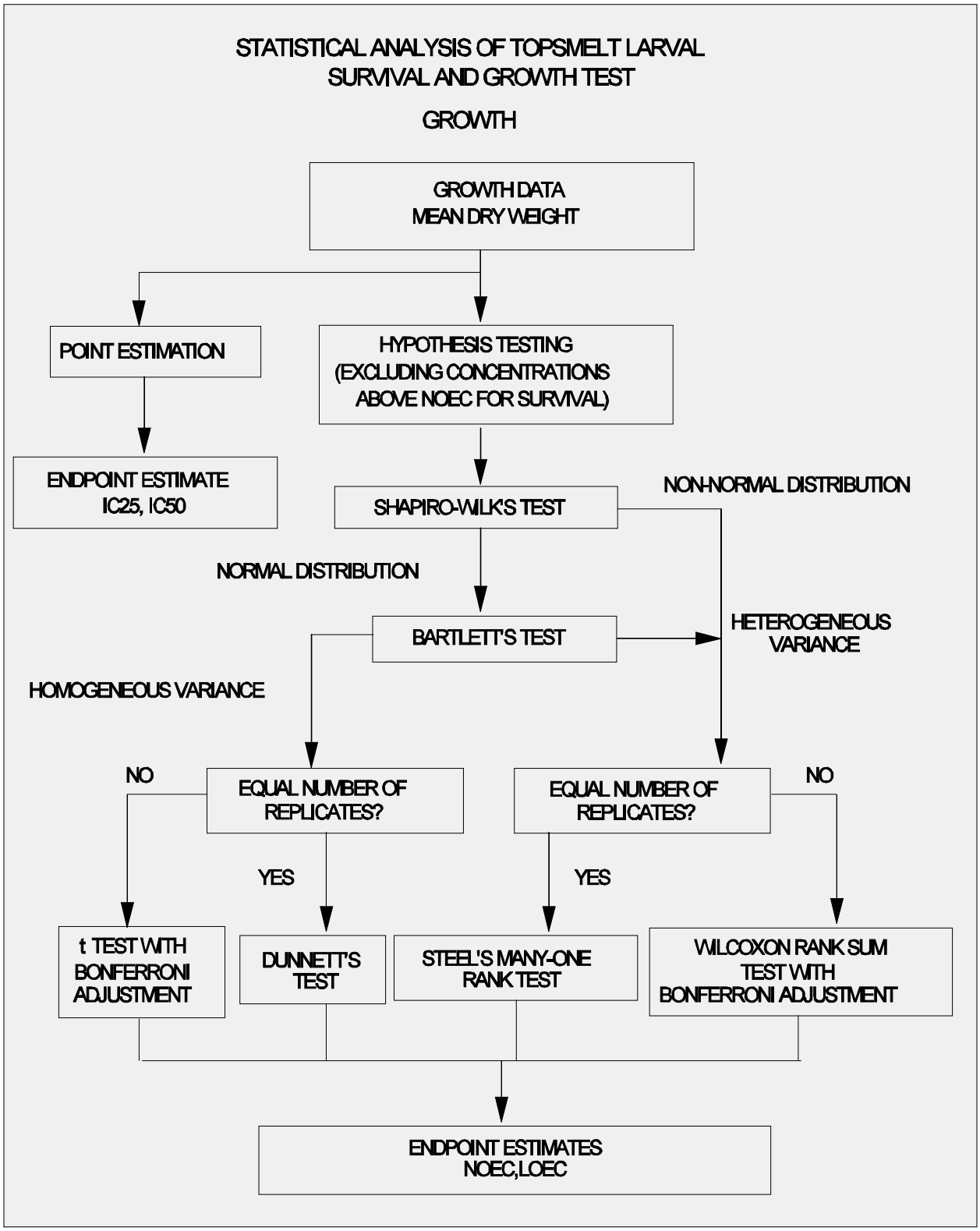

Figure 4. Flowchart for statistical analysis of the topsmelt, *Atherinops affinis*, larval growth data.

TABLE 13. TOPSMELT, *ATHERINOPS AFFINIS*, GROWTH DATA

Replicate	Control	Copper Concentration (µg/L) 32.0	56.0	100.0	180.0
A	0.00134	0.00146	-	-	-
B	0.00153	0.00142	-	-	-
C	0.00134	0.00150	-	-	-
D	0.00146	0.00128	-	-	-
E	0.00144	0.00141	-	-	-
Mean(Y_i)	0.00142	0.00141	-	-	-
S_i^2	0.000000006	0.000000007	-	-	-
i	1	2	3	4	5

TABLE 14. CENTERED OBSERVATIONS FOR SHAPIRO-WILK'S EXAMPLE

Replicate	Control	32.0 µg/L Copper
A	-0.00008	0.00005
B	0.00011	0.00001
C	-0.00008	0.00009
D	0.00004	-0.00003
E	0.00002	-0.00013

11.13.3.5.2 Calculate the denominator, D, of the test statistic:

$$D = \sum_{i=1}^{n} (X_i - \bar{X})^2$$

Where: X_i = the ith centered observation

$\bar{X}$ = the overall mean of the centered observations

n = the total number of centered observations.

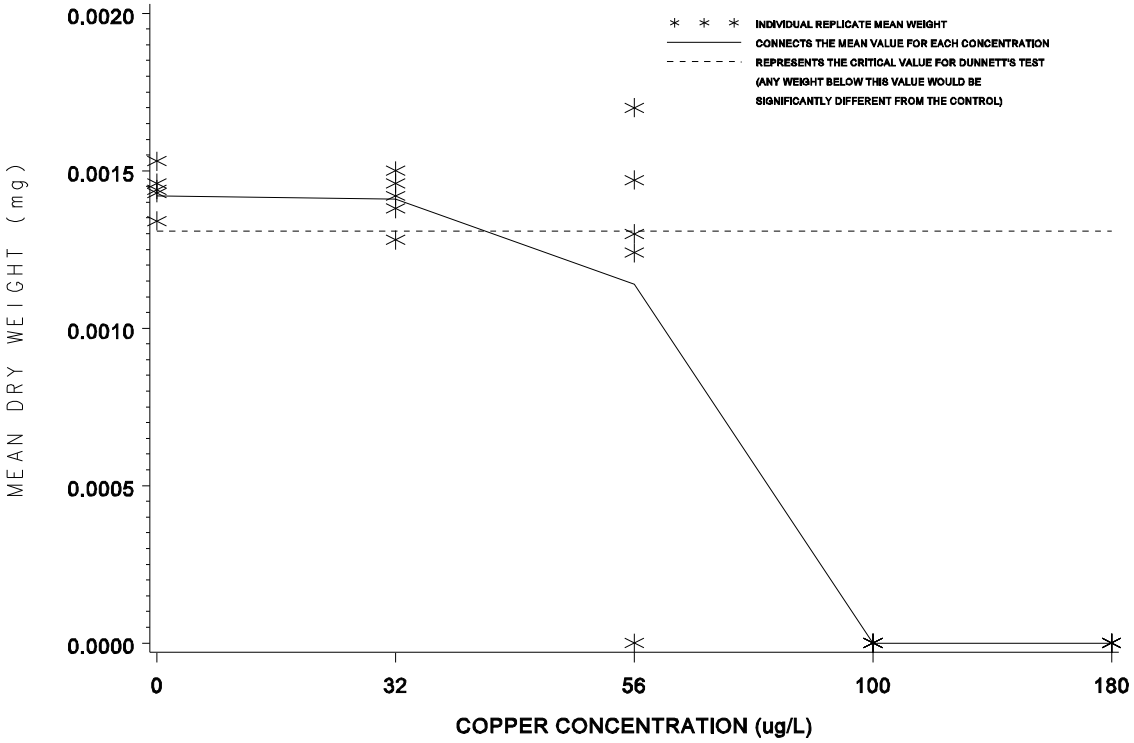

Figure 5. Plot of weight data from topsmelt, *Atherinis affinis*, larval survival and growth test.

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For this set of data, n = 10

$$\bar{X} = \frac{1}{10}(0.00) = 0.00$$

$$D = 0.000000055$$

11.13.3.5.3 Order the centered observations from smallest to largest:

$$X^{(1)} \bullet X^{(2)} \bullet \ldots \bullet X^{(n)}$$

Where $X^{(i)}$ is the ith ordered observation. These ordered observations are listed in Table 15.

11.13.3.5.4 From Table 4, Appendix B, for the number of observations, n, obtain the coefficients a_1, a_2, ..., a_k where k is n/2 if n is even and (n-1)/2 if n is odd. For the data in this example, n = 10 and k = 5. The a_i values are listed in Table 16.

TABLE 15. ORDERED CENTERED OBSERVATIONS FOR SHAPIRO-WILK'S EXAMPLE

i	$X^{(i)}$	i	$X^{(i)}$
1	-0.00013	6	0.00002
2	-0.00008	7	0.00004
3	-0.00008	8	0.00005
4	-0.00003	9	0.00009
5	0.00001	10	0.00011

TABLE 16. COEFFICIENTS AND DIFFERENCES FOR SHAPIRO-WILK'S EXAMPLE

i	a_i	$X^{(n-i+1)} - X^{(i)}$	
1	0.5739	0.00024	$X^{(10)} - X^{(1)}$
2	0.3291	0.00017	$X^{(9)} - X^{(2)}$
3	0.2141	0.00013	$X^{(8)} - X^{(3)}$
4	0.1224	0.00007	$X^{(7)} - X^{(4)}$
5	0.0399	0.00001	$X^{(6)} - X^{(5)}$

11.13.3.5.5 Compute the test statistic, W, as follows:

$$W = \frac{1}{D}\left[\sum_{i=1}^{k} a_i\left(X^{(n-i+1)} - X^{(i)}\right)\right]^2$$

The differences $X^{(n-i+1)} - X^{(i)}$ are listed in Table 16. For this set of data:

$$W = \frac{1}{0.000000055}(0.0002305)^2 = 0.966$$

11.13.3.5.6 The decision rule for this test is to compare W with the critical value found in Table 6, Appendix B. If the computed W is less than the critical value, conclude that the data are not normally distributed. For this example, the critical value at a significance level of 0.01 and 10 observations (n) is 0.781. Since W = 0.966 is greater than the critical value, the conclude that the data are normally distributed.

11.13.3.6 Test for Homogeneity of Variance

11.13.3.6.1 The test used to examine whether the variation in mean dry weight is the same across all effluent concentrations including the control, is Bartlett's Test (Snedecor and Cochran, 1980). The test statistic is as follows:

$$B = \frac{\left[\left(\sum_{i=1}^{P} V_i\right) \ln \bar{S}^2 - \sum_{i=1}^{P} V_i \ln S_i^2\right]}{C}$$

Where: V_i = degrees of freedom for each effluent concentration and control, $V_i = (n_i - 1)$

n_i = the number of replicates for concentration i

p = number of levels of effluent concentration including the control

ln = $\log_e$

i = 1, 2, ..., p where p is the number of concentrations including the control

$$\overline{S}^2 = \frac{\left(\sum_{i=1}^{P} V_i S_i^2\right)}{\sum_{i=1}^{P} V_i}$$

$$C = 1 + [3(p-1)]^{-1}\left[\sum_{i=1}^{P} 1/V_i - \left(\sum_{i=1}^{P} V_i\right)^{-1}\right]$$

11.13.3.6.2 For the data in this example (see Table 14), all effluent concentrations including the control have the same number of replicates (n_i = 5 for all i). Thus, V_i = 4 for all i.

11.13.3.6.3 Bartlett's statistic is therefore:

$$B = [(8)\ln(6.5 \times 10^{-9}) - 4\sum_{i=1}^{P} \ln(S_i^2)] / 1.125$$

$$= [8(-18.851) - 4(-37.709)]/1.125$$

$$= 0.028/1.125$$

$$= 0.0249$$

11.13.3.6.4 B is approximately distributed as chi-square with p - 1 degrees of freedom, when the variances are in fact the same. Therefore, the appropriate critical value for this test, at a significance level of 0.01 with one degree of freedom, is 6.635. Since B = 0.0249 is less than the critical value of 6.635, conclude that the variances are not different.

11.13.3.7 Dunnett's Procedure

11.13.3.7.1 To obtain an estimate of the pooled variance for the Dunnett's Procedure, construct an ANOVA table as described in Table 17.

TABLE 17. ANOVA TABLE

Source	df	Sum of Squares (SS)	Mean Square(MS) (SS/df)
Between	p - 1	SSB	S_B^2 = SSB/(p-1)
Within	N - p	SSW	S_W^2 = SSW/(N-p)
Total	N - 1	SST	

Where: p = number of concentration levels including the control

N = total number of observations $n_1 + n_2 \ldots + n_p$

n_i = number of observations in concentration i

$$SSB = \sum_{i=1}^{p} T_i^2/n_i - G^2/N$$ Between Sum of Squares

$$SST = \sum_{i=1}^{p} \sum_{j=1}^{n_i} Y_{ij}^2 - G^2/N$$ Total Sum of Squares

$SSW = SST - SSB$ Within Sum of Squares

G = the grand total of all sample observations,

$$G = \sum_{i=1}^{P} T_i$$

T_i = the total of the replicate measurements for concentration i

Y_{ij} = the jth observation for concentration i (represents the mean dry weight of the mysids for concentration i in test chamber j)

11.13.3.7.2 For the data in this example:

$n_1 = n_2 = 5$

$N = 10$

$T_1 = Y_{11} + Y_{12} + Y_{13} + Y_{14} + Y_{15} = 0.00711$

$T_2 = Y_{21} + Y_{22} + Y_{23} + Y_{24} + Y_{25} = 0.00704$

$G = T_1 + T_2 = 0.01415$

$$SSB = \sum_{i=1}^{P} T_i^2/n_i - G^2/N$$

$$= \frac{1}{5}(1.001137 \times 10^{-4}) - \left(\frac{0.01415}{10}\right)^2 = 4.90 \times 10^{-10}$$

$$SST = \sum_{i=1}^{P} \sum_{j=1}^{n_i} Y_{ij}^2 - G^2/N$$

$$= 0.0000201 - \left(\frac{0.01415}{10}\right)^2 = 7.775 \times 10^{-8}$$

$SSW = SST - SSB = 7.775 \times 10^{-8} - (4.9 \times 10^{-10}) = 7.726 \times 10^{-8}$

$S_B = SSB/(p-1) = (4.9 \times 10^{-10})/(2-1) = 4.9 \times 10^{-10}$

$S_W = SSW/(N-p) = 7.726 \times 10^{-8}/(10-2) = 9.658 \times 10^{-9}$

11.13.3.7.3 Summarize these calculations in the ANOVA table (Table 18).

TABLE 18. ANOVA TABLE FOR DUNNETT'S PROCEDURE EXAMPLE

Source	df	Sum of Squares (SS)	Mean Square(MS) (SS/df)
Between	1	4.90×10^{-10}	4.9×10^{-10}
Within	8	7.726×10^{-8}	9.658×10^{-9}
Total	9	7.775×10^{-8}	

11.13.3.7.4 To perform the individual comparisons, calculate the *t* statistic for each concentration, and control combination as follows:

$$t_i = \frac{(Y_1 - Y_i)}{S_W\sqrt{(1/n_1) + (1/n_i)}}$$

Where: Y_i = mean dry weight for effluent concentration i

Y_1 = mean dry weight for the control

S_W = square root of the within mean square

n_1 = number of replicates for the control

n_i = number of replicates for concentration i.

11.13.3.7.5 Table 19 includes the calculated *t* values for each concentration and control combination. In this example there is only one comparison, of the 32.0 µg/L copper concentration with the control. The calculation is as follows:

$$t_2 \cdot \frac{(0.00142 \cdot 0.00141)}{[\,9.828 \times 10^{-5}\sqrt{(1/5)\cdot(1/5)}\,]} \cdot 0.161$$

TABLE 19. CALCULATED *t* VALUES

Copper Concentration (µg/L)	i	t_i
32.0	2	0.161

11.13.3.7.6 Since the purpose of this test is to detect a significant reduction in mean weight, a one-sided test is appropriate. The critical value for this one-sided test is found in Table 5, Appendix C. For an overall alpha level of 0.05, 8 degrees of freedom for error and one concentration (excluding the control) the critical value is 1.86. The mean weight for concentration i is considered significantly less than the mean weight for the control if t_i is greater than the critical value. Since t_2 is less than 1.86, the 32.0 µg/L concentration does not have significantly lower growth than the control. Hence the NOEC and the LOEC for growth cannot be calculated.

11.13.3.7.7 To quantify the sensitivity of the test, the minimum significant difference (MSD) that can be statistically detected may be calculated:

$$MSD \cdot d\ S_w\sqrt{(1/n_1)\cdot(1/n)}$$

Where: d = the critical value for Dunnett's Procedure

S_W = the square root of the within mean square

n = the common number of replicates at each concentration (this assumes equal replication at each concentration)

n_1 = the number of replicates in the control.

11.13.3.7.8 In this example:

$$MSD \cdot 1.86\,(9.828 \times 10^{-5})\sqrt{(1/4) \cdot (1/4)}$$

$$= 1.86\ (9.828 \times 10^{-5})(0.632)$$

$$= 0.000116$$

11.13.3.7.9 Therefore, for this set of data, the minimum difference that can be detected as statistically significant is 0.000116 mg.

11.13.3.7.10 This represents a 8.2% reduction in mean weight from the control.

11.13.3.8 Calculation of the ICp

11.13.3.8.1 The growth data from Table 4 are utilized in this example. As seen from Table 4 and Figure 6, the observed means are monotonically non-increasing with respect to concentration (mean response for each higher concentration is less than or equal to the mean response for the previous concentration and the responses between concentrations follow a linear trend). Therefore, the means do not require smoothing prior to calculating the IC. In the following discussion, the observed means are represented by Y_i and the smoothed means by M_i.

11.13.3.8.2 Since $Y_5 = 0 < Y_4 = 0 < Y_3 = 0.00114 < Y_2 = 0.00141 < Y_1 = 0.00142$, set $M_1 = 0.00142$, $M_2 = 0.00141$, $M_3 = 0.00114$, $M_4 = 0$ and $M_5 = 0$.

11.13.3.8.3 Table 20 contains the response means and smoothed means and Figure 8 gives a plot of the smoothed response curve.

11.13.3.8.4 An IC25 can be estimated using the Linear Interpolation Method. A 25% reduction in weight, compared to the controls, would result in a mean dry weight of 0.001065 mg, where $M_1(1-p/100) = 0.00142(1-25/100)$. Examining the smoothed means and their associated concentrations (Table 20), the response, 0.001065 mg, is bracketed by C_3 = 56.0 µg/L copper and C_4 = 100.0 µg/L copper.

11.13.3.8.5 Using the equation from Section 4.2 of Appendix M, the estimate of the IC25 is calculated as follows:

$$ICp \cdot C_j \cdot [M_1(1 \cdot p/100) \cdot M_j] \frac{(C_{(j \cdot 1)} \cdot C_j)}{(M_{(j \cdot 1)} \cdot M_j)}$$

$$IC25 = 56.0 + [0.00142(1 - 25/100) - 0.00114] \frac{(100.0 - 56.0)}{(0.0 - 0.00114)}$$

$$= 58.9 \ \mu g/L.$$

11.13.3.8.6 When the ICPIN program was used to analyze this set of data, requesting 80 resamples, the estimate of the IC25 was 58.9089 µg/L. The empirical 95% confidence interval for the true mean was 44.2778 µg/L to 67.0000 µg/L. The computer program output for the IC25 for this data set is shown in Figure 7.

TABLE 20. TOPSMELT, *ATHERINOPS AFFINIS*, MEAN GROWTH RESPONSE AFTER SMOOTHING

Copper Conc. (µg/L)	i	Response Means (mg) Y_i	Smoothed Means (mg) M_i
Control	1	0.00142	0.00142
32.0	2	0.00141	0.00141
56.0	3	0.00114	0.00114
100.0	4	0.0	0.0
180.0	5	0.0	0.0

11.14.1 PRECISION

11.14.1.1 Single-Laboratory Precision

11.14.1.1.1 Data on the single-laboratory precision of the topsmelt larval survival and growth test using copper chloride as the reference toxicant are provided in Tables 21 and 22. In the five copper tests presented here, the NOECs for survival were 100 µg/L for all tests but one; this test had a NOEC of 180 µg/L. The coefficient of variation for copper based on the LC25 is 17.3% for survival; the coefficient of variation for copper based

on the LC50 is 9.7% for survival. The weight endpoint was less sensitive than survival in all but one test. An IC25 could be calculated for three of five tests and the coefficient of variation for these three tests was 60.69%, the coefficient of variation based on the IC50 for these three tests was 4.75%.

11.14.1.2 Multilaboratory Precision

14.11.1.2.1 Data on the interlaboratory precision of the topsmelt larval survival and growth test are provided in Table 23. Three separate interlaboratory tests were conducted. In the first comparison both laboratories derived identical NOECs for copper (100µg/L). The coefficient of variation, based on LC50s for survival was 36%. In the second comparison the NOEC for effluent was 20% at both laboratories. The coefficient of variation, based on the LC50s for survival was 19%. In the third comparison the NOEC for copper was 32 µg/L at both laboratories. The coefficient of variation, based on the LC50s for survival was 3%.

11.11.2 ACCURACY
11.11.2.1 The accuracy of toxicity tests cannot be determined.

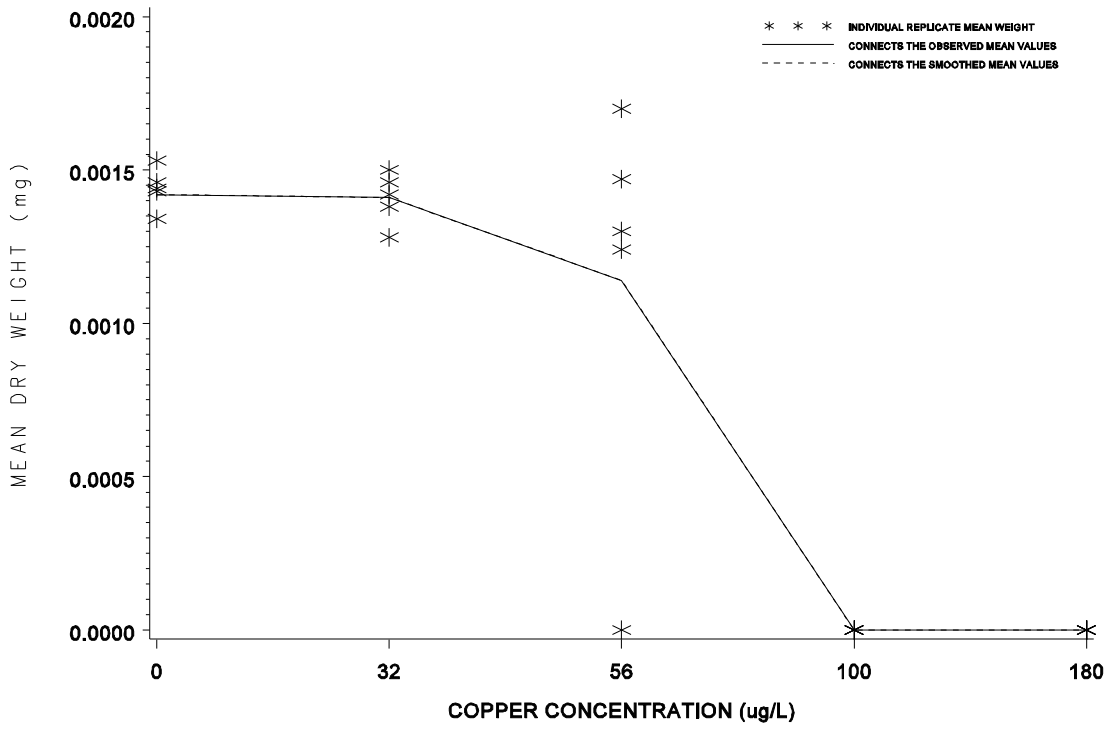

Figure 6. Plot of raw data, observed means, and smoothed means for topsmelt, *Atherinis affinis*, growth data from Tables 4 and 21.

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Conc. ID		1	2	3	4	5
Conc. Tested		0	32	56	100	180
Response	1	.00134	.00146	0	0	0
Response	2	.00153	.00142	.00147	0	0
Response	3	.00134	.00150	.00170	0	0
Response	4	.00146	.00138	.00124	0	0
Response	5	.00144	.00128	.00130	0	0

*** Inhibition Concentration Percentage Estimate ***
Toxicant/Effluent: Copper
Test Start Date: Test Ending Date:
Test Species: Atherinops affinis
Test Duration: 7 days
DATA FILE: wc_aa.icp
OUTPUT FILE: wc_aa.i25

Conc. ID	Number Replicates	Concentration ug/L	Response Means	Std. Dev.	Pooled Response Means
1	5	0.000	0.001	0.000	0.001
2	5	32.000	0.001	0.000	0.001
3	5	56.000	0.001	0.001	0.001
4	5	100.000	0.000	0.000	0.000
5	5	180.000	0.000	0.000	0.000

The Linear Interpolation Estimate: 58.9089 Entered P Value: 25

Number of Resamplings: 80
The Bootstrap Estimates Mean: 58.1571 Standard Deviation: 7.9299
Original Confidence Limits: Lower: 44.2778 Upper: 67.0000
Expanded Confidence Limits: Lower: 36.9622 Upper: 71.0455
Resampling time in Seconds: 0.11 Random_Seed: -498847050

Figure 7. ICPIN program output for the IC25

TABLE 21. SINGLE LABORATORY PRECISION OF THE TOPSMELT, *ATHERINOPS AFFINIS* SURVIVAL ENDP0INT WITH COPPER (CU •G/L) CHLORIDE AS A REFERENCE TOXICANT

Test Number	NOEC	LC25	LC50
1	100	142.1	187.4
2	100	NC[3]	162.4
3	100	151.7	165.6
4	180	181.0	190.6
5	100	119.2	204.0

# of Tests	Statistic	LC25	LC50
5	Mean SD CV (%)	148.5 25.6 17.3	182.0 17.6 9.7%

TABLE 22. SINGLE LABORATORY PRECISION OF THE TOPSMELT, *ATHERINOPS AFFINIS* GROWTH ENDP0INT WITH COPPER (CU •G/L) CHLORIDE AS A REFERENCE TOXICANT

Test Number	NOEC	LC25	LC50
1	180	222.1	264.2
2	180	NC[4]	NC[4]
3	>180	NC[4]	NC[4]
4	56	47.6	NC[4]
5	>180	NC[4]	NC[4]

# of Tests	Statistic	LC25	LC50
5	Mean SD CV (%)	156.8 95.2 60.7%	

[1]Data from Anderson et al. 1994; point estimates calculated using probit analysis, except where noted.
[2]Five replicate exposure chambers with five larvae per chamber were used for each treatment.
[3]LC50 calculated using Spearman-Karber method, this method does not calculate an LC25.
[4]Point estimate not calculated because the response was less than either 25 or 50%.

TABLE 23. MULTI-LABORATORY PRECISION OF THE TOPSMELT, *ATHERINOPS AFFINIS*, GROWTH AND SURVIVAL TEST CONDUCTED WITH COPPER (CU •G/L) CHLORIDE AS A REFERENCE TOXICANT

Test Number	Toxicant	Laboratory	Survival NOEC	Survival LC50	Growth
1	Copper[a]	1[b]	100	162.0	NS[c]
	Copper[a]	2[d]	100	274.0	NS
	CV		36%		
2	Effluent	1[b]	20	31.4	NS
	Effluent	2[e]	20	23.9	10
	CV		19%		
3	Copper[a]	1[b]	32	55.7	NS
	Copper[a]	1[e]	32	58.4	NS
	CV		3%		

Two separate interlaboratory comparisons were conducted, in August 1990 and August 1991.

[a]The August 1990 copper test was conducted at 34‰ salinity; the August 1991 copper test was conducted at 20‰ salinity.
[b]Marine Pollution Studies Laboratory, Monterey County, California.
[c]Not Significant.
[d]Vantuna Research Group, Occidental College, California.
[e]Chevron Research and Technology Co., Environmental Research Group.

APPENDIX I. TOPSMELT TEST: STEP-BY-STEP SUMMARY

PREPARATION OF TEST SOLUTIONS

A. Determine test concentrations and appropriate dilution water based on NPDES permit conditions and guidance from the appropriate regulatory agency.

B. Prepare effluent test solutions by diluting well mixed unfiltered effluent using volumetric flasks and pipettes. Use hypersaline brine where necessary to maintain all test solutions at 34 ± 2‰. Include brine controls in tests that use brine.

C. Prepare a copper reference toxicant stock solution (10,000 µg/L) by adding 0.0268 g of copper chloride ($CuCl_2 \circ 2H_2O$) to 1 liter of reagent water.

D. Prepare zinc reference toxicant solution of 0 (control) 56, 100, 180, and 180 µg/L by adding 0, 5.6, 10.0, 18.0, and 32.0 mL of stock solution, respectively, to a 1-L volumetric flask and filling to 1-L with dilution water.

E. Sample effluent and reference toxicant solutions for physical/chemical analysis. Measure salinity, pH and dissolved oxygen from each test concentration.

F. Randomize numbers for test chambers and record the chamber numbers with their respective test concentrations on a randomization data sheet. Store the data sheet safely until after the test samples have been analyzed.

G. Place test chambers in a water bath or environmental chamber set to 20•C and allow temperature to equilibrate.

H. Measure the temperature daily in one random replicate (or separate chamber) of each test concentration. Monitor the temperature of the water bath or environmental chamber continuously.

I. At the end of the test, measure salinity, pH, and dissolved oxygen concentration from each test concentration.

PREPARATION AND ANALYSIS OF TEST ORGANISMS

A. Obtain 9-15 day old larvae from a commerical supplier or in-house cultures.

B. Larvae must be randomized before placing them into the test chambers. Be sure that all water used in culture, transfer, and test solutions is within 1•C of the test temperature.

C. Remove all dead larvae daily, and add 40 newly hatched *Artemia* nauplii per larva twice daily; once in the morning and once in the afternoon. Adjust feeding to account for larva mortality.

D. Renew test solutions daily using freshly prepared solutions, immediately after cleaning the test chambers.

E. After 7 days, count and record the number of live and dead larvae in each chamber. After counting, use the randomization sheet to assign the correct test concentration to each chamber. Remove all dead larvae.

F. The surviving larvae in each test chamber are immediately prepared as a group for dry weight determination, or preserved in 4% formalin then 70% ethanol. Preserved organisms are dried and weighed with 7 days.

G. Carefully transfer the larvae to a prenumbered, preweighed micro-weigh boat using fine-tipped forceps. Dry for 24 hours at 60•C or at 105•C for a minimum of 6 hours. Weigh each weigh boat on a microbalance (accurate to 1 µg). Record the chamber number, larvae weight, weigh boat weight (recorded previously), and number of larvae per weigh boat (replicate) on the data sheet.

H. Analyze the data.

I. Include standard reference toxicant point estimate values in the standard quality control charts.

Data Sheet for Larval Fish Toxicity Test

Test Start Date: Start Time:
Fish Species:

Test End Date: End Time:
Collection/Arrival Date:

Reference Toxicant:
Broodstock Source:

Fish Age at Start:

Test Cont. #	Concentration	Alive Numer							Total Number Alive	Total Number at Start	Notes
		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7			

Data Sheet for Weighing Larval Fish

Test Start Date: Start Time: Fish Species :

Test End Date: End Time: Collection/Arrival Date:

Toxicant: Fish Age at Start:

Sample Source:

Sample Type: Sediment Elutriate Porewater Water

Test Container Number	Site Code or Concentration	Foil Number	Foil Weight (mg)	Total Weight (mg)	Weight of Larval Fish (mg)	Number of Fish Larvae	Weight per Larval Fish (mg)
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
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28							
29							
30							
31							
32							
33							
34							
35							

Computer Data Storage
Disk:
File:

Notes

Note: See larval mortality data on separate sheet.

SECTION 12

MYSID, *Holmesimysis costata* SURVIVAL AND GROWTH TEST METHOD

Adapted from a method developed by
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Appendix I Step-by Step Summary

SECTION 12

MYSID, *HOLMESIMYSIS COSTATA* SURVIVAL AND GROWTH TEST

12.1 SCOPE AND APPLICATION

12.1.1 This method estimates the chronic toxicity of effluents and receiving waters to the mysid, *Holmesimysis costata,* using three-to-four day old juveniles in a seven-day, static-renewal exposure. The effects include the synergistic, antagonistic, and additive effects of all chemical, physical, and additive components which adversely affect the physiological and biochemical functions of the test organisms.

12.1.2 Daily observations of mortality make it possible to also calculate acute toxicity for desired exposure periods (i.e., 24-h, 48-h, 96-h LC50s).

12.1.3 Detection limits of the toxicity of an effluent or a pure substance are organism dependent.

12.1.4 Brief excursions in toxicity may not be detected using 24-h composite samples. Also, because of the long sample collection period involved in composite sampling and because test chambers are not sealed, highly volatile and highly degradable toxicants present in the source may not be detected in the test.

12.1.5 This method is commonly used in one of two forms: (1) a definitive test, consisting of a minimum of five effluent concentrations and a control, and (2) a receiving water test(s), consisting of one or more receiving water concentrations and a control.

12.1.6 This method should be restricted to use by, or under the supervision of, professionals experienced in aquatic toxicity testing. Specific experience with any toxicity test is usually needed before acceptable results become routine.

12.2 SUMMARY OF METHOD

12.2.1 This method provides step-by-step instructions for

performing a 7-day static-renewal toxicity test using growth and survival juvenile mysids to determine the toxicity of substances in marine waters. The test endpoints are survival and growth.

12.3 **INTERFERENCES**

12.3.1 Toxic substances may be introduced by contaminants in dilution water, glassware, sample hardware, and testing equipment (see Section 5, Facilities, Equipment, and Supplies).

12.3.2 Improper effluent sampling and handling may adversely affect test results (see Section 8, Effluent and Receiving Water Sampling, Sample Handling, and Sample Preparation for Toxicity Tests).

12.3.3 The test results can be confounded by (1) the presence of pathogenic and/or predatory organisms in the dilution water, effluent, and receiving water, (2) the condition of the brood stock from which the test animals were taken, (3) the amount and type of natural food in the effluent, receiving water, or dilution water, (4) nutritional value of the brine shrimp, *Artemia* nauplii, fed during the test, and (5) the quality of the brine shrimp, *Artemia* nauplii, or other food added during the test, which may sequester metals and other toxic substances, and lower the DO.

12.4 **SAFETY**

12.4.1 See Section 3, Health and Safety.

12.5 **APPARATUS AND EQUIPMENT**

12.5.1 Tanks, trays, or aquaria -- for holding and acclimating adult mysids, e.g., standard salt water aquarium or Instant Ocean Aquarium (capable of maintaining seawater at 10-20•C), with appropriate filtration and aeration system.

12.5.2 Air pump, air lines, and air stones -- for aerating water containing mysids for supplying air to test solutions with low dissolved oxygen.

12.5.3 Constant temperature chambers or water baths -- for maintaing test solution temperature and keeping dilution water

supply, juvenile mysids, and stock suspensions at test temperature (13 or 15•C) prior to the test.

12.5.4 Water purification system -- Millipore Super-Q, Deionized water (DI) or equivalent.

12.5.5 Refractometer -- for determining salinity.

12.5.6 Hydrometer(s) -- for calibrating refractometer.

12.5.7 Thermometers, glass or electronic, laboratory grade -- for measuring water temperatures.

12.5.8 Thermometer, National Bureau of Standards Certified (see USEPA METHOD l70.l, USEPA, l979) -- to calibrate laboratory thermometers.

12.5.9 pH and DO meters -- for routine physical and chemical measurements.

12.5.10 Standard or micro-Winkler apparatus -- for determining DO (optional) and calibrating the DO meter.

12.5.11 Winkler bottles -- for dissolved oxygen determinations.

12.5.12 Balance -- Analytical, capable of accurately weighing to 0.0001 g (for weighing reference toxicants).

12.5.13 Microbalance -- Analytical, capable of accurately weighing to 0.000001 g (for weighing mysids).

12.5.14 Fume hood -- to protect the analyst from effluent or formaldehyde fumes.

12.5.15 Glass stirring rods -- for mixing test solutions.

12.5.16 Graduated cylinders -- Class A, borosilicate glass or non-toxic plastic labware, 50-l000 mL for making test solutions.

12.5.17 Volumetric flasks -- Class A, borosilicate glass or non-toxic plastic labware, 10-1000 mL for making test solutions.

12.5.18 Pipets, automatic -- adjustable, to cover a range of

delivery volumes from 0.010 to 100 mL.

12.5.19 Pipet bulbs and fillers -- PROPIPET® or equivalent.

12.5.20 Wash bottles -- for reagent water, for topping off graduated cylinders, for rinsing small glassware and instrument electrodes and probes.

12.5.21 Wash bottles -- for dilution water.

12.5.22 20-liter cubitainers or polycarbonate water cooler jugs -- for making hypersaline brine.

12.5.23 Cubitainers, beakers, or similar chambers of non-toxic composition for holding, mixing, and dispensing dilution water and other general non-effluent, non-toxicant contact uses. These should be clearly labeled and not used for other purposes.

12.5.24 Pipets, volumetric: 1, 10, 25, 50, and 100 mL -- for dilutions.

12.5.25 Plastic randomization cups (approximately 100 mL, one for each test chamber).

12.5.26 Brine shrimp, *Artemia*, culture unit -- see Subsection 12.6.24 and Section 4, Quality Assurance.

12.5.27 Separatory funnels, 2-L -- two to four for culturing *Artemia*.

12.5.28 Mysid culture apparatus (see Section 12.6.25.5). This test requires 400 three- to four-day-old juvenile mysids.

12.5.29 Gear for collecting adult mysids, including a small boat, 0.5 mm-mesh hand nets, plastic buckets, and portable air supply (mysids may also be obtained from commercial suppliers;).

12.5.30 Pipet bulbs and glass tubes (4 mm diameter, with fire-polished edges) for handling adult mysids.

12.5.31 Siphon tubes (fire polished glass with attached silicone tubing) -- for test solution renewals.

12.5.32 Fire-polished wide-bore 10 mL pipet -- for handling juveniles.

12.5.33 Forceps with fine points -- for transferring juveniles to weighing pans.

12.5.34 Light box -- for examining organisms.

12.5.35 Drying oven, 50-105•C range -- for drying organisms.

12.5.36 Desiccator -- for holding dried organisms.

12.5.37 Clean NITEX® mesh sieves (• 150 µm, 500-1000µm) -- for concentrating organisms. (NITEX® is available from Sterling Marine Products, 18 Label Street, Montclair, NJ 07042; 201-783-9800).

12.5.38 60 µm NITEX® filter - for filtering receiving water.

12.6 **REAGENTS AND SUPPLIES**

12.6.1 Sample containers -- for sample shipment and storage (see Section 8, Effluent and Receiving Water Sampling, and Sample Handling, and Sample Preparation for Toxicity Tests).

12.6.2 Data sheets (one set per test) -- for data recording (Figures 1 and 2).

12.6.3 Tape, colored -- for labelling test chambers and containers.

12.6.4 Markers, water-proof -- for marking containers, etc.

12.6.5 Parafilm -- to cover graduated cylinders and vessels.

12.6.6 Gloves, disposable -- for personal protection from contamination.

12.6.7 Pipets, serological -- l-l0 mL, graduated.

12.6.8 Pipet tips -- for automatic pipets.

12.6.9 Coverslips -- for microscope slides.

12.6.10 Lens paper -- for cleaning microscope optics.

12.6.11 Laboratory tissue wipes -- for cleaning and drying electrodes, microscope slides, etc.

12.6.12 Disposable countertop covering -- for protection of work surfaces and minimizing spills and contamination.

12.6.13 pH buffers 4, 7, and l0 (or as per instructions of instrument manufacturer) -- for standards and calibration check (see USEPA Method l50.l, USEPA, l979).

12.6.14 Membranes and filling solutions -- for dissolved oxygen probe (see USEPA Method 360.l, USEPA, l979), or reagents for modified Winkler analysis.

12.6.15 Laboratory quality assurance samples and standards -- for the above methods.

12.6.16 Test chambers -- 1000 mL, five chambers per concentration. The chambers should be borosilicate glass (for effluents) or nontoxic disposable plastic labware (for reference toxicants). To avoid contamination from the air and excessive evaporation of test solutions during the test, the chambers should be covered during the test with safety glass plates or a plastic sheet (6 mm thick).

12.6.17 Micro-weighing pans, aluminum -- to determine the dry weight of organisms. Weighting pan should be about 5 mg or less to minimize noise in measurement of the small mysids.

12.6.18 Fronds of kelp (*Macrocystis*) for habitat in culture.

12.6.19 Reference toxicant solutions (see Subsection 12.10.2.4 and see Section 4, Quality Assurance).

12.6.20 Reagent water -- defined as distilled or deionized water that does not contain substances which are toxic to the test organisms (see Section 5, Facilities, Equipment, and Supplies and Section 7, Dilution Water).

12.6.21 Effluent and receiving water -- see Section 8, Effluent and Surface Water Sampling, and Sample Handling, and Sample Preparation for Toxicity Tests.

12.6.22 Dilution water and hypersaline brine -- see Section 7, Dilution Water and Section 12.6.24, Hypersaline Brines. The dilution water should be uncontaminated 1-µm-filtered natural seawater. Hypersaline brine should be prepared from dilution water.

12.6.23 HYPERSALINE BRINES

12.6.23.1 Most industrial and sewage treatment effluents entering marine and estuarine systems have little measurable salinity. Exposure of larvae to these effluents will usually require increasing the salinity of the test solutions. It is important to maintain an essentially constant salinity across all treatments. In some applications it may be desirable to match the test salinity with that of the receiving water (See Section 7.1). Two salt sources are available to adjust salinities -- artificial sea salts and hypersaline brine (HSB) derived from natural seawater. Use of artificial sea salts is necessary only when high effluent concentrations preclude salinity adjustment by HSB alone.

12.6.23.2 Hypersaline brine (HSB) can be made by concentrating natural seawater by freezing or evaporation. HSB should be made from high quality, filtered seawater, and can be added to the effluent or to reagent water to increase salinity. HSB has several desirable characteristics for use in effluent toxicity testing. Brine derived from natural seawater contains the necessary trace metals, biogenic colloids, and some of the microbial components necessary for adequate growth, survival, and/or reproduction of marine and estuarine organisms, and it can be stored for prolonged periods without any apparent degradation. However, even if the maximum salinity HSB (100‰) is used as a diluent, the maximum concentration of effluent (0‰) that can be tested is 66% effluent at 34‰ salinity (see Table 1).

12.6.23.3 High quality (and preferably high salinity) seawater should be filtered to at least 10 µm before placing into the freezer or the brine generator. Water should be collected on an incoming tide to minimize the possibility of contamination.

12.6.23.4 Freeze Preparation of Brine

12.6.23.4.1 A convenient container for making HSB by freezing is one that has a bottom drain. One liter of brine can be made from four liters of seawater. Brine may be collected by partially freezing seawater at -10 to -20•C until the remaining liquid has reached the target salinity. Freeze for approximately six hours, then separate the ice (composed mainly of fresh water) from the remaining liquid (which has now become hypersaline).

12.6.23.4.2 It is preferable to monitor the water until the target salinity is achieved rather than allowing total freezing followed by partial thawing. Brine salinity should never exceed 100‰. It is advisable not to exceed about 70‰ brine salinity unless it is necessary to test effluent concentrations greater than 50%.

12.6.23.4.3 After the required salinity is attained, the HSB should be filtered through a 1 µm filter and poured directly into portable containers (20-L cubitainers or polycarbonate water cooler jugs are suitable). The brine storage containers should be capped and labelled with the salinity and the date the brine was generated. Containers of HSB should be stored in the dark at 4•C (even room temperature has been acceptable). HSB is usually of acceptable quality even after several months in storage.

12.6.23.5 Heat Preparation of Brine

12.6.23.5.1 The ideal container for making brine using heat-assisted evaporation of natural seawater is one that (1) has a high surface to volume ratio, (2) is made of a non-corrosive material, and (3) is easily cleaned (fiberglass containers are ideal). Special care should be used to prevent any toxic materials from coming in contact with the seawater being used to generate the brine. If a heater is immersed directly into the seawater, ensure that the heater materials do not corrode or leach any substances that would contaminate the brine. One successful method is to use a thermostatically controlled heat exchanger made from fiberglass. If aeration is needed, use only oil-free air compressors to prevent contamination.

12.6.23.5.2 Before adding seawater to the brine generator, thoroughly clean the generator, aeration supply tube, heater, and

any other materials that will be in direct contact with the brine. A good quality biodegradable detergent should be used, followed by several (at least three) thorough reagent water rinses.

TABLE 1. MAXIMUM EFFLUENT CONCENTRATION (%) THAT CAN BE TESTED AT 34‰ WITHOUT THE ADDITION OF DRY SALTS GIVEN THE INDICATED EFFLUENT AND BRINE SALINITIES.

Effluent Salinity ‰	Brine 60 ‰	Brine 70 ‰	Brine 80 ‰	Brine 90 ‰	Brine 100 ‰
0	43.33	51.43	57.50	62.22	66.00
1	44.07	52.17	58.23	62.92	66.67
2	44.83	52.94	58.97	63.64	67.35
3	45.61	53.73	59.74	64.37	68.04
4	46.43	54.55	60.53	65.12	68.75
5	47.27	55.38	61.33	65.88	69.47
10	52.00	60.00	65.71	70.00	73.33
15	57.78	65.45	70.77	74.67	77.65
20	65.00	72.00	76.67	80.00	82.50
25	74.29	80.00	83.64	86.15	88.00

12.6.23.5.3 Seawater should be filtered to at least 10 µm before being put into the brine generator. The temperature of the seawater is increased slowly to 40•C. The water should be aerated to prevent temperature stratification and to increase water evaporation. The brine should be checked daily (depending on the volume being generated) to ensure that the salinity does not exceed 100‰ and that the temperature does not exceed 40•C. Additional seawater may be added to the brine to obtain the volume of brine required.

12.6.23.5.4 After the required salinity is attained, the HSB

should be filtered through a 1 µm filter and poured directly into portable containers (20-L cubitainers or polycarbonate water cooler jugs are suitable). The brine storage containers should be capped and labelled with the salinity and the date the brine was generated. Containers of HSB should be stored in the dark at 4•C (even room temperature has been acceptable). HSB is usually of acceptable quality even after several months in storage.

12.6.23.6 Artificial Sea Salts

12.6.23.6.1 No data from mysids using sea salts or artificial seawater (e.g., GP2) are available for evaluation at this time, and their use must be considered provisional.

12.6.23.7 Dilution Water Preparation from Brine

12.6.23.7.1 Although salinity adjustment with brine is the preferred method, the use of high salinity brines and/or reagent water has sometimes been associated with discernible adverse effects on test organisms. For this reason, it is recommended that only the minimum necessary volume of brine and reagent water be used to offset the low salinity of the effluent, and that brine controls be included in the test. The remaining dilution water should be natural seawater. Salinity may be adjusted in one of two ways. First, the salinity of the highest effluent test concentration may be adjusted to an acceptable salinity, and then serially diluted. Alternatively, each effluent concentration can be prepared individually with appropriate volumes of effluent and brine.

12.6.23.7.2 When HSB and reagent water are used, thoroughly mix together the reagent water and HSB before mixing in the effluent. Divide the salinity of the HSB by the expected test salinity to determine the proportion of reagent water to brine. For example, if the salinity of the brine is 100‰ and the test is to be conducted at 34‰, 100‰ divided by 34‰ = 2.94. The proportion of brine is 1 part, plus 1.94 parts reagent water. To make 1 L of dilution water at 34‰ salinity from a HSB of 100‰, 340 mL of brine and 660 mL of reagent water are required. Verify the salinity of the resulting mixture using a refractometer.

12.6.23.8 Test Solution Salinity Adjustment

12.6.23.8.1 Table 2 illustrates the preparation of test solutions (up to 50% effluent) at 34‰ by combining effluent, HSB, and dilution water. Note: if the highest effluent concentration does not exceed 50% effluent, it is convenient to prepare brine so that the sum of the effluent salinity and brine salinity equals 68‰; the required brine volume is then always equal to the effluent volume needed for each effluent concentration as in the example in Table 2.

12.6.23.8.2 Check the pH of all brine mixtures and adjust to within 0.2 units of dilution water pH by adding, dropwise, dilute hydrochloric acid or sodium hydroxide(see Section 8.8.9, Effluent and Receiving Water Sampling, Sample Handling, and Sample Preparation for Toxicity Tests).

12.6.23.8.3 To calculate the amount of brine to add to each effluent dilution, determine the following quantities: salinity of the brine (SB, in ‰), the salinity of the effluent (SE, in ‰), and volume of the effluent to be added (VE, in mL). Then use the following formula to calculate the volume of brine (VB, in mL) to be added:

$$VB = VE \times (34 - SE)/(SB - 34)$$

12.6.23.8.4 This calculation assumes that dilution water salinity is 34 ± 2‰.

12.6.23.9 Preparing Test Solutions

12.6.23.9.1 Two hundred mL of test solution are needed for each test chamber. To prepare test solutions at low effluent concentrations (<6%), effluents may be added directly to dilution water. For example, to prepare 1% effluent, add 10 mL of effluent to a 1-liter volumetric flask using a volumetric pipet or calibrated automatic pipet. Fill the volumetric flask to the 1-liter mark with dilution water, stopper it, and shake to mix. Distribute equal volumes into the replicate test chambers.

12.6.23.9.2 To prepare a test solution at higher effluent concentrations, hypersaline brine must usually be used. For example, to prepare 40% effluent, add 400 mL of effluent to a 1-liter volumetric flask. Then, assuming an effluent salinity of 2‰ and a brine salinity of 66‰, add 400 mL of brine (see

equation above and Table 2) and top off the flask with dilution water. Stopper the flask and shake well. Distribute equal volumes into the replicate test chambers.

12.6.23.10 Brine Controls

12.6.23.10.1 Use brine controls in all tests where brine is used. Brine controls contain the same volume of brine as does the highest effluent concentration using brine, plus the volume of reagent water needed to reproduce the hyposalinity of the effluent in the highest concentration, plus dilution water. Calculate the amount of reagent water to add to brine controls by rearranging the above equation, (See, 12.6.23.8.3) setting SE = 0, and solving for VE.

$$VE = VB \times (SB - 34)/(34 - SE)$$

If effluent salinity is essentially 0‰, the reagent water volume needed in the brine control will equal the effluent volume at the highest test concentration. However, as effluent salinity and effluent concentration increase, less reagent water volume is needed.

12.6.24 BRINE SHRIMP, *ARTEMIA SP*., NAUPLII -- for feeding cultures and test organisms.

12.6.24.1 Newly hatched *Artemia sp.* nauplii are used for food for the stock cultures and test organisms. Although there are many commercial sources of brine shrimp cysts, the Brazilian or Colombian strains are preferred because the supplies examined have had low concentrations of chemical residues and produce nauplii of suitably small size. (One source that has been found to be acceptable is Aquarium Products, 180L Penrod Ct., Glen Burnie, Maryland 21061). For commercial sources of brine shrimp, *Artemia*, cysts, see Table 2 of Section 5, Facilities, Equipment, and Supplies); and Section 4, Quality Assurance.

12.6.24.2 Each new batch of *Artemia* cysts should be evaluated for size (Vanhaecke and Sorgeloos, 1980, and Vanhaecke et al., 1980) and nutritional suitability (Leger, et al., 1985, Leger, et al., 1986) against known suitable reference cysts by performing a side-by-side larval growth test using the "new" and "reference" cysts. The "reference" cysts used in the suitability test may be

a previously tested and acceptable batch of cysts, or may be obtained from the Quality Assurance Research Division, EMSL, Cincinnati, OH 45268, 513-569-7325. A sample of newly-hatched *Artemia* nauplii from each new batch of cysts should be chemically analyzed. The *Artemia* cysts should not be used if the concentration of total organochlorine pesticides 0.15 ug/g wet weight or that the total concentration of organochlorine pesticides plus PCBs exceeds 0.30 µg/g wet weight (For analytical methods see USEPA, 1982).

12.6.24.3 *Artemia* nauplii are obtained as follows:

1. Add 1 L of seawater, or an aqueous unionized salt (NaCl) solution prepared with 35 g salt or artificial sea salts per liter, to a 2-L separatory funnel, or equivalent.
2. Add 10 mL *Artemia* cysts to the separatory funnel and aerate for 24 h at 27•C. Hatching time varies with incubation temperature and the geographic strain of *Artemia* used (see USEPA, 1985a; USEPA, 1993a; ASTM, 1993).
3. After 24 h, cut off the air supply in the separatory funnel. *Artemia* nauplii are phototactic, and will concentrate at the bottom of the funnel if it is covered for 5-10 minutes with a dark cloth or paper towel. To prevent mortality, do not leave the concentrated nauplii at the bottom of the funnel more than 10 min without aeration.
4. Drain the nauplii into a funnel fitted with a •150 µm NITEX® or stainless steel screen, and rinse with seawater or equivalent before use.

12.6.24.4 Testing *Artemia* nauplii as food for toxicity test organisms.

12.6.24.4.1 The primary criteria for acceptability of each new supply of brine shrimp cysts is adequate survival, and growth of the mysids. The mysids used to evaluate the acceptability of the brine shrimp nauplii must be the same geographical origin and stage of development (3 to 4 days old) as those used routinely in the toxicity tests. Two 7-day chronic tests are performed side-by-side, each consisting of five replicate test vessels containing five juveniles (25 organisms per test, total of 50

TABLE 2. EXAMPLES OF EFFLUENT DILUTION SHOWING VOLUMES OF EFFLUENT (x‰), BRINE, AND DILUTION WATER NEEDED FOR ONE LITER OF EACH TEST SOLUTION.

FIRST STEP: Combine brine with deionized water or natural seawater to achieve a brine of 68-x‰ and, unless natural seawater is used for dilution water, also a brine-based dilution water of 34‰.

SERIAL DILUTION:

Step 1. Prepare the highest effluent concentration to be tested by adding equal volumes of effluent and brine to the appropriate volume of dilution water. An example using 40% is shown.

Effluent Conc. (%)	Effluent x‰	Brine (68-x)‰	Dilution Water* 34‰
40	800 mL	800 mL	400 mL

Step 2. Use either serially prepared dilutions of the highest test concentration or individual dilutions of 100% effluent.

Effluent Conc. (%)	Effluent Source	Dilution Water* (34‰)
20	1000 mL of 40%	1000 mL
10	1000 mL of 20%	1000 mL
5	1000 mL of 10%	1000 mL
2.5	1000 mL of 5%	1000 mL
Control	none	1000 mL

INDIVIDUAL PREPARATION

Effluent Conc. (%)	Effluent x‰	Brine (68-x)‰	Dilution Water* 34‰
40	400 mL	400 mL	200 mL
20	200 mL	200 mL	600 mL
10	100 mL	100 mL	800 mL
5	50 mL	50 mL	900 mL
2.5	25 mL	25 mL	950 mL
Control	none	none	1000 mL

*May be natural seawater or brine-reagent water equivalent.

organisms). The juveniles in one set of test chambers is fed reference (acceptable) nauplii and the other set is fed nauplii from the "new" source of *Artemia* cysts.

12.6.24.4.2 The feeding rate and frequency, test vessels, volume of control water, duration of the tests, and age of the *Artemia* nauplii at the start of the test, should be the same as used for the routine toxicity tests.

12.6.24.4.3 Results of the brine shrimp, *Artemia*, nauplii nutrition assay, where there are only two treatments, can be evaluated statistically by use of a t test. The "new" food is acceptable if there are no statistically significant differences in the survival or growth of the mysids fed the two sources of nauplii.

12.6.25 TEST ORGANISMS

12.6.25.1 The test organisms for this method are juveniles of the mysid crustacean, *Holmesimysis costata* (Holmes 1900; previously referred to as *Acanthomysis sculpta*). *H. costata* occurs in the surface canopy of the giant kelp *Macrocystis pyrifera* where it feeds on zooplankters, kelp, epiphytes, and detritus. There are few references to the ecology of this mysid species (Holmquist, 1979; Clutter, 1967, 1969; Green, 1970; Turpen et al., 1994). *H. costata* is numerically abundant in kelp forest habitats and is considered to be an important food source for kelp forest fish (Clark 1971, Mauchline 1980). Mysids are called opossum shrimp because females brood their young in an abdominal pouch, the marsupium. *H. costata* eggs develop for about 20 days in the marsupium before the young are released as juveniles; broods are released at night during molting. Females release their first brood at 55 to 70 days post-release (at 12•C), and may have multiple broods throughout their approximately 120-day life.

12.6.25.2 *H. costata* has been used in previous toxicity studies with a variety of toxicants (Tatem and Portzer, 1985; Davidson et al., 1986; Machuzac and Mikel, 1987; Reish and Lemay, 1988; Asato, 1988; Martin et al., 1989; Singer et al., 1990; 1991; Hunt et al., In Press). Mysids are useful as toxicity test organisms because of their widespread availability, ecological importance, sensitivity to toxicants, and amenability to laboratory culture

(Nimmo et al., 1977; Mauchline, 1980; Gentile et al., 1982; Lussier et al., 1985).

12.6.25.3 Species Identification

12.6.25.3.1 Laboratories unfamiliar with the test organism should collect preliminary samples to verify species identification. Refer to Holmquist (1979) or send samples of mysids and any similar co-occurring organisms to a qualified taxonomist. Request certification of species identification from any organism suppliers. Records of verification should be maintained along with a few preserved specimens.

12.6.25.3.2 There have been recent revisions to the taxonomy of *H. costata.* Previous authors have referred to this species as *Acanthomysis sculpta.* However, Holmquist's (1979) review considers previous references to *Acanthomysis sculpta* in California to be synonymous with *Holmesimysis costata*; we consider Holmquist's designation to be definitive.

12.6.25.4 Obtaining Broodstock

12.6.25.4.1 *H. costata* can be collected by sweeping a small-mesh (0.5 - 1 mm) hand net through the water just under the surface canopy blades of giant kelp *Macrocystis pyrifera*. Although this method collects mysids of all sizes, attention should be paid to the number of gravid females collected because these are used to produce the juvenile mysids used in toxicity testing. Mysids should be collected from waters remote from sources of pollution to minimize the possibility of physiological or genetic adaptation to toxicants.

12.6.25.4.2 Mysids can be transported for a short time (< 3 hours) in tightly covered 20 liter plastic buckets. The buckets should be filled to the top with seawater from the collection site, and should be <u>gently</u> aerated or oxygenated to maintain dissolved oxygen above 60% saturation. Transport temperatures should remain within 3•C of the temperature at the collection site.

12.6.25.4.3 For longer transport times of up to 36 hours, mysids can be shipped in sealed plastic bags filled with seawater. The following transport procedure has been used successfully: 1)

fill the plastic bag with one liter of dilution water seawater, 2) saturate the seawater with oxygen by bubbling pure oxygen for at least 10 minutes, 3) place 25-30 adult mysids, or up to 100 juvenile mysids in each bag, 4) for adults add about 20 *Artemia* nauplii per mysid, for 100 juveniles add a pinch (10 to 20 mg) of ground Tetramin® flake food and 200 newly-hatched *Artemia* nauplii, 5) seal the bag securely, eliminating any airspace, then 6) place it within a second sealed bag in an ice chest. Do not overfeed mysids in transport, as this may deplete dissolved oxygen, causing stress or mortality in transported mysids. A well insulated ice chest should be cooled to approximately 15•C by adding one 1-liter blue ice block for every five 1-liter bags of mysids (a temperature range of 12 to 16•C is tolerable). Wrap the ice in newspaper and a plastic bag to insulate it from the mysid bags. Pack the bags tightly to avoid shifting within the cooler.

12.6.25.5 Broodstock Culture and Handling

12.6.25.5.1 After collection, the mysids should be transported directly to the laboratory and placed in seawater tanks or aquaria equipped with flowing seawater or adequate aeration and filtration. Initial flow rates should be adjusted so that any temperature change occurs gradually (0.5•C per hour). The water temperature should be held at 15 ± 1•C. **Note:** Mysids collected north of Pt. Conception, California, should be held and tested at 13 ± 1•C.

12.6.25.5.2 Mysids can be cultured in tanks ranging from 4 to 1000 liters. Tanks should be equipped with gentle aeration and blades of *Macrocystis* to provide habitat. Static culture tanks can be used if there is constant aeration, temperature control, and frequent water changes (one half the water volume changed at least twice a week). Maintain culture density below 20 animals per liter by culling out adult males or juveniles.

12.6.25.5.3 Adult mysids should be fed 100 *Artemia* nauplii per mysid per day. Juveniles should be fed 5 to 10 newly released *Artemia* nauplii per juvenile per day and a pinch (10 to 20 mg) of ground Tetramin® flake food per 100 juveniles per day. Static chambers should be carefully monitored and rations adjusted to

prevent overfeeding and fouling of culture water. Refer to section 12.6.19 for details of *Artemia* culture and quality control.

12.6.25.6 Culture Materials

12.6.25.6.1 Refer to Section 5, Facilities and Equipment, for a discussion of suitable materials to be used in laboratory culture of mysids. Be sure all new materials are properly leached in seawater before use. After use, all culture materials should be washed in soap and water, then rinsed with seawater before re-use.

12.6.25.7 Test Organisms

12.6.25.7.1 Approximately 150 gravid female mysids should be isolated to provide approximately 400 juveniles for each set of toxicity tests (5 juveniles/chamber x 30 reference toxicant chambers and approximately 35 effluent chambers, plus additional mysids so that only healthy active juveniles are used in the test). Gravid females can be identified by their large, extended marsupia filled with (visible) eyed juveniles. Marsupia appear distended and gray when females are ready to release young, due to presence of the juveniles.

12.6.25.7.2 Gravid females are easily isolated from other mysids using the following technique: (1) use a small dip net to capture about 100 mysids from the culture tank, (2)transfer the mysids to a screen-bottomed plastic tube (150 µm-mesh, 25-cm diam.) partly immersed in a water bath or bucket, (3)lift the screen-tube out of the water to immobilize mysids on the damp screen, (4)gently draw the gravid females off the screen with a suction bulb and fire-polished glass tube (5-mm bore), (5) collect the gravid females in a separate screen tube. Re-immerse the screen continuously during the isolation process; mysids should not be exposed to air for more than a few seconds at a time.

12.6.25.7.3 Four or five days before a toxicity test begins, transfer gravid females into a removable, 2-mm-mesh screened cradle suspended within an aerated 80-liter aquarium. Before transfer, make sure there are no juveniles in with the adult females. Extraneous juveniles are excluded to avoid

inadvertently mixing them with the soon-to-be released juveniles used in testing. Provide the gravid females with newly hatched *Artemia* nauplii (approximately 200 per mysid) to help stimulate juvenile release. *Artemia* can be provided continuously throughout the night from an aerated reservoir holding approximately 75,000 *Artemia*. Direct the flow from the feeder into the screened compartment with the females, and add a few blades of *Macrocystis* for habitat. The females are placed within the screened compartment so that as the juveniles are released, they can swim through the mesh into the bottom of the aquarium. Outflows on flow-through aquaria should be screened (150-µm-mesh) to retain juveniles and allow some *Artemia* to escape.

12.6.25.7.4 Juveniles are generally released at night, so it is important to turn off all lights at night to promote release. In the morning, the screened compartment containing the females should be removed and placed in a separate aquarium. Juveniles should be slowly siphoned through a wide-diameter hose into a 150-µm-mesh screen-bottom tube (25 cm diam.) immersed in a bucket filled with clean seawater. Once the release aquarium is emptied, it should be washed with hot fresh water to eliminate stray juveniles that might mix with the next cohort.

12.6.25.7.5 After collection, the number of juveniles should be estimated visually or by counting subsamples with a small beaker. If there are not enough juveniles to conduct the necessary tests, they can be mixed with juveniles from one previous or subsequent release so that the test is initiated with three and/or four-day old juveniles. Initial experiments indicate that mysids 2-days-old and younger survive poorly in toxicity tests and that mysids older than four days may vary in their toxicant sensitivity or survival rate (Hunt et al., 1989; Martin et al., 1989).

12.6.25.7.6 Test juveniles should be transferred to additional screen-tubes (or to 4-liter static beakers if flowing seawater is unavailable). The screen-tubes are suspended in a 15-liter bucket so that dilution water seawater (0.5 liter/min) can flow into the tube, through the screen, and overflow from the bucket. Check water flow rates (< one liter/min) to make sure that juveniles or *Artemia* nauplii are not forced down onto the screen. The height of the bucket determines the level of water in the screen tube. About 200 to 300 juveniles can be held in each screen-tube (200 juveniles per static 4-liter beaker). Juveniles

should be fed 40 newly hatched *Artemia* nauplii per mysid per day and a pinch (10 to 20 mg) of ground Tetramin® flake food per 100 juveniles per day. A blade of *Macrocystis* (well rinsed in seawater) should be added to each chamber. Chambers should be gently aerated and temperature controlled at 15 ± 1•C (or 13 ± 1•C if collected north of Pt. Conception). Half of the seawater in static chambers should be changed at least once between isolation and test initiation.

12.6.25.7.7 The day juveniles are isolated is designated day 0 (the morning after their nighttime release). The toxicity test should begin on day three or four. For example, if juveniles are isolated on Friday, the toxicity test should begin on the following Monday or Tuesday.

12.7 EFFLUENT AND RECEIVING WATER COLLECTION, PRESERVATION, AND STORAGE

12.7.1 See Section 8, Effluent and Receiving Water Sampling, Sample Handling, and Sample Preparation for Toxicity Tests.

12.8 CALIBRATION AND STANDARIZATION

12.8.1 See Section 4, Quality Assurance.

12.9 QUALITY CONTROL

12.9.1 See Section 4, Quality Assurance.

12.10 TEST PROCEDURES

12.10.1 TEST DESIGN

12.10.1.1 The test consists of at least five effluent concentrations plus a dilution water control. Tests that use brine to adjust salinity must also contain five replicates of a brine control.

12.10.1.2 Effluent concentrations are expressed as percent effluent.

12.10.2 TEST SOLUTIONS

12.10.2.1 Receiving waters

12.10.2.1.1 The sampling point is determined by the objectives of the test. At estuarine and marine sites, samples are usually collected at mid-depth. Receiving water toxicity is determined with samples used directly as collected or with samples passed through a 60 µm NITEX® filter and compared without dilution, against a control. Using five replicates chambers per test, each containing 200 mL would require approximately 1 L or more of sample per test per renewal.

12.10.2.2 Effluents

12.10.2.2.1 The selection of the effluent test concentrations should be based on the objectives of the study. A dilution factor of at least 0.5 is commonly used. A dilution factor of 0.5 provides hypothesis test discrimination of ± 100%, and testing of a 16 fold range of concentrations. Hypothesis test discrimination shows little improvement as dilution factors are increased beyond 0.5 and declines rapidly if smaller dilution factors are used. **USEPA recommends that one of the five effluent treatments must be a concentration of effluent mixed with dilution water which corresponds to the permittee's instream waste concentration (IWC).** At least two of the effluent treatments must be of lesser effluent concentration than the IWC, with one being at least one-half the concentration of the IWC. If 100‰ HSB is used as a diluent, the maximum concentration of effluent that can be tested will be 66% at 34‰ salinity.

12.10.2.2.2 If the effluent is known or suspected to be highly toxic, a lower range of effluent concentrations should be used (such as 25%, 12.5%, 6.25%, 3.12% and 1.56%).

12.10.2.2.3 The volume of effluent required for a 75% renewal of five replicates per concentration for five concentrations of effluent and two controls, each containing 200 mL of test solution, is approximately 370 mL.

12.10.2.2.4 Effluent dilutions should be prepared for all replicates in each treatment in one container to minimize variability among the replicates. Dispense into the appropriate effluent test chambers.

12.10.2.3 Dilution Water

12.10.2.3.1 Dilution water should be uncontaminated 1-µm-filtered natural seawater or hypersaline brine prepared from uncontaminated natural seawater plus reagent water (see Section 7, Dilution Water). Natural seawater may be uncontaminated receiving water. This water is used in all dilution steps and as the control water.

12.10.2.4 Reference Toxicant Test

12.10.2.4.1 Reference toxicant tests should be conducted as described in Quality Assurance (see Section 4.7).

12.10.2.4.2 The preferred reference toxicant for mysids is zinc sulfate ($ZnSO_4 \circ 7H_2O$). Reference toxicant tests provide an indication of the sensitivity of the test organisms and the suitability of the testing laboratory (see Section 4 Quality Assurance). Another toxicant may be specified by the appropriate regulatory agency. Prepare a 10,000 µg/L zinc stock solution by adding 0.0440 g of zinc sulfate ($ZnSO_4 \circ 7H_2O$) to one liter of reagent water in a polyethylene volumetric flask. Alternatively, certified standard solutions can be ordered from commercial companies.

12.10.2.4.3 Reference toxicant solutions should be five replicates each of 0 (control), 10, 18, 32, and 56, and 100 µg/L total zinc. Prepare one liter of each concentration by adding 0, 1.0, 1.8, 3.2, 5.6, and 10.0 mL of stock solution, respectively, to one-liter volumetric flasks and fill with dilution water. Start with control solutions and progress to the highest concentration to minimize contamination.

12.10.2.4.4 If the effluent and reference toxicant tests are to be run concurrently, then the tests must use juvenile originating from or released from the same pool of gravid females. The tests must be handled in the same way and test solutions delivered to the test chambers at the same time. Reference toxicant tests must be conducted at 34 ± 2‰.

12.10.3 START OF THE TEST

12.10.3.1 Prior to Beginning the Test

12.10.3.1.1 The test should begin as soon as possible, preferably within 24 h of sample collection. The maximum holding time following retrieval of the sample from the sampling device should not exceed 36 h for off-site toxicity tests unless permission is granted by the permitting authority. In no case should the sample be used in a test more than 72 h after sample collection (see Section 8 Effluent and Receiving Water Sampling, Sample Handling, and Sample Preparation for Toxicity Test).

12.10.3.1.2 Just prior to test initiation (approximately 1 h), the temperature of a sufficient quantity of the sample to make the test solutions should be adjusted to the test temperature (13 or 15 ± 1•C) and maintained at that temperature during the addition of dilution water.

12.10.3.1.3 Increase the temperature of the water bath, room, or incubator to the required test temperature (13 or 15 ± 1•C).

12.10.3.1.4 Randomize the placement of test chambers in the temperature-controlled water bath, room, or incubator at the beginning of the test, using a position chart. Assign numbers for the position of each test chamber using a random numbers or similar process (see Appendix A, for an example of randomization). Maintain the chambers in this configuration throughout the test, using a position chart. Record these numbers on a separate data sheet together with the concentration and replicate numbers to which they correspond. Identify this sheet with the date, test organism, test number, laboratory, and investigator's name, and safely store it away until after the mysids have been examined at the end of the test.

12.10.3.1.5 Note: Loss of the randomization sheet would invalidate the test by making it impossible to analyze the data afterwards. Make a copy of the randomization sheet and store separately. Take care to follow the numbering system exactly while filling chambers with the test solutions.

12.10.3.1.6 Arrange the test chambers randomly in the water bath or controlled temperature room. Once chambers have been labeled randomly and filled with test solutions, they can be arranged in numerical order for convenience, since this will also ensure random placement of treatments.

12.10.3.2 Randomized Assignment of Mysids to Test Chambers

12.10.3.2.1 The juvenile mysids must be randomized before placing them into the test chambers. Pool all of the test juveniles into a 1-liter beaker. Using a 10-mL wide-bore pipet or fire-polished glass tube (approximately 2-3 mm inside diameter), place one or two juveniles into as many plastic cups as there are test chambers (including reference toxicant chambers). These cups should contain enough clean dilution seawater to maintain water quality and temperature during the transfer process (approximately 50 mL per cup). When each of the cups contains one or two juveniles, repeat the process, adding mysids until each cup contains 5 animals.

12.10.3.2.2 Carefully pour or pipet off excess water in the cups, leaving less than 5 mL with the test mysids. This 5 mL volume can be estimated visually after initial measurements. Carefully pour or pipet the juveniles into the test chambers immediately after reducing the water volume. Gently rocking the water back and forth before pouring may help prevent juveniles from clinging to the walls of the randomization cups. Juveniles can become trapped in drops; have a squirt bottle ready to gently rinse down any trapped mysids. If more than 5 mLs of water are added to the test solution with the juveniles, report the amount on the data sheet. Be sure that all water used in culture, transfer, and test solutions is within 1•C of the test temperature. Because of the small volumes involved in the transfer process, temperature control is best accomplished in a constant-temperature room.

12.10.3.2.3 Verify that all five animals are in the test chambers by counting the number in each chamber after transfer. This initial count is important because mysids unaccounted for at the end of the test are assumed to be dead.

12.10.4 LIGHT, PHOTOPERIOD, SALINITY AND TEMPERATURE

12.10.4.1 The light quality and intensity should be at ambient laboratory conditions are generally adequate. Light intensity should be 10-20 $\mu E/m^2/s$, or 50 to 100 foot candles (ft-c), with a 16 h light and 8 h dark cycle. A 30 minute phase-in/out period is recommended.

12.10.4.2 The water temperature in the test chambers should be maintained at 13 or 15 ± 1•C. It is critical that the test water temperature be maintained at 13 ± 1•C (for mysids collected north of Pt. Conception, California) or 15 ± 1•C (for mysids collected south of Pt. Conception, California). If a water bath is used to maintain the test temperature, the water depth surrounding the test cups should be as deep as possible without floating the chambers.

12.10.4.3 The test salinity should be in the range of 34 ± 2‰. The salinity should vary by no more than ±2‰ among the chambers on a given day. If effluent and receiving water tests are conducted concurrently, the salinities of these tests should be similar.

12.10.4.4 Rooms or incubators with high volume ventilation should be used with caution because the volatilization of the test solutions and evaporation of dilution water may cause wide fluctuations in salinity. Covering the test chambers with clean polyethylene plastic may help prevent volatilization and evaporation of the test solutions.

12.10.5 DISSOLVED OXYGEN (DO) CONCENTRATION

12.10.5.1 Aeration may affect the toxicity of effluent and should be used only as a last resort to maintain a satisfactory DO. The DO concentration should be measured on new solutions at the start of the test (Day 0). The DO should not fall below 4.0 mg/L (see Section 8, Effluent and Receiving Water Sampling, Sample Handling, and Sample Preparation for Toxicity Tests). If it is necessary to aerate, all treatments and the control should be aerated. The aeration rate should not exceed that necessary to maintain a minimum acceptable DO and under no circumstances should it exceed 100 bubbles/minute, using a pipet with a 1-2 mm orifice, such as a 1 mL KIMAX® serological pipet No. 37033, or equivalent.

12.10.6 FEEDING

12.10.6.1 *Artemia* nauplii are prepared as described above.

12.10.6.2 The feeding rates in the test beakers should be closely controlled to avoid overfeeding and fouling of test

solutions. Add 40 newly hatched *Artemia* nauplii per mysid per day. *Artemia* nauplii should be well rinsed with clean seawater and concentrated so that no more than one mL of seawater is added during feeding. (Use a 100-µm-mesh screen tube for rinsing and concentrating the nauplii; see Section 12.6.24.3). Test performance may be enhanced by feeding half the ration twice daily. If mysids die during the course of the experiment, the ration should be reduced proportionally. The mysids should not be fed on day 7.

12.10.7 DAILY CLEANING OF TEST CHAMBERS

12.10.7.1 Before the renewal of test solutions, uneaten and dead *Artemia*, dead mysids and other debris are removed from the bottom of the test chambers with a pipette. As much of the uneaten *Artemia* as possible should be removed from each chamber to ensure that the mysids eat primarily newly hatched nauplii. By placing the test chambers on a light box, inadvertent removal of live mysids can be greatly reduced because they can be more easily seen. If a mysid is lost during siphoning, note the test chamber from it came, and reduce the initial count from five to four for that chamber when calculating survival at the end of the test.

12.10.8 OBSERVATIONS DURING THE TEST

12.10.8.1 Routine Chemical and Physical Observations

12.10.8.1.1 DO is measured at the beginning of the exposure period in one test chamber at each test concentration and in the control.

12.10.8.1.2 Temperature, pH, and salinity are measured at the beginning of the exposure period in one test chamber at each concentration and in the control. Temperature should also be monitored continuously or observed and recorded daily for at least two locations in the environmental control system or the samples. Temperature should be measured in a sufficient number of test chambers at the end of the test to determine temperature variation in the environmental chamber.

12.10.8.1.3 Record all the measurements on the data sheet.

12.10.8.2 Routine Biological Observations

12.10.8.2.1 The number of live mysids are counted and recorded each day. Dead animals and excess food should be removed with a pipette before test solutions are renewed. This is necessary to avoid cannibalism and to prevent fouling of test solutions.

12.10.8.2.2 Protect the mysids from unnecessary disturbance during the test by carrying out the daily test observations, solution renewals, and removal of the dead mysids, carefully. Make sure the mysids remain immersed during the performance of the above operations.

12.10.9 TEST SOLUTION RENEWAL

12.10.9.1 The test duration is 7 days. Because effluent toxicity may change over short time periods in test chambers, the test solutions must be renewed after 48 h and 96 h. Prepare renewal test solutions in the same way as initial test solutions. Remove three quarters of the original test solution from each chamber, taking care to avoid losing or damaging mysids. This can be done by siphoning with a small-bore (2 to 3 mm) fire-polished glass tube or pipet. Attach the glass tube to clear plastic tubing fitted with a pinch clamp so that the siphon flow can be stopped quickly if necessary to release entrained mysids. It is convenient to siphon old solutions into a small (500 mL) chamber in order to check to make sure that no mysids have been inadvertently removed during solution renewals. If a mysid is siphoned, return it to the test chamber and note it on the data sheet. Follow the chamber randomization sheet to siphon first from the controls, then work sequentially to the highest test concentration to avoid cross-contamination.

12.10.9.2 To minimize disturbance to the juvenile mysids, refill the chambers to the 200-mL mark by carefully siphoning new test solution into the test chambers using small diameter plastic tubing attached to a bent clean glass rod that directs incoming solution upward or to the side to slow the current and minimize turbulence.

12.10.9.3 The effluent or receiving water used in the test is stored in an incubator or refrigerator at 4•C. Plastic chambers such as 8-20 L cubitainers have proven suitable for effluent collection and storage. For on-site toxicity studies no more than 24 h should elapse between collection of the effluent and

use in a toxicity test (see Section 8, Effluent and Receiving Water Sampling, Sample Handling, and Sample Preparation for Toxicity Tests).

12.10.9.4 Approximately 1 h before test initiation, a sufficient quantity of effluent or receiving water sample is warmed to 13 ± 1•C or 15 ± 1•C to prepare the test solutions. A sufficient quantity of effluent should be warmed to make the test solutions.

12.10.10 TERMINATION OF THE TEST

12.10.10.1 Ending the Test

12.10.10.1.1 Record the time the test is terminated.

12.10.10.1.2 Temperature, pH, dissolved oxygen, and salinity are measured at the end of the exposure period in one test chamber at each concentration and in the control.

12.10.10.1.3 On the last day of the test, examine each test chamber, and remove and record any dead mysids. Sum the cumulative total of all mortalities observed in each test chamber over the 7 days of the test, subtract this from the initial number of mysids (5), and verify the number of survivors. Immobile mysids that do not respond to a stimulus are considered dead. The stimulus should be two or three gentle prods with a disposable pipet. Mysids that exhibit any response clearly visible to the naked eye are considered living. The most commonly observed movement in moribund mysids is a quick contraction of the abdomen. This or any other obvious movement qualifies a mysid as alive.

12.10.10.2 Weighing

12.10.10.2.1 To prepare mysids for weighing at the end of the exposure period, remove any remaining dead mysids, then carefully pour the contents of the test chamber through a small mesh screen (<300µm). Count the mysids before screening, and take care to keep track of them on the screen. <u>Make sure mortality counts have already been recorded.</u> Briefly dip the screen containing the mysids in deionized water to rinse away the salt. Using fine point forceps, carefully transfer the mysids from the screen to a preweighed and labelled micro-weigh boat. Carefully fold the

foil weigh boats over the mysids to avoid loss while drying test organisms.

12.10.10.2.2 To prepare weigh boats prior to testing, write the test chamber number on each with a fine felt-tipped marker, dry the ink and weigh boat in a drying oven, allow the dry weigh boats to cool in a desiccator, weigh the weigh boats to the nearest 1 microgram (µg) on a microbalance, and record the weight and chamber number on the data sheet. Place the weighed weigh boats in a clean ziplock bag until ready to use for weighing mysids. The juvenile mysids are very small, and light (60 µg) relative to the weigh boats (4 mg). Take all precautions to make sure weigh boats remain clean and dry during weighing and subsequent storage, so that mysid weights may be accurately determined by subtraction.

12.10.10.2.3 When all mysids are loaded onto weigh boats, arrange them all in a dish, small tray or other small open chamber, and place them in a clean drying oven. Dry for at least 24 hours at 60•C or for at least 6 hours at 105•C. Remove the weigh boats with mysids from the drying oven and place them in a desiccator to cool for one hour. When cool, carefully weigh each weigh boat on a microbalance (accurate to 1 µg). Record the chamber number, mysid weight, weigh boat weight (recorded previously), and number of mysids per weigh boat (replicate) on the data sheet.

12.10.10.3 Endpoint

12.10.10.3.1 Growth is measured as dry weight of surviving mysids. All surviving mysids from a single replicate test chamber are pooled together and weighed, then this total weight is divided by the number of original mysids to obtain the mean dry weight per individual for each replicate, which is used for statistical analysis.

12.10.10.3.2 The percentage of surviving mysids in each chamber at the end of the test will be used for subsequent statistical analysis.

12.11 SUMMARY OF TEST CONDITIONS AND TEST ACCEPTABILITY CRITERIA

12.11.1 A summary of test conditions and test acceptability criteria is listed in Table 3.

12.12 ACCEPTABILITY OF TEST RESULTS

12.12.1 Test results are acceptable only if all the following requirements are met:

(1) Control survival must be at least 75%.

(2) The average weight of control mysids must be at least 40 µg per mysid.

(3) Between replicate variability in the mortality data must be low enough that the minimum significant difference (%MSD) is less than 40% in the reference toxicant test.

(4) Between replicate variability in the weight data must be low enough that the %MSD is less than 50 µg in the reference toxicant test.

(5) Both the mortality NOEC and LC50 must be less than 100 µg/L zinc in the reference toxicant test.

12.13 DATA ANALYSIS

12.13.1 GENERAL

12.13.1.1 Tabulate and summarize the data. Table 4 presents a sample set of survival and growth data.

12.13.1.2 The endpoints of the mysid 7-day chronic test are based on the adverse effects on survival and growth. The LC50 and the IC25 are calculated using point estimation techniques (see Section 9, Chronic Toxicity Test Endpoints and Data Analysis). LOEC and NOEC values for survival and growth are obtained using a hypothesis testing approach such as Dunnett's Procedure (Dunnett, 1955) or Steel's Many-one Rank Test (Steel, 1959; Miller, 1981) (see Section 9). Separate analyses are

performed for the estimation of the LOEC and NOEC endpoints and for the estimation of the LC50 and IC25. Concentrations at which there is no survival in any of the test chambers are excluded from the statistical analysis of the NOEC and LOEC for survival and growth, but included in the estimation of the LC50 and IC25. See the Appendices for examples of the manual computations, and examples of data input and program output.

12.13.1.3 The statistical tests described here must be used with a knowledge of the assumptions upon which the tests are contingent. The assistance of a statistician is recommended for analysts who are not proficient in statistics.

12.13.2 EXAMPLE OF ANALYSIS OF MYSID, *HOLMESIMYSIS COSTATA*, SURVIVAL DATA

12.13.2.1 Formal statistical analysis of the survival data is outlined in Figures 1 and 2. The response used in the analysis is the proportion of animals surviving in each test or control chamber. Separate analyses are performed for the estimation of the NOEC and LOEC endpoints and for the estimation of the LC50 endpoint. Concentrations at which there is no survival in any of the test chambers are excluded from statistical analysis of the NOEC and LOEC, but included in the estimation of the LC, EC, and IC endpoints.

12.13.2.2 For the case of equal numbers of replicates across all concentrations and the control, the evaluation of the NOEC and LOEC endpoints is made via a parametric test, Dunnett's Procedure, or a nonparametric test, Steel's Many-one Rank Test, on the arc sine square root transformed data. Underlying assumptions of Dunnett's Procedure, normality and homogeneity of variance, are formally tested. The test for normality is the Shapiro-Wilk's Test, and Bartlett's Test is used to test for homogeneity of variance. If either of these tests fails, the nonparametric test, Steel's Many-one Rank Test, is used to determine the NOEC and LOEC endpoints. If the assumptions of Dunnett's Procedure are met, the endpoints are estimated by the parametric procedure.

12.13.2.3 If equal numbers of replicates occur among the concentration levels tested, there are parametric and nonparametric alternative analyses. The parametric analysis is a

TABLE 3. SUMMARY OF TEST CONDITIONS AND TEST ACCEPTABILITY CRITERIA FOR THE MYSID, *HOLMESIMYSIS COSTATA*, GROWTH AND SURVIVAL TEST WITH EFFLUENTS AND RECEIVING WATERS

1. Test type:	Static-renewal
2. Salinity:	34 ± 2‰
3. Temperature:	13 ± 1•C (mysids collected north of Pt. Conception) 15 ± 1•C (mysids collected south of Pt. Conception)
4. Light quality:	Ambient laboratory illumination
5. Light intensity:	10-20 µE/m^2/s (Ambient laboratory illumination)
6. Photoperiod:	16 h light, 8 h darkness
7. Test chamber:	1000 mL
8. Test solution volume:	200 mL
9. Renewal of test solutions:	75% renewal at 48 and 96 hours
10. Age of test organisms:	3 to 4 days post-hatch juveniles
11. No. organisms per test chamber:	5
12. No. replicate chambers per concentration:	5
13. No. mysids per concentration:	25
14. Source of food:	Newly hatched *Artemia* nauplii (less than 24 h old)
15. Feeding regime:	Feed 40 nauplii per larvae daily (dividing into morning and evening feedings)

16. Cleaning:	Siphon during test solution renewal
17. Aeration:	None unless DO falls below 4.0 mg/L, then gently aerate in all cups
18. Dilution water:	Uncontaminated 1-µm-filtered natural seawater or hypersaline brine prepared from natural seawater
19. Test concentrations:	Effluents: Minimum of 5 and a control Receiving waters: 100% receiving water and a control
20. Dilution factor:	Effluents: •0.5 series Receiving waters: None, or •0.5
21. Test duration:	7 days
22. Endpoints:	Survival and growth
23. Test acceptability criteria:	•75% survival, average dry weight • 0.40 µg in the controls; survival MSD <40%; growth MSD <50 µg; and both survival and growth NOECs must be less than 100 µg/L with zinc
24. Sampling requirements:	For on-site tests, samples must be used within 24 h of the time they are removed from the sampling device (see Section 8, Effluent and Receiving Water Sampling, Sample Handling, and Sample Preparation for Toxicity Tests)
25. Sample volume required:	2 L per renewal

TABLE 4. DATA FOR HOLMESIMYSIS COSTATA 7-DAY SURVIVAL AND GROWTH TEST[1]

Treatment	Replicate Chamber	Total Mysids	No. Alive	Prop. Alive	Mean Weight
Control, Brine	1	5	5	1.00	0.051
	2	5	5	1.00	0.050
	3	5	5	1.00	0.040
	4	5	5	1.00	0.064
	5	5	5	1.00	0.039
Control, Dilution	1	5	5	1.00	0.048
	2	5	5	1.00	0.058
	3	5	5	1.00	0.047
	4	5	5	1.00	0.058
	5	5	5	1.00	0.051
1.80%		1	5	5	1.00
					0.055
	2	5	5	1.00	0.048
	3	5	5	1.00	0.042
	4	5	4	0.80	0.041
	5	5	5	1.00	0.052
3.20%		1	5	5	1.00
					0.057
	2	5	4	0.80	0.050
	3	5	5	1.00	0.046

t test with the Bonferroni adjustment (see Appendix D). The Wilcoxon Rank Sum Test with the Bonferroni adjustment is the nonparametric alternative.

12.13.2.4 Probit Analysis (Finney, 1971; see Appendix G) is used to estimate the concentration that causes a specified percent decrease in survival from the control. In this analysis, the total mortality data from all test replicates at a given concentration are combined. If the data do not fit the Probit model, the Spearman-Karber method, the Trimmed Spearman-Karber

method, or the Graphical method may be used to estimate the LC50 (see Appendices H-K).

12.13.2.5 The proportion of survival in each replicate must first be transformed by the arc sine square root transformation procedure described in Appendix B. The raw and transformed data, means and variances of the transformed observations at each concentration including the control are listed in Table 5. A plot of the survival data is provided in Figure 3.

12.13.2.6 Test for Normality

12.13.2.6.1 The first step of the test for normality is to center the observations by subtracting the mean of all observations within a concentration from each observation in that concentration. The centered observations are listed in Table 6.

12.13.2.6.2 Calculate the denominator, D, of the test statistic:

$$D = \sum_{i=1}^{n} (X_i - \bar{X})^2$$

Where: X_i = the ith centered observation

$\bar{X}$ = the overall mean of the centered observations

n = the total number of centered observations.

12.13.2.6.3 For this set of data, n = 25

$$\bar{X} = \frac{1}{25}(0.001) = 0.00$$

$$D = 0.227$$

12.13.2.6.4 Order the centered observations from smallest to largest:

$$X^{(1)} \le X^{(2)} \le \ldots \le X^{(n)}$$

Where $X^{(i)}$ is the ith ordered observation. These ordered observations are listed in Table 7.

TABLE 5. MYSID, HOLMESIMYSIS COSTATA, SURVIVAL DATA

	Replicate	Control	Concentration (%) 1.80	3.20	5.60	10.00
RAW	1	1.00	1.00	1.00	0.80	0.20
	2	1.00	1.00	0.80	1.00	0.00
	3	1.00	1.00	1.00	1.00	0.00
	4	1.00	0.80	1.00	0.80	0.00
	5	1.00	1.00	0.80	0.80	0.00
ARC SINE SQUARE ROOT TRANS-FORMED	1	1.345	1.345	1.345	1.107	0.464
	2	1.345	1.345	1.107	1.345	0.225
	3	1.345	1.345	1.345	1.345	0.225
	4	1.345	1.107	1.345	1.107	0.225
	5	1.345	1.345	1.107	1.107	0.225
Mean(Y_i)		1.345	1.297	1.250	1.202	0.273
S_i^2		0.000	0.011	0.017	0.017	0.011
i		1	2	3	4	5

12.13.2.6.5 From Table 4, Appendix B, for the number of observations, n, obtain the coefficients a_1, a_2,...., a_k where k is n/2 if n is even and (n-1)/2 if n is odd. For the data in this example, n = 25 and k = 12. The a_i values are listed in Table 8.

12.13.2.6.6 Compute the test statistic, W, as follows:

$$W = \frac{1}{D}\left[\sum_{i=1}^{k} a_i\left(X^{(n-i+1)} - X^{(i)}\right)\right]^2$$

The differences $X^{(n-i+1)}$ - $X^{(i)}$ are listed in Table 8.

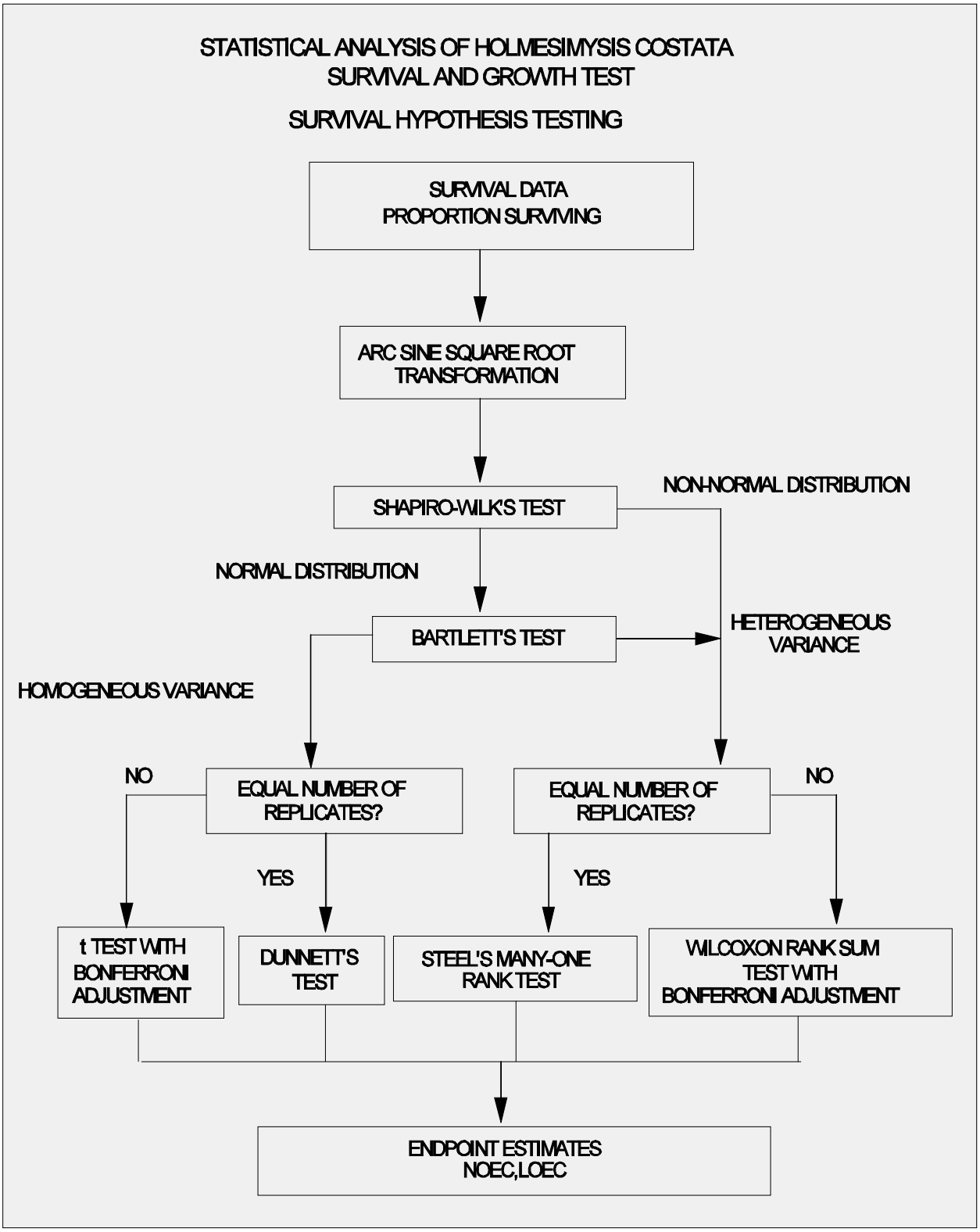

Figure 1. Flowchart for statistical analysis of mysid, *Holmesimysis costata*, survival data by hypothesis testing.

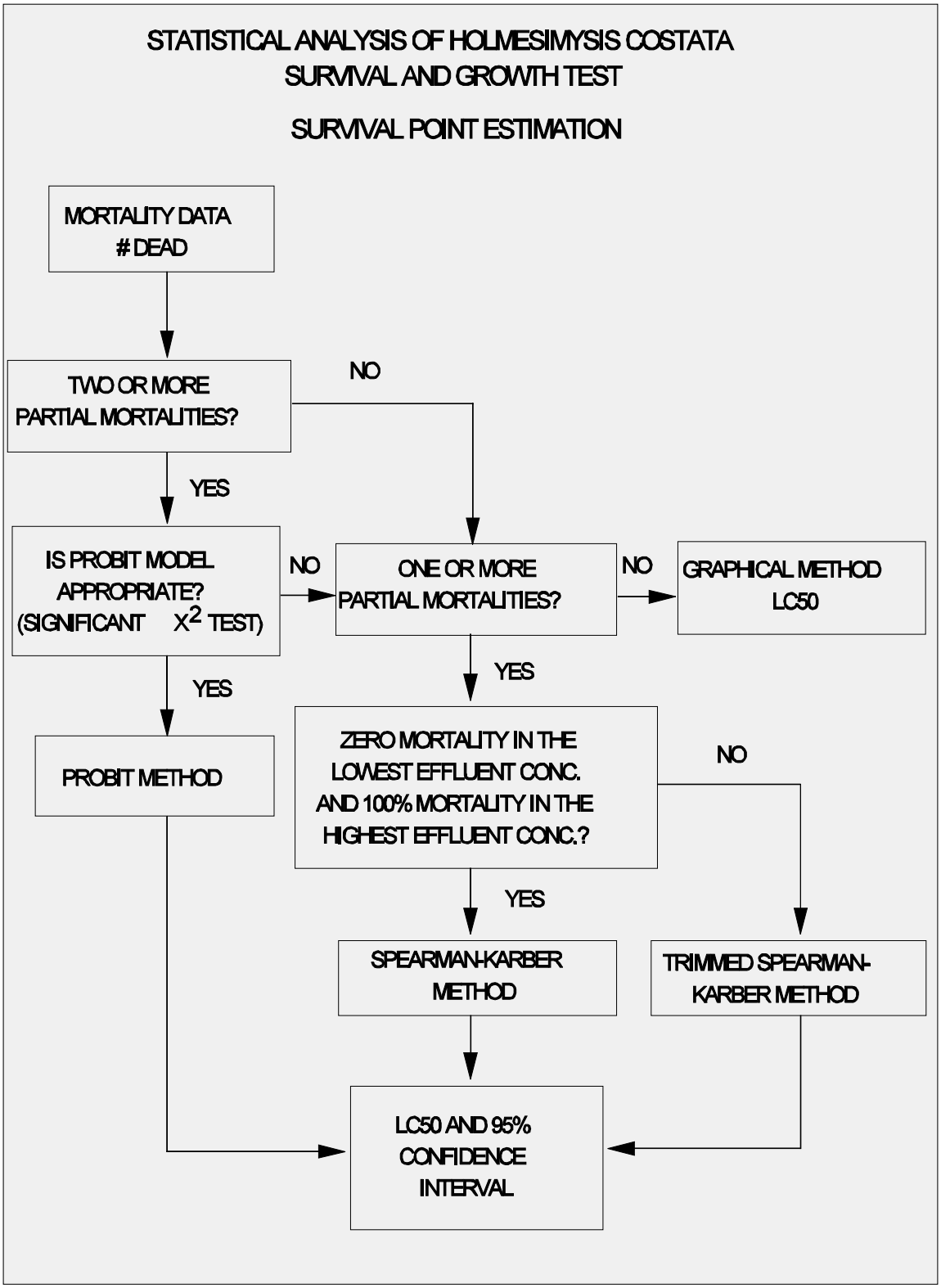

Figure 2.Flowchart for statistical analysis of mysid, *Holmesimysis costata*, survival data by point estimation.

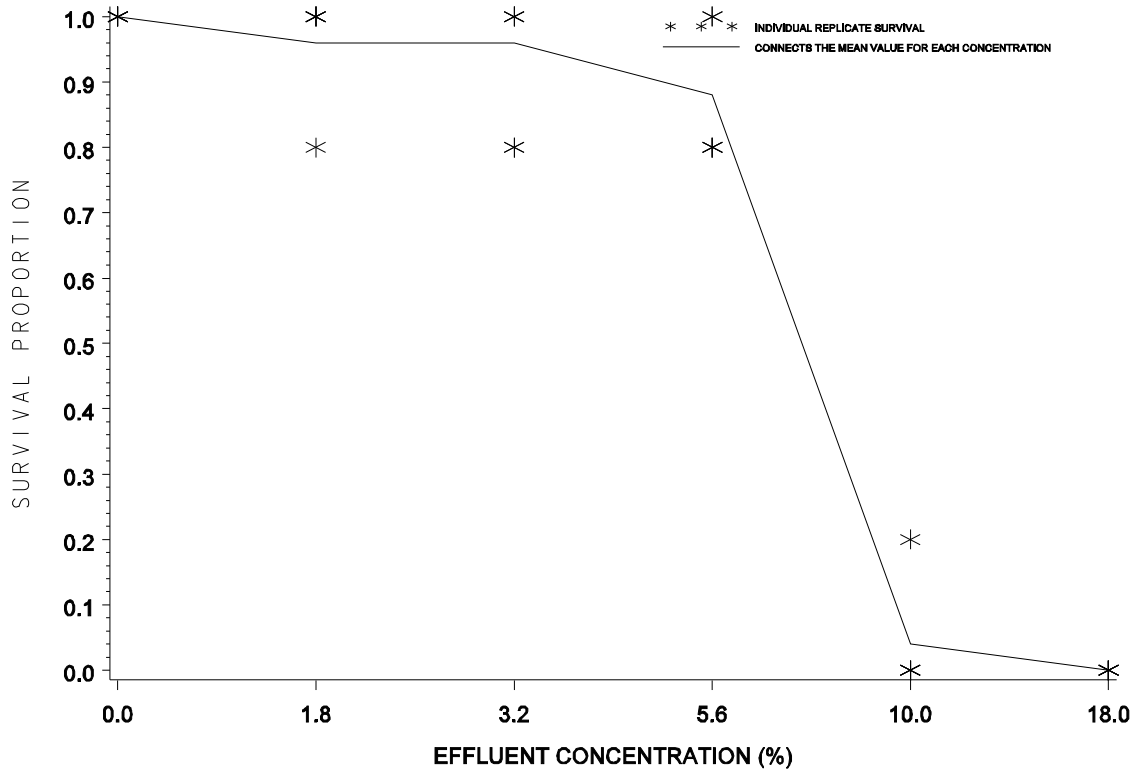

Figure 3. Plot of survival of mysids, *Holmesimysis costata*, at each treatment

TABLE 6. CENTERED OBSERVATIONS FOR SHAPIRO-WILK'S EXAMPLE

Replicate	Control (Dilution)	Concentration 1.80	3.20	5.60	10.00
1	0.000	0.048	0.095	-0.095	0.191
2	0.000	0.048	-0.143	0.143	-0.048
3	0.000	0.048	0.095	0.143	-0.048
4	0.000	-0.190	0.095	-0.095	-0.048
5	0.000	0.048	-0.143	-0.095	-0.048

TABLE 7. ORDERED CENTERED OBSERVATIONS FOR SHAPIRO-WILK'S EXAMPLE

i	$X^{(i)}$	i	$X^{(i)}$
1	-0.190	14	0.000
2	-0.143	15	0.000
3	-0.143	16	0.048
4	-0.095	17	0.048
5	-0.095	18	0.048
6	-0.095	19	0.048
7	-0.048	20	0.095
8	-0.048	21	0.095
9	-0.048	22	0.095
10	-0.048	23	0.143
11	0.000	24	0.143
12	0.000	25	0.191
13	0.000		

TABLE 8. COEFFICIENTS AND DIFFERENCES FOR SHAPIRO-WILK'S EXAMPLE

i	a_i	$X^{(n-i+1)} - X^{(i)}$	
1	0.4450	0.381	$X^{(25)} - X^{(1)}$
2	0.3069	0.286	$X^{(24)} - X^{(2)}$
3	0.2543	0.286	$X^{(23)} - X^{(3)}$
4	0.2148	0.190	$X^{(22)} - X^{(4)}$
5	0.1822	0.190	$X^{(21)} - X^{(5)}$
6	0.1539	0.190	$X^{(20)} - X^{(6)}$
7	0.1283	0.096	$X^{(19)} - X^{(7)}$
8	0.1046	0.096	$X^{(18)} - X^{(8)}$
9	0.0823	0.096	$X^{(17)} - X^{(9)}$
10	0.0610	0.096	$X^{(16)} - X^{(10)}$
11	0.0403	0.000	$X^{(15)} - X^{(11)}$
12	0.0200	0.000	$X^{(14)} - X^{(12)}$

For this data in this example:

$$W = \frac{1}{0.227} (0.4708)^2 = 0.976$$

12.13.2.6.7 The decision rule for this test is to compare W as calculated in Subsection 6.6 with the critical value found in Table 6, Appendix B. If the computed W is less than the critical value, conclude that the data are not normally distributed. For this set of data, the critical value at a significance level of 0.01 and n = 25 observations is 0.888. Since W = 0.976 is greater than the critical value, conclude that the data are normally distributed.

12.13.2.6.8 Since the variance of the control group is zero, Bartlett's test statistic can not be calculated. Therefore, the survival data variances are considered to be heterogeneous.

12.13.2.6.9 Since the data do not meet the assumption of homogeneity of variance, Steel's Many-one Rank Test will be used to analyze the survival data.

12.13.2.7 Steel's Many-one Rank Test

12.13.2.7.1 For each control and concentration combination, combine the data and arrange the observations in order of size from smallest to largest. Assign the ranks (1, 2, ... , 10) to the ordered observations with a rank of 1 assigned to the smallest observation, rank of 2 assigned to the next larger observation, etc. If ties occur when ranking, assign the average rank to each tied observation.

12.13.2.7.2 An example of assigning ranks to the combined data for the control and 1.80% concentration is given in Table 9. This ranking procedure is repeated for each control/concentration combination. The complete set of rankings is summarized in Table 10. The ranks are then summed for each concentration level, as shown in Table 11.

12.13.2.7.3 For this example, determine if the survival in any of the concentrations is significantly lower than the survival in the control. If this occurs, the rank sum at that concentration would be significantly lower than the rank sum of the control. Thus compare the rank sums for the survival at each of the various concentration levels with some "minimum" or critical rank sum, at or below which the survival would be considered significantly lower than the control. At a significance level of 0.05, the minimum rank sum in a test with four concentrations (excluding the control) is 17(See Table 5, Appendix E).

12.13.2.8.1 The data used to calculate the LC50 is summarized in Table 12. For this example, although there are two concentrations with partial mortalities, the chi-square test for heterogeneity was significant, indicating that Probit Analysis is inappropriate for this set of data. Inspection of the data reveals that the smoothed, adjusted proportion mortality for the lowest concentration will not be zero, indicating that the Trimmed Spearman-Karber Method is recommended to calculated the LC50 for this dataset.

12.13.2.8.2 For the Trimmed Spearman-Karber analysis, run the USEPA Trimmed Spearman-Karber program, TSK. An example of the program output is provided in Figure 4.

TABLE 9. ASSIGNING RANKS TO THE CONTROL AND 1.80% CONCENTRATION LEVEL FOR STEEL'S MANY-ONE RANK TEST

Rank	Transformed Proportion of Total Mortality	Concentration
1	1.107	1.80%
6	1.345	Control
6	1.345	Control
6	1.345	Control
6	1.345	Control
6	1.345	Control
6	1.345	1.80%
6	1.345	1.80%
6	1.345	1.80%
6	1.345	1.80%

TABLE 10. TABLE OF RANKS[1]

Replicate	Control	Concentration (%) 1.80	3.20	5.60	10.0
1	1.345(6,6.5,7,8)	1.345(6)	1.345(6.5)	1.107(2)	0.464(5)
2	1.345(6,6.5,7,8)	1.345(6)	1.107(1.5)	1.345(7)	0.225(2.5)
3	1.345(6,6.5,7,8)	1.345(6)	1.345(6.5)	1.345(7)	0.225(2.5)
4	1.345(6,6.5,7,8)	1.107(1)	1.345(6.5)	1.107(2)	0.225(2.5)
5	1.345(6,6.5,7,8)	1.345(6)	1.107(1.5)	1.107(2)	0.225(2.5)

[1]Control ranks are given in the order of the concentration with which they were ranked.

TABLE 11. RANK SUMS

Concentration	Rank Sum
1.80	25.0
3.20	22.5
5.60	20.0
10.00	15.0

TABLE 12. DATA FOR TRIMMED SPEARMAN-KARBER ANALYSIS

		Concentration (%)				
	Control	***1.80***	***3.20***	***5.60***	***10.0***	***18.0***
No Dead	***0***	***1***	***2***	***3***	***24***	***25***
No Exposed	***25***	***25***	***25***	***25***	***25***	***25***

12.13.3 EXAMPLE OF ANALYSIS OF MYSID, *HOLMESIMYSIS COSTATA* GROWTH DATA

12.13.3.1 Formal statistical analysis of the growth data is outlined in Figure 5. The response used in the statistical analysis is mean weight per surviving organism per replicate. The IC25 can be calculated for the growth data via a point

```
TRIMMED SPEARMAN-KARBER METHOD.  VERSION 1.5


DATE:                        TEST NUMBER: 1            DURATION:    7 days

TOXICANT :  Effluent
SPECIES:  Holmesimysis costata

RAW DATA:  Concentration       Number      Mortalities
--- ----   (%)                 Exposed
               .00                 25           0
              1.80                 25           1
              3.20                 25           2
              5.60                 25           3
             10.00                 25          24
             18.00                 25          25

 SPEARMAN-KARBER TRIM:               4.00%

 SPEARMAN-KARBER ESTIMATES:     LC50:           6.95
                95% LOWER CONFIDENCE:           6.22
                95% UPPER CONFIDENCE:           7.76
-----------------------------------------------------------------------
```

Figure 4. Output for USEPA Trimmed Spearman-Karber Program, version 1.5.

estimation technique (see Section 9, Chronic Toxicity Test Endpoints and Data Analysis). Hypothesis testing can be used to obtain an NOEC and LOEC for growth. Concentrations above the NOEC for survival are excluded from the hypothesis test for growth effects.

12.13.3.2 The statistical analysis using hypothesis tests consists of a parametric test, Dunnett's Procedure, and a nonparametric test, Steel's Many-one Rank Test. The underlying

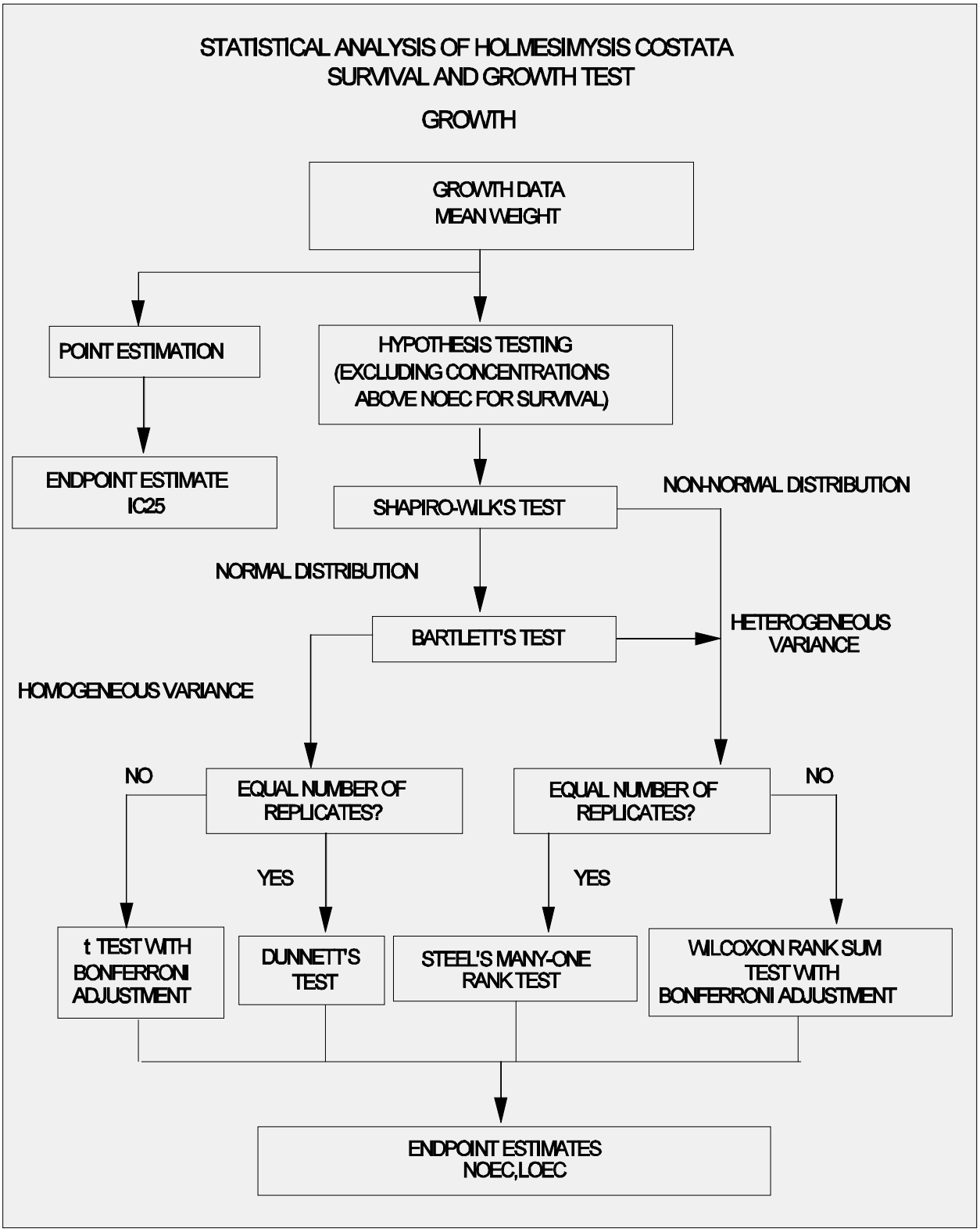

Figure 5. Flowchart for statistical analysis of mysid, *Holmesimysis costata*, growth data.

assumptions of the Dunnett's Procedure, normality and homogeneity of variance, are formally tested. The test for normality is the Shapiro-Wilk's Test and Bartlett's Test is used to test for homogeneity of variance. If either of these tests fails, the nonparametric test, Steel's Many-one Rank Test, is used to determine the NOEC and LOEC endpoints. If the assumptions of Dunnett's Procedure are met, the endpoints are determined by the parametric test.

12.13.3.3 Additionally, if unequal numbers of replicates occur among the concentration levels tested, there are parametric and nonparametric alternative analyses. The parametric analysis is a *t* test with the Bonferroni adjustment. The Wilcoxon Rank Sum Test with the Bonferroni adjustment is the nonparametric alternative. For detailed information on the Bonferroni adjustment, see Appendix D.

12.13.3.4 The data, mean and variance of the observations at each concentration including the control for this example are listed in Table 13. A plot of the data is provided in Figure 6. Since there is significant mortality in the 10.0% concentration, its effect on growth is not considered.

12.13.3.5 Test for Normality

12.13.3.5.1 The first step of the test for normality is to center the observations by subtracting the mean of all observations within a concentration from each observation in that concentration. The centered observations are listed in Table 14.

12.13.3.5.2 Calculate the denominator, D, of the statistic:

$$D = \sum_{i=1}^{n} (X_i - \bar{X})^2$$

TABLE 13. MYSID, HOLMESIMYSIS COSTATA, GROWTH DATA

Replicate	Control	Concentration (%) 1.80	3.20	5.60	10.0
1	0.048	0.055	0.057	0.041	0.033
2	0.058	0.048	0.050	0.040	0.000
3	0.047	0.042	0.046	0.041	0.000
4	0.058	0.041	0.043	0.043	0.000
5	0.051	0.052	0.045	0.040	0.000
Mean($\bar{Y}_i$)	0.052	0.048	0.048	0.041	0.007
S_i^2	0.0000283	0.0000373	0.0000307	0.0000015	0.000218
i	1	2	3	4	5

TABLE 14. CENTERED OBSERVATIONS FOR SHAPIRO-WILK'S EXAMPLE

Replicate	Control	Concentration (%) 1.80	3.20	5.60
1	-0.004	0.007	0.009	0.000
2	0.006	0.000	0.002	-0.001
3	-0.005	-0.006	-0.002	0.000
4	0.006	-0.007	-0.005	0.002
5	-0.001	0.004	-0.003	-0.001

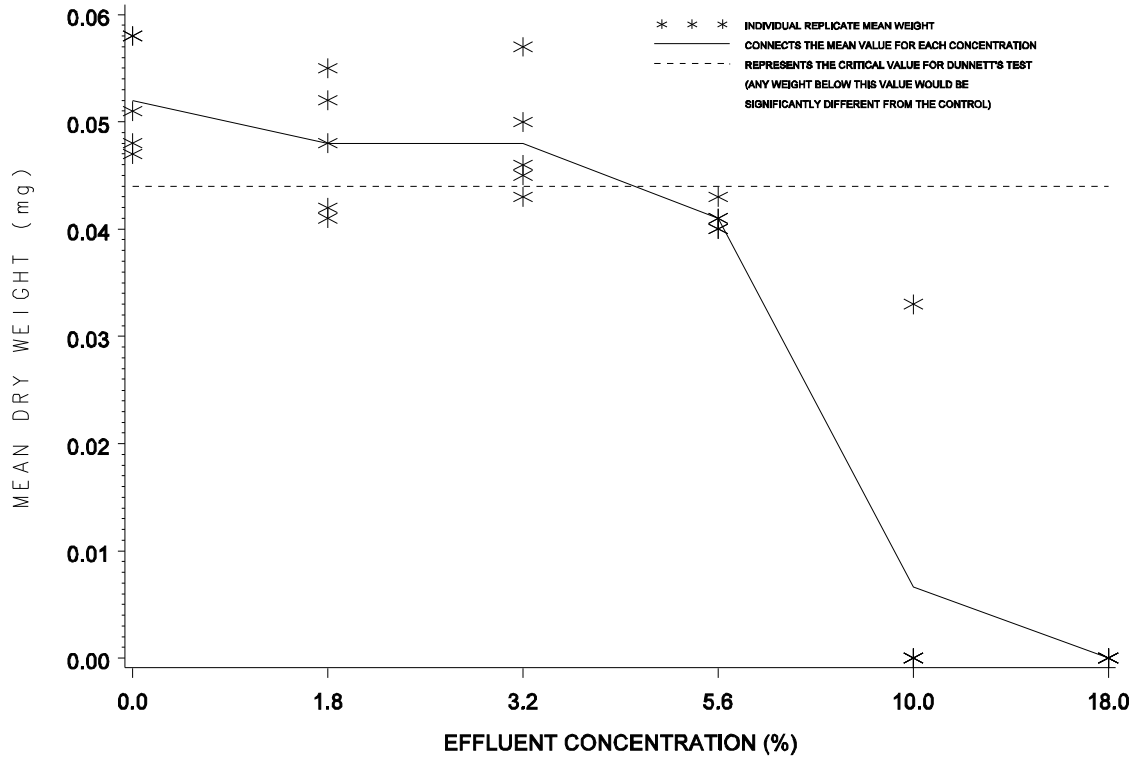

Figure 6. Plot of growth data for mysid, *Holmesimysis costata*, test.

Where: X_i = the ith centered observation

$\bar{X}$ = the overall mean of the centered observations

n = the total number of centered observations

12.13.3.5.3 For this set of data, n = 20

$$\bar{X} = \frac{1}{20}(0.001) = 0.000$$

$$D = 0.000393$$

12.13.3.5.4 Order the centered observations from smallest to largest

$$X^{(1)} \bullet X^{(2)} \bullet \ldots \bullet X^{(n)}$$

where $X^{(i)}$ denotes the ith ordered observation. The ordered observations for this example are listed in Table 15.

TABLE 15. ORDERED CENTERED OBSERVATIONS FOR SHAPIRO-WILK'S EXAMPLE

i	$X^{(i)}$	*i*	$X^{(i)}$
1	-0.007	11	0.000
2	-0.006	12	0.000
3	-0.005	13	0.000
4	-0.005	14	0.002
5	-0.004	15	0.002
6	-0.003	16	0.004
7	-0.002	17	0.006
8	-0.001	18	0.006
9	-0.001	19	0.007
10	-0.001	20	0.009

12.13.3.5.5 From Table 4, Appendix B, for the number of observations, n, obtain the coefficients a_1, a_2, ... a_k where k is n/2 if n is even and (n-1)/2 if n is odd. For the data in this example, n = 20 and k = 10. The a_i values are listed in Table 16.

12.13.3.5.6 Compute the test statistic, W, as follows:

$$W = \frac{1}{D}\left[\sum_{i=1}^{k} a_i\left(X^{(n-i+1)} - X^{(i)}\right)\right]^2$$

The differences $X^{(n-i+1)} - X^{(i)}$ are listed in Table 16. For this set of data:

$$W = \frac{1}{0.000393}(0.0194)^2 = 0.958$$

TABLE 16. COEFFICIENTS AND DIFFERENCES FOR SHAPIRO-WILK'S EXAMPLE

i	a_i	$X^{(n-i+1)} - X^{(i)}$	
1	0.4734	0.016	$X^{(20)} - X^{(1)}$
2	0.3211	0.013	$X^{(19)} - X^{(2)}$
3	0.2565	0.011	$X^{(18)} - X^{(3)}$
4	0.2085	0.011	$X^{(17)} - X^{(4)}$
5	0.1686	0.008	$X^{(16)} - X^{(5)}$
6	0.1334	0.005	$X^{(15)} - X^{(6)}$
7	0.1013	0.004	$X^{(14)} - X^{(7)}$
8	0.0711	0.001	$X^{(13)} - X^{(8)}$
9	0.0422	0.001	$X^{(12)} - X^{(9)}$
10	0.0140	0.001	$X^{(11)} - X^{(10)}$

12.13.3.5.7 The decision rule for this test is to compare W as calculated in Subsection 12.13.3.5.6 to a critical value found in Table 6, Appendix B. If the computed W is less than the critical value, conclude that the data are not normally distributed. For this set of data, the critical value at a significance level of

0.01 and n = 20 observations is 0.868. Since W = 0.958 is greater than the critical value, conclude that the data are normally distributed.

12.13.3.6 Test for Homogeneity of Variance

12.13.3.6.1 The test used to examine whether the variation in mean weight of the mysids is the same across all concentration levels including the control, is Bartlett's Test (Snedecor and Cochran, 1980). The test statistic is as follows:

$$B = \frac{\left[\left(\sum_{i=1}^{p} V_i\right) \ln \bar{S}^2 - \sum_{i=1}^{p} V_i \ln S_i^2\right]}{C}$$

Where: V_i = degrees of freedom for each concentration and the control, $V_i = (n_i - 1)$

p = number of concentration levels including the control

$\ln$ = $\log_e$

i = 1, 2, ..., p where p is the number of concentrations including the control

n_i = the number of replicates for concentration i.

$$\bar{S}^2 = \frac{\left(\sum_{i=1}^{p} V_i S_i^2\right)}{\sum_{i=1}^{p} V_i}$$

$$C = 1 + [3(p-1)]^{-1}\left[\sum_{i=1}^{p} 1/V_i - \left(\sum_{i=1}^{p} V_i\right)^{-1}\right]$$

12.13.3.6.2 For the data in this example (See Table 13), all concentrations including the control have the same number of replicates (n_i = 5 for all i). Thus, V_i = 4 for all i.

12.13.3.6.3 Bartlett's statistic is therefore:

$$B = [(16)\ln(0.0000245) - 4 \sum_{i=1}^{P} \ln(S_i^2)]/1.104$$

$$= [16(-10.617) - 4(-44.470)]/1.104$$

$$= [-169.872 - (-177.880)]/1.104$$

$$= 7.254$$

12.13.3.6.4 B is approximately distributed as chi-square with p - 1 degrees of freedom, when the variances are in fact the same. Therefore, the appropriate critical value for this test, at a significance level of 0.01 with three degrees of freedom, is 9.210. Since B = 7.254 is less than the critical value of 9.210, conclude that the variances are not different.

12.13.3.7 Dunnett's Procedure

12.13.3.7.1 To obtain an estimate of the pooled variance for the Dunnett's Procedure, construct an ANOVA table as described in Table 17.

TABLE 17. ANOVA TABLE

Source	***df***	***Sum of Squares (SS)***	***Mean Square(MS) (SS/df)***
Between	***p - 1***	***SSB***	$S_B^2 = SSB/(p-1)$
Within	***N - p***	***SSW***	$S_W^2 = SSW/(N-p)$

Where: p = number of concentration levels including the control

N = total number of observations $n_1 + n_2 \ldots + n_p$

n_i = number of observations in concentration i

$$SSB = \sum_{i=1}^{P} T_i^2/n_i - G^2/N$$ Between Sum of Squares

$$SST = \sum_{i=1}^{P} \sum_{j=1}^{n_i} Y_{ij}^2 - G^2/N$$ Total Sum of Squares

$$SSW = SST - SSB$$ Within Sum of Squares

G = the grand total of all sample observations,

$$G = \sum_{i=1}^{P} T_i$$

T_i = the total of the replicate measurements for concentration i

Y_{ij} = the jth observation for concentration i (represents the mean weight of the mysids for concentration i in test chamber j)

12.13.3.7.2 For the data in this example:

$$n_1 = n_2 = n_3 = n_4 = 5$$

$$N = 20$$

$$T_1 = Y_{11} + Y_{12} + \ldots + Y_{15} = 0.262$$
$$T_2 = Y_{21} + Y_{22} + \ldots + Y_{25} = 0.238$$
$$T_3 = Y_{31} + Y_{32} + \ldots + Y_{35} = 0.241$$
$$T_4 = Y_{41} + Y_{42} + \ldots + Y_{45} = 0.205$$
$$G = T_1 + T_2 + T_3 + T_4 = 0.946$$

$$SSB = \sum_{i=1}^{P} T_i^2/n_i - G^2/N$$

$$= \frac{1}{5}(0.225) - \frac{(0.946)^2}{20} = 0.000254$$

$$SST = \sum_{i=1}^{P} \sum_{j=1}^{n_i} Y_{ij}^2 - G^2/N$$

$$= 0.0455 - \frac{(0.946)^2}{} = 0.000754$$

$$SSW = SST - SSB$$

$$= 0.000754 - 0.000254 = 0.000500$$

$$S_B^2 = SSB/(p-1) = 0.000254/(4-1) = 0.0000847$$

$$S_W^2 = SSW/(N-p) = 0.000500/(20-4) = 0.0000313$$

12.13.3.7.3 Summarize these calculations in the ANOVA table (Table 18).

TABLE 18. ANOVA TABLE FOR DUNNETT'S PROCEDURE EXAMPLE

Source	*df*	*Sum of Squares (SS)*	*Mean Square (MS) (SS/df)*
Between	*3*	*0.000254*	*0.0000847*
Within	*16*	*0.000500*	*0.0000313*
Total	*19*	*0.000754*	

12.13.3.7.4 To perform the individual comparisons, calculate the *t* statistic for each concentration, and control combination as follows:

$$t_i = \frac{(\overline{Y_1} - \overline{Y_i})}{S_w\sqrt{(1/n_1) + (1/n_i)}}$$

Where: $\overline{Y}_i$ = mean weight for concentration i

$\overline{Y}_1$ = mean weight for the control

S_W = square root of the within mean square

n_1 = number of replicates for the control

n_i = number of replicates for concentration i

12.13.3.7.5 Table 19 includes the calculated *t* values for each concentration and control combination. In this example, comparing the 1.80% concentration with the control the calculation is as follows:

$$t_2 \cdot \frac{(0.052 \cdot 0.048)}{[0.00559\sqrt{(1/5) \cdot (1/5)}]}$$

$$= 1.131$$

TABLE 19. CALCULATED t VALUES

Concentration (ppb)	*i*	t_i
1.80	*2*	*1.131*
3.20	*3*	*1.131*
5.60	*4*	*3.111*

12.13.3.7.6 Since the purpose of this test is to detect a significant reduction in mean weight, a one-sided test is appropriate. The critical value for this one-sided test is found in Table 5, Appendix C. For an overall alpha level of 0.05, 16 degrees of freedom for error and three concentrations (excluding the control) the approximate critical value is 2.23. The mean weight for concentration "i" is considered significantly less than the mean weight for the control if t_i is greater than the critical value. Therefore, the 5.60% concentration has significantly lower mean weight than the control. Hence the NOEC and the LOEC for growth are 3.20% and 5.60%, respectively.

12.13.3.7.7 To quantify the sensitivity of the test, the minimum significant difference (MSD) that can be detected statistically may be calculated.

$$MSD \cdot d\ S_w\sqrt{(1/n_1) \cdot (1/n)}$$

Where: d = the critical value for Dunnett's Procedure

S_W = the square root of the within mean square

n = the common number of replicates at each concentration
(this assumes equal replication at each concentration)

n_1 = the number of replicates in the control.

12.13.3.7.8 In this example:

$$MSD \cdot 2.23(0.00559)\sqrt{(1/5)\cdot(1/5)}$$

$$= 2.23\ (0.00559)(0.632)$$

$$= 0.00788$$

12.13.3.7.9 Therefore, for this set of data, the minimum difference that can be detected as statistically significant is 0.00788 mg.

12.13.3.7.10 This represents a 15.2% reduction in mean weight from the control.

12.13.3.8 Calculation of the ICp

12.13.3.8.1 The growth data from Table 13 are utilized in this example. As seen in the table, the observed means are monotonically non-increasing with respect to concentration. Therefore, the smoothed means will be simply the corresponding observed mean. The observed means are represented by $\bar{Y}_i$ and the smoothed means by M_i. Table 20 contains the smoothed means and Figure 7 gives a plot of the smoothed response curve.

12.13.3.8.2 An IC25 can be estimated using the Linear Interpolation Method. A 25% reduction in weight, compared to the controls, would result in a mean weight of 0.039 mg, where $M_1(1-p/100) = 0.052(1-25/100)$. Examining the smoothed means and their associated concentrations (Table 20), the response, 0.039 mg, is bracketed by C_4 = 5.60% and C_5 = 10.0%.

12.13.3.8.5 Using the equation in Section 4.2 from Appendix L, the estimate of the IC25 is calculated as follows:

$$ICp \cdot C_j \cdot [M_1(1 \cdot p/100) \cdot M_j] \frac{(C_{(j \cdot 1)} \cdot C_j)}{(M_{(j \cdot 1)} \cdot M_j)}$$

$$IC25 = 5.60 + [0.052(1 - 25/100) - 0.041] \frac{(10.0 - 5.60)}{(0.0066 - 0.041)}$$
$$= 5.86\%.$$

12.13.3.8.7 When the ICPIN program was used to analyze this set of data, requesting 80 resamples, the estimate of the IC25 was 5.86%. The empirical 95.0% confidence interval for the true mean was 4.9440% to 6.2553%. The computer program output for the IC25 for this data set is shown in Figure 8.

TABLE 20. MYSID, HOLMESIMYSIS COSTATA, MEAN GROWTH RESPONSE AFTER SMOOTHING

Toxicant Conc. (%)	i	Response Means Y_i (mg)	Smoothed Means M_i (mg)
Control	1	0.052	0.052
1.80	2	0.048	0.048
3.20	3	0.048	0.048
5.60	4	0.041	0.041
10.00	5	0.0066	0.0066
18.00	6	0.000	0.000

12.14 PRECISION AND ACCURACY

12.12.1 PRECISION

12.12.1.1 Single-Laboratory Precision

12.12.1.1.1 Data on the single laboratory precision of the *Holmesimysis costata* growth and survival test with zinc sulfate

are shown in Table 21. NOECs for mysid survival were either 32 or 56 µg/L Zn. There was also good agreement among LC50s, with a coefficient of variation of 14%. Mysids did not exhibit a growth response at zinc concentrations below those causing significant mortality; NOEC values for growth were always greater than or equal to the highest zinc concentration. IC50 values for growth could not be calculated.

12.12.1.2 Multi-laboratory Precision

12.12.1.2.1 The multi-laboratory data indicate a similar level of test precision (Table 22). The four multi-laboratory tests were conducted over a two year period, and each used split effluent samples tested at two laboratories. Survival NOEC values were the same for both laboratories in three of the four tests, with the NOECs varying by one concentration in the fourth test. The mean coefficient of variation between LC50 values from different laboratories was 21%. The two available comparisons of growth NOEC values indicate similar responses at both laboratories. Growth was the more sensitive indicator of toxicity in three of the four effluent tests.

12.14.2 ACCURACY

12.14.2.1 The accuracy of toxicity tests cannot be determined.

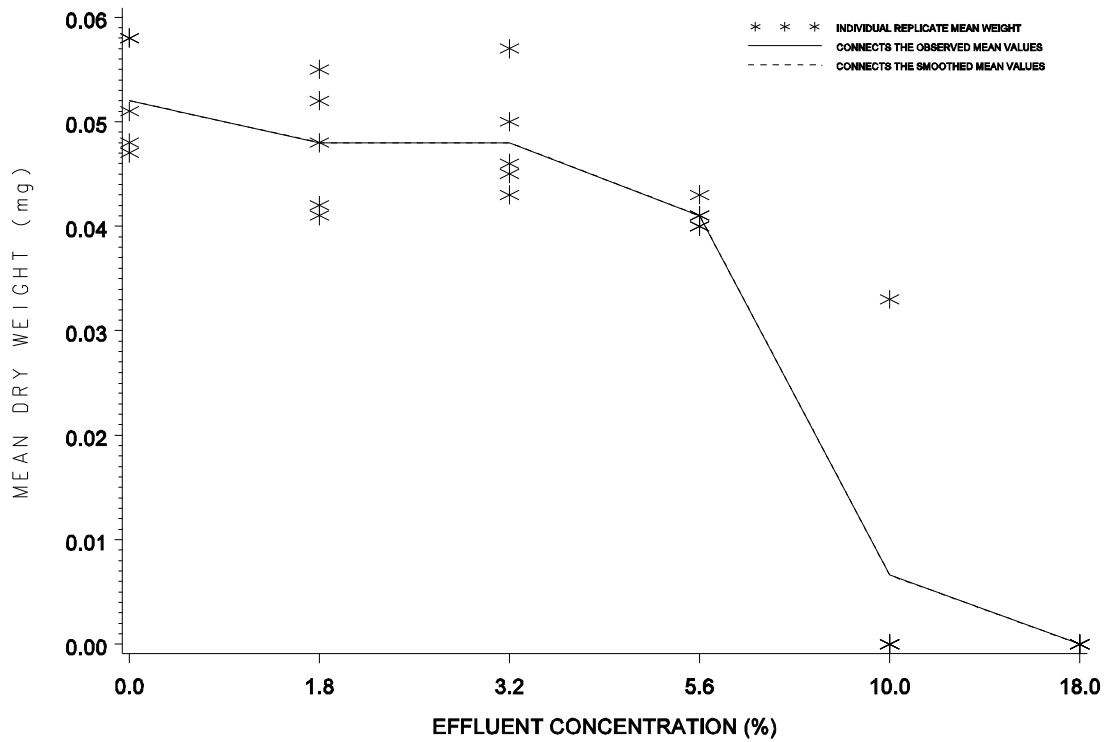

Figure 7. Plot of raw data, observed means, and smoothed means for the mysid, *Holmesimysis costata*, Growth data from tables 13 and 20

```
Conc. ID              1         2         3         4         5         6
-----------------------------------------------------------------------------
Conc. Tested          0      1.80      3.20      5.60      10.0      18.0
-----------------------------------------------------------------------------
Response  1        .048      .055      .057      .041      .033         0
Response  2        .058      .048      .050      .040         0         0
Response  3        .047      .042      .046      .041         0         0
Response  4        .058      .041      .043      .043         0         0
Response  5        .051      .052      .045      .040         0         0
-----------------------------------------------------------------------------
*** Inhibition Concentration Percentage Estimate ***
Toxicant/Effluent: Effluent
Test Start Date:    Test Ending Date:
Test Species: mysid, Holmesimysis costata
Test Duration:          7 days
DATA FILE: mysid.icp
OUTPUT FILE:  mysid.i25
-----------------------------------------------------------------------------
Conc.     Number     Concentration     Response      Std.       Pooled
 ID     Replicates                %       Means       Dev.   Response Means
-----------------------------------------------------------------------------
  1          5             0.000          0.052      0.005      0.052
  2          5             1.800          0.048      0.006      0.048
  3          5             3.200          0.048      0.006      0.048
  4          5             5.600          0.041      0.001      0.041
  5          5            10.000          0.007      0.015      0.007
  6          5            18.000          0.000      0.000      0.000
-----------------------------------------------------------------------------
The Linear Interpolation Estimate:     5.8174   Entered P Value: 25
-----------------------------------------------------------------------------
Number of Resamplings:   80
The Bootstrap Estimates Mean:   5.8205 Standard Deviation:     0.2673
Original Confidence Limits:   Lower:     4.9440 Upper:     6.2553
Expanded Confidence Limits:   Lower:     4.5073 Upper:     6.4743
Resampling time in Seconds:     0.22  Random_Seed: 526805435
```

Figure 8. Output for USEPA Linear Interpolation Program for the IC25.

TABLE 21. SINGLE LABORATORY PRECISION DATA FOR THE MYSID, *HOLMESIMYSIS COSTATA* GROWTH AND SURVIVAL TEST WITH ZINC (ZN µG/L) SULFATE AS THE REFERENCE TOXICANT

Test	Survival		Growth
	NOEC	LC50	NOEC
1	32	47	>32
2	32	59	>32
3	56	62	>56
4	56	65	>56
N	4	4	4
Mean	44	58	>44
SD		7.9	
CV (%)		14	

No growth effect was observed in zinc concentrations below those causing significant mortality (10, 18, 32, 56 and 100 µg/L).

All tests were conducted at MPSL.

TABLE 22. MULTI-LABORATORY PRECISION DATA FOR THE MYSID, *HOLMESIMYSIS COSTATA* GROWTH AND SURVIVAL TEST WITH SPLIT EFFLUENT (%) ON THE SAME DATE.

Test	Effluent Type	Lab	Survival NOEC	Survival LC50	Growth NOEC
1	BKME	OSU	1.0	1.8	0.5[L]
1	BKME	MPSL	1.0	1.3	0.5[L]
			CV=26%		
2	POTW	ATL	3.2	4.1	>3.2[L]
2	POTW	MPSL	3.2	5.1	>3.2[L]
			CV=14%		
3	POTW	SRH	10.0	12.8	na
3	POTW	MPSL	10.0	11.7	3.2[W]
			CV=6%		
4	POTW	SRH	10.0	15.8	5.6[W]
4	POTW	MPSL	5.6	9.1	3.2[W]
			CV=38%		

Mean Interlaboratory CV= 21%

[L] Length was measured as the growth endpoint in tests 1 and 2,
[W] Weight was measured in test 3 and 4.
na Data was not available.

OSU is the Oregon State University Laboratory at the Hatfield Marine Science Center in Newport Oregon.

ATL is Aquatic Testing Laboratory in Ventura, California.

SRH is S.R. Hansen and Associates in Concord, California.

MPSL is the Marine Pollution Studies Laboratory near Monterey, California.

APPENDIX I. MYSID TEST: STEP-BY-STEP SUMMARY

PREPARATION OF TEST SOLUTIONS

A. Determine test concentrations and appropriate dilution water based on NPDES permit conditions and guidance from the appropriate regulatory agency.

B. Prepare effluent test solutions by diluting well mixed unfiltered effluent using volumetric flasks and pipettes. Use hypersaline brine where necessary to maintain all test solutions at 34 ± 2‰. Include brine controls in tests that use brine.

C. Prepare a zinc reference toxicant stock solution (10,000 µg/L) by adding 0.0440 g of zinc sulfate ($ZnSO_4 \circ 7H_2O$) to 1 liter of reagent water.

D. Prepare zinc reference toxicant solution of 0 (control) 10, 18, 32, 56 and 100 µg/L by adding 0, 1.0 1.8, 3.2, 5.6 and 10.0 mL of stock solution, respectively, to a 1-L volumetric flask and filling to 1-L with dilution water.

E. Sample effluent and reference toxicant solutions for physical/chemical analysis. Measure salinity, pH and dissolved oxygen from each test concentration.

F. Randomize numbers for test chambers and record the chamber numbers with their respective test concentrations on a randomization data sheet. Store the data sheet safely until after the test samples have been analyzed.

G. Place test chambers in a water bath or environmental chamber set to 13 or 15•C and allow temperature to equilibrate.

H. Measure the temperature daily in one random replicate (or separate chamber) of each test concentration. Monitor the temperature of the water bath or environmental chamber continuously.

I. At the end of the test, measure salinity, pH, and dissolved oxygen concentration from each test concentration.

PREPARATION AND ANALYSIS OF TEST ORGANISMS

A. Four to five days prior to the beginning of the toxicity test, isolate approximately 150 gravid female mysids in a screened (2-mm-mesh) compartment within an aerated 80-liter aquarium (15•C). Add a surplus of *Artemia* nauplii (200 per mysid, static; 500 per mysid, flow-through) to stimulate overnight release of juveniles. Add blades of kelp as habitat.

B. Isolate the newly released juveniles by slowly siphoning into a screen-tube (150-µm-mesh, 25 cm diam.) immersed in a bucket of clean seawater. Transfer juveniles into additional screen-tubes or static 4-liter beakers at a density of approximately 50 juveniles per liter. Juveniles should be fed five to ten newly released *Artemia* nauplii per juvenile per day and a pinch (10 to 20 mg) of ground Tetramin® flake food per 100 juveniles per day. Maintain the juveniles for three days at 13 to 15•C, changing the water at least once in static chambers.

C. After three days, begin randomized introduction of juveniles into the test chambers. Place one or two mysids at a time into as many plastic cups as there are test chambers. Repeat the process until each cup has exactly five juvenile mysids.

D. Eliminate excess water from the cups (no more than 5 mL should remain) and pipet the mysids into the test chambers using a wide bore glass tube or pipet (approximately 3 mm ID). Make sure no mysids are left in the randomization cups. Count the number of juveniles in each test chamber to verify that each has five.

E. Remove all dead mysids daily, and add 40 newly hatched *Artemia* nauplii/mysid/day, adjusting feeding to account for mysid mortality.

F. At 48 and 96 hours, renew 75% of the test solution in each chamber.

G. After 7 days, count and record the number of live and dead mysids in each chamber. After counting, use the randomization sheet to assign the correct test concentration to each chamber. Remove all dead mysids.

H. Carefully pour the contents of each test chamber through a small mesh screen (<300µm). Count the mysids and record before screening. Briefly dip the screen containing the mysids in fresh water to rinse away the salt. Carefully transfer the mysids from the screen to a prenumbered, preweighed micro-weigh boat using fine-tipped forceps. Dry for 24 hours at 60•C. Weigh each weigh boat on a microbalance (accurate to 1 µg). Record the chamber number, mysid weight, weigh boat weight (recorded previously), and number of mysids per weigh boat (replicate) on the data sheet.

I. Analyze the data.

J. Include standard reference toxicant point estimate values in the standard quality control charts.

Data Sheet for Juvenile Holmesimysis Toxicity Test

Test Start Date: Start Time: Mysid Source
Test End Date: End Time: Collection/Arrival Date:
Reference Toxicant: Mysid Age at Start:
Sample Source:

Test Cont. #	Toxic Conc.	Number Alive							Total Number Alive	Total Number at Start	Notes and Initials
		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7			
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
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24											
25											
26											
27											
28											
29											
30											
31											
32											
33											
34											
35											

Computer Data Storage
Disk:
File:

Note: See juvenile growth data on separate sheet.

Data Sheet for Weighing Juvenile Mysids

Test Start Date:
Start Time:
Mysid Source :
Test End Date:
End Time:
Collection/Arrival Date:
Reference Toxicant:

Mysid Age at Start:
Sample Source:
Sample Type:

Test Container Number	Site Code or Concentration	Foil Number	Foil Weight (µg)	Total Weight (µg)	Mysid Wt (Total - Foil) (mg)	Number of Mysids	Weight per Mysid (µg)
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
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24							
25							
26							
27							
28							
29							
30							
31							
32							
33							
34							
35							

Computer Data Storage
Disk:
File:
Note: See mysid mortality data on separate sheet.

SECTION 13

PACIFIC OYSTER, *Crassostrea gigas* AND MUSSEL, *Mytilus sp.* EMBRYO-LARVAL DEVELOPMENT TEST METHOD

Adapted from a method developed by
Gary A. Chapman, U.S. EPA, ORD Newport, OR
and Debra L. Denton, U.S. EPA, Region IX

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Appendix I Step-by Step Summary

SECTION 13

PACIFIC OYSTER, *CRASSOSTREA GIGAS*, AND MUSSEL, *MYTILUS SPP.* EMBRYO-LARVAL DEVELOPMENT TEST

13.1 SCOPE AND APPLICATION

13.1.1 This method estimates the chronic toxicity of effluents and receiving waters to the embryos and larvae of several bivalve molluscs, the Pacific oyster (*Crassostrea gigas*) and the mussels (*Mytilus edulis*, *M. californianus*, *M. galloprovincialis*, or *M. trossulus*) in a 48-h static non-renewal exposure. The effects include the synergistic, antagonistic, and additive effects of all the chemical, physical, and biological components which adversely affect the physiological and biochemical functions of the test organisms.

13.1.2 Detection limits of the toxicity of an effluent or chemical substance are organism dependent.

13.1.3 Brief excursions in toxicity may not be detected using 24-h composite samples. Also, because of the long sample collection period involved in composite sampling, and because the test chambers are not sealed, highly volatile and highly degradable toxicants in the source may not be detected in the test.

13.1.4 This test is commonly used in one of two forms: (1) a definitive test, consisting of a minimum of five effluent concentrations and a control, and (2) a receiving water test(s), consisting of one or more receiving water concentrations and a control.

13.1.5 This method should be restricted to use by, or under the supervision of, professionals experienced in aquatic toxicity testing. Specific experience with any toxicity test is usually needed before acceptable results become routine.

13.2 SUMMARY OF METHOD

13.2.1 The method provides step-by-step instructions for performing a 48-h static non-renewal toxicity test using embryos and larvae of the test species to determine the toxicity of

substances in marine and estuarine waters. The test endpoint is normal shell development and should include mortality as a measure of adverse effect.

13.3 INTERFERENCES

13.3.1 Toxic substances may be introduced by contaminants in dilution water, glassware, sample hardware, and testing equipment (see Section 5, Facilities and Equipment, and Supplies).

13.3.2 Improper effluent sampling and handling may adversely affect test results (see Section 8, Effluent and Receiving Water Sampling, and Sample Handling, and Sample Preparation for Toxicity Tests).

13.4 SAFETY

13.4.1 See Section 3, Health and Safety

13.5 APPARATUS AND EQUIPMENT

13.5.1 Tanks, trays, or aquaria -- for holding and acclimating adult pacific oysters and mussels, e.g., standard salt water aquarium or Instant Ocean Aquarium (capable of maintaining seawater at 10-20•C), with appropriate filtration and aeration system.

13.5.2 Air pump, air lines, and air stones -- for aerating water containing broodstock or for supplying air to test solutions with low dissolved oxygen.

13.5.3 Constant temperature chambers or water baths -- for maintaining test solution temperature and keeping dilution water supply, gametes, and embryo stock suspensions at test temperature prior to the test.

13.5.4 Water purification system -- Millipore Super-Q, Deionized water (DI) or equivalent.

13.5.5 Refractometer -- for determining salinity.

13.5.6 Hydrometer(s) -- for calibrating refractometer.

13.5.7 Thermometers, glass or electronic, laboratory grade -- for measuring water temperatures.

13.5.8 Thermometer, National Bureau of Standards Certified (see USEPA METHOD l70.l, USEPA, l979) -- to calibrate laboratory thermometers.

13.5.9 pH and DO meters -- for routine physical and chemical measurements.

13.5.10 Standard or micro-Winkler apparatus -- for determining DO (optional) and calibrating the DO meter.

13.5.11 Winkler bottles -- for dissolved oxygen determinations.

13.5.12 Balance -- Analytical, capable of accurately weighing to 0.0001 g.

13.5.13 Fume hood -- to protect the analyst from effluent or formaldehyde fumes.

13.5.14 Glass stirring rods -- for mixing test solutions.

13.5.15 Graduated cylinders -- Class A, borosilicate glass or non-toxic plastic labware, 50-l000 mL for making test solutions. (Note: not to be used interchangeably for gametes or embryos and test solutions).

13.5.16 Volumetric flasks -- Class A, borosilicate glass or non-toxic plastic labware, 100-1000 mL for making test solutions.

13.5.17 Pipets, automatic -- adjustable, to cover a range of delivery volumes from 0.010 to 1.000 mL.

13.5.18 Pipet bulbs and fillers -- PROPIPET® or equivalent.

13.5.19 Wash bottles -- for reagent water, for topping off graduated cylinders, for rinsing small glassware and instrument electrodes and probes.

13.5.20 Wash bottles -- for dilution water.

13.5.21 20-liter cubitainers or polycarbonate water cooler jugs -- for making hypersaline brine.

13.5.22 Cubitainers, beakers, or similar chambers of non-toxic composition for holding, mixing, and dispensing dilution water and other general non-effluent, non-toxicant contact uses. These should be clearly labeled and not used for other purposes.

13.5.23 Beakers, 50 mL -- for pooling surrogate water samples for chemistry measurements at the end of the test.

13.5.24 Beakers, 250 mL borosilicate glass -- for preparation of test solutions.

13.5.25 Beakers, 1,000 mL borosilicate glass -- for mixing gametes for fertilization of eggs.

13.5.26 Inverted or compound microscope -- for inspecting gametes and making counts of embryos and larvae. The use of an inverted scope is not required, but recommended. Its use reduces the exposure of workers to hazardous fumes (formalin or glutaraldehyde) during the counting of larvae and reduces sample examination time. Alternatively, a Sedgewick-Rafter cell may be used on a regular compound scope.

13.5.27 Counter, two unit, 0-999 -- for recording counts of embryos and larvae.

13.5.28 A perforated plunger -- for maintaining a homogeneous suspension of embryos.

13.5.29 Nytex screens, ca. 75 µm and ca. 37 µm -- for rinsing gametes to separate individual gametes from larger material; for retaining eggs, embryos, or larvae.

13.5.30 60 µm NITEX® filter -- for filtering receiving water.

13.6 **REAGENTS AND SUPPLIES**

13.6.1 Sample containers -- for sample shipment and storage (see Section 8, Effluent and Receiving Water Sampling, and Sample Handling, and Sample Preparation for Toxicity Tests).

13.6.2 Data sheets (one set per test) -- for data recording (see Figure 1).

13.6.3 Tape, colored -- for labelling test chambers and containers.

13.6.4 Markers, water-proof -- for marking containers, etc.

13.6.5 Parafilm -- to cover graduated cylinders and vessels containing gametes, embryos.

13.6.6 Gloves, disposable -- for personal protection from contamination.

13.6.7 Pipets, serological -- l-l0 mL, graduated.

13.6.8 Pipet tips -- for automatic pipets.

13.6.9 Coverslips -- for microscope slides.

13.6.10 Lens paper -- for cleaning microscope optics.

13.6.11 Laboratory tissue wipes -- for cleaning and drying electrodes, microscope slides, etc.

13.6.12 Disposable countertop covering -- for protection of work surfaces and minimizing spills and contamination.

13.6.13 pH buffers 4, 7, and l0 (or as per instructions of instrument manufacturer) -- for standards and calibration check (see USEPA Method l50.l, USEPA, l979).

13.6.14 Membranes and filling solutions -- for dissolved oxygen probe (see USEPA Method 360.l, USEPA, l979), or reagents for modified Winkler analysis.

13.6.15 Laboratory quality assurance samples and standards -- for the above methods.

13.6.16 Test chambers -- 30 mL, four chambers per concentration. The chambers should be borosilicate glass or nontoxic disposable

plastic labware. The test may be performed in other sized chambers as long as the density of embryos is the same.

13.6.17 Formaldehyde, 37% (Concentrated Formalin) -- for preserving larvae. Note: formaldehyde has been identified as a carcinogen and is irritating to skin and mucous membranes. It should not be used at a concentration higher than necessary to achieve morphological preservation of larvae for counting and only under conditions of maximal ventilation and minimal opportunity for volatilization into room air.

13.6.19 Reference toxicant solutions (see Section 13.10.2.4 and Section 4, Quality Assurance).

13.6.20 Reagent water -- defined as distilled or deionized water that does not contain substances which are toxic to the test organisms (see Section 5, Facilities, Equipment, and Supplies and Section 7, Dilution Water).

13.6.21 Effluent and receiving water -- see Section 8, Effluent and Surface Water Sampling, and Sample Handling, and Sample Preparation for Toxicity Tests.

13.6.22 Dilution water and hypersaline brine -- see Section 7, Dilution Water and Section 13.6.24, Hypersaline Brines. The dilution water should be uncontaminated 1-µm-filtered natural seawater. Hypersaline brine should be prepared from dilution water.

13.6.23 HYPERSALINE BRINES

13.6.23.1 Most industrial and sewage treatment effluents entering marine and estuarine systems have little measurable salinity. Exposure of larvae to these effluents will usually require increasing the salinity of the test solutions. It is important to maintain an essentially constant salinity across all treatments. In some applications it may be desirable to match the test salinity with that of the receiving water (See Section 7.1). Two salt sources are available to adjust salinities -- artificial sea salts and hypersaline brine (HSB) derived from natural seawater. Use of artificial sea salts is necessary only when high effluent concentrations preclude salinity adjustment by HSB alone.

13.6.23.2 Hypersaline brine (HSB) can be made by concentrating natural seawater by freezing or evaporation. HSB should be made from high quality, filtered seawater, and can be added to the effluent or to reagent water to increase salinity. HSB has several desirable characteristics for use in effluent toxicity testing. Brine derived from natural seawater contains the necessary trace metals, biogenic colloids, and some of the microbial components necessary for adequate growth, survival, and/or reproduction of marine and estuarine organisms, and it can be stored for prolonged periods without any apparent degradation. However, even if the maximum salinity HSB (100‰) is used as a diluent, the maximum concentration of effluent (0‰) that can be tested is 66% effluent at 34‰ salinity (see Table 1).

13.6.23.3 High quality (and preferably high salinity) seawater should be filtered to at least 10 µm before placing into the freezer or the brine generator. Water should be collected on an incoming tide to minimize the possibility of contamination.

13.6.23.4 Freeze Preparation of Brine

13.6.23.4.1 A convenient container for making HSB by freezing is one that has a bottom drain. One liter of brine can be made from four liters of seawater. Brine may be collected by partially freezing seawater at -10 to -20•C until the remaining liquid has reached the target salinity. Freeze for approximately six hours, then separate the ice (composed mainly of fresh water) from the remaining liquid (which has now become hypersaline).

13.6.23.4.2 It is preferable to monitor the water until the target salinity is achieved rather than allowing total freezing followed by partial thawing. Brine salinity should never exceed 100‰. It is advisable not to exceed about 70‰ brine salinity unless it is necessary to test effluent concentrations greater than 50%.

13.6.23.4.3 After the required salinity is attained, the HSB should be filtered through a 1 µm filter and poured directly into portable containers (20-L cubitainers or polycarbonate water cooler jugs are suitable). The brine storage containers should be capped and labelled with the salinity and the date the brine was generated. Containers of HSB should be stored in the dark at

TABLE 1. MAXIMUM EFFLUENT CONCENTRATION (%) THAT CAN BE TESTED BY ADDING DILUTION WATER ONLY OR BRINE ONLY (WITHOUT ADDITION OF DRY SEA SALTS), GIVEN VARIOUS EFFLUENT SALINITIES, DILUTION WATER SALINITIES, AND BRINE SALINITIES, AND MAINTAINING 30‰ TEST SALINITY.

Effl.	Dilution Water Salinity ‰					Brine Salinity ‰				
‰	31	32	33	34	35	60	70	80	90	100
0	3.23	6.25	9.09	11.76	14.29	50.00	57.14	62.50	66.67	70.00
1	3.33	6.45	9.38	12.12	14.71	50.85	57.97	63.29	67.42	70.71
2	3.45	6.67	9.68	12.50	15.15	51.72	58.82	64.10	68.18	71.43
3	3.57	6.90	10.00	12.90	15.63	52.63	59.70	64.94	68.97	72.16
4	3.70	7.14	10.34	13.33	16.13	53.57	60.61	65.79	69.77	72.92
5	3.85	7.41	10.71	13.79	16.67	54.55	61.54	66.67	70.59	73.68
10	4.76	9.09	13.04	16.67	20.00	60.00	66.67	71.43	75.00	77.78
15	6.25	11.76	16.67	21.05	25.00	66.67	72.73	76.92	80.00	82.35
20	9.09	16.67	23.08	28.57	33.33	75.00	80.00	83.33	85.71	87.50
25	16.67	28.57	37.50	44.44	50.00	85.71	88.89	90.91	92.31	93.33

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4•C (even room temperature has been acceptable). HSB is usually of acceptable quality even after several months in storage.

13.6.23.5 Heat Preparation of Brine

13.6.23.5.1 The ideal container for making brine using heat-assisted evaporation of natural seawater is one that (1) has a high surface to volume ratio, (2) is made of a non-corrosive material, and (3) is easily cleaned (fiberglass containers are ideal). Special care should be used to prevent any toxic materials from coming in contact with the seawater being used to generate the brine. If a heater is immersed directly into the seawater, ensure that the heater materials do not corrode or leach any substances that would contaminate the brine. One successful method is to use a thermostatically controlled heat exchanger made from fiberglass. If aeration is needed, use only oil-free air compressors to prevent contamination.

13.6.23.5.2 Before adding seawater to the brine generator, thoroughly clean the generator, aeration supply tube, heater, and any other materials that will be in direct contact with the brine. A good quality biodegradable detergent should be used, followed by several (at least three) thorough reagent water rinses.

13.6.23.5.3 Seawater should be filtered to at least 10 µm before being put into the brine generator. The temperature of the seawater is increased slowly to 40•C. The water should be aerated to prevent temperature stratification and to increase water evaporation. The brine should be checked daily (depending on the volume being generated) to ensure that the salinity does not exceed 100‰ an that the temperature does not exceed 40•C. Additional seawater may be added to the brine to obtain the volume of brine required.

13.6.23.5.4 After the required salinity is attained, the HSB should be filtered through a 1 µm filter and poured directly into portable containers (20-L cubitainers or polycarbonate water cooler jugs are suitable). The brine storage containers should be capped and labelled with the salinity and the date the brine was generated. Containers of HSB should be stored in the dark at 4•C (even room temperature has been acceptable). HSB is usually of acceptable quality even after several months in storage.

13.6.23.6 Artificial Sea Salts

13.6.23.6.1 No data from mussel or oyster tests using sea salts or artificial seawater (e.g., GP2) are available for evaluation at this time, and their use must be considered provisional.

13.6.23.7 Dilution Water Preparation from Brine

13.6.23.7.1 Although salinity adjustment with brine is the preferred method, the use of high salinity brines and/or reagent water has sometimes been associated with discernible adverse effects on test organisms. For this reason, it is recommended that only the minimum necessary volume of brine and reagent water be used to offset the low salinity of the effluent, and that brine controls be included in the test. The remaining dilution water should be natural seawater. Salinity may be adjusted in one of two ways. First, the salinity of the highest effluent test concentration may be adjusted to an acceptable salinity, and then serially diluted. Alternatively, each effluent concentration can be prepared individually with appropriate volumes of effluent and brine.

13.6.23.7.2 When HSB and reagent water are used, thoroughly mix together the reagent water and HSB before mixing in the effluent. Divide the salinity of the HSB by the expected test salinity to determine the proportion of reagent water to brine. For example, if the salinity of the brine is 100‰ and the test is to be conducted at 30‰, 100‰ divided by 30‰ = 3.33. The proportion of brine is 1 part in 3.33 (one part brine to 2.33 parts reagent water). To make 1 L of dilution water at 30‰ salinity from a HSB of 100‰, 300 mL of brine and 700 mL of reagent water are required. Verify the salinity of the resulting mixture using a refractometer.

13.6.23.8 Test Solution Salinity Adjustment

13.6.23.8.1 Table 2 illustrates the preparation of test solutions (up to 50% effluent) at 34‰ by combining effluent, HSB, and dilution water. Note: if the highest effluent concentration does not exceed 50% effluent, it is convenient to prepare brine so that the sum of the effluent salinity and brine salinity equals 68‰; the required brine volume is then always

equal to the effluent volume needed for each effluent concentration as in the example in Table 2.

13.6.23.8.2 Check the pH of all test solutions and adjust to within 0.2 units of dilution water pH by adding, dropwise, dilute hydrochloric acid or sodium hydroxide (see Section 8.8.9, Effluent and Receiving Water Sampling, Sample Handling, and Sample Preparation for Toxicity Tests).

13.6.23.8.3 To calculate the amount of brine to add to each effluent dilution, determine the following quantities: salinity of the brine (SB, in ‰), the salinity of the effluent (SE, in ‰), and volume of the effluent to be added (VE, in mL). Then use the following formula to calculate the volume of brine (VB, in mL) to be added:

$$VB = VE \times (30 - SE)/(SB - 30)$$

13.6.23.8.4 This calculation assumes that dilution water salinity is 30 ± 2‰.

13.6.23.9 Preparing Test Solution**s**

13.6.23.9.1 Ten mL of test solution are needed for each test container. To prepare test solutions at low effluent concentrations (<6%), effluents may be added directly to dilution water. For example, to prepare 1% effluent, add 1.0 mL of effluent to a 100-mL volumetric flask using a volumetric pipet or calibrated automatic pipet. Fill the volumetric flask to the 100-mL mark with dilution water, stopper it, and shake to mix. Pour into a (150-250 mL) beaker and stir. Distribute equal volumes into the replicate test chambers. The remaining test solution can be used for chemistry.

13.6.23.9.2 To prepare a test solution at higher effluent concentrations, hypersaline brine must usually be used. For example, to prepare 40% effluent, add 400 mL of effluent to a 1-liter volumetric flask. Then, assuming an effluent salinity of 2‰ and a brine salinity of 66‰, add 400 mL of brine (see equation above and Table 2) and top off the flask with dilution water. Stopper the flask and shake well. Pour into a (100-250

TABLE 2. EXAMPLES OF EFFLUENT DILUTION SHOWING VOLUMES OF EFFLUENT (AT X‰), BRINE, AND DILUTION WATER NEEDED FOR ONE LITER OF EACH TEST SOLUTION.

FIRST STEP: Combine brine with reagent water or natural seawater to achieve a brine of 68-x‰ and, unless natural seawater is used for dilution water, also a brine-based dilution water of 34‰.

SERIAL DILUTION:
Step 1. Prepare the highest effluent concentration to be tested by adding equal volumes of effluent and brine to the appropriate volume of dilution water. An example using 40% is shown.

Effluent Conc. (%)	Effluent x‰	Brine (68-x)‰	Dilution Water* 34‰
40	800 mL	800 mL	400 mL

Step 2. Make serial dilutions from the highest test concentration.

Effluent Conc. (%)	Effluent Source	Dilution Water* (34‰)
20	1000 mL of 40%	1000 mL
10	1000 mL of 20%	1000 mL
5	1000 mL of 10%	1000 mL
2.5	1000 mL of 5%	1000 mL
Control	none	1000 mL

INDIVIDUAL PREPARATION:

Effluent Conc. (%)	Effluent x‰	Brine (68-x)‰	Dilution Water* 34‰
40	400 mL	400 mL	200 mL
20	200 mL	200 mL	600 mL
10	100 mL	100 mL	800 mL
5	50 mL	50 mL	900 mL
2.5	25 mL	25 mL	950 mL
Control	none	none	1000 mL

*May be natural seawater or brine-reagent water equivalent.

mL) beaker and stir. Distribute equal volumes into the replicate test chambers. The remaining test solution can be used for chemistry.

13.6.23.10 Brine Controls

13.6.23.10.1 Use brine controls in all tests where brine is used. Brine controls contain the same volume of brine as does the highest effluent concentration using brine, plus the volume of reagent water needed to reproduce the hyposalinity of the effluent in the highest concentration, plus dilution water. Calculate the amount of reagent water to add to brine controls by rearranging the above equation, (See, 13.6.23.8.3) setting SE = 0, and solving for VE.

$$VE = VB \times (SB - 30)/(30 - SE)$$

If effluent salinity is essentially 0‰, the reagent water volume needed in the brine control will equal the effluent volume at the highest test concentration. However, as effluent salinity and effluent concentration increase, less reagent water volume is needed.

13.6.24 TEST ORGANISMS, OYSTERS AND MUSSELS

13.6.24.1 The test organisms for this test are the Pacific, oyster, *Crassostrea gigas,* or mussels, *Mytilus spp*. (at least twelve per test). Pacific oysters are native to Japan, but have been cultured commercially on the west coast of the United States for over a century.

13.6.24.2 Species Identification

13.6.24.2.1 The three species of mussels included in this method are presumably native to the west coast. The California mussel (*Mytilus californianus*) is distributed along the exposed rocky coast from Alaska to Baja California and is found from intertidal areas to 150 feet depth. The other two mussels included in this method (*M. trossulus* and *M. galloprovinciallis*) are common in sheltered waters such as bays and estuaries and were previously considered to be west coast populations of *Mytilus edulis*. The two species are both present in central California, with *M.*

galloprovincialis reported from San Francisco Bay to Baja California, and *M. trossulus* reported from Monterey to Alaska.

13.6.24.2.2 Test organisms should be identified to species using morphological features in recognized keys. Separation of the "*M. edulis*" complex, (*M. trossulus*, and *M. galloprovinciallis*) may not be possible without electrophoretic characterization. The geographic source of the *Mytilus spp*. broodstock must be reported.

13.6.24.3 Obtaining Broodstock

13.6.24.3.1 Adult oysters (*Crassostrea gigas*) and mussels (*Mytilus spp*.) can be obtained from commercial suppliers and the mussels can also be collected from the field. Organisms are best shipped in damp towels or seaweed and kept cool (4-12•C). Note: if practical, check the sex ratio of brood stock or request such information from a commercial supplier. A highly skewed sex ratio could result in poor embryo yield.

13.6.24.4 Broodstock Culture and Handling

13.6.24.4.1 The adult bivalves are maintained in glass aquaria or fiberglass troughs or tanks. These are supplied continuously (approximately 5 L/min) with natural seawater, or salt water prepared from commercial sea salts is recirculated. The animals are checked daily and any obviously unhealthy animals are discarded. Prior to spawning, the animals should be brushed or gently scraped to remove barnacles and other encrusting organisms; this alleviates problems of egg and sperm contamination, especially through potential barnacle spawning.

13.6.24.4.2 Although ambient temperature seawater is usually acceptable for holding, recommended temperatures are 14-15•C for oyster and 8•C for mussels; conditioning bivalves to spawning condition usually requires holding for from 1-8 weeks at a higher temperature (20•C for oysters, 15-18•C for mussels).

13.6.24.4.3 Natural seawater (•30‰) is used to maintain the adult animals and as a control water in the tests.

13.6.24.4.4 Adult animals used in field studies are transported in insulated boxes or coolers packed with wet kelp or paper

toweling. Upon arrival at the field site, aquaria are filled with control water, loosely covered with a styrofoam sheet and allowed to equilibrate to the holding temperature before animals are added.

13.7 EFFLUENT AND RECEIVING WATER COLLECTION, PRESERVATION, AND STORAGE

13.7.1 See Section 8, Effluent and Receiving Water Sampling, Sample Handling, and Sample Preparation for Toxicity Tests.

13.8 CALIBRATION AND STANDARDIZATION

13.8.1 See Section 4, Quality Assurance.

13.9 QUALITY CONTROL

13.9.1 See Section 4, Quality Assurance.

13.10 TEST PROCEDURES

13.10.1 TEST DESIGN

13.10.1.1 The test consists of at least four replicates of five effluent concentrations plus a dilution water control. Tests that use brine to adjust salinity must also contain four replicates of a brine control. In addition, at least six extra count controls are prepared in dilution water and the number of embryos in each are counted at the time of test initiation. These counts provide an average initial embryo density that is used in the calculation of test results (see 13.13.1.3). Extra replicates are recommended for water chemistry during the tests (see Section 13.8 and Table 3).

13.10.1.2 Effluent concentrations are expressed as percent effluent.

13.10.2 TEST SOLUTIONS

13.10.2.1 Receiving waters

13.10.2.1.1 The sampling point is determined by the objectives of the test. At estuarine and marine sites, samples are usually

collected at mid-depth. Receiving water toxicity is determined with samples used directly as collected or with samples passed through a 60 µm NITEX® filter and compared without dilution, against a control. Using four replicate chambers per test, each containing 10 mL, and 400 mL for chemical analysis, would require approximately 440 mL of sample per test.

13.10.2.2 Effluents

14.10.2.2.1 The selection of the effluent test concentrations should be based on the objectives of the study. A dilution factor of at least 0.5 is commonly used. A dilution factor of 0.5 provides hypothesis test discrimination of ± 100%, and testing of a 16 fold range of concentrations. Hypothesis test discrimination shows little improvement as dilution factors are increased beyond 0.5 and declines rapidly if smaller dilution factors are used. USEPA recommends that one of the five effluent treatments must be a concentration of effluent mixed with dilution water which corresponds to the permittee's instream waste concentration (IWC). At least two of the effluent treatments must be of lesser effluent concentration than the IWC, with one being at least one-half the concentration of the IWC. If 100‰ HSB is used as a diluent, the maximum concentration of effluent that can be tested will be 70% at 30‰ salinity.

13.10.2.2.2 If the effluent is known or suspected to be highly toxic, a lower range of effluent concentrations should be used (such as 25%, 12.5%, 6.25%, 3.12% and 1.56%).

13.10.2.2.3 The volume in each test chamber is 10 mL.

13.10.2.2.4 Effluent dilutions should be prepared for all replicates in each treatment in one container to minimize variability among the replicates. Dispense into the appropriate effluent test chambers.

13.10.2.3 Dilution Water

13.10.2.3.1 Dilution water should be uncontaminated 1-µm-filtered natural seawater or hypersaline brine (prepared from uncontaminated natural seawater) plus reagent water (see Section

7, Dilution Water). Natural seawater may be uncontaminated receiving water. This water is used in all dilution steps and as the control water.

13.10.2.4 Reference Toxicant Test

13.10.2.4.1 Reference toxicant tests should be conducted as described in Quality Assurance (see Section 4.7).

13.10.2.4.2 The preferred reference toxicant for oysters and mussels is copper chloride ($CuCl_2 \circ H_2O$). Reference toxicant tests provide an indication of the sensitivity of the test organisms and the suitability of the testing laboratory (see Section 4 Quality Assurance). Another toxicant may be specified by the appropriate regulatory agency. Prepare a copper reference toxicant stock solution (2,000 mg/L) by adding 5.366 g of copper chloride ($CuCl_2 \circ 2H_2O$) to 1 liter of reagent water. For each reference toxicant test prepare a copper sub-stock of 3 mg/L by diluting 1.5 mL of stock to one liter with reagent water. Alternatively, certified standard solutions can be ordered from commercial companies.

13.10.2.4.3 Prepare a control (0 •g/L) plus four replicates each of at least five consecutive copper reference toxicant solutions (e.g., from the series 3.0, 4.4, 6.5, 9.5, 13.9, 20.4, and 30.0 •g/L, by adding 0.10, 0.15, 0.22, 0.32, 0.46, 0.68, and 1.00 mL of sub-stock solution, respectively, to 100-mL volumetric flasks and filling to 100-mL with dilution water). Start with control solutions and progress to the highest concentration to minimize contamination.

13.10.2.4.4 If the effluent and reference toxicant tests are to be run concurrently, then the tests must use embryos from the same spawn. The tests must be handled in the same way and test solutions delivered to the test chambers at the same time. Reference toxicant tests must be conducted at 30 ± 2‰.

13.10.3 COLLECTION OF GAMETES FOR THE TEST

13.10.3.1 Spawning Induction

13.10.3.1.1 Select at least a dozen bivalves and place them into a container filled with seawater (ca. 20•C for oysters, 15•C for

mussels) and allow time for them to resume pumping (ca. 30 minutes). Mussels will often start pumping following immersion if they have been kept out of water and refrigerated overnight prior to spawning.

TABLE 3. EXAMPLE OF TYPICAL TEST ARRAY SHOWING NUMBER AND TYPES OF TREATMENT CHAMBERS REQUIRED.

TREATMENT	Test Vials	Chemistry Vials
Count Control	6	0
Brine Control	4	1-3
Dilution Water Control	4	1-3
Effluent conc. 1	4	1-3
Effluent conc. 2	4	1-3
Effluent conc. 3	4	1-3
Effluent conc. 4	4	1-3
Effluent conc. 5	4	1-3
TOTAL Chambers = 41-55	34	7-21

13.10.3.1.2 Over a 15-20 minute period, increase the temperature (do not exceed 32•C for oysters, or 20•C for mussels), checking for spawning.

13.10.3.1.3 If no spawning occurs after 30 minutes, replace the water with some at the original temperature and after 15 minutes again increase the temperature as in 13.10.3.2. Although ASTM (1993) cautions against it, the addition of algae into the water can often stimulate spawning of bivalves; if this method is used, the organisms should be moved to clean water once spawning begins. Mussels can also be induced to spawn by injection of 0.5 M KCl into the posterior adductor muscle. Oysters can be induced to spawn by the addition of heat-killed sperm about one hour after initial temperature increase.

13.10.3.2 Pooling Gametes

13.10.3.2.1 When individuals are observed to be shedding gametes, remove each spawner from the tank and place each in a separate container (20•C water for oysters, 15•C for mussels). Alternatively, bivalves can be placed into individual chambers initially (at temperatures per 13.10.5.2) and these placed into a water bath that provides the desired maximum temperature.

13.10.3.2.2 Early in the spawning process, examine a small sample of the gametes from each spawner to confirm sex and to see if the gametes are of adequate quality.

13.10.3.2.3 Place a small amount of sperm from each male onto a microscope slide (well slides work nicely). Examine the sperm for motility; use sperm from those males with the better sperm motility.

13.10.3.2.4 A small sample of the eggs from each female should be examined for the presence of significant quantities of poor eggs (vacuolated, small, or abnormally shaped). If good quality eggs are available from one or more females, questionable batches of eggs should not be used for the test. It is more important to use high quality eggs than it is to use a pooled population of eggs.

13.10.3.2.5 Sperm and egg suspensions that are to be used for preparing the embryo stock should be passed through Nytex screen (ca. 75 •m) to separate out clumps of gametes or extraneous material.

13.10.3.2.6 The pooled eggs are placed into a 1 L beaker and sufficient dilution water added to achieve an egg density of about 5,000-8,000 eggs/mL (objects are just discernible when viewed through the egg suspension) in about 800-900 mL water volume.

13.10.3.3 Fertilization

13.10.3.3.1 Sperm density may vary from one spawning to the next. It is important to use enough sperm to achieve a high percent egg fertilization, but too many sperm can cause polyspermy with resultant abnormal development. To achieve an acceptable level of sperm, several egg suspensions of equal density should be fertilized using a range of sperm volumes,

e.g., 100 mL of egg suspension plus 1, 3, and 10 mL of sperm suspension. This test fertilization should be accomplished within 1 hour of spawning. Use the eggs with the lowest amount of sperm giving normal embryo development after 1.5-2.5 hours after fertilization, as determined by microscopic examination. Usually >90% of the eggs should be fertilized; oysters should have changed from the tear-drop shaped egg to a round single cell zygote; mussels should show a single polar body; or embryos of either species should have advanced to the two-cell stage.

13.10.4 START OF THE TEST

13.10.4.1 Prior to Beginning the Test

13.10.4.1.1 The test should begin as soon as possible, preferably within 24 h of sample collection. The maximum holding time following retrieval of the sample from the sampling device should not exceed 36 h for off-site toxicity tests unless permission is granted by the permitting authority. In no case should the sample be used in a test more than 72 h after sample collection (see Section 8 Effluent and Receiving Water Sampling, Sample Handling, and Sample Preparation for Toxicity Test).

13.10.4.1.2 Just prior to test initiation (approximately 1 h), the temperature of a sufficient quantity of the sample to make the test solutions should be adjusted to the test temperature (18 or 20 ± 1•C) and maintained at that temperature during the addition of dilution water.

13.10.4.1.3 Increase the temperature of the water bath, room, or incubator to the required test temperature (18 or 20 ± 1•C).

13.10.4.1.4 Randomize the placement of test chambers in the temperature-controlled water bath, room, or incubator at the beginning of the test, using a position chart. Assign numbers for the position of each test chamber using a random numbers or similar process (see Appendix A, for an example of randomization). Maintain the chambers in this configuration throughout the test, using a position chart. Record these numbers on a separate data sheet together with the concentration and replicate numbers to which they correspond. Identify this sheet with the date, test organism, test number, laboratory, and

investigator's name, and safely store it away until after the oysters or mussels have been examined at the end of the test.

13.10.4.1.5 Note: Loss of the randomization sheet would invalidate the test by making it impossible to analyze the data afterwards. Make a copy of the randomization sheet and store separately. Take care to follow the numbering system exactly while filling chambers with the test solutions.

13.10.4.1.6 Arrange the test chambers randomly in the water bath or controlled temperature room. Once chambers have been labeled randomly, they can be arranged in numerical order for convenience, since this will also ensure random placement of treatments.

13.10.4.2 Estimation of Embryo Density

13.10.4.2.1 Adjust the embryo suspension to a density of 1,500-3,000/mL. Confirm by counting chamber counts on 1 mL subsamples from a stirred suspension of embryos. Final larval density of 15/mL will provide reasonable precision (150 larvae) and be easier to count than 300 larvae. Add 0.1 mL of the embryo suspension to 10 mL of test solution into each of the randomized test vials. It is extremely important (for a consistent embryo density among test chambers) to maintain a homogeneous distribution of embryos in the stock suspension by regular, slow oscillation of a perforated plunger during embryo distribution.

13.10.4.3 Initial Density Counts

13.10.4.3.1 If tests are conducted on small volumes, using an inverted microscope, the total number of embryos injected into the count controls should be determined as soon as the test has been started. If larger test volumes are used, with counts based upon subsamples, the embros should be resuspended in the water using a perforated plunger. Then subsamples are taken (e.g., 5-10 mL) and the total number of embryos counted in the subsample. Two methods for these counts are to use a counting chamber of the same volume as the subsample, or to screen the embryos using a 37 •m screen and backwash with a smaller volume for small counting chambers. In either procedure, appropriate multiple rinsing is needed to achieve quantitative transfer of embryos.

13.10.4.3.2 Initial counts are required to determine survival in the controls and other treatments. High coefficients of variability in initial counts make survival estimates inexact and may actually decrease the sensitivity of the test.

13.10.4.4 Incubation

13.10.4.4.1 Cover and incubate the chambers in an environmental chamber or by partial immersion in a temperature-controlled water bath for 48 hours.

13.10.4.4.2 At the end of the 48-hour incubation period, examine a count control test chamber (or control test vial if the count controls were transferred to a counting chamber to make the initial counts) under a microscope to check for complete development of control organisms. If development is complete, the test should be ended. If development does not appear to be complete, the test should be continued until complete development occurs (but not beyond 54 hours total test duration).

13.10.5 LIGHT, PHOTOPERIOD, SALINITY AND TEMPERATURE

13.10.5.1 The light quality and intensity should be at ambient laboratory conditions. Light intensity should be 10-20 µE/m2/s, or 50 to 100 foot candles (ft-c), with a 16 h light and 8 h dark cycle.

13.10.5.2 The water temperature in the test chambers should be maintained at 18 or 20 ± 1•C. If a water bath is used to maintain the test temperature, the water depth surrounding the test cups should be as deep as possible without floating the chambers.

13.10.5.3 The test salinity should be in the range of 30 ± 2‰. The salinity should vary by no more than ±2‰ among the chambers on a given day. If effluent and receiving water tests are conducted concurrently, the salinities of these tests should be similar.

13.10.5.4 Rooms or incubators with high volume ventilation should be used with caution because the volatilization of the test solutions and evaporation of dilution water may cause wide fluctuations in salinity. Covering the test chambers with clean

polyethylene plastic may help prevent volatilization and evaporation of the test solutions.

13.10.6 DISSOLVED OXYGEN (DO) CONCENTRATION

13.10.6.1 Aeration may affect the toxicity of effluent and should be used only as a last resort to maintain a satisfactory DO. The DO concentration should be measured on new solutions at the start of the test (Day 0). The DO should not fall below 4.0 mg/L (see Section 8, Effluent and Receiving Water Sampling, Sample Handling, and Sample Preparation for Toxicity Tests). If it is necessary to aerate, all treatments and the control should be aerated. The aeration rate should not exceed that necessary to maintain a minimum acceptable DO and under no circumstances should it exceed 100 bubbles/minute, using a pipet with a 1-2 mm orifice, such as a 1 mL KIMAX® serological pipet No. 37033, or equivalent.

13.10.7 OBSERVATIONS DURING THE TEST

13.10.7.1 Routine Chemical and Physical Observations

13.10.7.1.1 DO is measured at the beginning of the exposure period in each test concentration and in the control.

13.10.7.1.2 Temperature, pH, and salinity are measured at the beginning of the exposure period in each test concentration and in the control. Temperature should also be monitored continuously or observed and recorded daily for at least two locations in the environmental control system or the samples. Temperature should be measured in a sufficient number of test chambers at the end of the test to determine temperature variation in the environmental chamber.

13.10.7.1.3 Record all the measurements on the data sheet.

13.10.8 TERMINATION OF THE TEST

13.10.8.1 Ending the Test

13.10.8.1.1 Record the time the test is terminated.

13.10.8.1.2 The pH, dissolved oxygen, and salinity are measured

at the end of the exposure period in one test chamber at each concentration and in the control. If small electrodes are used, these measurements can be performed in a single extra replicate vial set up specifically for this measurement. Measurements should not be made in vials that are to be counted, as larvae may adhere to electrodes, possibly biasing larval counts.

13.10.8.2 Sample Preservation

13.10.8.2.1 To terminate the test, add 0.25 mL of concentrated formalin (37% formaldehyde). It is advisable not to shake the contents at any time following test termination because the larvae may stick to the edge of the chambers. Simply allow the preservative to mix passively and the larvae to settle out. The use of glutaraldehyde instead of formalin is likely to be acceptable, but as no record of its use with this test is known, care should be taken to confirm that glutaraldehyde kills, preserves, and produces no artifacts that would confound the test results.

13.10.8.2.2 Note: Formaldehyde has been identified as a carcinogen and both glutaraldehyde and formaldehyde are irritating to skin and mucus membranes. Neither should be used at higher concentrations than needed to achieve morphological preservation and only under conditions of maximal ventilation and minimal opportunity for volatilization into room air.

13.10.8.3 Counting

13.10.8.3.1 After addition of preservative, observe all the larvae in each test vial. This can be done by examining the contents of each test vial with an inverted microscope at about 40X-50X magnification or by quantitative transfer of all larvae onto a counting chamber and counting using a compound microscope at about 100X. Using the mechanical stage, carefully count and score all larvae as either normal or abnormal. If substantial numbers of completely developed shells without meat are observed (i.e., > 5 percent of normal larvae), then these shells should be enumerated separately (as dead larvae). "Larvae possessing misshapened or otherwise malformed shells are considered normal, provided development has been completed" (ASTM, 1994). Record the final counts on the data sheet.

13.10.8.3.2 If the number of larvae observed appears to be low in relation to the number inoculated at the beginning of the test, this signifies either mortality and dissolution, or possible adherence to the walls of the vials or incomplete transfer to the counting chamber. Inspect the vials for evidence of the latter two occurrences.

13.10.8.4 Endpoint

13.10.8.4.1 The percentage of embryos that did not survive and develop to live larvae with completely developed shells (i.e., abnormal or dead organisms) is calculated for each treatment replicate (See 13.13.1.3). All larvae are considered live unless they are merely empty shells "without meat" (ASTM, 1994); embryos and larvae that are not yet in the D-hinge stage are counted as abnormal, even if they may have died during the test. Embryos and larvae that die and disintegrate during the test are estimated from initial embryo counts (See N' in 13.13.1.3).

13.10.8.4.2 Unless used as the dilution water, natural seawater controls are only used to check the relative performance of the dilution water controls (e.g., brine controls) required for salinity adjustment. Statistical analysis should use the appropriate dilution water control data.

13.11 **SUMMARY OF TEST CONDITIONS AND TEST ACCEPTABILITY CRITERIA**

13.11.1 A summary of test conditions and test acceptability criteria is listed in Table 4.

TABLE 4. SUMMARY OF TEST CONDITIONS AND TEST ACCEPTABILITY CRITERIA FOR, *CRASSOSTREA GIGAS* and *MYTILUS SPP*., EMBRYO-LARVAL DEVELOPMENT TEST WITH EFFLUENTS AND RECEIVING WATERS

1. Test type:	Static non-renewal
2. Salinity:	30 ± 2‰
3. Temperature:	20 ± 1•C (oysters) 15 or 18 ± 1•C (mussels)*
4. Light quality:	Ambient laboratory light

5. Light intensity:	l0-20 uE/m2/s (Ambient laboratory levels)
6. Photoperiod:	16 h light, 8 h darkness
7. Test chamber size:	30 mL
8. Test solution volume:	10 mL
9. No. larvae per chamber:	150-300
10. No. replicate chambers per concentration:	4 (plus 3 chemistry vials)
11. Dilution water:	Uncontaminated 1-µm-filtered natural seawater or hypersaline brine prepared from natural seawater
12. Test concentrations:	Effluents: Minimum of 5 and a control Receiving waters: 100% receiving water and a control
13. Dilution factor:	Effluents: •0.5 Receiving waters: None or •0.5
14. Test duration:	48 hours (or until complete development up to 54 hours)
15. Endpoint:	Survival and normal shell development
16. Test acceptability criteria:	Control survival must be •70% for oyster embryos or •50% for mussel embryos in control vials; •90% normal shell development in surviving controls; and must achieve a %MSD of <25%

17. Sampling requirements:	One sample collected at test initiation, and preferably used within 24 h of the time it is removed from the sampling device (see Section 8, Effluent and Receiving Water Sampling, Sample Handling, and Sample Preparation for Toxicity Tests)
18. Sample volume required:	1 L per test

*Mussel embryo-larval tests were commonly conducted at 15•C (ASTM, 1994). Experience has shown that many laboratories in northern Californa, Oregon, and Washington often fail to achieve adequate control development at 15•C in 48 hours. It is acceptable to conduct the test at 15•C with the permission of the regulatory authority. Developmental rates may be dependent upon species, local population characteristics, or other factors.

13.12 ACCEPTABILITY OF TEST RESULTS

13.12.1 For tests to be considered acceptable, the following requirements must be met:

(1) The mean survival must be at least 70% for oysters or at least 50% for mussels in the controls.

(2) The percent normal must be at least 90% in the surviving controls.

(3) The minimum significant difference (%MSD) is <25% relative to the control.

13.13 DATA ANALYSIS

13.13.1 GENERAL

13.13.1.1 Tabulate and summarize the data. Calculate the proportion of normally developed larvae for each replicate. A sample set of test data is listed in Table 5.

13.13.1.2 Final calculations are based upon counts of normal larvae and total larvae at test termination, and mean initial embryo count.

13.13.1.3 The percentage of embryos that did not survive or develop to live larvae with completely developed shells (i.e., abnormal or dead organisms) is calculated for each treatment replicate (including controls) using the formula:

$$A = \frac{100\,(N' - B')}{N'}$$

where:

A = percent abnormal and dead organisms
B' = the adjusted number of normal larvae at the end of the test
N' = the initial number of embryos in the test chambers expressed as the mean of the initial counts; and: if N > N', where

N = the actual number of larvae at the end of the test then: $B' = B\,(N' / N)$

where: B = the actual number of normal larvae at the end of the test but, when N • N', then: $B' = B$

The means of "A" are obtained for each treatment concentration, and the latter are corrected for control response using Abbott's formula, as follows:

$$E = \frac{100\,(A - M)}{100 - M}$$

where:

E = the mean percent abnormal/dead corrected for controls
A = the mean percent abnormal/dead
M = the value of A for the controls.

13.13.1.4 The statistical tests described here must be used with a knowledge of the assumptions upon which the tests are contingent. The assistance of a statistician is recommended for analysts who are not proficient in statistics.

TABLE 5. DATA FROM BIVALVE DEVELOPMENT TEST

Copper Concentration (µg/L)	Replicate	Initial Density	Number Surviving	Number Normal	Proportion Normal
Control	A	25	22	22	1.00
	B	25	25	24	0.96
	C	25	25	25	1.00
	D	30	30	29	0.97
0.13	A	25	23	22	0.96
	B	30	30	29	0.97
	C	25	25	25	1.00
	D	25	24	23	0.96
0.25	A	25	25	23	0.92
	B	25	19	18	0.95
	C	25	21	19	0.90
	D	25	23	22	0.96
0.50	A	25	11	10	0.91
	B	25	14	13	0.93
	C	25	17	15	0.88
	D	25	15	14	0.93
1.00	A	25	8	7	0.88
	B	25	6	5	0.83
	C	25	8	7	0.88
	D	25	11	9	0.82
2.00	A	25	2	2	1.00
	B	25	3	2	0.67
	C	25	4	3	0.75
	D	25	5	2	0.40

13.13.1.5 The endpoints of toxicity tests using bivalves are based on the reduction in proportion of normally developed larvae. The IC25 is calculated using the Linear Interpolation Method (see Section 9, Chronic Toxicity Test Endpoints and Data Analysis). LOEC and NOEC values for larval development are obtained using a hypothesis testing approach such as Dunnett's Procedure (Dunnett, 1955) or Steel's Many-one Rank Test (Steel, 1959; Miller, 1981) (see Section 9). Separate analyses are performed for the estimation of the LOEC and NOEC endpoints and for the estimation of the IC25. See the Appendices for examples of the manual computations, and examples of data input and program output.

13.13.2 EXAMPLE OF ANALYSIS OF BIVALVE EMBRYO-LARVAL DEVELOPMENT DATA

13.13.2.1 Formal statistical analysis of the embryo-larval development is outlined in Figure 1. The response used in the analysis is the proportion of normally developed surviving larvae in each test or control chamber. Separate analyses are performed for the estimation of the NOEC and LOEC endpoints and for the estimation of the IC25 endpoint. Concentrations at which there is no normal development in any of the test chambers are excluded from statistical analysis of the NOEC and LOEC, but included in the estimation of the IC25.

13.13.2.2 For the case of equal numbers of replicates across all concentrations and the control, the evaluation of the NOEC and LOEC endpoints is made via a parametric test, Dunnett's Procedure, or a nonparametric test, Steel's Many-one Rank Test, on the arc sine square root transformed data. Underlying assumptions of Dunnett's Procedure, normality and homogeneity of variance, are formally tested. The test for normality is the Shapiro-Wilk's Test, and Bartlett's Test is used to test for homogeneity of variance. If either of these tests fails, the nonparametric test, Steel's Many-one Rank Test, is used to determine the NOEC and LOEC endpoints. If the assumptions of Dunnett's Procedure are met, the endpoints are estimated by the parametric procedure.

13.13.2.3 If unequal numbers of replicates occur among the concentration levels tested, there are parametric and nonparametric alternative analyses. The parametric analysis is a *t* test with the Bonferroni adjustment (see Appendix D). The Wilcoxon Rank Sum Test with the Bonferroni adjustment is the nonparametric alternative.

13.13.2.4 Example of Analysis of Embryo-Larval Development Data

13.13.2.4.1 Since the response of interest is the proportion of normally developed surviving larvae, each replicate must first be transformed by the arc sine square root transformation procedure described in Appendix B. Because there are varying numbers of survivors in the replicates, the adjustment for response proportions of zero or one will not be made. The raw and transformed data, means and variances of the transformed observations at each effluent concentration and control are listed in Table 5. The data are plotted in Figure 2.

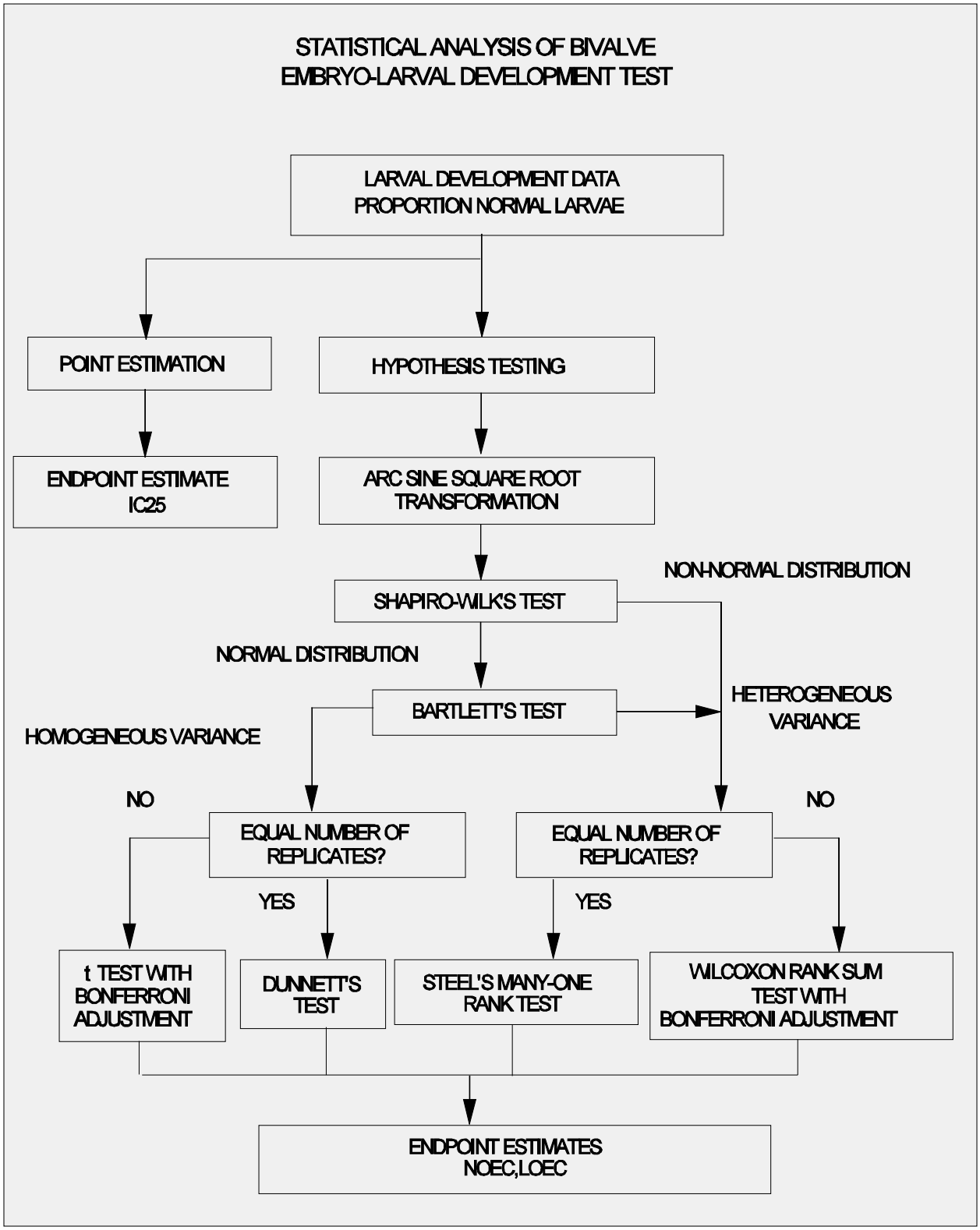

Figure 1. Flowchart for statistical analysis of the pacific oyster, *Crassostrea gigas*, and mussel, *Mytilus spp.*, development data.

13.13.2.5 Test for Normality

13.13.2.5.1 The first step of the test for normality is to center the observations by subtracting the mean of all observations within a concentration from each observation in that concentration. The centered observations are summarized in Table 6.

TABLE 6. BIVALVE EMBRYO-LARVAL DEVELOPMENT DATA

		Copper Concentration (µg/L)					
	Replicate	Control	0.13	0.25	0.50	1.00	2.00
RAW	A	1.00	0.96	0.92	0.91	0.88	1.00
	B	0.96	0.97	0.95	0.93	0.83	0.67
	C	1.00	1.00	0.90	0.88	0.88	0.75
	D	0.97	0.96	0.96	0.93	0.82	0.40
ARC SINE SQUARE ROOT TRANSFORMED	A	1.571	1.369	1.284	1.266	1.217	1.571
	B	1.369	1.397	1.345	1.303	1.146	0.959
	C	1.571	1.571	1.249	1.217	1.217	1.047
	D	1.397	1.369	1.369	1.303	1.133	0.685
Mean ($\bar{Y}_i$)		1.477	1.427	1.312	1.272	1.178	1.066
S_i^2		0.01191	0.00945	0.00303	0.00166	0.00203	0.13733
i		1	2	3	4	5	6

13.13.2.5.2 Calculate the denominator, D, of the statistic:

$$D = \sum_{i=1}^{n} (X_i - \bar{X})^2$$

Where: X_i = the ith centered observation
$\bar{X}$ = the overall mean of the centered observations
n = the total number of centered observations

13.13.2.5.3 For this set of data, n = 24

$$\bar{X} = \frac{1}{24}(-0.002) = 0.000$$

D = 0.4963

13.13.2.5.4 Order the centered observations from smallest to largest

$$X^{(1)} \bullet X^{(2)} \bullet \ldots \bullet X^{(n)}$$

where $X^{(i)}$ denotes the ith ordered observation. The ordered observations for this example are listed in Table 7

TABLE 7. ORDERED CENTERED OBSERVATIONS FOR SHAPIRO-WILK'S EXAMPLE

i	$X^{(i)}$	i	$X^{(i)}$
1	-0.381	13	-0.019
2	-0.108	14	-0.006
3	-0.107	15	0.031
4	-0.080	16	0.031
5	-0.063	17	0.033
6	-0.058	18	0.039
7	-0.058	19	0.039
8	-0.055	20	0.057
9	-0.045	21	0.094
10	-0.032	22	0.094
11	-0.030	23	0.144
12	-0.028	24	0.505

13.13.2.5.5 From Table 4, Appendix B, for the number of observations, n, obtain the coefficients a_1, a_2, ... a_k where k is n/2 if n is even and (n-1)/2 if n is odd. For the data in this example, n = 24 and k = 12. The a_i values are listed in Table 8.

13.13.2.5.6 Compute the test statistic, W, as follows:

$$W \bullet \frac{1}{D}\left[\bullet_{i \bullet 1}^{k} a_i (X^{(n \bullet i \bullet 1)} \bullet X^{(i)})\right]^2$$

The differences, $X^{(n-i+1)} - X^{(i)}$, are listed in Table 8. For the data in this example:

$$W = \frac{1}{0.4963} (0.6322)^2 = 0.805$$

TABLE 8. COEFFICIENTS AND DIFFERENCES FOR SHAPIRO-WILK'S EXAMPLE

i	a_i	$X^{(n-i+1)} - X^{(i)}$	
1	0.4493	0.886	$X^{(24)} - X^{(1)}$
2	0.3098	0.252	$X^{(23)} - X^{(2)}$
3	0.2554	0.201	$X^{(22)} - X^{(3)}$
4	0.2154	0.174	$X^{(21)} - X^{(4)}$
5	0.1807	0.120	$X^{(20)} - X^{(5)}$
6	0.1512	0.097	$X^{(19)} - X^{(6)}$
7	0.1245	0.097	$X^{(18)} - X^{(7)}$
8	0.0997	0.088	$X^{(17)} - X^{(8)}$
9	0.0764	0.076	$X^{(16)} - X^{(9)}$
10	0.0539	0.063	$X^{(15)} - X^{(10)}$
11	0.0321	0.024	$X^{(14)} - X^{(11)}$
12	0.0107	0.009	$X^{(13)} - X^{(12)}$

13.13.2.5.7 The decision rule for this test is to compare W as calculated in Subsection 5.6 to a critical value found in Table 6, Appendix B. If the computed W is less than the critical value, conclude that the data are not normally distributed. For the data in this example, the critical value at a significance level of 0.01 and n = 24 observations is 0.884. Since W = 0.805 is less than the critical value, conclude that the data are not normally distributed.

13.13.2.5.8 Since the data do not meet the assumption of normality, Steel's Many-one Rank Test will be used to analyze the embryo-larval development data.

13.13.2.6 Steel's Many-one Rank Test

13.13.2.6.1 For each control and concentration combination, combine the data and arrange the observations in order of size from smallest to largest. Assign the ranks (1, 2, ... , 8) to the ordered observations with a rank of 1 assigned to the smallest observation, rank of 2 assigned to the next larger observation, etc. If ties occur when ranking, assign the average rank to each tied observation.

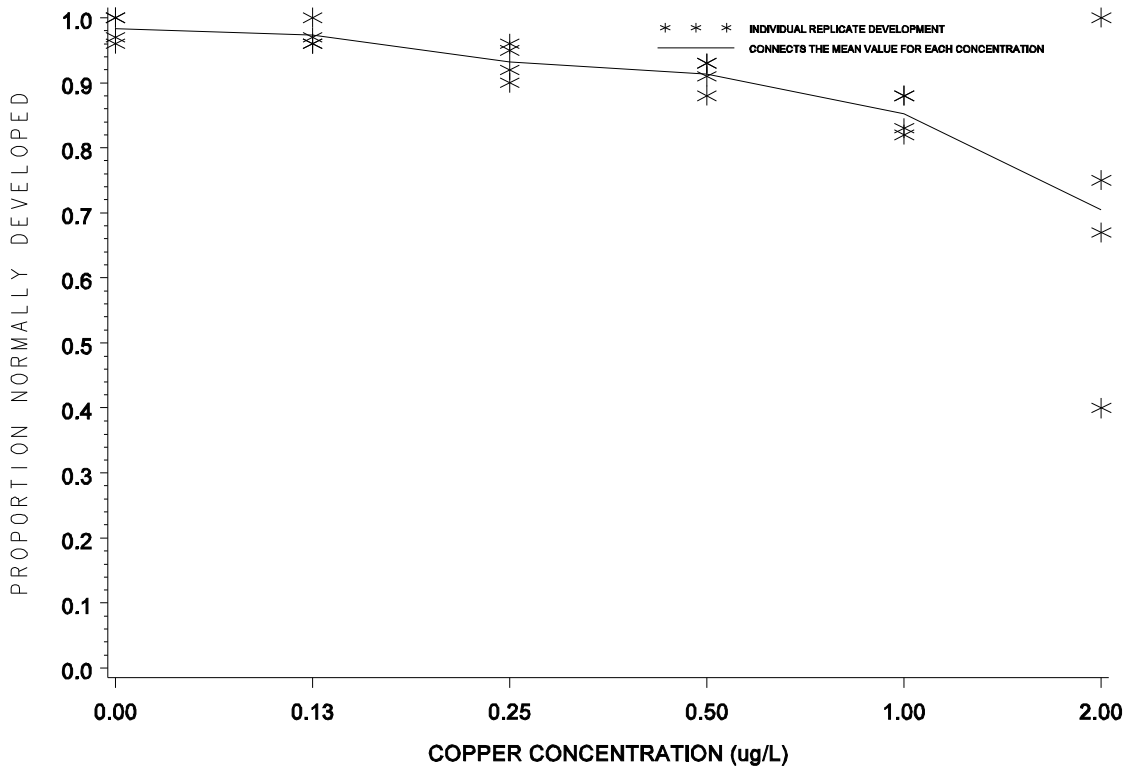

Figure 2. Plot of mean proportion of normaly developed bivalve larvae.

13.13.2.6.2 An example of assigning ranks to the combined data for the control and 0.13 µg/L concentration is given in Table 9. This ranking procedure is repeated for each control/concentration combination. The complete set of rankings is summarized in Table 10. The ranks are then summed for each concentration level, as shown in Table 11.

TABLE 9. ASSIGNING RANKS TO THE CONTROL AND 0.13 µg/L CONCENTRATION LEVEL FOR STEEL'S MANY-ONE RANK TEST

Rank	Transformed Proportion Normal	Concentration
2	1.369	0.13 µg/L
2	1.369	0.13 µg/L
2	1.369	Control
4.5	1.397	0.13 µg/L
4.5	1.397	Control
7	1.571	0.13 µg/L
7	1.571	Control
7	1.571	Control

13.13.2.6.3 For this example, determine if the survival in any of the concentrations is significantly lower than the survival in the control. If this occurs, the rank sum at that concentration would be significantly lower than the rank sum of the control. Thus compare the rank sums for the survival at each of the various concentration levels with some "minimum" or critical rank sum, at or below which the survival would be considered significantly lower than the control. At a significance level of 0.05, the minimum rank sum in a test with five concentrations (excluding the control) and four replicates is 10 (See Table 5, Appendix E).

13.13.2.6.4 Since the rank sums for the 0.50 µg/L and 1.00 µg/L concentration levels are equal to the critical value, the proportions of normal development in those concentrations are considered significantly less than that in the control. Since no other rank sum is less than or equal to the critical value, no

TABLE 10. TABLE OF RANKS[1]

Replicate	Control	Copper Concentration (µg/L) 0.13	0.25
1	1.571(7,7.5,7.5,7.5,7)	1.369(2)	1.284(2)
2	1.369(2,4.5,5,5,4)	1.397(4.5)	1.345(3)
3	1.571(7,7.5,7.5,7.5,7)	1.571(7)	1.249(1)
4	1.397(4.5,6,6,6,5)	1.369(2)	1.369(4.5)

Replicate	Copper Concentration (µg/L) (Continued) 0.50	1.00	2.00
1	1.266(2)	1.217(3.5)	1.571(7)
2	1.303(3.5)	1.146(2)	0.959(2)
3	1.217(1)	1.217(3.5)	1.047(3)
4	1.303(3.5)	1.133(1)	0.685(1)

[1]Control ranks are given in the order of the concentration with which they were ranked.

TABLE 11. RANK SUMS

Concentration µg/L Copper)	Rank Sum
0.13	15.5
0.25	10.5
0.50	10.0
1.00	10.0

other concentration has a significantly lower proportion normal than the control. Because the 0.50 µg/L concentration shows significantly lower normal development than the control while the higher 2.00 µg/L concentration does not, these test results are

considered to have an anomalous dose-response relationship and it is recommended that the test be repeated. If an NOEC and LOEC must be determined for this test, the lowest concentration with significant growth impairment versus the control is considered to the LOEC for growth. Thus, for this test, the NOEC and LOEC would be 0.25 µg/L and 0.50 µg/L, respectively.

13.13.2.7 Calculation of the ICp

13.13.2.7.1 The embryo-larval development data in Table 4 are utilized in this example. As can be seen from Table 4 and Figure 2, the observed means are monotonically non-increasing with respect to concentration (mean response for each higher concentration is not less than or equal to the mean response for the previous concentration and the responses between concentrations do not follow a linear trends). Therefore, it is not necessary to smooth the means prior to calculating the IC. The observed means, represented by $\bar{Y}_i$ become the corresponding smoothed means, M_i. Table 12 contains the response means and smoothed means and Figure 3 gives a plot of the smoothed response curve.

TABLE 12. BIVALVE MEAN LARVAL DEVELOPMENT RESPONSE AFTER SMOOTHING

Copper Conc. (µg/L)	i	Response Means, $\bar{Y}_i$ (proportion)	Smoothed Means, M_i (proportion)
Control	1	0.983	0.983
0.13	2	0.973	0.973
0.25	3	0.932	0.932
0.50	4	0.913	0.913
1.00	5	0.852	0.852
2.00	6	0.705	0.705

13.13.2.7.2 An IC25 can be estimated using the Linear Interpolation Method. A 25% reduction in mean proportion of normally developed larvae, compared to the controls, would result

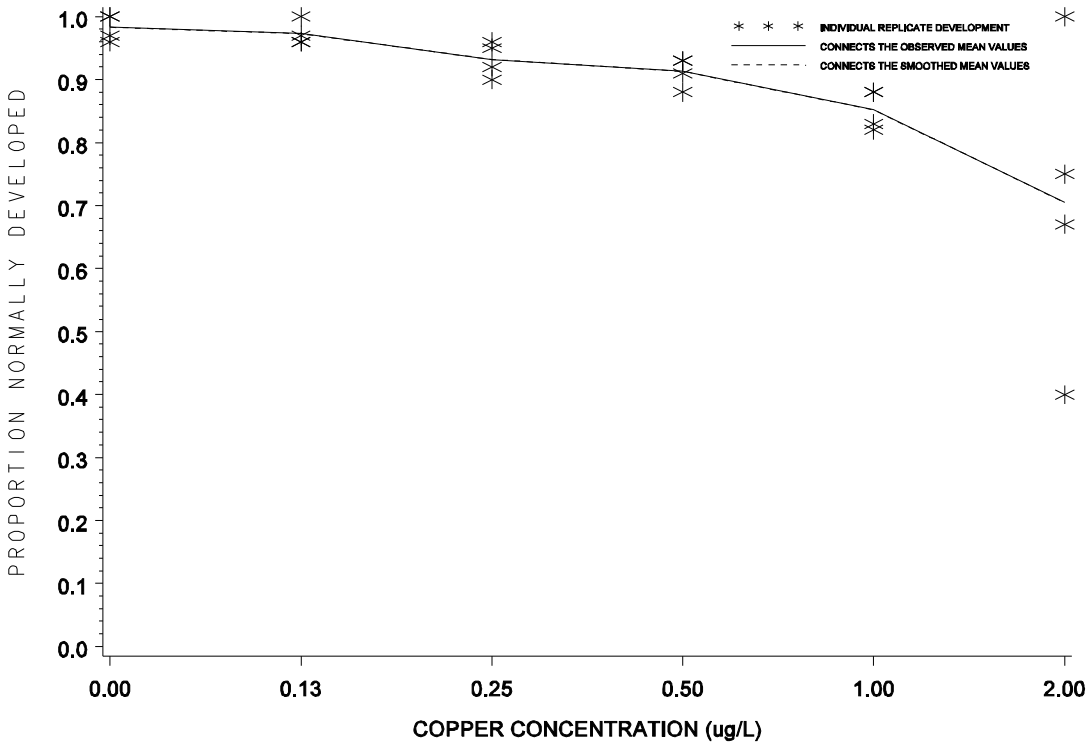

Figure 3. Plot of raw data, observed means, and smoothed means for the bivalve development data from Tables 4 and 12.

in a mean proportion of 0.737, where $M_1(1-p/100) = 0.983(1-25/100)$. Examining the means and their associated concentrations (Table 12), the response, 0.737, is bracketed by C_4 = 1.00 µg/L copper and C_5 = 2.00 µg/L copper.

13.13.2.7.3 Using the equation from Section 4.2 in Appendix L, the estimate of the IC25 is calculated as follows:

$$ICp \bullet C_j \bullet [M_1(1 \bullet p/100) \bullet M_j] \frac{(C_{(j \bullet 1)} \bullet C_j)}{(M_{(j \bullet 1)} \bullet M_j)}$$

```
     IC25 = 1.00 + [0.983(1 - 25/100) - 0.852] (2.00 - 1.00)
                                                S)))))))))))))Q
                                               (0.705 - 0.852)
                        = 1.78 µg/L.
```

13.13.2.7.4 When the ICPIN program was used to analyze this set of data, requesting 80 resamples, the estimate of the IC25 was 1.7839 µg/L. The empirical 95.0% confidence interval for the true mean was not available because the number of resamples which generated an IC25 estimate was not an even multiple of 40. The computer program output for the IC25 for this data set is shown in Figure 4.

13.14 **PRECISION AND ACCURACY**

13.14.1 PRECISION

13.14.1.1 Single-Laboratory Precision

13.14.1.1.1 Single-laboratory precision data for the *Mytilus spp*. with the reference toxicant cadmium and lyophilized pulp mill effluent with natural seawater are provided in Tables 4-5. The coefficient of variation, based on EC25, is 32.8% to 45.0% for cadmium and 14.2% to 30.6% for lyophilized pulp mill effluent. Single-laboratory precision data for the *Crassostrea gigas* with the reference toxicant cadmium and lyophilized pulp mill effluent with natural seawater are provided in Tables 6-7. The coefficient of variation, based on EC25, is 18.5% to 80.4% for cadmium and 20.8% to 43.3% for lyophilized pulp mill effluent.

13.14.1.2 Multi-laboratory Precision

Conc. ID		1	2	3	4	5	6
Conc. Tested		0	0.13	0.25	0.50	1.00	2.00
Response	1	1.00	0.96	0.92	0.91	0.88	1.00
Response	2	0.96	0.97	0.95	0.93	0.83	0.67
Response	3	1.00	1.00	0.90	0.88	0.88	0.75
Response	4	0.97	0.96	0.96	0.93	0.82	0.40

*** Inhibition Concentration Percentage Estimate ***
Toxicant/Effluent: Copper
Test Start Date: Test Ending Date:
Test Species: bivalve
Test Duration: 48 hours
DATA FILE: bivalve.icp
OUTPUT FILE: bivalve.i25

Conc. ID	Number Replicates	Concentration ug/L	Response Means	Std. Dev.	Pooled Response Means
1	4	0.000	0.983	0.021	0.983
2	4	0.130	0.973	0.019	0.973
3	4	0.250	0.932	0.028	0.932
4	4	0.500	0.913	0.024	0.913
5	4	1.000	0.852	0.032	0.852
6	4	2.000	0.705	0.247	0.705

The Linear Interpolation Estimate: 1.7839 Entered P Value: 25

Number of Resamplings: 80Those resamples not used had estimates above the highest concentration/ %Effluent.

The Bootstrap Estimates Mean: 1.6188 Standard Deviation: 0.1758

No Confidence Limits can be produced since the number of resamples generated is not a multiple of 40.
Resampling time in Seconds: 0.17 Random_Seed: -232404862

Figure 4. ICPIN program output for the IC25.

13.14.1.2.1 Multi-laboratory precision data for *Mytilus spp*. with the reference toxicant, cadmium and lyophilized pulp mill effluent are provided in Tables 12-13. The coefficient of variation for cadmium EC25 is 23.6%, and for effluent EC25 is 14.4% based on five laboratories. Multi-laboratory precision data for *Crassostrea gigas* with the reference toxicant, cadmium and lyophilized pulp mill effluent are provided in Tables 14-15. The coefficient of variation is 21.3% for cadmium EC25 and 14.2% for lyophilized pulp mill effluent EC25, based on results from five laboratories.

13.14.2 ACCURACY

13.14.2.1 The accuracy of toxicity tests cannot be determined.

TABLE 12. SINGLE AND MULTI-LABORATORY PRECISION OF THE MUSSEL, *MYTILUS SPP*., DEVELOPMENT TEST PERFORMED WITH CADMIUM CHLORIDE (CD MG/L) AS A REFERENCE TOXICANT

Month	Lab A	Lab B	Lab C	Lab D	Lab E
Oct-92	2.35	1.06	2.42	4.20	4.77
Nov-92	0.86	3.49	3.89	2.21	2.39
Dec-92	1.79	2.51	no data	2.27	3.73
Jan-93	3.69	2.25	6.77	no data	1.57
Feb-93	2.81	2.91	5.85	3.75	3.05
Mar-93	3.71	2.64	2.62	4.89	no data
Mean	2.54	2.48	4.31	3.46	3.10
SD	1.11	0.81	1.94	1.19	1.23
CV (%)	43.9	32.8	45.0	34.3	40.0

# of Labs	Statistic	EC25
5	Mean (N=5) SD CV(%)	3.18 0.75 23.6

These data are from: Pastorok, et al. (1994), West Coast Marine Species Chronic Protocol Variability Study, PTI Environmental Services, Prepared for Washington Department of Ecology, February, 1994.

TABLE 13. SINGLE AND MULTI-LABORATORY PRECISION OF THE MUSSEL, *MYTILUS SPP*., DEVELOPMENT TEST PERFORMED WITH LYOPHILIZED PULP MILL EFFLUENT (%) AS THE TOXICANT

Month	Lab A	Lab B	Lab C	Lab D	Lab E
Oct-92	1.78	1.40	2.02	1.83	1.85
Nov-92	1.57	1.94	2.70	1.98	no data
Dec-92	1.74	1.88	3.08	no data	1.87
Jan-93	3.17	2.03	2.46	1.07	no data
Feb-93	1.66	no data	no data	no data	no data
Mar-93	1.85	1.66	1.72	1.82	no data

Mean	1.96	1.78	2.40	1.68	1.86
SD	0.60	0.25	0.54	0.41	0.28
CV (%)	30.6	14.2	22.5	24.5	1.4

# of Labs	Statistic	EC25
5	Mean (n=5) SD CV(%)	1.93 0.28 14.4

These data are from: Pastorok, et al. (1994) West Coast Marine Species Chronic Protocol Variability Study, PTI Environmental Services, Prepared for Washington Department of Ecology, February, 1994.

TABLE 14. SINGLE AND MULTI-LABORATORY PRECISION OF THE OYSTER, *CRASSOSTREA GIGAS*, DEVELOPMENT TEST PERFORMED WITH CADMIUM CHLORIDE (CD MG/L) AS A REFERENCE TOXICANT

Month	Lab A	Lab B	Lab C	Lab D	Lab E
July-92	1.04	1.54	0.50	0.41	0.56
Aug-92	0.31	1.38	0.30	0.35	no data
Sept-92	0.68	0.20	0.49	no data	no data
Apr-93	no data	0.45	0.51	no data	0.95
May-93	0.46	0.30	1.05	0.52	0.83
June-93	0.26	1.55	0.93	no data	0.83
July-93	0.28	0.82	0.66	1.56	0.90

Mean	0.51	0.89	0.63	0.71	0.81
SD	0.31	0.59	0.27	0.57	0.15
CV (%)	60.6	66.7	42.1	80.4	18.5

# of Labs	Statistic	EC25
5	Mean (n=5) SD CV(%)	0.71 0.15 21.3

These data are from: Pastorok, et al. (1994), West Coast Marine Species Chronic Protocol Variability Study, PTI Environmental Services, Prepared for Washington Department of Ecology, February, 1994.

TABLE 15. SINGLE AND MULTI-LABORATORY PRECISION OF THE OYSTER, *CRASSOSTREA GIGAS*, DEVELOPMENT TEST PERFORMED WITH LYOPHILIZED PULP MILL EFFLUENT (%) AS THE TOXICANT

Month	Lab A	Lab B	Lab C	Lab D	Lab E
July-92	no data	0.91	1.28	no data	1.43
Aug-92	1.21	1.09	0.98	0.61	no data
Sept-92	0.76	1.66	0.83	no data	no data
Apr-93	0.80	1.10	1.61	1.66	no data
May-93	1.21	0.65	1.90	0.93	0.93
June-93	1.09	1.32	1.72	0.83	0.98
July-93	0.82	0.80	1.56	1.67	1.04
Mean	0.98	1.08	1.41	1.14	1.10
SD.	0.21	0.34	0.40	0.49	0.23
CV (%)	21.6	31.4	28.0	43.3	20.8

# of Labs	Statistic	EC25
5	Mean (n=5) SD CV(%)	1.14 0.16 14.2

These data are from: Pastorok, et al., (1994), West Coast Marine Species Chronic Protocol Variability Study, PTI Environmental Services, Prepared for Washington Department of Ecology, February, 1994.

APPENDIX I. BIVALVE TEST: STEP-BY-STEP SUMMARY

PREPARATION OF TEST SOLUTIONS

A. Determine test concentrations and appropriate dilution water based on NPDES permit conditions and guidance from the appropriate regulatory agency.

B. Prepare effluent test solutions by diluting well mixed unfiltered effluent using volumetric flasks and pipettes. Use hypersaline brine where necessary to maintain all test solutions at 30 ± 2‰. Include brine controls in tests that use brine.

C. Prepare a copper reference toxicant stock solution.

D. Prepare a series copper reference toxicant concentrations.

E. Sample effluent and reference toxicant solutions for physical/chemical analysis. Measure salinity, pH and dissolved oxygen from each test concentration.

F. Randomize numbers for test chambers and record the chamber numbers with their respective test concentrations on a randomization data sheet. Store the data sheet safely until after the test samples have been analyzed.

G. Place test chambers in a water bath or environmental chamber set to 18 or 20•C and allow temperature to equilibrate.

H. Measure the temperature daily in one random replicate (or separate chamber) of each test concentration. Monitor the temperature of the water bath or environmental chamber continuously.

I. At the end of the test, measure salinity, pH, and dissolved oxygen concentration from each test concentration.

PREPARATION AND ANALYSIS OF TEST ORGANISMS

A. Determine test concentrations and appropriate dilution water based on NPDES permit requirements and guidance from the appropriate regulatory agency.

B. Prepare test solutions by diluting well mixed unfiltered effluent using volumetric pipettes. Use hypersaline brine where necessary to maintain all test solutions at 30 ± 2‰. Include brine controls in tests that use brine.

C. Sample effluent and reference toxicant solutions for physical/chemical analysis. Measure salinity, pH and dissolved oxygen from each test concentration.

D. Randomize numbers for test chambers and record the chamber numbers with their respective test concentrations on a randomization data sheet. Store the data sheet safely until after the test samples have been analyzed.

E. Place test chambers in a water bath or environmental chamber set to 18 or 20•C as appropriate for the test species and allow temperature to equilibrate.

F. Measure the test solution temperature daily in a randomly located blank test chamber. Monitor the temperature of the water bath or environmental chamber continuously.

PREPARATION AND ANALYSIS OF TEST ORGANISMS

A. Obtain test organisms and hold or condition as necessary for spawning.

B. On day of test, spawn organisms, examine gametes, pool good eggs, pool good sperm.

C. Fertilize subsets of eggs with a range of sperm concentrations to obtain >90% embryogenesis without polyspermy.

D. Adjust embryo stock suspension density to 1500-3000/mL.

E. Introduce organisms to test chambers (150-300 embryos in 0.1 mL of stock).

F. Count all embryos in each of six extra controls set up for determining mean embryo density and variation. Return these to the test for later examination for developmental rate in controls.

G. Near the end of the 48-hour incubation period examine several of the extra controls to determine if development has reached the prodisoconch stage. If yes, terminate the test at 48 hours; if no, continue the test for up to 54 hours as required for complete development.

H. Terminate the test by addition of formalin.

I. Count larvae and record the number of normal prodisoconch larvae and other larvae in each test vial.

J. Analyze the data.

K. Include standard reference toxicant point estimate values in the standard quality control charts.

Sample data sheet for embryo microscopic examination.

BIVALVE DEVELOPMENT TEST: RESULTS

Bioassay No._____ Date_____

Counter_____

Number	Sample	Abnormal	Normal	%Normal	Notes

SECTION 14

RED ABALONE, *Haliotis rufescens* LARVAL DEVELOPMENT TEST METHOD

Adapted from a method developed by
John W. Hunt and Brian S. Anderson
Institute of Marine Sciences, University of California
Santa Cruz, California

(in association with)
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Marine Pollution Studies Laboratory
34500 Coast Route 1, Monterey, CA 93940

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Appendix I Step-by Step Summary

SECTION 14

RED ABALONE, *HALIOTUS RUFESCENS*
LARVAL DEVELOPMENT TEST METHOD

14.1 SCOPE AND APPLICATION

14.1.1 This method estimates the chronic toxicity of effluents and receiving waters to the larvae of red abalone, *Haliotis rufescens* during a 48-h static non-renewal exposure. The effects include the synergistic, antagonistic, and additive effects of all chemical, physical, and biological components which adversely affect the physiological and biochemical functions of the test organisms.

14.1.2 Detection limits of the toxicity of an effluent or chemical substance are organism dependent.

14.1.3 Brief excursions in toxicity may not be detected using 24-h composite samples. Also, because of the long sample collection period involved in composite sampling and because the test chambers are not sealed, highly volatile and highly degradable toxicants in the source may not be detected in the test.

14.1.4 This method is commonly used in one of two forms: (1) a definitive test, consisting of a minimum of five effluent concentrations and a control, and (2) a receiving water test(s), consisting of one or more receiving water concentrations and a control.

14.1.5 This method should be restricted to use by, or under the supervision of, professionals experienced in aquatic toxicity testing. Specific experience with any toxicity test is usually needed before acceptable results become routine.

14.2 SUMMARY OF METHOD

14.2.1 This method provides the step-by-step instructions for performing a 48-h static non-renewal test using early development of abalone larvae to determine the toxicity of substances in marine and estuarine waters. The test endpoint is normal shell development.

14.3 INTERFERENCES

14.3.1 Toxic substances may be introduced by contaminants in dilution water, glassware, sample hardware, and testing equipment (see Section 5, Facilities and Equipment, and Supplies).

14.3.2 Improper effluent sampling and handling may adversely affect test results (see Section 8, Effluent and Receiving Water Sampling, and Sample Handling, and Sample Preparation for Toxicity Tests).

14.4 SAFETY

14.4.1 See Section 3, Health and Safety.

14.5 APPARATUS AND EQUIPMENT

14.5.1 Tanks, trays, or aquaria -- for holding and acclimating adult red abalone, e.g., standard salt water aquarium or Instant Ocean Aquarium (capable of maintaining seawater at 10-20•C), with appropriate filtration and aeration system.

14.5.2 Air pump, air lines, and air stones -- for aerating water containing broodstock or for supplying air to test solutions with low dissolved oxygen.

14.5.3 Constant temperature chambers or water baths -- for maintaining test solution temperature and keeping dilution water supply, gametes, and embryo stock suspensions at test temperature (15•C) prior to the test.

14.5.4 Water purification system -- Millipore Super-Q, Deionized water (DI) or equivalent.

14.5.5 Refractometer -- for determining salinity.

14.5.6 Hydrometer(s) -- for calibrating refractometer.

14.5.7 Thermometers, glass or electronic, laboratory grade -- for measuring water temperatures.

14.5.8 Thermometer, National Bureau of Standards Certified (see USEPA METHOD l70.l, USEPA, l979) -- to calibrate laboratory thermometers.

14.5.9 pH and DO meters -- for routine physical and chemical measurements.

14.5.10 Standard or micro-Winkler apparatus -- for determining DO (optional) and calibrating the DO meter.

14.5.11 Winkler bottles -- for dissolved oxygen determinations.

14.5.12 Balance -- Analytical, capable of accurately weighing to 0.0001 g.

14.5.13 Fume hood -- to protect the analyst from effluent or formaldehyde fumes.

14.5.14 Glass stirring rods -- for mixing test solutions.

14.5.15 Graduated cylinders -- Class A, borosilicate glass or non-toxic plastic labware, 50-l000 mL for making test solutions. (Note: not to be used interchangeably for gametes or embryos and test solutions).

14.5.16 Volumetric flasks -- Class A, borosilicate glass or non-toxic plastic labware, 10-1000 mL for making test solutions.

14.5.17 Pipets, automatic -- adjustable, to cover a range of delivery volumes from 0.010 to 1.000 mL.

14.5.18 Pipet bulbs and fillers -- PROPIPET® or equivalent.

14.5.19 Wash bottles -- for reagent water, for topping off graduated cylinders, for rinsing small glassware and instrument electrodes and probes.

14.5.20 Wash bottles -- for dilution water.

14.5.21 20-liter cubitainers or polycarbonate water cooler jugs -- for making hypersaline brine.

14.5.22 Cubitainers, beakers, or similar chambers of non-toxic composition for holding, mixing, and dispensing dilution water and other general non-effluent, non-toxicant contact uses. These should be clearly labeled and not used for other purposes.

14.5.23 Beakers, 1,000 mL borosilicate glass -- for mixing gametes for fertilization of eggs.

14.5.24 Beakers, 250 mL borosilicate glass -- for preparation of test solutions.

14.5.25 Counter, two unit, 0-999 -- for recording counts of larvae.

14.5.26 Inverted or compound microscope -- for inspecting gametes and making counts of larvae.

14.5.27 Perforated plunger -- for stirring egg solutions.

14.5.28 Supply of *Macrocystis* or other macroalgae (if holding broodstock for longer than 5 days) -- for feeding abalone.

14.5.29 Stainless steel butter knife, rounded smooth-edged blade (for handling adult abalone). Abalone irons and plastic putty knives have also been used successfully.

14.5.30 Sieve or screened tube, approximately 37 µm-mesh -- for retaining larvae at the end of the test.

14.5.31 60 µm NITEX® filter -- for filtering receiving water.

14.6 REAGENTS AND SUPPLIES

14.6.1 Sample containers -- for sample shipment and storage (see Section 8, Effluent and Receiving Water Sampling, and Sample Handling, and Sample Preparation for Toxicity Tests).

14.6.2 Data sheets (one set per test) -- for data recording (See Appendix I).

14.6.3 Tape, colored -- for labelling test chambers and containers.

14.6.4 Markers, water-proof -- for marking containers, etc.

14.6.5 Parafilm -- to cover graduated cylinders and vessels containing gametes, embryos.

14.6.6 Gloves, disposable -- for personal protection from contamination.

14.6.7 Pipets, serological -- l-l0 mL, graduated.

14.6.8 Pipet tips -- for automatic pipets.

14.6.9 Coverslips -- for microscope slides.

14.6.10 Lens paper -- for cleaning microscope optics.

14.6.11 Laboratory tissue wipes -- for cleaning and drying electrodes, microscope slides, etc.

14.6.12 Disposable countertop covering -- for protection of work surfaces and minimizing spills and contamination.

14.6.13 pH buffers 4, 7, and l0 (or as per instructions of instrument manufacturer) -- for standards and calibration check (see USEPA Method l50.l, USEPA, l979).

14.6.14 Membranes and filling solutions -- for dissolved oxygen probe (see USEPA Method 360.l, USEPA, l979), or reagents for modified Winkler analysis.

14.6.15 Laboratory quality assurance samples and standards -- for the above methods.

14.6.16 Test chambers -- 600 mL, five chambers per concentration. The chambers should be borosilicate glass (for effluents) or nontoxic disposable plastic labware (for reference toxicants). To avoid contamination from the air and excessive evaporation of test solutions during the test, the chambers should be covered during the test with safety glass plates or a plastic sheet (6 mm thick).

14.6.17 Formaldehyde, 37% (Concentrated Formalin) -- for preserving larvae. Note: formaldehyde has been identified as a

carcinogen and is irritating to skin and mucous membranes. It should not be used at a concentration higher than necessary to achieve morphological preservation of larvae for counting and only under conditions of maximal ventilation and minimal opportunity for volatilization into room air.

14.6.18 Tris (hydroxymethyl) aminomethane and hydrogen peroxide (for H_2O_2 spawning method) -- for spawning abalone.

14.6.19 Reference toxicant solutions (see Subsection 14.10.2.4 and see Section 4, Quality Assurance).

14.6.20 Reagent water -- defined as distilled or deionized water that does not contain substances which are toxic to the test organisms (see Section 5, Facilities, Equipment, and Supplies and Section 7, Dilution Water).

14.6.21 Effluent and receiving water -- see Section 8, Effluent and Surface Water Sampling, and Sample Handling, and Sample Preparation for Toxicity Tests.

14.6.22 Dilution water and hypersaline brine -- see Section 7, Dilution Water and Section 14.6.24, Hypersaline Brines. The dilution water should be uncontaminated 1-µm-filtered natural seawater. Hypersaline brine should be prepared from dilution water.

14.6.23 HYPERSALINE BRINES

14.6.23.1 Most industrial and sewage treatment effluents entering marine and estuarine systems have little measurable salinity. Exposure of larvae to these effluents will usually require increasing the salinity of the test solutions. It is important to maintain an essentially constant salinity across all treatments. In some applications it may be desirable to match the test salinity with that of the receiving water (See Section 7.1). Two salt sources are available to adjust salinities -- artificial sea salts and hypersaline brine (HSB) derived from natural seawater. Use of artificial sea salts is necessary only when high effluent concentrations preclude salinity adjustment by HSB alone.

14.6.23.2 Hypersaline brine (HSB) can be made by concentrating natural seawater by freezing or evaporation. HSB should be made from high quality, filtered seawater, and can be added to the effluent or to reagent water to increase salinity. HSB has several desirable characteristics for use in effluent toxicity testing. Brine derived from natural seawater contains the necessary trace metals, biogenic colloids, and some of the microbial components necessary for adequate growth, survival, and/or reproduction of marine and estuarine organisms, and it can be stored for prolonged periods without any apparent degradation. However, even if the maximum salinity HSB (100‰) is used as a diluent, the maximum concentration of effluent (0‰) that can be tested is 66% effluent at 34‰ salinity (see Table 1).

14.6.23.3 High quality (and preferably high salinity) seawater should be filtered to at least 10 µm before placing into the freezer or the brine generator. Water should be collected on an incoming tide to minimize the possibility of contamination.

14.6.23.4 Freeze Preparation of Brine

14.6.23.4.1 A convenient container for making HSB by freezing is one that has a bottom drain. One liter of brine can be made from four liters of seawater. Brine may be collected by partially freezing seawater at -10 to -20•C until the remaining liquid has reached the target salinity. Freeze for approximately six hours, then separate the ice (composed mainly of fresh water) from the remaining liquid (which has now become hypersaline).

14.6.23.4.2 It is preferable to monitor the water until the target salinity is achieved rather than allowing total freezing followed by partial thawing. Brine salinity should never exceed 100‰. It is advisable not to exceed about 70‰ brine salinity unless it is necessary to test effluent concentrations greater than 50%.

14.6.23.4.3 After the required salinity is attained, the HSB should be filtered through a 1 µm filter and poured directly into portable containers (20-L cubitainers or polycarbonate water cooler jugs are suitable). The brine storage containers should be capped and labelled with the salinity and the date the brine was generated. Containers of HSB should be stored in the dark at

4•C (even room temperature has been acceptable). HSB is usually of acceptable quality even after several months in storage.

14.6.23.5 Heat Preparation of Brine

TABLE 1. MAXIMUM EFFLUENT CONCENTRATION (%) THAT CAN BE TESTED AT 34‰ WITHOUT THE ADDITION OF DRY SALTS GIVEN THE INDICATED EFFLUENT AND BRINE SALINITIES.

Effluent Salinity ‰	Brine 60 ‰	Brine 70 ‰	Brine 80 ‰	Brine 90 ‰	Brine 100 ‰
0	43.33	51.43	57.50	62.22	66.00
1	44.07	52.17	58.23	62.92	66.67
2	44.83	52.94	58.97	63.64	67.35
3	45.61	53.73	59.74	64.37	68.04
4	46.43	54.55	60.53	65.12	68.75
5	47.27	55.38	61.33	65.88	69.47
10	52.00	60.00	65.71	70.00	73.33
15	57.78	65.45	70.77	74.67	77.65
20	65.00	72.00	76.67	80.00	82.50
25	74.29	80.00	83.64	86.15	88.00

14.6.23.5.1 The ideal container for making brine using heat-assisted evaporation of natural seawater is one that (1) has a high surface to volume ratio, (2) is made of a non-corrosive material, and (3) is easily cleaned (fiberglass containers are ideal). Special care should be used to prevent any toxic materials from coming in contact with the seawater being used to generate the brine. If a heater is immersed directly into the seawater, ensure that the heater materials do not corrode or leach any substances that would contaminate the brine. One successful method is to use a thermostatically controlled heat

exchanger made from fiberglass. If aeration is needed, use only oil-free air compressors to prevent contamination.

14.6.23.5.2 Before adding seawater to the brine generator, thoroughly clean the generator, aeration supply tube, heater, and any other materials that will be in direct contact with the brine. A good quality biodegradable detergent should be used, followed by several (at least three) thorough reagent water rinses.

14.6.23.5.3 Seawater should be filtered to at least 10 µm before being put into the brine generator. The temperature of the seawater is increased slowly to 40•C. The water should be aerated to prevent temperature stratification and to increase water evaporation. The brine should be checked daily (depending on the volume being generated) to ensure that the salinity does not exceed 100‰ and that the temperature does not exceed 40•C. Additional seawater may be added to the brine to obtain the volume of brine required.

14.6.23.5.4 After the required salinity is attained, the HSB should be filtered through a 1 µm filter and poured directly into portable containers (20-L cubitainers or polycarbonate water cooler jugs are suitable). The brine storage containers should be capped and labelled with the salinity and the date the brine was generated. Containers of HSB should be stored in the dark at 4•C (even room temperature has been acceptable). HSB is usually of acceptable quality even after several months in storage.

14.6.23.6 Artificial Sea Salts

14.6.23.6.1 No data from red abalone tests using sea salts or artificial seawater (e.g., GP2) are available for evaluation at this time, and their use must be considered provisional.

14.6.23.7 Dilution Water Preparation from Brine

14.6.23.7.1 Although salinity adjustment with brine is the preferred method, the use of high salinity brines and/or reagent water has sometimes been associated with discernible adverse effects on test organisms. For this reason, it is recommended that only the minimum necessary volume of brine and reagent water be used to offset the low salinity of the effluent, and that

brine controls be included in the test. The remaining dilution water should be natural seawater. Salinity may be adjusted in one of two ways. First, the salinity of the highest effluent test concentration may be adjusted to an acceptable salinity, and then serially diluted. Alternatively, each effluent concentration can be prepared individually with appropriate volumes of effluent and brine.

14.6.23.7.2 When HSB and reagent water are used, thoroughly mix together the reagent water and HSB before mixing in the effluent. Divide the salinity of the HSB by the expected test salinity to determine the proportion of reagent water to brine. For example, if the salinity of the brine is 100‰ and the test is to be conducted at 34‰, 100‰ divided by 34‰ = 2.94. The proportion of brine is 1 part plus 1.94 parts reagent water. To make 1 L of dilution water at 34‰ salinity from a HSB of 100‰, 340 mL of brine and 660 mL of reagent water are required. Verify the salinity of the resulting mixture using a refractometer.

14.6.23.8 Test Solution Salinity Adjustment

14.6.23.8.1 Table 2 illustrates the preparation of test solutions (up to 50% effluent) at 34‰ by combining effluent, HSB, and dilution water. Note: if the highest effluent concentration does not exceed 50% effluent, it is convenient to prepare brine so that the sum of the effluent salinity and brine salinity equals 68‰; the required brine volume is then always equal to the effluent volume needed for each effluent concentration as in the example in Table 2.

14.6.23.8.2 Check the pH of all test solutions and adjust to within 0.2 units of dilution water pH by adding, dropwise, dilute hydrochloric acid or sodium hydroxide (see Section 8.8.9, Effluent and Receiving Water Sampling, Sample Handling, and Sample Preparation for Toxicity Tests).

14.6.23.8.3 To calculate the amount of brine to add to each effluent dilution, determine the following quantities: salinity of the brine (SB, in ‰), the salinity of the effluent (SE, in ‰), and volume of the effluent to be added (VE, in mL). Then use the following formula to calculate the volume of brine (VB, in mL) to be added:

$$VB = VE \times (34 - SE)/(SB - 34)$$

14.6.23.8.4 This calculation assumes that dilution water salinity is 34 ± 2‰.

14.6.23.9 Preparing Test Solutions

14.6.23.9.1 Two hundred mL of test solution are needed for each test chamber. To prepare test solutions at low effluent concentrations (<6%), effluents may be added directly to dilution water. For example, to prepare 1% effluent, add 10 mL of effluent to a 1-liter volumetric flask using a volumetric pipet or calibrated automatic pipet. Fill the volumetric flask to the 1-L mark with dilution water, stopper it, and shake to mix. Distribute equal volumes into the replicate test chambers.

14.6.23.9.2 To prepare a test solution at higher effluent concentrations, hypersaline brine must usually be used. For example, to prepare 40% effluent, add 400 mL of effluent to a 1-liter volumetric flask. Then, assuming an effluent salinity of 2‰ and a brine salinity of 66‰, add 400 mL of brine (see equation above and Table 2) and top off the flask with dilution water. Stopper the flask and shake well. Distribute equal volumes into the replicate test chambers.

14.6.23.10 Brine Controls

14.6.23.10.1 Use brine controls in all tests where brine is used. Brine controls contain the same volume of brine as does the highest effluent concentration using brine, plus the volume of reagent water needed to reproduce the hyposalinity of the effluent in the highest concentration, plus dilution water. Calculate the amount of reagent water to add to brine controls by rearranging the above equation, (See, 16.6.23.8.3) setting SE = 0, and solving for VE.

$$VE = VB \times (SB - 34)/(34 - SE)$$

If effluent salinity is essentially 0‰, the reagent water volume needed in the brine control will equal the effluent volume at the highest test concentration. However, as effluent salinity and effluent concentration increase, less reagent water volume is needed.

14.6.24 TEST ORGANISMS

14.6.24.1 The test organisms used for this test are red abalone, *Haliotis rufescens*. This large gastropod mollusc is harvested commercially in southern California and supports a popular recreational fishery throughout the state. It consumes a variety of seaweeds and small incidental organisms, and is an important food source for sea otters, lobsters, and octopods (Hines and Pearse 1892). Abalone are "broadcast" spawners that reproduce by equivalent.ejecting large numbers of gametes into the water column, where fertilization takes place externally. Free-swimming larvae hatch as trochophores, then undergo torsion while passing through a veliger stage. Abalone larvae do not feed during their one to three weeks in the plankton, but exist on energy stored in the yolk sack, supplemented perhaps by the uptake of dissolved amino acids. Once larvae come into contact with suitable substrate, they metamorphose and begin to consume benthic algae using a rasp-like tongue (the radula). Red abalone become reproductive after about two years at a length of about 7 cm, and can live for at least 25 years, growing to 30 cm in length. Refer to Hahn (1989) for a review of abalone life history and culture to Martin et al. (1977), Morse et al (1979) and Hunt and Anderson (1989 and 1993) for previous toxicity studies.

14.6.24.2 Species Identification

14.6.24.2.1 Broodstock should be positively identified to species. Epipodal characteristics provide the best means of identification. All California haliotids have a lacey epipodial fringe, except for the red and black abalone, which have smooth, lobed epipodia. The red abalone can be distinguished from the black by shell coloration and by the number of respiratory pores in the shell (reds have 3 to 4, blacks have 5 to 8). For further information on abalone taxonomy consult Owen et al. (1971), and Morris et al. (1980).

14.6.24.3 Obtaining Broodstock

14.6.24.3.1 Mature red abalone broodstock can be collected from rocky substrates from the intertidal to depths exceeding 30 meters. They are found most commonly in crevices in areas where there is an abundance of macroalgae. State collection permits are usually required for collecting abalone. Collection of

TABLE 2. EXAMPLES OF EFFLUENT DILUTION SHOWING VOLUMES OF EFFLUENT (x‰), BRINE, AND DILUTION WATER NEEDED FOR ONE LITER OF EACH TEST SOLUTION.

FIRST STEP: Combine brine with reagent water or natural seawater to achieve a brine of 68-x‰ and, unless natural seawater is used for dilution water, also a brine-based dilution water of 34‰.

SERIAL DILUTION:

Step 1. Prepare the highest effluent concentration to be tested by adding equal volumes of effluent and brine to the appropriate volume of dilution water. An example using 40% is shown.

Effluent Conc. (%)	Effluent x‰	Brine (68-x)‰	Dilution Water* 34‰
40	800 mL	800 mL	400 mL

Step 2. Use either serially prepared dilutions of the highest test concentration or individual dilutions of 100% effluent.

Effluent Conc. (%)	Effluent Source	Dilution Water* (34‰)
20	1000 mL of 40%	1000 mL
10	1000 mL of 20%	1000 mL
5	1000 mL of 10%	1000 mL
2.5	1000 mL of 5%	1000 mL
Control	none	1000 mL

INDIVIDUAL PREPARATION

Effluent Conc. (%)	Effluent x‰	Brine (68-x)‰	Dilution Water* 34‰
40	400 mL	400 mL	200 mL
20	200 mL	200 mL	600 mL
10	100 mL	100 mL	800 mL
5	50 mL	50 mL	900 mL
2.5	25 mL	25 mL	950 mL
Control	none	none	1000 mL

*May be natural seawater or brine-reagent water.

abalone is regulated by California law. Collectors must obtain a scientific collectors permit from the California Department of Fish and Game and observe any regulations regarding collection, transfer, and maintenance of abalone broodstock.

14.6.24.3.2 While abalone captured in the wild can be induced to spawn, those grown or conditioned in the laboratory have been more dependable. Commercial mariculture facilities in California produce large numbers of abalone, and distribution systems exist to supply live spawners to a number of market areas. In any case, broodstock should be obtained from sources free of contamination by toxic substances to avoid genetic or physiological preadaptation to pollutants.

14.6.24.3.3 Abalone broodstock can be transported for short time periods from the field or supply facility in clean covered plastic buckets filled with seawater. Use compressed air, or battery powered pumps to supply aeration. Compressed oxygen is not recommended because bubbled oxygen may induce unintended spawning (Morse et al., 1977). Maintain water temperatures within 3•C of the temperature at the collecting site. Four abalone in a 15-liter bucket should remain healthy for up to four hours under these conditions.

14.6.24.3.4 Abalone can be transported for up to 30 hours in sealed, oxygen-filled plastic bags containing moist (seawater) polyfoam sponges (Hahn, 1989). Cut the polyfoam into sections (about 20 X 40 cm) and allow them to soak in clean seawater for a few minutes. New sponges should be leached in seawater for at least 24 hours. Rinse the sponges in fresh seawater and wring them out well. Place the polyfoam inside double plastic trash bags, then place the abalone on the moist foam. It is important that there is no standing water in the bags. Put the abalone bags into an ice chest (10 to 15 liter), fill the bags with pure oxygen, squeeze the bags to purge out all the air, then refill with oxygen (approximately three liters of oxygen gas will support eight abalone). Seal the bags (air-tight) with a tie or rubber band. Wrap two small (one-liter) blue ice blocks in sections of newspaper (about 15 pages thick) for insulation, and place the wrapped blue ice in a sealed plastic bag in the chest on top of the abalone bags. Fill any remaining space with packing and seal the box for shipping. Avoid transporting the ice chest in temperatures below freezing or above 30•C.

14.6.24.4 Broodstock Culture and Handling

14.6.24.4.1 At the testing facility, place the abalone in aerated tanks with flowing seawater (1 to 2 liter/min). With high water quality, water flow, and aeration, abalone 8 to 10 cm long can be kept at a density of one per liter of tank space or one per 100 cm^2 of tank surface area, whichever provides the lower density. Density should be cut to a maximum of 0.5 per liter in recirculating systems and to a maximum of 0.25 per liter in static tanks. Tanks should be covered for shade and to prevent escape. Drain and rinse culture tanks twice weekly to prevent build-up of detritus. Remove any dead abalone immediately, and drain and scrub its tank.

14.6.24.4.2 Ideal maintenance temperature is 15 ± 1•C, the toxicity test temperature (see also Leighton, 1974). If broodstock are to be held for longer than 5 days at the testing facility, feed broodstock with blades of the giant kelp, *Macrocystis*. Feed to slight excess; large amounts of uneaten algae will foul culture water. If *Macrocystis* is unavailable, other brown algae (*Nereocystis*, *Egregia*, *Eisenia*) or any fleshy red algae can be substituted (Hahn, 1989).

14.6.24.4.3 Recirculating tanks should be equipped with biological or activated carbon filtration systems and oyster shell beds to maintain water quality. Measure the ammonia content of static or recirculating seawater daily to monitor the effectiveness of the filtration system. Un-ionized ammonia concentrations should not exceed 20 µg/liter and total ammonia concentrations should not exceed 1.0 mg/liter. Supply constant aeration and temperature control. Add only a few blades of algal food at each cleaning to prevent its accumulation and decay.

14.6.24.4.4 When handling abalone, use a rounded, dull-bladed stainless-steel butter knife, abalone iron, or plastic putty knife to release the animal's grip on the substrate. Gently slide the flat dull blade under the foot at the posterior end near the beginning of the shell whorl, and slide it under about two-thirds of the foot. Apply constant pressure to keep the front edge of the blade against the substrate and not up into the foot. Quickly and gently lift the foot off the substrate. A smooth deliberate motion is more effective and less damaging than repeated prying.

14.6.24.4.5 Assess the reproductive condition of the broodstock by examining the gonads, located under the right posterior edge of the shell. An abalone placed upside down on a flat surface will soon relax and begin moving the foot trying to right itself. Take advantage of this movement and use the dull blade to bend the foot away from the gonad area for inspection. The female ovary is jade green, the male testes are cream-colored. When the gonad fully envelopes the dark blue-gray conical digestive gland and is bulky along its entire length, the abalone is ready for spawning (Hahn, 1989). Ripe (recrudescent) spawners have a distinct color difference between the gray digestive gland and the green or cream-colored gonad. Less developed gonads appear gray (in females) or brown (in males).

14.6.24.4.6 Abalone 7 to 10 cm in shell length are recommended in broodstock. They are easier to handle than larger ones, and can be spawned more often (approximately every four months under suitable culture conditions; Ault, 1985). Though spawning fewer eggs than larger abalone, 10 cm abalone will produce over 100,000 eggs at a time (Ault, 1985). Twenty to thirty-five thousand eggs are needed for a single toxicant test, depending on test design. For further information of red abalone culture, see Ebert and Houk (1984) or Hahn (1989).

14.6.24.5 Culture Materials

14.6.24.5.1 See Section 4, Quality Assurance Section for a discussion of suitable materials to be used in laboratory culture of abalone. Be sure all new materials are properly leached in seawater before use. After use, all culture materials should be washed in soap and water, then rinsed with seawater before reuse.

14.7 EFFLUENT AND RECEIVING WATER COLLECTION, PRESERVATION, AND STORAGE

14.7.1 See Section 8, Effluent and Receiving Water Sampling, Sample Handling, and Sample Preparation for Toxicity Tests.

14.8 CALIBRATION AND STANDARDIZATION

14.8.1 See Section 4, Quality Assurance.

14.9 QUALITY CONTROL

14.9.1 See Section 4, Quality Assurance.

14.10 **TEST PROCEDURES**

14.10.1 TEST DESIGN

14.10.1.1 The test consists of at least five effluent concentrations plus a dilution water control. Tests that use brine to adjust salinity must also contain five replicates of a brine control.

14.10.1.2 Effluent concentrations are expressed as percent effluent.

14.10.2 TEST SOLUTIONS

14.10.2.1 Receiving waters

14.10.2.1.1 The sampling point is determined by the objectives of the test. At estuarine and marine sites, samples are usually collected at mid-depth. Receiving water toxicity is determined with samples used directly as collected or with samples passed through a 60 µm NITEX® filter and compared without dilution, against a control. Using five replicate chambers per test, each containing 200 mL would require approximately 1 L of sample per test.

14.10.2.2 Effluents

14.10.2.2.1 The selection of the effluent test concentrations should be based on the objectives of the study. A dilution factor of at least 0.5 is commonly used. A dilution factor of 0.5 provides hypothesis test discrimination of ± 100%, and testing of a 16 fold range of concentrations. Hypothesis test discrimination shows little improvement as dilution factors are increased beyond 0.5 and declines rapidly if smaller dilution factors are used. **USEPA recommends that one of the five effluent treatments must be a concentration of effluent mixed with dilution water which corresponds to the permittee's instream waste concentration (IWC).** At least two of the effluent treatments must be of lesser effluent concentration than the IWC,

with one being at least one-half the concentration of the IWC. If 100‰ HSB is used as a diluent, the maximum concentration of effluent that can be tested will be 66% at 34‰ salinity.

14.10.2.2.2 If the effluent is known or suspected to be highly toxic, a lower range of effluent concentrations should be used (such as 25%, 12.5%, 6.25%, 3.12% and 1.56%).

14.10.2.2.3 The volume in each test chamber is 200 mL.

14.10.2.2.4 Effluent dilutions should be prepared for all replicates in each treatment in one container to minimize variability among the replicates. Dispense into the appropriate effluent test chambers.

14.10.2.3 Dilution Water

14.10.2.3.1 Dilution water should be uncontaminated 1-µm-filtered natural seawater or hypersaline brine prepared from uncontaminated natural seawater plus reagent water (see Section 7, Dilution Water). Natural seawater may be uncontaminated receiving water. This water is used in all dilution steps and as the control water.

14.10.2.4 Reference Toxicant Test

14.10.2.4.1 Reference toxicant tests should be conducted as described in Quality Assurance (see Section 4.7).

14.10.2.4.2 The preferred reference toxicant for red abalone is zinc sulfate ($ZnSO_4 \circ H_2O$). Reference toxicant tests provide an indication of the sensitivity of the test organisms and the suitability of the testing laboratory (see Section 4 Quality Assurance). Another toxicant may be specified by the appropriate regulatory agency. Prepare a 10,000 µg/L zinc stock solution by adding 0.0440 g of zinc sulfate ($ZnSO_4 \circ H_2O$) to one liter of reagent water in a polyethylene volumetric flask. Alternatively, certified standard solutions can be ordered from commercial companies.

14.10.2.4.3 Reference toxicant solutions should be five replicates each of 0 (control), 10, 18, 32, and 56, and 100 µg/L total zinc. Prepare one liter of each concentration by adding 0,

1.0, 1.8, 3.2, 5.6, and 10.0 mL of stock solution, respectively, to one-liter volumetric flasks and fill with dilution water. Start with control solutions and progress to the highest concentration to minimize contamination.

14.10.2.4.4 If the effluent and reference toxicant tests are to be run concurrently, then the tests must use embryos from the same spawn. The tests must be handled in the same way and test solutions delivered to the test chambers at the same time. Reference toxicant tests must be conducted at 34 ± 2‰.

14.10.3 COLLECTION OF GAMETES FOR THE TEST

14.10.3.1 Spawning Induction

14.10.3.1.1 Note: Before beginning the spawning induction process, be sure that test solutions will be mixed, sampled, and temperature equilibrated in time to receive the newly fertilized eggs. Spawning induction generally takes about three hours, but if embryos are ready before test solutions are at the proper temperature, the delay may allow embryos to develop past the one-cell stage before transfer to the toxicant. Transfer can then damage the embryos, leading to unacceptable test results.

14.10.3.1.2 Culture work (spawning, etc.) and toxicant work should be done in separate laboratory rooms, and care should be taken to avoid contaminating organisms prior to testing.

14.10.3.1.3 Ripe abalone can be induced to spawn by stimulating the synthesis of prostoglandin-endoperoxide in the reproductive tissues (Morse et al., 1977). This can be done in two ways: addition of hydrogen peroxide to seawater buffered with Tris (Morse et al., 1977), or irradiation of seawater with ultraviolet light (Kikuchi and Uki, 1974). The first method is preferable for small laboratories because it avoids the cost and maintenance requirements of a UV system. If a UV system is available, this method may be preferable because it is simple, does not use chemicals that could accidentally harm larvae, and is considered to be less likely to force gametes from unripe adults.

14.10.3.1.4 If brood stock are shipped to the laboratory by a supplier, it is important to allow two days or more for laboratory acclimation before spawning induction; this should

increase the probability of achieving a successful spawn of viable gametes. Always bring brood stock up to acclimation temperature slowly to avoid premature spawning.

14.10.3.2 Hydrogen Peroxide Method

14.10.3.2.1 Select four ripe male abalone and four ripe females. Clean their shells of any loose debris. Place the males in one clean polyethylene bucket and the females in another. Cover the buckets with a tight fitting perforated lid, supply the chambers with flowing or recirculating (1 liter/minute) 20-µm-filtered seawater (15•C), and leave the animals without food for 24 to 48 hours to acclimate and eliminate wastes. If flowing seawater is unavailable, keep the spawners in larger (>30 liter) aquaria with aeration at 15 ± 1•C for 24 hours without food to eliminate wastes. Three hours prior to the desired spawning time, drain the buckets, wipe and rinse out mucus and debris, and refill with 6 liters of 1 µm-filtered seawater. If abalone have been kept in larger aquaria, put them in the buckets at this time. Check the abalone from time to time to make sure they remain underwater. Add air stones to the buckets and keep them aerated until spawning begins.

14.10.3.2.1 Dissolve 12.1 g of Tris into 50 mL of reagent water. When the Tris has dissolved completely, mix the hydrogen peroxide (H_2O_2) solution in a separate flask by pouring 10 mL of fresh* refrigerated H_2O_2 (30%) into 40 mL of refrigerated reagent water (1:5 dilution). Pour 25 mL of Tris solution and 25 mL of H_2O_2 solution into each of the spawning buckets (male and female). Stir well to mix; the final concentration in the spawning buckets will be approximately 6 mM Tris (pH = 9.1) and 5 m H_2O_2. Allow the abalone to remain in contact with the chemicals for 2.5 hours at 15 ± 1•C. The chemical reaction is temperature dependent (three hours of contact with H_2O_2 would be necessary at 11•C). Temperatures higher than 15•C are not recommended for spawning. Maintain constant aeration. Since females often begin spawning after the males, it may be useful to induce male spawning 15-30 minutes later, however egg quality should not be compromised if females spawn first (See 14.10.3.3.2 below).

*Note: Hydrogen peroxide loses potency over time. Purchase reagent or certified grade H_2O_2 in small containers (100

mL). Store unopened containers for no more than one year, and discard open containers after one month. Mark the purchase date and opening date on all containers, and keep all containers refrigerated.

14.10.3.2.3 After 2.5 hours, empty the spawning buckets, rinse them well, and refill them to the top with fresh dilution water seawater at the same temperature (15 ± 1•C). Keep the containers clean by siphoning away mucus and debris. Maintain constant aeration until spawning begins, then remove the air stones. The abalone begin spawning about three hours after the introduction of the chemicals (at 15 ± 1•C). Eggs are dark green and are visible individually to the naked eye, sperm appear as white clouds emanating from the respiratory pores.

14.10.3.2.4 If spawning begins before the chemicals have been removed, drain the buckets immediately, discarding any gametes. Rinse the buckets thoroughly and refill with clean, dilution water seawater (15 ± 1•C). Use only the gametes subsequently spawned in clean water for testing.

14.10.3.3 UV Irradiation Method

14.10.3.3.1 Select four ripe male abalone and four ripe females. Clean their shells of any debris. Place the males in one clean polyethylene bucket and the females in another. Cover the buckets with a tight fitting perforated lid, supply the containers with flowing or recirculating (1 liter/minute) 20-µm-filtered seawater (15 ± 1•C), and leave the animals without food for 24 to 48 hours to acclimate and eliminate wastes. If flowing seawater is unavailable, keep the spawners in larger (>30 liter) aquaria with aeration at 15 ± 1•C for 24 hours. Three hours prior to the desired spawning time, drain the buckets, wipe and rinse out mucus and debris, and refill with just enough water to cover the abalone (which should all be placed in the bottom of the bucket). Begin slowly filling the buckets with dilution water seawater (15 ± 1•C) that has passed through the UV sterilization unit. Flow rates to each of the buckets should be 150 mL/min. A low total flow rate (300 mL/minute) in the UV unit is necessary to permit sufficient seawater irradiation. (The sterilization unit should be cleaned and the UV bulb replaced at least once annually). Place the buckets in a water bath at 15 ± 1•C to counter the temperature increase caused by the slow

passage of the water past the UV lamp. Check the containers periodically, and keep them clean by siphoning out any debris. After three hours (± about 1/2 hour), abalone should begin spawning by ejecting clouds of gametes into the water. Eggs are dark green and are visible individually to the naked eye, sperm appear as white clouds emanating from the respiratory pores.

14.10.3.3.2 Note: If past experience or other factors indicate difficulties in achieving synchronous spawning, it may be helpful to induce a second group of females about an hour after the first. This will increase the chances of providing fresh eggs (less than one hour old) for fertilization if males spawn late (see below). Senescence of sperm is seldom a problem because males continue spawning over a longer period of time.

14.10.3.4 Pooling Gametes

14.10.3.4.1 Although it is not necessary, it is preferable to have more than one abalone of each sex spawn. To increase the probability of multiple spawners without risking senescence of the gametes, allow one-half hour after the first individual of the second sex begins to spawn before initiating fertilization. For example, if males spawn first, wait one-half hour after the first female spawns before fertilizing eggs. In most cases this will provide time for more than one of each sex to spawn. More important than multiple spawning, however, is avoiding delay of fertilization. Eggs should be fertilized within one hour of release (Uki and Kikuchi 1974). All sperm should be pooled, and all eggs should be pooled prior to fertilization. This can be accomplished by gentle swirling within the spawning buckets. Note: Take care to avoid contaminating eggs with sperm prior to the intended fertilization time. It is important that development is synchronous among all test embryos.

14.10.3.5 Fertilization

14.10.3.5.1 As the females spawn, allow the eggs to settle to the bottom. If necessary, gently stir to evenly distribute the eggs. Siphon out and discard any eggs that appear clumped together. Eggs are ready to transfer to a third (fertilization) bucket when either: (1) one-half hour has passed since the first individual of the second sex has spawned (2) multiple individuals of each sex have spawned, or 3) there are too many eggs on the

bottom of the bucket to allow evenly distributed eggs to avoid each other. Slowly siphon eggs into a third clean polyethylene bucket containing one or two liters of dilution water seawater (15 ± 1•C). Siphon carefully to avoid damaging the eggs and to avoid collecting any debris from the spawning container. Siphon about 100,000 eggs, enough to make a single even layer on the container bottom. Each egg should be individually distinguishable, and not touching other eggs. If excess eggs are available, siphon them into a second fertilization bucket to be used as a reserve. Keep all containers at 15 ± 1•C. Make sure that water temperatures differ by no more than 1•C when transferring eggs or sperm from one container to another.

14.10.3.5.2 As the males spawn, siphon sperm from directly above the respiratory pore and collect this in a 500 mL flask with filtered seawater. Keep the flask at 15 ± 1•C, and use it as a back-up in case the males stop spawning. If spawning continues renew this reserve every 15 minutes. Usually the males will continue spawning, turning the water in the bucket milky white. As long as the males continue spawning, partially drain and refill the bucket every 15 minutes, replacing old sperm-laden water with fresh seawater (15 ± 1•C). Use the freshest sperm possible for fertilization.

14.10.3.5.3 Make sure eggs are fertilized within one hour of release (Uki and Kikuchi, 1974, see note after Section 14.8.5.2). To fertilize the eggs, collect about 200 mL of sperm-laden water in a small beaker. The sperm concentration in the beaker does not have to be exact, just enough to give a slightly cloudy appearance (approximately 1 to 10 X 10^6 cells/mL in the fertilization bucket). See Hahn (1989) for further information on sperm concentrations and the method for fertilization. Pour the sperm solution into the fertilization bucket containing the clean isolated eggs. Using a hose fitted with a clean glass tube, add dilution water seawater to the fertilization bucket at a low flow rate (<1 liter/min; 15 ± 1•C). Use the water flow to gently roil the eggs to allow them to mix with the sperm and fertilize. When the bucket is about half-full and eggs are evenly mixed, stop the water flow and allow the eggs to settle to the bottom of the bucket (about 15 minutes). Fertilization is then complete.

14.10.3.5.4 Note: Once fertilized eggs have settled to the bottom of the bucket (15 minutes after addition of sperm), the following steps (rinsing, concentrating, and counting the embryos) must proceed without delay to assure that embryos are transferred into the test solutions within about one hour. Embryos must be delivered to the test chambers before the first cell division takes place. (Multicellular embryos are more susceptible to damage in handling, and test endpoint analysis assumes that the first cell division takes place in the toxicant solution).

14.10.3.5.5 After embryos have settled, carefully pour or siphon off the water from above the settled embryos to remove as much of the sperm laden water as possible without losing substantial numbers of embryos. Slowly refill the bucket with dilution water seawater (15 ± 1•C). Allow the embryos to settle, and siphon them into a tall 1000 mL beaker for counting. Siphon at a slow flow rate, and move the siphon along the bottom of the bucket quickly to pick up a large number of embryos in the short amount of time it takes to fill the beaker. Examine a sample of the embryos at 100X magnification. One to one hundred sperm should be visible around the circumference of each embryo, 15 sperm per egg is optimal. If sperm are so dense that the embryos appear fuzzy (>>100 sperm/egg), the abalone may develop abnormally and should not be used.

14.10.4 START OF THE TEST

14.10.4.1 Prior to Beginning the Test

14.10.4.1.1 The test should begin as soon as possible, preferably within 24 h of sample collection. The maximum holding time following retrieval of the sample from the sampling device should not exceed 36 h for off-site toxicity tests unless permission is granted by the permitting authority. In no case should the sample be used in a test more than 72 h after sample collection (see Section 8 Effluent and Receiving Water Sampling, Sample Handling, and Sample Preparation for Toxicity Test).

14.10.4.1.2 Just prior to test initiation (approximately 1 h), the temperature of a sufficient quantity of the sample to make

the test solutions should be adjusted to the test temperature (15 ± 1•C) and maintained at that temperature during the addition of dilution water.

14.10.4.1.3 Increase the temperature of the water bath, room, or incubator to the required test temperature (15 ± 1•C).

14.10.4.1.4 Randomize the placement of test chambers in the temperature-controlled water bath, room, or incubator at the beginning of the test, using a position chart. Assign numbers for the position of each test chamber using a random numbers or similar process (see Appendix A, for an example of randomization). Maintain the chambers in this configuration throughout the test, using a position chart. Record these numbers on a separate data sheet together with the concentration and replicate numbers to which they correspond. Identify this sheet with the date, test organism, test number, laboratory, and investigator's name, and safely store it away until after the abalone have been examined at the end of the test.

14.10.4.1.5 Note: Loss of the randomization sheet would invalidate the test by making it impossible to analyze the data afterwards. Make a copy of the randomization sheet and store separately. Take care to follow the numbering system exactly while filling chambers with the test solutions.

14.10.4.1.6 Arrange the test chambers randomly in the water bath or controlled temperature room. Once chambers have been labeled randomly and filled with test solutions, they can be arranged in numerical order for convenience, since this will also ensure random placement of treatments.

14.10.4.2 Estimation of Embryo Density

14.10.4.2.1 Evenly mix the embryos in the 1000 mL beaker by gentle vertical stirring with a clean perforated plunger. Never allow embryos to settle densely in the bottom of the beaker, and take care not to crush embryos while stirring. Take a sample of the evenly suspended embryos using a 1 mL wide bore graduated pipet. Hold the pipet up to the light and count the individual embryos using a hand counter. Alternatively, empty the contents of the pipet onto a Sedgewick-Rafter slide and count embryos under low magnification on a compound scope. Discard the sampled

embryos after counting. Density of embryos in the beaker should be between 200 and 300 embryos/mL. Dilute if the concentration is too high, let embryos settle and pour off excess water if concentration is too low. Take the mean of five samples from this solution to estimate the number of embryos per milliliter.

14.10.4.3 Delivery of Fertilized Embryos

14.10.4.3.1 Using the estimated embryo density in the 1000 mL beaker, calculate the volume of water that contains 1000 embryos. Remove 1000 embryos (or less for smaller volumes, see Section 14.10.1.3) by drawing the appropriate volume of water from the well-mixed beaker using a 10 mL wide bore pipet. Deliver the embryos into the test chambers directly from the pipet making sure not to touch the pipet to the test solution. Stir the embryo beaker with the plunger before taking aliquots. The temperature of the embryo suspension must be within 1•C of the temperature of the test solution. (As above, all solutions are kept at 15 ± 1•C). Record the volume of water delivered into the test chambers with the embryos. Embryos must be delivered into the test solutions within one hour of fertilization. Immediately after the embryos have been delivered, take a sample from the embryo beaker and examine it under 100X magnification. All embryos should still be in the one-cell stage; record any observations to the contrary on the data sheet.

14.10.4.4 Incubation

14.10.4.4.1 Incubate test organisms for 48 hours in the test chambers at 15 ± 1•C under low lighting (approximately 10 $\mu E/m^2/s$) with 16L:8D photoperiod. Fertilized embryos become trochophore larvae, hatch, and develop into veliger larvae in the test solutions during the exposure period.

14.10.5 LIGHT, PHOTOPERIOD, SALINITY AND TEMPERATURE

14.10.5.1 The light quality and intensity should be at ambient laboratory conditions. Light intensity should be 10-20 $\mu E/m^2/s$, or 50 to 100 foot candles (ft-c), with a 16 h light and 8 h dark cycle.

14.10.5.2 The water temperature in the test chambers should be maintained at 15 ± 1•C. If a water bath is used to maintain the

test temperature, the water depth surrounding the test cups should be as deep as possible without floating the chambers.

14.10.5.3 The test salinity should be in the range of 34 ± 2‰. The salinity should vary by no more than ±2‰ among the chambers on a given day. If effluent and receiving water tests are conducted concurrently, the salinities of these tests should be similar.

14.10.5.4 Rooms or incubators with high volume ventilation should be used with caution because the volatilization of the test solutions and evaporation of dilution water may cause wide fluctuations in salinity. Covering the test chambers with clean polyethylene plastic may help prevent volatilization and evaporation of the test solutions.

14.10.6 DISSOLVED OXYGEN (DO) CONCENTRATION

14.10.6.1 Aeration may affect the toxicity of effluent and should be used only as a last resort to maintain a satisfactory DO. The DO concentration should be measured on new solutions at the start of the test (Day 0). The DO should not fall below 4.0 mg/L (see Section 8, Effluent and Receiving Water Sampling, Sample Handling, and Sample Preparation for Toxicity Tests). If it is necessary to aerate, all treatments and the control should be aerated. The aeration rate should not exceed that necessary to maintain a minimum acceptable DO and under no circumstances should it exceed 100 bubbles/minute, using a pipet with a 1-2 mm orifice, such as a 1 mL KIMAX® serological pipet No. 37033, or equivalent.

14.10.7 OBSERVATIONS DURING THE TEST

14.10.7.1 Routine Chemical and Physical Observations

14.10.7.1.1 DO is measured at the beginning of the exposure period in one test chamber at each test concentration and in the control.

14.10.7.1.2 Temperature, pH, and salinity are measured at the beginning of the exposure period in one test chamber at each concentration and in the control. Temperature should also be monitored continuously or observed and recorded daily for at

least two locations in the environmental control system or the samples. Temperature should be measured in a sufficient number of test chambers at the end of the test to determine temperature variation in the environmental chamber.

14.10.7.1.3 Record all the measurements on the data sheet.

14.10.8 TERMINATION OF THE TEST

14.10.8.1 Ending the Test

14.10.8.1.1 Record the time the test is terminated.

14.10.8.1.2 Temperature, pH, dissolved oxygen, and salinity are measured at the end of the exposure period in one test chamber at each concentration and in the control.

14.10.8.2 Sample Preservation

14.10.8.2.1 After 48 hours exposure, the abalone larvae are fixed in formalin or glutaraldehyde. The two methods for sample preservation are described. Be sure that samples for physicochemical measurements have been taken before further processing of test solutions.

14.10.8.2.2 At the end of the 48-hour incubation period, remove each test chamber, swirl the solution to suspend all the larvae, and pour the entire contents through a 37 µm-mesh screen. The test solution is discarded and the larvae are retained on the screen. Using streams of filtered seawater from a squeeze bottle, rinse the larvae from the screen through a funnel into 25 mL screw cap vials. Be careful not to hit the larvae directly with the streams of water; rough handling during transfer may cause fragmentation of the larvae, making counting more difficult and less accurate. Add enough buffered formalin to preserve larvae in a 5% solution (some laboratories have successfully preserved larvae with lower formalin concentrations. Under-preserved larvae disintegrate quickly, however, and whole tests may have to be rejected if larvae have not been adequately fixed). Addition of formalin is more accurate if the vials are premarked with lines showing the volume of sample and the volume

of formalin to be added. Alternatively, a 0.05% final glutaraldehyde solution may be substituted. Larvae should be counted within two weeks.

14.10.8.2.3 Note: Formaldehyde has been identified as a carcinogen and both glutaraldehyde and formaldehyde are irritating to skin and mucus membranes. Neither should be used at higher concentrations than needed to achieve morphological preservation and only under conditions of maximal ventilation and minimal opportunity for volatilization into room air.

14.10.8.3 Counting

14.10.8.3.1 To count the larvae using a standard compound microscope, pipet all the larvae from the bottom of the preservation vial onto a Sedgewick-Rafter counting cell. Examine 100 larvae from each vial under 100X magnification. To best characterize the sample and to avoid bias, select groups of larvae one field of vision at a time, moving to the next field without looking through the lens. Be careful to work across the slide in one direction to avoid recounting the same areas. Count the number of normal and abnormal larvae using hand counters. The percent normal larvae is calculated as the number normal divided by the total number counted. After counting, use a funnel to return the larvae to the vial for future reference.

14.10.8.4 Endpoint

14.10.8.4.1 Examine the shape of the larval shell to distinguish normal from abnormal larvae. Count veliger larvae as normal if they have smoothly curved larval shells that are striated with calcareous deposits and are somewhat opaque. It is common for normal larvae to have a slight curved indentation near the leading edge of the shell. A single indentation is this area is counted as normal.

14.10.8.4.2 Larvae with both multiple indentations <u>and</u> an obvious lack of calcification (i.e. clear appearance in at least part of the shell) are counted as abnormal. The combination of these two features indicates inhibition of a biological process (lack of calcification) and actual damage to the organism (indentations) allowed by the thin shell. Refer to the accompanying photographs (Figure 1) for classification of

marginally deformed larvae. The following types of larvae are also counted as abnormal: (1) larvae that have arrested development (from one cell through trochophore stage), (2) larvae with obvious severe deformations, (3) larvae with broken shells, (4) larval shells separated from the rest of the animal, and (5) larvae found remaining in the egg membrane (however, take care to distinguish these from larvae that may have come in contact with loose egg cases). Record all counts and the test chamber number on the data sheet.

14.11 SUMMARY OF TEST CONDITIONS AND TEST ACCEPTABILITY CRITERIA

14.14.1 A summary of test conditions and test acceptability criteria is listed in Table 3.

14.12 ACCEPTABILITY OF TEST RESULTS

14.12.1 Test results are acceptable only if all the following requirements are met:

(1) the mean larval normality must be at least 80% in the controls.

(2) the response from 56 µg/L zinc treatment must be significantly different from the control response.

(3) the minimum significant difference (%MSD) is <20% relative to the control for the reference toxicant.

14.13 DATA ANALYSIS

14.13.1 GENERAL

14.13.1.1 Tabulate and summarize the data. Calculate the proportion of larvae with normally developed shells for each replicate. A sample set of test data is listed in Table 4.

14.13.1.2 The statistical tests described here must be used with a knowledge of the assumptions upon which the tests are contingent. The assistance of a statistician is recommended for analysts who are not proficient in statistics.

FIGURE 1. 48-HOUR-OLD ABALONE VELIGER LARVAE

Figures 1A -D Provided by John Hunt, Institute of Marine Sciences. Photocopied from:

"Marine Bioassay Project Procedures Manual of October, 1990." California State Water Resources Control Board.

The following three pages show 12 photographs of 48-hour-old abalone veliger larvae from effluent toxicity tests. All larvae were taken from intermediate effluent concentrations and were chosen to represent "borderline" cases (i.e. larvae that were slightly affected and are therefore, difficult to categorize as normal or abnormal). In most cases, larvae from lower and higher effluent concentrations are more easily categorized than those shown here; in the lower concentrations they are obviously without shell abnormalities and in the higher concentrations they are severely deformed. These photographs are presented as a visual reference to help standardize test analysis and eliminate bias in the interpretation of marginally deformed larvae. All larvae on the left-hand side of these pages were counted as normal, all larvae on the right-hand side were counted as abnormal.

TABLE 3. SUMMARY OF TEST CONDITIONS AND TEST ACCEPTABILITY CRITERIA FOR, *HALIOTIS RUFESCENS*, LARVAL DEVELOPMENT TEST WITH EFFLUENTS AND RECEIVING WATERS

1. Test type:	Static non-renewal
2. Salinity:	34 ± 2‰
3. Temperature:	15 ± 1•C
4. Light quality:	Ambient laboratory light
5. Light intensity:	10 µE/m^2/s (Ambient laboratory levels)
6. Photoperiod:	16 h light, 8 h darkness
7. Test chamber size:	600 mL
8. Test solution volume:	200 mL/replicate
9. Larvae density per chamber:	5-10 per mL
10. No. replicate chambers per concentration:	5
11. Dilution water:	Uncontaminated 1-µm-filtered natural seawater or hypersaline brine plus reagent water
12. Test concentrations:	Effluents: Minimum of 5 and a control Receiving waters: 100% receiving water and a control
13. Dilution factor:	Effluents: •0.5 Receiving waters: None or •0.5
14. Test duration:	48 h
15. Endpoint:	Normal shell development

16. Test acceptability criteria:	• 80% normal shell development in the controls; must have statistical significant effect at 56 µg/L zinc; must achieve a %MSD of <20%
17. Sampling requirements:	One sample collected at test initiation, and preferably used within 24 h of the time it is removed from the sampling device (see Section 8, Effluent and Receiving Water Sampling, Sample Handling, and Sample Preparation for Toxicity Tests)
18. Sample volume required:	2 L per test

14.13.1.3 The endpoints of toxicity tests using the red abalone are based on the reduction in proportion of normal shell development. The IC25 is calculated using the Linear Interpolation Method (see Section 9, Chronic Toxicity Test Endpoints and Data Analysis). LOEC and NOEC values for larval development are obtained using a hypothesis testing approach such as Dunnett's Procedure (Dunnett, 1955) or Steel's Many-one Rank Test (Steel, 1959; Miller, 1981) (see Section 9). Separate analyses are performed for the estimation of the LOEC and NOEC endpoints and for the estimation of the IC25. See the Appendices for examples of the manual computations, and examples of data input and program output.

14.13.2 EXAMPLE OF ANALYSIS OF RED ABALONE, *HALIOTUS RUFESCENS*, LARVAL DEVELOPMENT DATA

14.13.2.1 Formal statistical analysis of the larval development is outlined in Figure 2. The response used in the analysis is the proportion of larvae with normally developed shells in each test or control chamber. Separate analyses are performed for the estimation of the NOEC and LOEC endpoints and for the estimation of the IC25 endpoint. Concentrations at which there is no normal shell development in any of the test chambers are excluded from statistical analysis of the NOEC and LOEC, but included in the estimation of the IC25.

TABLE 4. DATA FROM RED ABALONE, *HALIOTUS RUFESCENS*, DEVELOPMENT TEST

Effluent Concentration (%)	Replicate	No. Larvae Counted	Number Normal	Proportion Normal
Brine Control	A	100	100	1.00
	B	100	98	0.98
	C	100	100	1.00
	D	100	99	0.99
	E	100	99	0.99
Dilution Control	A	100	99	0.99
	B	100	99	0.99
	C	100	99	0.99
	D	100	100	1.00
0.56	A	100	99	0.99
	B	100	99	0.99
	C	100	98	0.98
	D	100	100	1.00
	E	100	100	1.00
1.00	A	100	99	0.99
	B	100	100	1.00
	C	100	99	0.99
	D	100	99	0.99
	E	100	100	1.00
1.80	A	100	99	0.99
	B	100	99	0.99
	C	100	99	0.99
	D	100	98	0.98
	E	100	97	0.97
3.20	A	100	39	0.39
	B	100	57	0.57
	C	100	61	0.61
	D	100	65	0.65
	E	100	80	0.80
5.60	A	100	0	0.00
	B	100	0	0.00
	C	100	0	0.00
	D	100	0	0.00
	E	100	0	0.00
10.00	A	100	0	0.00
	B	100	0	0.00
	C	100	0	0.00
	D	100	0	0.00
	E	100	0	0.00

14.13.2.2 For the case of equal numbers of replicates across all concentrations and the control, the evaluation of the NOEC and LOEC endpoints is made via a parametric test, Dunnett's Procedure, or a nonparametric test, Steel's Many-one Rank Test, on the arc sine square root transformed data. Underlying assumptions of Dunnett's Procedure, normality and homogeneity of variance, are formally tested. The test for normality is the Shapiro-Wilk's Test, and Bartlett's Test is used to test for homogeneity of variance. If either of these tests fails, the nonparametric test, Steel's Many-one Rank Test, is used to determine the NOEC and LOEC endpoints. If the assumptions of Dunnett's Procedure are met, the endpoints are estimated by the parametric procedure.

14.13.2.3 If unequal numbers of replicates occur among the concentration levels tested, there are parametric and nonparametric alternative analyses. The parametric analysis is a *t* test with the Bonferroni adjustment (see Appendix D). The Wilcoxon Rank Sum Test with the Bonferroni adjustment is the nonparametric alternative.

14.13.2.4 Comparison of Brine and Dilution Controls

14.13.2.4.1 This example uses toxicity data from a red abalone, *Haliotus rufescens*, larval development test performed with effluent. The response of interest is the proportion of larvae with normally developed shells, thus each replicate must first be transformed by the arc sine square root transformation procedure described in Appendix B. Because the example test was run using both brine and dilution controls, the two controls must first be tested for significant differences in the normal shell development proportions. The raw and transformed data, means and variances of the transformed observations for the two controls are listed in Table 5.

14.13.2.4.2 Tests for Normality

14.13.2.4.2.1 In the two sample situation, the distributional assumption is that each sample comes from a normally distributed population. Thus in comparing the brine and dilution controls, the data for each concentration must be separately checked for normality. When the two response groups are tested separately, it is not necessary to center the data.

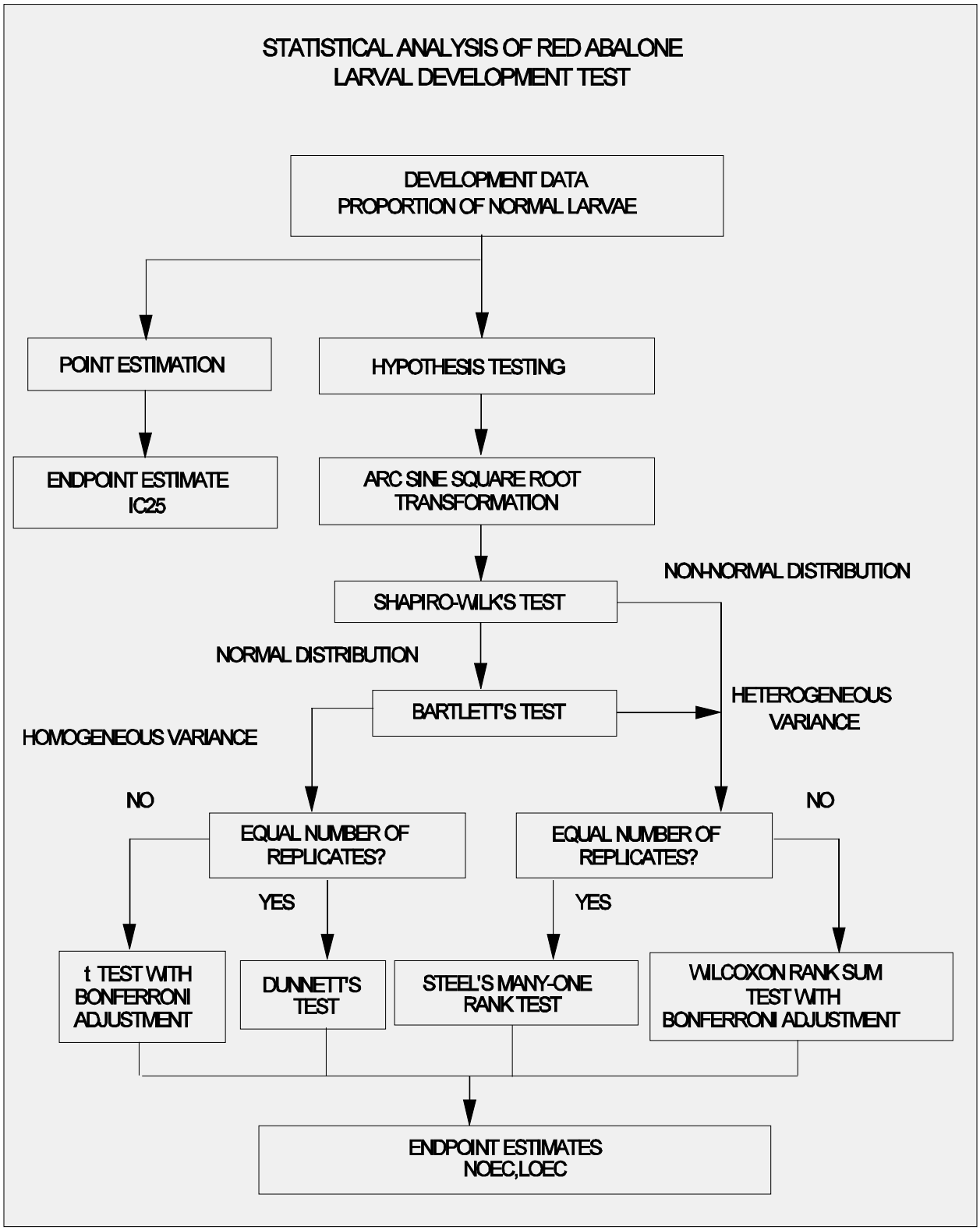

Figure 2. Flowchart for statistical analysis of red abalone, *Haliotus rufescens*, development data.

TABLE 5. RED ABALONE, *HALIOTUS RUFESCENS*, LARVAL DEVELOPMENT DATA FROM BRINE AND DILUTION CONTROLS

	Replicate	Brine Control	Dilution Control
RAW	A	1.00	0.99
	B	0.98	0.99
	C	1.00	0.99
	D	0.99	1.00
	E	0.99	
ARC SINE SQUARE ROOT TRANSFORMED	A	1.521	1.471
	B	1.429	1.471
	C	1.521	1.471
	D	1.471	1.521
	E	1.471	
Mean ($\bar{Y}_i$)		1.483	1.484
S_i^2		0.00152	0.000625
i		1	2

14.13.2.4.2.2 Calculate the denominator, D, of the statistic for each control group:

$$D = \sum_{i=1}^{n} (X_i - \bar{X})^2$$

Where: X_i = the ith centered observation

$\bar{X}$ = the overall mean of the centered observations

n = the total number of centered observations

14.13.2.4.2.3 For the brine control data,

n = 5

$$\bar{X} = \frac{1}{5}(7.413) = 1.483$$

$$D = 0.00609$$

For the dilution control data,

$$n = 4$$

$$\bar{X} = \frac{1}{4}(5.934) = 1.484$$

$$D = 0.00191$$

14.13.2.4.2.4 Order the observations for each control group from smallest to largest

$$X^{(1)} \bullet X^{(2)} \bullet \ldots \bullet X^{(n)}$$

where $X^{(i)}$ denotes the ith ordered observation. The ordered observations for the two groups in this example are listed in Table 6.

TABLE 6. ORDERED CENTERED OBSERVATIONS FOR SHAPIRO-WILK'S EXAMPLE

Brine Control		Dilution Control	
i	$X^{(i)}$	i	$X^{(i)}$
1	1.429	1	1.471
2	1.471	2	1.471
3	1.471	3	1.471
4	1.521	4	1.521
5	1.521		

14.13.2.4.2.5 From Table 4, Appendix B, for the number of observations, n, obtain the coefficients a_1, a_2, ... a_k where k is n/2 if n is even and (n-1)/2 if n is odd. For the datasets in this example, n = 5 and k = 2 for the brine control group, and n = 4 and k = 2 for the dilution control group. The a_i values are listed in Table 7.

TABLE 7. COEFFICIENTS AND DIFFERENCES FOR SHAPIRO-WILK'S EXAMPLE

i	a_i	$X^{(n-i+1)} - X^{(i)}$	
		Brine Control Group	
1	0.6646	0.092	$X^{(5)} - X^{(1)}$
2	0.2413	0.050	$X^{(4)} - X^{(3)}$
		Dilution Control Group	
1	0.6872	0.050	$X^{(4)} - X^{(1)}$
2	0.1667	0.000	$X^{(3)} - X^{(2)}$

14.13.2.4.2.6 Compute the test statistic, W, for each group as follows:

$$W = \frac{1}{D}\left[\sum_{i=1}^{k} a_i\left(X^{(n-i+1)} - X^{(i)}\right)\right]^2$$

The differences, $X^{(n-i+1)} - X^{(i)}$, are listed in Table 7. For the data in the brine example:

$$W = \frac{1}{0.00609}\,(0.07321)^2 = 0.880$$

For the data in the dilution example:

$$W = \frac{1}{0.00191}\,(0.03436)^2 = 0.618$$

14.13.2.4.2.7 The decision rule for this test is to compare W as

calculated in Subsection 2.6 to a critical value found in Table 6, Appendix B. If the computed W is less than the critical value, conclude that the data are not normally distributed. For the data in the brine control, the critical value at a significance level of 0.01 and n = 5 observations is 0.686. Since W = 0.880 is greater than the critical value, conclude that the brine control data are normally distributed. For the data in the dilution control, the critical value at a significance level of 0.01 and n = 4 observations is 0.687. Since W = 0.618 is less than the critical value, conclude that the dilution control data are not normally distributed.

14.13.2.4.2.8 Since the dilution control data does not meet the normality assumption, the Wilcoxon Rank Sum Test will be used to compare the responses in the two control groups.

14.13.2.4.3 Wilcoxon Rank Sum Test

14.13.2.4.3.1 To perform the Wilcoxon Rank Sum test, combine the data from the two groups and arrange in order from smallest to largest. Assign the rands (1, 2, ..., 9) to the ordered observations with a rank of 1 assigned to the smallest observation, rank of 2 assigned to the next larger observation, etc. If ties occur when ranking, assign the average rank to each tied observation. A table of the ranks is given in Table 8.

TABLE 8. ASSIGNING RANKS TO THE BRINE AND DILUTION CONTROLS FOR THE WILCOXON RANK SUM TEST

Rank	Transformed Proportion Normal	Control Group
1	1.429	Brine
4	1.471	Brine
4	1.471	Brine
4	1.471	Dilution
4	1.471	Dilution
4	1.471	Dilution
8	1.521	Brine
8	1.521	Dilution
8	1.521	Dilution

14.13.2.4.3.2 The ranks are then summed for both of the control groups. For this data, the sum of the ranks in the brine control group is 25 and the sum of the ranks in the dilution control group is 20.

14.13.2.4.3.3 For this situation, we wish to determine if the proportions of normally developed larvae in the two control groups are significantly different. To do this, compare the rank sum of the group with the smaller sample size with some "minimum" or critical rank sum, at or below which the devlopment in the controls would be considered significantly different. At a significance level of 0.05, the minimum rank sum in a test with five replicates in one group and and four replicates in the other is 11 (See Snedecor and Cochran, 1980).

14.13.2.4.3.4 The dilution control sample size is smaller than the sample size of the brine control group so its rank sum is compared to the critical value. Since its rank sum of 20 is greater than the critical value of 11, conclude that the development proportions for the two control groups are not significantly different.

14.13.2.5 Example of Analysis of Larval Development Data

14.13.2.5.1 Since the responses in the two control groups are not significantly different, only the dilution control group will be used in the analysis of the shell development responses for the effluent concentrations. As above, each replicate must first be transformed by the arc sine square root transformation procedure described in Appendix B. The raw and transformed data, means and variances of the transformed observations at each effluent concentration and dilution control are listed in Table 9. The data are plotted in Figure 3. Since there is 100% abnormality in all replicates for the 5.6% and 10.0% concentrations, they are not included in the statistical analysis and are considered qualitative abnormality effects.

14.13.2.6 Test for Normality

14.13.2.6.1 The first step of the test for normality is to center the observations by subtracting the mean of all

observations within a concentration from each observation in that concentration. The centered observations are summarized in Table 10.

14.13.2.6.2 Calculate the denominator, D, of the statistic:

$$D = \sum_{i=1}^{n} (X_i - \bar{X})^2$$

Where: X_i = the ith centered observation

$\bar{X}$ = the overall mean of the centered observations

n = the total number of centered observations

14.13.2.6.3 For this set of data, n = 24

$$\bar{X} = \frac{1}{24}(-0.004) = 0.000$$

D = 0.1127

14.13.2.6.4 Order the centered observations from smallest to largest

$$X^{(1)} \le X^{(2)} \le \ldots \le X^{(n)}$$

where $X^{(i)}$ denotes the ith ordered observation. The ordered observations for this example are listed in Table 11.

14.13.2.6.5 From Table 4, Appendix B, for the number of observations, n, obtain the coefficients a_1, a_2, ... a_k where k is n/2 if n is even and (n-1)/2 if n is odd. For the data in this example, n = 24 and k = 12. The a_i values are listed in Table 12.

14.13.2.5.6 Compute the test statistic, W, as follows:

$$W = \frac{1}{D}\left[\sum_{i=1}^{k} a_i (X^{(n-i+1)} - X^{(i)})\right]^2$$

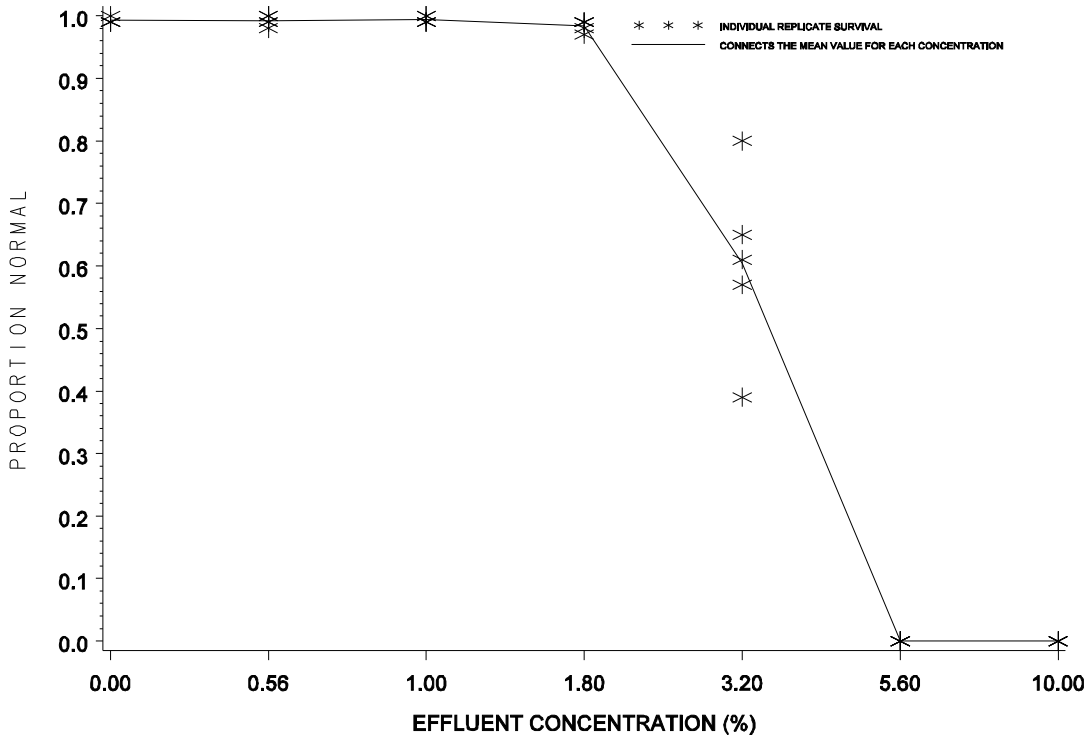

Figure 3. Plot of mean proportion of normally developed red abalone, *Haliotus rufescens* larvae.

TABLE 9. RED ABALONE, *HALIOTUS RUFESCENS*, SHELL DEVELOPMENT DATA

		Effluent Concentration (%)						
	Dilution							
	Replicate	Control	0.56	1.00	1.80	3.20	5.6	10.0
RAW	A	0.99	0.99	0.99	0.99	0.39	0	0
	B	0.99	0.99	1.00	0.99	0.57	0	0
	C	0.99	0.98	0.99	0.99	0.61	0	0
	D	1.00	1.00	0.99	0.98	0.65	0	0
	E		1.00	1.00	0.97	0.80	0	0
ARC SINE SQUARE ROOT TRANSFORMED	A	1.471	1.471	1.471	1.471	0.674	-	-
	B	1.471	1.471	1.521	1.471	0.856	-	-
	C	1.471	1.429	1.471	1.471	0.896	-	-
	D	1.521	1.521	1.471	1.429	0.938	-	-
	E		1.521	1.521	1.397	1.107	-	-
Mean ($\bar{Y}_i$)		1.484	1.483	1.491	1.448	0.894	-	-
S_i^2		0.000625	0.001523	0.000750	0.001137	0.024288	-	-
i		1	2	3	4	5	6	7

TABLE 10. CENTERED OBSERVATIONS FOR SHAPIRO-WILK'S EXAMPLE

	Effluent Concentration (%)				
Replicate	Control	0.56	1.00	1.80	3.20
A	-0.013	-0.012	-0.020	0.023	-0.220
B	-0.013	-0.012	0.030	0.023	-0.038
C	-0.013	-0.054	-0.020	0.023	0.002
D	0.037	0.038	-0.020	-0.019	0.044
E		0.038	0.030	-0.051	0.213

TABLE 11. ORDERED CENTERED OBSERVATIONS FOR SHAPIRO-WILK'S EXAMPLE

i	$X^{(i)}$	i	$X^{(i)}$
1	-0.220	13	-0.012
2	-0.054	14	0.002
3	-0.051	15	0.023
4	-0.038	16	0.023
5	-0.020	17	0.023
6	-0.020	18	0.030
7	-0.020	19	0.030
8	-0.019	20	0.037
9	-0.013	21	0.038
10	-0.013	22	0.038

TABLE 12. COEFFICIENTS AND DIFFERENCES FOR SHAPIRO-WILK'S EXAMPLE

i	a_i	$X^{(n-i+1)} - X^{(i)}$	
1	0.4493	0.433	$X^{(24)} - X^{(1)}$
2	0.3098	0.098	$X^{(23)} - X^{(2)}$
3	0.2554	0.089	$X^{(22)} - X^{(3)}$
4	0.2145	0.076	$X^{(21)} - X^{(4)}$
5	0.1807	0.057	$X^{(20)} - X^{(5)}$
6	0.1512	0.050	$X^{(19)} - X^{(6)}$
7	0.1245	0.050	$X^{(18)} - X^{(7)}$
8	0.0997	0.042	$X^{(17)} - X^{(8)}$
9	0.0764	0.036	$X^{(16)} - X^{(9)}$
10	0.0539	0.036	$X^{(15)} - X^{(10)}$

The differences, $X^{(n-i+1)} - X^{(i)}$, are listed in Table 12. For the data in this example:

$$W = \frac{1}{0.1127} (0.2974)^2 = 0.7848$$

14.13.2.5.7 The decision rule for this test is to compare W as calculated in 14.13.2.5.6 to a critical value found in Table 6, Appendix B. If the computed W is less than the critical value, conclude that the data are not normally distributed. For the data in this example, the critical value at a significance level of 0.01 and n = 24 observations is 0.884. Since W = 0.7848 is less than the critical value, conclude that the data are not normally distributed.

14.13.2.5.8 Since the data do not meet the assumption of normality, the Wilcoxon Rank Sum Test with the Bonferroni Adjustment will be used to analyze the shell development data.

14.13.2.6 Wilcoxon Rank Sum Test with the Bonferroni Adjustment

14.13.2.6.1 For each control and concentration combination, combine the data and arrange the observations in order of size from smallest to largest. Assign the ranks (1, 2, ... , 9) to the ordered observations with a rank of 1 assigned to the smallest observation, rank of 2 assigned to the next larger observation, etc. If ties occur when ranking, assign the average rank to each tied observation.

14.13.2.6.2 An example of assigning ranks to the combined data for the control and 0.56% concentration is given in Table 13. This ranking procedure is repeated for each control/concentration combination. The complete set of rankings is summarized in Table 14. The ranks are then summed for each concentration level, as shown in Table 15.

14.13.2.6.3 For this example, determine if the survival in any of the concentrations is significantly lower than the survival in the control. If this occurs, the rank sum at that concentration would be significantly lower than the rank sum of the control. Thus compare the rank sums for the survival at each of the various concentration levels with some "minimum" or critical rank sum, at or below which the survival would be considered significantly lower than the control. At a significance level of 0.05, the minimum rank sum in a test with four concentrations (excluding the control), four control replicates and five concentration replicates is 15 (See Table 5, Appendix F).

TABLE 13. ASSIGNING RANKS TO THE CONTROL AND 0.56% CONCENTRATION LEVEL FOR THE WILCOXON RANK SUM TEST WITH THE BONFERRONI ADJUSTMENT

Rank	Transformed Proportion Normal	Concentration
1	1.429	0.56 %
4	1.471	0.56 %
4	1.471	0.56 %
4	1.471	Control
4	1.471	Control
4	1.471	Control
8	1.521	0.56 %
8	1.521	0.56 %
8	1.521	Control

TABLE 14. TABLE OF RANKS[1]

Replicate	Control	Effluent Concentration (%) 0.56	1.00	1.80	3.20
1	1.471(4,3.5,5.5,7)	1.471(4)	1.471(3.5)	1.471(5.5)	0.674(1)
2	1.471(4,3.5,5.5,7)	1.471(4)	1.521(8)	1.471(5.5)	0.856(2)
3	1.471(4,3.5,5.5,7)	1.429(1)	1.471(3.5)	1.471(5.5)	0.896(3)
4	1.521(8,8,9,9)	1.521(8)	1.471(3.5)	1.429(2)	0.938(4)
5		1.521(8)	1.521(8)	1.397(1)	1.107(5)

[1]Control ranks are given in the order of the concentration with which they were ranked.

TABLE 15. RANK SUMS

Concentration (% Effluent)	Rank Sum
0.56	25.0
1.00	26.5
1.80	19.5
3.20	15.0

14.13.2.6.4 Since the rank sum for the 3.20% concentration level is equal to the critical value, the proportion normal in that concentration is considered significantly less than that in the control. Since no other rank sum is less than or equal to the critical value, no other concentration has a significantly lower proportion normal than the control. Hence, the NOEC and the LOEC are 1.80% and 3.20%, respectively.

14.13.2.7 Calculation of the ICp

14.13.2.7.1 The shell development data in Table 4 are utilized in this example. As can be seen from Table 4 and Figure 4, the observed means are not monotonically non-increasing with respect to concentration (mean response for each higher concentration is not less than or equal to the mean response for the previous concentration and the responses between concentrations do not follow a linear trends). Therefore, the means are smoothed prior to calculating the IC. In the following discussion, the observed means are represented by Y_i and the smoothed means by M_i.

14.13.2.7.2 Starting with the control mean, $Y_1 = 0.993$ and $Y_2 = 0.992$, we see that $Y_1 > Y_2$. Set $M_1 = Y_1$. Comparing Y_2 to Y_3, $Y_2 < Y_3$.

14.13.2.7.3 Calculate the smoothed means:

$$M_2 = M_3 = (Y_2 + Y_3)/2 = 0.993$$

14.13.2.7.4 Since $Y_7 = 0 < Y_6 = 0 < Y_5 = 0.604 < Y_4 = 0.984 < Y_3 = 0.993$, set $M_3 = 0.993$, $M_4 = 0.984$, $M_5 = 0.604$, $M_6 = 0$, and set $M_7 = 0$.

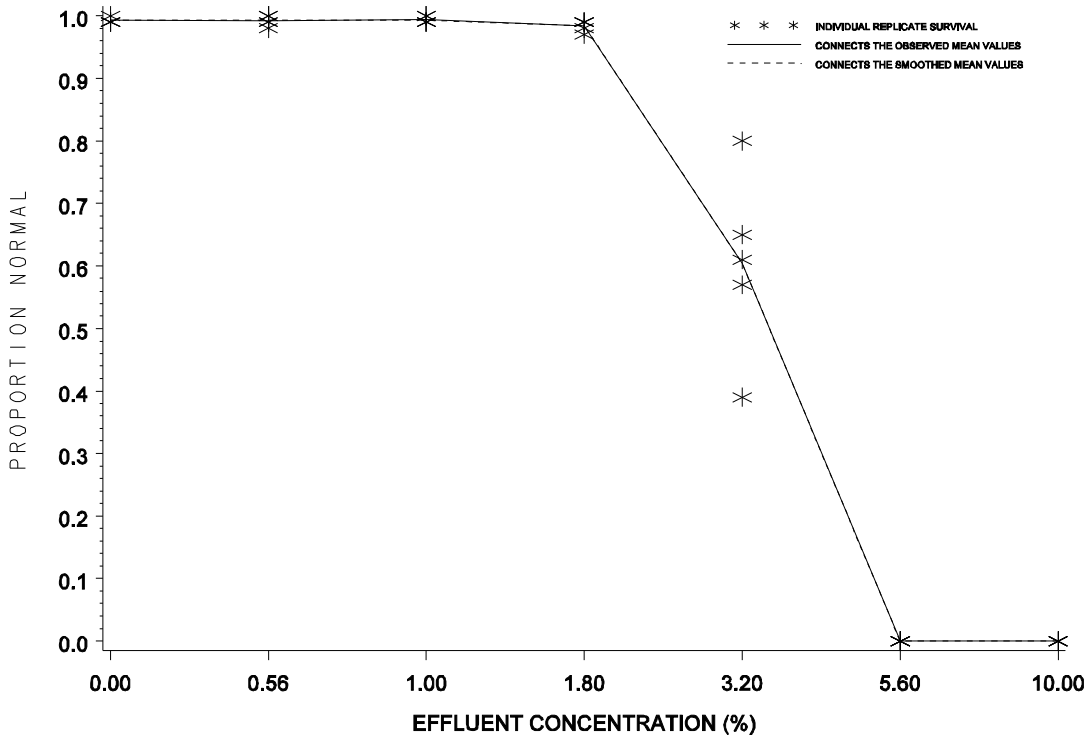

Figure 4. Plot of raw data, observed means, and smoothed means for red abalone, *Haliotus rufescens*, development data from Tables 4 and 16.

TABLE 16. RED ABALONE, *HALIOTUS RUFESCENS*, MEAN SHELL DEVELOPMENT RESPONSE AFTER SMOOTHING

Effluent Conc. (%)	i	Response Means, $\bar{Y}_i$ (proportion)	Smoothed Means, M_i (proportion)
Control	1	0.993	0.993
0.56	2	0.992	0.993
1.00	3	0.994	0.993
1.80	4	0.984	0.984
3.20	5	0.604	0.604
5.60	6	0.000	0.000
10.00	7	0.000	0.000

14.13.2.7.5 Table 16 contains the response means and smoothed means and Figure 4 gives a plot of the smoothed response curve.

14.13.2.7.6 An IC25 can be estimated using the Linear Interpolation Method. A 25% reduction in mean proportion of fertilized eggs, compared to the controls, would result in a mean proportion of 0.745, where $M_1(1-p/100) = 0.993(1-25/100)$. Examining the means and their associated concentrations (Table 16), the response, 0.745, is bracketed by C_4 = 1.80% effluent and C_5 = 3.20% effluent.

14.13.2.7.7 Using the equation from Section 4.2 in Appendix L, the estimate of the IC25 is calculated as follows:

$$ICp \bullet C_j \bullet [M_1(1 \bullet p/100) \bullet M_j] \frac{(C_{(j \bullet 1)} \bullet C_j)}{(M_{(j \bullet 1)} \bullet M_j)}$$

$$IC25 = 1.8 + [0.993(1 - 25/100) - 0.984] \left(\frac{3.2 - 1.8}{0.604 - 0.984}\right)$$

$$= 2.68\%.$$

14.13.2.7.8 When the ICPIN program was used to analyze this set of data, requesting 80 resamples, the estimate of the IC25 was 2.6818%. The empirical 95.0% confidence interval for the true

mean was 2.5000% to 3.1262 %. The computer program output for the IC25 for this data set is shown in Figure 5.

14.14 **PRECISION AND ACCURACY**

14.14.1 PRECISION

14.14.1.1 Single-Laboratory Precision

14.14.1.1.1 Data on the single laboratory precision of the *Haliotis rufescens* larval development method using zinc sulfate are shown in Table 17. Zinc concentrations were 18, 32, 56, and 100 µg/L. All tests were conducted at the Marine Pollution Studies Laboratory. There was good agreement among test EC50s, with a coefficient of variation of 8%.

14.14.1.2 Multi-laboratory Precision

14.14.1.2.1 The multi-laboratory data indicate a similar level of test precision Table 18. Data are presented for four interlaboratory trials in which either two or three laboratories tested both split effluent samples and reference toxicants. The mean coefficient of variation between EC50 values from different laboratories was 15%.

14.14.2 ACCURACY

14.14.2.1 The accuracy of toxicity tests cannot be determined.

Conc. ID	1	2	3	4	5	6	7
Conc. Tested	0	.56	1	1.8	3.2	5.6	10
Response 1	.99	.99	.99	.99	.39	0	0
Response 2	.99	.99	1.00	.99	.57	0	0
Response 3	.99	.98	.99	.99	.61	0	0
Response 4	1.00	1.00	.99	.98	.65	0	0
Response 5		1.00	1.00	.97	.80	0	0

*** Inhibition Concentration Percentage Estimate ***
Toxicant/Effluent: Effluent
Test Start Date: Test Ending Date:
Test Species: Red Abalone
Test Duration: 48 hours
DATA FILE: abalone.icp
OUTPUT FILE: abalone.i25

Conc. ID	Number Replicates	Concentration %	Response Means	Std. Dev.	Pooled Response Means
1	4	0.000	0.993	0.005	0.993
2	5	0.560	0.992	0.008	0.993
3	5	1.000	0.994	0.005	0.993
4	5	1.800	0.984	0.009	0.984
5	5	3.200	0.604	0.148	0.604
6	5	5.600	0.000	0.000	0.000
7	5	10.000	0.000	0.000	0.000

The Linear Interpolation Estimate: 2.6818 Entered P Value: 25

Number of Resamplings: 80
The Bootstrap Estimates Mean: 2.7085 Standard Deviation: 0.1510
Original Confidence Limits: Lower: 2.5000 Upper: 3.1262
Expanded Confidence Limits: Lower: 2.4091 Upper: 3.3484
Resampling time in Seconds: 0.27 Random_Seed: -770872716

Figure 5. ICPIN program output for the IC25.

TABLE 17. SINGLE LABORATORY PRECISION DATA FOR THE RED ABALONE, *HALIOTIS RUFESCENS* LARVAL DEVELOPMENT TEST WITH ZINC (ZN •G/L) SULFATE AS A REFERENCE TOXICANT

Test Date	NOEC (µg/L)	EC50 (µg/L)
March 1990	32	42[1]
May 1990	32	39[1]
January 1991	18	34[1]
February 1991	18	40[2]
Mean		38.4
SD		3.0
CV (%)		7.8

1 Source: Hunt et al., 1991
2 Source: Anderson et al., 1994

TABLE 18. MULTI-LABORATORY PRECISION OF THE RED ABALONE, *HALIOTIS RUFESCENS* LARVAL DEVELOPMENT TEST PERFORMED WITH ZINC (ZN •G/L) SULFATE AND EFFLUENT (%) AS THE TOXICANTS

Test Date	Toxicant	Lab	NOEC	EC50	CV
March 1990	Effluent	A	>3.2%	nc	
March 1990	Effluent	B	>3.2%	nc	
March 1990	Effluent	C	0.32%	1.83	nc
March 1990	Zinc	A	32	41	
March 1990	Zinc	B	18	28	
March 1990	Zinc	C	18	31	20%
May 1990	Effluent	A	3.2%	4.7	
May 1990	Effluent	D	1.8%	3.5	
May 1990	Effluent	C	3.2%	3.8	16%
May 1990	Zinc	A	32	39	
May 1990	Zinc	D	32	46	
May 1990	Zinc	C	32	37	12%
January 1991	Effluent	A	<0.56%	1.5	
January 1991	Effluent	C	1.25%	1.8	13%
January 1991	Zinc	A	18	34	
January 1991	Zinc	C	32	48	24%
January 1991	Effluent	A	1.0%	2.7	
January 1991	Effluent	C	1.8%	2.8	3.0%

Mean Interlaboratory CV = 15% Interlaboratory CV based on 6 tests for which CV values could be calculated. Source: Hunt et al., 1991.

nc = indicates that the CV could not be calculated because only one laboratory observed a 50% effect and calculated an EC50.

APPENDIX I. RED ABALONE TEST: STEP-BY-STEP SUMMARY

PREPARATION OF TEST SOLUTIONS

A. Determine test concentrations and appropriate dilution water based on NPDES permit conditions and guidance from the appropriate regulatory agency.

B. Prepare effluent test solutions by diluting well mixed unfiltered effluent using volumetric flasks and pipettes. Use hypersaline brine where necessary to maintain all test solutions at 34 ± 2‰. Include brine controls in tests that use brine.

C. Prepare a zinc reference toxicant stock solution (10,000 µg/L) by adding 0.0440 g of zinc sulfate ($ZnSO_4 \circ 7H_2O$) to 1 liter of reagent water.

D. Prepare zinc reference toxicant solution of 0 (control) 10, 18, 32, 56 and 100 µg/L by adding 0, 1.0 1.8, 3.2, 5.6 and 10.0 mL of stock solution, respectively, to a 1-L volumetric flask and filling to 1-L with dilution water.

E. Sample effluent and reference toxicant solutions for physical/chemical analysis. Measure salinity, pH and dissolved oxygen from each test concentration.

F. Randomize numbers for test chambers and record the chamber numbers with their respective test concentrations on a randomization data sheet. Store the data sheet safely until after the test samples have been analyzed.

G. Place test chambers in a water bath or environmental chamber set to 15•C and allow temperature to equilibrate.

H. Measure the temperature daily in one random replicate (or separate chamber) of each test concentration. Monitor the temperature of the water bath or environmental chamber continuously.

I. At the end of the test, measure salinity, pH, and dissolved oxygen concentration from each test concentration.

PREPARATION AND ANALYSIS OF TEST ORGANISMS

A. Obtain test organisms and hold or condition as necessary for spawning.

B. Induce four male and four female abalone to spawn using either H_2O_2 and Tris or UV irradiated seawater (300 mL/min flow rate through the UV unit). All solutions should be maintained at 15 ± 1•C.

C. Siphon eggs into a fertilization bucket. Add 200 mL of sperm-laden water to fertilize the eggs. Wash the fertilized eggs at least twice by slowly decanting and refilling the chamber with fresh filtered seawater. Temperatures should vary by no more than 1•C between waters used in mixing and refilling.

D. Suspend the embryos evenly in a 1000 mL beaker and count five samples in a 1 mL pipet to estimate embryo density.

E. Pipet 1000 fertilized embryos into each 200 mL test chamber. Be sure temperatures in the embryo beaker and the solutions are at 15 ± 1•C. Incubate for 48 h. For smaller-sized chambers, use proportionately fewer embryos.

F. At the end of the 48 h period, pour the entire test solution with larvae through a 37 µm-meshed screen. Wash larvae from the screen into 25 mL vials. Add buffered formalin to preserve the larvae in a 5% solution or glutaraldehyde for a 0.05% solution. Cap the flask and invert gently to mix.

G. Pipet a sample from each vial onto a Sedgwick-Rafter counting slide and count 100 larvae. Return the larvae to the vials for future reference.

H. Count the number of normal larvae for each replicate and divide by the total counted.

I. Analyze the data.

J. Include standard reference toxicant point estimate values in the standard quality control charts.

Salinity Adjustment Worksheet for Abalone

Date Sampled: Batch:
Date Adjusted: Region:

$$\frac{VS\ (TS-SS)}{(SB-TS)}$$

SS = Salinity of Sample
VS = Volume of Sample
TS = Target Salinity (34±2%)
VB = Volume of Brine
SB = Salinity of Brine

VDW = VBL - VBS

VDW = Volume of Dilution Water (Adjusted to 34±2%)
VBL = Largest Volume of Brine added to adjust salinity
VBS = Volume of Brine added to each Sample

Total Volume = VB added + VDW added
(Total volume should be the same for all samples)

Site Code (ID Org #) or concentration	Initial Salinity	TS	Vol. of Brine	Vol.Dil. Water	Total Volume	Final Salinity	Precision and Accuracy for Refractometer
		34±2					
		34±2					
		34±2					
		34±2					
		34±2					
		34±2					
		34±2					
		34±2					
		34±2					
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		34±2					
		34±2					
		34±2					
		34±2					

Initials: Double Checked:

Data Sheet for Mollusc Larval Development Toxicity Test

Test Start Date: Start Time: Mollusc Species:

Test End Date: End Time: Collection/Arrival Date:

Reference Toxicant:Reference Toxicant: Broodstock Source:

Sample Source:

Sample Type: Effluent Ref Tox Solid Elutriate Pore Water WaterSample Type: Effluent Ref Tox Solid Elutriate Pore Water Water

Test Cont. #	Station Code or Concentration	Sample ID #	After 48 hours		Notes
			Normal Larvae	Abnormal Larvae	
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					
35					

Computer Data StorageComputer Data Storage
Disk:
File:

Notes

SECTION 15

PURPLE URCHIN, *Strongylocentrotus purpuratus* AND SAND DOLLAR, *Dendraster excentricus* LARVAL DEVELOPMENT TEST METHOD

Adapted from a method developed by
Steven Bay and Darrin Greenstein
Southern California Coastal Water Research Project
Westminster, CA 92683

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Appendix I Step-by Step Summary

SECTION 15

SEA URCHIN, *Strongylocentrotus purpuratus* AND SAND DOLLAR, *Dendraster excentricus* LARVAL DEVELOPMENT TEST

15.1 SCOPE AND APPLICATION

15.1.1 This method estimates the chronic toxicity of effluents and receiving waters to the developing embryos of the purple sea urchin, *Strongylocentrotus purpuratus*, and the sand dollar, *Dendraster excentricus*, during a 72-h static non-renewal exposure. The effects include the synergistic, antangonistic, and additive effects of all chemical, physical, and biological components which adversely affect the physiological and biochemical functions of the test organisms.

15.1.2 Detection limits of the toxicity of an effluent or chemical substance are organism dependent.

15.1.3 Brief excursions in toxicity may not be detected using 24-h composite samples. Also, because of the long sample collection period involved in composite sampling and because the test chambers are not sealed, highly volatile and highly degradable toxicants in the source may not be detected in the test.

15.1.4 This test is commonly used in one of two forms: (1) a definitive test, consisting of a minimum of five effluent concentrations and a control, and (2) a receiving water test(s), consisting of one or more receiving water concentrations and a control.

15.1.5 This method should be restricted to use by, or under the supervision of, professionals experienced in aquatic toxicity testing. Specific experience with any toxicity test is usually needed before acceptable results become routine.

15.2 SUMMARY OF METHOD

15.2.1 The method provides the step-by-step instructions for

performing a 72-h static non-renewal test using the early development of the purple sea urchin, *Strongylocentrotus purpuratus*, and the sand dollar, *Dendraster excentricus*, to determine the toxicity of substances in marine and estuarine

waters. The test endpoint is normal larval development and may include mortality if modified for total counts at test initiation and termination.

15.3 **INTERFERENCES**

15.3.1 Toxic substances may be introduced by contaminants in dilution water, glassware, sample hardware, and testing equipment (see Section 5, Facilities, Equipment, and Supplies).

15.3.2 Improper effluent sampling and handling may adversely affect test results (see Section 8, Effluent and Receiving Water Sampling and Sample Handling, and Sample Preparation for Toxicity Tests).

15.4 **SAFETY**

15.4.1 See Section 3, Health and Safety

15.5 **APPARATUS AND EQUIPMENT**

15.5.1 Tanks, trays, or aquaria -- for holding and acclimating adult sea urchins and sand dollars, e.g., standard salt water aquarium or Instant Ocean Aquarium (capable of maintaining seawater at 10-20•C), with appropriate filtration and aeration system.

15.5.2 Air pump, air lines, and air stones -- for aerating water containing broodstock or for supplying air to test solutions with low dissolved oxygen.

15.5.3 Constant temperature chambers or water baths -- for maintaining test solution temperature and keeping dilution water supply, gametes, and embryo stock suspensions at test temperature (15•C) prior to the test.

15.5.4 Water purification system -- Millipore Super-Q, Deionized water (DI) or equivalent.

15.5.5 Refractometer -- for determining salinity.

15.5.6 Hydrometer(s) -- for calibrating refractometer.

15.5.7 Thermometers, glass or electronic, laboratory grade -- for measuring water temperatures.

15.5.8 Thermometer, National Bureau of Standards Certified (see USEPA METHOD l70.l, USEPA, l979) -- to calibrate laboratory thermometers.

15.5.9 pH and DO meters -- for routine physical and chemical measurements.

15.5.10 Standard or micro-Winkler apparatus -- for determining DO (optional) and calibrating the DO meter.

15.5.11 Winkler bottles -- for dissolved oxygen determinations.

15.5.12 Balance -- Analytical, capable of accurately weighing to 0.0001 g.

15.5.13 Fume hood -- to protect the analyst from effluent or formaldehyde fumes.

15.5.14 Glass stirring rods -- for mixing test solutions.

15.5.15 Graduated cylinders -- Class A, borosilicate glass or non-toxic plastic labware, 50-l000 mL for making test solutions. (Note: not to be used interchangeably for gametes or embryos and test solutions).

15.5.16 Volumetric flasks -- Class A, borosilicate glass or non-toxic plastic labware, 100-1000 mL for making test solutions.

15.5.17 Pipets, automatic -- adjustable, to cover a range of delivery volumes from 0.010 to 1.000 mL.

15.5.18 Pipet bulbs and fillers -- PROPIPET® or equivalent.

15.5.19 Wash bottles -- for reagent water, for topping off graduated cylinders, for rinsing small glassware and instrument electrodes and probes.

15.5.20 Wash bottles -- for dilution water.

15.5.21 20-liter cubitainers or polycarbonate water cooler jugs -- for making hypersaline brine.

15.5.22 Cubitainers, beakers, or similar chambers of non-toxic composition for holding, mixing, and dispensing dilution water and other general non-effluent, non-toxicant contact uses. These should be clearly labeled and not used for other purposes.

15.5.23 Beakers, 5-10 mL borosilicate glass -- for collecting sperm from sand dollars.

15.5.24 Beakers, 250 mL borosilicate glass -- for preparation of test solutions.

15.5.25 Beakers, 100 mL borosilicate glass -- for spawning; to support sea urchins and to collect sea urchin and sand dollar eggs.

15.5.26 Beakers, 1,000 mL borosilicate glass -- for rinsing and settling sea urchin eggs.

16.5.27 Vortex mixer -- to mix sea urchin semen in tubes prior to sampling.

15.5.28 Compound microscope -- for examining gametes, counting sperm cells (200-400x), eggs and embryos and (100x), and examining larvae. Dissecting scopes are sometimes used to count eggs at a lower magnification. One piece of equipment worthy of a special mention is an inverted microscope. The use of an inverted scope is not required, but recommended. Its use reduces the exposure of workers to hazardous fumes (formalin or glutaraldehyde) during the counting of larvae and reduces sample examination time. Alternatively, a Sedgewick-Rafter cell may be used on a regular compound scope.

15.5.29 Counter, two unit, 0-999 -- for recording sperm, egg, embryo, and larval counts.

15.5.30 Sedgwick-Rafter counting chamber -- for counting egg and embryo stock and examining larval development at the end of the test.

15.5.31 Centrifuge tubes, test tubes, or vials -- for holding semen.

15.5.32 Hemacytometers, Neubauer -- for counting sperm.

15.5.33 Siphon hose (3 mm i.d.) -- for removing wash water from settled eggs.

15.5.34 Perforated plunger -- for maintaining homogeneous distribution of eggs and embryos during sampling and distribution to test chambers.

15.5.35 Enamel or plastic tray -- for optional spawning platform.

15.5.36 Nitex® screening (0.5mm mesh) -- cleaning egg solutions.

15.5.37 60 µm NITEX® filter -- for filtering receiving waters.

15.6 **REAGENTS AND SUPPLIES**

15.6.1 Sample containers -- for sample shipment and storage (see Section 8, Effluent and Receiving Water Sampling, and Sample Handling, and Sample Preparation for Toxicity Tests).

15.6.2 Data sheets (one set per test) -- for data recording (see Figures 1-4).

15.6.3 Tape, colored -- for labelling test chambers and containers.

15.6.4 Markers, water-proof -- for marking containers, etc.

15.6.5 Parafilm -- to cover graduated cylinders and vessels containing gametes and embryos.

15.6.6 Gloves, disposable -- for personal protection from contamination.

15.6.7 Pipets, serological -- l-l0 mL, graduated.

15.6.8 Pipet tips -- for automatic pipets. Note: pipet tips for handling semen should be cut off to produce an opening about 1 mm in diameter; pipet tips for handling eggs should be cut off to produce an opening about 2 mm in diameter. This is necessary to provide smooth flow of the viscous semen, accurate sampling of eggs, and to prevent injury to eggs passing through a restricted opening. A clean razor blade can be used to trim pipet tips.

15.6.9 Coverslips -- for microscope slides.

15.6.10 Lens paper -- for cleaning microscope optics.

15.6.11 Laboratory tissue wipes -- for cleaning and drying electrodes, microscope slides, etc.

15.6.12 Disposable countertop covering -- for protection of work surfaces and minimizing spills and contamination.

15.6.13 pH buffers 4, 7, and l0 (or as per instructions of instrument manufacturer) -- for standards and calibration check (see USEPA Method l50.l, USEPA, l979).

15.6.14 Membranes and filling solutions -- for dissolved oxygen probe (see USEPA Method 360.l, USEPA, l979), or reagents for modified Winkler analysis.

15.6.15 Laboratory quality assurance samples and standards -- for the above methods.

15.6.16 Test chambers -- 30-mL glass scintillation vials with polypropylene caps, four chambers per concentration.

15.6.17 Formaldehyde, 10%, in seawater -- for preserving larvae. Note: formaldehyde has been identified as a carcinogen and is irritating to skin and mucous membranes. It should not be used at a concentration higher than necessary to achieve morphological preservation of larvae for counting and only under conditions of maximal ventilation and minimal opportunity for volatilization into room air.

15.6.18 Glutaraldehyde, 1% in seawater -- for preserving larvae.

Figure 1. Sample experiment set-up sheet.

SEA URCHIN EMBRYO DEVELOPMENT TEST

EXPERIMENT DESCRIPTION

Bioassay No._____ Start Date_____ Start time_____

Investigator_____ End Date_____ End Time_____

Sample Numbers	Sample	Concentration	Other Information

Figure 2. Sample worksheet for urchin spawning information.

SEA URCHIN DEVELOPMENT TEST

SPAWNING WORKSHEET

Bioassay no._____ Date _____

Spawning

No.	Injection time	Sex	Accepted? (Comments)
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			

Sperm density

#sperm counted=_____

_____

_____ mean=_____

_____

(mean)_____ x (5 x 10^6)=_____ sperm/mL

Egg dilution

eggs counted=_____

_____ mean=_____

_____

(mean)_____ x 100=_____ eggs/mL in stock

eggs/mL in stock ÷ 1,000= _____ Egg dilution factor

Figure 3. Sample worksheet for sea urchin fertilization information.

SEA URCHIN DEVELOPMENT TEST
FERTILIZATION WORKSHEET

Bioassay No. _____
Date_____

_____mL eggs used _____mL dilution water used

Fertilization and initiation

_____mL in egg dilution x 1,000 eggs/mL
= _____eggs in dilution

_____eggs in dilution x 500 sperm/egg
= _____sperm needed

_____sperm needed ÷ _____sperm/mL in sperm dilution=_____mL sperm dilution needed

Percent fertilized after 10 min _____

Time of inoculation_____

Figure 4. Sample data sheet for embryo microscopic examination.

SEA URCHIN DEVELOPMENT TEST: RESULTS

Bioassay No._____ Date_____

Counter_____

Number	Sample	Abnormal	Normal	%Normal	Notes

15.6.19 Acetic acid, 10%, reagent grade, in filtered (10•) seawater -- for preparing killed sperm dilutions for sperm counts.

15.6.20 Haemo-Sol or equivalent cleaner -- for cleaning hemacytometer and cover slips.

15.6.21 0.5 M KCl solution -- for inducing spawning.

15.6.22 Syringe, disposable, 3 or 5 mL -- for injecting KCl into sea urchins and sand dollars to induce spawning.

15.6.23 Needles, 25 gauge -- for injecting KCl.

15.6.24 Pasteur pipets and bulbs -- for sampling eggs from spawning beakers.

15.6.25 Hematocrit capillary tubes -- for sampling sperm for examination and for loading hemacytometers.

15.6.26 Microscope well-slides -- for pre-test assessment of sperm activity and egg condition.

15.6.27 Reference toxicant solutions (see Section 15.10.2.4 and Section 4, Quality Assurance).

15.6.28 Reagent water -- defined as distilled or deionized water that does not contain substances which are toxic to the test organisms (see Section 5, Facilities, Equipment, and Supplies).

15.6.29 Effluent and receiving water -- see Section 8, Effluent and Surface Water Sampling, and Sample Handling, and Sample Preparation for Toxicity Tests.

15.6.30 Dilution water and hypersaline brine -- see Section 7, Dilution Water and Section 15.6.24, Hypersaline Brines. The dilution water should be uncontaminated 1-µm-filtered natural seawater. Hypersaline brine should be prepared from dilution water.

15.6.31 HYPERSALINE BRINES

15.6.31.1 Most industrial and sewage treatment effluents

entering marine and estuarine systems have little measurable salinity. Exposure of larvae to these effluents will usually require increasing the salinity of the test solutions. It is important to maintain an essentially constant salinity across all treatments. In some applications it may be desirable to match the test salinity with that of the receiving water (See Section 7.1). Two salt sources are available to adjust salinities -- artificial sea salts and hypersaline brine (HSB) derived from natural seawater. Use of artificial sea salts is necessary only when high effluent concentrations preclude salinity adjustment by HSB alone.

15.6.31.2 Hypersaline brine (HSB) can be made by concentrating natural seawater by freezing or evaporation. HSB should be made from high quality, filtered seawater, and can be added to the effluent or to reagent water to increase salinity. HSB has several desirable characteristics for use in effluent toxicity testing. Brine derived from natural seawater contains the necessary trace metals, biogenic colloids, and some of the microbial components necessary for adequate growth, survival, and/or reproduction of marine and estuarine organisms, and it can be stored for prolonged periods without any apparent degradation. However, even if the maximum salinity HSB (100‰) is used as a diluent, the maximum concentration of effluent (0‰) that can be tested is 66% effluent at 34‰ salinity (see Table 1).

15.6.31.3 High quality (and preferably high salinity) seawater should be filtered to at least 10 µm before placing into the freezer or the brine generator. Water should be collected on an incoming tide to minimize the possibility of contamination.

15.6.31.4 Freeze Preparation of Brine

15.6.31.4.1 A convenient container for making HSB by freezing is one that has a bottom drain. One liter of brine can be made from four liters of seawater. Brine may be collected by partially freezing seawater at -10 to -20•C until the remaining liquid has reached the target salinity. Freeze for approximately six hours, then separate the ice (composed mainly of fresh water) from the remaining liquid (which has now become hypersaline).

TABLE 1. MAXIMUM EFFLUENT CONCENTRATION (%) THAT CAN BE TESTED AT 34‰ WITHOUT THE ADDITION OF DRY SALTS GIVEN THE INDICATED EFFLUENT AND BRINE SALINITIES.

Effluent Salinity ‰	Brine 60 ‰	Brine 70 ‰	Brine 80 ‰	Brine 90 ‰	Brine 100 ‰
0	43.33	51.43	57.50	62.22	66.00
1	44.07	52.17	58.23	62.92	66.67
2	44.83	52.94	58.97	63.64	67.35
3	45.61	53.73	59.74	64.37	68.04
4	46.43	54.55	60.53	65.12	68.75
5	47.27	55.38	61.33	65.88	69.47
10	52.00	60.00	65.71	70.00	73.33
15	57.78	65.45	70.77	74.67	77.65
20	65.00	72.00	76.67	80.00	82.50
25	74.29	80.00	83.64	86.15	88.00

15.6.31.4.2 It is preferable to monitor the water until the target salinity is achieved rather than allowing total freezing followed by partial thawing. Brine salinity should never exceed 100‰. It is advisable not to exceed about 70‰ brine salinity unless it is necessary to test effluent concentrations greater than 50%.

15.6.31.4.3 After the required salinity is attained, the HSB should be filtered through a 1 µm filter and poured directly into portable containers (20-L cubitainers or polycarbonate water cooler jugs are suitable). The brine storage containers should be capped and labelled with the salinity and the date the brine was generated. Containers of HSB should be stored in the dark at 4•C (even room temperature has been acceptable). HSB is usually of acceptable quality even after several months in storage.

15.6.31.5 Heat Preparation of Brine

15.6.31.5.1 The ideal container for making brine using heat-assisted evaporation of natural seawater is one that (1) has a high surface to volume ratio, (2) is made of a non-corrosive material, and (3) is easily cleaned (fiberglass containers are ideal). Special care should be used to prevent any toxic materials from coming in contact with the seawater being used to generate the brine. If a heater is immersed directly into the seawater, ensure that the heater materials do not corrode or leach any substances that would contaminate the brine. One successful method is to use a thermostatically controlled heat exchanger made from fiberglass. If aeration is needed, use only oil-free air compressors to prevent contamination.

15.6.31.5.2 Before adding seawater to the brine generator, thoroughly clean the generator, aeration supply tube, heater, and any other materials that will be in direct contact with the brine. A good quality biodegradable detergent should be used, followed by several (at least three) thorough reagent water rinses.

15.6.31.5.3 Seawater should be filtered to at least 10 µm before being put into the brine generator. The temperature of the seawater is increased slowly to 40•C. The water should be aerated to prevent temperature stratification and to increase water evaporation. The brine should be checked daily (depending on the volume being generated) to ensure that the salinity does not exceed 100‰ and that the temperature does not exceed 40•C. Additional seawater may be added to the brine to obtain the volume of brine required.

15.6.31.5.4 After the required salinity is attained, the HSB should be filtered through a 1 µm filter and poured directly into portable containers (20-L cubitainers or polycarbonate water cooler jugs are suitable). The brine storage containers should be capped and labelled with the salinity and the date the brine was generated. Containers of HSB should be stored in the dark at 4•C (even room temperature has been acceptable). HSB is usually of acceptable quality even after several months in storage.

15.6.31.6 Artificial Sea Salts

15.6.31.6.1 No data from sea urchin or sand dollar larval tests using sea salts or artificial seawater (e.g., GP2) are available

for evaluation at this time, and their use must be considered provisional.

15.6.31.7 Dilution Water Preparation from Brine

15.6.31.7.1 Although salinity adjustment with brine is the preferred method, the use of high salinity brines and/or reagent water has sometimes been associated with discernible adverse effects on test organisms. For this reason, it is recommended that only the minimum necessary volume of brine and reagent water be used to offset the low salinity of the effluent, and that brine controls be included in the test. The remaining dilution water should be natural seawater. Salinity may be adjusted in one of two ways. First, the salinity of the highest effluent test concentration may be adjusted to an acceptable salinity, and then serially diluted. Alternatively, each effluent concentration can be prepared individually with appropriate volumes of effluent and brine.

15.6.31.7.2 When HSB and reagent water are used, thoroughly mix together the reagent water and HSB before mixing in the effluent. Divide the salinity of the HSB by the expected test salinity to determine the proportion of reagent water to brine. For example, if the salinity of the brine is 100‰ and the test is to be conducted at 34‰, 100‰ divided by 34‰ = 2.94. The proportion is 1 part brine plus 1.94 parts reagent water. To make 1 L of dilution water at 34‰ salinity from a HSB of 100‰, 340 mL of brine and 660 mL of reagent water are required. Verify the salinity of the resulting mixture using a refractometer.

15.6.31.8 Test Solution Salinity Adjustment

15.6.31.8.1 Table 2 illustrates the preparation of test solutions (up to 50% effluent) at 34‰ by combining effluent, HSB, and dilution water. Note: if the highest effluent concentration does not exceed 50% effluent, it is convenient to prepare brine so that the sum of the effluent salinity and brine salinity equals 68‰; the required brine volume is then always equal to the effluent volume needed for each effluent concentration as in the example in Table 2.

15.6.31.8.2 Check the pH of all test solutions and adjust to within 0.2 units of dilution water pH by adding, dropwise, dilute

hydrochloric acid or sodium hydroxide (see Section 8.8.9, Effluent and Receiving Water Sampling, Sample Handling, and Sample Preparation for Toxicity Tests).

15.6.31.8.3 To calculate the amount of brine to add to each effluent dilution, determine the following quantities: salinity of the brine (SB, in ‰), the salinity of the effluent (SE, in ‰), and volume of the effluent to be added (VE, in mL). Then use the following formula to calculate the volume of brine (VB, in mL) to be added:

$$VB = VE \times (34 - SE)/(SB - 34)$$

15.6.31.8.4 This calculation assumes that dilution water salinity is 34 ± 2‰.

15.6.31.9 Preparing Test Solutions

15.6.31.9.1 Ten mL of test solution are needed for each test chamber. To prepare test solutions at low effluent concentrations (<6%), effluents may be added directly to dilution water. For example, to prepare 1% effluent, add 1.0 mL of effluent to a 100-mL volumetric flask using a volumetric pipet or calibrated automatic pipet. Fill the volumetric flask to the 100-mL mark with dilution water, stopper it, and shake to mix. Pour into a (150-250 mL) beaker and stir. Distribute equal volumes into the replicate test chambers. The remaining test solution can be used for chemistry.

15.6.31.9.2 To prepare a test solution at higher effluent concentrations, hypersaline brine must usually be used. For example, to prepare 40% effluent, add 400 mL of effluent to a 1-liter volumetric flask. Then, assuming an effluent salinity of 2‰ and a brine salinity of 66‰, add 400 mL of brine (see equation above and Table 2) and top off the flask with dilution water. Stopper the flask and shake well. Pour into a (100-250 mL) beaker and stir. Distribute equal volumes into the replicate test chambers. The remaining test solution can be used for chemistry.

TABLE 2. EXAMPLES OF EFFLUENT DILUTION SHOWING VOLUMES OF EFFLUENT (AT X‰), BRINE, AND DILUTION WATER NEEDED FOR ONE LITER OF EACH TEST SOLUTION.

FIRST STEP: Combine brine with reagent water or natural seawater to achieve a brine of 68-x‰ and, unless natural seawater is used for dilution water, also a brine-based dilution water of 34‰.

SERIAL DILUTION:

Step 1. Prepare the highest effluent concentration to be tested by adding equal volumes of effluent and brine to the appropriate volume of dilution water. An example using 40% is shown.

Effluent Conc. (%)	Effluent x‰	Brine (68-x)‰	Dilution Water* 34‰
40	800 mL	800 mL	400 mL

Step 2. Make serial dilutions from the highest test concentration.

Effluent Conc. (%)	Effluent Source	Dilution Water* (34‰)
20	1000 mL of 40%	1000 mL
10	1000 mL of 20%	1000 mL
5	1000 mL of 10%	1000 mL
2.5	1000 mL of 5%	1000 mL
Control	none	1000 mL

INDIVIDUAL PREPARATION:

Effluent Conc. (%)	Effluent x‰	Brine (68-x)‰	Dilution Water* 34‰
40	400 mL	400 mL	200 mL
20	200 mL	200 mL	600 mL
10	100 mL	100 mL	800 mL
5	50 mL	50 mL	900 mL
2.5	25 mL	25 mL	950 mL
Control	none	none	1000 mL

*May be natural seawater or brine-reagent water equivalent.

15.6.31.10 Brine Controls

15.6.31.10.1 Use brine controls in all tests where brine is used. Brine controls contain the same volume of brine as does the highest effluent concentration using brine, plus the volume of reagent water needed to reproduce the hyposalinity of the effluent in the highest concentration, plus dilution water. Calculate the amount of reagent water to add to brine controls by rearranging the above equation, (See, 15.6.31.8.3) setting SE = 0, and solving for VE.

$$VE = VB \times (SB - 34)/(34 - SE)$$

If effluent salinity is essentially 0‰, the reagent water volume needed in the brine control will equal the effluent volume at the highest test concentration. However, as effluent salinity and effluent concentration increase, less reagent water volume is needed.

15.6.32 TEST ORGANISMS, PURPLE URCHINS

15.6.32.1 Sea Urchins, *Strongylocentrotus purpuratus* (approximately 6 of each sex per test).

15.6.32.2 Species Identification

15.6.32.2.1 Although identification of purple sea urchins, *Strogylocentrotus purpuratus*, is usually a simple matter of confirming general body color, size, and spine appearance, those unfamiliar with the species should seek confirmation from local experts.

15.6.32.3 Obtaining Broodstock

15.6.32.3.1 Adult sea urchins (*Strongylocentrotus purpuratus*) can be obtained from commercial suppliers or collected from uncontaminated intertidal areas. State collection permits are usually required for collection of sea urchins and collection is prohibited or restricted in some areas. The animals are best transported "dry," surrounded either by moist seaweed or paper towels dampened with seawater. Animals should be kept at approximately their collection or culture temperature to prevent thermal shock which can prematurely induce spawning.

15.6.32.4 Broodstock Culture and Handling

15.6.32.4.1 The adult sea urchins are maintained in glass aquaria or fiberglass tanks. The tanks are supplied continuously (approximately 5 L/min) with filtered natural seawater, or salt water prepared from commericial sea salts is recirculated. The animals are checked daily and any obviously unhealthy animals are discarded.

15.6.32.4.2 Although ambient temperature seawater is usually acceptable, maintaining sea urchins in spawning condition usually requires holding at a relatively constant temperature. The culture unit should be capable of maintaining a constant temperature between 10 and 14•C with a water temperature control device.

15.6.32.4.3 Food for sea urchins -- kelp, recommended, but not necessarily limited to, *Laminaria sp*., *Hedophyllum sp*., *Nereocystis sp*., *Macrocystis sp*., *Egregia sp*., *Alaria sp*. or romaine lettuce. The kelp should be gathered from known uncontaminated zones or obtained from commerical supply houses whose kelp comes from known uncontaminated areas, or romaine lettuce. Fresh food is introduced into the tanks at least several times a week. Sun dried (12-24 hours) or oven dried (60•C overnight) kelp, stores well at room temperature or frozen, rehydrates well and is adequate to maintain sea urchins for long periods. Decaying food and fecal pellets are removed as necessary to prevent fouling.

15.6.32.4.4 Natural seawater (>30‰) is used to maintain the adult animals and (•32‰) as a control water in the tests.

15.6.32.4.5 Adult male and female (if sexes known) animals used in field studies are transported in separate or partitioned insulated boxes or coolers packed with wet kelp or paper toweling. Upon arrival at the field site, aquaria (or a single partitioned aquarium) are filled with control water, loosely covered with a styrofoam sheet and allowed to equilibrate to the holding temperature before animals are added. Healthy animals will attach to the kelp or aquarium within hours.

15.6.32.4.6 To successfully maintain about 25 adult animals for seven days at a field site, 40-L glass aquaria using aerated,

recirculating, clean saline water (32‰) and a gravel bed filtration system, are housed within a water bath, such as an INSTANT OCEAN[R] Aquarium. The sexes should be held separately if possible.

15.6.33 TEST ORGANISMS, SAND DOLLARS

15.6.33.1 Sand Dollars, *Dendraster excentricus*, (approximately 6 of each sex per test).

15.6.33.2 Species Identification

15.6.33.2.1 Although identification of sand dollars, *Dendraster excentricus*, is usually a simple matter of confirming general body appearance, those unfamiliar with the species should seek confirmation from local experts.

15.6.33.3 Obtaining Broodstock

15.6.33.3.1 Adult sand dollars (*Dendraster excentricus*) can be obtained from commercial suppliers or collected from subtidal zones (most areas) or from intertidal zones of some sheltered waters (e.g., Puget Sound). State collection permits may be required for collection of sand dollars and collection prohibited or restricted in some areas. The animals are best transported "dry," surrounded either by moist seaweed or paper towels dampened with seawater. Animals should be kept at approximately their collection or culture temperature to prevent thermal shock which can prematurely induce spawning.

15.6.33.4 Broodstock Culture and Handling

15.6.33.4.1 The adult sand dollars are maintained in glass aquaria or fiberglass tanks. The tanks are supplied continuously (approximately 5 L/min) with filtered natural seawater, or saltwater prepared from commercial sea salts is recirculated. The animals are checked daily and any obviously unhealthy animals are discarded. For longer periods than a few days, several centimeters or more of a sand substrate may be desirable.

15.6.33.4.2 Although ambient temperature seawater is usually acceptable, maintaining sand dollars in spawning condition usually requires holding at a relatively constant temperature.

The culture unit should be capable of maintaining a constant temperature between 8 and 12•C with a water temperature control device.

15.6.33.4.3 Sand dollars will feed on suspended or benthic materials such as phytoplankton, benthic diatoms, etc. No reports of laboratory populations being maintained in spawning condition over several years are known. It is probably most convenient to obtain sand dollars, use them, and then discard them after they cease to produce good quality gametes.

15.6.33.4.4 Natural seawater (>30‰) is used to maintain the adult animals and (•32‰) as a control water in the tests.

15.6.33.4.5 Adult male and female (if sexes known) animals used in field studies are transported in separate or partitioned insulated boxes or coolers packed with wet kelp or paper toweling. Upon arrival at the field site, trays or aquaria (or a single partitioned aquarium) are filled with control water, loosely covered with a styrofoam sheet and allowed to equilibrate to the holding temperature before animals are added.

15.6.33.4.6 To successfully maintain about 25 adult animals for seven days at a field site, 40-L glass aquaria using aerated, recirculating, clean saline water (>30‰) are housed within a water bath, such as an INSTANT OCEAN^{R} Aquarium. The sexes should be held separately if possible.

15.7 EFFLUENT AND RECEIVING WATER COLLECTION, PRESERVATION AND STORAGE

15.7.1 See Section 8, Effluent and Receiving Water Sampling and Sample Handling, and Sampling Preparation for Toxicity Tests.

15.8 CALIBRATION AND STANDARDIZATION

15.8.1 See Section 4, Quality Assurance.

15.9 QUALITY CONTROL

15.9.1 See Section 4, Quality Assurance.

15.10 TEST PROCEDURES

15.10.1 TEST DESIGN

15.10.1.1 The test consists of at least four replicates of five effluent concentrations plus a dilution water control. Tests that use brine to adjust salinity must also contain four replicates of a brine control.

15.10.1.2 Effluent concentrations are expressed as percent effluent.

15.10.2 TEST SOLUTIONS

15.10.2.1 Receiving waters

15.10.2.1.1 The sampling point is determined by the objectives of the test. At estuarine and marine sites, samples are usually collected at mid-depth. Receiving water toxicity is determined with samples used directly as collected or with samples passed through a 60 µm NITEX® filter and compared without dilution, against a control. Using four replicate chambers per test, each containing 10 mL, and 400 mL for chemical analysis, would require approximately 440 mL of sample per test.

15.10.2.2 Effluents

15.10.2.2.1 The selection of the effluent test concentrations should be based on the objectives of the study. A dilution factor of at least 0.5 is commonly used. A dilution factor of 0.5 provides hypothesis test discrimination of ± 100%, and testing of a 16 fold range of concentrations. Hypothesis test discrimination shows little improvement as dilution factors are increased beyond 0.5 and declines rapidly if smaller dilution factors are used. **USEPA recommends that one of the five effluent treatments must be a concentration of effluent mixed with dilution water which corresponds to the permittee's instream waste concentration (IWC).** At least two of the effluent treatments must be of lesser effluent concentration than the IWC, with one being at least one-half the concentration of the IWC. If 100‰ HSB is used as a diluent, the maximum concentration of effluent that can be tested will be 66% at 34‰ salinity.

15.10.2.2.2 If the effluent is known or suspected to be highly toxic, a lower range of effluent concentrations should be used (such as 25%, 12.5%, 6.25%, 3.12% and 1.56%).

15.10.2.2.3 The volume in each test chamber is 10 mL.

15.10.2.2.4 Effluent dilutions should be prepared for all replicates in each treatment in one container to minimize variability among the replicates. Dispense into the appropriate effluent test chambers.

15.10.2.3 Dilution Water

15.10.2.3.1 Dilution water should be uncontaminated 1-µm-filtered natural seawater or hypersaline brine prepared from uncontaminated natural seawater plus reagent water (see Section 7, Dilution Water). Natural seawater may be uncontaminated receiving water. This water is used in all dilution steps and as the control water.

15.10.2.4 Reference Toxicant Test

15.10.2.4.1 Reference toxicant tests should be conducted as described in Quality Assurance (see Section 4.7).

15.10.2.4.2 The preferred reference toxicant for sea urchins and sand dollars is copper chloride ($CuCl_2 \circ H_2O$). Reference toxicant tests provide an indication of the sensitivity of the test organisms and the suitability of the testing laboratory (see Section 4 Quality Assurance). Another toxicant may be specified by the appropriate regulatory agency. Prepare a copper reference toxicant stock solution (2,000 mg/L) by adding 5.366 g of copper chloride ($CuCl_2 \circ 2H_2O$) to 1 liter of reagent water. For each reference toxicant test prepare a copper sub-stock of 3 mg/L by diluting 1.5 mL of stock to one liter with reagent water. Alternatively, certified standard solutions can be ordered from commercial companies.

15.10.2.4.3 Prepare a control (0 •g/L) plus four replicates each of at least five consecutive copper reference toxicant solutions (e.g., from the series 3.0, 4.4, 6.5, 9.5, 13.9, 20.4, and 30.0 •g/L, by adding 0.10, 0.15, 0.22, 0.32, 0.46, 0.68, and 1.00 mL of sub-stock solution, respectively, to 100-L volumetric flasks

and filling to 100-mL with dilution water). Alternatively, certified standard solutions can be ordered from commercial companies. Start with control solutions and progress to the highest concentration to minimize contamination.

15.10.2.4.4 If the effluent and reference toxicant tests are to be run concurrently, then the tests must use embryos from the same spawn. The tests must be handled in the same way and test solutions delivered to the test chambers at the same time. Reference toxicant tests must be conducted at 34 ± 2‰.

15.10.3 COLLECTION OF GAMETES FOR THE TEST

15.10.3.1 Spawning Induction

15.10.3.1.1 Pour seawater into 100 mL beakers and place in 15•C bath or room. Allow to come to temperature. Select a sufficient number of sea urchins or sand dollars (based upon recent or past spawning success) so that three of each sex are likely to provide gametes of acceptable quantity and quality for the test. During optimal spawning periods this may only require six animals, three of each sex, when the sexes are known from prior spawning. During other periods, especially if the sex is not known, many more animals may be required.

15.10.3.1.2 Care should be exercised when removing sea urchins from holding tanks so that damage to tube-feet is minimized. Following removal, sea urchins should be placed into a container lined with seawater-moistened paper towels to prevent reattachment.

15.10.3.1.3 Place each sand dollar, oral side up, on a 100 mL beaker filled with 15•C seawater or each sea urchin onto a clean tray covered with several layers of seawater moistened paper towels.

15.10.3.1.4 Handle sexes separately once known; this minimizes the chance of accidental egg fertilization. Throughout the test process, it is best if a different worker, different pipets, etc. are used for males (semen) and females (eggs). Frequent washing of hands is a good practice.

15.10.3.1.5 Fill a 3 or 5 mL syringe with 0.5 M KCl and inject

0.5 mL through the soft periostomal membrane of each sea urchin (See Figure 5) or into the oral opening each sand dollar. If sexes are known, use a separate needle for each sex. If sexes are not known, rinse the needle with hot tap water between each injection. This will avoid the accidental injection of sperm from males into females. Note the time of injection on the data sheet.

15.10.3.1.6 Spawning of sea urchins is sometimes induced by holding the injected sea urchin and gently shaking or swirling it for several seconds. This may provide an additional physical stimulus, or may aid in distributing the injected KCl.

15.10.3.1.7 Place the sea urchins onto the beakers or tray (oral side down). Place the sand dollars onto the beakers (oral side up). Females will release orange (sea urchins) or purple (sand dollars) eggs and males will release cream-colored semen.

15.10.3.1.8 As gametes begin to be shed, note the time on the data sheet and separate the sexes. Place male sand dollars with the oral side up atop a small (5-10 mL) glass beaker filled with 12•C seawater. Leave spawning sea urchin males on tray or beaker (oral side down) for semen collection. Female sand dollars and sea urchins are left to shed eggs into the 100-mL beakers.

15.10.3.1.9 If sufficient quantities of gametes are available, only collect gametes for the first 15 min after each animal starts releasing. This helps to insure good quality gametes. As a general guideline, do not collect gametes from any individual for more than 30 minutes after the first injection.

15.10.3.1.10 If no spawning occurs after 5 or 10 minutes, a second 0.5 mL injection may be tried. If animals do not produce sufficient gametes following injection of 1.0 mL of KCl, they should probably not be reinjected as this seldom results in acquisition of good quality gametes and may result in mortality of adult urchins.

15.10.3.1.11 Sections 15.10.4.2 and 15.10.6.4 describe collection and dilution of the sperm and eggs. While some of the gamete handling needs to be in a specific order, parts of the procedure can be done simultaneously while waiting for gametes to settle.

dilution water on a microscope slide (well slides work nicely). Examine the sperm for motility; use sperm from males with high sperm motility.

15.10.3.4 Pooling of Sperm

15.10.3.4.1 Pool equal quantities of semen from each of the sea urchin males that has been deemed good. If possible, 0.025 mL should be pooled from each of those used and a total of at least 0.05 mL of pooled semen should be available. Sperm collected from good male sand dollars should be pooled after first decanting off the overlying water (the final sand dollar sperm density usually is between $2x10^9$ and $2x10^{10}$ sperm/mL).

15.10.3.5 Storage of Sperm

15.10.3.5.1 Cover each test tube or beaker with a cap or parafilm, as air exposure of semen may alter its pH through gas exchange and reduce the viability of the sperm. Keep sperm covered and on ice or refrigerated (<5•C). The sperm should be used within 4 h of collection.

15.10.4 PREPARATION OF SPERM DILUTION FOR USE IN THE TEST

15.10.4.1 Sperm Dilution

15.10.4.1.1 When ready to use sperm, mix by agitating the tube with a vortex mixer. Add about 0.025 mL of semen to a 100 mL beaker containing 50 mL of 15•C dilution water. Stir this solution thoroughly with a Pasteur pipette. A drop of egg solution from each female may be placed on a well slide and a small amount of sperm solution added to test fertilization. If no fertilization membrane forms on eggs from any female, then new gametes should be collected. Keep the sperm dilution covered and at 15•C until ready for use. This dilution should be used to fertilize the eggs within 1.5 hours of being made.

15.10.4.2 Sperm Density Determination

15.10.4.2.1 Take 0.5 mL subsample of the sperm solution and add it to 5 mL of 10% acetic acid in a 50 mL graduated cylinder, to kill the sperm. Bring the volume to 50 mL with dilution water. Mix by inversion and place one drop of the killed sperm solution

onto each side of a hemocytometer. Let sperm settle for about 15 minutes. Count the number of sperm in 80 small squares on each side of the hemocytometer. If the counts for each side are within 80% of one another, then take the mean of those two counts. If the counts are not that close, then refill the hemocytometer, recount and take the mean of the four counts. Use the following equations to determine sperm density and record the results on the spawning worksheet (Figure 2).

$$\#\text{sperm/mL} = \frac{(\text{dilution})(\text{count})(\text{hemacytometer conversion factor})(\text{mm3/mL})}{\text{number of squares counted}}$$

dilution=100
conversion factor=4000
mm^3/mL=1000
number of squares=80

Therefore:

$$\#\text{sperm/mL} = (\text{count})(5 \times 10^6) \qquad \text{(Equation 2A)}$$

15.10.5 PREPARATION OF EGG SUSPENSION FOR USE IN THE TEST

15.10.5.1 Acceptability of Eggs

15.10.5.1.1 Place a small sample of eggs from each female in the counting chamber and examine eggs with the microscope. Look for the presence of significant quantities of immature or abnormal appearing eggs (germinal vesicle present, unusually large or small or irregularly shaped). Do not use the eggs from females having more than 10% abnormal eggs or from females whose eggs did not fertilize during the test in Section 15.10.5.1.

15.10.5.2 Pooling of Eggs

15.10.5.2.1 Allow eggs to settle in the collection beakers. Decant some of the water from the collection beakers taking care not to pour off many eggs. Pour the remaining sea urchin eggs

through the Nitex® screen (to remove fecal material and other debris) into a 1 liter beaker. Repeat with each of the "good" females. Bring the volume up to about 600 mL with dilution water. Allow the eggs to settle to the bottom again. Siphon off about 400 mL of the overlying water and then bring back up to 600 mL with dilution water. Do not allow the temperature to rise above the 15•C test temperature; somewhat cooler temperatures for holding would be acceptable.

15.10.5.2.2 Pooled sand dollar eggs should be treated gently and no additional screening or rinsing step is recommended. Mix well once just before subsampling for egg stock calculations. This is best done in a large graduated cylinder appropriate for the number of eggs available. Cover with parafilm and invert gently several times.

15.10.5.3 Density of Eggs

15.10.5.3.1 Using a plunger, mix the sea urchin egg suspension well. While continuing to mix, remove a 10 mL sample and place in a 1 liter graduated cylinder. Bring the volume up to 1 liter with dilution water. Mix this dilution well and remove a 1 mL sample to a counting cell. Count all the eggs in the 1 mL sample. Repeat the process and take the mean of the two counts. Calculate the number of eggs per mL in the stock solution using Equation 3 and record the results.

# of eggs in count x 100= # eggs/mL in stock (Equation 3)

15.10.5.4 Dilution of Eggs

15.10.5.4.1 When using scintillation vials as the test chamber, the final concentration of eggs in the diluted stock must be 250 eggs/0.25 mL, which is equal to 1,000 eggs/mL. To calculate the dilution factor for the eggs, use Equation 4. (If larger test chambers are used, the total number of eggs used will be greater and the stock solution density may be adjusted, but the final concentration of eggs in the test solutions must remain 25 eggs/mL).

# of eggs/mL in stock ÷ 1,000= Dilution factor (Equation 4)

15.10.5.4.2 The dilution factor must be greater than one. If

not, concentrate the eggs and recount (starting at Section 15.4.5.3 The dilution factor minus 1 equals the number of parts of water that go with one part of eggs in the final dilution. For example: if the dilution factor were 5.3, then 4.3 parts of water would be used with 1 part eggs.

15.10.5.4.3 Make a dilution of the egg stock so that there is more than enough volume to perform the bioassay.

15.10.5.5 Fertilization of Eggs

15.10.5.5.1 The recommended initial sperm to egg ratio for fertilization of the eggs is 500:1. Calculate the volume of sperm dilution (Section 15.10.5.1) to add to the egg dilution, by using the following equations and record the results (Figure 3).

volume of egg dilution x 1,000 eggs/mL= total # of eggs in dilution (Equation 5A)

total # of eggs in dilution x 500 sperm/egg= # of sperm needed (Equation 5B)

# of sperm needed ÷ # sperm/mL in sperm dilution= mL of sperm solution (Equation 5C)

15.10.5.5.2 Add this volume of the sperm dilution to the egg dilution and mix gently with a plunger. Wait 10 min, then check for fertilization. If fertilization is not at least 90%, add a second volume of the sperm dilution. Wait 10 min and recheck. If fertilization is still not 90%, then the test must be restarted with different gametes.

15.10.5.5.3 The test should be initiated within 1 hour of fertilization being achieved.

15.10.6 START OF THE TEST

15.10.6.1 Prior to Beginning the Test

15.10.6.1.1 The test should begin as soon as possible, preferably within 24 h of sample collection. The maximum holding time following retrieval of the sample from the sampling device should not exceed 36 h for off-site toxicity tests unless permission is granted by the permitting authority. In no case

should the sample be used in a test more than 72 h after sample collection (see Section 8 Effluent and Receiving Water Sampling, Sample Handling, and Sample Preparation for Toxicity Test).

15.10.6.1.2 Just prior to test initiation (approximately 1 h), the temperature of a sufficient quantity of the sample to make the test solutions should be adjusted to the test temperature (15 ± 1•C) and maintained at that temperature during the addition of dilution water.

15.10.6.1.3 Increase the temperature of the water bath, room, or incubator to the required test temperature (15 ± 1•C).

15.10.6.1.4 Randomize the placement of test chambers in the temperature-controlled water bath, room, or incubator at the beginning of the test, using a position chart. Assign numbers for the position of each test chamber using a random numbers or similar process (see Appendix A, for an example of randomization). Maintain the chambers in this configuration throughout the test, using a position chart. Record these numbers on a separate data sheet together with the concentration and replicate numbers to which they correspond. Identify this sheet with the date, test organism, test number, laboratory, and investigator's name, and safely store it away until after the sea urchins or sand dollars have been examined at the end of the test.

15.10.6.1.5 Note: Loss of the randomization sheet would invalidate the test by making it impossible to analyze the data afterwards. Make a copy of the randomization sheet and store separately. Take care to follow the numbering system exactly while filling chambers with the test solutions.

15.10.6.1.6 Arrange the test chambers randomly in the water bath or controlled temperature room. Once chambers have been labeled randomly and filled with test solutions, they can be arranged in numerical order for convenience, since this will also ensure random placement of treatments.

15.10.6.1.6 If mortality is to be included as an endpoint, at least 5 extra control chambers should be set up and identified on the randomization sheet as initial count chambers.

15.10.6.2 Delivery of Fertilized Eggs

15.10.6.2.1 Gently mix the solution of fertilized eggs. Deliver 0.25 mL of egg solution to each vial, using an automatic pipette with the tip cut off to provide at least a 0.5 mm opening. Deliver the embryos into the test chambers directly from the pipette, taking care not to touch the pipette to the test solution. The egg solution temperature must be within 1•C of the test solutions. Keep the eggs well mixed during the delivery procedure.

15.10.6.3 Incubation

15.10.6.3.1 The embryos are incubated for 72 hours in the test chambers at 15 ± 1•C at ambient light level.

15.10.6.3.2 The optional extra control chambers for initial counts should be counted as soon as possible after test initiation. If they are sampled and counted in a non-destructive manner they may be returned to the test but used only as a check for larval developmental rate. They must not be used for for routine control counts at the end of the test.

15.10.7 LIGHT, PHOTOPERIOD, SALINITY AND TEMPERATURE

15.10.7.1 The light quality and intensity should be at ambient laboratory conditions. Light intensity should be 10-20 $\mu E/m^2/s$, or 50 to 100 foot candles (ft-c), with a 16 h light and 8 h dark cycle.

15.10.7.2 The water temperature in the test chambers should be maintained at 15 ± 1•C. If a water bath is used to maintain the test temperature, the water depth surrounding the test cups should be as deep as possible without floating the chambers.

15.10.7.3 The test salinity should be in the range of 34 ± 2‰. The salinity should vary by no more than ±2‰ among the chambers on a given day. If effluent and receiving water tests are conducted concurrently, the salinities of these tests should be similar.

15.10.7.4 Rooms or incubators with high volume ventilation should be used with caution because the volatilization of the

test solutions and evaporation of dilution water may cause wide fluctuations in salinity. Covering the test chambers with clean polyethylene plastic may help prevent volatilization and evaporation of the test solutions.

15.10.8 DISSOLVED OXYGEN (DO) CONCENTRATION

15.10.8.1 Aeration may affect the toxicity of effluent and should be used only as a last resort to maintain a satisfactory DO. The DO concentration should be measured on new solutions at the start of the test (Day 0). The DO should not fall below 4.0 mg/L (see Section 8, Effluent and Receiving Water Sampling, Sample Handling, and Sample Preparation for Toxicity Tests). If it is necessary to aerate, all treatments and the control should be aerated. The aeration rate should not exceed that necessary to maintain a minimum acceptable DO and under no circumstances should it exceed 100 bubbles/minute, using a pipet with a 1-2 mm orifice, such as a 1 mL KIMAX® serological pipet No. 37033, or equivalent.

15.10.9 OBSERVATIONS DURING THE TEST

15.10.9.1 Routine Chemical and Physical Observations

15.10.9.1.1 The DO should be measured in each test solution at the beginning of the exposure period.

15.10.9.1.2 The temperature, pH, and salinity should be measured in all each test solution at the beginning of the exposure period. Temperature should also be monitored continuously or observed and recorded daily for at least two locations in the environmental control system or the samples. Temperature should be measured in a sufficient number of test chambers at the end of the test to determine temperature variation in the environmental chamber.

15.10.9.1.3 Record all the measurements on the data sheet.

15.10.9.2 Routine Biological Observations

15.10.9.2.1 Developing embryos do not need to be monitored during the test under normal circumstances.

15.10.10 TERMINATION OF THE TEST

15.10.10.1 Ending the Test

15.10.10.1.1 Record the time the test is terminated.

15.10.10.1.2 Temperature, pH, dissolved oxygen, and salinity are measured at the end of the exposure period in one test chamber at each concentration and in the control(s).

15.10.10.2 Sample Preservation

15.10.10.2.1 To terminate the test, add 1.0 mL of 37% (concentrated) buffered formalin to each sample to give a final formalin concentration of 4%. As an alternate fixative, 0.5 mL of 1.0% glutaraldehyde may be used, in each test chamber. Tightly cap and gently mix each chamber and store for later evaluation. (If the test is performed in larger chambers, a 10 mL subsample of well mixed test solution is to be taken from each chamber and preserved).

15.10.10.3 Counting

15.10.10.3.1 It is recommended that the embryos be examined within one week of preservation. Longer storage times may also be used, but run the risk of sample degradation due to improper preservation. Larvae can be counted directly in the scintillation vials using an inverted microscope. If an inverted scope is not available, then samples should be loaded into a Sedgewick-Rafter cell, as follows. The embryos should first be allowed to settle to the bottom of the sample chamber. All but about 1 mL of the overlying liquid should then be removed. All of the remaining liquid containing the embryos should then be transferred to the counting chamber. Whichever scope is used, the embryos should be examined at about 100x power. The first 100 embryos encountered are counted using a multi-unit handcounter to track normal versus abnormal larvae. Record the data by sample number on a data sheet (Figure 4).

15.10.10.3.2 Mortality can be determined only if: (1) all surviving larvae are counted (either in the test vials with an inverted microscope or by <u>total</u> transfer to a counting chamber); or (2) the test solution is stirred with a plunger and

quantitative subsampling is conducted followed by total larval counts on the subsample. The latter procedure requires homogeneous distribution of larvae in the test solution, quantitative transfer of larvae (without adherence to transfer hardware or test chambers), and accurate volume measurements. Mortality is most important to consider with point estimates (e.g., EC25) or when mortality occurs at the NOEC for normal development.

15.10.10.4 Endpoint

15.10.10.4.1 Normal Larvae

15.10.10.4.1.1 Normally developed pluteus larvae have several distinctive characteristics:

(1) The larvae should have a pyramid shape with a pair of skeletal rods that extend at least half the length of the long axis of the larvae (Figure 6D).

(2) The gut should be differentiated into three parts (Figure 6E). If the gut appears lobed and constricts distally in specimens with an obstructed view (e.g., Figure 6D), then normal gut development may be inferred.

(3) Development of post-oral arms has begun.

15.10.10.4.2 Abnormal Larvae

15.10.10.4.2.1 Larvae need only be scored as abnormal or normal to conduct the test, but the categories of abnormalities may be tracked as well. Abnormal larvae should fit into one of the following categories:

(1) Pathological prehatched: Embryos at the single or multi-cell stage with the fertilization membrane still visible.

(2) Pathological hatched: larvae that have no fertilization membrane and demonstrate an extensive

degree of malformation or necrosis. Most of these larvae appear as dark balls of cells or dissociated blobs of cells.

(3) Inhibited: larvae at the blastula or gastrula stage that have no gut differentiation or have no or underdeveloped skeleton. These larvae appear to be developing regularly, but are at a stage earlier than attained by control organisms (e.g., Figure 6A-C).

(4) Gut abnormalities: larvae whose overall appearance is normal, but have guts that are lacking, undifferentiated, abnormally shaped or project outside of the larvae (exogastrulated).

(5) Skeletal abnormalities: larvae whose overall appearance is normal, but have missing spicules, extraneous spicules or rods growing in abnormal directions. Note: Some larvae may exhibit a separation of the rods at the apex. This may be caused by preservation and should not be termed abnormal. Since the test is started with already fertilized eggs, any unfertilized eggs that are encountered should not be counted as either normal or abnormal, but should be ignored.

15.11 SUMMARY OF TEST CONDITIONS

15.11.1 A summary of test conditions and test acceptability criteria is listed in Table 3.

15.12 ACCEPTABILITY OF TEST RESULTS

15.12.1 Test results are acceptable only if all the following requirements are met:

(1) larval normality must be at least 80% in the controls.

(2) the minimum significant difference (%MSD) is •20% relative to the controls.

15.13 DATA ANALYSIS

15.13.1 GENERAL

15.13.1.1 Tabulate and summarize the data. Calculate the

TABLE 3. SUMMARY OF TEST CONDITIONS AND TEST ACCEPTABILITY CRITERIA FOR THE PURPLE URCHIN, *STRONGYLOCENTROTUS PURPURATUS*, AND SAND DOLLAR, *DENDRASTER EXCENTRICUS* EMBRYO DEVELOPMENT TEST WITH EFFLUENTS AND RECEIVING WATERS

1. Test type:	Static non-renewal
2. Salinity:	34 ± 2‰
3. Temperature:	15 ± 1•C
4. Light quality:	Ambient laboratory illumination
5. Light intensity:	10-20 µE/m_2/s (Ambient laboratory levels)
6. Photoperiod:	16 h light, 8 h darkness
7. Test chamber size:	30 mL
8. Test solution volume:	10 mL
9. No. replicate chambers per concentration:	4
10. Dilution water:	Uncontaminated 1-µm-filtered natural seawater or hypersaline brine prepared from natural seawater
11. Test concentrations:	Effluents: Minimum of 5 and a control Receiving waters: 100% receiving water and a control
12. Dilution factor:	Effluents: •0.5 Receiving waters: 100% receiving water and a control
13. Test duration:	72 ± 2 hr
14. Endpoint:	Normal development; mortality can be included
15. Test acceptability criteria:	•80% normal shell development in the controls; must achieve a %MSD of <25%

16. Sampling requirements:	One sample collected at test initiation, and preferably used within 24 h of the time it is removed from the sampling device (see Section 8, Effluent and Receiving Water Sampling, Sample Handling, and Sample Preparation for Toxicity Tests)
17. Sample volume required:	1 L per test

proportion of normally developed larvae for each replicate. A sample set of test data is listed in Table 4.

15.13.1.2 The statistical tests described here must be used with a knowledge of the assumptions upon which the tests are contingent. The assistance of a statistician is recommended for analysts who are not proficient in statistics.

15.13.1.3 The endpoints of toxicity tests using the purple sea urchin are based on the reduction in proportion of normally developed larvae. The IC25 is calculated using the Linear Interpolation Method (see Section 9, Chronic Toxicity Test Endpoints and Data Analysis). LOEC and NOEC values for development are obtained using a hypothesis testing approach such as Dunnett's Procedure (Dunnett, 1955) or Steel's Many-one Rank Test (Steel, 1959; Miller, 1981) (see Section 9). Separate analyses are performed for the estimation of the LOEC and NOEC endpoints and for the estimation of the IC25. See the Appendices for examples of the manual computations, and examples of data input and program output.

15.13.2 EXAMPLE OF ANALYSIS OF PURPLE SEA URCHIN, *STRONGYLOCENTROTUS PURPURATUS*, DEVELOPMENT DATA

15.13.2.1 Formal statistical analysis of the larval development data is outlined in Figure 7. The response used in the analysis is the proportion of normally developed larvae in each test or control chamber. Separate analyses are performed for the estimation of the NOEC and LOEC endpoints and for the estimation of the IC25 endpoint. Concentrations at which there are no normally developed larvae in any of the test chambers are excluded from statistical analysis of the NOEC and LOEC, but included in the estimation of the IC25.

TABLE 4. DATA FROM PURPLE SEA URCHIN, *STRONGYLOCENTROTUS PURPURATUS*, DEVELOPMENT TEST

Copper Concentration (µg/L)	Replicate	No. Larvae Exposed	No. Larvae Normally Developed	Proportion Normal
Control	A	100	87	0.87
	B	100	89	0.89
	C	100	81	0.81
	D	101	89	0.88
	E	74	62	0.84
3.2	A	110	98	0.89
	B	100	82	0.82
	C	100	91	0.91
	D	100	83	0.83
	E	100	89	0.89
5.6	A	102	86	0.84
	B	100	89	0.89
	C	100	85	0.85
	D	107	90	0.84
	E	100	85	0.85
10.0	A	100	70	0.70
	B	100	71	0.71
	C	100	77	0.77
	D	100	74	0.74
	E	100	87	0.87
18.0	A	100	7	0.07
	B	100	12	0.12
	C	100	14	0.14
	D	100	16	0.16
	E	100	10	0.10
32.0	A	101	0	0.00
	B	102	0	0.00
	C	100	0	0.00
	D	100	0	0.00
	E	100	0	0.00

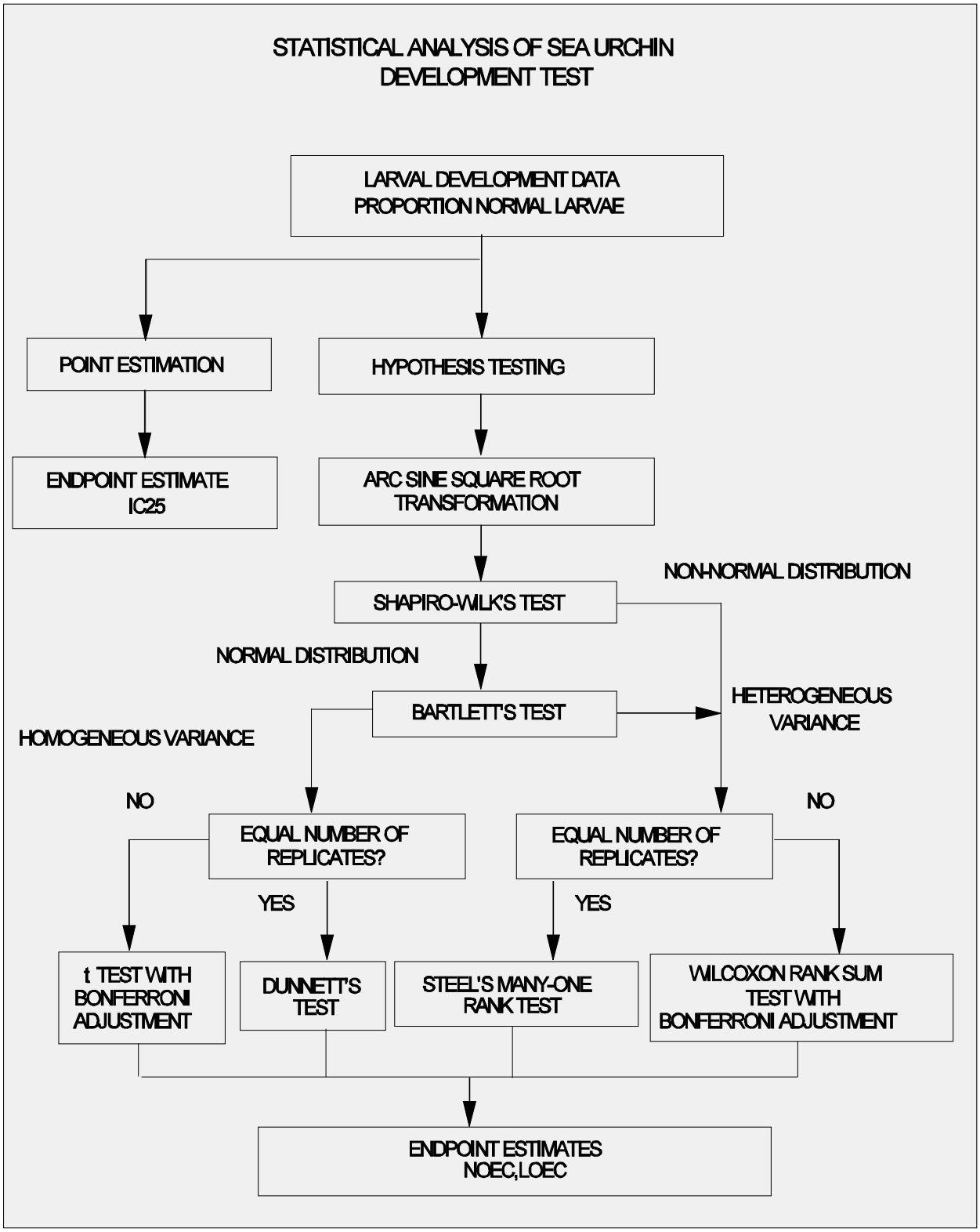

Figure 7. Flowchart for statistical analysis of sea urchin, *Strongylocentrotus purpuratus*, development test.

15.13.2.2 For the case of equal numbers of replicates across all concentrations and the control, the evaluation of the NOEC and LOEC endpoints is made via a parametric test, Dunnett's Procedure, or a nonparametric test, Steel's Many-one Rank Test, on the arc sine square root transformed data. Underlying assumptions of Dunnett's Procedure, normality and homogeneity of variance, are formally tested. The test for normality is the Shapiro-Wilk's Test, and Bartlett's Test is used to test for homogeneity of variance. If either of these tests fails, the nonparametric test, Steel's Many-one Rank Test, is used to determine the NOEC and LOEC endpoints. If the assumptions of Dunnett's Procedure are met, the endpoints are estimated by the parametric procedure.

15.13.2.3 If unequal numbers of replicates occur among the concentration levels tested, there are parametric and nonparametric alternative analyses. The parametric analysis is a *t* test with the Bonferroni adjustment (see Appendix D). The Wilcoxon Rank Sum Test with the Bonferroni adjustment is the nonparametric alternative.

15.13.2.4 Example of Analysis of Development Data

15.13.2.4.1 This example uses toxicity data from a purple sea urchin, *Strongylocentrotus purpuratus*, development test performed with copper. The response of interest is the proportion of normally developed larvae, thus each replicate must first be transformed by the arc sine square root transformation procedure described in Appendix B. The raw and transformed data, means and variances of the transformed observations at each copper concentration and control are listed in Table 5. The data are plotted in Figure 8. Because there is zero normal development in all five replicates of the 32.0 µg/L copper concentration, it was not included in the statistical analysis and is considered a qualitative development effect.

15.13.2.5 Test for Normality

15.13.2.5.1 The first step of the test for normality is to center the observations by subtracting the mean of all observations within a concentration from each observation in that concentration. The centered observations are summarized in Table 6.

15.13.2.5.2 Calculate the denominator, D, of the statistic:

$$D = \sum_{i=1}^{n} (X_i - \bar{X})^2$$

Where: X_i = the ith centered observation

$\bar{X}$ = the overall mean of the centered observations

n = the total number of centered observations

15.13.2.5.3 For this set of data, n = 25

$$\bar{X} = \frac{1}{25}(-0.001) = 0.000$$

D = 0.0680

TABLE 5. SEA URCHIN, *STRONGYLOCENTROTUS PURPURATUS*, DEVELOPMENT DATA

		Copper Concentration (µg/L)				
	Replicate	Control	3.2	5.6	10.0	18.0
RAW	A	0.87	0.89	0.84	0.70	0.07
	B	0.89	0.82	0.89	0.71	0.12
	C	0.81	0.91	0.85	0.77	0.14
	D	0.88	0.83	0.84	0.74	0.16
	E	0.84	0.89	0.85	0.87	0.10
ARC SINE SQUARE ROOT TRANSFORMED	A	1.202	1.234	1.159	0.991	0.268
	B	1.234	1.133	1.234	1.002	0.354
	C	1.120	1.266	1.173	1.071	0.383
	D	1.217	1.146	1.159	1.036	0.412
	E	1.159	1.234	1.173	1.202	0.322
Mean ($\bar{Y}_i$)		1.186	1.203	1.180	1.060	0.348
S_i^2		0.00215	0.00351	0.00097	0.00725	0.00311
i		1	2	3	4	5

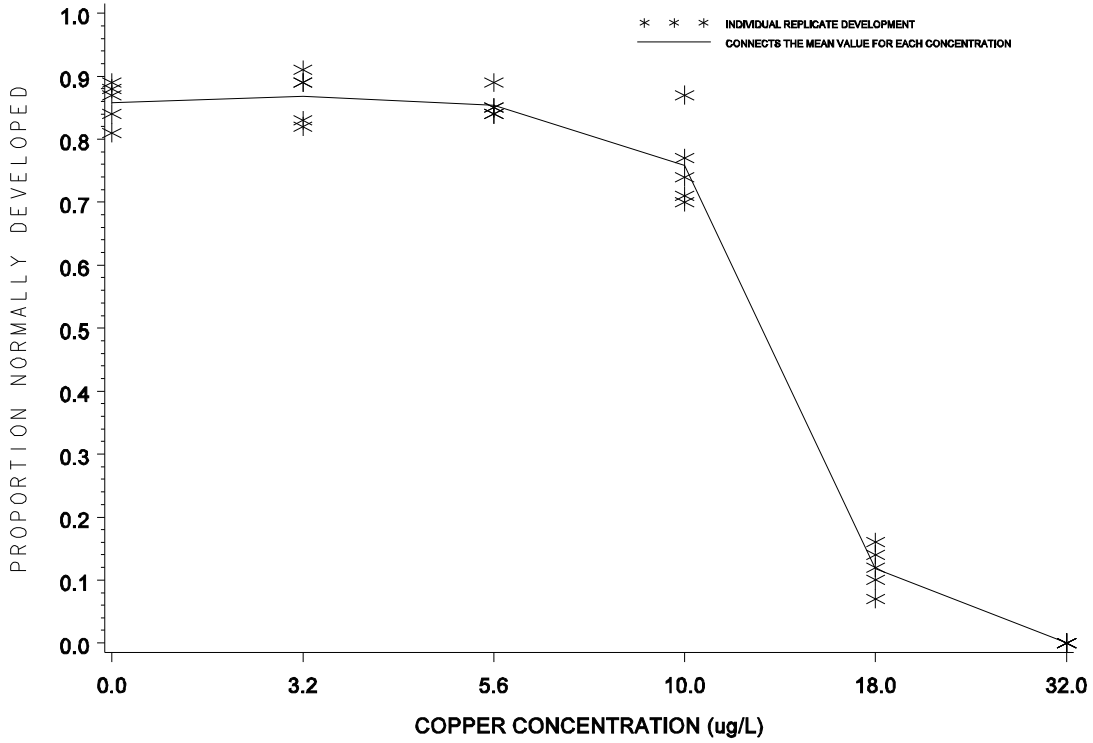

Figure 8. Plot of proportion of normally developed sea urchin, *Strongylocentrotus purpuratus*, larvae,

15.13.2.5.4 Order the centered observations from smallest to largest

$$X^{(1)} \leq X^{(2)} \leq \ldots \leq X^{(n)}$$

where $X^{(i)}$ denotes the ith ordered observation. The ordered observations for this example are listed in Table 7.

TABLE 6. CENTERED OBSERVATIONS FOR SHAPIRO-WILK'S EXAMPLE

Replicate	Control	Copper Concentration (µg/L) 3.2	5.6	10.0	18.0
A	0.016	0.031	-0.021	-0.069	-0.080
B	0.048	-0.070	0.054	-0.058	0.006
C	-0.066	0.063	-0.007	0.011	0.035
D	0.031	-0.057	-0.021	-0.024	0.064
E	-0.027	0.031	-0.007	0.142	-0.026

15.13.2.5.5 From Table 4, Appendix B, for the number of observations, n, obtain the coefficients a_1, a_2, ... a_k where k is n/2 if n is even and (n-1)/2 if n is odd. For the data in this example, n = 25 and k = 12. The a_i values are listed in Table 8.

15.13.2.5.6 Compute the test statistic, W, as follows:

$$W = \frac{1}{D}\left[\sum_{i=1}^{k} a_i\left(X^{(n-i+1)} - X^{(i)}\right)\right]^2$$

The differences, $X^{(n-i+1)} - X^{(i)}$, are listed in Table 8. For the data in this example:

$$W = \frac{1}{0.0680}(0.2545)^2 = 0.953$$

TABLE 7. ORDERED CENTERED OBSERVATIONS FOR SHAPIRO-WILK'S EXAMPLE

i	$X^{(i)}$	i	$X^{(i)}$
1	-0.080	14	0.006
2	-0.070	15	0.011
3	-0.069	16	0.016
4	-0.066	17	0.031
5	-0.058	18	0.031
6	-0.057	19	0.031
7	-0.027	20	0.035
8	-0.026	21	0.048
9	-0.024	22	0.054
10	-0.021	23	0.063
11	-0.021	24	0.064
12	-0.007	25	0.142
13	-0.007		

TABLE 8. COEFFICIENTS AND DIFFERENCES FOR SHAPIRO-WILK'S EXAMPLE

i	a_i	$X^{(n-i+1)} - X^{(i)}$	
1	0.4450	0.222	$X^{(25)} - X^{(1)}$
2	0.3069	0.134	$X^{(24)} - X^{(2)}$
3	0.2543	0.132	$X^{(23)} - X^{(3)}$
4	0.2148	0.120	$X^{(22)} - X^{(4)}$
5	0.1822	0.106	$X^{(21)} - X^{(5)}$
6	0.1539	0.092	$X^{(20)} - X^{(6)}$
7	0.1283	0.058	$X^{(19)} - X^{(7)}$
8	0.1046	0.057	$X^{(18)} - X^{(8)}$
9	0.0823	0.055	$X^{(17)} - X^{(9)}$
10	0.0610	0.037	$X^{(16)} - X^{(10)}$
11	0.0403	0.032	$X^{(15)} - X^{(11)}$
12	0.0200	0.013	$X^{(14)} - X^{(12)}$

15.13.2.5.7 The decision rule for this test is to compare W as calculated in Subsection 5.6 to a critical value found in Table 6, Appendix B. If the computed W is less than the critical value, conclude that the data are not normally distributed. For the data in this example, the critical value at a significance level of 0.01 and n = 25 observations is 0.888. Since W = 0.953

is greater than the critical value, conclude that the data are normally distributed.

15.13.2.6 Test for Homogeneity of Variance

15.13.2.6.1 The test used to examine whether the variation in the proportion of normally developed larvae is the same across all copper concentrations including the control, is Bartlett's Test (Snedecor and Cochran, 1980). The test statistic is as follows:

$$B = \frac{\left[\left(\sum_{i=1}^{P} V_i\right) \ln \bar{S}^2 - \sum_{i=1}^{P} V_i \ln S_i^2\right]}{C}$$

Where: V_i = degrees of freedom for each concentration and control,

$V_i = (n_i - 1)$

p = number of concentration levels including the control

n_i = the number of replicates for concentration i.

ln = $\log_e$

i = 1,2, ..., p where p is the number of concentrations including the control

$$\bar{S}^2 = \frac{\left(\sum_{i=1}^{P} V_i S_i^2\right)}{\sum_{i=1}^{P} V_i}$$

$$C = 1 + [3(p-1)]^{-1}\left[\sum_{i=1}^{P} 1/V_i - \left(\sum_{i=1}^{P} V_i\right)^{-1}\right]$$

15.13.2.6.2 For the data in this example (see Table 5), all concentrations including the control have the same number of replicates (n_i = 5 for all i). Thus, V_i = 4 for all i.

15.13.2.6.3 Bartlett's statistic is, therefore:

$$B = [(20)\ln(0.00340) - 4 \cdot \sum_{i=1}^{P} \ln(S_i^2)] / 1.100$$

$$= [20(-5.6840) - 4(-29.4325)]/1.100$$

$$= 4.050/1.100$$

$$= 3.6818$$

15.13.2.6.4 B is approximately distributed as chi-square with p-1 degrees of freedom, when the variances are in fact the same. Therefore, the appropriate critical value for this test, at a significance level of 0.01 with 4 degrees of freedom, is 13.28. Since B = 3.6818 is less than the critical value of 13.28, conclude that the variances are not different.

15.13.2.7 Dunnett's Procedure

15.13.2.7.1 To obtain an estimate of the pooled variance for the Dunnett's Procedure, construct an ANOVA table as described in Table 9.

Where: p = number of concentration levels including the control

TABLE 9. ANOVA TABLE

Source	df	Sum of Squares (SS)	Mean Square(MS) (SS/df)
Between	p - 1	SSB	S_B^2 = SSB/(p-1)
Within	N - p	SSW	S_W^2 = SSW/(N-p)
Total	N - 1	SST	

N = total number of observations $n_1 + n_2 \ldots + n_p$

n_i = number of observations in concentration i

$$SSB = \sum_{i=1}^{p} T_i^2/n_i - G^2/N$$ Between Sum of Squares

$$SST = \sum_{i=1}^{p} \sum_{j=1}^{n_i} Y_{ij}^2 - G^2/N$$ Total Sum of Squares

$$SSW = SST - SSB$$ Within Sum of Squares

G = the grand total of all sample observations, $G = \sum_{i=1}^{p} T_i$

T_i = the total of the replicate measurements for concentration i

Y_{ij} = the jth observation for concentration i (represents the proportion of normal larvae for concentration i in test chamber j)

15.13.2.7.2 For the data in this example:

$n_1 = n_2 = n_3 = n_4 = n_5 = 5$

$N = 25$

$T_1 = Y_{11} + Y_{12} + Y_{13} + Y_{14} + Y_{15} = 5.932$
$T_2 = Y_{21} + Y_{22} + Y_{23} + Y_{24} + Y_{25} = 6.013$
$T_3 = Y_{31} + Y_{32} + Y_{33} + Y_{34} + Y_{35} = 5.898$
$T_4 = Y_{41} + Y_{42} + Y_{43} + Y_{44} + Y_{45} = 5.302$
$T_5 = Y_{51} + Y_{52} + Y_{53} + Y_{54} + Y_{55} = 1.739$

$G = T_1 + T_2 + T_3 + T_4 + T_5 = 24.884$

$$SSB = \sum_{i=1}^{p} T_i^2/n_i - G^2/N$$
$$(137.267)/5 - (24.884)^2/25 = 2.685$$

$$SST = \sum_{i=1}^{p} \sum_{j=1}^{n_i} Y_{ij}^2 - G^2/N$$
$$27.521 - (24.884)^2/25 = 2.752$$

$$SSW = SST - SSB = 2.752 - 2.685 = 0.067$$

$S_B^2 = SSB/(p-1) = 2.685/(5-1) = 0.6713$

$S_W^2 = SSW/(N-p) = 0.067/(25-5) = 0.0034$

15.13.2.7.3 Summarize these calculations in the ANOVA table (Table 10).

TABLE 10. ANOVA TABLE FOR DUNNETT'S PROCEDURE EXAMPLE

Source	df	Sum of Squares (SS)	Mean Square(MS) (SS/df)
Between	4	2.685	0.6713
Within	20	0.067	0.0034
Total	24	2.752	

15.13.2.7.4 To perform the individual comparisons, calculate the *t* statistic for each concentration, and control combination as follows:

$$t_i \bullet \frac{(\bar{Y}_1 \bullet \bar{Y}_i)}{S_w \sqrt{(1/n_1) \bullet (1/n_i)}}$$

Where: $\bar{Y}_i$ = mean proportion normal larvae for concentration i

$\bar{Y}_1$ = mean proportion normal larvae for the control

S_w = square root of the within mean square

n_1 = number of replicates for the control

n_i = number of replicates for concentration i.

Since we are looking for a decreased response from the control in the proportion of normally developed larvae, the concentration mean is subtracted from the control mean.

15.13.2.7.5 Table 11 includes the calculated *t* values for each concentration and control combination. In this example, comparing the 3.2 µg/L copper concentration with the control the calculation is as follows:

$$t_2 \bullet \frac{(1.186 \bullet 1.203)}{0.0583\sqrt{(1/5)\bullet(1/5)}} \bullet \bullet 0.461$$

TABLE 11. CALCULATED *t* VALUES

Copper Concentration (µg/L)	i	t_i
3.2	2	-0.461
5.6	3	0.163
10.0	4	3.417
18.0	5	22.727

15.13.2.7.6 Since the purpose of this test is to detect a significant decrease in the proportion of normally developed larvae, a one-sided test is appropriate. The critical value for this one-sided test is found in Table 5, Appendix C. For an overall alpha level of 0.05, 20 degrees of freedom for error and four concentrations (excluding the control) the critical value is 2.30. The mean proportion of normally developed larvae for concentration i is considered significantly less than the mean proportion of normally developed larvae for the control if t_i is greater than the critical value. Therefore, the 10.0 µg/L and 18.0 µg/L concentrations have a significantly lower mean proportion of normally developed larvae than the control. Hence the NOEC is 5.6 µg/L copper and the LOEC is 10.0 µg/L copper.

15.13.2.7.7 To quantify the sensitivity of the test, the minimum significant difference (MSD) that can be statistically detected may be calculated:

$$MSD \bullet d\,S_w\sqrt{(1/n_1)\bullet(1/n)}$$

Where: d = the critical value for Dunnett's Procedure

S_w = the square root of the within mean square

n = the common number of replicates at each concentration (this assumes equal replication at each concentration)

n_1 = the number of replicates in the control.

15.13.2.7.8 In this example,

$$MSD \bullet 2.30\,(0.0583)\sqrt{(1/5)\bullet(1/5)}$$

$$= 2.30\ (0.0583)(0.6325)$$

$$= 0.085$$

15.13.2.7.9 The MSD (0.085) is in transformed units. To determine the MSD in terms of proportion of normally developed larvae, carry out the following conversion.

1. Subtract the MSD from the transformed control mean.

$$1.186 - 0.085 = 1.101$$

2. Obtain the untransformed values for the control mean and the difference calculated in step 1 of 13.2.7.9.

$$[\ \text{Sine}\ (1.186)\ ]^2 = 0.859$$

$$[\ \text{Sine}\ (1.101)\ ]^2 = 0.795$$

3. The untransformed MSD (MSD_u) is determined by subtracting the untransformed values from step 2 in 14.2.7.9.

$$MSD_u = 0.859 - 0.795 = 0.064$$

15.13.2.7.10 Therefore, for this set of data, the minimum difference in mean proportion of normally developed larvae between the control and any copper concentration that can be detected as statistically significant is 0.064.

15.13.2.7.11 This represents a 7.5% decrease in the proportion of normally developed larvae from the control.

15.13.2.8 Calculation of the ICp

15.13.2.8.1 The development data in Table 4 are utilized in this example. As can be seen from Figure 9, the observed means are not monotonically non-increasing with respect to concentration.

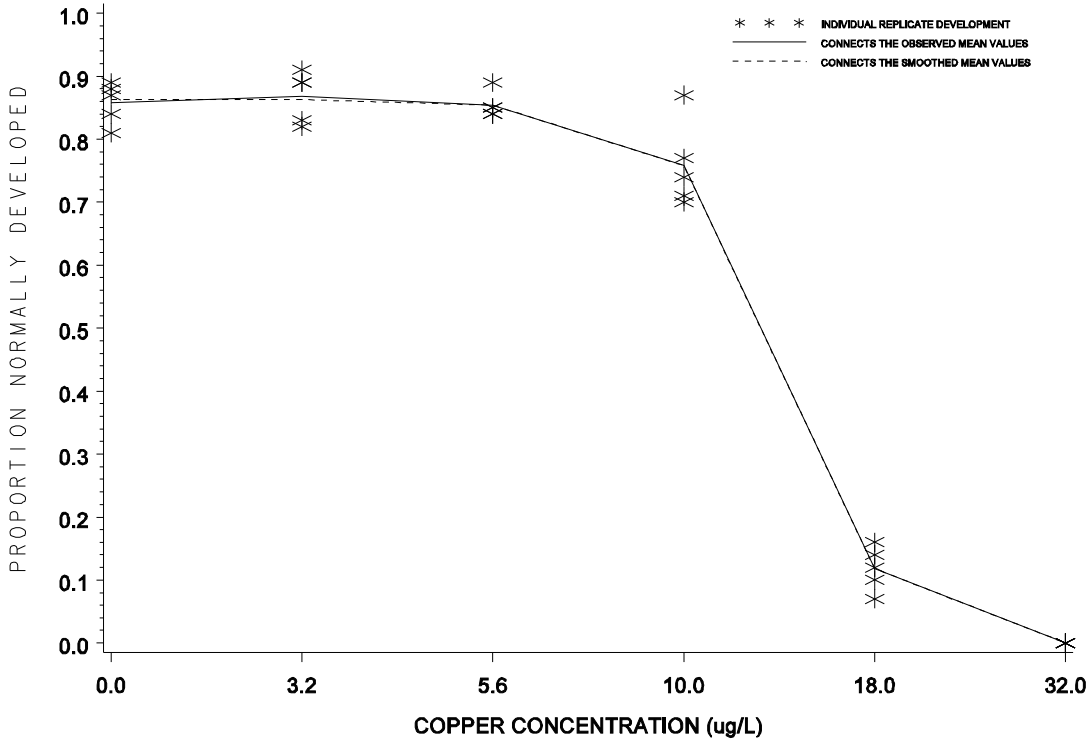

Figure 9. Plot of raw data, observed means, and smoothed means for the sea urchin, *Strogylocentrotus purpuratus*, larval development data from Tables 4 and 12.

Therefore, the means must be smoothed prior to calculating the IC.

15.13.2.8.2 Starting with the observed control mean, $\overline{Y}_1 = 0.858$, and the observed mean for the lowest copper concentration, $\overline{Y}_2 = 0.868$, we see that $\overline{Y}_1$ is less than $\overline{Y}_2$.

15.13.2.8.3 Calculate the smoothed means:

$$M_1 = M_2 = (\overline{Y}_1 + \overline{Y}_2)/2 = 0.863$$

15.13.2.8.4 Since $\overline{Y}_3 = 0.854 > \overline{Y}_4 = 0.758 > \overline{Y}_5 = 0.118 > \overline{Y}_6 = 0.0$, set $M_3 = 0.854$, $M_4 = 0.758$, $M_5 = 0.118$, and $M_6 = 0.0$. Table 12 contains the smoothed means and Figure 8 gives a plot of the smoothed means and the interpolated response curve.

15.13.2.8.5 An IC25 can be estimated using the Linear Interpolation Method. A 25% reduction in mean proportion of normally developed larvae, compared to the controls, would result in a mean proportion of 0.647, where $M_1(1-p/100) = 0.863(1-25/100)$. Examining the means and their associated concentrations (Table 12), the response, 0.647, is bracketed by $C_4 = 10.0$ µg/L copper and $C_5 = 18.0$ µg/L copper.

TABLE 12. SEA URCHIN, *STRONYLOCENTROTUS PURPURATUS*, MEAN PROPORTION OF NORMALLY DEVELOPED LARVAE

Copper Conc. (µg/L)	i	Response Means, $\overline{Y}_i$ (proportion)	Smoothed Means, M_i (proportion)
Control	1	0.858	0.863
0.05	2	0.868	0.863
0.10	3	0.854	0.854
0.15	4	0.758	0.758
0.20	5	0.118	0.118
0.40	6	0.000	0.000

15.13.2.8.6 Using the equation from Section 4.2 in Appendix L, the estimate of the IC25 is calculated as follows:

$$ICp \bullet C_j \bullet [M_1(1 \bullet p/100) \bullet M_j] \frac{(C_{(j \bullet 1)} \bullet C_j)}{(M_{(j \bullet 1)} \bullet M_j)}$$

Conc. ID	1	2	3	4	5	6
Conc. Tested	0	3.2	5.6	10	18	32
Response 1	.87	.89	.84	.70	.07	0
Response 2	.89	.82	.89	.71	.12	0
Response 3	.81	.91	.85	.77	.14	0
Response 4	.88	.83	.84	.74	.16	0
Response 5	.84	.89	.85	.87	.10	0

*** Inhibition Concentration Percentage Estimate ***
Toxicant/Effluent: Copper Chloride
Test Start Date: Test Ending Date:
Test Species: Purple Sea Urchin, Strongylocentrotus purpuratus
Test Duration: 72 hours
DATA FILE: urch_dev.icp
OUTPUT FILE: urch_dev.i25

Conc. ID	Number Replicates	Concentration ug/L	Response Means	Std. Dev.	Pooled Response Means
1	5	0.000	0.858	0.033	0.863
2	5	3.200	0.868	0.040	0.863
3	5	5.600	0.854	0.021	0.854
4	5	10.000	0.758	0.068	0.758
5	5	18.000	0.118	0.035	0.118
6	5	32.000	0.000	0.000	0.000

The Linear Interpolation Estimate: 11.3844 Entered P Value: 25

Number of Resamplings: 80
The Bootstrap Estimates Mean: 11.3702 Standard Deviation: 0.2898
Original Confidence Limits: Lower: 10.7785 Upper: 11.9375
Expanded Confidence Limits: Lower: 10.4756 Upper: 12.2141
Resampling time in Seconds: 0.16 Random_Seed: 83761380

Figure 10. ICPIN program output for the IC25.

$$IC25 = 10.0 + [0.863(1 - 25/100) - 0.758] (18.0 - 10.0) \left(\frac{0.118 - 0.758}{0.863 - 0.758}\right)$$

$$= 11.38 \ \mu g/L.$$

15.13.2.8.7 When the ICPIN program was used to analyze this set of data, requesting 80 resamples, the estimate of the IC25 was 11.3844 µg/L. The empirical 95.0% confidence interval for the true mean was 10.7785 µg/L to 11.9375 µg/L. The computer program output for the IC25 for this data set is shown in Figure 10.

15.14 **PRECISION AND ACCURACY**

15.14.1 PRECISION

15.14.1.1 Single Laboratory Precision

15.14.1.1.1 Data on the single-laboratory precision of the development test using copper as a reference toxicant is provided in Table 13. The NOEC varied by only one concentration interval indicating good precision. The coefficient of variation for the EC50 and EC25 were 22% and 21% indicating acceptable precision.

15.14.1.2 Multi-Laboratory Precision

15.14.1.2.1 Data on the multi-laboratory precision of the development test using copper as a reference toxicant is provided in Table 14. The NOEC for laboratory's A and B were identical. The difference in NOEC observed for lab C was probably due the wide range of concentrations used (See Footnote 4). The coefficient of variation for the EC50 was 39%, indicating acceptable interlaboratory precision.

15.14.2 ACCURACY

15.14.2.1 The accuracy of tox1icity tests cannot be determined.

Table 13. SINGLE-LABORATORY PRECISION OF THE PURPLE SEA URCHIN, *STRONGYLOCENTROTUS PURPURATUS*, DEVELOPMENT TEST WITH COPPER (CU µG/L) SULFATE AS A REFERENCE TOXICANT[1].

Test Number	NOEC (µg/L)	EC50 (µg/L)	EC25 (µg/L)
1	10.0	19.4	15.1
2	10.0	18.3	15.4
3	5.6	10.8	9.0
4	5.6	14.3	11.0
5	5.6	16.8	12.9
Mean CV(%)		15.9 22.0	12.7 21.0

[1] Tests performed by Marine Pollution Studies Laboratory, Granite Canyon, Monterey California.

TABLE 14. MULTI-LABORATORY PRECISION OF THE PURPLE SEA URCHIN, *STRONGYLOCENTROTUS PURPURATUS*, DEVELOPMENT TEST WITH COPPER (CU µG/L) SULFATE AS A REFERENCE TOXICANT.[1]

Lab	NOEC (µg/L)	EC50 (µg/L)
A[2]	10.0	22.5
B[3]	10.0	15.2
C[4]	1.8	10.1
Mean CV(%)		15.9 39.0

[1]Data from labs A and B are from an interlaboratory study using split reference toxicant samples and dilution water. Test performed in August, 1993. Test duration was 72 hr. Concentrations were 3.2, 5.6, 10, 18 and 32 •g/L.

[2]Test performed by Southern California Coastal Water Research Project, Westminster, CA.

[3]Test performed by Marine Pollution Studies Laboratory, Granite Canyon, Monterey California.

[4] Test performed by MEC Analytical Systems, Inc., Tiburon, CA. Test performed in April, 1994. Test duration was 96 hr. Concentrations were 0.1, 0.32, 1.8, 18 and 56 •g/L.

APPENDIX I. SEA URCHIN DEVELOPMENT: STEP-BY-STEP SUMMARY

PREPARATION OF TEST SOLUTIONS

A. Determine test concentrations and appropriate dilution water based on NPDES permit conditions and guidance from the appropriate regulatory agency.

B. Prepare effluent test solutions by diluting well mixed unfiltered effluent using volumetric flasks and pipettes. Use hypersaline brine where necessary to maintain all test solutions at 34 ± 2‰. Include brine controls in tests that use brine.

C. Prepare a copper reference toxicant stock solution.

D. Prepare a copper reference toxicant series. Add 10 mL of test solution each vial.

E. Sample effluent and reference toxicant solutions for physical/chemical analysis. Measure salinity, pH and dissolved oxygen of each test concentration.

F. Randomize numbers for test chambers and record the chamber numbers with their respective test concentrations on a randomization data sheet. Store the data sheet safely until after the test samples have been analyzed.

G. Place test chambers in a water bath or environmental chamber set to 15•C and allow temperature to equilibrate.

H. Measure the temperature daily in one random replicate (or separate chamber) of each test concentration. Monitor the temperature of the water bath or environmental chamber continuously.

I. At the end of the test, measure salinity, pH, and dissolved oxygen concentration from each test concentration.

PREPARTION AND ANALYSIS OF TEST ORGANISMS

A. Obtain test organisms and hold or condition as necessary for spawning.

B. Place six 100 mL beakers of dilution water in 15•C water bath or room. Select 6-8 sea urchins and place on tray covered with seawater moistened paper towels. Induce

spawning by injecting each sea urchin with 0.5 mL of 0.5 M KCl. Place animals back onto tray, oral side down.

C. When spawning begins, note time that each animal begins spawning. Leave males on tray for semen collection. Place spawning females oral side up on 100 mL beakers. Do not collect gametes more than 15 min after spawning begins.

D. Collect semen using either a Pasteur pipette or a 100 •L autopipette. Pipette semen from each male into a separate 5 mL conical test tube, stored in an ice water bath.

E. Check for the motility of sperm from each male.

F. Pool semen by pipetting equal amounts from each "good" male to another centrifuge tube. At least 0.025 mL should be taken from each male and a total of at least 0.05 mL should be available. Cover the tube and store in a refrigerator until ready for use.

G. Finish collecting eggs before diluting semen.

H. Mix pooled semen by agitating on a vortex mixer. Add about 0.025 mL of semen to a 100 mL beaker containing 50 mL of 15•C dilution water. Stir thoroughly with a Pasteur pipette. Test eggs from each female to determine if they can be fertilized.

I. Take 0.5 mL subsample of sperm dilution and add to 5 mL of 10% acetic acid in a 50 mL graduated cylinder. Bring to 50 mL with dilution water. Mix well by inversion and load a drop into each side of hemocytometer. Count the sperm in 80 small squares. Calculate the sperm density using Equation 2A.

J. Examine sample of eggs from each female. Do not use the eggs from any female whose eggs appear abnormal or that did not fertilize in Section G.

K. Decant water from eggs of each usable female and pour through Nitex® screen into a 1 liter beaker. Bring volume up to about 600 mL with dilution water. Allow to resettle, siphon about 400 mL of overlying water and bring back to 600 mL with dilution water.

L. Mix egg solution well and make an accurate 100x dilution using at least 10 mL of the egg solution. Mix the dilution well and count two different 1 mL subsamples in a counting

cell. Use the mean of the two counts in Equation 3 to determine the density of the egg stock.

M. Use Equation 4 to determine the egg dilution factor and make dilution of eggs with dilution water.

N. Use Equations 5 A-C to determine the volume of the sperm dilution that is necessary to fertilize the egg dilution. Add the appropriate volume of sperm and after 10 minutes, check fertilization success.

O. Gently mix the fertilized egg solution with a plunger and deliver 0.25 mL of egg solution to each vial. Make sure that the pipette tip is cut off to provide at least a 0.5 mm opening. Keep egg solution well mixed during addition period.

P. Incubate the embryos for 72 hours at 15 ± 1•C.

Q. Test termination and analysis

R. Perform water quality measurements as at the start.

S. After 72 hours, add 1.0 mL of 37% buffered formalin or 0.5 mL of 1.0% glutaraldehyde to each test chamber. Tightly cap and gently mix each vial.

T. Examine each sample with a microscope and determine the percentage of normally developed embryos.

U. Analyze the data.

V. Include standard reference toxicant point estimate values in the standard quality control charts.

APPENDIX II. USING THE NEUBAUER HEMACYTOMETER TO ENUMERATE SEA URCHIN SPERM

The Neubauer hemacytometer is a specialized microscope slide with two counting grids and a coverslip.

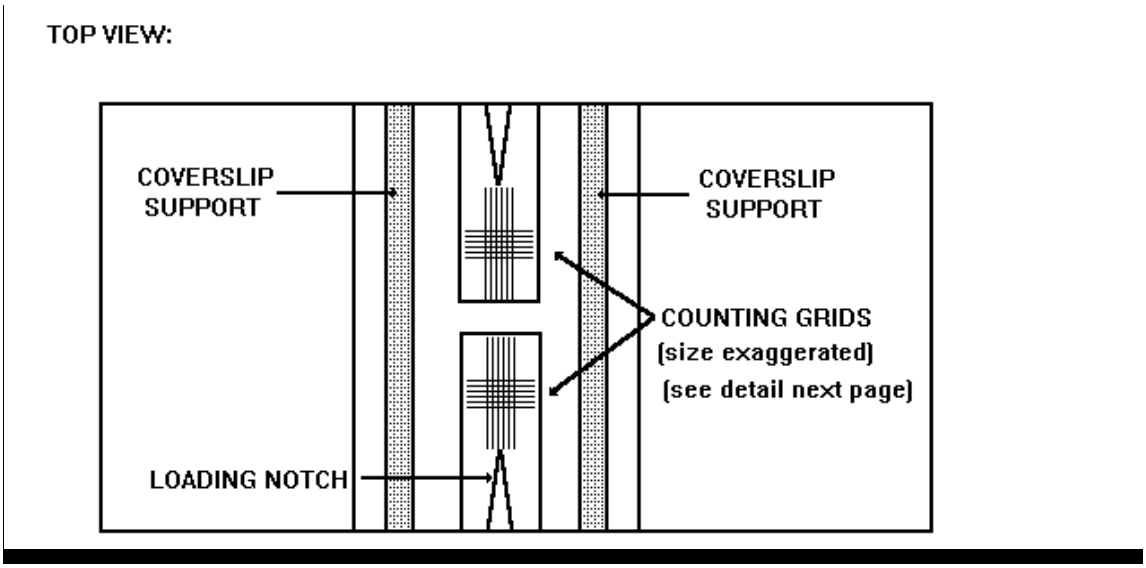

Together, the total area of each grid (1 mm^2) and the vertical distance between the grid and the coverslip (0.1 mm), provide space for a specific microvolume of aqueous sample (0.1 mm^3).

SIDE VIEW:

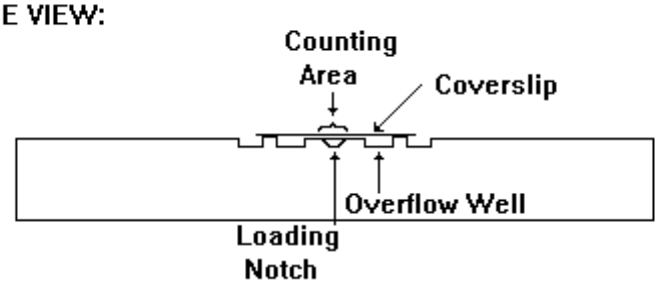

END VIEW THROUGH MID-CROSS SECTION:

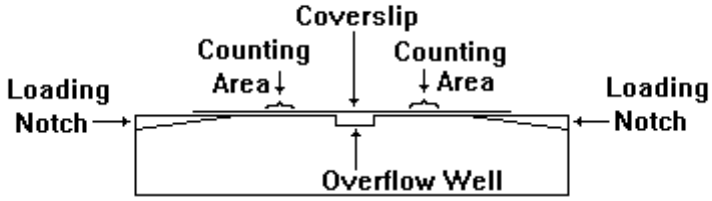

This volume of liquid and the cells suspended therein (e.g., blood cells or sperm cells) represent 1/10,000th of the liquid volume and cell numbers of a full milliliter (cm^3) of the sampled material.

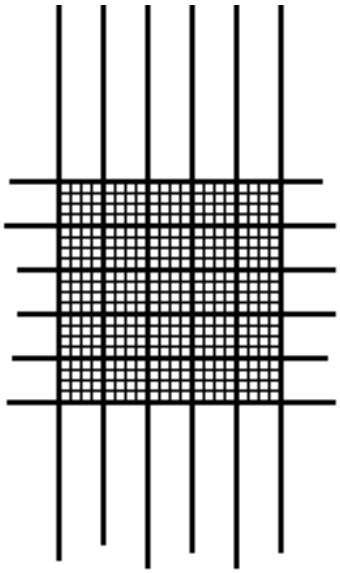

NEUBAUER
HEMACYTOMETER
GRID OF 400 SQUARES

If the full 400-squares of each grid are counted, this represents the number of sperm in 0.1 mm^3. Multiplying this value times 10 yields the sperm per mm^3 (and is the source of the hemacytometer factor of 4,000 squares/mm^3). If this product is multiplied by 1,000 mm^3/cm^3, the answer is the number of sperm in one milliliter of the sample. If the counted sample represents a dilution of a more concentrated original sample, the above answer is multiplied by the dilution factor to yield the cell density in the original sample. If the cells are sufficiently dense, it is not necessary to count the entire 400-square field, and the final calculation takes into account the number of squares actually counted:

$$\text{cells/mL} = \frac{(\text{dilution})\ (4{,}000\ \text{squares/mm}^3)\ (1{,}000\ \text{mm}^3/\text{cm}^3)\ (\text{cell count})}{(\text{number of squares counted})}$$

Thus, with a dilution of 4000 (0.025 mL of semen in 100 mL of dilution water), 80 squares counted, and a count of 100, the calculation becomes:

$$\text{cells/mL} = \frac{(4{,}000)\ (4{,}000)\ (1{,}000)\ (100)}{80}$$

$$= 20{,}000{,}000{,}000\ \text{cells/mL}$$

There are several procedures that are necessary for counts to be consistent within and between laboratories. These include mixing the sample, loading and emptying the hematocrit tube, cleaning the hemacytometer and cover slip, and actual counting procedures.

Obviously, if the sample is not homogeneous, subsamples can vary in sperm density. A few extra seconds in mixing can save a lot of wasted minutes in subsequent counting procedures. A full hematocrit tube empties more easily than one with just a little liquid, so withdraw a full sample. This can be expedited by tipping the sample vial.

Because the sperm are killed prior to sampling, they will slowly settle. For this reason, the sample in the hematocrit tube should be loaded onto the hemacytometer as rapidly as possible. Two replicate samples are withdrawn in fresh hematocrit tubes and loaded onto opposite sides of a hemacytometer.

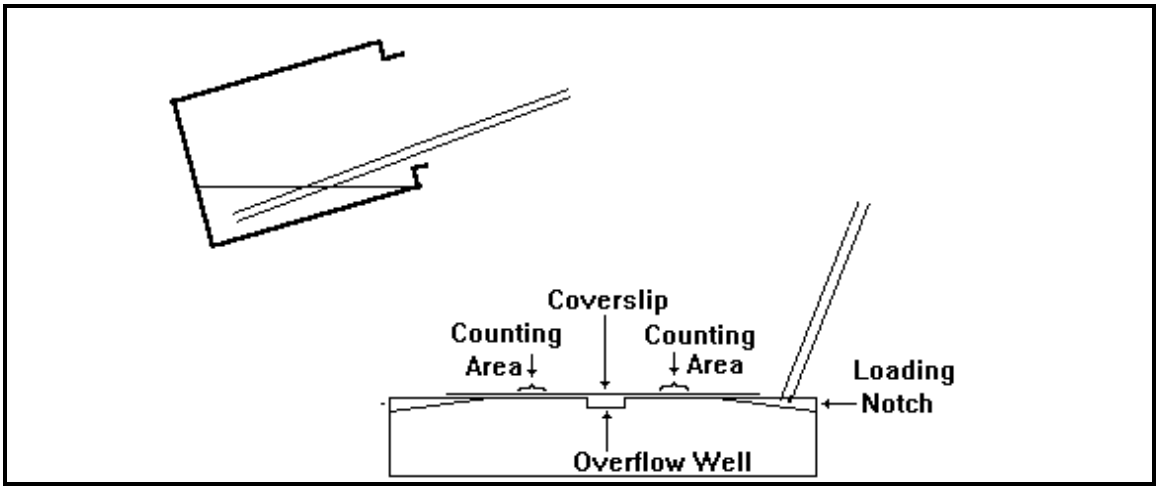

The loaded hemacytometer is left for 15 minutes to allow the sperm to settle onto the counting field. If the coverslip is moved after the samples are loaded, the hemacytometer should be rinsed and refilled with fresh sample. After 15 minutes, the hemacytometer is placed under a microscope and the counting grid located at 100x. Once the grid is properly positioned, the microscope is adjusted to 200x or 400x, and one of the corner squares is positioned for counting (any one of the four corners is appropriate). For consistency, use the same procedure each time (Many prefer to start in the upper left corner of the optical field, and this procedure will be used in the examples given below). Examine the first large square in the selected corner. If no sperm are visible, or if the sperm are so dense or clumped to preclude accurate counting, count a sample with a more appropriate dilution.

In making counts of sperm, it is necessary to adopt a consistent method of scanning the smaller squares and counting sperm that fall upon the lines separating the squares. Count the sperm in the small squares by beginning in the upper left hand corner (square 1) and proceding right to square 4, down to square 5, left to square 8, etc. until all 16 squares are counted.

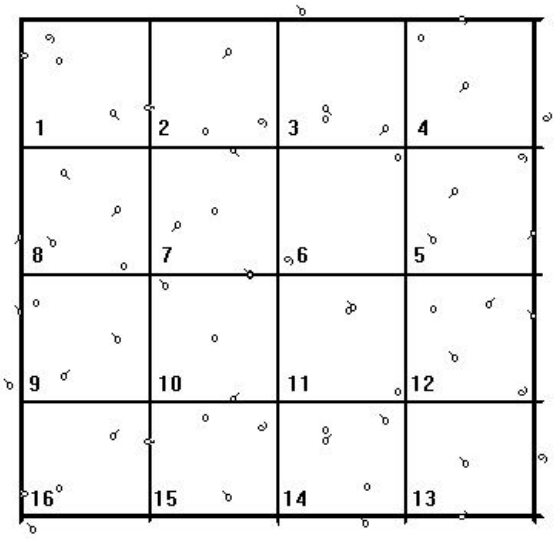

Because sperm that appear <u>on</u> lines might be counted as being in either square, it is important to avoid double counting or non-counting. For this reason a convention is decided upon and used consistently: paraphrasing the instructions received with one (Hausser Scientific) counting chamber "to avoid counting (sperm) twice, the best practice is to count all touching the top and left, and none touching the lower and right, boundary lines." Whatever convention is chosen, it must be adhered to. The example below shows a sperm count based upon a selected convention of counting sperm that fall on the upper and left lines, but not on the lower or right lines:

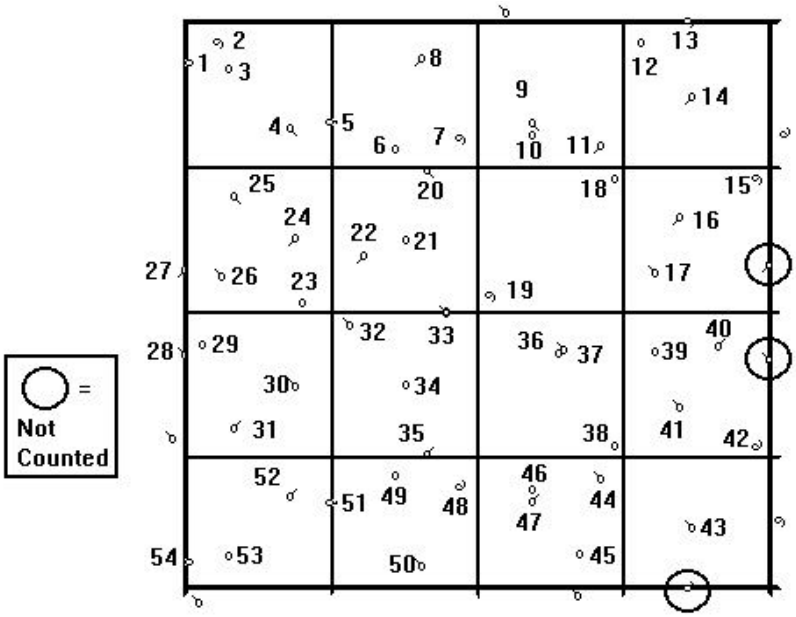

In the above illustration, sperm falling on the lower and right lines are not counted. The count begins at the upper left as illustrated in the preceding figure. A typical count sequence is demonstrated by the numbers next to each sperm illustrated. Sperm identified as numbers 1, 5, 13, 20, 27, 28, 33, 51 and 54 touch lines and are counted as being in the square below them or to their right. The circled sperm are not counted as being in this field of 16 small squares (but they would be included in any counts of adjacent squares in which they would be on upper or left hand lines).

Once these counting conventions have been selected, it is advisable to follow another strict protocol outlining the number and sequence of large squares to be counted. Because the sperm may not be randomly distributed across the counting grid, it is recommended to count an array of squares covering the entire grid. The following procedure is recommended:

Count the number of sperm in the first large square.

1. If the number is less than 10, count all 25 squares using the same scanning pattern outlined above (left to right through squares 1 to 5, down to square 6, left through square 10, down to 11, etc.). See pattern no. 3.

2. If the number is between 10 and 19, count 9 large squares using pattern no. 2.

3. If the number is 20 or greater, count 5 large squares using pattern no. 1.

1				2
		3		
4				5

Pattern no. 1

1				2
	4		3	
		5		
	7		6	
8				9

Pattern no. 2

1	2	3	4	5
10	9	8	7	6
11	12	13	14	15
20	19	18	17	16
21	22	23	24	25

Pattern no. 3

The final consideration in achieving good replicate counts is keeping the hemacytometers and coverslips clean. They should be rinsed in distilled water soon after use. The coverslips should be stored in a good biocleanser such as hemasol. For an hour or so prior to use, the hemacytometer slides should also be soaked in the solution. Both slides and coverslips should then be rinsed off with reagent water, blotted dry with a lint-free tissue, and wiped with lens paper.

SECTION 16

PURPLE URCHIN, *Strongylocentrotus purpuratus* AND SAND DOLLAR, *Dendraster excentricus* FERTILIZATION TEST METHOD

Adapted from a method developed by
Gary A. Chapman, U.S. EPA, ORD Newport, OR 97365
and Debra L. Denton, U.S. EPA, Region IX, CA 94105

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Appendix I Step-by Step Summary

SECTION 16

SEA URCHIN, *Strongylocentrotus purpuratus* AND SAND DOLLAR, *Dendraster excentricus* FERTILIZATION TEST

16.1 SCOPE AND APPLICATION

16.1.1 This method estimates the chronic toxicity of effluents and receiving waters to the gametes of sea urchins, (*Strongylocentrotus purpuratus*), or sand dollars (*Dendraster excentricus*) during a static non-renewal 20 minute sperm exposure and a subsequent 20 minute exposure period following the addition of eggs for measuring the fertilizing capacity of the sperm. The effects include the synergistic, antagonistic, and additive effects of all chemical, physical, and biological components which adversely affect the physiological and biochemical functions of the test organisms.

16.1.2 The purpose of the test is to determine the concentrations of a test substance that reduce egg fertilization by exposed sperm relative to that attained by sperm in control solutions. Concentrations of materials adversely affecting egg fertilization under the conditions of this test are usually acutely and chronically toxic to one or more of several common marine test species and, by extension, are presumably acutely and chronically toxic to other of the many untested marine species.

16.1.3 Detection limits of the toxicity of an effluent or chemical substance are organism dependent.

16.1.4 Brief excursions in toxicity may not be detected using 24-h composite samples. Also, because of the long sample collection period involved in composite sampling and because the test chambers are not sealed, highly volatile and highly degradable toxicants in the source may not be detected in the test.

16.1.5 This test is commonly used in one of two forms: (1) a definitive test, consisting of a minimum of five effluent concentrations and a control, and (2) a receiving water test(s),

consisting of one or more receiving water concentrations and a control.

16.1.6 This method should be restricted to use by, or under the supervision of, professionals experienced in aquatic toxicity testing. Specific experience with any toxicity test is usually needed before acceptable results become routine.

16.2 SUMMARY OF METHOD

16.2.1 The method provides the step-by-step instructions for exposing sperm suspensions (appropriate sperm density may first be determined in a trial fertilization test) to effluents or receiving waters for 20 minutes. Eggs are then added to the sperm suspensions and, twenty minutes after the eggs are added, the test is terminated by the addition of a preservative. The percent fertilization is determined by microscopic examination of 100 eggs in an aliquot of eggs from each treatment. The test endpoint is normal egg fertilization.

16.3 INTERFERENCES

16.3.1 Toxic substances may be introduced by contaminants in dilution water, glassware, sample hardware, and testing equipment (see Section 5, Facilities, Equipment, and Supplies).

16.3.2 Improper effluent sampling and handling may adversely affect test results (see Section 8, Effluent and Receiving Water Sampling and Sample Handling, and Sample Preparation for Toxicity Tests).

16.4 SAFETY

16.4.1 See Section 3, Health and Safety

16.5 APPARATUS AND EQUIPMENT

16.5.1 Tanks, trays, or aquaria -- for holding and acclimating adult sea urchins and sand dollars, e.g., standard salt water aquarium or Instant Ocean Aquarium (capable of maintaining seawater at 10-20•C), with appropriate filtration and aeration system.

16.5.2 Air pump, air lines, and air stones -- for aerating water containing broodstock or for supplying air to test solutions with low dissolved oxygen.

16.5.3 Constant temperature chambers or water baths -- for maintaining test solution temperature and keeping dilution water supply, gametes, and embryo stock suspensions at test temperature (12•C) prior to the test. (Incubators are usually unsatisfactory because test tubes must be removed for addition of sperm and eggs and the small test volumes can rapidly change temperature at normal room temperatures.)

16.5.4 Water purification system -- Millipore Super-Q, Deionized water (DI) or equivalent.

16.5.5 Refractometer -- for determining salinity.

16.5.6 Hydrometer(s) -- for calibrating refractometer.

16.5.7 Thermometers, glass or electronic, laboratory grade -- for measuring water temperatures.

16.5.8 Thermometer, National Bureau of Standards Certified (see USEPA METHOD l70.l, USEPA, l979) -- to calibrate laboratory thermometers.

16.5.9 pH and DO meters -- for routine physical and chemical measurements.

16.5.10 Standard or micro-Winkler apparatus -- for determining DO (optional) and calibrating the DO meter.

16.5.11 Winkler bottles -- for dissolved oxygen determinations.

16.5.12 Balance -- Analytical, capable of accurately weighing to 0.0001 g.

16.5.13 Fume hood -- to protect the analyst from effluent or formaldehyde fumes.

16.5.14 Glass stirring rods -- for mixing test solutions.

16.5.15 Graduated cylinders -- Class A, borosilicate glass or non-toxic plastic labware, 50-l000 mL for making test solutions. (Note: not to be used interchangeably for gametes or embryos and test solutions).

16.5.16 Volumetric flasks -- Class A, borosilicate glass or non-toxic plastic labware, 10-1000 mL for making test solutions.

16.5.17 Pipets, automatic -- adjustable, to cover a range of delivery volumes from 0.010 to 1.000 mL.

16.5.18 Pipet bulbs and fillers -- PROPIPET® or equivalent.

16.5.19 Wash bottles -- for reagent water, for topping off graduated cylinders, for rinsing small glassware and instrument electrodes and probes.

16.5.20 Wash bottles -- for dilution water.

16.5.21 20-liter cubitainers or polycarbonate water cooler jugs -- for making hypersaline brine.

16.5.22 Cubitainers, beakers, or similar chambers of non-toxic composition for holding, mixing, and dispensing dilution water and other general non-effluent, non-toxicant contact uses. These should be clearly labeled and not used for other purposes. Strong solutions of NaOH and formaldehyde should not be held for several month periods in Cubitainers: interaction or leaching into solutions of 0.1 N or 1 N NaOH used for pH adjustment of dilution water has caused poor egg fertilization; formaldehyde similarly stored has induced abberant partial membrane elevation in eggs.

16.5.23 Beakers, 5-10 mL borosilicate glass -- for collecting sperm from sand dollars.

16.5.24 Beakers, 100 mL borosilicate glass -- for spawning; to support sea urchins and to collect sea urchin and sand dollar eggs.

16.5.25 Beakers, 1,000 mL borosilicate glass -- for rinsing and settling sea urchin eggs.

16.5.26 Vortex mixer -- to mix sea urchin semen in tubes prior to sampling.

16.5.27 Compound microscope -- for examining gametes, counting sperm cells (200-400x) and eggs (100x), and examining fertilized eggs. Dissecting scopes are sometimes used to count eggs at a lower magnification.

16.5.28 Counter, two unit, 0-999 -- for recording sperm and egg counts.

16.5.29 Sedgwick-Rafter counting chamber -- for counting egg stock and examining eggs for fertilization at the end of the test.

16.5.30 Hemacytometers, Neubauer -- for counting sperm.

16.5.31 Siphon hose (3 mm i.d.) -- for removing wash water from settled eggs.

16.5.32 Centrifuge tubes, test tubes, or vials -- for holding semen.

16.5.33 Perforated plunger -- for maintaining homogeneous distribution of eggs during sampling and distribution to test tubes.

16.5.34 60 µm NITEX® filter -- for filtering receiving water.

16.6 **REAGENTS AND SUPPLIES**

16.6.1 Sample containers -- for sample shipment and storage (see Section 8, Effluent and Receiving Water Sampling, and Sample Handling, and Sample Preparation for Toxicity Tests).

16.6.2 Data sheets (one set per test) -- for data recording (see Figures 1 and 2).

16.6.3 Tape, colored -- for labelling test chambers and containers.

16.6.4 Markers, water-proof -- for marking containers, etc.

16.6.5 Parafilm -- to cover graduated cylinders and vessels containing gametes.

16.6.6 Gloves, disposable -- for personal protection from contamination.

16.6.7 Pipets, serological -- l-l0 mL, graduated.

16.6.8 Pipet tips -- for automatic pipets. Note: pipet tips for handling semen should be cut off to produce an opening about 1 mm in diameter; pipet tips for handling eggs should be cut off to produce an opening about 2 mm in diameter. This is necessary to provide smooth flow of the viscous semen, accurate sampling of eggs, and to prevent injury to eggs passing through a restricted opening. A clean razor blade can be used to trim pipet tips.

16.6.9 Coverslips -- for microscope slides.

16.6.10 Lens paper -- for cleaning microscope optics.

16.6.11 Laboratory tissue wipes -- for cleaning and drying electrodes, microscope slides, etc.

16.6.12 Disposable countertop covering -- for protection of work surfaces and minimizing spills and contamination.

16.6.13 pH buffers 4, 7, and 10 (or as per instructions of instrument manufacturer) -- for standards and calibration check (see USEPA Method l50.l, USEPA, l979).

16.6.14 Membranes and filling solutions -- for dissolved oxygen probe (see USEPA Method 360.l, USEPA, l979), or reagents for modified Winkler analysis.

16.6.15 Laboratory quality assurance samples and standards -- for the above methods.

16.6.16 Test chambers -- test tubes, borosilicate glass, 16 x 100 mm or 16 x 125 mm, with caps for conducting the test, four chambers per concentration.

Figure 1. Sample data sheet for spawning record.

Animal No.	Sex	Time Injected	Time Spawn	Comments
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				

Pooled eggs from female nos. _____.

Pooled (_____ mL) of sperm each from male nos. _____.

Figure 2. Sample data sheet for egg and sperm counts.

EGG COUNTS -

Sample	Dilution	Count	Eggs/mL

For 100 mL egg suspension at 2,240 eggs/mL use:

100 mL x 2,240 eggs/mL / (counted eggs/mL) = mL of egg stock

224,000 eggs / _____ eggs/mL = _____ mL

If required stock >100 mL, concentrate egg stock by settling the eggs and decanting off sufficient overlying water to retain:

(_____ eggs/mL / 2,240 eggs/mL) x 100 = _____ % volume

SPERM COUNTS -

Sample	Dilution	Count	Squares	Sperm/mL

$$\text{SPERM/mL} = \frac{\text{(DIL.FACT.) (COUNT) (4000) (1000)}}{\text{(NO. SQUARES COUNTED)}}$$

16.6.17 Formaldehyde, 10%, in seawater -- for preserving eggs. Note: formaldehyde has been identified as a carcinogen and is irritating to skin and mucous membranes. It should not be used at a concentration higher than necessary to achieve morphological preservation of larvae for counting and only under conditions of maximal ventilation and minimal opportunity for volatilization into room air.

16.6.18 Glutaraldehyde, 1% in seawater -- for preserving eggs.

16.6.13 pH buffers 4, 7, and l0 (or as per instructions of
16.6.19 Acetic acid, 10%, reagent grade, in filtered (10•) seawater -- for preparing killed sperm dilutions for sperm counts.

16.6.20 Haemo-Sol or equivalent cleaner -- for cleaning hemacytometer and cover slips.

16.6.21 0.5 M KCl solution -- for inducing spawning.

16.6.22 Syringe, disposable, 3 or 5 mL -- for injecting KCl into sea urchins and sand dollars to induce spawning.

16.6.23 Needles, 25 gauge -- for injecting KCl.

16.6.24 Pasteur pipets and bulbs -- for sampling eggs from spawning beakers.

16.6.25 Hematocrit capillary tubes -- for sampling sperm for examination and for loading hemacytometers.

16.6.26 Microscope well-slides -- for pre-test assessment of sperm activity and egg condition.

16.6.27 Reference toxicant solutions (see 16.10.2.4 and Section 4, Quality Assurance).

16.6.28 Reagent water -- defined as distilled or deionized water that does not contain substances which are toxic to the test organisms (see Section 5, Facilities, Equipment, and Supplies and Section 7, Dilution Water).

16.6.29 Effluent and receiving water -- see Section 8, Effluent and Surface Water Sampling, and Sample Handling, and Sample Preparation for Toxicity Tests.

16.6.30 Dilution water and hypersaline brine -- see Section 7, Dilution Water and Section 16.6.24, Hypersaline Brines. The dilution water should be uncontaminated 1-µm-filtered natural seawater. Hypersaline brine should be prepared from dilution water.

16.6.31 HYPERSALINE BRINES

16.6.31.1 Most industrial and sewage treatment effluents entering marine and estuarine systems have little measurable salinity. Exposure of larvae to these effluents will usually require increasing the salinity of the test solutions. It is important to maintain an essentially constant salinity across all treatments. In some applications it may be desirable to match the test salinity with that of the receiving water (See Section 7.1). Two salt sources are available to adjust salinities -- artificial sea salts and hypersaline brine (HSB) derived from natural seawater. Use of artificial sea salts is necessary only when high effluent concentrations preclude salinity adjustment by HSB alone.

16.6.31.2 Hypersaline brine (HSB) can be made by concentrating natural seawater by freezing or evaporation. HSB should be made from high quality, filtered seawater, and can be added to the effluent or to reagent water to increase salinity. HSB has several desirable characteristics for use in effluent toxicity testing. Brine derived from natural seawater contains the necessary trace metals, biogenic colloids, and some of the microbial components necessary for adequate growth, survival, and/or reproduction of marine and estuarine organisms, and it can be stored for prolonged periods without any apparent degradation. However, even if the maximum salinity HSB (100‰) is used as a diluent, the maximum concentration of effluent (0‰) that can be tested is 66% effluent at 34‰ salinity (see Table 1).

16.6.31.3 High quality (and preferably high salinity) seawater should be filtered to at least 10 µm before placing into the freezer or the brine generator. Water should be collected on an incoming tide to minimize the possibility of contamination.

16.6.31.4 Freeze Preparation of Brine

16.6.31.4.1 A convenient container for making HSB by freezing is one that has a bottom drain. One liter of brine can be made from four liters of seawater. Brine may be collected by partially freezing seawater at -10 to -20•C until the remaining liquid has reached the target salinity. Freeze for approximately six hours, then separate the ice (composed mainly of fresh water) from the remaining liquid (which has now become hypersaline).

16.6.31.4.2 It is preferable to monitor the water until the target salinity is achieved rather than allowing total freezing followed by partial thawing. Brine salinity should never exceed 100‰. It is advisable not to exceed about 70‰ brine salinity unless it is necessary to test effluent concentrations greater than 50%.

16.6.31.4.3 After the required salinity is attained, the HSB should be filtered through a 1 µm filter and poured directly into portable containers (20-L cubitainers or polycarbonate water cooler jugs are suitable). The brine storage containers should be capped and labelled with the salinity and the date the brine was generated. Containers of HSB should be stored in the dark at 4•C (even room temperature has been acceptable). HSB is usually of acceptable quality even after several months in storage.

16.6.31.5 Heat Preparation of Brine

16.6.31.5.1 The ideal container for making brine using heat-assisted evaporation of natural seawater is one that (1) has a high surface to volume ratio, (2) is made of a non-corrosive material, and (3) is easily cleaned (fiberglass containers are ideal). Special care should be used to prevent any toxic materials from coming in contact with the seawater being used to generate the brine. If a heater is immersed directly into the seawater, ensure that the heater materials do not corrode or leach any substances that would contaminate the brine. One successful method is to use a thermostatically controlled heat exchanger made from fiberglass. If aeration is applied, use only oil-free air compressors to prevent contamination.

16.6.31.5.2 Before adding seawater to the brine generator, thoroughly clean the generator, aeration supply tube, heater, and any other materials that will be in direct contact with the

brine. A good quality biodegradable detergent should be used, followed by several (at least three) thorough reagent water rinses.

16.6.31.5.3 Seawater should be filtered to at least 10 µm before being put into the brine generator. The temperature of the seawater is increased slowly to 40•C. The water should be aerated to prevent temperature stratification and to increase water evaporation. The brine should be checked daily (depending on the volume being generated) to ensure that the salinity does not exceed 100‰ and that the temperature does not exceed 40•C. Additional seawater may be added to the brine to obtain the volume of brine required.

16.6.31.5.4 After the required salinity is attained, the HSB should be filtered through a 1 µm filter and poured directly into portable containers (20-L cubitainers or polycarbonate water cooler jugs are suitable). The brine storage containers should be capped and labelled with the salinity and the date the brine was generated. Containers of HSB should be stored in the dark at 4•C (even room temperature has been acceptable). HSB is usually of acceptable quality even after several months in storage.

16.6.31.6 Artificial Sea Salts

16.6.31.6.1 No data from sea urchin or sand dollar fertilization tests using sea salts are available for evaluation at this time, and their use should be considered provisional. The use of GP2 artificial seawater (Table 2) has been found to provide control fertilization equal to that of natural seawater.

16.6.31.6.2 The GP2 reagent grade chemicals (Table 2) should be mixed with deionized (DI) water or its equivalent in a single batch, never by test concentration or replicate. The reagent water used for hydration should be between 21-26•C. The artificial seawater must be conditioned (aerated) for 24 h before use as the testing medium. If the solution is to be autoclaved, sodium bicarbonate is added after the solution has cooled. A stock solution of sodium bicarbonate is made up by dissolving 33.6 g $NaHCO_3$ in 500 mL of reagent water. Add 2.5 mL of this stock solution for each liter of the GP2 artificial seawater.

16.6.31.7 Dilution Water Preparation from Brine

16.6.31.7.1 Although salinity adjustment with brine is the preferred method, the use of high salinity brines and/or reagent water has sometimes been associated with discernible adverse effects on test organisms. For this reason, it is recommended that only the minimum necessary volume of brine and reagent water be used to offset the low salinity of the effluent, and that brine controls be included in the test. The remaining dilution water should be natural seawater. Salinity may be adjusted in one of two ways. First, the salinity of the highest effluent

test concentration may be adjusted to an acceptable salinity, and then serially diluted. Alternatively, each effluent concentration can be prepared individually with appropriate volumes of effluent and brine.

16.6.31.7.2 When HSB and reagent water are used, thoroughly mix together the reagent water and HSB before mixing in the effluent. Divide the salinity of the HSB by the expected test salinity to determine the proportion of reagent water to brine. For example, if the salinity of the brine is 100‰ and the test is to be conducted at 34‰, 100‰ divided by 34‰ = 2.94. Thus, the proportion is one part brine plus 1.94 parts reagent water). To make 1 L of dilution water at 34‰ salinity from a HSB of 100‰, 340 mL of brine and 660 mL of reagent water are required. Verify the salinity of the resulting mixture using a refractometer.

16.6.31.8 Test Solution Salinity Adjustment

16.6.31.8.1 Table 3 illustrates the preparation of test solutions (up to 50% effluent) at 34‰ by combining effluent, HSB, and dilution water. Note: if the highest effluent concentration does not exceed 50% effluent, it is convenient to prepare brine so that the sum of the effluent salinity and brine salinity equals 68‰; the required brine volume is then always equal to the effluent volume needed for each effluent concentration as in the example in Table 3.

16.6.31.8.2 Check the pH of all brine mixtures and adjust to within 0.2 units of dilution water pH by adding, dropwise, dilute hydrochloric acid or sodium hydroxide.

TABLE 1. MAXIMUM EFFLUENT CONCENTRATION (%) THAT CAN BE TESTED AT 34‰ WITHOUT THE ADDITION OF DRY SALTS GIVEN THE INDICATED EFFLUENT AND BRINE SALINITIES.

Effluent Salinity ‰	Brine 60 ‰	Brine 70 ‰	Brine 80 ‰	Brine 90 ‰	Brine 100 ‰
0	43.33	51.43	57.50	62.22	66.00
1	44.07	52.17	58.23	62.92	66.67
2	44.83	52.94	58.97	63.64	67.35
3	45.61	53.73	59.74	64.37	68.04
4	46.43	54.55	60.53	65.12	68.75
5	47.27	55.38	61.33	65.88	69.47
10	52.00	60.00	65.71	70.00	73.33
15	57.78	65.45	70.77	74.67	77.65
20	65.00	72.00	76.67	80.00	82.50
25	74.29	80.00	83.64	86.15	88.00

16.6.31.8.3 To calculate the amount of brine to add to each effluent dilution, determine the following quantities: salinity of the brine (SB, in ‰), the salinity of the effluent (SE, in ‰), and volume of the effluent to be added (VE, in mL). Then use the following formula to calculate the volume of brine (VB, in mL) to be added:

$$VB = VE \times (34 - SE)/(SB - 34)$$

16.6.31.8.4 This calculation assumes that dilution water salinity is 34 ± 2‰.

16.6.31.9 Preparing Test Solutions

TABLE 2. REAGENT GRADE CHEMICALS USED IN THE PREPARATION OF GP2 ARTIFICIAL SEAWATER FOR THE PURPLE URCHIN *STRONGYLOCENTROTUS PURPURATUS*, AND SAND DOLLAR *DENDRASTER EXCENTRICUS* TOXICITY TEST[1,2]

Compound	Concentration (g/L)	Amount (g) Required for 20 L
NaCl	23.90	478.0
Na_2SO_4	4.00	80.0
KCl	0.698	13.96
KBr	0.100	2.00
$Na_2B_4O_7 \bullet 10\ H_2O$	0.039	0.78
$MgCl_2 \bullet 6\ H_2O$	10.80	216.0
$CaCl_2 \bullet 2\ H_2O$	1.50	30.0
$SrCl_2 \bullet 6\ H_2O$	0.025	0.490
$NaHCO_3$	0.193	3.86

[1]Modified GP2 from Spotte et al. (1984)
[2]The constituent salts and concentrations were taken from USEPA (1990b). The salinity is 34.0 g/L.

16.6.31.9.1 Five mL of test solution are needed for each test chamber. To prepare test solutions at low effluent concentrations (<6%), effluents may be added directly to dilution water. For example, to prepare 1% effluent, add 1.0 mL of effluent to a 100-mL volumetric flask using a volumetric pipet or calibrated automatic pipet. Fill the volumetric flask to the 100-mL mark with dilution water, stopper it, and shake to mix. Pour into a (150-250 mL) beaker and stir. Distribute equal volumes into the replicate test chambers. The remaining test solution can be used for chemistry.

16.6.31.9.2 To prepare a test solution at higher effluent concentrations, hypersaline brine must usually be used. For

example, to prepare 40% effluent, add 400 mL of effluent to a 1-liter volumetric flask. Then, assuming an effluent salinity of 2‰ and a brine salinity of 66‰, add 400 mL of brine (see equation above and Table 3) and top off the flask with dilution water. Stopper the flask and shake well. Pour into a (100-250 mL) beaker and stir. Distribute equal volumes into the replicate test chambers. The remaining test solution can be used for chemistry.

16.6.31.10 Brine Controls

16.6.31.10.1 Use brine controls in all tests where brine is used. Brine controls contain the same volume of brine as does the highest effluent concentration using brine, plus the volume of reagent water needed to reproduce the hyposalinity of the effluent in the highest concentration, plus dilution water. Calculate the amount of reagent water to add to brine controls by rearranging the above equation, (See, 16.6.33.8.3) setting SE = 0, and solving for VE.

$$VE = VB \times (SB - 34)/(34 - SE)$$

If effluent salinity is essentially 0‰, the reagent water volume needed in the brine control will equal the effluent volume at the highest test concentration. However, as effluent salinity and effluent concentration increase, less reagent water volume is needed.

16.6.32 TEST ORGANISMS, PURPLE URCHINS

16.6.32.1 Sea Urchins, *Strongylocentrotus purpuratus* (approximately 6 of each sex per test).

16.6.32.2 Adult sea urchins (*Strongylocentrotus purpuratus*) can be obtained from commercial suppliers or collected from uncontaminated intertidal or subtidal areas. State collection permits are usually required for collection of sea urchins and collection is prohibited or restricted in some areas. The animals are best transported "dry," surrounded either by moist seaweed or paper towels dampened with seawater. Animals should be kept at approximately their collection or culture temperature to prevent thermal shock which can prematurely induce spawning.

TABLE 3. EXAMPLES OF EFFLUENT DILUTION SHOWING VOLUMES OF EFFLUENT (AT X‰), BRINE, AND DILUTION WATER NEEDED FOR ONE LITER OF EACH TEST SOLUTION.

FIRST STEP: Combine brine with reagent water or natural seawater to achieve a brine of 68-x‰ and, unless natural seawater is used for dilution water, also a brine-based dilution water of 34‰.

SERIAL DILUTION:

Step 1. Prepare the highest effluent concentration to be tested by adding equal volumes of effluent and brine to the appropriate volume of dilution water. An example using 40% is shown.

Effluent Conc. (%)	Effluent x‰	Brine (68-x)‰	Dilution Water* 34‰
40	800 mL	800 mL	400 mL

Step 2. Use either serially prepared dilutions of the highest test concentration or individual dilutions of 100% effluent.

Effluent Conc. (%)	Effluent Source	Dilution Water* (34‰)
20	1000 mL of 40%	1000 mL
10	1000 mL of 20%	1000 mL
5	1000 mL of 10%	1000 mL
2.5	1000 mL of 5%	1000 mL
Control	none	1000 mL

INDIVIDUAL PREPARATION:

Effluent Conc. (%)	Effluent x‰	Brine (68-x)‰	Dilution Water* 34‰
40	400 mL	400 mL	200 mL
20	200 mL	200 mL	600 mL
10	100 mL	100 mL	800 mL
5	50 mL	50 mL	900 mL
2.5	25 mL	25 mL	950 mL
Control	none	none	1000 mL

*May be natural seawater or brine-reagent water equivalent.

16.6.32.3 The adult sea urchins are maintained in glass aquaria or fiberglass tanks. The tanks are supplied continuously (approximately 5 L/min) with filtered natural seawater, or salt water prepared from commericial sea salts is recirculated. The animals are checked daily and any obviously unhealthy animals are discarded.

16.6.32.4 Although ambient temperature seawater is usually acceptable, maintaining sea urchins in spawning condition usually requires holding at a relatively constant temperature. The culture unit should be capable of maintaining a constant temperature between 10 and 14•C with a water temperature control device.

16.6.32.5 Food for sea urchins -- kelp, recommended, but not necessarily limited to, *Laminaria sp*., *Hedophyllum sp*., *Nereocystis sp*., *Macrocystis sp*., *Egregia sp*., *Alaria sp*. or romaine lettuce. The kelp should be gathered from known uncontaminated zones or obtained from commerical supply houses whose kelp comes from known uncontaminated areas, or romaine lettuce. Fresh food is introduced into the tanks at least several times a week. Sun dried (12-24 hours) or oven dried (60•C overnight) kelp, stores well at room temperature or frozen, rehydrates well and is adequate to maintain sea urchins for long periods. Decaying food and fecal pellets are removed as necessary to prevent fouling.

16.6.32.6 Natural seawater (>30‰) is used to maintain the adult animals and (•32‰) as a control water in the tests.

16.6.32.7 Adult male and female (if sexes known) animals used in field studies are transported in separate or partitioned insulated boxes or coolers packed with wet kelp or paper toweling. Upon arrival at the field site, aquaria (or a single partitioned aquarium) are filled with control water, loosely covered with a styrofoam sheet and allowed to equilibrate to the holding temperature before animals are added. Healthy animals will attach to the kelp or aquarium within hours.

16.6.32.8 To successfully maintain about 25 adult animals for seven days at a field site, 40-L glass aquaria using aerated, recirculating, clean saline water (32‰) and a gravel bed filtration system, are housed within a water bath, such as an

INSTANT OCEAN[R] Aquarium. The sexes should be held separately if possible.

16.6.33 TEST ORGANISMS, SAND DOLLARS

16.6.33.1 Sand Dollars, *Dendraster excentricus*, (approximately 6 of each sex per test).

16.6.33.2 Adult sand dollars (*Dendraster excentricus*) can be obtained from commercial suppliers or collected from subtidal zones (most areas) or from intertidal zones of some sheltered waters (e.g., Puget Sound). State collection permits may be required for collection of sand dollars and collection prohibited or restricted in some areas. The animals are best transported "dry," surrounded either by moist seaweed or paper towels dampened with seawater. Animals should be kept at approximately their collection or culture temperature to prevent thermal shock which can prematurely induce spawning.

16.6.33.3 The adult sand dollars are maintained in glass aquaria or fiberglass tanks. The tanks are supplied continuously (approximately 5 L/min) with filtered natural seawater, or saltwater prepared from commercial sea salts is recirculated. The animals are checked daily and any obviously unhealthy animals are discarded. For longer periods than a few days, several centimeters or more of a sand substrate may be desirable.

16.6.33.4 Although ambient temperature seawater is usually acceptable, maintaining sand dollars in spawning condition usually requires holding at a relatively constant temperature. The culture unit should be capable of maintaining a constant temperature between 8 and 12•C with a water temperature control device.

16.6.33.5 Sand dollars will feed on suspended or benthic materials such as phytoplankton, benthic diatoms, etc. No reports of laboratory populations being maintained in spawning condition over several years are known. It is probably most convenient to obtain sand dollars, use them, and then discard them after they cease to produce good quality gametes.

16.6.33.6 Natural seawater (>30‰) is used to maintain the adult animals and (•32‰) as a control water in the tests.

16.6.33.7 Adult male and female (if sexes known) animals used in field studies are transported in separate or partitioned insulated boxes or coolers packed with wet kelp or paper toweling. Upon arrival at the field site, trays or aquaria (or a single partitioned aquarium) are filled with control water, loosely covered with a styrofoam sheet and allowed to equilibrate to the holding temperature before animals are added.

16.7 EFFLUENT AND RECEIVING WATER COLLECTION, PRESERVATION AND STORAGE

16.7.1 Section 8, Effluent and Receiving Water Sampling and Sample Handling, and Sampling Preparation for Toxicity Tests.

16.8 CALIBRATION AND STANDARDIZATION

16.8.1 See Section 4, Quality Assurance.

16.9 QUALITY CONTROL

16.9.1 See Section 4, Quality Assurance.

16.10 TEST PROCEDURES

16.10.1 TEST DESIGN

16.10.1.1 The test consists of at least four effluent concentrations plus a dilution water control. Tests that use brine to adjust salinity must also contain four replicates of a brine control. In addition, four extra controls are prepared for egg controls.

16.10.1.2 Effluent concentrations are expressed as percent effluent.

16.10.2 TEST SOLUTIONS

16.10.2.1 Receiving waters

16.10.2.1.1 The sampling point is determined by the objectives of the test. At estuarine and marine sites, samples are usually collected at mid-depth. Receiving water toxicity is determined with samples used directly as collected or with samples passed

through a 60 µm NITEX® filter and compared without dilution, against a control. Using four replicate chambers per test, each containing 5 mL, and 400 mL for chemical analysis, would require approximately 420 mL or more of sample per test.

16.10.2.2 Effluents

16.10.2.2.1 The selection of the effluent test concentrations should be based on the objectives of the study. A dilution factor of at least 0.5 is commonly used. A dilution factor of 0.5 provides hypothesis test discrimination of ± 100%, and testing of a 16 fold range of concentrations. Hypothesis test discrimination shows little improvement as dilution factors are increased beyond 0.5 and declines rapidly if smaller dilution factors are used. **USEPA recommends that one of the five effluent treatments must be a concentration of effluent mixed with dilution water which corresponds to the permittee's instream waste concentration (IWC).** At least two of the effluent treatments must be of lesser effluent concentration than the IWC, with one being at least one-half the concentration of the IWC. If 100‰ HSB is used as a diluent, the maximum concentration of effluent that can be tested will be 66% at 34‰ salinity.

16.10.2.2.2 If the effluent is known or suspected to be highly toxic, a lower range of effluent concentrations should be used (such as 25%, 12.5%, 6.25%, 3.12% and 1.56%).

16.10.2.2.3 The volume in each test chamber is 5 mL.

16.10.2.2.4 Effluent dilutions should be prepared for all replicates in each treatment in one container to minimize variability among the replicates. Dispense into the appropriate effluent test chambers.

16.10.2.3 Dilution Water

16.10.2.3.1 Dilution water should be uncontaminated 1-µm-filtered natural seawater, or hypersaline brine prepared from uncontaminated natural seawater plus reagent water; or sea salts (see Section 7, Dilution Water). Natural seawater may be uncontaminated receiving water. This water is used in all dilution steps and as the control water.

16.10.2.4 Reference Toxicant Test

16.10.2.4.1 Reference toxicant tests should be conducted as described in Quality Assurance (see Section 4.7).

16.10.2.4.2 The preferred reference toxicant for sea uchins and sand dollar is copper chloride ($CuCl_2 \circ H_2O$). Reference toxicant tests provide an indication of the sensitivity of the test organisms and the suitability of the testing laboratory (see Section 4 Quality Assurance). Another toxicant may be specified by the appropriate regulatory agency. Prepare a copper reference toxicant stock solution (2,000 mg/L) by adding 5.366 g of copper chloride ($CuCl_2 \circ 2H_2O$) to 1 liter of reagent water. For each reference toxicant test prepare a copper sub-stock of 3 mg/L by diluting 1.5 mL of stock to one liter with reagent water. Alternatively, certified standard solutions can be ordered from commercial companies.

16.10.2.4.3 Prepare a control (0 •g/L) plus four replicates each of at least five consecutive copper reference toxicant solutions (e.g., from the series 3.0, 4.4, 6.5, 9.5, 13.9, 20.4, and 30.0 •g/L, by adding 0.10, 0.15, 0.22, 0.32, 0.46, 0.68, and 1.00 mL of sub-stock solution, respectively, to 100-L volumetric flasks and filling to 100-mL with dilution water). Start with control solutions and progress to the highest concentration to minimize contamination.

16.10.2.4.4 If the effluent and reference toxicant tests are to be run concurrently, then the tests must use embryos from the same spawn. The tests must be handled in the same way and test solutions delivered to the test chambers at the same time. Reference toxicant tests must be conducted at 34 ± 2‰.

16.10.3 COLLECTION OF GAMETES FOR THE TEST

16.10.3.1 Spawning Induction

16.10.3.1.1 Pour seawater into 100 mL beakers and place in 12•C bath or room. Allow to come to temperature. Select a sufficient number of sea urchins or sand dollars (based upon recent or past spawning success) so that three of each sex are likely to provide gametes of acceptable quantity and quality for the test. During optimal spawning periods this may only require six animals, three

of each sex, when the sexes are known from prior spawning. During other periods, especially if the sex is not known, many more animals may be required.

16.10.3.1.2 Care should be exercised when removing sea urchins from holding tanks so that damage to tube-feet is minimized. Following removal, sea urchins should be placed into a container lined with seawater-moistened paper towels to prevent reattachment.

16.10.3.1.3 Place each sand dollar, oral side up, on a 100 mL beaker filled with 12•C seawater or each sea urchin onto a clean tray covered with several layers of seawater moistened paper towels.

16.10.3.1.4 Handle sexes separately once known; this minimizes the chance of accidental egg fertilization. Throughout the test process, it is best if a different worker, different pipets, etc. are used for males (semen) and females (eggs). Frequent washing of hands is a good practice.

16.10.3.1.5 Fill a 3 or 5 mL syringe with 0.5 M KCl and inject 0.5 mL through the soft periostomal membrane of each sea urchin (See Figure 3) or into the oral opening each sand dollar. If sexes are known, use a separate needle for each sex. If sexes are not known, rinse the needle with hot tap water between each injection. This will avoid the accidental injection of sperm from males into females. Note the time of injection (sample data sheet, Figure 1).

16.10.3.1.6 Spawning of sea urchins is sometimes induced by holding the injected sea urchin and gently shaking or swirling it for several seconds. This may provide an additional physical stimulus, or may aid in distributing the injected KCl.

16.10.3.1.7 Place the sea urchins onto the beakers or tray (oral side down). Place the sand dollars onto the beakers (oral side up). Females will release orange (sea urchins) or purple (sand dollars) eggs and males will release cream-colored semen.
16.10.3.1.8 As gametes begin to be shed, note the time on the data sheet and separate the sexes. Place male sand dollars with the oral side up atop a small (5-10 mL) glass beaker filled with 12•C seawater. Leave spawning sea urchin males on tray or beaker

(oral side down) for semen collection. Female sand dollars and sea urchins are left to shed eggs into the 100-mL beakers.

16.10.3.1.9 If sufficient quantities of gametes are available, only collect gametes for the first 15 min after each animal starts releasing. This helps to insure good quality gametes. As a general guideline, do not collect gametes from any individual for more than 30 minutes after the first injection.
16.10.3.1.10 If no spawning occurs after 5 or 10 minutes, a second 0.5 mL injection may be tried. If animals do not produce sufficient gametes following injection of 1.0 mL of KCl, they should probably not be reinjected as this seldom results in acquisition of good quality gametes and may result in mortality of adult urchins.

16.10.3.1.11 Collect the undiluted semen from each male sea urchin, using a 0.1 mL automatic pipet. Store the sperm from each male in a separate, labelled, conical, glass centrifuge tube, covered with a cap or parafilm, on ice. Air exposure of semen may alter its pH through gas exchange and reduce the viability of the sperm. Note: undiluted semen from *Strongylocentrotus purpuratus* typically contains about 4×10^{10} sperm/mL.

16.10.3.1.12 Sections 15.10.4.2 and 15.10.6.4 describe collection and dilution of the sperm and eggs. While some of the gamete handling needs to be in a specific order, parts of the procedure can be done simultaneously while waiting for gametes to settle.

16.10.3.2 Collection of Sperm

16.10.3.2.1 Sea urchin semen should be collected dry (directly from the surface of the sea urchin), using either a Pasteur pipette or a 0.1 mL autopipette with the end of the tip cut off so that the opening is at least 2 mm. Pipette semen from each male into separate 1-15 mL conical test tubes, stored in an ice water bath.

16.10.3.3 Viability of Sperm

16.10.3.3.1 Early in the spawning process, place a very small amount of sperm from each male sea urchin or sand dollar into

dilution water on a microscope slide (well slides work nicely). Examine the sperm for motility; use sperm from males with high sperm motility. It is more important to use high quality sperm than it is to use a pooled population of sperm.

16.10.3.4 Pooling of Sperm

16.10.3.4.1 Pool equal quantities of semen from each of the sea urchin males that has been deemed good. If possible, 0.025 mL should be pooled from each of those used and a total of at least 0.05 mL of pooled semen should be available. Sperm collected from good male sand dollars should be pooled after first decanting off the overlying water (the final sand dollar sperm density usually is between $2x10^9$ and $2x10^{10}$ sperm/mL).

16.10.3.5 Storage of Sperm

16.10.3.5.1 Cover each test tube or beaker with a cap or parafilm, as air exposure of semen may alter its pH through gas exchange and reduce the viability of the sperm. Keep sperm covered and on ice or refrigerated (<5•C). The sperm should be used in a toxicity test within 4 h of collection.

16.10.4 PREPARATION OF EGG SUSPENSION FOR USE IN THE TEST

16.10.4.1 Acceptability of Eggs

16.10.4.1.1 Prior to pooling, a small sample of the eggs from each female should be examined for the presence of significant quantities of poor eggs (vacuolated, small, or irregularly shaped) and mixed with good sperm to determine extent of fertilization. If good quality eggs are available from one or more females, questionable eggs should not be used for the test. It is more important to use high quality eggs than it is to use a pooled population of eggs.

16.10.4.2 Pooling of Eggs

16.10.4.2.1 Allow eggs to settle in the collection beakers. Decant some of the water from the collection beakers taking care not to pour off many eggs. The sea urchin eggs are pooled into a 1 L beaker, and the volume brought to 600 mL with 12•C dilution water. The eggs are suspended by swirling and the eggs allowed

to settle for 15 minutes at 12•C. About 500 mL of the overlying water are siphoned off, the volume brought back to 600 mL with more 12•C dilution water, and the eggs resuspended and allowed to settle for a second 15 minute period. After again siphoning off the overlying 500 mL, the rinsed eggs are gently transferred to either a 100 or a 250 mL graduated cylinder and brought to volume with 12•C dilution water. Eggs are stored at 12•C throughout the pre-test period.

16.10.4.2.2 Pooled sand dollar eggs should be treated gently and no additional rinsing step is recommended. Mix well once just before subsampling for egg stock calculations. This is best done in a large graduated cylinder appropriate for the number of eggs available. Cover with parafilm and invert gently several times.

16.10.4.3 Density of Eggs

16.10.4.3.1 Subsamples of the egg stock are then taken for determining egg density. Place 9 mL of dilution water in each of two 22 mL liquid scintillation vials. Label A and B. Place 1 mL of well-mixed egg stock into vial A. Mix well. (The remaining egg stock is covered with parafilm and stored at 12•C.) Transfer 1 mL of egg suspension from vial A to vial B. Mix contents of vial B and transfer 1 mL of egg suspension B into a Sedgewick-Rafter counting chamber. Count eggs under a compound microscope. If count is <30, count a 1 mL sample from vial A (see sample data sheet, Figure 2).

16.10.4.3.2 Prepare 100 mL of egg stock in dilution water at the final target concentration of 2,240 eggs/mL (224,000 eggs in 100 mL). If the egg stock is >2,240 eggs/mL (A >224 or B >30 eggs/mL), dilute the egg stock by transferring:

224,000 eggs / ____D___ eggs/mL = _____mL

of well-mixed egg stock to a 100 mL graduated cylinder and bring the total volume to 100 mL with dilution water where:

D = (Count A) x 10 or (Count B) x 100.

If the egg stock is <2,240 eggs/mL (A <224 eggs/mL), concentrate the eggs by allowing them to settle and then decant enough water to retain the following percent of the original volume:

(___D___ eggs/mL / 2,240) x 100 = % volume.

16.10.4.3.3 Check the egg stock density. Place 9 mL of dilution water into a 22 mL scintillation vial; add 1 mL of the final egg stock. Mix well and transfer 1 mL into a Sedgewick-Rafter counting chamber. The egg count should be between 200 and 245. Adjust egg stock volume and recheck counts if necessary to obtain counts within this range. Because some eggs (especially sand dollar eggs) may be sensitive to handling, it is advisable to separately prepare egg stocks for the fertilization trial and the definitive test (but use the same pooled batch of eggs).

16.10.5 PREPARATION OF SPERM DILUTION FOR USE IN THE (OPTIONAL) TRIAL FOR ESTIMATING APPROPRIATE SPERM DENSITY FOR TEST

16.10.5.1 A trial fertilization is recommended to reduce the likelihood of a failed test due to inadequate control fertilization or exceeding the maximum acceptable sperm density. However, two other alternative approaches are acceptable:

1) Conduct the test at a low enough sperm density that oversperming does not create test insensitivity. This can be met by using a confirmed sperm stock density of •5.6×10^6/mL (this is equivalent to a sperm:egg ratio of •500:1 at 200 eggs/mL); or

2) Conduct the test, but include two extra sets of controls, one set receiving only 0.050 mL of the sperm stock and the other receiving 0.2 mL of the sperm stock. The control fertilization in the 0.050 mL sperm stock controls must be at least 5% lower than that in the 0.2 mL sperm stock controls or the test is unacceptable. Confirm that the sperm stock density did not exceed the maximum acceptable density of 3.36×10^7 sperm/mL.

16.10.5.2 Fertilization trial is conducted to determine the sperm density that will provide about 80-100 percent control egg fertilization while avoiding significant "oversperming" that can reduce test sensitivity. Although usually expressed as a sperm:egg ratio (e.g., 1,000:1), because egg density is held constant at 200/mL, the sperm:egg ratio is also a measure of sperm density.

16.10.5.3 It is unacceptable to conduct a definitive toxicity test if the sperm:egg ratio exceeds 3,000:1. This is a cut-off based on gradual loss of test sensitivity at higher sperm densities, even in cases where control fertilization is considerably below 100 percent.

16.10.5.4 It is unnecessary to conduct trials for definitive toxicity tests at sperm:egg ratios below 500:1, because this ratio should never cause significant "oversperming."

16.10.5.5 Sperm density of sea urchin semen or sand dollar sperm suspension is checked by hemocytometer counts and a replicated series of nominal S:E ratios set up (3,000, 1288, 550, 234, and 100:1) based upon appropriate dilution calculations.

16.10.5.6 For sea urchins and sand dollars, prepare a killed sperm preparation for determining the dilution required to obtain a sperm stock (3.36×10^7 sperm/mL) for the maximum sperm density (6×10^5 sperm/200 eggs/mL--3,000:1) needed for the trial. A sperm density of about 1×10^7 is convenient to count. If the approximate sperm density is known, the dilution procedures outlined in Table 4 can be followed without initial sperm counts; the actual trial sperm density must still be determined by subsequent counts. For example (Table 4), if expected sperm density is ca. 5×10^8 dilute 0.2 mL of sperm to 10 mL, if ca. 5×10^9 dilute 0.2 mL of sperm to 100 mL (or 0.025 mL of sperm to 10 mL), if ca. 5×10^{10} dilute 0.040 mL to 200 mL. Table 4 is provided for guidance as a quick reference for dilution volumes if sperm density of pooled semen is can be reasonably estimated, and as a check for mathematical accuracy of formula calculations for sperm dilution.

16.10.5.7 Mix the pooled sea urchin semen (16.10.3.8) by agitating the centrifuge tube for about 5 seconds using a vortex mixer. <u>Very slowly</u> withdraw a subsample of semen using an automatic pipet, wipe off the outside of the pipet tip with tissue, and empty the pipet contents into an Erlenmeyer flask containing the appropriate volume (Table 4) of a sperm killing solution of 1% glacial acetic acid in dilution water (e.g., 10 mL of 10% glacial acetic acid plus 90 mL of dilution water).

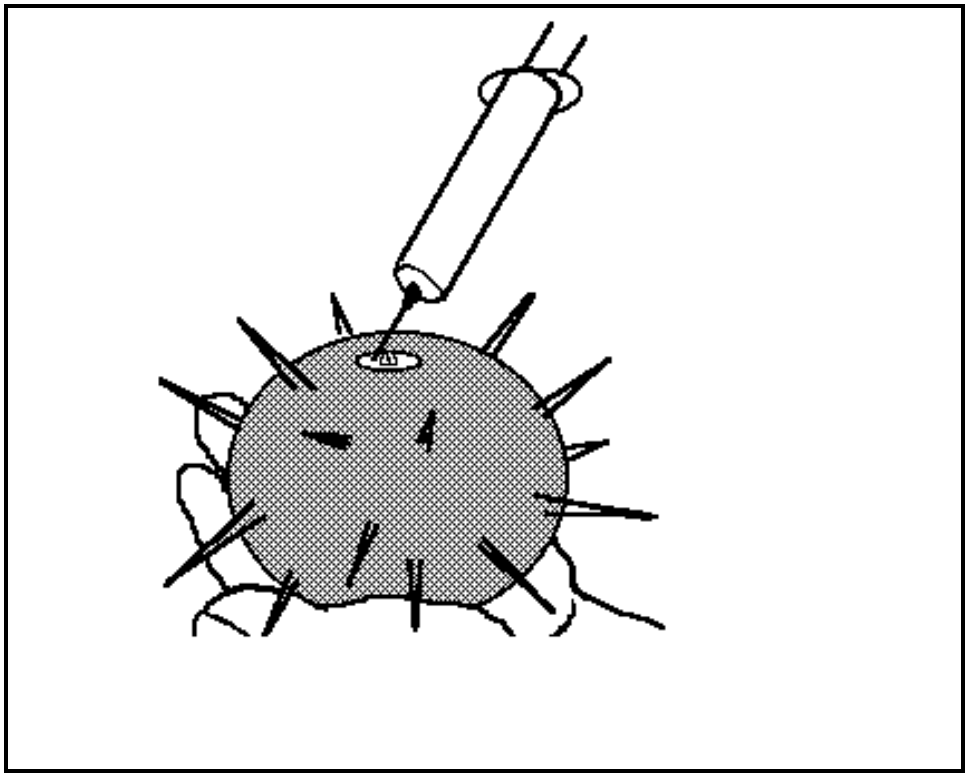

Figure 3. Showing the location and orientation used in the injection of KCl into sea urchins to stimulate spawning.

Repeatedly rinse the residual semen from the pipet tip by filling and emptying until no further cloudy solution is expelled from the pipet (this may require several dozen rinses). Cover the flask with parafilm and mix thoroughly by repeated inversion.

16.10.5.8 Mix the chilled suspension of pooled sand dollar sperm (16.10.5.6) using a stirring rod. Pipet the appropriate volume of sperm suspension (Table 4) into an Erlenmeyer flask containing the appropriate volume (Table 4) of a sperm killing solution of 1% glacial acetic acid in dilution water (e.g., 10 mL of 10% glacial acetic acid plus 90 mL of dilution water).

16.10.5.9 Transfer samples of well-mixed sperm suspension to both sides of two Neubauer hemacytometers. Let the sperm settle 15 min.

16.10.5.10 Count the sperm on one hemacytometer following procedures outlined in Appendix II. If the lower count is at

least 80% of the higher count use the mean count to estimate sperm density in semen and the required dilution volume for the test stock. If the two counts do not agree within 20%, count the two fields on the other hemacytometer. Calculate the sperm density in the semen or sperm suspension using the mean of all four counts unless one count can be eliminated as an obvious outlier.

16.10.5.11 Calculate the volume of dilution water necessary to dilute the sea urchin semen or the sand dollar sperm suspension to the sperm density (sperm/mL) required for the sperm stock for the trial. See Table 5 for recommended dilution procedures; it also provides a quick reference for dilution volumes once sperm density of pooled semen is known, or a check for mathematical accuracy of formula calculations for sperm dilution. Note: table values for sperm densities from $1x10^8$ to $9x10^9$ are for volume (mL) of sperm stock for total volume of 100 mL; table values for sperm densities •$1x10^{10}$ are for dilution water volumes for 0.025 mL of semen. Table 5 is used as follows: given a sperm density in the semen stock (e.g., $4.7x10^9$) find the row containing the integer (characteristic) and the exponent ($4x10^9$) in the left hand column, then read across to the column coresponding to the mantissa (0.7). The value at the intersection of the row and column (0.71 mL) is the volume of semen per 100mL needed for sperm stock to achieve a 3000:1 sperm:egg ratio in the trial.

16.10.5.12 For the approximate sperm:egg ratios dilute the 3000:1 stock as follows:

1288:1	5 mL	3000:1 stock with 6.6 mL dilution water
550:1	2 mL	3000:1 stock with 9.9 mL dilution water
234:1	1 mL	3000:1 stock with 11.8 mL dilution water
100:1	0.5 mL	3000:1 stock with 16.5 mL dilution water

16.10.6 SPERM DENSITY TRIAL

16.10.6.1 The series of trial sperm:egg ratios should include 3,000:1 and several lower ratios. The ratios 100:1, 234:1, 550:1, 1288:1 and 3,000:1 are recommended because they evenly divide the log sperm:egg ratio. Fertilization appears to be a linear function of the log of sperm density (Figure 4). Recommended sperm dilution procedures are given in Table 5.

16.10.6.4 Quantitive evaluation of the sperm density trial should be obtained by counting 100 eggs from each tube until a suitable sperm density can be determined for the definitive test. Examples of sperm density selection are given in Table 6. Percent fertilization may be lower in the test than in the trial because the viability of the stored sperm may decrease during the period of the trial. If the sperm have very good viability (e.g., cases 1 and 2, Table 6), this loss of viability should be small. On the other hand, if viability is inherently poorer (cases 3, 4 and 5, Table 6), the loss of viability could be greater and probably should be taken into account in selecting the sperm density for the test. Case 6 (Table 6) represents a special case in which egg viability may affect the percent fertilization; in this case the asymptote of the fertilization curve is assumed to represent 100% fertilization for purposes of selection of sperm density for the test.

16.10.6.5 Prepare killed sperm preparations of the trial sperm stock suspensions to provide confirmation of the nominal sperm:egg ratios. It saves time if these can be prepared and loaded onto hemacytometers while the trial is being conducted. Alternatively, once the trial has been evaluated, the selected nominal sperm density can be confirmed by direct hemacytometer count.

16.10.6.6 Record all the counts made, select a target sperm:egg ratio for the test, and calculate the dilution of the stored sperm stock needed to provide the necessary sperm density for the definitive test.

16.10.6.7 Table 5 can be used for deriving the volumes needed for preparing the final sperm stock. For a pooled sperm suspension density of $4x10^9$ and a target sperm:egg ratio of 500:1, simply read the dilution for the 3000:1 sperm:egg ratio from Figure 5 (0.84 mL / 100 mL) and reduce the sperm volume by 3,000 / 500 = 6. In this case 0.84 / 6 = 0.14 mL; the dilution factor checks out (100 / 0.14 = 714).

TABLE 4. Dilution volume guide for initial count of sperm density to achieve recommended counting density of 1 x 10^7/mL.

Initial Sperm/mL	mL/10mL	mL/100mL	mL/200mL
1×10^8	1.000		
2×10^8	0.500		
3×10^8	0.333		
4×10^8	0.250		
5×10^8	0.200		
6×10^8	0.167		
7×10^8	0.143		
8×10^8	0.125		
9×10^8	0.111		
1×10^9	0.100	1.000	
2×10^9	0.050	0.500	1.000
3×10^9	0.033	0.333	0.667
4×10^9	0.025	0.250	0.500
5×10^9		0.200	0.400
6×10^9		0.167	0.333
7×10^9		0.143	0.286
8×10^9		0.125	0.250
9×10^9		0.111	0.222
1×10^{10}		0.100	0.200
2×10^{10}		0.050	0.100
3×10^{10}		0.033	0.067
4×10^{10}		0.025	0.050
5×10^{10}			0.040
6×10^{10}			0.033
7×10^{10}			0.029
8×10^{10}			0.025
9×10^{10}			0.022

Note: to obtain quantitatively repeatable samples of semen it is important that: (1) the pipet tip have an opening of at least 1 mm; (2) samples be withdrawn slowly to avoid cavitation and entrainment of air in the semen sample; (3) samples not include fragments of broken spines (which usually settle to the test tube bottom upon vortexing); and (4) wiping semen from the pipet tip with tissue be done with care to avoid wicking semen from within the pipet tip.

Bring the indicated volume of sperm stock to 100 mL

Density	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
1.00e+08	33.60	30.55	28.00	25.85	24.00	22.40	21.00	19.76	18.67	17.68
2.00e+08	16.80	16.00	15.27	14.61	14.00	13.44	12.92	12.44	12.00	11.59
3.00e+08	11.20	10.84	10.50	10.18	9.88	9.60	9.33	9.08	8.84	8.62
4.00e+08	8.40	8.20	8.00	7.81	7.64	7.47	7.30	7.15	7.00	6.86
5.00e+08	6.72	6.59	6.46	6.34	6.22	6.11	6.00	5.89	5.79	5.69
6.00e+08	5.60	5.51	5.42	5.33	5.25	5.17	5.09	5.01	4.94	4.87
7.00e+08	4.80	4.73	4.67	4.60	4.54	4.48	4.42	4.36	4.31	4.25
8.00e+08	4.20	4.15	4.10	4.05	4.00	3.95	3.91	3.86	3.82	3.78
9.00e+08	3.73	3.69	3.65	3.61	3.57	3.54	3.50	3.46	3.43	3.39
1.00e+09	3.36	3.05	2.80	2.58	2.40	2.24	2.10	1.98	1.87	1.77
2.00e+09	1.68	1.60	1.53	1.46	1.40	1.34	1.29	1.24	1.20	1.16
3.00e+09	1.12	1.08	1.05	1.02	0.99	0.96	0.93	0.91	0.88	0.86
4.00e+09	0.84	0.82	0.80	0.78	0.76	0.75	0.73	0.71	0.70	0.69
5.00e+09	0.67	0.66	0.65	0.63	0.62	0.61	0.60	0.59	0.58	0.57
6.00e+09	0.56	0.55	0.54	0.53	0.53	0.52	0.51	0.50	0.49	0.49
7.00e+09	0.48	0.47	0.47	0.46	0.45	0.45	0.44	0.44	0.43	0.43
8.00e+09	0.42	0.41	0.41	0.40	0.40	0.40	0.39	0.39	0.38	0.38
9.00e+09	0.37	0.37	0.37	0.36	0.36	0.35	0.35	0.35	0.34	0.34

To dilute dense semen: add 0.025 mL of semen into these volumes (mL) of dilution water

Density	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
1.00e+10	7.44	8.44	9.44	10.44	11.44	12.44	13.44	14.44	15.44	16.44
2.00e+10	14.88	15.88	16.88	17.88	18.88	19.88	20.88	21.88	22.88	23.88
3.00e+10	22.32	23.32	24.32	25.32	26.32	27.32	28.32	29.32	30.32	31.32
4.00e+10	29.76	30.76	31.76	32.76	33.76	34.76	35.76	36.76	37.76	38.76
5.00e+10	37.20	38.20	39.20	40.20	41.20	42.20	43.20	44.20	45.20	46.20
6.00e+10	44.64	45.64	46.64	47.64	48.64	49.64	50.64	51.64	52.64	53.64
7.00e+10	52.08	53.08	54.08	55.08	56.08	57.08	58.08	59.08	60.08	61.08
8.00e+10	59.52	60.52	61.52	62.52	63.52	64.52	65.52	66.52	67.52	68.52
9.00e+10	66.96	67.96	68.96	69.96	70.96	71.96	72.96	73.96	74.96	75.96

TABLE 5. DILUTION VOLUMES OF SPERM STOCK OF INDICATED DENSITY ($1.0X10^8$ TO $9.9X10^{10}$) TO ACHIEVE THE SPERM STOCK DENSITY ($3.36X10^7$) FOR A 3000:1 SPERM:EGG RATIO.

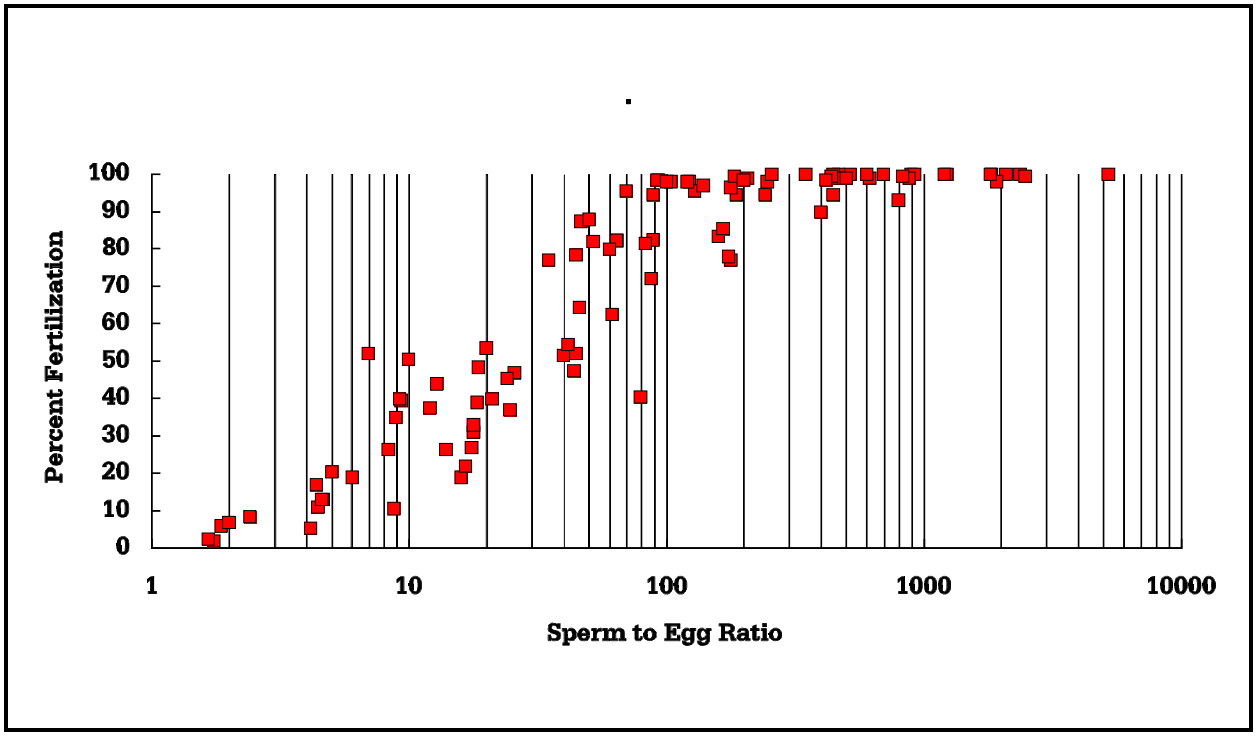

Figure 4. Relationship between sea urchin sperm:egg ration and percent control fertilization from 21 trials conducted by EPA (Feb-May 1991).

16.10.7 OBSERVATIONS DURING THE TEST

16.10.7.1 It is recommended that all observations be made on extra test solution remaining after the test tubes have been filled.

16.10.7.2 DO, pH, and salinity are measured at the beginning of the test. Due to the short duration of the test, no additional measurements of these parameters are required. Temperature is measured several times during the test as outlined in 16.10.7.

16.10.7.3 Record all measurements on the data sheet.

16.10.8 START OF THE DEFINITIVE TEST

16.10.8.1 Prior to Beginning the Test
produced good fertility, or if some produced good fertility.

TABLE 6. EXAMPLES OF RESULTS OF TRIAL FERTILIZATION TESTS WITH SPECIFIED SPERM DENSITIES AND TARGET SPERM DENSITY SELECTION (SPERM:EGG RATIO) FOR THE DEFINITIVE TEST.

sperm: egg	case 1	case 2	case 3	case 4	case 5	case 6
100:1	100*	95*	85	70	40	70
234:1	100	98	95*	80	64	85*
550:1	100	100	98	98*	82	89
1288:1	100	100	100	100	84	90
3000:1	100	100	100	100	88*	90

* recommended selection (interpolation to intermediate sperm:egg ratios may be used if found desirable)

1. If all trials exceed 90% fertilization, select 100:1 (case 1 and case 2).

2. If not all trials exceed 90% fertilization select the lowest sperm:egg ratio that does exceed 90% fertilization (case 3 and case 4).

3. If no trials exceed 90% fertilization, select the highest sperm:egg ratio (case 5) unless fertilization appears to become asymptotic below 100% (case 6).

4. If even the highest sperm:egg ratio fails to achieve 70% fertilization it is probable that an acceptable test cannot be conducted with these gametes.

   11,200 x target S:E ratio = target density; e.g., if target S:E = 500:1, target density = 11,200 x 500 = 5,600,000 sperm/mL. (11,200 = (1,120 eggs/tube)(0.1 mL of sperm stock/tube)).

   (stock sperm/mL)/(target sperm/mL) = dilution; e.g., if stock sperm has $4x10^9$ sperm/mL, then dilution = $4x10^9$ / $5.6x10^6$ = 714

16.10.8.1.1 The test should begin as soon as possible, preferably within 24 h of sample collection. The maximum holding time following retrieval of the sample from the sampling device should not exceed 36 h for off-site toxicity tests unless

permission is granted by the permitting authority. In no case should the sample be used in a test more than 72 h after sample collection (see Section 8 Effluent and Receiving Water Sampling, Sample Handling, and Sample Preparation for Toxicity Test).

16.10.8.1.2 Just prior to test initiation (approximately 1 h), the temperature of a sufficient quantity of the sample to make the test solutions should be adjusted to the test temperature (12 ± 1•C) and maintained at that temperature during the addition of dilution water.

16.10.8.1.3 Increase the temperature of the water bath, room, or incubator to the required test temperature (12 ± 1•C).

16.10.8.1.4 Randomize the placement of test chambers in the temperature-controlled water bath, room, or incubator at the beginning of the test, using a position chart. Assign numbers for the position of each test chamber using a random numbers or similar process (see Appendix A, for an example of randomization). Maintain the chambers in this configuration throughout the test, using a position chart. Record these numbers on a separate data sheet together with the concentration and replicate numbers to which they correspond. Identify this sheet with the date, test organism, test number, laboratory, and investigator's name, and safely store it away until after the sea urchins and sand dollars have been examined at the end of the test.

16.10.8.1.5 Note: Loss of the randomization sheet would invalidate the test by making it impossible to analyze the data afterwards. Make a copy of the randomization sheet and store separately. Take care to follow the numbering system exactly while filling chambers with the test solutions.

16.10.8.1.6 Arrange the test chambers randomly in the water bath or controlled temperature room. Once chambers have been labeled randomly, they can be arranged in numerical order for convenience, since this will also ensure random placement of treatments.

16.10.9.2 Sperm Exposure

16.10.9.2.1 Mix the iced sea urchin semen or sand dollar sperm suspension as described in 16.10.5.7 and 16.10.5.8 (do not kill the sperm). Combine the required volumes of sperm and dilution water and mix this sperm stock well by repeated inversion of the graduate cylinder or beaker. Begin test within 5 minutes. Table 5 (for 3000:1 sperm:egg ratio) can be used to aid in calculating appropriate volumes by reducing the sperm volume or increasing the dilution water volume by the factor:

$$f = 3000:1 \text{ / target sperm:egg ratio}$$

16.10.9.2.2 The test tubes containing 5.0 mL of the various test solutions should have been equilibrated in a 12•C waterbath. Into each test tube, inject 0.100 mL of the sperm stock (except see 16.7.4 and 16.11.4) and note the time of first and last injection. It is important that the injection be performed with care that the entire volume goes directly into the test solution and not onto the side of the test tube. Similarly, the pipet tip should not touch the test solution or the side of the test tube, risking transfer of traces of test solution(s) into the sperm stock. Using repeated single 0.100 mL refill and injection, about 12 tubes per minute is a reasonable injection rate. More rapid rates of injection can be attained with repeating (single fill, multiple injection) pipets. Sperm injection rate (tubes/min) should not exceed that possible for egg injection.

16.10.9.2.3 Unless the test tubes are totally randomized, injection of sperm should be performed by replicate, i.e., the first set of replicates should receive sperm, then the second set, then the third set, etc. The sperm stock solution should be mixed frequently to maintain a homogeneous sperm stock.

16.10.9.2.4 Confirm the sperm density. Pipet 9 mL of sperm stock solution into a vial or test tube containing 1 mL of 10% acetic acid. Fill both sides of a hemacytometer with this dilution after mixing well. Let stand for 15 minutes. Count both sides of the hemacytometer using counting pattern no. 1 outlined in Appendix II and take the average count. For a sperm:egg ratio of 500:1 the stock sperm density will be 5,600,000 sperm/mL. (For counting pattern no. 1, this amounts to a total count of 102 sperm for the five large squares.) Calculate the sperm density in the sperm stock. If either: (1) the stock sperm density is greater than 33,600,000 sperm/mL (S:E

>3,000:1), or (2) the sperm density is more than 2x the target density, the test must be restarted with freshly diluted semen.

16.10.9.2.5 Check the temperature of the test solutions several times during the sperm exposure by including a temperature blank test tube containing 5 mL of dilution water with a thermometer.

16.10.9.3 Adding Eggs to the Test

16.10.9.3.1 Exactly 20 minutes after the sperm addition to the test was begun, begin to add the eggs, with every tube (including egg blanks - 11.7.4) receiving 0.5 mL of egg stock. Follow the same pattern of introduction for the eggs as used with the sperm so that each test tube has a sperm incubation period of 20 minutes. Note the time of start and finish of egg addition. This duration should be within one minute of that used for the sperm.

16.10.9.3.2 In order to maintain the same sperm:egg ratio in each test tube, the eggs must be maintained in a uniform distribution in the water column of the egg stock. Slow, gentle agitation of the egg stock in a beaker using a perforated plunger appears to be the best method of achieving a uniform distribution. Frequent inversion and mixing of egg stock in either a graduated cylinder or a multiple injection pipet may be acceptable.

16.10.9.3.3 The eggs should be injected using a pipet with an opening of at least 2 mm in order to avoid damaging the eggs and to provide sufficient flow to obtain a representative sample.

16.10.9.3.4 Two pair of egg blanks should be included in the test design, one at the beginning of the injection sequence (effluent blank) and one at the end of the injection sequence (egg blank). These tubes receive no sperm. The effluent blank contains the highest concentration of effluent and the egg blank contains dilution water. Examination of the effluent blank will indicate if the effluent induces a false fertilization membrane (a possible event, but probably rare) thus masking toxicity. Examination of the egg blank will indicate if accidentally fertilized eggs were used in the test (this is a minor factor unless a significant portion of the eggs were accidentally fertilized; it can indicate poor laboratory techniques). These

blanks are kept capped until the eggs are added in order to avoid contamination by sperm.

16.10.10 LIGHT, PHOTOPERIOD, SALINITY AND TEMPERATURE

16.10.10.1 The echinoderm fertilization test can be conducted in the dark or at ambient laboratory light levels. Due to its short duration, the fertilization test requires no photoperiod.

16.10.10.2 The water temperature in the test chambers should be maintained at 12 ± 1•C. If a water bath is used to maintain the test temperature, the water depth surrounding the test cups should be as deep as possible without floating the chambers. A sensor placed in a temperature blank vial with standard volume of test solution can provide a direct measure of test solution temperature, one which may be more stable than the temperature in the air or water in the medium surrounding the test vials. Do not measure temperatures directly in a test vial, but prepare and handle the temperature blank(s) exactly as the normal control vials. Record the temperature several times between the beginning and the end of the test.

16.10.10.3 The test salinity should be in the range of 34 ± 2‰. The salinity should vary by no more than ±2‰ among the chambers on a given day. If effluent and receiving water tests are conducted concurrently, the salinities of these tests should be similar.

16.10.10.4 Rooms or incubators with high volume ventilation should be used with caution because the volatilization of the test solutions and evaporation of dilution water may cause wide fluctuations in salinity.

16.10.11 DISSOLVED OXYGEN (DO) CONCENTRATION

16.10.11.1 Aeration may affect the toxicity of effluent and should be used only as a last resort to maintain a satisfactory DO. The DO concentration should be measured on new solutions at the start of the test (Day 0). The DO should not fall below 4.0 mg/L (see Section 8, Effluent and Receiving Water Sampling, Sample Handling, and Sample Preparation for Toxicity Tests). If it is necessary to aerate, all treatments and the control should be aerated. The aeration rate should not exceed that necessary

to maintain a minimum acceptable DO and under no circumstances should it exceed 100 bubbles/minute, using a pipet with a 1-2 mm orifice, such as a 1 mL KIMAX® serological pipet No. 37033, or equivalent.

16.10.12 OBSERVATIONS DURING THE TEST

16.10.12.1 Routine Chemical and Physical Observations

16.10.12.1.1 DO is measured at the beginning of the exposure period in one test chamber at each test concentration and in the control.

16.10.12.1.2 Temperature, pH, and salinity are measured at the beginning of the exposure period in one test chamber at each concentration and in the control. Temperature should also be monitored continuously or observed and recorded daily for at least two locations in the environmental control system or the samples. Temperature should be measured in a sufficient number of test chambers at the end of the test to determine temperature variation in the environmental chamber.

16.10.12.1.3 Record all the measurements on the data sheet.

16.10.13 TERMINATION OF THE TEST

16.10.13.1 Ending the Test

16.10.13.1.1 Record the time the test is terminated.

16.10.13.1.2 Because of the short test duration water quality measurements are not necessary at the end.

16.10.13.2 Sample Preservation

16.10.13.2.1 Exactly 20 minutes after the egg addition, the test should be stopped by the addition of a fixative to kill the sperm and eggs (both unfertilized and fertilized [zygotes]) and to preserve the eggs for examination. Again, the time allotted to fixative addition should be about the same as that for sperm and egg addition and the sequence of addition the same as for the introduction of the gametes.

16.10.13.2.2 The choice of formaldehyde or glutaraldehyde is up to the individual laboratory. There are at least two acceptable procedures: (1) the EPA *Arbacia* method of adding 10% formaldehyde in dilution water at the rate of 2 mL to each test tube; or (2) the addition of 1% glutaraldehyde (vol/vol) in clean seawater at the rate of 0.5 mL to each test tube. Glutaraldehyde should be made up fresh each day. Because concentrated glutaraldehyde is commonly only 25% strength, 1% glutaraldehyde is obtained by diluting the concentrate by 25x (e.g., 4 mL + 96 mL seawater).

16.10.13.2.3 It must be noted that formaldehyde has been identified as a carcinogen and that both glutaraldehyde and formaldehyde are irritating to skin and mucous membranes. Neither should be used at higher concentrations than needed to achieve morphological preservation of eggs for counting and only under conditions of maximal ventilation and minimal opportunity for volatilization into room air. Before using either compound in this method, the user should consult the latest material safety data available.

16.10.13.3 Counting

16.10.13.3.1 Immediately after termination of the test, the tubes are capped (or otherwise covered) and the contents mixed by inversion. They can be stored at room temperature until the eggs are examined for fertilization. Counts should be completed within 48 hours and, if counts extend over two days, should be made by replicate, i.e., count all replicate 1 tubes, then replicate 2, etc.

16.10.13.3.2 At least 100 eggs from each test tube are examined and scored for the presence or absence of an elevated fertilization membrane. Newly fertilized eggs will almost always have a completely elevated membrane around the egg (See Figures 5 and 6). Often a double membrane appears in sea urchin eggs, but following storage, even of only several hours, the inner (hyaline) membrane may disappear. Fertilized eggs may touch the outer membrane, or the membrane(s) may partially collapse. Because these phenomena only occur after preservation, eggs with any elevation of the fertilization membrane are counted as fertilized.

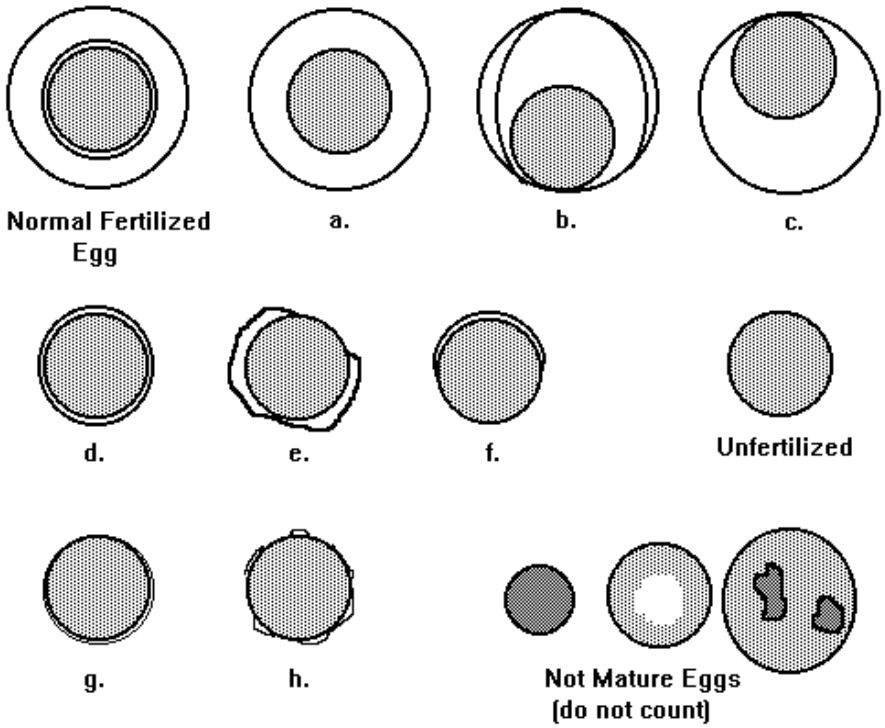

Figure 5. Examples of typical fertilized and unfertilized sea urchin eggs and a number of examples of atypical "fertilized" eggs (a through h). Normal fertilized eggs have an outer fertilization membrane and an inner hyaline membrane. After preservation, the hyaline membrane sometimes disappears (a); in other cases the egg is displaced from the center and contacts the perimeter either inside an enlarged hyaline envelope (b) or with no visible hyaline membrane (c). In some instances there appears to be only a slight elevation of the outer membrane or only the hyaline membrane appears, fully (d), partially (f), or only as a halo (g). In some batches of eggs the membrane(s) appear to be fragile and some collapse (e). In rare cases sperm appear to activate membrane elevation over only segments of the egg leading to a blistered appearance (h). When eggs appearing as those in examples f, g, and h are common in a test, the results should be examined closely to see if their occurrence appears to be dose-related (indicating an effect on fertilization), not dose-related (indicating a problem with egg quality or preservative), or is common in the effluent egg control (indicating an effluent- produced false fertilization). Eggs that are not mature are capable of being fertilized, but should never be counted. These include obviously smaller (often denser) eggs, normal sized eggs with a distinct, clear center, and very large eggs with often irregular color and density.

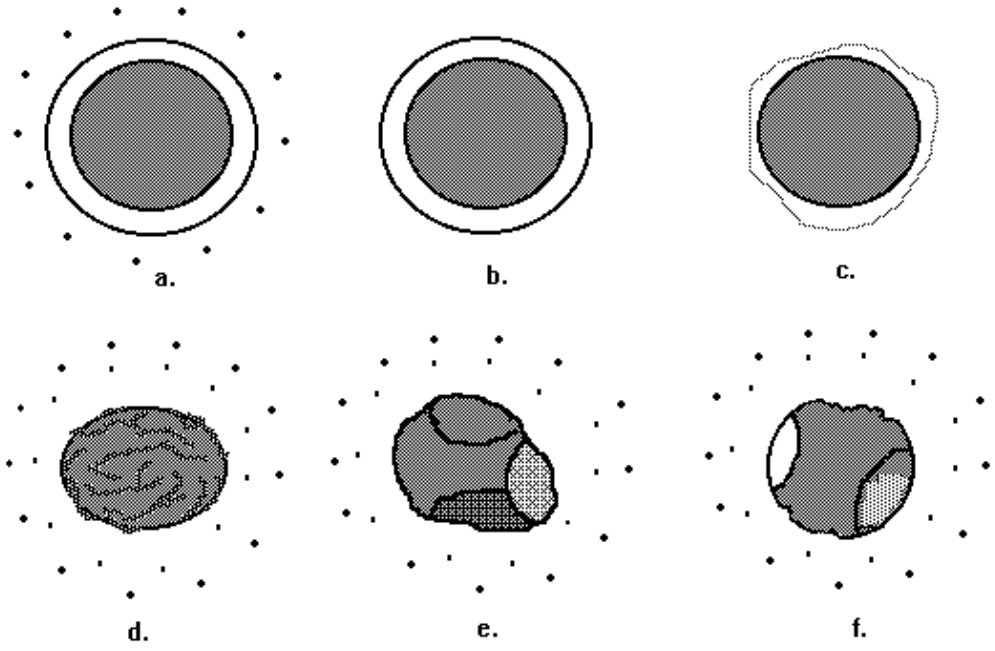

Figure 6. Examples of typical fertilized and unfertilized sand dollar eggs. Nearly all newly released eggs are characterized by a surrounding sphere of small purple chromatophores embedded within the transparent gelatinous coat surrounding the egg. The coat and the chromatophores may be lost or retained in the test and subsequent handling. Typical fertilized eggs are represented by (a) and (b). Some fertilized eggs (c) show only a wispy remnant of the fertilization membrane. Eggs when spawned usually appear as in (d) and (e) or somewhere in between. The more rounded "raisin" appearing egg in (d) is usually superior to the "asteroid" appearing egg in (e) although the latter can provide acceptable test results. However, the more irregularly shaped or vacuolated the eggs appear, the poorer the control fertilization is likely to be. The egg shown in (f), the "pitted olive," never shows a fertilization membrane and should not be counted.

16.10.13.3.3 It is convenient to concentrate the eggs prior to counting. If the eggs are allowed to completely settle (ca 30 minutes after termination and mixing), most of the overlying solution can be removed with a pipet, leaving the eggs concentrated in a much smaller volume. The eggs are then resuspended by filling and emptying a 1 mL pipet about 5 times from the remaining volume and finally transferring 1 mL of the egg suspension into a 1 mL Sedgewick-Rafter counting chamber (other volume counting chambers can be used).

16.10.13.3.4 Failure to completely resuspend the eggs can result in biasing the counts towards higher percent fertilization due to a tendency seen in rare batches of eggs in which unfertile eggs tend to be adhesive. This phenomenon may be further influenced by the choice of preservative, the strength of the preservative, and the period between preservation and counting. However, other sampling procedures may be used once demonstrated not to bias sampling and if no clumping of adhesive eggs is observed in a given test; for example, concentrated eggs may be picked up from the test tube and deposited in a small drop on a microscope slide, or eggs can be scored by examination with the test tubes laying on their sides and viewed at low power or with an inverted microscope.

16.10.13.4 Endpoint

16.10.13.4.1 In a count of at least 100 eggs, record the number of eggs with fertilization membranes and the number of eggs without fertilization membranes.

16.11 SUMMARY OF TEST CONDITIONS AND TEST ACCEPTABILITY CRITERIA

16.11.1 A summary of test conditions and test acceptability criteria is listed in Table 7.

TABLE 7. SUMMARY OF TEST CONDITIONS AND TEST ACCEPTABILITY CRITERIA FOR, *STRONGYLOCENTROTUS PURPURATUS* AND *DENDRASTER EXCENTRICUS*, FERTILIZATION TEST WITH EFFLUENTS AND RECEIVING WATERS

1. Test type:	Static non-renewal
2. Salinity:	34 ± 2‰
3. Temperature:	12 ± 1•C
4. Light quality:	Ambient laboratory light during test preparation

5. Light intensity:	l0-20 uE/m²/s (Ambient laboratory levels)
6. Test chamber size:	16 x 100 or 16 x 125 mm
7. Test solution volume:	5 mL
8. Number of spawners:	Pooled sperm from up to four males and pooled eggs from up to four females are used per test
9. No. egg and sperm cells per chamber:	About 1,120 eggs and not more than 3,360,000 sperm per test tube
10. No. replicate chambers per concentration:	4
11. Dilution water:	Uncontaminated 1-µm-filtered natural seawater or hypersaline brine prepared from natural seawater or artificial sea salts
12. Test concentrations:	Effluents: Minimum of 5 and a control Receiving waters: 100% a control
13. Dilution factor:	Effluents: •0.5 Receiving waters: None or •0.5
14. Test duration:	40 min (20 min plus 20 min)
15. Endpoint:	Fertilization of eggs
16. Test acceptability criteria:	•70% egg fertilization in controls; %MSD of <25%; and appropriate sperm counts
17. Sampling requirements:	One sample collected at test initiation, and preferably used within 24 h of the time it is removed from the sampling device (see Section 8, Effluent and Receiving Water Sampling, and Sample Preparation for Toxicity Tests)
18. Sample volume required:	1 L

16.12 ACCEPTABILITY OF TEST RESULTS

16.12.1 Test results are acceptable only if all the following requirements are met:

(1) Egg fertilization at the NOEC must be greater than 80% of that in the controls.

(2) The minimum significant difference (%MSD) is <25% relative to the control.

(3) The sperm count for the final sperm stock must not exceed 33,600,000/mL.

(4) If the sperm count for the final sperm stock is between 5,600,000 and 33,600,000/mL it must not exceed 2x of the target density from the trial, or if no target density was specified for the test (see 11.5.1), the high sperm density controls (0.2 mL sperm stock) must have at least 5% higher fertilization than the low sperm density controls (0.05 mL sperm stock).

(5) Dilution water egg blanks and effluent egg blanks should contain essentially no eggs with fertilization membranes.

16.13 DATA ANALYSIS

16.13.1 GENERAL

16.13.1.1 Tabulate and summarize the data. Calculate the proportion of fertilized eggs for each replicate. A sample set of test data is listed in Table 8.

16.13.1.2 The statistical tests described here must be used with a knowledge of the assumptions upon which the tests are contingent. The assistance of a statistician is recommended for analysts who are not proficient in statistics.

16.13.1.3 The endpoints of toxicity tests using the sea urchin and the sand dollar are based on the reduction in proportion of eggs fertilized. The IC25 is calculated using the Linear Interpolation Method (see Section 9, Chronic Toxicity Test Endpoints and Data Analysis). LOEC and NOEC values for fecundity are obtained using a hypothesis testing approach such as Dunnett's Procedure (Dunnett, 1955) or Steel's Many-one Rank Test (Steel, 1959; Miller, 1981) (see Section 9). Separate analyses

are performed for the estimation of the LOEC and NOEC endpoints

and for the estimation of the IC25. See the Appendices for examples of the manual computations, and examples of data input and program output.

TABLE 8. DATA FROM SEA URCHIN, *STRONGYLOCENTROTUS PURPURATUS*, FERTILIZATION TEST

Effluent Concentration (%)	Replicate	No. of Eggs Counted	No. of Eggs Fertilized	Proportion Fertilized
Control	A	100	97	0.97
	B	100	90	0.90
	C	100	100	1.00
0.05	A	100	100	1.00
	B	100	100	1.00
	C	100	98	0.98
0.10	A	100	100	1.00
	B	100	97	0.97
	C	100	99	0.99
0.15	A	100	98	0.98
	B	100	96	0.96
	C	100	97	0.97
0.20	A	100	94	0.94
	B	100	88	0.88
	C	100	97	0.97
0.40	A	100	43	0.43
	B	100	63	0.63
	C	100	46	0.46
0.60	A	100	2	0.02
	B	100	1	0.01
	C	100	9	0.09
0.80	A	100	0	0.00
	B	100	0	0.00
	C	100	0	0.00

16.13.2 EXAMPLE OF ANALYSIS OF SEA URCHIN, *STRONGYLOCENTROTUS PURPURATUS*, AND SAND DOLLAR, *DENDRASTER EXCENTRICUS*, FERTILIZATION DATA

16.13.2.1 Formal statistical analysis of the fertilization data is outlined in Figure 7.

The response used in the analysis is the proportion of fertilized eggs in each test or control chamber. Separate analyses are performed for the estimation of the NOEC and LOEC endpoints and for the estimation of the IC25 endpoint. Concentrations at which there are no eggs fertilized in any of the test chambers are excluded from statistical analysis of the NOEC and LOEC, but included in the estimation of the IC25.

16.13.2.2 For the case of equal numbers of replicates across all concentrations and the control, the evaluation of the NOEC and LOEC endpoints is made via a parametric test, Dunnett's Procedure, or a nonparametric test, Steel's Many-one Rank Test, on the arc sine square root transformed data. Underlying assumptions of Dunnett's Procedure, normality and homogeneity of variance, are formally tested. The test for normality is the Shapiro-Wilk's Test, and Bartlett's Test is used to test for homogeneity of variance. If either of these tests fails, the nonparametric test, Steel's Many-one Rank Test, is used to determine the NOEC and LOEC endpoints. If the assumptions of Dunnett's Procedure are met, the endpoints are estimated by the parametric procedure.

16.13.2.3 If unequal numbers of replicates occur among the concentration levels tested, there are parametric and nonparametric alternative analyses. The parametric analysis is a *t* test with the Bonferroni adjustment (see Appendix D). The Wilcoxon Rank Sum Test with the Bonferroni adjustment is the nonparametric alternative.

16.13.2.4 Example of Analysis of Fecundity Data

16.13.2.4.1 This example uses toxicity data from a sea urchin, *Strongylocentrotus purpuratus*, fertilization test performed with effluent. The response of interest is the proportion of fertilized eggs, thus each replicate must first be transformed by the arc sine square root transformation procedure described in Appendix B. The raw and transformed data, means and variances of the transformed observations at each effluent concentration and control are listed in Table 9. The data are plotted in Figure 8. Because there is zero fertilization in all three replicates for the 0.80% effluent concentration, it was not included in the statistical analysis and is considered a qualitative fecundity effect.

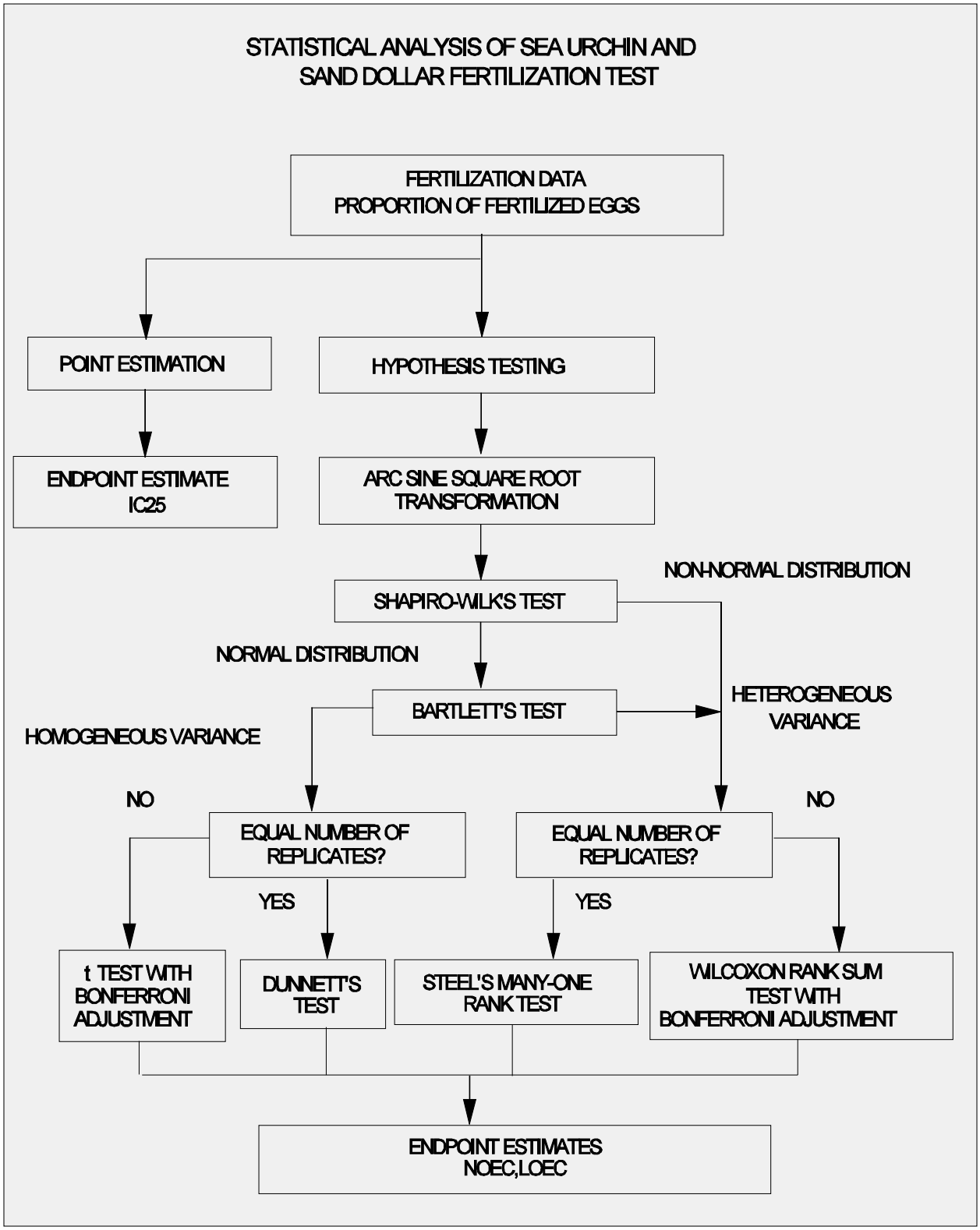

Figure 7. Flowchart for statistical analysis of sea urchin, *Strongylocentrotus purpuratus*, and sand dollar, *Dendraster excentricus*, test.

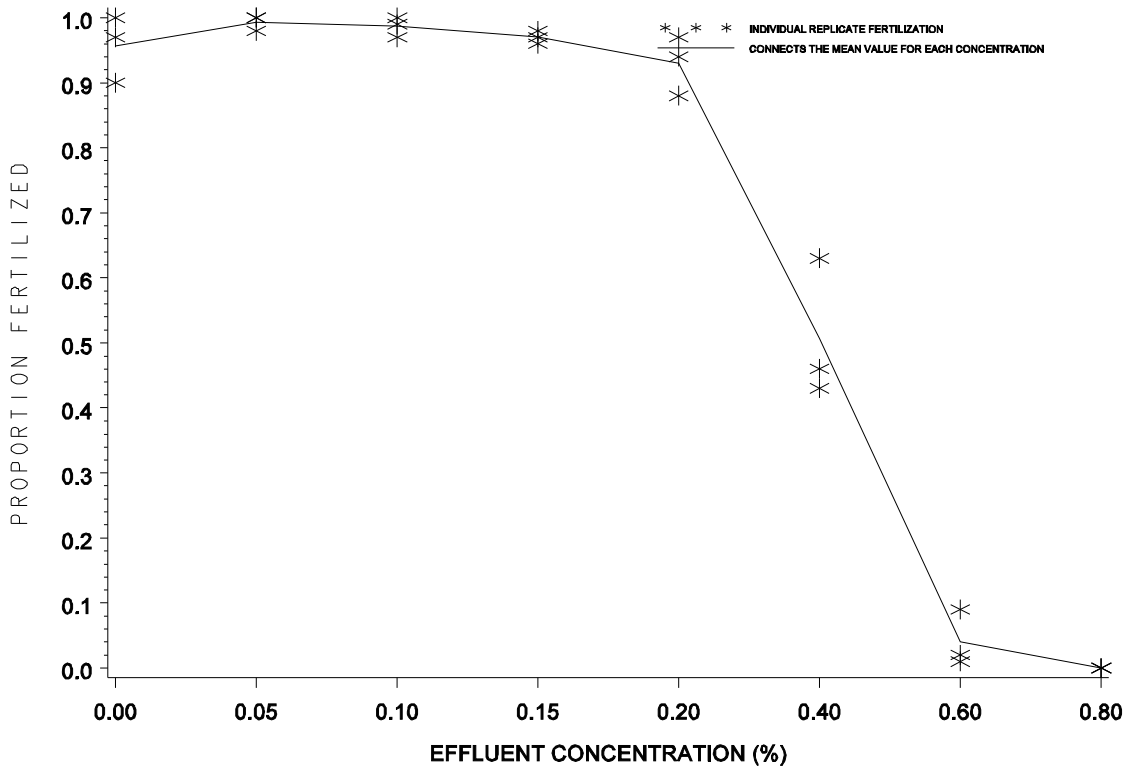

Figure 8. Plot of proportion of fertilized sea urchin, *Strongylocentrotus purpuratus*, eggs

16.13.2.5 Test for Normality

16.13.2.5.1 The first step of the test for normality is to center the observations by subtracting the mean of all observations within a concentration from each observation in that concentration. The centered observations are summarized in Table 10.

TABLE 9. SEA URCHIN, *STRONGYLOCENTROTUS PURPURATUS*, FERTILIZATION DATA

		Effluent Concentration (%)						
	Rep.	Control	0.05	0.10	0.15	0.20	0.40	0.60
RAW	A	0.97	1.00	1.00	0.98	0.94	0.43	0.02
	B	0.90	1.00	0.97	0.96	0.88	0.63	0.01
	C	1.00	0.98	0.99	0.97	0.97	0.46	0.09
ARC SINE SQUARE ROOT TRANSFORMED	A	1.397	1.521	1.521	1.429	1.323	0.715	0.142
	B	1.249	1.521	1.397	1.369	1.217	0.917	0.100
	C	1.521	1.429	1.471	1.397	1.397	0.745	0.305
Mean ($\bar{Y}_i$)		1.389	1.490	1.463	1.398	1.312	0.792	0.182
S_i^2		0.01854	0.00282	0.00389	0.00090	0.00819	0.01188	0.01173
i		1	2	3	4	5	6	7

TABLE 10. CENTERED OBSERVATIONS FOR SHAPIRO-WILK'S EXAMPLE

	Effluent Concentration (%)						
Replicate	Control	0.05	0.10	0.15	0.20	0.40	0.60
A	0.008	0.031	0.058	0.031	0.011	-0.077	-0.040
B	-0.140	0.031	-0.066	-0.029	-0.095	0.125	-0.082
C	0.132	-0.061	0.008	-0.001	0.085	-0.047	0.123

16.13.2.5.2 Calculate the denominator, D, of the statistic:

$$D = \sum_{i=1}^{n} (X_i - \bar{X})^2$$

Where: X_i = the ith centered observation

$\bar{X}$ = the overall mean of the centered observations

n = the total number of centered observations

16.13.2.5.3 For this set of data, n = 21

$$\bar{X} = \frac{1}{21}(0.005) = 0.000$$

D = 0.1159

16.13.2.5.4 Order the centered observations from smallest to largest

$$X^{(1)} \le X^{(2)} \le \ldots \le X^{(n)}$$

where $X^{(i)}$ denotes the ith ordered observation. The ordered observations for this example are listed in Table 11.

16.13.2.5.5 From Table 4, Appendix B, for the number of observations, n, obtain the coefficients a_1, a_2, ... a_k where k is n/2 if n is even and (n-1)/2 if n is odd. For the data in this example, n = 21 and k = 10. The a_i values are listed in Table 12.

16.13.2.5.6 Compute the test statistic, W, as follows:

$$W = \frac{1}{D}\left[\sum_{i=1}^{k} a_i (X^{(n-i+1)} - X^{(i)})\right]^2$$

The differences, $X^{(n-i+1)} - X^{(i)}$, are listed in Table 12. For the data in this example:

$$W = \frac{1}{0.1159}(0.3345)^2 = 0.9654$$

16.13.2.5.7 The decision rule for this test is to compare W as calculated in 2.6 to a critical value found in Table 6, Appendix B. If the computed W is less than the critical value, conclude that the data are not normally distributed. For the data in this

TABLE 11. ORDERED CENTERED OBSERVATIONS FOR SHAPIRO-WILK'S EXAMPLE

i	$X^{(i)}$	i	$X^{(i)}$
1	-0.140	12	0.008
2	-0.095	13	0.011
3	-0.082	14	0.031
4	-0.077	15	0.031
5	-0.066	16	0.031
6	-0.061	17	0.058
7	-0.047	18	0.085
8	-0.040	19	0.123
9	-0.029	20	0.125
10	-0.001	21	0.132
11	0.008		

TABLE 12. COEFFICIENTS AND DIFFERENCES FOR SHAPIRO-WILK'S EXAMPLE

i	a_i	$X^{(n-i+1)} - X^{(i)}$	
1	0.4643	0.272	$X^{(21)} - X^{(1)}$
2	0.3185	0.220	$X^{(20)} - X^{(2)}$
3	0.2578	0.205	$X^{(19)} - X^{(3)}$
4	0.2119	0.162	$X^{(18)} - X^{(4)}$
5	0.1736	0.124	$X^{(17)} - X^{(5)}$
6	0.1399	0.092	$X^{(16)} - X^{(6)}$
7	0.1092	0.078	$X^{(15)} - X^{(7)}$
8	0.0804	0.071	$X^{(14)} - X^{(8)}$
9	0.0530	0.040	$X^{(13)} - X^{(9)}$
10	0.0263	0.009	$X^{(12)} - X^{(10)}$

example, the critical value at a significance level of 0.01 and n = 21 observations is 0.873. Since W = 0.9654 is greater than the critical value, conclude that the data are normally distributed.

16.13.2.6 Test for Homogeneity of Variance

16.13.2.6.1 The test used to examine whether the variation in the proportion of fertilized eggs is the same across all effluent

concentrations including the control, is Bartlett's Test (Snedecor and Cochran, 1980). The test statistic is as follows:

$$B = \frac{[(\sum_{i=1}^{p} V_i) \ln \bar{S}^2 - \sum_{i=1}^{p} V_i \ln S_i^2]}{C}$$

Where: V_i = degrees of freedom for each concentration and control,

$V_i = (n_i - 1)$

p = number of concentration levels including the control

n_i = the number of replicates for concentration i.

ln = $\log_e$

i = 1,2, ..., p where p is the number of concentrations including the control

$$\bar{S}^2 = \frac{(\sum_{i=1}^{p} V_i S_i^2)}{\sum_{i=1}^{p} V_i} \qquad C = 1 + [3(p-1)]^{-1}[\sum_{i=1}^{p} 1/V_i - (\sum_{i=1}^{p} V_i)^{-1}]$$

16.13.2.6.2 For the data in this example (see Table 8), all effluent concentrations including the control have the same number of replicates (n_i = 3 for all i). Thus, V_i = 2 for all i.

16.13.2.6.3 Bartlett's statistic is, therefore:

$$B = [(14)\ln(0.008279) - 2\sum_{i=1}^{p} \ln(S_i^2)] / 1.1905$$

$$= [14(-4.7940) - 2(-36.1047)]/1.1905$$

$$= 5.0934/1.1905$$

$$= 4.2784$$

16.13.2.6.4 B is approximately distributed as chi-square with p-1 degrees of freedom, when the variances are in fact the same. Therefore, the appropriate critical value for this test, at a significance level of 0.01 with 6 degrees of freedom, is 16.81. Since B = 4.2784 is less than the critical value of 16.81, conclude that the variances are not different.

16.13.2.7 Dunnett's Procedure

16.13.2.7.1 To obtain an estimate of the pooled variance for the Dunnett's Procedure, construct an ANOVA table as described in Table 13.

TABLE 13. ANOVA TABLE

Source	df	Sum of Squares (SS)	Mean Square(MS) (SS/df)
Between	p - 1	SSB	S_B^2 = SSB/(p-1)
Within	N - p	SSW	S_W^2 = SSW/(N-p)
Total	N - 1	SST	

Where: p = number of concentration levels including the control

N = total number of observations $n_1 + n_2 \ldots + n_p$

n_i = number of observations in concentration i

$SSB = \sum_{i=1}^{P} T_i^2/n_i - G^2/N$ Between Sum of Squares

$SST = \sum_{i=1}^{P} \sum_{j=1}^{n_i} Y_{ij}^2 - G^2/N$ Total Sum of Squares

$SSW = SST - SSB$ Within Sum of Squares

G = the grand total of all sample observations, $G = \sum_{i=1}^{p} T_i$

T_i = the total of the replicate measurements for concentration i

Y_{ij} = the jth observation for concentration i (represents the proportion of fertilized eggs for concentration i in test chamber j)

16.13.2.7.2 For the data in this example:

$$n_1 = n_2 = n_3 = n_4 = n_5 = n_6 = n_7 = 3$$

$$N = 21$$

$$T_1 = Y_{11} + Y_{12} + Y_{13} = 4.167$$
$$T_2 = Y_{21} + Y_{22} + Y_{23} = 4.471$$
$$T_3 = Y_{31} + Y_{32} + Y_{33} = 4.389$$
$$T_4 = Y_{41} + Y_{42} + Y_{43} = 4.194$$
$$T_5 = Y_{51} + Y_{52} + Y_{53} = 3.937$$
$$T_6 = Y_{61} + Y_{62} + Y_{63} = 2.377$$
$$T_7 = Y_{71} + Y_{72} + Y_{73} = 0.547$$

$$G = T_1 + T_2 + T_3 + T_4 + T_5 + T_6 + T_7 = 24.082$$

$$SSB = \sum_{i=1}^{p} T_i^2/n_i - G^2/N$$
$$= (95.656)/3 - (24.082)^2/21 = 4.269$$

$$SST = \sum_{i=1}^{p} \sum_{j=1}^{n_i} Y_{ij}^2 - G^2/N$$
$$= 32.001 - (24.082)^2/21 = 4.385$$

$$SSW = SST - SSB = 4.385 - 4.269 = 0.116$$

$$S_B^2 = SSB/(p-1) = 4.269/(7-1) = 0.7115$$

$$S_W^2 = SSW/(N-p) = 0.116/(21-7) = 0.0083$$

16.13.2.7.3 Summarize these calculations in the ANOVA table (Table 14).

16.13.2.7.4 To perform the individual comparisons, calculate the *t* statistic for each concentration, and control combination as follows:

$$t_i = \frac{(\bar{Y}_1 - \bar{Y}_i)}{S_w \sqrt{(1/n_1) + (1/n_i)}}$$

TABLE 14. ANOVA TABLE FOR DUNNETT'S PROCEDURE EXAMPLE

Source	df	Sum of Squares (SS)	Mean Square(MS) (SS/df)
Between	6	4.269	0.7115
Within	14	0.116	0.0083
Total	20	4.385	

Where: $\bar{Y}_i$ = mean proportion fertilized eggs for concentration i

$\bar{Y}_1$ = mean proportion fertilized eggs for the control

S_W = square root of the within mean square

n_1 = number of replicates for the control

n_i = number of replicates for concentration i.

Since we are looking for a decreased response from the control in the proportion of fertilized eggs, the concentration mean is subtracted from the control mean.

16.13.2.7.5 Table 15 includes the calculated *t* values for each concentration and control combination. In this example, comparing the 0.05% concentration with the control the calculation is as follows:

$$t_2 \cdot \frac{(1.389 \cdot 1.490)}{0.0911\sqrt{(1/3)\cdot(1/3)}} \cdot \cdot 1.358$$

16.13.2.7.6 Since the purpose of this test is to detect a significant decrease in the proportion of fertilized eggs, a one-sided test is appropriate. The critical value for this one-sided test is found in Table 5, Appendix C. For an overall alpha level of 0.05, 14 degrees of freedom for error and six concentrations (excluding the control) the critical value is 2.53. The mean proportion of fertilized eggs for concentration i is considered significantly less than the mean proportion of

fertilized eggs for the control if t_i is greater than the critical value. Therefore, the 0.40% and 0.60% concentrations have a significantly lower mean proportion of fertilized eggs than the control. Hence the NOEC is 0.20% effluent and the LOEC is 0.40% effluent.

TABLE 15. CALCULATED *t* VALUES

Effluent Concentration (%)	i	t_i
0.05	2	-1.358
0.10	3	-0.995
0.15	4	-0.121
0.20	5	1.035
0.40	6	8.026
0.60	7	16.227

16.13.2.7.7 To quantify the sensitivity of the test, the minimum significant difference (MSD) that can be statistically detected may be calculated:

$$MSD \bullet d\, S_w \sqrt{(1/n_1) \bullet (1/n)}$$

Where: d = the critical value for Dunnett's Procedure

S_W = the square root of the within mean square

n = the common number of replicates at each concentration (this assumes equal replication at each concentration)

n_1 = the number of replicates in the control.

16.13.2.7.8 In this example,

$$MSD \bullet 2.53\,(0.0911)\sqrt{(1/3) \bullet (1/3)}$$

$$= 2.53\ (0.0911)(0.8165)$$

$$= 0.188$$

16.13.2.7.9 The MSD (0.188) is in transformed units. To determine the MSD in terms of proportion of fertilized eggs, carry out the following conversion.

1. Subtract the MSD from the transformed control mean.

$$1.389 - 0.188 = 1.201$$

2. Obtain the untransformed values for the control mean and the difference calculated in step 1 of 13.2.7.9.

$$[\text{ Sine } (1.389)]^2 = 0.967$$

$$[\text{ Sine } (1.201)]^2 = 0.869$$

3. The untransformed MSD (MSD_u) is determined by subtracting the untransformed values from step 2 in 14.2.7.9.

$$MSD_u = 0.967 - 0.869 = 0.098$$

16.13.2.7.10 Therefore, for this set of data, the minimum difference in mean proportion of fertilized eggs between the control and any effluent concentration that can be detected as statistically significant is 0.098.

16.13.2.7.11 This represents a 10.2% decrease in the proportion of fertilized eggs from the control.

16.13.2.8 Calculation of the ICp

16.13.2.8.1 The fertilization data in Table 7 are utilized in this example. As can be seen from Figure 8, the observed means are not monotonically non-increasing with respect to concentration. Therefore, the means must be smoothed prior to calculating the IC.

16.13.3.8.2 Starting with the observed control mean, $\overline{Y}_1 = 0.957$, and the observed mean for the lowest effluent concentration, $\overline{Y}_2 = 0.993$, we see that $\overline{Y}_1$ is less than $\overline{Y}_2$.

16.13.3.8.3 Calculate the smoothed means:

$$M_1 = M_2 = (\overline{Y}_1 + \overline{Y}_2)/2 = 0.975$$

16.13.3.8.4 Since $\overline{Y}_3 = 0.987$ is larger than M_2, average $\overline{Y}_3$ with the previous concentrations:

$$M_1 = M_2 = M_3 = (M_1 + M_2 + \overline{Y}_3)/3 = 0.979.$$

16.13.3.8.5 Since $M_3 > \overline{Y}_4 = 0.970 > \overline{Y}_5 = 0.930 > \overline{Y}_6 = 0.507 > \overline{Y}_7 = 0.040 > \overline{Y}_8 = 0.0$, set $M_4 = 0.970$, $M_5 = 0.930$, $M_6 = 0.507$, $M_7 = 0.040$, and $M_8 = 0.0$. Table 16 contains the smoothed means and Figure 10 gives a plot of the smoothed means and the interpolated response curve.

16.13.2.8.6 An IC25 can be estimated using the Linear Interpolation Method. A 25% reduction in mean proportion of fertilized eggs, compared to the controls, would result in a mean

proportion of 0.734, where $M_1(1-p/100) = 0.979(1-25/100)$. Examining the means and their associated concentrations (Table 16), the response, 0.734, is bracketed by C_5 = 0.20% effluent and C_6 = 0.40% effluent.

16.13.2.8.7 Using the equation from Section 4.2 in Appendix L, the estimate of the IC25 is calculated as follows:

$$ICp \bullet C_j \bullet [M_1(1 \bullet p/100) \bullet M_j] \frac{(C_{(j \bullet 1)} \bullet C_j)}{(M_{(j \bullet 1)} \bullet M_j)}$$

$$IC25 = 0.20 + [0.979(1 - 25/100) - 0.930] \frac{(0.40 - 0.20)}{(0.507 - 0.930)}$$

$$= 0.29\%.$$

TABLE 16. SEA URCHIN, *STRONYLOCENTROTUS PURPURATUS*, MEAN PROPORTION OF FERTILIZED EGGS

Effluent Conc. (%)	i	Response Means, $\bar{Y}_i$ (proportion)	Smoothed Means, M_i (proportion)
Control	1	0.957	0.979
0.05	2	0.993	0.979
0.10	3	0.987	0.979
0.15	4	0.970	0.970
0.20	5	0.930	0.930
0.40	6	0.507	0.507
0.60	7	0.040	0.040
0.80	8	0.000	0.000

16.13.2.8.8 When the ICPIN program was used to analyze this set of data, requesting 80 resamples, the estimate of the IC25 was 0.2925%. The empirical 95.0% confidence interval for the true mean was 0.2739% to 0.3241%. The computer program output for the IC25 for this data set is shown in Figure 10.

16.14 **PRECISION AND ACCURACY**

16.14.1 PRECISION

16.14.1.1 Single-Laboratory Precision

16.14.1.1.1 Single-laboratory precision data for *Strongylocentrotus purpurtatus* with the reference toxicant copper, tested in natural seawater, are provided in Table 17. The coefficient of variation based on the EC25 is 29%, and on EC50 is 24%, showing acceptable precision. Single-laboratory precision data for *Dendraster excentricus* with the reference toxicant copper, tested in natural seawater, are provided in Tables 18 and 19. The coefficient of variation based on the EC25, is 18% to 29% and EC50, is 21% to 33%, showing acceptable precision.

16.14.1.2 Multi-laboratory Precision

16.14.1.2.1 Multi-laboratory precision data for *Strongylocentrotus purpuratus*, with the reference toxicant copper, tested in natural seawater, are provided in Table 20. The coefficient of variation for the EC25 was 52%, based on data from five laboratories.

16.14.2 ACCURACY

16.14.2.1 The accuracy of toxicity tests cannot be determined.

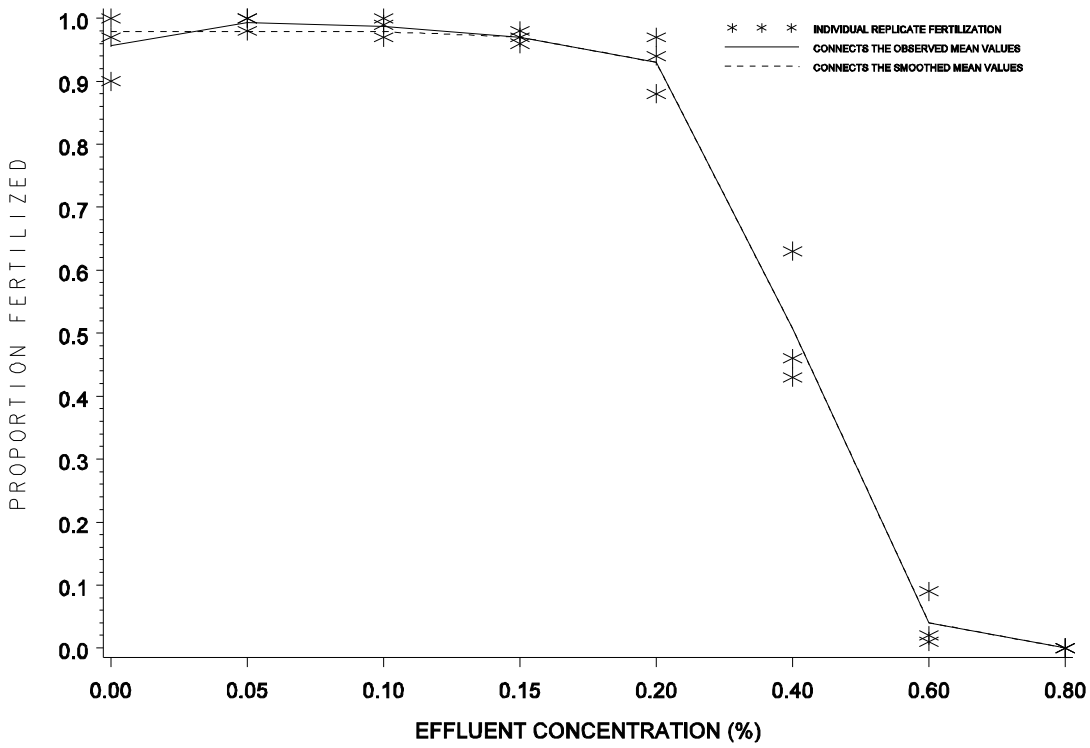

Figure 9. Plot of raw data, observed means, and smoothed means for the sea urchin, *Strongylocentrotus purpuratus*, eggs.

Conc. ID	1	2	3	4	5	6	7	8
Conc. Tested	0	.05	.10	.15	.20	.40	.60	.80
Response 1	.97	1.00	1.00	.98	.94	.43	.02	0
Response 2	.90	1.00	.97	.96	.88	.63	.01	0
Response 3	1.00	.98	.99	.97	.97	.46	.09	0

*** Inhibition Concentration Percentage Estimate ***
Toxicant/Effluent: Effluent
Test Start Date: Test Ending Date:
Test Species: Sea Urchin, Strongylocentrotus purpuratus
Test Duration: 40 minutes
DATA FILE: urchin.icp
OUTPUT FILE: urchin.i25

Conc. ID	Number Replicates	Concentration %	Response Means	Std. Dev.	Pooled Response Means
1	3	0.000	0.957	0.051	0.979
2	3	0.050	0.993	0.012	0.979
3	3	0.100	0.987	0.015	0.979
4	3	0.150	0.970	0.010	0.970
5	3	0.200	0.930	0.046	0.930
6	3	0.400	0.507	0.108	0.507
7	3	0.600	0.040	0.044	0.040
8	3	0.800	0.000	0.000	0.000

The Linear Interpolation Estimate: 0.2925 Entered P Value: 25

Number of Resamplings: 80
The Bootstrap Estimates Mean: 0.2917 Standard Deviation: 0.0141
Original Confidence Limits: Lower: 0.2739 Upper: 0.3241
Expanded Confidence Limits: Lower: 0.2533 Upper: 0.3589
Resampling time in Seconds: 0.22 Random_Seed: -25579058

Figure 10. ICPIN program output for the IC25.

TABLE 17. SINGLE LABORATORY PRECISION OF THE SEA URCHIN, *STRONGYLOCENTROTUS PURPURATUS* FERTILIZATION TEST PERFORMED IN SEAWATER USING GAMETES FROM ADULTS MAINTAINED IN SEAWATER AFTER BEING COLLECTED FROM NATURAL POPULATIONS WITH COPPER (CU µG/L) SULFATE AS THE REFERENCE TOXICANT

Test Number	NOEC (µg/L)	EC25 (µg/L)	EC50 (µg/L)
1	6.9	9.7	14.3
2	23.0	26.2	30.9
3	11.2	19.6	25.8
4	16.0	16.4	31.1
5	15.3	17.8	24.6
6	10.8	18.6	28.3
Mean CV(%)		18.1 29.0	25.8 24.0

Tests performed by Sally Noack, AScI, at EPA's Pacific Ecosystems Branch of ERL-Narragansett, Newport, OR.
Copper concentrations were measured and within 10% of nominal; nominal concentrations were 5, 8, 12, 17, 25, 35, and 50 µg/L.
These tests used only three replicates per concentration.

TABLE 18. SINGLE LABORATORY PRECISION OF THE SAND DOLLAR, *DENDRASTER EXCENTRICUS* FERTILIZATION TEST PERFORMED IN SEAWATER USING GAMETES FROM ADULTS MAINTAINED IN SEAWATER AFTER BEING COLLECTED FROM NATURAL POPULATIONS WITH COPPER (CU µG/L) SULFATE AS THE REFERENCE TOXICANT

Test Date	Test Number	NOEC (µg/L)	EC25 (µg/L)	EC50 (µg/L)
7/11/94	1* 2** 3***	5.0 5.0 -	9.4 14.6 16.0	12.6 17.5 18.6
7/14/94	1* 2** 3***	12.0 <5.0 17.0	16.7 19.6 23.0	20.9 25.8 30.5
7/17/94	1* 2** 3***	8.0 5.0 12.0	15.3 13.5 13.4	17.7 16.4 17.0
7/19/94	1* 2** 3***	12.0 17.0 12.0	12.8 18.6 13.3	15.6 22.1 16.0
Mean	1 2 3 overall		13.5 16.6 16.4	16.7 20.5 20.5
SD	1 2 3 overall		3.2 3.0 4.6	3.5 4.3 6.7
CV(%)	1 2 3 overall		24% 18% 28%	21% 21% 33%

Tests performed at National Council of the Paper Industry for Air and Stream Improvement, Inc. Anacortes, WA.
Copper concentrations were nominal; nominal concentrations were 5, 8, 12, 17, 25, 35, and 50 µg/L.

* Tests conducted with nominal S:E ratio of 147:1
** Tests conducted with nominal S:E ratio of 166:1
*** Tests conducted with nominal S:E ratio of 224:1

TABLE 19. SINGLE LABORATORY PRECISION OF THE SAND DOLLAR, *DENDRASTER EXCENTRICUS* FERTILIZATION TEST PERFORMED IN SEAWATER USING GAMETES FROM ADULTS MAINTAINED IN SEAWATER AFTER BEING COLLECTED FROM NATURAL POPULATIONS WITH COPPER (CU µG/L) SULFATE AS THE REFERENCE TOXICANT.

Test Number	NOEC (µg/L)	EC25 (µg/L)	EC50 (µg/L)
1	17.0	25.8	31.0
2	25.0	34.3	41.8
3	12.0	31.1	43.7
4	8.0	14.2	19.8
5	25.0	27.2	30.5
Mean CV(%)		26.5 29.0	33.4 29.0

Tests performed by Gary Chapman and Debra Denton at EPA's Pacific Ecosystems Branch of ERL-Narragansett, Newport, OR.

Copper concentrations were nominal; nominal concentrations were 5, 8, 12, 17, 25, 35, and 50 µg/L.

TABLE 20. MULTIPLE LABORATORY PRECISION OF THE SEA URCHIN, *STONGYLOCENTROTUS PURPURATUS*, FERTILIZATION TEST PERFORMED WITH COPPER (CU µG/L) SULFATE AS A REFERENCE TOXICANT

Lab	# of Tests	Statistic	EC25 (µg/L)
A	3	Mean SD CV(%)	7.8 3.0 38%
B	2	Mean SD CV(%)	4.0 - -
C	6	Mean SD CV(%)	18.0 5.4 30%
D	2	Mean NA CV(%)	14.9 - -
E	6	Mean SD CV(%)	19.3 10.5 54%

# of Lab Means	Statistic	EC25
5	Mean SD CV(%)	12.8 6.6 52%

Tests performed as part of a methods evaluation effort organized by the US EPA laboratory in Newport, Oregon; tests were conducted in 1991 by volunteer laboratories in California and Washington.

APPENDIX I. PURPLE URCHIN AND SAND DOLLAR TEST: STEP-BY-STEP SUMMARY

PREPARATION OF TEST SOLUTIONS

A. Determine test concentrations and appropriate dilution water based on NPDES permit conditions and guidance from the appropriate regulatory agency.

B. Prepare effluent test solutions by diluting well mixed unfiltered effluent using volumetric flasks and pipettes. Use hypersaline brine where necessary to maintain all test solutions at 34 ± 2‰. Include brine controls in tests that use brine.

C. Prepare a copper reference toxicant stock solution (2,000 mg/L) by adding 5.366 g of copper chloride ($CuCl_2 \circ 2H_2O$) to 1 liter of reagent water. For each reference toxicant test prepare a copper sub-stock of 3 mg/L by diluting 1.5 mL of stock to one liter with reagent water.

D. Prepare a control (0 •g/L) plus at least five consecutive copper reference toxicant solutions (e.g., from the series 3.0, 4.4, 6.5, 9.5, 13.9, 20.4, and 30.0 •g/L, by adding 0.10, 0.15, 0.22, 0.32, 0.46, 0.68, and 1.00 mL of sub-stock solution, respectively, to 100-L volumetric flasks and filling to 100-mL with dilution water).

E. Randomize numbers for test chambers and record the chamber numbers with their respective test concentrations on a randomization data sheet. Store the data sheet safely until after the test samples have been analyzed.

F. Sample effluent and reference toxicant solutions for physical/chemical analysis. Measure salinity, pH and dissolved oxygen from each test concentration.

G. Place test chambers in a water bath or environmental chamber set to 12•C and allow temperature to equilibrate.

H. Measure the temperature in several temperature blanks during the course of the test.

PREPARATION AND ANALYSIS OF TEST ORGANISMS

A. Obtain test organisms and hold or condition as necessary for spawning.

B. On day of test, spawn organisms, examine gametes, pool good eggs, pool good sperm.

C. Determine egg and sperm densities and adjust as necessary.

D. Run trial sperm:egg fertilization test (optional).

E. Adjust sperm density for definitive test.

F. Inject sperm into test solutions.

G. 20 minutes later inject eggs into test solutions.

H. 20 minutes after egg addition, stop the test by the addition of preservative.

I. Confirm sperm density in definitive test by hemacytometer counts.

J. Count at least 100 eggs in each test tube.

K. Analyze the data.

L. Include standard reference toxicant point estimate values in the standard quality control charts.

APPENDIX II. USING THE NEUBAUER HEMACYTOMETER TO ENUMERATE SEA URCHIN SPERM

The Neubauer hemacytometer is a specialized microscope slide with two counting grids and a coverslip.

TOP VIEW:

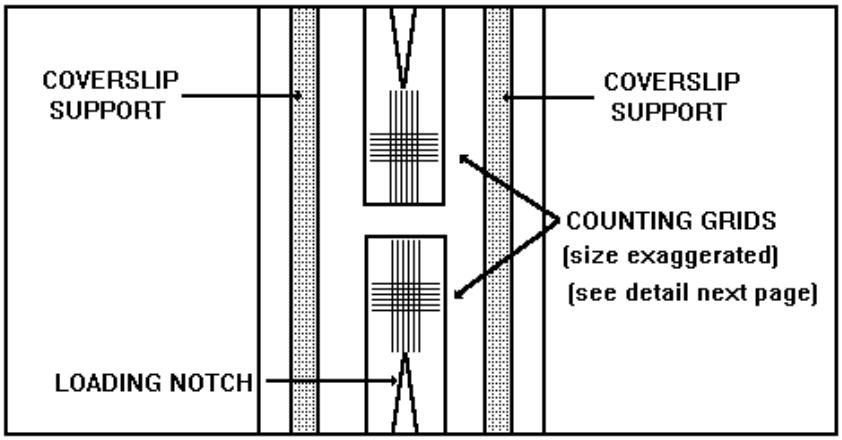

Together, the total area of each grid (1 mm^2) and the vertical distance between the grid and the coverslip (0.1 mm), provide space for a specific microvolume of aqueous sample (0.1 mm^3).

SIDE VIEW:

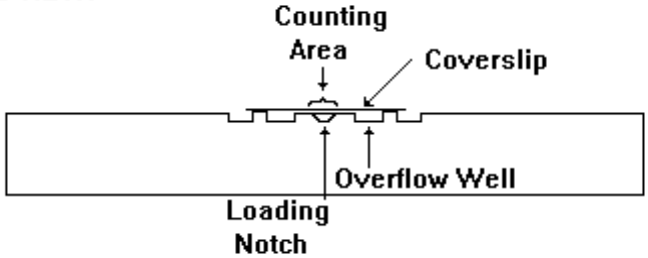

END VIEW THROUGH MID-CROSS SECTION:

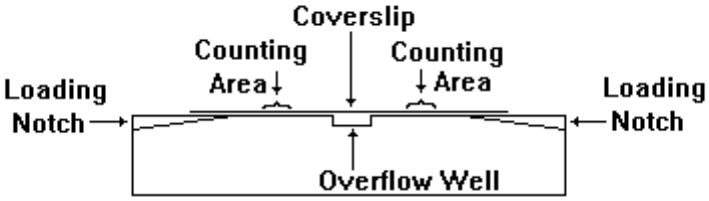

This volume of liquid and the cells suspended therein (e.g., blood cells or sperm cells) represent 1/10,000th of the liquid volume and cell numbers of a full milliliter (cm^3) of the sampled material.

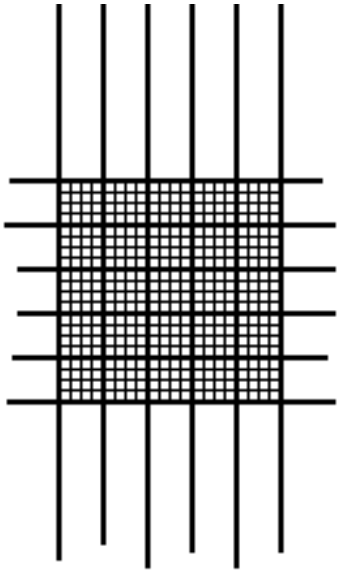

NEUBAUER
HEMACYTOMETER
GRID OF 400 SQUARES

If the full 400-squares of each grid are counted, this represents the number of sperm in 0.1 mm^3. Multiplying this value times 10 yields the sperm per mm^3 (and is the source of the hemacytometer factor of 4,000 squares/mm^3). If this product is multiplied by 1,000 mm^3/cm^3, the answer is the number of sperm in one milliliter of the sample. If the counted sample represents a dilution of a more concentrated original sample, the above answer is multiplied by the dilution factor to yield the cell density in the original sample. If the cells are sufficiently dense, it is not necessary to count the entire 400-square field, and the final calculation takes into account the number of squares actually counted:

$$\text{cells/mL} = \frac{(\text{dilution})\ (4{,}000\ \text{squares/mm}^3)\ (1{,}000\ \text{mm}^3/\text{cm}^3)\ (\text{cell count})}{(\text{number of squares counted})}$$

Thus, with a dilution of 4000 (0.025 mL of semen in 100 mL of dilution water), 80 squares counted, and a count of 100, the calculation becomes:

$$\text{cells/mL} = \frac{(4{,}000)\ (4{,}000)\ (1{,}000)\ (100)}{80}$$

$$= 20{,}000{,}000{,}000\ \text{cells/mL}$$

There are several procedures that are necessary for counts to be consistent within and between laboratories. These include mixing the sample, loading and emptying the hematocrit tube, cleaning the hemacytometer and cover slip, and actual counting procedures.

Obviously, if the sample is not homogeneous, subsamples can vary in sperm density. A few extra seconds in mixing can save a lot of wasted minutes in subsequent counting procedures. A full hematocrit tube empties more easily than one with just a little liquid, so withdraw a full sample. This can be expedited by tipping the sample vial.

Because the sperm are killed prior to sampling, they will slowly settle. For this reason, the sample in the hematocrit tube should be loaded onto the hemacytometer as rapidly as possible. Two replicate samples are withdrawn in fresh hematocrit tubes and loaded onto opposite sides of a hemacytometer.

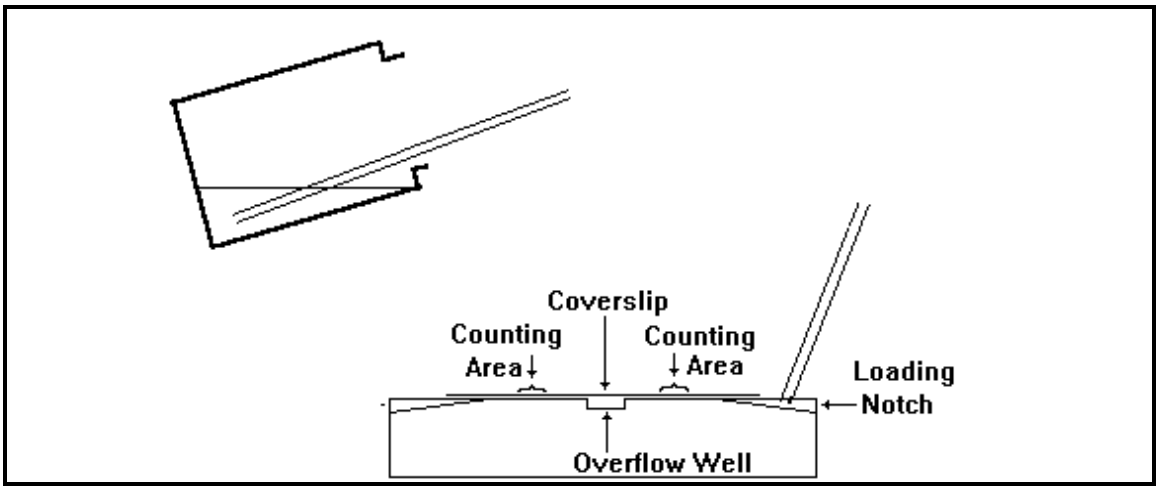

The loaded hemacytometer is left for 15 minutes to allow the sperm to settle onto the counting field. If the coverslip is moved after the samples are loaded, the hemacytometer should be rinsed and refilled with fresh sample. After 15 minutes, the hemacytometer is placed under a microscope and the counting grid located at 100x. Once the grid is properly positioned, the microscope is adjusted to 200x or 400x, and one of the corner squares is positioned for counting (any one of the four corners is appropriate). For consistency, use the same procedure each time (Many prefer to start in the upper left corner of the optical field, and this procedure will be used in the examples given below).

Examine the first large square in the selected corner. If no sperm are visible, or if the sperm are so dense or clumped to preclude accurate counting, count a sample with a more appropriate dilution.

In making counts of sperm, it is necessary to adopt a consistent method of scanning the smaller squares and counting sperm that fall upon the lines separating the squares. Count the sperm in the small squares by beginning in the upper left hand corner (square 1) and proceding right to square 4, down to square 5, left to square 8, etc. until all 16 squares are counted.

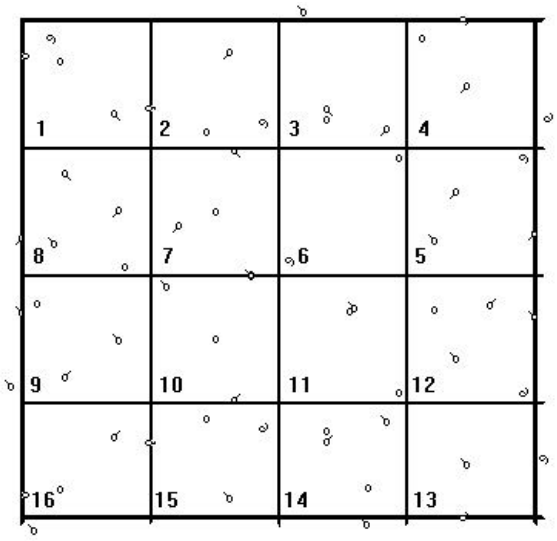

Because sperm that appear <u>on</u> lines might be counted as being in either square, it is important to avoid double counting or non-counting. For this reason a convention is decided upon and used consistently: paraphrasing the instructions received with one (Hausser Scientific) counting chamber "to avoid counting (sperm) twice, the best practice is to count all touching the top and left, and none touching the lower and right, boundary lines." Whatever convention is chosen, it must be adhered to. The example below shows a sperm count based upon a selected convention of counting sperm that fall on the upper and left lines, but not on the lower or right lines:

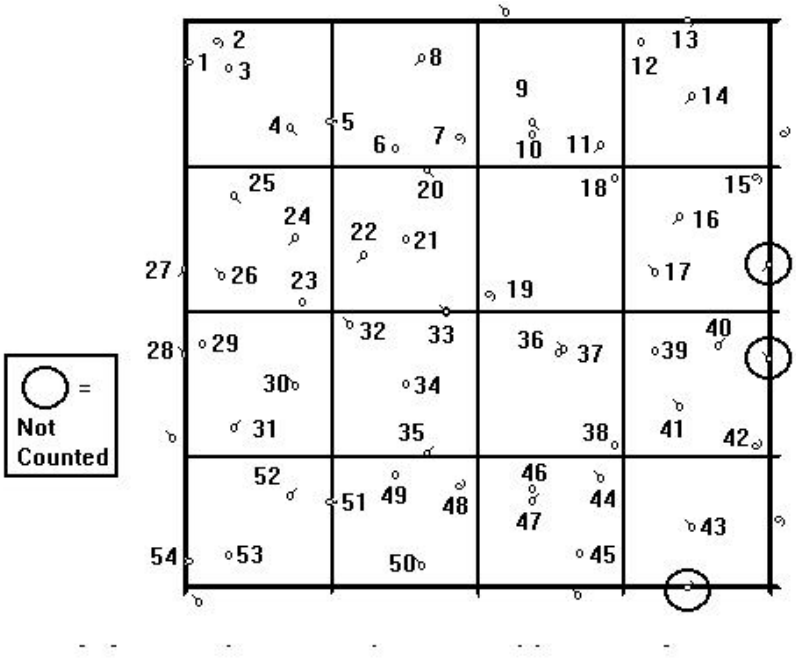

In the above illustration, sperm falling on the lower and right lines are not counted. The count begins at the upper left as illustrated in the preceding figure. A typical count sequence is demonstrated by the numbers next to each sperm illustrated. Sperm identified as numbers 1, 5, 13, 20, 27, 28, 33, 51 and 54 touch lines and are counted as being in the square below them or to their right. The circled sperm are not counted as being in this field of 16 small squares (but they would be included in any counts of adjacent squares in which they would be on upper or left hand lines).

Once these counting conventions have been selected, it is advisable to follow another strict protocol outlining the number and sequence of large squares to be counted. Because the sperm may not be randomly distributed across the counting grid, it is recommended to count an array of squares covering the entire grid. The following procedure is recommended:

Count the number of sperm in the first large square.

1. If the number is less than 10, count all 25 squares using the same scanning pattern outlined above (left to right through squares 1 to 5, down to square 6, left through square 10, down to 11, etc.). See pattern no. 3.

2. If the number is between 10 and 19, count 9 large squares using pattern no. 2.

3. If the number is 20 or greater, count 5 large squares using pattern no. 1.

1				2
		3		
4				5

Pattern no. 1

1				2
	4		3	
		5		
	7		6	
8				9

Pattern no. 2

1	2	3	4	5
10	9	8	7	6
11	12	13	14	15
20	19	18	17	16
21	22	23	24	25

Pattern no. 3

The final consideration in achieving good replicate counts is keeping the hemacytometers and coverslips clean. They should be rinsed in distilled water soon after use. The coverslips should be stored in a good biocleanser such as hemasol. For an hour or so prior to use, the hemacytometer slides should also be soaked in the solution. Both slides and coverslips should then be rinsed off with reagent water, blotted dry with a lint-free tissue, and wiped with lens paper.

SECTION 17

GIANT KELP, *Macrocystis pyrifera* GERMINATION AND GERM-TUBE GROWTH TEST METHOD

Adapted from a method developed by
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Appendix I Step-by Step Summary

SECTION 17

GIANT KELP, *MACROCYSTIS PYRIFERA* GERMINATION AND GROWTH TEST

17.1 SCOPE AND APPLICATION

17.1.1 This method estimates the chronic toxicity of effluents and receiving water to zoospores and embryonic gametophytes of giant kelp, *Macrocystis pyrifera* during a 48-h static non-renewal exposure. The effects include the synergistic, antagonistic, and additive effects of all the chemical, physical, and biological components which adversely affect the physiological and biochemical functions of the test organisms.

17.1.2 Detection limits of the toxicity of an effluent or chemical substance are organism dependent.

17.1.3 Brief excursions in toxicity may not be detected using 24-h composite samples. Also, because of the long sample collection period involved in composite sampling and because the test chambers are not sealed, highly volatile and highly degradable toxicants in the source may not be detected in the test.

17.1.4 This method is commonly used in one of two forms: (1) a definitive test, consisting of minimum of five effluent concentrations and a control, and (2) a receiving water test(s), consisting of one or more receiving water concentrations and a control.

17.1.5 This method should be restricted to use by, or under the supervision of, professionals experienced in aquatic toxicity testing. Specific experience with any toxicity test is usually needed before acceptable results become routine.

17.2 SUMMARY OF METHOD

17.2.1 This method provides step-by-step instructions for performing a 48-h day static non-renewal toxicity test using giant kelp to determine the toxicity of substances in marine and

estuarine waters. The test endpoints are germination of gameophyte spores and length of embryonic gametophyte germination tubes.

17.3 INTERFERENCES

17.3.1 Toxic substances may be introduced by contaminants in dilution water, glassware, sample hardware, and testing equipment (see Section 5, Facilities and Equipment, and Supplies).

17.3.2 Improper effluent sampling and handling may adversely affect test results (see Section 8, Effluent and Receiving Water Sampling, and Sample Handling, and Sample Preparation for Toxicity Tests).

17.4 SAFETY

17.4.1 See Section 3, Health and Safety.

17.5 APPARATUS AND EQUIPMENT

17.5.1 Tanks, trays, or aquaria -- for holding and acclimating giant kelp, e.g., standard salt water aquarium or Instant Ocean Aquarium (capable of maintaining seawater at 10-20•C), with appropriate filtration and aeration system.

17.5.2 Air pump, air lines, and air stones -- for aerating water containing broodstock or for supplying air to test solutions with low dissolved oxygen.

17.5.3 Constant temperature chambers or water baths -- for maintaining test solution temperature and keeping dilution water supply, gametes, and embryo stock suspensions at test temperature (15•C) prior to the test.

17.5.4 Water purification system -- Millipore Super-Q, Deionized water (DI) or equivalent.

17.5.5 Refractometer -- for determining salinity.

17.5.6 Hydrometer(s) -- for calibrating refractometer.

17.5.7 Thermometers, glass or electronic, laboratory grade -- for measuring water temperatures.

17.5.8 Thermometer, National Bureau of Standards Certified (see USEPA METHOD l70.l, USEPA, l979) -- to calibrate laboratory thermometers.

17.5.9 pH and DO meters -- for routine physical and chemical measurements.

17.5.10 Standard or micro-Winkler apparatus -- for determining DO (optional) and calibrating the DO meter.

17.5.11 Winkler bottles -- for dissolved oxygen determinations.

17.5.12 Balance -- Analytical, capable of accurately weighing to 0.0001 g.

17.5.13 Fume hood -- to protect the analyst from effluent or formaldehyde fumes.

17.5.14 Glass stirring rods -- for mixing test solutions.

17.5.15 Graduated cylinders -- Class A, borosilicate glass or non-toxic plastic labware, 50-l000 mL for making test solutions. (Note: not to be used interchangeably for gametes or embryos and test solutions).

17.5.16 Volumetric flasks -- Class A, borosilicate glass or non-toxic plastic labware, 10-1000 mL for making test solutions.

17.5.17 Pipets, automatic -- adjustable, to cover a range of delivery volumes from 0.010 to 1.000 mL.

17.5.18 Pipet bulbs and fillers -- PROPIPET® or equivalent.

17.5.19 Wash bottles -- for reagent water, for topping off graduated cylinders, for rinsing small glassware and instrument electrodes and probes.

17.5.20 Wash bottles -- for dilution water.

17.5.21 20-liter cubitainers or polycarbonate water cooler jugs -- for making hypersaline brine.

17.5.22 Cubitainers, beakers, or similar chambers of non-toxic composition for holding, mixing, and dispensing dilution water and other general non-effluent, non-toxicant contact uses. These should be clearly labeled and not used for other purposes.

17.5.23 Beakers, 250 borosilicate glass -- for mixing test solutions.

17.5.24 Beakers, 1,000 mL borosilicate glass -- for holding sporophyll blades.

17.5.25 Inverted or compound microscope -- for inspecting zoopspores and embryonic gametophytes.

17.5.26 Hemacytometer (bright-line rbc) -- for measuring zoospore density.

17.5.27 Counter, two unit, 0-999 -- for recording counts of zoopspores.

17.5.28 Light meter (irradiance meter w/cosine corrected sensor) -- for measuring light intensity.

17.5.29 Cool white fluorescent lights -- for providing light during incubation of developing gametophytes.

17.5.30 60 µm NITEX® filter -- for filtering receiving water.

17.6 **REAGENTS AND SUPPLIES**

17.6.1 Sample containers -- for sample shipment and storage (see Section 8, Effluent and Receiving Water Sampling, and Sample Handling, and Sample Preparation for Toxicity Tests).

17.6.2 Data sheets (one set per test) -- for data recording (Figures 1 and 2).

17.6.3 Tape, colored -- for labelling test chambers and containers.

17.6.4 Markers, water-proof -- for marking containers, etc.

17.6.5 Parafilm -- to cover graduated cylinders and vessels.

17.6.6 Gloves, disposable -- for personal protection from contamination.

17.6.7 Pipets, serological -- l-l0 mL, graduated.

17.6.8 Pipet tips -- for automatic pipets.

17.6.9 Coverslips -- for microscope slides.

17.6.10 Lens paper -- for cleaning microscope optics.

17.6.11 Laboratory tissue wipes -- for cleaning and drying electrodes, microscope slides, etc.

17.6.12 Disposable countertop covering -- for protection of work surfaces and minimizing spills and contamination.

17.6.13 pH buffers 4, 7, and l0 (or as per instructions of instrument manufacturer) -- for standards and calibration check (see USEPA Method l50.l, USEPA, l979).

17.6.14 Membranes and filling solutions -- for dissolved oxygen probe (see USEPA Method 360.l, USEPA, l979), or reagents for modified Winkler analysis.

17.6.15 Laboratory quality assurance samples and standards -- for the above methods.

17.6.16 Test chambers -- 600 mL, five chambers per concentration. The chambers should be borosilicate glass (for effluents) or nontoxic disposable plastic labware (for reference toxicants). To avoid contamination from the air and excessive evaporation of test solutions during the test, the chambers should be covered during the test with safety glass plates or a plastic sheet (6 mm thick).

17.6.17 Glutaraldehyde -- for specimen preservation - optional; (see Section 17.10.8.2).

17.6.18 Microscope slide (flat) -- for each test chamber to serve as the substratum upon which the zoospores will settle.

17.6.19 Reference toxicant solutions (see Section 17.10.2.4 and see Section 4, Quality Assurance).

17.6.20 Reagent water -- defined as distilled or deionized water that does not contain substances which are toxic to the test organisms (see Section 5, Facilities, Equipment, and Supplies and Section 7, Dilution Water).

17.6.21 Effluent and receiving water -- see Section 8, Effluent and Surface Water Sampling, and Sample Handling, and Sample Preparation for Toxicity Tests.

17.6.22 Dilution water and hypersaline brine -- see Section 7, Dilution Water and Section 17.6.24, Hypersaline Brines. The dilution water should be uncontaminated 1-µm-filtered natural seawater. Hypersaline brine should be prepared from dilution water.

17.6.23 HYPERSALINE BRINES

17.6.23.1 Most industrial and sewage treatment effluents entering marine and estuarine systems have little measurable salinity. Exposure of larvae to these effluents will usually require increasing the salinity of the test solutions. It is important to maintain an essentially constant salinity across all treatments. In some applications it may be desirable to match the test salinity with that of the receiving water (See Section 7.1). Two salt sources are available to adjust salinities -- artificial sea salts and hypersaline brine (HSB) derived from natural seawater. Use of artificial sea salts is necessary only when high effluent concentrations preclude salinity adjustment by HSB alone.

17.6.23.2 Hypersaline brine (HSB) can be made by concentrating natural seawater by freezing or evaporation. HSB should be made from high quality, filtered seawater, and can be added to the effluent or to reagent water to increase salinity. HSB has several desirable characteristics for use in effluent toxicity testing. Brine derived from natural seawater contains the necessary trace metals, biogenic colloids, and some of the

microbial components necessary for adequate growth, survival, and/or reproduction of marine and estuarine organisms, and it can be stored for prolonged periods without any apparent degradation. However, even if the maximum salinity HSB (100‰) is used as a diluent, the maximum concentration of effluent (0‰) that can be tested is 66% effluent at 34‰ salinity (see Table 1).

TABLE 1. MAXIMUM EFFLUENT CONCENTRATION (%) THAT CAN BE TESTED AT 34‰ WITHOUT THE ADDITION OF DRY SALTS GIVEN THE INDICATED EFFLUENT AND BRINE SALINITIES.

Effluent Salinity ‰	Brine 60 ‰	Brine 70 ‰	Brine 80 ‰	Brine 90 ‰	Brine 100 ‰
0	43.33	51.43	57.50	62.22	66.00
1	44.07	52.17	58.23	62.92	66.67
2	44.83	52.94	58.97	63.64	67.35
3	45.61	53.73	59.74	64.37	68.04
4	46.43	54.55	60.53	65.12	68.75
5	47.27	55.38	61.33	65.88	69.47
10	52.00	60.00	65.71	70.00	73.33
15	57.78	65.45	70.77	74.67	77.65
20	65.00	72.00	76.67	80.00	82.50
25	74.29	80.00	83.64	86.15	88.00

17.6.23.3 High quality (and preferably high salinity) seawater should be filtered to at least 10 µm before placing into the freezer or the brine generator. Water should be collected on an incoming tide to minimize the possibility of contamination.

17.6.23.4 Freeze Preparation of Brine

17.6.23.4.1 A convenient container for making HSB by freezing is one that has a bottom drain. One liter of brine can be made from

four liters of seawater. Brine may be collected by partially freezing seawater at -10 to -20•C until the remaining liquid has reached the target salinity. Freeze for approximately six hours, then separate the ice (composed mainly of fresh water) from the remaining liquid (which has now become hypersaline).

17.6.23.4.2 It is preferable to monitor the water until the target salinity is achieved rather than allowing total freezing followed by partial thawing. Brine salinity should never exceed 100‰. It is advisable not to exceed about 70‰ brine salinity unless it is necessary to test effluent concentrations greater than 50%.

17.6.23.4.3 After the required salinity is attained, the HSB should be filtered through a 1 µm filter and poured directly into portable containers (20-L cubitainers or polycarbonate water cooler jugs are suitable). The brine storage containers should be capped and labelled with the salinity and the date the brine was generated. Containers of HSB should be stored in the dark at 4•C (even room temperature has been acceptable). HSB is usually of acceptable quality even after several months in storage.

17.6.23.5 Heat Preparation of Brine

17.6.23.5.1 The ideal container for making brine using heat-assisted evaporation of natural seawater is one that (1) has a high surface to volume ratio, (2) is made of a non-corrosive material, and (3) is easily cleaned (fiberglass containers are ideal). Special care should be used to prevent any toxic materials from coming in contact with the seawater being used to generate the brine. If a heater is immersed directly into the seawater, ensure that the heater materials do not corrode or leach any substances that would contaminate the brine. One successful method is to use a thermostatically controlled heat exchanger made from fiberglass. If aeration is needed, use only oil-free air compressors to prevent contamination.

17.6.23.5.2 Before adding seawater to the brine generator, thoroughly clean the generator, aeration supply tube, heater, and any other materials that will be in direct contact with the brine. A good quality biodegradable detergent should be used, followed by several (at least three) thorough reagent water rinses.

17.6.23.5.3 Seawater should be filtered to at least 10 µm before being put into the brine generator. The temperature of the seawater is increased slowly to 40•C. The water should be aerated to prevent temperature stratification and to increase water evaporation. The brine should be checked daily (depending on the volume being generated) to ensure that the salinity does not exceed 100‰ and that the temperature does not exceed 40•C. Additional seawater may be added to the brine to obtain the volume of brine required.

17.6.23.5.4 After the required salinity is attained, the HSB should be filtered through a 1 µm filter and poured directly into portable containers (20-L cubitainers or polycarbonate water cooler jugs are suitable). The brine storage containers should be capped and labelled with the salinity and the date the brine was generated. Containers of HSB should be stored in the dark at 4•C (even room temperature has been acceptable). HSB is usually of acceptable quality even after several months in storage.

17.6.23.6 Artificial Sea Salts

17.6.23.6.1 No data from giant kelp tests using sea salts or artificial seawater (e.g., GP2) are available for evaluation at this time, and their use must be considered provisional.

17.6.23.7 Dilution Water Preparation from Brine

17.6.23.7.1 Although salinity adjustment with brine is the preferred method, the use of high salinity brines and/or reagent water has sometimes been associated with discernible adverse effects on test organisms. For this reason, it is recommended that only the minimum necessary volume of brine and reagent water be used to offset the low salinity of the effluent, and that brine controls be included in the test. The remaining dilution water should be natural seawater. Salinity may be adjusted in one of two ways. First, the salinity of the highest effluent test concentration may be adjusted to an acceptable salinity, and then serially diluted. Alternatively, each effluent concentration can be prepared individually with appropriate volumes of effluent and brine.

17.6.23.7.2 When HSB and reagent water are used, thoroughly mix together the reagent water and HSB before mixing in the

effluent. Divide the salinity of the HSB by the expected test salinity to determine the proportion of reagent water to brine. For example, if the salinity of the brine is 100‰ and the test is to be conducted at 34‰, 100‰ divided by 34‰ = 2.94. The proportion of brine is 1 part, plus 1.94 parts reagent water. To make 1 L of dilution water at 34‰ salinity from a HSB of 100‰, 340 mL of brine and 660 mL of reagent water are required. Verify the salinity of the resulting mixture using a refractometer.

17.6.23.8 Test Solution Salinity Adjustment

17.6.23.8.1 Table 2 illustrates the preparation of test solutions (up to 50% effluent) at 34‰ by combining effluent, HSB, and dilution water. Note: if the highest effluent concentration does not exceed 50% effluent, it is convenient to prepare brine so that the sum of the effluent salinity and brine salinity equals 68‰; the required brine volume is then always equal to the effluent volume needed for each effluent concentration as in the example in Table 2.

17.6.23.8.2 Check the pH of all test solutions and adjust to within 0.2 units of dilution water pH by adding, dropwise, dilute hydrochloric acid or sodium hydroxide (see Section 8.8.9, Effluent and Receiving Water Sampling, Sample Handling, and Sample Preparation for Toxicity Tests).

17.6.23.8.3 To calculate the amount of brine to add to each effluent dilution, determine the following quantities: salinity of the brine (SB, in ‰), the salinity of the effluent (SE, in ‰), and volume of the effluent to be added (VE, in mL). Then use the following formula to calculate the volume of brine (VB, in mL) to be added:

$$VB = VE \times (34 - SE)/(SB - 34)$$

17.6.23.8.4 This calculation assumes that dilution water salinity is 34 ± 2‰.

17.6.23.9 Preparing Test Solutions

17.6.23.9.1 Two hundred mL of test solution are needed for each test chamber. To prepare test solutions at low effluent concentrations (<6%), effluents may be added directly to dilution

water. For example, to prepare 1% effluent, add 10 mL of effluent to a 1-liter volumetric flask using a volumetric pipet or calibrated automatic pipet. Fill the volumetric flask to the 1-Liter mark with dilution water, stopper it, and shake to mix. Distribute equal volumes into the replicate test chambers.

17.6.23.9.2 To prepare a test solution at higher effluent concentrations, hypersaline brine must usually be used. For example, to prepare 40% effluent, add 400 mL of effluent to a 1-liter volumetric flask. Then, assuming an effluent salinity of 2‰ and a brine salinity of 66‰, add 400 mL of brine (see equation above and Table 2) and top off the flask with dilution water. Stopper the flask and shake well. Distribute equal volumes into the replicate test chambers.

17.6.23.10 Brine Controls

17.6.23.10.1 Use brine controls in all tests where brine is used. Brine controls contain the same volume of brine as does the highest effluent concentration using brine, plus the volume of reagent water needed to reproduce the hyposalinity of the effluent in the highest concentration, plus dilution water. Calculate the amount of reagent water to add to brine controls by rearranging the above equation, (See, 17.6.23.8.3) setting SE = 0, and solving for VE.

$$VE = VB \times (SB - 34)/(34 - SE)$$

If effluent salinity is essentially 0‰, the reagent water volume needed in the brine control will equal the effluent volume at the highest test concentration. However, as effluent salinity and effluent concentration increase, less reagent water volume is needed.

17.6.24 TEST ORGANISMS

17.6.24.1 The test organisms for this method are the zoospores of the giant kelp, *Macrocystis pyrifera*. *Macrocystis* is the dominant canopy forming Laminarian alga in southern and central California and forms extensive subtidal forests along the coast. Giant kelp forests support a rich diversity of marine life and provide habitat and food for hundreds of invertebrate and vertebrate species (North, 1971; Foster and Schiel, 1985). It

TABLE 2. EXAMPLES OF EFFLUENT DILUTION SHOWING VOLUMES OF EFFLUENT (x‰), BRINE, AND DILUTION WATER NEEDED FOR ONE LITER OF EACH TEST SOLUTION.

FIRST STEP: Combine brine with reagent water or natural seawater to achieve a brine of 68-x‰ and, unless natural seawater is used for dilution water, also a brine-based dilution water of 34‰.

SERIAL DILUTION:

Step 1. Prepare the highest effluent concentration to be tested by adding equal volumes of effluent and brine to the appropriate volume of dilution water. An example using 40% is shown.

Effluent Conc. (%)	Effluent x‰	Brine (68-x)‰	Dilution Water* 34‰
40	800 mL	800 mL	400 mL

Step 2. Use either serially prepared dilutions of the highest test concentration or individual dilutions of 100% effluent.

Effluent Conc. (%)	Effluent Source	Dilution Water* (34‰)
20	1000 mL of 40%	1000 mL
10	1000 mL of 20%	1000 mL
5	1000 mL of 10%	1000 mL
2.5	1000 mL of 5%	1000 mL
Control	none	1000 mL

INDIVIDUAL PREPARATION

Effluent Conc. (%)	Effluent x‰	Brine (68-x)‰	Dilution Water* 34‰
40	400 mL	400 mL	200 mL
20	200 mL	200 mL	600 mL
10	100 mL	100 mL	800 mL
5	50 mL	50 mL	900 mL
2.5	25 mL	25 mL	950 mL
Control	none	none	1000 mL

*May be natural seawater or brine-reagent water equivalent.

is an appropriate toxicity test species because of its availability, economic and ecological importance, history of successful laboratory culture (North, 1976; Luning, 1980; Kuwabara, 1981; Deysher and Dean, 1984; Linfield, 1985), and previous use in toxicity testing (Smith and Harrison, 1978; James et al., 1987; Anderson and Hunt, 1988; Hunt et al., 1989; Anderson et al., 1990). Other Laminarian alga species have proven to be useful for laboratory toxicity testing (Chung and Brinkhuis, 1986; Thompson and Burrows, 1984; Hopkin and Kain, 1978; see Thursby et al., 1993 for review).

17.6.24.2 Like all kelps, *Macrocystis* has a life cycle that alternates between a microscopic gametophyte stage and a macroscopic sporophyte stage. It is the sporophyte stage that forms kelp forests. These plants produce reproductive blades (sporophylls) at their base. The sporophylls develop patches (sori) in which biflagellate, haploid zoospores are produced. The zoospores are released into the water column where they swim and eventually settle onto the bottom and germinate. The dioecious spores develop into either male or female gametophytes. The male gametophytes produce flagellated gametes which may fertilize eggs produced by the female gametophytes. Fertilized eggs develop into sporophytes within 12- 15 days, completing the lifecycle.

17.6.24.3 The method described here focuses on germination of the zoospores and the initial growth of the developing gametophytes. It involves the controlled release of zoospores from the sporophyll blades, followed by the introduction of a spore suspension of known density into the test containers. The zoospores swim through the test solution and eventually settle onto glass microscope slides. The settled spores germinate by extruding the cytoplasm of the spore through the germ-tube into the first gametophytic cell. This stage is often referred to as the "dumbell" stage. The two endpoints measured after 48 hours are germination success and growth of the embryonic gametophytes (germ-tube length).

17.6.24.4 Species Identification

17.6.24.4.1 Although there is some debate over the taxonomy of the genus *Macrocystis*, Abbott and Hollenberg (1976) consider only two species in California: *M. pyrifera*, and *M. integrifolia*. The

two are distinguished from each other based on habitat and the morphology of their holdfasts. *Macrocystis pyrifera* occurs subtidally while *M. integrifolia* occurs in the low intertidal and shallow subtidal zones. *Macrocystis pyrifera* has a conical holdfast while *M. integrifolia* has a more flattened, creeping holdfast. Consult Abbott and Hollenberg (1976) for a more detailed taxonomic discussion of the two species.

17.6.24.5 Obtaining Zoospores

17.6.24.5.1 *Macrocystis* zoospores are obtained from the reproductive blades (sporophylls) of the adult plant. The sporophylls are located near the base of the plant just above its conical holdfast. Sporophylls must be collected subtidally and should be collected from at least five different plants in any one location to give a good genetic representation of the population. The sporophylls should be collected from areas free of point and non-point source pollution to minimize the possibility of genetic or physiological adaptation to pollutants. In situations where a thermocline is present at the collection site, the sporophylls should be collected from below the thermocline to ensure adequate spore release. Sporophylls are identified in the field by the presence of darkened patches called sori. The zoospores develop within the sori. In addition, the sporophylls are distinguished from vegetative blades by their thinner width, basal location on the adult plant, and general lack of pneumatocysts (air bladders). Collection of algae is regulated by California law. Collectors must obtain a scientific collector's permit from the California Department of Fish and Game and observe any regulations regarding collection and transport of kelp. For further information regarding sporophyll collection, contact the Marine Pollution Studies Laboratory, 34500 Coast Route 1, Granite Canyon, Monterey CA, 93940, (408) 624-0947.

17.6.24.6 Broodstock Culture and Handling

17.6.24.6.1 After collection, the sporophylls should be kept damp and not exposed to direct sunlight. Avoid immersing the blades in seawater, however, to prevent premature spore release. The sporophylls should be <u>rinsed thoroughly</u> in 0.2 µm filtered seawater to remove diatoms and other epiphytic organisms. The individual blades can be gently rubbed between fingers under

running filtered seawater or brushed with a soft bristled brush. The blades are stored between moist paper towels (lasagna style so that the sporophylls do not overlap each other, and each layer of sporophylls are separated by a layer of paper towels) at approximately 9-12•C until needed. The zoospores must be released within 24 hours of collection to insure their viability. Preliminary data indicate that prolonged storage times may affect test results (Bottomley et al., 1991); however as long as germination rates meet control acceptability criteria this should not affect test results. Sporophylls should be kept shaded to prevent damage to the spores. For holding or transport times longer than approximately six hours, the sporophylls should be placed in an ice chest with blue ice. The blue ice should be wrapped in newspaper (10 layers) for insulation, then plastic to prevent leaking.

17.7 EFFLUENT AND RECEIVING WATER COLLECTION, PRESERVATION, AND STORAGE

17.7.1 See Section 8, Effluent and Receiving Water Sampling, Sample Handling, and Sample Preparation for Toxicity Tests.

17.8 CALIBRATION AND STANDARDIZATION

17.8.1 See Section 4, Quality Assurance.

17.9 QUALITY CONTROL

17.9.1 See Section 4, Quality Assurance.

17.10 TEST PROCEDURES

17.10.1 TEST DESIGN

17.10.1.1 The test consists of at least five effluent concentrations plus a dilution water control. Tests that use brine to adjust salinity must also contain five replicates of a brine control.

17.10.1.2 Effluent concentrations are expressed as percent effluent.

17.10.2 TEST SOLUTIONS

17.10.2.1 Receiving waters

17.10.2.1.1 The sampling point is determined by the objectives of the test. At estuarine and marine sites, samples are usually collected at mid-depth. Receiving water toxicity is determined with samples used directly as collected or with samples passed through a 60 µm NITEX® filter and compared without dilution, against a control. Using five replicate chambers per test, each containing 200 mL, analysis would require approximately 1 L of sample per test.

17.10.2.2 Effluents

17.10.2.2.1 The selection of the effluent test concentrations should be based on the objectives of the study. A dilution factor of at least 0.5 is commonly used. A dilution factor of 0.5 provides hypothesis test discrimination of ± 100%, and testing of a 16 fold range of concentrations. Hypothesis test discrimination shows little improvement as dilution factors are increased beyond 0.5 and declines rapidly if smaller dilution factors are used. **USEPA recommends that one of the five effluent treatments must be a concentration of effluent mixed with dilution water which corresponds to the permittee's instream waste concentration (IWC).** At least two of the effluent treatments must be of lesser effluent concentration than the IWC, with one being at least one-half the concentration of the IWC. If 100‰ HSB is used as a diluent, the maximum concentration of effluent that can be tested will be 66% at 34‰ salinity.

17.10.2.2.2 If the effluent is known or suspected to be highly toxic, a lower range of effluent concentrations should be used (such as 25%, 12.5%, 6.25%, 3.12% and 1.56%).

17.10.2.2.3 The volume in each test chamber is 200 mL.

17.10.2.2.4 Effluent dilutions should be prepared for all replicates in each treatment in one container to minimize variability among the replicates. Dispense into the appropriate effluent test chambers.

17.10.2.3 Dilution Water

17.10.2.3.1 Dilution water should be uncontaminated 1-µm-

filtered natural seawater or hypersaline brine prepared from uncontaminated natural seawater plus reagent water (see Section 7, Dilution Water). Natural seawater may be uncontaminated receiving water. This water is used in all dilution steps and as the control water.

17.10.2.4 Reference Toxicant Test

17.10.2.4.1 Reference toxicant tests should be conducted as described in Quality Assurance (see Section 4.7).

17.10.2.4.2 The preferred reference toxicant for giant kelp is copper chloride ($CuCl_2 \circ 2H_2O$). Reference toxicant tests provide an indication of the sensitivity of the test organisms and the suitability of the testing laboratory (see Section 4 Quality Assurance). Another toxicant may be specified by the appropriate regulatory agency. Prepare a 10,000 µg/L copper stock solution by adding 0.0268 g of copper chloride ($CuCl_2 \circ 2H_2O$) to one liter of reagent water in a polyethylene volumetric flask. Alternatively, certified standard solutions can be ordered from commercial companies.

17.10.2.4.3 Reference toxicant solutions should be five replicates each of 0 (control), 5.6, 10, 18, 32, 100, and 180 µg/L total copper. Prepare one liter of each concentration by adding 0, 0.56, 1.0, 1.8, 3.2, 5.6, 10.0, and 18.0 mL of stock solution, respectively, to one-liter volumetric flasks and fill with dilution water. Start with control solutions and progress to the highest concentration to minimize contamination.

17.10.2.4.4 If the effluent and reference toxicant tests are to be run concurrently, then the tests must use zoospores from the same release. The tests must be handled in the same way and test solutions delivered to the test chambers at the same time. Reference toxicant tests must be conducted at 34 ± 2‰.

17.10.3 RELEASE OF ZOOSPORES FOR THE TEST

17.10.3.1 Zoospores are released by slightly desiccating the sporophyll blades, and then placing them in filtered seawater. To desiccate the sporophylls, blot the blades with paper towels and expose them to air for 1 hour.

17.10.3.2 The number of sporophyll blades needed depends upon their maturity; usually 25-30 blades (~ 100 grams wet weight) are sufficient. After 1 hour the blades should be rinsed again thoroughly using 0.2 µm-filtered seawater, then placed in a one L glass or plastic beaker filled with 0.2 µm filtered seawater at 15-16•C. The release water should never exceed 18•C.

17.10.3.3 After one hour, a sufficient number of zoospores should be present to conduct the test. The presence of zoospores is indicated by a slight cloudiness in the water. To verify whether zoospores are present, periodically sample the solution and observe the sample microscopically (100x).

17.10.3.4 To insure that the zoospores are viable and have not begun to germinate before they are exposed to the toxicant, the zoospore release process should not be longer than two hours. If it takes longer than two hours to get an adequate density of zoospores (~7,500 zoospores/mL of test solution), repeat the release process with a new batch of sporophylls.

17.10.3.5 After the zoospores are released, remove the sporophylls and let the spore mixture settle for 30 minutes. After 30 minutes, decant 250 mLs from the top of the spore solution into a separate clean glass beaker. Sample the spore solution and determine the spore density using a bright-line hemacytometer (100x). Spores may be counted directly, or to obtain a more accurate count, fix a sample of spores by mixing nine milliliters of spore solution with 1-mL of 37% buffered formalin (or acetic acid) in a test tube. Shake the sample well before placing it on the hemacytometer.

17.10.3.6 After counting, the density is multiplied by 1.111 to correct for the dilution caused by adding 1 mL of formalin to the sample. Use at least five replicate counts. After the density is determined, calculate the volume of zoospores necessary to give approximately 7,500 spores/mL of test solution. To prevent over-dilution of the test solution, this volume should not exceed 1% of the test solution volume. If this volume exceeds 1% of the test solution volume, it should be noted in the results.

17.10.3.7 Test solutions must be prepared while the zoospores are releasing from the sporophylls. Test solutions must be mixed, sampled, and temperature equilibrated in time to receive

the swimming zoospores as soon as they are counted. Zoospore release and counting should be done in a room separate from that used for toxicant preparation, and care should be taken to avoid contaminating the zoospores prior to testing.

17.10.4 START OF THE TEST

17.10.4.1 Prior to Beginning the Test

17.10.4.1.1 The test should begin as soon as possible, preferably within 24 h of sample collection. The maximum holding time following retrieval of the sample from the sampling device should not exceed 36 h for off-site toxicity tests unless permission is granted by the permitting authority. In no case should the sample be used in a test more than 72 h after sample collection (see Section 8 Effluent and Receiving Water Sampling, Sample Handling, and Sample Preparation for Toxicity Test).

17.10.4.1.2 Just prior to test initiation (approximately 1 h), the temperature of a sufficient quantity of the sample to make the test solutions should be adjusted to the test temperature (15 ± 1•C) and maintained at that temperature during the addition of dilution water.

17.10.4.1.3 Increase the temperature of the water bath, room, or incubator to the required test temperature (15 ± 1•C).

17.10.4.1.4 Randomize the placement of test chambers in the temperature-controlled water bath, room, or incubator at the beginning of the test, using a position chart. Assign numbers for the position of each test chamber using a random numbers or similar process (see Appendix A, for an example of randomization). Maintain the chambers in this configuration throughout the test, using a position chart. Record these numbers on a separate data sheet together with the concentration and replicate numbers to which they correspond. Identify this sheet with the date, test organism, test number, laboratory, and investigator's name, and safely store it away until after the gametophyte spores have been examined at the end of the test.

17.10.4.1.5 Note: Loss of the randomization sheet would invalidate the test by making it impossible to analyze the data afterwards. Make a copy of the randomization sheet and store

separately. Take care to follow the numbering system exactly while filling chambers with the test solutions.

17.10.4.1.6 Arrange the test chambers randomly in the water bath or controlled temperature room. Once chambers have been labeled randomly and filled with test solutions, they can be arranged in

numerical order for convenience, since this will also ensure random placement of treatments.

17.10.4.2 Estimation of Zoospore Density

17.10.4.2.1 After determining the zoospore density and calculating the volume yielding 7,500 zoospores/mL test solution, add this volume to each test chamber (this is the <u>start time</u> of the test). Observe a sample of zoospores microscopically to verify that they are swimming before adding them to the test chambers.

17.10.4.2.2 Incubate the developing gametophytes for 48 hours in the test chambers at 15•C under 50 $\mu E/m^2/s$. The zoospores germinate and develop to the "dumbell" gametophyte stage during the exposure period.

17.10.5 LIGHT, PHOTOPERIOD, SALINITY AND TEMPERATURE

17.10.5.1 The lights used in this method are cool white fluorescent lights adjusted to give 50 $\mu E/m^2/s$ at the top of each test chamber. Each test chamber must receive the same quanta of light (50 ± 10 $\mu E/m^2/s$). Areas of increased light can be eliminated by taping the outside of the light diffuser or wrapping the fluorescent bulbs with aluminum foil.

17.10.5.2 The water temperature in the test chambers should be maintained at 15 ± 1•C. If a water bath is used to maintain the test temperature, the water depth surrounding the test cups should be as deep as possible without floating the chambers.

15.10.5.3 The test salinity should be in the range of 34 ± 2‰. The salinity should vary by no more than ±2‰ among the chambers on a given day. If effluent and receiving water tests are conducted concurrently, the salinities of these tests should be similar.

15.10.5.4 Rooms or incubators with high volume ventilation should be used with caution because the volatilization of the test solutions and evaporation of dilution water may cause wide fluctuations in salinity. Covering the test chambers with clean polyethylene plastic may help prevent volatilization and evaporation of the test solutions.

17.10.6 DISSOLVED OXYGEN (DO) CONCENTRATION

17.10.6.1 Aeration may affect the toxicity of effluent and should be used only as a last resort to maintain a satisfactory DO. The DO concentration should be measured on new solutions at the start of the test (Day 0). The DO should not fall below 4.0 mg/L (see Section 8, Effluent and Receiving Water Sampling, Sample Handling, and Sample Preparation for Toxicity Tests). If it is necessary to aerate, all treatments and the control should be aerated. The aeration rate should not exceed that necessary to maintain a minimum acceptable DO and under no circumstances should it exceed 100 bubbles/minute, using a pipet with a 1-2 mm orifice, such as a 1 mL KIMAX® serological pipet No. 37033, or equivalent.

17.10.7 OBSERVATIONS DURING THE TEST

17.10.7.1 Routine Chemical and Physical Observations

17.10.7.1.1 DO is measured at the beginning of the exposure period in one test chamber at each test concentration and in the control.

17.10.7.1.2 Temperature, pH, and salinity are measured at the beginning of the exposure period in one test chamber at each concentration and in the control. Temperature should also be monitored continuously or observed and recorded daily for at least two locations in the environmental control system or the samples. Temperature should be measured in a sufficient number of test chambers at the end of the test to determine temperature variation in the environmental chamber.

17.10.7.1.3 Record all the measurements on the data sheet.

17.10.8 TERMINATION OF THE TEST

17.10.8.1 Ending the Test

17.10.8.1.1 Record the time the test is terminated.

17.10.8.1.2 Temperature, pH, dissolved oxygen, and salinity are measured at the end of the exposure period in one test chamber at each concentration and in the control.

17.10.8.2 Sample preservation

17.10.8.2.1 In some cases it may be convenient to preserve the kelp cultures for later analysis. Preliminary work by Anderson and Hunt (Marine Pollution Studies Laboratory unpublished data) indicates that cultures can be preserved in 0.1% glutaraldehyde (final concentration) and that preservation has no significant effect on germination or germ-tube growth. Other researchers have used higher glutaraldehyde concentrations and found adequate preservation with no effect on spore germination or gametophyte growth (K. Goodwin, Calif. Inst. of Tech., unpublished data).

17.10.8.2.2 Because data on the effects of preservation are preliminary, it is recommended that anyone interested in preserving kelp cultures for later analysis first demonstrate that preservation does not affect test results. This can be accomplished by comparing germination and germ-tube growth in preserved vs non-preserved kelp cultures. We also recommend that if it is necessary to preserve kelp cultures for later analysis, a complete test should be preserved so that if any replicates are read preserved, all of the replicates should be read preserved. In the case where concurrent reference toxicant and complex effluent tests are conducted, it may be convenient to fix one test in glutaraldehyde and read the other test immediately.

17.10.8.2.3 When fixing kelp cultures, it is important to minimize disturbance to the gametophytes. Make sure that the culture slides are fixed and stored horizontally. We have used disposable petri dishes for preservation chambers; these allow individual replicate slides to be labelled and preserved separately to avoid mixing replicates. **Note:** Glutaraldehyde is toxic. If you intend to use this material as a preservative, study the material data safety sheets from the supplier and

follow strict safety precautions. Make sure test chambers and solutions contaminated with this material are disposed of properly.

17.10.8.3 Counting

17.10.8.3.1 After 48 hours, the test is terminated. Because it takes a considerable amount of time to read the test, reading can begin after 45 hours and must be completed within six hours. Remove the slide without decanting the test solution. The test slide can be lifted from the bottom of the test chamber with a separate clean microscope slide. Blot the bottom on a paper towel and place an 18-mm square cover slip on the slide. Blot the excess water around the edge of the cover slip to eliminate the flow of water under the cover slip.

17.10.8.4 Endpoints

17.10.8.4.1 The endpoints measured for the 48 hour *Macrocystis* method are percent germination success and germination tube length. Germination is considered successful if a germ-tube is present on the settled zoospore. Germination is considered to be unsuccessful if no germination tube is visible. To differentiate between a germinated and non-germinated zoospore, observe the settled zoospores at 400x magnification and determine whether they are circular (non-germinated) or have a protuberance that extends at least one spore diameter (about 3.0 µm) from the edge of the spore (germinated). Spores with a germination tubes less than one spore diameter are considered non-germinated.

17.10.8.4.2 The first 100 spores encountered while moving across the microscope slide are counted for each replicate of each treatment. **Note:** Sewage effluents may contain certain objects, such as ciliates, which look similar to non-germinated kelp spores. It is important to ensure that only kelp spores are counted for this endpoint. Kelp spores are green-brown in color, spherical, and lack mobility. Also, components of the cytoplasm of kelp spores appear to fluoresce a light green color when the spore is slightly out of focus. If a particular object cannot be identified, it should not be counted.

17.10.8.4.3 The growth endpoint is the measurement of the total length of the germination tube from the edge of the original

spore membrane. Only germinated spores with straight germination tubes and within the same focal plane are measured; if a spore is not completely in focus from tip to tip it should not be measured. The spores to be measured are randomly selected by moving the microscope stage to a new field of view without looking through the ocular lens.

17.10.8.4.4 Measure the germination-tube length of the spore whose spore case center is nearest the micrometer in each field; the spores case can be distinguished from the growing tip because it is usually clear (empty) at 48 hours, and it is more circular than the growing tip. If more than one spore case is touching the micrometer, both (or all) germinated spores are measured. A total of 10 spores for each replicate of each treatment are measured. It is easier to measure germ-tube length with a micrometer having a 10 mm linear scale (0.1 mm subdivisions); measure lengths to the nearest micron (typically to the nearest half micrometer unit; see Section 10200E, Standard Methods 17th edition, for micrometer/microscope calibration procedures). In situations where germination is significantly inhibited it may be difficult to find germinated spores for germ-tube growth measurement using the random search technique.

17.10.8.4.5 To expedite reading, the slide can be scanned to find germinated spores if germination is 30% or less. In this situation the first 10 spores encountered are measured for germ-tube length.

17.11 SUMMARY OF TEST CONDITIONS AND TEST ACCEPTABILITY CRITERIA

17.11.1 A summary of test conditions and test acceptability criteria is listed in Table 3.

17.12 ACCEPTABILITY OF TEST RESULTS

17.12.1 For tests to be considered acceptable, the following requirements must be met:

(1) Mean control germination must be at least 70% in the controls.

(2) Mean germination-tube length in the controls must be at least 10 µm in the controls.

(3) The germination-tube growth NOEC must be below 35 µg/liter in the reference toxicant test.

(4) The minimum significant difference (%MSD) is <20% relative to the control for both germination and germ-tube length in the reference toxicant test.

TABLE 3. SUMMARY OF TEST CONDITIONS AND TEST ACCEPTABILITY CRITERIA FOR GIANT KELP, *MACROCYSTIS PYRIFERA*, GERMINATION AND GERM-TUBE LENGTH TEST WITH EFFLUENTS AND RECEIVING WATERS

1. Test type:	Static non-renewal
2. Salinity:	34 ± 2‰
3. Temperature:	15 ± 1•C
4. Light quality:	Ambient laboratory illumination
5. Light intensity:	50 ± 10 µE/m^2/s
6. Photoperiod:	16 h light, 8 h darkness
7. Test chamber size:	600 mL
8. Test solution volume:	200 mL/replicate
9. Spore density per test chamber:	7500/mL of test solution
10. No. replicate chambers per concentration:	5
11. Dilution water:	Uncontaminated 1-µm-filtered natural seawater or hypersaline brine prepared from natural seawater
12. Test concentrations:	Effluents: Minimum of 5 and a control Receiving waters: 100% receiving water and a control
13. Dilution factor:	Effluents: •0.5 Receiving waters: None or •0.5
14. Test duration:	48 h

15. Endpoints:	Germination and germ-tube length
16. Test acceptability criteria:	• 70% germination in the controls; • 10 µm germ-tube length in the controls and the NOEC must be below 35 µg/L in the reference toxicant test; must achieve a %MSD of <20 for both germination and germ-tube length in the reference toxicant.
17. Sampling requirements:	One sample collected at test initiation, and preferably used within 24 h of the time it is removed from the sampling device (see Section 8, Effluent and Receiving Water Sampling, Sample Handling, and Sample Preparation for Toxicity Tests)
18. Sample volume required:	2 L per test

17.13 **DATA ANALYSIS**

17.13.1 GENERAL

17.13.1.1 Tabulate and summarize the data. Table 4 presents a sample set of germination and growth data.

17.13.1.2 The endpoints of the giant kelp 48-hour chronic test are based on the adverse effects on germination and growth. The IC25 endpoints are calculated using point estimation techniques (see Section 9, Chronic Toxicity Test Endpoints and Data Analysis). LOEC and NOEC values for germination and growth are obtained using a hypothesis testing approach such as Dunnett's Procedure (Dunnett, 1955) or Steel's Many-one Rank Test (Steel, 1959; Miller, 1981) (see Section 9). Separate analyses are performed for the estimation of the LOEC and NOEC endpoints and for the estimation of the IC25 endpoints. Concentrations at which there is no germination in any of the test chambers are excluded from the statistical analysis of the NOEC and LOEC for germination and growth, but included in the estimation of the

IC25. See the Appendices for examples of the manual computations, and examples of data input and program output.

17.13.1.3 The statistical tests described here must be used with a knowledge of the assumptions upon which the tests are contingent. The assistance of a statistician is recommended for analysts who are not proficient in statistics.

17.13.2 EXAMPLE OF ANALYSIS OF GIANT KELP, *MACROCYSTIS PYRIFERA*, GERMINATION DATA

17.13.2.1 Formal statistical analysis of the germination data is outlined in Figure 1. The response used in the analysis is the proportion of germinated spores in each test or control chamber. Separate analyses are performed for the estimation of the NOEC and LOEC endpoints and for the estimation of the IC25 endpoint. Concentrations at which there is no germination in any of the test chambers are excluded from statistical analysis of the NOEC and LOEC, but included in the estimation of the IC endpoints.

17.13.2.2 For the case of equal numbers of replicates across all concentrations and the control, the evaluation of the NOEC and LOEC endpoints is made via a parametric test, Dunnett's Procedure, or a nonparametric test, Steel's Many-one Rank Test, on the arc sine square root transformed data. Underlying assumptions of Dunnett's Procedure, normality and homogeneity of variance, are formally tested. The test for normality is the Shapiro-Wilk's Test, and Bartlett's Test is used to test for homogeneity of variance. If either of these tests fails, the nonparametric test, Steel's Many-one Rank Test, is used to determine the NOEC and LOEC endpoints. If the assumptions of Dunnett's Procedure are met, the endpoints are estimated by the parametric procedure.

17.13.2.3 If unequal numbers of replicates occur among the concentration levels tested, there are parametric and nonparametric alternative analyses. The parametric analysis is a *t* test with the Bonferroni adjustment (see Appendix D). The Wilcoxon Rank Sum Test with the Bonferroni adjustment is the nonparametric alternative.

TABLE 4. DATA FROM GIANT KELP, *MACTOCYSTIS PYRIFERA* GERMINATION AND GROWTH TEST

Copper Conc. (µg/L)	Replicate Chamber	Number Counted	Number Germinated	Proportion Germinated	Mean Length
Control	1	100	89	0.89	19.58
	2	100	88	0.88	18.75
	3	100	85	0.85	19.14
	4	100	89	0.89	16.50
	5	100	91	0.91	17.93
5.6	1	100	82	0.82	18.26
	2	100	55	0.55	16.25
	3	100	84	0.84	16.39
	4	100	96	0.96	18.70
	5	100	85	0.85	15.62
10.0	1	100	90	0.90	13.31
	2	100	90	0.90	18.92
	3	100	70	0.70	15.62
	4	100	83	0.83	14.30
	5	100	87	0.87	15.29
18.0	1	100	88	0.88	18.59
	2	100	52	0.52	12.88
	3	100	83	0.83	16.28
	4	100	54	0.54	15.38
	5	100	49	0.49	19.75
32.0	1	100	71	0.71	12.54
	2	100	82	0.82	10.67
	3	100	86	0.86	15.95
	4	100	81	0.81	12.54
	5	100	82	0.82	11.66
56.0	1	100	84	0.84	11.44
	2	100	68	0.68	11.88
	3	100	62	0.62	11.88
	4	100	80	0.80	11.00
	5	100	83	0.83	11.55
100.0	1	100	66	0.66	7.92
	2	100	72	0.72	7.59
	3	100	63	0.63	8.25
	4	100	72	0.72	9.13
	5	100	71	0.71	8.80
180.0	1	100	37	0.37	6.49
	2	100	69	0.69	7.25
	3	100	0	0.00	--
	4	100	32	0.32	7.63
	5	100	48	0.48	8.13

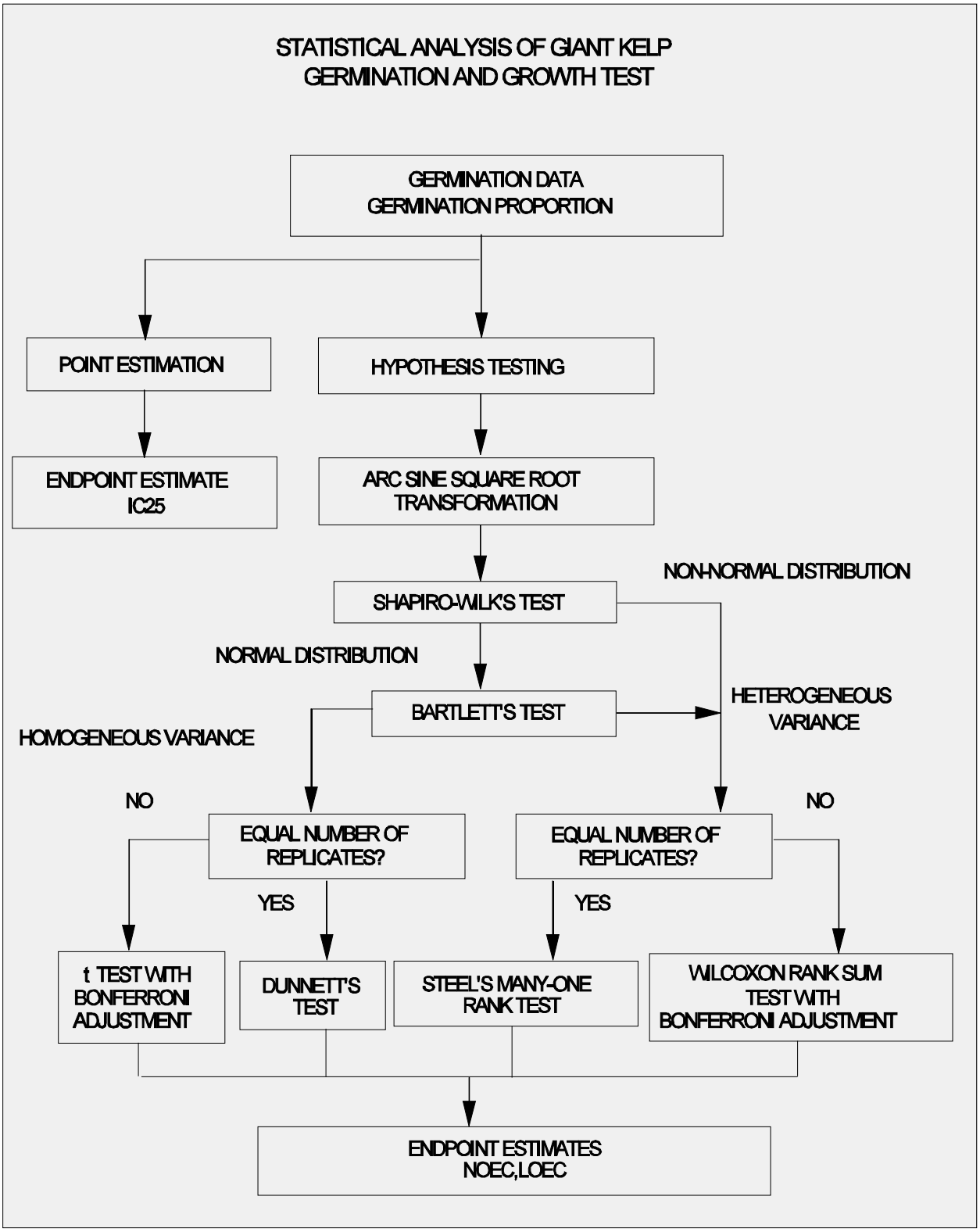

Figure 1. Flowchart for statistical analysis of giant kelp, *Macrocystis pyrifera*, germination data.

17.13.2.4 Example of Analysis of Germination Data

17.12.2.4.1 This example used toxicity data from a giant kelp, Macrocystis pyrifera, germination and growth test performed with copper. The response of interest is the proportion of germinated spores, thus each replicate must be transformed by the arc sine square root transformation procedure described in Appendix B. The raw and transformed data, means and variances of the transformed observations at each concentration including the control are listed in Table 5. A plot of the survival data is provided in Figure 2.

17.13.2.5 Test for Normality

17.13.2.5.1 The first step of the test for normality is to center the observations by subtracting the mean of all observations within a concentration from each observation in that concentration. The centered observations are listed in Table 6.

17.13.2.5.2 Calculate the denominator, D, of the test statistic:

$$D = \sum_{i=1}^{n} (X_i - \bar{X})^2$$

Where: X_i = the ith centered observation

$\bar{X}$ = the overall mean of the centered observations

n = the total number of centered observations.

17.13.2.5.3 For this set of data, n = 40

$$\bar{X} = \frac{1}{40}(-0.002) = 0.000$$

$$D = 0.9281$$

17.13.2.5.4 Order the centered observations from smallest to largest:

$$X^{(1)} \le X^{(2)} \le \ldots \le X^{(n)}$$

TABLE 5. GIANT KELP, *MACTOCYSTIS PYRIFERA* GERMINATION DATA

COPPER CONCENTRATION (µg/L)	REPLICATE CHAMBER	RAW DATA	ARC SINE SQUARE ROOT TRANSFORMED	i	MEAN $\bar{Y}$	S_i^2
Control	1	0.89	1.233	1	1.224	0.00114
	2	0.88	1.217			
	3	0.85	1.173			
	4	0.89	1.233			
	5	0.91	1.266			
5.6	1	0.82	1.133	2	1.134	0.03670
	2	0.55	0.835			
	3	0.84	1.159			
	4	0.96	1.369			
	5	0.85	1.173			
10.0	1	0.90	1.249	3	1.167	0.01152
	2	0.90	1.249			
	3	0.70	0.991			
	4	0.83	1.146			
	5	0.87	1.202			
18.0	1	0.88	1.217	4	0.954	0.04423
	2	0.52	0.805			
	3	0.83	1.146			
	4	0.54	0.825			
	5	0.49	0.775			
32.0	1	0.71	1.002	5	1.115	0.00466
	2	0.82	1.133			
	3	0.86	1.187			
	4	0.81	1.120			
	5	0.82	1.133			
56.0	1	0.84	1.159	6	1.058	0.01272
	2	0.68	0.970			
	3	0.62	0.907			
	4	0.80	1.107			
	5	0.83	1.146			
100.0	1	0.66	0.948	7	0.979	0.00191
	2	0.72	1.013			
	3	0.63	0.917			
	4	0.72	1.013			
	5	0.71	1.002			
180.0	1	0.37	0.654	8	0.610	0.11914
	2	0.69	0.980			
	3	0.00	0.050			
	4	0.32	0.601			
	5	0.48	0.765			

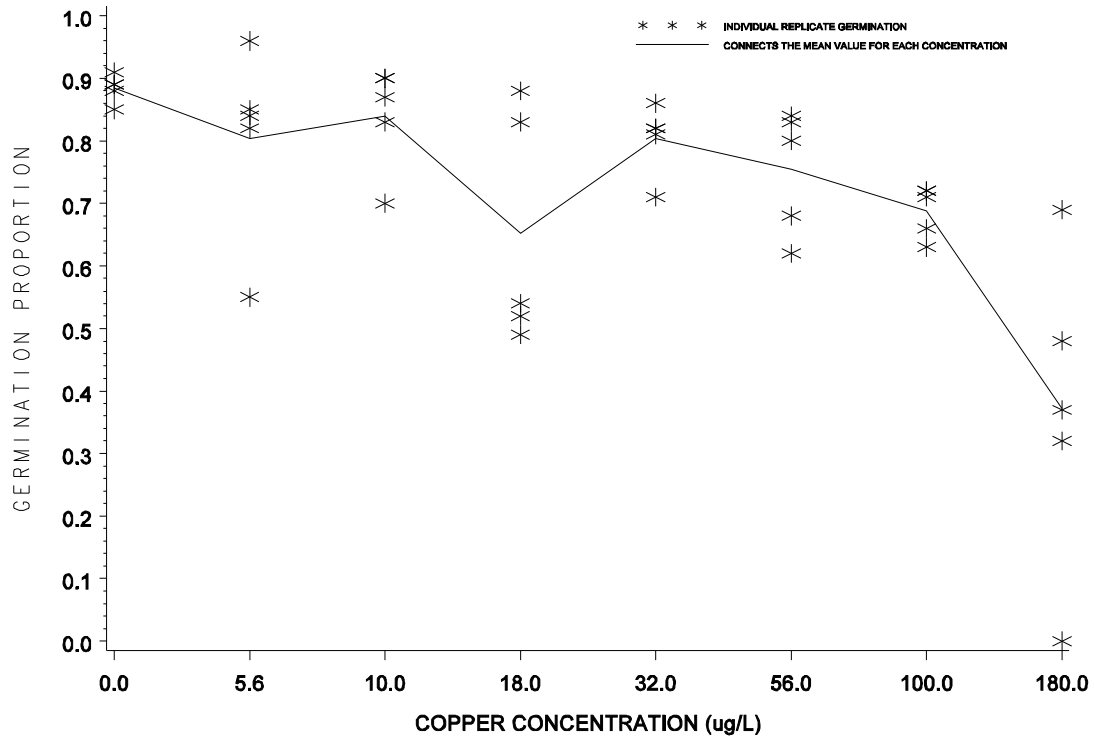

Figure 2. Plot of germination proportions of the giant kelp, *Macrocystis pyrifera*, at each treatment level.

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TABLE 6. CENTERED OBSERVATIONS FOR SHAPIRO-WILK'S EXAMPLE

		Copper Concentration (µg/L)						
Rep	Control	5.6	10.0	18.0	32.0	56.0	100.0	180.0
1	0.009	-0.001	0.082	0.263	-0.113	0.101	-0.031	0.044
2	-0.007	-0.299	0.082	-0.149	0.018	-0.088	0.034	0.370
3	-0.051	0.025	-0.176	0.192	0.072	-0.151	-0.062	-0.560
4	0.009	0.235	-0.021	-0.129	0.005	0.049	0.034	-0.009
5	0.042	0.039	0.035	-0.179	0.018	0.088	0.023	0.155

TABLE 7. ORDERED CENTERED OBSERVATIONS FOR SHAPIRO-WILK'S EXAMPLE

i	$X^{(i)}$	i	$X^{(i)}$
1	-0.560	21	0.018
2	-0.299	22	0.023
3	-0.179	23	0.025
4	-0.176	24	0.034
5	-0.151	25	0.034
6	-0.149	26	0.035
7	-0.129	27	0.039
8	-0.113	28	0.042
9	-0.088	29	0.044
10	-0.062	30	0.049
11	-0.051	31	0.072
12	-0.031	32	0.082
13	-0.021	33	0.082
14	-0.009	34	0.088
15	-0.007	35	0.101
16	-0.001	36	0.155
17	0.005	37	0.192
18	0.009	38	0.235
19	0.009	39	0.263
20	0.018	40	0.370

Where $X^{(i)}$ is the ith ordered observation. These ordered observations are listed in Table 7.

17.13.2.5.5 From Table 4, Appendix B, for the number of observations, n, obtain the coefficients a_1, a_2,...., a_k where k is n/2 if n is even and (n-1)/2 if n is odd. For the data in this example, n = 40 and k = 20. The a_i values are listed in Table 8.

17.13.2.5.6 Compute the test statistic, W, as follows:

$$W = \frac{1}{D}\left[\sum_{i=1}^{k} a_i\left(X^{(n-i+1)} - X^{(i)}\right)\right]^2$$

The differences $X^{(n-i+1)} - X^{(i)}$ are listed in Table 8. For this data in this example:

$$W = \frac{1}{0.9281}(0.9230)^2 = 0.918$$

TABLE 8. COEFFICIENTS AND DIFFERENCES FOR SHAPIRO-WILK'S EXAMPLE

i	a_i	$X^{(n-i+1)} - X^{(i)}$	
1	0.3964	0.930	$X^{(40)} - X^{(1)}$
2	0.2737	0.562	$X^{(39)} - X^{(2)}$
3	0.2368	0.414	$X^{(38)} - X^{(3)}$
4	0.2098	0.368	$X^{(37)} - X^{(4)}$
5	0.1878	0.306	$X^{(36)} - X^{(5)}$
6	0.1691	0.250	$X^{(35)} - X^{(6)}$
7	0.1526	0.217	$X^{(34)} - X^{(7)}$
8	0.1376	0.195	$X^{(33)} - X^{(8)}$
9	0.1237	0.170	$X^{(32)} - X^{(9)}$
10	0.1108	0.134	$X^{(31)} - X^{(10)}$
11	0.0986	0.100	$X^{(30)} - X^{(11)}$
12	0.0870	0.075	$X^{(29)} - X^{(12)}$
13	0.0759	0.063	$X^{(28)} - X^{(13)}$
14	0.0651	0.048	$X^{(27)} - X^{(14)}$
15	0.0546	0.042	$X^{(26)} - X^{(15)}$
16	0.0444	0.035	$X^{(25)} - X^{(16)}$
17	0.0343	0.029	$X^{(24)} - X^{(17)}$
18	0.0244	0.016	$X^{(23)} - X^{(18)}$
19	0.0146	0.014	$X^{(22)} - X^{(19)}$
20	0.0049	0.000	$X^{(21)} - X^{(20)}$

TABLE 9. ASSIGNING RANKS TO THE CONTROL AND 5.6 µg/L CONCENTRATION LEVEL FOR STEEL'S MANY-ONE RANK TEST

Rank	Transformed Proportion Germinated	Concentration
1	0.835	5.6 µg/L
2	1.133	5.6 µg/L
3	1.159	5.6 µg/L
4.5	1.173	5.6 µg/L
4.5	1.173	Control
6	1.217	Control
7.5	1.233	Control
7.5	1.233	Control
9	1.266	Control
10	1.369	5.6 µg/L

TABLE 10. TABLE OF RANKS[1]

Rep.	Control	Concentration (µg/L) 5.6	10.0
1	1.233(7.5,6.5,8.5,8.5,8.5,8.5,8.5)	1.133(2)	1.249(8.5)
2	1.217(6,5,6.5,7,7,7,7)	0.835(1)	1.249(8.5)
3	1.173(4.5,3,5,5,6,6,6)	1.159(3)	0.991(1)
4	1.233(7.5,6.5,8.5,8.5,8.5,8.5,8.5)	1.369(10)	1.146(2)
5	1.266(9,10,10,10,10,10,10)	1.173(4.5)	1.202(4)

Concentration (µg/L) (Continued)

Rep.	18.0	32.0	56.0	100.0	180.0
1	1.217(6.5)	1.002(1)	1.159(5)	0.948(2)	0.654(3)
2	0.805(2)	1.133(3.5)	0.970(2)	1.013(4.5)	0.980(5)
3	1.146(4)	1.187(6)	0.907(1)	0.917(1)	0.050(1)
4	0.825(3)	1.120(2)	1.107(3)	1.013(4.5)	0.601(2)
5	0.775(1)	1.133(3.5)	1.146(4)	1.002(3)	0.765(4)

[1]Control ranks are given in the order of the concentration with which they were ranked.

17.13.2.5.7 The decision rule for this test is to compare W as calculated in Subsection 5.6 with the critical value found in Table 6, Appendix B. If the computed W is less than the critical value, conclude that the data are not normally distributed. For this set of data, the critical value at a significance level of 0.01 and n = 40 observations is 0.919. Since W = 0.918 is less than the critical value, conclude that the data are not normally distributed.

17.13.2.5.8 Since the data do not meet the assumption of normality, Steel's Many-one Rank Test will be used to analyze the germination data.

17.13.2.6 Steel's Many-one Rank Test

17.13.2.6.1 For each control and concentration combination, combine the data and arrange the observations in order of size from smallest to largest. Assign the ranks (1, 2, ... , 10) to the ordered observations with a rank of 1 assigned to the smallest observation, rank of 2 assigned to the next larger observation, etc. If ties occur when ranking, assign the average rank to each tied observation.

17.13.2.6.2 An example of assigning ranks to the combined data for the control and 5.6 µg/L copper concentration is given in Table 9. This ranking procedure is repeated for each control/concentration combination. The complete set of rankings is summarized in Table 10. The ranks are then summed for each concentration level, as shown in Table 11.

17.13.2.6.3 For this example, determine if the survival in any of the concentrations is significantly lower than the survival in the control. If this occurs, the rank sum at that concentration would be significantly lower than the rank sum of the control. Thus compare the rank sums for the survival at each of the various concentration levels with some "minimum" or critical rank sum, at or below which the survival would be considered significantly lower than the control. At a significance level of 0.05, the minimum rank sum in a test with seven concentrations (excluding the control) and five replicates is 16 (See Table 5, Appendix E).

17.13.2.6.4 Since the rank sum for the 32.0 µg/L concentration is equal to the critical value and the rank sums for the 56.0, 100.0 and 180.0 µg/L concentrations are less than the critical value, the germination proportions in those concentrations are considered significantly less than that in the control. Hence, the NOEC and the LOEC are considered to be 18.0 µg/L and 32.0 µg/L, respectively.

TABLE 11. RANK SUMS

Concentration	Rank Sum
5.6	20.5
10.0	24.0
18.0	16.5
32.0	16.0
56.0	15.0
100.0	15.0
180.0	15.0

17.13.2.7 Calculation of the ICp

17.13.2.7.1 The germination data from Table 4 and Figure 2 are utilized in this example. As can be seen from the figure, the observed means are not monotonically non-increasing with respect to concentration. Therefore, the means must be smoothed prior to calculating the IC.

17.13.2.7.2 Starting with the observed control mean, $\overline{Y}_1 = 0.884$ is less than the observed mean for the lowest effluent concentration, $\overline{Y}_2 = 0.804$, so set $M_1 = 0.884$.

17.13.2.7.3 Comparing $\overline{Y}_2$ to $\overline{Y}_3 = 0.840$, we see that $\overline{Y}_2$ is less than $\overline{Y}_3$.

17.13.2.7.4 Calculate the smoothed means:

$$M_2 = M_3 = (\overline{Y}_2 + \overline{Y}_3)/2 = 0.822$$

17.13.2.7.5 Since M_3 is larger than $\overline{Y}_4 = 0.652$, set $M_4 = 0.652$. Since $\overline{Y}_5 = 0.804$ is larger than M_4, these means must be smoothed.

17.13.2.7.6 Calculate the smoothed means:

$$M_4 = M_5 = (M_4 + \overline{Y}_5)/2 = 0.728.$$

17.13.2.7.7 Since $\overline{Y}_6 = 0.754$ is larger than M_5, average $\overline{Y}_6$ with the two previous concentrations:

$$M_4 = M_5 = M_6 = (M_4 + M_5 + \overline{Y}_6)/3 = 0.737.$$

17.13.2.7.8 Since $M_6 > \overline{Y}_7 = 0.688 > \overline{Y}_8 = 0.372$, set $M_7 = 0.688$ and $M_8 = 0.372$. Table 12 contains the smoothed means and Figure 3 gives a plot of the smoothed means and the interpolated response curve.

17.13.2.7.9 An IC25 can be estimated using the Linear Interpolation Method. A 25% reduction in germination, compared to the controls, would result in a mean germination of 0.663, where $M_1(1\text{-}p/100) = 0.884(1\text{-}25/100)$. Examining the smoothed means and their associated concentrations (Table 12), the response, 0.663, is bracketed by $C_7 = 100.0$ µg/L and $C_8 = 180.0$ µg/L.

17.13.2.7.10 Using the equation in Section 4.2 from Appendix L, the estimate of the IC25 is calculated as follows:

$$ICp \bullet C_j \bullet [M_1(1 \bullet p/100) \bullet M_j] \frac{(C_{(j \bullet 1)} \bullet C_j)}{(M_{(j \bullet 1)} \bullet M_j)}$$

IC25 = 100.0 + [0.884(1 - 25/100) - 0.688] (180.0 - 100.0)
S))))))))))))))Q
(0.372 - 0.688)
= 106.3 µg/L.

17.13.2.7.11 When the ICPIN program was used to analyze this set of data, requesting 80 resamples, the estimate of the IC25 was 106.3291 µg/L. The empirical 95.0% confidence interval for the true mean was 94.6667 µg/L to 117.0588 µg/L. The computer program output for the IC25 for this data set is shown in Figure 4.

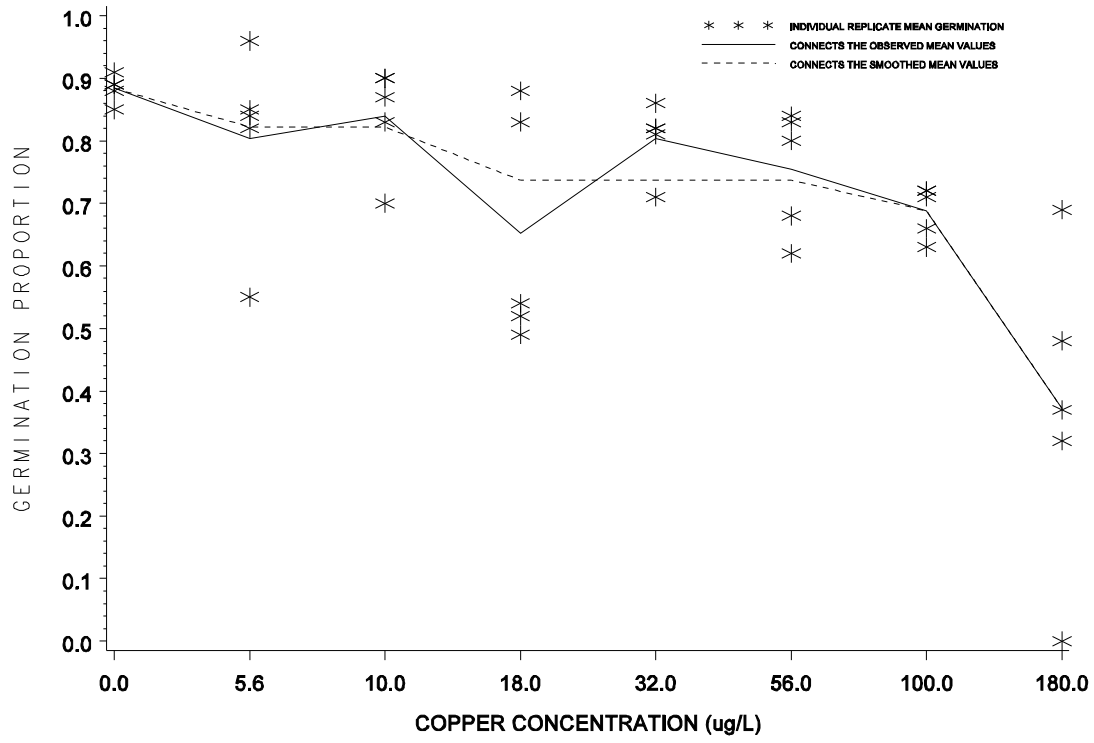

Figure 3. Plot of raw data, observed means, and smoothed means for the giant kelp, *Macrocystis pyrifera*, germination data from Tables 4 and 13.

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Conc. ID	1	2	3	4	5	6	7	8
Conc. Tested	0	5.6	10	18	32	56	100	180
Response 1	.89	.82	.90	.88	.71	.84	.66	.37
Response 2	.88	.55	.90	.52	.82	.68	.72	.69
Response 3	.85	.84	.70	.83	.86	.62	.63	0
Response 4	.89	.96	.83	.54	.81	.80	.72	.32
Response 5	.91	.85	.87	.49	.82	.83	.71	.48

*** Inhibition Concentration Percentage Estimate ***
Toxicant/Effluent: Copper
Test Start Date: Test Ending Date:
Test Species: Giant Kelp, Macrocystis pyrifera
Test Duration: 48 hours
DATA FILE: kelpgerm.icp
OUTPUT FILE: kelpgerm.i25

Conc. ID	Number Replicates	Concentration ug/L	Response Means	Std. Dev.	Pooled Response Means
1	5	0.000	0.884	0.022	0.884
2	5	5.600	0.804	0.152	0.822
3	5	10.000	0.840	0.083	0.822
4	5	18.000	0.652	0.187	0.737
5	5	32.000	0.804	0.056	0.737
6	5	56.000	0.754	0.098	0.737
7	5	100.000	0.688	0.041	0.688
8	5	180.000	0.372	0.252	0.372

The Linear Interpolation Estimate: 106.3291 Entered P Value: 25

Number of Resamplings: 80
The Bootstrap Estimates Mean: 105.8680 Standard Deviation: 5.6981
Original Confidence Limits: Lower: 94.6667 Upper: 117.0588
Expanded Confidence Limits: Lower: 88.8354 Upper: 122.4237
Resampling time in Seconds: 0.28 Random_Seed: 390692880

Figure 4. ICPIN program output for the IC25.

17.13.3 EXAMPLE OF ANALYSIS OF GIANT KELP, *MACROCYSTIS PYRIFERA*, GROWTH DATA

17.13.3.1 Formal statistical analysis of the growth data is outlined in Figure 5. The response used in the statistical analysis is mean germ-tube length per replicate. An IC25 can be calculated for the growth data via a point estimation technique (see Section 9, Chronic Toxicity Test Endpoints and Data Analysis). Hypothesis testing can be used to obtain the NOEC and LOEC for growth.

17.13.3.2 The statistical analysis using hypothesis tests consists of a parametric test, Dunnett's Procedure, and a nonparametric test, Steel's Many-one Rank Test. The underlying assumptions of the Dunnett's Procedure, normality and homogeneity of variance, are formally tested. The test for normality is the Shapiro-Wilk's Test and Bartlett's Test is used to test for homogeneity of variance. If either of these tests fails, the nonparametric test, Steel's Many-one Rank Test, is used to determine the NOEC and LOEC endpoints. If the assumptions of Dunnett's Procedure are met, the endpoints are determined by the parametric test.

17.13.3.3 Additionally, if unequal numbers of replicates occur among the concentration levels tested, there are parametric and nonparametric alternative analyses. The parametric analysis is a *t* test with the Bonferroni adjustment. The Wilcoxon Rank Sum Test with the Bonferroni adjustment is the nonparametric alternative. For detailed information on the Bonferroni adjustment, see Appendix D.

17.13.3.4 The data, mean and variance of the observations at each concentration including the control for this example are listed in Table 13. A plot of the data is provided in Figure 6.

17.13.3.5 Test for Normality

17.13.3.5.1 The first step of the test for normality is to center the observations by subtracting the mean of all observations within a concentration from each observation in that concentration. The centered observations are listed in Table 14.

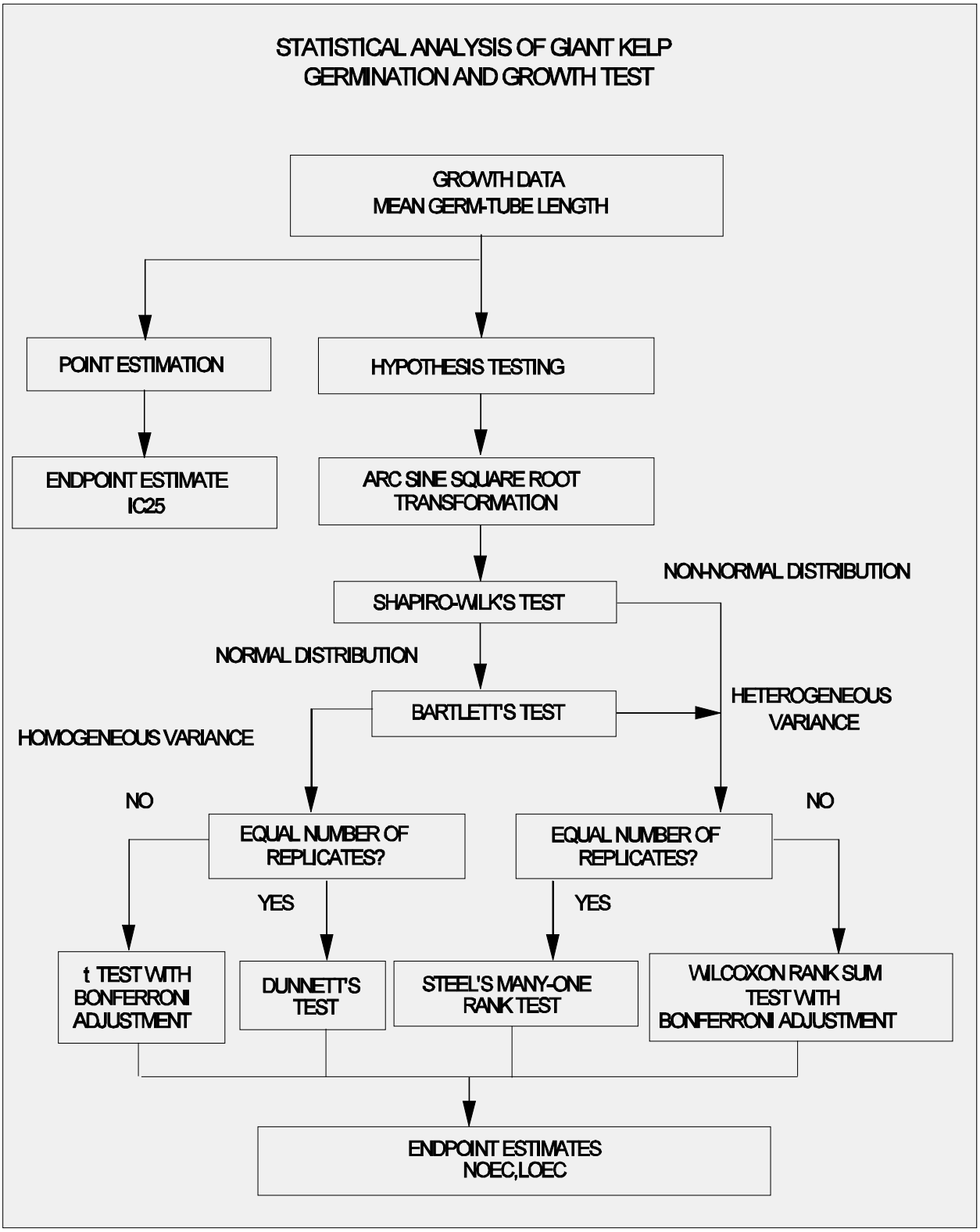

Figure 5. Flowchart for statistical analysis of giant kelp, *Macrocystis pyrifera*, growth data.

TABLE 13. GIANT KELP, *MACROCYSTIS PYRIFERA*, GROWTH DATA

	Copper Concentration (µg/L)							
Rep	Control	5.60	10.0	18.0	32.0	56.0	100.0	180.0
1	19.58	18.26	13.31	18.59	12.54	11.44	7.92	6.49
2	18.75	16.25	18.92	12.88	10.67	11.88	7.59	7.25
3	19.14	16.39	15.62	16.28	15.95	11.88	8.25	--
4	16.50	18.70	14.30	15.38	12.54	11.00	9.13	7.63
5	17.93	15.62	15.29	19.75	11.66	11.55	8.80	8.13
Mean($\bar{Y}_i$)	18.38	17.04	15.49	16.58	12.67	11.55	8.34	7.38
S_i^2	1.473	1.827	4.498	7.327	3.953	0.133	0.396	0.478
i	1	2	3	4	5	6	7	8

TABLE 14. CENTERED OBSERVATIONS FOR SHAPIRO-WILK'S EXAMPLE

	Copper Concentration (µg/L)							
Rep	Control	5.6	10.0	18.0	32.0	56.0	100.0	180.0
1	1.20	1.22	-2.18	2.01	-0.13	-0.11	-0.42	-0.89
2	0.37	-0.79	3.43	-3.70	-2.00	0.33	-0.75	-0.13
3	0.76	-0.65	0.13	-0.30	3.28	0.33	-0.09	--
4	-1.88	1.66	-1.19	-1.20	-0.13	-0.55	0.79	0.25
5	-0.45	-1.42	-0.20	3.17	-1.01	0.00	0.46	0.75

17.13.3.5.2 Calculate the denominator, D, of the statistic:

$$D = \sum_{i=1}^{n} (X_i - \bar{X})^2$$

Where: X_i = the ith centered observation

$\bar{X}$ = the overall mean of the centered observations

n = the total number of centered observations

17.13.3.5.3 For this set of data, n = 39

$$\bar{X} = \frac{1}{39}(-0.03) = 0.000$$

$$D = 79.8591$$

17.13.3.5.4 Order the centered observations from smallest to largest

$$X^{(1)} \bullet X^{(2)} \bullet \ldots \bullet X^{(n)}$$

where $X^{(i)}$ denotes the ith ordered observation. The ordered observations for this example are listed in Table 15.

TABLE 15. ORDERED CENTERED OBSERVATIONS FOR SHAPIRO-WILK'S EXAMPLE

i	$X^{(i)}$	i	$X^{(i)}$
1	-3.70	21	-0.11
2	-2.18	22	-0.09
3	-2.00	23	0.00
4	-1.88	24	0.13
5	-1.42	25	0.25
6	-1.20	26	0.33
7	-1.19	27	0.33
8	-1.01	28	0.37
9	-0.89	29	0.46
10	-0.79	30	0.75
11	-0.75	31	0.76
12	-0.65	32	0.79
13	-0.55	33	1.20
14	-0.45	34	1.22
15	-0.42	35	1.66
16	-0.30	36	2.01
17	-0.20	37	3.17
18	-0.13	38	3.28
19	-0.13	39	3.43
20	-0.13		

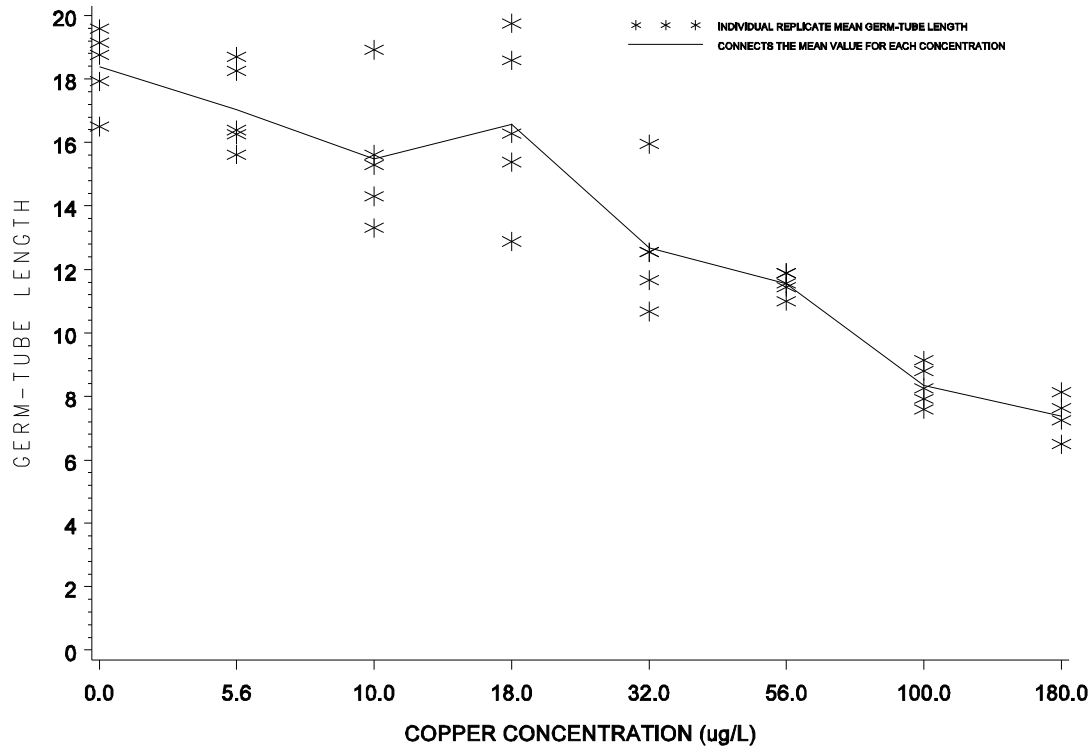

Figure 6. Plot of mean growth data for the giant kelp, *Macrocystis pyrifera*, tests.

17.13.3.5.5 From Table 4, Appendix B, for the number of observations, n, obtain the coefficients a_1, a_2, ... a_k where k is n/2 if n is even and (n-1)/2 if n is odd. For the data in this example, n = 39 and k = 19. The a_i values are listed in Table 16.

17.13.3.5.6 Compute the test statistic, W, as follows:

$$W = \frac{1}{D}\left[\sum_{i=1}^{k} a_i\left(X^{(n-i+1)} - X^{(i)}\right)\right]^2$$

The differences $X^{(n-i+1)} - X^{(i)}$ are listed in Table 16. For this set of data:

$$W = \frac{1}{79.8591}(8.7403)^2 = 0.957$$

TABLE 16. COEFFICIENTS AND DIFFERENCES FOR SHAPIRO-WILK'S EXAMPLE

i	a_i	$X^{(n-i+1)} - X^{(i)}$	
1	0.3989	7.13	$X^{(39)} - X^{(1)}$
2	0.2755	5.46	$X^{(38)} - X^{(2)}$
3	0.2380	5.17	$X^{(37)} - X^{(3)}$
4	0.2104	3.89	$X^{(36)} - X^{(4)}$
5	0.1880	3.08	$X^{(35)} - X^{(5)}$
6	0.1689	2.42	$X^{(34)} - X^{(6)}$
7	0.1520	2.39	$X^{(33)} - X^{(7)}$
8	0.1366	1.80	$X^{(32)} - X^{(8)}$
9	0.1225	1.65	$X^{(31)} - X^{(9)}$
10	0.1092	1.54	$X^{(30)} - X^{(10)}$
11	0.0967	1.21	$X^{(29)} - X^{(11)}$
12	0.0848	1.02	$X^{(28)} - X^{(12)}$
13	0.0733	0.88	$X^{(27)} - X^{(13)}$
14	0.0622	0.78	$X^{(26)} - X^{(14)}$
15	0.0515	0.67	$X^{(25)} - X^{(15)}$
16	0.0409	0.43	$X^{(24)} - X^{(16)}$
17	0.0305	0.20	$X^{(23)} - X^{(17)}$
18	0.0203	0.04	$X^{(22)} - X^{(18)}$
19	0.0101	0.02	$X^{(21)} - X^{(19)}$

17.13.3.5.7 The decision rule for this test is to compare W as calculated in Subsection 5.6 to a critical value found in Table 6, Appendix B. If the computed W is less than the critical value, conclude that the data are not normally distributed. For this set of data, the critical value at a significance level of 0.01 and n = 39 observations is 0.917. Since W = 0.957 is greater than the critical value, conclude that the data are normally distributed.

17.13.3.6 Test for Homogeneity of Variance

17.13.3.6.1 The test used to examine whether the variation in mean weight of the mysids is the same across all concentration levels including the control, is Bartlett's Test (Snedecor and Cochran, 1980). The test statistic is as follows:

$$B = \frac{\left[\left(\sum_{i=1}^{P} V_i\right) \ln \bar{S}^2 - \sum_{i=1}^{P} V_i \ln S_i^2\right]}{C}$$

Where: V_i = degrees of freedom for each copper concentration and control, $V_i = (n_i - 1)$

p = number of concentration levels including the control

ln = $\log_e$

i = 1, 2, ..., p where p is the number of concentrations including the control

n_i = the number of replicates for concentration i.

$$\bar{S}^2 = \frac{\left(\sum_{i=1}^{P} V_i S_i^2\right)}{\sum_{i=1}^{P} V_i}$$

$$C = 1 + [3(p-1)]^{-1}\left[\sum_{i=1}^{P} 1/V_i - \left(\sum_{i=1}^{P} V_i\right)^{-1}\right]$$

17.13.3.6.2 For the data in this example (See Table 13), all concentrations including the control have five replicates except the 180 µg/L concentration which has four replicates (n_i = 5 for i = 1 - 7; n_8 = 4). Thus, V_i = 4 for i = 1 - 7 and V_8 = 3.

17.13.3.6.3 Bartlett's statistic is therefore:

$$B = [(31)\ln(2.5761) - \sum_{i=1}^{P} V_i \ln(S_i^2)] / 1.0977$$

$$= [31(0.9463) - [4\ln(1.4729) + ... + 3\ln(0.4780)] / 1.0977$$

$$= [29.3353 - 9.4481] / 1.0977$$

$$= 18.12$$

17.13.3.6.4 B is approximately distributed as chi-square with p - 1 degrees of freedom, when the variances are in fact the same. Therefore, the appropriate critical value for this test, at a significance level of 0.01 with seven degrees of freedom, is 18.48. Since B = 18.12 is less than the critical value, conclude that the variances are not different.

17.13.3.7 *t* Test with Bonferroni's Adjustment

17.13.3.7.1 To obtain an estimate of the pooled variance for the *t* test with Bonferroni's adjustment, construct an ANOVA table as described in Table 17.

TABLE 17. ANOVA TABLE

Source	df	Sum of Squares (SS)	Mean Square(MS) (SS/df)
Between	p - 1	SSB	S_B^2 = SSB/(p-1)
Within	N - p	SSW	S_W^2 = SSW/(N-p)
Total	N - 1	SST	

Where: p = number of concentration levels including the control

N = total number of observations $n_1 + n_2 \ldots + n_p$

n_i = number of observations in concentration i

$$SSB = \sum_{i=1}^{P} T_i^2/n_i - G^2/N$$ Between Sum of Squares

$$SST = \sum_{i=1}^{P} \sum_{j=1}^{n_i} Y_{ij}^2 - G^2/N$$ Total Sum of Squares

$$SSW = SST - SSB$$ Within Sum of Squares

G = the grand total of all sample observations,

$$G = \sum_{i=1}^{P} T_i$$

T_i = the total of the replicate measurements for concentration i

Y_{ij} = the jth observation for concentration i (represents the mean length of the germ-tubes for concentration i in test chamber j)

17.13.3.7.2 For the data in this example:

$n_1 = n_2 = n_3 = n_4 = n_5 = n_6 = n_7 = 5; \quad n_8 = 4$

$N = 39$

$T_1 = Y_{11} + Y_{12} + Y_{13} + Y_{14} + Y_{15} = 91.90$
$T_2 = Y_{21} + Y_{22} + Y_{23} + Y_{24} + Y_{25} = 85.22$
$T_3 = Y_{31} + Y_{32} + Y_{33} + Y_{34} + Y_{35} = 77.44$
$T_4 = Y_{41} + Y_{42} + Y_{43} + Y_{44} + Y_{45} = 82.88$
$T_5 = Y_{51} + Y_{52} + Y_{53} + Y_{54} + Y_{55} = 63.36$
$T_6 = Y_{61} + Y_{62} + Y_{63} + Y_{64} + Y_{65} = 57.75$
$T_7 = Y_{71} + Y_{72} + Y_{73} + Y_{74} + Y_{75} = 41.69$
$T_8 = Y_{81} + Y_{82} + Y_{83} + Y_{84} = 29.50$

$G = T_1 + T_2 + T_3 + T_4 + T_5 + T_6 + T_7 + T_8 = 529.74$

$$SSB = \sum_{i=1}^{P} T_i^2/n_i - G^2/N$$

$$= 7749.905 - \frac{(529.74)^2}{39} = 554.406$$

$$SST = \sum_{i=1}^{P} \sum_{j=1}^{n_i} Y_{ij}^2 - G^2/N$$

$$= 7829.764 - \frac{(529.74)^2}{39} = 634.265$$

$$SSW = SST - SSB = 634.265 - 554.406 = 79.859$$

$$S_B^2 = SSB/(p-1) = 554.406/(8-1) = 79.201$$

$$S_W^2 = SSW/(N-p) = 79.859/(39-8) = 2.576$$

17.13.3.7.3 Summarize these calculations in the ANOVA table (Table 18).

TABLE 18. ANOVA TABLE FOR THE *t* TEST WITH BONFERRONI'S ADJUSTMENT EXAMPLE

Source	df	Sum of Squares (SS)	Mean Square (MS) (SS/df)
Between	7	554.406	79.201
Within	31	79.859	2.576
Total	38	634.265	

17.13.3.7.4 To perform the individual comparisons, calculate the *t* statistic for each concentration, and control combination as follows:

$$t_i = \frac{(\bar{Y}_1 - \bar{Y}_i)}{S_W\sqrt{(1/n_1) + (1/n_i)}}$$

Where: $\bar{Y}_i$ = mean length for concentration i

$\bar{Y}_1$ = mean length for the control

S_W = square root of the within mean square

n_1 = number of replicates for the control

n_i = number of replicates for concentration i

17.13.3.7.5 Table 19 includes the calculated *t* values for each concentration and control combination. In this example, comparing the 5.6 µg/L concentration with the control, the calculation is as follows:

$$t_2 \cdot \frac{(18.38 \cdot 17.04)}{[1.605\sqrt{(1/5)\cdot(1/5)}]}$$

$$= 1.320$$

TABLE 19. CALCULATED *t* VALUES

Concentration (µg/L)	i	t_i
5.6	2	1.320
10.0	3	2.847
18.0	4	1.773
32.0	5	5.625
56.0	6	6.728
100.0	7	9.891
180.0	8	10.836

17.13.3.7.6 Since the purpose of this test is to detect a significant reduction in mean length, a one-sided test is appropriate. The critical value for this one-sided test is found in Table 5, Appendix D. For an overall alpha level of 0.05, 31 degrees of freedom for error and seven concentrations (excluding the control) the approximate critical value is 2.597. The mean weight for concentration "i" is considered significantly less than the mean weight for the control if t_i is greater than the critical value. Therefore, the 10.0 µg/L, 32 µg/L, 56.0 µg/L,

100.0 µg/L, 180.0 µg/L concentrations have significantly lower mean length than the control. Because the 10.0 µg/L concentration shows signigicantly lower mean length than the control while the higher 18.0 µg/L concentration does not, these test results are considered to have an anomalous dose-response relationship and it is recommended that the test be repeated. If an NOEC and LOEC must be determined for this test, the lowest concentration with significant growth impairment versus the control is considered to the LOEC for growth. Thus, for this test, the NOEC and LOEC would be 5.6 µg/L and 10.0 µg/L, respectively.

17.13.3.8 Calculation of the ICp

17.13.3.8.1 The growth data from Table 13 and Figure 3 are utilized in this example. As can be seen in the figure, the observed means are not monotonically non-increasing with respect to concentration. Therefore, the means must be smoothed prior to calculating the IC

17.13.3.8.2 Starting with the observed control mean, $\overline{Y}_1 = 18.38$ is greater than the observed mean for the lowest copper concentration, $\overline{Y}_2 = 17.044$, so set $M_1 = 18.38$. Likewise, $\overline{Y}_2$ is greater than the observed mean for the next copper concentration, $\overline{Y}_3 = 15.488$, so set $M_2 = 17.044$.

17.13.3.8.3 Comparing $\overline{Y}_3$ to $\overline{Y}_4 = 16.576$, we see that $\overline{Y}_3$ is less than $\overline{Y}_4$.

17.13.3.8.4 Calculate the smoothed means:

$$M_3 = M_4 = (\overline{Y}_3 + \overline{Y}_4)/2 = 16.032$$

17.13.3.8.5 Since $M_4 > \overline{Y}_5 = 12.672 > \overline{Y}_6 = 11.550 > \overline{Y}_7 = 8.338 > \overline{Y}_8 = 7.375$, set $M_5 = 12.672$, $M_6 = 11.550$, $M_7 = 8.338$ and $M_8 = 7.375$. Table 20 contains the smoothed means and Figure 7 gives a plot of the smoothed response curve.

TABLE 20. GIANT KELP, *MACROCYSTIS PYRIFERA*, MEAN GERM-TUBE LENGTHS AFTER SMOOTHING

Copper Conc. (µg/L)	i	Response Means Y_i (mm)	Smoothed Means M_i (mm)
Control	1	18.380	18.380
5.6	2	17.044	17.044
10.0	3	15.488	16.032
18.0	4	16.576	16.032
32.0	5	12.672	12.672
56.0	6	11.550	11.550
100.0	7	8.338	8.338
180.0	8	7.375	7.375

17.13.3.8.7 Using the equation in Section 4.2 from Appendix L, the estimate of the IC25 is calculated as follows:

$$ICp = C_j + [M_1(1 - p/100) - M_j]\frac{(C_{(j+1)} - C_j)}{(M_{(j+1)} - M_j)}$$

$$IC25 = 18.0 + [18.380(1 - 25/100) - 16.032] \frac{(32.0 - 18.0)}{(12.672 - 16.032)}$$

$$= 27.36 \ \mu g/L.$$

17.13.3.8.6 An IC25 can be estimated using the Linear Interpolation Method. A 25% reduction in length, compared to the controls, would result in a mean length of 13.785 mm, where $M_1(1-p/100) = 18.380(1-25/100)$. Examining the smoothed means and their associated concentrations (Table 20), the response, 13.785 mm, is bracketed by C_4 = 18.0 µg/L and C_5 = 32.0 µg/L.

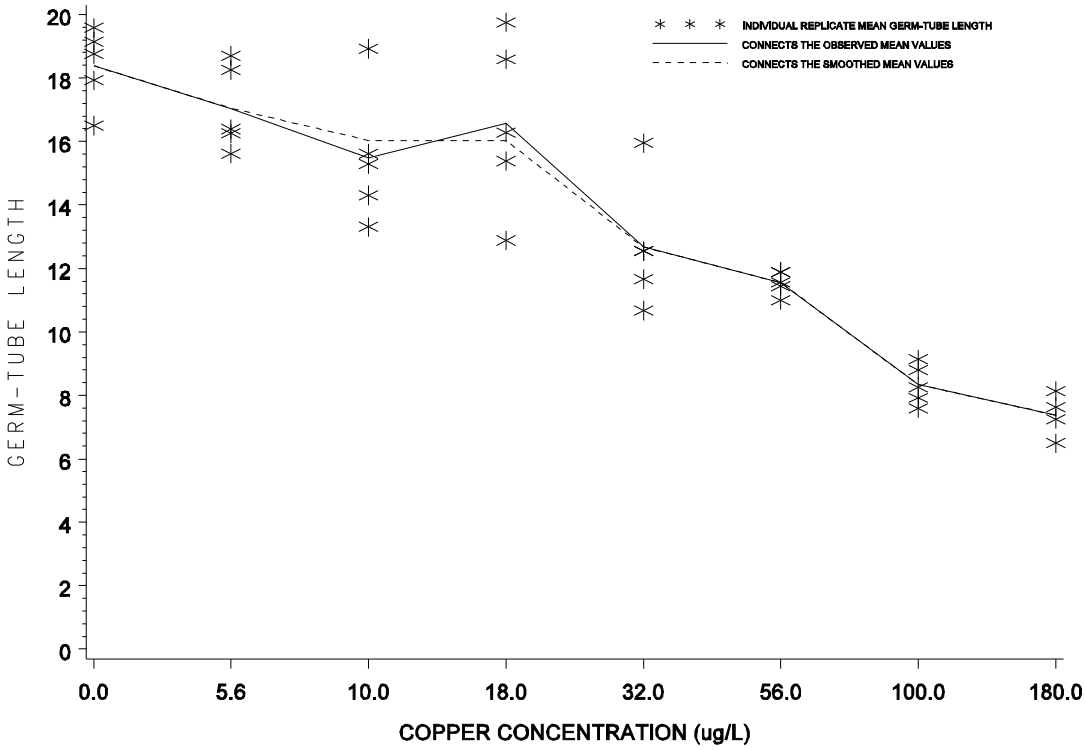

Figure 7. Plot of raw data, observed means, and smoothed means for the giant Kelp, *Macrocystis pyrifera*, growth data from Tables 13 and 20.

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17.13.3.8.8 When the ICPIN program was used to analyze this set of data, requesting 80 resamples, the estimate of the IC25 was 27.3625 µg/L. The empirical 95.0% confidence interval for the true mean was 20.8734 µg/L to 42.3270 µg/L. The computer program output for the IC25 for this data set is shown in Figure 8.

17.14 **PRECISION AND ACCURACY**

17.14.1 PRECISION

17.14.1.1 Single-Laboratory Precision

17.14.1.1.1 Single-laboratory precision data for the giant kelp 48-hour test method with the reference toxicants copper chloride and sodium azide with natural seawater are provided in Tables 21-22. The coefficient of variation (CV) of the germination EC50s using copper was 38.8%; the CV of the germ-tube length IC40s using copper was 32.9% (Table 21). The coefficient of variation (CV) of the germination EC50s using azide was 36.7%; the CV of the germ-tube length IC25s using azide was 30.8%, the CV of the germ-tube length IC50s using azide was 28.4% (Table 22).

17.14.1.2 Multi-laboratory Precision

17.14.1.2.1 Multi-laboratory precision data for the kelp 48-hour test method with the reference toxicant copper chloride are provided in Table 23. The coefficient of variation of the IC50s for the germ-tube length endpoint ranged between 8.4% and 55.5% using copper chloride. The coefficient of variation of the IC50s for the germination endpoint ranged between >1.1% and 67.6% using copper chloride.

17.14.2 ACCURACY

17.14.2.1 The accuracy of toxicity tests cannot be determined.

```
Conc. ID        1    2    3    4    5    6    7    8
-----------------------------------------------------
Conc. Tested    0  5.6   10   18   32   56  100  180
-----------------------------------------------------
Response  1 19.5818.2613.3118.5912.5411.44 7.92 6.49
Response  2 18.7516.2518.9212.8810.6711.88 7.59 7.25
Response  3 19.1416.3915.6216.2815.9511.88 8.25
Response  4 16.5018.7014.3015.3812.5411.00 9.13 7.63
Response  5 17.9315.6215.2919.7511.6611.55 8.80
-----------------------------------------------------
*** Inhibition Concentration Percentage Estimate ***
Toxicant/Effluent: Copper
Test Start Date:    Test Ending Date:
Test Species: Giant kelp, Macrocystis pyrifera
Test Duration:        48 hours
DATA FILE: kelpgrow.icp
OUTPUT FILE: kelpgrow.i25
-----------------------------------------------------------------------
Conc.     Number     Concentration     Response      Std.       Pooled
 ID     Replicates            ug/L       Means       Dev.   Response Means
-----------------------------------------------------------------------
  1          5             0.000         18.380      1.214     18.380
  2          5             5.600         17.044      1.352     17.044
  3          5            10.000         15.488      2.121     16.032
  4          5            18.000         16.576      2.707     16.032
  5          5            32.000         12.672      1.988     12.672
  6          5            56.000         11.550      0.365     11.550
  7          5           100.000          8.338      0.629      8.338
  8          4           180.000          7.375      0.691      7.375
-----------------------------------------------------------------------
The Linear Interpolation Estimate:    27.3625   Entered P Value: 25
-----------------------------------------------------------------------
Number of Resamplings:   80
The Bootstrap Estimates Mean:  27.5292 Standard Deviation:     4.7812
Original Confidence Limits:   Lower:    20.8734 Upper:    42.3270
Expanded Confidence Limits:   Lower:    17.6289 Upper:    49.8093
Resampling time in Seconds:     0.28  Random_Seed: -35158431
```

Figure 8. ICPIN program output for the IC25.

TABLE 21. SINGLE LABORATORY PRECISION OF THE GIANT KELP, *MACROCYSTIS PYRIFERA* GERMINATION AND GERM-TUBE LENGTH TEST WITH COPPER (CU •G/L) CHLORIDE AS THE REFERENCE TOXICANT

Test Number	Germ-Tube Length		Germination	
	NOEC	IC40	NOEC	EC50
1	<5.6	122.7	10.0	67.5
2	10.0	43.1	18.0	73.5
3	18.0	70.7	18.0	124.3
4	5.6	88.0	56.0	101.6
5	32.0	124.7	56.0	122.9
Mean	89.8		90.7	
CV	38.8%		32.9%	

Data from Anderson et al., 1994

TABLE 22. SINGLE LABORATORY PRECISION OF THE GIANT KELP, *MACROCYSTIS PYRIFERA* GERMINATION AND GERM-TUBE LENGTH TEST WITH SODIUM AZIDE (MG/L) AS THE REFERENCE TOXICANT

Test Date	Germ-Tube Length			Germination	
	NOEC	IC25	IC50	NOEC	EC50
2/11/92	18.0	39.5	133.7	18.0	52.3
2/18/92	18.0	34.1	96.5	32.0	72.6
6/29/92	32.0	57.5	142.2	32.0	132.1
7/07/92	10.0	33.1	92.5	10.0	79.2
7/15/92	18.0	42.8	138.9	18.0	117.8
7/16/92	5.6	25.0	68.4	10.0	48.3
7/22/92	10.0	30.2	80.6	18.0	62.4
10/09/92	5.6	25.1	80.0	5.6	60.3
7/02/92	10.0	24.8	80.1	18.0	84.0
Mean	34.7	101.4		78.8	
CV	30.8%	28.4%		36.7%	

Data from Hunt et al., 1991

TABLE 23. MULTI-LABORATORY PRECISION OF THE GIANT KELP, *MACROCYSTIS PYRIFERA* GERMINATION AND GERM-TUBE LENGTH TEST PERFORMED WITH COPPER CHLORIDE (µG/L) AS THE REFERENCE TOXICANT

	Lab	Germ-tube length NOEC	Germ-tube length IC40	Germination NOEC	Germination EC50	CV Germ-tube	CV Germination
March 1990	1	5.6	122.7	10.0	46.9	8.4%	>1.1%
	2	32.0	117.8	32.0	46.2		
	3	18.0	104.1	32.0	*		
May 1990	1	10.0	43.1	18.0	112.0	39.9%	59.3%
	2	<5.6	99.1	32.0	164.2		
	3	18.0	68.7	18.0	67.9		
May 1990	1	18.0	70.7	18.0	112.0	45.3%	nc
	2	18.0	91.3	56.0	64.5		
	3	32.0	134.2	32.0	158.0		
December 1990	1	5.6	88.0	56.0	77.7	45.3%	nc
	2	5.6	45.3	18.0	*		
September 1990	1	32.0	124.7	56.0	127.4	55.5%	7.4%
	2	18.0	54.4	56.0	114.8		
September 1989	1	<10.0	89.3**	56.0	115.5	44.5%	67.6%
	2	<10.0	171.8**	56.0	327.7		
November 1989	1	32.0	>180.0	<10.0	>180.0	nc	nc
	2	10.0	>180.0	18.0	>180.0		
May 1988	1	<56.0	232.0***	<56.0	211.0	nc	50.0%
	2	<56.0	*	56.0	100.7		

* No EC50 calculated because response was less than 50%.
** Only concentration means available, therefore no IC40 values were calculated.
nc Not calculated (Insufficient numbers to calculate the coefficient of variation).
*** IC50 value, not IC40

Data from Hunt et al., 1991

APPENDIX I. MACROCYSTIS TEST: STEP-BY-STEP SUMMARY

PREPARATION OF TEST SOLUTIONS

A. Determine test concentrations and appropriate dilution water based on NPDES permit conditions and guidance from the appropriate regulatory agency.

B. Prepare effluent test solutions by diluting well mixed unfiltered effluent using volumetric flasks and pipettes. Use hypersaline brine where necessary to maintain all test solutions at 34 ± 2‰. Include brine controls in tests that use brine.

C. Prepare a copper reference toxicant stock solution (10,000 µg/L) by adding 0.0268 of copper chloride ($CuCl_2 \circ 2H_2O$) to 1 liter of reagent water.

D. Prepare copper reference toxicant solution of 0 (control) 5.6, 10, 18, 32, 100 and 180 µg/L by adding 0, 0.56, 1.0 1.8, 3.2, 10.0 and 18.0 mL of stock solution, respectively, to a 1-L volumetric flask and filling to 1-L with dilution water.

E. Sample effluent and reference toxicant solutions for physical/chemical analysis. Measure salinity, pH and dissolved oxygen from each test concentration.

F. Randomize numbers for test chambers and record the chamber numbers with their respective test concentrations on a randomization data sheet. Store the data sheet safely until after the test samples have been analyzed.

G. Place test chambers in a water bath or environmental chamber set to 15•C and allow temperature to equilibrate.

H. Measure the temperature daily in one random replicate (or separate chamber) of each test concentration. Monitor the temperature of the water bath or environmental chamber continuously.

I. At the end of the test, measure salinity, pH, and dissolved oxygen concentration from each test concentration.

PREPARATION AND ANALYSIS OF TEST ORGANISMS

A. Collect sporophylls and rinse in 0.2 µm filtered seawater. Store at 9-12•C for no more than 24 hours before zoospore release.

B. Blot sporophylls and leave exposed to air for one hour.

C. Place 25-30 sporophylls one liter of 0.2 µm filtered seawater for no more than two hours. The presence of zoospores is indicated by a slight cloudiness in the water.

D. Take a sample of the zoospore solution from the top 5 centimeters of the beaker and determine the spore density using a hemacytometer. Determine the volume of water necessary to give 7,500 spores/mL of test solution. This volume should not exceed one percent of the test solution volume.

E. Verify that the zoospores are swimming, then pipet the volume of water necessary to give 7,500 spores/mL into each of the test chambers. Take zoospores from the top 5 centimeters of the release beaker so that only swimming zoospores are used.

F. At 48 ± 3 hours, count the number of germinated and non-germinated spores of the first 100 spores encountered in each replicate of each concentration. Measure the length of 10 randomly selected germination tubes (or preserve with 0.1% glutaraldehyde for later examination).

G. Analyze the data.

H. Include standard reference toxicant point estimate values in the standard quality control charts.

Data Sheet for Kelp Toxicity Test

Test Start Date: Start Time: Kelp Species :
Test End Date: End Time: Collection/Arrival Date:
Reference Toxicant: Kelp Source:

Sample Source: Microscope Model:
Sample Type: Solid Elutriate Pore Water Water Effluent Ref Tox
Micrometer Conversion Factor:

Test Cont. #	Station Code	Number of Spores Germ.	Number of Spores Not Germ.	Length Measurements (in ocular micrometer units)										Notes
				L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	
1														
2														
3														
4														
5														
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APPENDIX A

INDEPENDENCE, RANDOMIZATION, AND OUTLIERS

1. STATISTICAL INDEPENDENCE

1.1 Dunnett's Procedure and the *t* test with Bonferroni's adjustment are parametric procedures based on the assumptions that (1) the observations within treatments are independent and normally distributed, and (2) that the variance of the observations is homogeneous across all toxicant concentrations and the control. Of the three possible departures from the assumptions, non-normality, heterogeneity of variance, and lack of independence, those caused by lack of independence are the most difficult to resolve (see Scheffe, 1959). For toxicity data, statistical independence means that given knowledge of the true mean for a given concentration or control, knowledge of the error in any one actual observation would provide no information about the error in any other observation. Lack of independence is difficult to assess and difficult to test for statistically. It may also have serious effects on the true alpha or beta level. Therefore, it is of utmost importance to be aware of the need for statistical independence between observations and to be constantly vigilant in avoiding any patterned experimental procedure that might compromise independence. One of the best ways to help insure independence is to follow proper randomization procedures throughout the test.

2. RANDOMIZATION

2.1 Randomization of the distribution of test organisms among test chambers, and the arrangement of treatments and replicate chambers is an important part of conducting a valid test. The purpose of randomization is to avoid situations where test organisms are placed serially into test chambers, or where all replicates for a test concentration are located adjacent to one another, which could introduce bias into the test results.

2.2 An example of randomization of the distribution of test organisms among test chambers, and an example of randomization of arrangement of treatments and replicate chambers are described using the topsmelt, *Atherinops affinis*, Survival and Growth test. For the purpose of the example, the test design is as follows:

Five effluent concentrations are tested in addition to the control. The effluent concentrations are as follows: 6.25%, 12.5%, 25.0%, 50.0%, and 100.0%. There are five replicate chambers per treatment. Each replicate chamber contains five larvae.

2.3 RANDOMIZATION OF FISH TO REPLICATE CHAMBERS EXAMPLE

2.3.1 Consider first the random assignment of the fish to the replicate chambers. The first step is to label each of the replicate chambers with the control or effluent concentration and the replicate number. The next step is to assign each replicate chamber three double-digit numbers. An example of this assignment is provided in Table A.1. Note that the double digits 00 and 91 through 99 were not used.

2.3.2 The random numbers used to carry out the random assignment of fish to replicate chambers are provided in Table A.2.
The third step is to choose a starting position in Table A.2, and read the first double digit number. The first number read identifies the replicate chamber for the first fish taken from the tank. For the example, the first entry in row 2 was chosen as the starting position. The first number in this row is 37. According to Table A.1, this number corresponds to replicate chamber 2 of the 6.25% effluent concentration. Thus, the first fish taken from the tank is to be placed in replicate chamber 2 of the 6.25% effluent concentration.

2.3.3 The next step is to read the double digit number to the right of the first one. The second number identifies the replicate chamber for the second fish taken from the tank. Continuing the example, the second number read in row 2 of Table A.2 is 54. According to Table A.1, this number corresponds to replicate chamber 4 of the 50.0% effluent concentration. Thus, the second fish taken from the tank is to be placed in replicate chamber 4 of the 50.0% effluent concentration.

2.3.4 Continue in this fashion until all the fish have been randomly assigned to a replicate chamber. In order to fill each replicate chamber with ten fish, the assigned numbers will be used more than once. If a number is read from the table that was not assigned to a replicate chamber, then ignore it and continue to the next number. If a replicate chamber becomes filled and a

number is read from the table that corresponds to it, then ignore that value and continue to the next number. The first ten random summarized in Table A.3.2.3.5 Three double-digit numbers were assigned to each replicate chamber (instead of one or two double-digit numbers) in order to make efficient use of the random number table (Table A.2). To illustrate, consider the assignment of only one double-digit number to each replicate chamber: the first column of assigned numbers in Table A.1. Whenever the numbers 00 and 31 through 99 are read from Table A.2, they will be disregarded and the next number will be read.

TABLE A.1. RANDOM ASSIGNMENT OF FISH TO REPLICATE CHAMBERS EXAMPLE
ASSIGNED NUMBERS FOR EACH REPLICATE CHAMBER

Assigned Numbers	Replicate Chamber	
01, 31, 61	Control,	replicate chamber 1
02, 32, 62	Control,	replicate chamber 2
03, 33, 63	Control,	replicate chamber 3
04, 34, 64	Control,	replicate chamber 4
05, 35, 65	Control,	replicate chamber 5
06, 36, 66	6.25% effluent,	replicate chamber 1
07, 37, 67	6.25% effluent,	replicate chamber 2
08, 38, 68	6.25% effluent,	replicate chamber 3
09, 39, 69	6.25% effluent,	replicate chamber 4
10, 40, 70	6.25% effluent,	replicate chamber 5
11, 41, 71	12.5% effluent,	replicate chamber 1
12, 42, 72	12.5% effluent,	replicate chamber 2
13, 43, 73	12.5% effluent,	replicate chamber 3
14, 44, 74	12.5% effluent,	replicate chamber 4
15, 45, 75	12.5% effluent,	replicate chamber 5
16, 46, 76	25.0% effluent,	replicate chamber 1
17, 47, 77	25.0% effluent,	replicate chamber 2
18, 48, 78	25.0% effluent,	replicate chamber 3
19, 49, 79	25.0% effluent,	replicate chamber 4
20, 50, 80	25.0% effluent,	replicate chamber 5
21, 51, 81	50.0% effluent,	replicate chamber 1
22, 52, 82	50.0% effluent,	replicate chamber 2
23, 53, 83	50.0% effluent,	replicate chamber 3
24, 54, 84	50.0% effluent,	replicate chamber 4
25, 55, 85	50.0% effluent,	replicate chamber 5
26, 56, 86	100.0% effluent,	replicate chamber 1
27, 57, 87	100.0% effluent,	replicate chamber 2
28, 58, 88	100.0% effluent,	replicate chamber 3
29, 59, 89	100.0% effluent,	replicate chamber 4
30, 60, 90	100.0% effluent,	replicate chamber 5

TABLE A.2. TABLE OF RANDOM NUMBERS (Dixon and Massey, 1983)

10 09 73 25 33	76 52 01 35 86	34 67 35 43 76	80 95 90 91 17	39 29 27 49 45
37 54 20 48 05	64 89 47 42 96	24 80 52 40 37	20 63 61 04 02	00 82 29 16 65
08 42 26 89 53	19 64 50 93 03	23 20 90 25 60	15 95 33 47 64	35 08 03 36 06
99 01 90 25 29	09 37 67 07 15	38 31 13 11 65	88 67 67 43 97	04 43 62 76 59
12 80 79 99 70	80 15 73 61 47	64 03 23 66 53	98 95 11 68 77	12 27 17 68 33
66 06 57 47 17	34 07 27 68 50	36 69 73 61 70	65 81 33 98 85	11 19 92 91 70
31 06 01 08 05	45 57 18 24 06	35 30 34 26 14	86 79 90 74 39	23 40 30 97 32
85 26 97 76 02	02 05 16 56 92	68 66 57 48 18	73 05 38 52 47	18 62 38 85 79
63 57 33 21 35	05 32 54 70 48	90 55 35 75 48	28 46 82 87 09	83 49 12 56 24
73 79 64 57 53	03 52 96 47 78	35 80 83 42 82	60 93 52 03 44	35 27 38 84 35
98 52 01 77 67	14 90 56 86 07	22 10 94 05 58	60 97 09 34 33	50 50 07 39 98
11 80 50 54 31	39 80 82 77 32	50 72 56 82 48	29 40 52 42 01	52 77 56 78 51
83 45 29 96 34	06 28 89 80 83	13 74 67 00 78	18 47 54 06 10	68 71 17 78 17
88 68 54 02 00	86 50 75 84 01	36 76 66 79 51	90 36 47 64 93	29 60 91 10 62
99 59 46 73 48	87 51 76 49 69	91 82 60 89 28	93 78 56 13 68	23 47 83 41 13
65 48 11 76 74	17 46 85 09 50	58 04 77 69 74	73 03 95 71 86	40 21 81 65 44
80 12 43 56 35	17 72 70 80 15	45 31 82 23 74	21 11 57 82 53	14 38 55 37 63
74 35 09 98 17	77 40 27 72 14	43 23 60 02 10	45 52 16 42 37	96 28 60 26 55
69 91 62 68 03	66 25 22 91 48	36 93 68 72 03	76 62 11 39 90	94 40 05 64 18
09 89 32 05 05	14 22 56 85 14	46 42 75 67 88	96 29 77 88 22	54 38 21 45 98
91 49 91 45 23	68 47 92 76 86	46 16 28 35 54	94 75 08 99 23	37 08 92 00 48
80 33 69 45 98	26 94 03 68 58	70 29 73 41 35	53 14 03 33 40	42 05 08 23 41
44 10 48 19 49	85 15 74 79 54	32 97 92 65 75	57 60 04 08 81	22 22 20 64 13
12 55 07 37 42	11 10 00 20 40	12 86 07 46 97	96 64 48 94 39	28 70 72 58 15
63 60 64 93 29	16 50 53 44 84	40 21 95 25 63	43 65 17 70 82	07 20 73 17 90
61 19 69 04 46	26 45 74 77 74	51 92 43 37 29	65 39 45 95 93	42 58 26 05 27
15 47 44 52 66	95 27 07 99 53	59 36 78 38 48	82 39 61 01 18	33 21 15 94 66
94 55 72 85 73	67 89 75 43 87	54 62 24 44 31	91 19 04 25 92	92 92 74 59 73
42 48 11 62 13	97 34 40 87 21	16 86 84 87 67	03 07 11 20 59	25 70 14 66 70
23 52 37 83 17	73 20 88 98 37	68 93 59 14 16	26 25 22 96 63	05 52 28 25 62
04 49 35 24 94	75 24 63 38 24	45 86 25 10 25	61 96 27 93 35	65 33 71 24 72
00 54 99 76 54	64 05 18 81 59	96 11 96 38 96	54 69 28 23 91	23 28 72 95 29
35 96 31 53 07	26 89 80 93 45	33 35 13 54 62	77 97 45 00 24	90 10 33 93 33
59 80 80 83 91	45 42 72 68 42	83 60 94 97 00	13 02 12 48 92	78 56 52 01 06
46 05 88 52 36	01 39 09 22 86	77 28 14 40 77	93 91 08 36 47	70 61 74 29 41
32 17 90 05 97	87 37 92 52 41	05 56 70 70 07	86 74 31 71 57	85 39 41 18 38
69 23 46 14 06	20 11 74 52 04	15 95 66 00 00	18 74 39 24 23	97 11 89 63 38
19 56 54 14 30	01 75 87 53 79	40 41 92 15 85	66 67 43 68 06	84 96 28 52 07
45 15 51 49 38	19 47 60 72 46	43 66 79 45 43	59 04 79 00 33	20 82 66 95 41
94 86 43 19 94	36 16 81 08 51	34 88 88 15 53	01 54 03 54 56	05 01 45 11 76
98 08 62 48 26	45 24 02 84 04	44 99 90 88 96	39 09 47 34 07	35 44 13 18 80
33 18 51 62 32	41 94 15 09 49	89 43 54 85 81	88 69 54 19 94	37 54 87 30 43
80 95 10 04 06	96 38 27 07 74	20 15 12 33 87	25 01 62 52 98	94 62 46 11 71
79 75 24 91 40	71 96 12 82 96	69 86 10 25 91	74 85 22 05 39	00 38 75 95 79
18 63 33 25 37	98 14 50 65 71	31 01 02 46 74	05 45 56 14 27	77 93 89 19 36
74 02 94 39 02	77 55 73 22 70	97 79 01 71 19	52 52 75 80 21	80 81 45 17 48
54 17 84 56 11	80 99 33 71 43	05 33 51 29 69	56 12 71 92 55	36 04 09 03 24
11 66 44 98 83	52 07 98 48 27	59 38 17 15 39	09 97 33 34 40	88 46 12 33 56
48 32 47 79 28	31 24 96 47 10	02 29 53 68 70	32 30 75 75 46	15 02 00 99 94
69 07 49 41 38	87 63 79 19 76	35 58 40 44 01	10 51 82 16 15	01 84 87 69 38

2.4 RANDOMIZATION OF REPLICATE CHAMBERS TO POSITIONS EXAMPLE

2.4.1 Next consider the random assignment of the 30 replicate chambers to positions within the water bath (or equivalent). Assume that the replicate chambers are to be positioned in a five row by six column rectangular array. The first step is to label the positions in the water bath. Table A.4 provides an example layout. assignments of fish to replicate chambers for the example are

TABLE A.3. EXAMPLE OF RANDOM ASSIGNMENT OF FIRST TEN FISH TO REPLICATE CHAMBERS

Fish	Assignment
First fish taken from tank	6.25% effluent, replicate chamber 2
Second fish taken from tank	50.0% effluent, replicate chamber 4
Third fish taken from tank	25.0% effluent, replicate chamber 5
Fourth fish taken from tank	25.0% effluent, replicate chamber 3
Fifth fish taken from tank	Control, replicate chamber 5
Sixth fish taken from tank	Control, replicate chamber 4
Seventh fish taken from tank	100.0% effluent, replicate chamber 4
Eighth fish taken from tank	25.0% effluent, replicate chamber 2
Ninth fish taken from tank	12.5% effluent, replicate chamber 2
Tenth fish taken from tank	50.0% effluent, replicate chamber 4

TABLE A.4. RANDOM ASSIGNMENT OF REPLICATE CHAMBERS TO POSITIONS: EXAMPLE LABELLING THE POSITIONS WITHIN THE WATER BATH

1	2	3	4	5	6
7	8	9	10	11	12
13	14	15	16	17	18
19	20	21	22	23	24
25	26	27	28	29	30

2.4.2 The second step is to assign each of the 30 positions three double-digit numbers. An example of this assignment is provided in Table A.5. Note that the double digits 00 and 91 through 99 were not used.

2.4.3 The random numbers used to carry out the random assignment of replicate chambers to positions are provided in Table A.2. The third step is to choose a starting position in Table A.2, and read the first double-digit number. The first number read identifies the position for the first replicate chamber of the control. For the example, the first entry in row 10 of Table A.2 was chosen as the starting position. The first number in this row was 73. According to Table A.5, this number corresponds to position 13. Thus, the first replicate chamber for the control will be placed in position 13.

2.4.4 The next step is to read the double-digit number to the right of the first one. The second number identifies the position for the second replicate chamber of the control. Continuing the example, the second number read in row 10 of Table A.2 is 79. According to Table A.5, this number corresponds to position 19. Thus, the second replicate chamber for the control will be placed in position 19.

2.4.5 Continue in this fashion until all the replicate chambers have been assigned to a position. The first five numbers read will identify the positions for the control replicate chambers, the second five numbers read will identify the positions for the lowest effluent concentration replicate chambers, and so on. If a number is read from the table that was not assigned to a position, then ignore that value and continue to the next number. If a number is repeated in Table A.2, then ignore the repeats and continue to the next number. The complete randomization of replicate chambers to positions for the example is displayed in Table A.6.

2.4.6 Three double-digit numbers were assigned to each position (instead of one or two) in order to make efficient use of the random number table (Table A.2). To illustrate, consider the assignment of only one double-digit number to each position: the first column of assigned numbers in Table A.5. Whenever the numbers 00 and 31 through 99 are read from Table A.2, they will be disregarded and the next number will be read.

3. **OUTLIERS**

3.1 An outlier is an inconsistent or questionable data point that appears unrepresentative of the general trend exhibited by the majority of the data. Outliers may be detected by tabulation of the data, plotting, and by an analysis of the residuals. An explanation should be sought for any questionable data points. Without an explanation, data points should be discarded only with extreme caution. If there is no explanation, the analysis should be performed both with and without the outlier, and the results of both analyses should be reported.

3.2 Gentleman-Wilk's A statistic gives a test for the condition that the extreme observation may be considered an outlier. For a discussion of this, and other techniques for evaluating outliers, see Draper and John (1981).

TABLE ***A.5.*** ***RANDOM ASSIGNMENT OF REPLICATE CHAMBERS TO POSITIONS: EXAMPLE ASSIGNED NUMBERS FOR EACH POSITION***

Assigned Numbers	Position
01, 31, 61	1
02, 32, 62	2
03, 33, 63	3
04, 34, 64	4
05, 35, 65	5
06, 36, 66	6
07, 37, 67	7
08, 38, 68	8
09, 39, 69	9
10, 40, 70	10
11, 41, 71	11
12, 42, 72	12
13, 43, 73	13
14, 44, 74	14
15, 45, 75	15
16, 46, 76	16
17, 47, 77	17
18, 48, 78	18
19, 49, 79	19
20, 50, 80	20
21, 51, 81	21
22, 52, 82	22
23, 53, 83	23
24, 54, 84	24
25, 55, 85	25
26, 56, 86	26
27, 57, 87	27
28, 58, 88	28
29, 59, 89	29
30, 60, 90	30

TABLE A.6. EXAMPLE OF RANDOM ASSIGNMENT OF REPLICATE CHAMBERS TO POSITIONS:

ASSIGNMENT OF ALL 30 POSITIONS

25.0%	50.0%	6.25%	Control	6.25%	100.0%
25.0%	12.5%	50.0%	25.0%	50.0%	12.5%
Control	12.5%	100.0%	100.0%	6.25%	6.25%
Control	12.5%	100.0%	6.25%	Control	25.0%
100.0%	25.0%	Control	50.0%	50.0%	12.5%

APPENDIX B

VALIDATING NORMALITY AND HOMOGENEITY OF VARIANCE ASSUMPTIONS

1. INTRODUCTION

1.1 Dunnett's Procedure and the *t* test with Bonferroni's adjustment are parametric procedures based on the assumptions that the observations within treatments are independent and normally distributed, and that the variance of the observations is homogeneous across all toxicant concentrations and the control. These assumptions should be checked prior to using these tests, to determine if they have been met. Tests for validating the assumptions are provided in the following discussion. If the tests fail (if the data do not meet the assumptions), a nonparametric procedure such as Steel's Many-one Rank Test may be more appropriate. However, the decision on whether to use parametric or nonparametric tests may be a judgement call, and a statistician should be consulted in selecting the analysis.

2. TEST FOR NORMAL DISTRIBUTION OF DATA

2.1 SHAPIRO-WILK'S TEST

2.1.1 One formal test for normality is the Shapiro-Wilk's Test (Conover, 1980). The test statistic is obtained by dividing the square of an appropriate linear combination of the sample order statistics by the usual symmetric estimate of variance. The calculated W must be greater than zero and less than or equal to one. This test is recommended for a sample size of 50 or less. If the sample size is greater than 50, the Kolmogorov "D" statistic (Stephens, 1974) is recommended. An example of the Shapiro-Wilk's test is provided below.

2.2 The example uses growth data from the Mysid Larval Survival and Growth Test. The same data are used later in the discussions of the homogeneity of variance determination in Section 3 of this appendix and Dunnett's Procedure in Appendix C. The data, the mean and variance of the observations at each concentration, including the control, are listed in Table B.1.

TABLE B.1. MYSID, *HOLMESIMYSIS COSTATA*, GROWTH DATA

Replicate	Control	Concentration (%) 1.80	3.20	5.60
1	0.048	0.055	0.057	0.041
2	0.058	0.048	0.050	0.040
3	0.047	0.042	0.046	0.041
4	0.058	0.041	0.043	0.043
5	0.051	0.052	0.045	0.040
Mean(Y_i)	0.052	0.048	0.048	0.041
S_i^2	0.0000283	0.0000373	0.0000307	0.0000015
i	1	2	3	4

2.3 The first step of the test for normality is to center the observations by subtracting the mean of all observations within a concentration from each observation in that concentration. The centered observations are listed in Table B.2.

TABLE B.2. CENTERED OBSERVATIONS FOR SHAPIRO-WILK'S EXAMPLE

Replicate	Control	Concentration (%) 1.80	3.20	5.60
1	-0.004	0.007	0.009	0.000
2	0.006	0.000	0.002	-0.001
3	-0.005	-0.006	-0.002	0.000
4	0.006	-0.007	-0.005	0.002
5	-0.001	0.004	-0.003	-0.001

2.4 Calculate the denominator, D, of the statistic:

$$D = \sum_{i=1}^{n} (X_i - \bar{X})^2$$

Where: X_i = the ith centered observation

$\bar{X}$ = the overall mean of the centered observations

n = the total number of centered observations

2.4.1 For this set of data, n = 20

$$\bar{X} = \frac{1}{20}(0.001) = 0.000$$

$$D = 0.000393$$

2.5 Order the centered observations from smallest to largest

$$X^{(1)} \bullet X^{(2)} \bullet \ldots \bullet X^{(n)}$$

where $X^{(i)}$ denotes the ith ordered observation. The ordered observations for this example are listed in Table B.3.

TABLE B.3. ORDERED CENTERED OBSERVATIONS FOR SHAPIRO-WILK'S EXAMPLE

i	$X^{(i)}$	i	$X^{(i)}$
1	-0.007	11	0.000
2	-0.006	12	0.000
3	-0.005	13	0.000
4	-0.005	14	0.002
5	-0.004	15	0.002
6	-0.003	16	0.004
7	-0.002	17	0.006
8	-0.001	18	0.006
9	-0.001	19	0.007
10	-0.001	20	0.009

2.6 From Table B.4, for the number of observations, n, obtain the coefficients a_1, a_2, ... a_k where k is n/2 if n is even and (n-1)/2 if n is odd. For the data in this example, n = 20 and k = 10. The a_i values are listed in Table B.5.

TABLE B.4. COEFFICIENTS FOR THE SHAPIRO-WILK'S TEST (Conover, 1980)

	Number of Observations								
i • n	2	3	4	5	6	7	8	9	10
1	0.7071	0.7071	0.6872	0.6646	0.6431	0.6233	0.6052	0.5888	0.5739
2	-	0.0000	0.1667	0.2413	0.2806	0.3031	0.3164	0.3244	0.3291
3	-	-	-	0.0000	0.0875	0.1401	0.1743	0.1976	0.2141
4	-	-	-	-	-	0.0000	0.0561	0.0947	0.1224
5	-	-	-	-	-	-	-	0.0000	0.0399

	Number of Observations									
i • n	11	12	13	14	15	16	17	18	19	20
1	0.5601	0.5475	0.5359	0.5251	0.5150	0.5056	0.4968	0.4886	0.4808	0.4734
2	0.3315	0.3325	0.3325	0.3318	0.3306	0.3290	0.3273	0.3253	0.3232	0.3211
3	0.2260	0.2347	0.2412	0.2460	0.2495	0.2521	0.2540	0.2553	0.2561	0.2565
4	0.1429	0.1586	0.1707	0.1802	0.1878	0.1939	0.1988	0.2027	0.2059	0.2085
5	0.0695	0.0922	0.1099	0.1240	0.1353	0.1447	0.1524	0.1587	0.1641	0.1686
6	0.0000	0.0303	0.0539	0.0727	0.0880	0.1005	0.1109	0.1197	0.1271	0.1334
7	-	-	0.0000	0.0240	0.0433	0.0593	0.0725	0.0837	0.0932	0.1013
8	-	-	-	-	0.0000	0.0196	0.0359	0.0496	0.0612	0.0711
9	-	-	-	-	-	-	0.0000	0.0163	0.0303	0.0422
10	-	-	-	-	-	-	-	-	0.0000	0.0140

	Number of Observations									
i • n	21	22	23	24	25	26	27	28	29	30
1	0.4643	0.4590	0.4542	0.4493	0.4450	0.4407	0.4366	0.4328	0.4291	0.4254
2	0.3185	0.3156	0.3126	0.3098	0.3069	0.3043	0.3018	0.2992	0.2968	0.2944
3	0.2578	0.2571	0.2563	0.2554	0.2543	0.2533	0.2522	0.2510	0.2499	0.2487
4	0.2119	0.2131	0.2139	0.2145	0.2148	0.2151	0.2152	0.2151	0.2150	0.2148
5	0.1736	0.1764	0.1787	0.1807	0.1822	0.1836	0.1848	0.1857	0.1864	0.1870
6	0.1399	0.1443	0.1480	0.1512	0.1539	0.1563	0.1584	0.1601	0.1616	0.1630
7	0.1092	0.1150	0.1201	0.1245	0.1283	0.1316	0.1346	0.1372	0.1395	0.1415
8	0.0804	0.0878	0.0941	0.0997	0.1046	0.1089	0.1128	0.1162	0.1192	0.1219
9	0.0530	0.0618	0.0696	0.0764	0.0823	0.0876	0.0923	0.0965	0.1002	0.1036
10	0.0263	0.0368	0.0459	0.0539	0.0610	0.0672	0.0728	0.0778	0.0822	0.0862
11	0.0000	0.0122	0.0228	0.0321	0.0403	0.0476	0.0540	0.0598	0.0650	0.0697
12	-	-	0.0000	0.0107	0.0200	0.0284	0.0358	0.0424	0.0483	0.0537
13	-	-	-	-	0.0000	0.0094	0.0178	0.0253	0.0320	0.0381
14	-	-	-	-	-	-	0.0000	0.0084	0.0159	0.0227
15	-	-	-	-	-	-	-	-	0.0000	0.0076

TABLE B.4. COEFFICIENTS FOR THE SHAPIRO-WILK'S TEST (CONTINUED)

	Number of Observations									
i • n	31	32	33	34	35	36	37	38	39	40
1	0.4220	0.4188	0.4156	0.4127	0.4096	0.4068	0.4040	0.4015	0.3989	0.3964
2	0.2921	0.2898	0.2876	0.2854	0.2834	0.2813	0.2794	0.2774	0.2755	0.2737
3	0.2475	0.2462	0.2451	0.2439	0.2427	0.2415	0.2403	0.2391	0.2380	0.2368
4	0.2145	0.2141	0.2137	0.2132	0.2127	0.2121	0.2116	0.2110	0.2104	0.2098
5	0.1874	0.1878	0.1880	0.1882	0.1883	0.1883	0.1883	0.1881	0.1880	0.1878
6	0.1641	0.1651	0.1660	0.1667	0.1673	0.1678	0.1683	0.1686	0.1689	0.1691
7	0.1433	0.1449	0.1463	0.1475	0.1487	0.1496	0.1505	0.1513	0.1520	0.1526
8	0.1243	0.1265	0.1284	0.1301	0.1317	0.1331	0.1344	0.1356	0.1366	0.1376
9	0.1066	0.1093	0.1118	0.1140	0.1160	0.1179	0.1196	0.1211	0.1225	0.1237
10	0.0899	0.0931	0.0961	0.0988	0.1013	0.1036	0.1056	0.1075	0.1092	0.1108
11	0.0739	0.0777	0.0812	0.0844	0.0873	0.0900	0.0924	0.0947	0.0967	0.0986
12	0.0585	0.0629	0.0669	0.0706	0.0739	0.0770	0.0798	0.0824	0.0848	0.0870
13	0.0435	0.0485	0.0530	0.0572	0.0610	0.0645	0.0677	0.0706	0.0733	0.0759
14	0.0289	0.0344	0.0395	0.0441	0.0484	0.0523	0.0559	0.0592	0.0622	0.0651
15	0.0144	0.0206	0.0262	0.0314	0.0361	0.0404	0.0444	0.0481	0.0515	0.0546
16	0.0000	0.0068	0.0131	0.0187	0.0239	0.0287	0.0331	0.0372	0.0409	0.0444
17	-	-	0.0000	0.0062	0.0119	0.0172	0.0220	0.0264	0.0305	0.0343
18	-	-	-	-	0.0000	0.0057	0.0110	0.0158	0.0203	0.0244
19	-	-	-	-	-	-	0.0000	0.0053	0.0101	0.0146
20	-	-	-	-	-	-	-	-	0.0000	0.0049

	Number of Observations									
i • n	41	42	43	44	45	46	47	48	49	50
1	0.3940	0.3917	0.3894	0.3872	0.3850	0.3830	0.3808	0.3789	0.3770	0.3751
2	0.2719	0.2701	0.2684	0.2667	0.2651	0.2635	0.2620	0.2604	0.2589	0.2574
3	0.2357	0.2345	0.2334	0.2323	0.2313	0.2302	0.2291	0.2281	0.2271	0.2260
4	0.2091	0.2085	0.2078	0.2072	0.2065	0.2058	0.2052	0.2045	0.2038	0.2032
5	0.1876	0.1874	0.1871	0.1868	0.1865	0.1862	0.1859	0.1855	0.1851	0.1847
6	0.1693	0.1694	0.1695	0.1695	0.1695	0.1695	0.1695	0.1693	0.1692	0.1691
7	0.1531	0.1535	0.1539	0.1542	0.1545	0.1548	0.1550	0.155l	0.1553	0.1554
8	0.1384	0.1392	0.1398	0.1405	0.1410	0.1415	0.1420	0.1423	0.1427	0.1430
9	0.1249	0.1259	0.1269	0.1278	0.1286	0.1293	0.1300	0.1306	0.1312	0.1317
10	0.1123	0.1136	0.1149	0.1160	0.1170	0.1180	0.1189	0.1197	0.1205	0.1212
11	0.1004	0.1020	0.1035	0.1049	0.1062	0.1073	0.1085	0.1095	0.1105	0.1113
12	0.0891	0.0909	0.0927	0.0943	0.0959	0.0972	0.0986	0.0998	0.1010	0.1020
13	0.0782	0.0804	0.0824	0.0842	0.0860	0.0876	0.0892	0.0906	0.0919	0.0932
14	0.0677	0.0701	0.0724	0.0745	0.0765	0.0783	0.0801	0.0817	0.0832	0.0846
15	0.0575	0.0602	0.0628	0.0651	0.0673	0.0694	0.0713	0.0731	0.0748	0.0764
16	0.0476	0.0506	0.0534	0.0560	0.0584	0.0607	0.0628	0.0648	0.0667	0.0685
17	0.0379	0.0411	0.0442	0.0471	0.0497	0.0522	0.0546	0.0568	0.0588	0.0608
18	0.0283	0.0318	0.0352	0.0383	0.0412	0.0439	0.0465	0.0489	0.0511	0.0532
19	0.0188	0.0227	0.0263	0.0296	0.0328	0.0357	0.0385	0.0411	0.0436	0.0459
20	0.0094	0.0136	0.0175	0.0211	0.0245	0.0277	0.0307	0.0335	0.0361	0.0386
21	0.0000	0.0045	0.0087	0.0126	0.0163	0.0197	0.0229	0.0259	0.0288	0.0314
22	-	-	0.0000	0.0042	0.0081	0.0118	0.0153	0.0185	0.0215	0.0244
23	-	-	-	-	0.0000	0.0039	0.0076	0.0111	0.0143	0.0174
24	-	-	-	-	-	-	0.0000	0.0037	0.0071	0.0104
25	-	-	-	-	-	-	-	-	0.0000	0.0035

2.7 Compute the test statistic, W, as follows:

$$W = \frac{1}{D}\left[\sum_{i=1}^{k} a_i\left(X^{(n-i+1)} - X^{(i)}\right)\right]^2$$

The differences $X^{(n-i+1)} - X^{(i)}$ are listed in Table B.5. For this set of data:

$$W = \frac{1}{0.000393}(0.0194)^2 = 0.958$$

TABLE B.5. COEFFICIENTS AND DIFFERENCES FOR SHAPIRO-WILK'S EXAMPLE

i	a_i	$X^{(n-i+1)} - X^{(i)}$	
1	0.4734	0.016	$X^{(20)} - X^{(1)}$
2	0.3211	0.013	$X^{(19)} - X^{(2)}$
3	0.2565	0.011	$X^{(18)} - X^{(3)}$
4	0.2085	0.011	$X^{(17)} - X^{(4)}$
5	0.1686	0.008	$X^{(16)} - X^{(5)}$
6	0.1334	0.005	$X^{(15)} - X^{(6)}$
7	0.1013	0.004	$X^{(14)} - X^{(7)}$
8	0.0711	0.001	$X^{(13)} - X^{(8)}$
9	0.0422	0.001	$X^{(12)} - X^{(9)}$
10	0.0140	0.001	$X^{(11)} - X^{(10)}$

2.8 The decision rule for this test is to compare the computed W to the critical value found in Table B.6. If the computed W is less than the critical value, conclude that the data are not normally distributed. For this set of data, the critical value at a significance level of 0.01 and n = 20 observations is 0.868. Since W = 0.958 is greater than the critical value, conclude that the data are normally distributed.

2.9 In general, if the data fail the test for normality, a transformation such as to log values may normalize the data. After transforming the data, repeat the Shapiro Wilk's Test for normality.

TABLE B.6. QUANTILES OF THE SHAPIRO WILK'S TEST STATISTIC (Conover, 1980)

n	0.01	0.02	0.05	0.10	0.50	0.90	0.95	0.98	0.99
3	0.753	0.756	0.767	0.789	0.959	0.998	0.999	1.000	1.000
4	0.687	0.707	0.748	0.792	0.935	0.987	0.992	0.996	0.997
5	0.686	0.715	0.762	0.806	0.927	0.979	0.986	0.991	0.993
6	0.713	0.743	0.788	0.826	0.927	0.974	0.981	0.986	0.989
7	0.730	0.760	0.803	0.838	0.928	0.972	0.979	0.985	0.988
8	0.749	0.778	0.818	0.851	0.932	0.972	0.978	0.984	0.987
9	0.764	0.791	0.829	0.859	0.935	0.972	0.978	0.984	0.986
10	0.781	0.806	0.842	0.869	0.938	0.972	0.978	0.983	0.986
11	0.792	0.817	0.850	0.876	0.940	0.973	0.979	0.984	0.986
12	0.805	0.828	0.859	0.883	0.943	0.973	0.979	0.984	0.986
13	0.814	0.837	0.866	0.889	0.945	0.974	0.979	0.984	0.986
14	0.825	0.846	0.874	0.895	0.947	0.975	0.980	0.984	0.986
15	0.835	0.855	0.881	0.901	0.950	0.975	0.980	0.984	0.987
16	0.844	0.863	0.887	0.906	0.952	0.976	0.981	0.985	0.987
17	0.851	0.869	0.892	0.910	0.954	0.977	0.981	0.985	0.987
18	0.858	0.874	0.897	0.914	0.956	0.978	0.982	0.986	0.988
19	0.863	0.879	0.901	0.917	0.957	0.978	0.982	0.986	0.988
20	0.868	0.884	0.905	0.920	0.959	0.979	0.983	0.986	0.988
21	0.873	0.888	0.908	0.923	0.960	0.980	0.983	0.987	0.989
22	0.878	0.892	0.911	0.926	0.961	0.980	0.984	0.987	0.989
23	0.881	0.895	0.914	0.928	0.962	0.981	0.984	0.987	0.989
24	0.884	0.898	0.916	0.930	0.963	0.981	0.984	0.987	0.989
25	0.888	0.901	0.918	0.931	0.964	0.981	0.985	0.988	0.989
26	0.891	0.904	0.920	0.933	0.965	0.982	0.985	0.988	0.989
27	0.894	0.906	0.923	0.935	0.965	0.982	0.985	0.988	0.990
28	0.896	0.908	0.924	0.936	0.966	0.982	0.985	0.988	0.990
29	0.898	0.910	0.926	0.937	0.966	0.982	0.985	0.988	0.990
30	0.900	0.912	0.927	0.939	0.967	0.983	0.985	0.988	0.990
31	0.902	0.914	0.929	0.940	0.967	0.983	0.986	0.988	0.990
32	0.904	0.915	0.930	0.941	0.968	0.983	0.986	0.988	0.990
33	0.906	0.917	0.931	0.942	0.968	0.983	0.986	0.989	0.990
34	0.908	0.919	0.933	0.943	0.969	0.983	0.986	0.989	0.990
35	0.910	0.920	0.934	0.944	0.969	0.984	0.986	0.989	0.990
36	0.912	0.922	0.935	0.945	0.970	0.984	0.986	0.989	0.990
37	0.914	0.924	0.936	0.946	0.970	0.984	0.987	0.989	0.990
38	0.916	0.925	0.938	0.947	0.971	0.984	0.987	0.989	0.990
39	0.917	0.927	0.939	0.948	0.971	0.984	0.987	0.989	0.991
40	0.919	0.928	0.940	0.949	0.972	0.985	0.987	0.989	0.991
41	0.920	0.929	0.941	0.950	0.972	0.985	0.987	0.989	0.991
42	0.922	0.930	0.942	0.951	0.972	0.985	0.987	0.989	0.991
43	0.923	0.932	0.943	0.951	0.973	0.985	0.987	0.990	0.991
44	0.924	0.933	0.944	0.952	0.973	0.985	0.987	0.990	0.991
45	0.926	0.934	0.945	0.953	0.973	0.985	0.988	0.990	0.991
46	0.927	0.935	0.945	0.953	0.974	0.985	0.988	0.990	0.991
47	0.928	0.936	0.946	0.954	0.974	0.985	0.988	0.990	0.991
48	0.929	0.937	0.947	0.954	0.974	0.985	0.988	0.990	0.991
49	0.929	0.937	0.947	0.955	0.974	0.985	0.988	0.990	0.991
50	0.930	0.938	0.947	0.955	0.974	0.985	0.988	0.990	0.991

3. TEST FOR HOMOGENEITY OF VARIANCE

3.1 For Dunnett's Procedure and the t test with Bonferroni's adjustment, the variances of the data obtained from each toxicant concentration and the control are assumed to be equal. Bartlett's Test is a formal test of this assumption. In using this test, it is assumed that the data are normally distributed.

3.2 The data used in this example are growth data from a Mysid Survival and Growth Test, and are the same data used in Appendix C. These data are listed in Table B.7, together with the calculated variance for the control and each toxicant concentration.

TABLE B.7. MYSID, *HOLMESIMYSIS COSTATA*, GROWTH DATA

		Concentration (%)		
Replicate	Control	1.80	3.20	5.60
1	0.048	0.055	0.057	0.041
2	0.058	0.048	0.050	0.040
3	0.047	0.042	0.046	0.041
4	0.058	0.041	0.043	0.043
5	0.051	0.052	0.045	0.040
Mean(Y_i)	0.052	0.048	0.048	0.041
S_i^2	0.0000283	0.0000373	0.0000307	0.0000015
i	1	2	3	4

3.3 The test statistic for Bartlett's Test (Snedecor and Cochran, 1980) is as follows:

$$B = \frac{\left[\left(\sum_{i=1}^{p} V_i\right) \ln \bar{S}^2 - \sum_{i=1}^{p} V_i \ln S_i^2\right]}{C}$$

Where: V_i = degrees of freedom for each effluent concentration and control, ($V_i = n_i - 1$)

p = number of levels of toxicant concentration including the control

ln = $\log_e$

i = 1, 2, ..., p where p is the number of concentrations including the control

n_i =the number of replicates for concentration i.

$$\bar{S}^2 = \frac{\left(\sum_{i=1}^{p} V_i S_i^2\right)}{\sum_{i=1}^{p} V_i}$$

$$C = 1 + [3(p-1)]^{-1}\left[\sum_{i=1}^{p} 1/V_i - \left(\sum_{i=1}^{p} V_i\right)^{-1}\right]$$

3.4 Since B is approximately distributed as chi-square with p - 1 degrees of freedom when the variances are equal, the appropriate critical value is obtained from a table of the chi-square distribution for p - 1 degrees of freedom and a significance level of 0.01. If B is less than the critical value then the variances are assumed to be equal.

3.5 For the data in this example, all concentrations including the control have the same number of replicates (n_i - 5 for all i). Thus, V_i = 4 for all i. For this data, p = 4, $\bar{S}^2$ = 0.0000245, and C = 1.104. Bartlett's statistic is therefore:

$$B = [(16)\ln(0.0000245) - 4\sum_{i=1}^{p} \ln(S_i^2)]/1.104$$

$$= [16(-10.617) - 4(-44.470)]/1.104$$

$$= [-169.872 - (-177.880)]/1.104$$

$$= 7.254$$

3.6 Since B is approximately distributed as chi-square with p - 1 degrees of freedom when the variances are equal, the appropriate critical value for the test is 9.21 for a significance level of 0.01. Since B = 7.254 is less than 9.21, conclude that the variances are not different.

4. **TRANSFORMATIONS OF THE DATA**

4.1 When the assumptions of normality and/or homogeneity of variance are not met, transformations of the data may remedy the problem, so that the data can be analyzed by parametric procedures, rather than nonparametric technique such as Steel's Many-one Rank Test or Wilcoxon's Rank Sum Test. Examples of transformations include log, square root, arc sine square root, and reciprocals. After the data have been transformed, the Shapiro-Wilk's and Bartlett's tests should be performed on the transformed observations to determine whether the assumptions of normality and/or homogeneity of variance are met.

4.2 ARC SINE SQUARE ROOT TRANSFORMATION (USEPA, 1993).

4.2.1 For data consisting of proportions from a binomial (response/no response; live/dead) response variable, the variance within the ith treatment is proportional to P_i (1 - P_i), where P_i is the expected proportion for the treatment. This clearly violates the homogeneity of variance assumption required by parametric procedures such as Dunnett's Procedure or the *t* test with Bonferroni's adjustment, since the existence of a treatment effect implies different values of P_i for different treatments, i. Also, when the observed proportions are based on small samples, or when P_i is close to zero or one, the normality assumption may be invalid. The arc sine square root (arc sine •• P•) transformation is commonly used for such data to stabilize the variance and satisfy the normality requirement.

4.2.2 Arc sine transformation consists of determining the angle (in radians) represented by a sine value. In the case of arc sine square root transformation of mortality data, the organism response proportion (proportion dead or affected; proportion surviving) is taken as the sine value, the square root of the sine value is determined, and the angle (in radians) for the square root of the sine value is determined. Whenever the response proportion is 0 or 1, a special modification of the arc sine square root transformation must be used (Bartlett, 1937). An explanation of the arc sine square root transformation and the modification is provided below.

4.2.3 Calculate the response proportion (RP) at each effluent concentration, in this case proportion surviving where:

RP = (number of surviving or unaffected organisms)/(number exposed).

Example: If 12 of 20 animals in a given treatment replicate survive:

RP = 12/20

= 0.60

4.2.4 Transform each RP to its arc sine square root, as follows:

4.2.4.1 For RPs greater than zero or less than one:

Angle (radians) = $\sqrt{RP}$

Example: If RP = 0.60:

Angle = arc sine $\sqrt{0.60}$

= arc sine 0.7746

= 0.8861 radians

4.2.4.2 Modification of the arc sine square root when RP = 0.

Angle (in radians) = arc sine $\sqrt{1/4N}$

Where: N = Number of animals/treatment replicate

Example: If 20 animals are used:

Angle = arc sine $\sqrt{1/80}$

= arc sine 0.1118

= 0.1120 radians

4.2.4.3 Modification of the arc sine square root when RP = 0

Angle = 1.5708 radians - (radians for RP = 0)

Example: Using above value:

Angle = 1.5708 - 0.1120

= 1.4588 radians

APPENDIX C

DUNNETT'S PROCEDURE

1. MANUAL CALCULATIONS

1.1 Dunnett's Procedure (Dunnett, 1955; Dunnett, 1964) is used to compare each concentration mean with the control mean to decide if any of the concentrations differ from the control. This test has an overall error rate of alpha, which accounts for the multiple comparisons with the control. It is based on the assumptions that the observations are independent and normally distributed and that the variance of the observations is homogeneous across all concentrations and control. (See Appendix B for a discussion on validating the assumptions). Dunnett's Procedure uses a pooled estimate of the variance, which is equal to the error value calculated in an analysis of variance. Dunnett's Procedure can only be used when the same number of replicate test vessels have been used at each concentration and the control. When this condition is not met, the *t* test with Bonferroni's adjustment is used (see Appendix D).

1.2 The data used in this example are growth data from a Mysid Survival and Growth Test, and are the same data used in Appendix B. These data are listed in Table C.1.

TABLE C.1. MYSID, *HOLMESIMYSIS COSTATA*, GROWTH DATA

	Concentration (%)			
Replicate	Control	1.80	3.20	5.60
1	0.048	0.055	0.057	0.041
2	0.058	0.048	0.050	0.040
3	0.047	0.042	0.046	0.041
4	0.058	0.041	0.043	0.043
5	0.051	0.052	0.045	0.040
Mean ($\bar{Y}_i$)	0.052	0.048	0.048	0.041
Total (T_i)	0.262	0.238	0.241	0.205
i	1	2	3	4

1.3 One way to obtain an estimate of the pooled variance is to construct an ANOVA table including all sums of squares, as described in Table C.2:

TABLE C.2. ANOVA TABLE

Source	df	Sum of Squares (SS)	Mean Square(MS) (SS/df)
Between	p - 1	SSB	S_B^2 = SSB/(p-1)
Within	N - p	SSW	S_W^2 = SSW/(N-p)
Total	N - 1	SST	

Where: p = number of effluent concentrations including the control:

N = the total sample size; $N = \sum_i n_i$

n_i = the number of replicates for concentration "i"

$SST = \sum_{ij} Y_{ij}^2 - G^2/N$ Total Sum of Squares

$SSB = \sum_i T_i^2/n_i - G^2/N$ Between Sum of Squares

$SSW = SST - SSB$ Within Sum of Squares

G = the grand total of all sample observations; $G = \sum_{i=1}^{P} T_i$

T_i = the total of the replicate measurements for concentration i

N = the total sample size; $N = \sum_i n_i$

n_i = the number of replicates for concentration i

Y_{ij} = the jth observation for concentration i

1.4 For the data in this example:

$n_1 = n_2 = n_3 = n_4 = n_5 = 5$

$N = 20$

$T_1 = Y_{11} + Y_{12} + Y_{13} + Y_{14} + Y_{15} = 0.262$
$T_2 = Y_{21} + Y_{22} + Y_{23} + Y_{24} + Y_{25} = 0.238$
$T_3 = Y_{31} + Y_{32} + Y_{33} + Y_{34} + Y_{35} = 0.241$
$T_4 = Y_{41} + Y_{42} + Y_{43} + Y_{44} + Y_{45} = 0.205$

$G = T_1 + T_2 + T_3 + T_4 = 0.946$

$$SSB = \sum_{i=1}^{p} T_i^2/n_i - G^2/N$$

$$= \frac{1}{5}(0.225) - \frac{(0.946)^2}{20} = 0.000254$$

$$SST = \sum_{i=1}^{p} \sum_{j=1}^{n_i} Y_{ij}^2 - G^2/N$$

$$= 0.0455 - \frac{(0.946)^2}{20} = 0.000754$$

$$SSW = SST - SSB = 0.000754 - 0.000254 = 0.000500$$

$S_B^2 = SSB/(p-1) = 0.000254/(4-1) = 0.0000847$

$S_W^2 = SSW/(N-p) = 0.000500/(20-4) = 0.0000313$

1.5 Summarize these data in the ANOVA table, as shown in Table C.3:

TABLE C.3. COMPLETED ANOVA TABLE FOR DUNNETT'S PROCEDURE EXAMPLE

Source	df	Sum of Squares (SS)	Mean Square (MS) (SS/df)
Between	3	0.000254	0.0000847
Within	16	0.000500	0.0000313
Total	19	0.000754	

1.6 To perform the individual comparisons, calculate the *t* statistic for each concentration and control combination, as follows:

$$t_i \cdot \frac{(\bar{Y}_1 \cdot \bar{Y}_i)}{S_w\sqrt{(1/n_1) \cdot (1/n_i)}}$$

Where: $\bar{Y}_1$ = mean for the control

$\bar{Y}_i$ = mean for each concentratioon i

S_w = square root of the within mean square

n_1 = number of replicates in the control

n_i = number of replicates for concentration i.

1.7 Table C.4 includes the calculated *t* values for each concentration and control combination.

TABLE C.4. CALCULATED *t* VALUES

Concentration (ppb)	i	t_i
1.80	2	1.131
3.20	3	1.131
5.60	4	3.111

1.8 Since the purpose of the test is only to detect a decrease in growth from the control, a one-sided test is appropriate. The critical value for the one-sided comparison is read from the table of Dunnett's "*t*" values (Table C.5; this table assumes an equal number of replicates in all treatment concentrations and the control). For this set of data, with an overall alpha level of 0.05, 16 degrees of freedom and three concentrations excluding the control, the critical value is 2.23. The mean weight for concentration "i" is considered significantly less than the mean weight for the control if t_i is greater than the critical value. Comparing each of the calculated *t* values in Table C.4 with the critical value, a significant decrease in growth from the control is detected in the 5.60% concentration. Therefore, the NOEC and the LOEC for growth are 3.20% and 5.60%, respectively.

TABLE C.5. DUNNETT'S "T" VALUES (Miller, 1981)

	(One-tailed) d^a_k																	
v k	a = .05									a = 0.1								
	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9
5	2.02	2.44	2.68	2.85	2.98	3.08	3.16	3.24	3.30	3.37	3.90	4.21	4.43	4.60	4.73	4.85	4.94	5.03
6	1.94	2.34	2.56	2.71	2.83	2.92	3.00	3.07	3.12	3.14	3.61	3.88	4.07	4.21	4.33	4.43	4.51	4.59
7	1.89	2.27	2.48	2.62	2.73	2.82	2.89	2.95	3.01	3.00	3.42	3.56	3.83	3.96	4.07	4.15	4.23	4.30
8	1.86	2.22	2.42	2.55	2.66	2.74	2.81	2.87	2.92	2.90	3.29	3.51	3.67	3.79	3.88	3.96	4.03	4.09
9	1.83	2.18	2.37	2.50	2.60	2.68	2.75	2.81	2.86	2.82	3.19	3.40	3.55	3.66	3.75	3.82	3.89	3.94
10	1.81	2.15	2.34	2.47	2.56	2.64	2.70	2.76	2.81	2.76	3.11	3.31	3.45	3.56	3.64	3.71	3.78	3.83
11	1.80	2.13	2.31	2.44	2.53	2.60	2.67	2.72	2.77	2.72	3.06	3.25	3.38	3.48	3.56	3.63	3.69	3.74
12	1.78	2.11	2.29	2.41	2.50	2.58	2.64	2.69	2.74	2.68	3.01	3.19	3.32	3.42	3.50	3.56	3.62	3.67
13	1.77	2.09	2.27	2.39	2.48	2.55	2.61	2.66	2.71	2.65	2.97	3.15	3.27	3.37	3.44	3.91	3.56	3.61
14	1.76	2.08	2.25	2.37	2.46	2.53	2.59	2.64	2.69	2.62	2.94	3.11	3.23	3.32	3.40	3.46	3.51	3.56
15	1.75	2.07	2.24	2.36	2.44	2.51	2.57	2.62	2.67	2.60	2.91	3.08	3.20	3.29	3.36	3.42	3.47	3.52
16	1.75	2.06	2.23	2.34	2.43	2.50	2.56	2.61	2.65	2.58	2.88	3.05	3.17	3.26	3.33	3.39	3.44	3.48
17	1.74	2.05	2.22	2.33	2.42	2.49	2.54	2.59	2.64	2.57	2.86	3.03	3.14	3.23	3.30	3.36	3.41	3.45
18	1.73	2.04	2.21	2.32	2.41	2.48	2.53	2.58	2.62	2.55	2.84	3.01	3.12	3.21	3.27	3.33	3.38	3.42
19	1.73	2.03	2.20	2.31	2.40	2.47	2.52	2.57	2.61	2.54	2.83	2.99	3.10	3.18	3.25	3.31	3.36	3.40
20	1.72	2.03	2.19	2.30	2.39	2.46	2.51	2.56	2.60	2.53	2.81	2.97	3.08	3.17	3.23	3.29	3.34	3.38
24	1.71	2.01	2.17	2.28	2.36	2.43	2.48	2.53	2.57	2.49	2.77	2.92	3.03	3.11	3.17	3.22	3.27	3.31
30	1.70	1.99	2.15	2.25	2.33	2.40	2.45	2.50	2.54	2.46	2.72	2.87	2.97	3.05	3.11	3.16	3.21	3.24
40	1.68	1.97	2.13	2.23	2.31	2.37	2.42	2.47	2.51	2.42	2.68	2.82	2.92	2.99	3.05	3.10	3.14	3.18
60	1.67	1.95	2.10	2.21	2.28	2.35	2.39	2.44	2.48	2.39	2.64	2.78	2.87	2.94	3.00	3.04	3.08	3.12
120	1.66	1.93	2.08	2.18	2.26	2.32	2.37	2.41	2.45	2.36	2.60	2.73	2.82	2.90	2.94	2.99	3.03	3.06

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1.9 To quantify the sensitivity of the test, the minimum significant difference (MSD) may be calculated. The formula is as follows:

$$MSD \cdot d\ S_w \sqrt{(1/n_1) \cdot (1/n)}$$

Where: d = critical value for the Dunnett's Procedure

S_w = the square root of the within mean square

n = the number of replicates at each concentration, assuming an equal number of replicates at all treatment concentrations

n_1 = number of replicates in the control

For example:

$$MSD \cdot 2.23(0.00559)\sqrt{(1/5) \cdot (1/5)}$$

$$= 2.23\ (0.00559)(0.632)$$

$$= 0.00788$$

1.10 Therefore, for this set of data, the minimum difference between the control mean and a concentration mean that can be detected as statistically significant is 0.00788 mg. This represents a 15.2% reduction in mean weight from the control.

1.11 If the data have not been transformed, the MSD (and the percent decrease from the control mean that it represents) can be reported as is.

1.11.1 In the case where the data have been transformed, the MSD would be in transformed units. In this case carry out the following conversion to determine the MSD in untransformed units.

1.11.2 Subtract the MSD from the transformed control mean. Call this difference D. Next, obtain untransformed values for the control mean and the difference, D. Finally, compute the untransformed MSD as follows:

$$MSD_u = control_u - D_u$$

Where: MSD_u = the minimum significant difference for untransformed data

$Control_u$ = the untransformed control mean

D_u = the untransformed difference

1.11.3 Calculate the percent reduction from the control that MSD_u represents as:

$$\text{Percent Reduction} = \frac{MSD_u}{Control_u} \times 100$$

1.11.3.1 An example of a conversion of the MSD to untransformed units, when the arc sine square root transformation was used on the data, follows.

Step 1. Subtract the MSD from the transformed control mean. As an example, assume the data in Table C.1 were transformed by the arc sine square root transformation. Thus:

$$0.052 - 0.00788 = 0.04412$$

Step 2. Obtain untransformed values for the control mean (0.052) and the difference (0.04412) obtained in Step 1, above.

$$[\text{ Sine } (0.052)]^2 = 0.00270$$

$$[\text{ Sine } (0.04412)]^2 = 0.00195$$

Step 3. The untransformed MSD (MSD_u) is determined by subtracting the untransformed values obtained in Step 2.

$$MSD_u = 0.00270 - 0.00195 = 0.00075$$

In this case, the MSD would represent a 1.4% decrease in survival from the control [(0.00075/0.052)(100)].

2. **COMPUTER CALCULATIONS**

2.1 This computer program incorporates two analyses: an analysis of variance (ANOVA), and a multiple comparison of treatment means with the control mean (Dunnett's Procedure). The ANOVA is used to obtain the error value. Dunnett's Procedure indicates which toxicant concentration means (if any) are statistically different from the control mean at the 5% level of significance. The program also provides the minimum difference between the control and treatment means that could be detected as statistically significant, and tests the validity of the homogeneity of variance assumption by Bartlett's Test. The multiple comparison is performed based on procedures described by Dunnett (1955).

2.2 The source code for the Dunnett's program is structured into a series of subroutines, controlled by a driver routine. Each subroutine has a specific function in the Dunnett's Procedure, such as data input, transforming the data, testing for equality of variances, computing p values, and calculating the one-way analysis of variance.

2.3 The program compares up to seven toxicant concentrations against the control, and can accommodate up to 50 replicates per concentration.

2.4 If the number of replicates at each toxicant concentration and control are not equal, a *t* test with the Bonferroni adjustment is performed instead of Dunnett's Procedure (see Appendix D).

2.5 The program was written in IBM-PC FORTRAN by Computer Sciences Corporation, 26 W. Martin Luther King Drive, Cincinnati, OH 45268. A compiled version of the program can be obtained from EMSL-Cincinnati by sending a diskette with a written request.

2.6 DATA INPUT AND OUTPUT

2.6.1 The mysid growth data from Table C.1 are used to illustrate the data input and output for this program.

2.6.2 Data Input

2.6.2.1 When the program is entered, the user is asked to select the type of data to be analyzed:

1. Response proportions, like survival or fertilization proportions data.
2. Counts and measurements, like offspring counts, cystocarp and algal cell counts, weights, chlorophyll measurements or turbidity measurements.

2.6.2.2 After the type of analysis for the data is chosen, the user has the following options:

1. Create a data file
2. Edit a data file
3. Perform analysis on existing data set
4. Stop

2.6.2.3 When Option 1 (Create a data file) is selected for response proportions, the program prompts the user for the following information:

1. Number of concentrations, including control
2. For each concentration and replicate:
   - number of organisms exposed per replicate
   - number of organisms responding per replicate (survival, egg fertilization, etc.)

2.6.2.4 After the data have been entered, the user may save the file on a disk, and the program returns to the main menu (see below).

2.6.2.5 Sample data input is shown in Figure C.1.

2.6.3. Program Output

2.6.3.1 When Option 3 (perform analysis on existing data set) is selected from the menu, the user is asked to select the transformation desired, and indicate whether they expect the means of the test groups to be less or greater than the mean for the control group (see Figure C.2).

```
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                              Version 1.5

What type of data do you wish to analyze?

     1)  response proportions
         (like survival data or fertility proportion data)
         Note:  The program calculates a proportion after prompting for
                number of exposed organisms and number of responding
                organisms.

     2)  counts and measurements
         (like offspring counts, cystocarps and algal cell counts,
         weights, chlorophyll measurements, or turbidity measurements)


 Enter "1", "2", (or "q" to quit program): 2


Title ? Appendix C, Dunnett's Procedure Example - Mysid Data

Output to printer or disk file ? P

 1) Create a data file
 2) Edit a data file
 3) Analyze an existing data set
 4) Stop

Your choice ? 1

Number of concentrations, including control ? 4


Number of observations for conc. 1 (the control) ? 5

Enter the data for conc. 1 (the control) one observation at a time.

NO.  1? 0.048

NO.  2? 0.058

NO.  3? 0.047

NO.  4? 0.058

NO.  5? 0.051
```

Figure C.1. Sample Data Input for Dunnett's Program for Survival Data from Table C.1.

```
Enter the data for conc.  2 one observation at a time.

NO.  1? 0.055

NO.  2? 0.048

NO.  3? 0.042

NO.  4? 0.041

NO.  5? 0.052

Number of observations for conc.  3 ? 5

Enter the data for conc.  3 one observation at a time.

NO.  1? 0.057

NO.  2? 0.050

NO.  3? 0.046

NO.  4? 0.043

NO.  5? 0.045

Number of observations for conc.  4 ? 5

Enter the data for conc.  4 one observation at a time.

NO.  1? 0.041

NO.  2? 0.040

NO.  3? 0.041

NO.  4? 0.043

NO.  5? 0.040

Do you wish to save the data on disk ? Y

Disk file for output ? c:\mysid.dat
```

Figure C.1. Sample Data Input for Dunnett's Program for Survival Data from Table C.1. (Continued)

```
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 1) Create a data file
 2) Edit a data file
 3) Analyze an existing data set
 4) Stop

Your choice ? 3


File name ? c:\mysid.dat



 Available Transformations
     1)  no transform
     2)  square root
     3)  log10

Your choice ? 1



 Dunnett's test as implemented in this program is
 a one-sided test. You must specify the direction
 the test is to be run; that is, do you expect the
 means for the test concentrations to be less than
 or greater than the mean for the control
 concentration.

Direction for Dunnetts test : L=less than, G=greater than ? L
```

Figure C.2. Example of Choosing Option 3 from the Main Menu of the Dunnett Program.

2.6.3.2 Summary statistics (Figure C.3) for the raw and transformed data, if applicable, the ANOVA table, results of Bartlett's Test, the results of the multiple comparison procedure, and the minimum detectable difference are included in the program output.

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Version 1.5

Appendix C, Dunnett's Procedure Example - Mysid Data

Summary Statistics and ANOVA

Transformation = None

Conc.	n	Mean	s.d.	cv%
1 = control	5	.0524	.0053	10.2
2	5	.0476	.0061	12.8
3	5	.0482	.0055	11.5
4*	5	.0410	.0012	3.0

*) the mean for this conc. is significantly less than
the control mean at alpha = 0.05 (1-sided) by Dunnett's test

Minimum detectable difference for Dunnett's test = -.006974
This difference corresponds to -13.31 percent of control

Between concentrations
sum of squares = .000333 with 3 degrees of freedom.

Error mean square = .000024 with 16 degrees of freedom.

Bartlett's test p-value for equality of variances = .060

Do you wish to restart the program ?

Figure C.3. Example of Program Output for the Dunnett's Program Using the Data in Table C.1.

APPENDIX D

t TEST WITH BONFERRONI'S ADJUSTMENT

1. The *t* test with Bonferroni's adjustment is used as an alternative to Dunnett's Procedure when the number of replicates is not the same for all concentrations. This test sets an upper bound of alpha on the overall error rate, in contrast to Dunnett's Procedure, for which the overall error rate is fixed at alpha. Thus, Dunnett's Procedure is a more powerful test.

2. The *t* test with Bonferroni's adjustment is based on the same assumptions of normality of distribution and homogeneity of variance as Dunnett's Procedure (See Appendix B for testing these assumptions), and, like Dunnett's Procedure, uses a pooled estimate of the variance, which is equal to the error value calculated in an analysis of variance.

3. An example of the use of the *t* test with Bonferroni's adjustment is provided below. The data used in the example are a set of red abalone growth data. Because there are only four replicates in the highest concentration, Dunnett's Procedure cannot be used. The length data are presented in Table D.1.

TABLE D.1. GIANT KELP, *MACROCYSTIS PYRIFERA*, GROWTH DATA

	Copper Concentration (µg/L)							
Rep	Control	5.60	10.0	18.0	32.0	56.0	100.0	180.0
1	19.58	18.26	13.31	18.59	12.54	11.44	7.92	6.49
2	18.75	16.25	18.92	12.88	10.67	11.88	7.59	7.25
3	19.14	16.39	15.62	16.28	15.95	11.88	8.25	--
4	16.50	18.70	14.30	15.38	12.54	11.00	9.13	7.63
5	17.93	15.62	15.29	19.75	11.66	11.55	8.80	8.13
$\bar{Y}_i$	18.38	17.04	15.49	16.58	12.67	11.55	8.34	7.38
S_i^2	1.473	1.827	4.498	7.327	3.953	0.133	0.396	0.478
i	1	2	3	4	5	6	7	8

3.1 One way to obtain an estimate of the pooled variance is to construct an ANOVA table including all sums of squares, as described in Table D.2:

TABLE D.2. ANOVA TABLE

Source	***df***	***Sum of Squares (SS)***	***Mean Square(MS) (SS/df)***
Between	***p - 1***	***SSB***	$S_B^2 = SSB/(p-1)$
Within	***N - p***	***SSW***	$S_W^2 = SSW/(N-p)$

Where: p = number of effluent concentrations including the control

N = the total sample size; $N = \sum_i n_i$

n_i = the number of replicates for concentration i

$$SST = \sum_{ij} Y_{ij}^2 - G^2/N$$

Total Sum of Squares

$$SSB = \sum_i T_i^2/n_i - G^2/N$$ Between Sum of Squares

$$SSW = SST - SSB$$ Within Sum of Squares

Where: G = The grand total of all sample observations; $G = \sum_{i=1}^{P} T_i$

T_i = The total of the replicate measurements for concentration i

Y_{ij} = The jth observation for concentration i

3.2 For the data in this example:

$n_1 = n_2 = n_3 = n_4 = n_5 = n_6 = n_7 = 5; \quad n_8 = 4$

$N = 39$

$T_1 = Y_{11} + Y_{12} + Y_{13} + Y_{14} + Y_{15} = 91.90$
$T_2 = Y_{21} + Y_{22} + Y_{23} + Y_{24} + Y_{25} = 85.22$
$T_3 = Y_{31} + Y_{32} + Y_{33} + Y_{34} + Y_{35} = 77.44$
$T_4 = Y_{41} + Y_{42} + Y_{43} + Y_{44} + Y_{45} = 82.88$
$T_5 = Y_{51} + Y_{52} + Y_{53} + Y_{54} + Y_{55} = 63.36$
$T_6 = Y_{61} + Y_{62} + Y_{63} + Y_{64} + Y_{65} = 57.75$
$T_7 = Y_{71} + Y_{72} + Y_{73} + Y_{74} + Y_{75} = 41.69$
$T_8 = Y_{81} + Y_{82} + Y_{83} + Y_{84} = 29.50$

$G = T_1 + T_2 + T_3 + T_4 + T_5 + T_6 + T_7 + T_8 = 529.74$

$$SSB = \sum_{i=1}^{p} T_i^2/n_i - G^2/N$$

$$= 7749.905 - \frac{(529.74)^2}{39} = 554.406$$

$$SST = \sum_{i=1}^{p} \sum_{j=1}^{n_i} Y_{ij}^2 - G^2/N$$

$$= 7829.764 - \frac{(529.74)^2}{39} = 634.265$$

$$SSW = SST - SSB = 634.265 - 554.406 = 79.859$$

$S_B^2 = SSB/(p-1) = 554.406/(8-1) = 79.201$

$S_W^2 = SSW/(N-p) = 79.859/(39-8) = 2.576$

3.3 Summarize these calculations in the ANOVA table (Table D.3):

TABLE D.3. COMPLETED ANOVA TABLE FOR THE *t* TEST WITH BONFERRONI'S ADJUSTMENT EXAMPLE

Source	df	Sum of Squares (SS)	Mean Square (MS) (SS/df)
Between	7	554.406	79.201
Within	31	79.859	2.576
Total	38	634.265	

3.4 To perform the individual comparisons, calculate the *t* statistic for each concentration and control combination, as follows:

$$t_i \cdot \frac{(\bar{Y}_1 \cdot \bar{Y}_i)}{S_w\sqrt{(1/n_1) \cdot (1/n_i)}}$$

Where: $\bar{Y}_i$ = mean for concentration i

$\bar{Y}_1$ = mean for the control

S_w = square root of the within mean square

n_1 = number of replicates in the control.

n_i = number of replicates for concentration i.

3.5 Table D.4 includes the calculated *t* values for each concentration and control combination.

TABLE D.4. CALCULATED t VALUES

Concentration (µg/L)	i	t_i
5.6	2	1.320
10.0	3	2.847
18.0	4	1.773
32.0	5	5.625
56.0	6	6.728
100.0	7	9.891
180.0	8	10.217

3.6 Since the purpose of this test is to detect a significant reduction in mean length, a one-sided test is appropriate. The critical value for this one-sided test is found in Table D.5. For an overall alpha level of 0.05, 31 degrees of freedom for error and seven concentrations (excluding the control) the approximate critical value is 2.597. The mean length for concentration "i" is considered significantly less than the mean length for the control if t_i is greater than the critical value. Comparing each of the calculated t values in Table D.4 with the critical value, the 10.0 µg/L, 32 µg/L, 56.0 µg/L, 100.0 µg/L, 180.0 µg/L concentrations have significantly lower mean length than the control. Because the 10.0 µg/L concentration shows signigicantly lower mean length that the control while the higher 18.0 µg/L concentration does not, these test results are considered to have an anomalous dose-response relationship and it is recommended that the test be repeated. If an NOEC and LOEC must be determined for this test, the lowest concentration with significant growth impairment versus the control is considered to the LOEC for growth. Thus, for this test, the NOEC and LOEC would be 5.6 µg/L and 10.0 µg/L, respectively.

TABLE D.5. CRITICAL VALUES FOR "t" FOR THE t TEST WITH BONFERRONI'S ADJUSTMENT P = 0.05
CRITICAL LEVEL, ONE TAILED

d.f.	K = 1	K = 2	K = 3	K = 4	K = 5	K = 6	K = 7	K = 8	K = 9	K = 10
1	6.314	12.707	19.002	25.452	31.821	38.189	44.556	50.924	57.290	63.657
2	2.920	4.303	5.340	6.206	6.965	7.649	8.277	8.861	9.408	9.925
3	2.354	3.183	3.741	4.177	4.541	4.857	5.138	5.392	5.626	5.841
4	2.132	2.777	3.187	3.496	3.747	3.961	4.148	4.315	4.466	4.605
5	2.016	2.571	2.912	3.164	3.365	3.535	3.681	3.811	3.927	4.033
6	1.944	2.447	2.750	2.969	3.143	3.288	3.412	3.522	3.619	3.708
7	1.895	2.365	2.642	2.842	2.998	3.128	3.239	3.336	3.422	3.500
8	1.860	2.307	2.567	2.752	2.897	3.016	3.118	3.206	3.285	3.356
9	1.834	2.263	2.510	2.686	2.822	2.934	3.029	3.111	3.185	3.250
10	1.813	2.229	2.406	2.634	2.764	2.871	2.961	3.039	3.108	3.170
11	1.796	2.201	2.432	2.594	2.719	2.821	2.907	2.981	3.047	3.106
12	1.783	2.179	2.404	2.561	2.681	2.778	2.863	2.935	2.998	3.055
13	1.771	2.161	2.380	2.533	2.651	2.746	2.827	2.897	2.958	3.013
14	1.762	2.145	2.360	2.510	2.625	2.718	2.797	2.864	2.924	2.977
15	1.754	2.132	2.343	2.490	2.603	2.694	2.771	2.837	2.895	2.947
16	1.746	2.120	2.329	2.473	2.584	2.674	2.749	2.814	2.871	2.921
17	1.740	2.110	2.316	2.459	2.567	2.655	2.729	2.793	2.849	2.899
18	1.735	2.101	2.305	2.446	2.553	2.640	2.712	2.775	2.830	2.879
19	1.730	2.094	2.295	2.434	2.540	2.626	2.697	2.759	2.813	2.861
20	1.725	2.086	2.206	2.424	2.528	2.613	2.684	2.745	2.798	2.846
21	1.721	2.080	2.278	2.414	2.518	2.602	2.672	2.732	2.785	2.832
22	1.718	2.074	2.271	2.406	2.509	2.592	2.661	2.721	2.773	2.819
23	1.714	2.069	2.264	2.398	2.500	2.583	2.651	2.710	2.762	2.808
24	1.711	2.064	2.258	2.391	2.493	2.574	2.642	2.701	2.752	2.797
25	1.709	2.060	2.253	2.385	2.486	2.566	2.634	2.692	2.743	2.788

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TABLE D.5. CRITICAL VALUES FOR "t" FOR THE t TEST WITH BONFERRONI'S ADJUSTMENT
P = 0.05 CRITICAL LEVEL, ONE TAILED (CONTINUED)

df	K = 1	K = 2	K = 3	K = 4	K = 5	K = 6	K = 7	K = 8	K = 9	K = 10
29	1.700	2.046	2.235	2.364	2.463	2.541	2.607	2.664	2.713	2.757
30	1.698	2.043	2.231	2.360	2.458	2.536	2.602	2.658	2.707	2.750
31	1.696	2.040	2.228	2.356	2.453	2.531	2.597	2.652	2.701	2.745
32	1.694	2.037	2.224	2.352	2.449	2.527	2.592	2.647	2.696	2.739
33	1.693	2.035	2.221	2.349	2.445	2.523	2.587	2.643	2.691	2.734
34	1.691	2.033	2.219	2.346	2.442	2.519	2.583	2.638	2.686	2.729
35	1.690	2.031	2.216	2.342	2.438	2.515	2.579	2.634	2.682	2.724
36	1.689	2.029	2.213	2.340	2.435	2.512	2.575	2.630	2.678	2.720
37	1.688	2.027	2.211	2.337	2.432	2.508	2.572	2.626	2.674	2.716
38	1.686	2.025	2.209	2.334	2.429	2.505	2.568	2.623	2.670	2.712
39	1.685	2.023	2.207	2.332	2.426	2.502	2.565	2.619	2.667	2.708
40	1.684	2.022	2.205	2.329	2.424	2.499	2.562	2.616	2.663	2.705
50	1.676	2.009	2.189	2.311	2.404	2.478	2.539	2.592	2.638	2.678
60	1.671	2.001	2.179	2.300	2.391	2.463	2.324	2.576	2.621	2.661
70	1.667	1.995	2.171	2.291	2.381	2.453	2.513	2.564	2.609	2.648
80	1.665	1.991	2.166	2.285	2.374	2.446	2.505	2.556	2.600	2.639
90	1.662	1.987	2.162	2.280	2.369	2.440	2.499	2.549	2.593	2.632
100	1.661	1.984	2.158	2.276	2.365	2.435	2.494	2.544	2.588	2.626
110	1.659	1.982	2.156	2.273	2.361	2.432	2.490	2.540	2.583	2.622
120	1.658	1.980	2.153	2.270	2.358	2.429	2.487	2.536	2.580	2.618
Infinite	1.645	1.960	2.129	2.242	2.327	2.394	2.450	2.498	2.540	2.576

d.f. = Degrees of freedom for MSE (Mean Square Error) from ANOVA.
K = Number of concentrations to be compared to the control.

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APPENDIX E

STEEL'S MANY-ONE RANK TEST

1. Steel's Many-one Rank Test is a nonparametric test for comparing treatments with a control. This test is an alternative to Dunnett's Procedure, and may be applied to data when the normality assumption has not been met. Steel's Test requires equal variances across the treatments and the control, but it is thought to be fairly insensitive to deviations from this condition (Steel, 1959). The tables for Steel's Test require an equal number of replicates at each concentration. If this is not the case, use Wilcoxon's Rank Sum Test, with Bonferroni's adjustment (See Appendix F).

2. For an analysis using Steel's Test, for each control and concentration combination, combine the data and arrange the observations in order of size from smallest to largest. Assign the ranks to the ordered observations (1 to the smallest, 2 to the next smallest, etc.). If ties occur in the ranking, assign the average rank to the observation. (Extensive ties would invalidate this procedure). The sum of the ranks within each concentration is then calculated. To determine if the response in a concentration is significantly less than the response in the control, the rank sum for each concentration is compared to the significant values of rank sums given later in the section. In this table, k equals the number of treatments excluding the control and n equals the number of replicates for each concentration and the control.

3. An example of the use of this test is provided below. The test employs embryo-larval development data from a bivalve 48-hour chronic test. The data are listed in Table E.1.

4. For each control and concentration combination, combine the data and arrange the observations in order of size from smallest to largest. Assign the ranks (1, 2, 3, ..., 8) to the ordered observations (1 to the smallest, 2 to the next smallest, etc.). If ties occur in the ranking, assign the average rank to each tied observation.

5. An example of assigning ranks to the combined data for the control and 0.13 µg/L copper concentration is given in Table E.2.

This ranking procedure is repeated for each control and concentration combination. The complete set of rankings is listed in Table E.3. The ranks are then summed for each toxicant concentration, as shown in Table E.4.

6. For this set of data, determine if the development in any of the effluent concentrations is significantly lower than the development of the control organisms. If this occurs, the rank sum at that concentration would be significantly lower than the rank sum of the control. Thus, compare the rank sums for the development at each of the various effluent concentrations with some "minimum" or critical rank sum, at or below which the survival would be considered to be significantly lower than the control. At a probability level of 0.05, the critical rank sum in a test with five concentrations and four replicates per concentration, is 10 (see Table F.4).

7. Since the rank sums for the 0.50 µg/L and 1.00 µg/L concentration levels are equal to the critical value, the proportions of normal development in those concentrations are considered significantly less than that in the control. Since no other rank sum is less than or equal to the critical value, no other concentration has a significantly lower proportion normal than the control. Because the 0.50 µg/L concentration shows signigicantly lower normal development than the control while the higher 2.00 µg/L concentration does not, these test results are considered to have an anomalous dose-response relationship and it is recommended that the test be repeated. If an NOEC and LOEC must be determined for this test, the lowest concentration with significant impairment versus the control is considered to the LOEC for growth. Thus, for this test, the NOEC and LOEC would be 0.25 µg/L and 0.50 µg/L, respectively.

TABLE E.1. BIVALVE EMBRYO-LARVAL DEVELOPMENT DATA

	Replicate	Control	Copper Concentration (µg/L) 0.13	0.25	0.50	1.00	2.00
RAW	A	1.00	0.96	0.92	0.91	0.88	1.00
	B	0.96	0.97	0.95	0.93	0.83	0.67
	C	1.00	1.00	0.90	0.88	0.88	0.75
	D	0.97	0.96	0.96	0.93	0.82	0.60
ARC SINE SQUARE ROOT TRANSFORMED	A	1.571	1.369	1.284	1.266	1.217	1.571
	B	1.369	1.397	1.345	1.303	1.146	0.959
	C	1.571	1.571	1.249	1.217	1.217	1.047
	D	1.397	1.369	1.369	1.303	1.133	0.886
Mean ($\bar{Y}_i$)		1.477	1.427	1.312	1.272	1.178	1.116
S_i^2		0.01191	0.00945	0.00303	0.00166	0.00203	0.09644
i		1	2	3	4	5	6

TABLE E.2. ASSIGNING RANKS TO THE CONTROL AND 0.13 µg/L CONCENTRATION LEVEL FOR STEEL'S MANY-ONE RANK TEST

Rank	Transformed Proportion Normal	Concentration
2	1.369	0.13 µg/L
2	1.369	0.13 µg/L
2	1.369	Control
4.5	1.397	0.13 µg/L
4.5	1.397	Control
7	1.571	0.13 µg/L
7	1.571	Control
7	1.571	Control

TABLE E.3. TABLE OF RANKS[1]

Replicate	Control	Copper Concentration (µg/L) 0.13	0.25
1	1.571(7,7.5,7.5,7.5,7)	1.369(2)	1.284(2)
2	1.369(2,4.5,5,5,4)	1.397(4.5)	1.345(3)
3	1.571(7,7.5,7.5,7.5,7)	1.571(7)	1.249(1)
4	1.397(4.5,6,6,6,5)	1.369(2)	1.369(4.5)

Replicate	Copper Concentration (µg/L) (Continued) 0.50	1.00	2.00
1	1.266(2)	1.217(3.5)	1.571(7)
2	1.303(3.5)	1.146(2)	0.959(2)
3	1.217(1)	1.217(3.5)	1.047(3)
4	1.303(3.5)	1.133(1)	0.886(1)

[1]Control ranks are given in the order of the concentration with which they were ranked.

TABLE E.4. RANK SUMS

Concentration µg/L Copper)	Rank Sum
0.13	15.5
0.25	10.5
0.50	10.0
1.00	10.0
2.00	13.0

TABLE E.5. SIGNIFICANT VALUES OF RANK SUMS: JOINT CONFIDENCE COEFFICIENTS OF 0.95 (UPPER) and 0.99 (LOWER) FOR ONE-SIDED ALTERNATIVES (Steel, 1959)

		k = number of treatments (excluding control)							
n	%	2	3	4	5	6	7	8	9
	%								
	%								
4	%	11	10	10	10	10	--	--	--
	%	--	--	--	--	--	--	--	--
5	%	18	17	17	16	16	16	16	15
	%	15	--	--	--	--	--	--	--
6	%	27	26	25	25	24	24	24	23
	%	23	22	21	21	--	--	--	--
7	%	37	36	35	35	34	34	33	33
	%	32	31	30	30	29	29	29	29
8	%	49	48	47	46	46	45	45	44
	%	43	42	41	40	40	40	39	39
9	%	63	62	61	60	59	59	58	58
	%	56	55	54	53	52	52	51	51
10	%	79	77	76	75	74	74	73	72
	%	71	69	68	67	66	66	65	65
11	%	97	95	93	92	91	90	90	89
	%	87	85	84	83	82	81	81	80
12	%	116	114	112	111	110	109	108	108
	%	105	103	102	100	99	99	98	98
13	%	138	135	133	132	130	129	129	128
	%	125	123	121	120	119	118	117	117
14	%	161	158	155	154	153	152	151	150
	%	147	144	142	141	140	139	138	137
15	%	186	182	180	178	177	176	175	174
	%	170	167	165	164	162	161	160	160
16	%	213	209	206	204	203	201	200	199
	%	196	192	190	188	187	186	185	184
17	%	241	237	234	232	231	229	228	227
	%	223	219	217	215	213	212	211	210
18	%	272	267	264	262	260	259	257	256
	%	252	248	245	243	241	240	239	238
19	%	304	299	296	294	292	290	288	287
	%	282	278	275	273	271	270	268	267
20	%	339	333	330	327	325	323	322	320
	%	315	310	307	305	303	301	300	299

APPENDIX F

WILCOXON RANK SUM TEST

1. Wilcoxon's Rank Sum Test is a nonparametric test, to be used as an alternative to Steel's Many-one Rank Test when the number of replicates are not the same at each concentration. A Bonferroni's adjustment of the pairwise error rate for comparison of each concentration versus the control is used to set an upper bound of alpha on the overall error rate, in contrast to Steel's Many-one Rank Test, for which the overall error rate is fixed at alpha. Thus, Steel's Test is a more powerful test.

2. The use of this test may be illustrated with devlopment data from the red abalone test in Table F.1. The control group has four replicates while each of the concentration levels has five replicates. Since there is 100% abnormality in all replicates for the 5.6% and 10.0% concentrations, they are not included in the statistical analysis and are considered qualitative abnormality effects.

3. For each concentration and control combination, combine the data and arrange the values in order of size, from smallest to largest. Assign ranks to the ordered observations (a rank of 1 to the smallest, 2 to the next smallest, etc.). If ties in rank occur, assign the average rank to each tied observation.

4. An example of assigning ranks to the combined data for the control and effluent concentration 0.56% is given in Table F.2. This ranking procedure is repeated for each of the three remaining control versus test concentration combinations. The complete set of ranks is listed in Table F.3. The ranks are then summed for each effluent concentration, as shown in Table F.4.

5. For this set of data, determine if the development in any of the test concentrations is significantly lower than the development in the control. If this occurs, the rank sum at that concentration would be significantly lower than the rank sum of the control. Thus, compare the rank sums for fecundity of each of the various effluent concentrations with some "minimum" or critical rank sum, at or below which the fecundity would be considered to be significantly lower than the control. At a

probability level of 0.05, the critical rank in a test with four concentrations (excluding the control), four control replicates, and five concentration replicates is 15 (see Table F.5, for K = 4).

TABLE F.1. RED ABALONE, HALIOTUS RUFESCENS, SHELL DEVELOPMENT DATA

		Effluent Concentration (%)						
	Replicate	Dilution Control	0.56	1.00	1.80	3.20	5.6	10.0
RAW	A	0.99	0.99	0.99	0.99	0.39	0	0
	B	0.99	0.99	1.00	0.99	0.57	0	0
	C	0.99	0.98	0.99	0.99	0.61	0	0
	D	1.00	1.00	0.99	0.98	0.65	0	0
	E		1.00	1.00	0.97	0.80	0	0
ARC SINE SQUARE ROOT TRANSFORMED	A	1.471	1.471	1.471	1.471	0.674	-	-
	B	1.471	1.471	1.521	1.471	0.856	-	-
	C	1.471	1.429	1.471	1.471	0.896	-	-
	D	1.521	1.521	1.471	1.429	0.938	-	-
	E		1.521	1.521	1.397	1.107	-	-
Mean ($\bar{Y}_i$)		1.484	1.483	1.491	1.448	0.894	-	-
S_i^2		0.000625	0.001523	0.000750	0.001137	0.024288	-	-
i		1	2	3	4	5	6	7

TABLE F.2. ASSIGNING RANKS TO THE CONTROL AND 0.56% CONCENTRATION LEVEL FOR THE WILCOXON RANK SUM TEST WITH THE BONFERRONI ADJUSTMENT

Rank	Transformed Proportion Normal	Concentration
1	1.429	0.56 %
4	1.471	0.56 %
4	1.471	0.56 %
4	1.471	Control
4	1.471	Control
4	1.471	Control
8	1.521	0.56 %
8	1.521	0.56 %
8	1.521	Control

TABLE F.3. TABLE OF RANKS[1]

Replicate	Control	Effluent Concentration (%) 0.56	1.00	1.80	3.20
1	1.471(4,3.5,5.5,7)	1.471(4)	1.471(3.5)	1.471(5.5)	0.674(1)
2	1.471(4,3.5,5.5,7)	1.471(4)	1.521(8)	1.471(5.5)	0.856(2)
3	1.471(4,3.5,5.5,7)	1.429(1)	1.471(3.5)	1.471(5.5)	0.896(3)
4	1.521(8,8,9,9)	1.521(8)	1.471(3.5)	1.429(2)	0.938(4)
5		1.521(8)	1.521(8)	1.397(1)	1.107(5)

[1]Control ranks are given in the order of the concentration with which they were ranked.

6. Comparing the rank sums in Table F.4 to the appropriate critical rank, the rank sum for the 3.20% concentration level is equal to the critical value, so the proportion normal in that concentration is considered significantly less than that in the control. Since no other rank sum is less than or equal to the critical value, no other concentration has a significantly lower proportion normal than the control. Hence, the NOEC and the LOEC are 1.80% and 3.20%, respectively.

TABLE F.4. RANK SUMS

Concentration (% Effluent)	Rank Sum
0.56	25.0
1.00	26.5
1.80	19.5
3.20	15.0

TABLE F.5. CRITICAL VALUES FOR WILCOXON'S RANK SUM TEST WITH BONFERRONI'S ADJUSTMENT OF ERROR RATE FOR COMPARISON OF "K" TREATMENTS VERSUS A CONTROL FIVE PERCENT CRITICAL LEVEL (ONE-SIDED ALTERNATIVE: TREATMENT CONTROL)

K	No. Replicates in Control	No. of Replicates Per Effluent Concentration							
		3	4	5	6	7	8	9	10
1	3	6	10	16	23	30	39	49	59
	4	6	11	17	24	32	41	51	62
	5	7	12	19	26	34	44	54	66
	6	8	13	20	28	36	46	57	69
	7	8	14	21	29	39	49	60	72
	8	9	15	23	31	41	51	63	72
	9	10	16	24	33	43	54	66	79
	10	10	17	26	35	45	56	69	82
2	3	--	--	15	22	29	38	47	58
	4	--	10	16	23	31	40	49	60
	5	6	11	17	24	33	42	52	63
	6	7	12	18	26	34	44	55	66
	7	7	13	20	27	36	46	57	69
	8	8	14	21	29	38	49	60	72
	9	8	14	22	31	40	51	62	75
	10	9	15	23	32	42	53	65	78
3	3	--	--	--	21	29	37	46	57
	4	--	10	16	22	30	39	48	59
	5	--	11	17	24	32	41	51	62
	6	6	11	18	25	33	43	53	65
	7	7	12	19	26	35	45	56	68
	8	7	13	20	28	37	47	58	70
	9	7	13	21	29	39	49	61	73
	10	8	14	22	31	41	51	63	76
4	3	--	--	--	21	28	37	46	56
	4	--	--	15	22	30	38	48	59
	5	--	10	16	23	31	40	50	61
	6	6	11	17	24	33	42	52	64
	7	6	12	18	26	34	44	55	67
	8	7	12	19	27	36	46	57	69
	9	7	13	20	28	38	48	60	72
	10	7	14	21	30	40	50	62	75

TABLE F.5. CRITICAL VALUES FOR WILCOXON'S RANK SUM TEST WITH BONFERRONI'S ADJUSTMENT OF ERROR RATE FOR COMPARISON OF "K" TREATMENTS VERSUS A CONTROL FIVE PERCENT CRITICAL LEVEL (ONE-SIDED ALTERNATIVE: TREATMENT CONTROL) (CONTINUED)

K	No. Replicates in Control	No. of Replicates Per Effluent Concentration							
		3	4	5	6	7	8	9	10
5	3	--	--	--	--	28	36	46	56
	4	--	--	15	22	29	38	48	58
	5	--	10	16	23	31	40	50	61
	6	--	11	17	24	32	42	52	63
	7	6	11	18	25	34	43	54	66
	8	6	12	19	27	35	45	56	68
	9	7	13	20	28	37	47	59	71
	10	7	13	21	29	39	49	61	74
6	3	--	--	--	--	28	36	45	56
	4	--	--	15	21	29	38	47	58
	5	--	10	16	22	30	39	49	60
	6	--	11	16	24	32	41	51	63
	7	6	11	17	25	33	43	54	65
	8	6	12	18	26	35	45	56	68
	9	6	12	19	27	37	47	58	70
	10	7	13	20	29	38	49	60	73
7	3	--	--	--	--	--	36	45	56
	4	--	--	--	21	29	37	47	58
	5	--	--	15	22	30	39	49	60
	6	--	10	16	23	32	41	51	62
	7	--	11	17	25	33	43	53	65
	8	6	11	18	26	35	44	55	67
	9	6	12	19	27	36	46	58	70
	10	7	13	20	28	38	48	60	72
8	3	--	--	--	--	--	36	45	55
	4	--	--	--	21	29	37	47	57
	5	--	--	15	22	30	39	49	59
	6	--	10	16	23	31	40	51	62
	7	--	11	17	24	33	42	53	64
	8	6	11	18	25	34	44	55	67
	9	6	12	19	27	36	46	57	69
	10	6	12	19	28	37	48	59	72

TABLE F.5. CRITICAL VALUES FOR WILCOXON'S RANK SUM TEST WITH BONFERRONI'S ADJUSTMENT OF ERROR RATE FOR COMPARISON OF "K" TREATMENTS VERSUS A CONTROL FIVE PERCENT CRITICAL LEVEL (ONE-SIDED ALTERNATIVE: TREATMENT CONTROL) (CONTINUED)

K	No. Replicates in Control	No. of Replicates Per Effluent Concentration							
		3	4	5	6	7	8	9	10
9	3	--	--	--	--	--	--	45	55
	4	--	--	--	21	28	37	46	57
	5	--	--	15	22	30	39	48	59
	6	--	10	16	23	31	40	50	62
	7	--	10	17	24	33	42	52	64
	8	--	11	18	25	34	44	55	66
	9	6	11	18	26	35	46	57	69
	10	6	12	19	28	37	47	59	71
10	3	--	--	--	--	--	--	45	55
	4	--	--	--	21	28	37	46	57
	5	--	--	15	22	29	38	48	59
	6	--	10	16	23	31	40	50	61
	7	--	10	16	24	32	42	52	64
	8	--	11	17	25	34	43	54	66
	9	6	11	18	26	35	45	56	68
	10	6	12	19	27	37	47	58	71

APPENDIX G

SINGLE CONCENTRATION TOXICITY TEST - COMPARISON OF CONTROL WITH 100% EFFLUENT OR RECEIVING WATER OR COMPARISON OF DILUTION AND BRINE CONTROLS

1. To statistically compare a control with one concentration, such as 100% effluent or the instream waste concentration, a *t* test is the recommended analysis. The *t* test is based on the assumptions that the observations are independent and normally distributed and that the variances of the observations are equal between the two groups.

2. Shapiro-Wilk's test may be used to test the normality assumption (See Appendix B for details). For the two sample case, the datasets must be tested for normality separately. If either set of data does not meet the normality assumption, the nonparametric test, Wilcoxon's Rank Sum Test, may be used to analyze the data. An example of this test is given in Appendix F. Since a control and one concentration are being compared, the K = 1 section of Table F.5 contains the needed critical values for one-sided tests. An additional reference, such as Snedecor and Cochran (1980) must be used to determine critical values for two-sided tests, such as comparing brine and dilution controls.

3. The *F* test for equality of variances is used to test the homogeneity of variance assumption. When conducting the *F* test, the alternative hypothesis of interest is that the variances are not equal.

4. To make the two-tailed *F* test at the 0.01 level of significance, put the larger of the two variances in the numerator of *F*.

$$F \cdot \frac{S_1^2}{S_2^2} \quad \text{where } S_1^2 > S_2^2$$

5. Compare *F* with the 0.005 level of a tabled *F* value with n_1 - 1 and n_2 - 1 degrees of freedom, where n_1 and n_2 are the number of replicates for each of the two groups.

6. A set of mysid growth data from a single-concentration effluent test will be used to illustrate the *F* test. The raw data, mean and variance for the two controls are given in Table G.1. The data from each concentration meets the assumption of normality.

TABLE G.1. MYSID, HOLMESIMYSIS COSTATA, GROWTH DATA FROM A SINGLE-CONCENTATION EFFLUENT TEST

	Replicate	Control	Effluent
RAW	A	0.048	0.041
	B	0.058	0.033
	C	0.047	0.044
	D	0.055	0.040
	E	0.051	0.043
Mean ($\bar{Y}_i$)		0.052	0.040
S_i^2		0.0000217	0.0000187
i		1	2

7. Since the variability of the control is greater than the variability of the effluent concentration, S^2 for the control is placed in the numerator of the F statistic and S^2 for the effluent concentration control is placed in the denominator.

$$F = \frac{0.0000217}{0.0000187} = 1.160$$

8. There are 5 replicates for the each groups, so the numerator and denominator degrees of freedom, n_i - 1, are both 4. For a two-tailed test at the 0.01 level of significance, the critical F value is obtained from a table of the *F* distribution (Snedecor and Cochran, 1980). The critical *F* value for this test is 23.16. Since 2.41 is not greater than 23.16, conclude that the variances of the brine and dilution controls are homogeneous.

9. Equal Variance *t* Test.

9.1 To perform the *t* test, calculate the following test statistic:

$$t = \frac{\bar{Y}_1 - \bar{Y}_2}{S_p\sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$$

Where: $\bar{Y}_1$ = mean for the control

$\bar{Y}_2$ = mean for the effluent concentration

$$S_p = \sqrt{\frac{(n_1 - 1)S_1^2 + (n_2 - 1)S_2^2}{n_1 + n_2 - 2}}$$

S_1^2 = estimate of the variance for the control

S_2^2 = estimate of the variance for the effluent concentration

n_1 = number of replicates for the control

n_2 = number of replicates for the effluent concentration

9.2 Since we are concerned here with a decrease in response from the control, a one-tailed test is appropriate. Thus, we will compare the calculated *t* with a critical *t*, where the critical *t* is at the 5% level of significance with $n_1 + n_2 - 2$ degrees of freedom. If the calculated *t* exceeds the critical *t*, the mean responses are declared different.

9.3 When comparing brine and dilution controls, the concern is for any difference between the two control groups, and a two-tailed test is appropriate. In that case, the calculated *t* would be compared with a critical *t*, where the critical *t* is a two-tailed value at the 5% level of significance with $n_1 + n_2 - 2$ degrees of freedom. If the absolute value of the calculated *t* exceeds the critical *t*, the mean responses are declared different.

9.4 Using the data from Table G.1 to illustrate the *t* test, the calculation of *t* is as follows:

$$t = \frac{0.052 - 0.040}{0.00449\sqrt{\frac{1}{5} + \frac{1}{5}}} = 4.226$$

$$S_p = \sqrt{\frac{(5-1)\,0.0000217 + (5-1)\,0.0000187}{5 + 5 - 2}} = 0.00449$$

Where:

9.5 For a one-tailed test at the 0.05 level of significance and 8 degrees of freedom, the appropriate critical *t* value is 1.860. Note: Table D.5 for K = 1 includes the critical *t* values for comparing two groups in a one-tailed test. Since t = 4.226 is greater than 1.860, conclude that the growth in the effluent concentration is significantly less than the control group growth.

9.6 Critical *t* values for two-tailed tests, such as those needed in comparing a brine control and a dilution control, can be found in a table of the *t* distribution, such as the one in Snedecor and Cochran, 1980. Note that the critical *t* for a two-tailed test is the upper-tail value at the a/2 level of significance.

10. UNEQUAL VARIANCE *t* TEST.

10.1 If the *F* test for equality of variance fails, the *t* test is still a valid test. However, the denominator of the *t* statistic is adjusted as follows:

$$t = \frac{\bar{Y}_1 - \bar{Y}_2}{\sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}}}$$

Where: $\bar{Y}_1$ = mean for the control

$\bar{Y}_2$ = mean for the effluent concentration

S_1^2 = estimate of the variance for the control

S_2^2 = estimate of the variance for the effluent concentration

n_1 = number of replicates for the control

n_2 = number of replicates for the effluent concentration

10.2 Additionally, the degrees of freedom for the test are adjusted using the following formula:

$$df = \frac{(n_1 - 1)(n_2 - 1)}{(n_2 - 1)C^2 + (1 - C)^2(n_1 - 1)}$$

Where:

$$C = \frac{\frac{S_1^2}{n_1}}{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}}$$

10.3 The modified degrees of freedom is usually not an integer. Common practice is to round down to the nearest integer.

10.4 The *t* test is then conducted as the equal variance *t* test. The calculated *t* is compared to the critical *t* at the 0.05 significance level with the modified degrees of freedom. If the calculated *t* exceeds the critical *t*, the mean responses are found to be statistically different.

APPENDIX H

PROBIT ANALYSIS

1. This program calculates the EC1 and EC50 (or LC1 and LC50), and the associated 95% confidence intervals.

2. The program is written in IBM PC Basic for the IBM compatible PC by Computer Sciences Corporation, 26 W. Martin Luther King Drive, Cincinnati, OH 45268. A compiled, executable version of the program and supporting documentation can be obtained from EMSL-Cincinnati by sending a written request to EMSL at 3411 Church Street, Cincinnati, OH 45244.

2.1 A set of mortality data from a mysid survival and growth test is given in Table H.1. The program's data input routine is illustrated with this data in Figure H.1. The program begins with a request for the following information:

1. Desired output of abbreviated (A) or full (F) output? (Note: only abbreviated output is shown below.)
2. Output designation (P = printer, D = disk file).
3. Title for the output.
4. The number of exposure concentrations.
5. Toxicant concentration data.2.2 The program output for the abbreviated output options, shown in Figure H.2, includes the following:

TABLE H.1. DATA FOR PROBIT ANALYSIS

		Concentration (%)				
	Control	***1.80***	***3.20***	***5.60***	***10.0***	***18.0***
No. Dead	***1***	***0***	***3***	***9***	***24***	***25***
No. Exposed	***25***	***25***	***25***	***25***	***25***	***25***

2.2 The program output for the abbreviated output options, shown in figure H.2, includes the following:

1. A table of the observed proportion responding and the proportion responding adjusted for the controls.
2. The calculated chi-square statistic for heterogeneity and the tabular value. This test is one indicator of how well the data fit the model. The program will issue a warning when the test indicates that the data do not fit the model.
3. The estimated LC1 and LC50 values and associated 95% confidence intervals.

```
$$$
```

Example of Probit Analysis for Appendix H

Conc.	Number Exposed	Number Resp.	Observed Proportion Responding	Proportion Responding Adjusted for Controls
Control	25	1	0.0400	0.0000
1.8000	25	0	0.0000	-.0306
3.2000	25	3	0.1200	0.0930
5.6000	25	9	0.3600	0.3404
10.0000	25	24	0.9600	0.9588
18.0000	25	25	1.0000	1.0000

Chi - Square for Heterogeneity (calculated) = 3.004
Chi - Square for Heterogeneity
(tabular value at 0.05 level) = 7.815

Example of Probit Analysis for Appendix H

Estimated LC/EC Values and Confidence Limits

Point	Exposure Conc.	95% Confidence Limits Lower	Upper
LC/EC 1.00	2.642	1.384	3.519
LC/EC 50.00	5.973	4.998	6.920

Figure H.2. USEPA Probit Analysis Program used for Calculating LC/EC Values, Version 1.5.

APPENDIX I

SPEARMAN-KARBER METHOD

1. The Spearman-Karber Method is a nonparametric statistical procedure for estimating the LC50 and the associated 95% confidence interval (Finney, 1978). The Spearman-Karber Method estimates the mean of the distribution of the $\log_{10}$ of the tolerance. If the log tolerance distribution is symmetric, this estimate of the mean is equivalent to an estimate of the median of the log tolerance distribution.

2. If the response proportions are not monotonically non-decreasing with increasing concentration (constant or steadily increasing with concentration), the data must be smoothed. Abbott's procedure is used to "adjust" the concentration response proportions for mortality occurring in the control replicates.

3. Use of the Spearman-Karber Method is recommended when partial mortalities occur in the test solutions, but the data do not fit the Probit model.

4. To calculate the LC50 using the Spearman-Karber Method, the following must be true: 1) the smoothed adjusted proportion mortality for the lowest effluent concentration (not including the control) must be zero, and 2) the smoothed adjusted proportion mortality for the highest effluent concentration must be one.

5. To calculate the 95% confidence interval for the LC50 estimate, one or more of the smoothed adjusted proportion mortalities must be between zero and one.

6. The Spearman-Karber Method is illustrated below using a set of mortality data from a Mysid Survival and Growth test. These data are listed in Table I.1.

TABLE I.1. EXAMPLE OF SPEARMAN-KARBER METHOD: MORTALITY DATA FROM A MYSID SURVIVAL AND GROWTH TEST (25 ORGANISMS PER CONCENTRATION)

Effluent Concentration %	Number of Mortalities	Mortality Proportion
Control	2	0.08
6.25	2	0.08
12.5	0	0.00
25.0	3	0.12
50.0	16	0.64
100.0	25	1.00

7. Let p_0, p_1, ..., p_k denote the observed response proportion mortalities for the control and k effluent concentrations. The first step is to smooth the p_i if they do not satisfy $p_0 \cdot p_1 \cdot \ldots \cdot p_k$. The smoothing process replaces any adjacent p_i's that do not conform to $p_0 \cdot p_1 \cdot \ldots \cdot p_k$ with their average. For example, if p_i is less than p_{i-1} then:

$$p_{i\cdot 1}^{s} \cdot p_i^{s} \cdot (p_i \cdot p_{i\cdot 1})/2$$

Where: p_i^s = the smoothed observed proportion mortality for effluent concentration i.

7.1 For the data in this example, because the observed mortality proportions for the control and the 6.25% effluent concentration are greater than the observed response proportions for the 12.5% effluent concentration, the responses for these three groups must be averaged:

$$p_0^s \cdot p_1^s \cdot p_2^s \cdot \frac{0.08 \cdot 0.08 \cdot 0.00}{3} \cdot \frac{0.16}{3} \cdot 0.053$$

7.2 Since $p_3 = 0.12$ is larger than p_2^s, set $p_3^s = 0.12$. Similarly, $p_4 = 0.64$ is larger than p_3^s, so set $p_4^s = 0.64$. Finally, $p_5 = 1.00$ is larger than p_4^s, so set $p_5^s = 1.00$. Additional smoothing is not necessary. The smoothed observed proportion mortalities are shown in Table I.2.

TABLE I.2. EXAMPLE OF SPEARMAN-KARBER METHOD: SMOOTHED, ADJUSTED MORTALITY DATA FROM A MYSID SURVIVAL AND GROWTH TEST

Effluent Concentration %	*Mortality Proportion*	*Smoothed Mortality Proportion*	*Smoothed, Adjusted Mortality Proportion*
Control	*0.08*	*0.053*	*0.000*
6.25	*0.08*	*0.053*	*0.000*
12.5	*0.00*	*0.053*	*0.000*
25.0	*0.12*	*0.120*	*0.071*
50.0	*0.64*	*0.640*	*0.620*
100.0	*1.00*	*1.000*	*1.000*

8. Adjust the smoothed observed proportion mortality in each effluent concentration for mortality in the control group using Abbott's formula (Finney, 1971). The adjustment takes the form:

$$p_i^a = (p_i^s - p_0^s) / (1 - p_0^s)$$

Where: p_0^s = the smoothed observed proportion mortality for the control

p_i^s = the smoothed observed proportion mortality for effluent concentration i.

8.1 For the data in this example, the data for each effluent concentration must be adjusted for control mortality using Abbott's formula, as follows:

$$p_0^a \cdot p_1^a \cdot p_2^a \cdot \frac{p_1^s \cdot p_0^s}{1 \cdot p_0^s} \cdot \frac{0.053 \cdot 0.053}{1 \cdot 0.053} \cdot \frac{0.0}{0.947} \cdot 0.0$$

$$p_3^a = \frac{p_3^s - p_0^s}{1 - p_0^s} = \frac{0.120 - 0.053}{1 - 0.053} = \frac{0.067}{0.947} = 0.071$$

$$p_4^a = \frac{p_4^s - p_0^s}{1 - p_0^s} = \frac{0.640 - 0.053}{1 - 0.053} = \frac{0.587}{0.947} = 0.620$$

$$p_5^a = \frac{p_5^s - p_0^s}{1 - p_0^s} = \frac{1.000 - 0.053}{1 - 0.053} = \frac{0.947}{0.947} = 1.000$$

The smoothed, adjusted response proportions for the effluent concentrations are shown in Table I.2. A plot of the smoothed, adjusted data is shown in Figure I.1.

9. Calculate the $\log_{10}$ of the estimated LC50, m, as follows:

$$m = \sum_{i=1}^{k-1} \frac{(p_{i+1}^a - p_i^a)(X_i + X_{i+1})}{2}$$

Where: p_i^a = the smoothed adjusted proportion mortality at concentration i

X_i = the $\log_{10}$ of concentration i

k = the number of effluent concentrations tested, not including the control.

9.1 For this example, the $\log_{10}$ of the estimated LC50, m, is calculated as follows:

```
m = [(0.000 - 0.000) (0.7959 + 1.0969)]/2 +
    [(0.071 - 0.000) (1.0969 + 1.3979)]/2 +
    [(0.620 - 0.071) (1.3979 + 1.6990)]/2 +
    [(1.000 - 0.620) (1.6990 + 2.0000)]/2

  = 1.64147
```

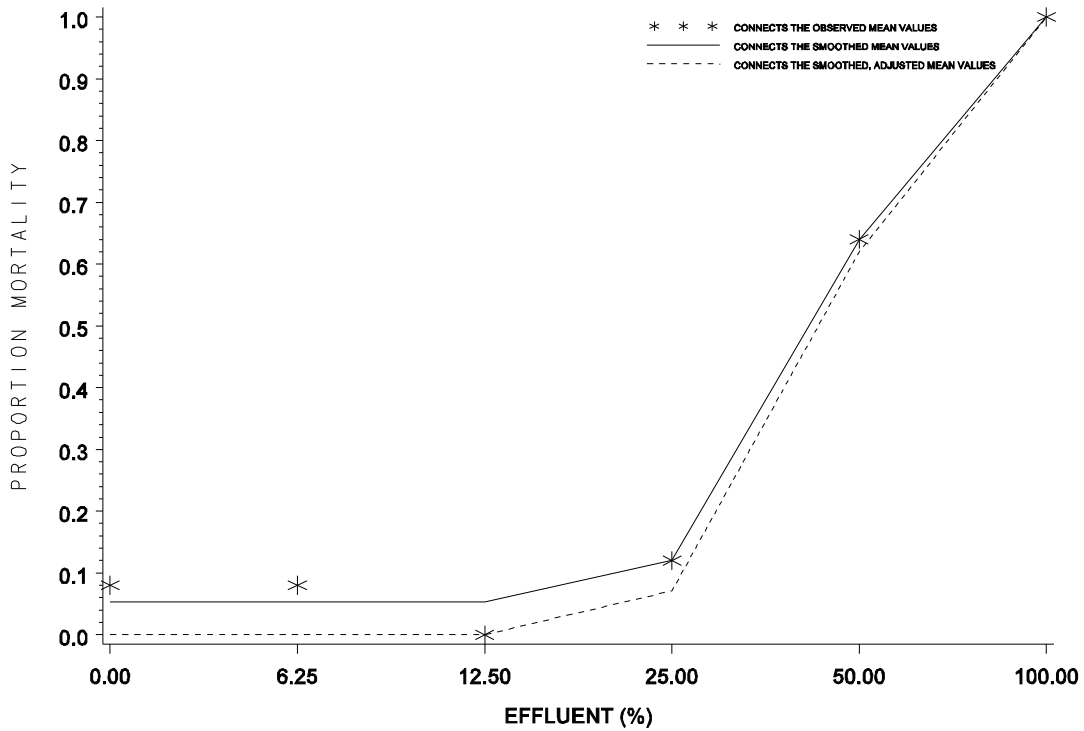

Figure I.1. Plot of observed, smoothed, and adjusted response proportions for mysid, Holmesimysis costata, survival data.

10. Calculate the estimated variance of m as follows:

$$V(m) = \sum_{i=2}^{k-1} \frac{p_i^a(1-p_i^a)(X_{i-1}-X_{i-1})^2}{4(n_i-1)}$$

Where: X_i = the $\log_{10}$ of concentration i

n_i = the number of organisms tested at effluent concentration i

p_i^a = the smoothed adjusted observed proportion mortality at effluent concentration i

k = the number of effluent concentrations tested, not including the control.

10.1 For this example, the estimated variance of m, V(m), is calculated as follows:

$$V(m) = (0.000)(1.000)(1.3979 - 0.7959)^2/4(24) + (0.071)(0.929)(1.6990 - 1.0969)^2/4(24) + (0.620)(0.380)(2.0000 - 1.3979)^2/4(24)$$

$$= 0.0011388$$

11. Calculate the 95% confidence interval for m:

$$m \pm 2.0\sqrt{V(m)}$$

11.1 For this example, the 95% confidence interval for m is calculated as follows:

$$1.64147 \pm 2\sqrt{0.0011388} = (1.57398, 1.70896)$$

12. The estimated LC50 and a 95% confidence interval for the estimated LC50 can be found by taking base_{10} antilogs of the above values.

12.1 For this example, the estimated LC50 is calculated as follows:

$$LC50 = antilog(m) = antilog(1.64147) = 43.8\%.$$

12.2 The limits of the 95% confidence interval for the estimated LC50 are calculated by taking the antilogs of the upper and lower limits of the 95% confidence interval for m as follows:

lower limit: antilog(1.57398) = 37.5%

upper limit: antilog(1.70896) = 51.2%

APPENDIX J

TRIMMED SPEARMAN-KARBER METHOD

1. The Trimmed Spearman-Karber Method is a modification of the Spearman-Karber Method, a nonparametric statistical procedure for estimating the LC50 and the associated 95% confidence interval (Hamilton, et al, 1977). The Trimmed Spearman-Karber Method estimates the trimmed mean of the distribution of the $\log_{10}$ of the tolerance. If the log tolerance distribution is symmetric, this estimate of the trimmed mean is equivalent to an estimate of the median of the log tolerance distribution.

2. If the response proportions are not monotonically non-decreasing with increasing concentration (constant or steadily increasing with concentration), the data must be smoothed. Abbott's procedure is used to "adjust" the concentration response proportions for mortality occurring in the control replicates.

3. Use of the Trimmed Spearman-Karber Method is recommended only when the requirements for the Probit Analysis and the Spearman-Karber Method are not met.

4. To calculate the LC50 using the Trimmed Spearman-Karber Method, the smoothed, adjusted, observed proportion mortalities must bracket 0.5.

5. To calculate the 95% confidence interval for the LC50 estimate, one or more of the smoothed, adjusted, observed proportion mortalities must be between zero and one.

6. Let p_0, p_1, ..., p_k denote the observed proportion mortalities for the control and the k effluent concentrations. The first step is to smooth the p_i if they do not satisfy $p_0 \bullet p_1 \bullet \ldots \bullet p_k$. The smoothing process replaces any adjacent p_i's that do not conform to $p_0 \bullet p_1 \bullet \ldots \bullet p_k$, with their average. For example, if p_i is less than p_{i-1} then:

$$p^s_{i-1} = p^s_i = (p_i + p_{i-1})/2$$

Where: p^s_i = the smoothed observed proportion mortality for effluent concentration i.

7. Adjust the smoothed observed proportion mortality in each effluent concentration for mortality in the control group using Abbott's formula (Finney, 1971). The adjustment takes the form:

$$p_i^a = (p_i^s - p_0^s) / (1 - p_0^s)$$

Where: p_0^s = the smoothed observed proportion mortality for the control

p_i^s = the smoothed observed proportion mortality for effluent concentration i.

8. Calculate the amount of trim to use in the estimation of the LC50 as follows:

$$\text{Trim} = \max(p_1^a, 1-p_k^a)$$

Where: p_1^a = the smoothed, adjusted proportion mortality for the lowest effluent concentration, exclusive of the control

p_k^a = the smoothed, adjusted proportion mortality for the highest effluent concentration

k = the number of effluent concentrations, exclusive of the control.

The minimum trim should be calculated for each data set rather than using a fixed amount of trim for each data set.

9. Due to the intensive nature of the calculation for the estimated LC50 and the calculation of the associated 95% confidence interval using the Trimmed Spearman-Karber Method, it is recommended that the data be analyzed by computer.

10. A computer program which estimates the LC50 and associated 95% confidence interval using the Trimmed Spearman-Karber Method, can be obtained through EMSL, 3411 Church Street, Cincinnati, OH 45244. The program can be obtained from EMSL-Cincinnati by sending a written request to the above address.

11. The Trimmed Spearman-Karber program automatically performs the following functions:

a. Smoothing.
b. Adjustment for mortality in the control.
c. Calculation of the necessary trim.
d. Calculation of the LC50.
e. Calculation of the associated 95% confidence interval.

12. To illustrate the Trimmed Spearman-Karber method using the Trimmed Spearman-Karber computer program, a set of data from a Topsmelt Larval Survival and Growth test will be used. The data are listed in Table J.1.

TABLE J.1. EXAMPLE OF TRIMMED SPEARMAN-KARBER METHOD: MORTALITY DATA FROM A TOPSMELT LARVAL SURVIVAL AND GROWTH TEST (25 ORGANISMS PER CONCENTRATION)

Effluent Concentration %	Number of Mortalities	Mortality Proportion
Control	0	0.00
6.25	2	0.08
12.5	1	0.04
25.0	5	0.20
50.0	25	1.00
100.0	25	1.00

12.1 The program requests the following input (Figure J.1):
a. Output destination (D = disk file or P = printer).
b. Control data.
c. Data for each toxicant concentration.

12.2 The program output includes the following (Figure J.2):
a. A table of the concentrations tested, number of organisms exposed, and the mortalities.
b. The amount of trim used in the calculation.
c. The estimated LC50 and the associated 95% confidence interval.

```
A:>TSK

TRIMMED SPEARMAN-KARBER METHOD.  VERSION 1.5
ENTER DATE OF TEST:
1
 ENTER TEST NUMBER:
2
WHAT IS TO BE ESTIMATED?
(ENTER "L" FOR LC50 AND "E" FOR EC50)
L
ENTER TEST SPECIES NAME:
Topsmelt
ENTER TOXICANT  NAME:
effluent
ENTER UNITS FOR EXPOSURE CONCENTRATION OF TOXICANT :
%
ENTER THE NUMBER OF INDIVIDUALS IN THE CONTROL:
25
ENTER THE NUMBER OF MORTALITIES IN THE CONTROL:
0
ENTER THE NUMBER OF CONCENTRATIONS
(NOT INCLUDING THE CONTROL;  MAX = 10):
5
ENTER THE  5 EXPOSURE CONCENTRATIONS (IN INCREASING ORDER):
6.25  12.5  25  50  100
ARE THE NUMBER OF INDIVIDUALS AT EACH EXPOSURE CONCENTRATION EQUAL(Y/N)?
y
ENTER THE NUMBER OF INDIVIDUALS AT EACH EXPOSURE CONCENTRATION:
25
ENTER UNITS FOR DURATION OF EXPERIMENT
(ENTER "H" FOR HOURS, "D" FOR DAYS, ETC.):
Days
ENTER DURATION OF TEST:
7
ENTER THE NUMBER OF MORTALITIES AT EACH EXPOSURE CONCENTRATION:
2 1 5 25 25
WOULD YOU LIKE THE AUTOMATIC TRIM CALCULATION(Y/N)?
y
```

Figure J.1. Example input for Trimmed Spearman-Karber Method.

TRIMMED SPEARMAN-KARBER METHOD. VERSION 1.5

```
 DATE:   1                  TEST NUMBER: 2            DURATION:    7 Days
 TOXICANT:  effluent
 SPECIES:   Topsmelt

 RAW DATA:  Concentration       Number      Mortalities
 --- ----   (%)                 Exposed
                .00                 25           0
               6.25                 25           2
              12.50                 25           1
              25.00                 25           5
              50.00                 25          25
             100.00                 25          25

  SPEARMAN-KARBER TRIM:             6.00%

  SPEARMAN-KARBER ESTIMATES:     LC50:          30.98
                 95% LOWER CONFIDENCE:          27.17
                 95% UPPER CONFIDENCE:          35.32

 NOTE:  MORTALITY PROPORTIONS WERE NOT MONOTONICALLY INCREASING.
        ADJUSTMENTS WERE MADE PRIOR TO SPEARMAN-KARBER ESTIMATION.
-------------------------------------------------------------------------------
```

Figure J.2. Example output for Trimmed Spearman-Karber Method.

APPENDIX K

GRAPHICAL METHOD

1. The Graphical Method is used to calculate the LC50. It is a mathematical procedure which estimates the LC50 by linearly interpolating between points of a plot of observed percent mortality versus the base 10 logarithm ($\log_{10}$) of percent effluent concentration. This method does not provide a confidence interval for the LC50 estimate and its use is only recommended when there are no partial mortalities after the data is smoothed and adjusted for control mortality. The only requirement for the Graphical Method is that the observed percent mortalities bracket 50%.

2. For an analysis using the Graphical Method the data must first be smoothed and adjusted for mortality in the control replicates. The procedure for smoothing and adjusting the data is detailed in the following steps.

3. The Graphical Method is illustrated below using a set of mortality data from a Topsmelt Larval Survival and Growth test. These data are listed in Table K.1.

TABLE K.1. EXAMPLE OF GRAPHICAL METHOD: MORTALITY DATA FROM A TOPSMELT LARVAL SURVIVAL AND GROWTH TEST (25 ORGANISMS PER CONCENTRATION)

Effluent Concentration %	Number of Mortalities	Mortality Proportion
Control	1	0.04
6.25	0	0.00
12.5	0	0.00
25.0	0	0.00
50.0	25	1.00
100.0	25	1.00

4. Let p_0, p_1, ..., p_k denote the observed proportion mortalities for the control and the k effluent concentrations. The first step is to smooth the p_i if they do not satisfy $p_0 \cdot p_1 \cdot \ldots \cdot p_k$. The smoothing process replaces any adjacent p_i's that do not conform to $p_0 \cdot p_1 \cdot \ldots \cdot p_k$ with their average. For example, if p_i is less than p_{i-1} then:

$$p^s_{i-1} \cdot p^s_i \cdot (p_i \cdot p_{i-1})/2$$

Where: p^s_i = the smoothed observed proportion mortality for effluent concentration i.

4.1 For the data in this example, because the observed mortality proportions for the 6.25%, 12.5%, and 25.0% effluent concentrations are less than the observed response proportion for the control, the values for these four groups must be averaged:

$$p^s_0 \cdot p^s_1 \cdot p^s_2 \cdot p^s_3 \cdot \frac{0.04 \cdot 0.00 \cdot 0.00 \cdot 0.00}{4} \cdot \frac{0.04}{4} \cdot 0.01$$

4.2 Since $p_4 = p_5 = 1.00$ are larger then 0.01, set $p^s_4 = p^s_5 = 1.00$. Additional smoothing is not necessary. The smoothed observed proportion mortalities are shown in Table K.2.

5. Adjust the smoothed observed proportion mortality in each effluent concentration for mortality in the control group using Abbott's formula (Finney, 1971). The adjustment takes the form:

$$p^a_i \cdot (p^s_i \cdot p^s_0)/(1 \cdot p^s_0)$$

Where: p^s_0 = the smoothed observed proportion mortality for the control

p^s_i = the smoothed observed proportion mortality for effluent concentration i.

5.1 Because the smoothed observed proportion mortality for the control group is greater than zero, the responses must be adjusted using Abbott's formula, as follows:

$$p_0^a \cdot p_1^a \cdot p_2^a \cdot p_3^a \cdot \frac{p_1^s \cdot p_0^s}{1 \cdot p_0^s} \cdot \frac{0.01 \cdot 0.01}{1 \cdot 0.0125} \cdot \frac{0.0}{0.99} \cdot 0.0$$

$$p_4^a \cdot p_5^a \cdot \frac{p_4^s \cdot p_0^s}{1 \cdot p_0^s} \cdot \frac{1.00 \cdot 0.01}{1 \cdot 0.01} \cdot \frac{0.99}{0.99} \cdot 1.00$$

A table of the smoothed, adjusted response proportions for the effluent concentrations is shown in Table K.2.

TABLE K.2. EXAMPLE OF GRAPHICAL METHOD: SMOOTHED, ADJUSTED MORTALITY DATA FROM A TOPSMELT LARVAL SURVIVAL AND GROWTH TEST

Effluent Concentration %	Mortality Proportion	Smoothed Mortality Proportion	Smoothed, Adjusted Mortality Proportion
Control	0.04	0.01	0.00
6.25	0.00	0.01	0.00
12.5	0.00	0.01	0.00
25.0	0.00	0.01	0.00
50.0	1.00	1.00	1.00
100.0	1.00	1.00	1.00

5.2 Plot the smoothed, adjusted data on 2-cycle semi-log graph paper with the logarithmic axis (the y axis) used for percent effluent concentration and the linear axis (the x axis) used for observed percent mortality. A plot of the smoothed, adjusted data is shown in Figure K.1.

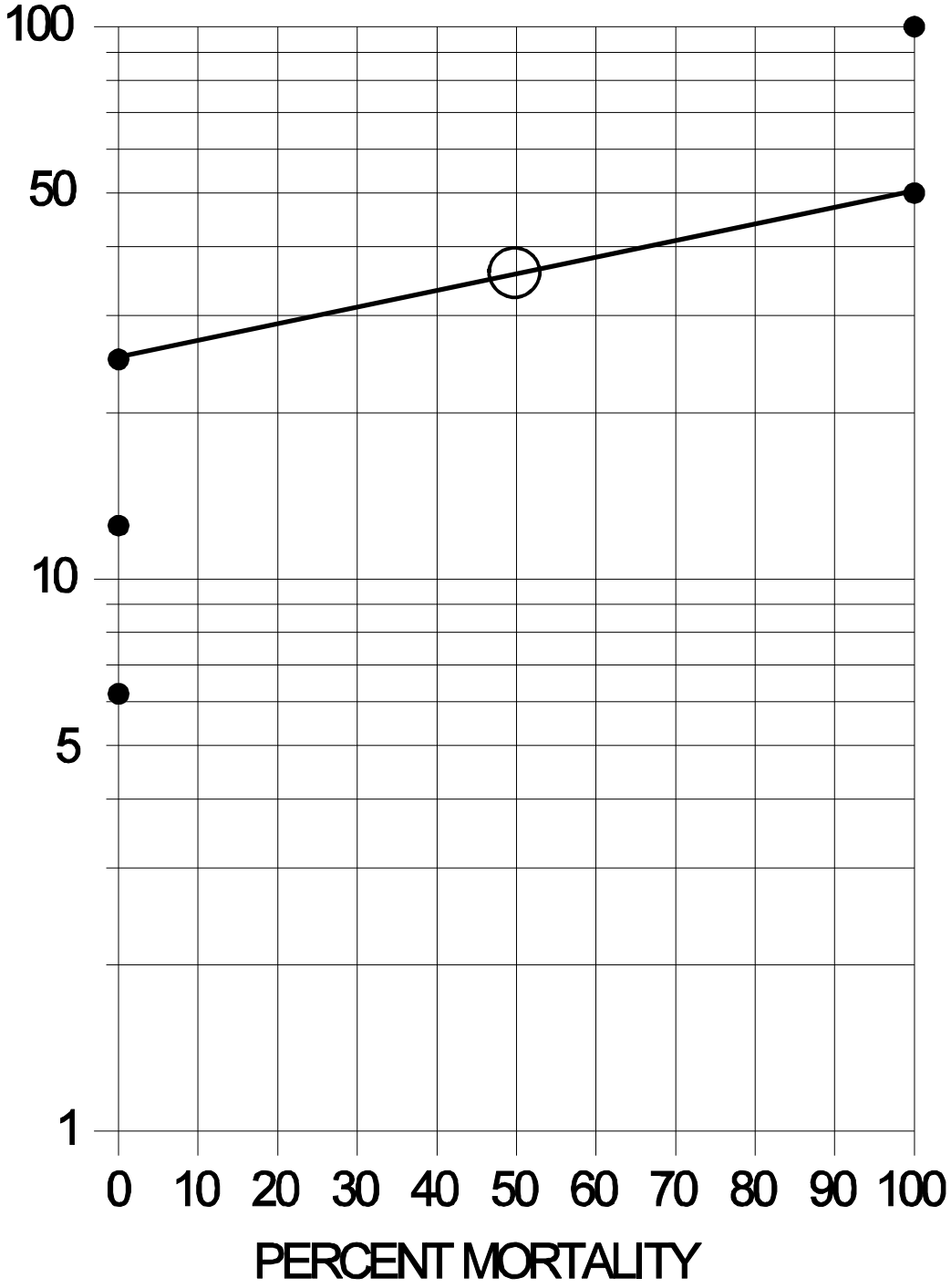

Figure K.1. Plot of the smoothed adjusted response proportions for topsmelt, Atherinops affinis, survival data.

6. Locate the two points on the graph which bracket 50% mortality and connect them with a straight line.

7. On the scale for percent effluent concentration, read the value for the point where the plotted line and the 50% mortality line intersect. This value is the estimated LC50 expressed as a percent effluent concentration.

7.1 For this example, the two points on the graph which bracket the 50% mortality line (0% mortality at 25% effluent, and 100% mortality at 50% effluent) are connected with a straight line. The point at which the plotted line intersects the 50% mortality line is the estimated LC50. The estimated LC50 = 35% effluent.

APPENDIX L

LINEAR INTERPOLATION METHOD

1. GENERAL PROCEDURE

1.1 The Linear Interpolation Method is used to calculate a point estimate of the effluent or other toxicant concentration that causes a given percent reduction (e.g., 25%, 50%, etc.) in the reproduction or growth of the test organisms (Inhibition Concentration, or IC). The procedure was designed for general applicability in the analysis of data from short-term chronic toxicity tests, and the generation of an endpoint from a continuous model that allows a traditional quantitative assessment of the precision of the endpoint, such as confidence limits for the endpoint of a single test, and a mean and coefficient of variation for the endpoints of multiple tests.

1.2 The Linear Interpolation Method assumes that the responses (1) are monotonically non-increasing, where the mean response for each higher concentration is less than or equal to the mean response for the previous concentration, (2) follow a piecewise linear response function, and (3) are from a random, independent, and representative sample of test data. If the data are not monotonically non-increasing, they are adjusted by smoothing (averaging). In cases where the responses at the low toxicant concentrations are much higher than in the controls, the smoothing process may result in a large upward adjustment in the control mean. Also, no assumption is made about the distribution of the data except that the data within a group being resampled are independent and identically distributed.

2. DATA SUMMARY AND PLOTS

2.1 Calculate the mean responses for the control and each toxicant concentration, construct a summary table, and plot the data.

3. MONOTONICITY

3.1 If the assumption of monotonicity of test results is met, the observed response means ($\bar{Y}_i$) should stay the same or decrease

as the toxicant concentration increases. If the means do not decrease monotonically, the responses are "smoothed" by averaging (pooling) adjacent means.

3.2 Observed means at each concentration are considered in order of increasing concentration, starting with the control mean (Y_1). If the mean observed response at the lowest toxicant concentration (Y_2) is equal to or smaller than the control mean (Y_1), it is used as the response. If it is larger than the control mean, it is averaged with the control, and this average is used for both the control response (M_1) and the lowest toxicant concentration response (M_2). This mean is then compared to the mean observed response for the next higher toxicant concentration (Y_3). Again, if the mean observed response for the next higher toxicant concentration is smaller than the mean of the control and the lowest toxicant concentration, it is used as the response. If it is higher than the mean of the first two, it is averaged with the first two, and the mean is used as the response for the control and two lowest concentrations of toxicant. This process is continued for data from the remaining toxicant concentrations. A numerical example of smoothing the data is provided below. (Note: Unusual patterns in the deviations from monotonicity may require an additional step of smoothing). Where Y_i decrease monotonically, the Y_i become M_i without smoothing.

4. **LINEAR INTERPOLATION METHOD**

4.1 The method assumes a linear response from one concentration to the next. Thus, the ICp is estimated by linear interpolation between two concentrations whose responses bracket the response of interest, the (p) percent reduction from the control.

4.2 To obtain the estimate, determine the concentrations C_J and C_{J+1} which bracket the response M_1 (1 - p/100), where M_1 is the smoothed control mean response and p is the percent reduction in response relative to the control response. These calculations can easily be done by hand or with a computer program as described below. The linear interpolation estimate is calculated as follows:

$$ICp \cdot C_J \cdot [\, M_1 (1 \cdot p/100) \cdot M_J \,] \; \frac{(C_{J.1} \cdot C_J)}{(M_{J.1} \cdot M_J)}$$

Where: C_J = tested concentration whose observed mean response is greater than $M_1(1 - p/100)$.

C_{J+1} = tested concentration whose observed mean response is less than $M_1(1 - p/100)$.

M_1 = smoothed mean response for the control.

M_J = smoothed mean response for concentration J.

M_{J+1} = smoothed mean response for concentration J + 1.

p = percent reduction in response relative to the control response.

IC*p* = estimated concentration at which there is a percent reduction from the smoothed mean control response. The IC*p* is reported for the test, together with the 95% confidence interval calculated by the ICPIN.EXE program described below.

4.3 If the C_J is the highest concentration tested, the IC*p* would be specified as *greater than* C_J. If the response at the lowest concentration tested is used to extrapolate the ICp value, the ICp should be expressed as a *less than the lowest test concentration.*

5. **CONFIDENCE INTERVALS**

5.1 Due to the use of a linear interpolation technique to calculate an estimate of the ICp, standard statistical methods for calculating confidence intervals are not applicable for the ICp. This limitation is avoided by use a technique known as the bootstrap method as proposed by Efron (1982) for deriving point estimates and confidence intervals.

5.2 In the Linear Interpolation Method, the smoothed response means are used to obtain the ICp estimate reported for the test. The bootstrap method is used to obtain the 95% confidence interval for the true mean. In the bootstrap method, the test data Y_{ji} is randomly resampled with replacement to produce a new set of data Y_{ji}*, that is statistically equivalent to the original data, but a new and slightly different estimate of the IC*p* (IC*p**) is obtained. This process is repeated at least 80 times (Marcus and Holtzman, 1988) resulting in multiple "data" sets, each with an associate ICp* estimate. The distribution of the ICp* estimates derived from the sets of resampled data approximates the sampling distribution of the ICp estimate. The standard error of the ICp is estimated by the standard deviation of the individual ICp* estimates. Empirical confidence intervals are derived from the quantiles of the ICp* empirical distribution. For example, if the test data are resampled a minimum of 80 times, the empirical 2.5% and the 97.5% confidence limits are approximately the second smallest and second largest ICp* estimates (Marcus and Holtzman, 1988).

5.3 The width of the confidence intervals calculated by the bootstrap method is related to the variability of the data. When confidence intervals are wide, the reliability of the IC estimate is in question. However, narrow intervals do not necessarily indicate that the estimate is highly reliable, because of undetected violations of assumptions and the fact that the confidence limits based on the empirical quantiles of a bootstrap distribution of 80 samples may be unstable.

5.4 The bootstrapping method of calculating confidence intervals is computationally intensive. For this reason, all of the calculations associated with determining the confidence intervals for the ICp estimate have been incorporated into a computer program. Computations are most easily done with a computer program such as the revision of the BOOTSTRP program (USEPA, 1988; USEPA, 1989) which is now called "ICPIN" and is described below in subsection 7.

6. **MANUAL CALCULATIONS**

6.1 DATA SUMMARY AND PLOTS

6.1.1 The data used in this example are the mysid growth data used in the example in Section 14. The data is presented as the mean weight per surviving organism. Table L.1 includes the raw data and the mean growth for each concentration. A plot of the data is provided in Figure L.1.

6.2 MONOTONICITY

6.2.1. As seen in the table, the observed means are monotonically non-increasing with respect to concentration. Therefore, the smoothed means will be simply the corresponding observed mean. The observed means are represented by $\bar{Y}_i$ and the smoothed means by M_i. Table L.2 contains the smoothed means and Figure L.1 gives a plot of the smoothed response curve.

6.3 LINEAR INTERPOLATION

6.3.1 An estimates of the IC25 can be calculated using the Linear Interpolation Method. A 25% reduction in mean weight, compared to the controls, would result in a mean weight of 0.039, where $M_1(1-p/100) = 0.052(1-25/100)$. Examining the smoothed means and their associated concentrations (Table L.2), the response, 0.039 mg, is bracketed by C_4 = 5.60% and and C_5 = 10.0%.

TABLE L.1. MYSID, HOLMESIMYSIS COSTATA, GROWTH DATA

		Concentration (%)			
Replicate	***Control***	***1.80***	***3.20***	***5.60***	***10.0***
1	***0.048***	***0.055***	***0.057***	***0.041***	***0.033***
2	***0.058***	***0.048***	***0.050***	***0.040***	***0.000***
3	***0.047***	***0.042***	***0.046***	***0.041***	***0.000***
4	***0.058***	***0.041***	***0.043***	***0.043***	***0.000***
5	***0.051***	***0.052***	***0.045***	***0.040***	***0.000***
Mean($\bar{Y}_i$)	***0.052***	***0.048***	***0.048***	***0.041***	***0.007***
i	***1***	***2***	***3***	***4***	***5***

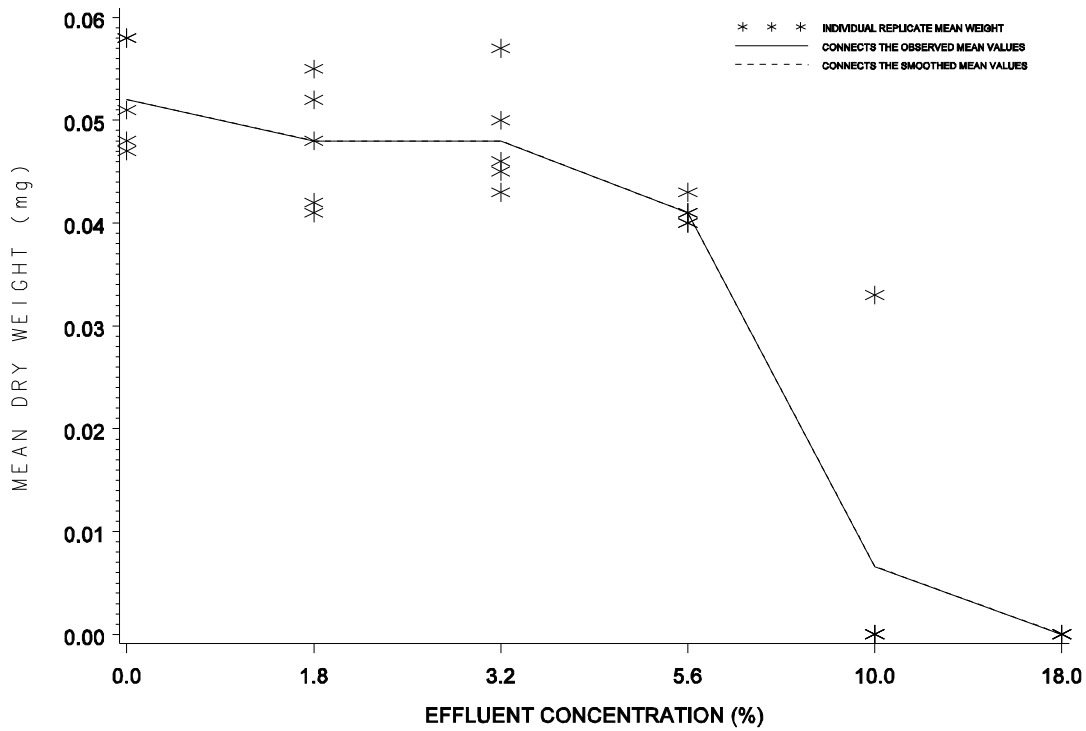

Figure L.1. Plot of raw data, observed means, and smoothed means for the mysid, Holmesimsys costata, growth data.

TABLE L.2. MYSID, HOLMESIMYSIS COSTATA, MEAN GROWTH RESPONSE AFTER SMOOTHING

Toxicant Conc. (%)	i	Response Means Y_i (mg)	Smoothed Means M_i (mg)
Control	1	0.052	0.052
1.80	2	0.048	0.048
3.20	3	0.048	0.048
5.60	4	0.041	0.041
10.00	5	0.007	0.007
18.00	6	0.000	0.000

6.3.2 Using the equation from section 4.2, the estimate of the IC25 is calculated as follows:

$$ICp = C_J + [\,M_1 - (1 - p/100) \cdot M_J\,]\ \frac{(C_{J+1} - C_J)}{(M_{J+1} - M_J)}$$

$$IC25 = 5.60 + [0.052 - (1 - 25/100) \cdot 0.041]\frac{(10.0 - 5.60)}{(0.007 - 0.041)}$$

$$= 5.86\%$$

6.4 CONFIDENCE INTERVALS

6.4.1 Confidence intervals for the ICp are derived using the bootstrap method. As described above, this method involves randomly resampling the individual observations and recalculating the ICp at least 80 times, and determining the mean ICp, standard deviation, and empirical 95% confidence intervals. For this reason, the confidence intervals are calculated using a computer program called ICPIN. This program is described below and is available to carry out all the calculations of both the interpolation estimate (ICp) and the confidence intervals.

7. **COMPUTER CALCULATIONS**

7.1 The computer program, ICPIN, prepared for the Linear Interpolation Methods was written in TURBO PASCAL for IBM compatible PCs. The program (version 2.0) has been modified by Computer Science Corporation, Duluth, MN with funding provided by the Environmental Research Laboratory, Duluth, MN (Norberg-King, 1993). The program was originally developed by Battelle Laboratories, Columbus, OH through a government contract supported by the Environmental Research Laboratory, Duluth, MN (USEPA, 1988). A compiled, executable version of the program and supporting documentation can be obtained by sending a written request to EMSL-Cincinnati, 3411 Church Street, Cincinnati, OH 45244.

7.2 The ICPIN.EXE program performs the following functions: 1) it calculates the observed response means ($\overline{Y}_i$) (response means); 2) it calculates the standard deviations; 3) checks the responses for monotonicity; 4) calculates smoothed means (M_i) (pooled response means) if necessary; 5) uses the means, M_i, to calculate the initial ICp of choice by linear interpolation; 6) performs a user-specified number of bootstrap resamples between 80 and 1000 (as multiples of 40); 7) calculates the mean and standard deviation of the bootstrapped ICp estimates; and 8) provides an original 95% confidence intervals to be used with the initial ICp when the number of replicates per concentration is over six and provides both original and expanded confidence intervals when the number of replicates per concentration are less than seven (Norberg-King, 1993).

7.3 For the IC*p* calculation, up to twelve treatments can be input (which includes the control). There can be up to 40 replicates per concentration, and the program does not require an equal number of replicates per concentration. The value of p can range from 1% to 99%.

7.4 DATA INPUT

7.4.1 Data is entered directly into the program onscreen. A sample data entry screen in shown in Figure L.2. The program documentation provides guidance on the entering and analysis of data for the Linear Interpolation Method.

```
ICp Data Entry/Edit Screen                          Current File:
Conc. ID        *   1       *     2     *     3     *     4     *   5       *  6
Conc. Tested    *           *           *           *           *           *
Response  1     *           *           *           *           *           *
Response  2     *           *           *           *           *           *
Response  3     *           *           *           *           *           *
Response  4     *           *           *           *           *           *
Response  5     *           *           *           *           *           *
Response  6     *           *           *           *           *           *
Response  7     *           *           *           *           *           *
Response  8     *           *           *           *           *           *
Response  9     *           *           *           *           *           *
Response 10     *           *           *           *           *           *
Response 11     *           *           *           *           *           *
Response 12     *           *           *           *           *           *
Response 13     *           *           *           *           *           *
Response 14     *           *           *           *           *           *
Response 15     *           *           *           *           *           *
Response 16     *           *           *           *           *           *
Response 17     *           *           *           *           *           *
Response 18     *           *           *           *           *           *
Response 19     *           *           *           *           *           *
Response 20     *           *           *           *           *           *

4444444444444444444444444444444444444444444444444444444444444444444444444444
F10 for Command Menu                    Use Arrow Keys to Switch Fields
```

Figure L.2. ICp data entry/edit screen. Twelve concentration identifications can be used. Data for concentrations are entered in columns 1 through 6. For concentrations

7.4.2 The user selects the ICp estimate desired (e.g., IC25 or IC50) and the number of resamples to be taken for the bootstrap method of calculating the confidence intervals. The program has the capability of performing any number of resamples from 80 to 1000 as multiples of 40. However, Marcus and Holtzman (1988) recommend a minimum of 80 resamples for the bootstrap method be used and at least 250 resamples are better (Norberg-King, 1993).

7.5 DATA OUTPUT

7.5.1 The program output includes the following (see Figure L.3)

1. A table of the concentration identification, the concentration tested and raw data response for each replicate and concentration.
2. A table of test concentrations, number of replicates, concentration (units), response means (Y_i), standard deviations for each response mean, and the pooled response means (smoothed means; M_i).
3. The linear interpolation estimate of the ICp using the means (M_i). *Use this value for the ICp estimate.*
4. The mean ICp and standard deviation from the bootstrap resampling.
5. The confidence intervals calculated by the bootstrap method for the ICp. Provides an original 95% confidence intervals to be used with the initial ICp when the number of replicates per concentration is over six and provides both original and expanded confidence intervals when the number of replicates per concentration are less than seven.

7.6 ICPIN program output for the analysis of the mysid growth data in Table L.1 is provided in Figure L.3.

7.6.1 When the ICPIN program was used to analyze this set of data, requesting 80 resamples, the estimate of the IC25 was 5.8174%. The empirical 95% confidence intervals for the true mean was 4.9440% to 6.2553%.

Conc. ID	1	2	3	4	5	6
Conc. Tested	0	1.80	3.20	5.60	10.0	18.0
Response 1	.048	.055	.057	.041	.033	0
Response 2	.058	.048	.050	.040	0	0
Response 3	.047	.042	.046	.041	0	0
Response 4	.058	.041	.043	.043	0	0
Response 5	.051	.052	.045	.040	0	0

*** Inhibition Concentration Percentage Estimate ***
Toxicant/Effluent: Effluent
Test Start Date: Test Ending Date:
Test Species: mysid, Holmesimysis costata
Test Duration: 7 days
DATA FILE: mysid.icp
OUTPUT FILE: mysid.i25

Conc. ID	Number Replicates	Concentration %	Response Means	Std. Dev.	Pooled Response Means
1	5	0.000	0.052	0.005	0.052
2	5	1.800	0.048	0.006	0.048
3	5	3.200	0.048	0.006	0.048
4	5	5.600	0.041	0.001	0.041
5	5	10.000	0.007	0.015	0.007
6	5	18.000	0.000	0.000	0.000

The Linear Interpolation Estimate: 5.8174 Entered P Value: 25

Number of Resamplings: 80
The Bootstrap Estimates Mean: 5.8205 Standard Deviation: 0.2673
Original Confidence Limits: Lower: 4.9440 Upper: 6.2553
Expanded Confidence Limits: Lower: 4.5073 Upper: 6.4743
Resampling time in Seconds: 0.22 Random_Seed: 526805435

Figure L.3. Example of ICPIN program output for the IC25.

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Liquid Assets:

A Summertime Perspective on the Importance of Clean Water to the Nation's Economy

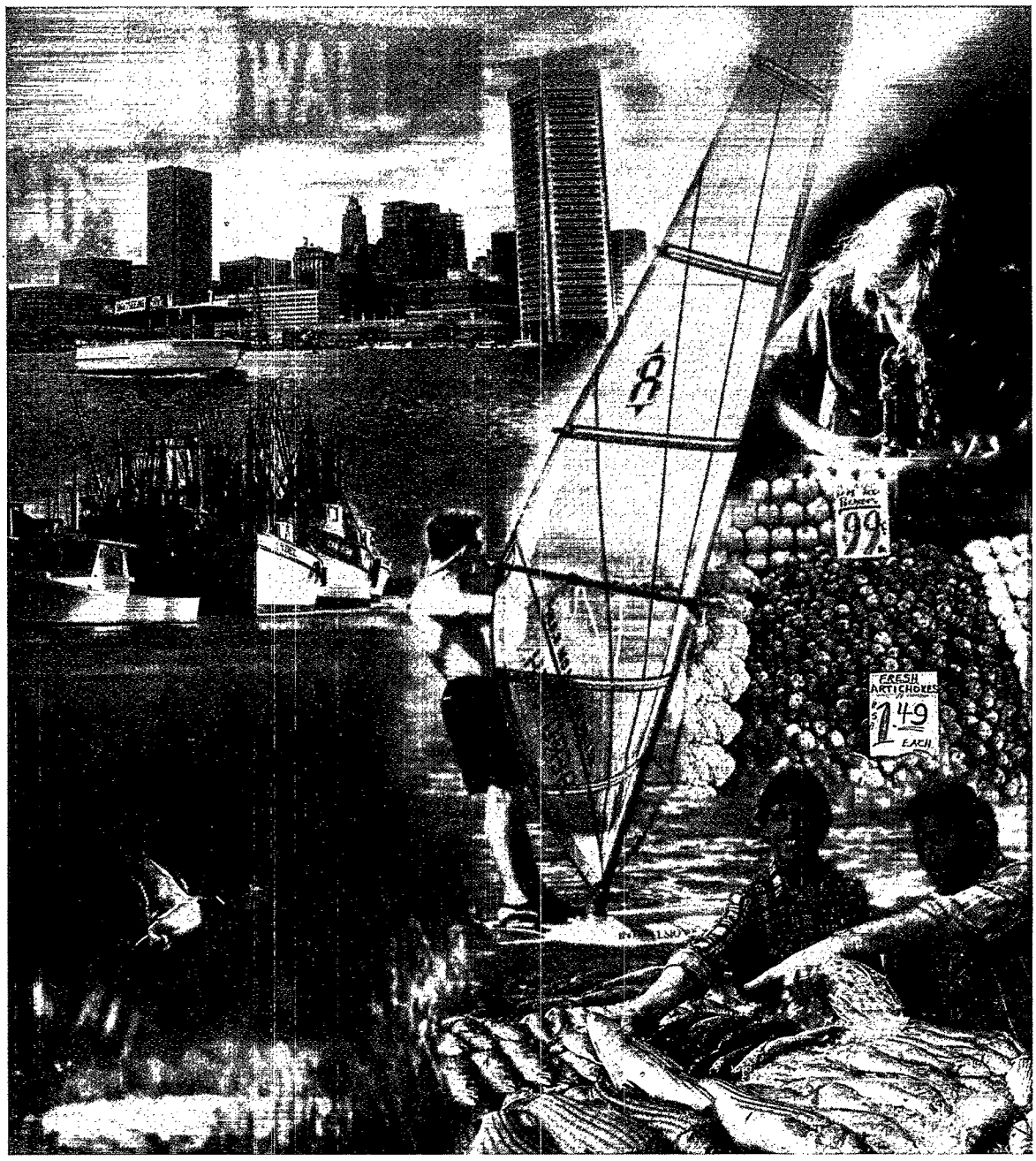

In Memory...

Edmund S. Muskie
1914 - 1996

This report is dedicated to the memory of Edmund Muskie, an American statesman from Maine who served our nation as a Secretary of State, as a United States Senator, and as a strong advocate for the environment.

The following observation, which captures the central theme of this report, was made by Mr. Muskie during a speech in 1966.

> *"High quality water is more than the dream of conservationists, more than a political slogan; high quality water in the right quantity at the right place at the right time, is essential to health, recreation, and economic growth"*

Thirty years later, it still holds true.

049525

Liquid Assets:

A Summertime Perspective on the Importance of Clean Water to the Nation's Economy

049526

United States Environmental Protection Agency
Office of Water
Washington, DC

Second printing, August 1996

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Executive Summary

Each year, the Memorial Day weekend launches a busy season of recreational activity around America's rivers, lakes, and beaches. In addition to providing fun and relaxation, these activities also provide a major boost for our nation's economy. Billions of dollars are spent on food, lodging, gas, special equipment, licenses, and services, all so people can enjoy themselves on and around the water.

But, the dividends from clean water are not limited to just the recreation and tourism industry. From Main Street to Wall Street to the family farm, clean water affects the profits and growth potential of many other economic sectors, including agriculture, commercial fishing, real estate, and manufacturing. This report, *Liquid Assets: A Summertime Perspective on the Importance of Clean Water to the Nation's Economy*, provides a snapshot of these sectors to highlight how and why clean water and a safe, clean environment are so important to economic prosperity and healthy, thriving communities.

Clean water is a vital commodity for major sectors of the U.S. economy.

- **Beaches, rivers, and lakes are the number one vacation choice for Americans,** helping to support a flourishing recreation and tourism industry. Each year, Americans take over 1.8 billion trips to go fishing, swimming, or boating, or just to relax around favorite water destinations.

- **About 15 percent of American farm lands use irrigation** to support operations—and maintain our lucrative position as "breadbasket to the world." Crops grown on irrigated lands are valued at nearly $70 billion a year—about 40 percent of the total value of all crops sold.

- **The $45 billion commercial fishing and shellfishing industry needs clean water in order to deliver products safe for us to eat.** Americans now eat 15 pounds of fish and shellfish per person a year.

- On average, **the value of real estate along desirable water areas is nearly 30 percent greater than similar properties located inland.** A *Money* magazine survey found that clean water and clean air are the two most important factors Americans consider in choosing a place to live.

- **Manufacturers use about 13 trillion gallons of water every year**—more than 9 times the volume that flows through the Mississippi River into the Gulf of Mexico every day. The soft drink manufacturing industry alone uses over 12 billion gallons of water a year to produce products valued at more than $50 billion.

Clean water means jobs.

- The **recreation and tourism industry is the second largest employer in the country** after health care, providing jobs for over 6 million Americans.

- **Agriculture, which relies on clean water for livestock and crops, provides farm jobs for over 3 million people.** The largest agricultural sector, cattle production, employs over 186,000 people on the farm and over a million more in other areas of the economy.

- The **environmental technology industry is creating jobs at twice the rate of the U.S. economy as a whole,** now employing over one million people.

- **Over a quarter of a million people work to harvest fish and shellfish** from the Great Lakes, the Gulf of Mexico, and other waterbodies that serve as "protein factories" around the country.

Clean water means profits.

- With sales of more than $380 billion, **the recreation and tourism industry provides a $22 billion trade surplus, the highest of all economic sectors.** Annual sales for just three activities—fishing, boating, and viewing and hunting ducks and other birds—is estimated at nearly $45 billion.

- Using clean water for irrigation and raising animals, American farmers produce and sell over **$174 billion worth of food and fiber products** every year. The cattle industry, with sales of more than $40 billion, provides one-fourth of the world's beef.

- Our fleet of commercial fishing vessels delivers **fish and shellfish products worth $3.5 billion a year, a value that increases by more than tenfold in the commercial marketplace.** In Puget Sound, an acre of shellfishing beds produces oysters, mussels, and other products worth between $40,000 and $60,000 every three years.

- The **clean water technology industry has sales of over $64 billion a year here in the U.S. and over $170 billion abroad.** With an international environmental market expected to double by the turn of the century, the forecast for future earnings looks promising.

Clean water provides a major stimulus for healthy, thriving local economies.

In communities across the country, clean water is often a critical factor in determining economic conditions.

- In rural West Virginia, white-water rivers attract 200,000 people a year for rafting trips, and help support the State's $2.5 billion recreation and tourism industry.
- In South Florida, the total value of all uses of the Indian River Estuary is estimated at over $700 million a year.
- In the West, recreational activity around Lake Mead National Park generates spending of nearly $940 million a year.

These profiles show that for businesses and communities throughout the country, clean water can mean the difference between economic decline and a bright, prosperous future. They also show just why clean water needs such special care and attention.

The national portfolio of water resources is large and diverse...

- 3.5 million miles of rivers and streams
- 41 million acres of lakes
- 58,000 miles of shoreline
- 34,400 square miles of estuaries (excludes Alaska)
- 278 million acres of wetlands
- 33,000 trillion gallons of ground water

...but so are the challenges of managing it.

While seemingly plentiful, clean water is a resource at risk.

- Our drinking water supply is one of the safest in the world, but one out of every five people receives water from a facility that violates a national safety requirement.
- Our rivers, lakes, and coastal waters are cleaner today than 25 years ago, yet nearly 40 percent are still too polluted for safe swimming or fishing.
- Wetland losses have been significantly reduced, but between 70,000 and 90,000 acres are still lost every year.
- Advisories or bans have been issued for more than 1,500 waterbodies to protect the public from eating chemically contaminated fish.
- One out of every three shellfishing beds is closed for harvest.
- More than 2,000 beaches were closed in 1994 to protect the public from harmful bacteria and other pollutants found in the water.

These problems represent major challenges that defy quick and easy solutions. Firm commitment and strong partnerships involving individuals and organizations from the public and private sectors offer the greatest promise for ensuring clean water in the future.

Under the Clinton Administration, EPA has led and supported multiple partnerships to provide safe, clean water for our communities.

- A national drinking water loan program was proposed to help communities meet their drinking water needs. This program, which establishes a powerful financial partnership between EPA and the States, marks the first time ever that ensuring safe drinking water has been made a federal investment priority.
- National guidance was issued to better control raw sewage spills—spills that can cause beach and shellfishing bed closures—in more than 1,000 communities. This consensus product, developed with State and local governments, industry and environmentalists, provides for sound environmental management at one-fourth the cost of previous proposals.
- A historic consensus agreement on water allocation was negotiated among multiple parties, including farmers, urban users and environmentalists in California's Bay-Delta region. The common sense agreement broke a ten-year deadlock on one of the area's most difficult issues.
- Following extensive negotiations with the States, industries and other interested parties, national guidance was issued to reduce the flow of toxic pollution into the Great Lakes. By ensuring more consistent standards of performance, the guidance provides for a safer, cleaner environment and a more level economic playing field among competitors.
- One of America's most unique ecosystems—the Florida Everglades— is being restored. A comprehensive approach, including $1.5 billion in federal funding, is helping to speed up the restoration process.

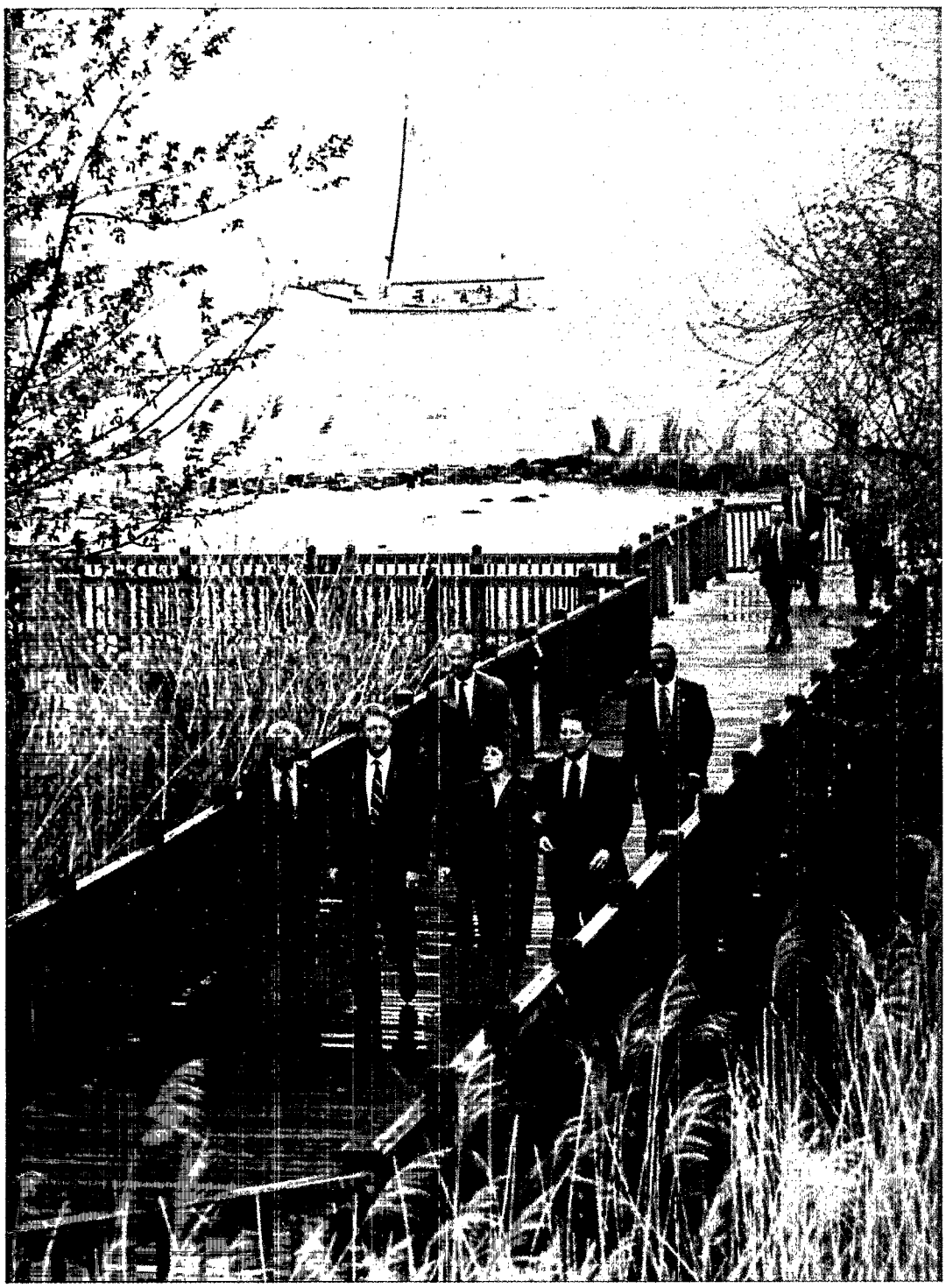

President Bill Clinton and Vice President Al Gore visit a wildlife and recreation area along the Chesapeake Bay.

Good News, Bad News

The Current Condition of Our Nation's Water Resources

Our drinking water supply is one of the safest in the world, but...

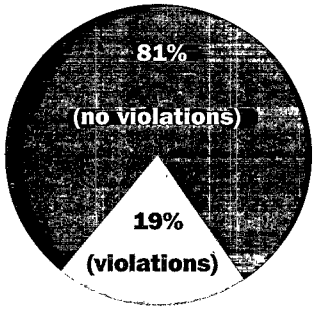

...one out of every five people receives water from a facility violating a national safety requirement.

Our rivers, lakes and coastal waters are cleaner today than 25 years ago, but...

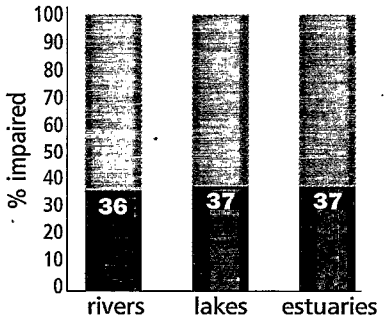

...nearly 40 percent of those surveyed are still too polluted for safe fishing or swimming.

Wetland losses have been significantly reduced, but...

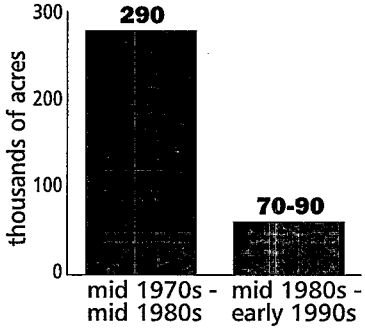

...between 70,000 and 90,000 acres are still lost every year.

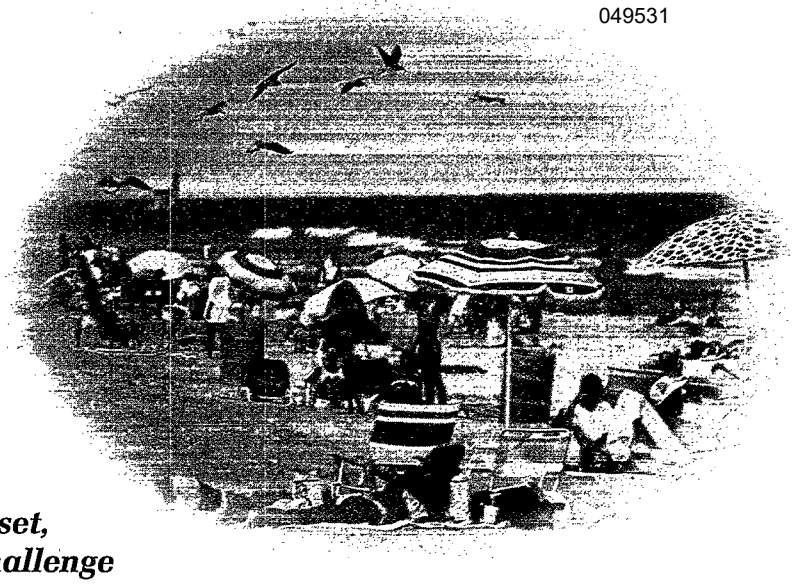

Clean Water:

A National Asset, A National Challenge

Each year, the Memorial Day weekend launches a busy season of recreational activity around America's beaches, lakes, and streams. In fact, these areas are our number one vacation choice. In addition to providing relaxation and family fun, travel to these areas also provides a boost to our national economy. Billions of dollars are spent each year for food, lodging, gas, as well as special equipment, licenses, and services, all so people can enjoy themselves on and around the water.

The impact of clean water on the recreation and tourism industry is profound. But, the same is true for many other sectors of our economy. In many ways, clean water is the fuel that powers the nation's economic engine. Commercial fishing, agriculture, real estate, and manufacturing are just a few of the sectors which rely on clean water to operate and ensure productivity.

Despite the many benefits that water provides for society and our economy, some communities are unable to use local water resources to their full advantage. Contaminated drinking water supplies, fish kills, and beach closures are just a few of the problems that communities can face. These problems, which can have far-reaching consequences, call for continued environmental vigilance.

America's Water Resources: A Large and Diverse Portfolio

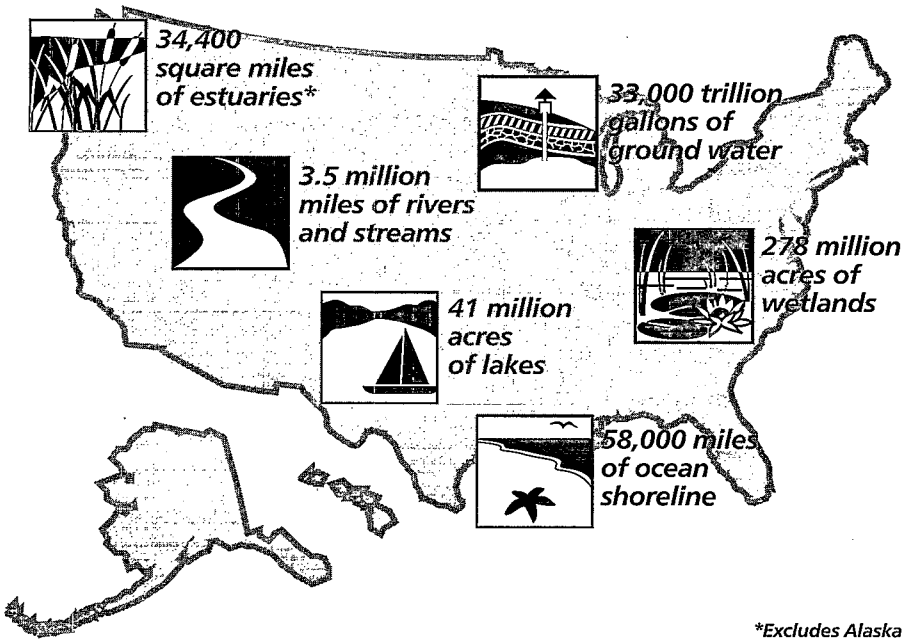

**Excludes Alaska*

Profile

What Is Water Worth?

The answer is over $700 million a year for the waters of Indian River Lagoon, an estuary along South Florida's Atlantic coast. An economic evaluation was undertaken to support development of a comprehensive plan for managing the estuary. The results, based on a number of uses by those living in the area, show that the people there are wise to invest in its protection.

Use	Value ($ millions)
Recreational Fishing	*339*
Swimming	*136*
Boating	*59*
Nature Observation	*88*
Water Sports	*5*
Hunting	*2*
Passive Use	*44 - 58*
Commercial Shellfishing	*13*
Riverfront Real Estate	*33*
Total Value	***719 - 733***

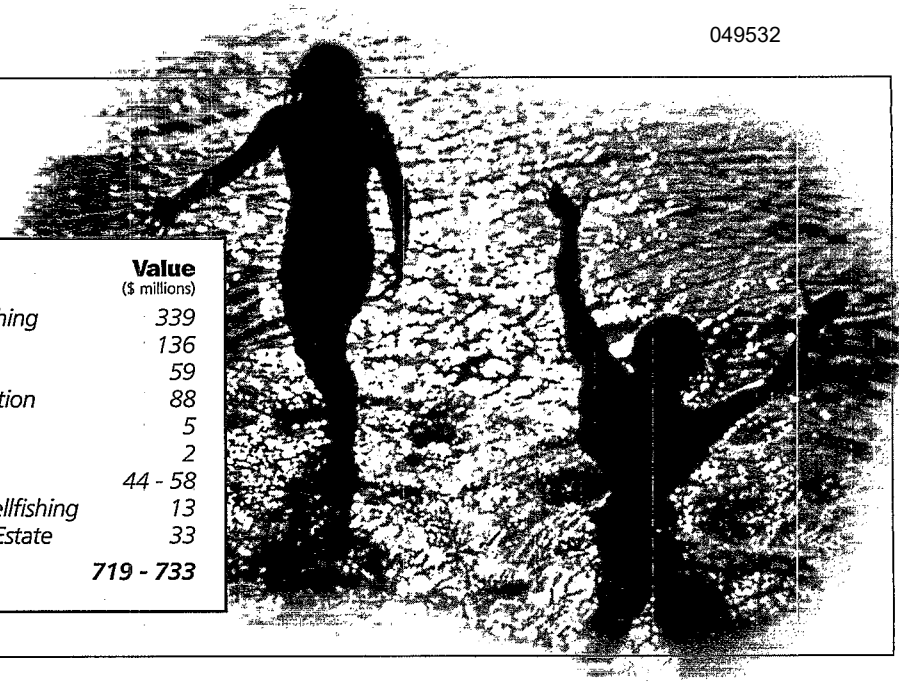

Increasingly, the evidence shows that strong environmental protection and a strong, healthy economy go hand in hand. A study by the Institute for Southern Studies showed that states with the best environmental records also offered the best job opportunities and climate for economic development. Similarly, a study out of the Massachusetts Institute of Technology found that States with stronger environmental standards outperformed those with weaker standards on all economic measures.

This report, *Liquid Assets: A Summertime Perspective on the Importance of Clean Water to the Nation's Economy*, demonstrates the linkage between a strong economy and clean water by focusing on specific sectors. Sector profiles were developed using statistical data from federal agencies, or using appropriate information from other relevant sources, such as trade organizations or individuals working in a particular business. In addition, the report provides information on our nations's clean water laws, on the many efforts underway to help improve water quality in communities throughout the country, and on the many challenges that still lie ahead.

The Economy and the Environment

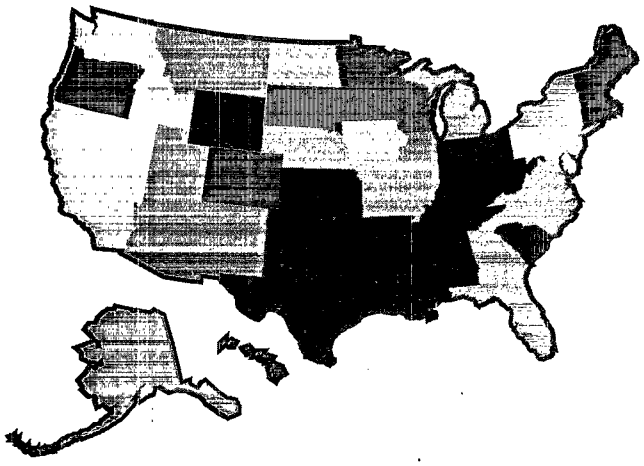

The states with the best record of environmental stewardship...

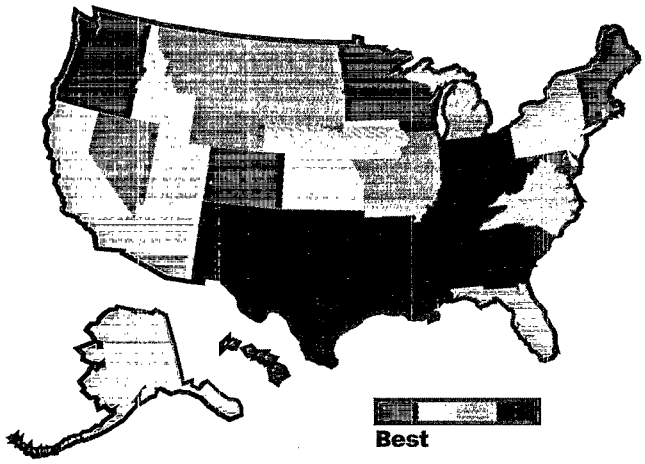

...often have the healthiest economies.

Source: The Institute for Southern Studies

The Business of Clean Water:

A Look at How Water Quality Affects Major Economic Sectors

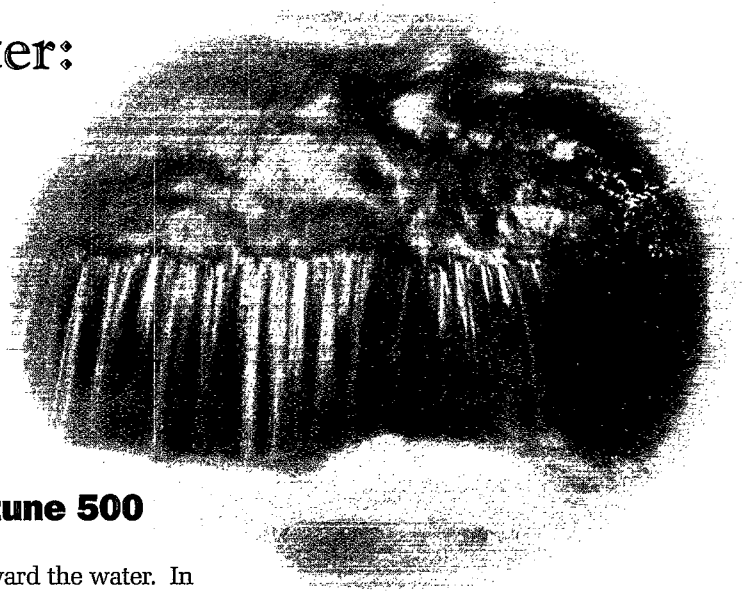

What do soft drink manufacturing, river rafting companies, and the commercial fishing industry have in common? They all have a basic need for clean water. Day in and day out, these and other sectors of the U.S. economy rely on clean water to grow, process or deliver their products and services. In various ways, water quality can either help or hurt productivity. Take a look at a few sectors for which clean water is a vital commodity.

Recreation and Tourism: Rivaling the Fortune 500

An abundance of beautiful beaches, white water rivers, and calm, cool lakes is one of the factors contributing to a flourishing recreation and tourism industry in this country. Water has a powerful attraction for people, one that is translating into jobs and profits for our economy. In 1993, recreation and tourism was the second largest employer in the nation behind only the health care industry. It provided jobs for over 6 million people, and generated sales of over $380 billion, nearly three times the amount of farm products. The industry has a $22 billion trade surplus, the largest of any sector in the U.S. economy.

When people decide to plan vacations and travel for pleasure, there is a strong tendency to head toward the water. In fact, a 1994 Roper Survey found that beaches, rivers, and lakes are Americans' top vacation choices followed by federal and state parks. About a fourth of the population goes swimming every year, making it our second most popular recreational activity behind walking. All total, Americans make an estimated 1.8 billion trips a year to enjoy boating, fishing, swimming or just relaxing around the water.

About 300 million trips are made every year to go boating. Over half of these trips involve power boating, but sailing and paddle sports, such as kayaking, canoeing, and rafting, are popular, too. Boating sales are estimated at over $14 billion a year, and over 6,000 companies are involved in manufacturing boats, trailers, motors and accessory items. The recreational marine boating industry alone employs about 600,000 people.

"beaches, rivers, and lakes are Americans' top vacation choices"

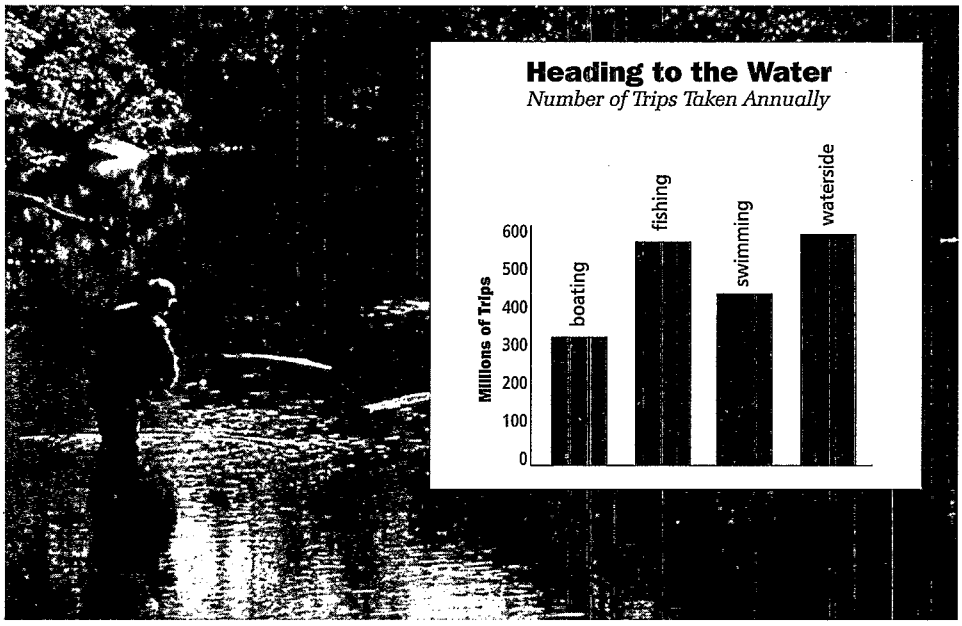

A significant portion of recreational spending is tied to fish and wildlife, both of which require high-quality water and habitat, such as wetlands, for survival. Nearly 49 million American anglers spend $24 billion a year pursuing their sport, ultimately generating $69 billion for our economy. If sportfishing were incorporated as a single business, it would rank 27th on the Fortune 500 List of top sales producers, surpassing such giants as Coca-Cola, GTE, and Dow Chemical.

Ducks and other birds that depend on clean water also generate economic activity for the recreation and tourism industry. In 1991, nearly 3 million people spent about $544 million hunting migratory waterfowl. And even more Americans watch and photograph them. Over 19 million people participate every year, spending over $3 billion, and generating nearly $10 billion in total economic activity. When all birds, not just waterfowl, are factored in, the impact is even more significant. The

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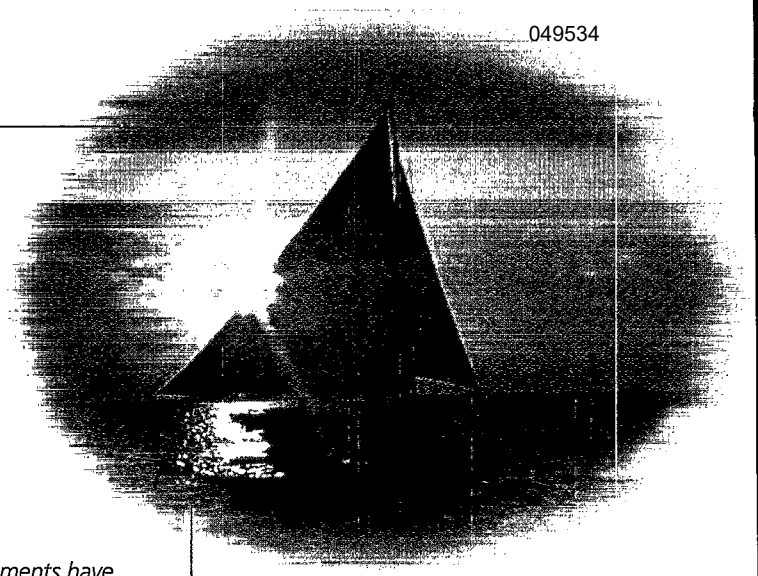

Profile

The Return of Recreation on the Potomac

The Potomac River, which flows through the nation's capital, provides one of the best examples of how water quality can limit or enhance recreational opportunities for people living in or visiting an area. For decades the Potomac suffered from the harmful effects of water pollution. As early as 1894, the U.S. Public Health Service declared, "At certain times of the year, the Potomac River is so loaded with sediments as to be unfit for bathing as well as for drinking and cooking purposes." In 1965, President Lyndon Johnson called the Potomac a "national disgrace" and promised to have "clean water by 1975."

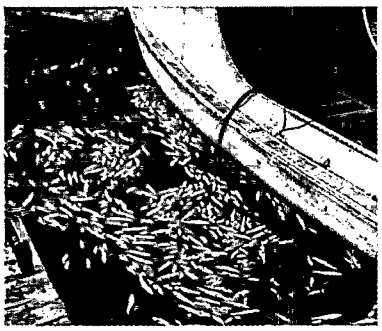

1960s: Fish kills were commonplace.

Over time, dramatic improvements have been made, largely as a result of the Clean Water Act of 1972. The legislation was the foundation for stronger environmental performance standards and federal funding. These funds helped to build a state-of-the-art sewage treatment plant which now treats over 70 percent of the region's waste before discharging it into the Potomac. Improved sewage treatment is recognized as the single biggest factor in the Potomac's restoration.

With improvements made in sewage treatment, more recent efforts have focused on reducing another major pollution source—polluted runoff from urban and rural areas. In 1987, a landmark agreement was reached between Federal, State, and local governments in the region which called for reducing nutrient loadings, such as fertilizers, by 40 percent by the year 2000. The agreement focused on the Chesapeake Bay, but as a major bay tributary, it also applies to the Potomac.

Today, the Potomac River is a much cleaner and safer body of water. Restaurants and shops line the river in Georgetown and Old Town Alexandria. A bass fishing industry has been established, and the river has been the sight of national and regional fishing tournaments. In total, the economic benefit of recreation and other uses of the river is estimated at about $120 million a year for Maryland, Virginia, West Virginia, and Washington, D.C.

Nina Wilson, owner of Potomac Party Cruises since the late 1970s, offers a glimpse of how water quality has improved over the years, and what these improvements have meant for her business. Speaking of earlier conditions, she said "I was ashamed of the unsightly, filthy, smelly water of the Potomac. In particular, luncheon business suffered as a result of noticeably poor water quality in the light of day." Today, her business thrives, and annual revenues have increased by tens of thousands of dollars. These increases are clearly linked to a cleaner environment. According to Ms. Wilson, "the Potomac is much, much cleaner and more inviting."

1990s: A fishing guide at work.

U.S. Fish and Wildlife Service estimates that nearly 30 million people participate, and the total economic impact is nearly $20 billion. Birdwatching, in particular, is a high growth sport. In just the past 5 years, the American Birding Association has seen its membership nearly triple.

Water-based recreation can have significant impacts for local, State, or regional economies. Tony Fedler of the Sport Fishing Institute commented in *Fisheries Magazine* that "Many state governments are beginning to recognize the economic payoffs of helping attract more fishers and increasing good fishing opportunities. By investing in boat ramps, fishing piers, aquatic habitat, angler education, fish stocking, and similar programs, communities are helping their economy by attracting more anglers."

West Virginia is just one State that has recognized and moved to capitalize on its ecological riches. With over 29,000 miles of rivers, West Virginia offers some of the country's best white-water rafting. In 1994, over 200,000 people enjoyed rafting trips on five commercially regulated rivers. The State now brings in over $2.5 billion a year from all tourism activities, and business continues to grow.

In the western United States, recreational use of the Colorado River is valued at about $100 million a year. Lake Mead National Park provides another major economic stimulus for the region. The park is visited by over 9 million people, and collectively, these visitors spend nearly $940 million.

Given the strong attraction of water as a recreational choice, the future growth and prosperity of the tourism industry is certain to be affected by water quality conditions. Commenting on the medical waste wash-ups that closed New York and New Jersey beaches in 1988, real estate agent Jack McHugh stated, "No one came back in 1989. We are usually completely booked-up by March. That year, we sat around waiting for the phone to ring." Economic losses to the region were estimated at more than $4 billion. In 1994, sewage and health concerns about other pollutants led States to close nearly 2,300 beaches to the public.

Economic losses also result when recreational fisheries are placed off limits. In 1995, States issued fish consumption advisories or bans for over 1,500 rivers and lakes where the fish were too contaminated to eat. Mercury is the toxic pollutant most often causing these advisories. While specific data regarding the impact of these advisories on recreational fishing do not exist, warning signs along a river clearly diminish the joy of the fishing experience—and quite possibly, economic opportunity for the local community.

Fish Consumption Advisories in the United States

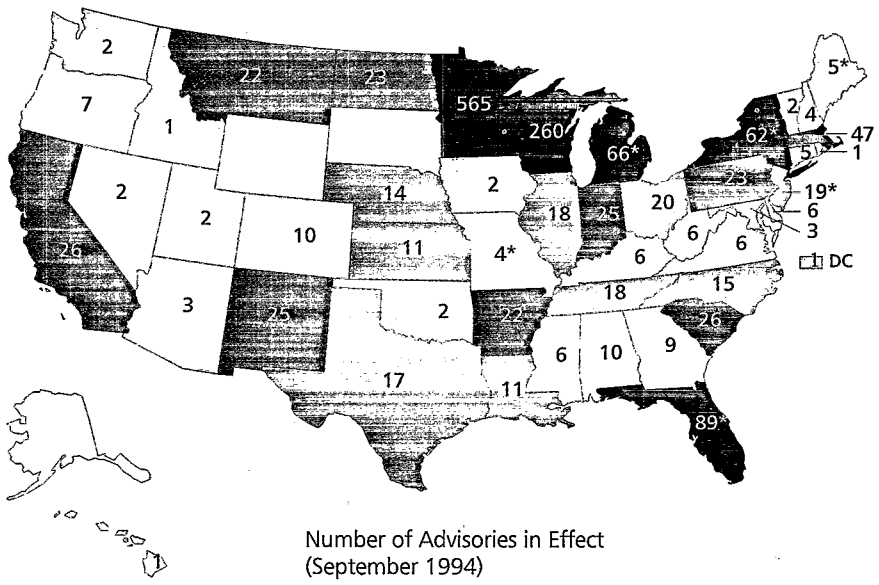

Major Eastern Whitewater Rivers Ranked by Annual User Days

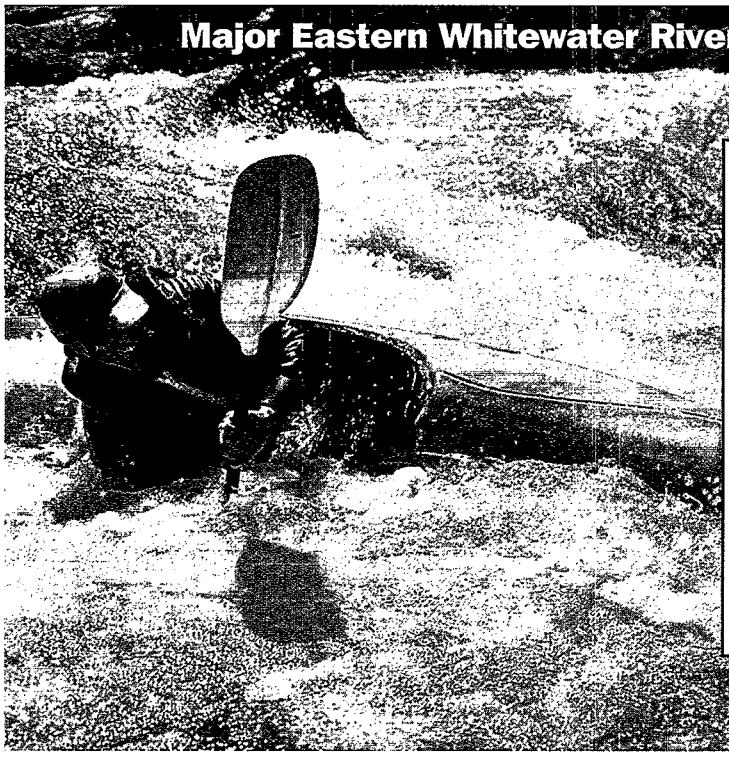

RIVER	STATE	ANNUAL USE
LeHigh	PA	129,350
Youghiogheny	PA	125,000
Nantahala	NC	100,000
Ocohee	TN	90,000
New	WV	83,000
Shenandoah	WV/MD	60,000
Chattooga	GA/SC	55,129
Cheat	WV	40,000
Gauley	WV	25,000
Kennebec	ME	14,400
Penobscot (W. Branch)	ME	12,000
Nolichucky	TN	8,000
Indian-Hudson	NY	3,500
Total		**745,379**

Profile

Reopening of Shellfishing Beds in Puget Sound

Thanks to the effort of scores of people, from public officials to farmers to homeowners to volunteers, clam and oyster harvesting has recently been allowed again in at least four areas of Puget Sound. Although more than 20,000 acres of Washington's commercial shellfish beds still remain closed, there has been success in reducing pollution that had caused some beds to be closed for as long as 12 years. "The oyster industry is more prosperous than ever," says Tim Smith of the Pacific Coast Oyster Growers Association. "It also has a more uncertain future. It's all about the water."

The revival of the half shell trade, coupled with a booming Asian market, has helped turn Washington's $40 million a year oyster industry into the nation's largest. Mussels and clams, produced almost exclusively in Puget Sound, generate an additional $18 million annually. An acre of oyster tidelands can yield about $40,000 to $60,000 every three years, depending on the location and oceanic conditions.

Since 1986, the State has prohibited or restricted oyster harvesting on nearly 45,000 acres of shellfish beds—a quarter of all available grounds in Puget Sound. The culprit is usually poorly treated waste contaminating the waters. A number of steps have helped reduce this contamination. For example, about 100 farmers in the Burley Lagoon watershed have cooperated with the Kitsap Conservation District to cover manure piles, construct fences along streams to keep animals out, and rotate grazing areas to reduce runoff from erosion. Also, a major campaign was launched to identify and upgrade failing septic systems in the watershed.

"Homeowners and farmers have worked hard to improve their sewage systems, farm management practices, and to stop the pollution that was damaging Burley Lagoon," stated Eric Slagle, an Assistant Secretary of the State Department of Health. "It's great to see that effort pay off."

Commercial Fishing: What a Catch

H.L. Mencken, an American journalist, once compared the Chesapeake Bay to a giant protein factory. Every year, our nation's protein factories—the Great Lakes, the Gulf of Mexico, and other coastal areas—produce over 10 billion pounds of fish and shellfish. Producing fish and shellfish for consumption and industrial uses, these fisheries are valued at $3.5 billion annually. However, once these products enter the retail market, the value increases more than tenfold. Americans now eat an average of 15 pounds of fish a year, collectively spending $35 billion. An additional $7 billion is sold every year to our trading partners.

The vessels and ports which support the commercial fishing industry generate additional revenues for the economy. Our commercial fishing fleet includes nearly 70,000 vessels and boats, and employs 250,000 people. But, there is reason to be worried about this industry's future.

Data from the National Marine Fisheries Service show declining populations for many species, including salmon, bluefin tuna, cod, haddock, and flounder. These declines can be linked to a number of factors, most notably overfishing. But environmental degradation is a key factor, too. Wetlands, for example, provide critical habitat during various life cycle phases for about 70 percent of all commercial fish species. While wetland losses have been significantly reduced in recent years, about 70,000 - 90,000 acres are still lost annually. Polluted runoff from urban and rural areas, and impacts from poorly treated sewage, represent additional stressors. Shellfish, such as oysters, clams, and mussels, extract their food by filtering water over their gills. If these waters are contaminated, the shellfish can become contaminated too. To protect the public from eating unsafe products, States may restrict or close shellfishing beds. The result can be a significant loss of revenue. In 1994, nearly one out of every three shellfish beds was closed or placed under special restrictions by States.

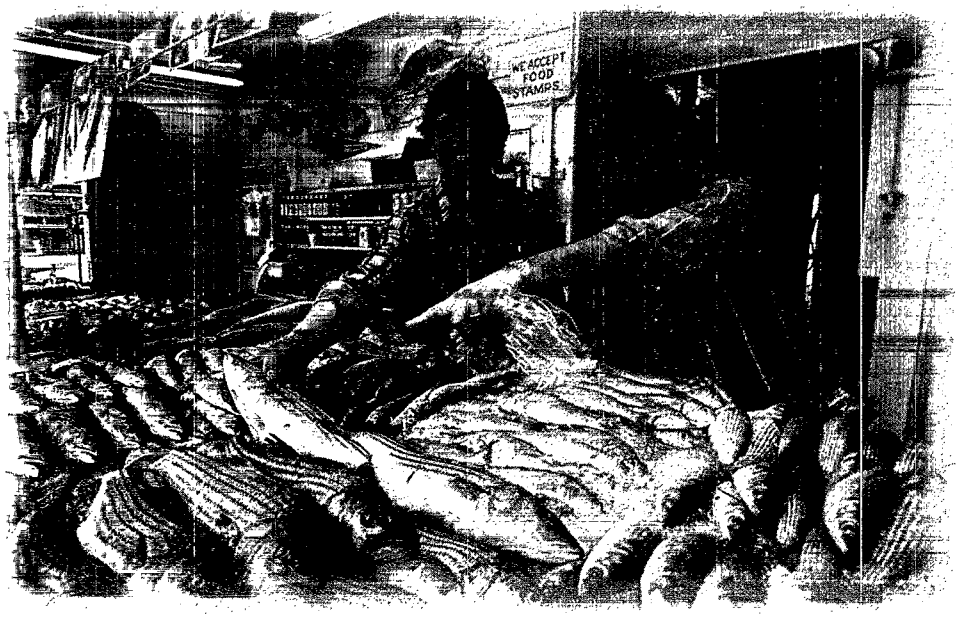

Agriculture: A Bountiful Market

Water is an absolute necessity for ensuring agricultural productivity. Without water, there would be no farming in this country—no fruits, no vegetables, no grain, and no livestock. The loss would be seen on the dinner table—and nationally, in the gross domestic product.

American farmers produce food and fiber products worth $174 billion a year. In 1994, the industry provided jobs for about 3 million people. The cattle industry represents the largest sector of the agricultural economy. With sales of over $40 billion a year, this industry supports about 186,000 farm jobs and over a million more jobs in other areas of the economy.

Other products, not always recognized as part of the agricultural industry, contribute, too. For example, those poinsettias purchased by so many Americans during the holidays generate over $170 million a year. Farm-raised fish are another agricultural product, and as an industry, aquaculture continues to grow strongly. The U.S. Department of Agriculture reports the industry has grown by 20 percent per year since 1980.

Agriculture is an important industry in every state. From cranberry bogs in Massachusetts, to corn fields in Kansas, to potato farms in Idaho, agriculture provides jobs and helps boost our economy. All together, American farmers produce over 165 different agricultural products, making this nation the "breadbasket to the world." In 1994, the U.S. exported over $45 billion in products. Record sales of $60 billion are forecast for 1996.

Water, in combination with rich agricultural lands and technological advancements, helps make all this productivity possible. Irrigation for agriculture represents our nation's single largest use of fresh water—about 40 percent. An estimated 136 billion gallons are used daily to irrigate crops. About 4.5 billion gallons are used to raise livestock, including horses and farm-raised fish, as well as other animals raised for meat, eggs, dairy products, wool, and fur.

Having sufficient quantity is the most important water issue for farmers. But quality matters, too. Today many farmers are working hard to manage their operations in a more environmentally sound manner.

Did You Know....

Each year, one American farmer provides food and fiber for 129 people—97 in the U.S. and 32 abroad.

One-fourth of the world's beef and nearly one-fifth of the world's grain, milk, and eggs are produced in the U.S.

About 15 percent of America's 2 million farms use irrigation.

Oh, How Does Your Garden Grow?

Gallons of water needed to produce a single food serving...

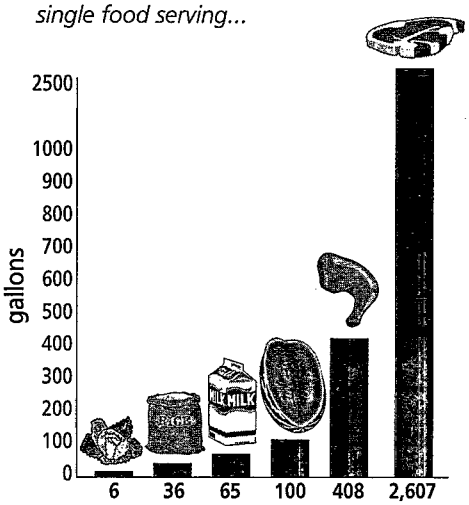

Profile

Wisconsin Farmers Save Money and Protect Water Quality

Farmers all over the country are finding it makes good environmental and economic sense to cut down on the amount of fertilizers and pesticides that are wasted when rain washes them off farmland. Farmers in Wisconsin's Lake Mendota watershed, for example, took the guesswork out of nutrient application, basing their fertilizer rates on soil test results. They reduced phosphorus application by more than 50 percent on more than 30,000 acres and saved $200,000 in the process.

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Profile

Real Estate Values Around Lake Champlain

A study of real estate values around Lake Champlain in the mid-'80s demonstrated the real-world effect that pollution can have in a community and on peoples' pocketbooks. Property values in an area of the lake with good water quality were compared to those in an area of poorer water quality. On average, houses in the better quality areas were worth about 20 percent more—a $4,500 difference for these homeowners.

Real Estate: Location, Location, Location

When it comes to real estate, a waterfront view is a prime selling feature—as long as the water is clean. Ocean, lake, or riverfront properties often sell or rent for several times the value of similar properties located inland. In fact, according to the National Association of Home Builders, proximity to water raises the value of a home by about 28 percent. Similarly, a 1991 American Housing Survey found that "when all else is equal, the price of a home located within 300 feet from a body of water increases by up to 28 percent."

Community and business leaders also understand the potential value of waterfront locations. Today, waterfronts are often a focal point for urban renewal in many cities. These opportunities are due, in part, to the federal Clean Water Act. Prior to passage, many of our rivers and waterfronts were so polluted that no one wanted to go near them, much less invest in new development. As an example, the Nashua River in New Hampshire was reported to be so degraded that some property along the

Waterfronts Act as Magnets

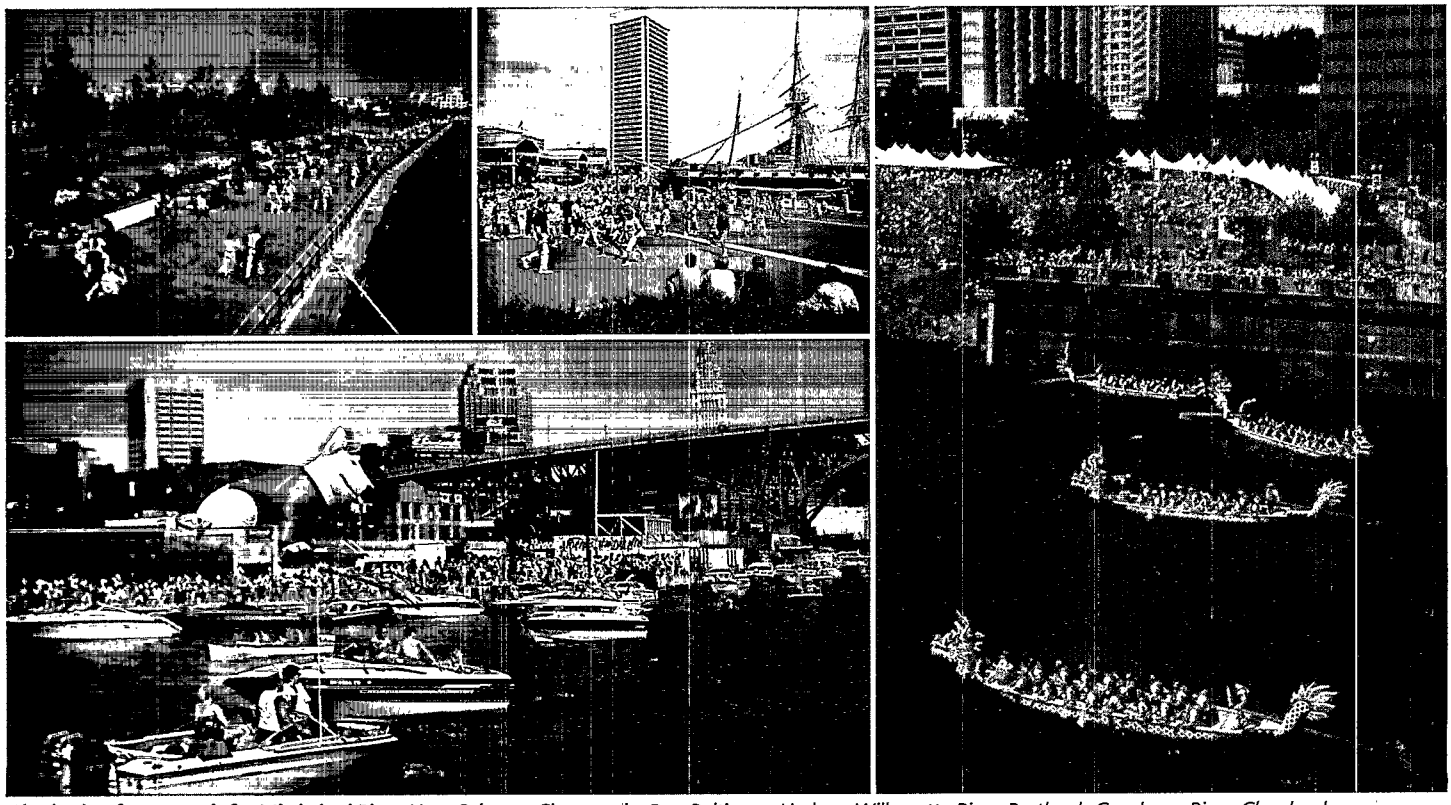

Clockwise from top left: *Mississippi River, New Orleans; Chesapeake Bay, Baltimore Harbor; Willamette River, Portland; Cuyahoga River, Cleveland*

river was actually assessed as "worthless" because of the poor conditions. Today, because of cleaner water and revitalization efforts along the Nashua River and in other communities, waterfront areas are often considered "priceless" by those who enjoy them. They act as a strong magnet for business, tourists, and local residents. Restaurants, shops, and aquariums are springing up in areas that were once no more than dilapidated urban wastelands.

Many communities now hold festivals and other special events to celebrate the beauty and bounty of their waters. These events are held because people recognize and value the contribution that a river or lake or beach can have in enhancing their overall quality of life. Clean water consistently ranks as a leading quality of life indicator. Each year, *Money* magazine conducts a "Best Places To Live" survey, and in 1995, clean water and air were the two most important factors for choosing a place to live, over low crime rates, plentiful doctors or hospitals, or low taxes.

Profile

The Change in Chattanooga

What happens when a city receives the title of most polluted city in the country? This label, attached by the U.S. Department of Health, Education, and Welfare in 1970, served as a wake-up call for Chattanooga, Tennessee, a city of 150,000 which sits on a bend of the Tennessee River in the southeastern corner of the State. Chattanooga has transformed itself with a major focus on cleaner water, and today, it receives international recognition as a model of sustainable development. In fact, it was recently chosen as one of 21 areas selected for study by President Clinton's Council on Sustainable Development.

Over the years, easy access to transportation by railway and the river helped Chattanooga grow into a small industrial city. With this growth came pollution, and by the 1960s, the haze in the air was so thick that headlights were sometimes necessary at midday, and the river was unsafe for fishing or swimming.

In 1984, after years of decay, concerned citizens and members of the business community established "Chattanooga Venture" to tackle the city's problems. A group of over 1,700 community members reached consensus on 40 goals that included water quality, air quality, economic development, transportation, education, and housing. Together, they showed a desire for a strong local economy, but also clean air, recreational use of their river, and locally caught fish that were safe to eat.

Restoration of the waterfront was a top priority, and over the next 10 years, deteriorating warehouses and piers were removed to open up access and views of the river. In 1992, the Tennessee Aquarium opened with a focus on freshwater fish and their river and lake habitats. Built at a cost of $45 million, it generated $133 million during its first year of operation. About 1.3 million people now visit every year.

Waterfront space was also revitalized for a new 4-acre park and plaza area, known as Ross's Landing. Today, the area provides residents and visitors with open space as well as shopping and restaurants. In addition, about 2 miles of a planned 22-mile-long park along the eastern shore have been completed, providing recreational benefits for cyclists, pedestrians, skaters, and anglers. Mixed commercial and residential buildings are also planned along this greenway.

The improvements that have been made to Chattanooga's waterfront led James Yenckel, writer for the Washington Post *Sunday Travel Section to write, "By reinvesting in its river heritage, Chattanooga seems to have restored its faith in itself, and it appears—at least to my eyes—to be well on its way to becoming one of the prettiest cities for its size in America."*

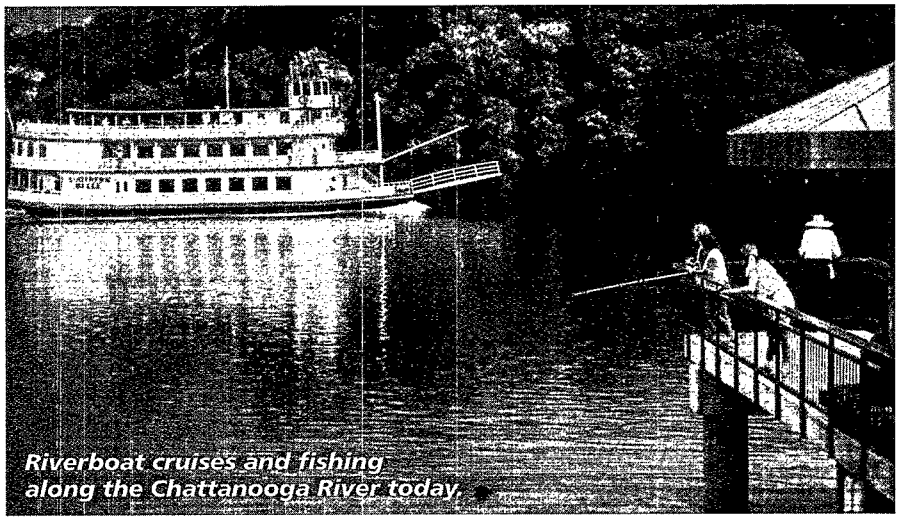

Riverboat cruises and fishing along the Chattanooga River today.

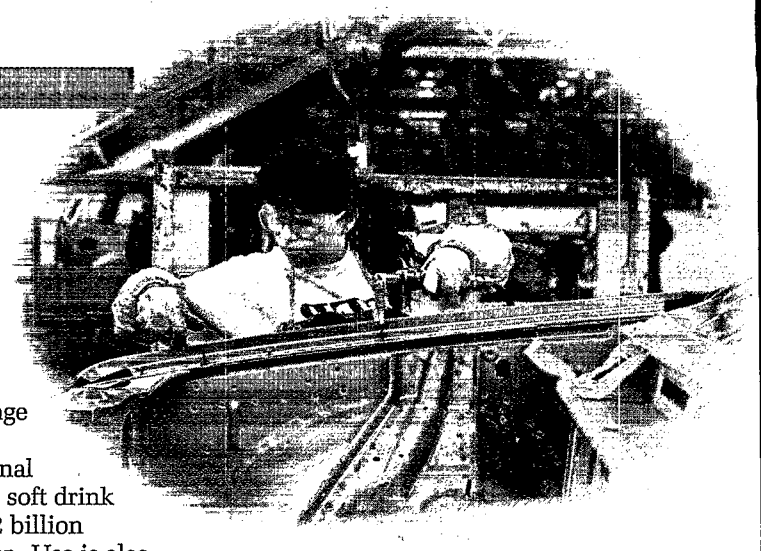

Manufacturing: The Universal Solvent Is Also a Key Ingredient

The size and nature of American industries vary widely, and yet, in one way or another, nearly all of them share a common need—a reliable source of water to support operations. In some cases, water is needed primarily for production purposes, such as in the manufacturing of computer chips or steel. In others, clean water is an essential ingredient in the final product, such as soft drinks and pharmaceuticals.

"My company requires high-quality water to produce a high-quality product."

The most recent data on water used in all manufacturing was last gathered by the Bureau of the Census over a decade ago. At that time, manufacturing companies used over 13 trillion gallons of water a year—more than 9 times the volume that flows from the Mississippi River into the Gulf of Mexico every day. About 84 percent of total use was attributed to four major industries—chemicals, metals, paper products, and petroleum.

More recent data on water are available from specific industries. For example, water is clearly vital to beverage manufacturers, and according to its national trade association, the soft drink industry uses over 12 billion gallons of water a year. Use is also high for malt beverage producers—it takes about 10 barrels of water to produce a single barrel of beer. These are highly lucrative industries, with each generating about $50 billion a year in sales. Together, they support about 3.5 million jobs and generate $270 billion in total economic activity. In sum, all manufacturing contributes about $1 trillion a year to the U.S. gross domestic product.

Increasingly, companies are choosing to become directly involved in community programs to protect the local water source. The Hershey Foods Corporation is working with its local water company in Pennsylvania to ensure that its water stays clean. And Coors Brewing Company in Colorado is working to prevent pollution of the local aquifer.

"Water is a fundamental input to our production process. My company requires high-quality water to produce a high-quality product. We must support protection of the community's ground water supply not only to protect our employees, but also to keep production costs down," says Jack Huggins, President and Chief Executive Officer of an ethanol and agricultural feed producing company in Pekin, Illinois. This reliance has not been lost on the local Chamber of Commerce. "We are going to use the Pekin protected water supply as a marketing tool for the community to expand business and attract companies," said Charles Renner, the Chamber of Commerce Executive Director. Indeed, if the water supply can be protected, the water supplier can avoid having to install expensive treatment technology. The result is a lower water bill for manufacturers and other customers in the community, as well as a higher level of confidence in the local drinking water supply.

Clean water often plays a role in corporate marketing campaigns. Several national companies use powerful images of water to convey qualities of freshness and purity. For example, Olympia Brewing Company in Washington has adopted the motto "It's the water" as its marketing slogan. As Samuel Rowse, President of juice manufacturer Veryfine Products, noted, "The integrity of a town's water reflects upon the integrity of the companies within that town."

Bringing Products to Market: How Many Gallons of Water Are Used...?

To process a quarter pound of hamburger?	*1*
To make one board foot of lumber?	*5*
To process one can of fruit or vegetables?	*9*
To process one chicken?	*12*
To make one pound of plastic?	*24*
To make one pound of wool or cotton?	*101*
To refine one barrel of crude oil?	*1,851*
To make four new tires?	*2,072*
To manufacture a new car, including tires?	*39,090*
To produce one ton of steel?	*62,600*

Latest Estimate:

Manufacturing companies use over 13 trillion gallons of water a year—more than 9 times the volume that flows from the Mississippi River into the Gulf of Mexico every day.

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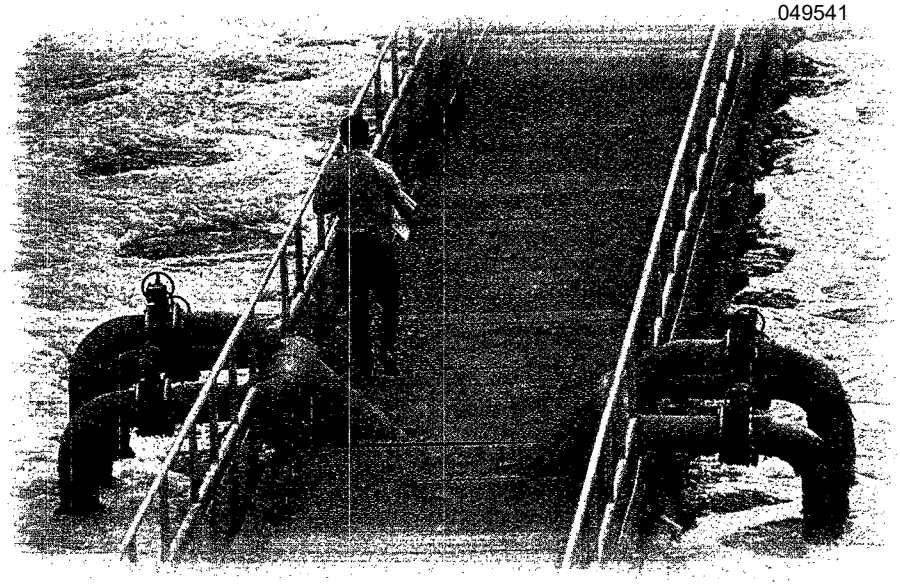

Environmental Technology: New Products, New Markets

The future of the environmental technology industry depends not so much on *using* clean water, but on *delivering* it as a final product. Water companies treat water from local water sources, such as a river, an aquifer, or reservoir, and provide a product safe for drinking. Similarly, sewage plants treat wastewater from our homes and industries before releasing it to local rivers and streams. In 1994, the market for water-related equipment, chemicals, and services was over $64 billion here in the United States and over $170 billion worldwide.

While the U.S. has traditionally represented the world's strongest environmental market because of higher standards, other countries are beginning to invest in environmental infrastructure and technologies. The international environmental market, now estimated at over $400 billion for all media (i.e., water, air, and waste), is expected to double in size by the turn of the century, and foreign shores represent major market development opportunities. In general, water-related investments are likely to be among the first made. Safe drinking water and sewage treatment are essential services that simply do not exist in some areas.

While improving the environment, U.S. and global investments in environmental technologies also create high-skill, high-wage jobs. Nearly 1.3 million Americans are employed by more than 50,000 private environmental technology companies nationwide. Thousands more work for public companies, such as sewage treatment and drinking water plants. In 1995, the Department of Labor identified environmental technology as a key growth sector for the economy, creating jobs at about twice the rate of the economy as a whole.

"As we protect our environment, we must invest in the environmental technologies of the future which will create jobs."

President Clinton
State of the Union Address,
January 1994

Clean Water Technology Keeps Our Communities Healthy

The United States has:

- *nearly **58,000 community water systems** providing drinking water for about 80 million households.*
- *nearly **16,000 public sewage treatment plants** providing service for about 71 million households.*

***Wastewater treatment technology** prevents over 900 million pounds of sewage and 1 billion pounds of toxic chemicals from entering our waterways every year.*

***Drinking water safety standards and technologies** help prevent over 100,000 cases of gastrointestinal illness and reduce lead exposure for over 50 million people.*

Profile

Creating Jobs *and* a Clean Environment

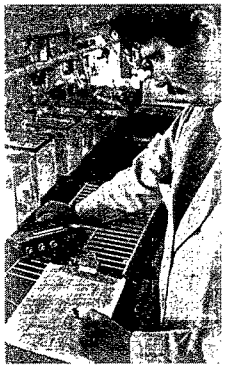

Environmental technology represents a major growth industry for California's economy. The State's Employment Development Department estimates that about 200,000 people work in the environmental technology sector. Revenues from this industry are expected to reach $27 billion by 1997, up from $19 billion in 1992.

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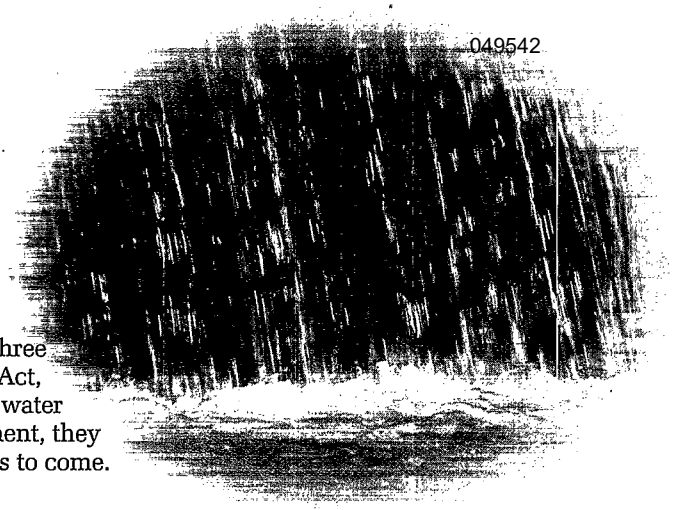

Clean Water Insurance:

Our Three Major Water Laws

Over the years, major legislation has been written, debated, and signed into law to help protect the quality of America's water resources. The three most significant laws are the Clean Water Act, the Safe Drinking Water Act, and the Ocean Dumping Act. Together, they represent a national clean water insurance policy. By providing a framework for protection and investment, they offer the promise of safer, cleaner waters for all of us and for generations to come.

Clean Water Act

The Federal Water Pollution Control Act is the primary Federal legislation that protects surface waters, such as lakes, rivers, and coastal areas. Originally enacted in 1948, the legislation was significantly expanded and strengthened in 1972 in response to growing public concern for serious and widespread water pollution problems. This 1972 legislation, which became known as the Clean Water Act (CWA), provided the foundation for the dramatic progress in reducing water pollution over the past twenty years. Amendments to the 1972 Clean Water Act were made in 1977, 1981, and 1987.

The Clean Water Act focuses on improving water quality by maintaining and restoring the physical, chemical, and biological integrity of the nation's waters. It provides a comprehensive framework of standards, technical tools, and financial assistance to address the many stressors that can cause pollution and adversely affect water quality, including municipal and industrial wastewater discharges, polluted runoff from urban and rural areas, and habitat destruction.

The Clean Water Act requires national performance standards for major industries, such as iron and steel manufacturing and petroleum refining, that provide a minimum level of pollution control based on the best technologies available. These national standards result in the removal of over one billion pounds of toxic pollution from our waters every year.

In addition, the Clean Water Act establishes a framework whereby States and Tribes survey their waters, determine appropriate uses, such as recreation or water supply, and then set specific water quality criteria for various pollutants to protect those uses. These criteria, together with the national industry standards, are the basis for permits that limit the amount of pollution that can be discharged to a waterbody. Under the National Pollutant Discharge Elimination System, sewage treatment plants and industries that discharge wastewater are required to obtain permits and to meet the specified limits in those permits.

The Clean Water Act also provides Federal funding to help States and communities meet their clean water infrastructure needs. Since 1972, over $66 billion in Federal grants and loans have been provided, primarily for building or upgrading sewage treatment plants. Funding is also provided to address another major water quality problem—polluted runoff from urban and rural areas.

Protecting valuable aquatic habitat, such as wetlands, is another important component of this law. Filling wetlands with dredged or fill material can destroy or degrade these important aquatic areas and have a profound impact on water quality. To minimize impacts, the Clean Water Act establishes a permitting program to ensure that these types of activities are conducted in an environmentally sound manner.

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Safe Drinking Water Act

The Safe Drinking Water Act was passed in 1974 following public concern over findings of harmful chemicals in drinking water supplies. The law established the basic Federal-State partnership for drinking water used today. It focuses on ensuring safe water from public water supplies and on protecting the nation's aquifers from contamination.

To ensure the safety of public water supplies, the law requires EPA to set safety standards for drinking water.

Standards are now in place for over 80 different contaminants. EPA sets a maximum level for each contaminant; however, in cases where it is not economically or technologically feasible to make this distinction, EPA specifies an appropriate treatment technology instead. Water suppliers are required to test their drinking water supplies and maintain records to ensure quality and safety. Most States have the responsibility for ensuring that their public water supplies are in compliance with the national safety standards.

Provisions also authorize EPA to conduct basic research on drinking water contamination, to provide technical assistance to States and municipalities, and to provide grants to States to help them manage their drinking water programs.

To protect ground water supplies, the law provides a framework for managing underground injection of wastes. EPA has responsibility for issuing permits for these operations and ensuring compliance. As part of that responsibility, EPA may disallow new underground injection wells based on concerns over possible contamination of a current or potential drinking water aquifer.

Ocean Dumping Act

Also passed in 1972, the Ocean Dumping Act provides a framework for managing ocean dumping activities and for conducting basic oceanic research. The law bans ocean dumping of radiological, chemical, and biological warfare agents and high-level radioactive waste. Amendments in 1988 extended this ban to sewage sludge, industrial waste, and medical wastes.

The law provides a mechanism for meeting U.S. commitments under the 1972 Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matters, an international ocean dumping treaty signed by 80 countries.

It also authorizes research on the effects of ocean dumping, pollution, over-fishing, and other human-induced stressors, including oil spills. Provisions added in 1992 establish a national coastal water quality monitoring program to evaluate the health and quality of ocean waters and the pollution sources that affect them.

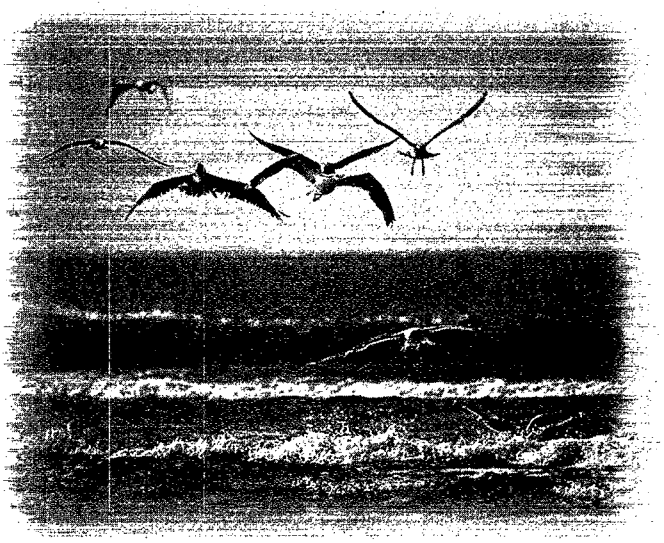

Joint Ventures:

How EPA Works in Partnership to Improve our Waters and Protect Public Health

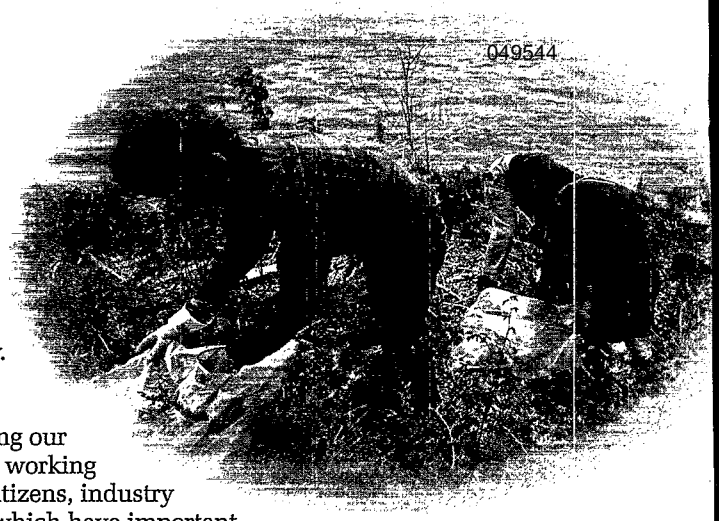

"Waste not, want not," a common American adage, should be considered as a national motto for managing our nation's water resources. Indeed, because our rivers, lakes, and coastal waters are so vital to our economy, our health, and our overall quality of life, they must be treated as a national treasure of the very highest priority.

EPA has a major role in managing this national treasure, acting as the nation's clean water guardian. But, the job of protecting and improving our waters cannot be done by just one government agency. Today, EPA is working hard to build and nurture partnerships with other federal agencies, citizens, industry and business leaders, and State, local and Tribal governments, all of which have important contributions to make in keeping our waters safe and clean. By leveraging resources and targeting actions to those problems in need of attention, EPA and its partners are helping to make safe, clean water and stronger economies a reality for all of us.

Restoring Valuable Ecosystems

EPA and its partners are involved in clean-up and protection efforts in hundreds of watersheds throughout the country, but a few areas are getting special attention. Nationally, these areas represent some of our most important waters—ecologically and economically.

The Everglades

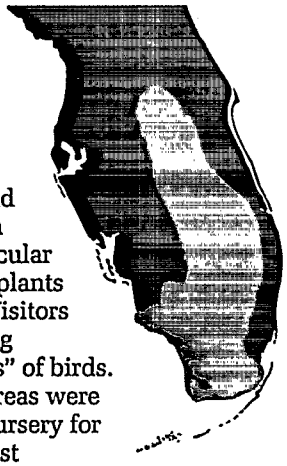

One hundred years ago, this unique ecosystem of water and land provided a home to spectacular populations of plants and animals. Visitors described seeing literally "clouds" of birds. Rich wetland areas were the principal nursery for the State's robust commercial and sport fishing industries. Today, while still a major tourist attraction, the Everglades are recognized as being on the verge of collapse. Ninety percent of the wading birds are gone, the estuarine fisheries have declined, and dozens of species are listed as endangered or threatened.

How did this happen? In the 1940s, intense flooding in South Florida took lives and damaged property. A complex system of public canals, levees, pumping stations and other structures was built to control the water and make the land more suitable for farming and urban development. The system worked—too well. Half of the Everglades' wetlands were drained and converted to agriculture or urban developments.

Over time, the impact of these conversions has become obvious, and a series of actions has been taken to restore the natural ecosystem. In 1993, Florida and the U.S. Army Corps of Engineers began the task of converting the Kissimmee River from an "engineered" channel back into its more natural, riverine form. In addition, a special federal task force on South Florida ecosystem restoration was established to improve coordination among the Federal, State, and Tribal interests in the area. A milestone was reached when the State and the sugar industry agreed to work together to reduce phosphorus loadings by 75 percent. This past January, the Clinton Administration announced a comprehensive restoration approach, including a $1.5 billion federal assistance package, to speed up the restoration process. Among other things, the funding is to be used to acquire, in partnership with Florida, enough land to make restoration a reality, including the purchase and reconversion of over 100,000 acres of farm lands. The funding is also to be used to continue work on the Kissimmee River, to construct wetlands to serve as natural filters for phosphorus and other pollutants, and to develop a multi-species recovery plan. Most recently, in April 1996, Congress passed and the President signed into law a new Federal Agriculture Improvement and Reform Act, otherwise known as the Farm Bill, which provides up to $300 million for Everglades restoration.

Together, these and other investments have the potential to make an enormous difference in the health of this great ecosystem, and future generations may very well look back and point to the 1990s as the turning point in Everglades history. A Save Our Everglades campaign has helped to acquire and protect over 326,000 acres of land in the area. Hydrologic improvements have helped rid the ecosystem of exotic species that invade and disrupt the area's natural vegetation and habitat. And, in just the last three years, phosphorus levels in water discharged from farm lands north of the Everglades have been cut by about 30 percent.

But while signs of improvement can be seen, the ecosystem remains in critical condition. The road to recovery will require continued vigilance and commitment to addressing the many stressors that threaten this fragile ecosystem and the many species that live there.

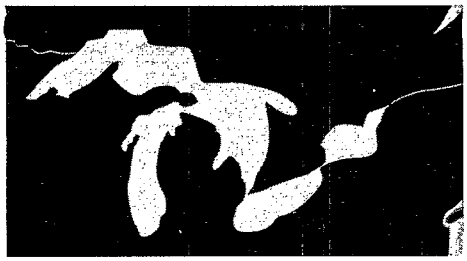

The Great Lakes

Considering that about 95 percent of all fresh water above ground in the U.S. is in the Great Lakes, it is pretty clear why water quality there is so important. Over 23 million people living in the region depend on these magnificent lakes to provide their drinking water and to support other uses. Not surprisingly, a study by the Health Education Research organization found that over 80 percent of those surveyed wanted to see more done to protect the Great Lakes environment.

And more is being done. In just the past two years, toxic pollution from a wide variety of sources, including manufacturing and sewage treatment plants, has been significantly reduced. PCB emissions have been virtually eliminated and levels of mercury, the pollutant most often found in contaminated fish, have been cut by over 60 percent.

The eight States which border the Great Lakes have long recognized the need to work together on common-sense, cost-effective solutions to reduce the harmful effects of toxic pollution. In the late 1980s, the States asked EPA to help develop a consistent approach for achieving these reductions. In 1994, a major milestone was reached. After working closely with the States, industry, and other interested parties, EPA issued guidance that goes a long way toward reducing toxic pollution. Known as the Great Lakes Water Quality Initiative, this guidance will help ensure a consistent level of environmental protection throughout the region. In addition to providing a cleaner, healthier environment, the guidance will also help to level the economic playing field among corporate competitors. Companies in similar industries throughout the region will be held to the same performance standard, eliminating economic advantages that might occur as a result of lower standards in some areas.

Other efforts are also underway to help protect the Great Lakes from toxic pollution. DDT and other pesticides have been banned for use in this country, and yet they can still pose a powerful threat if old supplies are forgotten or disposed of improperly. Several States in the Region now host agricultural "clean sweeps" to gather and arrange proper disposal of these and other pesticides. EPA has helped States and counties sponsor these events, and many individuals have volunteered their time to help organize and manage them. Between 1992 and 1994, community clean sweep events helped remove nearly 20,000 pounds of toxic material from around Lake Superior.

The medical industry is another active partner, helping to reduce one of region's most serious toxic problems—mercury. The majority of mercury pollution in the Great Lakes comes from air pollution generated by coal-burning utilities and incinerators. However, mercury is also found in many medical products, and unless these products are disposed of properly, the very products designed to improve public health can cause serious harm. To reduce this risk, EPA supports a partnership between regional doctors, nurses, hospitals, local governments and the National Wildlife Federation aimed at educating those working in the industry about proper disposal and product alternatives. The goal is to reduce mercury, and if possible, to eliminate the use of mercury-containing products altogether.

"Many hospitals and health care facilities throughout Michigan are already taking steps to eliminate as much of the mercury we use as possible. In keeping with our mission of providing quality health care and promoting a healthy environment, we're looking forward to spreading this information across the Michigan health care community," said David Seaman, Executive Vice-President of the State Health and Hospital Association.

While the amount of toxic pollution being released into the Great Lakes is being reduced, the problem is not completely solved. Toxic chemicals from the air, from contaminated bottom sediments, from agricultural and urban runoff and from Superfund sites still pose a threat to the environment and the people who live there. These sources present a management challenge, and they call for a continued strong emphasis on pollution prevention and toxics control throughout the region.

Profile

Action by the Auto Industry

The American Automobile Manufacturers Association, on behalf of Chrysler Corporation, Ford Motor Company and General Motors Corporation, worked with the Michigan Department of Natural Resources to establish an automobile pollution prevention project. Launched in 1991, the manufacturers agreed to voluntary actions to help reduce emissions of over 65 toxic chemicals in the Great Lakes area. Since that time, toxic emissions have been cut by 15 percent. If zinc emissions from two plants are excluded, the rate of total toxic reduction is over 50 percent. Because of its success, the program is now being expanded to automobile manufacturers in other parts of the country.

San Francisco Bay-Delta

The San Francisco Bay-Delta is another area getting special attention. Comprising more than 1,650 square miles—an area about the size of Rhode Island—the estuary is a source of drinking water for 20 million people, provides irrigation for over 4.5 million acres of farmland, supports more than 120 species of fish, and is an internationally important waterfowl migration area. It also drains nearly 40 percent of California's land area. Over the years, water diversion, loss of wetlands, and polluted runoff from urban and rural areas have seriously impacted the health of the ecosystem.

Today, multiple government agencies, groups, and individuals are working to stop the pollution and repair the damage. One of the most important efforts to date occurred in 1994. The Clinton Administration worked with

Profile

Volunteers Make a Difference

Increasingly, private citizens are turning their concern for their local environment into action by volunteering to monitor water quality in lakes, rivers, or coastal areas. In the Bay-Delta area, hundreds of people, young and old, have received training and begun to collect and report important water quality information. Mike Rigney, who works at the Coyote Creek Riparian Station, has trained nearly 200 people in the last few years. When asked whether these volunteers really provide reliable data, Mike was quick to answer "yes!" Indeed, these individuals are making a valiant and valuable contribution, doing what they can to help improve conditions in their community.

industry, farmers, environmentalists, state officials, and others to craft a historic consensus-based agreement on actions to improve the Bay-Delta environment while providing more certainty in water supplies for the State's future. The common-sense strategy allocates water use among the estuary, farmers, and urban users, breaking gridlock on a decade-long water war in the region.

The North Bay Initiative is another important component in the ecosystem's restoration. The North Bay is known for vast ranch lands, rich aquatic habitats, and some of the most productive vineyards in the world. EPA and other Federal, State, and local governments are working together and with landowners in the area to promote common-sense land use management.

The San Francisco Bay National Estuary Program has provided a major platform for planning, coordinating, and managing many restoration activities. The National Estuary Program, which includes 27 other high-priority estuaries in addition to the Bay-Delta, brings together multiple stakeholders, including government, business interests, and private citizens to set priorities and find practical solutions for the problems threatening their estuary. Mapping the distribution of native fish species and streamside forests, preserving wetlands, and monitoring water quality are just a few of the activities that have been conducted since the San Francisco Bay-Delta program was established in 1987.

Work to restore the Bay-Delta is also being done by the academic community. For example, Professor Robert Twiss of the University of California at Berkeley's Center for Environmental Design and Research is building an extensive geographic information system (GIS), an electronic tool that can map and compare different environmental and land use factors. With more than 50 data sources, the GIS will be able to show everything from streams and wetlands to urban growth scenarios. To Twiss, GIS and advanced telecommunications have the power to ensure wide public access to information. Rather than having one centralized government repository, Twiss envisions a large number of information suppliers (universities, government agencies, volunteer groups) and users (libraries, schools, homes, private firms) connected by a network. "Demystifying and de-professionalizing this kind of information is a very important democratic principle," says Twiss. "It's enormously empowering. It's a way for the estuary project to connect at the grassroots level."

These and other efforts are helping to improve conditions in one of the country's most productive areas. In particular, the Bay-Delta accord addressing water allocation shows that progress can be made on even the most complex and contentious issues. Remaining challenges, as well as emerging ones, such as the rapid introduction and growth of exotic species, will require a similar level of resolve and commitment to finding workable, common-sense solutions.

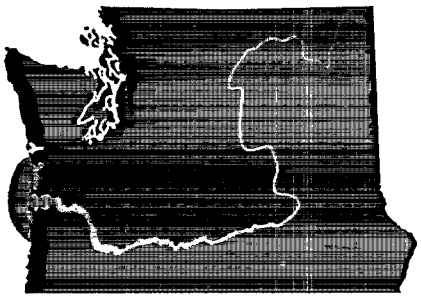

The Columbia River

As the second largest river in the U.S., the Columbia River is a resource of national and regional significance. This mighty river drains seven states before emptying into the Pacific Ocean, where the mixing of fresh water with salt water provides important estuarine habitat for fish, other aquatic species and wildlife. The river also helps to support agriculture, forestry, commercial and sport fisheries, hydropower generation, and recreation and tourism industries.

Despite its many uses and benefits for the region, evidence continues to show that this great river is at risk. High concentrations of PCBs, dioxin and other toxic pollutants have been found in sediment and fish tissue in the lower river. Reproductive success for salmon and other species is being affected, and fish consumption advisories are now in place throughout the region. Dam operations, along with habitat loss and pollution, have hurt fisheries. Some salmon species are threatened, endangered, or already extinct. These impacts represent quite a loss in a river that was once a passageway for over 15 million salmon a year.

Recognizing the significance of the resource and the need to ensure its protection and restoration, the Lower Columbia River was selected as a site for inclusion in the National Estuary Program in 1995. A team of concerned citizens along with representatives from Federal, State, and local government agencies, environmental groups, and industry is being established to plan and guide priority actions. In addition, in 1994, President Clinton announced a Pacific Northwest Forest Plan to improve management of over 25 million acres of

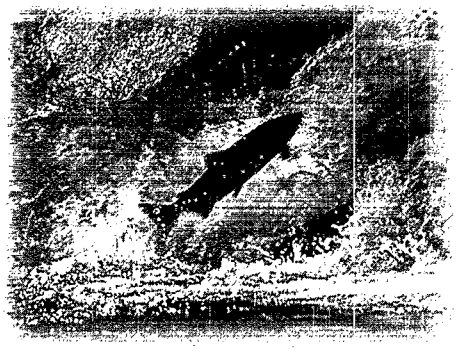

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federally owned forests in the region. Improving forest management will involve protecting streamside areas and reducing polluted runoff from harvest areas, both of which should help to improve water quality and habitat for salmon and other fisheries. One of the largest-scale ecosystem management efforts ever undertaken, the plan will maintain and restore old growth forests, water quality, fish and wildlife habitat, and allow sustainable timber harvests of over 1 billion board feet per year. It calls for over 2.6 million acres to be set aside along streams and wetlands to provide clean water and habitat for fish and wildlife. It provides a stronger scientific basis for managing the area's resources by increasing monitoring and data analyses, and provides funding for education and training to help counter any potential job losses related to timber harvesting restrictions. To date, more than 500 watershed restoration projects have been initiated or completed to improve ecological conditions.

The comprehensive management plan being developed through the National Estuary Program and the Forest Plan provide a strong basis for addressing some of the highest priority problems facing the region. But, they represent only a beginning. Remaining challenges, such as how to best reduce toxic pollution, call for continued action and attention.

Targeting High-Priority Problems

As a result of public and private sector investments in infrastructure and technologies and a commitment to preventing pollution and improving overall environmental performance, our waters are much cleaner today compared to twenty-five years ago. But, we still have areas where the water is too polluted to safely swim or eat the fish. And Americans are increasingly worried about the safety of their drinking water. The problems that still plague our waters do not have fast and easy fixes. To a great extent, our ability to find and apply workable solutions will depend on strong, highly committed partnerships involving individuals as well as the public and private sectors.

Drinking Water Contamination

In 1993, a drinking water crisis in Milwaukee sounded a national alarm on drinking water safety. The contaminant *Cryptosporidium* shut down the city's water supply, costing businesses and commercial establishments over $50 million in lost economic activity. Even more importantly, it left over 400,000 people sick, and was attributed as the cause of over 100 deaths.

Unlike many microorganisms, *Cryptosporidium* cannot be eliminated with normal disinfection processes, but contamination can be reduced through careful filtration. Recognizing the need to protect people from this and other microbial contaminants, public water suppliers and EPA developed the "Partnership for Safe Water." Under this voluntary program, suppliers that use surface waters carefully survey their filtration systems, operating and maintenance procedures, and other management activities to determine whether action is needed to reduce the risk of contamination occurring. To date, 140 water companies serving more than 74 million Americans have joined up and committed to take action, if needed.

The Groundwater Guardian Program is another voluntary way to improve drinking water safety. Established and managed by a nonprofit organization in the Midwest, and strongly promoted by EPA, this program focuses on communities that rely on ground water for their drinking water. It provides special recognition and technical assistance to help communities protect their ground water from contamination. Since beginning in 1994, Groundwater Guardian programs have been established in nearly 100 communities in 31 States.

These voluntary efforts represent practical approaches to help ensure safe drinking water. But for some risks, stronger safeguards are needed. For example, to better protect the public against *Cryptosporidium*, EPA recently began requiring the nation's largest water suppliers to monitor for signs of contamination. The data will be used to clarify current scientific uncertainties and allow EPA to move forward on setting an appropriate safety standard for all systems in the future.

Profile

Guarding Ground Water in Oklahoma

Ada, Oklahoma, is a small town of 15,000 people which relies on a single aquifer for its drinking water. Eight people there have formed a Groundwater Guardian team and are now volunteering their time and energy to keep their ground water clean. To accomplish this goal, the team focuses on education. In the past year, they have developed and widely distributed an information brochure to the local citizens. They have also made numerous presentations to local service clubs and held public meetings to inform local residents about drinking water issues.

Profile

Rochester Takes Action

Rochester, New York, is one city that has already acted to address its combined sewer overflow problems. Using an approach similar to the national combined sewer overflow policy, Rochester's sewer system now captures and treats more than 3 billion gallons of combined sewage annually. Automated rainfall monitoring and computerized "smart" controls help the system optimize its response to a variety of rainfall and flow conditions. As a result, combined sewer overflows discharge to the Genesee River only about twice a year, and they have been virtually eliminated as a cause of beach closures on Lake Ontario. An increase in real estate values along Irondequoit Bay has been directly linked to the recent water quality improvements.

Raw Sewage Spills

For the most part, raw sewage is no longer routinely dumped into our nation's waters. Sewage treatment plants are very effective at treating wastewater so that it can be safely discharged to local waterbodies. In fact, the amount of pollution being discharged from these plants has been cut by over one-third during the past twenty years, even as the number of people being served has doubled.

Yet, in some communities, raw sewage spills still occur. Sometimes spills occur because a sewer line is blocked, broken or too small. Spills can also occur during periods of heavy rainfall when the capacity of the sewer line or sewage treatment plant becomes overloaded and sewer lines overflow into city streets or streams. In many older cities, sewers were designed to carry stormwater runoff along with sewage, and to overflow if a heavy rain exceeded the capacity of the system. These combined sewer overflows, or "CSOs" as they are often called, occur in about 1,000 cities around the country.

In addition to spilling raw sewage, CSOs can also release untreated industrial wastewater and street debris. The result can be a real menace to public health, recreational uses, and commercial fishing. In fact, CSOs are a leading cause of beach closures and shellfishing restrictions around the country.

While the local impacts of CSOs can be significant, so is the cost of fixing them. For years, many cities were too daunted by the financial considerations to take action. But in 1994, a breakthrough occurred. Working closely with the States, affected cities, and environmental groups, EPA helped develop a consensus policy to guide action on CSOs. It encourages cities to pursue certain minimum, low-cost controls and to develop a full understanding of local CSO occurrences and impacts before making longer-term investments in additional wastewater treatment, temporary storage capacity, and sewer rehabilitation. The policy balances the need to protect the environment and the public with the need for reasonable, cost-effective controls tailored to local environmental and financial conditions. This departure from a one-size-fits-all regulatory approach is expected to provide sound environmental protection at one-fourth the cost of previous proposals.

Profile

Golf Goes Green

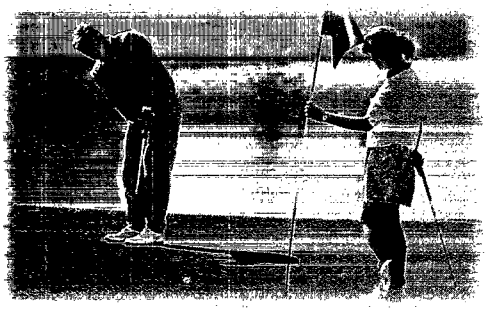

For years, the golf industry and the environmental community have been at odds over environmental benefits of golf courses. Golf course architects, superintendents, and owners have always considered themselves stewards of the land. In contrast, the environmental community viewed the use of pesticides and other golf course management practices as damaging to habitat and water quality. With little actual contact, neither constituency had a clear grasp of the other's ideas and the distance between the two camps continued to grow.

In January 1995, however, a new relationship was established. At that time, EPA helped convene the first ever national meeting between the golf industry and the environmental community. A diverse group of 75 participants met to consider, "Is golf as environmentally safe and sensitive as it can be?" and "How can we make it more so?" The conference opened a long-overdue dialogue that has led to an agreed-upon set of principles for managing golf courses in an environmentally sound manner. They are not rules, but rather a set of voluntary guidelines for golf course developers, architects, superintendents, owners, and individual golfers. The principles have been very well received, earning endorsements from the American Society of Golf Course Architects, the Ladies Professional Golf Association, the Southern Environmental Law Center, and the National Wildlife Federation.

Polluted Runoff

Rain, sleet, and snowmelt wash off the land into streams, lakes, and bays or seep into ground water. Moving across farm fields, city streets, or suburban backyards, this runoff picks up soil particles, pesticides, fertilizers, animal wastes and other pollutants. Because it comes from so many areas and sources, polluted runoff is much more difficult to quantify and to control than pollution from industry and municipal wastewater outfalls. Yet, State and Tribal water quality agencies now estimate that it is the leading cause of water pollution.

To deal with the problem, EPA is emphasizing voluntary, cooperative management approaches designed to create greater awareness about how our waters can become polluted from everyday activities or lifestyle choices. Many businesses now understand how their operations can affect water quality, and they are willing to work with EPA to find common-sense, practical solutions.

EPA's Partners in Prevention program has helped bring many of these partners

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to the table. Through this program, EPA is working with national associations to accelerate voluntary adoption by their members of modern, economical management practices that reduce polluted runoff while maintaining or even enhancing production.

One partner that is very active and providing leadership for the entire livestock industry is the National Pork Producers Council (Pork Council), an organization that represents over 90,000 pork producers in all 50 States. If not managed properly, waste from hog farms can have a devastating impact on water quality. To improve overall environmental performance, the Pork Council produced and distributed to its members the *Guide to Environmental Quality in Pork Production*, a "plain-English" handbook describing sound management practices that should be followed. Since publication in 1993, the Pork Council has been working in partnership with EPA, the U.S. Department of Agriculture, and State water quality agencies to hold workshops designed to deliver hands-on, practical advice for putting these practices into place. Over 65 workshops have been conducted in 14 States. The next step is an Environmental Assurance Program which will promote on-the-farm self-assessments to identify potentially needed environmental improvements. Most recently, the Pork Council held a national summit on environmental issues to continue to improve the industry's commitment and response to ongoing concerns, including proper management and design of hog waste lagoons.

In the summer of 1995, a hog waste spill along the New River in North Carolina killed thousands of fish and resulted in a health warning to protect public health. This incident, which serves as an example of why environmental performance standards are needed, was followed by national guidance from EPA in 1996 which clarifies how large livestock operations should be managed to ensure compliance with national water pollution control requirements.

Investing in Technology and Infrastructure

Since 1972, the Federal government has invested over $66 billion in municipal wastewater treatment. Millions more have been invested by State and local governments to help meet the service needs of a constantly growing population. And these investments have paid off.

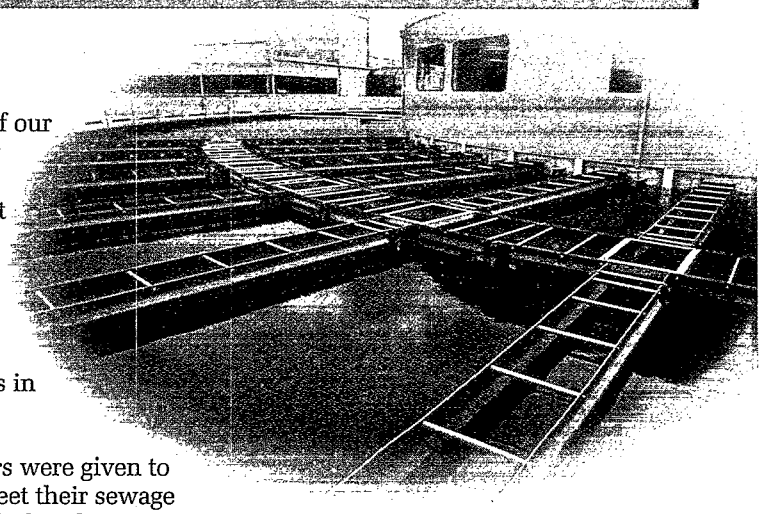

The fact that so many of our nation's waters are now cleaner compared to 25 years ago is in large part due to better sewage treatment. Today, the U.S. enjoys what is probably the most advanced network of sewage treatment plants in the world.

For years, Federal dollars were given to communities to help meet their sewage treatment needs through the Clean Water Act Construction Grants Program. However, in 1987, Congress replaced the grants program with a revolving loan program, known as the State Revolving Fund. Under this program, EPA provides grants to the States, and the States then make loans to communities. As the money is paid back, new loans are given to other communities also needing help.

This program represents a powerful financial partnership between EPA and the States, allowing the States to fund their highest priority needs. While traditionally used to build or improve wastewater plants, the State Revolving Fund is also being used to address other water quality problems, such as polluted runoff and sewer overflows.

The program is also a model of efficiency, allowing Federal, State, and local government agencies to leverage limited dollars. Because of the revolving nature, over a twenty-year period, an initial federal investment can result in the construction of up to 4 times as many projects compared to a one-time federal grant. And because of new streamlined requirements, State Revolving Fund projects are completed about 30 percent faster than those funded with grants. Local governments can benefit by saving a great deal of money. The typical cost of a project funded with a State Revolving Fund loan is about 30 percent to 50 percent less than the cost of a project funded through the commercial bond market.

Because of the program's efficiency and importance in helping communities meet their clean water goals, in 1994, the Clinton Administration recommended a similar program to help communities provide an equally important service—safe drinking water. A total of $1.8 billion has been proposed since then, marking the first time ever that funds to ensure safe drinking water have been made a federal investment priority.

Profile

Sewage Solutions in Indiana

Two small towns in Indiana, Wanatah and Lake of the Woods, received loans from the State Revolving Fund to help replace septic tanks and construct badly needed sewage collection and treatment systems. In both cases, the septic tanks were not functioning properly because of inadequate lot sizes and unsuitable soils. The result was sewage contamination in local streams and lakes. The centralized treatment systems allowed each town to eliminate a major source of water pollution, restoring recreational opportunities for local citizens.

The new sewage systems also helped restore economic opportunity. "In Wanatah, growth was at a standstill due to the septic tank moratorium" said Chuck Mack, the town utility supervisor. The SRF loan allowed the community to lift the moratorium and begin providing service to commercial and private residents. Because of the loan's lower interest rates, these services are provided at a lower monthly cost. According to Mr. Mack, "We see the loan as a real benefit to our community."

Conclusion

Clean water has irreplaceable value and enormous potential for affecting many sectors of the economy. A full spectrum of industries and commercial businesses are at stake as well as the livelihoods of real people. Real estate agents in the Northeast, commercial fishermen in the Gulf of Mexico, charterboat captains in the Great Lakes, and hotel owners along Southern California beaches are just a few of the people that depend on clean water to deliver their products and services.

Investing in clean water is a common-sense way to protect these businesses and ensure healthy, thriving communities. And many people and organizations are making that investment by joining in partnership with EPA, States, Tribes, and others to help clean up and protect our waters. These partnerships are encouraging as they demonstrate a willingness to invest both time and resources in order to receive the most important of all dividends—the assurance of safe, clean water for use today and tomorrow. In the short term and long term, for communities and for the nation, it is hard to imagine a sounder investment opportunity.

A Final Footnote

How You Can Help Keep Our Waters Clean

If you would like to find out more about water issues, contact EPA at the following address.

U.S. Environmental Protection Agency
Office of Water Communications Staff
Mail Code 4102
401 M Street, SW
Washington, DC 20460
(202) 260-3881

Information is also available on the Internet. Visit EPA's World Wide Web site at "http://www.epa.gov/OW" or send an electronic message to "OW-GENERAL@epamail.epa.gov".

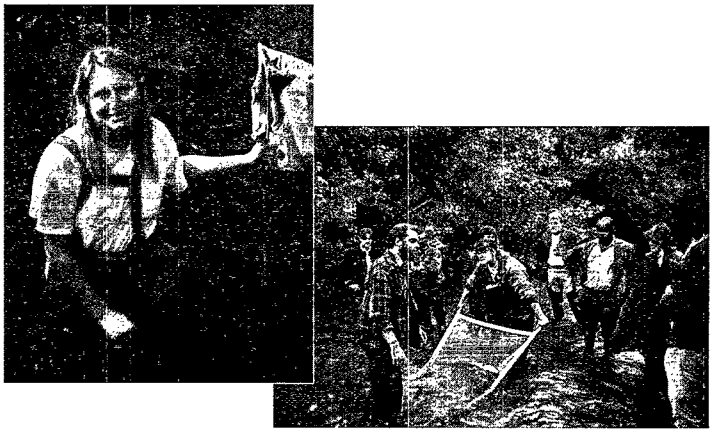

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Washington, DC.

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Washington, DC.

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Attachment 9
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Smith

FEDERAL REGISTER
Vol. 61, No. 166

Notices

ENVIRONMENTAL PROTECTION AGENCY (EPA)

[FRL-5559-9]

Interim Permitting Approach for Water Quality-Based Effluent Limitations in Storm Water Permits

61 FR 43761

Final National Policy

DATE: Monday, August 26, 1996

ACTION: Notice.

SUMMARY: Notice is hereby given that the Environmental Protection Agency (EPA) has issued a policy outlining an interim approach for incorporating water quality-based effluent limitations into storm water permits.

Background and Purpose

Due to the nature of storm water discharges, and the typical lack of information on which to base numeric water quality-based effluent limitations (expressed as concentration and mass), EPA has developed an interim permitting approach for National Pollution Discharge Elimination System (NPDES) storm water permits. While this interim permitting approach applies only to EPA, the Agency also encourages authorized States and Tribes to adopt similar policies for storm water permits.

The policy addresses issues related to the type of effluent limitations that are most appropriate for NPDES storm water permits to provide for the attainment of water quality standards. Since the policy only applies to water quality-based effluent limitations, it is not intended to affect technology-based limitations, such as those based on effluent guidelines or the permit writer's best professional judgements, that are incorporated into storm water permits. With this policy, the Office of Water is seeking to fulfill objectives of the 1996-1997 National Water Program Agenda for the Future, including reducing the threat of wet weather discharges to water quality, providing States and local governments with greater flexibility to solve wet weather problems, and identifying and taking appropriate steps to reduce the existing burden of the Storm Water Phase I program.

Numerous parties were involved in preparing this policy. In addition to receiving significant input from the Urban Wet Weather Flows (UWWF) Federal Advisory

Committee, EPA also consulted with the States and Regional Storm Water Coordinators. This interim permitting approach may be modified as a result of ongoing policy dialogue with the UWWF Federal Advisory Committee.

Policy Statement

In response to recent questions regarding the type of water quality-based effluent limitations that are most appropriate for National Pollutant Discharge Elimination System (NPDES) storm water permits, the Environmental Protection Agency (EPA) is adopting an interim permitting approach for regulating wet weather storm water discharges. Due to the nature of storm water discharges, and the typical lack of information on which to base numeric water quality-based effluent limitations (expressed as concentration and mass), EPA will use an interim permitting approach for NPDES storm water permits.

The interim permitting approach uses best management practices (BMPs) in first-round storm water permits, and expanded or better-tailored BMPs in subsequent permits, where necessary, to provide for the attainment of water quality standards. In cases where adequate information exists to develop more specific conditions or limitations to meet water quality standards, these conditions or limitations are to be incorporated into storm water permits, as necessary and appropriate. This interim permitting approach is not intended to affect those storm water permits that already include appropriately derived numeric water quality-based effluent limitations. Since the policy only applies to water quality-based effluent limitations, it is not intended to affect technology-based limitations, such as those based on effluent guidelines or the permit writer's best professional judgement, that are incorporated into storm water permits.

Each storm water permit should include coordinated and cost-effective monitoring program to gather necessary information to determine the extent to which the permit provides for attainment of applicable water quality standards and to determine the appropriate conditions or limitations for subsequent permits. Such a monitoring program may include, ambient monitoring, receiving water assessment, discharge monitoring (as needed), or a combination of monitoring procedures designed to gather necessary information.

This interim permitting approach applies only to EPA, however, EPA also encourages authorized States and Tribes to adopt similar policies for storm water permits. This interim permitting approach provides time, where necessary, to more fully assess the range of issues and possible options for the control of storm water discharges for the protection of water quality. This interim permitting approach may be modified as a result of the ongoing Urban Wet Weather Flows Federal Advisory Committee policy dialogue on this subject.

DATES: The policy was signed by the Assistant Administrator for Water on August 1, 1996.

FOR FURTHER INFORMATION CONTACT: If you have questions about the police, please contact, Bill Swietlik, Storm Water Phase I Matrix Manager, Office of Wastewater Management, at (202) 260-9529 or William Hall, Urban Wet Weather Flows Matrix Manager, Office of Wastewater Management, at (202) 260-1458, or by Internet: hall.william@epamail.epa.gov.

Dated: August 19, 1996.

Fred Lindsey, Acting Director, Office of Wastewater Management, Designated Federal Official.

[FR Doc. 96-21671 Filed 8-23-96; 8:45 am]

049558

United States
Environmental Protection
Agency

Office of Water (4303)
Washington, DC 20460

EPA-821-R-99-012
August 1999

Preliminary Data Summary of Urban Storm Water Best Management Practices

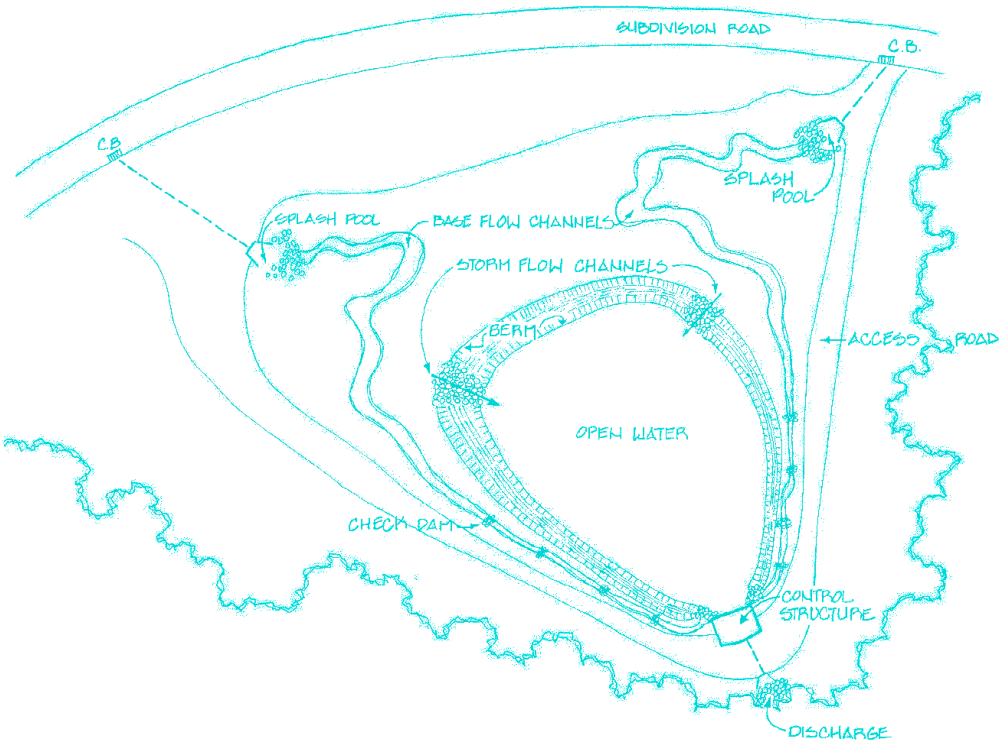

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Disclaimer

Mention of trade names or commercial products does not constitute endorsement by EPA or recommendation for use.

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1.0 Summary

The significance of storm water runoff in affecting water quality in the United States has become an increasing concern in recent years, as further improvements are made in controlling other point sources such as municipal sewage and industrial waste. EPA conducted a broad analysis of storm water runoff characteristics in its *Nationwide Urban Runoff Program* between 1979 and 1983. During the 1980's the Agency made several attempts to promulgate regulatory controls for storm water runoff under the statutory framework of the 1972 Clean Water Act. Following enactment of the Water Quality Act of 1987, EPA began development of a more comprehensive regulatory program. During the course of these actions, the use of best management practices (BMPs) in addressing runoff problems was frequently identified, however it was known that additional research on the performance of BMPs was also needed.

EPA's Engineering and Analysis Division conducted a study on storm water best management practices during 1997 and 1998 as part of its series of preliminary studies in the effluent guidelines program. This report summarizes existing information and data regarding the effectiveness of BMPs to control and reduce pollutants in urban storm water. The report provides a synopsis of what is currently known about the expected costs and environmental benefits of BMPs, and identifies information gaps as well.

Detailed information about BMP design is beyond the scope of this report. Readers are encouraged to consult the wide range of storm water BMP design manuals available from states and localities and other organizations for detailed design guidelines. Information regarding BMP performance and selection is also provided in other EPA documents, such as *Guidance Specifying Management Measure for Sources of Nonpoint Source Pollution in Coastal Water* (US EPA, 1993a); *Urban Runoff Pollution Prevention and Control Planning* (US EPA, 1993c); and *Municipal Wastewater Management Fact Sheets: Storm Water Best Management Practices* (US EPA, 1996e). In addition, readers are encouraged to consult the ASCE/WEF Manuals of Practice, *Design and Construction of Urban Stormwater Management Systems* (ASCE/WEF, 1992) and *Urban Runoff Quality Management* (ASCE/WEF, 1998) for a more thorough discussion of storm water management design.

Summary of Findings

1. Waterways and receiving waters near urban and suburban areas are often adversely affected by urban storm water runoff. Impacts may be manifested in terms of:

- alterations in hydraulic characteristics of streams receiving runoff such as higher peak flow rates, increased frequency and duration of bankfull and sub-bankfull flows, increased occurrences of downstream flooding, and reduced baseflow levels

- changes in receiving stream morphology such as increased rates of sediment transport and deposition, increased shoreline erosion, stream channel widening, and increased stream bed scouring

- aquatic habitat impacts leading to changes in fish and macroinvertebrate populations and loss of sensitive species

- public health and recreation impacts such as increased risk of illness due to contact with contaminated water bodies, contamination of drinking water supplies, beach closures, restrictions on fishing, and shellfish bed closures.

2. A wide variety of BMPs, both structural and non-structural, are available to address urban storm water runoff and discharges.

- For various reasons (such as cost, suitability to site, etc.) some of these BMP types are widely used, some infrequently; some are relatively new designs that are not widely in use.

- Many BMPs are used primarily for water quantity control (i.e. to prevent flooding), although they may provide ancillary water quality benefits.

- Some BMP types have been analyzed for performance in terms of site-specific pollutant removal, although not extensively enough to allow for generalizations.

- The pollutant removal performance of some BMP types is essentially undocumented.

- Some BMP types, particularly non-structural and those that do not have discrete inflow or outflow points, are difficult to monitor.

- There is no widely-accepted definition of "efficiency" or "pollutant removal" for storm water BMPs.

- The role of chemical pollutant monitoring vs. receiving stream biological monitoring in evaluating BMP performance is not well documented.

3. Only a few cost studies have been conducted for storm water BMPs.

- Due to the limited cost data, a lack of clear definitions of performance, and limited "performance" data, it is difficult at this time to develop cost-effectiveness comparisons for various BMP types.

4. The benefits of individual BMPs are site-specific and depend on a number of factors including:

- the number, intensity and duration of wet weather events;
- the pollutant removal efficiency of the BMP;
- the water quality and physical conditions of the receiving waters;
- the current and potential use of the receiving waters; and
- the existence of nearby "substitute" sites of unimpaired waters.

Because these factors will vary substantially from site to site, data are not available with which to develop estimates of benefits for individual BMP types.

5. A number of researchers are continuing to work on BMP performance monitoring, and there are several attempts underway to develop comparison frameworks through the construction of comprehensive databases on BMP design characteristics and performance.

Organization of Report

This report is divided into six chapters. Chapter 1 presents a summary of the major findings of the report. Chapter 2 presents a general introduction of the purposes and goals of this evaluation. Chapter 3 summarizes existing regulations and permits developed by EPA to address urban storm water discharges, including regulations under the National Pollutant Discharge Elimination System (NPDES) and the Coastal Zone Act Reauthorization Amendments (CZARA). Chapter 4 presents an assessment of the environmental problems attributable to urban storm water discharges and Chapter 5 identifies the best management practices that can be used to control the quantity and improve the quality of storm water prior to discharge. Chapter 6 identifies the costs and benefits of storm water BMPs.

2.0 Introduction and Scope

2.1 Effluent Guidelines Program and Consent Decree Requirements

Effluent guidelines are national standards for categories of dischargers to surface waters. The program was established in 1972 under Title III of the Clean Water Act (CWA). Since that time EPA has developed effluent guideline regulations for over 50 categories, primarily industrial dischargers. In these regulations the Agency typically establishes numeric “end-of-pipe” effluent limitations for specific chemical pollutants and/or indicator parameters (e.g. BOD, oil and grease). For some categories, EPA has also issued narrative requirements for best management practices (BMPs) to address control of storm water runoff, plant maintenance schedules and training of plant personnel. The effluent limitations are generally based on the performance of available or demonstrated control and treatment technologies. Resulting effluent limitations are commonly referred to as "technology-based" standards. The regulations are implemented in National Pollutant Discharge Elimination System (NPDES) permits, which are issued by EPA and State agencies under the authority of CWA Section 402.

The Water Quality Act of 1987 added section 304(m) to the CWA. This provision requires EPA to publish a biennial Effluent Guidelines Plan and develop additional regulations. EPA’s effluent guidelines program is currently subject to a consent decree (“Decree”) in *Natural Resources Defense Council et al v. Browner* (D.D.C. 89-2980, January 31, 1992, as amended). The Decree requires the Agency to propose effluent guideline regulations and take final action for 20 point source categories, according to a specified schedule. Additionally, the Decree requires that the Agency conduct 11 preliminary studies to assist in selecting categories for regulation development.

The 1987 amendments also added section 402(p) to the CWA, which requires development of a national program for regulation of storm water discharges. This is discussed further in Chapter 3 of this report.

In 1996, the Natural Resources Defense Council (NRDC) recommended that EPA develop effluent guidelines for categories of storm water dischargers, to supplement the existing NPDES permit regulations covering storm water discharges. Because municipal storm water discharges present a range of complex phenomena that have not been extensively documented in the professional literature, and because there is a lack of generally accepted methods for evaluating storm water management practices, EPA determined that conducting a preliminary study would be appropriate to satisfy one of the study obligations under the Decree. This preliminary study is intended to assist decision making on initiating regulatory development projects.

2.2 Types of Discharges Addressed

This study is focused on BMPs designed to prevent, control or treat storm water discharges, and the nature and measurement of storm water discharges. Storm water discharges may flow directly into surface waters, into municipal separate storm sewer systems ("MS4s"), and/or infiltrate into groundwater. The emphasis on BMPs is intended to support the national NPDES storm water program. Some aspects of the BMPs described herein may also be relevant for other types of wet weather pollution problems, such as combined sewer overflows (CSOs).

Storm water BMPs may be organized into two major groups with multiple subgroups:

- *Structural* BMPs include:
  - > infiltration systems such as infiltration basins and porous pavement
  - > detention systems such as basins and underground vaults
  - > retention systems such as wet ponds
  - > constructed wetland systems
  - > filtration systems such as media filters and bioretention systems
  - > vegetated systems such as grass filter strips and vegetated swales
  - > minimizing directly-connected impervious surfaces
  - > miscellaneous and vendor-supplied systems such as oil/water separators and hydrodynamic devices

- *Non-Structural* BMPs include:
  - > automotive product and household hazardous material disposal
  - > commercial and retail space good housekeeping
  - > industrial good housekeeping
  - > modified use of fertilizers, pesticides and herbicides
  - > lawn debris management
  - > animal waste disposal
  - > maintenance practices such as catch basin cleaning, street and parking lot sweeping, road and ditch maintenance
  - > illicit discharge detection and elimination
  - > educational and outreach programs
  - > storm drain inlet stenciling
  - > low-impact development and land use planning.

The impacts of storm water discharges are described in Chapter 4. Various BMP designs for addressing storm water discharges are described in Chapter 5, and the costs and economic impacts of BMP are described in Chapter 6.

2.3 Data Sources and Data Collection Techniques

ASCE National Stormwater BMP Database

Since 1995, EPA and the American Society of Civil Engineers (ASCE) have operated under a cooperative agreement to develop a database of storm water BMP design and performance. The initial version of this database provides pollutant removal data and other performance measures on approximately 75 BMPs based on published studies and reports. These studies and reports were carefully selected from a comprehensive screening of virtually all available published literature on BMP performance, amounting to about 800 bibliographic references.

A significant objective of the database is to provide a design tool for local storm water designers and planners. The database has the capacity to report extensive detail about the design of BMPs, along with descriptive information about the adjacent watershed, hydrology and other geographic data.

As of early 1999, the initial version of the database is being tested, and a public release will be available in mid-1999. EPA and ASCE are continuing to develop the database and are encouraging organizations that have conducted BMP monitoring to submit their findings to the ASCE Database Clearinghouse for entry into the database. As new data are gathered, periodic updates will be made available to the public through use of the Internet.

Center for Watershed Protection National Pollutant Removal Performance Database

In 1997, the Center for Watershed Protection developed a database for the Chesapeake Research Consortium titled, "National Pollutant Removal Performance Database for Stormwater BMPs" (Brown and Schueler, 1997a). This database focuses on the pollutant removal efficiency of commonly used and innovative urban BMPs for storm water control. The database is derived from 123 research studies developed between 1977 and 1996.

All of the studies in the database utilized data collected with automated sampling equipment and had documented methods to compute pollutant removal efficiencies. More than three-quarters of the studies were based on four or more storm samples, while the remaining studies were either based on fewer than four storms or the sample size was not stated.

Literature Cited

- EPA reports including the Nationwide Urban Runoff Program (NURP), National Water Quality Inventory, Coastal Nonpoint Pollution Program Guidance, NPDES Rules, guidance documents and fact sheets.

- Other Federal agency publications from U.S. Geological Survey and U.S. Department of Agriculture.
- Professional journals and manuals of practice such as those from ASCE and the Water Environment Federation
- Publications of research organizations such as the Center for Watershed Protection, Terrene Institute, Metropolitan Washington Council of Governments and the Watershed Management Institute
- State and local government BMP design manuals.

BMP Performance Data Developed for this Preliminary Study

EPA conducted field performance evaluations at three structural BMP sites during 1998. While these evaluations contribute to the literature on BMP performance, EPA also intended that the field testing would serve as an experimental framework for refining evaluation methodology. Three sites in the Washington, D.C. area were monitored: a constructed wetland, a peat-sand filter, and a regional wet pond. Data summaries for these monitoring activities appear in Chapter 5. Additional findings will be provided in a supplement to this report.

3.0 Existing Storm Water Regulations and Permits

Congress added Section 402(p) to the Clean Water Act in 1987 to require implementation of a comprehensive approach for addressing storm water discharges in two phases. Section 402(p)(4) required EPA to develop permit application regulations under the National Pollutant Discharge Elimination System (NPDES), submission of NPDES permit applications, issuance of NPDES permits, and compliance with NPDES permit conditions. Section 402(p)(6) requires EPA to designate storm water discharges to be regulated (within the statutory definitions provided in section 402(p)(2)) and establish a comprehensive regulatory program, which may include performance standards, guidelines, guidance, and management practices and treatment requirements.

3.1 Phase I NPDES

EPA promulgated the first phase of NPDES storm water permit application regulations ("Phase I") on November 16, 1990 (US EPA, 1990). The provisions addressing MS4s cover those systems serving a population of 100,000 or more. This includes 173 cities, 47 counties and additional systems designated by EPA or states based on such system's interrelationship with or proximity to the aforementioned systems, such as state highway departments. A total of 260 permits, covering approximately 880 operators (local governments, state highway departments, etc.) have been identified as subject to Phase I permit application requirements. As of late 1998, approximately 228 such permits have been issued in final form.

The CWA requires that MS4 permits effectively prohibit non-storm water discharges into the storm sewers as well as reduce the discharge of pollutants to the maximum extent practicable (including management practices, control techniques and system, design and engineering methods, and other provisions appropriate for the control of such pollutants).

Phase I MS4 permittees were required to submit an application that included source identification information, precipitation data, existing data on the volume and quality of storm water discharges, a list of receiving water bodies and existing information on impacts on receiving waters, a field screening analysis for illicit connections and illegal dumping, and other information.

Following this submission, MS4 permittees were to gather and provide additional information including:

- discharge characterization data based on quantitative data from 5 to 10 representative locations in approved sampling plans; estimates of the annual pollutant load and event mean concentration of system discharges for selected conventional pollutants and heavy metals; a proposed schedule to provide estimates of seasonal pollutant loads; and the mean concentration for certain detected constituents in a representative storm event;

- a proposed management program including descriptions of: structural and source control measures that are to be implemented to reduce pollutants in runoff from commercial and residential areas; a program to detect and remove illicit discharges; and a program to control pollutants in construction site runoff.

The Phase I rule also covers storm water discharges "associated with industrial activity." This includes facilities covered by effluent guidelines and other designated classes of industrial and commercial facilities, such as hazardous waste treatment, storage, or disposal; landfills; recycling; vehicle maintenance and equipment cleaning; sewage sludge handling; construction activity (sites with 5 or more acres of disturbed land); and facilities where materials are exposed to storm water. Permittees must prepare a storm water pollution prevention plan which describes pollution sources, measures and controls.

EPA and the states used several permit mechanisms for the many facilities receiving NPDES permits for the first time. EPA issued "baseline" general permits to cover a wide range of facilities with basic requirements, with the intent that more specific requirements would follow in subsequent permit cycles. Industry-specific or "group" permits were issued based on applications submitted by business associations, and other sites were issued individual permits.

The management and pollution prevention plans prepared by MS4s and industrial permittees vary in their level of detail and specificity regarding design and implementation of best management practices (BMPs). EPA and some states have issued guidance on preparation of these plans (US EPA, 1992d; US EPA, 1992e). The Agency has not conducted a nationwide review of these plans.

3.2 Phase II NPDES

EPA proposed the NPDES storm water regulations for the second phase of storm water discharge control ("Phase II") on January 9, 1998 (US EPA, 1998c). EPA is required to promulgate the Phase II rule in 1999 under a separate consent decree.

The proposal designates two classes of facilities for automatic coverage on a nationwide basis under the NPDES program, (1) small municipal separate storm sewer systems located in urbanized areas (about 3,500 municipalities would be included in the program); and (2) construction activities (pollutants include sediments and erosion from these sites) that disturb equal to or greater than one and less than five acres of land (about 110,000 sites per year will be included in the program). Those facilities designated above would need to apply for NPDES storm water permits by 2002. EPA is anticipating that most permittees would be covered under general permits.

EPA is also proposing to conditionally exclude from the NPDES storm water program Phase I facilities that have "no exposure" of industrial activities, such as industrial products,

processes, or raw materials, to storm water, thereby reducing application of the program to many industrial activities currently covered by the program that have no industrial storm water discharges.

Some facilities that EPA is proposing to cover under the Phase II rule are currently subject to state and/or local storm water management requirements.

3.3 Coastal Zone Act Requirements

Section 6217 of the Coastal Zone Act Reauthorization Amendments (CZARA) of 1990 provides that States with approved coastal zone management programs must develop and submit coastal nonpoint pollution control programs to EPA and the National Oceanic and Atmospheric Administration (NOAA) for approval. Failure to submit an approvable program would result in a reduction of federal grants to such states under both the Coastal Zone Management Act and section 319 of the CWA.

State coastal nonpoint pollution control programs under CZARA are to include enforceable policies and mechanisms that ensure implementation of the management measures throughout the coastal management area. Section 6217(g)(5) defines management measures as "economically achievable measures for the control of the addition of pollutants from existing and new categories and classes of nonpoint sources of pollution, which reflect the greatest degree of pollutant reduction achievable through the application of the best available nonpoint pollution control practices, technologies, processes, siting criteria, operating methods, or other alternatives." The amendments provide for a technology-based approach based on technical and economic achievability under the rationale that neither States nor EPA have the money, time, or other resources to create and expeditiously implement a program that depends on establishing cause and effect linkages between particular land use activities and specific water quality problems. If this technology-based approach fails to achieve and maintain applicable water quality standards and to protect designated uses, sec. 6217(b)(3) requires additional management measures.

EPA issued *Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters* under sec. 6217(g) in January 1993 (US EPA, 1993a). The guidance identifies management measures for five major categories of nonpoint source pollution: agriculture; forestry; urban; marinas and recreational boating; and hydromodification. The management measures reflect the greatest degree of pollutant reduction that is economically achievable for each of the listed sources. These management measures provide reference standards for the states to use in developing or refining their coastal nonpoint programs. In general, the management measures were written to describe systems designed to reduce the generation of pollutants. A few management measures, however, contain quantitative standards that specify pollutant loading reductions. For example, the new development management measure, which is applicable to storm water runoff associated with construction in urban areas,

requires (1) that by design or performance the average annual total suspended solid loadings be reduced by 80 percent and (2) to the extent practicable, that the pre-development peak runoff rate and average volume be maintained. The management measures approach was adopted to provide state officials with flexibility in selecting strategies and management systems and practices that are appropriate for regional or local conditions, provided that equivalent or higher levels of pollutant control are achieved.

Storm water discharges regulated under the existing NPDES program, such as discharges from municipal separate storm sewers serving a population of 100,000 or more and from construction activities that disturb 5 or more acres, do not need to be addressed in Coastal Nonpoint Pollution Control programs. However, potential new sources, such as urban development adjacent to or surrounding municipal systems serving a population of 100,000 or more, smaller urbanized areas, and construction sites that disturb less than 5 acres, that are identified in management measures under section 6217 guidance need to be addressed in Coastal Nonpoint Pollution Control Programs until such discharges are issued an NPDES permit. EPA and NOAA have worked and continue to work together in their activities to ensure that authorities between NPDES and CZARA do not overlap.

EPA and NOAA published *Coastal Nonpoint Pollution Control Program: Program Development and Approval Guidance* (US EPA, 1993d), which addresses such issues as the basis and process for EPA/NOAA approval of State Coastal Nonpoint Pollution Control programs, how EPA and NOAA expect state programs to implement management measures in conformity with EPA guidance, and procedures for reviewing and modifying state coastal boundaries to meet program requirements. The document clarifies that states generally must implement management measures for each source category identified in the EPA guidance developed under section 6217(g). The document also sets quantitative performance standards for some measures. Coastal Nonpoint Pollution Control programs are not required to address sources that are clearly regulated under the NPDES program as point source discharges. Specifically, such programs would not need to address small municipal separate storm sewer systems and construction sites covered under NPDES storm water permits (both general and individual). The guidance also clarifies that regulatory and non-regulatory mechanisms may be used to meet the requirement for enforceable policies and mechanisms, provided that non-regulatory approaches are backed by enforceable state authority ensuring that the management measures will be implemented. Backup authority may include sunset provisions for incentive programs. For example, a state may provide additional incentives if too few owners or operators participate in a tax incentive program or develop mandatory requirements to achieve the necessary implementation of management measures.

3.4 Regional, State and Local Programs

In addition to the existing Federal storm water management programs, there are a variety of State, local and regional storm water management programs in existence. Many of these

programs pre-date the Federal programs and may include BMP design or performance standards, site plan review and inspection programs, and technical assistance. A review of these programs is outside the scope of this report.

4.0 Environmental Assessment

Waterways and receiving waters near urban and suburban areas are often adversely affected by urban storm water runoff. The degree and type of impact varies from location to location, but it is often significant relative to other sources of pollution and environmental degradation. Urban storm water runoff affects water quality, water quantity, habitat and biological resources, public health, and the aesthetic appearance of urban waterways. As reported in the National Water Quality Inventory 1996 Report to Congress (US EPA, 1998d), urban runoff was the leading source of pollutants causing water quality impairment related to human activities in ocean shoreline waters and the second leading cause in estuaries across the nation. Urban runoff was also a significant source of impairment in rivers and lakes. The percent of total impairment attributed to urban runoff is substantial. This impairment constitutes approximately 5,000 square miles of estuaries, 1.4 million acres of lakes, and 30,000 miles of rivers. Seven states also reported in the Inventory that urban runoff contributes to wetland degradation.

Adverse impacts on receiving waters associated with storm water discharges have been discussed by EPA (1995b) in terms of three general classes. These are:

- Short-term changes in water quality during and after storm events including temporary increases in the concentration of one or more pollutants, toxics or bacteria levels.

- Long-term water quality impacts caused by the cumulative effects associated with repeated storm water discharges from a number of sources.

- Physical impacts due to erosion, scour, and deposition associated with increased frequency and volume of runoff that alters aquatic habitat.

As described in the Terrene Institute's *Fundamentals of Urban Runoff Management* (Horner et al, 1994), pollutants associated with urban runoff potentially harmful to receiving waters fall into the categories listed below:

- Solids
- Oxygen-demanding substances
- Nitrogen and phosphorus
- Pathogens
- Petroleum hydrocarbons
- Metals
- Synthetic organics.

These pollutants degrade water quality in receiving waters near urban areas, and often contribute to the impairment of use and exceedences of criteria included in State water quality standards. The quantity of these pollutants per unit area delivered to receiving waters tends to increase with the degree of development in urban areas.

While water quality impacts are often unobserved by the general public, other storm water impacts are more visible. Stream channel erosion and channel bank scour provide direct evidence of water quantity impacts caused by urban storm water. Urban runoff increases directly with imperviousness and the degree of watershed development. As urban areas grow, urban streams are forced to accommodate larger volumes of storm water runoff that recur on a more frequent basis. This leads to stream channel instability. The change in watershed hydrology associated with urban development also causes channel widening and scour, and the introduction of larger amounts of sediment to urban streams. Visible impacts include eroded and exposed stream banks, fallen trees, sedimentation, and recognizably turbid conditions. The increased frequency of flooding in urban areas also poses a threat to public safety and property.

Both water quality and water quantity impacts associated with urban storm water combine to impact aquatic and riparian habitat in urban streams. Higher levels of pollutants, increased flow velocities and erosion, alteration of riparian corridors, and sedimentation associated with storm water runoff negatively impact the integrity of aquatic ecosystems. These impacts include the degradation and loss of aquatic habitat, and reduction in the numbers and diversity of fish and macroinvertebrates.

Public health impacts are for the most part related to bacteria and disease causing organisms carried by urban storm water runoff into waters used for water supplies, fishing and recreation. Water supplies can potentially be contaminated by urban runoff, posing a public health threat. Bathers and others coming in contact with contaminated water at beaches and other recreational sites can become seriously ill. Beach closures caused by urban runoff have a negative impact on the quality of life, and can impede economic development as well. Similarly, the bacterial contamination of shellfish beds poses a public health threat to consumers, and shellfish bed closures negatively impact the fishing industry and local economies.

Aesthetic impacts in the form of debris and litter floating in urban waterways and concentrated on stream banks and beaches are quite visible to the general public. Storm water is a major source of floatables that include paper and plastic bags and packaging materials, bottles, cans, and wood. The presence of floatables and other debris in receiving waters during and following storm events reduces visual attractiveness of the waters and detracts from their recreational value. Nuisance algal conditions including surface scum and odor problems can also be attributed to urban storm water in many instances.

Based on available information and data, the following general statements can be made about urban storm water impacts.

- Impacts to water quality in terms of water column chemistry tend to be transient and elusive, particularly in rivers.
- Impacts to habitat and aquatic life are generally more profound, and are easier to see and quantify than changes in water column chemistry.

- Impacts are typically complex because urban storm water is often one of several sources including municipal discharges and diffuse runoff from agricultural and rural areas that affect urban waterways.
- Impacts are often interrelated and cumulative. For example, both degraded water quality and increased water quantity join to impact habitat and biological resources.

The following sections describe the sources of urban storm water runoff, the pollutants contained in urban runoff and the impacts attributable to urban storm water discharges. Examples supported by field observation and data have been used extensively to show storm water impacts. The impacts described include water quality impacts, water quantity impacts, public health impacts, habitat impacts, and aesthetic impacts.

4.1 Overview of Storm Water Discharges

Storm water runoff from urbanized areas is generated from a number of sources including residential areas, commercial and industrial areas, roads, highways and bridges. Essentially, any surface which does not have the capability to pond and infiltrate water will produce runoff during storm events. When a land area is altered from a natural forested ecosystem to an urbanized land use consisting of rooftops, streets and parking lots, the hydrology of the system is significantly altered. Water which was previously ponded on the forest floor, infiltrated into the soil and converted to groundwater, utilized by plants and evaporated or transpired into the atmosphere is now converted directly into surface runoff. An important measure of the degree of urbanization in a watershed is the level of impervious surfaces. As the level of imperviousness increases in a watershed, more rainfall is converted to runoff. Figure 4-1 illustrates this transformation.

Figure 4-1. Effects of Imperviousness on Runoff and Infiltration

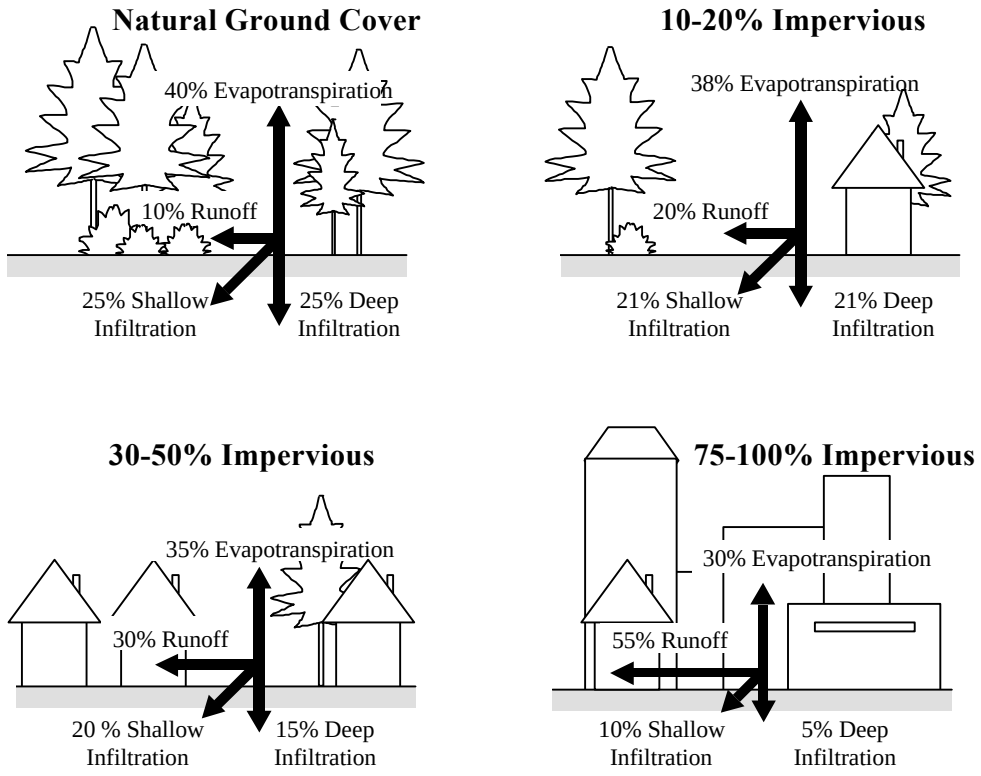

Source: Adapted from Arnold and Gibbons, 1996

The traditional means of managing storm water runoff in urban areas has been to construct a vast curb-and-gutter, catch basin, and storm drain network to transport this runoff volume quickly and efficiently away from the urbanized area and discharge the water to receiving streams. Two types of sewer systems are used to convey storm water runoff: separate storm sewers and combined sewers.

- *Separate storm sewer systems* convey only storm water runoff. Water conveyed in separate storm sewers is frequently discharged directly to receiving streams without receiving any intentional form of treatment. (In a municipality with a separate storm sewer system, sanitary sewer flows are conveyed in a distinct sanitary sewer system to municipal wastewater treatment plants.)

- In a *combined sewer system*, storm water runoff is combined with sanitary sewer flows for conveyance. Flows from combined sewers are treated by municipal wastewater

treatment plants prior to discharge to receiving streams. During large rainfall events however, the volume of water conveyed in combined sewers can exceed the storage and treatment capacity of the wastewater treatment system. As a result, discharges of untreated storm water and sanitary wastewater directly to receiving streams can frequently occur in these systems. These types of discharges are known as combined sewer overflows (CSOs).

Historically, as urbanization occurred and storm drainage infrastructure systems were developed in this country, the primary concern was to limit nuisance and potentially damaging flooding due to the large volumes of storm water runoff that are generated. Little, if any, thought was given to the environmental impacts of such practices. As a result, streams that receive storm water runoff frequently cannot convey the large volumes of water generated during runoff events without significant degradation of the receiving stream. In addition to the problems associated with excess water volume, the levels of toxic or otherwise harmful pollutants in storm water runoff and CSOs can cause significant water quality problems in receiving streams.

In addition to point sources such as municipal separate storm sewers and combined sewer overflows, storm water runoff can enter receiving streams as a non-point source. Storm water runoff from a variety of sources such as parking lots, highways, open land, rangeland, residential areas and commercial areas can enter waterways directly as sheet flow or as a series of diffuse, discrete flows. Due to the diffuse nature of many storm water discharges, it is difficult to quantify the range of pollutant loadings to receiving streams that are attributable to storm water discharges. It is much easier, however, to measure the increased stream flows during rainfall events that occur in urbanized areas and to document impacts to streams that receive storm water runoff.

Awareness of the damaging effects storm water runoff is causing to the water quality and aquatic life of receiving streams is a relatively recent development. Storm water management traditionally was, and still is in many cases, a flood control rather than a quality control program. Local governments intending to improve the quality of their runoff-impacted streams are incorporating best management practices (BMPs) into their drainage programs. BMPs which reduce the volume of runoff discharged to receiving streams, such as minimizing directly connected impervious surfaces, providing on-site storage and infiltration and implementing stream buffers and restoring riparian cover along urban streams can help to prevent further degradation and even result in improvements of streams which receive storm water discharges. However, in many existing urbanized areas, the cost of infrastructure changes necessary to retrofit existing storm water drainage systems with structural BMPs--to provide for storm water quality as well as quantity control--can be prohibitively expensive. In these cases, non-structural BMPs can be implemented to reduce pollutant sources and to reduce the transfer of urban pollutants to runoff, before more expensive, structural controls are instituted.

The climate of a region can have a significant impact on the quantity and quality of storm water runoff. Factors such as the length of the antecedent dry periods between storms, the

average rainfall intensity, the storm duration and the amount of snowmelt present can have significant impacts on the characteristics of runoff from an area. In areas where there is a significant amount of atmospheric deposition of particulates, storm water runoff can contain high concentrations of suspended solids, metals and nutrients. Areas that have infrequent rainfall such as the southwest U.S. can have runoff with significant concentrations of pollutants, especially from “hot spots” such as roads, parking lots and industrial areas. These areas, which typically have high-intensity, short-duration rainfall events, can generate significant loadings of suspended solids in storm water runoff. Many specific geographic factors can influence the nature and constituents contained in storm water runoff. Factors such as the soil types, slopes, land use patterns and the amount of imperviousness of a watershed can greatly affect the quality and quantity of runoff that is produced from an area.

4.2 Pollutants in Urban Storm Water

Storm water runoff from urban areas can contain significant concentrations of harmful pollutants that can contribute to adverse water quality impacts in receiving streams. Effects can include such things as beach closures, shellfish bed closures, limits on fishing and limits on recreational contact in waters that receive storm water discharges. Contaminants enter storm water from a variety of sources in the urban landscape.

Urban storm water runoff has been the subject of intensive research since the inception of the Water Quality Act of 1965. There have been numerous studies conducted to characterize the nature of urban storm water runoff and the performance of storm water BMPs. Data sources include the "208 Studies," the area-wide waste treatment management plans conducted by states under section 208 of the 1972 CWA; EPA's Nationwide Urban Runoff Program (NURP); the U.S. Geological Survey (USGS) Urban Stormwater Database; and the Federal Highway Administration (FHWA) study of storm water runoff loadings from highways. In addition to these federal sources, there is a great deal of information in the technical literature, as well as data collected by states, counties and municipalities. A recent data source is storm water monitoring data collected by municipalities regulated by the Phase I NPDES storm water regulations. As part of the Phase I permit application, regulated municipalities were required to collect data from five representative sites during a minimum of three storm events.

The most comprehensive study of urban runoff was NURP, conducted by EPA between 1978 and 1983. NURP was conducted in order to examine the characteristics of urban runoff and similarities or differences between urban land uses, the extent to which urban runoff is a significant contributor to water quality problems nationwide, and the performance characteristics and effectiveness of management practices to control pollution loads from urban runoff (US EPA, 1983). Sampling was conducted for 28 NURP projects which included 81 specific sites and more than 2,300 separate storm events. NURP focused on the following ten constituents:

- Total Suspended Solids (TSS)

- Biochemical Oxygen Demand (BOD)
- Chemical Oxygen Demand (COD)
- Total Phosphorus (TP)
- Soluble Phosphorus (SP)
- Total Kjeldahl Nitrogen (TKN)
- Nitrate + Nitrite (N)
- Total Copper (Cu)
- Total Lead (Pb)
- Total Zinc (Zn).

NURP examined both the soluble and the particulate fraction of pollutants, since the water quality impacts can depend greatly on the form that the contaminant is present. NURP also examined coliform bacteria and priority pollutants at a subset of sites. Median event mean concentrations (EMCs) for the ten general NURP pollutants for various urban land use categories are presented in Table 4-1.

Table 4-1. Median Event Mean Concentrations for Urban Land Uses

Pollutant	Units	Residential		Mixed		Commercial		Open/ Non-Urban	
		Median	COV	Median	COV	Median	COV	Median	COV
BOD	mg/l	10	0.41	7.8	0.52	9.3	0.31	--	--
COD	mg/l	73	0.55	65	0.58	57	0.39	40	0.78
TSS	mg/l	101	0.96	67	1.14	69	0.85	70	2.92
Total Lead	µg/l	144	0.75	114	1.35	104	0.68	30	1.52
Total Copper	µg/l	33	0.99	27	1.32	29	0.81	--	--
Total Zinc	µg/l	135	0.84	154	0.78	226	1.07	195	0.66
Total Kjeldahl Nitrogen	µg/l	1900	0.73	1288	0.50	1179	0.43	965	1.00
Nitrate + Nitrite	µg/l	736	0.83	558	0.67	572	0.48	543	0.91
Total Phosphorus	µg/l	383	0.69	263	0.75	201	0.67	121	1.66
Soluble Phosphorus	µg/l	143	0.46	56	0.75	80	0.71	26	2.11

COV: Coefficient of variation
Source: Nationwide Urban Runoff Program (US EPA 1983)

Results from NURP indicate that there is not a significant difference in pollutant concentrations in runoff from different urban land use categories. There is a significant difference, however, in pollutant concentrations in runoff from urban sources than that produced from non-urban areas.

The pollutants that are found in urban storm water runoff originate from a variety of sources. The major sources include contaminants from residential and commercial areas, industrial activities, construction, streets and parking lots, and atmospheric deposition. Contaminants commonly found in storm water runoff and their likely sources are summarized in Table 4-2.

Table 4-2. Sources of Contaminants in Urban Storm Water Runoff

Contaminant	Contaminant Sources
Sediment and Floatables	Streets, lawns, driveways, roads, construction activities, atmospheric deposition, drainage channel erosion
Pesticides and Herbicides	Residential lawns and gardens, roadsides, utility right-of-ways, commercial and industrial landscaped areas, soil wash-off
Organic Materials	Residential lawns and gardens, commercial landscaping, animal wastes
Metals	Automobiles, bridges, atmospheric deposition, industrial areas, soil erosion, corroding metal surfaces, combustion processes
Oil and Grease/ Hydrocarbons	Roads, driveways, parking lots, vehicle maintenance areas, gas stations, illicit dumping to storm drains
Bacteria and Viruses	Lawns, roads, leaky sanitary sewer lines, sanitary sewer cross-connections, animal waste, septic systems
Nitrogen and Phosphorus	Lawn fertilizers, atmospheric deposition, automobile exhaust, soil erosion, animal waste, detergents

The concentrations of pollutants found in urban runoff are directly related to degree of development within the watershed. This trend is shown in Table 4-3, a compilation of typical pollutant loadings from different urban land uses.

Table 4-3. Typical Pollutant Loadings from Runoff by Urban Land Use (lbs/acre-yr)

Land Use	TSS	TP	TKN	NH_3-N	NO_2+NO_3-N	BOD	COD	Pb	Zn	Cu
Commercial	1000	1.5	6.7	1.9	3.1	62	420	2.7	2.1	0.4
Parking Lot	400	0.7	5.1	2	2.9	47	270	0.8	0.8	0.04
HDR	420	1	4.2	0.8	2	27	170	0.8	0.7	0.03
MDR	190	0.5	2.5	0.5	1.4	13	72	0.2	0.2	0.14
LDR	10	0.04	0.03	0.02	0.1	NA	NA	0.01	0.04	0.01
Freeway	880	0.9	7.9	1.5	4.2	NA	NA	4.5	2.1	0.37
Industrial	860	1.3	3.8	0.2	1.3	NA	NA	2.4	7.3	0.5
Park	3	0.03	1.5	NA	0.3	NA	2	0	NA	NA
Construction	6000	80	NA	NA	NA	NA	NA	NA	NA	NA

HDR: High Density Residential, MDR: Medium Density Residential, LDR: Low Density Residential
NA: Not available; insufficient data to characterize loadings
Source: Horner et al, 1994

As indicated in Table 4-3, urban storm water runoff can contain significant concentrations of solids, nutrients, organics and metals. A comparison of the concentration of water quality parameters in urban runoff with the concentrations in domestic wastewater is shown in Table 4-4.

Table 4-4. Comparison of Water Quality Parameters in Urban Runoff with Domestic Wastewater (mg/l)

Constituent	Urban Runoff		Domestic Wastewater		
	Separate Sewers		Before Treatment		After Secondary
	Range	Typical	Range	Typical	Typical
COD	200-275	75	250-1,000	500	80
TSS	20-2,890	150	100-350	200	20
Total P	0.02-4.30	0.36	4-15	8	2
Total N	0.4-20.0	2	20-85	40	30
Lead	0.01-1.20	0.18	0.02-0.94	0.10	0.05
Copper	0.01-0.40	0.05	0.03-1.19	0.22	0.03
Zinc	0.01-2.90	0.02	0.02-7.68	0.28	0.08
Fecal Coliform per 100 ml	400-50,000		10^6-10^8		200

Source: Bastian, 1997

As indicated in Table 4-4, the concentrations of select water quality parameters in urban runoff is comparable to that found in untreated domestic wastewater. When untreated urban runoff is discharged directly to receiving streams, the loadings of pollutants can be much higher than the loadings attributable to treated domestic wastewater.

The following paragraphs summarize the major pollutants which are commonly found in urban storm water runoff.

4.2.1 Solids, Sediment and Floatables

Solids are one of the most common contaminants found in urban storm water. Solids originate from many sources including the erosion of pervious surfaces and dust, litter and other particles deposited on impervious surfaces from human activities and the atmosphere. Stream bank erosion and erosion at construction sites are also major sources of solids. Solids contribute to many water quality, habitat and aesthetic problems in urban waterways. Elevated levels of solids increase turbidity, reduce the penetration of light at depth within the water column, and limit the growth of desirable aquatic plants. Solids that settle out as bottom deposits contribute to sedimentation and can alter and eventually destroy habitat for fish and bottom-dwelling organisms

(see Figure 4-2). Solids also provide a medium for the accumulation, transport and storage of other pollutants including nutrients and metals. Sediment bound pollutants often have a long history of interaction with the water column through cycles of deposition, re-suspension, and re-deposition. Impaired navigation due to sedimentation represents another impact affecting recreation and commerce. The relative contribution of TSS in urban storm water from different land uses is presented in Table 4-3. As shown in Table 4-4, the typical concentration of TSS in urban runoff is substantially higher than that in treated wastewater (Bastian, 1997). Construction produces the highest loading of TSS over other urban land use categories evaluated.

Figure 4-2. Effects of Siltation on Rivers and Streams

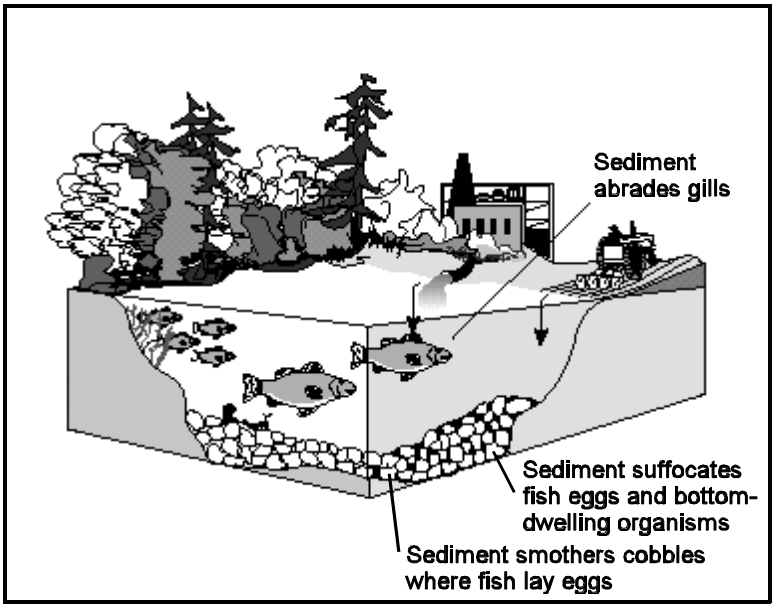

Source: US EPA, 1998d.

4.2.2 Oxygen-Demanding Substances and Dissolved Oxygen

The oxygen-demanding substances found in urban storm water can be measured by Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD), and Total Organic Carbon (TOC). Maintaining appropriate levels of dissolved oxygen in receiving waters is one of the most important considerations for the protection of fish and aquatic life. The amount of dissolved oxygen in urban runoff is typically 5.0 mg/l or greater, and it rarely poses a direct threat to in-stream conditions. As shown in Table 4-4, the level of COD associated with urban runoff is comparable to treated wastewater. The direct impact of urban storm water runoff on dissolved oxygen conditions in receiving waters is not thought to be substantial. However, the secondary impacts on the dissolved oxygen balance in receiving waters due to nutrient enrichment, eutrophication, and resulting sediment oxygen demand may be important.

4.2.3 Nitrogen and Phosphorus

Nitrogen and phosphorus are the principal nutrients of concern in urban storm water. The major sources of nutrients in urban storm water are urban landscape runoff (fertilizers, detergents, plant debris), atmospheric deposition, and improperly functioning septic systems (Terrene Institute, 1996). Animal waste can also be an important source. There are a number of parameters used to measure the various forms of nitrogen and phosphorus found in runoff. Ammonia (NH_3) nitrogen is the nitrogen form that is usually the most readily toxic to aquatic life. Nitrate (NO_3) and nitrite (NO_2) are the inorganic fractions of nitrogen. Very little nitrite is usually found in storm water. Total Kjeldahl nitrogen (TKN) measures the organic and ammonia nitrogen forms. By subtraction, the organic fraction can be determined. Total phosphorus measures the total amount of phosphorus in both the organic and inorganic forms. Ortho-phosphate measures phosphorus that is most immediately biologically available. Most of the soluble phosphorus in storm water is usually present in the ortho-phosphate form.

The degree to which nitrogen and phosphorus are present in a river, lake or estuary can determine the trophic status and amount of algal biomass produced. Excess nutrients tend to increase primary biological productivity. The major impact associated with nutrient over-enrichment is excessive growth of algae that leads to nuisance algal blooms and eutrophic conditions. A secondary impact is the residual negative effect of decomposing algae in the form of sediment oxygen demand that depletes dissolved oxygen concentrations, particularly in bottom waters. The NURP study reported that nutrient levels in urban runoff appear not to be high in comparison with other possible discharges. However, more recent studies and programs have recognized that the amount of nitrogen and phosphorus present in urban storm water can be substantial, and becomes increasingly important as other point sources of nutrients are brought under control. Walker (1987) reported that “cause-effect relationships linking urban development to lake and reservoir eutrophication are well established,” and that “urban watersheds typically export 5 to 20 times as much phosphorus per unit per year, as compared to undeveloped watersheds in a given region.” The nutrient loadings from different urban and suburban land uses are presented in Table 4-3. As shown in Table 4-4, the total phosphorus and total nitrogen concentrations in urban runoff are substantially less than treated wastewater concentrations, but storm water volumes can be greater during wet weather events.

4.2.4 Pathogens

Pathogens are disease-producing organisms that present a potential public health threat when they are present in contact waters. Since storm water runoff typically does not come into contact with domestic wastewaters, and direct exposure to runoff is usually limited, there is generally little threat of pathogens in storm water runoff causing a public health risk. However, where runoff is discharged to recreational waters such as beaches and lakes, or where runoff comes into contact with shellfish beds, there is a potential public health risk associated with pathogen contamination.

There are a number of indicator organisms that have been used to evaluate the presence of harmful pathogens in storm water runoff. Several strains of bacteria are present naturally in the soil and can be transported by runoff. In addition, BMPs with standing water can be breeding grounds for naturally occurring bacteria. Therefore, interpretation of bacteriological sampling results can be difficult. Nevertheless, indicator organisms can provide useful insight into the public health risk associated with runoff. Fecal coliform has been widely used as an indicator for the presence of harmful pathogens in domestic wastewaters, and therefore studies characterizing storm water runoff have frequently used this indicator as well. Other bacterial indicators that have been used to evaluate the presence of harmful pathogens in storm water runoff include *Escherichia coli, streptococci* and *enterococci*. The presence of enteric viruses has also been evaluated in storm water runoff, as well as protozoans such as *Giardia lamblia* and *cryptosporidium*.

Fecal coliform concentrations in urban runoff were evaluated by NURP at 17 sites for 156 storm events. NURP reported that coliform bacteria are present at high levels in urban runoff and can be expected to exceed EPA water quality criteria during and immediately after storm events in many surface waters, even those providing high degrees of dilution. Concentrations of fecal coliform found by NURP exhibited a large degree of variability, and did not indicate any distinctions based on land use. Data from different sites did show a dramatic seasonal effect on coliform concentrations. Coliform counts in urban runoff during warmer periods of the year were found to be approximately 20 times greater that those found during colder periods. Based on this data, NURP concluded that coliform sources unrelated to those traditionally associated with human health risk may be significant.

The Terrene Institute (1996) reported that the primary sources of pathogens in urban storm water drains are animal wastes (including pets and birds), failing septic systems, illicit sewage connections, and boats and marinas. Field et al (1993) reported pathogens levels from storm water runoff and urban streams as shown in Table 4-5. Pathogens enumerated included bacteria (total and fecal coliform, fecal streptococci, enterococci, *Pseudomonas aeruginosa*, *Staphylococcus aureus*, and *Salmonella*) and enteroviruses (poliovirus, Coxsackie virus, and Echovirus).

Table 4-5. Densities of Selected Pathogens and Indicator Microorganisms in Storm Water in Baltimore, Maryland Area

Geometric Mean Densities								
Sampling Station	Entero-virus	*Salmon sp.*	*Pseudomon. aeruginosa*	*Staph. aureus*	Total Coliform	Fecal Coliform	Fecal Strep.	*Enterococci*
	PFU/ 10 L	MPN/ 10 L	MPN/ 10 L	MPN/ 100 mL	MPN/ 100 mL (10^4)	MPN/ 100 mL (10^3)	No./ 100 mL (10^4)	No./100 mL (10^4)
Bush St.	6.9	30	2000	120	38	83	56	12
Northwood	170	5.7	590	12	3.8	6.9	5	2.1

PFU: Plaque-forming units
MPN: Most Probable Number
Source: Field et al, 1993

As shown earlier in Table 4-4, typical fecal coliform concentrations for separate urban storm sewers varied widely, ranging between 400-50,000 mpn/100 ml. An example of fecal coliform concentrations measured in sheet flow associated with different impervious surfaces is presented in Table 4-6. The broad range in concentrations illustrates the highly variable nature of fecal coliform concentrations in storm water.

Table 4-6. Fecal Coliform Concentrations Collected in Sheetflow from Urban Land Uses

Land Use	**Median (MPN/100 ml)**	**Range (MPN/100 ml)**
Unpaved driveways and storage areas	26	0.02-300
Roof runoff	1.6	0.56-2.6
Sidewalks	55	19-90
Paved parking and driveways	2.8	0.03-66
Paved roads	19	1.8-430

MPN: Most Probable Number
Source: Field et al, 1993.

4.2.5 Petroleum Hydrocarbons

Petroleum hydrocarbons include oil and grease; the “BTEX” compounds: benzene, toluene, ethyl benzene, and xylene; and a variety of polynuclear aromatic hydrocarbons (PAHs). Sources of petroleum hydrocarbons include parking lots and roadways, leaking storage tanks,

auto emissions, and improper disposal of waste oil. Petroleum hydrocarbons are typically concentrated along transportation corridors.

Petroleum hydrocarbons are known for their acute toxicity at low concentrations (Schueler, 1987). A study by Shepp (1996) measured the petroleum hydrocarbon concentrations in urban runoff from a variety of impervious areas in the District of Columbia and suburban Maryland. The amount of car traffic affects the concentration of hydrocarbons in runoff, with median concentrations ranging from 0.7 to 6.6 mg/l. Concentrations at these levels exceed the maximum concentrations recommended for the protection of drinking water supplies and fisheries protection. As pointed out by Shepp, the maximum concentration of petroleum hydrocarbons for protection of fisheries is 0.01 to 0.1 mg/l.

4.2.6 Metals

The primary sources of metals in urban storm water are industry and automobiles. Atmospheric deposition (both wet and dry) can make a substantial contribution in some parts of the country. A major finding of the NURP study is as follows:

> Heavy metals (especially copper, lead and zinc) are by far the most prevalent priority pollutant constituents found in urban runoff. End-of-pipe concentrations exceed EPA ambient water quality criteria and drinking water standards in many instances. Some of the metals are present often enough and in high enough concentrations to be potential threats to beneficial uses.

Metals in urban storm water have the potential to impact water supply and cause acute or chronic toxic impacts for aquatic life. Typical pollutant loading rates and urban runoff concentrations for lead, zinc and copper are presented in Tables 4-3 and 4-4. The frequency with which metals were detected as priority pollutants in the NURP study is presented in Table 4-7.

Table 4-7. Most Frequently Detected Priority Pollutants in Nationwide Urban Runoff Program Samples (1978-83)

Inorganics	Organics
Detected in 75% or more	
94% Lead 94% Zinc 91% Copper	None
Detected in 50-74%	
58% Chromium 52% Arsenic	None
Detected in 20-49%	
48% Cadmium 43% Nickel 23% Cyanides	22% Bis(2-ethylhexyl)phthalate 20% α-Hexachloro-cyclohexane
Detected in 10-19%	
13% Antimony 12% Beryllium 11% Selenium	19% α-Endosulfan 19% Pentachlorophenol* 17% Chlordane* 15% Lindane* 15% Pyrene** 14% Phenol 12% Phenanthrene** 11% Dichloromethane 10% 4-Nitrophenol 10% Chrysene** 10% Fluoranthene**

* Chlorinated hydrocarbon
** Polynuclear aromatic hydrocarbon
Source: US EPA, 1983

A major study of the quality of Wisconsin storm water (Bannerman et al, 1996) found that the probability of event mean concentrations for some metals (particularly copper and zinc) exceeding Wisconsin water quality criteria for cold water fish communities was high (Table 4-8). A study in Coyote Creek, California reported lead and zinc levels from urban runoff of 100 to 500 times the concentration in the ambient water column (Pitt, 1995).

Table 4-8. Probability of Event Mean Concentration of Constituents in Wisconsin Storm Water Exceeding Wisconsin Surface Water and Ground Water Quality Standards: Metals

Constituent	Probability of exceeding acute toxicity criteria for cold water fish communities (percent)	
	Storm Sewers	Streams
Cadmium, total recoverable	11	0
Copper, total recoverable	87	9
Lead, total recoverable	18	0
Silver, total recoverable	20	-
Zinc, total recoverable	91	7

Source: Bannerman et al, 1996.

4.2.7 Synthetic Organic Compounds

Synthetic organic compounds include a variety of manufactured compounds covering pesticides, solvents and household and industrial chemicals. The frequency that synthetic inorganics were detected as priority pollutants in the NURP study is presented in Table 4-7. In general, organic contaminants were found in less than 20 percent of samples. Nevertheless, synthetic organics do represent a threat. Even low concentrations of some synthetic organics over a long period of time have the potential to pose a severe health risks to humans and aquatic life though direct ingestion or bioaccumulation in the food chain. There is also some evidence that pesticides are found in higher concentrations in urban areas than agricultural areas (US EPA, 1995b). Further, Bannerman et al found that the probability for storm water and urban stream samples to exceed human cancer criteria for public water supply, and toxicity criteria for coldwater fish communities equaled or approached 100 percent for 10 compounds (Table 4-9).

Table 4-9. Probability of Event Mean Concentration of Constituents in Wisconsin Storm Water Exceeding Wisconsin Surface Water and Ground Water Quality Standards: Synthetic Organic Compounds

Constituent (Human cancer criteria for public water supply/ coldwater fish communities)	**Probability of exceedance (percent)**	
	Storm Sewers	**Streams**
Benzo[a]anthracene	98	100
Benzo[a]pyrene	99	100
Benzo[b]fluoranthene	100	100
Benzo[ghi]perylene	99	100
Benzo[k]fluoranthene	99	99
Chrysene	100	100
Indeno pyrene	100	99
Phenanthrene	100	99
Pyrene	100	100
DDT	98	100

Source: Bannerman et al, 1996

4.2.8 Temperature

Water temperature is an important measure of water quality. As described by Malina (1996), "the temperature of water affects some of the important physical properties and characteristics of water, such as… specific conductivity and conductance, salinity, and the solubility of dissolved gases (e.g., oxygen and carbon dioxide)." Specifically, water holds less oxygen as it becomes warmer, resulting in less oxygen being available for respiration by aquatic organisms. Furthermore, elevated temperatures increase the metabolism, respiration, and oxygen demand of fish and other aquatic life, approximately doubling the respiration for a 10°C (18°F) temperature rise; hence the demand for oxygen is increased under conditions where supply is lowered (California SWRCB, 1963).

Certain species of fish, such as salmon and trout, are particularly sensitive and require relatively low water temperatures. Even lower temperatures are required for spawning and egg

hatching (US EPA, 1976). If the temperature of a stream reach is raised by 5 to 10°C (9 to 18°F), it is probable that such cold-water game fish will avoid this reach and that they will be replaced by "rougher," more tolerant fish (California SWRCB, 1963). Thus, even without direct mortality, the character of the fish life will change. Sudden changes in temperature directly stress the aquatic ecosystem. The states have adopted varying criteria to protect fisheries from such stresses. Typically, states limit in-stream temperature rises above natural ambient temperatures to 2.8°C (5°F). Allowable temperature rises in streams that support cold water fisheries may be lower, with some states adopting values as low as 1°C (1.8°F) and 0.6°C (1°F) (US EPA, 1988).

The temperature of urban waters is often affected directly by urban runoff. Urban runoff can be heated as it flows over rooftops, parking lots and roadways. When it reaches urban waterways it can cause a temporary fluctuation in the in-stream water temperature. Other factors that tend to increase summer water temperature in urban waters include the removal of vegetation from stream banks, reduced ground water baseflow, and discharges from storm water facilities with elevated water temperature. Frequent fluctuations in stream temperature stress the aquatic ecosystem, and make it difficult for temperature-sensitive species to survive.

Galli (1990a) undertook a major study of thermal impacts associated with urbanization and storm water management in Maryland. Temperature observations were taken at stream stations representing different levels of development, with impervious cover ranging from 1 percent to 60 percent. Results were compared with Maryland Class III standards for natural trout waters (68 °F) and Class IV standards for recreational trout waters (75 °F). As shown in Figure 4-3, streams in developed watersheds (Lower Whiteoak and Tanglewood Stations) have significantly higher spring and summer temperatures than streams in less developed watersheds. Galli also found that "imperviousness together with local meteorological conditions had the largest influence on urban stream temperatures." As shown in Figure 4-4, the rate of increase in baseflow water temperature in this study was determined to be 0.14 °F for each one percent increase in watershed imperviousness.

Figure 4-3. Relationship Between Increasing Imperviousness and Urban Stream Temperature

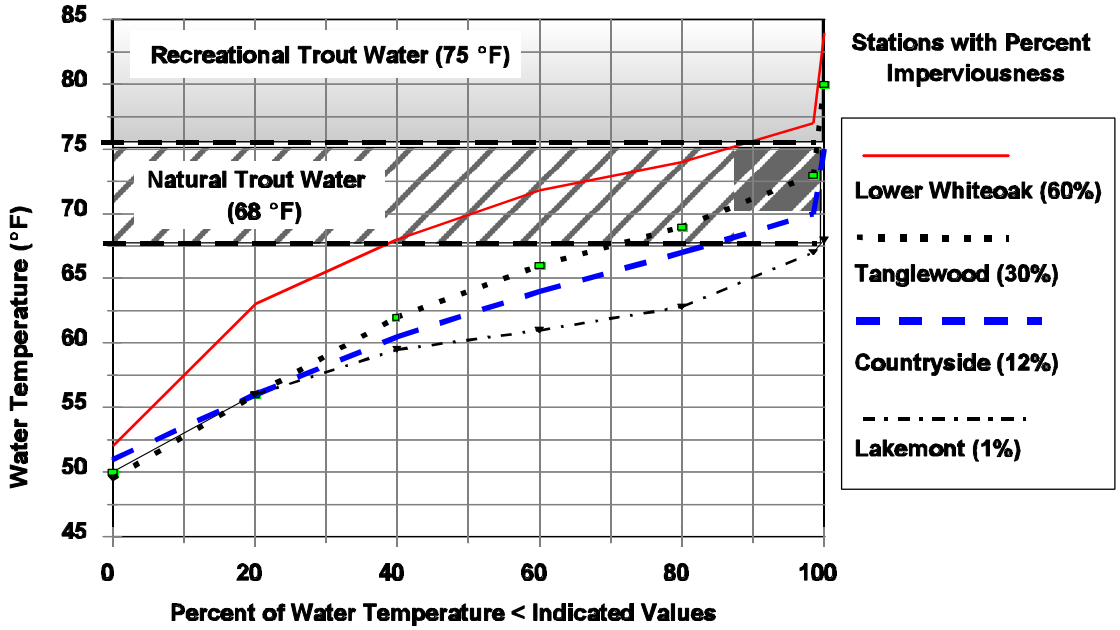

Source: Galli, 1990a

Figure 4-4. Relationship Between Watershed Imperviousness and Baseflow Water Temperature

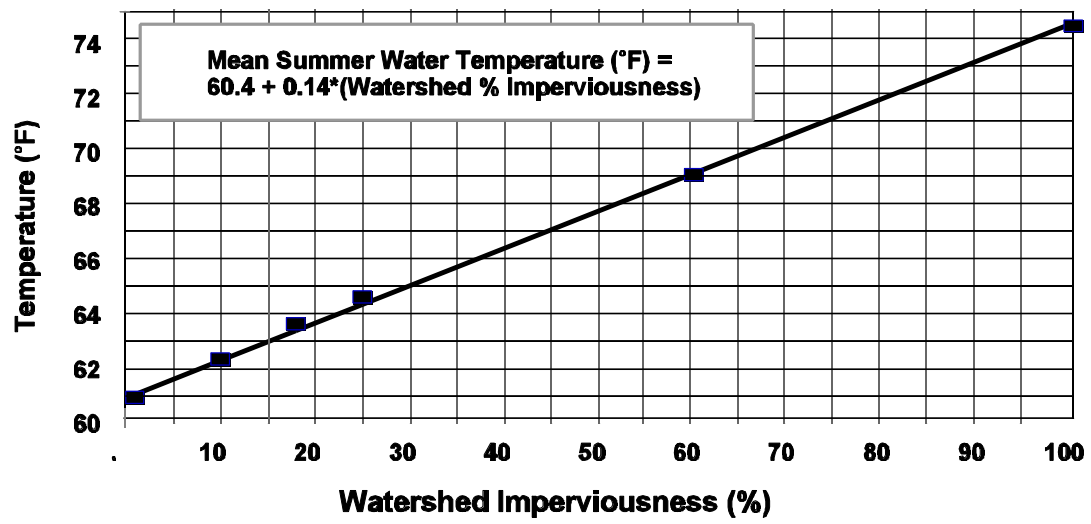

Source: Galli, 1990a

4.2.9 pH

As pointed out by Novotny and Olem (1994), "most aquatic biota are sensitive to pH variations," and "fish kills and reduction and change of other species result when the pH is altered outside their tolerance limits." Most pH impacts in urban waters are caused by runoff of rainwater with low pH levels (acid precipitation). In fact, urban areas tend to have more acidic rainfall than less developed areas. Some buffering of low pH rainwater occurs during contact with buildings, parking lots, roads and collection systems, and during overland flow. This is often very site specific. The alkalinity and thus the capacity of receiving waters to neutralize acidic storm water can also be important, and again is very site specific. Examples of pH impacts on fish populations are difficult to identify due to the cumulative, overlapping impacts from other factors. However, it is thought that the acidification problem in both the United States and Canada grows in magnitude when "episodic acidification" (brief periods of low pH levels from snow melt or heavy downpours) is taken into account (US EPA, 1992a). The spring snow melt can coincide with fish spawning periods.

4.3 Reported Impacts of Urban Storm Water

Urban runoff, which includes runoff from impervious surfaces such as streets, parking lots, buildings, lawns and other paved areas is one of the leading causes of water quality impairment in the United States. Based on the 1996 state Water Quality Inventory reports, siltation (sediment discharged from urban runoff, as well as construction sites, agriculture, mining and forests) is the leading cause of impaired water quality in rivers and streams. In the portion of the inventory identifying sources, urban runoff was listed as the leading source of pollutants causing water quality impairment related to human activities in ocean shoreline waters and the second leading cause in estuaries across the nation. Urban runoff was also a significant source of impairment in rivers and lakes. Urban runoff accounts for 47 percent of impaired miles of surveyed ocean shoreline, 46 percent of the impaired square miles of surveyed estuaries, 22 percent of the impaired acres of surveyed lakes and 14 percent of the impaired miles of surveyed rivers. Figure 4-5 illustrates the level of impairment attributable to urban storm water runoff based on states' Water Quality Inventory assessment reports.

Figure 4-5. Proportions of Impaired Water Bodies Attributed to Urban Runoff

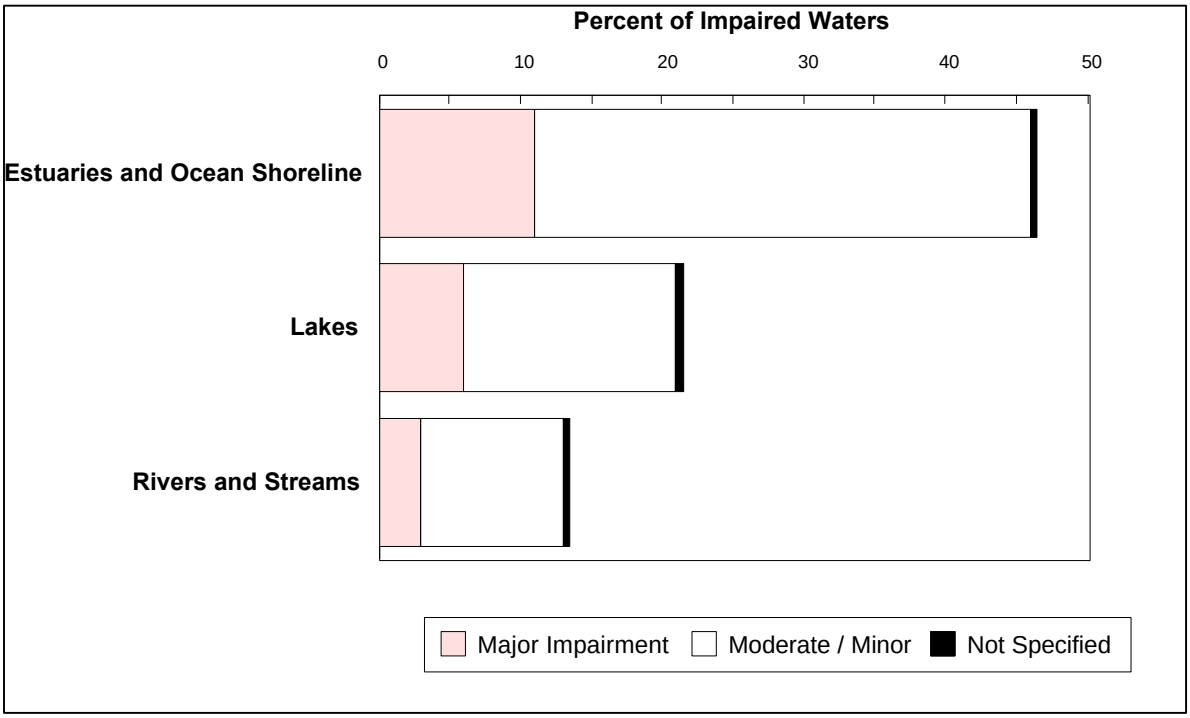

Source: EPA, 1998d.

4.3.1 Flow Impacts

The volume and flow rate of storm water discharges can have significant impacts on receiving streams. In many cases, the impacts on receiving streams due to high storm water flow

rates or volumes can be more significant than those attributable to the contaminants found in storm water discharges. While studies linking increased storm water flows due to urbanization to stream degradation are generally lacking in quantitative data, there are a number of studies that support this hypothesis. EPA summarized studies which contain documented evidence of impacts on steams due to urbanization (US EPA, 1997a). Impacts of urbanization and increased storm water discharges to receiving streams documented in this evaluation include:

- Increase in the number of bankfull events and increased peak flow rates
- Sedimentation and increased sediment transport
- Frequent flooding
- Stream bed scouring and habitat degradation
- Shoreline erosion and stream bank widening
- Decreased baseflow
- Loss of fish populations and loss of sensitive aquatic species
- Aesthetic degradation
- Changes in stream morphology
- Increased temperatures.

The amount of runoff generated within a watershed increases steadily with development. The presence of impervious areas such as roofs, parking lots and highways limits the volume of rain water infiltrated into the soil, and increases the amount of runoff generated. Urbanized areas also tend to have reduced storage capacities for runoff because of regrading, paving, and the removal of vegetative cover. Decreases in infiltration and evapotranspiration and an increase in runoff are the result of urbanization, with runoff volume linked to the percent of impervious area. The relationship between runoff coefficient and percent impervious area is illustrated in Figure 4-6.

Figure 4-6. Relationship of Watershed Imperviousness to Runoff Coefficient Levels

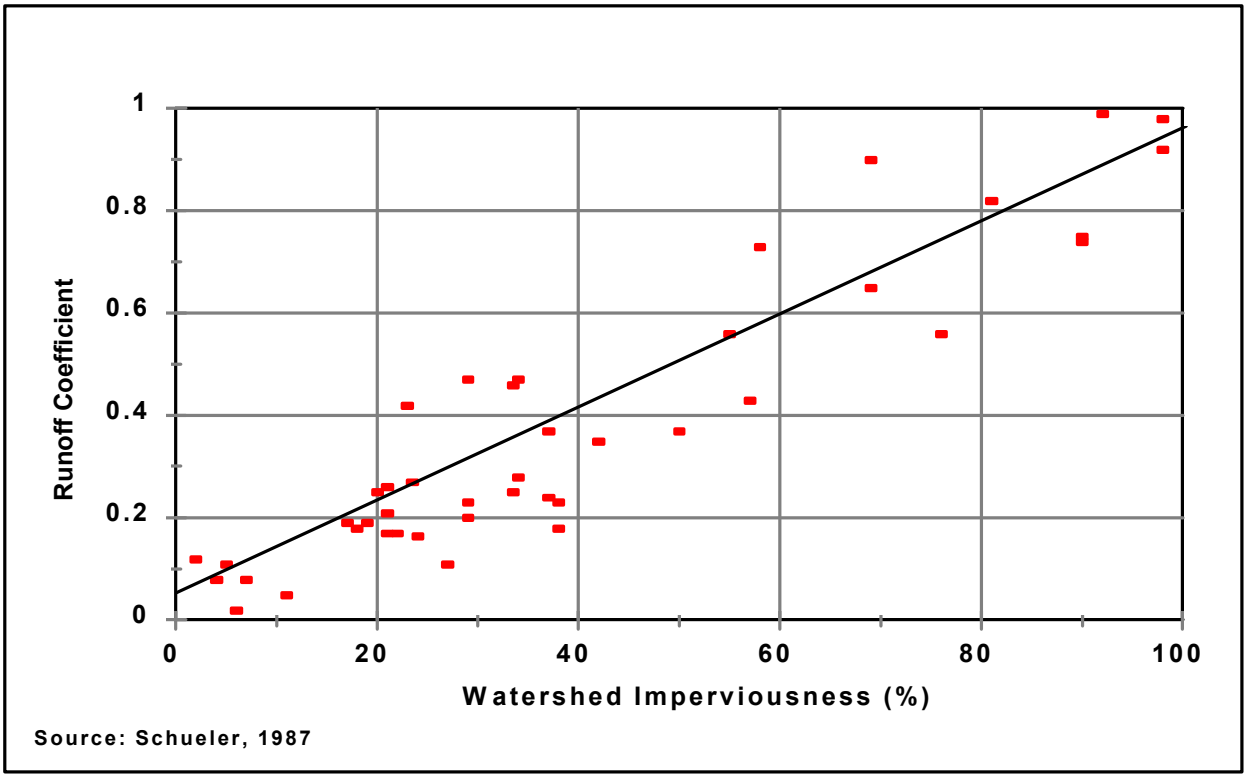

As shown in Table 4-10, the physical impacts to streams associated with increased imperviousness are substantial (US EPA, 1997a).

Table 4-10. Impacts from Increases in Impervious Surfaces

Increased Imperviousness Leads to:	Resulting Impacts				
	Flooding	Habitat loss	Erosion	Channel Widening	Stream bed Alteration
Increased Volume	✔	✔	✔	✔	✔
Increased Peak Flow	✔	✔	✔	✔	✔
Increased Peak Duration	✔	✔	✔	✔	✔
Increased Stream Temp.		✔			
Decreased Base Flow		✔			
Changes in Sediment Loading	✔	✔	✔	✔	✔

Source: EPA, 1997

The Delaware Department of Natural Resources and Environmental Control also identified a list of impacts on physical stream habitat attributed to urban storm water (DE DNREC, 1997). This list is as follows:

- Accelerated bank erosion
- Accelerated bank undercutting
- Increased siltation (burial of stable habitats)
- Elimination of meanders (channelization)
- Channel widening
- Reduced depth
- Reduced baseflow
- Loss of shade
- Increased temperature.

Specific impacts in the areas of flooding, stream bank erosion, and ground water recharge are described in the following subsections.

Flooding

Urbanization increases the frequency and severity of flooding due to increased runoff. Because of the decreased availability of pervious, permeable surfaces, and the related decrease in storage capacity, smaller more frequently occurring storms can create flooding problems. Hydrographs in urban streams peak higher and faster than streams in undeveloped areas. A comparison of estimated runoff volume and peak discharge for developed and undeveloped areas is presented in Table 4-11. As shown, both runoff volume and peak discharge are substantially increased under developed conditions.

Table 4-11. Comparison of Estimated Runoff Volume and Peak Discharge for Developed and Undeveloped Areas

Storm Frequency (years)	Undeveloped Conditions (Woods in good condition)		Developed Conditions (Half-Acre Residential)	
	Estimated Runoff (in)	Estimated Peak Discharge (cfs)	Estimated Runoff (in)	Estimated Peak Discharge (cfs)
2	0.14	1.00	0.60	11.6
10	0.52	5.60	1.33	27.4
100	1.40	19.7	2.64	58.6

Source: Horner et al, 1994

The effects of urbanization on stream shape and the flood plain are illustrated in Figure 4-7. Increased peak discharge raises the flood plain level, flooding areas which were previously not at risk.

Figure 4-7. Effect of Urbanization on Stream Slope and Flooding

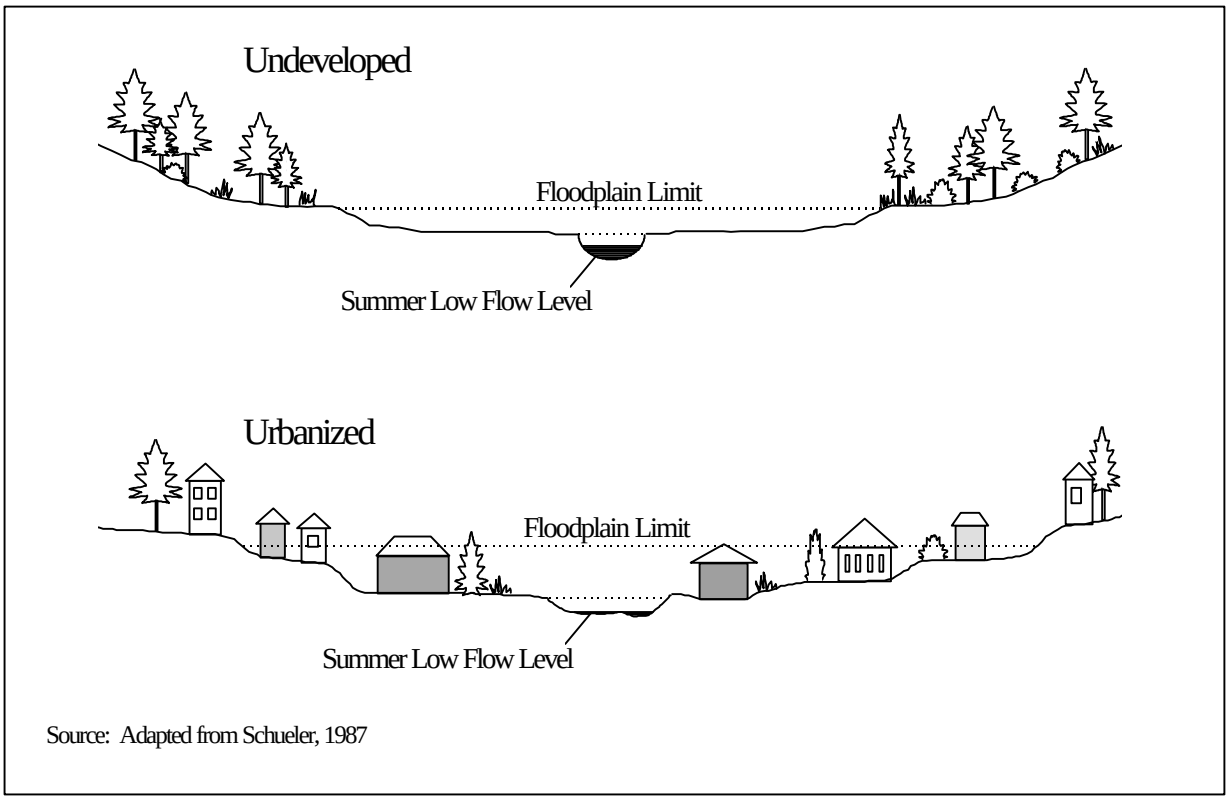

Source: Adapted from Schueler, 1987

A comparison of hydrographs from an urbanized stream (Lincoln Creek) and a non-urbanized stream (Jackson Creek) in Wisconsin are presented in Figure 4-8 (Masterson and Bannerman, 1994). As illustrated, the hydrograph for the urbanized stream exhibits a much higher peak flow rate that would correspond to a higher flood level.

Figure 4-8. Hydrographs for Urban and Non-Urban Streams

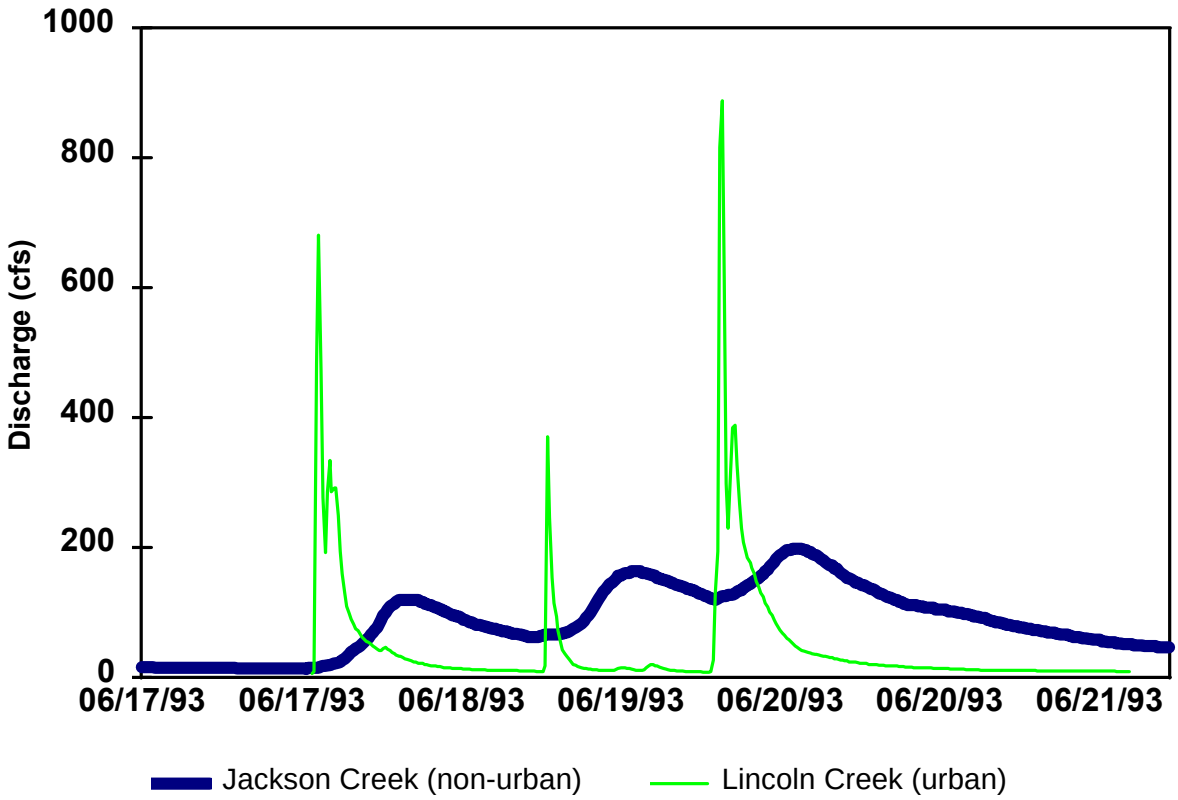

Source: Masterson and Bannerman, 1994

Stream Bank Erosion

Stream bank erosion is a natural phenomenon and source of both sediment and nutrients. However, urbanization can greatly accelerate the process of stream bank erosion. As the amount of impervious area increases, a greater volume of storm water is discharged directly to receiving waters, often at a much higher velocity. The increased volume and velocity of the runoff can overwhelm the natural carrying capacity of the stream network. In addition, streams in urbanized areas can experience an increase in bankfull flows. Since bankfull flows are highly erosive, substantial alterations in stream channel morphology can result.

Excessive bank erosion occurs as streams become wider and straighter to accommodate greater flows and an excess number of erosion-causing events. Signs of stream bank erosion attributable to increased storm water include undercut and fallen stream banks, felled bushes and

trees along the banks, and exposed sewer and utility pipes. Sediments from eroding banks (and upland construction) are deposited in areas where the water slows, causing buildup, destruction of benthic habitat, and a decreased stream capacity for flood waters. This ultimately results in a greater potential for further erosion.

Krug and Goddard (1986) documented these phenomena in their study of Pheasant Branch, a developing watershed of 24.5 square miles near Middleton, Wisconsin. Local population grew markedly between 1970 to 1980, from 8,246 to 11,851, and is projected to reach 18,000 by the year 2000. Problems of stream channel erosion and suspended sediment developed in Pheasant Branch as a result of this growth. The increased erosion and sediment loadings have decreased the mean stream bed elevation by almost 2 feet, and increased the mean channel width by nearly 35 percent.

Table 4-12 shows the modeled percent increase at three sites for the volume of the 2-year flood, bankfull width, and bankfull depth under two development scenarios. These are the projected development levels in the year 2000 (projected urbanization), and complete urbanization of the watershed. The projected results are shown relative to pre-development conditions.

Table 4-12. Percent Increase of Two-Year Flood, Bankfull Width, and Bankfull Depth from Pre-Development Conditions to Urbanized Conditions (Based on Modeling Results)

Site	Projected Urbanization			Complete Urbanization		
	2-year	Width	Depth	2-year	Width	Depth
	(Percent Increase from Pre-urbanization)			(Percent Increase from Pre-urbanization)		
Site 1	99	40	30	140	60	40
Site 2	324	110	80	361	110	80
Site 3	32	10	10	224	80	60

Source: EPA, 1997a

An example of the impact of urbanization on increased sediment loadings in several small streams in Wisconsin before, during and after development is illustrated in Figure 4-9 (Krug and Goddard, 1986). Sediment loads are greatest during construction, but remain elevated after construction relative to pre-development conditions.

Figure 4-9. Sediment Loadings on Small Streams in Wisconsin

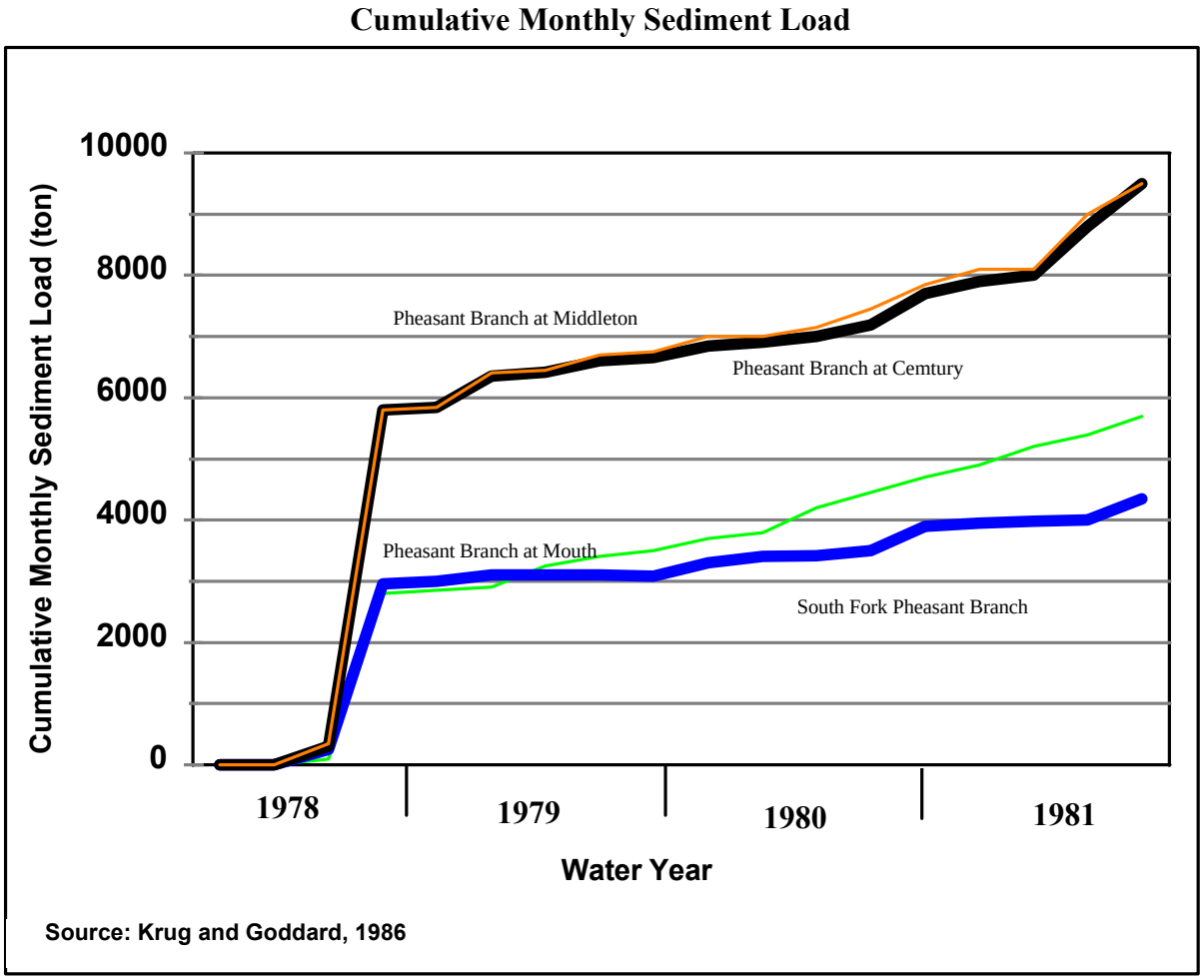

Ground Water Recharge

Urbanization can have a major impact on ground water recharge. As shown earlier in Figure 4-1, both shallow and deep infiltration decrease as watersheds undergo development and urbanization. Ground water recharge is reduced along with a lowering of the water table. This change in watershed hydrology alters the baseflow contribution to stream flow, and it is most pronounced during dry periods. Ferguson (1990) points out that "base flows are of critical environmental and economic concern for several reasons. Base flows must be capable of absorbing pollution from sewage treatment plants and non-point sources, supporting aquatic life dependent on stream flow, and replenishing water-supply reservoirs for municipal use in the seasons when [water] levels tend to be lowest and water demands highest."

Base flows on Long Island, New York were substantially impacted by the construction of storm water conveyance systems during the period of rapid development between the 1940s and

1970s. As illustrated in Table 4-13, a steady decline in the average percent of baseflow was observed for streams in urbanized sewered areas relative to streams in un-sewered or rural areas (US EPA, 1997a).

Table 4-13. Average Percent Base Flow of Selected Streams on Long Island by Area

Years	Urbanized Sewered Area (% Flow from Base Flow)		Urbanized Un-sewered Area (% Flow from Base Flow)		Rural Un-sewered Area (% Flow from Base Flow)	
	Stream 1	Stream 2	Stream 1	Stream 2	Stream 1	Stream 2
1948-1953	(No data)	86	84	94	96	95
1953-1964	63	69	89	89	95	97
1964-1970	17	22	83	84	96	97

Source: US EPA, 1997a

4.3.2 Habitat Impacts

Natural ecosystems are a complex arrangement of interactions between the land, water, plants, and animals. The relationship between storm water discharge and the biological integrity of urban streams is illustrated in Figure 4-10 (Masterson and Bannerman, 1994). As shown, habitat is impacted by changes in both water quality and quantity, and the volume and quality of sediment. As reported by Schueler (1987), “no single factor is responsible for the progressive degradation of urban stream ecosystems. Rather, it is probably the cumulative impacts of many individual factors such as sedimentation, scouring, increased flooding, lower summer flows, higher water temperatures, and pollution.”

Figure 4-10. Relationship Between Urban Storm Water and Aquatic Ecosystems

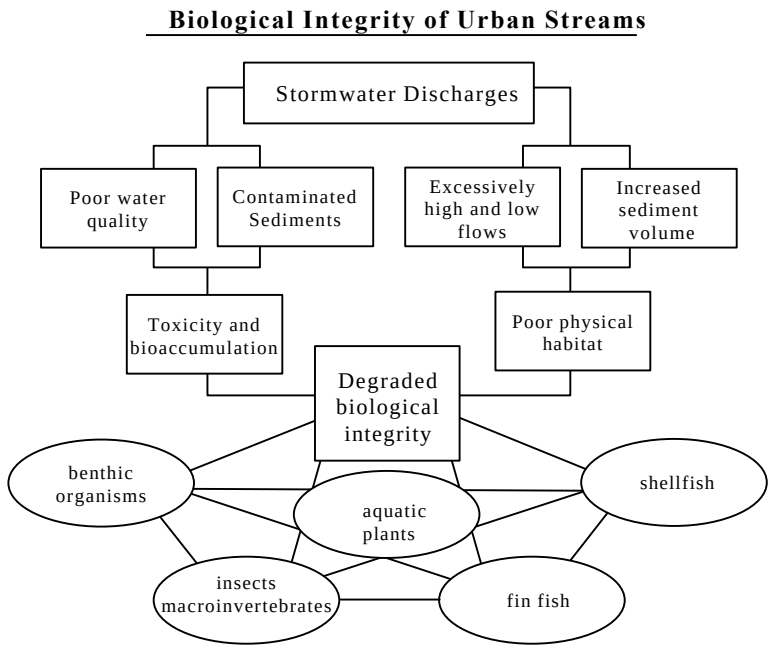

Source: Adapted from Masterson and Bannerman, 1994

Schueler and Claytor (1995) also suggest a direct relationship between watershed imperviousness and stream health (Figure 4-11), and found that stream health impacts tend to begin in watersheds with only 10-20 percent imperviousness (the ten percent threshold). As shown, sensitive streams can exist relatively unaffected by urban storm water with good levels of stream quality where impervious cover is less than 10 percent although some sensitive streams have been observed to experience water quality impacts at as low as 5 percent imperviousness. Impacted streams are threatened and exhibit physical habitat changes (erosion and channel widening) and decreasing water quality where impervious cover is in the range of 10 to 25 percent. Streams in watersheds where the impervious cover exceeds 25 percent are typically degraded, have a low level of stream quality, and do not support a rich aquatic community.

Figure 4-11. Relationship Between Impervious Cover and Stream Quality

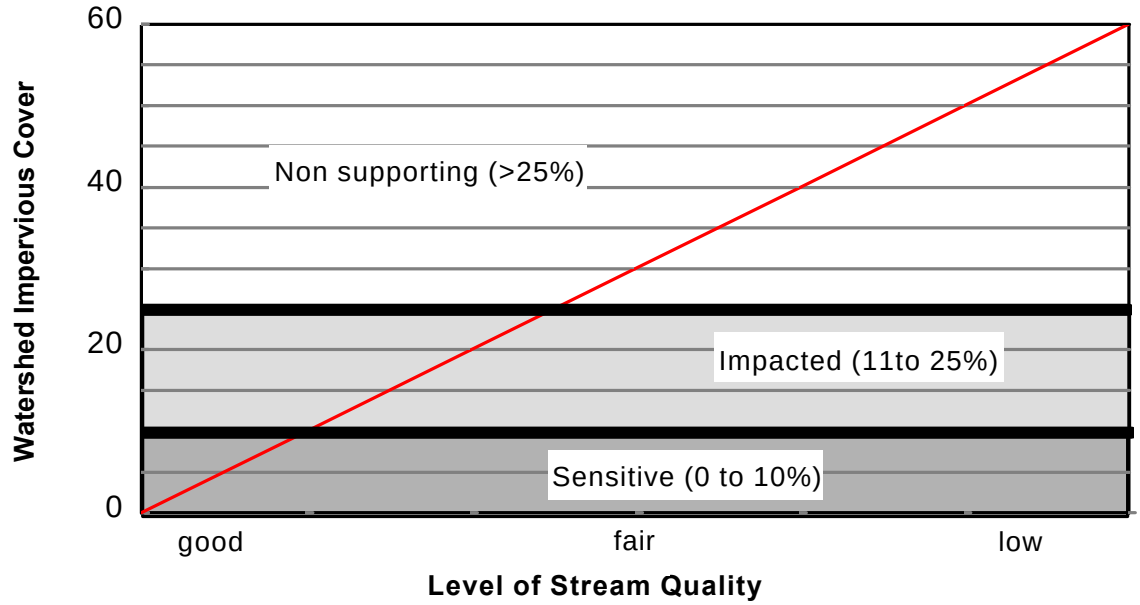

Source: Schueler and Claytor, 1995

A summary of water quality impacts on habitat is presented in Table 4-14. The alteration of species distribution is the major impact, with pollutant tolerant and less sensitive species replacing native species in storm water impacted receiving waters.

Table 4-14. Water Quality Parameters Affecting Habitat

Water Quality Parameter	Habitat Effect
Bacteria	Contamination
Heavy metals	Alteration of species distribution
Toxic organics	Alteration of species distribution
Nutrients	Eutrophication, algal blooms
Sediment	Decreased spawning areas
BOD	Reduced dissolved oxygen levels
Temperature	Reduced dissolved oxygen levels
pH	Alteration of species distribution

Figure 4-12 illustrates that the pH tolerance of various forms of aquatic life varies substantially (US EPA, 1992b). The tolerance of aquatic life to changes in temperature, turbidity and toxic substances is also very important. Contaminants like heavy metals, pesticides, and hydrocarbons can alter the species distribution in receiving waters. Acute and chronic toxicity impacts may also occur. The relative toxicity of storm water samples from a variety of loading source areas is presented in Table 4-15. Some of the identified chronic toxicity effects are decreased growth and respiration rates (US EPA, 1996a). Toxic loads can reduce the hatching and survival rates of aquatic organisms, cause gross effects such as lesions or fin erosion in fish, and can eventually destroy the entire population of some sensitive species (Novotny and Olem, 1994). Hydrocarbons can be especially detrimental to benthic organisms because they can become bound to urban runoff sediments (Schueler, 1987).

Figure 4-12. Low pH Tolerance by Different Species

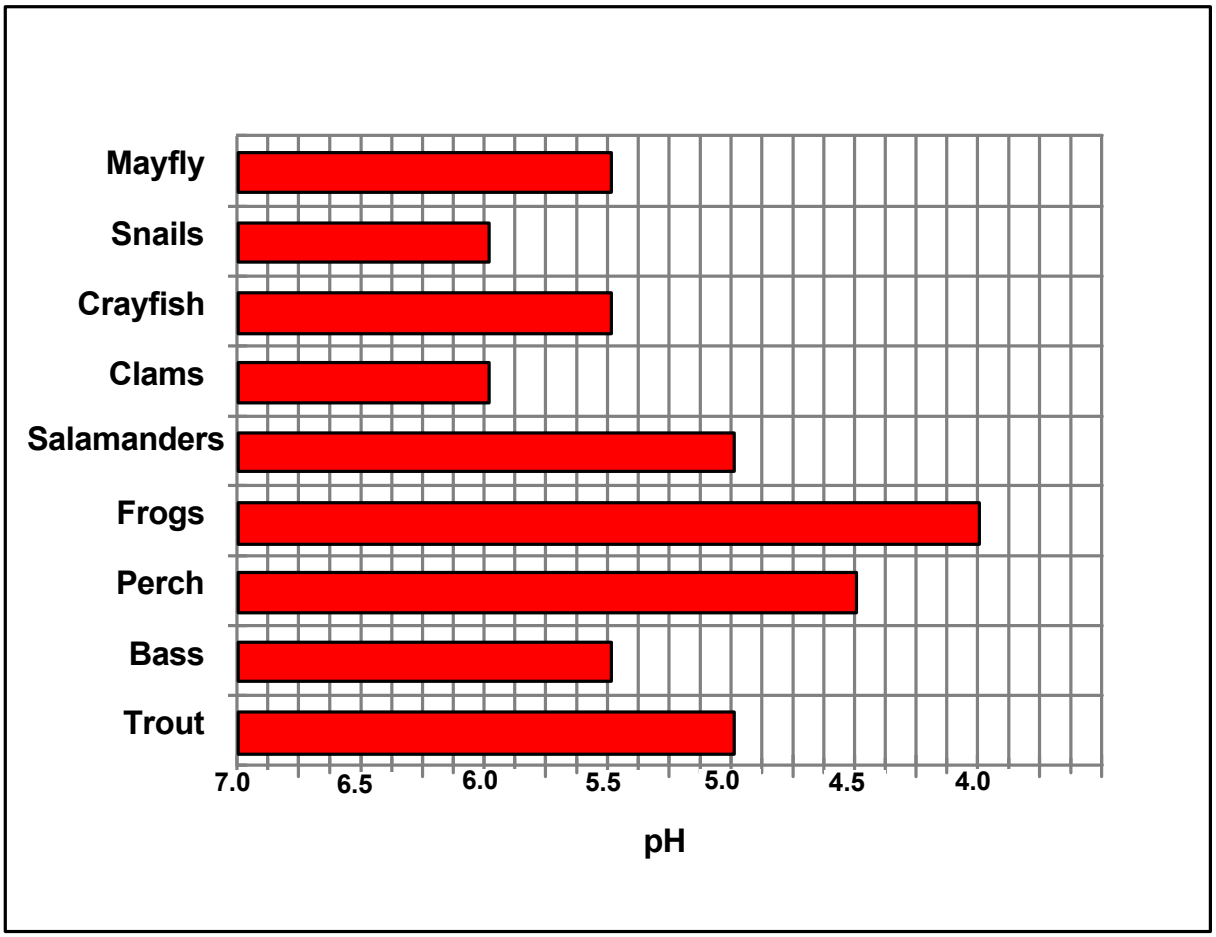

Source: EPA, 1992b

Table 4-15. Relative Toxicities of Samples Using Microtox® Measurement Method

Local Source Areas	Highly Toxic (%)	Moderately Toxic (%)	Not Toxic (%)
Roofs	8	58	33
Parking areas	19	31	50
Storage areas	25	50	25
Streets	0	67	33
Loading docks	0	67	33
Vehicle service areas	0	40	60
Landscaped areas	17	17	66
Urban creeks	0	11	89
Detention ponds	8	8	84
All source areas	9	32	59

Note: Microtox® results are primarily for comparison purposes.
Source: Pitt et al, 1995.

The physical impacts to streams due to urbanization and changes in watershed hydrology also cause many habitat changes. As illustrated in the comparison of healthy and eroding stream banks in Figure 4-13, loss of depth, sediment deposition, loss of shoreline vegetation, and higher temperatures combine to impact habitat.

Figure 4-13. Comparison of a Healthy Stream Bank and an Eroding Bank

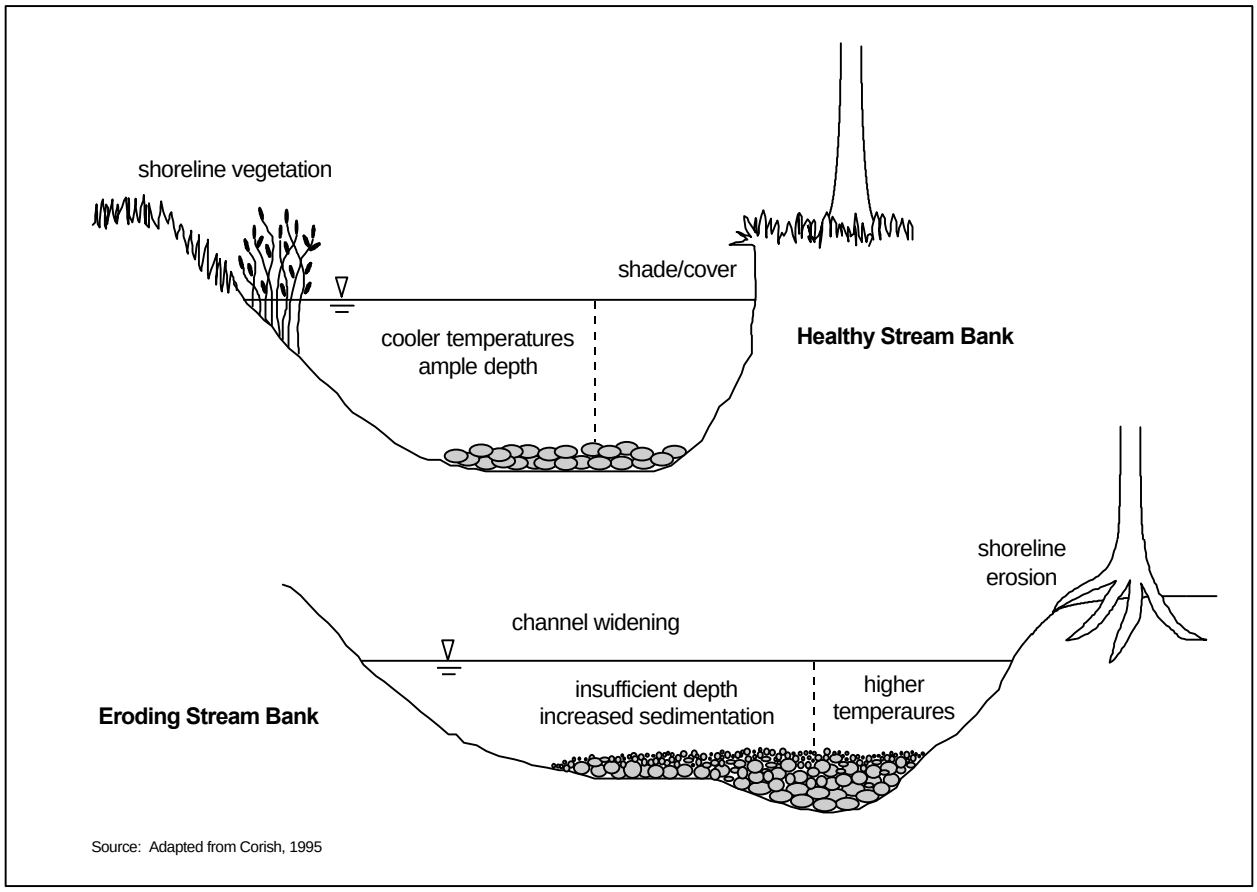

Schueler (1987) states that sediment pollution in the form of increased suspended solids can cause the following harmful impacts to aquatic life:

- Increased turbidity
- Decreased light penetration
- Reduced prey capture for sight feeding predators
- Clogging of gills/filters of fish and aquatic invertebrates
- Reduced spawning and juvenile fish survival.

Sediment is also a carrier of metals and other pollutants, and a source of bioaccumulating pollutants for bottom feeding organisms. The rate of bioaccumulation is widely variable based upon site specific conditions including species, concentration, pH, temperature, and other factors. Barron (1995) reports that the bioaccumulation of organic contaminants results primarily from direct exposure to water and sediment rather than through the food chain.

Macroinvertebrate Impacts

The biological integrity of receiving waters impacted by urban storm water is typically reduced from more pristine, undeveloped circumstances. Impacts include a reduction in total numbers and diversity of macroinvertebrates, and the emergence of more pollutant-tolerant species. In a study in Delaware, it was found that approximately 70 percent of the macroinvertebrate community in streams in undeveloped, forested watersheds consisted of pollution sensitive mayflies, stoneflies and caddisflies, as compared with 20 percent in urbanized watersheds (Maxted and Shaver, 1997). As shown in Table 4-16, the relative abundance of pollution tolerant organisms increased with urbanization, including worms, midges and beetles.

Table 4-16. Delaware Insect Population Abundance by Degree of Urbanization

Population Description				Relative Abundance by Degree of Urbanization (%)		
Class/ Order	**Genus species**	**Common Name**	**PT**	**None**	**Low**	**High**
Insecta/Trichoptera	Diplectrona modesta	caddisfly	0	14	2	1
Insecta/Ephemeroptera	Ephemerella spp.	mayfly	1	12	1	0
Insecta/Plecoptera	Allocapnia spp.	stonefly	3	10	18	3
Insecta/Ephemeroptera	Eurylophella spp.	mayfly	1	8	1	2
Insecta/Coleoptera	Anchytarsus bicolor	beetle	4	6	3	0
Insecta/Ephemeroptera	Stenonema spp.	mayfly	4	5	3	1
Insecta/Coleoptera	Optiservus spp.	beetle	4	4	2	8
Insecta/Coleoptera	Oulimnius latiusculus	beetle	2	4	3	5
Insecta/Trichoptera	Cheumatopsyche spp.	caddisfly	5	1	10	8
Insecta/Trichoptera	Hydropsyche betteni	caddisfly	6	1	4	5
Insecta/Diptera	Simulium vittatum	blackfly	7	0	8	1
Insecta/Diptera	Parametriocnemus spp.	midge	5	0	0	4
Oligochaeta	unidentified (Tubificidae)	worm	10	0	0	4

Note: rare organisms (fewer than 4 per 100 organisms) not included. Relative abundance (%) and pollution tolerance (PT) of macroinvertebrate species commonly found in Piedmont streams of Delaware for three levels of urbanization; none (0-2% impervious cover), low (6-13%), and high (15-50%); PT range from 0 (low tolerance) to 10 (high tolerance).
Source: Maxted and Shaver, 1997.

A study by Kohlepp and Hellenthal (1992) quantified the effects of sediment deposits on macroinvertebrates in Juday Creek, a tributary to the St. Joseph River in Indiana. The study included data before and after upstream channel maintenance operations introduced a large amount of sediment to the creek, similar to increased sediment yield from urban areas. A dramatic change in the species distribution of macroinvertebrates in the river was observed, and this was attributed to the changing sediment load and increased sedimentation. As shown in Figure 4-14, "the result was a shift from a community dominated by filter-feeders in both numbers and production rate in 1981-82, to a community in 1989-90 in which less desirable collector-gatherers and shredders increased in importance in terms of relative contribution to both numbers and production."

Figure 4-14. Effects of Sediment Deposits on Macroinvertebrates in Juday Creek, Indiana Proportion by Functional Feeding Group (percent)

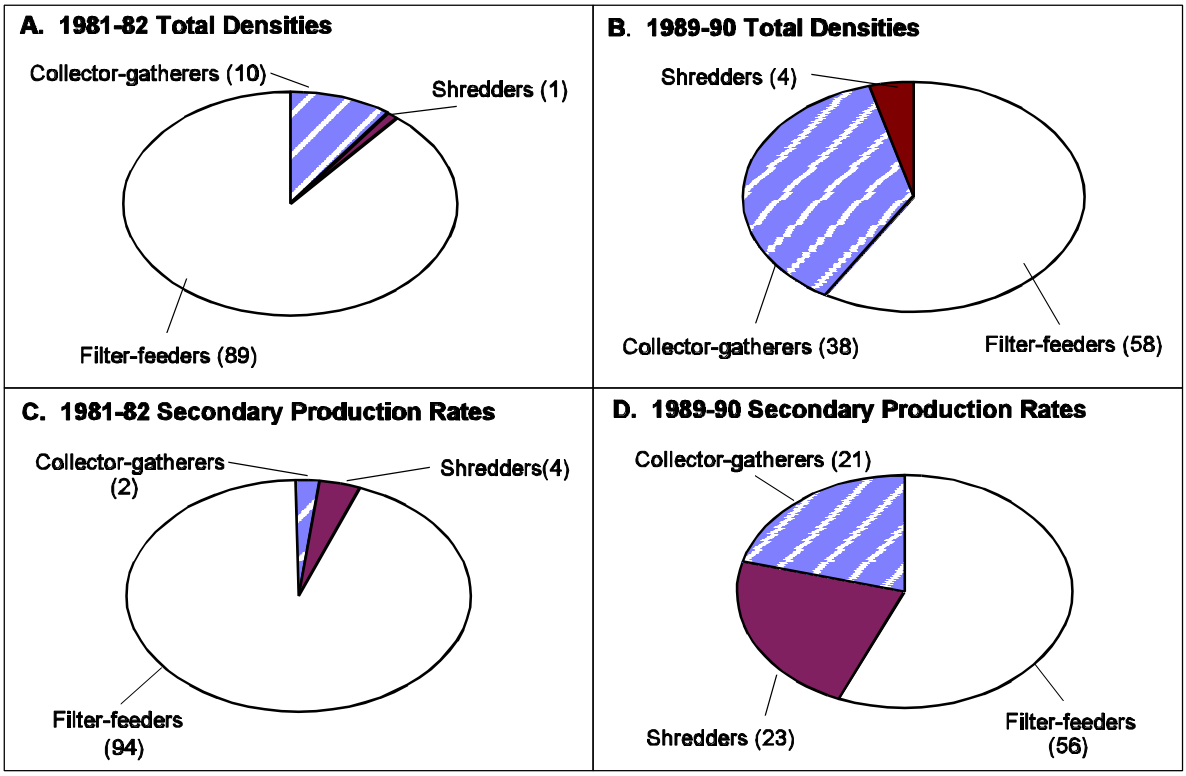

Source: Kohlepp and Hellenthal, 1992

Fish Impacts

The health of an ecosystem is often measured by the abundance and variety of fish species present, and the presence of native species. A case study in California compared fish populations in urbanized and non-urbanized sections of Coyote Creek (Pitt, 1995). The relative abundance of different fish species in the different reaches is presented in Table 4-17. As shown, the native fish are generally replaced by introduced fish in the urbanized section.

Table 4-17. Relative Abundance of Native and Introduced Fish in Urbanized and Non-Urbanized Areas in Coyote Creek, California

Species	Relative Abundance (%)	
	Non-urbanized Reach	Urbanized Reach
Native Fish		
Hitch	34.8	4.8
Threespine stickleback	27.3	0.8
Sacramento sucker	12.6	0.1
Introduced Fish		
Mosquitofish	5.6	66.9
Fathead Minnow	0.6	20.6
Threadfin shad	-	2.4

Source: Pitt, 1995

An illustration of the abundance of fish eggs and larvae associated with different levels of urban land use in New York is presented in Figure 4-15 (Limburg and Schmidt, 1990). This graph supports the “10 percent rule” reported by Schueler and Claytor (1995): stream impacts tend to begin in watersheds with only 10 to 20 percent imperviousness.

Figure 4-15. Average Densities of Fish Eggs and Larvae in New York

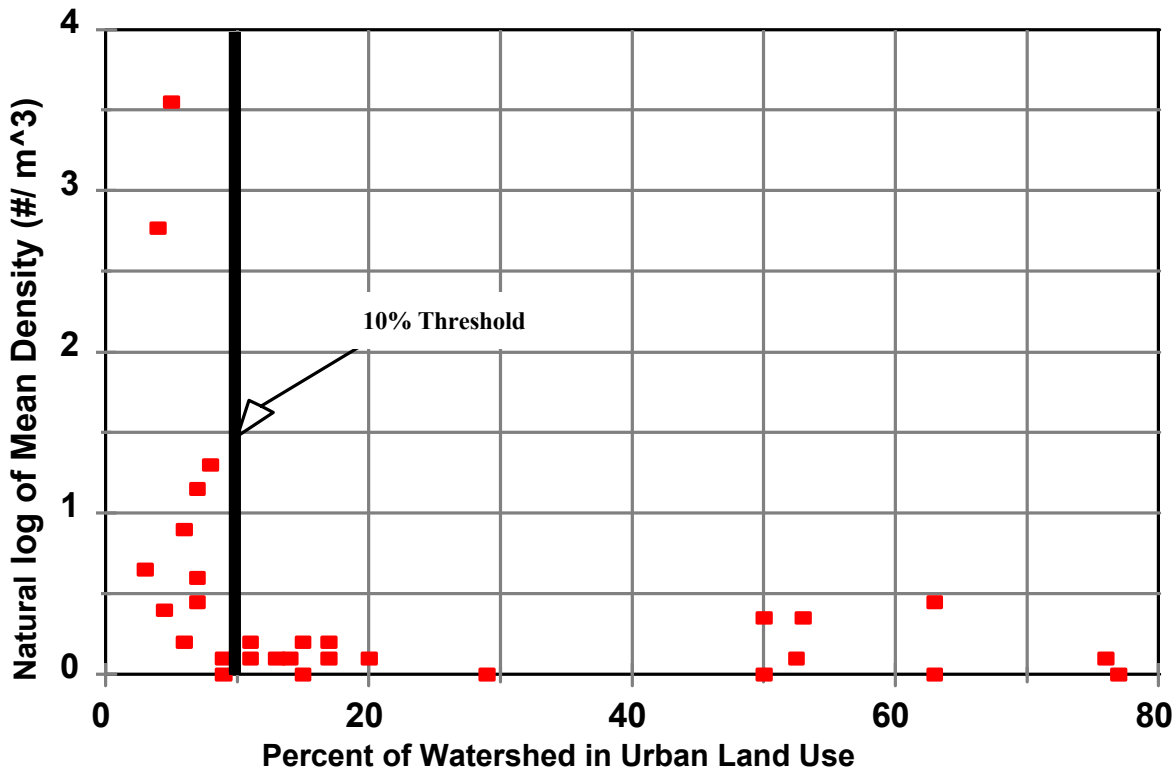

Source: Limburg and Schmidt, 1990

The change in the resident fish community due to urbanization in Tuckahoe Creek in Virginia was quantified by Weaver and Garman (1994). With urbanization increasing the percent of urban land from 7 percent to 28 percent between 1958 and 1990, a dramatic change in the fish assemblage was observed. As shown in Table 4-18, the total number of fish observed dropped sharply along with the total number of species present and the number of common species present.

Table 4-18. Effects of Urbanization on the Fish Community of Tuckahoe Creek, Virginia (Composite of 6 Sites)

Indicator	Fish Assemblage Year	
	1958	1990
% Urban (by land area)	7	28
total abundance	2,056	412
# species - total	31	23
# species - common*	21	6
% bluegill/shiner	28	67

* more than 10 individuals
Source: Weaver and Garman, 1994

4.3.3 Public Health Impacts

Public health impacts associated with urban storm water occur when humans ingest or come in contact with pathogens. While these impacts are not widely reported, they do occur, and some impacts have been documented. Examples related to swimming and contact recreation impacts and shellfish impacts are presented.

Contact Recreation Impacts

Beach closures are a common occurrence in many communities throughout the United States. Beach closures are primarily due to high levels of bacteria in water samples. The presence of medical waste and other dangerous floatable substances on beaches can also cause beach closures to occur. Storm water runoff can be responsible for both bacteria and floatables. Elevated levels of bacteria and viruses represent the most common threat to public health. Diarrhea and infection of the ear, eye, nose, or throat are possible.

A study of epidemiological impacts associated with swimming in the vicinity of storm water outfalls in Santa Monica Bay in California was conducted in 1995 (SMBRP, 1996). The study focused on health effects, and not on possible sources of contamination to the storm drain

system, such as illicit sewage connections and infiltration.[1] While the effects observed may be atypical of properly constructed and maintained storm drain outfalls, the findings indicate the potential health risks associated with pathogens. Major findings of this study are as follows:

- There is an increased risk of illness associated with swimming near flowing storm drain outlets in Santa Monica Bay.
- There is an increased risk of illness associated with swimming in areas with high densities of bacterial indicators.
- The total coliform to fecal coliform ratio was found to be one of the better indicators for predicting health risks.
- Illnesses were reported more often on days when the samples were positive for enteric viruses.
- High densities of bacterial indicators were measured on a significant number of survey days, particularly in front of drains.

People who swim in areas adjacent to flowing storm drains were found to be 50 percent more likely to get sick than people who swam in other areas. The sicknesses included fever, nausea, gastroenteritis, and flu-like symptoms such as nasal congestion, sore throat, fever, or coughing. As illustrated in Figure 4-16, swimmers who swam directly in front of storm drains were much more likely to become ill than those who swam away from the storm drains at distances of 100 to 400 meters. A comparative health outcome in terms of relative risk for swimming in front of the storm drain vs. swimming 400 meters away is presented in Table 4-19.

[1] Pilot studies conducted in the Bay prior to 1995 noted that some outfalls had regular dry weather discharges; this is a common indicator of storm drain contamination (SMBRP, 1990; SMBRP, 1992).

Figure 4-16. Health Effects Observed Relative to Distance from Santa Monica Bay Storm Drains

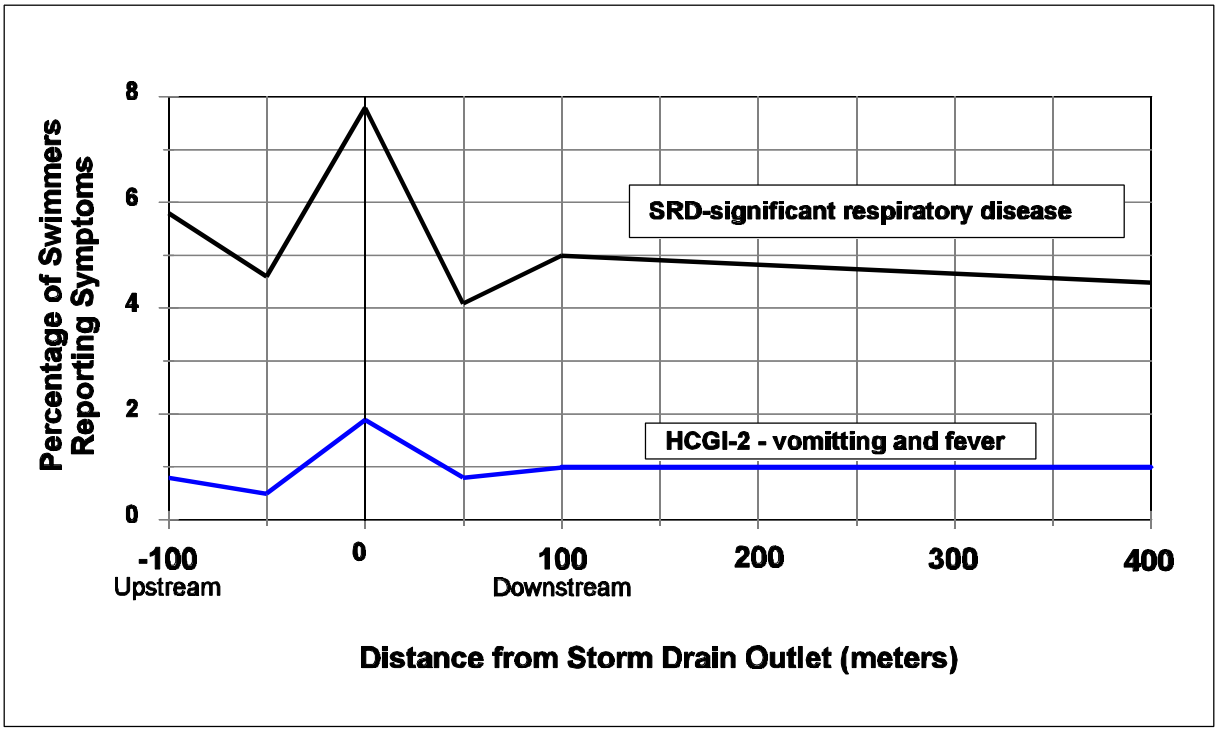

Source: Santa Monica Bay Restoration Project, 1996

Table 4-19. Comparative Health Outcomes for Swimming in Front of Drains in Santa Monica Bay

Health Outcome	Relative Risk for Swimming in Front of Drains*	Estimated No. Of Excess Cases per 10,000 Persons
Fever	57%	259
Chills	58%	138
Ear Discharge	127%	88
Vomiting	61%	115
Coughing with phlegm	59%	175
Any of the above symptoms	44%	373
HCGI-2	111%	95
SRD	66%	303
HCGI-2 or SRD	53%	314

* Compared to swimming 400 meters or more away from drains
Source: Santa Monica Bay Restoration Project, 1996

Seafood Hazard

The consumption of contaminated seafood, particularly shellfish, is a major public health problem. Shellfish are susceptible to bioaccumulating bacteria and viruses because they are filter feeders. In waters polluted by urban runoff, bacteria and viruses can be concentrated in the shellfish to much higher levels than those found in the surrounding waters. This becomes a public health concern because many potentially harmful bacteria and viruses can be ingested when people eat contaminated shellfish. As shown in Figure 4-17, the largest proportion of shellfish harvesting restrictions are caused by urban runoff (US EPA, 1995a).

Figure 4-17. Sources Associated with Shellfish Harvesting Restrictions, in Percent

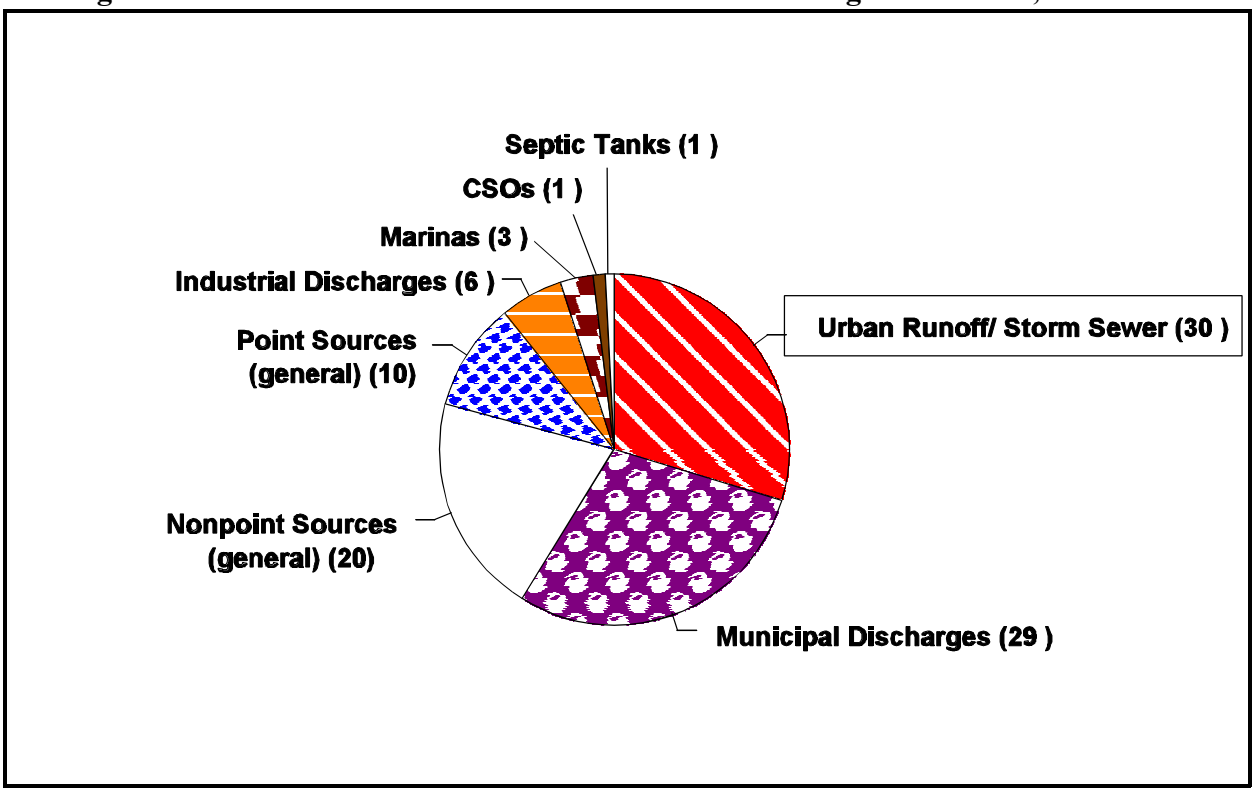

Source: US EPA, 1995a

Fish can also be contaminated for a number of reasons. Recent fish sampling surveys in regions of the U.S. have shown widespread mercury contamination in streams, wetlands, reservoirs, and lakes. Based on 1997 data, 33 states have issued fish consumption advisories because of mercury contamination (US EPA, 1998a). Mercury is an urban/industrial pollutant that is released into the air and ends up in urban runoff by atmospheric deposition (Krabbenhoft and Rickert, 1995). The effects of fish contamination go beyond health issues, and hurt the recreational fishing industry as a whole.

4.3.4 Aesthetic Impacts

The aesthetic impacts associated with urban storm water are often difficult to quantify. However, aesthetic impacts are often very visible to the general public. EPA reports that "people have a strong emotional attachment to water, arising from its aesthetic qualities--tranquillity, coolness, and beauty" (US EPA, 1995c). The presence of floatables within urban waters and deposited along the banks of waterways represents a common aesthetic impact in most urban settings. Floatable wastes originate from street litter and improper solid waste disposal practices. The average total street debris loading rate in New York City was quantified at approximately 156 pounds per curb-mile per day, with a range from 3 to 2,700 pounds (HydroQual, 1995).

Aesthetic impacts from the eutrophication of urban waterways is caused in part by nutrients delivered in urban storm water. As reported by Schueler (1987), aesthetic impacts and nuisance conditions associated with eutrophication can include:

- Surface algal scum
- Water discoloration
- Strong odors
- Release of toxins.

The visual damage to urban streams from accelerated rates of storm water runoff also contribute to aesthetic impacts. These include eroded stream banks, fallen trees, and sedimentation. In summary, aesthetic impacts are often very visible in public areas where shoreline recreation occurs. Aesthetic impacts are therefore the storm water impacts most familiar to the general public.

5.0 Description and Performance of Storm Water Best Management Practices

A storm water best management practice (BMP) is a technique, measure or structural control that is used for a given set of conditions to manage the quantity and improve the quality of storm water runoff in the most cost-effective manner. BMPs can be either engineered and constructed systems ("structural BMPs") that improve the quality and/or control the quantity of runoff such as detention ponds and constructed wetlands, or institutional, education or pollution prevention practices designed to limit the generation of storm water runoff or reduce the amounts of pollutants contained in the runoff ("non-structural BMPs"). No single BMP can address all storm water problems. Each type has certain limitations based on drainage area served, available land space, cost, pollutant removal efficiency, as well as a variety of site-specific factors such as soil types, slopes, depth of groundwater table, etc. Careful consideration of these factors is necessary in order to select the appropriate BMP or group of BMPs for a particular location.

5.1 Goals of Storm Water Best Management Practices

Storm water BMPs can be designed to meet a variety of goals, depending on the needs of the practitioner. In existing urbanized areas, BMPs can be implemented to address a range of water quantity and water quality considerations. For new urban development, BMPs should be designed and implemented so that the post-development peak discharge rate, volume and pollutant loadings to receiving waters are the same as pre-development values. In order to meet these goals, BMPs can be implemented to address three main factors: flow control, pollutant removal and pollutant source reductions.

5.1.1 Flow Control

Flow control involves managing both the volume and intensity of storm water discharges to receiving waters. Urbanization significantly alters the hydrology of a watershed. Increasing development leads to higher amounts of impervious surfaces. As a result, the response of an urbanized watershed to precipitation is significantly different from the response of a natural watershed. The most common effects are reduced infiltration and decreased travel time, which significantly increase peak discharges and runoff volumes. Factors that influence the amount of runoff produced include precipitation depth, infiltrative capacity of soils, soil moisture, antecedent rainfall, cover type, the amount of impervious surfaces and surface retention. Travel time is determined primarily by slope, length of flow path, depth of flow and roughness of flow surfaces. Peak discharges are based on the relationship of these parameters, and on the total drainage area of the watershed, the time distribution of rainfall, and the effects of any natural or manmade storage (USDA/NRCS, 1986).

High flow rates of storm water discharges can cause a number of impacts to receiving streams (see section 4.3), and may also increase the pollutant concentrations in storm water runoff. High velocity runoff can detach and transport significant amounts of suspended solids and

associated pollutants such as nutrients and metals from the urban landscape. In addition, high flow rates in drainage channels and receiving waters can erode stream banks and channels, further increasing suspended solids concentrations in waters that receive storm water discharges. In order to reduce the pollutant concentrations in runoff and receiving water impacts associated with high storm water flow rates, BMPs that provide flow attenuation are frequently implemented.

In areas undergoing new development or redevelopment, the most effective method of controlling impacts from storm water discharges is to limit the amount of rainfall that is converted to runoff. By utilizing site design techniques that incorporate on-site storage and infiltration and reduce the amounts of directly connected impervious surfaces, the amount of runoff generated from a site can be significantly reduced. This can reduce the necessity for traditional structural BMPs to manage runoff from newly developed areas. There are a number of practices that can be used to promote on-site storage and infiltration and to limit the amount of impervious surfaces that are generated. However, the use of on-site infiltration can be limited in certain areas due to factors such as slope, depth to the water table, and geologic conditions.

- *Site design features* such as providing rain barrels, dry wells or infiltration trenches to capture rooftop and driveway runoff, maintaining open space, preserving stream buffers and riparian corridors, using porous pavement systems for parking lots and driveways, and using grassed filter strips and vegetated swales in place of traditional curb-and-gutter type drainage systems can greatly reduce the amount of storm water generated from a site and the associated impacts.

- *Street construction features* such as placing sidewalks on only one side of the street, limiting street widths, reducing frontage requirements and eliminating or reducing the radius of cul-de-sacs also have the potential to significantly reduce the amount of impervious surfaces and therefore the amount of rainfall that is converted to runoff.

- *Construction practices* such as minimizing disturbance of soils and avoiding compaction of lawns and greenways with construction equipment can help to maintain the infiltrative capacity of soils.

There are several guides that contain useful information regarding development practices that can limit the impacts associated with storm water runoff (Delaware DNREC, 1997; US EPA, 1996b; Center for Watershed Protection, 1998).

In areas that are already developed, flow control can be more complicated. Since a drainage infrastructure already exists, retrofitting these systems to provide flow control can be prohibitively expensive. Regional storm water management systems can be used to manage runoff in these areas, but space considerations and high capital costs can limit their usefulness. Depending on site-specific constraints, however, there are a number of practices that can be incorporated on-site to reduce runoff volumes from these areas. Down spouts can be disconnected from the storm drain system and this rainfall can instead be collected and stored on a

property in rain barrels to be used for watering lawns and landscaping during inter-event periods. Infiltration and retention practices such as bioretention areas and infiltration trenches can be constructed to capture runoff from rooftops, lawns and driveways and reduce the volume of runoff discharged to storm sewers. Curb-and-gutter systems can be replaced with grassed swales or wetland channels to provide temporary ponding of runoff. Storm water from commercial areas and golf courses can be collected and stored in ponds and subsequently be used for irrigation. Storm water reuse can help to maintain a more natural, pre-development hydrologic balance in the watershed (Livingston et al, 1998). Parking lots can also be used as short-term storage areas for ponded storm water, and bioretention facilities placed around the perimeter of parking lots can be used to infiltrate this water volume.

Where the generation of runoff cannot be avoided, end-of-pipe structural BMPs may be implemented to decrease the impacts of storm water discharges to receiving streams. However, BMPs are limited in their ability to control impacts, and frequently cause secondary impacts such as increased temperatures of discharges to receiving streams. BMPs that can be designed to provide significant flow attenuation include grassed swales, vegetated filter strips, detention and retention basins, wetland basins, and wetland channels and swales. These BMPs can also provide the added benefit of removing pollutants such as suspended solids and associated nutrients and metals from storm water runoff.

The environmental aspects of storm water quantity control must be carefully balanced against the hazard and nuisance effects of flooding. Large or intense storm events or rapid snowmelt can produce significant quantities of runoff from urban areas with high levels of imperviousness. This runoff must be rapidly transported from urbanized areas in order to prevent loss of life and property due to flooding of streets, residences and businesses. This is frequently accomplished by replacing natural drainage paths in the watershed with paved gutters, storm sewers or other artificial means of drainage. These drainage systems can convey runoff at a faster rate than natural drainage paths, allowing rapid transport of runoff away from areas where flooding is likely to occur. However, as large quantities of runoff are conveyed rapidly from the urban landscape and discharged to receiving streams, downstream areas can flood. Following urbanization, large volumes of runoff can be produced from even small storm events due to the high amounts of impervious surfaces. As a result, flooding of streams that receive runoff can occur much more frequently following urbanization due to this excessive amount of runoff production. Therefore, design of storm water drainage systems must always balance flood protection with ecological concerns.

In highly urbanized and densely populated cities, little opportunity exists for retrofitting storm drainage systems with BMPs to provide water quantity control due to flooding considerations. The large area of impervious surfaces in heavily urbanized areas produce large quantities of runoff. Rapid conveyance by the storm drain system is frequently the only option that exists in order to prevent flooding of yards, streets and basements. In these areas, the most appropriate BMPs are those that limit the generation of pollutants or remove pollutants from the urban landscape. With this principle in mind, a unique opportunity exists in newly developing

areas or in more sparsely populated suburban areas to use BMPs that control runoff at the point of generation, instead of trying to manage it at the point of discharge to the receiving stream. When rainfall is managed as a *resource* instead of as a waste stream requiring treatment, future problems with quantity control may be avoidable. When rainfall is managed at the site level by promoting the concepts of conservation design, and by providing on-site storage, infiltration and usage of rainfall for irrigation of the urban landscape, the need for traditional curb-and-gutter storm drainage system can be reduced. As a result, the need for constructing and maintaining capital-, land- and maintenance-intensive regional BMPs to manage large flows from developed watersheds may be reduced. Nuisance flooding of downstream areas can also be limited by reducing the overall volume of water draining from a watershed. Limiting the discharge of large volumes of storm water to urban streams can help to prevent the degradation of these streams to the point of being non-supporting of a designated use.

5.1.2 Pollutant Removal

Urbanized areas export large quantities of pollutants during storm events. The high population of pollutant sources in urbanized areas contribute large quantities of pollutants that accumulate on streets, rooftops and other surfaces. During rainfall or snowmelt, these pollutants are mobilized and transported from the streets and rooftops into the storm drain system, where they are conveyed and ultimately discharged to waterways. In order to reduce the impacts to receiving waters from the high concentrations of pollutants contained in the runoff, BMPs can be implemented to remove these pollutants.

Properly-designed, constructed and maintained structural BMPs can effectively remove a wide range of pollutants from urban runoff. Pollutant removal in storm water BMPs can be accomplished through a number of physical and biochemical processes. The efficiency of a given BMP in removing pollutants is dependent upon a number of site-specific variables, including the size, type and design of the BMP; the soil types and characteristics; the geology and topography of the site; the intensity and duration of the rainfall; the length of antecedent dry periods; climatological factors such as temperature, solar radiation, and wind; the size and characteristics of the contributing watershed; and the properties and characteristics of the various pollutants.

Pollutant removal in urban storm water BMPs can occur through the following mechanisms:

Sedimentation

Sedimentation is the removal of suspended particulates from the water column by gravitational settling. The settling of discrete particles is dependent upon the particle velocity, the fluid density, the fluid viscosity, and the particle diameter and shape. Sedimentation can be a major mechanism of pollutant removal in BMPs such as ponds and constructed wetlands. Sedimentation can remove a variety of pollutants from storm water runoff. Pollutants such as metals, hydrocarbons, nutrients and oxygen demanding substances can become adsorbed or attached to particulate matter, particularly clay soils. Removal of these particulates by

sedimentation can therefore result in the removal of a large portion of these associated pollutants. The main factor governing the efficiency of a BMP at removing suspended matter by sedimentation is the time available for particles to undergo settling. Fine particulates such as clay and silt can require detention times of days or even weeks to settle out of suspension. Therefore, it is important to evaluate the settling characteristics of the particulates in runoff before BMP design in order to determine the detention time necessary for adequate settling to occur. The overall efficiency of a BMP in removing particulates by settling is also dependent upon the initial concentration of suspended solids in the runoff. In general, runoff with higher initial concentrations of suspended solids will have a greater removal efficiency. In addition, some particles, such as fine clays, will not settle out of suspension without the aid of a coagulant. As a result there is usually a minimum practical limit of approximately 10 mg/l of TSS, below which additional TSS removal can not be expected to occur (UDFCD, 1992).

Flotation

Flotation is the separation of particulates with a specific gravity less than that of water. Trash such as paper, styrofoam "peanuts" used for packaging, and other low-density materials can be removed from storm water by the mechanism of flotation. If the inlet area of the BMP is designed to allow for the accumulation of floatable materials, then these accumulated materials can periodically be manually removed from the BMP. Significant amounts of floatables can be removed from storm water in properly designed BMPs in this manner. In addition, oils and hydrocarbons will frequently rise to the surface in storm water BMPs. If the BMP is designed with an area for these materials to accumulate, then significant removals of these pollutants can occur. Many modular or drop-in filtration systems incorporate an oil and grease or hydrocarbon trap with a submerged outlet pipe that allows these contaminants to accumulate and to be periodically removed.

Filtration

Filtration is the removal of particulates from water by passing the water through a porous media. Media commonly used in storm water BMPs include soil, sand, gravel, peat, compost, and various combinations such as peat/sand, soil/sand and sand/gravel. Filtration is a complex process dependent on a number of variables. These include the particle shape and size, the size of the voids in the filter media, and the velocity at which the fluid moves through the media. Filtration can be used to remove solids and attached pollutants such as metals and nutrients. Organic filtration media such as peat or leaf compost can also be effective at removing soluble nutrients from urban runoff.

Infiltration

Infiltration is the most effective means of controlling storm water runoff since it reduces the volume of runoff that is discharged to receiving waters and the associated water quality and quantity impacts that runoff can cause. Infiltration is also an important mechanism for pollutant control. As runoff infiltrates into the ground, particulates and attached contaminants such as metals and nutrients are removed by filtration, and dissolved constituents can be removed by adsorption. However, infiltration is not appropriate in all areas.

Adsorption

Adsorption, while not a common mechanism used in storm water BMPs, can occur in infiltration systems where the underlying soils contain appreciable amounts of clay. Dissolved metals that are contained in storm water runoff can be bound to the clay particles as storm water runoff percolates through clay soils in infiltration systems.

Biological Uptake

Biological uptake of nutrients is an important mechanism of nutrient control in storm water BMPs. Urban runoff typically contains significant concentrations of nutrients. Ponds and wetlands can be useful for removing these nutrients through biological uptake. This occurs as aquatic plants, algae, microorganisms and phytoplankton utilize these nutrients for growth. Periodic harvesting of vegetation in BMPs allows for permanent removal of these nutrients. If plants are not harvested, however, nutrients can be re-released to the water column from plant tissue after the plants die.

Biological Conversion

Organic contaminants can be broken down by the action of aquatic microorganisms in storm water BMPs. Bacteria present in BMPs can degrade complex and/or toxic organic compounds into less harmful compounds that can reduce the toxicity of runoff to aquatic biota.

Degradation

BMPs such as ponds and wetlands can provide the conditions necessary for the degradation of certain organic compounds, including certain pesticides and herbicides. Open pool BMPs can provide the necessary conditions for volatilization, hydrolysis and photolysis of a variety of organic compounds to take place.

5.1.3 Pollutant Source Reductions

Source reduction is an effective non-structural way of controlling the amounts of pollutants entering storm water runoff. A wide range of pollutants are washed off of impervious surfaces during runoff events. Removing these contaminants from the urban landscape prior to precipitation can effectively limit the amounts of pollutants contained in the storm water runoff. Source reduction can be accomplished by a number of different processes including: limiting applications of fertilizers, pesticides and herbicides; periodic street sweeping to remove trash, litter and particulates from streets; collection and disposal of lawn debris; periodic cleaning of catch basins; elimination of improper dumping of used oil, antifreeze, household cleaners, paint, etc. into storm drains; and identification and elimination of illicit cross-connections between sanitary sewers and storm sewers.

5.2 Types of Storm Water Best Management Practices

There are a variety of storm water BMPs available for managing urban runoff. Regardless of the type, storm water BMPs are most effective when implemented as part of a comprehensive storm water management program that includes proper selection, design, construction, inspection and maintenance. Storm water BMPs can be grouped into two broad categories: structural and non-structural. *Structural* BMPs are used to treat the storm water at either the point of generation or the point of discharge to either the storm sewer system or to receiving waters. *Non-structural* BMPs include a range of pollution prevention, education, institutional, management and development practices designed to limit the conversion of rainfall to runoff and to prevent pollutants from entering runoff at the source of runoff generation. The descriptions in this section provide summary information on a variety of commonly used structural and nonstructural storm water BMPs. Information provided includes a general description of the technology or practice, important components and factors to incorporate into BMP design and planning, and the positive and negative aspects of the technology or practice. In addition, maintenance considerations for structural BMPs are discussed. Quantitative performance data for BMPs are not included in this section. These data are included in section 5.5, "Effectiveness of BMPs in Managing Urban Runoff."

5.2.1 Structural BMPs

There are a wide variety of structural BMPs in use for storm water management. Structural BMPs include engineered and constructed systems that are designed to provide for water quantity and/or water quality control of storm water runoff. Structural BMPs can be grouped into several general categories. However, the distinction between BMP types and the terminology used to group structural BMPs is an area that needs standardization. In particular, the terms "retention" and "detention" are sometimes used interchangeably, although they do have distinct meanings. Storm water detention is usually defined as providing temporary storage of a runoff volume for subsequent release (WEF/ASCE, 1992). Examples include detention basins, underground vaults, tanks or pipes, and deep tunnels, as well as temporary detention in parking lots, roof tops, depressed grassy areas, etc. Retention is generally defined as providing storage of storm water runoff without subsequent surface discharge (WEF/ASCE, 1992). With the strict interpretation of this definition, retention practices would be limited to those practices that either infiltrate or evaporate runoff, such as infiltration trenches, wells or basins. However, retention is also commonly used to describe practices that retain a runoff volume (and hence have a permanent pool) until it is displaced in part or in total by the runoff event from the next storm. Examples include retention ponds, tanks, tunnels, and underground vaults or pipes, and wetland basins. For purposes of this document, and in being consistent with the definitions and terminology used in the ASCE National Stormwater BMP Database, structural BMPs have been grouped and defined as follows:

- Infiltration systems capture a volume of runoff and infiltrates it into the ground.

- Detention systems capture a volume of runoff and temporarily retain that volume for subsequent release. Detention systems to not retain a significant permanent pool of water between runoff events.

- Retention systems capture a volume of runoff and retain that volume until it is displaced in part or in total by the next runoff event. Retention systems therefore maintain a significant permanent pool volume of water between runoff events.

- Constructed wetland systems are similar to retention and detention systems, except that a major portion of the BMP water surface area (in pond systems) or bottom (in meadow-type systems) contains wetland vegetation. This group also includes wetland channels.

- Filtration systems use some combination of a granular filtration media such as sand, soil, organic material, carbon or a membrane to remove constituents found in runoff.

- Vegetated systems (biofilters) such as swales and filter strips are designed to convey and treat either shallow flow (swales) or sheetflow (filter strips) runoff

- Minimizing directly connected impervious surfaces describes a variety of practices that can be used to reduce the amount of surface area directly connected to the storm drainage system by minimizing or eliminating traditional curb and gutter. This is considered by some to be a non-structural practice, but is has been included under the structural heading in this report due to the need to design and construct alternative conveyance and treatment options.

- Miscellaneous and vendor-supplied systems include a variety of proprietary and miscellaneous systems that do not fit under any of the above categories. These include catch basin inserts, hydrodynamic devices, and filtration devices.

5.2.1.1 Infiltration Systems

Infiltration systems include infiltration basins, porous pavement systems, and infiltration trenches or wells. An infiltration BMP is designed to capture a volume of storm water runoff, retain it and infiltrate that volume into the ground. Infiltration of storm water has a number of advantages and disadvantages. The advantages of infiltration include both water quantity control and water quality control. Water quantity control can occur by taking surface runoff and infiltrating this water into the underlying soil. This reduces the volume of water that is discharged to receiving streams, thereby reducing some of the potential impacts caused by an excess flow as well as increased pollutant concentrations in the receiving stream. Infiltration systems can be designed to capture a volume of storm water and infiltrate this water into the ground over a period of several hours or even days, thereby maximizing the infiltrative capacity of the BMP. Infiltration can have many secondary benefits such as increasing recharge of underlying aquifers

and increasing baseflow levels of nearby streams. Infiltration BMPs can also provide water quality treatment. Pollutant removal can occur as water percolates through the various soil layers. As the water moves through the soil, particles can be filtered out. In addition, microorganisms in the soil can degrade organic pollutants that are contained in the infiltrated storm water.

Although infiltration of storm water has many benefits, it also has some drawbacks. First, infiltration may not be appropriate in areas where groundwater is a primary source of drinking water due to the potential for contaminant migration. This is especially true if the runoff is from a commercial or industrial area where the potential for contamination by organics or metals is present. Also, the performance of infiltration BMPs is limited in areas with poorly permeable soils. In addition, infiltration BMPs can experience reduced infiltrative capacity and even clogging due to excessive sediment accumulation. Frequent maintenance may be required to restore the infiltrative capacity of the system. Care must also be taken during construction to limit compaction of the soil layers underlying the BMP. Excessive compaction due to construction equipment may cause a reduced infiltrative capacity of the system. Plus, excessive sediment generation during construction and site grading/stabilization may cause premature clogging of the system. Infiltration systems should not be placed into service until disturbed areas in the drainage have been stabilized by dense vegetation or grasses.

Infiltration Basins

Infiltration basins are designed to capture a storm water runoff volume, hold this volume and infiltrate it into the ground over a period of days. Infiltration basins are almost always placed off-line, and are designed to only intercept a certain volume of runoff. Any excess volume will be bypassed. The basin may or may not be lined with plants. Vegetated infiltration systems help to prevent migration of pollutants and the roots of the vegetation can increase the permeability of the soils, thereby increasing the efficiency of the basin. Infiltration basins are typically not designed to retain a permanent pool volume. Their main purpose is to simply transform a surface water flow into a ground water flow and to remove pollutants through mechanisms such as filtration, adsorption and biological conversion as the water percolates through the underlying soil. Infiltration basins should be designed to drain within 72 hours in order to prevent mosquito breeding and potential odor problems due to standing water and to ensure that the basin is ready to receive runoff from the next storm (US EPA, 1993a). In addition to removing pollutants, infiltration basins are useful to help restore or maintain pre-development hydrology in a watershed. Infiltration can increase the water table, increase baseflow and reduce the frequency of bankfull flooding events. A diagram of a typical infiltration basin is shown below.

Figure 5-1. Infiltration Basin

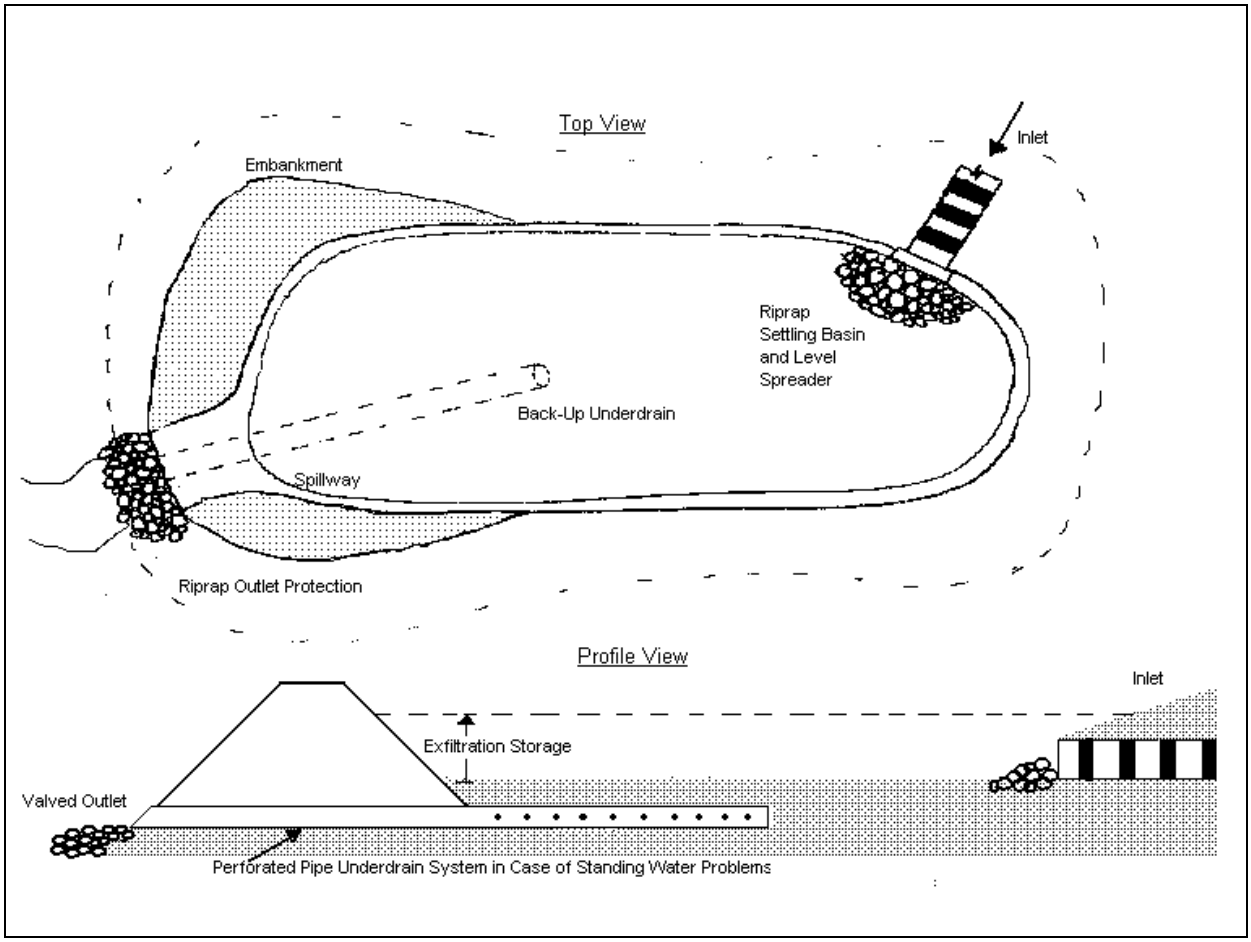

Source: Adapted from Schueler et al, 1992

Porous Pavement Systems

Porous pavement is an infiltration system where storm water runoff is infiltrated into the ground through a permeable layer of pavement or other stabilized permeable surface. These systems can include porous asphalt, porous concrete, modular perforated concrete block, cobble pavers with porous joints or gaps or reinforced/stabilized turf (Urbonas and Strecker, 1996). Permeable pavement can be used in parking lots, roads and other paved areas and can greatly reduce the amount of runoff and associated pollutants leaving the area. Porous pavement systems are suitable for a limited number of applications. Typically, porous pavement can only be used in areas that are not exposed to high volumes of traffic or heavy equipment. They are particularly useful for driveways and streets and in residential areas, and in parking areas in commercial areas. Porous pavement is not effective in areas that receive runoff with high amounts of sediment due to the tendency of the pores to clog. Porous pavements require maintenance including periodic vacuuming or jet-washing to remove sediment from the pores. Paved areas should be clearly marked to indicate that a porous pavement system is in use and to prevent frequent use by

equipment, to prevent excess traffic volume, to limit the use of de-icing chemicals and sand, and to prevent resurfacing with non-porous pavement.

The performance of porous asphalt has been historically very poor in the mid-Atlantic region. However, many of these failures can be attributed to lack of proper erosion and sediment controls during construction or lack of contractor experience with installation of porous pavement systems. Porous concrete systems in use in Florida have performed very well (Florida Concrete and Products Assn., 1993). When properly designed and maintained, porous pavement systems can be an effective means of managing urban storm water runoff. Porous pavement systems are particularly useful for overflow parking areas that are not used on a daily basis. A diagram of a porous asphalt pavement system is shown below.

Figure 5-2. Porous Pavement System

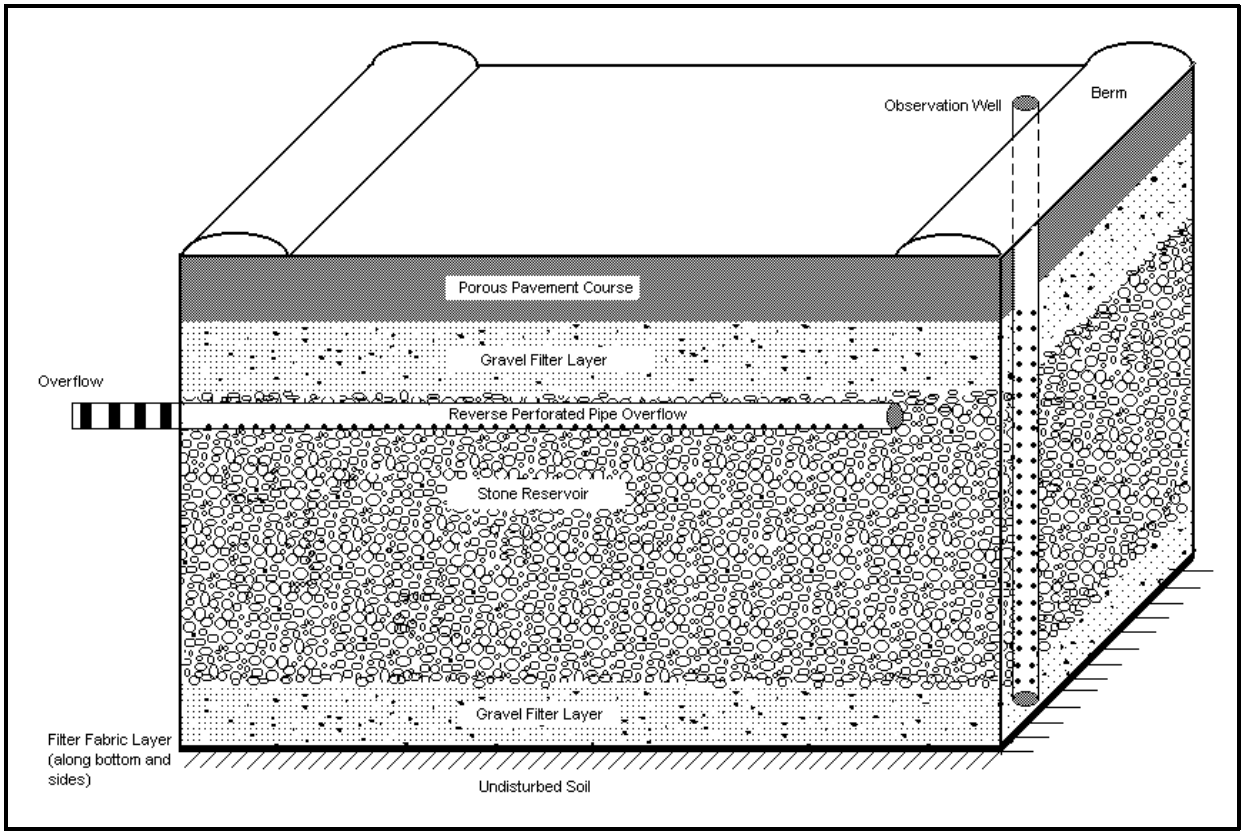

Source: Adapted from Schueler, 1987.

Infiltration Trenches and Wells

An infiltration trench or well is a gravel-filled trench or well designed to infiltrate storm water into the ground. A volume of storm water runoff is diverted into the trench or well where it infiltrates into the surrounding soil. Typically infiltration trenches and wells can only capture a small amount of runoff and therefore may be designed to capture the first flush of a runoff event. For this reason, they are frequently used in combination with another BMP such as a detention

basin to control peak hydraulic flows. Infiltration trenches and wells can be used to remove suspended solids, particulates, bacteria, organics and soluble metals and nutrients through the mechanisms of filtration, absorption and microbial decomposition. They are also useful to provide groundwater recharge and to increase base flow levels in nearby streams. As with all infiltration practices, the possibility for groundwater contamination exists and must be considered where groundwater is a source of drinking water. A diagram of an infiltration trench is shown below.

Figure 5-3. Infiltration Trench

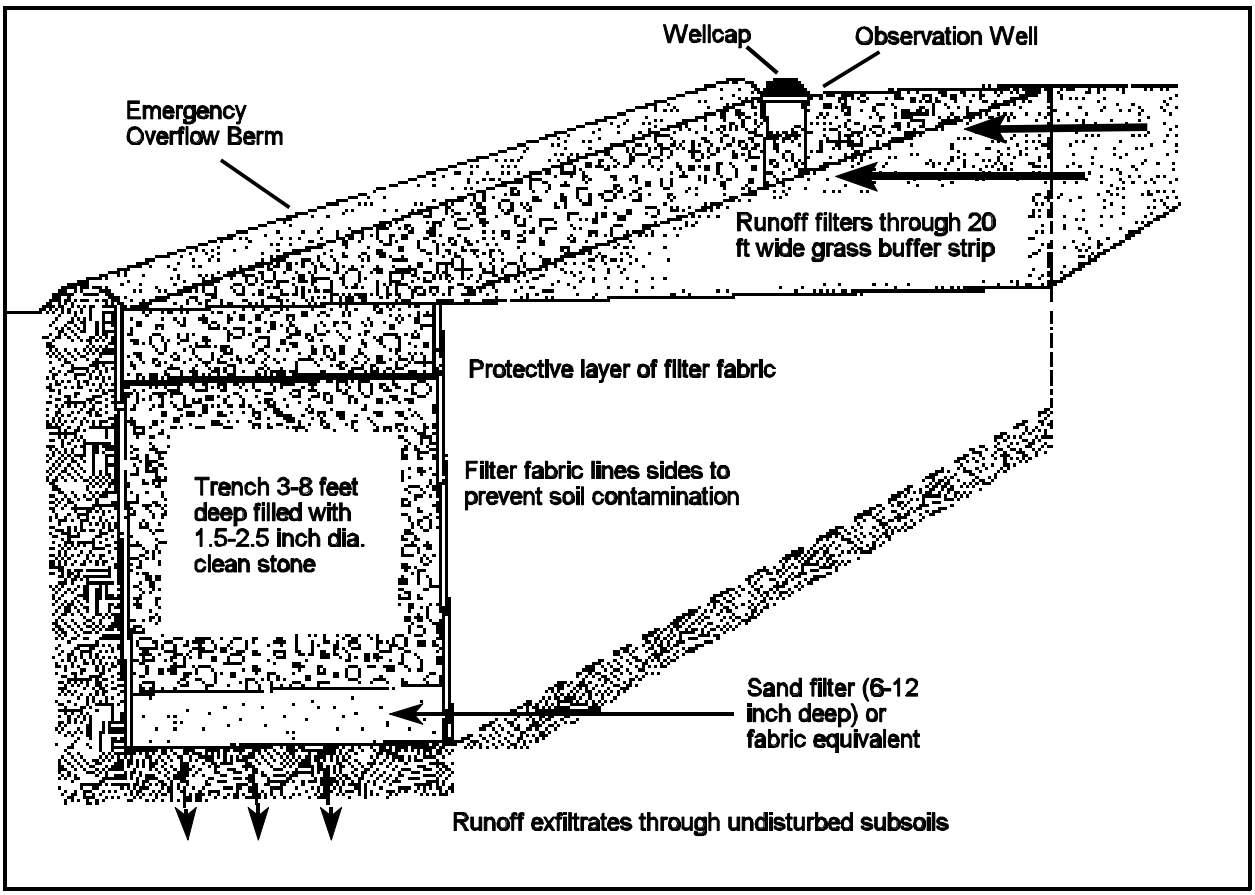

Source: Schueler et al, 1992.

5.2.1.2 Detention Systems

Detention systems are BMPs that are designed to intercept a volume of storm water runoff and temporarily impound the water for gradual release to the receiving stream or storm sewer system. Detention systems are designed to completely empty out between runoff events, and therefore provide mainly water quantity control as opposed to water quality control. Detention basins can provide limited settling of particulate matter, but a large portion of this material can be

re-suspended by subsequent runoff events. Detention facilities should be considered mainly as practices used to reduce the peak discharge of storm water to receiving streams to limit downstream flooding and to provide some degree of channel protection. There are several types of detention facilities used to manage storm water runoff, including detention basins and underground vaults, pipes and tanks.

Detention Basins

Detention basins are designed to intercept a volume of storm water, temporarily impound the water and release it shortly after the storm event. The main purpose of a detention basin is quantity control by reducing the peak flow rate of storm water discharges. They are designed to not retain a permanent pool volume between runoff events. and most basins are designed to empty in a time period of less than 24 hours. The treatment efficiency of detention basins is usually limited to removal of suspended solids and associated contaminants due to gravity settling. The efficiency can be increased by incorporating a forebay or pre-settling chamber for the accumulation of coarse sediment, facilitating periodic cleaning in order to prevent washout by subsequent runoff events. Detention basins can limit downstream scour and loss of aquatic habitat by reducing the peak flow rate and energy of storm water discharges to the receiving stream, but their removal of pollutant of potential water quality concern can be limited. A diagram of a typical detention basin is shown below.

Figure 5-4. Detention Basin

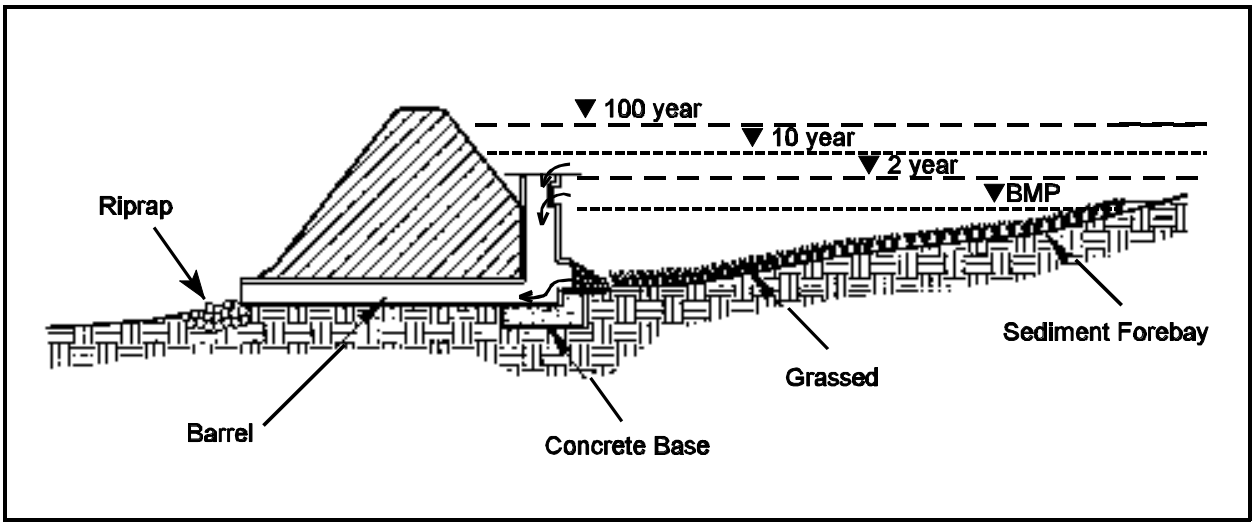

Source: NVPDC, 1992.

Underground Vaults, Pipes and Tanks

Underground detention facilities, such as vaults, pipes and tanks, are designed to provide temporary storage of storm water runoff. Significant water quality improvements should not be expected in underground detention facilities. They should mainly be used for providing storage to limit downstream effects due to high peak flow rates. Like detention basins, underground

detention systems are designed to empty out between runoff events so that storage capacity is available for subsequent runoff events. In addition, studies are being conducted to evaluate the usefulness of in-system detention (storing runoff temporarily in the storm drainage system through the use of valves, gates, orifices, etc.), although these evaluations are in the preliminary stages and are only useful in certain cases (Lake Barcroft Watershed Improvement District, 1998). This is a potential alternative for retrofitting existing storm drains in the upper portions of the drainage system to delay the peak discharge rate and provide a limited amount of additional temporary storage volume. However, a careful analysis of the storm drainage system is necessary in order to prevent flooding in the upper reaches of the drainage area.

5.2.1.3 Retention Systems

Retention systems include wet ponds and other retention systems such as underground pipes or tanks. Retention systems are designed to capture a volume of runoff and retain that volume until it is displaced in part or in total by the next runoff event. Retention systems can provide both water quantity and quality control. The volume available for storage, termed the water quality volume, is provided above the permanent pool level of the system. The main pollutant removal mechanisms in retention systems is sedimentation. By retaining a permanent pool of water, retention systems can benefit from the added biological and biochemical pollutant removal mechanisms provided by aquatic plants and microorganisms, mimicking a natural pond or lake ecosystem. Also, sediments that accumulate in the pond are less likely to be re-suspended and washed out due to the presence of a permanent pool of water. In addition to sedimentation, other pollutant removal mechanisms in retention systems include filtration of suspended solids by vegetation, infiltration, biological uptake of nutrients by aquatic plants and algae, volatilization of organic compounds, uptake of metals by plant tissue, and biological conversion of organic compounds.

<u>Retention Ponds</u>

Retention ponds (also known as wet ponds) are designed to intercept a volume of storm water runoff and to provide storage and treatment of this runoff volume. Water in the pond above the permanent pool level is displaced in part or completely by the runoff volume from subsequent runoff events. Retention ponds, when properly designed and maintained, can be extremely effective BMPs, providing both water quality improvements and quantity control, as well as providing aesthetic value and aquatic and terrestrial habitat for a variety of plants and animals.

Pollutant removal in retention ponds can occur through a number of mechanisms. The main mechanism is the removal of suspended solids and associated pollutants through gravity settling. Aquatic plants and microorganisms can also provide uptake of nutrients and degradation of organic contaminants. Retention basins that incorporate an aquatic bench around the perimeter of the basin that is lined with aquatic vegetation can have an added pollutant removal efficiency. This littoral zone can aid in pollutant removal efficiency by incorporating mechanisms found in wetland systems. These mechanisms include removal of sediment by filtration by aquatic plants,

removal of metals and nutrients through biological uptake by aquatic vegetation and degradation of organic contaminants. If the bottom of the pond is not lined, then infiltration can occur aiding in the maintenance of local groundwater supplies. A diagram of a typical wet pond is shown below.

Figure 5-5. Retention Pond

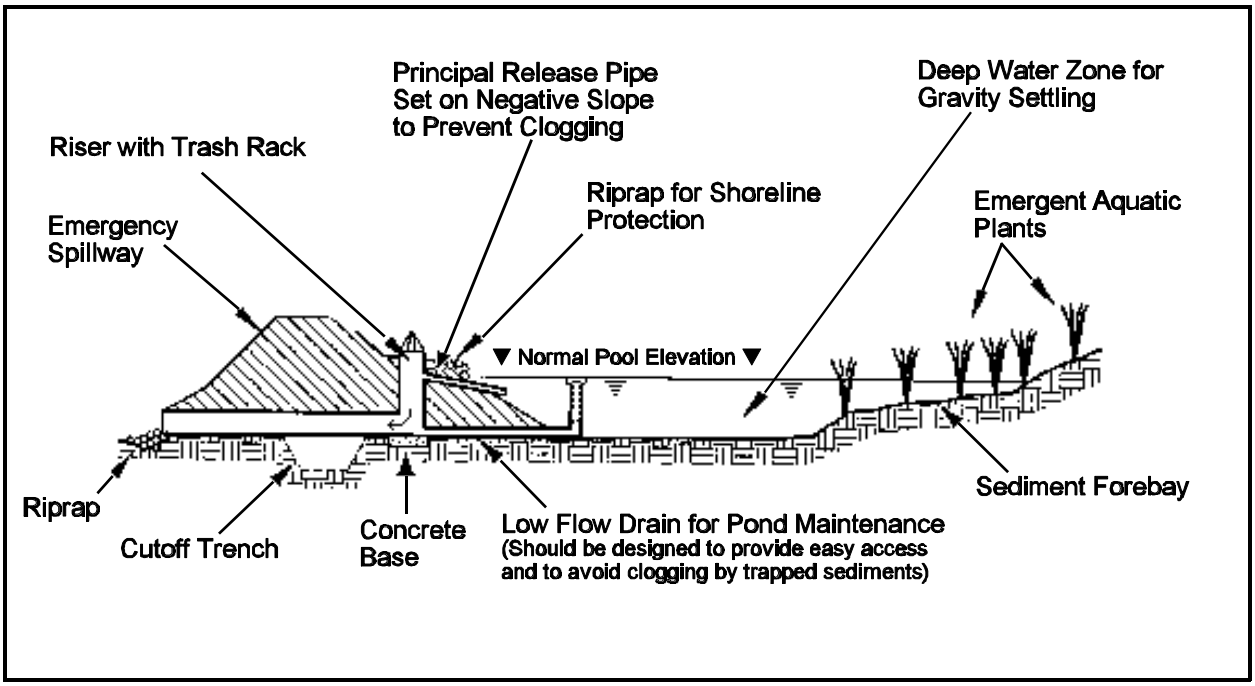

Source: NVPDC, 1992.

Retention Tanks, Tunnels, Vaults and Pipes

Retention systems other than ponds include surface tanks and underground vaults, pipes and tunnels. These systems are not as prevalent as typical wet ponds, and therefore little information is contained in the literature about their design, applicability and usefulness.

5.2.1.4 Constructed Wetland Systems

Constructed wetland systems incorporate the natural functions of wetlands to aid in pollutant removal from storm water. Constructed wetlands can also provide for quantity control of storm water by providing a significant volume of ponded water above the permanent pool elevation. Constructed wetland systems have limits to their application. A water balance must be performed to determine the availability of water to sustain the aquatic vegetation between runoff events and during dry periods. In addition, a sediment forebay or some other pretreatment provision should be incorporated into the wetland system design to allow for the removal of coarse sediments that can degrade the performance of the system. Also, construction sediment should be prevented from entering constructed wetlands, as the resulting sediment loading can

severely degrade the performance of the system. Constructed wetlands are particularly appropriate where groundwater levels are close to the surface because groundwater can supply the water necessary to sustain the wetland system.

Storm water runoff should not be intentionally routed to natural wetlands without pretreatment due to the potentially damaging effects runoff can have on natural wetland systems. In addition, natural wetlands that receive storm water runoff should be evaluated to determine if the runoff is causing degradation of the wetland, and if so measures should be taken to protect the wetland from further degradation and to repair any damage that has been done. In addition, local permitting authorities should be consulted prior to designing and maintaining constructed wetland systems in order to determine if any local regulations apply to their use or maintenance.

Wetland Basins and Wetland Channels

Wetland basins and channels are any of a number of systems that incorporate mechanisms of natural wetland systems for water quality improvement and quantity control. A wetland channel is designed to develop dense wetland vegetation and to convey runoff very slowly (Urbonas and Strecker, 1996). Generally, this rate is less that 2 feet-per-second at the 2-year peak flow. Wetland basins may be designed with or without an open water (permanent pool) component. Wetland basins with open water are similar to retention ponds, except that a significant portion (usually 50 percent or more) of the permanent pool volume is covered by emergent wetland vegetation. Wetland basins without open water are inundated with water during runoff events, but do not maintain a significant permanent pool. Wetland basins of this type, also known as a wetland meadow, support a variety of wetland plants adapted to saturated soil conditions and tolerant of periodic inundation by runoff.

Pollutant removal in wetlands can occur through a number of mechanisms including sedimentation, filtration, volatilization, adsorption, absorption, microbial decomposition and plant uptake. In addition, wetlands can provide for significant water storage during runoff events, thus supplying water quantity control as well. A diagram of a typical storm water wetland system is included below.

Figure 5-6. Constructed Wetland System

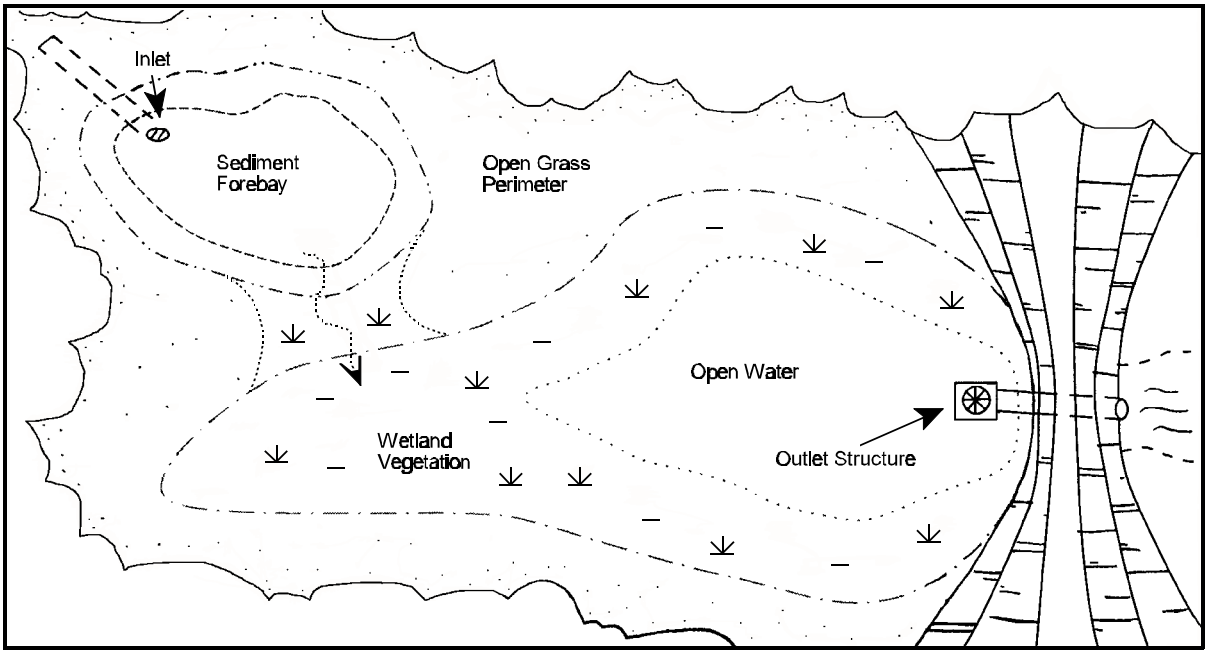

5.2.1.5 Filtration Systems

A filtration system is a device that uses a media such as sand, gravel, peat or compost to remove a fraction of the constituents found in storm water. There are a wide variety of filter types in use. There are also a variety of proprietary designs that use specialized filter media made from materials such as leaf compost. Filters are primarily a water quality control device designed to remove particulate pollutants. Quantity control can be included by providing additional storage volume in a pond or basin, by providing vertical storage volume above the filter bed, or by allowing water to temporarily pond in parking lots or other areas before being discharged to the filter. Media filters are commonly used to treat runoff from small sites such as parking lots and small developments, in areas with high pollution potential such as industrial areas, or in highly urbanized areas where land availability or costs preclude the use of other BMP types. Filters should be placed off-line (i.e., a portion of the runoff volume, called the water quality volume, is diverted to the BMP, while any flows in excess of this volume are bypassed) and are sometimes designed to intercept and treat only the first half inch or inch of runoff and bypass larger storm water flows. A benefit of using filters in highly urbanized areas is that the filter can be placed under parking lots or in building basements, limiting or eliminating costly land requirements. However, placing filters “out of sight” may have implications for continued maintenance and performance. Media filters should use a forebay or pre-settling chamber to remove a portion of the settleable solids prior to filtration. This helps to extend the life of the filter run and prevent clogging of the filter media by removing a portion of the coarse sediment. Also, care must be

taken to prevent construction site sediments and debris such as fines washed off of newly paved areas from entering the filter, as these can cause premature clogging of the filter.

Filter types in common use include surface sand filters such as the “Austin” sand filter and underground vault filters such as the “D.C.” sand filter and the “Delaware” sand filter. There are a number of variations of these basic designs in common use. In addition, there are a number of proprietary filtering systems in use. There are also a number of variations in the types of filtration media that are in use in media filters. Designs may incorporate features such as a layer of filter cloth or a plastic screen, a gravel layer, a peat layer, a compost layer, a layer of peat or a peat/sand mixture. Typical variations in filtration media are shown below.

Figure 5-7. Filter Media

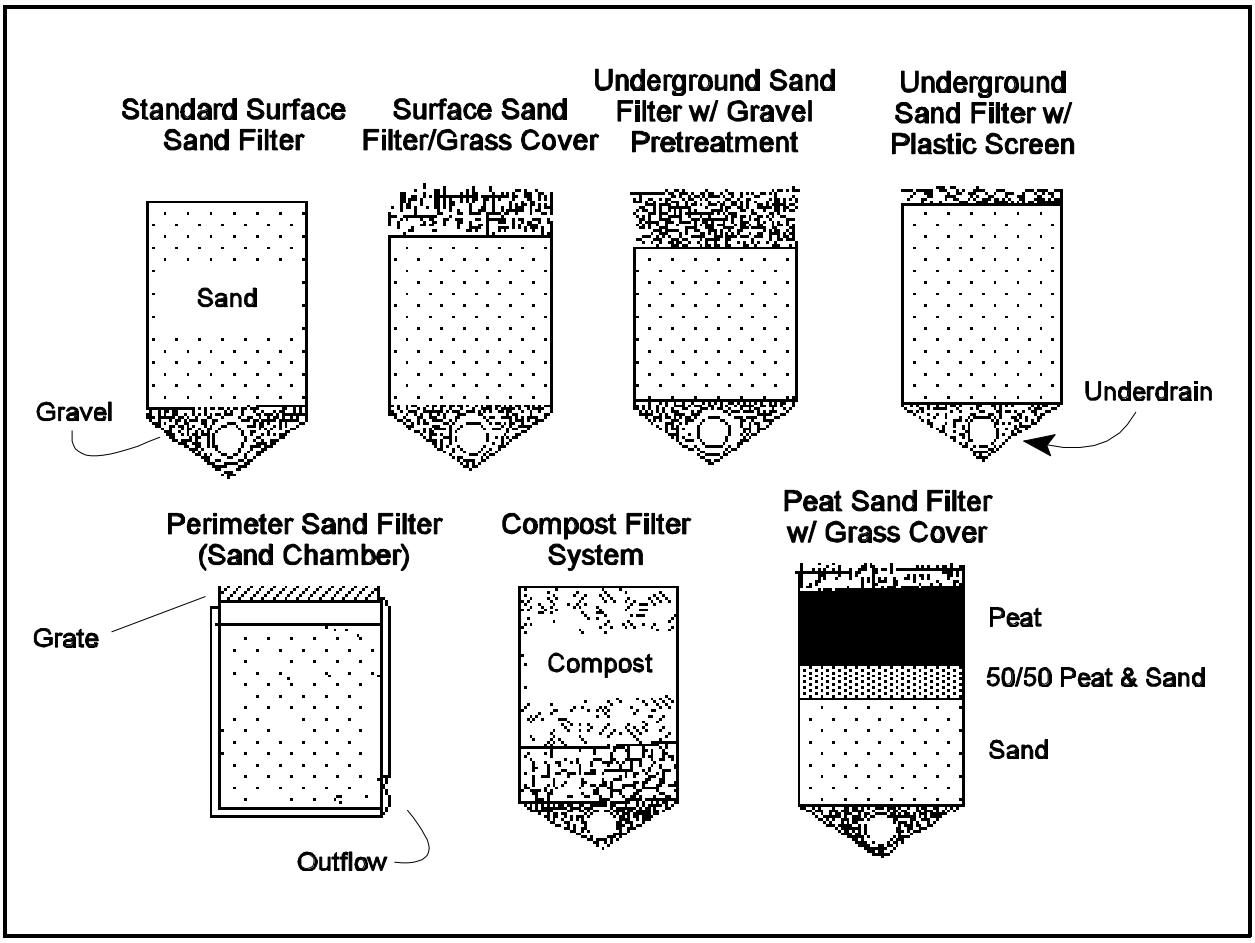

Source: Claytor and Schueler, 1996

Surface Sand Filter

The surface sand filter was developed in Florida in 1981 for sites that could not infiltrate runoff or were too small for effective use of detention systems. The city of Austin, Texas took the development of filter technology further in the mid-1980's. The surface sand filter system

usually incorporates two basins. Runoff first enters a sedimentation basin where coarse particles are removed by gravity settling. This sedimentation basin can be either wet or dry. Water then flows over a weir or through a riser into the filter basin. The filter bed consists of sand with a gravel and perforated pipe under-drain system to capture the treated water. The surface of the filter bed may be planted with grass. Additional storage volume is provided above the filter bed to increase the volume of water that can be temporarily ponded in the system prior to filtration. This two-basin configuration can help to limit premature clogging of the filter bed due to excessive sediment loading. There are several design variations of the simple surface sand filter. Austin uses two variations, termed the partial and the full sedimentation-filtration systems. A diagram of the Austin surface sand filter is shown in Figure 5-8.

Figure 5-8. Austin Full Sedimentation-Filtration System

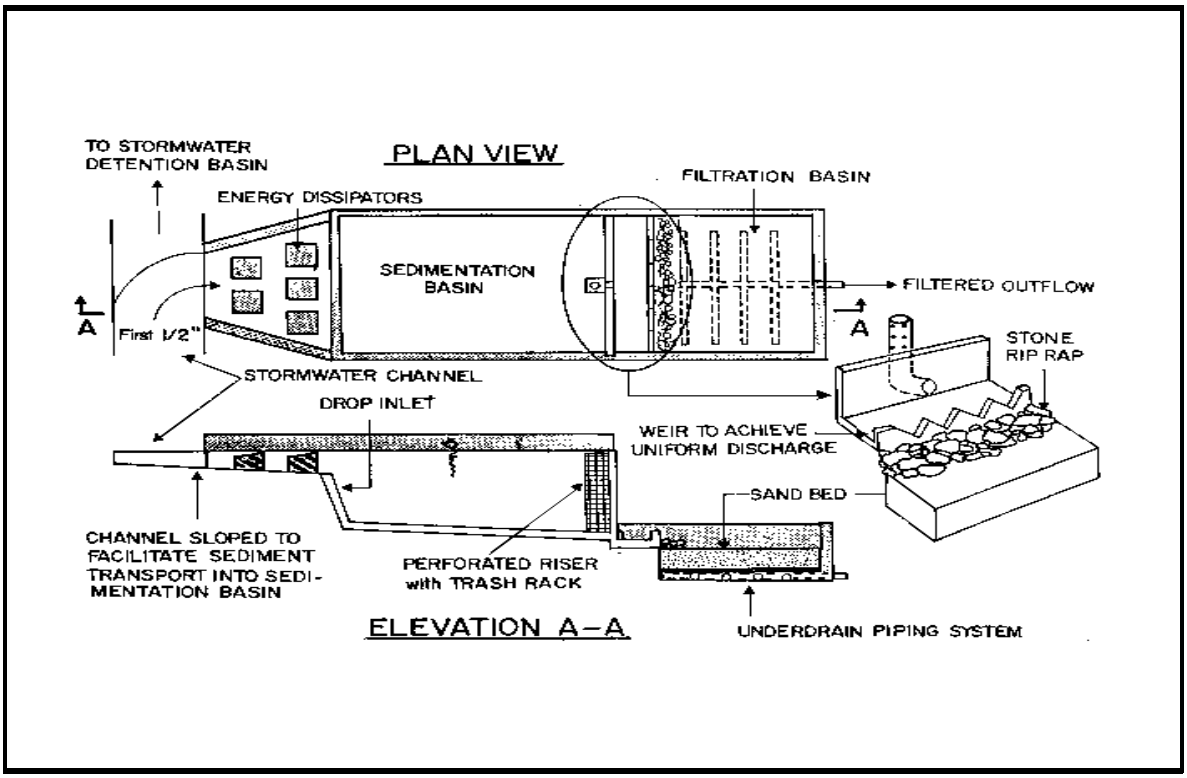

Source: Bell, 1998

Underground Vault Sand Filter

The underground vault sand filter was developed by the District of Columbia in the late 1980's. This filter design incorporates three chambers. The first chamber and the throat of the second chamber contain a permanent pool of water and functions as a sedimentation chamber and an oil and grease and floatables trap, as well as provides for temporary runoff storage. A submerged opening or inverted elbow near the bottom of the dividing wall connects the two chambers. This submerged opening provides a water seal that prevents the transfer of oil and

floatables to the second chamber which contains the filter bed. During a storm event, water flows through the opening into the second chamber and onto the filter bed. Additional runoff storage volume is provided above the filter bed. Filtered water is collected by a gravel and perforated pipe under-drain system and flows into the third chamber, which contains a clearwell and a connection to the storm drain system. Overflow protection can be provided by placing the filter off-line, or by providing a weir at the top of the wall connecting the filter chamber with the clearwell chamber to serve as an overflow. A schematic of the "D.C. Sand Filter" is shown below.

Figure 5-9. Underground Vault Sand Filter

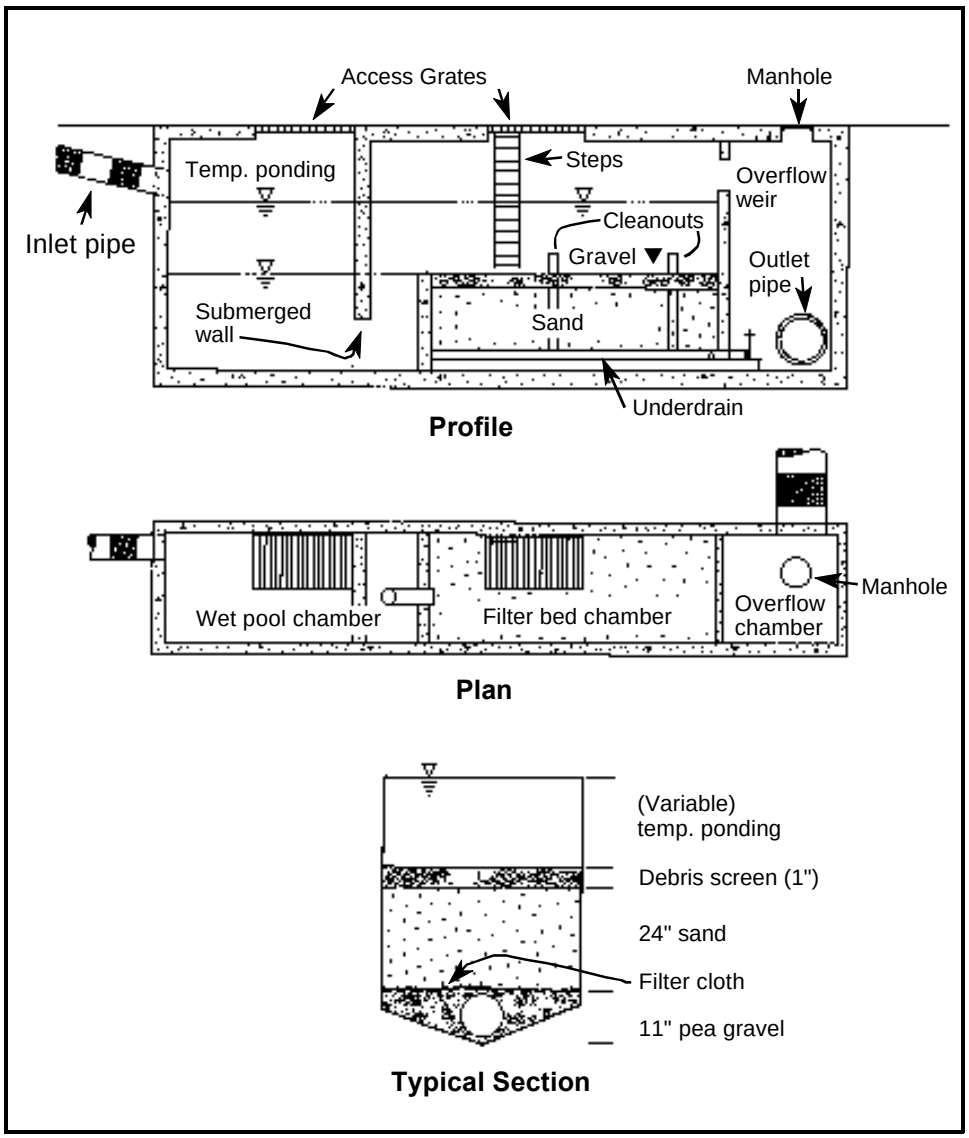

Source: Claytor and Schueler, 1996.

Another underground vault sand filter, also termed a "perimeter" sand filter because it is particularly suited for use around the perimeter of parking lots, was developed in Delaware by Shaver and Baldwin and is known as the "Delaware Sand Filter." This system contains two chambers and a clearwell. Storm water runoff enters the first chamber, which serves as a sedimentation chamber. Water then flows over a series of weirs and into the second chamber which contains the filter media. Additional storage volume is provided by water temporarily ponding in both chambers. Filtered water is collected by a series of gravel and perforated pipe under-drains, and flows into a clearwell that contains a connection to the storm drain system. A schematic of the Delaware Sand Filter is shown below.

Figure 5-10. Delaware Sand Filter

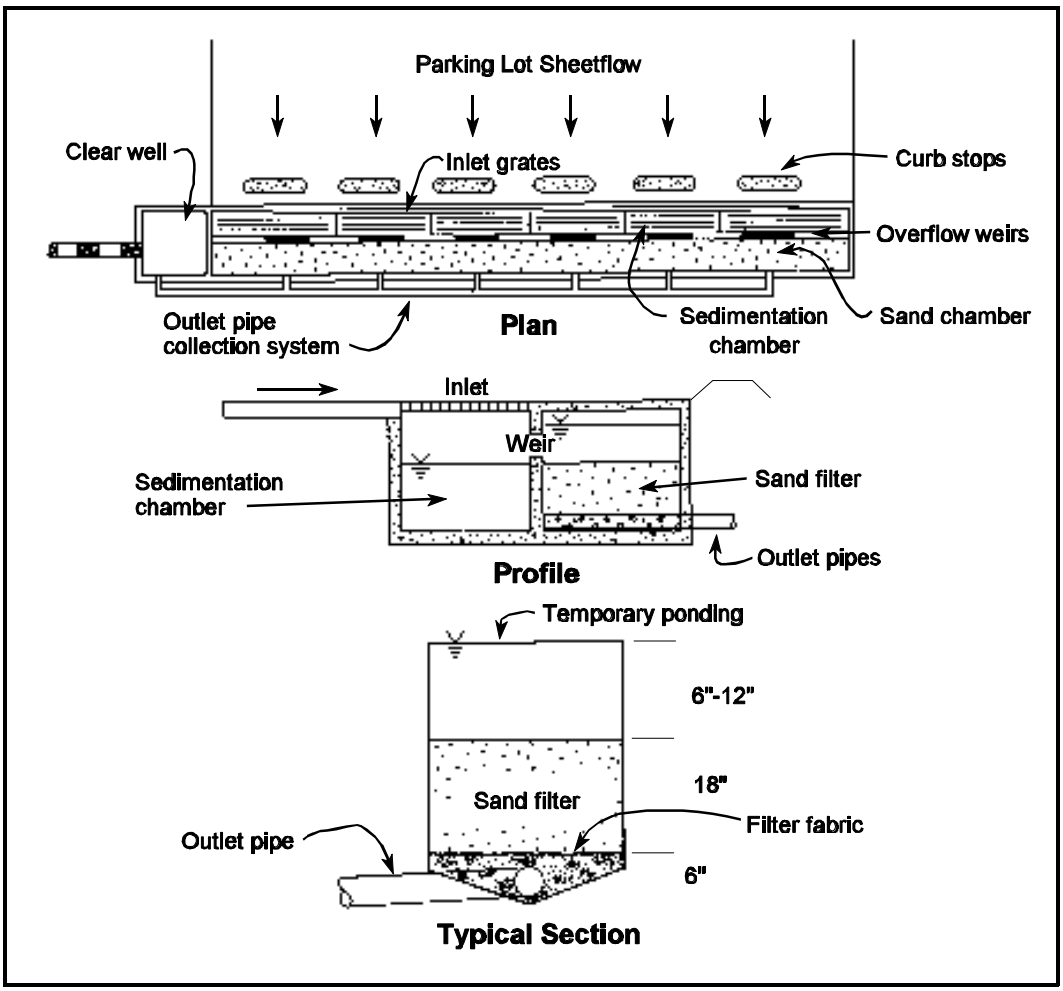

Source: Shaver and Baldwin, 1991

In addition to the three basic filtering systems (D.C., Austin, and Delaware), there are a number of variations in use. The city of Alexandria, Virginia has developed a compound storm water filtering system (Bell, 1998). This design incorporates an anoxic filtration zone in a

permanently flooded gravel layer in the filter. This anoxic zone aids in nitrogen removal by anoxic denitrification. Another configuration uses an upflow anaerobic filter upstream of the sand filter to enhance phosphorus removal by precipitating more iron on the sand filter. A diagram of the Alexandria Compound Filtration System is shown below.

Figure 5-11. Alexandria Compound Filter

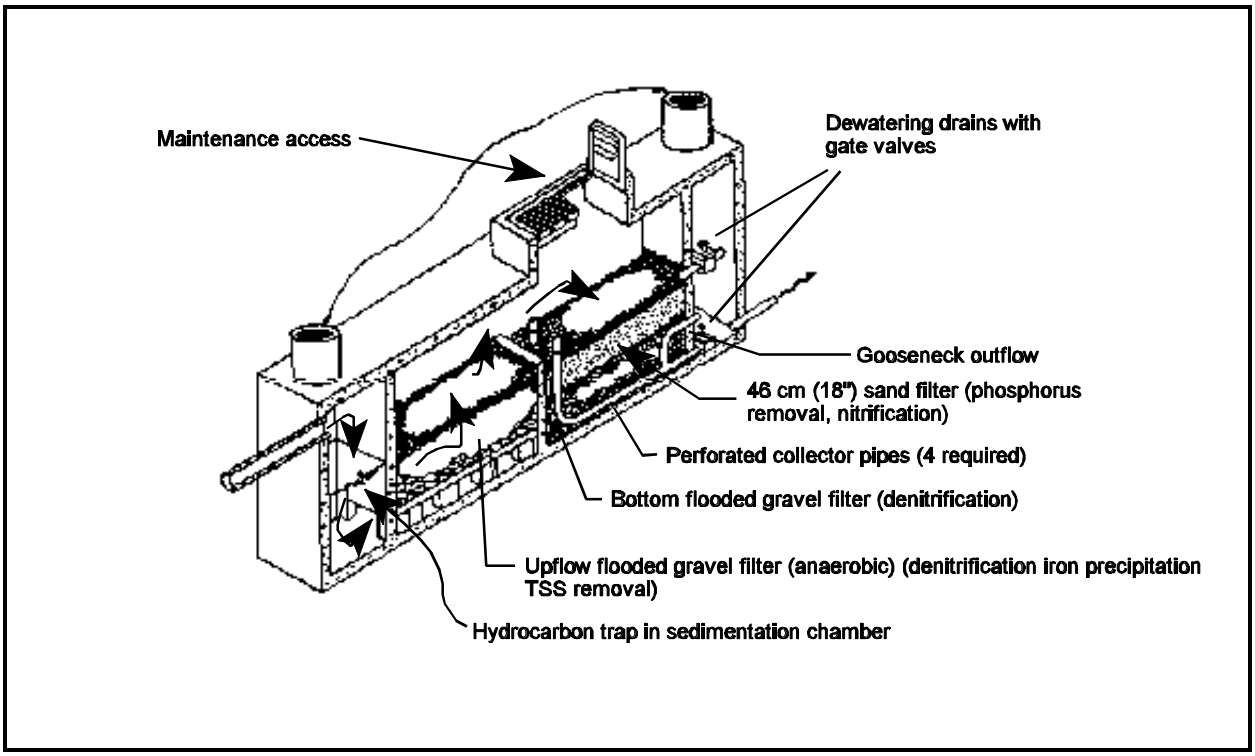

Source: Bell, 1998.

Filters that use an organic filtration media, such as peat or leaf compost, are useful in areas where additional nutrient or metal control is desirable due to the adsorptive capacity, its ion-exchange capability, and is ability to serve as a medium for the growth of a variety of microorganisms. However, peat must be carefully selected (fibric and/or hemic peat should be used, not sapric) and one must question the environmental consequences of destroying peat bogs to obtain filtration media when other technologies are available.

There are a number of references available that contain information on the design and selection of filtering systems for storm water treatment (Urbonas, 1999; Bell, 1998; Claytor and Schueler, 1996; Galli, 1990b; MDE, 1998; NVPDC, 1996a).

Biofiltration/Bioretention Systems

Bioretention systems are designed to mimic the functions of a natural forest ecosystem for treating storm water runoff. Bioretention systems are a variation of a surface sand filter, where the sand filtration media is replaced with a planted soil bed. Storm water flows into the bioretention area, ponds on the surface, and gradually infiltrates into the soil bed. Pollutants are removed by a number of processes including adsorption, filtration, volatilization, ion exchange and decomposition (Prince George's County, MD, 1993). Treated water is allowed to infiltrate into the surrounding soil, or is collected by an under-drain system and discharged to the storm sewer system or directly to receiving waters. When water is allowed to infiltrate into the surrounding soil, bioretention systems can be an excellent source of groundwater recharge. A diagram of a typical bioretention area is shown below.

Figure 5-12. Bioretention System
Traffic Island

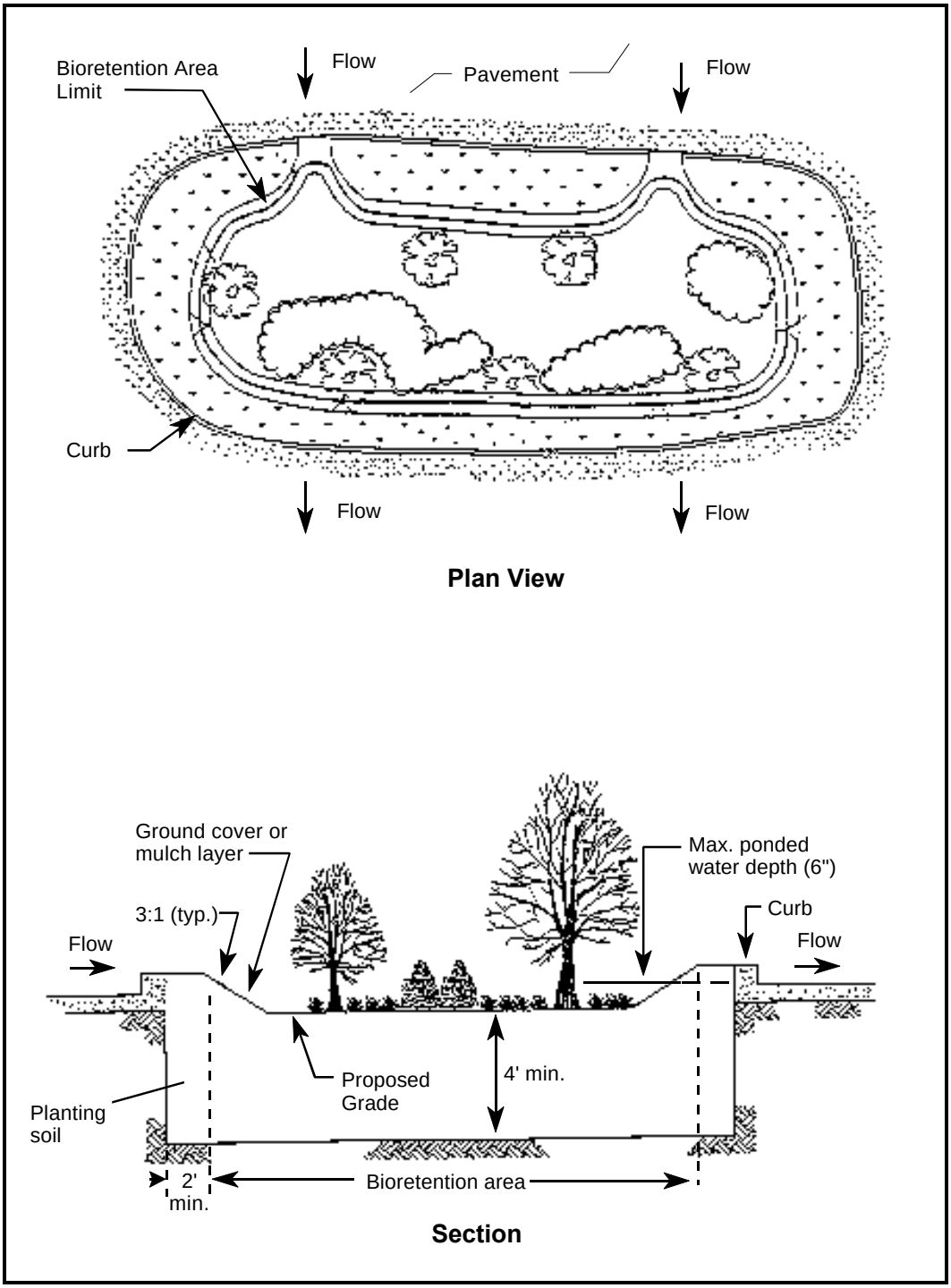

Source: Prince George's County, 1993.

The components of a bioretention system include:

- *Grass Buffer Strips* - runoff enters the bioretention area as sheet flow through the grass buffer strips. The buffers reduce the velocity of the runoff and filter particulates from the runoff.

- *Ponding Area* - The ponding area provides for surface storage of storm water runoff before it filters through the soil bed. The ponding area also allows for evaporation of ponded water as well as allows for settling of sediment in the runoff.

- *Organic Mulch Layer* - The organic mulch layer has several functions. It protects the soil bed from erosion, retains moisture in the plant root zone, provides a medium for biological growth and decomposition of organic matter, and provides some filtration of pollutants.

- *Planting Soil Bed* - The planting soil bed provides water and nutrients to support plant life in the bioretention system. Storm water filters though the planting soil bed where pollutants are removed by the mechanisms of filtration, plant uptake, adsorption and biological degradation.

- *Sand Bed* - the sand bed underlies the planting soil bed and allows water to drain from the planting soil bed through the sand bed and into the surrounding soil. The sand bed also provides additional filtration and allows for aeration of the planting soil bed.

- *Plants* - Plants are an important component of a bioretention system. Plants remove water though evapotranspiration and remove pollutants and nutrient through uptake. The plant species selected are designed to replicate a forested ecosystem and to survive stresses such as frequent periods of inundation during runoff events and drying during inter-event periods.

In addition to providing for treatment of storm water, bioretention facilities, when properly maintained, can be aesthetically pleasing. Bioretention facilities can be placed in areas such as parking lot islands, in landscaped areas around buildings, the perimeter of parking lots, and in other open spaces. Since local regulations frequently require site plans to incorporate a certain percentage of open landscaped area, additional land requirements for bioretention facilities are often not required. The layout of bioretention facilities can be very flexible, and the selection of plant species can provide for a wide variety of landscape designs. However, it is important that a landscape architect with proper experience in designing bioretention areas be consulted prior to construction to insure that the plants selected can tolerate the growing conditions present in bioretention facilities. Bioretention facilities can be adapted easily for use on individual residential lots. Prince George's County, MD has developed the concept of "rain gardens" which are small bioretention systems for use in single or multi-lot residential areas. They provide an easily maintainable, aesthetically pleasing, and effective means of controlling runoff from residential

areas. By disconnecting down spouts and placing a series of bioretention areas throughout a residential area, the volume of storm water runoff produced and requiring subsequent management can be significantly reduced.

Additional design information on bioretention facilities can be found in *Design Manual for Use of Bioretention in Stormwater Management* (Prince George's County, 1993) and in *Design of Stormwater Filtering Systems* (Claytor and Schueler, 1996).

5.2.1.6 Vegetated Systems (Biofilters)

Vegetated systems such as grass filter strips and vegetated swales are used for conveying and treating storm water flows. These BMPs are commonly referred to as *biofilters*, since the grasses and vegetation "filter" the storm water as it flows. Open channel vegetated systems are alternatives to traditional curb-and-gutter and storm sewer conveyance systems. By conveying storm water runoff in vegetated systems, some degree of treatment, storage and infiltration can be provided prior to discharge to the storm sewer system. This can help to reduce the overall volume of storm water runoff that is generated from a particular drainage area.

<u>Grass Filter Strips</u>

Grass filter strips are densely vegetated, uniformly graded areas that intercept sheet runoff from impervious surfaces such as parking lots, highways and rooftops. Grass filter strips are frequently planted with turf grass, however alternatives that adopt any natural vegetated form such as meadows or small forest may be used. Grass filter strips can either accept sheet flow directly from impervious surfaces, or concentrated flow can be distributed along the width of the strip using a gravel trench or other level spreader. Grass filter strips are designed to trap sediments, to partially infiltrate this runoff and to reduce the velocity of the runoff. Grass filter strips are frequently used as a "pretreatment" system prior to storm water being treated by BMPs such as filters or bioretention systems. Grass filter strips can also be used in combination with riparian buffers in treating sheet flows and in stabilizing drainage channel banks and stream banks. In semi-arid climates, grass filter strips may need to be irrigated to maintain a dense stand of vegetation and to prevent export of unstabilized soil. A diagram of a grass filter strip is shown below.

Figure 5-13. Grass Filter Strip

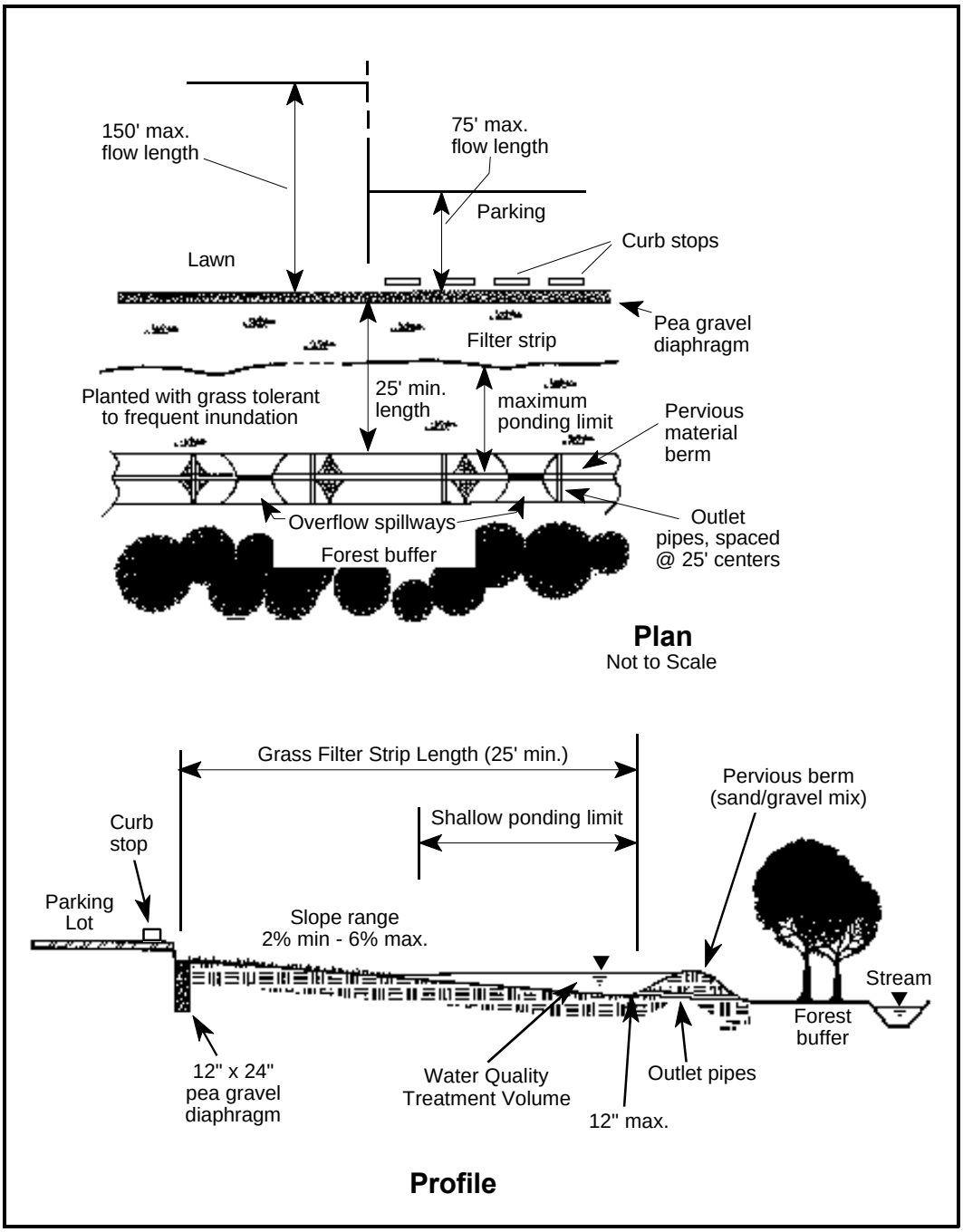

Source: Claytor and Schueler, 1996.

Vegetated Swales

Vegetated swales are broad, shallow channels with a dense stand of vegetation covering the side slopes and channel bottom. Vegetated swales are designed to slowly convey storm water runoff, and in the process trap pollutants, promote infiltration and reduce flow velocities. Vegetated swales can be either wet or dry. Dry swales are used in areas where standing water is not desired, such as in residential areas. Wet swales can be used where standing water does not create a nuisance problem and where the groundwater level is close enough to the surface to maintain the permanent pool in inter-event periods. Wet swales provide the added benefit of being able to include a range of wetland vegetation to aid in pollutant removal.

5.2.1.7 Minimizing Directly-Connected Impervious Surfaces

Minimizing directly-connected impervious surface areas involves a variety of practices designed to limit the amount of storm water runoff that is directly connected to the storm drainage system. Runoff is instead directed to landscaped areas, grass buffer strips, and grassed swales to reduce the velocity of runoff, reduce runoff volumes, attenuate peak flows, and encourage filtration and infiltration of runoff (UDFCD, 1992). By incorporating these principles into site designs, the size and number of conventional BMPs such as ponds and constructed wetland systems can be significantly reduced.

Minimizing directly connected impervious surfaces incorporates both non-structural and structural control measures. Discussions in this section address the structural measures that can be incorporated into existing urbanized or newly developed areas to minimize the amount of runoff discharged to the storm drain system. Additional discussion on non-structural practices that can be used to minimize runoff generation in new developments is included in Section 5.2.3 “Low Impact Development Practices.”

The Denver *Urban Storm Drainage Criteria Manual* (UDFCD, 1992) identifies the following three levels of minimizing directly connected impervious areas:

- *Level 1*: Runoff generated from impervious surfaces such as rooftops, driveways and parking lots is directed to flow over vegetated areas before flowing to a storm sewer system. This increases the travel time of runoff and promotes the removal of suspended solids by sedimentation and filtration.
- *Level 2*: Street curb-and-gutter systems are replaced by grassed swales and pervious street shoulders. Conveyance systems and storm sewer inlets are still used to collect runoff at downstream intersections and crossings.
- *Level 3*: In addition to incorporating Levels 1 and 2, swales are oversized and driveway and street crossing culverts are configured to use the grassed swales as detention basins having the capacity to capture runoff volume for a design storm (2-, 5-, 10- or 100-year runoff).

Practices that reduce the amount of directly connected impervious surfaces can easily be incorporated into site design plans during the planning stages of development projects. Using these practices can result in significant development cost savings due to the decreased need for drainage infrastructure and large end-of-pipe structural BMPs such as ponds and constructed wetlands. These practices can also limit secondary impacts from structural BMPs, such as temperature increases from retention ponds. Minimizing directly connected impervious areas can also be applied to existing urbanized areas through retrofit. Practices that can be used in retrofit instances include disconnecting rooftop downspouts from the storm drain system, use of on-site retention and infiltration to limit the amount of runoff leaving the site and replacing traditional curb-and-gutter systems with grassed swales and wetland channels. Additional discussion on practices that minimize runoff generation is included in Section 5.2.3.

5.2.1.8 Miscellaneous and Vendor-Supplied Systems

There are a wide variety of miscellaneous and proprietary devices that are used for urban storm water management. Many of these systems are "drop-in" systems, and incorporate some combination of filtration media, hydrodynamic sediment removal, oil and grease removal, or screening to remove pollutants from storm water. A few of the systems available include:

- BaySaver
- CDS Technologies
- Hydrasep®
- Storm*ceptor*®
- StormFilter™
- StormTreat™ System
- Vortechs™.

A thorough evaluation of vendor-supplied systems was not conducted in this report. Readers are encouraged to contact the product vendors to obtain information regarding these systems.

One of the main problems facing the use of proprietary devices is the lack of peer-reviewed performance data for these systems. Several vendor-supplied storm water treatment systems are being evaluated through EPA's Environmental Technology Verification (ETV) program. With financial assistance from the ETV program, the Civil Engineering Research Foundation (CERF) established the Environmental Technology Evaluation Center, commonly known as "EvTEC, " in 1998. EvTEC is a private sector program designed to utilize networks of experts, testing facilities and stakeholders to evaluate technologies dealing with a variety of environmental problems. One of the EvTEC projects is a collaborative effort with the Washington Department of Transportation (WSDOT) to verify the performance of innovative storm water BMPs under field operating conditions. These evaluations, which are scheduled to begin in 1999, are expected to provide comparable, peer-reviewed data on the performance of these systems (CERF, 1998).

5.2.2 Non-Structural BMPs

Non-structural BMPs include institutional and pollution-prevention type practices designed to prevent pollutants from entering storm water runoff or reduce the volume of storm water requiring management. Non-structural BMPs can be very effective in controlling pollution generation at the source, which in turn can reduce or eliminate the need for costly end-of-pipe treatment by structural BMPs. Non-structural BMPs discussed in this report include education and source controls, recycling and maintenance practices.

5.2.2.1 Education, Recycling and Source Controls

Public education can be an effective means of reducing the amounts of non-point source pollutants entering receiving streams. The public is often unaware that the combined effects of their actions can cause significant non-point source pollution problems. Proper education on day-to-day activities such as recycling of used automotive fluids, household chemical and fertilizer use, animal waste control and other activities can significantly reduce non-point source pollutant loadings to urban streams. The main components of a public education program include:

Automotive Product Disposal

Discharge of automotive fluids such as motor oil and antifreeze to the land or storm drains can cause significant water quality problems. "Do-it-yourself" automobile mechanics often incorrectly assume that materials that are dumped into storm drains will receive treatment at a wastewater treatment plant prior to discharge. Education on appropriate recycling and disposal techniques for these materials can help to reduce pollutant loadings to streams. Education programs should identify the location of community automotive products recycling centers. In addition to impacts associated with dumping used oil and antifreeze, potential runoff pollutant sources from home automobile maintenance activities include dirt, cleaners, oils and solvents from car washing, leaking fluids such as brake and transmission fluid and gasoline spills. To reduce impacts from these activities, the following practices should be used:

- all spills or leaks should be cleaned up using a dry absorbent such as cat litter or commercially available absorbents and disposed of appropriately;
- car washing should be done away from storm drains using biodegradable cleaners, or at a commercial carwash;
- all used fluids should be recycled or disposed of appropriately;
- all fluid leaks should be repaired as soon as possible to reduce loss to the environment.

Commercial and Retail Space Good Housekeeping

Commercial and retail areas can contribute significant pollutant loadings to runoff. The biggest contributor of pollutant is usually impervious surfaces used for vehicle parking, storage and maintenance areas, which can contribute sediment, metals and hydrocarbons. Other sources include raw material and finished product storage areas, pesticides and fertilizers from grounds maintenance, and rooftop runoff. Good housekeeping practices include using porous pavement or

modular paving systems for vehicle parking lots; limiting exposure of materials and equipment to rainfall; spill cleanup, using dry cleanup techniques instead of wet techniques; and limiting direct runoff of rooftops to storm drains.

General Community Outreach

A main problem associated with identifying and controlling nonpoint source pollution is that the public is generally unaware of the sources and control measures for urban nonpoint source pollutants. Information dissemination is a critical need of most local storm water programs. Information that explains the sources of nonpoint source pollution, control measures available and the steps homeowners and commercial owners can do to reduce impacts of their activities can help to increase the public awareness of the need to control nonpoint source pollution. A few of the techniques available for providing educational materials to the public include television, radio and newspaper announcements, distribution of flyers, community newsletters, workshops and seminars, conducting teacher training programs at schools, and supporting citizen-based watershed stewardship groups and volunteer monitoring programs.

Industrial Good Housekeeping

Industrial areas can contribute significant loadings of toxic pollutants to storm water runoff. Therefore, educational programs that inform industrial site owners and operators about pollution prevention and source control programs to reduce nonpoint source pollutant can significantly reduce the amounts of pollutants discharged from industrial areas. Pollution prevention practices include minimizing or eliminating exposure of materials and products to rainfall by storing inside or under cover, spill cleanup, minimizing pesticide/herbicide and fertilizer use, and minimizing discharges of equipment wash water to storm drains.

Storm Drain Inlet Stenciling

Since storm drains frequently discharge runoff directly to water bodies without receiving any type of treatment, storm drain stenciling programs that educate residents not to dump materials into storm drains or onto sidewalks, streets, parking lots and gutters can be effective at reducing nonpoint source pollution associated with illegal dumping. Residents are frequently unaware that materials dumped down storm drains may be discharged to a local water body. Therefore, stenciling the inlets can be a simple yet effective means of alerting residents of this fact. The Northern Virginia *Nonstructural Urban BMP Handbook* (NVPDC, 1996b) contains a useful discussion on developing a storm drain stenciling program.

Pesticide/Herbicide Use

Due to their high aquatic toxicity, pesticides and herbicides can be a significant source of water quality impairment in urban streams. Pesticide usage in the United States was estimated at more than 1.2 billion pounds of active ingredients in 1995 (US EPA, 1997b). Of this total, agricultural usage constituted 939 million pounds (77 percent), commercial, industrial and government usage accounted for 150 million pounds (13 percent) and home and garden usage accounted for 133 million pounds (11 percent). A significant portion of these applications find their way into storm water runoff and ultimately into receiving streams through spray drift,

transport by soils, solubilization by runoff, and by spillage, dumping and improper disposal of containers and residuals. Education on the proper methods of application, application rates and alternatives to pesticides can help to reduce the amount of pesticides that are carried by urban runoff. Alternatives to pesticides, such as in integrated pest management program and pesticide alternatives such as insecticidal soap or natural bacteria, can also reduce the need for pesticides.

Fertilizer Use

A significant amount of nutrients in urban runoff results from misapplication of fertilizer to the urban landscape. Residential lawn and garden maintenance and maintenance of landscape and turfgrass at golf courses, schools and commercial areas uses significant amounts of fertilizers containing nitrogen and phosphorus. Since most fertilizers are water soluble, over-application or application before rainfall events can allow significant quantities to be carried away by storm water runoff. Education on proper application of fertilizers can help to reduce the quantities of nutrients reaching receiving waters.

Household Hazardous Material Disposal

A variety of hazardous and potentially harmful chemicals and materials are improperly used and disposed of by residential homeowners. Materials such as paints and thinners, cleaning products, wood preservatives, driveway sealants and a variety of other miscellaneous household chemicals can find their way into storm water if improperly used, stored or disposed of. Education on usage and holding an annual or semi-annual community household hazardous waste collection program can help to reduce the amounts of these materials that enter storm water runoff.

Lawn Debris Management

Lawn debris such as grass trimmings and leaves require proper management in order to reduce impacts to urban streams. Grass trimmings and leaves can be carried away by runoff and can find their way into streams where they rapidly decompose and release nutrients. Grass trimmings and leaf litter can be controlled by composting or by community curbside collection programs. Composted yard debris can be an excellent source of mulch for residential landscape and gardens. Use of mulch can greatly reduce the need for inorganic fertilizers, which helps to keep nutrient loadings to streams to a minimum.

Pet Waste Disposal

Pet waste can cause significant loadings of bacteria, nutrients and oxygen demanding substances to urban runoff. Pet waste deposited on yards, sidewalks and streets can be carried by runoff into storm drains. As an example, it is estimated that 11,445 pounds of dog waste are generated in the Four Mile Run watershed in northern Virginia each day.[2] 378 pounds of BOD, 39 pounds of total phosphorus and 189 pounds of total nitrogen are washed off into Four Mile Run and its tributaries annually as a result of this pollution load (NVPDC, 1996b). In many areas,

[2] This estimate was calculated based on the total waste load generated by the dog population in the area, not the waste load deposited on yards, sidewalks and streets.

regulations exist prohibiting the deposit of pet waste on public property. However, it is often very difficult to enforce these laws. Community education on the impacts associated with pet waste and alternative disposal methods such as flushing and disposal in the trash can help to reduce impacts associated with pest waste. A particularly useful method of controlling pet waste is for communities to provide pet waste receptacles in parks and other public areas for pet owners to deposit droppings from their pets.

Illicit Discharge Detection and Elimination

Illicit discharges to storm sewers can be a significant source of pollutants in urban storm water. A study conducted in Sacramento, California indicated that slightly less than one-half of the water discharged from a municipal separate storm sewer system was not directly attributable to precipitation runoff (US EPA, 1993b). A major source of illicit discharges to storm drain systems are direct connections of sanitary sewer piping to the storm drain system. In addition to direct connections, seepage and sewage from leaking sanitary sewer lines can find their way into storm drains, especially in areas where storm drains run parallel to the sanitary sewer lines. Spills can also be collected by storm drain inlets.

Detection and elimination of illicit connections and discharges can significantly reduce the concentrations of bacteria, nutrients and oxygen demanding substances contained in storm water discharges. Several methods exist for detection and elimination of illicit cross-connections. Useful indicators of the presence of cross connections include dry weather flows in storm sewer lines and biological indicators that indicate the presence of human fecal matter in storm drain outfalls. Once illicit connections are detected, excavation and correction of the illicit connections are necessary. In addition to detection and elimination of existing cross-connections, plans for new development should be carefully reviewed and inspections should be conducted during construction in order to prevent future cross-connections from being placed. Storm drain stenciling programs and a public spill reporting system can help to educate the public on proper procedures for managing spills to prevent discharge to the storm sewer system.

5.2.2.2 Maintenance Practices

Maintenance programs are necessary in order to reduce the pollutant contribution from the urban landscape and to ensure that storm water collection and treatment systems are operating as designed. Major maintenance practices that can be used include:

Catch Basin Cleaning

Catch basins naturally accumulate sediment and debris such as trash and leaf litter. In order to ensure their continued effectiveness, catch basins need to be periodically cleaned. This can be done by manual means, or by using a vacuum truck.

Street and Parking Lot Sweeping

Urban streets and parking lots can accumulate large amounts of pollutants that can be washed off during storm events. Streets and parking lots comprise a significant portion of the total impervious area within a developed watershed, and a large percentage, if not the entire area, of streets and parking lots are usually directly connected to the storm drain system. In an investigation conducted by Bannerman (Bannerman et al, 1993), data on runoff volumes from streets and parking lots collected during 4 years from two urbanized areas in Wisconsin indicated that 54 percent of the total runoff volume from residential areas was due to direct runoff from streets and parking lots, and that 80 percent of the total runoff volume from commercial areas was due to direct runoff from streets and parking lots. A breakdown of the runoff volumes based on source area is shown in Table 5-1.

Table 5-1. Percent Runoff Volumes Contributed by Source Area in Two Urbanized Areas of Wisconsin

Land Use	**Source Area Percent Runoff Contribution**					
	Feeder Streets	Collector Streets	Arterial Streets	Parking Lots	Total % due to roads and parking lots	Total Other %*
Residential	34	20	--	--	54	46
Commercial	--	10	21	49	80	20

* Other land uses include lawns, driveways, rooftops and sidewalks
Source: Adapted from Bannerman et al, 1993

Furthermore, Bannerman found that runoff from streets and parking lots contributed a significant portion of the total runoff pollutant loading. Table 5-2 summarizes the pollutant load contributions based on land uses, and indicates the total contaminant contribution in the urbanized area attributable to runoff from streets and parking lots.

Table 5-2. Contaminant Load Percentages in Two Urbanized Areas of Wisconsin

Contaminant	Percent Contribution by Source Area						Total Contaminant Contribution by Streets and Parking Lots
	Residential		*Commercial*		*Industrial*		
	Streets	**Parking Lots**	**Streets**	**Parking Lots**	**Streets**	**Parking Lots**	
Total Solids	76	--	57	31	20	60	**78**
Suspended Solids	80	--	68	27	25	55	**80**
Total Phosphorus	58	--	56	28	19	29	**54**
Dissolved Phosphorus	46	--	50	27	18	11	**39**
Dissolved Copper	73	--	50	39	16	73	**82**
Total Copper	78	--	60	32	22	67	**85**
Total Zinc	80	--	45	32	9	30	**49**
Fecal Coliform	78	--	82	10	10	19	**71**

Source: Adapted from Bannerman et al, 1993

Based on these data, streets and parking lots can contribute significant pollutant loadings to urban runoff. Therefore, sweeping programs that can remove a portion of these materials from streets and parking lots may significantly reduce the pollutant load contributions to urban runoff.

Road and Ditch Maintenance

Road and street surfaces undergo breakdown due to frictional action of traffic, freeze-thaw breakdown, frost heaving, and erosion of road subbase. Failure to correct deteriorating pavement can allow exposure of unstabilized subbase material to erosive forces of water and subsequent increases in suspended solids concentrations. The same process occurs in roadside ditches where high runoff rates cause channelization and erosion. Roadside ditches also accumulate sediment and debris from the road surface, which enters runoff during rainfall events. Maintenance of roads and cleaning and stabilization of ditches can help to reduce pollutant loadings from these sources. In roadside ditches, reducing the length and slope of ditch runs and

reducing the velocity of runoff by using check dams can help to prevent excessive channelization and erosion.

Road Salting and Sanding

Road salting and sanding can contribute large quantities of sediment and salts to runoff. Highway maintenance programs in areas where road icing is a problem frequently apply large quantities of sand, salt, and coal ash to prevent icy road surfaces. Snowmelt can carry a large portion of these materials into the storm drainage system and ultimately to receiving streams. High salt concentrations can have significant impacts on receiving streams. In addition, road salt can contain cyanide, which may cause acute or chronic toxicity to aquatic organisms. Alternative deicing products such as acetates, formates and agricultural residues can be used if impacts due to traditional deicing products are significant.

Sediment and Floatables Removal from BMPs

Sediment and floatables removal is an important component of maintenance for BMPs that are designed for sediment capture. Removal of accumulated sediment is important so that the BMP continues to operate efficiently. Accumulation of excess sediment in pond and constructed wetland systems can lead to reduced storage capacity, short-circuiting and re-suspension of previously settled particles. All of these can lead to decreased efficiency of the BMP. Floatables in BMPs can accumulate and block outlet structures leading to changes in BMP hydraulics. Floatables can cause aesthetic impacts, and floating material such as algal scum and other debris can lead to odor problems. Sediment removal is also needed periodically in filtration systems. Sedimentation chambers require periodic cleanout of sediments and floatables (including accumulated oil) and filter beds will accumulate a sediment layer on the surface that will decrease the filtration rate of the system over time. Periodic removal of this sediment layer and a portion of the filtration media is necessary in order to restore the filtration capacity of the system. Sediments also accumulate in infiltration basins. The accumulation of sediments, particularly sediments from construction activities and improperly stabilized soil, will lead to a rapid reduction of the infiltrative capacity of infiltration basins, trenches and wells.

The frequency of sediment removal in BMP types can vary widely. Some BMPs require sediment removal every two or three years, while others may not need maintenance for more than 20 years. The frequency that sediment must be removed depends greatly on the land use and degree of soil stabilization in the contributing watershed. BMPs that receive runoff from a watershed that has significant construction activities will accumulate sediment at a rate much faster than a watershed with little or no construction activity. In addition, watersheds with dense, well established vegetation will contribute less sediment than sparsely vegetated watersheds. Also, watersheds in arid or semi-arid regions, which frequently are subject to high intensity rainfall and highly erosive storm water flows will produce large quantities of solids requiring frequent removal from BMPs. Table 5-3 summarizes maintenance requirements and frequency for different structural BMP types.

Vegetation Maintenance

Vegetative BMPs such as constructed wetlands, grassed filter strips, vegetated swales, and bioretention facilities require periodic vegetation maintenance to enhance performance. Grassed filter strips and vegetated swales require a dense stand of vegetation in order to function properly and to prevent export of sediment from unstabilized planting areas. Several seasons of planting and re-seeding of sparsely vegetated areas may be needed in order to reach optimum performance. Constructed wetland systems frequently require re-planting of wetland vegetation in areas where original plantings failed to become established. Once wetland systems are functioning, periodic vegetation harvesting is necessary to remove excess vegetation and stored nutrients. Invasive species also need to be periodically removed to promote growth of beneficial wetland vegetation. Grassed filter strips and vegetated swales require periodic mowing to remove excess vegetation and stored nutrients. Mowing of these systems should not be done too close to the ground, as dense vegetation is needed for optimum performance.

General BMP Maintenance

BMPs require a variety of periodic maintenance activities in order to enhance performance. In addition to sediment removal and vegetation maintenance, periodic maintenance and repair of outlet structures is needed, filtration media need to be periodically replaced, and eroded areas need to be repaired, to name a few. Table 5-3 summarizes general maintenance activities and frequency for a few BMP types. The actual maintenance schedule varies considerably based on site-specific conditions, and the values given should be used only as a general guideline for established residential or commercial areas without significant inputs of construction sediment or other sediment loadings.

Table 5-3. Recommended BMP Maintenance Schedules

BMP	Activity	Schedule
Retention Pond / Wetland[1]	• Cleaning and removal of debris after major storm events • Harvest excess vegetation • Repair of embankment and side slopes • Repair of control structure	Annual or as needed
	• Removal of accumulated sediment from forebays or sediment storage areas	5-year cycle, or as needed
	• Removal of accumulated sediment from main cells of pond once the original volume has been significantly reduced	20-year cycle (although can vary)
Detention Basin	• Removal of accumulated sediment • Repair of control structure • Repair of embankment and side slopes	Annual or as needed
Infiltration Trench[1]	• Cleaning and removal of debris after major storm events • Mowing[4] and maintenance of upland vegetated areas • Maintenance of inlets and outlets	Annual or as needed
Infiltration Basin[2]	• Cleaning and removal of debris after major storm events • Mowing[4] and maintenance of upland vegetated areas	Annual or as needed
	• Removal of accumulated sediment from forebays or sediment storage areas	3- to 5-year cycle
Sand Filters[3]	• Removal of trash and debris from control openings • Repair of leaks from the sedimentation chamber or deterioration of structural components • Removal of the top few inches of sand and cultivation of the surface when filter bed is clogged (only works for a few cycles) • Clean-out of accumulated sediment from filter bed chamber • Clean out of accumulated sediment from sedimentation chamber	Annual or as needed

1. Modified from Livingston et al (1997)
2. Modified from Livingston et al (1997), based on infiltration trench requirements
3. Modified from Claytor and Schueler (1996)
4. Mowing may be required several times a year, depending on local conditions

Table 5-3. Recommended BMP Maintenance Schedules (continued)

BMP	Activity	Schedule
Bioretention[1]	• Repair of eroded areas • Mulching of void areas • Removal and replacement of all dead and diseased vegetation • Watering of plant material	Bi-Annual or as needed
	• Removal of mulch and application of a new layer	Annual
Grass Swale[2]	• Mowing[4] and litter and debris removal • Stabilization of eroded side slopes and bottom • Nutrient and pesticide use management • De-thatching swale bottom and removal of thatching • Discing or aeration of swale bottom	Annual or as needed
	• Scraping swale bottom, and removal of sediment to restore original cross section and infiltration rate • Seeding or sodding to restore ground cover (use proper erosion and sediment control)	5-year cycle
Filter Strip[3]	• Mowing[4] and litter and debris removal • Nutrient and pesticide use management • Aeration of soil in the filter strip • Repair of eroded or sparse grass areas	Annual or as needed

1. Modified from Prince George's County (1993)
2. Modified from Livingston et al (1997)
3. Modified from Livingston et al (1997) based on grass swale recommendations
4. Mowing may be required several times a year, depending on local conditions

5.2.3 Low-Impact Development Practices

There are a number of low-impact development practices that can be used at the site level. While these practices often do not produce direct removal of pollutants from runoff, they can significantly reduce runoff volumes that are generated, reduce the impacts associated with runoff and reduce the need for conventional structural BMPs. There are a number of practices that are in use, and therefore an exhaustive summary has not been included in this document. However, a few of the more common practices in use are presented briefly in the following sections.

Minimizing Impervious Areas

Minimizing the amount of impervious surfaces that are created in a new development can greatly reduce the volume of storm water runoff that is generated. There are many opportunities that exist for reducing impervious surfaces, including:

- limiting the number, length and radius of cul-de-sacs;

- using porous pavement or modular block pavers in parking areas and low-traffic areas;
- reducing the width of streets;
- placing sidewalks on only one side of the street;
- reducing frontage requirements to lessen paved surface areas.

Although the above practices can reduce the amounts of impervious surfaces that are created, there will still be a great deal of impervious surfaces that must be included into a site plan such as rooftops, streets, driveways and lawns. To limit the impacts associated with runoff from these surfaces, it is important to limit the amount of areas that are directly connected to the storm drainage system. This can be accomplished by providing on-site retention and infiltration to collect rooftop and driveway runoff, and through the use of BMPs such as grassed swales, vegetated filter strips and wetland channels in place of traditional curb-and-gutter systems.

Directed Growth

Directed growth involves placing controls on land use through mechanisms such as master planning and zoning ordinances. Local governments may utilize these mechanisms in order to protect sensitive areas from development and to target growth to areas that are more suitable for development where it is easier to control the impacts associated with runoff. Directed growth can be a complex process, and must balance a number of factors such as economic considerations, local laws and ordinances, secondary impacts such as increased traffic and population in certain areas, as well as the availability of public utilities such as sewage treatment and drinking water service, and schools, hospitals and fire stations. Nevertheless, with careful planning and consideration, directed growth can help to reduce impacts associated with development of an area.

Sensitive Area Protection

Sensitive area protection is an important component of conservation design. Sensitive areas include the areas adjacent to streams, wetlands and natural drainage channels, cold water fisheries, shellfish beds, swimming beaches, recharge areas, and drinking water supplies. These areas are particularly susceptible to degradation by storm water runoff. Preservation of these areas and incorporation of stream and wetland buffers into site plans can help to preserve the integrity of these areas.

Open Space Preservation

Preservation of open space such as forested areas and meadows can help to reduce the impacts associated with development of an area. Open space preservation helps to reduce the generation of runoff, and can reduce the overall impact that results from development of an area by limiting the amount of impervious areas that are created. Open space allows the preservation of buffers and natural drainage corridors, and retains the natural storm water filtering, retention and infiltration effects of these areas. Open space can also increase the aesthetics of a development, and make the area more desirable to potential home buyers.

Minimizing Soil and Vegetation Disturbance

Soil and vegetation disturbance can significantly increase the amount of runoff that is generated from a site and the concentrations of pollutants that are transported by the runoff. Disturbed soil areas are particularly susceptible to erosion during storm events. Vegetation helps to stabilize soil and prevent detachment and transport by flowing water. By minimizing the area that is disturbed to only areas undergoing active construction (often termed "fingerprinting"), erosion of soil can be minimized. In addition, disturbance of soil and vegetation should be limited to only those areas that are necessary. Disturbing soil by excavation, grading and compaction reduces the infiltrative capacity of the soil, creating additional runoff that must be managed. Maintaining naturally vegetated areas minimizes the amount of increased runoff that is produced.

5.3 BMP Selection

BMP selection is a complex process. There are a number of competing factors that need to be addressed when selecting the appropriate BMP or suite of BMPs for an area. It should be stressed that BMPs should be incorporated into a comprehensive stormwater management program. Without proper BMP selection, design, construction and maintenance, BMPs will not be effective in managing urban runoff. BMP selection can be tailored to address the various sources of runoff produced from urbanized areas. For example, a particular suite of BMPs may be developed for use on construction sites and new land development, where opportunities exist for incorporating BMPs that are focused on runoff prevention, reducing impervious surfaces and maintaining natural drainage patterns. In established urban communities, a different suite of BMPs may be more appropriate due to space constraints. In these areas, BMPs may be selected to focus on pollution prevention practices along with retrofit of the established storm drain system with regional BMPs. *Site suitability* for selecting a particular BMP strategy is key to successful performance. Most BMPs have limitations for their applicability, and therefore cannot be applied nationwide. A few considerations to incorporate into BMP selection are:

- drainage area;
- land uses;
- average rainfall frequency, duration and intensity;
- runoff volumes and flow rates;
- soil types;
- site slopes;
- geology/topography;
- availability of land;
- future development/land use in watershed;
- depth to groundwater table;
- availability of supplemental water to support vegetative BMPs;
- susceptibility to freezing;
- safety and community acceptance;
- maintenance accessability;
- periodic and long-term maintenance/rehabilitation needs.

In addition to site-specific applicability requirements, factors such as BMP cost, local regulations or requirements, aesthetics, the experience of a developer or contractor with a particular design, and competing receiving water considerations such as temperature and nutrient levels should be addressed. The combination of these factors make selection of appropriate BMPs a difficult task, and one that should be done only by an experienced storm water practitioner. This is especially true in established urban areas, where knowledge of local factors that affect design and performance is needed. BMP use in arid and semi-arid climates also presents unique challenges. The availability of water to support vegetative and open pool BMPs such as retention ponds and wetland systems is of primary concern in these areas. Without adequate water sources, these systems may not function properly and may become public nuisances. A designer with adequate experience in designing BMPs for arid climates should be consulted in these instances. In addition to arid climates, BMP use in areas where freezing conditions can be encountered presents design problems. In cold climates, design modifications may be needed to adjust for freezing and spring snowmelt (Caraco and Claytor, 1997). Given the variety of local considerations that exist, developing a matrix of BMP applicability is outside of the scope of this report. There are several references that readers should consult to obtain additional information on BMP selection, including *Fundamentals of Urban Runoff Management* (Horner et al, 1994), *Controlling Urban Runoff: A Practical Manual for Planning and Designing Urban BMPs* (Schueler, 1987), *A Watershed Approach to Urban Runoff: Handbook for Decisionmakers* (Terrene Institute, 1996), *Urban Targeting and BMP Selection* (Terrene Institute, 1990), *Guidance Specifying Management Measures for Sources on Nonpoint Source Pollution in Coastal Waters* (US EPA, 1993a), *Handbook Urban Runoff Pollution Prevention and Control Planning* (US EPA, 1993c), *Municipal Wastewater Management Fact Sheets: Storm Water Best Management Practices* (US EPA, 1996e), *Design and Construction of Urban Stormwater Management Systems* (WEF and ASCE, 1992), and *Urban Runoff Quality Management* (WEF and ASCE, 1998).

5.4 Monitoring BMP Effectiveness

Monitoring the effectiveness of BMPs can be done in a number of ways. Since urban runoff frequently contains pollutants that can contribute to water quality impacts to receiving streams, the ability of a BMP to remove pollutants from runoff is often of concern. The typical method for measurement of the pollutant removal efficiency of a BMP system is to collect and analyze *water quality samples*. This can be accomplished by measuring the concentration of a target parameter or group of parameters in an inflow sample or set of samples and comparing these values to samples collected from the outflow of the BMP. The reduction in concentrations or loading across the BMP can be termed the pollutant removal efficiency.

In addition to monitoring the pollutant removal efficiency of BMPs, it is important to *monitor the hydraulic performance* of the BMP. A major problem associated with urban runoff is the total volume and flow rate of water that is discharged to the storm sewer system or the receiving stream. To evaluate the effectiveness of BMPs in reducing these impacts, hydraulic parameters such as the reduction in peak discharge rate, reduction in total volume discharged, and

the time effects of discharges are frequently measured. To do this, measurement of flow rates and water volumes into and out of the system are conducted by using flow monitoring equipment.

Since the ultimate goal of BMPs is to protect or improve the quality of receiving streams, another method of evaluating the effectiveness of BMPs is to *evaluate the quality of waters receiving runoff*. Measures of water quality such as pollutant levels, pH, dissolved oxygen and other parameters can give an indication as to the effectiveness of a given BMP or group of BMPs. Evaluation of the contaminant levels present in sediments of receiving waters is also an important measure of BMP effectiveness. In addition, measures of aquatic habitat and stream channel morphology can give an indication as to the effectiveness of BMPs in controlling impacts or improving channel or habitat quality. Another measure to evaluate the effectiveness of BMPs is to measure the organisms that live in the receiving stream. Biological indicators such as macroinvertebrate counts, fish counts, and aquatic plant surveys can indicate the overall health of the receiving stream and indicate, over time, the effectiveness of BMPs. A potential problem with in-stream indicators is that it is sometimes difficult to isolate the impacts or improvements attributable to one particular variable. Since there are potentially a number of different factors that can influence a stream such as the amount of riparian cover, the existence of point source discharges, seepage from on-site disposal systems, as well as urban runoff, in can be very difficult to isolate impacts or improvements attributable to one particular stressor. Therefore, many years of data, collected both before and after a BMP implementation, may be needed to indicate a change. In spite of these shortcomings, in-stream monitoring and evaluation of the cumulative effects in a watershed as a result of BMP implementation is a very important measure of BMP effectiveness.

5.4.1 Water Quality Monitoring of BMPs

BMP monitoring can be conducted for a number of reasons, and the type of monitoring conducted and the instrumentation or equipment used can vary greatly depending upon the parameters of interest. BMP monitoring and data analysis is a complex process, and therefore a thorough explanation of all of the available monitoring practices and procedures is not included here. An important point to emphasize with respect to BMP monitoring is that consistent data reporting is needed in order to compare data between studies. Consistent reporting of BMP design parameters and watershed parameters as well as consistent monitoring methods and data analysis protocols is key to conducting data comparisons. It is recommended that individuals conducting BMP monitoring use the data reporting protocols developed by the American Society of Civil Engineers (ASCE) for the National Stormwater BMP Database (Urbonas and Strecker, 1996). These protocols are included with the database software, and are also available from the ASCE website.[3]

The following discussion includes a description of the most common methods used to evaluate BMP performance. Readers are encouraged to consult various monitoring manuals that

[3] The website address is http://www.asce.org/peta/tech/nsbd01.html

are available and papers that are contained in the literature for more detailed information on BMP monitoring and data analysis. Recommended references include *Monitoring Guidance for Determining the Effectiveness of Nonpoint Source Controls* (US EPA, 1997c), *NPDES Storm Water Sampling Guidance Document* (US EPA, 1992c), and *Stormwater NPDES Related Monitoring Needs* (Torno, 1995).

BMPs are frequently evaluated by collecting inflow and outflow samples and comparing concentrations of pollutants. Samples can be collected in a number of different ways. The most common way is by collecting flow- or time-weighted composite samples from inflow and outflow points and measuring the concentrations of a targeted group of parameters in these samples. Composite samples can be collected by using automatic samplers, or by collecting a series of discrete samples and manually compositing. Composite samples are useful for determining an overall average or "event mean" concentration for a particular sampling point, and are commonly used to evaluate BMP performance. However, composite samples cannot be used to evaluate any trends in pollutant concentrations over time or varying flow rates. In order to conduct these types of evaluations, it is necessary to collect a series of discrete grab samples either by an automatic sampler or by collecting grabs manually. By collecting a series of discrete time-weighted or flow-weighted samples, a "pollutograph" of concentration versus time or flow rate can be prepared, which can give insight into the performance of the BMP under various hydraulic loadings. Sample results can then be combined mathematically to determine representative event mean concentrations. Manual grab samples are also used for collecting samples that are not amenable to collection by automated equipment, such as microbiological samples, samples for oil and grease evaluation, and samples for volatile organic compounds analysis.

BMP monitoring frequently incorporates measurements of water flow rates and volumes into and out of the system. Flow rates are frequently determined by using a combination of a primary control device (weir, flume or orifice) that is calibrated to discharge water according to a known relationship based on the depth of the water flowing over or through the device, along with a secondary control device (bubbler, pressure transducer, float, etc.) that is used to measure the depth of water flowing through or over the primary control device. A digital recorder is frequently used to record the depth of water measured by the secondary control device and to calculate the flow rate through the primary control device based on a pre-determined relationship between water depth and flow rate. The digital recorder can be used to log this flow data for subsequent retrieval and analysis, and can activate automated sampling equipment to collect samples at pre-determined flow rates or times. By using a configuration such as this, flow-weighted samples or discrete samples can be collected automatically, reducing or eliminating the need for personnel to be on-site during an event.

In addition to measuring surface runoff contributions to BMPs, measurement of the contribution of groundwater and subsurface flow may be necessary for BMPs that have a significant groundwater contribution. Constructed wetland systems that are close to or at groundwater level are a good example of BMPs where measurement of groundwater flows may be necessary.

BMP monitoring programs also frequently incorporate measurements of rainfall depths, intensities and duration by using a rain gauge. Additional meteorological monitoring equipment can measure parameters such as air temperature, solar radiation, humidity, atmospheric pressure and wind speed and direction, which can aid in interpreting BMP performance data. Other instruments such as continuous pH, dissolved oxygen, and conductivity meters are also frequently incorporated into BMP monitoring programs in order to measure parameters of interest.

BMP monitoring programs can also include measurements of the atmospheric deposition rates of pollutants by using wet deposition and dry deposition sampling equipment. Atmospheric deposition can contribute significant loadings of pollutants to storm water BMPs, especially to BMPs that have a large surface area such as ponds or constructed wetlands.

Analysis of data collected from BMP monitoring programs can be conducted in a number of ways. Some of the most common methods used to measure effectiveness are measures of pollutant removal efficiency based on event mean concentrations (EMC). An event mean concentration can be determined directly from a flow-weighted composite sample. Estimations of pollutant removal efficiency in use include the efficiency ratio, the summation of loads, and the regression of loads. These methods are defined as follows (from Martin and Smoot, 1986 and reported by Strecker, 1995):

- The efficiency ratio (ER) is defined in terms of the average event mean concentration of pollutants from inflows and outflows:

$$ER = 1 - \frac{Average\ outlet\ EMC}{Average\ inlet\ EMC}$$

- The summation of loads method is based on the loads of pollutants removed during monitored storms:

$$SOL = 1 - \frac{\sum\ of\ outlet\ loads}{\sum\ of\ inlet\ loads}$$

- The regression of loads method defines the efficiency ratio as the slope of a simple linear regression of inlet loads and outlet loads of pollutants. The equation is:

$$Loads\ in = \$ \cdot Loads\ out$$

where β equals the slope of the regression line, with the intercept constrained at zero.

The above are only a few of the methods available for computing BMP pollutant removal efficiency. The selection of method can have a large impact on the reported removal efficiency. As a result, reported removal efficiency is not always comparable between studies due to differences in the way that pollutant removal was calculated. Additional work is needed in this area in order to standardize BMP data analysis and reporting.

5.4.2 Receiving Stream Assessments

Receiving stream assessments are an important means of determining the effectiveness of BMPs. The health of the biological community and the quality of the habitat present in the stream can be strong indicators of the effectiveness of BMPs. There are a number of biological indicators that can be used to evaluate streams, and a discussion of these methods is not within the scope of this document. Readers are encouraged to consult available documents for additional information on this subject, and for recommendations on developing biological criteria programs. Recommended readings include *Biological Criteria Technical Guidance for Streams and Small Rivers* (US EPA, 1996c) and *Restoring Life in Running Waters: Better Biological Monitoring* (Karr and Chu, 1998).

Physical habitat and fish and macroinvertebrate diversity indices have been identified as suitable indicators to assess the effectiveness of storm water controls (Center for Watershed Protection, 1996). EPA's *Rapid Bioassessment Protocols for Use in Streams and Rivers* (US EPA, 1997f) can be used to survey biological communities. In addition, many local and state environmental protection agencies have developed monitoring protocols for streams within their geographic area. Readers are encouraged to contact county and state environmental agencies to obtain more information regarding stream assessments. In addition to surveys of biological communities, measures of stream habitat are also useful for determining the effectiveness of BMPs. Some available methods for assessing habitat include:

- Physical habitat assessment component of EPA's Rapid Bioassessment Protocols;
- The Rapid Stream Assessment Technique (RSAT);
- The Ohio EPA's Qualitative Habitat Evaluation Index (QHEI);
- The Rosgen Stream Classification.

EPA used several receiving stream assessment methods in its 1998 field work at one BMP site. Findings from these assessments will appear in a supplement to this report.

5.5 Effectiveness of BMPs in Managing Urban Runoff

There has been a great deal of storm water and BMP monitoring data collected by a number of organizations. However, most of these data have focused on characterization of pollutants in runoff, and not on the effectiveness of various control measures. Several nation-wide monitoring programs have been conducted to characterize pollutants in urban storm water

runoff and to evaluate the performance of storm water BMPs. The major federal monitoring programs that have been conducted are listed in Table 5-4.

Table 5-4. Sources of Storm Water Runoff and BMP Monitoring Data

Data Source	Year	Type of Monitoring Conducted
"208 Studies" under FWPCA Amendments of 1972	late 1970's	Limited storm water quality data
Nationwide Urban Runoff Program (NURP)	1978-83	Storm water quality data collected at 81 outfalls at 28 cities for a total of 2,300 storm events as well as some BMP data
Federal Highway Administration (FHWA)	1970's - 80's	Storm water runoff loadings from highways at 31 sites in 11 states
USGS Urban Storm Studies*	1970's - 90's	Rainfall, runoff and water-quality data for areas throughout the United States
Phase I NPDES Municipalities (260 permittees)	1990's	Storm water and BMP monitoring data for 5 representative sites during a minimum of 3 storm events

* USGS prepared a database that includes rainfall, runoff and water-quality data for 717 storms from 99 stations in 22 metropolitan areas throughout the United States, including much of the data collected during the NURP program, in the mid-1980's (Driver et al, 1985)

The USGS has been collecting urban rainfall and runoff data for several decades. In the 1970's and early 1980's, monitoring programs were conducted to collect water quality data in addition to rainfall and runoff data in order to characterize the pollutants present in storm water runoff and to evaluate the impacts attributable to wet weather discharges. The major programs included the Nationwide Urban Runoff Program (NURP) conducted by EPA and USGS and the FHWA evaluation of runoff from highways. Data from these evaluations indicated that urban storm water runoff was contributing significant levels of pollutants to the nations waters, and that control of urban runoff was warranted. However, these investigations also indicated that there was insufficient data available to quantify the degree of impacts attributable to urban runoff and to evaluate the effectiveness of various runoff control practices.

In addition to the major federal investigations, some data has been published in the professional literature. A number of bibliographies have been prepared that include storm water BMP-related literature. These include the ASCE Urban BMP Effectiveness Bibliography, and the National Highway Runoff Water-Quality Data and Methodology Synthesis Bibliography compiled by USGS and FHWA. The Center for Watershed Protection (CWP) has prepared a database containing BMP performance data for 123 structural BMPs (Brown and Schueler, 1997a). The

FHWA and ASCE are currently developing databases of published highway and urban BMP effectiveness data. In addition to data in the published literature, a large amount of data has been collected by various cities and municipalities as part of the storm water permitting program under the Phase I NPDES program for storm water discharges. To date, EPA has not undertaken a concerted effort to collect and evaluate this data. In addition to published data sources, a number of states, counties and cities have collected a significant amount of monitoring data for their own use. The extent of this data is not currently known, but several county and city storm water programs have collected a great deal of potentially useful BMP monitoring data. An effort to collect and evaluate these data may provide more useful information on the effectiveness of various control measures.

The effectiveness of BMPs can be measured in various ways. Non-structural BMPs deal mainly with pollution prevention and limiting the amounts of pollutants that are carried away by runoff. Their effectiveness is best measured in terms of the degree of change in people's habits following implementation of the management program or by the degree of reduction of various pollutant sources. It is oftentimes very difficult to measure the success of non-structural BMPs in terms of pollution reduction and receiving stream improvements. Structural BMPs can be measured in terms in the reductions of pollutants discharged from the system and by the degree of attenuation of storm water flow rates and volumes discharged to the environment. Various physical, chemical and biological evaluation methods exist for determining the pollutant removal efficiency of structural BMPs. The following sections summarize existing data on the pollutant removal efficiency of a variety of BMPs.

5.5.1 Controlling Pollution Generation

The literature on the effectiveness of BMPs in controlling the generation of pollutants is not very extensive. Pollution prevention type BMPs such as street sweeping, public education and outreach, collection of lawn debris, etc., are conceptually very effective means of controlling the generation of pollutants that can enter storm water runoff. However, it is often very difficult to develop a representative means of monitoring or evaluating their effectiveness. Additional work in this area is needed in order to measure the effectiveness of these controls. Effectiveness data and information for pollution prevention BMPs that has been identified is presented in the following sections.

Education and Outreach

Evaluating the performance of education and outreach programs is difficult. There is little quantitative data in the literature that measures the effectiveness of these programs in improving water quality. Information exists on how educational programs have been implemented and what their success rate has been as far as changing the habits of a select group of people, but data linking implementation with improvements in water quality are scarce. Nevertheless, educational programs are a valuable component of a comprehensive storm water management program. Surrogate measures of the effectiveness of education and outreach programs include:

- numbers of flyers distributed per given time period;
- number of radio or television broadcasts;
- number of public workshops held per year;
- the percentage of storm drains that have been stenciled;
- the number of volunteer monitoring and stewardship groups that have been formed.

A literature review by ASCE (Strecker and Quigley, 1998) did not identify any published studies that contained quantitative information evaluating the effectiveness of Education and Outreach BMPs in improving water quality.

Recycling and Source Controls

Evaluating the effectiveness of recycling and source control programs can be measured in terms of the quantities of materials that are being recycled, but it is often difficult to determine water quality improvements as a result of these programs. Measures of effectiveness include:

- surveys that evaluate how many residents have changed habits such as picking up pet waste and composting lawn debris;
- volumes of materials such as used oil and antifreeze that are recycled;
- the volume and types of materials collected during community household hazardous waste collection days;
- the number of illicit cross connections that have been detected and eliminated;
- the total curb miles of streets that are swept annually and the quantity of materials removed; and
- reductions in pesticide and fertilizer usage.

Monitoring of storm water quality to evaluate the effectiveness of source control programs is possible, however very few studies have been conducted. The difficulty stems from isolating the impacts of a particular source control program on the overall water quality draining from the watershed. The ASCE bibliography identified one study that potentially contains quantitative information about the effectiveness of recycling automotive products as a BMP (Horner et al, 1985). Additional data are needed in this area in order to evaluate the effectiveness of recycling and source controls.

Maintenance Practices

Maintenance practices are a necessary part of any municipal storm water program. In addition to maintenance of storm water management infrastructure and BMP maintenance, a range of municipal maintenance activities impact the quality of storm water runoff. As with other non-structural control practices, data evaluating the effectiveness of maintenance practices at reducing the impacts associated with storm water discharges are scarce.

Studies conducted during the NURP project indicated that street sweeping was generally not an effective BMP. This is mainly due to the fact that street sweepers remove only the coarse particles on streets, and are not generally effective at removing the fine particles. It is the "fines"

that frequently contain the highest fractions of pollutants, especially metals. In fact, the NURP study report from Winston-Salem reported that street sweeping could actually increase the concentrations of select pollutants by removing the surface "armoring" of coarse particles, which during normal runoff events inhibit the removal of fine surface loads (Noel et al, 1987). Likewise, NURP studies conducted in Long Island, New York, Champaign, Illinois and Bellevue, Washington found little or no benefit of street sweeping programs. A study in Durham, New Hampshire, which evaluated the effectiveness of pavement vacuum cleaning, indicated that this technology was effective at removing BOD and fecal streptococci bacteria. It was thought that these contaminants were mainly associated with the coarser sediments, which this technology was able to effectively remove. Although the NURP data indicated that street sweeping was not an effective BMP for improving water quality, the usefulness of street sweeping programs cannot be discounted. Improvements in sweeper technology have occurred since the NURP studies were conducted, and today's sweepers may be more efficient at removing fine particulates. Regardless, sweeping programs can remove a significant amount of dirt and debris from streets and parking lots. However, obtaining data linking sweeping programs to water quality improvements may be difficult due to the variety of pollutant sources present in urban areas.

Data on other maintenance practices are likewise scarce. Practices such as catch basin cleaning, street pavement repair, and ditch maintenance are all necessary components of a storm water management program. However, data that indicate their effectiveness may be difficult to obtain due to the lack of appropriate evaluation methodologies and the difficulty associated with isolating water quality improvements attributable to these practices. The ASCE bibliography identified two NURP studies that included evaluating the effectiveness of catch basin cleaning as a storm water BMP (Lake Hills and Surrey Downs, Bellevue, Washington).

5.5.2 Controlling Pollution Discharges

There has been a great deal of published data documenting the efficiency of BMPs in removing pollutants from storm water. Much of this data provides useful insights into the performance of various types of storm water BMPs. For the purposes of this study, *efficiency* has been used to describe the ability of the management practice to remove pollutants from runoff. *Effectiveness* refers to the actual improvements in water quality, habitat or other parameters as a result of implementing the management practice. Most of the data contained in the literature reports efficiency of a BMP. Little of the available data can be used to evaluate actual effectiveness.

Brown and Schueler (1997a) documented the pollutant removal efficiency of commonly used and innovative urban storm water BMPs. The number of monitoring reports of various BMP categories included in this study are summarized in Table 5-5.

Table 5-5. Monitoring Studies for BMP Categories

BMP Type	Number of Studies
Detention Basins	8
Retention Basins	35
Wetland Systems	36
Filtration Systems	15
Swales and Filter Strips	20
Other	4

Evaluation of the existing BMP monitoring data gives an indication of the information gaps that exist in BMP monitoring studies that have been performed to date. Commonly used BMPs that are seldom monitored include infiltration trenches, infiltration basins, bioretention practices and filter strips. The reason for the limited number of monitoring studies for these practices is due to the difficulty involved in collecting inflow and outflow samples to calculate pollutant removals. Bioretention practices and filter strips frequently accept runoff as sheet flow, which must be concentrated in order to collect a representative sample. Infiltration practices and bioretention practices can discharge water through a large surface area into surrounding soil layers, and therefore collection of a representative "outflow" sample is problematic. There are also a number of innovative and infrequently used BMPs that are seldom monitored. These include sand filters, vegetated filter strips, filters with organic media, wetland channels and swales.

In addition to a general lack of monitoring data for certain types of BMPs, there is also a lack of performance data for all BMP types for certain parameters. While BMP monitoring studies typically monitor for parameters such as total phosphorus, total lead, and total suspended solids, there is little monitoring data available for parameters such as bacteria, dissolved metals and hydrocarbons. Table 5-6 summarizes the frequency with which selected parameters have been monitored in BMP performance studies (Brown and Schueler, 1997a).

Table 5-6. Extent of Monitoring for Selected Pollutants in BMP Performance Studies

Parameter	Percent Monitored
Total Phosphorus	94
Total Lead	94
Total Suspended Solids	92
Total Nitrogen	70
Soluble Nitrogen	70
Total Zinc	67
Soluble Phosphorus	60
Organic Carbon	55
Total Copper	42
Bacteria	19
Total Cadmium	15
Total Dissolved Solids	13
Dissolved Metals	10
Hydrocarbons	9

Review of the existing BMP monitoring data gives an indication of the pollutant removal efficiency of various BMPs. Several efforts have been conducted to attempt to evaluate the range of pollutant removals that can be expected to occur in various BMP designs. Evaluation of these data can give an indication of the range of pollutant removals expected, however arriving at a fixed numerical "percent removal" for each BMP type or category is a difficult task. The main problem associated with comparing BMP performance data is the variety of techniques that are used to compute performance, as well as the variation in the ways that samples are collected and in the parameters that are measured in the samples. Performance calculations are further complicated by the errors that result from measuring flow rates and volumes of storm water that pass through the BMP. A study conducted by USGS evaluated 23 flow measurement techniques in order to determine potential differences in reported flows. Average percent differences between reported total storm volumes were in many cases greater than 25 percent over a range of storms (Strecker, 1998). With errors of this magnitude, calculation of pollutant loadings and loadings reductions can be complicated significantly.

Efficiency of a BMP can be related to the removal of individual pollutants on both an event basis and on a long-term basis. Frequently, the statistical rigor with which BMP sampling data are analyzed is poor or even nonexistent. Most BMP performance data are reported as event mean concentrations (EMCs). An EMC can either be determined directly from a flow-weighted composite sample, or calculated based on a series of discrete samples. While an EMC may be an appropriate method for determining the reduction in pollutant concentrations for an individual event, an EMC may not give an indication of the long-term performance of the BMP or the performance for runoff events of varying intensity and volume. A more appropriate means of determining the long-term performance of a BMP may be to do a statistical evaluation of inflow

and outflow loadings over a range of storm event sizes and durations. Samples must also account for the seasonality of performance that results with certain BMP types such as ponds and constructed wetlands. The selection of the method used can have a significant impact on the reported performance. Additional work to standardize BMP monitoring protocols and to standardize calculations for performance is needed in order to make BMP monitoring data comparable from site to site.

BMP performance can vary considerably based on differences in the design criteria and performance standards for which the BMP was designed. Comparing pollutant removal efficiency for similar BMP types with very different performance goals may result in widely disparate efficiency estimations. In addition to differences in performance goals, variations in watershed parameters can cause significant differences in performance among otherwise similar BMPs. In most cases, parameters such as the size of the drainage area, the level of watershed imperviousness, the duration and volume of runoff entering the BMP, and the land use of contributing drainage areas are not easily comparable from study to study. In addition, differences in BMP design parameters such as the ratio of the BMP volume to the contributing drainage area, the retention time in the BMP, the physical dimensions and the construction of the BMP further complicate direct comparisons between BMP monitoring data. Also, a great deal of variability exists in the performance of each BMP due to event and seasonal variations.

Despite these shortcomings, some general ranges of expected BMP efficiency have been compiled from the literature. Documents that summarize BMP efficiency information include the CWP's National Pollutant Removal Performance Database (Brown and Schueler, 1997a), the Terrene Institute's report *The Use of Wetlands for Controlling Stormwater Pollution* (Strecker et al, 1992), as well as a variety of articles and documents contained in the professional and scientific literature. In addition, the ASCE National Storm Water BMP Database is expected to provide BMP monitoring studies in a format that will facilitate evaluation and comparison of BMP performance data. Readers are encouraged to consult the variety of referenced information resources for more detailed BMP performance data than is presented in this report. Table 5-7 presents expected pollutant removal efficiencies for various BMP types (US EPA, 1993c). The values found in this table give an indication of the expected overall pollutant removal efficiency for a properly sited, designed, sized, constructed and maintained BMP. The sections that follow Table 5-7 summarize the actual performance data contained in the literature on pollutant removal efficiencies for selected BMP types.

Table 5-7. Structural BMP Expected Pollutant Removal Efficiency

BMP Type	Typical Pollutant Removal (percent)				
	Suspended Solids	Nitrogen	Phosphorus	Pathogens	Metals
Dry Detention Basins	30 - 65	15 - 45	15 - 45	< 30	15 - 45
Retention Basins	50 - 80	30 - 65	30 - 65	< 30	50 - 80
Constructed Wetlands	50 - 80	< 30	15 - 45	< 30	50 - 80
Infiltration Basins	50 - 80	50 - 80	50 - 80	65 - 100	50 - 80
Infiltration Trenches/ Dry Wells	50 - 80	50 - 80	15 - 45	65 - 100	50 - 80
Porous Pavement	65 - 100	65 - 100	30 - 65	65 - 100	65 - 100
Grassed Swales	30 - 65	15 - 45	15 - 45	< 30	15 - 45
Vegetated Filter Strips	50 - 80	50 - 80	50 - 80	< 30	30 - 65
Surface Sand Filters	50 - 80	< 30	50 - 80	< 30	50 - 80
Other Media Filters	65 - 100	15 - 45	< 30	< 30	50 - 80

Source: Adapted from US EPA, 1993c.

Infiltration Systems

Infiltration systems can be considered 100 percent effective at removing pollutants in the fraction of water that is infiltrated, since the pollutants found in this volume are not discharged directly to surface waters. Quantifying the removal efficiency of infiltration systems, therefore, can perhaps best be determined by calculating the percent of the average annual runoff volume that is infiltrated, and assuming 100 percent removal of the pollutants found in that runoff volume. Since collecting samples of runoff once it has been infiltrated can be very difficult, little field data exist on the efficiency of infiltration for treatment of storm water. Since infiltrated water does not leave the BMP as a discrete flow, there is no representative way of collecting a true outflow sample. Infiltration systems can be monitored by installing a series of wells around the perimeter of the BMP for collecting samples. However, this can add significant costs to any monitoring effort. Table 5-8 summarizes the available field data on the efficiency of infiltration practices in treating storm water. Reported removal efficiencies are based on the results of three studies that evaluated the performance of infiltration trenches and two studies that evaluated the efficiency of porous pavement systems.

Table 5-8. Pollutant Removal Efficiency of Infiltration Practices

Parameter	Median or Average Removal Efficiency (percent)	Number of Observations
Total Phosphorus	65	5
Ammonia-Nitrogen	83	3
Nitrate	82	3
Total Nitrogen	83	2
Suspended Solids	89	2
Organic Carbon	82	1
Lead	98	1
Zinc	99	1

Source: Brown and Schueler, 1997a

Conceptually, infiltration should provide significant pollutant removal for a wide variety of storm water pollutants. As water moves through the underlying soil layers, suspended particulates and associated pollutants should be filtered out. In addition, pollutants can be adsorbed by soil particles and microorganisms in the soil can degrade organic pollutants. There is little data available, however, regarding the potential mobility of metals and hydrocarbons that enter groundwater due to infiltration of storm water. This may be a particular problem in areas with extremely high soil permeabilities (such as coastal areas), where pollutants can rapidly enter underlying aquifers with insufficient contact time for breakdown or adsorption of contaminants. Consequently, additional data gathering to target the behavior of these pollutants is warranted.

The success of infiltration systems has been mixed. In same areas, infiltration has been applied successfully, while in others infiltration systems have clogged in a very short time. Many failures can be attributed to contractor inexperience, to compaction of soil by construction equipment and to excess sediment loading during construction activities, and to improper design and siting. In order to apply infiltration successfully, the following guidelines should be applied:

- Permeability of soils must be verified. A percolation rate of 0.5 inches per hour or more, and an soil layer of 4 feet or more is essential (Cahill, 1994).
- Construction site runoff must be kept from entering the recharge bed, and the infiltration system should not be placed into service until all disturbed land that drains to the system has been stabilized by vegetation. Strict erosion and sediment controls during any construction or re-landscaping is a must to prevent clogging of the system.

- A sedimentation basin or chamber placed before the infiltration system to remove a portion of the sediment can help to extend the life of the infiltration system.
- Use of filter fabric between the recharge bed and soil interface (in porous pavement and infiltration trench systems) can prevent the migration of soil into the recharge bed.
- Construction traffic should be directed away from the infiltration bed before and during construction to prevent compaction of underlying soil layers and loss of infiltrative capacity.
- Porous pavement systems should be clearly marked to prevent use by heavy vehicles and resurfacing with non-porous pavement.
- A basin drain should be provided so that the basin can be drained and maintenance performed if the basin becomes clogged.

Readers are encouraged to consult the ASCE/WEF manual of practice (WEF and ASCE, 1992) for additional guidelines on using infiltration systems.

Retention Basins (wet ponds)

Retention basins can be very effective systems for removing pollutants from storm water. Retention basins provide quiescent conditions with long retention times that allow a large fraction of suspended solids and associated pollutants such as metals, nutrients and organics to be removed by sedimentation. In addition, degradation of organic compounds by microorganisms and uptake of nutrients by aquatic vegetation can provide additional water quality benefits. Retention basins have been one of the most widely-monitored storm water BMP types, mainly due to their prevalence and relative ease of monitoring in comparison to other BMP types. In arid regions, artificial or decorative lakes can function as retention basins. However, as with all other BMP types, the available monitoring data are not always comparable from study to study due to variations in procedures, protocols and methods. Although the mechanisms taking place in retention basins are fairly well known, additional data are needed in order to determine what the important design parameters are and to determine what event, seasonal and long-term performance variances exist. Table 5-9 summarizes the pollutant removal efficiency of retention basins systems. Reported removal efficiencies are based on data contained in 35 studies evaluating retention basins.

Table 5-9. Pollutant Removal Efficiency of Retention Basins

Parameter	Median or Average Removal Efficiency (percent)	Range of Removals (percent)		Number of Observations
		Low	High	
Soluble Phosphorus	34	-12	90	20
Total Phosphorus	46	0	91	44
Ammonia-Nitrogen	23	-107	83	14
Nitrate	23	-85	97	27
Organic Nitrogen	23	2	34	6
Total Nitrogen	30	-12	85	24
Suspended Solids	70	-33	99	43
Bacteria	74	-6	99	10
Organic Carbon	35	-30	90	29
Cadmium	47	-25	54	5
Chromium	49	25	62	5
Copper	55	10	90	18
Lead	67	-97	95	34
Zinc	51	-38	96	32

Source: Brown and Schueler, 1997a

The wide range of variability in reported removal efficiencies of retention systems is due to a number of factors. Watershed variables such as the area draining to the pond, the percent imperviousness and land use of the watershed, the design features of the basin such as surface area and depth of permanent pool, and hydraulic and hydrologic parameters such as rainfall intensity, rainfall volume, length of antecedent dry periods, time of concentration and peak inflow rate can have a large impact on the efficiency of a particular retention system. Studies that contain data on the efficiency of retention systems sometimes report only pollutant removal statistics, but fail to report the relationship to the hydraulics of the system. A thorough evaluation of the hydraulics of the system is needed in order to properly evaluate the efficiency of ponds. This evaluation should also include a measure of the expected suspended solids settling characteristics of the pond influent through a settling velocity column test or particle size distribution analysis, which can shed light on the observed efficiency of the pond in removing

sediments and associated pollutants. Greb and Bannerman (1997) reported that the influent particle size distribution plays a significant role in the overall solids removal efficiency. Perhaps the greatest parameter influencing pond efficiency is retention time. Studies indicate that residence times on the order of 14 days may be necessary to allow for sufficient removal of sediment and associated pollutants and to meet receiving water standards (Rushton and Dye, 1993). In fact, Florida requires that the permanent pool volume of ponds treating runoff from new land use activities must provide a minimum residence time of 14 days.

While retention systems can be very effective at removing pollutants from storm water, there are some potential problems associated with these systems. During periods of intense runoff, the retention time in the pond can decrease, resulting in decreased efficiency. In addition, previously removed sediments can be re-suspended, resulting in a net export of pollutants from the pond. This is one of the reasons that negative removals are frequently reported for pond systems for parameters such as suspended solids and associated contaminants such as nutrients and metals. Also, changes in water chemistry such as increased or decreased pH, alkalinity and hardness can occur in the pond, which can effect the solubility of metals that are present in pond sediments and the behavior of various nutrient species. This can also affect the chemistry of the receiving waters, since the aquatic toxicity of certain metal species is dependant on hardness. There is also evidence that anaerobic bottom sediments promote more soluble forms of phosphorus and some metals, which can increase their release to the water column (Rushton and Dye, 1993).

Perhaps the greatest problem is the increased temperature of discharges that occur from storm water retention systems. Retention ponds can have a significant surface area, and during summer months elevation of the temperature of water in the pond can occur. When this warm water is displaced during the next runoff event, the elevated temperature can cause detrimental impacts to the receiving waters, including loss of sensitive species and downstream shift of trophic status (Galli, 1988). Ponds can also fail to function properly in the winter time when the surface of the pond freezes. Water entering the pond can flow over the ice surface directly to the outlet structure. This short circuiting can limit the retention time of storm water entering the ponds and reduce the sedimentation efficiency. Outlet structures are also prone to freezing in the winter time, which can cause serious flooding problems. In order to prevent cold-weather problems with wet ponds, several design features can be incorporated in ponds that are used in cold climates. Readers are encouraged to consult the *Stormwater BMP Design Supplement for Cold Climates* published by CWP (Caraco and Claytor, 1997) for additional information regarding BMP designs for cold climates.

Retention systems also present a potential hazard to nearby residents and children, can often become populated with large number of waterfowl, and can be breeding grounds for mosquitoes and odor producers if not designed and maintained properly. Large ponds also can present a danger of downstream flooding and risk of catastrophic loss of life and property in the event of an embankment or outlet structure failure. Several pond failures have occurred that are attributable to piping around outlet structures and eventual failure of embankments due to poor

installation. Careful adherence to design and construction standards is necessary and inspections during construction should be conducted to ensure that ponds are installed correctly.

In addition to relating performance to measures of pollutant reduction across the BMP, evaluations that measure effluent from BMPs and compares these values to receiving water criteria can provide useful data. One such study was conducted in Florida, and it was determined that effluent from 22 wet detention facilities was in most cases in compliance with class III Florida state water quality standards. The ponds evaluated in this study were permitted by Florida and met the required state design criteria. Parameters analyzed in samples included eight metal species, six nutrient species, turbidity, TSS, temperature, dissolved oxygen, pH and conductivity. The constituents that were in compliance 100 percent of the time included un-ionized ammonia, iron, manganese (class II standard) and nickel. All other analyzed parameters, with the exception of dissolved oxygen, were in compliance greater than 65 percent of the time, with most in compliance greater than 79 percent of the time. Dissolved oxygen was in noncompliance 64 percent of the time (Carr and Kehoe, 1997). The results of this study indicate that evaluation of constituents in BMP effluent and comparison with water quality standards may be an effective measure of BMP effectiveness. In many cases, data of this nature may be more useful than data that indicates percent removal of a targeted group of constituents across the BMP. It is also important to note that the Florida study found that concentrations of constituents (with the exception of dissolved oxygen) in samples collected at these systems did not vary significantly between samples collected immediately before the outflow weir and after the outflow weir. Therefore, sampling before the weir, where more convenient, does not significantly alter sample results. This may be useful where the BMP discharges through an outflow structure where samples are not easily collected (such as in a manhole or other confined space).

In addition to treating runoff, retention systems can be adapted for storm water reuse. Florida is actively seeking reuse of storm water runoff for reuse as irrigation water. Reuse of storm water reduces the volume of water and the amount of pollutants discharged to receiving streams. In addition, reuse of storm water as irrigation water can help to recharge aquifers and restore pre-development hydrologic conditions. Also, significant financial incentives exist for reuse as irrigation in areas where water rates are high. However, the health risks of storm water reuse have not been thoroughly investigated. Additional research in this area is warranted to determine if a risk of exposure to potentially harmful microorganisms or other health risks exist. Livingston et al (1998) presented a discussion of storm water reuse opportunities and discussed design considerations for sizing ponds for reuse. Readers are encouraged to consult this reference for additional information on storm water reuse.

There are a number of design features that can be included in retention system designs to increase their effectiveness, reduce maintenance burdens and reduce impacts to receiving waters. These include:

- A broad, flat aquatic bench around the perimeter of the pond planted with emergent wetland vegetation;

- A permanent pool volume that provides a long residence time to promote maximum removal of suspended solids;
- An irregular pool shape that increases sinuosity of flow paths;
- A sediment forebay for removal of coarse sediments and ease of maintenance;
- A submerged reversed-slope pipe or other non-clogging low-flow orifice;
- Concrete, rather than corrugated metal risers and outlet structures;
- Preservation of riparian cover along drainage channels to limit temperature increases;
- Maintenance access to forebays and inlet and outlet structures for removal of sediments and repairs.

Prince William Parkway Regional Wet Pond

In 1998 EPA conducted sampling activities at a retention system in Prince William County, Virginia. The Prince William Parkway Wet Pond is a regional wet pond located adjacent to a major county road in Dale City. The pond has a surface area of 4 acres, and has a total volume of approximately 25 acre-feet at the permanent pool level. The pond is approximately 1,000 feet in length, 260 feet wide at its widest point, and was constructed by placing an earthen dam in what appears to previously have been a natural drainage channel. The discharge is to Cow Branch, a tributary of Neabsco Creek. The contributing drainage area to the pond is approximately 310 acres. The land use of the watershed is approximately 20 percent commercial, 30 percent forested, 40 percent open land, 5 percent residential (mostly lots less than 1 acre) and 5 percent from other sources. The pond is designed to control up to the 100-year storm event for the fully developed watershed conditions. There are a total of 5 discrete inflow points to the wet pond. Three of these points were natural drainage channels (identified as P1, P2 and P3), while the 4th and 5th points were concrete channels. Points P1, P2 and P3, which represent a majority of the contributing drainage area, were monitored during the course of the study period. The contributing drainage area and percent imperviousness of these sub-basins are:

Sub-Basin	Area (acres)	Imperviousness (%)
P1	84	41
P2	122	17
P3	107	17

The other two inflow points, which conveyed runoff from a small segment of Prince William Parkway, were not monitored and their contributions of both storm flow and pollutant loadings were considered negligible due to the small drainage area in comparison to the overall watershed area. The outflow of the pond occurs through a pair of 8 by 8-foot concrete box culverts. A concrete V-notch weir is installed at the outflow of the pond. See Figure 5-14.

Figure 5-14. Prince William Parkway Regional Wet Pond

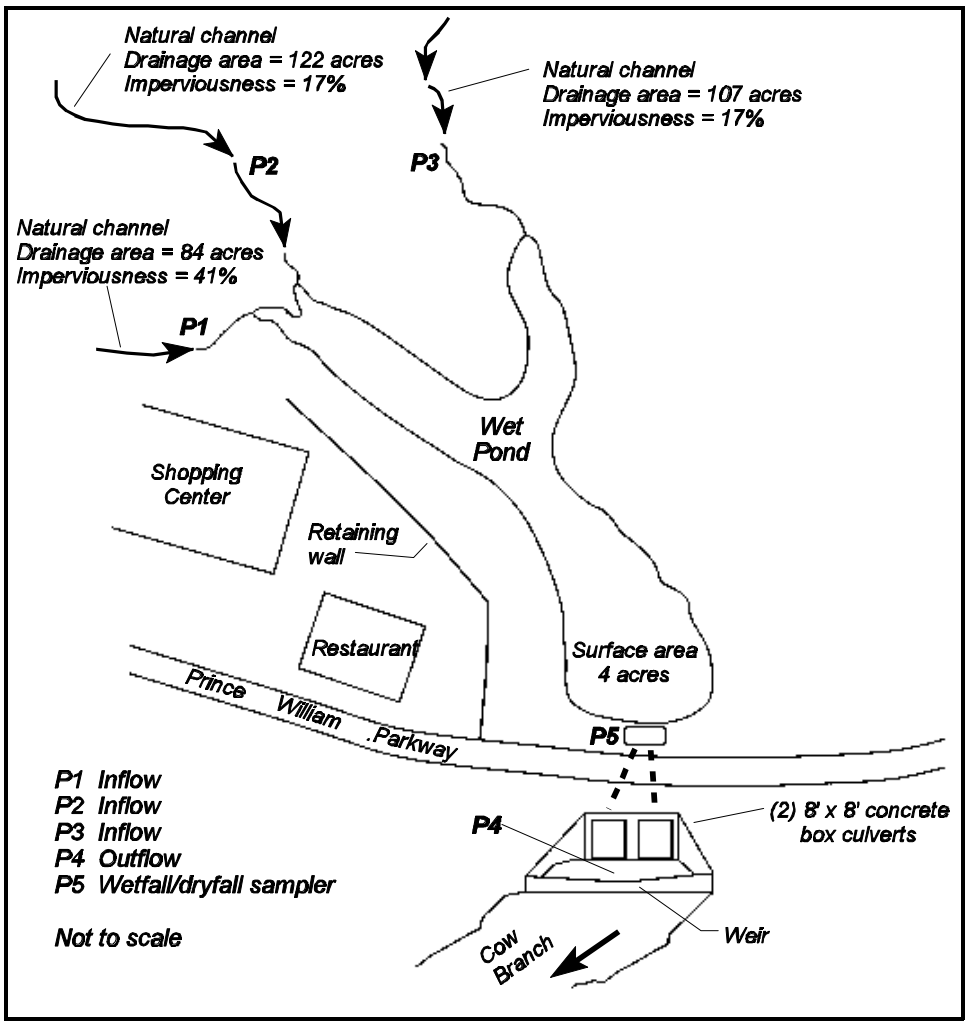

During May through October 1998, rainfall and hydrologic data were collected for 14 storm events and water quality samples were collected during 10 storm events at the pond. In addition, samples of atmospheric deposition (dryfall) and precipitation (wetfall) were collected for a number of storms. The following tables summarize a portion of the analytical data collected during the study period and the corresponding flow volume at each of the sampling points. Wetfall volumes were determined by multiplying the total storm rainfall depth by the surface area of the pond. A detailed presentation of the sampling results and an analysis of the sampling data will be included in a supplement to this report.

Table 5-10. Summary of Prince William Parkway Regional Wet Pond Sampling Data

Sample Location ➤ Sample Dates and Analytes	P1	P1 (dissolved)	P2	P2 (dissolved)	P3	P3 (dissolved)	P4	P4 (dissolved)	Wetfall	Dryfall
6/01/98										
Total Kjeldahl Nitrogen (mg/l as N)	---	---	---	0.95	---	---	---	1.1	0.67	ND (0.1)
Ammonia (mg/l as N)	---	---	0.97	0.39	---	---	0.39	0.37	0.61	ND (0.1)
Nitrate/Nitrite (mg/l as N)	---	---	0.45	0.52	---	---	0.13	0.18	0.18	ND (0.01)
Biochemical Oxygen Demand (mg/l)	---	---	4	7	---	---	4	3	---	---
Chemical Oxygen Demand (mg/l)	---	---	ND (20)	ND (10)	---	---	ND (10)	ND (10)	---	---
Total Organic Carbon (mg/l)	---	---	7	9.1	---	---	5.4	6.5	2.2	ND (1)
Phosphorus (mg/l)	---	---	0.02	ND (0.01)	---	---	0.02	0.03	ND (0.01)	ND (0.01)
Total Orthophosphate (mg/l)	---	---	ND (0.01)	---	---	---	ND (0.01)	---	---	ND (0.01)
Total Suspended Solids (mg/l)	---	---	266	---	---	---	48	---	---	---
Total Dissolved Solids (mg/l)	---	---	46	---	---	---	65	---	---	---
Volatile Suspended Solids (mg/l)	---	---	26	---	---	---	14	---	---	---
Chloride (mg/l)	---	---	4	---	---	---	13	---	---	---
Alkalinity (mg/L)	---	---	5	---	---	---	26	---	---	---
Hardness (mg/l as CaCO3)	---	---	35	---	---	---	35	---	---	---
Runoff Volume (gallons)	201,800		619,700		152,500		1,071,000		61,000	
6/11/98										
Total Kjeldahl Nitrogen (mg/l as N)	---	---	5.6	1.12	---	---	9.52	9.52	2.24	8.96
Ammonia (mg/l as N)	---	---	ND (1)	ND (1)	---	---	ND (1)	ND (1)	ND (1)	ND (1)
Nitrate/Nitrite (mg/l as N)	---	---	0.53	0.59	---	---	0.13	0.16	0.18	0.42
Biochemical Oxygen Demand (mg/l)	---	---	---	3.65	---	---	6.9	2.8	---	---
Chemical Oxygen Demand (mg/l)	---	---	45.6	26	---	---	27.6	27.2	---	---
Total Organic Carbon (mg/l)	---	---	9.35	7.91	---	---	9.35	6.47	3.58	3.58
Phosphorus (mg/l)	---	---	0.25	0.051	---	---	0.25	0.017	0.044	0.038
Total Orthophosphate (mg/l)	---	---	0.094	---	---	---	0.062	---	ND (0.01)	---
Total Suspended Solids (mg/l)	---	---	14	---	---	---	8	---	---	---
Total Dissolved Solids (mg/l)	---	---	49	---	---	---	62	---	---	---
Volatile Suspended Solids (mg/l)	---	---	3	---	---	---	3	---	---	---
Alkalinity (mg/L)	---	---	13.2	---	---	---	24	---	---	---
Hardness (mg/l as CaCO3)	---	---	18	---	---	---	26	---	---	---
Runoff Volume (gallons)	244,500		849,400		242,200		1,434,000		81,500	

Sample Location ➤ Sample Dates and Analytes	P1	P1 (dissolved)	P2	P2 (dissolved)	P3	P3 (dissolved)	P4	P4 (dissolved)	Wetfall	Dryfall
6/12/98										
Total Kjeldahl Nitrogen (mg/l as N)	8.96	11.8	8.96	2.8	---	---	1.68	8.4	5.04	---
Ammonia (mg/l as N)	1.12	ND (1)	ND (1)	ND (1)	---	---	ND (1)	ND (1)	1.12	---
Nitrate/Nitrite (mg/l as N)	1	0.88	0.57	0.61	---	---	0.15	0.12	0.66	---
Biochemical Oxygen Demand (mg/l)	4.3		2.5	2	---	---	3.7	40.8	---	---
Chemical Oxygen Demand (mg/l)	36.4	47.2	106	14	---	---	27.2	20.4	---	---
Total Organic Carbon (mg/l)	5.83	10.2	5.83	5.83	---	---	10.2	10.2	4.37	---
Phosphorus (mg/l)	0.1	0.049	0.82	0.08	---	---	0.18	0.04	0.046	---
Total Orthophosphate (mg/l)	0.038	---	0.099	---	---	---	0.099	---	---	---
Total Suspended Solids (mg/l)	18	---	53	---	---	---	9	---	---	---
Total Dissolved Solids (mg/l)	90	---	37	---	---	---	65	---	---	---
Volatile Suspended Solids (mg/l)	6	---	6	---	---	---	6	---	---	---
Alkalinity (mg/L)	13.9	---	9.7	---	---	---	24	---	---	---
Hardness (mg/l as CaCO3)	28	---	20	---	---	---	28	---	---	---
Runoff Volume (gallons)	162,400		237,600		191,700		631,000		36,000	
6/13/98										
Total Kjeldahl Nitrogen (mg/l as N)	---	---	ND (1)	7.84	---	---	1.68	17.4	---	---
Ammonia (mg/l as N)	---	---	ND (1)	1.12	---	---	ND (1)	ND (1)	---	---
Nitrate/Nitrite (mg/l as N)	---	---	0.2	0.25	---	---	0.28	0.29	---	---
Biochemical Oxygen Demand (mg/l)	---	---	5.9	2.5	---	---	3.9	ND (2)	---	---
Chemical Oxygen Demand (mg/l)	---	---	32.8	25.2	---	---	22.8	20.8	---	---
Total Organic Carbon (mg/l)	---	---	4.37	4.37	---	---	5.83	5.83	---	---
Phosphorus (mg/l)	---	---	0.35	---	---	---	0.091	0.17	---	---
Total Orthophosphate (mg/l)	---	---	0.097	---	---	---	ND (0.1)	---	---	---
Total Suspended Solids (mg/l)	---	---	31	---	---	---	8	---	---	---
Total Dissolved Solids (mg/l)	---	---	245	---	---	---	54	---	---	---
Volatile Suspended Solids (mg/l)	---	---	6	---	---	---	4	---	---	---
Alkalinity (mg/L)	---	---	5.2	---	---	---	22	---	---	---
Hardness (mg/l as CaCO3)	---	---	10		---	---	24	---	---	---
Runoff Volume (gallons)	166,700		411,600		136,000		765,000		43,500	

Sample Location ➤ Sample Dates and Analytes	P1	P1 (dissolved)	P2	P2 (dissolved)	P3	P3 (dissolved)	P4	P4 (dissolved)	Wetfall	Dryfall
6/15/98										
Total Kjeldahl Nitrogen (mg/l as N)	3.92	2.24	8.4	13.4	---	---	21.3	5.6	---	---
Ammonia (mg/l as N)	---	2.8	1.12	9.52	---	---	16.8	6.16	---	---
Nitrate/Nitrite (mg/l as N)	0.23	0.21	0.2	0.35	---	---	0.29	0.31	---	---
Biochemical Oxygen Demand (mg/l)	4.25	3.8	4.05	2.7	---	---	1.8	4	---	---
Chemical Oxygen Demand (mg/l)	18.4	24	22	66.4	---	---	21.6	17.2	---	---
Total Organic Carbon (mg/l)	7.11	19	4.47	9.75	---	---	5.79	20.3	---	---
Phosphorus (mg/l)	0.072	---	0.2	---	---	---	0.069	---	---	---
Total Orthophosphate (mg/l)	0.017	---	ND (0.01)	---	---	---	ND (0.01)	---	---	---
Total Suspended Solids (mg/l)	ND (4)	---	21	---	---	---	ND (4)	---	---	---
Total Dissolved Solids (mg/l)	61	---	58	---	---	---	19	---	---	---
Volatile Suspended Solids (mg/l)	ND (4)	---	5	---	---	---	ND (4)	---	---	---
Alkalinity (mg/L)	10	---	4.2	---	---	---	ND (20)	---	---	---
Hardness (mg/l as CaCO3)	18	---	10	---	---	---	24		---	---
Runoff Volume (gallons)	841,600		1,260,900		719,600		3,097,500		176,000	
6/17/98										
Total Kjeldahl Nitrogen (mg/l as N)	1.05	1.06	---	---	0.55	---	0.75	0.97	---	---
Ammonia (mg/l as N)	0.32	0.26	---	---	ND (0.1)	---	ND (0.1)	ND (0.1)	---	---
Nitrate/Nitrite (mg/l as N)	0.33	0.33	---	---	0.12	---	0.19	0.2	---	---
Biochemical Oxygen Demand (mg/l)	4	4	---	---	---	---	6	4	---	---
Chemical Oxygen Demand (mg/l)	ND (10)	ND (10)	---	---	ND (10)	---	ND (10)	26	---	---
Total Organic Carbon (mg/l)	8.8	9	---	---	7.5	---	8	7.9	---	---
Phosphorus (mg/l)	0.12	---	---	---	0.11	---	0.13	---	---	---
Total Orthophosphate (mg/l)	ND (0.01)	---	---	---	ND (0.01)	---	ND (0.01)	---	---	---
Total Suspended Solids (mg/l)	ND (4)	---	---	---	19	---	8	---	---	---
Total Dissolved Solids (mg/l)	142	---	---	---	121	---	79	---	---	---
Volatile Suspended Solids (mg/l)	ND (4)	---	---	---	ND (4)	---	ND (4)	---	---	---
Alkalinity (mg/L)	26	---	---	---	13	---	10	---	---	---
Hardness (mg/l as $CaCO_3$)	24	---	---	---	---	---	12	---	---	---
Runoff Volume (gallons)	129,400		215,200		162,500		554,500		31,500	

Sample Location ➤ Sample Dates and Analytes	P1	P1 (dissolved)	P2	P2 (dissolved)	P3	P3 (dissolved)	P4	P4 (dissolved)	Wetfall	Dryfall
6/23/98										
Total Kjeldahl Nitrogen (mg/l as N)	0.22	---	1.44	6.1	1.15	0.3	0.76	0.51	---	---
Ammonia (mg/l as N)	0.12	---	0.2	0.5	0.14	0.13	0.31	ND (0.1)	---	---
Nitrate/Nitrite (mg/l as N)	0.23	---	0.4	0.42	0.15	0.14	0.21	0.17	---	---
Biochemical Oxygen Demand (mg/l)	ND (2)	---	ND (2)	6	ND (2)	23	ND (2)	52	---	---
Chemical Oxygen Demand (mg/l)	ND (10)	---	31	15	34	ND (10)	ND (10)	ND (10)	---	---
Total Organic Carbon (mg/l)	3.1	---	4.4	7.7	4.7	7.4	3.2	3.8	---	---
Phosphorus (mg/l)	0.06	---	0.02	---	ND (0.01)	---	0.04	---	---	---
Total Orthophosphate (mg/l)	0.03	---	ND (0.01)	---	ND (0.01)	---	ND (0.01)	---	---	---
Total Suspended Solids (mg/l)	19	---	33	---	29	---	10	---	---	---
Total Dissolved Solids (mg/l)	47	---	79	---	64	---	69	---	---	---
Volatile Suspended Solids (mg/l)	9	---	16	---	13	---	11	---	---	---
Alkalinity (mg/L)	6	---	13	---	7	---	14	---	---	---
Hardness (mg/l as $CaCO_3$)	8	---	20	---	10	---	19	---	---	---
Runoff Volume (gallons)	1,207,300		1,064,200		756,800		3,499,000		199,000	
6/24/98										
Total Kjeldahl Nitrogen (mg/l as N)	0.73	---	0.71	---	0.7	---	0.53	---	---	---
Ammonia (mg/l as N)	0.22	---	0.22	---	0.16	---	0.55	---	---	---
Nitrate/Nitrite (mg/l as N)	0.4	---	0.61	---	0.27	---	0.32	---	---	---
Biochemical Oxygen Demand (mg/l)	3	---	4	---	3	---	2	---	---	---
Chemical Oxygen Demand (mg/l)	ND (10)	---	ND (10)	---	14	---	ND (10)	---	---	---
Total Organic Carbon (mg/l)	3.8	---	4	---	5.6	---	3.1	---	---	---
Phosphorus (mg/l)	0.05	---	0.1	---	0.05	---	0.12	---	---	---
Total Orthophosphate (mg/l)	ND (0.01)	---	ND (0.01)	---	ND (0.01)	---	ND (0.01)	---	---	---
Total Suspended Solids (mg/l)	ND (4)	---	57	---	54	---	8	---	---	---
Total Dissolved Solids (mg/l)	45	---	48	---	69	---	51	---	---	---
Volatile Suspended Solids (mg/l)	4	---	5	---	6	---	3	---	---	---
Alkalinity (mg/L)	6	---	6	---	12	---	8	---	---	---
Hardness (mg/l as $CaCO_3$)	8	---	11	---	17	---	15	---	---	---
Runoff Volume (gallons)	293,200		682,400		290,400		1,415,000		80,000	

Sample Location ➤ Sample Dates and Analytes	P1	P1 (dissolved)	P2	P2 (dissolved)	P3	P3 (dissolved)	P4	P4 (dissolved)	Wetfall	Dryfall
7/31/98										
Total Kjeldahl Nitrogen (mg/l as N)	1.3	1	2.7	---	---	---	1.2	---	---	---
Ammonia (mg/l as N)	1	1.1	0.74	---	---	---	0.96	---	1.5	---
Nitrate/Nitrite (mg/l as N)	1.51	1.51	1.81	---	---	---	0.13	---	---	---
Biochemical Oxygen Demand (mg/l)	6	26	27	6	---	---	5	---	---	---
Chemical Oxygen Demand (mg/l)	16	ND (10)	106	---	---	---	ND (10)	---	---	---
Total Organic Carbon (mg/l)	11	11	20	---	---	---	8.1	---	---	---
Phosphorus (mg/l)	0.05	---	0.36	---	---	---	0.09	---	---	---
Total Orthophosphate (mg/l)	0.03	---	ND (0.1)	---	---	---	ND (0.01)	---	ND (0.01)	---
Total Suspended Solids (mg/l)	9	---	51	---	---	---	11	---	---	---
Total Dissolved Solids (mg/l)	92	---	115	---	---	---	90	---	---	---
Volatile Suspended Solids (mg/l)	9	---	16	---	---	---	7	---	---	---
Alkalinity (mg/L)	17	---	15	---	---	---	25	---	---	---
Hardness (mg/l as $CaCO_3$	40	---	52	---	---	---	36	---	---	---
Runoff Volume (gallons)	79,400		436,900		32,000		593,000		33,500	

Constructed Wetland Systems

Constructed wetlands can be effective BMPs for removing pollutants from urban storm water. The main mechanism of pollutant removal in wetland systems is sedimentation (Strecker et al, 1992). Other pollutant removal mechanisms include filtration by aquatic vegetation and by underlying soil and gravel in systems where subsurface flow is present, biological conversion of organic compounds by microorganisms, uptake of nutrients by aquatic plants and algae, uptake of metals by plant tissue, adsorption of metals by clay soils, and volatilization of hydrocarbons and volatile organics. While the literature contains hundreds of references to constructed wetlands systems, very few quantitative studies have been conducted with sufficient rigor to provide good estimates of performance. Strecker's evaluation of the literature on wetland treatment systems identified only 17 reports that discussed the results of research on a functioning wetland system (of 140 reviewed reports). This indicates that there is a general lack of thorough, scientifically-defensible evaluations on the performance of wetland treatment systems. As a result, there is a wide range of variability in reported efficiency data. Table 5-11 summarizes the pollutant removal efficiency of constructed wetland systems based on Strecker's evaluation of published studies.

Table 5-11. Pollutant Removal Efficiency of Constructed Wetland Systems

Parameter	Median Removal Efficiency (percent)	Range of Removals (percent)		Number of Observations
		Low	High	
Soluble Phosphorus	23	-30	78	12
Ortho-Phosphate	28	-109	93	7
Total Phosphorus	46	-120	97	37
Ammonia-Nitrogen	33	-86	62	15
Nitrate	46	4	95	18
Organic Nitrogen	7	-36	39	7
Total Nitrogen	24	-20	83	11
Suspended Solids	76	-300	98	26
Bacteria	78	55	97	3
Organic Carbon	28	-31	93	15
Cadmium	69	-80	80	6
Chromium	73	38	98	3
Copper	39	2	84	10
Lead	63	23	94	17
Zinc	54	-74	90	16

Sources: Strecker at al (1992); Organic Carbon, Bacteria and Metals from Brown and Schueler, 1997a

Evaluation of wetland performance is problematic because the basic mechanisms taking place in wetland systems are not well understood. Wetlands are complex ecosystems, and variations in design and watershed factors can have a significant impact on performance. As a result, data collected from various sites are not always comparable.

Due to the limited amount of comparable data that is available on the performance of storm water wetland systems, it is difficult to arrive at any meaningful relationships indicating the important factors in wetland system design. Strecker indicated that perhaps the greatest factor influencing performance of constructed wetlands is the hydrology of the watershed and the inflow hydraulics. Other factors having a major influence on performance are wetland size and volume, the design of the inlet and outlet structures, flow patterns through the system, vegetational

community structure, seasonal productivity and decay of wetland plants, and changes in evapotranspiration rates. In addition, the presence of subsurface flows can complicate wetland performance evaluations.

Strecker recommends that an important evaluation step in determining wetland performance is to compare runoff volumes with storage volumes and contact surface area of the wetland. However, he was unable to conduct this evaluation due to the lack of consistent reporting of rainfall statistics, watershed imperviousness, land uses, flow volumes, capacity and surface areas for contact. In order to ensure the comparability of future data reporting for wetland systems, it is recommended that a standardized set of monitoring protocols be adopted for all future monitoring efforts.

An important factor in the variation of reported efficiency is the wide range of designs that are used in constructed wetland systems. A few design variations include:

- ponds with an emergent wetland area on the pond perimeter;
- shallow wetlands with subsurface flow;
- wetland channels;
- pond-wetland systems;
- extended detention wetlands.

Although the design of a particular systems is dependent upon a number of site-specific variables, there are some important design factors that should be incorporated in wetland system designs including:

- a pre-settling chamber for removal of heavy sediments and to limit disturbance of the wetland to remove accumulated sediments;
- adjustable level control at the outlet by means of an adjustable weir or orifice;
- design the flow path to limit short circuiting and dead space and to maximize detention time;
- a broad, densely planted aquatic bench;
- selection of planting species to produce a dense stand of vegetation for filtration and nutrient uptake;
- periodic harvesting of excess vegetation to prevent nutrient release and to remove undesirable species.

Crestwood Marsh Constructed Wetland

In 1998 EPA conducted sampling activities at a constructed wetland in Manassas, Virginia. The Crestwood Marsh is located in a residential area and was originally constructed as a dry detention basin, but conditions at the site were such that a wetland system formed on its own. The outlet structure was modified in 1995 to provide an extended detention time of 24 hours within the wetland. As a result of this modification, the system has developed into a shallow emergent marsh and contains a variety of wetland species. The wetland has a surface area of

8,830 ft^2. The water quality detention volume of the wetland is 2,524 ft^3, and the flood control volume above the water quality volume is 3,523 ft^3. The area draining to the wetland is a 7-acre townhouse community, with the land area consisting of approximately 60 percent townhouses, 30 percent forested and 10 percent open space. The drainage area is estimated to be approximately 40 percent impervious. The constructed wetland is located at the headwaters of a small unnamed stream that drains to Bull Run, within the Occoquan River Watershed.

Flow enters the wetland at the eastern corner through an 18-inch concrete pipe situated flush with the bottom grade (point C1). From this point, water gradually spreads throughout the wetland and drains to the northern corner of the pond and is discharged through a 6-inch PVC outlet pipe (point C3). There is an additional inlet point located at the southwest corner of the wetland, which consists of overland flow from an adjacent area of forested parkland. EPA concentrated the flow at this point in order to allow estimation of flow rates and volumes, and to allow for collection of water quality samples (point C2). See Figure 5-15.

Figure 5-15. Crestwood Marsh Constructed Wetland

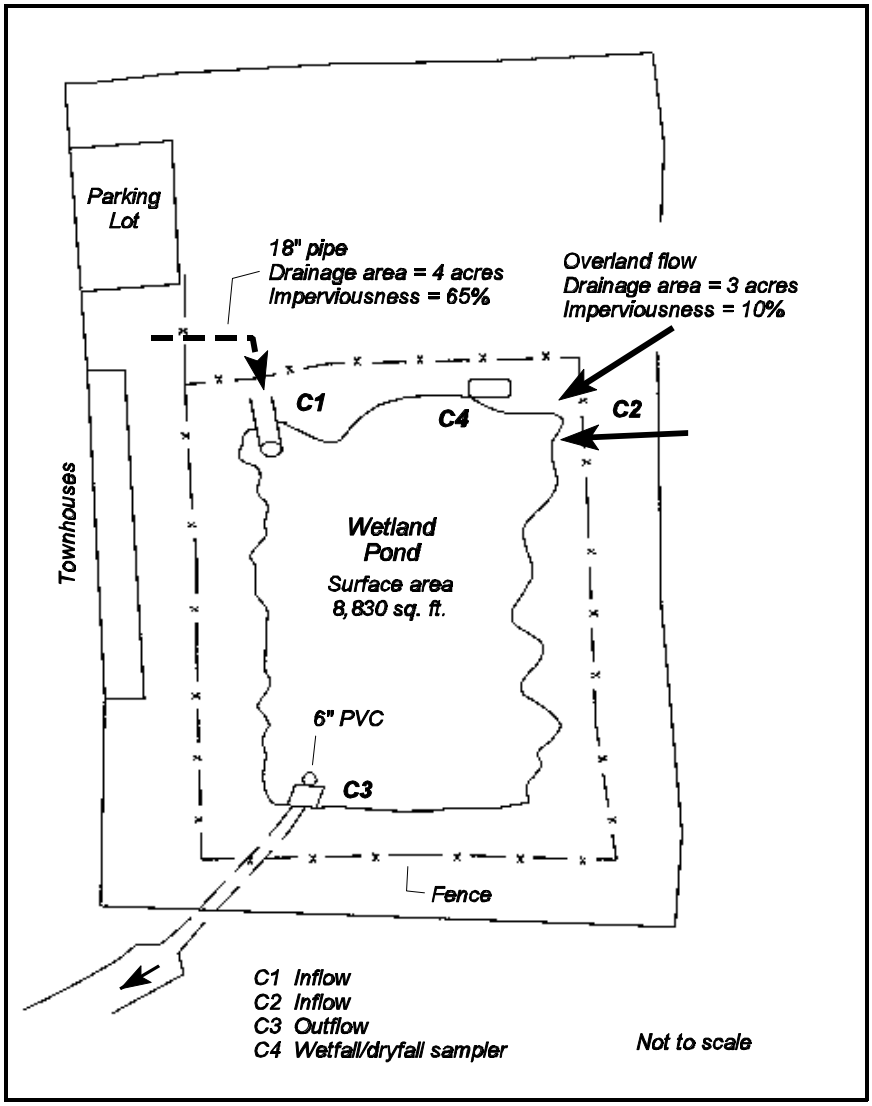

During the spring and summer of 1998, storm event sampling was conducted during nine events. Sampling consisted of collecting flow-weighted composite samples as well as recording rainfall depth, and runoff flow rates and volumes into and out of the wetland. In addition to water quality monitoring, atmospheric deposition and wetfall deposition samples were collected during the study period. The water quality sampling data collected during the study period are summarized in the tables below. Additional data, as well as a detailed description of the sampling program, wetland design, and an evaluation of the performance of the wetland will be included in a supplement to this report.

Table 5-12. Summary of Crestwood Marsh Constructed Wetland Sampling Data

Sample Date ➤	06/01/98			06/11/98			06/12/98		
Analytes **Location ➤**	**C1**	**C2**	**C3**	**C1**	**C2**	**C3**	**C1**	**C2**	**C3**
Runoff Volume (gal)	7,625	No Flow	1,376	9,439	No Flow	3,237	11,621	No Flow	3,903
Total Suspended Solids (mg/l)	41	--	--	18	--	--	70	--	4
Chemical Oxygen Demand (mg/l)	75	--	--	28.4	--	--	37.2	--	--
Total Organic Carbon (mg/l)	13	--	--	5.02	--	--	5.83	--	--
Total Kjeldahl Nitrogen (mg/l as N)	2	--	--	12.3	--	--	5.04	--	--
Total Inorganic Nitrogen (mg/l as N)	0.67	--	--	0.33	--	--	0.47	--	--
Ammonia (mg/l as N)	0.75	--	--	<1	--	--	1.12	--	--
Total Phosphorus (mg/l)	0.12	--	--	0.084	--	--	0.22	--	--
Ortho-Phosphate (mg/l)	<0.01	--	--	0.032	--	--	0.18	--	0.021
Alkalinity (mg/l as $CaCO_3$)	31	--	--	6.8	--	--	4.8	--	4.3
Hardness (mg/l as $CaCO_3$)	--	--	--	--	--	--	14	--	--
Lead	--	--	--	--	--	--	6.9	--	--
Copper	--	--	--	--	--	--	10.1	--	--
Zinc	--	--	--	--	--	--	64.9	--	--
Nickel	--	--	--	--	--	--	6.6	--	--
Aluminum	--	--	--	--	--	--	2690	--	--
Chromium	--	--	--	--	--	--	4.4	--	--

Sample Date ➤	06/14/98			06/16/98			06/23/98		
Analytes **Location ➤**	**C1**	**C2**	**C3**	**C1**	**C2**	**C3**	**C1**	**C2**	**C3**
Runoff Volume (gal)	7,624	No Flow	No Flow	53,457	6,985	57,216	81,327	6,334	139,390
Total Suspended Solids (mg/l)	44	--	--	<4	19	<4	5	34	6
Chemical Oxygen Demand (mg/l)	64	--	--	12.8	45.6	15.2	<10	24	<10
Total Organic Carbon (mg/l)	14.3	--	--	4.47	9.75	5.79	4.1	7.4	3.1
Total Kjeldahl Nitrogen (mg/l as N)	3.36	--	--	2.8	7.28	17.4	0.57	0.44	0.8
Total Inorganic Nitrogen (mg/l as N)	0.4	--	--	0.2	0.15	0.16	0.81	0.27	0.53
Ammonia (mg/l as N)	1.12	--	--	<1	<1	<1	0.37	0.27	0.32
Total Phosphorus (mg/l)	0.17	--	--	0.078	0.2	0.11	0.2	0.24	0.05
Ortho-Phosphate (mg/l)	0.058	--	--	0.05	0.032	0.026	0.12	0.05	0.05
Alkalinity (mg/l as $CaCO_3$)	6.5	--	--	5.2	20	6.7	11	8	<1
Hardness (mg/l as $CaCO_3$)	--	--	--	--	24	44	20	10	<1
Lead	6.6	--	--	<2	<2	<2	--	--	--
Copper	10.3	--	--	<1	<1	<1	--	--	--
Zinc	68.5	--	--	<2	<2	<2	--	--	--

Sample Date ➤	06/14/98			06/16/98			06/23/98		
Analytes **Location ➤**	**C1**	**C2**	**C3**	**C1**	**C2**	**C3**	**C1**	**C2**	**C3**
Nickel	<1	--	--	2.3	<1	<1	--	--	--
Aluminum	3450	--	--	<54	3420	<54	--	--	--
Chromium	<1	--	--	2	4.7	<1	--	--	--

Sample Date ➤	06/24/98			07/24/98			07/31/98		
Analytes **Location ➤**	**C1**	**C2**	**C3**	**C1**	**C2**	**C3**	**C1**	**C2**	**C3**
Runoff Volume (gal)	11,766	7,604	38,353	20,820	9,645	4,579	11,929	761	No Flow
Total Suspended Solids (mg/l)	37	45	<4	68	--	5	30	--	--
Chemical Oxygen Demand (mg/l)	<10	67	18	32	--	<10	27	--	--
Total Organic Carbon (mg/l)	3.6	17	9.2	7.9	--	10.4	12	--	--
Total Kjeldahl Nitrogen (mg/l as N)	0.52	1.28	0.48	1.14	--	0.9	1	--	--
Total Inorganic Nitrogen (mg/l as N)	0.52	0.11	0.15	0.48	--	0.33	0.67	--	--
Ammonia (mg/l as N)	0.18	0.13	0.15	0.46	--	0.22	0.97	--	--
Total Phosphorus (mg/l)	0.11	0.12	0.02	0.15	--	0.83	0.1	--	--
Ortho-Phosphate (mg/l)	0.03	<0.01	<0.01	0.09	--	0.28	0.03	--	--
Alkalinity (mg/l as $CaCO_3$)	7	17	15	2	--	8	4	--	--
Hardness (mg/l as $CaCO_3$)	6	28	17	15	--	--	21	--	--
Lead	--	--	--	18.2	--	--	16.2	--	--
Copper	--	--	--	10.4	--	--	8	--	--
Zinc	--	--	--	75.2	--	--	86.3	--	--
Nickel	--	--	--	10	--	--	11.1	--	--
Aluminum	--	--	--	2430	--	--	1370	--	--
Chromium	--	--	--	7.7	--	--	4.8	--	--

Filtration and Bioretention Systems

Filtration systems are seeing increased usage, especially in ultra-urban environments where space constraints prohibit the use of detention, retention and constructed wetland systems. Filtration systems can provide significant water quality improvements, but only a small amount, if any, water quantity control. It should also be stressed that filters must be placed off-line in order to assure continued functioning, and therefore only provide treatment of a volume of water based on a design storm. Any volume in excess of the design storm is bypassed without treatment.

Limited monitoring data are available on the efficiency of storm water filtering systems. This is mainly due to storm water filters being a relatively new technology, as opposed to more conventional BMPs such as wet ponds and constructed wetland systems. As a result, only a few published monitoring studies are available to evaluate the efficiency of various filter designs. The following Table 5-13 summarizes the pollutant removal efficiencies for storm water filtration systems. Removal efficiencies are based on data collected from 13 monitoring studies.

Table 5-13. Pollutant Removal Efficiency of Storm Water Filtration Systems

Parameter	Median or Average Removal Efficiency (percent)	Range of Removals (percent)		Number of Observations
		Low	High	
Soluble Phosphorus	-31	-37	-25	2
Total Phosphorus	45	-25	80	15
Ammonia-Nitrogen	68	43	94	4
Nitrate	-13	-100	27	13
Organic Nitrogen	28	0	56	2
Total Nitrogen	32	13	71	9
Suspended Solids	81	8	98	15
Bacteria	37	36	83	5
Organic Carbon	57	10	99	11
Cadmium	26	N/A	N/A	1
Chromium	54	47	61	2
Copper	34	22	84	9
Lead	71	-16	89	11
Zinc	69	33	91	15

Source: Brown and Schueler, 1997a

Storm water filtration systems can be highly effective at removing pollutants from storm water runoff. They are particularly effective at removing TSS and total phosphorus, although many filters export inorganic nitrogen due to nitrification of ammonia and organic nitrogen in the filter (Bell, 1998). Bell's study reported that significant phosphorus removals can be attributed to reaction and precipitation with sand that contains iron, calcium and aluminum. Although the limited data that are available on storm water filters indicates that their overall performance is good, additional data are needed to evaluate their efficiency, especially data that can be used to evaluate their long-term hydraulic performance and maintenance requirements. For example, Urbonas et al (1997) found that the hydraulic flow-through rate of a sand filter decreased from 3 feet-per-hour per square foot of filter area to less than 0.05 feet-per-hour after only several storms. This rapid decrease in flow-through rate causes a marked decrease in efficiency, since

more of the storm flow will be bypassed unless adequate detention storage volume is provided upstream of the filter. Therefore, overall TSS removal rates are significantly lower when this bypass flow is accounted for (for example, Urbonas' evaluation of storms over the 1995 season resulted in only a 15 percent overall TSS removal when bypass flows were taken into account). Due to the potential decrease in efficiency of sand filtration systems, careful consideration of design parameters is needed. Urbonas (1999) presents a thorough discussion of sand filtration design. Readers are urged to consult this reference for information on sand filtration system design.

In order to provide adequate filter functioning, the following basic design and operation guidelines should be followed:

- The filter should be placed off-line;
- A sedimentation chamber or basin should be provided upstream of the filter bed in order to allow for the removal of sediments to extend the length of the filter run between maintenance activities;
- The filter should be sized adequately or else adequate detention facilities should be provided upstream of the filter in order to capture expected storm water flows and to minimize bypasses;
- Care should be taken to limit excessive sediment loadings to the filter during construction or landscaping activities;
- Periodic maintenance to remove accumulated sediments and restore the filter flow-through rate may be necessary in areas with high solids loadings.

As with filtration systems, the available data on the performance of bioretention facilities are limited. Since bioretention facilities incorporate many of the same mechanisms as filtration systems, their performance for removal of parameters such as TSS are expected to be similar. Due to their biological nature, however, bioretention facilities are expected to also provide conditions necessary for uptake of nutrients by vegetation, degradation of organic contaminants by soil microorganisms, and biochemical reactions within the soil matrix and around the root zone of plants. Available data on the efficiency of bioretention facilities (based on laboratory data and one field study) indicates that bioretention can obtain removals on the order of 95-97 percent for metals, 75 percent for total phosphorus, 69 percent for TKN, 79 percent for ammonia, 21 percent for nitrate and 56 percent for total nitrogen (adapted from Bell (1998), average of all reported values).

The following general guidelines should be followed when designing bioretention facilities:

- Water should not be allowed to pond for more than four days in order to prevent mosquito breeding and to prevent adverse effects on plants;
- Plants selected for bioretention should be tolerant to stresses found in urban areas such as pollutants, variable soil moisture, periodic inundation, and high temperatures;

- Native plant species should be used whenever possible (Prince George's County, 1993), and species diversity should be maintained in order to prevent loss of all plants in the event of disease or infestation.
- Plants should be placed with regard to the elevation and moisture level of the planting bed (i.e., more water-tolerant species should be placed in lower areas where water is likely to pond longer);
- A mulch layer should be installed and maintained in order to prevent erosion of soils and to retain soil moisture;
- Where concentrated runoff enters the bioretention system, reinforcement (such as stone stabilization or synthetic erosion protection materials) may be needed to reduce erosion of the mulch layer and disturbance of the planting bed (Claytor and Schueler, 1996).
- The clay content of soils used in bioretention facilities may need to be limited to prevent clogging of the soil bed (Bell, 1998).

Readers are encouraged to consult *Design Manual for Use of Bioretention in Stormwater Management* (Prince George's County, 1993) and *Design of Stormwater Filtering Systems* (Claytor and Schueler, 1996) for additional information on the bioretention concept.

Hollywood Branch Peat/Sand Filter

In 1998 EPA conducted sampling activities at a peat/sand filter in Montgomery County, Maryland. The Hollywood Branch filter is a surface sand filter with a peat/sand filtration media that was designed based on the Galli paper (1990b). The filter is located in a county park in the Colesville area of Montgomery County and discharges to Hollywood Branch, a first-order stream that discharges into Paint Branch approximately 3,000 feet downstream of the filter. The drainage area covers approximately 140 acres and consists of 73 percent residential, 13 percent industrial and 14 percent other sources. The filter was one of several retrofit projects installed by Montgomery County as part of a watershed restoration effort in the Paint Branch watershed.

The filter is located off-line of the storm drainage system, and is designed to capture the first 0.1 watershed inches of runoff via a flow-splitter located in the storm sewer. This corresponds to a runoff volume of approximately 50,280 ft^3. Any runoff in excess of this amount bypasses the filter and is discharged directly to Hollywood Branch. Runoff from the flow splitter first enters a small stilling basin before being discharged to the filter. The stilling basin functions as a pre-settling chamber to remove coarse sediments in order to prolong the life of the filter. The stilling basin has a volume of 16,940 ft^3 at the permanent pool level, a depth of 3 feet, and length-to-width ratio of approximately 3:1. The edge of the stilling basin is planted with emergent wetland vegetation. Water is discharged from the stilling basin and into the filter through a submerged 18 inch pipe. The filter has dimensions of 265 feet by 63 feet. The filter is designed to pond water to a maximum depth of 2 feet, which corresponds to a volume of 33,880 ft^3. The filter bed is designed to have a minimum infiltration rate of 1.0 inch/hour. The filter bed consists of a 12-inch peat top layer, underlain by a 4-inch sand/peat mix, which is underlain by a 20-inch layer of sand. Water entering the filter is distributed by a series of interconnected 6 inch PVC half-pipes placed along the surface of the filter bed. The filter contains an under-drain system

consisting of 6 inch perforated PVC pipes encased in a crushed gravel layer. Filtered water collected in the under-drain system is discharged to Hollywood Branch through a 12-inch concrete pipe. See Figure 5-16.

Figure 5-16. Hollywood Branch Peat/Sand Filter

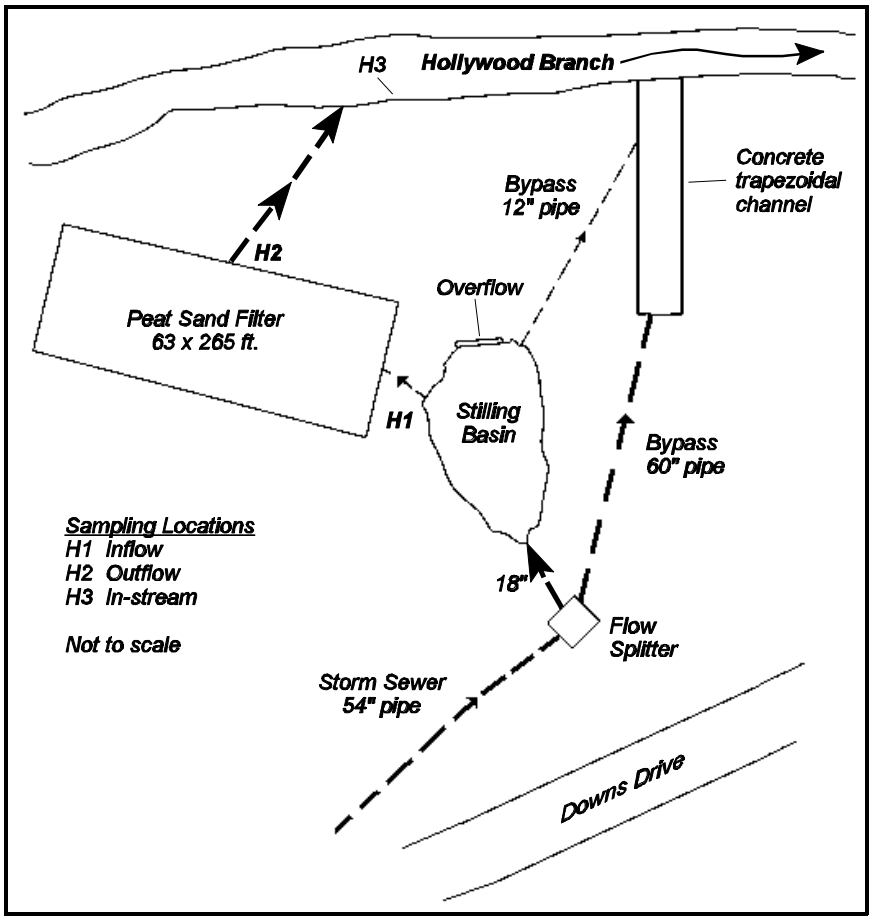

The monitoring program consisted of recording runoff flow rates and volumes and collecting flow-weighted composite samples from the inflow and outflow of the filter using automatic sampling equipment. A tipping bucket rain gauge was used to record precipitation levels. Flow monitoring and water quality sampling was conducted for five events during the spring and summer of 1998. Baseflow samples were collected from the filter on three occasions. In addition, in-stream sediment samples were collected on one occasion, and bioassessment and physical habitat measurements were also conducted.

The following tables summarize the chemical sampling data collected during this evaluation. Additional information describing the sampling program, additional sampling and

assessment data (including sediment, bioassessment and physical habitat assessment) and an analysis of the performance of the filter will be included as a supplement to this report.

Table 5-14. Summary of Hollywood Branch Peat/Sand Filter Storm Event Sampling Data

Analytes / Sample Dates ➤	06/01/98		06/12/98		06/14/98		06/24/98		07/31/98	
	Inflow	Outflow	Inflow	Outflow	Inflow	Outflow	Inflow	Outflow	Inflow	Outflow
Event Volume (gal)	7,597	No flow	68,436	28,470	308,705	149,184	131,744	75,003	151,395	72,537
Total Suspended Solids (mg/l)	--	--	10	< 4	7	17	12	8	38	31
Chemical Oxygen Demand (mg/l)	16	--	25.2	17.6	24	14.4	< 10	11	30	34
Total Organic Carbon (mg/l)	10.4	--	7.29	4.37	4.37	4.37	5.5	6	14	10.4
Total Kjeldahl Nitrogen (mg/l as N)	2	--	7.28	5.6	2.24	11.2	0.91	0.78	1.8	0.68
Total Inorganic Nitrogen (mg/l as N)	1.11	--	0.77	2.14	0.66	2.07	1	1.86	1.13	2.21
Ammonia (mg/l as N)	0.56	--	< 1	< 1	1.68	14.6	0.28	0.16	0.32	< 0.1
Total Phosphorus (mg/l)	0.14	--	0.094	0.16	0.19	0.14	0.19	0.2	0.18	0.15
Ortho-Phosphate (mg/l)	--	--	0.047	0.27	0.23	0.049	< 0.01	< 0.01	0.1	< 0.01
Lead (µg/l)	2.1	--	13.6	2.4	2.3	3.7	2.7	5.6	3.8	8.9
Copper (µg/l)	6.8	--	8.3	2	4.7	1.3	7	4	6.5	11.3
Zinc (µg/l)	17.1	--	40.1	< 2	< 2	< 2	26.8	22.6	43	41.8
Nickel (µg/l)	2.4	--	2.4	22.3	<1	< 1	1.5	4.7	3.2	7.4
Aluminum (µg/l)	< 54	--	488	1360	899	2010	956	2810	497	3450
Chromium (µg/l)	< 1	--	1.4	6.3	< 1	< 1	< 1	4.8	< 1	7.7

Table 5-15. Summary of Hollywood Branch Peat/Sand Filter Baseflow Sampling Data

Sample Dates ➤ Analytes	05/19/98		06/23/98		08/14/98	
	Inflow	Outflow	Inflow	Outflow	Inflow	Outflow
Total Suspended Solids (mg/l)	< 4	< 4	---	< 4	---	< 4
Chemical Oxygen Demand (mg/l)	< 10	< 10	---	< 10	---	< 20
Total Organic Carbon (mg/l)	< 10	< 10	---	3.5	---	6.6
Total Kjeldahl Nitrogen (mg/l as N)	1.66	19.8	---	0.55	---	1.28
Total Inorganic Nitrogen (mg/l as N)	1.79	0.64	---	0.74	---	0.23
Ammonia (mg/l as N)	0.49	< 0.1	---	< 0.1	---	< 1
Total Phosphorus (mg/l)	0.02	< 0.01	---	0.14	---	0.054
Ortho-Phosphate (mg/l)	0.02	0.02	---	< 0.01	---	0.069
Lead (µg/l)	< 2	< 2	---	---	---	< 2
Copper (µg/l)	< 1	< 1	---	---	---	1.2
Zinc (µg/l)	< 2	< 2	---	---	---	30.5
Nickel (µg/l)	2.3	3.1	---	---	---	2.7
Aluminum (µg/l)	59.8	< 54	---	---	---	1590
Chromium (µg/l)	< 1	--	---	---	---	2.3

Open Channel Vegetated Systems

Open channel vegetated systems are used widely for storm water quality control. However, these systems can be difficult to monitor, especially systems that intercept runoff as sheet flow such as grass filter strips. As a result, data on these types of systems are not as prevalent as other more readily monitored BMP types such as ponds and constructed wetlands. Table 5-16 summarizes the pollutant removal efficiency of open channel vegetated systems. Removal efficiencies are based on data collected from 20 monitoring studies.

Table 5-16. Pollutant Removal Efficiency of Open Channel Vegetated Systems

Parameter	Average or Median Removal Efficiency (percent)	Range of Removals (percent)		Number of Observations
		Low	High	
Soluble Phosphorus	11	-45	72	8
Total Phosphorus	15	-100	99	18
Ammonia-Nitrogen	3	-19	78	4
Nitrate	11	-100	99	13
Organic Nitrogen	39	11	86	3
Total Nitrogen	11	-100	99	10
Suspended Solids	66	-100	99	18
Bacteria	-25	-100	0	5
Organic Carbon	23	-100	99	11
Cadmium	49	20	80	6
Chromium	47	14	88	5
Copper	41	-35	89	15
Lead	50	-100	99	19
Zinc	49	-100	99	19

Source: Brown and Schueler, 1997a

Evaluation of available data does not provide a good indication as to the actual performance of these systems. The above data indicate that a wide range in pollutant removal efficiency is reported in the literature for open channel vegetated systems. Since there are a variety of system designs lumped into the above summary, arriving at efficiency estimates for a

particular system type given available data is difficult. In general, these types of BMPs should be effective at removing suspended solids and associated pollutants from runoff by sedimentation and by filtration by vegetation, and are certainly effective at slowing the velocity of storm water runoff and for providing detention of runoff if check dams or other structures are incorporated to provide ponding of runoff. However, dense vegetation must be maintained in order to assure proper functioning. In addition, negative removals are frequently reported for sediment and nutrients. If open channel vegetated systems are not properly maintained, significant export of sediments and associated pollutants such as metals and nutrients can occur from eroded soil. In addition, standing water in these systems can be a significant source of bacteria and can provide the conditions necessary for mosquito breeding. Additional data gathering is needed in order to support these assumptions and to quantify the efficiency of these systems.

Open channel vegetated systems can be used as pretreatment devices for other BMPs, or can be used in a "treatment train" approach. For example, grass filter strips are commonly used to accept sheet flow from parking lots in order to pre-treat runoff prior to being treated by a bioretention facility or a filter. Vegetated swales can be used to convey runoff to BMPs such as ponds or constructed wetlands, providing pretreatment of the runoff volume. When used in combination with other BMPs, the overall quality of the treated runoff can be improved and the total runoff volume can be reduced due to infiltration that occurs in the open channel vegetated systems.

Miscellaneous and Vendor-Supplied Systems

Little data exist in the published literature on the efficiency of vendor-supplied systems. Data is frequently available from the vendors, and as more of these systems are installed it is expected that more data will become available. An evaluation of the efficiency of these systems has not been included in this report. The EvTEC program (see section 5.2.1.8) and other evaluation programs should provide useful information that indicates the efficiency of these systems in removing pollutants from runoff.

5.5.3 Controlling Flow Impacts

The removal of pollutants from storm water runoff is an important function of storm water BMPs. However, in many cases receiving water problems are not due to the pollutants contained in storm water, but rather can be attributed to the large flow rates that result in receiving streams that receive storm water discharges. Therefore, in some cases, controlling the volume and flow rate of storm water discharges is as important, if not more important, than removing pollutants prior to discharge. Site-specific parameters will dictate the importance of flow control in preventing degradation of receiving waters.

Evaluating the effectiveness of BMPs in controlling flow impacts is not an easy task. Site-specific variations such as slope, soil types, ground cover, and watershed-imperviousness can greatly impact the hydraulic response of a watershed to rainfall. In addition, receiving water

parameters greatly influence the degree of flow control that is necessary in order to prevent degradation. As a result, little information is contained in the literature describing the performance of BMPs at controlling impacts in receiving streams due to excessive storm water flows. The literature that does exist, however, indicates a direct correlation between urbanization and receiving stream degradation. It is not difficult to infer, therefore, that storm water flow is a major contributor to receiving stream degradation, and that control of storm water flow rates and volumes is warranted in order to restore degraded receiving waters and to prevent degradation of receiving waters in newly developing areas. Additional information on the hydrological benefits of BMPs is presented in section 6.3.2 of this report.

Important measures of the effectiveness of BMPs at controlling storm water flows include:

- reductions in peak flow rate across the BMP;
- total storage volume provided in the BMP;
- infiltrative capacity of the BMP;
- retention time in the BMP;
- relationship of post-development hydrologic conditions to pre-development hydrology;
- retention volume necessary for receiving stream channel protection.

Local conditions will dictate the BMP design parameters that are necessary to reduce impacts due to flow. For example, the state of Maryland has developed unified BMP sizing criteria that is designed to provide adequate control of pollutants, limit degradation of streams, provide adequate groundwater recharge, and protect downstream areas from flooding. Additional work is needed in other areas of the country to evaluate the effectiveness criteria necessary to limit flow impacts and to provide adequate BMP sizing standards.

Flow control can be accomplished by using both structural and non-structural practices. Structural BMPs that can provide flow control include retention basins, detention basins, constructed wetlands, infiltration practices, grassed swales and minimizing directly connected impervious surface areas. Filters and bioretention facilities can also be adapted to provide some degree of quantity control if they are used in conjunction with detention basins or other means of providing detention of storm water prior to treatment, such as providing temporary ponding in overflow parking areas. Non-structural BMPs and land-use practices that can help to reduce the volume of storm water runoff discharged to receiving streams should also be considered a vital component of storm water management. Practices that can reduce the impact of storm water runoff due to excessive flows include land use regulations such as zoning, natural area and stream buffer preservation, limits on impervious surfaces, and cluster development. Practices that limit the generation of storm water can be very effective in preventing degradation of streams, and can limit the need for structural storm water controls. Information on development practices aimed at reducing impacts due to site development practices can be found in *Conservation Design for Stormwater Management* (Delaware DNREC, 1997) and in *Green Development* (US EPA, 1996b).

5.6 Conclusions

There are a wide variety of BMPs available to manage storm water runoff. The efficiency of various BMP types has been documented to some degree, but there is still a great need for focused research in certain areas, particularly for newer and innovative structural BMP types, as well as non-structural BMPs. However, due to the complexity involved in isolating the reaction of a complex and highly variable system such as a watershed to one isolated input, evaluations of non-structural BMPs are ambitious tasks. Still, where storm water management is largely driven by the availability of scarce funding, data that indicate the cost-effectiveness of various control strategies are badly needed.

Ultimately, receiving stream morphology, habitat and biological communities may turn out the be the driving factors indicating the success of BMPs at controlling impacts due to storm water flows and the pollutants that they contain. In order for such measures to work, however, it is necessary to isolate the response of a receiving stream system to the implementation of BMPs. Frequently, there are too many variables in a watershed and too many other potential sources of degradation to isolate the improvements (or even to indicate potential negative impacts) of a particular BMP or group of BMPs. For example, Maxted and Shaver (1997) did not observe a significant difference in macroinvertebrate communities between 8 sites with storm water retention ponds and 33 sites with no storm water controls. In addition, the BMPs did not prevent the almost complete loss of sensitive aquatic species. Whether or not these impacts were caused by storm water flows, pollutants or other non-storm water sources was not indicated, and the data to be able to answer these questions may not be forthcoming in the foreseeable future. Therefore, until data are available to indicate that specific BMPs can prevent impacts and prevent degradation of receiving streams in urbanized areas, one should not assume that structural, "end-of-pipe" BMPs are the only answer to the storm water problem.

Available data seem to indicate that urbanization and traditional urban development at almost any level can cause degradation of streams, and that BMPs may be able to mitigate these impacts to a certain level. Accordingly, storm water management should start at the point of runoff generation, and incorporate site planning principles that prevent or minimize the generation of runoff, prevent development in floodplains, preserve natural drainage systems, and avoid disturbing sensitive areas such as wetlands and riparian areas. Where runoff generation cannot be avoided, then properly sited, designed, constructed and operated BMPs can be implemented to attempt to reduce the impacts associated with this runoff. There are data available on the effectiveness of BMPs in reducing pollutant loads, but these data are not comprehensive enough to either characterize the performance of all BMPs in use or to determine if they are actually controlling impacts to receiving waters. Additional data gathering is necessary, but the monitoring and data analysis protocols necessary to do so have not been fully developed. Standardization of monitoring protocols for data transferability is a vital component of successful data evaluation, and is an area that should be actively pursued in the near future.

6.0 Costs and Benefits of Storm Water BMPs

Storm water best management practices (BMPs) are the primary tool to improve the quality of urban streams and meet the requirements of NPDES permits. They include both the structural and non-structural options reviewed in Section 5.2 of this report. Some BMPs can represent a significant cost to communities, but these costs should be weighed against the various benefits they provide. This chapter will focus on reviewing available data on the costs and potential benefits of both structural and non-structural BMPs designed to improve the quality of urban and urbanizing streams, and the larger water bodies to which they drain.

As described in previous chapters, storm water runoff can contribute loadings of nutrients, metals, oil and grease, and litter that result in impairment of local water bodies. The extent to which these impairments are eliminated by BMPs will depend on a number of factors, including the number, intensity, and duration of wet weather events; BMP construction and maintenance activities; and the site-specific water quality and physical conditions. Because these factors will vary substantially from site to site, data and information are not available with which to develop dollar estimates of costs and benefits for individual types of BMPs. However, EPA's national estimates of costs and benefits associated with implementation of the NPDES Phase II rule are discussed in Section 6.4.

6.1 Structural BMP Costs

The term structural BMPs, often referred to as "Treatment BMPs," refers to physical structures designed to remove pollutants from storm water runoff, reduce downstream erosion, provide flood control and promote groundwater recharge. In contrast with non-structural BMPs, structural measures include some engineering design and construction.

Structural BMPs evaluated in this report include:

- Retention Basins
- Detention Basins
- Constructed Wetlands
- Infiltration Practices
- Filters
- Bioretention
- Biofilters (swales and filter strips).

The two infiltration systems focused on in this report are infiltration trenches and infiltration basins. Although bioretention can serve as a filtering system or infiltration practice, it is discussed separately because it has separate cost data and design criteria. In this report, wet swales are assumed to have the same cost as biofilters, because there are little cost data available on this practice. Additional information about these structural BMPs, including descriptions, applicability and performance data can be found in Chapter 5 of this report. Other BMPs include

experimental and proprietary products, as well as some conventional structures such as water quality inlets. They are not included in this analysis because sufficient data are not available to support either the performance or the cost of these practices.

6.1.1 Base Capital Costs

The base capital costs refer primarily to the cost of constructing the BMP. This may include the cost of erosion and sediment control during construction. The costs of design, geotechnical testing, legal fees, land costs, and other unexpected or additional costs are not included in this estimate. The cost of constructing any BMP is variable and depends largely on site conditions and drainage area. For example, if a BMP is constructed in very rocky soils, the increased excavation costs may substantially increase the cost of construction. Also, land acquisition costs vary greatly from site to site.[4] In addition, designs vary slightly among BMP types. A wet pond may be designed with or without various levels of landscaping, for example. The data in Table 6-1 represent typical unit costs (dollars per cubic foot of treated water volume) from various studies, and should be considered planning level. In the case of retention and detention basins, ranges are used to reflect the economies of scale involved in designing these BMPs.

[4] Land cost is the largest variable influencing overall BMP cost.

Table 6-1. Typical Base Capital Construction Costs for BMPs

BMP Type	Typical Cost* ($/cf)	Notes	Source
Retention and Detention Basins	0.50-1.00	Cost range reflects economies of scale in designing this BMP. The lowest unit cost represents approx. 150,000 cubic feet of storage, while the highest is approx. 15,000 cubic feet. Typically, dry detention basins are the least expensive design options among retention and detention practices.	Adapted from Brown and Schueler (1997b)
Constructed Wetland	0.60-1.25	Although little data are available to assess the cost of wetlands, it is assumed that they are approx. 25% more expensive (because of plant selection and sediment forebay requirements) than retention basins..	Adapted from Brown and Schueler (1997b)
Infiltration Trench	4.00	Represents typical costs for a 100-foot long trench.	Adapted from SWRPC (1991)
Infiltration Basin	1.30	Represents typical costs for a 0.25-acre infiltration basin.	Adapted from SWRPC (1991)
Sand Filter	3.00-6.00	The range in costs for sand filter construction is largely due to the different sand filter designs. Of the three most common options available, perimeter sand filters are moderate cost whereas surface sand filters and underground sand filters are the most expensive.	Adapted from Brown and Schueler (1997b)
Bioretention	5.30	Bioretention is relatively constant in cost, because it is usually designed as a constant fraction of the total drainage area.	Adapted from Brown and Schueler (1997b)
Grass Swale	0.50	Based on cost per square foot, and assuming 6 inches of storage in the filter.	Adapted from SWRPC (1991)
Filter Strip	0.00-1.30	Based on cost per square foot, and assuming 6 inches of storage in the filter strip. The lowest cost assumes that the buffer uses existing vegetation, and the highest cost assumes that sod was used to establish the filter strip.	Adapted from SWRPC (1991)

* Base year for all cost data: 1997

In some ways there is no such value as the “average” construction cost for some BMPs, because many BMPs can be designed for widely varying drainage areas. However, there is some

value in assessing the cost of a typical application of each BMP. The data in Table 6-2 reflect base capital costs for typical applications of each category of BMP. It is important to note that, since many BMPs have economies of scale, it is not practical to extrapolate these values to larger or smaller drainage areas in many cases.

Table 6-2. Base Costs of Typical Applications of Storm Water BMPs[1]

BMP Type	Typical Cost ($/BMP)	Application	Data Source
Retention Basin	$100,000	50-Acre Residential Site (Impervious Cover = 35%)	Adapted from Brown and Schueler (1997b)
Wetland	$125,000	50-Acre Residential Site (Impervious Cover = 35%)	Adapted from Brown and Schueler (1997b)
Infiltration Trench	$45,000	5-Acre Commercial Site (Impervious Cover = 65%)	Adapted from SWRPC (1991)
Infiltration Basin	$15,000	5-Acre Commercial Site (Impervious Cover = 65%)	Adapted from SWRPC (1991)
Sand Filter	$35,000-$70,000[2,3]	5-Acre Commercial Site (Impervious Cover = 65%)	Adapted from Brown and Schueler (1997b)
Bioretention	$60,000	5-Acre Commercial Site (Impervious Cover = 65%)	Adapted from Brown and Schueler (1997b)
Grass Swale	$3,500	5-Acre Residential Site (Impervious Cover = 35%)	Adapted from SWRPC (1991)
Filter Strip	$0-$9,000[3]	5-Acre Residential Site (Impervious Cover = 35%)	Adapted from SWRPC (1991)

1. Base costs do not include land costs.
2. Total capital costs can typically be determined by increasing these costs by approximately 30%.
3. A range is given to account for design variations.

Although various manuals report construction cost estimates for storm water ponds, EPA has identified only three studies that have systematically evaluated the construction costs associated with structural BMPs since 1985. The three studies used slightly different estimation procedures. Two of these studies were conducted in the Washington, DC region and used a similar methodology (Wiegand et al, 1986; Brown and Schueler, 1997b). In both studies, the costs were determined based on engineering estimates of construction costs from actual BMPs throughout the region. In the third study, conducted in Southeastern Wisconsin, costs were determined using standardized cost data for different elements of the BMP, and assumptions of BMP design (SWRPC, 1991).

Any costs reported in the literature need to be adjusted for inflation and regional differences. All costs reported in this report assume a 3 percent annual inflation rate. In addition, studies are adjusted to the "twenty cities average" construction cost index, to adjust for regional biases, based on a methodology followed by the American Public Works Association (APWA, 1992). Using EPA's rainfall zones (see Figure 6-1), a cost adjustment factor is assigned to each zone (Table 6-3). For example, rainfall region 1 has a factor of 1.12. Thus, all studies in the Northeastern United States are divided by 1.12 in order to adjust for this bias.

Table 6-3. Regional Cost Adjustment Factors

Rainfall Zone	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Adjustment Factor	1.12	0.90	0.67	0.92	0.67	1.24	1.04	1.04	0.76

Source: Modified from APWA, 1992

Figure 6-1. Rainfall Zones of the United States

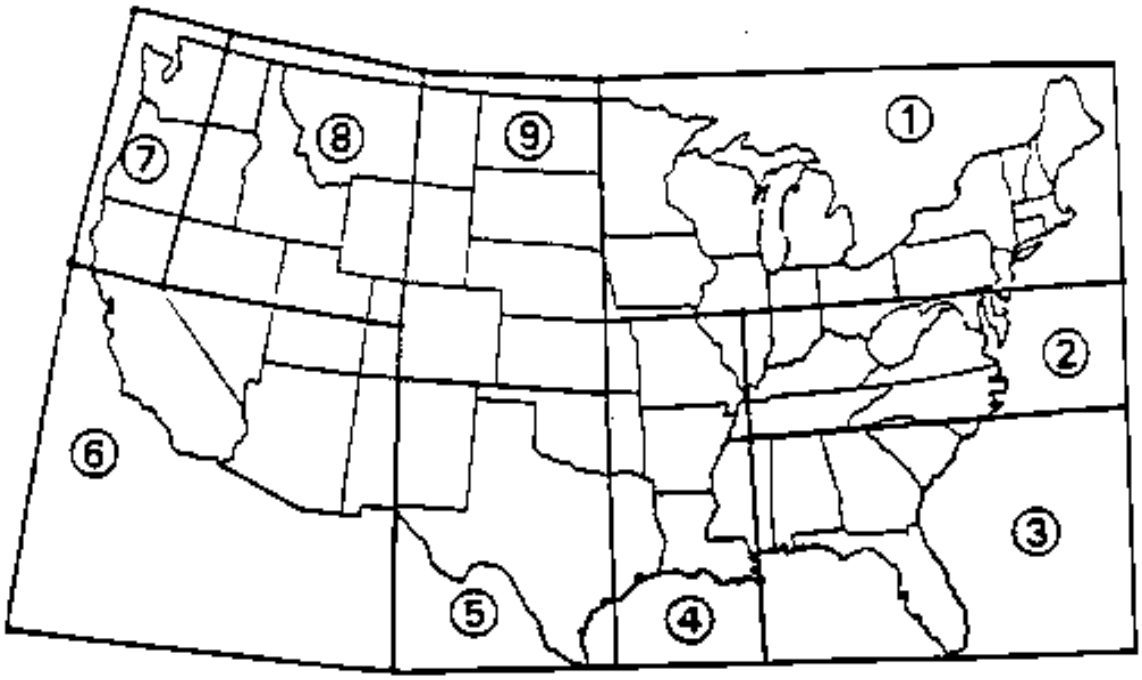

Not shown: Alaska (Zone 7); Hawaii (Zone 7); Northern Mariana Islands (Zone 7); Guam (Zone 7); American Samoa (Zone 7); Trust Territory of the Pacific Islands (Zone 7); Puerto Rico (Zone 3) Virgin Islands (Zone 3).
Source: NPDES Phase I regulations, 40 CFR Part 122, Appendix E (US EPA, 1990)

6.1.1.1 Retention/Detention Basins and Constructed Wetlands

The total volume of the basin is generally a strong predictor of cost (Table 6-4). There are some economies of scale associated with constructing these systems, as evidenced by the slope of the volume equations derived. This is largely because of the costs of inlet and outlet design, and mobilization of heavy equipment that are relatively similar regardless of basin size.

Erosion and sediment control represents only about 5 percent of the construction cost of basins and wetlands (Brown and Schueler, 1997b). Thus, the construction cost estimates presented in Table 6-2 are comparable. The cost of building storm water retention and detention systems has increased since 1986 (Figure 6-2), even after adjusting for inflation. Part of the reason for this increase is thought to be attributable to the improved design of these systems to enhance water quality driven by a more complex regulatory and review environment (Brown and Schueler, 1997b). The cost estimations made by SWRPC (1991) were generally a mid-range between the earlier and more recent studies.

Table 6-4. Base Capital Costs for Storm Water Ponds and Wetlands

BMP Type	Cost Equation or Estimate	Costs Included		Source
		Construc-tion	E&S Control	
Retention Basins and Wetlands	$7.75V^{0.75}$	✔	✔	Wiegand et al, 1986
	$18.5V^{0.70}$	✔		Brown and Schueler, 1997b
Detention Basins	$7.47V^{0.78}$	✔	✔	Brown and Schueler, 1997b
Retention Basins	1.06V: 0.25 acre retention basin (23,300 cubic feet)	✔		SWRPC, 1991
	0.43V: 1.0 acre retention basin (148,000 cubic feet)			
	0.33V: 3.0 acre retention basin (547,000 cubic feet)			
	0.31V: 5.0 acre retention basin (952,000 cubic feet)			

Notes
V refers to the total basin volume in cubic feet
Costs presented from SWRPC (1991) are “moderate” costs reported in that study.

Figure 6-2. Retention Basin Construction Cost

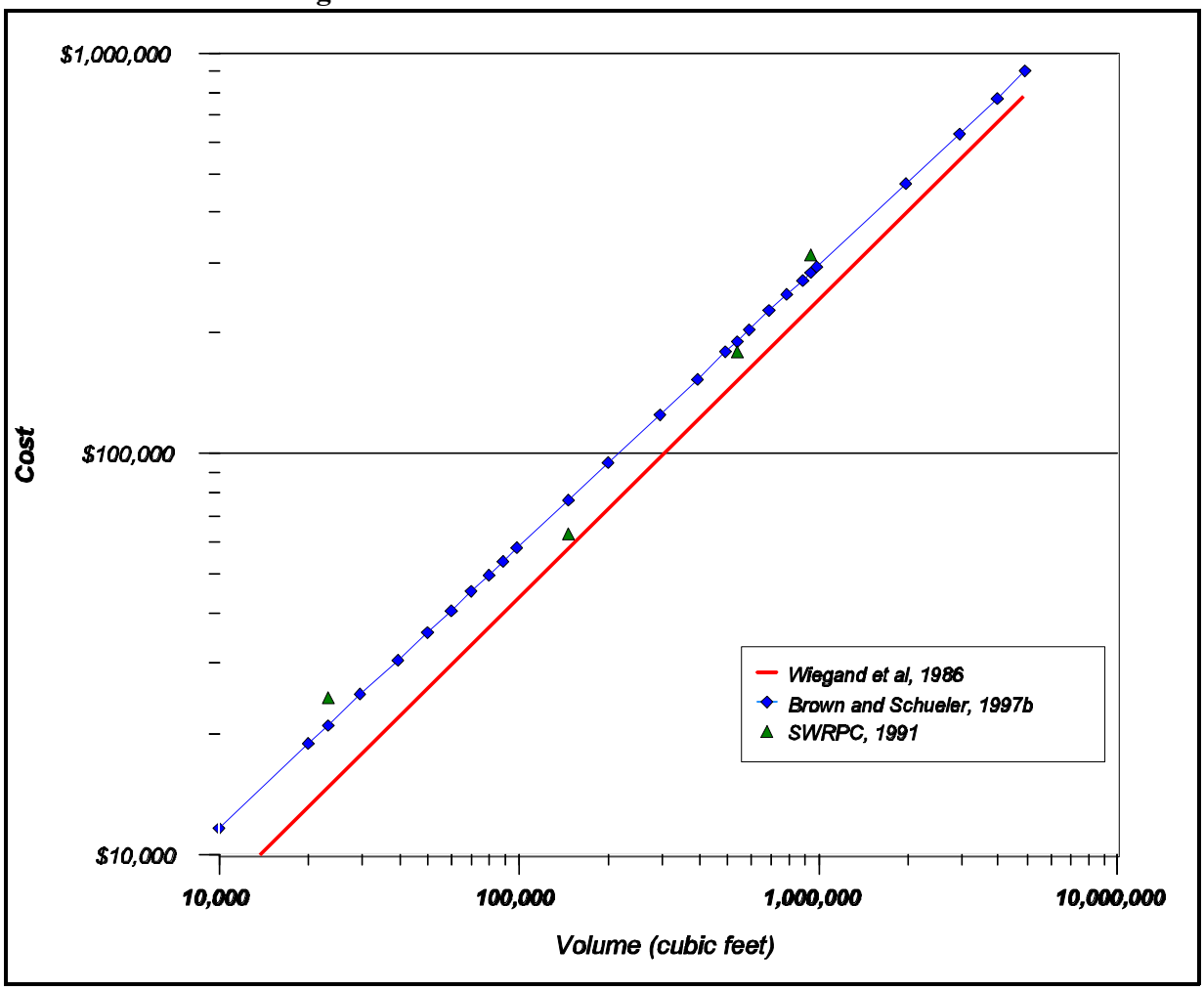

6.1.1.2 Infiltration Practices

Costs for infiltration BMPs are highly variable from site to site, depending on soils and other geotechnical information. Perhaps because of this variability, cost estimates for infiltration trenches have been widely different (Table 6-5; Figure 6-3). Brown and Schueler (1997b) concluded that the Wiegand (1986) equation underestimated cost, partially because of the lack of pretreatment in earlier designs, although they were unable to develop a consistent equation due to a small sample size.

It is difficult to estimate the cost of infiltration basins, mainly due to a lack of recent cost data. The costs estimates for SWRPC are dramatically higher than those estimated by Schueler, 1987 (Figure 6-4). This is largely because the SWRPC document assumes that 50 percent

additional volume is excavated for the spillway, while Schueler uses a retention basin cost equation.

Table 6-5. Base Capital Costs for Infiltration Practices

BMP Type	Cost Equation or Estimate[4]	Costs Included		Source
		Construc-tion	E&S Control	
Infiltration Trenches[1]	$33.7V^{0.63}$	✔		Wiegand et al, 1986
	2V to 4V; average of 2.5V	✔		Brown and Schueler, 1997b
	$4,400: 3-foot deep, 4-foot wide, 100-foot long trench	✔		SWRPC, 1991
	$10,400: 6-foot deep, 10-foot wide, 100-foot long trench			
	3.9V+2,900: 3-foot deep, 100-foot long trench	✔		Modified from SWRPC, 1991
Infiltration Basins[2]	$13.2V^{0.69}$	✔	✔	Schueler, 1987; Modified from Wiegand et al, 1986
	1.3V: 0.25-acre infiltration basin (15,000 cubic feet)	✔		SWRPC, 1991
	0.8V: 1.0-acre infiltration basin (76,300 cubic feet)			
Porous Pavement[3]	50,000A	✔		SWRPC, 1991
	80,000A	✔		Schueler, 1987

1. V for infiltration trenches refers to the treatment volume (cubic feet) within the trench, assuming a porosity of 32%.
2. V for infiltration basins refers to the total basin volume (cubic feet).
3. A is the surface area in acres of porous pavement.
4. Costs presented from SWRPC (1991) are “moderate” costs reported in that study.

Figure 6-3. Infiltration Trench Cost

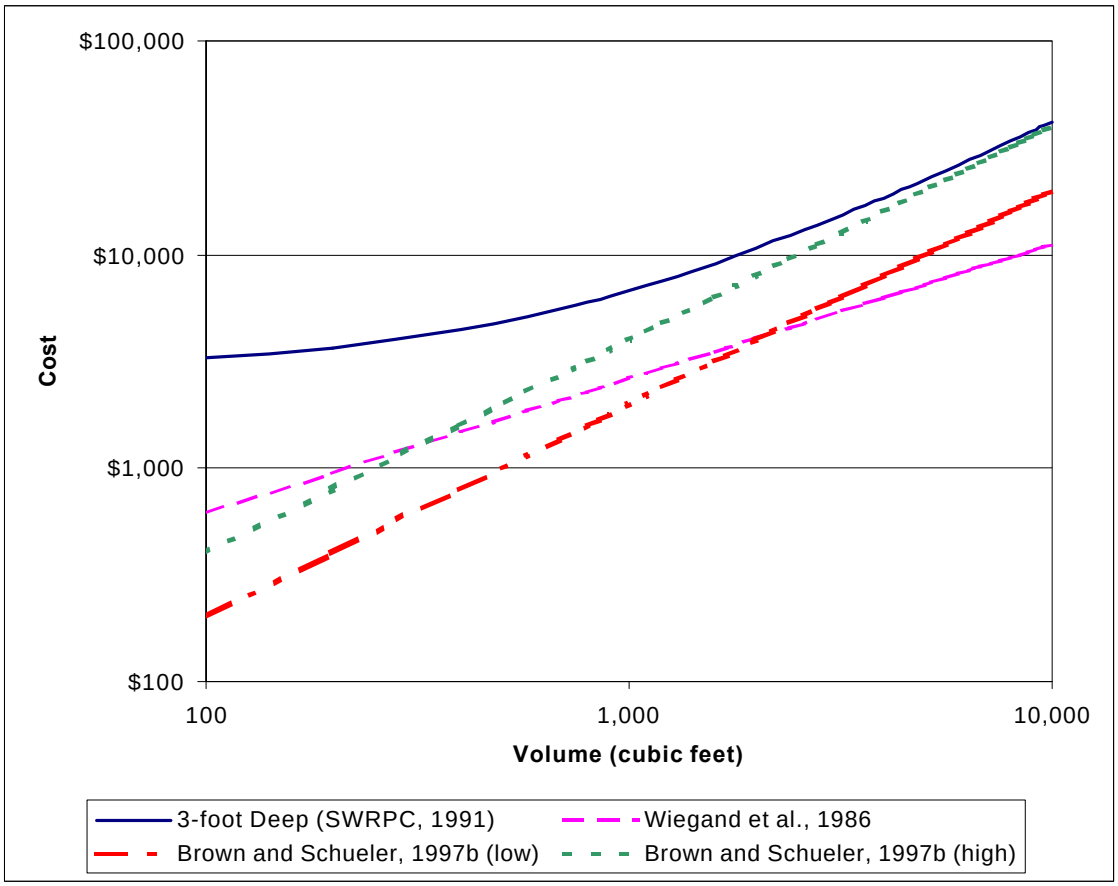

Figure 6-4. Infiltration Basin Construction Cost

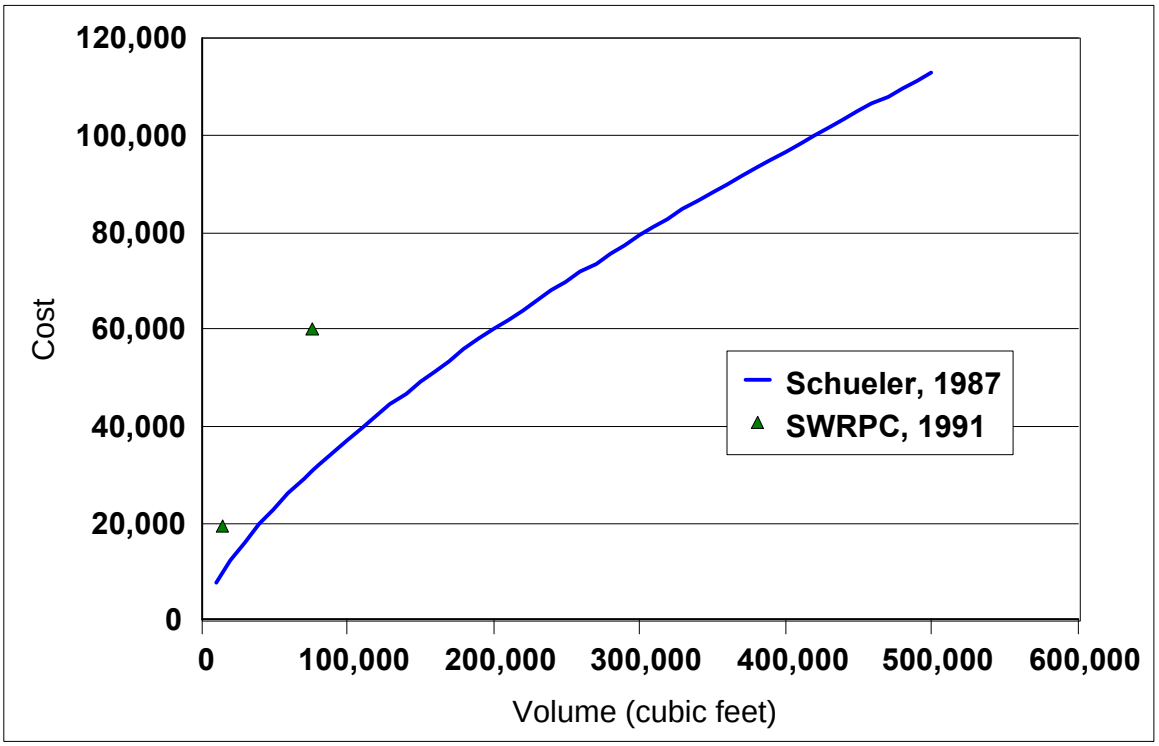

6.1.1.3 Sand Filters

Since sand filters have not been used as long as other BMPs, less information is available on their cost than on most BMPs. In addition, the costs of sand filters vary significantly due to the wide range of design criteria for sand filters (Table 6-6). Brown and Schueler (1997b) were unable to derive a valid relationship between sand filter cost and water quality volume, with costs ranging between $2 and $6 per cubic foot of water quality volume, with a mean cost of $2.50 per cubic foot. The water quality volume includes the pore space in the sand filter, plus additional storage in the pretreatment basin.

Because of the lack of cost data, no equation referencing the economies of scale has been developed. However, it appears that economies of scale do exist. For example, data from Austin indicates that the cost per acre decreased by over 80 percent for a design of a 20-acre drainage area, when compared with a 1-acre drainage area. (Schueler, 1994a).

Table 6-6. Construction Costs for Various Sand Filters

Region (Design)	Cost/Impervious Acre
Delaware	$10,000
Alexandria, VA (Delaware)	$23,500
Austin, TX (< 2 acres)	$16,000
Austin, TX (> 5 acres)	$3,400
Washington, DC (underground)	$14,000
Denver, CO	$30,000-$50,000

Source: Schueler, 1994a

6.1.1.4 Bioretention

Little information is available on the costs of bioretention because it is a relatively new practice. Brown and Schueler (1997b) found consistent construction costs of approximately $5.30 per cubic foot of water quality volume for the construction cost. The water quality volume includes 9 inches above the surface area of the bioretention structure.

6.1.1.5 Vegetative BMPs

The two major types of vegetative BMPs include filter strips and grassed swales (also called “biofilters”). The costs for these BMPs vary, and largely depend on the method used to establish vegetation (Table 6-7).

Table 6-7. Base Capital Costs of Vegetative BMPs

BMP Type	Cost Equation or Estimate[1]	Costs Included		Source
		Construc-tion	E&S Control	
Filter Strips	Existing Vegetation: 0	✔		SWRPC, 1991
	Seed: $13,800/acre			
	Sod: $29,000/acre			
Grassed Channels	25¢ per square foot	✔		SWRPC, 1991

1. Costs presented from SWRPC (1991) are "moderate" costs reported in that study.

6.1.2 Design, Contingency and Permitting Costs

Most BMP cost studies assess only part of the cost of constructing a BMP, usually excluding permitting fees, engineering design and contingency or unexpected costs. In general, these costs are expressed as a fraction of the construction cost (Table 6-8). These costs are generally only estimates, based on the experience of designers.

Table 6-8. Design, Contingency and Permitting Costs

Additional Costs Estimate (Fraction of base construction costs)	Source	Comments
25%	Wiegand et al, 1986	Includes design, contingencies and permitting fees
32%	Brown and Schueler, 1997b	Includes design, contingencies, permitting process and erosion and sediment control

6.1.3 Land Costs

The cost of land is extremely variable both regionally and by surrounding land use. For example, many suburban jurisdictions require open space allocations within the developed site, reducing the effective cost of land for BMPs to zero (Schueler, 1987). On the other hand, the cost of land may far outweigh construction and design costs in ultra-urban settings. For this

reason, some underground BMPs that are relatively expensive to construct may be attractive in this "ultra-urban" setting if sub-surface conditions are suitable (Lundgren, 1996). The land consumed per treatment volume depends largely on how much of the BMP's treatment is underground, and varies considerably (Table 6-9).

Table 6-9. Relative Land Consumption of Storm Water BMPs

BMP Type	Land consumption (% of Impervious Area)
Retention Basin	2-3%
Constructed Wetland	3-5%
Infiltration Trench	2-3%
Infiltration Basin	2-3%
Porous Pavement	0%
Sand Filters	0%-3%
Bioretention	5%
Swales	10%-20%
Filter Strips	100%

Note: Represents the amount of land needed as a percent of the impervious area that drains to the practice to achieve effective treatment.
Source: Claytor and Schueler, 1996

6.1.4 Operation and Maintenance Costs

Maintenance can be broken down into two primary categories: aesthetic/nuisance maintenance and functional maintenance. Functional maintenance is important for performance and safety reasons, while aesthetic maintenance is important primarily for public acceptance of BMPs, and because it may also reduce needed functional maintenance. Aesthetic maintenance is obviously more important for BMPs that are very visible, such as ponds and biofiltration facilities.

In most studies, operation and maintenance (O&M) costs have been estimated as a percentage of base construction costs (Table 6-10). While some BMPs require infrequent, costly

maintenance, others need more frequent but less costly maintenance.[5] Accordingly, selection of appropriate structural BMPs must factor in maintenance cost (and a responsible party to carry out maintenance) to ensure the necessary long-term performance. Typical maintenance activities are included in Table 5-3.

Table 6-10. Annual Maintenance Costs

BMP	Annual Maintenance Cost (% of Construction Cost)	Source(s)
Retention Basins and Constructed Wetlands	3%-6%	Wiegand et al, 1986 Schueler, 1987 SWRPC, 1991
Detention Basins[1]	<1%	Livingston et al, 1997; Brown and Schueler, 1997b
Constructed Wetlands[1]	2%	Livingston et al, 1997; Brown and Schueler, 1997b
Infiltration Trench	5%-20%	Schueler, 1987 SWRPC, 1991
Infiltration Basin[1]	1%-3%	Livingston et al, 1997; SWRPC, 1991
	5%-10%	Wiegand et al, 1986; Schueler, 1987; SWRPC, 1991
Sand Filters[1]	11%-13%	Livingston et al, 1997; Brown and Schueler, 1997b
Swales	5%-7%	SWRPC, 1991
Bioretention	5%-7%	(Assumes the same as swales)
Filter strips	$320/acre (maintained)	SWRPC, 1991

1. Livingston et al (1997) reported maintenance costs from the maintenance budgets of several cities, and percentages were derived from costs in other studies

[5] Maintenance costs can also vary significantly based on a variety of site- and region-specific parameters, therefore the maintenance costs presented in Table 6-10 should be considered only as general guidelines.

6.1.5 Long-Term BMP Costs: Two Scenarios

In order to compare various BMP options, costs were calculated for a 5-acre commercial site and a 38-acre residential site.[6] Construction costs were evaluated using the following steps:

1. *Calculate the water quality volume* (WQ_v).[7]
Using a water quality volume based on a 1-inch storm, the volume is equal to:

$$WQ_v = (.05 + .9I)\,A/12$$

where: WQ_v = Water Quality Volume (Acre-Feet)
I = Impervious Fraction in the Watershed
A = Watershed Area (Acres)

2. *Calculate the detention storage volume.*
Total detention storage was determined using standard peak flow methods (USDA/NRCS, 1986). Detention storage was calculated for a 5-inch storm.

3. *Calculate total volume.*
Many BMPs do not require any detention storage, but for BMPs that do provide flood storage, the total volume is the sum of the water quality and detention volumes calculated in steps 1 and 2.

4. *Determine the construction cost.*
The construction cost for each BMP is determined based on equations described in Section 6.1.1.

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[6] Although these evaluations are useful for comparing potential costs of various structural BMPs, they should not be applied for use in all areas of the country. In addition, the BMPs, selected in these examples and the sizing criteria that the costs were based on should not be considered as recommendations for actual BMP selection and design. They are presented solely for illustrative purposes.

[7] "Water quality volume" refers to the volume of water that the BMP is designed to treat. For example, a BMP may be designed to capture the first inch of runoff from the drainage area. Any volume of rainfall over the first inch would bypass the BMP. Therefore water quality volume for this BMP would be one watershed inch.

6.1.5.1 5-Acre Commercial Development

The following data were used as the basis for the 5-acre commercial development.

Table 6-11. Data for the Commercial Site Scenario

Area (A)	5 acres
Impervious Cover (I)	65%
Water Quality Volume P · Rv · A/12 P = 1" of rainfall Rv = 0.5 + 0.9 (I) A = Drainage Area	0.26 ac-ft
Total Detention Storage (using TR-55 model)	0.74 ac-ft
Total Storage	1.00 ac-ft

These data were then used to compare various BMP options (Table 6-12). Grassed swales and filter strips were not included in this analysis because, although they do improve water quality, they are typically used only in combination with other BMPs in a new development area. Again, it is important to note that the cost of land is not included in this calculation. Although retention basins are the least expensive option on an annual basis, the cost of land may drive designs to less space-consumptive BMPs, such as sand filters or bioretention systems.

Table 6-12. BMP Costs for a Five Acre Commercial Development

BMP Type	Construction Cost Equation	Construction Cost	Typical Design, Contingency & Other Capital Costs (30% of Construction Costs)	Annual Maintenance Costs (% of Construction, $)	Notes	Sources
Retention Basin	$18.5V_t^{0.70}$	$32,700	$9,810	5%; $1,640	Much of the cost associated with this BMP is the extra storage to provide flood control and channel protection. Ponds are very reliable.	a, b, c, d, e
Infiltration Trench	$3.9WQ_v$ +2,900	$47,100	$14,100	12%; $5,650	Although infiltration trenches are designed to last a long time, they need to be inspected and rebuilt if they become clogged.	c, d, e
Infiltration Basin	$1.3WQ_v$	$14,700	$4,410	8%; $1,180	Infiltration basins require careful siting and design to perform effectively..	b, c, d, e
Sand Filter	$4WQ_v$	$45,200	$13,600	12%; $5,420	Sand filters require frequent maintenance in order to function long-term.	a, e, f
Bioretention	$5.30WQ_v$	$60,000	$18,000	6%; $3,600	Bioretention is a relatively new BMP. Little is known about its long-term performance.	a, d

1. WQv = Water Quality Volume, cu. ft. 2. V_t = Total Volume, cu. ft.
3. Sand filter volume was estimated at 4WQv, which is slightly high, to account for the relatively small drainage area.

a. Brown and Schueler, 1997b b. Wiegand et al, 1986 c. Schueler, 1987 d. SWRPC, 1991 e. US EPA, 1993a f. Livingston et al, 1997

6.1.5.2 38-Acre Residential Development

The following data were used as the basis for the 38-acre residential development.

Table 6-13. Data for the Residential Site Scenario

Area (A)	38 acres
Impervious Cover (I)	36%
Water Quality Volume	1.1 ac-ft
Total Detention Storage (using TR-55 model)	2.8 ac-ft
Total Storage	3.9 ac-ft

The same analysis conducted for the commercial site was repeated for the larger site (Table 6-14). Bioretention and infiltration systems were not included in this analysis, because these BMPs are best applied on smaller sites. The costs of swales and filter strips were also not included, although they could be effectively used in combination with retention systems to provide pretreatment.

6.1.6 Adjusting Costs Regionally

The cost data in these examples can be adjusted to specific zones of the country using the regional cost adjustment factors in Table 6-3. For example, if costs for Rainfall Zone 1 were needed, the data in Tables 6-12 or 6-14 would be multiplied by 1.12.

In addition, design variations in different regions of the country may cause prices to be changed. For example, wetland and wet ponds may be restricted in arid regions of the country. Furthermore, while retention basins are used in semi-arid regions, they usually incorporate design variations to improve their performance (Saunders and Gilroy, 1997). In cold regions, BMPs may need to be adapted to account for snowmelt treatment, deep freezes and road salt application (Oberts, 1994; Caraco and Claytor, 1997), which will cause additional changes in BMP costs.

Table 6-14. BMP Costs for a Thirty-Eight Acre Residential Development

BMP Type	Construction Cost Equation	Construction Cost	Design, Contingency and other Capital Costs (30% of Construction)	Annual Maintenance Costs (% of Construction; $)	Notes	Sources
Retention Basin	$18.5V_t^{0.70}$	$84,800	$25,400	5%; $4,240	Pond systems are relatively easy to apply to large sites.	a, b, c, d, e
Sand Filter	$2WQ_v$	$95,800	$28,700	12%; $11,500	Although the sand filter is used in this example, some evidence suggests that sand filters may be subject to clogging if used on a site that drains a relatively pervious drainage area such as this one.	a, e, f

1. WQv = Water Quality Volume, cu. ft. 2. Vt = Total Volume, cu. ft.
3. Sand filter volume was estimated at 2V, which is slightly low, to account for the relatively large drainage area

a. Brown and Schueler, 1997b b. Wiegand et al, 1986 c. Schueler, 1987 d. SWRPC, 1991 e. US EPA, 1993a f. Livingston et al, 1997

6.2 Non-Structural BMP Costs

Non-structural BMPs are management measures that prevent degradation of water resources by preventing pollution at the source, rather than treating polluted runoff. Non-structural practices include a variety of site-specific and regional practices, including: street sweeping, illicit connection identification and elimination, public education and outreach, land use modifications to minimize the amount of impervious surface area, waste collection and proper materials storage. While non-structural practices play an invaluable role in protecting surface waters, their costs are generally not as easily quantified as for structural BMPs. This is primarily because there are no "design standards" for these practices. For example, the cost of a public education program may vary due to staff size. However, it is possible to identify costs associated with specific components of these programs based on past experience.

6.2.1 Street Sweeping

The costs of street sweeping include the capital costs of purchasing the equipment, plus the maintenance and operational costs to operate the sweepers, as well as costs of disposing the materials that are removed. Both equipment and operating costs vary depending on the type of sweeper selected. There are several different options for sweepers, but the two basic choices are mechanical sweepers versus vacuum-assisted sweepers. Mechanical sweepers use brushes to remove particles from streets. Vacuum-assisted dry sweepers, on the other hand, use a specialized brush and vacuum system in order to remove finer particles. While the equipment costs of mechanical sweepers are significantly higher, the total operation and maintenance costs of vacuum sweepers can be lower (Table 6-15).

Table 6-15. Street Sweeper Cost Data

Sweeper Type	Life (Years)	Purchase Price ($)	Operation and Maintenance Costs ($/curb mile)	Sources
Mechanical	5	75,000	30	Finley, 1996; SWRPC, 1991
Vacuum-assisted	8	150,000	15	Satterfield, 1996; SWRPC, 1991

Using these data, the cost of operating street sweepers per curb mile were developed, assuming various sweeping frequencies (Table 6-16). The following assumptions were made to conduct this analysis:

- One sweeper serves 8,160 curb miles during a year (SWRPC, 1991).

- The annual interest rate is 8 percent.

Table 6-16. Annualized Sweeper Costs ($/curb mile/year)

Sweeper Type	Sweeping Frequency					
	Weekly	Bi-weekly	Monthly	Four times per year	Twice per year	Annual
Mechanical	1,680	840	388	129	65	32
Vacuum-Assisted	946	473	218	73	36	18

Modified from Finley, 1996; SWRPC, 1991; and Satterfield, 1996

6.2.2 Illicit Connection Identification and Elimination

One source of pollutants is direct connections or infiltration to the storm drain system of wastewaters other than storm water, such as industrial wastes. These pollutants are then discharged through the storm drain system directly to streams without receiving treatment. These illicit connections can be identified using visual inspection during dry weather or through the use of smoke or dye tests. Using visual inspection techniques, illicit connections can be identified for between $1,250 and $1,750 per square mile (Center for Watershed Protection, 1996).

6.2.3 Public Education and Outreach

Public education programs encompass many other more specific programs, such as fertilizer and pesticide management, public involvement in stream restoration and monitoring projects, storm drain stenciling, and overall awareness of aquatic resources. All public education programs seek to reduce pollutant loads by changing people's behavior. They also make the public aware of and gain support for programs in place to protect water resources. Most municipalities have at least some educational component as a part of their program. A recent survey found that 30 of the 32 municipal storm water programs surveyed (94 percent) incorporate an education element and 11 programs (34 percent) mandated this element in law or regulation (Livingston et al, 1997).

The City of Seattle, with a population of approximately 535,000, has a relatively aggressive education program, including classroom and field involvement programs. The 1997 budget for some aspects of the program is included in Table 6-17. Although this does not necessarily reflect typical effort or expenditures, it does provide information on some educational expenditures. These data represent only a portion of the entire annual budget.

Table 6-17. Public Education Costs in Seattle, Washington

Item	Description	1997 Budget
Supplies for Volunteers	Covers supplies for the Stewardship Through Environmental Partnership Program	$17,500
Communications	Communications strategy highlighting a newly formed program within the city	$18,000
Environmental Education	Transportation costs from schools to field visits (105 schools with four trips each)	$46,500
Education Services / Field Trips	Fees for student visits to various sites	$55,000
Teacher Training	Covers the cost of training classroom teachers for the environmental education program	$3,400
Equipment	Equipment for classroom education, including displays, handouts, etc.	$38,800
Water Interpretive Specialist: Staff	Staff to provide public information at two creeks	$79,300
Water Interpretive Specialist: Equipment	Materials and equipment to support interpretive specialist program	$12,100
Youth Conservation Corps	Supports clean-up activities in creeks	$210,900

Source: Washington DOE, 1997

Some unit costs for educational program components (based on two different programs) are included in Table 6-18.

Table 6-18. Unit Program Costs for Public Education Programs

Item	Cost	Source
Public Attitude Survey	$1,250-$1,750 per 1,000 households	Center for Watershed Protection, 1996
Flyers	10-25¢/ flyer	Ferguson et al, 1997
Soil Test Kit*	$10	Ferguson et al, 1997
Paint	25-30¢/SD Stencil	Ferguson et al, 1997
Safety Vests for Volunteers	$2	Ferguson et al, 1997

* Includes cost of testing, but not sampling.

Although public education has the intended benefit of raising public awareness, and therefore creating support of environmental programs, it is difficult to quantify actual pollutant reductions associated with education efforts. Public attitudes can be used as a gauge of how these programs perform, however. In Prince George's County, Maryland a public survey was used in combination with modeling to estimate pollutant load reductions associated with public education (Smith et al, 1994; Claytor, 1996; Figure 6-5). An initial study was conducted to estimate pollution from field application of fertilizers, and use of detergents, oil and antifreeze. Pollutant reductions were then completed assuming that 70 percent of the population complied with recommendations of the public education program. A follow-up survey was used to assess the effectiveness of the program. Although insufficient data were available to support a second model run, a follow-up survey indicated that educational programs influenced many citizen behaviors, such as recycling. They were unsuccessful, however, at changing the rate at which citizens apply lawn fertilizers.

Figure 6-5. Changes in Pollutant Load Associated with a Public Education Program Based on a Public Survey

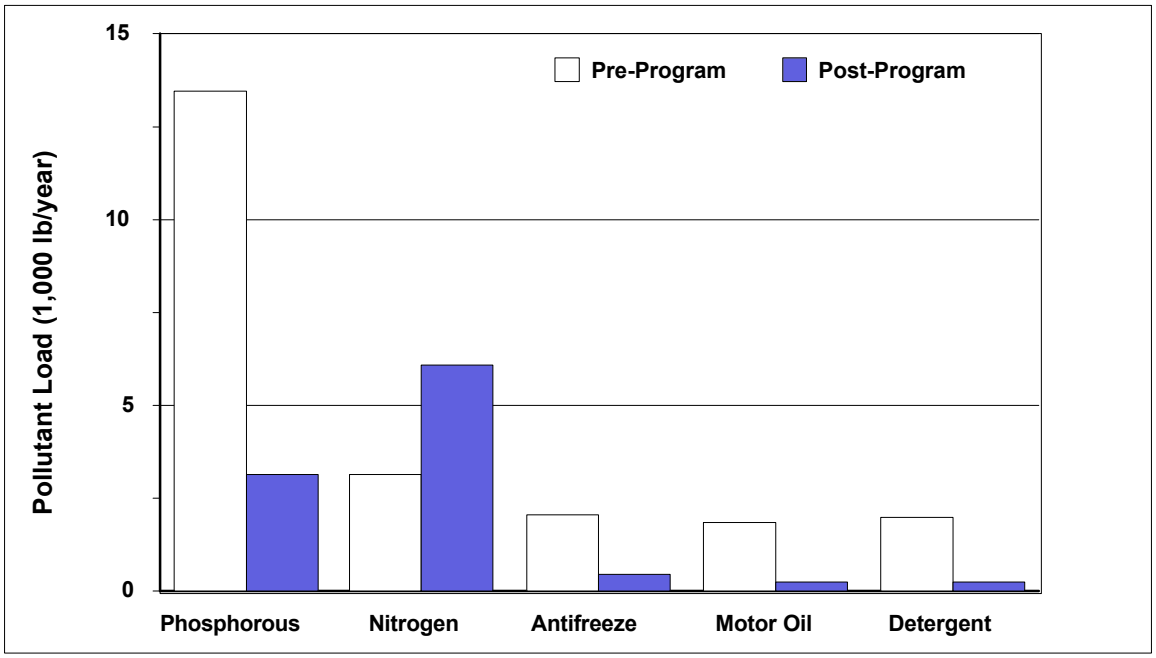

Source: Claytor, 1996

6.2.4 Land Use Modifications

One of the most effective tools to reduce the impacts of urbanization on water resources is to modify the way growth and development occurs across the landscape. At the jurisdictional or regional level, growth can be managed to minimize the outward extension of development. Jurisdictions can direct growth away from environmentally sensitive areas using such techniques as open space preservation, re-zoning or the transfer of development rights. At the site level, the nature of development can be modified to reduce the impacts of impervious cover at individual development projects through techniques such as reduced street widths, clustered housing, smaller parking lots, and incorporation of vegetative BMPs into site design. While there are legal fees associated with changing both local and regional zoning codes, data suggest that concentrating development and minimizing impervious cover at the site level can actually reduce construction costs to both developers and local governments.

By concentrating development near urban areas, the capital costs of development can be lowered substantially due to existing infrastructure and other public services. With conventional development patterns, the cost of servicing residential developments exceeds the tax revenues from these developments by approximately 15 percent (Pelley, 1997). By encouraging growth to occur in a compact region, rather than over a large area, these capital costs can be reduced substantially (Table 6-19).

Table 6-19. Comparison of Capital Costs of Municipal Infrastructure for a Single Dwelling Unit

Development Pattern	Capital Costs[1] (1987 Dollars)
Compact Growth[2]	$18,000
Low-Density Growth (3 units/acre)	$35,000
Low-Density Growth, 10 Miles from Existing Development[3]	$48,000

Notes
1. Costs include streets (full curb and gutter), central sewers and water supply, storm drainage and school construction.
2. Assumes housing mix of 30% single family units and townhouses; 70% apartments.
3. Assumes housing is located 10 miles from major concentration of employment, drinking water plant and sewage treatment plant.

Source: Frank, 1989

Savings can also be realized at the site level by reducing the costs of clearing and grading, paving and drainage infrastructure. A recent study compared conventional development plans with alternative options designed to reduce the impacts of development on the quality of water resources. The cost savings realized through these alternative options are summarized in Table 6-20. In all site designs, the road width was reduced from 28 feet to 20 feet, lot sizes were reduced or reconfigured to consume less open space, and on-site storm water treatment was provided.

Table 6-20. Impervious Cover Reduction and Cost Savings of Conservation Development

Location	Techniques Used	Impervious Cover Reduction	Cost Savings
Sussex County, DE	1. Reduced street widths 2. Smaller lots 3. Cluster development	38%	52%
New Castle County, DE	4.Houses clustered into attached units around courtyards	6%	63%
Kent County, DE	5. Reduced road and driveway widths 6. Minimum disturbance boundary	24%	39%

Source: Delaware DNREC, 1997

6.2.5 Oil and Hazardous Waste Collection

Providing a central location for the disposal of oil or hazardous wastes protects water quality by offering citizens an alternative to disposing of these materials in the storm drain. Disposal costs vary considerably depending on the size of the program, and what types of wastes are collected. One study estimated the capital costs at approximately $30,000, with about $12,000 maintenance for a used oil collection recycling program in a typical MS4 (US EPA, 1998b). This estimate was based on data from the Galveston Bay National Estuary Program. Data from the City of Livonia, Michigan indicates that the cost of hazardous waste disposal averages about $12 per gallon (Ferguson et al, 1997).

6.2.6 Proper Storage of Materials

Proper storage of materials can prevent accidental spills or runoff into the storm drain. The design of storage structures varies depending on the needs of the facility. There are also training costs associated with the proper storage of materials. Typical cost estimates, based on standard construction data, are $6 to $11 per square foot for pre-engineered buildings and $3.40 to $5 per square foot for a 6-inch thick concrete slab (Ferguson et al, 1997).

6.3 Benefits of Storm Water BMPs

Although it is possible to estimate the economic benefits of water quality improvement (US EPA, 1983a), it is difficult to create a "balance sheet" of economic costs and benefits for individual BMPs. Ideally, benefits analysis would specify and quantify a chain of events: pollutant loading reductions achieved by the BMP; the physical-chemical properties of receiving streams and consequent linkages to biologic/ecologic responses in the aquatic environment; and human responses and values associated with these changes. However, the necessary data to conduct such an analysis does not currently exist. Instead, the benefits can be outlined in terms of: 1) effectiveness at reducing pollutant loads; 2) direct water quality impacts; and 3) economic benefits or costs.

6.3.1 Storm Water Pollutant Reduction

A primary function of storm water BMPs is to prevent pollutants from reaching streams and rivers. While all BMPs achieve this function to some extent, there is considerable variability between different types of BMPs. The extent of benefits from non-structural BMPs may be more speculative, partly because their ability to influence human behavior is difficult to predict.

A detailed discussion of pollution removal efficiencies for individual structural BMPs is provided in Section 5.5 of this report, so only non-structural BMPs will be reviewed in this section. Unlike structural BMPs, it is generally not possible to associate specific pollutant removal rates with non-structural BMPs, with the exception of street sweeping (Satterfield, 1996). However, some non-structural BMPs are targeted at specific pollutants. Table 6-21 outlines non-structural BMPs believed by designers to be the most effective for removing specific types of pollutants.

Table 6-21. Non-Structural BMPs Suited to Controlling Various Pollutants

Pollutant	Appropriate BMPs	
Solids	Street Sweeping	Land Use Modifications
Oxygen-Demanding Substances	Street Sweeping Education: Storm Drain Stenciling Land Use Modifications	Education: Pet Scoop Ordinance Illicit Connections Eliminated
Nitrogen and Phosphorus	Street Sweeping Education: Pet Scoop Ordinance Land Use Modifications Proper Materials Handling	Illicit Connections Eliminated Education: Lawn Care Materials Storage and Recycling
Pathogens	Illicit Connections Eliminated Land Use Modifications	Education: Pet Scoop Ordinance
Petroleum Hydrocarbons	Street Sweeping Education: Storm Drain Stenciling Proper Materials Handling	Illicit Connections Eliminated Materials Storage and Recycling Land Use Modifications
Metals	Street Sweeping Education: Storm Drain Stenciling Proper Materials Handling	Illicit Connections Eliminated Materials Storage and Recycling Land Use Modifications
Synthetic Organics	Illicit Connections Eliminated Education: Storm Drain Stenciling Proper Materials Handling	Education: Lawn Care Materials Storage and Recycling Land Use Modifications
Temperature	Land Use Modifications	
pH	Illicit Connections Eliminated Proper Materials Handling	Materials Storage and Recycling Land Use Modifications

6.3.1.1 Solids

Both highway runoff and soil erosion can be sources of solids in urban runoff. Street sweeping can reduce solids in urban runoff by removing solids from roadways and parking lots before they can be detached and transported by runoff. The benefits associated with street sweeping depend largely on the climate. In arid regions, airborne pollutants are a serious concern, and there is a long time between storms for pollutants to accumulate[8]. In humid regions, on the other hand, frequent rainfall makes the use of sweepers between storms less practical. In colder

[8] Therefore, regular sweeping programs in these areas can potentially remove large amounts of solids from roadways.

regions, sweeping is recommended twice per year: once in the fall after leaves fall and once in the spring in anticipation of the spring snowmelt (MPCA, 1989).

Modifying land use to preserve open space and to limit the impervious cover can also reduce solids loads. By preserving open space and maintaining vegetative cover, the amount of land cleared is limited, thus reducing the erosion potential during construction. Natural vegetated cover has less than one percent of the erosion potential of bare soil (Wischmeier and Smith, 1978).

6.3.1.2 Oxygen-Demanding Substances

Since the primary oxygen-demanding substances are organic materials (such as leaves and yard waste), BMPs that target these substances are best suited to reducing the oxygen demand in storm water. BMPs that reduce sediment loads often also reduce the loads of the organic material associated with that sediment. Pet waste is also a significant source of organic pollutants, and its control can reduce the loads of oxygen demanding substances in urban runoff. Finally, programs geared at reducing illegal dumping and eliminating illicit connections and accidental spills of materials can reduce the oxygen demand associated with these sources.

6.3.1.3 Nitrogen and Phosphorus

Nitrogen and phosphorus are prevalent in urban and suburban storm water. Nitrogen and phosphorus are natural components of soil, and can enter runoff from storm-induced erosion. Additional sources include the use of fertilizer on urban lawns and airborne deposition. Street sweeping can reduce nutrient loads by removing deposited nutrients from the street surface. Programs that focus on lawn chemical handling or replacing turf with natural vegetation also act to reduce nutrient loading. Finally, programs that educate the public or industry about illegal dumping to storm drains can result in reducing the nutrient loads associated with dumping chemicals that have high nutrient content. Energy conservation and reduced automobile use can reduce airborne nitrogen deposition.

6.3.1.4 Pathogens

Pathogens, including protozoa, viruses and bacteria, are prevalent in urban runoff. Bacteria can be found naturally in soil, and the urban landscape can produce large loads of bacteria that can be carried by runoff. Dogs in particular can be a significant source of pathogens. Thus, pet scoop ordinances and associated education are effective tools at reducing bacteria in urban runoff. Illicit connections of sewage may also be a source of pathogens, therefore eliminating these sources can effectively reduce pathogens in runoff.

6.3.1.5 Petroleum Hydrocarbons

Petroleum hydrocarbons are present in many chemicals used in the urban environment, from gasoline to cleaning solvents. Since roadways are a major source of petroleum pollution, scheduled street sweeping can be used to remove hydrocarbon build-up prior to storm water runoff. Programs geared at preventing spills of chemicals to the storm drain, either through deliberate or accidental dumping, are effective at reducing hydrocarbon loads. Modifying the way land is developed can reduce hydrocarbon loads on both a site and a regional level by reducing the use of the automobile and replacing impervious surfaces with natural vegetation.

6.3.1.6 Metals

Metals sources in urban runoff include automobiles and household chemicals, which can contain trace metals. Street sweeping can reduce metals loads deposited on the road surface. In addition, programs that focus on reducing dumping and proper material storage can reduce accidental or purposeful spills of chemicals with trace metals to the storm drain system. Finally, modifying land use can reduce metals loads by reducing impervious cover, thus reducing total runoff containing metals, and reducing the roadway length, which is often a source of runoff containing metals.

6.3.1.7 Synthetic Organics

Much of the source of synthetic organics in the urban landscape is household cleaners and pesticides. Thus, education programs geared at reducing chemical and pesticide use, and proper storage and handling of these chemicals, can reduce their concentrations in urban runoff. In addition, land use modifications that replace turf with natural vegetation will reduce pesticide use.

6.3.1.8 Temperature

Most non-structural BMPs are not able to prevent the increase in temperature associated with urban development. One exception is the use of site designs that more closely mimic the natural hydrograph by reducing impervious cover and encouraging infiltration.

6.3.1.9 pH

The primary source of low pH in urban runoff is acid rain, and most non-structural BMPs are not used to treat this problem. BMPs that focus on proper materials handling and disposal can prevent dumping of chemicals with extremely high or low pH, but this is generally not a major problem in urban watersheds.

6.3.2 Hydrological and Habitat Benefits

As reviewed in Chapter 4, one major impact of urbanization is induced through the conversion of farmland, forests, wetlands, and meadows to rooftops, roads, and lawns. This process of urbanization has a profound influence on surface water hydrology, morphology, water quality, and ecology (Horner et al, 1994). In this section, the hydrologic and related habitat impacts are briefly discussed as well as the potential benefits that can be achieved by managing storm water runoff using structural and non-structural BMPs.

Many of these impacts can be directly or indirectly related to the change in the hydrologic cycle from a natural system to the urban system. Figure 4-1 illustrates the fundamental effects that occur along with the development process. In the natural setting, very little annual rainfall is converted to runoff and about half is infiltrated into the underlying soils and water table. This water is filtered by the soils, supplies deep water aquifers, and helps support adjacent surface waters with clean water during dry periods. In the urbanizing conditions, less and less annual rainfall is infiltrated and more and more volume is converted to runoff. Not only is this runoff volume greater, it also occurs more frequently and at higher magnitudes. The result is that less water is available to streams and waterways during dry periods and more flow is occurring during storms. A recent study in the Pacific Northwest found that the ratio of the two-year storm to the baseflow discharge increased more than 20 percent in developed sub-watersheds (impervious cover approximately 50 percent) versus undeveloped sub-watersheds (May et al, 1997).

As a result of urbanization, runoff from storm events increases and accelerates flows, increases stream channel erosion, and causes accelerated channel widening and down cutting (Booth, 1990). This accelerated erosion is a significant source of sediment delivery to receiving waters and also can have a smothering effect on stream channel substrates, thereby eliminating aquatic species habitat. As a result, aquatic habitat is often degraded or eliminated in many urban streams. The results are that aquatic biological communities are among the first to be impacted and/or simplified by land conversion and resulting stream channel modifications. Subsurface drainage systems which frequently serve urbanized areas also contribute to the problem, by bypassing any attenuation achieved through surface flows over vegetated areas.

A unifying theme in stream degradation is this direct link with impervious cover. Impervious cover, or imperviousness, is defined as the sum of roads, parking lots, sidewalks, rooftops, and other impermeable surfaces in the urban landscape. This unifying theme can be used to guide the efforts of the many participants in watershed protection. Figure 6-6 visually illustrates this trend in degradation for a series of small headwater streams in the Mid-Atlantic Piedmont. Here, four stream segments, each with approximately the same drainage area, and subjected to the same physiographic conditions, respond to the effects of increased impervious cover. Similar results have been observed in the Southern United States with studies in Virginia, North Carolina and Georgia evidencing this same decline in fish and macroinvertebrate populations with increasing impervious cover (Crawford and Lenant, 1989; Weaver and Garman, 1994; Couch et al, 1996)

Figure 6-6. Effects of Impervious Cover on Stream Quality

Sensitive Stream ➜
(Impervious Cover ≤10%)
- *Stable Channel*
- *Excellent Biodiversity*
- *Excellent Water Quality*

🡐 Impacted Stream
(Impervious Cover 10-20%)
- *Channel Becoming Unstable*
- *Fair to Good Biodiversity*
- *Fair to Good Water Quality*

Restorable Stream ➜
(Impervious Cover ≈40%)
- *Highly Unstable Channel*
- *Poor Biodiversity*
- *Poor to Fair Water Quality*

Non-Supporting Stream ➜
(Impervious Cover ≈65%)
- *Poor to No Biodiversity*
- *Poor Water Quality*

To mitigate this impact, many local and state governments have required the installation of storm water management detention basins to attenuate this increased runoff volume. It is important to recognize that the change in hydrology caused by urbanization affects more than just a single storm return interval (e.g., the two-year event). Urbanization shifts the entire "rainfall frequency spectrum" (RFS) to a higher magnitude. As illustrated in Figure 6-7, the most significant change is to the smallest, most frequent storms that occur several times per year. In the undeveloped condition, most of the rainfall from these events is infiltrated into the underlying soil. In the developed condition, much of this rainfall is runoff. As the storm return interval increases, the difference between the undeveloped and developed condition narrows. Many jurisdictions only require management of specific storms, usually the two, ten and sometimes, the one hundred year events. The two-year storm is probably the most frequently used control point along this frequency spectrum. Hence, while BMPs may do a fairly good job of managing these specific control points, there have been very few locations across the country that have specific criteria in place to manage storm water over a wide range of runoff events. Claytor and Schueler (1996) describe the RFS as:

> ...classes of frequencies often broken down by return interval, such as the two year storm return interval. Four principal classes are typically targeted for control by stormwater management practices. The two smallest, most frequent classes [Zones 1 and 2] are often referred to as water quality storms, where the control objectives are groundwater recharge, pollutant load reduction, and to some extent control of channel erosion producing events. The two larger classes [Zones 3 and 4] are typically referred to as quantity storms, where the control objectives are channel erosion control, overbank control, and flood control.

Figure 6-7. Stormwater Control Points Along the Rainfall Frequency Spectrum

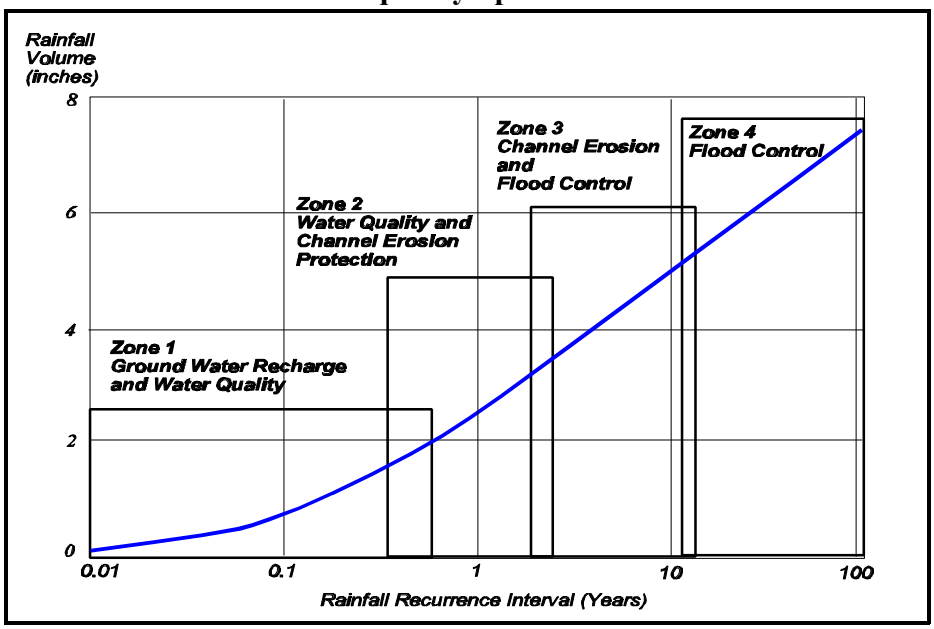

Source: Claytor and Schueler, 1996

One recent study by MacRae (1997) concluded that stream channels below storm water detention basins designed to manage the two year storm experienced accelerated erosion at three times the pre-developed rate. His findings went on to suggest that the streams were eroding at much the same rate as if no storm water controls existed.

Other jurisdictions have employed an additional level of detention storage above and beyond that required for the two year storm. This concept is often called “extended detention” (ED). McCuen and Moglen (1988) conducted a theoretical analysis of this design criteria based on sediment transport capacity of the pre-developed channel versus that with ED control. This study found ED could produce an 85 percent reduction in the pre-developed peak flow of the two-year storm. What it did not analyze, however, was the erosion potential over a wide range of storms. MacRae (1993) suggested a different storm water control criterion called “distributed runoff control” (DRC). Here, channel erosion is minimized if the erosion potential along a channel's perimeter is maintained constant with pre-developed levels. This is accomplished by providing a non-uniform distribution of the storage-discharge relationship within a BMP, where multiple control points are provided along the runoff frequency spectrum.

6.3.2.1 Benefits of BMPs to Control Hydrologic Impacts

Numerous prior studies have documented the degradation of aquatic ecosystems of urban and suburban headwater streams. As stated above, in general, the studies point to a decrease in stream quality with increasing urbanization. Unfortunately, the benefits of BMPs to protect streams from hydrologic impacts have only recently been investigated and only for a few studies.

Maxted and Shaver (1997), Jones et al (1997), and Horner et al (1997) attempted to isolate the potential beneficial influence of local storm water best management practices on the impervious cover/stream quality relationship. Horner examined the possible influence of stream-side management on stream quality as a function of urbanization. Coffman et al (1998) recently presented data on the potential hydrologic benefits of alternative land development techniques. Called the “Low Impact Development Approach,” this methodology attempts to mimic pre-developed hydrology by infiltrating more rainfall at the source, increasing the flow path and time of concentration of the remaining runoff, and providing more detention storage throughout the drainage network, as opposed to a one location at the end of the pipe.

The preliminary findings of Maxted and Shaver, and Jones et al, suggest that, for the BMPs examined, stream quality (as measured by a limited group of environmental indicators) cannot be sustained when compared to reference stream conditions. Jones assessed several BMPs by conducting biomonitoring (fish and macroinvertebrate sampling) above and below BMPs and comparing them to a reference watershed. He found that the biological community tended to be degraded immediately below BMPs as compared to the reference watersheds. One major flaw in the study was the lack of analysis in developed watersheds without BMPs. This would have compared the influence of BMPs on the aquatic community as compared to no BMPs.

Maxted and Shaver examined eight sub-watersheds with and without BMPs. Their study also concluded that BMPs did not adequately mitigate the impacts of urbanization once watershed impervious reached 20 percent cover. While this study was useful in defining the cumulative impacts of BMPs on watersheds, several critical questions remain. First, since no sub-watersheds with less than 22 percent impervious cover were analyzed, little is known about BMP ability to protect the most sensitive species seen in less developed watersheds. Data for sub-watersheds with BMPs was collected approximately three years after data for the sub-watersheds without BMPs, so climatic/seasonal constraints may have affected the outcome as much, or more than the BMPs themselves.

Horner et al (1997) evaluated several sub-watersheds, with varying levels of impervious cover, but only tangentially related the effectiveness of BMPs to protecting stream quality. Horner found that at relatively low levels of urbanization (approximately 4 percent impervious area) the most sensitive aquatic biological communities (e.g., salmonids) were adversely affected, and stream quality degradation (as measured by a several indicators) continued at a relatively continuous rate with increasing impervious area. Horner's study demonstrates a link between urbanization and stream quality in the Puget Sound region, but since the effects of BMPs were not directly assessed, the question of whether BMPs could "raise" these thresholds could not be answered.

Horner did find a positive relationship between stream quality and riparian buffer width and quality. Here, the otherwise direct relationship of degrading stream quality with increasing impervious cover was positively altered where good riparian cover existed. In other words, increasing the buffer width and condition tended to keep the stream systems healthier.

Coffman demonstrated techniques for maintaining pre-developed hydrologic parameters by replicating the curve number and time of concentration. The analysis indicated the amount of storage required on-site to accommodate the change in site imperviousness. The benefits of this type of development, while not yet fully monitored in a field study, are likely to include increased groundwater recharge, reduced channel erosion potential, and decreased flood potential.

One major hydrologic benefit of storm water management structures is the ability to mitigate for the potential flooding associated with medium to larger storms. Storm water detention and retention facilities have been applied in many parts of the country since about 1970 (Ferguson and Debo, 1990). These facilities include wet and dry basins, as well as rooftop and parking lot detention and underground storage vaults. These *storage facilities* attempt to reduce flooding downstream from developments by reducing the rate of flow out of the particular structure being used. Although the rate of flow is reduced, the volume of flow is generally not reduced. Instead, this volume is delivered downstream at a slower rate, and stretched out over a longer time. With the exception of properly design wet ponds, these structures do not provide any water quality benefit beyond the hydrologic modifications. This technique has proved to be a successful method of suppressing flood peaks when properly applied on a watershed-wide basis.

6.3.3 Human Health Benefits

Storm water can impact human health through direct contact from swimming or through contamination of seafood. Most human health problems are caused by pathogens, but metals and synthetic organics may cause increased cancer risks if contaminated seafood are consumed. Mercury, PCBs, and some pesticides have been linked to human birth defects, cancer, neurological disorders and kidney ailments. The risks may be greater to sensitive populations such as children or the elderly. BMPs that reduce pathogens, metals and synthetic organics will help to limit these health risks.

Economic benefits of avoiding human health problems can include swimming and recreation costs, as well as saved medical costs. One study in Saginaw, Michigan estimated that the swimming and beach recreation benefits associated with a CSO retention project exceeded seven million dollars (US EPA, 1998c). As another example, EPA initially estimated that proposed Phase II storm water controls would reduce the cost of shellfish-related illnesses by between $73,000 and $300,000 per year (US EPA, 1997d).

6.3.4 Additional and Aesthetic Benefits

Storm water BMPs can be perceived as assets or detriments to a community, depending on their design. Some examples of benefits include: increased wildlife habitat, increased property values, recreational opportunities, and supplemental uses. Detriments include: mosquito breeding, reduced property values, less developable land and safety concerns. These detriments can be mitigated through careful design.

6.3.4.1 Property Values and Public Perception

The impacts of BMPs on property values are site-specific. The presence of a structural BMP can affect property values in one of three ways: increase the value, decrease the value, or have no impact. BMPs that are visually aesthetic and safe for children can lead to increased property values. A practice becoming more prevalent is to situate developments around man-made ponds, lakes, or wetlands created to control flooding and reduce the impacts of urban runoff. Buffer zones and open areas that control runoff also provide land for outdoor recreation such as walking or hiking and for wildlife habitat. In many cases, developers are able to realize additional profits and quicker sales from units that are adjacent to such areas. A survey of residents in an Illinois subdivision indicates that residents are willing to pay between 5 percent and 25 percent more to be located next to a wet pond, but that being located next to a poorly-designed dry detention basin can reduce home values (Emmerling-Dinovo, 1995).

Safety is also a concern among the public. A childless adult may perceive a wet pond as an amenity, but a family might view it as a potential hazard to children. These concerns can be alleviated using such design features as gently sloping edges, a safety “bench” (a flat area

surrounding a pond) and the use of dense vegetation surrounding ponds and infiltration basins to act as a barrier.

Aesthetic maintenance is also important when considering long term impacts on property values. Poorly-maintained wet ponds or constructed wetlands may be unsightly due to excess algal growth or public littering. Wet ponds and constructed wetlands can also become mosquito breeding grounds. However, mosquito problems can usually be reduced or eliminated through proper design and/or organic controls such as mosquito-eating fish. Successful designs avoid shallow or stagnant water, and reduce large areas of periodic drying, as occur in a dry detention basin (McLean, 1995). All BMPs need to have trash and debris removed periodically to prevent odor and preserve aesthetic values.

6.3.4.2 Dual-Use Systems

Since BMPs can consume a large amount of space, communities may opt to use these facilities for other purposes in addition to storm water management. Two examples are "water reuse" ponds and dual use infiltration or detention basins. In one study, a storm water pond was used to irrigate a golf course in Florida, decreasing the cost of irrigation by approximately 85 percent (Schueler, 1994b). In the southwestern United States, BMPs are often completely dry in between rain events. In these regions, it is very common to design infiltration basins or detention basins as parks that are maintained as a public open space (Livingston et al, 1997).

6.4 Review of Economic Analysis of the NPDES Phase II Storm Water Rule

The proposed storm water Phase II rule specifies that Phase II municipalities and operators of construction sites disturbing between one and five acres of land must apply for and receive a storm water permit. To meet this requirement, municipalities must develop a storm water pollution prevention plan that addresses six minimum measures[9]. Operators of construction sites are required to incorporate soil and erosion controls into their construction sites and implement a water pollution prevention plan. The analysis presented here is a summary of the most recent benefit-cost analysis prepared for the proposed Phase II storm water rule (Preliminary draft number 3). In order to address the issues raised in the public comments and during internal review, EPA gathered additional data and information to refine the analysis of potential benefits and costs conducted for the proposed Phase II rule. These data, analyses, and results are described in detail in the Preliminary Draft of the Economic Analysis of the Final Phase II Storm

[9] The six minimum measures are:

- Public Education and Outreach on Storm Water Impacts
- Public Involvement/Participation
- Illicit Discharge Detection and Elimination
- Construction Site Storm Water Runoff Control
- Post-Construction Storm Water Management in New Development and Redevelopment
- Pollution Prevention/Good Housekeeping for Municipal Operations (US EPA, 1998c).

Water Rule ("EA"), and are summarized in the sections that follow. All cost and benefit estimates are presented in 1998 dollars.

The reader should note that the Agency continues to revise the analysis based on internal review and new data and information. EPA envisions completing the economic analysis in conjunction with the Storm Water Phase II Final Rule. Hence, all estimates are subject to future refinement.

6.4.1 Analyses of Potential Costs

This section provides an overview of the methodology used to estimate costs and pollutant loading reductions for both municipalities and construction sites subject to the final Phase II rulemaking. The specific components of the analysis are discussed in detail in the Draft Final EA. Current Agency estimates of national compliance costs, which are subject to change, are also provided.

6.4.1.1 Municipal Costs

EPA estimated annual per household program cost for automatically designated municipalities (MS4s) using actual expenditures reported by 35 Phase I municipalities. Based on census data, EPA estimated the Phase II municipal universe to be 5,040 MS4s with a total population of 85 million people and 32.5 million households. An average annual per household administrative cost was estimated to address application, record keeping, and reporting requirements, which was added to the program per household cost to derive a total average per household cost. To obtain the national estimate of compliance costs, the Agency multiplied the estimated total per household compliance cost ($9.09) by the expected number of households in Phase II communities. EPA estimates the national Phase II municipal compliance costs to be approximately $295 million (see Section 4.2.1.3 in the draft EA)[10].

6.4.1.2 Construction Costs

In estimating incremental costs attributable to the final Phase II rule, EPA estimated a per site cost for construction sites of one, three, and five acres and multiplied the cost by the total number of Phase II construction starts in these size categories to obtain a national estimate of compliance costs. The Agency used construction start data from eleven municipalities that record construction start information to estimate the number of construction starts disturbing between one and five acres of land (see Section 4.2.2.1 in the Draft Final EA).

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[10] Estimated annual per household cost of compliance ranged from $0.63 to $60.44. See Section 4.2.1.2 in the Draft Final EA for a discussion of how EPA chose the mean value of $9.09 per household. Note that the estimated per household cost does not include municipal expenditures for post-construction storm water controls.

In estimating construction BMP costs, EPA used standard cost estimates from R.S. Means (R.S. Means, 1997a and 1997b) and created 27 model sites of typical site conditions in the United States. The model sites considered three different site sizes (1, 3, and 5 acres), three slope variations (3, 7, and 12 percent), and three soil erosivity conditions (low, medium, and high). The Agency used a database compiled by the Water Environment Federation (1992) to develop and apply BMP combinations appropriate to the model site conditions. For example, sites with shallow slopes and a low erosivity require few BMPs, while larger, steeper, and more erosive sites required more BMPs. Detailed site plans, assumptions, and BMPs that could be used are found in Appendix B-3 of the Draft Final EA. Based on the assumption that any combination of site factors are equally likely to occur on a given site, EPA averaged the matrix of estimated costs to develop an average cost for one, three, and five acre starts for all soil erodibilities and slopes. The average BMP cost was estimated to be $1,206 for a one-acre site, $4,598 for a three-acre site, and $8,709 for a five-acre site.

Administrative costs for the following elements were estimated per construction site and added to each BMP cost: submittal of a notice of intent (NOI) for permit coverage ($74); notification to municipalities ($17); development of a storm water pollution prevention plan ($1,219); record retention ($2); and submittal of a notice of termination ($17) for a total cost of $1,329 per site. From this analysis, EPA estimated total average compliance costs (BMP plus administrative) for a Phase II construction site of $2,535 for sites disturbing between one and two acres of land, $5,927 for sites disturbing between two and four acres, and $10,038 for sites disturbing between four and five acres of land.

The total per site costs were then multiplied by the total number of Phase II construction sites within each of those size categories to obtain the national compliance cost estimate. EPA estimated construction costs for 15 climatic zones to reflect regional variations in rainfall intensity and amount. Once the Phase II storm water rule is fully implemented, the total annual compliance cost is expected to be approximately $512 million (assuming 109,652 construction starts in 1998).

6.4.1.3 Pollutant Loading Reductions

To estimate municipal pollutant loading reductions for the final Phase II rulemaking, EPA used the results from a 1997 EPA draft report that calculated national municipal loading reductions for TSS based on the NURP study (US EPA, 1997d). To estimate pollutant loading reductions from Phase II construction starts, the U.S. Army Corps of Engineers developed a model based on EPA's 27 models sites to estimate sediment loads from construction starts with and without Phase II controls (US ACE, 1998). Estimating the pollutant loading reduction for TSS does not capture the full extent of potential loading reductions that result from implementing storm water controls, but provides a minimum estimate of the reductions that may result from the

Phase II rule[11]. EPA also anticipates that the rule will result in reductions in oil and grease, nitrogen, phosphorus, pathogens, lead, copper, zinc and other metals. Estimated annual TSS loading reductions range from 639,115 to approximately 4 million tons for municipalities and 2 million to 8 million tons for construction sites assuming BMP effectiveness of 20 to 80 percent.

6.4.2 Assessment of Potential Benefits

A number of potential problems are associated with assessing the benefits from the Phase II rule, including identifying the regulated municipalities as sources of current impairment to waters and determining the likely effectiveness of various measures; difficulties in water quality modeling; difficulties in modeling construction site BMP effectiveness; and most importantly, the inability to monetize some categories of benefits with currently available data.

The national benefits of Phase II controls will depend on a number of factors, including the number, intensity, and duration of wet weather events; the success of municipal programs; the effectiveness of the selected construction site BMPs; the site-specific water quality and physical conditions of receiving waters; the current and potential use of receiving waters; and the existence of nearby "substitute" sites of unimpaired waters. Because these factors will vary substantially from site to site, data are not available with which to develop estimates of benefits for each site and aggregate to obtain a national estimate. As a result, the Agency developed national level estimates of benefits based largely on a benefits transfer approach. This approach allows estimates of value developed for one site and level of environmental change to be applied in the analysis of similar sites and environmental changes.

6.4.2.1 Anticipated Benefits of Municipal Measures

As part of an effort to quantify the value of the United States' waters impaired by storm water discharges, EPA applied adjusted Carson and Mitchell (1993) estimates of willingness to pay (WTP) for incremental water quality improvements to estimates of waters impaired by storm water discharges as reported by states in their biennial Water Quality Inventory reports[12]. Potential Phase II benefits are assumed to equal the WTP for the different water quality levels multiplied by the water quality impairment associated with Phase II municipalities multiplied by the relevant number of households (WTP x percent impaired x number of households).

The Carson and Mitchell estimates apply to all fresh water, however it is not clear how these values would be apportioned among rivers, lakes and the Great Lakes. Lakes are the water

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[11] To date, there are no national studies that estimate pollutant loading reductions due to the implementation of municipal storm water controls for the other pollutants found in storm water runoff and discharges.

[12]EPA adjusted the WTP amounts to account for inflation growth in real per capita income, inflation, and a 30 percent increase in attitudes towards pollution control.

bodies most impaired by urban runoff and discharges, followed closely by the Great Lakes and then rivers. Hence, EPA applied the WTP values to the categories separately and assumed that the higher resulting value for lakes represents the high end of the range and the lower resulting value for rivers represents the low end of a value range for all fresh waters (i.e. high end assumes that lake impairment is more indicative of national fresh water impairment while low end assumes that river impairment is more indicative).

The extent to which impairment will be eliminated by the municipal measures is uncertain; hence, estimates are adjusted for a range of potential effectiveness of municipal measures. EPA expects that municipal programs will achieve at least 80% effectiveness, resulting in estimated annual benefits from fresh water use and passive use in the range of $67.2 to $241.2 million. The potential value of improvements in marine waters and human health benefits have not been quantified at this time.

6.4.2.2 Anticipated Benefits of Construction Site Controls

EPA estimates the benefits of construction site controls using a benefits transfer approach applying WTP estimates for an erosion and sediment control plan from Paterson et al (1993) contingent valuation (CV) survey of North Carolina residents. The adjusted WTP estimates are intended to reflect potential benefits of erosion and sediment control programs that protect all lakes, rivers, and streams. In order to transfer adjusted WTP results to estimate the potential benefits of the Phase II rule, EPA calculated the percentage of Phase II construction starts that are not covered by a state program or CZARA for each state. This percentage is multiplied by the number of households in the state and the adjusted mean WTP of $25. The results were then summed across all states and indicate that WTP for the erosion and sediment controls of the Phase II rule may be as high as $624.2 million per year.

6.4.3 Comparison of Benefits and Costs

EPA estimates the total compliance costs of the rule to be $807.2 million. The largest portion of the total cost, $512 million, is associated with erosion and sediment controls at construction sites. EPA was able to develop a partial monetary estimate of expected benefits of both the six minimum municipal measures and the construction components of the rule. The sum of these benefits ranges from $700 to $865 million annually [assuming 80 percent effectiveness of municipal programs and using the mean WTP ($25) from Paterson]. The largest portion of benefits, $624 million, are associated with erosion and sediment controls for construction sites.

6.5 Financial Issues

Effective storm water programs require both the existence of well-performing, cost-effective BMPs and sufficient funding. Financing issues are discussed extensively in other Agency

reports and only briefly reviewed below.[13] Section 6.5.1 focuses on financing options for municipal storm water programs but does not discuss regulatory impacts on municipalities.

6.5.1 Municipal Financing of Storm Water Programs

Around the nation, local government general tax funds are the most commonly used source of funding for storm water programs. However, this may be the least suitable source of storm water program or maintenance funding. General tax revenues originate at a number of sources and are used to finance an equally diverse number of public programs, including education, police and fire protection, civil and criminal courts, and social and economic support programs. Storm water programs and maintenance must compete against a large number of other vital public programs for a very limited number of tax dollars. This problem has been compounded in recent years by tax caps and the public's general opposition to new or higher taxes.

The unreliability of general tax funds has led many communities around the country to develop storm water utilities. Storm water utilities rely on dedicated user charges related to the level of service provided. Charges are typically paid by property owners and managed in a separate enterprise fund. A variety of methods are used to determine charges, but are usually based on some estimate of the amount of storm water runoff contributed by the property, such as the total impervious surface or a ratio of impervious surface to total property area. Generally a flat rate is charged for residential properties.

There are several advantages of using utility fees to finance storm water programs. Unlike general tax revenues, utility charges are a dedicated, stable, and predictable source of funds and are not subject to state "tax cap" limitations. Also, because charges are based on the user's contribution to storm water runoff, it is often seen as more equitable or fair. Finally, utility fees provide a mechanism to incorporate economic incentives for implementation of on-site storm water management through reduced charges. For example, credits or discounts are often provided for on-site retention of storm water by nonresidential property owners. Providing such incentives creates greater flexibility by allowing each user to choose the cheaper option - paying the utility charge or implementing on-site controls. Storm water utilities are now well established as an effective financing option. As of 1991, over 100 communities across the country had instituted storm water utilities (US EPA, 1994a).

Similar to utility fees, the use of inspection or permit fees to help publicly finance storm water programs represents a relatively new application of an established component of government revenues. Often, these fees are associated with the issuance of a permit, such as a

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[13] EPA has prepared publications to assist local governments in planning for program funding (US EPA, 1994b). More recently the Agency has established an internet site with current information, the "Environmental Finance Information Network." The website address is http://www.epa.gov/efinpage/efin.htm .

building permit, clearing permit, storm water permit, or sewer connection permit. A permit program based upon fees for annual inspections, such as a storm water discharge or storm water operating permit, can provide a continuing source of funds. However, many permit or inspection fees are a one time charge, typically when the facility is first constructed. These are generally not a good funding source for continuing storm water system maintenance.

Finally, the use of dedicated contributions from land developers may be used to finance public maintenance of storm water systems. Under this program, the local government assumes the operation and maintenance of a storm water system constructed as part of a private development. All or a portion of the estimated required funding for the O&M is obtained through a one-time contribution by the land developer to a dedicated account which is controlled by the local government. Often the developer is responsible for O&M during a "warranty period," frequently the first two years. Dedicated contributions provide a secure, dedicated funding source that is not subject to state tax cap limits. A disadvantage is that dedicated contributions are only applicable to new storm water systems.

6.6 Summary

The use of BMPs to control storm water runoff and discharges where none previously existed will ultimately result in a change in pollutant loadings, and there are indications that in the aggregate BMPs will improve water quality. The actual manner in which the loadings reductions are achieved will depend on the BMPs selected, which will determine the associated costs. The physical-chemical properties of receiving streams and consequent linkages to biologic/ecologic responses in the aquatic environment, and human responses and values associated with these changes will determine the benefits.

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049772

United States Environmental Protection Agency | Office of Water Washington, D.C. | EPA 832-F-99-022 September 1999

Storm Water Management Fact Sheet

Non-Storm Water Discharges to Storm Sewers

DESCRIPTION

Identifying and eliminating non-storm water discharges to storm sewers is an important and very cost-effective Best Management Practice (BMP) for improving runoff water quality. Non-storm water discharges can include discharges of process water, air conditioner condensate, non-contact cooling water, vehicle wash water, or sanitary wastes, and are typically the result of unauthorized connections of sanitary or process wastewater drains to storm sewers. These connections are common, yet often go undetected. Typically these discharges are significant sources of pollutants, and, unless regulated by an NPDES permit, they are also illegal.

Environmental impact evaluations have shown that the elimination of non-storm water discharges is an effective BMP, because such discharges may contain a significant loading of pollutants.

Several studies exist on the contents of non-storm water discharges. Pitt and Shawley (1982) reported that non-storm water discharges were found to contribute substantial quantities of a variety of pollutants, even though the individual concentrations of each pollutant were not high. During extended periods of base flow conditions, the lower concentration was offset, leading to a substantial loading of pollutants. Gartner, Lee and Associates, Ltd. (1983) conducted an extensive survey of non-storm water discharges in the Humber River watershed (Toronto). Out of 625 outfalls, about 10 percent were considered significant pollutant sources. Further investigations identified many industrial and sanitary non-storm water discharges into the storm drainage system.

Sources found in industrial areas included liquid dripping from animal hides stored in tannery yards, and washdowns of storage yards at meat packing facilities. Therefore, it is anticipated that elimination of non-storm water discharges will be a highly effective BMP.

Identifying and eliminating non-storm water discharges has rarely been done at industrial facilities. Part of the problem is education: many facility operators are unaware of what constitutes a non-storm water discharge and what the potential environmental impacts of these discharges are. Compliance with NPDES permit requirements for the presence of non-storm water discharges will greatly improve the implementation of this BMP.

APPLICABILITY

Almost every industrial facility that has not been tested or evaluated for the presence of potential non-storm water discharges should be so evaluated. Typically NPDES permit certification includes:

- Identification of potential non-storm water discharges.
- Results of a site evaluation for the presence of non-storm water discharges.
- The evaluation criteria or test method used.
- The date of testing and/or evaluation.
- The on-site drainage points that were directly observed during the test and/or evaluation.

This certification must be signed in accordance for the facility's NPDES storm water permit. A sample certification form is shown in Figure 1.

ADVANTAGES AND DISADVANTAGES

Identifying and eliminating non-storm water discharges can be an easy and cost-effective method for preventing runoff contamination and pollution of receiving water bodies. However, identifying these discharges may be problematic. Possible problems in identifying non-storm water discharges include:

- A non-storm water discharge may not occur on the date of the test or evaluation.
- The method used to test or evaluate the discharge may not be applicable to the situation.
- A lack of available data on the location of storm drains and sanitary sewers, especially in older industrial facilities, may make identifying an illicit connection difficult.

KEY PROGRAM COMPONENTS

Key program criteria include identifying and locating non-storm water entries into storm drainage and investigating their sources.

For any effective investigation of pollution within a storm water system, all pollutant sources must be included. For many pollutants, storm water may contribute the smaller portion of the total pollutant mass discharge from a storm drainage system. In addition to conventional storm water runoff associated with rainfall, pollutant sources may include dry-weather entries occurring during both warm and cold months and snowmelt runoff. Consequently, much less pollution reduction benefit will occur if only storm water is considered in a control plan for controlling storm drainage discharges.

The investigations may also identify illicit point source outfalls that do not carry storm water. Obviously, these outfalls also need to be controlled and permitted. Figure 1 can be used as a sample worksheet to report non-storm water discharges.

There are four primary methods for investigating non-storm water discharges.

Visual Inspection

The simplest method for detecting non-storm water connections in the storm water collection system is to observe all discharge points during periods of dry weather. Key parameters to look for are the presence of stains, smudges, odors, and other abnormal conditions.

Sanitary and Storm Sewer Map Review

A review of a plant schematic is another simple way to determine if there are any unauthorized connections to the storm water collection system. A sanitary or storm sewer map, or plant schematic, is a map of pipes and drainage systems used to carry

NON-STORM WATER DISCHARGE ASSESSMENT AND CERTIFICATION			Worksheet Completed By: _____ Title: _____ Date: _____ Signature: _____		
Date of Test or Evaluation	Outfall Directly Observed During the Test (Identify as indicated on the site map)	Method Used to Test or Evaluate Discharge	Describe Results from Test for the Presence of Non-Storm Water Discharge	Identify Potential Significant Sources	Name of Person Who Conducted the Test or Evaluation

Source: U. S. EPA, 1992.

FIGURE 1 SAMPLE WORKSHEET FOR RECORDING NON-STORM WATER DISCHARGES

process wastewater, non-contact cooling water, and sanitary wastes. These maps (especially as-built plans) should be reviewed to verify that there are no unauthorized connections. However, a common problem at many sites is that they often do not have accurate or current schematics.

Dye Testing

Another method for detecting improper connections to the storm water collection system is dye testing. A dye test can be performed by simply releasing a dye (either pellet or powder) into either the sanitary or process wastewater system. Discharge points from the storm water collection system are then examined for color change.

Sampling and Chemical Analysis

Sewer mapping and visual inspection are also helpful in identifying locations for sampling. Chemical tests are needed to supplement the visual or physical inspections. Chemical tests can help quantify the approximate components of the discharge mixture at the outfall or discharge point. Samples should be collected, stored, and analyzed in accordance with standard quality assurance and quality control (QA/QC) procedures. Statistical analysis of the chemical test results can be used to estimate the relative magnitudes of the various flow sources. In most cases, non-storm water discharges are made up of many separate sources of flow, such as leaking domestic water systems, sanitary discharges, ground water infiltration, automobile washwater, etc. Key parameters that can be helpful in identifying the source of the non-storm water flows include biochemical oxygen demand (BOD), chemical oxygen demand (COD), total organic carbon (TOC), specific conductivity, temperature, fluoride, hardness, ammonia, ammonium, potassium, surfactant fluorescence, pH, total available chlorine, and toxicity screening. It may be possible to identify the source of the non-storm water discharge by examining the flow for specific chemicals.

Just as high levels of pathogenic bacteria are usually associated with a discharge from a sanitary waste water source, the presence of certain chemicals is generally associated with specific industries. Table 1, includes a listing of various chemicals that may be associated with a variety of activities.

IMPLEMENTATION

Identification of non-storm water discharges should be part of every facility's maintenance program. Facilities should conduct annual inspections for non-storm water discharges, even if previous tests have found no such discharges. New processes, building additions, or other plant changes may have brought about unauthorized connections to the storm water conveyance system.

COSTS

The above methods are mostly time-intensive; therefore, the cost is dependent on the level of effort employed, and on the level of expertise. Visual inspections are the least expensive of the three. Dye testing may be more cost effective for buildings that do not have current schematics of their sanitary and storm sewer systems. The cost of disconnecting illicit discharges from the storm water system will vary depending on the type and location of the connection.

The full use of all of the applicable procedures is most likely necessary to identify all pollutant sources. For example, attempting to reduce costs by examining only a certain class of outfalls, or using inappropriate testing procedures, will significantly reduce the utility of the testing program and result in inaccurate conclusions.

REFERENCES

1. California Environmental Protection Agency, Draft, 1992. *Staff Proposal for Modification to Water Quality Order No. 91-13 DWQ Waste Discharge Requirements for Discharges of Storm Water Associated with Industrial Activities*.

2. Gartner, Lee and Associates, Ltd., 1983. *Toronto Area Watershed Management Strategy Study, Technical Report No. 1, Humber River and Tributary Dry Weather Outfall Study*. Ontario Ministry of the Environment, Toronto, Ontario.

TABLE 1 CHEMICALS COMMONLY FOUND IN INDUSTRIAL DISCHARGES

Chemical	Industries
Acetic Acid	Acetate rayon, pickle and beetroot manufacture
Alkalis	Cotton and straw kiering, cotton manufacture
Ammonia	Gas and coke manufacture, chemical manufacture
Arsenic	Sheep-dipping, felt mongering
Chlorine	Laundries, paper mills, textile bleaching
Chromium	Plating, chrome tanning, aluminum anodizing
Cadmium	Plating
Citric Acid	Soft drinks and citrus fruit processing
Copper	Plating, pickling, rayon manufacture
Cyanides	Plating, metal cleaning, case-hardening, gas manufacture
Fats, Oils	Wool scouring, laundries, textiles, old refineries
Fluorides	Gas and coke manufacture, chemical manufacture, fertilizer plants,
Formalin	Manufacture of synthetic resins and penicillin
Hydrocarbons	Petrochemical and rubber factories
Hydrogen Peroxide	Textile bleaching, rocket motor testing
Lead	Battery manufacture, lead mining, paint manufacture, gasoline
Metcaptins	Oil refining, pulp mills
Mineral Acids	Chemical manufacture, mines, iron and copper pickling, brewing, textiles
Nickel	Plating
Nitro Compounds	Explosives and chemical works
Organic Acids	Distilleries and fermentation plants
Phenols	Gas and coke manufacture, synthetic resin manufacture, textiles,
Silver	Plating and photography
Starch	Food, textile, wallpaper manufacture
Sugars	Dairies, foods, sugar refining, preserves, wood process
Sulfides	Textiles, tanneries, gas manufacture, rayon manufacture
Sulfites	Wood process, vicose manufacture, bleaching
Tannic Acid	Tanning, sawmills
Tartaric Acid	Dyeing, wine, leather, and chemical manufacture
Zinc	Galvanizing, plating, viscose manufacture, rubber process

Source: Pitt *et al.,* 1992.

3. Pitt, R. and G. Shawley, 1982. *A Demonstration of Non-Point Pollution Management on Castro Valley Creek*, Alameda County Flood Control District (Hayward, California) and U.S. EPA, Washington, DC.

4. Pitt, R., D. Barbe, D. Adrian, and R. Field, 1992. *Investigation of Inappropriate Pollution Entries Into Storm Drainage Systems -- A Users Guide*, U.S. EPA, Edison, New Jersey.

5. Pitt, R., and R. Field, 1992. Non-Storm Water Discharges into Storm Drainage Systems. NTIS Report No. PB92-158559.

6. U.S. EPA, 1992. *Storm Water Management For Industrial Activities: Developing Pollution Prevention Plans and Best Management Practice.* EPA 833-R-92-006.

7. Washington State Department of Ecology, February, 1992. *Storm Water Management Manual for the Puget Sound Basin*.

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United States Environmental Protection Agency | Office of Water Washington, D.C. | 832-F-99-046 September 1999

Storm Water Management Fact Sheet
Visual Inspection

DESCRIPTION

Visual inspection is a Best Management Practice (BMP) in which members of a Storm Water Pollution Prevention Team visually examine material storage and outdoor processing areas, the storm water discharges from such areas, and the environment in the vicinity of the discharges, to identify contaminated runoff and its possible sources.

In a visual inspection, storm water runoff may be examined for the presence of floating and suspended materials, oil and grease, discoloration, turbidity, odor, or foam; and storage areas may be inspected for leaks from containers, discolorations on the storage area floor, or other indications of a potential for pollutants to contaminate storm water runoff.

Visual inspections may indicate the need to modify a facility to reduce the risk of contaminating runoff.

APPLICABILITY

The U.S. EPA has recognized visual inspection as a baseline BMP for over 10 years. Its implementation, however, has been sporadic. Implementation may increase as more facilities develop Storm Water Pollution Prevention Plans. Implementation may also increase as facility management recognizes visual inspection to be effective both in protecting water quality and in reducing costs.

ADVANTAGES AND DISADVANTAGES

Visual inspections are an effective way to identify a variety of problems. Correcting these problems can improve the water quality of the receiving water.

Limitations associated with visual inspections include the following:

- Visual inspections are effective only for those areas clearly visible to the human eye.
- The inspections need to be performed by qualified personnel.
- To be effective, inspections must be carried out routinely. This requires a corporate commitment to implementing them.
- Inspectors need to be properly motivated to perform a thorough visual inspection.

KEY PROGRAM COMPONENTS

Visual inspections for signs of storm water contamination should be performed routinely. Flows should be observed during dry periods to determine the presence of any stains, sludge, odors, and other abnormal conditions.

Visual inspections should also be made at all storm water discharge outlet locations during the first hour of a storm event, once runoff has reached its maximum flow rate. Inspectors should examine the discharge for the presence of floating and suspended materials, oil and grease, discoloration, turbidity, foam, or odor.

Inspection frequency interval may be determined by the storm water discharge permit, by storm frequency, or by the potential risk from the site. Inspections should be made at least once a month in areas with frequent storms; inspections may be less frequent where storms are less frequent. Finally, inspection frequency may be based in part on the history of previous spills and leaks. Experienced personnel should evaluate the causes of previous accidents, assess the risks for future accidents, and determine an inspection schedule based on these risks.

Proper records of inspection results must be kept. The record for each inspection should include the date of the inspection, the names of the personnel who performed the inspection, and their observations.

Visual inspections of a facility should focus on the following key areas:

- Storage facilities.
- Transfer pipelines.
- Loading and unloading areas.
- Pipes, pumps, valves, and fittings.
- Tanks (including internal and external inspection of the tank for corrosion and inspection of its support or foundation for deterioration).
- Primary or secondary containment facilities.
- Shipping containers.

In addition, a visual inspection should include assessing the integrity of the storm water collection system; checking for leaks, seepage, and overflows from sludge and waste disposal sites; and ensuring that dry chemicals and dust from industrial areas is not exposed to wind or other elements that may move them into the runoff.

IMPLEMENTATION

A visual inspection BMP program should be incorporated into every storm water discharger's record keeping and internal reporting structure.

Outfall flow rates and the presence of oil sheens, floatables, coarse solids, color, and odors will probably be the most useful indicators of potential problems. Specific parameters to look for in completing a visual inspection include the following:

- Odor: Discharge odors can vary widely. Some may indicate the source of contamination. Industrial discharges may smell like a particular spoiled product, oil, gasoline, a specific chemical, or a solvent. For example, the decomposition of organic wastes in a discharge will release sulfide compounds, creating an intense smell of rotten eggs. Significant sanitary wastewater contributions will also cause pronounced and distinctive odors.

- Color: Color may indicate inappropriate discharges, especially from industrial sources. Industrial discharges may be any color. Dark colors, such as brown, gray, or black, are most common. For instance, flow contaminated by meat processing industries is usually a deep reddish-brown. Paper mill wastes (plating-mill wastes) are often yellow. Wash water from cement and stone working plants can cause cloudy discharges. Contamination from industrial areas may come from process waters (slug or continuous discharges); from equipment and work area wash water discharged to floor drains; or from spills washed into storm drains.

- Turbidity: Turbidity is often affected by the degree of gross contamination. Industrial flows can be cloudy (moderately turbid) or opaque (highly turbid). Undiluted industrial discharges, such as those coming from continual flow sources or intermittent spills, are often highly turbid. Sanitary wastewater is also often cloudy in nature.

- Floatable matter: A contaminated flow may also contain floatable solids or liquids. Identifying floatables can aid in finding the source of the contamination, because these substances are usually direct products or byproducts of the manufacturing process or the sanitary system. Examples of floatables of industrial origin are animal fats, spoiled food products, oils, plant parts, solvents, sawdust, foams, packing materials, and fuel.

- Deposits and Stains: Deposits and stains (residues) are any type of coating that remains after a non-storm water discharge has ceased. Deposits or stains usually are of a dark color and usually cover the area surrounding the storm water discharge. They often contain fragments of floatable substances, and, at times, take the form of a crystalline or amorphous powder. For example, contamination from leather tanneries often produces grayish-black deposits containing fragments of animal flesh and hair. Another characteristic example is the coating of white crystalline powder formed on sewer outfalls by nitrogenous fertilizer wastes.

- Vegetation: Storm water discharges often affect surrounding vegetation. Industrial pollutants often cause a substantial alteration in the chemical composition and pH of the discharge water, which can affect plant growth even when the source of contamination is intermittent. For example, nutrients from various food product wastes increase plant growth. In contrast, the discharge of chemical dyes and inorganic pigments from textile mills may decrease vegetation, as these discharges are often very acidic. In either case, even when the pollution source is gone, the vegetation surrounding the discharge will continue to show the effects of the contamination.

  In order to accurately judge if the vegetation surrounding a discharge is normal, the observer must take into account recent weather conditions, as well as the time of year. Increased or inhibited plant growth near storm water discharges, as well as dead and decaying plants, is often a sign of pollution. However, it is important to distinguish whether plant damage is caused by contamination or by the physical effects of increased flows, such as scour. This can be done by chemically analyzing the flow or by confirming its source through additional visual inspections.

- Structural Damage: Structural damage is also a sign of industrial discharge contamination. Cracked or deteriorated concrete or peeling surface paint at an outfall usually indicates the presence of severely contaminated discharges. Contaminants causing this type of damage are usually very acidic or basic and are usually of industrial origin. For instance, discharges from primary metal industries may cause structural damage because their batch dumps are highly acidic.

The effectiveness visual inspections in reducing storm water runoff contamination is highly variable and dependent upon site-specific parameters. These factors include inspectors' motivation level, the types of industrial activity occurring at the facility, and the facility's maintenance procedures. Because familiarity with facility operations is essential in performing effective visual inspections, the inspections should be assigned to qualified staff such as maintenance personnel or environmental engineers. Figure 1 provides a sample visual evaluation worksheet that can be used to record the results of the inspections.

COSTS

Costs for performing the visual inspection BMP are minimal and consist of direct labor and overhead costs for staff hours spent on training, planning inspections, inspecting, and completing follow up activities. Annual costs can be estimated using the example in Table 1. Figure 2 can be used as a worksheet to calculate the estimated annual cost for implementing a visual inspection program.

Outfall # _____ Photograph # _____ Date: _____

Location: _____

Weather: air temp.: _____^{0}C rain: Y N sunny cloudy

Outfall flow rate estimate:_____L/sec

Known industrial or commercial uses in drainage area? Y N

Describe: _____

PHYSICAL OBSERVATIONS

Odor: none sewage sulfide oil gas rancid-sour other: _____

Color: none yellow brown green gray other: _____

Turbidity: none cloudy opaque

Floatables: none petroleum sheen sewage other: _____ (collect sample)

Deposits/stains: none sediment oily describe: _____ (collect sample)

Vegetation conditions: normal excessive growth inhibited growth

extent: _____

Damage to outfall structures:

identify structure: _____

damage: none / concrete cracking / concrete spalling / peeling paint / corrosion

other damage: _____

extent: _____

Source: Pitt, et. al, 1992.

FIGURE 1 VISUAL INSPECTION WORKSHEET

REFERENCES

1. California Environmental Protection Agency, 1992. Staff Proposal for Modification to Water Quality Order No. 91-13 DWQ Waste Discharge Requirements for Dischargers of Storm Water Associated with Industrial Activities, Draft Wording, Monitoring Program and Reporting Requirements.

2. Pitt R., D. Barbe, D. Adrian, and R. Field, 1992. *Investigation of Inappropriate Pollutant Entries into Storm Drainage Systems-A Users Guide*. U.S. EPA, Edison, NJ.

3. U.S. EPA, 1981. *NPDES BMP Guidance Document*.

4. U.S. EPA. Pre-print, 1992. *Storm Water Management for Industrial Activities: Developing Pollution Prevention Plans and Best Management Practices*. EPA 832-R-92-006.

ADDITIONAL INFORMATION

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TABLE 1 EXAMPLE OF VISUAL INSPECTION PROGRAM COSTS

Title	Quantity		Average Hourly Rate ($)		Overhead* Multiplier		Estimated Yearly Hours on SW Training		Estimated Annual Cost ($)
Storm Water Engineer	1	x	15	x	2.0	x	20	=	600
Plant Management	5	x	20	x	2.0	x	10	=	2,000
Plant Employees	100	x	10	x	2.0	x	5	=	10,000
					TOTAL ESTIMATED ANNUAL COST				**$12,600**

*Note: Defined as a multiplier (typically ranging between 1 and 3) that takes into account those costs associated with payroll expenses, building expenses, etc.

Source: U.S. EPA, 1992.

Title	Quantity		Average Hourly Rate ($)		Overhead Multiplier		Estimated Yearly Hours on SW Training		Estimated Annual Cost($)
_____	_____	x	_____	x	_____	x	_____	=	_____ (A)
_____	_____	x	_____	x	_____	x	_____	=	_____ (B)
_____	_____	x	_____	x	_____	x	_____	=	_____ (C)
_____	_____	x	_____	x	_____	x	_____	=	_____ (D)

Source: U.S. EPA, 1992.

FIGURE 2 SAMPLE INSPECTION PROGRAM COST WORKSHEET

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Wednesday
December 8, 1999

Part II

Environmental Protection Agency

40 CFR Parts 9, 122, 123, and 124
National Pollutant Discharge Elimination System—Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule

Report to Congress on the Phase II Storm Water Regulations; Notice

049785

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 9, 122 , 123, and 124

[FRL—6470–8]

RIN 2040–AC82

National Pollutant Discharge Elimination System—Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: Today's regulations (Phase II) expand the existing National Pollutant Discharge Elimination System (NPDES) storm water program (Phase I) to address storm water discharges from small municipal separate storm sewer systems (MS4s) (those serving less than 100,000 persons) and construction sites that disturb one to five acres. Although these sources are automatically designated by today's rule, the rule allows for the exclusion of certain sources from the national program based on a demonstration of the lack of impact on water quality, as well as the inclusion of others based on a higher likelihood of localized adverse impact on water quality. Today's regulations also exclude from the NPDES program storm water discharges from industrial facilities that have "no exposure" of industrial activities or materials to storm water. Finally, today's rule extends from August 7, 2001 until March 10, 2003 the deadline by which certain industrial facilities owned by small MS4s must obtain coverage under an NPDES permit. This rule establishes a cost-effective, flexible approach for reducing environmental harm by storm water discharges from many point sources of storm water that are currently unregulated.

EPA believes that the implementation of the six minimum measures identified for small MS4s should significantly reduce pollutants in urban storm water compared to existing levels in a cost-effective manner. Similarly, EPA believes that implementation of Best Management Practices (BMP) controls at small construction sites will also result in a significant reduction in pollutant discharges and an improvement in surface water quality. EPA believes this rule will result in monetized financial, recreational and health benefits, as well as benefits that EPA has been unable to monetize. Expected benefits include reduced scouring and erosion of streambeds, improved aesthetic quality of waters, reduced eutrophication of aquatic systems, benefit to wildlife and endangered and threatened species, tourism benefits, biodiversity benefits and reduced costs for siting reservoirs. In addition, the costs of industrial storm water controls will decrease due to the exclusion of storm water discharges from facilities where there is "no exposure" of storm water to industrial activities and materials.

DATES: This regulation is effective on February 7, 2000. The incorporation by reference of the rainfall erosivity factor publication listed in the rule is approved by the Director of the Federal Register as of February 7, 2000. For judicial review purposes, this final rule is promulgated as of 1:00 p.m. Eastern Standard Time, on December 22, 1999 as provided in 40 CFR 23.2.

ADDRESSES: The complete administrative record for the final rule and the ICR have been established under docket numbers W–97–12 (rule) and W–97–15 (ICR), and includes supporting documentation as well as printed, paper versions of electronic comments. Copies of information in the record are available upon request. A reasonable fee may be charged for copying. The record is available for inspection and copying from 9 a.m. to 4 p.m., Monday through Friday, excluding legal holidays, at the Water Docket, EPA, East Tower Basement, 401 M Street, SW, Washington, DC. For access to docket materials, please call 202/260–3027 to schedule an appointment.

FOR FURTHER INFORMATION CONTACT: George Utting, Office of Wastewater Management, Environmental Protection Agency, Mail Code 4203, 401 M Street, SW, Washington, DC 20460; (202) 260–5816; sw2@epa.gov.

SUPPLEMENTARY INFORMATION: Entities potentially regulated by this action include:

Category	Examples of regulated entities
Federal, State, Tribal, and Local Governments.	Operators of small separate storm sewer systems, industrial facilities that discharge storm water associated with industrial activity or construction activity disturbing 1 to 5 acres.
Industry	Operators of industrial facilities that discharge storm water associated with industrial activity.
Construction Activity.	Operators of construction activity disturbing 1 to 5 acres.

This table is not intended to be exhaustive, but rather provides a guide for readers regarding entities likely to be regulated by this action. This table lists the types of entities that EPA is now aware could potentially be regulated by this action. Other types of entities not listed in the table could also be regulated. To determine whether your facility or company is regulated by this action, you should carefully examine the applicability criteria in §§ 122.26(b), 122.31, 122.32, and 123.35 of the final rule. If you have questions regarding the applicability of this action to a particular entity, consult the person listed in the preceding **FOR FURTHER INFORMATION CONTACT** section.

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I. Background

A. Proposed Rule and Pre-Proposal Outreach

On January 9, 1998 (63 FR 1536), EPA proposed to expand the National Pollutant Discharge Elimination System (NPDES) storm water program to include storm water discharges from municipal separate storm sewer systems (MS4s) and construction sites that were smaller than those previously included in the program. The proposal also addressed industrial sources that have "no exposure" of industrial activities and materials to storm water. Today, EPA is promulgating a final rule to implement most of the proposed revisions with minor changes based on public comments received on the proposal. Today's final rule also extends the deadline by which certain industrial facilities operated by municipalities of less than 100,000 population must be covered by a NPDES permit; the deadline is changed from August 7, 2001 until March 10, 2003.

In 1972, Congress amended the Federal Water Pollution Control Act (commonly referred to as the Clean Water Act (CWA)) to prohibit the discharge of any pollutant to waters of the United States from a point source unless the discharge is authorized by an NPDES permit. The NPDES program is a program designed to track point sources and require the implementation of the controls necessary to minimize the discharge of pollutants. Initial efforts to improve water quality under the NPDES program primarily focused on reducing pollutants in industrial process wastewater and municipal sewage. These discharge sources were easily identified as responsible for poor, often drastically degraded, water quality conditions.

As pollution control measures for industrial process wastewater and municipal sewage were implemented and refined, it became increasingly evident that more diffuse sources of water pollution were also significant causes of water quality impairment. Specifically, storm water runoff draining large surface areas, such as agricultural and urban land, was found to be a major cause of water quality impairment, including the nonattainment of designated beneficial uses.

In 1987, Congress amended the CWA to require implementation, in two phases, of a comprehensive national program for addressing storm water discharges. The first phase of the program, commonly referred to as "Phase I," was promulgated on November 16, 1990 (55 FR 47990). Phase I requires NPDES permits for storm water discharge from a large number of priority sources including municipal separate storm sewer systems ("MS4s") generally serving populations of 100,000 or more and several categories of industrial activity, including construction sites that disturb five or more acres of land.

Today's rule, which is the second phase of the storm water program, expands the existing program to include discharges of storm water from smaller municipalities in urbanized areas and from construction sites that disturb between one and five acres of land. Today's rule allows certain sources to be excluded from the national program based on a demonstrable lack of impact on water quality. The rule also allows other sources not automatically regulated on a national basis to be designated for inclusion based on increased likelihood for localized adverse impact on water quality.

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Today's rule also conditionally excludes storm water discharges from industrial facilities that have "no exposure" of industrial activities or materials to storm water. Today's rule and the effort that led to its development are commonly referred to as "Phase II." On August 7, 1995, EPA promulgated a final rule that required facilities to be regulated under Phase II to apply for a NPDES permit by August 7, 2001, unless the NPDES permitting authority designates them as requiring a permit by an earlier date. (60 FR 40230). That rule is referred to as "the Interim Phase II Rule." Today's rule replaces the Interim Phase II rule.

EPA performed extensive outreach and worked with a variety of stakeholders prior to proposing today's rule. On September 9, 1992, EPA published a notice requesting information and public comment on how to prepare regulations under CWA section 402(p)(6) (see 57 FR 41344). The notice identified three sets of issues associated with developing new NPDES storm water regulations: (1) How should EPA identify unregulated sources of storm water to protect water quality, (2) what types of control strategies should EPA develop for these sources, and (3) what are appropriate deadlines for implementing new requirements. The notice recognized that potential sources for coverage under the section 402(p)(6) regulations would fall into two main categories: municipal separate storm sewer systems and individual (commercial and residential) sources. EPA received more than 130 comments on the September 9, 1992, notice. For further discussion of the comments received, see *Storm Water Discharges Potentially Addressed by Phase II of the National Pollutant Discharge Elimination System: Report to Congress* (EPA, 1995a), pp. 1–21 to 1–22, and Appendix J (which provides a detailed summary of the comments received as they relate to the specific issues raised in the notice).

In early 1993, the Rensselaerville Institute and EPA held public and expert meetings to assist in developing and analyzing options for identifying unregulated sources and possible controls. The report on the 1993 meetings identified two options that were favored by the various groups that participated. One option was a program that allowed States to select sources to be controlled in a manner consistent with criteria developed by EPA. A second option was a tiered approach under which EPA would select high priority sources for control by NPDES permits and States would select other sources for control under a State water quality program other than the NPDES program. For additional details see the "Report on the EPA Storm Water Management Program (Rensselaerville Study)," Appendix I of *Storm Water Discharges Potentially Addressed by Phase II of the National Pollutant Discharge Elimination System: Report to Congress* (EPA, 1995a).

EPA also conducted outreach with representatives of small entities in conjunction with the convening of a Small Business Advocacy Review Panel under the Small Business Regulatory Enforcement Fairness Act (SBREFA). This process is discussed in section IV.E of today's preamble. For additional background see the discussion in the preamble to the proposal for today's rule.

To assist EPA by providing advice and recommendations regarding the urban municipal wet weather water pollution control program, EPA established the Urban Wet Weather Flows Federal Advisory Committee (hereinafter, "FACA Committee") under the Federal Advisory Committee Act (FACA). The Office of Management and Budget approved the charter for the FACA Committee on March 10, 1995. The FACA Committee provided a forum for identifying and addressing issues associated with water quality impacts from storm water sources.

The FACA Committee established two subcommittees: the Storm Water Phase II FACA Subcommittee and the Sanitary Sewer Overflows (SSOs) FACA Subcommittee. Consistent with the requirements of FACA, the membership of both the FACA Committee and the subcommittees was balanced among EPA's various outside stakeholder interests, including representatives from municipalities, States, Indian Tribes, EPA, industrial and commercial sectors, agriculture, and environmental and public interest groups.

The Storm Water Phase II FACA Subcommittee ("Subcommittee") met fourteen times between September 1995 and June 1998. The 32 Subcommittee members discussed possible regulatory frameworks at these meetings as well as during numerous other meetings and conference calls. Members of the FACA Committee provided views regarding the development of the "no exposure" provision and other provisions in drafts of the Phase II rule. EPA provided Subcommittee members with four successive drafts of the proposed rule and preamble, outlines of the rule, summaries of the written comments received on each draft, and documents identifying the changes made to each draft. In the course of providing input to the Committee, individual Subcommittee members provided significant input and advice that EPA considered in the context of public comments received. Ultimately, the Subcommittee did not provide a written report back to the FACA Committee, and the FACA Committee did not provide written advice and recommendations to EPA. The Agency, therefore, did not rely on group recommendations in developing today's rule, but does consider the process to have resulted in important public outreach.

B. Water Quality Concerns/ Environmental Impact Studies and Assessments

Storm water runoff from lands modified by human activities can harm surface water resources and, in turn, cause or contribute to an exceedance of water quality standards by changing natural hydrologic patterns, accelerating stream flows, destroying aquatic habitat, and elevating pollutant concentrations and loadings. Such runoff may contain or mobilize high levels of contaminants, such as sediment, suspended solids, nutrients (phosphorous and nitrogen), heavy metals and other toxic pollutants, pathogens, toxins, oxygen-demanding substances (organic material), and floatables (U.S. EPA. 1992. *Environmental Impacts of Storm Water Discharges: A National Profile.* EPA 841–R–92–001. Office of Water. Washington, DC). After a rain, storm water runoff carries these pollutants into nearby streams, rivers, lakes, estuaries, wetlands, and oceans. The highest concentrations of these contaminants often are contained in "first flush" discharges, which occur during the first major storm after an extended dry period (Schueler, T.R. 1994. "First Flush of Stormwater Pollutants Investigated in Texas." Note 28. *Watershed Protection Techniques* 1(2)). Individually and combined, these pollutants impair water quality, threatening designated beneficial uses and causing habitat alteration or destruction.

Uncontrolled storm water discharges from areas of urban development and construction activity negatively impact receiving waters by changing the physical, biological, and chemical composition of the water, resulting in an unhealthy environment for aquatic organisms, wildlife, and humans. The following sections discuss the studies and data that address and support this finding.

Although water quality problems also can occur from agricultural storm water discharges and return flows from irrigated agriculture, this area of

concern is statutorily exempted from regulation as a point source under the Clean Water Act and is not discussed here. (See CWA section 502(14)). Other storm water sources not specifically identified in the regulations may be of concern in certain areas and can be addressed on a case-by-case (or category-by-category) basis through the NPDES designation authority preserved by CWA section 402(p)(2)(6), as well as today's rule.

1. Urban Development

Urbanization alters the natural infiltration capability of the land and generates a host of pollutants that are associated with the activities of dense populations, thus causing an increase in storm water runoff volumes and pollutant loadings in storm water discharged to receiving waterbodies (U.S. EPA, 1992). Urban development increases the amount of impervious surface in a watershed as farmland, forests, and meadowlands with natural infiltration characteristics are converted into buildings with rooftops, driveways, sidewalks, roads, and parking lots with virtually no ability to absorb storm water. Storm water and snow-melt runoff wash over these impervious areas, picking up pollutants along the way while gaining speed and volume because of their inability to disperse and filter into the ground. What results are storm water flows that are higher in volume, pollutants, and temperature than the flows in less impervious areas, which have more natural vegetation and soil to filter the runoff (U.S. EPA, 1997. *Urbanization and Streams: Studies of Hydrologic Impacts.* EPA 841–R–97-009. Office of Water. Washington, DC).

Studies reveal that the level of imperviousness in an area strongly correlates with the quality of the nearby receiving waters. For example, a study in the Puget Sound lowland ecoregion found that when the level of basin development exceeded 5 percent of the total impervious area, the biological integrity and physical habitat conditions that are necessary to support natural biological diversity and complexity declined precipitously (May, C.W., E.B. Welch, R.R. Horner, J.R. Karr, and B.W. May. 1997. *Quality Indices for Urbanization Effects in Puget Sound Lowland Streams,* Technical Report No. 154. University of Washington Water Resources Series). Research conducted in numerous geographical areas, concentrating on various variables and employing widely different methods, has revealed a similar conclusion: stream degradation occurs at relatively low levels of imperviousness, such as 10 to 20 percent (even as low as 5 to 10 percent according to the findings of the Washington study referenced above) (Schueler, T.R. 1994. "The Importance of Imperviousness." *Watershed Protection Techniques* 1(3); May, C., R.R. Horner, J.R. Karr, B.W. Mar, and E.B. Welch. 1997. "Effects Of Urbanization On Small Streams In The Puget Sound Lowland Ecoregion." *Watershed Protection Techniques* 2(4); Yoder, C.O., R.J. Miltner, and D. White. 1999. "Assessing the Status of Aquatic Life Designated Uses in Urban and Suburban Watersheds." In *Proceedings: National Conference on Retrofits Opportunities in Urban Environments.* EPA 625–R–99–002, Washington, DC; Yoder, C.O and R.J. Miltner. 1999. "Assessing Biological Quality and Limitations to Biological Potential in Urban and Suburban Watersheds in Ohio." In *Comprehensive Stormwater & Aquatic Ecosystem Management Conference Papers,* Auckland, New Zealand). Furthermore, research has indicated that few, if any, urban streams can support diverse benthic communities at imperviousness levels of 25 percent or more. An area of medium density single family homes can be anywhere from 25 percent to nearly 60 percent impervious, depending on the design of the streets and parking (Schueler, 1994).

In addition to impervious areas, urban development creates new pollution sources as population density increases and brings with it proportionately higher levels of car emissions, car maintenance wastes, pet waste, litter, pesticides, and household hazardous wastes, which may be washed into receiving waters by storm water or dumped directly into storm drains designed to discharge to receiving waters. More people in less space results in a greater concentration of pollutants that can be mobilized by, or disposed into, storm water discharges from municipal separate storm sewer systems. A modeling system developed for the Chesapeake Bay indicated that contamination of the Bay and its tributaries from runoff is comparable to, if not greater than, contamination from industrial and sewage sources (Cohn-Lee, R. and D. Cameron. 1992. "Urban Stormwater Runoff Contamination of the Chesapeake Bay: Sources and Mitigation." *The Environmental Professional,* Vol. 14).

a. Large-Scale Studies and Assessments

In support of today's regulatory designation of MS4s in urbanized areas, the Agency relied on broad-based assessments of urban storm water runoff and related water quality impacts, as well as more site-specific studies. The first national assessment of urban runoff characteristics was completed for the *Nationwide Urban Runoff Program (NURP)* study (U.S. EPA. 1983. *Results of the Nationwide Urban Runoff Program, Volume 1—Final Report.* Office of Water. Washington, D.C.). The NURP study is the largest nationwide evaluation of storm water discharges, which includes adverse impacts and sources, undertaken to date.

EPA conducted the NURP study to facilitate understanding of the nature of urban runoff from residential, commercial, and industrial areas. One objective of the study was to characterize the water quality of discharges from separate storm sewer systems that drain residential, commercial, and light industrial (industrial parks) sites. Storm water samples from 81 residential and commercial properties in 22 urban/suburban areas nationwide were collected and analyzed during the 5-year period between 1978 and 1983. The majority of samples collected in the study were analyzed for eight conventional pollutants and three heavy metals.

Data collected under the NURP study indicated that discharges from separate storm sewer systems draining runoff from residential, commercial, and light industrial areas carried more than 10 times the annual loadings of total suspended solids (TSS) than discharges from municipal sewage treatment plants that provide secondary treatment. The NURP study also indicated that runoff from residential and commercial areas carried somewhat higher annual loadings of chemical oxygen demand (COD), total lead, and total copper than effluent from secondary treatment plants. Study findings showed that fecal coliform counts in urban runoff typically range from tens to hundreds of thousands per hundred milliliters of runoff during warm weather conditions, with the median for all sites being around 21,000/100 ml. This is generally consistent with studies that found that fecal coliform mean values range from 1,600 coliform fecal units (CFU)/100 ml to 250,000 cfu/100 ml (Makepeace, D.K., D.W. Smith, and S.J. Stanley. 1995. "Urban Storm Water Quality: Summary of Contaminant Data." *Critical Reviews in Environmental Science and Technology* 25(2):93-139). Makepeace, et al., summarized ranges of contaminants from storm water, including physical contaminants such as total solids (76—36,200 mg/L) and copper (up to 1.41 mg/L); organic chemicals; organic compounds, such as oil and grease (up to 110 mg/L); and microorganisms.

Monitoring data summarized in the NURP study provided important information about urban runoff from residential, commercial, and light industrial areas. The study concluded that the quality of urban runoff can be affected adversely by several sources of pollution that were not directly evaluated in the study, including illicit discharges, construction site runoff, and illegal dumping. Data from the NURP study were analyzed further in the U.S. Geological Survey (USGS) Urban Storm Water Data Base for 22 Metropolitan Areas Throughout the United States study (Driver, N.E., M.H. Mustard, R.B. Rhinesmith, and R.F. Middleburg. 1985. *U.S. Geological Survey Urban Storm Water Data Base for 22 Metropolitan Areas Throughout the United States.* Report No. 85–337 USGS. Lakewood, CO). The USGS report summarized additional monitoring data compiled during the mid-1980s, covering 717 storm events at 99 sites in 22 metropolitan areas and documented problems associated with metals and sediment concentrations in urban storm water runoff. More recent reports have confirmed the pollutant concentration data collected in the NURP study (Marsalek, J. 1990. "Evaluation of Pollutant Loads from Urban Nonpoint Sources." *Wat. Sci. Tech.* 22(10/11):23–30; Makepeace, et al., 1995).

Commenters argued that the NURP study does not support EPA's contention that urban activities significantly jeopardize attainment of water quality standards. One commenter argued that the NURP study and the 1985 USGS study are seriously out of date. Because they were issued 10 years or more before the implementation of the current storm water permit program, the data in those reports do not reflect conditions that exist after implementation of permits issued by authorized States and EPA for storm water from construction sites, large municipalities, and industrial activities.

In response, EPA notes that it is not relying solely on the NURP study to describe current water quality impairment. Rather, EPA is citing NURP as a source of data on typical pollutant concentrations in urban runoff. Recent studies have not found significantly different pollutant concentrations in urban runoff when compared to the original NURP data (see Makepeace, et al., 1995; Marsalek, 1990; and Pitt, et al., 1995).

America's Clean Water—the States' Nonpoint Source Assessment (Association of State and Interstate Water Pollution Control Administrators (ASIWPCA). 1985. *America's Clean Water—The States' Nonpoint Source Assessment.* Prepared in cooperation with the U.S. EPA, Office of Water, Washington, DC), a comprehensive study of diffuse pollution sources conducted under the sponsorship of the Association of State and Interstate Water Pollution Control Administrators (ASIWPCA) and EPA revealed that 38 States reported urban runoff as a major cause of designated beneficial use impairment and 21 States reported storm water runoff from construction sites as a major cause of beneficial use impairment. In addition, the 1996 305(b) Report (U.S. EPA. 1998. *The National Water Quality Inventory, 1996 Report to Congress.* EPA 841–R–97–008. Office of Water. Washington, DC), provides a national assessment of water quality based on biennial reports submitted by the States as required under CWA section 305(b) of the CWA. In the CWA 305(b) reports, States, Tribes, and Territories assess their individual water quality control programs by examining the attainment or nonattainment of the designated uses assigned to their rivers, lakes, estuaries, wetlands, and ocean shores. A designated use is the legally applicable use specified in a water quality standard for a watershed, waterbody, or segment of a waterbody. The designated use is the desirable use that the water quality should support. Examples of designated uses include drinking water supply, primary contact recreation (swimming), and aquatic life support. Each CWA 305(b) report indicates the assessed fraction of a State's waters that are fully supporting, partially supporting, or not supporting designated beneficial uses.

In their reports, States, Tribes, and Territories first identified and then assigned the sources of water quality impairment for each impaired waterbody using the following categories: industrial, municipal sewage, combined sewer overflows, urban runoff/storm sewers, agricultural, silvicultural, construction, resource extraction, land disposal, hydrologic modification, and habitat modification. The 1996 Inventory, based on a compilation of 60 individual 305(b) reports submitted by States, Tribes, and Territories, assessed the following percentages of total waters nationwide: 19 percent of river and stream miles; 40 percent of lake, pond, and reservoir acres; 72 percent of estuary square miles; and 6 percent of ocean shoreline waters. The 1996 Inventory indicated that approximately 40 percent of the Nation's assessed rivers, lakes, and estuaries are impaired. Waterbodies deemed as "impaired" are either partially supporting designated uses or not supporting designated uses.

The 1996 Inventory also found urban runoff/discharges from storm sewers to be a major source of water quality impairment nationwide. Urban runoff/storm sewers were found to be a source of pollution in 13 percent of impaired rivers; 21 percent of impaired lakes, ponds, and reservoirs; and 45 percent of impaired estuaries (second only to industrial discharges). In addition, urban runoff was found to be the leading cause of ocean impairment for those ocean miles surveyed.

In addition, a recent USGS study of urban watersheds across the United States has revealed a link between urban development and contamination of local waterbodies. The study found the highest levels of organic contaminants, known as polycyclic aromatic hydrocarbons (PAHs) (products of combustion of wood, grass, and fossil fuels), in the reservoirs of urbanized watersheds (U.S. Geological Survey (USGS). 1998. *Research Reveals Link Between Development and Contamination in Urban Watersheds.* USGS news release. USGS National Water-Quality Assessment Program).

Urban storm water also can contribute significant amounts of toxicants to receiving waters. Pitt, et. al. (1993), found heavy metal concentrations in the majority of samples analyzed. Industrial or commercial areas were likely to be the most significant pollutant source areas (Pitt, R., R. Field, M. Lalor, M. Brown 1993. "Urban stormwater toxic pollutants: assessment, sources, and treatability" *Water Environment Research,* 67(3):260–75).

b. Local and Watershed-Based Studies

In addition to the large-scale nationwide studies and assessments, a number of local and watershed-based studies from across the country have documented the detrimental effects of urban storm water runoff on water quality. A study of urban streams in Milwaukee County, Wisconsin, found local streams to be highly degraded due primarily to urban runoff, while three studies in the Atlanta, Georgia, region were characterized as being "the first documentation in the Southeast of the strong negative relationship between urbanization and stream quality that has been observed in other ecoregions" (Masterson, J. and R. Bannerman. 1994. "Impacts of Storm Water Runoff on Urban Streams in Milwaukee County, Wisconsin." Paper presented at National Symposium on Water Quality: American Water Resources Association; Schueler, T.R. 1997. "Fish Dynamics in Urban Streams Near Atlanta, Georgia."

Technical Note 94. *Watershed Protection Techniques* 2(4)). Several other studies, including those performed in Arizona (Maricopa County), California (San Jose's Coyote Creek), Massachusetts (Green River), Virginia (Tuckahoe Creek), and Washington (Puget Sound lowland ecoregion), all had the same finding: runoff from urban areas greatly impair stream ecology and the health of aquatic life; the more heavily developed the area, the more detrimental the effects (Lopes, T. and K. Fossum. 1995. "Selected Chemical Characteristics and Acute Toxicity of Urban Stormwater, Streamflow, and Bed Material, Maricopa County, Arizona." *Water Resources Investigations Report* 95–4074. USGS; Pitt, R. 1995. "Effects of Urban Runoff on Aquatic Biota." In *Handbook of Ecotoxicology;* Pratt, J. and R. Coler. 1979. "Ecological Effects of Urban Stormwater Runoff on Benthic Macroinvertebrates Inhabiting the Green River, Massachusetts." Completion Report Project No. A–094. Water Resources Research Center. University of Massachusetts at Amherst.; Schueler, T.R. 1997. "Historical Change in a Warmwater Fish Community in an Urbanizing Watershed." Technical Note 93. *Watershed Protection Techniques* 2(4); May, C., R. Horner, J. Karr, B. Mar, and E. Welch. 1997. "Effects Of Urbanization On Small Streams In The Puget Sound Lowland Ecoregion." *Watershed Protection Techniques* 2(4)).

Pitt and others also described the receiving water effects on aquatic organisms associated with urban runoff (Pitt, R.E. 1995. "Biological Effects of Urban Runoff Discharges" In *Stormwater Runoff and Receiving Systems: Impact, Monitoring, and Assessment,* ed. E.E Herricks, Lewis Publishers; Crunkilton, R., J. Kleist, D. Bierman, J. Ramcheck, and W. DeVita. 1999. "Importance of Toxicity as a Factor Controlling the Distribution of Aquatic Organisms in an Urban Stream." In *Comprehensive Stormwater & Aquatic Ecosystem Management Conference Papers.* Auckland, New Zealand).

In Wisconsin, runoff samples were collected from streets, parking lots, roofs, driveways, and lawns. Source areas were broken up into residential, commercial, and industrial. Geometric mean concentration data for residential areas included total solids of about 500–800 mg/L from streets and 600 mg/L from lawns. Fecal coliform data from residential areas ranged from 34,000 to 92,000 cfu/100 mL for streets and driveways. Contaminant concentration data from commercial and industrial source areas were lower for total solids and fecal coliform, but higher for total zinc (Bannerman, R.T., D.W. Owens, R.B. Dods, and N.J. Hornewer. 1993. "Sources of Pollutants in Wisconsin Stormwater." *Wat. Sci. Tech.* 28(3–5):241–59).

Bannerman, et al. also found that streets contribute higher loads of pollutants to urban storm water than any other residential development source. Two small urban residential watersheds were evaluated to determine that lawns and streets are the largest sources of total and dissolved phosphorus in the basins (Waschbusch, R.J., W.R. Selbig, and R.T. Bannerman. 1999. "Sources of Phosphorus in Stormwater and Street Dirt from Two Urban Residential Basins In Madison, Wisconsin, 1994–95." *Water Resources Investigations Report* 99–4021. U.S. Geological Survey). A number of other studies have indicated that urban roadways often contain significant quantities of metal elements and solids (Sansalone, J.J. and S.G. Buchberger. 1997. "Partitioning and First Flush of Metals in Urban Roadway Storm Water." *ASCE Journal of Environmental Engineering* 123(2); Sansalone, J.J., J.M. Koran, J.A. Smithson, and S.G. Buchberger. 1998. "Physical Characteristics of Urban Roadway Solids Transported During Rain Events" *ASCE Journal of Environmental Engineering* 124(5); Klein, L.A., M. Lang, N. Nash, and S.L. Kirschner. 1974. "Sources of Metals in New York City Wastewater" *J. Water Pollution Control Federation* 46(12):2653–62; Barrett, M.E, R.D. Zuber, E.R. Collins, J.F. Malina, R.J. Charbeneau, and G.H Ward., 1993. "A Review and Evaluation of Literature Pertaining to the Quantity and Control of Pollution from Highway Runoff and Construction." Research Report 1943–1. Center for Transportation Research, University of Texas, Austin).

c. Beach Closings/Advisories

Urban wet weather flows have been recognized as the primary sources of estuarine pollution in coastal communities. Urban storm water runoff, sanitary sewer overflows, and combined sewer overflows have become the largest causes of beach closings in the United States in the past three years. Storm water discharges from urban areas not only pose a threat to the ecological environment, they also can substantially affect human health. A survey of coastal and Great Lakes communities reports that in 1998, more than 1,500 beach closings and advisories were associated with storm water runoff (Natural Resources Defense Council. 1999. "A Guide to Water Quality at Vacation Beaches" New York, NY). Other reports also document public health, shellfish bed, and habitat impacts from storm water runoff, including more than 823 beach closings/advisories issued in 1995 and more than 407 beach closing/advisories issued in 1996 due to urban runoff (Natural Resources Defense Council. 1996. *Testing the Waters Volume VI: Who Knows What You're Getting Into.* New York, NY; NRDC. 1997. *Testing the Waters Volume VII: How Does Your Vacation Beach Rate.* New York, NY; Morton, T. 1997. *Draining to the Ocean: The Effects of Stormwater Pollution on Coastal Waters.* American Oceans Campaign, Santa Monica, CA). The Epidemiological Study of Possible Adverse Health Effects of Swimming in Santa Monica Bay (Haile, R.W., et. al. 1996. "An Epidemiological Study of Possible Adverse Health Effects of Swimming in Santa Monica Bay." *Final Report prepared for the Santa Monica Bay Restoration Project*) concluded that there is a 57 percent higher rate of illness in swimmers who swim adjacent to storm drains than in swimmers who swim more than 400 yards away from storm drains. This and other studies document a relationship between gastrointestinal illness in swimmers and water quality, the latter of which can be heavily compromised by polluted storm water discharges.

2. Non-Storm Water Discharges Through Municipal Storm Sewers

Studies have shown that discharges from MS4s often include wastes and wastewater from non-storm water sources. Federal regulations (§ 122.26(b)(2)) define an illicit discharge as "* * * any discharge to an MS4 that is not composed entirely of storm water * * *," with some exceptions. These discharges are "illicit" because municipal storm sewer systems are not designed to accept, process, or discharge such wastes. Sources of illicit discharges include, but are not limited to: sanitary wastewater; effluent from septic tanks; car wash, laundry, and other industrial wastewaters; improper disposal of auto and household toxics, such as used motor oil and pesticides; and spills from roadway and other accidents.

Illicit discharges enter the system through either direct connections (e.g., wastewater piping either mistakenly or deliberately connected to the storm drains) or indirect connections (e.g., infiltration into the MS4 from cracked sanitary systems, spills collected by drain outlets, and paint or used oil dumped directly into a drain). The result is untreated discharges that contribute high levels of pollutants,

including heavy metals, toxics, oil and grease, solvents, nutrients, viruses and bacteria into receiving waterbodies. The NURP study, discussed earlier, found that pollutant levels from illicit discharges were high enough to significantly degrade receiving water quality and threaten aquatic, wildlife, and human health. The study noted particular problems with illicit discharges of sanitary wastes, which can be directly linked to high bacterial counts in receiving waters and can be dangerous to public health.

Because illicit discharges to MS4s can create severe widespread contamination and water quality problems, several municipalities and urban counties performed studies to identify and eliminate such discharges. In Michigan, the Ann Arbor and Ypsilanti water quality projects inspected 660 businesses, homes, and other buildings and identified 14 percent of the buildings as having improper storm sewer drain connections. The program assessment revealed that, on average, 60 percent of automobile-related businesses, including service stations, automobile dealerships, car washes, body shops, and light industrial facilities, had illicit connections to storm sewer drains. The program assessment also showed that a majority of the illicit discharges to the storm sewer system resulted from improper plumbing and connections, which had been approved by the municipality when installed (Washtenaw County Statutory Drainage Board. 1987. Huron River Pollution Abatement Program).

In addition, an inspection of urban storm water outfalls draining into Inner Grays, Washington, indicated that 32 percent of these outfalls had dry weather flows. Of these flows, 21 percent were determined to have pollutant levels higher than the pollutant levels expected in typical urban storm water runoff characterized in the NURP study (U.S. EPA. 1993. *Investigation of Inappropriate Pollutant Entries Into Storm Drainage Systems—A User's Guide.* EPA 600/R–92/238. Office of Research and Development. Washington, DC). That same document reports a study in Toronto, Canada, that found that 59 percent of outfalls from the MS4 had dry-weather flows. Chemical tests revealed that 14 percent of these dry-weather flows were determined to be grossly polluted.

Inflows from aging sanitary sewer collection systems are one of the most serious illicit discharge-related problems. Sanitary sewer systems frequently develop leaks and cracks, resulting in discharges of pollutants to receiving waters through separate storm sewers. These pollutants include sanitary waste and materials from sewer main construction (e.g., asbestos cement, brick, cast iron, vitrified clay). Municipalities have long recognized the reverse problem of storm water infiltration into sanitary sewer collection systems; this type of infiltration often disrupts the operation of the municipal sewage treatment plant.

The improper disposal of materials is another illicit discharge-related problem that can result in contaminated discharges from separate storm sewer systems in two ways. First, materials may be disposed of directly in a catch basin or other storm water conveyance. Second, materials disposed of on the ground may either drain directly to a storm sewer or be washed into a storm sewer during a storm event. Improper disposal of materials to street catch basins and other storm sewer inlets often occurs when people mistakenly believe that disposal to such areas is an environmentally sound practice. Part of the confusion may occur because some areas are served by combined sewer systems, which are part of the sanitary sewer collection system, and people assume that materials discharged to a catch basin will reach a municipal sewage treatment plant. Materials that are commonly disposed of improperly include used motor oil; household toxic materials; radiator fluids; and litter, such as disposable cups, cans, and fast-food packages. EPA believes that there has been increasing success in addressing these problems through initiatives such as storm drain stenciling and recycling programs, including household hazardous waste special collection days.

Programs that reduce illicit discharges to separate storm sewers have improved water quality in several municipalities. For example, Michigan's Huron River Pollution Abatement Program found the elimination of illicit connections caused a measurable improvement in the water quality of the Washtenaw County storm sewers and the Huron River (Washtenaw County Statutory Drainage Board, 1987). In addition, an illicit detection and remediation program in Houston, Texas, has significantly improved the water quality of Buffalo Bayou. Houston estimated that illicit flows from 132 sources had a flow rate as high as 500 gal/min. Sources of the illicit discharges included broken and plugged sanitary sewer lines, illicit connections from sanitary lines to storm sewer lines, and floor drain connections (Glanton, T., M.T. Garrett, and B. Goloby. 1992. The Illicit Connection: Is It the Problem? *Wat. Env. Tech.* 4(9):63–8).

3. Construction Site Runoff

Storm water discharges generated during construction activities can cause an array of physical, chemical, and biological water quality impacts. Specifically, the biological, chemical, and physical integrity of the waters may become severely compromised. Water quality impairment results, in part, because a number of pollutants are preferentially absorbed onto mineral or organic particles found in fine sediment. The interconnected process of erosion (detachment of the soil particles), sediment transport, and delivery is the primary pathway for introducing key pollutants, such as nutrients (particularly phosphorus), metals, and organic compounds into aquatic systems (Novotny, V. and G. Chesters. 1989. "Delivery of Sediment and Pollutants from Nonpoint Sources: A Water Quality Perspective." *Journal of Soil and Water Conservation,* 44(6):568–76). Estimates indicate that 80 percent of the phosphorus and 73 percent of the Kjeldahl nitrogen in streams is associated with eroded sediment (U.S. Department of Agriculture. 1989. "The Second RCA Appraisal, Soil, Water and Related Resources on Nonfederal Land in the United States, Analysis of Condition and Trends." Cited in Fennessey, L.A.J., and A.R. Jarrett. 1994. "The Dirt in a Hole: a Review of Sedimentation Basins for Urban Areas and Construction Sites." *Journal of Soil and Water Conservation,* 49(4):317–23).

In watersheds experiencing intensive construction activity, the localized impacts of water quality may be severe because of high pollutant loads, primarily sediments. Siltation is the largest cause of impaired water quality in rivers and the third largest cause of impaired water quality in lakes (U.S. EPA, 1998). The 1996 305(b) report also found that construction site discharges were a source of pollution in: 6 percent of impaired rivers; 11 percent of impaired lakes, ponds, and reservoirs; and 11 percent of impaired estuaries. Introduction of coarse sediment (coarse sand or larger) or a large amount of fine sediment is also a concern because of the potential of filling lakes and reservoirs (along with the associated remediation costs for dredging), as well as clogging stream channels (e.g., Paterson, R.G., M.I. Luger, E.J. Burby, E.J. Kaiser, H.R. Malcolm, and A.C. Beard. 1993. "Costs and Benefits of Urban Erosion and Sediment Control: North Carolina Experience." *Environmental Management* 17(2):167–78). Large inputs of coarse sediment into

stream channels initially will reduce stream depth and minimize habitat complexity by filling in pools (U.S. EPA. 1991. *Monitoring Guidelines to Evaluate Effects of Forestry Activities on Streams in the Pacific Northwest and Alaska*. EPA 910/9–91–001. Seattle, WA). In addition, studies have shown that stream reaches affected by construction activities often extend well downstream of the construction site. For example, between 4.8 and 5.6 kilometers of stream below construction sites in the Patuxent River watershed were observed to be impacted by sediment inputs (Fox, H.L. 1974. "Effects of Urbanization on the Patuxent River, with Special Emphasis on Sediment Transport, Storage, and Migration." Ph.D. dissertation. Johns Hopkins University, Baltimore, MD. As Cited in Klein, R.D. 1979. "Urbanization and Stream Quality Impairment." *Water Resources Bulletin* 15(4): 948–63).

A primary concern at most construction sites is the erosion and transport process related to fine sediment because rain splash, rills (i.e., a channel small enough to be removed by normal agricultural practices and typically less than 1-foot deep), and sheetwash encourage the detachment and transport of this material to waterbodies (Storm Water Quality Task Force. 1993. *California Storm Water Best Management Practice Handbooks—Construction Activity*. Oakland, CA: Blue Print Service). Construction sites also can generate other pollutants associated with onsite wastes, such as sanitary wastes or concrete truck washout.

Although streams and rivers naturally carry sediment loads, erosion from construction sites and runoff from developed areas can elevate these loads to levels well above those in undisturbed watersheds. It is generally acknowledged that erosion rates from construction sites are much greater than from almost any other land use (Novotny, V. and H. Olem. 1994. *Water Quality: Prevention, Identification, and Management of Diffuse Pollution*. New York: Van Nostrand Reinhold). Results from both field studies and erosion models indicate that erosion rates from construction sites are typically an order of magnitude larger than row crops and several orders of magnitude greater than rates from well-vegetated areas, such as forests or pastures (USDA. 1970. "Controlling Erosion on Construction Sites." *Agriculture Information Bulletin*, Washington, DC; Meyer, L.D., W.H. Wischmeier, and W.H. Daniel. 1971. "Erosion, Runoff and Revegetation of Denuded Construction Sites." *Transactions of the ASAE* 14(1):138–41; Owen, O.S. 1975. *Natural Resource Conservation*. New York: MacMillan. As cited in Paterson, et al., 1993).

A recent review of the efficiency of sediment basins indicated that inflows from 12 construction sites had a mean TSS concentration of about 4,500 mg/L (Brown, W.E. 1997. "The Limits of Settling." Technical Note No. 83. *Watershed Protection Techniques* 2(3)). In Virginia, suspended sediment concentrations from housing construction sites were measured at 500–3,000 mg/L, or about 40 times larger than the concentrations from already-developed urban areas (Kuo, C.Y. 1976. "Evaluation of Sediment Yields Due to Urban Development." Bulletin No. 98. Virginia Water Resources Research Center, Virginia Polytechnic Institute and State University, Blacksburg, VA).

Similar impacts from storm water runoff have been reported in a number of other studies. For example, Daniel, et al., monitored three residential construction sites in southeastern Wisconsin and determined that annual sediment yields were more than 19 times the yields from agricultural areas (Daniel, T.C., D. McGuire, D. Stoffel, and B. Miller. 1979. "Sediment and Nutrient Yield from Residential Construction Sites" *Journal of Environmental Quality* 8(3):304–08). Daniel, et al., identified total storm runoff, followed by peak storm runoff, as the most influential factors controlling the sediment loadings from residential construction sites. Daniel, et al., also found that suspended sediment concentrations were 15,000–20,000 mg/L in moderate events and up to 60,000 mg/L in larger events.

Wolman and Schick (Wolman, M.G. and A.P. Schick. 1967. "Effects of Construction on Fluvial Sediment, Urban and Suburban Areas of Maryland." *Water Resources Research* 3(2): 451–64) studied the impacts of development on fluvial systems in Maryland and determined that sediment yields in areas undergoing construction were 1.5 to 75 times greater than detected in natural or agricultural catchments. The authors summarize the potential impacts of construction on sediment yields by stating that "the equivalent of many decades of natural or even agricultural erosion may take place during a single year from areas cleared for construction" (Wolman and Schick, 1967).

A number of studies have examined the effects of road construction on erosion rates and sediment yields. A highway construction project in West Virginia disturbed only 4.2 percent of a 4.72-square-mile basin, but resulted in a three-fold increase in suspended sediment yields (Downs, S.C. and D.H. Appel. 1986. *Progress Report on the Effects of Highway Construction on Suspended-Sediment Discharge in the Coal River and Trace Fork, West Virginia*, 1975–81. USGS Water Resources Investigations Report 84–4275. Charlestown, WV). During the largest storm event, it was estimated that 80 percent of the sediment in the stream originated from the construction site. As is often the case, the increase in suspended sediment load could not be detected further downstream, where the drainage area was more than 50 times larger (269 square miles).

Another study evaluated the effect of 290 acres of highway construction on watersheds ranging in size from 5 to 38 square miles. Suspended sediment loads in the smallest watershed increased by 250 percent, and the estimated sediment yield from the construction area was 37 tons/acre during a 2-year period (Hainly, R.A. 1980. *The Effects of Highway Construction on Sediment Discharge into Blockhouse Creek and Stream Valley Run, Pennsylvania*. USGS Water Resources Investigations Report 80–68. Harrisburg, PA). A more recent study in Hawaii showed that highway construction increased suspended sediment loads by 56 to 76 percent in three small (1 to 4 square mile) basins (Hill, B.R. 1996. *Streamflow and Suspended-Sediment Loads Before and During Highway Construction, North Halawa, Haiku, and Kamooalii Drainage Basins, Oahu, Hawaii, 1983–91*. USGS Water Resources Investigations Report 96–4259. Honolulu, HI). A 1970 study determined that sediment yields from construction areas can be as much as 500 times the levels detected in rural areas (National Association of Counties Research Foundation. 1970. *Urban Soil Erosion and Sediment Control*. Water Pollution Control Research Series, Program #15030 DTL. Federal Water Quality Administration, U.S. Department of Interior. Washington, DC)

Yorke and Herb (Yorke, T.H., and W.J. Herb. 1978. *Effects of Urbanization on Streamflow and Sediment Transport in the Rock Creek and Anacostia River Basins, Montgomery County, Maryland, 1962–74*. USGS Professional Paper 1003, Washington, DC) evaluated nine subbasins in the Maryland portion of the Anacostia watershed for more than a decade in an effort to define the impacts of changing land use/land cover on sediment in runoff. Average annual suspended sediment yields for construction sites ranged from 7 to 100 tons/acre. Storm water discharges from construction sites that occur when the land area is disturbed (and prior to

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surface stabilization) can significantly impact designated uses. Examples of designated uses include public water supply, recreation, and propagation of fish and wildlife. The siltation process described previously can threaten all three designated uses by (1) depositing high concentrations of pollutants in public water supplies; (2) decreasing the depth of a waterbody, which can reduce the volume of a reservoir or result in limited use of a water body by boaters, swimmers, and other recreational enthusiasts; and (3) directly impairing the habitat of fish and other aquatic species, which can limit their ability to reproduce.

Excess sediment can cause a number of other problems for waterbodies. It is associated with increased turbidity and reduced light penetration in the water column, as well as more long-term effects associated with habitat destruction and increased difficulty in filtering drinking water. Numerous studies have examined the effect that excess sediment has on aquatic ecosystems. For example, sediment from road construction activity in Northern Virginia reduced aquatic insect and fish communities by up to 85 percent and 40 percent, respectively (Reed, J.R. 1997. "Stream Community Responses to Road Construction Sediments." Bulletin No. 97. Virginia Water Resources Research Center, Virginia Polytechnic Institute, Blacksburg, VA. As cited in Klein, R.D. 1990. *A Survey of Quality of Erosion and Sediment Control and Storm Water Management in the Chesapeake Bay Watershed.* Annapolis, MD: Chesapeake Bay Foundation). Other studies have shown that fine sediment (fine sand or smaller) adversely affects aquatic ecosystems by reducing light penetration, impeding sight-feeding, smothering benthic organisms, abrading gills and other sensitive structures, reducing habitat by clogging interstitial spaces within a streambed, and reducing the intergravel dissolved oxygen by reducing the permeability of the bed material (Everest, F.H., J.C. Beschta, K.V. Scrivener, J.R. Koski, J.R. Sedell, and C.J. Cederholm. 1987. "Fine Sediment and Salmonid Production: A Paradox." *Streamside Management: Forestry and Fishery Interactions,* Contract No. 57, Institute of Forest Resources, University of Washington, Seattle, WA). For example, 4.8 and 5.6 kilometers of stream below construction sites in the Patuxent River watershed in Maryland were found to have fine sediment amounts 15 times greater than normal (Fox, 1974. As cited in Klein, 1979). Benthic organisms in the streambed can be smothered by sediment deposits, causing changes in aquatic flora and fauna, such as fish species composition (Wolman and Schick, 1967). In addition, the primary cause of coral reef degradation in coastal areas is attributed to land disturbances and dredging activities due to urban development (Rogers, C.S. 1990. "Responses of Coral Reefs and Reef Organizations to Sedimentation." *Marine Ecology Progress Series,* 62:185–202).

EPA believes that the water quality impact from small construction sites is as high as or higher than the impact from larger sites on a per acre basis. The concentration of pollutants in the runoff from smaller sites is similar to the concentrations in the runoff from larger sites. The proportion of sediment that makes it from the construction site to surface waters is likely the same for larger and smaller construction sites in urban areas because the runoff from either site is usually delivered directly to the storm drain network where there is no opportunity for the sediment to be filtered out.

The expected contribution of total sediment yields from small sites depends, in part, on the extent to which erosion and sedimentation controls are being applied. Because current storm water regulations are more likely to require erosion and sedimentation controls on larger sites in urban areas, smaller construction sites that lack such programs are likely to contribute a disproportionate amount of the total sediment from construction activities (MacDonald, L.H. 1997. *Technical Justification for Regulating Construction Sites 1–5 Acres in Size.* Unpublished report submitted to U.S. EPA, Washington, DC). Smaller construction sites are less likely to have an effective plan to control erosion and sedimentation, are less likely to properly implement and maintain their plans, and are less likely to be inspected (Brown, W. and D. Caraco. 1997. *Controlling Storm Water Runoff Discharges from Small Construction Sites: A National Review.* Submitted to Office of Wastewater Management, U.S. EPA, Washington, DC., by the Center for Watershed Protection, Silver Spring, MD). The proportion of sediment that makes it from the construction site to surface waters is likely the same for larger and smaller construction sites in urban areas because the runoff from either site is usually delivered directly to the storm drain network, where there is no opportunity for the sediment to be filtered out.

To confirm its belief that sediment yields from small sites are as high as or higher than the 20 to 150 tons/acre/year measured from larger sites, EPA gave a grant to the Dane County, Wisconsin Land Conservation Department, in cooperation with the USGS, to evaluate sediment runoff from two small construction sites. The first was a 0.34 acre residential lot and the second was a 1.72 acre commercial office development. Runoff from the sites was channeled to a single discharge point for monitoring. Each site was monitored before, during, and after construction.

The Dane County study found that total solids concentrations from these small sites are similar to total solids concentrations from larger construction sites. Results show that for both of the study sites, total solids and suspended solids concentrations were significantly higher during construction than either before or after construction. For example, preconstruction total solids concentrations averaged 642 mg/L during the period when ryegrass was established, active construction total solids concentrations averaged 2,788 mg/L, and post-construction total solids concentrations averaged 132 mg/L (on a pollutant load basis, this equaled 7.4 lbs preconstruction, 35 lbs during construction, and 0.6 lbs post-construction for total solids). While this site was not properly stabilized before construction, after construction was complete and the site was stabilized, post-construction concentrations were more than 20 times less than during construction. The results were even more dramatic for the commercial site. The commercial site had one preconstruction event, which resulted in total solids concentrations of 138 mg/L, while active construction averaged more than 15,000 mg/L and post-construction averaged only 200 mg/L (on a pollutant load basis, this equaled 0.3 lbs preconstruction, 490 lbs during construction, and 13.4 lbs post-construction for total solids). The active construction period resulted in more than 75 times more sediment than either before or after construction (Owens, D.W., P. Jopke, D.W. Hall, J. Balousek and A. Roa. 1999. "Soil Erosion from Small Construction Sites." Draft USGS Fact Sheet. USGS and Dane County Land Conservation Department, WI). The total solids concentrations from these small sites in Wisconsin are similar to total solids concentrations from larger construction sites. For example, a study evaluating the effects of highway construction in West Virginia found that a small storm produced a sediment concentration of 7,520 mg/L (Downs and Appel, 1986).

One important aspect of small construction sites is the number of small sites relative to larger construction sites

and total land area within the watershed. Brown and Caraco surveyed 219 local jurisdictions to assess erosion and sediment control (ESC) programs. Seventy respondents provided data on the number of ESC permits for construction sites smaller than 5 acres. In 27 cases (38 percent of the respondents), more than three-quarters of the permits were for sites smaller than 5 acres; in another 18 cases (26 percent), more than half of the permits were for sites smaller than 5 acres.

In addition, data on the total acreage disturbed by smaller construction sites have been collected recently in two States (MacDonald, 1997). The most recent and complete data set is the listing of the disturbed area for each of the 3,831 construction sites permitted in North Carolina for 1994–1995 and 1995–1996. Nearly 61 percent of the sites that were 1 acre or larger were between 1.0 and 4.9 acres in size. This proportion was consistent between years. Data showed that this range of sites accounted for 18 percent of the total area disturbed by construction. The values showed very little variation between the 2 years of data. The total disturbed area for all sites over this 2-year period was nearly 33,000 acres, or about 0.1 percent of the total area of North Carolina.

EPA estimates that construction sites disturbing greater than 5 acres disturb 2.1-million acres of land (78.1 percent of the total) while sites disturbing between 1 and 5 acres of land disturb 0.5-million acres of land (19.4 percent). The remaining sites on less than 1 acres of land disturb 0.07-million acres of land (only 2.5 percent of the total). Given the high erosion rates associated with most construction sites, small construction sites can be a significant source of water quality impairment, particularly in small watersheds that are undergoing rapid development. Exempting sites under 1 acre will exclude only about 2.5 percent of acreage from program coverage, but will exclude a far higher number of sites, approximately 25 percent.

Several studies have determined that the most effective construction runoff control programs rely on local plan review and field enforcement (Paterson, R. G. 1994. "Construction Practices: the Good, the Bad, and the Ugly." *Watershed Protection Techniques* 1(3)). In his review, Paterson suggests that, given the critical importance of field implementation of erosion and sediment control programs and the apparent shortcomings that exist, much more focus should be given to plan implementation.

Several commenters disputed the data presented in the proposed rule for storm water discharges from smaller construction sites. One commenter stated that EPA has not adequately explained the basis for permitting construction activity down to 1 disturbed acre. Another commenter stated that EPA did not present sufficient data on water quality impacts from construction sites disturbing less than 5 acres.

EPA believes that the data presented above sufficiently support nationwide designation of storm water discharges from construction activity disturbing more than 1 acre. Based on total disturbed land area within a watershed, the cumulative effects of numerous small construction sites can have impacts similar to those of larger sites in a particular area. In addition, waivers for storm water discharges from smaller construction activity will exclude sites not expected to impair water quality. EPA will continue to collect water quality data on construction site storm water runoff.

C. Statutory Background

In 1972, Congress enacted the CWA to prohibit the discharge of any pollutant to waters of the United States from a point source unless the discharge is authorized by an NPDES permit. Congress added CWA section 402(p) in 1987 to require implementation of a comprehensive program for addressing storm water discharges. Section 402(p)(1) required EPA or NPDES-authorized States or Tribes to issue NPDES permits for the following five classes of storm water discharges composed entirely of storm water ("storm water discharges") specifically listed under section 402(p)(2):

(A) a discharge subject to an NPDES permit before February 4, 1987

(B) a discharge associated with industrial activity

(C) a discharge from a municipal separate storm sewer system serving a population of 250,000 or more

(D) a discharge from a municipal separate storm sewer system serving a population of 100,000 or more but less than 250,000

(E) a discharge that an NPDES permitting authority determines to be contributing to a violation of a water quality standard or a significant contributor of pollutants to the waters of the United States.

Section 402(p)(3)(A) requires storm water discharges associated with industrial activity to meet all applicable provisions of section 402 and section 301 of the CWA, including technology-based requirements and any more stringent requirements necessary to meet water quality standards. Section 402(p)(3)(B) establishes NPDES permit standards for discharges from municipal separate storm sewer systems, or MS4s. NPDES permits for discharges from MS4s (1) may be issued on a system or jurisdiction-wide basis, (2) must include a requirement to effectively prohibit non-storm water discharges into the storm sewers, and (3) must require controls to reduce pollutant discharges to the maximum extent practicable, including best management practices, and other provisions as the Administrator or the States determine to be appropriate for the control of such pollutants. At this time, EPA determines that water quality-based controls, implemented through the iterative processes described today are appropriate for the control of such pollutants and will result in reasonable further progress towards attainment of water quality standards. See sections II.L and II.H.3 of the preamble.

In CWA section 402(p)(4), Congress established statutory deadlines for the initial steps in implementing the NPDES program for storm water discharges. This section required development of NPDES permit application regulations, submission of NPDES permit applications, issuance of NPDES permits for sources identified in section 402(p)(2), and compliance with NPDES permit conditions. In addition, this section required industrial facilities and large MS4s to submit NPDES permit applications for storm water discharges by February 4, 1990. Medium MS4s were to submit NPDES permit applications by February 4, 1992. EPA and authorized NPDES States were prohibited from requiring an NPDES permit for any other storm water discharges until October 1, 1994.

Section 402(p)(5) required EPA to conduct certain studies and submit a report to Congress. This requirement is discussed in the following section.

Section 402(p)(6) requires EPA, in consultation with States and local officials, to issue regulations for the designation of additional storm water discharges to be regulated to protect water quality. It also requires EPA to extend the existing storm water program to regulate newly designated sources. At a minimum, the extension must establish (1) priorities, (2) requirements for State storm water management programs, and (3) expeditious deadlines. Section 402(p)(6) specifies that the program may include performance standards, guidelines, guidance, and management practices and treatment requirements, as

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appropriate. Today's rule implements this section.

D. EPA's Reports to Congress

Under CWA section 402(p)(5), EPA, in consultation with the States, was required to conduct a study. The study was to identify unregulated sources of storm water discharges, determine the nature and extent of pollutants in such discharges, and establish procedures and methods to mitigate the impacts of such discharges on water quality. Section 402(p)(5) also required EPA to report the results of the first two components of that study to Congress by October 1, 1988, and the final report by October 1, 1989.

In March 1995, EPA submitted to Congress a report that reviewed and analyzed the nature of storm water discharges from municipal and industrialacilities that were not already regulated under the initial NPDES regulations for storm water (U.S. Environmental Protection Agency, Office of Water. 1995. *Storm Water Discharges Potentially Addressed by Phase II of the National Pollutant Discharge Elimination System Storm Water Program: Report to Congress.* Washington, D.C. EPA 833–K–94–002) ("Report"). The Report also analyzed associated pollutant loadings and water quality impacts from these unregulated sources. Based on identification of unregulated municipal sources and analysis of information on impacts of storm water discharges from municipal sources, the Report recommended that the NPDES program for storm water focus on the 405 "urbanized areas" identified by the Bureau of the Census. The Report further found that a number of discharges from unregulated industrial facilities warranted further investigation to determine the need for regulation. It classified these unregulated industrial discharges in two groups: Group A and Group B. Group A comprised sources that may be considered a high priority for inclusion in the NPDES program for storm water because discharges from these sources are similar or identical to already regulated sources. These "look alike" storm water discharge sources were not covered in the initial NPDES regulations for storm water due to the language used to define "associated with industrial activity." In the initial regulations for storm water, "industrial activity" is identified using Standard Industrial Classification (SIC) codes. The use of SIC codes led to incomplete categorization of industrial activities with discharges that needed to be regulated to protect water quality. Group B consisted of 18 industrial sectors, which included sources that EPA expected to contribute to storm water contamination due to the activities conducted and pollutants anticipated onsite (e.g., vehicle maintenance, machinery and electrical repair, and intensive agricultural activities).

EPA reported on the latter component of the section 402(p)(5) study via President Clinton's Clean Water Initiative, which was released on February 1, 1994 (U.S. Environmental Protection Agency, Office of Water. 1994. *President Clinton's Clean Water Initiative.* Washington, D.C. EPA 800–R–94–001) ("Initiative"). The Initiative addressed a number of issues associated with NPDES requirements for storm water discharges and proposed (1) establishing a phased compliance with a water quality standards approach for discharges from municipal separate storm sewer systems with priority on controlling discharges from municipal growth and development areas, (2) clarifying that the maximum extent practicable standard should be applied in a site-specific, flexible manner, taking into account cost considerations as well as water quality effects, (3) providing an exemption from the NPDES program for storm water discharges from industrial facilities with no activities or significant materials exposed to storm water, (4) providing extensions to the statutory deadlines to complete implementation of the NPDES program for the storm water program, (5) targeting urbanized areas for the requirements in the NPDES program for storm water, and (6) providing control of discharges from inactive and abandoned mines located on Federal lands in a more targeted, flexible manner. Additionally, prior to promulgation of today's rule, section 431 of the Agency's Appropriation Act for FY 2000 (Departments of Veterans Affairs and Housing and Urban Development and Independent Agencies Appropriations Act of 2000, Public Law 106–74, section 432 (1999)) directed EPA to report on certain matters to be covered in today's rule. That report supplements the study required by CWA Section 402(p)(5). EPA is publishing the availability of that report elsewhere in this issue of the **Federal Register**.

Several commenters asserted that the Report to Congress is an inadequate basis for the designation and regulation of sources covered under today's final rule, specifically the nationwide designation of small municipal separate storm sewer systems within urbanized areas and construction activities disturbing between one and five acres.

EPA believes that it has developed an adequate record for today's regulation both through the Report to Congress and the Clean Water Initiative and through more recent activities, including the FACA Subcommittee process, regulatory notices and evaluation of comments, and recent research and analysis. EPA does not interpret the congressional reporting requirements of CWA section 402(p)(5) to be the sole basis for determining sources to be regulated under today's final rule.

EPA's decision to designate on a national basis small MS4s in urbanized areas is supported by studies that clearly show a direct correlation between urbanization and adverse water quality impacts from storm water discharges. (Schueler, T. 1987. *Controlling Urban Runoff: A Practical Manual for Planning & Designing Urban BMPs.* Metropolitan Washington Council of Governments). "Urbanized areas"—within which all small MS4s would be covered—represent the most intensely developed and dense areas of the Nation. They constitute only two percent of the land area but 63 percent of the total population. See section I.B.1, Urban Development, above, for studies and assessments of the link between urban development and storm water impacts on water resources.

Commenters argued that the Report to Congress does not address storm water discharges from construction sites. They further argued that the designation of small construction sites per today's final rule goes beyond the President's 1994 Initiative because the Initiative only recommends requiring municipalities to implement a storm water management program to control unregulated storm water sources, "including discharges from construction of less than 5 acres, which are part of growth, development and significant redevelopment activities." They point out that the Initiative provides that unregulated storm water discharges not addressed through a municipal program would not be covered by the NPDES program. Commenters assert that EPA has not developed a record independent of its section 402(p)(5) studies that demonstrates the necessity of regulating under a separate NPDES permit storm water discharges from smaller construction sites "to protect water quality." EPA disagrees.

EPA evaluated the nature and extent of pollutants from construction site sources in a process that was separate and distinct from the development of the Report to Congress. Today's decision to regulate certain storm water discharges from construction sites disturbing less than 5 acres arose in part

out of the 9th Circuit remand in *NRDC v. EPA*, 966 F.2d 1292 (9th Cir. 1992). In that case, the court remanded portions of the Phase I storm water regulations related to discharges from construction sites. Those regulations define "storm water discharges associated with industrial activity" to include only those storm water discharges from construction sites disturbing 5 acres or more of total land area (see 40 CFR 122.26(b)(14)(x)). In its decision, the court concluded that the 5-acre threshold was improper because the Agency had failed to identify information "to support its perception that construction activities on less than 5 acres are non-industrial in nature" (966 F.2d at 1306). The court remanded the below 5 acre exemption to EPA for further proceedings (966 F.2d at 1310).

In a **Federal Register** notice issued on December 18, 1992, EPA noted that it did not believe that the Court's decision had the effect of automatically subjecting small construction sites to the existing application requirements and deadlines. EPA believed that additional notice and comment were necessary to clarify the status of these sites. The information received during the notice and comment process and additional research, as discussed in section I.B.3 Construction Site Runoff, formed the basis for the designation of construction activity disturbing between one and five acres on a nationwide basis. EPA's objectives in today's proposal include an effort to (1) address the 9th Circuit remand, (2) address water quality concerns associated with construction activities that disturb less than 5 acres of land, and (3) balance conflicting recommendations and concerns of stakeholders.

One commenter noted that EPA's proposal would fail to regulate industrial facilities identified as Group A and Group B in the March 1995 *Report to Congress*. EPA is relying on the analysis in the Report, which provided that the recommendation for coverage was meant as guidance and was not intended to be an identification of specific categories that must be regulated under Section 402(p)(6). *Report to Congress*, p. 4–1. The Report recognized the existence of limited data on which to base loadings estimates to support the nationwide designation of individual or categories of sources. *Report to Congress*, p. 4–44. Furthermore, during FACA Subcommittee discussion, EPA continued to urge stakeholders to provide further data relating to industrial and commercial storm water sources, which EPA did not receive. EPA concluded that, due to insufficient data, these sources were not appropriate for nationwide designation at this time.

E. Industrial Facilities Owned or Operated by Small Municipalities

Congress granted extensions to the NPDES permit application process for selected classes of storm water discharges associated with industrial activity. On December 18, 1991, Congress enacted the Intermodal Surface Transportation Efficiency Act (ISTEA), which postponed NPDES permit application deadlines for most storm water discharges associated with industrial activity at facilities that are owned or operated by small municipalities. EPA and States authorized to administer the NPDES program could not require any municipality with a population of less than 100,000 to apply for or obtain an NPDES permit for any storm water discharge associated with industrial activity prior to October 1, 1992, except for storm water discharges from airports, power plants, or uncontrolled sanitary landfills. See 40 CFR 122.26(e)(1); 57 FR 11524, April 2, 1992 (reservation of NPDES application deadlines for ISTEA facilities).

The facilities exempted by ISTEA discharge storm water in the same manner (and are expected to use identical processes and materials) as the industrial facilities regulated under the 1990 Phase I regulations. Accordingly, these facilities pose similar water quality problems. The extended moratorium for these facilities was necessary to allow municipalities additional time to comply with NPDES requirements. The proposal for today's rule would have maintained the existing deadline for seeking coverage under an NPDES permit (August 7, 2001).

Today's rule changes the permit application deadline for such municipally owned or operated facilities discharging industrial storm water to make it consistent with the application date for small regulated MS4s. Because EPA missed its March 1999 deadline for promulgating today's rule, and the deadline for MS4s to submit permit applications has been extended to three years and 90 days from the date of this notice, the deadline for permitting ISTEA sources has been similarly extended. The permitting of these sources is discussed below in section "II.I.3. ISTEA Sources."

F. Related Nonpoint Source Programs

Today's rule addresses point source discharges of storm water runoff and non-storm water discharges into MS4s. Many of these sources have been addressed by nonpoint source control programs, which are described briefly below.

In 1987, section 319 was added to the CWA to provide a framework for funding State and local efforts to address pollutants from nonpoint sources not addressed by the NPDES program. To obtain funding, States are required to submit Nonpoint Source Assessment Reports identifying State waters that, without additional control of nonpoint sources of pollution, could not reasonably be expected to attain or maintain applicable water quality standards or other goals and requirements of the CWA. States are also required to prepare and submit for EPA approval a statewide Nonpoint Source Management Program for controlling nonpoint source water pollution to navigable waters within the State and improving the quality of such waters. State program submittals must identify specific best management practices (BMPs) and measures that the State proposes to implement in the first four years after program submission to reduce pollutant loadings from identified nonpoint sources to levels required to achieve the stated water quality objectives.

State nonpoint source programs funded under section 319 can include both regulatory and nonregulatory State and local approaches. Section 319(b)(2)(B) specifies that a combination of "nonregulatory or regulatory programs for enforcement, technical assistance, financial assistance, education, training, technology transfer, and demonstration projects' may be used, as necessary, to achieve implementation of the BMPs or measures identified in the section 319 submittals.

Section 6217 of the Coastal Zone Act Reauthorization Amendments (CZARA) of 1990 provides that States with approved coastal zone management programs must develop coastal nonpoint pollution control programs and submit them to EPA and the National Oceanic and Atmospheric Administration (NOAA) for approval. Failure to submit an approvable program will result in a reduction of Federal grants under both the Coastal Zone Management Act and section 319 of the CWA.

State coastal nonpoint pollution control programs under CZARA must include enforceable policies and mechanisms that ensure implementation of the management measures throughout the coastal management area. *EPA issued Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters* under section 6217(g) in

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January 1993. The guidance identifies management measures for five major categories of nonpoint source pollution. The management measures reflect the greatest degree of pollutant reduction that is economically achievable for each of the listed sources. These management measures provide reference standards for the States to use in developing or refining their coastal nonpoint programs. A few management measures, however, contain quantitative standards that specify pollutant loading reductions. For example, the New Development Management Measure, which is applicable to construction in urban areas, requires (1) that by design or performance the average annual total suspended solid loadings be reduced by 80 percent and (2) to the extent practicable, that the pre-development peak runoff rate and average volume be maintained.

EPA and NOAA published *Coastal Nonpoint Pollution Control Program: Program Development and Approval Guidance* (1993). The document clarifies that States generally must implement management measures for each source category identified in the EPA guidance developed under section 6217(g). Coastal Nonpoint Pollution Control Programs are not required to address sources that are clearly regulated under the NPDES program as point source discharges. Specifically, such programs would not need to address small MS4s and construction sites covered under NPDES storm water permits (both general and individual).

II. Description of Program

A. Overview

1. Objectives EPA Seeks To Achieve in Today's Rule

EPA seeks to achieve several objectives in today's final rule. First, EPA is implementing the requirement under CWA section 402(p)(6) to provide a comprehensive storm water program that designates and controls additional sources of storm water discharges to protect water quality. Second, EPA is addressing storm water discharges from the activities exempted under the 1990 storm water permit application regulations that were remanded by the Ninth Circuit Court of Appeals in NRDC v. EPA, 966 F.2d 1292 (9th Circuit, 1992). These are construction activities disturbing less than 5 acres and so-called "light" industrial activities not exposed to storm water (see discussion of "no exposure" below). Third, EPA is providing coverage for the so-called "donut holes" created by the existing NPDES storm water program. Donut holes are geographic gaps in the NPDES storm water program's regulatory scheme. They are MS4s located within areas covered by the existing NPDES storm water program, but not currently addressed by the storm water program because it is based on political jurisdictions. Finally, EPA also is trying to promote watershed planning as a framework for implementing water quality programs where possible.

Although EPA had options for different approaches (see alternatives discussed in the January 9, 1998, proposed regulation), EPA believes it can best achieve its objectives through flexible innovations within the framework of the NPDES program. Unlike the interim section 402(p)(6) storm water regulations EPA promulgated in 1995, EPA no longer designates all of the unregulated storm water discharges for nationwide coverage under the NPDES program for storm water. The framework for today's final rule is one that balances automatic designation on a nationwide basis and locally-based designation and waivers. Nationwide designation applies to those classes or categories of storm water discharges that EPA believes present a high likelihood of having adverse water quality impacts, regardless of location. Specifically, today's rule designates discharges from small MS4s located in urbanized areas and storm water discharges from construction activities that result in land disturbance equal to or greater than one and less than five acres. As noted under Section I.B., Water Quality Concerns/Environmental Impact Studies and Assessments, these two categories of storm water sources, when unregulated, tend to cause significant adverse water quality impacts. Additional sources are not covered on a nationwide basis either because EPA currently lacks information indicating a consistent potential for adverse water quality impact or because EPA believes that the likelihood of adverse impacts on water quality is low, with some localized exceptions. Additional individual sources or categories of storm water discharges could, however, be covered under the program through a local designation process. A permitting authority may designate additional small MS4s after developing designation criteria and applying those criteria to small MS4s located outside of an urbanized area, in particular those with a population of 10,000 or more and a population density of at least 1,000. Exhibit 1 illustrates the designation framework for today's final rule.

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EXHIBIT 1.—PHASE II SOURCE DECISIONS

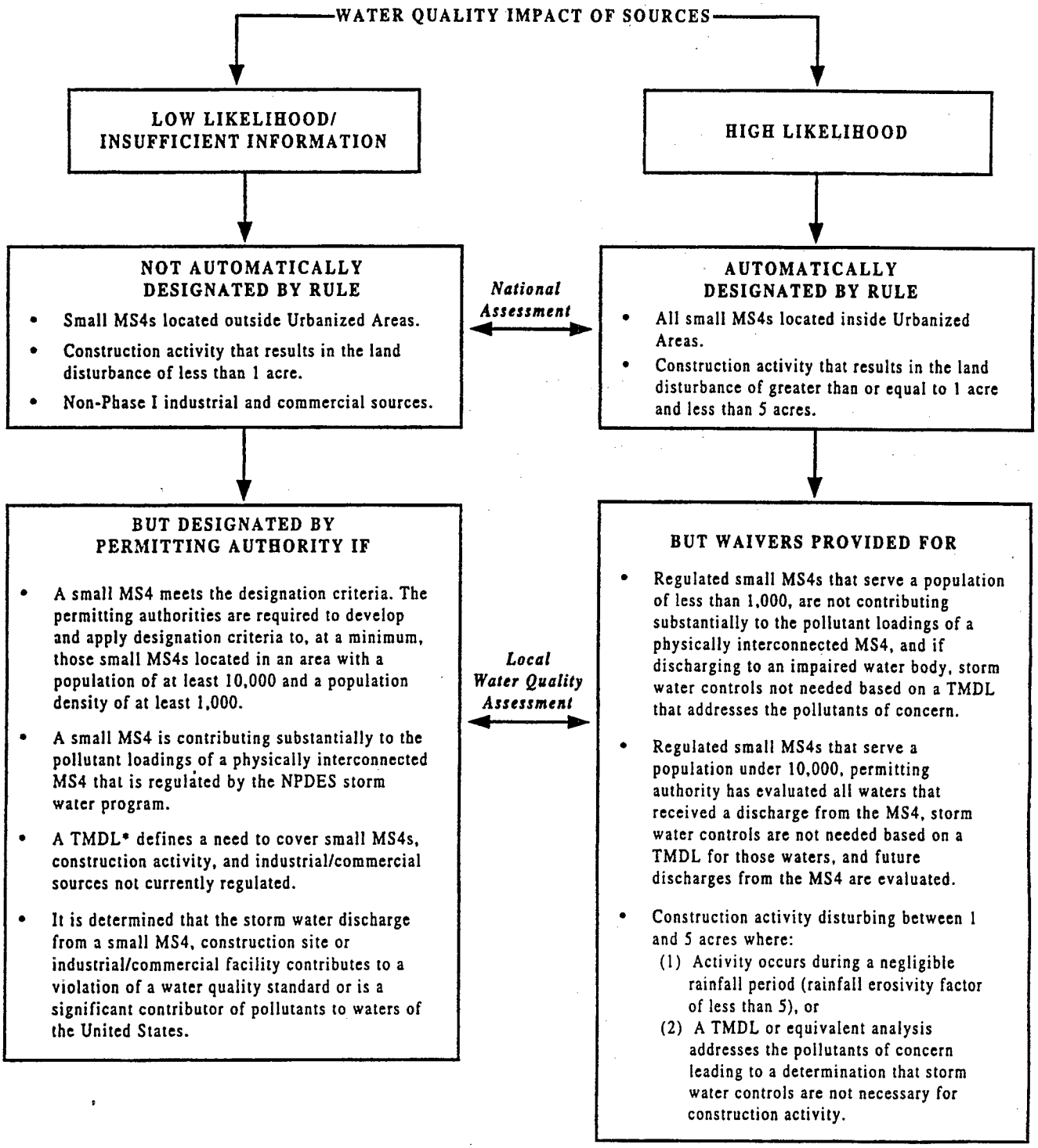

*EPA will continue to require States to comply with their Total Maximum Daily Load (TMDL) implementation schedules.

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The designation framework for today's final rule provides a significant degree of flexibility. The proposed provisions for nationwide designation of storm water discharges from construction and from small MS4s in urbanized areas allowed for a waiver of applicable requirements based on appropriate water quality conditions. Today's final rule expands and simplifies those waivers.

The permitting authority may waive the requirement for a permit for any small MS4 serving a jurisdiction with a population of less than 1,000 unless storm water controls are needed because the MS4 is contributing to a water quality impairment. The permitting authority may also waive permit coverage for MS4s serving a jurisdiction with a population of less than 10,000 if all waters that receive a discharge from the MS4 have been evaluated and discharges from the MS4 do not significantly contribute to a water quality impairment or have the potential to cause an impairment. Today's rule also allows States with a watershed permitting approach to phase in coverage for MS4s in jurisdictions with populations under 10,000.

Water quality conditions are also the basis for a waiver of requirements for storm water discharges from construction activities disturbing between one and five acres. For these small construction sources, the rule provides significant flexibility for waiving otherwise applicable regulatory requirements where a permitting authority determines, based on water quality and watershed considerations, that storm water discharge controls are not needed.

Coverage can be extended to municipal and construction sources outside the nationwide designated classes or categories based on watershed and case-by-case assessments. For the municipal storm water program, today's rule provides broad discretion to NPDES permitting authorities to develop and implement criteria for designating storm water discharges from small MS4s outside of urbanized areas. Other storm water discharges from unregulated industrial, commercial, and residential sources will not be subject to the NPDES permit requirements unless a permitting authority determines on a case-by-case basis (or on a categorical basis within identified geographic areas such as a State or watershed) that regulatory controls are needed to protect water quality. EPA believes that the flexibility provided in today's rule facilitates watershed planning.

2. General Requirements for Regulated Entities Under Today's Rule

As previously noted, today's final rule defines additional classes and categories of storm water discharges for coverage under the NPDES program. These designated dischargers are required to seek coverage under an NPDES permit. Furthermore, all NPDES-authorized States and Tribes are required to implement these provisions and make any necessary amendments to current State and Tribal NPDES regulations to ensure consistency with today's final rule. EPA remains the NPDES permitting authority for jurisdictions without NPDES authorization.

Today's final rule includes some new requirements for NPDES permitting authorities implementing the CWA section 402(p)(6) program. EPA has made a significant effort to build flexibility into the program while attempting to maintain an appropriate level of national consistency. Permitting authorities must ensure that NPDES permits issued to MS4s include the minimum control measures established under the program. Permitting authorities also have the ability to make numerous decisions including who is regulated under the program, i.e., case-by-case designations and waivers, and how responsibilities should be allocated between regulated entities.

Today's final rule extends the NPDES program to include discharges from the following: small MS4s within urbanized areas (with the exception of systems waived from the requirements by the NPDES permitting authority); other small MS4s meeting designation criteria to be established by the permitting authority; and any remaining MS4 that contributes substantially to the storm water pollutant loadings of a physically interconnected MS4 already subject to regulation under the NPDES program. Small MS4s include urban storm sewer systems owned by Tribes, States, political subdivisions of States, as well as the United States, and other systems located within an urbanized area that fall within the definition of an MS4. These include, for example, State departments of transportation (DOTs), public universities, and federal military bases.

Today's final rule requires all regulated small MS4s to develop and implement a storm water management program. Program components include, at a minimum, 6 minimum measures to address: public education and outreach; public involvement; illicit discharge detection and elimination; construction site runoff control; post-construction storm water management in new development and redevelopment; and pollution prevention and good housekeeping of municipal operations. These program components will be implemented through NPDES permits. A regulated small MS4 is required to submit to the NPDES permitting authority, either in its notice of intent (NOI) or individual permit application, the BMPs to be implemented and the measurable goals for each of the minimum control measures listed above.

The rule addresses all storm water discharges from construction site activities involving clearing, grading and excavating land equal to or greater than 1 acre and less than 5 acres, unless requirements are otherwise waived by the NPDES permitting authority. Discharges from such sites, as well as construction sites disturbing less than 1 acre of land that are designated by the permitting authority, are required to implement requirements set forth in the NPDES permit, which may reference the requirements of a qualifying local program issued to cover such discharges.

The rule also addresses certain other sources regulated under the existing NPDES program for storm water. For municipally-owned industrial sources required to be regulated under the existing NPDES storm water program but exempted from immediate compliance by the Intermodal Surface Transportation Act of 1991 (ISTEA), the rule revises the existing deadline for seeking coverage under an NPDES permit (August 7, 2001) to make it consistent with the application date for small regulated MS4s. (See section I.3. below.) The rule also provides relief from NPDES storm water permitting requirements for industrial sources with no exposure of industrial materials and activities to storm water.

3. Integration of Today's Rule With the Existing Storm Water Program

In developing an approach for today's final rule, numerous early interested stakeholders encouraged EPA to seek opportunities to integrate, where possible, the proposed Phase II requirements with existing Phase I requirements, thus facilitating a unified storm water discharge control program. EPA believes that this objective is met by using the NPDES framework. This framework is already applied to regulated storm water discharge sources and is extended to those sources designated under today's rule. This approach facilitates program consistency, public access to information, and program oversight.

EPA believes that today's final rule provides consistency in terms of program coverage and requirements for existing and newly designated sources. For example, the rule includes most of the municipal donut holes, those MS4s located in incorporated places, townships or towns with a population under 100,000 that are within Phase I counties. These MS4s are not addressed by the existing NPDES storm water program while MS4s in the surrounding county are currently addressed. In addition, the minimum control measures required in today's rule for regulated small MS4s are very similar to a number of the permit requirements for medium and large MS4s under the existing storm water program. Following today's rule, permit requirements for all regulated MS4s (both those under the existing program and those under today's rule) will require implementation of BMPs. Furthermore, with regard to the development of NPDES permits to protect water quality, EPA intends to apply the August 1, 1996, *Interim Permitting Approach for Water Quality-Based Effluent Limitations in Storm Water Permits* (hereinafter, "Interim Permitting Approach") (see Section II.L.1. for further description) to all MS4s covered by the NPDES program.

EPA is applying NPDES permit requirements to construction sites below 5 acres that are similar to the existing requirements for those above 5 acres and above. In addition, today's rule allows compliance with qualifying local, Tribal, or State erosion and sediment controls to meet the erosion and sediment control requirements of the general permits for storm water discharges associated with construction, both above and below 5 acres.

4. General Permits

EPA recommends using general permits for all newly regulated storm water sources under today's rule. The use of general permits, instead of individual permits, reduces the administrative burden on permitting authorities, while also limiting the paperwork burden on regulated parties seeking permit authorization. Permitting authorities may, of course, require individual permits in some cases to address specific concerns, including permit non-compliance.

EPA recommends that general permits for MS4s, in particular, be issued on a watershed basis, but recognizes that each permitting authority must decide how to develop its general permit(s). Permit conditions developed to address concerns and conditions of a specific watershed could reflect a watershed plan; such permit conditions must provide for attainment of applicable water quality standards (including designated uses), allocations of pollutant loads established by a TMDL, and timing requirements for implementation of a TMDL. If the permitting authority issues a State-wide general permit, the permitting authority may include separate conditions tailored to individual watersheds or urbanized areas. Of course, for a newly regulated MS4, modification of an existing individual MS4 permit to include the newly regulated MS4 as a "limited co-permittee" also remains an option.

5. Tool Box

During the FACA process, many Storm Water Phase II FACA Subcommittee representatives expressed an interest, which was endorsed by the full Committee, in having EPA develop a "tool box" to assist States, Tribes, municipalities, and other parties involved in the Phase II program. EPA made a commitment to work with Storm Water Phase II FACA Subcommittee representatives in developing such a tool box, with the expectation that a tool box would facilitate implementation of the storm water program in an effective and cost-efficient manner. EPA has developed a preliminary working tool box (available on EPA's web page at www.epa.gov/owm/sw/toolbox). EPA intends to have the tool box fully developed by the time of the first general permits. EPA also intends to update the tool box as resources and data become available. The tool box will include the following eight main components: fact sheets; guidances; a menu of BMPs for the six MS4 minimum measures; an information clearinghouse; training and outreach efforts; technical research; support for demonstration projects; and compliance monitoring/assistance tools. EPA intends to issue the menu of BMPs, both structural and non-structural, by October 2000. In addition, EPA will issue by October 2000 a "model" permit and will issue by October 2001 guidance materials on the development of measurable goals for municipal programs.

In an attempt to avoid duplication, the Agency has undertaken an effort to identify and coordinate sources of information that relate to the storm water discharge control program from both inside and outside the Agency. Such information includes research and demonstration projects, grants, storm water management-related programs, and compendiums of available documents, including guidances, related directly or indirectly to the comprehensive NPDES storm water program. Based on this effort, EPA is developing a tool box containing fact sheets and guidance documents pertaining to the overall program and rule requirements (e.g., guidance on municipal and construction programs, and permitting authority guidance on designation and waiver criteria); models of current programs aimed at assisting States, Tribes, municipalities, and others in establishing programs; a comprehensive list of reference documents organized according to subject area (e.g., illicit discharges, watersheds, water quality standards attainment, funding sources, and similar types of references); educational materials; technical research data; and demonstration project results. The information collected by EPA will not only provide the background for tool box materials, but will also be made available through an information clearinghouse on the world wide web.

With assistance from EPA, the American Public Works Association (APWA) developed a workbook and series of workshops on the proposed Phase II rule. Ten workshops were held from September 1998 through May 1999. Depending on available funding, these workshops may continue after publication of today's final rule. EPA also intends to provide training to enable regional offices to educate States, Tribes, and municipalities about the storm water program and the availability of the tool box materials.

The CWA currently provides funding mechanisms to support activities related to storm water. These mechanisms will be described in the tool box. Activities funded under grant and loan programs, which could be used to assist in storm water program development, include programs in the nonpoint source area, storm water demonstration projects, source water protection and wastewater construction projects. EPA has already provided funding for numerous research efforts in these areas, including a database of BMP effectiveness studies (described below), an assessment of technologies for storm water management, a study of the effectiveness of storm water BMPs for controlling the impacts of watershed imperviousness, protocols for wet weather monitoring, development of a dynamic model for wet weather flows, and numerous outreach projects.

EPA has entered into a cooperative agreement with the Urban Water Resources Research Council of the American Society of Civil Engineers (ASCE) to develop a scientifically-based management tool for the information

needed to evaluate the effectiveness of urban storm water runoff BMPs nationwide. The long-term goal of the National Stormwater BMP Database project is to promote technical design improvements for BMPs and to better match their selection and design to the local storm water problems being addressed. The project team has collected and evaluated hundreds of existing published BMP performance studies and created a database covering about 75 test sites. The database includes detailed information on the design of each BMP and its watershed characteristics, as well as its performance. Eventually the database will include the nationwide collection of information on the characteristics of structural and non-structural BMPs, data collection efforts (*e.g.*, sampling and flow gaging equipment), climatological characteristics, watershed characteristics, hydrologic data, and constituent data. The database will continue to grow as new BMP data become available. The initial release of the database, which includes data entry and retrieval software, is available on CD–ROM and operates on Windows®-compatible personal computers. The ASCE project team envisions that periodic updates to the database will be distributed through the Internet. The team is currently developing a system for Internet retrieval of selected database records, and this system is expected to be available in early 2000.

EPA and ASCE invite BMP designers, owners and operators to participate in the continuing database development effort. To make this effort successful, a large database is essential. Interested persons are encouraged to submit their BMP performance evaluation data and associated BMP watershed characteristics for potential entry into the database. The software included in the CD-ROM allows data providers to enter their BMP data locally, retain and edit the data as needed, and submit them to the ASCE Database Clearinghouse when ready.

To obtain a copy of the database, please contact Jane Clary, Database Clearinghouse Manager, Wright Water Engineers, Inc., 2490 W. 26th Ave., Suite 100A, Denver, CO 80211; Phone 303–480–1700; E-mail clary@wrightwater.com.

In addition, EPA requests that researchers planning to conduct BMP performance evaluations compile and collect BMP reporting information according to the standard format developed by ASCE. The format is provided with the database software and is also available on the ASCE website at www.asce.org/peta/tech/nsbd01.html.

6. Deadlines Established in Today's Action

Exhibit 2 outlines the various deadlines established under today's final rule. EPA believes that the dates allow sufficient time for completion of both the NPDES permitting authority's and the permittee's program responsibilities.

EXHIBIT 2–STORM WATER PHASE II ACTIONS DEADLINES

Activity	Deadline date
NPDES-authorized States modify NPDES program if no statutory change is required.	1 year from date of publication of today's rule in the **Federal Register.**
NPDES-authorized States modify NPDES program if statutory change is required.	2 years from date of publication of today's rule in the **Federal Register.**
EPA issues a menu of BMPs for regulated small MS4s	October 27, 2000
ISTEA sources submit permit application	3 years and 90 days from date of publication of today's rule in the **Federal Register.**
Permitting authority issues general permit(s) (if this type of permit coverage is selected).	3 years from date of publication of today's rule in the **Federal Register.**
Regulated small MS4s submit permit application:	
a. If designated under § 122.32(a)(1) unless the permitting authority has established a phasing schedule under § 123.35(d)(3).	a. 3 years and 90 days from date of publication of today's rule in the **Federal Register.**
b. If designated under § 122.32(a)(2) or §§ 122.26(a)(9)(i) (C) or (D).	b. Within 180 days of notice.
Storm water discharges associated with small construction activity submit permit application:	
a. If designated under § 122.26(b)(15)(i)	a. 3 years and 90 days from date of publication of today's rule in the **Federal Register**
b. If designated under § 122.26(b)(15)(ii)	b. Within 180 days of notice.
Permitting authority designates small MS4s under § 123.35(b)(2)	3 years from date of publication of today's rule in the **Federal Register** or 5 years from date of publication of today's rule in the **Federal Register** if a watershed plan is in place
Regulated small MS4s' program fully developed and implemented	Up to 5 years from date of permit issuance.
Reevaluation of the municipal storm water rules by EPA	13 years from date of publication of today's rule in the **Federal Register**
Permitting authority determination on a petition	Within 180 days of receipt.
Non-municipal sources designated under § 122.26(a)(9)(i) (C) or (D) submit permit application.	Within 180 days of notice.
Submission of No Exposure Certification	Every 5 years.

B. Readable Regulations

Today, EPA is finalizing new regulations in a "readable regulation" format. This reader-friendly, plain language approach is a departure from traditional regulatory language and should enhance the rule's readability. These plain language regulations use questions and answers, "you" to identify the person who must comply, and terms like "must" rather than "shall" to identify a mandate. This new format, which minimizes layers of subparagraphs, should also allow the reader to easily locate specific provisions of the regulation.

Some sections of today's final rule are presented in the traditional language and format because these sections amend existing regulations. The readable regulation format was not used in these existing provisions in an attempt to avoid confusion or disruption

of the readability of the existing regulations.

Most commenters supported EPA's use of plain language and agreed with EPA that the question and answer format makes the rule easier to understand. Three commenters thought that EPA should retain the traditional rule format. The June 1, 1998, Presidential memorandum directs all government agencies to write documents in plain language. Based on the majority of the comments, EPA has retained the plain language format used in the January 9, 1998, proposal in today's final rule.

The proposal to today's final rule included guidance as well as legal requirements. The word "must" indicates a requirement. Words like "should," "could," or "encourage" indicate a recommendation or guidance. In addition, the guidance was set off in parentheses to distinguish it from requirements.

EPA received numerous comments supporting the inclusion of guidance in the text of the Code of Federal Regulations (CFR), as well as comments opposing inclusion of guidance. Supporters stated that preambles and guidance documents are often not accessible when rules are implemented. Any language not included in the CFR is therefore not available when it may be most needed. Commenters that opposed including guidance in the CFR expressed the concern that any language in the rule might be interpreted as a requirement, in spite of any clarifying language. They suggested that guidance be presented in the preamble and additional guidance documents.

The majority of commenters on this issue thought that the guidance should be retained but the distinction between requirements and guidance should be better clarified. Suggestions included clarifying text, symbols, and a change from use of the word "should" to "EPA recommends" or "EPA suggests". EPA believes that it is important to include the guidance in the rule and agrees that the distinction between requirements and EPA recommendations must be very clear. In today's final rule, EPA has put the guidance in paragraphs entitled "Guidance" and replaced the word "should" with "EPA recommends." This is intended to clarify that the recommendations contained in the guidance paragraphs are not legally binding.

C. Program Framework: NPDES Approach

Today's rule regulates Phase II sources using the NPDES permit program. EPA interprets Clean Water Act section 402(p)(6) as authorizing the Agency to develop a storm water program for Phase II sources either as part of the existing NPDES permit program or as a stand alone non-NPDES program such as a self-implementing rule. Under either approach, EPA interprets section 402(p)(6) as directing EPA to publish regulations that "regulate" the remaining unregulated sources, specifically to establish requirements that are federally enforceable under the CWA. Although EPA believes that it has the discretion to not require sources regulated under CWA section 402(p)(6) to be covered by NPDES permits, the Agency has determined, for the reasons discussed below, that it is most appropriate to use NPDES permits in implementing the program to address the sources designated for regulation in today's rule.

As discussed in Section II.A, Overview, EPA sought to achieve certain goals in today's final rule. EPA believes that the NPDES program best achieves EPA's goals for today's final rule for the reasons discussed below.

Requiring Phase II sources to be covered by NPDES permits helps address the consistency problems currently caused by municipal "donut holes." Donut holes are gaps in program coverage where a small unregulated MS4 is located next to or within a regulated larger MS4 that is subject to an NPDES permit under the Phase I NPDES storm water program. The existence of such "donut holes" creates an equity problem because similar discharges may remain unregulated even though they cause or contribute to the same adverse water quality impacts. Using NPDES permits to regulate the unregulated discharges in these areas is intended to facilitate the development of a seamless regulatory program for the mitigation and control of contaminated storm water discharges in an urbanized area. For example, today's rule allows a newly regulated MS4 to join as a "limited" co-permittee with a regulated MS4 by referencing a common storm water management program. Such cooperation should be further encouraged by the fact that the minimum control measures required in today's rule for regulated small MS4s are very similar to a number of the permit requirements for medium and large MS4s under the Phase I storm water program. The minimum control measures applicable to discharges from smaller MS4s are described with slightly more generality than under the Phase I permit application regulations for larger MS4s, thus enabling maximum flexibility for operators of smaller MS4s to optimize efforts to protect water quality.

Today's rule also applies NPDES permit requirements to construction sites below 5 acres that are similar to the existing requirements for those 5 acres and above. In addition, the rule would allow compliance with qualifying local, Tribal, or State erosion and sediment controls to meet the erosion and sediment control requirements of the general permits for storm water discharges associated with construction, both above and below 5 acres.

Incorporating the CWA section 402(p)(6) program into the NPDES program capitalizes upon the existing governmental infrastructure for administration of the NPDES program. Moreover, much of the regulated community already understands the NPDES program and the way it works.

Another goal of the NPDES program approach is to provide flexibility in order to facilitate and promote watershed planning and sensitivity to local conditions. NPDES permits promote those goals in several ways. NPDES general permits may be used to cover a category of regulated sources on a watershed basis or within political boundaries. The NPDES permitting process provides a mechanism for storm water controls tailored on a case-by-case basis, where necessary. In addition, the NPDES permit requirements of a permittee may be satisfied by another cooperating entity. Finally, NPDES permits may incorporate the requirements of existing State, Tribal and local programs, thereby accommodating State and Tribes seeking to coordinate the storm water program with other programs, including those that focus on watershed-based nonpoint source regulation.

In promoting the watershed approach to program administration, EPA believes NPDES general permits can cover a category of dischargers within a defined geographic area. Areas can be defined very broadly to include political boundaries (e.g., county), watershed boundaries, or State or Tribal land.

NPDES permits generally require an application or a notice of intent(NOI) to trigger coverage. This information exchange assures communication between the permitting authority and the regulated community. This communication is critical in ensuring that the regulated community is aware of the requirements and the permitting authority is aware of the potential for adverse impacts to water quality from identifiable locations. The NPDES permitting process includes the public as a valuable stakeholder and ensures

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that the public is included and information is made publicly available.

Another concern for EPA and several stakeholders was that the program ensure citizen participation. The NPDES approach ensures opportunities for citizen participation throughout the permit issuance process, as well as in enforcement actions. NPDES permits are also federally enforceable under the CWA.

EPA believes that the use of NPDES permits makes a significant difference in the degree of compliance with regulations in the storm water program. The NPDES program provides for public participation in the development, enforcement and revision of storm water management programs. Citizen suit enforcement has assisted in focusing attention on adverse water quality impacts on a localized, public priority basis. Citizens frequently rely on the NPDES permitting process and the availability of NOIs to track program implementation and help them enforce regulatory requirements.

NPDES permits are also advantageous to the permittee. The NPDES permit informs the permittee about the scope of what it is expected do to be in compliance with the Clean Water Act. As explained more fully in EPA's April 1995 guidance, *Policy Statement on Scope of Discharge Authorization and Shield Associated with NPDES Permits*, compliance with an NPDES permit constitutes compliance with the Clean Water Act (see CWA section 402(k)). In addition, NPDES permittees are excluded from duplicative regulatory regimes under the Resource Conservation and Recovery Act and the Comprehensive Emergency Response, Compensation and Liability Act under RCRA's exclusions to the definition of "solid waste" and CERCLA's exemption for "federally permitted releases."

EPA considered suggestions that the Agency authorize today's rule to be implemented as a self-implementing rule. This would be a regulation promulgated at the Federal, State, or Tribal level to control some or all of the storm water dischargers regulated under today's rule. Under this approach, a rule would spell out the specific requirements for dischargers and impose the restrictions and conditions that would otherwise be contained in an NPDES permit. It would be effective until modified by EPA, a State, or a Tribe, unlike an NPDES permit which cannot exceed a duration of five years. Some stakeholders believed that this approach would reduce the burden on the regulated community (e.g., by not requiring permit applications), and considerably reduce the amount of additional paperwork, staff time and accounting required to administer the proposed permit requirements.

EPA is sensitive to the interest of some stakeholders in having a streamlined program that minimizes the burden associated with permit administration and maximizes opportunities for field time spent by regulatory authorities. Key provisions in today's rule address some of these concerns by promoting a streamlined approach to permit issuance by, for example, using general permits and allowing the incorporation of existing programs. By adopting the NPDES approach rather than a self-implementing rule, today's rule also allows for consistent regulation between larger MS4s and construction sites regulated under the existing storm water management rule and smaller sources regulated under today's rule.

EPA believes that it is most appropriate to use NPDES permits to implement a program to address the sources regulated by today's rule. In addition to the reasons discussed above, NPDES permits provide a better mechanism than would a self-implementing rule for tailoring storm water controls on a case-by-case basis, where necessary. One commenter reasoned this concern could be addressed by including provisions in the regulation that allow site-specific BMPs (*i.e.*, case-by-case permits), suggesting storm water discharges that might require site-specific BMPs can be identified during the designation process of the regulatory authority. EPA believes that, in addition to its complexity, the commenter's approach lacks the other advantages of the NPDES permitting process.

A self-implementing rule would not ensure the degree of public participation that the NPDES permit process provides for the development, enforcement and revision of the storm water management program. A self-implementing rule also might not have provided the regulated community the "permit shield" under CWA section 402(k) that is provided by an NPDES permit. Based on all these considerations, EPA declined to adopt a self-implementing rule approach and adopted the NPDES approach.

Some State representatives sought alternative approaches for State implementation of the storm water program for Phase II sources. These State representatives asserted that a non-NPDES alternative approach best facilitated watershed management and avoided duplication and overlapping regulations. These representatives believed the NPDES approach would undercut State programs that had developed storm water controls tailored to local watershed concerns. Finally, a number of commenters expressed the view that States implement a variety of programs not based on the CWA that are effective in controlling storm water, and that EPA should provide incentives for their implementation and improvement in performance.

Throughout the development of the rule, State representatives sought alternatives to the NPDES approach for State implementation of the storm water program for Phase II sources. Discussions focused on an approach whereby States could develop an alternative program that EPA would approve or disapprove based on identified criteria, including that the alternative non-NPDES program would result in "equivalent or better protection of water quality." The State representatives, however, were unable to propose or recommend criteria for gauging whether a program would provide equivalent protection. EPA also did not receive any suggestions for objective, workable criteria in response to the Agency's explicit request for specific criteria (by which EPA could objectively judge such programs) in the preamble to the proposed rule.

EPA evaluated several existing State initiatives to address storm water and found many cases where standards under State programs may be coordinated with the Federal storm water program. Where the NPDES permit is developed in coordination with State standards, there are opportunities to avoid duplication and overlapping requirements. Under today's rule, an NPDES permitting authority may include conditions in the NPDES permit that direct an MS4 to follow the requirements imposed under State standards, rather than the requirements of § 122.34(b). This is allowed as long as the State program at a minimum imposes the relevant requirements of § 122.34(b). Additional opportunities follow from other provisions in today's rule.

Seeking to further explore the feasibility of a non-NPDES approach, the Agency, after the proposal, had extensive discussions with representatives of a number of States. Discussions related specifically to possible alternatives for regulations of urban storm water discharges and MS4s specifically. The Agency also sought input on these issues from other stakeholders.

As a result of these discussions, many of the commenters provided input on issues such as: whether or not the Agency should require NPDES permits; whether location of MS4s in urbanized

areas should be the basis for designation or whether designation should be based on other determinations relating to water quality; whether States should be allowed to satisfy the conditions of the rule through the use of existing State programs; and issues concerning timing and resources for program implementation.

In response, today's rule still follows the regulatory scheme of the proposed rule, but incorporates additional flexibility to address some of the concerns raised by commenters.

In order to facilitate implementation by States that utilize a watershed permitting approach or similar approach (*i.e.*, based on a State's unified watershed assessments), today's rule allows States to phase in coverage for MS4s in jurisdictions with a population less than 10,000. Under such an approach, States could focus their resources on a rolling basis to assist smaller MS4s in developing storm water programs.

In addition, in response to concerns that the rule should not require permit coverage for MS4s that do not significantly contribute to water quality impairments, today's rule provides options for two waivers for small MS4s. The rule allows permitting authorities to exempt from the requirement for a permit any MS4 serving a jurisdiction with a population less than 1,000, unless the State determines that the MS4 must implement storm water controls because it is significantly contributing to a water quality impairment. A second waiver option applies to MS4s serving a jurisdiction with a population less than 10,000. For those MS4s, the State must determine that discharges from the MS4 do not significantly contribute to a water quality impairment, or have the potential for such an impairment, in order to provide the exemption. The State must review this waiver on a periodic basis no less frequently than once every five years.

Throughout the development of today's rule, commenters questioned whether the Clean Water Act authorized the use of the NPDES permit program, pointing out that the text of CWA 402(p)(6) does not use the word "permit." Based on the absence of the word "permit" and the express mention of State storm water management programs, the commenters asserted that Congress did not intend for Phase II sources to be regulated using NPDES permits.

EPA disagrees with the commenters' interpretation of section 402(p)(6). Section 402(p)(6) does not preclude use of permits as part of the "comprehensive program" to regulate designated sources. The language provides EPA with broad discretion in the establishment of the "comprehensive program." Absence of the word "permit" (a term that the statute does not otherwise define) does not preclude use of a permit, which is a familiar and reasonably well understood regulatory implementation vehicle. First, section 402(p)(6) says that EPA must establish a comprehensive program that "shall, at a minimum, establish priorities, establish requirements for State stormwater management programs, and establish expeditious deadlines." The "at a minimum" language suggests that the Agency may, and perhaps should, develop a comprehensive program that does more than merely attend to these minimum criteria. Use of the term "at a minimum" preserves for the Agency broad discretion to establish a comprehensive program that includes use of NPDES permits.

Further, in the final sentence of the section, Congress included additional language to affirm the Agency's discretion. The final sentence clarifies that the Phase II program "may include performance standards, guidelines, guidance, and management practices and treatment requirements, as appropriate." Under existing CWA programs, performance standards, (effluent limitations) guidelines, management practices, and treatment requirements are typically implemented through NPDES or dredge and fill permits.

Although EPA believes that it had the discretion to not require permits, the Agency has determined that it is reasonable to interpret section 402(p)(6) to authorize permits. Moreover, for the reasons discussed above, the Agency believes that it is appropriate to use NPDES permits in implementing today's rule.

D. Federal Role

Today's final rule describes EPA's approach to expand the existing storm water program under CWA section 402(p)(6). As in all other Federal programs, the Federal government plays an integral role in complying with, developing, implementing, overseeing, and enforcing the program. This section describes EPA's role in the revised storm water program.

1. Develop Overall Framework of the Program

The storm water discharge control program under CWA section 402(p)(6) consists of the rule, tool box, and permits. EPA's primary role is to ensure timely development and implementation of all components. Today's rule is a refinement of the first step in developing the program. EPA is fully committed to continuing to work with involved stakeholders on developing the tool box and issuing permits. As noted in today's rule, EPA will assess the municipal storm water program based on (1) evaluations of data from the NPDES municipal storm water program, (2) research concerning water quality impacts on receiving waters from storm water, and (3) research on BMP effectiveness. (Section II.H, Municipal Role, provides a more detailed discussion of this provision.)

EPA is planning to standardize minimum requirements for construction and post-construction BMPs in a new rulemaking under Title III of the CWA. While larger construction sites are already subject to NPDES permits (and smaller sites will be subject to permits pursuant to today's rule), the permits generally do not contain specific requirements for BMP design or performance. The permits require the preparation of storm water pollution prevention plans, but actual BMP selection and design is at the discretion of permittees, in conformance with applicable State and local requirements. Where there are existing State and local requirements specific to BMPs, they vary widely, and many jurisdictions do not have such requirements.

In developing these regulations, EPA intends to evaluate the inclusion of design and maintenance criteria as minimum requirements for a variety of BMPs used for erosion and sediment control at construction sites, as well as for permanent BMPs used to manage post-construction storm water discharges. The Agency plans to consider the merits and performance of all appropriate management practices (both structural and non-structural) that can be used to reduce adverse water quality impacts. EPA does not intend to require the use of particular BMPs at specific sites, but plans to assist builders and developers in BMP selection by publishing data on the performance to be expected by various BMP types. EPA would like to build upon the successes of some of the effective State and local storm water programs currently in place around the country, and to establish nation-wide criteria to support builders and local jurisdictions in appropriate BMP selection.

2. Encourage Consideration of Smart Growth Approaches

In the proposal, EPA invited comment on possible approaches for providing

incentives for local decision making that would limit the adverse impacts of growth and development on water quality. EPA asked for comments on this "smart growth" approach.

EPA received comments on all sides of this issue. A number of commenters supported the idea of "smart growth" incentives but did not present concrete ideas. Several commenters suggested "smart growth" criteria. States that have adopted "smart growth" laws were worried that EPA's focus on urbanized areas for municipal requirements could encourage development outside of designated growth areas. Today's final rule clearly allows States to expand coverage of their municipal storm water program outside of urbanized areas. In addition, the flexibility of the six municipal minimum measures should avoid encouragement of development into rural rather than urban areas. For example, as part of the post-construction minimum measure, EPA recommends that municipalities consider policies and ordinances that encourage infill development in higher density urban areas, and areas with existing infrastructure, in order to meet the measure's intent.

EPA also received several comments expressing concern that incorporating "smart growth" incentives threatened the autonomy of local governments. One commenter was worried that "incentives" could become more onerous than the minimum measures. EPA is very aware of municipal concerns about possible federal interference with local land use planning. EPA is also cognizant of the difficulty surrounding incentives for "smart growth" activities due to these concerns. However, the Agency believes it has addressed these concerns by proposing a flexible approach and will continue to support the concept of "smart growth" by encouraging policies that limit the adverse impacts of growth and development on water quality.

3. Provide Financial Assistance

Although Congress has not established a fund to fully finance implementation of the proposed extension of the existing NPDES storm water program under CWA section 402(p)(6), numerous federal financing programs (administered by EPA and other federal agencies) can provide some financial assistance. The primary funding mechanism is the Clean Water State Revolving Fund (SRF) program, which provides sources of low-cost financing for a range of water quality infrastructure projects, including storm water. In addition to the SRF, federal financial assistance programs include the Water Quality Cooperative Agreements under CWA section 104(b)(3), Water Pollution Control Program grants to States under CWA section 106, and the Transportation Equity Act for the 21st Century (TEA-21) among others. In addition, Section 319 funds may be used to fund any urban storm water activities that are not specifically required by a draft or final NPDES permit. EPA will develop a list of potential funding sources as part of the tool box implementation effort. EPA anticipates that some of these programs will provide funds to help develop and, in limited circumstances, implement the CWA section 402(p)(6) storm water discharge control program.

EPA received numerous comments that requested additional funding. Congress provided one substantial new source of potential funding for transportation related storm water projects—TEA-21. The Department of Transportation has included a number of water-related provisions in its TEA-21 planning. These include Transportation Enhancements, Environmental Restoration and Pollution Abatement, and Environmental Streamlining. More information on TEA-21 is available at the following internet sites: www.fhwa.dot.gov/tea21/outreach.htm and www.tea21.org.

4. Implement the Program in Jurisdictions Not Authorized To Administer the NPDES Program

Because today's final rule uses the NPDES framework, EPA will be the NPDES permitting authority in several States, Tribal jurisdictions, and Territories. As such, EPA will have the same responsibilities as any other NPDES permitting authority—issuing permits, designating additional sources, and taking appropriate enforcement actions—and will seek to tailor the storm water discharge control program to the specific needs in that State, Tribal jurisdiction, or Territory. EPA also plans to provide support and oversight, including outreach, training, and technical assistance to the regulated communities. Section II.G. of today's preamble provides a separate discussion related to the NPDES permitting authority's responsibilities for today's final rule.

5. Oversee State and Tribal Programs

Under the NPDES program, EPA plays an oversight role for NPDES-approved States and Tribes. In this role, EPA and the State or Tribe work together to implement, enforce, and improve the NPDES program. Part of this oversight role includes working with States and Tribes to modify their programs where programmatic or implementation concerns impede program effectiveness. This role will be vitally important when States and Tribes make adjustments to develop, implement, and enforce today's extension of the existing NPDES storm water discharge control program. In addition, States maintain a continuing planning process (CPP) under CWA section 303(e), which EPA periodically reviews to assess the program's achievements.

In its oversight role, EPA takes action to address States and Tribes who have obtained NPDES authorization but are not fulfilling their obligations under the NPDES program. If an NPDES-authorized State or Tribe fails to implement an adequate NPDES storm water program, for example, EPA typically enters into extensive discussions to resolve outstanding issues. EPA has the authority to withdraw the entire NPDES program when resolution cannot be reached. Partial program withdrawal is not provided for under the CWA except for partial approvals.

EPA is also working with the States and Tribes to improve nonpoint source management programs and assessments to incorporate key program elements. Key nonpoint source program elements include setting short and long term goals and objectives; establishing public and private partnerships; using a balanced approach incorporating Statewide and watershed-wide abatement of existing impairments; preventing future impairments; developing processes to address both impaired and threatened waters; reviewing and upgrading all program components, including program revisions on a 5-year cycle; addressing federal land management and activities inconsistent with State programs; and managing State nonpoint source management programs effectively.

In particular, EPA works with the States and Tribes to strengthen their nonpoint source pollution programs to address all significant nonpoint sources, including agricultural sources, through the CWA section 319 program. EPA is working with other government agencies, as well as with community groups, to effect voluntary changes regarding watershed protection and reduced nonpoint source pollution.

In addition, EPA and NOAA have published programmatic and technical guidance to address coastal nonpoint source pollution. Under Section 6217 of the CZARA, States are developing and implementing coastal nonpoint pollution control programs approved by EPA and NOAA.

6. Comply With Applicable Requirements as a Discharger

Today's final rule covers federally operated facilities in a variety of ways. These facilities are generally areas where people reside, such as a federal prison, hospital, or military base. It also includes federal parkways and road systems with separate storm sewer systems. Today's rule requires federal MS4s to comply with the same application deadlines that apply to regulated small MS4s generally. EPA believes that all federal MS4s serve populations of less than 100,000.

EPA received several comments that asked if individual buildings like post offices are considered to be small MS4s and thereby regulated in today's rule if they are in an urbanized area. Most of these buildings have at most a parking lot with runoff or a storm sewer that connects with a municipality's MS4. EPA does not intend that individual federal buildings be considered to be small MS4s. This is discussed in section II.H.2.b. of today's preamble.

Federal facilities can also be included under requirements addressing storm water discharges associated with small construction activities. In any case, discharges from these facilities will need to comply with all applicable NPDES requirements and any additional water quality-related requirements imposed by a State, Tribal, or local government. Failure to comply can result in enforcement actions. Federal facilities can act as models for municipal and private sector facilities and implement or test state-of-the-art management practices and control measures.

E. State Role

Today's final rule sets forth an NPDES approach for implementing the extension of the existing storm water discharge control program under CWA section 402(p)(6). State assumption of the NPDES program is voluntary, consistent with the principles of federalism. Because most States are approved to implement the NPDES program, they will tailor their storm water discharge control programs to address their water quality needs and objectives. While today's rule establishes the basic framework for the section 402(p)(6) program, States as well as Tribes (see discussion in section II.F) have an important role in fine-tuning the program to address the water quality issues within their jurisdictions. The basic framework allows for adjustments based on factors that vary geographically, including climate patterns and terrain.

Where States do not have NPDES authority, they are not required to implement the storm water discharge control program, but they may still participate in water quality protection through participation in the CWA section 401 certification process (for any permits) and through development of water quality standards and TMDLs.

1. Develop the Program

In expanding the existing NPDES program for storm water discharges, States must evaluate whether revisions to their NPDES programs are necessary. If so, modifications must be made in accordance with § 123.62. Under § 123.62, States must revise their NPDES programs within 1 year, or within 2 years if statutory changes are necessary.

Some States and departments of transportation (DOTs) commented that this timeframe is too short, anticipating that the State legislative process and the modification of regulations combined would take beyond 2 years. The deadline language in § 123.62 is not new language for the storm water discharge control program; it applies to all NPDES programs. EPA believes the vast majority of States will meet the deadline and will work with States in those cases where there may be difficulty meeting this deadline due to the timing of legislative sessions and the regulatory development process.

An authorized State NPDES program must meet the requirements of CWA section 402(b) and conform to the guidelines issued under CWA section 304(i)(2). Today's final rule under § 123.25 adds specific cross references to the storm water discharge control program components to ensure that States adequately address these requirements.

2. Comply With Applicable Requirements as a Discharger

Today's final rule covers State operated separate storm sewer systems in a variety of ways. These systems generally drain areas where people reside, such as a prison, hospital, or other populated facility. These systems are included under the definition of a regulated small MS4, which specifically identifies systems operated by State departments of transportation. Alternatively, storm water discharges from State activities may be regulated under the section addressing storm water discharges associated with small construction activities. In any case, discharges from these facilities must comply with all applicable NPDES requirements. Failure to comply can result in enforcement actions. State facilities can act as models for municipal and private sector facilities and implement or test state-of-the-art management practices and control measures.

3. Communicate With EPA

Under approved NPDES programs, States have an ongoing obligation to share information with EPA. This dialogue is particularly important in the CWA section 402(p)(6) storm water program where these governments continue to develop a great deal of the guidance and outreach related to water quality.

F. Tribal Role

The proposal to today's final rule provides background information on EPA's 1984 Indian Policy and the criteria for treatment of an Indian Tribe in the same manner as a State. Today's final rule extends the existing NPDES program for storm water discharges to two types of dischargers located in Indian country. First, the final rule designates storm water discharges from any regulated small MS4, including Tribal systems. Second, the final rule regulates discharges associated with construction activity disturbing between one and five acres of land, including sites located in Indian country. Operators in each of these categories of regulated activity must apply for coverage under an NPDES permit by 3 years and 90 days from the date of publication of today's final rule. Under existing regulations, however, EPA or an authorized NPDES Tribe may require a specified storm water discharger to apply for NPDES permit coverage before this deadline based on a determination that the discharge is contributing to a violation of a water quality standard (including designated uses) or is a significant contributor of pollutants.

Under today's rule, a Tribal governmental entity may regulate storm water discharges on its reservation in two ways—as either an NPDES-authorized Tribe or as a regulated MS4. If a Tribe is authorized to operate the NPDES program, the Tribe must implement today's final rule for the NPDES program for storm water for covered dischargers located within the EPA recognized boundaries. Otherwise, EPA is generally the permitting/program authority within Indian country. Discussions about the State Role in the preceding section also apply to NPDES authorized Tribes. For additional information on the role and responsibilities of the permitting authority in the NPDES storm water program, see § 123.35 (and Section II.G. of today's preamble) and § 123.25(a).

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Under today's final rule, if the Indian reservation is located entirely or partially within an "urbanized area," as defined in § 122.32(a)(1), the Tribe must obtain an NPDES permit if it operates a small MS4 within the urbanized area portion. Tribal MS4s located outside an urbanized area are not automatically covered, but may be designated by EPA pursuant to § 122.32(a)(2) of today's rule or may request designation as a regulated small MS4 from EPA. A Tribe that is a regulated MS4 for NPDES program purposes is required to implement the six minimum control measures to the extent allowable under Federal law.

The Tribal representative on the Storm Water Phase II FACA Subcommittee asked EPA to provide a list of the Tribes located in urbanized areas that would fall within the NPDES storm water program under today's final rule. In December 1996, EPA developed a list of federally recognized American Indian Areas located wholly or partially in Bureau of the Census-designated urbanized areas (see Appendix 1). Appendix 1 not only provides a listing of reservations and individual Tribes, but also the name of the particular urbanized area in which the reservation is located and an indication of whether the urbanized area contains a medium or large MS4 that is already covered by the existing Phase I regulations.

Some of the Tribes listed in Appendix 1 are only partially located in an urbanized area. If the Tribe's MS4 serves less than 1,000 people within an urbanized area, the permitting authority may waive the Tribe's MS4 storm water requirements if it meets the conditions of § 122.32(c). EPA does not have information on the Tribal populations within the urbanized areas, so it can not identify the Tribes that are eligible for a waiver. Therefore, a Tribe that believes it qualifies for a waiver should contact its permitting authority.

G. NPDES Permitting Authority's Role for the NPDES Storm Water Small MS4 Program

As noted previously, the NPDES permitting authority can be EPA or an authorized State or an authorized Tribe. The following discussion describes the role of the NPDES permitting authority under today's final rule.

1. Comply With Implementation Requirements

NPDES permitting authorities must perform certain duties to implement the NPDES storm water municipal program. Section 123.35(a) of today's final rule emphasizes that permitting authorities have existing obligations under the NPDES program. Section 123.35 focuses on specific issues related to the role of the NPDES authority to support administration and implementation of the municipal storm water program under CWA section 402(p)(6).

2. Designate Sources

Section 123.35(b) of today's final rule addresses the requirements for the NPDES permitting authority to designate sources of storm water discharges to be regulated under §§ 122.32 through 122.36. NPDES permitting authorities must develop a process, as well as criteria, to designate small MS4s. They must also have the authority to designate a small MS4 if and when circumstances that support a waiver under § 122.32(c) change. EPA may make designations if an NPDES-approved State or Tribe fails to do so.

NPDES permitting authorities must examine geographic jurisdictions that they believe should be included in the storm water discharge control program but are not located in an "urbanized area". Small MS4s in these areas are not designated automatically. Discharges from such areas should be brought into the program if found to have actual or potential exceedances of water quality standards, including impairment of designated uses, or other adverse impacts on water quality, as determined by local conditions or watershed and TMDL assessments. EPA's aim is to address discharges to impaired waters and to protect waters with the potential for problems. EPA encourages NPDES permitting authorities, local governments, and the interested public to work together in the context of a watershed plan to address water quality issues, including those associated with municipal storm water runoff.

EPA received comments stating that the process of developing criteria and applying it to all MS4s outside an urbanized area serving a population of 10,000 or greater and with a density of 1,000 people per square mile is too time-consuming and resource-intensive. These commenters believe that the permitting authority should decide which MS4s must be brought into the storm water discharge control program and that population and density should not be an overriding criteria. One suggested way of doing so was to only designate MS4s with demonstrated contributions to the impairment of water quality uses as shown by a TMDL. EPA disagrees with this suggestion. The TMDL process is time-consuming. MS4s outside of urbanized areas may cause water quality problems long before a TMDL is completed.

EPA believes that permitting authorities should consider the potential water quality impacts of storm water from all jurisdictions with a population of 10,000 or greater and a density of 1,000 people per square mile. EPA is using data summarized in the NURP study and in the CWA section 305(b) reports to support this approach for targeted designation outside of urbanized areas. EPA is not mandating which criteria are to be used, but has provided examples of criteria that may be useful in evaluating potential water quality impacts. EPA believes that the flexibility provided in this section of today's final rule allows the permitting authority to develop criteria and a designation process that is easy to use and protects water quality. Therefore, the provisions of § 123.35(b) remain as proposed.

a. Develop Designation Criteria

Under § 123.35(b), the NPDES permitting authority must establish designation criteria to evaluate whether a storm water discharge results in or has the potential to result in exceedances of water quality standards, including impairment of designated uses, or other significant water quality impacts, including adverse habitat and biological impacts.

EPA recommends that NPDES permitting authorities consider, in a balanced manner, certain locally-focused criteria for designating any MS4 located outside of an urbanized area on the basis of significant water quality impacts. EPA recommends consideration of criteria such as discharge to sensitive waters, high growth or growth potential, high population density, contiguity to an urbanized area, significant contribution of pollutants to waters of the United States, and ineffective control of water quality concerns by other programs. These suggested designation criteria are intended to help encourage the permitting authority to use an objective method for identifying and designating, on a local basis, sources that adversely impact water quality. More information about these criteria and the reasons why they are suggested by EPA is included in the January 9, 1998, proposal (63 FR 1561) for today's final rule.

The suggested criteria are meant to be taken in the aggregate, with a great deal of flexibility as to how each should be weighed in order to best account for watershed and other local conditions and to allow for a more tailored case-by-case analysis. The application of criteria is meant to be geographically specific. Furthermore, each criterion does not have to be met in order for a small MS4

to qualify for designation, nor should an MS4 necessarily be designated on the basis of one or two criteria alone.

EPA believes that the application of the recommended designation criteria provides an objective indicator of real and potential water quality impacts from urban runoff on both the local and watershed levels. EPA encourages the application of the recommended criteria in a watershed context, thereby allowing for the evaluation of the water quality impacts of the portions of a watershed outside of an urbanized area. For example, situations exist where the urbanized area represents a small portion of a degraded watershed, and the adjacent nonurbanized areas of the watershed have significant cumulative effects on the quality of the receiving waters.

EPA received numerous suggestions of additional criteria that should be added and reasons why some of the criteria in the proposal to today's final rule were not appropriate. EPA developed its suggested designation criteria based on findings of the NURP study and other studies that indicate pollutants of concern, including total suspended solids, chemical oxygen demand, and temperature. These criteria were the subject of considerable discussion by the Storm Water Phase II FACA Subcommittee. EPA developed them in response to recommendations from the subcommittee during development of the proposed rule. The listed criteria are only suggestions. Permitting authorities are required to develop their own criteria. EPA has not found any reason to change its suggested list of criteria and the suggestions remain as proposed.

b. Apply Designation Criteria

After customizing the designation criteria for local conditions, the permitting authority must apply such criteria, at a minimum, to any MS4 located outside of an urbanized area serving a jurisdiction with a population of at least 10,000 and a population density of 1,000 people per square mile or greater (see § 123.35(b)(2)). If the NPDES permitting authority determines that an MS4 meets the criteria, the permitting authority must designate it as a regulated small MS4. This designation must occur within 3 years of publication of today's final rule. Alternatively, the NPDES authority can designate within 5 years from the date of final regulation if the designation criteria are applied on a watershed basis where a comprehensive watershed plan exists (a comprehensive watershed plan is one that includes the equivalents of TMDLs) (see § 123.35(b)(3)). The extended 5 year deadline is intended to provide incentives for watershed-based designations. If an NPDES-authorized State or Tribe does not develop and apply designation criteria within this timeframe, then EPA has the opportunity to do so in lieu of the authorized State or Tribe.

NPDES permitting authorities can designate any small MS4, including one below 10,000 in population and 1,000 in density. EPA established the 10,000/1,000 threshold based on the likelihood of adverse water quality impacts at these population and density levels. In addition, the 1,000 persons per square mile threshold is consistent with both the Bureau of the Census definition of an "urbanized area" (see Section II.H.2. below) and stakeholder discussions concerning the definition of a regulated small MS4.

One commenter requested that EPA develop interim deadlines for development of designation criteria. EPA believes that the designation deadline identified in today's final rule at § 123.35(b)(3) provides States and Tribes with a flexibility that allows them to develop and apply the criteria locally in a timely fashion, while at the same time establishing an expeditious deadline.

c. Designate Physically Interconnected Small MS4s

In addition to applying criteria on a local basis for potential designation, the NPDES permitting authority must designate any MS4 that contributes substantially to the pollutant loadings of a physically interconnected municipal separate storm sewer that is regulated by the NPDES program for storm water discharges (see § 123.35(b)(4)). To be "physically interconnected," the MS4 of one entity, including roads with drainage systems and municipal streets, is physically connected directly to the municipal separate storm sewer of another entity. This provision applies to all MS4s located outside of an urbanized area. EPA added this section in recognition of the concerns of local government stakeholders that a local government should not have to shoulder total responsibility for a storm water program when storm water discharges from another MS4 are also contributing pollutants or adversely affecting water quality. This provision also helps to provide some consistency among MS4 programs and to facilitate watershed planning in the implementation of the NPDES storm water program. EPA recommended physical interconnectedness in the existing NPDES storm water regulations as a factor for consideration in the designation of additional sources.

Today's final rule does not include interim deadlines for identifying physically interconnected MS4s. However, consistent with the deadlines identified in § 123.35(b)(3) of today's final rule, EPA encourages the permitting authority to make these determinations within 3 years from the date of publication of the final rule or within 5 years if the permitting authority is implementing a comprehensive watershed plan. Alternatively, the affected jurisdiction could use the petition process under 40 CFR 122.26(f) in seeking to have the permitting authority designate the contributing jurisdiction.

Several commenters expressed concerns about who could be designated under this provision (§ 123.35(b)(4)). One commenter requested that the word "substantially" be deleted from the rule because they believe any MS4 that contributes at all to a physically interconnected municipal separate storm sewer should be regulated. EPA believes that the word "substantially" provides necessary flexibility to the permitting authorities. The permitting authority can decide if an MS4 is contributing discharges to another municipal separate storm sewer in a manner that requires regulation. If the operator of a regulated municipal separate storm sewer believes that some of its pollutant loadings are coming from an unregulated MS4, it can petition the permitting authority to designate the unregulated MS4 for regulation.

d. Respond to Public Petitions for Designation

Today's final rule reiterates the existing opportunity for the public to petition the permitting authority for designation of a point source to be regulated to protect water quality. The petition opportunity also appears in existing NPDES regulations at 40 CFR 122.26(f). Any person may petition the permitting authority to require an NPDES permit for a discharge composed entirely of storm water that contributes to a violation of a water quality standard or is a significant contributor of pollutants to the waters of the United States (see § 123.32(b)). The NPDES permitting authority must make a final determination on any petition within 180 days after receiving the petition (see § 123.35(c)). EPA believes that a 180 day limit balances the public's need for a timely final determination with the NPDES permitting authority's need to prioritize its workload. If an NPDES-approved State or Tribe fails to act

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within the 180-day timeframe, EPA may make a determination on the petition. EPA believes that public involvement is an important component of the NPDES program for storm water and feels that this provision encourages public participation. Section II.K, Public Involvement/Public Role, further discusses this topic.

3. Provide Waivers

Today's rule provides two opportunities for the NPDES permitting authority to exempt certain small MS4s from the need for a permit based on water quality considerations. See §§ 122.32(d) and (e). The two waiver opportunities have different size thresholds and take different approaches to considering the water quality impacts of discharges from the MS4.

In the proposal, EPA requested comment on the option of waiving coverage for all MS4s with less than 1,000 people unless the permitting authority determined that the small MS4 should be regulated based on significant adverse water quality impacts. A number of commenters supported this option. They expressed concern that compliance with the rule requirements and certification of one of the waiver provisions were both costly for very small communities. They stated that the permitting authority should identify a water quality problem before requiring compliance. Today's rule essentially adopts this alternative approach for MS4s serving a population under 1,000.

The final rule has expanded the waiver provision that EPA proposed for small MS4s with a population less than 1,000. The proposed rule would have required a small MS4 operator to certify that storm water controls are not needed based on either wasteload allocations that are part of TMDLs that address the pollutants of concern, or a comprehensive watershed plan implemented for the waterbody that includes the equivalents of TMDLs and addresses the pollutant(s) of concern. Commenters noted that the proposed waivers would be unattainable if a TMDL or equivalent analysis was required for every pollutant that could possibly be present in any amount in discharges from an MS4 regardless of whether the pollutant is causing water quality impairment. Commenters asked that EPA identify what constitutes the "pollutant(s) of concern" for which a TMDL or its equivalent must be developed. For example, § 122.30(c) indicates that the MS4 program is intended to control "sediment, suspended solids, nutrients, heavy metals, pathogens, toxins, oxygen-demanding substances, and floatables." Commenters asked whether TMDLs or equivalent analyses have to address all of these.

EPA has revised the proposed waiver in response to these concerns. Under today's rule, NPDES permitting authorities may waive the requirements of today's rule for any small MS4 with a population less than 1,000 that does not contribute substantially to the pollutant loadings of a physically interconnected MS4, unless the small MS4 discharges pollutants that have been identified as a cause of impairment of the waters to which the small MS4 discharges. If the small MS4 does discharge pollutants that have been identified as impairing the water body into which the small MS4 discharges, the NPDES permitting authority may grant a waiver only if it determines that storm water controls are not needed based on an EPA approved or established TMDL that addresses the pollutant(s) of concern.

Unlike the proposed rule, § 122.32(d) does not allow the waiver for MS4s serving a population under 1,000 to be based on "the equivalent of a TMDL." Because § 122.32(d) requires a pollutant specific analysis only for a pollutant that has been identified as a cause of impairment, a TMDL is required for such pollutant before the waiver may be granted. Once a pollutant has been identified as the cause of impairment of a water body, the State should develop a TMDL for that pollutant for that water body. Thus, § 122.32(d) takes a different approach than that taken for the waiver in § 122.32(e) for MS4s serving a population under 10,000, which can be based upon an analysis that is "the equivalent of a TMDL." This is because § 122.32(d) requires an analysis to support the waiver for MS4s under 1,000 only if a waterbody to which the MS4 discharges has been identified as impaired. The § 122.32(e) waiver, on the other hand, would be available for larger MS4s but only after the State affirmatively establishes lack of impairment based upon a comprehensive analysis of smaller urban waters that might not otherwise be evaluated for the purposes of CWA section 303. Since § 122.32(e) requires the analysis of waters that have not been identified as impaired, an actual TMDL is not required and an analysis that is the equivalent of a TMDL can suffice to support the waiver.

Where a State is the NPDES permitting authority, the permitting authority is responsible for the development of the TMDLs as well as the assessment of the extent to which a small MS4's discharge contributes pollutants to a neighboring regulated system. In States where EPA is the permitting authority, EPA will use a State's TMDLs to determine whether storm water controls are required for the small MS4s.

The proposed rule would have required the operator of the small MS4 serving a population under 1,000 to certify that its discharge was covered under a TMDL that indicated that discharges from its particular system were not having an adverse impact on water quality (*i.e.*, it was either not assigned wasteload allocations under TMDLs or its discharge is within an assigned allocation). Many commenters expressed concerns that MS4 operators serving less than 1,000 persons may lack the technical capacity to certify that their discharges are not contributing to adverse water quality impacts. These commenters thought that the permitting authority should make such a certification. Today's rule provides flexibility as to how the waiver is administered. Permitting authorities are ultimately responsible for granting the waiver, but are free to determine whether or not to require small MS4 operators that are seeking waivers to submit information or a written certification.

Under § 122.32(e) a State may grant a waiver to an MS4 serving a population between 1,000 and 10,000 only if the State has made a comprehensive effort to ensure that the MS4 will not cause or contribute to water quality impairment. To grant a § 122.32(e) waiver, the NPDES permitting authority must evaluate all waters of the U.S. that receive a discharge from the MS4 and determine that storm water controls are not needed. The permitting authority's evaluation must be based on wasteload allocations that are part of an EPA approved or established TMDL or, if a TMDL has not been developed or approved, an equivalent analysis that determines sources and allocations for the pollutant(s) of concern. The pollutants of concern that the permitting authority must evaluate include biochemical oxygen demand (BOD), sediment or a parameter that addresses sediment (such as total suspended solids, turbidity or siltation), pathogens, oil and grease, and any other pollutant that has been identified as a cause of impairment of any water body that will receive a discharge from the MS4. Finally, the permitting authority must have determined that future discharges from the MS4 do not have the potential to result in exceedances of water quality standards, including impairment of designated uses, or other significant

water quality impacts, including habitat and biological impacts.

Although EPA did not propose this specific approach, the Agency did request comment on whether to increase the proposed 1,000 population threshold for a waiver. The § 122.32(e) waiver was developed in response to comments, including States' concerns that they needed greater flexibility to focus their efforts on MS4s that were causing water quality impairment. Several commenters thought that the threshold should be increased from 1,000 to 5,000 or 10,000. Others suggested additional ways of qualifying for a waiver for MS4s that discharge to waters that are not covered by a TMDL or watershed plan. EPA carefully considered all the options for expanding the waiver provisions and has decided to expand the waiver only in the very narrow circumstances described above where a comprehensive analysis has been undertaken to demonstrate that the MS4 is not causing water quality impairment.

The NPDES permitting authority can, at any time, mandate compliance with program requirements from a previously waived small MS4 if circumstances change. For example, a waiver can be withdrawn in circumstances where the permitting authority later determines that a waived small MS4's storm water discharge to a small stream will cause adverse impacts to water quality or significantly interfere with attainment of water quality standards. A "change in circumstances" could involve receipt of new information. Changed circumstances can also allow a regulated small MS4 operator to request a waiver at any time.

Some commenters expressed concerns about allowing any small MS4 waivers. One commenter stated that storm water pollution prevention plans are necessary to control storm water pollution and should be required from all regulated small MS4s. For the reasons stated in the Background section above, EPA agrees that the discharges from most MS4s in urbanized areas should be addressed by a storm water management program outlined in today's rule. For MS4s serving very small areas, however, the TMDL development process provides an opportunity to determine whether an MS4 serving a population less than 1,000 is having a negative impact on any receiving water that is impaired by a pollutant that the MS4 discharges. MS4s serving populations up to 10,000 may receive a waiver only if a comprehensive analysis of its impact on receiving water has been performed.

Other commenters said that waivers should not be allowed for small MS4s that discharge into another regulated MS4. These commenters stated that the word "substantially" should be removed from § 122.32(d)(i) so that a waiver would not be allowed for any system "contributing to the storm water pollutant loadings of a physically interconnected regulated MS4." As previously mentioned under the designation discussion of section II.G.2.c, EPA believes that the word "substantially" provides needed flexibility to the permitting authorities. It is important to note that this is only one aspect that the permitting authority must consider when deciding on the appropriateness of a waiver.

4. Issue Permits

NPDES permitting authorities have a number of responsibilities regarding the permit process. Sections 123.35(d) through (g) ensure a certain level of consistency for permits, yet provide numerous opportunities for flexibility. NPDES permitting authorities must issue NPDES permits to cover municipal sources to be regulated under § 122.32, unless waived under § 122.32(c). EPA encourages permitting authorities to use general permits as the vehicle for permitting and regulating small MS4s. The Agency notes, however, that some operators may wish to take advantage of the option to join as a co-permittee with an MS4 regulated under the existing NPDES storm water program.

Today's final rule includes a provision, § 123.35(f), that requires NPDES permitting authorities to either include the requirements in § 122.34 for NPDES permits issued for regulated small MS4s or to develop permit limits based on a permit application submitted by a small MS4. See Section II.H.3.a, Minimum Control Measures, for more details on the actual § 122.34 requirements. See Section II.H.3.c for alternative and joint permitting options.

In an attempt to avoid duplication of effort, § 122.34(c) allows NPDES permitting authorities to include permit conditions that direct an MS4 to meet the requirements of a qualifying local, Tribal, or State municipal storm water management program. For a local, Tribal, or State program to "qualify," it must impose, at a minimum, the relevant requirements of § 122.34(b). A regulated small MS4 must still follow the procedural requirements for an NPDES permit (*i.e.*, submit an application, either an individual application or an NOI under a general permit) but will instead follow the substantive pollutant control requirements of the qualifying local, Tribal, or State program.

Under § 122.35(b), NPDES permitting authorities may also recognize existing responsibilities among governmental entities for the minimum control measures in an NPDES small MS4 storm water permit. For example, the permit might acknowledge the existence of a State administered program that addresses construction site runoff and require that the municipalities only develop substantive controls for the remaining minimum control measures. By acknowledging existing programs, this provision is meant to reduce the duplication of efforts and to increase the flexibility of the NPDES storm water program.

Section 123.35(e) of today's final rule requires permitting authorities to specify a time period of up to 5 years from the issuance date of an NPDES permit for regulated small MS4 operators to fully develop and implement their storm water programs. As discussed more fully below, permitting authorities should be providing extensive support to the local governments to assist them in developing and implementing their programs.

In the proposed rule, EPA stated that the permitting authority would develop the menu of BMPs and if they failed to do so, EPA would develop the menu. Commenters felt that EPA should develop a menu of BMPs, rather than just providing guidance. In the settlement agreement for seeking an extension to the deadline for issuing today's rule, EPA committed to developing a menu of BMPs by October 27, 2000. Permitting authorities can adopt EPA's menu or develop their own. The menu itself is not intended to replace more comprehensive BMP guidance materials. As part of the tool box efforts, EPA will provide separate guidance documents that discuss the results from EPA-sponsored nationwide studies on the design, operation and maintenance of BMPs. Additionally, EPA expects that the new rulemaking on construction BMPs may provide more specific design, operation and maintenance criteria.

5. Support and Oversee the Local Programs

NPDES permitting authorities are responsible for supporting and overseeing the local municipal programs. Section 123.35(h) of today's final rule highlights issues associated with these responsibilities.

To the extent possible, NPDES permitting authorities should provide financial assistance to MS4s, which

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often have limited resources, for the development and implementation of local programs. EPA recognizes that funding for programs at the State and Tribal levels may also be limited, but strongly encourages States and Tribes to provide whatever assistance is possible. In lieu of actual dollars, NPDES permitting authorities can provide cost-cutting assistance in a number of ways. For example, NPDES permitting authorities can develop outreach materials for MS4s to distribute or the NPDES permitting authority can actually distribute the materials. Another option is to implement an erosion and sediment control program across an entire State (or Tribal land), thus alleviating the need for the MS4 to implement its own program. The NPDES permitting authority must balance the need for site-specific controls, which are best handled by a local MS4, with its ability to offer financial assistance. EPA, States, Tribes, and MS4s should work as a team in making these kinds of decisions.

NPDES permitting authorities are responsible for overseeing the local programs. Permitting authorities should work with the regulated community and other stakeholders to assist in local program development and implementation. This might include sharing information, analyzing reports, and taking enforcement actions, as necessary. NPDES permitting authorities play a vital role in supporting local programs by providing technical and programmatic assistance, conducting research projects, and monitoring watersheds. The NPDES permitting authority can also assist the MS4 permittee in obtaining adequate legal authority at the local level in order to implement the local component of the CWA section 402(p)(6) program.

NPDES permitting authorities are encouraged to coordinate and utilize the data collected under several programs. States and Tribes address point and nonpoint source storm water discharges through a variety of programs. In developing programs to carry out CWA section 402(p)(6), EPA recommends that States and Tribes coordinate all of their water pollution evaluation and control programs, including the continuing planning process under CWA section 303(e), the existing NPDES program, the CZARA program, and nonpoint source pollution control programs.

In addition, NPDES permitting authorities are encouraged to provide a brief (*e.g.*, two-page) reporting format to facilitate compilation and analysis of data from reports submitted under § 122.34(g)(3). EPA intends to develop a model form for this purpose.

H. Municipal Role

1. Scope of Today's Rule

Today's final rule attempts to establish an equitable and comprehensive four-pronged approach for the designation of municipal sources. First, the approach defines for automatic coverage the municipal systems believed to be of highest threat to water quality. Second, the approach designates municipal systems that meet a set of objective criteria used to measure the potential for water quality impacts. Third, the approach designates on a case-by-case basis municipal systems that "contribute substantially to the pollutant loadings of a physically-interconnected [regulated] MS4." Finally, the approach designates on a case-by-case basis, upon petition, municipal systems that "contribute to a violation of a water quality standard or are a significant contributor of pollutants."

Today's final rule automatically designates for regulation small MS4s located in urbanized areas, and requires that NPDES permitting authorities examine for potential designation, at a minimum, a particular subset of small MS4s located outside of urbanized areas. Today's rule also includes provisions that allow for waivers from the otherwise applicable requirements for the smallest MS4s that are not causing impairment of a receiving water body. Qualifications for the waivers vary depending on whether the MS4 serves a population under 1,000 or a population under 10,000. See §§ 122.32(d) and (e). These waivers are discussed further in section II.G.3. Any small MS4 automatically designated by the final rule or designated by the permitting authority under today's final rule is defined as a "regulated" small MS4 unless it receives a waiver.

In today's final rule, all regulated small MS4s must establish a storm water discharge control program that meets the requirements of six minimum control measures. These minimum control measures are public education and outreach on storm water impacts, public involvement participation, illicit discharge detection and elimination, construction site storm water runoff control, post-construction storm water management in new development and redevelopment, and pollution prevention/good housekeeping for municipal operations.

Today's rule allows for a great deal of flexibility in how an operator of a regulated small MS4 is authorized to discharge under an NPDES permit, by providing various options for obtaining permit coverage and satisfying the required minimum control measures. For example, the NPDES permitting authority can incorporate by reference qualifying State, Tribal, or local programs in an NPDES general permit and can recognize existing responsibilities among different governmental entities for the implementation of minimum control measures. In addition, a regulated small MS4 can participate in the storm water management program of an adjoining regulated MS4 and can arrange to have another governmental entity implement a minimum control measure on their behalf.

2. Municipal Definitions

a. Municipal Separate Storm Sewer Systems (MS4s)

The CWA does not define the term "municipal separate storm sewer." EPA defined municipal separate storm sewer in the existing storm water permit application regulations to mean, in part, a conveyance or system of conveyances (including roads with drainage systems and municipal streets) that is "owned or operated by a State, city, town borough, county, parish, district, association, or other public body * * * designed or used for collecting or conveying storm water which is not a combined sewer and which is not part of a Publicly Owned Treatment Works as defined at 40 CFR 122.2" (see § 122.26(b)(8)(i)). Section 122.26 contains definitions of medium and large municipal separate storm sewer systems but no definition of a municipal separate storm sewer *system*, even though the term MS4 is commonly used. In today's rule, EPA is adding a definition of municipal separate storm sewer system and small municipal separate storm sewer system along with the abbreviations MS4 and small MS4.

The existing municipal permit application regulations define "medium" and "large" MS4s as those located in an incorporated place or county with a population of at least 100,000 (medium) or 250,000 (large) as determined by the latest Decennial Census (see §§ 122.26(b)(4) and 122.26(b)(7)). In today's final rule, these regulations have been revised to define all medium and large MS4s as those meeting the above population thresholds according to the 1990 Decennial Census.

Today's rule also corrects the titles and contents of Appendices F, G, H,& I to Part 122. EPA is adding those incorporated places and counties whose 1990 population caused them to be defined as a "medium" or "large" MS4. All of these MS4s have applied for

permit coverage so the effect of this change to the appendices is simply to make them more accurate. They will not need to be revised again because today's rule "freezes" the definition of "medium" and "large" MS4s at those that qualify based on the 1990 census.

EPA received several comments supporting and opposing the proposal to "freeze" the definitions based on the 1990 census. Commenters who disagreed with EPA's position cited the unfairness of municipalities that reach the medium or large threshold at a later date having fewer permitting requirements compared to those that were already at the population thresholds when the existing storm water regulations took effect. EPA recognizes this disparity but does not believe it is unfair, as explained in the proposed rule. The decision was based on the fact that the deadlines from the existing regulations have lapsed, and because the permitting authority can always require more from operators of MS4s serving "newly over 100,000" populations.

b. Small Municipal Separate Storm Sewer Systems

The proposal to today's final rule added "the United States" as a potential owner or operator of a municipal separate storm sewer. This addition was intended to address an omission from existing regulations and to clarify that federal facilities are, in fact, covered by the NPDES program for municipal storm water discharges when the federal facility is like other regulated MS4s. EPA received a comment that this change would cause federal facilities located in Phase 1 areas to be considered Phase 1 dischargers due to the definition of medium and large MS4s. All MS4s located in Phase 1 cities or counties are defined as Phase 1 medium or large MS4s. EPA believes that all federal facilities serve a population of under 100,000 and should be regulated as small MS4s. Therefore, in § 122.26(a)(16) of today's final rule, EPA is adding federal facilities to the NPDES storm water discharge control program by changing the proposed definition of small municipal separate storm sewer system. Paragraph (i) of this section restates the definition of municipal separate storm sewer with the addition of "the United States" as a owner or operator of a small municipal separate storm sewer. Paragraph (ii) repeats the proposed language that states that a small MS4 is a municipal separate storm sewer that is not medium or large.

Most commenters agreed that federal facilities should be covered in the same way as other similar MS4s. However, EPA received several comments asking whether individual federal buildings such as post offices or urban offices of the U.S. Park Service must apply for coverage as regulated small MS4s. Most of these buildings have, at most, a parking lot with runoff or a storm sewer that connects with a municipality's MS4. In § 122.26(a)(16)(iii), EPA clarifies that the definition of small MS4 does not include individual buildings. These buildings may have a municipal separate storm sewer but they do not have a "system" of conveyances. The minimum measures for small MS4s were written to apply to storm sewer "systems" providing storm water drainage service to human populations and not to individual buildings. This is true of municipal separate storm sewers from State buildings as well as from federal buildings.

There will likely be situations where the permitting authority must decide if a federal or State complex should be regulated as a small MS4. A federal complex of two or three buildings could be treated as a single building and not be required to apply for coverage. In these situations, permitting authorities will have to use their best judgment as to the nature of the complex and its storm water conveyance system. Permitting authorities should also consider whether the federal or State complex cooperates with its municipality's efforts to implement their storm water management program.

Along with the questions about individual buildings, EPA received many questions about how various provisions of the rule should be interpreted for federal and State facilities. EPA acknowledges that federal and State facilities are different from municipalities. EPA believes, however, that the minimum measures are flexible enough that they can be implemented by these facilities. As an example, DOD commenters asked about how to interpret the term "public" for military installations when implementing the public education measure. EPA agrees with the suggested interpretation of "public" for DOD facilities as "the resident and employee population within the fence line of the facility."

EPA also received many comments from State departments of transportation (DOTs) that suggested the ways in which they are different from municipalities and should therefore be regulated differently. Storm water discharges from State DOTs in Phase 1 areas should already be regulated under Phase I. The preamble to Phase 1 clearly states that "all systems within a geographical area including highways and flood control districts will be covered." Many permitting authorities regulated State DOTs as co-permittees with the Phase 1 municipality in which the highway is located. State DOTs that are already regulated under Phase I are not required to comply with Phase II. State DOTs that are not already regulated have various options for meeting the requirements of today's rule. These options are discussed in Section II.H.3.c.iv below. Several DOTs commented that some of the minimum measures are outside the scope of their mission or that they do not have the legal authority required for implementation. EPA believes that the flexibility of the minimum measures allows them to be implemented by most MS4s, including DOTs. When a DOT does not have the necessary legal authority, EPA encourages the DOT to coordinate their storm water management efforts with the surrounding municipalities and other State agencies. Under today's rule, DOTs can use any of the options of § 122.35 to share their storm water management responsibilities. DOTs may also want to work with their permitting authority to develop a State-wide DOT storm water permit.

There are many storm water discharges from State DOTs and other State MS4s located in Phase 1 areas that were not regulated under Phase 1. Today's rule adds many more State facilities as well as all federal facilities located in urbanized areas. All of these State and federal facilities that fit the definition of a small MS4 must be covered by a storm water management program. The individual permitting authorities must decide what type of permit is most applicable.

The existing NPDES storm water program already regulates storm water from federally or State-operated industrial sources. Federal or State facilities that are currently regulated due to their industrial discharges may already be implementing some of today's rule requirements.

EPA received comments that questioned the apparent inconsistency between regulating a federal facility such as a hospital and not regulating a similar private facility. Normally, this type of private facility is regulated by the MS4. EPA believes that federal facilities are subject to local water quality regulations, including storm water requirements, by virtue of the waiver of sovereign immunity in CWA section 313. However, there are special problems faced by MS4s in their efforts to regulate federal facilities that have not been encountered in regulating

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similar private facilities. To ensure comprehensive coverage, today's rule merely clarifies the need for permit coverage for these federal facilities.

i. Combined Sewer Systems (CSS). The definition of small MS4s does not include combined sewer systems. A combined sewer system is a wastewater collection system that conveys sanitary wastewater and storm water through a single set of pipes to a publicly-owned treatment works (POTW) for treatment before discharging to a receiving waterbody. During wet weather events when the capacity of the combined sewer system is exceeded, the system is designed to discharge prior to the POTW treatment plant directly into a receiving waterbody. Such an overflow is a combined sewer overflow or CSO. Combined sewer systems are not subject to existing regulations for municipal storm water discharges, nor will they be subject to today's regulations. EPA addresses combined sewer systems and CSOs in the National Combined Sewer Overflow (CSO) Control Policy issued on April 19, 1994 (59 FR 18688). The CSO Control Policy contains provisions for developing appropriate, site-specific NPDES permit requirements for combined sewer systems. CSO discharges are subject to limitations based on the best available technology economically achievable for toxic pollutants and based on the best conventional pollutant control technology for conventional pollutants. MS4s are subject to a different technology standard for all pollutants, specifically to reduce pollutants to the maximum extent practicable.

Some municipalities are served by both separate storm sewer systems and combined sewer systems. If such a municipality is located within an urbanized area, only the separate storm sewer systems within that municipality is included in the NPDES storm water program and subject to today's final rule. If the municipality is not located in an urbanized area, then the NPDES permitting authority has discretion as to whether the discharges from the separate storm sewer system is subject to today's final rule. The NPDES permitting authority will use the same process to designate discharges from portions of an MS4 for permit coverage where the municipality is also served by a combined sewer system.

EPA recognizes that municipalities that have both combined and separate storm sewer systems may wish to find ways to develop a unified program to meet all wet weather water pollution control requirements more efficiently. In the proposal to today's final rule, EPA sought comment on ways to achieve such a unified program. Many municipalities that are served by CSSs and MS4s commented that it is inequitable to force them to comply with Phase II at this time because implementation of the CSO Control Policy through their NPDES permits already imposes a significant financial burden. They requested an extension of the implementation time frame. They did not provide ideas on how to unify the two programs. EPA encourages permitting authorities to work with these municipalities as they develop and begin implementation of their CSO and storm water management programs. If both sets of requirements are carefully coordinated early, a cost-effective wet weather program can be developed that will address both CSO and storm water requirements.

ii. Owners/Operators. Several commenters mentioned the difference between the existing storm water application requirement for municipal operators and the proposed municipal requirement for owners or operators to apply. They felt that this inconsistency is confusing. The preamble to the existing regulations makes numerous references to owner/operator so there was no intent to make a clear distinction between Phase I and Phase II. Section 122.21(b) states that when the owner and operator are different, the operator must obtain the permit. MS4s often have several operators. The owner may be responsible for one part of the system and a regional authority may be responsible for other aspects. EPA proposed the "owner or operator" language to convey this dual responsibility. However, when the owner is responsible for some part of a storm water management plan, it is also an operator.

EPA has revised the regulation language to clarify that "an operator" must apply for a permit. When responsibilities for the MS4 are shared, all operators must apply.

c. Regulated Small MS4s

In today's final rule, all small MS4s located in an urbanized area are automatically designated as "regulated" small MS4s provided that they were not previously designated into the existing storm water program. Unlike medium and large MS4s under the existing storm water regulations, not all small MS4s are designated under today's final rule. Therefore, today's rule distinguishes between "small" MS4s and "regulated small" MS4s.

EPA's definition of "regulated small MS4s" in the proposal to today's rule included mention of incorporated places and counties. Along with the definition, EPA included Appendices 6 and 7 to assist in the identification of areas that would probably require coverage as "automatically designated" (Appendix 6) or "potentially designated" (Appendix 7). The definition and the appendices raised many questions about exactly who was required to comply with the proposed requirements. Commenters raised issues about the definition of "incorporated place" and the status of towns, townships, and other places that are not considered incorporated by the Census Bureau. They also asked about special districts, regional authorities, MS4s already regulated, and other questions in order to clarify the rule's coverage.

EPA has revised § 122.32(a) to clarify that discharges are regulated under today's rule if they are from a small MS4 that is in an urbanized area and has not received a waiver or they are designated by the permitting authority. Today's rule does not regulate the county, city, or town. Today's rule regulates the MS4. Therefore, even though a county may be listed in Appendix 6, if that county does not own or operate the municipal storm sewer systems, the county does not have to submit an application or develop a storm water management program. If another entity does own or operate an MS4 within the county, for example, a regional utility district, that other entity needs to submit the application and develop the program.

Some commenters suggested that EPA should change the rule language to specifically allow regional authorities to be the permitted entity and to allow small MS4s to apply as co-permittees. EPA believes that the best way to clarify that regional authorities can be the primary permitted entity is the change to § 122.32(a) and the explanation above. Because EPA assumes that today's regulation will be implemented through general permits, MS4s will not be co-permittees under a general permit in the same manner as under individual permits. EPA has added § 122.33(a)(4) and made a minor change to § 122.35(a) to clarify that small MS4s can work together to share the responsibilities of a storm water management program. This is discussed further in Section II.H.3.c.iv below.

The proposed rule stated that when a county or Federal Indian reservation is only partially included in an urbanized area, only MS4s in the urbanized portion of the county or Federal Indian reservation would be regulated. In the rare cases when an incorporated place is only partially included in the urbanized area, the entire incorporated place would be regulated. EPA received comments asking about towns and

townships, because they were not considered to be incorporated areas according to the Census Bureau's definition. Would the whole town/township be covered or only the part of the town/township in the urbanized area? States use many different types of systems in their geographical divisions. Some towns are similar to incorporated cities and others are large areas that are more similar to counties. Some commenters thought that the urbanized area boundary was arbitrary, and if part of a town or county was covered, it all should be covered. Other commenters noted that some townships and counties encompass very large areas of which only a small portion is urbanized. Due to the great variety of situations, EPA has decided that for all geographical entities, only MS4s in the urbanized area are automatically designated. The population densities associated with the Census Bureau's designation of urbanized areas provide the basis for designation of these areas to protect water quality. This focused designation provides for consistency and allows for flexibility on the part of the MS4 and the permitting authority. In those situations where an incorporated place or a town is not all in an "urbanized area", there is a good possibility that it is served by more than one MS4. In those cases where the area is served by the same MS4, it makes sense to develop a storm water program for the whole area. Permitting authorities may also decide to designate all MS4s within a county or township, if they believe it is necessary to protect water quality.

Most operators of MS4s will not need to independently determine the status of coverage under today's rule. EPA has revised the proposed Appendices 6 and 7 to include towns and townships. Therefore, these appendices will alert most MS4s as to whether they are likely to be covered under today's rule. However, each permitting authority must make the decision as to who requires coverage. Most likely, an illustrative list of the regulated areas will be published with the general permit. If not, the operator can contact its permitting authority or the Bureau of the Census to find out if their separate storm sewer systems are within an urbanized area.

i. Urbanized Area Description. Under the Bureau of the Census definition of "urbanized area," adopted by EPA for the purposes of today's final rule, "an urbanized area (UA) comprises a place and the adjacent densely settled surrounding territory that together have a minimum population of 50,000 people." The proposal to today's rule provided the full definition and case studies to help explain the census category of "urbanized area." Appendix 2 is a simplified urbanized area illustration to help demonstrate the concept of urbanized areas in relation to today's final rule. The "urbanized area" is the shaded area that includes within its boundaries incorporated places, a portion of a Federal Indian reservation, portions of two counties, an entire town, and portions of another town. All small MS4s located in the shaded area are covered by the rule, unless and until waived by the permitting authority. Any small MS4s located outside of the shaded area are subject to potential designation by the permitting authority.

There are 405 urbanized areas in the United States that cover 2 percent of total U.S. land area and contain approximately 63 percent of the nation's population (see Appendix 3 for a listing of urbanized areas of the United States and Puerto Rico). These numbers include U.S. Territories, although Puerto Rico is the only territory to have Census-designated urbanized areas. Urbanized areas constitute the largest and most dense areas of settlement. The purpose of determining an "urbanized area" is to delineate the boundaries of development and map the actual built-up urban area. The Bureau of the Census geographers liken it to flying over an urban area and drawing a line around the boundary of the built-up area as seen from the air.

Using data from the latest decennial census, the Census Bureau applies the urbanized area definition nationwide (including U.S. Tribes and Territories) and determines which places and counties are included within each urbanized area. For each urbanized area, the Bureau provides full listings of who is included, as well as detailed maps and special CD-ROM files for use with computerized mapping systems (such as GIS). Each State's data center receives a copy of the list, and some maps, automatically. The States also have the CD–ROM files and a variety of publications available to them for reference from the Bureau of the Census. In addition, local or regional planning agencies may have urbanized area files already. New listings for urbanized areas based on the 2000 Census will be available by July/August 2001, but the more comprehensive computer files will not be available until late 2001/early 2002.

Additional designations based on subsequent census years will be governed by the Bureau of the Census' definition of an urbanized area in effect for that year. Based on historical trends, EPA expects that any area determined by the Bureau of the Census to be included within an urbanized area as of the 1990 Census will not later be excluded from the urbanized area as of the 2000 Census. However, it is important to note that even if this situation were to occur, for example, due to a possible change in the Bureau of the Census' urbanized area definition, a small MS4 that is automatically designated into the NPDES program for storm water under an urbanized area calculation for any given Census year will remain regulated regardless of the results of subsequent urbanized area calculations.

ii. Rationale for Using Urbanized Areas. EPA is using urbanized areas to automatically designate regulated small MS4s on a nationwide basis for several reasons: (1) studies and data show a high correlation between degree of development/ urbanization and adverse impacts on receiving waters due to storm water (U.S. EPA, 1983; Driver et al., 1985; Pitt, R.E. 1991. "Biological Effects of Urban Runoff Discharges." Presented at the Engineering Foundation Conference: *Urban Runoff and Receiving Systems; An Interdisciplinary Analysis of Impact, Monitoring and Management,* August 1991. Mt. Crested Butte, CO. American Society of Civil Engineers, New York. 1992.; Pitt, R.E. 1995. "Biological Effects of Urban Runoff Discharges," in *Storm water Runoff and Receiving Systems: Impact, Monitoring, and Assessment.* Lewis Publishers, New York.; Galli, J. 1990. *Thermal Impacts Associated with Urbanization and Storm water Management Best Management Practices.* Prepared for the Sediment and Storm water Administration of the Maryland Department of the Environment.; Klein, 1979), (2) the blanket coverage within the urbanized area encourages the watershed approach and addresses the problem of "donut-holes," where unregulated areas are surrounded by areas currently regulated (storm water discharges from donut hole areas present a problem due to their contributing uncontrolled adverse impacts on local waters, as well as by frustrating the attainment of water quality goals of neighboring regulated communities), (3) this approach targets present and future growth areas as a preventative measure to help ensure water quality protection, and (4) the determination of urbanized areas by the Bureau of the Census allows operators of small MS4s to quickly determine whether they are included in the NPDES storm water program as a regulated small MS4.

Urbanized areas have experienced significant growth over the past 50 years. According to EPA calculations

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based on Census data from 1980 to 1990, the national average rate of growth in the United States during that 10-year period was more than 4 percent. For the same period, the average growth within urbanized areas was 15.7 percent and the average for outside of urbanized areas was just more than 1 percent. The new development occurring in these growing areas can provide some of the best opportunities for implementing cost-effective storm water management controls.

EPA received many comments on the proposal to designate discharges based on location within urbanized areas. EPA considered numerous other approaches, several of which are discussed in the proposal to today's final rule. Several commenters wanted designation to be based on proven water quality problems rather than inclusion in an urbanized area. One commenter proposed an approach based on the CWA 303(d) listing of impaired waters and the wasteload allocation conducted under the TMDL process. (See section II.L. on the section 303(d) and TMDL process). The commenter's proposal would designate small MS4s on a case-by-case basis, covering only those discharges where receiving streams are shown to have water quality problems, particularly a failure to meet water quality standards, including designated uses. The commenter further described a non-NPDES approach where a State would require cost-effective measures based on a proportionate share under a waste load allocation, equitably allocated among all pollutant contributors. These waste load allocations would be developed with input from all stakeholders, and remedial measures would be implemented in a phased manner based on the probability of results and/or economic feasibility. The States would then periodically reassess the receiving streams to determine whether the remedial measures are working, and if not, require additional control measures using the same procedure used to establish the initial measures. What the commenter describes is almost a TMDL.

EPA considered a remedial approach based on water quality impairment and rejected it for failure to prevent almost certain degradation caused by urban storm water. EPA's main concern in opting not to take a case-by-case approach to designation was that this approach would not provide controls for storm water discharges in receiving streams until after a site-specific demonstration of adverse water quality impact. The commenter's suggestion would do nothing to prevent pollution in waters that may be meeting water quality standards, including supporting designated uses. The approach would also rely on identifying storm water management programs following comprehensive watershed plans and TMDL development. In most States, water quality assessments have traditionally been conducted for principal mainstream rivers and their major tributaries, not all surface waters. The establishment of TMDLs nationwide will take many years, and many States will conduct additional monitoring to determine water quality conditions prior to establishing TMDLs. In addition, a case-by-case approach would not address the problem of "donut holes" within urbanized areas and a lack of consistency among similarly situated municipal systems would remain commonplace. After careful consideration of all comments, EPA still believes that the approach in today's rule is the most appropriate to protect water quality. Protection includes prevention as well as remediation.

d. Municipal Designation by the Permitting Authority

Today's final rule also allows NPDES permitting authorities to designate MS4s that should be included in the storm water program as regulated small MS4s but are not located within urbanized areas. The final rule requires, at a minimum, that a set of designation criteria be applied to all small MS4s within a jurisdiction that serves a population of at least 10,000 and has a population density of at least 1,000. Appendix 7 to this preamble provides an illustrative list of places that the Agency anticipates meet this criteria. In addition, any small MS4 may be the subject of a petition to the NPDES permitting authority for designation. See Section II.G, NPDES Permitting Authority's Role for more details on the designation and petition processes. EPA believes that the approach of combining nationwide and local designation to determine municipal coverage balances the potential for significant adverse impacts on water quality with local watershed protection and planning efforts.

e. Waiving the Requirements for Small MS4s

Today's final rule includes some flexibility in the nationwide coverage of all small MS4s located in urbanized areas by providing the NPDES permitting authority with the discretion to waive the otherwise applicable requirements of the smallest MS4s that are not causing the impairment of a receiving water body. Qualifications for the waiver vary depending on whether the MS4 serves a population under 1,000 or a population between 1,000 and 10,000. Note that even if a small MS4 has requirements waived, it can subsequently be brought back into the program if circumstances change. See Section II.G, NPDES Permitting Authority's Role, for more details on this process.

3. Municipal Permit Requirements

a. Overview

i. Summary of Permitting Options. Today's rule outlines six minimum control measures that constitute the framework for a storm water discharge control program for regulated small MS4s that, when properly implemented, will reduce pollutants to the maximum extent practicable (MEP). These six minimum control measures are specified in § 122.34(b) and are discussed below in section "II.H.3.b, Program Requirements-Minimum Control Measures." All operators of regulated small MS4s are required to obtain coverage under an NPDES permit, unless the requirement is waived by the permitting authority in accordance with today's rule. Implementation of § 122.34(b) may be required either through an individual permit or, if the State or EPA makes one available to the facility, through a general permit. The process for issuing and obtaining these permits is discussed below in section "II.H.3.c, Application Requirements."

As an alternative to implementing a program that complies with the requirements of § 122.34, today's rule provides operators of regulated small MS4s with the option of applying for an individual permit under § 122.26(d). The permit application requirements in § 122.26 were originally drafted to apply to medium and large MS4s. Although EPA believes that the requirements of § 122.34 provide a regulatory option that is appropriate for most small MS4s, the operators of some small MS4s may prefer more individualized requirements. This alternative permitting option for regulated small MS4s that wish to develop their own program is discussed below in section "II.H.3.c.iii. Alternative Permit Option." The second alternative permitting option for regulated small MS4s is to become co-permittees with a medium or large MS4 regulated under § 122.26(d), as discussed below in section "II.H.3.c.v. Joint Permit Programs."

ii. Water Quality-Based Requirements. Any NPDES permit issued under today's rule must, at a minimum, require the operator to develop, implement, and

enforce a storm water management program designed to reduce the discharge of pollutants from a regulated system to the MEP, to protect water quality, and satisfy the appropriate water quality requirements of the Clean Water Act (see MEP discussion in the following section). Absent evidence to the contrary, EPA presumes that a small MS4 program that implements the six minimum measures in today's rule does not require more stringent limitations to meet water quality standards. Proper implementation of the measures will significantly improve water quality. As discussed further below, however, small MS4 permittees should modify their programs if and when available information indicates that water quality considerations warrant greater attention or prescriptiveness in specific components of the municipal program. If the program is inadequate to protect water quality, including water quality standards, then the permit will need to be modified to include any more stringent limitations necessary to protect water quality.

Regardless of the basis for the development of the effluent limitations (whether designed to implement the six minimum measures or more stringent or prescriptive limitations to protect water quality), EPA considers narrative effluent limitations requiring implementation of BMPs to be the most appropriate form of effluent limitations for MS4s. CWA section 402(p)(3)(b)(iii) expresses a preference for narrative rather than numeric effluent limits, for example, by reference to "management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants." 33 U.S.C. 1342(p)(3)(B)(iii). EPA determines that pollutants from wet weather discharges are most appropriately controlled through management measures rather than end-of-pipe numeric effluent limitations. As explained in the Interim Permitting Policy for Water Quality-Based Effluent Limitations in Storm Water Permits, issued on August 1, 1996 [61 FR 43761 (November 26, 1996), EPA believes that the currently available methodology for derivation of numeric water quality-based effluent limitations is significantly complicated when applied to wet weather discharges from MS4s (compared to continuous or periodic batch discharges from most other types of discharge). Wet weather discharges from MS4s introduce a high degree of variability in the inputs to the models currently available for derivation of water quality based effluent limitations, including assumptions about instream and discharge flow rates, as well as effluent characterization. In addition, EPA anticipates that determining compliance with any such numeric limitations may be confounded by practical limitations in sample collection.

In the first two to three rounds of permit issuance, EPA envisions that a BMP-based storm water management program that implements the six minimum measures will be the extent of the NPDES permit requirements for the large majority of regulated small MS4s. Because the six measures represent a significant level of control if properly implemented, EPA anticipates that a permit for a regulated small MS4 operator implementing BMPs to satisfy the six minimum control measures will be sufficiently stringent to protect water quality, including water quality standards, so that additional, more stringent and/or more prescriptive water quality based effluent limitations will be unnecessary.

If a small MS4 operator implements the six minimum control measures in § 122.34(b) and the discharges are determined to cause or contribute to non-attainment of an applicable water quality standard, the operator needs to expand or better tailor its BMPs within the scope of the six minimum control measures. EPA envisions that this process will occur during the first two to three permit terms. After that period, EPA will revisit today's regulations for the municipal separate storm sewer program.

If the permitting authority (rather than the regulated small MS4 operator) needs to impose additional or more specific measures to protect water quality, then that action will most likely be the result of an assessment based on a TMDL or equivalent analysis that determines sources and allocations of pollutant(s) of concern. EPA believes that the small MS4's additional requirements, if any, should be guided by its equitable share based on a variety of considerations, such as cost effectiveness, proportionate contribution of pollutants, and ability to reasonably achieve wasteload reductions. Narrative effluent limitations in the form of BMPs may still be the best means of achieving those reductions.

See Section II.L, Water Quality Issues, for further discussion of this approach to permitting, consistent with EPA's interim permitting guidance. Pursuant to CWA section 510, States implementing their own NPDES programs may develop more stringent or more prescriptive requirements than those in today's rule.

EPA's interpretation of CWA section 402(p)(3)(B)(iii) was recently reviewed by the Ninth Circuit in *Defenders of Wildlife, et al* v. *Browner*, No. 98–71080 (September 15, 1999). The Court upheld the Agency's action in issuing five MS4 permits that included water quality-based effluent limitations. The Court did, however, disagree with EPA's interpretation of the relationship between CWA sections 301 and 402(p). The Court reasoned that MS4s are not compelled by section 301(b)(1)(C) to meet all State water quality standards, but rather that the Administrator or the State may rely on section 402(p)(3)(B)(iii) to require such controls. Accordingly, the *Defenders of Wildlife* decision is consistent with the Agency's 1996 "Interim Permitting Policy for Water Quality-Based Effluent Limitations in Storm Water Permits."

As noted, the 1996 Policy describes how permits would implement an iterative process using BMPs, assessment, and refocused BMPs, leading toward attainment of water quality standards. The ultimate goal of the iteration would be for water bodies to support their designated uses. EPA believes this iterative approach is consistent with and implements section 301(b)(1)(C), notwithstanding the Ninth Circuit's interpretation. As an alternative to basing these water quality-based requirements on section 301(b)(1)(C), however, EPA also believes the iterative approach toward attainment of water quality standards represents a reasonable interpretation of CWA section 402(p)(3)(B)(iii). For this reason, today's rule specifies that the "compliance target" for the design and implementation of municipal storm water control programs is "to reduce pollutants to the maximum extent practicable (MEP), to protect water quality, and to satisfy the appropriate water quality requirements of the CWA." The first component, reductions to the MEP, would be realized through implementation of the six minimum measures. The second component, to protect water quality, reflects the overall design objective for municipal programs based on CWA section 402(p)(6). The third component, to implement other applicable water quality requirements of the CWA, recognizes the Agency's specific determination under CWA section 402(p)(3)(B)(iii) of the need to achieve reasonable further progress toward attainment of water quality standards according to the iterative BMP process, as well as the determination that State or EPA officials who establish TMDLs could allocate waste loads to

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MS4s, as they would to other point sources.

EPA does not presume that water quality will be protected if a small MS4 elects not to implement all of the six minimum measures and instead applies for alternative permit limits under § 122.26(d). Operators of such small MS4s that apply for alternative permit limits under § 122.26(d) must supply additional information through individual permit applications so that the permit writer can determine whether the proposed program reduces pollutants to the MEP and whether any other provisions are appropriate to protect water quality and satisfy the appropriate water quality requirements of the Clean Water Act.

iii. *Maximum Extent Practicable.* Maximum extent practicable (MEP) is the statutory standard that establishes the level of pollutant reductions that operators of regulated MS4s must achieve. The CWA requires that NPDES permits for discharges from MS4s "shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods." CWA Section 402(p)(3)(B)(iii). This section also calls for "such other provisions as the [EPA] Administrator or the State determines appropriate for the control of such pollutants." EPA interprets this standard to apply to all MS4s, including both existing regulated (large and medium) MS4s, as well as the small MS4s regulated under today's rule.

For regulated small MS4s under today's rule, authorization to discharge may be under either a general permit or individual permit, but EPA anticipates and expects that general permits will be the most common permit mechanism. The general permit will explain the steps necessary to obtain permit authorization. Compliance with the conditions of the general permit and the series of steps associated with identification and implementation of the minimum control measures will satisfy the MEP standard. Implementation of the MEP standard under today's rule will typically require the permittee to develop and implement appropriate BMPs to satisfy each of the required six minimum control measures.

In issuing the general permit, the NPDES permitting authority will establish requirements for each of the minimum control measures. Permits typically will require small MS4 permittees to identify in their NOI the BMPs to be performed and to develop the measurable goals by which implementation of the BMPs can be assessed. Upon receipt of the NOI from a small MS4 operator, the NPDES permitting authority will have the opportunity to review the NOI to verify that the identified BMPs and measurable goals are consistent with the requirement to reduce pollutants under the MEP standard, to protect water quality, and to satisfy the appropriate water quality requirements of the Clean Water Act. If necessary, the NPDES permitting authority may ask the permittee to revise their mix of BMPs, for example, to better reflect the MEP pollution reduction requirement. Where the NPDES permit is not written to implement the minimum control measures specified under § 122.34(b), for example in the case of an individual permit under § 122.33(b)(2)(ii), the MEP standard will be applied based on the best professional judgment of the permit writer.

Commenters argued that MEP is, as yet, an undefined term and that EPA needs to further clarify the MEP standards by providing a regulatory definition that includes recognition of cost considerations and technical feasibility. Commenters argued that, without a definition, the regulatory community is not adequately on notice regarding the standard with which they need to comply. EPA disagrees that affected MS4 permittees will lack notice of the applicable standard. The framework for the small MS4 permits described in this notice provides EPA's interpretation of the standard and how it should be applied.

EPA has intentionally not provided a precise definition of MEP to allow maximum flexibility in MS4 permitting. MS4s need the flexibility to optimize reductions in storm water pollutants on a location-by-location basis. EPA envisions that this evaluative process will consider such factors as conditions of receiving waters, specific local concerns, and other aspects included in a comprehensive watershed plan. Other factors may include MS4 size, climate, implementation schedules, current ability to finance the program, beneficial uses of receiving water, hydrology, geology, and capacity to perform operation and maintenance.

The pollutant reductions that represent MEP may be different for each small MS4, given the unique local hydrologic and geologic concerns that may exist and the differing possible pollutant control strategies. Therefore, each permittee will determine appropriate BMPs to satisfy each of the six minimum control measures through an evaluative process. Permit writers may evaluate small MS4 operator's proposed storm water management controls to determine whether reduction of pollutants to the MEP can be achieved with the identified BMPs.

EPA envisions application of the MEP standard as an iterative process. MEP should continually adapt to current conditions and BMP effectiveness and should strive to attain water quality standards. Successive iterations of the mix of BMPs and measurable goals will be driven by the objective of assuring maintenance of water quality standards. If, after implementing the six minimum control measures there is still water quality impairment associated with discharges from the MS4, after successive permit terms the permittee will need to expand or better tailor its BMPs within the scope of the six minimum control measures for each subsequent permit. EPA envisions that this process may take two to three permit terms.

One commenter observed that MEP is not static and that if the six minimum control measures are not achieving the necessary water quality improvements, then an MS4 should be expected to revise and, if necessary, expand its program. This concept, it is argued, must be clearly part of the definition of MEP and thus incorporated into the binding and operative aspects of the rule. As is explained above, EPA believes that it is. The iterative process described above is intended to be sensitive to water quality concerns. EPA believes that today's rule contains provisions to implement an approach that is consistent with this comment.

b. Program Requirements'Minimum Control Measures

A regulated small MS4 operator must develop and implement a storm water management program designed to reduce the discharge of pollutants from their MS4 to protect water quality. The storm water management program must include the following six minimum measures.

i. Public Education and Outreach on Storm Water Impacts. Under today's final rule, operators of small MS4s must implement a public education program to distribute educational materials to the community or conduct equivalent outreach activities about the impacts of storm water discharges on water bodies and the steps to reduce storm water pollution. The public education program should inform individuals and households about the problem and the steps they can take to reduce or prevent storm water pollution.

EPA believes that as the public gains a greater understanding of the storm water program, the MS4 is likely to gain

more support for the program (including funding initiatives). In addition, compliance with the program will probably be greater if the public understands the personal responsibilities expected of them. Well-informed citizens can act as formal or informal educators to further disseminate information and gather support for the program, thus easing the burden on the municipalities to perform all educational activities.

MS4s are encouraged to enter into partnerships with their States in fulfilling the public education requirement. It may be more cost-effective to utilize a State education program instead of numerous MS4s developing their own programs. MS4 operators are also encouraged to work with other organizations (e.g., environmental, nonprofit and industry organizations) that might be able to assist in fulfilling this requirement.

The public education program should be tailored, using a mix of locally appropriate strategies, to target specific audiences and communities (particularly minority and disadvantaged communities). Examples of strategies include distributing brochures or fact sheets, sponsoring speaking engagements before community groups, providing public service announcements, implementing educational programs targeted at school age children, and conducting community-based projects such as storm drain stenciling, and watershed and beach cleanups. Operators of MS4s may use storm water educational information provided by the State, Tribe, EPA, or environmental, public interest, trade organizations, or other MS4s. Examples of successful public education efforts concerning polluted runoff can be found in many State nonpoint source pollution control programs under CWA section 319.

The public education program should inform individuals and households about steps they can take to reduce storm water pollution, such as ensuring proper septic system maintenance, ensuring the use and disposal of landscape and garden chemicals including fertilizers and pesticides, protecting and restoring riparian vegetation, and properly disposing of used motor oil or household hazardous wastes. Additionally, the program could inform individuals and groups on how to become involved in local stream and beach restoration activities as well as activities coordinated by youth service and conservation corps and other citizen groups. Finally, materials or outreach programs should be directed toward targeted groups of commercial, industrial, and institutional entities likely to have significant storm water impacts. For example, MS4 operators should provide information to restaurants on the impact of grease clogging storm drains and to auto garages on the impacts of used oil discharges.

EPA received comments from representatives of State DOTs and U.S. Department of Defense (DOD) installations seeking exemption from the public education requirement. While today's rule does not exempt DOTs and military bases from the user education requirement, the Agency believes the flexibility inherent in the Rule addresses many of the concerns expressed by these commenters.

Certain DOT representatives commented that if their agencies were not exempt from the user education measure's requirements, they should at least be allowed to count DOT employee education as an adequate substitute. EPA supports the use of existing materials and programs, granted such materials and programs meet the rule's requirement that the MS4 user community (*i.e.*, the public) is also educated concerning the impacts of storm water discharges on water bodies and the steps to reduce storm water pollution.

Finally, certain DOD representatives requested that "public," as applied to their installations, be defined as the resident and employee populations within the fence line of the facility. EPA agrees that the education effort should be directed toward those individuals who frequent the federally owned land (*i.e.*, residents and individuals who come there to work and use the MS4 facilities).

EPA also received a number of comments from municipalities stating that education would be more thorough and cost effective if accomplished by EPA on the national level. EPA believes that a collaborative State and local approach, in conjunction with significant EPA technical support, will best meet the goal of targeting, and reaching, specific local audiences. EPA technical support will include a tool box which will contain fact sheets, guidance documents, an information clearinghouse, and training and outreach efforts.

Finally, EPA received comments expressing concern that the public education program simply encourages the distribution of printed material. EPA is sensitive to this concern. Upon evaluation, the Agency made changes to the proposal's language for today's rule. The language has been changed to reflect EPA's belief that a successful program is one that includes a variety of strategies locally designed to reach specific audiences.

ii. Public Involvement/Participation. Public involvement is an integral part of the small MS4 storm water program. Accordingly, today's final rule requires that the municipal storm water management program must comply with applicable State and local public notice requirements. Section 122.34(b)(2) recommends a public participation process with efforts to reach out and engage all economic and ethnic groups. EPA believes there are two important reasons why the public should be allowed and encouraged to provide valuable input and assistance to the MS4's program.

First, early and frequent public involvement can shorten implementation schedules and broaden public support for a program. Opportunities for members of the public to participate in program development and implementation could include serving as citizen representatives on a local storm water management panel, attending public hearings, working as citizen volunteers to educate other individuals about the program, assisting in program coordination with other pre-existing programs, or participating in volunteer monitoring efforts. Moreover, members of the public may be less likely to raise legal challenges to a MS4's storm water program if they have been involved in the decision making process and program development and, therefore, internalize personal responsibility for the program themselves.

Second, public participation is likely to ensure a more successful storm water program by providing valuable expertise and a conduit to other programs and governments. This is particularly important if the MS4's storm water program is to be implemented on a watershed basis. Interested stakeholders may offer to volunteer in the implementation of all aspects of the program, thus conserving limited municipal resources.

EPA recognizes that there are a number of challenges associated with public involvement. One challenge is in engaging people in the public meeting and program design process. Another challenge is addressing conflicting viewpoints. Nevertheless, EPA strongly believes that these challenges can be addressed by use of an aggressive and inclusive program. Section II.K. provides further discussion on public involvement.

A number of municipalities sought clarification from EPA concerning what the public participation program must

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actually include. In response, the actual requirements are minimal, but the Agency's *recommendations* are more comprehensive. The public participation program must only comply with applicable State and local public notice requirements. The remainder of the preamble, as well as the Explanatory Note accompanying the regulatory text, provide guidance to the MS4s concerning what elements a successful and inclusive program should include. EPA will provide technical support as part of the tool box (*i.e.,* providing model public involvement programs, conducting public workshops, *etc.*) to assist MS4 operators meet the intent of this measure.

Finally, the Agency encourages MS4s to seek public participation prior to submitting an NOI. For example, public participation at this stage will allow the MS4 to involve the public in developing the BMPs and measurable goals for their NOI.

iii. Illicit Discharge Detection and Elimination. Discharges from small MS4s often include wastes and wastewater from non-storm water "illicit" discharges. Illicit discharge is defined at 40 CFR 122.26(b)(2) as any discharge to a municipal separate storm sewer that is not composed entirely of storm water, except discharges pursuant to an NPDES permit and discharges resulting from fire fighting activities. As detailed below, other sources of non-storm water, that would otherwise be considered illicit discharges, do not need to be addressed unless the operator of the MS4 identifies one or more of them as a significant source of pollutants into the system. EPA's Nationwide Urban Runoff Program (NURP) indicated that many storm water outfalls still discharge during substantial dry periods. Pollutant levels in these dry weather flows were shown to be high enough to significantly degrade receiving water quality. Results from a 1987 study conducted in Sacramento, California, revealed that slightly less than one-half of the water discharged from a municipal separate storm sewer system was not directly attributable to precipitation runoff (U.S. Environmental Protection Agency, Office of Research and Development. 1993. *Investigation of Inappropriate Pollutant Entries Into Storm Drainage Systems—A User's Guide.* Washington, DC EPA 600/R–92/238.) A significant portion of these dry weather flows results from illicit and/or inappropriate discharges and connections to the municipal separate storm sewer system. Illicit discharges enter the system through either direct connections (*e.g.,* wastewater piping either mistakenly or deliberately connected to the storm drains) or indirect connections (*e.g.,* infiltration into the storm drain system or spills collected by drain inlets).

Under the existing NPDES program for storm water, permit applications for large and medium MS4s are to include a program description for effective prohibition against non-storm water discharges into their storm sewers (see 40 CFR 122.26 (d)(1)(v)(B) and (d)(1)(iv)(B)). Further, EPA believes that in implementing municipal storm water management plans under these permits, large and medium MS4 operators generally found their illicit discharge detection and elimination programs to be cost-effective. Properly implemented programs also significantly improved water quality.

In today's rule, any NPDES permit issued to an operator of a regulated small MS4 must, at a minimum, require the operator to develop, implement and enforce an illicit discharge detection and elimination program. Inclusion of this measure for regulated small MS4s is consistent with the "effective prohibition" requirement for large and medium MS4s. Under today's rule, the NPDES permit will require the operator of a regulated small MS4 to: (1) Develop (if not already completed) a storm sewer system map showing the location of all outfalls, and names and location of all waters of the United States that receive discharges from those outfalls; (2) to the extent allowable under State, Tribal, or local law, effectively prohibit through ordinance, or other regulatory mechanism, illicit discharges into the separate storm sewer system and implement appropriate enforcement procedures and actions as needed; (3) develop and implement a plan to detect and address illicit discharges, including illegal dumping, to the system; and (4) inform public employees, businesses, and the general public of hazards associated with illegal discharges and improper disposal of waste.

The illicit discharge and elimination program need only address the following categories of non-storm water discharges if the operator of the small MS4 identifies them as significant contributors of pollutants to its small MS4: water line flushing, landscape irrigation, diverted stream flows, rising ground waters, uncontaminated ground water infiltration (as defined at 40 CFR 35.2005(20)), uncontaminated pumped ground water, discharges from potable water sources, foundation drains, air conditioning condensation, irrigation water, springs, water from crawl space pumps, footing drains, lawn watering, individual residential car washing, flows from riparian habitats and wetlands, dechlorinated swimming pool discharges, and street wash water (discharges or flows from fire fighting activities are excluded from the definition of illicit discharge and only need to be addressed where they are identified as significant sources of pollutants to waters of the United States). If the operator of the MS4 identifies one or more of these categories of sources to be a significant contributor of pollutants to the system, it could require specific controls for that category of discharge or prohibit the discharges completely.

Several comments were received on the mapping requirements of the proposal. Most comments said that more flexibility should be given to the MS4s to determine their mapping needs, and that resources could be better spent in addressing problems once the illicit discharges are detected. EPA reviewed the mapping requirements in the proposed rule and agrees that some of the information is not necessary in order to begin an illicit discharge detection and elimination program. Today's rule requires a map or set of maps that show the locations of all outfalls and names and locations of receiving waters. Knowing the locations of outfalls and receiving waters are necessary to be able to conduct dry weather field screening for non-storm water flows and to respond to illicit discharge reports from the public. EPA recommends that the operator collect any existing information on outfall locations (*e.g.,* review city records, drainage maps, storm drain maps), and then conduct field surveys to verify the locations. It will probably be necessary to "walk" (*i.e.* wade small receiving waters or use a boat for larger receiving waters) the streambanks and shorelines, and it may take more than one trip to locate all outfalls. A coding system should be used to mark and identify each outfall. MS4 operators have the flexibility to determine the type (*e.g.* topographic, GIS, hand or computer drafted) and size of maps which best meet their needs. The map scale should be such that the outfalls can be accurately located. Once an illicit discharge is detected at an outfall, it may be necessary to map that portion of the storm sewer system leading to the outfall in order to locate the source of the discharge.

Several comments requested clarification of the requirement to develop and implement a plan to detect and eliminate illicit discharges. EPA recommends that plans include procedures for the following: locating priority areas; tracing the source of an illicit discharge; removing the source of the discharge; and program evaluation

and assessment. EPA recommends that MS4 operators identify priority areas (*i.e.*, problems areas) for more detailed screening of their system based on higher likelihood of illicit connections (*e.g.*, areas with older sanitary sewer lines), or by conducting ambient sampling to locate impacted reaches. Once priority areas are identified, EPA recommends visually screening outfalls during dry weather and conducting field tests, where flow is occurring, of selected chemical parameters as indicators of the discharge source. EPA's manual for investigation of inappropriate pollutant entries into the storm drainage system (EPA, 1993) suggests the following parameter list: specific conductivity, fluoride and/or hardness concentration, ammonia and/or potassium concentration, surfactant and/or fluorescence concentration, chlorine concentration, pH and other chemicals indicative of industrial sources. The manual explains why each parameter is a good indicator and how the information can be used to determine the type of source flow. The Agency is not recommending that fluoride and chlorine, generally used to locate potable water discharges, be addressed under this program, therefore a short list of parameters may include conductivity, ammonia, surfactant and pH. Some MS4s have found it useful to measure for fecal coliform or E. coli in their testing program. Observations of physical characteristics of the discharge are also helpful such as flow rate, temperature, odor, color, turbidity, floatable matter, deposits and stains, and vegetation.

The implementation plan should also include procedures for tracing the source of an illicit discharge. Once an illicit discharge is detected and field tests provide source characteristics, the next step is to determine the actual location of the source. Techniques for tracing the discharge to its place of origin may include: following the flow up the storm drainage system via observations and/or chemical testing in manholes or in open channels; televising storm sewers; using infrared and thermal photography; conducting smoke or dye tests.

The implementation plan should also include procedures for removing the source of the illicit discharge. The first step may be to notify the property owner and specify a length of time for eliminating the discharge. Additional notifications and escalating legal actions should also be described in this part of the plan.

Finally, the implementation plan should include procedures for program evaluation and assessment. Procedures could include documentation of actions taken to locate and eliminate illicit discharges such as: number of outfalls screened, complaints received and corrected, feet of storm sewers televised, numbers of discharges and quantities of flow eliminated, number of dye or smoke tests conducted. Appropriate records of such actions should be kept and should be submitted as part of the annual reports for the first permit term, as specified by the permitting authority (reports only need to be submitted in years 2 and 4 in later permits). For more on reporting requirements, see § 122.34(g).

EPA received comments regarding an MS4's legal authority beyond its jurisdictional boundaries to inspect or take enforcement against illicit discharges. EPA recognizes that illicit flows may originate in one jurisdiction and cross into one or more jurisdictions before being discharged at an outfall. In such instances, EPA expects the MS4 that detects the illicit flow to trace it to the point where it leaves their jurisdiction and notify the adjoining MS4 of the flow, and any other physical or chemical information. The adjoining MS4 should then trace it to the source or to the location where it enters their jurisdiction. The process of notifying the adjoining MS4 should continue until the source is located and eliminated. In addition, because any non-storm water discharge to waters of the U.S. through an MS4 is subject to the prohibition against unpermitted discharges pursuant to CWA section 301 (a), remedies are available under the federal enforcement provisions of CWA sections 309 and 505.

EPA requested and received comments regarding the prohibition and enforcement provision for this minimum measure. Commenters specifically questioned the proposal that the operator only has to implement the appropriate prohibition and enforcement procedures "to the extent allowable under State or Tribal law." They raised concerns that by qualifying prohibition and enforcement procedures in this manner, the operator could altogether ignore this minimum measure where affirmative legal authority did not exist. Comments suggested that EPA require States to grant authority to those municipalities where it did not exist. Other comments, however, stated that municipalities cannot exercise legal authority not granted to them under State law, which varies considerably from one State to another. EPA has no intention of directing State legislatures on how to allocate authority and responsibility under State law. As noted above, there is at least one remedy (the federal CWA) to control non-storm water discharges through MS4s. If State law prevents political subdivisions from controlling discharges through storm sewers, EPA anticipates common sense will prevail to provide those MS4 operators with the ability to meet the requirements applicable for their discharges.

One comment reinforced the importance of public information and education to the success of this measure. EPA agrees and suggests that MS4 operators consider a variety of ways to inform and educate the public which could include storm drain stenciling; a program to promote, publicize, and facilitate public reporting of illicit connections or discharges; and distribution of visual and/or printed outreach materials. Recycling and other public outreach programs could be developed to address potential sources of illicit discharges, including used motor oil, antifreeze, pesticides, herbicides, and fertilizers.

EPA received comments that State DOT's lack authority to implement this measure. EPA believes that most DOTs can implement most parts of this measure. If a DOT does not have the necessary legal authority to implement any part of this measure, EPA encourages them to coordinate their storm water management efforts with the surrounding MS4s and other State agencies. Many DOTs that are regulated under Phase I of this program are co-permittees with the local regulated MS4. Under today's rule, DOTs can use any of the options of § 122.35 to share their storm water management responsibilities.

EPA received comments requesting clarification of various terms such as "outfall" and "illicit discharge." One comment asked EPA to reinforce the point that a "ditch" could be considered an outfall. The term "outfall" is defined at 40 CFR 122.26(b)(9) as "a point source at the point where a municipal separate storm sewer discharges to waters of the United States * * *". The term municipal separate storm sewer is defined at 40 CFR § 122.26(b)(8) as "a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains) * * *". Following the logic of these definitions, a "ditch" may be part of the municipal separate storm sewer, and at the point where the ditch discharges to waters of the United States, it would be an outfall. As with any determination about jurisdictional provisions of the CWA, however, final decisions require case specific evaluations of fact.

One commenter specifically requested clarification on the relationship between the term "illicit discharge" and non-storm water discharges from fire fighting. The comment suggested that it would be impractical to attempt to determine whether the flow from a specific fire (*i.e.*, during a fire) is a significant source of pollution. EPA intends that MS4s will address all allowable non-storm water flows categorically rather than individually. If an MS4 is concerned that flows from fire fighting are, as a category, contributing substantial amounts of pollutants to their system, they could develop a program to address those flows prospectively. The program may include an analysis of the flow from several sources, steps to minimize the pollutant contribution, and a plan to work with the sources of the discharge to minimize any adverse impact on water quality. During the development of such a program, the MS4 may determine that only certain types of flows within a particular category are a concern, for example, fire fighting flows at industrial sites where large quantities of chemicals are present. In this example, a review of existing procedures with the fire department and/or hazardous materials team may reveal weaknesses or strengths previously unknown to the MS4 operator.

EPA received comments requesting modifications to the rule to include on-site sewage disposal systems (i.e., septic systems) in the scope of the illicit discharge program. On-site sewage disposal systems that flow into storm drainage systems are within the definition of illicit discharge as defined by the regulations. Where they are found to be the source of an illicit discharge, they need to be eliminated similar to any other illicit discharge source. Today's rule was not modified to include discharges from on-site sewage disposal systems specifically because those sources are already within the scope of the existing definition of illicit discharge.

iv. Construction Site Storm Water Runoff Control. Over a short period of time, storm water runoff from construction site activity can contribute more pollutants, including sediment, to a receiving stream than had been deposited over several decades (see section I.B.3). Storm water runoff from construction sites can include pollutants other than sediment, such as phosphorus and nitrogen, pesticides, petroleum derivatives, construction chemicals, and solid wastes that may become mobilized when land surfaces are disturbed. Generally, properly implemented and enforced construction site ordinances effectively reduce these pollutants. In many areas, however, the effectiveness of ordinances in reducing pollutants is limited due to inadequate enforcement or incomplete compliance with such local ordinances by construction site operators (Paterson, R.G. 1994. "Construction Practices: The Good, the Bad, and the Ugly." *Watershed Protection Techniques* 1(2)).

Today's rule requires operators of regulated small MS4s to develop, implement, and enforce a pollutant control program to reduce pollutants in any storm water runoff from construction activities that result in land disturbance of 1 or more acres (see § 122.34(b)(4)). Construction activity on sites disturbing less than one acre must be included in the program if the construction activity is part of a larger common plan of development or sale that would disturb one acre or more.

The construction runoff control program of the regulated small MS4 must include an ordinance or other regulatory mechanism to require erosion and sediment controls to the extent practicable and allowable under State, Tribal or local law. The program also must include sanctions to ensure compliance (for example, non-monetary penalties, fines, bonding requirements, and/or permit denials for non-compliance). The program must also include, at a minimum: requirements for construction site operators to implement appropriate erosion and sediment control BMPS, such as silt fences, temporary detention ponds and diversions; procedures for site plan review by the small MS4 which incorporate consideration of potential water quality impacts; requirements to control other waste such as discarded building materials, concrete truck washout, chemicals, litter, and sanitary waste at the construction site that may adversely impact water quality; procedures for receipt and consideration of information submitted by the public to the MS4; and procedures for site inspection and enforcement of control measures by the small MS4.

Today's rule provides flexibility for regulated small MS4s by allowing them to exclude from their construction pollutant control program runoff from those construction sites for which the NPDES permitting authority has waived NPDES storm water small construction permit requirements. For example, if the NPDES permitting authority waives permit coverage for storm water discharges from construction sites less than 5 acres in areas where the rainfall erosivity factor is less than 5, then the regulated small MS4 does not have to include these sites in its storm water management program. Even if requirements for a discharge from a given construction site are waived by the NPDES permitting authority, however, the regulated small MS4 may still chose to control those discharges under the MS4's construction pollutant control program, particularly where such discharges may cause siltation problems in storm sewers. See Section II.I.1.b for more information on construction waivers by the permitting authority.

Some commenters suggested that the proposed construction minimum measure requirements went beyond the permit application requirements concerning construction for medium and large MS4s. In response, EPA has made changes to the proposed measure so that it more closely resembles the MS4 permit application requirements in existing regulations. For example, as described below, the Agency revised the proposed requirements for "pre-construction review of site management plans" to require "procedures for site plan review."

One commenter expressed concerns that addressing runoff from construction sites within urbanized areas (through the small MS4 program) differently from construction sites outside urbanized areas (which will not be covered by the small MS4 program) will encourage urban sprawl. Today's rule, together with the existing requirements, requires all construction greater than or equal to 1 acre, unless waived, to be covered by an NPDES permit whether it is located inside or outside of an urbanized area (see § 122.26(b)(15)). Today's rule does not require small MS4s to control runoff from construction sites more stringently or prescriptively than is required for construction site runoff outside urbanized areas. Therefore, today's rule imposes no substantively different onsite controls on runoff of storm water from construction sites in urbanized areas than from construction sites outside of urbanized areas.

One commenter recommended that the small MS4 construction site storm water runoff control program address all storm water runoff from construction sites, not just the runoff into the MS4. The commenter also believed that MS4s should provide clear, objective standards for all construction sites. EPA agrees. Because today's rule only regulates discharges from the MS4, the construction pollutant control measure only requires small MS4 operators to control runoff into its system. As a practical matter, however, EPA anticipates that MS4 operators will find that regulation of all construction site

runoff, whether they runoff into the MS4 or not, will prove to be the most simple and efficient program. The Agency may provide more specific criteria for construction site BMPs in the forthcoming rule being developed under CWA section 402(m). See section II.D.1 of today's rule.

One commenter stated that there is no need for penalties at the local level by the small MS4 because the CWA already imposes sufficient penalties to ensure compliance. EPA disagrees and believes that enforcement and compliance at the local level is both necessary and preferable. Examples of sanctions, some not available under the CWA, include non-monetary penalties, monetary fines, bonding requirements, and denial of future or other local permits.

One commenter recommended that EPA should not include the requirement to control pollutants other than sediment from construction sites in this measure. EPA disagrees with this comment. The requirement is to control waste that "may cause adverse impacts on water quality." Such wastes may include discarded building materials, concrete truck washout, chemicals, pesticides, herbicides, litter, and sanitary waste. These wastes, when exposed to and mobilized by storm water, can contribute to water quality impairment.

The proposed rule required "procedures for pre-construction review of site management plans." EPA requested comment on expanding this provision to require both review and approval of construction site storm water plans. Many commenters expressed the concern that review and approval of site plans is not only costly and time intensive, but may unnecessarily delay construction projects and unduly burden staff who administer the local program. In addition, some commenters expressed confusion whether EPA proposed pre-construction review for all site management plans or only higher priority sites. To address these comments, and be consistent with the permit application requirements for larger MS4s, EPA changed "procedures for pre-construction review of site management plans" to "procedures for site plan review." Today's rule requires the small MS4 to develop procedures for site plan review so as to incorporate consideration of adverse potential water quality impacts. Procedures should include review of site erosion and sediment control plans, preferably before construction activity begins on a site. The objective is for the small MS4 operator and the construction site operator to address storm water runoff from construction activity early in the project design process so that potential consequences to the aquatic environment can be assessed and adverse water quality impacts can be minimized or eliminated.

One commenter requested that EPA delete the requirement for "procedures for receipt and consideration of information submitted by the public" because it went beyond existing storm water requirements. Another commenter stated that establishing a separate process to respond to public inquiries on a project is a burden to small communities, especially if the project has gone through an environmental review. One commenter requested clarification of this provision. EPA has retained this requirement in today's final rule to require some formality in the process for addressing public inquiries regarding storm water runoff from construction activities. EPA does not intend that small MS4s develop a separate, burdensome process to respond to every public inquiry. A small MS4 could, for example, simply log public complaints on existing storm water runoff problems from construction sites and pass that information on to local inspectors. The inspectors could then investigate complaints based on the severity of the violation and/or priority area.

One commenter believed that the proposed requirement of "regular inspections during construction" would require every construction project to be inspected more than once by the small MS4 during the term of a construction project. EPA has deleted the reference to "regular inspections." Instead, the small MS4 will be required to "develop procedures for site inspection and enforcement of control measures." Procedures could include steps to identify priority sites for inspection and enforcement based on the nature and extent of the construction activity, topography, and the characteristics of soils and receiving water quality.

In order to avoid duplication of small MS4 construction requirements with NPDES construction permit requirements, today's rule adds § 122.44(s) to recognize that the NPDES permitting authority can incorporate qualifying State, Tribal, or local erosion and sediment control requirements in NPDES permits for construction site discharges. For example, a construction site operator who complies with MS4 construction pollutant control programs that are referenced in the NPDES construction permit would satisfy the requirements of the NPDES permit. See section II.I.1.d for more information on incorporating qualifying programs by reference into NPDES construction permits. This provision has no impact on, or direct relation to, the small MS4 operator's responsibilities under the construction site storm water runoff control minimum measure. Conversely, under § 122.35(b), the permitting authority may recognize in the MS4's permit that another governmental entity, or the permitting authority itself, is responsible for implementing one or more of the minimum measures (including construction site storm water runoff control), and not include this measure in the small MS4's permit. In this case, the other governmental entity's program must satisfy all of the requirements of the omitted measure.

v. Post-Construction Storm Water Management in New Development and Redevelopment. The NURP study and more recent investigations indicate that prior planning and designing for the minimization of pollutants in storm water discharges is the most cost-effective approach to storm water quality management. Reducing pollutant concentrations in storm water after the discharge enters a storm sewer system is often more expensive and less efficient than preventing or reducing pollutants at the source. Increased human activity associated with development often results in increased pollutant loading from storm water discharges. If potential adverse water quality impacts are considered from the beginning stages of a project, new development and redevelopment provides more opportunities for water quality protection. For example, minimization of impervious areas, maintenance or restoration of natural infiltration, wetland protection, use of vegetated drainage ways, and use of riparian buffers have been shown to reduce pollutant loadings in storm water runoff from developed areas. EPA encourages operators of regulated small MS4s to identify specific problem areas within their jurisdictions and initiate innovative solutions and designs to focus attention on those areas through local planning.

In today's rule at § 122.34(b)(5), NPDES permits issued to an operator of a regulated small MS4 will require the operator to develop, implement, and enforce a program to address storm water runoff from new development and redevelopment projects that result in land disturbance of greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale, that discharge into the MS4. Specifically, the NPDES permit will require the operator of a regulated small MS4 to: (1) Develop and implement

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strategies which include a combination of structural and/or non-structural best management practices (BMPs) appropriate for the community; (2) use an ordinance, or other regulatory mechanism to address post-construction runoff from new development and redevelopment projects to the extent allowable under State, Tribal or local law; (3) ensure adequate long-term operation and maintenance of BMPs; and (4) ensure that controls are in place that would minimize water quality impacts. EPA intends the term "redevelopment" to refer to alterations of a property that change the "footprint" of a site or building in such a way that results in the disturbance of equal to or greater than 1 acre of land. The term is not intended to include such activities as exterior remodeling, which would not be expected to cause adverse storm water quality impacts and offer no new opportunity for storm water controls.

EPA received comments requesting guidance and clarification of the rule requirements. The scope of the comments ranged from general requests for more details on how MS4 operators should accomplish the four requirements listed above, to specific requests for information regarding transfer of ownership for structural controls, as well as ongoing responsibility for operation and maintenance. By the term "combination" of BMPs, EPA intends a combination of structural and/or non-structural BMPs. For this requirement, the term "combination" is meant to emphasize that multiple BMPs should be considered and adopted for use in the community. A single BMP generally cannot significantly reduce pollutant loads because pollutants come from many sources within a community. The BMPs chosen should: (1) Be appropriate for the local community; (2) minimize water quality impacts; and (3) attempt to maintain pre-development runoff conditions. In choosing appropriate BMPs, EPA encourages small MS4 operators to participate in locally-based watershed planning efforts which attempt to involve a diverse group of stakeholders. Each new development and redevelopment project should have a BMP component. If an approach is chosen that primarily focuses on regional or non-structural BMPs, however, then the BMPs may be located away from the actual development site (*e.g.*, a regional water quality pond).

Non-structural BMPs are preventative actions that involve management and source controls such as: (1) Policies and ordinances that provide requirements and standards to direct growth to identified areas, protect sensitive areas such as wetlands and riparian areas, maintain and/or increase open space (including a dedicated funding source for open space acquisition), provide buffers along sensitive water bodies, minimize impervious surfaces, and minimize disturbance of soils and vegetation; (2) policies or ordinances that encourage infill development in higher density urban areas, and areas with existing storm sewer infrastructure; (3) education programs for developers and the public about project designs that minimize water quality impacts; and (4) other measures such as minimization of the percentage of impervious area after development, use of measures to minimize directly connected impervious areas, and source control measures often thought of as good housekeeping, preventive maintenance and spill prevention. Detailed examples of non-structural BMPs follow.

Preserving open space may help to protect water quality as well as provide other benefits such as recharging groundwater supplies, detaining storm water, supporting wildlife and providing recreational opportunities. Although securing funding for open space acquisition may be difficult, various funding mechanisms have been used. New Jersey uses a portion of their State sales tax (voter approved for a ten year period) as a stable source of funding to finance the preservation of historic sites, open space and farmland. Colorado uses part of the proceeds from the State lottery to acquire and manage open space. Some local municipalities use a percentage of the local sales tax revenue to pay for open space acquisition (*e.g.*, Jefferson County, CO has had an open space program in place since 1977 funded by a 0.50 percent sales tax). Open space can be acquired in the form of: fee simple purchase; easements; development rights; purchase and sellback or leaseback arrangements; purchase options; private land trusts; impact fees; and land dedication requirements. Generally, fee simple purchases provide the highest level of development control and certainty of preservation, whereas the other forms of acquisition may provide less control, though they would also generally be less costly.

Cluster development, while allowing housing densities comparable to conventional zoning practice, concentrates housing units in a portion of the total site area which provides for greater open space, recreation, stream protection and storm water control. This type of development, by reducing lot sizes, can protect sensitive areas and result in less impervious surface, as well as reduce the cost for roads and other infrastructure.

Minimizing directly connected impervious areas (DCIAs) is a drainage strategy that seeks to reduce paved areas and directs storm water runoff to landscaped areas or to structural controls such as grass swales or buffer strips. This strategy can slow the rate of runoff, reduce runoff volumes, attenuate peak flows, and encourage filtering and infiltration of storm water. It can be made an integral part of drainage planning for any development (Urban Drainage and Flood Control District, Denver, CO. 1992. *Urban Storm Drainage Criteria Manual, Volume 3—Best Management Practices).* The Urban Drainage and Flood Control District manual describes three levels for minimizing DCIAs. At Level 1 all impervious surfaces are made to drain over grass-covered areas before reaching a storm water conveyance system. Level 2 adds to Level 1 and replaces street curb and gutter systems with low-velocity grass-lined swales and pervious street shoulders. In addition to Levels 1 and 2, Level 3 over-sizes swales and configures driveway and street crossing culverts to use grass-lined swales as elongated detention basins.

Structural BMPs include: (1) Storage practices such as wet ponds and extended-detention outlet structures; (2) filtration practices such as grassed swales, sand filters and filter strips; and (3) infiltration practices such as infiltration basins and infiltration trenches.

EPA recommends that small MS4 operators ensure the appropriate implementation of the structural BMPs by considering some or all of the following: (1) Pre-construction review of BMP designs; (2) inspections during construction to verify BMPs are built as designed; (3) post-construction inspection and maintenance of BMPs; and (4) sanctions to ensure compliance with design, construction or operation and maintenance (O&M) requirements of the program.

EPA cautions that certain infiltration systems such as dry wells, bored wells or tile drainage fields may be subject to Underground Injection Control (UIC) program requirements (see 40 CFR Part 144.12.). To find out more about these requirements, contact your state UIC Program, or call EPA's Safe Drinking Water Hotline at 1–800–426–4791.

In order to meet the third post-construction requirement (ensuring adequate long-term O&M of BMPs), EPA recommends that small MS4 operators evaluate various O&M management agreement options. The most common options are agreements between the

MS4 operator and another party such as post-development landowners (*e.g.*, homeowners' associations, office park owners, other government departments or entities), or regional authorities (*e.g.*, flood control districts, councils of government). These agreements typically require the post-construction property owner to be responsible for the O&M and may include conditions which: allow the MS4 operator to be reimbursed for O&M performed by the MS4 operator that is the responsibility of the property owner but is not performed; allow the MS4 operator to enter the property for inspection purposes; and in some cases specify that the property owner submit periodic reports.

In providing the guidance above, EPA intends the requirements in today's rule to be consistent with the permit application requirements for large MS4s for post-construction controls for new development and redevelopment. MS4 operators have significant flexibility both to develop this measure as appropriate to address local concerns, and to apply new control technologies as they become available. Storm water pollution control technologies are constantly being improved. EPA recommends that MS4s be responsive to these changes, developments or improvements in control technologies. EPA will provide more detailed guidance addressing the responsibility for long-term O&M of storm water controls in guidance materials. The guidance will also provide information on appropriate planning considerations, structural controls and non-structural controls. EPA also intends to develop a broad menu of BMPs as guidance to ensure flexibility to accommodate local conditions.

EPA received comments suggesting that requirements for new development be treated separately from redevelopment in the rule. The comment stressed that new development on raw land presents fewer obstacles and more opportunities to incorporate elements for preventing water quality impacts, whereas redevelopment projects are constrained by space limitations and existing infrastructure. Another comment suggested allowing waivers from the redevelopment requirements if the redevelopment does not result in additional adverse water quality impacts, and where BMPs are not technologically or economically feasible. EPA recognizes that redevelopment projects may have more site constraints which narrow the range of appropriate BMPs. Today's rule provides small MS4 operators with the flexibility to develop requirements that may be different for redevelopment projects, and may also include allowances for alternate or off-site BMPs at certain redevelopment projects. Non-structural BMPs may be the most appropriate approach for smaller redevelopment projects.

EPA received comments requesting clarification on what is meant by "pre-development" conditions within the context of redevelopment. Pre-development refers to runoff conditions that exist onsite immediately before the planned development activities occur. Pre-development is not intended to be interpreted as that period before any human-induced land disturbance activity has occurred.

EPA received comments on the guidance language in the proposed rule and preamble which suggest that implementation of this measure should "attempt to maintain pre-development runoff conditions" and that "post-development conditions should not be different than pre-development conditions in a way that adversely affects water quality." Many comments expressed concern that maintaining pre-development runoff conditions is impossible and cost-prohibitive, and objected to any reference to "flow" or increase in volume of runoff. Other comments support the inclusion of this language in the final rule. Similar references in today's rule relating to pre-development runoff conditions are intended as *recommendations* to *attempt* to maintain pre-development runoff conditions. With these recommendations, EPA intends to prevent water quality impacts resulting from increased discharges of pollutants, which may result from increased volume of runoff. In many cases, consideration of the increased flow rate, velocity and energy of storm water discharges following development unavoidably must be taken into consideration in order to reduce the discharge of pollutants, to meet water quality standards and to prevent degradation of receiving streams. EPA recommends that municipalities consider these factors when developing their post-construction storm water management program.

Some comments said that the quoted phrases in the paragraph above are directives that imply federal land use control, which they argue is beyond the authority of the CWA. EPA recognizes that land use planning is within the authority of local governments.

EPA disagrees, however, with the implication that today's rule dictates any such land use decisions. The requirement for small MS4 operators to develop a program to address discharges resulting from new development and redevelopment is essentially a pollution prevention measure. The Rule provides the MS4 operator with flexibility to determine the appropriate BMPs to address local water quality concerns. EPA recognizes that these program goals may not be applied to every site, and expects that MS4s will develop an appropriate combination of BMPs to be applied on a site-by-site, regional or watershed basis.

vi. Pollution Prevention/Good Housekeeping for Municipal Operations. Under today's final rule, operators of MS4s must develop and implement an operation and maintenance program ("program") that includes a training component and has the ultimate goal of preventing or reducing storm water from municipal operations (in addition to those that constitute storm water discharges associated with industrial activity). This measure's emphasis on proper O&M of MS4s and employee training, as opposed to requiring the MS4 to undertake major new activities, is meant to ensure that municipal activities are performed in the most efficient way to minimize contamination of storm water discharges.

The program must include government employee training that addresses prevention measures pertaining to municipal operations such as: parks, golf courses and open space maintenance; fleet maintenance; new construction or land disturbance; building oversight; planning; and storm water system maintenance. The program can use existing storm water pollution prevention training materials provided by the State, Tribe, EPA, or environmental, public interest, or trade organizations.

EPA also encourages operators of MS4s to consider the following in developing a program: (1) Implement maintenance activities, maintenance schedules, and long-term inspection procedures for structural and non-structural storm water controls to reduce floatables and other pollutants discharged from the separate storm sewers; (2) implement controls for reducing or eliminating the discharge of pollutants from streets, roads, highways, municipal parking lots, maintenance and storage yards, waste transfer stations, fleet or maintenance shops with outdoor storage areas, and salt/sand storage locations and snow disposal areas operated by the MS4; (3) adopt procedures for the proper disposal of waste removed from the separate storm sewer systems and areas listed above in (2), including dredge

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spoil, accumulated sediments, floatables, and other debris; and (4) adopt procedures to ensure that new flood management projects are assessed for impacts on water quality and existing projects are assessed for incorporation of additional water quality protection devices or practices. Ultimately, the effective performance of the program measure depends on the proper maintenance of the BMPs, both structural and non-structural. Without proper maintenance, BMP performance declines significantly over time. Additionally, BMP neglect may produce health and safety threats, such as structural failure leading to flooding, undesirable animal and insect breeding, and odors. Maintenance of structural BMPs could include: replacing upper levels of gravel; dredging of detention ponds; and repairing of retention basin outlet structure integrity. Maintenance of non-structural BMPs could include updating educational materials periodically.

EPA emphasizes that programs should identify and incorporate existing storm water practices and training, as well as non-storm water practices or programs that have storm water pollution prevention benefits, as a means to avoid duplication of efforts and reduce overall costs. EPA recommends that MS4s incorporate these new obligations into their existing programs to the greatest extent feasible and urges States to evaluate MS4 programs with programmatic efficiency in mind. EPA designed this minimum control measure as a modified version of the permit application requirements for medium and large MS4s described at 40 CFR 122.26(d)(2)(iv), in order to provide more flexibility for these smaller MS4s. Today's requirements provide for a consistent approach to control pollutants from O&M among medium, large, and regulated small MS4s.

By properly implementing a program, operators of MS4s serve as a model for the rest of the regulated community. Furthermore, the establishment of a long-term program could result in cost savings by minimizing possible damage to the system from floatables and other debris and, consequently, reducing the need for repairs.

EPA received comments requesting clarification of what this measure requires. Certain municipalities expressed concern that the measure has the potential to impose significant costs associated with EPA's requirement that operators of MS4s consider implementing controls for reducing or eliminating the discharge of pollutants from streets, roads, highways, municipal parking lots, and salt/sand storage locations and snow disposal areas operated by the municipality. EPA disagrees that a requirement to *consider* such controls will impose considerable costs.

One commenter objected to the preamble language from the proposal suggesting that EPA does not expect the MS4 to undertake new activity. While it remains the Agency's expectation that major new activity will not be required, the MEP process should drive MS4s to incorporate the measure's obligations into their existing programs to achieve the pollutant reductions to the maximum extent practicable.

Certain commenters requested a definition for "municipal operations." EPA has revised the language to more clearly define municipal operations. Questions may remain concerning whether discharges from specific municipal activities constitute discharges associated with industrial activities (requiring NPDES permit authorization according to the requirements for industrial storm water that apply in that State) or from municipal operations (subject only to the controls developed in the MS4 control program). Even though there may be different substantive requirements that apply depending on the source of the discharge, EPA has modified the deadlines for permit coverage so that all the regulated municipally owned and operated sources become subject to permit requirements on the same date. The deadline is the same for permit coverage for this minimum measure as for permit coverage for municipally owned/operated industrial sources.

c. Application Requirements

An NPDES permit that authorizes the discharge from a regulated small MS4 may take the form of either an individual permit issued to one or more facilities as co-permittees or a general permit that applies to a group of MS4s. For reasons of administrative efficiency and to reduce the paperwork burden on permittees, EPA expects that most discharges from regulated small MS4s will be authorized under general permits. These NPDES general permits will provide specific instructions on how to obtain coverage, including application requirements. Typically, such application requirements will be satisfied by the submission of a Notice of Intent (NOI) to be covered by the general permit. In this section, EPA explains the small MS4 operator's application requirements for obtaining coverage under a NPDES permit for storm water.

i. Best Management Practices and Measurable Goals, Section 122.34(d) of today's rule requires the operator of a regulated small MS4 that wishes to implement a program under § 122.34 to identify and submit to the NPDES permitting authority a list of the best management practices ("BMPs") that will be implemented for each minimum control measure in their storm water management program. They also must submit measurable goals for the development and implementation of each BMP. The BMPs and the measurable goals must be included either in an NOI to be covered under a general permit or in an individual permit application.

The operator's submission must identify, as appropriate, the months and years in which the operator will undertake actions required to implement each of the minimum control measures, including interim milestones and the frequency of periodic actions. The Agency revised references to "starting and completing" actions from the proposed rule because many actions will be repetitive or ongoing. The submission also must identify the person or persons responsible for implementing or coordinating the small MS4 storm water program. See § 122.34(d). The submitted BMPs and measurable goals become enforceable according to the terms of the permit. The first permit can allow the permittee up to five years to fully implement the storm water management program.

Several commenters opposed making the measurable goals enforceable permit conditions. Some suggested that a permittee should be able to change its goals so that BMPs that are not functioning as intended can be replaced. EPA agrees that a permittee should be free to switch its BMPs and corresponding goals to others that accomplish the minimum measure or measures. The permittee is required to implement BMPs that address the minimum measures in § 122.34(b). If the permittee determines that its original combination of BMPs are not adequate to achieve the objectives of the municipal program, the MS4 should revise its program to implement BMPs that are adequate and submit to the permitting authority a revised list of BMPs and measurable goals. EPA suggests that permits describe the process for revising BMPs and measurable goals, such as whether the permittee should follow the same procedures as were required for the submission of the original NOI and whether the permitting authority's approval is necessary prior to the permittee implementing the revised

BMPs. The permittee should indicate on its periodic report whether any BMPs and measurable goals have been revised since the last periodic report.

Some commenters expressed concern that making the measurable goals enforceable would encourage the development of easily attained goals and, conversely, discourage the setting of ambitious goals. Others noted that it is often difficult to determine the pollutant reduction that can be achieved by BMPs until several years after implementation. Much of the opposition to the enforceability of measurable goals appears to have been based on a mistaken understanding that measurable goals must consist of pollutant reduction targets to be achieved by the corresponding BMPs.

Today's rule requires the operator to submit either measurable goals that serve as BMP design objectives or goals that quantify the progress of implementation of the actions or performance of the permittee's BMPs. At a minimum, the required measurable goals should describe specific actions taken by the permittee to implement each BMP and the frequency and the dates for such actions. Although the operator may choose to do so, it is not required to submit goals that measure whether a BMP or combination of BMPs is effective in achieving a specific result in terms of storm water discharge quality. For example, a measurable goal might involve a commitment to inspect a given number of drainage areas of the collection system for illicit connections by a certain date. The measurable goal need not commit to achieving a specific amount of pollutant reduction through the elimination of illicit connections. Other measurable goals could include the date by which public education materials would be developed, a certain percentage of the community participating in a clean-up campaign, the development of a mechanism to address construction site runoff, and a reduction in the percentage of imperviousness associated with new development projects.

To reduce the risk that permittees will develop inadequate BMPs, EPA intends to develop a menu of BMPs to assist the operators of regulated small MS4s with the development of municipal programs. States may also develop a menu of BMPs. Today's rule provides that the measurable goals that demonstrate compliance with the minimum control measures in §§ 122.34 (b)(3) through (b)(6) do not have to be met if the State or EPA has not issued a menu of BMPs at the time the MS4 submits its NOI. Commenters pointed out that the proposed rule would have made the measurable goals unenforceable if the menu of BMPs was not available, but the proposal was silent as to the enforceability of the implementation of BMPs. Today's rule clarifies that the operators are not free to do nothing prior to the issuance of a menu of BMPs; they still must make a good faith effort to implement the BMPs designed to comply with each measure. See § 122.34(d)(2). The operators would not, however, be liable for failure to meet its measurable goals if a menu of BMPs was not available at the time they submit their NOI.

The proposed rule provision in § 123.35 stated that the "[f]ailure to issue the menu of BMPs would not affect the legal status of the general permit." This concept is included in the final rule in § 122.34(d)(2)'s clarification that the permittee still must comply with other requirements of the general permit.

Unlike the proposed rule, today's rule does not require that each BMP in the menu developed by the State or EPA be regionally appropriate, cost-effective and field-tested. Various commenters criticized those criteria as unworkable, and one described them as "ripe for ambiguity and abuse." Other commenters feared that the operators of regulated small MS4s would never be required to achieve their goals until menus were developed that were cost-effective, field-tested and appropriate for every conceivable subregion.

While some municipal commenters supported the requirement that a menu of BMPs be made available that included BMPs that had been determined to be regionally appropriate, field-tested and cost-effective, others raised concerns that they would be restricted to a limited menu. Some commenters supported such a detailed menu because they thought they would only be able to select BMPs that were on the menu, while others thought that it was the permitting authority's responsibility to develop BMPs narrowly tailored to their situation. In response, EPA notes that the operators will not be restricted to implementing only, or all of, the BMPs included on the menu. Since the menu does not require permittees to implement the BMPs included on the menu, it is also not necessary to apply the public notice and other procedures that some commenters thought should be applied to the development of the menu of BMPs.

The purpose of the BMP menu is to provide guidance to assist the operators of regulated small MS4s with the development and refinement of their local program, not to limit their options. Permittees may implement BMPs other than those on the menu unless a State restricts its permittees to specific BMPs. To the extent possible, EPA will develop a menu of BMPs that describes the appropriateness of BMPs to specific regions, whether the BMPs have been field-tested, and their approximate costs. The menu, however, is not intended to relieve permittees of the need to implement BMPs that are appropriate for their specific circumstances.

If there are no known relevant BMPs for a specific circumstance, a permittee has the option of developing and implementing pilot BMPs that may be better suited to their circumstances. Where BMPs are experimental, the permittee should consider committing to measurable goals that address its schedule for implementing its selected BMPs rather than goals of achieving specific pollutant reductions. If the BMPs implemented by the permittee do not achieve the desired objective, the permittee may be required to commit to different or revised BMPs.

As stated in § 123.35(g), EPA is committed to issuing a menu of BMPs prior to the deadline for the issuance of permits. This menu would serve as guidance for all operators of regulated small MS4s nationwide. After developing the initial menu of BMPs, EPA intends to periodically modify, update, and supplement the menu of BMPs based on the assessments of the MS4 storm water program and research. States may rely on EPA's menu of BMPs or issue their own. If States develop their own menus, they would constitute additional guidance (or perhaps requirements in some States) for the operators to follow. Several commenters were confused by the proposed rule language that stated that States must provide or issue a menu of BMPs and, if they fail to do so, EPA "may" do so. Some read this language as not requiring either EPA or the State to develop the menu. EPA had intended that it would develop a menu and that States could either provide the EPA developed menu or one developed by the State.

EPA has dropped the proposed language that States "must" develop the menu of BMPs. Some commenters thought that it was inappropriate to require States to issue guidance. A menu of BMPs issued by either EPA or a permittee's State will satisfy the condition in § 122.34(d) that a regulatory authority provide a menu of BMPs. A State could require its permittees to follow its menu of BMPs provided that they are adequate to implement § 122.34(b).

Several commenters raised concerns that operators of small MS4s could be

required to submit their BMPs and measurable goals before EPA or the State has issued a menu of BMPs. EPA has assumed primary responsibility for developing a menu of BMPs to minimize the possibility of this occurring. Should a general permit be issued before a menu of BMPs is available, the permit writer would have the option of delaying the date by which the identification of the BMPs and measurable goals must be submitted to the permitting authority until some time after a menu of BMPs is available.

Several municipal commenters raised concerns that they would begin to develop a program only to be later told by the permitting authority or challenged in a citizen suit that their BMPs were inadequate. They expressed a need for certainty regarding what their permit required. Several commenters suggested that EPA require permitting authorities to approve or disapprove the submitted BMPs and measurable goals. EPA disagrees that formal approval or disapproval by the permitting authority is needed.

EPA acknowledges that the lack of a formal approval process does place on the permittee some responsibility for designing and determining the adequacy of its BMPs. Once the permittee has submitted its BMPs to the permitting authority as part of its NOI, it must implement them in order to achieve the corresponding measurable goals. EPA does not believe that this results in the uncertainty to the extent expressed by some commenters or unduly expose the permittee to the risk of citizen suit. If the permit is very specific regarding what the permittee must do, then the uncertainty is eliminated. If the permit is less prescriptive, the permittee has greater latitude in determining for itself what constitutes an adequate program. A citizen suit could impose liability on the permittee only if the program that it develops and implements clearly does not satisfy the requirements of the general permit. EPA believes today's approach strikes a balance between the competing goals of providing certainty as to what constitutes an adequate program and providing flexibility to the permittees.

Commenters were divided on whether five years was a reasonable and expeditious schedule for a MS4 to implement its program. Some thought that it was an appropriate amount of time to allow for the development and implementation of adequate programs. One questioned whether the permittee had to be implementing all of its program within that time, and suggested that there may be cases where a permitting authority would need flexibility to allow more time. One commenter suggested that five years is too long and would amount to a relaxation of implementation in their area. EPA believes it will take considerable time to complete the tasks of initially developing a program, commencing to implement it, and achieving results. EPA notes, however, that full implementation of an appropriate program must occur as expeditiously as possible, and not later than five years.

EPA solicited comment on how an NOI form might best be formatted to allow for measurable goal information (*e.g.*, through the use of check boxes or narrative descriptions) while taking into account the Agency's intention to facilitate computer tracking. All commenters supported the development of a checklist NOI, but most noted that there would need to be room for additional information to cover unusual situations. One noted that, while a summary of measurable goals might be reduced to one sheet, attachments that more fully described the program and the planned BMPs would be necessary. EPA agrees that in most cases a "checklist" will not be able to capture the information on what BMPs a permittee intends to implement and its measurable goals for their implementation. EPA will continue to consider whether to develop a model NOI form and make it available for permitting authorities that choose to use it. What will be required on an MS4's NOI, however, is more extensive than what is usually required on an NOI, so a "form" NOI for MS4s may be impractical.

ii. Individual Permit Application for a § 122.34(b) program. In some cases, an operator of a regulated small MS4s may seek coverage under an individual NPDES permit, either because it chooses to do so or because the NPDES permitting authority has not made the general permit option available to that source. For small MS4s that are to implement a § 122.34(b) program in today's rule, EPA is promulgating simplified individual permit application requirements at § 122.33(b)(2)(i). Under the simplified individual permit application requirements, the operator submits an application to the NPDES permitting authority that includes the information required under § 122.21(f) and an estimate of square mileage served by the small MS4. They are also required to supply the BMP and measurable goal information required under § 122.34(d). Consistent with CWA section 308 and analogous State law, the permitting authority could request any additional information to gain a better understanding of the system and the areas draining into the system.

Commenters suggested that the requirements of § 122.21(f) are not necessarily applicable to a small MS4. One suggested that it was not appropriate to require the following information: a description of the activities conducted by the applicant which require it to obtain an NPDES permit; the name, mailing address, and location of the facility; and up to four Standard Industrial Classification ("SIC") codes which best reflect the principal products or services provided by the facility. In response, EPA notes that the requirements in § 122.21(f) are generic application requirements applicable to NPDES applicants. With the exception of the SIC code requirement, EPA believes that they are applicable to MS4s. In the SIC code portion of the standard application, the applicant may simply put "not applicable."

One commenter asked that EPA clarify whether § 122.21(f)(5)'s requirement to indicate "whether the facility is located on Indian lands," referred to tribal lands, Indian country, or Indian reservations. For some local governments this is a complex issue with no easy "yes" or "no" answer. See the discussion in the Section II.F in the proposal to today's rule regarding what tribal lands are subject to the federal trust responsibility for purposes of the NPDES program.

One commenter suggested that the application should not have to list the permits and approvals required under § 122.21(f)(6). EPA notes that the applicant must only list the environmental permits that the applicant has received that cover the small MS4. The applicant is not required to list permits for other operations conducted by the small MS4 operator (*e.g.*, for an operation of an airport or landfill). Again, in most cases the applicant could respond "not applicable" to this portion of the application.

One commenter suggested that the topographic map requirement of § 122.21(f)(7) was completely different from, and significantly more onerous than, the mapping requirement outlined in the proposed rule at § 122.34(b)(3)(i). EPA agrees and has modified the final rule to clarify that a map that satisfies the requirements of § 122.34(b)(3)(i) also satisfies the map requirements for MS4 applicants seeking individual permits under § 122.33(b)(2)(i).

EPA is adding a new paragraph to § 122.44(k) to clarify that requirements to implement BMPs developed pursuant to CWA 402(p) are appropriate permit

conditions. While such conditions could be included under the existing provision in § 122.44(k)(3) for "practices reasonably necessary to achieve effluent limitations and standards or to carry out the purposes and intent of the CWA," EPA believes it is clearer to specifically list in § 122.44(k) BMPs that implement storm water programs in light of the frequency with which they are used as effluent limitations.

iii. Alternative Permit Options/Tenth Amendment. As an alternative to implementing a program that addresses each of the six minimum measures according to the requirements of § 122.34(b), today's rule provides the operators of regulated small MS4s with the option of applying for an individual permit under existing § 122.26(d). *See* § 122.33(b)(2)(ii). If a system operator does not want to be held accountable for implementation of each of the minimum measures, an individual permit option under § 122.33(b)(2)(ii) remains available. (As explained in the next section of this preamble, § 122.35(b) also provides an opportunity for relief from permit obligations for some of the minimum measures, but that relief exists within the framework of the minimum measures.)

EPA originally drafted the individual permit application requirements in § 122.26(d) to apply to medium and large MS4s. Today's rule abbreviates the individual permit application requirements for small MS4s. Although EPA believes that the storm water management program requirements of § 122.34, including the minimum measures, provide the most appropriate means to control pollutants from most small MS4s, the Agency does recognize that the operators of some small MS4s may prefer more individualized permit requirements. Among other possible reasons, an operator may seek to avoid having to "regulate" third parties discharging into the separate storm sewer system. Alternatively, an operator may determine that structural controls, such as constructed wetlands, are more appropriate or effective to address the discharges that would otherwise be addressed under the construction and/or development/redevelopment measures.

Some MS4s commenters alleged that an absolute requirement to implement the minimum measures violates the Tenth Amendment to the U.S. Constitution. While EPA disagrees that requiring MS4s to implement the minimum measures would violate the Constitution, today's rule does provide small MS4s with the option of developing more individualized measures to reduce the pollutants and pollution associated with urban storm water that will be regulated under today's rule.

Some commenters specifically objected that § 122.34's minimum measures for small MS4s violate the Tenth Amendment insofar as they require the operators of MS4s to regulate third parties. The minimum measures include requirements for small MS4 operators to prohibit certain non-storm water discharges, control storm water discharges from construction greater than one acre, and take other actions to control third party sources of storm water discharges into their MS4s. Commenters also argued that it was inappropriate for EPA to require local governments to enact ordinances that will consume local revenues and put local governments in the position of bearing the political responsibility for implementing the program. One commenter argued that EPA was prohibited from conditioning the issuance of an NPDES permit upon the small MS4 operators waiving their constitutional right to be free from such requirements to regulate third parties. The Agency replies to each comment in turn.

Because the rule does rely on local governments—who operate municipal separate storm sewer systems—to regulate discharges from third parties into storm sewers, EPA acknowledges that the rule implicates the Tenth Amendment and constitutional principles of federalism. EPA disagrees, however, that today's rule is inconsistent with federalism principles. [As political subdivisions of States, municipalities enjoy the same protections as States under the Tenth Amendment.]

The Supreme Court has interpreted the Tenth Amendment to preclude federal actions that compel States or their political subdivisions to enact or administer a federal regulatory program. *See New York* v. *United States,* 505 U.S. 144 (1992); *Printz* v. *United States,* 117 S.Ct. 2365 (1997). The *Printz* case, however, did acknowledge that the restriction does not apply when federal requirements of general applicability—requirements that regulate all parties engaging in a particular activity—do not excessively interfere with the functioning of State governments when those requirements are applied to States (or their political subdivisions). *See Printz,* 117 S.Ct. at 2383.

Today's rule imposes a federal requirement of general applicability, namely, the requirement to obtain and comply with an NPDES permit, on municipalities that operate a municipal separate storm sewer system. By virtue of this rule, the permit will require the municipality/storm sewer operator to develop a storm water control program. The rule specifies the components of the control program, which are primarily "management'-type controls, for example, municipal regulation of third party storm water discharges associated with construction, as well as development and redevelopment, when those discharges would enter the municipal system.

Unlike the circumstances reviewed in the *New York* and *Printz* cases, today's rule merely applies a generally applicable requirement (the CWA permit requirement) to municipal point sources. The CWA establishes a generally applicable requirement to obtain an NPDES permit to authorize point source discharge to waters of the United States. Because municipalities own and operate separate storm sewers, including storm sewers into which third parties may discharge pollutants, NPDES permits may require municipalities to control the discharge of pollutants into the storm sewers in the first instance. Because NPDES permits can impose end-of-pipe numeric effluent limits, narrative effluent limits in the form of "management" program requirements are also within the scope of Clean Water Act authority. As noted above, however, EPA believes that such narrative limitations are the most appropriate form of effluent limitation for these types of permits. For municipal separate storm sewer permits, CWA section 402(p)(3)(B)(iii) specifically authorizes "controls to reduce pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants."

The Agency did not design the minimum measures in § 122.34 to "commandeer" state regulatory mechanisms, but rather to reduce pollutant discharges from small MS4s. The permit requirement in CWA section 402 is a requirement of general applicability. The operator of a small MS4 that does not prohibit and/or control discharges into its system essentially accepts "title" for those discharges. At a minimum, by providing free and open access to the MS4s that convey discharges to the waters of the United States, the municipal storm sewer system enables water quality impairment by third parties. Section 122.34 requires the operator of a regulated small MS4 to control a third

party only to the extent that the MS4 collection system receives pollutants from that third party and discharges it to the waters of the United States. The operators of regulated small MS4s cannot passively receive and discharge pollutants from third parties. The Agency concedes that administration of a municipal program will consume limited local revenues for implementation; but those consequences stem from the municipal operator's identity as a permitted sewer system operator. The Tenth Amendment does not create a blanket municipal immunity from generally applicable requirements. Development of a program based on the minimum measures and implementation of that program should not "excessively interfere" with the functioning of municipal government, especially given the "practicability" threshold under CWA section 402(p)(3)(B)(iii).

As noted above, today's rule also allows regulated small MS4s to opt out of the minimum measures approach. The individual permit option provides for greater flexibility in program implementation and also responds to the comment about requiring a municipal permit applicant's waiver of any arguable constitutional rights. The individual permit option responds to questions about the rule's alleged unconstitutionality by more specifically focusing on the pollutants discharged from municipal point sources. Today's rule gives operators of MS4s the option to seek an individual permit that varies from the minimum measures/ management approach that is otherwise specified in today's rule. Even if the minimum measures approach was constitutionally suspect, a requirement that standing alone would violate constitutional principles of federalism does not raise concerns if the entity subject to the requirement may opt for an alternative action that does not raise a federalism issue.

For municipal system operators who seek to avoid third party regulation according to all or some of the minimum measures, § 122.26(d) requires the operator to submit a narrative description of its storm water sewer system and any existing storm water control program, as well as the monitoring data to enable the permit writer to develop appropriate permit conditions. The permit writer can then develop permit conditions and limitations that vary from the six minimum measures prescribed in today's rule. The information will enable the permit writer to develop an NPDES permit that will result in pollutant reduction to the maximum extent practicable. *See NRDC* v. *EPA*, 966 F.2d at 1308, n17. If determined appropriate under CWA section 402(p)(3)(B)(iii), for example BMPs to meet water quality standards, the permit could also incorporate any more stringent or prescriptive effluent limits based on the individual permit application information.

For small MS4 operators seeking an individual permit, both Part 1 and Part 2 of the application requirements in § 122.26(d)(1) and (2) are required to be submitted within 3 years and 90 days of the date of publication of this **Federal Register** notice. Some of the information required in Part 1 will necessarily have to be developed by the permit applicant prior to the development of Part 2 of the application. The permit applicant should coordinate with its permitting authority regarding the timing of review of the information.

The operators of regulated small MS4s that apply under § 122.26(d) may apply to implement certain of the § 122.34(b) minimum control measures, and thereby focus the necessary evaluation for additional limitations on alternative controls to the § 122.34(b) measures that the small MS4 will not implement. The permit writer may determine "equivalency" for some or all of the minimum measures by developing a rough estimate of the pollutant reduction that would be achieved if the MS4 implemented the § 122.34 minimum measure and to incorporate that pollutant reduction estimate in the small MS4's individual permit as an effluent limitation. The Agency recognizes that, based on current information, any such estimates will probably have a wide range. Anticipation of this wide range is one of the reasons EPA believes MS4 operators need flexibility in determining the mix of BMPs (under the minimum measures) to achieve water quality objectives. Therefore, for example, if a system operator seeks to employ an alternative that involves structural controls, wide ranges will probably be associated with gross pollutant reduction estimates. Permit writers will undoubtedly develop other ways to ensure that permit limits ensure reduction of pollutants to the maximum extent practicable.

Small MS4 operators that pursue this individual permit option do not need to submit details about their future program requirements (*e.g.*, the MS4's future plans to obtain legal authority required by §§ 122.26(d)(1)(ii) and (d)(2)). A small MS4 operator might elect to supply such information if it intends for the permit writer to take those plans into account when developing the small MS4's permit conditions.

Several operators of small MS4s commented that they currently lacked the authority they would need to implement one or more of the minimum measures in § 122.34(b). Today's rule recognizes that the operators of some small MS4s might not have the authority under State law to implement one or more of the measures using, for example, an ordinance or other regulatory mechanism. To address these situations, each minimum measure in § 122.34(b) that would require the small MS4 operator to develop an ordinance or other regulatory mechanism states that the operator is only required to implement that requirement to "the extent allowable under State, Tribal or local law." See § 122.34(b)(3)(ii) (illicit discharge elimination), § 122.34(b)(4)(ii) (construction runoff control) and § 122.34(b)(5)(ii) (post-construction storm water management). This regulatory language does not mean that a operator of a small MS4 with ordinance making authority can simply fail to pass an ordinance necessary for a § 122.34(b) program. The reference to "the extent allowable under * * * local law" refers to the local laws of *other* political subdivisions to which the MS4 operator is subject. Rather, a small MS4 operator that seeks to implement a program under section § 122.34(b) may omit a requirement to develop an ordinance or other regulatory mechanism only to the extent its municipal charter, State constitution or other legal authority prevents the operator from exercising the necessary authority. Where the operator cannot obtain the authority to implement any activity that is only required to "the extent allowable under State, Tribal or local law," the operator may satisfy today's rule by administering the remaining § 122.34(b) requirements.

Finally, although today's rule provides operators of small MS4s with an option of applying for a permit under § 122.26(d), States authorized to administer the NPDES program are not required to provide this option. NPDES-authorized States could require all regulated small MS4s to be permitted under the minimum measures management approach in § 122.34 as a matter of State law. Such an approach would be deemed to be equally or more stringent than what is required by today's rule. *See* 40 CFR 123.2(i). The federalism concerns discussed above do not apply to requirements imposed by a State on its political subdivisions.

iv. Satisfaction of Minimum Measure Obligations by Another Entity. An operator of a regulated small MS4 may

satisfy the requirement to implement one or more of the six minimum measures in § 122.34(b) by having a third party implement the measure or measures. Today's rule provides a variety of means for small MS4 operators to share responsibility for different aspects of their storm water management program. The means by which the operators of various MS4s share responsibility may affect who is ultimately responsible for performance of the minimum measure and who files the periodic reports on the implementation of the minimum measure. Section 122.35 addresses these issues. The rule describes two different variants on third party implementation with different consequences if the third party fails to implement the measure.

If the permit covering the discharge from a regulated small MS4 identifies the operator as the entity responsible for a particular minimum control measure, then the operator-permittee remains responsible for the implementation of that measure even if another entity has agreed to implement the control measure. Section 122.35(a). Another party may satisfy the operator-permittee's responsibility by implementing the minimum control measure in a manner at least as stringent or prescriptive as the corresponding NPDES permit requirement. If the third party fails to do so, the operator-permittee remains responsible for its performance. The operator of the MS4 should consider entering into an agreement with the third party that acknowledges the responsibility to implement the minimum measure. The operator-permittee's NOI and its annual § 122.34(f)(3) reports submitted to the NPDES permitting authority must identify the third party that is satisfying one or more of the permit obligations. This requirement ensures that the permitting authority is aware which entity is supposed to implement which minimum measures.

If, on the other hand, the regulated small MS4's permit recognizes that an NPDES permittee other than the operator-permittee is responsible for a particular minimum control measure, then the operator-permittee is relieved from the responsibility for implementing that measure. The operator-permittee is also relieved from the responsibility for implementing any measure that the operator's permit indicates will be performed by the NPDES permitting authority. Section 122.35(b). The MS4 operator-permittee would be responsible for implementing the remaining minimum measures.

Today's final rule differs from the proposed version of § 122.35(b), which stated that, even if the third party's responsibility is recognized in the permit, the MS4 operator-permittee remained responsible for performance if the third party failed to perform the measure consistent with § 122.34(b). Under today's rule, the operator-permittee is relieved from responsibility for performance of a measure if the third party is an NPDES permittee whose permit makes it responsible for performance of the measure (including, for example, a State agency other than the State agency that issues NPDES permits) or if the third party is the NPDES permitting authority itself. Because the permitting authority is acknowledging the third party's responsibility in the permit, commenters thought that the MS4 operator-permittee should not be responsible for ensuring that the other entity is implementing the control measure properly. EPA agrees that the operator-permittee should not be conditionally responsible when the requirements are enforceable against some other NPDES permittee. If the third party fails to perform the minimum measure, the requirements will be enforceable against the third party. In addition, the NPDES permitting authority could reopen the operator-permittee's permit under § 122.62 and modify the permit to make the operator responsible for implementing the measure. A new paragraph has been added to § 122.62 to clarify that the permit may be reopened in such circumstances.

Today's rule also provides that the operator-permittee is not conditionally responsible where it is the State NPDES permitting authority itself that fails to implement the measure. The permitting authority does not need to issue a permit to itself (i.e., to the same State agency that issues the permit) for the sole purpose of relieving the small MS4 from responsibility in the event the State agency does not satisfy its obligation to implement a measure. EPA does not believe that the small MS4 should be responsible in the situation where the NPDES permit issued to the small MS4 operator recognizes that the State agency that issues the permit is responsible for implementing a measure. If the State does fail to implement the measure, the State agency could be held accountable for its commitment in the permit to implement the measure. Where the State does not fulfill its responsibility to implement a measure, a citizen also could petition for withdrawal of the State's NPDES program or it could petition to have the MS4's permit reopened to require the MS4 operator to implement the measure.

EPA notes that not every State program that addresses erosion and sediment control from construction sites will be adequate to satisfy the requirement that each regulated small MS4 have a program to the extent required by § 122.34(b)(4). For example, although all NPDES States are required to issue NPDES permits for construction activity that disturbs greater than one acre, the State's NPDES permit program will not necessarily be extensive enough to satisfy a regulated small MS4's obligation under § 122.34(b)(4). NPDES States will not necessarily be implementing all of the required elements of that minimum measure, such as procedures for site plan review in each jurisdiction required to develop a program and procedures for receipt and consideration of information submitted by the public on individual construction sites. In order for a State erosion and sediment control program to satisfy a small MS4 operator's obligation to implement § 122.34(b)(4), the State program would have to include all of the elements of that minimum measure.

Where the operator-permittee is itself performing one or more of the minimum measures, the operator-permittee remains responsible for all of the reporting requirements under § 122.34(f)(3). The operator-permittee's reports should identify each entity that is performing the control measures within the geographic jurisdiction of the regulated small MS4. If the other entity also operates a regulated MS4 and files reports on the progress of implementation of the measures within the geographic jurisdiction of the MS4, then the operator-permittee need not include that same information in its own reports.

If the other entity operates a regulated MS4 and is performing all of the minimum measures for the permittee, the permittee is not required to file the reports required by § 122.34(f)(3). This relief from reporting is specified in § 122.35(a).

Section 122.35 addresses the concerns of some commenters who sought relief for governmental facilities that are classified as small MS4s under today's rule. These facilities frequently discharge storm water through another regulated MS4 and could be regulated by that MS4's program. For example, a State owned office complex that operates its storm sewer system in an urbanized area will be regulated as an MS4 under today's rule even though its system may be subject to the storm water controls of the municipality in

which it is located. Today's rule specifically revised the definition of MS4 to recognize that different levels of government often operate MS4s and that each such separate entity (including the federal government) should be responsible for its discharges. If both MS4s agree, the downstream MS4 can develop a storm water management program that regulates the discharge from both MS4s. The upstream small MS4 operator still must submit an NOI that identifies the entity on which the upstream small MS4 operator is relying to satisfy its permit obligations. No reports are required from the upstream small MS4 operator, but the upstream operator must remain in compliance with the downstream MS4 operator's storm water management program. This option allows small MS4s to work together to develop one storm water management program that satisfies the permit obligations of both. If they cannot agree, the upstream small MS4 operator must develop its own program.

As mentioned previously, comments from federal facilities and State organizations that operate MS4s requested that their permit requirements differ from those of MS4s that are political subdivisions of States (cities, towns, counties, etc.). EPA acknowledges that there are differences; e.g., many federal and State facilities do not serve a resident population and thus might require a different approach to public education. EPA believes, however, that MS4s owned by State and federal governments can develop storm water management plans that address the minimum measures. Federal and State owned small MS4s may choose to work with adjacent municipally owned MS4s to develop a unified plan that addresses all of the required measures within the jurisdiction of all of the contiguous MS4s. The options in § 122.35 minimize the burden on small MS4s that are covered by another MS4's program.

One commenter recommended that if one MS4 discharges into a second MS4, the operator of the upstream MS4 should have to provide a copy of its NOI or permit application to the operator of the receiving MS4. EPA did not adopt this recommendation because the NOI and permit application will be publicly available; but EPA does recommend that NPDES permitting authorities consider it as a possible permit requirement. The commenter also suggested that monitoring data should be collected by the upstream MS4 and provided to the downstream MS4. EPA is not adopting such a uniform monitoring requirement because EPA believes it is more appropriate to let the MS4 operators work out the need for such data. If necessary, the downstream MS4s might want to make such data a condition to allowing the upstream MS4 to connect to its system.

v. Joint Permit Programs. Many commenters supported allowing the operators of small MS4s to apply as co-permittees so they each would not have to develop their own storm water management program. Today's rule specifically allows regulated small MS4s to join with either other small MS4s regulated under § 122.34(d) or with medium and large MS4s regulated under § 122.26(d).

As is discussed in the previous section, regulated small MS4s may indicate in their NOIs that another entity is performing one or more of its required minimum control measures. Today's rule under § 122.33(b)(1) also specifically allows the operators of regulated small MS4s to jointly submit an NOI. The joint NOI must clearly indicate which entity is required to implement which control measure in each geographic jurisdiction within the service area of the entire small MS4. The operator of each regulated small MS4 remains responsible for the implementation of each minimum measure for its MS4 (unless, as is discussed in the previous section above, the permit recognizes that another entity is responsible for completing the measure.) The joint NOI, therefore, is legally equivalent to each entity submitting its own NOI. EPA is, however, revising the rule language to specifically authorize the joint submission of NOIs in response to comments that suggested that such explicit authorization might encourage programs to be coordinated on a watershed basis.

Section 122.33(b)(2)(iii) authorizes regulated small MS4s to jointly apply for an individual permit to implement today's rule, where allowed by an NPDES permitting authority. The permit application should contain sufficient information to allow the permitting authority to allocate responsibility among the parties under one of the two permitting options in §§ 122.33(b)(2)(i) and (ii).

Section 122.33(b)(3) of today's rule also allows an operator of a regulated small MS4 to join as a co-permittee in an existing NPDES permit issued to an adjoining medium or large MS4 or source designated under the existing storm water program. This co-permittee option applies only with the agreement of all co-permittees. Under this co-permittee arrangement, the operator of the regulated small MS4 must comply with the terms and conditions of the applicable permit rather than the permit condition requirements of § 122.34 of today's rule. The regulated small MS4 that wishes to be a co-permittee must comply with the applicable requirements of § 122.26(d), but would not be required to fulfill all the permit application requirements applicable to medium and large MS4s. Specifically, the regulated small MS4 is not required to comply with the application requirements of § 122.26(d)(1)(iii) (Part 1 source identification), § 122.26 (d)(1)(iv) (Part 1 discharge characterization), and § 122.26(d)(2)(iii) (Part 2 discharge characterization data). Furthermore, the regulated small MS4 operator could satisfy the requirements in § 122.26(d)(1)(v) (Part 1 management programs) and § 122.26(d)(2)(iv) (Part 2 proposed management program) by referring to the adjoining MS4 operator's existing plan. An operator pursuing this option must describe in the permit modification request how the adjoining MS4's storm water program addresses or needs to be supplemented in order to adequately address discharges from the MS4. The request must also explain the role of the small MS4 operator in coordinating local storm water activities and describe the resources available to accomplish the storm water management plan.

EPA sought comments regarding the appropriateness of the application requirements in these subsections of § 122.26(d). One commenter stated that newly regulated smaller MS4s should not be required to meet the existing regulations' Part II application requirements under § 122.26(d) regarding the control of storm water discharges from industrial activity. EPA disagrees. The smaller MS4 operators designated for regulation in today's rule may satisfy this requirement by referencing the legal authority of the already regulated MS4 program to the extent the newly regulated MS4 will rely on such legal authority to satisfy its permit requirements. If the smaller MS4 operator plans to rely on its own legal authorities, it must identify it in the application. If the smaller MS4 operator does not elect to use its own legal authority, they may file an individual permit application for an alternate program under § 122.33(b)(2)(ii).

The explanatory language in § 122.33(b)(3) recommends that the smaller MS4s designated under today's rule identify how an existing plan "would need to be supplemented in order to adequately address your discharges." One commenter suggested that this must be regulatory language and not guidance. EPA disagrees that this needs to be mandatory language.

Since many of the smaller MS4s designated today are "donut holes" within the geographic jurisdiction of an already regulated MS4, the larger MS4's program generally will be adequate to address the newly regulated MS4's discharges. The small MS4 applicant should consider the adequacy of the existing MS4's program to address the smaller MS4's water quality needs, but EPA is not imposing specific requirements. Where circumstances suggest that the existing program is inadequate with respect to the newly designated MS4 and the applicant does not address the issue, the NPDES permitting authority must require that the existing program be supplemented.

Commenters recommended that the application deadline for smaller MS4s designated today be extended so that existing regulated MS4s would not have to modify their permit in the middle of their permit term, provided that permit renewal would occur within a reasonable time (12 to 18 months) of the deadline. In response, EPA notes that today's rule allows operators of newly designated small MS4s up to three years and 90 days from the promulgation of today's rule to submit an application to be covered under the permit issued to an already regulated MS4. The permitting authority has a reasonable time after receipt of the application to modify the existing permit to include the newly designated source. If an existing MS4's permit is up for renewal in the near future, the operator of a newly designated small MS4 may take that into account when timing its application and the NPDES permitting authority may take that into account when processing the application.

Another commenter suggested that the rule should include a provision to allow permit application requirements for smaller MS4s designated today to be determined by the permitting authority to account for the particular needs/wants of an already regulated MS4 operator. EPA does not believe that the regulations should specifically require this approach. When negotiating whether to include a newly designated MS4 in its program, the already regulated MS4 operator may require the newly designated MS4's operator to provide any information that is necessary.

The co-permitting approach allows small MS4s to take advantage of existing programs to ease the burden of creating their own programs. The operators of regulated small MS4s, however, may find it simpler to apply for a program under today's rule, and to identify the medium or large MS4 operator that is implementing portions of its § 122.34(b) minimum measures.

d. Evaluation and Assessment

Under today's rule, operators of regulated small MS4s are required to evaluate the appropriateness of their identified BMPs and progress toward achieving their identified measurable goals. The purpose of this evaluation is to determine whether or not the MS4 is meeting the requirements of the minimum control measures. The NPDES permitting authority is responsible for determining whether and what types of monitoring needs to be conducted and may require monitoring in accordance with State/Tribe monitoring plans appropriate to the watershed. EPA does not encourage requirements for "end-of-pipe" monitoring for regulated small MS4s. Rather, EPA encourages permitting authorities to carefully examine existing ambient water quality and assess data needs. Permitting authorities should consider a combination of physical, chemical, and biological monitoring or the use of other environmental indicators such as exceedance frequencies of water quality standards, impacted dry weather flows, and increased flooding frequency. (Claytor, R. and W. Brown. 1996. *Environmental Indicators to Assess Storm Water Control Programs and Practices.* Center for Watershed Protection, Silver Spring, MD.) Section II.L., Water Quality Issues, discusses monitoring in greater detail.

As recommended by the Intergovernmental Task Force on Monitoring Water Quality (ITFM), the NPDES permitting authority is encouraged to consider the following watershed objectives in determining monitoring requirements: (1) To characterize water quality and ecosystem health in a watershed over time, (2) to determine causes of existing and future water quality and ecosystem health problems in a watershed and develop a watershed management program, (3) to assess progress of watershed management program or effectiveness of pollution prevention and control practices, and (4) to support documentation of compliance with permit conditions and/or water quality standards. With these objectives in mind, the Agency encourages participation in group monitoring programs that can take advantage of existing monitoring programs undertaken by a variety of governmental and nongovernental entities. Many States may already have a monitoring program in effect on a watershed basis. The ITFM report is included in the docket for today's rule (Intergovernmental Task Force on Monitoring Water Quality. 1995. *The Strategy for Improving Water-Quality Monitoring in the United States: Final Report of the Intergovernmental Task Force on Monitoring Water Quality.* Copies can be obtained from: U.S. Geological Survey, Reston, VA.).

EPA expects that many types of entities will have a role in supporting group monitoring activities—including federal agencies, State agencies, the public, and various classes or categories of point source dischargers. Some regulated small MS4s might be required to contribute to such monitoring efforts. EPA expects, however, that their participation in monitoring activities will be relatively limited. For purposes of today's rule, EPA recommends that, in general, NPDES permits for small MS4s should not require the conduct of any additional monitoring beyond monitoring that the small MS4 may be already performing. In the second and subsequent permit terms, EPA expects that some limited ambient monitoring might be appropriately required for perhaps half of the regulated small MS4s. EPA expects that such monitoring will only be done in identified locations for relatively few pollutants of concern. EPA does not anticipate "end-of-pipe" monitoring requirements for regulated small MS4s.

EPA received a wide range of comments on this section of the rule. Some commenters believe that EPA should require monitoring; others want a strong statement that the newly regulated small MS4s should not be required to monitor. Many commenters raised questions about exactly what EPA expects MS4s to do to evaluate and assess their BMPs. EPA has intentionally written today's rule to provide flexibility to both MS4s and permitting authorities regarding appropriate evaluation and assessment. Permitting authorities can specify monitoring or other means of evaluation when writing permits. If additional requirements are not specified, MS4s can decide what they believe is the most appropriate way to evaluate their storm water management program. As mentioned above, EPA expects that the necessity for monitoring and its extent may change from permit cycle to permit cycle. This is another reason for making the evaluation and assessment rule requirements very flexible.

i. Recordkeeping. The NPDES permitting authority is required to include at least the minimum appropriate recordkeeping conditions in each permit. Additionally, the NPDES permitting authority can specify that permittees develop, maintain, and/or

submit other records to determine compliance with permit conditions. The MS4 operator must keep these records for at least 3 years but is not required to submit records to the NPDES permitting authority unless specifically directed to do so. The MS4 operator must make the records, including the storm water management program, available to the public at reasonable times during regular business hours (see 40 CFR 122.7 for confidentiality provision). The MS4 operator is also able to assess a reasonable charge for copying and to establish advance notice requirements for members of the public.

EPA received a comment that questioned EPA's authority to require MS4s to make their records available to the public. EPA disagrees with the commenter and believes that the CWA does give EPA the authority to require that MS4 records be available. It is also more practical for the public to request records directly from the MS4 than to request them from EPA who would then make the request to the MS4. Based on comments, EPA revised the proposed rule so as not to limit the time for advance notice requirements to 2 business days.

ii. Reporting. Under today's rule, the operator of a regulated small MS4 is required to submit annual reports to the NPDES permitting authority for the first permit term. For subsequent permit terms, the MS4 operator must submit reports in years 2 and 4 unless the NPDES permitting authority requires more frequent reports. EPA received several comments supporting this timing for report submittal. Other commenters suggested that annual reports during the first permit cycle are too burdensome and not necessary. EPA believes that annual reports are needed during the first 5-year permit term to help permitting authorities track and assess the development of MS4 programs, which should be established by the end of the initial term. Information contained in these reports can also be used to respond to public inquiries.

The report must include (1) the status of compliance with permit conditions, an assessment of the appropriateness of identified BMPs and progress toward achieving measurable goals for each of the minimum control measures, (2) results of information collected and analyzed, including monitoring data, if any, during the reporting period, (3) a summary of what storm water activities the permittee plans to undertake during the next reporting cycle, and (4) a change in any identified measurable goal(s) that apply to the program elements.

The NPDES permitting authority is encouraged to provide a brief two-page reporting format to facilitate compiling and analyzing the data from submitted reports. EPA does not believe that submittal of a brief annual report of this nature is overly burdensome, and has not changed the required reporting time frame from the proposal. The permitting authority will use the reports in evaluating compliance with permit conditions and, where necessary, will modify the permit conditions to address changed conditions.

iii. Permit-As-A-Shield. Section 122.36 describes the scope of authorization (i.e. "permit-as-a-shield") under an NPDES permit as provided by section 402(k) of the CWA. Section 402(k) provides that compliance with an NPDES permit is deemed compliance, for purposes of enforcement under CWA sections 309 and 505, with CWA sections 301, 302, 306, 307, and 403, except for any standard imposed under section 307 for toxic pollutants injurious to human health.

EPA's Policy Statement on Scope of Discharge Authorization and Shield Associated with NPDES Permits, originally issued on July 1, 1994, and revised on April 11, 1995, provides additional information on this matter.

e. Other Applicable NPDES Requirements

Any NPDES permit issued to an operator of a regulated small MS4 must also include other applicable NPDES permit requirements and standard conditions, specifically the applicable requirements and conditions at 40 CFR 122.41 through 122.49. Reporting requirements for regulated small MS4s are governed by § 122.34 and not the existing requirements for medium and large MS4s at § 122.42(c). In addition, the NPDES permitting authority is encouraged to consult the Interim Permitting Approach, issued on August 1, 1996. The discussion on the Interim Permitting Approach in Section II.L.1, Water Quality Based Effluent Limits, provides more information. The provisions of §§ 122.41 through 122.49 establish permit conditions and limitations that are broadly applicable to the entire range of NPDES permits. These provisions should be interpreted in a manner that is consistent with provisions that address specific classes or categories of discharges. For example, § 122.44(d) is a general requirement that each NPDES permit shall include conditions to meet water quality standards. This requirement will be met by the specific approach outlined in today's rule for the implementation of BMPs. BMPs are the most appropriate form of effluent limitations to satisfy technology requirements and water quality-based requirements in MS4 permits (see the introduction to Section II.H.3, Municipal Permit Requirements, Section II.H.3.h, Reevaluation of Rule, and the discussion of the Interim Permitting Policy in Section II.L.1. below).

f. Enforceability

NPDES permits are federally enforceable. Violators may be subject to the enforcement actions and penalties described in CWA sections 309, 504, and 505 or under similar water pollution enforcement provisions of State, tribal or local law. Compliance with a permit issued pursuant to section 402 of the Clean Water Act is deemed compliance, for purposes of sections 309 and 505, with sections 301, 302, 306, 307, and 403 (except any standard imposed under section 307 for toxic pollutants injurious to human health).

g. Deadlines

Today's final rule includes "expeditious deadlines" as directed by CWA section 402(p)(6). In proposed § 122.26(e), the permit application for the "ISTEA" facilities was maintained as August 7, 2001 and the permit application deadline for storm water discharges associated with other construction activity was established as 3 years and 90 days from the final rule date. In proposed § 122.33(c)(1), operators of regulated small MS4s were required to seek permit coverage within 3 years and 90 days from the date of publication of the final rule. In proposed § 122.33(c)(2), operators of regulated small MS4s designated by the NPDES permitting authority on a local basis under § 122.32(a)(2) must seek coverage under an NPDES permit within 60 days of notice, unless the NPDES permitting authority specifies a later date.

In order to increase the clarity of today's final rule, EPA has changed the location of some of the above requirements. All application deadlines for both Phase I and Phase II are now listed or referenced in § 122.26(e). Section 122.26(e)(1) contains the deadlines for storm water associated with industrial activity. Paragraph (i) has been changed to correct a typographical error. Paragraph (ii) has been revised to reflect the changed application date for "ISTEA" facilities. (See discussion in section I.3, ISTEA Sources). The application deadline for storm water discharges associated with other construction activity is now in a new § 122.26(e)(8). The application deadline for regulated small MS4s

remains in § 122.33(c) because this section is written in "readable regulation" format, but it is also described in a new § 122.26(e)(9).

Under today's rule, permitting authorities are allowed up to 3 years to issue a general permit and MS4s designated under § 122.32(a)(1) are allowed up to 3 years and 90 days to submit a permit application. Operators of regulated small MS4s that choose to be a co-permittee with an adjoining MS4 with an existing NPDES storm water permit must apply for a modification of that permit within the same time frame. Several commenters stated that 90 days was not adequate time to submit an NOI. This might be true if facilities did not start developing their storm water program until publication of their general permit. In fact, municipalities should start developing their storm water program upon publication of today's final rule, if they have not already done so. Municipalities that are uncertain if they fall within the urbanized area should ask their permitting authority. EPA believes that municipalities should not automatically take three years and 90 days to develop a program and submit their NOI. Three years is the maximum amount of time to issue a general permit. MS4s that are automatically designated under today's rule may have less than 3 years and 90 days if the permitting authority issues a permit that requires submission of NOIs before that time. EPA encourages States to modify their NPDES program to include storm water and issue their permits as soon as possible. It is important for permitting authorities to keep their municipalities informed of their progress in developing or modifying their NPDES storm water requirements.

EPA recognizes that MS4s brought into the program due to the 2000 Census calculations do not have as much time to develop a program as those already designated from the 1990 Census. However, the official Bureau of the Census urbanized area calculation for the 2000 Census is expected to be published in the **Federal Register** in the spring of 2002, which should give the potentially affected MS4s adequate time to prepare for compliance under the applicable permit. However, if the publication of this information is delayed, MS4s in newly designated urbanized areas will have 180 days from the time the new designations are published to submit an NOI, consistent with the time frame for other regulated MS4s that are designated after promulgation of the rule.

The proposed application deadline for MS4s designated under § 122.32(a)(2) was within 60 days of notice. Many commenters stated that 60 days does not provide adequate time for the preparation of an NOI or permit application. EPA agrees that newly designated MS4s may not be aware that they might be designated since the permitting authority could take several years to develop designation criteria. EPA has decided that the application time frame for these facilities should be consistent with the 180 days allowed for facilities designated under §§ 122.26(a)(9)(i)(C) and (D). Section 122.33(c)(2) of today's final rule contains the modified time frame of 180 days to apply for coverage.

h. Reevaluation of Rule

The municipal caucus of the Storm Water Phase II FACA Subcommittee asked EPA to demonstrate its commitment to revisit the municipal requirements of today's rule and make changes where necessary after evaluating the storm water program and researching the effectiveness of municipal BMPs. In § 122.37 of today's final rule, EPA commits to revisiting the regulations for the municipal storm water discharge control program after completion of the first two permit terms. EPA intends to use this time to work closely with stakeholders on research efforts. Gathering and analyzing data related to the storm water program, including data regarding the effectiveness of BMPs, is critical to EPA's storm water program evaluation. EPA does not intend to change today's NPDES municipal storm water program until the end of this period, except under the following circumstances: a court decision requires changes; a technical change is necessary for implementation; or the CWA is modified, thereby requiring changes. After careful analysis, EPA might also consider changes from consensus-based stakeholder requests regarding requirements applicable to newly regulated MS4s. EPA will apply the August 1, 1996, Interim Permitting Approach to today's program during this interim period and encourages all permitting authorities to use this approach in municipal storm water permits for newly regulated MS4s and in determining MS4 permit requirements under a TMDL approach. After careful consideration of the data, EPA will make modifications as necessary.

EPA received comments that supported waiting two permit cycles before re-evaluating the rule and other comments that requested re-evaluation much sooner. EPA anticipates two full permit cycles are necessary to obtain enough data to significantly evaluate the rule. The re-evaluation time frame of 13 years from today remains as proposed.

I. Other Designated Storm Water Discharges

1. Discharges Associated with Small Construction Activity

Section 122.26(b)(15) of today's rule designates certain construction activities for regulation as "storm water discharges associated with small construction activity." Specifically, storm water discharges from construction activity equal to or greater than 1 acre and less than 5 acres are automatically designated except in those circumstances where the operator (i.e., person responsible for discharges that might occur) certifies to the permitting authority that one of two specific waiver circumstances (described in section b. below) applies. Sites below one acre may be designated under § 122.26(b)(15)(ii) where necessary to protect water quality.

Today's rule regulates these construction-related storm water sources under CWA section 402(p)(6) to protect water quality rather than under CWA section 402(p)(2). Designation under 402(p)(6) gives States and EPA the flexibility to waive the permit requirement for construction activity that is not likely to impair water quality, and to designate additional sources below one acre that are likely to cause water quality impairment. Thus, the one acre threshold of today's rule is not an absolute threshold like the five acre threshold that applies under the existing storm water rule.

Today's rule regulating certain storm water discharges from construction activity disturbing less than 5 acres is consistent with the 9th Circuit remand in *NRDC* v. *EPA*, 966 F.2d 1292 (9th Cir. 1992). In that case, the court remanded portions of the existing storm water regulations related to discharges from construction sites. The existing Phase I regulations define "storm water discharges associated with industrial activity" to include storm water discharges from construction sites disturbing 5 acres or more of total land area (see 40 CFR 122.26(b)(14)(x)). In its decision, the court concluded that the 5-acre threshold was improper because the Agency had failed to identify information "to support its perception that construction activities on less than 5 acres are non-industrial in nature" (966 F.2d at 1306). The court remanded the exemption to EPA for further proceedings (966 F.2d at 1310). EPA's objectives in today's action include an effort to (1) address the 9th Circuit

remand to reconsider regulation of storm water discharges from construction activities that disturb less than 5 acres of land, (2) address water quality concerns associated with such activities, and (3) balance conflicting recommendations and concerns of stakeholders in the regulation of additional construction activity.

EPA responded to the Ninth Circuit's decision by designating discharges from construction activities that disturb between 1 and 5 acres as "discharges associated with small construction activity" under CWA section 402(p)(6), rather than as "discharges associated with industrial activity" under CWA section 402(p)(2)(B). Although a size criterion alone may be an indicator of whether runoff from construction sites between 1 and 5 acres is "associated with industrial activity," the Agency is instead relying on a size threshold in tandem with provisions that allow for designations and waivers based on potential for "predicted water quality impairments" to regulate construction sites between 1 and 5 acres under CWA section 402(p)(6). This approach was chosen by the Agency for the sake of simplicity and certainty and, most importantly, to protect water quality consistent with the mandate of CWA section 402(p)(6). Today's rule also includes extended application deadlines for this new category of dischargers under the authority of CWA section 402(p)(6) (see § 122.26(e)(8) of today's rule).

In today's rule, EPA is regulating storm water discharges from additional construction sites to better protect the Nation's waters, while remaining sensitive to a concern that the Agency should not regulate discharges from construction sites that might not or do not have adverse water quality impacts. EPA believes that today's rule will successfully accomplish this objective by establishing a 1-acre threshold nationwide that includes the flexibility to allow the permitting authority to both waive requirements for discharges from sites that are not expected to cause adverse water quality impacts and to designate discharges from sites below 1-acre based on adverse water quality impacts.

In addition to the diminishing water quality benefits of regulating all sites below one acre, the Agency relied on practical considerations in establishing a one acre threshold and not setting a lower threshold. Regardless of the threshold established by EPA, a NPDES permit can only be required if a construction site has a point source discharge. A point source discharge means that pollutants are added to waters of the United States through a discernible, confined, discrete conveyance. "Sheet flow" runoff from a small construction site would not result in a point source discharge unless and until it channelized. As the amount of disturbed land surface decreases, precipitation is less likely to channelize and create a "point source" discharge (assuming the absence of steep slopes or other factors that lead to increased channelization). Categorical designation of very small sites may create confusion about applicability of the NPDES permitting program to those sites. EPA's one acre threshold reflects, in part, the need to recognize that smaller sites are less likely to result in point source discharges. Of course, the NPDES permitting authority could designate smaller sites (below one acre, assuming point source discharges occur from the smaller designated sites) for regulation if a watershed or other local assessment indicated the need to do so. The Phase II rule includes this designation authority at 40 CFR 122.26(a)(9)(i)(D) and (b)(15)(ii).

The one acre threshold also provides an administrative tool for more easily identifying those sites that are identified for coverage by the rule (but may receive a waiver) and those that are not automatically covered (but may be designated for inclusion). Although all construction sites less than five acres could have a significant water quality impact cumulatively, EPA is automatically designating for permit coverage only those storm water discharges from construction sites that disturb land equal to or greater than one acre. Categorical regulation of discharges from construction below this one acre threshold would overwhelm the resources of permitting authorities and might not yield corresponding water quality benefits. Construction activities that disturb less than one acre make up, in total, a very small percentage of the total land disturbance from construction nationwide. The one acre threshold is reasonable for accomplishing the water quality goals of CWA section 402(p)(6) because it results in 97.5% of the total acreage disturbed by construction being designated for coverage by the NPDES storm water program, while excluding from automatic coverage the numerous smaller sites that represent 24.7% of the total number of construction sites.

Some commenters believed that EPA has not adequately identified water quality problems associated with storm water discharges from construction activity disturbing less than five acres. Other commenters believed that storm water discharges from small construction activity is a significant water quality problem nationwide. Section I.B.3, Construction Site Runoff, provides a detailed discussion of adverse water quality impacts resulting from construction site storm water discharges. EPA is regulating storm water discharges from construction activity disturbing between 1 and 5 acres because the cumulative impact of many sources, and not just a single identified source, is typically the cause for water quality impairments, particularly for sediment-related water quality standards.

Several commenters requested that EPA regulate discharges from small construction activity as "discharges associated with industrial activity" under CWA 402(p)(4) and not, as proposed, as "storm water discharges associated with other activity" under CWA 402(p)(6). EPA is regulating discharges from small construction sites as "small construction activity" under the authority of CWA section 402(p)(6), rather than section 402(p)(4), to ensure that regulation of these sources is water quality-sensitive. CWA section 402(p)(6) affords the opportunity for designations and waivers of sources based on potential for "predicted water quality impairments." Regulation of storm water "associated with industrial activity" does not necessarily focus regulation to protect water quality.

a. Scope

The definition of "storm water discharges associated with small construction activity" includes discharges from construction activities, such as clearing, grading, and excavating activities, that result in the disturbance of equal to or greater than 1 acre and less than 5 acres (see § 122.26(b)(15)(i)). Such activities could include: road building; construction of residential houses, office buildings, or industrial buildings; or demolition activity. The definition of "storm water discharges associated with small construction activity" also includes any other construction activity, regardless of size, designated based on the potential for contribution to a violation of a water quality standard or for significant contribution of pollutants to waters of the United States (§ 122.26(b)(15)(ii)). This designation is made by the Director, or in States with approved NPDES programs, either the Director or the EPA Regional Administrator.

For the purposes of today's rule, the definition of "storm water discharges associated with small construction activity" includes discharges from activities disturbing less than 1 acre if that construction activity is part of a

"larger common plan of development or sale" with a planned disturbance of equal to or greater than 1 acre of land. A "larger common plan of development or sale" means a contiguous area where multiple separate and distinct construction activities are planned to occur at different times on different schedules under one plan, *e.g.*, a housing development of five ¼ acre lots (§ 122.26(b)(15)(i)).

In addition to the regulatory text for smaller construction, the Agency is also revising the existing text of § 122.26(b)(14)(x) to clarify EPA's intention regarding construction projects involving a larger common plan of development or sale ultimately disturbing 5 or more acres. Operators of such sites are required to seek coverage under an NPDES permit regardless of the number of lots in the larger plan because designation for permit coverage is based on the total amount of land area to be disturbed under the common plan. This designation attempts to address the potential cumulative effects of numerous construction activities concentrated in a given area.

Several commenters asked that EPA allow the permitting authority to set the appropriate size threshold based on water quality studies. While EPA agrees that location-specific water quality studies provide an ideal information base from which to make regulatory decisions, today's rule establishes a default standard for regulation in the absence of location-specific studies. The rule does allow for deviation from the default standard through additional designations and waivers, however, when supported by location-specific water quality information. The rule codifies the ability of permitting authorities to provide waivers for sites greater than or equal to one acre (the default standard) and designate additional discharges from small sites below one acre when location-specific information suggests that the default 1 acre standard is either unnecessary (waivers) or too limited (designations) to protect water quality.

Some commenters wanted EPA to base the regulation of storm water discharges from construction sites not only on size, but also on the duration and intensity of activity occurring on the site. EPA believes that a national 1-acre threshold, in combination with waivers and additional designations, is the most effective and simplest way to address adverse water quality impacts from storm water from small construction sites. Moreover, as discussed below, the waiver for rainfall erosivity does account for projects of limited duration. EPA believes, however, that the intensity of activity occurring on-site would be a very difficult condition to quantify.

Many commenters requested that EPA maintain the 5 acre threshold from the existing regulations, which include opportunities for site-specific designation, as the regulatory scope for regulating storm water from construction sites, *i.e.*, that the Agency not automatically regulate storm water discharges from sites less than 5 acres. Several commenters wanted construction requirements to be applied to sites smaller than 1 acre, while some commenters suggested alternative thresholds of 2 or 3 acres. The rest of the commenters supported the 1 acre threshold. None of the commenters presented any data or rationales to support a specific size threshold.

EPA examined alternative size thresholds, including 0.5 acre, 1 acre, 2 acres and 5 acres. EPA had difficulty evaluating the alternative size thresholds because, while directly proportional to the size of the disturbed site, the water quality threat posed by discharges from construction sites of differing sizes varies nationwide, depending on the local climatological, geological, geographical, and hydrological influences. In order to ensure improvements in water quality nationwide, however, today's rule does not allow various permitting authorities to establish different size thresholds except based on the waiver and designation provisions of the rule. EPA believes that the water quality impact from small construction sites is as high as or higher than the impact from larger sites on a per acre basis. By selecting the 1 acre size threshold and coupling it with waivers and additional designations, EPA is seeking to standardize improvement of water quality on a national basis while providing permitting authorities with the opportunity to designate those unregulated activities causing water quality impairments regardless of site size, as well as to waive requirements when information demonstrates that regulation is unnecessary.

EPA recognizes that the size criterion alone may not be the most ideal predictor of the need for regulation, but effective protection of water quality depends as much on simplicity in implementation as it does on the scientific information underlying the regulatory criteria. The default size criterion of 1 acre will ensure protection against adverse water quality impacts from storm water from small construction sites while not overburdening the resources of permitting authorities and the construction industry to implement the program to protect water quality in the first place.

One commenter stated a need to clarify whether routine road maintenance is considered construction activity for the purpose of today's rule. The NPDES general permit for discharges from construction sites larger than 5 acres defined "commencement of construction" as the *initial* disturbance of soils associated with clearing, grading, or excavating activities or other construction activities (63 FR 7913). For construction sites disturbing less than 5 acres, EPA does not consider construction activity to include *routine* maintenance performed to maintain the *original* line and grade, hydraulic capacity, or original purpose of the facility.

Two commenters believed that the Multi-Sector General Permit for storm water discharges from industrial activities (MSGP) (60 FR 50804) already applies to storm water discharges from construction activities at oil and gas exploration and production sites and asked for a clarification on this issue. Commenters also requested a single general permit to authorize both industrial storm water discharges and construction site discharges which occur at the same industrial site.

Currently, when construction activity disturbing more than 5 acres occurs on an industrial site covered by the MSGP, authorization under a separate NPDES construction permit is needed because the MSGP does not include the "construction" industrial sector. While the MSGP does address sediment and erosion control, it is not as specific as the NPDES general permit for storm water discharges from construction activities disturbing more than 5 acres. Though permitting authorities could conceivably develop a single general permit to authorize storm water discharges associated with construction activity at these industrial facilities, the commenter's request is not addressed by today's rulemaking. When today's rule is implemented through general permits (to be issued later), the permitting authority will have discretion whether or not to incorporate the permit requirements for both the industrial storm water discharges and construction site storm water discharges into a single general permit. This type of request should be addressed to the permitting authority.

One commenter suggested that discharges from small construction sites should be regulated through a "self-implementing rule" approach. While today's rule is not a self-implementing rule, it does add § 122.28(b)(2)(v), which

gives the permitting authority the discretion to authorize a construction general permit for sites less than 5 acres without submitting a notice of intent. Such non-registration general permits function similarly to self-implementing rules, but are, in fact, permits. Today's rule will be implemented through NPDES permits rather than self-implementing regulations to capitalize on the compliance, tracking, enforcement, and public participation associated with NPDES permits (see discussion in section II.C).

Other commenters believed that only the permitting authority should regulate construction site storm water discharges (under a NPDES permit) and that a small MS4 operator's regulation of storm water discharges associated with construction (under the small MS4 NPDES storm water program) is redundant. EPA disagrees that control measure implementation by the NPDES authority and the small MS4 operator is redundant. To the extent the two efforts overlap, today's rule provides for consolidation and coordination of substantive requirements via incorporation by reference permitting. Small MS4s operators may choose to impose more prescriptive requirements than an NPDES permitting authority based on localized water quality needs. In those cases, EPA intends that the substantive requirements from the small MS4 program should apply as the NPDES permit requirements for the construction site discharger. In cases where a small MS4 program does not prioritize and focus on storm water from construction sites (beyond the small MS4 minimum control measure in today's rule, which does not require the small MS4 operator to control construction site discharges in a manner as prescriptive as is expected for discharges regulated under NPDES permits), the Agency intends that the NPDES general permit will provide the substantive standards applicable to the construction site discharge. EPA does anticipate, however, that implementation of MS4 programs to address construction site runoff within their jurisdiction will enhance overall NPDES compliance by construction site dischargers. EPA also notes that under § 122.35(b), the permitting authority may recognize its own program to control storm water discharges from construction sites in lieu of requiring such a program in an MS4's NPDES permit, provided that the permitting authority's program satisfies the requirements of § 122.34(b)(4), including, for example, procedures for site plan reviews and consideration of information submitted by the public on individual construction sites in each jurisdiction required to be covered by the program.

b. Waivers

Under § 122.26(b)(15)(i) of today's rule, NPDES permitting authorities may waive today's requirement for construction site operators to obtain a permit in two circumstances. The first waiver is intended to apply where little or no rainfall is expected during the period of construction. The second waiver may be granted when a TMDL or equivalent analysis indicates that controls on construction site discharges are not needed to protect water quality.

The first waiver is based on "low predicted rainfall erosivity" which can be found using tables of rainfall-runoff erosivity (R) values published for each region in the U.S. R factors are published in the U.S. Department of Agriculture (USDA) Agricultural Handbook 703 (Renard, K.G., Foster, G.R., Weesies, G.A., McCool, D.K., and D.C. Yoder. 1997. *Predicting Soil Erosion by Water: A Guide to Conservation Planning with the Revised Universal Soil Loss Equation (RUSLE).* U.S. Department of Agriculture Handbook 703). The R factor varies based on the time during the year when construction activity occurs, where in the country it occurs, and how long the construction activity lasts. The permitting authority may determine, using Handbook 703, which times of year, if any, the waiver opportunity is available for construction activity. EPA will provide assistance either through computer programs or the World Wide Web on how to determine whether this waiver applies for a particular geographic area and time period. Application of this waiver for regulatory purposes will be determined by the authorized NPDES authority. This waiver is discussed further in the following section titled Rainfall-Erosivity Waiver.

The second waiver is based on a consideration of ambient water quality. This waiver is available after a State or EPA develops and implements TMDLs for the pollutant(s) of concern from storm water discharges associated with construction activity. This waiver is also available for sites discharging to non-impaired waters that do not require TMDLs, when an equivalent analysis has determined allocations for small construction sites for the pollutant(s) of concern or determined that such allocations are not needed to protect water quality based on consideration of existing in-stream concentrations, expected growth in pollutant contributions from all sources, and a margin of safety. The Agency envisions an equivalent analysis that would demonstrate that water quality is *not* threatened by storm water discharges from small construction activity. This waiver is discussed further below in the sections titled TMDL Waiver and Water Quality Issues.

The proposed rule included a waiver based on "low predicted soil loss." This waiver provision would have been applicable on a case-by-case basis where the annual soil loss rate for the period of construction for a site, using the Revised Universal Soil Loss Equation (RUSLE), would be less than 2 tons/acre/year. The annual soil loss rate of less than 2 tons/acre/year would be calculated through the use of the RUSLE equation, assuming the constants of no ground cover and no runoff controls in place.

Several commenters found the low soil loss waiver too complex and impractical, and stated that expertise is not available at the local level to prepare and evaluate eligibility for the waiver. Another commenter questioned whether two tons/acre/year was an appropriate threshold for predicting adverse water quality impacts. Two other commenters said that RUSLE was never intended to predict off-site impacts and is not an indicator of potential harm to water quality. EPA agrees with the commenters on the difficulty associated with determining and implementing this waiver. Most construction site operators are not familiar with the RUSLE program, and the potential burden on the permitting authority, construction industry, USDA's Natural Resources Conservation Service and conservation districts probably would have been significant. The Agency has not included this waiver in the final rule.

Two commenters asked that EPA allow States the flexibility to develop their own waiver criteria but did not suggest how the Agency (or affected stakeholders) could evaluate the acceptability of alternative State waiver criteria. Therefore, the final rule does not provide for any such alternative waivers. If a State does seek to develop alternate waiver criteria, then EPA procedures afford the opportunity for subsequent actions, for example, under the Project XL Program in EPA's Office of Reinvention, which seeks cleaner, smarter, and cheaper solutions to environmental problems. Many commenters suggested that EPA extend these waivers to existing industrial storm water regulations for construction activity greater than 5 acres. These construction site discharges are

regulated as industrial storm water discharges under CWA 402(p)(2) and are not eligible for such water quality-based waivers.

Two commenters were concerned that waivers would create a potential for significant degradation of small streams. EPA disagrees. If small streams are threatened, the permitting authority would choose not to provide any waivers. In addition, permitting authorities may protect small streams by designating discharges from small construction activity based on the potential for contribution to a violation of a water quality standard or for significant contribution of pollutants to waters of the U.S.

Two commenters asked that the waiver options be eliminated. They felt it would create a gross inequity within the construction community if some projects will not be subject to the requirements of today's rule. While the comments may be valid, EPA disagrees that waivers should be disallowed on this basis. Construction site discharges that qualify for a waiver from permitting requirements are not expected to present a threat to water quality, which is the basis for designation and regulation under today's rule.

A number of commenters suggested additional waivers in cases where new development will result in no additional adverse impacts to water quality as compared to the existing development it replaces. EPA believes these waivers are either unworkable or unnecessary. It would be very difficult for most construction operators to determine, as well as for other stakeholders to verify, on a site-by-site basis, that there is no potential for adverse impact to water quality compared to the replaced development.

Other commenters proposed waivers in cases where a local erosion and sediment control program covers the project or a separate waiver for small linear utility projects. Instead of waivers, today's rule addresses the first suggestion through the qualifying program provision described in the section titled Cross-Referencing State/Local Erosion and Sediment Control Programs below. Today's rule provides waivers for small linear projects in so far as they satisfy conditions for low rainfall erosivity. (See § 122.26(b)(15)(i)(A).)

Other commenters suggested waivers based on distance to water body, existence of vegetated buffer around water body, slope of disturbed land, or if discharging to very large bodies of water. As a result of public outreach, EPA believes that these proposed waivers would be generally unworkable for construction site dischargers and permitting authorities because of the difficulty in applying them to all small sites.

One commenter mentioned that waivers for the R factor (rainfall-erosivity) and soil loss are effluent standards that have not been developed in accordance with sections 301 and 304 of the CWA. EPA disagrees that these sections are relevant to the designation of sources in today's rule. The waiver provisions in this section of the rule are jurisdictional because they affect the scope of the universe of entities subject to the NPDES program. Therefore, the waiver provisions are not themselves substantive control standards implemented through NPDES permits, and thus, not subject to the statutory criteria in sections 301 and 304.

Another commenter stated that waivers would allow exemptions to the technology based requirements and would thus be inconsistent with the two-fold approach of the CWA (a technology based minimum and a water quality based overlay). EPA acknowledges that the CWA does not generally provide for waivers for the Act's technology-based requirements. The waiver provisions do not create exemptions from technology-based standards that apply to NPDES dischargers; they provide exemption from the underlying requirement for an NPDES permit in the first place. Protection of water quality is the reason these smaller sites are designated for regulation under NPDES. The Act's two fold approach imposes more stringent water quality based effluent limitations when technology-based limitations applicable to regulated dischargers are insufficient to meet water quality standards. Under today's rule, water quality protection is the basis for determining which of the unregulated sources should be regulated at all. Thus, today's rule is entirely consistent with the Act's two fold approach.

i. Rainfall-Erosivity Waiver. The rainfall-erosivity waiver under § 122.26(b)(15)(i)(A) is intended to exempt the requirements for a permit when and where negligible rainfall/runoff-erosivity is expected. In the development of the Universal Soil Loss Equation, analysis of data indicated that when factors other than rainfall are held constant, soil loss is directly proportional to a rainfall factor composed of total storm kinetic energy times the maximum 30 minute intensity. The average annual sum of the storm energy and intensity values for an area comprise the R factor—the rainfall erosivity index. A detailed explanation of the R factor can be found in *Predicting Soil Erosion by Water: A Guide to Conservation Planning With the Revised Universal Soil Loss Equation (RUSLE)* (USDA, 1997).

This waiver is time-sensitive and is dependent on when during the year a construction activity takes place, how long it lasts, and the expected rainfall and intensity during that time. R factors vary based on location. EPA anticipates that this waiver opportunity responds to concerns about the requirement for a permit when it is not expected to rain, especially in the arid areas of the U.S. Under today's rule, the permitting authority could waive the requirements for a permit for time periods when the rainfall-erosivity factor ("R" in RUSLE) is less than *five* during the period of construction. For the purposes of calculating this waiver, the period of construction activity starts at the time of initial disturbance and ends with the time of final stabilization. The operator must submit a written certification to the Director in order to apply for such a waiver. EPA believes that those areas receiving negligible rainfall during certain times of the year are unlikely to have storm events causing discharges that could adversely impact receiving streams. Consequently, BMPs would not be necessary on those smaller sites. This waiver is most applicable to projects of short duration and to the arid regions of the country where the occurrence of rainfall follows a cyclic pattern—between no rain and extremely heavy rain. EPA review of rainfall records for these areas indicates that, during periods of the year when the number of events and quantity of rain are low, storm water discharges from the smaller construction sites regulated under today's rule should be minimal.

Some commenters supported the use of the R factor as a waiver, while others felt that a waiver based on rainfall statistics ignores the fact that it may rain on any given day and it is the cumulative effect of wet weather discharges which cause water quality impairments. A commenter also asked what happens in "El Nino" years when significantly more rainfall than normal occurs. Another commenter also expressed concern that this waiver was not based on a measured water quality impact, but instead on an indicator of potential impact. In response to the previous comments, EPA notes that, under CWA 402(p)(6), sources are designated on their *potential* for adverse impact. Designation under the section is prospective, not retrospective or remedial only. For that reason, the waivers under today's rule also operate prospectively. EPA wanted to waive requirements for sites with little

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potential to impair water quality, and the R factor is the most straightforward way to do this. The permitting authority, if electing to use waivers, could always suspend the use of waivers in certain areas or during certain times. In addition, the permitting authority may choose to use a lower R factor threshold than the one set by EPA. Application of this waiver is at the discretion of the permitting authority, subject only to the limitation that R factors cannot exceed 5.

One commenter expressed the need for EPA to provide a justification for the threshold value used for the R factor. None of the commenters included any data to show that EPA's proposed R factor of 2 was either too high or too low. EPA is using the R factor as an indicator of the potential to impact water quality. In an effort to determine which R threshold should be used, EPA conducted additional analysis of the rainfall/runoff erosivity factor for 134 sites across the country. For an R factor threshold of 5, approximately 12% of sites would be waived if the project period lasted 6 months, 27% for 3 months, 47% for 1 month, and 60% of sites would be waived if the project lasted for only 15 days. None of the 134 sites would be waived if the project lasted an entire year. For an R factor threshold of 2, approximately 9% of sites would be waived if the project period lasted 6 months, 15% for 3 months, 31% for 1 month, and 43% for 15 days. For an R factor threshold of 10, approximately 22% of sites would be waived if the project period lasted 6 months, 37% for 3 months, 60% for 1 month, and 78% for 15 days. EPA believes that an R factor of 5 is an adequate threshold to waive requirements for sites because they would not reasonably be expected to impair water quality.

EPA will develop, as part of the tool box described in section II.A.5, guidance materials and computer or web-accessible programs to assist permitting authorities and construction site discharges in determining if any resulting storm water discharges from specific projects are eligible for this waiver.

ii. Water Quality Waiver. The water quality waiver under § 122.26(b)(15)(i)(B) is available where storm water controls are not needed based on a comprehensive, location-specific evaluation of water quality needs. The waiver is available based on either an EPA-approved "total maximum daily load" (TMDL) under section 303(d) of the CWA that addresses the pollutant(s) of concern or, for sites discharging to non-impaired waters that do not require TMDLs, an equivalent analysis that has either determined allocations for small construction sites for the pollutant(s) of concern or determined that such allocations are not needed to protect water quality based on consideration of existing in-stream concentrations, expected growth in pollutant contributions from all sources, and a margin of safety. The pollutants of concern that must be addressed include sediment or a parameter that addresses sediment (such as total suspended solids (TSS), turbidity or siltation) and any other pollutant that has been identified as a cause of impairment of any water body that will receive a discharge from the construction activity. The operator must certify to the NPDES permitting authority that the construction activity will take place, and storm water discharges will occur, within the applicable drainage area evaluated in the TMDLs or equivalent analyses.

Today's rule modifies the approach in the proposed rule. EPA proposed to allow a waiver of permit requirements for small construction if storm water controls were determined to be unnecessary based on "wasteload allocations that are part of 'total maximum daily loads' (TMDLs) that address the pollutants of concern," or "a comprehensive watershed plan, implemented for the water body, that includes the equivalents of TMDLs, and addresses the pollutants of concern."

Commenters asked for clarification of the terms "comprehensive watershed plans" and "equivalent of TMDLs." EPA intended that both terms would include a comprehensive analysis that determines that controls on small construction sites are not needed based on consideration of existing in-stream concentrations, expected growth in pollutant contributions from all sources, and a margin of safety. Today's rule makes this clarification.

One commenter pointed out that there are no water quality standards for suspended solids, the major pollutant expected in discharges from construction activity. The commenter asserted that no waiver would ever be available. Another commenter noted that there are no sediment criteria developed for streams, also making this waiver useless. EPA notes that a number of States and Tribes have water quality standards that address TSS, which are narrative in form, and that may serve as a basis for water quality-based effluent limits. As efforts to identify impairments and improve water quality progress, some States may yet develop water quality standards for suspended solids. Although several TMDLs for sediment and related parameters have been established, EPA does recognize that currently it is extremely difficult to develop TMDLs for sediment. EPA is partially addressing this concern by clarifying in today's rule that the waivers may be based on a TMDL or equivalent analyses for sediment or one of the various pollutant parameters that are a proxy for sediment. These include TSS, turbidity and siltation.

Other commenters noted that this waiver was unattainable if a TMDL or equivalent analysis must be available for every pollutant that could possibly be present in any amount in discharges from small construction sites regardless of whether the pollutant is causing water quality impairment. Commenters asked that EPA identify what constitutes the "pollutants of concern" for which a TMDL or its equivalent must be developed. EPA has revised the proposed rule in response to these concerns.

In order for discharges from construction sites under five acres to qualify for the water quality waiver of today's rule, the construction site operator must demonstrate that storm water controls are not necessary for sediment or a parameter that addresses sediment (such as TSS, turbidity or siltation) and any other pollutant that has been identified as a cause of impairment of any water body that will receive a discharge from the construction activity. Even if the water body is not currently impaired for sediment, today's rule requires an analysis of the potential impacts of sediment because the storm water discharges from the construction activity will be a new source of loading to the water body that could constitute a new impairment. Because the water body will not necessarily have been included on a "303(d) list" and a TMDL will not necessarily be required, the rule continues to allow an analysis that is the equivalent of a TMDL. The designation of storm water discharges from small construction activity for regulation in today's rule is intended to control pollutants other than sediment. This waiver provision requires a TMDL or equivalent analysis for a pollutant other than gross particulates (*i.e.*, sediment and other particulate-focused pollutant parameters) only if the receiving water is currently impaired for that pollutant.

One commenter expressed the concern that construction operators will not know if they are in a watershed covered by a TMDL. To the extent this is an operator's concern, he or she could contact their NPDES permitting

authority before applying for permit coverage to determine if receiving water is subject to a TMDL. Alternatively, the permitting authority could identify the TMDL (or equivalent analysis) areas in the general permit or another operator-accessible information source.

Another commenter expressed the concern that a TMDL waiver is likely to be ineffective because the TMDL list is submitted only once every 2 years. By the time a water is listed, the activity may have been completed and stabilized. The commenter argued that, if a watershed is impaired due to sediment from construction, then storm water controls will still be needed, because small construction can only be waived when it is not identified as a source of impairment. In response, EPA notes that an analysis that is the equivalent of a TMDL (specifically, equivalent to the component of a TMDL that comprehensively analyses existing ambient conditions against the applicable water quality standards) may also provide a basis for waiver from the default 1 acre designation. Also, even if a water has been identified as impaired for sediment, it is possible that a site or category of sites may receive an allocation that is sufficiently high enough to allow discharges without storm water controls.

c. Permit Process and Administration

The operator of the construction site, as with any operator of a point source discharge, is responsible for obtaining coverage under a NPDES permit as required by § 122.21(b). The "operator" of the construction site, as explained in the current NPDES construction general permit, is typically the party or parties that either individually or collectively meet the following two criteria: (1) Operational control over the site specifications, including the ability to make modifications in the specifications; and (2) day-to-day operational control of those activities at the site necessary to ensure compliance with permit conditions (63 FR 7859). If more than one party meets these criteria, then each party involved would typically be a co-permittee with any other operators. The operator could be the owner, the developer, the general contractor, or individual contractor. When responsibility for operational control is shared, all operators must apply.

In today's rule, EPA is not requiring an NOI for NPDES general permits for storm water discharges from construction activities regulated by § 122.26(b)(15) if the NPDES permitting authority finds that the use of NOIs would be inappropriate (see § 122.28(b)(2)(v)). Under this approach, the NPDES permitting authority will have the discretion to decide whether or not to require NOIs for discharges from construction activity less than 5 acres. Compared to the existing storm water regulation, the permitting authority thus has increased flexibility in program implementation. EPA does recommend the use of NOIs, however because NOIs track permit coverage and provide a useful information source to prioritize inspections or enforcement. Requiring an NOI allows for greater accountability by, and tracking of, dischargers. This simple permit application and reporting mechanism also allows for better outreach to the regulated community, uses an existing and familiar mechanism, and is consistent with the existing requirements for storm water discharges from larger construction activities. Today's rule does not amend the requirement for NOIs in general permits for storm water discharges from construction activity disturbing 5 acres for more. See § 122.28(b)(2)(v).

EPA expects that the vast majority of discharges of storm water associated with small construction activity identified in § 122.26(b)(15) will be regulated through general permits. In the event that an NPDES permitting authority decides to issue an individual construction permit, however, individual application requirements for these construction site discharges are found at § 122.26(c)(1)(ii). For any discharges of storm water associated with small construction activity identified in § 122.26(b)(15) that are not authorized by a general permit, a permit application made pursuant to § 122.26(c) must be submitted to the Director by 3 years and 90 days after publication of the final rule.

Some commenters expressed concern that linear construction projects (*e.g.*, roads, highways, pipelines) that cross several jurisdictions will have to comply with multiple sets of requirements from various jurisdictions, including multiple local governments and States. EPA is limited in its options to address these concerns because the Agency cannot issue NPDES permits in States authorized to implement the NPDES program nor preempt other more stringent local and State requirements. EPA believes, however, that the option for incorporating by reference the State, Tribal or local requirements (see discussion in Section II.I.2.d., Cross-Referencing State/Local Erosion and Sediment Control Programs) should limit the administrative burden on the operator responsible for discharges from linear construction projects. If the operator were to implement the most comprehensive of the various requirements for the whole project, it could avoid confusion due to differing requirements for different sections of the project. In addition, linear utility projects, which usually have a shorter project period, are more likely to be eligible for the rainfall erosivity waiver.

One commenter stated there was no reason to delay the application period for regulated storm water discharges from small construction activities. The commenter requested that the newly regulated construction site discharges should be required to seek permit coverage within 90 days, as opposed to 3 years, of the effective date of the rule. The Agency does not accept this request. EPA anticipates that NPDES permitting authorities will need one to two years to develop adequate legal authority to implement a program to address this new category of discharges, as well as to develop and issue general permits. Moreover, to ensure effective implementation to protect water quality, regulatory authorities will need additional time to inform small construction site operators of requirements and provide guidance and training on these requirements.

Finally, EPA received a comment requesting that the three year file retention requirement be deleted for discharges from small construction sites. While EPA recognizes that the three year record retention schedule may be unnecessary for certain construction projects, the Agency has determined it is necessary to retain files after the completion of the project to ensure permit compliance, including applicable construction site stabilization enabling permit termination for such sites.

d. Cross-Referencing State, Tribal or Local Erosion and Sediment Control Programs

In developing the NPDES permit requirements for construction sites less than 5 acres, members of the Storm Water Phase II FACA Subcommittee asked EPA to try to minimize redundancy in the construction permit requirements. In response, today's rule at § 122.44(s) provides for incorporation of qualifying State, Tribal or local erosion and sediment control program requirements by reference into the NPDES permit authorizing storm water discharges from construction sites (described under §§ 122.26(b)(15) and (b)(14)(x)). The incorporation by reference approach applies not only to the newly regulated storm water discharges (from construction activity disturbing between 1 and 5 acres, including designated sites, but

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excluding waived sites) but also to discharges from construction activity disturbing 5 or more acres already covered by the existing storm water regulations. For this latter category of discharges from construction activity disturbing 5 or more acres, the incorporation by reference approach requires that the pollutant control requirements from the incorporated program also satisfy the statutory standard for limitations representing application of the best available technology economically achievable (BAT) and best conventional pollutant control technology (BCT).

For permits issued for discharges from small construction activity defined under § 122.26(b)(15), a qualifying State, Tribal, or local erosion and sediment control program is one that includes the program elements described under § 122.44(s)(1). These elements include requirements for construction site operators to implement appropriate erosion and sediment control BMPs, requirements to control waste, a requirement to develop a storm water pollution prevention plan, and requirements to submit a site plan for review. A storm water pollution prevention plan includes site descriptions, descriptions of appropriate control measures, copies of approved State, Tribal or local requirements, maintenance procedures, inspection procedures, and identification of non-storm water discharges. The construction site's permit would require it to follow the requirements of the qualifying local program rather than require it to follow two different sets of requirements. If a partially-qualifying program does not have all of the elements described under § 122.44(s)(1), then the NPDES permitting authority may still incorporate language in the small construction site discharge's permit that requires the construction site operator to follow the program, but the construction site discharge permit also must incorporate the missing required elements in order to satisfy CWA requirements.

The term "local" refers to the geographic area of applicability, not the form of government that develops and administers the program. Thus, a qualifying federal erosion and control program, such as certain programs developed and administered by the federal Bureau of Land Management, could be a qualifying local program.

As a result of this provision, local requirements will, in effect, provide the substantive construction site erosion and sediment control requirements for the NPDES permit authorization. Therefore, by following one set of erosion and sediment control requirements, construction site operators satisfy both local and NPDES permit requirements without duplicative effort. At the same time, noncompliance with the referenced local requirements will be considered noncompliance with the NPDES permit which is federally enforceable. The NPDES permitting authority will, of course, retain the discretion to decide whether to include the alternative requirements in the general permit. EPA believes that this approach will best balance the need for consideration of specific local requirements and local implementation with the need for federal and citizen oversight, and will extend supplemental NPDES requirements to control storm water discharges from construction sites.

EPA developed the "incorporation by reference" approach based on implementation efforts designed by the State of Michigan. Michigan relies on localities to develop substantive controls for storm water discharges associated with construction activities on a localized basis. Localities, however, are not required to do so. In areas where the local authority does not choose to participate, the State administers the sedimentation and erosion control requirements. The State agency, as the NPDES permitting authority, receives an NOI (termed "notice of coverage" by Michigan) under the general permit and tracks and exercises oversight, as appropriate, over the activity causing the storm water discharge. Michigan's goal under these procedures is to utilize the existing erosion and sediment control program infrastructure authorized under State law for storm water discharge regulation. (See U.S. Environmental Protection Agency, Office of Water. January 7, 1994. Memo: From Michael B. Cook, Director OWEC, to Water Management Division Directors, Regarding the "Approach Taken by Michigan to Regulate Storm Water Discharges from Construction Activities.")

Most commenters supported the general concept of incorporating by reference qualifying programs. Two commenters expressed concern that different local construction requirements will create an impossible regulatory scheme for builders who work in different localities. EPA believes that allowing States to incorporate qualifying programs by reference will minimize the differences for builders who work in different areas of the State. These differences already exist, however, not only for erosion and sediment controls, but also other aspects of construction. In any event, the criteria for qualification for localized programs should provide a certain degree of standardization for various localities' requirements. EPA expects that the new rule for construction and post-construction BMPs being developed under CWA section 304(m) will also encourage standardization of local requirements. (See discussion of this new rulemaking in section II.D.1, Federal Role of this preamble).

Two commenters requested that an "incorporation by reference" should include permission, in writing, from the qualifying local program administrator because of a perceived extra burden on the referenced program. Any program requirements incorporated by reference in NPDES permits should already apply to construction site dischargers in the applicable area and therefore should not add any additional burden to the referenced program. EPA has left to the discretion of the permitting authority the decision on whether to seek permission from the qualifying program before cross-referencing it in an NPDES permit.

One commenter stated that a qualifying local program should require a SWPPP. The proposed rule defined the qualifying local program as a program the meets the minimum program requirements established in the proposed construction minimum control measure for small MS4s. To ensure consistency in the controls for storm water discharges between the larger, already regulated construction sites and the discharges from smaller sites that will be regulated as a result of today's rule, EPA has made a change to define a qualifying local program as one that includes the elements described in § 122.44(s)(1). Section 122.44(s)(1) requires the development and implementation of a storm water pollution prevention plan as a criterion for qualification of local programs for incorporation by reference. As noted above, if a qualifying program does not include all the elements in § 122.44(s)(1) then the permitting authority will need to specify the missing elements in order to rely on the incorporation by reference approach.

One commenter asked what happens in regard to the use of qualifying programs when a construction site operator is also the qualifying local program operator. The provision for incorporation by reference applies in this situation also. The local program operator will be required to comply with requirements it has established for others.

e. Alternative Approaches

EPA received a number of comments on alternative permitting approaches. Several commenters supported regulating discharges only from those construction sites within urbanized areas. Other commenters opposed this approach. EPA chose to address storm water discharges from construction sites located both within and outside urbanized areas because of the potential for adverse water quality impact from storm water discharges from smaller sites in all areas. Regulating only those sites within urbanized areas would have excluded a large number of potential contributors to water quality impairment and would not address large areas of new development occurring on the outer fringes of urbanized areas. In fact, designating only small construction discharges within urbanized areas might create a perverse incentive for building only outside urbanized areas. Such an incentive would be inconsistent with the Agency's intention behind designating to protect water quality. The Agency intends that designation to protect water quality in today's rule should be both remedial and preventive.

A number of commenters encouraged EPA to cover municipal construction activities under the small MS4 general permit, instead of issuing a separate NPDES construction permit to these municipal construction projects. Similarly, a number of commenters supported EPA giving industrial facilities the option of having storm water from construction activities on the site covered by the industrial storm water permit. Several other commenters found that combining multiple permit types under one general permit introduced a degree of complexity which was confusing to permittees. Permitting authorities have the option of combining MS4 and construction permits or industrial and construction permits, however, specific requirements for each would still need to be included in the permit issued. EPA agrees that this would probably result in a more complex and confusing permit compared to the existing component permits.

Several commenters supported an alternative for regulated small MS4s where a local qualified program alone, without an NPDES permit, is sufficient to enforce compliance with construction site discharge requirements. On the other hand, one commenter stated that linking the local construction erosion and sediment control program to the existing NPDES program for storm water from larger construction has driven improvements in many local programs. Another commenter stated that the potential fines under the NPDES program will encourage compliance and will be much stronger than any fines a local program may have. EPA agrees that the NPDES program is the best approach to address water quality impacts from construction sites and provides benefits such as accountability and federal enforcement.

A number of commenters supported issuing one permit for each construction company, instead of a permit for each individual construction activity (also requested for storm water discharges from the larger, already regulated construction sites). Other commenters found that a 'licensing' program for construction site operators would have many problems, including identifying who to permit and tracking information on active sites. EPA is regulating only the storm water discharges associated with construction activity from small sites, not the construction activity itself. Separate NPDES permits (either individual or general permit coverage) for construction site discharges avoid potential problems in tracking sites and operator accountability. Section 122.28(b)(2)(v) gives permitting authorities the option to issue a general permit without requiring an NOI. If an NOI is not required for each activity, permitting authorities could pursue other options such as a company-wide NOI, license instead of an NOI, or another mechanism.

2. Other Sources

In the *Storm Water Discharges Potentially Addressed by Phase II of the National Pollutant Discharge Elimination System Storm Water Program*, Report to Congress, March 1995, ("Report") submitted by EPA pursuant to CWA section 402(p)(5), EPA examined the remaining unregulated point sources of storm water for the potential to adversely affect water quality. Due to very limited national data on which to estimate pollutant loadings on the basis of discharge categories, the discussion of the extent of unregulated storm water discharges is limited to an analysis of the number and geographic distribution of the unregulated storm water discharges. Therefore, EPA is not designating any additional unregulated point sources of storm water on a nationwide, categorical basis. Instead, the remainder of the sources will be regulated based on case-by-case post-promulgation designations by the NPDES permitting authority.

EPA did, however, evaluate a variety of categories of discharges for potential designation in the Report. EPA's efforts to identify sources and categories of unregulated storm water discharges for potential designation for regulation in today's rule started with an examination of approximately 7.7 million commercial, retail, industrial, and institutional facilities identified as "unregulated." In general, the distribution of these facilities follows the distribution of population, with a large percentage of facilities concentrated within urbanized areas (see page 4-35 of the Report). This examination resulted in identification of two general classes of facilities with the potential for discharging pollutants to waters of the United States through storm water point sources.

The first group (Group A) included sources that are very similar, or identical, to regulated "storm water discharges associated with industrial activity" but that were not included in the existing storm water regulations because EPA used SIC codes in defining the universe of regulated industrial activities. By relying on SIC codes, a classification system created to identify industries rather than environmental impacts from these industries discharges, some types of storm water discharges that might otherwise be considered "industrial" were not included in the existing NPDES storm water program. The second general class of facilities (Group B) was identified on the basis of potential for activities and pollutants that could contribute to storm water contamination.

EPA estimates that Group A has approximately 100,000 facilities. Discharges from facilities in this group, which may be of high priority due to their similarity to regulated storm water discharges from industrial facilities, include, for example, auxiliary facilities or secondary activities (*e.g.*, maintenance of construction equipment and vehicles, local trucking for an unregulated facility such as a grocery store) and facilities intentionally omitted from existing storm water regulations (*e.g.*, publicly owned treatment works with a design flow of less than 1 million gallons per day, landfills that have not received industrial waste).

Group B consists of nearly one million facilities. EPA organized Group B sources into 18 sectors for the purposes of the Report. The automobile service sector (*e.g.*, gas/service stations, general automobile repair, new and used car dealerships, car and truck rental) makes up more than one-third of the total number of facilities identified in all 18 sectors.

EPA conducted a geographical analysis of the industrial and commercial facilities in Groups A and

B. The geographical analysis shows that the majority are located in urbanized areas (see Section 4.2.2, Geographic Extent of Facilities, in the Report). In general, about 61 percent of Group A facilities and 56 percent of Group B facilities are located in urbanized areas. The analysis also showed that nearly twice as many industrial facilities are found in all urbanized areas as are found in large and medium municipalities alone. Notable exceptions to this generalization included lawn/garden establishments, small unregulated animal feedlots, wholesale livestock, farm and garden machinery repair, bulk petroleum wholesale, farm supplies, lumber and building materials, agricultural chemical dealers, and petroleum pipelines, which can frequently be located in smaller municipalities or rural areas.

In identifying potential categories of sources for designation in today's notice, EPA considered designation of discharges from Group A and Group B facilities. EPA applied three criteria to each potential category in both groups to determine the need for designation: (1) The likelihood for exposure of pollutant sources included in that category, (2) whether such sources were adequately addressed by other environmental programs, and (3) whether sufficient data were available at this time on which to make a determination of potential adverse water quality impacts for the category of sources. As discussed previously, EPA searched for applicable nationwide data on the water quality impacts of such categories of facilities.

By application of the first criterion, the likelihood for exposure, EPA considered the nature of potential pollutant sources in exposed portions of such sites. As precipitation contacts industrial materials or activities, the resultant runoff is likely to mobilize and become contaminated by pollutants. As the size of these exposed areas increases, EPA expects a proportional increase in the pollutant loadings leaving the site. If EPA concluded that a category of sources has a high potential for exposure of raw materials, intermediate products, final products, waste materials, byproducts, industrial machinery, or industrial activity to rainfall, the Agency rated that category of sources as having "high" potential for adverse water quality impact. EPA's application of the first criterion showed that a number of Group A and B sources have a high likelihood of exposure of pollutants.

Through application of the second criterion, EPA assessed the likelihood that pollutant sources are regulated in a comprehensive fashion under other environmental protection programs, such as programs under the Resource Conservation and Recovery Act (RCRA) or the Occupational Health and Safety Act (OSHA). If EPA concluded that the category of sources was sufficiently addressed under another program, the Agency rated that source category as having "low" potential for adverse water quality impact. Application of the second criterion showed that some categories were likely to be adequately addressed by other programs.

After application of the third criterion, availability of nationwide data on the various storm water discharge categories, EPA concluded that available data would not support any such nationwide designations. While such data could exist on a regional or local basis, EPA believes that permitting authorities should have flexibility to regulate only those categories of sources contributing to localized water quality impairments.

EPA received comments requesting designation of additional industrial, commercial and retail sources (*e.g.* industrial activity "look-alikes", roads, commercial facilities and institutions, and vehicle maintenance facilities) in the final rule, because the commenters believe that the data exist to support national designation of some of these sources. Other comments were received opposing designation of any additional sources. Today's rule does not designate any additional industrial or commercial category of sources either because EPA currently lacks information indicating a consistent potential for adverse water quality impact or because of EPA's belief that the likelihood of adverse impacts on water quality is low, with some possible exceptions on a more local basis. Since the time the Agency submitted the Report, EPA has continued to seek additional data and has requested available data from the FACA members. If sufficient regional or nationwide data become available in the future, the permitting authority could at that time designate a category of sources or individual sources on a case-by-case basis. Therefore, today's rule encourages control of storm water discharges from Groups A and B through self-initiated, voluntary BMPs, unless the discharge (or category of discharges) is designated for permitting by the permitting authority. See discussion in section I.D., EPA's Reports to Congress.

3. ISTEA Sources

Provisions within the Intermodal Surface Transportation and Efficiency Act (ISTEA) of 1991 temporarily exempted storm water discharges associated with industrial activity that are owned or operated by municipalities serving populations less than 100,000 people (except for airports, power plants, and uncontrolled sanitary landfills) from the need to apply for or obtain a storm water discharge permit (section 1068(c) of ISTEA). Congress extended the NPDES permitting moratorium for these facilities to allow small municipalities additional time to comply with NPDES requirements for certain sources of industrial storm water. The August 7, 1995 storm water final rule (60 FR 40230) further extended this moratorium until August 7, 2001. However, today's rule changes this deadline so that previously exempted industrial facilities owned or operated by municipalities serving populations less than 100,000 people, must now submit an application for a permit within 3 years and 90 days from date of publication of today's rule.

EPA received comments recommending that permit requirements for municipally owned or operated industrial storm water discharges, including those previously exempt under ISTEA, be included in a single NPDES permit for all MS4 storm water discharges. The existing NPDES regulations already provide permitting authorities the ability to issue a single "combination" permit for MS4 discharges. However, if the permitting authorities chose to issue this type of permit, they must make sure that in doing so, they are not creating a double standard for industrial facilities covered under the combination permit versus those covered under separate general or individual permits. In order to avoid this double standard, combination permits would have to contain requirements that are the same or very similar to the requirements found in separate MS4 and industrial permits, *i.e.*, the minimum measures and other necessary requirements of an MS4 permit, and the SWPPP, monitoring and reporting requirements, and other necessary requirements of an industrial permit. If such a combined MS4 general permit were issued, the regulations require that each discharger submit NOIs for their respective discharges, except for discharges from small construction activities. Flexibility exists in developing a combination NOI which could reduce the need to submit duplicative information, *e.g.* owner/operator name and address. The combination NOI would still need to require specific information for each separate municipally owned or operated industrial location, including

construction projects disturbing 5 or more acres. The regulations at § 122.28(b)(2)(ii) list the necessary contents of an NOI, which require: the facility name, facility address, type of facility or discharge and receiving stream for each industrial discharge location. When viewed in its entirety, a combination permit, which by necessity would need to contain all elements of otherwise separate industrial and MS4 permit requirements, and require NOI information for each separate industrial activity, may have few advantages when compared to obtaining separate MS4 and industrial general permit coverage.

In order to allow the permitting authority to issue a single storm water permit for the MS4 and all municipally owned or operated industrial facilities, including those previously exempt under ISTEA, today's rule requires applications for ISTEA sources within 3 yrs and 90 days from date of publication of today's rule. The permitting authority has the ultimate decision to determine whether or not a single all-encompassing MS4 permit is appropriate.

4. Residual Designation Authority

The NPDES permitting authority's existing designation authority, as well as the petition provisions are being retained. Today's rule contains two provisions related to designation authority at §§ 122.26(a)(9)(i)(C) and (D). Subsection (C) adds designation authority where storm water controls are needed for the discharge based upon wasteload allocations that are part of TMDLs that address the pollutant(s) of concern. EPA intends that the NPDES permitting authority have discretion in the matter of designations based on TMDLs under subsection (C). Subsection (D) carries forward residual designation authority under former § 122.26(g), and has been modified to provide clarification on categorical designation. Under today's rule, EPA and authorized States continue to exercise the authority to designate remaining unregulated discharges composed entirely of storm water for regulation on a case-by-case basis (including § 123.35). Individual sources are subject to regulation if EPA or the State, as the case may be, determines that the storm water discharge from the source contributes to a violation of a water quality standard or is a significant contributor of pollutants to waters of the United States. This standard is based on the text of section CWA 402(p). In today's rule, EPA believes, as Congress did in drafting section CWA 402(p)(2)(E), that individual instances of storm water discharge might warrant special regulatory attention, but do not fall neatly into a discrete, predetermined category. Today's rule preserves the regulatory authority to subsequently address a source (or category of sources) of storm water discharges of concern on a localized or regional basis. For example, as States and EPA implement TMDLs, permitting authorities may need to designate some point source discharges of storm water on a categorical basis either locally or regionally in order to assure progress toward compliance with water quality standards in the watershed.

EPA received comments asking that § 122.26(a)(9)(i)(D) as proposed be modified to include specific language clarifying the permitting authority's ability to designate additional sources on a categorical basis as explained in the preamble to the proposed rule. One comment requested that the designation language include "categories of sources on a Statewide basis." EPA agrees that the intent of the language may not have been clear regarding categorical designation. Today's rule modifies subsection (D) to clarify that the designation authority can be applied within different geographic areas to any single discharge (i.e., a specific facility), or category of discharges that are contributing to a violation of a water quality standard or are significant contributors of pollutants to waters of the United States. The added term "within a geographic area" allows "State-wide" or "watershed-wide" designation within the meaning of the terms.

One commenter questioned the Agency's legal authority to provide for such residual designation authority. The stakeholder argued that the lapse of the October 1, 1994, permitting moratorium under CWA section 402(p)(1) eliminated the significance of the CWA section 402(p)(2) exceptions to the moratorium, including the exception for discharges of storm water determined to be contributing to a violation of a water quality standard or a significant contributor of pollutants under CWA section 402(p)(2)(E). The stakeholder further argued that EPA's authority to designate sources for regulation under CWA section 402(p)(6) is limited to storm water discharges other than those described under CWA section 402(p)(2). Because CWA section 402(p)(2)(E) describes individually designated discharges, the stakeholder concluded that regulations under CWA section 402(p)(6) cannot provide for post-promulgation designation of individual sources. EPA disagrees.

First, as explained previously, EPA anticipates that NPDES permitting authorities may yet determine that individual unregulated point sources of storm water discharges require regulation on a case-by-case basis. This conclusion is consistent with the Congress' recognition of the potential need for such designation under the first phase of storm water regulation as described in CWA section 402(p)(2)(E). Under CWA section 402(p)(2)(E), Congress recognized the need for both EPA and the State to retain authority to regulate unregulated point sources of storm water under the NPDES permit program. Second, to the extent that CWA section 402(p)(6) requires designation of a "category" of sources, the permitting authority may designate such (as yet unidentified) sources as a category that should be regulated to protect water quality. Though such sources may exist and discharge today, if neither EPA nor the State/Tribal NPDES permitting authority has designated the source for regulation under CWA section 402(p)(2)(E) to date, then CWA section 402(p)(6) provides the authority to designate such sources.

The Agency can designate a category of "not yet identified" sources to be regulated, based on local concerns, even if data do not exist to support nationwide regulation of such sources. EPA does not interpret the language in CWA section 402(p) to preclude States from exercising designation authority under these provisions because such designation (and subsequent regulation of designated sources) is within the "scope" of the NPDES program.

EPA also believes that sources regulated pursuant to a State designation are part of (and regulated under) a federally approved State NPDES program, and thus subject to enforcement under CWA sections 309 and 505. Under existing NPDES State program regulations, State programs that are "greater in scope of coverage" are not part of the federally-approved program. By contrast, any such State regulation of sources in this "reserved category" will be within the scope of the federal program because today's rule recognizes the need for such post promulgation designations of unregulated point sources of storm water. Such regulation will be "more stringent" than the federal program rather than "greater in scope of coverage" (40 CFR 123.1(h)).

EPA does not interpret the congressional direction in CWA section 402(p)(6) to preclude regulation of point sources of storm water that should be regulated to protect water quality. Under CWA section 510, Congress expressly recognized and preserved the authority of States to adopt and enforce

more stringent regulation of point sources, as well as any requirement respecting the control or abatement of pollution. Section 510 applies, "except as expressly provided" in the CWA. CWA section 502(14) does expressly provide affirmative limitations on the regulation of certain pollutant sources through the point source control program, the NPDES permitting program. Section 502(14) excludes agricultural storm water and return flows from irrigated agriculture from the definition of point source, and section 402(l) limits applicability of the section 402 permit program for return flows from irrigated agriculture, as well as for storm water runoff from certain oil, gas, and mining operations. Unlike sections 502(14) and 402(l), EPA does not interpret CWA section 402(p)(6) as an express provision limiting the authority to designate point sources of storm water for regulation on a case-by-case basis after the promulgation of final regulations. Any source of storm water discharge is encouraged to assess its potential for storm water contamination and take preventive measures against contamination. Such proactive actions could result in the avoidance of future regulation.

One comment was received requesting clarification of the term "non-municipal" in § 122.26(a)(9)(ii). The commenter is concerned that the term "non-municipal," in this context, implies that municipally owned or operated facilities cannot be designated. The term "non-municipal" in this context refers to the universe of unregulated industrial and commercial facilities that could potentially be designated according to § 122.26(a)(9)(i) authority. There is no exemption for municipally owned or operated facilities under these designation provisions.

Finally, EPA received comments and evaluated the proposal under which operators of regulated small, medium, and large MS4s would be responsible for controlling discharges from industrial and other facilities into their systems in lieu of requiring NPDES permit coverage for such facilities. EPA did not adopt this framework due to concerns with administrative and technical burden on the MS4 operators, as well as concerns about such an intergovernmental mandate.

J. Conditional Exclusion for "No Exposure" of Industrial Activities and Materials to Storm Water

1. Background

In 1992, the Ninth Circuit court remanded to EPA for further rulemaking, a portion of the definition of "storm water discharge associated with industrial activity" that excluded the category of industrial activity identified as "light industry" when industrial materials and/or activities were not exposed to storm water. See *NRDC* v. *EPA*, 966 F.2d 1292, 1305 (9th Cir. 1992). Today's final rule responds to that remand. In the 1990 storm water regulations, EPA excluded the light industry category from the requirement for an NPDES permit if the industrial materials and/or activities were not "exposed" to storm water (see § 122.26(b)(14)). The Agency had reasoned that most of the activity at these types of facilities takes place indoors and that emissions from stacks, use of unhoused manufacturing equipment, outside material storage or disposal, and generation of large amounts of dust or particles would be atypical (55 FR 48008, November 16, 1990).

The Ninth Circuit determined that the exemption was arbitrary and capricious for two reasons. First, the court found that EPA had not established a record to support its assumption that light industry that was not exposed to storm water was not "associated with industrial activity," particularly when other types of industrial activity not exposed to storm water remained "associated with industrial activity." The court specifically found that "[t]o exempt these industries from the normal permitting process based on an unsubstantiated assumption about this group of facilities is arbitrary and capricious." Second, the court concluded that the exemption impermissibly "altered the statutory scheme" for permitting because the exemption relied on the unverified judgment of the light industrial facility operator to determine non-applicability of the permit application requirements. In other words, the court was critical that the operator would determine for itself that there was "no exposure" and then simply not apply for a permit without any further action. Without a basis for ensuring the effective operation of the permitting scheme—either that facilities would self-report actual exposure or that EPA would be required to inspect and monitor such facilities—the court vacated and remanded the rule to EPA for further rulemaking.

One of the major concerns expressed by the FACA Committee, was that EPA streamline and reinvent certain troublesome or problematic aspects of the existing permitting program for storm water discharges. One area identified was the mandatory applicability of the permitting program to all industrial facilities, even those "light industrial" activities that are of very low risk or of no risk to storm water contamination. Such dischargers may not have any industrial sources of storm water contamination on the plant site, yet they are still required to apply for an NPDES storm water permit and meet all permitting requirements. Examples of such facilities are a soap manufacturing plant (SIC Code 28) or hazardous waste treatment and disposal facility, where all industrial activities, even loading docks, are inside a building or under a roof.

Although they did not provide a written report, the FACA Committee members advised EPA that the existing storm water program should be revised to allow such facilities to seek an exclusion from the NPDES storm water permitting requirements. The Committee agreed that such an exclusion should also provide a strong incentive for other industrial facilities that conduct industrial activities outdoors to move the activities under cover or into buildings to prevent contamination of rainfall and storm water runoff. The committee believed that such a "no exposure" permit exclusion could be a valuable incentive for storm water pollution prevention.

In today's final rule, the Agency responds to both of the bases for the court's remand. The exclusion from permitting based on "no exposure" applies to all industrial categories listed in the existing storm water regulations except construction. The court's opinion rejected EPA's distinction between light industry and other industry, but it did not preclude an interpretation that treats all "non-exposed" industrial facilities in the same fashion. Presuming that an industrial facility adequately prevents exposure of industrial materials and activities to storm water, today's rule treats discharges from "non-exposed" industrial facilities in a manner similar to the way Congress intended for discharges from administrative buildings and parking lots. Specifically, permits will not be required for storm water discharges from these facilities on a categorical basis.

To assure that discharges from industrial facilities really are similar to discharges from administrative buildings and parking lots, and to respond to the second basis for the court's remand, the permitting exclusion is "conditional". The person responsible for a point source discharge from a "no exposure" industrial source must meet the conditions of the exclusion, and complete, sign and submit the certification to the permitting authority for tracking and

accountability purposes. EPA believes today's rule, therefore, is fully consistent with the direction provided by the court.

EPA relied upon the "no exposure" concept discussed by the FACA Committee in developing the "no exposure" provisions of today's rule. EPA is deleting the sentence regarding "no exposure" for the facilities in § 122.26(b)(14)(xi) and adding a new § 122.26(g) titled "Conditional Exclusion for No Exposure of Industrial Activities to Storm Water." The "no exposure" provision will make storm water discharges from all classes of industrial facilities eligible for exclusion, except storm water discharges from regulated construction activities. Regulated construction activities cannot claim "no exposure" because the main pollutants of concern (*e.g.*, sediment) generally cannot entirely be sheltered from storm water.

Today's rule represents a significant expansion in the scope of the "no exposure" provision originally promulgated in the 1990 rule, which was only for storm water discharges from light industry. The intent of today's "no exposure" provision is to provide a simplified method for complying with the CWA to all industrial facilities that are entirely indoors. This includes facilities that are located within a large office building, or at which the only items permanently exposed to precipitation are roofs, parking lots, vegetated areas, and other non-industrial areas or activities.

EPA received several comments related to storm water runoff from parking lots, roof tops, lawns, and other non-industrial areas of an industrial facility. Storm water discharges from these areas, which may contain pollutants or which may result in additional storm water flows, are not directly regulated under the existing storm water permitting program because they are not "storm water discharges associated with industrial activity". Many comments on this issue supported maintaining the exclusion from the existing regulations for storm water permitting for discharges from administrative buildings, parking lots, and other non-industrial areas. Other comments opposed allowing the continued exclusion for discharges from non-industrial areas of the site because discharges from these areas are potentially a significant cause of receiving water impairment. These comments urged that such discharges should not be excluded from NPDES permit coverage. Today's rule does not require permit coverage for discharges from a facility's exposed areas that are separate from industrial activities such as runoff from office buildings and accompanying parking lots, lawns and other non-industrial areas. This approach is consistent with the existing storm water rules which were based on Congress's intent to exclude non-industrial areas such as "parking lots and administrative and employee buildings." 133 Cong. Rec. 985 (1987). EPA also lacks data indicating that discharges from these areas at an industrial facility cause significant receiving water impairments. Therefore, the non-industrial areas at a facility do not need to be assessed as part of the "no exposure" certification.

EPA received comments related to industrial facilities that achieve "no exposure" by constructing large amounts of impervious surfaces, such as roofs, where previously there were pervious or porous surfaces into which storm water could infiltrate. Some commenters made the point that large amounts of impervious area may cause a significant increase in storm water volume flowing off the industrial facility, and thus may cause adverse receiving water impacts simply due to the increased quantity of storm water flow. Some commenters said that storm water discharges from impervious areas at an industrial facility are generally more frequent, and often larger, than discharges from the pre-existing natural surfaces. They believe that these discharges will contain pollutants typical of commercial areas and roads and are an equal threat to direct human uses of the water and can cause equal damage to aquatic life and its habitat. Other commenters believe that if Congress or EPA addresses the issue of flow, it should be addressed on a broader scale than merely through the "no exposure" exclusion, and that EPA has no authority under any existing legal framework to regulate flow directly. Some commenters stated that developing federal parameters for the control of water quantity, *i.e.* flow, would result in federal intrusion into land use planning, an authority that they claim is solely within the purview of State governments and their political subdivisions.

EPA is not attempting to regulate flow via the "no exposure" provisions. EPA does agree, however, that increases in impervious surfaces can result in increased runoff volumes from the site which in turn may increase pollutant loading. In addition, the Agency notes that in some States water quality standards include water quality criteria for flow or turbidity. Therefore, in order to provide a minimal amount of information on possible impacts from increased pollutant loading and runoff volume, EPA's "no exposure" certification form (see Appendix 4) asks the discharger to indicate if they have paved or roofed over a formerly exposed, pervious area in order to qualify for the "no exposure" exclusion. If the answer is yes, the discharger must indicate, by choosing from three possible responses, approximately how much impervious area was created to achieve "no exposure". The choices are: (1) less than 1 acre, (2) 1 to 5 acres, and (3) more than 5 acres. This requirement provides additional information that will aid in determining if discharges from the facility are causing adverse receiving water impacts. EPA intends to prevent water quality impacts resulting from increased discharges of pollutants, which may result from increased volume of runoff. In many cases, consideration of the increased flow rate, velocity and energy of storm water discharges, following construction of large amounts of impervious surfaces, must be taken into consideration in order to reduce the discharge of pollutants, to meet water quality standards and to prevent degradation of receiving streams. EPA recommends that dischargers consider these factors when making modifications to their site in order to qualify for the "no exposure" exclusion.

2. Today's Rule

In order to claim relief under the "no exposure" provision, the discharger of an otherwise regulated facility must submit a no exposure certification that incorporates the questions of § 122.26(g)(4)(iii) to the NPDES permitting authority once every 5 years. This provision applies across all categories of industrial activity covered by the existing program, except discharges from construction activities.

In addition to submitting a "no exposure" certification every 5 years, the facility must allow the NPDES permitting authority or operator of an MS4 (where there is a storm water discharge to the MS4) to inspect the facility and to make such inspection reports publicly available upon request. Also, upon request, the facility must submit a copy of the "no exposure" certification to the operator of the MS4 into which the facility discharges (if applicable). All "no exposure" certifications must be signed in accordance with the signatory requirements of § 122.22. The "no exposure" certification is non-transferable. In the event that the facility operator changes, the new discharger must submit a new "no exposure" certification.

Members of the FACA Committee urged that EPA not allow dischargers certifying "no exposure" to take actions to qualify for this provision that result in a net environmental detriment. In developing a regulatory implementation mechanism, however, EPA found that the phrase "no net environmental detriment," was too imprecise to use within this context. Therefore, today's rule addresses this issue by requiring information that should help the permitting authority to determine whether actions taken to qualify for the exclusion interfere with the attainment or maintenance of water quality standards, including designated uses. Permitting authorities will be able, where necessary, to make a determination by evaluating the activities that changed at the industrial site to achieve "no exposure", and assess whether these changes cause an adverse impact on, or have the reasonable potential to cause an instream excursion of, water quality standards, including designated uses. EPA anticipates that many efforts to achieve "no exposure" will employ simple good housekeeping and contaminant cleanup activities. Other efforts may involve moving materials and industrial activities indoors into existing buildings or structures.

In very limited cases, industrial operators may make major changes at a site to achieve "no exposure". These efforts may include constructing a new building or cover to eliminate exposure or constructing structures to prevent run-on and storm water contact with industrial materials or activities. Where major changes to achieve "no exposure" increase the impervious area of the site, the facility operator must provide this information on the "no exposure" certification form as discussed above. Using this and other available data and information, permitting authorities should be able to assess whether any major change has resulted in increased pollutant concentrations or loadings, toxicity of the storm water runoff, or a change in natural hydrological patterns that would interfere with the attainment and maintenance of water quality standards, including designated uses or appropriate narrative, chemical, biological, or habitat criteria where such State or Tribal water quality standards exist. In these instances, the facility operator and their NPDES permitting authority should take appropriate actions to ensure that attainment or maintenance of water quality standards can be achieved. The NPDES permitting authority should decide if the facility must obtain coverage under an individual or general permit to ensure that appropriate actions are taken to address adverse water quality impacts.

While the intent of today's "no exposure" provision is to reduce the regulatory burdens on industrial facilities and government agencies, the FACA Committee suggested that the NPDES permitting authority consider a compliance assessment program to ensure that facilities that have availed themselves of this "no exposure" option meet the applicable requirements. Inspections could be conducted at the discretion of the NPDES authority and be coordinated with other facility inspections. EPA expects, however, that the permitting authority will conduct inspections when it becomes aware of potential water quality impacts possibly caused by the facility's storm water discharges or when requested to do so by adversely affected members of the public. The intent of this provision is that the 5 year "no exposure" certification be fully available to, and enforceable by, appropriate federal and State authorities under the CWA. Private citizens can enforce against facilities for discharges of storm water that are inconsistent with a "no exposure" certification if storm water discharges from such facilities are not otherwise permitted and in compliance with applicable requirements.

EPA received comments from owners, operators and representatives of Phase I facilities classified as "light industry" as defined by the regulations at § 122.26(b)(14)(xi). The comments recommended maintaining the approach of the existing regulations which does not require the discharger to submit any supporting documentation to the permitting authority in order to claim the "no exposure" exclusion from permitting. As discussed previously, the "no exposure" concept was developed in response to the Ninth Circuit court's remand of part of the existing rules back to EPA. The court found that EPA cannot rely on the "unverified judgment" of the facility. The comments opposing documentation did not address the "unverified judgment" concern.

Today's rule is a "conditional" exclusion from permitting which requires all categories, including the "light industrial" facilities that have no exposure of materials to storm water, to submit a certification to the permitting authority. Upon receipt of a complete certification, the permitting authority can review the information, or call, or inspect the facility if there are doubts about the facility's "no exposure" claim. Also, if the facility discharges into an MS4, the operator of the MS4 can request a copy of the certification, and can inspect the facility. The public can request a copy of the certification and/or inspection reports. In adopting these conditional "no exposure" provisions, the Agency addressed the Ninth Circuit court's ruling regarding the discharger's unverified judgment.

EPA received one comment requesting clarification on whether the anti-backsliding provisions in the regulations at § 122.44(l) apply to industrial facilities that are currently covered under an NPDES storm water permit, and whether such facilities could qualify for the "no exposure" exclusion under today's rule. The anti-backsliding provisions will not prevent most industrial facilities that can certify "no exposure" under today's rule from qualifying for an exclusion from permitting. The anti-backsliding provisions contain 5 exceptions that allow permits to be renewed, reissued or modified with less stringent conditions. One exception at § 122.44(l)(2)(A) allows less stringent conditions if "material and substantial alterations or additions to the permitted facility occurred after permit issuance which justify the application of a less stringent effluent limitation." Section 122.44(l)(B)(1) also allows less stringent requirements if "information is available which was not available at the time of permit issuance and which would have justified the application of less stringent effluent limitations at the time of permit issuance." Facility's operators who certify "no exposure" and submit the required information once every 5 years will have provided the permitting authority "information that was not available at the time of permit issuance." Also, some facilities may, in order to achieve "no exposure", make "material and substantial alterations or additions to the permitted facility." Therefore, most facilities covered under existing NPDES general permits for storm water (e.g., EPA's Multi-Sector General Permit) will be eligible for the conditional "no exposure" exclusion from permitting without concern about the anti-backsliding provisions. Such dischargers will have met one or both of the anti-backsliding exceptions detailed above. Facilities that are covered under individual permits containing numeric limitations for storm water should consult with their permitting authority to determine whether the anti-backsliding provisions will prevent them from qualifying for the exclusion from permitting (for that discharge point) based on a certification of "no exposure".

EPA received several comments regarding the timing of when the "no exposure" certification should be submitted. The proposed rule said that the "no exposure" certification notice must be submitted "at the beginning of each permit term or prior to commencing discharges during a permit term." Some commenters interpreted this statement to mean that existing facilities can only submit the certification at the time a permit is being issued or renewed. EPA intended the phrase "at the beginning of each permit term" to mean "once every 5 years" and today's rule reflects this clarification. EPA envisions that the NPDES storm water program will be implemented primarily through general permits which are issued for a 5 year term. Likewise the "no exposure" certification term is 5 years. The NPDES permitting authority will maintain a simple registration list that should impose only a minor administrative burden on the permitting authority. The registration list will allow for tracking of industrial facilities claiming the exclusion. This change allows a facility to submit a "no exposure" certification at any time during the term of the permit, provided that a new certification is submitted every 5 years from the time it is first submitted (assuming that the facility maintains a "no exposure" status). Once a discharger has established that the facility meets the definition of "no exposure", and submits the necessary "no exposure" certification, the discharger must maintain their "no exposure" status. Failure to maintain "no exposure" at their facility could result in the unauthorized discharge of pollutants to waters of the United States and enforcement for violation of the CWA. Where a discharger believes that exposure could occur in the future due to some anticipated change at the facility, the discharger should submit an application and obtain coverage under an NPDES permit prior to such discharge to avoid penalties.

Where EPA is the permitting authority, dischargers may submit a "no exposure" certification at any time after the effective date of today's rule. Where EPA is not the permitting authority, dischargers may not be able to submit the certification until the non-federal permitting authority completes any necessary statutory or regulatory changes to adopt this "no exposure" provision. EPA recommends that the discharger contact the permitting authority for guidance on when the "no exposure" certification should be submitted.

EPA received comments on the proposed rule requirement that the discharger "must comply immediately with all the requirements of the storm water program including applying for and obtaining coverage under an NPDES permit," if changes occur at the facility which cause exposure of industrial activities or materials to storm water. The comments expressed the difficultly of immediate compliance. EPA expects that most facility changes can be anticipated, therefore dischargers should apply for and obtain NPDES permit coverage in advance of changes that result in exposure to industrial activities or materials. Permitting authorities may grant additional time, on a case-by-case basis, for preparation and implementation of a storm water pollution prevention plan.

Finally, today's rule at § 122.26(g)(4) includes the information which must be included on the "no exposure" certification. Authorized States, Tribes or U.S. Territories may develop their own form which includes this required information, at a minimum. EPA adopted the requirements (with modification) from the draft "No Exposure Certification Form" published as an appendix to the proposed rule. Modifications were made to the draft form to address comments received and to streamline the required information. EPA included these certification requirements in today's rule in order to preserve its integrity. Dischargers in areas where EPA is the permitting authority should use the "No Exposure Certification" form included in Appendix 4.

3. Definition of "No Exposure"

For purposes of this section, "no exposure" means that all industrial materials or activities are protected by a storm resistant shelter to prevent exposure to rain, snow, snowmelt, and/or runoff. Industrial materials or activities include, but are not limited to, material handling equipment or activities, industrial machinery, raw materials, intermediate products, by-products, final products, or waste products. Material handling activities include the storage, loading and unloading, transportation, or conveyance of any raw material, intermediate product, final product or waste product. However, storm resistant shelter is not required for: (1) Drums, barrels, tanks, and similar containers that are tightly sealed, provided those containers are not deteriorated and do not leak; (2) adequately maintained vehicles used in material handling; and (3) final products, other than products that would be mobilized in storm water discharge (e.g., rock salt). Each of these three exceptions to the no exposure definition are discussed in more detail below.

EPA intends the term "storm resistant shelter" to include completely roofed and walled buildings or structures, as well as structures with only a top cover but no side coverings, provided material under the structure is not otherwise subject to any run-on and subsequent runoff of storm water. While the Agency intends that this provision promote permanent "no exposure", EPA understands that certain vehicles could pass between buildings and, during passage, be exposed to rain and snow. Adequately maintained vehicles such as trucks, automobiles, forklifts, or other such general purpose vehicles at the industrial site that are not industrial machinery, and that are not leaking contaminants or are not otherwise a source of industrial pollutants, could be exposed to precipitation or runoff. Such activities alone does not prevent a discharger from being able to certify no exposure under this provision. Similarly, trucks or other vehicles awaiting maintenance at vehicle maintenance facilities, as defined at § 122.26(b)(14)(viii), that are not leaking contaminants or are not otherwise a source of industrial pollutants, are not considered exposed.

In addition, EPA recognizes that there are circumstances where permanent "no exposure" of industrial activities or materials is not possible. Under such conditions, materials and activities may be sheltered with temporary covers, such as tarps, between periods of permanent enclosure. The final rule does not specify every such situation. EPA intends that permitting authorities will address this issue on a case-by-case basis. Permitting authorities can determine the circumstances under which temporary structures will or will not meet the requirements of this section. Until permitting authorities specifically determine otherwise, EPA recommends application of the "no exposure" exclusion for temporary sheltering of industrial materials or activities only during facility renovation or construction, provided that the temporary shelter achieves the intent of this section. Moreover, "exposure" that results from a leak in protective covering would only be considered "exposure" if not corrected prior to the next storm water discharge event. EPA received one comment requesting that this allowance for temporary shelter be limited to facility renovation or construction directly related to the industrial activity requiring temporary shelter, and be scheduled to minimize the use of temporary shelter. Another comment suggested placing time limits

on the use of temporary shelter. The commenter did not recommend a specific time period, rather the comment said that renovation in some instances may take years, and that EPA should not allow temporary shelter over prolonged periods. EPA agrees that the use of temporary shelter must be related to the renovation or construction at the site, and be scheduled or designed to minimize the use of temporary shelter. Further, EPA agrees that the use of temporary shelter should be limited in duration, but does not intend to define "temporary" or "prolonged period".

Many final products are intended for outdoor use and pose little risk of storm water contamination, such as new cars. Therefore, final products, except those that can be mobilized in storm water discharge, can be "exposed" and still allow the discharge to certify "no exposure". EPA intends the term "final products" to mean those products that are not used in producing another product. Any product that can be used to make another product is considered an "intermediate product." For example, a facility that makes horse trailers can store the finished trailers outdoors as a final product. The storage of those final products does not prevent eligibility to claim "no exposure". However, any facility that makes parts for the horse trailers (e.g., metal tubing, sheet metal, paint) is not eligible for the "no exposure" exclusion from permitting if those "intermediate products" are stored outdoors (i.e., "exposed").

EPA received comments related to materials in drums, barrels, tanks and similar containers. Some comments objected to the language in the preamble to the proposed rule that would have recommended that the "exposure" determination for drums and barrels be based on the "potential to leak." Those comments said that all drums and barrels have the potential to leak, thereby making certification impossible. They recommended allowing outdoor storage of drums and barrels except for those that "are leaking" at the time of certification. Other comments suggested allowing drums and barrels to be stored outside only if the drums and barrels: are empty; have secondary containment; or there is a spill contingency plan in place. Opposing comments suggested that allowing outdoor exposure of drums and barrels, based on existing integrity and condition, is inconsistent with the "however packaged" proposed rule language, and also would not satisfy the Ninth Circuit remand. The comments point out that the former rule was invalidated by the court in part because it relied on the "unverified judgment" of the light industrial facility operator to determine the non-applicability of the permit requirements, and that allowing the facility operator to determine the condition of their drums and barrels would result in the same flaw.

In response, EPA believes that drums and barrels that are stored outdoors pose little risk of storm water contamination unless they are open, deteriorated or leaking. The Agency has modified today's rule accordingly. EPA intends the term "open" to mean any container that is not tightly sealed and "sealed" to mean banded or otherwise secured and without operational taps or valves. Drums, barrels, tanks, and similar containers may only be *stored* outdoors under this conditional exclusion. The addition of material to or withdrawing of material from these containers while outside is deemed "exposure". Moving the containers while outside does not create "exposure" provided that the containers are not open, deteriorated or leaking. In order to complete the "no exposure" certification, a facility operator must inspect all drums, barrels, tanks or other containers stored outside to ensure that they are not open, deteriorated, or leaking. EPA recommends that the discharger designate someone at the facility to conduct frequent inspections to verify that the drums, barrels, tanks or other containers remain in a condition such that they are not open, deteriorated or leaking. Drums, barrels, tanks or other containers stored outside that have valves which are used to put material in or take material out of the container, and that have dripped or may drip, are considered to be "leaking" and must be under a storm resistant shelter in order to qualify for the no exposure exclusion. Likewise, leaking pipes containing contaminants exposed to storm water are deemed "exposed." If at any time drums, barrels, tanks or similar containers are opened, deteriorated or leaking, the discharger should take immediate actions to close or replace the container. Any resulting unpermitted discharge would violate the CWA. The Director, the operator of the MS4, or the municipality may inspect the facility to verify that all of the applicable areas meet the "no exposure" conditions as specified in the rule language. In requiring submission of the conditional "no exposure" certification and allowing the permitting authority and the operator of the MS4 to inspect the facility, today's rule does not rely on the unverified judgment of the facility to determine that the no exposure provision is being met.

EPA received several comments related to trash dumpsters that are located outside. The preamble to the proposed rule listed dumpsters in the same grouping as drums and barrels, which based exposure on the "potential to leak". Today's rule distinguishes between dumpsters and drums/barrels. In the Phase I Question and Answer document (volume 1, question 52) the Agency noted that a covered dumpster containing waste material that is kept outside is not considered "exposed" as long as "the container is completely covered and nothing can drain out holes in the bottom, or is lost in loading onto a garbage truck." EPA affirms this approach today. Industrial refuse and industrial trash that is left uncovered is deemed "exposed."

For purposes of this provision, particulate matter emissions from roof stacks/vents that are regulated and in compliance under other environmental protection programs, such as air quality control programs, and that do not cause storm water contamination, are considered "not exposed." EPA received comments on the phrase in the draft "no exposure" certification form that asked whether "particulate emissions from roof stacks/vents not otherwise regulated, and in quantities detectable in the storm water outflow," are exposed to precipitation. One comment expressed concern that the phrase "in quantities detectable in the storm water outflow" implies that the facility must conduct monitoring prior to completing the checklist, and must continue to monitor after receiving the no exposure exclusion, in order to be able to verify compliance with the no exposure provision. Another comment said that current measurement technology allows detection of pollutants at levels that may not cause environmental harm. EPA does not intend to require monitoring of runoff from facilities with roof stacks/vents prior to or after completing and submitting the no exposure certification. EPA has thus replaced the phrase "in quantities detectable" with "evident" to convey the message that emissions from some roof stacks/vents have the potential to contaminate storm water discharges in quantities that are considered significant or that cause or contribute to a water quality standards violation. In those instances where the permitting authority determines that particulate emissions from facility roof stacks/vents are a significant contributor of pollutants or contributing to water quality violations, the permitting authority may require the discharger to apply for and obtain coverage under a

permit. Visible deposits of residuals (*e.g.*, particulate matter) near roof or side vents are considered "exposed". Likewise, visible "track out" (*i.e.*, pollutants carried on the tires of vehicles) or windblown raw materials are deemed "exposed."

EPA received a comment requesting an allowance under the "no exposure" provision for industrial facilities with several outfalls at a site where some, but not all of the outfalls drain non-exposed areas. The commenter provided an example of an industrial facility that has 5 outfalls draining different areas of the site, where two of those outfalls drain areas where industrial activities or materials are not exposed to storm water. The comment requested that the facility in this example be allowed to submit a "no exposure" certification in order to be relieved of permitting obligations for discharges from those two outfalls.

EPA agrees, but the comment would be implemented on an outfall-by-outfall basis in the permitting process, not through the "no exposure" exclusion. The "no exposure" provision was developed to allow exclusion from permitting of discharges from entire industrial facilities (except construction), based on a claim of "no exposure" for all areas of the facility where industrial materials or activities occur. Where exposure to industrial materials or activities exist at some but not all areas of the facility, the "no exposure" exclusion from permitting is not allowed because permit coverage is still required for storm water discharges from the exposed areas. Relief from permit requirements for outfalls draining non-exposed areas should be addressed through the permit process, in coordination with the permitting authority. Most NPDES general permits for storm water discharge provide enough flexibility to allow minimal or no requirements for non-exposed areas at industrial facilities. If the permitting authority determines that additional flexibility is needed for this scenario, the permits could be modified as necessary.

K. Public Involvement/Public Role

The Phase II FACA Subcommittee discussed the appropriate role of the public in successful implementation of a municipal storm water program. EPA believes that an educated and actively involved public is essential to a successful municipal storm water program. An educated public increases program compliance from residents and businesses as they realize their individual and collective responsibility for protecting water resources (*e.g.*, the residents and businesses could be subject to a local ordinance that prohibits dumping used oil down storm sewers). Finally, the program is also more likely to receive public support and participation when the public is actively involved from the program's inception and allowed to participate in the decision making process.

In a time of limited staff and financial resources, public volunteers offer diverse backgrounds and expertise that may be used to plan, develop, and implement a program that is tailored to local needs (*e.g.*, participate in public meetings and other opportunities for input, perform lawful volunteer monitoring, assist in program coordination with other preexisting and related programs, aid in the development and distribution of educational materials, and provide public training activities). The public's participation is also useful in the areas of information dissemination/education and reporting of violators, where large numbers of community members can be more effective than a few regulators.

The public can also petition the NPDES permitting authority to require an NPDES permit for a discharge composed entirely of storm water that contributes to a violation of a water quality standard or is a significant contributor of pollutants to waters of the United States. In evaluating such a petition, the NPDES permitting authority is encouraged to consider the set of designation criteria developed for the evaluation of small MS4s located outside of an urbanized area in places with a population of at least 10,000 and a population density of 1,000 or more. Furthermore, any person can protect water bodies by taking civil action under section 505 of the CWA against any person who is alleged to be in violation of an effluent standard or permit condition. If civil action is taken, EPA encourages citizen plaintiffs to resolve any disagreements or concerns directly with the parties involved, either informally or through any available alternative dispute resolution process.

EPA recognizes that public involvement and participation pose challenges. It requires a substantial initial investment of staff and financial resources, which could be very limited. Even with this investment, the public might not be interested in participating. In addition, public participation could slow down the decision making process. However, the benefits are numerous.

EPA encourages members of the public to contact the NPDES permitting authority or local MS4s operator for information on the municipal storm water program and ways to participate. Such information may also be available from local environmental, nonprofit and industry groups.

Some commenters stressed the need to suggest to the public that they have a responsibility to fund the municipal storm water program. While EPA believes it is important that the program be adequately funded, today's rule does not address appropriate mechanisms or levels for such funding.

EPA received comments expressing concern that considerable public involvement requirements could result in increased litigation. EPA is not convinced there is a correlation between meaningful public education programs and any increased probability of litigation.

Finally, EPA received comments stating that the Agency should not en courage volunteer monitoring unless proper procedures are followed. EPA agrees. EPA encourages only lawful monitoring, *i.e.*, obtaining the necessary approval if there is any question about lawful access to sites. Moreover, as a matter of good practice and to enhance the validity and usefulness of the results, any party, public or private, conducting water quality monitoring is encouraged to use appropriate quality control procedures and approved sampling and analytic methods.

L. Water Quality Issues

1. Water Quality Based Effluent Limits

In addition to technology based requirements, all point source discharges of industrial storm water are subject to more stringent NPDES permitting requirements when necessary to meet water quality standards. CWA sections 402(p)(3)(A) and 301(b)(1)(C). For municipal separate storm sewers, EPA or the State may determine that other permit provisions (*e.g.* one of the minimum measures) are appropriate to protect water quality and, for discharges to impaired waters, to achieve reasonable further progress toward attainment of water quality standards pending implementation of a TMDL. CWA section 402(p)(3)(B)(iii). See *Defenders of Wildlife, et al. Browner*, No. 98–71080 (9th cir., August 11, 1999). Discharges of storm water also must comply with applicable antidegradation policies and implementation methods to maintain and protect water quality. 40 CFR 131.12. Section 122.34(a) emphasizes this point by specifically noting that a storm water management program designed to reduce the discharge of pollutants from the storm sewer system "to the maximum extent practicable" is also designed to protect water quality.

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Permits issued to non-municipal sources of storm water must include water quality-based effluent limits where necessary to meet water quality standards.

Commenters challenged EPA's interpretation of the CWA as requiring water quality-based effluent limits for MS4s when necessary to protect water quality. Commenters asserted that CWA 402(p)(3)(B), which addresses permit requirements for municipal discharges, limits the scope of municipal program requirements to an effective prohibition on non-storm water discharges to a separate storm sewer and to controls which reduce pollutants to the "maximum extent practicable, including management practices, control techniques and system design and engineering methods." They asserted that the final rule should clarify that neither numeric nor narrative water quality-based limits are appropriate or authorized for MS4s.

EPA disagrees that section 402(p)(3) divests permitting authorities of the tools necessary to issue permits to meet water quality standards. Section 402(p)(3)(B)(iii) specifically preserves the authority for EPA or the State to include other provisions determined appropriate to reduce pollutants in order to protect water quality. *Defenders of Wildlife,* slip op. at 11688. Small MS4s regulated under today's rule are designated under CWA 402(p)(6) "to protect water quality."

Commenters argued that water quality standards, particularly numeric criteria, were not designed to address storm water discharges. The episodic nature and magnitude of storm water events, they argue, make it impossible to apply the "end of pipe" compliance assessment approach, for example, in the development of water quality based effluent limits.

EPA's disagrees with the commenters arguments about the inability of water quality criteria to address high flow conditions. Today's final rule does, however, address the concern that numeric effluent limits will necessitate end of pipe treatment and the need to provide a workable alternative.

Today's rule was developed under the approach outlined in the Interim Permitting Policy for Water Quality-Based Effluent Limitations in Storm Water Permits, issued on August 1, 1996. 61 FR 43761 (November 26, 1996) (the "Interim Permitting Policy"). EPA intends to issue NPDES permits consistent with the Interim Permitting Policy, which provides as follows:

In response to recent questions regarding the type of water quality-based effluent limitations that are most appropriate for NPDES storm water permits, EPA is adopting an interim permitting approach for regulating wet weather storm water discharges. Due to the nature of storm water discharges, and the typical lack of information on which to base numeric water quality-based effluent limitations (expressed as concentration and mass), EPA will use an interim permitting approach for NPDES storm water permits.

"The interim permitting approach uses best management practices (BMPs) in first-round storm water permits, and expanded or better-tailored BMPs in subsequent permits, where necessary, to provide for the attainment of water quality standards. In cases where adequate information exists to develop more specific conditions or limitations to meet water quality standards, these conditions or limitations are to be incorporated into storm water permits, as necessary and appropriate. This interim permitting approach is not intended to affect those storm water permits that already include appropriately derived numeric water quality-based effluent limitations. Since the interim permitting approach only addresses water quality-based effluent limitations, it also does not affect technology-based effluent limitations, such as those based on effluent limitations guidelines or developed using best professional judgment, that are incorporated into storm water permits.

"Each storm water permit should include a coordinated and cost-effective monitoring program to gather necessary information to determine the extent to which the permit provides for attainment of applicable water quality standards and to determine the appropriate conditions or limitations of subsequent permits. Such a monitoring program may include ambient monitoring, receiving water assessment, discharge monitoring (as needed), or a combination of monitoring procedures designed to gather necessary information.

"This interim permitting approach applies only to EPA; however, EPA also encourages authorized States and Tribes to adopt similar policies for storm water permits. This interim permitting approach provides time, where necessary, to more fully assess the range of issues and possible options for the control of storm water discharges for the protection of water quality. This interim permitting approach may be modified as a result of the ongoing Urban Wet Weather Flows Federal Advisory Committee policy dialogue on this subject."

One commenter challenged the Interim Permitting Policy on a procedural basis, arguing that it was published without opportunity for public notice and comment. In response, EPA notes that the Policy was included verbatim and made available for public comment in the proposal to today's final rule. Prior to that proposal, the Agency defended the application of the Policy on a case-by-case basis in individual permit proceedings. Moreover, the essential elements of the Policy—that narrative effluent limitations are the most appropriate form of effluent limitations for storm water dischargers from municipal sources—was inherent in § 122.34(a) of the proposed rule, and was the subject of extensive public comment. In any event, the Policy does not constitute a binding obligation. It is policy, not regulation.

Consistent with the recognition of data needs underlying the Policy, EPA will evaluate the small MS4 storm water regulations after the second round of permit issuance. Section 122.34(e)(2) of today's rule expressly provides that for the interim ten-year period, "EPA strongly recommends that until the evaluation of the storm water program in § 122.37, no additional requirements beyond the minimum control measures be imposed on regulated small MS4s without the agreement of the operator of the affected small MS4, except where an approved TMDL or equivalent analysis provides adequate information to develop more specific measures to protect water quality." This approach addresses the concern for protecting water resources from the threat posed by storm water discharges with the important qualification that there must be adequate information on the watershed or a specific site as a basis for requiring tailored storm water controls beyond the minimum control measures. As indicated, the Interim Permitting Policy has several important limitations—it does not apply to technology-based controls or to sources that already have numeric end of pipe effluent limitations. EPA encourages authorized States and Tribes to adopt policies similar to the Interim Permitting Policy when developing storm water discharge programs. For a discussion of appropriate monitoring activities, see Section H.3.d., Evaluation and Assessment.

Where a water quality analysis indicates there is a need and basis for deriving water quality-based effluent limits in NPDES permits for storm water discharges regulated under today's rule, EPA believes that most of these cases would be satisfied by narrative effluent

limitations that require the implementation of BMPs. NPDES permit limits will in most cases continue to be based on the specific approach outlined in today's rule for the implementation of BMPs as the most appropriate form of effluent limitation to satisfy technology and water quality-based requirements. See § 122.34(a). For storm water management plans with existing BMPs, this may require further tailoring of BMPs to address the pollutant(s) of concern, the nature of the discharge and the receiving water. If the permitting authority determines that, through implementation of appropriate BMPs required by the NPDES storm water permit, the discharge has the necessary controls to provide for attainment of water quality standards, additional controls are not needed in the permit. Conversely, if a discharger (MS4, industrial or construction) fails to adopt and implement adequate BMPs, the permittee and/or the permitting authority should consider a different mix of BMPs or more specific conditions to ensure water quality protection.

Some commenters observed that there was no evidence from the experience of storm water dischargers regulated under the existing NPDES storm water program, or from studies or reports that allegedly support EPA's position, that implementation of BMPs to satisfy the six minimum control measures would meet applicable water quality standards for a regulated small MS4. In response, EPA acknowledges that the six minimum measures are intended to implement the statutory requirement to control discharges to the maximum extent practicable, and they may not result in the attainment of water quality standards in all cases. The control measures do, however, focus on and address well-documented threats to water quality associated with storm water discharges. Based on the collective expertise of the FACA Sub-committee, EPA believes that implementation of the six minimum measures will, for most regulated small MS4s, be adequate to protect water quality, and for other regulated small MS4s will substantially reduce the adverse impacts of their discharges on water quality.

Some commenters asserted that analyses of existing water quality criteria suggest that numeric criteria for aquatic life may be overprotective if applied to storm water discharges. These comments maintained that an approach that prohibits exceedance of applicable water quality criteria is unworkable. Various commenters recommended wet weather specific criteria, variances to the criteria during wet weather events, and seasonal designated uses. Other commenters noted that water quality-based effluent limits in NPDES permits have traditionally been developed based on dry weather flow conditions (*e.g.*, assuming critical low-flow conditions in the receiving water to ensure protection of aquatic life and human health). Wet weather discharges, however, typically occur under high-flow conditions in the receiving water. Assumptions regarding mass balance equations and size of mixing zones may also not be pertinent during wet weather.

EPA acknowledges the need to devise a regulatory program that is both flexible enough to accommodate the episodic nature, variability and volume of wet weather discharges and prescriptive enough to ensure protection of the water resource. EPA believes that wet weather discharges can be adequately addressed in the existing regulations through refining designated uses and assigning criteria that are tailored to the level of water quality protection described by the refined designated use.

EPA believes that lack of precision in assigning designated uses and corresponding criteria by States and Tribes, in many cases may result in application of water quality criteria that may not appropriately match the intended condition of the water body. States and Tribes have frequently designated uses without regard to site-specific wet weather conditions. Because certain uses (swimming, for example) might not exist during high-intensity storm events or in the winter, States may factor such climatic conditions and seasonal uses into their use designations with appropriate analyses. This would acknowledge that a lower level of control, at lower compliance cost, would be appropriate to protect that use. Before modifying any designated use, however, States would need to evaluate the effect of less stringent water quality criteria on protecting other uses, including any threatened or endangered species, drinking water supplies and downstream uses. EPA will further evaluate these issues in the context of the Water Quality Standards Regulation, Advance Notice of Proposed Rule Making (ANPRM), 63 FR, 36742, July 7, 1998.

One of the major themes presented by EPA in the ANPRM is that refinement in use designations and tailoring of water quality criteria to match refined use designations is an important future direction of the water quality standards program. In assigning criteria to protect general use classifications, a State or Tribe must ensure that the criteria are sufficiently protective to safeguard the full range of waters of the State, *i.e.*, criteria would be based on the most sensitive use. This approach has been disputed, especially for aquatic life uses, where evidence suggests that the general use criteria will require controls more stringent than needed to protect the existing or potential aquatic life community for a specific water body. EPA recognizes that there is a growing need to more precisely tailor use descriptions and criteria to match site-specific conditions, ensuring that uses and criteria provide an appropriate level of protection, which, to the extent possible, are not overprotective. EPA is engaged in an ongoing evaluation of its regulations in this area through the ANPRM effort. At the same time, EPA continues to encourage States and Tribes to review the applicability of the designated uses and associated criteria using existing provisions in the water quality standards regulation.

2. Total Maximum Daily Loads and Analysis To Determine the Need for Water Quality-Based Limitations

The development and implementation of total maximum daily loads (TMDLs) provide a link between water quality standards and effluent limitations. CWA section 303(d) requires States to develop TMDLs to provide more stringent water quality-based controls when technology-based controls are inadequate to achieve applicable water quality standards. A TMDL is the sum of the individual wasteload allocations for point sources and load allocations for nonpoint sources, with consideration for natural background conditions. A TMDL quantifies the maximum allowable loading of a pollutant to a water body and allocates this maximum load to contributing point and nonpoint sources so that water quality criteria will not be exceeded and designated uses will be protected. A TMDL also includes a margin of safety to account for uncertainty about the relationship between pollutant loads and water quality.

Today's final rule refers to TMDLs in several provisions. For the purpose of today's rule, EPA relies on the component of the TMDL that evaluates existing conditions and allocates loads. For discharges to waters that are not impaired and for which a TMDL has not been developed, today's rule also refers to an "equivalent analysis." The discussion that follows uses the term "TMDL" for both.

Under revised § 122.26(a)(9)(i)(C), the permitting authority may designate

storm water discharges that require NPDES permits based on TMDLs that address the pollutants of concern. For storm water discharges associated with small construction activity, § 122.26(b)(15)(i)(B) provides a waiver provision where it may be determined that storm water controls are not needed based on TMDLs that address sediment and any other pollutants of concern. The NPDES permitting authority may waive requirements under the program for certain small MS4s within urbanized areas serving less than 1,000 persons provided that, if the small MS4 discharges any pollutant that has been identified as a cause of impairment of a water body into which it discharges, the discharge is in compliance with a wasteload allocation in a TMDL for the pollutant of concern. The permitting authority may also waive requirements for MS4s in urbanized areas serving between 1,000 and 10,000 persons, if the permitting authority determines that storm water controls are not needed, as provided in § 123.35(d)(2). See § 122.32(c).

Under CWA section 303(d), States identify which of their water bodies need TMDLs and rank them in order of priority. Generally, once a TMDL has been completed for one or more pollutants in a water body, a wasteload allocation for each point source discharging the pollutant(s) is implemented as an enforceable condition in the NPDES permit. Regulated small MS4s are essentially like other point source discharges for purposes of the TMDL process.

A TMDL and the resulting wasteload allocations for pollutant(s) of concern in a water body may not be available because the water body is not on the State's 303(d) list, the TMDL has not yet been completed, or the TMDL did not include specific pollutants of concern. In these cases, the permitting authority must determine whether point sources discharge pollutant(s) in amounts that cause, have the reasonable potential to cause, or contribute to excursions above State water quality standards, including narrative water quality criteria. This so-called "reasonable potential" analysis is intended to determine whether and for what pollutants water quality based effluent limits are required. The analysis is, in effect, a substitute for a similar determination that would be made as part of a TMDL, where necessary. When "reasonable potential" exists, regulations at § 122.44(d) require a water quality-based effluent limit for the pollutant(s) of concern in NPDES permits. The water quality-based effluent limits may be narrative requirements to implement BMPs or, where necessary, may be numeric pollutant effluent limitations.

Commenters, generally from the regulated community, objected that, due to references to the need to develop a program "to protect water quality" and to additional NPDES permit requirements beyond the minimum control measures based on TMDLs or their equivalent, regulated small MS4s will be subject to uncertain permit limitations beyond the six minimum control measures. Commenters also asserted that through the imposition of a wasteload allocation under a TMDL in impaired water bodies, there is a likelihood that unattainable, yet enforceable narrative and numeric standards will be imposed on regulated small MS4s.

As is discussed in the preceding section, NPDES permits must include any more stringent limitations when necessary to meet water quality standards. However, even if a regulated small MS4 is subject to water quality based effluent limits, such limits may be in the form of narrative effluent limitations that require the implementation of BMPs. As discussed earlier, EPA has adopted the Interim Permitting Policy and incorporated it in the development of today's rule to recognize the appropriateness of BMP-based limits developed on a case-by-case basis.

EPA formed a Federal Advisory Committee to provide advice to EPA on identifying water quality-limited water bodies, establishing TMDLs for them as appropriate, and developing appropriate watershed protection programs for these impaired waters in accordance with CWA section 303(d). Operating under the auspices of the National Advisory Council for Environmental Policy and Technology (NACEPT), the committee produced its *Report of the Federal Advisory Committee on the Total Maximum Daily Load (TMDL) Program* (July 1998). EPA recently published a proposed rule to implement the Report's recommendations (64 FR 46012, August 23, 1999).

3. Anti-Backsliding

In general, the term "anti-backsliding" refers to statutory provisions at CWA sections 303(d)(4) and 402(o) and regulatory provisions at 40 CFR 122.44(l). These provisions prohibit the renewal, reissuance, or modification of an existing NPDES permit that contain effluent limits, permit terms, limitations and conditions, or standards that are less stringent than those established in the previous permit. There are also exceptions to this prohibition known as "antibacksliding exceptions."

The issue of backsliding from prior permit limits, standards, or conditions is not expected to initially apply to most storm water dischargers designated under today's proposal because they generally have not been previously authorized by an NPDES permit. However, the backsliding prohibition would apply if a storm water discharge was previously covered under another NPDES permit. Also, the backsliding prohibition could apply when an NPDES storm water permit is reissued, renewed, or modified. In most cases, however, EPA does not believe that these provisions would restrict revisions to storm water NPDES permits.

One commenter questioned whether, if BMPs implemented by a regulated small MS4 operator fail to produce results in removal of pollutants and the permittee attempts to substitute a more effective BMP, the small MS4 operator could be accused of violating the anti-backsliding provisions and also be exposed to citizen lawsuits. In response, EPA notes that in such circumstances the MS4's permit has not changed and, therefore, the prohibition against backsliding is not applicable. Further, any change in the mix of BMPs that was intended to be more effective at controlling pollutants would not be considered backsliding, even if it did not include all of the previously implemented BMPs.

4. Water Quality-Based Waivers and Designations

Several sections of today's final rule refer to water quality standards in identifying those storm water discharges that are and are not required to be permitted under today's rule. As noted in § 122.30 of today's rule, CWA section 402(p)(6) requires the designation of municipal storm water sources that need to be regulated to protect water quality and the establishment of a comprehensive storm water program to regulate these sources. Requirements applicable to certain municipal sources may be waived based on the absence of demonstrable water quality impacts. Section 122.32(c). The section 402(p)(6) mandate to protect water quality also provides the basis for regulating discharges associated with small construction. See also § 122.26(b)(15)(i). Further, today's rule carries forward the existing authority for the permitting authority to designate sources of storm water discharges based upon water quality considerations. Section 122.26(a)(9)(i)(C) and (D).

As is discussed above in sections II.H.2.e (for small MS4s) and II.I.1.b.ii

(for small construction), the requirements of today's rule may be waived based on wasteload allocations that are part of "total maximum daily loads" (TMDLs) that address the pollutants of concern or, in the case of small construction and municipalities serving between 1,000 and 10,000 persons, the equivalents of TMDLs. One commenter stated that waivers would allow exemptions to the technology based requirements and would thus be inconsistent with the two-fold approach of the CWA (a technology based minimum and a water quality based overlay). EPA acknowledges that waivers are not allowed for other technology-based requirements under the CWA. A more flexible approach is allowed, however, for sources designated for regulation under 402(p)(6) to protect water quality. For such sources EPA may allow a waiver where it is demonstrated that an individual source does not present the threat to water quality that was the basis for EPA's designation.

III. Cost-Benefit Analysis

EPA has determined that the range of the rule's benefits exceeds the range of regulatory costs. The estimated rule costs range from $847.6 million to $981.3 million annually with corresponding estimated monetized annual benefits which range from $671.5 million to $1.628 billion, expected to exceed costs.

The rule's cost and benefit estimates are based on an annual comparison of costs and benefits for a representative year (1998) in which the rule is implemented. This differs from the approach used for the proposed rule which projected cost and benefits over three permit terms. EPA has chosen to use the current approach because it determined that the ratio of annual benefits and costs would not change significantly over time. Moreover, because there is not an initial outlay of capital costs with benefits accruing in the future (*i.e.*, benefits and costs are almost immediately at a steady state), it is not necessary to discount costs in order to account for a time differential.

EPA developed detailed estimates of the costs and benefits of complying with each of the incremental requirements imposed by the rule. The Agency used two approaches, a national water quality model and national water quality assessment, to estimate the potential benefits of the rule. Both approaches show that the benefits are likely to exceed costs.

These estimates, including descriptions of the methodology and assumptions used, are described in detail in the *Economic Analysis of the Final Phase II Rule*, which is included in the record of this rule making. Exhibit 3 summarizes costs and benefits associated with the basic elements of today's rule.

EXHIBIT 3.—COMPARISON OF ANNUAL COMPLIANCE COST AND BENEFIT ESTIMATES [1]

Monetized benefits	National water quality model (millions of 1998 dollars)	National water quality assessment (millions of 1998 dollars)
Municipal Minimum Measures		$131.0–$410.2
Controls for Construction Sites		$540.5–$686.0
Total Annual Benefits	$1,628.5	$671.5–$1,096.2

Costs	Millions of 1998 dollars [2]
Municipal Minimum Measures	$297.3
Controls/Waivers for Construction Sites	$545.0–$678.7
Federal/State Administrative Costs	$5.3
Total Annual Costs	$847.6–$981.31

[1] National level benefits are not inclusive of all categories of benefits that can be expected to result from the regulation.
[2] Total may not add due to rounding.

A. Costs

1. Municipal Costs

Initially, to determine municipal costs for the proposed rule, EPA used anticipated expenditure data included in permit applications from a sample of 21 Phase I MS4s. Certain commenters criticized the Agency for using anticipated expenditures because they could be significantly different from the actual expenditures. These commenters suggested that the Agency use the actual cost incurred by the Phase I MS4s. Other comments stated that because the Phase I MS4s, in general, are large municipalities, they may not be representative of the Phase II MS4s for estimating regulatory costs. Finally, one commenter noted that the sample of 21 municipalities used to project cost was relatively small.

To address the concerns of the commenters, EPA utilized a National Association of Flood and Stormwater Management Agencies (NAFSMA) survey of the Phase II community to obtain incremental cost estimates for Phase II municipalities. Using the list of potential Phase II designees published in the **Federal Register** (63 FR 1616), NAFSMA contacted more than 1,600 jurisdictions. The goal of the survey was to solicit information from those communities about the proposed Phase II NPDES storm water program. Several of the survey questions corresponded directly to the minimum measures required by the Phase II rule. One hundred twenty-one surveys were returned to NAFSMA and were used to develop municipal costs.

Using the NAFSMA information, EPA estimated average annual per household program costs for automatically designated municipalities. EPA also estimated an average annual per household administrative cost for municipalities to address application, record keeping, and reporting requirements of the Rule. The total average per household cost of the rule is expected to $9.16 per household.

To determine potential national level costs for municipalities, EPA multiplied the number of households (32.5 million) by the per household cost ($9.16). EPA estimates the annual cost of the Phase II municipal program at $298 million.

As an alternative method, and point of comparison, to the NAFSMA-based approach, EPA reviewed actual expenditures reported from 35 Phase I MS4s. The Agency targeted these 35 Phase I MS4s because they had participated in the NPDES program for

nearly one permit term, were smaller in size and had detailed data reflecting their actual program implementation costs. Of the 35 MS4s, appropriate cost data was only available for 26 of those MS4s. EPA analyzed the expenditure data and identified the relevant expenditures, excluding costs presented in the annual reports unrelated to the requirements of the Rule. The cost range and annual per household program costs of $9.08 are similar to those found using the NAFSMA survey data.

2. Construction Costs

In order to estimate the rule's construction-related cost on a national level (the soil and erosion controls (SEC) requirements of the rule and the potential impacts of the post-construction municipal measure on construction), EPA estimated a per site cost for sites of one, three, and five acres and multiplied these costs by the total number of estimated Phase II construction starts across these size categories.

To estimate the percentage of starts subject to the soil and erosion control requirements between 1 and 5 acres, with respect to each category of building permits (residential, commercial, *etc.*), EPA initially used data from Prince George's County (PGC), Maryland, and applied these percentages to national totals. In the proposal, EPA recognized that the PGC data may not be representative of the entire country and requested data that could be used to develop better estimates of the number of construction sites between 1 and 5 acres. EPA did not receive any substantiated national data from commenters.

In view of the unavailability of national data from commenters, EPA made extensive efforts to collect construction site data around the country. The Agency contacted more than 75 municipalities. EPA determined that 14 of the contacted municipalities had useable construction site data. Using data from these 14 municipalities, EPA developed an estimate of the percentage of construction starts on one to five acres. EPA then multiplied this percentage by the number of building permits issued nationwide to determine the total number of construction starts occurring on one to five acres. Finally, to isolate the number of construction starts incrementally regulated by Phase II, EPA subtracted the number of activities regulated under equivalent programs (*e.g.*, areas covered by the Coastal Zone Act Reauthorization Amendments of 1990, and areas covered by equivalent State level soil and erosion control requirements). Ultimately, EPA estimated that 110,223 construction starts would be incrementally covered by the rule annually.

EPA then used standard cost estimates from *Building Construction Cost Data* and *Site Work Landscape Cost Data* (R.S. Means, 1997a and 1997b) to estimate construction BMP costs for 27 model sites in a variety of typical site conditions across the United States. The model sites included three different site sizes (one, three and five acres), three slope variations (3%, 7%, and 12%), and three soil erosivity conditions (low, medium, and high). EPA chose BMP combinations appropriate to the model site conditions. Based on the assumption that any combination of site factors is equally likely to occur in a given site, EPA developed average cost of sediment and erosion control for all model sites. EPA estimated that, on average, BMPs for a 1 acre site will cost $1,206, for a 3 acre site $4,598 and for a 5 acre site $8,709.

EPA then estimated administrative costs per construction site for the following elements required under the rule: Submittal of a notice of intent for permit coverage; notification to municipalities; development of a storm water pollution prevention plan; record retention; and submittal of a notice of termination. EPA estimated the average total administrative cost per site to be $937.

EPA also considered the cost implications of NPDES permit authorities waiving the applicability of requirements to storm water discharges from small construction sites based on two different criteria involving water quality impact and low rainfall. EPA received comments stating that a waiver would require a significant investment in training or acquisition of a consultant. Based on comments received, EPA eliminated one of the waiver conditions involving low soil loss threshold because it necessitated use of the Revised Universal Soil Loss Equation which could require extensive technical expertise.

Based on the opinions of construction industry experts, EPA estimates that 15 percent of the construction sites that would otherwise be covered by today's rule will be eligible to receive waivers. Therefore, the Agency has excluded 15 percent of the construction sites when deriving costs of sediment and erosion control. The average cost for sites to qualify for the waiver is expected to be $34 per site. The construction cost analysis for the proposed rule did not include any costs for the preparation and submission of waiver applications because EPA believed those costs would be negligible. However, in response to public comments, EPA has estimated these potential costs.

EPA has also estimated the potential costs for construction site operators to implement the post-construction minimum measure. These are costs that may be incurred by construction site operators if the MS4 chooses to meet the post-construction minimum measure by requiring on-site structural, site-by-site control of post-construction runoff. Municipalities may select from an array of structural and non-structural options in implementing this measure, so the potential costs to construction operators is uncertain. Nonetheless, EPA developed average annual BMP costs for sites of one, three, five and seven acres. EPA's analysis accounted for varying levels of imperviousness that characterize residential, commercial, and institutional land uses. Nationwide, these costs are expected to range from $44 million to $178 million annually.

Finally, to establish national incremental annual costs for Phase II construction starts, EPA multiplied the total costs of compliance for the chosen site size categories by the total number of Phase II construction starts and added post-construction costs. EPA estimates the annual compliance cost to range from $545 million to $678.7 million.

B. Quantitative Benefits

In the Economic Analysis for the proposed rule, a "top-down" approach was used to estimate economic benefits. Under this approach, the combined economic benefits for wet weather programs were estimated first, and then were divided among various water programs on the basis of expert opinion. As a result, the benefits estimates for an individual program were rather uncertain. Moreover, this approach was inconsistent with the approach used to estimate the cost of the proposed storm water rule, which was developed using municipal-based and cost-based data to develop "bottom-up" costs. Therefore, EPA decided to use a "bottom-up" approach for estimating benefits of the Phase II rule. To adequately reflect the quantifiable benefits of the rule, EPA used two different methods: (1) National Water Quality Model and (2) National Water Quality Assessment.

To monetize benefits in both approaches, the Agency applied Carson and Mitchell's (1993) estimates of household willingness-to-pay (WTP) for water quality improvement to estimates of waters impaired by storm water discharges. Carson and Mitchell's 1993 study reports the results of their 1983 national survey of WTP for incremental

improvements in fresh water quality. Carson and Mitchell estimate the WTP for three minimum levels of fresh water quality: boatable, fishable, and sizable. EPA adjusted the WTP amounts to account for inflation, growth in real per capita income, and increased attitudes towards pollution control. The adjusted WTP amounts for improvements in fresh water quality are $210 for boatable, $158 for fishable, and $177 for sizable. A brief summary of the national water quality model and national water quality assessment approaches follow.

1. National Water Quality Model

One approach EPA used to estimate the benefits of the Phase II municipal and construction site controls was the National Water Pollution Control Assessment Model (NWPCAM). NWPCAM estimates benefits of the storm water program at the national level, including the impact on small streams. This model estimates water quality and the resultant use support for the 632,000 miles of rivers and streams in the USEPA Reach File Version 1 (RF1), which covers the continental United States. The model analyzes water quality changes by stream reach. The parameters modeled in the NWPCAM are biological oxygen demand (BOD), total suspended solids (TSS), dissolved oxygen (DO), and fecal coliforms (FC).

The model projects changes in water quality due to the Phase II municipal and construction site controls. To calculate the economic benefits of change in water quality, the number of households in the proximity of the stream reach are determined, by overlaying the model results on the 1990 Census of Populated Places and Minor Civil Divisions, and updating the population to 1998. Economic benefits are calculated using the Carson and Mitchell WTP values. The benefits are separately estimated for local and non-local waters on the basis of WTP values and proximity to water quality changes.

The value of the change in use support for local waters is greater than the value of the non-local waters because of the opportunity to use local waters by the local population. This model assumes that if improvement occurs in waters that are not close to population centers the economic value is lower. Therefore, benefits are estimated for local and non-local waters separately. This assumption is based on Carson and Mitchell's survey which asked respondents to apportion each of their stated WTP values between achieving the water quality goals in their own State and achieving those goals in the nation as a whole. On average, respondents allocated 67% of their values to achieving in-State water quality goals and the remainder to the nation as a whole. Carson and Mitchell argue that for valuing local water quality changes 67% is a reasonable upper bound for the local multiplier and 33% for the non-local water quality changes. For the purposes of this analysis, the locality is defined as urban sites and associated populations linked into the NWPCAM framework. Using this methodology, the total monetized benefits of Phase II control of urban and construction site runoff is estimated to be $1.628 billion per year. The local and non-local benefits due to Phase II controls are presented in Exhibit 4.

EXHIBIT 4.—LOCAL AND NON-LOCAL BENEFITS ESTIMATES DUE TO PHASE II CONTROLS NATIONAL WATER QUALITY MODEL ESTIMATE

Use support	Local benefits ($million/yr)	Non-local benefits [1] ($million/yr)	Total benefits ($million/yr)
Swimming, Fishing, and Boating	306.20	60.60	366.80
Fishing and Boating	395.10	51.90	447.00
Boating	700.10	114.60	814.70
Total	1401.40	227.10	1628.50

[1] To estimate non-local willingness to pay per household, the 33% of willingness is multiplied by the fraction of previously impaired national waters (in each use category) that attain the beneficial use as a result of the Phase II rule. To estimate the aggregate non-local benefits, non-local willingness to pay is multiplied with the total number of households in the US.

While the numbers of miles that are estimated to change their use support are small, the benefits estimates are quite significant. This is because urban runoff and, to a large extent, construction activity occurs where the people actually reside and the water quality changes mostly occur close to these population centers. NWPCAM indicates that changes in pollution loads have the most effect immediately downstream of pollution changes. As a result, the aggregate WTP is large because large numbers of households in these population centers are associated with the local waters that reflect improvement in designated use support.

2. National Water Quality Assessment

EPA also estimated benefits of the Phase II Storm Water program using the 1998 National Water Quality Inventory (305(b)) Report to Congress, rather than the NWPCAM as a basis for estimating impairment addressed by the rule. The Water Quality Assessment method separately estimates benefits associated with improvements to fresh water, marine water and construction site controls, and then aggregates these separate categories into an estimate of total annual benefits.

a. Municipal Measures

i. Fresh Waters Benefits

In order to develop estimates for the potential value of the municipal measures (except storm water runoff controls for construction sites), EPA applied Carson & Mitchell WTP values to estimated existing and projected future fresh water impairment. Carson & Mitchell did not evaluate marine waters, so only fresh water values were available from their research. Even though the Carson and Mitchell estimates apply to all fresh water, it is not clear how these values would be apportioned among rivers, lakes, and the Great Lakes. The 305(b) data indicate that lakes are the most impaired by urban runoff/storm sewers, followed closely by the Great Lakes, and then rivers. Therefore, EPA applied the WTP values to the categories separately and assumed that the higher resulting value for lakes represents the high end of the range (*i.e.*, assuming that lake impairment is more indicative of national fresh water impairment) and that the lower resulting value for impaired rivers represents the low end of a value range for all fresh waters (*i.e.*, assuming that river impairment is more indicative of national fresh water impairment). In addition, EPA estimated that the post-construction runoff

requirements of the municipal program might result in benefits of at least $16.8 million annually from avoided future runoff. The post-construction estimate significantly underestimates potential program benefits because it does not account for avoided hydrologic changes and resulting water quality impairment associated with increases in imperviousness from development and redevelopment. Summing the benefits across the water quality use support levels yields an estimate of benefits ranging from approximately $121.9 million to $378.2 million per year.

ii. Marine Waters Benefits

In addition to the fresh water benefits captured by the Carson and Mitchell study, EPA anticipates benefits as a result of improvements to marine waters. Sufficient methods have not been developed to quantify national-level benefits for commercial or recreational fishing. EPA used beach closure data and visitation estimates from its Beach Watch Program to estimate potential reductions in marine swimming visits due to storm water runoff contamination events in 1997. The estimated 86,100 trips that did not occur because of beach closures in coastal Phase II communities is a lower bound because it represents only those beaches that report both closures and visitation data. EPA estimates potential swimming benefits from the rule to be at least $2.1 million annually.

EPA developed an analysis of potential benefits associated with avoided health impacts from exposure to contaminants in storm sewer effluent. Based on a study of incremental illnesses found among people who swam within one yard of storm drains in Santa Monica Bay, EPA estimated a range of incremental illnesses (Haile *et al.*, 1996). Depending on assumptions made about number of exposures to contaminants and contaminant concentrations, benefits ranged from $7.0 million to $29.9 million annually.

b. Construction Benefits

The major pollutant resulting from construction activities is sediment. However, in addition to sediment, construction activities also yield pollutants such as pesticides, petroleum products, and solvents. Because circumstances will vary considerably from site to site, data is not available with which to develop estimates of benefits for each site and aggregate to obtain a national-level estimate.

In the proposed rule, EPA estimated the combined benefits of all wet weather programs, and then used expert opinions to allocate them to different individual programs. To eliminate the possible overlap between the benefits of the soil and erosion control requirements, municipal measures, and other wet weather storm water programs, EPA chose to use an approach in today's final rule that directly estimates the benefits of soil and erosion requirements.

A survey of North Carolina residents (Paterson *et al.*, 1993) indicated that households are willing to pay for erosion and sediment controls similar to those in today's rule. Based on income and other indicators, the values derived from the study are expected to be similar to values held in the rest of the country. Using the mean value of the willingness to pay of $25 per household, EPA projects annual benefits of the soil and erosion requirements to range from $540.5–$686 million.

c. Summary of Benefits From the National Water Quality Assessment

Total benefits from municipal measures and construction site controls are expected to range from $671.5 million to $1.1 billion per year, including benefits of approximately $13.7 million per year associated with small stream improvements. A summary of the potential benefits is presented in Exhibit 5.

As shown in Exhibit 5, it was not possible to monetize all categories of benefits using the WTP estimates. In particular, benefits for improving marine water quality such as fishing and passive use benefits are not included in the values used to estimate the potential benefits of the municipal minimum measures (excluding construction sites controls), and they are not estimated separately, because information is not currently available.

EXHIBIT 5.—POTENTIAL ANNUAL BENEFITS OF THE PHASE II STORM WATER RULE NATIONAL WATER QUALITY ASSESSMENT ESTIMATE

Benefit category	Annual WTP
Municipal Minimum Measures [1]	
Fresh Water Use and Passive Use [2]	$121.9–$378.2
Marine Recreational Swimming	$2.1
Human Health (Marine Waters)	$7.0–$29.9
Other Marine Use and Passive Use	(+)
Erosion and Sediment Controls for Construction Sites	
Fresh Water and Marine Use and Passive Use [3]	$540.5–$686
Total Phase II Program	
Total Use & Passive Use (Fresh Water and Marine)	>$671.5–>$1,096.2

+= positive benefits expected but not monetized.
[1] Includes water quality benefit of municipal programs, based on 80% effectiveness of municipal programs.
[2] Based on research by Carson and Mitchell (1993). Fresh water value only. Does not include commercial fishery, navigation, or diversionary (*e.g.* municipal drinking water cost savings or risk reductions) benefits. May not fully capture human health risk reduction or ecological values.
[3] Based on research by Paterson *et al.* (1993). Although the survey's description of the benefits of reducing soil erosion from construction sites included reduced dredging, avoided flooding, and water storage capacity benefits, these benefit categories may not be fully incorporated in the WTP values. Small streams may account for over 2% of total benefits.

C. Qualitative Benefits

There are additional benefits to storm water control that cannot be quantified or monetized. Thus, the current estimate of monetized benefits may understate the true value of storm water controls because it omits many ways in which society is likely to benefit from reduced storm water pollution, such as improved

aesthetic quality of waters, benefits to wildlife and to threatened and endangered species, cultural values, and biodiversity benefits.

A benefit that EPA did not monetize completely is the flood control benefits attributable to municipal storm water controls reducing downstream flooding, although flood control benefits associated with sediment and erosion control are already reflected to some extent in the construction benefits. Similarly, the Agency could not value the benefits from increased property value due to storm water controls reflected in the rule, even though a commenter suggested inclusion of these benefits in the estimates.

Moreover, while a number of commenters requested that EPA include ecological benefits, the Agency was not able to fully monetize these benefits. Urbanization usually increases the amount of sediment, nutrients, metals and other pollutants associated with land disturbance and development. Development usually not only results in a dramatic increase in the volume of water runoff, but also in a substantial decrease in that water's quality due to stream scour, runoff and dispersion of toxic pollutants, and oversiltation. These kinds of secondary benefits could not be fully reflected in the monetized benefits. EPA was able to only monetize the aquatic life support benefits for waters assumed to be impaired. Thus, only the aquatic life support benefits attributable to municipal controls, reflected through human satisfaction, are taken into account.

Reduced nutrient level is another benefit of the storm water control which is not fully captured by the economic analysis. High nutrient levels often lead to eutrophication of the aquatic system. The quality change in ecological sources as the result of storm water controls to reduce pollutants is not fully reflected in the present benefits.

D. National Economic Impact

Finally, the Agency determined that the rule will have minimal impacts on the economy or employment. This is because the final rule regulates small MS4s and construction sites under 5 acres, not the typical industrial plants or other non-construction activities that could directly impact production and thus those sectors of the economy.

Discussions with representatives within the construction industry indicate that construction costs will likely be passed on to buyers, thus not seriously affecting the housing industry directly. One commenter argued that the rule will have a negative employment effect because the builders will build fewer homes requiring less building materials as a result of the declining demand induced by the cost of the soil and erosion controls. EPA disagrees with this argument because the cost of the controls, as the percentage of the price of a median home, is negligible and will be passed on to final buyers.

Flexibility within the rule allows MS4s to tailor the storm water program requirements to their needs and financial position, minimizing impacts. For sedimentation and erosion controls on construction sites, the rule contemplates application of commonly used BMPs to reduce costs for the construction industry. Thus, the rule attempts to use existing practices to prevent pollution, which should minimize impacts on States, Tribes, municipalities and the construction industry.

Thus, EPA concludes that the effect of the rule, if any, on the national economy will be minimal. The benefits of today's rule more than offset any cost impacts on the national economy.

IV. Regulatory Requirements

A. Paperwork Reduction Act

The Office of Management and Budget (OMB) has approved some of the information collection requirements contained in this final rule (*i.e.* those found in 40 CFR 122.26(g) and 123.35(b)) under the provisions of the *Paperwork Reduction Act*, 44 U.S.C. 3501 *et seq.* and has assigned OMB control number 2040–0211.

The burden and costs described below are for the information collection, reporting, and record keeping requirements for the three year period beginning with the effective date of today's rule. Additional information collection requirements for regulated small MS4s and small construction sites will occur after this initial three year period and will be counted in a subsequent information collection requirement. The total burden of the information collection requirements for the first three years of this rule is estimated at 56,369 hours with a corresponding cost of $2,151,305 million annually. This burden and cost is for industrial facilities to complete and submit the no exposure certification, for NPDES-authorized States to process and review the no exposure certification, and for the NPDES-authorized States to develop designation criteria and assess additional MS4s outside of urbanized areas. Compliance with the applicable information collection requirements imposed under this rule are mandatory, pursuant to CWA section 402.

Exhibit 6 presents average annual burden and cost estimates for Phase II respondents for the first three years. Burden means the total time, effort, or financial resources expended by persons to generate, maintain, retain, disclose or provide information to or for a Federal agency. This includes the time needed to review instructions; develop, acquire, install, and utilize technology and systems for the purposes of collecting, validating, and verifying information, processing and maintaining information, and disclosing and providing information; adjust existing ways for complying with any previously applicable instructions and requirements; train personnel to be able to respond to a collection of information; search data sources; complete and review the collection of information; and transmit or otherwise disclose the information.

EXHIBIT 6.—AVERAGE ANNUAL BURDEN AND COST ESTIMATES FOR PHASE II RESPONDENTS

Information collection activity	A Respondents per year (projected) [1]	B Burden hours per respondent per year (predicted)	(A)×(B)=C Annual respondent burden hours (projected)	D Respondent labor cost ($/hr) (1998 $)	(C)×(D)=E Annual Cost ($) (projected)
Ind. No Expos. Facilities:[2]					
No Expos. Certification	36,377	1.0	36,377	44.35	1,613,320
Annual Subtotal			36,377		1,613,320
NPDES-Authorized States:[3]					
Designation of Addit. MS4s[4]	15	332.8	4,892	26.91	131,644

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EXHIBIT 6.—AVERAGE ANNUAL BURDEN AND COST ESTIMATES FOR PHASE II RESPONDENTS—Continued

Information collection activity	A Respondents per year (projected) [1]	B Burden hours per respondent per year (predicted)	(A)×(B)=C Annual respondent burden hours (projected)	D Respondent labor cost ($/hr) (1998 $)	(C)×(D)=E Annual Cost ($) (projected)
No Exp. Cert. Proc. & Rev	30,200	0.5	15,100	26.91	406,341
Annual Subtotal			19,992		537,985
Annual Totals			56,369		2,151,305

Notes:

[1] Source: U.S. EPA, Office of Wastewater Management. Economic Analysis for the Storm Water Phase II Rule.

[2] The total number of potential no exposure respondents was divided by 5 to estimate an annual total. It was assumed that the annual number of respondents for the no exposure certification would be spread over the five year period the exclusion applies.

[3] The number of respondents in each category represents only those respondents located within the 44 NPDES-authorized States and Territories. The burden and cost estimates provided in this section are for the NPDES-authorized States in their role as the permitting authority for municipal designations and industrial no exposure.

[4] The number of respondents for this activity, 15, represents the number of NPDES-authorized States and Territories that must develop designation criteria and assess small MS4s located outside of an urbanized area for possible Phase II coverage divided by the three year ICR period.

Given the requirements of today's regulation, EPA believes there will be no capital startup and no operation and maintenance costs associated with information collection requirements of the rule.

The government burden associated with today's rule will impact State, Tribal, and Territorial governments (NPDES-authorized governmental entities) that have storm water program authority, as well as the federal government (*i.e.*, EPA), where it is the NPDES permitting authority. As of March 1999, 43 States and the Virgin Islands had NPDES authority.

The annual burden imposed upon authorized governmental entities (delegated States and the Virgin Islands) and the federal government for the next three years is estimated to be 19,992 hours ($537,985) and 4,087 hours ($115,948) respectively, for a total of 24,079 hours ($653,933). This estimate is based on the average time that governments will expend to carry out the following activities: designate additional MS4s (332.8 hours) and process and review "no exposure" certificates from industrial dischargers (0.5 hour).

Under the existing rule, storm water discharges from light industrial activities identified under § 122.26(b)(14)(xi) were exempted from the permit application requirements if they were not exposed to storm water. Today's rule expands the applicability of the "no exposure" exclusion to include all industrial activity regulated under § 122.26(b)(14) (except category (x), construction). The "no exposure" provision is applied through the use of a written certification process, thus representing a slight reporting burden increase for "light" industries with "no exposure'.

In addition to the information collection, reporting, and record keeping burden for the next three years, today's rule contains information collection requirements that will not begin until three years or more from the effective date of today's rule. These information collection requirements were not included in the information collection request approved by OMB. EPA will submit these burden estimates for OMB approval when it submits ICR 2040–0211 to OMB for renewal in three years. The rule burdens for regulated small MS4s and small construction sites that will be included in the ICR renewal fall into three areas: application for an NPDES permit or submittal of waiver information, record keeping of storm water management activities, and submittal of reports to the permitting authority. There will also be an additional burden for the permitting authority to review this information.

An agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a currently valid OMB control number. The OMB control numbers for EPA's regulations are listed in 40 CFR Part 9 and 48 CFR Chapter 15. EPA is amending the table in 40 CFR Part 9 of currently approved ICR control numbers issued by OMB for various regulations to list the first three years of information requirements contained in this final rule.

B. Executive Order 12866

Under Executive Order 12866, [58 FR 51,735 (October 4, 1993)] the Agency must determine whether the regulatory action is "significant" and therefore subject to OMB review and the requirements of the Executive Order. The Order defines "significant regulatory action" as one that is likely to result in a rule that may:

(1) have an annual effect on the economy of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities;

(2) create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;

(3) materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or

(4) raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order.

Pursuant to the terms of Executive Order 12866, it has been determined that this rule is a "significant regulatory action". As such, this action was submitted to OMB for review. Changes made in response to OMB suggestions or recommendations will be documented in the public record.

C. Unfunded Mandates Reform Act

Title II of the Unfunded Mandates Reform Act of 1995 (UMRA), Public Law 104–4, establishes requirements for Federal agencies to assess the effects of their regulatory actions on State, local, and tribal governments and the private sector. Under section 202 of the UMRA, EPA generally must prepare a written statement, including a cost-benefit analysis, for proposed and final rules with "Federal mandates" that may result in expenditures to State, local, and tribal governments, in the aggregate, or to the private sector, of $100 million or more in any one year. Before promulgating an EPA rule for which a

written statement is needed, section 205 of the UMRA generally requires EPA to identify and consider a reasonable number of regulatory alternatives and adopt the least costly, most cost-effective or least burdensome alternative that achieves the objectives of the rule. The provisions of section 205 do not apply when they are inconsistent with applicable law. Moreover, section 205 allows EPA to adopt an alternative other than the least costly, most cost-effective or least burdensome alternative if the Administrator publishes with the final rule an explanation why that alternative was not adopted.

EPA has determined that today's rule contains a Federal mandate that may result in expenditures of $100 million or more in any one year for both State, local, and tribal governments, in the aggregate, and the private sector. Accordingly, EPA has prepared under section 202 of the UMRA a written statement which is summarized below.

1. Summary of UMRA Section 202 Written Statement

EPA promulgates today's storm water regulation pursuant to the specific mandate of Clean Water Act section 402(p)(6), as well as sections 301, 308, 402, and 501. (33 U.S.C. sections 1342(p)(6), 1311, 1318, 1342, 1361.) Section 402(p)(6) of the CWA requires that EPA designate sources to be regulated to protect water quality and establish a comprehensive program to regulate those sources.

In the *Economic Analysis of the Final Phase II Rule* (EA), EPA describes the qualitative and monetized benefits associated with today's rule and then compares the monetized benefits with the estimated costs for the rule. EPA developed detailed estimates of the costs and benefits of complying with each of the incremental requirements imposed by the rule. These estimates, including descriptions of the methodology and assumptions used, are described in detail in the EA. The Agency used two approaches, a national water quality model and national water quality assessment, to estimate the potential benefits of the rule. Both approaches show that the benefits are likely to exceed costs. Exhibit 3 in section III of this preamble summarizes the costs and benefits associated with the basic elements of today's rule.

There are additional benefits to storm water control that cannot be quantified or monetized. Thus, the current estimate of monetized benefits may understate the true value of storm water controls because it omits many ways by which society is likely to benefit from reduced storm water pollution, such as improved aesthetic quality of waters, benefits to wildlife and to threatened and endangered species, cultural values, and biodiversity benefits.

Several commenters asserted that today's rule is an unfunded mandate and that, without funding, the monitoring of the already existing pollution control programs would suffer. In section II.D.3 of the preamble, EPA lists some of the programs that EPA anticipates may provide funds to help develop and, in limited circumstances, implement storm water management programs.

In the EA, EPA reviewed the expected effect of today's rule on the national economy. The Agency determined that the rule will have minimal impacts on the economy or employment. This is because the final rule regulates small MS4s and construction sites under 5 acres, not the typical industrial plants or other non-construction activities that could directly impact production and thus those sectors of the economy.

Discussions with representatives within the construction industry indicate that construction costs will likely be passed on to buyers, thus not seriously affecting the housing industry directly. Flexibility within the rule allows MS4s to tailor the storm water program requirements to their needs and financial position, minimizing impacts. For sedimentation and erosion controls on construction sites, the rule contemplates application of commonly used BMPs to reduce costs for the construction industry. Thus, the rule attempts to use existing practices to prevent pollution, which should minimize impacts on States, Tribes, municipalities and the construction industry.

Thus, EPA concludes that the effect of the rule, if any, on the national economy would be minimal. The benefits of today's rule more than offset any cost impacts on the national economy.

Consistent with the intergovernmental consultation provisions of section 204 of the UMRA and Executive Order 12875, "Enhancing the Intergovernmental Partnership," EPA consulted with the governmental entities affected by this rule.

First, EPA provided States, Tribal and local governments with the opportunity to comment on draft alternative approaches for the proposed rule through publishing a notice requesting information and public comment in the **Federal Register** on September 9, 1992 (57 FR 41344). This notice presented a full range of regulatory alternatives. At that time, EPA received more than 130 comments, including approximately 43 percent from municipalities and 24 percent from State or Federal agencies. These comments were the genesis of many of the provisions in the today's rule, including reliance on the NPDES program framework (including general permits), providing State and local governments flexibility in selecting additional sources requiring regulation, and focusing on high priority polluters. These comments helped to focus on pollution prevention, watershed-based concerns and BMPs. They also led to certain exemptions for facilities that do not pollute national waters.

In early 1993, EPA, in conjunction with the Rensselaerville Institute, held public and expert meetings to assist in developing and analyzing options for identifying unregulated storm water sources and possible controls. These meetings provided participants an additional opportunity to provide input into the CWA section 402(p)(6) program development process. The final rule addresses several of the key concerns identified in these groups, including provisions that provide flexibility to the States to select sources to be controlled and types of permits to be issued, and flexibility to MS4s in selecting BMPs.

EPA also conducted outreach with representatives of small entities, including small government representatives, in conjunction with the convening of a Small Business Advocacy Review Panel under SBREFA which is discussed in section IV.E. of the preamble.

In addition, EPA established the Urban Wet Weather Flows Advisory Committee under the Federal Advisory Committee Act (FACA). The Urban Wet Weather Flows Advisory Committee, in turn established the Storm Water Phase II Subcommittee. Consistent with FACA, the membership of the Committee and the Storm Water Phase II Subcommittee was balanced among EPA's various outside stakeholder interests, including representatives from State governments, municipal governments (both elected officials and appointed officials) and Tribal governments, as well as industrial and commercial sectors, agriculture, environmental and public interest groups.

In general, municipal and Tribal government representatives supported the NPDES approach in today's rule for the following reasons: It will be uniformly applied on a nationwide basis; it provides flexibility to allow incorporation of State and local programs; it resolves the problem of donut holes that cause water quality impacts in urbanized areas; and it allows co-permitting of small regulated

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MS4s with those regulated under the existing storm water program.

In contrast, State representatives sought alternative approaches for State implementation of the storm water program for Phase II sources. State representatives asserted that a non-NPDES alternative approach best facilitated watershed management and avoided duplication and overlapping regulations. These representatives pointed out that there are a variety of State programs—not based on the CWA—implementing effective storm water controls, and that EPA should provide incentives for their implementation and improvement in performance. EPA continues to believe that an NPDES approach is the best approach in order to adequately protect water quality. However, EPA has worked with States on an alternative approach that provides flexibility within the NPDES framework. The final rule allows States with a watershed permitting approach to phase in permit coverage for MS4s in jurisdictions with a population less than 10,000 and provides two waivers from coverage for small MS4s. This issue is discussed in section II.C of the preamble, Program Framework: NPDES Approach.

Some municipal governments objected that the rule's minimum measures for small MS4s violate the Tenth Amendment insofar as they require the operators of MS4s to regulate third parties according to the "minimum measures" for municipal storm water management programs. EPA disagrees that today's rule is inconsistent with Tenth Amendment principles. Permits issued under today's rule will not compel political subdivisions of States to regulate in their sovereign capacities, but rather to effectively control discharges out of their storm sewer systems in their owner/operator capacities. For MS4s that do not accept this "default" minimum measures-based approach (to control discharges out of the storm sewer system by exercising local powers to control discharges into the storm sewer system), today's rule allows for alternative permits through individual permit applications. EPA made revisions to the rule to allow regulated small MS4s to opt out of the minimum measures approach and instead apply for an individual permit. This issue is discussed in section II.H.3.c.iii of the preamble, Alternative Permit Option/ Tenth Amendment.

2. Selection of the Least Costly, Most Cost-Effective or Least Burdensome Alternative That Achieves the Objectives of the Statute

Today's rule evolved over time and incorporated aspects of alternatives that responded to concerns presented by the various stakeholders. A primary characteristic of today's rule is the flexibility it offers both the permitting authority and the regulated sources (small MS4s and small construction sites), by the use of general permits, implementation of BMPs suited to specific locations, and allowing MS4s to develop their own program goals.

In the administrative record supporting the proposed rule, EPA estimated ranges of costs associated with six different options, including a no action option, the proposed option, and four other options that considered various combinations of the following: Covering all the unregulated construction sites below 5 acres, all small MS4s, certain industrial and commercial activities, and all point sources. EPA developed detailed cost estimates for the incremental requirements imposed under the final regulation, and for each of the alternatives, and applied these estimates to the remaining unregulated point sources of storm water. The Agency compared the estimated annual range of costs imposed under today's rule and other major options considered. The range of values for each option included the costs for compliance, including paperwork requirements for the operators of small construction sites, industrial facilities, and MS4s and administrative costs for State and Federal NPDES permitting authorities.

Today's rule reflects the least costly option that achieves the objectives of the statute, thus meeting the requirements of section 205. EPA did not consider "no regulation" to be an "option" because it would not achieve the objectives of CWA section 402(p)(6). A portion of currently unregulated point sources of storm water need to reduce pollutants to protect water quality.

Today's rule is estimated to range in cost from $847.6 million to $981.3 million annually, although the cost estimate for the proposed rule was reported as a range of $138 to $869 million annually. That range reflected a unit cost range for the municipal minimum measures and a cost range per construction site for soil erosion control. EPA has since revised its cost analysis to allow it to report the current estimate, which is toward the high end of the original cost range. The four other regulatory options considered at proposal involved higher regulatory costs and, therefore, were not selected. These four options and their estimated costs are as follows:

(1) An option based on the August 7, 1995 direct final rule was estimated to cost between $2.2 billion and $78.9 billion per year.

(2) A "Plan B" option was estimated to cost between $0.6 billion and $3.2 billion per year.

(3) An option based on the September 30, 1996 draft proposed rule was estimated to cost between $0.2 billion and $3.7 billion per year.

(4) An option based on the February 13, 1997 draft proposed rule, was estimated to cost between $0.2 billion and $3.5 billion.

There are three reasons why the costs for these four options exceeded the estimated cost range for the proposed rule. The first two options regulated substantially more municipal governments. The first, third, and fourth options required industrial facilities to apply for permits. Finally, the first three options applied permit requirements to construction sites below 1 acre. Consequently, these options would be more costly than today's rule even with the revised analysis methods used to estimate costs.

3. Effects on Small Governments

Before EPA establishes any regulatory requirements that may significantly or uniquely affect small governments, including tribal governments, it must have developed under section 203 of the UMRA a small government agency plan. The plan must provide for notifying potentially affected small governments, enabling officials of affected small governments to have meaningful and timely input in the development of EPA regulatory proposals with significant Federal intergovernmental mandates, and informing, educating, and advising small governments on compliance with the regulatory requirements. EPA has determined that this rule contains no regulatory requirements that might significantly or uniquely affect small governments. Although today's rule expands the NPDES program (with modifications) to certain MS4s serving populations below 100,000 and although many MS4s are owned by small governments, EPA does not believe today's rule significantly or uniquely affects small governments. As explained in section IV.E. of the preamble, EPA today certifies that the rule will not have a significant impact on small governmental jurisdictions. In addition, the rule will not have a unique impact on small governments because the rule will affect small governments in

to the same extent as (or to a lesser extent than) larger governments that are already covered by the existing storm water rules. Thus, today's rule is not subject to the requirements of section 203 of UMRA.

Notwithstanding this finding, in developing today's rule, EPA provided notice of the requirements to potentially affected small governments; enabled officials of affected small governments to provide meaningful and timely input in the development of regulatory proposals; and informed, educated and advised small governments on compliance with the requirements.

Concerning notice, EPA provided States, local, and Tribal governments with the opportunity to comment on alternative approaches for an early draft of the proposed rule by publishing a notice requesting information and public comment in the **Federal Register** on September 9, 1992 (57 FR 41344). This notice presented a full range of regulatory alternatives. At that time, EPA received more than 130 comments, including approximately 43 percent from municipalities and 24 percent from State or Federal agencies.

The Agency also provided, through the SBREFA panel process and the FACA process, the opportunity for elected officials of small governments (and their representatives) to meaningfully participate in the development of the rule. Through such participation and exchange, EPA not only notified potentially affected small governments of requirements of the developing rule, but also allowed officials of affected small governments to have meaningful and timely input into the development of regulatory proposals.

In addition to involving municipalities in the development of the rule, EPA also continues to inform, educate, and advise small governments on compliance with the requirements of today's rule. For example, EPA supported 10 workshops, presented by the American Public Works Association from September 1998 through May 1999, designed to educate local governments on the implementation of the rule. The workshop curriculum included information on a variety of key issues such as anticipated regulatory requirements, agency reporting, best management practices, construction site controls, post construction management for new and redeveloped sites, public education and public involvement strategies, detection and control of illicit discharges, and good housekeeping practices. Moreover, EPA has prepared a series of fact sheets, available on the EPA website at www.epa.gov/owm/sw/toolbox, that explains the rule in detail.

Finally, to assist small governments in implementing the Phase II program, EPA is committed to the following: (1) developing a tool box of implementation strategies; (2) providing written technical assistance, including guidance on developing BMPs and measurable goals; and (3) compiling a comprehensive evaluation of the NPDES municipal storm water Phase II program over the next 13 years.

D. Executive Order 13132

Executive Order 13132, entitled "Federalism" (64 FR 43255, August 10, 1999), requires EPA to develop an accountable process to ensure "meaningful and timely input by State and local officials in the development of regulatory policies that have federalism implications." "Policies that have federalism implications" is defined in the Executive Order to include regulations that have "substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government." Under Executive Order 13132, EPA may not issue a regulation that has federalism implications, that imposes substantial direct compliance costs, and that is not required by statute, unless the Federal government provides the funds necessary to pay the direct compliance costs incurred by State and local governments, or EPA consults with State and local officials early in the process of developing the proposed regulation. EPA also may not issue a regulation that has federalism implications and that preempts State law unless the Agency consults with State and local officials early in the process of developing the proposed regulation.

If EPA complies by consulting, Executive Order 13132 requires EPA to provide to the Office of Management and Budget (OMB), in a separately identified section of the preamble to the rule, a federalism summary impact statement (FSIS). The FSIS must include a description of the extent of EPA's prior consultation with State and local officials, a summary of the nature of their concerns and the agency's position supporting the need to issue the regulation, and a statement of the extent to which the concerns of State and local officials have been met. For final rules subject to Executive Order 13132, EPA also must submit to OMB a statement from the agency's Federalism Official certifying that EPA has fulfilled the Executive Order's requirements.

EPA has concluded that this final rule may have federalism implications. As discussed above in section IV.C., the rule contains a Federal mandate that may result in the expenditure by State, local and tribal governments, in the aggregate, of $100 million or more in any one year. Accordingly, the rule may have substantial direct effects on the States; on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government, as specified in Executive Order 13132. Moreover, the rule will impose substantial direct compliance costs on State or local governments. Accordingly, EPA provides the following FSIS under section 6(b) of Executive Order 13132.

1. Description of the Extent of the Agency's Prior Consultation with State and Local Governments

Although this rule was proposed long before the November 2, 1999 effective date of Executive Order 13132, EPA consulted extensively with affected State and local governments pursuant to the intergovernmental consultation provisions of Executive Order 12875, "Enhancing the Intergovernmental Partnership" (now revoked by Executive Order 13132) and section 204 of UMRA.

First, EPA provided State and local governments the opportunity to comment on draft alternative approaches for the proposed rule through publishing a notice requesting information and public comment in the **Federal Register** on September 9, 1992 (57 FR 41344). This notice presented a full range of regulatory alternatives. At that time, EPA received more than 130 comments, including approximately 43 percent from municipalities and 24 percent from State or Federal agencies. These comments were the genesis of many of the provisions in the today's rule, including reliance on the NPDES program framework (including general permits), providing State and local governments flexibility in selecting additional sources requiring regulation, and focusing on high priority polluters. These comments helped to focus on pollution prevention, watershed-based concerns and BMPs. They also led to certain exemptions for facilities that do not pollute national waters.

In early 1993, EPA, in conjunction with the Rensselaerville Institute, held public and expert meetings to assist in developing and analyzing options for identifying unregulated storm water sources and possible controls. These meetings provided participants an additional opportunity to provide input into the CWA section 402(p)(6) program

development process. The final rule addresses several of the key concerns identified in these groups, including provisions that provide flexibility to the States to select sources to be controlled and types of permits to be issued, and flexibility to MS4s in selecting BMPs.

EPA also conducted outreach with representatives of small entities, including small governments, in conjunction with the convening of a Small Business Advocacy Review Panel under SBREFA which is discussed in section III.F. of the preamble.

In addition, EPA established the Urban Wet Weather Flows Advisory Committee (FACA), which in turn established the Storm Water Phase II Subcommittee. Consistent with the Federal Advisory Committee Act, the membership of the Committee and the Storm Water Phase II Subcommittee was balanced among EPA's various outside stakeholder interests, including representatives from State governments, municipal governments (both elected officials and appointed officials) and Tribal governments, as well as industrial and commercial sectors, agriculture, environmental and public interest groups.

2. Summary of Nature of State and Local Government Concerns, and Statement of the Extent to Which Those Concerns Have Been Met

In general, municipal government representatives supported the NPDES approach in today's rule for the following reasons: it will be uniformly applied on a nationwide basis; it provides flexibility to allow incorporation of State and local programs; it resolves the problem of donut holes that cause water quality impacts in urbanized areas; and it allows co-permitting of small regulated MS4s with those regulated under the existing storm water program.

In contrast, State representatives sought alternative approaches for State implementation of the storm water program for Phase II sources. State representatives asserted that a non-NPDES alternative approach best facilitated watershed management and avoided duplication and overlapping regulations. These representatives pointed out that there are a variety of State programs—not based on the CWA—implementing effective storm water controls, and that EPA should provide incentives for their implementation and improvement in performance. EPA continues to believe that an NPDES approach is the best approach in order to adequately protect water quality. However, EPA has worked with States on an alternative approach that provides flexibility within the NPDES framework. The final rule allows States with a watershed permitting approach to phase in permit coverage for MS4s in jurisdictions with a population less than 10,000 and provides two waivers from coverage for small MS4s. This issue is discussed in section II.C of the preamble, Program Framework: NPDES Approach.

Some municipal governments objected that the rule's minimum measures for small MS4s violate the Tenth Amendment insofar as they require the operators of MS4s to regulate third parties according to the "minimum measures" for municipal storm water management programs. EPA disagrees that today's rule is inconsistent with Tenth Amendment principles. Permits issued under today's rule will not compel political subdivisions of States to regulate in their sovereign capacities, but rather to effectively control discharges out of their storm sewer systems in their owner/operator capacities. For MS4s that do not accept this "default" minimum measures-based approach (to control discharges out of the storm sewer system by exercising local powers to control discharges into the storm sewer system), today's rule allows for alternative permits through individual permit applications. EPA made revisions to the rule to allow regulated small MS4s to opt out of the minimum measures approach and instead apply for an individual permit. This issue is discussed in section II.H.3.c.iii of the preamble, Alternative Permit Option/ Tenth Amendment.

3. Summary of the Agency's Position Supporting the Need To Issue the Regulation

As discussed more fully in section I.B. above, today's rule is needed because uncontrolled storm water discharges from areas of urban development and construction activity have been shown to have negative impacts on receiving waters by changing the physical, biological, and chemical composition of the water, resulting in an unhealthy environment for aquatic organisms, wildlife, and people. As discussed in section II.C., the NPDES approach in today's rule is needed to ensure uniform application on a nationwide basis, to provide flexibility to allow incorporation of State and local programs, to resolve the problem of donut holes that cause water quality impacts in urbanized areas, and to allow co-permitting of small regulated MS4s with those regulated under the existing storm water program.

The draft final rule was transmitted to OMB on July 6, 1999. Because transmittal occurred before the November 2, 1999 effective date of Executive Order 13132, certification under section 8 of the Executive Order is not required.

E. Regulatory Flexibility Act (RFA), as amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA), 5 U.S.C. 601 et seq.

The RFA generally requires an Agency to prepare a regulatory flexibility analysis of any rule subject to notice and comment rulemaking requirements under the Administrative Procedure Act or any other statute unless the agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. Small entities include small businesses, small organizations, and small governmental jurisdictions.

For purposes of assessing the impact of today's rule on small entities, small entity is defined as: (1) a building contractor (SIC 15) with up to $17.0 million in annual revenue; (2) a small governmental jurisdiction that is a government of a city, county, town, school district, or special district with a population of less than 50,000; and (3) a small organization that is any not-for-profit enterprise which is independently owned and operated and is not dominant in its field.

After considering the economic impacts of today's final rule on small entities, I certify that this action will not have a significant economic impact on a substantial number of small entities.

Although this final rule will not have a significant economic impact on a substantial number of small entities, EPA nonetheless has tried to reduce the impact of this rule on small entities.

For purposes of evaluating the economic impact of this rule on small governmental jurisdictions, EPA compared annual compliance costs with annual government revenues obtained from the 1992 Census of Governments, using state-specific estimates of annual revenue per capita for municipalities in three population size categories (fewer than 10,000, 10,000–25,000, and 25,000–50,000).

In order to estimate the annual compliance cost for small governmental jurisdictions, EPA used the mean variable municipal cost of $8.93 per household as calculated in a 1998 study of 121 municipalities conducted by the national Association of Flood and Stormwater Management Agencies (NAFSMA). In addition, EPA used the estimated fixed administrative costs of $1,545 per municipality for reporting,

recordkeeping, and application requirements for today's rule.

In evaluating the economic impact of this rule on small governmental jurisdictions, EPA determined that compliance costs represent more than 1 percent of estimated revenues for only 10 percent of small governments and more than 3 percent of the revenue for 0.7 percent of these entities. In both absolute and relative terms, EPA does not consider this a significant economic impact on a substantial number of small entities.

EPA normally uses the "sales test" for determining the economic impact on small businesses. Under a sales test, annual compliance costs are compared with the small business's total annual sales. However, the direct application of the sales test is not suitable in this case, because of the uncertainty associated with estimating the number of units an "average" developer/contractor develops or builds in a typical year. For this rule, EPA has approximated the sales test by estimating compliance costs for three sizes of construction sites and comparing them with a representative sale price for three building categories. Although EPA's analysis is not exactly a "sales test," it is similar to the sales test, producing comparable results.

For small building contractors, EPA estimated administrative compliance costs of $870 per site for applying for coverage, reporting, record keeping, monitoring and preparing a storm water pollution prevention plan. EPA estimated compliance costs for installing soil and erosion controls as ranging from $1,206 to $8,709 per site. EPA compliance cost estimates are based on 27 theoretical model construction sites designed to mimic the mostly likely used best management practices around the country.

In evaluating the economic impact on small building contractors, EPA divided the revised compliance costs per construction start by the appropriate homes-to-site ratio for each of the three sizes of construction sites. The average compliance cost per home ranges from approximately $450 to $650. EPA concluded that compliance costs are roughly 0.22 to 0.43 percent of both the mean, $181,300, and median, $151,000, sale price of a home.

The absence of data to specifically assess annual compliance costs for building contractors as a percentage of annual sales (i.e., a very direct estimate of the impact on potentially affected small businesses) led EPA to perform additional market analysis to examine the ability of potentially affected firms to pass along regulatory costs to buyers for single-family homes constructed subject to today's rule. If the small building contractors covered by the rule are able to pass on the costs of compliance, either completely or partially, to their purchasers, then the rule's impact on these small business entities is significantly reduced. The market analysis shows that demand for homes is not overly sensitive to small changes in price, therefore builders should be able to pass on at least a significant fraction of the compliance costs to buyers.

EPA also assessed the effect of the building contractors' costs on average monthly mortgage rates and on the demand for new homes. Based on that screening analysis, EPA concludes that the costs to building contractors, and the potential changes in housing prices and monthly mortgage payments for single-family home buyers, are not expected to have a significant impact on the market for single-family houses. In both absolute and relative terms, EPA does not consider this a significant economic impact on a substantial number of small entities.

EPA also certified this rule at proposal. Even though the Agency was not required to, we convened a Small Business Advocacy Review Panel ("Panel") in June 1997. A number of small entity representatives had already been actively involved with EPA through the FACA process, and were, therefore, broadly knowledgeable about the development of the proposed and final rules. Prior to convening the Panel, EPA consulted with the Small Business Administration to identify a group of small entity representatives to advise the Panel. The Agency distributed a briefing package describing its preliminary analysis under the RFA to the small entity representatives (as well as to representatives from OMB and SBA) and conducted two telephone conference calls and an all-day meeting at EPA Headquarters in May of 1997 with small entity representatives. With this preliminary work complete, in June 1997, EPA formally convened the SBREFA Panel, comprising representatives from OMB, SBA, EPA's Office of Water and EPA's Small Business Advocacy Chair. The Panel received written comments from small entity representatives based on their involvement in the earlier meetings, and invited additional comments.

Consistent with requirements of the RFA, the Panel evaluated the assembled materials and small-entity comments on issues related to: (1) a description and the number of small entities that would be regulated; (2) a description of the projected record keeping, reporting and other compliance requirements applicable to small entities; (3) identification of other Federal rules that may duplicate, overlap, or conflict with the proposal to the final rule; and (4) regulatory alternatives that would minimize any significant economic impact of the rule on small entities while accomplishing the stated objectives of the CWA section 402(p)(6).

On August 7, 1997, the Panel provided a Final Report (hereinafter, "Report") to the EPA Administrator. A copy of the Report is included in the docket for the rule. The Panel acknowledged and commended EPA's efforts to work with stakeholders, including small entities, through the FACA process. The SBREFA Panel stated that, because of EPA's extensive outreach and responsiveness in addressing stakeholder concerns, commenters during the SBREFA process raised fewer concerns than might otherwise have been expected. Based on the advice and recommendations of the Panel, today's rule includes a number of provisions designed to minimize any significant impact on small entities. (See Appendix 5).

F. National Technology Transfer And Advancement Act

Section 12(d) of the National Technology Transfer and Advancement Act of 1995 ("NTTAA"), Public Law 104–113, section 12(d) (15 U.S.C. 272 note) directs EPA to use voluntary consensus standards in its regulatory activities unless to do so would be inconsistent with applicable law or otherwise impractical. Voluntary consensus standards are technical standards (*e.g.*, materials specifications, test methods, sampling procedures, and business practices) that are developed or adopted by voluntary consensus standard bodies. The NTTAA directs EPA to provide Congress, through OMB, explanations when the Agency decides not to use available and applicable voluntary consensus standards.

This action does not mandate the use of any particular technical standards, although in designing appropriate BMPs regulated small MS4s and small construction sites are encouraged to use any voluntary consensus standards that may be applicable and appropriate. Because no specific technical standards are included in the rule, section 12(d) of the NTTAA is not applicable.

G. Executive Order 13045

Executive Order 13045: "Protection of Children from Environmental Health Risks and Safety Risks" (62 FR 19885, April 23, 1997) applies to any rule that: (1) Is determined to be "economically

significant" as defined under E.O. 12866, and (2) concerns an environmental health or safety risk that EPA has reason to believe may have a disproportionate effect on children. If the regulatory action meets both criteria, the Agency must evaluate the environmental health or safety effects of the planned rule on children, and explain why the planned regulation is preferable to other potentially effective and reasonably feasible alternatives considered by the Agency.

This final rule is not subject to E.O. 13045 because it does not concern an environmental health or safety risk that may have a disproportionate effect on children. The rule expands the scope of the existing NPDES permitting program to require small municipalities and small construction sites to regulate their storm water discharges. The rule does not itself, however, establish standards or criteria that would be included in permits for those sources. Such standards or criteria will be developed through other actions, for example, in the establishment of water quality standards or subsequently in the issuance of permits themselves. As such, today's action does not concern an environmental health or safety risk that may have a disproportionate effect on children. To the extent it does address a risk that may have a disproportionate effect on children, expanding the scope of the permitting program will have a corresponding disproportionate benefit to children to protect them from such risk.

H. Executive Order 13084

Under Executive Order 13084, EPA may not issue a regulation that is not required by statute, that significantly or uniquely affects the communities of Indian tribal governments, and that imposes substantial direct compliance costs on those communities, unless the Federal government provides the funds necessary to pay the direct compliance costs incurred by the Tribal governments, or EPA consults with those governments. If EPA complies by consulting, Executive Order 13084 requires EPA to provide to the Office of Management and Budget, in a separately identified section of the preamble to the rule, a description of the extent of EPA's prior consultation with representatives of affected Tribal governments, a summary of the nature of their concerns, and a statement supporting the need to issue the regulation. In addition, Executive Order 13084 requires EPA to develop an effective process permitting elected officials and other representatives of Indian Tribal governments "to provide meaningful and timely input in the development of regulatory policies on matters that significantly or uniquely affect their communities."

Today's rule does not significantly or uniquely affect the communities of Indian Tribal governments. Even though the Agency is not required to address Tribes under the Regulatory Flexibility Act, EPA used the same revenue test that was used for municipalities to assess the impact of the rule on communities of Tribal governments and determine that they will not be significantly affected. In addition, the rule will not have a unique impact on the communities of Tribal governments because small municipal governments are also covered by this rule and larger municipal governments are already covered by the existing storm water rules. Accordingly, the requirements of section 3(b) of Executive Order 13084 do not apply to this rule.

I. Congressional Review Act

The Congressional Review Act, 5 U.S.C. section 801 *et seq.*, as added by the Small Business Regulatory Enforcement Fairness Act of 1996, generally provides that before a rule may take effect, the agency promulgating the rule must submit a rule report, which includes a copy of the rule, to each House of the Congress and the Comptroller General of the United States. EPA will submit a report containing this rule and other required information to the U.S. Senate, the U.S. House of Representatives, and the Comptroller General of the United States prior to publication of the rule in the **Federal Register**. A major rule cannot take effect until 60 days after it is published in the **Federal Register**. This rule is a "major rule" as defined by 5 U.S.C. 804(2). This rule will be effective on February 7, 2000.

List of Subjects

40 CFR Part 9

Environmental protection, Reporting and recordkeeping requirements.

40 CFR Part 122

Administrative practice and procedure, Confidential business information, Environmental protection, Hazardous substances, Incorporation by reference, Reporting and recordkeeping requirements, Sewage disposal, Waste treatment and disposal, Water pollution control.

40 CFR Part 123

Administrative practice and procedure, Confidential business information, Hazardous materials, Indians—lands, Intergovernmental relations, Penalties, Reporting and recordkeeping requirements, Sewage disposal, Waste treatment and disposal, Water pollution control, Penalties.

40 CFR Part 124

Administrative practice and procedure, Air pollution control, Hazardous waste, Indians—lands, Reporting and recordkeeping requirements, Water pollution control, Water supply.

Dated: October 29, 1999.

Carol M. Browner,

Administrator.

Appendices to the Preamble

APPENDIX 1 TO PREAMBLE—FEDERALLY-RECOGNIZED AMERICAN INDIAN AREAS LOCATED FULLY OR PARTIALLY IN BUREAU OF THE CENSUS URBANIZED AREAS

[Based on 1990 Census data]

State	American Indian Area	Urbanized Area
AZ	Pascua Yacqui Reservation (pt.): Pascua Yacqui Tribe of Arizona	Tucson, AZ (Phase I).
AZ	Salt River Reservation (pt.): Salt River Pima-Maricopa Indian Community of the Salt River Reservation, California.	Phoenix, AZ (Phase I).
AZ	San Xavier Reservation (pt.): Tohono O'odham Nation of Arizona (formerly known as the Papago Tribe of the Sells, Gila Bend & San Xavier Reservation).	Tucson, AZ (Phase I).
CA	Augustine Reservation: Augustine Band of Cahuilla Mission of Indians of the Augustine Reservation, CA.	Indio-Coachella, CA (Phase I).
CA	Cabazon Reservation: Cabazon Band of Cahuilla Mission Indians of the Cabazon Reservation, CA.	Indio-Coachella, CA (Phase I).

APPENDIX 1 TO PREAMBLE—FEDERALLY-RECOGNIZED AMERICAN INDIAN AREAS LOCATED FULLY OR PARTIALLY IN BUREAU OF THE CENSUS URBANIZED AREAS—Continued

[Based on 1990 Census data]

State	American Indian Area	Urbanized Area
CA	Fort Yuma (Quechan) (pt.): Quechan Tribe of the Fort Yuma Indian Reservation, California & Arizona.	Yuma, AZ–CA.
CA	Redding Rancheria: Redding Rancheria of California	Redding, CA.
FL	Hollywood Reservation: Seminole Tribe	Fort Lauderdale, FL (Phase I).
FL	Seminole Trust Lands: Seminole Tribe of Florida, Dania, Big Cypress & Brighton Reservations.	Fort Lauderdale, FL (Phase I).
ID	Fort Hall Reservation and Trust Lands: Shosone-Bannock Tribes of the Fort Hall Reservation of Idaho.	Pocatello, ID.
ME	Penobscot Reservation and Trust Lands (pt.): Penobscot Tribe of Maine	Bangor, ME.
MN	Shakopee Community: Shakopee Mdewakanton Sioux Community of Minnesota (Prior Lake).	Minneapolis-St. Paul, MN (Phase I).
NM	Sandia Pueblo (pt.): Pueblo of Sandia, New Mexico	Albuquerque, NM (Phase I).
NV	Las Vegas Colony: Las Vegas Tribe of Paiute Indians of the Las Vegas Indian Colony, Nevada.	Las Vegas, NV (Phase I).
NV	Reno-Sparks Colony: Reno-Sparks Indian Colony, Nevada	Reno, NV (Phase I).
OK	Osage Reservation (pt.): Osage Nation of Oklahoma	Tulsa, OK (Phase I).
OK	Absentee Shawnee-Citizens Band of Potawatomi TJSA (pt.): Absentee-Shawnee Tribe of Indians of Oklahoma; Citizen Potawatomi Nation, Oklahoma.	Oklahoma City, OK (Phase I).
OK	Cherokee TJSA 9 (pt.): Cherokee Nation of Oklahoma; United Keetoowah Band of Cherokee Indians of Oklahoma.	Ft. Smith, AR–OK; Tulsa, OK (Phase I).
OK	Cheyenne-Arapaho TJSA (pt.): Cheyenne-Arapaho Tribes of Oklahoma	Oklahoma City, OK (Phase I).
OK	Choctaw TJSA (pt.): Choctaw Nation of Oklahoma	Ft. Smith, AR–OK (Phase I).
OK	Creek TJSA (pt.): Alabama-Quassarte Tribal Town of the Creek Nation of Oklahoma; Kialegee Tribal Town of the Creek Indian Nation of Oklahoma; Muscogee (Creek) Nation of Oklahoma; Thlopthlocco Tribal Town of the Creek Nation of Oklahoma.	Tulsa, OK (Phase I).
OK	Kiowa-Comanche-Apache-Ft. Sill Apache: Apache Tribe of Oklahoma; Comanche Indian Tribe, Oklahoma; Fort Sill Apache Tribe of Oklahoma; Kiowa Indian Tribe of Oklahoma.	Lawton, OK.
TX	Ysleta del Sur Reservation: Ysleta Del Sur Pueblo of Texas	El Paso, TX–NM (Phase I).
WA	Muckleshoot Reservation and Trust Lands (pt.): Muckleshoot Indian Tribe of the Muckleshoot Reservation.	Seattle, WA (Phase I).
WA	Puyallup Reservation and Trust Lands (pt.): Puyallup Tribe of the Puyallup Reservation, WA.	Tacoma, WA (Phase I).
WA	Yakima Reservation (pt.): Confederated Tribes and Bands of the Yakama Indian Nation of the Yakama Reservation, WA.	Yakima, WA.
WI	Oneida (West) (pt.): Oneida Tribe of Wisconsin	Green Bay, WI.

Please Note

"(pt.)" indicates that the American Indian Area (AIA) listed is only partially located within the referenced urbanized area.

The first line under "American Indian Area" is the name of the federally-recognized reservation/colony/rancheria or trust land as it appears in the Bureau of the Census data. After this first line, the names of the tribes included in the AIA are listed as they appear in the Bureau of Indian Affairs' list of Federally Recognized Indian Tribes. [Federal Register: Nov. 13, 1996, Vol. 66, No. 220, pgs. 58211–58216]

"TJSAs" are Tribal Jurisdiction Statistical Areas in Oklahoma that are defined in conjunction with the federally-recognized tribes in Oklahoma who have definite land areas under their jurisdiction, but do not have reservation status.

"(Phase I)" indicates that the referenced urbanized area includes a medium or large MS4 currently regulated under the existing NPDES storm water program (i.e., Phase I). Any Tribally operated MS4 within these such urban areas would not automatically have been covered under Phase I, however.

Sources

Michael Ratcliffe, Geographic Concepts Division, Bureau of the Census, U.S. Department of Commerce.

1990 Census of Population and Housing, Summary Population and Housing Characteristics, United States. Tables 9 & 10. [1990 CPH–1–1]. Bureau of the Census, U.S. Department of Commerce.

BILLING CODE 6560–50–P

049867

APPENDIX 2 TO PREAMBLE—URBANIZED AREA ILLUSTRATION

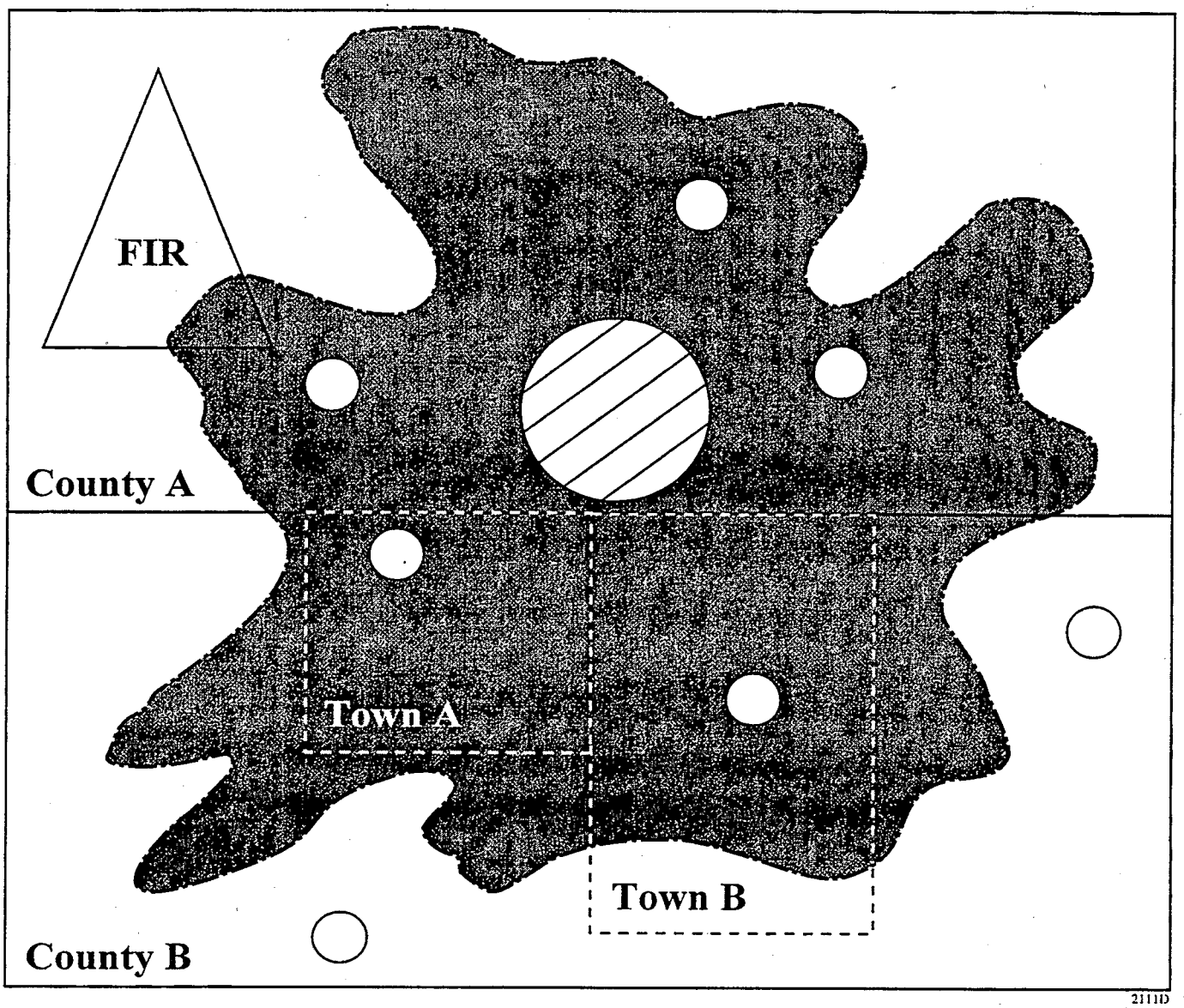

2111D

Central Place

Incorporated Place

Federal Indian Reservation (FIR)

Unincorporated "Urbanized Area" Portion of a Town (MCD) or County

Urbanized Area

Town or Township as a functioning Minor Civil Division (MCD). An MCD is the primary subdivision of a County.

County

BILLING CODE 6560–50–C

049868

Appendix 3 to the Preamble—Urbanized Areas of the United States and Puerto Rico

(Source: 1990 Census of Population and Housing, U.S. Bureau of the Census—This list is subject to change with the Decennial Census)

Alabama

Anniston
Auburn-Opelika
Birmingham
Columbus, GA–AL
Decatur
Dothan
Florence
Gadsden
Huntsville
Mobile
Montgomery
Tuscaloosa

Alaska

Anchorage

Arizona

Phoenix
Tucson
Yuma, AZ–CA

Arkansas

Fayetteville-Springdale
Fort Smith, AR–OK
Little Rock-North Little Rock
Memphis, TN–AR–MS
Pine Bluff
Texarkana, AR–TX

California

Antioch-Pittsburgh
Bakersfield
Chico
Davis
Fairfield
Fresno
Hemet-San Jacinto
Hesperia-Apple Valley-Victorville
Indio-Coachella
Lancaster-Palmdale
Lodi
Lompoc
Los Angeles
Merced
Modesto
Napa
Oxnard-Ventura
Palm Springs
Redding
Riverside-San Bernardino
Sacramento
Salinas
San Diego
San Francisco-Oakland
San Jose
San Luis Obispo
Santa Barbara
Santa Cruz
Santa Maria
Santa Rosa
Seaside-Monterey
Simi Valley
Stockton
Vacaville
Visalia
Watsonville
Yuba City
Yuma

Colorado

Boulder
Colorado Springs
Denver
Fort Collins
Grand Junction
Greeley
Longmont
Pueblo

Connecticut

Bridgeport-Milford
Bristol
Danbury, CT–NY
Hartford-Middletown
New Britain
New Haven-Meriden
New London-Norwich
Norwalk
Springfield, MA–CT
Stamford, CT–NY
Waterbury
Worcester, MA–CT

Delaware

Dover
Wilmington, DE–NJ–MD–PA

District of Columbia

Washington, DC–MD–VA

Florida

Daytona Beach
Deltona
Fort Lauderdale-Hollywood-Pompano Beach
Fort Myers-Cape Coral
Fort Pierce
Fort Walton Beach
Gainesville
Jacksonville
Kissimmee
Lakeland
Melbourne-Palm Bay
Miami-Hialeah
Naples
Ocala
Orlando
Panama City
Pensacola
Punta Gorda
Sarasota-Bradenton
Spring Hill
Stuart
Tallahassee
Tampa-St. Petersburg-Clearwater
Titusville
Vero Beach
West Palm Beach-Boca Raton-Delray Beach
Winter Haven

Georgia

Albany
Athens
Atlanta
Augusta
Brunswick
Chattanooga
Columbus
Macon
Rome
Savannah
Warner Robins

Hawaii

Honolulu
Kailua

Idaho

Boise City
Idaho Falls
Pocatello

Illinois

Alton
Aurora
Beloit, WI–IL
Bloomington-Normal
Champaign-Urbana
Chicago, IL-Northwestern IN
Crystal Lake
Davenport-Rock Island-Moline, IA–IL
Decatur
Dubuque
Elgin
Joliet
Kankakee
Peoria
Rockford
Round Lake Beach-McHenry, IL–WI
St. Louis, MO–IL
Springfield

Indiana

Anderson
Bloomington
Chicago, IL-Northwestern IN
Elkhart-Goshen
Evansville, IN–KY
Fort Wayne
Indianapolis
Kokomo
Lafayette-West Lafayette
Louisville, KY–IN
Muncie
South Bend-Mishawaka, IN–MI
Terre Haute

Iowa

Cedar Rapids
Davenport-Rock Island-Moline, IA–IL
Des Moines
Dubuque, IA–IL–WI
Iowa City
Omaha, NE–IA
Sioux City, IA–NE–SD
Waterloo-Cedar Falls

Kansas

Kansas City, MO–KS
Lawrence
St. Joseph, MO–KS
Topeka
Wichita

Kentucky

Cincinnati, OH–KY
Clarksville, TN–KY
Evansville, IN–KY
Huntington-Ashland, WV–KY–OH
Lexington-Fayette
Louisville, KY–IN
Owensboro

Louisiana

Alexandria
Baton Rouge
Houma
Lafayette
Lake Charles
Monroe
New Orleans
Shreveport

Slidell

Maine

Bangor
Lewiston-Auburn
Portland
Portsmouth-Dover-Rochester, NH–ME

Maryland

Annapolis
Baltimore
Cumberland
Frederick
Hagerstown, MD–PA–WV
Washington, DC–MD–VA
Wilmington, DE–NJ–MD–PA

Massachusetts

Boston
Brockton
Fall River, MA–RI
Fitchburg-Leominster
Hyannis
Lawrence-Haverhill, MA–NH
Lowell, MA–NH
New Bedford
Pittsfield
Providence-Pawtucket, RI–MA
Springfield, MA–CT
Taunton
Worcester, MA–CT

Michigan

Ann Arbor
Battle Creek
Bay City
Benton Harbor
Detroit
Flint
Grand Rapids
Holland
Jackson
Kalamazoo
Lansing-East Lansing
Muskegon
Port Huron
Saginaw
South Bend-Mishawaka, IN–MI
Toledo, OH–MI

Minnesota

Duluth, MN–WI
Fargo-Moorhead, ND–MN
Grand Forks, ND–MN
La Crosse, WI–MN
Minneapolis-St.Paul
Rochester
St. Cloud

Mississippi

Biloxi-Gulfport
Hattiesburg
Jackson
Memphis, TN–AR–MS
Pascagoula

Missouri

Columbia
Joplin
Kansas City, MO–KS
St. Joseph, MO–KS
St. Louis, MO–IL
Springfield

Montana

Billings
Great Falls
Missoula

Nebraska

Lincoln
Omaha, NE–IA
Sioux City, IA–NE–SD

Nevada

Las Vegas
Reno

New Hampshire

Lawrence-Haverhill, MA–NH
Lowell, MA–NH
Manchester
Nashua
Portsmouth-Dover-Rochester, NH–ME

New Jersey

Allentown-Bethlehem-Easton, PA–NJ
Atlantic City
New York, NY-Northeastern NJ
Philadelphia, PA–NJ
Trenton, NJ–PA
Vineland-Millville
Wilmington, DE–NJ–MD–PA

New Mexico

Albuquerque
El Paso
Las Cruces
Santa Fe

New York

Albany-Schenectady-Troy
Binghamton
Buffalo-Niagara Falls
Danbury, CT–NY
Elmira
Glens Falls
Ithaca
Newburgh
New York, NY–Northeastern NJ
Poughkeepsie
Rochester
Stamford, CT–NY
Syracuse
Utica-Rome

North Carolina

Asheville
Burlington
Charlotte
Durham
Fayetteville
Gastonia
Goldsboro
Greensboro
Greenville
Hickory
High Point
Jacksonville
Kannapolis
Raleigh
Rocky Mount
Wilmington
Winston-Salem

North Dakota

Bismark
Fargo-Moorhead, ND–MN
Grand Forks, ND–MN

Ohio

Akron
Canton
Cincinnati, OH–KY
Cleveland
Columbus
Dayton
Hamilton
Huntington-Ashland, WV–KY–OH
Lima
Lorain-Elyria
Mansfield
Middletown
Newark
Parkersburg, WV–OH
Sharon, PA–OH
Springfield
Steubenville-Weirton, OH–WV–PA
Toledo, OH–MI
Wheeling, WV–OH
Youngstown-Warren

Oklahoma

Fort Smith, AR–OK
Lawton
Oklahoma City
Tulsa

Oregon

Eugene-Springfield
Longview
Medford
Portland-Vancouver, OR–WA
Salem

Pennsylvania

Allentown-Bethlehem-Easton, PA–NJ
Altoona
Erie
Hagerstown, MD–PA–WV
Harrisburg
Johnstown
Lancaster
Monessen
Philadelphia, PA–NJ
Pittsburgh
Pottstown
Reading
Scranton-Wilkes-Barre
Sharon, PA–OH
State College
Steubenville-Weirton, OH–WV–PA
Trenton, NJ–PA
Williamsport
Wilmington, DE–NJ–MD–PA
York

Rhode Island

Fall River, MA–RI
Newport
Providence-Pawtucket, RI–MA

South Carolina

Anderson
Augusta, GA–SC
Charleston
Columbia
Florence
Greenville
Myrtle Beach
Rock Hill
Spartanburg
Sumter

South Dakota

Rapid City
Sioux City, IA–NE–SD
Sioux Falls

Tennessee

Bristol, TN-Bristol, VA

Chattanooga, TN–GA
Clarksville, TN–KY
Jackson
Johnson City
Kingsport, TN–VA
Knoxville
Memphis, TN–AR–MS
Nashville

Texas

Abilene
Amarillo
Austin
Beaumont
Brownsville
Bryan-College Station
Corpus Christi
Dallas-Fort Worth
Denton
El Paso, TX–NM
Galveston
Harlingen
Houston
Killeen
Laredo
Lewisville
Longview
Lubbock
McAllen-Edinburg-Mission
Midland
Odessa
Port Arthur
San Angelo
San Antonio
Sherman-Denison
Temple
Texarkana, TX-Texarkana, AR
Texas City
Tyler
Victoria
Waco
Wichita Falls

Utah

Logan
Ogden
Provo-Orem
Salt Lake City

Vermont

Burlington

Virginia

Bristol, TN-Bristol, VA
Charlottesville
Danville
Fredericksburg
Kingsport, TN–VA
Lynchburg
Norfolk-Virginia Beach-Newport News
Petersburg
Richmond
Roanoke
Washington, DC–MD–VA

Washington

Bellingham
Bremerton
Longview, WA–OR
Olympia
Portland-Vancouver, OR–WA
Richland-Kennewick-Pasco
Seattle
Spokane
Tacoma
Yakima

West Virginia

Charleston
Cumberland, MD–WV
Hagerstown, MD–PA–WV
Huntington-Ashland, WV–KY–OH
Parkersburg, WV–OH
Steubenville-Weirton, OH–WV–PA
Wheeling, WV–OH

Wisconsin

Appleton-Neenah
Beloit, WI–IL
Duluth, MN–WI
Eau Claire
Green Bay
Janesville
Kenosha
La Crosse, WI–MN
Madison
Milwaukee
Oshkosh
Racine
Round Lake Beach-McHenry, IL–WI
Sheboygan
Wausau

Wyoming

Casper
Cheyenne

Puerto Rico

Aquadilla
Arecibo
Caguas
Cayey
Humacao
Mayaguez
Ponce
San Juan
Vega Baja-Manati

BILLING CODE 6560–50–P

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Appendix 4 to the Preamble—No Exposure Certification Form

NPDES FORM 3510-11

EPA

United States Environmental Protection Agency
Washington, DC 20460

Form Approved
OMB No. 2040-0211

NO EXPOSURE CERTIFICATION for Exclusion from NPDES Storm Water Permitting

Submission of this No Exposure Certification constitutes notice that the entity identified in Section A does not require permit authorization for its storm water discharges associated with industrial activity in the State identified in Section B under EPA's Storm Water Multi-Sector General Permit due to the existence of a condition of no exposure.

A condition of no exposure exists at an industrial facility when all industrial materials and activities are protected by a storm resistant shelter to prevent exposure to rain, snow, snowmelt, and/or runoff. Industrial materials or activities include, but are not limited to, material handling equipment or activities, industrial machinery, raw materials, intermediate products, by-products, final products, or waste products. Material handling activities include the storage, loading and unloading, transportation, or conveyance of any raw material, intermediate product, final product or waste product. A storm resistant shelter is not required for the following industrial materials and activities:

- drums, barrels, tanks, and similar containers that are tightly sealed, provided those containers are not deteriorated and do not leak. "Sealed" means banded or otherwise secured and without operational taps or valves;
- adequately maintained vehicles used in material handling; and
- final products, other than products that would be mobilized in storm water discharges (e.g., rock salt).

A No Exposure Certification must be provided for each facility qualifying for the no exposure exclusion. In addition, the exclusion from NPDES permitting is available on a facility-wide basis only, not for individual outfalls. If any industrial activities or materials are or will be exposed to precipitation, the facility is not eligible for the no exposure exclusion.

By signing and submitting this No Exposure Certification form, the entity in Section A is certifying that a condition of no exposure exists at its facility or site, and is obligated to comply with the terms and conditions of 40 CFR 122.26(g).

ALL INFORMATION MUST BE PROVIDED ON THIS FORM.

Detailed instructions for completing this form and obtaining the no exposure exclusion are provided on pages 3 and 4.

A. Facility Operator Information

1. Name: _____ 2. Phone: _____

3. Mailing Address: a. Street: _____

b. City: _____ c. State: ____ d. Zip Code: _____-____

B. Facility/Site Location Information

1. Facility Name: _____

2. a. Street Address: _____

b. City: _____ c. County: _____

d. State: ____ e. Zip Code: _____-____

3. Is the facility located on Indian Lands? Yes ☐ No ☐

4. Is this a Federal facility? Yes ☐ No ☐

5. a. Latitude: ___ ° ___ ' ___ " b. Longitude: ___ ° ___ ' ___ "

6. a. Was the facility or site previously covered under an NPDES storm water permit? Yes ☐ No ☐

b. If yes, enter NPDES permit number: _____

7. SIC/Activity Codes: Primary: ____ Secondary (if applicable): ____

8. Total size of site associated with industrial activity: _____ acres

9. a. Have you paved or roofed over a formerly exposed, pervious area in order to qualify for the no exposure exclusion? Yes ☐ No ☐

b. If yes, please indicate approximately how much area was paved or roofed over. Completing this question does not disqualify you for the no exposure exclusion. However, your permitting authority may use this information in considering whether storm water discharges from your site are likely to have an adverse impact on water quality, in which case you could be required to obtain permit coverage.

Less than one acre ☐ One to five acres ☐ More than five acres ☐

NPDES FORM 3510-11 | EPA

NO EXPOSURE CERTIFICATION for Exclusion from NPDES Storm Water Permitting

Form Approved OMB No. 2040-0211

C. Exposure Checklist

Are any of the following materials or activities exposed to precipitation, now or in the foreseeable future? (Please check either "Yes" or "No" in the appropriate box.) **If you answer "Yes" to any of these questions (1) through (11), you are not eligible for the no exposure exclusion.**

	Yes	No
1. Using, storing or cleaning industrial machinery or equipment, and areas where residuals from using, storing or cleaning industrial machinery or equipment remain and are exposed to storm water	☐	☐
2. Materials or residuals on the ground or in storm water inlets from spills/leaks	☐	☐
3. Materials or products from past industrial activity	☐	☐
4. Material handling equipment (except adequately maintained vehicles)	☐	☐
5. Materials or products during loading/unloading or transporting activities	☐	☐
6. Materials or products stored outdoors (except final products intended for outside use [e.g., new cars] where exposure to storm water does not result in the discharge of pollutants)	☐	☐
7. Materials contained in open, deteriorated or leaking storage drums, barrels, tanks, and similar containers	☐	☐
8. Materials or products handled/stored on roads or railways owned or maintained by the discharger	☐	☐
9. Waste material (except waste in covered, non-leaking containers [e.g., dumpsters])	☐	☐
10. Application or disposal of process wastewater (unless otherwise permitted)	☐	☐
11. Particulate matter or visible deposits of residuals from roof stacks and/or vents not otherwise regulated (i.e., under an air quality control permit) and evident in the storm water outflow	☐	☐

D. Certification Statement

I certify under penalty of law that I have read and understand the eligibility requirements for claiming a condition of "no exposure" and obtaining an exclusion from NPDES storm water permitting.

I certify under penalty of law that there are no discharges of storm water contaminated by exposure to industrial activities or materials from the industrial facility or site identified in this document (except as allowed under 40 CFR 122.26(g)(2)).

I understand that I am obligated to submit a no exposure certification form once every five years to the NPDES permitting authority and, if requested, to the operator of the local municipal separate storm sewer system (MS4) into which the facility discharges (where applicable). I understand that I must allow the NPDES permitting authority, or MS4 operator where the discharge is into the local MS4, to perform inspections to confirm the condition of no exposure and to make such inspection reports publicly available upon request. I understand that I must obtain coverage under an NPDES permit prior to any point source discharge of storm water from the facility.

Additionally, I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is to the best of my knowledge and belief true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Print Name: _____

Print Title: _____

Signature: _____

Date: _____

 049873

NPDES FORM 3510-11 | EPA

Instructions for the NO EXPOSURE CERTIFICATION for Exclusion from NPDES Storm Water Permitting

Form Approved OMB No. 2040-0211

Who May File a No Exposure Certification

Federal law at 40 CFR Part 122.26 prohibits point source discharges of storm water associated with industrial activity to waters of the U.S. without a National Pollutant Discharge Elimination System (NPDES) permit. However, NPDES permit coverage is not required for discharges of storm water associated with industrial activities identified at 40 CFR 122.26(b)(14)(i)-(ix) and (xi) if the discharger can certify that a condition of "no exposure" exists at the industrial facility or site.

Storm water discharges from construction activities identified in 40 CFR 122.26(b)(14)(x) and (b)(15) are not eligible for the no exposure exclusion.

Obtaining and Maintaining the No Exposure Exclusion

This form is used to certify that a condition of no exposure exists at the industrial facility or site described herein. This certification is only applicable in jurisdictions where EPA is the NPDES permitting authority and must be re-submitted at least once every five years.

The industrial facility operator must maintain a condition of no exposure at its facility or site in order for the no exposure exclusion to remain applicable. If conditions change resulting in the exposure of materials and activities to storm water, the facility operator must obtain coverage under an NPDES storm water permit immediately.

Where to File the No Exposure Certification Form

Mail the completed no exposure certification form to:

Storm Water No Exposure Certification (4203)
USEPA
401 M Street, SW
Washington, D.C. 20460

Completing the Form

You must type or print, using uppercase letters, in appropriate areas only. Enter only one character per space (i.e., between the marks). Abbreviate if necessary to stay within the number of characters allowed for each item. Use one space for breaks between words. One form must be completed for each facility or site for which you are seeking to certify a condition of no exposure. Additional guidance on completing this form can be accessed through EPA's web site at www.epa.gov/owm/sw. Please make sure you have addressed all applicable questions and have made a photocopy for your records before sending the completed form to the above address.

Section A. Facility Operator Information

1. Provide the legal name of the person, firm, public organization, or any other entity that operates the facility or site described in this certification. The name of the operator may or may not be the same as the name of the facility. The operator is the legal entity that controls the facility's operation, rather than the plant or site manager.

2. Provide the telephone number of the facility operator.

3. Provide the mailing address of the operator (P.O. Box numbers may be used). Include the city, state, and zip code. All correspondence will be sent to this address.

Section B. Facility/Site Location Information

1. Enter the official or legal name of the facility or site.

2. Enter the complete street address (if no street address exists, provide a geographic description [e.g., Intersection of Routes 9 and 55]), city, county, state, and zip code. Do not use a P.O. Box number.

3. Indicate whether the facility is located on Indian Lands.

4. Indicate whether the industrial facility is operated by a department or agency of the Federal Government (see also Section 313 of the Clean Water Act).

5. Enter the latitude and longitude of the approximate center of the facility or site in degrees/minutes/seconds. Latitude and longitude can be obtained from United States Geological Survey (USGS) quadrangle or topographic maps, by calling 1-(888) ASK-USGS, or by accessing EPA's web site at http://www.epa.gov/owm/sw/industry/index.htm and selecting Latitude and Longitude Finders under the Resources/Permit section.

   Latitude and longitude for a facility in decimal form must be converted to degrees (°), minutes (′), and seconds (″) for proper entry on the certification form. To convert decimal latitude or longitude to degrees/minutes/seconds, follow the steps in the following example.

   Example: Convert decimal latitude 45.1234567 to degrees (°), minutes (′), and seconds (″).

   a) The numbers to the left of the decimal point are the degrees: 45°.

   b) To obtain minutes, multiply the first four numbers to the right of the decimal point by 0.006: 1234 x 0.006 = 7.404.

   c) The numbers to the left of the decimal point in the result obtained in (b) are the minutes: 7′.

   d) To obtain seconds, multiply the remaining three numbers to the right of the decimal from the result obtained in (b) by 0.06: 404 x 0.06 = 24.24. Since the numbers to the right of the decimal point are not used, the result is 24″.

   e) The conversion for 45.1234567 = 45° 7′ 24″.

6. Indicate whether the facility was previously covered under an NPDES storm water permit. If so, include the permit number.

7. Enter the 4-digit SIC code which identifies the facility's primary activity, and second 4-digit SIC code identifying the facility's secondary activity, if applicable. SIC codes can be obtained from the Standard Industrial Classification Manual, 1987.

8. Enter the total size of the site associated with industrial activity in acres. Acreage may be determined by dividing square footage by 43,560, as demonstrated in the following example.

   Example: Convert 54,450 ft^2 to acres

   Divide 54,450 ft^2 by 43,560 square feet per acre:
   54,450 ft^2 ÷ 43,560 ft^2/acre = 1.25 acres.

9. Check "Yes" or "No" as appropriate to indicate whether you have paved or roofed over a formerly exposed, pervious area (i.e., lawn, meadow, dirt or gravel road/parking lot) in order to qualify for no exposure. If yes, also indicate approximately how much area was paved or roofed over and is now impervious area.

NPDES FORM 3510-11 | EPA

Instructions for the NO EXPOSURE CERTIFICATION for Exclusion from NPDES Storm Water Permitting

Form Approved OMB No. 2040-0211

Section C. Exposure Checklist

Check "Yes" or "No" as appropriate to describe the exposure conditions at your facility. If you answer "Yes" to **ANY** of the questions (1) through (11) in this section, a potential for exposure exists at your site and you cannot certify to a condition of no exposure. You must obtain (or already have) coverage under an NPDES storm water permit. After obtaining permit coverage, you can institute modifications to eliminate the potential for a discharge of storm water exposed to industrial activity, and then certify to a condition of no exposure.

Section D. Certification Statement

Federal statutes provide for severe penalties for submitting false information on this application form. Federal regulations require this application to be signed as follows:

For a corporation: by a responsible corporate officer, which means:

(i) president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision making functions for the corporation, or

(ii) the manager of one or more manufacturing, production, or operating facilities, provided the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;

For a partnership or sole proprietorship: by a general partner or the proprietor; or

For a municipal, State, Federal, or other public facility: by either a principal executive or ranking elected official.

Paperwork Reduction Act Notice

Public reporting burden for this certification is estimated to average 1.0 hour per certification, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Burden means the total time, effort, or financial resources expended by persons to generate, maintain, retain, or disclose to provide information to or for a Federal agency. This includes the time needed to review instructions; develop, acquire, install, and utilize technology and systems for the purposes of collecting, validating, and verifying information, processing and maintaining information, and disclosing and providing information; adjust the existing ways to comply with any previously applicable instructions and requirements; train personnel to be able to respond to a collection of information; search data sources; complete and review the collection of information; and transmit or otherwise disclose the information. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. Send comments regarding the burden estimate, any other aspect of the collection of information, or suggestions for improving this form, including any suggestions which may increase or reduce this burden to: Director, OPPE Regulatory Information Division (2137), USEPA, 401 M Street, SW, Washington, D.C. 20460. Include the OMB control number of this form on any correspondence. Do not send the completed No Exposure Certification form to this address.

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BILLING CODE 6560–50–C

Appendix 5 to Preamble—Regulatory Flexibility for Small Entities

A. Regulatory Flexibility for Small Municipal Storm Sewer Systems (MS4s)

Different Compliance, Reporting, or Timetables That Are Responsive to Resources of Small Entities

NPDES permitting authorities can issue general permits instead of requiring individual permits. This flexibility avoids the high application costs and administrative burden associated with individual permits.

NPDES permitting authorities can specify a time period of up to five years for small MS4s to fully develop and implement their program

Analytic monitoring is not required.

After the first permit term and subsequent permit terms, submittal of a summary report is only required in years two and four (Phase I municipalities are currently required to submit a detailed report each year).

A brief reporting format is encouraged to facilitate compiling and analyzing data from submitted reports. EPA intends to develop a model form for this purpose.

NPDES Permitting Authorities can phase in permit coverage for small MS4s serving jurisdictions with a population under 10,000 on a schedule consistent with a State watershed permitting approach.

Clarifying, Consolidating, or Simplifying Compliance and Reporting Requirements

The rule avoids duplication in permit requirements by allowing NPDES permitting authorities to include permit conditions that direct an MS4 to follow the requirements of a qualifying local program rather than the requirements of a minimum measure. Compliance with these programs is considered compliance with the NPDES general permit.

The rule allows NPDES permitting authorities to recognize existing responsibilities among different municipal entities to satisfy obligations for the minimum control measures.

A further alternative allows a small MS4 to satisfy its NPDES permit obligations if another governmental entity is already implementing a minimum control measure in the jurisdiction of the small MS4. The following conditions must be met:

1. The other entity is implementing the control measure,
2. The particular control measure (or component thereof) is at least as stringent as the corrersponding NPDES permit requirement, and
3. The other entity agrees to implement the control measure on your behalf.

The rule allows a covered small MS4 to "piggy-back" on to the storm water management program of an adjoining Phase I MS4. A small MS4 is waived from the application requirements of § 122.26(d)(1)(iii), (iv) and (d)(2)(iii) [discharge characterization] and may satisfy the requirements of § 122.26(d)(1)(v) and (d)(2)(iv) [identifying a management plan] by referencing the adjoining Phase I MS4's storm water management plan.

The rule accommodates the use of the watershed approach through NPDES general permits that could be issued on a watershed basis. The small MS4 can develop measures that are tailored to meet their watershed requirements. The small MS4's storm water management program can tie into watershed-wide plans.

Performance Rather Than Design Standards for Small Entities

Small governmental jurisdictions whose MS4s are covered by this rule are allowed to choose the best management practices (BMPs) to be implemented and the measurable goals for each of the minimum control measures:

1. Public education and outreach on storm water impacts
2. Public Involvement/Participation
3. Illicit discharge detection and elimination

4. Construction site storm water runoff control

5. Post-construction storm water management in new development and redevelopment

6. Pollution prevention/good housekeeping for municipal operations

EPA will provide guidance and recommend, but not mandate, certain BMPs for some of the minimum control measures listed above. States can provide guidance to supplement or supplant EPA guidance.

Small MS4s can identify the measurable goals for each of the minimum control measures listed above. In their reports to the NPDES permitting authority, the small MS4s must evaluate their progress towards achievement of their identified measurable goals.

Waivers for Small Entities From Coverage

The rule allows permitting authorities to waive from coverage MS4s operated by small governmental jurisdictions located within an urbanized area and serving a population less than 1,000 people where the permitting authority has determined the MS4 is not contributing substantially to the pollutant loadings of an interconnected MS4 and, if the MS4 discharges pollutants that have been identified as a cause of impairment in the receiving water of the MS4 then the permitting authority has determined that storm water controls are not needed based on a TMDL that addresses the pollutants of concern.

The rule allows the permitting authority to waive from coverage MS4s serving a population under 10,000 where the permitting authority has evaluated all waters that receive a discharge from the MS4 and the permitting authority has determined that storm water controls are not needed based on a TMDL that addresses the pollutants of concern and future discharges do not have the potential to result in exceedances of water quality standards.

B. Regulatory Flexibility for Small Construction Activities

Different Compliance, Reporting, or Timetables That Are Responsive to Resources of Small Entities

The rule gives NPDES permitting authorities discretion not to require the submittal of a notice of intent (NOI) for coverage under a NPDES general permit, thereby reducing administrative and financial burden. All construction sites disturbing greater than 5 acres must submit an NOI.

Clarifying, Consolidating, or Simplifying Compliance and Reporting Requirements

The rule avoids duplication by allowing the NPDES permitting authority to incorporate by reference State, Tribal, or local programs under a NPDES general permit. Compliance with these programs is considered compliance with the NPDES general permit.

Performance Rather Than Design Standards for Small Entities

The operator of a covered construction activity selects and implement the BMPs most appropriate for the construction site based on the operator's storm water pollution prevention plan.

Waivers for Small Entities From Coverage

Waivers could be granted based on the use of a rainfall erosivity factor or a comprehensive analysis of water quality impacts.

(A) *Low rainfall waiver:* When the rainfall erosivity factor ("R" from Revised Universal Soil Loss Equation) is less than 5 during the period of construction activity, a permit is not required.

(B) *Determination based on Water Quality Analysis:* The NPDES permitting authority can waive from coverage construction activities disturbing from 1 acre up to 5 acres of land where storm water controls are not needed based on:

1. A TMDL approved or established by EPA that addresses the pollutants of concern, or

2. For non-impaired waters, an equivalent analysis that determines that such allocations are not needed to protect water quality based on consideration of existing in-stream concentrations, expected growth in pollutant contributions from all sources, and a margin of safety.

C. Regulatory Flexibility for Industrial/Commercial Facilities

Waivers for Small Entities From Coverage

The rule provides a "no-exposure" waiver provision for Phase I industrial/commercial facilities. Qualifying facilities seeking this provision simply need to complete a self-certification form indicating that no industrial materials or activities are exposed to rain, snow, snow melt and/or runoff.

Appendix 6 of Preamble—Governmental Entities Located Fully or Partially Within an Urbanized Area

(This is a reference list only, *not* a list of all operators of small MS4s subject to §§ 122.32–122.36. For example, a listed governmental entity is only regulated if it operates a small MS4 within an "urbanized area" boundary as determined by the Bureau of the Census. Furthermore, entities such as military bases, large hospitals, prison complexes, universities, sewer districts, and highway departments that operate a small MS4 within an urbanized area are also subject to the permitting regulations but are not individually listed here. See § 122.26(b)(16) for the definition of a small MS4 and § 122.32(a) for the definition of a regulated small MS4.)

(Source: 1990 Census of Population and Housing, U.S. Bureau of the Census. This list is subject to change with the Decennial Census)

AL Anniston city
AL Attalla city
AL Auburn city
AL Autauga County
AL Blue Mountain town
AL Calhoun County
AL Colbert County
AL Dale County
AL Decatur city
AL Dothan city
AL Elmore County
AL Etowah County
AL Flint City town
AL Florence city
AL Gadsden city
AL Glencoe city
AL Grimes town
AL Hartselle city
AL Hobson City town
AL Hokes Bluff city
AL Houston County
AL Kinsey town
AL Lauderdale County
AL Lee County
AL Limestone County
AL Madison County
AL Midland City town
AL Montgomery County
AL Morgan County
AL Muscle Shoals city
AL Napier Field town
AL Northport city
AL Opelika city
AL Oxford city
AL Phenix City city
AL Prattville city
AL Priceville town
AL Rainbow City city
AL Russell County
AL Sheffield city
AL Southside city
AL Sylvan Springs town
AL Talladega County
AL Tuscaloosa city
AL Tuscaloosa County
AL Tuscumbia city
AL Weaver city
AR Alexander town
AR Barling city
AR Benton County
AR Cammack Village city
AR Crawford County
AR Crittenden County
AR Farmington city
AR Fayetteville city
AR Fort Smith city
AR Greenland town
AR Jacksonville city
AR Jefferson County
AR Johnson city
AR Marion city
AR Miller County
AR North Little Rock city
AR Pine Bluff city
AR Pulaski County
AR Saline County
AR Sebastian County
AR Shannon Hills city
AR Sherwood city
AR Springdale city
AR Sunset town
AR Texarkana city
AR Van Buren city
AR Washington County
AR West Memphis city
AR White Hall city
AZ Apache Junction city
AZ Chandler city
AZ El Mirage town
AZ Gilbert town
AZ Guadalupe town
AZ Maricopa County
AZ Oro Valley town
AZ Paradise Valley town
AZ Peoria city
AZ Pinal County

AZ South Tucson city
AZ Surprise town
AZ Tolleson city
AZ Youngtown town
AZ Yuma city
AZ Yuma County
CA Apple Valley town
CA Belvedere city
CA Benicia city
CA Brentwood city
CA Butte County
CA Capitola city
CA Carmel-by-the-Sea city
CA Carpinteria city
CA Ceres city
CA Chico city
CA Compton city
CA Corte Madera town
CA Cotati city
CA Davis city
CA Del Rey Oaks city
CA Fairfax town
CA Hesperia city
CA Imperial County
CA Lakewood city
CA Lancaster city
CA Larkspur city
CA Lodi city
CA Lompoc city
CA Marin County
CA Marina city
CA Marysville city
CA Merced city
CA Merced County
CA Mill Valley city
CA Monterey city
CA Monterey County
CA Morgan Hill city
CA Napa city
CA Napa County
CA Novato city
CA Pacific Grove city
CA Palm Desert city
CA Palmdale city
CA Piedmont city
CA Placer County
CA Redding city
CA Rocklin city
CA Rohnert Park city
CA Roseville city
CA Ross town
CA San Anselmo town
CA San Buenaventura (Ventura) city
CA San Francisco city
CA San Joaquin County
CA San Luis Obispo city
CA San Luis Obispo County
CA San Rafael city
CA Sand City city
CA Santa Barbara city
CA Santa Barbara County
CA Santa Cruz city
CA Santa Cruz County
CA Santa Maria city
CA Sausalito city
CA Scotts Valley city
CA Seaside city
CA Shasta County
CA Solano County
CA Sonoma County
CA Stanislaus County
CA Suisun City city
CA Sutter County
CA Tiburon town
CA Tulare County
CA Vacaville city
CA Victorville city
CA Villa Park city
CA Visalia city
CA Watsonville city
CA West Sacramento city
CA Yolo County
CA Yuba City city
CA Yuba County
CO Adams County
CO Arvada city
CO Boulder city
CO Boulder County
CO Bow Mar town
CO Broomfield city
CO Cherry Hills Village city
CO Columbine Valley town
CO Commerce City city
CO Douglas County
CO Edgewater city
CO El Paso County
CO Englewood city
CO Evans city
CO Federal Heights city
CO Fort Collins city
CO Fountain city
CO Garden City town
CO Glendale city
CO Golden city
CO Grand Junction city
CO Greeley city
CO Greenwood Village city
CO Jefferson County
CO La Salle town
CO Lakeside town
CO Larimer County
CO Littleton city
CO Longmont city
CO Manitou Springs city
CO Mesa County
CO Mountain View town
CO Northglenn city
CO Pueblo city
CO Pueblo County
CO Sheridan city
CO Thornton city
CO Weld County
CO Westminster city
CO Wheat Ridge city
CT Ansonia city
CT Avon town
CT Beacon Falls town
CT Berlin town
CT Bethel town
CT Bloomfield town
CT Bozrah town
CT Branford town
CT Bridgeport city
CT Bristol city
CT Brookfield town
CT Burlington town
CT Cheshire town
CT Cromwell town
CT Danbury city
CT Darien town
CT Derby city
CT Durham town
CT East Granby town
CT East Hartford town
CT East Haven town
CT East Lyme town
CT East Windsor town
CT Easton town
CT Ellington town
CT Enfield town
CT Fairfield County
CT Fairfield town
CT Farmington town
CT Franklin town
CT Glastonbury town
CT Greenwich town
CT Groton city
CT Groton town
CT Guilford town
CT Hamden town
CT Hartford city
CT Hartford County
CT Ledyard town
CT Lisbon town
CT Litchfield County
CT Manchester town
CT Meriden city
CT Middlebury town
CT Middlefield town
CT Middlesex County
CT Middletown city
CT Milford city (remainder)
CT Monroe town
CT Montville town
CT Naugatuck borough
CT New Britain city
CT New Canaan town
CT New Fairfield town
CT New Haven city
CT New Haven County
CT New London city
CT New London County
CT New Milford town
CT Newington town
CT Newtown town
CT North Branford town
CT North Haven town
CT Norwalk city
CT Norwich city
CT Orange town
CT Oxford town
CT Plainville town
CT Plymouth town
CT Portland town
CT Preston town
CT Prospect town
CT Rocky Hill town
CT Seymour town
CT Shelton city
CT Sherman town
CT Somers town
CT South Windsor town
CT Southington town
CT Sprague town
CT Stonington town
CT Stratford town
CT Suffield town
CT Thomaston town
CT Thompson town
CT Tolland County
CT Tolland town
CT Trumbull town
CT Vernon town
CT Wallingford town
CT Waterbury city
CT Waterford town
CT Watertown town
CT West Hartford town
CT West Haven city
CT Weston town
CT Westport town
CT Wethersfield town
CT Wilton town
CT Windham County
CT Windsor Locks town
CT Windsor town
CT Wolcott town
CT Woodbridge town

049877

CT Woodmont borough
DE Camden town
DE Dover city
DE Kent County
DE Newark city
DE Wyoming town
FL Alachua County
FL Baldwin town
FL Bay County
FL Belleair Shore town
FL Biscayne Park village
FL Brevard County
FL Callaway city
FL Cape Canaveral city
FL Cedar Grove town
FL Charlotte County
FL Cinco Bayou town
FL Clay County
FL Cocoa Beach city
FL Cocoa city
FL Collier County
FL Daytona Beach city
FL Daytona Beach Shores city
FL Destin city
FL Edgewater city
FL El Portal village
FL Florida City city
FL Fort Pierce city
FL Fort Walton Beach city
FL Gainesville city
FL Gulf Breeze city
FL Hernando County
FL Hillsboro Beach town
FL Holly Hill city
FL Indialantic town
FL Indian Harbour Beach city
FL Indian River County
FL Indian River Shores town
FL Indian Shores town
FL Kissimmee city
FL Lazy Lake village
FL Lynn Haven city
FL Malabar town
FL Marion County
FL Martin County
FL Mary Esther city
FL Melbourne Beach town
FL Melbourne city
FL Melbourne Village town
FL Naples city
FL New Smyrna Beach city
FL Niceville city
FL Ocala city
FL Ocean Breeze Park town
FL Okaloosa County
FL Orange Park town
FL Ormond Beach city
FL Osceola County
FL Palm Bay city
FL Panama City city
FL Parker city
FL Ponce Inlet town
FL Port Orange city
FL Port St. Lucie city
FL Punta Gorda city
FL Rockledge city
FL Santa Rosa County
FL Satellite Beach city
FL Sewall's Point town
FL Shalimar town
FL South Daytona city
FL Springfield city
FL St. Johns County
FL St. Lucie County
FL St. Lucie village
FL Stuart city
FL Sweetwater city
FL Titusville city
FL Valparaiso city
FL Vero Beach city
FL Virginia Gardens village
FL Volusia County
FL Walton County
FL Weeki Wachee city
FL West Melbourne city
FL Windermere town
GA Albany city
GA Athens city
GA Bartow County
GA Brunswick city
GA Catoosa County
GA Centerville city
GA Chattahoochee County
GA Cherokee County
GA Chickamauga city
GA Clarke County
GA Columbia County
GA Conyers city
GA Dade County
GA Dougherty County
GA Douglas County
GA Douglasville city
GA Fayette County
GA Floyd County
GA Fort Oglethorpe city
GA Glynn County
GA Grovetown city
GA Henry County
GA Houston County
GA Jones County
GA Lee County
GA Lookout Mountain city
GA Mountain Park city
GA Oconee County
GA Payne city
GA Rockdale County
GA Rome city
GA Rossville city
GA Stockbridge city
GA Vernonburg town
GA Walker County
GA Warner Robins city
GA Winterville city
GA Woodstock city
IA Altoona city
IA Asbury city
IA Bettendorf city
IA Black Hawk County
IA Buffalo city
IA Carter Lake city
IA Cedar Falls city
IA Clive city
IA Coralville city
IA Council Bluffs city
IA Dallas County
IA Dubuque city
IA Dubuque County
IA Elk Run Heights city
IA Evansdale city
IA Hiawatha city
IA Iowa City city
IA Johnson County
IA Johnston city
IA Le Claire city
IA Linn County
IA Marion city
IA Norwalk city
IA Panorama Park city
IA Pleasant Hill city
IA Polk County
IA Pottawattamie County
IA Raymond city
IA Riverdale city
IA Robins city
IA Scott County
IA Sergeant Bluff city
IA Sioux City city
IA University Heights city
IA Urbandale city
IA Warren County
IA Waterloo city
IA West Des Moines city
IA Windsor Heights city
IA Woodbury County
ID Ada County
ID Ammon city
ID Bannock County
ID Bonneville County
ID Chubbuck city
ID Idaho Falls city
ID Iona city
ID Pocatello city
ID Power County
IL Addison township
IL Addison village
IL Algonquin township
IL Algonquin village
IL Alorton village
IL Alsip village
IL Alton city
IL Antioch township
IL Antioch village
IL Arlington Heights village
IL Aroma Park village
IL Aroma township
IL Aurora city
IL Aurora township
IL Avon township
IL Ball township
IL Bannockburn village
IL Barrington township
IL Barrington village
IL Bartlett village
IL Bartonville village
IL Batavia city
IL Batavia township
IL Beach Park village
IL Bedford Park village
IL Belleville city
IL Bellevue village
IL Bellwood village
IL Bensenville village
IL Benton township
IL Berkeley village
IL Berwyn city
IL Bethalto village
IL Blackhawk township
IL Bloom township
IL Bloomingdale township
IL Bloomingdale village
IL Bloomington city
IL Bloomington township
IL Blue Island city
IL Bolingbrook village
IL Bourbonnais township
IL Bourbonnais village
IL Bowling township
IL Bradley village
IL Bremen township
IL Bridgeview village
IL Bristol township
IL Broadview village
IL Brookfield village
IL Brooklyn village
IL Buffalo Grove village
IL Burbank city
IL Burnham village
IL Burr Ridge village

IL Burritt township
IL Burton township
IL Cahokia village
IL Calumet City city
IL Calumet Park village
IL Calumet township
IL Canteen township
IL Capital township
IL Carbon Cliff village
IL Carol Stream village
IL Carpentersville Village
IL Cary village
IL Caseyville township
IL Caseyville village
IL Centreville city
IL Centreville township
IL Champaign city
IL Champaign County
IL Champaign township
IL Channahon township
IL Cherry Valley township
IL Cherry Valley village
IL Chicago city
IL Chicago Heights city
IL Chicago Ridge village
IL Chouteau township
IL Cicero town
IL Cincinnati township
IL Clarendon Hills village
IL Coal Valley township
IL Coal Valley village
IL Collinsville city
IL Collinsville township
IL Colona township
IL Colona village
IL Columbia city
IL Country Club Hills city
IL Countryside city
IL Crest Hill city
IL Crestwood village
IL Crete township
IL Crete village
IL Creve Coeur village
IL Crystal Lake city
IL Cuba township
IL Curran township
IL Darien city
IL Decatur city
IL Decatur township
IL Deer Park village
IL Deerfield township
IL Deerfield village
IL Des Plaines city
IL Dixmoor village
IL Dolton village
IL Dorr township
IL Downers Grove township
IL Downers Grove village
IL Dry Grove township
IL Du Page township
IL Dundee township
IL Dunleith township
IL Dupo village
IL East Alton village
IL East Dubuque city
IL East Dundee village
IL East Hazel Crest village
IL East Moline city
IL East Peoria city
IL East St. Louis city
IL Edwardsville city
IL Edwardsville township
IL Ela township
IL Elgin city
IL Elgin township
IL Elk Grove township
IL Elk Grove Village village
IL Elm Grove township
IL Elmhurst city
IL Elmwood Park village
IL Evanston city
IL Evergreen Park village
IL Fairmont City village
IL Fairview Heights city
IL Flossmoor village
IL Fondulac township
IL Ford Heights village
IL Forest Park village
IL Forest View village
IL Forsyth village
IL Fort Russell township
IL Foster township
IL Fox Lake village
IL Fox River Grove village
IL Frankfort township
IL Frankfort village
IL Franklin Park village
IL Fremont township
IL Gardner township
IL Geneva city
IL Geneva township
IL Gilberts village
IL Glen Carbon village
IL Glen Ellyn village
IL Glencoe village
IL Glendale Heights village
IL Glenview village
IL Glenwood village
IL Godfrey township
IL Golf village
IL Grafton township
IL Grandview village
IL Granite City city
IL Grant township
IL Grayslake village
IL Green Oaks village
IL Green Rock city
IL Groveland township
IL Gurnee village
IL Hainesville village
IL Hampton township
IL Hampton village
IL Hanna township
IL Hanover Park village
IL Hanover township
IL Harlem township
IL Harristown township
IL Harristown village
IL Hartford village
IL Harvey city
IL Harwood Heights village
IL Hawthorn Woods village
IL Hazel Crest village
IL Henry County
IL Hensley township
IL Hickory Hills city
IL Hickory Point township
IL Highland Park city
IL Highwood city
IL Hillside village
IL Hinsdale village
IL Hodgkins village
IL Hoffman Estates village
IL Hollis township
IL Homer township
IL Hometown city
IL Homewood village
IL Indian Creek village
IL Indian Head Park village
IL Inverness village
IL Itasca village
IL Jarvis township
IL Jerome village
IL Jo Daviess County
IL Joliet city
IL Joliet township
IL Justice village
IL Kane County
IL Kankakee city
IL Kankakee County
IL Kankakee township
IL Kendall County
IL Kenilworth village
IL Kickapoo township
IL Kildeer village
IL La Grange Park village
IL La Grange village
IL Lake Barrington village
IL Lake Bluff village
IL Lake Forest city
IL Lake in the Hills village
IL Lake Villa township
IL Lake Villa village
IL Lake Zurich village
IL Lakemoor village
IL Lakewood village
IL Lansing village
IL Leland Grove city
IL Lemont township
IL Leyden township
IL Libertyville township
IL Libertyville village
IL Limestone township
IL Lincolnshire village
IL Lincolnwood village
IL Lindenhurst village
IL Lisle township
IL Lisle village
IL Lockport city
IL Lockport township
IL Lombard village
IL Long Creek township
IL Long Grove village
IL Loves Park city
IL Lynwood village
IL Lyons township
IL Lyons village
IL Machesney Park village
IL Macon County
IL Madison city
IL Madison County
IL Maine township
IL Markham city
IL Marquette Heights city
IL Maryville village
IL Matteson village
IL Maywood village
IL McCook village
IL McCullom Lake village
IL McHenry city
IL McHenry County
IL McHenry township
IL McLean County
IL Medina township
IL Melrose Park village
IL Merrionette Park village
IL Midlothian village
IL Milan village
IL Milton township
IL Moline city
IL Moline township
IL Monee township
IL Monroe County
IL Montgomery village
IL Moro township
IL Morton Grove village
IL Morton township
IL Morton village

IL Mount Prospect village
IL Mount Zion township
IL Mount Zion village
IL Mundelein village
IL Nameoki township
IL Naperville city
IL Naperville township
IL National City village
IL New Lenox township
IL New Lenox village
IL New Millford village
IL New Trier township
IL Newport township
IL Niles township
IL Niles village
IL Normal town
IL Normal township
IL Norridge village
IL North Aurora village
IL North Barrington village
IL North Chicago city
IL North Pekin village
IL North Riverside village
IL Northbrook village
IL Northfield township
IL Northfield village
IL Northlake city
IL Norwood Park township
IL Norwood village
IL Nunda township
IL Oak Brook village
IL Oak Forest city
IL Oak Grove village
IL Oak Lawn village
IL Oak Park village
IL Oakbrook Terrace city
IL Oakley township
IL Oakwood Hills village
IL O'Fallon city
IL O'Fallon township
IL Olympia Fields village
IL Orland Hills village
IL Orland Park village
IL Orland township
IL Oswego township
IL Oswego village
IL Otto township
IL Owen township
IL Palatine township
IL Palatine village
IL Palos Heights city
IL Palos Hills city
IL Palos Park village
IL Palos township
IL Park City city
IL Park Forest village
IL Park Ridge city
IL Pekin city
IL Pekin township
IL Peoria city
IL Peoria County
IL Peoria Heights village
IL Phoenix village
IL Pin Oak township
IL Plainfield township
IL Plainfield village
IL Pontoon Beach village
IL Posen village
IL Precinct 10
IL Prospect Heights city
IL Proviso township
IL Rich township
IL Richton Park village
IL Richwoods township
IL River Forest village
IL River Grove village
IL Riverdale village
IL Riverside township
IL Riverside village
IL Riverwoods village
IL Robbins village
IL Rochester township
IL Rock Island city
IL Rock Island County
IL Rock Island township
IL Rockdale village
IL Rockford township
IL Rockton township
IL Rockton village
IL Rolling Meadows city
IL Romeoville village
IL Roscoe township
IL Roscoe village
IL Roselle village
IL Rosemont village
IL Round Lake Beach village
IL Round Lake Heights village
IL Round Lake Park village
IL Round Lake village
IL Roxana village
IL Rutland township
IL Sangamon County
IL Sauget village
IL Sauk Village village
IL Savoy village
IL Schaumburg township
IL Schaumburg village
IL Schiller Park village
IL Shields township
IL Shiloh Valley township
IL Shiloh village
IL Shorewood village
IL Silvis city
IL Skokie village
IL Sleepy Hollow village
IL Somer township
IL South Beloit city
IL South Chicago Heights village
IL South Elgin village
IL South Holland village
IL South Moline township
IL South Rock Island township
IL South Roxana village
IL South Wheatland township
IL Southern View village
IL Spring Bay township
IL Springfield city
IL Springfield township
IL St. Charles city
IL St. Charles township
IL St. Clair County
IL St. Clair township
IL Steger village
IL Stickney township
IL Stickney village
IL Stites township
IL Stone Park village
IL Stookey township
IL Streamwood village
IL Sugar Grove township
IL Sugar Loaf township
IL Summit village
IL Sunnyside village
IL Swansea village
IL Tazewell County
IL Thornton township
IL Thornton village
IL Tinley Park village
IL Tolono township
IL Tower Lakes village
IL Tremont township
IL Troy city
IL Troy township
IL University Park village
IL Urbana city
IL Urbana township
IL Venice city
IL Venice township
IL Vernon Hills village
IL Vernon township
IL Villa Park village
IL Warren township
IL Warrenville city
IL Washington city
IL Washington Park village
IL Washington township
IL Wauconda township
IL Waukegan city
IL Waukegan township
IL Wayne township
IL West Chicago city
IL West Deerfield township
IL West Dundee village
IL West Peoria township
IL Westchester village
IL Western Springs village
IL Westmont village
IL Wheatland township
IL Wheaton city
IL Wheeling township
IL Wheeling village
IL Whitmore township
IL Will County
IL Willow Springs village
IL Willowbrook village
IL Wilmette village
IL Winfield township
IL Winfield village
IL Winnebago County
IL Winnetka village
IL Winthrop Harbor village
IL Wood Dale city
IL Wood River city
IL Wood River township
IL Woodford County
IL Woodridge village
IL Woodside township
IL Worth township
IL Worth village
IL York township
IL Zion city
IN Aboite township
IN Adams township
IN Allen County
IN Anderson city
IN Anderson township
IN Baugo township
IN Beech Grove city
IN Bloomington city
IN Bloomington township
IN Boone County
IN Buck Creek township
IN Calumet township
IN Carmel city
IN Castleton town
IN Cedar Creek township
IN Center township
IN Centre township
IN Chesterfield town
IN Chesterton town
IN Clark County
IN Clarksville town
IN Clay township
IN Clermont town
IN Cleveland township
IN Concord township
IN Country Club Heights town

IN Crown Point city
IN Crows Nest town
IN Cumberland town
IN Daleville town
IN Delaware County
IN Delaware township
IN Dyer town
IN Eagle township
IN East Chicago city
IN Edgewood town
IN Elkhart city
IN Elkhart County
IN Elkhart township
IN Evansville city
IN Fairfield township
IN Fall Creek township
IN Fishers town
IN Floyd County
IN Fort Wayne city
IN Franklin township
IN Gary city
IN German township
IN Goshen city
IN Greenwood city
IN Griffith town
IN Hamilton County
IN Hamilton township
IN Hammond city
IN Hancock County
IN Hanover township
IN Harris township
IN Harrison township
IN Hendricks County
IN Highland town
IN Hobart city
IN Hobart township
IN Homecroft town
IN Honey Creek township
IN Howard County
IN Howard township
IN Indian Village town
IN Jackson township
IN Jefferson township
IN Jeffersonville city
IN Jeffersonville township
IN Johnson County
IN Knight township
IN Kokomo city
IN Lafayette city
IN Lafayette township
IN Lake County
IN Lake Station city
IN Lawrence city
IN Lawrence township
IN Liberty township
IN Lincoln township
IN Lost Creek township
IN Madison County
IN Meridian Hills town
IN Merrillville town
IN Mishawaka city
IN Monroe County
IN Mount Pleasant township
IN Muncie city
IN Munster town
IN New Albany city
IN New Albany township
IN New Chicago town
IN New Haven city
IN New Whiteland town
IN Newburgh town
IN North Crows Nest town
IN North township
IN Ogden Dunes town
IN Ohio township
IN Osceola town
IN Osolo township
IN Otter Creek township
IN Penn township
IN Perry township
IN Pigeon township
IN Pike township
IN Pleasant township
IN Portage city
IN Portage township
IN Porter County
IN Porter town
IN Richland township
IN Riley township
IN River Forest town
IN Rocky Ripple town
IN Roseland town
IN Ross township
IN Salem township
IN Schererville town
IN Seelyville town
IN Sellersburg town
IN Selma town
IN Silver Creek township
IN South Bend city
IN Southport city
IN Speedway town
IN Spring Hill town
IN St. John town
IN St. John township
IN St. Joseph County
IN St. Joseph township
IN Sugar Creek township
IN Taylor township
IN Terre Haute city
IN Tippecanoe County
IN Tippecanoe township
IN Union township
IN Utica township
IN Van Buren township
IN Vanderburgh County
IN Vigo County
IN Wabash township
IN Warren Park town
IN Warren township
IN Warrick County
IN Washington township
IN Wayne township
IN Wea township
IN West Lafayette city
IN West Terre Haute town
IN Westchester township
IN Westfield town
IN White River township
IN Whiteland town
IN Whiting city
IN Williams Creek town
IN Woodlawn Heights town
IN Wynnedale town
IN Yorktown town
IN Zionsville town
KS Attica township
KS Bel Aire city
KS Countryside city
KS Delano township
KS Doniphan County
KS Douglas County
KS Eastborough city
KS Elwood city
KS Fairway city
KS Gypsum township
KS Haysville city
KS Johnson County
KS Kechi city
KS Kechi township
KS Lake Quivira city
KS Lawrence city
KS Leawood city
KS Lenexa city
KS Merriam city
KS Minneha township
KS Mission city
KS Mission Hills city
KS Mission township
KS Mission Woods city
KS Monticello township
KS Ohio township
KS Olathe city
KS Olathe township
KS Park City city
KS Park township
KS Prairie Village city
KS Riverside township
KS Roeland Park city
KS Salem township
KS Sedgwick County
KS Shawnee city
KS Shawnee County
KS Shawnee township
KS Soldier township
KS Tecumseh township
KS Topeka township
KS Waco township
KS Wakarusa township
KS Washington township
KS Westwood city
KS Westwood Hills city
KS Williamsport township
KS Wyandotte County
KY Alexandria city
KY Ashland city
KY Bellefonte city
KY Bellevue city
KY Boone County
KY Boyd County
KY Bromley city
KY Bullitt County
KY Campbell County
KY Catlettsburg city
KY Christian County
KY Covington city
KY Crescent Park city
KY Crescent Springs city
KY Crestview city
KY Crestview Hills city
KY Daviess County
KY Dayton city
KY Edgewood city
KY Elsmere city
KY Erlanger city
KY Fairview city
KY Flatwoods city
KY Florence city
KY Forest Hills city
KY Fort Mitchell city
KY Fort Thomas city
KY Fort Wright city
KY Fox Chase city
KY Greenup County
KY Hebron Estates city
KY Henderson city
KY Henderson County
KY Highland Heights city
KY Hillview city
KY Hunters Hollow city
KY Independence city
KY Jessamine County
KY Kenton County
KY Kenton Vale city
KY Lakeside Park city
KY Latonia Lakes city
KY Ludlow city
KY Melbourne city

KY Newport city
KY Oak Grove city
KY Owensboro city
KY Park Hills city
KY Pioneer Village city
KY Raceland city
KY Russell city
KY Silver Grove city
KY Southgate city
KY Taylor Mill city
KY Villa Hills city
KY Wilder city
KY Woodlawn city
KY Wurtland city
LA Alexandria city
LA Baker city
LA Ball town
LA Bossier City city
LA Bossier Parish
LA Broussard town
LA Caddo Parish
LA Calcasieu Parish
LA Carencro city
LA Denham Springs city
LA Houma city
LA Lafayette city
LA Lafayette Parish
LA Lafourche Parish
LA Lake Charles city
LA Livingston Parish
LA Monroe city
LA Ouachita Parish
LA Pineville city
LA Plaquemines Parish
LA Port Allen city
LA Rapides Parish
LA Richwood town
LA Scott town
LA Slidell city
LA St. Bernard Parish
LA St. Charles Parish
LA St. Tammany Parish
LA Sulphur city
LA Terrebonne Parish
LA West Baton Rouge Parish
LA West Monroe city
LA Westlake city
LA Zachary city
MA Abington town
MA Acton town
MA Acushnet town
MA Agawam town
MA Amesbury town
MA Andover town
MA Arlington town
MA Ashland town
MA Attleboro city
MA Auburn town
MA Avon town
MA Barnstable County
MA Barnstable town
MA Bedford town
MA Bellingham town
MA Belmont town
MA Berkshire County
MA Beverly city
MA Billerica town
MA Blackstone town
MA Boxborough town
MA Boylston town
MA Braintree town
MA Bridgewater town
MA Bristol County
MA Brockton city
MA Brookline town
MA Burlington town
MA Cambridge city
MA Canton town
MA Charlton town
MA Chelmsford town
MA Chelsea city
MA Chicopee city
MA Cohasset town
MA Concord town
MA Dalton town
MA Danvers town
MA Dartmouth town
MA Dedham town
MA Dennis town
MA Dighton town
MA Dover town
MA Dracut town
MA Dudley town
MA East Bridgewater town
MA East Longmeadow town
MA Easthampton town
MA Easton town
MA Essex County
MA Essex town
MA Everett city
MA Fairhaven town
MA Fall River city
MA Fitchburg city
MA Foxborough town
MA Framingham town
MA Franklin town
MA Freetown town
MA Georgetown town
MA Gloucester city
MA Grafton town
MA Granby town
MA Groton town
MA Groveland town
MA Hadley town
MA Halifax town
MA Hamilton town
MA Hampden County
MA Hampden town
MA Hampshire County
MA Hanover town
MA Hanson town
MA Haverhill city
MA Hingham town
MA Hinsdale town
MA Holbrook town
MA Holden town
MA Holliston town
MA Holyoke city
MA Hudson town
MA Hull town
MA Lanesborough town
MA Lawrence city
MA Leicester town
MA Leominster city
MA Lexington town
MA Lincoln town
MA Littleton town
MA Longmeadow town
MA Lowell city
MA Ludlow town
MA Lunenburg town
MA Lynn city
MA Lynnfield town
MA Malden city
MA Manchester town
MA Mansfield town
MA Marblehead town
MA Marlborough city
MA Mashpee town
MA Maynard town
MA Medfield town
MA Medford city
MA Medway town
MA Melrose city
MA Merrimac town
MA Methuen town
MA Middlesex County
MA Middleton town
MA Millbury town
MA Millis town
MA Millville town
MA Milton town
MA Nahant town
MA Natick town
MA Needham town
MA New Bedford city
MA Newton city
MA Norfolk town
MA North Andover town
MA North Attleborough town
MA North Reading town
MA Northampton city
MA Northborough town
MA Northbridge town
MA Norton town
MA Norwell town
MA Norwood town
MA Oxford town
MA Paxton town
MA Peabody city
MA Pembroke town
MA Pittsfield city
MA Plainville town
MA Plymouth County
MA Quincy city
MA Randolph town
MA Raynham town
MA Reading town
MA Rehoboth town
MA Revere city
MA Rockland town
MA Rockport town
MA Salem city
MA Sandwich town
MA Saugus town
MA Scituate town
MA Seekonk town
MA Sharon town
MA Shrewsbury town
MA Somerset town
MA Somerville city
MA South Hadley town
MA Southampton town
MA Southborough town
MA Southwick town
MA Springfield city
MA Stoneham town
MA Stoughton town
MA Stow town
MA Sudbury town
MA Sutton town
MA Swampscott town
MA Swansea town
MA Taunton city
MA Tewksbury town
MA Tyngsborough town
MA Uxbridge town
MA Wakefield town
MA Walpole town
MA Waltham city
MA Watertown town
MA Wayland town
MA Webster town
MA Wellesley town
MA Wenham town
MA West Boylston town
MA West Bridgewater town
MA West Springfield town

MA Westborough town
MA Westfield city
MA Westford town
MA Westminster town
MA Weston town
MA Westport town
MA Westwood town
MA Weymouth town
MA Whitman town
MA Wilbraham town
MA Williamsburg town
MA Wilmington town
MA Winchester town
MA Winthrop town
MA Woburn city
MA Worcester County
MA Wrentham town
MA Yarmouth town
MD Allegany County
MD Annapolis city
MD Bel Air town
MD Berwyn Heights town
MD Bladensburg town
MD Bowie city
MD Brentwood town
MD Brookeville town
MD Capitol Heights town
MD Cecil County
MD Cheverly town
MD Chevy Chase Section Five village
MD Chevy Chase Section Three village
MD Chevy Chase town
MD Chevy Chase Village town
MD College Park city
MD Colmar Manor town
MD Cottage City town
MD Cumberland city
MD District Heights city
MD Edmonston town
MD Elkton town
MD Fairmount Heights town
MD Forest Heights town
MD Frederick city
MD Frostburg city
MD Funkstown town
MD Gaithersburg city
MD Garrett Park town
MD Glen Echo town
MD Glenarden town
MD Greenbelt city
MD Hagerstown city
MD Highland Beach town
MD Hyattsville city
MD Kensington town
MD Landover Hills town
MD Laurel city
MD Martin's Additions village
MD Morningside town
MD Mount Rainier city
MD New Carrollton city
MD North Brentwood town
MD Riverdale town
MD Rockville city
MD Seat Pleasant city
MD Smithsburg town
MD Somerset town
MD Takoma Park city
MD University Park town
MD Walkersville town
MD Washington Grove town
MD Williamsport town
ME Androscoggin County
ME Auburn city
ME Bangor city
ME Berwick town
ME Brewer city
ME Cape Elizabeth town
ME Cumberland County
ME Eliot town
ME Falmouth town
ME Gorham town
ME Kittery town
ME Lebanon town
ME Lewiston city
ME Lisbon town
ME Old Town city
ME Orono town
ME Penobscot County
ME Penobscot Indian Island Reservation
ME Portland city
ME Sabattus town
ME Scarborough town
ME South Berwick town
ME South Portland city
ME Veazie town
ME Westbrook city
ME York County
MI Ada township
MI Allegan County
MI Allen Park city
MI Alpine township
MI Ann Arbor township
MI Auburn Hills city
MI Bangor township
MI Bath township
MI Battle Creek city
MI Bay City city
MI Bay County
MI Bedford township
MI Belleville city
MI Benton Charter township
MI Benton Harbor city
MI Berkley city
MI Berlin township
MI Berrien County
MI Beverly Hills village
MI Bingham Farms village
MI Birmingham city
MI Blackman township
MI Bloomfield Hills city
MI Bloomfield township
MI Bridgeport township
MI Brownstown township
MI Buena Vista Charter township
MI Burtchville township
MI Burton city
MI Byron township
MI Calhoun County
MI Canton township
MI Carrollton township
MI Cascade township
MI Cass County
MI Center Line city
MI Chesterfield township
MI Clarkston village
MI Clawson city
MI Clay township
MI Clayton township
MI Clinton County
MI Clinton township
MI Clio city
MI Clyde township
MI Commerce township
MI Comstock township
MI Cooper township
MI Dalton township
MI Davison city
MI Davison township
MI De Witt township
MI Dearborn city
MI Dearborn Heights city
MI Delhi Charter township
MI Delta township
MI Detroit city
MI East China township
MI East Detroit city
MI East Grand Rapids city
MI East Lansing city
MI Eaton County
MI Ecorse city
MI Emmett township
MI Erie township
MI Essexville city
MI Farmington city
MI Farmington Hills city
MI Ferndale city
MI Fillmore township
MI Flat Rock city
MI Flint township
MI Flushing city
MI Flushing township
MI Fort Gratiot township
MI Frankenlust township
MI Franklin village
MI Fraser city
MI Fruitport township
MI Gaines township
MI Garden City city
MI Genesee County
MI Genesee township
MI Georgetown township
MI Gibraltar city
MI Grand Blanc city
MI Grand Blanc township
MI Grand Rapids Charter township
MI Grandville city
MI Grosse Ile township
MI Grosse Pointe city
MI Grosse Pointe Farms city
MI Grosse Pointe Park city
MI Grosse Pointe Shores village
MI Grosse Pointe Woods city
MI Hampton township
MI Hamtramck city
MI Harper Woods city
MI Harrison township
MI Hazel Park city
MI Highland Park city
MI Highland township
MI Holland city
MI Holland township
MI Howard township
MI Hudsonville city
MI Huntington Woods city
MI Huron township
MI Independence township
MI Ingham County
MI Inkster city
MI Ira township
MI Jackson city
MI Jackson County
MI James township
MI Kalamazoo city
MI Kalamazoo County
MI Kalamazoo township
MI Keego Harbor city
MI Kent County
MI Kentwood city
MI Kimball township
MI Kochville township
MI Lake Angelus city
MI Laketon township
MI Laketown township
MI Lansing city
MI Lansing township
MI Lathrup Village city
MI Leoni township
MI Lincoln Park city

MI Lincoln township
MI Livonia city
MI Macomb County
MI Macomb township
MI Madison Heights city
MI Marysville city
MI Melvindale city
MI Meridian township
MI Milford township
MI Milton township
MI Monitor township
MI Monroe County
MI Mount Clemens city
MI Mount Morris city
MI Mount Morris township
MI Mundy township
MI Muskegon city
MI Muskegon County
MI Muskegon Heights city
MI Muskegon township
MI New Baltimore city
MI Niles city
MI Niles township
MI North Muskegon city
MI Northville city
MI Northville township
MI Norton Shores city
MI Novi city
MI Novi township
MI Oak Park city
MI Oakland Charter township
MI Oakland County
MI Orchard Lake Village city
MI Orion township
MI Oshtemo township
MI Ottawa County
MI Parchment city
MI Park township
MI Pavilion township
MI Pennfield township
MI Pittsfield township
MI Plainfield township
MI Pleasant Ridge city
MI Plymouth city
MI Plymouth township
MI Pontiac city
MI Port Huron city
MI Port Huron township
MI Portage city
MI Portsmouth township
MI Redford township
MI Richfield township
MI River Rouge city
MI Riverview city
MI Rochester city
MI Rochester Hills city
MI Rockwood city
MI Romulus city
MI Roosevelt Park city
MI Roseville city
MI Ross township
MI Royal Oak city
MI Royal Oak township
MI Saginaw city
MI Saginaw County
MI Saginaw township
MI Schoolcraft township
MI Scio township
MI Shelby township
MI Shoreham village
MI Sodus township
MI South Rockwood village
MI Southfield city
MI Southfield township
MI Southgate city
MI Spaulding township
MI Spring Arbor township
MI Springfield city
MI Springfield township
MI St. Clair city
MI St. Clair County
MI St. Clair Shores city
MI St. Clair township
MI St. Joseph Charter township
MI St. Joseph city
MI Stevensville village
MI Sullivan township
MI Summit township
MI Sumpter township
MI Superior township
MI Swartz Creek city
MI Sylvan Lake city
MI Taylor city
MI Texas township
MI Thetford township
MI Thomas township
MI Trenton city
MI Troy city
MI Utica city
MI Van Buren township
MI Vienna township
MI Walker city
MI Walled Lake city
MI Washington township
MI Washtenaw County
MI Waterford township
MI Wayne city
MI West Bloomfield township
MI Westland city
MI White Lake township
MI Whiteford township
MI Williamstown township
MI Wixom city
MI Wolverine Lake village
MI Woodhaven city
MI Wyandotte city
MI Wyoming city
MI Ypsilanti city
MI Ypsilanti township
MI Zeeland city
MI Zilwaukee city
MN Andover city
MN Anoka city
MN Anoka County
MN Apple Valley city
MN Arden Hills city
MN Benton County
MN Birchwood Village city
MN Blaine city
MN Bloomington city
MN Brooklyn Center city
MN Brooklyn Park city
MN Burnsville city
MN Carver County
MN Cascade township
MN Champlin city
MN Chanhassen city
MN Circle Pines city
MN Clay County
MN Coon Rapids city
MN Cottage Grove city
MN Credit River township
MN Crystal city
MN Dakota County
MN Dayton city
MN Deephaven city
MN Dilworth city
MN Duluth city
MN Eagan city
MN East Grand Forks city
MN Eden Prairie city
MN Excelsior city
MN Falcon Heights city
MN Farmington city
MN Fort Snelling unorg.
MN Fridley city
MN Gem Lake city
MN Golden Valley city
MN Grant township
MN Greenwood city
MN Ham Lake city
MN Haven township
MN Hennepin County
MN Hermantown city
MN Hilltop city
MN Hopkins city
MN Houston County
MN Inver Grove Heights city
MN La Crescent city
MN La Crescent township
MN Lake Elmo city
MN Lakeville city
MN Landfall city
MN Lauderdale city
MN Le Sauk township
MN Lexington city
MN Lilydale city
MN Lino Lakes city
MN Little Canada city
MN Long Lake city
MN Loretto city
MN Mahtomedi city
MN Maple Grove city
MN Maple Plain city
MN Maplewood city
MN Marion township
MN Medicine Lake city
MN Medina city
MN Mendota city
MN Mendota Heights city
MN Midway township
MN Minden township
MN Minnetonka Beach city
MN Minnetonka city
MN Minnetrista city
MN Moorhead city
MN Moorhead township
MN Mound city
MN Mounds View city
MN New Brighton city
MN New Hope city
MN Newport city
MN North Oaks city
MN North St. Paul city
MN Oakdale city
MN Oakport township
MN Olmsted County
MN Orono city
MN Osseo city
MN Plymouth city
MN Polk County
MN Prior Lake city
MN Proctor city
MN Ramsey city
MN Robbinsdale city
MN Rochester city
MN Rochester township
MN Rosemount city
MN Roseville city
MN Sartell city
MN Sauk Rapids city
MN Sauk Rapids township
MN Savage city
MN Scott County
MN Sherburne County
MN Shoreview city
MN Shorewood city
MN South St. Paul city

MN Spring Lake Park city
MN Spring Park city
MN St. Anthony city
MN St. Cloud city
MN St. Cloud township
MN St. Louis County
MN St. Paul Park city
MN Stearns County
MN Sunfish Lake city
MN Tonka Bay city
MN Vadnais Heights city
MN Victoria city
MN Waite Park city
MN Washington County
MN Wayzata city
MN West St. Paul city
MN White Bear Lake city
MN White Bear township
MN Willernie city
MN Woodbury city
MN Woodland city
MN Wright County
MO Airport Drive village
MO Airport township
MO Andrew County
MO Arnold city
MO Avondale city
MO Ballwin city
MO Battlefield town
MO Bella Villa city
MO Bellefontaine Neighbors city
MO Bellerive village
MO Bel-Nor village
MO Bel-Ridge village
MO Belton city
MO Berkeley city
MO Beverly Hills city
MO Big Creek township
MO Birmingham village
MO Black Jack city
MO Blanchette township
MO Blue Springs city
MO Blue township
MO Bonhomme township
MO Boone County
MO Boone township
MO Breckenridge Hills village
MO Brentwood city
MO Bridgeton city
MO Brooking township
MO Buchanan County
MO Calverton Park village
MO Campbell No. 1 township
MO Campbell No. 2 township
MO Carl Junction city
MO Carroll township
MO Carterville city
MO Cass County
MO Cedar township
MO Center township
MO Charlack city
MO Chesterfield city
MO Chouteau township
MO Christian County
MO Clarkson Valley city
MO Clay County
MO Clay township
MO Claycomd village
MO Clayton city
MO Clayton township
MO Cliff Village village
MO Columbia city
MO Columbia township
MO Concord township
MO Cool Valley city
MO Cottleville town
MO Cottleville township
MO Country Club Hills city
MO Country Club village
MO Country Life Acres village
MO Crestwood city
MO Creve Coeur city
MO Creve Coeur township
MO Crystal Lake Park city
MO Dardenne township
MO Dellwood city
MO Dennis Acres village
MO Des Peres city
MO Duquesne village
MO Edmundson village
MO Ellisville city
MO Fenton city
MO Ferguson city
MO Ferguson township
MO Flordell Hills city
MO Florissant city
MO Florissant township
MO Fox township
MO Friedens township
MO Frontenac city
MO Galena township
MO Gallatin township
MO Gladstone city
MO Glen Echo Park village
MO Glenaire village
MO Glendale city
MO Grandview city
MO Grantwood Village town
MO Gravois township
MO Greendale city
MO Greene County
MO Hadley township
MO Hanley Hills village
MO Harvester township
MO Hazelwood city
MO High Ridge township
MO Hillsdale village
MO Houston Lake city
MO Huntleigh city
MO Imperial township
MO Iron Gates village
MO Jackson County
MO Jasper County
MO Jefferson County
MO Jefferson township
MO Jennings city
MO Joplin city
MO Joplin township
MO Kickapoo township
MO Kimmswick city
MO Kinloch city
MO Kirkwood city
MO Ladue city
MO Lake St. Louis city
MO Lake Tapawingo city
MO Lake Waukomis city
MO Lakeshire city
MO Leawood village
MO Lee's Summit city
MO Lemay township
MO Lewis and Clark township
MO Liberty city
MO Liberty township
MO Mac Kenzie village
MO Manchester city
MO Maplewood city
MO Marlborough village
MO Maryland Heights city
MO May township
MO Meramec township
MO Midland township
MO Mineral township
MO Missouri River township
MO Missouri township
MO Moline Acres city
MO Mount Pleasant township
MO Newton County
MO Normandy city
MO Normandy township
MO North Campbell No. 1 township
MO North Campbell No. 2 township
MO North Campbell No. 3 township
MO North Kansas City city
MO North View township
MO Northmoor city
MO Northwest township
MO Northwoods city
MO Norwood Court town
MO Oakland city
MO Oakland Park village
MO Oaks village
MO Oakview village
MO Oakwood Park village
MO Oakwood village
MO O'Fallon city
MO O'Fallon township
MO Olivette city
MO Overland city
MO Pagedale city
MO Parkdale town
MO Parkville city
MO Pasadena Hills city
MO Pasadena Park village
MO Pettis township
MO Pine Lawn city
MO Platte County
MO Platte township
MO Platte Woods city
MO Pleasant Valley city
MO Prairie township
MO Queeny township
MO Randolph village
MO Raymore city
MO Raymore township
MO Raytown city
MO Redings Mill village
MO Richmond Heights city
MO Rivers township
MO Riverside city
MO Riverview village
MO Rock Hill city
MO Rock township
MO Rocky Fork township
MO Saginaw village
MO Shoal Creek Drive village
MO Shoal Creek township
MO Shrewsbury city
MO Silver Creek village
MO Sioux township
MO Sni-A-Bar township
MO Spanish Lake township
MO Spencer Creek township
MO St. Ann city
MO St. Charles city
MO St. Ferdinand township
MO St. George city
MO St. John city
MO St. Joseph city
MO St. Louis city
MO St. Peters city
MO St. Peters township
MO Sugar Creek city
MO Sunset Hills city
MO Sycamore Hills village
MO Town and Country city
MO Twin Groves township
MO Twin Oaks village
MO Unity Village village

MO University City city
MO Uplands Park village
MO Valley Park city
MO Velda Village city
MO Velda Village Hills village
MO Vinita Park city
MO Vinita Terrace village
MO Warson Woods city
MO Washington township
MO Wayne township
MO Weatherby Lake city
MO Webb City city
MO Webster Groves city
MO Wellston city
MO Wentzville township
MO Westwood village
MO Wilbur Park village
MO Wilson township
MO Winchester city
MO Windsor township
MO Woodson Terrace city
MO Zumbehl township
MS Bay St. Louis city
MS Biloxi city
MS Brandon city
MS Clinton city
MS DeSoto County
MS D'Iberville city
MS Flowood town
MS Forrest County
MS Gautier city
MS Gulfport city
MS Hancock County
MS Harrison County
MS Hattiesburg city
MS Hinds County
MS Horn Lake city
MS Jackson County
MS Lamar County
MS Long Beach city
MS Madison city
MS Madison County
MS Moss Point city
MS Ocean Springs city
MS Pascagoula city
MS Pass Christian city
MS Pearl city
MS Petal city
MS Rankin County
MS Richland city
MS Ridgeland city
MS Southaven city
MS Waveland city
MT Billings city
MT Cascade County
MT Great Falls city
MT Missoula city
MT Missoula County
MT Yellowstone County
NC Alamance County
NC Apex town
NC Archdale city
NC Asheville city
NC Belmont city
NC Belville town
NC Bessemer City city
NC Biltmore Forest town
NC Black Mountain town
NC Brookford town
NC Brunswick County
NC Buncombe County
NC Burke County
NC Burlington city
NC Cabarrus County
NC Carrboro town
NC Cary town
NC Catawba County
NC Chapel Hill town
NC China Grove town
NC Clemmons village
NC Concord city
NC Conover city
NC Cramerton town
NC Dallas town
NC Davidson County
NC Durham County
NC Edgecombe County
NC Elon College town
NC Fletcher town
NC Forsyth County
NC Garner town
NC Gaston County
NC Gastonia city
NC Gibsonville town
NC Goldsboro city
NC Graham city
NC Greenville city
NC Guilford County
NC Harnett County
NC Haw River town
NC Henderson County
NC Hickory city
NC High Point city
NC Hildebran town
NC Hope Mills town
NC Indian Trail town
NC Jacksonville city
NC Jamestown town
NC Kannapolis city
NC Landis town
NC Leland town
NC Long View town
NC Lowell city
NC Matthews town
NC McAdenville town
NC Mebane city
NC Mecklenburg County
NC Mint Hill town
NC Montreat town
NC Mount Holly city
NC Nash County
NC New Hanover County
NC Newton city
NC Onslow County
NC Orange County
NC Pineville town
NC Pitt County
NC Randolph County
NC Ranlo town
NC Rocky Mount city
NC Rowan County
NC Rural Hall town
NC Spring Lake town
NC Stallings town
NC Thomasville city
NC Union County
NC Wake County
NC Walkertown town
NC Wayne County
NC Weaverville town
NC Wilmington city
NC Winterville town
NC Woodfin town
NC Wrightsville Beach town
ND Barnes township
ND Bismarck city
ND Bismarck unorg.
ND Burleigh County
ND Captain's Landing township
ND Cass County
ND Fargo city
ND Grand Forks city
ND Grand Forks County
ND Grand Forks township
ND Hay Creek township
ND Lincoln city
ND Mandan city
ND Mandan unorg.
ND Morton County
ND Reed township
ND West Fargo city
NE Bellevue city
NE Bellevue No. 2 precinct
NE Benson precinct
NE Boys Town village
NE Chicago precinct
NE Covington precinct
NE Dakota County
NE Douglas County
NE Douglas precinct
NE Florence precinct
NE Garfield precinct
NE Gilmore No. 1 precinct
NE Gilmore No. 2 precinct
NE Gilmore No. 3 precinct
NE Grant precinct
NE Highland No. 1 precinct
NE Highland No. 2 precinct
NE Jefferson precinct
NE La Platte precinct
NE La Vista city
NE Lancaster County
NE Lancaster precinct
NE McArdle precinct
NE Millard precinct
NE Papillion city
NE Papillion No. 2 precinct
NE Pawnee precinct
NE Ralston city
NE Richland No. 1 precinct
NE Richland No. 2 precinct
NE Richland No. 3 precinct
NE Sarpy County
NE South Sioux City city
NE Union precinct
NE Yankee Hill precinct
NH Amherst town
NH Auburn town
NH Bedford town
NH Dover city
NH Durham town
NH Goffstown town
NH Hillsborough County
NH Hollis town
NH Hooksett town
NH Hudson town
NH Litchfield town
NH Londonderry town
NH Madbury town
NH Manchester city
NH Merrimack County
NH Merrimack town
NH Nashua city
NH New Castle town
NH Newington town
NH Pelham town
NH Plaistow town
NH Portsmouth city
NH Rochester city
NH Rockingham County
NH Rollinsford town
NH Rye town
NH Salem town
NH Somersworth city
NH Strafford County
NH Windham town
NJ Aberdeen township
NJ Absecon city

NJ Allendale borough
NJ Allenhurst borough
NJ Alpha borough
NJ Alpine borough
NJ Asbury Park city
NJ Atlantic City city
NJ Atlantic County
NJ Atlantic Highlands borough
NJ Audubon borough
NJ Audubon Park borough
NJ Avon-by-the-Sea borough
NJ Barrington borough
NJ Bay Head borough
NJ Bayonne city
NJ Beachwood borough
NJ Bedminster township
NJ Belleville township
NJ Bellmawr borough
NJ Belmar borough
NJ Bergenfield borough
NJ Berkeley Heights township
NJ Berkeley township
NJ Berlin borough
NJ Berlin township
NJ Bernards township
NJ Bernardsville borough
NJ Beverly city
NJ Bloomfield township
NJ Bloomingdale borough
NJ Bogota borough
NJ Boonton town
NJ Boonton township
NJ Bordentown city
NJ Bordentown township
NJ Bound Brook borough
NJ Bradley Beach borough
NJ Branchburg township
NJ Brick township
NJ Bridgewater township
NJ Brielle borough
NJ Brigantine city
NJ Brooklawn borough
NJ Buena borough
NJ Buena Vista township
NJ Burlington city
NJ Burlington County
NJ Burlington township
NJ Butler borough
NJ Byram township
NJ Caldwell Borough township
NJ Camden city
NJ Cape May County
NJ Carlstadt borough
NJ Carneys Point township
NJ Carteret borough
NJ Cedar Grove township
NJ Chatham borough
NJ Chatham township
NJ Cherry Hill township
NJ Chesilhurst borough
NJ Chester township
NJ Chesterfield township
NJ Cinnaminson township
NJ City of Orange township
NJ Clark township
NJ Clayton borough
NJ Clementon borough
NJ Cliffside Park borough
NJ Clifton city
NJ Closter borough
NJ Collingswood borough
NJ Colts Neck township
NJ Commercial township
NJ Cranford township
NJ Cresskill borough
NJ Cumberland County
NJ Deal borough
NJ Delanco township
NJ Delran township
NJ Demarest borough
NJ Denville township
NJ Deptford township
NJ Dover town
NJ Dover township
NJ Dumont borough
NJ Dunellen borough
NJ East Brunswick township
NJ East Greenwich township
NJ East Hanover township
NJ East Newark borough
NJ East Orange city
NJ East Rutherford borough
NJ Eastampton township
NJ Eatontown borough
NJ Edgewater borough
NJ Edgewater Park township
NJ Edison township
NJ Egg Harbor township
NJ Elizabeth city
NJ Elk township
NJ Elmwood Park borough
NJ Emerson borough
NJ Englewood city
NJ Englewood Cliffs borough
NJ Englishtown borough
NJ Essex Fells township
NJ Evesham township
NJ Ewing township
NJ Fair Haven borough
NJ Fair Lawn borough
NJ Fairfield township
NJ Fairview borough
NJ Fanwood borough
NJ Fieldsboro borough
NJ Florence township
NJ Florham Park borough
NJ Fort Lee borough
NJ Franklin Lakes borough
NJ Franklin township
NJ Freehold borough
NJ Freehold township
NJ Galloway township
NJ Garfield city
NJ Garwood borough
NJ Gibbsboro borough
NJ Glassboro borough
NJ Glen Ridge Borough township
NJ Glen Rock borough
NJ Gloucester City city
NJ Gloucester County
NJ Gloucester township
NJ Green Brook township
NJ Greenwich township
NJ Guttenberg town
NJ Hackensack city
NJ Haddon Heights borough
NJ Haddon township
NJ Haddonfield borough
NJ Hainesport township
NJ Haledon borough
NJ Hamilton township
NJ Hanover township
NJ Harding township
NJ Harrington Park borough
NJ Harrison town
NJ Hasbrouck Heights borough
NJ Haworth borough
NJ Hawthorne borough
NJ Hazlet township
NJ Helmetta borough
NJ Highland Park borough
NJ Highlands borough
NJ Hillsborough township
NJ Hillsdale borough
NJ Hillside township
NJ Hi-Nella borough
NJ Hoboken city
NJ Ho-Ho-Kus borough
NJ Holmdel township
NJ Hopatcong borough
NJ Hopewell township
NJ Howell township
NJ Hunterdon County
NJ Interlaken borough
NJ Irvington township
NJ Island Heights borough
NJ Jackson township
NJ Jamesburg borough
NJ Jefferson township
NJ Jersey City city
NJ Keansburg borough
NJ Kearny town
NJ Kenilworth borough
NJ Keyport borough
NJ Kinnelon borough
NJ Lakehurst borough
NJ Lakewood township
NJ Laurel Springs borough
NJ Lavallette borough
NJ Lawnside borough
NJ Lawrence township
NJ Leonia borough
NJ Lincoln Park borough
NJ Linden city
NJ Lindenwold borough
NJ Linwood city
NJ Little Falls township
NJ Little Ferry borough
NJ Little Silver borough
NJ Livingston township
NJ Loch Arbour village
NJ Lodi borough
NJ Long Branch city
NJ Longport borough
NJ Lopatcong township
NJ Lumberton township
NJ Lyndhurst township
NJ Madison borough
NJ Magnolia borough
NJ Mahwah township
NJ Manalapan township
NJ Manasquan borough
NJ Manchester township
NJ Mantoloking borough
NJ Mantua township
NJ Manville borough
NJ Maple Shade township
NJ Maplewood township
NJ Margate City city
NJ Marlboro township
NJ Matawan borough
NJ Maywood borough
NJ Medford Lakes borough
NJ Medford township
NJ Mendham borough
NJ Mendham township
NJ Mercer County
NJ Merchantville borough
NJ Metuchen borough
NJ Middlesex borough
NJ Middlesex County
NJ Middletown township
NJ Midland Park borough
NJ Millburn township
NJ Millstone borough
NJ Milltown borough
NJ Millville city
NJ Mine Hill township

NJ Monmouth Beach borough
NJ Monmouth County
NJ Monroe township
NJ Montclair township
NJ Montvale borough
NJ Montville township
NJ Moonachie borough
NJ Moorestown township
NJ Morris County
NJ Morris Plains borough
NJ Morris township
NJ Morristown town
NJ Mount Arlington borough
NJ Mount Ephraim borough
NJ Mount Holly township
NJ Mount Laurel township
NJ Mount Olive township
NJ Mountain Lakes borough
NJ Mountainside borough
NJ National Park borough
NJ Neptune City borough
NJ Neptune township
NJ Netcong borough
NJ New Brunswick city
NJ New Milford borough
NJ New Providence borough
NJ Newark city
NJ Newfield borough
NJ North Arlington borough
NJ North Bergen township
NJ North Brunswick township
NJ North Caldwell township
NJ North Haledon borough
NJ North Plainfield borough
NJ Northfield city
NJ Northvale borough
NJ Norwood borough
NJ Nutley township
NJ Oakland borough
NJ Oaklyn borough
NJ Ocean City city
NJ Ocean County
NJ Ocean Gate borough
NJ Ocean township
NJ Oceanport borough
NJ Old Bridge township
NJ Old Tappan borough
NJ Oradell borough
NJ Palisades Park borough
NJ Palmyra borough
NJ Paramus borough
NJ Park Ridge borough
NJ Parsippany-Troy Hills township
NJ Passaic city
NJ Passaic County
NJ Passaic township
NJ Paterson city
NJ Paulsboro borough
NJ Pennington borough
NJ Penns Grove borough
NJ Pennsauken township
NJ Pennsville township
NJ Pequannock township
NJ Perth Amboy city
NJ Phillipsburg town
NJ Pine Beach borough
NJ Pine Hill borough
NJ Pine Valley borough
NJ Piscataway township
NJ Pitman borough
NJ Pittsgrove township
NJ Plainfield city
NJ Pleasantville city
NJ Pohatcong township
NJ Point Pleasant Beach borough
NJ Point Pleasant borough
NJ Pompton Lakes borough
NJ Prospect Park borough
NJ Rahway city
NJ Ramsey borough
NJ Randolph township
NJ Raritan borough
NJ Readington township
NJ Red Bank borough
NJ Ridgefield borough
NJ Ridgefield Park village
NJ Ridgewood village
NJ Ringwood borough
NJ River Edge borough
NJ River Vale township
NJ Riverdale borough
NJ Riverside township
NJ Riverton borough
NJ Rochelle Park township
NJ Rockaway borough
NJ Rockaway township
NJ Rockleigh borough
NJ Roseland borough
NJ Roselle borough
NJ Roselle Park borough
NJ Roxbury township
NJ Rumson borough
NJ Runnemede borough
NJ Rutherford borough
NJ Saddle Brook township
NJ Saddle River borough
NJ Salem County
NJ Sayreville borough
NJ Scotch Plains township
NJ Sea Bright borough
NJ Sea Girt borough
NJ Seaside Heights borough
NJ Seaside Park borough
NJ Secaucus town
NJ Shamong township
NJ Shrewsbury borough
NJ Shrewsbury township
NJ Somerdale borough
NJ Somers Point city
NJ Somerset County
NJ Somerville borough
NJ South Amboy city
NJ South Belmar borough
NJ South Bound Brook borough
NJ South Brunswick township
NJ South Hackensack township
NJ South Orange Village township
NJ South Plainfield borough
NJ South River borough
NJ South Toms River borough
NJ Spotswood borough
NJ Spring Lake borough
NJ Spring Lake Heights borough
NJ Springfield township
NJ Stanhope borough
NJ Stratford borough
NJ Summit city
NJ Sussex County
NJ Tabernacle township
NJ Tavistock borough
NJ Teaneck township
NJ Tenafly borough
NJ Teterboro borough
NJ Tinton Falls borough
NJ Totowa borough
NJ Trenton city
NJ Union Beach borough
NJ Union City city
NJ Union township
NJ Upper Saddle River borough
NJ Upper township
NJ Ventnor City city
NJ Verona township
NJ Victory Gardens borough
NJ Vineland city
NJ Voorhees township
NJ Waldwick borough
NJ Wall township
NJ Wallington borough
NJ Wanaque borough
NJ Warren County
NJ Warren township
NJ Washington township
NJ Watchung borough
NJ Waterford township
NJ Wayne township
NJ Weehawken township
NJ Wenonah borough
NJ West Caldwell township
NJ West Deptford township
NJ West Long Branch borough
NJ West New York town
NJ West Orange township
NJ West Paterson borough
NJ Westampton township
NJ Westfield town
NJ Westville borough
NJ Westwood borough
NJ Wharton borough
NJ Willingboro township
NJ Winfield township
NJ Winslow township
NJ Woodbridge township
NJ Woodbury city
NJ Woodbury Heights borough
NJ Woodcliff Lake borough
NJ Woodlynne borough
NJ Wood-Ridge borough
NJ Wyckoff township
NM Bernalillo County
NM Corrales village
NM Dona Ana County
NM Las Cruces city
NM Los Ranchos de Albuquerque village
NM Mesilla town
NM Rio Rancho city
NM Sandoval County
NM Santa Fe city
NM Santa Fe County
NM Sunland Park city
NY Albany city
NY Albany County
NY Amherst town
NY Amityville village
NY Ardsley village
NY Ashland town
NY Atlantic Beach village
NY Babylon town
NY Babylon village
NY Baldwinsville village
NY Ballston town
NY Barker town
NY Baxter Estates village
NY Bayville village
NY Beacon city
NY Bedford town
NY Belle Terre village
NY Bellerose village
NY Bellport village
NY Bethlehem town
NY Big Flats town
NY Binghamton city
NY Binghamton town
NY Blasdell village
NY Boston town
NY Briarcliff Manor village
NY Brighton town
NY Brightwaters village

NY Bronxville village
NY Brookhaven town
NY Brookville village
NY Broome County
NY Brunswick town
NY Buchanan village
NY Buffalo city
NY Camillus town
NY Camillus village
NY Carmel town
NY Cayuga Heights village
NY Cedarhurst village
NY Charlton town
NY Cheektowaga town
NY Chemung County
NY Chenango town
NY Chestnut Ridge village
NY Chili town
NY Cicero town
NY Clarence town
NY Clarkstown town
NY Clay town
NY Clayville village
NY Clifton Park town
NY Clinton village
NY Cohoes city
NY Colonie town
NY Colonie village
NY Conklin town
NY Cornwall on Hudson village
NY Cornwall town
NY Cortlandt town
NY Croton-on-Hudson village
NY De Witt town
NY Deerfield town
NY Depew village
NY Dickinson town
NY Dobbs Ferry village
NY Dryden town
NY Dutchess County
NY East Fishkill town
NY East Greenbush town
NY East Hills village
NY East Rochester village
NY East Rockaway village
NY East Syracuse village
NY East Williston village
NY Eastchester town
NY Elma town
NY Elmira city
NY Elmira Heights village
NY Elmira town
NY Elmsford village
NY Endicott village
NY Erie County
NY Evans town
NY Fairport village
NY Farmingdale village
NY Fayetteville village
NY Fenton town
NY Fishkill town
NY Fishkill village
NY Floral Park village
NY Flower Hill village
NY Floyd town
NY Fort Edward town
NY Fort Edward village
NY Frankfort town
NY Freeport village
NY Garden City village
NY Gates town
NY Geddes town
NY Glen Cove city
NY Glens Falls city
NY Glenville town
NY Grand Island town
NY Grand View-on-Hudson village
NY Great Neck Estates village
NY Great Neck Plaza village
NY Great Neck village
NY Greece town
NY Green Island village
NY Greenburgh town
NY Guilderland town
NY Halfmoon town
NY Hamburg town
NY Hamburg village
NY Harrison village
NY Hastings-on-Hudson village
NY Haverstraw town
NY Haverstraw village
NY Hempstead town
NY Hempstead village
NY Henrietta town
NY Herkimer County
NY Hewlett Bay Park village
NY Hewlett Harbor village
NY Hewlett Neck village
NY Hillburn village
NY Horseheads town
NY Horseheads village
NY Hudson Falls village
NY Huntington Bay village
NY Huntington town
NY Hyde Park town
NY Irondequoit town
NY Irvington village
NY Island Park village
NY Islandia village
NY Islip town
NY Ithaca city
NY Ithaca town
NY Johnson City village
NY Kenmore village
NY Kensington village
NY Kent town
NY Kings Point village
NY Kingsbury town
NY Kirkland town
NY Kirkwood town
NY La Grange town
NY Lackawanna city
NY LaFayette town
NY Lake Grove village
NY Lake Success village
NY Lancaster town
NY Lancaster village
NY Lansing town
NY Lansing village
NY Larchmont village
NY Lattingtown village
NY Lawrence village
NY Lee town
NY Lewiston town
NY Lewiston village
NY Lindenhurst village
NY Liverpool village
NY Lloyd Harbor village
NY Lloyd town
NY Long Beach city
NY Lynbrook village
NY Lysander town
NY Malta town
NY Malverne village
NY Mamaroneck town
NY Mamaroneck village
NY Manlius town
NY Manlius village
NY Manorhaven village
NY Marcy town
NY Massapequa Park village
NY Matinecock village
NY Menands village
NY Mill Neck village
NY Mineola village
NY Minoa village
NY Monroe County
NY Montebello village
NY Montgomery town
NY Moreau town
NY Mount Kisco village
NY Mount Pleasant town
NY Mount Vernon city
NY Munsey Park village
NY Muttontown village
NY New Castle town
NY New Hartford town
NY New Hartford village
NY New Hempstead village
NY New Hyde Park village
NY New Rochelle city
NY New Square village
NY New Windsor town
NY New York Mills village
NY Newburgh city
NY Newburgh town
NY Niagara County
NY Niagara Falls city
NY Niagara town
NY Niskayuna town
NY North Castle town
NY North Greenbush town
NY North Hempstead town
NY North Hills village
NY North Syracuse village
NY North Tarrytown village
NY North Tonawanda city
NY Northport village
NY Nyack village
NY Ogden town
NY Old Brookville village
NY Old Westbury village
NY Oneida County
NY Onondaga County
NY Onondaga town
NY Orange County
NY Orangetown town
NY Orchard Park town
NY Orchard Park village
NY Oriskany village
NY Ossining town
NY Ossining village
NY Oswego County
NY Owego town
NY Oyster Bay town
NY Paris town
NY Patchogue village
NY Patterson town
NY Peekskill city
NY Pelham Manor village
NY Pelham town
NY Pelham village
NY Pendleton town
NY Penfield town
NY Perinton town
NY Philipstown town
NY Phoenix village
NY Piermont village
NY Pittsford town
NY Pittsford village
NY Plandome Heights village
NY Plandome Manor village
NY Plandome village
NY Pleasant Valley town
NY Pleasantville village
NY Poestenkill town
NY Pomona village
NY Poospatuck Reservation

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NY Poquott village
NY Port Chester village
NY Port Dickinson village
NY Port Jefferson village
NY Port Washington North village
NY Poughkeepsie city
NY Poughkeepsie town
NY Pound Ridge town
NY Putnam County
NY Putnam Valley town
NY Queensbury town
NY Ramapo town
NY Rensselaer city
NY Rensselaer County
NY Riverhead town
NY Rochester city
NY Rockville Centre village
NY Rome city
NY Roslyn Estates village
NY Roslyn Harbor village
NY Roslyn village
NY Rotterdam town
NY Russell Gardens village
NY Rye Brook village
NY Rye city
NY Rye town
NY Saddle Rock village
NY Salina town
NY Sands Point village
NY Saratoga County
NY Scarsdale town
NY Scarsdale village
NY Schaghticoke town
NY Schenectady city
NY Schenectady County
NY Schodack town
NY Schroeppel town
NY Schuyler town
NY Scotia village
NY Sea Cliff village
NY Shoreham village
NY Sloan village
NY Sloatsburg village
NY Smithtown town
NY Solvay village
NY Somers town
NY South Floral Park village
NY South Glens Falls village
NY South Nyack village
NY Southampton town
NY Southport town
NY Spencerport village
NY Spring Valley village
NY Stewart Manor village
NY Stony Point town
NY Suffern village
NY Suffolk County
NY Syracuse city
NY Tarrytown village
NY Thomaston village
NY Tioga County
NY Tompkins County
NY Tonawanda city
NY Tonawanda town
NY Troy city
NY Tuckahoe village
NY Ulster County
NY Union town
NY Upper Brookville village
NY Upper Nyack village
NY Utica city
NY Valley Stream village
NY Van Buren town
NY Vestal town
NY Veteran town
NY Village of the Branch village
NY Wappinger town
NY Wappingers Falls village
NY Warren County
NY Washington County
NY Waterford town
NY Waterford village
NY Watervliet city
NY Webster town
NY Webster village
NY Wesley Hills village
NY West Haverstraw village
NY West Seneca town
NY Westbury village
NY Westchester County
NY Western town
NY Wheatfield town
NY White Plains city
NY Whitesboro village
NY Whitestown town
NY Williamsville village
NY Williston Park village
NY Woodsburgh village
NY Yonkers city
NY Yorktown town
NY Yorkville village
OH Addyston village
OH Allen County
OH Allen township
OH Amberley village
OH Amelia village
OH American township
OH Amherst city
OH Amherst township
OH Anderson township
OH Arlington Heights village
OH Auglaize County
OH Aurora city
OH Austintown township
OH Avon city
OH Avon Lake city
OH Bainbridge township
OH Barberton city
OH Batavia township
OH Bath township
OH Bay Village city
OH Beachwood city
OH Beaver township
OH Beavercreek city
OH Beavercreek township
OH Bedford city
OH Bedford Heights city
OH Bellaire city
OH Bellbrook city
OH Belmont County
OH Belpre city
OH Belpre township
OH Bentleyville village
OH Berea city
OH Bethel township
OH Bexley city
OH Blendon township
OH Blue Ash city
OH Boardman township
OH Brady Lake village
OH Bratenahl village
OH Brecksville city
OH Brice village
OH Bridgeport village
OH Brilliant village
OH Brimfield township
OH Broadview Heights city
OH Brook Park city
OH Brookfield township
OH Brooklyn city
OH Brooklyn Heights village
OH Brookside village
OH Brown township
OH Brownhelm township
OH Brunswick city
OH Brunswick Hills township
OH Butler County
OH Butler township
OH Campbell city
OH Canfield city
OH Canfield township
OH Canton city
OH Canton township
OH Carlisle township
OH Carlisle village
OH Centerville city
OH Chagrin Falls township
OH Chagrin Falls village
OH Champion township
OH Chesapeake village
OH Cheviot city
OH Chippewa township
OH Cincinnati city
OH Clark County
OH Clear Creek township
OH Clermont County
OH Cleveland city
OH Cleveland Heights city
OH Cleves village
OH Clinton township
OH Coal Grove village
OH Coitsville township
OH Colerain township
OH Columbia township
OH Concord township
OH Copley township
OH Coventry township
OH Cridersville village
OH Cross Creek township
OH Cuyahoga County
OH Cuyahoga Falls city
OH Cuyahoga Heights village
OH Deer Park city
OH Deerfield township
OH Delaware County
OH Delhi township
OH Doylestown village
OH Dublin city
OH Duchouquet township
OH East Cleveland city
OH Eastlake city
OH Eaton township
OH Elmwood Place village
OH Elyria city
OH Elyria township
OH Englewood city
OH Erie County
OH Etna township
OH Euclid city
OH Evendale village
OH Fairborn city
OH Fairfax village
OH Fairfield city
OH Fairfield County
OH Fairfield township
OH Fairlawn city
OH Fairport Harbor village
OH Fairview Park city
OH Fayette township
OH Forest Park city
OH Fort Shawnee village
OH Franklin city
OH Franklin County
OH Franklin township
OH Gahanna city
OH Garfield Heights city
OH Geauga County
OH Genoa township

OH German township
OH Girard city
OH Glendale village
OH Glenwillow village
OH Golf Manor village
OH Goshen township
OH Grand River village
OH Grandview Heights city
OH Green township
OH Green village
OH Greene County
OH Greenhills village
OH Grove City city
OH Groveport village
OH Hamilton city
OH Hamilton County
OH Hamilton township
OH Hanging Rock village
OH Hanover township
OH Harbor View village
OH Harrison township
OH Hartville village
OH Heath city
OH Highland Heights city
OH Hilliard city
OH Hills and Dales village
OH Hinckley township
OH Holland village
OH Howland township
OH Hubbard city
OH Hubbard township
OH Huber Heights city
OH Hudson township
OH Hudson village
OH Independence city
OH Ironton city
OH Island Creek township
OH Jackson township
OH Jefferson County
OH Jefferson township
OH Jerome township
OH Kent city
OH Kettering city
OH Kirtland city
OH Lake County
OH Lake township
OH Lakeline village
OH Lakemore village
OH Lakewood city
OH Lawrence County
OH Lawrence township
OH Lemon township
OH Lexington village
OH Liberty township
OH Licking County
OH Licking township
OH Lima city
OH Lima township
OH Lincoln Heights city
OH Linndale village
OH Lockland village
OH Lorain city
OH Lorain County
OH Louisville city
OH Loveland city
OH Lowellville village
OH Lucas County
OH Lyndhurst city
OH Macedonia city
OH Mad River township
OH Madeira city
OH Madison township
OH Mahoning County
OH Maineville village
OH Mansfield city
OH Maple Heights city
OH Marble Cliff village
OH Mariemont village
OH Martins Ferry city
OH Mason city
OH Massillon city
OH Maumee city
OH Mayfield Heights city
OH Mayfield village
OH McDonald village
OH Mead township
OH Medina County
OH Mentor city
OH Mentor-on-the-Lake city
OH Meyers Lake village
OH Miami County
OH Miami township
OH Miamisburg city
OH Middleburg Heights city
OH Middletown city
OH Mifflin township
OH Milford city
OH Millbury village
OH Millville village
OH Minerva Park village
OH Mingo Junction city
OH Mogadore village
OH Monclova township
OH Monroe township
OH Monroe village
OH Montgomery city
OH Montgomery County
OH Moorefield township
OH Moraine city
OH Moreland Hills village
OH Mount Healthy city
OH Munroe Falls village
OH New Miami village
OH New Middletown village
OH New Rome village
OH Newark city
OH Newark township
OH Newburgh Heights village
OH Newton township
OH Newtown village
OH Niles city
OH Nimishillen township
OH North Bend village
OH North Canton city
OH North College Hill city
OH North Olmsted city
OH North Randall village
OH North Ridgeville city
OH North Royalton city
OH Northfield Center township
OH Northfield village
OH Northwood city
OH Norton city
OH Norwich township
OH Norwood city
OH Oakwood city
OH Oakwood village
OH Obetz village
OH Ohio township
OH Olmsted Falls city
OH Olmsted township
OH Ontario village
OH Orange township
OH Orange village
OH Oregon city
OH Ottawa County
OH Ottawa Hills village
OH Painesville city
OH Painesville township
OH Palmyra township
OH Parma city
OH Parma Heights city
OH Pease township
OH Pepper Pike city
OH Perry township
OH Perrysburg city
OH Perrysburg city
OH Perrysburg township
OH Pierce township
OH Plain township
OH Pleasant township
OH Poland township
OH Poland village
OH Portage County
OH Powell village
OH Prairie township
OH Proctorville village
OH Pultney township
OH Randolph township
OH Ravenna city
OH Ravenna township
OH Reading city
OH Reminderville village
OH Reynoldsburg city
OH Richfield township
OH Richfield village
OH Richland County
OH Richmond Heights city
OH Riveredge township
OH Riverlea village
OH Riverside village
OH Rocky River city
OH Rome township
OH Ross township
OH Rossford city
OH Russell township
OH Russia township
OH Sagamore Hills township
OH Seven Hills city
OH Shadyside village
OH Shaker Heights city
OH Sharon township
OH Sharonville city
OH Shawnee Hills village
OH Shawnee township
OH Sheffield Lake city
OH Sheffield township
OH Sheffield village
OH Silver Lake village
OH Silverton city
OH Solon city
OH South Amherst village
OH South Euclid city
OH South Point village
OH South Russell village
OH Springboro city
OH Springdale city
OH Springfield city
OH Springfield township
OH St. Bernard city
OH St. Clair township
OH Stark County
OH Steubenville city
OH Steubenville township
OH Stow city
OH Strongsville city
OH Struthers city
OH Suffield township
OH Sugar Bush Knolls village
OH Sugar Creek township
OH Summit County
OH Sycamore township
OH Sylvania city
OH Sylvania township
OH Symmes township
OH Tallmadge city
OH Terrace Park village
OH The Village of Indian Hill city

OH Timberlake village
OH Trenton city
OH Trotwood city
OH Troy township
OH Trumbull County
OH Truro township
OH Turtle Creek township
OH Tuscarawas township
OH Twinsburg city
OH Twinsburg township
OH Union city
OH Union County
OH Union township
OH University Heights city
OH Upper Arlington city
OH Upper township
OH Urbancrest village
OH Valley View village
OH Valleyview village
OH Vandalia city
OH Vermilion city
OH Vermilion township
OH Violet township
OH Wadsworth city
OH Wadsworth township
OH Waite Hill village
OH Walbridge village
OH Walton Hills village
OH Warren city
OH Warren County
OH Warren township
OH Warrensville Heights city
OH Warrensville township
OH Washington County
OH Washington township
OH Wayne County
OH Wayne township
OH Weathersfield township
OH Wells township
OH West Carrollton City city
OH West Milton village
OH Westerville city
OH Westlake city
OH Whitehall city
OH Whitewater township
OH Wickliffe city
OH Willoughby city
OH Willoughby Hills city
OH Willowick city
OH Wintersville village
OH Wood County
OH Woodlawn village
OH Woodmere village
OH Worthington city
OH Wyoming city
OH Youngstown city
OK Arkoma town
OK Bethany city
OK Bixby city
OK Broken Arrow city
OK Canadian County
OK Catoosa city
OK Choctaw city
OK Cleveland County
OK Comanche County
OK Creek County
OK Del City city
OK Edmond city
OK Forest Park town
OK Hall Park town
OK Harrah town
OK Jenks city
OK Jones town
OK Lake Aluma town
OK Lawton city
OK Le Flore County
OK Logan County
OK Midwest City city
OK Moffett town
OK Moore city
OK Mustang city
OK Nichols Hills city
OK Nicoma Park city
OK Norman city
OK Oklahoma County
OK Osage County
OK Pottawatomie County
OK Rogers County
OK Sand Springs city
OK Sequoyah County
OK Smith Village town
OK Spencer city
OK The Village city
OK Tulsa County
OK Valley Brook town
OK Wagoner County
OK Warr Acres city
OK Woodlawn Park town
OK Yukon city
OR Central Point city
OR Columbia County
OR Durham city
OR Jackson County
OR Keizer city
OR King City city
OR Lane County
OR Marion County
OR Maywood Park city
OR Medford city
OR Phoenix city
OR Polk County
OR Rainier city
OR Springfield city
OR Troutdale city
OR Tualatin city
OR Wood Village city
PA Abington township
PA Adamsburg borough
PA Alburtis borough
PA Aldan borough
PA Aleppo township
PA Aliquippa city
PA Allegheny County
PA Allegheny township
PA Allen township
PA Allenport borough
PA Alsace township
PA Altoona city
PA Ambler borough
PA Ambridge borough
PA Amwell township
PA Antis township
PA Antrim township
PA Archbald borough
PA Arnold city
PA Ashley borough
PA Aspinwall borough
PA Aston township
PA Avalon borough
PA Avoca borough
PA Baden borough
PA Baldwin borough
PA Baldwin township
PA Beaver borough
PA Beaver County
PA Beaver Falls city
PA Bell Acres borough
PA Belle Vernon borough
PA Bellevue borough
PA Ben Avon borough
PA Ben Avon Heights borough
PA Bensalem township
PA Berks County
PA Bern township
PA Bethel Park borough
PA Bethel township
PA Bethlehem city
PA Bethlehem township
PA Big Beaver borough
PA Birdsboro borough
PA Birmingham township
PA Blair County
PA Blair township
PA Blakely borough
PA Blawnox borough
PA Boyertown borough
PA Brackenridge borough
PA Braddock borough
PA Braddock Hills borough
PA Bradfordwoods borough
PA Brentwood borough
PA Bridgeport borough
PA Bridgeville borough
PA Bridgewater borough
PA Brighton township
PA Bristol borough
PA Bristol township
PA Brookhaven borough
PA Brownstown borough
PA Brownsville borough
PA Brownsville township
PA Bryn Athyn borough
PA Buckingham township
PA Bucks County
PA California borough
PA Caln township
PA Cambria County
PA Camp Hill borough
PA Canonsburg borough
PA Canton township
PA Carbondale city
PA Carbondale township
PA Carnegie borough
PA Carroll township
PA Castle Shannon borough
PA Catasauqua borough
PA Cecil township
PA Center township
PA Centre County
PA Chalfant borough
PA Chalfont borough
PA Charleroi borough
PA Charlestown township
PA Chartiers township
PA Cheltenham township
PA Chester city
PA Chester County
PA Chester Heights borough
PA Chester township
PA Cheswick borough
PA Chippewa township
PA Churchill borough
PA Clairton city
PA Clarks Green borough
PA Clarks Summit borough
PA Clifton Heights borough
PA Coal Center borough
PA Coatesville city
PA Colebrookdale township
PA College township
PA Collegeville borough
PA Collier township
PA Collingdale borough
PA Columbia borough
PA Colwyn borough
PA Concord township
PA Conemaugh township
PA Conestoga township

PA Conewago township
PA Conshohocken borough
PA Conway borough
PA Coplay borough
PA Coraopolis borough
PA Courtdale borough
PA Crafton borough
PA Crescent township
PA Cumberland County
PA Cumru township
PA Daisytown borough
PA Dale borough
PA Dallas borough
PA Dallas township
PA Dallastown borough
PA Darby borough
PA Darby township
PA Daugherty township
PA Dauphin County
PA Delaware County
PA Delmont borough
PA Derry township
PA Dickson City borough
PA Donora borough
PA Dormont borough
PA Douglass township
PA Dover borough
PA Dover township
PA Downingtown borough
PA Doylestown borough
PA Doylestown township
PA Dravosburg borough
PA Duboistown borough
PA Duncansville borough
PA Dunlevy borough
PA Dunmore borough
PA Dupont borough
PA Duquesne city
PA Duryea borough
PA East Allen township
PA East Bradford township
PA East Brandywine township
PA East Caln township
PA East Conemaugh borough
PA East Coventry township
PA East Deer township
PA East Fallowfield township
PA East Goshen township
PA East Hempfield township
PA East Lampeter township
PA East Lansdowne borough
PA East McKeesport borough
PA East Norriton township
PA East Pennsboro township
PA East Petersburg borough
PA East Pikeland township
PA East Pittsburgh borough
PA East Rochester borough
PA East Taylor township
PA East Vincent township
PA East Washington borough
PA East Whiteland township
PA Easton city
PA Easttown township
PA Eastvale borough
PA Economy borough
PA Eddystone borough
PA Edgewood borough
PA Edgeworth borough
PA Edgmont township
PA Edwardsville borough
PA Elco borough
PA Elizabeth borough
PA Elizabeth township
PA Ellport borough
PA Ellwood City borough
PA Emmaus borough
PA Emsworth borough
PA Erie city
PA Erie County
PA Etna borough
PA Exeter borough
PA Exeter township
PA Export borough
PA Fairfield township
PA Fairview township
PA Fallowfield township
PA Falls township
PA Fallston borough
PA Farrell city
PA Fayette City borough
PA Fayette County
PA Fell township
PA Ferguson township
PA Ferndale borough
PA Findlay township
PA Finleyville borough
PA Folcroft borough
PA Forest Hills borough
PA Forks township
PA Forty Fort borough
PA Forward township
PA Fountain Hill borough
PA Fox Chapel borough
PA Franconia township
PA Franklin borough
PA Franklin County
PA Franklin Park borough
PA Franklin township
PA Frankstown township
PA Frazer township
PA Freedom borough
PA Freemansburg borough
PA Geistown borough
PA Glassport borough
PA Glendon borough
PA Glenfield borough
PA Glenolden borough
PA Green Tree borough
PA Greensburg city
PA Hallam borough
PA Hampden township
PA Hampton township
PA Hanover township
PA Harborcreek township
PA Harmar township
PA Harmony township
PA Harris township
PA Harrisburg city
PA Harrison township
PA Harveys Lake borough
PA Hatboro borough
PA Hatfield borough
PA Hatfield township
PA Haverford township
PA Haysville borough
PA Heidelberg borough
PA Hellam township
PA Hellertown borough
PA Hempfield township
PA Hepburn township
PA Hermitage city
PA Highspire borough
PA Hilltown township
PA Hollidaysburg borough
PA Homestead borough
PA Homewood borough
PA Hopewell township
PA Horsham township
PA Houston borough
PA Hughestown borough
PA Hulmeville borough
PA Hummelstown borough
PA Hunker borough
PA Indiana township
PA Ingram borough
PA Irwin borough
PA Ivyland borough
PA Jackson township
PA Jacobus borough
PA Jeannette city
PA Jefferson borough
PA Jenkins township
PA Jenkintown borough
PA Jermyn borough
PA Jessup borough
PA Johnstown city
PA Juniata township
PA Kenhorst borough
PA Kennedy township
PA Kilbuck township
PA Kingston borough
PA Kingston township
PA Koppel borough
PA Lackawanna County
PA Laflin borough
PA Lancaster city
PA Lancaster County
PA Lancaster township
PA Langhorne borough
PA Langhorne Manor borough
PA Lansdale borough
PA Lansdowne borough
PA Larksville borough
PA Laurel Run borough
PA Laureldale borough
PA Lawrence County
PA Lawrence Park township
PA Lebanon County
PA Leesport borough
PA Leet township
PA Leetsdale borough
PA Lehigh County
PA Lehman township
PA Lemoyne borough
PA Liberty borough
PA Limerick township
PA Lincoln borough
PA Lititz borough
PA Logan township
PA Loganville borough
PA London Britain township
PA Londonderry township
PA Lorain borough
PA Lower Allen township
PA Lower Alsace township
PA Lower Burrell city
PA Lower Chichester township
PA Lower Frederick township
PA Lower Gwynedd township
PA Lower Heidelberg township
PA Lower Macungie township
PA Lower Makefield township
PA Lower Merion township
PA Lower Moreland township
PA Lower Nazareth township
PA Lower Paxton township
PA Lower Pottsgrove township
PA Lower Providence township
PA Lower Salford township
PA Lower Saucon township
PA Lower Southampton township
PA Lower Swatara township
PA Lower Yoder township
PA Loyalsock township
PA Luzerne borough
PA Luzerne County
PA Luzerne township

PA Lycoming County
PA Lycoming township
PA Macungie borough
PA Madison borough
PA Maidencreek township
PA Malvern borough
PA Manchester township
PA Manheim township
PA Manor borough
PA Manor township
PA Marcus Hook borough
PA Marple township
PA Marshall township
PA Marysville borough
PA Mayfield borough
PA McCandless township
PA McKean township
PA McKees Rocks borough
PA McKeesport city
PA Mechanicsburg borough
PA Media borough
PA Mercer County
PA Middle Taylor township
PA Middletown borough
PA Middletown township
PA Millbourne borough
PA Millcreek township
PA Millersville borough
PA Millvale borough
PA Modena borough
PA Mohnton borough
PA Monaca borough
PA Monessen city
PA Monongahela city
PA Monroe township
PA Montgomery County
PA Montgomery township
PA Montoursville borough
PA Moon township
PA Moosic borough
PA Morrisville borough
PA Morton borough
PA Mount Lebanon township
PA Mount Oliver borough
PA Mount Penn borough
PA Mountville borough
PA Muhlenberg township
PA Munhall borough
PA Municipality of Monroeville borough
PA Municipality of Murrysville borough
PA Nanticoke city
PA Narberth borough
PA Nether Providence township
PA Neville township
PA New Brighton borough
PA New Britain borough
PA New Britain township
PA New Cumberland borough
PA New Eagle borough
PA New Galilee borough
PA New Garden township
PA New Hanover township
PA New Kensington city
PA New Sewickley township
PA New Stanton borough
PA Newell borough
PA Newport township
PA Newton township
PA Newtown borough
PA Newtown township
PA Norristown borough
PA North Belle Vernon borough
PA North Braddock borough
PA North Catasauqua borough
PA North Charleroi borough
PA North Coventry township
PA North Franklin township
PA North Huntingdon township
PA North Irwin borough
PA North Londonderry township
PA North Sewickley township
PA North Strabane township
PA North Versailles township
PA North Wales borough
PA North Whitehall township
PA North York borough
PA Northampton borough
PA Northampton County
PA Northampton township
PA Norwood borough
PA Oakmont borough
PA O'Hara township
PA Ohio township
PA Old Forge borough
PA Old Lycoming township
PA Olyphant borough
PA Ontelaunee township
PA Osborne borough
PA Paint borough
PA Paint township
PA Palmer township
PA Palmyra borough
PA Parkside borough
PA Patterson Heights borough
PA Patterson township
PA Patton township
PA Paxtang borough
PA Penbrook borough
PA Penn borough
PA Penn Hills township
PA Penn township
PA Penndel borough
PA Pennsbury Village borough
PA Pequea township
PA Perkiomen township
PA Perry County
PA Perry township
PA Peters township
PA Phoenixville borough
PA Pine township
PA Pitcairn borough
PA Pittsburgh city
PA Pittston city
PA Pittston township
PA Plains township
PA Pleasant Hills borough
PA Plum borough
PA Plymouth borough
PA Plymouth township
PA Port Vue borough
PA Potter township
PA Pottstown borough
PA Pringle borough
PA Prospect Park borough
PA Pulaski township
PA Radnor township
PA Rankin borough
PA Ransom township
PA Reading city
PA Red Lion borough
PA Reserve township
PA Richland township
PA Ridley Park borough
PA Ridley township
PA Robinson township
PA Rochester borough
PA Rochester township
PA Rockledge borough
PA Roscoe borough
PA Rose Valley borough
PA Ross township
PA Rosslyn Farms borough
PA Rostraver township
PA Royalton borough
PA Royersford borough
PA Rutledge borough
PA Salem township
PA Salisbury township
PA Scalp Level borough
PA Schuylkill township
PA Schwenksville borough
PA Scott township
PA Scranton city
PA Sewickley borough
PA Sewickley Heights borough
PA Sewickley Hills borough
PA Sewickley township
PA Shaler township
PA Sharon city
PA Sharon Hill borough
PA Sharpsburg borough
PA Sharpsville borough
PA Shenango township
PA Shillington borough
PA Shiremanstown borough
PA Silver Spring township
PA Sinking Spring borough
PA Skippack township
PA Somerset County
PA Souderton borough
PA South Abington township
PA South Coatesville borough
PA South Fayette township
PA South Greensburg borough
PA South Hanover township
PA South Heidelberg township
PA South Heights borough
PA South Huntingdon township
PA South Park township
PA South Pymatuning township
PA South Strabane township
PA South Whitehall township
PA South Williamsport borough
PA Southmont borough
PA Southwest Greensburg borough
PA Speers borough
PA Spring City borough
PA Spring Garden township
PA Spring township
PA Springdale borough
PA Springdale township
PA Springettsbury township
PA Springfield township
PA St. Lawrence borough
PA State College borough
PA Steelton borough
PA Stockdale borough
PA Stonycreek township
PA Stowe township
PA Sugar Notch borough
PA Summit township
PA Susquehanna township
PA Sutersville borough
PA Swarthmore borough
PA Swatara township
PA Swissvale borough
PA Swoyersville borough
PA Tarentum borough
PA Taylor borough
PA Telford borough
PA Temple borough
PA Thornburg borough
PA Thornbury township
PA Throop borough
PA Tinicum township
PA Towamencin township
PA Trafford borough
PA Trainer borough

PA Trappe borough
PA Tredyffrin township
PA Tullytown borough
PA Turtle Creek borough
PA Union township
PA Upland borough
PA Upper Allen township
PA Upper Chichester township
PA Upper Darby township
PA Upper Dublin township
PA Upper Gwynedd township
PA Upper Leacock township
PA Upper Macungie township
PA Upper Makefield township
PA Upper Merion township
PA Upper Milford township
PA Upper Moreland township
PA Upper Pottsgrove township
PA Upper Providence township
PA Upper Saucon township
PA Upper Southampton township
PA Upper St. Clair township
PA Upper Yoder township
PA Uwchlan township
PA Valley township
PA Vanport township
PA Verona borough
PA Versailles borough
PA Wall borough
PA Warminster township
PA Warrington township
PA Warrior Run borough
PA Warwick township
PA Washington city
PA Washington County
PA Washington township
PA Wayne township
PA Wernersville borough
PA Wesleyville borough
PA West Bradford township
PA West Brownsville borough
PA West Chester borough
PA West Conshohocken borough
PA West Deer township
PA West Earl township
PA West Easton borough
PA West Elizabeth borough
PA West Fairview borough
PA West Goshen township
PA West Hanover township
PA West Hempfield township
PA West Homestead borough
PA West Lampeter township
PA West Lawn borough
PA West Manchester township
PA West Mayfield borough
PA West Middlesex borough
PA West Mifflin borough
PA West Newton borough
PA West Norriton township
PA West Pikeland township
PA West Pittston borough
PA West Pottsgrove township
PA West Reading borough
PA West Taylor township
PA West View borough
PA West Whiteland township
PA West Wyoming borough
PA West York borough
PA Westmont borough
PA Westmoreland County
PA Westtown township
PA Wheatland borough
PA Whitaker borough
PA White Oak borough
PA White township
PA Whitehall township
PA Whitemarsh township
PA Whitpain township
PA Wilkes-Barre city
PA Wilkes-Barre township
PA Wilkins township
PA Wilkinsburg borough
PA Williams township
PA Williamsport city
PA Willistown township
PA Wilmerding borough
PA Wilson borough
PA Windber borough
PA Windsor borough
PA Windsor township
PA Worcester township
PA Wormleysburg borough
PA Wrightsville borough
PA Wyoming borough
PA Wyomissing borough
PA Wyomissing Hills borough
PA Yardley borough
PA Yatesville borough
PA Yeadon borough
PA Yoe borough
PA York city
PA York County
PA York township
PA Youngwood borough
PR Aibonita
PR Anasco
PR Aquada
PR Aquadilla
PR Aquas Buenas
PR Arecibo
PR Bayamon
PR Cabo Rojo
PR Caguas
PR Camuy
PR Canovanas
PR Catano
PR Cayey
PR Cidra
PR Dorado
PR Guaynabo
PR Gurabo
PR Hatillo
PR Hormigueros
PR Humacao
PR Juncos
PR Las Piedras
PR Loiza
PR Manati
PR Mayaguez
PR Moca
PR Naguabo
PR Naranjito
PR Penuelas
PR Ponce
PR Rio Grande
PR San German
PR San Lorenzo
PR Toa Alta
PR Toa Baja
PR Trujillo Alto
PR Vega Alta
PR Vega Baja
PR Yabucao
RI Barrington town
RI Bristol town
RI Burrillville town
RI Central Falls city
RI Coventry town
RI Cranston city
RI Cumberland town
RI East Greenwich town
RI East Providence city
RI Glocester town
RI Jamestown town
RI Johnston town
RI Lincoln town
RI Middletown town
RI Newport city
RI Newport County
RI North Kingstown town
RI North Providence town
RI North Smithfield town
RI Pawtucket city
RI Portsmouth town
RI Providence city
RI Providence County
RI Scituate town
RI Smithfield town
RI Tiverton town
RI Warren town
RI Warwick city
RI Washington County
RI West Greenwich town
RI West Warwick town
RI Woonsocket city
SC Aiken city
SC Aiken County
SC Anderson city
SC Anderson County
SC Arcadia Lakes town
SC Berkeley County
SC Burnettown town
SC Cayce city
SC Charleston city
SC Charleston County
SC City View town
SC Columbia city
SC Cowpens town
SC Darlington County
SC Dorchester County
SC Edgefield County
SC Florence city
SC Florence County
SC Folly Beach city
SC Forest Acres city
SC Fort Mill town
SC Georgetown County
SC Goose Creek city
SC Hanahan city
SC Horry County
SC Irmo town
SC Isle of Palms city
SC Lexington County
SC Lincolnville town
SC Mount Pleasant town
SC Myrtle Beach city
SC North Augusta city
SC North Charleston city
SC Pickens County
SC Pineridge town
SC Quinby town
SC Rock Hill city
SC South Congaree town
SC Spartanburg city
SC Spartanburg County
SC Springdale town
SC Sullivan's Island town
SC Summerville town
SC Sumter city
SC Sumter County
SC Surfside Beach town
SC West Columbia city
SC York County
SD Big Sioux township
SD Central Pennington unorg.
SD Lincoln County
SD Mapleton township

SD Minnehaha County
SD North Sioux City city
SD Pennington County
SD Rapid City city
SD Split Rock township
SD Union County
SD Wayne township
TN Alcoa city
TN Anderson County
TN Bartlett town
TN Belle Meade city
TN Berry Hill city
TN Blount County
TN Brentwood city
TN Bristol city
TN Carter County
TN Church Hill town
TN Clarksville city
TN Collegedale city
TN Davidson County
TN East Ridge city
TN Elizabethton city
TN Farragut town
TN Forest Hills city
TN Germantown city
TN Goodlettsville city
TN Hamilton County
TN Hawkins County
TN Hendersonville city
TN Jackson city
TN Johnson City city
TN Jonesborough town
TN Kingsport city
TN Knox County
TN Lakesite city
TN Lakewood city
TN Lookout Mountain town
TN Loudon County
TN Madison County
TN Maryville city
TN Montgomery County
TN Mount Carmel town
TN Mount Juliet city
TN Oak Hill city
TN Red Bank city
TN Ridgeside city
TN Rockford city
TN Shelby County
TN Signal Mountain town
TN Soddy-Daisy city
TN Sullivan County
TN Sumner County
TN Washington County
TN Williamson County
TN Wilson County
TX Addison city
TX Alamo city
TX Alamo Heights city
TX Allen city
TX Archer County
TX Azle city
TX Balch Springs city
TX Balcones Heights city
TX Bayou Vista village
TX Baytown city
TX Bedford city
TX Bell County
TX Bellaire city
TX Bellmead city
TX Belton city
TX Benbrook city
TX Beverly Hills city
TX Bexar County
TX Blue Mound city
TX Bowie County
TX Brazoria County
TX Brazos County
TX Brookside Village city
TX Brownsville city
TX Bryan city
TX Buckingham town
TX Bunker Hill Village city
TX Cameron County
TX Carrollton city
TX Castle Hills city
TX Cedar Hill city
TX Cedar Park city
TX Chambers County
TX Cibolo city
TX Clear Lake Shores city
TX Clint town
TX Cockrell Hill city
TX College Station city
TX Colleyville city
TX Collin County
TX Comal County
TX Combes town
TX Converse city
TX Copperas Cove city
TX Corinth town
TX Coryell County
TX Crowley city
TX Dallas County
TX Dalworthington Gardens city
TX Deer Park city
TX Denison city
TX Denton city
TX Denton County
TX DeSoto city
TX Dickinson city
TX Donna city
TX Double Oak town
TX Duncanville city
TX Ector County
TX Edgecliff village
TX Edinburg city
TX El Lago city
TX El Paso County
TX Ellis County
TX Euless city
TX Everman city
TX Farmers Branch city
TX Flower Mound town
TX Forest Hill city
TX Fort Bend County
TX Friendswood city
TX Galena Park city
TX Galveston city
TX Galveston County
TX Grand Prairie city
TX Grapevine city
TX Grayson County
TX Gregg County
TX Groves city
TX Guadalupe County
TX Haltom City city
TX Hardin County
TX Harker Heights city
TX Harlingen city
TX Harrison County
TX Hedwig Village city
TX Hewitt city
TX Hickory Creek town
TX Hidalgo County
TX Highland Park town
TX Highland Village city
TX Hill Country Village city
TX Hilshire Village city
TX Hitchcock city
TX Hollywood Park town
TX Howe town
TX Humble city
TX Hunters Creek Village city
TX Hurst city
TX Hutchins city
TX Impact town
TX Jacinto City city
TX Jefferson County
TX Jersey Village city
TX Johnson County
TX Jones County
TX Katy city
TX Kaufman County
TX Keller city
TX Kemah city
TX Kennedale city
TX Killeen city
TX Kirby city
TX Kleberg County
TX La Marque city
TX La Porte city
TX Lacy-Lakeview city
TX Lake Dallas city
TX Lake Worth city
TX Lakeside City town
TX Lakeside town
TX Lampasas County
TX Lancaster city
TX League City city
TX Leander city
TX Leon Valley city
TX Lewisville city
TX Live Oak city
TX Longview city
TX Lubbock County
TX Lumberton city
TX Martin County
TX McAllen city
TX McLennan County
TX Meadows city
TX Midland city
TX Midland County
TX Mission city
TX Missouri City city
TX Montgomery County
TX Morgan's Point city
TX Nash city
TX Nassau Bay city
TX Nederland city
TX Nolanville city
TX North Richland Hills city
TX Northcrest town
TX Nueces County
TX Odessa city
TX Olmos Park city
TX Palm Valley town
TX Palmview city
TX Pantego town
TX Parker County
TX Pearland city
TX Pflugerville city
TX Pharr city
TX Piney Point Village city
TX Port Arthur city
TX Port Neches city
TX Portland city
TX Potter County
TX Primera town
TX Randall County
TX Richardson city
TX Richland Hills city
TX River Oaks city
TX Robinson city
TX Rockwall city
TX Rockwall County
TX Rollingwood city
TX Rose Hill Acres city
TX Rowlett city

TX Sachse city
TX Saginaw city
TX San Angelo city
TX San Benito city
TX San Juan city
TX San Patricio County
TX Sansom Park city
TX Santa Fe city
TX Schertz city
TX Seabrook city
TX Seagoville city
TX Selma city
TX Shavano Park city
TX Sherman city
TX Shoreacres city
TX Smith County
TX Socorro town
TX South Houston city
TX Southside Place city
TX Spring Valley city
TX Stafford town
TX Sugar Land city
TX Sunset Valley city
TX Tarrant County
TX Taylor County
TX Taylor Lake Village city
TX Temple city
TX Terrell Hills city
TX Texarkana city
TX Texas City city
TX Tom Green County
TX Travis County
TX Tye town
TX Tyler city
TX Universal City city
TX University Park city
TX Victoria city
TX Victoria County
TX Wake Village city
TX Waller County
TX Watauga city
TX Webb County
TX Webster city
TX Weslaco city
TX West Lake Hills city
TX West University Place city
TX Westover Hills town
TX Westworth village
TX White Oak city
TX White Settlement city
TX Wichita County
TX Wichita Falls city
TX Williamson County
TX Wilmer city
TX Windcrest city
TX Woodway city
UT American Fork city
UT Bluffdale city
UT Bountiful city
UT Cache County
UT Cedar Hills town
UT Centerville city
UT Clearfield city
UT Clinton city
UT Davis County
UT Draper city
UT Farmington city
UT Farr West city
UT Fruit Heights city
UT Harrisville city
UT Highland city
UT Hyde Park city
UT Kaysville city
UT Layton city
UT Lehi city
UT Lindon city
UT Logan city
UT Mapleton city
UT Midvale city
UT Millville city
UT Murray city
UT North Logan city
UT North Ogden city
UT North Salt Lake city
UT Ogden city
UT Orem city
UT Pleasant Grove city
UT Pleasant View city
UT Providence city
UT Provo city
UT River Heights city
UT Riverdale city
UT Riverton city
UT Roy city
UT Sandy city
UT Smithfield city
UT South Jordan city
UT South Ogden city
UT South Salt Lake city
UT South Weber city
UT Springville city
UT Sunset city
UT Syracuse city
UT Uintah town
UT Utah County
UT Washington Terrace city
UT Weber County
UT West Bountiful city
UT West Jordan city
UT West Point city
UT West Valley City city
UT Woods Cross city
VA Albemarle County
VA Alexandria city
VA Amherst County
VA Bedford County
VA Botetourt County
VA Bristol city
VA Campbell County
VA Charlottesville city
VA Colonial Heights city
VA Danville city
VA Dinwiddie County
VA Fairfax city
VA Falls Church city
VA Fredericksburg city
VA Gate City town
VA Gloucester County
VA Hanover County
VA Herndon town
VA Hopewell city
VA James City County
VA Loudoun County
VA Lynchburg city
VA Manassas city
VA Manassas Park city
VA Occoquan town
VA Petersburg city
VA Pittsylvania County
VA Poquoson city
VA Prince George County
VA Richmond city
VA Roanoke city
VA Roanoke County
VA Salem city
VA Scott County
VA Spotsylvania County
VA Stafford County
VA Suffolk city
VA Vienna town
VA Vinton town
VA Washington County
VA Weber City town
VA Williamsburg city
VA York County
VT Burlington city
VT Chittenden County
VT Colchester town
VT Essex Junction village
VT Essex town
VT Shelburne town
VT South Burlington city
VT Williston town
VT Winooski city
WA Algona city
WA Auburn city
WA Beaux Arts Village town
WA Bellevue city
WA Bellingham city
WA Benton County
WA Bonney Lake city
WA Bothell city
WA Bremerton city
WA Brier city
WA Clyde Hill town
WA Cowlitz County
WA Des Moines city
WA DuPont city
WA Edmonds city
WA Everett city
WA Fife city
WA Fircrest town
WA Franklin County
WA Gig Harbor city
WA Hunts Point town
WA Issaquah city
WA Kelso city
WA Kennewick city
WA Kent city
WA Kirkland city
WA Kitsap County
WA Lacey city
WA Lake Forest Park city
WA Longview city
WA Lynnwood city
WA Marysville city
WA Medina city
WA Mercer Island city
WA Mill Creek city
WA Millwood town
WA Milton city
WA Mountlake Terrace city
WA Mukilteo city
WA Normandy Park city
WA Olympia city
WA Pacific city
WA Pasco city
WA Port Orchard city
WA Puyallup city
WA Redmond city
WA Renton city
WA Richland city
WA Ruston town
WA Selah city
WA Steilacoom town
WA Sumner city
WA Thurston County
WA Tukwila city
WA Tumwater city
WA Union Gap city
WA Vancouver city
WA West Richland city
WA Whatcom County
WA Woodway city
WA Yakima city
WA Yakima County
WA Yarrow Point town
WI Algoma town

WI Allouez village
WI Altoona city
WI Appleton city
WI Ashwaubenon village
WI Bayside village
WI Bellevue town
WI Beloit city
WI Beloit town
WI Big Bend village
WI Black Wolf town
WI Blooming Grove town
WI Brookfield city
WI Brookfield town
WI Brown County
WI Brown Deer village
WI Brunswick town
WI Buchanan town
WI Burke town
WI Butler village
WI Caledonia town
WI Calumet County
WI Campbell town
WI Cedarburg city
WI Cedarburg town
WI Chippewa County
WI Chippewa Falls city
WI Clayton town
WI Combined Locks village
WI Cudahy city
WI Dane County
WI De Pere city
WI De Pere town
WI Delafield town
WI Douglas County
WI Dunn town
WI Eagle Point town
WI Eau Claire city
WI Eau Claire County
WI Elm Grove village
WI Elmwood Park village
WI Fitchburg city
WI Fox Point village
WI Franklin city
WI Germantown town
WI Germantown village
WI Glendale city
WI Grafton town
WI Grafton village
WI Grand Chute town
WI Green Bay city
WI Greendale village
WI Greenfield city
WI Greenville town
WI Hales Corners village
WI Hallie town
WI Harmony town
WI Harrison town
WI Hobart town
WI Holmen village
WI Howard village
WI Janesville city
WI Janesville town
WI Kaukauna city
WI Kenosha city
WI Kenosha County
WI Kimberly village
WI Kohler village
WI La Crosse city
WI La Crosse County
WI La Prairie town
WI Lafayette town
WI Lannon village
WI Lima town
WI Lisbon town
WI Little Chute village
WI Madison town
WI Maple Bluff village
WI Marathon County
WI McFarland village
WI Medary town
WI Menasha city
WI Menasha town
WI Menomonee Falls village
WI Mequon city
WI Middleton city
WI Middleton town
WI Monona city
WI Mount Pleasant town
WI Muskego city
WI Neenah city
WI Neenah town
WI Nekimi town
WI New Berlin city
WI North Bay village
WI Norway town
WI Oak Creek city
WI Onalaska city
WI Onalaska town
WI Oshkosh city
WI Oshkosh town
WI Outagamie County
WI Ozaukee County
WI Pewaukee town
WI Pewaukee village
WI Pleasant Prairie town
WI Pleasant Prairie village
WI Racine city
WI Racine County
WI Rib Mountain town
WI River Hills village
WI Rock County
WI Rock town
WI Rothschild village
WI Salem town
WI Schofield city
WI Scott town
WI Sheboygan city
WI Sheboygan County
WI Sheboygan Falls city
WI Sheboygan Falls town
WI Sheboygan town
WI Shelby town
WI Shorewood Hills village
WI Shorewood village
WI Somers town
WI South Milwaukee city
WI St. Francis city
WI Stettin town
WI Sturtevant village
WI Superior city
WI Superior village
WI Sussex village
WI Thiensville village
WI Turtle town
WI Union town
WI Vandenbroek town
WI Vernon town
WI Washington County
WI Washington town
WI Waukesha city
WI Waukesha County
WI Waukesha town
WI Wausau city
WI Wauwatosa city
WI West Allis city
WI West Milwaukee village
WI Weston town
WI Westport town
WI Wheaton town
WI Whitefish Bay village
WI Wilson town
WI Wind Point village
WI Winnebago County
WV Bancroft town
WV Barboursville village
WV Belle town
WV Benwood city
WV Berkeley County
WV Bethlehem village
WV Brooke County
WV Cabell County
WV Cedar Grove town
WV Ceredo city
WV Charleston city
WV Chesapeake town
WV Clearview village
WV Dunbar city
WV East Bank town
WV Follansbee city
WV Glasgow town
WV Glen Dale city
WV Hancock County
WV Huntington city
WV Hurricane city
WV Kanawha County
WV Kenova city
WV Marmet city
WV Marshall County
WV McMechen city
WV Mineral County
WV Moundsville city
WV Nitro city
WV North Hills town
WV Ohio County
WV Parkersburg city
WV Poca town
WV Putnam County
WV Ridgeley town
WV South Charleston city
WV St. Albans city
WV Triadelphia town
WV Vienna city
WV Wayne County
WV Weirton city
WV Wheeling city
WV Wood County
WY Casper city
WY Cheyenne city
WY Evansville town
WY Laramie County
WY Mills town
WY Natrona County

Appendix 7 of Preamble—Governmental Entities (Located Outside of an Urbanized Area) That Must Be Examined By the NPDES Permitting Authority for Potential Designation Under § 123.35(b)(2)

(All listed entities have a population of at least 10,000 and a population density of at least 1,000. A listed entity would only be potentially designated if it operates a small MS4. See § 122.26(b)(16) for the definition of a small MS4.)

(This list does not include all operators of small MS4s that may be designated by the NPDES permitting authority. Operators of small MS4s in areas with populations below 10,000 and densities below 1,000 may also be designated but examination of them is not required. Also, entities such as military bases, large hospitals, prison complexes, universities, sewer districts, and highway departments that operate a small MS4 in an area listed here, or in an area otherwise designated by the NPDES permitting authority, may be designated and become subject to permitting regulations.) (Source: 1990 Census of Population and Housing, U.S. Bureau of the Census. This list is subject to change with the Decennial Census)

AL Daphne city
AL Jacksonville city
AL Selma city
AR Arkadelphia city
AR Benton city
AR Blytheville city
AR Conway city
AR El Dorado city
AR Hot Springs city
AR Magnolia city
AR Rogers city
AR Searcy city
AR Stuttgart city
AZ Douglas city
CA Arcata city
CA Arroyo Grande city
CA Atwater city
CA Auburn city
CA Banning city
CA Brawley city
CA Calexico city
CA Clearlake city
CA Corcoran city
CA Delano city
CA Desert Hot Springs city
CA Dinuba city
CA Dixon city
CA El Centro city
CA El Paso de Robles (Paso Robles) city
CA Eureka city
CA Fillmore city
CA Gilroy city
CA Grover City city
CA Hanford city
CA Hollister city
CA Lemoore city
CA Los Banos city
CA Madera city
CA Manteca city
CA Oakdale city
CA Oroville city
CA Paradise town
CA Petaluma city
CA Porterville city
CA Red Bluff city
CA Reedley city
CA Ridgecrest city
CA Sanger city
CA Santa Paula city
CA Selma city
CA South Lake Tahoe city
CA Temecula city
CA Tracy city
CA Tulare city
CA Turlock city
CA Ukiah city
CA Wasco city
CA Woodland city
CO Canon City city
CO Durango city
CO Lafayette city
CO Louisville city
CO Loveland city
CO Sterling city
FL Bartow city
FL Belle Glade city
FL De Land city
FL Eustis city
FL Haines City city
FL Key West city
FL Leesburg city
FL Palatka city
FL Plant City city
FL St. Augustine city
FL St. Cloud city
GA Americus city
GA Carrollton city
GA Cordele city
GA Dalton city
GA Dublin city
GA Griffin city
GA Hinesville city
GA Moultrie city
GA Newnan city
GA Statesboro city
GA Thomasville city
GA Tifton city
GA Valdosta city
GA Waycross city
IA Ames city
IA Ankeny city
IA Boone city
IA Burlington city
IA Fort Dodge city
IA Fort Madison city
IA Indianola city
IA Keokuk city
IA Marshalltown city
IA Mason City city
IA Muscatine city
IA Newton city
IA Oskaloosa city
IA Ottumwa city
IA Spencer city
ID Caldwell city
ID Coeur d'Alene city
ID Lewiston city
ID Moscow city
ID Nampa city
ID Rexburg city
ID Twin Falls city
IL Belvidere city
IL Canton city
IL Carbondale city
IL Centralia city
IL Charleston city
IL Danville city
IL De Kalb city
IL Dixon city
IL Effingham city
IL Freeport city
IL Galesburg city
IL Jacksonville city
IL Macomb city
IL Mattoon city
IL Mount Vernon city
IL Ottawa city
IL Pontiac city
IL Quincy city
IL Rantoul village
IL Sterling city
IL Streator city
IL Taylorville city
IL Woodstock city
IN Bedford city
IN Columbus city
IN Crawfordsville city
IN Frankfort city
IN Franklin city
IN Greenfield city
IN Huntington city
IN Jasper city
IN La Porte city
IN Lebanon city
IN Logansport city
IN Madison city
IN Marion city
IN Martinsville city
IN Michigan City city
IN New Castle city
IN Noblesville city
IN Peru city
IN Plainfield town
IN Richmond city
IN Seymour city
IN Shelbyville city
IN Valparaiso city
IN Vincennes city
IN Wabash city
IN Warsaw city
IN Washington city
KS Arkansas City city
KS Atchison city
KS Coffeyville city
KS Derby city
KS Dodge City city
KS El Dorado city
KS Emporia city
KS Garden City city
KS Great Bend city
KS Hays city
KS Hutchinson city
KS Junction City city
KS Leavenworth city
KS Liberal city
KS Manhattan city
KS McPherson city
KS Newton city
KS Ottawa city
KS Parsons city
KS Pittsburg city
KS Salina city
KS Winfield city
KY Bowling Green city
KY Danville city
KY Frankfort city
KY Georgetown city
KY Glasgow city
KY Hopkinsville city
KY Madisonville city
KY Middlesborough city
KY Murray city
KY Nicholasville city
KY Paducah city
KY Radcliff city
KY Richmond city
KY Somerset city
KY Winchester city

LA Abbeville city
LA Bastrop city
LA Bogalusa city
LA Crowley city
LA Eunice city
LA Hammond city
LA Jennings city
LA Minden city
LA Morgan City city
LA Natchitoches city
LA New Iberia city
LA Opelousas city
LA Ruston city
LA Thibodaux city
MA Amherst town
MA Clinton town
MA Milford town
MA Newburyport city
MD Aberdeen town
MD Cambridge city
MD Salisbury city
MD Westminster city
ME Waterville city
MI Adrian city
MI Albion city
MI Alpena city
MI Big Rapids city
MI Cadillac city
MI Escanaba city
MI Grand Haven city
MI Marquette city
MI Midland city
MI Monroe city
MI Mount Pleasant city
MI Owosso city
MI Sturgis city
MI Traverse City city
MN Albert Lea city
MN Austin city
MN Bemidji city
MN Brainerd city
MN Faribault city
MN Fergus Falls city
MN Hastings city
MN Hutchinson city
MN Mankato city
MN Marshall city
MN New Ulm city
MN North Mankato city
MN Northfield city
MN Owatonna city
MN Stillwater city
MN Willmar city
MN Winona city
MO Cape Girardeau city
MO Farmington city
MO Hannibal city
MO Jefferson City city
MO Kennett city
MO Kirksville city
MO Marshall city
MO Maryville city
MO Poplar Bluff city
MO Rolla city
MO Sedalia city
MO Sikeston city
MO Warrensburg city
MO Washington city
MS Brookhaven city
MS Canton city
MS Clarksdale city
MS Cleveland city
MS Columbus city
MS Greenville city
MS Greenwood city
MS Grenada city
MS Indianola city
MS Laurel city
MS McComb city
MS Meridian city
MS Natchez city
MS Starkville city
MS Vicksburg city
MS Yazoo City city
MT Bozeman city
MT Havre city
MT Helena city
MT Kalispell city
NC Albemarle city
NC Asheboro city
NC Boone town
NC Eden city
NC Elizabeth City city
NC Havelock city
NC Henderson city
NC Kernersville town
NC Kinston city
NC Laurinburg city
NC Lenoir city
NC Lexington city
NC Lumberton city
NC Monroe city
NC New Bern city
NC Reidsville city
NC Roanoke Rapids city
NC Salisbury city
NC Sanford city
NC Shelby city
NC Statesville city
NC Tarboro town
NC Wilson city
ND Dickinson city
ND Jamestown city
ND Minot city
ND Williston city
NE Beatrice city
NE Columbus city
NE Fremont city
NE Grand Island city
NE Hastings city
NE Kearney city
NE Norfolk city
NE North Platte city
NE Scottsbluff city
NJ East Windsor township
NJ Plainsboro township
NJ Bridgeton city
NJ Princeton borough
NM Alamogordo city
NM Artesia city
NM Clovis city
NM Deming city
NM Farmington city
NM Gallup city
NM Hobbs city
NM Las Vegas city
NM Portales city
NM Roswell city
NM Silver City town
NV Elko city
NY Amsterdam city
NY Auburn city
NY Batavia city
NY Canandaigua city
NY Corning city
NY Cortland city
NY Dunkirk city
NY Fredonia village
NY Fulton city
NY Geneva city
NY Gloversville city
NY Jamestown city
NY Kingston city
NY Lockport city
NY Massena village
NY Middletown city
NY Ogdensburg city
NY Olean city
NY Oneonta city
NY Oswego city
NY Plattsburgh city
NY Potsdam village
NY Watertown city
OH Alliance city
OH Ashland city
OH Ashtabula city
OH Athens city
OH Bellefontaine city
OH Bowling Green city
OH Bucyrus city
OH Cambridge city
OH Chillicothe city
OH Circleville city
OH Coshocton city
OH Defiance city
OH Delaware city
OH Dover city
OH East Liverpool city
OH Findlay city
OH Fostoria city
OH Fremont city
OH Galion city
OH Greenville city
OH Lancaster city
OH Lebanon city
OH Marietta city
OH Marion city
OH Medina city
OH Mount Vernon city
OH New Philadelphia city
OH Norwalk city
OH Oxford city
OH Piqua city
OH Portsmouth city
OH Salem city
OH Sandusky city
OH Sidney city
OH Tiffin city
OH Troy city
OH Urbana city
OH Washington city
OH Wilmington city
OH Wooster city
OH Xenia city
OH Zanesville city
OK Ada city
OK Altus city
OK Bartlesville city
OK Chickasha city
OK Claremore city
OK McAlester city
OK Miami city
OK Muskogee city
OK Okmulgee city
OK Owasso city
OK Ponca City city
OK Stillwater city
OK Tahlequah city
OK Weatherford city
OR Albany city
OR Ashland city
OR Astoria city
OR Bend city
OR City of the Dalles city
OR Coos Bay city
OR Corvallis city
OR Grants Pass city
OR Hermiston city

OR Klamath Falls city
OR La Grande city
OR Lebanon city
OR McMinnville city
OR Newberg city
OR Pendleton city
OR Roseburg city
OR Woodburn city
PA Berwick borough
PA Bloomsburg town
PA Butler city
PA Carlisle borough
PA Chambersburg borough
PA Ephrata borough
PA Hanover borough
PA Hazleton city
PA Indiana borough
PA Lebanon city
PA Meadville city
PA New Castle city
PA Oil City city
PA Pottsville city
PA Sunbury city
PA Uniontown city
PA Warren city
RI Narragansett town
SC Clemson city
SC Easley city
SC Gaffney city
SC Greenwood city
SC Newberry town
SC Orangeburg city
SD Aberdeen city
SD Brookings city
SD Huron city
SD Mitchell city
SD Vermillion city
SD Watertown city
SD Yankton city
TN Brownsville city
TN Cleveland city
TN Collierville town
TN Cookeville city
TN Dyersburg city
TN Greeneville town
TN Lawrenceburg city
TN McMinnville city
TN Millington city
TN Morristown city
TN Murfreesboro city
TN Shelbyville city
TN Springfield city
TN Union City city
TX Alice city
TX Alvin city
TX Andrews city
TX Angleton city
TX Bay City city
TX Beeville city
TX Big Spring city
TX Borger city
TX Brenham city
TX Brownwood city
TX Burkburnett city
TX Canyon city
TX Cleburne city
TX Conroe city
TX Coppell city
TX Corsicana city
TX Del Rio city
TX Dumas city
TX Eagle Pass city
TX El Campo city
TX Gainesville city
TX Gatesville city
TX Georgetown city
TX Henderson city
TX Hereford city
TX Huntsville city
TX Jacksonville city
TX Kerrville city
TX Kingsville city
TX Lake Jackson city
TX Lamesa city
TX Levelland city
TX Lufkin city
TX Mercedes city
TX Mineral Wells city
TX Mount Pleasant city
TX Nacogdoches city
TX New Braunfels city
TX Palestine city
TX Pampa city
TX Pecos city
TX Plainview city
TX Port Lavaca city
TX Robstown city
TX Rosenberg city
TX Round Rock city
TX San Marcos city
TX Seguin city
TX Snyder city
TX Stephenville city
TX Sweetwater city
TX Taylor city
TX The Colony city
TX Uvalde city
TX Vernon city
TX Vidor city
UT Brigham City city
UT Cedar City city
UT Spanish Fork city
UT Tooele city
VA Blacksburg town
VA Christiansburg town
VA Front Royal town
VA Harrisonburg city
VA Leesburg town
VA Martinsville city
VA Radford city
VA Staunton city
VA Waynesboro city
VA Winchester city
VT Rutland city
WA Aberdeen city
WA Anacortes city
WA Centralia city
WA Ellensburg city
WA Moses Lake city
WA Mount Vernon city
WA Oak Harbor city
WA Port Angeles city
WA Pullman city
WA Sunnyside city
WA Walla Walla city
WA Wenatchee city
WI Beaver Dam city
WI Fond du Lac city
WI Fort Atkinson city
WI Manitowoc city
WI Marinette city
WI Marshfield city
WI Menomonie city
WI Monroe city
WI Oconomowoc city
WI Stevens Point city
WI Sun Prairie city
WI Two Rivers city
WI Watertown city
WI West Bend city
WI Whitewater city
WI Wisconsin Rapids city
WV Beckley city
WV Bluefield city
WV Clarksburg city
WV Fairmont city
WV Martinsburg city
WV Morgantown city
WY Evanston city
WY Gillette city
WY Green River city
WY Laramie city
WY Rock Springs city
WY Sheridan city

For the reasons set forth in the preamble, chapter I of title 40 of the Code of Federal Regulations is amended as follows:

PART 9—OMB APPROVALS UNDER THE PAPERWORK REDUCTION ACT

1. The authority citation for part 9 continues to read as follows:

Authority: 7 U.S.C. 135 *et seq.*, 136–136y; 15 U.S.C. 2001, 2003, 2005, 2006, 2601–2671; 21 U.S.C. 331j, 346a, 348; 31 U.S.C. 9701; 33 U.S.C. 1251 *et seq.*, 1311, 1313d, 1314, 1318, 1321, 1326, 1330, 1342, 1344, 1345 (d) and (e), 1361; E.O. 11735, 38 FR 21243, 3 CFR, 1971–1975 Comp. p. 973; 42 U.S.C. 241, 242b, 243, 246, 300f, 300g, 300g–1, 300g–2, 300g–3, 300g–4, 300g–5, 300g–6, 300j–1, 300j–2, 300j–3, 300j–4, 300j–9, 1857 *et seq.*, 6901–6992k, 7401–7671q, 7542, 9601–9657, 11023, 11048.

2. In § 9.1 the table is amended by adding entries in numerical order under the indicated heading to read as follows:

§ 9.1 OMB approvals under the Paperwork Reduction Act.

* * * * *

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40 CFR citation	OMB control No.
* * * * * * *	
EPA Administered Permit Programs: The National Pollutant Discharge Elimination System	
* * * * * * *	
122.26(g)	2040–0211
* * * * * * *	
State Permit Requirements	
* * * * * * *	
123.35(b)	2040–0211
* * * * * * *	

PART 122—EPA ADMINISTERED PERMIT PROGRAMS: THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

1. The authority citation for part 122 continues to read as follows:

Authority: The Clean Water Act, 33 U.S.C. 1251 *et seq.*

2. Revise § 122.21(c)(1) to read as follows:

§ 122.21 Application for a permit (applicable to State programs, see § 123.25).

* * * * *

(c) *Time to apply.* (1) Any person proposing a new discharge, shall submit an application at least 180 days before the date on which the discharge is to commence, unless permission for a later date has been granted by the Director. Facilities proposing a new discharge of storm water associated with industrial activity shall submit an application 180 days before that facility commences industrial activity which may result in a discharge of storm water associated with that industrial activity. Facilities described under § 122.26(b)(14)(x) or (b)(15)(i) shall submit applications at least 90 days before the date on which construction is to commence. Different submittal dates may be required under the terms of applicable general permits. Persons proposing a new discharge are encouraged to submit their applications well in advance of the 90 or 180 day requirements to avoid delay. See also paragraph (k) of this section and § 122.26(c)(1)(i)(G) and (c)(1)(ii).

* * * * *

3. Amend § 122.26 as follows:

a. Revise paragraphs (a)(9), (b)(4)(i), (b)(7)(i), (b)(14) introductory text, (b)(14)(x), (b)(14)(xi);

b. Redesignate paragraph (b)(15) as paragraph (b)(20) and add new paragraphs (b)(15) through (b)(19);

c. Revise the heading for paragraph (c), the first sentence of paragraph (c)(1) introductory text, the first sentence of paragraph (c)(1)(ii) introductory text, paragraphs (e) heading and introductory text, (e)(1), (e)(5) introductory text, and (e)(5)(i);

d. Add paragraphs (e)(8) and (e)(9); and

e. Revise paragraphs (f)(4), (f)(5), and (g).

The additions and revisions read as follows:

§ 122.26 Storm water discharges (applicable to State NPDES programs, see § 123.25).

(a) * * *

(9)(i) On and after October 1, 1994, for discharges composed entirely of storm water, that are not required by paragraph (a)(1) of this section to obtain a permit, operators shall be required to obtain a NPDES permit only if:

(A) The discharge is from a small MS4 required to be regulated pursuant to § 122.32;

(B) The discharge is a storm water discharge associated with small construction activity pursuant to paragraph (b)(15) of this section;

(C) The Director, or in States with approved NPDES programs either the Director or the EPA Regional Administrator, determines that storm water controls are needed for the discharge based on wasteload allocations that are part of "total maximum daily loads" (TMDLs) that address the pollutant(s) of concern; or

(D) The Director, or in States with approved NPDES programs either the Director or the EPA Regional Administrator, determines that the discharge, or category of discharges within a geographic area, contributes to a violation of a water quality standard or is a significant contributor of pollutants to waters of the United States.

(ii) Operators of small MS4s designated pursuant to paragraphs (a)(9)(i)(A), (a)(9)(i)(C), and (a)(9)(i)(D) of this section shall seek coverage under an NPDES permit in accordance with §§ 122.33 through 122.35. Operators of non-municipal sources designated pursuant to paragraphs (a)(9)(i)(B), (a)(9)(i)(C), and (a)(9)(i)(D) of this section shall seek coverage under an NPDES permit in accordance with paragraph (c)(1) of this section.

(iii) Operators of storm water discharges designated pursuant to paragraphs (a)(9)(i)(C) and (a)(9)(i)(D) of this section shall apply to the Director for a permit within 180 days of receipt of notice, unless permission for a later date is granted by the Director (see § 124.52(c) of this chapter).

(b) * * *

(4) * * *

(i) Located in an incorporated place with a population of 250,000 or more as determined by the 1990 Decennial Census by the Bureau of the Census (Appendix F of this part); or

* * * * *

(7) * * *

(i) Located in an incorporated place with a population of 100,000 or more but less than 250,000, as determined by the 1990 Decennial Census by the Bureau of the Census (Appendix G of this part); or

* * * * *

(14) *Storm water discharge associated with industrial activity* means the discharge from any conveyance that is used for collecting and conveying storm

water and that is directly related to manufacturing, processing or raw materials storage areas at an industrial plant. The term does not include discharges from facilities or activities excluded from the NPDES program under this part 122. For the categories of industries identified in this section, the term includes, but is not limited to, storm water discharges from industrial plant yards; immediate access roads and rail lines used or traveled by carriers of raw materials, manufactured products, waste material, or by-products used or created by the facility; material handling sites; refuse sites; sites used for the application or disposal of process waste waters (as defined at part 401 of this chapter); sites used for the storage and maintenance of material handling equipment; sites used for residual treatment, storage, or disposal; shipping and receiving areas; manufacturing buildings; storage areas (including tank farms) for raw materials, and intermediate and final products; and areas where industrial activity has taken place in the past and significant materials remain and are exposed to storm water. For the purposes of this paragraph, material handling activities include storage, loading and unloading, transportation, or conveyance of any raw material, intermediate product, final product, by-product or waste product. The term excludes areas located on plant lands separate from the plant's industrial activities, such as office buildings and accompanying parking lots as long as the drainage from the excluded areas is not mixed with storm water drained from the above described areas. Industrial facilities (including industrial facilities that are federally, State, or municipally owned or operated that meet the description of the facilities listed in paragraphs (b)(14)(i) through (xi) of this section) include those facilities designated under the provisions of paragraph (a)(1)(v) of this section. The following categories of facilities are considered to be engaging in "industrial activity" for purposes of paragraph (b)(14):

* * * * *

(x) Construction activity including clearing, grading and excavation, except operations that result in the disturbance of less than five acres of total land area. Construction activity also includes the disturbance of less than five acres of total land area that is a part of a larger common plan of development or sale if the larger common plan will ultimately disturb five acres or more;

(xi) Facilities under Standard Industrial Classifications 20, 21, 22, 23, 2434, 25, 265, 267, 27, 283, 285, 30, 31 (except 311), 323, 34 (except 3441), 35, 36, 37 (except 373), 38, 39, and 4221–25;

(15) *Storm water discharge associated with small construction activity* means the discharge of storm water from:

(i) Construction activities including clearing, grading, and excavating that result in land disturbance of equal to or greater than one acre and less than five acres. Small construction activity also includes the disturbance of less than one acre of total land area that is part of a larger common plan of development or sale if the larger common plan will ultimately disturb equal to or greater than one and less than five acres. Small construction activity does not include routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of the facility. The Director may waive the otherwise applicable requirements in a general permit for a storm water discharge from construction activities that disturb less than five acres where:

(A) The value of the rainfall erosivity factor ("R" in the Revised Universal Soil Loss Equation) is less than five during the period of construction activity. The rainfall erosivity factor is determined in accordance with Chapter 2 of *Agriculture Handbook Number 703, Predicting Soil Erosion by Water: A Guide to Conservation Planning With the Revised Universal Soil Loss Equation (RUSLE)*, pages 21–64, dated January 1997. The Director of the Federal Register approves this incorporation by reference in accordance with 5 U.S.C 552(a) and 1 CFR part 51. Copies may be obtained from EPA's Water Resource Center, Mail Code RC4100, 401 M St. S.W., Washington, DC 20460. A copy is also available for inspection at the U.S. EPA Water Docket , 401 M Street S.W., Washington, DC. 20460, or the Office of the Federal Register, 800 N. Capitol Street N.W. Suite 700, Washington, DC. An operator must certify to the Director that the construction activity will take place during a period when the value of the rainfall erosivity factor is less than five; or

(B) Storm water controls are not needed based on a "total maximum daily load" (TMDL) approved or established by EPA that addresses the pollutant(s) of concern or, for non-impaired waters that do not require TMDLs, an equivalent analysis that determines allocations for small construction sites for the pollutant(s) of concern or that determines that such allocations are not needed to protect water quality based on consideration of existing in-stream concentrations, expected growth in pollutant contributions from all sources, and a margin of safety. For the purpose of this paragraph, the pollutant(s) of concern include sediment or a parameter that addresses sediment (such as total suspended solids, turbidity or siltation) and any other pollutant that has been identified as a cause of impairment of any water body that will receive a discharge from the construction activity. The operator must certify to the Director that the construction activity will take place, and storm water discharges will occur, within the drainage area addressed by the TMDL or equivalent analysis.

(ii) Any other construction activity designated by the Director, or in States with approved NPDES programs either the Director or the EPA Regional Administrator, based on the potential for contribution to a violation of a water quality standard or for significant contribution of pollutants to waters of the United States.

EXHIBIT 1 TO § 122.26(B)(15).—SUMMARY OF COVERAGE OF "STORM WATER DISCHARGES ASSOCIATED WITH SMALL CONSTRUCTION ACTIVITY" UNDER THE NPDES STORM WATER PROGRAM

Automatic Designation: Required Nationwide Coverage.	• Construction activities that result in a land disturbance of equal to or greater than one acre and less than five acres. • Construction activities disturbing less than one acre if part of a larger common plan of development or sale with a planned disturbance of equal to or greater than one acre and less than five acres. (see § 122.26(b)(15)(i).)
Potential Designation: Optional Evaluation and Designation by the NPDES Permitting Authority or EPA Regional Administrator..	• Construction activities that result in a land disturbance of less than one acre based on the potential for contribution to a violation of a water quality standard or for significant contribution of pollutants. (see § 122.26(b)(15)(ii).)

EXHIBIT 1 TO § 122.26(B)(15).—SUMMARY OF COVERAGE OF "STORM WATER DISCHARGES ASSOCIATED WITH SMALL CONSTRUCTION ACTIVITY" UNDER THE NPDES STORM WATER PROGRAM—Continued

Potential Waiver: Waiver from Requirements as Determined by the NPDES Permitting Authority..	Any automatically designated construction activity where the operator certifies: (1) A rainfall erosivity factor of less than five, or (2) That the activity will occur within an area where controls are not needed based on a TMDL or, for non-impaired waters that do not require a TMDL, an equivalent analysis for the pollutant(s) of concern. (see § 122.26(b)(15)(i).)

(16) *Small municipal separate storm sewer system* means all separate storm sewers that are:

(i) Owned or operated by the United States, a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the CWA that discharges to waters of the United States.

(ii) Not defined as "large" or "medium" municipal separate storm sewer systems pursuant to paragraphs (b)(4) and (b)(7) of this section, or designated under paragraph (a)(1)(v) of this section.

(iii) This term includes systems similar to separate storm sewer systems in municipalities, such as systems at military bases, large hospital or prison complexes, and highways and other thoroughfares. The term does not include separate storm sewers in very discrete areas, such as individual buildings.

(17) *Small MS4* means a small municipal separate storm sewer system.

(18) *Municipal separate storm sewer system* means all separate storm sewers that are defined as "large" or "medium" or "small" municipal separate storm sewer systems pursuant to paragraphs (b)(4), (b)(7), and (b)(16) of this section, or designated under paragraph (a)(1)(v) of this section.

(19) *MS4* means a municipal separate storm sewer system.

* * * * *

(c) *Application requirements for storm water discharges associated with industrial activity and storm water discharges associated with small construction activity*—(1) *Individual application.* Dischargers of storm water associated with industrial activity and with small construction activity are required to apply for an individual permit or seek coverage under a promulgated storm water general permit. * * *

* * * * *

(ii) An operator of an existing or new storm water discharge that is associated with industrial activity solely under paragraph (b)(14)(x) of this section or is associated with small construction activity solely under paragraph (b)(15) of this section, is exempt from the requirements of § 122.21(g) and paragraph (c)(1)(i) of this section. * * *

* * * * *

(e) *Application deadlines.* Any operator of a point source required to obtain a permit under this section that does not have an effective NPDES permit authorizing discharges from its storm water outfalls shall submit an application in accordance with the following deadlines:

(1) *Storm water discharges associated with industrial activity.* (i) Except as provided in paragraph (e)(1)(ii) of this section, for any storm water discharge associated with industrial activity identified in paragraphs (b)(14)(i) through (xi) of this section, that is not part of a group application as described in paragraph (c)(2) of this section or that is not authorized by a storm water general permit, a permit application made pursuant to paragraph (c) of this section must be submitted to the Director by October 1, 1992;

(ii) For any storm water discharge associated with industrial activity from a facility that is owned or operated by a municipality with a population of less than 100,000 that is not authorized by a general or individual permit, other than an airport, powerplant, or uncontrolled sanitary landfill, the permit application must be submitted to the Director by March 10, 2003.

* * * * *

(5) A permit application shall be submitted to the Director within 180 days of notice, unless permission for a later date is granted by the Director (see § 124.52(c) of this chapter), for:

(i) A storm water discharge that the Director, or in States with approved NPDES programs, either the Director or the EPA Regional Administrator, determines that the discharge contributes to a violation of a water quality standard or is a significant contributor of pollutants to waters of the United States (see paragraphs (a)(1)(v) and (b)(15)(ii) of this section);

* * * * *

(8) For any storm water discharge associated with small construction activity identified in paragraph (b)(15)(i) of this section, see § 122.21(c)(1). Discharges from these sources require permit authorization by March 10, 2003, unless designated for coverage before then.

(9) For any discharge from a regulated small MS4, the permit application made under § 122.33 must be submitted to the Director by:

(i) March 10, 2003 if designated under § 122.32(a)(1) unless your MS4 serves a jurisdiction with a population under 10,000 and the NPDES permitting authority has established a phasing schedule under § 123.35(d)(3) (see § 122.33(c)(1)); or

(ii) Within 180 days of notice, unless the NPDES permitting authority grants a later date, if designated under § 122.32(a)(2) (see § 122.33(c)(2)).

(f) * * *

(4) Any person may petition the Director for the designation of a large, medium, or small municipal separate storm sewer system as defined by paragraph (b)(4)(iv), (b)(7)(iv), or (b)(16) of this section.

(5) The Director shall make a final determination on any petition received under this section within 90 days after receiving the petition with the exception of petitions to designate a small MS4 in which case the Director shall make a final determination on the petition within 180 days after its receipt.

(g) *Conditional exclusion for "no exposure" of industrial activities and materials to storm water.* Discharges composed entirely of storm water are not storm water discharges associated with industrial activity if there is "no exposure" of industrial materials and activities to rain, snow, snowmelt and/or runoff, and the discharger satisfies the conditions in paragraphs (g)(1) through (g)(4) of this section. "No exposure" means that all industrial materials and activities are protected by a storm resistant shelter to prevent exposure to rain, snow, snowmelt, and/or runoff. Industrial materials or activities include, but are not limited to, material handling equipment or activities, industrial machinery, raw materials, intermediate products, by-products, final products, or waste

products. Material handling activities include the storage, loading and unloading, transportation, or conveyance of any raw material, intermediate product, final product or waste product.

(1) *Qualification.* To qualify for this exclusion, the operator of the discharge must:

(i) Provide a storm resistant shelter to protect industrial materials and activities from exposure to rain, snow, snow melt, and runoff;

(ii) Complete and sign (according to § 122.22) a certification that there are no discharges of storm water contaminated by exposure to industrial materials and activities from the entire facility, except as provided in paragraph (g)(2) of this section;

(iii) Submit the signed certification to the NPDES permitting authority once every five years;

(iv) Allow the Director to inspect the facility to determine compliance with the "no exposure" conditions;

(v) Allow the Director to make any "no exposure" inspection reports available to the public upon request; and

(vi) For facilities that discharge through an MS4, upon request, submit a copy of the certification of "no exposure" to the MS4 operator, as well as allow inspection and public reporting by the MS4 operator.

(2) *Industrial materials and activities not requiring storm resistant shelter.* To qualify for this exclusion, storm resistant shelter is not required for:

(i) Drums, barrels, tanks, and similar containers that are tightly sealed, provided those containers are not deteriorated and do not leak ("Sealed" means banded or otherwise secured and without operational taps or valves);

(ii) Adequately maintained vehicles used in material handling; and

(iii) Final products, other than products that would be mobilized in storm water discharge (e.g., rock salt).

(3) *Limitations.* (i) Storm water discharges from construction activities identified in paragraphs (b)(14)(x) and (b)(15) are not eligible for this conditional exclusion.

(ii) This conditional exclusion from the requirement for an NPDES permit is available on a facility-wide basis only, not for individual outfalls. If a facility has some discharges of storm water that would otherwise be "no exposure" discharges, individual permit requirements should be adjusted accordingly.

(iii) If circumstances change and industrial materials or activities become exposed to rain, snow, snow melt, and/or runoff, the conditions for this exclusion no longer apply. In such cases, the discharge becomes subject to enforcement for un-permitted discharge. Any conditionally exempt discharger who anticipates changes in circumstances should apply for and obtain permit authorization prior to the change of circumstances.

(iv) Notwithstanding the provisions of this paragraph, the NPDES permitting authority retains the authority to require permit authorization (and deny this exclusion) upon making a determination that the discharge causes, has a reasonable potential to cause, or contributes to an instream excursion above an applicable water quality standard, including designated uses.

(4) *Certification.* The no exposure certification must require the submission of the following information, at a minimum, to aid the NPDES permitting authority in determining if the facility qualifies for the no exposure exclusion:

(i) The legal name, address and phone number of the discharger (see § 122.21(b));

(ii) The facility name and address, the county name and the latitude and longitude where the facility is located;

(iii) The certification must indicate that none of the following materials or activities are, or will be in the foreseeable future, exposed to precipitation:

(A) Using, storing or cleaning industrial machinery or equipment, and areas where residuals from using, storing or cleaning industrial machinery or equipment remain and are exposed to storm water;

(B) Materials or residuals on the ground or in storm water inlets from spills/leaks;

(C) Materials or products from past industrial activity;

(D) Material handling equipment (except adequately maintained vehicles);

(E) Materials or products during loading/unloading or transporting activities;

(F) Materials or products stored outdoors (except final products intended for outside use, e.g., new cars, where exposure to storm water does not result in the discharge of pollutants);

(G) Materials contained in open, deteriorated or leaking storage drums, barrels, tanks, and similar containers;

(H) Materials or products handled/stored on roads or railways owned or maintained by the discharger;

(I) Waste material (except waste in covered, non-leaking containers, e.g., dumpsters);

(J) Application or disposal of process wastewater (unless otherwise permitted); and

(K) Particulate matter or visible deposits of residuals from roof stacks/vents not otherwise regulated, i.e., under an air quality control permit, and evident in the storm water outflow;

(iv) All "no exposure" certifications must include the following certification statement, and be signed in accordance with the signatory requirements of § 122.22: "I certify under penalty of law that I have read and understand the eligibility requirements for claiming a condition of "no exposure" and obtaining an exclusion from NPDES storm water permitting; and that there are no discharges of storm water contaminated by exposure to industrial activities or materials from the industrial facility identified in this document (except as allowed under paragraph (g)(2)) of this section. I understand that I am obligated to submit a no exposure certification form once every five years to the NPDES permitting authority and, if requested, to the operator of the local MS4 into which this facility discharges (where applicable). I understand that I must allow the NPDES permitting authority, or MS4 operator where the discharge is into the local MS4, to perform inspections to confirm the condition of no exposure and to make such inspection reports publicly available upon request. I understand that I must obtain coverage under an NPDES permit prior to any point source discharge of storm water from the facility. I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based upon my inquiry of the person or persons who manage the system, or those persons directly involved in gathering the information, the information submitted is to the best of my knowledge and belief true, accurate and complete. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

4. Revise § 122.28(b)(2)(v) to read as follows:

§ 122.28 General permits (applicable to State NPDES programs, see § 123.25).

* * * * *

(b) * * *

(2) * * *

(v) Discharges other than discharges from publicly owned treatment works, combined sewer overflows, municipal

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separate storm sewer systems, primary industrial facilities, and storm water discharges associated with industrial activity, may, at the discretion of the Director, be authorized to discharge under a general permit without submitting a notice of intent where the Director finds that a notice of intent requirement would be inappropriate. In making such a finding, the Director shall consider: the type of discharge; the expected nature of the discharge; the potential for toxic and conventional pollutants in the discharges; the expected volume of the discharges; other means of identifying discharges covered by the permit; and the estimated number of discharges to be covered by the permit. The Director shall provide in the public notice of the general permit the reasons for not requiring a notice of intent.

* * * * *

5. Add §§ 122.30 through 122.37 to subpart B to read as follows:

§ 122.30 What are the objectives of the storm water regulations for small MS4s?

(a) Sections 122.30 through 122.37 are written in a "readable regulation" format that includes both rule requirements and EPA guidance that is not legally binding. EPA has clearly distinguished its recommended guidance from the rule requirements by putting the guidance in a separate paragraph headed by the word "guidance".

(b) Under the statutory mandate in section 402(p)(6) of the Clean Water Act, the purpose of this portion of the storm water program is to designate additional sources that need to be regulated to protect water quality and to establish a comprehensive storm water program to regulate these sources. (Because the storm water program is part of the National Pollutant Discharge Elimination System (NPDES) Program, you should also refer to § 122.1 which addresses the broader purpose of the NPDES program.)

(c) Storm water runoff continues to harm the nation's waters. Runoff from lands modified by human activities can harm surface water resources in several ways including by changing natural hydrologic patterns and by elevating pollutant concentrations and loadings. Storm water runoff may contain or mobilize high levels of contaminants, such as sediment, suspended solids, nutrients, heavy metals, pathogens, toxins, oxygen-demanding substances, and floatables.

(d) EPA strongly encourages partnerships and the watershed approach as the management framework for efficiently, effectively, and consistently protecting and restoring aquatic ecosystems and protecting public health.

§ 122.31 As a Tribe, what is my role under the NPDES storm water program?

As a Tribe you may:

(a) Be authorized to operate the NPDES program including the storm water program, after EPA determines that you are eligible for treatment in the same manner as a State under §§ 123.31 through 123.34 of this chapter. (If you do not have an authorized NPDES program, EPA implements the program for discharges on your reservation as well as other Indian country, generally.);

(b) Be classified as an owner of a regulated small MS4, as defined in § 122.32. (Designation of your Tribe as an owner of a small MS4 for purposes of this part is an approach that is consistent with EPA's 1984 Indian Policy of operating on a government-to-government basis with EPA looking to Tribes as the lead governmental authorities to address environmental issues on their reservations as appropriate. If you operate a separate storm sewer system that meets the definition of a regulated small MS4, you are subject to the requirements under §§ 122.33 through 122.35. If you are not designated as a regulated small MS4, you may ask EPA to designate you as such for the purposes of this part.); or

(c) Be a discharger of storm water associated with industrial activity or small construction activity under §§ 122.26(b)(14) or (b)(15), in which case you must meet the applicable requirements. Within Indian country, the NPDES permitting authority is generally EPA, unless you are authorized to administer the NPDES program.

§ 122.32 As an operator of a small MS4, am I regulated under the NPDES storm water program?

(a) Unless you qualify for a waiver under paragraph (c) of this section, you are regulated if you operate a small MS4, including but not limited to systems operated by federal, State, Tribal, and local governments, including State departments of transportation; and:

(1) Your small MS4 is located in an urbanized area as determined by the latest Decennial Census by the Bureau of the Census. (If your small MS4 is not located entirely within an urbanized area, only the portion that is within the urbanized area is regulated); or

(2) You are designated by the NPDES permitting authority, including where the designation is pursuant to §§ 123.35(b)(3) and (b)(4) of this chapter, or is based upon a petition under § 122.26(f).

(b) You may be the subject of a petition to the NPDES permitting authority to require an NPDES permit for your discharge of storm water. If the NPDES permitting authority determines that you need a permit, you are required to comply with §§ 122.33 through 122.35.

(c) The NPDES permitting authority may waive the requirements otherwise applicable to you if you meet the criteria of paragraph (d) or (e) of this section. If you receive a waiver under this section, you may subsequently be required to seek coverage under an NPDES permit in accordance with § 122.33(a) if circumstances change. (See also § 123.35(b) of this chapter.)

(d) The NPDES permitting authority may waive permit coverage if your MS4 serves a population of less than 1,000 within the urbanized area and you meet the following criteria:

(1) Your system is not contributing substantially to the pollutant loadings of a physically interconnected MS4 that is regulated by the NPDES storm water program (see § 123.35(b)(4) of this chapter); and

(2) If you discharge any pollutant(s) that have been identified as a cause of impairment of any water body to which you discharge, storm water controls are not needed based on wasteload allocations that are part of an EPA approved or established "total maximum daily load" (TMDL) that addresses the pollutant(s) of concern.

(e) The NPDES permitting authority may waive permit coverage if your MS4 serves a population under 10,000 and you meet the following criteria:

(1) The permitting authority has evaluated all waters of the U.S., including small streams, tributaries, lakes, and ponds, that receive a discharge from your MS4;

(2) For all such waters, the permitting authority has determined that storm water controls are not needed based on wasteload allocations that are part of an EPA approved or established TMDL that addresses the pollutant(s) of concern or, if a TMDL has not been developed or approved, an equivalent analysis that determines sources and allocations for the pollutant(s) of concern;

(3) For the purpose of this paragraph (e), the pollutant(s) of concern include biochemical oxygen demand (BOD), sediment or a parameter that addresses sediment (such as total suspended solids, turbidity or siltation), pathogens, oil and grease, and any pollutant that has been identified as a cause of impairment of any water body that will receive a discharge from your MS4; and

(4) The permitting authority has determined that future discharges from your MS4 do not have the potential to result in exceedances of water quality standards, including impairment of designated uses, or other significant water quality impacts, including habitat and biological impacts.

§ 122.33 If I am an operator of a regulated small MS4, how do I apply for an NPDES permit and when do I have to apply?

(a) If you operate a regulated small MS4 under § 122.32, you must seek coverage under a NPDES permit issued by your NPDES permitting authority. If you are located in an NPDES authorized State, Tribe, or Territory, then that State, Tribe, or Territory is your NPDES permitting authority. Otherwise, your NPDES permitting authority is the EPA Regional Office.

(b) You must seek authorization to discharge under a general or individual NPDES permit, as follows:

(1) If your NPDES permitting authority has issued a general permit applicable to your discharge and you are seeking coverage under the general permit, you must submit a Notice of Intent (NOI) that includes the information on your best management practices and measurable goals required by § 122.34(d). You may file your own NOI, or you and other municipalities or governmental entities may jointly submit an NOI. If you want to share responsibilities for meeting the minimum measures with other municipalities or governmental entities, you must submit an NOI that describes which minimum measures you will implement and identify the entities that will implement the other minimum measures within the area served by your MS4. The general permit will explain any other steps necessary to obtain permit authorization.

(2)(i) If you are seeking authorization to discharge under an individual permit and wish to implement a program under § 122.34, you must submit an application to your NPDES permitting authority that includes the information required under §§ 122.21(f) and 122.34(d), an estimate of square mileage served by your small MS4, and any additional information that your NPDES permitting authority requests. A storm sewer map that satisfies the requirement of § 122.34(b)(3)(i) will satisfy the map requirement in § 122.21(f)(7).

(ii) If you are seeking authorization to discharge under an individual permit and wish to implement a program that is different from the program under § 122.34, you will need to comply with the permit application requirements of § 122.26(d). You must submit both Parts of the application requirements in §§ 122.26(d)(1) and (2) by March 10, 2003. You do not need to submit the information required by §§ 122.26(d)(1)(ii) and (d)(2) regarding your legal authority, unless you intend for the permit writer to take such information into account when developing your other permit conditions.

(iii) If allowed by your NPDES permitting authority, you and another regulated entity may jointly apply under either paragraph (b)(2)(i) or (b)(2)(ii) of this section to be co-permittees under an individual permit.

(3) If your small MS4 is in the same urbanized area as a medium or large MS4 with an NPDES storm water permit and that other MS4 is willing to have you participate in its storm water program, you and the other MS4 may jointly seek a modification of the other MS4 permit to include you as a limited co-permittee. As a limited co-permittee, you will be responsible for compliance with the permit's conditions applicable to your jurisdiction. If you choose this option you will need to comply with the permit application requirements of § 122.26, rather than the requirements of § 122.34. You do not need to comply with the specific application requirements of § 122.26(d)(1)(iii) and (iv) and (d)(2)(iii) (discharge characterization). You may satisfy the requirements in § 122.26 (d)(1)(v) and (d)(2)(iv) (identification of a management program) by referring to the other MS4's storm water management program.

(4) Guidance: In referencing an MS4's storm water management program, you should briefly describe how the existing plan will address discharges from your small MS4 or would need to be supplemented in order to adequately address your discharges. You should also explain your role in coordinating storm water pollutant control activities in your MS4, and detail the resources available to you to accomplish the plan.

(c) If you operate a regulated small MS4:

(1) Designated under § 122.32(a)(1), you must apply for coverage under an NPDES permit, or apply for a modification of an existing NPDES permit under paragraph (b)(3) of this section by March 10, 2003, unless your MS4 serves a jurisdiction with a population under 10,000 and the NPDES permitting authority has established a phasing schedule under § 123.35(d)(3) of this chapter.

(2) Designated under § 122.32(a)(2), you must apply for coverage under an NPDES permit, or apply for a modification of an existing NPDES permit under paragraph (b)(3) of this section, within 180 days of notice, unless the NPDES permitting authority grants a later date.

§ 122.34 As an operator of a regulated small MS4, what will my NPDES MS4 storm water permit require?

(a) Your NPDES MS4 permit will require at a minimum that you develop, implement, and enforce a storm water management program designed to reduce the discharge of pollutants from your MS4 to the maximum extent practicable (MEP), to protect water quality, and to satisfy the appropriate water quality requirements of the Clean Water Act. Your storm water management program must include the minimum control measures described in paragraph (b) of this section unless you apply for a permit under § 122.26(d). For purposes of this section, narrative effluent limitations requiring implementation of best management practices (BMPs) are generally the most appropriate form of effluent limitations when designed to satisfy technology requirements (including reductions of pollutants to the maximum extent practicable) and to protect water quality. Implementation of best management practices consistent with the provisions of the storm water management program required pursuant to this section and the provisions of the permit required pursuant to § 122.33 constitutes compliance with the standard of reducing pollutants to the "maximum extent practicable." Your NPDES permitting authority will specify a time period of up to 5 years from the date of permit issuance for you to develop and implement your program.

(b) *Minimum control measures*—(1) *Public education and outreach on storm water impacts.* (i) You must implement a public education program to distribute educational materials to the community or conduct equivalent outreach activities about the impacts of storm water discharges on water bodies and the steps that the public can take to reduce pollutants in storm water runoff.

(ii) Guidance: You may use storm water educational materials provided by your State, Tribe, EPA, environmental, public interest or trade organizations, or other MS4s. The public education program should inform individuals and households about the steps they can take to reduce storm water pollution, such as ensuring proper septic system maintenance, ensuring the proper use and disposal of landscape and garden chemicals including fertilizers and pesticides, protecting and restoring riparian vegetation, and properly disposing of used motor oil or

household hazardous wastes. EPA recommends that the program inform individuals and groups how to become involved in local stream and beach restoration activities as well as activities that are coordinated by youth service and conservation corps or other citizen groups. EPA recommends that the public education program be tailored, using a mix of locally appropriate strategies, to target specific audiences and communities. Examples of strategies include distributing brochures or fact sheets, sponsoring speaking engagements before community groups, providing public service announcements, implementing educational programs targeted at school age children, and conducting community-based projects such as storm drain stenciling, and watershed and beach cleanups. In addition, EPA recommends that some of the materials or outreach programs be directed toward targeted groups of commercial, industrial, and institutional entities likely to have significant storm water impacts. For example, providing information to restaurants on the impact of grease clogging storm drains and to garages on the impact of oil discharges. You are encouraged to tailor your outreach program to address the viewpoints and concerns of all communities, particularly minority and disadvantaged communities, as well as any special concerns relating to children.

(2) *Public involvement/participation.* (i) You must, at a minimum, comply with State, Tribal and local public notice requirements when implementing a public involvement/participation program.

(ii) Guidance: EPA recommends that the public be included in developing, implementing, and reviewing your storm water management program and that the public participation process should make efforts to reach out and engage all economic and ethnic groups. Opportunities for members of the public to participate in program development and implementation include serving as citizen representatives on a local storm water management panel, attending public hearings, working as citizen volunteers to educate other individuals about the program, assisting in program coordination with other pre-existing programs, or participating in volunteer monitoring efforts. (Citizens should obtain approval where necessary for lawful access to monitoring sites.)

(3) *Illicit discharge detection and elimination.* (i) You must develop, implement and enforce a program to detect and eliminate illicit discharges (as defined at § 122.26(b)(2)) into your small MS4.

(ii) You must:

(A) Develop, if not already completed, a storm sewer system map, showing the location of all outfalls and the names and location of all waters of the United States that receive discharges from those outfalls;

(B) To the extent allowable under State, Tribal or local law, effectively prohibit, through ordinance, or other regulatory mechanism, non-storm water discharges into your storm sewer system and implement appropriate enforcement procedures and actions;

(C) Develop and implement a plan to detect and address non-storm water discharges, including illegal dumping, to your system; and

(D) Inform public employees, businesses, and the general public of hazards associated with illegal discharges and improper disposal of waste.

(iii) You need address the following categories of non-storm water discharges or flows (i.e., illicit discharges) only if you identify them as significant contributors of pollutants to your small MS4: water line flushing, landscape irrigation, diverted stream flows, rising ground waters, uncontaminated ground water infiltration (as defined at 40 CFR 35.2005(20)), uncontaminated pumped ground water, discharges from potable water sources, foundation drains, air conditioning condensation, irrigation water, springs, water from crawl space pumps, footing drains, lawn watering, individual residential car washing, flows from riparian habitats and wetlands, dechlorinated swimming pool discharges, and street wash water (discharges or flows from fire fighting activities are excluded from the effective prohibition against non-storm water and need only be addressed where they are identified as significant sources of pollutants to waters of the United States).

(iv) Guidance: EPA recommends that the plan to detect and address illicit discharges include the following four components: procedures for locating priority areas likely to have illicit discharges; procedures for tracing the source of an illicit discharge; procedures for removing the source of the discharge; and procedures for program evaluation and assessment. EPA recommends visually screening outfalls during dry weather and conducting field tests of selected pollutants as part of the procedures for locating priority areas. Illicit discharge education actions may include storm drain stenciling, a program to promote, publicize, and facilitate public reporting of illicit connections or discharges, and distribution of outreach materials.

(4) *Construction site storm water runoff control.* (i) You must develop, implement, and enforce a program to reduce pollutants in any storm water runoff to your small MS4 from construction activities that result in a land disturbance of greater than or equal to one acre. Reduction of storm water discharges from construction activity disturbing less than one acre must be included in your program if that construction activity is part of a larger common plan of development or sale that would disturb one acre or more. If the NPDES permitting authority waives requirements for storm water discharges associated with small construction activity in accordance with § 122.26(b)(15)(i), you are not required to develop, implement, and/or enforce a program to reduce pollutant discharges from such sites.

(ii) Your program must include the development and implementation of, at a minimum:

(A) An ordinance or other regulatory mechanism to require erosion and sediment controls, as well as sanctions to ensure compliance, to the extent allowable under State, Tribal, or local law;

(B) Requirements for construction site operators to implement appropriate erosion and sediment control best management practices;

(C) Requirements for construction site operators to control waste such as discarded building materials, concrete truck washout, chemicals, litter, and sanitary waste at the construction site that may cause adverse impacts to water quality;

(D) Procedures for site plan review which incorporate consideration of potential water quality impacts;

(E) Procedures for receipt and consideration of information submitted by the public, and

(F) Procedures for site inspection and enforcement of control measures.

(iii) Guidance: Examples of sanctions to ensure compliance include non-monetary penalties, fines, bonding requirements and/or permit denials for non-compliance. EPA recommends that procedures for site plan review include the review of individual pre-construction site plans to ensure consistency with local sediment and erosion control requirements. Procedures for site inspections and enforcement of control measures could include steps to identify priority sites for inspection and enforcement based on the nature of the construction activity, topography, and the characteristics of soils and receiving

water quality. You are encouraged to provide appropriate educational and training measures for construction site operators. You may wish to require a storm water pollution prevention plan for construction sites within your jurisdiction that discharge into your system. See § 122.44(s) (NPDES permitting authorities' option to incorporate qualifying State, Tribal and local erosion and sediment control programs into NPDES permits for storm water discharges from construction sites). Also see § 122.35(b) (The NPDES permitting authority may recognize that another government entity, including the permitting authority, may be responsible for implementing one or more of the minimum measures on your behalf.)

(5) *Post-construction storm water management in new development and redevelopment.*

(i) You must develop, implement, and enforce a program to address storm water runoff from new development and redevelopment projects that disturb greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale, that discharge into your small MS4. Your program must ensure that controls are in place that would prevent or minimize water quality impacts.

(ii) You must:

(A) Develop and implement strategies which include a combination of structural and/or non-structural best management practices (BMPs) appropriate for your community;

(B) Use an ordinance or other regulatory mechanism to address post-construction runoff from new development and redevelopment projects to the extent allowable under State, Tribal or local law; and

(C) Ensure adequate long-term operation and maintenance of BMPs.

(iii) Guidance: If water quality impacts are considered from the beginning stages of a project, new development and potentially redevelopment provide more opportunities for water quality protection. EPA recommends that the BMPs chosen: be appropriate for the local community; minimize water quality impacts; and attempt to maintain pre-development runoff conditions. In choosing appropriate BMPs, EPA encourages you to participate in locally-based watershed planning efforts which attempt to involve a diverse group of stakeholders including interested citizens. When developing a program that is consistent with this measure's intent, EPA recommends that you adopt a planning process that identifies the municipality's program goals (*e.g.*, minimize water quality impacts resulting from post-construction runoff from new development and redevelopment), implementation strategies (e.g., adopt a combination of structural and/or non-structural BMPs), operation and maintenance policies and procedures, and enforcement procedures. In developing your program, you should consider assessing existing ordinances, policies, programs and studies that address storm water runoff quality. In addition to assessing these existing documents and programs, you should provide opportunities to the public to participate in the development of the program. Non-structural BMPs are preventative actions that involve management and source controls such as: policies and ordinances that provide requirements and standards to direct growth to identified areas, protect sensitive areas such as wetlands and riparian areas, maintain and/or increase open space (including a dedicated funding source for open space acquisition), provide buffers along sensitive water bodies, minimize impervious surfaces, and minimize disturbance of soils and vegetation; policies or ordinances that encourage infill development in higher density urban areas, and areas with existing infrastructure; education programs for developers and the public about project designs that minimize water quality impacts; and measures such as minimization of percent impervious area after development and minimization of directly connected impervious areas. Structural BMPs include: storage practices such as wet ponds and extended-detention outlet structures; filtration practices such as grassed swales, sand filters and filter strips; and infiltration practices such as infiltration basins and infiltration trenches. EPA recommends that you ensure the appropriate implementation of the structural BMPs by considering some or all of the following: pre-construction review of BMP designs; inspections during construction to verify BMPs are built as designed; post-construction inspection and maintenance of BMPs; and penalty provisions for the noncompliance with design, construction or operation and maintenance. Storm water technologies are constantly being improved, and EPA recommends that your requirements be responsive to these changes, developments or improvements in control technologies.

(6) *Pollution prevention/good housekeeping for municipal operations.*

(i) You must develop and implement an operation and maintenance program that includes a training component and has the ultimate goal of preventing or reducing pollutant runoff from municipal operations. Using training materials that are available from EPA, your State, Tribe, or other organizations, your program must include employee training to prevent and reduce storm water pollution from activities such as park and open space maintenance, fleet and building maintenance, new construction and land disturbances, and storm water system maintenance.

(ii) Guidance: EPA recommends that, at a minimum, you consider the following in developing your program: maintenance activities, maintenance schedules, and long-term inspection procedures for structural and non-structural storm water controls to reduce floatables and other pollutants discharged from your separate storm sewers; controls for reducing or eliminating the discharge of pollutants from streets, roads, highways, municipal parking lots, maintenance and storage yards, fleet or maintenance shops with outdoor storage areas, salt/sand storage locations and snow disposal areas operated by you, and waste transfer stations; procedures for properly disposing of waste removed from the separate storm sewers and areas listed above (such as dredge spoil, accumulated sediments, floatables, and other debris); and ways to ensure that new flood management projects assess the impacts on water quality and examine existing projects for incorporating additional water quality protection devices or practices. Operation and maintenance should be an integral component of all storm water management programs. This measure is intended to improve the efficiency of these programs and require new programs where necessary. Properly developed and implemented operation and maintenance programs reduce the risk of water quality problems.

(c) If an existing qualifying local program requires you to implement one or more of the minimum control measures of paragraph (b) of this section, the NPDES permitting authority may include conditions in your NPDES permit that direct you to follow that qualifying program's requirements rather than the requirements of paragraph (b) of this section. A qualifying local program is a local, State or Tribal municipal storm water management program that imposes, at a minimum, the relevant requirements of paragraph (b) of this section.

(d)(1) In your permit application (either a notice of intent for coverage

under a general permit or an individual permit application), you must identify and submit to your NPDES permitting authority the following information:

(i) The best management practices (BMPs) that you or another entity will implement for each of the storm water minimum control measures at paragraphs (b)(1) through (b)(6) of this section;

(ii) The measurable goals for each of the BMPs including, as appropriate, the months and years in which you will undertake required actions, including interim milestones and the frequency of the action; and

(iii) The person or persons responsible for implementing or coordinating your storm water management program.

(2) If you obtain coverage under a general permit, you are not required to meet any measurable goal(s) identified in your notice of intent in order to demonstrate compliance with the minimum control measures in paragraphs (b)(3) through (b)(6) of this section unless, prior to submitting your NOI, EPA or your State or Tribe has provided or issued a menu of BMPs that addresses each such minimum measure. Even if no regulatory authority issues the menu of BMPs, however, you still must comply with other requirements of the general permit, including good faith implementation of BMPs designed to comply with the minimum measures.

(3) Guidance: Either EPA or your State or Tribal permitting authority will provide a menu of BMPs. You may choose BMPs from the menu or select others that satisfy the minimum control measures.

(e)(1) You must comply with any more stringent effluent limitations in your permit, including permit requirements that modify, or are in addition to, the minimum control measures based on an approved total maximum daily load (TMDL) or equivalent analysis. The permitting authority may include such more stringent limitations based on a TMDL or equivalent analysis that determines such limitations are needed to protect water quality.

(2) Guidance: EPA strongly recommends that until the evaluation of the storm water program in § 122.37, no additional requirements beyond the minimum control measures be imposed on regulated small MS4s without the agreement of the operator of the affected small MS4, except where an approved TMDL or equivalent analysis provides adequate information to develop more specific measures to protect water quality.

(f) You must comply with other applicable NPDES permit requirements, standards and conditions established in the individual or general permit, developed consistent with the provisions of §§ 122.41 through 122.49, as appropriate.

(g) *Evaluation and assessment*—(1) *Evaluation.* You must evaluate program compliance, the appropriateness of your identified best management practices, and progress towards achieving your identified measurable goals.

Note to Paragraph (g)(1): The NPDES permitting authority may determine monitoring requirements for you in accordance with State/Tribal monitoring plans appropriate to your watershed. Participation in a group monitoring program is encouraged.

(2) *Recordkeeping.* You must keep records required by the NPDES permit for at least 3 years. You must submit your records to the NPDES permitting authority only when specifically asked to do so. You must make your records, including a description of your storm water management program, available to the public at reasonable times during regular business hours (see § 122.7 for confidentiality provision). (You may assess a reasonable charge for copying. You may require a member of the public to provide advance notice.)

(3) *Reporting.* Unless you are relying on another entity to satisfy your NPDES permit obligations under § 122.35(a), you must submit annual reports to the NPDES permitting authority for your first permit term. For subsequent permit terms, you must submit reports in year two and four unless the NPDES permitting authority requires more frequent reports. Your report must include:

(i) The status of compliance with permit conditions, an assessment of the appropriateness of your identified best management practices and progress towards achieving your identified measurable goals for each of the minimum control measures;

(ii) Results of information collected and analyzed, including monitoring data, if any, during the reporting period;

(iii) A summary of the storm water activities you plan to undertake during the next reporting cycle;

(iv) A change in any identified best management practices or measurable goals for any of the minimum control measures; and

(v) Notice that you are relying on another governmental entity to satisfy some of your permit obligations (if applicable).

§ 122.35 As an operator of a regulated small MS4, may I share the responsibility to implement the minimum control measures with other entities?

(a) You may rely on another entity to satisfy your NPDES permit obligations to implement a minimum control measure if:

(1) The other entity, in fact, implements the control measure;

(2) The particular control measure, or component thereof, is at least as stringent as the corresponding NPDES permit requirement; and

(3) The other entity agrees to implement the control measure on your behalf. In the reports you must submit under § 122.34(g)(3), you must also specify that you rely on another entity to satisfy some of your permit obligations. If you are relying on another governmental entity regulated under section 122 to satisfy all of your permit obligations, including your obligation to file periodic reports required by § 122.34(g)(3), you must note that fact in your NOI, but you are not required to file the periodic reports. You remain responsible for compliance with your permit obligations if the other entity fails to implement the control measure (or component thereof). Therefore, EPA encourages you to enter into a legally binding agreement with that entity if you want to minimize any uncertainty about compliance with your permit.

(b) In some cases, the NPDES permitting authority may recognize, either in your individual NPDES permit or in an NPDES general permit, that another governmental entity is responsible under an NPDES permit for implementing one or more of the minimum control measures for your small MS4 or that the permitting authority itself is responsible. Where the permitting authority does so, you are not required to include such minimum control measure(s) in your storm water management program. (For example, if a State or Tribe is subject to an NPDES permit that requires it to administer a program to control construction site runoff at the State or Tribal level and that program satisfies all of the requirements of § 122.34(b)(4), you could avoid responsibility for the construction measure, but would be responsible for the remaining minimum control measures.) Your permit may be reopened and modified to include the requirement to implement a minimum control measure if the entity fails to implement it.

§ 122.36 As an operator of a regulated small MS4, what happens if I don't comply with the application or permit requirements in §§ 122.33 through 122.35?

NPDES permits are federally enforceable. Violators may be subject to the enforcement actions and penalties described in Clean Water Act sections 309 (b), (c), and (g) and 505, or under applicable State, Tribal, or local law. Compliance with a permit issued pursuant to section 402 of the Clean Water Act is deemed compliance, for purposes of sections 309 and 505, with sections 301, 302, 306, 307, and 403, except any standard imposed under section 307 for toxic pollutants injurious to human health. If you are covered as a co-permittee under an individual permit or under a general permit by means of a joint Notice of Intent you remain subject to the enforcement actions and penalties for the failure to comply with the terms of the permit in your jurisdiction except as set forth in § 122.35(b).

§ 122.37 Will the small MS4 storm water program regulations at §§ 122.32 through 122.36 and § 123.35 of this chapter change in the future?

EPA will evaluate the small MS4 regulations at §§ 122.32 through 122.36 and § 123.35 of this chapter after December 10, 2012 and make any necessary revisions. (EPA intends to conduct an enhanced research effort and compile a comprehensive evaluation of the NPDES MS4 storm water program. EPA will re-evaluate the regulations based on data from the NPDES MS4 storm water program, from research on receiving water impacts from storm water, and the effectiveness of best management practices (BMPs), as well as other relevant information sources.)

6. In § 122.44, redesignate paragraphs (k)(2) and (k)(3) as paragraphs (k)(3) and (k)(4), remove the comma at the end of newly redesignated paragraph (k)(3) and add a semicolon in its place, and add new paragraphs (k)(2) and (s) to read as follows:

§ 122.44 Establishing limitations, standards, and other permit conditions (applicable to State NPDES programs, see § 123.25).

* * * * *

(k) * * *

(2) Authorized under section 402(p) of CWA for the control of storm water discharges;

* * * * *

(s) *Qualifying State, Tribal, or local programs.* (1) For storm water discharges associated with small construction activity identified in § 122.26(b)(15), the Director may include permit conditions that incorporate qualifying State, Tribal, or local erosion and sediment control program requirements by reference. Where a qualifying State, Tribal, or local program does not include one or more of the elements in this paragraph (s)(1), then the Director must include those elements as conditions in the permit. A qualifying State, Tribal, or local erosion and sediment control program is one that includes:

(i) Requirements for construction site operators to implement appropriate erosion and sediment control best management practices;

(ii) Requirements for construction site operators to control waste such as discarded building materials, concrete truck washout, chemicals, litter, and sanitary waste at the construction site that may cause adverse impacts to water quality;

(iii) Requirements for construction site operators to develop and implement a storm water pollution prevention plan. (A storm water pollution prevention plan includes site descriptions, descriptions of appropriate control measures, copies of approved State, Tribal or local requirements, maintenance procedures, inspection procedures, and identification of non-storm water discharges); and

(iv) Requirements to submit a site plan for review that incorporates consideration of potential water quality impacts.

(2) For storm water discharges from construction activity identified in § 122.26(b)(14)(x), the Director may include permit conditions that incorporate qualifying State, Tribal, or local erosion and sediment control program requirements by reference. A qualifying State, Tribal or local erosion and sediment control program is one that includes the elements listed in paragraph (s)(1) of this section and any additional requirements necessary to achieve the applicable technology-based standards of "best available technology" and "best conventional technology" based on the best professional judgment of the permit writer.

7. Add § 122.62(a)(14) to read as follows:

§ 122.62 Modification or revocation and reissuance of permits (applicable to State programs, see § 123.25).

* * * * *

(a) * * *

(14) For a small MS4, to include an effluent limitation requiring implementation of a minimum control measure or measures as specified in § 122.34(b) when:

(i) The permit does not include such measure(s) based upon the determination that another entity was responsible for implementation of the requirement(s); and

(ii) The other entity fails to implement measure(s) that satisfy the requirement(s).

* * * * *

8. Revise Appendices F, G, H, and I to Part 122 to read as follows:

APPENDIX F TO PART 122.—INCORPORATED PLACES WITH POPULATIONS GREATER THAN 250,000 ACCORDING TO THE 1990 DECENNIAL CENSUS BY THE BUREAU OF THE CENSUS

State	Incorporated Place
Alabama	Birmingham.
Arizona	Phoenix.
	Tucson.
California	Long Beach.
	Los Angeles.
	Oakland.
	Sacramento.
	San Diego.
	San Francisco.
	San Jose.
Colorado	Denver.
District of Columbia	
Florida	Jacksonville.
	Miami.
	Tampa.
Georgia.	Atlanta.
Illinois	Chicago.
Indiana	Indianapolis.
Kansas	Wichita.
Kentucky	Louisville.
Louisiana	New Orleans.
Maryland	Baltimore.
Massachusetts	Boston.
Michigan	Detroit.
Minnesota	Minneapolis.
	St. Paul.
Missouri	Kansas City.
	St. Louis.
Nebraska	Omaha.
New Jersey	Newark.
New Mexico	Albuquerque.
New York	Buffalo.
	Bronx Borough.
	Brooklyn Borough.
	Manhattan Borough.
	Queens Borough.
	Staten Island Borough.
North Carolina	Charlotte.
Ohio	Cincinnati.
	Cleveland.
	Columbus.
	Toledo.
Oklahoma	Oklahoma City.
	Tulsa.
Oregon	Portland.
Pennsylvania	Philadelphia.
	Pittsburgh.
Tennessee	Memphis.
	Nashville/Davidson.
Texas	Austin.
	Dallas.
	El Paso.
	Fort Worth.
	Houston.

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APPENDIX F TO PART 122.—INCORPORATED PLACES WITH POPULATIONS GREATER THAN 250,000 ACCORDING TO THE 1990 DECENNIAL CENSUS BY THE BUREAU OF THE CENSUS—Continued

State	Incorporated Place
	San Antonio.
Virginia	Norfolk.
	Virginia Beach.
Washington	Seattle.
Wisconsin	Milwaukee.

APPENDIX G TO PART 122.—INCORPORATED PLACES WITH POPULATIONS GREATER THAN 100,000 BUT LESS THAN 250,000 ACCORDING TO THE 1990 DECENNIAL CENSUS BY THE BUREAU OF THE CENSUS

State	Incorporated place
Alabama	Huntsville.
	Mobile.
	Montgomery.
Alaska	Anchorage.
Arizona	Mesa.
	Tempe.
Arkansas	Little Rock.
California	Anaheim.
	Bakersfield.
	Berkeley.
	Chula Vista.
	Concord.
	El Monte.
	Escondido.
	Fremont.
	Fresno.
	Fullerton.
	Garden Grove.
	Glendale.
	Hayward.
	Huntington Beach.
	Inglewood.
	Irvine.
	Modesto.
	Moreno Valley.
	Oceanside.
	Ontario.
	Orange.
Colorado	Aurora.

APPENDIX G TO PART 122.—INCORPORATED PLACES WITH POPULATIONS GREATER THAN 100,000 BUT LESS THAN 250,000 ACCORDING TO THE 1990 DECENNIAL CENSUS BY THE BUREAU OF THE CENSUS—Continued

State	Incorporated place
	Colorado Springs.
	Lakewood.
	Pueblo.
Connecticut	Bridgeport.
	Hartford.
	New Haven.
	Stamford.
	Waterbury.
Florida	Fort Lauderdale.
	Hialeah.
	Hollywood.
	Orlando.
	St. Petersburg.
	Tallahassee.
Georgia	Columbus.
	Macon.
	Savannah.
Idaho	Boise City.
Illinois	Peoria.
	Rockford.
Indiana	Evansville.
	Fort Wayne.
	Gary.
	South Bend.
Iowa	Cedar Rapids.
	Davenport.
	Des Moines.
Kansas	Kansas City.
	Topeka.
Kentucky	Lexington-Fayette.
Louisiana	Baton Rouge.
	Shreveport.
Massachusetts	Springfield.
	Worcester.
Michigan	Ann Arbor.
	Flint.
	Grand Rapids.
	Lansing.
	Livonia.
	Sterling Heights.
	Warren.
Mississippi	Jackson.
Missouri	Independence.
	Springfield.
Nebraska	Lincoln.
Nevada	Las Vegas.
	Reno.

APPENDIX G TO PART 122.—INCORPORATED PLACES WITH POPULATIONS GREATER THAN 100,000 BUT LESS THAN 250,000 ACCORDING TO THE 1990 DECENNIAL CENSUS BY THE BUREAU OF THE CENSUS—Continued

State	Incorporated place
New Jersey	Elizabeth.
	Jersey City.
	Paterson.
New York	Albany.
	Rochester.
	Syracuse.
	Yonkers.
North Carolina	Durham.
	Greensboro.
	Raleigh.
	Winston-Salem.
Ohio	Akron.
	Dayton.
	Youngstown.
Oregon	Eugene.
Pennsylvania	Allentown.
	Erie.
Rhode Island	Providence.
South Carolina	Columbia.
Tennessee	Chattanooga.
	Knoxville.
Texas	Abilene.
	Amarillo.
	Arlington.
	Beaumont.
	Corpus Christi.
	Garland.
	Irving.
	Laredo.
	Lubbock.
	Mesquite.
	Pasadena.
	Plano.
	Waco.
Utah	Salt Lake City.
Virginia	Alexandria.
	Chesapeake.
	Hampton.
	Newport News.
	Portsmouth.
	Richmond.
	Roanoke.
Washington	Spokane.
	Tacoma.
Wisconsin	Madison.

APPENDIX H TO PART 122.—COUNTIES WITH UNINCORPORATED URBANIZED AREAS WITH A POPULATION OF 250,000 OR MORE ACCORDING TO THE 1990 DECENNIAL CENSUS BY THE BUREAU OF THE CENSUS

State	County	Unincorporated urbanized population
California	Los Angeles	886,780
	Sacramento	594,889
	San Diego	250,414
Delaware	New Castle	296,996
Florida	Dade	1,014,504
Georgia	DeKalb	448,686
Hawaii	Honolulu [1]	114,506
Maryland	Anne Arundel	344,654
	Baltimore	627,593
	Montgomery	599,028

APPENDIX H TO PART 122.—COUNTIES WITH UNINCORPORATED URBANIZED AREAS WITH A POPULATION OF 250,000 OR MORE ACCORDING TO THE 1990 DECENNIAL CENSUS BY THE BUREAU OF THE CENSUS—Continued

State	County	Unincorporated urbanized population
	Prince George's	494,369
Texas	Harris	729,206
Utah	Salt Lake	270,989
Virginia	Fairfax	760,730
Washington	King	520,468

[1] County was previously listed in this appendix; however, population dropped to below 250,000 in the 1990 Census.

APPENDIX I TO PART 122.—COUNTIES WITH UNINCORPORATED URBANIZED AREAS GREATER THAN 100,000 BUT LESS THAN 250,000 ACCORDING TO THE 1990 DECENNIAL CENSUS BY THE BUREAU OF THE CENSUS

State	County	Unincorporated urbanized population
Alabama	Jefferson	78,608
Arizona	Pima	162,202
California	Alameda	115,082
	Contra Costa	131,082
	Kern	128,503
	Orange	223,081
	Riverside	166,509
	San Bernardino	162,202
Colorado	Arapahoe	103,248
Florida	Broward	142,329
	Escambia	167,463
	Hillsborough	398,593
	Lee	102,337
	Manatee	123,828
	Orange	378,611
	Palm Beach	360,553
	Pasco	148,907
	Pinellas	255,772
	Polk	121,528
	Sarasota	172,600
	Seminole	127,873
Georgia	Clayton	133,237
	Cobb	322,595
	Fulton	127,776
	Gwinnett	237,305
	Richmond	126,476
Kentucky	Jefferson	239,430
Louisiana	East Baton Rouge	102,539
	Parish	331,307
	Jefferson Parish	.....
Maryland	Howard	157,972
North Carolina	Cumberland	146,827
Nevada	Clark	327,618
Oregon	Multnomah [1]	52,923
	Washington	116,687
South Carolina	Greenville	147,464
	Richland	130,589
Virginia	Arlington	170,936
	Chesterfield	174,488
	Henrico	201,367
	Prince William	157,131
Washington	Pierce	258,530
	Snohomish	157,218

[1] County was previously listed in this appendix; however, population dropped to below 100,000 in the 1990 Census.

PART 123—STATE PROGRAM REQUIREMENTS

1. The authority citation for part 123 continues to read as follows:

Authority: The Clean Water Act, 33 U.S.C. 1251 *et seq.*

2. Amend § 123.25 by removing the word "and" at the end of paragraph (a)(37), by removing the period at the end of paragraph (a)(38) and adding a semicolon in its place, and by adding paragraphs (a)(39) through (a)(45) to read as follows:

§ 123.25 Requirements for permitting.

(a) * * *

(39) § 122.30 (What are the objectives of the storm water regulations for small MS4s?);

(40) § 122.31 (For Indian Tribes only) (As a Tribe, what is my role under the NPDES storm water program?);

(41) § 122.32 (As an operator of a small MS4, am I regulated under the NPDES storm water program?);

(42) § 122.33 (If I am an operator of a regulated small MS4, how do I apply for an NPDES permit? When do I have to apply?);

(43) § 122.34 (As an operator of a regulated small MS4, what will my NPDES MS4 storm water permit require?);

(44) § 122.35 (As an operator of a regulated small MS4, may I share the responsibility to implement the minimum control measures with other entities?); and

(45) § 122.36 (As an operator of a regulated small MS4, what happens if I don't comply with the application or permit requirements in §§ 122.33 through 122.35?).

* * * * *

3. Add § 123.35 to subpart B to read as follows:

§ 123.35 As the NPDES Permitting Authority for regulated small MS4s, what is my role?

(a) You must comply with the requirements for all NPDES permitting authorities under Parts 122, 123, 124, and 125 of this chapter. (This section is meant only to supplement those requirements and discuss specific issues related to the small MS4 storm water program.)

(b) You must develop a process, as well as criteria, to designate small MS4s other than those described in § 122.32(a)(1) of this chapter, as regulated small MS4s to be covered under the NPDES storm water discharge control program. This process must include the authority to designate a small MS4 waived under paragraph (d) of this section if circumstances change. EPA may make designations under this section if a State or Tribe fails to comply with the requirements listed in this paragraph. In making designations of small MS4s, you must:

(1)(i) Develop criteria to evaluate whether a storm water discharge results in or has the potential to result in exceedances of water quality standards, including impairment of designated uses, or other significant water quality impacts, including habitat and biological impacts.

(ii) Guidance: For determining other significant water quality impacts, EPA recommends a balanced consideration of the following designation criteria on a watershed or other local basis: discharge to sensitive waters, high growth or growth potential, high population density, contiguity to an urbanized area, significant contributor of pollutants to waters of the United States, and ineffective protection of water quality by other programs;

(2) Apply such criteria, at a minimum, to any small MS4 located outside of an urbanized area serving a jurisdiction with a population density of at least 1,000 people per square mile and a population of at least 10,000;

(3) Designate any small MS4 that meets your criteria by December 9, 2002. You may wait until December 8, 2004 to apply the designation criteria on a watershed basis if you have developed a comprehensive watershed plan. You may apply these criteria to make additional designations at any time, as appropriate; and

(4) Designate any small MS4 that contributes substantially to the pollutant loadings of a physically interconnected municipal separate storm sewer that is regulated by the NPDES storm water program.

(c) You must make a final determination within 180 days from receipt of a petition under § 122.26(f) of this chapter (or analogous State or Tribal law). If you do not do so within that time period, EPA may make a determination on the petition.

(d) You must issue permits consistent with §§ 122.32 through 122.35 of this chapter to all regulated small MS4s. You may waive or phase in the requirements otherwise applicable to regulated small MS4s, as defined in § 122.32(a)(1) of this chapter, under the following circumstances:

(1) You may waive permit coverage for each small MS4s in jurisdictions with a population under 1,000 within the urbanized area where all of the following criteria have been met:

(i) Its discharges are not contributing substantially to the pollutant loadings of a physically interconnected regulated MS4 (see paragraph (b)(4) of this section); and

(ii) If the small MS4 discharges any pollutant(s) that have been identified as a cause of impairment of any water body to which it discharges, storm water controls are not needed based on wasteload allocations that are part of an EPA approved or established "total maximum daily load" (TMDL) that address the pollutant(s) of concern.

(2) You may waive permit coverage for each small MS4 in jurisdictions with a population under 10,000 where all of the following criteria have been met:

(i) You have evaluated all waters of the U.S., including small streams, tributaries, lakes, and ponds, that receive a discharge from the MS4 eligible for such a waiver.

(ii) For all such waters, you have determined that storm water controls are not needed based on wasteload allocations that are part of an EPA approved or established TMDL that addresses the pollutant(s) of concern or, if a TMDL has not been developed or approved, an equivalent analysis that determines sources and allocations for the pollutant(s) of concern.

(iii) For the purpose of paragraph (d)(2)(ii) of this section, the pollutant(s) of concern include biochemical oxygen demand (BOD), sediment or a parameter that addresses sediment (such as total suspended solids, turbidity or siltation), pathogens, oil and grease, and any pollutant that has been identified as a cause of impairment of any water body that will receive a discharge from the MS4.

(iv) You have determined that current and future discharges from the MS4 do not have the potential to result in exceedances of water quality standards, including impairment of designated uses, or other significant water quality impacts, including habitat and biological impacts.

(v) Guidance: To help determine other significant water quality impacts, EPA recommends a balanced consideration of the following criteria on a watershed or other local basis: discharge to sensitive waters, high growth or growth potential, high population or commercial density, significant contributor of pollutants to waters of the United States, and ineffective protection of water quality by other programs.

(3) You may phase in permit coverage for small MS4s serving jurisdictions with a population under 10,000 on a schedule consistent with a State watershed permitting approach. Under this approach, you must develop and implement a schedule to phase in permit coverage for approximately 20 percent annually of all small MS4s that qualify for such phased-in coverage. Under this option, all regulated small MS4s are required to have coverage under an NPDES permit by no later than March 8, 2007. Your schedule for phasing in permit coverage for small MS4s must be approved by the Regional Administrator no later than December 10, 2001.

(4) If you choose to phase in permit coverage for small MS4s in jurisdictions with a population under 10,000, in accordance with paragraph (d)(3) of this section, you may also provide waivers in accordance with paragraphs (d)(1) and (d)(2) of this section pursuant to your approved schedule.

(5) If you do not have an approved schedule for phasing in permit coverage, you must make a determination whether to issue an NPDES permit or allow a waiver in accordance with paragraph (d)(1) or (d)(2) of this section, for each eligible MS4 by December 9, 2002.

(6) You must periodically review any waivers granted in accordance with paragraph (d)(2) of this section to determine whether any of the information required for granting the waiver has changed. At a minimum, you must conduct such a review once every five years. In addition, you must consider any petition to review any waiver when the petitioner provides evidence that the information required for granting the waiver has substantially changed.

(e) You must specify a time period of up to 5 years from the date of permit issuance for operators of regulated small MS4s to fully develop and implement their storm water program.

(f) You must include the requirements in §§ 122.33 through 122.35 of this chapter in any permit issued for regulated small MS4s or develop permit limits based on a permit application submitted by a regulated small MS4. (You may include conditions in a regulated small MS4 NPDES permit that direct the MS4 to follow an existing qualifying local program's requirements, as a way of complying with some or all of the requirements in § 122.34(b) of this chapter. See § 122.34(c) of this chapter. Qualifying local, State or Tribal program requirements must impose, at a minimum, the relevant requirements of § 122.34(b) of this chapter.)

(g) If you issue a general permit to authorize storm water discharges from small MS4s, you must make available a menu of BMPs to assist regulated small MS4s in the design and implementation of municipal storm water management programs to implement the minimum measures specified in § 122.34(b) of this chapter. EPA plans to develop a menu of BMPs that will apply in each State or Tribe that has not developed its own menu. Regardless of whether a menu of BMPs has been developed by EPA, EPA encourages State and Tribal permitting authorities to develop a menu of BMPs that is appropriate for local conditions. EPA also intends to provide guidance on developing BMPs and measurable goals and modify, update, and supplement such guidance based on the assessments of the NPDES MS4 storm water program and research to be conducted over the next thirteen years.

(h)(1) You must incorporate any additional measures necessary to ensure effective implementation of your State or Tribal storm water program for regulated small MS4s.

(2) Guidance: EPA recommends consideration of the following:

(i) You are encouraged to use a general permit for regulated small MS4s;

(ii) To the extent that your State or Tribe administers a dedicated funding source, you should play an active role in providing financial assistance to operators of regulated small MS4s;

(iii) You should support local programs by providing technical and programmatic assistance, conducting research projects, performing watershed monitoring, and providing adequate legal authority at the local level;

(iv) You are encouraged to coordinate and utilize the data collected under several programs including water quality management programs, TMDL programs, and water quality monitoring programs;

(v) Where appropriate, you may recognize existing responsibilities among governmental entities for the control measures in an NPDES small MS4 permit (see § 122.35(b) of this chapter); and

(vi) You are encouraged to provide a brief (e.g., two page) reporting format to facilitate compiling and analyzing data from submitted reports under § 122.34(g)(3) of this chapter. EPA intends to develop a model form for this purpose.

PART 124—PROCEDURES FOR DECISIONMAKING

1. The authority citation for part 124 continues to read as follows:

Authority: Resource Conservation and Recovery Act, 42 U.S.C. 6901 *et seq.*; Safe Drinking Water Act, 42 U.S.C. 300(f) *et seq.*; Clean Water Act, 33 U.S.C. 1251 *et seq.*; Clean Air Act, 42 U.S.C. 7401 *et seq.*

2. Revise § 124.52(c) to read as follows:

§ 124.52 Permits required on a case-by-case basis.

* * * * *

(c) Prior to a case-by-case determination that an individual permit is required for a storm water discharge under this section (see § 122.26(a)(1)(v), (c)(1)(v), and (a)(9)(iii) of this chapter), the Regional Administrator may require the discharger to submit a permit application or other information regarding the discharge under section 308 of the CWA. In requiring such information, the Regional Administrator shall notify the discharger in writing and shall send an application form with the notice. The discharger must apply for a permit within 180 days of notice, unless permission for a later date is granted by the Regional Administrator. The question whether the initial designation was proper will remain open for consideration during the public comment period under § 124.11 or § 124.118 and in any subsequent hearing.

[FR Doc. 99–29181 Filed 12–7–99; 8:45 am]
BILLING CODE 6560–50–P

ENVIRONMENTAL PROTECTION AGENCY

[FRL–6472–8]

Report to Congress on the Phase II Storm Water Regulations

AGENCY: Environmental Protection Agency (EPA).

ACTION: Notice of availability of Report to Congress.

SUMMARY: EPA submitted a Report to Congress prior to promulgation of the new Phase II storm water regulations. The Report was required in the Agency's appropriation legislation for fiscal year 2000. The appropriation legislation also requires that USEPA invite public comment on the Report. By this notice, USEPA invites public comment.

DATES: Written comments on this notice and the Report to Congress must be submitted on or before January 7, 2000.

ADDRESSES: The Report to Congress on the Phase II Storm Water Regulations is available through the Internet on the EPA Office of Wastewater Management web site at http://www.epa.gov/owm/sw/phase2. Hard copies may be obtained by contacting the U.S. EPA Water Resource Center, 401 M Street, S.W., Washington, D.C. 20460; telephone: (202) 260–7786 (24-hour voice mail), fax: (202) 260–0386, e-mail: center.resource@epa.gov. Comments should be mailed to George Utting, USEPA, Office of Wastewater Management, Mail Code 4203, 401 M Street, S.W., Washington, D.C. 20460. Comments also may be faxed to (202) 260–1460 or submitted via the Internet to sw2@epamail.epa.gov.

FOR FURTHER INFORMATION CONTACT: George Utting, Office of Wastewater Management, Mail Code 4203, 401 M Street, S.W., Washington, D.C. 20460; telephone (202) 260–9530; email: sw2@epamail.epa.gov.

SUPPLEMENTARY INFORMATION: On October 29, 1999, the Administrator of EPA signed a regulation that implements Section 402(p)(6) of the Clean Water Act. This rulemaking is referred to as the final Phase II storm water rule and is also published in today's **Federal Register**.

The Phase II storm water rule expands the existing National Pollutant Discharge Elimination System (NPDES) permitting program to address storm water runoff from construction sites between one and five acres and municipal separate storm sewer systems in urbanized areas serving populations of less than 100,000. The Phase II rule builds on the existing Phase I program, which controls storm water runoff from municipalities with populations greater than 100,000 and 11 industrial categories, including construction disturbing over five acres.

Statutory Authority

The Report to Congress on the Phase II Storm Water Regulations was required by section 431(a) of the Departments of Veterans Affairs and Housing and Urban Development and Independent Agencies Appropriations Act of 2000, Public Law 106–74 (1999) (Appropriations Act). Section 431(a) of the Appropriations Act directed EPA to submit a report that addresses the following issues with respect to the Phase II Storm Water Rule: (1) An analysis of the impact of the rule on local governments, (2) an explanation of the rationale for lowering the threshold for regulation of construction sites from 5 acres to 1 acre, (3) an explanation of why the coverage of the regulation is based on a census-determined population instead of a water quality threshold and documentation that storm water runoff is generally a problem in communities with populations of 50,000 to 100,000, and (4) information that supports the position of the Administrator that the Phase II storm water program should be administered as part of the NPDES permit program.

On October 28, 1999, EPA delivered to the Committee on Environment and Public Works in the Senate and the Committee on Transportation and Infrastructure in the House of Representatives a report that satisfied the mandate of section 431(a). Section 431(c) of the Appropriations Act directs EPA to publish the report in the **Federal Register** for public comment. By today's notice, EPA invites public comment by January 7, 2000. EPA will carefully review and evaluate comments received and determine whether the comments warrant further action.

Dated: November 4, 1999.

J. Charles Fox,

Assistant Administrator, Office of Water.

[FR Doc. 99–29301 Filed 12–7–99; 8:45 am]

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EPA

United States
Environmental Protection Agency
(4203)
Washington, DC 20460

Official Business
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049918

United States
Environmental Protection
Agency

Office of Water
(4204)

EPA 833-R-00-002
March 2000
049919

Storm Water Phase II Compliance Assistance Guide

Compliance Guide Notice

The statements in this document are intended solely as guidance to aid regulated entities in complying with the Storm Water Phase II final rule. The guidance is not a substitute for reading the regulation and understanding all its requirements as it applies to your facility. This guidance does not constitute rulemaking by the EPA and may not be relied on to create a substantive or procedural right or benefit enforceable, at law or in equity, by any person. EPA may decide to update this guide without public notice to reflect changes in EPA's approach to implementing Storm Water Phase II or to clarify and update text. To determine whether EPA has revised this document and/or to obtain copies, go to EPA's web site at www.epa.gov/owm/sw/phase2.

1.0 INTRODUCTION

After reading this introduction, you should know whether you need to use this guide, what the guide covers, and where to get the latest information on the regulation.

The U.S. Environmental Protection Agency (EPA) published the regulation entitled "National Pollutant Discharge Elimination System - Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges" (*Federal Register*, Volume 64, Number 235, pages 68722-68852) on December 8, 1999 as required by Section 402(p) of the Clean Water Act (CWA). This guide explains how to tell if you are subject to the regulation and what to do if you are required to comply.

1.1 Who should use this guide?

This new rule regulates storm water discharges from two categories:

First, the rule covers storm water discharges to certain ***municipal separate storm sewer systems*** (MS4s). Public entities which operate these MS4s, such as cities, counties, States, and the Federal government, could be regulated under this rule. MS4 operators should read section 4 for more information.

Second, the rule also covers storm water discharges from ***construction activity*** generally disturbing between 1 and 5 acres. A construction operator could include the site owner, developer, contractor, or subcontractor. Construction site operators should read section 5 for more information.

The storm water Phase II final rule also provide regulatory relief for certain ***industrial facilities*** (currently permitted under EPA's storm water regulations) where storm water runoff is not exposed to industrial activities. Operators of industrial facilities interested in the no exposure exclusion should read section 6.

1.2 What Does this Guide Cover?

The purpose of this guide is to help the regulated community comply with the Storm Water Phase II Rule. This guide answers the following basic questions:

- Why is the Storm Water Phase II Rule important?
- Am I subject to the Storm Water Phase II Rule?
- What must I do to comply with the Storm Water Phase II Rule?

1.3 How Do I Use this Guide?

This guide is organized into seven major sections plus three appendices.

Section 1.0 Introduces you to this guide and the Storm Water Phase II Rule. Describes basic types of entities regulated so you can determine if you are affected by the rule.

Section 2.0 Provides background on why the Storm Water Phase II Rule is needed. Topics such as the environmental impacts of storm water and why storm water should be controlled are discussed. The history of the NPDES Storm Water program is briefly described.

Section 3.0 Delivers an overview of the Storm Water Phase II requirements. The basic components of the program are described and schedules and timelines are highlighted.

Section 4.0 Gives step-by-step procedures for operators of small MS4s to determine if they are subject to the regulation and provides information on how to demonstrate compliance.

Section 5.0 Gives step-by-step procedures for operators of small construction activities to determine if they are subject to the regulation and provides information on how to demonstrate compliance.

Section 6.0 Provides a discussion of how the Rule affects industrial facilities, including which industrial facilities are covered, and an explanation of the No Exposure exclusion and how to determine if you qualify.

Section 7.0 Documents the Compliance Assurance Process - Discusses how EPA will determine compliance, what happens if you or EPA discovers noncompliance, and the legal status of the guide.

Appendices Provides additional references and where to go for more information on storm water.

1.4 Where Can I Get More Information on the Storm Water Phase II Rule?

Additional information on the NPDES storm water Phase II rule, including a series of fact sheets and a full copy of the final rule, can be found on EPA's web pages at http://www.epa.gov/owm/sw/phase2.

Compliance assistance will be covered in Section 7 of the guide. One source for compliance assistance and information on the rule is the Local Government Environmental Assistance Network (LGEAN). LGEAN is one of EPA's compliance

assistance centers and can be found on the web at www.lgean.org or contacted by phone at 1-877-TO-LGEAN.

2.0 BACKGROUND

After reading section 2, you should understand the environmental impacts of storm water and the history of the storm water program, including existing regulations to control storm water (Phase I).

2.1 What are the Environmental Impacts from Storm Water Discharges?

Storm water runoff from lands modified by human activities can harm surface water and, in turn, cause or contribute to an exceedance of water quality standards by changing natural hydrologic patterns, accelerating natural stream flows, destroying aquatic habitat, and elevating pollutant concentrations and loadings. Such runoff may contain high levels of contaminants, such as sediment, suspended solids, nutrients (phosphorus and nitrogen), heavy metals, pathogens, toxins, oxygen-demanding substances (organic material), and floatables (U.S. EPA. 1992. *Environmental Impacts of Storm Water Discharges: A National Profile*. EPA 841-R-92-001. Office of Water. Washington, DC). After a rain, storm water runoff carries these pollutants into nearby streams, rivers, lakes, estuaries, wetlands, and oceans. Individually and combined, these pollutants impair water quality, threatening designated beneficial uses and causing habitat alteration and destruction.

The 1996 305(b) Report (U.S. EPA. 1998. The National Water Quality Inventory, 1996 Report to Congress. EPA 841-R-97-008. Office of Water. Washington, DC), provides a national assessment of water quality based on biennial reports submitted by the States as required under CWA section 305(b) of the CWA. In the CWA 305(b) reports, States, Tribes, and Territories assess their individual water quality control programs by examining the attainment or

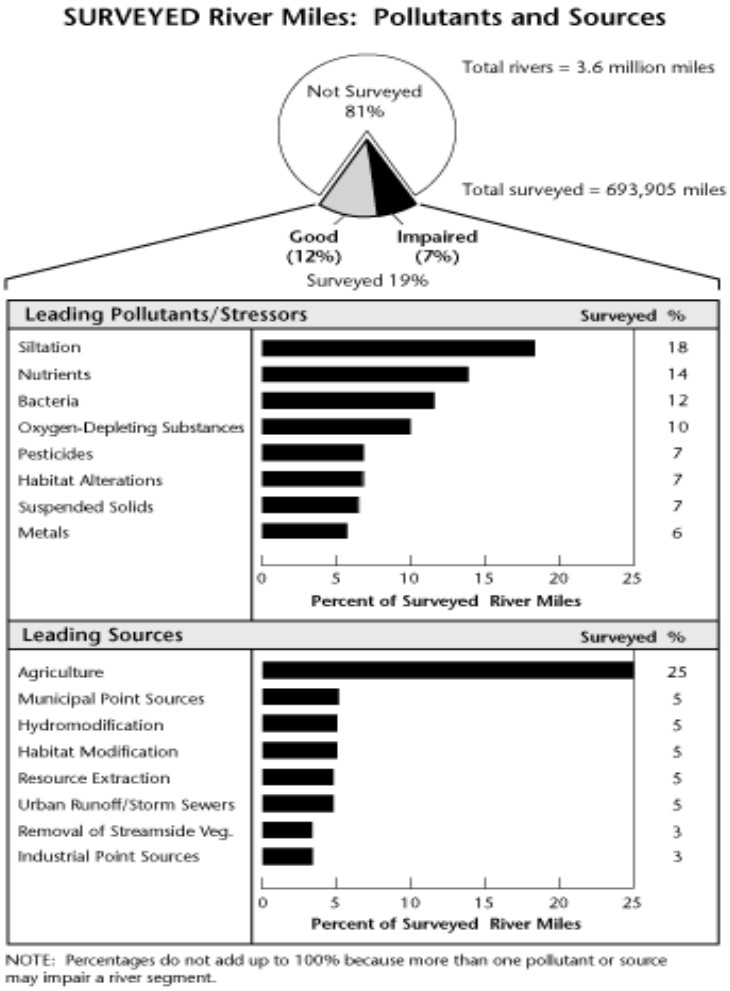

Figure 2-1. Pollutants and Sources in Surveyed River Miles (EPA, 1998)

nonattainment of the designated uses assigned to their rivers, lakes, estuaries, wetlands, and ocean shores. The 1996 Inventory indicated that approximately 40 percent of the Nation's assessed rivers, lakes, and estuaries are impaired.

The 1996 Inventory also found urban runoff/discharges from storm sewers to be a major source of water quality impairment nationwide. Urban runoff/storm sewers were found to be a source of pollution in 13 percent of impaired rivers; 21 percent of impaired lakes, ponds, and reservoirs; and 45 percent of impaired estuaries (second only to industrial discharges). See Figures 2-1 and 2-2 for an illustration of the pollutants and sources of pollution for both rivers and estuaries. In addition to these waterbodies, urban runoff was found to be the leading cause of ocean impairment for those ocean miles surveyed.

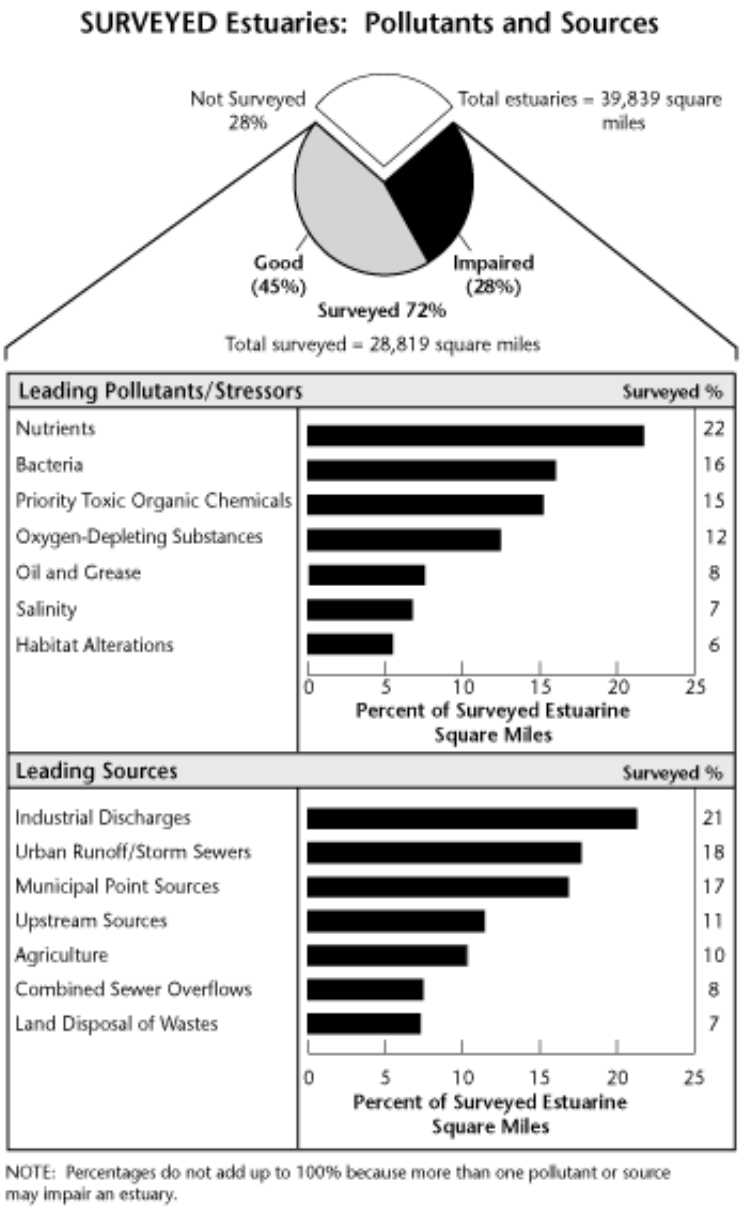

Figure 2-2. Pollutants and Sources in surveyed Estuaries (EPA, 1998)

Urbanization alters the natural infiltration capability of the land and generates a host of pollutants that are associated with the activities of dense populations, thus causing an increase in storm water runoff volumes and pollutant loadings in storm water discharged to receiving waterbodies (U.S. EPA, 1992). Urban development increases the amount of impervious surface in a watershed as farmland, forests, and meadowlands are converted into buildings with rooftops, driveways, sidewalks, roads, and parking lots with virtually no ability to absorb storm water. Storm water and snow-melt runoff wash over these impervious areas, picking up pollutants along the way while gaining speed and volume because of their inability to disperse and filter into the ground (see Figure 2-3 which illustrates the increased runoff resulting from increased impervious area). The resulting storm water flows are higher in volume, pollutants, and temperature than the flows in less impervious areas, which have more natural vegetation and soil to filter the runoff (U.S. EPA, 1997. *Urbanization and Streams: Studies of Hydrologic Impacts*.

EPA 841-R-97-009. Office of Water. Washington, DC).

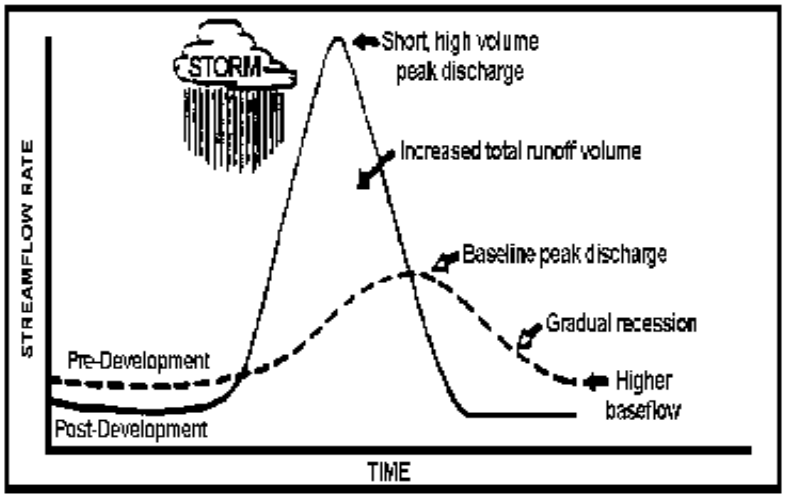

Figure 1. Impacts of urbanization on stream flow (Schueler, 1987).

In addition to the pollutants picked up by storm water runoff before it enters a storm drain, studies have shown that discharges from a storm drain system often include wastes and wastewater from non-storm water sources, referred to as illicit discharges. These discharges are 'illicit' because municipal storm sewer systems are not designed to accept, process, or discharge such wastes. Sources of illicit discharges can include sanitary wastewater illegally connected to the storm drain system; effluent from septic tanks; car wash, laundry, and other industrial wastewaters; improper disposal of auto and household toxics, such as used motor oil and pesticides; and spills from roadways.

Illicit discharges enter the system through either direct connections (e.g., wastewater piping either mistakenly or deliberately connected to the storm drains) or indirect connections (e.g., infiltration into the MS4 from cracked sanitary systems, spills collected by drain outlets, and paint or used oil dumped directly into a drain). The result is untreated discharges that contribute high levels of pollutants, including heavy metals, toxics, oil and grease, solvents, nutrients, viruses and bacteria into receiving waterbodies.

2.2 Summary of EPA's Storm Water Program

In 1972, Congress amended the Federal Water Pollution Control Act (commonly referred to as the Clean Water Act (CWA)) to prohibit the discharge of any pollutant to waters of the United States from a point source unless the discharge is authorized by an NPDES permit. The NPDES program is designed to track point sources and require the implementation of the controls necessary to minimize the discharge of pollutants. Initial efforts to improve water quality under the NPDES program primarily focused on reducing pollutants in industrial process wastewater and municipal sewage. These discharge sources were easily identified as responsible for poor water quality.

As pollution control measures for industrial process wastewater and municipal sewage were implemented and refined, it became increasingly evident that more diffuse sources of water pollution were also significant causes of water quality impairment. Specifically, storm water runoff was found to be a major cause of water quality impairment.

In 1987, Congress amended the CWA to require implementation, in two phases, of a comprehensive national program for addressing storm water discharges. The first phase of the program, commonly referred to as “Phase I,” was promulgated on November 16, 1990 (55 FR 47990). Phase I requires NPDES permits for storm water discharge from a large number of priority sources including medium and large municipal separate storm sewer systems (“MS4s”) generally serving populations of 100,000 or more and several categories of industrial activity, including construction activity that disturbs five or more acres of land.

The Phase I permits for municipal separate storm sewer systems mostly covere larger cities, and require them to develop a storm water management program, track and oversee industrial facilities regulated under the NPDES storm water program, conduct some monitoring, and submit periodic reports.

The operators of construction activities disturbing greater than 5 acres have been required to obtain NPDES permit coverage since 1992. General permits for large construction activity require construction operators to develop and implement a storm water pollution prevention plan to control erosion, sediment and other wastes on the site.

The Phase I industrial storm water program also regulates the following industrial sectors:

- facilities subject to EPA storm water effluent guidelines, new source performance standards, or toxic pollutant effluent standards
- heavy manufacturing facilities
- mining/oil and gas
- hazardous waste faciliites
- landfills
- recycling facilities
- steam electric power
- transportation facilities
- sewage treatment plants
- construction activity (described above), and
- light manufacturing facilities.

The second phase of the storm water program, which this guide addresses, requires permits for storm water discharges from certain small municipal separate storm sewer systems and construction activity generally disturbing between 1 and 5 acres. See Figure 2-4 for a summary of the federal storm water permit requirements under Phases I and II.

Figure 2-4. Summary of Federal Permit Requirements Under the NPDES Storm Water Program

	Municipal Separate Storm Sewer Systems (MS4s)	Construction Activity	Industrial Activity
Requirements in Effect Now (Phase I)	**Medium and Large MS4s** (§ 122.26(d)) • Storm Water Management Program: - Public education and outreach - Public participation efforts - Illicit discharge detection and elimination program - Construction and post-construction runoff control program for all construction activity (no size threshold) - BMPs to reduce pollutants from industrial, commercial, and residential areas • Track/oversee industrial facilities regulated under the NPDES storm water program • Conduct analytical and visual monitoring of MS4 discharges • Submit periodic program assessment reports	**Category (x) Construction Activity (5+ Acres)*** CGP: • Storm Water Pollution Prevention Plan (SWPPP) - Site description - Description of BMPs for erosion and sediment, post-construction storm water management, and other controls - Self-evaluation and reporting **Category (x) is one of the categories of "storm water discharges associated with industrial activity." Temporarily excluded from permitting: Category (x) construction activity operated by a municipality of <100,000 (ISTEA moratorium).*	**Ten Categories of Industrial Activity (Categories (i)-(ix),(xi))*** MSGP: • SWPPP - Site evaluation -Description of appropriate storm water management BMPs - Self-evaluation, monitoring, and reporting • If discharging into a medium or large MS4, notify the MS4 operator **Temporarily excluded from permitting: Industrial activity operated by a municipality of <100,000, except for power plants, airports, and uncontrolled sanitary landfills (ISTEA moratorium).*
Requirements that Will Be in Effect by 2003 (Phase II)	**Regulated Small MS4s** (§ 122.34 outlined here, but may choose permit coverage under § 122.26(d) instead) • Storm Water Management Program: - Public education and outreach - Public participation efforts - Illicit discharge detection and elimination program - Construction runoff control program for construction activity disturbing 1 acre or greater - Post-construction runoff control program for construction activity disturbing 1 acre or greater - Good housekeeping/pollution prevention for municipal operations • Conduct assessment of identified BMPs and measurable goals for each minimum control measure • Submit annual program assessment reports	**Small Construction Activity (≤1 and <5 Acres)** • Expected to be similar to Category (x) Construction Activity requirements above **Category (x) Construction Activity Operated by a Municipality of < 100,000** • Same requirements as for Category (x) Construction Activity above	**Industrial Activity Operated by a Municipality of <100,000*** • Same requirements as for Ten Categories of Industrial Activity above **Does not include: Power plants, airports, and uncontrolled sanitary landfills*

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3.0 REGULATION REQUIREMENTS

After reading section 3.0, you should understand the basic components and requirements of the Storm Water Phase II Rule and the rule's compliance schedule/timeline. This information is meant to serve as a basis for understanding the details of the Rule as discussed in further sections of this guidance.

3.1 What Does The Storm Water Phase II Rule Require?

This regulation can be divided into three main components, each with distinct requirements, affecting three types of entities. These components and the requirements for each are summarized below.

Regulated Small MS4s (see section 4.0)

A certain subset of operators of small MS4s (primarily those located in urbanized areas) are required to implement programs and practices to control polluted storm water runoff from the jurisdiction serviced by the MS4. The operator must design its storm water management program to satisfy applicable CWA water quality requirements and technology standards. The program must include the development and implementation of best management practices (BMPs) and measurable goals for the following six minimum measures, and include evaluation and reporting efforts:

- Public education and outreach,
- Public participation/involvement,
- Illicit discharge detection and elimination,
- Construction site runoff control,
- Post-construction runoff control, and
- Pollution prevention/good housekeeping for municipal operations.

Two waivers from coverage are available for small MS4s brought into the program by the Phase II regulation.

Small Construction Activity (see section 5.0)

All construction operators disturbing more than 1 acre and less than 5 acres are required to apply for an NPDES storm water permit for small construction activity. EPA already regulates construction activity disturbing more than 5 acres. A construction operator is usually the developer or landowner, but can also be the contractor or another party responsible for the operational control of erosion and sediment control practices on site.

Unlike the requirements for regulated small MS4s, the requirements for small construction activity (primarily activity disturbing between 1 and 5 acres of land) are not detailed in the Phase II regulation. Rather, the requirements are left to the discretion of the NPDES permitting authority when it develops the small construction activity permit. EPA expects the permit for small construction activity to be similar to the existing storm water general permits for large construction activity regulated under the Phase I program. EPA's existing Construction General Permit includes requirements to:

- Submit a Notice of Intent (NOI);
- Develop and implement a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP includes erosion and sediment controls, controls on waste at the site, self-inspection/monitoring, and reporting efforts; and
- Submit a Notice of Termination (NOT) when permit coverage is no longer necessary.

Two waivers from coverage are available for small construction activity.

Industrial Activity (see section 6.0)

Eleven categories of industrial activity are regulated under Phase I of the NPDES Storm Water Program. Under the Phase II Rule, no new categories of industrial activity are designated into the storm water program. The Rule does, however, include a revised no exposure exclusion that is available to all regulated categories of industrial activity (except category (x) - large construction activity) if the facility operator can certify that storm water runoff is not exposed to industrial activities.

Also, this regulation further extends the deadline to obtain permit coverage for those industrial activities operated by municipalities with populations of less than 100,000 that were temporarily exempted from permitting under the Intermodal Surface Transportation Enforcement Act (ISTEA) of 1991.

3.2 What Is the Phase II Rule's Compliance Schedule/Timeline?

The Phase II Final Rule was published in the *Federal Register* on December 8, 1999 (64 *FR* 68722). The following table lists milestones for EPA, the NPDES permitting authorities, and the regulated community under this program.

Storm Water Phase II Program Compliance Timeline

ACTIVITY	DEADLINE
Conditional No Exposure Exclusion option available in States where EPA is the NPDES permitting authority	February 7, 2000
Submission of No Exposure Certification	Every 5 years
EPA issues a menu of BMPs for small MS4 programs	October 2000
EPA issues a model general permit for small MS4s	October 2000
EPA issues guidance on measurable goals for small MS4 programs	October 2001
NPDES permitting authority determines designation of small MS4s located outside of an urbanized area that serve a jurisdiction with a population of 10,000 and population density of 1,000	By December 9, 2002; or by December 8, 2004 if apply designation criteria on a watershed basis under a comprehensive watershed plan
NPDES permitting authority determines waivers for regulated small MS4s in urbanized areas	By December 9, 2002
NPDES permitting authority issues general permits for regulated small MS4s and small construction activity	By December 9, 2002
Operators of regulated small MS4s and small construction activity designated by the rule must obtain permit coverage	By March 10, 2003
Operators of regulated small MS4s and small construction activity designated by NPDES permitting authority must obtain permit coverage	Within 180 days of notice
Temporarily exempted municipal operators of industrial activity must obtain permit coverage (ISTEA moratorium)	By March 10, 2003
The NPDES permitting authority may phase in coverage for small MS4s serving jurisdictions with a populations less than 10,000 on a schedule consistent with a State watershed permitting approach	Completion of phase-in by March 8, 2007
The regulated small MS4s must fully implement their storm water management programs	By the end of the first permit term – typically a 5-year period
Re-evaluation of the Phase II small MS4 regulations by EPA	By December 2012
NPDES permitting authority determination on a petition for designation of a non-regulated storm water discharger	Within 180 days of receipt

4.0 REGULATED SMALL MS4S

After reading section 4.0, you should understand what an MS4 is, which operators of MS4s are subject to the Phase II small MS4 regulations (including who may be waived from coverage), the small MS4 permit options, and the permit requirements for a small MS4 storm water management program. The discussion of these elements concludes with a step-by-step review of the process for compliance with the small MS4 program and possible funding options. Special concerns regarding Federal and State-operated small MS4s are also addressed.

4.1 MS4 DEFINITIONS

EPA's National Pollutant Discharge Elimination System (NPDES) storm water permitting program labels municipal separate storm sewer systems (MS4s) as either "small," " medium," or "large" for the purposes of regulation. The definitions of each are included herein. The Phase I storm water program covers medium and large MS4s. The Phase II storm water regulation covers a certain subset of small MS4s, known as "regulated small" MS4s. Regulated small MS4 coverage under the rule is discussed in section 4.2.

4.1.1 What is an "MS4"?

What constitutes a municipal separate storm sewer system (MS4) is often misinterpreted and misunderstood. The term MS4 does not solely refer to municipally-owned storm sewer systems, but rather is a term of art with a much broader application that can include, in addition to local jurisdictions, State departments of transportation, universities, local sewer districts, hospitals, military bases, and prisons. An MS4 also is not always just a system of underground pipes – it can include roads with drainage systems, gutters, and ditches. The regulatory definition of an MS4 is provided in the text box below.

According to 40 CFR 122.26(b)(8), "***municipal separate storm sewer*** means a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains):

(i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law)...including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the Clean Water Act that discharges into waters of the United States.

(ii) Designed or used for collecting or conveying storm water;

(iii) Which is not a combined sewer; and

(iv) Which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.2."

4.1.2 What is a "large" MS4?

A ***large* MS4** is any MS4 located in an incorporated place or county with a population of 250,000 or greater as of the 1990 Census. The Phase II Final Rule revised the original large MS4 definition (found in the 1990 Phase I regulations) by freezing it as of the 1990 Census so that no new large MS4s could be automatically designated based on the 2000 Census, or any subsequent Census. Listings of incorporated places and counties with populations of 250,000 or greater as of the 1990 Census are included in the revised Appendices F and H to Part 122, found in the Phase II Final Rule.

4.1.3 What is a "medium" MS4?

A ***medium* MS4** is any MS4 located in an incorporated place or county with a population between 100,000 - 249,999 as of the 1990 Census. The Phase II Final Rule revised the original medium MS4 definition (found in the 1990 Phase I regulations) by freezing it as of the 1990 Census so that no new medium MS4s could be automatically designated based on the 2000 Census, or any subsequent Census. Listings of incorporated places and counties with populations between 100,000 - 249,999 as of the 1990 Census are included in the revised Appendices G and I to Part 122, found in the Phase II Final Rule.

Important Note: Many MS4s in areas below 100,000 in population have been individually brought into the Phase I program by NPDES permitting authorities. Such already regulated MS4s are considered Phase I MS4s and are not required to develop a Phase II program.

4.1.4 What is a "small" MS4?

A ***small* MS4** is any MS4 that is not already regulated under the Phase I storm water program. Unlike the definitions of medium and large MS4s, the definition of a small MS4: 1) is not dependant on a population threshold, and 2) includes Federally-owned systems, such as military bases and veterans hospitals.

4.2 COVERAGE: Who Is Subject to the Phase II Final Rule?

4.2.1 Are All Small MS4s Covered by the Phase II Final Rule?

No. The universe of small MS4s is quite large since it includes every MS4 except for the approximately 900 medium and large MS4s already regulated under the Phase I storm water program. Only a select sub-set of small MS4s, referred to as ***regulated* small MS4s**, are covered by the Phase II Final Rule, either through automatic nationwide designation by the rule or designation on a case-by-case basis by the NPDES permitting authority.

4.2.2 How Is A Small MS4 Designated as a Regulated Small MS4 under Phase II?

A *small* MS4 can be designated as a *regulated small* MS4, and thereby be subject to the Phase II rule, in any one of the three ways explained in the following subsections.

4.2.2.1 Automatic Nationwide Designation by the Rule

The Phase II Final Rule requires "automatic" nationwide coverage of all operators of small MS4s that are located within the boundaries of a Bureau of the Census-delineated “urbanized area” (UA) based on the latest decennial Census. This doesn't just include municipal operators of small MS4s, but also universities, highway departments, and any other operator of a storm sewer system that is located fully or partially within the UA. **Refer to section 4.3 for more information on how to determine if a particular small MS4 is located within a UA.**

> **Important Note:** Only the portion of the small MS4 that is located within the UA boundaries is regulated under Phase II. For example, if a county operates a small MS4 that serves the whole county but only half of the MS4 falls within the UA boundary, then the county must obtain permit coverage (and implement a storm water management program) only for the half of the MS4 in the UA.

Once a small MS4 is designated into the program based on the UA boundaries, it cannot be waived from the program if in a subsequent UA calculation the small MS4 is no longer within the UA boundaries. An automatically designated small MS4 remains regulated unless, or until, it meets the criteria for a waiver. See section 4.4 for more information on waivers from coverage for regulated small MS4s in urbanized areas.

An operator of a small MS4 located outside of a UA boundary may be designated as a regulated small MS4 if the NPDES permitting authority determines that the small MS4's discharges cause, or have the potential to cause, an adverse impact on water quality. See sections 4.2.2.2 and 4.2.2.3 below for more information on designations by the permitting authority.

Preamble of the Phase II Final Rule: Appendix 6

A listing of governmental entities that are located either fully or partially within a UA according to the 1990 Census can be found in Appendix 6 to the Preamble of the Phase II Final Rule. The list is a general geographic reference intended to help operators of small MS4s determine whether or not they are located in a UA and, consequently, required to comply with the regulation; it is not a list of all Phase II regulated MS4s and it may contain errors. For example, the list does not include small MS4 operators such as colleges and universities, Federal prison complexes, and State highway departments located within a UA.

4.2.2.2 Potential Designation by the NPDES Permitting Authority — Required Evaluation of 10,000/1,000 Areas

The Phase II Final Rule requires the NPDES permitting authority to develop a set of designation criteria and apply them, *at a minimum*, to all small MS4s located outside of a UA that serve a jurisdiction with a population of at least 10,000 and a population density of at least 1,000 people/square mile. The permitting authority is required to *evaluate* such small MS4s but is not required to *designate* them into the program unless they meet the designation criteria.

Recommended Designation Criteria

EPA recommends in the Phase II regulations that the NPDES permitting authority use a balanced consideration of the following designation criteria on a watershed or other local basis:

- ✔ Discharge to sensitive waters;
- ✔ High population density;
- ✔ High growth or growth potential;
- ✔ Contiguity to a UA;
- ✔ Significant contributor of pollutants to waters of the United States; and
- ✔ Ineffective protection of water quality concerns by other programs.

Preamble of the Phase II Final Rule: Appendix 7

A listing of governmental entities located outside of a UA that have a population of at least 10,000 and a population density of at least 1,000 people per square mile, can be found in Appendix 7 to the Preamble of the Phase II Final Rule. Similar to Appendix 6, the list is a geographic reference only – it is not a list of regulated entities and it may contain errors. Operators of small MS4s located within a listed area could be examined by their NPDES permitting authority for potential designation into the Phase II

program. Furthermore, the NPDES permitting authority reserves the right to designate for regulation any small MS4 that is contributing pollutants to waters of the United States, whether or not its jurisdiction is found in Appendix 7.

Deadline for Designation

The NPDES permitting authority is required to designate small MS4s meeting the designation criteria by December 9, 2002, or by December 8, 2004 if a comprehensive State watershed plan is in place and the criteria are being applied on a watershed basis.

4.2.2.3 Potential Designation by the NPDES Permitting Authority — Physically Interconnected

The Phase II Final Rule requires the NPDES permitting authority to designate any small MS4 located outside of a UA that contributes substantially to the pollutant loadings of a *physically interconnected* MS4 that is permitted by the NPDES storm water program. This means the other MS4 could be a large, medium, or regulated small MS4.

Small MS4s located right outside the boundary of an urbanized area are the ones most likely to meet this criterion for designation and, therefore, should make an effort to become aware of whether they discharge pollutants directly into a regulated MS4. The sooner a small MS4 operator is prepared for potential designation and implementation of the Phase II program, the better.

> ***Physically interconnected*** means that one MS4 is connected to a second MS4 in such a way that it allows for *direct* discharges into the second system.

Deadline for Designation

The final rule does not set a deadline for designation of small MS4s meeting this criterion.

4.3 URBANIZED AREAS: What Are They and How Does a Small MS4 Operator Determine If It Is Located in One?

As discussed in section 4.2, the Phase II Final Rule covers all small municipal separate storm sewer systems (MS4s) located within an “urbanized area” (UA). Based on the 1990 Census, there are 405 UAs in the United States that cover 2 percent of total U.S. land area and contain approximately 63 percent of the Nation’s population. These numbers include Puerto Rico — the only U.S. Territory with UAs.

UAs constitute the largest and most dense areas of settlement. UA calculations delineate boundaries around these dense areas of settlement and, in doing so, identify the areas of concentrated development. UA designations are used for several

purposes in both the public and private sectors. For example, the Federal Government has used UAs to calculate allocations for transportation funding, and some planning agencies and development firms use UA boundaries to help ascertain current, and predict future, growth areas.

4.3.1. What Is the Definition of an Urbanized Area (UA)?

The Bureau of the Census determines UAs by applying a detailed set of published UA criteria (see 55 *FR* 42592, October 22, 1990) to the latest decennial census data. Although the full UA definition is complex, the Bureau of the Census' general definition of a UA, based on population and population density, is provided below.

> An ***urbanized area*** (**UA**) is a land area comprising one or more places – central place(s) – and the adjacent densely settled surrounding area – urban fringe – that together have a residential population of at least 50,000 and an overall population density of at least 1,000 people per square mile. It is a calculation used by the Bureau of the Census to determine the geographic boundaries of the most heavily developed and dense urban areas.

UA Facts:

- The basic unit for delineating the UA boundary is the census block. Census blocks are based on visible physical boundaries, such as the city block, when possible, or on invisible political boundaries, when not. An urbanized area can comprise places, counties, Federal Indian Reservations, and minor civil divisions (MCDs - towns and townships).

- A UA can include governmental entities of every population size: 200; 7,000; 15,000; 30,000, 200,000; or 3 million! Entities with small populations are commonly found in the urban fringe of the UA.

- Before the time of permit issuance (by December 9, 2002), new UA calculations based on the 2000 Census should be published. The regulated small MS4 universe then will be based on these new calculations.

4.3.2. What Does A UA Look Like?

The drawing below (see Figure 4-1) is a simplified UA illustration that demonstrates the concept of UAs in relation to the Phase II Final Rule. This "urbanized area" includes within its boundaries incorporated places, a portion of a Federal Indian reservation, an entire MCD, a portion of another MCD, and portions of two counties. Any and all operators of small MS4s located within the boundaries of the UA are covered under the Phase II Final Rule, regardless of political boundaries. Operators of small MS4s located outside of the UA are subject to potential designation into the Phase II MS4 program by the NPDES permitting authority, as explained in section 4.2.

Figure 4-1

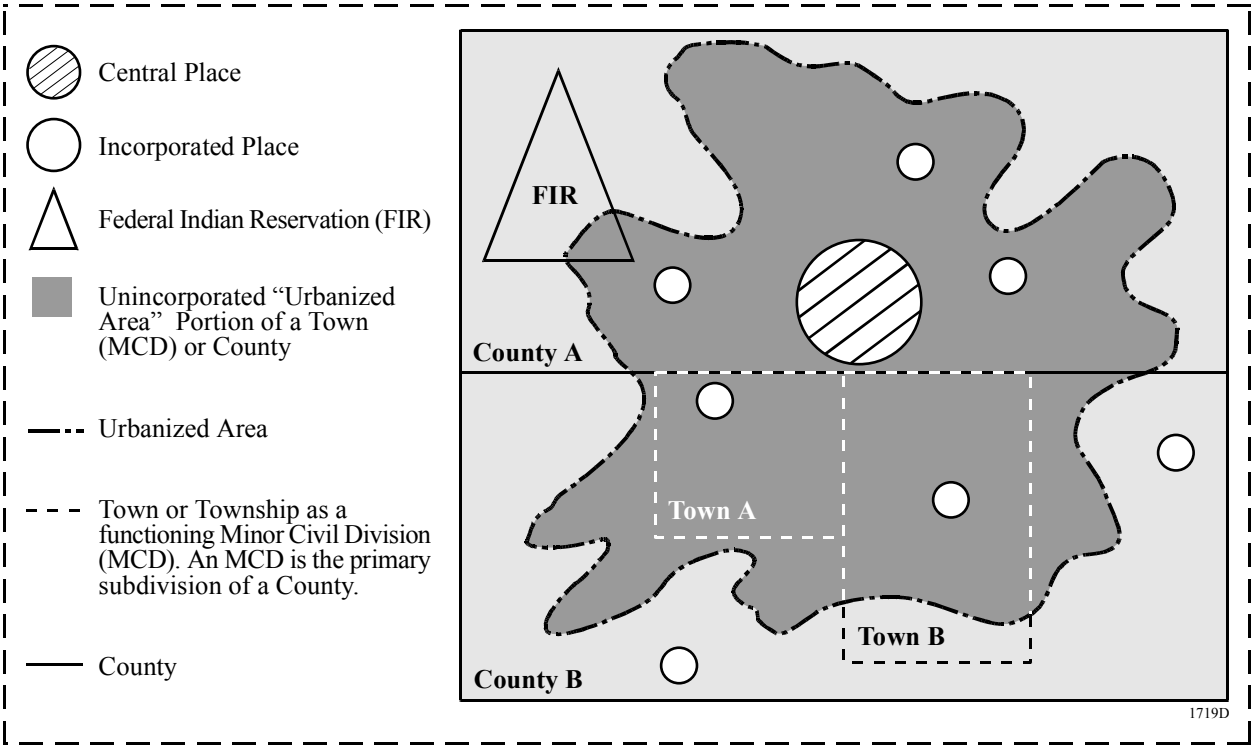

4.3.3 How Can An Operator of a Regulated Small MS4 Determine If It Is Located Within a UA?

Operators of small MS4s can determine if they are located within a UA, and therefore covered under the Phase II storm water program, through the following two steps:

— STEP 1 —

Refer to a listing of incorporated places, MCDs, and counties that are located entirely or partially within a UA. Such a listing, based on the 1990 Census and including only those entities not regulated under Phase I, can be found in Appendix 6 to the Preamble of the Phase II Final Rule. If a small MS4 is located in a listed incorporated place, MCD, or county, then the operator of the small MS4 should follow step (2) below. It is important to note that Appendix 6 is general guidance only and may contain errors. For this reason, even if a particular small MS4 isn't located in a listed area, EPA recommends that the small MS4 operator follow Step 2.

— STEP 2 —

Some operators of small MS4s may find that they are located within an

entity listed in Appendix 6 but not know if their systems are within the urbanized portion of the listed entity, or they are not on the list but want to confirm their status as recommended above. In such cases, they should contact one or more of the following institutions for more detailed information on the location of UA boundaries:

- **The State or NPDES Permitting Authority**

***Storm Water Coordinators*:** The NPDES permitting authority may be the State or the U.S. EPA Region. The Storm Water Coordinators for each U.S. EPA Region are listed in Section 8. These regional contacts can assist with UA information and provide the names of State storm water contacts.

***State Data Centers*:** Each State's Data Center receives listings of all entities that are located in UAs, as well as detailed maps and electronic files of UA boundaries. The Bureau of the Census web site includes a list of contact names and phone numbers for the Data Center in each State at www.census.gov/sdc/www.

***State Planning/Economic/Transportation Agencies*:** These agencies typically use UAs to assess current development and forecast future growth trends and, therefore, should have detailed UA information readily available to help determine the UA boundaries in any given area.

- **County or Regional Planning Commissions/ Boards**

As with State agencies, these entities are likely to have detailed UA data and maps to help determine UA boundaries.

- **The Bureau of the Census**

***Urbanized Areas Staff*:** 301 457-1099

***Web Site*:** www.census.gov
The site provides information on purchasing UA maps and electronic files for use with computerized mapping systems. Obtain free UA cartographic boundary files (Arc/Info export format) for Geographical Information System (GIS) use at: www.census.gov:80/geo/www/cob/ua.html.

***UA Maps*:** Detailed UA maps are available for purchase with a $25 minimum order ($5 per map sheet). Each map sheet measures 36 by 42 inches. For prices and a listing of UAs, visit www.census.gov/mp/www/geo/msgeo12.html. Order from the Department of Commerce, Bureau of the Census (MS 1921), P.O. Box 277943, Atlanta, GA 30384-7943 (Phone: 301 457-4100; Toll-free fax: 1-888-249-7295).

- **U.S. EPA**

EPA is currently modifying a web-based geographic program called *Enviromapper* for use in determining UA boundaries. This program will allow users to enter a location (by name, zip code, or street address) and see a map that will show if the location is within a UA boundary. EPA is committed to using Enviromapper to create a tool that, someday, will be the only tool necessary to determine the location of UA boundaries. Information about *Enviromapper* will be available at www.epa.gov/owm/phase2.

4.3.4 How Will the Year 2000 Census Affect the Determination of Status as a Regulated Small MS4?

The listing of incorporated places, MCDs, and counties located within UAs in the United States and Puerto Rico, found in Appendix 6, is based on the 1990 Census. New listings for UAs based on the 2000 Census are scheduled to be available by August of 2001. Once the official 2000 Census listings are published by the Bureau of the Census, operators of small MS4s located within the revised boundaries of former 1990 UAs, or in any newly defined 2000 UAs, become regulated small MS4s and must develop a storm water management program.

Any additional automatic designations of small MS4s based on subsequent census years is governed by the Bureau of the Census' definition of a UA in effect for that year and the UA boundaries determined as a result of the definition.

Once a small MS4 is designated into the Phase II storm water program based on the UA boundaries, it can not be waived from the program if in a subsequent UA calculation the small MS4 is no longer within the UA boundaries. An automatically designated small MS4 will remain regulated unless, or until, it meets the criteria for a waiver.

4.4 WAIVERS: Which Regulated Small MS4s May Obtain a Waiver From Coverage?

Two waiver options are available to operators of regulated small MS4s in urbanized areas if the NPDES permitting authority determines that their discharges do not cause, or have the potential to cause, water quality impairment.

> **Important Note:** The waivers are granted by the NPDES permitting authority, the operator of the regulated small MS4 can not determine for itself that it meets the waiver criteria. If the permitting authority is not proactive in assessing small MS4s for potential waivers, an operator may petition for a waiver assessment.

If a permitting authority decides to grant waivers, it is required to do so by December 9, 2002 to coincide with the expected date of the small MS4 permit issuance. The

permitting authority is also required to periodically review any waivers granted to small MS4 operators to determine whether any information required for granting the waiver has changed. Minimally, such a review needs to be conducted once every five years. The waiver options are described in the following two subsections.

Deadline for Waivers

The NPDES permitting authorities are required to make their waiver determinations by March 9, 2002 to coincide with the expected issuance of their small MS4 general permit. If the permit authority chooses to phase in permit coverage based on a comprehensive watershed plan (see section 4.5.2.2), then regulated small MS4s may be waived on the same schedule. The phase-in of permit coverage and waivers is to be completed no later than March 8, 2007.

4.4.1 Option 1: Less than 1,000 Population in a UA

The first waiver option applies where:

(1) the jurisdiction served by the system is less than 1,000 people;

(2) the system is not contributing substantially to the pollutant loadings of a physically interconnected regulated MS4; and

(3) if the small MS4 discharges any pollutants identified as a cause of impairment of any water body to which it discharges, storm water controls are not needed based on wasteload allocations that are part of an EPA approved or established "total maximum daily load" (TMDL) that addresses the pollutant(s) of concern.

> ***TMDLs*** are water quality assessments that determine the source or sources of pollutants of concern for a particular waterbody, consider the maximum amount of pollutants the waterbody can assimilate, and then allocate to each source a set level of pollutants that it is allowed to discharge (i.e., a "wasteload allocation"). Small MS4s that are not given a wasteload allocation would meet the third criterion above.

The third criterion of this waiver option <u>need only be met if</u> the small MS4 is discharging into a impaired water body and the discharge contains a pollutant or pollutants that are the cause of the impairment (i.e., the "pollutants of concern").

4.4.2 Option 2: Less than 10,000 Population in a UA

The second waiver option applies where:

(1) the jurisdiction served by the system is less than 10,000 people;

(2) an evaluation of all waters of the U.S. that receive a discharge from the system shows that storm water controls are not needed based on wasteload allocations that are part of an EPA approved or established TMDL that addresses the pollutant(s) of concern or an equivalent analysis; and

(3) it is determined that future discharges from the small MS4 do not have the potential to result in exceedances of water quality standards.

> ***Pollutants of Concern*** include biochemical oxygen demand (BOD), sediment or a parameter that addresses sediment (such as total suspended solids, turbidity or siltation), pathogens, oil and grease, and any pollutant that has been identified as a cause of impairment in any water body to which the MS4 discharges.

This waiver option differs from the first option in that: 1) it applies to a larger jurisdiction size (up to 10,000 rather than 1,000), 2) it requires a determination that the discharges are not affecting the receiving water body, whether the water body is impaired or not (in the first option an assessment is only necessary if the water body is impaired and the MS4 is discharging a pollutant of concern), 3) the determination must be based on a TMDL <u>or</u> an equivalent analysis (the first option does not allow for an equivalent analysis), and 4) an assessment of the impacts of future discharges must be performed (no such assessment is necessary under the first option).

4.5 PERMITTING OPTIONS: What Permitting Choices are Available?

The Storm Water Phase II Final Rule requires operators of a particular subset of small MS4s in urbanized areas to obtain National Pollutant Discharge Elimination System (NPDES) permit coverage because their storm water discharges are considered “point sources” of pollution. All point source discharges, unlike nonpoint sources such as agricultural runoff, are required under the Clean Water Act (CWA) to be covered by federally enforceable NPDES permits. Those MS4s already permitted under the NPDES Phase I storm water program, even MS4s serving less than 100,000 people, are not required to be permitted under the Phase II storm water program.

NPDES storm water permits are issued by an NPDES permitting authority, which may be an NPDES-authorized State or a U.S. EPA Region in non-authorized States. Once a permit application is submitted by the operator of a regulated small MS4 and a permit is obtained, the conditions of the permit must be satisfied (i.e., development and implementation of a storm water management program) and periodic reports must be submitted on the status and effectiveness of the program. This section addresses the flexible permit options the Phase II regulations allow for the regulated small MS4 operator, as well as for the permitting authority. The permit requirements are discussed in section 4.6.

4.5.1 For Regulated Small MS4 Operators

4.5.1.1 The Types of Permit Coverage Available

Unlike the Phase I program that requires individual permits for medium and large MS4s, the Phase II approach allows operators of regulated small MS4s to choose from as many as three permitting options as listed below. Each NPDES permitting authority reserves the authority to determine, however, which options are available to the regulated small MS4s in their jurisdiction.

1) General Permits

General permits are strongly encouraged by EPA. The Phase II program has been designed specifically to accommodate a general permit approach.

General permits prescribe one set of requirements for all applicable permittees. General permits are drafted by the NPDES permitting authority, then published for public comment before being finalized and issued.

A Notice of Intent (NOI) serves as the application for the general permit. The regulated small MS4 operator complies with the permit application requirements by submitting an NOI to the NPDES permitting authority that describes the storm water management plan, including best management practices (BMPs) and measurable goals. The operator has the flexibility to develop an individualized storm water program that addresses the particular characteristics and needs of its system, provided the requirements of the general permit are satisfied.

For general permit coverage, the regulated small MS4 operator must follow the Phase II permit application requirements (see section 4.6.2).

2) Individual Permits

Individual permits are required for Phase I medium and large MS4s, but not recommended by EPA for Phase II program implementation.

Individual permits prescribe a particular set of requirements for a particular permittee or a group of co-permittees. Individual permits require the submission of a more comprehensive permit application than an NOI that is submitted under a general permit. Once the permit application is received, an individual permit is drafted by the NPDES permitting authority, then published for public comment before being finalized and issued.

The Phase II rule allows a regulated small MS4 to submit an individual application for coverage under either the:

- Phase II MS4 regulation (see § 122.34 of the Phase II rule), or
- Phase I MS4 regulation (see 40 CFR §122.26(d)).

3) Modification of an Existing Phase I Individual Permit – A Co-Permittee Option with Medium and Large MS4s

The operator of a regulated small MS4 could participate as a limited co-permittee in a neighboring Phase I MS4's storm water management program by seeking a modification of the existing Phase I individual permit. As a limited co-permittee the small MS4 operator would be responsible for compliance with the permit's conditions applicable to its jurisdiction.

Note: A list of Phase I medium and large MS4s can be obtained from the EPA Office of Wastewater Management (OWM) or downloaded from the OWM web site.

The permittee must comply with the applicable terms of the modified Phase I individual permit rather than the minimum control measures in the Phase II Final Rule.

4.5.1.2 Co-permittee with Another Operator of a Regulated Small MS4

Section 4.5.1.1 explained the permitting option of a modification of an existing Phase I individual permit in order to be a co-permittee with a medium or large MS4. Regulated small MS4 operators may also choose to share responsibilities for meeting the Phase II program requirements with another regulated small MS4 operator under a general or individual permit. Those operators choosing to do so may submit jointly an NOI or individual permit application that identifies who will implement which minimum measures within the area served by the MS4s.

4.5.1.3 Relying on Another Entity to Satisfy One or More of the Minimum Control Measures

Under either a general or individual permit, the Phase II small MS4 permittee has the option of relying on other entities that are already performing one or more of the minimum control measures to implement the measure(s) on the permittee's behalf. This is only allowable where the existing control measure, or component thereof, is at least as stringent as the Phase II rule requirements (under § 122.34(b)) and the other entity has agreed to the arrangement.

For example, a county may already have an illicit discharge detection and elimination program in place and may allow an operator of a regulated small MS4 within the county's jurisdiction to rely on the county program instead of formulating and implementing a new program. In such a case, the permittee would not need to

implement the particular measure, but would still be ultimately responsible for its effective implementation. For this reason, EPA recommends that the permittee enter into a legally binding agreement with the other entity. If the permittee chooses to rely on another entity, they must note this in their permit application and subsequent reports.

Note: Also, the other entity does not necessarily need to be a governmental entity. For example, a permittee could rely on a non-profit organization that is performing public education efforts on environmental issues to satisfy the public education and outreach minimum measure.

A Phase II permittee also has the option to rely on another entity to satisfy all of the permittee's small MS4 permit obligations – but only if the other entity is a governmental entity permitted under the NPDES storm water program. Should this option be chosen, the permittee must note this in its NOI, but does not need to file the otherwise required periodic reports on the status of the program. Again, it is important to note that the permittee would remain ultimately liable under the small MS4 permit. This option is particularly beneficial for operators that serve a low population, have limited resources or legal authority, or are surrounded by an NPDES regulated municipality. For example, let's assume a college campus or a veteran's hospital are operators of small MS4s and they are located in the middle of a Phase II regulated city. Negotiating with the city to implement the storm water management program for them in their jurisdictions could be a cost-effective and less burdensome option than for each to implement their own programs.

4.5.2 For the NPDES Permitting Authority

4.5.2.1 Alternative Options for Writing Permit Requirements

Two permitting options tailored to minimize duplication of effort by the regulated small MS4 permittee can be incorporated into the general or individual permit by the NPDES permitting authority:

1) Recognizing Another Governmental Entity's Program

The permitting authority can recognize in a small MS4 permit that another governmental entity is responsible under an NPDES permit for implementing any or all of the minimum control measures. In such a case, responsibility for implementation of the measure(s) would rest with the other governmental entity, thereby relieving the small MS4 permittee of its responsibility to implement that particular measure(s). See Table 4-1 for examples of both this option and the following option.

STORM WATER PHASE II RULE SMALL MS4 FLEXIBLE PERMITTING OPTIONS

	Referencing a QUALIFYING LOCAL PROGRAM (QLP)	RECOGNIZING an NPDES-Regulated Entity	RELYING on Another Entity	CO-PERMITTEE with an NPDES-Regulated Entity
NPDES PERMITTING AUTHORITY Responsibilities	• PA assesses local, State, and Tribal NPDES and non-NPDES programs to determine if their requirements are equivalent to one or more Phase II minimum measures for regulated small MS4s • PA chooses whether to reference a QLP in small MS4 permit. Requires permittee to follow requirements of QLP rather than new permit requirements. • PA does not need to notify the administrator of the QLP or obtain permission since referencing the QLP has no bearing/no affect on the administrator.	• PA assesses entities that are, or will be, performing the equivalent of 1 or more of the small MS4 minimum measures under an NPDES permit. • PA chooses whether to recognize such an entity in a small MS4 permit.	N/A	N/A
SMALL MS4 OPERATOR Responsibilities	• The operator should already be complying with any QLP referenced in the permit. • Compliance with the QLP is considered compliance with the NPDES permit; therefore operator held liable if doesn't comply with the QLP.	• Operator has no responsibility to perform the measure(s) that is being done by the recognized entity. • Not held liable if the other entity fails to perform the measure effectively; however, PA may then require the operator to implement the measure itself.	• Operator chooses, under its own permit, whether to rely on another entity to implement 1 or more minimum measure on its behalf – can be a non-NPDES regulated entity. • Operator notes in NOI or indiv. permit application that it is relying on another entity to implement a measure. • Remain liable if other entity fails to perform the measure effectively.	• Operator chooses whether to be a co-permittee with another regulated MS4 and submits a single NOI or individual permit application • The operators determine who will do what and include this information in the permit application
EXAMPLES	The QLP in the small MS4 permit could be a State program that requires MS4 operators to detect & eliminate illicit discharges into their systems.	A county doing educational outreach for the whole county under a Phase I NPDES permit could be recognized, thereby relieving all small MS4s in the county from having to have their own educational outreach programs.	1. An environmental group is doing educational outreach on the impacts of storm water runoff. 2. A county is already implementing a construction runoff control program under a Phase I NPDES permit.	

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2) Referencing a Qualifying Local Program

The NPDES permitting authority can include conditions in a small MS4 permit that direct a permittee to follow the requirements of an existing qualifying local program rather than the requirements of particular minimum control measure(s). A qualifying local program is defined as a local, State or Tribal municipal storm water program that imposes requirements that are equivalent to those of the Phase II MS4 minimum measures (as found in § 122.34(b) of the rule). Unlike in Option 1 above, under this option the permittee remains responsible for the implementation of the minimum measure through its compliance with the qualifying local program.

4.5.2.2. Alternative Option for Permit Coverage: Phase-in Coverage for Regulated Small MS4s with Populations under 10,000

Permitting authorities may phase-in permit coverage for regulated small MS4s serving jurisdictions with a population under 10,000 on a schedule consistent with a State watershed permitting approach. Under this alternative option, the permitting authority must develop and implement a schedule to phase-in permit coverage for approximately 20 percent annually of all regulated small MS4s that qualify, completing the phase-in schedule in no more than five years. In such a case, the regulated small MS4 operators would be notified by the permitting authority concerning the operator's deadlines for permit coverage.

Deadlines for Phase-In

- Permitting authorities are required to have their phase-in schedule approved by the USEPA Regional Administrator no later than December 10, 2001.
- Under the phase-in option, all regulated small MS4s are required to have coverage under an NPDES permit no later than March 8, 2007.

4.6 REQUIREMENTS: What Requirements Are Regulated Small MS4s Subject To?

A regulated small MS4 operator is required to submit a permit application and obtain coverage under a NPDES storm water permit. Under the permit, the operator will be required to develop and implement a storm water management program that includes six minimum control measures, evaluation/assessment and reporting efforts, and recordkeeping, as described herein. This section begins by highlighting the standards an operator must meet to ensure compliance with the Phase II regulations.

4.6.1 Applicable Standards

A Phase II small MS4 operator must design a storm water management program so that it:

❑ Reduces the discharge of pollutants to the “maximum extent practicable”

(MEP);

- ❑ Protects water quality; and
- ❑ Satisfies the appropriate water quality requirements of the Clean Water Act.

The standard of MEP is the same standard applied to Phase I medium and large MS4 programs. There is no regulatory definition of MEP in order to allow the permitting authority and regulated MS4s maximum flexibility in their interpretation of it as appropriate.

Compliance with the technical standard of MEP requires the successful implementation of approved BMPs. The Phase II Final Rule considers narrative effluent limitations that require the implementation of BMPs and the achievement of measurable goals as the most appropriate form of effluent limitations to achieve the protection of water quality, rather than requiring that storm water discharges meet numeric effluent limitations.

EPA intends to issue Phase II NPDES permits consistent with its August 1, 1996, Interim Permitting Approach policy, which calls for BMPs in first-round storm water permits and expanded or better tailored BMPs in subsequent permits, where necessary, to provide for the attainment of water quality standards. In cases where information exists to develop more specific conditions or limitations to meet water quality standards, these conditions or limitations should be incorporated into the storm water permit. Monitoring is not required under the Phase II Rule, but the NPDES permitting authority has the discretion to require monitoring if deemed necessary.

4.6.2 Permit Application Requirements

The permit application requirements differ depending on the type of permit chosen. The following subsections describe the applicable requirements for each type of permit option allowable under the Phase II regulation.

Deadline for Submission of Permit Application

The deadline for submission of each type of permit application is the same – it must be done no later than March 10, 2003 unless the NPDES permitting authority chooses to phase-in permit coverage on a watershed basis and establishes other deadlines (see section 4.5.2.2).

4.6.2.1 General Permit Under Phase II Regulations

Operators of regulated small MS4s are required to submit in their NOI the following information:

- ❑ Best management practices (BMPs) for each of the six minimum control measures:

  ❶ Public education and outreach on storm water impacts
  ❷ Public participation/involvement
  ❸ Illicit discharge detection and elimination
  ❹ Construction site storm water runoff control
  Post-construction storm water management in new development/ redevelopment
  ❻ Pollution prevention/good housekeeping for municipal operations

- ❑ Measurable goals for each minimum control measure (i.e, narrative or numeric standards used to gauge program effectiveness);

- ❑ Estimated months and years in which actions to implement each measure will be undertaken, including interim milestones and frequency; and

- ❑ The person or persons responsible for implementing or coordinating the storm water program.

The operator of a regulated small MS4 has the flexibility to determine the BMPs and measurable goals, for each minimum control measure, that are most appropriate for the system. The chosen BMPs and measurable goals, submitted in the permit application, become the required storm water management program; however, the NPDES permitting authority can require changes in the mix of chosen BMPs and measurable goals if all or some of them are found to be inconsistent with the provisions of the Phase II Final Rule. Likewise, the permittee can change its mix of BMPs if it determines that the program is not as effective as it could be. Section 4.6.2 fully describes the minimum control measures, including sample BMPs and measurable goals for each, while section 4.6.3 describes the permit requirements concerning evaluation/assessment and recordkeeping activities.

4.6.2.2 Individual Permit Under the Phase II Regulation

For individual permit coverage under Phase II, the regulated small MS4 operator must follow the requirements of 40 CFR § 122.21(f) and the Phase II permit application requirements as described in section 4.6.2.1 above. The operator must also provide an estimate of the square mileage served by the system and any additional information requested by the NPDES permitting authority. A storm sewer map that satisfies the requirements of § 122.34(b)(3)(i) of the Phase II rule will satisfy the map requirements of § 122.21(f)(7).

4.6.2.3 Individual Permit Under the Phase I Regulation

For individual permit coverage under Phase I, the regulated small MS4 operator must follow the permit application requirements detailed at 40 CFR § 122.26(d). The operator must submit both Part 1 and Part 2 of the application requirements in §§ 122.26(d)(1) and (2) by March 10, 2003. The operator would not need to submit the information required by §§ 122.26(d)(1)(ii) and (d)(2) regarding legal authority unless it wanted the permitting authority to take that information into account when developing the individual permit.

4.6.2.4 Modification of an Existing Phase I Individual Permit

Under this permit option, the operator of a regulated small MS4 must follow Phase I permit application requirements in § 122.26(d), with some exclusions, rather than Phase II permit application requirements. The operator would not need to follow the application requirements of §§ 122.26(d)(1)(iii) and (iv) and (d)(2)(iii) – *discharge characterization*. The operator may satisfy the requirements in §§ 122.26(d)(1)(v) and (d)(2)(iv) – *identification of a management program* – by referring to the Phase I MS4's storm water management program.

EPA Recommendations

In referencing a Phase I's MS4's storm water management program, the operator should briefly describe how the existing plan will address discharges from the small MS4 or would need to be supplemented in order to adequately address the small MS4 discharges. The small MS4 operator should explain their role in coordinating storm water pollutant control activities in their MS4 service area and detail the resources available to accomplish the plan.

If a small MS4 is considering this option, it should find out when the Phase I MS4's permit is scheduled for renewal and become thoroughly familiar with the Phase I MS4's permit conditions. This co-permitting approach will be most successful if both MS4s have had thorough discussions of their storm water programs and if the small MS4 submits it’s application at the time that the Phase I MS4 is submitting its reapplication.

4.6.2 Program Requirements: The Six Minimum Control Measures

If coverage is obtained under a general permit or an individual permit under the Phase II regulations, the operator of a regulated small MS4 is required to implement a storm water management program that includes, at a minimum, the six minimum control measures described in the following subsections. As you read these subsections, keep in mind that the operator has a great deal of flexibility in determining the best management practices they will use to accomplish each measure. The rule allows the operators to chose the BMPs and measurable goals for each measure as appropriate for their particular MS4 service area – as long as the chosen BMPs and measurable goals result in effective control of pollutants in storm water runoff. Otherwise, the permitting authority may require changes in the chosen mix of BMPs and measurable goals to result in a more effective program.

4.6.2.1 Public Education and Outreach on Storm Water Impacts

Why Is Public Education and Outreach Necessary?

An informed and knowledgeable community is crucial to the success of a storm water management program since it helps to ensure the following:

Greater support for the program as the public gains a greater understanding of the reasons why it is necessary and important. Public support is particularly beneficial when operators of small MS4s attempt to institute new funding initiatives for the program or seek volunteers to help implement the program; and

Greater compliance with the program as the public becomes aware of the personal responsibilities expected of them and others in the community, including the individual actions they can take to protect or improve the quality of area waters.

What Is Required?

To satisfy this minimum control measure, the operator of a regulated small MS4 must:

- ❑ Implement a public education program to distribute educational materials to the community, or conduct equivalent outreach activities about the impacts of storm water discharges on local waterbodies and the steps that can be taken to reduce storm water pollution; and

- ❑ Determine the appropriate best management practices (BMPs) and measurable goals for this minimum control measure. Some program implementation approaches, BMPs (i.e., the program actions/activities), and measurable goals are suggested below.

What Are Some Guidelines for Developing and Implementing This Measure?

Three main action areas are important for successful implementation of a public education and outreach program:

❶ ***Forming Partnerships***
Operators of regulated small MS4s are encouraged to enter into partnerships with other governmental entities to fulfill this minimum control measure's requirements. It is generally more cost-effective to use an existing program, or to develop a new regional or state-wide education program, than to have numerous operators developing their own local programs. Operators also are encouraged to seek assistance from non-governmental organizations (e.g., environmental, civic, and industrial organizations), since many already have educational materials and perform outreach activities.

❷ ***Using Educational Materials and Strategies***

Operators of regulated small MS4s may use storm water educational information provided by their State, Tribe, EPA Region, or environmental, public interest, or trade organizations instead of developing their own materials. Operators should strive to make their materials and activities relevant to local situations and issues, and incorporate a variety of strategies to ensure maximum coverage. Some examples include:

Brochures or fact sheets for general public and specific audiences;

Recreational guides to educate groups such as golfers, hikers, paddlers, climbers, fishermen, and campers;

Alternative information sources, such as web sites, bumper stickers, refrigerator magnets, posters for bus and subway stops, and restaurant placemats;

A library of educational materials for community and school groups;

Volunteer citizen educators to staff a ***public education task force;***

Event participation with educational displays at home shows and community festivals;

Educational programs for school-age children;

Storm drain stenciling of storm drains with messages such as “Do Not Dump - Drains Directly to Lake;”

Storm water hotlines for information and for citizen reporting of polluters;

Economic incentives to citizens and businesses (e.g., rebates to homeowners purchasing mulching lawnmowers or biodegradable lawn products);and

Tributary signage to increase public awareness of local water resources.

❸ ***Reaching Diverse Audiences***

The public education program should use a mix of appropriate local strategies to address the viewpoints and concerns of a variety of audiences and communities, including minority and disadvantaged communities, as well as children. Printing posters and brochures in more than one language or posting large warning signs (e.g., cautioning against fishing or swimming) near storm sewer outfalls are methods that can be used to reach audiences less likely to read standard materials. Directing materials or outreach programs toward specific groups of commercial, industrial, and institutional entities likely to have significant storm water impacts is also recommended. For example, information could be provided to restaurants on the effects of grease clogging storm drains and to auto garages on the effects of dumping used oil into storm drains.

What Are Appropriate Measurable Goals?

Measurable goals, which are required for each minimum control measure, are intended to gauge permit compliance and program effectiveness. The measurable goals, as well as the BMPs, should reflect the needs and characteristics of the operator and the area served by its small MS4. Furthermore, they should be chosen using an integrated approach that fully addresses the requirements and intent of the minimum control measure. An integrated approach for this minimum measure could include the following measurable goals:

Target Date	Activity
1 year.....	Brochures developed (bilingual, if appropriate) and distributed in water utility bills; a storm water hotline in place; volunteer educators trained.
2 years.....	A web site created school curricula developed; storm drains stenciled.
3 years.....	A certain percentage of restaurants no longer dumping grease and other pollutants down storm sewer drains.
4 years.....	A certain percentage reduction in litter or animal waste detected in discharges.

4.6.2.2 Public Participation/Involvement

Why Is Public Participation and Involvement Necessary?

EPA believes that the public can provide valuable input and assistance to a regulated small MS4's municipal storm water management program and, therefore, suggests that the public be given opportunities to play an active role in both the development and implementation of the program. An active and involved community is crucial to the success of a storm water management program because it allows for:

Broader public support since citizens who participate in the development and decision making process are partially responsible for the program and, therefore, may be less likely to raise legal challenges to the program and more likely to take an active role in its implementation;

Shorter implementation schedules due to fewer obstacles in the form of public and legal challenges and increased sources in the form of citizen volunteers;

A broader base of expertise and ***economic benefits*** since the community can be a valuable, and free, intellectual resource; and

A conduit to other programs as citizens involved in the storm water program development process provide important cross-connections and relationships with other community and government programs. This benefit is particularly valuable when trying to implement a storm water program on a watershed basis, as encouraged by EPA.

What Is Required?

To satisfy this minimum control measure, the operator of a regulated small MS4 must:

- ❑ Comply with applicable State, Tribal, and local public notice requirements; and
- ❑ Determine the appropriate best management practices (BMPs) and measurable goals for this minimum control measure. Possible implementation approaches, BMPs (i.e., the program actions and activities), and measurable goals are described below.

What Are Some Guidelines for Developing and Implementing This Measure?

Operators of regulated small MS4s should include the public in developing, implementing, and reviewing their storm water management programs. The public participation process should make every effort to reach out and engage all economic and ethnic groups. EPA recognizes that there are challenges associated with public involvement. Nevertheless, EPA strongly believes that these challenges can be addressed through an aggressive and inclusive program. Challenges and example practices that can help ensure successful participation are discussed below.

Implementation Challenges

The best way to handle common notification and recruitment challenges is to know the audience and think creatively about how to gain its attention and interest. Traditional methods of soliciting public input are not always successful in generating interest, and subsequent involvement, in all sectors of the community. For example, municipalities often rely solely on advertising in local newspapers to announce public meetings and other opportunities for public involvement. Since there may be large sectors of the population who do not read the local press, the audience reached may be limited. Therefore, alternative advertising methods should be used whenever possible, including radio or television spots, postings at bus or subway stops, announcements in neighborhood newsletters, announcements at civic organization meetings, distribution of flyers, mass mailings, door-to-door visits, telephone notifications, and multilingual announcements. These efforts, of course, are tied closely to the efforts for the public education and outreach minimum control measure.

In addition, advertising and soliciting for help could and should be targeted at specific population sectors, including ethnic, minority, and low-income communities; academia and educational institutions; neighborhood and community groups; outdoor recreation groups; and business and industry. The goal is to involve a diverse cross-section of people who could offer a multitude of concerns, ideas, and connections during the program development process.

Possible Practices (BMPs)

There are a variety of practices that could be incorporated into a public participation and involvement program, such as:

Public meetings/citizen panels allow citizens to discuss various viewpoints and provide input concerning appropriate storm water management policies and BMPs;

Volunteer water quality monitoring gives citizens first-hand knowledge of the quality of local water bodies and provides a cost-effective means of collecting water quality data;

Volunteer educators/speakers who can conduct workshops, encourage public participation, and staff special events;

Storm drain stenciling is an important and simple activity that concerned citizens, especially students, can do;

Community clean-ups along local waterways, beaches, and around storm drains;

Citizen watch groups can aid local enforcement authorities in the identification of polluters; and

"Adopt A Storm Drain" programs encourage individuals or groups to keep storm drains free of debris and to monitor what is entering local waterways through storm drains.

What Are Appropriate Measurable Goals?

Measurable goals, which are required for each minimum control measure, are intended to gauge permit compliance and program effectiveness. The measurable goals, as well as the BMPs, would greatly depend on the needs and characteristics of the operator and the area served by its small MS4. Furthermore, they should be chosen using an integrated approach that fully addresses the requirements and intent of the minimum control measure. An integrated approach for this minimum measure could include the following measurable goals:

Target Date	Activity
1 year.....	Notice of a public meeting in several different print media and bilingual flyers; citizen panel established; volunteers organized to locate outfalls/illicit discharges and stencil drains.
2 years.....	Final recommendations of the citizen panel; radio spots promoting program and participation.
3 years.....	A certain percentage of the community participating in community clean-ups.
4 years.....	Citizen watch groups established in a certain percentage of neighborhoods; outreach to every different population sector completed.

4.6.2.3 Illicit Discharge Detection and Elimination

What Is An "Illicit Discharge"?

Federal regulations define an illicit discharge as "...any discharge to an MS4 that is not composed entirely of storm water..." with some exceptions. These exceptions include discharges from NPDES-permitted industrial sources and discharges from fire-fighting activities. Illicit discharges (see Table 4-2) are considered "illicit" because MS4s are not designed to accept, process, or discharge such non-storm water wastes. It is important to note that "illicit" does not mean "illegal." Not every illicit discharge is necessarily a prohibited illegal discharge.

Why Are Illicit Discharge Detection and Elimination Efforts Necessary?

Discharges from MS4s often include wastes and wastewater from non-storm water sources. A study conducted in 1987 in Sacramento, California, found that almost one-half of the water discharged from a local MS4 was not directly attributable to precipitation runoff. A significant portion of these dry weather flows were from illicit and/or inappropriate discharges and connections to the MS4.

Table 4-2

Sources of Illicit Discharges
Sanitary wastewater
Effluent from septic tanks
Car wash wastewaters
Improper oil disposal
Radiator flushing disposal
Laundry wastewaters
Spills from roadway accidents
Improper disposal of auto and household toxics

Illicit discharges enter the system through either direct connections (e.g., wastewater piping either mistakenly or deliberately connected to the storm drains) or indirect connections (e.g., infiltration into the MS4 from cracked sanitary systems, spills collected by drain outlets, or paint or used oil dumped directly into a drain). The result is untreated discharges that contribute high levels of pollutants, including heavy metals, toxics, oil and grease, solvents, nutrients, viruses, and bacteria to receiving waterbodies. Pollutant levels from these illicit discharges have been shown in EPA studies to be high enough to significantly degrade receiving water quality and threaten aquatic, wildlife, and human health.

What Is Required?

Recognizing the adverse effects illicit discharges can have on receiving waters, the final rule requires an operator of a regulated small MS4 to develop and implement an illicit discharge detection and elimination program. This program must include the following:

- ❑ A storm sewer system map, showing the location of all outfalls and the names and location of all waters of the United States that receive discharges from those outfalls;

- ❑ Through an ordinance, or other regulatory mechanism, a prohibition (to the extent allowable under State, Tribal, or local law) on non-storm water discharges into the MS4, and appropriate enforcement procedures and actions;

- ❑ A plan to detect and address non-storm water discharges, including illegal dumping, into the MS4;

- ❑ The education of public employees, businesses, and the general public about the hazards associated with illegal discharges and improper disposal of waste; and

- ❑ The determination of appropriate best management practices (BMPs) and measurable goals for this minimum control measure. Some program implementation approaches, BMPs (i.e., the program actions/activities), and measurable goals are suggested below.

Does This Measure Need to Address All Illicit Discharges?

No. The illicit discharge detection and elimination program does not need to address the following categories of non-storm water discharges or flows unless the operator of the regulated small MS4 identifies them as significant contributors of pollutants to its MS4:

- ❑ Water line flushing
- ❑ Landscape irrigation
- ❑ Diverted stream flows
- ❑ Rising ground waters
- ❑ Uncontaminated ground water infiltration
- ❑ Uncontaminated pumped ground water
- ❑ Discharges from potable water sources
- ❑ Foundation drains
- ❑ Air conditioning condensation
- ❑ Irrigation water
- ❑ Springs
- ❑ Water from crawl space pumps
- ❑ Footing drains
- ❑ Lawn watering
- ❑ Individual residential car washing
- ❑ Flows from riparian habitats and wetlands
- ❑ Dechlorinated swimming pool discharges
- ❑ Street wash water.

What Are Some Guidelines for Developing and Implementing This Measure?

The objective of the illicit discharge detection and elimination minimum control measure is to have regulated small MS4 operators gain a thorough awareness of their systems. This awareness allows them to determine the types and sources of illicit discharges entering their system, and establish the legal, technical, and educational means needed to eliminate these discharges. Permittees could meet these objectives

in a variety of ways depending on their individual needs and abilities, but some general guidance for each requirement is provided below.

The Map

The storm sewer system map is meant to demonstrate a basic awareness of the intake and discharge areas of the system. It is needed to help determine the extent of discharged dry weather flows, the possible sources of the dry weather flows, and the particular waterbodies these flows may be affecting. An existing map, such as a topographical map, on which the location of major pipes and outfalls can be clearly presented would demonstrate such an awareness.

EPA recommends collecting all existing information on outfall locations (e.g., review city records, drainage maps, storm drain maps), and then conducting field surveys to verify locations. It probably will be necessary to walk (i.e., wade through small receiving waters or use a boat for larger waters) the streambanks and shorelines for visual observation. More than one trip may be needed to locate all outfalls.

Legal Prohibition and Enforcement

EPA recognizes that some permittees may have limited authority under State, Tribal or local law to establish and enforce an ordinance, or other regulatory mechanism, prohibiting illicit discharges. In such a case, the permittee is encouraged to obtain the necessary authority, if at all possible. Otherwise, the NPDES permitting authority assumes responsibility for implementation of this component of the minimum measure, yet the permittee would remain ultimately responsible for the quality of its MS4 discharge. Model ordinances, including examples of amendments to local codes or existing ordinances, will be provided in the Phase II storm water guidance for regulated small MS4s, which is part of EPA's planned implementation "tool box" for the rule.

The Plan

The plan to detect and address illicit discharges is the central component of this minimum control measure. The plan is dependant upon several factors, including the permittee's available resources, size of staff, and degree and character of its illicit discharges. EPA envisions a plan similar to the one recommended for use in meeting Michigan's general storm water NPDES permit for small MS4s. As guidance only, the four steps of a recommended plan are outlined below:

❶ **Locate Problem Areas**
EPA recommends that priority areas be identified for detailed screening of the system based on the likelihood of illicit connections (e.g., areas with older sanitary sewer lines). Some methods that could be used to locate problem areas include: public complaints; visual screening; water sampling from manholes and outfalls during dry weather; and use of infrared and thermal photography.

❷ **Find the Source**
Once a problem area or discharge is found, additional efforts usually would be

necessary to determine the source of the problem. Some methods that could be used to find the source of the illicit discharge include: dye-testing buildings in problem areas; dye- or smoke-testing buildings at the time of sale; tracing the discharge upstream in the storm sewer; employing a certification program that shows that buildings have been checked for illicit connections; implementing an inspection program of existing septic systems; and using video to inspect the storm sewers.

❸ **Remove/Correct Illicit Connections**
Once the source is identified, the offending discharger should be notified and directed to correct the problem. Education efforts and working with the discharger can be effective in resolving the problem before taking legal action.

❹ **Document Actions Taken**
As a final step, all actions taken under the plan should be documented. Doing so would illustrate that progress is being made to eliminate illicit connections and discharges. Documented actions should be included in the required annual reports and include information such as: the number of outfalls screened; any complaints received and corrected; the number of discharges and quantities of flow eliminated; and the number of dye or smoke tests conducted.

Educational Outreach

Outreach to public employees, businesses, property owners, the general community, and elected officials regarding ways to detect and eliminate illicit discharges is an integral part of this minimum measure that will help gain support for the permittee's storm water program. Suggested educational outreach efforts include:

- Developing ***informative brochures, and guidances*** for specific audiences (e.g., carpet cleaning businesses) and school curricula;
- Designing a program to ***publicize and facilitate public reporting*** of illicit discharges;
- ***Coordinating volunteers*** for locating, and visually inspecting, outfalls or to stencil storm drains; and
- Initiating ***recycling programs*** for commonly dumped wastes, such as motor oil, antifreeze, and pesticides.

What Are Appropriate Measurable Goals?

Measurable goals, which are required for each minimum control measure, are intended to gauge permit compliance and program effectiveness. The measurable goals, as well as the BMPs, should reflect the needs and characteristics of the operator and the area served by its small MS4. Furthermore, they should be chosen using an integrated approach that would fully address the requirements and intent of the minimum control measure. An integrated approach for this minimum measure could

include the following measurable goals:

Target Date	Activity
1 year.....	Sewer system map completed; recycling program for household hazardous waste in place.
2 years.....	Ordinance in place; training for public employees completed; a certain percentage of sources of illicit discharges determined.
3 years.....	A certain percentage of: illicit discharges detected; illicit discharges eliminated; and households participating in quarterly household hazardous waste special collection days.
4 years.....	Most illicit discharge sources detected and eliminated.

The educational outreach measurable goals for this minimum control measure could be combined with the measurable goals for the Public Education and Outreach minimum control measure.

4.6.2.4 Construction Site Storm Water Runoff Control

Why Is The Control of Construction Site Runoff Necessary?

Polluted storm water runoff from construction sites often flows to MS4s and ultimately is discharged into local rivers and streams. Of the pollutants listed in Table 4-3, sediment is usually the main pollutant of concern. Sediment runoff rates from construction sites are typically 10 to 20 times greater than those of agricultural lands, and 1,000 to 2,000 times greater than those of forest lands. During a short period of time, construction sites can contribute more sediment to streams than can be deposited naturally during several decades. The resulting siltation, and the contribution of other pollutants from construction sites, can cause physical, chemical, and biological harm to our nation's waters. For example, excess sediment can quickly fill rivers and lakes, requiring dredging and destroying aquatic habitats.

Table 4-3

Pollutants Commonly Discharged From Construction Sites
Sediment
Solid and sanitary wastes
Phosphorous (fertilizer)
Nitrogen (fertilizer)
Pesticides
Oil and grease
Concrete truck washout
Construction chemicals
Construction debris

What Is Required?

The Phase II Final Rule requires an operator of a regulated small MS4 to develop, implement, and enforce a program to reduce pollutants in storm water runoff to their MS4 from construction activities that result in a land disturbance of greater than or equal to one acre. The small MS4 operator is required to:

- ❑ Have an ordinance or other regulatory mechanism requiring the implementation of proper erosion and sediment controls, and controls for other wastes, on applicable construction sites;

- ❑ Have procedures for site plan review of construction plans that consider potential water quality impacts;
- ❑ Have procedures for site inspection and enforcement of control measures;
- ❑ Have sanctions to ensure compliance (established in the ordinance or other regulatory mechanism);
- ❑ Establish procedures for the receipt and consideration of information submitted by the public; and
- ❑ Determine the appropriate best management practices (BMPs) and measurable goals for this minimum control measure. Suggested BMPs (i.e., the program actions/activities) and measurable goals are presented below.

What Are Some Guidelines for Developing and Implementing This Measure?

Further explanation and guidance for each component of a regulated small MS4's construction program is provided below.

Regulatory Mechanism

Through the development of an ordinance or other regulatory mechanism, the small MS4 operator needs to establish a construction program that requires controls for polluted runoff from construction sites with a land disturbance of greater than or equal to one acre. Because there may be limitations on regulatory legal authority, the small MS4 operator is required to satisfy this minimum control measure only to the maximum extent practicable and allowable under State, Tribal, or local law. If an operator is unable to establish an enforceable construction program due to a lack of legal authority, and is unsuccessful in trying to obtain the necessary authority, the NPDES permitting authority would then assume responsibility.

EPA intends to develop a model ordinance that a small MS4 operator could use as a basis for its construction program. Alternatively, amendments to existing erosion and sediment control programs, or other ordinances, can also provide the basis for the program.

Site Plan Review

The small MS4 operator is required to include in its construction program requirements for the implementation of appropriate BMPs on construction sites to control erosion and sediment, as well as waste at the site. To determine if a construction site is in compliance with such provisions, the small MS4 operator should review the site plans submitted by the construction site operator before ground is broken.

Site plan review aids in compliance and enforcement efforts since it alerts the small MS4 operator early in the process to the planned use or non-use of proper BMPs and provides a way to track new construction activities. The tracking of sites is useful not only for the small MS4 operator's recordkeeping and reporting purposes, which will be required activities under their NPDES storm water permit (see Fact Sheet 2.9), but also for members of the public interested in ensuring that the sites are in compliance.

Inspections and Penalties

Once construction commences, the BMPs should be in place and the small MS4 operator's enforcement activities should begin. To ensure that the BMPs are properly installed, the small MS4 operator is required to develop procedures for site inspection and enforcement of control measures to deter infractions. Procedures could include steps to identify priority sites for inspection and enforcement based on the nature and extent of the construction activity, topography, and the characteristics of soils and receiving water quality. Inspections give the MS4 operator an opportunity to provide additional guidance and education, issue warnings, or assess penalties. To conserve staff resources, one possible option for small MS4 operators could be to have these inspections performed by the same inspector that visits the sites to check compliance with health and safety building codes.

Information Submitted by the Public

A final requirement of the small MS4 program for construction activity is the development of procedures for the receipt and consideration of public inquiries, concerns, and information submitted regarding local construction activities. This provision is intended to further reinforce the public participation component of the regulated small MS4 storm water program and to recognize the crucial role that the public can play in identifying instances of noncompliance.

The small MS4 operator is required only to *consider* the information submitted, and may not need to follow-up and respond to every complaint or concern. Although some form of enforcement action or reply is not required, the small MS4 operator is required to demonstrate acknowledgment and consideration of the information submitted. A simple tracking process in which submitted public information, both written and verbal, is recorded and then given to the construction site inspector for possible follow-up would suffice.

What Are Appropriate Measurable Goals?

Measurable goals, which are required for each minimum control measure, are intended to gauge permit compliance and program effectiveness. The measurable goals, as well as the BMPs, should reflect the needs and characteristics of the operator and the area served by its small MS4. Furthermore, they should be chosen using an integrated approach that fully addresses the requirements and intent of the minimum control measure. An integrated approach for this minimum measure could include the following measurable goals:

Target Date	Activity
1 year.....	Ordinance or other regulatory mechanism in place; procedures for information submitted by the public in place.
2 years.....	Procedures for site inspections implemented; a certain percentage rate of compliance achieved by construction operators.
3 years.....	Maximum compliance with ordinance; improved clarity and reduced sedimentation of local waterbodies.
4 years.....	Increased numbers of sensitive aquatic organisms in local waterbodies.

Am I Correct in Thinking that Construction Sites Are Already Covered Under the NPDES Storm Water Program?

Yes. EPA's Phase I NPDES storm water program requires operators of construction activities that disturb five or more acres to obtain a NPDES construction storm water permit. General permit requirements include the submission of a Notice of Intent and the development of a storm water pollution prevention plan (SWPPP). The SWPPP must include a site description and measures and controls to prevent or minimize pollutants in storm water discharges. The Phase II Final Rule similarly regulates discharges from smaller construction sites disturbing equal to or greater than one acre and less than five acres.

Even though all construction sites that disturb more than one acre are covered nationally by an NPDES storm water permit, the construction site runoff control minimum measure for the small MS4 program is needed to induce more localized site regulation and enforcement efforts, and to enable operators of regulated small MS4s to more effectively control construction site discharges into their MS4s.

To aid operators of regulated construction sites in their efforts to comply with both local requirements and their NPDES permit, the Phase II Final Rule includes a provision that allows the NPDES permitting authority to reference a "qualifying State, Tribal or local program" in the NPDES general permit for construction. This means that if a construction site is located in an area covered by a qualifying local program, then the construction site operator's compliance with the local program would constitute compliance with their NPDES permit. A regulated small MS4's storm water program for construction could be a "qualifying program" if the MS4 operator requires a SWPPP, in addition to the requirements summarized in this fact sheet.

The ability to reference other programs in the NPDES permit is intended to reduce confusion between overlapping and similar requirements, while still providing for both local and national regulatory coverage of the construction site. The provision allowing NPDES permitting authorities to reference other programs has no impact on, or direct relation to, the small MS4 operator's responsibilities under the construction site runoff control minimum measure profiled in this fact sheet.

Is a Small MS4 Operator Required to Regulate Construction Sites that the Permitting Authority has Waived from the NPDES Construction Program?

No. If the NPDES permitting authority waives requirements for storm water discharges associated with small construction activity (see § 122.26(b)(15) of the Phase II rule), the small MS4 operator is not required to develop, implement, and/or enforce a program to reduce pollutant discharges from such sites.

4.6.2.5 Post-construction Storm Water Management in New Development/ Redevelopment

Why Is The Control of Post-Construction Runoff Necessary?

Post-construction storm water management in areas undergoing new development or redevelopment is necessary because runoff from these areas has been shown to significantly effect receiving waterbodies. Many studies indicate that prior planning and design for the minimization of pollutants in post-construction storm water discharges is the most cost-effective approach to storm water quality management.

There are generally two forms of substantial impacts of post-construction runoff. The first is caused by an increase in the type and quantity of pollutants in storm water runoff. As runoff flows over areas altered by development, it picks up harmful sediment and chemicals such as oil and grease, pesticides, heavy metals, and nutrients (e.g., nitrogen and phosphorus). These pollutants often become suspended in runoff and are carried to receiving waters, such as lakes, ponds, and streams. Once deposited, these pollutants can enter the food chain through small aquatic life, eventually entering the tissues of fish and humans. The second kind of post-construction runoff impact occurs by increasing the quantity of water delivered to the waterbody during storms. Increased impervious surfaces interrupt the natural cycle of gradual percolation of water through vegetation and soil. Instead, water is collected from surfaces such as asphalt and concrete and routed to drainage systems where large volumes of runoff quickly flow to the nearest receiving water. The effects of this process include streambank scouring and downstream flooding, which often lead to a loss of aquatic life and damage to property.

What Is Required?

The Phase II Final Rule requires an operator of a regulated small MS4 to develop, implement, and enforce a program to reduce pollutants in post-construction runoff to their MS4 from new development and redevelopment projects that result in the land disturbance of greater than or equal to 1 acre. The small MS4 operator is required to:

- ❑ Develop and implement strategies which include a combination of structural and/or non-structural best management practices (BMPs);

- ❑ Have an ordinance or other regulatory mechanism requiring the implementation of post-construction runoff controls to the extent allowable under State, Tribal or local law;

- ❑ Ensure adequate long-term operation and maintenance of controls;

- ❑ Determine the appropriate best management practices (BMPs) and measurable goals for this minimum control measure.

What Is Considered a "Redevelopment" Project?

The term "redevelopment" refers to alterations of a property that change the "footprint" of a site or building in such a way that the disturbance of equal to or greater than 1 acre of land results. The term does not include such activities as exterior remodeling. Because redevelopment projects may have site constraints not found on new development sites, the rule provides flexibility for implementing post-construction controls on redevelopment sites that consider these constraints.

What Are Some Guidelines for Developing and Implementing This Measure?

This section includes some sample non-structural and structural BMPs that could be used to satisfy the requirements of the post-construction runoff control minimum measure. It is important to recognize that many BMPs are climate-specific, and not all BMPs are appropriate in every geographic area. Because the requirements of this measure are closely tied to the requirements of the construction site runoff control minimum measure (see Fact Sheet 2.6), EPA recommends that small MS4 operators develop and implement these two measures in tandem. Sample BMPs follow.

❑ **Non-Structural BMPs**

- **Planning and Procedures**. Runoff problems can be addressed efficiently with sound planning procedures. Master Plans, Comprehensive Plans, and zoning ordinances can promote improved water quality by guiding the growth of a community away from sensitive areas and by restricting certain types of growth (industrial, for example) to areas that can support it without compromising water quality.

- **Site-Based Local Controls**. These controls can include buffer strip and riparian zone preservation, minimization of disturbance and imperviousness, and maximization of open space.

❑ **Structural BMPs**

- **Storage Practices**. Storage or detention BMPs control storm water by gathering runoff in wet ponds, dry basins, or multichamber catch basins and slowly

releasing it to receiving waters or drainage systems. These practices both control storm water volume and settle out particulates for pollutant removal.

- **Infiltration Practices**. Infiltration BMPs are designed to facilitate the percolation of runoff through the soil to ground water, and, thereby, result in reduced storm water quantity and reduced mobilization of pollutants. Examples include infiltration basins/trenches, dry wells, and porous pavement.

- **Vegetative Practices**. Vegetative BMPs are landscaping features that, with optimal design and good soil conditions, enhance pollutant removal, maintain/improve natural site hydrology, promote healthier habitats, and increase aesthetic appeal. Examples include grassy swales, filter strips, artificial wetlands, and rain gardens.

What Are Appropriate Measurable Goals?

Measurable goals, which are required for each minimum control measure, are intended to gauge permit compliance and program effectiveness. The measurable goals, as well as the BMPs, should reflect needs and characteristics of the operator and the area served by its small MS4. Furthermore, the measurable goals should be chosen using an integrated approach that fully addresses the requirements and intent of the minimum control measure. An integrated approach for this minimum measure could include the following goals:

Target Date	Activity
1 year.....	Strategies developed that include structural and/or non-structural BMPs.
2 years.....	Strategies codified by use of ordinance or other regulatory mechanism.
3 years.....	Reduced percent of new impervious surfaces associated with new development projects.
4 years.....	Improved clarity and reduced sedimentation of local waterbodies.

4.6.2.6 Pollution Prevention/Good Housekeeping for Municipal Operations

Why Is Pollution Prevention/Good Housekeeping Necessary?

The Pollution Prevention/Good Housekeeping for municipal operations minimum control measure is a key element of the small MS4 storm water management program. This measure requires the small MS4 operator to examine and subsequently alter own actions to help ensure a reduction in the amount and type of pollution that (1) collects on streets, parking lots, open spaces, and storage and vehicle maintenance areas and is discharged into local waterways; and (2) results from actions such as environmentally damaging land development and flood management practices or poor maintenance of storm sewer systems.

While this measure is meant primarily to accomplish the goal of improving or protecting the quality of receiving waters by altering the performance of municipal or facility operations, it also can result in a cost savings for the small MS4 operator, since proper and timely maintenance of storm sewer systems can help avoid repair costs from damage caused by age and neglect.

What Is Required?

Recognizing the benefits of pollution prevention practices, the rule requires an operator of a regulated small MS4 to:

- ❑ Develop and implement an operation and maintenance program with the ultimate goal of preventing or reducing pollutant runoff from municipal operations into the storm sewer system;

- ❑ Include employee training on how to incorporate pollution prevention/good housekeeping techniques into municipal operations such as park and open space maintenance, fleet and building maintenance, new construction and land disturbances, and storm water system maintenance. To minimize duplication of effort and conserve resources, the MS4 operator could use training materials that are available from EPA, their State or Tribe, or relevant organizations;

- ❑ Determine the appropriate best management practices (BMPs) and measurable goals for this minimum control measure. Some program implementation approaches, BMPs (i.e., the program actions/activities), and measurable goals are suggested below.

What Are Some Guidelines for Developing and Implementing This Measure?

The intent of this control measure is to ensure that existing municipal, State or Federal operations are performed in ways that will minimize contamination of storm water discharges. EPA encourages the small MS4 operator to consider the following components when developing their program for this measure:

Maintenance activities, maintenance schedules, and long-term inspection procedures for structural and non-structural controls to reduce floatables and other pollutants discharged from the separate storm sewers;

Controls for reducing or eliminating the discharge of pollutants from areas such as roads and parking lots, maintenance and storage yards (including salt/sand storage and snow disposal areas), and waste transfer stations. These controls could include programs that promote recycling (to reduce litter), minimize pesticide use, and ensure the proper disposal of animal waste;

Procedures for the proper disposal of waste removed from the separate

storm sewer systems and the areas listed in the bullet above, including dredge spoil, accumulated sediments, floatables, and other debris; and

Ways to ensure that new flood management projects assess the impacts on water quality and examine existing projects for incorporation of additional water quality protection devices or practices. EPA encourages coordination with flood control managers for the purpose of identifying and addressing environmental impacts from such projects.

The effective performance of this control measure hinges on the proper maintenance of the BMPs used, particularly for the first two bullets above. For example, structural controls, such as grates on outfalls to capture floatables, typically need regular cleaning, while non-structural controls, such as training materials and recycling programs, need periodic updating.

What Are Appropriate Measurable Goals?

Measurable goals, which are required for each minimum control measure, are meant to gauge permit compliance and program effectiveness. The measurable goals, as well as the BMPs, should consider the needs and characteristics of the operator and the area served by its small MS4. The measurable goals should be chosen using an integrated approach that fully addresses the requirements and intent of the minimum control measure. An integrated approach for this minimum measure could include the following measurable goals:

Target Date	Activity
1 year.....	Pollution prevention plan (the new BMPs and revised procedures) completed; employee training materials gathered or developed; procedures in place for catch basin cleaning after each storm and regular street sweeping.
2 years.....	Training for appropriate employees completed; recycling program fully implemented.
3 years.....	Some pollution prevention BMPs incorporated into master plan; a certain percentage reduction in pesticide and sand/salt use; maintenance schedule for BMPs established.
4 years.....	A certain percentage reduction in floatables discharged; a certain compliance rate with maintenance schedules for BMPs; controls in place for all areas of concern.

4.6.3 Program Requirements: Evaluation/Assessment & Reporting

If coverage is obtained under a general permit or an individual permit under the Phase II regulations, the operator of a regulated small MS4 is required to comply with the evaluation/assessment and reporting requirements summarized in this section.

Frequency of Reports

Reports must be submitted annually during the first permit term – permit terms are typically a 5-year period. For subsequent permit terms, reports must be submitted in years 2 and 4 only, unless the NPDES permitting authority requests more frequent reports. Reports do not need to be submitted if the operator of the regulated small MS4 is relying on another entity to satisfy all permit obligations (see section 4.5.1.3)

Required Report Content

The reports must include the following:

- ❑ The status of compliance with permit conditions, including an assessment of the appropriateness of the selected BMPs and progress toward achieving the selected measurable goals for each minimum measure;
- ❑ Results of any information collected and analyzed, including monitoring data, if any;
- ❑ A summary of the storm water activities planned for the next reporting cycle;
- ❑ A change in any identified best management practices or measurable goals for any minimum measure; and
- ❑ Notice of relying on another governmental entity to satisfy some of the permit obligations (if applicable – see section 4.5.1.3).

A Change in Selected BMPs

If, upon evaluation of the program, improved controls are identified as necessary, permittees should revise their mix of BMPs to provide for a more effective program. Such a change, and an explanation of the change, must be noted in a report to the NPDES permitting authority.

Recordkeeping Requirements

Records required by the NPDES permitting authority must be kept for at least 3 years and made accessible to the public at reasonable times during regular business hours. Records need not be submitted to the NPDES permitting authority unless the permittee is requested to do so.

4.7 SMALL MS4 PROGRAM COMPLIANCE PROCESS: What Do I Need to Do To Comply?

Sections 4.1 through 4.6 of this guidance have provided a details on who's covered and what's required under the Phase II regulations for regulated small MS4s. Now that you are familiar with the Phase II program, this section walks you through the process, from beginning to end, that an operator of a regulated small should take to comply with the regulation. This step-by-step "walk-through" references the appropriate sections of the

guidance along the way as a means for understanding how the information in sections 4.1 through 4.6 fits together.

The last page of this section includes a permitting decision tree to help operators of MS4s determine if they need an NPDES storm water permit. By starting in the upper left hand corner, an operator can follow the decision tree to determine if they fall under Phase I or Phase II, and if they are eligible for a waiver.

Step 1: Determine if you are an operator of an MS4 (see section 4.1.1).

Step 2: As an operator of an MS4, determine if you are an operator of a small MS4 (see section 4.1.4).

Step 3: As an operator of a small MS4, determine if you are an operator of a regulated small MS4 (see section 4.2). You need to find out if you are:

A. Automatically designated by the rule

- First, determine if your system is located partially or fully within an urbanized area (See section 4.3),
- Second, determine if you may qualify for a waiver (waivers are at the discretion of the permitting authority). If you qualify for a waiver, stop here. (See section 4.4)

B. Potentially designated by the NPDES permitting authority

- Determine if your system, located outside of a UA, may fit the criteria for potential designation. Since designations are at the discretion of the permitting authority, a final determination is made by the permitting authority and not the small MS4 operator. If designated, continue with Step 4.

Step 4: Read Phase II Rule and guidance materials to get a sense of the permitting options (see section 4.5) and program requirements (see section 4.6).

Step 5: Determine which neighbors are regulated as Phase I MS4s (refer to list on the EPA web site) or Phase II MS4s (refer to Appendix 6 and maps of your UA). This information will be used to base your decision as to whether to:

- Be a co-permittee with another regulated MS4. (See section 4.5.1.2)
- Rely on another regulated MS4 for partial or full implementation of the minimum measures on your behalf. (See section 4.5.1.3)

Step 6: Determine if programs similar to one or more of the minimum measures is already being performed by another entity. This information will be used to decide whether you wish to rely on another entity for partial implementation of the minimum measures on your behalf. (See section 4.5.1.3)

Step 7: Determine which permit option to choose (depends on which are made available by the your NPDES permitting authority) (See section 4.5.1)

- General permit under the Phase II regulation
- Individual permit under the Phase I or Phase II regulation
- Modification of a Phase I individual permit (Co-permittee with a large or medium MS4)

In determine which option to choose, think about...

— If you wish to be a co-permittee and share responsibilities based on information from Step 5

— If, instead of the co-permittee option, you wish to have own permit but rely on another entity for implementing a measure or measures based on information from Steps 5 & 6.

Step 8: Begin planning and development of your storm water management program

- Use menu of BMPs as a guide (provided by EPA or the permitting authority). The EPA web site will also have references and links to helpful guidance on every facet of a storm water management program for MS4s.

- Meet with staff who will be responsible for implementing the storm water management program (may be a multi-departmental team). Task them with:
  — Assessing the storm water management characteristics and needs of the area served by the regulated small MS4.
  — Determining appropriate BMPs and measurable goals
  — Determining who will be responsible for what under the program

- Form a citizen advisory panel to help develop the program and give them similar tasks as those given to the staff.

- Meet with local Phase I and Phase II MS4 operators to discuss co-permittee status or sharing of resources, such as: hiring one enforcement inspector for multiple areas, co-sponsoring household hazardous waste collection events, or sharing a street sweeper, recycling truck, illicit discharge detection cameras, or any other equipment. (Note: Nothing listed here is required by the Phase II rule -- they are only examples)

- Meet with other entities that you may rely on to implement one or more of the minimum measures to discuss the arrangement and any legal agreements.

Step 9: **A. Under a General Permit:**

1) Once a general permit is issued, read it carefully. You may not be

required to implement every minimum measure due to the permitting authority recognizing or referencing other similar programs (see section 4.5.2.1). For this reason, before the permit is issued (which is expected to be no later than December 9, 2002) follow Step 8 but only do a preliminary storm water management program until the final permit requirements are know. Once the permit is issued, if you have chosen this option you will need to make final decisions on the following issues and complete the development of your storm water management plan:

- Do you want to be a co-permittee with another regulated small MS4?
- Do you want to rely on another entity for some or all of the permit requirements?
- Which BMPs and measurable goals will you use for each minimum measure you will be implementing?

2) Fill out an NOI in accordance with the Phase II regulation. (See section 4.6.2.1)

B. Under an Individual Permit (new or modified):

If you have chosen one of the individual permit options (i.e., under Phase II, under Phase I, or modified existing Phase I), you will need to continue efforts in Step 8, as applicable, and complete development of your permit application in accordance with the Phase II regulation. (See sections 4.6.2.2 through 4.6.2.4)

Step 10: Submit your NOI under a general permit or your individual permit application to the NPDES permitting authority <u>by March 10, 2003</u>; unless your NPDES permitting authority phases-in permit coverage and establishes alternative deadlines (see section 4.5.2.2).

Step 11: Implement your storm water management program in accordance with applicable standards (see section 4.6.1). The Phase II rule allows you up to five years to fully implement your program, although the exact timeframe is at the discretion of the your NPDES permitting authority.

Step 12: Write annual reports in your first permit term assessing the effectiveness of BMPs and if measurable goals were met, and submit the reports to your NPDES permitting authority. You may change the mix of BMPs originally selected if you find that such a change is necessary to ensure a more effective program. This step, as required in the Phase II regulations at § 122.34(g) and described in section 4.6.3, is not applicable if you sought coverage under an individual permit under the Phase I regulations or under a modification of an existing Phase I MS4 permit.

Step 13: Be aware that you may need to take over implementation of a minimum control measure if you are relying on another entity for its implementation and the other entity fails to perform it effectively. This is why EPA encourages a legally-binding agreement when choosing to rely on another entity. Also, the permitting authority may chose to change your mix of BMPs and measurable goals as submitted in you permit application if it determines that your program is not effectively controlling pollutant discharges.

4.8 FEDERAL AND STATE-OPERATED REGULATED SMALL MS4S: Unique Program Implementation Issues

In addition to local government jurisdictions, small MS4s include certain Federal and State-operated MS4s. Federal facilities were not designated for regulation by the NPDES Phase I storm water program for MS4s. The Phase II Final Rule, however, includes the "United States" in the definition of a small MS4, thereby including Federal MS4 operators in the NPDES Phase II storm water program. Federal and State-operated small MS4s can include universities, prisons, hospitals, roads (i.e., departments of transportation), military bases (e.g., State Army National Guard barracks), parks, and office buildings/complexes.

The small MS4 program, largely designed with municipally-operated small MS4s in mind, raises a number of implementation issues for Federal and State operators of regulated small MS4s who must obtain an NPDES permit that requires the development and implementation of a storm water management program that includes the six minimum control measures. This section highlights potential implementation issues related to the minimum control measures, and then discusses the implementation options included in the rule that may help resolve these issues.

4.8.1 What Are Some Implementation Concerns?

This section profiles the three most common implementation issues raised in the public comments submitted regarding Federal/State implementation of the small MS4 program.

How Does the Final Rule Account for Unique Characteristics?

Federal and State small MS4s possess a number of characteristics that set them apart from their municipal counterparts. For example, whereas municipally-operated MS4s largely serve resident populations, many Federal or State-operated MS4s, such as medical clinics and departments of transportation (DOTs), do not. Other types of Federal and State MS4s, such as military bases, prisons, and State universities, serve populations that are different from a typical municipal population. Their unique characteristics might lead Federal or State MS4 operators to question either the need to implement the entire suite of minimum control measures or their ability to comply fully with their Phase II storm water permit. The flexibility within the minimum measures allows Federal and State MS4s to develop a storm water program that comprises the

minimum measures in a way that makes sense for their circumstances.

What If the Operator Lacks Legal Authority?

Three of the minimum control measures (illicit discharge detection and elimination, and the two construction-related measures) require enforceable controls on third party activities to ensure successful implementation of the measure. Some Federal and State operators, however, may not have the necessary legal regulatory authority to adopt these enforceable controls in the same manner as do local governments.

For example, a State DOT that is responsible for the portions of its roads running through urbanized areas may not have the legal authority to impose restrictions on, and penalties against, illicit (i.e., non-storm water) discharges into its MS4 if the source of the discharge is outside the DOT's right-of-way or jurisdiction. As in the case of local governments that lack such authority, State and Federal MS4s are expected to utilize the authority they do possess and to seek cooperative arrangements.

How Can the Program Be Implemented in Areas Where There Are Multiple Regulated Entities?

Since the final rule provides automatic coverage of all small MS4s within an urbanized area, regardless of political boundaries, coverage of multiple governments and agencies in a single area is likely. For example, a city government that operates a small MS4 within an urbanized area must obtain permit coverage alongside the county, State, and Federal DOTs if they all operate a portion of the roads (i.e., MS4s) in the city. All four entities are responsible for developing a storm water management program for their MS4s (or portions thereof) within the urbanized area. EPA encourages State and Federal small MS4 operators to establish cooperative agreements with cities and counties in implementing their storm water programs.

4.8.2 Are There Implementation Strategies that Help Facilitate Program Implementation?

This section offers two hypothetical strategies for resolving the implementation issues raised above. The best solution may include a creative combination of strategies.

STRATEGY #1
A Focus on Choosing Appropriate BMPs

The final rule requires the permittee to choose *appropriate* best management practices (BMPs) for each minimum control measure. In other words, EPA expects Phase II permittees to tailor their storm water management plans and their BMPs to fit the particular characteristics and needs of the permittee and the area served by its MS4. Therefore, the Federal or State operator of a regulated storm sewer system can take advantage of the flexibility provided by the rule to utilize the most suitable minimum control measures for its MS4. Below is an example of tailored activities and BMPs that

Federal or State operators can implement for each measure:

- ❑ **Public Education and Outreach**. Distribute brochures and post fliers to educate employees of a Federal hospital about the problems associated with storm water runoff and the steps they can take to reduce pollutants in storm water discharges. For example, employees could be advised against carelessly discarding trash on the ground or allowing their cars to leak oil/fluids in the parking lot.

- ❑ **Public Participation/Involvement**. Provide notice of storm water management plan development and hold meetings at which employees of a Federal office complex are encouraged to voice their ideas and opinions about the effort. Request volunteers to help develop the plan.

- ❑ **Illicit Discharge Detection and Elimination**. Develop a map of the storm sewer system on a military base. Perform visual dry weather monitoring of any outfalls to determine whether the storm sewer system is receiving any non-storm water discharges from the base. If a dry weather flow is found, trace it back to the source and stop the discharge. Should a Federal military base identify an illicit discharge, the source of which is traced to the boundary of its system, the Federal operator should refer the discharge to the adjoining regulated MS4 for further action.

- ❑ **Construction Site Runoff Control**. Require the implementation of erosion and sediment controls, and control of waste, for any Federal or State DOT road construction. The DOT would review site plans for proper controls, perform inspections, and establish penalties in the construction contract if controls are not implemented. If construction is done directly by the regulated DOT instead of a private contractor, the DOT could be penalized by the NPDES permitting authority for non-compliance with its small MS4 permit in the event that controls are not properly implemented.

- ❑ **Post-Construction Runoff Control**. Require the implementation of post-construction storm water controls for any new construction on the grounds of a prison. This can be required as part of a construction contract, instituted as internal policy, and considered during site plan review.

- ❑ **Pollution Prevention/Good Housekeeping for Municipal Operations**. Train maintenance staff at a State university to employ pollution prevention techniques whenever possible. For example, routinely pick up trash/litter from the university grounds, use less salt on the parking lots and access roads in the winter, perform any maintenance of university vehicles under shelter only, limit pesticide use to the minimum needed, use vegetative buffer strips in the parking lots to filter runoff, and keep dumpster lids closed.

STRATEGY #2
Working with Other Entities

There may be instances when the Federal or State permittee has limited capabilities to satisfy one or more of the minimum control measures. As discussed above, the permittee may lack the proper legal authority to enforce controls (although it should try to obtain the necessary legal authority if at all possible).

In the case of limited capabilities, the permittee can work with neighboring operators of regulated small MS4s, preferably on a watershed basis, to form a shared storm water management program in which each permittee is responsible for activities that are within individual legal authorities and abilities. The final rule allows the permittee to rely on other entities, with their permission, to implement those minimum measures that the permittee is otherwise unable to implement. Three examples are:

- ❑ A State DOT with limited regulatory legal authority can reference a local sewer district's illicit detection and elimination program in its permit application, provided the program sufficiently addresses illicit discharges into the DOT's storm sewer system.

- ❑ The permittee or NPDES permitting authority can reference such programs as coastal nonpoint pollution control programs, State or local watershed programs, State or local construction programs, and environmental education efforts by public or private entities.

- ❑ The permittee can become a co-permittee with a neighboring Phase I MS4 through a modification of the Phase I MS4's individual permit. This may be the most logical and preferable option for those Federal and State entities located in close proximity to Phase I MS4s.

Choosing to work with other governmental entities as a co-permittee, or referencing parts of each other's plans, can help resolve issues that may arise where multiple regulated jurisdictions exist in the same area. Permittees can avoid duplicative efforts, as well as territorial or regulatory disputes, by working together to implement the storm water program.

Suggested Steps for Working with Other Entities

(1) Identify the boundaries of the urbanized area.

(2) Identify the operators of storm sewer systems or portions of the systems within the urbanized area such as local, State, Tribal or Federal governments or other entities.

(3) In seeking permit coverage:

Identify where another entity's program may satisfy one or more minimum control measure. If a program has requirements that are equivalent to a minimum control measure's required elements, the operator of the regulated small MS4 may reference the program in its permit application, provided the other entity gives it permission to do so. While such an arrangement relieves the operator from performing the minimum measure itself, the operator remains ultimately responsible for the measure's effective implementation.

OR

Team with an operator of a Phase I MS4 and become a co-permittee on its existing Phase I individual permit.

4.9 FUNDING OPTIONS

Possibly the biggest challenge for an operator of a regulated small MS4 in implementing a storm water management program is finding funding for the program. Funding is needed to maintain the staff, equipment and materials necessary to develop and implement an effective program. Adequate funding is critical to the success of the program but attaining it can be difficult as many other important programs compete for the same limited revenues from a general fund. Therefore, the operator of a regulated small MS4 will need to consider alternative funding options. This section provides brief introductions to some of the various funding options currently in use across the country. The following information on funding options was written by the American Public Works Association (AWPA) as part of their Storm Water Phase II workshops:

Debt Financing: Typically used for capital-intensive projects, local governments can issue debt to finance storm water management programs and facilities. Revenue bonds - or bonds that rely on ongoing source of revenue may be used. Alternatively, a general obligation bond can be issued which are backed by the full faith and credit of your municipality (based on your ability to generate revenues though taxes and other fees).

Grants and Loans: Federal, State, or Regional grant or loan funds may be available for some elements of the storm water program, depending on the BMP's selected and the location. Grants and loans are usually applicable to specific projects and not on-going activities, such as operation and maintenance.

Users /Utility Fees: Utility services charges are rates billed to customers for providing storm water management services. The service charges may be flat rates, or variable rates based on classes of

customers. Utility service charges may represent a dedicated source of funding and an ongoing method of funding some or all storm water management programs.

Special Assessment: Properties can be assessed annually to fund storm water management programs. Often, special assessments are used to fund a special district or authority that can implement all or portions of a region's storm water management program.

Local Improvement Under this type of funding system, individual properties benefitted by storm water projects are assessed to fund the project. Some states require special enabling legislation to establish this type of special benefits district.

General Fund: General fund monies are used for may storm water programs. If storm water programs are funded from your General Fund, the programs are at risk in each budget cycle. In addition, in order to increase funding levels for your program, other local government services may be affected or a general tax increase may be required.

Inspection Fees: Plan review and inspection fees allows the community to recover some or all of the direct cost associated with performing design reviews for pre and post construction BMP's.

Developer Fees: The developers construct needed facilities as a condition of development and bear associated costs.

Alternative Fees: Instead of constructing on-site facilities to meet development requirements, developers may be given the option of paying a comparable fee to be used by the local government to build regional facilities that are designed to meet the same objectives as the developer-constructed on-site mitigation.

Connection Fees: A one time charge assessed at the time of development to recover a proportionate share of the cost of existing facilities and planned future facilities. The applicability depends upon legislation in each state.

Additional Resources

- Storm Water Utilities: Innovative Financing for Storm Water Management. 1992. U.S. EPA, Office of Policy, Planning, and Evaluation. Washington, D.C.
- State and Local Funding of Nonpoint Source Control Programs. 1992. U.S. EPA, Office of Water, Assessment and Watershed Protection Division. Washington, D.C.
- Storm Water Management Utility Implementation Manual. South Carolina Land Resources Commission, Columbia, S.C.

- Storm Water Maintenance and Financing Options (draft). 1987. State of Maryland, Maryland Department of Natural Resources.

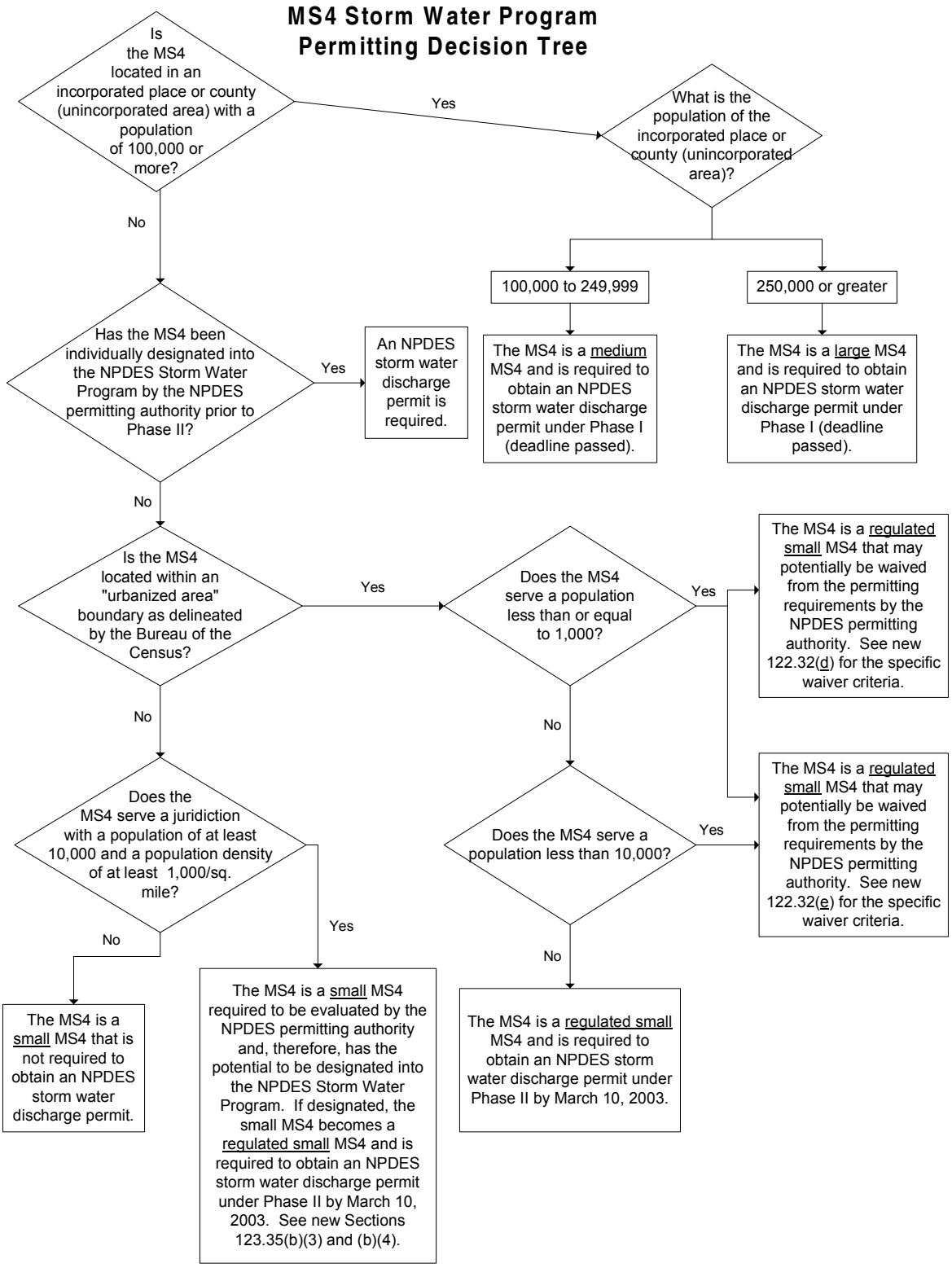

1. See Appendices F, G, H, and I to Part 122 (as revised by the Phase II Final Rule) for the list of incorporated places and counties (unincorporated areas) with a population of 100,000 or greater. If the MS4 is located in a listed entity, then the answer to this question is "Yes" and the MS4 is covered under the Phase I MS4 program as a medium or large MS4.

5.0 SMALL CONSTRUCTION ACTIVITY

After reading Section 5.0, you should understand what type of construction activity is subject to the Phase II small construction activity regulations (including who may be waived from coverage), who is considered an operator of small construction activity, the permit options and requirements for small construction activity, and the interaction of the NPDES storm water program for construction with the NPDES storm water program for regulated MS4s. The discussion of these elements concludes with a step-by-step review of the process for compliance with the Phase II regulations for small construction activity.

5.1 COVERAGE: Who Is Subject to the Phase II Rule?

The NPDES Storm Water Program defines construction activities as "small" and "large" for the purposes of regulation. The Phase I storm water program covers large construction activity. The Phase II storm water regulation covers small construction activity. To understand who is covered under the Phase II Rule, it is necessary to understand who is already covered under the Phase I Rule. Toward this end, this section provides a definition of the type of construction activity covered by Phase I and Phase II, as well as other definitions essential to understanding the construction component of the NPDES Storm Water Program.

5.1.1 What Type of Construction Activity Is Covered Under the Phase I Regulations?

The Phase I Rule identifies eleven categories of industrial activity in the definition of "storm water discharge associated with industrial activity" that must obtain an NPDES storm water discharge permit (see section 6.1). Category (x) of this definition includes construction activity (including clearing, grading and excavation) that results in ***a total land disturbance of 5 acres or greater***. Disturbances of less than 5 acres are also regulated under category (x) if they are part of a "larger common plan of development or sale" with a planned land disturbance of 5 acres or greater. Phase I construction activity is commonly referred to as "large"

Construction activities can include road building, construction of residential houses, office buildings, industrial sites, or demolition.

Land Disturbance means exposed soil due to clearing, grading, or excavation activities.

Larger common plan of development or sale describes a situation in which multiple construction activities are occurring, or will occur, on a contiguous area.

An operator is the person or persons that has either operational control of construction project plans and specifications, or day-to-day operational control of activities necessary to ensure compliance with storm water permit conditions.

construction activity. The Phase I rule requires all operators of large construction activity to obtain an NPDES storm water discharge permit before discharging storm water runoff to a municipal separate storm sewer system or waters of the United States.

5.1.2 What Type of Construction Activity Is Covered Under the Phase II Regulations?

In 1992, the Ninth Circuit court remanded for further proceedings the portion of EPA's Phase I storm water regulation related to category (x) construction activity (NRDC v. EPA, 966 F.2d at 1292). EPA responded to the court's decision by designating under Phase II storm water discharges from construction site activities that ultimately will result in a ***land disturbance of equal to or greater than 1 and less than 5 acres*** as "storm water discharges associated with *small construction* activity" (see § 122.26(b)(15)). The Phase II rule requires all operators of small construction activity to obtain an NPDES storm water discharge permit before discharging storm water runoff to a municipal separate storm sewer system or waters of the United States.

Construction activities disturbing less than 1 acre are also included in Phase II of the NPDES storm water program if they are part of a larger common plan of development or sale with a planned disturbance of equal to or greater than 1 acre and less than 5 acres, or if they are designated by the NPDES permitting authority. The NPDES permitting authority or EPA Region may designate construction activities disturbing less than 1 acre based on the potential for contribution to a violation of a water quality standard or for significant contribution of pollutants to waters of the United States.

The definition of small construction activity does not apply where the construction operator can certify to one of two waivers – see section 5.2 for more information on waiver options.

5.1.3 What is meant by the terms "land disturbance," "larger common plan of development or sale," and "operator" of a construction site?

The definitions of "land disturbance," "larger common plan of development or sale," and "operator" of a construction site are key in understanding coverage under the NPDES Storm Water Program for construction activity. These definitions originate from the NPDES storm water general permit for large construction activity.

- **Land disturbance** refers to exposed soil resulting from activities such as clearing, grading and excavating.

- **Larger common plan of development or sale** is a contiguous area where multiple separate and distinct construction activities are occurring under one plan (e.g., the operator is building on three half-acre lots in a 6-acre development). The "plan" in a common plan of development or sale is broadly defined as any announcement or piece of documentation (including a sign, public notice or hearing, sales pitch,

advertisement, drawing, permit application, zoning request, computer design, etc.) or physical demarcation (including boundary signs, lot stakes, surveyor markings, etc.) indicating that construction activities may occur on a specific plot.

- **An operator** of a construction site is the person (or persons) responsible for obtaining coverage under an NPDES storm water permit for construction activity, and complying with the permit requirements. An operator is the person or persons that meet either of the following criteria:

  - ❑ Has operational control of construction project plans and specifications, including the ability to make modifications to those plans and specifications; or

  - ❑ Has day-to-day operational control of those activities at a project which are necessary to ensure compliance with a storm water pollution prevention plan (SWPPP) for the site or other permit conditions (e.g., they are authorized to direct workers at a site to carry out activities required by the SWPPP or comply with other permit conditions).

  There may be more than one party at a site responsible for “operational control.” Depending on the project and the distinction between the parties’ (e.g., owner’s vs. developer’s) responsibilities, there can either be a single party acting as a site operator needing permit coverage or there can be two (or more) operators who may share permit responsibilities. In cases where there are two or more operators , both parties will need permit coverage if they choose to keep the responsibilities as described in the above bullets separate, or they choose to separately maintain operational control for different portions of the site, etc. In such cases both operators should obtain permit coverage as co-permittees by co-submitting separate Notice of Intent forms, and should share in meeting permit conditions (e.g., generating the storm water pollution prevention plan, performing inspections, etc.). The option to have one sole operator who is willing to assume complete responsibility / liability for all permit requirements still exists and, in many cases, may be the less overall burdensome way to comply with storm water requirements.

  There are other instances where parties conduct earth disturbing activities at a site but do not need their own permit coverage. Examples for whom this may apply include a subcontractor who is under the supervision of the operator, or an entity that is neither a subcontractor nor has operational control (e.g., a utility line installer).

  Additional information on the responsibilities of operators can be found in Part III.E of EPA's NPDES Construction General Permit, published on February 17, 1998 (63 FR 7858). Part II of the fact sheet contained in the NPDES Construction General Permit also provides answers to common questions regarding roles and responsibilities of different parties involved on a construction site.

Important note: NPDES-authorized States may use a different definition of "operator" than the one provided above.

5.2 WAIVERS: Which Small Construction Activity Sites May Obtain a Waiver From Coverage?

Under the Phase II Rule, NPDES permitting authorities have the option of providing a waiver from Phase II coverage and requirements to operators of small construction activity who certify to one of two conditions:

❶ Low predicted rainfall potential (i.e., activity occurs during a negligible rainfall period), where the rainfall erosivity factor ("R" in the Revised Universal Soil Loss Equation [RUSLE]) would be less than 5 during the period of construction activity.

❷ A determination that storm water controls are not necessary based on either:

(A) A "total maximum daily load" (TMDL) that address the pollutant(s) of concern for construction activities; **OR**

(B) For nonimpaired waters that don't require TMDLs, an equivalent analysis that determines allocations for small construction sites for the pollutants of concern or determines that such allocations are not needed to protect water quality based on consideration of instream concentrations, expected growth in pollutant concentrations from all sources, and a margin of safety.

> **Pollutants of concern** include sediment or a parameter that addresses sediment (such as total suspended solids, turbidity, or siltation) and any other pollutant that has been identified as a cause of impairment of a receiving waterbody.

The intent of these waiver provisions (see §§ 122.26(b)(15)(A) and(B)) is to waive only those sites that are highly unlikely to have a negative effect on water quality. Therefore, before applying for a waiver, operators of small construction activity are encouraged to consider the potential water quality impacts that may result from their project and to carefully examine such factors as proximity to water resources and sensitivity of receiving waters. Small construction activities disturbing less than 1 acre that are designated by the permitting authority are not eligible for these waivers.

5.2.1 Waiver 1: The Rainfall Erosivity Factor Waiver

The Rainfall Erosivity Factor waiver is based on the potential for a construction activity to occur in an area, or during a certain period of time, where there is low

predicted rainfall potential and, therefore, less likelihood of causing impacts. This waiver is time-sensitive and is dependent on when during the year a construction activity takes place, how long it lasts, and the expected rainfall and intensity during that time. It creates an incentive for construction site operators to build during the dry part of the year.

How would an operator qualify for, and certify to, this waiver?

To qualify for this waiver, the construction site operator must determine the value of the rainfall erosivity factor (R factor) in the Revised Universal Soil Loss Equation (RUSLE) and then certify to the permitting authority that the value of the factor is less than 5 during the period of construction. The RUSLE is a refinement of the Universal Soil Loss Equation (USLE), which is a method developed by the U.S. Department of Agriculture to measure soil loss from agricultural lands at various times of the year on a regional basis. The R factor varies based on location and time period during the year.

A construction site operator will need site-specific data to calculate the values for rainfall erosivity using the RUSLE. The rainfall erosivity factor is determined in accordance with Chapter 2 of *Agriculture Handbook Number 703, Predicting Soil Erosion by Water: A Guide to Conservation Planning With the Revised Universal Soil Loss Equation (RUSLE)*. This handbook is no longer in print but Chapter 2 can be obtained from EPA's web site or by contacting EPA's Water Resource Center.

5.2.1 Waiver 2: The Water Quality Waiver

The Water Quality waiver consists of: 1) a component for small construction sites that will discharge to an impaired waterbody where total maximum daily load (TMDL) assessments have been performed, and 2) a component for small construction sites that will discharge to non-impaired waters where an analysis equivalent to the TMDL assessments have been performed.

For impaired waters where technology-based controls required by NPDES permits are not achieving State water quality standards, the CWA requires implementation of the TMDL process.

> The **TMDL process** establishes the maximum amount of pollutants a waterbody can assimilate before water quality is impaired, then requires that this maximum level not be exceeded. A TMDL assessment determines the source or sources of a pollutant of concern, considers the maximum allowable level of that pollutant for the waterbody, then allocates to each source or category of sources a set level of the pollutant that it is allowed to discharge into the waterbody. Allocations to point sources are called wasteload allocations.

A TMDL is developed for each pollutant that is found to be contributing to the impairment of a waterbody or a segment of a waterbody. To allow a waiver for construction activities, a TMDL would need to address sediment, or a parameter that addresses sediment such as total suspended solids, turbidity, or siltation. Additional TMDLs addressing common pollutants from construction sites such as nitrogen, phosphorus, and oil and grease also may be necessary to ensure water quality protection and allow a waiver from the NPDES storm water program. More information on TMDLs can be found at http://www.epa.gov/owow/tmdl/.

Non-impaired waterbodies do not require TMDL assessments. However, construction site operators that discharge to non-impaired waterbodies are still eligible for this waiver. A construction site operator is eligible for a waiver if an analysis equivalent to a TMDL assessment is conducted for the pollutants of concern and it is determined through this analysis that small construction sites would not have to control their contribution of pollutants of concern to the waterbody to protect water quality. The analysis may also determine that allocations are not needed to protect water quality based on consideration of variables including existing in-stream concentrations; expected growth in pollutant contributions from all sources; and a margin of safety. In this situation, the construction site operator also qualifies for a waiver.

How would an operator qualify for, and certify to, this waiver?

EPA expects that when TMDLs, or equivalent analyses are completed, there may be a determination that certain classes of sources, such as small construction sites, would not have to control their contribution of pollutants of concern to the waterbody in order for the waterbody to be in attainment with water quality standards (i.e., these sources were not assigned wasteload allocations). In such a case, to qualify for the Water Quality waiver, the operator of the construction site would need to certify that its construction activity will take place, and the storm water discharges will occur, within the area covered either by the TMDLs or equivalent analysis. A certification form would likely be provided by the NPDES permitting authority.

5.3 PERMIT OPTIONS

The Storm Water Phase II Rule requires operators of small construction activities to obtain National Pollutant Discharge Elimination System (NPDES) permit coverage because their storm water discharges are considered “point sources” of pollution. Point source pollutant discharges, unlike nonpoint sources such as agricultural runoff, are required under the Clean Water Act (CWA) to be covered by federally enforceable NPDES permits.

NPDES storm water permits are issued by an NPDES permitting authority, which may be an NPDES-authorized State or a U.S. EPA Region in non-authorized States (see *Appendix A* for a list of U.S. EPA Regions). Once a permit application is submitted by the operator of a small construction activity, the conditions of the permit must be

satisfied (i.e., implementation of a storm water pollution prevention plan). This section addresses the permit options under the Phase II regulations for operators of small construction activity, as well as for the permitting authority. The permit requirements are discussed in Section 5.4.

5.3.1 For Operators of Small Construction Activity: What Types of Permit Coverage Are Available?

Similar to the Phase I program for large construction activity, the Phase II approach allows operators of small construction activities to choose between two permitting options. Each NPDES permitting authority has the discretion, however, to determine which options are available to operators of small construction activities in their jurisdiction.

1) General Permits

General permits are strongly encouraged by EPA for small construction activity. EPA anticipates that the existing general permit for large construction activity will serve as a model for small construction activity general permits.

General permits prescribe one set of requirements for all applicable permittees. General permits are drafted by the NPDES permitting authority, then published for public comment before being finalized and issued.

A Notice of Intent (NOI) serves as the application for the general permit. Under the Phase II Rule, NPDES permitting authorities have the discretion to not require submittal of an NOI under a general permit for small construction activity.

Small construction operators must submit an NOI and obtain coverage under a general permit by March 10, 2003 or an earlier date set by the permitting authority (if this option is available).

2) Individual Permits

NPDES permitting authorities may deny coverage under general permits and require operators to submit an individual NPDES permit application based on information such as water quality data.

In the event that an NPDES permitting authority decides to issue an individual construction permit for small construction activity, operators are subject to the individual application requirements found at 40 CFR §122.26(c)(1)(ii).

For any discharges of storm water associated with small construction activity identified in §122.26(b)(15) that are not authorized by a general permit, an individual permit application must be submitted to the permitting authority by

March 10, 2003.

5.3.2 For the NPDES Permitting Authority

5.3.2.1 Alternative Option for Writing Permit Requirements: Referencing a Qualifying State, Tribal or Local Erosion and Sediment Control Program

Under §122.44(s) of the Phase II Rule, permitting authorities have the flexibility to develop permit conditions that incorporate by reference qualifying State, Tribal, or local erosion and sediment control programs into permits for large and small construction activity.

To be considered a qualifying State, Tribal, or local program, the program must require construction site operators to:

- Implement appropriate erosion and sediment control BMPs;
- Control waste such as discarded building materials, concrete truck washout, chemicals, litter, and sanitary waste at the site that may cause adverse impacts to water quality;
- Submit a site plan for review that incorporates consideration of potential water quality impacts; and
- Develop and implement a storm water pollution prevention plan (SWPPP) containing elements similar to those required by other NPDES construction storm water permits.

In addition to these elements, a qualifying program for large construction activities must also include any additional requirements necessary to achieve the applicable technology-based standards of “Best Available Technology” (BAT) and “Best Conventional Technology” (BCT) based on the best professional judgment of the permit writer.

> **Important Note:** Not all the construction programs administered by NPDES-permitted MS4s would qualify. A primary reason for this is because NPDES-permitted MS4s are not obligated under their permit to require construction operators to develop a SWPPP.

Should a State, Tribal, or local program include one or more, but not all, of the elements listed above, the NPDES permitting authority can reference the program in the permit, provided it also lists the missing element(s) as a condition in the permit.

5.3.2.2 Permit Application: Optional Use of NOIs

Under the Phase II Rule, EPA is providing NPDES permitting authorities with the

discretion to not require NOIs under a general permit for discharges from small construction activity, if desired. EPA does, however, recommend the use of NOIs for tracking permit coverage and prioritizing inspections and enforcement. This alternative option does not apply to general permits for large construction activity.

5.4 PERMIT REQUIREMENTS

The Phase II Rule requires operators of small construction sites, nationally, to obtain an NPDES permit and implement practices to minimize pollutant runoff. The Phase II Rule directs permitting authorities to develop and issue permits for small construction activity no later than December 9, 2002. Operators of small construction activity will be required to obtain permit coverage by March 10, 2003, or an earlier date set by the permitting authority. However, operators may have to comply with local, State, or Tribal construction runoff control programs (see section 4.6.2.4 for information on the Phase II small MS4's construction program).

For the Phase II small construction program, EPA has taken an approach similar to Phase I where the program requirements are not fully defined in the rule but rather in the NPDES permit by the NPDES permitting authority. EPA recommends that the NPDES permitting authorities use their existing Phase I NPDES construction general permits as a guide to developing their Phase II construction permits. In doing so, the Phase II requirements would be similar to the Phase I requirements described in subsection 5.4.2, although the applicable standards for small construction activity are different as outlined in subsection 5.4.1.

5.4.1 Applicable Water Quality Standards

Unlike the technology-based standards of BAT and BCT that are applicable to large construction activity, an operator of small construction activity is required to design its pollutant control plan so that it:

- ❑ Protects water quality (under CWA section 402(p)(6)); and
- ❑ Satisfies the appropriate water quality requirements of the CWA.

The water quality standards for large and small construction activity are different because they were designated into the NPDES storm water program under two separate sections of the CWA with differing standards. Practically, though, the standard for small construction activity would be substantively the same as the standard for large construction activity.

5.4.2 Potential Small Construction Activity Permit Requirements

EPA currently has only one type of permit available for construction activity operators, the NPDES Construction General Permit. This permit provides coverage to

large construction activities only. EPA expects any general permit for small construction activity to be very similar to the CGP. To gain familiarity with the CGP, the three main elements of the CGP are included below.

> **Important note:** This section on the CGP requirements is included for informational purposes only in order to provide a sense of what the permit requirements for small construction activity may be – these are not the requirements for small construction activity.

5.4.2.1 Notice of Intent

A complete and accurate NOI must be submitted to the NPDES permitting authority. An NOI includes general information and a certification that the activity will not impact endangered or threatened species. This certification is unique to EPA's NOI and is not a requirement of most NPDES-delegated State's NOIs.

An NOI must be postmarked at least two days prior to commencement of any work on site (if the operator has control over plans and specifications) or two days prior to commencement of the operator's portion of the work (if the operator has only day-to-day operational control).

5.4.2.2 Storm Water Pollution Prevention Plan (SWPPP)

The most important requirement of the CGP is the construction storm water pollution prevention plan (SWPPP) that includes the appropriate BMPs to minimize the discharge of pollutants from the site. The CGP requires at least one SWPPP for each construction project or site.

The construction site operator, or operators, must develop the SWPPP prior to submitting the NOI to obtain permit coverage. Unlike the NOI and other reporting forms, the operator(s) does not submit the SWPPP to the permitting authority. Instead, the SWPPP remains onsite and made accessible according to the requirements described in the CGP.

The SWPPP comprises several elements:

- **Site description.** This will contain a description of potential pollutant sources and other information.

- **Controls (BMPs).** This part of the SWPPP must clearly describe not only the controls, but also the timing and responsible permittee for implementing the controls in the following categories:

  ✔ Erosion and Sediment Controls
  ✔ Storm Water Management Controls

✓ Other Controls

- **Inspections.** Another critical element of the SWPPP is regular inspections of disturbed areas of the site that has not been stabilized; exposed materials storage areas; structural controls; and vehicle entrances and exits.

- **Maintenance.** The SWPPP also requires that operators perform maintenance on the controls (BMPs) to ensure they are in effective operating condition.

- **Signatures.** The SWPPP must be signed by at least one of the persons responsible for submitting an NOI for the project.

- **Accessibility.** The CGP requires the operator(s) to retain a copy of the SWPPP at the construction site or other local location accessible to the permitting authority.

More information on the construction SWPPP requirements can be found in the CGP, published on February 17, 1998 (63 *FR* 7858, p. 7906). EPA has also issued a construction general permit for Regions IV and VI. Contact your EPA Regional office or State environmental agency for information on construction permits in your State. In addition, EPA published a construction SWPPP guidance in a document entitled *Storm Water Management for Construction Activities: Developing Storm Water Pollution Prevention Plans and Best Management Practices* (EPA 832-R-92-005, September 1992).

5.4.2.3 Notice of Termination (NOT)

A completed Notice of Termination (NOT) must be submitted to the NPDES permitting authority within 30 days after one or more of the following conditions have been met:

- Final stabilization has been achieved on all portions of the site for which the permittee is responsible;

- Another operator/permittee has assumed control over all areas of the site that have not been finally stabilized; or

- For residential construction only: temporary stabilization of a lot has been completed prior to transference of ownership to the homeowner, with the homeowner being made aware of the need to perform final stabilization.

5.5 INTEGRATION OF NPDES PROGRAM FOR CONSTRUCTION WITH NPDES PROGRAM FOR MS4S

There is often confusion about the interaction between the NPDES Storm Water Program for construction activity, which has been the topic of discussion in this section, and the construction runoff control program implemented by NPDES-regulated MS4s, which was the topic of discussion in section 4.6.2.4.

- These are two separate and distinct construction programs.
- A construction operator is subject to requirements under BOTH programs if it is located in an NPDES-regulated MS4's jurisdiction.

The NPDES Storm Water Program for Construction is administered by the NPDES permitting authority, either the State or an EPA Regional Office.

- This program requires the construction site operator to seek coverage under an NPDES storm water discharge permit for construction. The current permit, the Construction General Permit, requires the operator to submit an NOI, develop a SWPPP, and comply with other applicable NPDES storm water discharge permit requirements.
- The Construction General Permit (CGP) currently only applies to large construction activity disturbing greater than 5 acres. Permits for small construction activity will be issued by each NPDES permitting authority by December 9, 2002.

The NPDES Storm Water Program for MS4s: MS4 Construction Runoff Control Programs are administered by the MS4 operator. The MS4 operator's NPDES storm water discharge permit requires it to establish requirements to control storm water discharges from construction activity and new development and redevelopment.

- Regulated small MS4s must control 1 acre and above.
- Medium and large MS4s have no particular size thresholds that they must control – differs among MS4s
- The specific requirements of the construction programs will vary among MS4s. An MS4 permit typically does not specify that the MS4 operator must require a SWPPP or that a permit application be submitted.

5.6 SMALL CONSTRUCTION ACTIVITY COMPLIANCE PROCESS: What Do I Need To Do To Comply?

Sections 5.1 through 5.5 of this guidance have provided details on who's covered, who may be waived, and what may be required under the Phase II regulations for small construction activity. Now that you are familiar with the Phase II program, this section

walks you through the process, from beginning to end, that an operator of a small construction activity should take to comply with the regulation. This step-by-step "walk-through" assumes the issuance of a general permit for small construction activity that is similar to the CGP. Remember, the general permit for small construction activity may have different requirements, timeframes, and deadlines than what is noted here. Repeat the steps for each individual construction site.

The last page of this section includes a permitting decision tree to help operators of construction activity determine if they need an NPDES storm water permit. By starting in the upper left hand corner, an operator can follow the decision tree to determine if they fall under Phase I, Phase II, or are eligible for a waiver.

Step 1: Determine if your construction site will discharge storm water runoff into a MS4 (see section 4.1.1 for definition) or to waters of the United States. If so, proceed to Step 2. If not, stop here.

> ***Waters of the United States*** include interstate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce. (Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA are not waters of the United States.) A complete definition can be found at 40 CFR 122.2.

Step 2: Determine if your construction site's storm water discharge will meet the definition of a "storm water discharge associated with small construction activity." If so, proceed to Step 3. If not, stop here. (See section 5.1.2)

Step 3: If your site meets the definition of small construction activity, determine if it qualifies for a waiver from the permit requirements. If so, stop here. If not, proceed to Step 4. (See section 5.2)

Step 4: Obtain and read the applicable storm water discharge permit for small construction activity (or the CGP until the small construction permit has been issued to get a sense of the upcoming permit requirements). The small construction permit should be issued by the NPDES permitting authority by December 9, 2002. (See section 5.4.2 for potential requirements)

Step 5: Determine which parties are considered *operators* and, therefore, are responsible for complying with the requirements described in the storm water permit for small construction activity (See section 5.1.3)

Step 6: Develop a SWPPP. (See section 5.4.2.2)

- SWPPPs must be developed prior to submitting the NOI.
- You do not need to submit the SWPPP to your NPDES permitting authority, however, it should be accessible to the public.

Step 7: Complete and submit an NOI. (See section 5.4.2.1)

- Your NPDES permitting authority may or may not require a NOI. If so, the Phase II regulation requires that you submit your NOI no later than March 10, 2003 (or 90 days after the NPDES permitting authority issues the permit, whichever comes first).
- Submit a completed NOI to your NPDES permitting authority two days prior to beginning work at the construction site.

Step 8: Implement the SWPPP.

- Includes generation of inspection reports that are to be kept on-site.

Step 9: Complete and submit an NOT. (See section 5.4.2.3)

- Submit a completed NOT to your NPDES permitting authority within 30 days after one or more of the appropriate conditions have been met.

Construction Activities Storm Water Program Permitting Decision Tree

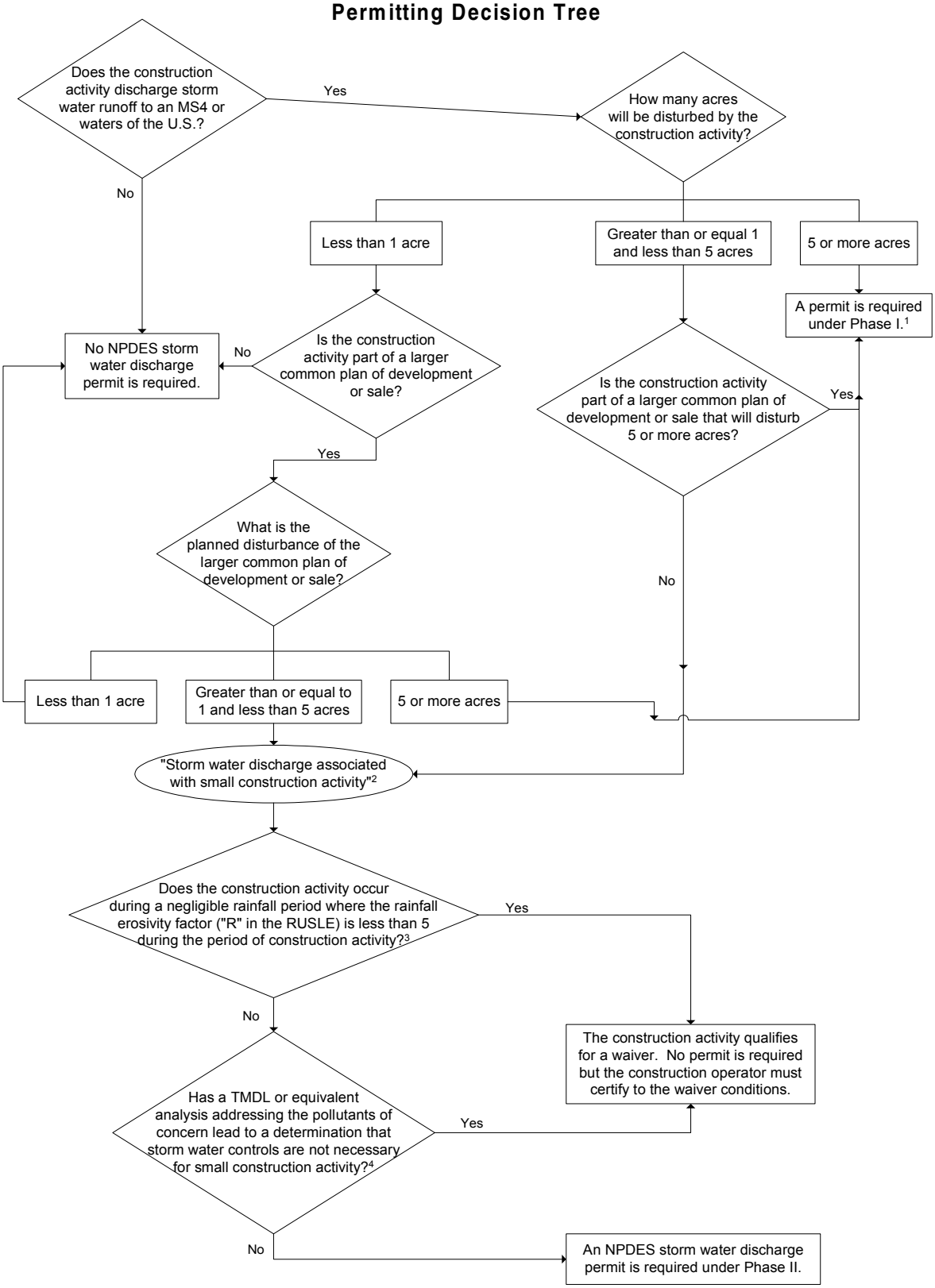

1. Construction activity disturbing, or part of a planned disturbance of, five or more acres is a "storm water discharge associated with industrial activity" under category (x). See 40 CFR 122.26(b)(14)(x).
2. See new 122.26(b)(15) for the definition of "storm water discharge associated with small construction activity."
3. See new 122.26(b)(15)(i)(A) for more details.
4. See new 122.26(b)(15)(i)(B) for more details.

6.0 INDUSTRIAL ACTIVITY

After reading section 6.0, you should understand the basic components and requirements of the Phase II regulations as they affect the categories of industrial activity covered by the Phase I regulations. Phase II revises the original Phase I industrial no exposure exemption and also sets a new deadline for permit coverage for the municipally-owned industrial activity that had been temporarily exempted from storm water permit coverage.

6.1 PHASE I INDUSTRIAL ACTIVITY: What Industrial Activities are Covered by Phase I of EPA's Storm Water Program?

The 1990 storm water regulations for Phase I of the federal storm water program identify eleven categories of industrial activities under the definition of a "storm water discharge associated with industrial activity" that must obtain a National Pollutant Discharge Elimination System (NPDES) permit. The categories contain industries listed either by reference to an industry's Standard Industrial Classification (SIC) code, or by a short narrative description of the activity found at the industrial site (see text box at right for more detailed descriptions). For facilities that match the SIC codes or description in one of the categories, only those that have a storm water discharge to a *municipal separate storm sewer system (MS4)* or *waters of the United States* are required to seek permit coverage. The NPDES permit requirements vary between individual and general permits, but in general involve the development of a storm water pollution prevention plan based upon site assessments, monitoring and reporting data on storm water discharges, and mitigating any possible effects of discharges on endangered species and national historic properties (for EPA issued permits).

Storm Water Discharge Associated with Industrial Activity (40 CFR 122.26(b)(14)(i) - (xi))

- Facilities subject to storm water effluent limitation guidelines; new source performance standards, or toxic pollutant effluent standards under 40 CFR Subchapter N.
- "Heavy" industrial facilities with SIC codes listed in 40 CFR 122.26(b)(14)(ii), (iii), and (vi)
- "Light" industrial facilities with SIC codes listed in 40 CFR 122.26(b)(14)(xi), which conduct the activities specified in that sections.
- Hazardous waste treatment, storage, or disposal facilities.
- Landfills, land application sites, and open dumps that receive or have received industrial waste.
- Steam electric power generating facilities.
- Sewage treatment works.
- Construction activity (including clearing, grading, and excavation) disturbing five or more acres of land, or less than five acres of land if it is part of a larger common plan of development or sale of five acre or greater.

Under the Phase I regulations, operators of facilities within category eleven (xi), commonly referred to as "light industry," were exempted from the definition of "storm water discharge associated with industrial activity," and the subsequent requirement to obtain an NPDES permit, provided their industrial materials or activities were not "exposed" to storm water. This Phase I no exposure exemption from permitting was limited to those facilities identified in category (xi), and did not require category (xi) facility operators to submit any information supporting their no exposure claim.

In 1992, the Ninth Circuit court remanded to EPA for further rulemaking the no exposure exemption for light industry after making a determination that the limited exemption was arbitrary and capricious. The result was a revised no exposure exemption (now an "exclusion") as part of the Phase II regulation.

6.2 PHASE II NO EXPOSURE EXCLUSION: What is the Conditional No Exposure Exclusion for Industrial Activity as Revised by this Regulation?

The intent of the no exposure provision is to provide a simplified method for complying with the Clean Water Act to all industrial facilities that are entirely indoors. This includes facilities that are located within a large office building, or at which the only items permanently exposed to precipitation are roofs, parking lots, vegetated areas, and other non-industrial areas or activities.

As revised in the Phase II regulation, if a condition of No Exposure exists at a Phase I industrial facility, then permits will not be required for storm water discharges from these facilities. All industrial facilities that have no exposure of materials to storm water, including the "light industrial" facilities, must submit a certification to the permitting authority. The facility must certify that a condition of No Exposure exists at its facility and either maintain a condition of no exposure or obtain a permit. The following subsections discuss who is eligible for the revised no exposure exclusion, the definition of no exposure, and the requirement to submit a written certification of no exposure in place of a permit application.

6.2.1 Who is Eligible to Qualify for the No Exposure Exclusion?

The Phase II Conditional No Exposure Exclusion represents a significant expansion in the scope of the original no exposure provision in terms of eligibility. Now, <u>all Phase I industrial categories</u> with a condition of no exposure, except for construction activity, <u>are eligible</u> for the no exposure exclusion. The exclusion from permitting is available on a facility-wide basis only, not for individual outfalls

6.2.2 What is the Definition of No Exposure?

The Phase II regulatory definition of no exposure is as follows:

> ***No exposure*** means all industrial materials and activities are protected

by a storm resistant shelter to prevent exposure to rain, snow, snowmelt, and/or runoff. Industrial materials or activities include, but are not limited to, material handling equipment or activities, industrial machinery, raw materials, intermediate products, by-products, final products, or waste products.

A storm resistant shelter is not required for the following industrial materials and activities:

- Drums, barrels, tanks, and similar containers that are tightly sealed, provided those containers are not deteriorated and do not leak. "Sealed" means banded or otherwise secured and without operational taps or valves;
- Adequately maintained vehicles used in materials handling;
- Final products, other than products that would be mobilized in storm water discharges (e.g., rock salt).

The term "storm-resistant shelter," as used in the no exposure definition, includes completely roofed and walled buildings or structures, as well as structures with only a top cover but no side coverings, provided material under the structure is not otherwise subject to any run-on and subsequent runoff of storm water.

While the intent of the no exposure provision is to promote a condition of permanent no exposure, certain machinery, such as trucks, may become temporarily exposed to rain and snow while passing between buildings. Adequately maintained mobile equipment (e.g., trucks, automobiles, forklifts, trailers, or other such general purpose vehicles found at the industrial site that are not industrial machinery, and that are not leaking contaminants or are not otherwise a source of industrial pollutants) also can be exposed to precipitation or runoff. Such activities alone would not prevent a facility from certifying to no exposure. Similarly, trucks or other vehicles awaiting maintenance at vehicle maintenance facilities that are not leaking contaminants or are not otherwise a source of industrial pollutants, would not be considered exposed.

EPA recognizes that there are circumstances where permanent no exposure of industrial activities or materials is not possible and, therefore, under such conditions, materials and activities could be sheltered with temporary covers (e.g., tarps) between periods of permanent enclosure. The No Exposure provision does not specify every such situation, but NPDES permitting authorities can address this issue on a case-by-case basis.

The Phase II regulation also addresses particulate matter emissions from roof stacks/vents. If regulated by, and in compliance with, other environmental protection programs (i.e., air quality control programs) and not causing storm water contamination, they are considered not exposed. Particulate matter or visible deposits of residuals from roof stacks and/or vents not otherwise regulated (i.e., under an air quality control program) and evident in storm water outflow are considered "exposed." Likewise,

visible “track out” (i.e., pollutants carried on the tires of vehicles) or windblown raw materials are considered “exposed.” Leaking pipes containing contaminants exposed to storm water are deemed “exposed,” as are past sources of storm water contamination that remain onsite. General refuse and trash, not of an industrial nature, is not considered exposed as long as the container is completely covered and nothing can drain out holes in the bottom, or is lost in loading onto a garbage truck. Industrial refuse and trash that is left uncovered, however, is considered “exposed.”

6.2.3 What Do I Need To Know About Certifying to a Condition of No Exposure?

In order to obtain the Conditional No Exposure exclusion, you will have to submit written certification that your facility meets the definition of “no exposure,” even if you are a category (xi) facility operator. The Phase II Rule included as an appendix to the preamble a four-page No Exposure Certification form to be used for this purpose in areas where EPA is the NPDES permitting authority. EPA's certification form uses a series of yes/no questions which you must answer regarding the your industrial activity. You may certify to no exposure if you can answer "no" to all of the questions.

> **Important note:** EPA's No Exposure Certification form applies <u>only</u> in areas where EPA is the NPDES permitting authority. Where a State is the NPDES permitting authority, the State will issue its own form. Since most aspects of EPA's form are also regulatory requirements as to what must be included within a written certification of no exposure, you may expect the State forms to be very similar to EPA's.

The Certification form serves two purposes: 1) as an aid to help you in determining whether you have a condition of No Exposure at your facility or site, and 2) as the necessary written certification of No Exposure, provided you are able to answer all the questions in the negative.

- ❑ If, after you have completed the form, you find that you answered "yes" to one or more of the questions about possible exposure, you must make the appropriate changes at the facility if you still wish to apply for the conditional exclusion. These changes must remove the particular material, process, or activity at the facility or site from exposure to storm water.

- ❑ If, after completing the form, you find that you were able to check "no" to every question, you qualify for the no exposure exclusion and must sign and submit the form to your NPDES permitting authority.

Certification Facts:

- The certification must be completed and submitted to your permitting authority once every 5 years, and can only be done so if the condition of no exposure continues to exist at the facility.
- The Certification must be provided for each facility qualifying for the no exposure

exclusion.

- The form is non-transferable. If a new operator takes over your facility, they must complete, sign, and submit a new form to claim the no exposure exclusion when they assume control over the operations of the facility.

6.2.4 Are There Any Concerns Related to Water Quality Standards?

Yes. An operator certifying that its facility qualifies for the conditional no exposure exclusion may, nonetheless, be required by the permitting authority to obtain permit authorization. Such a requirement would follow the permitting authority's determination that the facility's discharge is likely to have an adverse impact on water quality.

Many efforts to achieve no exposure can employ simple good housekeeping and contaminant cleanup activities such as moving materials and activities indoors into existing buildings or structures. In limited cases, however, industrial operators may make major changes at a site to achieve no exposure. These efforts may include constructing a new building or cover to eliminate exposure or constructing structures to prevent run-on and storm water contact with industrial materials and activities. Major changes undertaken to achieve no exposure, however, can increase the impervious area of the site, such as when a building is placed in a formerly vegetated area. Increased impervious area can lead to an increase in the volume and velocity of storm water runoff, which, in turn, can result in a higher concentration of pollutants in the discharge, since fewer pollutants are naturally filtered out.

The concern of increased impervious area is addressed in one of the last questions on the Certification form, which asks, "Have you paved or roofed over a formerly exposed, pervious area in order to qualify for the no exposure exclusion? If yes, please indicate approximately how much area was paved or roofed over." This question is intended to aid the NPDES permitting authority in assessing the likelihood of such actions interfering with water quality standards. Where this is a concern, the facility operator and its NPDES permitting authority should take appropriate actions to ensure that water quality standards can be achieved.

6.2.5 Industrial Program Compliance Process: What Do I Need To Do To Obtain the No Exposure Exclusion and Comply with Applicable Requirements?

Sections 6.1 through 6.2.4. of this guidance have provided information necessary to understand the conditional no exposure exclusion. Now that you are familiar with the no exposure exclusion, this section walks you through the process, from beginning to end, that an operator of industrial activity will need to take to comply with the Phase II regulation. This step-by-step "walk-through" assumes the issuance of a no exposure certification form that is similar to EPA's form. Remember, a State's certification form may have different requirements and deadlines than what is noted here. Repeat the steps for each individual facility or site.

Step 1: Determine if your industrial activity meets the definition of a "discharge associated with industrial activity." If so, proceed to Step 2. If not, stop here. (See section 6.1)

- If you are a regulated industrial operator, you need to **either** apply for a storm water permit, **or** submit a no exposure certification, in order to be in compliance with the NPDES storm water regulations. Any storm water permit you may currently hold becomes null and void once a completed conditional no exposure certification form is submitted

Step 2: Obtain the no exposure certification form from your NPDES permitting authority. Determine if your regulated industrial activity meets the definition of " no exposure" and qualifies for the exclusion from permitting. If it does, proceed to Step 3. If not, stop here and obtain industrial storm water permit coverage (probably through the multi-sector general permit or similar permit).

- The conditional no exposure exclusion option is currently available only for facilities in areas where EPA is the NPDES permitting authority. In all other areas, where the State is the NPDES permitting authority, the facility operators will need to wait until the State makes the option available.

Step 3: Submit the certification form to your NPDES permitting authority -- a new form must be submitted once every 5 years.

- Be aware that even when you certify to no exposure, your NPDES permitting authority still retains the authority to require you to apply for an individual or general permit if it has determined that your discharge is contributing to the violation of, or interfering with the attainment or maintenance of, water quality standards, including designated uses.

Step 4: Submit a copy, upon request, of the certification form to the municipality in which the facility is located.

Step 5: Allow your NPDES permitting authority or, if discharging into a municipal separate storm sewer system, the operator of the system, to (1) inspect the facility and (2) make such inspection reports publicly available upon request.

Step 6: Maintain a condition of no exposure.

- The no exposure exclusion is conditional and not an outright exemption. Therefore, if there is a change in circumstances that causes exposure of industrial activities or materials to storm water, the you are required to comply immediately with all the requirements of the NPDES Storm Water Program, including applying for and obtaining a storm water discharge permit.

- Failure to maintain the condition of no exposure or obtain coverage under an NPDES permit can lead to the unauthorized discharge of pollutants to waters of the United States, resulting in penalties under the CWA.

6.3 ISTEA MORATORIUM: How Has this Regulation Affected the Municipally-Operated Industrial Activity Subject to the Intermodal Surface Transportation Enforcement Act (ISTEA) Moratorium?

Provisions within ISTEA temporarily delayed the deadline for Phase I industrial activities operated by municipalities with populations of less than 100,000 people to obtain an NPDES storm water discharge permit. Congress delayed the permitting deadline to allow small municipalities additional time to comply with NPDES requirements. This moratorium on permitting did not apply to power plants, airports, and uncontrolled sanitary landfills operated by small municipalities.

The Phase II Rule slightly extended this temporary exemption from permitting and set a deadline of no later than March 10, 2003 for all ISTEA-exempted municipally-operated industrial activities to obtain NPDES permit coverage. Of course, like any other regulated industrial activity, these municipally-operated industrial activities are eligible to qualify for the no exposure exclusion from permitting if a condition of no exposure exists. Municipal-operators must follow the same procedures outlined in Section 6.2.4 in order to obtain an exclusion from permitting.

Many of the small municipalities that will now have to obtain permit coverage for their industrial activity will also have to obtain permit coverage for their small MS4 (see section 4.0) and small construction activity (see section 5.0). The Phase II regulation deadlines for industrial, small MS4, and small construction permit coverage are all the same – no later than March 10, 2003 – to allow the NPDES permitting authority to issue one individual permit that covers all three components if it chooses to do so.

7.0 THE COMPLIANCE ASSURANCE PROCESS

After reading section 7, you should understand how EPA will determine compliance, what happens if you or the EPA discovers noncompliance, and where to go for compliance assistance information.

7.1 How Will EPA Determine Compliance?

EPA employs several approaches to monitor compliance with its environmental regulations, including both EPA-initiated and facility-initiated methods.

1. **Inspections** – EPA may conduct periodic inspections at facilities subject to this regulation. Inspections may be initiated by disclosures to EPA, randomly selecting facilities, or a variety of targeting methods. Inspections may be used, for instance, to monitor recordkeeping requirements, visit sites where storm water controls should be in place, and/or verify that facilities have permits.

2. **Permits, Records, and Reports** – Permits are not required for small construction sites and regulated small MS4s for up to three years and 90 days from the effective date of the final rule. After general permits are issued, the NPDES permitting authorities intend to use the data in storm water permit applications, construction waiver certifications, storm water pollution prevention plans (SWPPPs), no exposure certifications, records, and reports (as required by the Phase II regulation) to set appropriate permit conditions and track discharges covered by a storm water permit. Compliance and enforcement authorities will use the information to assess the regulated entity's level of compliance.

3. **Review of No Exposure Certifications** – Operators of industrial facilities that are eligible for a no exposure exclusion from the NPDES permitting requirements may prepare, and submit for review, a no exposure certification. NPDES authorities will use the information contained in the certification in determining compliance with the no exposure provisions. This information will particularly assist in determining compliance with the no exposure certification in conjunction with complaints from the public.

4. **Self-audit and Self Disclosure** – Facilities have the primary responsibility for ensuring that they are in continuous compliance. EPA encourages the facility to take advantage of EPA's Audit Policy, Small Business Policy, or Small Community Policy (these will be discussed in more detail in section 7.2).

   In addition to this document, to aid in determining whether it is in compliance, the facility might use a document currently being developed by EPA entitled "Protocol for Conducting Environmental Compliance Audits under the Storm

Water Program." This protocol, which is a part of a set containing other statute-specific audit protocols, is a tool to assist and encourage businesses and organizations to perform environmental audits and disclose violations in accordance with EPA's Audit Policy. The protocol provides guidance on key requirements, defines regulatory terms, gives an overview of the federal laws affecting a particular environmental management area, and includes a checklist for review of the facility. EPA anticipates making the document available for public use in summer 2000. To see a sample of protocols that have been completed under other statutes (RCRA, EPCRA, CERCLA), visit the Internet site: http://es.epa.gov/oeca/ccsmd/profile.html.

7.2 If I Discover a Violation, How Can I Work With The Agency to Correct It?

EPA promotes environmental compliance by providing incentives. By participating in compliance assistance programs or voluntarily disclosing violations and promptly correcting violations, businesses may get penalty waivers or reductions. EPA has three policies that potentially apply to entities regulated by the Storm Water Phase II Rule. These policies do not apply if an enforcement action has already been initiated.

Audit Policy. The first of these policies is *"Incentives for Self-Policing: Discovery, Disclosure, Correction and Prevention of Violations"* (60 FR 66706), known as the "Audit Policy". EPA initiated this policy to provide entities of all sizes with incentives to voluntarily discover and promptly disclose and correct violations of environmental regulations. For a more detailed description of the Audit Policy, visit the Internet site at: www.epa.gov/oeca/polguid/polyguid1.html.

Small Business Policy. EPA's *"Policy on Compliance Incentives for Small Business"* was developed to help small businesses with 100 or fewer employees achieve environmental compliance by creating benefits for businesses that make a good faith effort to comply with environmental regulations before a government agency discovers a violation or otherwise takes an enforcement action. The Policy currently provides incentives, such as penalty waivers or penalty reduction, for businesses that participate in on-site compliance assistance programs or conduct environmental audits to discover, disclose, and correct violations. The Policy is presently being modified to broaden when and how a small business can take advantage of the Policy. Revisions are expected in spring of 2000. Please see www.epa.gov/oeca/polguid or contact Ginger Gotliffe (202-564-7072) for more information.

Small Community Policy. The "*Policy on Flexible State Enforcement Responses to Small Community Violations"* (November, 1995) promotes alternative strategies for communities to achieve environmental and economic goals. States are encouraged to use multimedia compliance assistance and prioritize compliance issues to address specific needs of their small communities. As long as states work within the parameters of the Policy, EPA will generally defer to their decision to waive part or all of the penalty for a small community's environmental violations. This approach allows small

communities to apply their limited resources to fixing their environmental problems, rather than to paying penalties. The policy applies to communities generally comprised of fewer than 2,500 residents. In the context of the Storm Water Phase II Rule, small MS4s that are not eligible for waivers from their regulatory requirements would be most likely to take advantage of this policy. For a more detailed description of the Small Communities Policy, visit the Internet sites: www.epa.gov/oeca/scpolcy.html or www.epa.gov/oeca/ccsmd/mun.html.

7.3 Where Can I Go for Compliance Assistance on the Storm Water Phase II Rule?

The permitting authority is the leading source for information on the Storm Water Phase II Rule. EPA is also developing a "tool box" to assist States, Tribes, municipalities, and other parties involved in the Phase II program. This tool box will facilitate implementation of the storm water program in an effective and cost-efficient manner. The tool box is available on EPA's web page at http://www.epa.gov'owm/sw/phase2 and consists of the following eight major components:

- Fact Sheets
- Guidance Documents
- Menu of BMPs
- Training and Outreach Efforts
- Information Clearinghouse
- Technical Research
- Support for Demonstration Projects
- Compliance Monitoring/Assistance Tools

In addition, EPA provides widely available compliance assistance through the establishment of national compliance assistance centers, in partnership with industry, academic institutions, and other federal and state agencies. Centers have been established that provide services for several industries that contain many small businesses. Compliance assistance centers offer a range of communications services, including Web sites, e-mail groups, fax-back systems, and telephone assistance lines. Each Center is targeted to a specific sector and explains relevant federal environmental regulations. For instance, local governments can use the services of the Local Government Environmental Assistance Network (LGEAN). LGEAN is a "first-stop shop" providing environmental management, planning, and regulatory information for local government elected and appointed officials, managers, and staff. It provides 24-hour access to regulatory and pollution prevention information, message boards, regulatory updates, grants and information, and more. It is a good source for compliance assistance information on the Storm Water Phase II Rule.

For more information on EPA's compliance assistance centers, please contact Tracy Back (202-564-7076). You can access all the centers through www.epa.gov/oeca/mcfac.html or individually at:

EPA's Compliance Assistance Centers

Center	Phone	Web Address
Local Government Environmental Assistance Network (LGEAN)	1-877-TO-LGEAN	www.lgean.org
National Metal Finishing Resource Center	1-800-AT-NMFRC	www.nmfrc.org
Printers' National Environmental Assistance Center	1-888-USPNEAC	www.pneac.org
CCAR-Greenlink (the Automotive Compliance Information Assistance Center)	1-888-GRN-LINK	www.ccar-greenlink.org
National Agriculture Compliance Assistance Center	1-888-663-2155	www.epa.gov/oeca/ag
Printed Wiring Board Resource Center	1-734-995-4911	www.pwbrc.org
ChemAlliance	1-800-672-6048	www.chemalliance.org
Transportation Environmental Resource Center	1-888-459-0656	www.transource.org
Paints and Coatings Resource Center	1-800-286-6372	www.paintcenter.org

7.4 If the Agency Discovers a Violation, What Might Be Its Response?

To maximize compliance, EPA implements a balanced program of compliance assistance, compliance incentives, and traditional law enforcement. EPA knows that small businesses which must comply with complicated new statutes or rules often want to do the right thing, but may lack the requisite knowledge, resources, or skills. Compliance assistance information and technical advice helps small businesses to understand and meet their environmental obligations. Compliance incentives, such as our Small Business Policy, encourage persons to voluntarily discover, disclose, and correct violations before they are identified by the government. EPA's strong law enforcement program protects all of us by targeting persons who neither comply nor cooperate to address their problems.

EPA uses a variety of methods to determine whether regulated entities are complying, including inspecting facilities, reviewing records and reports, and responding to citizen complaints. If we learn an entity is violating the law, EPA (or a State, if the program is delegated) may file an enforcement action seeking penalties of up to $27,500, per violation, per day. While the statutory maximum penalty is currently $27,500, it may be increased periodically based on inflation in accordance with the Debt Collection Improvement Act of 1996. The proposed penalty in a given case will depend on many factors, including the number, length, and severity of the violations, the economic benefit obtained by the violator, and its ability to pay. EPA has polices in place to ensure penalties are calculated fairly. These policies are available to the public. In addition, any company charged with a violation has the right to contest EPA's allegations and proposed penalty before an impartial judge or jury.

EPA recognizes that we can achieve the greatest possible protection by encouraging businesses and organizations to work with us to discover, disclose, and correct violations. That is why we have issued Audit, Small Business, and Small Community policies to eliminate or reduce penalties for small and large entities which cooperate with EPA to address compliance problems. To help the regulated community in understanding their requirements for compliance with the rule, EPA provides compliance assistance through its regional offices, Office of Enforcement and Compliance Assurance at Headquarters, and national compliance assistance centers partners.

ABBREVIATIONS:

BAT	Best Available Technology Economically Achievable (applies to non-conventional and toxic pollutants)
BCT	Best Conventional Pollutant Control Technology (applies to conventional pollutants)
BMP	Best Management Practice
BPJ	Best Professional Judgment
BPT	Best Practicable Control Technology Currently Available (generally applies to conventional pollutants and some metals)
CFR	Code of Federal Regulations
CGP	Construction General Permit
COD	Chemical Oxygen Demand
CSO	Combined Sewer Overflow
CWA	Clean Water Act (formerly referred to as the Federal Water Pollution Control Act or Federal Water Pollution Control Act Amendments of 1972)
CZARA	Coastal Zone Act Reauthorization Amendments
D.O.	Dissolved Oxygen
DMR	Discharge Monitoring Report
ELG	Effluent Limitations Guidelines
EPA	Environmental Protection Agency
FR	Federal Register
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
MSGP	Multi Sector General Permit
NOI	Notice of Intent
NOT	Notice of Termination
NOV	Notice of Violation
NPDES	National Pollutant Discharge Elimination System
NPS	Non-point Source
O&M	Operation and Maintenance
OW	Office of Water
OWM	Office of Wastewater Management
PA	Permitting Authority
POTW	Publicly Owned Treatment Works
SIC	Standard Industrial Classification
SWPPP	Storm Water Pollution Prevention Plan
TMDL	Total Maximum Daily Load
TSS	Total Suspended Solids
UA	Urbanized Area

DEFINITIONS:

Best Available Treatment(BAT)/Best Control Technology (BCT): A level of technology based on the very best (state of the art) control and treatment measures that have been developed or are capable of being developed and that are economically achievable within the appropriate industrial category.

Best Management Practices (BMPs): Activities or structural improvements that help reduce the quantity and improve the quality of storm water runoff. BMPs include treatment requirements, operating procedures, and practices to control site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Category (xi) facilities: Specific facilities classified as light industry with equipment or materials exposed to storm water.

Clean Water Act (Water Quality Act): (formerly the Federal Water Pollution Control Act or Federal Water Pollution Control Act Amendments of 1972). Public law 92-500; 33 U.S.C. 1251 et seq.; legislation which provides statutory authority for the NPDES program. Also know as the Federal Water Pollution Control Act.

Conveyance: The process of water moving from one place to another.

Discharge: The volume of water (and suspended sediment if surface water) that passes a given location within a given period of time.

Erosion: When land is diminished or worn away due to wind, water, or glacial ice. Often the eroded debris (silt or sediment) becomes a pollutant via storm water runoff. Erosion occurs naturally but can be intensified by land clearing activities such as farming, development, road-building, and timber harvesting.

Excavation: The process of removing earth, stone, or other materials from land.

General Permit: A permit issued under the NPDES program to cover a certain class or category of storm water discharges. These permits reduce the administrative burden of permitting storm water discharges.

Grading: The cutting and/or filling of the land surface to a desired slope or elevation.

Illicit Connection: Any discharge to a municipal separate storm sewer that is not composed entirely of storm water and is not authorized by an NPDES permit, with some exceptions (e.g., discharges due to fire fighting activities).

Industrial Activity: Any activity which is directly related to manufacturing, processing or raw materials storage areas at an industrial plant.

Large Municipal Separate Storm Sewer System (MS4): An MS4 located in an incorporated place or county with a population of 250,000 or more, as determined by

the latest U.S. Census

Light Manufacturing Facilities: Described under Category (xi) of the definition of "storm water discharges associated with industrial activity." [40 CFR 122.26(b)(14)(xi)] Under the Phase I NPDES Storm Water Program, these facilities were eligible for exemption from storm water permitting requirements if certain areas and activities were not exposed to storm water. As a result of the Phase II Final Rule, these facilities must now certify to a condition of no exposure.

Maximum Extent Practicable (MEP): A standard for water quality that applies to all MS4 operators regulated under the NPDES Storm Water Program. Since no precise definition of MEP exists, it allows for maximum flexibility on the part of MS4 operators as they develop and implement their programs.

Medium Municipal Separate Storm Sewer System (MS4): MS4 located in an incorporated place or county with a population of 100,000 or more but less than 250,000, as determined by the latest U.S. Census.

Municipal Separate Storm Sewer System (MS4): A publically-owned conveyance or system of conveyances that discharges to waters of the U.S. and is designed or used for collecting or conveying storm water, is not a combined sewer, and is not part of a publicly-owned treatment works (POTW).

Multi-Sector General Permit (MSGP): An NPDES permit that regulates storm water discharges from eleven categories of industrial activities.

No exposure: All industrial materials or activities are protected by a storm resistant shelter to prevent exposure to rain, snow, snowmelt, and/or runoff. Industrial materials or activities include, but are not limited to, material handling equipment or activities, industrial machinery, raw materials, intermediate products, by-products, final products, or waste products. Material handling activities include the storage, loading and unloading, transportation, or conveyance of any raw material, intermediate product, final product or waste product.

Non-authorized States: any State that does not have the authority to regulate the NPDES Storm Water Program.

Non-point Source (NPS) Pollutants: Pollutants from many diffuse sources. NPS pollution is caused by rainfall or snowmelt moving over and through the ground. As the runoff moves, it picks up and carries away natural and human-made pollutants, finally depositing them into lakes, rivers, wetlands, coastal waters, and even our underground sources of drinking water.

Notice of Intent (NOI): An application to notify the permitting authority of a facility's intention to be covered by a general permit; exempts a facility from having to submit an individual or group application.

NPDES: "National Pollutant Discharge Elimination System" the name of the surface water quality program authorized by Congress as part of the 1987 Clean Water Act. This is EPA's program to control the discharge of pollutants to waters of the United States (see 40 CFR 122.2).

O&M Expenditures: The operating and maintenance costs associated with the continual workings of a project.

Outfall: The point where wastewater or drainage discharges from a sewer pipe, ditch, or other conveyance to a receiving body of water.

Permitting Authority (PA): The NPDES-authorized state agency or EPA regional office that administers the NPDES Storm Water Program. PAs issue permits, provide compliance assistance, and inspect and enforce the program.

Physically interconnected MS4: This means that one MS4 is connected to a second MS4 in such a way that it allows for direct discharges into the second system.

Point Source Pollutant: Pollutants from a single, identifiable source such as a factory or refinery.

Pollutant Loading: The total quantity of pollutants in storm water runoff.

Qualifying local program: A local, State or Tribal municipal storm water management program that imposes, at a minimum, the relevant requirements of one or more of the minimum control measures includes in 122.34(b).

Regulated MS4: Any MS4 covered by the NPDES Storm Water Program (regulated small, medium, or large MS4s).

Retrofit: The modification of storm water management systems through the construction and/or enhancement of wet ponds, wetland plantings, or other BMPs designed to improve water quality

Runoff: Drainage or flood discharge that leaves an area as surface flow or as pipeline flow. Has reached a channel or pipeline by either surface or sub-surface routes.

Sanitary Sewer: A system of underground pipes that carries sanitary waste or process wastewater to a treatment plant.

Sediment: Soil, sand, and minerals washed from land into water, usually after rain. Sediment can destroy fish-nesting areas, clog animal habitats, and cloud waters so that sunlight does not reach aquatic plants.

Sheet flow: The portion of precipitation that moves initially as overland flow in very shallow depths before eventually reaching a stream channel.

Site Plan: A graphical representation of a layout of buildings and facilities on a parcel of land.

Site Runoff: Any drainage or flood discharge that is released from a specified area.

Small Municipal Separate Storm Sewer System (MS4): Any MS4 that is not regulated under Phase I of the NPDES Storm Water Program and Federally-owned MS4s.

Stakeholder: An entity that holds a special interest in an issue or program -- such as the storm water program -- since it is or may be affected by it.

Standard Industrial Classification (SIC) Code: A four digit number which is used to identify various types of industries.

Storm Drain: A slotted opening leading to an underground pipe or an open ditch for carrying surface runoff.

Storm Water: Precipitation that accumulates in natural and/or constructed storage and storm water systems during and immediately following a storm event.

Storm Water Management: Functions associated with planning, designing, constructing, maintaining, financing, and regulating the facilities (both constructed and natural) that collect, store, control, and/or convey storm water.

Storm Water Pollution Prevention Plan (SWPPP): A plan to describe a process whereby a facility thoroughly evaluates potential pollutant sources at a site and selects and implements appropriate measures designed to prevent or control the discharge of pollutants in storm water runoff.

Surface Water: Water that remains on the surface of the ground, including rivers, lakes, reservoirs, streams, wetlands, impoundments, seas, estuaries, etc.

Total Maximum Daily Load (TMDL): The maximum amount of pollutants which can released into a water body without adversely affecting the water quality.

Tool Box: A term to describe the activities and materials that EPA plans to perform/produce to facilitate implementation of the storm water program in an effective and cost-efficient manner. The eight components include: 1)fact sheets; 2) guidance documents; 3) menu of BMPs; 4) compliance assistance; 5) information clearing house; 6) training and outreach efforts; 7) technical research; and 8) support for demonstration projects.

Urbanized Area (UA): A Bureau of the Census determination of a central place (or places) and the adjacent densely settled surrounding territory that together have a minimum residential population of 50,000 people and a minimum average density of 1,000 people/square mile. This is a simplified definition of a UA, the full definition is very complex.

Urban Runoff: Storm water from urban areas, which tends to contain heavy concentrations of pollutants from urban activities.

Watershed: That geographical area which drains to a specified point on a water course, usually a confluence of streams or rivers (also known as drainage area, catchment, or river basin).

Wet Weather Flows: Water entering storm drains during rainstorms/wet weather events.

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Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms

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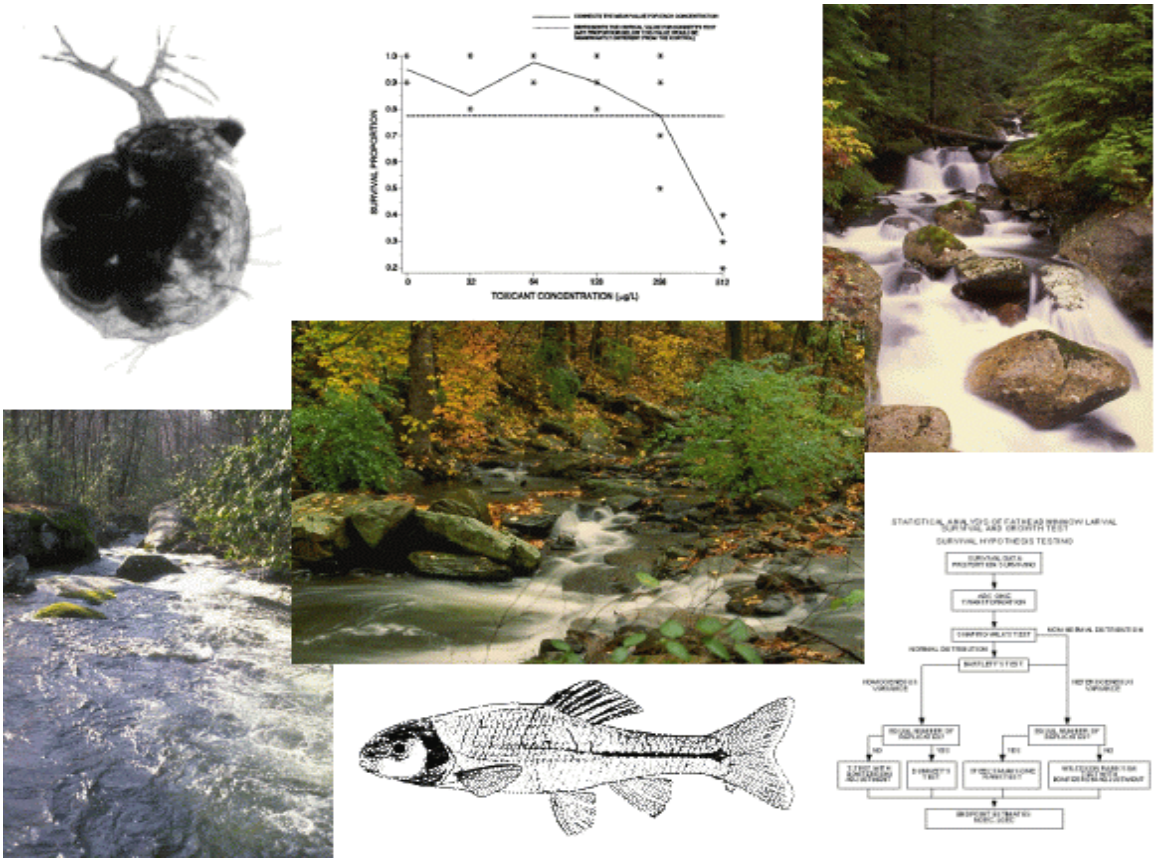

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SECTION 1

INTRODUCTION

1.1 This manual describes chronic toxicity tests for use in the National Pollutant Discharge Elimination System (NPDES) Permits Program to identify effluents and receiving waters containing toxic materials in chronically toxic concentrations. The methods included in this manual are referenced in Table IA, 40 CFR Part 136 regulations and, therefore, constitute approved methods for chronic toxicity tests. They are also suitable for determining the toxicity of specific compounds contained in discharges. The tests may be conducted in a central laboratory or on-site, by the regulatory agency or the permittee.

1.2 The data are used for NPDES permits development and to determine compliance with permit toxicity limits. Data can also be used to predict potential acute and chronic toxicity in the receiving water, based on the LC50, NOEC, IC50 or IC25 (see Section 9, Chronic Toxicity Endpoints and Data Analysis) and appropriate dilution, application, and persistence factors. The tests are performed as a part of self-monitoring permit requirements, compliance biomonitoring inspections, toxics sampling inspections, and special investigations. Data from chronic toxicity tests performed as part of permit requirements are evaluated during compliance evaluation inspections and performance audit inspections.

1.3 Modifications of these tests are also used in toxicity reduction evaluations and toxicity identification evaluations to identify the toxic components of an effluent, to aid in the development and implementation of toxicity reduction plans, and to compare and control the effectiveness of various treatment technologies for a given type of industry, irrespective of the receiving water (USEPA, 1988c; USEPA, 1989b; USEPA 1989c; USEPA, 1989d; USEPA, 1989e; USEPA, 1991a; USEPA, 1991b; and USEPA, 1992).

1.4 This methods manual serves as a companion to the acute toxicity test methods for freshwater and marine organisms (USEPA, 2002a), the short-term chronic toxicity test methods for marine and estuarine organisms (USEPA, 2002b), and the manual for evaluation of laboratories performing aquatic toxicity tests (USEPA, 1991c). In 2002, EPA revised previous editions of each of the three methods manuals (USEPA, 1993a; USEPA, 1994a; USEPA, 1994b).

1.5 Guidance for the implementation of toxicity tests in the NPDES program is provided in the Technical Support Document for Water Quality-based Toxics Control (USEPA, 1991a).

1.6 These freshwater short-term toxicity tests are similar to those developed for marine and estuarine organisms to evaluate the toxicity of effluents discharged to marine and estuarine waters under the NPDES permit program. Methods are presented in this manual for three species of freshwater organisms from three phylogenetic groups. The methods are all static renewal type seven-day tests except the green alga, *Selenastrum capricornutum*, test which lasts four days.

1.7 The three species for which test methods are provided are the fathead minnow, *Pimephales promelas*; the daphnid, *Ceriodaphnia dubia*; and the green alga, *Selenastrum capricornutum*.

1.7.1 Two of the methods incorporate the chronic endpoint of growth in addition to lethality and one incorporates reproduction. The fathead minnow, *Pimephales promelas*, embryo-larval survival and teratogenicity test incorporates teratogenic effects in addition to lethality. The green alga, *Selenastrum capricornutum*, growth test has the advantage of a relatively short exposure period (96 h).

1.8 The validity of the freshwater chronic methods in predicting adverse ecological impacts of toxic discharges was demonstrated in field studies (USEPA, 1984; USEPA, 1985b; USEPA, 1985c; USEPA, 1985d; USEPA, 1986a; USEPA, 1986b; USEPA, 1986c; USEPA, 1986d; Birge et al., 1989; and Eagleson et al., 1990).

1.9 The use of any test species or test conditions other than those described in the methods summary tables in this manual shall be subject to application and approval of alternate test procedures under 40 CFR 136.4 and 40 CFR 136.5.

1.10 These methods are restricted to use by, or under the supervision of, analysts experienced in the use or conduct of aquatic toxicity tests and the interpretation of data from aquatic toxicity testing. Each analyst must demonstrate the ability to generate acceptable test results with these methods using the procedures described in this methods manual.

1.11 This manual was prepared in the established EMSL-Cincinnati format (USEPA, 1983).

SECTION 2

SHORT-TERM METHODS FOR ESTIMATING CHRONIC TOXICITY

2.1 INTRODUCTION

2.1.1 The objective of aquatic toxicity tests with effluents or pure compounds is to estimate the "safe" or "no effect" concentration of these substances, which is defined as the concentration which will permit normal propagation of fish and other aquatic life in the receiving waters. The endpoints that have been considered in tests to determine the adverse effects of toxicants include death and survival, decreased reproduction and growth, locomotor activity, gill ventilation rate, heart rate, blood chemistry, histopathology, enzyme activity, olfactory function, and terata. Since it is not feasible to detect and/or measure all of these (and other possible) effects of toxic substances on a routine basis, observations in toxicity tests generally have been limited to only a few effects, such as mortality, growth, and reproduction.

2.1.2 Acute lethality is an obvious and easily observed effect which accounts for its wide use in the early period of evaluation of the toxicity of pure compounds and complex effluents. The results of these tests were usually expressed as the concentration lethal to 50% of the test organisms (LC50) over relatively short exposure periods (one-to-four days).

2.1.3 As exposure periods of acute tests were lengthened, the LC50 and lethal threshold concentration were observed to decline for many compounds. By lengthening the tests to include one or more complete life cycles and observing the more subtle effects of the toxicants, such as a reduction in growth and reproduction, more accurate, direct, estimates of the threshold or safe concentration of the toxicant could be obtained. However, laboratory life-cycle tests may not accurately estimate the "safe" concentration of toxicants because they are conducted with a limited number of species under highly controlled, steady-state conditions, and the results do not include the effects of the stresses to which the organisms would ordinarily be exposed in the natural environment.

2.1.4 An early published account of a full life-cycle, fish toxicity test was that of Mount and Stephan (1967). In this study, fathead minnows, *Pimephales promelas*, were exposed to a graded series of pesticide concentrations throughout their life cycle, and the effects of the toxicant on survival, growth, and reproduction were measured and evaluated. This work was soon followed by full life-cycle tests using other toxicants and fish species.

2.1.5 McKim (1977) evaluated the data from 56 full life-cycle tests, 32 of which used the fathead minnow, *Pimephales promelas*, and concluded that the embryo-larval and early juvenile life-stages were the most sensitive stages. He proposed the use of partial life-cycle toxicity tests with the early life-stages (ELS) of fish to establish water quality criteria.

2.1.6 Macek and Sleight (1977) found that exposure of critical life-stages of fish to toxicants provides estimates of chronically safe concentrations remarkably similar to those derived from full life-cycle toxicity tests. They reported that "for a great majority of toxicants, the concentration which will not be acutely toxic to the most sensitive life stages is the chronically safe concentration for fish, and that the most sensitive life stages are the embryos and fry". Critical life-stage exposure was considered to be exposure of the embryos during most, preferably all, of the embryogenic (incubation) period, and exposure of the fry for 30 days post-hatch for warm water fish with embryogenic periods ranging from one-to-fourteen days, and for 60 days post-hatch for fish with longer embryogenic periods. They concluded that in the majority of cases, the maximum acceptable toxicant concentration (MATC) could be estimated from the results of exposure of the embryos during incubation, and the larvae for 30 days post-hatch.

2.1.7 Because of the high cost of full life-cycle fish toxicity tests and the emerging consensus that the ELS test data usually would be adequate for estimating chronically safe concentrations, there was a rapid shift by aquatic toxicologists to 30 - 90-day ELS toxicity tests for estimating chronically safe concentrations in the late 1970s. In

1980, USEPA adopted the policy that ELS test data could be used in establishing water quality criteria if data from full life-cycle tests were not available (USEPA, 1980a).

2.1.8 Published reports of the results of ELS tests indicate that the relative sensitivity of growth and survival as endpoints may be species dependent, toxicant dependent, or both. Ward and Parrish (1980) examined the literature on ELS tests that used embryos and juveniles of the sheepshead minnow, *Cyprinodon variegatus*, and found that growth was not a statistically sensitive indicator of toxicity in 16 of 18 tests. They suggested that the ELS tests be shortened to 14 days posthatch and that growth be eliminated as an indicator of toxic effects.

2.1.9 In a review of the literature on 173 fish full life-cycle and ELS tests performed to determine the chronically safe concentrations of a wide variety of toxicants, such as metals, pesticides, organics, inorganics, detergents, and complex effluents, Woltering (1984) found that at the lowest effect concentration, significant reductions were observed in fry survival in 57%, fry growth in 36%, and egg hatchability in 19% of the tests. He also found that fry survival and growth were very often equally sensitive, and concluded that the growth response could be deleted from routine application of the ELS tests. The net result would be a significant reduction in the duration and cost of screening tests with no appreciable impact on estimating MATCs for chemical hazard assessments. Benoit et al. (1982), however, found larval growth to be the most significant measure of effect, and survival to be equally or less sensitive than growth in early life-stage tests with four organic chemicals.

2.1.10 Efforts to further reduce the length of partial life-cycle toxicity tests for fish without compromising their predictive value have resulted in the development of an eight-day, embryo-larval survival and teratogenicity test for fish and other aquatic vertebrates (USEPA, 1981; Birge et al., 1985), and a seven-day larval survival and growth test (Norberg and Mount, 1985).

2.1.11 The similarity of estimates of chronically safe concentrations of toxicants derived from short-term, embryo-larval survival and teratogenicity tests to those derived from full life-cycle tests has been demonstrated by Birge et al. (1981), Birge and Cassidy (1983), and Birge et al. (1985).

2.1.12 Use of a seven-day, fathead minnow, *Pimephales promelas*, larval survival and growth test was first proposed by Norberg and Mount at the 1983 annual meeting of the Society for Environmental Toxicology and Chemistry (Norberg and Mount, 1983). This test was subsequently used by Mount and associates in field demonstrations at Lima, OH (USEPA, 1984), and at many other locations. Growth was frequently found to be more sensitive than survival in determining the effects of complex effluents.

2.1.13 Norberg and Mount (1985) performed three single toxicant fathead minnow larval growth tests with zinc, copper, and DURSBAN®, using dilution water from Lake Superior. The results were comparable to, and had confidence intervals that overlapped with, chronic values reported in the literature for both ELS and full life-cycle tests.

2.1.14 Mount and Norberg (1984) developed a seven-day cladoceran partial life-cycle test and experimented with a number of diets for use in culturing and testing the daphnid, *Ceriodaphnia reticulata* (Norberg and Mount, 1985). As different laboratories began to use this cladoceran test, it was discovered that apparently more than one species was involved in the tests conducted by the same laboratory. Berner (1986) studied the problem and determined that perhaps as many as three variant forms were involved and it was decided to recommend the use of the more common *Ceriodaphnia dubia* rather than the originally reported *Ceriodaphnia reticulata*. The method was adopted for use in the first edition of the freshwater short-term chronic methods (USEPA, 1985e).

2.1.15 The green alga, *Selenastrum capricornutum*, bottle test was developed, after extensive design, evaluation, and application, for the National Eutrophication Research Program (USEPA, 1971). The test was later modified for use in the assessment of receiving waters and the effects of wastes originating from industrial, municipal, and agricultural point and non-point sources (USEPA, 1978a).

2.1.16 The use of short-term toxicity tests including subchronic and chronic tests in the NPDES Program is especially attractive because they provide a more direct estimate of the safe concentrations of effluents in receiving waters than was provided by acute toxicity tests, at an only slightly increased level of effort, compared to the fish full life-cycle chronic and 28-day ELS tests and the 21-day daphnid, *Daphnia magna*, life-cycle test.

2.2 TYPES OF TESTS

2.2.1 The selection of the test type will depend on the NPDES permit requirements, the objectives of the test, the available resources, the requirements of the test organisms, and effluent characteristics such as fluctuations in effluent toxicity.

2.2.2 Effluent chronic toxicity is generally measured using a multi-concentration, or definitive test, consisting of a control and a minimum of five effluent concentrations. The tests are designed to provide dose-response information, expressed as the percent effluent concentration that affects the hatchability, gross morphological abnormalities, survival, growth, and/or reproduction within the prescribed period of time (four to seven days). The results of the tests are expressed in terms of the highest concentration that has no statistically significant observed effect on those responses when compared to the controls or the estimated concentration that causes a specified percent reduction in responses versus the controls.

2.2.3 Use of pass/fail tests consisting of a single effluent concentration (e.g., the receiving water concentration or RWC) and a control **is not recommended**. If the NPDES permit has a whole effluent toxicity limit for acute toxicity at the RWC, it is prudent to use that permit limit as the midpoint of a series of five effluent concentrations. This will ensure that there is sufficient information on the dose-response relationship. For example, the effluent concentrations utilized in a test may be: (1) 100% effluent, (2) (RWC + 100)/2, (3) RWC, (4) RWC/2, and (5) RWC/4. More specifically, if the RWC = 50%, appropriate effluent concentrations may be 100%, 75%, 50%, 25%, and 12.5%.

2.2.4 Receiving (ambient) water toxicity tests commonly employ two treatments, a control and the undiluted receiving water, but may also consist of a series of receiving water dilutions.

2.2.5 A negative result from a chronic toxicity test does not preclude the presence of toxicity. Also, because of the potential temporal variability in the toxicity of effluents, a negative test result with a particular sample does not preclude the possibility that samples collected at some other time might exhibit chronic toxicity.

2.2.6 The frequency with which chronic toxicity tests are conducted under a given NPDES permit is determined by the regulatory agency on the basis of factors such as the variability and degree of toxicity of the waste, production schedules, and process changes.

2.2.7 Tests recommended for use in this methods manual may be static non-renewal or static renewal. Individual methods specify which static type of test is to be conducted.

2.3 STATIC TESTS

2.3.1 Static non-renewal tests - The test organisms are exposed to the same test solution for the duration of the test.

2.3.2 Static-renewal tests - The test organisms are exposed to a fresh solution of the same concentration of sample every 24 h or other prescribed interval, either by transferring the test organisms from one test chamber to another, or by replacing all or a portion of solution in the test chambers.

2.4 ADVANTAGES AND DISADVANTAGES OF TOXICITY TEST TYPES

2.4.1 STATIC NON-RENEWAL, SHORT-TERM TOXICITY TESTS:

Advantages:

1. Simple and inexpensive.
2. Very cost effective in determining compliance with permit conditions.
3. Limited resources (space, manpower, equipment) required; would permit staff to perform many more tests in the same amount of time.
4. Smaller volume of effluent required than for static renewal or flow-through tests.

Disadvantages:

1. Dissolved oxygen (DO) depletion may result from high chemical oxygen demand (COD), biological oxygen demand (BOD), or metabolic wastes.
2. Possible loss of toxicants through volatilization and/or adsorption to the exposure vessels.
3. Generally less sensitive than static renewal, because the toxic substances may degrade or be adsorbed, thereby reducing the apparent toxicity. Also, there is less chance of detecting slugs of toxic wastes, or other temporal variations in waste properties.

2.4.2 STATIC RENEWAL, SHORT-TERM TOXICITY TESTS:

Advantages:

1. Reduced possibility of DO depletion from high COD and/or BOD, or ill effects from metabolic wastes from organisms in the test solutions.
2. Reduced possibility of loss of toxicants through volatilization and/or adsorption to the exposure vessels.
3. Test organisms that rapidly deplete energy reserves are fed when the test solutions are renewed, and are maintained in a healthier state.

Disadvantages:

1. Require greater volume of effluent than non-renewal tests.
2. Generally less chance of temporal variations in waste properties.

SECTION 3

HEALTH AND SAFETY

3.1 GENERAL PRECAUTIONS

3.1.1 Each laboratory should develop and maintain an effective health and safety program, requiring an ongoing commitment by the laboratory management. This program should include (1) a safety officer with the responsibility and authority to develop and maintain a safety program, (2) the preparation of a formal, written, health and safety plan, which is provided to each of the laboratory staff, (3) an ongoing training program on laboratory safety, and (4) regularly scheduled, documented, safety inspections.

3.1.2 Collection and use of effluents in toxicity tests may involve significant risks to personal safety and health. Personnel collecting effluent samples and conducting toxicity tests should take all safety precautions necessary for the prevention of bodily injury and illness which might result from ingestion or invasion of infectious agents, inhalation or absorption of corrosive or toxic substances through skin contact, and asphyxiation due to lack of oxygen or presence of noxious gases.

3.1.3 Prior to sample collection and laboratory work, personnel will determine that all necessary safety equipment and materials have been obtained and are in good condition.

3.1.4 Guidelines for the handling and disposal of hazardous materials must be strictly followed.

3.2 SAFETY EQUIPMENT

3.2.1 PERSONAL SAFETY GEAR

3.2.1.1 Personnel should use safety equipment, as required, such as rubber aprons, laboratory coats, respirators, gloves, safety glasses, hard hats, and safety shoes. Plastic netting on glass beakers, flasks, and other glassware minimizes breakage and subsequent shattering of the glass.

3.2.2 LABORATORY SAFETY EQUIPMENT

3.2.2.1 Each laboratory (including mobile laboratories) should be provided with safety equipment such as first aid kits, fire extinguishers, fire blankets, emergency showers, chemical spill clean up kits, and eye fountains.

3.2.2.2 Mobile laboratories should be equipped with a telephone or other means to enable personnel to summon help in case of emergency.

3.3 GENERAL LABORATORY AND FIELD OPERATIONS

3.3.1 Work with effluents should be performed in compliance with accepted rules pertaining to the handling of hazardous materials (see safety manuals listed in Section 3, Health and Safety, Subsection 3.5). It is recommended that personnel collecting samples and performing toxicity tests not work alone.

3.3.2 Because the chemical composition of effluents is usually only poorly known, they should be considered as potential health hazards, and exposure to them should be minimized. Fume and canopy hoods over the toxicity test areas must be used whenever possible.

3.3.3 It is advisable to cleanse exposed parts of the body immediately after collecting effluent samples.

3.3.4 All containers are to be adequately labeled to indicate their contents.

3.3.5 Staff should be familiar with safety guidelines on Material Safety Data Sheets for reagents and other chemicals purchased from suppliers. Incompatible materials should not be stored together. Good housekeeping contributes to safety and reliable results.

3.3.6 Strong acids and volatile organic solvents employed in glassware cleaning must be used in a fume hood or under an exhaust canopy over the work area.

3.3.7 Electrical equipment or extension cords not bearing the approval of Underwriter Laboratories must not be used. Ground-fault interrupters must be installed in all "wet" laboratories where electrical equipment is used.

3.3.8 Mobile laboratories should be properly grounded to protect against electrical shock.

3.4 DISEASE PREVENTION

3.4.1 Personnel handling samples which are known or suspected to contain human wastes should be immunized against tetanus, typhoid fever, polio, and hepatitis B.

3.5 SAFETY MANUALS

3.5.1 For further guidance on safe practices when collecting effluent samples and conducting toxicity tests, check with the permittee and consult general safety manuals, including USEPA (1986e) and Walters and Jameson (1984).

3.6 WASTE DISPOSAL

3.6.1 Wastes generated during toxicity testing must be properly handled and disposed of in an appropriate manner. Each testing facility will have its own waste disposal requirements based on local, state, and Federal rules and regulations. It is extremely important that these rules and regulations be known, understood, and complied with by all persons responsible for, or otherwise involved in performing the toxicity testing activities. Local fire officials should be notified of any potentially hazardous conditions.

SECTION 4

QUALITY ASSURANCE

4.1 INTRODUCTION

4.1.1 Development and maintenance of a toxicity test laboratory quality assurance (QA) program (USEPA, 1991a) requires an ongoing commitment by laboratory management. Each toxicity test laboratory should (1) appoint a quality assurance officer with the responsibility and authority to develop and maintain a QA program; (2) prepare a quality assurance plan with stated data quality objectives (DQOs); (3) prepare a written description of laboratory standard operating procedures (SOPs) for culturing, toxicity testing, instrument calibration, sample chain-of-custody procedures, laboratory sample tracking system, glassware cleaning, etc.; and (4) provide an adequate, qualified technical staff for culturing and testing the organisms, and suitable space and equipment to assure reliable data.

4.1.2 QA practices for toxicity testing laboratories must address all activities that affect the quality of the final effluent toxicity test data, such as: (1) effluent sampling and handling; (2) the source and condition of the test organisms; (3) condition of equipment; (4) test conditions; (5) instrument calibration; (6) replication; (7) use of reference toxicants; (8) record keeping; and (9) data evaluation.

4.1.3 Quality control practices, on the other hand, consist of the more focused, routine, day-to-day activities carried out within the scope of the overall QA program. For more detailed discussion of quality assurance and general guidance on good laboratory practices and laboratory evaluation related to toxicity testing, see FDA, (1978); USEPA, (1979d), USEPA (1980b), USEPA (1980c), and USEPA (1991c); DeWoskin (1984); and Taylor (1987).

4.1.4 Guidance for the evaluation of laboratories performing toxicity tests and laboratory evaluation criteria may be found in USEPA (1991c).

4.2 FACILITIES, EQUIPMENT, AND TEST CHAMBERS

4.2.1 Separate test organism culturing and toxicity testing areas should be provided to avoid possible loss of cultures due to cross-contamination. Ventilation systems should be designed and operated to prevent recirculation or leakage of air from chemical analysis laboratories or sample storage and preparation areas into organism culturing or testing areas, and from testing and sample preparation areas into culture rooms.

4.2.2 Laboratory and toxicity test temperature control equipment must be adequate to maintain recommended test water temperatures. Recommended materials must be used in the fabrication of the test equipment which comes in contact with the effluent (see Section 5, Facilities, Equipment and Supplies; and specific toxicity test method).

4.3 TEST ORGANISMS

4.3.1 The test organisms used in the procedures described in this manual are the fathead minnow, *Pimephales promelas*, the daphnid, *Ceriodaphnia dubia*, and the green alga, *Selenastrum capricornutum*. The fish and invertebrates should appear healthy, behave normally, feed well, and have low mortality in the cultures, during holding, and in test controls. Test organisms should be positively identified to species (see Section 6, Test Organisms).

4.4 LABORATORY WATER USED FOR CULTURING AND TEST DILUTION WATER

4.4.1 The quality of water used for test organism culturing and for dilution water used in toxicity tests is extremely important. Water for these two uses should come from the same source. The dilution water used in effluent toxicity tests will depend in part on the objectives of the study and logistical constraints, as discussed in detail in Section 7, Dilution Water. For tests performed to meet NPDES objectives, synthetic, moderately hard water should be used.

The dilution water used for internal quality assurance tests with organisms, food, and reference toxicants should be the water routinely used with success in the laboratory. Types of water are discussed in Section 5, Facilities, Equipment and Supplies. Water used for culturing and test dilution should be analyzed for toxic metals and organics at least annually or whenever difficulty is encountered in meeting minimum acceptability criteria for control survival and reproduction or growth. The concentration of the metals Al, As, Cr, Co, Cu, Fe, Pb, Ni, and Zn, expressed as total metal, should not exceed 1 mg/L each, and Cd, Hg, and Ag, expressed as total metal, should not exceed 100 ng/L each. Total organochlorine pesticides plus PCBs should be less than 50 ng/L (APHA, 1992). Pesticide concentrations should not exceed USEPA's Ambient Water Quality chronic criteria values where available.

4.5 EFFLUENT AND RECEIVING WATER SAMPLING AND HANDLING

4.5.1 Sample holding times and temperatures of effluent samples collected for on-site and off-site testing must conform to conditions described in Section 8, Effluent and Receiving Water Sampling, Sample Handling, and Sample Preparation for Toxicity Tests.

4.6 TEST CONDITIONS

4.6.1 Water temperature should be maintained within the limits specified for each test. The temperature of test solutions must be measured by placing the thermometer or probe directly into the test solutions, or by placing the thermometer in equivalent volumes of water in surrogate vessels positioned at appropriate locations among the test vessels. Temperature should be recorded continuously in at least one test vessel for the duration of each test. Test solution temperatures should be maintained within the limits specified for each test. DO concentration and pH should be checked at the beginning of each test and daily throughout the test period.

4.7 QUALITY OF TEST ORGANISMS

4.7.1 The health of test organisms is primarily assessed by the performance (survival, growth, and/or reproduction) of organisms in control treatments of individual tests. The health and sensitivity of test organisms is also assessed by reference toxicant testing. In addition to documenting the sensitivity and health of test organisms, reference toxicant testing is used to initially demonstrate acceptable laboratory performance (Subsection 4.15) and to document ongoing laboratory performance (Subsection 4.16).

4.7.2 Regardless of the source of test organisms (in-house cultures or purchased from external suppliers), the testing laboratory must perform at least one acceptable reference toxicant test per month for each toxicity test method conducted in that month (Subsection 4.16). If a test method is conducted only monthly, or less frequently, a reference toxicant test must be performed concurrently with each effluent toxicity test.

4.7.3 When acute or short-term chronic toxicity tests are performed with effluents or receiving waters using test organisms obtained from outside the test laboratory, concurrent toxicity tests of the same type must be performed with a reference toxicant, unless the test organism supplier provides control chart data from at least the last five monthly short-term chronic toxicity tests using the same reference toxicant and control conditions (see Section 6, Test Organisms).

4.7.4 The supplier should certify the species identification of the test organisms, and provide the taxonomic reference (citation and page) or name(s) of the taxonomic expert(s) consulted.

4.7.5 If routine reference toxicant tests fail to meet test acceptability criteria, then the reference toxicant test must be immediately repeated.

4.8 FOOD QUALITY

4.8.1 The nutritional quality of the food used in culturing and testing fish and invertebrates is an important factor in the quality of the toxicity test data. This is especially true for the unsaturated fatty acid content of brine shrimp nauplii, *Artemia*. Problems with the nutritional suitability of the food will be reflected in the survival, growth, and reproduction of the test organisms in cultures and toxicity tests. *Artemia* cysts, and other foods must be obtained as described in Section 5, Facilities, Equipment, and Supplies.

4.8.2 Problems with the nutritional suitability of food will be reflected in the survival, growth, and reproduction of the test organisms in cultures and toxicity tests. If a batch of food is suspected to be defective, the performance of organisms fed with the new food can be compared with the performance of organisms fed with a food of known quality in side-by-side tests. If the food is used for culturing, its suitability should be determined using a short-term chronic test which will determine the affect of food quality on growth or reproduction of each of the relevant test species in culture, using four replicates with each food source. Where applicable, foods used only in chronic toxicity tests can be compared with a food of known quality in side-by-side, multi-concentration chronic tests, using the reference toxicant regularly employed in the laboratory QA program.

4.8.3 New batches of food used in culturing and testing should be analyzed for toxic organics and metals or whenever difficulty is encountered in meeting minimum acceptability criteria for control survival and reproduction or growth. If the concentration of total organochlorine pesticides exceeds 0.15 mg/g wet weight, or the concentration of total organochlorine pesticides plus PCBs exceeds 0.30 µg/g wet weight, or toxic metals (Al, As, Cr, Cd, Cu, Pb, Ni, Zn, expressed as total metal) exceed 20 µg/g wet weight, the food should not be used (for analytical methods see AOAC, 1990 and USDA, 1989). For foods (e.g., such as YCT) which are used to culture and test organisms, the quality of the food should meet the requirements for the laboratory water used for culturing and test dilution water as described in Section 4.4 above.

4.9 ACCEPTABILITY OF SHORT-TERM CHRONIC TOXICITY TESTS

4.9.1 For the tests to be acceptable, control survival in fathead minnow, *Pimephales promelas*, and the daphnid, *Ceriodaphnia dubia*, tests must be 80% or greater. At the end of the test, the average dry weight of surviving seven-day-old fathead minnows in control chambers must equal or exceed 0.25 mg. In *Ceriodaphnia dubia* controls, 60% or more of the surviving females must have produced their third brood in 7 ± 1 days, and the number of young per surviving female must be 15 or greater. In algal toxicity tests, the mean cell density in the controls after 96 h must equal or exceed 1×10^6 cells/mL and not vary more than 20% among replicates. If these criteria are not met, the test must be repeated.

4.9.2 An individual test may be conditionally acceptable if temperature, DO, and other specified conditions fall outside specifications, depending on the degree of the departure and the objectives of the tests (see test condition summaries). The acceptability of the test would depend on the experience and professional judgment of the laboratory investigator and the reviewing staff of the regulatory authority. Any deviation from test specifications must be noted when reporting data from the test.

4.10 ANALYTICAL METHODS

4.10.1 Routine chemical and physical analyses for culture and dilution water, food, and test solutions must include established quality assurance practices outlined in USEPA methods manuals (USEPA, 1979a and USEPA, 1979b).

4.10.2 Reagent containers should be dated and catalogued when received from the supplier, and the shelf life should not be exceeded. Also, working solutions should be dated when prepared, and the recommended shelf life should be observed.

4.11 CALIBRATION AND STANDARDIZATION

4.11.1 Instruments used for routine measurements of chemical and physical parameters such as pH, DO, temperature, and conductivity, must be calibrated and standardized according to instrument manufacturer's procedures as indicated in the general section on quality assurance (see USEPA Methods 150.1, 360.1, 170.1, and 120.1 in USEPA, 1979b). Calibration data are recorded in a permanent log book.

4.11.2 Wet chemical methods used to measure hardness, alkalinity and total residual chlorine must be standardized prior to use each day according to the procedures for those specific USEPA methods (see USEPA Methods 130.2 and 310.1 in USEPA, 1979b).

4.12 REPLICATION AND TEST SENSITIVITY

4.12.1 The sensitivity of the tests will depend in part on the number of replicates per concentration, the significance level selected, and the type of statistical analysis. If the variability remains constant, the sensitivity of the test will increase as the number of replicates is increased. The minimum recommended number of replicates varies with the objectives of the test and the statistical method used for analysis of the data.

4.13 VARIABILITY IN TOXICITY TEST RESULTS

4.13.1 Factors which can affect test success and precision include (1) the experience and skill of the laboratory analyst; (2) test organism age, condition, and sensitivity; (3) dilution water quality; (4) temperature control; and (5) the quality and quantity of food provided. The results will depend upon the species used and the strain or source of the test organisms, and test conditions, such as temperature, DO, food, and water quality. The repeatability or precision of toxicity tests is also a function of the number of test organisms used at each toxicant concentration. Jensen (1972) discussed the relationship between sample size (number of fish) and the standard error of the test, and considered 20 fish per concentration as optimum for Probit Analysis.

4.14 TEST PRECISION

4.14.1 The ability of the laboratory personnel to obtain consistent, precise results must be demonstrated with reference toxicants before they attempt to measure effluent toxicity. The single-laboratory precision of each type of test to be used in a laboratory should be determined by performing at least five tests with a reference toxicant.

4.14.2 Test precision can be estimated by using the same strain of organisms under the same test conditions and employing a known toxicant, such as a reference toxicant.

4.14.3 Interlaboratory precision data from a 1991 study of chronic toxicity tests with two species using the reference toxicants potassium chloride and copper sulfate are shown in Table 1. Table 2 shows interlaboratory precision data from a study of three chronic toxicity test methods using effluent, receiving water, and reference toxicant sample types (USEPA, 2001a; USEPA, 2001b). The effluent sample was a municipal wastewater spiked with KCl, the receiving waster sample was a river water spiked with KCl, and the reference toxicant sample consisted of moderately-hard synthetic freshwater spiked with KCl. Additional precision data for each of the tests described in this manual are presented in the sections describing the individual test methods.

TABLE 1. NATIONAL INTERLABORATORY STUDY OF CHRONIC TOXICITY TEST PRECISION, 1991: SUMMARY OF RESPONSES USING A REFERENCE TOXICANT[1]

Organism	Endpoint	No. Labs	% Effluent[2]	SD	CV(%)
Pimephales promelas	Survival, NOEC	146	NA	NA	NA
	Growth, IC25	124	4.67	1.87	40.0
	Growth, IC50	117	6.36	2.04	32.1
	Growth, NOEC	142	NA	NA	NA
Ceriodaphnia dubia	Survival, NOEC	162	NA	NA	NA
	Reproduction, IC25	155	2.69	1.96	72.9
	Reproduction, IC50	150	3.99	2.35	58.9
	Reproduction, NOEC	156	NA	NA	NA

[1] From a national study of interlaboratory precision of toxicity test data performed in 1991 by the Environmental Monitoring Systems Laboratory- Cincinnati, U.S. Environmental Protection Agency, Cincinnati, OH 45268. Participants included Federal, state, and private laboratories engaged in NPDES permit compliance monitoring.

[2] Expressed as % effluent; in reality it was a reference toxicant (KCl) but was not known by the persons conducting the tests.

TABLE 2. NATIONAL INTERLABORATORY STUDY OF CHRONIC TOXICITY TEST PRECISION, 2000: PRECISION OF RESPONSES USING EFFLUENT, RECEIVING WATER, AND REFERENCE TOXICANT SAMPLE TYPES[1].

Organism	Endpoint	Number of Tests[2]	CV (%)[3]
Pimephales promelas	Growth, IC25	73	20.9
Ceriodaphnia dubia	Reproduction, IC25	34	35.0
Selenastrum capricornutum (with EDTA)	Growth, IC25	21	34.3
	Growth, IC50	22	32.2
Selenastrum capricornutum (without EDTA)	Growth, IC25	21	58.5
	Growth, IC50	22	58.5

1 From EPA's WET Interlaboratory Variability Study (USEPA, 2001a; USEPA, 2001b).
2 Represents the number of valid tests (i.e., those that met test acceptability criteria) that were used in the analysis of precision. Invalid tests were not used.
3 CVs based on total interlaboratory variability (including both within-laboratory and between-laboratory components of variability) and averaged across sample types. IC25s or IC50s were pooled for all laboratories to calculate the CV for each sample type. The resulting CVs were then averaged across sample types.

4.14.4 Additional information on toxicity test precision is provided in the Technical Support Document for Water Quality-based Control (see pp. 2-4, and 11-15 in USEPA, 1991a).

4.14.5 In cases where the test data are used in Probit Analysis or other point estimation techniques (see Section 9, Chronic Toxicity Test Endpoints and Data Analysis), precision can be described by the mean, standard deviation, and relative standard deviation (percent coefficient of variation, or CV) of the calculated endpoints from the replicated tests. In cases where the test data are used in the Linear Interpolation Method, precision can be estimated by empirical confidence intervals derived by using the ICPIN Method (see Section 9, Chronic Toxicity Test Endpoints and Data Analysis). However, in cases where the results are reported in terms of the No-Observed-Effect Concentration (NOEC) and Lowest-Observed-Effect Concentration (LOEC) (see Section 9, Chronic Toxicity Test Endpoints and Data Analysis) precision can only be described by listing the NOEC-LOEC interval for each test. It is not possible to express precision in terms of a commonly used statistic. However, when all tests of the same toxicant yield the same NOEC-LOEC interval, maximum precision has been attained. The "true" no effect concentration could fall anywhere within the interval, NOEC ± (NOEC minus LOEC).

4.14.6 It should be noted here that the dilution factor selected for a test determines the width of the NOEC-LOEC interval and the inherent maximum precision of the test. As the absolute value of the dilution factor decreases, the width of the NOEC-LOEC interval increases, and the inherent maximum precision of the test decreases. When a dilution factor of 0.3 is used, the NOEC could be considered to have a relative variability as high as ± 300%. With a dilution factor of 0.5, the NOEC could be considered to have a relative variability of ± 100%. As a result of the variability of different dilution factors, **USEPA recommends the use of the dilution factor of 0.5 or greater**. Other factors which can affect test precision include: test organism age, condition, and sensitivity; temperature

control; and feeding.

4.15 DEMONSTRATING ACCEPTABLE LABORATORY PERFORMANCE

4.15.1 It is a laboratory's responsibility to demonstrate its ability to obtain consistent, precise results with reference toxicants before it performs toxicity tests with effluents for permit compliance purposes. To meet this requirement, the intralaboratory precision, expressed as percent coefficient of variation (CV%), of each type of test to be used in the laboratory should be determined by performing five or more tests with different batches of test organisms, using the same reference toxicant, at the same concentrations, with the same test conditions (i.e., the same test duration, type of dilution water, age of test organisms, feeding, etc.), and the same data analysis methods. A reference toxicant concentration series (0.5 or higher) should be selected that will consistently provide partial mortalities at two or more concentrations.

4.16 DOCUMENTING ONGOING LABORATORY PERFORMANCE

4.16.1 Satisfactory laboratory performance is demonstrated by performing at least one acceptable test per month with a reference toxicant for each toxicity test method conducted in the laboratory during that month. For a given test method, successive tests must be performed with the same reference toxicant, at the same concentrations, in the same dilution water, using the same data analysis methods. Precision may vary with the test species, reference toxicant, and type of test. Each laboratory's reference toxicity data will reflect conditions unique to that facility, including dilution water, culturing, and other variables; however, each laboratory's reference toxicity results should reflect good repeatability.

4.16.2 A control chart should be prepared for each combination of reference toxicant, test species, test conditions, and endpoints. Toxicity endpoints from five or six tests are adequate for establishing the control charts. Successive toxicity endpoints (NOECs, IC25s, LC50s, etc.) should be plotted and examined to determine if the results (X_1) are within prescribed limits (Figure 1). The chart should plot logarithm of concentration on the vertical axis against the date of the test or test number on the horizontal axis. The types of control charts illustrated (see USEPA, 1979a) are used to evaluate the cumulative trend of results from a series of samples, thus reference toxicant test results should not be used as a *de facto* criterion for rejection of individual effluent or receiving water tests. For endpoints that are point estimates (LC50s and IC25s), the cumulative mean ($\bar{X}$) and upper and lower control limits (± 2S) are re-calculated with each successive test result. Endpoints from hypothesis tests (NOEC, NOAEC) from each test are plotted directly on the control chart. The control limits would consist of one concentration interval above and below the concentration representing the central tendency. After two years of data collection, or a minimum of 20 data points, the control chart should be maintained using only the 20 most recent data points.

4.16.3 Laboratories should compare the calculated CV (i.e., standard deviation / mean) of the IC25 for the 20 most recent data points to the distribution of laboratory CVs reported nationally for reference toxicant testing (Table 3-2 in USEPA, 2000b). If the calculated CV exceeds the 75th percentile of CVs reported nationally, the laboratory should use the 75th and 90th percentiles to calculate warning and control limits, respectively, and the laboratory should investigate options for reducing variability. Note: Because NOECs can only be a fixed number of discrete values, the mean, standard deviation, and CV cannot be interpreted and applied in the same way that these descriptive statistics are interpreted and applied for continuous variables such as the IC25 or LC50.

4.16.4 The outliers, which are values falling outside the upper and lower control limits, and trends of increasing or decreasing sensitivity, are readily identified. In the case of endpoints that are point estimates (LC50s and IC25s), at the $P_{0.05}$ probability level, one in 20 tests would be expected to fall outside of the control limits by chance alone. If more than one out of 20 reference toxicant tests fall outside the control limits, the laboratory should investigate sources of variability, take corrective actions to reduce identified sources of variability, and perform an additional reference toxicant test during the same month. Control limits for the NOECs will also be exceeded occasionally, regardless of how well a laboratory performs. In those instances when the laboratory can document the cause for the outlier (e.g., operator error, culture health or test system failure), the outlier should be excluded from the future calculations of the control limits. If two or more consecutive tests do not fall within the control limits, the results

must be explained and the reference toxicant test must be immediately repeated. Actions taken to correct the problem must be reported.

4.16.5 If the toxicity value from a given test with a reference toxicant falls well outside the expected range for the other test organisms when using the standard dilution water and other test conditions, the laboratory should investigate sources of variability, take corrective actions to reduce identified sources of variability, and perform an additional reference toxicant test during the same month. Performance should improve with experience, and the control limits for endpoints that are point estimates should gradually narrow. However, control limits of ± 2S will be exceeded 5% of the time by chance alone, regardless of how well a laboratory performs. Highly proficient laboratories which develop very narrow control limits may be unfairly penalized if a test result which falls just outside the control limits is rejected *de facto*. For this reason, the width of the control limits should be considered in determining whether or not a reference toxicant test result falls "well" outside the expected range. The width of the control limits may be evaluated by comparing the calculated CV (i.e., standard deviation / mean) of the IC25 for the 20 most recent data points to the distribution of laboratory CVs reported nationally for reference toxicant testing (Table 3-2 in USEPA, 2000b). In determining whether or not a reference toxicant test result falls "well" outside the expected range, the result also may be compared with upper and lower bounds for ±3S, as any result outside these control limits would be expected to occur by chance only 1 out of 100 tests (Environment Canada, 1990). When a result from a reference toxicant test is outside the 99% confidence intervals, the laboratory must conduct an immediate investigation to assess the possible causes for the outlier.

4.16.6 Reference toxicant test results should not be used as a *de facto* criterion for rejection of individual effluent or receiving water tests. Reference toxicant testing is used for evaluating the health and sensitivity of organisms over time and for documenting initial and ongoing laboratory performance. While reference toxicant test results should not be used as a *de facto* criterion for test rejection, effluent and receiving water test results should be reviewed and interpreted in the light of reference toxicant test results. The reviewer should consider the degree to which the reference toxicant test result fell outside of control chart limits, the width of the limits, the direction of the deviation (toward increased test organism sensitivity or toward decreased test organism sensitivity), the test conditions of both the effluent test and the reference toxicant test, and the objective of the test.

4.17 REFERENCE TOXICANTS

4.17.1 Reference toxicants such as sodium chloride (NaCl), potassium chloride (KCl), cadmium chloride ($CdCl_2$), copper sulfate ($CuSO_4$), sodium dodecyl sulfate (SDS), and potassium dichromate ($K_2Cr_2O_7$), are suitable for use in the NPDES Program and other Agency programs requiring aquatic toxicity tests. EMSL-Cincinnati hopes to release USEPA-certified solutions of cadmium and copper for use as reference toxicants through cooperative research and development agreements with commercial suppliers, and will continue to develop additional reference toxicants for future release. Standard reference materials can be obtained from commercial supply houses, or can be prepared inhouse using reagent grade chemicals. The regulatory agency should be consulted before reference toxicant(s) are selected and used.

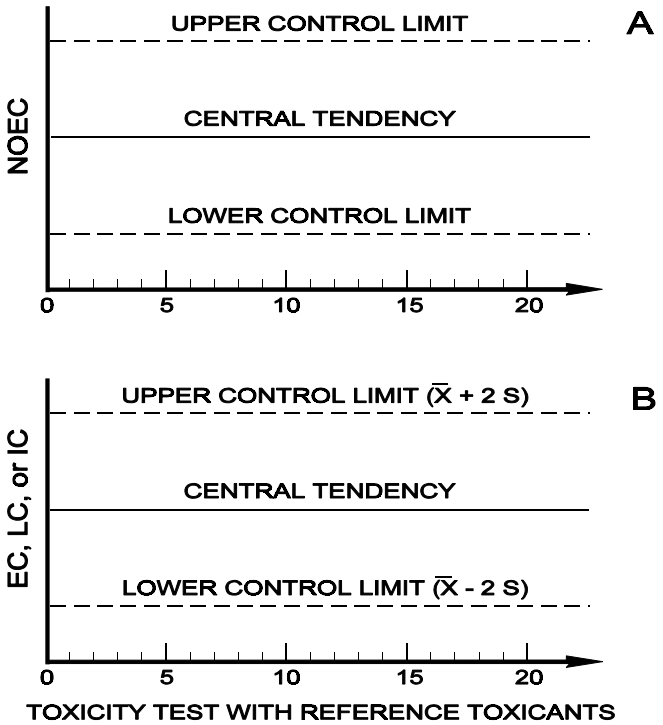

Figure 1. Control charts. (A) hypothesis testing results; (B) point estimates (LC, EC, or IC).

$$\bar{X} = \frac{\sum_{i=1}^{n} X_i}{n}$$

$$S = \sqrt{\frac{\sum_{i=1}^{n} X_i^2 - \frac{(\sum_{i=1}^{n} X_i)^2}{n}}{n-1}}$$

Where: X_i = Successive toxicity values from toxicity tests.

n = Number of tests.

$\bar{X}$ = Mean toxicity value.

S = Standard deviation.

4.18 RECORD KEEPING

4.18.1 Proper record keeping is important. A complete file should be maintained for each individual toxicity test or group of tests on closely related samples. This file should contain a record of the sample chain-of-custody; a copy of the sample log sheet; the original bench sheets for the test organism responses during the toxicity test(s); chemical analysis data on the sample(s); detailed records of the test organisms used in the test(s), such as species, source, age, date of receipt, and other pertinent information relating to their history and health; information on the calibration of equipment and instruments; test conditions employed; and results of reference toxicant tests. Laboratory data should be recorded on a real-time basis to prevent the loss of information or inadvertent introduction of errors into the record. Original data sheets should be signed and dated by the laboratory personnel performing the tests.

4.18.2 The regulatory authority should retain records pertaining to discharge permits. Permittees are required to retain records pertaining to permit applications and compliance for a minimum of 3 years [40 CFR 122.41(j)(2)].

SECTION 5

FACILITIES, EQUIPMENT, AND SUPPLIES

5.1 GENERAL REQUIREMENTS

5.1.1 Effluent toxicity tests may be performed in a fixed or mobile laboratory. Facilities must include equipment for rearing and/or holding organisms. Culturing facilities for test organisms may be desirable in fixed laboratories which perform large numbers of tests. Temperature control can be achieved using circulating water baths, heat exchangers, or environmental chambers. Water used for rearing, holding, acclimating, and testing organisms may be ground water, receiving water, dechlorinated tap water, or reconstituted synthetic water. Dechlorination can be accomplished by carbon filtration, or the use of sodium thiosulfate. Use of 3.6 mg (anhydrous) sodium thiosulfate/L will reduce l.0 mg chlorine/L. After dechlorination, total residual chlorine should be non-detectable. Air used for aeration must be free of oil and toxic vapors. Oil-free air pumps should be used where possible. Particulates can be removed from the air using BALSTON® Grade BX or equivalent filters, and oil and other organic vapors can be removed using activated carbon filters (BALSTON®, C-1 filter, or equivalent).

5.1.2 The facilities must be well ventilated and free from fumes. Laboratory ventilation systems should be checked to ensure that return air from chemistry laboratories and/or sample holding areas is not circulated to test organism culture rooms or toxicity test rooms, or that air from toxicity test rooms does not contaminate culture areas. Sample preparation, culturing, and toxicity test areas should be separated to avoid cross contamination of cultures or toxicity test solutions with toxic fumes. Air pressure differentials between such rooms should not result in a net flow of potentially contaminated air to sensitive areas through open or loosely- fitting doors. Organisms should be shielded from external disturbances.

5.1.3 Materials used for exposure chambers, tubing, etc., that come in contact with the effluent and dilution water should be carefully chosen. Tempered glass and perfluorocarbon plastics (TEFLON®) should be used whenever possible to minimize sorption and leaching of toxic substances. These materials may be reused following decontamination. Containers made of plastics, such as polyethylene, polypropylene, polyvinyl chloride, TYGON®, etc., may be used as test chambers or to ship, store and transfer effluents and receiving waters, but they should not be reused unless absolutely necessary, because they could carry over adsorbed toxicants from one test to another, if reused. However, these containers may be repeatedly reused for storing uncontaminated waters, such as deionized or laboratory-prepared dilution waters and receiving waters. Glass or disposable polystyrene containers can be used for test chambers. The use of large (≥ 20 L) glass carboys is discouraged for safety reasons.

5.1.4 New plastic products of a type not previously used should be tested for toxicity before initial use by exposing the test organisms in the test system where the material is used. Equipment (pumps, valves, etc.) which cannot be discarded after each use because of cost, must be decontaminated according to the cleaning procedures listed below (see Section 5, Facilities, Equipment and Supplies, Subsection 5.3.2). Fiberglass and stainless steel, in addition to the previously mentioned materials, can be used for holding, acclimating, and dilution water storage tanks, and in the water delivery system, but once contaminated with pollutants the fiberglass should not be reused. All material should be flushed or rinsed thoroughly with the test media before using in the test.

5.1.5 Copper, galvanized material, rubber, brass, and lead must not come in contact with culturing, holding, acclimation, or dilution water, or with effluent samples and test solutions. Some materials, such as several types of neoprene rubber (commonly used for stoppers), may be toxic and should be tested before use.

5.1.6 Silicone adhesive used to construct glass test chambers absorbs some organochlorine and organophosphorus pesticides, which are difficult to remove. Therefore, as little of the adhesive as possible should be in contact with water. Extra beads of adhesive inside the containers should be removed.

5.2 TEST CHAMBERS

5.2.1 Test chamber size and shape are varied according to size of the test organism. Requirements are specified in each toxicity test method.

5.3 CLEANING TEST CHAMBERS AND LABORATORY APPARATUS

5.3.1 New plasticware used for sample collection or organism exposure vessels does not require thorough cleaning before use. It is sufficient to rinse new sample containers once with dilution water before use. New glassware must be soaked overnight in 10% acid (see below) and rinsed well in deionized water and dilution water.

5.3.2 All non-disposable sample containers, test vessels, tanks, and other equipment that have come in contact with effluent must be washed after use to remove contaminants as described below.

1. Soak 15 min in tap water and scrub with detergent, or clean in an automatic dishwasher.
2. Rinse twice with tap water.
3. Carefully rinse once with fresh, dilute (10%, V:V) hydrochloric or nitric acid to remove scale, metals and bases. To prepare a 10% solution of acid, add 10 mL of concentrated acid to 90 mL of deionized water.
4. Rinse twice with deionized water.
5. Rinse once with full-strength, pesticide-grade acetone to remove organic compounds (use a fume hood or canopy).
6. Rinse three times with deionized water.

5.3.3 Special requirements for cleaning glassware used in the green alga, *Selenastrum capricornutum*, toxicity tests (Method 1003.0, Section 14). Prepare all graduated cylinders, test flasks, bottles, volumetric flasks, centrifuge tubes and vials used in algal assays as follows:

1. Wash with non-phosphate detergent solution, preferably heated to ≥ 50°C. Brush the inside of flasks with a stiff-bristle brush to loosen any attached material. The use of a commercial laboratory glassware washer or heavy-duty kitchen dishwasher (under-counter type) is highly recommended.
2. Rinse with tap water.
3. Test flasks should be thoroughly rinsed with acetone and a 10% solution (by volume) of reagent grade hydrochloric acid (HCl). It may be advantageous to soak the flasks in 10% HCl for several days. Fill vials and centrifuge tubes with the 10% HCl solution and allow to stand a few minutes; fill all larger containers to about one-tenth capacity with HCl solution and swirl so that the entire surface is bathed.
4. Rinse twice with MILLIPORE® MILLI-Q® OR QPAK™$_2$, or equivalent, water.
5. New test flasks, and all flasks which through use may become contaminated with toxic organic substances, must be rinsed with pesticide-grade acetone or heat-treated before use. To thermally degrade organics, place glassware in a high temperature oven at 400°C for 30 min. After cooling, go to 7. If acetone is used, go to 6.
6. Rinse thoroughly with MILLIPORE® MILLI-Q® or QPAK™$_2$, or equivalent water, and dry in an 105°C oven. All glassware should be autoclaved before use and between uses.
7. Cover the mouth of each chamber with aluminum foil or other closure, as appropriate, before storing.

5.3.4 The use of sterile, disposable pipets will eliminate the need for pipet washing and minimize the possibility of contaminating the cultures with toxic substances.

5.3.5 All test chambers and equipment must be thoroughly rinsed with the dilution water immediately prior to use in each test.

5.4 APPARATUS AND EQUIPMENT FOR CULTURING AND TOXICITY TESTS

5.4.1 Apparatus and equipment requirements for culturing and testing are specified in each toxicity test method. Also, see USEPA, 2002a.

5.4.2 WATER PURIFICATION SYSTEM

5.4.2.1 A good quality, laboratory grade deionized water, providing a resistance of 18 megaohm-cm, must be available in the laboratory and in sufficient quantity for laboratory needs. Deionized water may be obtained from MILLIPORE® Milli-Q®, MILLIPORE® QPAK™$_2$ or equivalent system. If large quantities of high quality deionized water are needed, it may be advisable to supply the laboratory grade deionizer with preconditioned water from a Culligan®, Continental®, or equivalent mixed-bed water treatment system.

5.5 REAGENTS AND CONSUMABLE MATERIALS

5.5.1 SOURCES OF FOOD FOR CULTURE AND TOXICITY TESTS

1. Brine shrimp, *Artemia* sp., cysts -- Many commercial sources of brine shrimp cysts are available.
2. Frozen adult brine shrimp, *Artemia* -- Available from most pet supply shops or other commercial sources.
3. Flake fish food -- TETRAMIN® and BIORIL® are available from most pet shops.
4. Trout chow -- Available from commercial sources.
5. Cereal leaves, CEROPHYLL® or equivalent -- Available from commercial sources.
6. Yeast -- Packaged dry yeast, such as Fleischmann's, or equivalent, can be purchased at the local grocery store or commercial sources.
7. Alfalfa Rabbit Pellets -- Available from feed stores as Purina rabbit chow.
8. Algae - Available from commercial sources.

5.5.1.1 All food should be tested for nutritional suitability and chemically analyzed for organochlorine pesticides, PCBs, and toxic metals (see Section 4, Quality Assurance).

5.5.2 Reagents and consumable materials are specified in each toxicity test method section. Also, see Section 4, Quality Assurance.

5.6 TEST ORGANISMS

5.6.1 Test organisms should be obtained from inhouse cultures or from commercial suppliers (see specific test method; Section 4, Quality Assurance; and Section 6, Test Organisms).

5.7 SUPPLIES

5.7.1 See test methods (see Sections 11-14) for specific supplies.

SECTION 6

TEST ORGANISMS

6.1 TEST SPECIES

6.1.1 The species used in characterizing the chronic toxicity of effluents and/or receiving waters will depend on the requirements of the regulatory authority and the objectives of the test. It is essential that good quality test organisms be readily available throughout the year from inhouse or commercial sources to meet NPDES monitoring requirements. The organisms used in the toxicity tests must be identified to species. If there is any doubt as to the identity of the test organism, representative specimens should be sent to a taxonomic expert to confirm the identification.

6.1.2 Toxicity test conditions and culture methods for the species listed in Subsection 6.1.3 are provided in this manual also, see USEPA, 2002a.

6.1.3 The organisms used in the short-term chronic toxicity tests described in this manual are the fathead minnow, *Pimephales promelas*, the daphnid, *Ceriodaphnia dubia* (Berner, 1986), and the green alga, *Selenastrum capricornutum*.

6.1.4 Some states have developed culturing and testing methods for indigenous species that may be as sensitive, or more sensitive, than the species recommended in Subsection 6.1.3. However, USEPA allows the use of indigenous species only where state regulations require their use or prohibit importation of the recommended species in Subsection 6.1.3. Where state regulations prohibit importation of non-native fishes or the use of recommended test species, permission must be requested from the appropriate state agency prior to their use.

6.1.5 Where states have developed culturing and testing methods for indigenous species other than those recommended in this manual, data comparing the sensitivity of the substitute species and the one or more recommended species must be obtained in side-by-side toxicity tests with reference toxicants and/or effluents, to ensure that the species selected are at least as sensitive as the recommended species. These data must be submitted to the permitting authority (State or Region) if required. USEPA acknowledges that reference toxicants prepared from pure chemicals may not always be representative of effluents. However, because of the observed and/or potential variability in the quality and toxicity of effluents, it is not possible to specify a representative effluent.

6.1.6 Guidance for the selection of test organisms where the salinity of the effluent and/or receiving water requires special consideration is provided in the Technical Support Document for Water Quality-based Toxics Control (USEPA, 1991a).

1. Where the salinity of the receiving water is < 1‰, freshwater organisms are used regardless of the salinity of the effluent.
2. Where the salinity of the receiving water is ≥ 1‰, the choice of organisms depends on state water quality standards and/or permit requirements.

6.2 SOURCES OF TEST ORGANISMS

6.2.1 The test organisms recommended in this manual can be cultured in the laboratory using culturing and handling methods for each organism described in the respective test method sections. The fathead minnow, *Pimephales promelas,* culture method is given in Section 11 and not repeated in Section 12. Also, see USEPA (2002a).

6.2.2 Inhouse cultures should be established wherever it is cost effective. If inhouse cultures cannot be maintained or it is not cost effective, test organisms or starter cultures should be purchased from experienced commercial suppliers (see USEPA, 2002a).

6.2.3 Starter cultures of the green algae, *Selenastrum capricornutum, S. minutum,* and *Chlamydomonas reinhardti* are available from commercial suppliers.

6.2.4 Because the daphnid, *Ceriodaphnia dubia*, must be cultured individually in the laboratory for at least seven days before the test begins, it will be necessary to obtain a starter culture from a commercial source at least three weeks before the test is to begin if they are not being cultured inhouse.

6.2.5 If, because of their source, there is any uncertainty concerning the identity of the organisms, it is advisable to have them examined by a taxonomic specialist to confirm their identification. For detailed guidance on identification, see the individual test methods.

6.2.6 FERAL (NATURAL OCCURRING, WILD CAUGHT) ORGANISMS

6.2.6.1 The use of test organisms taken from the receiving water has strong appeal, and would seem to be a logical approach. However, it is generally impractical and not recommended for the following reasons:

1. Sensitive organisms may not be present in the receiving water because of previous exposure to the effluent or other pollutants.
2. It is often difficult to collect organisms of the required age and quality from the receiving water.
3. Most states require collecting permits, which may be difficult to obtain. Therefore, it is usually more cost effective to culture the organisms in the laboratory or obtain them from private, state, or Federal sources. The fathead minnow, *Pimephales promelas*, the daphnid, *Ceriodaphnia dubia*, and the green alga, *Selenastrum capricornutum*, are easily cultured in the laboratory or readily available commercially.
4. The required QA/QC records, such as the single laboratory precision data, would not be available.
5. Since it is mandatory that the identity of the test organism be known to species level, it would be necessary to examine each organism caught in the wild to confirm its identity. This would usually be impractical or, at the least, very stressful to the organisms.
6. Test organisms obtained from the wild must be observed in the laboratory for a minimum of one week prior to use, to assure that they are free of signs of parasitic or bacterial infections and other adverse effects. Fish captured by electroshocking must not be used in toxicity testing.

6.2.6.2 Guidelines for collecting natural occurring organisms are provided in USEPA (1973), USEPA (1990) and USEPA (1993b).

6.2.7 Regardless of their source, test organisms should be carefully observed to ensure that they are free of signs of stress and disease, and in good physical condition. Some species of test organisms can be obtained from commercial stock certified as "disease-free".

6.3 **LIFE STAGE**

6.3.1 Young organisms are often more sensitive to toxicants than are adults. For this reason, the use of early life stages, such as larval fish, is required for all tests. In a given test, all organisms should be approximately the same age and should be taken from the same source. Since age may affect the results of the tests, it would enhance the value and comparability of the data if the same species in the same life stages were used throughout a monitoring program at a given facility.

6.4 LABORATORY CULTURING

6.4.1 Instructions for culturing and/or holding the recommended test organisms are included in the respective test methods (also, see USEPA, 2002a).

6.5 HOLDING AND HANDLING TEST ORGANISMS

6.5.1 Test organisms should not be subjected to changes of more than 3°C in water temperature in any 12 h period or 2 units of pH in any 24-h period.

6.5.2 Organisms should be handled as little as possible. When handling is necessary, it should be done as gently, carefully, and quickly as possible to minimize stress. Organisms that are dropped or touch a dry surface or are injured during handling must be discarded. Dipnets are best for handling larger organisms. These nets are commercially available or can be made from small-mesh nylon netting, silk batting cloth, plankton netting, or similar material. Wide-bore, smooth glass tubes (4 to 8 mm ID) with rubber bulbs or pipettors (such as PROPIPETTE®) should be used for transferring smaller organisms such as larval fish.

6.5.3 Holding tanks for fish are supplied with good quality water (see Section 5, Facilities, Equipment, and Supplies) with flow-through rate of at least two tank volumes per day. Otherwise use a recirculation system where water flows through an activated carbon or undergravel filter to remove dissolved metabolites. Culture water can also be piped through high intensity ultraviolet light sources for disinfection, and to photodegrade dissolved organics.

6.5.4 Crowding must be avoided because it will stress the organisms and lower the DO concentrations to unacceptable levels. The solution of oxygen depends on temperature and altitude. The DO must be maintained at a minimum of 4.0 mg/L. Aerate gently if necessary.

6.5.5 The organisms should be observed carefully each day for signs of disease, stress, physical damage, or mortality. Dead and abnormal organisms should be removed as soon as observed. It is not uncommon for some fish mortality (5-10%) to occur during the first 48 h in a holding tank because of individuals that refuse to feed on artificial food and die of starvation. Organisms in the holding tanks should generally be fed as in the cultures (see culturing methods in the respective methods).

6.5.6 Fish should be fed as much as they will eat at least once a day with live brine shrimp nauplii, *Artemia,* or frozen adult brine shrimp, or dry food (frozen food should be completely thawed before use). Adult brine shrimp can be supplemented with commercially prepared food such as TETRAMIN® or BIORIL® flake food, or equivalent. Excess food and fecal material should be removed from the bottom of the tanks at least twice a week by siphoning.

6.5.7 A daily record of feeding, behavioral observations, and mortality should be maintained.

6.6 TRANSPORTATION TO THE TEST SITE

6.6.1 Organisms are transported from the base or supply laboratory to a remote test site in culture water or standard dilution water in plastic bags or large-mouth screw-cap (500 mL) plastic bottles in styrofoam coolers. Adequate DO is maintained by replacing the air above the water in the bags with oxygen from a compressed gas cylinder, and sealing the bags or by use of an airstone supplied by a portable pump. The DO concentration must not fall below 4.0 mg/L.

6.6.2 Upon arrival at the test site, the organisms are transferred to receiving water if receiving water is to be used as the test dilution water. All but a small volume of the holding water (approximately 5%) is removed by siphoning and replaced slowly over a 10 to 15 minute period with dilution water. If receiving water is to be used as the dilution water, caution must be exercised in exposing the test organisms to it, because of the possibility that it might be toxic. For this reason, it is recommended that only approximately 10% of the test organisms be exposed initially

to the dilution water. If this group does not show excessive mortality or obvious signs of stress in a few hours, the remainder of the test organisms may be transferred to the dilution water.

6.6.3 A group of organisms must not be used for a test if they appear to be unhealthy, discolored, or otherwise stressed, or if mortality appears to exceed 10% preceding the test. If the organisms fail to meet these criteria, the entire group must be discarded and a new group obtained. The mortality may be due to the presence of toxicity, if the receiving water is used as dilution water, rather than a diseased condition of the test organisms. If the acclimation process is repeated with a new group of test organisms and excessive mortality occurs, it is recommended that an alternative source of dilution water be used.

6.7 TEST ORGANISM DISPOSAL

6.7.1 When the toxicity test(s) is concluded, all test organisms (including controls) should be humanely destroyed and disposed of in an appropriate manner.

SECTION 7

DILUTION WATER

7.1 TYPES OF DILUTION WATER

7.1.1 The type of dilution water used in effluent toxicity tests will depend largely on the objectives of the study.

7.1.1.1 If the objective of the test is to estimate the absolute chronic toxicity of the effluent, a synthetic (standard) dilution water is used. If the test organisms have been cultured in water which is different from the test dilution water, a second set of controls, using culture water, should be included in the test.

7.1.1.2 If the objective of the test is to estimate the chronic toxicity of the effluent in uncontaminated receiving water, the test may be conducted using dilution water consisting of a single grab sample of receiving water (if non-toxic), collected either upstream and outside the influence of the outfall, or with other uncontaminated natural water (ground or surface water) or standard dilution water having approximately the same characteristics (hardness, alkalinity, and conductivity) as the receiving water. Seasonal variations in the quality of receiving waters may affect effluent toxicity. Therefore, the pH, alkalinity, hardness, and conductivity of receiving water samples should be determined before each use. If the test organisms have been cultured in water which is different from the test dilution water, a second set of controls, using culture water, should be included in the test.

7.1.1.3 If the objective of the test is to determine the additive or mitigating effects of the discharge on already contaminated receiving water, the test is performed using dilution water consisting of receiving water collected immediately upstream or outside the influence of the outfall. A second set of controls, using culture water, should be included in the test.

7.1.2 An acceptable dilution water is one which is appropriate for the objectives of the test; supports adequate performance of the test organisms with respect to survival, growth, reproduction, or other responses that may be measured in the test (i.e., consistently meets test acceptability criteria for control responses); is consistent in quality; and does not contain contaminants that could produce toxicity. Receiving waters, synthetic waters, or synthetic waters adjusted to approximate receiving water characteristics may be used for dilution provided that the water meets the above listed qualifications for an acceptable dilution water. USEPA (2000a) provides additional guidance on selecting appropriate dilution waters.

7.1.3 When dual controls (one control using culture water and one control using dilution water) are used (see Subsections 7.1.1.1 - 7.1.1.3 above), the dilution water control should be used to determine test acceptability. It is also the dilution water control that should be compared to effluent treatments in the calculation and reporting of test results. The culture water control should be used to evaluate the appropriateness of the dilution water source. Significant differences between organism responses in culture water and dilution water controls could indicate toxicity in the dilution water and may suggest an alternative dilution water source. USEPA (2000a) provides additional guidance on dual controls.

7.2 STANDARD, SYNTHETIC DILUTION WATER

7.2.1 Standard, synthetic dilution water is prepared with deionized water and reagent grade chemicals or mineral water (Tables 3 and 4). The source water for the deionizer can be ground water or tap water.

7.2.2 DEIONIZED WATER USED TO PREPARE STANDARD, SYNTHETIC, DILUTION WATER

7.2.2.1 Deionized water is obtained from a MILLIPORE® MILLI-Q®, MILLIPORE® QPAK™$_2$ or equivalent system. It is advisable to provide a preconditioned (deionized) feed water by using a Culligan®, Continental®, or

equivalent system in front of the MILLIPORE® System to extend the life of the MILLIPORE® cartridges (see Section 5, Facilities, Equipment, and Supplies).

7.2.2.2 The recommended order of the cartridges in a four-cartridge deionizer (i.e., MILLI-Q® System or equivalent) is (1) ion exchange, (2) ion exchange, (3) carbon, and (4) organic cleanup (such as ORGANEX-Q®, or equivalent) followed by a final bacteria filter. The QPAK™$_2$ water system is a sealed system which does not allow for the rearranging of the cartridges. However, the final cartridge is an ORGANEX-Q® filter, followed by a final bacteria filter. Commercial laboratories using this system have not experienced any difficulty in using the water for culturing or testing. Reference to the MILLI-Q® systems throughout the remainder of the manual includes all MILLIPORE® or equivalent systems.

7.2.3 STANDARD, SYNTHETIC FRESHWATER

7.2.3.1 To prepare 20 L of synthetic, moderately hard, reconstituted water, use the reagent grade chemicals in Table 3 as follows:

1. Place 19 L of MILLI-Q®, or equivalent, water in a properly cleaned plastic carboy.
2. Add 1.20 g of $MgSO_4$, 1.92 g $NaHCO_3$, and 0.080g KCl to the carboy.
3. Aerate overnight.
4. Add 1.20 g of $CaSO_4 \bullet 2H_20$ to 1 L of MILLI-Q® or equivalent deionized water in a separate flask. Stir on magnetic stirrer until calcium sulfate is dissolved, add to the 19 L above, and mix well.
5. For *Ceriodaphnia dubia* culturing and testing, add sufficient sodium selenate (Na_2SeO_4) to provide 2 mg selenium per liter of final dilution water.
6. Aerate the combined solution vigorously for an additional 24 h to dissolve the added chemicals and stabilize the medium.
7. The measured pH, hardness, etc., should be as listed in Table 3.

TABLE 3. PREPARATION OF SYNTHETIC FRESHWATER USING REAGENT GRADE CHEMICALS[1]

Water Type	Reagent Added (mg/L)[2]				Approximate Final Water Quality		
	$NaHCO_3$	$CaSO_4 \bullet 2H_2O$	$MgSO_4$	KCl	pH[3]	Hardness[4]	Alkalinity[4]
Very soft	12.0	7.5	7.5	0.5	6.4-6.8	10-13	10-13
Soft	48.0	30.0	30.0	2.0	7.2-7.6	40-48	30-35
Moderately Hard	96.0	60.0	60.0	4.0	7.4-7.8	80-100	57-64
Hard	192.0	120.0	120.0	8.0	7.6-8.0	160-180	110-120
Very hard	384.0	240.0	240.0	16.0	8.0-8.4	280-320	225-245

1 Taken in part from Marking and Dawson (1973).
2 Add reagent grade chemicals to deionized water.
3 Approximate equilibrium pH after 24 h of aeration.
4 Expressed as mg $CaCO_3$/L.

7.2.3.2 If large volumes of synthetic reconstituted water will be needed, it may be advisable to mix 1 L portions of concentrated stock solutions of $NaHCO_3$, $MgSO_4$, and KCl for use in preparation of the reconstituted waters.

7.2.3.3 To prepare 20 L of standard, synthetic, moderately hard, reconstituted water, using mineral water such as PERRIER® Water, or equivalent (Table 4), follow the instructions below.

1. Place 16 L of MILLI-Q® or equivalent water in a properly cleaned plastic carboy.
2. Add 4 L of PERRIER® Water, or equivalent.
3. Aerate vigorously for 24 h to stabilize the medium.
4. The measured pH, hardness and alkalinity of the aerated water will be as indicated in Table 4.
5. This synthetic water is referred to as diluted mineral water (DMW) in the toxicity test methods.

TABLE 4. PREPARATION OF SYNTHETIC FRESHWATER USING MINERAL WATER[1]

Water Type	Volume of Mineral Water Added (mL/L)[2]	Proportion of Mineral Water (%)	Approximate Final Water Quality		
			pH[3]	Hardness[4]	Alkalinity[4]
Very soft	50	2.5	7.2-8.1	10-13	10-13
Soft	100	10.0	7.9-8.3	40-48	30-35
Moderately Hard	200	20.0	7.9-8.3	80-100	57-64
Hard	400	40.0	7.9-8.3	160-180	110-120
Very hard[5]	---	---	---	---	---

[1] From Mount et al. (1987), and data provided by Philip Lewis, EMSL-Cincinnati, OH.
[2] Add mineral water to Milli-Q® water, or equivalent, to prepare Diluted Mineral Water (DMW).
[3] Approximate equilibrium pH after 24 h of aeration.
[4] Expressed as mg $CaCO_3$/L.
[5] Dilutions of PERRIER® Water form a precipitate when concentrations equivalent to "very hard water" are aerated.

7.3 USE OF RECEIVING WATER AS DILUTION WATER

7.3.1 If the objectives of the test require the use of uncontaminated receiving water as dilution water, and the receiving water is uncontaminated, it may be possible to collect a sample of the receiving water upstream of, or close to, but outside of the zone influenced by the effluent. However, if the receiving water is contaminated, it may be necessary to collect the sample in an area "remote" from the discharge site, matching as closely as possible the physical and chemical characteristics of the receiving water near the outfall.

7.3.2 The sample should be collected immediately prior to the test, but never more than 96 h before the test begins. Except where it is used within 24 h, or in the case where large volumes are required for flow through tests, the sample should be chilled to 0-6°C during or immediately following collection, and maintained at that temperature prior to use in the test.

7.3.3 Receiving water containing debris or indigenous organisms that may be confused with or attack the test organisms should be filtered through a sieve having 60 mm mesh openings prior to use.

7.3.4 Where toxicity-free dilution water is required in a test, the water is considered acceptable if test organisms show the required survival, growth, and reproduction in the controls during the test.

7.3.5 The regulatory authority may require that the hardness of the dilution water be comparable to the receiving water at the discharge site. This requirement can be satisfied by collecting an uncontaminated receiving water with a suitable hardness, or adjusting the hardness of an otherwise suitable receiving water by addition of reagents as indicated in Table 3.

7.4 USE OF TAP WATER AS DILUTION WATER

7.4.1 The use of tap water as dilution water is discouraged unless it is dechlorinated and passed through a deionizer and carbon filter. Tap water can be dechlorinated by deionization, carbon filtration, or the use of sodium thiosulfate. Use of 3.6 mg/L (anhydrous) sodium thiosulfate will reduce 1.0 mg chlorine/L (APHA, 1992). Following dechlorination, total residual chlorine should not exceed 0.01 mg/L. Because of the possible toxicity of thiosulfate to test organisms, a control lacking thiosulfate should be included in toxicity tests utilizing thiosulfate-dechlorinated water.

7.4.2 To be adequate for general laboratory use following dechlorination, the tap water is passed through a deionizer and carbon filter to remove toxic metals and organics, and to control hardness and alkalinity.

7.5 DILUTION WATER HOLDING

7.5.1 A given batch of dilution water should not be used for more than 14 days following preparation because of the possible build-up of bacterial, fungal, or algal slime growth and the problems associated with it. The container should be kept covered and the contents should be protected from light.

SECTION 8

EFFLUENT AND RECEIVING WATER SAMPLING, SAMPLE HANDLING, AND SAMPLE PREPARATION FOR TOXICITY TESTS

8.1 EFFLUENT SAMPLING

8.1.1 The effluent sampling point should be the same as that specified in the NPDES discharge permit (USEPA, 1988a). Conditions for exception would be: (l) better access to a sampling point between the final treatment and the discharge outfall; (2) if the processed waste is chlorinated prior to discharge, it may also be desirable to take samples prior to contact with the chlorine to determine toxicity of the unchlorinated effluent; or (3) in the event there is a desire to evaluate the toxicity of the influent to municipal waste treatment plants or separate wastewater streams in industrial facilities prior to their being combined with other wastewater streams or non-contact cooling water, additional sampling points may be chosen.

8.1.2 The decision on whether to collect grab or composite samples is based on the objectives of the test and an understanding of the short and long-term operations and schedules of the discharger. If the effluent quality varies considerably with time, which can occur where holding times are short, grab samples may seem preferable because of the ease of collection and the potential of observing peaks (spikes) in toxicity. However, the sampling duration of a grab sample is so short that full characterization of an effluent over a 24-h period would require a prohibitively large number of separate samples and tests. Collection of a 24-h composite sample, however, may dilute toxicity spikes, and average the quality of the effluent over the sampling period. Sampling recommendations are provided below (also see USEPA, 2002a).

8.1.3 Aeration during collection and transfer of effluents should be minimized to reduce the loss of volatile chemicals.

8.1.4 Details of date, time, location, duration, and procedures used for effluent sample and dilution water collection should be recorded.

8.2 EFFLUENT SAMPLE TYPES

8.2.1 The advantages and disadvantages of effluent grab and composite samples are listed below:

8.2.1.1 GRAB SAMPLES

Advantages:

1. Easy to collect; require a minimum of equipment and on-site time.
2. Provide a measure of instantaneous toxicity. Toxicity spikes are not masked by dilution.

Disadvantages:

1. Samples are collected over a very short period of time and on a relatively infrequent basis. The chances of detecting a spike in toxicity would depend on the frequency of sampling and the probability of missing a spike is high.

8.2.1.2 COMPOSITE SAMPLES

Advantages:

1. A single effluent sample is collected over a 24-h period.

2. The sample is collected over a much longer period of time than a single grab sample and contains all toxicity spikes.

Disadvantages:

1. Sampling equipment is more sophisticated and expensive, and must be placed on-site for at least 24 h.
2. Toxicity spikes may not be detected because they are masked by dilution with less toxic wastes.

8.3 EFFLUENT SAMPLING RECOMMENDATIONS

8.3.1 When tests are conducted on-site, test solutions can be renewed daily with freshly collected samples, except for the green alga, *Selenastrum capricornutum*, test which is not renewed.

8.3.2 When tests are conducted off-site, a minimum of three samples are collected. If these samples are collected on Test Days 1, 3, and 5, the first sample would be used for test initiation, and for test solution renewal on Day 2. The second sample would be used for test solution renewal on Days 3 and 4. The third sample would be used for test solution renewal on Days 5, 6, and 7.

8.3.3 Sufficient sample volume must be collected to perform the required toxicity and chemical tests. A 4-L (1-gal) CUBITAINER® will provide sufficient sample volume for most tests.

8.3.4 THE FOLLOWING EFFLUENT SAMPLING METHODS ARE RECOMMENDED:

8.3.4.1 Continuous Discharges

8.3.4.1.1 If the facility discharge is continuous, a single 24-h composite sample is to be taken.

8.3.4.2 Intermittent discharges

8.3.4.2.1 If the facility discharge is intermittent, a composite sample is to be collected for the duration of the discharge but not more than 24 hours.

8.4 RECEIVING WATER SAMPLING

8.4.1 Logistical problems and difficulty in securing sampling equipment generally preclude the collection of composite receiving water samples for toxicity tests. Therefore, based on the requirements of the test, a single grab sample or daily grab sample of receiving water is collected for use in the test.

8.4.2 The sampling point is determined by the objectives of the test. In rivers, samples should be collected from mid-stream and at mid-depth, if accessible. In lakes the samples are collected at mid-depth.

8.4.3 To determine the extent of the zone of toxicity in the receiving water downstream from the outfall, receiving water samples are collected at several distances downstream from the discharge. The time required for the effluent-receiving-water mixture to travel to sampling points downstream from the outfall, and the rate and degree of mixing, may be difficult to ascertain. Therefore, it may not be possible to correlate downstream toxicity with effluent toxicity at the discharge point unless a dye study is performed. The toxicity of receiving water samples from five stations downstream from the discharge point can be evaluated using the same number of test vessels and test organisms as used in one effluent toxicity test with five effluent dilutions.

8.5 EFFLUENT AND RECEIVING WATER SAMPLE HANDLING, PRESERVATION, AND SHIPPING

8.5.1 Unless the samples are used in an on-site toxicity test the day of collection (or hand delivered to the testing laboratory for use on the day of collection), they should be chilled and maintained at 0-6°C until used to inhibit microbial degradation, chemical transformations, and loss of highly volatile toxic substances.

8.5.2 Composite samples should be chilled as they are collected. Grab samples should be chilled immediately following collection.

8.5.3 If the effluent has been chlorinated, total residual chlorine must be measured immediately following sample collection.

8.5.4 Sample holding time begins when the last grab sample in a series is taken (i.e., when a series of four grab samples are taken over a 24-h period), or when a 24-h composite sampling period is completed. If the data from the samples are to be acceptable for use in the NPDES Program, the lapsed time (holding time) from sample collection to first use of each grab or composite sample must not exceed 36 h. EPA believes that 36 h is adequate time to deliver the samples to the laboratories performing the test in most cases. In the isolated cases, where the permittee can document that this delivery time cannot be met, the permitting authority can allow an option for on-site testing or a variance for an extension of shipped sample holding time. The request for a variance in sample holding time, directed to the USEPA Regional Administrator under 40 CFR 136.3(e) should include supportive data which show that the toxicity of the effluent sample is not reduced (e.g., because of volatilization and/or sorption of toxics on the sample container surfaces) by extending the holding time beyond more than 36 h. However, in no case should more than 72 h elapse between collection and first use of the sample. In static-renewal tests, each grab or composite sample may also be used to prepare test solutions for renewal at 24 h, 48 h, and/or 72 h after first use, if stored at 0-6°C, with minimum head space, as described in Subsection 8.5. If shipping problems (e.g., unsuccessful Saturday delivery) are encountered with renewal samples after a test has been initiated, the permitting authority may allow the continued use of the most recently used sample for test renewal. Guidance for determining the persistence of the sample is provided in Subsection 8.7.

8.5.5 To minimize the loss of toxicity due to volatilization of toxic constituents, all sample containers should be "completely" filled, leaving no air space between the contents and the lid.

8.5.6 SAMPLES USED IN ON-SITE TESTS

8.5.6.1 Samples collected for on-site tests should be used within 24 h.

8.5.7 SAMPLES SHIPPED TO OFF-SITE FACILITIES

8.5.7.1 Samples collected for off-site toxicity testing are to be chilled to 0-6°C during or immediately after collection, and shipped iced to the performing laboratory. Sufficient ice should be placed with the sample in the shipping container to ensure that ice will still be present when the sample arrives at the laboratory and is unpacked. Insulating material should not be placed between the ice and the sample in the shipping container unless required to prevent breakage of glass sample containers.

8.5.7.2 Samples may be shipped in one or more 4-L (l-gal) CUBITAINERS® or new plastic "milk" jugs. All sample containers should be rinsed with source water before being filled with sample. After use with receiving water or effluents, CUBITAINERS® and plastic jugs are punctured to prevent reuse.

8.5.7.3 Several sample shipping options are available, including Express Mail, air express, bus, and courier service. Express Mail is delivered seven days a week. Saturday and Sunday shipping and receiving schedules of private carriers vary with the carrier.

8.6 SAMPLE RECEIVING

8.6.1 Upon arrival at the laboratory, samples are logged in and the temperature is measured and recorded. If the samples are not immediately prepared for testing, they are stored at 0-6°C until used.

8.6.2 Every effort must be made to initiate the test with an effluent sample on the day of arrival in the laboratory, and the sample holding time should not exceed 36 h unless a variance has been granted by the NPDES permitting authority.

8.7 PERSISTENCE OF EFFLUENT TOXICITY DURING SAMPLE SHIPMENT AND HOLDING

8.7.1 The persistence of the toxicity of an effluent prior to its use in a toxicity test is of interest in assessing the validity of toxicity test data, and in determining the possible effects of allowing an extension of the holding time. Where a variance in holding time (> 36 h, but ≤ 72 h) is requested by a permittee, (see Subsection 8.5.4 above), information on the effects of the extension in holding time on the toxicity of samples must be obtained by comparing the results of multi-concentration chronic toxicity tests performed on effluent samples held 36 h with toxicity test results using the same samples after they were held for the requested, longer period. The portion of the sample set aside for the second test should be held under the same conditions as during shipment and holding.

8.8 PREPARATION OF EFFLUENT AND RECEIVING WATER SAMPLES FOR TOXICITY TESTS

8.8.1 When aliquots are removed from the sample container, the head space above the remaining sample should be held to a minimum. Air which enters a container upon removal of sample should be expelled by compressing the container before reclosing, if possible (i.e., where a CUBITAINER® is used), or by using an appropriate discharge valve (spigot).

8.8.2 With the daphnid, *Ceriodaphnia dubia*, and fathead minnow, *Pimephales promelas*, tests, effluents and receiving waters should be filtered through a 60-µm plankton net to remove indigenous organisms that may attack or be confused with the test organisms (see the daphnid, *Ceriodaphnia dubia*, test method for details). Receiving waters used in green alga, *Selenastrum capricornutum*, toxicity tests must be filtered through a 0.45-µm pore diameter filter before use. It may be necessary to first coarse-filter the dilution and/or waste water through a nylon sieve having 2- to 4-mm mesh openings to remove debris and/or break up large floating or suspended solids. Because filtration may increase the dissolved oxygen (DO) in the effluent, the DO should be checked both before and after filtering. Low dissolved oxygen concentrations will indicate a potential problem in performing the test. **Caution:** filtration may remove some toxicity.

8.8.3 If the samples must be warmed to bring them to the prescribed test temperature, supersaturation of the dissolved oxygen and nitrogen may become a problem. To avoid this problem, samples may be warmed slowly in open test containers. If DO is still above 100% saturation after warming to test temperature, samples should be aerated moderately (approximately 500 mL/min) for a few minutes using an airstone. If DO is below 4.0 mg/L after warming to test temperature, the solutions must be aerated moderately (approximately 500 mL/min) for a few minutes, using an airstone, until the DO is within the prescribed range (≥4.0 mg/L). **Caution:** avoid excessive aeration.

8.8.4 The DO concentration in the samples should be near saturation prior to use. Aeration may be used to bring the DO and other gases into equilibrium with air, minimize oxygen demand, and stabilize the pH. However, aeration during collection, transfer, and preparation of samples should be minimized to reduce the loss of volatile chemicals.

8.8.4.1 Aeration during the test may alter the results and should be used only as a last resort to maintain the required DO. Aeration can reduce the apparent toxicity of the test solutions by stripping them of highly volatile toxic substances, or increase their toxicity by altering pH. However, the DO in the test solutions should not be allowed to fall below 4.0 mg/L.

8.8.4.2 In static tests (renewal or non-renewal), low DOs may commonly occur in the higher concentrations of wastewater. Aeration is accomplished by bubbling air through a pipet at a rate of 100 bubbles/min. If aeration is necessary, all test solutions must be aerated. It is advisable to monitor the DO closely during the first few hours of the test. Samples with a potential DO problem generally show a downward trend in DO within 4 to 8 h after the test is started. Unless aeration is initiated during the first 8 h of the test, the DO may be exhausted during an unattended period, thereby invalidating the test.

8.8.5 At a minimum, pH, conductivity, and total residual chlorine are measured in the undiluted effluent or receiving water, and pH and conductivity are measured in the dilution water.

8.8.5.1 It is recommended that total alkalinity and total hardness also be measured in the undiluted effluent test water, receiving water, and the dilution water.

8.8.6 Total ammonia is measured in effluent and receiving water samples where toxicity may be contributed by un-ionized ammonia (i.e., where total ammonia $\geq$ 5 mg/L). The concentration (mg/L) of un-ionized (free) ammonia in a sample is a function of temperature and pH, and is calculated using the percentage value obtained from Table 5, under the appropriate pH and temperature, and multiplying it by the concentration (mg/L) of total ammonia in the sample.

8.8.7 Effluents and receiving waters can be dechlorinated using 6.7 mg/L anhydrous sodium thiosulfate to reduce 1 mg/L chlorine (APHA, 1992). Note that the amount of thiosulfate required to dechlorinate effluents is greater than the amount needed to dechlorinate tap water (see Section 7, Dilution Water, Subsection 7.4.1). Since thiosulfate may contribute to sample toxicity, a thiosulfate control should be used in the test in addition to the normal dilution water control.

8.8.8 Mortality or impairment of growth or reproduction due to pH alone may occur if the pH of the sample falls outside the range of 6.0 - 9.0. Thus, the presence of other forms of toxicity (metals and organics) in the sample may be masked by the toxic effects of low or high pH. The question about the presence of other toxicants can be answered only by performing two parallel tests, one with an adjusted pH, and one without an adjusted pH. Freshwater samples are adjusted to pH 7.0 by adding 1N NaOH or 1N HCl dropwise, as required, being careful to avoid overadjustment.

TABLE 5. PERCENT UNIONIZED NH_3 IN AQUEOUS AMMONIA SOLUTIONS: TEMPERATURES 15-26°C AND pH 6.0-8.9[1]

pH	TEMPERATURE (°C)											
	15	16	17	18	19	20	21	22	23	24	25	26
6.0	0.0274	0.0295	0.0318	0.0343	0.0369	0.0397	0.0427	0.0459	0.0493	0.0530	0.0568	0.0610
6.1	0.0345	0.0372	0.0400	0.0431	0.0464	0.0500	0.0537	0.0578	0.0621	0.0667	0.0716	0.0768
6.2	0.0434	0.0468	0.0504	0.0543	0.0584	0.0629	0.0676	0.0727	0.0781	0.0901	0.0901	0.0966
6.3	0.0546	0.0589	0.0634	0.0683	0.0736	0.0792	0.0851	0.0915	0.0983	0.1134	0.1134	0.1216
6.4	0.0687	0.0741	0.0799	0.0860	0.0926	0.0996	0.107	0.115	0.124	0.133	0.143	0.153
6.5	0.0865	0.0933	0.1005	0.1083	0.1166	0.1254	0.135	0.145	0.156	0.167	0.180	0.193
6.6	0.109	0.117	0.127	0.136	0.147	0.158	0.170	0.182	0.196	0.210	0.226	0.242
6.7	0.137	0.148	0.159	0.171	0.185	0.199	0.214	0.230	0.247	0.265	0.284	0.305
6.8	0.172	0.186	0.200	0.216	0.232	0.250	0.269	0.289	0.310	0.333	0.358	0.384
6.9	0.217	0.234	0.252	0.271	0.292	0.314	0.338	0.363	0.390	0.419	0.450	0.482
7.0	0.273	0.294	0.317	0.342	0.368	0.396	0.425	0.457	0.491	0.527	0.566	0.607
7.1	0.343	0.370	0.399	0.430	0.462	0.497	0.535	0.575	0.617	0.663	0.711	0.762
7.2	0.432	0.466	0.502	0.540	0.581	0.625	0.672	0.722	0.776	0.833	0.893	0.958
7.3	0.543	0.586	0.631	0.679	0.731	0.786	0.845	0.908	0.975	1.05	1.12	1.20
7.4	0.683	0.736	0.793	0.854	0.918	0.988	1.061	1.140	1.224	1.31	1.41	1.51
7.5	0.858	0.925	0.996	1.07	1.15	1.24	1.33	1.43	1.54	1.65	1.77	1.89
7.6	1.08	1.16	1.25	1.35	1.45	1.56	1.67	1.80	1.93	2.07	2.21	2.37
7.7	1.35	1.46	1.57	1.69	1.82	1.95	2.10	2.25	2.41	2.59	2.77	2.97
7.8	1.70	1.83	1.97	2.12	2.28	2.44	2.62	2.82	3.02	3.24	3.46	3.71
7.9	2.13	2.29	2.46	2.65	2.85	3.06	3.28	3.52	3.77	4.04	4.32	4.62
8.0	2.66	2.87	3.08	3.31	3.56	3.82	4.10	4.39	4.70	5.03	5.38	5.75
8.1	3.33	3.58	3.85	4.14	4.44	4.76	5.10	5.46	5.85	6.25	6.68	7.14
8.2	4.16	4.47	4.80	5.15	5.52	5.92	6.34	6.78	7.25	7.75	8.27	8.82
8.3	5.18	5.56	5.97	6.40	6.86	7.34	7.85	8.39	8.96	9.56	10.2	10.9
8.4	6.43	6.90	7.40	7.93	8.48	9.07	9.69	10.3	11.0	11.7	12.5	13.3
8.5	7.97	8.54	9.14	9.78	10.45	11.16	11.90	12.7	13.5	14.4	15.2	16.2
8.6	9.83	10.5	11.2	12.0	12.8	13.6	14.5	15.5	16.4	17.4	18.5	19.5
8.7	12.07	12.9	13.8	14.7	15.6	16.6	17.6	18.7	19.8	21.0	22.2	23.4
8.8	14.7	15.7	16.7	17.8	18.9	20.0	21.2	22.5	23.7	25.1	26.4	27.8
8.9	17.9	19.0	20.2	21.4	22.7	24.0	25.3	26.7	28.2	29.6	31.1	32.6

[1] Table provided by Teresa Norberg-King, ERL, Duluth, Minnesota. Also see Emerson et al. (1975), Thurston et al. (1974), and USEPA (1985a).

8.9 PRELIMINARY TOXICITY RANGE-FINDING TESTS

8.9.1 USEPA Regional and State personnel generally have observed that it is not necessary to conduct a toxicity range-finding test prior to initiating a static, chronic, definitive toxicity test. However, when preparing to perform a static test with a sample of completely unknown quality, or before initiating a flow-through test, it is advisable to conduct a preliminary toxicity range-finding test.

8.9.2 A toxicity range-finding test ordinarily consists of a down-scaled, abbreviated static acute test in which groups of five organisms are exposed to several widely-spaced sample dilutions in a logarithmic series, such as

100%, 10.0%, 1.00%, and 0.100%, and a control, for 8-24 h. **Caution**: if the sample must also be used for the full-scale definitive test, the 36-h limit on holding time (see Subsection 8.5.4) must not be exceeded before the definitive test is initiated.

8.9.3 It should be noted that the toxicity (LC50) of a sample observed in a range-finding test may be significantly different from the toxicity observed in the follow-up chronic definitive test because: (1) the definitive test is longer; and (2) the test may be performed with a sample collected at a different time, and possibly differing significantly in the level of toxicity.

8.10 MULTI-CONCENTRATION (DEFINITIVE) EFFLUENT TOXICITY TESTS

8.10.1 The tests recommended for use in determining discharge permit compliance in the NPDES program are multi-concentration, or definitive, tests which provide (1) a point estimate of effluent toxicity in terms of an IC25, IC50, or LC50, or (2) a no-observed-effect-concentration (NOEC) defined in terms of mortality, growth, reproduction, and/or teratogenicity and obtained by hypothesis testing. The tests may be static renewal or static non-renewal.

8.10.2 The tests consist of a control and a minimum of five effluent concentrations. USEPA recommends the use of a ≥0.5 dilution factor for selecting effluent test concentrations. Effluent test concentrations of 6.25%, 12.5%, 25%, 50%, and 100% are commonly used, however, test concentrations should be selected independently for each test based on the objective of the study, the expected range of toxicity, the receiving water concentration, and any available historical testing information on the effluent. USEPA (2000a) provides additional guidance on choosing appropriate test concentrations.

8.10.3 When these tests are used in determining compliance with permit limits, effluent test concentrations should be selected to bracket the receiving water concentration. This may be achieved by selecting effluent test concentrations in the following manner: (1) 100% effluent, (2) [RWC + 100]/2, (3) RWC, (4) RWC/2, and (5) RWC/4. For example, where the RWC = 50%, appropriate effluent concentrations may be 100%, 75%, 50%, 25%, and 12.5%.

8.10.4 If acute/chronic ratios are to be determined by simultaneous acute and short-term chronic tests with a single species, using the same sample, both types of tests must use the same test conditions, i.e., pH, temperature, water hardness, salinity, etc.

8.11 RECEIVING WATER TESTS

8.11.1 Receiving water toxicity tests generally consist of 100% receiving water and a control. The total hardness of the control should be comparable to the receiving water.

8.11.2 The data from the two treatments are analyzed by hypothesis testing to determine if test organism survival in the receiving water differs significantly from the control. Four replicates and 10 organisms per replicate are required for each treatment (see Summary of Test Conditions and Test Acceptability Criteria in the specific test method).

8.11.3 In cases where the objective of the test is to estimate the degree of toxicity of the receiving water, a multi-concentration test is performed by preparing dilutions of the receiving water, using a ≥ 0.5 dilution series, with a suitable control water.

SECTION 9

CHRONIC TOXICITY TEST ENDPOINTS AND DATA ANALYSIS

9.1 ENDPOINTS

9.1.1 The objective of chronic aquatic toxicity tests with effluents and pure compounds is to estimate the highest "safe" or "no-effect concentration" of these substances. For practical reasons, the responses observed in these tests are usually limited to hatchability, gross morphological abnormalities, survival, growth, and reproduction, and the results of the tests are usually expressed in terms of the highest toxicant concentration that has no statistically significant observed effect on these responses, when compared to the controls. The terms currently used to define the endpoints employed in the rapid, chronic and sub-chronic toxicity tests have been derived from the terms previously used for full life-cycle tests. As shorter chronic tests were developed, it became common practice to apply the same terminology to the endpoints. The terms used in this manual are as follows:

9.1.1.1 Safe Concentration - The highest concentration of toxicant that will permit normal propagation of fish and other aquatic life in receiving waters. The concept of a "safe concentration" is a biological concept, whereas the "no-observed-effect concentration" (below) is a statistically defined concentration.

9.1.1.2 No-Observed-Effect-Concentration (NOEC) - The highest concentration of toxicant to which organisms are exposed in a full life-cycle or partial life-cycle (short-term) test, that causes no observable adverse effects on the test organisms (i.e., the highest concentration of toxicant in which the values for the observed responses are not statistically significantly different from the controls). This value is used, along with other factors, to determine toxicity limits in permits.

9.1.1.3 Lowest-Observed-Effect-Concentration (LOEC) - The lowest concentration of toxicant to which organisms are exposed in a life-cycle or partial life-cycle (short-term) test, which causes adverse effects on the test organisms (i.e., where the values for the observed responses are statistically significantly different from the controls).

9.1.1.4 Effective Concentration (EC) - A point estimate of the toxicant concentration that would cause an observable adverse affect on a quantal, "all or nothing," response (such as death, immobilization, or serious incapacitation) in a given percent of the organisms, calculated by point estimation techniques. If the observable effect is death or immobility, the term, Lethal Concentration (LC), should be used (see Subsection 9.1.1.5). A certain EC or LC value might be judged from a biological standpoint to represent a threshold concentration, or lowest concentration that would cause an adverse effect on the observed response.

9.1.1.5 Lethal Concentration (LC) - The toxicant concentration that would cause death in a given percent of the test population. Identical to EC when the observed adverse effect is death. For example, the LC50 is the concentration of toxicant that would cause death in 50% of the test population.

9.1.1.6 Inhibition Concentration (IC) - The toxicant concentration that would cause a given percent reduction in a non-quantal biological measurement for the test population. For example, the IC25 is the concentration of toxicant that would cause a 25% reduction in mean young per female or in growth for the test population, and the IC50 is the concentration of toxicant that would cause a 50% reduction.

9.2 RELATIONSHIP BETWEEN ENDPOINTS DETERMINED BY HYPOTHESIS TESTING AND POINT ESTIMATION TECHNIQUES

9.2.1 If the objective of chronic aquatic toxicity tests with effluents and pure compounds is to estimate the highest "safe or no-effect concentration" of these substances, it is imperative to understand how the statistical endpoints of these tests are related to the "safe" or "no-effect" concentration. NOECs and LOECs are determined by hypothesis testing (Dunnett's Test, a t test with the Bonferroni adjustment, Steel's Many-one Rank Test, or the Wilcoxon Rank

Sum Test with the Bonferroni adjustment), whereas LCs, ICs, and ECs are determined by point estimation techniques (Probit Analysis, Spearman-Karber Method, Trimmed Spearman-Karber Method, Graphical Method or Linear Interpolation Method). There are inherent differences between the use of a NOEC or LOEC derived from hypothesis testing to estimate a "safe" concentration, and the use of a LC, EC, IC, or other point estimates derived from curve fitting, interpolation, etc.

9.2.2 Most point estimates, such as the LC, IC, or EC, are derived from a mathematical model that assumes a continuous dose-response relationship. By definition, any LC, IC, or EC value is an estimate of some amount of adverse effect. Thus the assessment of a "safe" concentration must be made from a biological standpoint rather than with a statistical test. In this instance, the biologist must determine some amount of adverse effect that is deemed to be "safe", in the sense that from a practical biological viewpoint it will not affect the normal propagation of fish and other aquatic life in receiving waters.

9.2.3 The use of NOECs and LOECs, on the other hand, assumes either (1) a continuous dose-response relationship, or (2) a non-continuous (threshold) model of the dose-response relationship.

9.2.3.1 In the case of a continuous dose-response relationship, it is also assumed that adverse effects that are not "statistically observable" are also not important from a biological standpoint, since they are not pronounced enough to test as statistically significant against some measure of the natural variability of the responses.

9.2.3.2 In the case of non-continuous dose-response relationships, it is assumed that there exists a true threshold, or concentration below which there is no adverse effect on aquatic life, and above which there is an adverse effect. The purpose of the statistical analysis in this case is to estimate as closely as possible where that threshold lies.

9.2.3.3 In either case, it is important to realize that the amount of adverse effect that is statistically observable (LOEC) or not observable (NOEC) is highly dependent on all aspects of the experimental design, such as the number of concentrations of toxicant, number of replicates per concentration, number of organisms per replicate, and use of randomization. Other factors that affect the sensitivity of the test include the choice of statistical analysis, the choice of an alpha level, and the amount of variability between responses at a given concentration.

9.2.3.4 Where the assumption of a continuous dose-response relationship is made, by definition some amount of adverse effect might be present at the NOEC, but is not great enough to be detected by hypothesis testing.

9.2.3.5 Where the assumption of a non-continuous dose-response relationship is made, the NOEC would indeed be an estimate of a "safe" or "no-effect" concentration if the amount of adverse effect that appears at the threshold is great enough to test as statistically significantly different from the controls in the face of all aspects of the experimental design mentioned above. If, however, the amount of adverse effect at the threshold were not great enough to test as statistically different, some amount of adverse effect might be present at the NOEC. In any case, the estimate of the NOEC with hypothesis testing is always dependent on the aspects of the experimental design mentioned above. For this reason, the reporting and examination of some measure of the sensitivity of the test (either the minimum significant difference or the percent change from the control that this minimum difference represents) is extremely important.

9.2.4 In summary, the assessment of a "safe" or "no-effect" concentration cannot be made from the results of statistical analysis alone, unless (1) the assumptions of a strict threshold model are accepted, and (2) it is assumed that the amount of adverse effect present at the threshold is statistically detectable by hypothesis testing. In this case, estimates obtained from a statistical analysis are indeed estimates of a "no-effect" concentration. If the assumptions are not deemed tenable, then estimates from a statistical analysis can only be used in conjunction with an assessment from a biological standpoint of what magnitude of adverse effect constitutes a "safe" concentration. In this instance, a "safe" concentration is not necessarily a truly "no-effect" concentration, but rather a concentration at which the effects are judged to be of no biological significance.

9.2.5 A better understanding of the relationship between endpoints derived by hypothesis testing (NOECs) and point estimation techniques (LCs, ICs, and ECs) would be very helpful in choosing methods of data analysis. Norberg-King (1991) reported that the IC25s were comparable to the NOECs for 23 effluent and reference toxicant data sets analyzed. The data sets included short-term chronic toxicity tests for the fathead minnow, *Pimephales promelas*, and the daphnid, *Ceriodaphnia dubia*. Birge et al. (1985) reported that LC1s derived from Probit Analysis of data from short-term embryo-larval tests with reference toxicants were comparable to NOECs for several organisms. Similarly, USEPA (1988d) reported that the IC25s were comparable to the NOECs for a set of daphnid, *Ceriodaphnia dubia*, chronic tests with a single reference toxicant. However, the scope of these comparisons was very limited, and sufficient information is not yet available to establish an overall relationship between these two types of endpoints, especially when derived from effluent toxicity test data.

9.3 **PRECISION**

9.3.1 HYPOTHESIS TESTS

9.3.1.1 When hypothesis tests are used to analyze toxicity test data, it is not possible to express precision in terms of a commonly used statistic. The results of the test are given in terms of two endpoints, the No-Observed- Effect Concentration (NOEC) and the Lowest-Observed-Effect Concentration (LOEC). The NOEC and LOEC are limited to the concentrations selected for the test. The width of the NOEC-LOEC interval is a function of the dilution series, and differs greatly depending on whether a dilution factor of 0.3 or 0.5 is used in the test design. Therefore, **USEPA recommends the use of the ≥ 0.5 dilution factor** (see Section 4, Quality Assurance). It is not possible to place confidence limits on the NOEC and LOEC derived from a given test, and it is difficult to quantify the precision of the NOEC-LOEC endpoints between tests. If the data from a series of tests performed with the same toxicant, toxicant concentrations, and test species, were analyzed with hypothesis tests, precision could only be assessed by a qualitative comparison of the NOEC-LOEC intervals, with the understanding that maximum precision would be attained if all tests yielded the same NOEC-LOEC interval. In practice, the precision of results of repetitive chronic tests is considered acceptable if the NOECs vary by no more than one concentration interval above or below a central tendency. Using these guidelines, the "normal" range of NOECs from toxicity tests using a 0.5 dilution factor (two-fold difference between adjacent concentrations), would be four-fold.

9.3.2 POINT ESTIMATION TECHNIQUES

9.3.2.1 Point estimation techniques have the advantage of providing a point estimate of the toxicant concentration causing a given amount of adverse (inhibiting) effect, the precision of which can be quantitatively assessed (1) within tests by calculation of 95% confidence limits, and (2) across tests by calculating a standard deviation and coefficient of variation.

9.3.2.2 It should be noted that software used to calculate point estimates occasionally may not provide associated 95% confidence intervals. This situation may arise when test data do not meet specific assumptions required by the statistical methods, when point estimates are outside of the test concentration range, and when specific limitations imposed by the software are encountered. USEPA (2000a) provides guidance on confidence intervals under these circumstances.

9.4 **DATA ANALYSIS**

9.4.1 ROLE OF THE STATISTICIAN

9.4.1.1 The use of the statistical methods described in this manual for routine data analysis does not require the assistance of a statistician. However, the interpretation of the results of the analysis of the data from any of the toxicity tests described in this manual can become problematic because of the inherent variability and sometimes unavoidable anomalies in biological data. If the data appear unusual in any way, or fail to meet the necessary assumptions, a statistician should be consulted. Analysts who are not proficient in statistics are strongly advised to seek the assistance of a statistician before selecting the method of analysis and using any of the results.

9.4.1.2 The statistical methods recommended in this manual are not the only possible methods of statistical analysis. Many other methods have been proposed and considered. Certainly there are other reasonable and defensible methods of statistical analysis for this kind of toxicity data. Among alternative hypothesis tests some, like Williams' Test, require additional assumptions, while others, like the bootstrap methods, require computer-intensive computations. Alternative point estimation approaches most probably would require the services of a statistician to determine the appropriateness of the model (goodness of fit), higher order linear or nonlinear models, confidence intervals for estimates generated by inverse regression, etc. In addition, point estimation or regression approaches would require the specification by biologists or toxicologists of some low level of adverse effect that would be deemed acceptable or safe. The statistical methods contained in this manual have been chosen because they are (1) applicable to most of the different toxicity test data sets for which they are recommended, (2) powerful statistical tests, (3) hopefully "easily" understood by nonstatisticians, and (4) amenable to use without a computer, if necessary.

9.4.2 PLOTTING THE DATA

9.4.2.1 The data should be plotted, both as a preliminary step to help detect problems and unsuspected trends or patterns in the responses, and as an aid in interpretation of the results. Further discussion and plotted sets of data are included in the methods and the Appendices.

9.4.3 DATA TRANSFORMATIONS

9.4.3.1 Transformations of the data, (e.g., arc sine square root and logs), are used where necessary to meet assumptions of the proposed analyses, such as the requirement for normally distributed data.

9.4.4 INDEPENDENCE, RANDOMIZATION, AND OUTLIERS

9.4.4.1 Statistical independence among observations is a critical assumption in all statistical analysis of toxicity data. One of the best ways to insure independence is to properly follow rigorous randomization procedures. Randomization techniques should be employed at the start of the test, including the randomization of the placement of test organisms in the test chambers and randomization of the test chamber location within the array of chambers. Discussions of statistical independence, outliers and randomization, and a sample randomization scheme, are included in Appendix A.

9.4.5 REPLICATION AND SENSITIVITY

9.4.5.1 The number of replicates employed for each toxicant concentration is an important factor in determining the sensitivity of chronic toxicity tests. Test sensitivity generally increases as the number of replicates is increased, but the point of diminishing returns in sensitivity may be reached rather quickly. The level of sensitivity required by a hypothesis test or the confidence interval for a point estimate will determine the number of replicates, and should be based on the objectives for obtaining the toxicity data.

9.4.5.2 In a statistical analysis of toxicity data, the choice of a particular analysis and the ability to detect departures from the assumptions of the analysis, such as the normal distribution of the data and homogeneity of variance, is also dependent on the number of replicates. More than the minimum number of replicates may be required in situations where it is imperative to obtain optimal statistical results, such as with tests used in enforcement cases or when it is not possible to repeat the tests. For example, when the data are analyzed by hypothesis testing, the nonparametric alternatives cannot be used unless there are at least four replicates at each toxicant concentration.

9.4.6 RECOMMENDED ALPHA LEVELS

9.4.6.1 The data analysis examples included in the manual specify an alpha level of 0.01 for testing the assumptions of hypothesis tests and an alpha level of 0.05 for the hypothesis tests themselves. These levels are

common and well accepted levels for this type of analysis and are presented as a recommended minimum significance level for toxicity test data analysis.

9.5 CHOICE OF ANALYSIS

9.5.1 The recommended statistical analysis of most data from chronic toxicity tests with aquatic organisms follows a decision process illustrated in the flowchart in Figure 2. An initial decision is made to use point estimation techniques (the Probit Analysis, the Spearman-Karber Method, the Trimmed Spearman-Karber Method, the Graphical Method, or Linear Interpolation Method) and/or to use hypothesis testing (Dunnett's Test, the t test with the Bonferroni adjustment, Steel's Many-one Rank Test, or the Wilcoxon Rank Sum Test with the Bonferroni adjustment). **NOTE: For the NPDES Permit Program, the point estimation techniques are the preferred statistical methods in calculating end points for effluent toxicity tests.** If hypothesis testing is chosen, subsequent decisions are made on the appropriate procedure for a given set of data, depending on the results of the tests of assumptions, as illustrated in the flowchart. A specific flow chart is included in the analysis section for each test.

9.5.2 Since a single chronic toxicity test might yield information on more than one parameter (such as survival, growth, and reproduction), the lowest estimate of a "no-observed-effect concentration" for any of the responses would be used as the "no-observed-effect concentration" for each test. It follows logically that in the statistical analysis of the data, concentrations that had a significant toxic effect on one of the observed responses would not be subsequently tested for an effect on some other response. This is one reason for excluding concentrations that have shown a statistically significant reduction in survival from a subsequent hypothesis test for effects on another parameter such as reproduction. A second reason is that the exclusion of such concentrations usually results in a more powerful and appropriate statistical analysis. In performing the point estimation techniques recommended in this manual, an all-data approach is used. For example, data from concentrations above the NOEC for survival are included in determining ICp estimates using the Linear Interpolation Method.

9.5.3 ANALYSIS OF GROWTH AND REPRODUCTION DATA

9.5.3.1 Growth data from the fathead minnow, *Pimephales promelas*, larval survival and growth test are analyzed using hypothesis testing or point estimation techniques according to the flowchart in Figure 2. The above mentioned growth data may also be analyzed by generating a point estimate with the Linear Interpolation Method. Data from effluent concentrations that have tested significantly different from the control for survival are excluded from further hypothesis tests concerning growth effects. Growth is defined as the dry weight per original number of test organisms when group weights are obtained. When analyzing the data using point estimation techniques, data from all concentrations are included in the analysis.

9.5.3.2 Reproduction data from the daphnid, *Ceriodaphnia dubia*, survival and reproduction test are analyzed using hypothesis testing or point estimation techniques according to the flowchart in Figure 2. In hypothesis testing, data from effluent concentrations that have significantly lower survival than the control, as determined by Fisher's Exact test, are not included in the hypothesis tests for reproductive effects. Data from all concentrations are included when using point estimation techniques.

9.5.4 ANALYSIS OF ALGAL GROWTH RESPONSE DATA

9.5.4.1 The growth response data from the green alga, *Selenastrum capricornutum*, toxicity test, after an appropriate transformation, if necessary, to meet the assumptions of normality and homogeneity of variance, may be analyzed by hypothesis testing according to the flowchart in Figure 2. Point estimates, such as the IC25 and IC50, would also be appropriate in analyzing algal growth data.

9.5.5 ANALYSIS OF MORTALITY DATA

9.5.5.1 Mortality data are analyzed by Probit Analysis, if appropriate, or other point estimation techniques (i.e., the Spearman-Karber Method, the Trimmed Spearman-Karber Method, or the Graphical Method) (see Appendices I-L and the discussion below). The mortality data can also be analyzed by hypothesis testing, after an arc sine square root transformation (see Appendix B-F), according to the flowchart in Figure 2.

9.5.5.2 Mortality data from the daphnid, *Ceriodaphnia dubia*, survival and reproduction test are analyzed by Fisher's Exact Test (Appendix G) prior to the analysis of the reproduction data. The mortality data may also be analyzed by Probit Analysis, if appropriate or other methods (see Subsection 9.5.5.1).

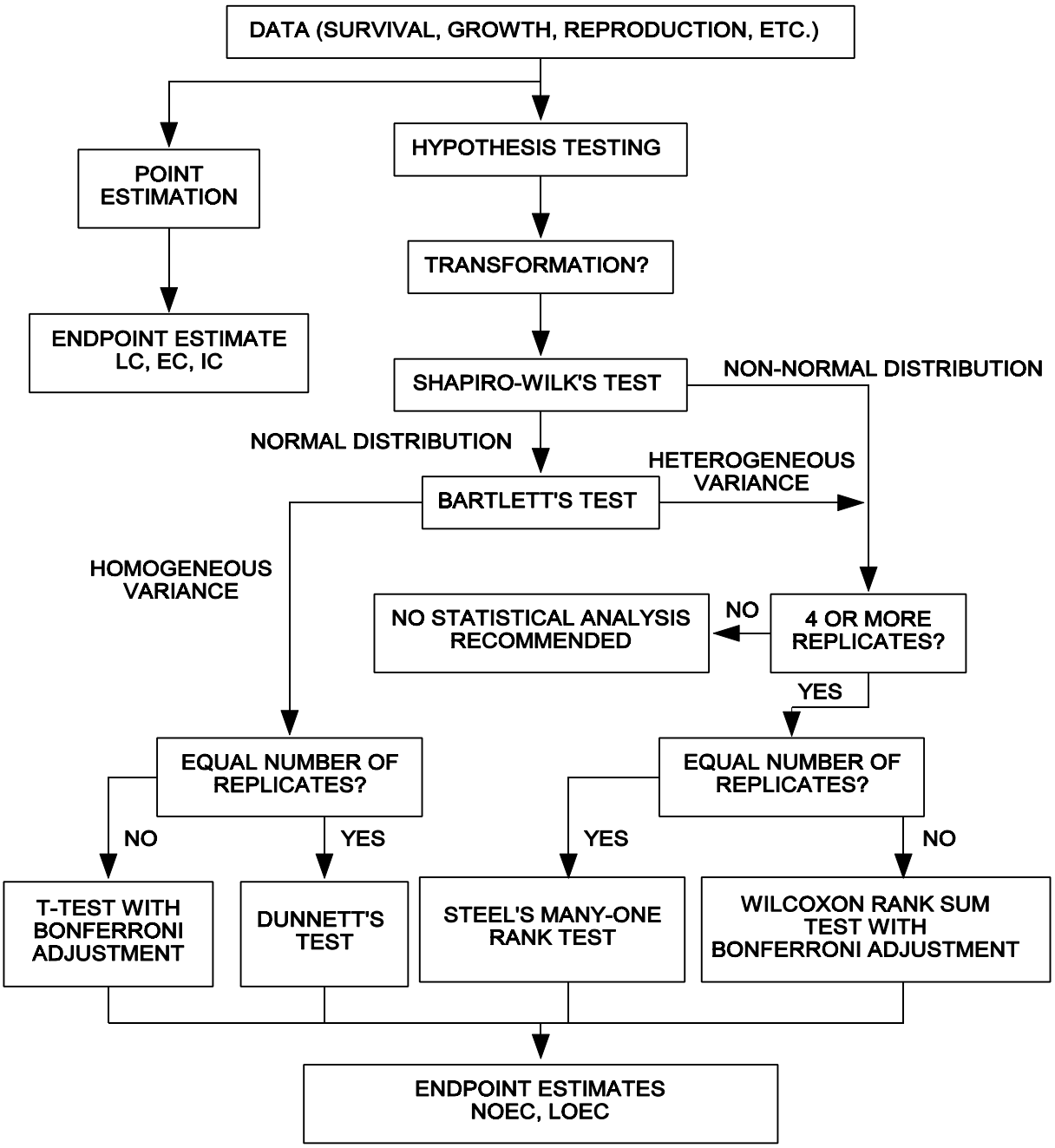

Figure 2. Flowchart for statistical analysis of test data

9.6 **HYPOTHESIS TESTS**

9.6.1 DUNNETT'S PROCEDURE

9.6.1.1 Dunnett's Procedure is used to determine the NOEC. The procedure consists of an analysis of variance (ANOVA) to determine the error term, which is then used in a multiple comparison procedure for comparing each of the treatment means with the control mean, in a series of paired tests (see Appendix C). Use of Dunnett's Procedure requires at least three replicates per treatment to check the assumptions of the test. In cases where the numbers of data points (replicates) for each concentration are not equal, a t test may be performed with Bonferroni's adjustment for multiple comparisons (see Appendix D), instead of using Dunnett's Procedure.

9.6.1.2 The assumptions upon which the use of Dunnett's Procedure is contingent are that the observations within treatments are normally distributed, with homogeneity of variance. Before analyzing the data, these assumptions must be tested using the procedures provided in Appendix B.

9.6.1.3 If, after suitable transformations have been carried out, the normality assumptions have not been met, Steel's Many-one Rank Test should be used if there are four or more data points (replicates) per toxicant concentration. If the numbers of data points for each toxicant concentration are not equal, the Wilcoxon Rank Sum Test with Bonferroni's adjustment should be used (see Appendix F).

9.6.1.4 Some indication of the sensitivity of the analysis should be provided by calculating (1) the minimum difference between means that can be detected as statistically significant, and (2) the percent change from the control mean that this minimum difference represents for a given test.

9.6.1.5 A step-by-step example of the use of Dunnett's Procedure is provided in Appendix C.

9.6.2 T TEST WITH THE BONFERRONI ADJUSTMENT

9.6.2.1 A t test with Bonferroni's adjustment is used as an alternative to Dunnett's Procedure when the number of replicates is not the same for all concentrations. This test sets an upper bound of alpha on the overall error rate, in contrast to Dunnett's Procedure, for which the overall error rate is fixed at alpha. Thus Dunnett's Procedure is a more powerful test.

9.6.2.2 The assumptions upon which the use of the t test with Bonferroni's adjustment is contingent are that the observations within treatments are normally distributed, with homogeneity of variance. These assumptions must be tested using the procedures provided in Appendix B.

9.6.2.3 The estimate of the safe concentration derived from this test is reported in terms of the NOEC. A step-by-step example of the use of the t test with Bonferroni's adjustment is provided in Appendix D.

9.6.3 STEEL'S MANY-ONE RANK TEST

9.6.3.1 Steel's Many-one Rank Test is a multiple comparison procedure for comparing several treatments with a control. This method is similar to Dunnett's Procedure, except that it is not necessary to meet the assumption of normality. The data are ranked, and the analysis is performed on the ranks rather than on the data themselves. If the data are normally or nearly normally distributed, Dunnett's Procedure would be more sensitive (would detect smaller differences between the treatments and control). For data that are not normally distributed, Steel's Many-one Rank Test can be much more efficient (Hodges and Lehmann, 1956).

9.6.3.2 It is necessary to have at least four replicates per toxicant concentration to use Steel's test. Unlike Dunnett's procedure, the sensitivity of this test cannot be stated in terms of the minimum difference between treatment means and the control mean that can be detected as statistically significant.

9.6.3.3 The estimate of the safe concentration is reported as the NOEC. A step-by-step example of the use of Steel's Many-one Rank Test is provided in Appendix E.

9.6.4 WILCOXON RANK SUM TEST WITH THE BONFERRONI ADJUSTMENT

9.6.4.1 The Wilcoxon Rank Sum Test with the Bonferroni Adjustment is a nonparametric test for comparing treatments with a control. The data are ranked and the analysis proceeds exactly as in Steel's Test except that Bonferroni's adjustment for multiple comparisons is used instead of Steel's tables. When Steel's test can be used (i.e., when there are equal numbers of data points per toxicant concentration), it will be more powerful (able to detect smaller differences as statistically significant) than the Wilcoxon Rank Sum Test with Bonferroni's adjustment.

9.6.4.2 The estimate of the safe concentration is reported as the NOEC. A step-by-step example of the use of the Wilcoxon Rank Sum Test with Bonferroni Adjustment is provided in Appendix F.

9.6.5 A CAUTION IN THE USE OF HYPOTHESIS TESTING

9.6.5.1 If in the calculation of an NOEC by hypothesis testing, two tested concentrations cause statistically significant adverse effects, but an intermediate concentration did not cause statistically significant effects, the results should be used with extreme caution.

9.7 **POINT ESTIMATION TECHNIQUES**

9.7.1 PROBIT ANALYSIS

9.7.1.1 Probit Analysis is used to estimate the LC1, LC50, EC1, or EC50 and the associated 95% confidence interval. The analysis consists of adjusting the data for mortality in the control, and then using a maximum likelihood technique to estimate the parameters of the underlying log tolerance distribution, which is assumed to have a particular shape.

9.7.1.2 The assumption upon which the use of Probit Analysis is contingent is a normal distribution of log tolerances. If the normality assumption is not met, and at least two partial mortalities are not obtained, Probit Analysis should not be used. It is important to check the results of Probit Analysis to determine if use of the analysis is appropriate. The chi-square test for heterogeneity provides one good test of appropriateness of the analysis. The computer program (see Appendix I) checks the chi-square statistic calculated for the data set against the tabular value, and provides an error message if the calculated value exceeds the tabular value.

9.7.1.3 A discussion of Probit Analysis, and examples of computer program input and output, are found in Appendix I.

9.7.1.4 In cases where Probit Analysis is not appropriate, the LC50 and associated confidence interval may be estimated by the Spearman-Karber Method (Appendix J) or the Trimmed Spearman-Karber Method (Appendix K). If the test results in 100% survival and 100% mortality in adjacent treatments (all or nothing effect), the LC50 may be estimated using the Graphical Method (Appendix L).

9.7.2 LINEAR INTERPOLATION METHOD

9.7.2.1 The Linear Interpolation Method (see Appendix M) is a procedure to calculate a point estimate of the effluent or other toxicant concentration [Inhibition Concentration, (IC)] that causes a given percent reduction (e.g., 25%, 50%, etc.) in the reproduction or growth of the test organisms. The procedure was designed for general applicability in the analysis of data from short-term chronic toxicity tests.

9.7.2.2 Use of the Linear Interpolation Method is based on the assumptions that the responses (1) are monotonically non-increasing (the mean response for each higher concentration is less than or equal to the mean response for the previous concentration), (2) follow a piecewise linear response function, and (3) are from a random, independent, and representative sample of test data. The assumption for piecewise linear response cannot be tested statistically, and no defined statistical procedure is provided to test the assumption for monotonicity. Where the observed means are not strictly monotonic by examination, they are adjusted by smoothing. In cases where the responses at the low toxicant concentrations are much higher than in the controls, the smoothing process may result in a large upward adjustment in the control mean.

9.7.2.3 The inability to test the monotonicity and piecewise linear response assumptions for this method makes it difficult to assess when the method is, or is not, producing reliable results. Therefore, the method should be used with caution when the results of a toxicity test approach an "all or nothing" response from one concentration to the next in the concentration series, and when it appears that there is a large deviation from monotonicity. See Appendix M for a more detailed discussion of the use of this method and a computer program available for performing calculations.

SECTION 10

REPORT PREPARATION AND TEST REVIEW

10.1 REPORT PREPARATION

The following general format and content are recommended for the report:

10.1.1 INTRODUCTION

1. Permit number
2. Toxicity testing requirements of permit
3. Plant location
4. Name of receiving water body
5. Contract Laboratory (if the tests are performed under contract)
   a Name of firm
   b. Phone number
   c. Address
6. Objective of test

10.1.2 PLANT OPERATIONS

1. Product(s)
2. Raw materials
3. Operating schedule
4. Description of waste treatment
5. Schematic of waste treatment
6. Retention time (if applicable)
7. Volume of waste flow (MGD, CFS, GPM)
8. Design flow of treatment facility at time of sampling

10.1.3 SOURCE OF EFFLUENT, RECEIVING WATER, AND DILUTION WATER

1. Effluent Samples
   a. Sampling point (including latitude and longitude)
   b. Collection dates and times
   c. Sample collection method
   d. Physical and chemical data
   e. Mean daily discharge on sample collection date
   f. Lapsed time from sample collection to delivery
   g. Sample temperature when received at the laboratory

2. Receiving Water Samples
   a. Sampling point (including latitude and longitude)
   b. Collection dates and times
   c. Sample collection method
   d. Physical and chemical data
   e. Streamflow (at time of sampling)
   f. Sample temperature when received at the laboratory
   g Lapsed time from sample collection to delivery

3. Dilution Water Samples
   a. Source

b. Collection date(s) and time(s)
c. Pretreatment
d. Physical and chemical characteristics

10.1.4 TEST METHODS

1. Toxicity test method used (title, number, source)
2. Endpoint(s) of test
3. Deviation(s) from reference method, if any, and the reason(s)
4. Date and time test started
5. Date and time test terminated
6. Type and volume of test chambers
7. Volume of solution used per chamber
8. Number of organisms per test chamber
9. Number of replicate test chambers per treatment
10. Acclimation of test organisms (temperature mean and range)
11. Test temperature (mean and range)
12. Specify if aeration was needed
13. Feeding frequency, and amount and type of food
14. Specify if (and how) pH control measures were implemented

10.1.5 TEST ORGANISMS

1. Scientific name and how determined
2. Age
3. Life stage
4. Mean length and weight (where applicable)
5. Source
6. Diseases and treatment (where applicable)
7. Taxonomic key used for species identification

10.1.6 QUALITY ASSURANCE

1. Reference toxicant used routinely; source
2. Date and time of most recent reference toxicant test, test results, and current control chart
3. Dilution water used in reference toxicant test
4. Results (NOEC or, where applicable, LOEC, LC50, EC50, IC25 and/or IC50); report percent minimum significant difference (PMSD) calculated for sublethal endpoints determined by hypothesis testing in reference toxicant test
5. Physical and chemical methods used

10.1.7 RESULTS

1. Provide raw toxicity data in tabular form, including daily records of affected organisms in each concentration (including controls) and replicate, and in graphical form (plots of toxicity data)
2. Provide table of LC50s, NOECs, IC25, IC50, etc. (as required in the applicable NPDES permit)
3. Indicate statistical methods used to calculate endpoints
4. Provide summary table of physical and chemical data
5. Tabulate QA data
6. Provide percent minimum significant difference (PMSD) calculated for sublethal endpoints

10.1.8 CONCLUSIONS AND RECOMMENDATIONS

1. Relationship between test endpoints and permit limits
2. Actions to be taken

10.2 TEST REVIEW

10.2.1 Test review is an important part of an overall quality assurance program (Section 4) and is necessary for ensuring that all test results are reported accurately. Test review should be conducted on each test by both the testing laboratory and the regulatory authority.

10.2.2 SAMPLING AND HANDLING

10.2.2.1 The collection and handling of samples are reviewed to verify that the sampling and handling procedures given in Section 8 were followed. Chain-of-custody forms are reviewed to verify that samples were tested within allowable sample holding times (Subsection 8.5.4). Any deviations from the procedures given in Section 8 should be documented and described in the data report (Subsection 10.1).

10.2.3 TEST ACCEPTABILITY CRITERIA

10.2.3.1 Test data are reviewed to verify that test acceptability criteria (TAC) requirements for a valid test have been met. Any test not meeting the minimum test acceptability criteria is considered invalid. All invalid tests must be repeated with a newly collected sample.

10.2.4 TEST CONDITIONS

10.2.4.1 Test conditions are reviewed and compared to the specifications listed in the summary of test condition tables provided for each method. Physical and chemical measurements taken during the test (e.g., temperature, pH, and DO) also are reviewed and compared to specified ranges. Any deviations from specifications should be documented and described in the data report (Subsection 10.1).

10.2.4.2 The summary of test condition tables presented for each method identify test conditions as required or recommended. For WET test data submitted under NPDES permits, all required test conditions must be met or the test is considered invalid and must be repeated with a newly collected sample. Deviations from recommended test conditions must be evaluated on a case-by-case basis to determine the validity of test results. Deviations from recommended test conditions may or may not invalidate a test result depending on the degree of the departure and the objective of the test. The reviewer should consider the degree of the deviation and the potential or observed impact of the deviation on the test result before rejecting or accepting a test result as valid. For example, if dissolved oxygen is measured below 4.0 mg/L in one test chamber, the reviewer should consider whether any observed mortality in that test chamber corresponded with the drop in dissolved oxygen.

10.2.4.3 Whereas slight deviations in test conditions may not invalidate an individual test result, test condition deviations that continue to occur frequently in a given laboratory may indicate the need for improved quality control in that laboratory.

10.2.5 STATISTICAL METHODS

10.2.5.1 The statistical methods used for analyzing test data are reviewed to verify that the recommended flowcharts for statistical analysis were followed. Any deviation from the recommended flowcharts for selection of statistical methods should be noted in the data report. Statistical methods other than those recommended in the statistical flowcharts may be appropriate (see Subsection 9.4.1.2), however, the laboratory must document the use of and provide the rationale for the use of any alternate statistical method. In all cases (flowchart recommended

methods or alternate methods), reviewers should verify that the necessary assumptions are met for the statistical method used.

10.2.6 CONCENTRATION-RESPONSE RELATIONSHIPS

10.2.6.1 The concept of a concentration-response, or more classically, a dose-response relationship is "the most fundamental and pervasive one in toxicology" (Casarett and Doull, 1975). This concept assumes that there is a causal relationship between the dose of a toxicant (or concentration for toxicants in solution) and a measured response. A response may be any measurable biochemical or biological parameter that is correlated with exposure to the toxicant. The classical concentration-response relationship is depicted as a sigmoidal shaped curve, however, the particular shape of the concentration-response curve may differ for each coupled toxicant and response pair. In general, more severe responses (such as acute effects) occur at higher concentrations of the toxicant, and less severe responses (such as chronic effects) occur at lower concentrations. A single toxicant also may produce multiple responses, each characterized by a concentration-response relationship. A corollary of the concentration-response concept is that every toxicant should exhibit a concentration-response relationship, given that the appropriate response is measured and given that the concentration range evaluated is appropriate. Use of this concept can be helpful in determining whether an effluent possesses toxicity and in identifying anomalous test results.

10.2.6.2 The concentration-response relationship generated for each multi-concentration test must be reviewed to ensure that calculated test results are interpreted appropriately. USEPA (2000a) provides guidance on evaluating concentration-response relationships to assist in determining the validity of WET test results. All WET test results (from multi-concentration tests) reported under the NPDES program should be reviewed and reported according to USEPA guidance on the evaluation of concentration-response relationships (USEPA, 2000a). This guidance provides review steps for 10 different concentration-response patterns that may be encountered in WET test data. Based on the review, the guidance provides one of three determinations: that calculated effect concentrations are reliable and should be reported, that calculated effect concentrations are anomalous and should be explained, or that the test was inconclusive and the test should be repeated with a newly collected sample. It should be noted that the determination of a valid concentration-response relationship is not always clear cut. Data from some tests may suggest consultation with professional toxicologists and/or regulatory officials. Tests that exhibit unexpected concentration-response relationships also may indicate a need for further investigation and possible retesting.

10.2.7 REFERENCE TOXICANT TESTING

10.2.7.1 Test review of a given effluent or receiving water test should include review of the associated reference toxicant test and current control chart. Reference toxicant testing and control charting is required for documenting the quality of test organisms (Subsection 4.7) and ongoing laboratory performance (Subsection 4.16). The reviewer should verify that a quality control reference toxicant test was conducted according to the specified frequency required by the permitting authority or recommended by the method (e.g., monthly). The test acceptability criteria, test conditions, concentration-response relationship, and test sensitivity of the reference toxicant test are reviewed to verify that the reference toxicant test conducted was a valid test. The results of the reference toxicant test are then plotted on a control chart (see Subsection 4.16) and compared to the current control chart limits (± 2 standard deviations).

10.2.7.2 Reference toxicant tests that fall outside of recommended control chart limits are evaluated to determine the validity of associated effluent and receiving water tests (see Subsection 4.16). An out of control reference toxicant test result does not necessarily invalidate associated test results. The reviewer should consider the degree to which the reference toxicant test result fell outside of control chart limits, the width of the limits, the direction of the deviation (toward increasing test organism sensitivity or toward decreasing test organism sensitivity), the test conditions of both the effluent test and the reference toxicant test, and the objective of the test. More frequent and/or concurrent reference toxicant testing may be advantageous if recent problems (e.g., invalid tests, reference toxicant test results outside of control chart limits, reduced health of organism cultures, or increased within-test variability) have been identified in testing.

10.2.8 TEST VARIABILITY

10.2.8.1 The within-test variability of individual tests should be reviewed. Excessive within-test variability may invalidate a test result and warrant retesting. For evaluating within-test variability, reviewers should consult EPA guidance on upper and lower percent minimum significant difference (PMSD) bounds (USEPA, 2000b).

10.2.8.2 When NPDES permits require sublethal hypothesis testing endpoints from Methods 1000.0,1002.0, or 1003.0 (e.g., growth or reproduction NOECs and LOECs), within-test variability must be reviewed and variability criteria must be applied as described in this section (10.2.8.2). When the methods are used for non-regulatory purposes, the variability criteria herein are recommended but are not required, and their use (or the use of alternative variability criteria) may depend upon the intended uses of the test results and the requirements of any applicable data quality objectives and quality assurance plan.

10.2.8.2.1 To measure test variability, calculate the percent minimum significant difference (PMSD) achieved in the test. The PMSD is the smallest percentage decrease in growth or reproduction from the control that could be determined as statistically significant in the test. The PMSD is calculated as 100 times the minimum significant difference (MSD) divided by the control mean. The equation and examples of MSD calculations are shown in Appendix C. PMSD may be calculated legitimately as a descriptive statistic for within-test variability, even when the hypothesis test is conducted using a non-parametric method. The PMSD bounds were based on a representative set of tests, including tests for which a non-parametric method was required for determining the NOEC or LOEC. The conduct of hypothesis testing to determine test results should follow the statistical flow charts provided for each method. That is, when test data fail to meet assumptions of normality or heterogeneity of variance, a non-parametric method (determined following the statistical flowchart for the method) should be used to calculate test results, but the PMSD may be calculated as described above (using parametric methods) to provide a measure of test variability.

10.2.8.2.2 Compare the PMSD measured in the test with the upper PMSD bound variability criterion listed in Table 6. When the test PMSD exceeds the upper bound, the variability among replicates is unusually large for the test method. Such a test should be considered insufficiently sensitive to detect toxic effects on growth or reproduction of substantial magnitude. A finding of toxicity at a particular concentration may be regarded as trustworthy, but a finding of "no toxicity" or "no statistically significant toxicity" at a particular concentration should not be regarded as a reliable indication that there is no substantial toxic effect on growth or reproduction at that concentration.

10.2.8.2.3 If the PMSD measured for the test is less than or equal to the upper PMSD bound variability criterion in Table 6, then the test's variability measure lies within normal bounds and the effect concentration estimate (e.g., NOEC or LOEC) would normally be accepted unless other test review steps raise serious doubts about its validity.

10.2.8.2.4 If the PMSD measured for the test exceeds the upper PMSD bound variability criterion in Table 6, then one of the following two cases applies (10.2.8.2.4.1, 10.2.8.2.4.2).

10.2.8.2.4.1 If toxicity is found at the permitted receiving water concentration (RWC) based upon the value of the effect concentration estimate (NOEC or LOEC), then the test shall be accepted and the effect concentration estimate may be reported, unless other test review steps raise serious doubts about its validity.

10.2.8.2.4.2 If toxicity is not found at the permitted RWC based upon the value of the effect concentration estimate (NOEC or LOEC) and the PMSD measured for the test exceeds the upper PMSD bound, then the test shall not be accepted, and a new test must be conducted promptly on a newly collected sample.

10.2.8.2.5 To avoid penalizing laboratories that achieve unusually high precision, lower PMSD bounds shall also be applied when a hypothesis test result (e.g., NOEC or LOEC) is reported. Lower PMSD bounds, which are based on the 10th percentiles of national PMSD data, are presented in Table 6. The 10th percentile PMSD represents a practical limit to the sensitivity of the test method because few laboratories are able to achieve such precision on a

regular basis and most do not achieve it even occasionally. In determining hypothesis test results (e.g., NOEC or LOEC), a test concentration shall not be considered toxic (i.e., significantly different from the control) if the relative difference from the control is less than the lower PMSD bounds in Table 6. See USEPA, 2000b for specific examples of implementing lower PMSD bounds.

10.2.8.3 To assist in reviewing within-test variability, EPA recommends maintaining control charts of PMSDs calculated for successive effluent tests (USEPA, 2000b). A control chart of PMSD values characterizes the range of variability observed within a given laboratory, and allows comparison of individual test PMSDs with the laboratory's typical range of variability. Control charts of other variability and test performance measures, such as the MSD, standard deviation or CV of control responses, or average control response, also may be useful for reviewing tests and minimizing variability. The log of PMSD will provide an approximately normal variate useful for control charting.

TABLE 6. VARIABILITY CRITERIA (UPPER AND LOWER PMSD BOUNDS) FOR SUBLETHAL HYPOTHESIS TESTING ENDPOINTS SUBMITTED UNDER NPDES PERMITS.[1]

Test Method	Endpoint	Lower PMSD Bound	Upper PMSD Bound
Method 1000.0, Fathead Minnow Larval Survival and Growth Test	growth	12	30
Method 1002.0, *Ceriodaphnia dubia* Survival and Reproduction Test	reproduction	13	47
Method 1003.0, *Selenastrum capricornutum* Growth Test	growth	9.1	29

[1] Lower and upper PMSD bounds were determined from the 10th and 90th percentile, respectively, of PMSD data from EPA's WET Interlaboratory Variability Study (USEPA, 2001a; USEPA, 2001b).

SECTION 11

TEST METHOD

FATHEAD MINNOW, *PIMEPHALES PROMELAS,* LARVAL SURVIVAL AND GROWTH TEST METHOD 1000.0

11.1 SCOPE AND APPLICATION

11.1.1 This method estimates the chronic toxicity of effluents and receiving water to the fathead minnow, *Pimephales promelas*, using newly hatched larvae in a seven-day, static renewal test. The effects include the synergistic, antagonistic, and additive effects of all the chemical, physical, and biological components which adversely affect the physiological and biochemical functions of the test organisms.

11.1.2 Daily observations on mortality make it possible to also calculate acute toxicity for desired exposure periods (i.e., 24-h, 48-h, 96-h LC50s).

11.1.3 Detection limits of the toxicity of an effluent or pure substance are organism dependent.

11.1.4 Brief excursions in toxicity may not be detected using 24-h composite samples. Also, because of the long sample collection period involved in composite sampling, and because the test chambers are not sealed, highly degradable or highly volatile toxicants present in the source may not be detected in the test.

11.1.5 This test method is commonly used in one of two forms: (1) a definitive test, consisting of a minimum of five effluent concentrations and a control, and (2) a receiving water test(s), consisting of one or more receiving water concentrations and a control.

11.2 SUMMARY OF METHOD

11.2.1 Fathead minnow, *Pimephales promelas*, larvae are exposed in a static renewal system for seven days to different concentrations of effluent or to receiving water. Test results are based on the survival and weight of the larvae.

11.3. INTERFERENCES

11.3.1 Toxic substances may be introduced by contaminants in dilution water, glassware, sample hardware, and testing equipment (see Section 5, Facilities, Equipment and Supplies).

11.3.2 Adverse effects of low dissolved oxygen (DO) concentrations, high concentrations of suspended and/or dissolved solids, and extremes of pH, alkalinity, or hardness, may mask the presence of toxic substances.

11.3.3 Improper effluent sampling and sample handling may adversely affect test results (see Section 8, Effluent and Receiving Water Sampling, Sample Handling, and Sample Preparation for Toxicity Tests).

11.3.4 Pathogenic and/or predatory organisms in effluent samples or receiving water that is used for dilution may affect test organism survival and confound test results. When pathogen interference is suggested by observation (11.3.4.1) and data evaluations (11.3.4.2) and confirmed by parallel testing (11.3.4.4), steps should be taken to minimize pathogen interference to the extent that test results are not confounded by mortality due to pathogens. Pathogen control techniques that do not require modification of effluent samples, such as use of the modified test design described in Subsection 11.3.4.5, are recommended for controlling pathogen interference. Upon approval by the regulatory authority, analysts also may use additional pathogen control techniques that require sample modification (11.3.4.6) provided that parallel testing of altered and unaltered samples further confirms the presence

of pathogen interference and demonstrates successful pathogen control (11.3.4.6).

11.3.4.1 A typical indication that pathogen interference has occurred in a WET test is when test organisms exhibit "sporadic mortality". This sporadic morality phenomenon is characterized by an unexpected concentration-response relationship (i.e., effects that do not increase with increasing effluent concentration) and organism survival that varies greatly among replicates and among effluent dilutions (USEPA, 2000a). The observed sporadic mortality among replicates may occur in receiving water controls, lower effluent concentrations, and occasionally in full-strength effluent on day 3 or day 4 of the chronic test. When sporadic mortality occurs, a fungal growth may appear directly on the fish, especially in the gill area. The fungus has not been definitively identified, but the fungal growth appears to be compatible with *Saprolegnea sp.* (Downey *et al.*, 2000). Microbiological evaluations on receiving waters, the fish, and the food indicated the ubiquitous nature of pathogenic organisms (e.g., *Flexibacter spp*., *Aeromonas hydrophila*), and eradicating them from the test through the decontamination of the fish and their food has not been practical (Geis *et al.*, 2000).

11.3.4.2 When pathogen interference is suspected, a series of data evaluations are required. The test data must be reviewed to determine a cause for any unexpected concentration-response pattern and subsequently to determine the validity of calculated results (USEPA, 2000a). USEPA (2000a) provides guidance on reviewing concentration-response relationships including specific response patterns that may indicate pathogen effects. Each treatment (including the control) should be evaluated for an unusually high mortality response and unevenness of mortalities among replicates. Within-treatment coefficient of variation (CVs) for survival of >40% in effluent or receiving water treatments but relatively small for control replicates in a standard reconstituted water may be an indication of pathogen interference. Receiving water controls from improper preparation or collection also should be evaluated.

11.3.4.3 Because of the ubiquitous nature of the pathogens or predatory organisms, all test equipment, glassware, and pipettes must be kept clean and dry when not in use. Use of separate glassware, pipettes, and siphons for each concentration is recommended to minimize cross contaminating replicates of all treatments. Care also should be taken to properly clean test chambers by removing excess food, dead fish larvae, and other debris prior to daily renewal (see Subsection 11.10.7). When proper laboratory hygiene and filtration through a 2-4 mm mesh opening (Subsection 8.8.2) do not eliminate the sporadic mortality, the analyst should determine the source and confirm pathogen interference using parallel testing (11.3.4.4).

11.3.4.4 Parallel tests should be conducted using reconstituted water and receiving water as diluents with the effluent to confirm that the test results are due to pathogen interference and to determine the source of pathogens in the test. This determination is an important step in controlling pathogen interference. When the dilution water exhibits the interference (i.e., pathogen interference is not observed in the test using reconstituted laboratory water for dilution), reconstituted laboratory water instead of receiving waters should be used to eliminate the interference. However, if receiving water is required, the analyst may modify the test design to control pathogen interference (Subsection 11.3.4.5) or treat the dilution water prior to testing to remove the interference (Subsection 11.3.4.6). If pathogen interference is due to pathogens in the effluent (i.e., pathogen interference is still observed in the test using reconstituted laboratory water for dilution), it is recommended that the analyst modify the test design to control pathogen interference (Subsection 11.3.4.5). Upon approval by the regulatory authority, analysts also may use various sample sterilization techniques to control pathogen interference (11.3.4.6) provided that parallel testing of altered and unaltered samples further confirms the presence of pathogen interference and demonstrates successful pathogen control.

11.3.4.5 When data evaluation indicates that sporadic mortality has occurred as described in Subsections 11.3.4.1 - 11.3.4.2, the test design can be modified as described below to control pathogen interference. The use of 2 fish per 20 ml in each 1 ounce plastic cup test solution or 2 fish per 50 ml in each 4 ounce plastic cup can be used rather than 10 fish per test chamber. The total number of fish tested remains unchanged (i.e., 40 per treatment). At test initiation, for each test concentration and replicate, the test cups must be labeled to easily recombine the fish to the original replicate at the end of the test. For example, for replicate A, each of the five plastic test cups would be identified as subreplicate A1, A2, A3, A4, and A5 repeating the pattern for subsequent replicates (e.g., for replicate B, each cup would be identified as subreplicate B1, B2, B3, B4, and B5). At test termination, all test organisms

from the five A subreplicates are combined for a survival and weight determination. Document the recombination of replicates in records.

11.3.4.5.1 All test chambers must be randomized using a template for randomization or by using a table of random numbers. Test chambers are randomized once at the beginning of the test (see Subsection 11.10.2.3). When using templates, a number of different templates should be prepared, so that the same template is not used for every test. Randomization procedures must be documented with daily records.

11.3.4.5.2 When adding or transferring the larvae to test chambers, the amount of excess water added to the chambers should be kept to a minimum to avoid unnecessary dilution of the test concentrations. The fish in each test chamber should be fed 0.1 mL of a concentrated suspension of newly hatched (less than 24-h old) brine shrimp nauplii three times daily at 4 h intervals, or 0.15 mL should be fed twice daily at an interval of 6 h. (NOTE: to prevent low dissolved oxygen levels, the amount of food added to cups should be adjusted to account for the modified test design that uses smaller test chambers). Dead test organisms should be removed as soon as they are observed.

11.3.4.5.3 Fish are transferred to new or clean test chambers daily. At the time of the daily renewal of the test solutions, the fish are transferred to a new test chamber containing fresh test solution using a pipette which has at least a 5mm bore diameter. Separate pipettes should be used for each treatment. Water transfer is kept to a minimum by allowing the fish to swim out of the pipette into the new test chamber. Any potential injury to individual fish should be recorded on the test sheets.

11.3.4.5.4 At test termination, the surviving larvae in each chamber must be counted and all subreplicates within a replicate (e.g., A1, A2, A3, A4, and A5) combined. For example, all test cups (within a treatment) labeled A would be combined for a survival and dry weight determination.

11.3.4.6 When parallel testing has confirmed pathogen interference, the regulatory authority may allow modifications of the effluent samples or receiving water diluent to remove or inactivate the pathogens (Subsection 11.3.4.6.1 - 11.3.4.6.4). Techniques that control pathogen interference without modifying the effluent sample (11.3.4.5) are recommended, but they may not always be able to minimize pathogen interference to the extent that test results are not confounded by mortality due to pathogens. Therefore, regulatory authorities may allow appropriate pathogen control techniques (including those that modify the effluent sample) on a case-by-case basis. TIE approaches (USEPA, 1991b; USEPA, 1992) and the following procedures (Subsection 11.3.4.6.1 - 11.3.4.6.4) can be used alone or in combination to ascertain the adverse influence on tests caused by pathogens. Prior to routine use of pathogen control techniques that modify the sample, the effects of pathogenic bacteria and the effectiveness of the selected pathogen control technique must be confirmed by parallel and simultaneous testing of the technique with altered and unaltered samples.

11.3.4.6.1 Use of ultra-violet light to irradiate the sample. The rate of pumping specified by the manufacturer of the apparatus should be used (provided that adequate disinfection is achieved), and the life of the UV light source must follow manufacturers' recommendations and be documented. For example, one liter of water can be irradiated for 20 min using an 8 watt UV light (Aquatic Ecosystems, Apopka, FL) prior to use each day of the test. Light sources have limited lifetimes and their effectiveness will decrease with age. The delivery pump and the light source should be on the same electrical circuit to ensure that when power is interrupted both terminate operation. QA/QC procedures should be put into place to assure that the light source is on at the beginning and at the end of the procedure. Treatment of the large volumes of water necessary for test dilution also may be impractical. Caution: Since the effluent or receiving water samples must be passed through the UV sterilizer and then test treatments prepared, there may be potential effects of UV light on the sample. UV exposure may increase or decrease toxicity from other pollutants in the sample. UV treatment is known to cause photoactivation of some organic compounds, which may increase toxicity. UV treatment also is known to cause the photochemical breakdown of certain organic compounds, which could decrease toxicity (if the parent compound is toxic) or increase toxicity (if reaction products are toxic). These effects should be considered in the selection of pathogen control strategies, and the analyst should attempt to minimize these effects to the extent reasonably practicable. The effectiveness of UV for

sterilization may decrease with turbid or stained samples. Bacteria can escape exposure by being lodged in crevices of particulate matter in the sample. All toxicity tests using a sterilized sample must include a blank preparation consisting of similarly sterilized laboratory water.

11.3.4.6.2 Ultra-filtration through a 0.22 µm pore diameter filter (such as Gelman Suprocap®) may be conducted on sample aliquots before daily use. Samples may need to be filtered through a glass fiber filter prior to the 0.22 µm filter. This is time consuming and volume restricted. Treatment of the large volumes of water necessary for test dilution may be impractical. Caution: Since the effluent or receiving water samples must be passed through the filter, the effect of filtering must be evaluated. Filtration can remove toxicity if toxic components of the sample are bound to particles (USEPA, 1991b; 1992). The removal of suspended solids also may influence the bioavailability of chemical pollutants. These effects should be considered in the selection of pathogen control strategies, and the analyst should attempt to minimize these effects to the extent reasonably practicable. The removal of toxicity by filtration must be evaluated for each sample by testing samples before and after filtration. All toxicity tests using a sterilized sample also must include a blank preparation consisting of similarly sterilized reconstituted laboratory water.

11.3.4.6.3 Use of chlorination and dechlorination. In some cases, pathogens can survive the chlorination/ dechlorination process and the pathogenic effects may increase due to lack of competition from other organisms. Sufficient data must be collected and documented to determine the effective dosage required. Caution: Chlorination of effluent samples could cause unknown effects on the sample. Chlorination could increase or decrease sample toxicity by oxidizing organic compounds or forming chlorination by-products. These effects should be considered in the selection of pathogen control strategies, and the analyst should attempt to minimize these effects to the extent reasonably practicable. Toxicity tests conducted with the addition of chlorine and subsequent dechlorination (USEPA, 1991b; 1992) to either effluent or receiving water samples also must include a blank preparation consisting of similarly treated laboratory water.

11.3.4.6.4 Use of antibiotics. The addition of wide spectrum antibiotics has been effective in removing the pathogen effect (Downey *et al.*, 2000). Antibacterial treatment such as those commonly used in aquaculture or home aquarium maintenance (e.g., oxytetracycline, chloramphenicol, and actinomycin) may be effective. Sufficient data must be collected to determine the effective dosage required. Caution: While antibiotics are effective, easy to use, inexpensive, and readily available, the antibiotic treatment may alter the sample in unknown or undesirable ways and may make the sample too cloudy. Large volumes of a sample may need to be treated. These effects should be considered in the selection of pathogen control strategies, and the analyst should attempt to minimize these effects to the extent reasonably practicable. All toxicity tests using antibiotic treatments also must include treatment blanks of similarly prepared laboratory water.

11.3.5 Food added during the test may sequester metals and other toxic substances and confound test results. Daily renewal of solutions, however, will reduce the probability of reduction of toxicity caused by feeding.

11.3.6 pH drift during the test may contribute to artifactual toxicity when ammonia or other pH-dependent toxicants (such as metals) are present. As pH increases, the toxicity of ammonia also increases (see Subsection 8.8.6), so upward pH drift may increase sample toxicity. For metals, toxicity may increase or decrease with increasing pH. Lead and copper were found to be more acutely toxic at pH 6.5 than at pH 8.0 or 8.5, while nickel and zinc were more toxic at pH 8.5 than at pH 6.5 (USEPA, 1992). In situations where sample toxicity is confirmed to be artifactual and due to pH drift (as determined by parallel testing as described in Subsection 11.3.6.1), the regulatory authority may allow for control of sample pH during testing using procedures outlined in Subsection 11.3.6.2. It should be noted that artifactual toxicity due to pH drift is not likely to occur unless pH drift is large (more than 1 pH unit) and/or the concentration of some pH-dependent toxicant in the sample is near the threshold for toxicity.

11.3.6.1 To confirm that toxicity is artifactual and due to pH drift, parallel tests must be conducted, one with controlled pH and one with uncontrolled pH. In the uncontrolled-pH treatment, the pH is allowed to drift during the test. In the controlled-pH treatment, the pH is maintained using the procedures described in Subsection 11.3.6.2.

The pH to be maintained in the controlled-pH treatment (or target pH) will depend on the objective of the test. If the objective of the WET test is to determine the toxicity of the effluent in the receiving water, the pH should be maintained at the pH of the receiving water (measured at the edge of the regulatory mixing zone). If the objective of the WET test is to determine the absolute toxicity of the effluent, the pH should be maintained at the pH of the sample upon completion of collection (as measured on an aliquot removed from the sample container).

11.3.6.1.1 During parallel testing, the pH must be measured in each treatment at the beginning (i.e., initial pH) and end (i.e., final pH) of each 24-h exposure period. For each treatment, the mean initial pH (e.g., averaging the initial pH measured each day for a given treatment) and the mean final pH (e.g., averaging the final pH measured each day for a given treatment) must be reported. pH measurements taken during the test must confirm that pH was effectively maintained at the target pH in the controlled-pH treatment. For each treatment, the mean initial pH and the mean final pH should be within ± 0.2 pH units of the target pH. Test procedures for conducting toxicity identification evaluations (TIEs) also recommend maintaining pH within ± 0.2 pH units in pH-controlled tests (USEPA, 1992).

11.3.6.1.2 Total ammonia also should be measured in each treatment at the outset of parallel testing. Total ammonia concentrations greater than 5 mg/L in the 100% effluent are an indicator that toxicity observed in the test may be due to ammonia (USEPA, 1992).

11.3.6.1.3 Results from both of the parallel tests (pH-controlled and uncontrolled treatments) must be reported to the regulatory authority. If the uncontrolled test meets test acceptability criteria and shows no toxicity at the permitted instream waste concentration, then the results from this test should be used for determining compliance. If the uncontrolled test shows toxicity at the permitted instream waste concentration, then the results from the pH-controlled test should be used for determining compliance, provided that this test meets test acceptability criteria and pH was properly controlled (see Subsection 11.3.6.1.1).

11.3.6.1.4 To confirm that toxicity observed in the uncontrolled test was artifactual and due to pH drift, the results of the controlled and uncontrolled-pH tests are compared. If toxicity is removed or reduced in the pH-controlled treatment, artifactual toxicity due to pH drift is confirmed for the sample. To demonstrate that a sample result of artifactual toxicity is representative of a given effluent, the regulatory authority may require additional information or additional parallel testing before pH control (as described in Subsection 11.3.6.2) is applied routinely to subsequent testing of the effluent.

11.3.6.2 The pH can be controlled with the addition of acids and bases and/or the use of a CO_2-controlled atmosphere over the test chambers. pH is adjusted with acids and bases by dropwise adding 1N NaOH or 1N HCl (see Subsection 8.8.8). The addition of acids and bases should be minimized to reduce the amount of additional ions (Na or Cl) added to the sample. pH is then controlled using the CO_2-controlled atmosphere technique. This may be accomplished by placing test solutions and test organisms in closed headspace test chambers, and then injecting a predetermined volume of CO_2 into the headspace of each test chamber (USEPA, 1991b; USEPA, 1992); or by placing test chambers in an atmosphere flushed with a predetermined mixture of CO_2 and air (USEPA, 1996). Prior experimentation will be needed to determine the appropriate CO_2/air ratio or the appropriate volume of CO_2 to inject. This volume will depend upon the sample pH, sample volume, container volume, and sample constituents. If more than 5% CO_2 is needed, adjust the solutions with acids (1N HCl) and then flush the headspace with no more than 5% CO_2 (USEPA, 1992). If the objective of the WET test is to determine the toxicity of the effluent in the receiving water, CO_2 is injected to maintain the test pH at the pH of the receiving water (measured at the edge of the regulatory mixing zone). If the objective of the WET test is to determine the absolute toxicity of the effluent, CO_2 is injected to maintain the test pH at the pH of the sample upon completion of collection. USEPA (1991b; 1992) and Mount and Mount (1992) provide techniques and guidance for controlling test pH using a CO_2-controlled atmosphere. In pH-controlled testing, control treatments must be subjected to all manipulations that sample treatments are subjected to. These manipulations must be shown to cause no lethal or sublethal effects on control organisms. In pH-controlled testing, the pH also must be measured in each treatment at the beginning and end of each 24-h exposure period to confirm that pH was effectively controlled at the target pH level.

11.4 SAFETY

11.4.1 See Section 3, Health and Safety.

11.5 APPARATUS AND EQUIPMENT

11.5.1 Fathead minnow and brine shrimp culture units -- see USEPA, 1985a and USEPA, 2002a. This test requires 240-360 larvae. It is preferable to obtain larvae from an in-house fathead minnow culture unit. If it is not feasible to culture fish in-house, embryos or newly hatched larvae can be shipped in well oxygenated water in insulated containers.

11.5.2 Samplers -- automatic sampler, preferably with sample cooling capability, that can collect a 24-h composite sample of 5 L.

11.5.3 Sample containers -- for sample shipment and storage (see Section 8, Effluent and Receiving Water Sampling, Sample Handling, and Sample Preparation for Toxicity Tests).

11.5.4 Environmental chamber or equivalent facility with temperature control (25 ± 1°C).

11.5.5 Water purification system -- MILLIPORE MILLI-Q®, deionized water or equivalent (see Section 5, Facilities, Equipment, and Supplies).

11.5.6 Balance -- analytical, capable of accurately weighing to 0.00001 g.

11.5.7 Reference weights, Class S -- for checking performance of balance. Weights should bracket the expected weights of the weighing pans and the expected weights of the pans plus fish.

11.5.8 Test chambers -- four borosilicate glass or non-toxic disposable plastic test chambers are required for each concentration and control. Test chambers may be 1 L, 500 mL or 250 mL beakers, 500 mL plastic cups, or fabricated rectangular (0.3 cm thick) glass chambers, 15 cm x 7.5 cm x 7.5 cm. To avoid potential contamination from the air and excessive evaporation of test solutions during the test, the chambers should be covered with safety glass plates or sheet plastic (6 mm thick).

11.5.9 Volumetric flasks and graduated cylinders -- Class A, borosilicate glass or non-toxic plastic labware, 10-1000 mL for making test solutions. 5.10

11.5.10 Volumetric pipets -- Class A, 1-100 mL.

11.5.11 Serological pipets -- 1-10 mL, graduated.

11.5.12 Pipet bulbs and fillers -- PROPIPET®, or equivalent.

11.5.13 Droppers, and glass tubing with fire polished edges, 4 mm ID -- for transferring larvae.

11.5.14 Wash bottles -- for rinsing small glassware and instrument electrodes and probes.

11.5.15 Thermometers, glass or electronic, laboratory grade -- for measuring water temperatures.

11.5.16 Bulb-thermograph or electronic-chart type thermometers -- for continuously recording temperature.

11.5.17 Thermometers, National Bureau of Standards Certified (see USEPA Method 170.1, USEPA, 1979b) -- to calabrate laboratory themometers.

11.5.18 Meters, pH, DO, and specific conductivity -- for routine physical and chemical measurements.

11.5.19 Drying oven -- 50-105° C range for drying larvae.

11.6 **REAGENTS AND CONSUMABLE MATERIALS**

11.6.1 Sample containers -- for sample shipment and storage (see Section 8, Effluent and Receiving Water Sampling, Sample Handling, and Sample Preparation for Toxicity Tests).

11.6.2 Data sheets (one set per test) -- for recording data.

11.6.3 Vials, marked -- 24 per test, containing 4% formalin or 70% ethanol to preserve larvae (optional).

11.6.4 Weighing boats, aluminum -- 24 per test.

11.6.5 Tape, colored -- for labeling test chambers.

11.6.6 Markers, waterproof -- for marking containers, etc.

11.6.7 Reagents for hardness and alkalinity tests -- see USEPA Methods 130.2 and 310.1, USEPA, 1979b.

11.6.8 Buffers, pH 4, pH 7, and pH 10 (or as per instructions of instrument manufacturer) -- for instrument calibration (see USEPA Method 150.1, USEPA, 1979b).

11.6.9 Specific conductivity standards -- see USEPA Method 120.1, USEPA, 1979b.

11.6.10 Membranes and filling solutions for DO probe (see USEPA Method 360.1, USEPA, 1979b), or reagents -- for modified Winkler analysis.

11.6.11 Laboratory quality control samples and standards -- for calibration of the above methods.

11.6.12 Reference toxicant solutions (see Section 4, Quality Assurance).

11.6.13 Ethanol (70%) or formalin (4%) -- for use as a preservative for the fish larvae.

11.6.14 Reagent water -- defined as distilled or deionized water that does not contain substances which are toxic to the test organisms (see Section 5, Facilities, Equipment, and Supplies).

11.6.15 Effluent, receiving water, and dilution water -- see Section 7, Dilution Water; and Section 8, Effluent and Receiving Water Sampling, Sample Handling, and Sample Preparation for Toxicity Tests.

11.6.16 Brine Shrimp, *Artemia*, Nauplii -- for feeding cultures and test organisms

11.6.16.1 Newly-hatched *Artemia* nauplii are used as food (see USEPA, 2002a) for fathead minnow, *Pimephales promelas*, larvae in toxicity tests and frozen brine shrimp and flake food are used in the maintenance of continuous stock cultures. Although there are many commercial sources of brine shrimp cysts, the Brazilian or Colombian strains are currently preferred because the supplies examined have had low concentrations of chemical residues and produce nauplii of suitably small size.

11.6.16.2 Each new batch of brine shrimp, *Artemia*, cysts must be evaluated for size (Vanhaecke and Sorgeloos, 1980, and Vanhaecke et al., 1980) and nutritional suitability (see Leger et al., 1985; Leger et al., 1986) against known suitable reference cysts by performing a side by side larval growth test using the "new" and "reference" cysts. The "reference" cysts used in the suitability test may be a previously tested and acceptable batch of cysts. A

sample of newly-hatched *Artemia* nauplii from each new batch of cysts should be chemically analyzed. The *Artemia* cysts should not be used if the concentration of total organochlorine exceeds 0.15 µg/g wet weight or the total concentration of organochlorine pesticides plus PCBs exceeds 0.30 µg/g wet weight. (For analytical methods see USEPA, 1982).

11.6.16.3 *Artemia* nauplii are obtained as follows:

1. Add 1 L of seawater, or a solution prepared by adding 35.0 g uniodized salt (NaCl) or artificial sea salts to 1 L deionized water, to a 2-L separatory funnel, or equivalent.
2. Add 10 mL *Artemia* cysts to the separatory funnel and aerate for 24-h at 27°C. (Hatching time varies with incubation temperature and the geographic strain of *Artemia* used) (see USEPA, 1991b; USEPA, 2002a and ASTM, 1993).
3. After 24 h, cut off the air supply in the separatory funnel. *Artemia* nauplii are phototactic, and will concentrate at the bottom of the funnel if it is covered for 5-10 min. To prevent mortality, do not leave the concentrated nauplii at the bottom of the funnel more than 10 min without aeration.
4. Drain the nauplii into a beaker or funnel fitted with a ≤ 150 µm Nitex® or stainless steel screen, and rinse with deionized water, or equivalent, before use.

11.6.16.4 Testing *Artemia* nauplii as food for toxicity test organisms.

11.6.16.4.1 The primary criterion for acceptability of each new supply of brine shrimp cysts is the ability of the nauplii to support good survival and growth of the fathead minnow larvae (see Subsection 11.12). The larvae used to evaluate the suitability of the brine shrimp nauplii must be of the same geographical origin, species, and stage of development as those used routinely in the toxicity tests. Sufficient data to detect differences in survival and growth should be obtained by using three replicate test vessels, each containing a minimum of 15 larvae, for each type of food.

11.6.16.4.2 The feeding rate and frequency, test vessels, volume of control water, duration of the test, and age of the nauplii at the start of the test, should be the same as used for the routine toxicity tests.

11.6.16.4.3 Results of the brine shrimp nutrition assay, where there are only two treatments, can be evaluated statistically by use of a t test. The "new" food is acceptable if there are no statistically significant differences in the survival and growth of the larvae fed the two sources of nauplii.

11.6.17 TEST ORGANISMS, FATHEAD MINNOWS, *PIMEPHALES PROMELAS*

11.6.17.1 Newly hatched fish less than 24 h old should be used for the test. If organisms must be shipped to the testing site, fish up to 48 h old may be used, all hatched within a 24-h window.

11.6.17.2 If the fish are kept in a holding tank or container, most of the water should be siphoned off to concentrate the fish. The fish are then transferred one at a time randomly to the test chambers until each chamber contains ten fish. Alternately, fish may be placed one or two at a time into small beakers or plastic containers until they each contain five fish. Three (minimum of two) of these beakers/plastic containers are then assigned to randomly-arranged control and exposure chambers.

11.6.17.2.1 The fish are transferred directly to the test vessels or intermediate beakers/plastic containers, using a large-bore, fire-polished glass tube (6 mm to 9 mm I.D. X 30 cm long) equipped with a rubber bulb, or a large volumetric pipet with tip removed and fitted with a safety type bulb filler. The glass or plastic containers should only contain a small volume of dilution water.

11.6.17.2.2 It is important to note that larvae should not be handled with a dip net. Dipping small fish with a net may result in damage to the fish and cause mortality.

11.6.17.3 The test is conducted with a minimum of four test chambers at each toxicant concentration and control. Fifteen (minimum of ten) embryos are placed in each replicate test chamber. Thus 60 (minimum of 40) fish are exposed at each test concentration.

11.6.17.4 Sources of organisms

11.6.17.4.1 Fathead minnows, *Pimephales promelas*, may be obtained from commercial biological supply houses. Fish obtained from outside sources for use as brood stock or in toxicity tests may not always be of suitable age and quality. Fish provided by supply houses should be guaranteed to be of (1) the correct species, (2) disease free, (3) in the requested age range, and (4) in good condition. This can be done by providing the record of the date on which the eggs were laid and hatched, and information on the sensitivity of contemporary fish to reference toxicants.

11.6.17.5 Inhouse Sources of Fathead Minnows, *Pimephales promelas*

11.6.17.5.1 Problems in obtaining suitable fish from outside laboratories can be avoided by developing an inhouse laboratory culture facility. Fathead minnows, *Pimephales promelas*, can be easily cultured in the laboratory from eggs to adults in static, recirculating, or flow-through systems. The larvae, juveniles, and adult fish should be kept in 60 L (15 gal) or 76 L (20 gal) rearing tanks supplied with reconstituted water, dechlorinated tap water, or natural water. The water should be analyzed for toxic metals and organics quarterly (see Section 4, Quality Assurance).

11.6.17.5.1.1 If a static or recirculating system is used, it is necessary to equip each tank with an outside activated carbon filter system, similar to those sold for tropical fish hobbyists (or one large activated carbon filter system for a series of tanks) to prevent the accumulation of toxic metabolic wastes (principally nitrite and ammonia) in the water.

11.6.17.5.2 Flow-through systems require large volumes of water and may not be feasible in some laboratories. The culture tanks should be shielded from extraneous disturbances using opaque curtains, and should be isolated from toxicity testing activities to prevent contamination.

11.6.17.5.3 To avoid the possibility of inbreeding of the inhouse brood stock, fish from an outside source should be introduced yearly into the culture unit.

11.6.17.5.4 Dissolved oxygen -- The DO concentration in the culture tanks should be maintained near saturation, using gentle aeration with 15 cm air stones if necessary. Brungs (1971), in a carefully controlled long-term study, found that the growth of fathead minnows was reduced significantly at all dissolved oxygen concentrations below 7.9 mg/L. Soderberg (1982) presented an analytical approach to the re-aeration of flowing water for culture systems.

11.6.17.5.5 Culture Maintenance

11.6.17.5.5.1 Adequate procedures for culture maintenance must be followed to avoid poor water quality in the culture system. The spawning and brood stock culture tanks should be kept free of debris (excess food, detritus, waste, etc.) by siphoning the accumulated materials (such as dead brine shrimp nauplii or cysts) from the bottom of the tanks daily with a glass siphon tube attached to a plastic hose leading to the floor drain. The tanks are more thoroughly cleaned as required. Algae, mostly diatoms and green algae, growing on the glass of the spawning tanks are left in place, except for the front of the tank, which is kept clean for observation. To avoid excessive build-up of algal growth, the walls of the tanks are periodically scraped. The larval culture tanks are cleaned once or twice a week to reduce the mass of fungus growing on the bottom of the tank.

11.6.17.5.5.2 Activated charcoal and floss in the tank filtration systems should be changed weekly, or more often if needed. Culture water may be maintained by preparation of reconstituted water or use of dechlorinated tap water. Distilled or deionized water is added as needed to compensate for evaporation.

11.6.17.5.5.3 Before new fish are placed in tanks, salt deposits are removed by scraping or with 5% acid solution, the tanks are washed with detergent, sterilized with a hypochlorite solution, and rinsed well with hot tap water and then with laboratory water.

11.6.17.5.6 Obtaining Embryos for Toxicity Tests

11.6.17.5.6.1 Embryos can be shipped to the laboratory from an outside source or obtained from adults held in the laboratory as described below.

11.6.17.5.6.2 For breeding tanks, it is convenient to use 60 L (15 gal) or 76 L (20 gal) aquaria. The spawning unit is designed to simulate conditions in nature conducive to spawning, such as water temperature and photoperiod. Spawning tanks must be held at a temperature of 25 ± 2°C. Each aquarium is equipped with a heater, if necessary, a continuous filtering unit, and spawning substrates. The photoperiod for the culture system should be maintained at 16 h light and 8 h darkness. For the spawning tanks, this photoperiod must be rigidly controlled. A convenient photoperiod is 5:00 AM to 9:00 PM. Fluorescent lights should be suspended about 60 cm above the surface of the water in the brood and larval tanks. Both DURATEST® and cool-white fluorescent lamps have been used, and produce similar results. An illumination level of 50 to 100 ft-c is adequate.

11.6.17.5.6.3 To simulate the natural spawning environment, it is necessary to provide substrates (nesting territories) upon which the eggs can be deposited and fertilized, and which are defended and cared for by the males. The recommended spawning substrates consist of inverted half-cylinders, 7.6 cm × 7.6 cm (3 in × 3 in) of Schedule 40 PVC pipe. The substrates should be placed equi-distant from each other on the bottom of the tanks.

11.6.17.5.6.4 To establish a breeding unit, 15-20 pre-spawning adults six to eight months old are taken from a "holding" or culture tank and placed in a 76-L spawning tank. At this point, it is not possible to distinguish the sexes. However, after less than a week in the spawning tank, the breeding males will develop their distinct coloration and territorial behavior, and spawning will begin. As the breeding males are identified, all but two are removed, providing a final ratio of 5-6 females per male. The excess spawning substrates are used as shelter by the females.

11.6.17.5.6.5 Sexing of the fish to ensure a correct female/male ratio in each tank can be a problem. However, the task usually becomes easier as experience is gained (Flickinger, 1966). Sexually mature females usually have large bellies and a tapered snout. The sexually mature males are usually distinguished by their larger overall size, dark vertical color bands, and the spongy nuptial tubercles on the snout. Unless the males exhibit these secondary breeding characteristics, no reliable method has been found to distinguish them from females. However, using the coloration of the males and the presence of enlarged urogenital structures and other characteristics of the females, the correct selection of the sexes can usually be achieved by trial and error.

11.6.17.5.6.6 Sexually immature males are usually recognized by their aggressive behavior and partial banding. These undeveloped males must be removed from the spawning tanks because they will eat the eggs and constantly harass the mature males, tiring them and reducing the fecundity of the breeding unit. Therefore, the fish in the spawning tanks must be carefully checked periodically for extra males.

11.6.17.5.6.7 A breeding unit should remain in their spawning tank about four months. Thus, each brood tank or unit is stocked with new spawners about three times a year. However, the restocking process is rotated so that at any one time the spawning tanks contain different age groups of brood fish.

11.6.17.5.6.8 Fathead minnows spawn mostly in the early morning hours. They should not be disturbed except for a morning feeding (8:00 AM) and daily examination of substrates for eggs in late morning or early afternoon. In nature, the male protects, cleans, and aerates the eggs until they hatch. In the laboratory, however, it is necessary to remove the eggs from the tanks to prevent them from being eaten by the adults, for ease of handling, for purposes of recording embryo count and hatchability, and for the use of the newly hatched young fish for toxicity tests.

11.6.17.5.6.9 Daily, beginning six to eight hours after the lights are turned on (11:00 AM - 1:00 PM), the substrates in the spawning tanks are each lifted carefully and inspected for embryos. Substrates without embryos are immediately returned to the spawning tank. Those with embryos are immersed in clean water in a collecting tray, and replaced with a clean substrate. A daily record is maintained of each spawning site and the estimated number of embryos on the substrate.

11.6.17.5.6.10 Three different methods are described for embryo incubation.

1. Incubation of Embryos on the Substrates: Several (2-4) substrates are placed on end in a circular pattern (with the embryos on the innerside) in 10 cm of water in a tray. The tray is then placed in a constant temperature water bath, and the embryos are aerated with a 2.5 cm airstone placed in the center of the circle. The embryos are examined daily, and the dead and fungused embryos are counted, recorded, and removed with forceps. At an incubation temperature of 25°C, 50% hatch occurs in five days. At 22°C embryos incubated on aerated tiles require 7 days for 50% hatch.

2. Incubation of Embryos in a Separatory Funnel: The embryos are removed from the substrates with a rolling action of the index finger ("rolled off") (Gast and Brungs, 1973), their total volume is measured, and the number of embryos is calculated using a conversion factor of approximately 430 embryos/mL. The embryos are incubated in about 1.5 L of water in a 2 L separatory funnel maintained in a water bath. The embryos are stirred in the separatory funnel by bubbling air from the tip of a plastic micro-pipette placed at the bottom, inside the separatory funnel. During the first two days, the embryos are taken from the funnel daily, those that are dead and fungused are removed, and those that are alive are returned to the separatory funnel in clean water. The embryos hatch in four days at a temperature of 25°C. However, usually on day three the eyed embryos are removed from the separatory funnel and placed in water in a plastic tray and gently aerated with an air stone. Using this method, the embryos hatch in five days. Hatching time is greatly influenced by the amount of agitation of the embryos and the incubation temperature. If on day three the embryos are transferred from the separatory funnel to a static, unaerated container, a 50% hatch will occur in six days (instead of five) and a 100% hatch will occur in seven days. If the culture system is operated at 22°C, embryos incubated on aerated tiles require seven days for 50% hatch.

3. Incubation in Embryo Incubation Cups: The embryos are "rolled off" the substrates, and the total number is estimated by determining the volume. The embryos are then placed in incubation cups attached to a rocker arm assembly (Mount, 1968). Both flow-through and static renewal incubation have been used. On day one, the embryos are removed from the cups and those that are dead and fungused are removed. After day one only dead embryos are removed from the cups. During the incubation period, the eggs are examined daily for viability and fungal growth, until they hatch. Unfertilized eggs, and eggs that have become infected by fungus, should be removed with forceps using a table top magnifier-illuminator. Non-viable eggs become milky and opaque, and are easily recognized. The non-viable eggs are very susceptible to fungal infection, which may then spread throughout the egg mass. Removal of fungus should be done quickly, and the substrates should be returned to the incubation tanks as rapidly as possible so that the good eggs are not damaged by desiccation. Hatching takes four to five days at an optimal temperature of 25°C. Hatching can be delayed several (two to four) days by incubating at lower temperatures. A large plastic tank receiving recirculating water from a temperature control unit, can be used as a water bath for incubation of embryos.

11.6.17.5.6.11 Newly-hatched larvae are transferred daily from the egg incubation apparatus to small rearing tanks, using a large bore pipette, until the hatch is complete. New rearing tanks are set up on a daily basis to separate fish by age group. Approximately 1500 newly hatched larvae are placed in a 60-L (15 gal) or 76-L (20 gal) all-glass aquarium for 30 days. A density of 150 fry per liter is suitable for the first four weeks. The water temperature in the rearing tanks is allowed to follow ambient laboratory temperatures of 20-25°C, but sudden, extreme variations in temperature must be avoided.

11.6.17.5.7 Food and Feeding

11.6.17.5.7.1 The amount of food and feeding schedule affects both growth and egg production. The spawning fish and pre-spawners in holding tanks usually are fed all the adult frozen brine shrimp and tropical fish flake food or dry commercial fish food (No. l or No. 2 granules) that they can eat (*ad libitum*) at the beginning of the work day and in the late afternoon (8:00 AM and 4:00 PM). The fish are fed twice a day (twice a day with dry food and once a day with adult shrimp) during the week and once a day on weekends.

11.6.17.5.7.2 Fathead minnow larvae are fed freshly-hatched brine shrimp (*Artemia*) nauplii twice daily until they are four weeks old. Utilization of older (larger) brine shrimp nauplii may result in starvation of the young fish because they are unable to ingest the larger food organisms (see Subsection 11.6.16 or USEPA, 2002a for instructions on the preparation of brine shrimp nauplii).

11.6.17.5.7.3 Fish older than four weeks are fed frozen brine shrimp and commercial fish starter (#l and #2), which is ground fish meal enriched with vitamins. As the fish grow, larger pellet sizes are used, as appropriate. (Starter, No. 1 and N. 2 granules, U.S. Fish and Wildlife Service Formulation Specification Diet SD9-30). Newly hatched brine shrimp nauplii, and frozen adult brine shrimp are fed to the fish cultures in volumes based on age, size, and number of fish in the tanks.

11.6.17.5.7.4 Fish in the larval tanks (from hatch to 30 days old) are fed commercial starter fish food at the beginning and end of the work day, and newly hatched brine shrimp nauplii (from the brine shrimp culture unit) once a day, usually mid-morning and mid-afternoon.

11.6.17.5.7.5 Attempts should be made to avoid introducing *Artemia* cysts and empty shells when the brine shrimp nauplii are fed to the fish larvae. Some of the mortality of the larval fish observed in cultures could be caused from the ingestion of these materials.

11.6.17.5.8 Disease Control

11.6.17.5.8.1 Fish are observed daily for abnormal appearance or behavior. Bacterial or fungal infections are the most common diseases encountered. However, if normal precautions are taken, disease outbreaks will rarely, if ever, occur. Hoffman and Mitchell (1980) have put together a list of some chemicals that have been used commonly for fish diseases and pests.

11.6.17.5.8.2 In aquatic culture systems where filtration is utilized, the application of certain antibacterial agents should be used with caution. A treatment with a single dose of antibacterial drugs can interrupt nitrate reduction and stop nitrification for various periods of time, resulting in changes in pH, and in ammonia, nitrite and nitrate concentrations (Collins et al., 1976). These changes could cause the death of the culture organisms.

11.6.17.5.8.3 Do not transfer equipment from one tank to another without first disinfecting tanks and nets. If an outbreak of disease occurs, any equipment, such as nets, airlines, tanks, etc., which has been exposed to diseased fish should be disinfected with sodium hypochlorite. Also to avoid the contamination of cultures or spread of disease, each time nets are used to remove live or dead fish from tanks, they are first sterilized with sodium hypochlorite or formalin, and rinsed in hot tap water. Before a new lot of fish is transferred to culture tanks, the tanks are cleaned and sterilized as described above.

11.6.17.5.8.4 It is recommended that chronic toxicity tests be performed monthly with a reference toxicant. Newly hatched fathead minnow larvae less than 24 h old are used to monitor the chronic toxicity of the reference toxicant to the test fish produced by the culture unit (see Section 4, Quality Assurance).

11.6.17.5.9 Record Keeping

11.6.17.5.9.1 Records, kept in a bound notebook, include: (l) type of food and time of feeding for all fish tanks; (2) time of examination of the tiles for embryos, the estimated number of embryos on the tile, and the tile position number; (3) estimated number of dead embryos and embryos with fungus observed during the embryonic development stages; (4) source of all fish; (5) daily observation of the condition and behavior of the fish; and (6) dates and results of reference toxicant tests performed (see Section 4, Quality Assurance).

11.7 EFFLUENT AND RECEIVING WATER COLLECTION, PRESERVATION, AND STORAGE

11.7.1 See Section 8, Effluent and Receiving Water Sampling, Sample Handling, and Sample Preparation for Toxicity Tests.

11.8 CALIBRATION AND STANDARDIZATION

11.8.1 See Section 4, Quality Assurance.

11.9 QUALITY CONTROL

11.9.1 See Section 4, Quality Assurance.

11.10 TEST PROCEDURES

11.10.1 TEST SOLUTIONS

11.10.1.1 Receiving Waters

11.10.1.1.1 The sampling point is determined by the objectives of the test. Receiving water toxicity is determined with samples used directly as collected or after samples are passed through a 60 µm NITEX® filter and compared without dilution, against a control. Using four replicate chambers per test, each containing 250 mL, and 400 mL for chemical analyses, would require approximately 1.5 L or more of sample per test per day.

11.10.1.2 Effluents

11.10.1.2.1 The selection of the effluent test concentrations should be based on the objectives of the study. A dilution factor of 0.5 is commonly used. A dilution factor of 0.5 provides precision of ± 100%, and testing of concentrations between 6.25% and 100% effluent using only five effluent concentrations (6.25%, 12.5%, 25%, 50%, and 100%). Test precision shows little improvement as the dilution factor is increased beyond 0.5, and declines rapidly if a smaller dilution factor is used. **Therefore, USEPA recommends the use of the ≥ 0.5 dilution factor.**

11.10.1.2.2 If the effluent is known or suspected to be highly toxic, a lower range of effluent concentrations should be used (such as 25%, 12.5%, 6.25%, 3.12%, and 1.56%). If a high rate of mortality is observed during the first 1 to 2 h of the test, additional dilutions should be added at the lower range of effluent concentrations.

11.10.1.2.3 The volume of effluent required for daily renewal of four replicates per concentration, each containing 250 mL of test solution, is approximately 2.5 L. Sufficient test solution (approximately 1500 mL) is prepared at each effluent concentration to provide 400 mL additional volume for chemical analyses at the high, medium, and low test concentrations. If the sample is used for more than one daily renewal of test solutions, the volume must be increased proportionately.

11.10.1.2.4 Tests should begin as soon as possible, preferably within 24 h of sample collection. The maximum holding time following retrieval of the sample from the sampling device should not exceed 36 h for off-site toxicity

tests unless permission is granted by the permitting authority. In no case should the sample be used for the first time in a test more than 72 h after sample collection (see Section 8, Effluent and Receiving Water Sampling, Sample Handling, and Sample Preparation for Toxicity Tests).

11.10.1.2.5 Just prior to test initiation (approximately 1 h) the temperature of sufficient quantity of the sample to make the test solutions should be adjusted to the test temperature and maintained at that temperature during the addition of dilution water.

11.10.1.2.6 The DO of the test solutions should be checked prior to the test initiation. If any of the solutions are supersaturated with oxygen, all of the solutions and the control should be gently aerated. If any solution has a DO concentration below 4.0 mg/L, all of the solutions and the control must be gently aerated.

11.10.1.3 Dilution Water

11.10.1.3.1 Dilution water may be uncontaminated receiving water, a standard synthetic (reconstituted) water, or some other uncontaminated natural water (see Section 7, Dilution Water).

11.10.2 START OF THE TEST

11.10.2.1 Label the test chambers with a marking pen. Use of color-coded tape to identify each treatment and replicate is helpful. A minimum of five effluent concentrations and a control are used for each effluent test. Each treatment (including the control) must have a minimum of four replicates.

11.10.2.2 Tests performed in laboratories that have in-house fathead minnow breeding cultures should use larvae less than 24 h old. When eggs or larvae must be shipped to the test site from a remote location, it may be necessary to use larvae older than 24 h because of the difficulty in coordinating test organism shipments with field operations. However, in the latter case, the larvae must not be more than 48 h old at the start of the test and must all be within 24 h of the same age.

11.10.2.3 Randomize the position of test chambers at the beginning of the test (see Appendix A). Maintain the chambers in this configuration throughout the test. Preparation of a position chart may be helpful.

11.10.2.4 The larvae are pooled and placed one or two at a time into each randomly arranged test chamber or intermediate container in sequential order, until each chamber contains 15 (minimum of 10) larvae, for a total of 60 larvae (minimum of 40) for each concentration (see Appendix A). The test organisms should come from a pool of larvae consisting of at least three separate spawnings. The amount of water added to the chambers when transferring the larvae should be kept to a minimum to avoid unnecessary dilution of the test concentrations.

11.10.2.4.1 The chambers may be placed on a light table to facilitate counting the larvae.

11.10.3 LIGHT, PHOTOPERIOD, AND TEMPERATURE

11.10.3.1 The light quality and intensity should be at ambient laboratory levels, which is approximately 10-20 $\mu E/m^2/s$, or 50 to 100 foot candles (ft-c), with a photoperiod of 16 h of light and 8 h of darkness. The water temperature in the test chambers should be maintained at 25 ± 1°C.

11.10.4 DISSOLVED OXYGEN (DO) CONCENTRATION

11.10.4.1 Aeration may affect the toxicity of effluents and should be used only as a last resort to maintain satisfactory DO concentrations. The DO concentrations should be measured in the new solutions at the start of the test (Day 0) and before daily renewal of the test solutions on subsequent days. The DO concentrations should not fall below 4.0 mg/L (see Section 8, Effluent and Receiving Water Sampling, Sample Handling, and Sample Preparation for Toxicity Tests). If it is necessary to aerate, all concentrations and the control should be aerated.

The aeration rate should not exceed 100 bubbles/min, using a pipet with an orifice of approximately 1.5 mm, such as a 1-mL, KIMAX® serological pipet, or equivalent. Care should be taken to ensure that turbulence resulting from aeration does not cause undue physical stress to the fish.

11.10.5 FEEDING

11.10.5.1 The fish in each test chamber are fed 0.1 g (approximately 700 to 1000) of a concentrated suspension of newly hatched (less than 24-h old) brine shrimp nauplii three times daily at 4-h intervals or, as a minimum, 0.15 g are fed twice daily at an interval of 6 h. Equal amounts of nauplii must be added to each replicate chamber to reduce variability in larval weight. Sufficient numbers of nauplii should be provided to assure that some remain alive in the test chambers for several hours, but not in excessive amounts which will result in depletion of DO below acceptable levels (below 4.0 mg/L).

11.10.5.2 The feeding schedule will depend on when the test solutions are renewed. If the test is initiated after 12:00 PM, the larvae may be fed only once the first day. On following days, the larvae normally would be fed at the beginning of the work day, at least 2 h before test solution renewal, and at the end of the work day, after test solution renewal. However, if the test solutions are changed at the beginning of the work day, the first feeding would be after test solution renewal in the morning, and the remaining feeding(s) would be at the appropriate intervals. The larvae are not fed during the final 12 h of the test.

11.10.5.3 The nauplii should be rinsed with freshwater to remove salinity before use (see USEPA, 2002a). At feeding time pipette about 5 mL (5 g) of concentrated newly hatched brine shrimp nauplii into a 120 mesh nylon net or plastic cup with nylon mesh bottom. Slowly run freshwater through the net or rinse by immersing the cup in a container of fresh water several times. Resuspend the brine shrimp in 10 mL of fresh water in a 30 mL beaker or simply set the cup of washed brine shrimp in ¼ inch of fresh water so that the cup contains about 10 mL of water. Allow the container to set for a minute or two to allow dead nauplii and empty cysts to settle or float to the surface before collecting the brine shrimp from just below the surface in a pipette for feeding. Distribute 2 drops (0.1 g) of the brine shrimp to each test chamber. If the survival rate in any test chamber falls below 50%, reduce the feeding in that chamber to 1 drop of brine shrimp at each subsequent feeding.

11.10.6 OBSERVATIONS DURING THE TEST

11.10.6.1 Routine Chemical and Physical Determinations

11.10.6.1.1 DO is measured at the beginning and end of each 24-h exposure period in at least one test chamber at each test concentration and in the control.

11.10.6.1.2 Temperature and pH are measured at the end of each 24-h exposure period in at least one test chamber at each test concentration and in the control. Temperature should also be monitored continuously or observed and recorded daily for at least two locations in the environmental control system or the samples. Temperature should be measured in a sufficient number of test vessels at least at the end of the test to determine the temperature variation in the environmental chamber.

11.10.6.1.3 The pH is measured in the effluent sample each day before new test solutions are made.

11.10.6.1.4 Conductivity, alkalinity and hardness are measured in each new sample (100% effluent or receiving water) and in the control.

11.10.6.1.5 Record all the measurements on the data sheet (Figure 1)

11.10.6.2 Routine Biological Observations

11.10.6.2.1 The number of live larvae in each test chamber are recorded daily (Figure 2) , and the dead larvae are discarded.

11.10.6.2.2 Protect the larvae from unnecessary disturbance during the test by carrying out the daily test observations, solution renewals, and removal of dead larvae, carefully. Make sure the larvae remain immersed during the performance of these operations.

Discharger:_____ Test Dates:_____

Location:_____ Analyst:_____

Conc:	Day 1	2	3	4	5	6	7	Remarks
Temp.								
D.O. Initial								
Final								
pH Initial								
Final								
Alkalinity								
Hardness								
Conductivity								
Chlorine								

Conc:	Day 1	2	3	4	5	6	7	Remarks
Temp.								
D.O. Initial								
Final								
pH Initial								
Final								
Alkalinity								
Hardness								
Conductivity								
Chlorine								

Conc:	Day 1	2	3	4	5	6	7	Remarks
Temp.								
D.O. Initial								
Final								
pH Initial								
Final								
Alkalinity								
Hardness								
Conductivity								
Chlorine								

Figure 1. Data form for the fathead minnow, *Pimephales promelas*, larval survival and growth test. Routine chemical and physical determinations.

Discharger:_____ Test Dates:_____

Location:_____ Analyst:_____

Conc:	Day 1	2	3	4	5	6	7	Remarks
Temp.								
D.O. Initial								
Final								
pH Initial								
Final								
Alkalinity								
Hardness								
Conductivity								
Chlorine								

Conc:	Day 1	2	3	4	5	6	7	Remarks
Temp.								
D.O. Initial								
Final								
pH Initial								
Final								
Alkalinity								
Hardness								
Conductivity								
Chlorine								

Conc:	Day 1	2	3	4	5	6	7	Remarks
Temp.								
D.O. Initial								
Final								
pH Initial								
Final								
Alkalinity								
Hardness								
Conductivity								
Chlorine								

Figure 1. Data form for the fathead minnow, *Pimephales promelas*, larval survival and growth test. Routine chemical and physical determinations (CONTINUED).

Discharger:_____ Test Dates:_____

Location:_____ Analyst:_____

No. Surviving Organisms

Conc:	Rep. No.	Day 1	2	3	4	5	6	7	Remarks
Control:									
Conc:									
Conc:									
Conc:									
Conc:									
Conc:									
Conc:									
Conc:									

Comments:

Figure 2. Survival data for the fathead minnow, *Pimephales promelas*, larval survival and growth test.

11.10.7 DAILY CLEANING OF TEST CHAMBERS

11.10.7.1 Before the daily renewal of test solutions, uneaten and dead *Artemia*, dead fish larvae, and other debris are removed from the bottom of the test chambers with a siphon hose. Alternately, a large pipet (50 mL) fitted with a rubber bulb can be used. Because of their small size during the first few days of the tests, larvae are easily drawn into the siphon tube or pipet when cleaning the test chambers. By placing the test chambers on a light box, inadvertent removal of larvae can be greatly reduced because they can be more easily seen. If the water siphoned from the test chambers is collected in a white plastic tray, the larvae caught up in the siphon can be retrieved and returned to the chambers. Any incidence of removal of live larvae from the test chambers during cleaning, and subsequent return to the chambers, should be noted in the records.

11.10.8 TEST SOLUTION RENEWAL

11.10.8.1 Freshly prepared solutions are used to renew the tests daily immediately after cleaning the test chambers. For on-site toxicity studies, fresh effluent or receiving water samples should be collected daily, and no more than 24 h should elapse between collection of the samples and their use in the tests (see Section 8, Effluent and Receiving Water Sampling, Sample Holding, and Sample Preparation for Toxicity Tests). For off-site tests, a minimum of three samples are collected, preferably on days one, three, and five. Maintain the samples in the refrigerator at 0-6ºC until used.

11.10.8.2 For test solution renewal, the water level in each chamber is lowered to a depth of 7 to 10 mm, which leaves 15 to 20% of the test solution. New test solution (250 mL) should be added slowly by pouring down the side of the test chamber to avoid excessive turbulence and possible injury to the larvae.

11.10.9 TERMINATION OF THE TEST

11.10.9.1 The test is terminated after seven days of exposure. At test termination, dead larvae are removed and discarded. The surviving larvae in each test chamber (replicate) are counted and immediately prepared as a group for dry weight determination, or are preserved as a group in 70% ethanol or 4% formalin. Preserved organisms are dried and weighed within 7 days. For safety, formalin should be used under a hood.

11.10.9.2 For immediate drying and weighing, place live larvae onto a 500 µm mesh screen in a large beaker to wash away debris that might contribute to the dry weight. Each group of larvae is rinsed with deionized water to remove food particles, transferred to a tared weighing boat that has been properly labeled, and dried at 60ºC, for 24 h or at 100ºC for a minimum of 6 h. Immediately upon removal from the drying oven, the weighing boats are placed in a dessicator until weighed, to prevent the absorption of moisture from the air. All weights should be measured to the nearest 0.01 mg and recorded on data sheets (Figure 3). Subtract tare weight to determine the dry weight of the larvae in each replicate. For each test chamber, divide the final dry weight by the number of original larvae in the test chamber to determine the average individual dry weight and record on the data sheet (Figure 3). For the controls, also calculate the mean weight per surviving fish in the test chamber to evaluate if weights met test acceptability criteria (See Section 11.11). Average weights should be expressed to the nearest 0.001 mg.

11.10.9.3 Prepare a summary table as illustrated in Figure 4.

11.11 **SUMMARY OF TEST CONDITIONS AND TEST ACCEPTABILITY CRITERIA**

11.11.1 A summary of test conditions and test acceptability criteria is presented in Table 1.

Discharge:_____ Test Date(s): _____ Drying Temperature (°C): _____
Location: _____ Weighing Date:_____ Drying Time (h): _____
Analyst: _____

Conc:	Rep. No.	A Wgt. of tare (mg)	B Dry wgt: tare and larvae (mg)	B-A Total dry wgt of larvae (mg)	C No. of original larvae (mg)	(B-A)/C Mean dry wgt of larvae (mg)	Remarks
Control							
Conc:							
Conc:							
Conc:							
Conc:							
Conc:							

Figure 3. Weight data for the fathead minnow, *Pimephales promelas*, larval survival and growth test. From USEPA (1989a).

Discharger: _____ Test Dates: _____

Location: _____ Analyst: _____

TREATMENT	CONTROL					
NO. LIVE LARVAE						
SURVIVAL (%)						
MEAN DRY WGT OF LARVAE (MG) ± SD						
TEMPERATURE RANGE (°C)						
DISSOLVED OXYGEN RANGE (MG/L)						
HARDNESS						
CONDUCTIVITY						

COMMENTS:

Figure 4. Summary data for the fathead minnow, *Pimephales promelas*, larval survival and growth test.

TABLE 1. SUMMARY OF TEST CONDITIONS AND TEST ACCEPTABILITY CRITERIA FOR FATHEAD MINNOW, *PIMEPHALES PROMELAS*, LARVAL SURVIVAL AND GROWTH TOXICITY TESTS WITH EFFLUENTS AND RECEIVING WATERS (TEST METHOD 1000.0)[1]

1.	Test type:	Static renewal (required)
2.	Temperature (°C):	25 ± 1°C (recommended) Test temperatures must not deviate (i.e., maximum minus minimum temperature) by more than 3°C during the test (required)
3.	Light quality:	Ambient laboratory illumination (recommended)
4.	Light intensity:	10-20 µE/m^2/s (50-100 ft-c)(ambient laboratory levels) (recommended)
5.	Photoperiod:	16 h light, 8 h darkness (recommended)
6.	Test chamber size:	500 mL (recommended minimum)
7.	Test solution volume:	250 mL (recommended minimum)
8.	Renewal of test solutions:	Daily (required)
9.	Age of test organisms:	Newly hatched larvae less than 24 h old. If shipped, not more than 48 h old, 24 h range in age (required)
10.	No. larvae per test chamber:	10 (recommended)
11.	No. replicate chambers per concentration:	4 (required minimum)
12.	No. larvae per concentration:	40 (required minimum)
13.	Source of food:	Newly hatched *Artemia* nauplii (less than 24 h old) (required)
14.	Feeding regime:	On days 0-6, feed 0.1 g newly hatched (less than 24-h old) brine shrimp nauplii three times daily at 4-h intervals or, as a minimum, 0.15 g twice daily at 6-h intervals (at the beginning of the work day prior to renewal, and at the end of the work day following renewal). Sufficient nauplii are added to provide an excess. (recommended)

[1] For the purposes of reviewing WET test data submitted under NPDES permits, each test condition listed above is identified as required or recommended (see Subsection 10.2 for more information on test review). Additional requirements may be provided in individual permits, such as specifying a given test condition where several options are given in the method.

TABLE 1. SUMMARY OF TEST CONDITIONS AND TEST ACCEPTABILITY CRITERIA FOR FATHEAD MINNOW, *PIMEPHALES PROMELAS*, LARVAL SURVIVAL AND GROWTH TOXICITY TESTS WITH EFFLUENTS AND RECEIVING WATERS (TEST METHOD 1000.0) (CONTINUED)

15.	Cleaning:	Siphon daily, immediately before test solution renewal (required)
16.	Aeration:	None, unless DO concentration falls below 4.0 mg/L. Rate should not exceed 100 bubbles/minimum (recommended)
17.	Dilution water:	Uncontaminated source of receiving or other natural water, synthetic water prepared using MILLIPORE MILLI-Q® or equivalent deionized water and reagent grade chemicals, or DMW (see Section 7, Dilution Water) (available options)
18.	Test concentrations:	Effluents: 5 and a control (required minimum) Receiving Water: 100% receiving water (or minimum of 5) and a control (recommended)
19.	Dilution factor:	Effluents: ≥ 0.5 (recommended) Receiving waters: None or ≥ 0.5 (recommended)
20.	Test duration:	7 days (required)
21.	Endpoints:	Survival and growth (weight) (required)
22.	Test acceptability criteria:	80% or greater survival in controls; average dry weight per surviving organism in control chambers equals or exceeds 0.25 mg (required)
23.	Sampling requirements:	For on-site tests, samples collected daily, and used within 24 h of the time they are removed from the sampling device; For off-site tests, a minimum of three samples (e.g., collected on days one, three and five) with a maximum holding time of 36 h before first use (see Section 8, Effluent and Receiving Water Sampling, Sample Handling, and Sample Preparation for Toxicity Tests, Subsection 8.5.4) (required)
24.	Sample volume required:	2.5 L/day (recommended)

11.12 ACCEPTABILITY OF TEST RESULTS

11.12.1 For the test results to be acceptable, survival in the controls must be at least 80%. The average dry weight per surviving control larvae at the end of the test must equal or exceed 0.25 mg.

11.13 DATA ANALYSIS

11.13.1 GENERAL

11.13.1.1 Tabulate and summarize the data. A sample set of survival and growth response data is shown in Table 2.

TABLE 2. SUMMARY OF SURVIVAL AND GROWTH DATA FOR FATHEAD MINNOW, *PIMEPHALES PROMELAS*, LARVAE EXPOSED TO A REFERENCE TOXICANT FOR SEVEN DAYS[1]

NaPCP Conc. (µg/L)	Proportion of Survival in Replicate Chambers A	B	C	D	Mean Prop. Surv	Avg Dry Wgt (mg) In Replicate Chambers A	B	C	D	Mean Dry Wgt (mg)
0	1.0	1.0	0.9	0.9	0.95	0.711	0.662	0.646	0.690	0.677
32	0.8	0.8	1.0	0.8	0.85	0.517	0.501	0.723	0.560	0.575
64	0.9	1.0	1.0	1.0	0.975	0.602	0.669	0.694	0.676	0.660
128	0.9	0.9	0.8	1.0	0.90	0.566	0.612	0.410	0.672	0.565
256	0.7	0.9	1.0	0.5	0.775	0.455	0.502	0.606	0.254	0.454
512	0.4	0.3	0.4	0.2	0.325	0.143	0.163	0.195	0.099	0.150

[1] Four replicates of 10 larvae each.

11.13.1.2 The endpoints of toxicity tests using the fathead minnow, *Pimephales promelas*, larvae are based on the adverse effects on survival and growth. The LC50, the IC25, and the IC50 are calculated using point estimation techniques (see Section 9, Chronic Toxicity Test Endpoints and Data Analysis). LOEC and NOEC values for survival and growth are obtained using a hypothesis testing approach such as Dunnett's Procedure (Dunnett, 1955) or Steel's Many-one Rank Test (Steel, 1959; Miller, 1981) (see Section 9). Separate analyses are performed for the estimation of the LOEC and NOEC endpoints and for the estimation of the LC50, IC25 and IC50. Concentrations at which there is no survival in any of the test chambers are excluded from the statistical analysis of the NOEC and LOEC for survival and growth, but included in the estimation of the LC50, IC25, and IC50. See the Appendices for examples of the manual computations, and examples of data input and program output.

11.13.1.3 The statistical tests described here must be used with a knowledge of the assumptions upon which the tests are contingent. Tests for normality and homogeneity of variance are included in Appendix B. The assistance of a statistician is recommended for analysts who are not proficient in statistics.

11.13.2 EXAMPLE OF ANALYSIS OF FATHEAD MINNOW, *PIMEPHALES PROMELAS*, SURVIVAL DATA

11.13.2.1 Formal statistical analysis of the survival data is outlined in Figures 5 and 6. The response used in the analysis is the proportion of animals surviving in each test or control chamber. Separate analyses are performed for the estimation of the NOEC and LOEC endpoints and for the estimation of the LC50, EC50, and IC endpoints. Concentrations at which there is no survival in any of the test chambers are excluded from statistical analysis of the NOEC and LOEC, but included in the estimation of the IC, EC, and LC endpoints.

11.13.2.2 For the case of equal numbers of replicates across all concentrations and the control, the evaluation of the NOEC and LOEC endpoints is made via a parametric test, Dunnett's Procedure, or a nonparametric test, Steel's Many-one Rank Test, on the arc sine square root transformed data. Underlying assumptions of Dunnett's Procedure, normality and homogeneity of variance, are formally tested. The test for normality is the Shapiro-Wilk's Test, and Bartlett's Test is used to test for homogeneity of variance. If either of these tests fails, the nonparametric test, Steel's Many-one Rank Test, is used to determine the NOEC and LOEC endpoints. If the assumptions of Dunnett's Procedure are met, the endpoints are estimated by the parametric procedure.

11.13.2.3 If unequal numbers of replicates occur among the concentration levels tested, there are parametric and nonparametric alternative analyses. The parametric analysis is a t test with the Bonferroni adjustment (see Appendix D). The Wilcoxon Rank Sum Test with the Bonferroni adjustment is the nonparametric alternative (see Appendix F).

11.13.2.4 Probit Analysis (Finney, 1971; see Appendix I) is used to estimate the concentration that causes a specified percent decrease in survival from the control. In this analysis, the total mortality data from all test replicates at a given concentration are combined. If the data do not fit the Probit analysis, the Spearman-Karber Method, the Trimmed Spearman-Karber Method, or the Graphical Method may be used (see Appendices I-L).

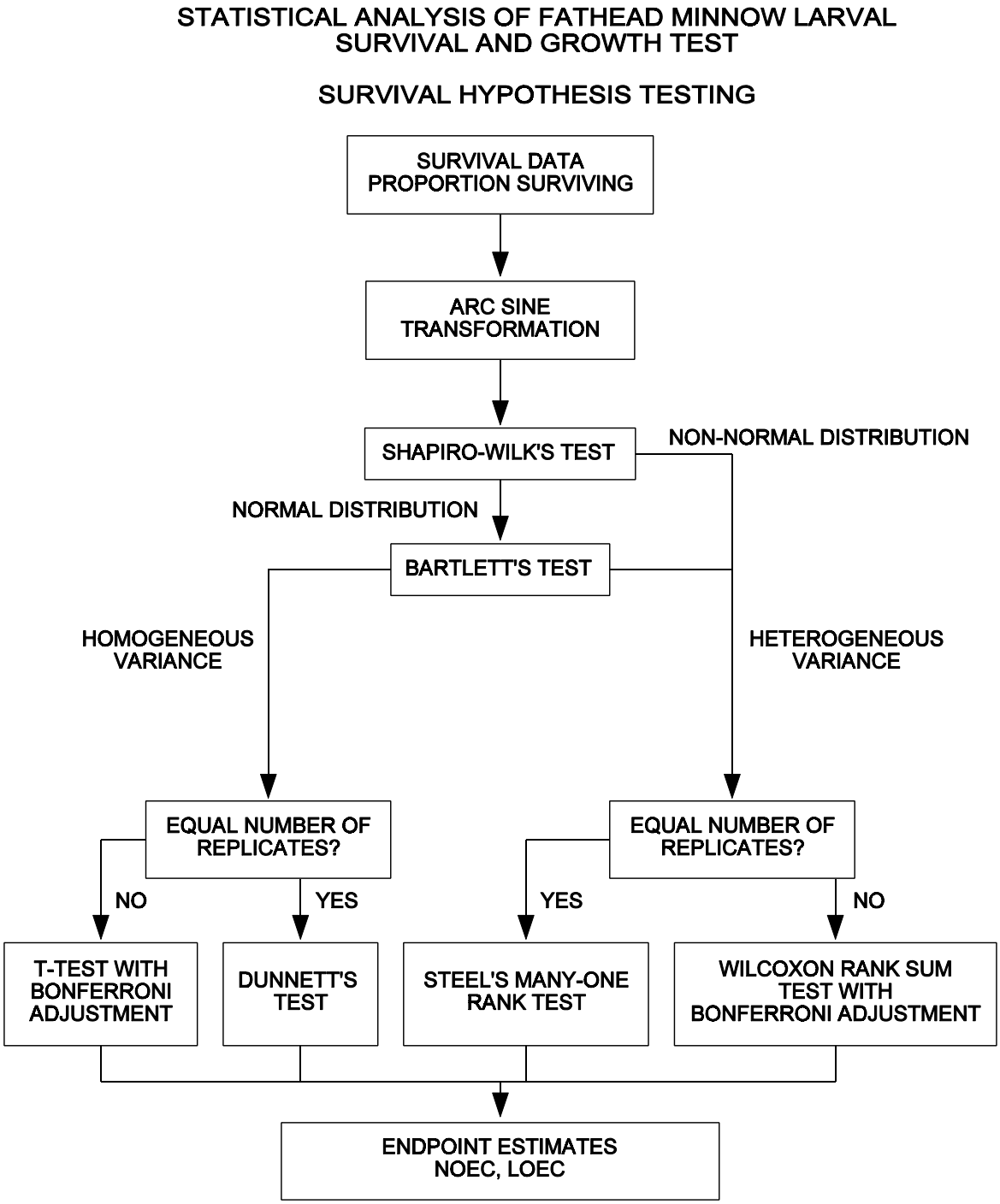

Figure 5. Flowchart for statistical analysis of the fathead minnow, *Pimephales promelas*, larval survival data by hypothesis testing.

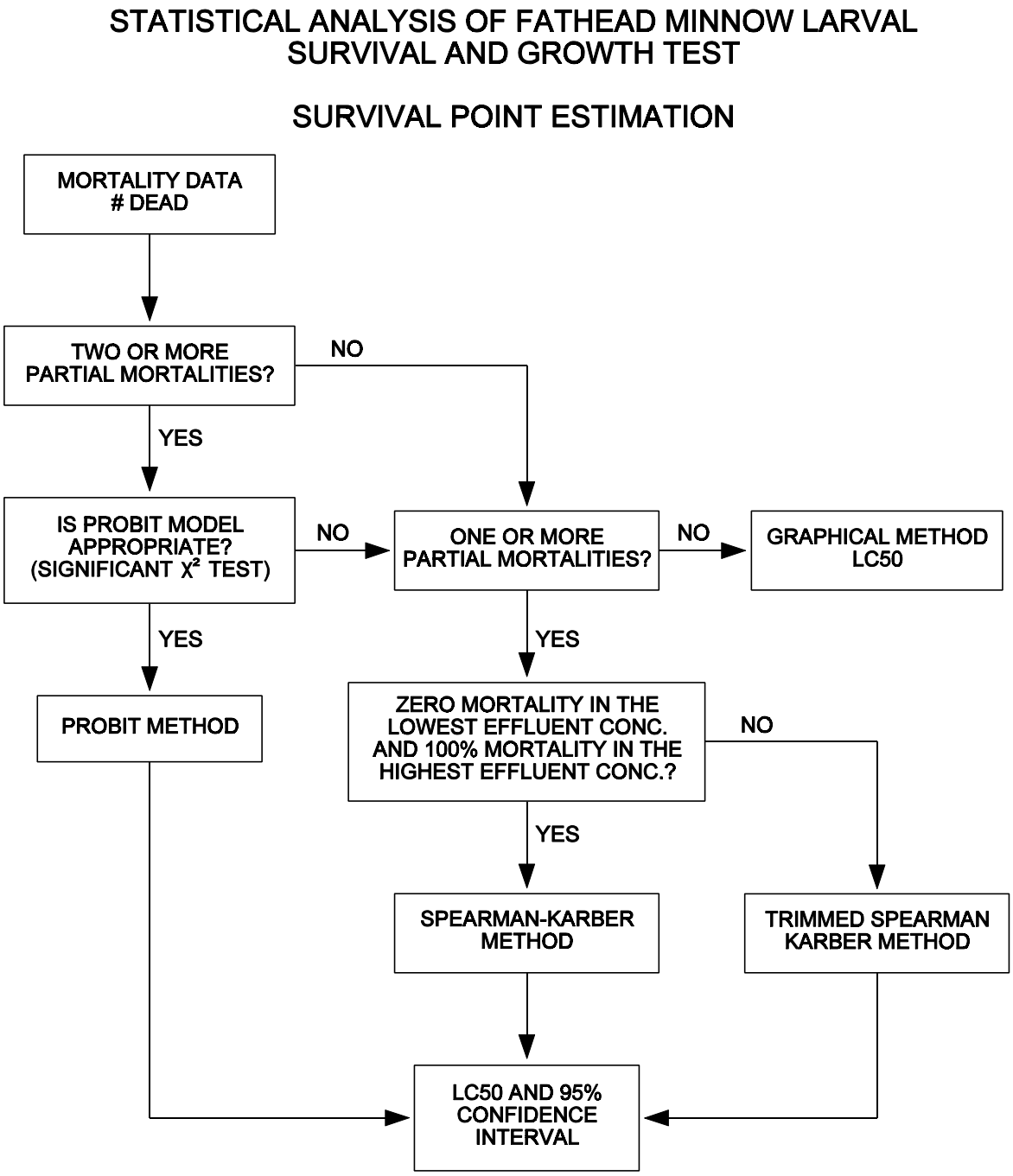

Figure 6. Flowchart for statistical analysis of the fathead minnow, *Pimephales promelas,* larval survival data by point estimation.

11.13.2.5 Example of Analysis of Survival Data

11.13.2.5.1 This example uses the survival data from the Fathead Minnow Larval Survival and Growth Test (Table 2). The proportion surviving in each replicate must first be transformed by the arc sine square root transformation procedure described in Appendix B. The raw and transformed data, means and variances of the transformed observations at each toxicant concentration and control are listed in Table 3. A plot of the survival proportions is provided in Figure 7.

TABLE 3. FATHEAD MINNOW, *PIMEPHALES PROMELAS*, SURVIVAL DATA

			NaPCP Concentration (µg/L)				
	Replicate	Control	32	64	128	256	512
RAW	A	1.0	0.8	0.9	0.9	0.7	0.4
	B	1.0	0.8	1.0	0.9	0.9	0.3
	C	0.9	1.0	1.0	0.8	1.0	0.4
	D	0.9	0.8	1.0	1.0	0.5	0.2
ARC SINE TRANS-FORMED	A	1.412	1.107	1.249	1.249	0.991	0.685
	B	1.412	1.107	1.412	1.249	1.249	0.580
	C	1.249	1.412	1.412	1.107	1.412	0.685
	D	1.249	1.107	1.412	1.412	0.785	0.464
Mean($\bar{Y}_i$)		1.330	1.183	1.371	1.254	1.109	0.604
S_i^2		0.0088	0.0232	0.0066	0.0155	0.0768	0.0111
i		1	2	3	4	5	6

11.13.2.6 Test for Normality

11.13.2.6.1 The first step of the test for normality is to center the observations by subtracting the mean of all observations within a concentration from each observation in that concentration. The centered observations are summarized in Table 4.

11.13.2.6.2 Calculate the denominator, D, of the statistic:

$$D = \sum_{i=1}^{n} (X_i - \bar{X})^2$$

Where: X_i = the ith centered observation

$\bar{X}$ = the overall mean of the centered observations

n = the total number of centered observations

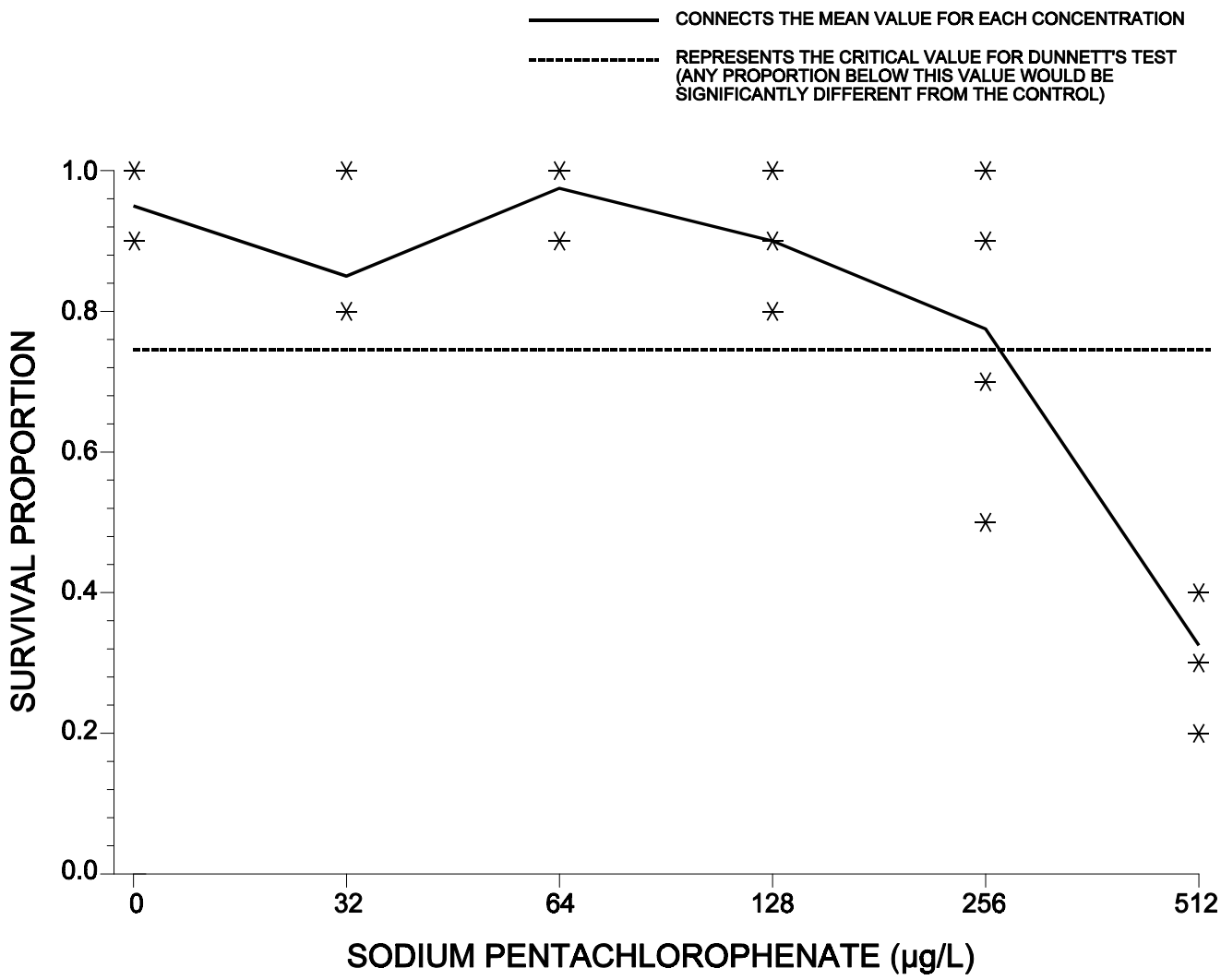

Figure 7. Plot of survival proportion data in Table 3.

TABLE 4. CENTERED OBSERVATIONS FOR SHAPIRO-WILK'S EXAMPLE

Replicate	Control	NaPCP Concentration (µg/L) 32	64	128	256	512
A	0.082	-0.076	-0.122	-0.005	-0.118	0.081
B	0.082	-0.076	0.041	-0.005	0.140	-0.024
C	-0.081	0.229	0.041	-0.147	0.303	0.081
D	-0.081	-0.076	0.041	0.158	-0.324	-0.140

11.13.2.6.3 For this set of data: n = 24

$$\bar{X} = \frac{1}{24}(0.000) = 0.000$$

D = 0.4265

11.13.2.6.4 Order the centered observations from smallest to largest

$$X^{(1)} \leq X^{(2)} \leq \ldots \leq X^{(n)}$$

where $X^{(i)}$ denotes the ith ordered observation. The ordered observations for this example are listed in Table 5.

TABLE 5. ORDERED CENTERED OBSERVATIONS FOR THE SHAPIRO-WILK'S EXAMPLE

i	$X^{(i)}$	i	$X^{(i)}$
1	-0.324	13	-0.005
2	-0.147	14	0.041
3	-0.140	15	0.041
4	-0.122	16	0.041
5	-0.118	17	0.081
6	-0.081	18	0.081
7	-0.081	19	0.082
8	-0.076	20	0.082
9	-0.076	21	0.140
10	-0.076	22	0.158
11	-0.024	23	0.229
12	-0.005	24	0.303

11.13.2.6.5 From Table 4, Appendix B, for the number of observations, n, obtain the coefficients a_1, a_2, ... a_k where k is n/2 if n is even and (n-1)/2 if n is odd. For the data in this example, n = 24 and k = 12. The a_i values are listed in Table 6.

TABLE 6. COEFFICIENTS AND DIFFERENCES FOR SHAPIRO-WILK'S EXAMPLE

i	a_i	$X^{(n-i+1)} - X^{(i)}$	
1	0.4493	0.627	$X^{(24)} - X^{(1)}$
2	0.3098	0.376	$X^{(23)} - X^{(2)}$
3	0.2554	0.298	$X^{(22)} - X^{(3)}$
4	0.2145	0.262	$X^{(21)} - X^{(4)}$
5	0.1807	0.200	$X^{(20)} - X^{(5)}$
6	0.1512	0.163	$X^{(19)} - X^{(6)}$
7	0.1245	0.162	$X^{(18)} - X^{(7)}$
8	0.0997	0.157	$X^{(17)} - X^{(8)}$
9	0.0764	0.117	$X^{(16)} - X^{(9)}$
10	0.0539	0.117	$X^{(15)} - X^{(10)}$
11	0.0321	0.065	$X^{(14)} - X^{(11)}$
12	0.0107	0.000	$X^{(13)} - X^{(12)}$

1.13.2.6.6 Compute the test statistic, W, as follows:

$$W = \frac{1}{D}\left[\sum_{i=1}^{k} a_i (X^{(n-i+1)} - X^{(i)})\right]^2$$

The differences $X^{(n-i+1)} - X^{(i)}$ are listed in Table 6. For the data in this example,

$$W = \frac{1}{0.4265}(0.6444)^2 = 0.974$$

11.13.2.6.7 The decision rule for this test is to compare W as calculated in Section 13.2.6.6 to a critical value found in Table 6, Appendix B. If the computed W is less than the critical value, conclude that the data are not normally distributed. For the data in this example, the critical value at a significance level of 0.01 and n = 24 observations is 0.884. Since W = 0.974 is greater than the critical value, conclude that the data are normally distributed.

11.13.2.7 Test for Homogeneity of Variance

11.13.2.7.1 The test used to examine whether the variation in mean proportion surviving is the same across all toxicant concentrations including the control, is Bartlett's Test (Snedecor and Cochran, 1980). The test statistic is as follows:

$$B = \frac{\left[\left(\sum_{i=1}^{P} V_i\right)\ln \overline{S}^2 - \sum_{i=1}^{P} V_i \ln S_i^2\right]}{C}$$

Where: V_i = degrees of freedom for each toxicant concentration and control, $V_i = (n_i - 1)$

n_i = the number of replicates for concentration i

ln = $\log_e$

i = 1, 2, ..., p where p is the number of concentrations including the control

$$\overline{S}^2 = \frac{(\sum_{i=1}^{P} V_i S_i^2)}{\sum_{i=1}^{P} V_i}$$

$$C = 1 + (3(p-1))^{-1}[\sum_{i=1}^{P} \frac{1}{V_i} - (\sum_{i=1}^{P} V_i)^{-1}]$$

11.13.2.7.2 For the data in this example (see Table 3), all toxicant concentrations including the control have the same number of replicates (n_i = 4 for all i). Thus, V_i = 3 for all i.

11.13.2.7.3 Bartlett's statistic is therefore:

$$B = [(18)\ln(0.0236) - 3\sum_{i=1}^{P} \ln(S_i^2)]/1.1296$$

$$= [18(-3.7465) - 3(-24.7516)]/1.1296$$

$$= 6.8178/1.1296$$

$$= 6.036$$

11.13.2.7.4 B is approximately distributed as chi-square with p - 1 degrees of freedom, when the variances are in fact the same. Therefore, the appropriate critical value for this test (from a table of chi-square distribution), at a significance level of 0.01 with five degrees of freedom, is 15.086. Since B = 6.036 is less than the critical value of 15.086, conclude that the variances are not different.

11.13.2.8 Dunnett's Procedure

11.13.2.8.1 To obtain an estimate of the pooled variance for the Dunnett's Procedure, construct an ANOVA table as described in Table 7.

TABLE 7. ANOVA TABLE

Source	df	Sum of Squares (SS)	Mean Square(MS) (SS/df)
Between	p - 1	SSB	S_B^2 = SSB/(p-1)
Within	N - p	SSW	S_W^2 = SSW/(N-p)
Total	N - 1	SST	

Where: p = number toxicant concentrations including the control

N = total number of observations $n_1 + n_2 \ldots + n_p$

n_i = number of observations in concentration i

$$SSB = \sum_{i=1}^{P} T_i^2/n_i - G^2/N$$ Between Sum of Squares

$$SST = \sum_{i=1}^{P}\sum_{j=1}^{n_i} Y_{ij}^2 - G^2/N$$ Total Sum of Squares

$$SSW = SST - SSB$$ Within Sum of Squares

G = the grand total of all sample observations, $G = \sum_{i=1}^{P} T_i$

T_i = the total of the replicate measurements for concentration i

Y_{ij} = the jth observation for concentration i (represents the proportion surviving for toxicant concentration i in test chamber j)

11.13.2.8.2 For the data in this example:

$n_1 = n_2 = n_3 = n_4 = n_5 = n_6 = 4$

N = 24

$T_1 = Y_{11} + Y_{12} + Y_{13} + Y_{14} = 5.322$
$T_2 = Y_{21} + Y_{22} + Y_{23} + Y_{24} = 4.733$
$T_3 = Y_{31} + Y_{32} + Y_{33} + Y_{34} = 5.485$
$T_4 = Y_{41} + Y_{42} + Y_{43} + Y_{44} = 5.017$
$T_5 = Y_{51} + Y_{52} + Y_{53} + Y_{54} = 4.437$
$T_6 = Y_{61} + Y_{62} + Y_{63} + Y_{64} = 2.414$

$$G = T_1 + T_2 + T_3 + T_4 + T_5 + T_6 = 27.408$$

$$SSB = \sum_{i=1}^{p} \frac{T_i^2}{n_i} - \frac{G^2}{N}$$

$$= \frac{1}{4}(131.495) - \frac{(27.408)^2}{24} = 1.574$$

$$SST = \sum_{i=1}^{p} \sum_{j=1}^{n_i} Y_{ij}^2 - \frac{G^2}{N}$$

$$= 33.300 - \frac{(27.408)^2}{24} = 2.000$$

$$SSW = SST - SSB = 2.000 - 1.574 = 0.4260$$

$$S_B^2 = SSB/(p-1) = 1.574/(6-1) = 0.3150$$

$$S_W^2 = SSW/(N-p) = 0.426/(24-6) = 0.024$$

11.13.2.8.3 Summarize these calculations in the ANOVA table (Table 8).

TABLE 8. ANOVA TABLE FOR DUNNETT'S PROCEDURE EXAMPLE

Source	df	Sum of Squares (SS)	Mean Square(MS) (SS/df)
Between	5	1.574	0.315
Within	18	0.426	0.024
Total	23	2.002	

11.13.2.8.4 To perform the individual comparisons, calculate the t statistic for each concentration, and control combination as follows:

$$t_i = \frac{(\bar{Y}_1 - \bar{Y}_i)}{S_w\sqrt{(1/n_1) + (1/n_i)}}$$

Where: $\bar{Y}_i$ = mean proportion surviving for concentration i

$\bar{Y}_1$ = mean proportion surviving for the control

S_W = square root of the within mean square

n_1 = number of replicates for the control

n_i = number of replicates for concentration i.

11.13.2.8.5 Table 9 includes the calculated t values for each concentration and control combination. In this example, comparing the 32 µg/L concentration with the control the calculation is as follows:

$$t_2 = \frac{(1.330 - 1.183)}{[0.155\sqrt{(1/4) + (1/4)}]} = 1.341$$

TABLE 9. CALCULATED T VALUES

NaPCP Concentration (µg/L)	i	t_i
32	2	1.341
64	3	-0.374
128	4	0.693
256	5	2.016
512	6	6.624

11.13.2.8.6 Since the purpose of this test is to detect a significant reduction in proportion surviving, a one-sided test is appropriate. The critical value for this one-sided test is found in Table 5, Appendix C. For an overall alpha level of 0.05, 18 degrees of freedom for error and five concentrations (excluding the control) the critical value is 2.41. The mean proportion surviving for concentration i is considered significantly less than the mean proportion surviving for the control if t_i is greater than the critical value. Since t_6 is greater than 2.41, the 512 µg/L concentration has significantly lower survival than the control. Hence the NOEC and the LOEC for survival are 256 µg/L and 512 µg/L, respectively.

11.13.2.8.7 To quantify the sensitivity of the test, the minimum significant difference (MSD) that can be detected statistically may be calculated.

$$MSD = d\ S_w\sqrt{(1/n_1) + (1/n)}$$

Where: d = the critical value for Dunnett's procedure

S_W = the square root of the within mean square

n = the common number of replicates at each concentration (this assumes equal replication at each concentration)

n_1 = the number of replicates in the control.

11.13.2.8.8 In this example:

$$MSD = 2.41(0.155)\sqrt{(1/4) + (1/4)}$$

$$= 2.41\ (0.155)(0.707)$$

$$= 0.264$$

11.13.2.8.9 The MSD (0.264) is in transformed units. To determine the MSD in terms of percent survival, carry out the following conversion.

1. Subtract the MSD from the transformed control mean.

   1.330 - 0.264 = 1.066

2. Obtain the untransformed values for the control mean and the difference calculated in 1.

   $[\text{Sine}\ (1.330)]^2 = 0.943$

   $[\text{Sine}\ (1.066)]^2 = 0.766$

3. The untransformed MSD (MSD_u) is determined by subtracting the untransformed values from 2.

   $MSD_u = 0.943 - 0.766 = 0.177$

11.13.2.8.10 Therefore, for this set of data, the minimum difference in mean proportion surviving between the control and any toxicant concentration that can be detected as statistically significant is 0.177.

11.13.2.8.11 This represents a decrease in survival of 19% from the control.

11.13.2.9 Calculation of the LC50

11.13.2.9.1 The data used for the Probit Analysis is summarized in Table 10. To perform the Probit Analysis, run the USEPA Probit Analysis Program. An example of the program input and output is supplied in Appendix I.

TABLE 10. DATA FOR PROBIT ANALYSIS

		NaPCP Concentration (µg/L)				
	Control	32	64	128	256	512
Number Dead	2	6	1	4	9	27
Number Exposed	40	40	40	40	40	40

11.13.2.9.2 For this example, the chi-square test for heterogeneity was not significant, thus Probit Analysis appears appropriate for this data.

11.13.2.9.3 Figure 8 shows the output data for the Probit Analysis of the data in Table 10 using the USEPA Probit Program.

11.13.3 EXAMPLE OF ANALYSIS OF FATHEAD MINNOW, *PIMEPHALES PROMELAS,* GROWTH DATA

11.13.3.1 Formal statistical analysis of the growth data is outlined in Figure 9. The response used in the statistical analysis is mean weight per original organism for each replicate. Because this measurement is based on the number of original organisms exposed (rather than the number surviving), the measured response is a combined survival and growth endpoint that can be termed biomass. An IC estimate can be calculated for the growth data via a point estimation technique (see Section 9, Chronic Toxicity Test Endpoints and Data Analysis). Hypothesis testing can be used to obtain the NOEC for growth. Concentrations above the NOEC for survival are excluded from the hypothesis test for growth effects.

11.13.3.2 The statistical analysis using hypothesis tests consists of a parametric test, Dunnett's Procedure, and a nonparametric test, Steel's Many-one Rank Test. The underlying assumptions of the Dunnett's Procedure, normality and homogeneity of variance, are formally tested. The test for normality is the Shapiro-Wilk's Test and Bartlett's Test is used to test for homogeneity of variance. If either of these tests fails, the nonparametric test, Steel's Many-one Rank Test, is used to determine the NOEC and LOEC endpoints. If the assumptions of Dunnett's Procedure are met, the endpoints are determined by the parametric test.

11.13.3.3 Additionally, if unequal numbers of replicates occur among the concentration levels tested there are parametric and nonparametric alternative analyses. The parametric analysis is a t test with the Bonferroni adjustment (see Appendix D). The Wilcoxon Rank Sum Test with the Bonferroni adjustment is the nonparametric alternative (see Appendix F).

Probit Analysis of Fathead Minnow Larval Survival Data

Conc.	Number Exposed	Number Resp.	Observed Proportion Responding	Proportion Responding Adjusted for Controls
Control	40	2	0.0500	0.0000
32.0000	40	6	0.1500	0.0779
64.0000	40	1	0.0250	-.0577
128.0000	40	4	0.1000	0.0237
256.0000	40	9	0.2250	0.1593
512.0000	40	27	0.6750	0.6474

Chi - Square for Heterogeneity (calculated) = 4.522
Chi - Square for Heterogeneity
(Tabular value at 0.05 level) = 7.815

Probit Analysis of Fathead Minnow Larval Survival Data

Estimated LC/EC Values and Confidence Limits

Point	Exposure Conc.	Lower 95% Confidence Limits	Upper 95% Confidence Limits
LC/EC 1.00	127.637	34.590	195.433
LC/EC 50.00	422.696	345.730	531.024

Figure 8. Output for USEPA Probit Analysis Program, Version 1.5

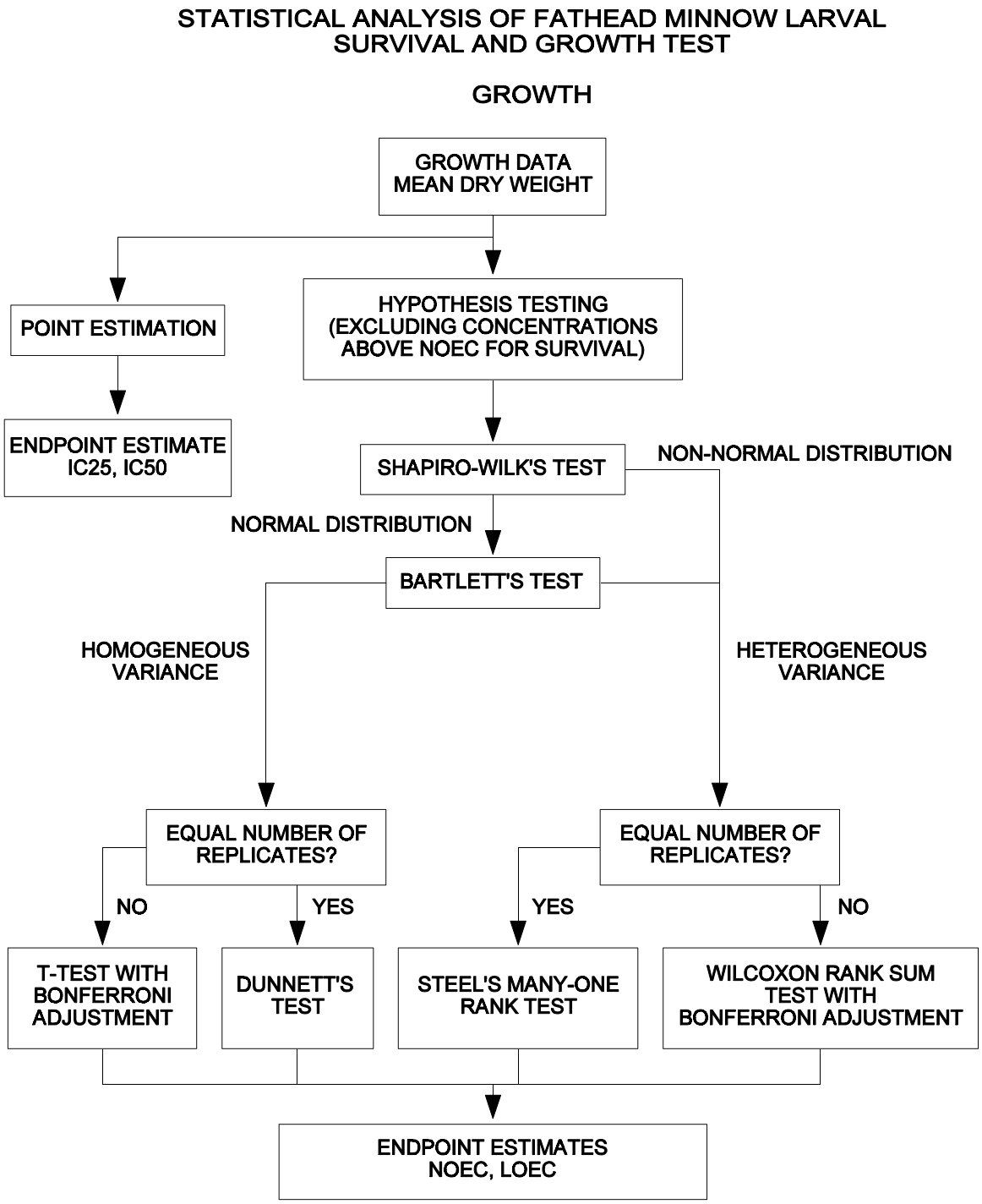

Figure 9. Flowchart for statistical analysis of fathead minnow, *Pimephales promelas,* larval growth data.

11.13.3.4 The data, mean and variance of the observations at each concentration including the control are listed in Table 11. A plot of the weight data for each treatment is provided in Figure 10. Since there is significant mortality in the 512 µg/L concentration, its effect on growth is not considered.

TABLE 11. FATHEAD MINNOW, *PIMEPHALES PROMELAS,* GROWTH DATA

		NaPCP Concentration (µg/L)				
Replicate	Control	32	64	128	256	512
A	0.711	0.517	0.602	0.566	0.455	-
B	0.662	0.501	0.669	0.612	0.502	-
C	0.646	0.723	0.694	0.410	0.606	-
D	0.690	0.560	0.676	0.672	0.254	-
Mean($\bar{Y}_i$)	0.677	0.575	0.660	0.565	0.454	-
S_i^2	0.00084	0.01032	0.00162	0.01256	0.0218	-
i	1	2	3	4	5	6

11.13.3.5 Test for Normality

11.13.3.5.1 The first step of the test for normality is to center the observations by subtracting the mean of all the observations within a concentration from each observation in that concentration. The centered observations are summarized in Table 12.

TABLE 12. CENTERED OBSERVATIONS FOR SHAPIRO-WILK'S EXAMPLE

		NaPCP Concentration (µg/L)			
Replicate	Control	32	64	128	256
A	0.034	-0.058	-0.058	0.001	0.001
B	-0.015	-0.074	0.009	0.047	0.048
C	-0.031	0.148	0.034	-0.155	0.152
D	0.013	-0.015	0.016	0.107	-0.200

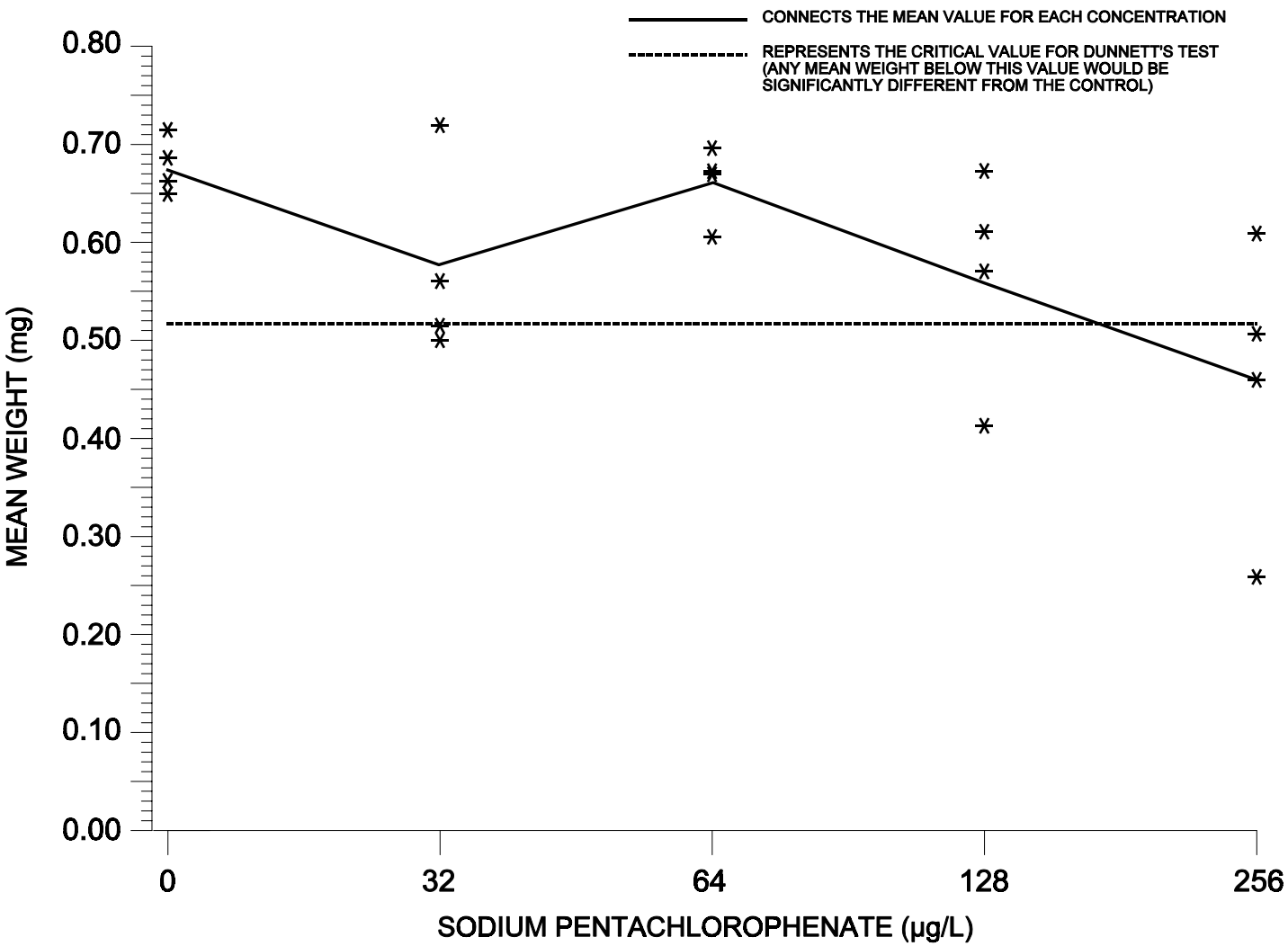

Figure 10. Plot of weight data from fathead minnow, *Pimephales promelas*, larval survival and growth test for point estimate testing.

11.13.3.5.2 Calculate the denominator, D, of the test statistic:

$$D = \sum_{i=1}^{n} (X_i - \bar{X})^2$$

Where: X_i = the ith centered observation

$\bar{X}$ = the overall mean of the centered observations

n = the total number of centered observations

For this set of data, n = 20

$\bar{X} = \frac{1}{20}(0.004) = 0.000$

D = 0.1414

11.13.3.5.3 Order the centered observations from smallest to largest

$$X^{(1)} \leq X^{(2)} \leq \ldots \leq X^{(n)}$$

Where $X^{(i)}$ is the ith ordered observation. These ordered observations are listed in Table 13.

TABLE 13. ORDERED CENTERED OBSERVATIONS FOR SHAPIRO-WILK'S EXAMPLE

i	$X^{(i)}$	i	$X^{(i)}$
1	-0.200	11	0.009
2	-0.155	12	0.013
3	-0.074	13	0.016
4	-0.058	14	0.034
5	-0.058	15	0.034
6	-0.031	16	0.047
7	-0.015	17	0.048
8	-0.015	18	0.107
9	0.001	19	0.148
10	0.001	20	0.152

11.13.3.5.4 From Table 4, Appendix B, for the number of observations, n, obtain the coefficients $a_1, a_2, \ldots, a_k$ where k is n/2 if n is even and (n-1)/2 if n is odd. For the data in this example, n = 20 and k = 10. The a_i values are listed in Table 14.

TABLE 14. COEFFICIENTS AND DIFFERENCES FOR SHAPIRO-WILK'S EXAMPLE

i	a_i	$X^{(n-i+1)} - X^{(i)}$	
1	0.4734	0.352	$X^{(20)} - X^{(1)}$
2	0.3211	0.303	$X^{(19)} - X^{(2)}$
3	0.2565	0.181	$X^{(18)} - X^{(3)}$
4	0.2085	0.106	$X^{(17)} - X^{(4)}$
5	0.1686	0.105	$X^{(16)} - X^{(5)}$
6	0.1334	0.065	$X^{(15)} - X^{(6)}$
7	0.1013	0.049	$X^{(14)} - X^{(7)}$
8	0.0711	0.031	$X^{(13)} - X^{(8)}$
9	0.0422	0.012	$X^{(12)} - X^{(9)}$
10	0.0140	0.008	$X^{(11)} - X^{(10)}$

11.13.3.5.5 Compute the test statistic, W, as follows:

$$W = \frac{1}{D}[\sum_{i=1}^{k} a_i(X^{(n-i+1)} - X^{(i)})]^2$$

the differences $X^{(n-i+1)} - X^{(i)}$ are listed in Table 14. For this set of data:

$$W = \frac{1}{0.1414}(0.3666)^2 = 0.9505$$

11.13.3.5.6 The decision rule for this test is to compare W with the critical value found in Table 6, Appendix B. If the computed W is less than the critical value, conclude that the data are not normally distributed. For this example, the critical value at a significance level of 0.01 and 20 observations (n) is 0.868. Since W = 0.9505 is greater than the critical value, the conclusion of the test is that the data are normally distributed.

11.13.3.6 Test for Homogeneity of Variance

11.13.3.6.1 The test used to examine whether the variation in mean dry weight is the same across all toxicant concentrations including the control, is Bartlett's Test (Snedecor and Cochran, 1980). The test statistic is as follows:

$$B = \frac{[(\sum_{i=1}^{P} V_i)\ln \overline{S}^2 - \sum_{i=1}^{P} V_i \ln S_i^2]}{C}$$

Where: V_i = degrees of freedom for each toxicant concentration and control, $V_i = (n_i - 1)$

n_i = the number of replicates for concentration i.

ln = $\log_e$

i = 1, 2, ..., p where p is the number of concentrations including the control

$$\bar{S}^2 = \frac{(\sum_{i=1}^{P} V_i S_i^2)}{\sum_{i=1}^{P} V_i}$$

$$C = 1 + (3(p-1))^{-1}[\sum_{i=1}^{P} 1/V_i - (\sum_{i=1}^{P} V_i)^{-1}]$$

11.13.3.6.2 For the data in this example, (see Table 11) all toxicant concentrations including the control have the same number of replicates (n_i = 4 for all i). Thus, V_i = 3 for all i.

11.13.3.6.3 Bartlett's statistic is therefore:

$$B = [(15)\ln(0.00947) - 3\sum_{i=1}^{P} \ln(S_i^2)]/1.133$$

= [15(-5.9145) - 3(-26.2842]/1.133

= 8.8911/1.133

= 7.847

11.13.3.6.4 B is approximately distributed as chi-square with p - 1 degrees of freedom, when the variances are in fact the same. Therefore, the appropriate critical value for this test, at a significance level of 0.01 with four degrees of freedom, is 13.277. Since B = 7.847 is less than the critical value of 13.277, conclude that the variances are not different.

11.13.3.7 Dunnett's Procedure

11.13.3.7.1 To obtain an estimate of the pooled variance for the Dunnett's Procedure, construct an ANOVA table as described in Table 15.

TABLE 15. ANOVA TABLE

Source	df	Sum of Squares (SS)	Mean Square(MS) (SS/df)
Between	p - 1	SSB	S_B^2 = SSB/(p-1)
Within	N - p	SSW	S_W^2 = SSW/(N-p)
Total	N - 1	SST	

Where: p = number toxicant concentrations including the control

N = total number of observations $n_1 + n_2 ... + n_p$

n_i = number of observations in concentration i

$$SSB = \sum_{i=1}^{P} T_i^2/n_i - G^2/N$$ Between Sum of Squares

$$SST = \sum_{i=1}^{P}\sum_{j=1}^{n_i} Y_{ij}^2 - G^2/N$$ Total Sum of Squares

$$SSW = SST - SSB$$ Within Sum of Squares

G = the grand total of all sample observations, $G = \sum_{i=1}^{P} T_i$

T_i = the total of the replicate measurements for concentration i

Y_{ij} = the jth observation for concentration i (represents the mean dry weight of the fish for toxicant concentration i in test chamber j)

11.13.3.7.2 For the data in this example:

$n_1 = n_2 = n_3 = n_4 = n_5 = 4$

N = 20

$T_1 = Y_{11} + Y_{12} + Y_{13} + Y_{14} = 2.709$
$T_2 = Y_{21} + Y_{22} + Y_{23} + Y_{24} = 2.301$

$T_3 = Y_{31} + Y_{32} + Y_{33} + Y_{34} = 2.641$
$T_4 = Y_{41} + Y_{42} + Y_{43} + Y_{44} = 2.260$
$T_5 = Y_{51} + Y_{52} + Y_{53} + Y_{54} = 1.817$
$G = T_1 + T_2 + T_3 + T_4 + T_5 = 11.728$

$$SSB = \sum_{i=1}^{P} T_i^2/n_i - G^2/N$$

$$= \frac{1}{4}(28.017) - \frac{(11.728)^2}{20} = 0.1270$$

$$SST = \sum_{i=1}^{P}\sum_{j=1}^{n_i} Y_{ij}^2 - G^2/N$$

$$= 7.146 - \frac{(11.728)^2}{20} = 0.2687$$

$$SSW = SST - SSB = 0.2687 - 0.1270 = 0.1417$$

$S_B^2 = SSB/(p-1) = 0.1270/(5-1) = 0.0318$

$S_W^2 = SSW/(N-p) = 0.041/(20-5) = 0.0094$

11.13.3.7.3 Summarize these calculations in the ANOVA table (Table 16).

TABLE 16. ANOVA TABLE FOR DUNNETT'S PROCEDURE EXAMPLE

Source	df	Sum of Squares (SS)	Mean Square(MS) (SS/df)
Between	4	0.1270	0.0318
Within	15	0.1417	0.0094
Total	19	0.2687	

11.13.3.7.4 To perform the individual comparisons, calculate the t statistic for each concentration, and control combination as follows:

$$t_i = \frac{(\bar{Y}_1 - \bar{Y}_i)}{S_w\sqrt{(1/n_1) + (1/n_i)}}$$

Where: $\bar{Y}_i$ = mean dry weight for toxicant concentration i

$\bar{Y}_1$ = mean dry weight for the control

S_W = square root of the within mean square

n_1 = number of replicates for the control

n_i = number of replicates for concentration i.

11.13.3.7.5 Table 17 includes the calculated t values for each concentration and control combination. In this example, comparing the 32 µg/L concentration with the control the calculation is as follows:

$$t_2 = \frac{(0.677 - 0.575)}{[0.097\sqrt{(1/4) + (1/4)}]} = 1.487$$

TABLE 17. CALCULATED T VALUES

NaPCP Concentration (µg/L)	i	t_i
32	2	1.487
64	3	0.248
128	4	1.632
256	5	3.251

11.13.3.7.6 Since the purpose of this test is to detect a significant reduction in mean weight, a one-sided test is appropriate. The critical value for this one-sided test is found in Table 5, Appendix C. For an overall alpha level of 0.05, 15 degrees of freedom for error and four concentrations (excluding the control) the critical value is 2.36. The mean weight for concentration "*i*" is considered significantly less than the mean weight for the control if t_i is greater than the critical value. Since t_5 is greater than 2.36, the 256 µg/L concentration had significantly lower growth than the control. Hence the NOEC and the LOEC for growth are 128 µg/L and 256 µg/L, respectively.

11.13.3.7.7 To quantify the sensitivity of the test, the minimum significant difference (MSD) that can be statistically detected may be calculated:

$$MSD = d\ S_w\sqrt{(1/n_1) + (1/n)}$$

Where: d = the critical value for the Dunnett's Procedure

S_W = the square root of the within mean square

n = the common number of replicates at each concentration (this assumes equal replication at each concentration)

n_1 = the number of replicates in the control.

11.13.3.7.8 In this example:

$$MSD = 2.36(0.052)\sqrt{(1/4) + (1/4)}$$

$$= 2.36\ (0.097)\ (0.707)$$

$$= 0.162$$

11.13.3.7.9 Therefore, for this set of data, the minimum difference that can be detected as statistically significant is 0.162 mg.

11.13.3.7.10 This represents a 24% reduction in mean weight from the control.

11.13.3.8 Calculation of the IC

11.13.3.8.1 The growth data in Table 2 modified to be mean weights per original number of fish are utilized in this example. As seen in Table 2 and Figure 11, the observed means are not monotonically non-increasing with respect to concentration (the mean response for each higher concentration is not less than or equal to the mean response for the previous concentration, and the responses between concentrations do not follow a linear trend). Therefore, the means are smoothed prior to calculating the IC. In the following discussion, the observed means are represented by $\bar{Y}_i$ and the smoothed means by M_i.

11.13.3.8.2 Starting with the control mean, $\bar{Y}_1 = 0.677$, we see that $\bar{Y}_1 > \bar{Y}_2$. Set $M_1 = \bar{Y}_1$ Comparing $\bar{Y}_2$ to $\bar{Y}_3$, $\bar{Y}_2 < \bar{Y}_3$.

11.13.3.8.3 Calculate the smoothed means:

$$M_2 = M_3 = (\bar{Y}_2 + \bar{Y}_3)/2 = 0.618$$

11.13.3.8.4 For the remaining observed means, $M_3 > \bar{Y}_4 > \bar{Y}_5 > \bar{Y}_6$. Thus, M_4 becomes $\bar{Y}_4$, M_5 becomes $\bar{Y}_5$ etc., for the remaining concentrations. Table 18 contains the smoothed means, and Figure 11 provides a plot of the smoothed concentration response curve.

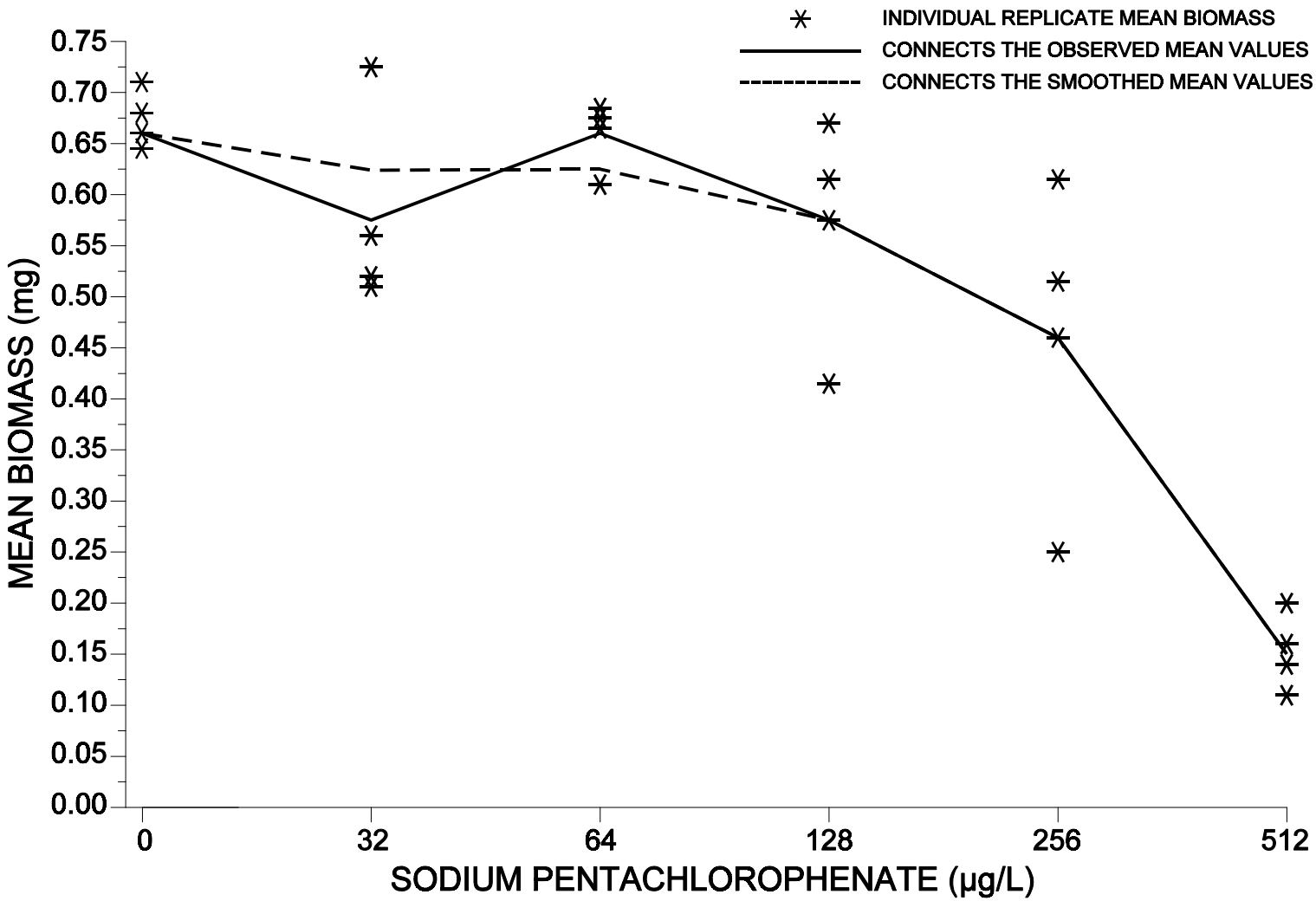

Figure 11. Plot of raw data, observed means, and smoothed means for the fathead minnow, *Pimephales promelas*, growth data in Tables 2 and 18.

TABLE 18. FATHEAD MINNOW, *PIMEPHALES PROMELAS*, MEAN GROWTH RESPONSE AFTER SMOOTHING

NaPCP Conc (µg/L)	i	Response means, $\bar{Y}_i$ (mg)	Smoothed means, M_i (mg)
Control	1	0.677	0.677
32	2	0.575	0.618
64	3	0.660	0.618
128	4	0.565	0.565
256	5	0.454	0.454
512	6	0.150	0.150

11.13.3.8.5 An IC25 and an IC50 can be estimated using the Linear Interpolation Method. A 25% reduction in weight, compared to the controls, would result in a mean dry weight of 0.508 mg, where $M_1(1 - p/100) = 0.677(1 - 25/100)$. A 50% reduction in weight, compared to the controls, would result in a mean weight of 0.339 mg, where $M_1(1 - p/100) = 0.677(1 - 50/100)$. Examining the smoothed means and their associated concentrations (Table 18), the response 0.508 mg is bracketed by C_4 = 128 µg/L and C_5 = 256 µg/L. For the 50% reduction (0.339 mg), the response (0.339 µg) is bracketed by C_5 = 256 µg/L and C_6 = 512 µg/L.

11.13.3.8.6 Using the equation in Section 4.2 from Appendix M, the estimate of the IC25 is calculated as follows:

$$ICp = C_j + [M_1(1 - p/100) - M_j]\frac{(C_{(j+1)} - C_j)}{(M_{(j+1)} - M_j)}$$

$$IC25 = 128 + [0.677(1 - 25/100) - 0.565]\frac{(256 - 128)}{(0.454 - 0.565)}$$

= 194 µg/L

11.13.3.8.7 Using the equation in Section 4.2 of Appendix M the estimate of the IC50 is calculated as follows:

$$ICp = C_j + [M_1(1 - p/100) - M_j]\frac{(C_{(j+1)} - C_j)}{(M_{(j+1)} - M_j)}$$

$$IC50 = 256 + [0.677(1 - 50/100) - 0.454]\frac{(512 - 256)}{(0.150 - 0.454)}$$

= 353 µg/L

11.13.3.8.8 When the ICPIN program was used to analyze this set of data, requesting 80 resamples, the estimate of the IC25 was 193.9503 µg/L. The empirical 95% confidence interval for the true mean was (54.9278 µg/L, 340.6617 µg/L). The computer program output for the IC25 for this data set is shown in Figure 12.

11.13.3.8.9 When the ICPIN program was used to analyze this set of data for the IC50, requesting 80 resamples, the estimate of the IC50 was 353.2884 µg/L. The empirical 95% confidence interval for the true mean was 208.4723 µg/L and 418.5276 µg/L. The computer program output is shown in Figure 13.

Conc. ID	1	2	3	4	5	6
Conc. Tested	0	32	64	128	256	512
Response 1	0.711	0.517	0.602	0.566	0.455	0.143
Response 2	0.662	0.501	0.669	0.612	0.502	0.163
Response 3	0.646	0.723	0.694	0.410	0.606	0.195
Response 4	0.690	0.560	0.676	0.672	0.254	0.099

*** Inhibition Concentration Percentage Estimate ***
Toxicant/Effluent: NaPCP
Test Start Date: Example Test Ending Date:
Test Species: Fathead minnows
Test Duration: 7-d
DATA FILE: fhmanual.icp
OUTPUT FILE: fhmanual.i25

Conc. ID	Number Replicates	Concentration µg/l	Response Means	Std. Dev.	Pooled Response Means
1	4	0.000	0.677	0.029	0.677
2	4	32.000	0.575	0.102	0.618
3	4	64.000	0.660	0.040	0.618
4	4	128.000	0.565	0.112	0.565
5	4	256.000	0.454	0.148	0.454
6	4	512.000	0.150	0.040	0.150

The Linear Interpolation Estimate: 193.9503 Entered P Value: 25

Number of Resamplings: 80
The Bootstrap Estimates Mean: 186.4935 Standard Deviation: 52.6094
Original Confidence Limits: Lower: 107.0613 Upper: 285.6449
Expanded Confidence Limits: Lower: 54.9278 Upper: 340.6617
Resampling time in Seconds: 1.81 Random Seed: 1272173518

Figure 12. ICPIN program output for the IC25.

Conc. ID	1	2	3	4	5	6
Conc. Tested	0	32	64	128	256	512
Response 1	0.711	0.517	0.602	0.566	0.455	0.143
Response 2	0.662	0.501	0.669	0.612	0.502	0.163
Response 3	0.646	0.723	0.694	0.410	0.606	0.195
Response 4	0.690	0.560	0.676	0.672	0.254	0.099

*** Inhibition Concentration Percentage Estimate ***
Toxicant/Effluent: NaPCP
Test Start Date: Example Test Ending Date:
Test Species: Fathead minnows
Test Duration: 7-d
DATA FILE: fhmanual.icp
OUTPUT FILE: fhmanual.i50

Conc. ID	Number Replicates	Concentration µg/l	Response Means	Std. Dev.	Pooled Response Means
1	4	0.000	0.677	0.029	0.677
2	4	32.000	0.575	0.102	0.618
3	4	64.000	0.660	0.040	0.618
4	4	128.000	0.565	0.112	0.565
5	4	256.000	0.454	0.148	0.454
6	4	512.000	0.150	0.040	0.150

The Linear Interpolation Estimate: 353.2884 Entered P Value: 50

Number of Resamplings: 80
The Bootstrap Estimates Mean: 345.1108 Standard Deviation: 37.0938
Original Confidence Limits: Lower: 262.7783 Upper: 394.0629
Expanded Confidence Limits: Lower: 208.4723 Upper: 418.5276
Resampling time in Seconds: 1.87 Random Seed: 1126354766

Figure 13. ICPIN program output for the IC50.

11.14 PRECISION AND ACCURACY

11.14.1 PRECISION – Data on single-laboratory and multilaboratory precision are described below (Subsections 11.14.1.1 and 11.14.1.2). Single-laboratory precision is a measure of the reproducibility of test results when tests are conducted using a specific method under reasonably constant conditions in the same laboratory. Single-laboratory precision is synonymous with the terms within-laboratory precision and intralaboratory precision. Multilaboratory precision is a measure of the reproducibility of test results from different laboratories using the same test method and analyzing the same test material. Multilaboratory precision is synonymous with the term interlaboratory precision. Interlaboratory precision, as used in this document, includes both within-laboratory and between-laboratory components of variability. In recent multilaboratory studies, these two components of interlaboratory precision have been displayed separately (termed within-laboratory and between-laboratory variability) and combined (termed total interlaboratory variability). The total interlaboratory variability that is reported from these studies is synonymous with interlaboratory variability reported from other studies where individual variability components are not separated.

11.14.1.1 Single-Laboratory Precision

11.14.1.1.1 Information on the single-laboratory precision of the fathead minnow larval survival and growth test is presented in Table 19. The range of NOECs was only two concentration intervals, indicating good precision.

11.14.1.1.2 EPA evaluated within-laboratory precision of the Fathead Minnow, *Pimephales promelas*, Larval Survival and Growth Test using a database of routine reference toxicant test results from 19 laboratories (USEPA, 2000b). The database consisted of 205 reference toxicant tests conducted in 19 laboratories using a variety of reference toxicants including: cadmium, chromium, copper, potassium chloride, sodium chloride, sodium pentachlorophenate, and sodium dodecyl sulfate. Among the 19 laboratories, the median within-laboratory CV calculated for routine reference toxicant tests was 26% for the IC25 growth endpoint. In 25% of laboratories, the within-laboratory CV was less than 21%; and in 75% of laboratories, the within-laboratory CV was less than 38%.

TABLE 19. PRECISION OF THE FATHEAD MINNOW, *PIMEPHALES PROMELAS*, LARVAL SURVIVAL AND GROWTH TEST, USING NAPCP AS A REFERENCE TOXICANT[1,2]

Test	NOEC (µg/L)	LOEC (µg/L)	Chronic Value (µg/L)
1	256	512	362
2	128	256	181
3	256	512	362
4	128	256	181
5	128	256	181
n:	5	5	5
Mean:	NA	NA	253.4

[1] From Pickering, 1988.
[2] For a discussion of the precision of data from chronic toxicity tests, (see Section 4, Quality Assurance).

11.14.1.2 Multilaboratory Precision

11.14.1.2.1 A multilaboratory study of Method 1000.0 described in the first edition of this manual (USEPA, 1985e), was performed using seven blind samples over an eight month period (DeGraeve et. al., 1988). In this study, each of the 10 participating laboratories was to conduct two tests simultaneous with each sample, each test having two replicates of 10 larvae for each of five concentrations and the control. Of the 140 tests planned, 135 were completed. Only nine of the 135 tests failed to meet the acceptance criterion of 80% survival in the controls. Of the 126 acceptable survival NOECs reported, an average of 41% were median values, and 89% were within one concentration interval of the median (Table 20). For the growth (weight) NOECs, an average of 32% were at the median, and 84% were within one concentration interval of the median (Table 21). Using point estimate techniques, the precision (CV) of the IC50 was 19.5% for the survival data and 19.8% for the growth data. If the mean weight acceptance criterion of 0.25 mg for the surviving control larvae, which is included in this revised edition of the method, had applied to the test results of the interlaboratory study, one third of the 135 tests would have failed to meet the test criteria (Norberg-King, personal communication and 1989 memorandum; DeGraeve et al., 1991).

11.14.1.2.2 In 2000, EPA conducted an interlaboratory variability study of the Fathead Minnow, *Pimephales promelas*, Larval Survival and Growth Test (USEPA, 2001a; USEPA, 2001b). In this study, each of 27 participant laboratories tested 3 or 4 blind test samples that included some combination of blank, effluent, reference toxicant, and receiving water sample types. The blank sample consisted of moderately-hard synthetic freshwater, the effluent sample was a municipal wastewater spiked with KCl, the receiving water sample was a river water spiked with KCl, and the reference toxicant sample consisted of moderately-hard synthetic freshwater spiked with KCl. Of the 101 Fathead Minnow Larval Survival and Growth tests conducted in this study, 98.0% were successfully completed and met the required test acceptability criteria. Of 24 tests that were conducted on blank samples, none showed false positive results for survival endpoints, and only one resulted in false positive results for the growth endpoint, yielding a false positive rate of 4.35%. Results from the reference toxicant, effluent, and receiving water sample types were used to calculate the precision of the method. Table 22 shows the precision of the IC25 for each of these sample types. Averaged across sample types, the total interlaboratory variability (expressed as a CV%) was 20.9% for IC25 results. Table 23 shows the frequency distribution of survival and growth NOEC endpoints for each sample type. For the survival endpoint, NOEC values spanned four concentrations for the reference toxicant sample type and two concentrations for the effluent and receiving water sample types. The percentage of values within one concentration of the median was 97.2%, 100%, and 100% for the reference toxicant, effluent, and receiving water sample types, respectively. For the growth endpoint, NOEC values spanned five concentrations for the reference toxicant sample type and four concentrations for the effluent and receiving water sample types. The percentage of values within one concentration of the median was 86.1%, 91.7%, and 76.9% for the reference toxicant, effluent, and receiving water sample types, respectively.

11.14.2 ACCURACY

11.14.2.1 The accuracy of toxicity tests cannot be determined.

TABLE 20. COMBINED FREQUENCY DISTRIBUTION FOR SURVIVAL NOECs FOR ALL LABORATORIES[1]

Sample	NOEC Frequency (%) Distribution					
	Tests with Two Reps			Tests with Four Reps		
	Median	± 1[2]	> 2[3]	Median	± 1[2]	> 2[3]
1. Sodium Pentachlorophenate (A)	35	53	12	57	29	14
2. Sodium Pentachlorophenate (B)	42	42	16	56	44	0
3. Potassium Dichromate (A)	47	47	6	75	25	0
4. Potassium Dichromate (B)	41	41	18	50	50	0
5. Refinery Effluent 301	26	68	6	78	22	0
6. Refinery Effluent 401	37	53	10	56	44	0
7. Utility Waste 501	56	33	11	56	33	11

[1] From DeGraeve et al., 1988.
[2] Percent of values at one concentration interval above or below the median. Adding this percentage to the percent of values at the median yields the percent of values within one concentration interval of the median.
[3] Percent of values two or more concentration intervals above or below the median.

TABLE 21. COMBINED FREQUENCY DISTRIBUTION FOR WEIGHT NOECs FOR ALL LABORATORIES[1]

	NOEC Frequency (%) Distribution					
	Tests with Two Reps			Tests with Four Reps		
Sample	Median	± 1[2]	> 2[3]	Median	± 1[2]	> 2[3]
1. Sodium Pentachlorophenate (A)	59	41	0	57	43	0
2. Sodium Pentachlorophenate (B)	37	63	0	22	45	33
3. Potassium Dichromate (A)	35	47	18	88	0	12
4. Potassium Dichromate (B)	12	47	41	63	25	12
5. Refinery Effluent 301	35	53	12	75	25	0
6. Refinery Effluent 401	37	47	16	33	56	11
7. Utility Waste 501	11	61	28	33	56	11

[1] From DeGraeve et al., 1988.
[2] Percent of values at one concentration interval above or below the median. Adding this percentage to the percent of values at the median yields the percent of values within one concentration interval of the median.
[3] Percent of values two or more concentration intervals above or below the median.

TABLE 22. PRECISION OF POINT ESTIMATES FOR VARIOUS SAMPLE TYPES[1]

Test Endpoint	Sample Type	CV (%)[2]		
		Within-lab[3]	Between-lab[4]	Total[5]
IC25	Reference toxicant	10.0	17.2	19.9
	Effluent	19.1	12.9	23.1
	Receiving water	-	-	19.8
	Average	14.6	15.0	20.9

1 From EPA's WET Interlaboratory Variability Study (USEPA, 2001a; USEPA, 2001b).
2 CVs were calculated based on the within-laboratory component of variability, the between-laboratory component of variability, and total interlaboratory variability (including both within-laboratory and between-laboratory components). For the receiving water sample type, within-laboratory and between-laboratory components of variability could not be calculated since the study design did not provide within-laboratory replication for this sample type.
3 The within-laboratory component of variability for duplicate samples tested at the same time in the same laboratory.
4 The between-laboratory component of variability for duplicate samples tested at different laboratories..
5 The total interlaboratory variability, including within-laboratory and between-laboratory components of variability. The total interlaboratory variability is synonymous with interlaboratory variability reported from other studies where individual variability components are not separated.

TABLE 23. FREQUENCY DISTRIBUTION OF HYPOTHESIS TESTING RESULTS FOR VARIOUS SAMPLE TYPES[1]

Test Endpoint	Sample Type	Median NOEC Value	% of Results at the Median	% of Results ±1[2]	% of Results ≥2[3]
Survival NOEC	Reference toxicant	50%	75.0	22.2	2.78
	Effluent	12.5%	76.9	23.1	0.00
	Receiving water	25%	69.2	30.8	0.00
Growth NOEC	Reference toxicant	50%	58.3	27.8	13.9
	Effluent	12.5%	66.7	25.0	8.33
	Receiving water	12.5%	30.8	46.1	23.1

[1] From EPA's WET Interlaboratory Variability Study (USEPA, 2001a; USEPA, 2001b).
[2] Percent of values at one concentration interval above or below the median. Adding this percentage to the percent of values at the median yields the percent of values within one concentration interval of the median.
[3] Percent of values two or more concentration intervals above or below the median.

SECTION 12

TEST METHOD

FATHEAD MINNOW, *PIMEPHALES PROMELAS*, EMBRYO-LARVAL SURVIVAL AND TERATOGENICITY TEST METHOD 1001.0

12.1 SCOPE AND APPLICATION

12.1.1 This method estimates the chronic toxicity of whole effluents and receiving water to the fathead minnow, *Pimephales promelas*, using embryos in a seven-day, static renewal test. The effects include the synergistic, antagonistic, and additive effects of all the chemical, physical, and biological components which adversely affect the physiological and biochemical functions of the test organisms. The test is useful in screening for teratogens because organisms are exposed during embryonic development.

12.1.2 Daily observations on mortality make it possible to also calculate the acute toxicity for desired exposure periods (i.e., 24-h, 48-h, 96-h LC50s).

12.1.3 Detection limits of the toxicity of an effluent or pure substance are organism dependent.

12.1.4 Brief excursions in toxicity may not be detected using 24-h composite samples. Also, because of the long sample collection period involved in composite sampling, and because the test chambers are not sealed, highly degradable and highly volatile toxicants, in the source may not be detected in the test.

12.1.5 This test method is commonly used in one of two forms: (1) a definitive test, consisting of a minimum of five effluent concentrations and a control, and (2) a receiving water test(s), consisting of one or more receiving water concentrations and a control.

12.2 SUMMARY OF METHOD

12.2.1 Fathead minnow, *Pimephales promelas*, embryos are exposed in a static renewal system to different concentrations of effluent or to receiving water for seven days, starting shortly after fertilization of the eggs. Test results are based on the total frequency of both mortality and gross morphological deformities (terata).

12.3 INTERFERENCES

12.3.1 Toxic substances may be introduced by contaminants in dilution water, glassware, sample hardware, and testing equipment (see Section 5, Facilities, Equipment, and Supplies).

12.3.2 Adverse effects of low dissolved oxygen (DO), high concentrations of suspended and/or dissolved solids, and extremes of pH may mask the presence of toxic substances.

12.3.3 Improper effluent sampling and sample handling may adversely affect test results (see Section 8, Effluent and Receiving Water Sampling, Sample Handling, and Sample Preparation for Toxicity Tests).

12.3.4 Pathogenic and/or predatory organisms in the dilution water and effluent may affect test organism survival and confound test results.

12.3.5 pH drift during the test may contribute to artifactual toxicity when ammonia or other pH-dependent toxicants (such as metals) are present. As pH increases, the toxicity of ammonia also increases (see Subsection 8.8.6), so upward pH drift may increase sample toxicity. For metals, toxicity may increase or decrease with

increasing pH. Lead and copper were found to be more acutely toxic at pH 6.5 than at pH 8.0 or 8.5, while nickel and zinc were more toxic at pH 8.5 than at pH 6.5 (USEPA, 1992). In situations where sample toxicity is confirmed to be artifactual and due to pH drift (as determined by parallel testing as described in Subsection 12.3.5.1), the regulatory authority may allow for control of sample pH during testing using procedures outlined in Subsection 12.3.5.2. It should be noted that artifactual toxicity due to pH drift is not likely to occur unless pH drift is large (more than 1 pH unit) and/or the concentration of some pH-dependent toxicant in the sample is near the threshold for toxicity.

12.3.5.1 To confirm that toxicity is artifactual and due to pH drift, parallel tests must be conducted, one with controlled pH and one with uncontrolled pH. In the uncontrolled-pH treatment, the pH is allowed to drift during the test. In the controlled-pH treatment, the pH is maintained using the procedures described in Subsection 12.3.5.2. The pH to be maintained in the controlled-pH treatment (or target pH) will depend on the objective of the test. If the objective of the WET test is to determine the toxicity of the effluent in the receiving water, the pH should be maintained at the pH of the receiving water (measured at the edge of the regulatory mixing zone). If the objective of the WET test is to determine the absolute toxicity of the effluent, the pH should be maintained at the pH of the sample upon completion of collection (as measured on an aliquot removed from the sample container).

12.3.5.1.1 During parallel testing, the pH must be measured in each treatment at the beginning (i.e., initial pH) and end (i.e., final pH) of each 24-h exposure period. For each treatment, the mean initial pH (e.g., averaging the initial pH measured each day for a given treatment) and the mean final pH (e.g., averaging the final pH measured each day for a given treatment) must be reported. pH measurements taken during the test must confirm that pH was effectively maintained at the target pH in the controlled-pH treatment. For each treatment, the mean initial pH and the mean final pH should be within ±0.2 pH units of the target pH. Test procedures for conducting toxicity identification evaluations (TIEs) also recommend maintaining pH within ± 0.2 pH units in pH-controlled tests (USEPA, 1992).

12.3.5.1.2 Total ammonia also should be measured in each treatment at the outset of parallel testing. Total ammonia concentrations greater than 5 mg/L in the 100% effluent are an indicator that toxicity observed in the test may be due to ammonia (USEPA, 1992).

12.3.5.1.3 Results from both of the parallel tests (pH-controlled and uncontrolled treatments) must be reported to the regulatory authority. If the uncontrolled test meets test acceptability criteria and shows no toxicity at the permitted instream waste concentration, then the results from this test should be used for determining compliance. If the uncontrolled test shows toxicity at the permitted instream waste concentration, then the results from the pH-controlled test should be used for determining compliance, provided that this test meets test acceptability criteria and pH was properly controlled (see Subsection 12.3.6.1.1).

12.3.5.1.4 To confirm that toxicity observed in the uncontrolled test was artifactual and due to pH drift, the results of the controlled and uncontrolled-pH tests are compared. If toxicity is removed or reduced in the pH-controlled treatment, artifactual toxicity due to pH drift is confirmed for the sample. To demonstrate that a sample result of artifactual toxicity is representative of a given effluent, the regulatory authority may require additional information or additional parallel testing before pH control (as described in Subsection 12.3.5.2) is applied routinely to subsequent testing of the effluent.

12.3.5.2 The pH can be controlled with the addition of acids and bases and/or the use of a CO_2-controlled atmosphere over the test chambers. pH is adjusted with acids and bases by dropwise adding 1N NaOH or 1N HCl (see Subsection 8.8.8). The addition of acids and bases should be minimized to reduce the amount of additional ions (Na or Cl) added to the sample. pH is then controlled using the CO_2-controlled atmosphere technique. This may be accomplished by placing test solutions and test organisms in closed headspace test chambers, and then injecting a predetermined volume of CO_2 into the headspace of each test chamber (USEPA, 1991b; USEPA, 1992); or by placing test chambers in an atmosphere flushed with a predetermined mixture of CO_2 and air (USEPA, 1996). Prior experimentation will be needed to determine the appropriate CO_2/air ratio or the appropriate volume of CO_2 to inject. This volume will depend upon the sample pH, sample volume, container volume, and sample constituents.

If more than 5% CO_2 is needed, adjust the solutions with acids (1N HCl) and then flush the headspace with no more than 5% CO_2 (USEPA, 1992). If the objective of the WET test is to determine the toxicity of the effluent in the receiving water, CO_2 is injected to maintain the test pH at the pH of the receiving water (measured at the edge of the regulatory mixing zone). If the objective of the WET test is to determine the absolute toxicity of the effluent, CO_2 is injected to maintain the test pH at the pH of the sample upon completion of collection. USEPA (1991b; 1992) and Mount and Mount (1992) provide techniques and guidance for controlling test pH using a CO_2-controlled atmosphere. In pH-controlled testing, control treatments must be subjected to all manipulations that sample treatments are subjected to. These manipulations must be shown to cause no lethal or sublethal effects on control organisms. In pH-controlled testing, the pH also must be measured in each treatment at the beginning and end of each 24-h exposure period to confirm that pH was effectively controlled at the target pH level.

12.4 SAFETY

12.4.1 See Section 3, Health and Safety.

12.5 APPARATUS AND EQUIPMENT

12.5.1 Fathead minnow and brine shrimp culture units -- See Section 11, Fathead Minnow, *Pimephales Promelas*, Larval Survival and Growth Test, and USEPA, 2002a. To test effluent toxicity on-site or in the laboratory, sufficient numbers of newly fertilized eggs must be available, preferably from a laboratory fathead minnow culture unit. If necessary, embryos can be shipped in well oxygenated water in insulated containers. In cases where shipping is necessary, up to 48-h old embryos may be used for the test.

12.5.2 Samplers -- automatic sampler, preferably with sample cooling capability, that can collect a 24-h composite sample of 5 L or more.

12.5.3 Sample containers -- for sample shipment and storage (see Section 8, Effluent and Receiving Water Sampling, Sample Handling, and Sample Preparation for Toxicity Tests).

12.5.4 Environmental chamber or equivalent facility with temperature control (25 ± 1°C).

12.5.5 Water purification system -- MILLIPORE MILLI-Q®, deionized water or equivalent (see Section 5, Facilities, Equipment, and Supplies).

12.5.6 Balance -- analytical, capable of accurately weighing to 0.00001 g.

12.5.7 Reference weights, Class S -- for checking performance of balance. Weights should bracket the expected weights of material to be weighed.

12.5.8 Test chambers -- four borosilicate glass or disposable, non-toxic plastic labware, per test solution, such as: 500-mL beakers; 100 mm x 15 mm or 100 mm x 20 mm glass or disposable polystyrene Petri dishes; or 12-cm OD, stackable "Carolina" culture dishes. The chambers should be covered with safety glass plates or sheet plastic during the test to avoid potential contamination from the air and excessive evaporation of the test solutions during the test.

12.5.9 Dissecting microscope, or long focal length magnifying lens, hand or stand supported -- for examining embryos and larvae in the test chambers.

12.5.10 Light box, microscope lamp, or flashlight -- for illuminating chambers during examination and observation of embryos and larvae.

12.5.11 Volumetric flasks and graduated cylinders -- Class A, borosilicate glass or non-toxic plastic labware, 10-1000 mL, for making test solutions.

12.5.12 Volumetric pipets -- Class A, 1-100 mL.

12.5.13 Serological pipets -- 1-10 mL, graduated.

12.5.14 Pipet bulbs and fillers -- PROPIPET®, or equivalent.

12.5.15 Droppers, and glass tubing with fire polished edges, 2-mm ID -- for transferring embryos, and 4-mm ID -- for transferring larvae.

12.5.16 Wash bottles -- for washing embryos from substrates and containers and for rinsing small glassware and instrument electrodes and probes.

12.5.17 Thermometers, glass or electronic, laboratory grade -- for measuring water temperatures.

12.5.18 Bulb-thermograph or electronic-chart type thermometers -- for continuously recording temperature.

12.5.19 Thermometer, National Bureau of Standards Certified (see USEPA Method 170.1, USEPA 1979b) -- to calibrate laboratory thermometers.

12.5.20 Meters, pH, DO, and specific conductivity -- for routine physical and chemical measurements.

12.6 **REAGENTS AND CONSUMABLE MATERIALS**

12.6.1 Sample containers -- for sample shipment and storage (see Section 8, Effluent and Receiving Water Sampling, Sample Handling and Sample Preparation for Toxicity Tests).

12.6.2 Data sheets (one set per test) -- for recording data.

12.6.3 Tape, colored -- for labelling test chambers.

12.6.4 Markers, waterproof -- for marking containers, etc.

12.6.5 Reagents for hardness and alkalinity tests -- see USEPA Methods 130.2 and 310.1, USEPA 1979b.

12.6.6 Membranes and filling solutions for DO probe (see USEPA Method 360.1, USEPA 1979b), or reagents -- for modified Winkler analysis.

12.6.7 Standard pH buffers, pH 4, pH 7, and pH 10 (or as per instructions of instrument manufacturer) -- for instrument calibration (see USEPA Method 150.1, USEPA 1979b).

12.6.8 Specific conductivity standards -- see USEPA Method 120.1, USEPA 1979b.

12.6.9 Laboratory quality control samples and standards -- for calibration of the above methods.

12.6.10 Reference toxicant solutions -- see Section 4, Quality Assurance.

12.6.11 Reagent water -- defined as distilled or deionized water which does not contain substances which are toxic to the test organisms (see Section 5, Facilities, Equipment, and Supplies).

12.6.12 Effluent, receiving water, and dilution water -- see Section 7, Dilution Water; and Section 8, Effluent and Receiving Water Sampling, Sample Handling, and Sample Preparation for Toxicity Tests.

12.6.13 TEST ORGANISMS, FATHEAD MINNOWS, *PIMEPHALES PROMELAS*

12.6.13.1 Fathead minnow embryos, less than 36-h old, are used for the test. The test is conducted with four (minimum of three) test chambers at each toxicant concentration and control. Fifteen (minimum of ten) embryos are placed in each replicate test chamber. Thus 60 (minimum of 30) embryos are exposed at each test concentration and 360 (minimum of 180) embryos would be needed for a test consisting of five effluent concentrations and a control.

12.6.13.2 Sources of Organisms

12.6.13.2.1 It is recommended that the embryos be obtained from inhouse cultures or other local sources if at all possible, because it is often difficult to ship the embryos so that they will be less than 36 h old for beginning the test. Receipt of embryos via Express Mail, air express, or other carrier, from a reliable outside source is an acceptable alternative, but they must not be over 48 h old when used to begin the test.

12.6.13.2.2 Culturing methods for fathead minnows, *Pimephales promelas*, are described in Section 6, Section 11 and in USEPA, 2002a.

12.6.13.2.3 Fish obtained from outside sources (see Section 5, Facilities, Equipment, and Supplies) such as commercial biological supply houses for use as brood stock should be guaranteed to be (1) of the correct species, (2) disease free, (3) in the requested age range, and (4) in good condition. This can be done by providing the record of the date on which the eggs were laid and hatched, and information on the sensitivity of the contemporary fish to reference toxicants.

12.6.13.3 Obtaining Embryos for Toxicity Tests from Inhouse Cultures.

12.6.13.3.1 Spawning substrates with the newly-spawned, fertilized embryos are removed from the spawning tanks or ponds, and the embryos are separated from the spawning substrate by using the index finger and rolling the embryos gently with a circular movement of the finger (see Gast and Brungs, 1973). The embryos are then combined and washed from the spawning substrate onto a 400 µm NITEX® screen, sprayed with a stream of deionized water to remove detritus and food particles, and back-washed with dilution water into a crystallizing dish for microscopic examination. Damaged and infertile eggs are discarded.

12.6.13.3.2 The embryos from three or more spawns are pooled in a single container to provide a sufficient number to conduct the tests. These embryos may be used immediately to start a test inhouse or may be transported for use at a remote location. When transportation is required, embryos should be taken from the substrates within 12 h of spawning. This permits off-site tests to be started with less than 36-h old embryos. Embryos should be transported or shipped in clean, opaque, insulated containers, in well aerated or oxygenated fresh culture or dilution water, and should be protected from extremes of temperature and any other stressful conditions during transport. Instantaneous changes of water temperature when embryos are transferred from culture unit water to test dilution water, or from transport container water to on-site test dilution water, should be less than 2°C. Sudden changes in pH, dissolved ions, osmotic strength, and DO should be avoided.

12.7 EFFLUENT AND RECEIVING WATER COLLECTION, PRESERVATION, AND STORAGE

12.7.1 See Section 8, Effluent and Receiving Water Sampling, Sample Handling, and Sample Preparation for Toxicity Tests.

12.8 CALIBRATION AND STANDARDIZATION

12.8.1 See Section 4, Quality Assurance.

12.9 QUALITY CONTROL

12.9.1 See Section 4, Quality Assurance.

12.10 TEST PROCEDURES

12.10.1 TEST SOLUTIONS

12.10.1.1 Receiving Waters

12.10.1.1.1 The sampling point is determined by the objectives of the test. Receiving water toxicity is determined with samples used directly as collected or after samples are passed through a 60 µm NITEX® filter and compared without dilution, against a control. Using four replicate chambers per test, each containing 100 mL, and 400 mL for chemical analysis, would require approximately one liter, or more, of sample per test day.

12.10.1.2 Effluents

12.10.1.2.1 The selection of the effluent test concentrations should be based on the objectives of the study. A dilution factor of 0.5 is commonly used. A dilution factor of 0.5 provides precision of ± 100%, and testing of concentrations between 6.25% and 100% effluent using only five effluent concentrations (6.25%, 12.5%, 25%, 50%, and 100%). Improvements in precision decline rapidly if the dilution factor is increased beyond 0.5 and precision declines rapidly if a smaller dilution factor is used. **Therefore, USEPA recommends the use of the ≥ 0.5 dilution factor.**

12.10.1.2.2 If the effluent is known or suspected to be highly toxic, a lower range of effluent concentrations should be used (such as 25%, 12.5%, 6.25%, 3.12%, and 1.56%). If a high rate of mortality is observed during the first 1 to 2 h of the test, additional dilutions should be added at the lower range of effluent concentrations.

12.10.1.2.3 The volume of effluent required for daily renewal of four replicates per concentration, each containing 100 mL of test solution, is 1.5 L. Sufficient test solution (approximately 1000 mL) is prepared at each effluent concentration to provide 400 mL additional volume for chemical analyses. If the sample is used for more than one daily renewal of test solutions, the volume must be increased proportionately.

12.10.1.2.4 Tests should begin as soon as possible, preferably within 24 h of sample collection. The maximum holding time following retrieval of the sample from the sampling device should not exceed 36 h for the off-site toxicity tests unless permission is granted by the permitting authority. In no case should the sample be used for the first time in a test more than 72 h after sample collection (see Section 8, Effluent and Receiving Water Sampling, Sample Handling, and Sample Preparation for Toxicity Tests).

12.10.1.2.5 Just prior to test initiation (approximately 1 h) the temperature of sufficient quantity of the sample to make the test solutions should be adjusted to the test temperature and maintained at that temperature during the addition of dilution water.

12.10.1.2.6 The DO of the test solutions should be checked prior to test initiation. If any of the solutions are supersaturated with oxygen, all of the solutions and the control should be gently aerated. If any solution has a DO below 4.0 mg/L, all of the solutions and the control must be gently aerated.

12.10.1.3 Dilution Water

12.10.1.3.1 Dilution water may be uncontaminated receiving water, a standard synthetic (reconstituted) water, or some other uncontaminated natural water (see Section 7, Dilution Water).

12.10.1.3.2 If the hardness of the test solutions (including the control) does not equal or exceed 25 mg/L as $CaCO_3$, it may be necessary to adjust the hardness by adding reagents for synthetic softwater as listed in Table 3, Section 7. In this case parallel tests should be conducted, one with the hardness adjusted and one unadjusted.

12.10.2 START OF THE TEST

12.10.2.1 Label the test chambers with a marking pen and use color-coded tape to identify each treatment and replicate. A minimum of five effluent concentrations and a control are used for each effluent test. Each treatment (including the control) should have four (minimum of three) replicates.

12.10.2.2 Tests performed in laboratories that have inhouse fathead minnow breeding cultures must initiate tests with embryos less than 36 h old. When the embryos must be shipped to the test site from a remote location, it may be necessary to use embryos older than 36 h because of the difficulty of coordinating test organism shipments with field operations. However, in the latter case, the embryos must not be more than 48 h old at the start of the test and should all be within 24 h of the same age.

12.10.2.3 Randomize the position of the test chambers at the beginning of the test (see Appendix A). Maintain the chambers in this configuration throughout the test. Preparation of a position chart may be helpful.

12.10.2.4 The test organisms should come from a pool of embryos consisting of at least three separate spawnings. Gently agitate and mix the embryos to be used in the test in a large container so that eggs from different spawns are thoroughly mixed.

12.10.2.5 Using a small bore (2 mm ID) glass tube, the embryos are placed one or two at a time into each randomly arranged test chamber or intermediate container in sequential order, until each chamber contains 15 (minimum of 10) embryos, for a total of 60 (minimum of 30) embryos for each concentration (see Appendix A). The amount of water added to the chambers when transferring the embryos to the compartments should be kept to a minimum to avoid unnecessary dilution of the test concentrations.

12.10.2.6 After the embryos have been distributed to each test chamber, examine and count them. Remove and discard damaged or infertile eggs and replace with new undamaged embryos. Placing the test chambers on a light table may facilitate examining and counting the embryos.

12.10.3 LIGHT, PHOTOPERIOD AND TEMPERATURE

12.10.3.1 The light quality and intensity should be at ambient laboratory levels, which is approximately 10-20 $\mu E/m^2/s$, or 50 to 100 foot candles (ft-c), with a photoperiod of 16 h of light and 8 h of darkness. The water temperature in the test chambers should be maintained at 25 ± 1 °C.

12.10.4 DISSOLVED OXYGEN (DO) CONCENTRATION

12.10.4.1 Aeration may affect the toxicity of effluents and should be used only as a last resort to maintain satisfactory DO concentrations. The DO concentrations should be measured in the new solutions at the start of the test (Day 0) and before daily renewal of the new solutions on subsequent days. The DO concentrations should not fall below 4.0 mg/L (see Section 8, Effluent and Receiving Water Sampling, Sample Handling, and Sample Preparation for Toxicity Tests). If it is necessary to aerate, all concentrations and the control should be aerated. The aeration rate should not exceed 100 bubbles/min, using a pipet with an orifice of approximately 1.5 mm, such as a l-mL KIMAX® serological Pipet, or equivalent. Care should be taken to ensure that turbulence resulting from the aeration does not cause undue physical stress to the embryos.

12.10.5 FEEDING

12.10.5.1 Feeding is not required.

12.10.6 OBSERVATIONS DURING THE TEST

12.10.6.1 Routine Chemical and Physical Determinations

12.10.6.1.1 DO is measured at the beginning and end of each 24-h exposure period in at least one test chamber at each test concentrations and in the control.

12.10.6.1.2 Temperature and pH are measured at the end of each 24-h exposure period in at least one test chamber at each test concentration and in the control. Temperature should also be monitored continuously or observed and recorded daily for at least two locations in the environmental control system or the samples. Temperature should be measured in a sufficient number of test vessels, at least at the end of the test, to determine temperature variation in the environmental chamber.

12.10.6.1.3 The pH is measured in the effluent sample each day before new test solutions are made.

12.10.6.1.4 Conductivity, alkalinity and hardness are measured in each new sample (100% effluent or receiving water) and in the control.

12.10.6.2 Record all the measurements on the data sheet (Figure 1).

12.10.6.3 Routine Biological Observations

12.10.6.3.1 At the end of the first 24 h of exposure, before renewing the test solutions, examine the embryos. Remove the dead embryos (milky colored and opaque) and record the number (Figure 2). If the rate of mortality (including those with fungal infection) exceeds 20% in the control chambers, or if excessive non-concentration-related mortality occurs, terminate the test and start a new test with new embryos.

12.10.6.3.2 At 25°C, hatching may begin on the fourth day. After hatching begins, count the number of dead and live embryos and the number of hatched, dead, live, and deformed larvae, daily. Deformed larvae are those with gross morphological abnormalities such as lack of appendages, lack of fusiform shape (non-distinct mass), lack of mobility, a colored, beating heart in an opaque mass, or other characteristics that preclude survival. Count and remove dead embryos and larvae as previously discussed and record the numbers for all of the test observations (Figure 2). Upon hatching, deformed larvae are counted as dead.

12.10.6.3.3 Protect the embryos and larvae from unnecessary disturbance during the test by carrying out the daily test observations, solution renewals, and removal of dead organisms carefully. Make sure that the test organisms remain immersed during the performance of the above operations.

12.10.7 DAILY CLEANING OF TEST CHAMBERS

12.10.7.1 Since feeding is not required, test chambers are not cleaned daily unless accumulation of particulate matter at the bottom of the chambers causes a problem.

12.10.8 TEST SOLUTION RENEWAL

12.10.8.1 Freshly prepared solutions are used to renew the tests daily. For on-site toxicity studies, fresh effluent or receiving water samples should be collected daily, and no more than 24 h should elapse between collection of the samples and their use in the tests (see Section 8, Effluent and Receiving Water Sampling, Sample Handling and Sample Preparation for Toxicity Tests). For off-site tests, a minimum of three samples are collected, preferably on days one, three, and five. Maintain the samples in the refrigerator at 0-6°C until used.

12.10.8.2 The test solutions are renewed immediately after removing dead embryos and/or larvae. During the daily renewal process, the water level in each chamber is lowered to a depth of 7 to 10 mm, which leaves 15 to 20% of the test solution. New test solution should be added slowly by pouring down the side of the test chamber to avoid excessive turbulence and possible injury to the embryos or larvae.

Discharger:_____ Test Dates:_____

Location:_____ Analyst:_____

Control:		Day 1	2	3	4	5	6	7	Remarks
Temp.									
D.O.	Initial								
	Final								
pH	Initial								
	Final								
Alkalinity									
Hardness									
Conductivity									
Chlorine									

Conc:		Day 1	2	3	4	5	6	7	Remarks
Temp.									
D.O.	Initial								
	Final								
pH	Initial								
	Final								
Alkalinity									
Hardness									
Conductivity									
Chlorine									

Conc:		Day 1	2	3	4	5	6	7	Remarks
Temp.									
D.O.	Initial								
	Final								
pH	Initial								
	Final								
Alkalinity									
Hardness									
Conductivity									
Chlorine									

Figure 1. Data form for the fathead minnow, *Pimephales promelas*, embryo-larval survival and teratogenicity test. Routine chemical and physical determinations.

Discharger:_____ Test Dates:_____

Location:_____ Analyst:_____

Control:	Day 1	2	3	4	5	6	7	Remarks
Temp.								
D.O. Initial								
Final								
pH Initial								
Final								
Alkalinity								
Hardness								
Conductivity								
Chlorine								

Conc:	Day 1	2	3	4	5	6	7	Remarks
Temp.								
D.O. Initial								
Final								
pH Initial								
Final								
Alkalinity								
Hardness								
Conductivity								
Chlorine								

Conc:	Day 1	2	3	4	5	6	7	Remarks
Temp.								
D.O. Initial								
Final								
pH Initial								
Final								
Alkalinity								
Hardness								
Conductivity								
Chlorine								

Figure 1. Data form for the fathead minnow, *Pimephales promelas*, embryo-larval survival and teratogenicity test. Routine chemical and physical determinations (CONTINUED)

Discharger:_____ Test Dates:_____

Location:_____ Analyst:_____

Conc:	Rep. No.	Condition of Embryo/larvae	Day						
			1	2	3	4	5	6	7
Control	1	Live/dead							
		Terata							
	2	Live/dead							
		Terata							
	3	Live/dead							
		Terata							
	4	Live/dead							
		Terata							
Treatment	1	Live/dead							
		Terata							
	2	Live/dead							
		Terata							
	3	Live/dead							
		Terata							
	4	Live/dead							
		Terata							
Treatment	1	Live/dead							
		Terata							
	2	Live/dead							
		Terata							
	3	Live/dead							
		Terata							
	4	Live/dead							
		Terata							
Treatment	1	Live/dead							
		Terata							
	2	Live/dead							
		Terata							
	3	Live/dead							
		Terata							
	4	Live/dead							
		Terata							

Figure 2. Data form for the fathead minnow, *Pimephales promelas*, embryo-larval survival and teratogenicity test. Survival and terata data.

Discharger:_____ Test Dates:_____

Location:_____ Analyst:_____

Conc:	Rep. No.	Condition of Embryo/larvae	Day						
			1	2	3	4	5	6	7
Treatment	1	Live/dead							
		Terata							
	2	Live/dead							
		Terata							
	3	Live/dead							
		Terata							
	4	Live/dead							
		Terata							
Treatment	1	Live/dead							
		Terata							
	2	Live/dead							
		Terata							
	3	Live/dead							
		Terata							
	4	Live/dead							
		Terata							

Comments:

Figure 2. Data form for the fathead minnow, *Pimephales promelas*, embryo-larval survival and teratogenicity test. Survival and terata data (CONTINUED).

12.10.9 TERMINATION OF THE TEST

12.10.9.1 The test is terminated after seven days of exposure. Count the number of surviving, dead, and deformed larvae, and record the numbers of each (Figure 2). The deformed larvae are treated as dead in the analysis of the data. Keep a separate record of the total number and percent of deformed larvae for use in reporting the teratogenicity of the test solution.

12.10.9.2 Prepare a summary of the data as illustrated in Figure 3.

12.11 SUMMARY OF TEST CONDITIONS AND TEST ACCEPTABILITY CRITERIA

12.11.1 A summary of test conditions and test acceptability criteria is presented in Table 1.

12.12 ACCEPTABILITY OF TEST RESULTS

12.12.1 For the test results to be acceptable, survival in the controls must be at least 80%.

Discharger: _____ Test Dates: _____

Location: _____ Analyst: _____

Treatment	Control					
No. dead embryos and larvae						
No. terata						
Total mortality (dead and deformed)						
Total mortality (%)						
Terata (%)						
Hatch (%)						

Comments:

Figure 3. Summary data for the fathead minnow, *Pimephales promelas*, embryo-larval survival and teratogenicity test.

TABLE 1. SUMMARY OF TEST CONDITIONS AND TEST ACCEPTABILITY CRITERIA FOR FATHEAD MINNOW, *PIMEPHALES PROMELAS,* EMBRYO-LARVAL SURVIVAL AND TERATOGENICITY TOXICITY TESTS WITH EFFLUENTS AND RECEIVING WATERS (TEST METHOD 1001.0)[1]

1.	Test type:	Static renewal (required)
2.	Temperature:	25 ± 1°C (recommended) Test temperatures must not deviate (i.e., maximum minus minimum temperature) by more than 3°C during the test (required)
3.	Light quality:	Ambient laboratory illumination (recommended)
4.	Light intensity:	10-20 $\mu E/m^2/s$ or 50-100 ft-c (ambient laboratory levels) (recommended)
5.	Photoperiod:	16 h light, 8 h dark (recommended)
6.	Test chamber size:	150 mL (recommended minimum)
7.	Test solution volume:	70 mL (recommended minimum)
8.	Renewal of test solutions:	Daily (required)
9.	Age of test organisms:	Less than 36-h old embryos (Maximum of 48-h if shipped) (required)
10.	No. embryos per test chamber:	15 (recommended) 10 (required minimum)
11.	No. replicate test chambers per concentration:	4 (recommended) 3 (required minimum)
12.	No. embryos per concentration:	60 (recommended) 30 (required minimum)
13.	Feeding regime:	Feeding not required
14.	Aeration:	None unless DO falls below 4.0 mg/L (recommended)

[1] For the purposes of reviewing WET test data submitted under NPDES permits, each test condition listed above is identified as required or recommended (see Subsection 10.2 for more information on test review). Additional requirements may be provided in individual permits, such as specifying a given test condition where several options are given in the method.

TABLE 1. SUMMARY OF TEST CONDITIONS AND TEST ACCEPTABILITY CRITERIA FOR FATHEAD MINNOW, *PIMEPHALES PROMELAS,* EMBRYO-LARVAL SURVIVAL AND TERATOGENICITY TOXICITY TESTS WITH EFFLUENTS AND RECEIVING WATERS (TEST METHOD 1001.0) (CONTINUED)

15. Dilution water:	Uncontaminated source of receiving or other natural water, synthetic water prepared using MILLIPORE MILLI-Q® or equivalent deionized water and reagent grade chemicals or DMW (see Section 7, Dilution Water). The hardness of the test solutions should equal or exceed 25 mg/L ($CaCO_3$) to ensure hatching success (available options)
16. Test concentrations:	Effluents: 5 and a control (required minimum) Receiving waters: 100% receiving water (or minimum of 5) and a control (recommended)
17. Dilution factor:	Effluents: ≥ 0.5 (recommended) Receiving waters: None, or ≥ 0.5 (recommended)
18. Test duration:	7 days (required)
19. Endpoint:	Combined mortality (dead and deformed organisms) (required)
20. Test acceptability criteria:	80% or greater survival in controls (required)
21. Sampling requirements:	For on-site tests, samples collected daily and used within 24 h of the time they are removed from the sampling device. For off-site tests, a minimum of three samples (e.g., collected on days one, three, and five) with a maximum holding time of 36 h before first use (see Section 8, Effluent and Receiving Water Sampling, Sample Handling, and Sample Preparation for Toxicity Tests, Subsection 8.5.4) (required)
22. Sample volume required:	1.5 to 2.5 L/day depending on the volume of test solutions used (recommended)

12.13 **DATA ANALYSIS**

12.13.1 GENERAL

12.13.1.1 Tabulate and summarize the data (Figure 3).

12.13.1.2 The endpoints of this toxicity test are based on total mortality, combined number of dead embryos, and dead and deformed larvae. The EC1 is calculated using Probit Analysis (Finney, 1971; see Appendix I). Separate analyses are performed for the estimation of LOEC and NOEC endpoints and for the estimation of the EC1 endpoint. Concentrations at which there is no survival in any of the test chambers are excluded from the statistical analysis of the NOEC and LOEC, but included in the estimation of the EC1 endpoint. See the Appendices for examples of the manual computations and examples of data input and output for the computer programs.

12.13.1.3 The statistical tests described here must be used with a knowledge of the assumptions upon which the tests are contingent. The assistance of a statistician is recommended for analysts who are not proficient in statistics.

12.13.2 EXAMPLE OF ANALYSIS OF FATHEAD MINNOW EMBRYO-LARVAL SURVIVAL AND TERATOGENICITY DATA

12.13.2.1 Formal statistical analysis of the total mortality data is outlined on the flowchart in Figure 4. The response used in the analysis is the total mortality proportion in each test or control chamber. Separate analyses are performed for the estimation of the NOEC and LOEC endpoints and for the estimation of the EC endpoint. Concentrations at which there is 100% total mortality in all of the test chambers are excluded from statistical analysis of the NOEC and LOEC, but included in the estimation of the EC1 endpoint.

12.13.2.2 For the case of equal numbers of replicates across all concentrations and the control, the evaluation of the NOEC and LOEC endpoints is made via a parametric test, Dunnett's Procedure, or a nonparametric test, Steel's Many-one Rank Test, on the arc sine square root transformed data. Underlying assumptions of Dunnett's Procedure, normality and homogeneity of variance, are formally tested. The test for normality is the Shapiro-Wilk's Test, and Bartlett's Test is used to test for homogeneity of variance. If either of these tests fails, the nonparametric test, Steel's Many-one Rank Test, is used to determine the NOEC and LOEC endpoints. If the assumptions of Dunnett's Procedure are met, the endpoints are estimated by the parametric procedure.

12.13.2.3 If unequal numbers of replicates occur among the concentration levels tested, there are parametric and nonparametric alternative analyses. The parametric analysis is a t test with the Bonferroni adjustment (see Appendix D). The Wilcoxon Rank Sum Test with the Bonferroni adjustment is the nonparametric alternative (see Appendix F).

12.13.2.4 Probit Analysis (Finney, 1971) is used to estimate the concentration that causes a specified percent decrease in survival from the control. In this analysis, the total mortality data from all test replicates at a given concentration are combined.

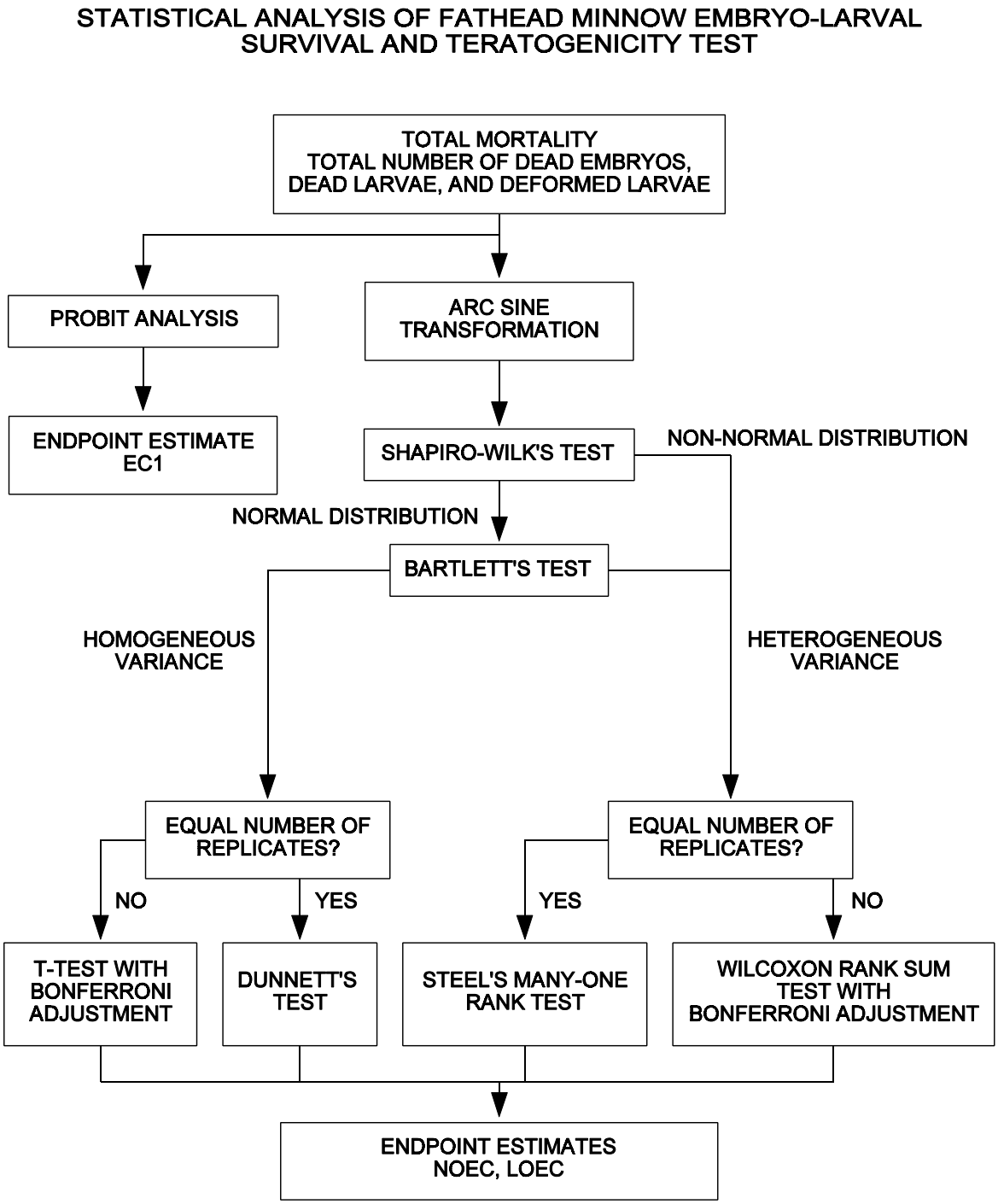

Figure 4. Flowchart for statistical analysis of fathead minnow, *Pimephales promelas*, embryo-larval data.

12.13.2.5 The data for this example are listed in Table 2. Total mortality, expressed as a proportion (combined total number of dead embryos, dead larvae and deformed larvae divided by the number of embryos at start of test), is the response of interest. The total mortality proportion in each replicate must first be transformed by the arc sine square root transformation procedure described in Appendix B. The raw and transformed data, means and variances of the transformed observations at each effluent concentration and control are listed in Table 3. A plot of the data is provided in Figure 5. Since there is 100% total mortality in replicates for the 50.0% concentration, it is not included in this statistical analysis and is considered a qualitative mortality effect.

TABLE 2. DATA FROM FATHEAD MINNOW, *PIMEPHALES PROMELAS*, EMBRYO-LARVAL TOXICITY TEST WITH GROUND WATER EFFLUENT

Effluent Conc. (%)	No. Eggs at Start	Dead at Test Termination		Deformed at Test Termination		Dead + Deformed at Termination	
		No.	%	No.	%	No.	%
Control	10	0	0	0	0	0	0
	10	2	20	0	0	2	20
	10	0	0	0	0	0	0
	10	1	10	0	0	1	10
3.125	10	0	0	0	0	0	0
	10	0	0	1	10	1	10
	10	0	0	0	0	0	0
	10	1	10	0	0	1	10
6.25	10	0	0	0	0	0	0
	10	0	0	0	0	0	0
	10	0	0	0	0	0	0
	10	0	0	1	10	1	10
12.5	10	0	0	0	0	0	0
	10	0	0	0	0	0	0
	10	0	0	0	0	0	0
	10	1	10	0	0	1	10
25.0	10	1	10	9	90	10	100
	10	2	20	8	80	10	100
	10	2	20	8	80	10	100
	10	1	10	4	40	5	50
50.0	10	4	40	6	60	10	100
	10	3	30	7	70	10	100
	10	5	50	5	50	10	100
	10	3	30	7	70	10	100

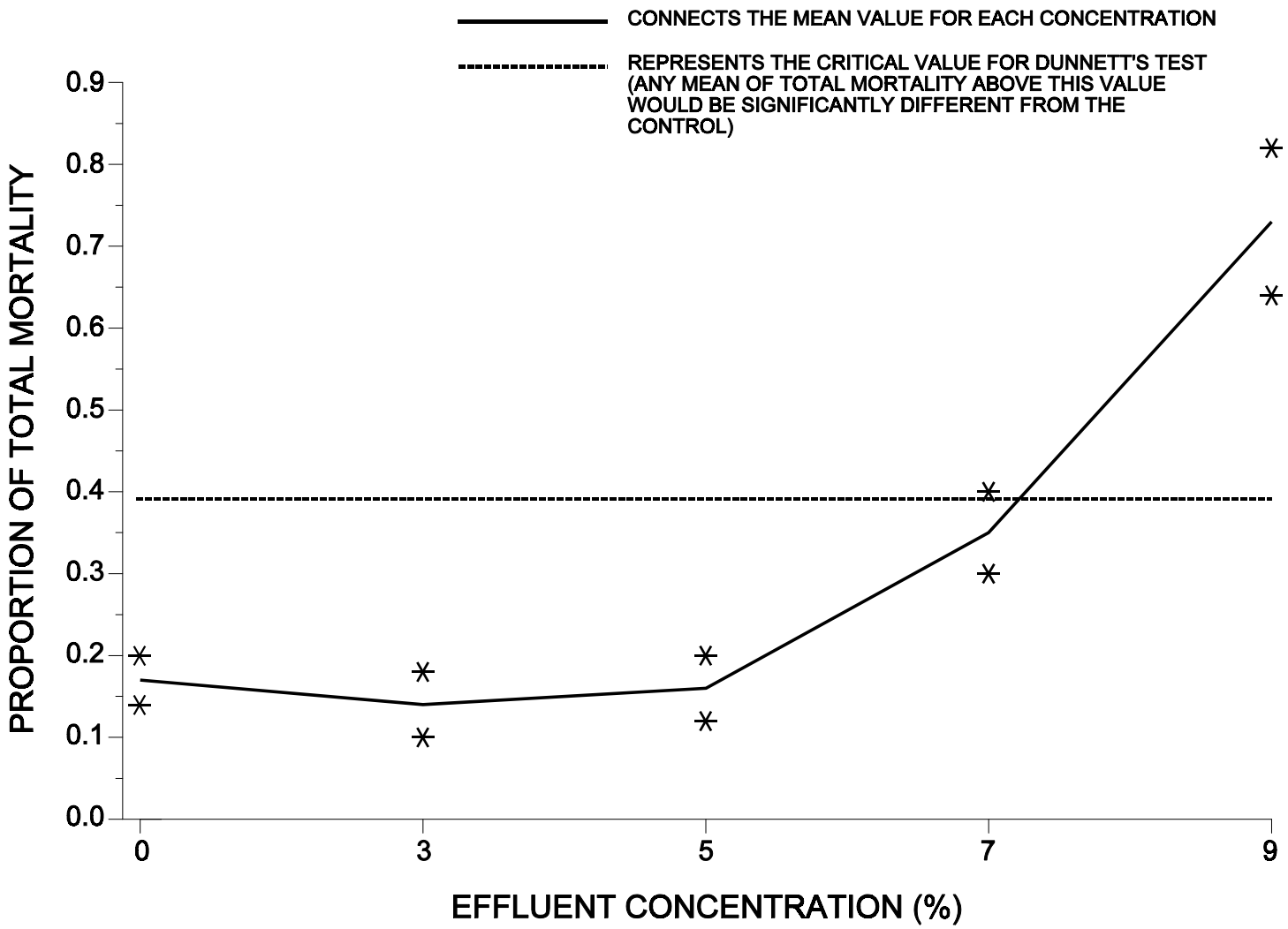

Figure 5. Plot of fathead minnow, *Pimephales promelas*, total mortality data from the embryo-larval test.

TABLE 3. FATHEAD MINNOW, *PIMEPHALES PROMELAS,* EMBRYO-LARVAL TOTAL MORTALITY DATA

			Effluent Concentration (%)				
	Replicate	Control	3.125	6.25	12.5	25.0	50.0
RAW	A	0.00	0.00	0.00	0.00	1.00	1.00
	B	0.20	0.10	0.00	0.00	1.00	1.00
	C	0.00	0.00	0.00	0.00	1.00	1.00
	D	0.10	0.10	0.10	0.10	0.50	1.00
ARC SINE	A	0.159	0.159	0.159	0.159	1.412	-
TRANS-	B	0.464	0.322	0.159	0.159	1.412	-
FORMED	C	0.159	0.159	0.159	0.159	1.412	-
	D	0.322	0.322	0.322	0.322	0.785	-
Mean($\bar{Y}_i$)		0.276	0.241	0.200	0.200	1.255	
S_i^2		0.022	0.009	0.007	0.007	0.098	
i		1	2	3	4	5	

12.13.2.6 Test for Normality

12.13.2.6.1 The first step of the test for normality is to center the observations by subtracting the mean of all observations within a concentration from each observation in that concentration. The centered observations are summarized in Table 4.

TABLE 4. CENTERED OBSERVATIONS FOR SHAPIRO-WILK'S EXAMPLE

		Effluent Concentration (%)				
Replicate	Control	3.125	6.25	12.5	25.0	50.0
A	-0.117	-0.082	-0.041	-0.041	0.157	-
B	0.188	0.081	-0.041	-0.041	0.157	-
C	-0.117	0.081	-0.041	-0.041	0.157	-
D	0.046	-0.082	0.122	0.122	-0.470	-

12.13.2.6.2 Calculate the denominator, D, of the statistic:

$$D = \sum_{i=1}^{n} (X_i - \bar{X})^2$$

Where: X_i = the ith centered observation

$\bar{X}$ = the overall mean of the centered observations

n = the total number of centered observations

12.13.2.6.3 For this set of data, $n = 20$

$$\bar{X} = \frac{1}{20}(-0.003) = 0.000$$

$$D = 0.4261$$

12.13.2.6.4 Order the centered observations from smallest to largest

$$X^{(1)} \leq X^{(2)} \leq \ldots \leq X^{(n)}$$

where $X^{(i)}$ denotes the ith ordered observation. The ordered observations for this example are listed in Table 5.

TABLE 5. ORDERED CENTERED OBSERVATIONS FOR THE SHAPIRO-WILK'S EXAMPLE

i	$X^{(i)}$	i	$X^{(i)}$
1	-0.470	11	-0.041
2	-0.117	12	0.046
3	-0.117	13	0.081
4	-0.082	14	0.081
5	-0.082	15	0.122
6	-0.041	16	0.122
7	-0.041	17	0.157
8	-0.041	18	0.157
9	-0.041	19	0.157
10	-0.041	20	0.188

12.13.2.6.5 From Table 4, Appendix B, for the number of observations, n, obtain the coefficients $a_1, a_2, \ldots, a_k$ where k is n/2 if n is even and (n-1)/2 if n is odd. For the data in this example, n = 20 and k = 10. The a_i values are listed in Table 6.

TABLE 6. COEFFICIENTS AND DIFFERENCES FOR THE SHAPIRO-WILK'S EXAMPLE

i	a_i	$X^{(n-i+1)} - X^{(i)}$	
1	0.4734	0.658	$X^{(20)} - X^{(1)}$
2	0.3211	0.274	$X^{(19)} - X^{(2)}$
3	0.2565	0.274	$X^{(18)} - X^{(3)}$
4	0.2085	0.239	$X^{(17)} - X^{(4)}$
5	0.1686	0.204	$X^{(16)} - X^{(5)}$
6	0.1334	0.163	$X^{(15)} - X^{(6)}$
7	0.1013	0.122	$X^{(14)} - X^{(7)}$
8	0.0711	0.122	$X^{(13)} - X^{(8)}$
9	0.0422	0.087	$X^{(12)} - X^{(9)}$
10	0.0140	0.000	$X^{(11)} - X^{(10)}$

12.13.2.6.6 Compute the test statistic, W, as follows:

$$W = \frac{1}{D}\left[\sum_{i=1}^{k} a_i (X^{(n-i+1)} - X^{(i)})\right]^2$$

The differences $X^{(n-i+1)} - X^{(i)}$ are listed in Table 6. For the data in this example,

$$W = \frac{1}{0.4261}(0.6004)^2$$
$$= 0.846$$

12.13.2.6.7 The decision rule for this test is to compare W as calculated in Section 13.2.6.6 to a critical value found in Table 6, Appendix B. If the computed W is less than the critical value, conclude that the data are not normally distributed. For the data in this example, the critical value at a significance level of 0.01 and n = 20 observations is 0.868. Since W = 0.846 is less than the critical value, conclude that the data are not normally distributed.

12.13.2.6.8 Since the data do not meet the assumption of normality, Steel's Many-one Rank Test will be used to analyze the total mortality data.

12.13.2.7 Steel's Many-one Rank Test

12.13.2.7.1 For each control and concentration combination, combine the data and arrange the observations in order of size from smallest to largest. Assign the ranks (1, 2, ..., 8) to the ordered observations with a rank of 1 assigned to the smallest observation, rank of 2 assigned to the next larger observation, etc. If ties occur when ranking, assign the average rank to each tied observation.

12.13.2.7.2 An example of assigning ranks to the combined data for the control and 3.125% effluent concentration is given in Table 7. This ranking procedure is repeated for each control/concentration combination. The complete set of rankings is summarized in Table 8. The control group ranks are next summed for each effluent concentration pairing, as shown in Table 9.

TABLE 7. ASSIGNING RANKS TO THE CONTROL AND 3.125% EFFLUENT CONCENTRATION FOR STEEL'S MANY-ONE RANK TEST

Rank	Transformed Proportion Mortality	Effluent Concentration (%)
2.5	0.159	Control
2.5	0.159	Control
2.5	0.159	3.125
2.5	0.159	3.125
6	0.322	Control
6	0.322	3.125
6	0.322	3.125
8	0.464	Control

TABLE 8. TABLE OF RANKS FOR STEEL'S MANY-ONE RANK TEST

			Effluent Concentration (%)							
Repl.	Control		3.125		6.25		12.5		25.0	
A	0.159	(2.5,3,3,1.5)	0.159	(2.5)	0.159	(3)	0.159	(3)	1.412	(7)
B	0.464	(8,8,8,4)	0.322	(6)	0.159	(3)	0.159	(3)	1.412	(7)
C	0.159	(2.5,3,3,1.5)	0.159	(2.5)	0.159	(3)	0.159	(3)	1.412	(7)
D	0.322	(6,6.5,6.5,3)	0.322	(6)	0.322	(3)	0.159	(3)	0.785	(5)

TABLE 9. RANK SUMS

Effluent Concentration (%)	Control Rank Sum
3.125	19
6.25	20.5
12.5	20.5
25.0	10

12.13.2.7.3 For this example, we want to determine if the total mortality in any of the effluent concentrations is significantly higher than the total mortality in the control. If this occurs, the rank sum of the control would be significantly less than the rank sum at that concentration. Thus we are only concerned with comparing the control rank sum for each pairing with the various effluent concentrations with some "minimum" or critical rank sum, at or below which the concentration total mortality would be considered significantly greater than the control. At a signficance level of 0.05, the minimum rank sum in a test with four concentrations (excluding the control) and four replicates per concentration is 10 (see Table 5, Appendix E).

12.13.2.7.4 Since the control rank sum for the 25.0% effluent concentration pairing is equal to the critical value, the total proportion mortality in the 25.0% concentration is considered significantly greater than that in the control. Since no other rank sums are less than or equal to the critical value, no other concentrations have signficantly higher total proportion mortality than the control. Hence the NOEC is 12.5% and the LOEC is 25.0%.

12.13.2.8 Calculation of the LC50

12.13.2.8.1 The data used for the Probit Analysis is summarized in Table 10. To perform the Probit Analysis, run the USEPA Probit Analysis Program. An example of the program input and output is supplied in Appendix I.

12.13.2.8.2 For this example, the chi-square test for heterogeneity was not significant. Thus Probit Analysis appears appropriate for this data.

12.13.2.8.3 Figure 6 shows the output data for the Probit Analysis of the data from Table 10 using the USEPA Probit Program.

TABLE 10. DATA FOR PROBIT ANALYSIS

		Effluent Concentration (%)				
	Control	3.125	6.25	12.5	25.0	50.0
Number Dead	3	1	0	1	6	15
Number Exposed	40	40	40	40	40	40

12.14 **PRECISION AND ACCURACY**

12.14.1 PRECISION

12.14.1.1 Single-laboratory Precision

12.14.1.1.1 Data shown in Tables 11 and 12 indicate that the precision of the embryo-larval survival and teratogenicity test, expressed as the relative standard deviation (or coefficient of variation, CV) of the LC1 values, was 62% for cadmium (Table 11) and 41% for Diquat (Table 12).

12.14.1.1.2 Precision data are also available from four embryo-larval survival and teratogenicity tests on trickling filter pilot plant effluent (Table 13). Although the data could not be analyzed by Probit Analysis, the NOECs and LOECs obtained using Dunnett's Procedure were the same for all four tests, 7% and 11% effluent, respectively, indicating maximum precision in terms of the test design.

12.14.1.2 Multilaboratory Precision

12.14.1.2.1 Data on the multilaboratory precision of this test are not yet available.

12.14.2 ACCURACY

12.14.2.1 The accuracy of toxicity tests cannot be determined.

USEPA PROBIT ANALYSIS PROGRAM
USED FOR CALCULATING LC/EC VALUES
Version 1.5

Probit Analysis of Fathead Minnow Embryo-Larval Survival
and Teratogenicity Data

Conc.	Number Exposed	Number Resp.	Observed Proportion Responding	Proportion Responding Adjusted for Controls
Control	20	2	0.1000	0.0000
0.5000	20	2	0.1000	0.0174
1.0000	20	1	0.0500	-.0372
2.0000	20	4	0.2000	0.1265
4.0000	20	16	0.8000	0.7816
8.0000	20	20	1.0000	1.0000

Chi - Square for Heterogeneity (calculated) = 0.441
Chi - Square for Heterogeneity (tabular value) = 7.815

Probit Analysis of Fathead Minnow Embryo-Larval Survival
and Teratogenicity Data

Estimated LC/EC Values and Confidence Limits

Point	Exposure Conc.	Lower 95% Confidence	Upper Limits
LC/EC 1.00	1.346	0.453	1.922
LC/EC 50.00	3.018	2.268	3.672

Figure 6. Output for USEPA Probit Program, Version 1.5.

TABLE 11. PRECISION OF THE FATHEAD MINNOW, *PIMEPHALES PROMELAS*, EMBRYO-LARVAL SURVIVAL AND TERATOGENICITY TEST, USING CADMIUM AS A REFERENCE TOXICANT[1,2]

Test	LC1[3] (mg/L)	95% Confidence Limits	NOEC[4] (mg/L)
1	0.014	0.009 - 0.018	0.012
2	0.006	0.003 - 0.010	0.012
3	0.005	0.003 - 0.009	0.013
4	0.003	0.002 - 0.004	0.011
5	0.006	0.003 - 0.009	0.012
N	5		5
Mean	0.0068		NA
SD	0.0042		
CV(%)	62		NA

1 Tests conducted by Drs. Wesley Birge and Jeffrey Black, University of Kentucky, Lexington, under a cooperative agreement with the Bioassessment and Ecotoxicology Branch, EMSL, USEPA, Cincinnati, OH.

2 Cadmium chloride was used as the reference toxicant. The nominal concentrations, expressed as cadmium (mg/L), were: 0.01, 0.032, 0.100, 0.320, and 1.000. The dilution water was reconstituted water with a hardness of 100 mg/L as calcium carbonate, and a pH of 7.8.

3 Determined by Probit Analysis.

4 Highest no-observed-effect concentration determined by independent statistical analysis (2X2 Chi-square Fisher's Exact Test). NOEC range of 0.011 - 0.013 represents a difference of one exposure concentration.

TABLE 12. PRECISION OF THE FATHEAD MINNOW, *PIMEPHALES PROMELAS*, EMBRYO-LARVAL, SURVIVAL AND TERATOGENICITY TOXICITY TEST, USING DIQUAT AS A REFERENCE TOXICANT[1,2]

Test	LC1[3] (mg/L)	95% Confidence Limits
1	0.58	0.32 - 0.86
2	2.31	--[4]
3	1.50	1.05 - 1.87
4	1.71	1.24 - 2.09
5	1.43	0.93 - 1.83
N	5	
Mean	1.51	
SD	0.62	
CV(%)	41.3	

1 Tests conducted by Drs. Wesley Birge and Jeffrey Black, University of Kentucky, Lexington, under a cooperative agreement with the Bioassessment and Ecotoxicology Branch, EMSL, USEPA, Cincinnati, OH.

2 The Diquat concentrations were determined by chemical analysis. The dilution water was reconstituted water with a hardness of 100 mg/L as calcium carbonate, and a pH of 7.8.

3 Determined by Probit Analysis.

4 Cannot be calculated.

TABLE 13. PRECISION OF THE FATHEAD MINNOW, *PIMEPHALES PROMELAS*, EMBRYO-LARVAL SURVIVAL AND TERATOGENICITY STATIC-RENEWAL TEST CONDUCTED WITH TRICKLING FILTER EFFLUENT[1,2,3]

Test No.	NOEC (% Effluent)	LOEC (% Effluent)
1	7	11
2	7	11
3	7	11
4	7	11

[1] Data provided by Timothy Neiheisel, Bioassessment and Ecotoxiology Branch, EMSL, USEPA, Cincinnati, OH.
[2] Effluent concentrations used: 3, 5, 7, 11 and 16%
[3] Maximum precision achieved in terms of NOEC-LOEC interval. For a discusssion of the precision of data from chronic toxicity tests (see Section 4, Quality Assurance).

SECTION 13

TEST METHOD

DAPHNID, *CERIODAPHNIA DUBIA*, SURVIVAL AND REPRODUCTION TEST METHOD 1002.0

13.1 SCOPE AND APPLICATION

13.1.1 This method measures the chronic toxicity of effluents and receiving water to the daphnid, *Ceriodaphnia dubia*, using less than 24 h old neonates during a three-brood (seven-day), static renewal test. The effects include the synergistic, antagonistic, and additive effects of all the chemical, physical, and biological components which adversely affect the physiological and biochemical functions of the test organisms.

13.1.2 Daily observations on mortality make it possible to also calculate acute toxicity for desired exposure periods (i.e., 24-h, 48-h, and 96-h LC50s).

13.1.3 Detection limits of the toxicity of an effluent or pure substance are organism dependent.

13.1.4 Brief excursions in toxicity may not be detected using 24-h composite samples. Also, because of the long sample collection period involved in composite sampling, and because the test chambers are not sealed, highly degradable or highly volatile toxicants in the source may not be detected in the test.

13.1.5 This test method is commonly used in one of two forms: (1) a definitive test, consisting of a minimum of five effluent concentrations and a control, and (2) a receiving water test(s), consisting of one or more receiving water concentrations and a control.

13.2 SUMMARY OF METHOD

13.2.1 *Ceriodaphnia dubia* are exposed in a static renewal system to different concentrations of effluent, or to receiving water, until 60% or more of surviving control females have three broods of offspring. Test results are based on survival and reproduction. If the test is conducted as described, the surviving control organisms should produce 15 or more young in three broods. If these criteria are not met at the end of 8 days, the test must be repeated.

13.3 INTERFERENCES

13.3.1 Toxic substances may be introduced by contaminants in dilution water, glassware, sample hardware, and testing equipment (see Section 5, Facilities, Equipment, and Supplies).

13.3.2 Improper effluent sampling and handling may adversely affect test results (see Section 8, Effluent and Receiving Water Sampling, Sample Handling, and Sample Preparation for Toxicity Tests).

13.3.3 Pathogenic and/or predatory organisms in the dilution water and effluent may affect test organism survival and confound test results.

13.3.4 The amount and type of natural food in the effluent or dilution water may confound test results.

13.3.5 Food added during the test may sequester metals and other toxic substances and confound test results. Daily renewal of solutions, however, will reduce the probability of reduction of toxicity caused by feeding.

13.3.6 pH drift during the test may contribute to artifactual toxicity when ammonia or other pH-dependent toxicants (such as metals) are present. As pH increases, the toxicity of ammonia also increases (see Subsection 8.8.6), so upward pH drift may increase sample toxicity. For metals, toxicity may increase or decrease with increasing pH. Lead and copper were found to be more acutely toxic at pH 6.5 than at pH 8.0 or 8.5, while nickel and zinc were more toxic at pH 8.5 than at pH 6.5 (USEPA, 1992). In situations where sample toxicity is confirmed to be artifactual and due to pH drift (as determined by parallel testing as described in Subsection 13.3.6.1), the regulatory authority may allow for control of sample pH during testing using procedures outlined in Subsection 13.3.6.2. It should be noted that artifactual toxicity due to pH drift is not likely to occur unless pH drift is large (more than 1 pH unit) and/or the concentration of some pH-dependent toxicant in the sample is near the threshold for toxicity.

13.3.6.1 To confirm that toxicity is artifactual and due to pH drift, parallel tests must be conducted, one with controlled pH and one with uncontrolled pH. In the uncontrolled-pH treatment, the pH is allowed to drift during the test. In the controlled-pH treatment, the pH is maintained using the procedures described in Subsection 13.3.6.2. The pH to be maintained in the controlled-pH treatment (or target pH) will depend on the objective of the test. If the objective of the WET test is to determine the toxicity of the effluent in the receiving water, the pH should be maintained at the pH of the receiving water (measured at the edge of the regulatory mixing zone). If the objective of the WET test is to determine the absolute toxicity of the effluent, the pH should be maintained at the initial pH of the sample upon completion of collection (as measured on an aliquot removed from the sample container).

13.3.6.1.1 During parallel testing, the pH must be measured in each treatment at the beginning (i.e., initial pH) and end (i.e., final pH) of each 24-h exposure period. For each treatment, the mean initial pH (e.g., averaging the initial pH measured each day for a given treatment) and the mean final pH (e.g., averaging the final pH measured each day for a given treatment) must be reported. pH measurements taken during the test must confirm that pH was effectively maintained at the target pH in the controlled-pH treatment. For each treatment, the mean initial pH and the mean final pH should be within ±0.2 pH units of the target pH. Test procedures for conducting toxicity identification evaluations (TIEs) also recommend maintaining pH within ±0.2 pH units in pH-controlled tests (USEPA, 1992).

13.3.6.1.2 Total ammonia also should be measured in each treatment at the outset of parallel testing. Total ammonia concentrations greater than 5 mg/L in the 100% effluent are an indicator that toxicity observed in the test may be due to ammonia (USEPA, 1992).

13.3.6.1.3 Results from both of the parallel tests (pH-controlled and uncontrolled treatments) must be reported to the regulatory authority. If the uncontrolled test meets test acceptability criteria and shows no toxicity at the permitted instream waste concentration, then the results from this test should be used for determining compliance. If the uncontrolled test shows toxicity at the permitted instream waste concentration, then the results from the pH-controlled test should be used for determining compliance, provided that this test meets test acceptability criteria and pH was properly controlled (see Subsection 13.3.6.1.1).

13.3.6.1.4 To confirm that toxicity observed in the uncontrolled test was artifactual and due to pH drift, the results of the controlled and uncontrolled-pH tests are compared. If toxicity is removed or reduced in the pH-controlled treatment, artifactual toxicity due to pH drift is confirmed for the sample. To demonstrate that a sample result of artifactual toxicity is representative of a given effluent, the regulatory authority may require additional information or additional parallel testing before pH control (as described in Subsection 13.3.6.2) is applied routinely to subsequent testing of the effluent.

13.3.6.2 The pH can be controlled with the addition of acids and bases and/or the use of a CO_2-controlled atmosphere over the test chambers. pH is adjusted with acids and bases by dropwise adding 1N NaOH or 1N HCl (see Subsection 8.8.8). The addition of acids and bases should be minimized to reduce the amount of additional ions (Na or Cl) added to the sample. pH is then controlled using the CO_2-controlled atmosphere technique. This may be accomplished by placing test solutions and test organisms in closed headspace test chambers, and then injecting a predetermined volume of CO_2 into the headspace of each test chamber (USEPA, 1991b; USEPA, 1992);

or by placing test chambers in an atmosphere flushed with a predetermined mixture of CO_2 and air (USEPA, 1996). Prior experimentation will be needed to determine the appropriate CO_2/air ratio or the appropriate volume of CO_2 to inject. This volume will depend upon the sample pH, sample volume, container volume, and sample constituents. If more than 5% CO_2 is needed, adjust the solutions with acids (1N HCl) and then flush the headspace with no more than 5% CO_2 (USEPA, 1992). If the objective of the WET test is to determine the toxicity of the effluent in the receiving water, CO_2 is injected to maintain the test pH at the pH of the receiving water (measured at the edge of the regulatory mixing zone). If the objective of the WET test is to determine the absolute toxicity of the effluent, CO_2 is injected to maintain the test pH at the pH of the sample upon completion of collection. USEPA (1991b; 1992) and Mount and Mount (1992) provide techniques and guidance for controlling test pH using a CO_2-controlled atmosphere. In pH-controlled testing, control treatments must be subjected to all manipulations that sample treatments are subjected to. These manipulations must be shown to cause no lethal or sublethal effects on control organisms. In pH-controlled testing, the pH also must be measured in each treatment at the beginning and end of each 24-h exposure period to confirm that pH was effectively controlled at the target pH level.

13.4 SAFETY

13.4.1 See Section 3, Health and Safety.

13.5 APPARATUS AND EQUIPMENT

13.5.1 *Ceriodaphnia* and algal culture units -- See *Ceriodaphnia* and algal culturing methods below and algal culturing methods in Section 14 and USEPA, 2002a.

13.5.2 Samplers -- automatic sampler, preferably with sample cooling capability, capable of collecting a 24-h composite sample of 5 L or more.

13.5.3 Sample containers -- for sample shipment and storage (see Section 8, Effluent and Receiving Water Sampling, Sample Handling, and Sample Preparation for Toxicity Tests).

13.5.4 Environmental chambers, incubators, or equivalent facilities with temperature control (25 ± 1 °C).

13.5.5 Water purification system -- MILLIPORE MILLI-Q®, deionized water or equivalent (see Section 5, Facilities, Equipment, and Supplies).

13.5.6 Balance -- analytical, capable of accurately weighing 0.00001 g.

13.5.7 Reference weights, Class S -- for checking performance of balance. Weights should bracket the expected weights of the material to be weighed.

13.5.8 Test chambers -- 10 test chambers are required for each concentration and control. Test chambers such as 30-mL borosilicate glass beakers or disposable polystyrene cups are recommended because they will fit in the viewing field of most stereoscopic microscopes. The glass beakers and plastic cups are rinsed thoroughly with dilution water before use. To avoid potential contamination from the air and excessive evaporation of the test solutions during the test, the test vessels should be covered with safety glass plates or sheet plastic (6 mm thick).

13.5.9 Mechanical shaker or magnetic stir plates -- for algal cultures.

13.5.10 Light meter -- with a range of 0-200 $\mu E/m^2/s$ (0-1000 ft-c).

13.5.11 Fluorometer (optional) -- equipped with chlorophyll detection light source, filters, and photomultiplier tube (Turner Model 110 or equivalent).

13.5.12 UV-VIS spectrophotometer (optional) -- capable of accommodating 1-5 cm cuvettes.

13.5.13 Cuvettes for spectrophotometer -- 1-5 cm light path.

13.5.14 Electronic particle counter (optional) -- Coulter Counter, ZBI, or equivalent, with mean cell (particle) volume determination.

13.5.15 Microscope with 10X, 45X, and 100X objective lenses, 10X ocular lenses, mechanical stage, substage condensor, and light source (inverted or conventional microscope) -- for determining sex and verifying identification.

13.5.16 Dissecting microscope, stereoscopic, with zoom objective, magnification to 50X -- for examining and counting the neonates in the test vessels.

13.5.17 Counting chamber -- Sedgwick-Rafter, Palmer-Maloney, or hemocytometer.

13.5.18 Centrifuge (optional) -- plankton, or with swing-out buckets having a capacity of 15-100 mL.

13.5.19 Centrifuge tubes -- 15-100 mL, screw-cap.

13.5.20 Filtering apparatus -- for membrane and/or glass fiber filters.

13.5.21 Racks (boards) -- to hold test chambers. It is convenient to use a piece of styrofoam insulation board, 50 cm x 30 cm x 2.5 cm (20 in x 12 in x 1 in), drilled to hold 60 test chambers, in six rows of 10 (see Figure 1).

13.5.22 Light box -- for illuminating organisms during examination.

13.5.23 Volumetric flasks and graduated cylinders -- class A, borosilicate glass or non-toxic plastic labware, 10-1000 mL, for culture work and preparation of test solutions.

13.5.24 Pipettors, adjustable volume repeating dispensers -- for feeding. Pipettors such as the Gilson REPETMAN®, Eppendorf, Oxford, or equivalent, provide a rapid and accurate means of dispensing small volumes (0.1 mL) of food to large numbers of test chambers.

13.5.25 Volumetric pipets -- class A, 1-100 mL.

13.5.26 Serological pipets -- 1-10 mL, graduated.

13.5.27 Pipet bulbs and fillers -- PROPIPET®, or equivalent.

13.5.28 Disposable polyethylene pipets, droppers, and glass tubing with fire-polished edges, ≥ 2mm ID -- for transferring organisms.

13.5.29 Wash bottles -- for rinsing small glassware and instrument electrodes and probes.

13.5.30 Thermometer, glass or electronic, laboratory grade, -- for measuring water temperatures.

13.5.31 Bulb-thermograph or electronic-chart type thermometers -- for continuously recording temperature.

13.5.32 Thermometer, National Bureau of Standards Certified (see USEPA Method 170.1, USEPA 1979b) -- to calibrate laboratory thermometers.

13.5.33 Meters, DO, pH, and specific conductivity -- for routine physical and chemical measurements.

13.6 REAGENTS AND CONSUMABLE MATERIALS

13.6.1 Sample containers -- for sample shipment and storage (see Section 8, Effluent and Receiving Water Sampling, Sample Handling, and Sample Preparation for Toxicity Tests).

13.6.2 Data sheets (one set per test) -- for recording the data.

13.6.3 Vials, marked -- for preserving specimens for verification (optional).

13.6.4 Tape, colored -- for labeling test vessels.

13.6.5 Markers, waterproof -- for marking containers.

13.6.6 Reagents for hardness and alkalinity tests -- see USEPA Methods 130.2 and 310.1, USEPA, 1979b.

13.6.7 Buffers, pH 4, pH 7, and pH 10 (or as per instructions of instrument manufacturer) -- for instrument calibration check (see USEPA Method 150.1, USEPA, 1979b).

13.6.8 Specific conductivity standards -- see USEPA Method 120.1, USEPA, 1979b.

13.6.9 Membranes and filling solutions for DO probe (see USEPA Method 360.1, USEPA, 1979b), or reagents -- for modified Winkler analysis.

13.6.10 Laboratory quality control samples and standards -- for calibration of the above methods.

13.6.11 Reference toxicant solutions -- see Section 4, Quality Assurance.

13.6.12 Reagent water -- defined as distilled or deionized water that does not contain substances which are toxic to the test organisms (see Section 5, Facilities, Equipment, and Supplies).

13.6.13 Effluent, surface water, and dilution water -- see Section 7, Dilution Water; and Section 8, Effluent and Receiving Water Sampling, Sample Handling, and Sample Preparation for Toxicity Tests.

13.6.14 Trout chow, yeast, and CEROPHYL® food (or substitute food) -- for feeding the cultures and test organisms.

13.6.14.1 Digested trout chow, or substitute flake food (TETRAMIN®, BIORIL®, or equivalent), is prepared as follows:

1. Preparation of trout chow or substitute flake food requires one week. Use starter or No. 1 pellets prepared according to current U.S. Fish and Wildlife Service specifications.
2. Add 5.0 g of trout chow pellets or substitute flake food to 1 L of MILLI-Q® water. Mix well in a blender and pour into a 2-L separatory funnel. Digest prior to use by aerating continuously from the bottom of the vessel for one week at ambient laboratory temperature. Water lost due to evaporation is replaced during digestion. Because of the offensive odor usually produced during digestion, the vessel should be placed in a fume hood or other isolated, ventilated area.
3. At the end of digestion period, place in a refrigerator and allow to settle for a minimum of 1 h. Filter the supernatant through a fine mesh screen (i.e., NITEX® 110 mesh). Combine with equal volumes of supernatant from CEROPHYLL® and yeast preparations (below). The supernatant can be used fresh, or frozen until use. Discard the sediment.

13.6.14.2 Yeast is prepared as follows:

1. Add 5.0 g of dry yeast, such as FLEISCHMANN'S® Yeast, Lake State Kosher Certified Yeast, or equivalent, to 1 L of MILLI-Q® water.
2. Stir with a magnetic stirrer, shake vigorously by hand, or mix with a blender at low speed, until the yeast is well dispersed.
3. Combine the yeast suspension immediately (do not allow to settle) with equal volumes of supernatant from the trout chow (above) and CEROPHYLL® preparations (below). Discard excess material.

13.6.14.3 CEROPHYLL® is prepared as follows:

1. Place 5.0 g of dried, powdered, cereal or alfalfa leaves, or rabbit pellets, in a blender. Cereal leaves, CEROPHYLL®, or equivalent are available from commercial sources. Dried, powdered, alfalfa leaves may be obtained from health food stores, and rabbit pellets are available at pet shops.
2. Add 1 L of MILLI-Q® water.
3. Mix in a blender at high speed for 5 min, or stir overnight at medium speed on a magnetic stir plate.
4. If a blender is used to suspend the material, place in a refrigerator overnight to settle. If a magnetic stirrer is used, allow to settle for 1 h. Decant the supernatant and combine with equal volumes of supernatant from trout chow and yeast preparations (above). Discard excess material.

13.6.14.4 Combined yeast-cerophyl-trout chow (YCT) is mixed as follows:

1. Thoroughly mix equal (approximately 300 mL) volumes of the three foods as described above.
2. Place aliquots of the mixture in small (50 mL to 100 mL) screw-cap plastic bottles and freeze until needed.
3. Freshly prepared food can be used immediately, or it can be frozen until needed. Thawed food is stored in the refrigerator between feedings, and is used for a maximum of two weeks. Do not store frozen over three months.
4. It is advisable to measure the dry weight of solids in each batch of YCT before use. The food should contain 1.7-1.9 g solids/L. Cultures or test solutions should contain 12-13 mg solids/L.

13.6.15 Algal food -- for feeding the cultures and test organisms.

13.6.15.1 Algal Culture Medium is prepared as follows:

1. Prepare (five) stock nutrient solutions using reagent grade chemicals as described in Table 1.
2. Add 1 mL of each stock solution, in the order listed in Table 1, to approximately 900 mL of MILLI-Q® water. Mix well after the addition of each solution. Dilute to 1 L, mix well. The final concentration of macronutrients and micronutrients in the culture medium is given in Table 2.
3. Immediately filter the medium through a 0.45 µm pore diameter membrane at a vacuum of not more than 380 mm (15 in.) mercury, or at a pressure of not more than one-half atmosphere (8 psi). Wash the filter with 500 mL deionized water prior to use.
4. If the filtration is carried out with sterile apparatus, filtered medium can be used immediately, and no further sterilization steps are required before the inoculation of the medium. The medium can also be sterilized by autoclaving after it is placed in the culture vessels.
5. Unused sterile medium should not be stored more than one week prior to use, because there may be substantial loss of water by evaporation.

TABLE 1. NUTRIENT STOCK SOLUTIONS FOR MAINTAINING ALGAL STOCK CULTURES

STOCK SOLUTION	COMPOUND	AMOUNT DISSOLVED IN 500 mL MILLI-Q® WATER	
1. MACRONUTRIENTS			
A.	$MgCl_2 \cdot 6H_2O$	6.08	g
	$CaCl_2 \cdot 2H_2O$	2.20	g
	$NaNO_3$	12.75	g
B.	$MgSO_4 \cdot 7H_2O$	7.35	g
C.	K_2HPO_4	0.522	g
D.	$NaHCO_3$	7.50	g
2. MICRONUTRIENTS			
	H_3BO_3	92.8	mg
	$MnCl_2 \cdot 4H_2O$	208.0	mg
	$ZnCl_2$	1.64	mg[1]
	$FeCl_3 \cdot 6H_2O$	79.9	mg
	$CoCl_2 \cdot 6H_2O$	0.714	mg[2]
	$Na_2MoO_4 \cdot 2H_2O$	3.63	mg[3]
	$CuCl_2 \cdot 2H_2O$	0.006	mg[4]
	$Na_2EDTA \cdot 2H_2O$	150.0	mg
	Na_2SeO_4	1.196	mg[5]

[1] $ZnCl_2$ - Weigh out 164 mg and dilute to 100 mL. Add 1 mL of this solution to Stock 2, micronutrients.

[2] $CoCl_2 \cdot 6H_2O$ - Weigh out 71.4 mg and dilute to 100 mL. Add 1 mL of this solution to Stock 2, micronutrients.

[3] $Na_2MoO_4 \cdot 2H_2O$ - Weigh out 36.6 mg and dilute to 10 mL. Add 1 mL of this solution to Stock 2, micronutrients.

[4] $CuCl_2 \cdot 2H_2O$ - Weigh out 60.0 mg and dilute to 1000 mL. Take 1 mL of this solution and dilute to 10 mL. Take 1 mL of the second dilution and add to Stock 2, micronutrients.

[5] Na_2SeO_4 - Weigh out 119.6 mg and dilute to 100 mL. Add 1 mL of this solution to Stock 2, micronutrients.

TABLE 2. FINAL CONCENTRATION OF MACRONUTRIENTS AND MICRONUTRIENTS IN THE CULTURE MEDIUM

MACRONUTRIENT	CONCENTRATION (mg/L)	ELEMENT	CONCENTRATION (mg/L)
$NaNO_3$	25.5	N	4.20
$MgCl_2 \cdot 6H_2O$	12.2	Mg	2.90
$CaCl_2 \cdot 2H_2O$	4.41	Ca	1.20
$MgSO_4 \cdot 7H_2O$	14.7	S	1.91
K_2HPO_4	1.04	P	0.186
$NaHCO_3$	15.0	Na	11.0
		K	0.469
		C	2.14

MICRONUTRIENT	CONCENTRATION (µg/L)	ELEMENT	CONCENTRATION (µg/L)
H_3BO_3	185.0	B	32.5
$MnCl_2 \cdot 4H_2O$	416.0	Mn	115.0
$ZnCl_2$	3.27	Zn	1.57
$CoCl_2 \cdot 6H_2O$	1.43	Co	0.354
$CuCl_2 \cdot 2H_2O$	0.012	Cu	0.004
$Na_2MoO_4 \cdot 2H_2O$	7.26	Mo	2.88
$FeCl_3 \cdot 6H_2O$	160.0	Fe	33.1
$Na_2EDTA \cdot 2H_2O$	300.0	--	----
Na_2SeO_4	2.39	Se	0.91

13.6.15.2 Algal Cultures

13.6.15.2.1 See Section 6, Test Organisms, for information on sources of "starter" cultures of *Selenastrum capricornutum, S. minutum*, and *Chlamydomonas reinhardti.*

13.6.15.2.2 Two types of algal cultures are maintained: "stock" cultures, and "food" cultures.

13.6.15.2.2.1 Establishing and Maintaining Stock Cultures of Algae:

1. Upon receipt of the "starter" culture (usually about 10 mL), a stock culture is initiated by aseptically transferring one milliliter to each of several 250-mL culture flasks containing 100 mL algal culture medium (prepared as described above). The remainder of the starter culture can be held in reserve for up to six months in a refrigerator (in the dark) at 4°C.
2. The stock cultures are used as a source of algae to initiate "food" cultures for *Ceriodaphnia dubia* toxicity tests. The volume of stock culture maintained at any one time will depend on the amount of algal food required for the *Ceriodaphnia dubia* cultures and tests. Stock culture volume may be rapidly "scaled up" to several liters, if necessary, using 4-L serum bottles or similar vessels, each containing 3 L of growth medium.
3. Culture temperature is not critical. Stock cultures may be maintained at 25°C in environmental chambers with cultures of other organisms if the illumination is adequate (continuous "cool-white" fluorescent lighting of approximately 86 ± 8.6 $\mu E/m^2/s$, or 400 ft-c).
4. Cultures are mixed twice daily by hand.
5. Stock cultures can be held in the refrigerator until used to start "food" cultures, or can be transferred to new medium weekly. One-to-three milliliters of 7-day old algal stock culture, containing approximately 1.5×10^6 cells/mL, are transferred to each 100 mL of fresh culture medium. The inoculum should provide an initial cell density of approximately 10,000-30,000 cells/mL in the new stock cultures. Aseptic techniques should be used in maintaining the stock algal cultures, and care should be exercised to avoid contamination by other microorganisms.
6. Stock cultures should be examined microscopically weekly, at transfer, for microbial contamination. Reserve quantities of culture organisms can be maintained for 6-12 months if stored in the dark at 4°C. It is advisable to prepare new stock cultures from "starter" cultures obtained from established outside sources of organisms (see Section 6, Test Organisms) every four to six months.

13.6.15.2.2.2 Establishing and Maintaining "Food" Cultures of Algae:

1. "Food" cultures are started seven days prior to use for *Ceriodaphnia dubia* cultures and tests. Approximately 20 mL of 7-day-old algal stock culture (described in the previous paragraph), containing 1.5×10^6 cells/mL, are added to each liter of fresh algal culture medium (i.e., 3 L of medium in a 4-L bottle, or 18 L in a 20-L bottle). The inoculum should provide an initial cell density of approximately 30,000 cells/mL. Aseptic techniques should be used in preparing and maintaining the cultures, and care should be exercised to avoid contamination by other microorganisms. However, sterility of food cultures is not as critical as in stock cultures because the food cultures are terminated in 7-10 days. A one-month supply of algal food can be grown at one time, and stored in the refrigerator.
2. Food cultures may be maintained at 25°C in environmental chambers with the algal stock cultures or cultures of other organisms if the illumination is adequate (continuous "cool-white" fluorescent lighting of approximately 86 ± 8.6 $\mu E/m^2/s$ or 400 ft-c).
3. Cultures are mixed continuously on a magnetic stir plate (with a medium size stir bar) or in a moderately aerated separatory funnel, or are mixed twice daily by hand. If the cultures are placed on a magnetic stir plate, heat generated by the stirrer might elevate the culture temperature several degrees. Caution should be exercised to prevent the culture temperature from rising more than 2-3°C.

13.6.15.2.3 Preparing Algal Concentrate for Use as *Ceriodaphnia dubia* Food:

1. An algal concentrate containing 3.0 to 3.5 X 10^7 cells/mL is prepared from food cultures by centrifuging the algae with a plankton or bucket-type centrifuge, or by allowing the cultures to settle in a refrigerator for at least three weeks and siphoning off the supernatant.
2. The cell density (cells/mL) in the concentrate is measured with an electronic particle counter, microscope and hemocytometer, fluorometer, or spectrophotometer (see Section 14, Green Alga, *Selenastrum capricornutum* Growth Test), and used to determine the dilution (or further concentration) required to achieve a final cell count of 3.0 to 3.5 X 10^7/mL.
3. Assuming a cell density of approximately 1.5 X 10^6 cells/mL in the algal food cultures at 7 days, and 100% recovery in the concentration process, a 3-L, 7-10 day culture will provide 4.5 X 10^9 algal cells. This number of cells would provide approximately 150 mL of algal cell concentrate (1500 feedings at 0.1 mL/feeding) for use as food. This would be enough algal food for four *Ceriodaphnia dubia* tests.
4. Algal concentrate may be stored in the refrigerator for one month.

13.6.15.3 Food Quality

13.6.15.3.1 USEPA recommends Fleishmann's® yeast, Cerophyll®, trout chow, and *Selenastrum capricornutum* as the preferred *Ceriodaphnia dubia* food combination. This recommendation is based on extensive data developed by many laboratories which indicated high *Ceriodaphnia dubia* survival and reproduction in culturing and testing. The use of substitute food(s) is acceptable only after side-by-side tests are conducted to determine that the quality of the substitute food(s) is equal to the USEPA recommended food combination based on survival and reproduction of *Ceriodaphnia dubia*.

13.6.15.3.2 The quality of food prepared with newly acquired supplies of yeast, trout chow, dried cereal leaves, algae, and/or any substitute food(s) should be determined in side-by-side comparisons of *Ceriodaphnia dubia* survival and reproduction, using the new food and food of known, acceptable quality, over a seven-day period in control medium.

13.6.16 TEST ORGANISMS, DAPHNIDS, *CERIODAPHNIA DUBIA*

13.6.16.1 Cultures of test organisms should be started at least three weeks before the brood animals are needed, to ensure an adequate supply of neonates for the test. Only a few individuals are needed to start a culture because of their prolific reproduction.

13.6.16.2 Neonates used for toxicity tests must be obtained from individually cultured organisms. Mass cultures may be maintained, however, to serve as a reserve source of organisms for use in initiating individual cultures and in case of loss of individual cultures.

13.6.16.3 Starter animals may be obtained from commercial sources and may be shipped in polyethylene bottles. Approximately 40 animals and 3 mL of food are placed in a l-L bottle filled full with culture water for shipment. Animals received from an outside source should be transferred to new culture media gradually over a period of 1-2 days to avoid mass mortality.

13.6.16.4 It is best to start the cultures with one animal, which is sacrificed after producing young, mounted on a microscope slide, and retained as a permanent slide mount to facilitate identification and permit future reference. The species identification of the stock culture should be verified by preparing slide mounts, regardless of the number of animals used to start the culture. The following procedure is recommended for making slide mounts of *Ceriodaphnia dubia* (modified from Beckett and Lewis, 1982):

1. Pipet the animal onto a watch glass.
2. Reduce the water volume by withdrawing excess water with the pipet.

3. Add a few drops of carbonated water (club soda or seltzer water) or 70% ethanol to relax the specimen so that the post-abdomen is extended. (Optional: with practice, extension of the postabdomen may be accomplished by putting pressure on the cover slip).
4. Place a small amount (one to three drops) of mounting medium on a glass microscope slide. The recommended mounting medium is CMCP-9/10 Medium, prepared by mixing two parts of CMCP-9 with one part of CMCP-10 stained with enough acid fuchsin dye to color the mixture a light pink. For more viscosity and faster drying, CMC-10 stained with acid fuchsin may be used.
5. Using forceps or a pipet, transfer the animal to the drop of mounting medium on the microscope slide.
6. Cover with a 12 mm round cover slip and exert minimum pressure to remove any air bubbles trapped under the cover slip. Slightly more pressure will extend the postabdomen.
7. Allow mounting medium to dry.
8. Make slide permanent by placing varnish around the edges of the coverslip.
9. Identify to species (see Pennak, 1978; Pennak, 1989; and Berner, 1986).
10. Label with waterproof ink or diamond pencil.
11. Store for permanent record.

13.6.16.5 Mass Culture

13.6.16.5.1 Mass cultures are used only as a "backup" reservoir of organisms.

13.6.16.5.2 One-liter or 2-L glass beakers, crystallization dishes, "battery jars," or aquaria may be used as culture vessels. Vessels are commonly filled to three-fourths capacity. Cultures are fed daily. Four or more cultures are maintained in separate vessels and with overlapping ages to serve as back-up in case one culture is lost due to accident or other unanticipated problems, such as low DO concentrations or poor quality of food or laboratory water.

13.6.16.5.3 Mass cultures which will serve as a source of brood organisms for individual culture should be maintained in good condition by frequent renewal with new culture medium at least twice a week for two weeks. At each renewal, the adult survival is recorded, and the offspring and the old medium are discarded. After two weeks, the adults are also discarded, and the culture is re-started with neonates in fresh medium. Using this schedule, 1-L cultures will produce 500 to 1000 neonate *Ceriodaphnia dubia* each week.

13.6.16.6 Individual Culture

13.6.16.6.1 Individual cultures are used as the immediate source of neonates for toxicity tests.

13.6.16.6.2 Individual organisms are cultured in 15 mL of culture medium in 30-mL (1 oz) plastic cups or 30-mL glass beakers. One neonate is placed in each cup. It is convenient to place the cups in the same type of board used for toxicity tests (see Figure 1).

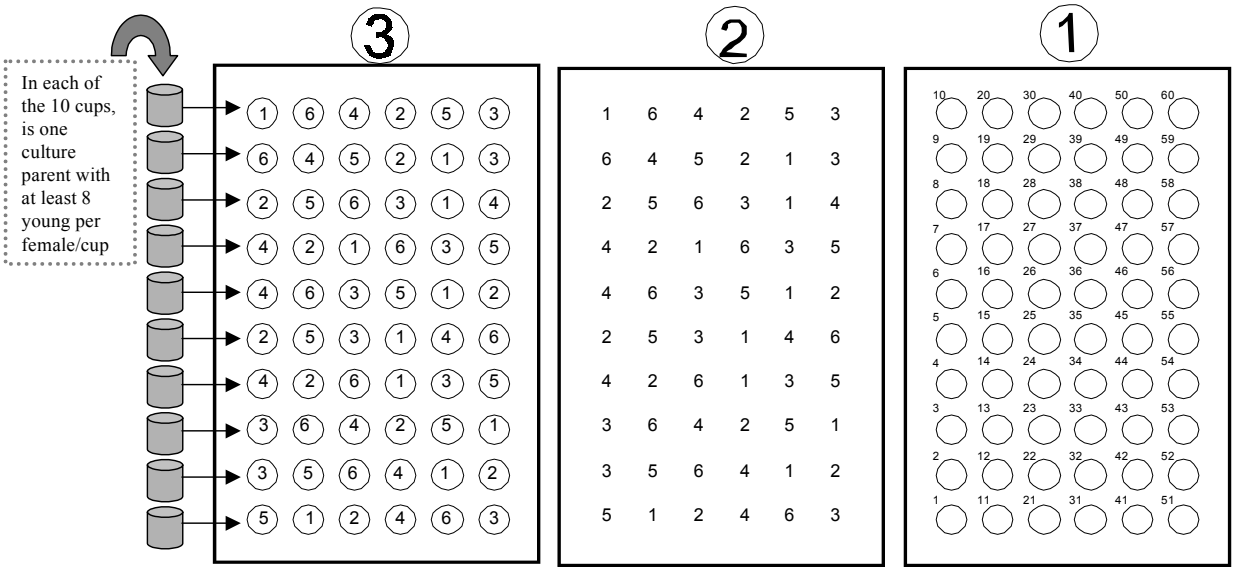

Figure 1. Examples of a test board and randomizing template: 1) test board with positions for six columns of ten replicate test chambers with each position numbered for recording results on data sheets, 2) cardboard randomizing template prepared by randomly drawing numbers (1-6) for each position in a row across the board, and 3) test board (1) placed on top of the randomizing template (2) for the purpose of assigning the position of test treatments (1-6) within each block (row on the test board). Following placement of test chambers, test organisms are allocated using blocking by known parentage. Test organisms from a single brood cup are distributed to each treatment within a given block (row on the test board).

13.6.16.6.3 Organisms are fed daily (see Subsection 13.6.16.9) and are transferred to fresh medium a minimum of three times a week, typically on Monday, Wednesday, and Friday. On the transfer days, food is added to the new medium immediately before or after the organisms are transferred.

13.6.16.6.4 To provide cultures of overlapping ages, new boards are started weekly, using neonates from adults which produce at least eight young in their third or fourth brood. These adults can be used as sources of neonates until 14 days of age. A minimum of two boards are maintained concurrently to provide backup supplies of organisms in case of problems.

13.6.16.6.5 Cultures which are properly maintained should produce at least 20 young per adult in three broods (seven days or less). Typically, 60 adult females (one board) will produce more than the minimum number of neonates (120) required for two tests.

13.6.16.6.6 Records should be maintained on the survival of brood organisms and number of offspring at each renewal. Greater than 20% mortality of adults, or less than an average of 20 young per female would indicate problems, such as poor quality of culture media or food. Cultures that do not meet these criteria should not be used as a source of test organisms.

13.6.16.7 Culture Medium

13.6.16.7.1 Moderately hard synthetic water prepared using MILLIPORE MILLI-Q® or equivalent deionized water and reagent grade chemicals or 20% DMW is recommended as a standard culture medium (see Section 7, Dilution Water).

13.6.16.8 Culture Conditions

13.6.16.8.1 The daphnid, *Ceriodaphnia dubia,* should be cultured at a temperature of 25 ± 1°C.

13.6.16.8.2 Day/night cycles prevailing in most laboratories will provide adequate illumination for normal growth and reproduction. A photoperiod of 16-h of light and 8-h of darkness is recommended. Light intensity should be 10-20 $\mu E/m^2/s$ or 50 to 100 ft-c.

13.6.16.8.3 Clear, double-strength safety glass or 6 mm plastic panels are placed on the culture vessels to exclude dust and dirt, and reduce evaporation.

13.6.16.8.4 The organisms are delicate and should be handled as carefully and as little as possible so that they are not unnecessarily stressed. They are transferred with a pipet of approximately 2-mm bore, taking care to release the animals under the surface of the water. Any organism that is injured during handling should be discarded.

13.6.16.9 Food and Feeding

13.6.16.9.1 Feeding the proper amount of the right food is extremely important in *Ceriodaphnia dubia* culturing. The key is to provide sufficient nutrition to support normal reproduction without adding excess food which may reduce the toxicity of the test solutions, clog the animal's filtering apparatus, or greatly decrease the DO concentration and increase mortality. A combination of Yeast, CEROPHYLL®, and Trout chow (YCT), along with the unicellular green alga, *Selenastrum capricornutum*, will provide suitable nutrition if fed daily.

13.6.16.9.2 Other algal species (such as *S. minutum* or *Chlamydomonas reinhardti*), other substitute food combinations (such as Flake Fish Food), or different feeding rates may be acceptable as long as performance criteria are met and side-by-side comparison tests confirm acceptable quality (see Subsection 13.6.15.3).

13.6.16.9.3 Cultures should be fed daily to maintain the organisms in optimum condition so as to provide maximum reproduction. Stock cultures which are stressed because they are not adequately fed may produce low

numbers of young, large numbers of males, and/or ephippial females. Also, their offspring may produce few young when used in toxicity tests.

13.6.16.9.4 Feed as follows:

1. If YCT is frozen, remove a bottle of food from the freezer 1h before feeding time, and allow to thaw.
2. YCT food mixture and algal concentrates should both be thoroughly mixed by shaking before dispensing.
3. Mass cultures are fed daily at the rate of 7 mL YCT and 7 mL algae concentrate/L culture.
4. Individual cultures are fed at the rate of 0.1 mL YCT and 0.1 mL algae concentrate per 15 mL culture.
5. Return unused YCT food mixture and algae concentrate to the refrigerator. Do not re-freeze YCT. Discard unused portion after two weeks.

13.6.16.10 It is recommended that chronic toxicity tests be performed monthly with a reference toxicant. Daphnid, *Ceriodaphnia dubia,* neonates less than 24 h old, and all within 8 h of the same age are used to monitor the chronic toxicity of the reference toxicant to the *Ceriodaphnia dubia* produced by the culture unit (see Section 4, Quality Assurance).

13.6.16.11 Record Keeping

13.6.16.11.1 Records, kept in a bound notebook, include (1) source of organisms used to start the cultures, (2) type of food and feeding times, (3) dates culture were thinned and restarted, (4) rate of reproduction in individual cultures, (5) daily observations of the condition and behavior of the organisms in the cultures, and (6) dates and results of reference toxicant tests performed (see Section 4, Quality Assurance).

13.7 EFFLUENT AND RECEIVING WATER COLLECTION, PRESERVATION, AND STORAGE

13.7.1 See Section 8, Effluent and Receiving Water Sampling, Sample Handling, and Sample Preparation for Toxicity Tests.

13.8 CALIBRATION AND STANDARDIZATION

13.8.1 See Section 4, Quality Assurance.

13.9 QUALITY CONTROL

13.9.1 See Section 4, Quality Assurance.

13.10 TEST PROCEDURES

13.10.1 TEST SOLUTIONS

13.10.1.1 Receiving Waters

13.10.1.1.1 The sampling point is determined by the objectives of the test. Receiving water toxicity is determined with samples used directly as collected or after samples are passed through a 60 µm NITEX® filter and compared without dilution, against a control. For a test consisting of single receiving water and control, approximately 600 mL of sample would be required for each test, assuming 10 replicates of 15 mL, and sufficient additional sample for chemical analysis.

13.10.1.2 Effluents

13.10.1.2.1 The selection of the effluent test concentrations should be based on the objectives of the study. A dilution factor of 0.5 is commonly used. A dilution factor of 0.5 provides precision of ± 100%, and testing of concentrations between 6.25% and 100% effluent using only five effluent concentrations (6.25%, 12.5%, 25%, 50%, and 100%). Improvements in precision decline rapidly if the dilution factor is increased beyond 0.5, and precision declines rapidly if a smaller dilution factor is used. **Therefore, USEPA recommends the use of the ≥ 0.5 dilution factor.**

13.10.1.2.2 If the effluent is known or suspected to be highly toxic, a lower range of effluent concentrations should be used (such as 25%, 12.5%, 6.25%, 3.12%, and 1.56%). If a high rate of mortality is observed during the first 1 to 2 h of the test, additional dilutions should be added at the lower range of effluent concentrations.

13.10.1.2.3 The volume of effluent required for daily renewal of 10 replicates per concentration, each containing 15 mL of test solution, with a dilution series of 0.5, is approximately 1 L/day. A volume of 15 mL of test solution is adequate for the organisms, and will provide a depth in which it is possible to count the animals under a stereomicroscope with a minimum of re-focusing. Ten test chambers are used for each effluent dilution and for the control. Sufficient test solution (approximately 550 mL) is prepared at each effluent concentration to provide 400 mL additional volume for chemical analyses at the high, medium, and low test concentrations.

13.10.1.2.4 Tests should begin as soon as possible, preferably within 24 h of sample collection. The maximum holding time following retrieval of the sample from the sampling device should not exceed 36 h for off-site toxicity tests unless permission is granted by the permitting authority. In no case should the sample be used for the first time in a test more than 72 h after sample collection (see Section 8, Effluent and Receiving Water Sampling, Sample Handling, and Sample Preparation for Toxicity Tests).

13.10.1.2.5 Just prior to test initiation (approximately one h) the temperature of sufficient quantity of the sample to make the test solutions should be adjusted to the test temperature and maintained at that temperature during the preparation of the test solutions.

13.10.1.2.6 The DO of the test solutions should be checked prior to test initiation. If any of the solutions are supersaturated with oxygen, all of the solutions and the control should be gently aerated. If any solution has a DO concentration below 4.0 mg/L, all the solutions and the control must be gently aerated.

13.10.1.3 Dilution Water

13.10.1.3.1 Dilution water may be uncontaminated receiving water, a standard synthetic (reconstituted) water, or some other uncontaminated natural water (see Section 7, Dilution Water).

13.10.2 START OF THE TEST

13.10.2.1 Label the test chambers with a marking pen. Use of color-coded tape to identify each treatment and replicate is helpful. A minimum of five effluent concentrations and a control are used for each effluent test. Each treatment (including the control) must have ten replicates.

13.10.2.2 The test chambers must be randomly assigned to a board using a template (Figure 1) or by using random numbers (see Appendix A). Randomizing the position of test chambers as described in Figure 1 (or equivalent) will assist in assigning test organisms using blocking by known parentage (Subsection 13.10.2.4). A number of different templates should be prepared, and the template used for each test should be identified on the data sheet. The same template must not be used for every test.

13.10.2.3 Neonates less than 24 h old, and all within 8 h of the same age, are required to begin the test. The neonates must be obtained from individual cultures using brood boards, as described above in Subsection 13.6.16.6,

Individual Culture (also see Section 6, Test Organisms). Neonates must be taken only from adults in individual cultures that have eight or more young in their third or subsequent broods. These adults can be used as brood stock until they are 14 days old. If the neonates are held more than one or two hours before using in the test, they should be fed (0.1 mL YCT and 0.1 mL algal concentrate/15 mL of media). Record the age range of test organisms, source, and feeding of neonates on test data sheets.

13.10.2.4 Ten brood cups, each with 8 or more young, are randomly selected from a brood board for use in setting up a test. To start the test, neonates from these ten brood cups are distributed to each test chamber in the test board (one per test chamber). Test organisms must be assigned to test chambers using a block randomization procedure, such that offspring from a single female are distributed evenly among the treatments, appearing once in every test concentration. This arrangement is referred to as "blocking by known parentage". The technique used to achieve blocking by known parentage should be recorded in the test data report. One effective technique is to block randomize the test board as described in Figure 1 and transfer one neonate from the first brood cup to each of the six test chambers in the first row on the test board. One neonate from the second brood cup is then transferred to each of the six test chambers in the second row on the test board. This process is continued until each of the 60 test chambers contains one neonate. The set of six test chambers (one for each test treatment) containing organisms derived from a single female parent is referred to as a block. When using the technique described in Figure 1, each row of the test board will represent a block.

13.10.2.4.1 The brood cups and test chambers may be placed on a light table to facilitate counting the neonates. However, care must be taken to avoid temperature increase due to heat from the light table.

13.10.2.4.2 Following the allocation of test organisms to the test board, additional neonates might remain in the ten brood cups that were selected for test setup. These additional neonates may be discarded, used as future culture organisms if needed, or used to start additional tests (provided that at least 6 neonates remain and these neonates continue to meet test organism age requirements).

13.10.2.5 Blocking by known parentage allows the performance of each test organism to be tracked to its parent culture organism. This technique ensures that any brood effects (i.e., differences in test organism fecundity or sensitivity attributable to the source of parentage) are evenly distributed among the test treatments. Also, by knowing the parentage of each test organism, blocks consisting largely of males can be omitted from all test treatments at the end of the test (see Subsection 13.13.1.4), decreasing variability among replicates.

13.10.3 LIGHT, PHOTOPERIOD, AND TEMPERATURE

13.10.3.1 The light quality and intensity should be at ambient laboratory levels, approximately 10-20 $\mu E/m^2/s$, or 50 to 100 ft-c, with a photoperiod of 16 h of light and 8 h of darkness.

13.10.3.2 It is critical that the test water temperature be maintained at 25 ± 1°C to obtain three broods in seven days.

13.10.4 DISSOLVED OXYGEN (DO) CONCENTRATION

13.10.4.1 Aeration may affect the toxicity of effluents and should be used only as a last resort to maintain satisfactory DO concentrations. The DO concentrations should be measured in the new solutions at the start of the test (Day 0) and before daily renewal of the test solutions on subsequent days. The DO concentration should not fall below 4.0 mg/L (see Section 8, Effluent and Receiving Water Sampling, Sample Handling, and Sample Preparation for Toxicity Tests). Aeration is generally not practical during the daphnid, *Ceriodaphnia dubia*, test. If the DO in the effluent and/or dilution water is low, aerate gently before preparing the test solutions. The aeration rate should not exceed 100 bubbles/min using a pipet with an orifice of approximately 1.5 mm, such as a 1 ml KIMAX® serological pipet, or equivalent. Care should be taken to ensure that turbulence resulting from aeration does not cause undue physical stress to the organisms.

13.10.5 FEEDING

13.10.5.1 The organisms are fed when the test is initiated, and daily thereafter. Food is added to the fresh medium immediately before or immediately after the adults are transferred. Each feeding consists of 0.1 mL YCT and 0.1 mL *Selenastrum capricornutum* concentrate/15 mL test solution (0.1 mL of algal concentrate containing 3.0-3.5 X 10^7 cells/mL will provide 2-2.3 X 10^5 cells/mL in the test chamber).

13.10.5.2 The YCT and algal suspension can be added accurately to the test chambers by using automatic pipettors, such as Gilson, Eppendorf, Oxford, or equivalent.

13.10.6 OBSERVATIONS DURING THE TEST

13.10.6.1 Routine Chemical and Physical Determinations

13.10.6.1.1 DO is measured at the beginning and end of each 24-h exposure period in at least one test chamber at each test concentration and in the control.

13.10.6.1.2 Temperature and pH are measured at the end of each 24-h exposure period in at least one test chamber at each test concentration and in the control. Temperature should be monitored continuously or observed and recorded daily for at least two locations in the environmental control system or the samples. Temperature should be measured in sufficient number of test vessels at least at the end of the test to determine the temperature variation in the environmental chamber.

13.10.6.1.3 The pH is measured in the effluent sample each day before new test solutions are made.

13.10.6.1.4 Conductivity, alkalinity and hardness are measured in each new sample (100% effluent or receiving water) and in the control.

13.10.6.1.5 Record the data on data sheet (Figure 2).

13.10.6.2 Routine Biological Observations

13.10.6.2.1 Three or four broods are usually obtained in the controls in a 7-day test conducted at 25 ± 1°C. A brood is a group of offspring released from the female over a short period of time when the carapace is discarded during molting. In the controls, the first brood of two-to-five young is usually released on the third or fourth day of the test. Successive broods are released every 30 to 36 h thereafter. The second and third broods usually consist of eight to 20 young each. The total number of young produced by a healthy control organism in three broods often exceeds 30 per female. In this three-brood test, offspring from fourth or higher broods should not be counted and should not be included in the total number of neonates produced during the test.

13.10.6.2.2 The release of a brood may be inadvertently interrupted during the daily transfer of organisms to fresh test solutions, resulting in a split in the brood count between two successive days. For example, four neonates of a brood of five might be released on Day 3, just prior to test solution renewal, and the fifth released just after renewal, and counted on Day 4. Partial broods, released over a two-day period, should be counted as one brood.

13.10.6.2.3 Each day, the live adults are transferred to fresh test solutions, and the numbers of live young are recorded (see data form, Figure 3). The young can be counted with the aid of a stereomicroscope with substage lighting. Place the test chambers on a light box over a strip of black tape to aid in counting the neonates. The young are discarded after counting.

13.10.6.2.4 Some of the effects caused by toxic substances include, (1) a reduction in the number of young produced, (2) young may develop in the brood pouch of the adults, but may not be released during the exposure

period, and (3) partially or fully developed young may be released, but are all dead at the end of the 24-h period. Such effects should be noted on the data sheets (Figure 3).

13.10.6.2.5 Protect the daphnids, *Ceriodaphnia dubia*, from unnecessary disturbance during the test by carrying out the daily test observations, solution renewals, and transfer of females carefully. Make sure the females remain immersed during the performance of these operations.

13.10.7 DAILY PREPARATION OF TEST CHAMBERS

13.10.7.1 The test is started (Day 0) with new disposable polystyrene cups or precleaned 30-mL borosilicate glass beakers that are labeled and color-coded with tape. Each following day, a new set of plastic cups or precleaned glass beakers is prepared, labeled, and color-coded with tape similar to the original set. New solutions are placed in the new set of test chambers, and the test organisms are transferred from the original test chambers to the new ones with corresponding labels and color-codes. Each day, previously used glass beakers are recleaned (see Section 5, Facilities, Equipment, and Supplies) for the following day, and previously used plastic cups are discarded.

Discharger:_____ Test Dates:_____

Location:_____ Analyst:_____

Control:		Day 1	2	3	4	5	6	7	Remarks
Temp.									
D.O.	Initial								
	Final								
pH	Initial								
	Final								
Alkalinity									
Hardness									
Conductivity									
Chlorine									

Conc:		Day 1	2	3	4	5	6	7	Remarks
Temp.									
D.O.	Initial								
	Final								
pH	Initial								
	Final								
Alkalinity									
Hardness									
Conductivity									
Chlorine									

Conc:		Day 1	2	3	4	5	6	7	Remarks
Temp.									
D.O.	Initial								
	Final								
pH	Initial								
	Final								
Alkalinity									
Hardness									
Conductivity									
Chlorine									

Figure 2. Data form for the daphnid, *Ceriodaphnia dubia,* survival and reproduction test. Routine chemical and physical determinations.

Discharger:_____ Test Dates:_____

Location:_____ Analyst:_____

Control:		Day 1	2	3	4	5	6	7	Remarks
Temp.									
D.O.	Initial								
	Final								
pH	Initial								
	Final								
Alkalinity									
Hardness									
Conductivity									
Chlorine									

Conc:		Day 1	2	3	4	5	6	7	Remarks
Temp.									
D.O.	Initial								
	Final								
pH	Initial								
	Final								
Alkalinity									
Hardness									
Conductivity									
Chlorine									

Conc:		Day 1	2	3	4	5	6	7	Remarks
Temp.									
D.O.	Initial								
	Final								
pH	Initial								
	Final								
Alkalinity									
Hardness									
Conductivity									
Chlorine									

Figure 2. Data form for the daphnid, *Ceriodaphnia dubia,* survival and reproduction test. Routine chemical and physical determinations (CONTINUED).

13.10.8 TEST SOLUTION RENEWAL

13.10.8.1 Freshly prepared solutions are used to renew the test daily. For on-site toxicity studies, fresh effluent or receiving water samples should be collected daily, and no more than 24 h should elapse between collection of the samples and their use in the tests (see Section 8, Effluent and Receiving Water Sampling, Sample Handling, and Sample Preparation for Toxicity Tests). For off-site tests, a minimum of three samples are collected, preferably on days one, three, and five. No more than 36 h should elapse between collection of the sample and the first use in the test. Maintain the samples in the refrigerator at 0-6°C until used.

13.10.8.2 New test solutions are prepared daily, and the test organisms are transferred to the freshly prepared solutions using a small-bore (2 mm) glass or polyethylene dropper or pipet. The animals are released under the surface of the water so that air is not trapped under the carapace. Organisms that are dropped or injured are discarded.

13.10.9 TERMINATION OF THE TEST

13.10.9.1 Tests should be terminated when 60% or more of the surviving control females have produced their third brood, or at the end of 8 days, whichever occurs first. Because of the rapid rate of development of *Ceriodaphnia dubia*, at test termination all observations on organism survival and numbers of offspring should be completed within two hours. An extension of more than a few hours in the test period would be a significant part of the brood production cycle of the animals, and could result in additional broods. In this three-brood test, offspring from fourth or higher broods should not be counted and should not be included in the total number of neonates produced during the test.

13.10.9.2 Count the young, conduct required chemical measurements, and complete the data sheets (Figure 3).

13.10.9.3 Any animal not producing young should be examined to determine if it is a male (Berner, 1986). In most cases, the animal will need to be placed on a microscope slide before examining (see Subsection 13.6.16.4).

13.10.9.3.1 In general, the occurrence of males in healthy, well-maintained individual cultures is rare. In interlaboratory testing of the *Ceriodaphnia dubia* Survival and Reproduction Test, males were identified in only 7% (9 of 126 tests) of tests conducted (USEPA, 2001a). The number of males identified in these tests ranged from 1 to 12. In five tests containing a large number of males (4-12), laboratories conducting those tests also noted that organism cultures were experiencing or recovering from some stress. Since male production in cladoceran populations is generally associated with conditions of environmental stress (Pennak, 1989), culture conditions should be examined whenever males are identified in a test.

13.11 SUMMARY OF TEST CONDITIONS AND TEST ACCEPTABILITY CRITERIA

13.11.1 A summary of test conditions and test acceptability criteria is presented in Table 3.

13.12 ACCEPTABILITY OF TEST RESULTS

13.12.1 For the test results to be acceptable, at least 80% of all control organisms must survive, and 60% of surviving control females must produce at least three broods, with an average of 15 or more young per surviving female.

Discharger:_____ Analyst:_____
Location: _____ Test Start-Date/Time: _____
Date Sample Collected: _____ Test Start-Date/time: _____

	Replicate										Number of Young	Number of Adults	Young per Adult
	1	2	3	4	5	6	7	8	9	10			
Conc.	Day												
	1												
	2												
	3												
	4												
	5												
	6												
	7												
	Total												

	Replicate										Number of Young	Number of Adults	Young per Adult
	1	2	3	4	5	6	7	8	9	10			
Conc.	Day												
	1												
	2												
	3												
	4												
	5												
	6												
	7												
	Total												

	Replicate										Number of Young	Number of Adults	Young per Adult
	1	2	3	4	5	6	7	8	9	10			
Conc.	Day												
	1												
	2												
	3												
	4												
	5												
	6												
	7												
	Total												

Figure 3. Data form for the daphnid, *Ceriodaphnia dubia*, survival and reproduction test. Daily summary of data.

Discharger:_____ Analyst:_____
Location: _____ Test Start-Date/Time: _____
Date Sample Collected: _____ Test Start-Date/time: _____

	Replicate										Number of Young	Number of Adults	Young per Adult
	1	2	3	4	5	6	7	8	9	10			
Conc.	Day												
	1												
	2												
	3												
	4												
	5												
	6												
	7												
	Total												

	Replicate										Number of Young	Number of Adults	Young per Adult
	1	2	3	4	5	6	7	8	9	10			
Conc.	Day												
	1												
	2												
	3												
	4												
	5												
	6												
	7												
	Total												

	Replicate										Number of Young	Number of Adults	Young per Adult
	1	2	3	4	5	6	7	8	9	10			
Conc.	Day												
	1												
	2												
	3												
	4												
	5												
	6												
	7												
	Total												

Figure 3. Data form for the daphnid, *Ceriodaphnia dubia*, survival and reproduction test. Daily summary of data (CONTINUED).

TABLE 3. SUMMARY OF TEST CONDITIONS AND TEST ACCEPTABILITY CRITERIA FOR DAPHNID, *CERIODAPHNIA DUBIA*, SURVIVAL AND REPRODUCTION TOXICITY TESTS WITH EFFLUENTS AND RECEIVING WATERS (TEST METHOD 1002.0)[1]

1.	Test type:	Static renewal (required)
2.	Temperature (°C):	25 ± 1°C (recommended) Test temperatures should not deviate (i.e., maximum minus minimum temperature) by more than 3°C during the test (required)
3.	Light quality:	Ambient laboratory illumination (recommended)
4.	Light intensity:	10-20 µE/m^2/s, or 50-100 ft-c (ambient laboratory levels) (recommended)
5.	Photoperiod:	16 h light, 8 h dark (recommended)
6.	Test chamber size:	30 mL (recommended minimum)
7.	Test solution volume:	15 mL (recommended minimum)
8.	Renewal of test solutions:	Daily (required)
9.	Age of test organisms:	Less than 24 h; and all released within a 8-h period (required)
10.	No. neonates per test chamber:	1 Assigned using blocking by known parentage (Subsection 13.10.2.4) (required)
11.	No. replicate test chambers per concentration:	10 (required minimum)
12.	No. neonates per test concentration:	10 (required minimum)
13.	Feeding regime:	Feed 0.1 mL each of YCT and algal suspension per test chamber daily (recommended)
14.	Cleaning:	Use freshly cleaned glass beakers or new plastic cups daily (recommended)
15.	Aeration:	None (recommended)
16.	Dilution water:	Uncontaminated source of receiving or other natural water, synthetic water prepared using MILLIPORE MILLI-Q® or equivalent deionized water and reagent grade chemicals or DMW (see Section 7, Dilution Water) (available options)

[1] For the purposes of reviewing WET test data submitted under NPDES permits, each test condition listed above is identified as required or recommended (see Subsection 10.2 for more information on test review). Additional requirements may be provided in individual permits, such as specifying a given test condition where several options are given in the method.

TABLE 3. SUMMARY OF TEST CONDITIONS AND TEST ACCEPTABILITY CRITERIA FOR DAPHNID, *CERIODAPHNIA DUBIA*, SURVIVAL AND REPRODUCTION TOXICITY TESTS WITH EFFLUENTS AND RECEIVING WATERS (TEST METHOD 1002.0) (CONTINUED)

17.	Test concentrations:	Effluents: 5 and a control (required minimum) Receiving Water: 100% receiving water (or minimum of 5) and a control (recommended)
18.	Dilution factor:	Effluents: ≥ 0.5 (recommended) Receiving Waters: None or ≥ 0.5 (recommended)
19.	Test duration:	Until 60% or more of surviving control females have three broods (maximum test duration 8 days) (required)
20.	Endpoints:	Survival and reproduction (required)
21.	Test acceptability criteria:	80% or greater survival of all control organisms and an average of 15 or more young per surviving female in the control solutions. 60% of surviving control females must produce three broods (required)
22.	Sampling requirements:	For on-site tests, samples collected daily and used within 24 h of the time they are removed from the sampling device. For off-site tests, a minimum of three samples (e.g., collected on days one, three, and five) with a maximum holding time of 36 h before first use (see Section 8, Effluent and Receiving Water Sampling, Sample Handling, and Sample Preparation for Toxicity Tests, Subsection 8.5.4) (required)
23.	Sample volume required:	1 L/day (recommended)

13.13 **DATA ANALYSIS**

13.13.1 GENERAL

13.13.1.1 Tabulate and summarize the data. A sample set of survival and reproduction data is listed in Table 4.

TABLE 4. SUMMARY OF SURVIVAL AND REPRODUCTION DATA FOR THE DAPHNID, *CERIODAPHNIA DUBIA*, EXPOSED TO AN EFFLUENT FOR SEVEN DAYS

Effluent Concentration (%)	No. of Young per Adult Replicate										No. Live Adults
	1	2	3	4	5	6	7	8	9	10	
Control	27	30	29	31	16	15	18	17	14	27	10
1.56	32	35	32	26	18	29	27	16	35	13	10
3.12	39	30	33	33	36	33	33	27	38	44	10
6.25	27	34	36	34	31	27	33	31	33	31	10
12.5	10	13	7	7	7	10	10	16	12	2	10
25.0	0	0	0	0	0	0	0	0	0	0	2

13.13.1.2 The endpoints of toxicity tests using the daphnid, *Ceriodaphnia dubia*, are based on the adverse effects on survival and reproduction. The LC50, the IC25, the IC50 and the EC50 are calculated using point estimation techniques, and LOEC and NOEC values for survival and reproduction are obtained using a hypothesis test approach such as Fisher's Exact Test (Finney, 1948; Pearson and Hartley, 1962), Dunnett's Procedure (Dunnett, 1955) or Steel's Many-one Rank Test (Steel, 1959; Miller, 1981) (see Section 9, Chronic Toxicity Test Endpoints and Data Analysis). Separate analyses are performed for the estimation of the LOEC and NOEC endpoints and for the estimation of the LC50, IC25, IC50 and EC50. Concentrations at which there is no survival in any of the test chambers are excluded from the statistical analysis of the NOEC and LOEC for reproduction, but included in the estimation of the LC50, IC25, IC50, and EC50. See the Appendices for examples of the manual computations, program listings, and examples of data input and program output.

13.13.1.3 The statistical tests described here must be used with a knowledge of the assumptions upon which the tests are contingent. Tests for normality and homogeneity of variance are included in Appendix B. The assistance of a statistician is recommended for analysts who are not proficient in statistics.

13.13.1.4 At the end of the test, if 50% or more of the surviving organisms in a block are identified as males, the entire block must be excluded from data analysis for the reproduction endpoint (i.e., calculation of the reproduction NOEC and IC25 as described in Subsection 13.13.3), but may be used in the analysis of the survival endpoint (i.e., calculation of the survival NOEC and LC50 as described in Subsection 13.13.2). For blocks having fewer than 50% of surviving organisms identified as males, the males (not the entire block) must be excluded from the analysis of reproduction (i.e., calculation of the reproduction NOEC and IC25 as described in Subsection 13.13.3), but may be used in the analysis of survival (i.e., calculation of the survival NOEC and LC50 as described in Subsection 13.13.2). Note that the exclusion of males from the analysis of reproduction may create unequal sample sizes among the concentrations, influencing the statistical methods chosen for analysis of reproduction (Figure 6). Determinations regarding test acceptability criteria for survival and reproduction (Subsection 13.12) must be made prior to exclusion of any blocks. In addition to these test acceptability criteria, if fewer than eight replicates in the

control remain after excluding males and blocks with 50% or more of surviving organisms identified as males, the test is invalid and must be repeated with a newly collected sample.

13.13.2 EXAMPLE OF ANALYSIS OF THE DAPHNID, *CERIODAPHNIA DUBIA*, SURVIVAL DATA

13.13.2.1 Formal statistical analysis of the survival data is outlined on the flowchart in Figure 4. The response used in the analysis is the number of animals surviving at each test concentration. Separate analyses are performed for the estimation of the NOEC and LOEC endpoints and for the estimation of the EC50, LC50, IC25, or IC50 endpoints. Concentrations at which there is no survival in any of the test chambers are excluded from the statistical analysis of the NOEC and LOEC, but included in the estimation of the LC, EC, and IC endpoints.

13.13.2.2 Fisher's Exact Test is used to determine the NOEC and LOEC endpoints. It provides a conservative test of the equality of any two survival proportions assuming only the independence of responses from a Bernoulli (binomial) population. Additional information on Fisher's Exact Test is provided in Appendix G.

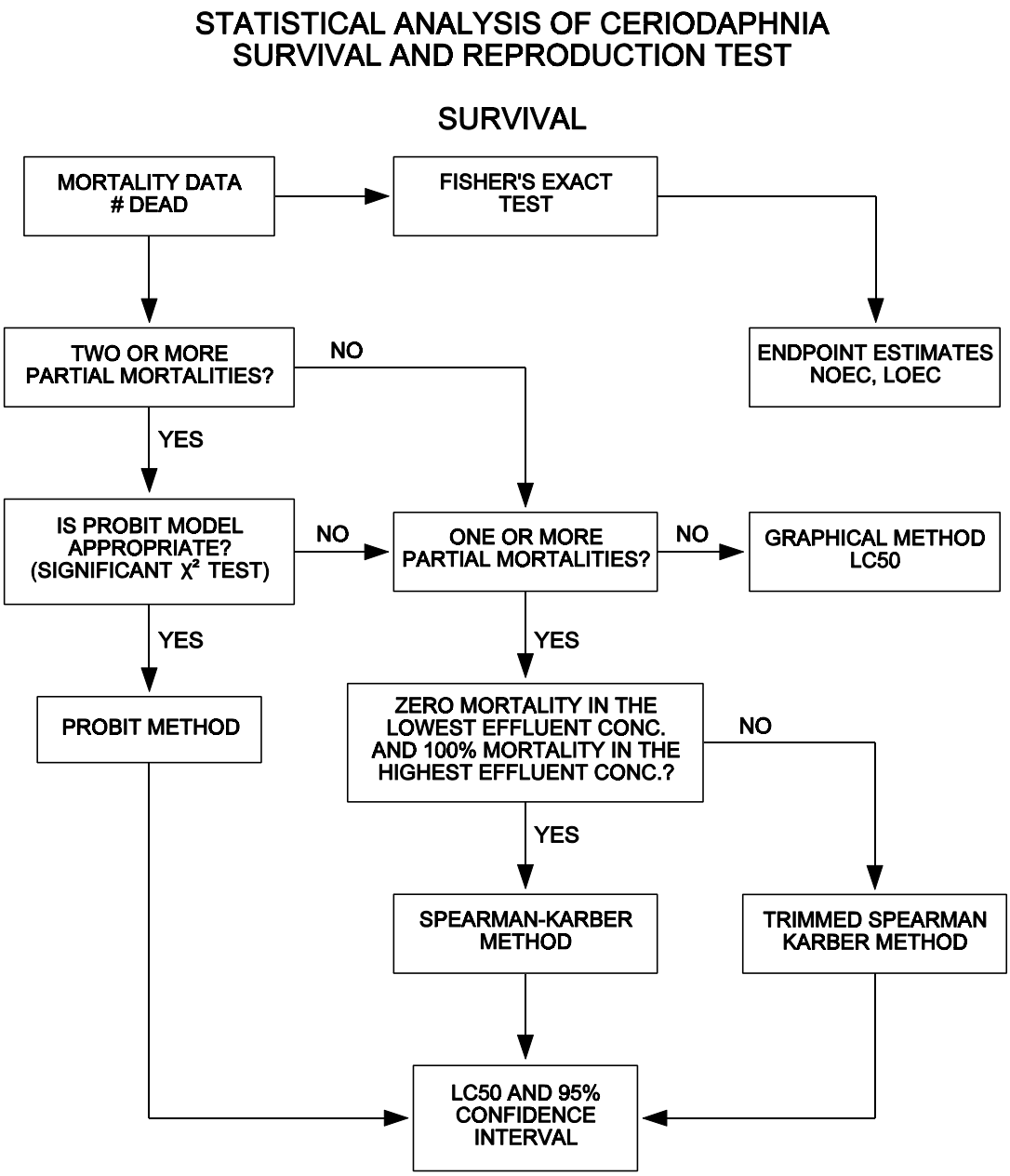

Figure 4. Flowchart for statistical analysis of the daphnid, *Ceriodaphnia dubia*, survival data.

13.13.2.3 Probit Analysis (Finney, 1971; Appendix I) is used to estimate the concentration that causes a specified percent decrease in survival from the control. In this analysis, the total number dead at a given concentration is the response.

13.13.2.4 Example of Analysis of Survival Data

13.13.2.4.1 The data in Table 4 will be used to illustrate the analysis of survival data from the daphnid, *Ceriodaphnia dubia*, Survival and Reproduction Test. As can be seen from the data in Table 4, there were no deaths in the 1.56%, 3.12%, 6.25%, and 12.5% concentrations. These concentrations are obviously not different from the control in terms of survival. This leaves only the 25% effluent concentration to be tested statistically for a difference in survival from the control.

13.13.2.5 Fisher's Exact Test

13.13.2.5.1 The basis for Fisher's Exact Test is a 2x2 contingency table. From the 2x2 table prepared by comparing the control and the effluent concentration, determine statistical significance by looking up a value in the table provided in Appendix G (Table G.5). However, to use this table the contingency table must be arranged in the format illustrated in Table 5.

TABLE 5. FORMAT OF THE 2x2 CONTINGENCY TABLE

	Number of		Number of
	Successes	Failures	Observations
Condition 1	a	A - a	A
Condition 2	b	B - b	B
Total	a + b	[(A+B) - a - b]	A + B

13.13.2.5.2 Arrange the table so that the total number of observations for row one is greater than or equal to the total for row two ($A \geq B$). Categorize a success such that the proportion of successes for row one is greater than or equal to the proportion of successes for row two ($a/A \geq b/B$). For these data, a success may be 'alive' or 'dead' whichever causes $a/A \geq b/B$. The test is then conducted by looking up a value in the table of significance levels of b and comparing it to the b value given in the contingency table. The table of significance levels of b is included in Appendix G, Table G.5. Enter Table G.5 in the section for A, subsection for B, and the line for a. If the b value of the contingency table is equal to or less than the integer in the column headed 0.05 in Table G.5, then the survival proportion for the effluent concentration is significantly different from that of the control. A dash or absence of entry in Table G.5 indicates that no contingency table in that class is significant.

13.13.2.5.3 To compare the control and the effluent concentration of 25%, the appropriate contingency table for the test is given in Table 6.

13.13.2.5.4 Since $10/10 \geq 3/10$, the category 'alive' is regarded as a success. For A = 10, B = 10 and, a = 10, under the column headed 0.05, the value from Table G.5 is b = 6. Since the value of b (b = 3) from the contingency table (Table 6), is less than the value of b (b = 6) from Table G.5 in Appendix G, the test concludes that the proportion

surviving in the 25% effluent concentration is significantly different from the control. Thus the NOEC for survival is 12.5% and the LOEC is 25%.

TABLE 6. 2x2 CONTIGENCY TABLE FOR CONTROL AND 25% EFFLUENT

	Number of		
	Alive	Dead	Number of Observations
Condition 1	10	0	10
Condition 2	3	7	10
Total	13	7	20

13.13.2.6 Calculation of the LC50

13.13.2.6.1 The data used for the Trimmed Spearman-Karber Method are summarized in Table 7. To perform the Trimmed Spearman-Karber Method, run the USEPA Trimmed Spearman-Karber Program. An example of the program input and output is supplied in Appendix J.

TABLE 7. DATA FOR TRIMMED SPEARMAN-KARBER ANALYSIS

	Effluent Concentration (%)					
	Control	1.56	3.12	6.25	12.5	25.0
Number Dead	0	0	0	0	0	8
Number Exposed	10	10	10	10	10	10

13.13.2.6.2 For this example, with only one partial mortality, Trimmed Spearman-Karber analysis appears appropriate for this data.

13.13.2.6.3 Figure 5 shows the output for the Trimmed Spearman-Karber Analysis of the data in Table 7 using the USEPA Program.

13.13.3 EXAMPLE OF ANALYSIS OF THE DAPHNID, *CERIODAPHNIA DUBIA,* REPRODUCTION DATA

13.13.3.1 Formal statistical analysis of the reproduction data is outlined on the flowchart in Figure 6. The response used in the statistical analysis is the number of young produced per adult female, which is determined by taking the total number of young produced until either the time of death of the adult or the end of the experiment, whichever comes first. In this three-brood test, offspring from fourth or higher broods should not be counted and should not be included in the total number of neonates produced during the test. An animal that dies before

producing young, if it has not been identified as a male, would be included in the analysis with zero entered as the number of young produced. The subsequent calculation of the mean number of live young produced per adult female for each toxicant concentration provides a combined measure of the toxicant's effect on both mortality and reproduction. An IC estimate can be calculated for the reproduction data using a point estimation technique (see Section 9, Chronic Toxicity Test Endpoints and Data Analysis). Hypothesis testing can be used to obtain an NOEC for reproduction. Concentrations above the NOEC for survival are excluded from the hypothesis test for reproduction effects.

13.13.3.2 The statistical analysis using hypothesis tests consists of a parametric test, Dunnett's Procedure, and a nonparametric test, Steel's Many-one Rank Test. The underlying assumptions of the Dunnett's Procedure, normality and homogeneity of variance, are formally tested using the Shapiro Wilk's Test for normality, and Bartlett's Test for homogeneity of variance. If either of these tests fails, a nonparametric test, Steel's Many-one Rank Test, is used to determine the NOEC and LOEC. If the assumptions of Dunnett's Procedure are met, the endpoints are determined by the parametric test.

13.13.3.3 Additionally, if unequal numbers of replicates occur among the concentration levels tested there are parametric and nonparametric alternative analyses. The parametric analysis is a t test with the Bonferroni adjustment (see Appendix D). The Wilcoxon Rank Sum Test with the Bonferroni adjustment is the nonparametric alternative (see Appendix F).

13.13.3.4 The data, mean, and variance of the observations at each concentration including the control are listed in Table 8. A plot of the number of young per adult female for each concentration is provided in Figure 7. Since there is significant mortality in the 25% effluent concentration, its effect on reproduction is not considered.

TABLE 8. THE DAPHNID, *CERIODAPHNIA DUBIA,* REPRODUCTION DATA

		Effluent Concentration (%)			
Replicate	Control	1.56	3.12	6.25	12.5
1	27	32	39	27	10
2	30	35	30	34	13
3	29	32	33	36	7
4	31	26	33	34	7
5	16	18	36	31	7
6	15	29	33	27	10
7	18	27	33	33	10
8	17	16	27	31	16
9	14	35	38	33	12
10	27	13	44	31	2
Mean $\overline{Y}_I$	22.4	26.3	34.6	31.7	9.4
S_i^2	48.0	64.0	23.4	8.7	15.1
i	1	2	3	4	5

TRIMMED SPEARMAN-KARBER METHOD. VERSION 1.5

DATE: 1 TEST NUMBER: 2 DURATION: 7 Days
TOXICANT: effluent
SPECIES: *Ceriodaphnia dubia*

RAW DATA:

Concentration (%)	Number Exposed	Mortalities
.00	10	0
1.25	10	0
3.12	10	0
6.25	10	0
12.5	10	0
25.0	10	8

SPEARMAN-KARBER TRIM: 20.00 %

SPEARMAN-KARBER ESTIMATES: LC50: 19.28
95% CONFIDENCE LIMITS
ARE NOT RELIABLE.

NOTE: MORTALITY PROPORTIONS WERE NOT MONOTONICALLY INCREASING.
ADJUSTMENTS WERE MADE PRIOR TO SPEARMAN-KARBER ESTIMATION.

Figure 5. Output for USEPA Trimmed Spearman-Karber program.

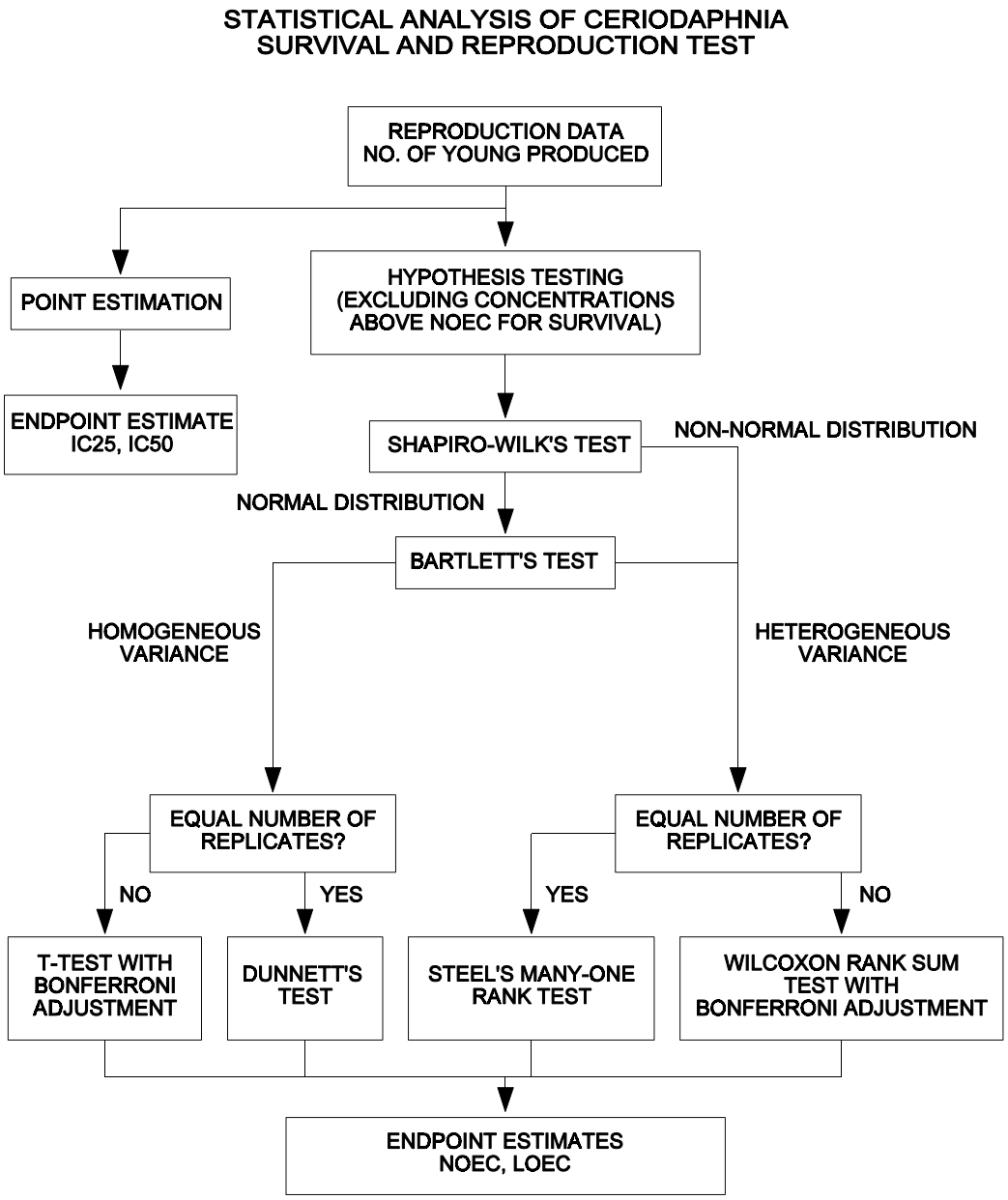

Figure 6. Flowchart for the statistical analysis of the daphnid, *Ceriodaphnia dubia*, reproduction data.

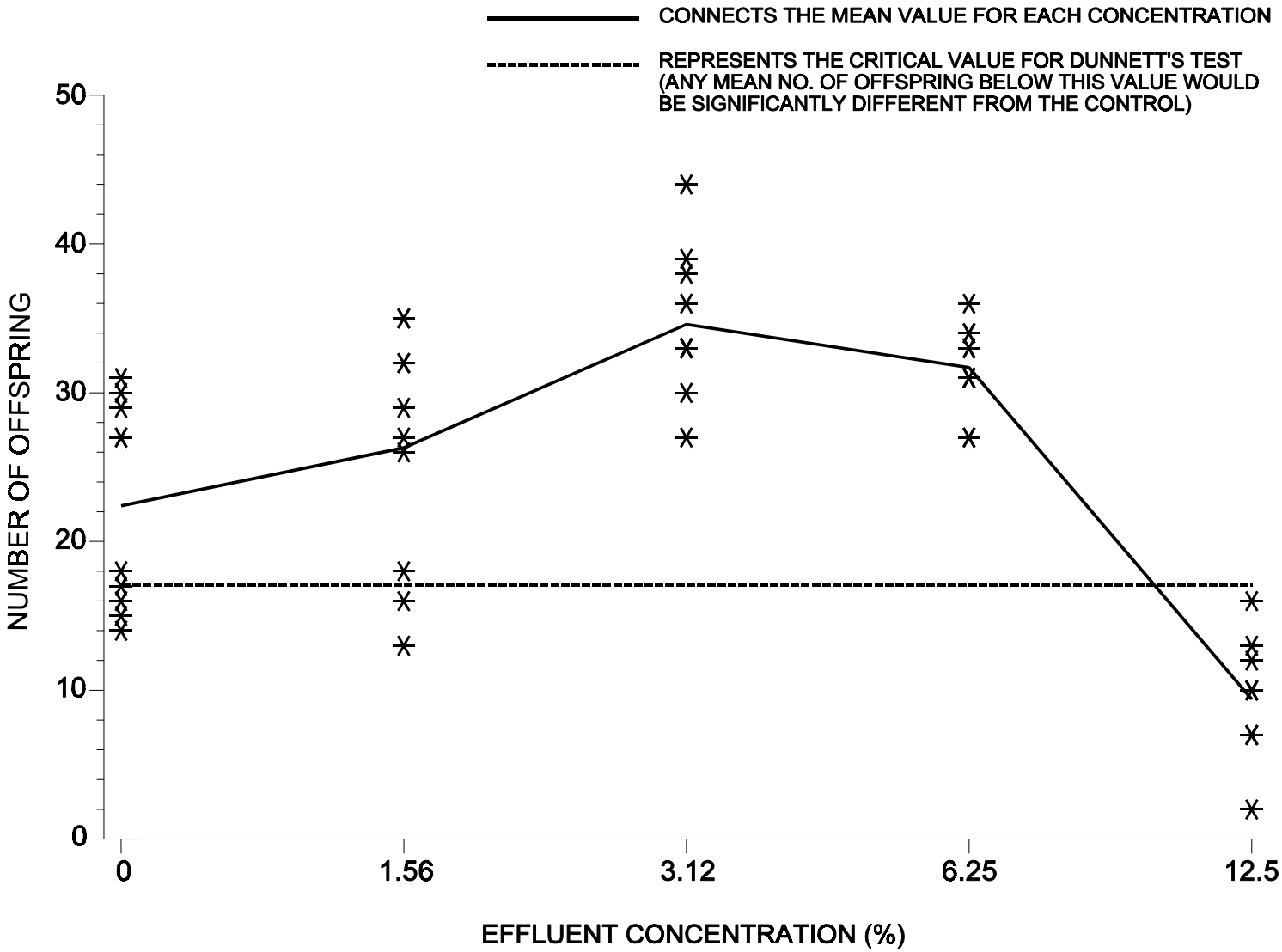

Figure 7. Plot of number of young per adult female from a daphnid, *Ceriodaphnia dubia*, survival and reproduction test.

13.13.3.5 Test for Normality

13.13.3.5.1 The first step of the test for normality is to center the observations by subtracting the mean of all the observations within a concentration from each observation in that concentration. The centered observations are summarized in Table 9.

TABLE 9. CENTERED OBSERVATIONS FOR SHAPIRO-WILK'S EXAMPLE

		Effluent Concentration (%)			
Replicate	Control	1.56	3.12	6.25	12.5
1	4.6	5.7	4.4	-4.7	0.6
2	7.6	8.7	-4.6	2.3	3.6
3	6.6	5.7	-1.6	4.3	-2.4
4	8.6	-0.3	-1.6	2.3	-2.4
5	-6.4	-8.3	1.4	-0.7	-2.4
6	-7.4	2.7	-1.6	-4.7	0.6
7	-4.4	0.7	-1.6	1.3	0.6
8	-5.4	-10.3	-7.6	-0.7	6.6
9	-8.4	8.7	3.4	1.3	2.6
10	4.6	-13.3	9.4	-0.7	-7.4

13.13.3.5.2 Calculate the denominator, D, of the test statistic:

$$D = \sum_{i=1}^{n} (X_i - \bar{X})^2$$

Where: X_i = the ith centered observation

$\bar{X}$ = the <u>overall</u> mean of the centered observations

n = the total number of centered observations.

For this set of data,

$$n = 50$$

$$\bar{X} = \frac{1}{50}(0.0) = 0.0$$

$$D = 1433.4$$

13.13.3.5.3 Order the centered observations from smallest to largest

$$X^{(1)} \leq X^{(2)} \leq \ldots \leq X^{(n)}$$

Where $X^{(i)}$ is the ith ordered observation. These ordered observations are listed in Table 10.

13.13.3.5.4 From Table 4, Appendix B, for the number of observations, n, obtain the coefficients $a_1, a_2, \ldots, a_k$ where k is n/2 if n is even and (n-1)/2 if n is odd. For the data in this example, n = 50, k = 25. The a_i values are listed in Table 11.

13.13.3.5.5 Compute the test statistic, W, as follows:

$$W = \frac{1}{D}\left[\sum_{i=1}^{k} a_i (X^{(n-i+1)} - X^{(i)})\right]^2$$

The differences $X^{(n-i+1)} - X^{(i)}$ are listed in Table 11.

For this set of data:

$$W = \frac{1}{1433.4}(37.3)^2 = 0.97$$

TABLE 10. ORDERED CENTERED OBSERVATIONS FOR SHAPIRO-WILK'S EXAMPLE

i	$X^{(i)}$	i	$X^{(i)}$
1	-13.3	26	0.6
2	-10.3	27	0.6
3	-8.4	28	0.7
4	-8.3	29	1.3
5	-7.6	30	1.3
6	-7.4	31	1.4
7	-7.4	32	2.3
8	-6.4	33	2.3
9	-5.4	34	2.6
10	-4.7	35	2.7
11	-4.7	36	3.4
12	-4.6	37	3.6
13	-4.4	38	4.3
14	-2.4	39	4.4
15	-2.4	40	4.6
16	-2.4	41	4.6
17	-1.6	42	5.7
18	-1.6	43	5.7
19	-1.6	44	6.6
20	-1.6	45	6.6
21	-0.7	46	7.6
22	-0.7	47	8.6
23	-0.7	48	8.7
24	-0.3	49	8.7
25	0.6	50	9.4

TABLE 11. COEFFICIENTS AND DIFFERENCES FOR SHAPIRO-WILK'S EXAMPLE

i	a_i	$X^{(n-i+1)} - X^{(i)}$	
1	0.3751	22.7	$X^{(50)} - X^{(1)}$
2	0.2574	19.0	$X^{(49)} - X^{(2)}$
3	0.2260	17.1	$X^{(48)} - X^{(3)}$
4	0.2032	16.9	$X^{(47)} - X^{(4)}$
5	0.1847	15.2	$X^{(46)} - X^{(5)}$
6	0.1691	14.0	$X^{(45)} - X^{(6)}$
7	0.1554	14.0	$X^{(44)} - X^{(7)}$
8	0.1430	12.1	$X^{(43)} - X^{(8)}$
9	0.1317	11.1	$X^{(42)} - X^{(9)}$
10	0.1212	9.3	$X^{(41)} - X^{(10)}$
11	0.1113	9.3	$X^{(40)} - X^{(11)}$
12	0.1020	9.0	$X^{(39)} - X^{(12)}$
13	0.0932	8.7	$X^{(38)} - X^{(13)}$
14	0.0846	6.0	$X^{(37)} - X^{(14)}$
15	0.0764	5.8	$X^{(36)} - X^{(15)}$
16	0.0685	5.1	$X^{(35)} - X^{(16)}$
17	0.0608	4.2	$X^{(34)} - X^{(17)}$
18	0.0532	3.9	$X^{(33)} - X^{(18)}$
19	0.0459	3.9	$X^{(32)} - X^{(19)}$
20	0.0386	3.0	$X^{(31)} - X^{(20)}$
21	0.0314	2.0	$X^{(30)} - X^{(21)}$
22	0.0244	2.0	$X^{(29)} - X^{(22)}$
23	0.0174	1.4	$X^{(28)} - X^{(23)}$
24	0.0104	0.9	$X^{(27)} - X^{(24)}$
25	0.0035	0.0	$X^{(26)} - X^{(25)}$

13.13.3.5.6 The decision rule for this test is to compare W with the critical value found in Table 6, Appendix B. If the computed W is less than the critical value, conclude that the data are not normally distributed. For this example, the critical value at a significance level of 0.01 and 50 observations (n) is 0.930. Since W = 0.97 is greater than the critical value, the conclusion of the test is that the data are normally distributed.

13.13.3.6 Test for Homogeneity of Variance

13.13.3.6.1 The test used to examine whether the variation in number of young produced is the same across all effluent concentrations including the control, is Bartlett's Test (Snedecor and Cochran, 1980). The test statistic is as follows:

$$B = \frac{[(\sum_{i=1}^{P} V_i)\ln \overline{S}^2 - \sum_{i=1}^{P} V_i \ln S_i^2]}{C}$$

Where: V_i = degrees of freedom for each effluent concentration and control, $V_i = (n_i - 1)$

p = number of levels of effluent concentration and control

n_i = the number of replicates for concentration i

ln = $\log_e$

i = 1, 2, ..., p where p is the number of concentrations including the control

$$\overline{S}^2 = \frac{(\sum_{i=1}^{P} V_i S_i^2)}{\sum_{i=1}^{P} V_i}$$

$$C = 1 + (3(p-1))^{-1}[\sum_{i=1}^{P} \frac{1}{V_i} - (\sum_{i=1}^{P} V_i)^{-1}]$$

13.13.3.6.2 For the data in this example (see Table 8), all effluent concentrations including the control have the same number of replicates (n_i = 10 for all i). Thus, V_i = 9 for all i.

13.13.3.6.3 Bartlett's statistic is therefore:

$$B = [(45)\ln(31.8) - 9\sum_{i=1}^{P} \ln(S_i^2)]/1.04$$

$$= [45(3.46) - 9(16.061)]/1.04$$

$$= 11.15/1.04$$

$$= 10.72$$

13.13.3.6.4 B is approximately distributed as chi-square with p - 1 degrees of freedom, when the variances are in fact the same. Therefore, the appropriate critical value for this test, at a significance level of 0.01 with four degrees of freedom, is 13.3. Since B = 10.7 is less than the critical value of 13.3, conclude that the variances are not different.

13.13.3.7 Dunnett's Procedure

13.13.3.7.1 To obtain an estimate of the pooled variance for the Dunnett's Procedure, construct an ANOVA table as described in Table 12.

TABLE 12. ANOVA TABLE

Source	df	Sum of Squares (SS)	Mean Square(MS) (SS/df)
Between	p - 1	SSB	= SSB/(p-1)
Within	N - p	SSW	= SSW/(N-p)
Total	N - 1	SST	

Where: p = number effluent concentrations including the control

N = total number of observations $n_1 + n_2 ... + n_p$

n_i = number of observations in concentration i

$$SSB = \sum_{i=1}^{P} \frac{T_i^2}{n_i} - \frac{G^2}{N}$$ Between Sum of Squares

$$SST = \sum_{i=1}^{P} \sum_{j=1}^{n_i} Y_{ij}^2 - \frac{G^2}{N}$$ Total Sum of Squares

$$SSW = SST - SSB$$ Within Sum of Squares

G = the grand total of all sample observations, $G = \sum_{i=1}^{P} T_i$

T_i = the total of the replicate measurements for concentration i

Y_{ij} = the jth observation for concentration i (represents the number of young produced by female j in effluent concentration i)

13.13.3.7.2 For the data in this example:

$n_1 = n_2 = n_3 = n_4 = n_5 = 10$

N = 50

$T_1 = Y_{11} + Y_{12} + . . . + Y_{110} = 224$
$T_2 = Y_{21} + Y_{22} + . . . + Y_{210} = 263$

$T_3 = Y_{31} + Y_{32} + \ldots + Y_{310} = 346$
$T_4 = Y_{41} + Y_{42} + \ldots + Y_{410} = 317$
$T_5 = Y_{51} + Y_{52} + \ldots + Y_{510} = 94$

$G = T_1 + T_2 + T_3 + T_4 + T_5 = 1244$

$$SSB = \sum_{i=1}^{P} \frac{T_i^2}{n_i} - \frac{G^2}{N}$$

$$t_2 = \frac{(22.4 - 26.3)}{[5.64\sqrt{(\frac{1}{10}) + (\frac{1}{10})}]} = -1.55$$

$$SST = \sum_{i=1}^{P}\sum_{j=1}^{n_i} Y_{ij}^2 - \frac{G^2}{N}$$

$$= 36{,}272 - \frac{(1244)^2}{50} = 5321.28$$

$$SSW = SST - SSB = 5321.28 - 3887.88 = 1433.40$$

S_B^2 = SSB/(p-1) = 3887.88/(5-1) = 971.97

S_W^2 = SSW/(N-p) = 1433.40/(50-5) = 31.85

13.13.3.7.3 Summarize these calculations in an ANOVA table (Table 13).

TABLE 13. ANOVA TABLE FOR DUNNETT'S PROCEDURE EXAMPLE

Source	df	Sum of Squares (SS)	Mean Square(MS) (SS/df)
Between	4	3887.88	971.97
Within	45	1433.40	31.85
Total	49	5321.28	

13.13.3.7.4 To perform the individual comparisons, calculate the t statistic for each concentration and control combination as follows:

$$t_i = \frac{(\bar{Y}_1 - \bar{Y}_i)}{S_w\sqrt{(\frac{1}{n_1}) + (\frac{1}{n_i})}}$$

Where: $\bar{Y}_i$ = mean number of young produced for effluent concentration i

$\bar{Y}_1$ = mean number of young produced for the control

S_W = square root of within mean square

n_1 = number of replicates for the control

n_i = number of replicates for concentration i.

Since we are looking for a decrease in reproduction from the control, the mean for concentration i is subtracted from the control mean in the t statistic above. However, if we were looking for an increased response over the control, the control mean would be subtracted from the mean at a concentration.

13.13.3.7.5 Table 14 includes the calculated t values for each concentration and control combination. In this example, comparing the 1.56% concentration with the control the calculation is as follows:

$$t_2 = \frac{(22.4 - 26.3)}{[5.64\sqrt{(\frac{1}{10}) + (\frac{1}{10})}]} = -1.55$$

TABLE 14. CALCULATED T VALUES

Effluent Concentration (%)	i	t_i
1.56	2	-1.55
3.12	3	-4.84
6.25	4	-3.69
12.5	5	5.16

13.13.3.7.6 Since the purpose of this test is to detect a significant reduction in mean reproduction, a one-sided test is appropriate. The critical value for this one-sided test is found in Table 5, Appendix C. Since an entry for 45 degrees of freedom for error is not provided in the table, the entry for 40 degrees of freedom for error, an alpha level of 0.05 and four concentrations (excluding the control) will be used, 2.23. The mean reproduction for concentration "i" is considered significantly less than the mean reproduction for the control if t_i is greater than the critical value.

Since t_5 is greater than 2.23, the 12.5% concentration has significantly lower reproduction than the control. Hence the NOEC and the LOEC for reproduction are 6.25% and 12.5%, respectively.

13.13.3.7.7 To quantify the sensitivity of the test, the minimum significant difference (MSD) that can be statistically detected may be calculated:

$$MSD = d\, S_w \sqrt{(\frac{1}{n_1}) + (\frac{1}{n})}$$

Where: d = the critical value for the Dunnett's Procedure

S_W = the square root of the within mean square

n = the common number of replicates at each concentration (this assumes equal replication at each concentration)

n_1 = the number of replicates in the control.

13.13.3.7.8 In this example:

$$MSD = 2.23(5.64)\sqrt{(\frac{1}{10})+(\frac{1}{10})}$$

$$= 2.23\ (5.64)\ (0.447)$$

$$= 5.62$$

13.13.3.7.9 Therefore, for this set of data, the minimum difference that can be detected as statistically significant is 5.62.

13.13.3.7.10 This represents a 25% decrease in mean reproduction from the control.

13.13.3.8 Calculation of the IC

13.13.3.8.1 The reproduction data in Table 4 are utilized in this example. As can be seen from Figure 8, the observed means are not monotonically non-increasing with respect to concentration. Therefore, the means must be smoothed prior to calculating the IC.

13.13.3.8.2 Starting with the observed control mean, $\overline{Y}_1$= 22.4, and the observed mean for the lowest effluent concentration,$\overline{Y}_2$= 26.3, we see that $\overline{Y}_1$ is less than $\overline{Y}_2$.

13.13.3.8.3 Calculate the smoothed means:

$$M_1 = M_2 = (\overline{Y}_1+\overline{Y}_2)/2 = 24.35$$

13.13.3.8.4 Since $\overline{Y}_3$= 34.6 is larger than M_2, average $\overline{Y}_3$ with the previous concentrations:

$$M_1 = M_2 = M_3 = (M_1 + M_2 + \overline{Y}_3)/3 = 27.7.$$

13.13.3.8.5 Additionally, $\overline{Y}_4$ = 31.7 is larger than M_3, and is pooled with the first three means. Thus:

$$(M_1 + M_2 + M_3 + \overline{Y}_4)/4 = 28.7 = M_1 = M_2 = M_3 = M_4$$

13.13.3.8.6 Since $M_4 > \overline{Y}_5$ = 9.4, set M_5 = 9.4. Likewise, $M_5 > \overline{Y}_6$ = 0, and M_6 becomes 0. Table 15 contains the smoothed means and Figure 8 gives a plot of the smoothed means and the interpolated response curve.

TABLE 15. DAPHNID, *CERIODAPHNIA DUBIA*, REPRODUCTION MEAN RESPONSE AFTER SMOOTHING

Response Effluent Conc. (%)	i	Smoothed Means, Y_i (young/female)	Means, M_i (young/female)
Control	1	22.4	28.75
1.56	2	26.3	28.75
3.12	3	34.6	28.75
6.25	4	31.7	28.75
12.5	5	9.4	9.40
25.0	6	0.0	0.00

13.13.3.8.7 Estimates of the IC25 and IC50 can be calculated using the Linear Interpolation Method. A 25% reduction in reproduction, compared to the controls, would result in a mean reproduction of 21.56 young per adult, where $M_1(1 - p/100) = 28.75(1 - 25/100)$. A 50% reduction in reproduction, compared to the controls, would result in a mean reproduction of 14.38 young per adult, where $M_1(1 - p/100) = 28.75(1 - 50/100)$. Examining the smoothed means and their associated concentrations (Table 15), the two effluent concentrations bracketing 21.56 young per adult are C_4 = 6.25% effluent and C_5 = 12.5% effluent. The two effluent concentrations bracketing a response of 14.38 young per adult are also C_4 = 6.25% and C_5 = 12.5%.

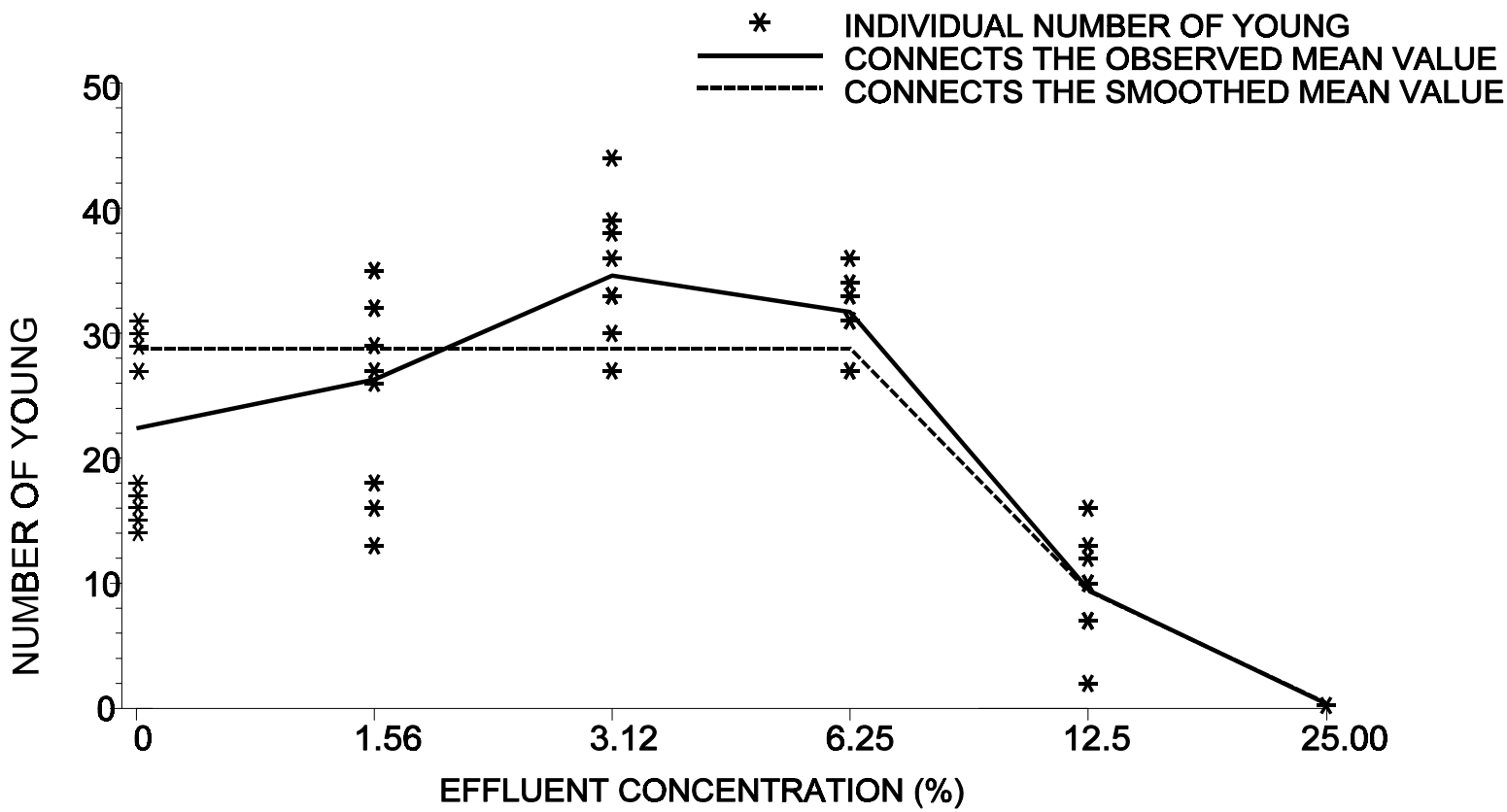

Figure 8. Plot of raw data, observed means, and smoothed means for the daphnid, *Ceriodaphnia dubia*, reproductive data.

13.13.3.8.8 Using equation from Section 4.2 in Appendix M, the estimate of the IC25 is as follows:

$$ICp = C_j + [M_1(1 - \frac{p}{100}) - M_j]\frac{(C_{(j+1)} - C_j)}{(M_{(j+1)} - M_j)}$$

$$IC25 = 6.25 + [28.75(1 - \frac{25}{100}) - 28.75]\frac{(12.5 - 6.25)}{(9.40 - 28.75)}$$

= 8.57% effluent

13.13.3.8.9 The estimate of the IC50 is as follows:

$$ICp = C_j + [M_1(1 - \frac{p}{100}) - M_j]\frac{(C_{(j+1)} - C_j)}{(M_{(j+1)} - M_j)}$$

$$IC50 = 6.25 + [28.75(1 - \frac{50}{100}) - 28.75]\frac{(12.5 - 6.25)}{(9.40 - 28.75)}$$

= 10.89% effluent

13.13.3.8.10 When the ICPIN program was used to analyze this data set for the IC25, requesting 80 resamples, the estimate of the IC25 was 8.5715% effluent. The empirical 95% confidence interval for the true mean was 8.3112% and 9.0418% effluent. The computer output for this data set is provided in Figure 9.

13.13.3.8.11 When the ICPIN program was used to analyze this data set for the IC50, requesting 80 resamples, the estimate of the IC50 was 10.8931% effluent. The empirical 95% confidence interval for the true mean was 10.4373% and 11.6269% effluent. The computer output for this data set is provided in Figure 10.

Conc. ID	1	2	3	4	5	6
Conc. Tested	0	1.56	3.12	6.25	12.5	25.0
Response 1	27	32	39	27	10	0
Response 2	30	35	30	34	13	0
Response 3	29	32	33	36	7	0
Response 4	31	26	33	34	7	0
Response 5	16	18	36	31	7	0
Response 6	15	29	33	27	10	0
Response 7	18	27	33	33	10	0
Response 8	17	16	27	31	16	0
Response 9	14	35	38	33	12	0
Response 10	27	13	44	31	2	0

```
*** Inhibition Concentration Percentage Estimate ***
Toxicant/Effluent: Effluent
Test Start Date: Example   Test Ending Date:
Test Species: Ceriodaphnia dubia
Test Duration:             7-d
DATA FILE: cdmanual.icp
OUTPUT FILE: cdmanual.i25
```

Conc. ID	Number Replicates	Concentration %	Response Means	Std. Dev.	Pooled Response Means
1	10	0.000	22.400	6.931	28.750
2	10	1.560	26.300	8.001	28.750
3	10	3.120	34.600	4.835	28.750
4	10	6.250	31.700	2.946	28.750
5	10	12.500	9.400	3.893	9.400
6	10	25.000	0.000	0.000	0.000

```
The Linear Interpolation Estimate:     8.5715   Entered P Value: 25
Number of Resamplings:   80
The Bootstrap Estimates Mean:   8.5891 Standard Deviation:     0.1831
Original Confidence Limits:   Lower:     8.3112 Upper:     9.0418
Resampling time in Seconds:     2.53  Random Seed: -641671986
```

Figure 9. Example of ICPIN program output for the IC25.

Conc. ID	1	2	3	4	5	6
Conc. Tested	0	1.56	3.12	6.25	12.5	25.0
Response 1	27	32	39	27	10	0
Response 2	30	35	30	34	13	0
Response 3	29	32	33	36	7	0
Response 4	31	26	33	34	7	0
Response 5	16	18	36	31	7	0
Response 6	15	29	33	27	10	0
Response 7	18	27	33	33	10	0
Response 8	17	16	27	31	16	0
Response 9	14	35	38	33	12	0
Response 10	27	13	44	31	2	0

*** Inhibition Concentration Percentage Estimate ***
Toxicant/Effluent: Effluent
Test Start Date: Example Test Ending Date:
Test Species: Ceriodaphnia dubia
Test Duration: 7-d
DATA FILE: cdmanual.icp
OUTPUT FILE: cdmanual.i50

Conc. ID	Number Replicates	Concentration %	Response Means	Std. Dev.	Pooled Response Means
1	10	0.000	22.400	6.931	28.750
2	10	1.560	26.300	8.001	28.750
3	10	3.120	34.600	4.835	28.750
4	10	6.250	31.700	2.946	28.750
5	10	12.500	9.400	3.893	9.400
6	10	25.000	0.000	0.000	0.000

The Linear Interpolation Estimate: 10.8931 Entered P Value: 50

Number of Resamplings: 80
The Bootstrap Estimates Mean: 10.9316 Standard Deviation: 0.3357
Original Confidence Limits: Lower: 10.4373 Upper: 11.6269
Resampling time in Seconds: 2.58 Random Seed: 172869646

Figure 10. Example of ICPIN program output for the IC50.

13.14 PRECISION AND ACCURACY

13.14.1 PRECISION – Data on single-laboratory and multilaboratory precision are described below (Subsections 13.14.1.1 and 13.14.1.2). Single-laboratory precision is a measure of the reproducibility of test results when tests are conducted using a specific method under reasonably constant conditions in the same laboratory. Single-laboratory precision is synonymous with the terms within-laboratory precision and intralaboratory precision. Multilaboratory precision is a measure of the reproducibility of test results from different laboratories using the same test method and analyzing the same test material. Multilaboratory precision is synonymous with the term interlaboratory precision. Interlaboratory precision, as used in this document, includes both within-laboratory and between-laboratory components of variability. In recent multilaboratory studies, these two components of interlaboratory precision have been displayed separately (termed within-laboratory and between-laboratory variability) and combined (termed total interlaboratory variability). The total interlaboratory variability that is reported from these studies is synonymous with interlaboratory variability reported from other studies where individual variability components are not separated.

13.14.1.1 Single-Laboratory Precision

13.14.1.1.1 Information on the single-laboratory precision of the daphnid, *Ceriodaphnia dubia*, survival and reproduction test is based on the NOEC and LOEC values from nine tests with the reference toxicant sodium pentachlorophenate (NaPCP) is provided in Table 16. The NOECs and LOECs of all tests fell in the same concentration range, indicating maximum possible precision. Table 17 gives precision data for the IC25 and IC50 values for seven tests with the reference toxicant NaPCP. Coefficient of variation was 41% for the IC25 and 28% for the IC50.

13.14.1.1.2 Ten sets of data from six laboratories met the acceptability criteria, and were statistically analyzed using nonparametric procedures to determine NOECs and LOECs.

13.14.1.1.3 EPA evaluated within-laboratory precision of the daphnid, *Ceriodaphnia dubia*, Survival and Reproduction Test using a database of routine reference toxicant test results from 33 laboratories (USEPA, 2000b). The database consisted of 393 reference toxicant tests conducted in 33 laboratories using a variety of reference toxicants including: cadmium, copper, potassium chloride, sodium chloride, and sodium pentachlorophenate. Among the 33 laboratories, the median within-laboratory CV calculated for routine reference toxicant tests was 27% for the IC25 reproduction endpoint. In 25% of laboratories, the within-laboratory CV was less than 17%; and in 75% of laboratories, the within-laboratory CV was less than 45%.

TABLE 16: SINGLE LABORATORY PRECISION OF THE DAPHNID, *CERIODAPHNIA DUBIA*, SURVIVAL AND REPRODUCTION TEST, USING NAPCP AS A REFERENCE TOXICANT[1,2]

Test	NOEC (mg/L)	LOEC (mg/L)	Chronic Value (mg/L)
1[3]	0.25	0.50	0.35
2[4]	0.20	0.60	0.35
3	0.20	0.60	0.35
4[5]	0.30	0.60	0.42
5	0.30	0.60	0.42
6	0.30	0.60	0.42
7	0.30	0.60	0.42
8	0.30	0.60	0.42
9	0.30	0.60	0.42

1 For a discussion of the precision of data from chronic toxicity tests see Section 4, Quality Assurance.

2 Data from Tests performed by Philip Lewis, Aquatic Biology Branch, EMSL-Cincinnati, OH. Tests were conduted in reconstituted hard water (hardness = 180 mg $CaC0_3$/L; pH - 8.1).

3 Concentrations used in Test 1 were: 0.03, 0.06, 0.12, 0.25, 0.50, 1.0 mg NaPCP/L.

4 Concentrations used in Tests 2 and 3 were: 0.007, 0.022, 0.067, 0.020, 0.60 mg NaPCP/L.

5 Concentrations used in Tests 4 through 9 were: 0.0375, 0.075, 0.150, 0.30, 0.60 mg NaPCP/L.

TABLE 17. THE DAPHNID, *CERIODAPHNIA DUBIA,* SEVEN-DAY SURVIVAL AND REPRODUCTION TEST PRECISION FOR A SINGLE LABORATORY USING NAPCP AS THE REFERENCE TOXICANT (USEPA, 1991a)

Test Number	NOEC (mg/L)	IC25 (mg/L)	IC50 (mg/L)
19	0.30	0.3754	0.4508
46A	0.20	0.0938	0.2608
46B	0.20	0.2213	0.2879
49	0.20	0.2303	0.2912
55	0.20	0.2306	0.3177
56	0.10	0.2241	0.2827
n	7	7	7
Mean	NA	0.2157	0.2953
CV(%)	NA	41.1	27.9

13.14.1.2 Multilaboratory Precision

13.14.1.2.1 A multilaboratory study was performed by the Aquatic Biology Branch, EMSL-Cincinnati in 1985e, involving a total of 11 analysts in 10 different laboratories (Neiheisel et. al., 1988; USEPA, 1988e). Each analyst performed one-to-three seven-day tests using aliquots of a copper-spiked effluent sample, for a total of 25 tests. The tests were performed on the same day in all participating laboratories, using a pre-publication draft of Method 1002.0. The NOECs and LOECs for these tests were within one concentration interval which, with a dilution factor of 0.5, is equivalent to a two-fold range in concentration (Table 18).

13.14.1.2.2 A second multilaboratory study of Method 1002.0 (using the first edition of this manual; USEPA, 1985c), was coordinated by Battelle, Columbus Division, and involved 11 participating laboratories (Table 19) (DeGraeve et al., 1989). All participants used 10% DMW (10% PERRIER® Water) as the culture and dilution water, and used their own formulation of food for culturing and testing the *Ceriodaphnia dubia*. Each laboratory was to conduct at least one test with each of eight blind samples. Each test consisted of 10 replicates of one organism each for five toxicant concentrations and a control. Of the 116 tests planned, 91 were successfully initiated, and 70 (77%) met the survival and reproduction criteria for acceptability of the results (80% survival and nine young per initial female). If the reproduction criteria of 15 young/female, used in this edition of the method, had been applied to the results of the interlaboratory study, 22 additional tests would have been unacceptable. The overall precision (CV) of the test was 27% for the survival data (7-day LC50s) and 37.5% and 39.0% for the reproduction data (IC50s and IC25s, respectively).

13.14.1.2.3 In 2000, EPA conducted an interlaboratory variability study of the daphnid, *Ceriodaphnia dubia*, Survival and Reproduction Test (USEPA, 2001a; USEPA, 2001b). In this study, each of 34 participant laboratories tested 3 or 4 blind test samples that included some combination of blank, effluent, reference toxicant, and receiving water sample types. The blank sample consisted of moderately-hard synthetic freshwater, the effluent sample was a municipal wastewater spiked with KCl, the receiving water sample was a river water spiked with KCl, and the reference toxicant sample consisted of moderately-hard synthetic freshwater spiked with KCl. Of the 122 *Ceriodaphnia dubia* Survival and Reproduction tests conducted in this study, 82.0% were successfully completed and met the required test acceptability criteria. Of 27 tests that were conducted on blank samples, none showed false positive results for survival endpoints, and only one resulted in false positive results for the growth endpoint, yielding a false positive rate of 3.70%. Results from the reference toxicant, effluent, and receiving water sample types were used to calculate the precision of the method. Table 20 shows the precision of the IC25 for each of these sample types. Averaged across sample types, the total interlaboratory variability (expressed as a CV%) was 35.0% for IC25 results. Table 21 shows the frequency distribution of survival and growth NOEC endpoints for each sample type. For the survival endpoint, NOEC values spanned three concentrations for the reference toxicant and effluent sample types and two concentrations for the receiving water sample type. The percentage of values within one concentration of the median was 97.2%, 91.3%, and 100% for the reference toxicant, effluent, and receiving water sample types, respectively. For the growth endpoint, NOEC values spanned five concentrations for the reference toxicant sample type, three concentrations for the effluent sample type, and two concentrations for the receiving water sample type. The percentage of values within one concentration of the median was 83.3%, 100%, and 100% for the reference toxicant, effluent, and receiving water sample types, respectively.

13.14.2 ACCURACY

13.14.2.1 The accuracy of toxicity tests cannot be determined.

TABLE 18. INTERLABORATORY PRECISION FOR THE DAPHNID, *CERIODAPHNIA DUBIA,* SURVIVAL AND REPRODUCTION TEST WITH COPPER SPIKED EFFLUENT (USEPA, 1988e)

		Endpoints (% Effluent)			
		Reproduction		Survival	
Analyst	Test	NOEC	LOEC	NOEC	LOEC
3	1	12	25	25	50
4	1	6	12	12	25
4	2	6	12	25	50
5	1	6	12	12	25
5	2	12	25	12	25
6	1	12	25	25	50
6	2	6	12	25	50
10	1	6	12	12	25
10	2	6	12	12	25
11	1	12	25	25	50

TABLE 19. INTERLABORATORY PRECISION DATA FOR THE DAPHNID, *CERIODAPHNIA DUBIA*, SUMMARIZED FOR EIGHT REFERENCE TOXICANTS AND EFFLUENTS (USEPA, 1991a)

Test Material	Mean IC50	CV%	Mean IC25	CV%
Sodium chloride	1.34	29.9	1.00	34.3
Industrial	3.6	83.3	3.2	78.1
Sodium chloride	0.96	57.4	0.09	44.4
Pulp and Paper	60.0	28.3	47.3	27.0
Potassium dichromate	35.8	30.8	23.4	32.7
Pulp and Paper	70.2	7.5	55.7	12.2
Potassium dichromate	53.2	25.9	29.3	46.8
Industrial	69.8	37.0	67.3	36.7
n		8		8
Mean		37.5		39.0
Standard Deviation		23.0		19.1

TABLE 20. PRECISION OF POINT ESTIMATES FOR VARIOUS SAMPLE TYPES[1]

Test Endpoint	Sample Type	CV (%)[2]		
		Within-lab[3]	Between-lab[4]	Total[5]
IC25	Reference toxicant	-	-	-
	Effluent	17.4	27.6	32.6
	Receiving water	-	-	37.4
	Average	17.4	27.6	35.0

1 From EPA's WET Interlaboratory Variability Study (USEPA, 2001a; USEPA, 2001b).

2 CVs were calculated based on the within-laboratory component of variability, the between-laboratory component of variability, and the total interlaboratory variability (including both within-laboratory and between-laboratory components). For the reference toxicant sample type a majority of the results were outside of the test concentration range, so precision estimates were not calculated. For the receiving water sample type, within-laboratory and between-laboratory components of variability could not be calculated since the study design did not provide within-laboratory replication for this sample type.

3 The within-laboratory (intralaboratory) component of variability for duplicate samples tested at the same time in the same laboratory.

4 The between-laboratory component of variability for duplicate samples tested at different laboratories.

5 The total interlaboratory variability, including within-laboratory and between-laboratory components of variability. The total interlaboratory variability is synonymous with interlaboratory variability reported from other studies where individual variability components are not separated.

TABLE 21. FREQUENCY DISTRIBUTION OF HYPOTHESIS TESTING RESULTS FOR VARIOUS SAMPLE TYPES[1]

Test Endpoint	Sample Type	Median NOEC Value	% of Results at the Median	% of Results ±1[2]	% of Results ≥2[3]
Survival NOEC	Reference toxicant	100%	97.2	0.00	2.78
	Effluent	25%	65.2	26.1	8.70
	Receiving water	25%	90.0	10.0	0.00
Growth NOEC	Reference toxicant	100%	72.2	11.1	16.7
	Effluent	12.5%	70.8	29.2	0.00
	Receiving water	25%	70.0	30.0	0.00

1 From EPA's WET Interlaboratory Variability Study (USEPA, 2001a; USEPA, 2001b).
2 Percent of values at one concentration interval above or below the median. Adding this percentage to the percent of values at the median yields the percent of values within one concentration interval of the median.
3 Percent of values two or more concentration intervals above or below the median.

SECTION 14

TEST METHOD

GREEN ALGA, *SELENASTRUM CAPRICORNUTUM*, GROWTH TEST METHOD 1003.0

14.1 SCOPE AND APPLICATION

14.1.1 This method measures the chronic toxicity of effluents and receiving water to the freshwater green alga, *Selenastrum capricornutum*, in a four-day static test. The effects include the synergistic, antagonistic, and additive effects of all the chemical, physical, and biological components which adversely affect the physiological and biochemical functions of the test organisms.

14.1.2 Detection limits of the toxicity of an effluent or pure substance are organism dependent.

14.1.3 Brief excursions in toxicity may not be detected using 24-h composite samples. Also, because of the long sample collection period involved in composite sampling, and because the test chambers are not sealed, highly degradable or highly volatile toxicants present in the source may not be detected in the test.

14.1.4 This test method is commonly used in one of two forms: (1) a definitive test, consisting of a minimum of five effluent concentrations and a control, and (2) a receiving water test(s), consisting of one or more receiving water concentrations and a control.

14.1.5 This test is very versatile because it can also be used to identify wastewaters which are biostimulatory and may cause nuisance growths of algae, aquatic weeds, and other organisms at higher trophic levels.

14.2 SUMMARY OF METHOD

14.2.1 A green alga, *Selenastrum capricornutum,* population is exposed in a static system to a series of concentrations of effluent, or to receiving water, for 96 h. The response of the population is measured in terms of changes in cell density (cell counts per mL), biomass, chlorophyll content, or absorbance.

14.3 INTERFERENCES

14.3.1 Toxic substances may be introduced by contaminants in dilution water, glassware, sample hardware, and testing equipment (see Section 5, Facilities, Equipment, and Supplies).

14.3.2 Adverse effects of high concentrations of suspended and/or dissolved solids, color, and extremes of pH may mask the presence of toxic substances.

14.3.3 Improper effluent sampling and handling may adversely affect test results (see Section 8, Effluent and Receiving Water Sampling, Sample Handling, and Sample Preparation for Toxicity Tests).

14.3.4 Pathogenic organisms and/or planktivores in the dilution water and effluent may affect test organism survival and growth, and confound test results.

14.3.5 Nutrients in the effluent or dilution water may confound test results.

14.4 SAFETY

14.4.1 See Section 3, Safety and Health.

14.5 APPARATUS AND EQUIPMENT

14.5.1 Laboratory *Selenastrum capricornutum* culture unit -- see culturing methods below and USEPA, 2002a. To test effluent toxicity, sufficient numbers of log-phase-growth organisms must be available.

14.5.2 Samplers -- automatic sampler, preferably with sample cooling capability, that can collect a 24-h composite sample of 5 L or more.

14.5.3 Sample containers -- for sample shipment and storage (see Section 8, Effluent and Receiving Water Sampling, Sample Handling, and Sample Preparation for Toxicity Tests).

14.5.4 Environmental chamber, incubator, or equivalent facility -- with "cool-white" fluorescent illumination (86 ± 8.6 $\mu E/m^2/s$, 400 ± 40 ft-c, or 4306 lux) and temperature control (25 ± 1 °C).

14.5.5 Mechanical shaker -- capable of providing orbital motion at the rate of 100 cycles per minute (cpm).

14.5.6 Light meter -- with a range of 0-200 $\mu E/m^2/s$ (0-1000 ft-c).

14.5.7 Water purification system -- MILLIPORE MILLI-Q®, deionized water or equivalent (see Section 5, Facilities, Equipment, and Supplies).

14.5.8 Balance -- analytical, capable of accurately weighing 0.00001 g.

14.5.9 Reference weights, class S -- for checking performance of balance.

14.5.10 Volumetric flasks and graduated cylinders -- class A, 10-1000 mL, borosilicate glass, for culture work and preparation of test solutions.

14.5.11 Volumetric pipets -- class A, 1-100 mL.

14.5.12 Serological pipets -- 1-10 mL, graduated.

14.5.13 Pipet bulbs and fillers -- PROPIPET®, or equivalent.

14.5.14 Wash bottles -- for rinsing small glassware, instrument electrodes, and probes.

14.5.15 Test chambers -- four 125 or 250 mL borosilicate, Erlenmeyer flasks, with foam plugs or stainless steel or Shumadzu closures. For special glassware cleaning requirements (see Section 5, Facilities, Equipment, and Supplies).

14.5.16 Culture chambers -- 1-4 L borosilicate, Erlenmeyer flasks.

14.5.17 Thermometers, glass or electronic, laboratory grade -- for measuring water temperatures.

14.5.18 Bulb-thermograph or electronic-chart type thermometers -- for continuously recording temperature.

14.5.19 Thermometer, National Bureau of Standards Certified, (see USEPA Method 170.1, USEPA, 1979b) -- to calibrate laboratory thermometers.

14.5.20 Meters, pH and specific conductivity -- for routine physical and chemical measurements.

14.5.21 Tissue grinder -- for chlorophyll extraction.

14.5.22 Fluorometer (Optional) -- equipped with chlorophyll detection light source, filters, and photomultiplier tube (Turner Model 110 or equivalent).

14.5.23 UV-VIS spectrophotometer -- capable of accommodating 1-5 cm cuvettes.

14.5.24 Cuvettes for spectrophotometer -- 1-5 cm light path.

14.5.25 Electronic particle counter (Optional) -- Coulter Counter, Model ZBI, or equivalent, with mean cell (particle) volume determination.

14.5.26 Microscope -- with 10X, 45X, and 100X objective lenses, 10X ocular lenses, mechanical stage, substage condenser, and light source (inverted or conventional microscope).

14.5.27 Counting chamber -- Sedgwick-Rafter, Palmer-Maloney, or hemocytometer.

14.5.28 Centrifuge -- with swing-out buckets having a capacity of 15-100 mL.

14.5.29 Centrifuge tubes -- 15-100 mL, screw-cap.

14.5.30 Filtering apparatus -- for membrane and/or glass fiber filters.

14.6 REAGENTS AND CONSUMABLE MATERIALS

14.6.1 Sample containers -- for sample shipment and storage (see Section 8, Effluent and Receiving Water Sampling, Sample Handling, and Sample Preparation for Toxicity Tests).

14.6.2 Data sheets (one set per test) -- for recording data.

14.6.3 Tape, colored -- for labeling test chambers.

14.6.4 Markers, waterproof -- for marking containers, etc.

14.6.5 Reagents for hardness and alkalinity tests -- see USEPA Methods 130.2 and 310.1, USEPA, 1979b.

14.6.6 Buffers pH 4, pH 7, and pH 10 (or as per instructions of instrument manufacturer) for instrument calibration (see USEPA Method 150.1, USEPA, 1979b).

14.6.7 Specific conductivity standards (see USEPA Method 120.1, USEPA, 1979b).

14.6.8 Standard particles -- such as chicken or turkey fibroblasts or polymer microspheres, 5.0 ± 0.03 µm diameter, 65.4 μm^3 volume, for calibration of electronic particle counters.

14.6.9 Membranes and filling solutions for DO probe (see USEPA Method 360.1, USEPA, 1979b), or reagents -- for modified Winkler analysis.

14.6.10 Laboratory quality control samples and standards -- for calibration of the above methods.

14.6.11 Reference toxicant solutions -- see Section 4, Quality Assurance.

14.6.12 Reagent water -- defined as distilled or deionized water that does not contain substances which are toxic to the test organisms (see Section 5, Facilities, Equipment, and Supplies).

14.6.13 Effluent or receiving water and dilution water -- see Section 7, Dilution Water; and Section 8, Effluent and Receiving Water Sampling, Sample Handling, and Sample Preparation for Toxicity Testing.

14.6.14 Acetone -- pesticide-grade or equivalent.

14.6.15 Dilute (10%) hydrochloric acid -- carefully add 10 mL of concentrated HCl to 90 mL of MILLI-Q® water.

14.6.16 TEST ORGANISMS, GREEN ALGA, *SELENASTRUM CAPRICORNUTUM*

14.6.16.1 *Selenastrum capricornutum*, a unicellular coccoid green alga, is the test organism. The genus and species name of this organism was formally changed to *Pseudokirchneriella subcapitata* (Hindak, 1990), however, the method manual will continue to refer to *Selenastrum capricornutum* to maintain consistency with previous versions of the method.

14.6.16.2 Algal Culture Medium is prepared as follows:

14.6.16.2.1 Prepare (five) stock nutrient solutions using reagent grade chemicals as described in Table 1.

14.6.16.2.2 Add 1 mL of each stock solution, in the order listed in Table 1, to approximately 900 mL of MILLI-Q® water. Mix well after the addition of each solution. Dilute to 1 L, mix well, and adjust the pH to 7.5 ± 0.1, using 0.1N NaOH or HCl, as appropriate. The final concentration of macronutrients and micronutrients in the culture medium is given in Table 2.

14.6.16.2.3 Immediately filter the pH-adjusted medium through a 0.45 µm pore diameter membrane at a vacuum of not more than 380 mm (15 in.) mercury, or at a pressure of not more than one-half atmosphere (8 psi). Wash the filter with 500 mL deionized water prior to use.

14.6.16.2.4 If the filtration is carried out with sterile apparatus, filtered medium can be used immediately, and no further sterilization steps are required before the inoculation of the medium. The medium can also be sterilized by autoclaving after it is placed in the culture vessels. If a 0.22 µg filter is used no sterilization is needed.

14.6.16.2.5 Unused sterile medium should not be stored more than one week prior to use, because there may be substantial loss of water by evaporation.

14.6.16.2.6 When prepared according to Table 1, the micronutrient stock solution contains ethylenediaminetetraacetic acid (EDTA). EPA requires the addition of EDTA to nutrient stock solutions when conducting the *Selenastrum capricornutum* Growth Test and submitting data under NPDES permits. The use of EDTA improves test method performance by reducing the incidence of false positives and increasing test method precision. In interlaboratory testing of split samples analyzed with and without the addition of EDTA, false positive rates were 0.00% with EDTA and 33.3% without EDTA (USEPA, 2001a). Interlaboratory variability, expressed as the CV for IC25 values, was 34.3% with EDTA and 58.5% without EDTA (USEPA, 2001a). While the addition of EDTA improves test performance, EPA also cautions that the addition of EDTA may cause the *Selenastrum capricornutum* Growth Test to underestimate the toxicity of metals. Regulatory authorities should consider this possibility when selecting test methods for monitoring effluents that are suspected to contain metals. As recommended in EPA's Technical Support Document for Water Quality-Based Toxics Control (USEPA, 1991a), the most sensitive of at least three test species from different phyla should be used for monitoring the toxicity of effluents.

TABLE 1. NUTRIENT STOCK SOLUTIONS FOR MAINTAINING ALGAL STOCK CULTURES AND TEST CONTROL CULTURES

STOCK SOLUTION	COMPOUND	AMOUNT DISSOLVED IN 500 mL MILLI-Q® WATER	
1. MACRONUTRIENTS			
A.	$MgCl_2 \cdot 6H_2O$	6.08	g
	$CaCl_2 \cdot 2H_2O$	2.20	g
	$NaNO_3$	12.75	g
B.	$MgSO_4 \cdot 7H_2O$	7.35	g
C	K_2HPO_4	0.522	g
D.	$NaHCO_3$	7.50	g
2. MICRONUTRIENTS			
	H_3BO_3	92.8	mg
	$MnCl_2 \cdot 4H_2O$	208.0	mg
	$ZnCl_2$	1.64	mg[1]
	$FeCl_3 \cdot 6H_2O$	79.9	mg
	$CoCl_2 \cdot 6H_2O$	0.714	mg[2]
	$Na_2MoO_4 \cdot 2H_2O$	3.63	mg[3]
	$CuCl_2 \cdot 2H_2O$	0.006	mg[4]
	$Na_2EDTA \cdot 2H_2O$	150.0	mg
	Na_2SeO_4	1.196	mg[5]

[1] $ZnCl_2$ - Weigh out 164 mg and dilute to 100 mL. Add 1 mL of this solution to Stock 2, micronutrients.
[2] $CoCl_2 \cdot 6H_2O$ - Weigh out 71.4 mg and dilute to 100 mL. Add 1 mL of this solution to Stock 2, micronutrients.
[3] $Na_2MoO_4 \cdot 2H_2O$ - Weigh out 36.6 mg and dilute to 10 mL. Add 1 mL of this solution to Stock 2, micronutrients.
[4] $CuCl_2 \cdot 2H_2O$ - Weigh out 60.0 mg and dilute to 1000 mL. Take 1 mL of this solution and dilute to 10 mL. Take 1 mL of the second dilution and add to Stock 2, micronutrients.
[5] Na_2SeO_4 - Weigh out 119.6 mg and dilute to 100 mL. Add 1 mL of this solution to Stock 2, micronutrients.

TABLE 2. FINAL CONCENTRATION OF MACRONUTRIENTS AND MICRONUTRIENTS IN THE CULTURE MEDIUM

MACRONUTRIENT	CONCENTRATION (mg/L)	ELEMENT	CONCENTRATION (mg/L)
$NaNO_3$	25.5	N	4.20
$MgCl_2 \cdot 6H_2O$	12.2	Mg	2.90
$CaCl_2 \cdot 2H_2O$	4.41	Ca	1.20
$MgSO_4 \cdot 7H_2O$	14.7	S	1.91
K_2HPO_4	1.04	P	0.186
$NaHCO_3$	15.0	Na	11.0
		K	0.469
		C	2.14

MICRONUTRIENT	CONCENTRATION (µg/L)	ELEMENT	CONCENTRATION (µg/L)
H_3BO_3	185.0	B	32.5
$MnCl_2 \cdot 4H_2O$	416.0	Mn	115.0
$ZnCl_2$	3.27	Zn	1.57
$CoCl_2 \cdot 6H_2O$	1.43	Co	0.354
$CuCl_2 \cdot 2H_2O$	0.012	Cu	0.004
$Na_2MoO_4 \cdot 2H_2O$	7.26	Mo	2.88
$FeCl_3 \cdot 6H_2O$	160.0	Fe	33.1
$Na_2EDTA \cdot 2H_2O$	300.0	--	----
Na_2SeO_4	2.39	Se	0.91

14.6.16.3 Stock Algal Cultures

14.6.16.3.1 See Section 6, Test Organisms, for information on sources of "starter" cultures of the green alga, *Selenastrum capricornutum*.

14.6.16.3.2 Upon receipt of the "starter" culture (usually about 10 mL), a stock culture is initiated by aseptically transferring 1 mL to a culture flask containing control algal culture medium (prepared as described above). The volume of stock culture medium initially prepared will depend upon the number of test flasks to be inoculated later from the stock, or other planned uses, and may range from 25 mL in a 125 mL flask to 2 L in a 4-L flask. The remainder of the starter culture can be held in reserve for up to six months in a refrigerator (in the dark) at 4°C.

14.6.16.3.3 Maintain the stock cultures at 25 ± 1°C, under continuous "Cool-White" fluorescent lighting of 86 ± 8.6 $\mu E/m^2/s$ (400 ± 40 ft-c). Shake continuously at 100 cpm or twice daily by hand.

14.6.16.3.4 Transfer 1 to 2 mL of stock culture weekly to 50 - 100 mL of new culture medium to maintain a continuous supply of "healthy" cells for tests. Aseptic techniques should be used in maintaining the algal cultures, and extreme care should be exercised to avoid contamination. Examine the stock cultures with a microscope for contaminating microorganisms at each transfer.

14.6.16.3.5 Viable unialgal culture material may be maintained for long periods of time if placed in a refrigerator at 4°C.

14.6.16.4 It is recommended that chronic toxicity tests be performed monthly with a reference toxicant. Algal cells four to seven days old are used to monitor the chronic toxicity (growth) of the reference toxicant to the algal stock produced by the culture unit (see Section 4, Quality Assurance, Subsection 4.17).

14.6.16.5 Record Keeping

14.6.16.5.1 Records, kept in a bound notebook, include (1) dates culture media was prepared, (2) source of "starter" cultures, (3) date stock cultures were started, (4) cell density in stock cultures, and (5) dates and results of reference toxicant tests performed (see Section 4, Quality Assurance).

14.7 EFFLUENT AND RECEIVING WATER COLLECTION, PRESERVATION, AND STORAGE

14.7.1 See Section 8, Effluent and Receiving Water Sampling, Sample Handling, and Sample Preparation for Toxicity Tests.

14.8 CALIBRATION AND STANDARDIZATION

14.8.1 See Section 4, Quality Assurance.

14.9 QUALITY CONTROL

14.9.1 See Section 4, Quality Assurance.

14.10 TEST PROCEDURES

14.10.1 TEST SOLUTIONS

14.10.1.1 Receiving Waters

14.10.1.1.1 The sampling point is determined by the objectives of the test. Receiving water toxicity is determined with samples used directly as collected or after samples are passed through a 60 µm NITEX® filter and compared

without dilution against a control. Using four replicate chambers per test, each containing 100 mL and 400 mL for chemical analyses, would require approximately 1 L or more of sample for the test.

14.10.1.2 Effluents

14.10.1.2.1 The selection of the effluent test concentrations should be based on the objectives of the study. A dilution factor of 0.5 is commonly used. A dilution factor of 0.5 provides precision of ± 100%, and testing of concentrations between 6.25% and 100% effluent using five effluent concentrations (6.25%, 12.5%, 25%, 50%, and 100%). Improvements in precision decline rapidly if the dilution factor is increased beyond 0.5 and precision declines rapidly if a smaller dilution factor is used. **Therefore, USEPA recommends using a ≥ 0.5 dilution factor**.

14.10.1.2.2 If the effluent is known or suspected to be highly toxic, a lower range of effluent concentrations should be used (such as 25%, 12.5%, 6.25%, 3.12%, and 1.56%). If a high rate of mortality is observed during the first 1 to 2 h of the test, additional dilutions should be added at the lower range of the effluent concentrations.

14.10.1.2.3 The volume of effluent required for the test is 1 to 2 L. Sufficient test solution (approximately 900 or 1500 mL) is prepared at each effluent concentration to provide 400 mL additional volume for chemical analyses at the high, medium, and low test concentrations. There is no daily renewal of test solution.

14.10.1.2.4 Tests should begin as soon as possible, preferably within 24 h of sample collection. The maximum holding time following retrieval of the sample from the sampling device should not exceed 36 h for off-site toxicity tests unless permission is granted by the permitting authority. In no case should the sample be usedfor the first time in a test more than 72 h after sample collection (see Section 8, Effluent and Receiving Water Sampling, Sample Handling, and Sample Preparation for Toxicity Tests).

14.10.1.2.5 Just prior to test initiation (approximately 1 h) the temperature of sufficient quantity of the sample to make test solutions should be adjusted to the test temperature and maintained at that temperature during the addition of dilution water.

14.10.1.2.6 The DO of the test solutions should be checked prior to test initiation. If any of the solutions are supersaturated with oxygen, all of the solutions and the control should be gently aerated. If or any solution has a DO concentration below 4.0 mg/L, all of the solutions and the control must be gently aerated.

14.10.1.2.7 Effluents may be toxic and/or nutrient poor. "Poor" growth in an algal toxicity test, therefore, may be due to toxicity or nutrient limitation, or both. To eliminate false negative results due to low nutrient concentrations, 1 mL of each stock nutrient solution is added per liter of effluent prior to use in preparing the test dilutions. Thus, all test treatments and controls will contain at a minimum the concentration of nutrients in the stock culture medium.

14.10.1.2.8 If samples contain volatile substances, the test sample should be added below the surface of the dilution water towards the bottom of the test container through an appropriate delivery tube.

14.10.1.3 Dilution Water

14.10.1.3.1 Dilution water may be stock culture medium, any uncontaminated receiving water, a standard synthetic (reconstituted) water, or some other natural water (see Section 7, Dilution Water). However, if water other than the stock culture medium is used for dilution water, 1 mL of each stock nutrient solution should be added per liter of dilution water. Natural waters used as dilution water must be filtered through a prewashed filter, such as a GF/A, GF/C, or equivalent filter, that provides 0.45 µm particle size retention.

14.10.1.3.2 If the growth of the algae in the test solutions is to be measured with an electronic particle counter, the effluent and dilution water must be filtered through a GF/A or GF/C filter, or other filter providing 0.45 µm particle

size retention, and checked for "background" particle count before it is used in the test. Glass-fiber filters generally provide more rapid filtering rates and greater filtrate volume before plugging.

14.10.1.4 Preparation of Inoculum

14.10.1.4.1 The inoculum is prepared no more than 2 to 3 h prior to the beginning of the test, using *Selenastrum capricornutum* harvested from a four- to-seven-day stock culture. Each milliliter of inoculum must contain enough cells to provide an initial cell density of approximately 10,000 cells/mL (± 10%) in the test flasks. Assuming the use of 250 mL flasks, each containing 100 mL of test solution, the inoculum must contain 1,000,000 cells/mL.

14.10.1.4.2 Estimate the volume of stock culture required to prepare the inoculum. As an example, if the four-to-seven-day-old stock culture used as the source of the inoculum has a cell density of 2,000,000 cells/mL, a test employing 24 flasks, each containing 100 mL of test medium and inoculated with a total of 1,000,000 cells, would require 24,000,000 cells or 15 mL of stock solution (24,000,000/2,000,000) to provide sufficient inoculum. It is advisable to prepare a volume 20% to 50% in excess of the minimum volume required, to cover accidental loss in transfer and handling.

14.10.1.4.3 Prepare the inoculum as follows:

1. Centrifuge 15 mL of stock culture at 1000 x g for 5 min. This volume will provide a 50% excess in the number of cells.
2. Decant the supernatant and resuspend the cells in 10 mL of control medium.
3. Repeat the centrifugation and decantation step, and resuspend the cells in 10 mL control medium.
4. Mix well and determine the cell density in the algal concentrate. Some cells will be lost in the concentration process.
5. Determine the density of cells (cells/mL) in the stock culture (for this example, assume 2,000,000 per mL).
6. Calculate the required volume of stock culture as follows:

$$\text{Volume (mL) of Stock Culture Required} = \frac{\text{Number test flasks to be used} \times \text{Volume of test Solutions/flask} \times \text{10,000 cells/mL}}{\text{Cell density (cells/mL) in the stock culture}}$$

$$= \frac{\text{24 flasks} \times \text{100 mL/flask} \times \text{10,000 cells/mL}}{\text{2,000,000 cells/mL}}$$

$$= \text{12.0 mL Stock Culture}$$

7. Dilute the cell concentrate as needed to obtain a cell density of 1,000,000 cells/mL, and check the cell density in the final inoculum.
8. The volume of the algal inoculum should be considered in calculating the dilution of toxicant in the test flasks.

14.10.2 START OF THE TEST

14.10.2.1 Label the test chambers with a marking pen and use the color-coded tape to identify each treatment and replicate. A minimum of five effluent concentrations and a control are used for each effluent test. Each treatment (including the control) should have a minimum of four replicates.

14.10.2.2 Randomize the position of the test flasks at the beginning of the test (see Appendix A). Preparation of a position chart may be helpful.

14.10.2.3 The test begins when the algae are added to the test flasks. Mix the inoculum well, and add 1 mL to the test solution in each randomly arranged flask. Make a final check of the cell density in three of the test solutions at time "zero" (within 2 h of the inoculation).

14.10.2.3.1 Alkalinity, hardness, and conductivity are measured at the beginning of the test in the high, medium, and low effluent concentrations and control before they are dispensed to the test chambers and the data recorded on the data sheet (Figure 1).

Discharger:_____ Test Dates: _____
Location:_____ Analyst: _____

Effluent Concentration

Parameter	Control							Remarks
Temperature								
pH								
Alkalinity								
Hardness								
Conductivity								
Chlorine								

Figure 1. Data form for the green alga, *Selenastrum capricornutum*, growth test. Routine chemical and physical determinations.

14.10.3 LIGHT, PHOTOPERIOD, AND TEMPERATURE

14.10.3.1 Test flasks are incubated under continuous illumination at 86 ± 8.6 µE/m^2/s (400 ± 40 ft-c), at 25 ± 1°C, and should be shaken continuously at 100 cpm on a mechanical shaker or twice daily by hand. Flask positions in the incubator should be randomly rotated each day to minimize possible spatial differences in illumination and temperature on growth rate. If it can be verified that test specifications are met at all positions, this need not be done.

14.10.4 DISSOLVED OXYGEN (DO) CONCENTRATION

14.10.4.1 Because of the continuous illumination of the test flasks, DO concentration should never be a problem during the test and no aeration will be required.

14.10.5 OBSERVATIONS DURING THE TEST

14.10.5.1 Routine Chemical and Physical Determinations

14.10.5.1.1 Temperature should be monitored continuously or observed and recorded daily for at least two locations in the environmental control system or the samples. Temperature should be checked in a sufficient number of test vessels at least at the end of the test to determine variability in the environmental chamber.

14.10.5.1.2 Temperature and pH are measured at the end of each 24-h exposure period in at least one test flask at each concentration and in the control.

14.10.5.1.3 Record all the measurements on the data sheet (Figure 1).

14.10.5.2 Biological Observations

14.10.5.2.1 Toxic substances in the test solutions may degrade or volatilize rapidly, and the inhibition in algal growth may be detectable only during the first one or two days in the test. It may be desirable, therefore, to determine the algal growth response daily. Otherwise, biological observations are not required until the test is terminated and the test solutions are not renewed during the test period.

14.10.6 TERMINATION OF THE TEST

14.10.6.1 The test is terminated 96 h after initiation. The algal growth in each flask is measured by one of the following methods: (a) cell counts, (b) chlorophyll content, or (c) turbidity (light absorbance).

14.10.6.2 Cell counts

14.10.6.2.1 Automatic Particle Counters

14.10.6.2.1.1 Several types of automatic electronic and optical particle counters are available for use in the rapid determination of cell density (cells/mL) and mean cell volume (MCV) in μm^3/cell. The Coulter Counter is widely used and is discussed in detail in USEPA (1978b).

14.10.6.2.1.2 If biomass data are desired for algal growth potential measurements, a Model ZM Coulter Counter is used. However, the instrument must be calibrated with a reference sample of particles of known volume.

14.10.6.2.1.3 When the Coulter Counter is used, an aliquot (usually 1 mL) of the test culture is diluted 10X to 20X with a l% sodium chloride electrolyte solution, such as ISOTON®, to facilitate counting. The resulting dilution is counted using an aperture tube with a 100-µm diameter aperture. Each cell (particle) passing through the aperture causes a voltage drop proportional to its volume. Depending on the model, the instrument stores the information on the number of particles and the volume of each, and calculates the mean cell volume. The following procedure is used:

1. Mix the algal culture in the flask thoroughly by swirling the contents of the flask approximately six times in a clockwise direction, and then six times in the reverse direction; repeat the two-step process at least once.
2. At the end of the mixing process, stop the motion of the liquid in the flask with a strong brief reverse mixing action, and quickly remove 1 mL of cell culture from the flask with a sterile pipet.
3. Place the aliquot in a counting beaker, and add 9 mL (or 19 mL) of electrolyte solution (such as Coulter ISOTON®).
4. Determine the cell density (and MCV, if desired).

14.10.6.2.2 Manual microscope counting method

14.10.6.2.2.1 Cell counts may be determined using a Sedgwick-Rafter, Palmer-Maloney, hemocytometer, inverted microscope, or similar methods. For details on microscope counting methods, see APHA (1992) and USEPA (1973). Whenever feasible, 400 cells per replicate are counted to obtain ± 10% precision at the 95% confidence level. This method has the advantage of allowing for the direct examination of the condition of the cells.

14.10.6.3 Chlorophyll Content

14.10.6.3.1 Chlorophyll may be estimated in-vivo fluorometrically, or in-vitro either fluorometrically or spectrophotometrically. In-vivo fluorometric measurements are recommended because of the simplicity and sensitivity of the technique and rapidity with which the measurements can be made (Rehnberg et al., 1982).

14.10.6.3.2 The in-vivo chlorophyll measurements are made as follows:

1. Adjust the "blank" reading of the fluorometer using the filtrate from an equivalent dilution of effluent filtered through a 0.45 µm particle retention filter.
2. Mix the contents of the test culture flask by swirling successively in opposite directions (at least three times), and remove 1 mL of culture from the flask with a sterile pipet.
3. Place the aliquot in a small disposable vial and record the fluorescence as soon as the reading stabilizes. (Do not allow the sample to stand in the instrument more than 1 min).
4. Discard the sample.

14.10.6.3.3 For additional information on chlorophyll measurement methods, (see APHA, 1992).

14.10.6.4 Turbidity (Absorbance)

14.10.6.4.1 A second rapid technique for growth measurement involves the use of a spectrophotometer to determine the turbidity, or absorbance, of the cultures at a wavelength of 750 nm. Because absorbance is a complex function of the volume, size, and pigmentation of the algae, it would be useful to construct a calibration curve to establish the relationship between absorbance and cell density.

14.10.6.4.2 The algal growth measurements are made as follows:

1. A blank is prepared as described for the fluorometric analysis.
2. The culture is thoroughly mixed as described above.
3. Sufficient sample is withdrawn from the test flask with a sterile pipet and transferred to a 1- to 5-cm cuvette.
4. The absorbance is read at 750 nm and divided by the light path length of the cuvette, to obtain an “absorbance-per-centimeter” value.
5. The 1-cm absorbance values are used in the same manner as the cell counts.

14.10.6.5 Record the data as indicated in Figure 2.

14.11 SUMMARY OF TEST CONDITIONS AND TEST ACCEPTABILITY CRITERIA

14.11.1 A summary of test conditions and test acceptability criteria is presented in Table 3.

14.12 ACCEPTABILITY OF TEST RESULTS

14.12.1 For the test results to be acceptable, the mean algal cell density in the control flasks must exceed 1×10^6 cells/mL at the end of the test, and the coefficient of variation (CV, calculated as standard deviation X 100 / mean) for algal cell density among the control replicates must not exceed 20%.

Discharger: _____ Test Dates: _____
Location: _____ Analyst: _____

Concentration	Cell Density Measurement Replicate 1	2	3	4	Treatment Mean	Comments
Control						
Conc:						
Conc:						
Conc:						
Conc:						
Conc:						

Comments:

Figure 2. Data form for the green alga, *Selenastrum capricornutum*, growth test, cell density determinations.

TABLE 3. SUMMARY OF TEST CONDITIONS AND TEST ACCEPTABILITY CRITERIA FOR GREEN ALGA, *SELENASTRUM CAPRICORNUTUM,* GROWTH TOXICITY TESTS WITH EFFLUENTS AND RECEIVING WATERS (TEST METHOD 1003.0)[1]

1.	Test type:	Static non-renewal (required)
2.	Temperature:	25 ± 1°C (recommended) Test temperatures must not deviate (i.e., maximum minus minimum temperature) by more than 3°C during the test (required)
3.	Light quality:	"Cool white" fluorescent lighting (recommended)
4.	Light intensity:	86 ± 8.6 µE/m^2/s (400 ± 40 ft-c or 4306 lux) (recommended)
5.	Photoperiod:	Continuous illumination (required)
6.	Test chamber size:	125 mL or 250 mL (recommended)
7.	Test solution volume:	50 mL or 100 mL[2] (recommended)
8.	Renewal of test solutions:	None (required)
9.	Age of test organisms:	4 to 7 days (required)
10.	Initial cell density in test chambers:	10,000 cells/mL (recommended)
11.	No. replicate chambers per concentration:	4 (required minimum)
12.	Shaking rate:	100 cpm continuous, or twice daily by hand (recommended)
13.	Aeration:	None (recommended)
14.	Dilution water:	Algal stock culture medium, enriched uncontaminated source of receiving or other natural water, synthetic water prepared using MILLIPORE MILLI-Q® or equivalent deionized water and reagent grade chemicals, or DMW (see Section 7, Dilution Water) (available options)

[1] For the purposes of reviewing WET test data submitted under NPDES permits, each test condition listed above is identified as required or recommended (see Subsection 10.2 for more information on test review). Additional requirements may be provided in individual permits, such as specifying a given test condition where several options are given in the method.

[2] For tests not continuously shaken use 25 mL in 125 mL flasks and 50 mL in 250 mL flasks.

TABLE 3. SUMMARY OF TEST CONDITIONS AND TEST ACCEPTABILITY CRITERIA FOR GREEN ALGA, *SELENASTRUM CAPRICORNUTUM,* GROWTH TOXICITY TESTS WITH EFFLUENTS AND RECEIVING WATERS (TEST METHOD 1003.0) (CONTINUED)

15.	Test concentrations:	Effluents: 5 and a control (required minimum) Receiving Water: 100% receiving water (or minimum of 5) and a control (recommended)
16.	Test dilution factor:	Effluents: ≥ 0.5 (recommended) Receiving Waters: None or ≥ 0.5 (recommended)
17.	Test duration:	96 h (required)
18.	Endpoint:	Growth (cell counts, chlorophyll fluorescence, absorbance, or biomass) (required)
19.	Test acceptability criteria:[3]	Mean cell density of at least 1 X 10^6 cells/mL in the controls; and variability (CV%) among control replicates less than or equal to 20% (required)
20.	Sampling requirements:	For on-site tests, one sample collected at test initiation, and used within 24 h of the time it is removed from the sampling device. For off-site tests, holding time must not exceed 36 h before first use (see Section 8, Effluent and Receiving Water Sampling, Sample Handling, and Sample Preparation for Toxicity Tests, Subsection 8.5.4) (required)
21.	Sample volume required:	1 or 2 L depending on test volume (recommended)

[3] If the test is conducted under non-NPDES applications (i.e., data are not submitted under NPDES permits) and used without EDTA in the nutrient stock solution, the test acceptability criteria are a mean cell density of at least 2 X 10^5 cells/mL in the controls, and variability (CV%) among control replicates less than or equal to 20%.

14.13 **DATA ANALYSIS**

14.13.1 GENERAL

14.13.1.1 Tabulate and summarize the data. A sample set of algal growth response data is shown in Table 4.

TABLE 4. GREEN ALGA, *SELENASTRUM CAPRICORNUTUM,* GROWTH RESPONSE DATA

			Toxicant Concentration (µg Cd/L)				
	Replicate	Control	5	10	20	40	80
	A	1209	1212	826	493	127	49.3
	B	1180	1186	628	416	147	40.0
	C	1340	1204	816	413	147	44.0
Log_{10}	A	3.082	3.084	2.917	2.693	2.104	1.693
Trans-	B	3.072	3.074	2.798	2.619	2.167	1.602
formed	C	3.127	3.081	2.912	2.616	2.167	1.643
	Mean($\bar{Y}_i$)	3.094	3.080	2.876	2.643	2.146	1.646

14.13.1.2 The endpoints of toxicity tests using the green alga, *Selenastrum capricornutum,* are based on the adverse effects on cell growth (see Section 9, Chronic Toxicity Test Endpoints and Data Analysis). The EC50, the IC25, and the IC50 are calculated using the point estimation techniques, and LOEC and NOEC values for growth are obtained using a hypothesis testing approach such as Dunnett's Procedure (Dunnett, 1955) or Steel's Many-one Rank Test (Steel, 1959; Miller, 1981). Separate analyses are performed for the estimation of the LOEC and NOEC endpoints and for the estimation of the EC50, IC25, and IC50. See the Appendices for examples of the manual computations, and examples of data input and program output.

14.13.1.3 The statistical tests described here must be used with a knowledge of the assumptions upon which the tests are contingent. Tests for normality and homogeneity of variance are included in Appendix B. The assistance of a statistician is recommended for analysts who are not proficient in statistics.

14.13.2 EXAMPLE OF ANALYSIS OF ALGAL GROWTH DATA

14.13.2.1 Formal statistical analysis of the growth data is outlined on the flowchart in Figure 3. The response used in the statistical analysis is the number of cells per milliliter per replicate. Separate analyses are performed for the estimation of the NOEC and LOEC endpoints and for the estimation of the IC25 and IC50 endpoints.

14.13.2.2 The statistical analysis using hypothesis tests consists of a parametric test, Dunnett's Procedure, and a nonparametric test, Steel's Many-one Rank Test. The underlying assumptions of the Dunnett's Procedure, normality and homogeneity of variance, are formally tested. The test for normality is the Shapiro-Wilk's Test, and Bartlett's Test is used to test for homogeneity of variance. If either of these tests fails, the nonparametric test, Steel's Many-one Rank Tests, is used to determine the NOEC and LOEC endpoints. If the assumptions of Dunnett's Procedure are met, the endpoints are determined by the parametric test.

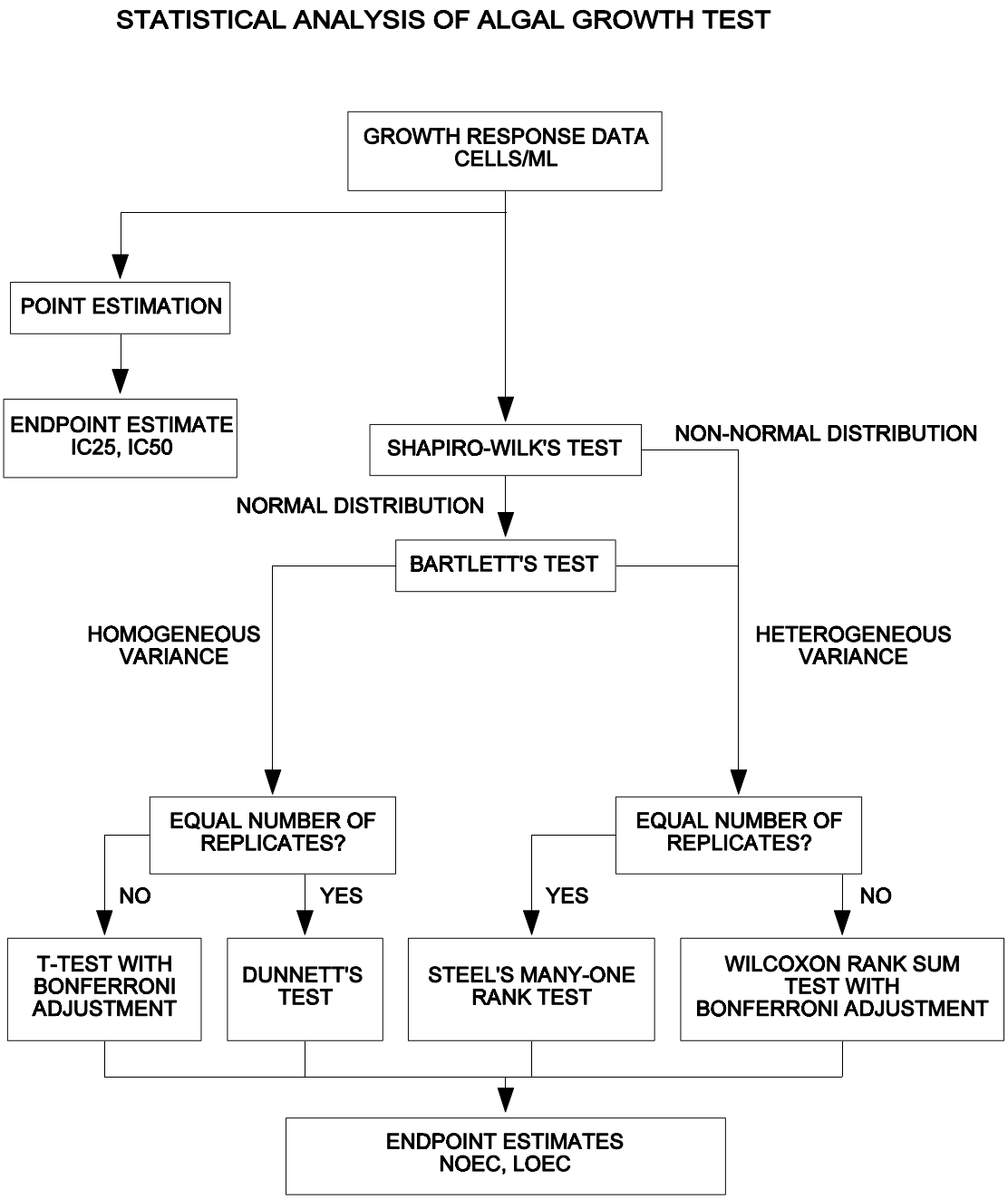

Figure 3. Flowchart for statistical analysis of the green alga, *Selenastrum capricornutum*, growth response data.

14.13.2.3 Additionally, if unequal numbers of replicates occur among the concentration levels tested there are parametric and nonparametric alternative analyses. The parametric analysis is a t test with the Bonferroni adjustment (see Appendix D). The Wilcoxon Rank Sum Test with the Bonferroni adjustment is the nonparametric alternative (see Appendix F).

14.13.2.4 Data from an algal growth test with cadmium chloride will be used to illustrate the statistical analysis. The cell counts were $\log_{10}$ transformed in an effort to stabilize the variance for the ANOVA analysis. The raw data, $\log_{10}$ transformed data, mean and standard deviation of the observations at each concentration including the control are listed in Table 4. A plot of the $\log_{10}$ transformed cell counts for each treatment is provided in Figure 4.

14.13.2.5 Test for Normality

14.13.2.5.1 The first step of the test for normality is to center the observations by subtracting the mean of all the observations within a concentration from each observation in that concentration. The centered observations are summarized in Table 5.

TABLE 5. CENTERED OBSERVATIONS FOR SHAPIRO-WILK'S EXAMPLE

		Toxicant Concentration (µg Cd/L)				
Replicate	Control	5	10	20	40	80
A	-0.012	0.004	0.041	0.050	-0.042	0.047
B	-0.022	-0.006	-0.078	-0.024	0.021	-0.044
C	0.033	0.001	0.036	-0.027	0.021	-0.003

14.13.2.5.2 Calculate the denominator, D, of the test statistic:

$$D = \sum_{i=1}^{n} (X_i - \overline{X})^2$$

Where: X_i = the ith centered observation

$\overline{X}$ = the overall mean of the centered observations

n = the total number of centered observations.

For this set of data, n = 18

$$\overline{X} = \frac{1}{18}(0.000) = 0.000$$

D = 0.0214

14.13.2.5.3 Order the centered observations from smallest to largest:

$$X^{(1)} \leq X^{(2)} \leq \ldots \leq X^{(n)}$$

Where $X^{(i)}$ is the ith ordered observation. These ordered observations are listed in Table 6.

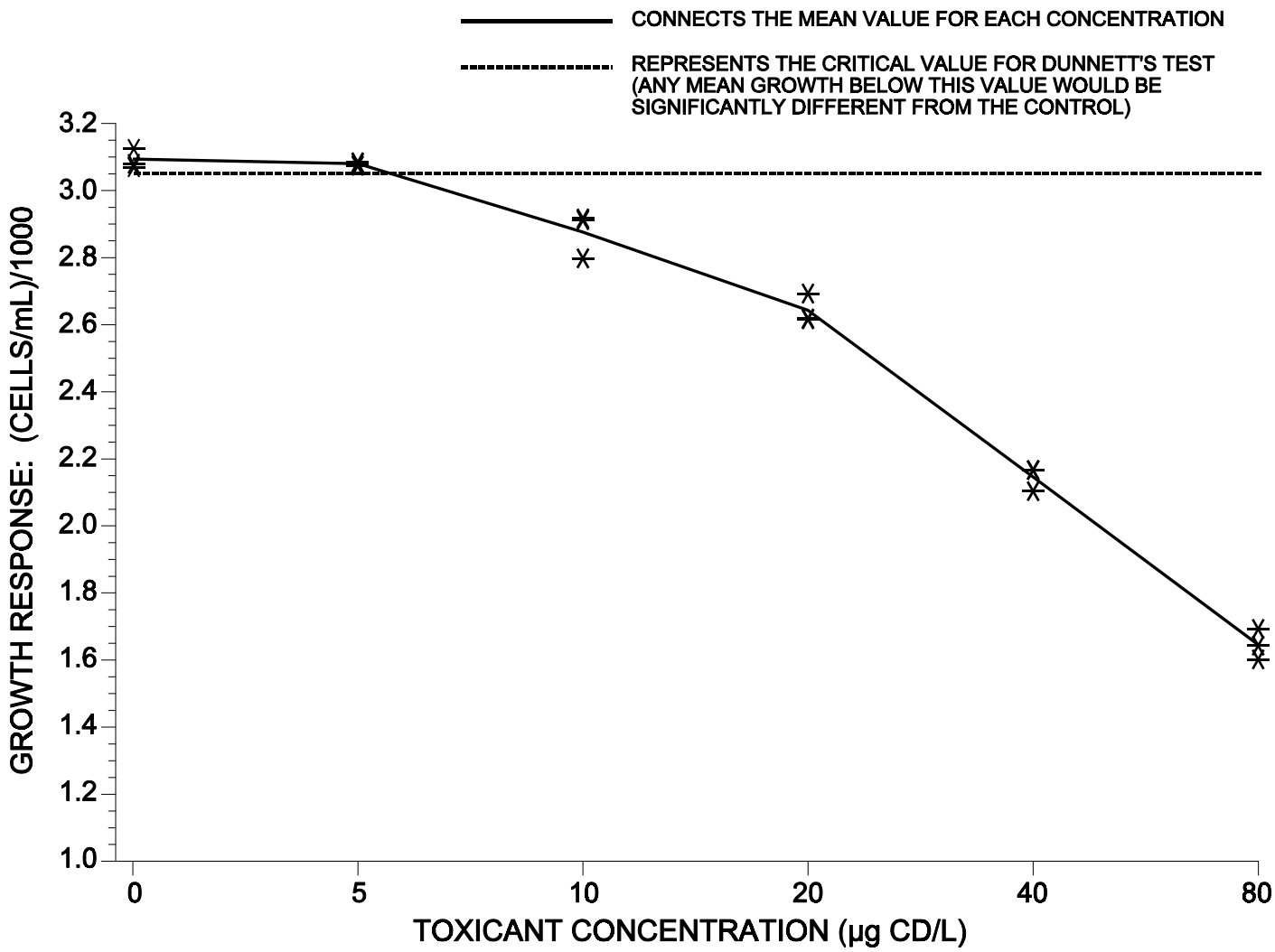

Figure 4. Plot of the $\log_{10}$ transformed cell count data from the green alga, *Selenastrum capricornutum*, growth response test in Table 4.

TABLE 6. ORDERED CENTERED OBSERVATIONS FOR SHAPIRO-WILK'S EXAMPLE

i	$X^{(i)}$	i	$X^{(i)}$
1	-0.078	10	0.001
2	-0.044	11	0.004
3	-0.042	12	0.021
4	-0.027	13	0.021
5	-0.024	14	0.033
6	-0.022	15	0.036
7	-0.012	16	0.041
8	-0.006	17	0.047
9	-0.003	18	0.050

14.13.2.5.4 From Table 4, Appendix B, for the number of observations, n, obtain the coefficients a_1, a_2, ..., a_k where k is n/2 if n is even and (n-1)/2 if n is odd. For the data in this example, n = 18 , k = 9. The a_i values are listed in Table 7.

14.13.2.5.5 Compute the test statistic, W, as follows:

$$W = \frac{1}{D}\left[\sum_{i=1}^{k} a_i (X^{(n-i+1)} - X^{(i)})\right]^2$$

The differences $X^{(n-i+1)} - X^{(i)}$ are listed in Table 7.

TABLE 7. COEFFICIENTS AND DIFFERENCES FOR SHAPIRO-WILK'S EXAMPLE

i	a_i	$X^{(n-i+1)} - X^{(i)}$	
1	0.4886	0.128	$X^{(18)} - X^{(1)}$
2	0.3253	0.091	$X^{(17)} - X^{(2)}$
3	0.2553	0.083	$X^{(16)} - X^{(3)}$
4	0.2027	0.063	$X^{(15)} - X^{(4)}$
5	0.1587	0.057	$X^{(14)} - X^{(5)}$
6	0.1197	0.043	$X^{(13)} - X^{(6)}$
7	0.0837	0.033	$X^{(12)} - X^{(7)}$
8	0.0496	0.010	$X^{(11)} - X^{(8)}$
9	0.0163	0.004	$X^{(10)} - X^{(9)}$

For this set of data:

$$W = \frac{1}{0.0214}(0.1436)^2 = 0.964$$

14.13.2.5.6 The decision rule for this test is to compare W with the critical value found in Table 6, Appendix B. If the computed W is less than the critical value, conclude that the data are not normally distributed. For this example, the critical value at a significance level of 0.01 and 18 observations (n) is 0.858. Since W = 0.964 is greater than the critical value, the conclusion of the test is that the data are normally distributed.

14.13.2.6 Test for Homogeneity of Variance

14.13.2.6.1 The test used to examine whether the variation in mean cell count is the same across all toxicant concentrations including the control, is Bartlett's Test (Snedecor and Cochran, 1980). The test statistic is as follows:

$$B = \frac{[(\sum_{i=1}^{P} V_i)\ln \overline{S}^2 - \sum_{i=1}^{P} V_i \ln S_i^2]}{C}$$

Where: V_i = degrees of freedom for each toxicant concentration and control, $V_i = (n_i - 1)$

p = number of levels of toxicant concentration including the control

n_i = the number of replicates for concentration i

ln = $\log_e$

i = 1, 2, ..., p, where p is the number of concentrations including the control

$$\overline{S}^2 = \frac{(\sum_{i=1}^{P} V_i S_i^2)}{\sum_{i=1}^{P} V_i}$$

$$C = 1 + (3(p-1))^{-1}[\sum_{i=1}^{P}\frac{1}{V_i} - (\sum_{i=1}^{P} V_i)^{-1}]$$

14.13.2.6.2 For the data in this example, (see Table 4) all toxicant concentrations including the control have the same number of replicates ($n_i = 3$ for all i). Thus, $V_i = 2$ for all i.

14.13.2.6.3 Bartlett's statistic is therefore:

$$B = \frac{[(12)\ln(0.0018) - 2\sum_{i=1}^{P}\ln(S_i^2)]}{1.194}$$

$$= [12(-6.3200) - 2(-41.9082)]/1.194$$

$$= 7.9764/1.194$$

$$= 6.6804$$

14.13.2.6.4 B is approximately distributed as chi-square with p - 1 degrees of freedom, when the variances are in fact the same. Therefore, the appropriate critical value for this test, at a significance level of 0.01 with five degrees of freedom, is 15.09. Since B = 6.6804 is less than the critical value of 15.09, conclude that the variances are not different.

14.13.2.7 Dunnett's Procedure

14.13.2.7.1 To obtain an estimate of the pooled variance for Dunnett's Procedure, construct an ANOVA table as described in Table 8.

TABLE 8. ANOVA TABLE

Source	df	Sum of Squares (SS)	Mean Square(MS) (SS/df)
Between	p - 1	SSB	S_B^2 = SSB/(p-1)
Within	N - p	SSW	S_W^2 = SSW/(N-p)
Total	N - 1	SST	

Where: p = number of toxicant concentrations including the control

N = total number of observations $n_1 + n_2 ... + n_p$

n_i = number of observations in concentration i

$$SSB = \sum_{i=1}^{P} \frac{T_i^2}{n_i} - \frac{G^2}{N}$$ Between Sum of Squares

$$SST = \sum_{i=1}^{P} \sum_{j=1}^{n_i} Y_{ij}^2 - \frac{G^2}{N}$$ Total Sum of Squares

$$SSW = SST - SSB$$ Within Sum of Squares

G = the grand total of all sample observations, $G = \sum_{i=1}^{P} T_i$

T_i = the total of the replicate measurements for concentration i

Y_{ij} = the jth observation for concentration i (represents the cell count for toxicant concentration i in test chamber j)

14.13.2.7.2 For the data in this example:

$n_1 = n_2 = n_3 = n_4 = n_5 = n_6 = 3$

$N = 18$

$T_1 = Y_{11} + Y_{12} + Y_{13} = 9.281$
$T_2 = Y_{21} + Y_{22} + Y_{23} = 9.239$
$T_3 = Y_{31} + Y_{32} + Y_{33} = 8.627$
$T_4 = Y_{41} + Y_{42} + Y_{43} = 7.928$
$T_5 = Y_{51} + Y_{52} + Y_{53} = 6.438$
$T_6 = Y_{61} + Y_{62} + Y_{63} = 4.938$

$G = T_1 + T_2 + T_3 + T_4 + T_5 + T_6 = 46.451$

$$SSB = \sum_{i=1}^{P} \frac{T_i^2}{n_i} - \frac{G^2}{N}$$

$$= \frac{1}{3}(374.606) - \frac{(46.451)^2}{18} = 4.997$$

$$SST = \sum_{i=1}^{P}\sum_{j=1}^{n_i} Y_{ij}^2 - \frac{G^2}{N}$$

$$= 124.890 - \frac{(46.451)^2}{18} = 5.018$$

$SSW = SST - SSB = 5.018 - 4.997 = 0.0210$

$S_B^2 = SSB/(p-1) = 4.996/(6-1) = 0.9990$

$S_W^2 = SSW/(N-p) = 0.021/(18-6) = 0.0018$

14.13.2.7.3 Summarize these calculations in the ANOVA table (Table 9).

TABLE 9. ANOVA TABLE FOR DUNNETT'S PROCEDURE EXAMPLE

Source	df	Sum of Squares (SS)	Mean Square (MS) (SS/df)
Between	5	4.997	0.999
Within	12	0.021	0.0018
Total	17	5.017	

14.13.2.7.4 To perform the individual comparisons, calculate the t statistic for each concentration, and control combination as follows:

$$t_i = \frac{(\bar{Y}_1 - \bar{Y}_i)}{S_w\sqrt{(\frac{1}{n_1}) + (\frac{1}{n_i})}}$$

Where: $\bar{Y}_i$ = mean cell count for toxicant concentration i

$\bar{Y}_1$ = mean cell count for the control

S_W = square root of the within mean square

n_1 = number of replicates for the control

n_i = number of replicates for concentration i.

14.13.2.7.5 Table 10 includes the calculated t values for each concentration and control combination. In this example, comparing the 5 µg/L concentration with the control the calculation is as follows:

$$t_2 = \frac{(3.094 - 3.080)}{[0.0424\sqrt{(1/3)+(1/3)}]} = 0.405$$

TABLE 10. CALCULATED T VALUES

Toxicant Concentration (µg Cd/L)	i	t_i
5	2	0.405
10	3	6.300
20	4	13.035
40	5	27.399
80	6	41.850

14.13.2.7.6 Since the purpose of this test is to detect a significant reduction in mean cell count, a one-sided test is appropriate. The critical value for this one-sided test is found in Table 5, Appendix C. For an overall alpha level of 0.05, 12 degrees of freedom for error and five concentrations (excluding the control) the critical value is 2.50. The mean count for concentration i is considered significantly less than the mean count for the control if t_i is greater than the critical value. Since t_3, t_4, t_5 and t_6 are greater than 2.50, the 10, 20, 40 and 80 µg/L concentrations have significantly lower mean cell counts than the control. Hence the NOEC and the LOEC for the test are 5 µg/L and 10 µg/L, respectively.

14.13.2.7.7 To quantify the sensitivity of the test, the minimum significant difference (MSD) that can be statistically detected may be calculated.

$$MSD = d\, S_w \sqrt{(1/n_1) + (1/n)}$$

Where: d = the critical value for Dunnett's Procedure

S_W = the square root of the within mean square

n = the common number of replicates at each concentration (this assumes equal replication at each concentration)

n_1 = the number of replicates in the control.

14.13.2.7.8 In this example:

$$MSD = 2.50(0.0424)\sqrt{(1/3)+(1/3)}$$

$$= 2.50\ (0.0424)(0.8165)$$

$$= 0.086$$

14.13.2.7.9 The MSD (0.086) is in transformed units. An approximate MSD in terms of cell count per 100 mL may be calculated via the following conversion.

1. Subtract the MSD from the transformed control mean.

   3.094 - 0.086 = 3.008

2. Obtain the untransformed values for the control mean and the difference calculated in 1.

   $10^{(3.094)} = 1241.6$

   $10^{(3.008)} = 1018.6$

3. The untransformed MSD (MSD_u) is determined by subtracting the untransformed values from 2.

   $MSU_u = 1241.6 - 1018.6 = 223$

14.13.2.7.10 Therefore, for this set of data, the minimum difference in mean cell count between the control and any toxicant concentration that can be detected as statistically significant is 223.

14.13.2.7.11 This represents a decrease in growth of 18% from the control.

14.13.2.8 Calculation of the ICp

14.13.2.8.1 The growth data in Table 4 are utilized in this example. Table 11 contains the means for each toxicant concentration. As can be seen, the observed means are monotonically non-increasing with respect to concentration. Therefore, it is not necessary to smooth the means prior to calculating the ICp. See Figure 5 for a plot of the response curve.

TABLE 11. ALGAL MEAN GROWTH RESPONSE AFTER SMOOTHING

Toxicant Concentration (µg Cd/L)	i	Response means, $\bar{Y}_i$ (cells/mL)	Smoothed mean, M_i (cells/mL)
Control	1	1243	1243
5	2	1201	1201
10	3	757	757
20	4	441	441
40	5	140	140
80	6	44	44

14.13.2.8.2 An IC25 and IC50 can be estimated using the Linear Interpolation Method (Appendix M). A 25% reduction in cell count, compared to the controls, would result in a mean count of 932 cells, where $M_1(1\text{-}p/100)$ = 1243(1-25/100). A 50% reduction in cell count, compared to the controls, would result in a mean count of 622 cells. Examining the means and their associated concentrations (Table 11), the response, 932 cells, is bracketed by C_2 = 5 µg Cd/L and C_3 = 10 µg Cd/L. The response, 622 cells, is bracketed by C_3 = 10 µg Cd/L and C_4 = 20 µg Cd/L.

14.13.2.8.3 Using the equation from section 4.2 of Appendix M, the estimate of the IC25 is calculated as follows:

$$ICp = C_j + [M_1(1-p/100) - M_j]\frac{(C(j+1) - C_j)}{(M_{(j+1)} - M_j)}$$

$$IC25 = 5 + [1243(1-25/100) - 1201]\frac{(10-5)}{(757-1201)}$$

= 8µg Cd/L.

14.13.2.8.4 The IC50 estimate is 14 µg Cd/L:

$$IC25 = 6.25 + [28.75(1-25/100) - 28.75]\frac{(12.5-6.25)}{(9.40-28.75)}$$

$$IC50 = 10 + [1243(1-50/100) - 757]\frac{(20-10)}{(441-757)}$$

= 14 µg Cd/L.

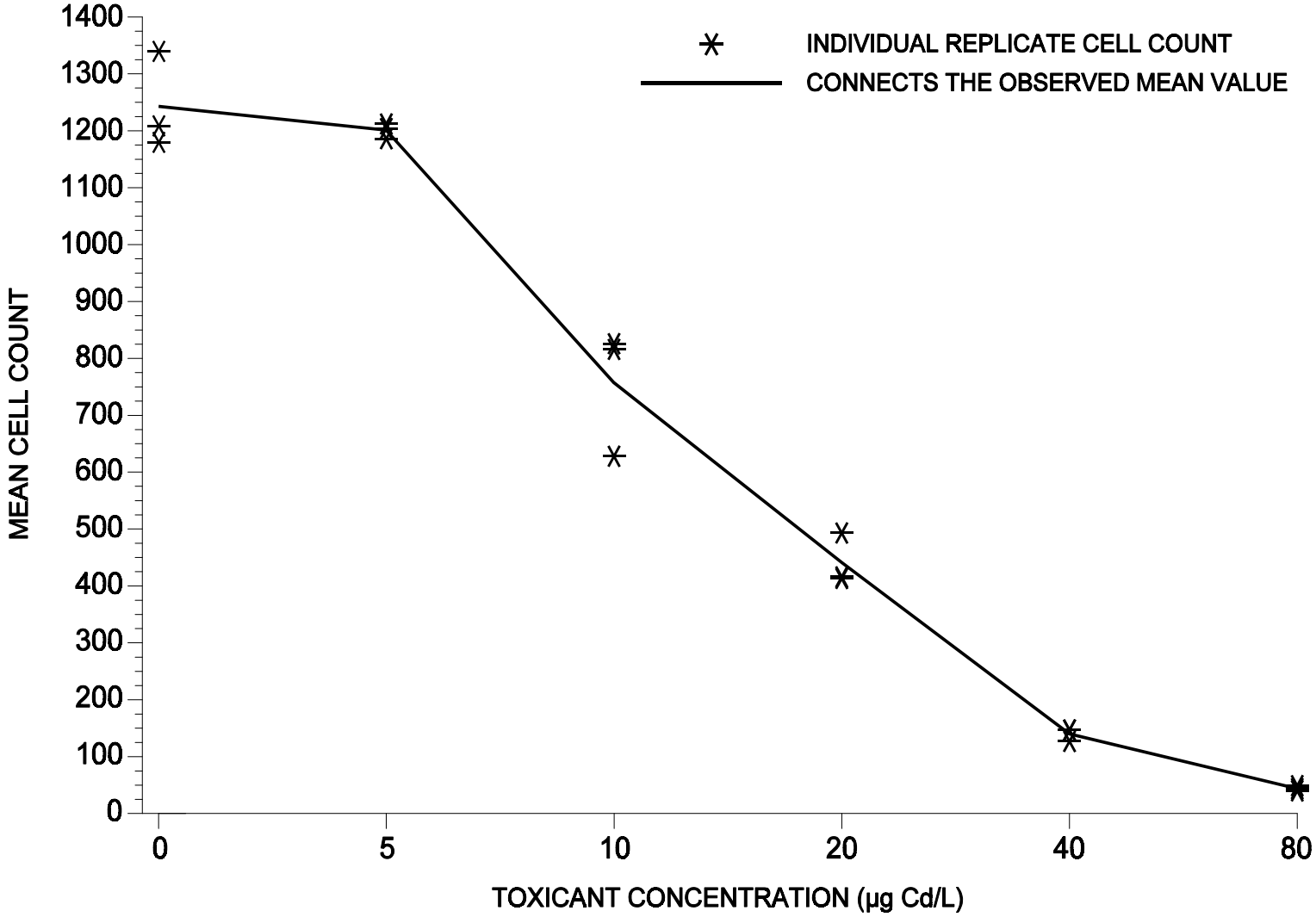

Figure 5. Plot of raw data and observed means for the green alga, *Selenastrum capricornutum*, growth data.

14.13.2.8.5 When the ICPIN program was used to analyze this set of data, requesting 80 resamples, the estimate of the IC25 was 8.0227µg Cd/L. The empirical 95% confidence interval for the true mean was 6.4087 µg Cd/L and 10.0313 µg Cd/L. The ICPIN computer program output for the IC25 for this data set is shown in Figure 6.

14.13.2.8.6 When the ICPIN program was used to analyze this set of data, requesting 80 resamples, the estimate of the IC50 was 14.2774 µg Cd/L. The empirical 95% confidence interval for the true mean was 9.7456 µg Cd/L and 18.5413 µg Cd/L. The computer program output for the IC50 for this data set is shown in Figure 7.

14.13.3 BIOSTIMULATION

14.13.3.1 Where the growth response in effluent (or surface water) exceeds growth in the control flasks, the percent stimulation, S(%), is calculated as shown below. Values which are significantly greater than the control indicate a possible degrading enrichment effect on the receiving water (Walsh et al., 1980):

$$S\ (\%) = \frac{T - C}{C}\ x\ 100$$

Where: T = Mean effluent or surface water response

C = Mean control response

14.14 **PRECISION AND ACCURACY**

14.14.1 PRECISION – Data on single-laboratory and multilaboratory precision are described below (Subsections 14.14.1.1 and 14.14.1.2). Single-laboratory precision is a measure of the reproducibility of test results when tests are conducted using a specific method under reasonably constant conditions in the same laboratory. Single-laboratory precision is synonymous with the terms within-laboratory precision and intralaboratory precision. Multilaboratory precision is a measure of the reproducibility of test results from different laboratories using the same test method and analyzing the same test material. Multilaboratory precision is synonymous with the term interlaboratory precision. Interlaboratory precision, as used in this document, includes both within-laboratory and between-laboratory components of variability. In recent multilaboratory studies, these two components of interlaboratory precision have been displayed separately (termed within-laboratory and between-laboratory variability) and combined (termed total interlaboratory variability). The total interlaboratory variability that is reported from these studies is synonymous with interlaboratory variability reported from other studies where individual variability components are not separated.

14.14.1.1 Single-Laboratory Precison

14.14.1.1.1 Data from repetitive 96-h toxicity tests conducted with cadmium chloride as the reference toxicant, using medium containing EDTA, are shown in Table 12. The precision (CV) of the 10 EC50s was 10.2%.

14.14.1.1.2 EPA evaluated within-laboratory precision of the green alga, *Selenastrum capricornutum*, Growth Test using a database of routine reference toxicant test results from nine laboratories (USEPA, 2000b). The database consisted of 85 reference toxicant tests conducted in 9 laboratories using a variety of reference toxicants including: copper, sodium chloride, and zinc. Among the 9 laboratories, the median within-laboratory CV calculated for routine reference toxicant tests was 26% for the IC25 growth endpoint. In 25% of laboratories, the within-laboratory CV was less than 25%; and in 75% of laboratories, the within-laboratory CV was less than 39%.

14.14.1.2 Multilaboratory Precision

14.14.1.2.1 In 2000, EPA conducted an interlaboratory variability study of the green alga, *Selenastrum capricornutum*, Growth Test (USEPA, 2001a; USEPA, 2001b). In this study, each of 11 participant laboratories tested 4 blind test samples that included some combination of blank, effluent, reference toxicant, and receiving water sample types. The blank sample consisted of moderately-hard synthetic freshwater, the effluent sample was a

municipal wastewater spiked with KCl, the receiving water sample was a river water spiked with KCl, and the reference toxicant sample consisted of moderately-hard synthetic freshwater spiked with KCl. Each sample was tested with and without the addition of EDTA. Of the 44 *Selenastrum capricornutum* Growth tests conducted with EDTA, 63.6% were successfully completed and met the required test acceptability criteria. Of the 44 tests conducted without EDTA, 65.9% were successfully completed and met the required test acceptability criteria. Of five tests that were conducted on blank samples with the addition of EDTA, none showed false positive results for the growth endpoint. Of 6 tests that were conducted on blank samples without the addition of EDTA, 2 showed false positive results for the growth endpoint, yielding a false positive rate of 33.3%. Results from the reference toxicant, effluent, and receiving water sample types were used to calculate the precision of the method. Table 13 shows the precision of the IC25 for each of these sample types. Averaged across sample types, the total interlaboratory variability (expressed as a CV%) was 34.3% and 58.5% for IC25 results in tests with EDTA and without EDTA, respectively. Table 14 shows the precision of growth NOEC endpoints for each sample type. NOEC values for tests with EDTA spanned three concentrations for the effluent sample type and four concentrations for the reference toxicant and receiving water sample types. NOEC values for tests without EDTA, spanned six concentrations for the reference toxicant sample type, four concentrations for the effluent sample type, and two concentrations for the receiving water sample type. The percentage of values within one concentration of the median for tests conducted with EDTA was 85.7%, 100%, and 85.7% for the reference toxicant, effluent, and receiving water sample types, respectively. The percentage of values within one concentration of the median for tests conducted without EDTA was 40.0%, 50.0%, and 100% for the reference toxicant, effluent, and receiving water sample types, respectively.

14.14.2 ACCURACY

14.14.2.1 The accuracy of toxicity tests cannot be determined.

Conc. ID		1	2	3	4	5	6
Conc. Tested		0	5	10	20	40	80
Response	1	1209	1212	826	493	127	49.3
Response	2	1180	1186	628	416	147	40.0
Response	3	1340	1204	816	413	147	44.0

*** Inhibition Concentration Percentage Estimate ***
Toxicant/Effluent: Cadmium
Test Start Date: Example Test Ending Date:
Test Species: Selenastrum capricornutum
Test Duration: 96 h
DATA FILE: scmanual.icp
OUTPUT FILE: scmanual.i25

Conc. ID	Number Replicates	Concentration µg/l	Response Means	Std. Dev.	Pooled Response Means
1	3	0.000	1243.000	85.247	1243.000
2	3	5.000	1200.667	13.317	1200.667
3	3	10.000	756.667	111.541	756.667
4	3	20.000	440.667	45.347	440.667
5	3	40.000	140.333	11.547	140.333
6	3	80.000	44.433	4.665	44.433

The Linear Interpolation Estimate: 8.0227 Entered P Value: 25

Number of Resamplings: 80
The Bootstrap Estimates Mean: 8.1627 Standard Deviation: 0.4733
Original Confidence Limits: Lower: 7.2541 Upper: 8.9792
Expanded Confidence Limits: Lower: 6.4087 Upper: 10.0313
Resampling time in Seconds: 1.65 Random Seed: -1575623987

Figure 6. ICPIN program output for the IC25.

Conc. ID	1	2	3	4	5	6
Conc. Tested	0	5	10	20	40	80
Response 1	1209	1212	826	493	127	49.3
Response 2	1180	1186	628	416	147	40.0
Response 3	1340	1204	816	413	147	44.0

*** Inhibition Concentration Percentage Estimate ***
Toxicant/Effluent: Cadmium
Test Start Date: Example Test Ending Date:
Test Species: Selenastrum capricornutum
Test Duration: 96 h
DATA FILE: scmanual.icp
OUTPUT FILE: scmanual.i50

Conc. ID	Number Replicates	Concentration µg/l	Response Means	Std. Dev.	Pooled Response Means
1	3	0.000	1243.000	85.247	1243.000
2	3	5.000	1200.667	13.317	1200.667
3	3	10.000	756.667	111.541	756.667
4	3	20.000	440.667	45.347	440.667
5	3	40.000	140.333	11.547	140.333
6	3	80.000	44.433	4.665	44.433

The Linear Interpolation Estimate: 14.2774 Entered P Value: 50

Number of Resamplings: 80
The Bootstrap Estimates Mean: 14.2057 Standard Deviation: 1.1926
Original Confidence Limits: Lower: 12.1194 Upper: 16.3078
Expanded Confidence Limits: Lower: 9.7456 Upper: 18.5413
Resampling time in Seconds: 1.65 Random Seed: -1751550803

Figure 7. ICPIN program output for the IC50.

TABLE 12. SINGLE LABORATORY PRECISION OF THE GREEN ALGA, *SELENASTRUM CAPRICORNUTUM*, 96-H TOXICITY TESTS, USING THE REFERENCE TOXICANT CADMIUM CHLORIDE (USEPA, 1991a)

Test Number	EC_{50} (mg/L)
1	2.3
2	2.4
3	2.3
4	2.8
5	2.6
6	2.1
7	2.1
8	2.1
9	2.6
10	2.4
n	10.0
Mean	2.37
CV (%)	10.2

TABLE 13. PRECISION OF POINT ESTIMATES FOR VARIOUS SAMPLE TYPES[1]

Test Endpoint	Sample Type	CV (%)[2]		
		Within-lab[3]	Between-lab[4]	Total[5]
IC25	Reference toxicant	10.9	20.8	23.5
(with EDTA)	Effluent	39.5	8.48	40.4
	Receiving water	-	-	38.9
	Average	25.2	14.6	34.3
IC25	Reference toxicant	25.6	83.6	87.5
(without EDTA)	Effluent	21.0	60.3	63.9
	Receiving water	-	-	24.1
	Average	23.3	72.0	58.5

1 From EPA's WET Interlaboratory Variability Study (USEPA, 2001a; USEPA, 2001b).

2 CVs were calculated based on the within-laboratory component of variability, the between-laboratory component of variability, and the total interlaboratory variability (including both within-laboratory and between-laboratory components). For the receiving water sample type, within-laboratory and between-laboratory components of variability could not be calculated since the study design did not provide within-laboratory replication for this sample type.

3 The within-laboratory (intralaboratory) component of variability for duplicate samples tested at the same time in the same laboratory.

4 The between-laboratory component of variability for duplicate samples tested at different laboratories.

5 The total interlaboratory variability, including within-laboratory and between-laboratory components of variability. The total interlaboratory variability is synonymous with interlaboratory variability reported from other studies where individual variability components are not separated.

TABLE 14. FREQUENCY DISTRIBUTION OF HYPOTHESIS TESTING RESULTS FOR VARIOUS SAMPLE TYPES[1]

Test Endpoint	Sample Type	Median NOEC Value	% of Results at the Median	% of Results ±1[2]	% of Results ≥2[3]
Growth NOEC	Reference toxicant	25%	57.1	28.6	14.3
(with EDTA)	Effluent	6.25%	42.9	57.1	0.00
	Receiving water	12.5%	28.6	57.1	14.3
Growth NOEC	Reference toxicant	18.8%	-[4]	40.0	60.0
(without EDTA)	Effluent	18.8%	-[4]	50.0	50.0
	Receiving water	6.25%	75.0	25.0	0.00

1 From EPA's WET Interlaboratory Variability Study (USEPA, 2001a; USEPA, 2001b).
2 Percent of values at one concentration interval above or below the median. Adding this percentage to the percent of values at the median yields the percent of values within one concentration interval of the median.
3 Percent of values two or more concentration intervals above or below the median.
4 The median NOEC fell between test concentrations, so no test results fell precisely on the median.

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APPENDIX A

INDEPENDENCE, RANDOMIZATION, AND OUTLIERS

1. STATISTICAL INDEPENDENCE

1.1 Dunnett's Procedure and the t test with Bonferroni's adjustment are parametric procedures based on the assumptions that (1) the observations within treatments are independent and normally distributed, and (2) that the variance of the observations is homogeneous across all toxicant concentrations and the control. Of the three possible departures from the assumptions, non-normality, heterogeneity of variance, and lack of independence, those caused by lack of independence are the most difficult to resolve (see Scheffe, 1959). For toxicity data, statistical independence means that given knowledge of the true mean for a given concentration or control, knowledge of the error in any one actual observation would provide no information about the error in any other observation. Lack of independence is difficult to assess and difficult to test for statistically. It may also have serious effects on the true alpha or beta level. Therefore, it is of utmost importance to be aware of the need for statistical independence between observations and to be constantly vigilant in avoiding any patterned experimental procedure that might compromise independence. One of the best ways to help ensure independence is to follow proper randomization procedures throughout the test.

2. RANDOMIZATION

2.1 Randomization of the distribution of test organisms among test chambers and the arrangement of treatments and replicate chambers is an important part of conducting a valid test. The purpose of randomization is to avoid situations where test organisms are placed serially into test chambers, or where all replicates for a test concentration are located adjacent to one another, which could introduce bias into the test results.

2.2 An example of randomization of the distribution of test organisms among test chambers, and an example of randomization of arrangement of treatments and replicate chambers are described using the Fathead Minnow Larval Survival and Growth test. For the purpose of the example, the test design is as follows: five effluent concentrations are tested in addition to the control. The effluent concentrations are as follows: 6.25%, 12.5%, 25.0%, 50.0%, and 100.0%. There are four replicate chambers per treatment. Each replicate chamber contains ten fish.

2.3 RANDOMIZATION OF FISH TO REPLICATE CHAMBERS EXAMPLE

2.3.1 Consider first the random assignment of the fish to the replicate chambers. The first step is to label each of the replicate chambers with the control or effluent concentration and the replicate number. The next step is to assign each replicate chamber four double-digit numbers. An example of this assignment is provided in Table A.1. Note that the double digits 00 and 97 through 99 were not used.

TABLE A.1. RANDOM ASSIGNMENT OF FISH TO REPLICATE CHAMBERS EXAMPLE ASSIGNED NUMBERS FOR EACH REPLICATE CHAMBER

Assigned Numbers	Replicate Chamber	
01, 25, 49, 73	Control,	replicate chamber 1
02, 26, 50, 74	Control,	replicate chamber 2
03, 27, 51, 75	Control,	replicate chamber 3
04, 28, 52, 76	Control,	replicate chamber 4
05, 29, 53, 77	6.25% effluent,	replicate chamber 1
06, 30, 54, 78	6.25% effluent,	replicate chamber 2
07, 31, 55, 79	6.25% effluent,	replicate chamber 3
08, 32, 56, 80	6.25% effluent,	replicate chamber 4
09, 33, 57, 81	12.5% effluent,	replicate chamber 1
10, 34, 58, 82	12.5% effluent,	replicate chamber 2
11, 35, 59, 83	12.5% effluent,	replicate chamber 3
12, 36, 60, 84	12.5% effluent,	replicate chamber 4
13, 37, 61, 85	25.0% effluent,	replicate chamber 1
14, 38, 62, 86	25.0% effluent,	replicate chamber 2
15, 39, 63, 87	25.0% effluent,	replicate chamber 3
16, 40, 64, 88	25.0% effluent,	replicate chamber 4
17, 41, 65, 89	50.0% effluent,	replicate chamber 1
18, 42, 66, 90	50.0% effluent,	replicate chamber 2
19, 43, 67, 91	50.0% effluent,	replicate chamber 3
20, 44, 68, 92	50.0% effluent,	replicate chamber 4
21, 45, 69, 93	100.0% effluent,	replicate chamber 1
22, 46, 70, 94	100.0% effluent,	replicate chamber 2
23, 47, 71, 95	100.0% effluent,	replicate chamber 3
24, 48, 72, 96	100.0% effluent,	replicate chamber 4

2.3.2 The random numbers used to carry out the random assignment of fish to replicate chambers are provided in Table A.2. The third step is to choose a starting position in Table A.2, and read the first double digit number. The first number read identifies the replicate chamber for the first fish taken from the tank. For the example, the first entry in row 2 was chosen as the starting position. The first number in this row is 37. According to Table A.1, this number corresponds to replicate chamber 1 of the 25.0% effluent concentration. Thus, the first fish taken from the tank is to be placed in replicate chamber 1 of the 25.0% effluent concentration.

2.3.3 The next step is to read the double digit number to the right of the first one. The second number identifies the replicate chamber for the second fish taken from the tank. Continuing the example, the second number read in row 2 of Table A.2 is 54. According to Table A.1, this number corresponds to replicate chamber 2 of the 6.25% effluent concentration. Thus, the second fish taken from the tank is to be placed in replicate chamber 2 of the 6.25% effluent concentration.

TABLE A.2. TABLE OF RANDOM NUMBERS (Dixon and Massey, 1983)

10	09	73	25	33	76	52	01	35	86	34	67	35	43	76	80	95	90	91	17	39	29	27	49	45
37	54	20	48	05	64	89	47	42	96	24	80	52	40	37	20	63	61	04	02	00	82	29	16	65
08	42	26	89	53	19	64	50	93	03	23	20	90	25	60	15	95	33	47	64	35	08	03	36	06
99	01	90	25	29	09	37	67	07	15	38	31	13	11	65	88	67	67	43	97	04	43	62	76	59
12	80	79	99	70	80	15	73	61	47	64	03	23	66	53	98	95	11	68	77	12	27	17	68	33
66	06	57	47	17	34	07	27	68	50	36	69	73	61	70	65	81	33	98	85	11	19	92	91	70
31	06	01	08	05	45	57	18	24	06	35	30	34	26	14	86	79	90	74	39	23	40	30	97	32
85	26	97	76	02	02	05	16	56	92	68	66	57	48	18	73	05	38	52	47	18	62	38	85	79
63	57	33	21	35	05	32	54	70	48	90	55	35	75	48	28	46	82	87	09	83	49	12	56	24
73	79	64	57	53	03	52	96	47	78	35	80	83	42	82	60	93	52	03	44	35	27	38	84	35
98	52	01	77	67	14	90	56	86	07	22	10	94	05	58	60	97	09	34	33	50	50	07	39	98
11	80	50	54	31	39	80	82	77	32	50	72	56	82	48	29	40	52	42	01	52	77	56	78	51
83	45	29	96	34	06	28	89	80	83	13	74	67	00	78	18	47	54	06	10	68	71	17	78	17
88	68	54	02	00	86	50	75	84	01	36	76	66	79	51	90	36	47	64	93	29	60	91	10	62
99	59	46	73	48	87	51	76	49	69	91	82	60	89	28	93	78	56	13	68	23	47	83	41	13
65	48	11	76	74	17	46	85	09	50	58	04	77	69	74	73	03	95	71	86	40	21	81	65	44
80	12	43	56	35	17	72	70	80	15	45	31	82	23	74	21	11	57	82	53	14	38	55	37	63
74	35	09	98	17	77	40	27	72	14	43	23	60	02	10	45	52	16	42	37	96	28	60	26	55
69	91	62	68	03	66	25	22	91	48	36	93	68	72	03	76	62	11	39	90	94	40	05	64	18
09	89	32	05	05	14	22	56	85	14	46	42	75	67	88	96	29	77	88	22	54	38	21	45	98
91	49	91	45	23	68	47	92	76	86	46	16	28	35	54	94	75	08	99	23	37	08	92	00	48
80	33	69	45	98	26	94	03	68	58	70	29	73	41	35	53	14	03	33	40	42	05	08	23	41
44	10	48	19	49	85	15	74	79	54	32	97	92	65	75	57	60	04	08	81	22	22	20	64	13
12	55	07	37	42	11	10	00	20	40	12	86	07	46	97	96	64	48	94	39	28	70	72	58	15
63	60	64	93	29	16	50	53	44	84	40	21	95	25	63	43	65	17	70	82	07	20	73	17	90
61	19	69	04	46	26	45	74	77	74	51	92	43	37	29	65	39	45	95	93	42	58	26	05	27
15	47	44	52	66	95	27	07	99	53	59	36	78	38	48	82	39	61	01	18	33	21	15	94	66
94	55	72	85	73	67	89	75	43	87	54	62	24	44	31	91	19	04	25	92	92	92	74	59	73
42	48	11	62	13	97	34	40	87	21	16	86	84	87	67	03	07	11	20	59	25	70	14	66	70
23	52	37	83	17	73	20	88	98	37	68	93	59	14	16	26	25	22	96	63	05	52	28	25	62
04	49	35	24	94	75	24	63	38	24	45	86	25	10	25	61	96	27	93	35	65	33	71	24	72
00	54	99	76	54	64	05	18	81	59	96	11	96	38	96	54	69	28	23	91	23	28	72	95	29
35	96	31	53	07	26	89	80	93	45	33	35	13	54	62	77	97	45	00	24	90	10	33	93	33
59	80	80	83	91	45	42	72	68	42	83	60	94	97	00	13	02	12	48	92	78	56	52	01	06
46	05	88	52	36	01	39	09	22	86	77	28	14	40	77	93	91	08	36	47	70	61	74	29	41
32	17	90	05	97	87	37	92	52	41	05	56	70	70	07	86	74	31	71	57	85	39	41	18	38
69	23	46	14	06	20	11	74	52	04	15	95	66	00	00	18	74	39	24	23	97	11	89	63	38
19	56	54	14	30	01	75	87	53	79	40	41	92	15	85	66	67	43	68	06	84	96	28	52	07
45	15	51	49	38	19	47	60	72	46	43	66	79	45	43	59	04	79	00	33	20	82	66	95	41
94	86	43	19	94	36	16	81	08	51	34	88	88	15	53	01	54	03	54	56	05	01	45	11	76
98	08	62	48	26	45	24	02	84	04	44	99	90	88	96	39	09	47	34	07	35	44	13	18	80
33	18	51	62	32	41	94	15	09	49	89	43	54	85	81	88	69	54	19	94	37	54	87	30	43
80	95	10	04	06	96	38	27	07	74	20	15	12	33	87	25	01	62	52	98	94	62	46	11	71
79	75	24	91	40	71	96	12	82	96	69	86	10	25	91	74	85	22	05	39	00	38	75	95	79
18	63	33	25	37	98	14	50	65	71	31	01	02	46	74	05	45	56	14	27	77	93	89	19	36
74	02	94	39	02	77	55	73	22	70	97	79	01	71	19	52	52	75	80	21	80	81	45	17	48
54	17	84	56	11	80	99	33	71	43	05	33	51	29	69	56	12	71	92	55	36	04	09	03	24
11	66	44	98	83	52	07	98	48	27	59	38	17	15	39	09	97	33	34	40	88	46	12	33	56
48	32	47	79	28	31	24	96	47	10	02	29	53	68	70	32	30	75	75	46	15	02	00	99	94
69	07	49	41	38	87	63	79	19	76	35	58	40	44	01	10	51	82	16	15	01	84	87	69	38

2.3.4 Continue in this fashion until all the fish have been randomly assigned to a replicate chamber. In order to fill each replicate chamber with ten fish, the assigned numbers will be used more than once. If a number is read from the table that was not assigned to a replicate chamber, then ignore it and continue to the next number. If a replicate chamber becomes filled and a number is read from the table that corresponds to it, then ignore that value and continue to the next number. The first ten random assignments of fish to replicate chambers for the example are summarized in Table A.3.

TABLE A.3. EXAMPLE OF RANDOM ASSIGNMENT OF FIRST TEN FISH TO REPLICATE CHAMBERS

Fish		Assignment	
First	fish taken from tank	25.0% effluent,	replicate chamber 1
Second	fish taken from tank	6.25% effluent,	replicate chamber 2
Third	fish taken from tank	50.0% effluent,	replicate chamber 4
Fourth	fish taken from tank	100.0% effluent,	replicate chamber 4
Fifth	fish taken from tank	6.25% effluent,	replicate chamber 1
Sixth	fish taken from tank	25.0% effluent,	replicate chamber 4
Seventh	fish taken from tank	50.0% effluent,	replicate chamber 1
Eighth	fish taken from tank	100.0% effluent,	replicate chamber 3
Ninth	fish taken from tank	50.0% effluent,	replicate chamber 2
Tenth	fish taken from tank	100.0% effluent,	replicate chamber 4

2.3.5 Four double-digit numbers were assigned to each replicate chamber (instead of one, two, or three double-digit numbers) in order to make efficient use of the random number table (Table A.2). To illustrate, consider the assignment of only one double-digit number to each replicate chamber: the first column of assigned numbers in Table A.1. Whenever the numbers 00 and 25 through 99 are read from Table A.2, they will be disregarded and the next number will be read.

2.4 RANDOMIZATION OF REPLICATE CHAMBERS TO POSITIONS EXAMPLE

2.4.1 Next consider the random assignment of the 24 replicate chambers to positions within the water bath (or equivalent). Assume that the replicate chambers are to be positioned in a four row by six column rectangular array. The first step is to label the positions in the water bath. Table A.4 provides an example layout.

TABLE A.4 RANDOM ASSIGNMENT OF REPLICATE CHAMBERS TO POSITIONS: EXAMPLE LABELING THE POSITIONS WITHIN THE WATER BATH

1	2	3	4	5	6
7	8	9	10	11	12
13	14	15	16	17	18
19	20	21	22	23	24

2.4.2 The second step is to assign each of the 24 positions four double-digit numbers. An example of this assignment is provided in Table A.5. Note that the double digits 00 and 97 through 99 were not used.

TABLE A.5. RANDOM ASSIGNMENT OF REPLICATE CHAMBERS TO POSITIONS: EXAMPLE ASSIGNED NUMBERS FOR EACH POSITION

Assigned Numbers	Position
01, 25, 49, 73	1
02, 26, 50, 74	2
03, 27, 51, 75	3
04, 28, 52, 76	4
05, 29, 53, 77	5
06, 30, 54, 78	6
07, 31, 55, 79	7
08, 32, 56, 80	8
09, 33, 57, 81	9
10, 34, 58, 82	10
11, 35, 59, 83	11
12, 36, 60, 84	12
13, 37, 61, 85	13
14, 38, 62, 86	14
15, 39, 63, 87	15
16, 40, 64, 88	16
17, 41, 65, 89	17
18, 42, 66, 90	18
19, 43, 67, 91	19
20, 44, 68, 92	20
21, 45, 69, 93	21
22, 46, 70, 94	22
23, 47, 71, 95	23
24, 48, 72, 96	24

2.4.3 The random numbers used to carry out the random assignment of replicate chambers to positions are provided in Table A.2. The third step is to choose a starting position in Table A.2, and read the first double-digit number. The first number read identifies the position for the first replicate chamber of the control. For the example, the first entry in row 10 of Table A.2 was chosen as the starting position. The first number in this row was 73. According to Table A.5, this number corresponds to position 1. Thus, the first replicate chamber for the control will be placed in position 1.

2.4.4 The next step is to read the double-digit number to the right of the first one. The second number identifies the position for the second replicate chamber of the control. Continuing the example, the second number read in row 10 of Table A.2 is 79. According to Table A.5, this number corresponds to position 7. Thus, the second replicate chamber for the control will be placed in position 7.

2.4.5 Continue in this fashion until all the replicate chambers have been assigned to a position. The first four numbers read will identify the positions for the control replicate chambers, the second four numbers read will identify the positions for the lowest effluent concentration replicate chambers, and so on. If a number is read from the table that was not assigned to a position, then ignore that value and continue to the next number. If a number is repeated in Table A.2, then ignore the repeats and continue to the next number. The complete randomization of

replicate chambers to positions for the example is displayed in Table A.6.

TABLE A.6. RANDOM ASSIGNMENT OF REPLICATE CHAMBERS TO POSITIONS: EXAMPLE ASSIGNMENT OF ALL 24 POSITIONS

Control	100.0%	6.25%	6.25%	6.25%	12.5%
Control	12.5%	Control	25.0%	12.5%	25.0%
100.0%	50.0%	100.0%	Control	100.0%	25.0%
50.0%	50.0%	25.0%	50.0%	12.5%	6.25%

2.4.6 Four double-digit numbers were assigned to each position (instead of one, two, or three) in order to make efficient use of the random number table (Table A.2). To illustrate, consider the assignment of only one double-digit number to each position: the first column of assigned numbers in Table A.5. Whenever the numbers 00 and 25 through 99 are read from Table A.2, they will be disregarded and the next number will be read.

3. **OUTLIERS**

3.1 An outlier is an inconsistent or questionable data point that appears unrepresentative of the general trend exhibited by the majority of the data. Outliers may be detected by tabulation of the data, plotting, and by an analysis of the residuals. An explanation should be sought for any questionable data points. Without an explanation, data points should be discarded only with extreme caution. If there is no explanation, the analysis should be performed both with and without the outlier, and the results of both analyses should be reported.

3.2 Gentleman-Wilk's A statistic gives a test for the condition that the extreme observation may be considered an outlier. For a discussion of this, and other techniques for evaluating outliers, see Draper and John (1981).

APPENDIX B

VALIDATING NORMALITY AND HOMOGENEITY OF VARIANCE ASSUMPTIONS

1. INTRODUCTION

1.1 Dunnett's Procedure and the t test with Bonferroni's adjustment are parametric procedures based on the assumptions that the observations within treatments are independent and normally distributed, and that the variance of the observations is homogeneous across all toxicant concentrations and the control. These assumptions should be checked prior to using these tests, to determine if they have been met. Tests for validating the assumptions are provided in the following discussion. If the tests fail (if the data do not meet the assumptions), a nonparametric procedure such as Steel's Many-one Rank Test may be more appropriate. However, the decision on whether to use parametric or nonparametric tests may be a judgment call, and a statistician should be consulted in selecting the analysis.

2. TEST FOR NORMAL DISTRIBUTION OF DATA

2.1 SHAPIRO-WILK'S TEST

2.1.1 One formal test for normality is the Shapiro-Wilk's Test (Conover, 1980). The test statistic is obtained by dividing the square of an appropriate linear combination of the sample order statistics by the usual symmetric estimate of variance. The calculated W must be greater than zero and less than or equal to one. This test is recommended for a sample size of 50 or less. If the sample size is greater than 50, the Kolmogorov "D" statistic (Stephens, 1974) is recommended. An example of the Shapiro-Wilk's test is provided below.

2.2 The example uses growth data from the Fathead Minnow Larval Survival and Growth Test. The same data are used in the discussion of the homogeneity of variance determination in Paragraph 3 and Dunnett's Procedure in Appendix C. The data, the mean and variance of the observations at each concentration, including the control, are listed in Table B.1.

TABLE B.1. FATHEAD LARVAL, *PIMEPHALES PROMELAS*, LARVAL GROWTH DATA (WEIGHT IN MG) FOR THE SHAPIRO-WILK'S TEST

		NaPCP Concentration (µg/L)			
Replicate	Control	32	64	128	256
A	0.711	0.646	0.669	0.629	0.650
B	0.662	0.626	0.669	0.680	0.558
C	0.718	0.723	0.694	0.513	0.606
D	0.767	0.700	0.676	0.672	0.508
Mean($\bar{Y}_i$)	0.714	0.674	0.677	0.624	0.580
S_i^2	0.0018	0.0020	0.0001	0.0059	0.0037
i	1	2	3	4	5

2.3 The first step of the test for normality is to center the observations by subtracting the mean of all the observations within a concentration from each observation in that concentration. The centered observations are listed in Table B.2.

TABLE B.2. EXAMPLE OF SHAPIRO-WILK'S TEST: CENTERED OBSERVATIONS

		NaPCP Concentration (µg/L)			
Replicate	Control	32	64	128	256
A	-0.003	-0.028	-0.008	0.005	0.070
B	-0.052	-0.048	-0.008	0.056	-0.022
C	0.004	0.049	0.017	-0.111	0.026
D	0.053	0.026	-0.001	0.048	-0.072

2.4 Calculate the denominator, D, of the test statistic:

$$D = \sum_{i=1}^{n} (X_i - \overline{X})^2$$

Where: X_i = the centered observations and $\overline{X}$ is the overall mean of the centered observations. For this set of data, $\overline{X} = 0$, and D = 0.0412.

2.5 Order the centered observations from smallest to largest.

$$X^{(1)} \leq X^{(2)} \leq \ldots \leq X^{(n)}$$

where $X^{(i)}$ denotes the ith ordered observation. The ordered observations are listed in Table B.3.

TABLE B.3. EXAMPLE OF THE SHAPIRO-WILK'S TEST: ORDERED OBSERVATIONS

i	$X^{(i)}$	i	$X^{(i)}$
1	-0.111	11	0.004
2	-0.072	12	0.005
3	-0.052	13	0.017
4	-0.048	14	0.026
5	-0.028	15	0.026
6	-0.022	16	0.048
7	-0.008	17	0.049
8	-0.008	18	0.053
9	-0.003	19	0.056
10	-0.001	20	0.070

2.6 From Table B.4, for the number of observations, n, obtain the coefficients $a_1, a_2, \ldots, a_k$, where k is n/2 if n is even, and (n-1)/2 if n is odd. For the data in this example, n = 20, k = 10. The a_i values are listed in Table B.5.

TABLE B.4. COEFFICIENTS FOR THE SHAPIRO-WILK'S TEST (Conover, 1980)

i \ n	Number of Observations 2	3	4	5	6	7	8	9	10
1	0.7071	0.7071	0.6872	0.6646	0.6431	0.6233	0.6052	0.5888	0.5739
2	-	0.0000	0.1667	0.2413	0.2806	0.3031	0.3164	0.3244	0.3291
3	-	-	-	0.0000	0.0875	0.1401	0.1743	0.1976	0.2141
4	-	-	-	-	-	0.0000	0.0561	0.0947	0.1224
5	-	-	-	-	-	-	-	0.0000	0.0399

i \ n	Number of Observations 11	12	13	14	15	16	17	18	19	20
1	0.5601	0.5475	0.5359	0.5251	0.5150	0.5056	0.4968	0.4886	0.4808	0.4734
2	0.3315	0.3325	0.3325	0.3318	0.3306	0.3209	0.3273	0.3253	0.3232	0.3211
3	0.2260	0.2347	0.2412	0.2460	0.2495	0.2521	0.2540	0.2553	0.2561	0.2565
4	0.1429	0.1586	0.1707	0.1802	0.1878	0.1939	0.1988	0.2027	0.2059	0.2085
5	0.0695	0.0922	0.1099	0.1240	0.1353	0.1447	0.1524	0.1587	0.1641	0.1686
6	0.0000	0.0303	0.0539	0.0727	0.0880	0.1005	0.1109	0.1197	0.1271	0.1334
7	-	-	0.0000	0.0240	0.0433	0.0593	0.0725	0.0837	0.0932	0.1013
8	-	-	-	-	0.0000	0.0196	0.0359	0.0496	0.0612	0.0711
9	-	-	-	-	-	-	0.0000	0.0163	0.0303	0.0422
10	-	-	-	-	-	-	-	-	0.0000	0.0140

i \ n	Number of Observations 21	22	23	24	25	26	27	28	29	30
1	0.4643	0.4590	0.4542	0.4493	0.4450	0.4407	0.4366	0.4328	0.4291	0.4254
2	0.3185	0.3156	0.3126	0.3098	0.3069	0.3043	0.3018	0.2992	0.2968	0.2944
3	0.2578	0.2571	0.2563	0.2554	0.2543	0.2533	0.2522	0.2510	0.2499	0.2487
4	0.2119	0.2131	0.2139	0.2145	0.2148	0.2151	0.2152	0.2151	0.2150	0.2148
5	0.1736	0.1764	0.1787	0.1807	0.1822	0.1836	0.1848	0.1857	0.1864	0.1870
6	0.1399	0.1443	0.1480	0.1512	0.1539	0.1563	0.1584	0.1601	0.1616	0.1630
7	0.1092	0.1150	0.1201	0.1245	0.1283	0.1316	0.1346	0.1372	0.1395	0.1415
8	0.0804	0.0878	0.0941	0.0997	0.1046	0.1089	0.1128	0.1162	0.1192	0.1219
9	0.0530	0.0618	0.0696	0.0764	0.0923	0.0876	0.0923	0.0965	0.1002	0.1036
10	0.0263	0.0368	0.0459	0.0539	0.0610	0.0672	0.0728	0.0778	0.0822	0.0862
11	0.0000	0.0122	0.0228	0.0321	0.0403	0.0476	0.0540	0.0598	0.0650	0.0697
12	-	-	0.0000	0.0107	0.0200	0.0284	0.0358	0.0424	0.0483	0.0537
13	-	-	-	-	0.0000	0.0094	0.0178	0.0253	0.0320	0.0381
14	-	-	-	-	-	-	0.0000	0.0084	0.0159	0.0227
15	-	-	-	-	-	-	-	-	0.0000	0.0076

TABLE B.4. COEFFICIENTS FOR THE SHAPIRO WILK'S TEST (CONTINUED)

i \ n	Number of Observations 31	32	33	34	35	36	37	38	39	40
1	0.4220	0.4188	0.4156	0.4127	0.4096	0.4068	0.4040	0.4015	0.3989	0.3964
2	0.2921	0.2898	0.2876	0.2854	0.2834	0.2813	0.2794	0.2774	0.2755	0.2737
3	0.2475	0.2462	0.2451	0.2439	0.2427	0.2415	0.2403	0.2391	0.2380	0.2368
4	0.2145	0.2141	0.2137	0.2132	0.2127	0.2121	0.2116	0.2110	0.2104	0.2098
5	0.1874	0.1878	0.1880	0.1882	0.1883	0.1883	0.1883	0.1881	0.1880	0.1878
6	0.1641	0.1651	0.1660	0.1667	0.1673	0.1678	0.1663	0.1686	0.1689	0.1691
7	0.1433	0.1449	0.1463	0.1475	0.1487	0.1496	0.1505	0.1513	0.1520	0.1526
8	0.1243	0.1265	0.1284	0.1301	0.1317	0.1331	0.1344	0.1356	0.1366	0.1376
9	0.1066	0.1093	0.1118	0.1140	0.1160	0.1179	0.1196	0.1211	0.1225	0.1237
10	0.0899	0.0931	0.0961	0.0988	0.1013	0.1036	0.1056	0.1075	0.1092	0.1108
11	0.0739	0.0777	0.0812	0.0844	0.0873	0.0900	0.0924	0.0947	0.0967	0.0986
12	0.0585	0.0629	0.0669	0.0706	0.0739	0.0770	0.0798	0.0824	0.0848	0.0870
13	0.0435	0.0485	0.0530	0.0572	0.0610	0.0645	0.0677	0.0706	0.0733	0.0759
14	0.0289	0.0344	0.0395	0.0441	0.0484	0.0523	0.0559	0.0592	0.0622	0.0651
15	0.0144	0.0206	0.0262	0.0314	0.0361	0.0404	0.0444	0.0481	0.0515	0.0546
16	0.0000	0.0068	0.0131	0.0187	0.0239	0.0287	0.0331	0.0372	0.0409	0.0444
17	-	-	0.0000	0.0062	0.0119	0.0172	0.0220	0.0264	0.0305	0.0343
18	-	-	-	-	0.0000	0.0057	0.0110	0.0158	0.0203	0.0244
19	-	-	-	-	-	-	0.0000	0.0053	0.0101	0.0146
20	-	-	-	-	-	-	-	-	0.0000	0.0049

i \ n	Number of Observations 41	42	43	44	45	46	47	48	49	50
1	0.3940	0.3917	0.3894	0.3872	0.3850	0.3830	0.3808	0.3789	0.3770	0.3751
2	0.2719	0.2701	0.2684	0.2667	0.2651	0.2635	0.2620	0.2604	0.2589	0.2574
3	0.2357	0.2345	0.2334	0.2323	0.2313	0.2302	0.2291	0.2281	0.2271	0.2260
4	0.2091	0.2085	0.2078	0.2072	0.2065	0.2058	0.2052	0.2045	0.2038	0.2032
5	0.1876	0.1874	0.1871	0.1868	0.1865	0.1862	0.1859	0.1855	0.1851	0.1847
6	0.1693	0.1694	0.1695	0.1695	0.1695	0.1695	0.1695	0.1693	0.1692	0.1691
7	0.1531	0.1535	0.1539	0.1542	0.1545	0.1548	0.1550	0.1551	0.1553	0.1554
8	0.1384	0.1392	0.1398	0.1405	0.1410	0.1415	0.1420	0.1423	0.1427	0.1430
9	0.1249	0.1259	0.1269	9,1278	0.1286	0.1293	0.1300	0.1306	0.1312	0.1317
10	0.1123	0.1136	0.1149	0.1160	9.1170	0.1180	0.1189	0.1197	0.1205	0.1212
11	0.1004	0.1020	0.1035	0.1049	0.1062	0.1073	0.1085	0.1095	0.1105	0.1113
12	0.0891	0.0909	0.0927	0.0943	0.0959	0.0972	0.0986	0.0998	0.1010	0.1020
13	0.0782	0.0804	0.0824	0.0842	0.0860	0.0876	0.0892	0.0906	0.0919	0.0932
14	0.0677	0.0701	0.0724	0.0745	0.0765	0.0783	0.0801	0.0817	0.0832	0.0846
15	0.0575	0.0602	0.0628	0.0651	0.0673	0.0694	0.0713	0.0731	0.0748	0.0764
16	0.0476	0.0506	0.0534	0.0560	0.0584	0.0607	0.0628	0.0648	0.0667	0.0685
17	0.0379	0.0411	0.0442	0.0471	0.0497	0.0522	0.0546	0.0568	0.0588	0.0608
18	0.0283	0.0318	0.0352	0.0383	0.0412	0.0439	0.0465	0.0489	0.0511	0.0532
19	0.0188	0.0227	0.0263	0.0296	0.0328	0.0357	0.0385	0.0411	0.0436	0.0459
20	0.0094	0.0136	0.0175	0.0211	0.0245	0.0277	0.0307	0.0335	0.0361	0.0386
21	0.0000	0.0045	0.0087	0.0126	0.0163	0.0197	0.0229	0.0259	0.0288	0.0314
22	-	-	0.0000	0.0042	0.0081	0.0118	0.0153	0.0185	0.0215	0.0244
23	-	-	-	-	0.0000	0.0039	0.0076	0.0111	0.0143	0.0174
24	-	-	-	-	-	-	0.0000	0.0037	0.0071	0.0104
25	-	-	-	-	-	-	-	-	0.0000	0.0035

2.7 Compute the test statistic, W, as follows:

$$W = \frac{1}{D} \left[\sum_{i=1}^{k} a_i \left(X^{(n-i+1)} - X^{(i)}\right)\right]^2$$

The differences, $X^{(n-i+1)} - X^{(i)}$, are listed in Table B.5.

2.8 The decision rule for this test is to compare the critical value from Table B.6 to the computed W. If the computed value is less than the critical value, conclude that the data are not normally distributed. For this example, the critical value at a significance level of 0.01 and 20 observations (n) is 0.868. The calculated value, 0.959, is not less than the critical value. Therefore, conclude that the data are normally distributed.

TABLE B.5. EXAMPLE OF THE SHAPIRO-WILK'S TEST: TABLE OF COEFFICIENTS AND DIFFERENCES

i	a_i	$X^{(n-i+1)} - X^{(i)}$	
1	0.4734	0.181	$X^{(20)} - X^{(1)}$
2	0.3211	0.128	$X^{(19)} - X^{(2)}$
3	0.2565	0.105	$X^{(18)} - X^{(3)}$
4	0.2085	0.097	$X^{(17)} - X^{(4)}$
5	0.1686	0.076	$X^{(16)} - X^{(5)}$
6	0.1334	0.048	$X^{(15)} - X^{(6)}$
7	0.1013	0.034	$X^{(14)} - X^{(7)}$
8	0.0711	0.025	$X^{(13)} - X^{(8)}$
9	0.0422	0.008	$X^{(12)} - X^{(9)}$
10	0.0140	0.005	$X^{(11)} - X^{(10)}$

2.9 In general, if the data fail the test for normality, a transformation such as to log values may normalize the data. After transforming the data, repeat the Shapiro-Wilk's Test for normality.

2.10 KOLMOGOROV "D" TEST

2.10.1 A formal two-sided test for normality is the Kolmogorov "D" Test. The test statistic is calculated by obtaining the difference between the cumulative distribution function estimated from the data and the standard normal cumulative distribution function for each standardized observation. This test is recommended for a sample size greater than 50. If the sample size is less than or equal to 50, then the Shapiro Wilk's Test is recommended. An example of the Kolmogorov "D" test is provided below.

2.10.2 The example uses reproduction data from the daphnid, *Ceriodaphnia dubia,* Survival and Reproduction Test. The observed data and the mean of the observations at each concentration, including the control, are listed in Table B.7.

2.10.3 The first step of the test for normality is to center the observations by subtracting the mean of all the observations within a concentration from each observation in that concentration. The centered observations for the example are listed in Table B.8.

TABLE B.6. QUANTILES OF THE SHAPIRO-WILK'S TEST STATISTIC (Conover, 1980)

n	0.01	0.02	0.05	0.10	0.50	0.90	0.95	0.98	0.99
3	0.753	0.756	0.767	0.789	0.959	0.998	0.999	1.000	1.000
4	0.687	0.707	0.748	0.792	0.935	0.987	0.992	0.996	0.997
5	0.686	0.715	0.762	0.806	0.927	0.979	0.986	0.991	0.993
6	0.713	0.743	0.788	0.826	0.927	0.974	0.981	0.986	0.989
7	0.730	0.760	0.803	0.838	0.928	0.972	0.979	0.985	0.988
8	0.749	0.778	0.818	0.851	0.932	0.972	0.978	0.984	0.987
9	0.764	0.791	0.829	0.859	0.935	0.972	0.978	0.984	0.986
10	0.781	0.806	0.842	0.869	0.938	0.972	0.978	0.983	0.986
11	0.792	0.817	0.850	0.876	0.940	0.973	0.979	0.984	0.986
12	0.805	0.828	0.859	0.883	0.943	0.973	0.979	0.984	0.986
13	0.814	0.837	0.866	0.889	0.945	0.974	0.979	0.984	0.986
14	0.825	0.846	0.874	0.895	0.947	0.975	0.980	0.984	0.986
15	0.835	0.855	0.881	0.901	0.950	0.975	0.980	0.984	0.987
16	0.844	0.863	0.887	0.906	0.952	0.976	0.981	0.985	0.987
17	0.851	0.869	0.892	0.910	0.954	0.977	0.981	0.985	0.987
18	0.858	0.874	0.897	0.914	0.956	0.978	0.982	0.986	0.988
19	0.863	0.879	0.901	0.917	0.957	0.978	0.982	0.986	0.988
20	0.868	0.884	0.905	0.920	0.959	0.979	0.983	0.986	0.988
21	0.873	0.888	0.908	0.923	0.960	0.980	0.983	0.987	0.989
22	0.878	0.892	0.911	0.926	0.961	0.980	0.984	0.987	0.989
23	0.881	0.895	0.914	0.928	0.962	0.981	0.984	0.987	0.989
24	0.884	0.898	0.916	0.930	0.963	0.981	0.984	0.987	0.989
25	0.888	0.901	0.918	0.931	0.964	0.981	0.985	0.988	0.989
26	0.891	0.904	0.920	0.933	0.965	0.982	0.985	0.988	0.989
27	0.894	0.906	0.923	0.935	0.965	0.982	0.985	0.988	0.990
28	0.896	0.908	0.924	0.936	0.966	0.982	0.985	0.988	0.990
29	0.898	0.910	0.926	0.937	0.966	0.982	0.985	0.988	0.990
30	0.900	0.912	0.927	0.939	0.967	0.983	0.985	0.988	0.990
31	0.902	0.914	0.929	0.940	0.967	0.983	0.986	0.988	0.990
32	0.904	0.915	0.930	0.941	0.968	0.983	0.986	0.988	0.990
33	0.906	0.917	0.931	0.942	0.968	0.983	0.986	0.989	0.990
34	0.908	0.919	0.933	0.943	0.969	0.983	0.986	0.989	0.990
35	0.910	0.920	0.934	0.944	0.969	0.984	0.986	0.989	0.990
36	0.912	0.922	0.935	0.945	0.970	0.984	0.986	0.989	0.990
37	0.914	0.924	0.936	0.946	0.970	0.984	0.987	0.989	0.990
38	0.916	0.925	0.938	0.947	0.971	0.984	0.987	0.989	0.990
39	0.917	0.927	0.939	0.948	0.971	0.984	0.987	0.989	0.991
40	0.919	0.928	0.940	0.949	0.972	0.985	0.987	0.989	0.991
41	0.920	0.929	0.941	0.950	0.972	0.985	0.987	0.989	0.991
42	0.922	0.930	0.942	0.951	0.972	0.985	0.987	0.989	0.991
43	0.923	0.932	0.943	0.951	0.973	0.985	0.987	0.990	0.991
44	0.924	0.933	0.944	0.952	0.973	0.985	0.987	0.990	0.991
45	0.926	0.934	0.945	0.953	0.973	0.985	0.988	0.990	0.991
46	0.927	0.935	0.945	0.953	0.974	0.985	0.988	0.990	0.991
47	0.928	0.936	0.946	0.954	0.974	0.985	0.988	0.990	0.991
48	0.929	0.937	0.947	0.954	0.974	0.985	0.988	0.990	0.991
49	0.929	0.937	0.947	0.955	0.974	0.985	0.988	0.990	0.991
50	0.930	0.938	0.947	0.955	0.974	0.985	0.988	0.990	0.991

TABLE B.7. *CERIODAPHNIA DUBIA* REPRODUCTION DATA FOR THE KOLMOGOROV "D" TEST

	Effluent Concentration (%)					
Replicate	Control	1.56	3.12	6.25	12.5	25.0
1	27	32	39	27	19	10
2	30	35	30	34	25	13
3	29	32	33	36	26	7
4	31	26	33	34	17	7
5	16	18	36	31	16	7
6	15	29	33	27	21	10
7	18	27	33	33	23	10
8	17	16	27	31	15	16
9	14	35	38	33	18	12
10	27	13	44	31	10	2
Mean	22.4	26.3	34.6	31.7	19.0	9.4

TABLE B.8. CENTERED OBSERVATIONS FOR KOLMOGOROV “D” EXAMPLE

	Effluent Concentration (%)					
Replicate	Control	1.56	3.12	6.25	12.5	25.0
1	4.6	5.7	4.4	-4.7	0.0	0.6
2	7.6	8.7	-4.6	2.3	6.0	3.6
3	6.6	5.7	-1.6	4.3	7.0	-2.4
4	8.6	-0.3	-1.6	2.3	-2.0	-2.4
5	-6.4	-8.3	1.4	-0.7	-3.0	-2.4
6	-7.4	2.7	-1.6	-4.7	2.0	0.6
7	-4.4	0.7	-1.6	1.3	4.0	0.6
8	-5.4	-10.3	-7.6	-0.7	-4.0	6.6
9	-8.4	8.7	3.4	1.3	-1.0	2.6
10	4.6	-13.3	9.4	-0.7	-9.0	-7.4

2.10.4 Order the centered observations from smallest to largest:

$$X^{(1)} \leq X^{(2)} \leq \ldots \leq X^{(n)}$$

where $X^{(i)}$ denotes the ith ordered observation, and n denotes the total number of centered observations. The ordered observations for the example are listed in Table B.9.

TABLE B.9. EXAMPLE CALCULATION OF THE KOLMOGOROV "D" STATISTIC

i	$X^{(i)}$	z_i	p_i	D_i+	D_i-
1	-13.3	-2.51	0.0060	0.0107	0.0060
2	-10.3	-1.94	0.0262	0.0071	0.0095
3	-9.0	-1.70	0.0446	0.0054	0.0113
4	-8.4	-1.58	0.0571	0.0096	0.0071
5	-8.3	-1.57	0.0582	0.0251	-0.0085
6	-7.6	-1.43	0.0764	0.0236	-0.0069
7	-7.4	-1.40	0.0808	0.0359	-0.0192
8	-7.4	-1.40	0.0808	0.0525	-0.0359
9	-6.4	-1.21	0.1131	0.0369	-0.0202
10	-5.4	-1.02	0.1539	0.0128	0.0039
11	-4.7	-0.89	0.1867	-0.0034	0.0200
12	-4.7	-0.89	0.1867	0.0133	0.0034
13	-4.6	-0.87	0.1922	0.0245	-0.0078
14	-4.4	-0.83	0.2033	0.0300	-0.0134
15	-4.0	-0.75	0.2266	0.0234	-0.0067
16	-3.0	-0.57	0.2843	-0.0176	0.0343
17	-2.4	-0.45	0.3264	-0.0431	0.0597
18	-2.4	-0.45	0.3264	-0.0264	0.0431
19	-2.4	-0.45	0.3264	-0.0097	0.0264
20	-2.0	-0.38	0.3520	-0.0187	0.0353
21	-1.6	-0.30	0.3821	-0.0321	0.0488
22	-1.6	-0.30	0.3821	-0.0154	0.0321
23	-1.6	-0.30	0.3821	0.0012	0.0154
24	-1.6	-0.30	0.3821	0.0179	-0.0012
25	-1.0	-0.19	0.4247	-0.0080	0.0247
26	-0.7	-0.13	0.4483	-0.0150	0.0316
27	-0.7	-0.13	0.4483	0.0017	0.0150
28	-0.7	-0.13	0.4483	0.0184	-0.0017
29	-0.3	-0.06	0.4761	0.0072	0.0094
30	0.0	0.00	0.5000	0.0000	0.0167
31	0.6	0.11	0.5438	-0.0271	0.0438
32	0.6	0.11	0.5438	-0.0105	0.0271
33	0.6	0.11	0.5438	0.0062	0.0105
34	0.7	0.13	0.5517	0.0150	0.0017
35	1.3	0.25	0.5987	-0.0154	0.0320
36	1.3	0.25	0.5987	0.0013	0.0154
37	1.4	0.26	0.6026	0.0141	0.0026
38	2.0	0.38	0.6480	-0.0147	0.0313
39	2.3	0.43	0.6664	-0.0164	0.0331
40	2.3	0.43	0.6664	0.0003	0.0164
41	2.6	0.49	0.6879	-0.0046	0.0212
42	2.7	0.51	0.6950	0.0050	0.0117
43	3.4	0.64	0.7389	-0.0222	0.0389
44	3.6	0.68	0.7517	-0.0184	0.0350
45	4.0	0.75	0.7734	-0.0234	0.0401
46	4.3	0.81	0.7910	-0.0243	0.0410
47	4.4	0.83	0.7967	-0.0134	0.0300

TABLE B.9. EXAMPLE CALCULATION OF THE KOLMOGOROV "D" STATISTIC (CONTINUED)

i	$X^{(i)}$	z_i	p_i	D_i+	D_i-
48	4.6	0.87	0.8078	-0.0078	0.0245
49	4.6	0.87	0.8078	0.0089	0.0078
50	5.7	1.08	0.8599	-0.0266	0.0432
51	5.7	1.08	0.8599	-0.0099	0.0266
52	6.0	1.13	0.8708	-0.0041	0.0208
53	6.6	1.25	0.8944	-0.0111	0.0277
54	6.6	1.25	0.8944	0.0056	0.0111
55	7.0	1.32	0.9066	0.0101	0.0066
56	7.6	1.43	0.9236	0.0097	0.0069
57	8.6	1.62	0.9474	0.0026	0.0141
58	8.7	1.64	0.9495	0.0172	-0.0005
59	8.7	1.64	0.9495	0.0338	-0.0172
60	9.4	1.77	0.9616	0.0384	-0.0217

2.10.5 The next step is to standardize the ordered observations. Let z_i denote the standardized value of the ith ordered observation. Then,

$$z_i = \frac{X^{(i)}}{s} \quad and \quad s^2 = \frac{\Sigma[X^{(i)}]^2}{(n-1)}$$

For the example, s = 5.3, and the standardized observations are listed in Table B.9.

2.10.6 From Table B.10, obtain the value of the standard normal cumulative distribution function (standard normal CDF) at z_i. Denote this value as p_i. Note that negative z are not listed in Table B.10. The value of the standard normal CDF at a negative number is one minus the value of the standard normal CDF at the absolute value of that number. For example, since the value of the standard normal CDF at 3.21 is 0.9993, the value of the standard normal CDF at -3.21 is 1 - 0.9993 = 0.0007. The p_i values for the example data are listed in Table B.9.

TABLE B.10. P IS THE VALUE OF THE STANDARD NORMAL CUMULATIVE DISTRIBUTION AT Z

z	p	z	p	z	p	z	p
0.00	0.5000	0.41	0.6591	0.82	0.7939	1.23	0.8907
0.01	0.5040	0.42	0.6628	0.83	0.7967	1.24	0.8925
0.02	0.5080	0.43	0.6664	0.84	0.7995	1.25	0.8944
0.03	0.5120	0.44	0.6700	0.85	0.8023	1.26	0.8962
0.04	0.5160	0.45	0.6736	0.86	0.8051	1.27	0.8980
0.05	0.5199	0.46	0.6772	0.87	0.8078	1.28	0.8997
0.06	0.5239	0.47	0.6808	0.88	0.8106	1.29	0.9015
0.07	0.5279	0.48	0.6844	0.89	0.8133	1.30	0.9032
0.08	0.5319	0.49	0.6879	0.90	0.8159	1.31	0.9049
0.09	0.5359	0.50	0.6915	0.91	0.8186	1.32	0.9066
0.10	0.5398	0.51	0.6950	0.92	0.8212	1.33	0.9082
0.11	0.5438	0.52	0.6985	0.93	0.8238	1.34	0.9099
0.12	0.5478	0.53	0.7019	0.94	0.8264	1.35	0.9115
0.13	0.5517	0.54	0.7054	0.95	0.8289	1.36	0.9131
0.14	0.5557	0.55	0.7088	0.96	0.8315	1.37	0.9147
0.15	0.5596	0.56	0.7123	0.97	0.8340	1.38	0.9162
0.16	0.5636	0.57	0.7157	0.98	0.8365	1.39	0.9177
0.17	0.5675	0.58	0.7190	0.99	0.8389	1.40	0.9192
0.18	0.5714	0.59	0.7224	1.00	0.8413	1.41	0.9207
0.19	0.5753	0.60	0.7257	1.01	0.8438	1.42	0.9222
0.20	0.5793	0.61	0.7291	1.02	0.8461	1.43	0.9236
0.21	0.5832	0.62	0.7324	1.03	0.8485	1.44	0.9251
0.22	0.5871	0.63	0.7357	1.04	0.8508	1.45	0.9265
0.23	0.5910	0.64	0.7389	1.05	0.8531	1.46	0.9279
0.24	0.5948	0.65	0.7422	1.06	0.8554	1.47	0.9292
0.25	0.5987	0.66	0.7454	1.07	0.8577	1.48	0.9306
0.26	0.6026	0.67	0.7486	1.08	0.8599	1.49	0.9319
0.27	0.6064	0.68	0.7517	1.09	0.8621	1.50	0.9332
0.28	0.6103	0.69	0.7549	1.10	0.8643	1.51	0.9345
0.29	0.6141	0.70	0.7580	1.11	0.8665	1.52	0.9357
0.30	0.6179	0.71	0.7611	1.12	0.8686	1.53	0.9370
0.31	0.6217	0.72	0.7642	1.13	0.8708	1.54	0.9382
0.32	0.6255	0.73	0.7673	1.14	0.8729	1.55	0.9394
0.33	0.6293	0.74	0.7704	1.15	0.8749	1.56	0.9406
0.34	0.6331	0.75	0.7734	1.16	0.8770	1.57	0.9418
0.35	0.6368	0.76	0.7764	1.17	0.8790	1.58	0.9429
0.36	0.6406	0.77	0.7794	1.18	0.8810	1.59	0.9441
0.37	0.6443	0.78	0.7823	1.19	0.8830	1.60	0.9452
0.38	0.6480	0.79	0.7852	1.20	0.8849	1.61	0.9463
0.39	0.6517	0.80	0.7881	1.21	0.8869	1.62	0.9474
0.40	0.6554	0.81	0.7910	1.22	0.8888	1.63	0.9484

TABLE B.10. P IS THE VALUE OF THE STANDARD NORMAL CUMULATIVE DISTRIBUTION AT Z (CONTINUED)

z	p	z	p	z	p	z	p
1.64	0.9495	2.05	0.9798	2.46	0.9931	2.87	0.9979
1.65	0.9505	2.06	0.9803	2.47	0.9932	2.88	0.9980
1.66	0.9515	2.07	0.9808	2.48	0.9934	2.89	0.9981
1.67	0.9525	2.08	0.9812	2.49	0.9936	2.90	0.9981
1.68	0.9535	2.09	0.9817	2.50	0.9938	2.91	0.9982
1.69	0.9545	2.10	0.9821	2.51	0.9940	2.92	0.9982
1.70	0.9554	2.11	0.9826	2.52	0.9941	2.93	0.9983
1.71	0.9564	2.12	0.9830	2.53	0.9943	2.94	0.9984
1.72	0.9573	2.13	0.9834	2.54	0.9945	2.95	0.9984
1.73	0.9582	2.14	0.9838	2.55	0.9946	2.96	0.9985
1.74	0.9591	2.15	0.9842	2.56	0.9948	2.97	0.9985
1.75	0.9599	2.16	0.9846	2.57	0.9949	2.98	0.9986
1.76	0.9608	2.17	0.9850	2.58	0.9951	2.99	0.9986
1.77	0.9616	2.18	0.9854	2.59	0.9952	3.00	0.9987
1.78	0.9625	2.19	0.9857	2.60	0.9953	3.01	0.9987
1.79	0.9633	2.20	0.9861	2.61	0.9955	3.02	0.9987
1.80	0.9641	2.21	0.9864	2.62	0.9956	3.03	0.9988
1.81	0.9649	2.22	0.9868	2.63	0.9957	3.04	0.9988
1.82	0.9656	2.23	0.9871	2.64	0.9959	3.05	0.9989
1.83	0.9664	2.24	0.9875	2.65	0.9960	3.06	0.9989
1.84	0.9671	2.25	0.9878	2.66	0.9961	3.07	0.9989
1.85	0.9678	2.26	0.9881	2.67	0.9962	3.08	0.9990
1.86	0.9686	2.27	0.9884	2.68	0.9963	3.09	0.9990
1.87	0.9693	2.28	0.9887	2.69	0.9964	3.10	0.9990
1.88	0.9699	2.29	0.9890	2.70	0.9965	3.11	0.9991
1.89	0.9706	2.30	0.9893	2.71	0.9966	3.12	0.9991
1.90	0.9713	2.31	0.9896	2.72	0.9967	3.13	0.9991
1.91	0.9719	2.32	0.9898	2.73	0.9968	3.14	0.9992
1.92	0.9726	2.33	0.9901	2.74	0.9969	3.15	0.9992
1.93	0.9732	2.34	0.9904	2.75	0.9970	3.16	0.9992
1.94	0.9738	2.35	0.9906	2.76	0.9971	3.17	0.9992
1.95	0.9744	2.36	0.9909	2.77	0.9972	3.18	0.9993
1.96	0.9750	2.37	0.9911	2.78	0.9973	3.19	0.9993
1.97	0.9756	2.38	0.9913	2.79	0.9974	3.20	0.9993
1.98	0.9761	2.39	0.9916	2.80	0.9974	3.21	0.9993
1.99	0.9767	2.40	0.9918	2.81	0.9975	3.22	0.9994
2.00	0.9772	2.41	0.9920	2.82	0.9976	3.23	0.9994
2.01	0.9778	2.42	0.9922	2.83	0.9977	3.24	0.9994
2.02	0.9783	2.43	0.9925	2.84	0.9977	3.25	0.9994
2.03	0.9788	2.44	0.9927	2.85	0.9978	3.26	0.9994
2.04	0.9793	2.45	0.9929	2.86	0.9979	3.27	0.9995

TABLE B.10. P IS THE VALUE OF THE STANDARD NORMAL CUMULATIVE DISTRIBUTION AT Z (CONTINUED)

z	p	z	p	z	p	z	p
3.28	0.9995	3.46	0.9997	3.64	0.9999	3.82	0.9999
3.29	0.9995	3.47	0.9997	3.65	0.9999	3.83	0.9999
3.30	0.9995	3.48	0.0997	3.66	0.9999	3.84	0.9999
3.31	0.9995	3.49	0.9998	3.67	0.9999	3.85	0.9999
3.32	0.9995	3.50	0.9998	3.68	0.9999	3.86	0.9999
3.33	0.9996	3.51	0.9998	3.69	0.9999	3.87	0.9999
3.34	0.9996	3.52	0.9998	3.70	0.9999	3.88	0.9999
3.35	0.9996	3.53	0.9998	3.71	0.9999	3.89	0.9999
3.36	0.9996	3.54	0.9998	3.72	0.9999	3.90	1.0000
3.37	0.9996	3.55	0.9998	3.73	0.9999	3.91	1.0000
3.38	0.9996	3.56	0.9998	3.74	0.9999	3.92	1.0000
3.39	0.9997	3.57	0.9998	3.75	0.9999	3.93	1.0000
3.40	0.9997	3.58	0.9998	3.76	0.9999	3.94	1.0000
3.41	0.9997	3.59	0.9998	3.77	0.9999	3.95	1.0000
3.42	0.9997	3.60	0.9998	3.78	0.9999	3.96	1.0000
3.43	0.9997	3.61	0.9998	3.79	0.9999	3.97	1.0000
3.44	0.9997	3.62	0.9999	3.80	0.9999	3.98	1.0000
3.45	0.9997	3.63	0.9999	3.81	0.9999	3.99	1.0000

2.10.7 Next, calculate the following differences for each ordered observation:

$$D_i+ = (i/n) - p_i$$

$$D_i- = p_i - [(i-1)/n]$$

The differences for the example are listed in Table B.9.

2.10.8 Obtain the maximum of the D_i+, and denote it as D+. Obtain the maximum of the D_i-, and denote it as D-. For the example, D+ = 0.0525, and D- = 0.0597.

2.10.9 Next, obtain the maximum of D+ and D-, and denote it as D. For the example, D = 0.0597.

2.10.10 The test statistic, D*, is calculated as follows:

$$D^* = D(\sqrt{n} - 0.01 + \frac{0.85}{\sqrt{n}})$$

For the example, D* = 0.4684.

2.10.11 The decision rule for the two tailed test is to compare the critical value from Table B.11 to the computed D*. If the computed value is greater than the critical value, conclude that the data are not normally distributed. For this example, the critical value at a significance level of 0.01 is 1.035. The calculated value, 0.4684, is not greater than the critical value. Thus, the conclusion of the test is that the data are normally distributed.

2.10.12 In general, if the data fail the test for normality, a transformation such as the log transformation may normalize the data. After transforming the data, repeat the Kolmogorov "D" test for normality.

TABLE B.11. CRITICAL VALUES FOR THE KOLMOGOROV "D" TEST

Alpha Level	Critical Value
0.010	1.035
0.025	0.955
0.050	0.895
0.100	0.819
0.150	0.775

3. TEST FOR HOMOGENEITY OF VARIANCE

3.1 For Dunnett's Procedure and the t test with Bonferroni's adjustment, the variances of the data obtained from each toxicant concentration and the control are assumed to be equal. Bartlett's Test is a formal test of this assumption. In using this test, it is assumed that the data are normally distributed.

3.2 The data used in this example are growth data from a Fathead Minnow Larval Survival and Growth Test, and are the same data used in Appendices C and D. These data are listed in Table B.12, together with the calculated variance for the control and each toxicant concentration.

TABLE B.12. FATHEAD LARVAL GROWTH DATA (WEIGHT IN MG) USED FOR BARTLETT'S TEST FOR HOMOGENEITY OF VARIANCE

		NaPCP Concentration (µg/L)			
Replicate	Control	32	64	128	256
A	0.711	0.646	0.669	0.629	0.650
B	0.662	0.626	0.669	0.680	0.558
C	0.718	0.723	0.694	0.513	0.606
D	0.767	0.700	0.676	0.672	0.508
Mean($\overline{Y}_i$)	0.714	0.674	0.677	0.624	0.580
S_i^2	0.0018	0.0020	0.0001	0.0059	0.0037
I	1	2	3	4	5

3.3 The test statistic for Bartlett's Test (Snedecor and Cochran, 1980) is as follows:

$$B = \frac{[(\sum_{i=1}^{P} V_i)\ln \overline{S}^2 - \sum_{i=1}^{P} V_i \ln S_i^2]}{C}$$

Where: V_i = degrees of freedom for each toxicant concentration and control

p = number of levels of toxicant concentration including the control

ln = $\log_e$

i = 1, 2, ..., p where p is the number of concentrations

n_i = the number of replicates for concentration i.

$$\bar{S}^2 = \frac{(\sum_{i=1}^{P} V_i S_i^2)}{\sum_{i=1}^{P} V_i}$$

$$C = 1 + [3(p-1)]^{-1}[\sum_{i=1}^{P}\frac{1}{V_i} - (\sum_{i=1}^{P} V_i)^{-1}]$$

3.4 Since B is approximately distributed as chi-square with p - 1 degrees of freedom when the variances are equal, the appropriate critical value is obtained from a table of the chi-square distribution for p - 1 degrees of freedom and a significance level of 0.01. If B is less than the critical value then the variances are assumed to be equal.

3.5 For the data in this example, $V_i = 3$, p = 5, $\bar{S}^2 = 0.0027$, and C = 1.133. The calculated B value is:

$$B = \frac{(15)[\ln(0.0027)] - 3\sum_{i=1}^{P}\ln(S_i^2)}{1.133}$$

$$= \frac{15(-5.9145) - 3(-32.4771)}{1.133}$$

$$= 7.691$$

3.6 Since B is approximately distributed as chi-square with p - 1 degrees of freedom when the variances are equal, the appropriate critical value for the test is 13.277 for a significance level of 0.01. Since B = 7.691 is less than the critical value of 13.277, conclude that the variances are not different.

4. TRANSFORMATIONS OF THE DATA

4.1 When the assumptions of normality and/or homogeneity of variance are not met, transformations of the data may remedy the problem, so that the data can be analyzed by parametric procedures, rather than by nonparametric technique such as Steel's Many-one Rank Test or Wilcoxon's Rank Sum Test. Examples of transformations include log, square root, arc sine square root, and reciprocals. After the data have been transformed, Shapiro-Wilk's and Bartlett's tests should be performed on the transformed observations to determine whether the assumptions of normality and/or homogeneity of variance are met.

4.2 ARC SINE SQUARE ROOT TRANSFORMATION (USEPA, 1993)

4.2.1 For data consisting of proportions from a binomial (response/no response; live/dead) response variable, the variance within the ith treatment is proportional to P_i (1 - P_i), where P_i is the expected proportion for the treatment. This clearly violates the homogeneity of variance assumption required by parametric procedures such as Dunnett's Procedure or the t test with Bonferroni's adjustment, since the existence of a treatment effect implies different values of P_i for different treatments, i. Also, when the observed proportions are based on small samples, or when P_i is

close to zero or one, the normality assumption may be invalid. The arc sine square root (arc sine $\sqrt{P}$) transformation is commonly used for such data to stabilize the variance and satisfy the normality requirement.

4.2.2 Arc sine transformation consists of determining the angle (in radians) represented by a sine value. In the case of arc sine square root transformation of mortality data, the proportion of dead (or affected) organisms is taken as the sine value, the square root of the sine value is calculated, and the angle (in radians) for the square root of the sine value is determined. Whenever the proportion dead is 0 or 1, a special modification of the arc sine square root transformation must be used (Bartlett, 1937). An explanation of the arc sine square root transformation and the modification is provided below.

4.2.3 Calculate the response proportion (RP) at each effluent concentration, where:

RP = (number of surviving or "unaffected" organisms)/(number exposed)

<u>Example:</u> If 12 of 20 animals in a given treatment replicate survive:

RP = 12/20

= 0.60

4.2.4 Transform each RP to its arc sine square root, as follows:

4.2.4.1 For RPs greater than zero or less than one:

Angle (radians) = arc sine $\sqrt{RP}$

<u>Example:</u> If RP = 0.60:

Angle = arc sine $\sqrt{0.60}$

= arc sine 0.7746

= 0.8861 radians

4.2.4.2 Modification of the arc sine square root when RP = 0:

Angle (in radians) = arc sine $\sqrt{1/4\,N}$

Where: N = Number of animals/treatment replicate

Example: If 20 animals are used:

Angle = arc sine $\sqrt{1/80}$

= arc sine 0.1118

= 0.1120 radians

4.2.4.3 Modification of the arc sine square root when RP = 1.0:

Angle = 1.5708 radians - (radians for RP = 0)

Example: Using above value:

Angle = 1.5708 - 0.1120

= 1.4588 radians

APPENDIX C

DUNNETT'S PROCEDURE

1. MANUAL CALCULATIONS

1.1 Dunnett's Procedure (Dunnett, 1955; Dunnett, 1964) is used to compare each concentration mean with the control mean to decide if any of the concentrations differ from the control. This test has an overall error rate of alpha, which accounts for the multiple comparisons with the control. It is based on the assumptions that the observations are independent and normally distributed and that the variance of the observations is homogeneous across all concentrations and control (see Appendix B for a discussion on validating the assumptions). Dunnett's Procedure uses a pooled estimate of the variance, which is equal to the error value calculated in an analysis of variance. Dunnett's Procedure can only be used when the same number of replicate test vessels have been used at each concentration and the control. When this condition is not met, a t test with Bonferroni's adjustment is used (see Appendix D).

1.2 The data used in this example are growth data from a Fathead Minnow Larval Survival and Growth Test, and are the same data used in Appendices B and D. These data are listed in Table C.1.

TABLE C.1. FATHEAD MINNOW, *PIMEPHALES PROMELAS,* LARVAL GROWTH DATA (WEIGHT IN MG) USED FOR DUNNETT'S PROCEDURE

		NaPCP Concentration (µg/L)			
Replicate	Control	32	64	128	256
A	0.711	0.517	0.602	0.566	0.455
B	0.662	0.501	0.669	0.612	0.502
C	0.646	0.723	0.694	0.410	0.606
D	0.690	0.560	0.676	0.672	0.254
Mean($\bar{Y}_i$)	0.677	0.575	0.660	0.565	0.454
Total(T_i)	2.709	2.301	2.641	2.260	1.817

1.3 One way to obtain an estimate of the pooled variance is to construct an ANOVA table including all sums of squares, using the following formulas:

Where: p = number of effluent concentrations including:

$$SST = \sum_{ij} Y_{ij}^2 - G^2/N$$ Total Sum of Squares

$$SSB = \sum_{i} T_i^2/n_i - G^2/N$$ Between Sum of Squares

$SSW = SST - SSB$ Within Sum of Squares

G = the grand total of all sample observations; $G = \sum_{i=1}^{P} T_i$

T_i = the total of the replicate measurements for concentration i

N = the total sample size; $N = \sum_i n_i$

n_i = the number of replicates for concentration i

Y_{ij} = the jth observation for concentration i

1.4 For the data in this example:

$n_1 = n_2 = n_3 = n_4 = n_5 = 4$

$N = 20$

$T_1 = Y_{11} + Y_{12} + Y_{13} + Y_{14} = 2.709$
$T_2 = Y_{21} + Y_{22} + Y_{23} + Y_{24} = 2.301$
$T_3 = Y_{31} + Y_{32} + Y_{33} + Y_{34} = 2.641$
$T_4 = Y_{41} + Y_{42} + Y_{43} + Y_{44} = 2.260$
$T_5 = Y_{51} + Y_{52} + Y_{53} + Y_{54} = 1.817$

$G = T_1 + T_2 + T_3 + T_4 + T_5 = 11.728$

$$SST = \sum_{ij} Y_{ij}^2 - G^2/N$$

$$= 7.146 - (11.728)^2/20$$

$$= 0.2687$$

$$SSB = \sum_i T_i^2/n_i - G^2/N$$

$$= \tfrac{1}{4}(28.017 - 11.728)^2/20$$

$$= 0.1270$$

$$SSW = SST - SSB$$

$$= 0.2687 - 0.1270$$

$$= 0.1417$$

1.5 Summarize these data in the ANOVA table (Table C.2).

TABLE C.2. ANOVA TABLE FOR DUNNETT'S PROCEDURE

Source	df	Sum of Squares (SS)	Mean Square (MS) (SS/df)
Between	p - 1	SSB	S_B^2 = SSB/(p-1)
Within	N - p	SSW	S_W^2 = SSW/(N-p)
Total	N - 1	SST	

1.6 Summarize data for ANOVA (Table C.3).

TABLE C.3. COMPLETED ANOVA TABLE FOR DUNNETT'S PROCEDURE

Source	df	SS	Mean Square
Between	5 - 1 = 4	0.1270	0.0318
Within	20 - 5 = 15	0.1417	0.0094
Total	19	0.2687	

1.7 To perform the individual comparisons, calculate the t statistic for each concentration and control combination, as follows:

$$t_i = \frac{(\overline{Y}_1 - \overline{Y}_i)}{S_w\sqrt{(1/n_1) + (1/n_i)}}$$

Where: $\overline{Y}_i$ = mean for concentration i

$\overline{Y}_1$ = mean for the control

S_w = square root of the within mean square

n_1 = number of replicates in the control

n_i = number of replicates for concentration i.

1.8 Table C.4 includes the calculated t values for each concentration and control combination.

TABLE C.4. CALCULATED T VALUES

NaPCP Concentration (µg/L)	i	t_i
32	2	1.487
64	3	0.248
128	4	1.633
256	5	3.251

1.9 Since the purpose of the test is only to detect a decrease in growth from the control, a one-sided test is appropriate. The critical value for the one-sided comparison (2.36), with an overall alpha level of 0.05, 15 degrees of freedom and four concentrations excluding the control is read from the table of Dunnett's "T" values (Table C.5; this table assumes an equal number of replicates in all treatment concentrations and the control). The mean weight for concentration i is considered significantly less than the mean weight for the control if t_i is greater than the critical value. Since T_5 is greater than 2.36, the 256 µg/L concentration has significantly lower growth than the control. Hence the NOEC and LOEC for growth are 128 µg/L and 256 µg/L, respectively.

TABLE C.5. DUNNETT'S "T" VALUES (Miller, 1981)

	(One-tailed)d^{α}_{k}																	
k / v	α = .05									α = 0.1								
	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9
5	2.02	2.44	2.58	2.85	2.98	3.08	3.16	3.24	3.30	3.37	3.90	4.21	4.43	4.50	4.73	4.85	4.94	5.03
6	1.94	2.34	2.56	2.71	2.83	2.92	3.00	3.07	3.12	3.14	3.61	4.88	4.07	4.21	4.33	4.43	4.51	4.39
7	1.89	2.27	2.48	2.62	2.73	2.82	2.89	2.95	3.01	3.00	3.42	3.56	3.83	3.96	4.07	4.15	4.23	4.30
8	1.86	2.22	2.42	2.55	2.56	2.74	2.81	2.87	2.92	2.90	3.20	3.51	3.67	3.79	3.18	3.96	4.03	4.09
9	1.83	2.18	2.37	2.50	2.60	2.68	2.75	2.81	2.86	2.82	3.19	3.40	3.55	3.86	3.75	3.82	3.89	3.94
10	1.81	2.15	2.34	2.47	2.56	2.64	2.70	2.76	2.81	2.76	3.11	3.31	3.45	3.56	3.64	3.71	3.78	3.83
11	1.80	2.13	2.31	2.44	2.53	2.60	2.67	2.72	2.77	2.72	3.06	3.25	3.38	3.46	3.56	3.63	3.69	3.74
12	1.78	2.11	2.29	2.41	2.50	2.58	2.64	2.59	2.74	2.68	3.01	3.19	3.32	3.42	3.50	3.56	3.62	3.67
13	1.77	2.09	2.27	2.39	2.48	2.55	2.61	2.68	2.71	2.65	2.97	3.15	3.27	3.37	3.44	3.91	3.56	3.61
14	1.76	2.08	2.25	2.37	2.46	2.53	2.59	2.64	2.69	2.62	2.94	3.11	3.23	3.32	3.40	3.46	3.51	3.56
15	1.75	2.07	2.24	2.36	2.44	2.51	2.57	2.62	2.67	2.60	2.91	3.08	3.20	3.29	3.36	3.42	3.47	3.52
16	1.75	2.06	2.23	2.34	2.43	2.50	2.56	2.61	2.65	2.58	2.38	3.05	3.17	3.28	3.33	3.39	3.44	3.48
17	1.74	2.05	2.22	2.33	2.42	2.49	2.54	2.59	2.64	2.57	2.86	3.03	3.14	3.23	3.30	3.36	3.41	3.45
18	1.73	2.04	2.21	2.32	2.41	2.48	2.53	2.58	2.62	2.55	2.84	3.01	3.12	3.21	3.27	3.33	3.38	3.40
19	1.73	2.03	2.20	2.31	2.40	2.47	2.52	2.57	2.61	2.54	2.83	2.99	3.10	3.18	3.25	3.31	3.36	3.40
20	1.72	2.03	2.19	2.30	2.30	2.46	2.51	2.56	2.60	2.53	2.81	2.97	3.08	3.17	3.23	3.29	3.34	3.40
24	1.71	2.01	3.17	2.28	2.36	2.43	2.48	2.53	2.57	2.40	2.77	2.92	3.03	3.11	3.17	3.22	3.27	3.31
30	1.70	1.99	2.15	2.25	2.33	2.40	2.45	2.50	2.54	2.46	2.72	2.87	2.97	3.05	3.11	3.16	3.21	3.24
40	1.68	1.97	2.13	2.23	2.31	2.37	2.42	2.47	2.51	2.42	2.68	2.32	2.92	2.99	3.06	3.10	3.14	3.18
60	1.67	1.95	2.10	2.21	2.28	2.35	2.39	2.44	2.48	2.39	2.64	2.78	2.87	2.94	3.08	3.04	3.06	3.12
120	1.86	1.93	2.08	2.18	2.26	2.32	2.37	2.41	2.45	2.36	2.60	2.73	2.82	2.90	2.94	2.90	3.03	3.06
α	1.64	1.92	2.06	2.16	2.23	2.29	2.34	2.33	2.42	2.33	2.56	2.68	2.77	2.34	2.90	2.93	2.97	3.00

1.10 To quantify the sensitivity of the test, the minimum significant difference (MSD) may be calculated. The formula is as follows:

$$MSD = d\, S_w \sqrt{(1/n_1) + (1/n)}$$

Where: d = critical value for the Dunnett's Procedure

S_w = the square root of the within mean square

n = the number of replicates at each concentration, assuming an equal number of replicates at all treatment concentrations

n_1 = number of replicates in the control

For example:

$$MSD = 2.36(0.097)[3\sqrt{(1/4)+(1/4)}] = 2.36(0.097)(\sqrt{2/4})$$

$$= 2.36\ (0.097)(0.707)$$

$$= 0.162$$

1.11 For this set of data, the minimum difference between the control mean and a concentration mean that can be detected as statistically significant is 0.087 mg. This represents a decrease in growth of 24% from the control.

1.11.1 If the data have not been transformed, the MSD (and the percent decrease from the control mean that it represents) can be reported as is.

1.11.2 In the case where the data have been transformed, the MSD would be in transformed units. In this case carry out the following conversion to determine the MSD in untransformed units.

1.11.2.1 Subtract the MSD from the transformed control mean. Call this difference D. Next, obtain untransformed values for the control mean and the difference, D.

$MSD_u = control_u - D_u$

Where: MSD_u = the minimum significant difference for untransformed data

$Control_u$ = the untransformed control mean

D_u = the untransformed difference

1.11.2.2 Calculate the percent reduction from the control that MSD_u represents as:

$$\text{Percent Reduction} = \frac{MSD_u}{Control_u} \times 100$$

1.11.3 An example of a conversion of the MSD to untransformed units, when the arc sine square root transformation was used on the data, follows:

Step 1. Subtract the MSD from the transformed control mean. As an example, assume the data in Table C.1 were transformed by the arc sine square root transformation. Thus:

$0.677 - 0.162 = 0.515$

Step 2. Obtain untransformed values for the control mean (0.677) and the difference (0.515) obtained in Step 1 above.

$[\text{Sine } (0.677)]^2 = 0.392$
$[\text{Sine } (0.515)]^2 = 0.243$

Step 3. The untransformed MSD (MSD_u) is determined by subtracting the untransformed values obtained in Step 2.

$MSD_u = 0.392 - 0.243 = 0.149$

In this case, the MSD would represent a 38.0% decrease in survival from the control [(0.149/0.392)(100)].

2. COMPUTER CALCULATIONS

2.1 This computer program incorporates two analyses: an analysis of variance (ANOVA), and a multiple comparison of treatment means with the control mean (Dunnett's Procedure). The ANOVA is used to obtain the error value. Dunnett's Procedure indicates which toxicant concentration means (if any) are statistically different from the control mean at the 5% level of significance. The program also provides the minimum difference between the control and treatment means that could be detected as statistically significant, and tests the validity of the homogeneity of variance assumption by Bartlett's Test. The multiple comparison is performed based on procedures described by Dunnett (1955).

2.2 The source code for the Dunnett's program is structured into a series of subroutines, controlled by a driver routine. Each subroutine has a specific function in the Dunnett's Procedure, such as data input, transforming the data, testing for equality of variances, computing p values, and calculating the one-way analysis of variance.

2.3 The program compares up to seven toxicant concentrations against the control, and can accommodate up to 50 replicates per concentration.

2.4 If the number of replicates at each toxicant concentration and control are not equal, a t test with Bonferroni's adjustment is performed instead of Dunnett's Procedure (see Appendix D).

2.5 The program was written in IBM-PC FORTRAN by Computer Sciences Corporation, 26 W. Martin Luther King Drive, Cincinnati, OH 45268. A compiled executable version of the program can be obtained from EMSL-Cincinnati by sending a written request to EMSL at 3411 Church Street, Cincinnati, OH 45244.

2.6 DATA INPUT AND OUTPUT

2.6.1 Reproduction data from a daphnid, *Ceriodaphnia dubia,* survival and reproduction test (Table C.6) are used to illustrate the data input and output for this program.

TABLE C.6. SAMPLE DATA FOR DUNNETT'S PROGRAM *CERIODAPHNIA DUBIA* REPRODUCTION DATA

		Effluent Concentration (%)			
Replicate	Control	1.56	3.12	6.25	12.5
1	27	32	39	27	10
2	30	35	30	34	13
3	29	32	33	36	7
4	31	26	33	34	7
5	16	18	36	31	7
6	15	29	33	27	10
7	18	27	33	33	10
8	17	16	27	31	16
9	14	35	38	33	12
10	27	13	44	31	2

2.6.2 Data Input

2.6.2.1 When the program is entered, the user is asked to select the type of data to be entered:

1. Response proportions, like survival or fertilization proportions.
2. Counts and measurements, like offspring counts, cystocarp counts or weights.

2.6.2.2 After the type of data is chosen, the user has the following options:

1. Create a data file
2. Edit a data file
3. Perform analysis on existing data set
4. Stop

2.6.2.3 When Option 1 (Create a data file) is selected for counts and measurements, the program prompts the user for the following information:

1. Number of concentrations, including control
2. For each concentration:
   - number of observations
   - data for each observation

2.6.2.4 After the data have been entered, the user may save the file on a disk, and the program returns to the menu (see below).

2.6.2.5 Sample data input is shown in Figure C.1.

```
                    EMSL Cincinnati Dunnett Software
                              Version 1.5

      1)    Create a data file
      2)    Edit a data file
      3)    Perform ANOVA on existing data
      4)    Stop

Your choice ? 1

Number of groups, including control ? 5

Number of observations for group  1 ? 10

Enter the data for group  1 one observation at a time.

NO.  1?  27

NO.  2?  30

NO.  3?  29

NO.  4?  31

NO.  5?  16

NO.  6?  15

NO.  7?  18

NO.  8?  17

NO.  9?  14

NO. 10?  27

Number of observations for group  2  ?  10

Do you wish to save the data on disk  ?y

Disk file for output  ?  cerio
```

Figure C.1. Sample Data Input for Dunnett's Program for Reproduction Data from Table C.6.

2.6.3 Program Output

2.6.3.1 When Option 3 (Perform analysis on existing data set) is selected from the menu, the user is asked to select the transformation desired, and indicate whether they expect the means of the test groups to be less or greater than the mean for the control group (see Figure C.2).

2.6.3.2 Summary statistics (Figure C.3) for the raw and transformed data, if applicable, the ANOVA table, results of Bartlett's Test, the results of the multiple comparison procedure and the minimum detectable difference are included in the program output.

EMSL Cincinnati Dunnett Software
Version 1.5

1) Create a data file
2) Edit a data file
3) Perform analysis on existing data set
4) Stop

Your choice ? 3

File name ? cerio

Available Transformations

1) no transform
2) square root
3) log10

Your choice ? 1

Dunnett's test as implemented in this program is
a one-sided test. You must specify the direction
the test is to be run; that is, do you expect the
means for the test groups to be less than or
greater than the mean for the control group mean.

Direction for Dunnett's test : L=less than, G=greater than ? L

Figure C.2. Example of Choosing Option 3 from the Menu of the Dunnett Program.

Ceriodaphnia Reproduction Data from Table C.6

Summary Statistics and ANOVA

Transformation = None

Group	n	Mean	s.d.	CV%
1 = control	10	22.4000	6.9314	30.9
2	10	26.3000	8.0007	30.4
3	10	34.6000	4.8351	14.0
4	10	31.7000	2.9458	9.3
5*	10	9.4000	3.8930	41.4

*) the mean for this group is significantly less than the control mean at alpha = 0.05 (1-sided) by Dunnett's test

Minimum detectable difference for Dunnett's test = -5.628560
This difference corresponds to -25.13 percent of control

Between concentrations
Sum of squares = 3887.880000 with 4 degrees of freedom.

Error mean square = 31.853333 with 45 degrees of freedom.

Bartlett's test p-value for equality of variances = .029

Do you wish to restart the program ?

Figure C.3. Example of Program Output for the Dunnett's Program Using the Reproduction Data from Table C.6.

APPENDIX D

T TEST WITH BONFERRONI'S ADJUSTMENT

1. The t test with Bonferroni's adjustment is used as an alternative to Dunnett's Procedure when the number of replicates is not the same for all concentrations. This test sets an upper bound of alpha on the overall error rate, in contrast to Dunnett's Procedure, for which the overall error rate is fixed at alpha. Thus, Dunnett's Procedure is a more powerful test.

2. The t test with Bonferroni's adjustment is based on the same assumptions of normality and homogeneity of variance as Dunnett's Procedure (see Appendix B for testing these assumptions), and, like Dunnett's Procedure, uses a pooled estimate of the variance, which is equal to the error value calculated in an analysis of variance.

3. An example of the use of the t test with Bonferroni's adjustment is provided below. The data used in the example are the same as in Appendix C, except that the third replicate from the 256 µg/L concentration is presumed to have been lost. Thus, Dunnett's Procedure cannot be used. The weight data are presented in Table D.1.

TABLE D.1. FATHEAD MINNOW, *PIMEPHALES PROMELAS,* LARVAL GROWTH DATA (WEIGHT IN MG) USED FOR THE T-TEST WITH BONFERRONI'S ADJUSTMENT

		NaPCP Concentration (µg/L)			
Replicate	Control	32	64	128	256
A	0.711	0.517	0.602	0.566	0.455
B	0.662	0.501	0.669	0.612	0.502
C	0.646	0.723	0.694	0.410	(LOST)
D	0.690	0.560	0.676	0.672	0.254
Mean($\bar{Y}$)	0.677	0.575	0.660	0.565	0.404
Total(T_i)	2.709	2.301	2.641	2.260	1.211

3.1 One way to obtain an estimate of the pooled variance is to construct an ANOVA table including all sums of squares, using the following formulas:

Where: p = number of effluent concentrations including the control

N = the total sample size; $N = \sum_i n_i$

n_i = the number of replicates for concentration i

$$SST = \sum_{ij} Y_{ij}^2 - G^2/N \qquad \text{Total Sum of Squares}$$

$$SSB = \sum_i T_i^2/n_i - G^2/N$$ Between Sum of Squares

$$SSW = SST - SSB$$ Within Sum of Squares

Where: G = The grand total of all sample observations; $G = \sum_{i=1}^{P} T_i$

T_i = The total of the replicate measurements for concentration i

Y_{ij} = The jth observation for concentration i

3.2 For the data in this example:

$n_1 = n_2 = n_3 = n_4 = 4$

$T_1 = Y_{11} + Y_{12} + Y_{13} + Y_{14} = 2.709$
$T_2 = Y_{21} + Y_{22} + Y_{23} + Y_{24} = 2.301$
$T_3 = Y_{31} + Y_{32} + Y_{33} + Y_{34} = 2.641$
$T_4 = Y_{41} + Y_{42} + Y_{43} + Y_{44} = 2.260$
$T_5 = Y_{51} + Y_{52} + Y_{53} + Y_{54} = 1.211$
$G = T_1 + T_2 + T_3 + T_4 + T_5 = 11.122$

$$SSB = \sum_i T_i^2/n_i - G^2/N$$

$$= 6.668 - (11.122)^2/19$$

$$= 0.158$$

$$SST = \sum_{ij} Y_{ij}^2 - G^2/N$$

$$= 6.779 - (11.122)^2/19$$

$$= 0.269$$

$$SSW = SST - SSB$$

= 0.269 - 0.158

= 0.111

3.3 Summarize these data in the ANOVA table (Table D.2):

TABLE D.2. ANOVA TABLE FOR BONFERRONI'S ADJUSTMENT

Source	df	Sum of Squares (SS)	Mean Square (MS) (SS/df)
Between	p - 1	SSB	S_B^2 = SSB/(p-1)
Within	N - p	SSW	S_W^2 = SSW/(N-p)
Total	N - 1	SST	

3.4 Summarize these data in the ANOVA table (Table D.3):

TABLE D.3. COMPLETED ANOVA TABLE FOR THE T-TEST WITH BONFERRONI'S ADJUSTMENT

Source	df	SS	Mean Square
Between	5 - 1 = 4	0.158	0.0395
Within	19 - 5 = 14	0.111	0.0029
Total	18	0.269	

3.5 To perform the individual comparisons, calculate the t statistic for each concentration and control combination, as follows:

$$t_i = \frac{(\bar{Y}_1 - \bar{Y}_i)}{S_w\sqrt{(1/n_1) + (1/n_i)}}$$

Where: $\bar{Y}_i$ = mean for each concentration

$\bar{Y}_1$ = mean for the control

S_w = square root of the within mean square

n_1 = number of replicates in the control.

n_i = number of replicates for concentration i.

3.6 Table D.4 includes the calculated t values for each concentration and control combination.

TABLE D.4. CALCULATED T VALUES

NaPCP Concentration (µg/L)	i	t_i
32	2	1.623
64	3	0.220
128	4	1.782
256	5	4.022

3.7 Since the purpose of the test is only to detect a decrease in growth from the control, a one-sided test is appropriate. The critical value for the one-sided comparison (2.510), with an overall alpha level of 0.05, fourteen degrees of freedom and four concentrations excluding the control, was obtained from Table D.5. The mean weight for concentration "i" is considered significantly less than the mean weight for the control if t_i is greater than the critical value. Since t_5 is greater than 2.510, the 256 µg/L concentration has significantly lower growth than the control. Hence the NOEC and LOEC for growth are 128 µg/L and 256 µg/L, respectively.

TABLE D.5. CRITICAL VALUES FOR "T" FOR THE T TEST WITH BONFERRONI'S ADJUSTMENT
P = 0.05 CRITICAL LEVEL, ONE TAILED

df	K = 1	K = 2	K = 3	K = 4	K = 5	K = 6	K = 7	K = 8	K = 9	K = 10
1	6.314	12.707	19.002	25.452	31.821	38.189	44.556	50.924	57.290	63.657
2	2.920	4.303	5.340	6.206	6.965	7.649	8.277	8.861	9.408	9.925
3	2.354	3.183	3.741	4.177	4.541	4.857	5.138	5.392	5.626	5.841
4	2.132	2.777	3.187	3.496	3.747	3.961	4.148	4.315	4.466	4.605
5	2.016	2.571	2.912	3.164	3.365	3.535	3.681	3.811	3.927	4.033
6	1.944	2.447	2.750	2.969	3.143	3.288	3.412	3.522	3.619	3.708
7	1.895	2.365	2.642	2.842	2.998	3.128	3.239	3.336	3.422	3.500
8	1.860	2.307	2.567	2.752	2.897	3.016	3.118	3.206	3.285	3.356
9	1.834	2.263	2.510	2.686	2.822	2.934	3.029	3.111	3.185	3.250
10	1.813	2.229	2.406	2.634	2.764	2.871	2.961	3.039	3.108	3.170
11	1.796	2.301	2.432	2.594	2.719	2.821	2.907	2.981	3.047	3.106
12	1.783	2.179	2.404	2.561	2.681	2.730	2.863	2.935	2.998	3.055
13	1.771	2.161	2.380	2.533	2.651	2.746	2.827	2.897	2.950	3.013
14	1.762	2.145	2.360	2.510	2.625	2.718	2.797	2.864	2.924	2.977
15	1.754	2.132	2.343	2.490	2.603	2.694	2.771	2.837	2.895	2.947
16	1.746	2.120	2.329	2.473	2.584	2.674	2.749	2.814	2.871	2.921
17	1.740	2.110	2.316	2.459	2.567	2.655	2.729	2.793	2.849	2.899
18	1.735	2.101	2.305	2.446	2.553	2.640	2.712	2.775	2.830	2.879
19	1.730	2.094	2.295	2.434	2.540	2.626	2.697	2.759	2.813	2.861
20	1.725	2.086	2.206	2.424	2.528	2.613	2.684	2.745	2.798	2.846
21	1.721	2.080	2.278	2.414	2.518	2.602	2.672	2.732	2.785	2.832
22	1.718	2.074	2.271	2.406	2.509	2.592	2.661	2.721	2.773	2.819
23	1.714	2.069	2.264	2.398	2.500	2.583	2.651	2.710	2.762	2.808
24	1.711	2.064	2.258	2.391	2.493	2.574	2.642	2.701	2.752	2.797
25	1.709	2.060	2.253	2.385	2.486	2.566	2.634	2.692	2.743	2.788
26	1.706	2.056	2.248	2.379	2.479	2.559	2.627	2.684	2.734	2.779
27	1.704	2.052	2.243	2.374	2.473	2.553	2.620	2.677	2.727	2.771
28	1.702	2.049	2.239	2.369	2.468	2.547	2.613	2.670	2.720	2.764

TABLE D.5. CRITICAL VALUES FOR "T" FOR THE T TEST WITH BONFERRONI'S ADJUSTMENT
P = 0.05 CRITICAL LEVEL, ONE TAILED (CONTINUED)

df	K = 1	K = 2	K = 3	K = 4	K = 5	K = 6	K = 7	K = 8	K = 9	K = 10
29	1.700	2.046	2.235	2.364	2.463	2.541	2.607	2.664	2.713	2.757
30	1.698	2.043	2.231	2.360	2.458	2.536	2.602	2.658	2.707	2.750
31	1.696	2.040	2.228	2.356	2.453	2.531	2.597	2.652	2.701	2.745
32	1.694	2.037	2.224	2.352	2.449	2.527	2.592	2.647	2.696	2.739
33	1.693	2.035	2.221	2.349	2.445	2.523	2.587	2.643	2.691	2.734
34	1.691	2.033	2.219	2.346	2.442	2.519	2.583	2.638	2.686	2.729
35	1.690	2.031	2.216	2.342	2.438	2.515	2.579	2.634	2.682	2.724
36	1.689	2.029	2.213	2.340	2.435	2.512	2.575	2.630	2.678	2.720
37	1.688	2.027	2.211	2.337	2.432	2.508	2.572	2.626	2.674	2.716
38	1.686	2.025	2.209	2.334	2.429	2.505	2.568	2.623	2.670	2.712
39	1.685	2.023	2.207	2.332	2.426	2.502	2.565	2.619	2.667	2.708
40	1.684	2.022	2.205	2.329	2.424	2.499	2.562	2.616	2.663	2.705
50	1.676	2.009	2.189	2.311	2.404	2.478	2.539	2.592	2.638	2.678
60	1.671	2.001	2.179	2.300	2.391	2.463	2.324	2.576	2.621	2.661
70	1.667	1.995	2.171	2.291	2.381	2.453	2.513	2.564	2.609	2.648
80	1.665	1.991	2.166	2.285	2.374	2.446	2.505	2.556	2.600	2.639
90	1.662	1.987	2.162	2.280	2.369	2.440	2.499	2.549	2.593	2.632
100	1.661	1.984	2.158	2.276	2.365	2.435	2.494	2.544	2.588	2.626
110	1.659	1.982	2.156	2.273	2.361	2.432	2.490	2.540	2.583	2.622
120	1.658	1.980	2.153	2.270	2.358	2.429	2.487	2.536	2.580	2.618
Infinite	1.645	1.960	2.129	2.242	2.327	2.394	2.450	2.498	2.540	2.576

d.f. = Degrees of freedom for MSE (Mean Square Error) from ANOVA.
K = Number of concentrations to be compared to the control.

APPENDIX E

STEEL'S MANY-ONE RANK TEST

1. Steel's Many-one Rank Test is a nonparametric test for comparing treatments with a control. This test is an alternative to Dunnett's Procedure, and may be applied to data when the normality assumption has not been met. Steel's Test requires equal variances across the treatments and the control, but it is thought to be fairly insensitive to deviations from this condition (Steel, 1959). The tables for Steel's Test require an equal number of replicates at each concentration. If this is not the case, use Wilcoxon's Rank Sum Test, with Bonferroni's adjustment (see Appendix F).

2. For an analysis using Steel's Test, for each control and concentration combination, combine the data and arrange the observations in order of size from smallest to largest. Assign the ranks to the ordered observations (1 to the smallest, 2 to the next smallest, etc.). If ties occur in the ranking, assign the average rank to the observation. (Extensive ties would invalidate this procedure). The sum of the ranks within each concentration and within the control is then calculated. To determine if the response in a concentration is significantly different from the response in the control, the minimum rank sum for each concentration and control combination is compared to the significant values of rank sums given later in this section. In this table, k equals the number of treatments excluding the control and n equals the number of replicates for each concentration and the control.

3. An example of the use of this test is provided below. The test employs reproduction data from a *Ceriodaphnia dubia* 7-day, chronic test. The data are listed in Table E.1. Significant mortality was detected via Fisher's Exact Test in the 50% effluent concentration. The data for this concentration is not included in the reproduction analysis.

TABLE E.1. EXAMPLE OF STEEL'S MANY-ONE RANK TEST: DATA FOR THE DAPHNID, *CERIODAPHNIA DUBIA*, 7-DAY CHRONIC TEST

Effluent Concentration	Replicate 1	2	3	4	5	6	7	8	9	10	No. Live Adults
Control	20	26	26	23	24	27	26	23	27	24	10
3%	13	15	14	13	23	26	0	25	26	27	9
6%	18	22	13	13	23	22	20	22	23	22	10
12%	14	22	20	23	20	23	25	24	25	21	10
25%	9	0	9	7	6	10	12	14	9	13	8
50%	0	0	0	0	0	0	0	0	0	0	0

4. For each control and concentration combination, combine the data and arrange the observations in order of size from smallest to largest. Assign ranks (1, 2, 3,..., 16) to the ordered observations (1 to the smallest, 2 to the next smallest, etc.). If ties occur in the ranking, assign the average rank to each tied observation.

5. An example of assigning ranks to the combined data for the control and 3% effluent concentration is given in Table E.2. This ranking procedure is repeated for each control and concentration combination. The complete set of rankings is listed in Table E.3. The ranks are then summed for each effluent concentration, as shown in Table E.4.

TABLE E.2. EXAMPLE OF STEEL'S MANY-ONE RANK TEST: ASSIGNING RANKS TO THE CONTROL AND 3% EFFLUENT CONCENTRATION

Rank	Number of Young Produced	Control or % Effluent
1	0	3
2.5	13	3
2.5	13	3
4	14	3
5	15	3
6	20	Control
8	23	Control
8	23	Control
8	23	3
10.5	24	Control
10.5	24	Control
12	25	3
15	26	Control
15	26	Control
15	26	Control
15	26	3
15	26	3
19	27	Control
19	27	Control
19	27	3

TABLE E.3. TABLE OF RANKS

Replicate (Organism)	Control[1]		Effluent Concentration (%) 3		6		12		25	
1	20	(6,4.5,3,11)	13	(2.5)	18	(3)	14	(1)	9	(5)
2	26	(15,17,17,17)	15	(5)	22	(7.5)	22	(6)	0	(1)
3	26	(15,17,17,17)	14	(4)	13	(1.5)	20	(3)	9	(5)
4	23	(8,11.5,8.5,12.5)	13	(2.5)	13	(1.5)	23	(8.5)	7	(3)
5	24	(10.5,14.5,12,14.5)	23	(8)	23	(11.5)	20	(3)	6	(2)
6	27	(19,19.5,19.5,19.5)	26	(15)	22	(7.5)	23	(8.5)	10	(7)
7	26	(15,17,17,17)	0	(1)	20	(4.5)	25	(14.5)	12	(8)
8	23	(8,11.5,8.5,12.5)	25	(12)	22	(7.5)	24	(12)	14	(10)
9	27	(19,19.5,19.5,19.5)	26	(15)	23	(11.5)	25	(14.5)	9	(5)
10	24	(10.5,14.5,12,14.5)	27	(19)	22	(7.5)	21	(5)	13	(9)

[1] Control ranks are given in the order of the concentration with which they were ranked.

TABLE E.4. RANK SUMS

Effluent Concentration (%)	Rank Sum
3	84
6	64
12	76
25	55

6. For this set of data, determine if the reproduction in any of the effluent concentrations is significantly lower than the reproduction by the control organisms. If this occurs, the rank sum at that concentration would be significantly lower than the rank sum of the control. Thus, compare the rank sums for the reproduction of each of the various effluent concentrations with some "minimum" or critical rank sum, at or below which the reproduction would be considered to be significantly lower than the control. At a probability level of 0.05, the critical rank in a test with four concentrations and ten replicates is 76 (see Table E.5 , for R=4).

7. Comparing the rank sums in Table E.4 to the appropriate critical rank, the 6%, 12% and 25% effluent concentrations are found to be significantly different from the control. Thus the NOEC and LOEC for reproduction are 3% and 6%, respectively.

TABLE E.5. SIGNIFICANT VALUES OF RANK SUMS: JOINT CONFIDENCE COEFFICIENTS OF 0.95 (UPPER) and 0.99 (LOWER) FOR ONE-SIDED ALTERNATIVES (Steel, 1959)

	k = number of treatments (excluding control)							
n	2	3	4	5	6	7	8	9
4	11	10	10	10	10	--	--	--
	--	--	--	--	--	--	--	--
5	18	17	17	16	16	16	16	15
	15	--	--	--	--	--	--	--
6	27	26	25	25	24	24	24	23
	23	22	21	21	--	--	--	--
7	37	36	35	35	34	34	33	33
	32	31	30	30	29	29	29	29
8	49	48	47	46	46	45	45	44
	43	42	41	40	40	40	39	39
9	63	62	61	60	59	59	58	58
	56	55	54	53	52	52	51	51
10	79	77	76	75	74	74	73	72
	71	69	68	67	66	66	65	65
11	97	95	93	92	91	90	90	89
	87	85	84	83	82	81	81	80
12	116	114	112	111	110	109	108	108
	105	103	102	100	99	99	98	98
13	138	135	133	132	130	129	129	128
	125	123	121	120	119	118	117	117
14	161	158	155	154	153	152	151	150
	147	144	142	141	140	139	138	137
15	186	182	180	178	177	176	175	174
	170	167	165	164	162	161	160	160
16	213	209	206	204	203	201	200	199
	196	192	190	188	187	186	185	184
17	241	237	234	232	231	229	228	227
	223	219	217	215	213	212	211	210
18	272	267	264	262	260	259	257	256
	252	248	245	243	241	240	239	238
19	304	299	296	294	292	290	288	287
	282	278	275	273	272	270	268	267
20	339	333	330	327	325	323	322	320
	315	310	307	305	303	301	300	299

APPENDIX F

WILCOXON RANK SUM TEST

1. Wilcoxon's Rank Sum Test is a nonparametric test, to be used as an alternative to Steel's Many-one Rank Test when the number of replicates are not the same at each concentration. A Bonferroni's adjustment of the pairwise error rate for comparison of each concentration versus the control is used to set an upper bound of alpha on the overall error rate, in contrast to Steel's Many-one Rank Test, for which the overall error rate is fixed at alpha. Thus, Steel's Test is a more powerful test.

2. An example of the use of the Wilcoxon Rank Sum Test is provided in Table F.1. The data used in the example are the same as in Appendix E, except that two males are presumed to have occurred, one in the control and one in the 12% effluent concentration. Thus, there is unequal replication for the reproduction analysis.

3. For each concentration and control combination, combine the data and arrange the values in order of size, from smallest to largest. Assign ranks to the ordered observations (a rank of 1 to the smallest, 2 to the next smallest, etc.). If ties in rank occur, assign the average rank to each tied observation.

TABLE F.1. EXAMPLE OF WILCOXON'S RANK SUM TEST: DATA FOR THE DAPHNID, *CERIODAPHNIA DUBIA*, 7-DAY CHRONIC TEST

Effluent Concentration	Replicate 1	2	3	4	5	6	7	8	9	10	No. Live Adults
Cont	M	26	26	23	24	27	26	23	27	24	10
3%	13	15	14	13	23	26	0	25	26	27	9
6%	18	22	13	13	23	22	20	22	23	22	10
12%	14	22	20	23	M	23	25	24	25	21	10
25%	9	0	9	7	6	10	12	14	9	13	8
50%	0	0	0	0	0	0	0	0	0	0	0

4. An example of assigning ranks to the combined data for the control and 3% effluent concentration is given in Table F.2. This ranking procedure is repeated for each of the three remaining control versus test concentration combinations. The complete set of ranks is listed in Table F.3. The ranks are then summed for each effluent concentration, as shown in Table F.4.

5. For this set of data, determine if the reproduction in any of the effluent concentrations is significantly lower than the reproduction by the control organisms. If this occurs, the rank sum at that concentration would be significantly lower than the rank sum for the control. Thus, compare the rank sums for the reproduction of each of the various effluent concentrations with some "minimum" or critical rank sum, at or below which the reproduction would be considered to be significantly lower than the control. At a probability level of 0.05, the critical rank in a test with four concentrations and nine replicates in the control is 72 for those concentrations with ten replicates, and 60 for those concentrations with nine replicates (see Table F.5, for K = 4).

6. Comparing the rank sums in Table F.4 to the appropriate critical rank, the 6%, 12% and 25% effluent concentrations are found to be significantly different from the control. Thus, the NOEC and LOEC for reproduction are 3% and 6%, respectively.

TABLE F.2. EXAMPLE OF WILCOXON'S RANK SUM TEST: ASSIGNING RANKS TO THE CONTROL AND EFFLUENT CONCENTRATIONS

Rank	Number of Young Produced	Control or % Effluent
1	0	3
2.5	13	3
2.5	13	3
4	14	3
5	15	3
7	23	Control
7	23	Control
7	23	3
9.5	24	Control
9.5	24	Control
11	25	3
14	26	Control
14	26	Control
14	26	Control
14	26	3
14	26	3
18	27	Control
18	27	Control
18	27	3

TABLE F.3. TABLE OF RANKS

Replicate (Organism)	Control[1]		Effluent Concentration (%) 3	6	12	25
1	M		13 (2.5)	18 (3)	14 (1)	9 (5)
2	26	(14,16,15,16)	15 (5)	22 (6.5)	22 (4)	0 (1)
3	26	(14,16,15,16)	14 (4)	13 (1.5)	20 (2)	9 (5)
4	23	(7,10.5,6.5,11.5)	13 (2.5)	13 (1.5)	23 (6.5)	7 (3)
5	24	(9.5,13.5,10,13.5)	23 (7)	23 (10.5)	M	6 (2)
6	27	(18,18.5,17.5,18.5)	26 (14)	22 (6.5)	23 (6.5)	10 (7)
7	26	(14,16,15,16)	0 (1)	20 (4)	25 (12.5)	12 (8)
8	23	(7,10.5,6.5,11.5)	25 (11)	22 (6.5)	24 (10)	14 (10)
9	27	(18,18.5,17.5,18.5)	26 (14)	23 (10.5)	25 (12.5)	9 (5)
10	24	(9.5,13.5,10,13.5)	27 (18)	22 (6.5)	21 (3)	13 (9)

[1] Control ranks are given in the order of the concentration with which they were ranked.

TABLE F.4. RANK SUMS

Effluent Concentration	Rank Sum	No. of Replicates	Critical Rank Sum
3	79	10	72
6	57	10	72
12	58	9	60
25	55	10	72

TABLE F.5. CRITICAL VALUES FOR WILCOXON'S RANK SUM TEST WITH BONFERRONI'S ADJUSTMENT OF ERROR RATE FOR COMPARISON OF "K" TREATMENTS VERSUS A CONTROL FIVE PERCENT CRITICAL LEVEL (ONE-SIDED ALTERNATIVE: TREATMENT CONTROL)

K	No. Replicates in Control	No. of Replicates Per Effluent Concentration							
		3	4	5	6	7	8	9	10
1	3	6	10	16	23	30	39	49	59
	4	6	11	17	24	32	41	51	62
	5	7	12	19	26	34	44	54	66
	6	8	13	20	28	36	46	57	69
	7	8	14	21	29	39	49	60	72
	8	9	15	23	31	41	51	63	72
	9	10	16	24	33	43	54	66	79
	10	10	17	26	35	45	56	69	82
2	3	--	--	15	22	29	38	47	58
	4	--	10	16	23	31	40	49	60
	5	6	11	17	24	33	42	52	63
	6	7	12	18	26	34	44	55	66
	7	7	13	20	27	36	46	57	69
	8	8	14	21	29	38	49	60	72
	9	8	14	22	31	40	51	62	75
	10	9	15	23	32	42	53	65	78
3	3	--	--	--	21	29	37	46	57
	4	--	10	16	22	30	39	48	59
	5	--	11	17	24	32	41	51	62
	6	6	11	18	25	33	43	53	65
	7	7	12	19	26	35	45	56	68
	8	7	13	20	28	37	47	58	70
	9	7	13	21	29	39	49	61	73
	10	8	14	22	31	41	51	63	76

TABLE F.5. CRITICAL VALUES FOR WILCOXON'S RANK SUM TEST WITH BONFERRONI'S ADJUSTMENT OF ERROR RATE FOR COMPARISON OF "K" TREATMENTS VERSUS A CONTROL FIVE PERCENT CRITICAL LEVEL (ONE-SIDED ALTERNATIVE: TREATMENT CONTROL) (CONTINUED)

K	No. Replicates in Control	No. of Replicates Per Effluent Concentration							
		3	4	5	6	7	8	9	10
4	3	--	--	--	21	28	37	46	56
	4	--	--	15	22	30	38	48	59
	5	--	10	16	23	31	40	50	61
	6	6	11	17	24	33	42	52	64
	7	6	12	18	26	34	44	55	67
	8	7	12	19	27	36	46	57	69
	9	7	13	20	28	38	48	60	72
	10	7	14	21	30	40	50	62	75
5	3	--	--	--	--	28	36	46	56
	4	--	--	15	22	29	38	48	58
	5	--	10	16	23	31	40	50	61
	6	--	11	17	24	32	42	52	63
	7	6	11	18	25	34	43	54	66
	8	6	12	19	27	35	45	56	68
	9	7	13	20	28	37	47	59	71
	10	7	13	21	29	39	49	61	74
6	3	--	--	--	--	28	36	45	56
	4	--	--	15	21	29	38	47	58
	5	--	10	16	22	30	39	49	60
	6	--	11	16	24	32	41	51	63
	7	6	11	17	25	33	43	54	65
	8	6	12	18	26	35	45	56	68
	9	6	12	19	27	37	47	58	70
	10	7	13	20	29	38	49	60	73
7	3	--	--	--	--	--	36	45	56
	4	--	--	--	21	29	37	47	58
	5	--	--	15	22	30	39	49	60
	6	--	10	16	23	32	41	51	62
	7	--	11	17	25	33	43	53	65
	8	6	11	18	26	35	44	55	67
	9	6	12	19	27	36	46	58	70
	10	7	13	20	28	38	48	60	72

TABLE F.5. CRITICAL VALUES FOR WILCOXON'S RANK SUM TEST WITH BONFERRONI'S ADJUSTMENT OF ERROR RATE FOR COMPARISON OF "K" TREATMENTS VERSUS A CONTROL FIVE PERCENT CRITICAL LEVEL (ONE-SIDED ALTERNATIVE: TREATMENT CONTROL) (CONTINUED)

K	No. Replicates in Control	No. of Replicate Per Effluent Concentration							
		3	4	5	6	7	8	9	10
8	3	--	--	--	--	--	36	45	55
	4	--	--	--	21	29	37	47	57
	5	--	--	15	22	30	39	49	59
	6	--	10	16	23	31	40	51	62
	7	--	11	17	24	33	42	53	64
	8	6	11	18	25	34	44	55	67
	9	6	12	19	27	36	46	57	69
	10	6	12	19	28	37	48	59	72
9	3	--	--	--	--	--	--	45	55
	4	--	--	--	21	28	37	46	57
	5	--	--	15	22	30	39	48	59
	6	--	10	16	23	31	40	50	62
	7	--	10	17	24	33	42	52	64
	8	--	11	18	25	34	44	55	66
	9	6	11	18	26	35	46	57	69
	10	6	12	19	28	37	47	59	71
10	3	--	--	--	--	--	--	45	55
	4	--	--	--	21	28	37	46	57
	5	--	--	15	22	29	38	48	59
	6	--	10	16	23	31	40	50	61
	7	--	10	16	24	32	42	52	64
	8	--	11	17	25	34	43	54	66
	9	6	11	18	26	35	45	56	68
	10	6	12	19	27	37	47	58	71

APPENDIX G

FISHER'S EXACT TEST

1. Fisher's Exact Test (Finney, 1948; Pearson and Hartley, 1962) is a statistical method based on the hypergeometric probability distribution that can be used to test if the proportion of successes is the same in two Bernoulli (binomial) populations. When used with the *Ceriodaphnia dubia* data, it provides a conservative test of the equality of any two survival proportions assuming only the independence of responses from a Bernoulli population. Additionally, since it is a conservative test, a pair-wise comparison error rate of 0.05 is suggested rather that an experiment-wise error rate.

2. The basis for Fisher's Exact Test is a 2×2 contingency table. However, in order to use this table the contingency table must be arranged in the format shown in Table G.1. From the 2×2 table, set up for the control and the concentration you wish to compare, you can determine statistical significance by looking up a value in the table provided later in this section.

TABLE G.1. FORMAT FOR CONTINGENCY TABLE

	Number of		
	Successes	Failures	Number of Observations
Row 1	a	A - a	A
Row 2	b	B - b	B
Total	a + b	[(A + B) - a - b]	A + B

3. Arrange the table so that the total number of observations for row one is greater than or equal to the total for row two ($A \geq B$). Categorize a success such that the proportion of successes for row one is greater than or equal to the proportion of successes for row two ($a/A \geq b/B$). For the *Ceriodaphnia dubia* survival data, a success may be 'alive' or 'dead', whichever causes $a/A \geq b/B$. The test is then conducted by looking up a value in the table of significance levels of b and comparing it to the b value given in the contingency table. The table of significance levels of b is Table G.5. Enter Table G.5 in the section for A, subsection for B, and the line for a. If the b value of the contingency table is equal to or less than the integer in the column headed 0.05 in Table G.5, then the survival proportion for the effluent concentration is significantly different from the survival proportion for the control. A dash or absence of entry in Table G.5 indicates that no contingency table in that class is significant.

4. To illustrate Fisher's Exact Test, a set of survival data (Table G.2) from the daphnid, *Ceriodaphnia dubia*, survival and reproduction test will be used.

5. For each control and effluent concentration construct a 2x2 contingency table.

6. For the control and effluent concentration of 1% the appropriate contingency table for the test is given in Table G.3.

TABLE G.2. EXAMPLE OF FISHER'S EXACT TEST: *CERIODAPHNIA DUBIA* MORTALITY DATA

Effluent Concentration (%)	No. Dead	Total[1]
Control	1	9
1	0	10
3	0	10
6	0	10
12	0	10
25	10	10

[1] Total number of live adults at the beginning of the test.

7. Since 10/10 > 8/9, the category 'alive' is regarded as a success. For A = 10, B = 9 and, a = 10, under the column headed 0.05, the value from Table G.5 is b = 5. Since the value of b (b = 8) from the contingency table (Table G.3), is greater than the value of b (b = 5) from Table G.5, the test concludes that the proportion of survival is not significantly different for the control and 1% effluent.

8. The contingency tables for the combinations of control and effluent concentrations of 3%, 6%, 12% are identical to Table G.3. The conclusion of no significant difference in the proportion of survival for the control and the level of effluent would also remain the same.

9. For the combination of control and 25% effluent, the contingency table would be constructed as Table G.4. The category 'dead' is regarded as a success, since 10/10 > 1/9. The b value (b = 1) from the contingency table (Table G.4) is less than the b value (b = 5) from the table of significance levels of b (Table G.5). Thus, the percent mortality for 25% effluent is significantly greater than the percent mortality for the control. Thus, the NOEC and LOEC for survival are 12% and 25%, respectively.

TABLE G.3. 2×2 CONTINGENCY TABLE FOR CONTROL AND 1% EFFLUENT

	Number of		Number of Observations
	Alive	Dead	
1% Effluent	10	0	10
Control	8	1	9
Total	18	1	19

Table G.4. 2x2 CONTINGENCY TABLE FOR CONTROL AND 25% EFFLUENT

	Number of		Number of Observations
	Dead	Alive	
25% Effluent	10	0	10
Control	1	8	9
Total	11	8	19

TABLE G.5. SIGNIFICANT LEVELS OF B: VALUES OF B (LARGE TYPE) AND CORRESPONDING PROBABILITIES (SMALL TYPE)[1]

	α	0-05	0-025	0-01	0-005
A=3 B=3	3	**0** $_{-050}$			——
A=4 B=4	4	**1** $_{-014}$	**1** $_{-014}$	——	——
3	4	**0** $_{-029}$	——	——	——
A=5 B=5	5	**1** $_{-024}$	**1** $_{-024}$	**0** $_{-004}$	**0** $_{-004}$
	4	**0** $_{-024}$	**1** $_{-024}$	——	——
4	5	**1** $_{-048}$	**0** $_{-008}$	**0** $_{-008}$	——
	4	**0** $_{-040}$	——	——	——
3	5	**0** $_{-018}$	**0** $_{-018}$	——	——
2	5	**0** $_{-048}$	——	——	——
A=6 B=6	6	**2** $_{-030}$	**1** $_{-008}$	**1** $_{-008}$	**0** $_{-001}$
	5	**1** $_{-040}$	**0** $_{-008}$	**0** $_{-008}$	——
	4	**0** $_{-030}$	——	——	——
5	6	**1** $_{-015}^{+}$	**0** $_{-015}^{+}$	**0** $_{-002}$	**0** $_{-002}$
	5	**0** $_{-013}$	**0** $_{-013}$	——	——
	4	**0** $_{-045}^{+}$	——	——	——
4	6	**1** $_{-033}$	**0** $_{-005}^{-}$	**0** $_{-005}^{-}$	**0** $_{-005}^{-}$
	5	**0** $_{-024}$	**0** $_{-024}$	——	——
3	6	**0** $_{-012}$	**0** $_{-012}$	——	——
	5	**0** $_{-048}$	——	——	——
2	6	**0** $_{-036}$	——	——	——
A=7 B=7	7	**3** $_{-035}^{-}$	**2** $_{-010}^{+}$	**1** $_{-002}$	**1** $_{-002}$
	6	**1** $_{-015}^{-}$	**1** $_{-015}^{-}$	**0** $_{-002}$	**0** $_{-002}$
	5	**1** $_{-010}^{+}$	**0** $_{-010}^{+}$	——	——
	4	**0** $_{-035}$-	——	——	——
6	7	**2** $_{-021}$	**2** $_{-021}$	**1** $_{-005}^{-}$	**1** $_{-005}^{-}$
	6	**1** $_{-025}^{+}$	**0** $_{-004}$	**0** $_{-004}$	**0** $_{-004}$
	5	**0** $_{-016}$	**0** $_{-016}$	——	——
	4	**0** $_{-049}$	——	——	——
5	7	**2** $_{-045}^{+}$	**1** $_{-010}^{+}$	**0** $_{-001}$	**0** $_{-001}$
	6	**1** $_{-045}^{+}$	**0** $_{-008}$	**0** $_{-008}$	——
	5	**0** $_{-027}$	——	——	——
	7	**1** $_{-024}$	**1** $_{-024}$	——	**0** $_{-003}$
	6	**0** $_{-015}^{+}$	**0** $_{-015}^{+}$	**0** $_{-003}$	——
	5	**0** $_{-045}^{+}$	——	——	——
	7	**0** $_{-008}$	**0** $_{-008}$	**0** $_{-008}$	——
	6	**0** $_{-033}$	——	——	——
	7	**0** $_{-028}$	——	——	——

	α	0-05	0-025	0-01	0-005
A=8	8	**4** $_{-038}$	**3** $_{-013}$	**2** $_{-003}$	**2** $_{-003}$
	7	**2** $_{-020}$	**2** $_{-020}$	**1** $_{-005}^{+}$	**0** $_{-001}$
	6	**1** $_{-020}$	**1** $_{-020}$	**0** $_{-003}$	**0** $_{-003}$
	5	**0** $_{-013}$	**0** $_{-013}$		
	4	**0** $_{-038}$			
7	8	**3** $_{-026}$	**2** $_{-007}$	**2** $_{-007}$	**1** $_{-001}$
	7	**2** $_{-035}^{-}$	**1** $_{-009}$	**1** $_{-009}$	**0** $_{-001}$
	6	**1** $_{-032}$	**0** $_{-006}$	**0** $_{-006}$	
	5	**0** $_{-019}$	**0** $_{-019}$		
6	8	**2** $_{-015}^{-}$	**2** $_{-015}^{-}$	**1** $_{-003}$	**1** $_{-003}$
	7	**1** $_{-016}$	**1** $_{-016}$	**0** $_{-002}$	**0** $_{-002}$
	6	**0** $_{-009}$	**0** $_{-009}$	**0** $_{-009}$	
	5	**0** $_{-028}$	——	——	
5	8	**2** $_{-035}^{-}$	**1** $_{-007}$	**1** $_{-007}$	**0** $_{-001}$
	7	**1** $_{-032}$	**0** $_{-005}^{-}$	**0** $_{-005}^{-}$	**0** $_{-005}^{-}$
	6	**0** $_{-016}$	**0** $_{-016}$	——	
	5	**0** $_{-044}$	——	——	
4	8	**1** $_{-018}$	**1** $_{-018}$	**0** $_{-002}$	**0** $_{-002}$
	7	**0** $_{-010}^{+}$	**0** $_{-010}^{+}$	——	
	6	**0** $_{-030}$	——	——	
3	8	**0** $_{-006}$	**0** $_{-006}$	**0** $_{-006}$	
	7	**0** $_{-024}$	**0** $_{-024}$	——	
2	8	**0** $_{-022}$	**0** $_{-022}$	——	
A=9	9	**5** $_{-041}$	**4** $_{-015}^{-}$	**3** $_{-005}^{-}$	**3** $_{-005}^{-}$
	8	**3** $_{-025}^{-}$	**3** $_{-025}^{-}$	**2** $_{-008}$	**1** $_{-002}$
	7	**2** $_{-028}$	**1** $_{-008}$	**1** $_{-008}$	**0** $_{-001}$
	6	**1** $_{-025}^{-}$	**1** $_{-025}^{-}$	**0** $_{-005}^{-}$	**0** $_{-005}^{-}$
	5	**0** $_{-015}^{-}$	**0** $_{-015}^{-}$	——	
	4	**0** $_{-041}$	——	——	
8	9	**4** $_{-029}$	**3** $_{-009}$	**3** $_{-009}$	**2** $_{-002}$
	8	**3** $_{-043}$	**2** $_{-013}$	**1** $_{-003}$	**1** $_{-003}$
	7	**2** $_{-044}$	**1** $_{-012}$	**0** $_{-002}$	**0** $_{-002}$
	6	**1** $_{-036}$	**0** $_{-007}$	**0** $_{-007}$	
	5	**0** $_{-020}$	**0** $_{-020}$	——	
7	9	**3** $_{-019}$	**3** $_{-019}$	**2** $_{-005}$	**2** $_{-005}^{-}$
	8	**2** $_{-024}$	**2** $_{-024}$	**1** $_{-006}$	**0** $_{-001}$
	7	**1** $_{-020}$	**1** $_{-020}$	**0** $_{-003}$	**0** $_{-003}$
	6	**0** $_{-010}^{+}$	**0** $_{-010}^{+}$	——	
	5	**0** $_{-029}$	——	——	
6	9	**3** $_{-044}$	**2** $_{-011}$	**1** $_{-002}$	**1** $_{-002}$
	8	**2** $_{-047}$	**1** $_{-011}$	**0** $_{-001}$	**0** $_{-001}$
	7	**1** $_{-035}^{-}$	**0** $_{-006}$	**0** $_{-006}$	
	6	**0** $_{-017}$	**0** $_{-017}$	——	
	5	**0** $_{-042}$	——	——	

[1] The table shows:(1) In bold type, for given a, A and B, the value of b ([a) which is just significant at the probability level quoted (one-tailed test); and (2) In small type, for given A, B and r = a + b, the exact probability (if there is independence) that b is equal to or less than the integer shown in bold type. From Pearson and Hartley (1962).

TABLE G.5. SIGNIFICANT LEVELS OF B: VALUES OF B (LARGE TYPE) AND CORRESPONDING PROBABILITIES (SMALL TYPE)[1] (CONTINUED)

	α	Probability			
		0-05	0-025	0-01	0-005
A=9 B=5	9	2 -027	1 -005⁻	1 -005⁻	1 -005⁻
	8	1 -023	1 -023	0 -003	0 -003
	7	0 -	0 -010⁺	——	——
	6	0 -028	——	——	——
4	9	1 -014	1 -014	0 -001	0 -001
	8	0 -007	0 -007	0 -007	——
	7	0 -021	0 -021	——	——
	6	0 -049	——	0 -005	——
3	9	1 -	0 -005⁻	0 -005⁻	0 -005⁻
	8	0 -018	0 -018	——	——
	7	0 -	——	——	——
2	9	0 -018	0 -018	——	——
A=10 B=10	10	6 -043	5 -016	4 -005⁺	3 -002
	9	4 -029	3 -010⁻	3 -010	2 -003
	8	3 -	2 -012	1 -003	1 -003
	7	2 -	1 -010⁻	1 -010⁻	0 -002
	6	1 -029	0 -005⁺	0 -005⁺	——
	5	0 -016	0 -016	——	——
	4	0 -043	——	——	——
9	10	5 -033	4 -011	3 -003	3 -003
	9	4 -	3 -017	2 -005⁻	2 -005⁻
	8	2 -019	2 -019	1 -004	1 -004
	7	1 -	1 -015⁻	0 -002	0 -002
	6	1 -040	0 -008	0 -008	——
	5	0 -022	0 -022	——	——
8	10	4 -023	4 -023	3 -007	2 -002
	9	3 -032	2 -009	2 -009	1 -002
	8	2 -031	1 -008	1 -008	0 -001
	7	1 -023	1 -023	0 -004	0 -004
	6	0 -011	0 -011	——	——
	5	0 -029	——	——	——
7	10	3 -	3 -015⁻	2 -003	2 -003
	9	2 -018	2 -018	1 -004	1 -004
	8	1 -013	1 -013	0 -002	0 -002
	7	1 -036	0 -006	0 -006	——
	6	0 -017	0 -017	——	——
	5	0 -041	——	——	——
6	10	3 -036	2 -008	2 -008	1 -001
	9	2 -036	1 -008	1 -008	0 -001
	8	1 -024	1 -024	0 -003	0 -003
	7	0 -	0 -010⁺	——	——
	6	0 -026	——	——	——
5	10	2 -022	2 -022	1 -004	1 -004
	9	1 -017	1 -017	0 -002	0 -002
	8	1 -	0 -007	0 -007	——
	7	0 -	0 -019	——	——
	6	0 -	——	——	——

	α	Probability			
		0-05	0-025	0-01	0-005
A=10 B=4	10	1 -011	1 -011	0 -001	0 -001
	9	1 -041	0 -005⁻	0 -005⁻	0 -005⁻
	8	0 -	0 -015⁻	——	——
	7	0 -	——	——	——
3	10	1 -038	0 -003	0 -003	0 -003
	9	0 -014	0 -014	——	——
	8	0 -	——	——	——
2	10	0 -	0 -015⁺	——	——
	9	0 -	——	——	——
A=11 B=11	11	7 -	6 -018	5 -006	4 -002
	10	5 -032	4 -012	3 -004	3 -004
	9	4 -040	3 -015⁻	2 -004	2 -004
	8	3 -043	2 -015⁻	1 -004	1 -004
	7	2 -040	1 -012	0 -002	0 -002
	6	1 -032	0 -006	0 -006	——
	5	0 -018	0 -018	——	——
	4	0 -	——	——	——
10	11	6 -	5 -012	4 -004	4 -004
	10	4 -021	4 -021	3 -007	2 -002
	9	3 -024	3 -024	2 -007	1 -002
	8	2 -023	2 -023	1 -006	0 -001
	7	1 -017	1 -017	0 -003	0 -003
	6	1 -043	0 -009	0 -009	——
	5	0 -023	0 -023	——	——
9	11	5 -026	4 -008	4 -008	3 -002
	10	4 -038	3 -012	2 -003	2 -003
	9	3 -040	2 -012	1 -003	1 -003
	8	2 -	1 -009	1 -009	0 -001
	7	1 -	1 -025⁻	0 -004	0 -004
	6	0 -012	0 -012	——	——
	5	0 -030	——	——	——
8	11	4 -018	4 -018	3 -005⁻	3 -005⁻
	10	3 -024	3 -024	2 -006	1 -001
	9	2 -022	2 -022	1 -005⁻	1 -005⁻
	8	1 -	1 -015⁻	0 -002	0 -002
	7	1 -037	0 -007	0 -007	——
	6	0 -017	0 -017	——	——
	5	0 -040	——	——	——
7	11	4 -043	3 -011	2 -002	2 -002
	10	3 -047	2 -013	1 002	1 -002
	9	2 -039	1 -009	1 -009	0 -001
	8	1 -	1 -025⁻	0 -004	0 -004
	7	0 -	0 -010⁺	——	——
	6	0 -	0 -025⁻	——	——
6	11	3 -	2 006	2 -006	1 -001
	10	2 -	1 -005⁺	1 -005⁺	0 -001
	9	1 -	1 -018	0 -002	0 -002

TABLE G.5. SIGNIFICANT LEVELS OF B: VALUES OF B (LARGE TYPE) AND CORRESPONDING PROBABILITIES (SMALL TYPE)[1] (CONTINUED)

	α	Probability			
		0-05	0-025	0-01	0-005
A=11 B=6	8	1 -043	0 -007	0 -007	——
	7	0 -017	0 -017	——	——
	6	0 -037	——	——	——
5	11	2 -018	2 -018	1 -003	1 -003
	10	1 -013	1 -013	0 -001	0 -001
	9	1 -036	0 -005⁻	0 -005⁻	0 -005⁻
	8	0 -013	0 -013	——	——
	7	0 -029	——	——	——
4	11	1 -009	1 -009	1 -009	0 -001
	10	1 -033	0 -004	0 -004	0 -004
	9	0 -011	0 -011	——	——
	8	0 -026	——	——	——
3	11	1 -033	0 -003	0 -003	0 -003
	10	0 -011	0 -011	——	——
	9	0 -027	——	——	——
2	11	0 -013	0 -013	——	——
	10	0 -038	——	——	——
A=12 B=12	12	8 -047	7 -019	6 -007	5 -002
	11	6 -034	5 -014	4 -005⁻	4 -005⁻
	10	5 -045⁻	4 -018	3 -006	2 -002
	9	4 -050⁻	3 -020	2 -006	1 -001
	8	3 -050⁻	2 -018	1 -005⁻	1 -005⁻
	7	2 -045⁻	1 -014	0 -002	0 -002
	6	1 -034	0 -007	0 -007	——
	5	0 -019	0 -019	——	——
	4	0 -047	——	——	——
11	12	7 -037	6 -014	5 -005⁻	5 -005⁻
	11	5 -024	5 -024	4 -008	3 -002
	10	4 -029	3 -010⁺	2 -003	2 -003
	9	3 -030	2 -009	2 -009	1 -002
	8	2 -026	1 -007	1 -007	0 -001
	7	1 -019	1 -019	0 -003	0 -003
	6	1 -045⁻	0 -009	0 -009	——
	5	0 -024	0 -024	——	——
10	12	6 -029	5 -010	5 -010⁻	4 -003
	11	5 -043	4 -015⁺	3 -005⁻	3 -005⁻
	10	4 -048	3 -017	2 -005⁻	2 -005⁻
	9	3 -046	2 -015⁻	1 -004	1 -004
	8	2 -038	1 -010⁺	0 -002	0 -002
	7	1 -026	0 -005⁻	0 -005⁻	0 -005-
	6	0 -012	0 -012	——	——
	5	0 -030	——	——	——
9	12	5 -021	5 -021	4 -006	3 -002
	11	4 -029	3 -009	3 -009	2 -002
	10	3 -029	2 -008	2 -008	1 -002
	9	2 -024	2 -024	1 -006	0 -001
	8	1 -016	1 -016	0 -002	0 -002

	α	Probability			
		0-05	0-025	0-01	0-005
A=12 B=9	7	1 -037	0 -007	0 -007	——
	6	0 -017	0 -017	——	——
	5	0 -039	——	——	——
8	12	5 -049	4 -014	3 -004	3 -004
	11	3 -018	3 -018	2 -004	2 -004
	10	2 -015⁺	2 -015⁺	1 -003	1 -003
	9	2 -040	1 -010⁻	1 -010⁻	0 -001
	8	1 -025⁻	1 -025⁻	0 -004	0 -004
	7	0 -010⁺	0 -010⁺	——	——
	6	0 -024	0 -024	——	——
7	12	4 -036	3 -009	3 -009	2 -002
	11	3 -038	2 -010⁻	2 -010⁻	1 -002
	10	2 -029	1 -006	1 -006	0 -001
	9	1 -017	1 -017	0 -002	0 -002
	8	1 -040	0 -007	0 -007	——
	7	0 -016	0 -016	——	——
	6	0 -034	——	——	——
6	12	3 -025⁻	3 -025⁻	2 -005⁻	2 -005⁻
	11	2 -022	2 -022	1 -004	1 -004
	10	1 -013	1 -013	0 -002	0 -002
	9	1 -032	0 -005⁻	0 -005⁻	0 -005⁻
	8	0 -011	0 -011	——	——
	7	0 -025⁻	0 -025⁻	——	——
	6	0 -050⁻	——	——	——
5	12	2 -015⁻	2 -015	1 -002	1 -002
	11	1 -010⁻	1 -010⁻	1 -010⁻	0 -001
	10	1 -028	0 -003	0 -003	0 -003
	9	0 -009	0 -009	0 -009	——
	8	0 -020	0 -020	——	——
	7	0 -041	——	——	——
4	12	2 -050	1 -007	1 -007	0 -001
	11	1 -027	0 -003	0 -003	0 -003
	10	0 -008	0 -008	0 -008	——
	9	0 -019	0 -019	——	——
	8	0 -038	——	——	——
3	12	1 -029	0 -002	0 -002	0 -002
	11	0 -009	0 -009	0 -009	——
	10	0 -022	0 -022	——	——
	9	0 -044	——	——	——
2	12	0 -011	0 -011	——	——
	11	0 -033	——	——	——
A=13 B=13	13	9 -048	8 -020	7 -007	6 -003
	12	7 -037	6 -015⁺	5 -006	4 -002
	11	6 -048	5 -021	4 -008	3 -002
	10	4 -024	4 -024	3 -008	2 -002
	9	3 -024	3 -024	2 -008	1 -002
	8	2 -021	2 -021	1 -006	0 -001

TABLE G.5. SIGNIFICANT LEVELS OF B: VALUES OF B (LARGE TYPE) AND CORRESPONDING PROBABILITIES (SMALL TYPE)[1] (CONTINUED)

	α	Probability					α	Probability			
		0-05	0-025	0-01	0-005			0-05	0-025	0-01	0-005
A=13 B=13	7	2 -048	1 -015+	0 -003	0 -003	A=13 B=7	11	2 -022	2 -022	1 -004	1 -004
	6	1 -037	0 -007	0 -007	——		10	1 -012	1 -012	0 -002	0 -002
	5	0 -020	0 -020	——	——		9	1 -029	0 -004	0 -004	0 -004
	4	0 -048		——	——		8	0 -010+	0 -010+	——	——
12	1	8 -039	7 -015-	6 -005+	5 -002		7	0 -022	0 -022	——	——
	1	6 -027	5 -010-	5 -010-	4 -003		6	0 -044	——	——	——
	1	5 -033	4 -013	3 -004	3 -004	6	13	3 -021	3 -021	2 -004	2 -004
	1	4 -036	3 -013	2 -004	2 -004		12	2 -017	2 -017	1 -003	1 -003
	9	3 -034	2 -011	1 -003	1 -003		11	2 -046	1 -010-	1 -010-	0 -001
	8	2 -029	1 -008	1 -008	0 -001		10	1 -024	1 -024	0 -003	0 -003
	7	1 -020	1 -020	0 -004	0 -004		9	1 -050-	0 -008	0 -008	——
	6	1 -046	0 -010-	0 -010-	——		8	0 -017	0 -017	——	——
	5	0 -024	0 -024	——	——		7	0 -034	——	——	——
11	1	7 -031	6 -011	5 -003	5 -003	5	13	2 -012	2 -012	1 -002	1 -002
	1	6 -048	5 -018	4 -006	3 -002		12	2 -044	1 -008	1 -008	0 -001
	1	4 -021	4 -021	3 -007	2 -002		11	1 -022	1 -022	0 -002	0 -002
	1	3 -021	3 -021	2 -006	1 -001		10	1 -047	0 -007	0 -007	——
	9	3 -050-	2 -017	1 -004	1 -004		9	0 -015-	0 -015-	——	——
	8	2 -040	1 -011	0 -002	0 -002		8	0 -029	——	——	——
	7	1 -027	0 -005-	0 -005-	0 -005-	4	13	2 -044	1 -006	1 -006	0 -000
	6	0 -013	0 -013	——	——		12	1 -022	1 -022	0 -002	0 -002
		0 -030		——	——		11	0 -006	0 -006	0 -006	——
10	1	6 -024	6 -024	5 -007	4 -002		10	0 -015-	0 -015-	——	——
	1	5 -035-	4 -012	3 -003	3 -003		9	0 -029	——	——	——
	1	4 -037	3 -012	2 -003	2 -003	3	13	1 -025	1 -025	0 -002	0 -002
	1	3 -033	2 -010+	1 -002	1 -002		12	0 -007	0 -007	0 -007	——
	9	2 -026	1 -006	1 -006	0 -001		11	0 -018	0 -018	——	——
	8	1 -017	1 -017	0 -003	0 -003		10	0 -036	——	——	——
	7	1 -038	0 -007	0 -007	——	2	13	0 -010-	0 -010-	0 -010-	——
	6	0 -017	0 -017	——	——		12	0 -029	——	——	——
	5	0 -038		——	——						
9	1	5 -017	5 -017	4 -005-	4 -005-						
	1	4 -023	4 -023	3 -007	2 -001	A=14	14	10 -049	9 -020	8 -008	7 -003
	1	3 -022	3 -022	2 -006	1 -001		13	8 -038	7 -016	6 -006	5 -002
	1	2 -017	2 -017	1 -004	1 -004		12	6 -023	6 -023	5 -009	4 -003
	9	2 -040	1 -010+	0 -001	0 -001		11	5 -027	4 -011	3 -004	3 -004
	8	1 -025-	1 -025-	0 -004	0 -004		10	4 -028	3 -011	2 -003	2 -003
	7	0'-010+	0 -010+	——	——		9	3 -027	2 -009	2 -009	1 -002
	6	0 -023	0 -023	——	——		8	2 -023	2 -023	1 -006	0 -001
	5	0 -049		——	——		7	1 -016	1 -016	0 -003	0 -003
8	1	5 -042	4 -012	3 -003	3 -003		6	1 -038	0 -008	0 -008	——
	1	4 -047	3 -014	2 -003	2 -003		5	0 -020	0 -020	——	——
	1	3 -041	2 -011	1 -002	1 -002		4	0 -049	——	——	——
	1	2 -029	1 -007	1 -007	0 -001	13	14	9 -041	8 -016	7 -006	6 -002
	9	1 -017	1 -017	0 -002	0 -002		13	7 -029	6 -011	5 -004	5 -004
	8	1 -037	0 -006	0 -006	——		12	6 -037	5 -015+	4 -005+	3 -002
	7	0 -015-	0 -015-	——	——		11	5 -041	4 -017	3 -006	2 -001
	6	0 -032		——	——		10	4 -041	3 -016	2 -005-	2 -005-
7	1	4 -031	3 -007	3 -007	2 -001		9	3 -038	2 -013	1 -003	1 -003
	1	3 -031	2 -007	2 -007	1 -001		8	2 -031	1 -009	1 -009	0 -001

TABLE G.5. SIGNIFICANT LEVELS OF B: VALUES OF B (LARGE TYPE) AND CORRESPONDING PROBABILITIES (SMALL TYPE)[1] (CONTINUED)

	α	Probability			
		0-05	0-025	0-01	0-005
A=14	7	1 -021	1 -021	0 -004	0 -004
	6	1 -048	0 -010+	——	——
	5	0 -025-	0 -025-	——	——
12	1	8 -033	7 -012	6 -004	6 -004
	1	6 -021	6 -021	5 -007	4 -002
	1	5 -025+	4 -009	4 -009	3 -003
	1	4 -026	3 -009	3 -009	2 -002
	1	3 -024	3 -024	2 -007	1 -002
	9	2 -019	2 -019	1 -005-	1 -005-
	8	2 -042	1 -012	0 -002	0 -002
	7	1 -028	0 -005+	0 -005+	——
	6	0 -013	0 -013	——	——
	5	0 -030	——	——	——
11	1	7 -026	6 -009	6 -009	5 -003
	1	6 -039	5 -014	4 -004	4 -004
	1	5 -043	4 -016	3 -005-	3 -005-
	1	4 -042	3 -015-	2 -004	2 -004
	1	3 -036	2 -011	1 -003	1 -003
	9	2 -027	1 -007	1 -007	0 -001
	8	1 -017	1 -017	0 -003	0 -003
	7	1 -038	0 -007	0 -007	——
	6	0 -017	0 -017	——	——
	5	0 -038	——	——	——
10	1	6 -020	6 -020	5 -006	4 -002
	1	5 -028	4 -009	4 -009	3 -002
	1	4 -028	3 -009	3 -009	2 -002
	1	3 -024	3 -024	2 -007	1 -001
	1	2 -018	2 -018	1 -004	1 -004
	9	2 -040	1 -011	0 -002	0 -002
	8	1 -024	1 -024	0 -004	0 -004
	7	0 -010-	0 -010-	0 -010-	——
	6	0 -022	0 -022	——	——
	5	0 -047	——	——	——
9	1	6 -047	5 -014	4 -004	4 -004
	1	4 -018	4 -018	3 -005-	3 -005-
	1	3 -017	3 -017	2 -004	2 -004
	1	3 -042	2 -012	1 -002	1 -002
	1	2 -029	1 -007	1 -007	0 -001
	9	1 -017	1 -017	0 -002	0 -002
	8	1 -036	0 -006	0 -006	——
	7	0 -014	0 -014	——	——
	6	0 -030	——	——	——
8	1	5 -036	4 -010-	4 -010-	3 -002
	1	4 -039	3 -011	2 -002	2 -002
	1	3 -032	2 -008	2 -008	1 -001
	1	2 -022	2 -022	1 -005-	1 -005-
	1	2 -048	1 -012	0 -002	0 -002
	9	1 -026	0 -004	0 -004	0 -004
	8	0 -009	0 -009	0 -009	——
	7	0 -020	0 -020	——	——
	6	0 -040	——	——	——

	α	Probability			
		0-05	0-025	0-01	0-005
A=14 B=7	14	4 -026	3 -006	3 -006	2 -001
	13	3 -025	2 -006	2 -006	1 -001
	12	2 -017	2 -017	1 -003	1 -003
	11	2 -041	1 -009	1 -009	0 -001
	10	1 -021	1 -021	0 -003	0 -003
	9	1 -043	0 -007	0 -007	——
	8	0 -015-	0 -015-	——	——
	7	0 -030	——	——	——
6	14	3 -018	3 -018	2 -003	2 -003
	13	2 -014	2 -014	1 -002	1 -002
	12	2 -037	1 -007	1 -007	0 -001
	11	1 -018	1 -018	0 -002	0 -002
	10	1 -038	0 -005+	0 -005+	——
	9	0 -012	0 -012	——	——
	8	0 -024	0 -024	——	——
	7	0 -044	——	——	——
5	14	2 -010+	2 -010+	1 -001	1 -001
	13	2 -037	1 -006	1 -006	0 -001
	12	1 -017	1 -017	0 -002	0 -002
	11	1 -038	0 -005-	0 -005-	0 -005-
	10	0 -011	0 -011	——	——
	9	0 -022	0 -022	——	——
	8	0 -040	——	——	——
4	14	2 -039	1 -005-	1 -005-	1 -005-
	13	1 -019	1 -019	0 -002	0 -002
	12	1 -044	0 -005-	0 -005-	0 -005-
	11	0 -011	0 -011	——	——
	10	0 -023	0 -023	——	——
	9	0 -041	——	——	——
3	14	1 -022	1 -022	0 -001	0 -001
	13	0 -006	0 -006	0 -006	——
	12	0 -015-	0 -015-	——	——
	11	0 -029	——	——	——
2	14	0 -008	0 -008	0 -008	——
	13	0 -025	0 -025	——	——
	12	0 -050	——	——	——
A=15 B=15	15	11 -050-	10 -021	9 -008	8 -003
	14	9 -040	8 -018	7 -007	6 -003
	13	7 -025+	6 -010+	5 -004	5 -004
	12	6 -030	5 -013	4 -005-	4 -005-
	11	5 -033	4 -013	3 -005-	3 -005-
	10	4 -033	3 -013	2 -004	2 -004
	9	3 -030	2 -010+	1 -003	1 -003
	8	2 -025+	1 -007	1 -007	0 -001
	7	1 -018	1 -018	0 -003	0 -003
	6	1 -040	0 -008	0 -008	——
	5	0 -021	0 -012	——	——
	4	0 -050-	——	——	——

TABLE G.5. SIGNIFICANT LEVELS OF B: VALUES OF B (LARGE TYPE) AND CORRESPONDING PROBABILITIES (SMALL TYPE)[1] (CONTINUED)

	α	Probability					α	Probability			
		0-05	0-025	0-01	0-005			0-05	0-025	0-01	0-005
A=15 B=14	15	10 -042	9 -017	8 -006	7 -002	A=15 B=9	13	4 -042	3 -013	2 -003	2 -003
	14	8 -031	7 -013	6 -005-	6 -005-		12	3 -032	2 -009	2 -009	1 -002
	13	7 -041	6 -017	5 -007	4 -002		11	2 -021	2 -021	1 -005-	1 -005-
	12	6 -046	5 -020	4 -007	3 -002		10	2 -045-	1 -011	0 -002	0 -002
	11	5 -048	4 -020	3 -007	2 -002		9	1 -024	1 -024	0 -004	0 -004
	10	4 -046	3 -018	2 -006	1 -001		8	1 -048	0 -009	0 -009	——
	9	3 -041	2 -014	1 -004	1 -004		7	0 -019	0 -019	——	——
	8	2 -033	1 -009	1 -009	0 -001		6	0 -037	——	——	——
	7	1 -022	1 -022	0 -004	0 -004	8	15	5 -032	4 -008	4 -008	3 -002
	6	1 -049	0 -011	——	——		14	4 -033	3 -009	3 -009	2 -002
	5	0 -025+	——	——	——		13	3 -026	2 -006	2 -006	1 -001
13	15	9 -035-	8 -013	7 -005-	7 -005-		12	2 -017	2 -017	1 -003	1 -003
	14	7 -023	7 -023	6 -009	5 -003		11	2 -037	1 -008	1 -008	0 -001
	13	6 -029	5 -011	4 -004	4 -004		10	1 -019	1 -019	0 -003	0 -003
	12	5 -031	4 -012	3 -004	3 -004		9	1 -038	0 -006	0 -006	——
	11	4 -030	3 -011	2 -003	2 -003		8	0 -013	0 -013	——	——
	10	3 -026	2 -008	2 -008	1 -002		7	0 -026	——	——	——
	9	2 -020	2 -020	1 -005+	0 -001		6	0 -050-	——	——	——
	8	2 -043	1 -013	0 -002	0 -002	7	15	4 -023	4 -023	3 -005-	3 -005-
	7	1 -029	0 -005+	0 -005+	——		14	3 -021	3 -021	2 -004	2 -004
	6	0 -013	0 -013	——	——		13	2 -014	2 -014	1 -002	1 -002
	5	0 -031	——	——	——		12	2 -032	1 -007	1 -007	0 -001
12	15	8 -028	7 -010-	7 -010-	6 -003		11	1 -015+	1 -015+	0 -002	0 -002
	14	7 -043	6 -016	5 -006	4 -002		10	1 -032	0 -005-	0 -005-	0 -005-
	13	6 -049	5 -019	4 -007	3 -002		9	0 -010+	0 -010+	——	——
	12	5 -049	4 -019	3 -006	2 -002		8	0 -020	0 -020	——	——
	11	4 -045+	3 -017	2 -005-	2 -005-		7	0 -038	——	——	——
	10	3 -038	2 -012	1 -003	1 -003	6	15	3 -015+	3 -015+	2 -003	2 -003
	9	2 -028	1 -007	1 -007	0 -001		14	2 -011	2 -011	1 -002	1 -002
	8	1 -018	1 -018	0 -003	0 -003		13	2 -031	1 -006	1 -006	0 -001
	7	1 -038	0 -007	0 -007	——		12	1 -014	1 -014	0 -002	0 -002
	6	0 -017	0 -017	——	——		11	1 -029	0 -004	0 -004	0 -004
	5	0 -037	——	——	——		10	0 -009	0 -009	0 -009	——
11	15	7 -022	7 -022	6 -007	5 -002		9	0 -017	0 -017	——	——
	14	6 -032	5 -011	4 -003	4 -003		8	0 -032	——	——	——
	13	5 -034	4 -012	3 -003	3 -003	5	15	2 -009	2 -009	2 -009	1 -001
	12	4 -032	3 -010+	2 -003	2 -003		14	2 -032	1 -005-	1 -005-	1 -005-
	11	3 -026	2 -008	2 -008	1 002		13	1 -014	1 -014	0 -001	0 -001
	10	2 -019	2 -019	1 -004	1 -004		12	1 -031	0 -004	0 -004	0 -004
	9	2 -040	1 -011	0 -002	0 -002		11	0 -008	0 -008	0 -008	——
	8	1 -024	1 -024	0 -004	0 -004		10	0 -016	0 -016	——	——
	7	1 -049	0 -010-	0 -010-	——		9	0 -030	——	——	——
	6	0 -022	0 -022	——	——	4	15	2 -035+	1 -004	1 -004	1 -004
	5	0 -046	——	——	——		14	1 -016	1 -016	0 -001	0 -001
10	15	6 -017	6 -017	5 -005-	5 -005-		13	1 -037	0 -004	0 -004	0 -004
	14	5 -023	5 -023	4 -007	3 -002		12	0 -009	0 -009	0 -009	——
	13	4 -022	4 -022	3 -007	2 -001		11	0 -018	0 -018	——	——
	12	3 -018	3 -018	2 -005-	2 -005-		10	0 -033	——	——	——
	11	3 -042	2 -013	1 -003	1 -003	3	15	1 -020	1 -020	0 -001	0 -001
	10	2 -029	1 -007	1 -007	0 -001		14	0 -005-	0 -005-	0 -005-	0 -005-
	9	1 -016	0 -016	0 -002	0 -002		13	0 -012	0 -012	——	——
	8	1 -034	0 -006	0 -006	——		12	0 -025-	0 -025-	——	——
	7	0 -013	1 -013	——	——		11	0 -043	——	——	——
	6	0 -028	——	——	——	2	15	0 -007	0 -007	0 -007	——
9	15	6 -042	5 -012	4 -003	4 -003		14	0 -022	0 -022	——	——
	14	5 -047	4 -015-	3 -004	3 -004		13	0 -044	——	——	——

APPENDIX H

SINGLE CONCENTRATION TOXICITY TEST - COMPARISON OF CONTROL WITH 100% EFFLUENT OR RECEIVING WATER

1. To statistically compare a control with one concentration, such as 100% effluent or the instream waste concentration, a t-test is the recommended analysis. The t-test is based on the assumptions that the observations are independent and normally distributed and that the variances of the observations are equal between the two groups.

2. Shapiro Wilk's test may be used to test the normality assumption (see Appendix B for details). If the data do not meet the normality assumption, the nonparametric test, Wilcoxon's Rank Sum Test, may be used to analyze the data. An example of this test is given in Appendix F. Since a control and one concentration are being compared, the K = 1 section of Table F.5 contains the needed critical values.

3. The F test for equality of variances is used to test the homogeneity of variance assumption. When conducting the F test, the alternative hypothesis of interest is that the variances are not equal.

4. To make the two-tailed F test at the 0.01 level of significance, put the larger of the two variances in the numerator of F.

$$F = \frac{S_1^2}{S_2^2} \quad where\ S_1^2 > S_2^2$$

5. Compare F with the 0.005 level of a tabled F value with n_1 - 1 and n_2 - 1 degrees of freedom, where n_1 and n_2 are the number of replicates for each of the two groups.

6. A set of *Ceriodaphnia dubia* reproduction data from an effluent screening test will be used to illustrate the F test. The raw data, mean and variance for the control and 100% effluent are given in Table H.1.

TABLE H.1. *CERIODAPHNIA DUBIA* REPRODUCTION DATA FROM AN EFFLUENT SCREENING TEST

	Replicate											
	1	2	3	4	5	6	7	8	9	10	$\overline{X}$	S^2
Control	36	38	35	35	28	41	37	33	.	.	35.4	14.5
100% Effluent	23	14	21	7	12	17	23	8	18	.	15.9	36.6

7. Since the variability of the 100% effluent is greater than the variability of the control, S^2 for the 100% effluent concentration is placed in the numerator of the F statistic and S^2 for the control is placed in the denominator.

$$F = \frac{36.61}{14.55}$$

8. There are 9 replicates for the effluent concentration and 8 replicates for the control. Thus, the numerator degrees of freedom is 8 and the denominator degrees of freedom is 7. For a two-tailed test at the 0.01 level of

significance, the critical F value is obtained from a table of the F distribution (Snedecor and Cochran, 1980). The critical F value for this test is 8.68. Since 2.52 is not greater than 8.68, the conclusion is that the variances of the control and 100% effluent are homogeneous.

9. EQUAL VARIANCE T-TEST

9.1 To perform the t-test, calculate the following test statistic:

$$t = \frac{\bar{Y}_1 - \bar{Y}_2}{S_p \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$$

Where: $\bar{Y}_1$ = Mean for the control

$\bar{Y}_2$ = Mean for the effluent concentration

$$S_p = \sqrt{\frac{(n_1 - 1)S_1^2 + (n_2 - 1)S_2^2}{n_1 + n_2 - 2}}$$

S_1^2 = Estimate of the variance for the control

S_2^2 = Estimate of the variance for the effluent concentration

n_1 = Number of replicates for the control

n_2 = Number of replicates for the effluent concentration

9.2 Since we are usually concerned with a decreased response from the control, such as a decrease in survival or a decrease in reproduction, a one-tailed test is appropriate. Thus, compare the calculated t with a critical t, where the critical t is at the 5% level of significance with $n_1 + n_2 - 2$ degrees of freedom. If the calculated t exceeds the critical t, the mean responses are declared different.

9.3 Using the data from Table H.1 to illustrate the t-test, the calculation of t is as follows:

$$t = \frac{35.4 - 15.9}{5.13\sqrt{\frac{1}{8} + \frac{1}{9}}} = 7.82$$

Where:

$$S_p = \sqrt{\frac{(8-1)14.5 + (9-1)36.6}{(8+9-2)}} = 5.13$$

9.4 For an 0.05 level of significance test with 15 degrees of freedom the critical t is 1.754 (Note: Table D.5 for K = 1 includes the critical t values for comparing two groups). Since 7.82 is greater than 1.754, the conclusion is that the reproduction in the 100% effluent concentration is significantly lower than the control reproduction.

10. UNEQUAL VARIANCE T-TEST

10.1 If the F test for equality of variance fails, the t-test is still a valid test. However, the denominator of the t statistic is adjusted as follows:

$$t = \frac{\bar{Y}_1 - \bar{Y}_2}{\sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}}}$$

Where: $\bar{Y}_1$ = Mean for the control

$\bar{Y}_2$ = Mean for the effluent concentration

S_1^2 = Estimate of the variance for the control

S_2^2 = Estimate of the variance for the effluent concentration

n_1 = Number of replicates for the control

n_2 = Number of replicates for the effluent concentration

10.2 Additionally, the degrees of freedom for the test are adjusted using the following formula:

$$df' = \frac{(n_1 - 1)(n_2 - 1)}{(n_2 - 1)C^2 + (1 - C)^2(n_1 - 1)}$$

Where:

$$C = \frac{\frac{S_1^2}{n_1}}{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}}$$

10.3 The modified degrees of freedom is usually not an integer. Common practice is to round down to the nearest integer.

10.4 The t-test is then conducted as the equal variance t-test. The calculated t is compared to the critical t at the 0.05 significance level with the modified degrees of freedom. If the calculated t exceeds the critical t, the mean responses are found to be statistically different.

APPENDIX I

PROBIT ANALYSIS

1. This program calculates the EC1 and EC50 (or LC1 and LC50), and the associated 95% confidence intervals.

2. The program is written in IBM PC Basic for the IBM compatible PC by Computer Sciences Corporation, 26 W. Martin Luther King Drive, Cincinnati, OH 45268. A compiled, executable version of the program can be obtained from EMSL-Cincinnati by sending a written request to EMSL at 3411 Church Street, Cincinnati, OH 45244.

2.1 Data input is illustrated by a set of total mortality data (Figure I.1) from a fathead minnow embryo-larval survival and teratogenicity test. The program requests the following input:

1. Desired output of abbreviated (A) or full (F) output? (Note: only abbreviated output is shown below.)
2. Output designation (P = printer, D = disk file).
3. Title for the output.
4. The number of exposure concentrations.
5. Toxicant concentration data.

2.2 The program output for the abbreviated output includes the following:

1. A table of the observed proportion responding and the proportion responding adjusted for the controls (see Figure I.2).
2. The calculated chi-square statistic for heterogeneity and the tabular value. This test is one indicator of how well the data fit the model. The program will issue a warning when the test indicates that the data do not fit the model.
3. Estimated LC1 and LC50 values and associated 95% confidence intervals (see Figure I.2).

USEPA PROBIT ANALYSIS PROGRAM
USED FOR CALCULATING LC/EC VALUES
Version 1.5

Do you wish abbreviated (A) or full (F) input/output? A
Output to printer (P) or disk file (D)? P
Title ? Example of Probit Analysis

Number responding in the control group = ? 2
Number of animals exposed in the concurrent control group = ? 20
Number of exposure concentrations, exclusive of controls ? 5

Input data starting with the lowest exposure concentration

Concentration = ? 0.5
Number responding = ? 2
Number exposed = ? 20

Concentration = ? 1.0
Number responding = ? 1
Number exposed = ? 20

Concentration = ? 2.0
Number responding = ? 4
Number exposed = ? 20

Concentration = ? 4.0
Number responding = ? 16
Number exposed = ? 20

Concentration = ? 8.0
Number responding = ? 20
Number exposed = ? 20

Number	Number Conc.	Number Resp.	Exposed
1	0.5000	2	20
2	1.0000	1	20
3	2.0000	4	20
4	4.0000	16	20
5	8.0000	20	20

Do you wish to modify your data ? N

The number of control animals which responded = 2
The number of control animals exposed = 20
Do you wish to modify these values ? N

Figure I.1. Sample Data Input for USEPA Probit Analysis program, Version 1.5.

Example of Probit Analysis

Conc.	Number Exposed	Number Resp.	Observed Proportion Responding	Proportion Responding Adjusted for Controls
Control	20	2	0.1000	0.0000
0.5000	20	2	0.1000	0.0174
1.0000	20	1	0.0500	-.0372
2.0000	20	4	0.2000	0.1265
4.0000	20	16	0.8000	0.7816
8.0000	20	20	1.0000	1.0000

Chi - Square for Heterogeneity (calculated) = 0.441
Chi - Square for Heterogeneity
(tabular value at 0.05 level) = 7.815

Example of Probit Analysis

Estimated LC/EC Values and Confidence Limits

Point	Exposure Conc.	Lower 95% Confidence	Upper Limits
LC/EC 1.00	1.346	0.453	1.922
LC/EC 50.00	3.018	2.268	3.672

Figure I.2. USEPA Probit Analysis Program Used for Calculating LC/EC Values, Version 1.5.

APPENDIX J

SPEARMAN-KARBER METHOD

1. The Spearman-Karber Method is a nonparametric statistical procedure for estimating the LC50 and the associated 95% confidence interval (Finney, 1978). The Spearman-Karber Method estimates the mean of the distribution of the $\log_{10}$ of the tolerance. If the log tolerance distribution is symmetric, this estimate of the mean is equivalent to an estimate of the median of the log tolerance distribution.

2. If the response proportions are not monotonically non-decreasing with increasing concentration (constant or steadily increasing with concentration), the data must be smoothed. Abbott's procedure is used to "adjust" the concentration response proportions for mortality occurring in the control replicates.

3. Use of the Spearman-Karber Method is recommended when partial mortalities occur in the test solutions, but the data do not fit the Probit model.

4. To calculate the LC50 using the Spearman-Karber Method, the following must be true: 1) the smoothed adjusted proportion mortality for the lowest effluent concentration (not including the control) must be zero, and 2) the smoothed adjusted proportion mortality for the highest effluent concentration must be one.

5. To calculate the 95% confidence interval for the LC50 estimate, one or more of the smoothed adjusted proportion mortalities must be between zero and one.

6. The Spearman-Karber Method is illustrated below using a set of mortality data from a Fathead Minnow Larval Survival and Growth test. These data are listed in Table J.1.

TABLE J.1. EXAMPLE OF SPEARMAN-KARBER METHOD: MORTALITY DATA FROM A FATHEAD MINNOW LARVAL SURVIVAL AND GROWTH TEST (40 ORGANISMS PER CONCENTRATION)

Effluent Concentration	Number of Mortalities	Mortality Proportion
Control	2	0.05
6.25%	2	0.05
12.5%	0	0.00
25.0%	0	0.00
50.0%	26	0.65
100.0%	40	1.00

7. Let $p_0, p_1, ..., p_k$ denote the observed response proportion mortalities for the control and k effluent concentrations. The first step is to smooth the p_i if they do not satisfy $p_0 \le p_1 \le ... \le p_k$. The smoothing process replaces any adjacent p_i's that do not conform to $p_0 \le p_1 \le ... \le p_k$ with their average. For example, if p_i is less than p_{i-1} then:

$$p_{i-1}^{s} = p_i^{s} = \frac{(p_i + p_{i-1})}{2}$$

Where: p_i^s = the smoothed observed proportion mortality for effluent concentration i.

7.1 For the data in this example, because the observed mortality proportions for the control and the 6.25% effluent concentration are greater than the observed response proportions for the 12.5% and 25.0% effluent concentrations, the responses for these four groups must be averaged:

$$p_0^{s} = p_1^{s} = p_2^{s} = p_3^{s} = \frac{0.05+0.05+0.00+0.00}{4} = \frac{0.10}{4} = 0.025$$

7.2 Since $p_4 = 0.65$ is larger than p_3^s, set $p_4^s = 0.65$. Similarly, $p_5 = 1.00$ is larger than p_4^s, so set $p_5^s = 1.00$. Additional smoothing is not necessary. The smoothed observed proportion mortalities are shown in Table J.2.

8. Adjust the smoothed observed proportion mortality in each effluent concentration for mortality in the control group using Abbott's formula (Finney, 1971). The adjustment takes the form:

Where: $p_i^a = (p_i^s - p_0^s) / (1 - p_0^s)$

p_0^s = the smoothed observed proportion mortality for the control

p_i^s = the smoothed observed proportion mortality for effluent concentration i.

8.1 For the data in this example, the data for each effluent concentration must be adjusted for control mortality using Abbott's formula, as follows:

$$p_0^{a} = p_1^{a} = p_2^{a} = p_3^{a} = \frac{p_1^{s} - p_0^{s}}{1 - p_0^{s}} = \frac{0.025-0.025}{1-0.025} = \frac{0.0}{0.975} = 0.0$$

$$p_4^{a} = \frac{p_4^{s} - p_0^{s}}{1 - p_0^{s}} = \frac{0.650-0.025}{1-0.025} = \frac{0.0625}{0.975} = 0.641$$

$$p_5^{a} = \frac{p_5^{s} - p_0^{s}}{1 - p_0^{s}} = \frac{1.000-0.025}{1-0.025} = \frac{0.975}{0.975} = 1.000$$

The smoothed, adjusted response proportions for the effluent concentrations are shown in Table J.2. A plot of the smoothed, adjusted data is shown in Figure J.1.

9. Calculate the $\log_{10}$ of the estimated LC50, m, as follows:

$$m = \sum_{i=1}^{k-1} \frac{(p_{i+1}^{a})(x_i + x_{i+1})}{2}$$

Where: p_i^a = the smoothed adjusted proportion mortality at concentration i

X_i = the $\log_{10}$ of concentration i

k = the number of effluent concentrations tested, not including the control.

9.1 For this example, the $\log_{10}$ of the estimated LC50, m, is calculated as follows:

m = [(0.000 - 0.000) (0.7959 + 1.0969)]/2 +
[(0.000 - 0.000) (1.0969 + 1.3979)]/2 +
[(0.641 - 0.000) (1.3979 + 1.6990)]/2 +
[(1.000 - 0.641) (1.6990 + 2.0000)]/2

= 1.656527

TABLE J.2. EXAMPLE OF SPEARMAN-KARBER METHOD: SMOOTHED, ADJUSTED MORTALITY DATA FROM A FATHEAD MINNOW LARVAL SURVIVAL AND GROWTH TEST

Effluent Concentration	Mortality Proportion	Smoothed Mortality Proportion	Smoothed, Adjusted Mortality Proportion
Control	0.05	0.025	0.000
6.25%	0.05	0.025	0.000
12.5%	0.00	0.025	0.000
25.0%	0.00	0.025	0.000
50.0%	0.65	0.650	0.641
100.0%	1.00	1.000	1.000

10. Calculate the estimated variance of m as follows:

$$V(m) = \sum_{i=2}^{k-1} \frac{p_i^{\,a}(1-p_i^{\,a})(X_{i+1}+X_{i-1})^2}{4(n_i-1)}$$

Where: X_i = the $\log_{10}$ of concentration i

n_i = the number of organisms tested at effluent concentration i

p_i^a = the smoothed adjusted observed proportion mortality at effluent concentration i

k = the number of effluent concentrations tested, not including the control.

10.1 For this example, the estimated variance of m, V(m), is calculated as follows:

V(m) = $(0.000)(1.000)(1.3979 - 0.7959)^2/4(39)$ +
$(0.000)(1.000)(1.6990 - 1.0969)^2/4(39)$ +
$(0.641)(0.359)(2.0000 - 1.3979)^2/4(39)$

= 0.00053477

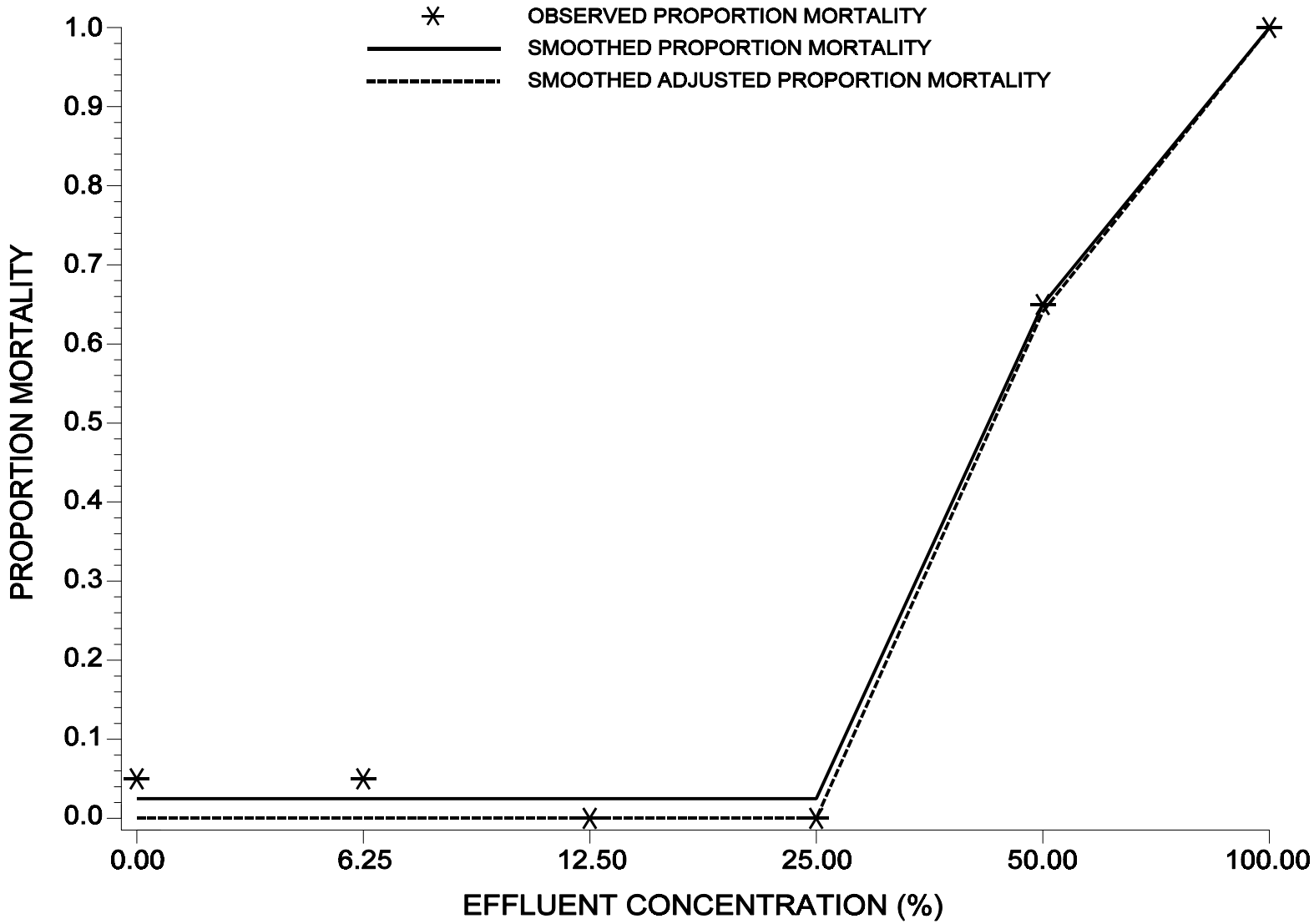

Figure J.1. Plot of the smoothed, adjusted data for the fathead minnow larval survival and growth test.

11. Calculate the 95% confidence interval for m: $m \pm 2.0\sqrt{V(m)}$

11.1 For this example, the 95% confidence interval for m is calculated as follows:

$$1.656527 \pm 2\sqrt{0.00053477} = (1.610277,\ 1.702777)$$

12. The estimated LC50 and a 95% confidence interval for the estimated LC50 can be found by taking base_{10} antilogs of the above values.

12.1 For this example, the estimated LC50 is calculated as follows:

LC50 = antilog(m) = antilog(1.656527) = 45.3%.

12.2 The limits of the 95% confidence interval for the estimated LC50 are calculated by taking the antilogs of the upper and lower limits of the 95% confidence interval for m as follows:

lower limit: antilog(1.610277) = 40.8%

upper limit: antilog(1.702777) = 50.4%

APPENDIX K

TRIMMED SPEARMAN-KARBER METHOD

1. The Trimmed Spearman-Karber Method is a modification of the Spearman-Karber Method, a nonparametric statistical procedure for estimating the LC50 and the associated 95% confidence interval (Hamilton et al, 1977). Appendix The Trimmed Spearman-Karber Method estimates the trimmed mean of the distribution of the $\log_{10}$ of the tolerance. If the log tolerance distribution is symmetric, this estimate of the trimmed mean is equivalent to an estimate of the median of the log tolerance distribution.

2. If the response proportions are not monotonically non-decreasing with increasing concentration (constant or steadily increasing with concentration), the data must be smoothed. Abbott's procedure is used to "adjust" the concentration response proportions for mortality occurring in the control replicates.

3. Use of the Trimmed Spearman-Karber Analysis is recommended only when the requirements for the Probit Method and the Spearman-Karber Method are not met.

4. To calculate the LC50 using the Trimmed Spearman-Karber Method, the smoothed, adjusted, observed proportion mortalities must bracket 0.5.

5. To calculate the 95% confidence interval for the LC50 estimate, one or more of the smoothed, adjusted, observed proportion mortalities must be between zero and one.

6. Let $p_0, p_1, ..., p_k$ denote the observed proportion mortalities for the control and the k effluent concentrations. The first step is to smooth the p_i if they do not satisfy $p_0 \le p_1 \le ... \le p_k$. The smoothing process replaces any adjacent p_i's that do not conform to $p_0 \le p_1 \le ... \le p_k$, with their average. For example, if p_i is less than p_{i-1} then:

Where: $p^s_{i-1} = p^s_i = (p_i + p_{i-1})/2$

p^s_i = the smoothed observed proportion mortality for effluent concentration i.

7. Adjust the smoothed observed proportion mortality in each effluent concentration for mortality in the control group using Abbott's formula (Finney, 1971). The adjustment takes the form:

Where: $p^a_i = (p^s_i - p^s_0) / (1 - p^s_0)$

p^s_0 = the smoothed observed proportion mortality for the control

p^s_i = the smoothed observed proportion mortality for effluent concentration i.

8. Calculate the amount of trim to use in the estimation of the LC50 as follows:

Where: Trim = $\max(p^a_1, 1-p^a_k)$

p^a_1 = the smoothed, adjusted proportion mortality for the lowest effluent concentration, exclusive of the control

p^a_k = the smoothed, adjusted proportion mortality for the highest effluent concentration

k = the number of effluent concentrations, exclusive of the control.

The minimum trim should be calculated for each data set rather than using a fixed amount of trim for each data set.

9. Due to the intensive nature of the calculation for the estimated LC50 and the calculation of the associated 95% confidence interval using the Trimmed Spearman-Karber Method, it is recommended that the data be analyzed by computer.

10. A computer program which estimates the LC50 and associated 95% confidence interval using the Trimmed Spearman-Karber Method, can be obtained from EMSL-Cincinnati by sending a written request to EMSL, 3411 Church Street, Cincinnati, OH 45244.

11. The Trimmed Spearman-Karber program automatically performs the following functions:

a. Smoothing.
b. Adjustment for mortality in the control.
c. Calculation of the necessary trim.
d. Calculation of the LC50.
e. Calculation of the associated 95% confidence interval.

12. To illustrate the Trimmed Spearman-Karber method using the Trimmed Spearman-Karber computer program, a set of data from a Fathead Minnow Larval Survival and Growth test will be used. The data are listed in Table K.1.

TABLE K.1. EXAMPLE OF TRIMMED SPEARMAN-KARBER METHOD: MORTALITY DATA FROM A FATHEAD MINNOW LARVAL SURVIVAL AND GROWTH TEST (40 ORGANISMS PER CONCENTRATION)

Effluent Concentration %	Number of Mortalities	Mortality Proportion
Control	2	0.05
6.25	0	0.00
12.5	2	0.05
25.0	0	0.00
50.0	0	0.00
100.0	32	0.80

12.1 The program requests the following input (Figure K.1):

a. Output destination (D = disk file, P = printer).
b. Control data.
c. Data for each toxicant concentration.

12.2 The program output includes the following (Figure K.2):

a. A table of the concentrations tested, number of organisms exposed, and mortalities.
b. The amount of trim used in the calculation.
c. The estimated LC50 and the associated 95% confidence interval.

```
A:>spearman

 TRIMMED SPEARMAN-KARBER METHOD.  VERSION 1.5

ENTER DATE OF TEST:
1
ENTER TEST NUMBER:
2
WHAT IS TO BE ESTIMATED?
(ENTER "L" FOR LC50 AND "E" FOR EC50)
 L
ENTER TEST SPECIES NAME:
Fathead minnow
ENTER TOXICANT  NAME:
Effluent
ENTER UNITS FOR EXPOSURE CONCENTRATION OF TOXICANT:
%
ENTER THE NUMBER OF INDIVIDUALS IN THE CONTROL:
 40
ENTER THE NUMBER OF MORTALITIES IN THE CONTROL:
2
ENTER THE NUMBER OF CONCENTRATIONS
(NOT INCLUDING THE CONTROL;  MAX = 10):
5
ENTER THE  5 EXPOSURE CONCENTRATIONS (IN INCREASING ORDER):
6.25  12.5  25  50  100
ARE THE NUMBER OF INDIVIDUALS AT EACH EXPOSURE CONCENTRATION EQUAL(Y/N)?
y
ENTER THE NUMBER OF INDIVIDUALS AT EACH EXPOSURE CONCENTRATION:        40

ENTER UNITS FOR DURATION OF EXPERIMENT
(ENTER "H" FOR HOURS, "D" FOR DAYS, ETC.):
Days
ENTER DURATION OF TEST:
7
ENTER THE NUMBER OF MORTALITIES AT EACH EXPOSURE CONCENTRATION:        0 2 0 0 32

WOULD YOU LIKE THE AUTOMATIC TRIM CALCULATION(Y/N)?
 y
```

Figure K.1. Example input for Trimmed Spearman-Karber Method.

TRIMMED SPEARMAN-KARBER METHOD. VERSION 1.5

DATE: 1 TEST NUMBER: 2 DURATION: 7 Days
TOXICANT: effluent
SPECIES: fathead minnow

RAW DATA: Concentration (%)	Number Exposed	Mortalities
.00	40	2
6.25	40	0
12.50	40	2
25.00	40	0
50.00	40	0
100.00	40	32

SPEARMAN-KARBER TRIM: 20.41%

SPEARMAN-KARBER ESTIMATES: LC50: 77.28
95% CONFIDENCE LIMITS
ARE NOT RELIABLE.

NOTE: MORTALITY PROPORTIONS WERE NOT MONOTONICALLY INCREASING.
ADJUSTMENTS WERE MADE PRIOR TO SPEARMAN-KARBER ESTIMATION.

Figure K.2. Example output for Trimmed Spearman-Karber Method.

APPENDIX L

GRAPHICAL METHOD

1. The Graphical Method is used to calculate the LC50. It is a mathematical procedure which estimates the LC50 by linearly interpolating between points of a plot of observed percent mortality versus the base 10 logarithm ($\log_{10}$) of percent effluent concentration. This method does not provide a confidence interval for the LC50 estimate and its use is only recommended when there are no partial mortalities. The only requirement for the Graphical Method is that the observed percent mortalities bracket 50%.

2. For an analysis using the Graphical Method the data must first be smoothed and adjusted for mortality in the control replicates. The procedure for smoothing and adjusting the data is detailed in the following steps.

3. The Graphical Method is illustrated below using a set of mortality data from an Fathead Minnow Larval Survival and Growth test. These data are listed in Table L.1.

TABLE L.1. EXAMPLE OF GRAPHICAL METHOD: MORTALITY DATA FROM A FATHEAD MINNOW LARVAL SURVIVAL AND GROWTH TEST (40 ORGANISMS PER CONCENTRATION)

Effluent Concentration %	Number of Mortalities	Mortality Proportion
Control	2	0.05
6.25	0	0.00
12.5	0	0.00
25.0	0	0.00
50.0	40	1.00
100.0	40	1.00

4. Let $p_0, p_1, ..., p_k$ denote the observed proportion mortalities for the control and the k effluent concentrations. The first step is to smooth the p_i if they do not satisfy $p_0 \le p_1 \le ... \le p_k$. The smoothing process replaces any adjacent p_i's that do not conform to $p_0 \le p_1 \le ... \le p_k$ with their average. For example, if p_i is less than p_{i-1} then:

$$p_{i-1}^s = p_i^s = (p_i + p_{i-1})/2$$

Where: p_i^s = the smoothed observed proportion mortality for effluent concentration i.

4.1 For the data in this example, because the observed mortality proportions for the 6.25%, 12.5%, and 25.0% effluent concentrations are less than the observed response proportion for the control, the values for these four groups must be averaged:

$$p_0^s = p_1^s = p_2^s = p_3^s = \frac{0.05+0.00+0.00+0.00}{4} = \frac{0.05}{4} = 0.0125$$

4.2 Since $p_4 = p_5 = 1.00$ are larger then 0.0125, set $p_4^s = p_5^s = 1.00$. Additional smoothing is not necessary. The smoothed observed proportion mortalities are shown in Table L.2.

TABLE L.2. EXAMPLE OF GRAPHICAL METHOD: SMOOTHED, ADJUSTED MORTALITY DATA FROM A FATHEAD MINNOW LARVAL SURVIVAL AND GROWTH TEST

Effluent Concentration %	Mortality Proportion	Smoothed Mortality Proportion	Smoothed, Adjusted Mortality Proportion
Control	0.05	0.0125	0.00
6.25	0.00	0.0125	0.00
12.5	0.00	0.0125	0.00
25.0	0.00	0.0125	0.00
50.0	1.00	1.0000	1.00
100.0	1.00	1.0000	1.00

5. Adjust the smoothed observed proportion mortality in each effluent concentration for mortality in the control group using Abbott's formula (Finney, 1971). The adjustment takes the form:

$$p_i^a = (p_i^s - p_0^s) / (1 - p_0^s)$$

Where: p_0^s = the smoothed observed proportion mortality for the control

p_i^s = the smoothed observed proportion mortality for effluent concentration i.

5.1 Because the smoothed observed proportion mortality for the control group is greater than zero, the responses must be adjusted using Abbott's formula, as follows:

$$p_0^a = p_1^a = p_2^a = p_3^a = \frac{p_1^s - p_0^s}{1 - p_0^s} = \frac{0.0125 - 0.0125}{1 - 0.0125} = \frac{0.0}{0.9875} = 0.0$$

$$p_4^a = p_5^a = \frac{p_4^s - p_0^s}{1 - p_0^s} = \frac{1.00 - 0.0125}{1 - 0.0125} = \frac{0.9875}{0.9875} = 1.00$$

A table of the smoothed, adjusted response proportions for the effluent concentrations are shown in Table L.2.

5.2 Plot the smoothed, adjusted data on 2-cycle semi-log graph paper with the logarithmic axis (the y axis) used for percent effluent concentration and the linear axis (the x axis) used for observed percent mortality. A plot of the smoothed, adjusted data is shown in Figure L.1.

6. Locate the two points on the graph which bracket 50% mortality and connect them with a straight line.

7. On the scale for percent effluent concentration, read the value for the point where the plotted line and the 50% mortality line intersect. This value is the estimated LC50 expressed as a percent effluent concentration.

7.1 For this example, the two points on the graph which bracket the 50% mortality line (0% mortality at 25% effluent, and 100% mortality at 50% effluent) are connected with a straight line. The point at which the plotted line intersects the 50% mortality line is the estimated LC50. The estimated LC50 = 35% effluent.

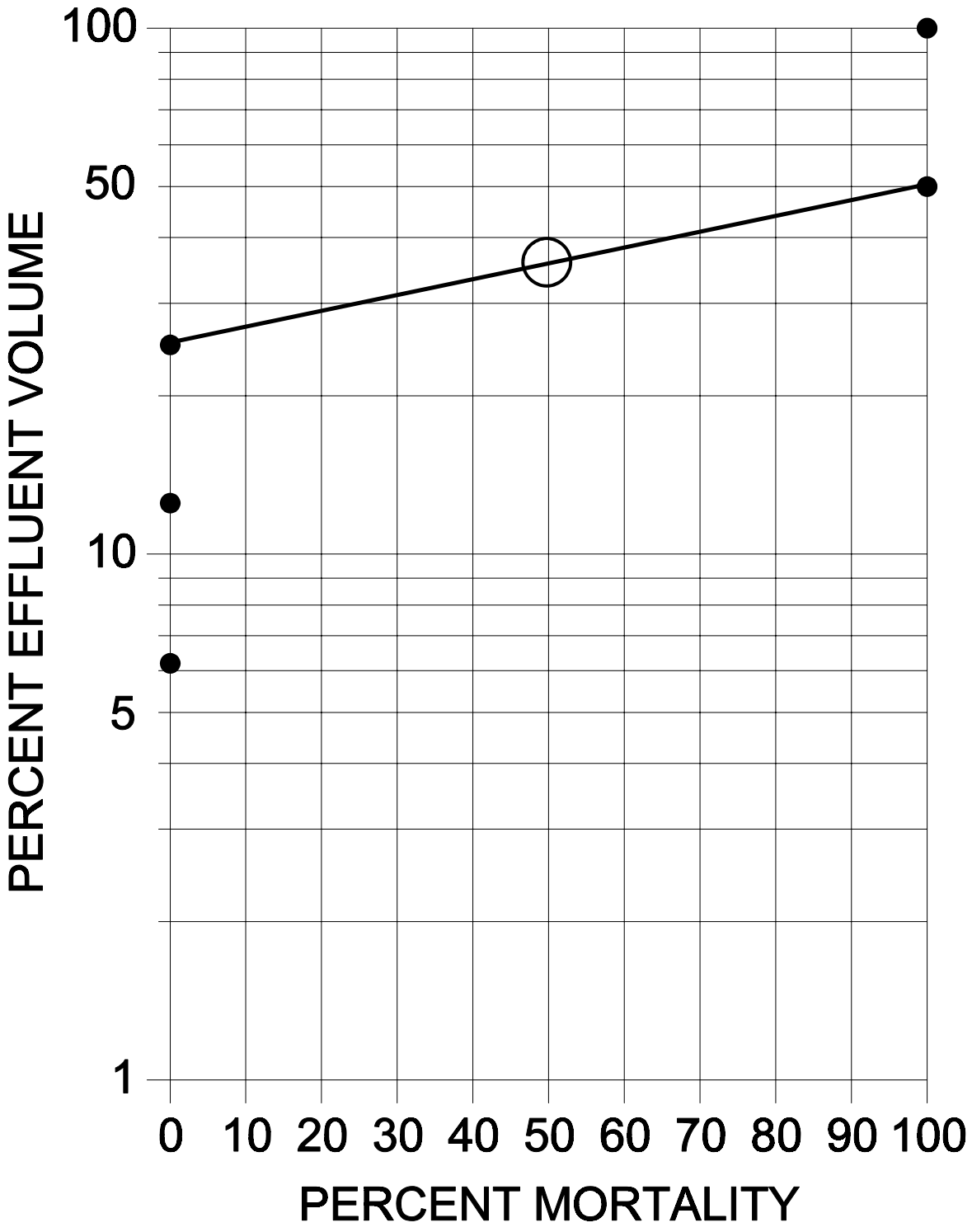

Figure L.1 Plot of the smoothed adjusted response proportions for fathead minnow, *Pimephales promelas*, survival data.

APPENDIX M

LINEAR INTERPOLATION METHOD

1. GENERAL PROCEDURE

1.1 The Linear Interpolation Method is used to calculate a point estimate of the effluent or other toxicant concentration that causes a given percent reduction (e.g., 25%, 50%, etc.) in the reproduction or growth of the test organisms (Inhibition Concentration, or IC). The procedure was designed for general applicability in the analysis of data from short-term chronic toxicity tests, and the generation of an endpoint from a continuous model that allows a traditional quantitative assessment of the precision of the endpoint, such as confidence limits for the endpoint of a single test, and a mean and coefficient of variation for the endpoints of multiple tests.

1.2 The Linear Interpolation Method assumes that the responses (1) are monotonically non-increasing, where the mean response for each higher concentration is less than or equal to the mean response for the previous concentration, (2) follow a piecewise linear response function, and (3) are from a random, independent, and representative sample of test data. If the data are not monotonically nonincreasing, they are adjusted by smoothing (averaging). In cases where the responses at the low toxicant concentrations are much higher than in the controls, the smoothing process may result in a large upward adjustment in the control mean. Also, no assumption is made about the distribution of the data except that the data within a group being resampled are independent and identically distributed.

2. DATA SUMMARY AND PLOTS

2.1 Calculate the mean responses for the control and each toxicant concentration, construct a summary table, and plot the data.

3. MONOTONICITY

3.1 If the assumption of monotonicity of test results is met, the observed response means ($\bar{Y}_i$) should stay the same or decrease as the toxicant concentration increases. If the means do not decrease monotonically, the responses are "smoothed" by averaging (pooling) adjacent means.

3.2 Observed means at each concentration are considered in order of increasing concentration, starting with the control mean ($\bar{Y}_1$). If the mean observed response at the lowest toxicant concentration ($\bar{Y}_2$) is equal to or smaller than the control mean ($\bar{Y}_1$), it is used as the response. If it is larger than the control mean, it is averaged with the control, and this average is used for both the control response (M_1) and the lowest toxicant concentration response (M_2). This mean is then compared to the mean observed response for the next higher toxicant concentration ($\bar{Y}_3$). Again, if the mean observed response for the next higher toxicant concentration is smaller than the mean of the control and the lowest toxicant concentration, it is used as the response. If it is higher than the mean of the first two, it is averaged with the first two, and the mean is used as the response for the control and two lowest concentrations of toxicant. This process is continued for data from the remaining toxicant concentrations. A numerical example of smoothing the data is provided below. (Note: Unusual patterns in the deviations from monotonicity may require an additional step of smoothing). Where $\bar{Y}_i$ decrease monotonically, the $\bar{Y}_i$ become M_i without smoothing.

4. LINEAR INTERPOLATION METHOD

4.1 The method assumes a linear response from one concentration to the next. Thus, the ICp is estimated by linear interpolation between two concentrations whose responses bracket the response of interest, the (p) percent reduction from the control.

4.2 To obtain the estimate, determine the concentrations C_J and C_{J+1} which bracket the response M_1 (1 - p/100), where M_1 is the smoothed control mean response and p is the percent reduction in response relative to the control

response. These calculations can easily be done by hand or with a computer program as described below. The linear interpolation estimate is calculated as follows:

$$ICp = C_J + [\ M_1\ (1 - p/100) - M_J\ ]\ \frac{(C_{J+1} - C_J)}{(M_{J+1} - M_J)}$$

Where: C_J = tested concentration whose observed mean response is greater than $M_1(1 - p/100)$.

C_{J+1} = tested concentration whose observed mean response is less than $M_1(1 - p/100)$.

M_1 = smoothed mean response for the control.

M_J = smoothed mean response for concentration J.

M_{J+1} = smoothed mean response for concentration J + 1.

p = percent reduction in response relative to the control response.

ICp = estimated concentration at which there is a percent reduction from the smoothed mean control response. The ICp is reported for the test, together with the 95% confidence interval calculated by the ICPIN.EXE program described below.

4.3 If the C_J is the highest concentration tested, the ICp would be specified as *greater than* C_J. If the response at the lowest concentration tested is used to extrapolate the ICp value, the ICp should be expressed as a *less than the lowest test concentration.*

5. CONFIDENCE INTERVALS

5.1 Due to the use of a linear interpolation technique to calculate an estimate of the ICp, standard statistical methods for calculating confidence intervals are not applicable for the ICp. This limitation is avoided by use a technique known as the bootstrap method as proposed by Efron (1982) for deriving point estimates and confidence intervals.

5.2 In the Linear Interpolation Method, the smoothed response means are used to obtain the ICp estimate reported for the test. The bootstrap method is used to obtain the 95% confidence interval for the true mean. In the bootstrap method, the test data Y_{ji} is randomly resampled with replacement to produce a new set of data Y_{ji}*, that is statistically equivalent to the original data, but a new and slightly different estimate of the ICp (ICp*) is obtained. This process is repeated at least 80 times (Marcus and Holtzman, 1988) resulting in multiple "data" sets, each with an associate ICp* estimate. The distribution of the ICp* estimates derived from the sets of resampled data approximates the sampling distribution of the ICp estimate. The standard error of the ICp is estimated by the standard deviation of the individual ICp* estimates. Empirical confidence intervals are derived from the quantiles of the ICp* empirical distribution. For example, if the test data are resampled a minimum of 80 time, the empirical 2.5% and the 97.5% confidence limits are approximately the second smallest and second largest ICp* estimates (Marcus and Holtzman, 1988).

5.3 The width of the confidence intervals calculated by the bootstrap method is related to the variability of the data. When confidence intervals are wide, the reliability of the IC estimate is in question. However, narrow intervals do not necessarily indicate that the estimate is highly reliable, because of undetected violations of assumptions and the fact that the confidence limits based on the empirical quantiles of a bootstrap distribution of 80 samples may be unstable.

5.4 The bootstrapping method of calculating confidence intervals is computationally intensive. For this reason, all of the calculations associated with determining the confidence intervals for the ICp estimate have been incorporated into a computer program. Computations are most easily done with a computer program such as the revision of the

BOOTSTRP program (USEPA, 1988; USEPA, 1989) which is now called "ICPIN" which is described below in subsection 7.

6. **MANUAL CALCULATIONS**

6.1 DATA SUMMARY AND PLOTS

6.1.1 The data used in this example are the *Ceriodaphnia dubia* reproduction data used in the example in Section 13. Table M.1 includes the raw data and the mean reproduction for each concentration. Data are included for all animals tested regardless of death of the organism. If an animal died during the test without producing young, a zero is entered. If death occurred after producing young, the number of young produced prior to death is entered. A plot of the data is provided in Figure M.1.

TABLE M.1. *CERIODAPHNIA DUBIA* REPRODUCTION DATA

		Effluent Concentration (%)				
Replicate	Control	1.56	3.12	6.25	12.5	25.0
1	27	32	39	27	10	0
2	30	35	30	34	13	0
3	29	32	33	36	7	0
4	31	26	33	34	7	0
5	16	18	36	31	7	0
6	15	29	33	27	10	0
7	18	27	33	33	10	0
8	17	16	27	31	16	0
9	14	35	38	33	12	0
10	27	13	44	31	2	0
Mean ($\overline{Y}_i$)	22.4	26.3	34.6	31.7	9.4	0
i	1	2	3	4	5	6

6.2 MONOTONICITY

6.2.1 As can be seen from the plot in Figure M.1, the observed means are not monotonically non-increasing with respect to concentration. Therefore, the means must be smoothed prior to calculating the IC.

6.2.2 Starting with the control mean $\overline{Y}_1 = 22.4$ and $\overline{Y}_2 = 26.3$, we see that $\overline{Y}_1 < \overline{Y}_2$. Calculate the smoothed means:

$$M_1 = M_2 = (\overline{Y}_1 + \overline{Y}_2)/2 = 24.35$$

6.2.3 Since $\overline{Y}_3 = 34.6$ is larger than M_2, average $\overline{Y}_3$ with the previous concentrations:

6.2.4 Additionally, $\overline{Y}_4 = 31.7$ is larger than M_3, and is pooled with the first three means. Thus,

$$M_1 = M_2 = M_3 = M_4 = (M_1 + M_2 + M_3 + \overline{Y}_4)/4 = 28.7$$

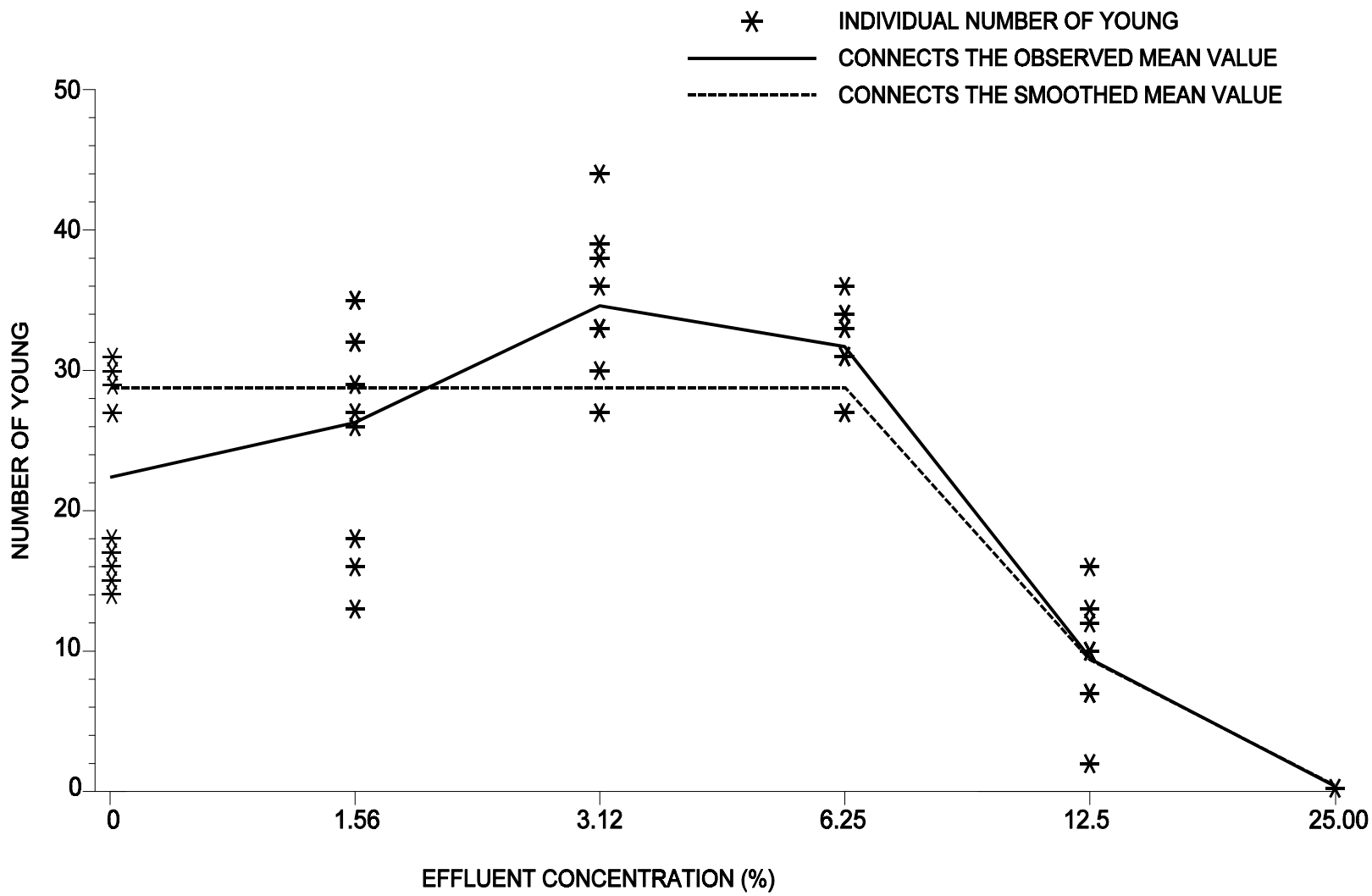

Figure M.1. Plot of raw data, observed means, and smoothed means for the daphnid, *Ceriodaphnia dubia*, reproductive data.

TABLE M.2. *CERIODAPHNIA DUBIA* REPRODUCTION MEAN RESPONSE AFTER SMOOTHING

Effluent Concentration %	i	Response Mean (Y_i) (Young/female)	Smoothed Mean (M_i) (Young/female)
Control	1	22.4	28.75
1.56	2	26.3	28.75
3.12	3	34.6	28.75
6.25	4	31.7	28.75
12.5	5	9.4	9.40
25.0	6	0.0	0.00

6.2.5 Since $M_4 > \overline{Y}_5 = 9.4$, set $M_5 = 9.4$. Likewise, $M_5 > \overline{Y}_6 = 0$ and M_6 becomes 0. Table M.2 contains the smoothed means and Figure M.1 gives a plot of the smoothed response curve.

6.3 LINEAR INTERPOLATION

6.3.1 Estimates of the IC25 and IC50 are calculated using the Linear Interpolation Method. A 25% reduction in reproduction, compared to the controls, would result in a mean reproduction of 21.56 young per adult, where $M_1(1-p/100) = 28.75(1-25/100)$. A 50% reduction in reproduction, compared to the controls, would result in a mean reproduction of 14.38 young per adult, where $M_1(1-p/100) = 28.75(1-50/100)$. Examining the smoothed means and their associated concentrations (Table M.2), the two effluent concentrations bracketing the reproduction of 21.56 young per adult are $C_4 = 6.25\%$ effluent and $C_5 = 12.5\%$ effluent. The two effluent concentrations bracketing a response of 14.38 young per adult are also $C_4 = 6.25\%$ effluent and $C_5 = 12.5\%$ effluent.

6.3.2 Using Equation 1 from 4.2, the estimate of the IC25 is calculated as follows:

$$ICp = C_J + [\, M_1\,(1 - p/100) - M_J \,]\ \frac{(C_{J+1} - C_J)}{(M_{J+1} - M_J)}$$

$$IC25 = 6.25 + [28.75\,(1 - 25/100) - 28.75]\frac{(12.5 - 6.25)}{(9.40 - 28.75)}$$

$$= 8.57\% \text{ effluent}$$

6.3.3 Using the equation from section 4.2, the estimate of the IC50 is calculated as follows:

$$ICp = C_J + [\, M_1\,(1 - p/100) - M_J \,]\ \frac{(C_{J+1} - C_J)}{(M_{J+1} - M_J)}$$

$$IC50 = 6.25 + [28.75\,(1 - 50/100) - 28.75]\ \frac{(12.5 - 6.25)}{(9.40 - 28.75)}$$

$$= 10.89\% \text{ effluent}$$

6.4 CONFIDENCE INTERVALS

6.4.1 Confidence intervals for the ICp are derived using the bootstrap method. As described above, this method involves randomly resampling the individual observations and recalculating the ICp at least 80 times, and determining the mean ICp, standard deviation, and empirical 95% confidence intervals. For this reason, the confidence intervals are calculated using a computer program called ICPIN. This program is described below and is available to carry out all the calculations of both the interpolation estimate (ICp) and the confidence intervals.

7. COMPUTER CALCULATIONS

7.1 The computer program, ICPIN, prepared for the Linear Interpolation Method was written in TURBO PASCAL for IBM compatible PCs. The program (version 2.0) has been modified by Computer Science Corporation, Duluth, MN with funding provided by the Environmental Research Laboratory, Duluth, MN (Norberg-King, 1993). The program was originally developed by Battelle Laboratories, Columbus, OH through a government contract supported by the Environmental Research Laboratory, Duluth, MN (USEPA, 1988). To obtain the program and supporting documentation, send a written request to EMSL-Cincinnati at 3411 Church Street, Cincinnati, OH 45244.

7.2 The ICPIN.EXE program performs the following functions: 1) it calculates the observed response means (Y_i) (response means); 2) it calculates the standard deviations; 3) checks the responses for monotonicity; 4) calculates smoothed means (M_i) (pooled response means) if necessary; 5) uses the means, M_i, to calculate the initial ICp of choice by linear interpolation; 6) performs a user-specified number of bootstrap resamples between 80 and 1000 (as multiples of 40); 7) calculates the mean and standard deviation of the bootstrapped ICp estimates; and 8) provides an original 95% confidence intervals to be used with the initial ICp when the number of replicates per concentration is over six and provides both original and expanded confidence intervals when the number of replicates per concentration are less than seven (Norberg-King, 1993).

7.3 For the IC*p* calculation, up to twelve treatments can be used (which includes the control). There can be up to 40 replicates per concentration, and the program does not require an equal number of replicates per concentration. The value of p can range from 1% to 99%.

7.4 DATA INPUT

7.4.1 Data is entered directly into the program onscreen. A sample data entry screen in shown in Figure M.2. The program documentation provides guidance on the entering and analysis of data for the Linear Interpolation Method (Norberg-King, 1993).

7.4.2 The user selects the ICp estimate desired (e.g., IC25 or IC50) and the number of resamples to be taken for the bootstrap method of calculating the confidence intervals. The program has the capability of performing any number of resamples from 80 to 1000 as multiples of 40. However, Marcus and Holtzman (1988) recommend a minimum of 80 resamples for the bootstrap method be used and at least 250 resamples are better (Norberg-King, 1993).

7.5 DATA OUTPUT.

7.5.1 The program output includes the following (Figures M.3 and M.4):

1. A table of the concentration identification, the concentration tested and raw data response for each replicate and concentration.
2. A table of test concentrations, number of replicates, concentration (units), response means ($\bar{Y}_i$), standard deviations for each response mean, and the pooled response means (smoothed means; M_i).
3. The linear interpolation estimate of the ICp using the means (M_i). *Use this value for the ICp estimate.*
4. The mean ICp and standard deviation from the bootstrap resampling.
5. The confidence intervals calculated by the bootstrap method for the ICp. Provides an original 95% confidence intervals to be used with the initial ICp when the number of replicates per concentration is

over six and provides both original and expanded confidence intervals when the number of replicates per concentration are less than seven.

7.6 ICPIN program output for the analysis of the *Ceriodaphnia dubia* reproduction data in Table M.1 is provided in Figures M.3 and M.4.

7.6.1 When the ICPIN program was used to analyze this set of data, requesting 80 resamples, the estimate of the IC25 was 8.57% effluent. The empirical 95% confidence intervals for the true mean were 8.30% to 8.85% effluent.

7.6.2 When the ICPIN program was used to analyze this set of data, requesting 80 resamples, the estimate of the IC50 was 10.89% effluent. The empirical 95% confidence intervals for the true mean were 10.36% to 11.62% effluent.

ICp Data Entry/Edit Screen Current File:

Conc. ID	1	2	3	4	5	6
Conc. Tested						
Conc. Tested						
Response 1						
Response 2						
Response 3						
Response 4						
Response 5						
Response 6						
Response 7						
Response 8						
Response 9						
Response 10						
Response 11						
Response 12						
Response 13						
Response 14						
Response 15						
Response 16						
Response 17						
Response 18						
Response 19						
Response 20						

F10 for Command Menu Use arrow Keys to Switch Fields

Figure M.2. ICp data entry/edit screen. Twelve concentrating identifications can be used. Data for concentrations are entered in columns 1 through 6. For concentrations 7 through 12 and responses 21-40 the data is entered in additional fields of the same screen.

Conc. ID	1	2	3	4	5	6
Conc. Tested	0	1.56	3.12	6.25	12.5	25.0
Response 1	27	32	39	27	10	0
Response 2	30	35	30	34	13	0
Response 3	29	32	33	36	7	0
Response 4	31	26	33	34	7	0
Response 5	16	18	36	31	7	0
Response 6	15	29	33	27	10	0
Response 7	18	27	33	33	10	0
Response 8	17	16	27	31	16	0
Response 9	14	35	38	33	12	0
Response 10	27	13	44	31	2	0

*** Inhibition Concentration Percentage Estimate ***
Toxicant/Effluent:
Test Start Date: app M Test Ending Date:
Test Species: Ceriodaphnia dubia
Test Duration: 7-d
DATA FILE: cerioman.icp
OUTPUT FILE: cerioman.i25

Conc. ID	Number Replicates	Concentration %	Response Means	Std. Dev.	Pooled Response Means
1	10	0.000	22.400	6.931	28.750
2	10	1.560	26.300	8.001	28.750
3	10	3.120	34.600	4.835	28.750
4	10	6.250	31.700	2.946	28.750
5	10	12.500	9.400	3.893	9.400
6	10	25.000	0.000	0.000	0.000

The Linear Interpolation Estimate: 8.5715 Entered P Value: 25

Number of Resamplings: 80
The Bootstrap Estimates Mean: 8.6014 Standard Deviation: 0.1467
Original Confidence Limits: Lower: 8.3040 Upper: 8.8496
Resampling time in Seconds: 2.53 Random Seed: -1652543090

Figure M.3. Example of ICPIN program output for the IC25.

Conc. ID	1	2	3	4	5	6
Conc. Tested	0	1.56	3.12	6.25	12.5	25.0
Response 1	27	32	39	27	10	0
Response 2	30	35	30	34	13	0
Response 3	29	32	33	36	7	0
Response 4	31	26	33	34	7	0
Response 5	16	18	36	31	7	0
Response 6	15	29	33	27	10	0
Response 7	18	27	33	33	10	0
Response 8	17	16	27	31	16	0
Response 9	14	35	38	33	12	0
Response 10	27	13	44	31	2	0

*** Inhibition Concentration Percentage Estimate ***
Toxicant/Effluent:
Test Start Date: app M Test Ending Date:
Test Species: Ceriodaphnia dubia
Test Duration: 7-d
DATA FILE: cerioman.icp
OUTPUT FILE: cerioman.i50

Conc. ID	Number Replicates	Concentration %	Response Means	Std. Dev.	Pooled Response Means
1	10	0.000	22.400	6.931	28.750
2	10	1.560	26.300	8.001	28.750
3	10	3.120	34.600	4.835	28.750
4	10	6.250	31.700	2.946	28.750
5	10	12.500	9.400	3.893	9.400
6	10	25.000	0.000	0.000	0.000

The Linear Interpolation Estimate: 10.8931 Entered P Value: 50

Number of Resamplings: 80
The Bootstrap Estimates Mean: 10.9108 Standard Deviation: 0.3267
Original Confidence Limits: Lower: 10.3618 Upper: 11.6201
Resampling time in Seconds: 2.58 Random Seed: 340510286

Figure M.4. Example of ICPIN program output for the IC50.

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

NOV 22 2002

OFFICE OF WATER

MEMORANDUM

SUBJECT: Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs

FROM: Robert H. Wayland, III, Director
Office of Wetlands, Oceans and Watersheds

James A. Hanlon, Director
Office of Wastewater Management

TO: Water Division Directors
Regions 1 - 10

This memorandum clarifies existing EPA regulatory requirements for, and provides guidance on, establishing wasteload allocations (WLAs) for storm water discharges in total maximum daily loads (TMDLs) approved or established by EPA. It also addresses the establishment of water quality-based effluent limits (WQBELs) and conditions in National Pollutant Discharge Elimination System (NPDES) permits based on the WLAs for storm water discharges in TMDLs. The key points presented in this memorandum are as follows:

NPDES-regulated storm water discharges must be addressed by the wasteload allocation component of a TMDL. See 40 C.F.R. § 130.2(h).

NPDES-regulated storm water discharges may not be addressed by the load allocation (LA) component of a TMDL. See 40 C.F.R. § 130.2 (g) & (h).

Storm water discharges from sources that are not currently subject to NPDES regulation may be addressed by the load allocation component of a TMDL. See 40 C.F.R. § 130.2(g).

It may be reasonable to express allocations for NPDES-regulated storm water discharges from multiple point sources as a single categorical wasteload allocation when data and information are insufficient to assign each source or outfall individual WLAs. See 40 C.F.R. § 130.2(i). In cases where wasteload allocations

are developed for categories of discharges, these categories should be defined as narrowly as available information allows.

The WLAs and LAs are to be expressed in numeric form in the TMDL. See 40 C.F.R. § 130.2(h) & (i). EPA expects TMDL authorities to make separate allocations to NPDES- regulated storm water discharges (in the form of WLAs) and unregulated storm water (in the form of LAs). EPA recognizes that these allocations might be fairly rudimentary because of data limitations and variability in the system.

NPDES permit conditions must be consistent with the assumptions and requirements of available WLAs. See 40 C.F.R. § 122.44(d)(1)(vii)(B).

WQBELs for NPDES-regulated storm water discharges that implement WLAs in TMDLs may be expressed in the form of best management practices (BMPs) under specified circumstances. See 33 U.S.C. §1342(p)(3)(B)(iii); 40 C.F.R. §122.44(k)(2)&(3). If BMPs alone adequately implement the WLAs, then additional controls are not necessary.

EPA expects that most WQBELs for NPDES-regulated municipal and small construction storm water discharges will be in the form of BMPs, and that numeric limits will be used only in rare instances.

When a non-numeric water quality-based effluent limit is imposed, the permit's administrative record, including the fact sheet when one is required, needs to support that the BMPs are expected to be sufficient to implement the WLA in the TMDL. See 40 C.F.R. §§ 124.8, 124.9 & 124.18.

The NPDES permit must also specify the monitoring necessary to determine compliance with effluent limitations. See 40 C.F.R. § 122.44(i). Where effluent limits are specified as BMPs, the permit should also specify the monitoring necessary to assess if the expected load reductions attributed to BMP implementation are achieved (e.g., BMP performance data).

The permit should also provide a mechanism to make adjustments to the required BMPs as necessary to ensure their adequate performance.

This memorandum is organized as follows:

(I). Regulatory basis for including NPDES-regulated storm water discharges in WLAs in TMDLs;

(II). Options for addressing storm water in TMDLs; and

(III). Determining effluent limits in NPDES permits for storm water discharges consistent with the WLA

(I). Regulatory Basis for Including NPDES-regulated Storm Water Discharges in WLAs in TMDLs

As part of the 1987 amendments to the CWA, Congress added Section 402(p) to the Act to cover discharges composed entirely of storm water. Section 402(p)(2) of the Act requires permit coverage for discharges associated with industrial activity and discharges from large and medium municipal separate storm sewer systems (MS4), i.e., systems serving a population over 250,000 or systems serving a population between 100,000 and 250,000, respectively. These discharges are referred to as Phase I MS4 discharges.

In addition, the Administrator was directed to study and issue regulations that designate additional storm water discharges, other than those regulated under Phase I, to be regulated in order to protect water quality. EPA issued regulations on December 8, 1999 (64 FR 68722), expanding the NPDES storm water program to include discharges from smaller MS4s (including all systems within "urbanized areas" and other systems serving populations less than 100,000) and storm water discharges from construction sites that disturb one to five acres, with opportunities for area-specific exclusions. This program expansion is referred to as Phase II.

Section 402(p) also specifies the levels of control to be incorporated into NPDES storm water permits depending on the source (industrial versus municipal storm water). Permits for storm water discharges associated with industrial activity are to require compliance with all applicable provisions of Sections 301 and 402 of the CWA, i.e., all technology-based and water quality-based requirements. See 33 U.S.C. §1342(p)(3)(A). Permits for discharges from MS4s, however, "shall require controls to reduce the discharge of pollutants to the maximum extent practicable ... and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants." See 33 U.S.C. §1342(p)(3)(B)(iii).

Storm water discharges that are regulated under Phase I or Phase II of the NPDES storm water program are point sources that must be included in the WLA portion of a TMDL. See 40 C.F.R. § 130.2(h). Storm water discharges that are not currently subject to Phase I or Phase II of the NPDES storm water program are not required to obtain NPDES permits. 33 U.S.C. §1342(p)(1) & (p)(6). Therefore, for regulatory purposes, they are analogous to nonpoint sources and may be included in the LA portion of a TMDL. See 40 C.F.R. § 130.2(g).

(II). Options for Addressing Storm Water in TMDLs

Decisions about allocations of pollutant loads within a TMDL are driven by the quantity and quality of existing and readily available water quality data. The amount of storm water data available for a TMDL varies from location to location. Nevertheless, EPA expects TMDL authorities will make separate aggregate allocations to NPDES-regulated storm water discharges

(in the form of WLAs) and unregulated storm water (in the form of LAs). It may be reasonable to quantify the allocations through estimates or extrapolations, based either on knowledge of land use patterns and associated literature values for pollutant loadings or on actual, albeit limited, loading information. EPA recognizes that these allocations might be fairly rudimentary because of data limitations.

EPA also recognizes that the available data and information usually are not detailed enough to determine waste load allocations for NPDES-regulated storm water discharges on an outfall-specific basis. In this situation, EPA recommends expressing the wasteload allocation in the TMDL as either a single number for all NPDES-regulated storm water discharges, or when information allows, as different WLAs for different identifiable categories, e.g., municipal storm water as distinguished from storm water discharges from construction sites or municipal storm water discharges from City A as distinguished from City B. These categories should be defined as narrowly as available information allows (e.g., for municipalities, separate WLAs for each municipality and for industrial sources, separate WLAs for different types of industrial storm water sources or dischargers).

(III). Determining Effluent Limits in NPDES Permits for Storm Water Discharges Consistent with the WLA

Where a TMDL has been approved, NPDES permits must contain effluent limits and conditions consistent with the requirements and assumptions of the wasteload allocations in the TMDL. See 40 CFR § 122.44(d)(1)(vii)(B). Effluent limitations to control the discharge of pollutants generally are expressed in numerical form. However, in light of 33 U.S.C. §1342(p)(3)(B)(iii), EPA recommends that for NPDES-regulated municipal and small construction storm water discharges effluent limits should be expressed as best management practices (BMPs) or other similar requirements, rather than as numeric effluent limits. See *Interim Permitting Approach for Water Quality-Based Effluent Limitations in Storm Water Permits*, 61 FR 43761 (Aug. 26, 1996). The Interim Permitting Approach Policy recognizes the need for an iterative approach to control pollutants in storm water discharges. Specifically, the policy anticipates that a suite of BMPs will be used in the initial rounds of permits and that these BMPs will be tailored in subsequent rounds.

EPA's policy recognizes that because storm water discharges are due to storm events that are highly variable in frequency and duration and are not easily characterized, only in rare cases will it be feasible or appropriate to establish numeric limits for municipal and small construction storm water discharges. The variability in the system and minimal data generally available make it difficult to determine with precision or certainty actual and projected loadings for individual dischargers or groups of dischargers. Therefore, EPA believes that in these situations, permit limits typically can be expressed as BMPs, and that numeric limits will be used only in rare instances.

Under certain circumstances, BMPs are an appropriate form of effluent limits to control pollutants in storm water. See 40 CFR § 122.44(k)(2) & (3). If it is determined that a BMP approach (including an iterative BMP approach) is appropriate to meet the storm water component of the TMDL, EPA recommends that the TMDL reflect this.

EPA expects that the NPDES permitting authority will review the information provided by the TMDL, see 40 C.F.R. § 122.44(d)(1)(vii)(B), and determine whether the effluent limit is appropriately expressed using a BMP approach (including an iterative BMP approach) or a numeric limit. Where BMPs are used, EPA recommends that the permit provide a mechanism to require use of expanded or better-tailored BMPs when monitoring demonstrates they are necessary to implement the WLA and protect water quality.

Where the NPDES permitting authority allows for a choice of BMPs, a discussion of the BMP selection and assumptions needs to be included in the permit's administrative record, including the fact sheet when one is required. 40 C.F.R.§§ 124.8, 124.9 & 124.18. For general permits, this may be included in the storm water pollution prevention plan required by the permit. See 40 C.F.R. § 122.28. Permitting authorities may require the permittee to provide supporting information, such as how the permittee designed its management plan to address the WLA(s). See 40 C.F.R. § 122.28. The NPDES permit must require the monitoring necessary to assure compliance with permit limitations, although the permitting authority has the discretion under EPA's regulations to decide the frequency of such monitoring. See 40 CFR § 122.44(i). EPA recommends that such permits require collecting data on the actual performance of the BMPs. These additional data may provide a basis for revised management measures. The monitoring data are likely to have other uses as well. For example, the monitoring data might indicate if it is necessary to adjust the BMPs. Any monitoring for storm water required as part of the permit should be consistent with the state's overall assessment and monitoring strategy.

The policy outlined in this memorandum affirms the appropriateness of an iterative, adaptive management BMP approach, whereby permits include effluent limits (e.g., a combination of structural and non-structural BMPs) that address storm water discharges, implement mechanisms to evaluate the performance of such controls, and make adjustments (i.e., more stringent controls or specific BMPs) as necessary to protect water quality. This approach is further supported by the recent report from the National Research Council (NRC), *Assessing the TMDL Approach to Water Quality Management* (National Academy Press, 2001). The NRC report recommends an approach that includes "adaptive implementation," i.e., "a cyclical process in which TMDL plans are periodically assessed for their achievement of water quality standards" . . . and adjustments made as necessary. *NRC Report* at ES-5.

This memorandum discusses existing requirements of the Clean Water Act (CWA) and codified in the TMDL and NPDES implementing regulations. Those CWA provisions and regulations contain legally binding requirements. This document describes these requirements; it does not substitute for those provisions or regulations. The recommendations in this memorandum are not binding; indeed, there may be other approaches that would be appropriate

in particular situations. When EPA makes a TMDL or permitting decision, it will make each decision on a case-by-case basis and will be guided by the applicable requirements of the CWA and implementing regulations, taking into account comments and information presented at that time by interested persons regarding the appropriateness of applying these recommendations to the particular situation. EPA may change this guidance in the future.

If you have any questions please feel free to contact us or Linda Boornazian, Director of the Water Permits Division or Charles Sutfin, Director of the Assessment and Watershed Protection Division.

cc:
Water Quality Branch Chiefs
Regions 1 - 10

Permit Branch Chiefs
Regions 1 - 10

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

JAN - 7 2003

OFFICE OF
WATER

MEMORANDUM

SUBJECT: Watershed-Based National Pollutant Discharge Elimination System (NPDES) Permitting Policy Statement

FROM: G. Tracy Mehan, III
Assistant Administrator

TO: Water Division Directors, Regions I - X

I am pleased to transmit to you the final Watershed-Based NPDES Permitting Policy Statement. The policy referenced in my December 3, 2002, memorandum on Advancing the Watershed Approach, represents an important aspect of EPA's commitment to watershed management and support for a holistic watershed approach to water quality management.

The policy describes the benefits of watershed-based permitting, and the implementing mechanisms for this component of the watershed approach, and how EPA will be encouraging an increase in the use of watershed-based NPDES permits over the next 12 months. Owing to the importance of NPDES permits and the potential benefits and efficiencies of this approach, I encourage you to work with your states to move watershed-based permitting from the concept stage to implementation stage.

If you have questions regarding this policy, please contact Robin Kime at (202) 564-5047. I greatly appreciate your support and leadership in this effort.

Attachment

cc: Christine Todd Whitman, Administrator
Linda Fisher, Deputy Administrator
Jessica Furey, Associate Administrator, Office of Policy, Economics, and Innovation
Regional Administrators
Office Directors, Office of Water

WATERSHED-BASED NPDES PERMITTING POLICY STATEMENT

Purpose

As outlined in Assistant Administrator for Water, G. Tracy Mehan's December 3, 2002, memo to EPA Office Directors and EPA Regions, EPA is committed to implement Office of Water programs through watershed management. EPA is issuing this policy statement to demonstrate the Agency's significant level of support for developing and issuing National Pollutant Discharge Elimination System (NPDES) permits on a watershed basis, and to further the objectives of the 1994 NPDES Watershed Strategy. For this Policy, watershed-based permitting is defined as an approach that produces NPDES permits that are issued to point sources on a geographic or watershed basis to meet watershed goals. This policy statement communicates EPA's policy on implementing NPDES permitting activities on a watershed basis, discusses the benefits of watershed-based permitting, presents an explanation of the process and several mechanisms to implement watershed-based permitting, and outlines how EPA will be encouraging watershed-based permitting.

A holistic watershed management approach provides a framework for addressing all stressors within a hydrologically defined drainage basin instead of viewing individual sources in isolation. Within a broader watershed management system, the watershed-based permitting approach is a tool that can assist with implementation activities. The utility of this tool relies heavily on a detailed, integrated and inclusive watershed planning process. Watershed planning includes monitoring and assessment activities that generate the data necessary for clear watershed goals to be established and permits to be designed to specifically address the goals.

Policy

EPA will build on the existing NPDES Watershed Strategy and previous activities to actively support and promote watershed-based NPDES permitting. Further, EPA will work to provide greater incentives and mechanisms necessary to undertake a more holistic and integrated approach to assessing water quality conditions, identifying and quantifying pollutant sources, developing and implementing efficient control practices, and working with stakeholders to the extent authorized by the Clean Water Act and implementing regulations. EPA will educate stakeholders about the benefits of watershed-based permitting, facilitate stakeholder involvement, and move watershed-based permitting from concept to implementation.

Benefits

EPA continues to support a holistic watershed approach to water quality management. The process for developing and issuing NPDES permits on a watershed basis is an important tool in water quality management. EPA believes that developing and issuing NPDES permits on a watershed basis can benefit all watershed stakeholders, from the NPDES permitting authority to local community

members. A watershed-based approach to point source permitting under the NPDES program may serve as one innovative tool for achieving new efficiencies and environmental results. EPA believes that watershed-based permitting can:

- lead to more environmentally effective results;
- emphasize measuring the effectiveness of targeted actions on improvements in water quality;
- provide greater opportunities for trading and other market based approaches;
- reduce the cost of improving the quality of the nation's waters;
- foster more effective implementation of watershed plans, including total maximum daily loads (TMDLs); and
- realize other ancillary benefits beyond those that have been achieved under the Clean Water Act (e.g., facilitate program integration including integration of Clean Water Act and Safe Drinking Water Act programs).

Explanation of the Process and Mechanisms to Implement Watershed-Based Permitting

Watershed-based permitting is a process that ultimately produces NPDES permits that are issued to point sources on a geographic or watershed basis. In establishing point source controls in a watershed-based permit, the permitting authority may focus on watershed goals, and consider multiple pollutant sources and stressors, including the level of nonpoint source control that is practicable. In general, there are numerous permitting mechanisms that may be used to develop and issue permits within a watershed approach. The most common approach currently used in many states is to re-issue NPDES permits according to a five-year rotating basin schedule. Each source receives an individual permit and the permits are issued based on basin or watershed management areas. This process allows permittees to compare their permits with other dischargers in the same area and facilitates sharing data to arrive at the most appropriate limits. Some other permit approaches currently available include:

Watershed-based General Permit - Common Sources. An NPDES permitting authority would develop and issue this type of general permit to a category of point sources within a watershed, such as all publicly owned treatment works (POTWs) or all confined animal feeding operations (CAFOs) or all storm water discharges from municipal separate storm sewer systems. This is similar to current general permits, except that the geographic area covered by the permit would correspond to the watershed boundary. The most significant difference between a traditional general permit and the watershed-based general permit for common sources would be permit requirements that reflect watershed-specific water quality standards.

Watershed-based General Permit - Collective Sources. Unlike the watershed-based general permit described above, this type of permit would address all point sources within the watershed or alternatively, several subcategories of point sources within the watershed. This type of permit would be similar to the multi-sector general permit for storm water discharges associated with industrial activity with requirements being tied to categories and subcategories of discharges. Again, the distinguishing

feature of this type of permit would be geographic coverage based on the watershed-boundaries and the permit requirements reflecting watershed-specific water quality standards.

Watershed-based Individual Permit - Multiple Permittees. Similar to the approach used for Phase I MS4s with multiple permittees, this type of permit would allow several point sources within a watershed to apply for and obtain permit coverage under an individual permit.

Integrated Municipal NPDES Permit. This type of permit would bundle all NPDES permit requirements for a municipality (e.g., storm water, combined sewer overflows, biosolids, pretreatment, etc.) into a single municipal permit. While this type of permit would focus on municipal boundaries rather than watershed boundaries, the analysis in developing permit requirements would reflect watershed-specific water quality standards.

These are not all the possible mechanisms that may be used. EPA and states may consider other possible approaches that are consistent with the NPDES regulations and the Clean Water Act (CWA).

How EPA will Be Encouraging Watershed-Based NPDES Permitting

EPA is developing a framework for watershed-based NPDES permitting. It will be supported by a targeted communications approach focused on informing key stakeholders about the variety of tools developed by EPA to implement a watershed-based permitting approach. Over the next 12 months, EPA anticipates developing and issuing guidance addressing different aspects of the watershed-based permitting approach, including general implementation issues, technical tools and approaches, and procedural considerations. EPA will also be researching and documenting case studies that demonstrate different approaches for watershed-based permitting. EPA will maintain and periodically update the list of case studies.

This policy expresses EPA's support for watershed-based NPDES permitting. Implementation of watershed-based permitting will be governed by existing requirements of the CWA and EPA's NPDES implementing regulations. Those CWA provisions and regulations contain legally binding requirements. This document does not substitute for those provisions or regulations. The recommendations in this memorandum are not binding; the permitting authority may consider other approaches consistent with the CWA and EPA regulations. When EPA makes a permitting decision, it will make each decision on a case-by-case basis and will be guided by the applicable requirements of the CWA and implementing regulations, taking into account comments and information presented at that time by interested persons regarding the appropriateness of applying these recommendations to the particular situation. EPA may change this guidance in the future.

July 29, 2005

MEMORANDUM

SUBJECT: Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act

FROM: Diane Regas, Director /s/
Office of Wetlands, Oceans and Watersheds

TO: Water Division Directors
Regions 1-10

I am pleased to provide a copy of the *Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act* (IRG). The 2006 IRG was developed in a cooperative effort between EPA Headquarters, EPA Regional offices, and a number of interested state partners. EPA also posted a draft version of the guidance on its Web site for public comment between February 22, 2005 and April 22, 2005. Subsequently, EPA received approximately 40 sets of comments on the draft from a wide range of stakeholders. Those comments have been addressed in the final guidance.

This guidance is for states, territories, authorized tribes, and interstate commissions that help states prepare and submit section 305(b) reports (hereinafter referred to as "jurisdictions"). It outlines development of their biennial Integrated Reports (IR) in support of EPA's strategy for achieving a broad-scale inventory of water quality conditions. The objective of this document is to provide jurisdictions a recommended reporting format and suggested content to be used in developing a single document that integrates the reporting requirements of the Clean Water Act (CWA) section 303(d), section 305(b), and section 314 (pursuant to the CWA, jurisdictions report to EPA biannually on the condition of waters within their boundaries). Each IR will report on the water quality standards attainment status of all waters, document the availability of data and information for each water, identify certain trends in water quality conditions, and provide information to managers in setting priorities for future actions to protect and restore the health of our nation's aquatic resources.

As stated in its introduction, the 2006 IRG is a comprehensive compilation of relevant guidance EPA has issued to date regarding IR; however, there are few changes from the 2004 guidance. The 2006 IRG provides: (1) increased emphasis on the use of the Assessment Database (ADB) or comparable electronic data format (the ADB is being modified to accommodate the recent format, content, and multi-category listing option that the guidance suggests), (2) greater clarity on the content and the format of those components of the IR that are

recommended and required under CWA sections 303(d), 305(b), and 314, (3) greater clarity on issues associated with data solicitation, collection, consideration, and interpretation of water quality standards, (4) additional information on the option to report water quality status of individual segments in more than one category (e.g., to show that some designated uses of a water are being attained and some designated uses are not), and (5) additional clarity and flexibility on alternatives to total maximum daily loads (TMDLs) for attaining water quality standards (e.g., utilization of reporting "Category 4b").

Thank you for all of your help and input in the development of this 2006 IRG. The document may be found on our Web site at: http://www.epa.gov/owow/tmdl/2006IRG. Should you have questions about the guidance, please contact Sarah Furtak at 202-566-1167.

Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act

July 29, 2005

Watershed Branch
Assessment and Watershed Protection Division
Office of Wetland, Oceans and Watersheds
Office of Water
United States Environmental Protection Agency

This document provides EPA's guidance for preparing the 2006 Integrated Report. The Integrated Report is intended to satisfy the listing requirements of sections 305(b) and 314 of the Clean Water Act (CWA). This guidance document discusses existing requirements of the CWA and EPA's implementing regulations. Those statutory and regulatory provisions contain legally binding requirements. This document describes those requirements; it does not substitute for them. The recommendations in this document are not binding; indeed, there may be other approaches that would be appropriate in particular circumstances. When EPA makes a decision on a state's section 303(d) list, it will make each decision on a case-by-case basis and will be guided by the applicable requirements of the CWA and implementing regulations, taking into account comments and information presented at that time by interested persons regarding the appropriateness of applying these recommendations to the particular situation.

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ABBREVIATIONS AND ACRONYMS

ADB	Assessment Database
AU	Assessment Unit
CALM	Consolidated Assessment and Listing Methodology
CPP	Continuing Planning Process
CFR	Code of Federal Regulations
CWA	Clean Water Act
DQO	Data Quality Objectives
DU	Designated Use
EPA	Environmental Protection Agency
FDA	Food and Drug Administration
FGDC	Federal Geographic Data Committee
GPRA	Government Performance Report Act
IR	Integrated Report
NHD	National Hydrography Dataset
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NSSP	National Shellfish Sanitation Program
OW	Office of Water
PPG	Performance Partnership Grant
PWS	Public Water Supply
QAPP	Quality Assurance Project Plan
QA/QC	Quality Assurance/Quality Control
RIT	Reach Indexing Tool
SDWA	Safe Drinking Water Act
STORET	STORage and RETrieval
TMDL	Total Maximum Daily Load
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WQC	Water Quality Criteria
WQS	Water Quality Standard

I. INTRODUCTION

The *Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act* was developed specifically for the 2006 reporting cycle. The objective of this document is to provide to states, territories, authorized tribes, and interstate commissions[1] a recommended reporting format and a suggested content to be used in developing a single document that integrates the reporting requirements of the Clean Water Act (CWA) section 303(d) and section 305(b). This guidance for developing the Integrated Report (IR) supports the Environmental Protection Agency's (EPA) strategy for achieving a broad-scale, national inventory of water quality conditions. Use of the IR format will serve to report on water quality standards (WQS) attainment status of assessed waters, document availability of data and information for each segment, identify trends in water quality conditions, and provide information to managers in setting priorities for future actions to protect and restore the health of our nation's aquatic resources.

EPA has established a goal that all fifty-six states and territories utilize the integrated reporting format by 2008. EPA continues to promote this comprehensive assessment approach in order to enhance the states' ability to track both programmatic and environmental goals of the CWA, and ideally, to increase the pace of achieving these important environmental goals. This document includes recommendations designed to allow states and other interested stakeholders to track the progress of interim management actions by employing the multi-category reporting framework. By issuing this guidance well in advance of the April 1, 2006 deadline for submission of CWA section 303(d) lists and section 305(b) reports, EPA intends to encourage the broadest possible adoption of the integrated reporting approach.

EPA continues to advocate the use of the five-part categorization format for sorting waters (see box below for brief description and Section V). While this document is more comprehensive than previous Integrated Report Guidance, there are clarifications to the previous (2004) Integrated Report Guidance. Specifically, this guidance provides:

- increased emphasis on the use of the Assessment Database (ADB) or compatible electronic data format (the ADB is being modified to accommodate the recent format, content, and multi-category listing option that the guidance suggests),
- greater clarity on the content and the format of those components of the IR that are recommended and required under CWA sections 303(d), 305(b), and 314,
- greater clarity on issues associated with data solicitation, collection, consideration, and interpretation of water quality standards,
- additional information on the option to report water quality status of individual segments in more than one category (e.g., to show that some designated uses of a water are being attained and some designated uses are not),[2] and
- additional clarity and flexibility on undertaking and reporting alternatives to total maximum daily loads (TMDLs) for attaining water quality standards (e.g., utilization of reporting "Category 4b").

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[1] In the remainder of this document, unless specified otherwise, *states* also refers to authorized tribes, territories and interstates commissions.

[2] In this guidance document EPA refers to "designated uses" as the basis and unit for reporting water quality, although note that states determine their section 303(d) list (i.e., Category 5) consistent with 40 CFR 130.7 (b)(3).

It is important to note that certain components of the recommended format and content for the 2006 IR document are based on requirements of the CWA and EPA's implementing regulations (e.g., the submission of an approvable section 303(d) list), whereas other components are based on Agency recommendations. In section II of this guidance, those components *required* by the CWA sections 303(d), 305(b), 314, and the corresponding regulations are identified.

In addition to identifying the required components in the 2006 IR submission, this guidance will indicate the components of the 2006 IR document for which EPA recommends states provide an opportunity for *public review and comment* (e.g., the list of impaired waters requiring TMDLs and the assessment methodology used by the state to develop their IR document).

Five Reporting Categories

Category 1: All designated uses are supported, no use is threatened;
Category 2: Available data and/or information indicate that some, but not all of the designated uses are supported;
Category 3: There is insufficient available data and/or information to make a use support determination;
Category 4: Available data and/or information indicate that at least one designated use is not being supported or is threatened, but a TMDL is not needed;
Category 5: Available data and/or information indicate that at least one designated use is not being supported or is threatened, and a TMDL is needed.

Integrated Monitoring and Assessment

The Clean Water Act requires states to provide every two years an assessment of the quality of all their waters (section 305(b)) and a list of those that are impaired or threatened (section 303(d)). To efficiently meet this charge, EPA recommends that states, tribes, and other water quality monitoring collaborators use a combination of monitoring and assessment techniques to:

1. increase the percentage and types of waters assessed;
2. reliably estimate the overall condition of all waters within a state; assess changes over time; and measure progress toward the "fishable-swimmable" goal of the Clean Water Act (section 305(b));
3. comprehensively identify all impaired and threatened waters to support section 303(d) listing requirements; and
4. prioritize site-specific assessments needed to confirm the location of both high quality and impaired waters, and support control, restoration, and prevention actions.

EPA has strongly encouraged states to use integrated monitoring and assessment techniques. These include probability-based assessments and other predictive tools, as well as site-specific assessments. The use of probability assessments can eliminate the risk of generating a biased picture of water quality conditions state-wide and provide a cost-effective bench mark of state water quality program effectiveness. The probability-based assessment results can also help a state decide if it should target certain waters for further assessment or if limited resources for water quality assessment could be used more effectively in other ways. States currently using broad-scale probability-based assessment to complement their site-specific assessment include VA, SC, KY, and IN, among others.

II REPORTING REQUIREMENTS UNDER THE CLEAN WATER ACT SECTIONS 303(D), 305(B), 314 AND CORRESPONDING REGULATIONS

EPA strongly encourages states to submit a single report (the Integrated Report) that satisfies the reporting requirements of CWA sections 303(d), 305(b) and 314. A summary of states' reporting requirements for each of these sections and corresponding regulations is provided below:

Section 303(d) – by April 1 of all even numbered years, a list of impaired and threatened[3] waters still requiring TMDLs; identification of the impairing pollutant(s); and priority ranking of these waters, including waters targeted for TMDL development within the next two years.

Section 305(b) – by April 1 of all even numbered years, a description of the water quality of all waters of the state (including, rivers/stream, lakes, estuaries/oceans and wetlands). States may also include in their section 305(b) submittal a description of the nature and extent of ground water pollution and recommendations of state plans or programs needed to maintain or improve ground water quality.

Section 314 – in each section 305(b) submittal, an assessment of status and trends of significant publicly owned lakes including extent of point source and nonpoint source impacts due to toxics, conventional pollutants, and acidification.

A more detailed description of states' reporting requirements under sections 305(b), 303(d) and 314 and corresponding regulations is provided in Table 2-1.

Integrated Reports that satisfy the reporting requirements of sections 303(d), 305(b) and 314 also satisfy the 305(b) reporting requirement for section 106 grant funds. For states to be eligible for section 106 grant funds, section 106(e)(1) requires that states must have the means to monitor water quality (including "navigable waters and to the extent practicable, ground waters") and annually update water quality data and include it in their section 305(b) submittals. Under Agency policy, EPA will not award any section 106 funding under a section 106 grant or a performance partnership grant (PPG) to any state that has not annually updated its monitoring data and submitted the most recent report required under section 305(b) (Note that tribal recipients have different requirements). Annual updates to the STORage and RETrieval (STORET) national warehouse satisfy the conditions of the section 106(e)(1) annual update for the purposes of receiving section 106 funds (*FY 2001 Clean Water Act Section 106 Guidance,* February 16, 2001 http://www.epa.gov/owm/rmes/section106priorities.pdf).

Integrated Reports that satisfy the reporting requirements of sections 303(d), 305(b) and 314 may also be used to satisfy the water quality report requirement for section 205(j) grant funds. CWA section 205(j) requires states to determine the nature, extent, and causes of water quality problems in various areas of the state and interstate region, and report on these annually. CWA regulations provide that in the

[3] *Threatened waters* States may define "threatened waters" in their assessment and listing methodologies. EPA recommends that states consider as threatened those waters that are currently attaining WQSs, but which are expected to not meet WQSs by the next listing cycle (every two years). For example, segments should be listed if the analysis demonstrates a declining trend in a specific water quality criteria (WQC), and the projected trend will result in a failure to meet a criterion by the date of the next list (i.e., 2008 for purposes of the 2006 assessment cycle); or, segments should be listed if there are proposed activities that will result in WQSs exceedances.

years in which it is prepared, the section 305(b) report satisfies the requirement for the annual water quality report under section 205(j). Furthermore, in years when the section 305(b) report is not required, the state may satisfy the annual section 205(j) report requirement by certifying that the most recently submitted section 305(b) report is current or by supplying an update of the sections of the most recently submitted section 305(b) report which require updating (40 CFR 130.8(d)).

Table 2-1. Summary of State Reporting Requirements Under CWA Sections 303(d), 305(b), and 314, and Corresponding Regulations

Authority	State Reporting Requirement
CWA section 303(d); 40 CFR 130.7	By April 1 of all even numbered years, states must submit to EPA the following information: • A list of water quality-limited (impaired and threatened) waters still requiring TMDL(s), pollutants causing the impairment and priority ranking for TMDL development (including waters targeted for TMDL development within the next two years). • A description of the methodology used to develop the list. • A description of the data and information used to identify waters, including a description of the existing and readily available data and information used. • A rationale for any decision to not use any existing and readily available data and information. • Any other reasonable information requested by EPA, such as demonstrating good cause for not including a water or waters on the list.
CWA section 305(b); 40 CFR 130.8	By April 1 of all even numbered years, states must submit to EPA the following information: • A description of the water quality of all waters[a] in the state and the extent to which the quality of waters provides for the protection and propagation of a balanced population of shellfish, fish, and wildlife and allows recreational activities in and on the water. • An estimate of the extent to which CWA control programs have improved water quality or will improve water quality, and recommendations for future actions necessary and identifications of waters needing action. • An estimate of the environmental, economic and social costs and benefits needed to achieve the objectives of the CWA and an estimate of the date of such achievement. • A description of the nature and extent of nonpoint source pollution and recommendations of programs needed to control each category of nonpoint sources, including an estimate of implementation costs. • An assessment of the water quality of all publicly owned lakes, including the status and trends of such water quality as specified in section 314(a)(1) of the CWA [see below for additional information].

Authority	State Reporting Requirement
CWA section 314	States must submit the following information in their section 305(b) reports: • An identification and classification according to eutrophic condition of all publicly owned lakes in such state. • A description of procedures, processes, and methods (including land use requirements), to control sources of pollution of such lakes. • A description of methods and procedures, in conjunction with appropriate federal agencies, to restore the quality of such lakes. • Methods and procedures to mitigate the harmful effects of high acidity, including innovative methods of neutralizing and restoring buffering capacity of lakes and methods of removing from lakes toxic metals and other toxic substances mobilized by high acidity. • A list and description of those publicly owned lakes in such state for which uses are known to be impaired, including those lakes which are known not to meet applicable water quality standards or which require implementation of control programs to maintain compliance with applicable standards and those lakes in which water quality has deteriorated as a result of high acidity that may reasonably be due to acid deposition. • An assessment of the status and trends of water quality in lakes in such state, including but not limited to, the nature and extent of pollution loading from point and nonpoint sources and the extent to which the use of lakes is impaired as a result of such pollution, particularly with respect to toxic pollution.

Note:
[a] "Waters of the United States" as defined in 40 CFR 122.2.

III. RECOMMENDED ORGANIZATION OF AN INTEGRATED REPORT

As states transition from reporting water quality results under separate documents (e.g., section 305(b) reports and section 303(d) lists) to reporting under a single Integrated Report (IR), it would be helpful to use a common organizational structure and method of reporting water quality results so that members of the public can more easily review reports and lists from different states. EPA's recommended organization for states' Integrated Report submittals is provided in Exhibit 3-1.

An annotated version of Exhibit 3-1 constitutes the remainder of Section III. The recommended structure and content for an IR are based, in large part, on EPA's 1997 guidelines[4] for CWA section 305(b) reports. Hence, states should consult EPA's 1997 guidelines for further details when needed.

The recommended organization provided in Section III also highlights what reporting elements are required by sections 303(d), 305(b), 314, and corresponding regulations (as discussed in Section II), versus those elements that are recommended. A summary of which elements of EPA's recommended organization for an Integrated Report are required verus recommended is provided Table 3-11 at the end of this section.

Exhibit 3-1
Recommended Organization for Year 2006 Integrated Report Submittals

EXECUTIVE SUMMARY
PART A. INTRODUCTION
PART B. BACKGROUND
- B1. Total Waters
- B2. Water Pollution Control Program
- B3. Cost/Benefit Assessment
- B4. Special State Concerns and Recommendations

PART C. SURFACE WATER MONITORING AND ASSESSMENT
- C1. Monitoring Program
- C2. Assessment Methodology
- C3. Assessment Results
- C4. Wetlands Program
- C5. Trends Analysis for Surface Waters
- C6. Public Health Issues

PART D. GROUND WATER MONITORING AND ASSESSMENT
PART E. PUBLIC PARTICIPATION

[4] Guidelines for Preparation of the Comprehensive State Water Quality Assessments (305(b) Reports) and Electronic Updates: Report Contents; Office of Water, US EPA; EPA-841-B-97-002a, September 1997.

EXECUTIVE SUMMARY

The Executive Summary should highlight the report's major points of information, conclusions and recommendation. States should include in this section a summary of the overall water quality (surface water and ground water) in the state, description of the causes and sources of water quality impairments, summary of the plan showing how the state will achieve comprehensive coverage of its waters, discussion of the programs to correct impairments and discussion of the general changes or trends in water quality.

In the summary of overall water quality status for surface waters, states may include the tables requested in Section C.3 (Assessment Results). States are also encouraged to include in this section summary maps that depict water quality status information.

PART A. INTRODUCTION

The Introduction should include a narrative discussion that defines the purpose and contents of the 2006 Integrated Report. The Introduction may include a rationale for why the state has chosen to streamline its reporting of water quality status (i.e., the results of placing segments into the five categories) and trends. The state may choose to explain why the use of this new reporting format will serve as a better mechanism to integrate CWA sections 303(d), 305(b), and 314 efforts in the state. The state may also choose to discuss how this integrated reporting format will clarify the complementary roles of predictive tools (e.g., probability-based monitoring designs, models, and remote-sensing) and site-specific monitoring to assess water quality conditions.

States may also describe in the Introduction how they are ensuring the development of an integrated database of assessment information that reflects the status of water quality standards attainment. Specifically, the Introduction may discuss how the state may increase the amount of assessment information that is geo-referenced and transmitted electronically through the ADB or a compatible data exchange format.

PART B. BACKGROUND INFORMATION

The Background section should include a description of total waters in the state, a description of the state's water pollution control program, a cost/benefit analysis of actions necessary to achieve the objective of the CWA, and any special state concerns and recommendations.

B.1 Scope of Waters in the Integrated Report

To put the report into perspective for the reader, the state should provide a brief water resource overview (as shown in Table 3-1) of all waters[5] in the state. States are also encouraged to include summary maps of water resource information in this subsection.

[5] "Waters of the United States" as defined in 40 CFR 122.2.

Table 3-1. Atlas

Topic[a]	Value	Scale[b]	Source[c]
State Population		N/A	N/A
Total Miles of River and Streams . Miles of perennial rivers/streams (subset) . Miles of intermittent (nonperennial) streams (subset) . Miles of ditches and canals (subset) . Border miles of shared rivers/streams (subset)			
Number of lakes/reservoirs/ponds[d] . Number of significant publicly owned lakes/reservoirs/ponds (subset)			
Acres of lakes/reservoirs/ponds . Acres of significant publicly owned lakes/reservoir/ponds (subset)			
Square Miles of estuaries/harbors/bays			
Miles of Ocean Coast			
Acres of Freshwater Wetlands			
Acres of Tidal Wetlands			

Notes:

N/A Not applicable

[a] State may add categories to the atlas table to reflect special areas of interest (such as, acres of playas; acres of riparian areas outside of wetlands; and miles of streams and acres of lakes on Tribal lands).

[b] State should specify the scale (e.g., 1:100,000; 1:24,000) in this column.

[c] State should specify the source (e.g., NHD, USGS quad maps, state inventory) in this column.

[d] Impoundments should be classified according to their hydrologic behavior, either as stream channel miles under rivers or as total surface acreage under lakes/reservoirs/ponds, but not under both categories. In general, impoundments should be reported as lakes/reservoirs/ponds unless they are run-of-river impoundments with very short retention times.

Please note, most of the tables in this section ask states to report on the extent, or size of waters. To clarify the source of these measurements, states should include in this subsection a description of the process used to make measurements of waters in the state. To promote national consistency in measurement and reporting, EPA recommends the use of the National Hydrography Dataset (NHD), which currently supports measurements at the 1:100,000 scale. Additional information on the NHD is available at www.epa.gov/owow/monitoring/georef/nhd.htm. EPA notes that many states are now making measurements at the 1:24,000 scale. Therefore, for purposes of reporting measurements in the Integrated Report, EPA asks that states indicate the scale at which the measurements were made.

B.2 Water Pollution Control Program

The state should provide a description of its approach to water quality management, including overviews of any watershed-based programs; the WQSs program; the point source control program; the nonpoint source control program; the TMDL program, and; program coordination with other state, tribal, and local agencies. States may also choose to highlight atmospheric deposition reduction strategies in this subsection. As shown in Table 2-1, CWA section 305(b) and EPA's implementing regulations require states to provide the following information about their water pollution control programs:

- *An estimate of the extent to which CWA control programs have improved water quality or will improve water quality, and recommendations for future actions necessary and identifications of waters needing action.*
- A *description of the nature and extent of nonpoint source pollution and recommendations of programs needed to control each category of nonpoint sources, including an estimate of implementation costs.*

B.3 Cost/Benefit Assessment

As shown in Table 2-1, CWA section 305(b) (and associated regulations) also requires states to provide an *estimate of the environmental, economic and social costs and benefits needed to achieve the objectives of the CWA and an estimate of the date of such achievement.* EPA recognizes that this information may be difficult to obtain due to the complexities of the economic analysis involved. Until such time as comparable procedures for evaluation costs and benefits are in wider use, states should provide a brief narrative that includes as much of the following information as possible.

For costs, EPA asks that states provide information on capital investments in municipal and industrial facilities, investments in nonpoint source measures, annual operation and maintenance costs of municipal and industrial facilities, total annual costs of municipal and industrial facilities, and annual costs to states and local governments to administer water pollution control activities.

For benefits, EPA asks that states provide information on improvements in recreational and commercial fishing; extent of stream miles, lakes acres, etc., improved from impaired to meeting WQSs; reduced costs of drinking water treatment due to cleaner intake water; and increase in use of beaches and recreational boating due to improved water quality.

B.4 Special State Concerns and Recommendations

In this subsection, states should (1) discuss special concerns that are significant issues within the state and that affect its water quality programs and (2) provide recommendations for actions that are necessary to achieve the objectives of the CWA.

PART C. SURFACE WATER MONITORING AND ASSESSMENT

The Surface Water Monitoring and Assessment section should include a description of the state's monitoring program, a description of the assessment methodology for classifying all surface waters, assessment results, a description of the state's wetlands program, an analysis of surface water quality trends, and information on public health issues.

C.1 Monitoring Program

This subsection should include a description (or reference applicable documents) of the following elements of the state's monitoring program:

- Monitoring Program Strategy
- Monitoring Objectives
- Monitoring Design
- Core and Supplemental Indicators
- Quality Assurance
- Data Management
- Data Analysis/Assessment
- Reporting
- Programmatic Evaluation
- General Support and Infrastructure Planning

EPA expects that states will develop, over time, a monitoring program that addresses the 10 elements listed above. The first of these elements (monitoring program strategy) is currently under development by states and will include a timeline to complete implementation of all 10 elements by 2014. Additional guidance on these elements is available in EPA's Elements of a State Water Monitoring and Assessment Program (US EPA, Office of Wetlands, Oceans, and Watersheds; EPA 841-B-03-003; March 2003).

As shown in Table 2-1, CWA section 305(b) and EPA's implementing regulations require states to provide a *description of the water quality of all waters*[6] *in the States and the extent to which the quality of waters provides for the protection and propagation of a balanced population of shellfish, fish, and wildlife and allows recreational activities in and on the water.* As a result, EPA and the states have established a long-term goal of comprehensively characterizing surface waters of each state using a variety of techniques. These techniques may include traditional targeted monitoring, probability-based monitoring surveys, targeted site-specific monitoring, landscape and water quality models, and remote sensing. States should include a description of their approach to comprehensive assessment in this subsection.

[6] "Waters of the United States" as defined in 40 CFR 122.2.

States should also include in this subsection a schedule that identifies the waters that will be monitored and assessed during the next two-year reporting cycle. If this information is included in other documents, such as the state's section 106 workplan or a Performance Partnership Grant (PPG), the state may provide a reference to that document. EPA does not expect that all waters will be scheduled for monitoring during the next two-year reporting cycle. This short-term monitoring schedule should be consistent with the state's monitoring priorities. The short-term monitoring schedule may present upcoming monitoring activities planned under the long-term strategy, including the use of probability-based monitoring, landscape and water quality models, and targeted monitoring to predict and verify water quality conditions. EPA intends that the monitoring schedule will inform stakeholders and EPA of a state's upcoming monitoring activities and will help promote collaboration and coordination among monitoring organizations.

C.2 Assessment Methodology

This subsection should include a description (or reference applicable documents) of the state's methodology for assessing the water quality attainment status of all waters[7] in the state. The assessment methodology should be consistent with the state's WQSs and include a description of the following as part of their section 303(d) list submissions:

- What data and information were used to make attainment determinations (e.g., results from site-specific and probabilistic monitoring and other predictive tools);
- How the data and information were used to make attainment determinations and place surface water segments in the five reporting categories;
- Rationales for any decision to not use any existing and readily available data and information;
- Changes in the assessment methodology since the last reporting cycle.

Assessment methodologies that include the information listed above also satisfy the state's requirements under CWA section 303(d) (and associated regulations) to provide the following information as shown in Table 2-1: (1) *a description of the methodology used to develop the section 303(d) list,* (2) *a description of the data and information used to identify [impaired and threatened] waters, including a description of the existing and readily available data and information used, and* (3) *a rationale for any decision to not use any existing and readily available data and information*[8].

EPA also encourages states to make the assessment methodology available to the public for review and comment. Hence, states are encouraged to provide a description of the public participation process for the IR in this section, or reference their CPP as appropriate. Additional information on development/use of an assessment methodology and EPA's five reporting categories is provided in Sections IV and V of this guidance, respectively.

[7] "Waters of the United States" as defined in 40 CFR 122.2.

[8] Although a description of the state's assessment methodology is required, EPA does not approve or disapprove the assessment methodology under CWA section 303(d).

C.3 Assessment Results

This subsection should present the results of the state's surface water assessments, including the five-part categorization of all surface water segments, probability-based survey results, the section 303(d) list, and State-level summaries of designated use support. In addition, states should satisfy CWA section 314 (Lakes Program) reporting requirements in this subsection.

States should attempt to manage their assessment results in the Assessment Database (ADB) or a compatible data management system and submit them electronically with the Integrated Report. That system should provide the supporting information for this section. The summary tables provided in this section can be generated directly out of the ADB and inserted into any word processing document.

Additional information on these reporting elements is provided below. How states organize the presentation of their assessment results in hard-copy format is left to their discretion. For example, states could organize their assessment results by the reporting elements italicized below, or by waterbody type (e.g., rivers/streams, lakes/ponds, estuaries/oceans, and wetlands).

Five-Part Categorization of Surface Waters

States should assign all of their surface water segments to one or more of the five reporting categories presented in Section V of this guidance. States should also include a summary of the extent of surface waters assigned to each reporting category as shown in Table 3-2.

Table 3-2. Size[a] of Surface Waters Assigned to Reporting Categories

Waterbody Type	Category							Total in State	Total Assessed
	1	2	3	4a	4b	4c	5		
River/stream miles									
Lake/pond acres									
Estuarine square miles									
Ocean coast miles									
Freshwater wetland									
Tidal wetland acres									

Note:

[a] For states that place surface water segments in more than one reporting category, the summation of the size of surface water segments assigned to the five reporting categories will be greater than the "Total in State" summation for each waterbody type. In such cases, EPA recommends that states provide a statement in the IR that clarifies the discrepancy.

Results of Probability-based Surveys

States should report the results of probability-based surveys as shown in Table 3-3. EPA is working on a supplemental module to the ADB for transmitting the results of probability-based surveys. Reporting the results is particularly important because probability-based surveys allow states to report on the condition of the entire population of surface waters (e.g., coastal waters, rivers and streams, estuaries, etc.) included in the design. Site-specific assessment results will not result in an assessment of all surface waters, unless the state is able to implement a census.

Table 3-3. Attainment Results Calculated Using Probabilistic Monitoring Designs

Project ID	**STX_1**	
Project Name	Downstate Sample Survey	
Target Population	All streams ordered 4 or greater in basins C and D	
Type of Waterbody	River	
Size of Target Population	100	
Units of Measurement	Miles	
Designated_use	Aquatic life	
Percent_attaining	75%	
Percent_not_attaining	23%	
Percent nonresponse	2%	
Indicator	Biological	
Assmt_date	20000201	
Precision	90%	

Section 303(d) List

As shown in Table 2-1, The Clean Water Act and EPA regulations require states to submit the following information as part of their section 303(d) list submission:

- *A list of water quality-limited (impaired and threatened) waters still requiring TMDL(s)* [waters assigned to Category 5], *pollutants causing the impairment, and priority ranking for TMDL development (including waters targeted for TMDL development within the next two years).*
- *Any other reasonable information requested by EPA, such as demonstrating good cause for not including a water or waters on the list.*

Although states are not required to provide "good cause" for each delisting prior to receiving a formal request from EPA, EPA recommends that states do so in the IR. States should highlight in this subsection those segment/pollutant combinations that have been either added or removed since the last reporting cycle and summary rationales ("good cause") for each delisting. Table 3-4 provides a recommended format for summarizing delisting rationales in this subsection. States should provide detailed rationales for removing segment/pollutant combinations from their previous 303(d) lists in the record of decision for the list.

States may also report on the status of their TMDL development by providing information such as that found in Table 3-5 in this subsection or in the discussion of their Water Pollution Control Program (Section B.2).

Table 3-4. Segment/Pollutant Combinations Removed from State's Year 2004 Section 303(d) List

Segment/ Pollutant Combination on Year 2004 Section 303(d) List	Segment (Waterbody) ID	Summary[a] Rationale for Delisting of Segment/Pollutant Combinations (*identify number of reason*) 1. State determines water quality standard is being met 2. Flaws in original listing 3. Other point source or nonpoint source controls are expected to meet water quality standards 4. Impairment due to non-pollutant 5. EPA approval of TMDL 6. Waterbody not in state's jurisdiction 7. Other

Note:
[a] Detailed justifications for removing waters from previous section 303(d) list should be provided in the record of decision for the listing cycle in which the state proposes the water for removal.

Table 3-5. TMDL Development Status

Segment/Pollutant Combination	Segment ID	Project Status[a]	Projected TMDL Submittal Date

Note:
[a] Under project status, states may provide a brief description of the status of TMDL development. This could be done by providing a 1 or 2 word description of status (e.g., "completed", "in draft") or by providing a more extensive description of status. For example, states may elect to include information on whether the TMDL is being developed under court order deadline, whether supplemental monitoring is being performed, and when public meetings are scheduled to be held.

State Summaries of Designated Use Support

The state should provide designated use support summaries for each waterbody type, as shown in Table 3-6. States should include values for applicable designated use categories such as aquatic life, fish consumption, shellfishing, swimming, secondary contact, drinking water, agricultural, cultural ceremonial, etc.

EPA recognizes that states may have site-specific results, as well as results of probability survey(s) that could be used to generate these results. When information from state-wide probability surveys is available, that information should be used to complete Table 3-6 for the appropriate waterbody type/use combination. Site-specific information should be used to provide designated use summaries for waterbody types where probability-results are not available or to complement the results of probability-results that are not state-wide in scope. It is important that the state indicate whether the state-wide numbers in Table 3-6 were generated via probability or site-specific surveys. In addition, states that report results based on probability surveys should complete Table 3-3 to provide additional information. States should also include state-level summaries of causes and sources (when possible) of impaired waters as shown in Tables 3-7 and 3-8, respectively.

Table 3-6. Individual Designated Use Support Summary *(One Table for Each Waterbody Type)*

Designated Use	Size of Surface Waters				
	Total in State	**Total Assessed**	**Supporting – Attaining WQ Standards**	**Not Supporting – Not Attaining WQ Standards**	**Insufficient Data and Information**
Aquatic Life State Defined 1. 2.					
Fish Consumption Shellfishing Swimming Secondary Contact Drinking Water State Defined 1. 2.					
Agricultural Industrial Cultural or Ceremonial State Defined 1. 2.					

Table 3-7. Size of Waters Impaired by Causes *(One Table for Each Waterbody Type)*

Cause/Impairment Type (Examples[a]) from ADB	Size of Waters Impaired
Ammonia (unionized)	
Cause/Stressor Unknown	
Chlorophyll a	
Copper	
Escherichia coli	
Mercury	
pH	
Phosphorus	
Turbidity	
Etc.	

Notes:

[a] The parameters identified in this table are used as examples only. Please refer to the complete list of causes available for reporting at http://www.epa.gov/waters/adb/

Table 3-8. Size of Waters Impaired by Sources *(One Table for Each Waterbody Type)*

Source Category (Examples[a]) from ADB	Size of Surface Waters Impaired
Industrial Point Sources	
Municipal Point Sources	
Combined Sewer Overflows	
Urban Runoff/Storm Sewers	
Agriculture	
Crop production	
Rangeland grazing	
Hydromodification	
Atmospheric Deposition	
Unknown Source	
Etc.	

Notes:

[a] The parameters identified in this table are used as examples only. Please refer to the complete list of sources available for reporting at http://www.epa.gov/waters/adb/

CWA Section 314 (Clean Lakes Program)

As shown in Table 2-1, states are required to submit the following information about the status of publicly owned lakes:

1. *An identification and classification according to eutrophic condition of all publicly owned lakes in such state.*

2. *A description of procedures, processes, and methods (including land use requirements), to control sources of pollution of such lakes*

3. *A description of methods and procedures, in conjunction with appropriate federal agencies, to restore the quality of such lakes*

4. *Methods and procedures to mitigate the harmful effects of high acidity, including innovative methods of neutralizing and restoring buffering capacity of lakes and methods of removing from lakes toxic metals and other toxic substances mobilized by high acidity*

5. *A list and description of those publicly owned lakes in such state for which uses are known to be impaired, including those lakes which are known not to meet applicable water quality standards or which require implementation of control programs to maintain compliance with applicable standards and those lakes in which water quality has deteriorated as a result of high acidity that may reasonably be due to acid deposition*

6. *An assessment of the status and trends of water quality in lakes in such state, including but not limited to, the nature and extent of pollution loading from point and nonpoint sources and the extent to which the use of lakes is impaired as a result of such pollution, particularly with respect to toxic pollution.*

Table 3-9 provides a recommended format for reporting on the trophic status of significant publicly owned lakes. States satisfy the requirement to provide a list of publicly owned lakes that are known to be impaired by placing such waters in Category 5 and including them on the section 303(d) list. Table 3-10 provides a recommended format for reporting on trends in lake water quality. States may satisfy the requirement to provide a trend analysis of water quality in lakes in this subsection or in Trend Analysis for Surface Waters (Section C.5).

Table 3-9. Trophic Status of Significant Publicly Owned Lakes

Description	Number of Lakes	Acres of Lakes
Total in state		
Assessed		
Oligotrophic		
Mesotrophic		
Eutrophic		
Hypereutrophic		
Dystrophic		
Unknown		

Table 3-10. Trends in Lake Water Quality

Description	Number of Lakes	Acres of Lakes
Assessed For Trends		
Improving		
Stable		
Degrading		
Fluctuating		
Trend unknown		

C.4 Wetlands Program

States may dedicate a section of their Integrated Report to providing a description of their wetlands program if not already covered in another section of the Report. This section could include information on development of wetland water quality standards, extent of wetland resources, integrity of wetlands resources, and wetland protection activities.

C.5 Trend Analysis for Surface Waters

As discussed in Section C.3, states are required under CWA section 314 to report on lake water quality trends. In addition to lake trends, states may also report on water quality trends for other surface waters in this section of the Integrated Report. To enhance states' and EPA's capability to perform water quality trend analyses, states should routinely and comprehensively update STORET and ADB (or compatible electronic data format).

C.6 Public Health Issues

In this subsection, states should provide information on public health issues, including information on their programs related to drinking water supplies, beach use, and fish/shellfish advisories. For drinking water programs, states should highlight the following information:

1. Total miles of rivers/streams and acres of lakes/reservoirs designated for drinking water use.
2. For waters designated for drinking water use, miles of rivers/streams and acres of lakes/reservoirs assigned to each of the five reporting categories.
3. Summary of the methodologies used to perform drinking water use assessments under the Clean Water Act, including the contaminants chosen for assessment and the rationale for their selection. Note, states may reference their assessment methodology for this information.
4. Identification and extent of impaired miles of rivers/streams and impaired acres of lakes/reservoirs that overlap source water areas of community water systems as delineated by states under SDWA section 1453.

States should consult Section 4, Chapter 8 (*Public Water Supply/ Drinking Water Use Reporting*) EPA's 1997 guidelines[9] for further details on reporting in this subsection.

PART D. GROUND WATER MONITORING AND ASSESSMENT

As discussed in Section II of this guidance, for states to be eligible for section 106 grant funds, section 106(e)(1) requires that states must have the means to monitor water quality (including "navigable waters and to the extent practicable, ground waters") and annually update water quality data and include it in their section 305(b) submittals. In this section, states should include a summary of their ground water monitoring and protection programs, ground water quality, ground water contamination sources, and ground water/surface water interactions. States should consult Section 5 (*Ground Water Assessment)* EPA's 1997 guidelines[10] for further details on reporting ground-water monitoring data.

PART E. PUBLIC PARTICIPATION

EPA regulations require states to describe in their Continuing Planning Processes (CPP) the process for involving the public and other stakeholders in the development of the section 303(d) list (40 CFR 130.7(a)). EPA encourages the state to provide opportunities for public participation in the development of the Integrated Report and demonstrate how it considered public comments in its final decisions.

States should respond to commenters by including a responsiveness summary in their Integrated Reports or by making the summary available by other means used by the state (e.g., internet posting, mailing to commenters). States should submit or make available to EPA at the time of the Integrated Report submittal a copy of all comment letters, e-mail, etc., received from the public and a responsiveness summary addressing all comments. The responses should provide enough detail to clearly explain how

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[9] Guidelines for Preparation of the Comprehensive State Water Quality Assessments (305(b) Reports) and Electronic Updates: Report Contents; Office of Water, US EPA; EPA-841-B-97-002a, September 1997.

[10] Guidelines for Preparation of the Comprehensive State Water Quality Assessments (305(b) Reports) and Electronic Updates: Report Contents; Office of Water, US EPA; EPA-841-B-97-002a, September 1997.

the state considered the comment and whether and how the placement of waters in the five categories changed in response to the comment.

If the state received comments on a particular issue that opposes or questions the state's decisions, the Regions should determine whether those comments are adequately addressed in the state's comment response document. If the Region agrees with the state's substantive decision, but believes that the state's comment response is inadequate, the Region can work with the state to supplement its response even after the formal submission is made (but prior to the Region's approval or disapproval action). If the state is unwilling or unable to supplement the state's responses, the Region should address the issue in its decision document or elsewhere in the administrative record.

Table 3-11. Summary of Water Quality Reporting Elements of an Integrated Report

Reporting Element	Required[a] (●) Versus Recommended (❍)
Executive Summary	❍
Part A. Introduction	❍
Part B. Background Information	
B.1 Total Waters	❍
B.2 Water Pollution Control Program	See below
Description of water quality management program	❍
An estimate of the extent to which CWA control programs have improved water quality or will improve water quality, and recommendations for future actions necessary and identifications of waters needing action.	●
A description of the nature and extent of nonpoint source pollution and recommendations of programs needed to control each category of nonpoint sources, including an estimate of implementation costs.	●
B.3 Cost/Benefit Analysis	●
B.4 Special State Concerns and Recommendations	❍
Part C. Surface Water Monitoring and Assessment	
C.1 Monitoring Program	❍
C.2 Assessment Methodology	See below
Description of data and information was used to make attainment determinations	●
Description of how the data and information was used to make attainment determinations	●
Rationales for any decision to not use any existing and readily available data and information.	●
Description of changes in the assessment methodology since the last reporting cycle	❍
C.3 Assessment Results	●[b] (See below)
Assessment Database (ADB)[c] and georeferencing information	❍
Five-part categorization of waters	❍
Results of Probability-based designs	❍
303(d) list: list of water quality-limited (impaired and threatened) waters still requiring TMDL(s) [waters assigned to Category 5], pollutants causing the impairment and priority ranking for TMDL development (including waters targeted for TMDL development within the next 2 years).	●
Changes from previous 303(d) list (i.e., the water/pollutants that have been added and the water/pollutants that have been delisted and the reason for their delisting)	❍

Reporting Element	Required[a] (●) Versus Recommended (❍)
Status of TMDL development	❍
State summaries of designated use support	❍
Eutrophic condition of all publicly owned lakes in such State	❍
A description of procedures used to control pollution and restore water quality	❍
Methods used to mitigate high acidity in lakes	●
A list and description of those publicly owned lakes in such State for which uses are known to be impaired and those lakes in which water quality has deteriorated as a result of high acidity that may reasonably be due to acid deposition	●
An assessment of the status and trends of water quality in lakes	●
C.4 Wetland Program	❍
C.5 Trends Analysis	❍
C.6 Public Health Issues	❍
Part D. Ground Water Monitoring & Assessment	❍
Part E. Public Participation	See below
Description of public participation process	❍
Copy of all comment letters, e-mail, etc., received from the public and a responsiveness summary	❍

Notes:

[a] Required by Clean Water Act sections 303(d), 305(b) or 314 and their corresponding regulations.

[b] CWA section 305(b) requires states to provide a description of the water quality of all waters in their state. As a result, EPA and the states have established a long-term goal of comprehensively characterizing surface waters of each state using a variety of techniques. These techniques may include traditional targeted monitoring, probability-based monitoring surveys, targeted site-specific monitoring, landscape and water quality modeling, and remote sensing.

[c] EPA strongly encourages all states to use the ADB. If the state is not using the ADB, this assessment unit specific information should be submitted in a compatible electronic system. The state should work with EPA to ensure that the electronic assessment information submitted can be compiled by EPA for regional and national reporting and can be sorted into the five part list as outlined in the IR guidance.

IV. ISSUES CONCERNING THE DEVELOPMENT AND USE OF AN ASSESSMENT METHODOLOGY

A. What constitutes an assessment methodology?

The assessment methodology constitutes the decision process (including principles of science, statistics and logic used in interpreting data and information relevant to segment conditions) that a state employs to determine to which of the five integrated reporting categories a segment belongs. It is important that assessment methodologies must be consistent with applicable WQSs. They should also be consistent with sound science and statistics.

As described in section 130.7 (b)(6) (i- iv), each state shall provide documentation to the Regional Administrator at the time that the integrated report or the separate section 303(d) list is submitted. This documentation must support the state's determination to list or not list its segments as required in 130.7(b)(1) and 130.7(b)(2). A major component of this documentation is a description of the methodology that the state used to develop their Integrated Report or the separate section 303(d) list.

The methodology should: 1) explain how the state identifies, considers (evaluates) all existing and readily available data and information; 2) articulate the basics of the quality assurance and quality control (QA/QC) criteria used to evaluate data submitted by outside entities to determine what weight, if any, should be assigned to said data and information; and 3) explain the analytical approaches, including statistical analyses, used to infer true segment conditions from all valid existing and readily available information. The decision processes the states describe in the methodology should provide all stakeholders with the opportunity to understand exactly how assessment decisions are made.

Prior to submission of its Integrated Report, each state should provide the public with the opportunity to review and comment on the methodology, consistent with their continuing planning process (CPP), public participation policies, and monitoring strategies.

B. What will EPA do with the methodology?

When a state has by rulemaking adopted a methodology as part of its approved water quality standards and the water quality standards are applicable for CWA purposes, 40 CFR § 131.21, EPA will apply the approved methodology as it reviews the state's submission in order to determine whether to approve or disapprove the section 303(d) list (Category 5). If a state has not by rulemaking adopted a methodology into its water quality standards, EPA will consider the state's methodology, to the extent that it reflects a reasonable interpretation of the state's water quality standards and sound science, in determining whether to approve or disapprove the section 303(d) list. In either scenario, EPA encourages the state to make available the most recent methodology used to develop the current Draft 2006 Integrated Report (or separate 303(d) list) prior to submission of their IR. The methodology allows EPA and other reviewers to understand the decision process followed by the states as they review the 2006 Draft. Where EPA has concerns with the assessment methodology, EPA will provide comments to the state to assist in developing an approvable section 303(d) list.

For methodologies that are not part of the state's applicable water quality standards, EPA will consider the methodology as it assesses whether the state conducted an adequate review of all existing and readily available water quality-related information, whether the factors that were used to make listing

and removal decisions were reasonable, whether the process for evaluating different kinds of water-quality related data and information is sufficient, and whether the process for resolving jurisdictional disagreements is sufficient. If EPA finds that the state's methodology is inconsistent with its water quality standards, and its application has resulted in an improper section 303(d) list, EPA may disapprove the list. Regardless of the suitability of the methodology, EPA must review the list for consistency with the relevant provisions of the CWA and the regulations.

EPA sees the methodology as an evolving document which states periodically revise as appropriate at some time during the listing cycle[11]. As such, EPA strongly encourages states to submit their draft and current methodologies to EPA and to the public for review and comment (but not formal approval) well in advance of any deadline the state sets for submission of data and information.

C. Data Assembly

40 CFR section 130.7(b)(5) requires that "Each State shall assemble and evaluate all existing and readily available water quality related data and information to develop the list."

States should solicit data and information including, but not limited to, the types listed below:

- observed effects (see glossary)
- closures, restrictions and/or advisories applicable to swimming, fish consumption, and drinking water
- violations of Safe Drinking Water Act (SDWA) standards
- segment-specific ambient monitoring-chemical, physical, and/or biological
- large-scale probabilistic monitoring designs
- simple dilution calculations
- predictive (simulation) modeling,
- landscape analysis
- remote sensing
- complaints and comments from the public

To the extent practicable, such types of data and information should be drawn from existing compilations of information regarding water quality, including, but not limited to:

- publicly-available databases (e.g., STORET)
- source water assessments per the Safe Drinking Water Act
- monitoring information from pesticides registrations
- watershed plans and other kinds of water quality or natural resource management plans
- Superfund Records of Decision
- reports prepared pursuant to sections 305(b), 303(d), 314, and 319 of the CWA

[11] EPA notes that it does not view state regulatory provisions concerning assessment methods that merely describe the sufficiency or reliability of information necessary for states to make an attainment decision as water quality standards, because they do not have the effect of changing the ambient conditions (i.e., magnitude, duration, frequency of concentrations of pollutants) considered necessary to support a designated use.

Such types of data and information should also be solicited from a wide variety of organizations and individuals, such as:

- other state agencies such as Fish and Wildlife, Parks, and Agriculture Departments
- federal agencies, including EPA, USGS, NOAA, USDA, and USFWS
- local governments
- drinking water utilities and state agencies responsible for SDWA implementation
- universities and other research institutions
- environmental consulting firms
- National Pollutant Discharge Elimination System (NPDES) permittees
- conservation/environmental organizations
- outdoor recreation organizations
- citizen monitoring groups

EPA regulations provide that states should actively solicit organizations and individuals such as those listed above. See 40 CFR 130.7(b)(5)(iii). EPA considers active solicitation as notifying local, state, and federal agencies, members of the public, and academic institutions that the state is seeking water quality related data and information for the purpose of developing the Integrated Report, through notices in the State Register, notices or announcements in appropriate local or trade papers, direct mailings to members of the public that have previously submitted public comments or other interested parties on the State's mailing list, or announcements and requests for data at appropriate public meetings or informational meetings. EPA recommends that states also request such data and information via letters sent to other state agencies, federal agencies and academic institutions that may have data/information.

If the state has specifications for data and information, these specifications should be included in any requests for information. To facilitate the timely completion of a draft list that can be distributed for public review and comment, states may set a reasonable "cut-off" date after which no additional data or information will be considered in the preparation of the draft section 303(d) list and other aspects of a preliminary Integrated Report. If a state institutes a cutoff date for data submission, effective prior to establishing a draft list, there could also be a separate data solicitation step prior to compilation of a final 303(d) list. Under this scenario, the state would compile the preliminary list using all information it has at hand based on identified data sources. Additional data submissions during the public comment period would then be evaluated, appropriate changes to the draft list would be made based on these new data or information.

If the state intends to consider only data and information submitted prior to a certain cutoff date, the state should clearly explain that this is the only opportunity for the public to provide data and information for the current assessment cycle, and that data submitted after that cutoff date would be considered during the next listing cycle. States should provide a mechanism for an exception to the limit for the submission of data if the submitter can demonstrate that the data were readily available prior to the data cutoff date and should have been included in any reasonably diligent state review of data. EPA will generally limit its review of a state listing submission to the data and information assembled by the state prior to the data cutoff date if the state was reasonably diligent in assembling available data and information and soliciting data and information from the public.

EPA is aware that many states have turned to the rotating basin strategy as a technically sound approach for making assessment determinations of the state's waters. In this approach, the available monitoring resources are concentrated or targeted in one portion of the state for a specified period of time, thus allowing for data to be collected and assessed in a spatially and temporally focused manner. Over time, every portion of the state is targeted for this higher resolution monitoring and assessment effort (often over a five-year period), however the state must consider all existing and readily available data and information during the development of its 2006 Integrated Report, regardless of where in the state the data and information were generated.

The state should make reasonable efforts to obtain and consider sources of data and information not provided by commenters. If particular data/information referenced in the public comments are not provided, EPA expects states to make a reasonable effort to secure the data. Solicitation requests should note that at a minimum commenters should provide as much information as possible in order for the state to be able to obtain the data or information, and again emphasize any state criteria for considering and prioritizing data sets.

D. How should the methodology describe data and information expectations?

1. Data Quality Considerations

A state must evaluate all existing and readily available data and information, to establish how it should be used in attempting to make a WQS attainment status determinations, applying reasonable and scientifically sound data evaluation procedures. Such evaluation protocols should strike a balance between: (1) employing only the very highest quality data, and (2) employing as much useful information about the condition of as many segments as possible. That is, these protocols should reflect both legitimate concerns about basing decisions on the best possible information and the fact that there is relatively little or no segment-specific monitoring data or other forms of assessment-relevant information available for the majority of the nation's waters.

Such protocols/evaluation criteria would include typical elements of a quality assurance project plan (QAPP). Examples of such elements include a description of the methods used to collect the data in the field, a description of the methods to assure proper handling and "chain of custody" of the samples during transport to the laboratory, documentation of the laboratory methods used to perform the analysis of samples, and a description of any independent audits to verify the consistency of the data. In their articulation of QA/QC expectations for data and information submitted by others, states should describe the types and amount of metadata that should be provided along with specific sets of data and information. If an outside entity fails to provide necessary metadata along with submitted data and information, the state should attempt to obtain the metadata from the data-submitting organization before concluding that the data and information is of low quality, simply due to lack of metadata.

Data quality criteria should be published along with any solicitations of data and information. Ideally, such QA/QC protocols should be made available to the public well in advance of any such solicitation for any given IR reporting cycle.

In addition to articulating their data review criteria, EPA recommends that states work with data-generating organizations not only during the period of time just before the Integrated Report development, but on a more continual basis, to help ensure their data are collected and stored in such a way that the data will of high quality. States may wish to encourage such organizations to develop QAPPs and submit them to the state for review and comment, and even perhaps formal approval by the state. A state may elect to employ a rebuttable presumption that data and information submitted by organizations with a state-approved QAPP meets the state's QA/QC standards. Lack of a State-approved QAPP should not, however, be used as the basis for summarily rejecting data and information submitted by such organizations, or assuming it is of low quality, regardless of the actual QA/QC protocols employed during the gathering, storage, and analysis of these data.

2. Data Representativeness Considerations

The spatial and temporal representativeness of data and information should be considered by states as they attempt to characterize conditions in a given segment. Clearly, the degree of confidence in a WQS attainment status determination increases as the amount of data and information grows. Ideally, all decisions about the WQS attainment status of individual assessment units would be based on a complete census of water quality conditions, which could involve sampling every portion of a waterbody at frequent intervals. Unfortunately, gathering this vast amount of data is not currently feasible, due to the limitations of current monitoring technology as well as the amount of funding available for gathering and analysis of water quality information.

Even for those segments where unusually large amounts of monitoring data is available, compared to most waterbodies, the percentage of all possible locations in time and space from which data has been collected is very, very small. Given this situation, states and EPA will continue to need to make WQS attainment status determinations by extrapolating, in time and space, to a substantial degree, from individual points of data.

Hence, state methodologies should describe, in general terms, the decision logic used to determine the temporal and spatial extent a grab sample can be construed to represent. In order to make credible assessment determinations, states should employ approaches that strike a balance between the extremes of: (1) considering every grab sample to be representative of merely the instant in which, and the drop of water from which, each was taken; or, (2) assuming each such sample is representative of conditions over several years, and covering hundreds of stream miles or hundreds of lake acres. (Note that available data and information should be used to assess attainment of applicable water quality standards unless a specific technical rationale is provided to support a determination that such data and information should not be used (see 40 CFR 130.7(b)(6)(iii-iv)).

Many state numeric water quality criteria include multiple day averaging periods, while most state monitoring programs do not collect samples at a rate of one or more per day. In such circumstances, states should decide how far out in time to extrapolate from the time at which a particular single grab was collected. EPA recommends that such decisions be based on contextual information regarding conditions when and where the grab was taken. For example, such information might include: 1) precipitation, 2) streamflow, 3) location of point source discharges in relation to the monitoring site, 4) land use patterns in the vicinity, 5) expected patterns of pollutant loading from the different kinds of sources present in the

watershed, 6) occurrence of a chemical spill or other unusual event, and 7) historic patterns of pollutant concentrations in the monitoring segment and/or waterbodies similar to it.

For instance, such contextual information might indicate that levels of a pollutant under study are likely to have remained fairly constant over a certain period. This would generally be a reasonable conclusion if, for example, available information suggested that both pollutant loadings and stream flow remained fairly steady over that period. In such cases, it could be reasonable to assume that the concentration seen in a sole available grab sample was representative of average conditions over the period of interest. On the other hand, if it were known that the watershed draining into a segment had a large number of precipitation-dependant sources of pollutants, a particular sample had been collected during the only significant rainfall that occurred during that period, and the precipitation event was of a duration shorter than the averaging period used in the water quality standard, then it could make sense to conclude that the concentration in that sample was not roughly equal to the average over the period in question (e.g., 1 day, 4 days, 7 days).

Similarly, contextual information can help inform a decision as to how far out in space to extrapolate from a particular sampling point. Where no point source dischargers are present and land use practices are the same over large areas, assuming data collected at a particular monitoring site is representative of conditions over a long stretch of river could be reasonable. On the other hand, if a number of point sources and a variety of nonpoint sources are found along a similar length of stream, it may be prudent to presume that data from a particular sampling site is representative of only a portion of that river reach.

In deciding how broad a span of time and space to assume a particular grab sample might represent, States may wish to consider the implications of a more expansive versus a more cautious approach to interpreting available monitoring data in the context of available metadata. Willingness to extrapolate further in time and space will generally lead to making WQS attainment/non-attainment determinations on a larger number of waters and designated uses, while a more cautious approach can result in a higher proportion of waters and uses being reported as “status unknown”.

Though a determination of whether a single grab sample can reasonably be construed to be representative of (i.e., close in value to) average conditions over a specified period is an important step in the assessment process, the mere fact that the only grab sample available for a particular period is not deemed representative of average conditions over said period does not necessarily mean that it could not be used as the basis of a WQS attainment status determination. For instance, despite being non-*representative* of the average concentration, it may be indicative of the average, or at least a fairly reliable indicator of whether or not the average concentration in the waterbody over said period is above or below the level specified in the WQS.

For example, it is widely known that dissolved oxygen levels rise and fall in most waterbodies following a diurnal cycle. Hence, if a grab sample were collected at 5 a.m. (around when DO levels should be at the lowest point during the daily cycle) and the DO level in the sample was above, or even somewhat below, the level specified in an applicable WQC expressed as a 24 hour average concentration, it would be reasonable to assume the daily average concentration of DO on the day the one grab was collected was <u>higher</u> than that specified by the WQC. (Conversely, if a DO sample were collected at 6p.m., i.e., during the *high* end of the diurnal cycle of DO levels, and the concentration was below, or

even slightly above, the specified concentration, it could be reasonable to conclude that the 24-hour average DO level was below that specified by the WQC.)[12]

Awareness of the types of sources upstream of a site and knowledge of the weather at the time of sampling can also be instructive. For instance, if the level in the sole grab of a pollutant associated primarily with nonpoint sources was slightly higher than the criterion-concentration, but the grab had been taken during a one-in-10-year one-hour rainfall event, it could be reasonable to assume the 4-day average was lower than the criterion-concentration.

Similarly, EPA believes that data should not automatically be treated as unrepresentative of relevant segment conditions solely on the basis of its age without supporting information indicating that the data are not a good indicator of current conditions. However, older data should be evaluated with care. For example if the most recent data for a particular assessment unit is 10 years old, and that data indicated that average and/or peak conditions in a segment at that time were worse than those specified by an applicable WQC; and, since that time, all the sources of the pollutant in question had been required to dramatically lower the levels of the pollutant in their effluent, and few changes that would lead to increased loadings of the pollutant had taken place in the watershed, it could be reasonable to assume that the segment was now meeting the WQC for that pollutant. By contrast, if 15 year old data indicated that a segment was then just barely meeting WQS for several pollutants associated with urban runoff, and the watershed of that segment had since that time undergone considerable urbanization, a conclusion that the segment was no longer meeting WQC for some or all of those pollutants could be warranted.

States should be cautious about employing assessment methodologies that assign little or no weight to data consistent with state QA/QC protocols based on the theory that it is "unrepresentative" simply because the data seem to reflect unusual circumstances. Rather, such unusual circumstances should be evaluated in the context of the specific requirements of applicable WQSs. In assessing potential adverse effects on humans or other life forms, it is just as important to be cognizant of potential short term events as it is to reflect longer term "average" conditions. Short term exposure to very high levels of pollutants (or low level of necessary elements like oxygen) can be extremely harmful, even lethal. For this reason, EPA and state WQC for a number of pollutants include concentration/duration combinations for short periods as well as such combinations for longer periods. Such criteria are typically referred to as acute and chronic WQC, respectively.

Extreme values or "outliers" can be very relevant when dealing with WQC aimed at protecting humans or other life forms against adverse effects of acute (short term) exposure to pollutants. The fact that such values may occur fairly infrequently and are not representative of long term average conditions is unimportant when dealing with WQC expressed as short-term that should occur only rarely, if ever. EPA's WQC addressing acute exposure of freshwater aquatic life to toxic chemicals are an example of WQC expressed in this way – they are one-hour average concentrations that should be surpassed no more than once every three years on average. WQC expressed as instantaneous concentrations never to be surpassed address even more rare, but nevertheless harmful, conditions.

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[12] Another example of using data sets consisting of just one grab sample to make inferences about conditions over longer periods is illustrated by one aspect of the 1986 EPA water quality criteria document for bacteria (www.epa.gov/waterscience/beaches/1986crit.pdf).

Caution regarding exclusion of "outliers" is expressed in EPA's *Guidance for Data Quality Assessment: Practical Methods for Data Analysis (QA/G-9)* (EPA/600/R-96/084) published in July 2000, available at http://www.epa.gov/quality/qa_docs.html):

> "One should never discard an outlier based solely on a statistical test. Instead, the decision to discard an outlier should be based on some scientific or quality assurance basis. Discarding an outlier from a data set should be done with extreme caution, particularly for environmental data sets, which often contain legitimate extreme values. If an outlier is discarded from the data set, all statistical analysis of the data should be applied to both the full and truncated data set so that the effect of discarding observations may be assessed. If scientific reasoning does not explain the outlier, it should not be discarded from the data set." (EPA/600/R-96/084, pp. 4-26).

Additional guidance about "outliers" can be found in the discussion of trimmed means on page 35 of *Biological Criteria: Technical Guidance for Survey Design and Statistical Evaluation of Biosurvey Data* (EPA/822/B/97/002).

However, disregarding valid data gathered during extreme conditions (e.g., significant droughts or floods) can be appropriate if applicable state's WQS include a provision specifying that some or all WQC do not apply during certain rare events, such a 7Q10 low (or high) stream flow. Also, data collected at certain times of years could legitimately be disregarded when making use support status determinations based on seasonal WQC – ones that apply only to times of year other than that when these particular data were collected.

In addition to such "temporal waivers" of WQS, state regulations often contain "spatial wavers"– portions of segments in which some or all WQS do not apply. Mixing zones in the immediate vicinity of NPDES-regulated discharges are the most common example of such exemptions. Hence, data collected within the confines of designated mixing zones should not be applied against some or all WQC otherwise applicable to the receiving segment.

3. Data Quantity Considerations

EPA encourages the collection of adequate data to make well-grounded attainment determinations. EPA has not established, required, nor encouraged the establishment of rigid minimum sample set size requirements in the WQS attainment status determination process. EPA is particularly concerned with application of such thresholds state-wide, without regard to key factors like the manner in which applicable WQC are expressed, variability in segment-specific conditions, and fluctuations in rates of pollutant loading. Rather if employed, target sample set sizes should not be applied in an assessment methodology as absolute exclusionary rules, and even the smallest data sets should be evaluated and, in appropriate circumstances, used. While it may be appropriate to identify target sample sizes as a methodology is developed, states should not exclude from further consideration data sets that do so solely because they not meet a target sample size. A methodology may provide for an initial sample size screen, but should also provide for a further assessment of sample sets that do not meet the target sample size. (EPA suggests that states avoid setting target sample set sizes higher than the amount of data available at most sites.)

Assessments based on larger sample sets are more likely to yield accurate conclusions than assessments based on smaller sample sets. For example, smaller sample sets are more prone to lead to erroneously concluding that at a WQC has not been exceeded, because they result in a lower probability of detecting WQSs exceedances that have actually occurred. (EPA, *Consolidated Assessment and Listing Methodology – Toward a Compendium of Best Practices* (CALM) July 2002, pp. 4-9).

Any target sample set size thresholds must be consistent with the state's EPA-approved water quality standards. Hence, when making an determination based on comparison of ambient data and other information to a numeric WQC expressed as an "average" concentration over a specified period of time, a statement of a desired number of samples may be appropriate. Still, the methodology should provide decision rules for concluding nonattainment in cases where the target data quantity expectations are not met, but the available data and information indicate a reasonable likelihood of a WQC exceedance (e.g., available samples with major digressions from the criterion concentration, corroborating evidence from independent lines of evidence such as biosurveys or incidence of waterborne disease, indications that conditions in the waterbody and loadings of the pollutant into the waterbody have remained fairly stable over the period in question).

Even a very small set of samples may be sufficient to indicate impairment, particularly when the duration/averaging periods of relevant WQC are quite short (an hour or less). For example, one grab sample meeting QA/QC specifications with a concentration higher than the criterion - concentration for a toxic compound could well be grounds for concluding that a WQC expressed as a concentration not be surpassed at any time had been exceeded. A single sample with a concentration that digressed from (was above) the criterion-concentration would be a particularly strong indicator of exceedance of such a criterion if it was the only sample that had been collected. In such a situation, the rate of digression in the sample set (in this instance a set of one) was 100%. This means that, if the timing of the sample was picked randomly, the chances are good that if additional samples had been taken over the period of concern, the vast majority of those would also have had concentrations above the criterion-concentration. (Of course, if the sole sample were collected during a time, condition and/or location condition excluded from application of said WQC, by the state's WQS regulation, it would not be an appropriate basis for 303(d)-listing a segment. Commonly encountered examples of such exclusions include streamflows below the low-flow 7Q10 or areas inside the designated mixing zone for an NPDES permittee.) *NOTE*: See Sec. IV.D.2 for discussion of a somewhat different issue regarding use of single grab samples.

4. Providing Excluded Data (considered and evaluated, but not used) to EPA

EPA regulations require states to provide as part of their section 303(d) list submission a rationale for not using any existing and readily available water quality-related data and information in developing the list. 40 CFR 130.7(b)(6)(iii). EPA recommends that states provide such a rationale on a segment-specific basis to assist EPA in reviewing the state's listing decisions. EPA may also request that states provide any data or information they decided not to use to develop their list and a case-specific rationale for that decision to not use the data in a particular WQS attainment status determination. EPA may review the data and rationale, disapprove section 303(d) listing decisions if appropriate, and make changes in the section 303(d) list based on data and information that was improperly excluded. Failure by a state to provide a reasonable technical rationale for a specific determination or for a decision not to use particular data or information may result in partial disapproval of the list for failure to include segments in Category 5, and potential additions of segments to the section 303(d) list by EPA.

E. Should a state use information other than site-specific ambient monitoring data?

Yes, as appropriate. Categorization decisions should generally not be based only on site specific ambient monitored data, and what was directly observed in the limited set of samples available to the water quality assessor, when other relevant types of information are available. For example, EPA regulations require that "reports from dilution calculations and predictive modeling" be included in the data and information that a state considers in its assessment process for section 303(d) listing (Category 5) purposes (40 CFR 130.7(b)(5)(ii)). Likewise, it may be appropriate to place a segment in any of the other four IR categories based on assessments resulting from the consideration of assessment tools such as predictive modeling, remote sensing data, land use analysis, knowledge about pollutant sources and loadings, observed effects, etc. (see longer listing of types of data and information in Sec. IV, Part C).

EPA believes that a valid assessment of a segment's condition should involve drawing conclusions beyond those which would be arrived at by taking into account nothing more that what was directly observed in the fraction of all possible segment conditions over a given span of time and volume of space represented by a typical set of ambient data. Simple dilution calculations, for example, can be used to estimate what concentration of a pollutant might be present under conditions (e.g., streamflow, pollutant loads) different from those extant at the times sampling was performed.

F. How should states use results of probability-based monitoring?

States should report the results of probability-based assessments as a component of their Integrated Report. A probability-based monitoring design is a type of sample survey design that ensures monitoring at a representative set of sample sites from which inferences can be made about the larger population or resource under investigation (e.g., rivers and streams throughout a state or watershed). It is similar to an opinion poll in which a sample of people are selected at random to represent a larger population. Probability-based designs are used in a wide range of disciplines when conducting a census (e.g., sampling every stream mile) is not economically feasible or is not necessary.

States are encouraged to use probability-based monitoring designs for developing probabilistic statements about waterbody conditions over broad scales (basins, the entire state). EPA believes that a probability-based monitoring design applied over large areas, such as an entire state or a large watershed, is a cost-effective approach to producing a statistical statement, of known confidence, describing the aggregate condition of water resources. For instance, based on such a study, a state might be able to state, with 75% confidence, that 37% of lakes of 50 acres or less fail to meet WQC for total phosphorus.

In addition, sampling performed under probability-based surveys provides site-specific data about each sample location. These data should be considered along with any other site-specific data that might be available, to determine if they should be used to make WQS attainment status determinations, leading to placing segments in the five categories.

The results of probability-based monitoring provide a useful benchmark for the extent that segments are likely to be healthy or degraded. This may help states refine their understanding of how much additional targeted monitoring is needed to complete identification of segments needing restoration, as well as high quality waters needing extra protection.

Though probability-based monitoring programs usually result only in a statistical statement, of known confidence, about aggregate waterbody conditions across a large area, in some instances, results may be compelling enough to support site-specific decisions about water quality in segments besides those from which ambient data were collected. For example, if a probability-based survey of fish tissue from a random sample of lakes across a state found, with a reasonably high level of confidence, that a very high percentage of lakes contain fish with tissue contaminant concentrations exceeding advisory levels, decision makers might decide to list all of the state's lakes as impaired for fish consumption use However, see Section V.H.6 below for additional guidance on use of fish consumption advisories in attainment determinations. For more information on the design and implementation of probability-based sample surveys, visit EPA's Aquatic Resource Monitoring web page at http://www.epa.gov/nheerl/arm/index.htm.

G. How should statistical approaches be used in attainment determinations?

The state's methodology should provide a rationale for any statistical interpretation of data for the purpose of making an assessment determination.

1. Description of statistical methods to be employed in various circumstances

The methodology should provide a clear explanation of which analytic tools the state uses and under which circumstances. EPA recommends that the methodology explain issues such as the selection of key sample statistics (arithmetic mean concentration, median concentration, or a percentile), null and alternative hypotheses, confidence intervals, and Type I and Type II error thresholds. The choice of a statistic tool should be based on the known or expected distribution of the concentration of the pollutant in the segment (e.g., normal or log normal) in both time and space.

Past EPA guidance (1997 305(b) and 2000 CALM) recommended making non attainment decisions, for "conventional pollutants" — TSS, pH, BOD, fecal coliform bacteria, and oil and grease[13] — when more than "10% of measurements exceed the water quality criterion." (However, EPA guidance has not encouraged use of the "10% rule" with other pollutants, including toxics.) Use of this rule when addressing conventional pollutants, is appropriate if its application is consistent with the manner in which applicable WQC are expressed. An example of a WQC for which an assessment based on the ten percent rule would be appropriate is the EPA acute WQC for fecal coliform bacteria, applicable to protection of water contact recreational use. This 1976-issued WQC was expressed as, "...no more than ten percent of the samples exceeding 400 CFU per 100 ml, during a 30-day period." Here, the assessment methodology is clearly reflective of the WQC.

[13] There are a variety of definitions for the term "conventional pollutants." Wherever this term is referred to in this guidance, it means "a pollutant other than a toxic pollutant."

On the other hand, use of the ten percent rule for interpreting water quality data is usually not consistent with WQC expressed either as: 1) instantaneous maxima not to be surpassed at any time, or 2) average concentrations over specified times. In the case of "instantaneous maxima (or minima) never to occur" criteria use of the ten percent rule typically leads to the belief that segment conditions are equal or better than specified by the WQC, when they in fact are considerably worse. (That is, pollutant concentrations are above the criterion-concentration a far greater proportion of the time than specified by the WQC.) Conversely, use of this decision rule in concert with WQC expressed as average concentrations over specific times can lead to concluding that segment conditions are worse than WQC, when in fact they are not.

If the state applies different decision rules for different types of pollutants (e.g., toxic, conventional, and non-conventional pollutants) and types of standards (e.g., acute vs. chronic criteria for aquatic life or human health), the state should provide a reasonable rationale supporting the choice of a particular statistical approach to each of its different sets of pollutants and types of standards.

2. Elucidation of policy choices embedded in selection of particular statistical approaches and use of certain assumptions

EPA strongly encourages states to highlight policy decisions implicit in the statistical analysis that they have chosen to employ in various circumstances. For example, if hypothesis testing is used, the state should make its decision-making rules transparent by explaining why it chose either "meeting WQS" or "not meeting WQS" as the null hypothesis (rebuttable presumption) as a general rule for all waters, a category of waters, or an individual segment. Starting with the assumption that a water is "healthy" when employing hypothesis testing means that a segment will be identified as impaired, and placed in Category 4 or 5, only if substantial amounts of credible evidence exist to refute that presumption. By contrast, making the null hypothesis "WQS not being met" shifts the burden of proof to those who believe the segment is, in fact, meeting WQS.

Which "null hypothesis" a state selects could likely create contrasting incentives regarding support for additional ambient monitoring among different stakeholders. If the null hypothesis is "meeting standards," there were no previous data on the segment, and no additional existing and readily available data and information are collected, then the "null hypothesis" cannot be rejected, and the segment would not be placed in Category 4 or 5. In this situation, those concerned about possible adverse consequences of having a segment declared "impaired" might have little interest in collection of additional ambient data. Meanwhile, users of the segment would likely want to have the segment monitored, so they can be ensured that it is indeed capable of supporting the uses of concern. On the other hand, if the null hypothesis is changed to "segment not meeting WQS," then those that would prefer that a particular segment not be labeled "impaired" would probably want more data collected, in hopes of proving that the null hypothesis is not true.

Another key policy issue in hypothesis testing is what significance level to use in deciding whether to reject the null hypothesis. Picking a high level of significance for rejecting the null hypothesis means that great emphasis is being placed on avoiding a Type I error (rejecting the null hypothesis, when in fact, the null hypothesis is true). This means that if a 0.10 significance level is chosen, the state wants to keep the chance of making a Type I error at or below ten percent. Hence, if the chosen null hypothesis

is "segment meeting WQS," the state is trying to keep the chance of saying a segment is impaired – when in reality it is not – under ten percent.

An additional policy issue is the Type II errors (not rejecting the null hypothesis, when it should have been). The probability of Type II errors depends on several factors. One key factor is the number of samples available. With a fixed number of samples, as the probability of Type I error decreases, the probability of a Type II error increases. States would ideally collect enough samples so the chances of making Type I and Type II errors are simultaneously small. Unfortunately, resources needed to collect such numbers of samples are quite often not available.

The final example of a policy issue that a state should describe is the rationale for concentrating limited resources to support data collection and statistical analysis in segments where there are documented water quality problems or where the combination of nonpoint source loadings and point source discharges would indicate a strong potential for a water quality problem to exist.

EPA recommends that, when picking the decision rules and statistical methods to be utilized when interpreting data and information, states attempt to minimize the chances of making either of the two following errors:

- Concluding the segment is impaired, when in fact it is not, and
- Deciding not to declare a segment impaired, when it is in fact impaired.

States should specify in their methodology what significance level they have chosen to use, in various circumstances. The methodology would best describe in "plain English" the likelihood of deciding to list a segment that in reality is not impaired (Type I error if the null hypothesis is "segment not impaired"). Also, EPA encourages states to estimate, in their assessment databases, the probability of making a Type II error (not putting on the 303(d) list a segment that in fact fails to meet WQS), when: 1) commonly-available numbers of grab samples are available, and 2) the degree of variance in pollutant concentrations are at commonly encountered levels. For example, if an assessment is being performed with a WQC expressed as a 30-day average concentration of a certain pollutant, it would be useful to estimate the probability of a Type II error when the number of available samples over a 30 day period is equal to the average number of samples for that pollutant in segments state-wide, or in a given group of segments, assuming a degree of variance in levels of the pollutant often observed over typical 30 day periods.

H. How should states use community-level bioassessment data?

Many states use multi-metric, community-level biological assessments to report water resource condition. Biological assessments provide direct measures of the cumulative response of the biological community to all sources of stress. Therefore, a biocriteria/bioassessment represents a very useful indicator of the use support status for aquatic life.

Credible assessments of biological condition can be accomplished with far fewer samples than with parameter-specific monitoring. However, attention to proper quality assurance and control is equally important in biological monitoring as it is in chemical and physical measurements. Threshold values for segment impairment determinations as well as quality assurance should be addressed in the state's methodology.

States should include biological assessments in the data and information they assemble and evaluate in developing their Integrated Reports, and must provide a rationale for any decision not to use the assessments in developing their section 303(d) lists.

States using biological assessments to make reporting determinations should also consider other types of data and information (i.e., chemical and physical). In instances in which the indication of aquatic life use support provided by biosurvey data and that provided by chemical and/or physical data differ, EPA continues to support the principle of independent applicability (see Section IV.K. below), as most recently articulated in its Consolidated Assessment and Listing Methodology guidance.

I. What information should the state provide regarding its interpretation of its WQS?

When deciding whether to put a segment in Category 1, 2, 4 or 5, a state is trying to answer the question, "What does available ambient monitoring data and other information tell us about whether or not this segment is meeting WQS?" In order to answer this question, it is necessary to be very clear about the WQS that apply to the segment– the DUs assigned to the segment, as well as the numeric water quality criteria (WQC) applicable to each DU, along with narrative WQC.

Ideally, states' WQS regulations will clearly articulate each DU and all WQC applicable to that DU. However, in some instances, there may be ambiguity in the way WQS are expressed. For example, a WQC could refer to an "average" concentration. This could mean the median, the arithmetic mean, the geometric mean, or something else describing a central tendency. Also, WQS regulations and guidance sometimes do not clearly state a duration component of a WQC (criterion-duration) – particularly some types of human health (HH) criteria. (For reference purposes: EPA HH criteria for carcinogens are presumed to have a duration of a year or more; whereas a duration of 30 days is employed in criteria addressing human pathogens and water contact recreation. EPA's aquatic life WQC for toxic chemicals present acute and chronic concentrations applicable to exposure durations of (a) 1 hour and (b) 4 days, respectively.)

For toxic ("priority" pollutants) and protection of freshwater aquatic life, EPA guidance recommends use of a once in three year maximum allowable excursion recurrence frequency (*Guidance for 2004 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d) and 305(b) of the Clean Water Act,* Section III (F), EPA, 2003). Hence, for example, if a state freshwater aquatic life WQC were expressed as "1-hour average concentration not to surpass 22 ug/L", EPA would assume an applicable excursion frequency of no more than once in 3 years.

J. How should states handle shared waters?

States with shared waters should make every effort to coordinate with each other in the development of their Integrated Reports. Coordination should occur early in the process. Where possible, states should work together to collect, assemble, solicit, and assess all readily available data and information relevant to the shared waters. Assessments for waters that are shared by neighboring states should be as consistent as possible. This is particularly important for segments listed in Category 5. However, differing state WQS can make consistent attainment decisions difficult. In such cases, EPA

Regional offices and interstate commissions, where applicable, should assist in resolving inconsistencies when they arise. The Integrated Report should document the coordination that has occurred between neighboring states and interstate commissions.

Some interstate commissions are required to prepare a section 305(b) report, but the responsibility of preparing Integrated Reports and section 303(d) lists rests with the states. Data and information in an interstate commission section 305(b) report should be considered by the states as one source of readily available data and information when they prepare their IR and make decisions on segments to be placed in Category 5; however, data in a section 305(b) interstate commission report should not be automatically entered in a state IR or section 303(d) list without consideration by the state about whether such inclusion is appropriate. EPA has made the necessary modification to its ADB system to ensure that interstate commission data stays segregated from state data.

K. How does the state make attainment decisions when different types of data indicate a different attainment status?[14]

To address the possibility of conflicting results among different types of data used to assess attainment with WQS, EPA recommends that states apply the policy on independent applicability as appropriate for making WQS attainment decisions. This policy was initially crafted to address development of NPDES permit discharge limits. Its use is slightly different in the context of WQS attainment decisions.

The intent of this policy is to protect against dismissing valuable information when evaluating aquatic life use support, particularly in detecting impairment. EPA's policy on independent application is based on the premise that any valid, representative dataset indicating an actual or projected water quality impairment should not be ignored when one is determining the appropriate action to be taken. However, EPA recognizes that there are circumstances when conflicting results should be investigated further before the attainment or nonattainment decision is made. For example, states may obtain multiple datasets of varying quality, which may influence the reliability of the assessment results.

Figure 4-1 elaborates on the use of the independent application policy in reconciling conflicting results among different datasets used to assess attainment with aquatic life-based WQS. The decision process begins in the upper left of Figure 4-1. When a state, territory, or authorized tribe has two or more types of data that do not indicate consistent attainment status, it should determine whether differences in assessment results can be attributed to differences in the quality of the datasets. For example, this may involve consideration of analytical methods, review of sampling techniques, and detailed assessment of datasets. When the differences are due to data quality issues, the independent application policy allows for resolving the differences by cleaning the data or weighing the higher quality dataset more favorably in the attainment decision.

[14]Part K of Section IV has been adapted from pages 3-9 to 3-10 of EPA's *Consolidated Assessment and Listing Methodologies (CALM)*, July 2002.

When detailed data analysis fails to identify data quality issues that explain the discrepancies, site-specific environmental conditions should be considered (e.g., effects of water chemistry, or the ability of species to adapt over time). Site specific WQC may be explored via application of the water effects ratio, resident species recalculations, or other appropriate methods.

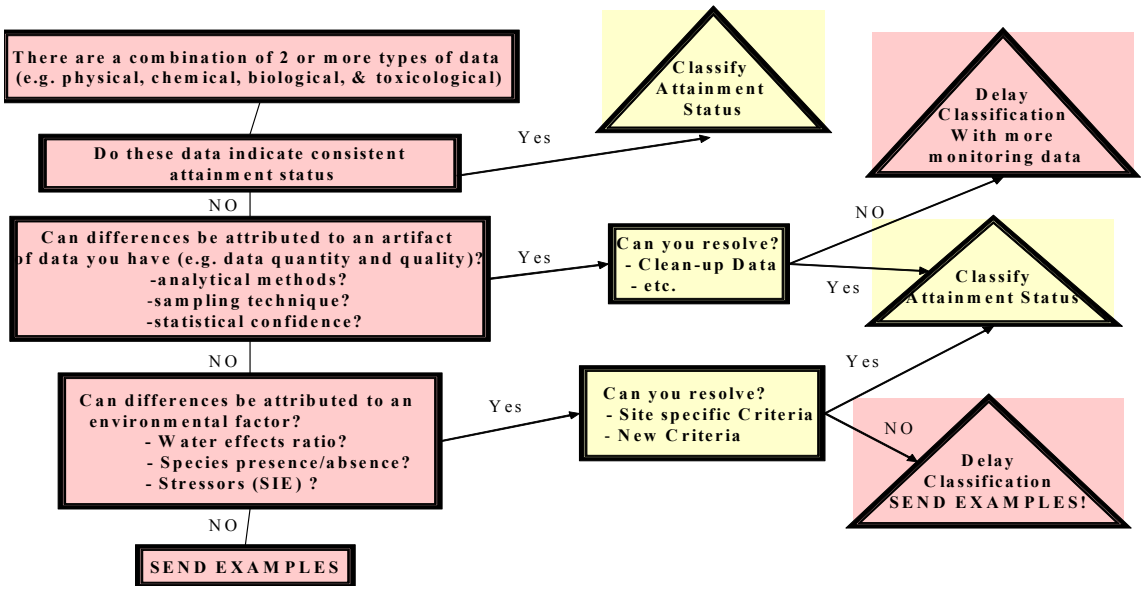

Figure 4-1. Using Multiple Types of Data to Assess Attainment

For Purposes of WQS Attainment/Nonattainment Determinations:

Policy of independent applicability *says*:

- When evaluating multiple types of data (e.g., biological, chemical) and any one type of data indicates an element of a WQS is not attained, the segment should most likely be identified as impaired.
- If there is reason to doubt the nonattainment finding, re-evaluate all of the data sets to resolve discrepancies. In some cases this may lead to modification of applicable WQS to account for site-specific information.

Policy of independent applicability *does not say*:

- Always assume that a single sample result showing impairment outweighs all other data showing attainment.
- Accept all differences in data findings at face value.

V. FIVE-PART CATEGORIZATION OF WATERS

Use of the Integrated Report format and the use of the five-part categorization scheme envisions that each state provides a comprehensive description of the water quality standards attainment status of all segments within a state. In this guidance, the term "segment" is synonymous with the term "assessment unit" (AU) used in previous IR Guidance. Fundamental to this accounting is the use of a consistent and rational segmentation and geo-referencing approach for all segments including rivers, streams, lakes, wetlands, estuaries, and coastal waters. There is no single approach to the development of a segmentation scheme. However, it is important that the selected segmentation approach be consistent with the state's water quality standards and be capable of providing a spatial scale that is adequate to characterize the WQS attainment status of the segment. The IRG provides some recommendations on how states may develop a segmentation scheme for monitoring, assessing and categorizing water quality conditions. Additionally, the IRG provides recommendations for assigning individual segments to the five-category system.

A. Recommendations for Segmenting Waters

EPA recommends that states consider using the National Hydrography Dataset (NHD)[15] coding scheme to georeference their segments, where segments may comprise part of an NHD reach, an individual NHD reach, or a collection of NHD reaches or parts of reaches. Alternatively, if a state has already developed a comparable Geographic Information System (GIS) framework, EPA requests that states provide any relevant information necessary to allow consistent georeferencing. Additionally, this information should be included in the state's ADB submission. States generally partition waters to represent homogeneity in physical, biological or chemical conditions. This segmentation may reflect an *a priori* knowledge of factors such as flow, channel morphology, substrate, riparian condition, adjoining land uses, confluence with other waterbodies, and potential sources of pollutant loadings (both point and nonpoint). While there is no single default dimension for a segment size, states have utilized these or similar principles when they defined the segments used in their water quality standards. Other factors may include the following:

- The expected natural variability of the measured criteria associated with the WQSs.
- The type of water (e.g., a small stream, a wide river, a tidal and stratified estuary, and coastal shoreline).
- Time of travel of a parcel of water in the waterbody or segment or the magnitude of any tidal excursions.
- The amount of and type of data and information necessary to provide a reasonably accurate characterization of the criteria (or core indicators) associated with the designated uses in the segment or waterbody.
- Any expected changes in significant influences in the watershed (land use, point or nonpoint sources of pollutants).
- Any site-specific concerns such as patchy or unique habitat distribution patterns or biological population distributions.

[15] By making this recommendation, EPA is not equating availability of geographical information on a water segment in the NHD with the legal definition of water of the U.S. under CWA.

Using NHD or other comparable GIS framework, a state should assign a discrete "address" or geo-location to each segment, and document the process used for defining water segments in their methodologies. The physical boundaries (beginning and end points) of a segment should be defined in such a manner that a scientifically valid assessment of each and every segment can be made. The individual size of a segment will vary based upon methodologies. Segments should, however, be larger than a sampling station but small enough to represent a relatively homogenous parcel of water (with regard to hydrology, land use influences, point and nonpoint source loadings, etc.).

B. How should segments be assigned to EPA's five reporting categories?

EPA continues to advocate the use of the five category approach for classifying the WQS attainment status for each segment. In this guidance document EPA refers to "designated uses" as the basis and unit for reporting water quality. A segment is considered impaired when WQS[16] are not being supported and/or met, and is considered threatened when WQS are not expected to be fully supported and/or met in the next listing cycle. In classifying the status of water quality in 2006, states have the option to report each segment in one or more categories. EPA recommends that states use the following five reporting categories to classify segments as meeting or not meeting applicable WQS:

Category 1: All designated uses are supported, no use is threatened;
Category 2: Available data and/or information indicate that some, but not all of the designated uses are supported;
Category 3: There is insufficient available data and/or information to make a use support determination;
Category 4: Available data and/or information indicate that at least one designated use is not being supported or is threatened, but a TMDL is not needed;
Category 5: Available data and/or information indicate that at least one designated use is not being supported or is threatened, and a TMDL is needed.

Exhibit 5-1 provides an example of how to consider designated uses in the categorization process. EPA believes that the placement of segments into the five reporting categories best allows states to document attainment of applicable WQSs, and to develop monitoring strategies that effectively respond to the needs identified in the assessment, while ensuring that the attainment status of each water quality standard applicable to a particular segment is addressed.

[16] Water quality standards include designated use(s), criteria, and the antidegradation policy. Water quality criteria are important elements of water quality standards and attainment of criteria should also be evaluated in making listing decisions (See 40 CFR 130.7 (b)(3)). Failure to meet WQC warrant listing of waters under section 303(d). EPA has not developed guidance at this time on determining attainment status for antidegradation policies. EPA recognizes that such policies, while an important part of WQS, may not lend themselves to "attainment" determinations on a segment specific basis.

Exhibit 5-1. 2006 Integrated Reporting Guidance: Segment Categorization Guide

The following schematic describes a process states might consider using for determining the placement of segments into the Integrated Report (IR) Categories. The process begins with the assessment of the water quality standard attainment status (designated use(s), criteria) of each segment, and concludes with the placement of each segment into one or more of the five IR Categories. The assessment of the water quality standards attainment status should be consistent with the state's assessment and listing methodology and must ensure that segments not meeting or not expected to meet applicable water quality standards are identified. While the schematic focuses on the assessment of designated uses (DU) for each segment, as previously stated all components of the water quality standard are considered in the categorization of a segment.

Step-by-step process to categorize a segment

1. For each segment, assemble and consider all existing and readily available data and/or information to determine the support status for each individual designated use.
2. Based on the data and information available, make support decisions for each DU in the segment and assign the appropriate symbol (✔+, ✔-, ?, T, 4a, 4b, 4c – See *Symbols and Definitions*).
3. Using the results of Step 2, place the segment into the appropriate category or categories.

Symbols and Definitions:

✔+ = The existing data and information shows that a use ***is supported***.

✔**-** = The existing data and information shows that a use ***is not supported.***

? = There is insufficient existing data and information to make a use support determination, consistent with the state's assessment and listing methodology.
T = A use in this segment is currently being supported, but is **THREATENED** and it is projected not to be supporting by the next scheduled list submission date.
4a = A TMDL to address a specific segment/pollutant combination has been approved or established by EPA.
4b = A use impairment caused by a pollutant is being addressed by the state through other pollution control requirements.
4c = A use is impaired, but the impairment is not caused by a pollutant.

In the following schematic, each box represents one (1) segment. Each segment may contain one or more DUs. After compiling and considering all existing and readily available data and information for each DU in a specific segment, support decisions are made. Placement of the segment into the appropriate category or categories is based on the sufficiency of the data and information, and the analysis of whether the data demonstrates that the DU is supported.

SEGMENT #1 (1 DU) **ASSESSMENT**

DU1 → **✔+**

SEGMENT #2 (2 DUs) **ASSESSMENT**

DU1, DU2 → **T, ✔-**

SEGMENT #3 (3 DUs) **ASSESSMENT**

DU1, DU2, DU3 → **✔+, ✔+, ?**

SEGMENT #4 (4 DUs) **ASSESSMENT**

DU1, DU2, DU3, DU4 → **✔-, 4a, ?, ✔+**

SEGMENT CATEGORIZATION

	DU1	DU2	DU3	DU4	Single Category	Multi-Category
SEGMENT 1	✔+				C1	C1
SEGMENT 2	T	✔-			C5	C5
SEGMENT 3	✔+	✔+	?		C2	C2 & C3
SEGMENT 4	✔-	4a	?	✔+	C5	C5, C4a, C3 & C2

Additional examples are provided below to further illustrate the process of segment classification into multiple categories.

	DU1	DU2	DU3	DU4	Single-Category	Multi-Category
SEGMENT A	✔+	✔+	✔+	✔+	C1	C1
SEGMENT B	✔-	✔-	✔-	✔-	C5	C5
SEGMENT C	✔-	✔-	✔-	T	C5	C5
SEGMENT D	?	?	?	?	C3	C3
SEGMENT E	4b	✔-	✔-	✔-	C5	C4b, C5
SEGMENT F	✔+	✔+	✔-	✔-	C5	C2 & C5
SEGMENT G	✔+	✔+	?	?	C2	C2 &C3
SEGMENT H	?	?	?	✔-	C5	C3 & C5
SEGMENT I	✔+	✔+	✔+	4c	C4c	C2, C4c
SEGMENT J	?	?	4c	T	C5	C3, C4c, & C5
SEGMENT K	✔+	?	?	✔-	C5	C2, C3, & C5
SEGMENT L	✔+	✔+	?	T	C5	C2, C3 & C5
SEGMENT M	✔+	?	4b	✔-	C5	C2, C3, C4b & C5

States have the option to place segments into more than one of the five categories when appropriate. The placement of segments into more than one category will allow states to:

1. Demonstrate progress in the efforts to develop TMDLs,
2. Track progress as segments incrementally attain some, but not all water quality standards, and
3. Identify those segments where there is a need to obtain additional data and information for purposes of determining attainment status of some water quality standards.

While EPA recommends that states adopt and utilize the IR format for reporting the status of their water quality in 2006, states may choose to submit separate 303(d) and 305(b) reports. Furthermore, even if a state chooses to use the IR format, it may choose to place each segment into only one category and rely on the reporting capability of ADB to provide detail on the support status of all individual uses. More detailed guidance for determining the appropriate categorization of segments is provided below. It is important to note that states must consider all existing and readily available data and information in developing their section 303(d) lists, and may choose to assess a segment and assign the segment to a category using data and information other than monitored data (e.g., land use, pollutant loading coefficients, remote sensing data, modeling, etc.).

C. May a state use subcategories or additional categories in its Integrated Report?

Yes, in order to refine their classifications, states may choose to establish new or additional subcategories in addition to the proposed five major categories. For example, a state may decide to divide Category 3 into two subcategories in order to distinguish between those segments for which no data and/or information exist from those segments for which some data and/or information exist, but the data are insufficient to make a determination whether the segment is attaining applicable standards. A state may also choose to use subcategories for segments placed into Category 3 when establishing monitoring priorities. For example, the state may place its segments into different subcategories depending on whether the segment is high, medium, or low priority for follow-up monitoring based on information from probability-based monitoring, landscape or water quality models, land use data, or limited site-specific monitoring.

D. Which segments should states include in Category 1?

Segments may be placed into Category 1 if all designated uses are supported, and no use is threatened. When a segment meets the Category 1 requirements, the state has concluded, consistent with their water quality standards (and their assessment methodology) that sufficient data and information exist to determine that ***all applicable water quality standards are being attained,*** thereby making the use of Category 2 unnecessary for this segment, (see Category 2 discussion below). By placing a segment into Category 1, the state is also concluding that there are adequate data and there is sufficient information to make a determination for any water quality standard, making the use of Category 3 unnecessary for this segment (see Category 3 discussion below).

1. *In order to place a segment in Category 1, must states have specific data and information regarding the status of each water quality standard?*[17]

No. States may describe in either their assessment methodology or in their water quality standards a subset or hierarchy of indicators (as described in the CALM guidance and *Elements of a State Water Monitoring and Assessment Program*) that serve to characterize whether conditions in a segment are capable of meeting all applicable water quality standards.

Because limited resources affect the design of water quality monitoring programs, the state should use a tiered approach to monitoring that includes a core set of baseline indicators selected to represent each applicable designated use, plus supplemental indicators selected according to site-specific or project-specific decision criteria. Using this tiered approach, the state should be able to make the best use of its resources to meet water quality decision needs, including assessing water quality standards attainment and designated use support, identifying needed changes to water quality standards, describing causes and sources of impairments, developing water quality-based source controls, and assessing whether water quality standards are attained. Where the assessment of the supplemental indicators applicable to every designated use in a segment documents that all uses are supported and no use is threatened, that segment should be placed into Category 1.

The monitoring strategy should define a core set of indicators (e.g., water quality parameters) for each water resource type that include physical/habitat, chemical/toxicological, and biological/ecological endpoints as appropriate, that reflect designated uses, and that can be used routinely to assess attainment with applicable water quality standards throughout the state. This core set of indicators is monitored to provide Statewide or basin/watershed level information on the fundamental attributes of the aquatic environment and to assess water quality standards attainment/impairment status. Previously, chemical and physical indicators were emphasized; however, biological monitoring and assessment should assume a prominent role in state monitoring as well.

The monitoring strategy should also describe the process the state uses for identifying supplemental indicators to monitor. Supplemental indicators are often key to identifying causes and sources of impairments and targeting appropriate source controls. These supplemental indicators may include each water quality criteria in the state's water quality standards, any pollutants controlled by the National Pollutant Discharge Elimination System (NPDES), and any other constituents or indicators of concern.

Table 5-1 presents examples of recommended core and supplemental water quality indicators. The Consolidated Assessment and Listing Methodology provides additional information on considerations for selection of supplemental indicators (see http://www.epa.gov/owow/monitoring/calm.html, Chapter 10).

[17] Part D(1) of Section V has been adapted from Section II (Part D) of *Elements of a State Water Monitoring and Assessment Program*; Office of Water, US EPA; EPA 841-B-03-003, March 2003.

Table 5-1. Recommended Water Quality Indicators for General Designated Use Categories

	Aquatic Life & Wildlife	Recreation	Drinking Water	Fish/Shellfish Consumption
Recommended Core Indicators	*Condition of biological communities (EPA recommends the use of at least two assemblages) *Dissolved oxygen *Temperature *Conductivity *pH *Habitat assessment *Flow *Nutrients *Landscape conditions (e.g., % cover of land uses) Additional indicators for lakes: *Eutrophic condition Additional indicators for wetlands: *Wetland hydrogeomorphic settings and functions	*Pathogen indicators (E. coli, enterococci) *Nuisance plant Growth *Flow *Nutrients *Chlorophyll *Landscape conditions (e.g., % cover of land uses) Additional indicators for lakes: *Secchi depth Additional indicators for wetlands: *Wetland hydrogeomorphic settings and functions	*Trace metals *Pathogens *Nitrates *Salinity *Sediments/TDS *Flow *Landscape conditions (e.g., % cover of land uses)	*Pathogens *Mercury *Chlordane *DDT *PCBs *Landscape conditions (e.g., % cover of land uses)
Supplemental Indicators	*Ambient toxicity *Sediment toxicity *Other chemicals of concern in water column or sediment *Health of organisms	*Other chemicals of concern in water column or sediment *Hazardous chemicals *Aesthetics	*Volatile organic compounds (VOCs) (in reservoirs) *Hydrophyllic pesticides *Nutrients *Other chemicals of concern in water column or sediment *Algae	*Other chemicals of concern in water column or sediment

Source: *Elements of a State Water Monitoring and Assessment Program*; Office of Water, US EPA; EPA 841-B-03-003, March 2003.

2. Should states use biosurvey data to list a segment as in attainment for aquatic life use support?

EPA encourages the use of biosurvey data in concert with other specified and supplemental indicators for making an aquatic life use attainment determination. Properly developed biosurvey data can provide direct evidence of aquatic life use support. States may develop, consistent with their assessment methodology and water quality standards, their own bioassessment approach to assessing aquatic life use support. CALM and the 2003 *Elements of a State Water Monitoring and Assessment Program,* recommend the use of at least two assemblages (e.g., fish and macroinvertebrates) in such assessments (See Table 5-1 taken from *Elements of a State Water Monitoring and Assessment Program*).

3. What data should states have to determine that a segment is meeting a "fish consumption" use?

Assessment determinations regarding fish/shellfish consumption uses should be based on parameter-specific data for two groups of pollutants: (1) human pathogens, or indicators thereof, and (2) chemicals with high bioaccumulation potential. Among the bioaccumulative pollutants, EPA recommends mercury, chlordane, Dichloro-diphenyl-trichloroethane (DDT), and polychlorinated biphenyls (PCBs) as core indicators.

E. Which segments should states include in Category 2?

Segments should be placed in Category 2 if the state determines that available data and/or information indicate that some, but not all of the designated uses are supported. If the state has chosen to use the multi-category approach, segments reported in Category 2 may also be reported in Categories 3, 4, or 5 depending upon the results of the analysis of all available data and information on the other uses in the segment. However, if a single-category approach is used, Category 5 takes precedence over all other categories.

F. Which segments should states include in Category 3?

Segments should be placed in Category 3 when there is insufficient available data and/or information to make a use support determination. Category 3 is consistent with and responds to one of the recommendations in the National Research Council's (NRC) report, Assessing the TMDL Approach to Water Quality Management (2001), in which the authors suggested that a category be created for those segments where there existed insufficient data and/or information to assess the use. The state should identify those segments that are higher and lower priority for followup monitoring, and may do so using predicative tools such as probability surveys or landscape models. Category 3 provides states with the flexibility to monitor these segments in a manner consistent with their overall monitoring strategy and schedule.

G. Which segments should states include in Category 4?

Segments may be placed in Category 4 if available data and/or information indicate that at least one designated use is not being supported or is threatened, but a TMDL is not needed. States may place segments that meet this definition in one of the following three subcategories:

- a state developed TMDL has been approved by EPA or a TMDL has been established by EPA for any segment-pollutant combination (Category 4a);

- other required control measures are expected to result in the attainment of an applicable water quality standard in a reasonable period of time (Category 4b);
- the non-attainment of any applicable water quality standard for the segment is the result of pollution and is not caused by a pollutant (Category 4c).

1. Which segments should states include in Category 4a?

Segments should be placed in Category 4a when a TMDL to address a specific segment/pollutant combination has been approved or established by EPA. Once the TMDL has been approved or established, the state should implement the TMDL as soon as practicable. Additionally, EPA encourages states to provide monitoring schedules for these segments to ensure that sufficient data and information are obtained to document progress of the implementation actions towards meeting the applicable water quality standards. Segments in this category may also be included in other categories, as appropriate (See Exhibit 5-1).

2. Which segments should states include in Category 4b?

EPA regulations recognize that alternative pollution control requirements may obviate the need for a TMDL. Segments are not required to be included on the section 303(d) list if technology-based effluent limitations required by the Act, more stringent effluent limitations required by state, local, or federal authority, or "[o]ther pollution control requirements (e.g., best management practices) required by local, State or Federal authority" are stringent enough to implement applicable water quality standards (see 40 CFR 130.7(b)(1)) within a reasonable period of time. This guidance acknowledges that the most effective method for achieving water quality standards for some water quality impaired segments may be through controls developed and implemented without TMDLs (referred to as a "4b alternative"). The discussion below focuses on the use of "other pollution control requirements" as a basis for the conclusion that a segment does not need a TMDL.

a. What demonstration does EPA expect a state to make to support a successful Category 4b proposal?

EPA will evaluate on a case-by-case basis a state's decisions to exclude certain segment/pollutant combinations from Category 5 (the section 303(d) list) based on the 4b alternative. States should provide in their submission the rationale which supports their conclusion that there are "other pollution control requirements" sufficiently stringent to achieve applicable water quality standards within a reasonable period of time.

Specifically, this rationale should include: (1) a statement of the problem causing the impairment, (2) a description of the proposed implementation strategy and supporting pollution controls necessary to achieve water quality standards, including the identification of point and nonpoint source loadings that when implemented assure the attainment of all applicable water quality standards, (3) an estimate or projection of the time when water quality standards will be met, (4) a reasonable schedule for implementing the necessary pollution controls, (5) a description of, and schedule for, monitoring milestones for tracking and reporting progress to EPA on the implementation of the pollution controls, and (6) a commitment to revise as necessary the implementation strategy and corresponding pollution controls if progress towards meeting water quality standards is not being shown. EPA acknowledges that the level of rigor necessary to support the state's rationale will vary depending on the complexity of the

water impairments and corresponding implementation strategies. Note that a state could pursue water quality trading under 4b, so long as it follows the principles described in the Agency's relevant guidance.

If the Agency determines that the controls are not, in fact, "requirements," or that they will not result in attainment of applicable water quality standards within a reasonable time, then EPA may disapprove the state's failure to include the segment at issue on the section 303(d) list (i.e., Category 5) and add the segment to the list. In subsequent list submissions, EPA may determine that a segment that has been placed into Category 4b must go back into Category 5, if the circumstances have changed such that the state can no longer support its original 4b demonstration.

b. What constitutes acceptable "pollution control requirements" to support Category 4b alternatives?

Because of the case-specific nature of water quality impairments and controls designed to address such impairments, EPA cannot identify classes of controls that will always be adequate to support a conclusion that a segment is not required to be included in Category 5. In evaluating whether a particular set of pollution controls are in fact "requirements" as specified in EPA's regulation, the Agency will consider a number of factors including: (1) authority (local, state, federal) under which the controls are required and will be implemented with respect to sources contributing to the water quality impairment (examples may include: self-executing state or local regulations, permits, and contracts and grant/funding agreements that require implementation of necessary controls), (2) existing commitments made by the sources to implementation of the controls (including an analysis of the amount of actual implementation that has already occurred), (3) the availability of dedicated funding for the implementation of the controls, and (4) other relevant factors as determined by EPA depending on case-specific circumstances.

Since the overriding objective of the 4b alternative is to promote implementation activities designed to achieve water quality standards in a reasonable period of time, for all of the factors listed above, EPA will evaluate each 4b alternative on a case-by-case basis, including in particular the existence of identifiable consequences for the failure to implement the proposed pollution controls. Depending on the specific situation, "other pollution control requirements" may be requirements other than those based on statutory or regulatory provisions, as long as some combination of the factors listed above are present and will lead to achievement of WQSs within a reasonable period of time. For example, established plans of government agencies that require for attainment of WQS with a reasonable period of time may qualify even when their components include incentive-based actions by private parties. States may also choose to rely on controls that have already been implemented where there is sufficient certainty that implementation will continue until WQS are achieved and will not be reversed. Because the controls are already in place and achieving progress, EPA may consider such controls to be requirements even if their implementation did not occur pursuant to binding legal authority.

c. What constitutes a reasonable period of time for purposes of 4b?

EPA expects that segments impaired by a pollutant but not listed under section 303(d) based on the implementation of existing control requirements will attain WQSs within a reasonable period of time. What constitutes a "reasonable time" will vary depending on factors such as the initial severity of the impairment, the cause of the impairment (e.g., point source discharges, in place sediment fluxes, atmospheric deposition, nonpoint source runoff), riparian condition, channel condition, the nature and behavior of the specific pollutant (e.g., conservative, reactive), the size and complexity of the segment (a

simple first-order stream, a large thermally-stratified lake, a density-stratified estuary, and tidally-influenced coastal segment), the nature of the control action, cost, public interest, etc. States should consider such factors and provide, as stated in Section IV.G.2.A. above, a time estimate by which the controls will result in WQS attainment, including an explanation of the basis for their conclusion. EPA will evaluate on a case-specific basis whether the estimated time for WQS attainment is reasonable.

d. What are some examples to illustrate how the preceding guidance would be applied?

EPA will evaluate on a case-specific basis each set of controls a state uses to support a decision to include a segment in Category 4b. The following circumstances are examples of controls which may be sufficient to support such a decision, depending on the facts of the specific case:

- A waterbody is impaired solely by point sources. Each point source has an NPDES permit containing limits sufficient to implement WQS in that waterbody by the end of the permit terms.
- A waterbody is impaired by nonpoint source sediment input. The state has adopted regulations requiring sources to implement certain best management practices (BMPs), and can enforce the regulatory requirements under state law. The state demonstrates that implementation of BMPs by these sources will result in meeting WQS in the waterbody in a reasonable time.
- A waterbody is impaired by nonpoint sources and the state has entered into contracts for source remediation. Implementation of the contract terms will result in attainment of WQS in the waterbody in a reasonable time. While the state cannot obtain specific performance as a contract remedy, it can file a claim for significant monetary damages if the terms are not met.
- A waterbody is impaired by nonpoint sources which have already implemented some or all of certain measures that will result in attainment of WQS in that waterbody in a reasonable time. The controls are unlikely to be removed or reversed (e.g., watershed restoration measures pursuant to 319 grant).
- A waterbody is impaired by nonpoint sources within federal lands where a forest management plan has been developed and is being implemented. In this case, certain elements are included in the forest management plan emphasizing BMP certification programs, require adaptive adjustments of practices, and specify monitoring options needed to demonstrate compliance with state water quality standards.

3. Which segments should states include in Category 4c?

Segments should be placed in Category 4c when the states demonstrates that the failure to meet an applicable water quality standard is not caused by a pollutant, but instead is caused by other types of pollution. Segments placed in Category 4c do not require the development of a TMDL. Pollution, as defined by the CWA is "the man-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of water" (section 502(19)). In some cases, the pollution is caused by the presence of a pollutant and a TMDL is required. In other cases, pollution does not result from a pollutant and a TMDL is not required. States should schedule these segments for monitoring to confirm that there continues to be no pollutant associated with the failure to meet the water quality standard and to support water quality management actions necessary to address the cause(s) of the impairment. Examples of circumstances where an impaired segment may be placed in Category 4c include segments impaired solely due to lack of adequate flow or to stream channelization.

EPA encourages the state to collect or assemble additional data and/or information to verify the initial placement of the segment, and to re-categorize the segment based on the assessment of the additional data and/or information where appropriate.

H. Which segments should states include in Category 5?

This category constitutes the section 303(d) list that EPA will review and approve or disapprove pursuant to 40 CFR 130.7. States must include on their section 303(d) list those waters required to be listed by the Clean Water Act and EPA's implementing regulations. Segments must be placed in Category 5 when, based on existing and readily available data and/or information, technology-based effluent limitations required by the Act, more stringent effluent limitations, and other pollution control requirements are not sufficient to implement an applicable water quality standard and a TMDL is needed. 40 CFR 130.7(b)(1).

A segment that is included in Category 5 may also be included in other categories where appropriate. For example, the segment may be attaining some applicable standards, in which case it may also be included in Category 2. As the state develops and EPA approves TMDLs for the pollutants identified as causing a Category 5 segment to exceed an applicable standard, the segment can be placed in Category 4a, but must also remain in Category 5 if it is exceeding any applicable standard and a TMDL needs to be developed for the pollutant causing that exceedance. However, note that Category 5 takes precedence if the state chooses to list a segment in only one category.

1. Is Category 5 of the Integrated Report for 2006 a new section 303(d) list, and must the state account for all segments previously listed as needing a TMDL in the 2004 list?

The section 303(d) list (segments in Category 5) once approved (or, if necessary, established by EPA following disapproval of a state's list) is a new list that replaces the previous list. The time frame for establishing TMDLs should be 8 to 13 years from the date of the original listing. For example, a segment originally included on the 1998 section 303(d) list, and still identified on the 2006 submission as requiring a TMDL, should be addressed by 2011.

Segments included on previous 303(d) lists or previously placed in Category 5 should be accounted for in subsequent submissions. However, the fact that a segment was previously included in Category 5 (or on the 303(d) list) does not necessarily mean that it must remain in Category 5 until a TMDL is established. In some cases, removing a segment from Category 5 prior to TMDL development may be warranted. For example, the state may determine that the conditions have changed such that the segment is no longer required to be on the section 303(d) list (e.g., if new data and/or information shows that the applicable standard is met). Alternatively, the state may determine that other required control measures are sufficient to implement the applicable standard, and therefore may move the segment to Category 4b. The state may also determine based on the assessment of new data and information that pollutants do not cause or contribute to the impairment of the segment and therefore may move the segment to Category 4c. The state may also demonstrate that the original Category 5 listing was erroneous (i.e., not consistent with its assessment methodology or WQSs).

EPA may request, as discussed below, that the state demonstrate good cause for not including individual segments (including previously listed segments) in Category 5 (40 CFR 130.7(b)(6)(iv)). EPA may request this demonstration if the state does not develop an adequate record supporting the basis for

the decision or does not specifically explain its decision to move segments previously listed in Category 5 to other categories.

2. *What constitutes good cause for not including in the current submission segments that were previously included in Category 5 (the section 303(d) List)?*

To provide interested stakeholders with a more complete understanding of the changes that may have occurred from one IR cycle (or 303(d) submission) to the next, and to help expedite EPA's review and approval/disapproval action for those segments in Category 5, EPA recommends that states submit with their IR (or their 303(d) list) a table documenting changes in segment placement or categorization from the 2004 IR, and a brief summary of the basis for those changes. Table 5-2 provides an example of how states might do this.

Table 5-2. Documentation of "Good Cause" to Move Segments from Category 5.

Segment previously in Category 5	New placement in 2006	Explanation for change
Segment 214	Category 4a	TMDL completed and approved by EPA for Chromium.
Segment 266	Category 4c	The analysis of new data concluded that the aquatic life use impairment is solely due to low river flow.
Segment 321	Category 4b	The state has proposed an alternative approach to attain WQS by implementing required controls via NPDES permits.
Segment 349	Category 1	The assessment of new data documents that applicable WQS are now being attained.
Segment 350	Category 3	Previous listing in Category 5 was inconsistent with assessment methodology. Available data insufficient to determine attainment status.

In addition, EPA may request that states provide "good cause" for not including on the 2006 section 303(d) list (Category 5) submission segments that were previously included on the list. If EPA makes such a request, the state must explain its basis for not including the segment on the list. Consistent with 40 CFR 130.7(b), "good cause" for not including segments in Category 5 may be based on the following determinations:

- The assessment and interpretation of more recent or more accurate data in the record demonstrate that the applicable WQS(s) is being met.
- The results of more sophisticated water quality modeling demonstrate that the applicable WQS(s) is being met.
- Flaws in the original analysis of data and information led to the segment being incorrectly listed.
- A demonstration pursuant to 40 CFR 130.7(b)(1)(ii) that there are effluent limitations required by state or local authorities that are more stringent than technology-based effluent limitations, required by the CWA, and that these more stringent effluent limitations will result in the attainment of WQSs for the pollutant causing the impairment.

- A demonstration pursuant to 40 CFR 130.7(b)(1)(iii) that there are other pollution control requirements required by state, local, or federal authority that will result in attainment of WQSs for a specific pollutant(s) within a reasonable time (i.e., 4b).
- Documentation that the state included on a previous section 303(d) list an impaired segment that was not required to be listed by EPA regulations, e.g., segments where there is no pollutant associated with the impairment.
- Approval or establishment by EPA of a TMDL since the last section 303(d) list.
- A state inappropriately listed a segment that is within Indian country, as defined in 18 U.S.C. section 1151.
- Other relevant information that supports the decision not to include the segment on the section 303(d) list.

EPA has the authority to disapprove a submission if EPA identifies existing and readily available information that shows a segment is required by the CWA and EPA regulations be included in Category 5 (the section 303(d) list). In that situation, EPA will partially disapprove the state's list and identify additional segments for inclusion in Category 5.

3. Can previously listed segments (without new data or information) be delisted solely because they have not yet been assessed with a new methodology?

No. EPA does not believe it would be appropriate to remove segments previously listed in Category 5 (without new data or information) ***solely*** because they have not yet been assessed with a new methodology. However, there are some situations where a segment may be removed from Category 5 without relying on data and information collected after the date of the previous list. For example, if the state evaluates the pre-existing data and information using a new or revised methodology that accurately reflect the applicable WQS, and the results of that evaluation provide a "good cause" basis for not including the segment on the 2006 section 303(d) list, the segment would no longer need to be included in Category 5. However, the delisting should only occur if it is determined that the basis for the decision is consistent with the state's applicable WQSs and is reasonable.

4. Must Category 5 include threatened segments?

Yes, states must include threatened segments in Category 5 where appropriate (40 CFR 130.7(b)). The definition of "water quality limited segment" in EPA's regulations implementing CWA section 303(d) includes waters not expected to meet applicable water quality standards, which EPA refers to as "threatened" waters. 40 CFR 130.2(j). EPA recommends that states consider as threatened those segments that are currently attaining WQS, but are projected as the result of applying a valid statistical methodology to exceed WQS by the next listing cycle (every two years). For example, segments should be listed if the analysis of existing data and information demonstrates a declining trend in the segment's WQS, and the projected trend will result in a failure to meet that standard by the date of the next list (i.e., 2008 for purposes of the 2006 assessment cycle). The state assessment and listing methodology should describe how the state identifies threatened segments.

5. Must Category 5 include an impaired segment if the specific pollutant causing the impairment has not been identified?

Yes, if a designated use is not supported and the segment is impaired or threatened, the fact that the specific pollutant is not known does not provide a basis for excluding the segment from Category 5. These segments must be listed unless the state can demonstrate that no pollutant(s) causes or contribute to the impairment. Prior to establishing a TMDL for such segments the pollutant causing the impairment must be identified.

If the assessment of the new data and information demonstrates that the use impairment is not associated with a pollutant and is attributable only to other types of pollution (e.g., flow or habitat alteration) the segment may be placed into Category 4c. EPA has developed guidance to assist states in identifying the causes of a biological impairment. This document, "Stressor Identification Guidance," was released in December 2000 (EPA 822-B-00-025). This document is also available on the Internet at: http://www.epa.gov/ost/waterscience/biocriteria/stressors/stressorid.pdf.

6. When should Category 5 include segments covered by fish and shellfish consumption advisories?

EPA generally believes that fish and shellfish consumption advisories and certain shellfish growing area classifications based on segment specific information demonstrate impairment of CWA section 101(a) "fishable" uses. This applies to fish and shellfish consumption advisories and certain shellfish area classifications for all pollutants that constitute potential risks to human health, regardless of the source of the pollutant. Furthermore, advisories based on the results from probability surveys or other predictive tools having a high degree of confidence (i.e., 95%) may also form the basis of listing segments as impaired. States, on their own prerogative, may choose to place segments into Category 5 (or on the section 303(d) list) using probability surveys when fish and shellfish consumption advisories and certain shellfish area classifications constitute potential risks to human health.

For purposes of determining whether a segment is impaired and should be included on section 303(d) lists states are required to consider all existing and readily available data and information (see 40 CFR 130.7). This should include physical, chemical and biological data, including data on pathogens (such as bacteria and phytotoxins) as well as fish and shellfish tissue concentration data, where such data are existing and readily available. States collect several types of monitoring data to help determine if segments are attaining or maintaining applicable water quality standards. If a state does not consider particular existing and readily available data and information in deciding which segments are impaired and must be placed on the section 303(d) list, they must provide an explanation to EPA of why they did not use such data and information.

While numeric human health criteria for ambient water column concentrations of pollutants are a basis for determining impairment, the attainment of such criteria does not always mean that designated uses are being protected. Segment-specific factors sometimes cause pollutants, including pathogens, to accumulate in fish and shellfish tissue at higher levels than predicted by the methodology used to derive the numeric human health criteria. Examples of such factors include water temperature, nutrient levels, food web structure, the concentration of dissolved organic carbon in the ambient water, and accumulations in the sediment. Hence, a segment can be meeting numeric ambient water quality criteria, but not attaining the designated uses because fish or shellfish tissue concentrations exceed levels that are protective of human health. In instances where tissue concentrations indicate an impairment of the

designated use, even though ambient water column concentrations of pollutants do not indicate an exceedance, EPA recommends states translate the applicable narrative criteria on a site- specific basis or adopt site specific numeric criteria to account for higher than expected exposures from contaminated fish or shellfish tissue and protect designated uses.

Applicable shellfish growing area classifications should be used as part of determinations of attainment of water quality standards and listing of impaired segments. Shellfish growing area classifications are developed by the National Shellfish Sanitation Program (NSSP) using water column and tissue data (where available), and information from sanitary surveys of the contributing watershed, to protect public health. The states review these NSSP classifications every three years. There are certain NSSP classifications and data that do not necessarily indicate WQS violation. These include: "Prohibited" classifications set as a precautionary measure due to the proximity of wastewater treatment discharges, or absence of a required sanitary survey; shellfish tissue pathogen data (which can fluctuate based on short-term conditions not representative of general water quality); or short-term actions to place growing areas in the closed status.

When deciding whether to identify a segment as impaired, states need to determine whether there are impairments of designated uses and narrative criteria, as well as the numeric criteria. Although the CWA does not explicitly direct the use of fish and shellfish consumption advisories or NSSP classifications to determine attainment of water quality standards, states are required to consider all existing and readily available data and information to identify impaired segments on their section 303(d) lists. For purposes of determining whether a segment is impaired and should be included on a section 303(d) list, EPA considers a fish or shellfish consumption advisory, a NSSP classification, and the supporting data, to be existing and readily available data and information that demonstrates non-attainment of a section 101(a) "fishable" use when:

- the advisory is based on fish and shellfish tissue data,
- a lower than "Approved" NSSP classification is based on water column and shellfish tissue data (and this is not a precautionary "Prohibited" classification or the state water quality standard does not identify lower than "Approved" as attainment of the standard),
- the data are collected from the specific segment in question, and
- the risk assessment parameters (e.g., toxicity, risk level, exposure duration and consumption rate) of the advisory or classification are cumulatively equal to or less protective than those in the state's water quality standards.

This applies to all pollutants that constitute potential risks to human health, regardless of the source of the pollutant. However, for fish/shellfish advisories for "dioxin and dioxin-like compounds", due to unique risk characterization issues, listing decisions should be made on a case-by-case basis.

EPA acknowledges that in some cases, fish and shellfish consumption advisories may not demonstrate that a section 101(a) "fishable" use is not being attained in an individual segment. For example, a state may have issued a statewide or regional warning regarding fish tissue contaminated with a bioaccumulative pollutant, based on data from a subset of segments. A state may use a higher fish consumption value in determining the need for an advisory compared to the value used in establishing water quality criteria for the protection of human health. As noted above, a state may also classify shellfish growing areas "Prohibited" as a precautionary measure due to the proximity of wastewater treatment discharges or where a required sanitary survey has not been conducted. In such instances, these

segments need not be listed as impaired under section 303(d) unless there are segment specific data (and the data were not considered during the development or review of a non-precautionary NSSP classification), showing non-attainment of section 101(a) uses.

Some fish and shellfish consumption advisories and NSSP classifications are based on Food and Drug Administration (FDA) action levels as opposed to EPA's risk-based methodology for the protection of human health. FDA action levels are established to protect consumers of interstate shipped, commercially marketed fish and shellfish rather than fish and shellfish caught and consumed within the state. FDA action levels also include non-risk based factors (e.g., economic impacts) in their derivation, while water quality criteria must protect the designated uses without regard to economic impacts.

Where tissue contamination that triggers an advisory based on FDA action levels indicates an exceedance of state human health criteria, the advisory is an indication that section 101(a) "fishable" uses are not attained, and therefore, these segments should be placed into Category 5 or included on the 303(d) list.

7. How should Category 5 handle segments for which WQS are being revised or where temporary variances are in place?

The attainment decision must be based on the applicable WQS. In the case of a standard that is being revised, that standard is not applicable until it has been approved by EPA. 40 CFR 131.21. Therefore states must include in Category 5 segments that do not meet an applicable WQS at the time of listing, even if the new standard is in the process of being revised to be less stringent, until such time as EPA approves the revised standard. However, these segments would not have to be considered a high priority for TMDL scheduling. If EPA approves a revised standard in the future, the segment may be removed from the section 303(d) list at that time provided the segment does not meet the listing requirements with respect to the new standard. With respect to variances, which are temporary and usually apply to a particular discharger, but may also apply to a segment, the applicable WQS typically is the underlying standard, and therefore the segment should be placed in Category 5 if it does not support one or more of the designated uses in the underlying standard.

8. Must Category 5 include a segment where the criterion has been exceeded, but the exceedance is the result of background or natural conditions?

In some cases, a segment may exhibit water quality characteristics or chemical concentrations approaching or exceeding those levels established in the state's water quality standards due solely to non-anthropogenic causes. If the state's water quality standards include a specific exclusion for exceedances caused by "natural conditions", these segments would not be considered impaired (i.e., they could be excluded from Categories 4 and 5). These segments should instead be placed into Categories 1 through 3 as appropriate. For such segments, these background or natural conditions can be defined by assessing the results of water quality monitoring efforts, by the use of predictive models, or a characterization based on data from a watershed with similar hydrologic, land use, and pollutant loading characteristics.

9. What additional information is needed for segments in Category 5?

Identification of Pollutants

Section 130.7(b)(4) requires states to identify, for each segment included on the section 303(d) list (Category 5), the "pollutants causing or expected to cause violations of the applicable water quality standards." For the 2006 listing cycle, segments identified as impaired or threatened based on biological criteria should be included in Category 5 unless the state demonstrates that a pollutant is not causing the impairment, or inclusion in Categories 4a or 4b is warranted. States must identify all pollutants that are known to be causing the impairment of a segment.

Prioritization and TMDL Schedule

Section 303(d)(1) requires states to "establish a priority ranking" for the segments it identifies on the list, taking into account the severity of the pollution and the uses to be made of such segments, and to establish TMDLs "in accordance with the priority ranking." Consistent with section 130.7(b)(4) each state shall also submit biennially a priority ranking including waters targeted for TMDL development in the next two years. Each listed pollutant-segment combination (i.e., those in Category 5) must receive a clear priority ranking, which EPA recommends be either in the form of a scheduled TMDL completion date or a ranking such as high, medium, or low. States have considerable flexibility in deciding how best to apply these factors in prioritizing their list of waters needing TMDLs. For example, a waterbody with a severe water quality problem may be given a high priority for TMDL development in light of the severity of the concern. Conversely, a severe water quality problem may require complex analysis before developing a TMDL, and the state may therefore choose to give it a lower priority to allow time to collect necessary information and complete the analysis. Thus, the most severe water quality problems or the most toxic pollutants need not always be given the highest priority for TMDL development, if circumstances warrant a lower priority. EPA will review the priority ranking but will not take action to approve or disapprove it.

Federal regulations provide that "schedules for submissions of TMDLs shall be determined by the Regional Administrator and the State" (40 CFR 130.7(d)(1)). Factors such as the state's use of a rotating basin approach or commitments specified in court orders or consent decrees may be considered when states develop priorities and schedules. EPA recommends that states develop a schedule for establishing TMDLs as expeditiously as practicable and that the schedule (1) identifies which TMDLs will be established in each year of the upcoming integrated reporting cycle and (2) estimates the approximate number of TMDLs to be established for each year thereafter. EPA encourages the states to ensure that the schedule provides that all TMDLs for every pollutant-segment combination listed on previous section 303(d) lists be established in a time frame that is no longer than 8 to 13 years from the time the pollutant-segment combination is first identified in Category 5. EPA will not take any action on the schedule. The schedule is intended to help the public and EPA to understand the state's priorities and assist in work planning.

In developing their schedules, states will need to decide which TMDLs are higher priority than others. States need not specifically identify each TMDL as high, medium or low priority. Instead, the schedule itself can reflect the state's priority ranking. The CWA does not prescribe a particular method of expressing a priority ranking, and EPA believes a TMDL schedule is a reasonable, efficient way to demonstrate priority ranking. In some circumstances, the order in which TMDLs are established might be

subject to some modifications as the schedule is implemented, based on logistical efficiencies or data availability.

VI. REPORTING RESULTS

States are required to submit their water quality report (integrated or separate 303(d) and 305(b)) to EPA by April 1, 2006. At this time, states should also submit their assessment results electronically in the ADB or compatible data management system along with georeferencing information. The EPA regional offices will provide states in their regions with the appropriate contact information for submitting both the water quality report and electronic assessment results.

As part of the review of the submittals, the EPA regional offices will coordinate with the states to makes revisions to (if necessary) and finalize the electronic assessment results. The EPA regional offices will provide the electronic assessment results to EPA headquarters when the results are ready to be incorporated into the National Assessment Database (NAD).

GLOSSARY

Assemble (data and information) Through solicitation and other means, gathering all *existing and readily available water quality-related data and information.*

Assessment Unit (AU). A waterbody whose attainment status is reported in the Integrated Report. An AU must be named and located based on the National Hydrography Dataset (NHD). Where the states's or territory's spatial resolution is on a finer scales than NHD, EPA will translate that resolution into the NHD.

Attainment The condition of meeting applicable *water quality standards*.

Assessment Making a decision, based on all *valid* (accepted) *existing and readily available water quality -related data and information*, about the condition of a segment with regard to *WQS* (i.e., making a *WQS attainment status determination*.)

Averaging period The period of time over which the receiving water concentration is averaged for comparison with criteria concentrations (see also Criterion-Duration).

Categorization determination Deciding in which of EPA's five summary categories (or a state's equivalent system) a particular segment-designated use combination or segment-pollutant combination belongs.

Cause(s) of Impairment The stressor(s), whose presence in a waterbody is/are, singly or in combination, causing or contributing to failure to meet any applicable WQS. Impairment causes include, but are not limited to, pollutants and other forms of pollution.

Characterization determination Making, based on all *valid existing and readily available water quality-related information*, a *WQS attainment status determination*; or, deciding that additional data collection and analysis will be needed before attainment status can be determined. A characterization determination can be made with regard to one or more, or all, of the *WQS* applicable to a *segment*.

Consider (data and information) Determining whether individual data points, data sets, or other forms of information meet previously published *quality assurance/quality control (QA/QC)* specifications (see also *evaluate (data and information)*). Data and other information meeting such specifications is *valid.*

Criterion-Duration The period of time (averaging period) over which ambient data is averaged for comparison with a *criterion-magnitude*. For example, certain EPA *WQC* for protection of aquatic life are expressed, in part, as 4-day average concentrations of a particular pollutant (i.e., the criterion-duration is 4 days). *WQC* expressed as a "concentration not to surpass (supercede, exceed, etc.)" are often called "instantaneous criteria", in that their duration/averaging period is just a second (instant).

Criterion-Frequency That element of a numeric *WQC* describing how often waterbody conditions can surpass the combined magnitude and duration components (i.e., specifying the allowed number of *excursions* that can occur within a certain period time (i.e., the acceptable rate of excursions). For example, certain EPA aquatic life *WQC* are stated as "the 4-day average concentration of the pollutant

shall not supercede ___ ug/L more often than once every 3 years, on average." Here, the *criterion-frequency* is "once every 3 years, on average."

Criterion-Magnitude (or Criterion-Concentration) That element of a numeric *WQC* specifying acceptable ambient levels of a pollutant or other indicator. Most criterion magnitudes are expressed as concentrations (e.g., milligrams/liter), though magnitudes for some parameters are expressed differently (e.g., pH and temperature).

Data Quality Objectives A specification of the quality of the data needed in order to meet the monitoring project's goals.

Designated Uses (DU) Those uses specified in state or tribal water quality standards regulations for a particular segment, whether or not they are being attained. (40 CFR 131.3.(g)) Uses so designated in *WQS* are not meant to specify those activities or processes that the waterbody is currently able to fully support. Rather, they are the uses/processes that the state or tribe wishes the waterbody to be clean enough to support, whether or not the waterbody can, in its current conditions, fully support them.

Digression (Exception) A single grab sample, or set of spatially-composited samples, with a concentration inconsistent with (higher than in most cases, but lower than for some parameters like dissolved oxygen) the *criterion-concentration* in an applicable *WQC*. For example, if the c*riterion-concentration* for a pollutant is 13 ug/L, and one has 4 grab samples containing concentrations of 9 ug/l, 17 ug/L, 5 ug/L and 22 ug/l, one would have observed two digressions" in this set of samples (see *excursion* and *exceedance,* for comparison).

Evaluate (data and information) Determining whether individual data points, data sets, or other forms of information meet previously published quality assurance/quality control (QA/QC) specifications (see also *consider (data and information)*). Data and other information meeting such specifications is *valid.*

Exceedance A situation in which ambient conditions are inconsistent with those desired conditions described by the combined three elements of a numeric *WQC* (magnitude, duration, and frequency). Put another way, when the rate of *excursions* is higher than that specified by the *criterion-frequency*. For example, an *exceedance* would have occurred if a *WQC* for a certain parameter says "the one-hour average concentration shall not surpass 40 ug/L more often than once in 3 years, on average" and during a given 3 year (1095 day) period there are two or more one hour periods in which the average concentration was 41 ug/L or higher. Waters on which one or more *exceedances* are failing to meet WQS, and therefore must be placed on the state's, territory's or tribes' section 303(d) list. By contrast, occurrence of a *digression* or an *excursion* does not, in and of itself, constitute a failure to meet applicable *WQS*.

Excursion Having an average concentration in a set of samples, or in a waterbody itself, that is inconsistent with the average concentration specified by the combination of the magnitude and duration components of an applicable *WQC*. For example, if a *WQC* says the 30-day average concentration of pollutant "x" should be no greater than 77 mg/L, and the results of monitoring, modeling or other studies indicate there is a 30-day period with a concentration of 88 mg/L, then an *excursion* has occurred (compare with *digression* and *exceedance*).

Existing and Readily Available Water Quality-Related Data and Information The definition of this term includes, but is not limited to:

- Information found in watershed plans and other types of water quality management plans;
- Information contained in reports and databases developed pursuant to the CWA, including: Integrated Reports, separate section 305(b) report, a section 303(d) list, a section 314 lakes assessment, a section 319(a) nonpoint assessment, STORET, the ADB, etc.;
- Information appearing in reports and databases developed pursuant to other federal statutes and programs, including but not limited to SDWA section 1453 source water assessments, Superfund and Resource Conservation and Recovery Act reports, the Toxic Release Inventory, USDA programs, and USGS programs;
- Restrictions and/or advisories regarding shellfish harvesting and water-based recreation;
- Any *observed effect* (see definition below);
- Results from site-specific biological, chemical, and physical monitoring and surveys;
- Results of utilization of remote-sensing technology efforts; and
- Results of use of predicative tools/ extrapolative tools (e.g., probabilistic surveys, landscape-models, dilution calculations and models estimating pollutant loadings and ambient water quality).

Impairment Failure to support a *water quality standard* .

Observed effect(s) Direct manifestations of an undesirable effect on waterbody conditions. For example, fish kills, fish lesions, depressed populations of certain aquatic species, and bioassessment scores are observed effects indicating changes in aquatic communities. Major algal blooms, undesirable taste and odor in raw and finished drinking water, and increased incidences of gastroenteritis and other waterborne diseases among swimmers are also observed effects. Depending on a state's *water quality standards* and specific waterbody conditions, *observed effects* may form the basis of an impairment decision. For example, depending on the magnitude and cause of a fish kill, this observed effect may or may not result in an assessment of "impaired." Generally speaking, pollutants and pollution are not considered *observed effects* (e.g., lead, pesticides, phosphorus); rather, they are causes of *observed effects*.

Parameter A specific pollutant, or other chemical/physical condition, such as phosphorus, copper, E. coli bacteria, BOD, temperature, pH, turbidity, etc

Quality assurance project plan (QAPP) A written document that outlines the procedures a monitoring project will use to ensure that the samples participants collect and analyze, the data they store and manage, and the reports they write are of high enough quality to meet project needs.

Quality assurance (QA) The overall management system which includes organization, planning, data collection, quality control, documentation, evaluation, and reporting activities. QA provides the information needed to ascertain the quality of data and whether they meet the requirements of a project. QA ensures data will meet defined standards of quality with a stated level of confidence.

Quality control (QC) Routine technical activities whose purposes are, essentially, error control. Since errors can occur in either the field, the laboratory, or in the office, QC must be part of each of these functions.

Population A group of animals (including humans), or plants belonging to the same species. This is the definition of "population" utilized most often in environmental sciences. Statisticians, however, use this word in a much broader sense–the set of individuals, items, circumstances or conditions that is being

studied. Frequently "target population" is used by statisticians to describe the entire universe of things/situations from which a set of samples is taken. Hence, the "target population" from which a set of water quality samples were taken would be all concentrations of the parameter of interest in every drop of water found in a particular assessment unit in every second of time over a certain period. The term "waterbody conditions" is used in this document in reference to what statisticians call "population".

Sample A single measurement or aliquot. Often called a "grab sample" in environmental monitoring. (Note: This is a different use of "sample" than that commonly employed by statisticians. What a statistician would call a "sample" is referred to as a "sample set" in this document.)

Sample Set A group of individual measurements or aliquots (i.e., a collection of "samples").

Section 304(a) criteria Those *WQC* developed by EPA under authority of section 304(a) of the CWA, based solely on the latest scientific information regarding the relationship that levels of a stressor (pollutant, etc.) has to effects on aquatic organisms or human health. These criteria are issued as guidance to states, territories, and tribes for use in developing their own *WQC*.

Segment A waterbody (river, lake, bay, estuary, wetland, etc.) or portion thereof.

Threatened waters EPA recommends that states consider as threatened those waters that are currently attaining WQSs, but which are expected to exceed WQSs by the next listing cycle (every two years). For example, segments should be listed if the analysis demonstrates a declining trend in a specific water quality criteria (WQC), and the projected trend will result in a failure to meet a criterion by the date of the next list (i.e., 2008 for purposes of the 2006 assessment cycle); or, segments should be listed if there are proposed activities that will result in WQSs exceedances.

Unsupported uses Those *designated uses* that are not fully supported by conditions in the waterbody to which those uses are assigned by *WQS*.

Use (data and information) Employing data and information to make a characterization determination.

Valid (data and information) Data meeting *QA/QC specifications*. Status should *use* all such data and information making *characterization determinations*.

Water Quality Criteria (WQC) Elements of state, territorial, or tribal *WQS*, expressed as parameter (pollutants, etc.) levels or narrative statements, representing a quality of water that supports one or more *designated uses*. Numeric *WQC* addressing chemical or physical conditions contain three attributes: 1) *magnitude* (e.g., concentration), 2) *duration* (averaging period), and 3*) frequency* (recovery interval).

Water Quality Standard (WQS) Provisions of state, tribal, or territorial (or, in some cases, federal) law which define the water quality goals for a waterbody/segment. *WQS* consist of: *designated uses, water quality criteria* (both numeric and narrative), as well as antidegradation policies and implementation procedures.

WQS Attainment Status Determination Deciding, based on use of all *valid* existing and readily available data and information, whether *WQS*, or components thereof, are being met or are not being met.

APPENDIX

DATA ELEMENTS FOR *2006 INTEGRATED WATER QUALITY MONITORING AND ASSESSMENT REPORT* AND DOCUMENTATION FOR DEFINING AND LINKING SEGMENTS TO THE NATIONAL HYDROGRAPHY DATASET

(Seventeen Sheets)

Data elements for *2006 Integrated Water Quality Monitoring and Assessment Report* and documentation for defining and linking segments to the National Hydrography Dataset.

The Clean Water Act (CWA) requires states to report water quality monitoring and assessment information to satisfy CWA sections 303(d) and 305(b). EPA recognizes that states use a variety of monitoring designs which allow them to characterize waters of the United States at different scales. This reporting format accommodates jurisdiction-wide or watershed-level assessments based on probability designs and attainment decisions on individual segment. The purpose of this appendix is to provide a consistent format for the Integrated Report. This appendix is organized as follows:

A. Reporting Segment Results
   1) Define the segment
   2) Report segment geographic information using the National Hydrography Dataset (NHD)
   3) Report on the trophic status for all lakes
   4) Report attainment decisions for the segment's standard and each of its designated use(s)
   5) Document how and when the attainment decision for each segment-designated use combination was determined
   6) Report any pollutants and non-pollutants causing impairments and their probable sources
   7) Report any observed effects of pollution for each segment-designated use combination
   8) Report on approved TMDLs and provide a schedule for establishing TMDLs
   9) Documenting the monitoring schedule

B. Reporting Attainment Decisions based on Probability Designs
   1) Identify the waters assessed through a probability design ("target population")
   2) Report the geographic locations of the target populations using NHD
   3) Report attainment results for standards
   4) Report the precision and date of the attainment results
   5) Report all pollutants and non-pollutants causing impairment and their probable sources

C. Data Elements to be reported using EPA's Assessment Database or an equivalent relational database

D. Minimal Database Design to support Electronic Submission

A. Reporting Segment Results

The following information should be submitted in order to identify and characterize segments. Jurisdictions should use a relational database to store and maintain their attainment results and, document decisions on standards attainment status, identify any pollutants or other types of pollution and their sources for all segments not attaining standards, and report the assessment metadata for each attainment decision. All segment information should be provided in a database format, preferably using EPA's Assessment Database (ADB) software. Following is a brief description of the data elements EPA expects to receive in electronic format. The permissible value domains for these data elements should be used and can be downloaded from http://www.epa.gov/waters/adb. This includes a standardized list of pollutants and non-pollutants, sources, assessment type and confidence codes.

1) Define the segments

As described in this guidance, all waters in the state that are "waters of the United States" (as defined n 40 CFR 122.2) should be assessed and reported on. These types of water may include, but are not limited to, lakes, rivers, estuaries, coastal shorelines, wetlands, oceans and ground water. The basic unit for assessing attainment status for sections 305(b) and 303(d) attainment is the segment.

The following descriptive information should be included for each segment:

- unique segment identifier (primary key)
- segment's type (river/stream, lake/reservoir, coastal shoreline, wetland, etc.)
- segment's size and units of measurement
- segment's name and location on the NHD
- segment's designated uses

2) Reporting segment geographic information using the National Hydrography Dataset (NHD)

Each state and territory must define their segments, in order to report the status of all of the Nation's waters in an effective and consistent manner. Segments are the basic unit of record for conducting and reporting the results of all water quality assessments. Currently, state and territory segments are defined using a wide range of criteria - from individual monitoring stations to Natural Resource Conservation Service watersheds. Sometimes these segments are defined using geographic information systems (GIS) but more often are only described textually. As a consequence, it is extremely difficult to ensure adequate assessment of all waters. EPA strongly encourages states and territories to uniformly adopt the National Hydrography Dataset (NHD) reach addressing protocol for assigning segments. Through a unique reach number and a position, reach addresses precisely locate water features, such as segments. These reach addresses get stored in a GIS compatible format. NHD reaches are typically defined from confluence to confluence and are the hydrographic equivalent of a street's block number. A reach address is analogous to a street address number. Additional NHD information and data is available from USGS, http://nhd.usgs.gov. EPA will provide hands on training to any interested jurisdiction on the protocols for linking water quality information to the NHD. Once the segment has a reach address, other critical water quality data -- such as the segments position within the stream networks, flow, and any other information linked to the NHD – becomes readily available.

States and territories should document the process used for defining segments in their assessment methodologies. Segments should not span more than one water quality standard. The individual size of segments will vary based upon assessment methodologies. segments should, however, be larger than a sampling station but small enough to represent a homogenous standard attainment within individual segments. An individual segment may comprise part of a NHD reach, an individual NHD reach, or a collection of NHD reaches and or parts of reaches.

The use of the NHD protocol for segment delineation provides powerful mapping and spatial analysis capabilities for all water quality characterization activities. This delineation approach will help target resources and activities such as scheduling monitoring, issuing permits, and targeting restoration measures. In particular, the application of NHD will provide much more spatial resolution in identifying segments requiring the establishment of TMDLs. Furthermore, the incorporation of NHD will aid in developing and implementing management actions in individual and/or multiple segments. Jurisdictions should use the NHD protocols for defining and linking the segments covered by completed TMDLs or bundles of TMDLs. This TMDL specific geographic information should be submitted to EPA simultaneously with a TMDL's submission.

For each segment in Category 5, the use of the NHD convention clearly defines the geographic bounds affected by the TMDL. This should delineate the specific geographic location of the targeted segment, a clear description of the standard, and a more focused representation of the relevant watershed(s) which contribute point and non-point source pollutant loads. For example, in the establishment of a TMDL for a section 303(d) listed segment, pollutant reduction efforts in a non-impaired segment may be the most logical and efficient action to the attainment of the standard in the impaired segment. By linking TMDLs to NHD the management actions throughout a watershed will be visible.

EPA recognizes that some states and territories may work with other spatial hydrographic data, however, states and territories should still provide NHD addresses for their segments. NHD is currently being developed at higher resolutions and jurisdictions may use these data. States and territories interested in developing higher resolution NHD are encouraged to work with United States Geological Survey (USGS).

The NHD-Reach Indexing Tool (RIT) is a useful tool for creating segment's reach addresses and can delineate user-defined polygons in wetlands, large estuaries, oceans, and near coastal segments. All GIS coverages submitted to EPA should have unique segment identifiers that match those in the jurisdiction's assessment database. Table 1 lists the basic requirements for a GIS submission and the appropriate metadata that should be included.

3) Report on the trophic status for all lakes

> The trophic condition of all lakes must be reported using values found on http://www.epa.gov/waters/adb.

Table 1. Reporting on Segment Geographic Information

Water Type	GIS Coverage	Database Metadata
Rivers	River segments should be included as a linear feature in a GIS coverage (e.g., ESRI Shapefile). NHD event table format is preferred.	Include standard metadata requirements for NHD event tables. A list of these requirements can be found at: http://www.epa.gov/waters/georef/nhdrit_datastructure.pdf Otherwise provide Federal Geographic Data Committee (FGDC) Content Standard for Digital Geospatial Metadata about the coverage, as well as the location of an segment identifiers in the coverage that can be joined to those in the database. FGDC metadata requirements can be found at: http://www.fgdc.gov/metadata/contstan.html
Lakes	Lake segments can be included as a linear or polygon feature in a GIS coverage (e.g., ESRI Shapefile). NHD event table format is preferred.	Include standard metadata requirements for NHD event tables. A list of these requirements can be found at: http://www.epa.gov/waters/georef/nhdrit_datastructure.pdf. Otherwise provide Federal Geographic Data Committee (FGDC) Content Standard for Digital Geospatial Metadata about the coverage, as well as the location of a segment identifiers in the coverage that can be joined to those in the database. FGDC metadata requirements can be found at: http://www.fgdc.gov/metadata/contstan.html
Estuaries	Estuarine segments should be included as a polygon feature in a GIS coverage (e.g., ESRI Shapefile).	Include Federal Geographic Data Committee (FGDC) Content Standard for Digital Geospatial Metadata about the coverage, as well as the location of a segment identifiers in the coverage that can be joined to those in the database. FGDC metadata requirements can be found at: http://www.fgdc.gov/metadata/contstan.html
Coastal Waters quality	Coastal shoreline segments should be included as a linear feature in a GIS coverage (e.g., ESRI Shapefile). Other near coastal units (e.g., shellfish beds) should be reported as polygons.	Include standard metadata requirements for NHD event tables. A list of these requirements can be found at: http://www.epa.gov/waters/georef/nhdrit_datastructure.pdf. Otherwise provide Include Federal Geographic Data Committee (FGDC) Content Standard for Digital Geospatial Metadata about the coverage, as well as the location of a segment identifiers in the coverage that can be joined to those in the database. FGDC metadata requirements can be found at: http://www.fgdc.gov/metadata/contstan.html
Wetlands	Wetlands segments should be included as a polygon feature in a GIS coverage (e.g., ESRI Shapefile).	Include Federal Geographic Data Committee (FGDC) Content Standard for Digital Geospatial Metadata about the coverage, as well as the location of a segment identifiers in the coverage that can be joined to those in the database. FGDC metadata requirements can be found at: http://www.fgdc.gov/metadata/contstan.html

4) Report attainment decisions for the segment's standard and each of its designated use(s)

EPA encourages states and territories to provide assessment information for every segment's designated use(s). Each segment's designated use should be assessed and reported to have one of the following conditions:

- Fully Supporting
- Not Supporting
- Insufficient or no data and information - Segments with insufficient data and information to support an attainment determination for a standard
- Not Assessed

For segments which are not attaining one or more designated uses, jurisdictions should determine and report if the segment is expected to attain its standard (i.e., all designated uses) in the near future. For these segments, jurisdictions should report the other pollution control requirements which when implemented will result in the attainment of water quality standards. Jurisdictions should also report the dates these actions were or will be implemented and the anticipated year of attainment. This information is need by EPA to validate the assumptions jurisdictions used when placing segments in Category 4b.

Threatened waters are those segments where a jurisdiction has determined that sufficient data exists to determine that all designated uses are being attained, and that non-attainment is predicted by the time the next *Integrated Report* is due to be submitted. These segments should be included in Category 5.

5) Document how and when the attainment decision for each segment-designated use combination was determined

EPA requests the following information be included to document the attainment decision for each assessed segment designated use:

- Assessment date (e.g., December 20, 2005) - This date documents when the jurisdiction completed the technical analysis of data and made its decision on the segment's designated use attainment status. A common way to store a full Y2K-compliant date is in the character format YYYYMMDD (e.g., 20031220 for December 20, 2005).

- Assessment type - Jurisdictions should list all types of data they used to make each use attainment decision (e.g., physical/chemical monitoring, toxicity testing (e.g., bioassays), benthic macro-invertebrate surveys, etc.).

- Assessment confidence - Assessment confidence levels, which range from 1 (least rigorous) to 4 (most rigorous) should be reported for each assessment type. Jurisdictions should provide definitions of their assessment confidence levels in their assessment methodologies.

6) Report any pollutants and or non-pollutants causing impairment and their probable sources

Jurisdictions should report all of the pollutants or other types of pollution for impaired or threatened segments. The list of acceptable pollutants and other types of pollution is available on http://www.epa.gov/waters/adb. The list contains a complete set of chemical characteristics and non-pollutant causes of impairment. Jurisdictions should link the specific pollutant to the designated use or designated uses that are not being attained.

Jurisdictions should also identify the probable sources contributing to an impairment. The sources should be documented using the list provided on http://www.epa.gov/waters/adb. These sources need to be linked to the appropriate pollutant causing the impairment.

7) Report any observed effects of pollution for each segment-designated use combination

Jurisdictions should document and report any observed effects of pollution for each segment-designated use combination. Observed effects may include; fish lesions, fish kills, stream bottom deposits, low combined biota/habitat bioassessment. How jurisdictions use observed effects to make attainment decisions is dependent upon a jurisdictions' interpretation of their water quality standards and should be documented in their assessment methodology.

8) Report on approved TMDLs and provide a schedule for establishing TMDLs

Jurisdictions must submit an estimated schedule for establishing TMDLs for every pollutant on each segment in Category 5. This schedule should specify the year for all TMDLs which will be established prior to the next Integrated Report, and the number per year for all others. In addition jurisdictions should indicate which of the pollutants on impaired segments have an approved TMDL. Jurisdictions should indicate the date EPA approved these TMDLs and the EPA TMDL identification number. Information on the approval date and EPA TMDL identification number can be found on http://www.epa.gov/waters/tmdl.

B. Reporting assessments based on State-wide or watershed-level probability designs

The following sections address the data requirements recommended by EPA for reporting probability-based assessments. This guidance defines the data elements and format necessary to document a jurisdiction's assessment based upon probability based monitoring designs. Each data element is defined in Table 3.

1) Identify the waters assessed through a probability design ("target population")

Study area findings should be associated with the area's standard(s) and should be clearly documented along with the target population that was monitored to develop the indicator. For instance, wadeable perennial streams throughout a state and territory may be the target population for an indicator of biological integrity related to aquatic life support. Each probability survey project should be assigned an ID (a Probability Survey Project ID).

2) Report the geographic locations of the target populations using NHD

Where the target population is not the same as an entire state, maps should be provided that use polygons to highlight a project's geographic area such as all waters of a specific class (e.g., lakes) throughout watershed units, eco-regions, or other geographic regions. States and territories are expected to have GIS polygon coverages (e.g., ESRI Shapefile) related to each probability survey project. GIS coverages should conform to Federal Geographic Data Committee (FGDC) Content Standard for Digital Geospatial Metadata. State in-house probability survey project polygons should be available with basic FGDC

compliant metadata in either a shapefile format or in a standard ESRI export file format (*.e00). Additional information can be found at: http://www.fgdc.gov/metadata/contstan.html. Additional information to define the geographic frame (sample frame or "population") for a probability survey project should include such items as: the water type relevant to the project (e.g., rivers); or other "stratification" features.

States and territories are also expected to develop size estimates for the entire target population. States and territories should be able to document the GIS Hydrography coverage or other data layer used to develop their target population sizes.

3) Report attainment results for water quality standards

For each probability survey project, attainment results should be summarized. The presentation of the study's findings should apply a breakpoint that clearly defines the estimated percentage of the total target population meeting standards and the percentage not meeting standards. For each probability survey project, a description of the project methodology should be provided. Where there are a small number of standard project designs, a state can make reference to pertinent sections from its monitoring strategy, QAPP and/or assessment methodology materials. The estimated percentage of the target population meeting standards should also be accompanied by the precision of the estimate, in the form of 90 or 95% confidence intervals.

4) Report the precision and date of the probable attainment results

A major attraction of probability designs is that statistics can be developed that show the confidence levels associated with attainment results. States and territories should provide a discussion of the statistical tests they apply to produce the precision value information or refer to other documents that provide this information such as a QAPP or assessment methodology. As with reporting for segment results, the assessment date should be included for each probability survey project indicating when the state and territory finished the technical analysis of data and made its decision on the standards attainment status.

5) Report any pollutants and non-pollutants and their probable sources

Where possible, EPA requests that states and territories develop pollutant and source summary information for each of their probability survey projects. The maximum impact percentage should not exceed the percent for the use non-attainment results reported.

C. Data elements to be reported using EPA's Assessment Database or an equivalent relational database

Data elements to be reported using either EPA's Assessment Database or the relational database structure outlined in Section D, Minimal Database Elements to Support Electronic Submission.

Table 2. Segment Specific Data Elements to be reported in the 2006 Integrated Report

Field Name	Field Type	Domain	Description	Requirement Condition
STATE	Text	http://www.epa.gov/waters/adb/	State or jurisdiction abbreviations	Always Required
TOT_WATER_TYPE	Text	http://www.epa.gov/waters/adb/	Water type for the Atlas of Total waters within a jurisdiction	Always Required
TOT_WATER_SIZE	Numeric	Dependent upon units used to measure	Water size for the Atlas of Total waters within a jurisdiction	Always Required
SCALE	Text	Free Text	Scale (i.e. 1:24,000) of the source used to determine the water size for the Atlas of total waters within a jurisdiction	Always Required
TOT_SOURCE	Text	Free Text	Source used to determine the water size for the Atlas of total waters within a jurisdiction	Always Required
ID305B	Text	Free text, Jurisdiction specific	Unique identifier for Assessment Unit ID (state defined)	Always Required
CYCLE	Date	YYYY	Reporting Cycle	Always Required
WATER_NAME	Text	Free Text	Name of Assessment Unit	Always Required
LOCATION	Text	Free Text, Jurisdiction specific *Note, this does not replace linking Assessment Units to the NHD	Text description of the Assessment Unit's location	Always Required

Field Name	Field Type	Domain	Description	Requirement Condition
WATER_TYPE	Text	http://www.epa.gov/waters/adb/	Water type for the Assessment Unit (e.g., River, Estuary, Wetland)	Always Required
WATER_SIZE	Numeric	Dependent upon units used to measure	Size of the Assessment Unit	Always Required
SIZE_UNIT	Text	http://www.epa.gov/waters/adb/	Size unit (e.g. Miles if WATER_TYPE is River)	Always Required
TROPHIC_STATUS	Text	http://www.epa.gov/waters/adb/	Trophic status of publicly owned lakes	Optional
TREND	Text	http://www.epa.gov/waters/adb/	Trend of publicly owned lakes	Optional
CYCLE_LAST_ASSESSED	Date	YYYY	The most recent cycle that an Assessment Unit was assessed	Optional
MONITORING_SCHEDULED_DATE	Date	YYYY	Date by which additional monitoring for attainment status will be completed	Optional
PREVIOUSID305B	Text	Free Text	Used for tracking Assessment Units from cycle to cycle. This field would be used when there is a change in the ID structure for an Assessment Unit, or if an Assessment Unit gets split	Conditionally Required: If an Assessment unit has changed from the previous reporting cycle, then a record needs to be maintained of how the new ID matches with the previous ID

Field Name	Field Type	Domain	Description	Requirement Condition
PREVIOUSCYCLE	Date	YYYY	Cycle for the previous Assessment Unit ID. Used for cycle tracking	Conditionally Required: If PREVIOUSID305B is populated, then the cycle that the previous ID is associated with should also be populated.
USE_NAME	Text	http://www.epa.gov/waterscience/wqs	Description of the designated use which is being assessed	Always Required
ATTAINMENT	Text	Fully Supporting, Not Supporting, Insufficient Information or Not Assessed	The attainment status for a particular designated use associated with an Assessment Unit	Always Required
THREATENED_FLAG	Text	Y/null	Flag used to indicate threatened waters. Threatened assessment units are those assessment units where uses are being attained, but non-attainment is predicted by the time the next *Integrated Report* is submitted.	Conditionally Required: Must be populated if the use is Threatened
ASSMNT_TYPE	Numeric	http://www.epa.gov/waters/adb/	Caption describing a category of data types used to make attainment/impairment decision	Conditionally Required: Must be populated for all uses that are assessed
ASSMNT_CONF	Numeric	http://www.epa.gov/waters/adb/	A score ranging from a lower range of 1 up to 4 indicating reliability and precision for a category of standard specific assessment type	Optional

Field Name	Field Type	Domain	Description	Requirement Condition
ASSMNT_DATE	Date	YYYYMMDD	Date the use attainment decision was made. Can be entered for each assessed use.	Optional
CAUSE_NAME	Text	http://www.epa.gov/waters/adb/	Description of the pollutants, non-pollutants and observed effects	Optional
SOURCE_NAME	Text	http://www.epa.gov/waters/adb/	Description of the source of the pollutant	Optional
CYCLE_FIRST_LISTED	Date	YYYY	First Year (cycle) water was listed for a given cause of impairment	Conditionally Required: Required for 303(d) listings
POLLUTANT_FLAG	Text	Y/N	Marked Y if the cause of impairment is a pollutant, N if the cause is pollution	Conditionally Required: Must be populated if the Cause of Impairment is a pollutant
EXPECTED_TO_ATTAIN_DATE	Date	YYYY	Date by which the assessment unit is projected to attain its standards	Conditionally Required: Required for parameters that are causes of impairment, but will meet standards by some given date in the future.
IMPLEMENTATION_ACTION	Text	Free Text	Pollution control requirements other than a TMDL taken for an Assessment Unit to meet standards	Conditionally Required: At least one action is required for each EXPECTED_TO_ATTAIN_DATE

Field Name	Field Type	Domain	Description	Requirement Condition
ACTION_DATE	Date	YYYYMMDD	Date other pollution control requirement was/will be completed	Conditionally Required: Required for each IMPLEMENTATION_ACTION
TMDL_SCHEDULE	Date	YYYY	Date when the jurisdiction anticipates submitting the TMDL for EPA approval	Conditionally Required: Either TMDL_SCHEDULE *or* TMDL_PRIORITY must be populated for causes that are part of the 303(d) list.
TMDL_PRIORITY	Text	High, Medium, Low	State's priority for developing a TMDL	Conditionally Required: Either TMDL_SCHEDULE *or* TMDL_PRIORITY must be populated for causes that are part of the 303(d) list.
TMDL_COMPLETION_DATE	Date	YYYYMMDD	Date TMDL was completed or the date by which a TMDL is projected to be completed	Optional
TMDL_ID	Numeric	http://www.epa.gov/waters/tmdl	EPA assigned unique identifier for approved TMDLs	Conditionally Required: Must be populated for causes that have had TMDLs established
TMDL_PROJECT_STATUS	Text	http://www.epa.gov/waters/adb/	Brief description regarding the status of the TMDL development for a given Assessment Unit/Pollutant combination.	Optional

Field Name	Field Type	Domain	Description	Requirement Condition
TMDL_STATUS_COMMENT	Text	Free Text	Summary comment describing the status of the TMDL development for a given Assessment Unit/Pollutant combination.	Optional
DELISTING_REASON	Text	http://www.epa.gov/waters/adb/	Reason an Assessment Unit/Cause has been removed from the 303(d) list	Conditionally Required: Must be populated for Assessment Units/Causes that have been removed from the 303(d) list
DELISTING_COMMENT	Text	Free Text	Summary comment describing the reasons for delisting	Optional
DELISTING_DATE	Date	YYYYMMDD	Date an Assessment Unit/Cause has been removed from the 303(d) list	Conditionally Required: Must be populated for Assessment Units/Causes that have been removed from the 303(d) list
MONITORING_STRATEGY	BLOB	Free Text	The jurisdiction's current monitoring strategy document stored in PDF, MS Word or WordPerfect format.	Optional
ASSESSMENT_METHODOLOGY	BLOB	Free Text	A copy of the assessment methodology used to make attainment decisions stored in PDF, MS Word or WordPerfect format.	Optional

Table 3. Probabilistic Monitoring Data Elements to be reported in the 2006 Integrated Report

Field Name	Field Type	Domain	Description	Requirement Condition
PROJECT_ID	Text	Free text jurisdiction specific	State assigned identifier used to uniquely identify the study/project	Always Required
CYCLE	Date	YYYY	Reporting Cycle	Always Required
PROJECT_NAME	Text	Free Text	Name of the project	Always Required
TARGET_POPULATION	Text	Free Text jurisdiction specific	Description of the project's target population	Always Required
WATER_TYPE	Text	http://www.epa.gov/waters/adb/	Water type for the assessment unit (e.g., River, Estuary, Wetland)	Always Required
WATER_SIZE	Numeric	Dependent upon units used to measure	Size represented by the target population	Conditionally Required: Required if WATER_TYPE is populated
SIZE_UNIT	Text	http://www.epa.gov/waters/adb/	Size unit (e.g. Miles if WATER_TYPE is River)	Conditionally Required: Required if WATER_SIZE is populated
LOCATION_TYPE	Text	Free Text	Description of the type of location (i.e. 8-digit HUC, County, etc.)	Optional
LOCATION_DESC	Text	Free Text	Values for locations associated with an Assessment Unit or Project ID.	Conditionally Required: Required if LOCATION_TYPE is populated
INDICATOR	Text	Free Text	A description of the indicator that was monitored (e.g. Biological indicator, Trophic State Index, etc.)	Always Required

Field Name	Field Type	Domain	Description	Requirement Condition
ASSMNT_DATE	Date	YYYYMMDD	Date the attainment decision was made	Optional
PRECISION	Numeric	1-100.00	Precision of the estimate, in the form of 90 or 95% confidence intervals	Optional
CONFIDENCE	Numeric	1-100.00	The confidence interval (% +/-) for the standard attainment decision	Optional
USE_NAME	Text	Designated Uses as described in state water quality standards	Description of the designated use which is being assessed	Optional
PERCENT_ATTAINING	Numeric	1-100.00 (%Attaining + %Not Attaining + % Nonresponse should not exceed 100)	Percent of target population attaining standard	Always Required
PERCENT_NOT_ATTAINING	Numeric	1-100.00 (%Attaining + %Not Attaining + % Nonresponse should not exceed 100)	Percent of target population not attaining designated standard	Always Required
PERCENT_NON_RESPONSE	Numeric	1-100.00 (%Attaining + %Not Attaining + % Nonresponse should not exceed 100)	Estimated percent of the target population for which a use attainment assessment could not be completed	Optional
CAUSE_NAME	Text	http://www.epa.gov/waters/adb/	Description of the pollutants, non-pollutants and observed effects	Optional

Field Name	Field Type	Domain	Description	Requirement Condition
CAUSE_PERCENT	Numeric	Sum of all impairment percentages not to exceed the percent not attaining	Percent of non-attaining population impaired by a specific cause (30% non-attainment attributed to nitrogen)	Optional
SOURCE_NAME	Text	http://www.epa.gov/waters/adb/	Description of the source of the pollutant	Optional
SOURCE_PERCENT	Numeric	Sum of all source percentages not to exceed 100% for a given impairment	Percent of non-attaining population attributable to a particular source of pollution (e.g. of the 30% of nitrogen impaired waters, 70% was potentially attributable to agricultural runoff)	Optional
MONITORING_STRATEGY	BLOB	Free Text	The jurisdiction's current monitoring strategy document stored in PDF, MS Word or WordPerfect format.	Optional
ASSESSMENT_METHODOLOGY	BLOB	Free Text	A copy of the assessment methodology used to make attainment decisions stored in PDF, MS Word or WordPerfect format.	Optional

D. Minimal Database Design to support electronic submission of the Integrated Report

The data elements and business processes outlined in the previous three sections must be assembled into a relational database design. EPA's Assessment Database is one data base design capable of storing and reporting the attainment status of a jurisdiction's waters. States and territories should use EPA's Assessment Database to track the attainment status of their segments and to submit the supporting information behind their Integrated Report. If a state or territory or authorized tribe chooses not to use the Assessment Database, then at a minimum they should use the database design outlined in Diagram A to transmit their Integrated Report to EPA. EPA will provide any interested state or territory training and support using the Assessment Database.

Diagram A. Entity relationship diagram for the minimum elements needed to support an electronic submission of the Integrated Report.

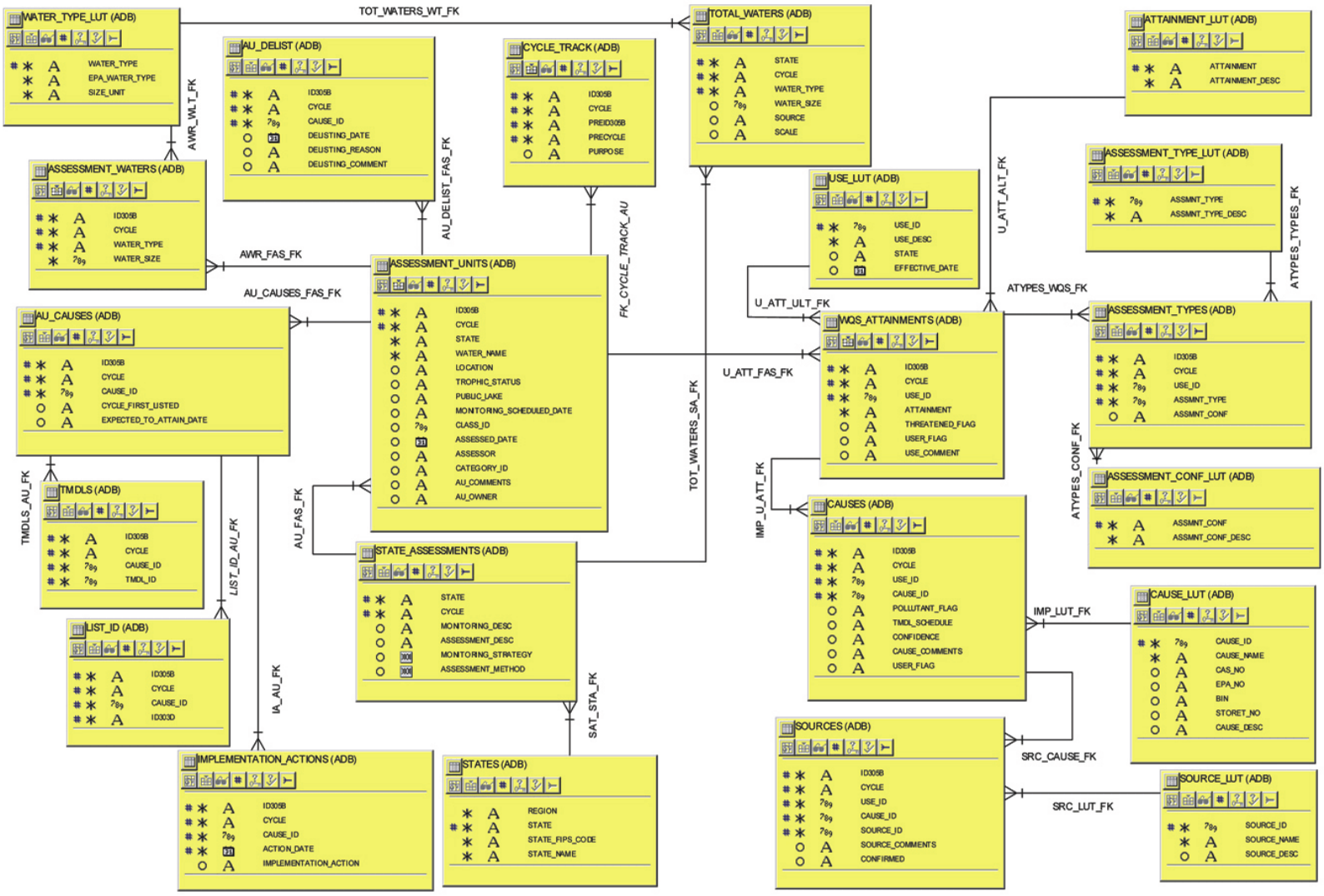

050465

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

MAR 5 2007

OFFICE OF WATER

MEMORANDUM

SUBJECT: Using Green Infrastructure to Protect Water Quality in Stormwater, CSO, Nonpoint Source and other Water Programs

FROM: Benjamin H. Grumbles
Assistant Administrator

TO: EPA Regional Administrators

Green infrastructure can be both a cost effective and an environmentally preferable approach to reduce stormwater and other excess flows entering combined or separate sewer systems in combination with, or in lieu of, centralized hard infrastructure solutions. EPA Water Programs are in a pivotal position to exert leadership in the consistent and reliable implementation of green infrastructure approaches. This memo is to highlight opportunities for the Regions, States, and Headquarters efforts to increase the development and use of green infrastructure in water program implementation.

Several cities, searching for alternatives to traditional hardscape solutions to wet weather discharge problems, have initiated some green infrastructure approaches. The Natural Resources Defense Council (NRDC) has recently published a document with information and case studies on these efforts. I strongly support the use of green infrastructure approaches described in the NRDC report and I suggest you share the report with States and promote other tools for green infrastructure. *Rooftops to Rivers: Green strategies for controlling stormwater and combined sewer overflows* (NRDC, June 2006) is available at:
http://www.nrdc.org/water/pollution/rooftops/contents.asp

Green infrastructure approaches essentially infiltrate, evapotranspirate or reuse stormwater, with significant utilization of soils and vegetation rather than traditional hardscape collection, conveyance and storage structures. Common green infrastructure approaches include green roofs, trees and tree boxes, rain gardens, vegetated swales, pocket wetlands, infiltration planters, vegetated median strips, reforestation, and protection and enhancement of riparian buffers and floodplains. Green infrastructure can be used where soil and vegetation can be worked into the landscape. It is most effective when supplemented with other decentralized storage and infiltration approaches, such as the use of permeable pavement, and rain barrels and cisterns to capture and re-use rainfall for watering plants or flushing toilets. These approaches can be used to keep rainwater out of the sewer system to reduce sewer overflows and to reduce the amount of untreated stormwater discharging to surface waters. Green infrastructure

facilitates or mimics natural processes that also recharge groundwater, preserve baseflows, moderate temperature impacts, and protect hydrologic and hydraulic stability.

Green infrastructure has a number of benefits:

- *Cleaner Water* – Vegetation and green space reduce the amount of stormwater runoff and, in combined systems, the volume of combined sewer overflows.
- *Enhanced Water Supplies* – Most green infiltration approaches result in stormwater percolation through the soil to recharge the groundwater and the base flow for streams.
- *Cleaner Air* – Trees and vegetation improve air quality by filtering many airborne pollutants and can help reduce the amount of respiratory illness.
- *Reduced Urban Temperatures* – Summer city temperatures can average 10°F higher than nearby suburban temperatures. High temperatures are linked to higher ground level ozone concentrations. Vegetation creates shade, reduces the amount of heat absorbing materials and emits water vapor – all of which cool hot air.
- *Increased Energy Efficiency* – Green space helps lower ambient temperatures and helps shade and insulate buildings, decreasing energy needed for heating and cooling.
- *Community Benefits* – Trees and plants improve urban aesthetics and community livability by providing recreational and wildlife areas and can raise property values.
- *Cost Savings* - Green infrastructure may save capital costs on digging big tunnels and stormwater ponds, operations and maintenance expenses for treatment plants, pipes, and other hard infrastructure; energy costs for pumping water; and costs of wet weather treatment and of repairing stormwater and sewage pollution impacts, such as streambank restoration.

The Office of Water is working with a coalition of organizations, including the Natural Resources Defense Council, the National Association of Clean Water Agencies, and the Low Impact Development Center, to develop additional strategies for green infrastructure approaches to water quality challenges. As those strategies take shape, we will send you additional tools and information on implementing green infrastructure in our water programs.

I am pleased that EPA Regions and States are looking for opportunities to incorporate green infrastructure. We would be very interested in hearing about your efforts, and to the extent they can be applied elsewhere, assist in disseminating information and tools. If you have any questions, please contact me or have your staff call Jenny Molloy at (202) 564-1939 with any questions, comments, ideas or information on green infrastructure approaches.

cc: Water Division Directors
OW Office Directors

050467

National Management Measures to Control Nonpoint Source Pollution from Hydromodification

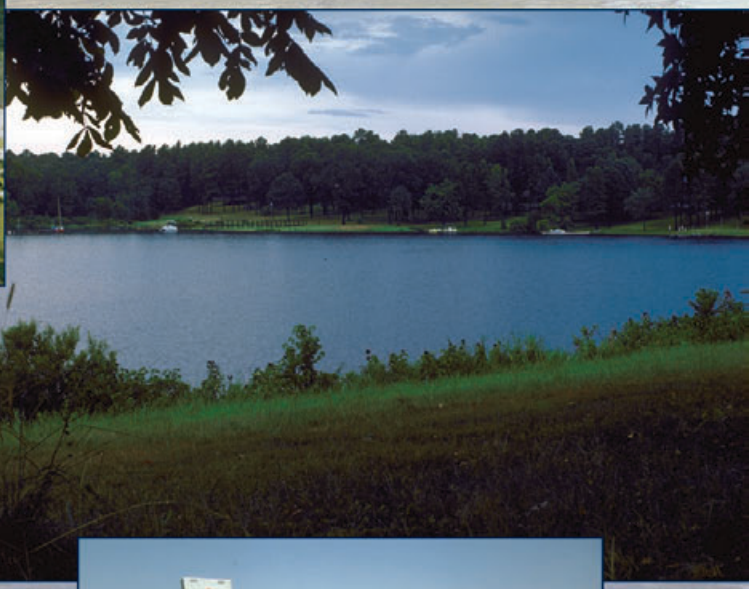

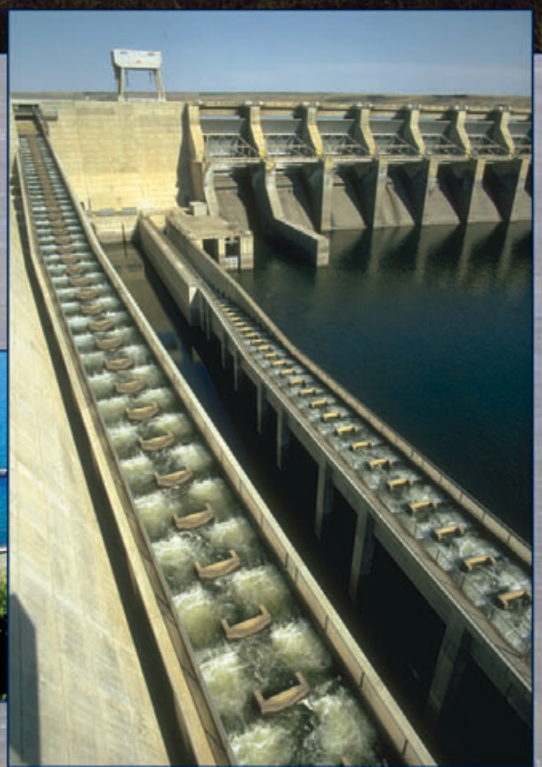

United States Environmental Protection Agency
Office of Water
Washington, DC 20460
(4503T)

EPA 841-B-07-002
July 2007

050469

National Management Measures to Control Nonpoint Source Pollution from Hydromodification

Nonpoint Source Control Branch
Office of Wetlands, Oceans and Watersheds
U.S. Environmental Protection Agency
Office of Water

July 2007

Disclaimer

This document provides technical guidance to states, territories, authorized tribes, and the public for managing hydromodification and reducing associated nonpoint source pollution of surface and ground water. At times, this document refers to statutory and regulatory provisions, which contain legally binding requirements. This document does not substitute for those provisions or regulations, nor is it a regulation itself. Thus, it does not impose legally-binding requirements on EPA, states, territories, authorized tribes, or the public and may not apply to a particular situation based upon the circumstances. EPA, state, territory, and authorized tribe decision makers retain the discretion to adopt approaches to manage hydromodification and reduce associated NPS pollution of surface and ground water on a case-by-case basis that differ from this guidance where appropriate. EPA may change this guidance in the future.

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Chapter 1: Introduction

The Nation's aquatic resources are among its most valuable assets. Although environmental protection programs in the United States have improved water quality during the past 35 years, many challenges remain. Significant strides have been made in reducing the impacts of discrete pollutant sources, but some aquatic ecosystems remain impaired, due in part to complex pollution problems caused by nonpoint source (NPS) pollution.[1] Of special concern are the problems in our streams, lakes, estuaries, aquifers, and other water bodies caused by runoff that is inadequately controlled or treated. These problems include changes in flow, increased sedimentation, higher water temperature, lower dissolved oxygen, degradation of aquatic habitat structure, loss of fish and other aquatic populations, and decreased water quality due to increased levels of nutrients, metals, hydrocarbons, bacteria, and other constituents.

What is Hydromodification?

USEPA (1993) defines hydromodification as the "alteration of the hydrologic characteristics of coastal and non-coastal waters, which in turn could cause degradation of water resources." Examples of hydromodification in streams include dredging, straightening, and, in some cases, complete stream relocation. Other examples include construction in or along streams, construction and operation of dams and impoundments, channelization in streams, dredging, and land reclamation activities. Hydromodification can also include activities in streams that are being done to maintain the stream's integrity such as removing snags.[2] Some indirect forms of hydromodification, such as erosion along streambanks or shorelines, are caused by the introduction or maintenance of structures in or adjacent to a waterbody and other activities, including many upland activities, that change the natural physical properties of the waterbody.

EPA has grouped hydromodification activities into three categories: (1) channelization and channel modification, (2) dams, and (3) streambank and shoreline erosion. The following definitions are offered to clarify the hydromodification activities associated with these three categories:

> Channelization and channel modification include activities such as straightening, widening, deepening, and clearing channels of debris and sediment. Categories of channelization and channel modification projects include flood control and drainage, navigation, sediment control, infrastructure protection, mining, channel and bank instability, habitat improvement/enhancement, recreation, and flow control for water supply (Watson et al., 1999). Channelization activities can play a critical role in NPS pollution by increasing the timing and delivery of pollutants, including sediment, that enter the water. Channelization can also be a cause of higher flows during storm events, which potentially increases the risk of flooding.

[1] For more information on NPS pollution, go to EPA's website at http://www.epa.gov/owow/nps.
[2] A tree or branch embedded in a lake or stream bed and constituting a hazard to navigation; a standing dead tree.

Dams[3] are artificial barriers on waterbodies that impound or divert water and are built for a variety of purposes, including flood control, power generation, irrigation, navigation, and to create ponds, lakes, and reservoirs for uses such as livestock watering, municipal water supply, fish farming, and recreation. While these types of dams are constructed to provide benefits to society, they can contribute to NPS pollution. For example dams can alter flows, which ultimately can cause impacts to water quality (changes to temperature or dissolved gases) and biological/habitat (disruption of spawning or altering of plant and benthic communities) above and below the dam.

Streambank and shoreline erosion are the wearing away of material in the area landward of the bank along non-tidal streams and rivers. Streambank erosion occurs when the force of flowing water in a river or stream exceeds the ability of soil and vegetation to hold the banks in place. Eroded material is carried downstream and redeposited in the channel bottom or in point bars located along bends in the waterway. Shoreline erosion occurs in large open waterbodies, such as the Great Lakes or coastal bays and estuaries, when waves and currents sort coarser sands and gravels from eroded bank materials and move them in both directions along the shore away from the area undergoing erosion. While the underlying forces causing the erosion may be different for streambank and shoreline erosion, the results (erosion and its impacts) are usually similar. It is also important to note that streambank and shoreline erosion are natural processes and that natural background levels of erosion also exist. However, human activities along or adjacent to streambanks or shorelines may increase erosion and other nonpoint sources of pollution.

Why is NPS Guidance on Hydromodification Important?

Hydromodification is one of the leading sources of impairment in our nation's waters. According to the *National Water Quality Inventory: 2000 Report to Congress* (USEPA, 2002a), there are almost 3.7 million miles of rivers and streams[4] in the United States. Approximately 280,000 miles of assessed rivers and streams in the United States are impaired for one or more designated uses, which include aquatic life support, fish consumption, primary and contact recreation, drinking water supply, and agriculture. Many of the pollutants causing impairment are delivered to surface and ground waters from diffuse sources, such as agricultural runoff, urban runoff, hydrologic modification, and atmospheric deposition of contaminants. The leading causes of

[3] Dams are defined according to Title 33 of the Code of Federal Regulations, section 222.6(h) (2003) as all artificial barriers together with appurtenant works which impound or divert water and which (1) are 25-feet or more in height or (2) have an impounding capacity of 50 acre-feet or more. Barriers that are six-feet or less in height, regardless of storage capacity or barriers that have a storage capacity at maximum water storage elevation of fifteen acre-feet or less regardless of height are not included. Federal regulations define dams for the purpose of ensuring public safety. For example, 33 CFR 222.6 states objectives, assigns responsibilities, and prescribes procedures for implementation of a National Program for Inspection of Non-Federal Dams. Most states use this or a very similar definition, which creates a category of dams that requires some form of inspection to ensure that they are structurally sound. Dams smaller than those defined above, such as those used to create farm ponds, are authorized under the NRCS program.
[4] Approximately 700,000 miles (19%) of the total 3.7 million miles of rivers and streams in the United States were assessed for the *National Water Quality Inventory: 2000 Report to Congress* (USEPA, 2002a).

beneficial use impairment (partially or not supporting one or more uses) are nutrients, sediment, pathogens (bacteria), metals, pesticides, oxygen-depleting materials, and habitat alterations (USEPA, 2002a).

The *National Water Quality Inventory: 2000 Report to Congress* (USEPA, 2002a) identified hydrologic modifications (i.e., hydromodification) as a leading source of water quality impairment in assessed surface waters. Of the 11 pollution source categories listed in the report, hydromodification was ranked as the second leading source of impairment in assessed rivers, second in assessed lakes, and sixth in assessed estuaries (Table 1.1). Three major types of hydromodification activities—channelization and channel modification, dams, and streambank and shoreline erosion—change a waterbody's physical structure as well as its natural functions.

Many hydromodification activities are necessary because of human activities. For example, hardening of streambanks to correct headcutting and streambank erosion is often necessary because of changes in landuse that increase impervious surfaces. While hydromodification activities are intended to provide some form of benefit (e.g., levees for reducing flooding, electricity from hydroelectric dams, or bulkheads to reduce shoreline erosion and protect valuable property), there may be unintended consequences resulting from the activity. To illustrate, levees may provide local flood reduction by keeping storm flows from spreading onto flood plains. However, these same levees may alter riparian wetland habitat that once relied on seasonal flooding.

Table 1.1 Leading Sources of Water Quality Impairment Related to Human Activities for Rivers, Lakes, and Estuaries (USEPA, 2002a)

	Rivers and Streams	Lakes, Ponds, and Reservoirs	Estuaries
Sources[a]	Agriculture (48%)[b]	Agriculture (41%)	Municipal Point Sources (37%)
	Hydrologic Modification (20%)[c]	**Hydrologic Modification (18%)**	Urban Runoff/Storm Sewers (32%)
	Habitat Modification (14%)[d]	Urban Runoff/Storm Sewers (18%)	Industrial Discharges (26%)
	Urban Runoff /Storm Sewers (13%)	Nonpoint Sources (14%)	Atmospheric Deposition (23%)
	Forestry (10%)	Atmospheric Deposition (13%)	Agriculture (18%)
	Municipal Point Sources (10%)	Municipal Point Sources (12%)	**Hydrologic Modification (14%)**
	Resource Extraction (10%)	Land Disposal (10%)	Resource Extraction (12%)

[a] Excluding unknown, natural, and "other" sources.
[b] Values in parentheses represent the approximate percentage of surveyed river miles, lake acres, or estuary square miles that are classified as impaired due to the associated sources.
[c] Hydrologic modifications include flow regulation and modification, dredging, and construction of dams. These activities may alter a lake's habitat in such a way that it becomes less suitable for aquatic life (USEPA, 2002a).
[d] Habitat modifications result from human activities, such as flow regulation, logging, and land-clearing practices. Habitat modifications—changes such as the removal of riparian (stream bank) vegetation—can make a river or stream less suitable for the organisms inhabiting it (USEPA, 2002a).

Purpose and Scope of the Guidance

National summaries, such as those shown in Table 1.1, are useful in providing an overview of the magnitude of problems associated with hydromodification. Solutions, however, are usually applied at the local level. For example, in Maryland, the Shore Erosion Task Force, after investigating shore erosion in the state, published recommendations to be implemented under a Comprehensive Shore Erosion Control Plan. To initiate statewide planning, the Maryland Department of Natural Resources established partnerships with two coastal counties that were significantly affected by shoreline erosion. These state-local partnerships enable the state to better identify and correct shoreline erosion problems throughout Maryland (MDNR, 2001).

State and local elected officials and agencies, landowners, developers, environmental and conservation groups, and others play a crucial role in working together for protecting, maintaining, and restoring water resources that are impacted by hydromodification activities. These local efforts, in aggregate, form the basis for changing the status of hydromodification as a national problem.

This guidance document provides background information about NPS pollution and offers a variety of solutions for reducing NPS pollution resulting from hydromodification activities. The background information provided in Chapter 2 includes a discussion of sources of NPS pollution associated with hydromodification and how the generated pollutants enter the Nation's waters. Chapter 3 (Channelization and Channel Modification), Chapter 4 (Dams), and Chapter 5 (Streambank and Shoreline Erosion) present technical information about how certain types of NPS pollution can be reduced or eliminated.

Since hydromodification is not associated with localized impacts and solutions, Chapter 6 provides a discussion on the broad concept of assessing and addressing water quality problems on a watershed level. Chapter 7 provides detailed information for practices that can be used to implement the management measures presented in this guidance. Chapter 8 provides a discussion of available models and assessment approaches that could be used to determine the effects of hydromodification activities. Chapter 9 summarizes additional dam removal information, including permitting requirements, process, and techniques for dam removal. The primary goal of this guidance document is to provide technical assistance to states, territories, tribes, local governments, and the public for managing hydromodification and reducing associated NPS pollution.

Document Organization

This document is divided into the following chapters:

- Chapter 1: Introduction
- Chapter 2: Background
- Chapter 3: Channelization and Channel Modification
- Chapter 4: Dams
- Chapter 5: Streambank and Shoreline Erosion

- Chapter 6: Guiding Principles
- Chapter 7: Practices for Implementing Management Measures
- Chapter 8: Modeling Information
- Chapter 9: Dam Removal Requirements, Process, and Techniques
- References Cited
- Additional Resources
- Appendix A: Federal, State, Nonprofit, and Private Financial and Technical Assistance Programs
- Appendix B: U.S. Environmental Agency Contacts

Activities to Control NPS Pollution

Historical Perspective

During the first 15 years of the national program to abate and control water pollution (1972–1987), EPA and the states focused most of their water pollution control activities on traditional point sources, which are stationary locations or fixed facilities from which pollutants are discharged; any single identifiable source of pollution (e.g., a pipe, ditch). EPA and the states have regulated these point sources through the National Pollutant Discharge Elimination System (NPDES) permit program established by section 402 of the Clean Water Act (CWA).[5] The NPDES program functions as the primary regulatory tool for assuring that state water quality standards are met. NPDES permits, issued by an authorized state or EPA, contain discharge limits designed to meet water quality standards and national technology-based effluent regulations.

In 1987, in view of the progress achieved in controlling point sources and the growing national awareness of the increasingly dominant influence of NPS pollution on water quality, Congress amended the CWA to focus greater national efforts on nonpoint sources.

Federal Programs and Funding

The CWA establishes several reporting, funding, and regulatory programs that address pollutants carried in runoff that is not subject to confinement or treatment. These programs relate to watershed management and nonpoint source control. Readers are encouraged to use the information contained in this guidance to develop nonpoint source management programs/plans that comprehensively address the following EPA programs:

- *Section 319 Grant Program*. Under section 319 of the CWA, EPA awards funds to states and eligible tribes to implement NPS management programs. These funds can be used for projects that address nonpoint source related sources of pollution, including hydromodification.[6]

- *Clean Water State Revolving Fund*. The Clean Water State Revolving Fund (CWSRF) program is an innovative method of financing environmental projects. Under the

[5] For more information on the NPDES program, refer to EPA's NPDES website at http://cfpub.epa.gov/npdes.
[6] More information about the section 319 program is provided at http://www.epa.gov/owow/nps/cwact.html.

program, EPA provides grants or "seed money" to all 50 states plus Puerto Rico to capitalize state loan funds. The states, in turn, make loans to communities, individuals, and others for high-priority water quality activities. As money is paid back into the revolving fund, new loans are made to other recipients. When funded with a loan from this program, a project typically costs much less than it would if funded through the bond market. Many states offer low or no interest rate loans to small and disadvantaged communities. In recent years, state programs have begun to devote an increasing volume of loans to nonpoint source, estuary management, and other water-quality projects. Eligible NPS projects include almost any activity that a state has identified in its nonpoint source management plan. Such activities include projects to control runoff from agricultural land; conservation tillage and other projects to address soil erosion; development of streambank buffer zones; and wetlands protection and restoration.[7]

- *Total Maximum Daily Loads*. Under section 303(d) of the CWA, states are required to compile a list of impaired waters that fail to meet any of their applicable water quality standards. This list, called a 303(d) list, is submitted to Congress every 2 years, and states are required to develop a Total Maximum Daily Load (TMDL) for each pollutant causing impairment for waterbodies on the list.[8]

- *Water Quality Certification.* Section 401 of the CWA requires that any applicant for a federal license or permit to conduct any activity that "may result in any discharge" into navigable waters must obtain a certification from the state or tribe in which the discharge originates that the discharge will comply with various provisions of the CWA, including sections 301 and 303. The federal license or permit may not be issued unless the state or tribe has granted or waived certification. The certification shall include conditions, e.g., "effluent limitations or other limitations" necessary to assure that the permit will comply with the state's or tribe's water quality standards or other appropriate requirements of state or tribal law. Such conditions must be included in the federal license or permit.

- *National Estuary Program.* Under the National Estuary Program, states work together to evaluate water quality problems and their sources, collect and compile water quality data, and integrate management efforts to improve conditions in estuaries. To date, 28 estuaries have been accepted into the program. Estuary programs can be an excellent source of water quality data and can provide information on management practices.[9]

- *Safe Drinking Water Act.* Many areas, especially urban fringe areas, need to maintain or improve the quality of surface and ground waters that are used as drinking water sources. This act requires states to develop Source Water Assessment Reports and implement Source Water Protection Programs. Low- or no-interest loans are available under the Drinking Water State Revolving Fund (SRF) Program.[10]

[7] Additional information about CWSRF is available at http://www.epa.gov/OWM/cwfinance/cwsrf/index.htm.
[8] More information on the TMDL program and 303(d) lists is provided at http://www.epa.gov/owow/tmdl.
[9] More information on the National Estuary Program is provided at http://www.epa.gov/nep.
[10] More information about the Safe Drinking Water Act and Source Water Protection Programs can be found at http://www.epa.gov/safewater/sdwa/index.html and http://www.epa.gov/safewater/protect.html.

- *Wildlife Habitat Incentives Program (WHIP)*. WHIP[11] is a voluntary program authorized by the Farm Security and Rural Investment Act of 2002 (Farm Bill)[12] that enables landowners to apply for technical and financial assistance to improve wildlife habitat. The program is administered by the Natural Resources Conservation Service (NRCS), which works with private landowners and operators, conservation districts, and federal, state, and tribal agencies to improve terrestrial and aquatic habitats. NRCS and participants work together to create a wildlife habitat development plan that includes a cost-share agreement. Continued assistance after habitat development includes monitoring, review of management guidelines, and technical advice. WHIP funds may also be used for dam removal. Additional information is available from an NRCS WHIP fact sheet.[13]

Two excellent resources for learning more about the CWA and the many programs established under it are *The Clean Water Act: An Owner's Manual* (Killam, 2005) and *The Clean Water Act Desk Reference* (WEF, 1997).

Introduction to Management Measures

Management measures may be implemented as part of state, tribal, or local programs to control nonpoint source pollution for a variety of purposes, including protection of water resources, aquatic wildlife habitat, and land downstream from increased pollution and flood risks. They can be used to guide in the development of a runoff management program. Management measures establish performance expectations and, in many cases, specify actions that can be taken to prevent or minimize nonpoint source pollution from hydromodification activities. Management measures might control the delivery of NPS pollutants to receiving water resources by:

- Minimizing pollutants available (source reduction)
- Retarding the transport and/or delivery of pollutants, either by reducing water transported, and thus the amount of the pollutant transported, or through deposition of the pollutant
- Remediating or intercepting the pollutant before or after it is delivered to the water resource through chemical or biological transformation

Management measures are generally designed to control a particular type of pollutant from specific activities and land uses. The intent of the six management measures in this guidance document is to provide information for addressing and considering the NPS pollution potential associated with hydromodification activities. Implementation of management measures can minimize and control hydromodification NPS pollution through erosion and sediment control, chemical and pollutant control, management of instream and riparian habitat restoration, and protection of surface water quality.

[11] http://www.nrcs.usda.gov/programs/whip
[12] http://www.nrcs.usda.gov/programs/farmbill/2002
[13] http://www.nrcs.usda.gov/programs/farmbill/2002/pdf/WHIPFct.pdf

Activities associated with these management measures may be regulated by federal, state, or local law (e.g., section 404 of the Clean Water Act). These measures do not supersede such requirements. Sometimes regulatory authorities may appear to conflict, as is sometimes the case of the CWA and water use and distribution. CWA sections 101(g) and 510 specifically allow for resolution of the conflict by placing water use and its distribution under the authority of the states, thus protecting any state agreements on "water rights." Users of this NPS guidance should recognize that the applicability of the guidance provided in this document will remain subject to state statutes, interstate compacts, and international treaties. As such, this guidance does not recommend or require any management measures or practices that hinder a state's ability to exercise existing water rights, which provide water for municipal, industrial, and agricultural needs. For further information regarding specific state policies on water rights and regulations of water use, contact the appropriate state water agency. Contact information is generally provided on state government Web sites.

This document also lists and describes management practices for each management measure. Management practices are specific actions taken to achieve, or aid in the achievement of, a management measure. A more familiar term might be best management practice (BMP). The word "best" has been dropped for the purposes of this guidance (as it was in the Coastal Management Measures Guidance (USEPA, 1993)) because the adjective is too subjective. The "best" practice in one area or situation might be entirely inappropriate in another area or situation. The practices listed in this document have been found by EPA to be representative of the types of practices that can be applied successfully to achieve the management measures. EPA recognizes that there is often site-specific, regional, and national variability in the selection of appropriate practices, as well as in the design constraints and pollution control effectiveness of practices. The practices presented for each management measure are not all-inclusive. States or local agencies and communities might wish to apply other technically and environmentally sound practices to achieve the goals of the management measures.

Channelization and Channel Modification (Chapter 3)

Channelization can cause a variety of instream flow changes and may result in the faster delivery of pollutants to downstream areas. Channel modification might result in a combination of harmful effects (higher flows or increased risk of downstream flooding) and beneficial effects (local flood control or enhanced flushing in a stream channel). The management measures for channelization and channel modification are intended to protect waterbodies by ensuring proper planning before a proposed project is implemented. Planning and evaluation can help to identify and prevent local and downstream problems before a project is started. An added benefit of planning and evaluation is to correct or prevent detrimental changes to the instream and riparian habitat associated with the project. Implementation of the management measures can also ensure that operation and maintenance programs for existing projects improve physical and chemical characteristics of surface waters and restore or maintain instream and riparian habitat when possible.

Management Measure 1: Physical and Chemical Characteristics of Surface Water: Ensure that the planning process for new hydromodification projects addresses changes to physical and chemical characteristics of surface waters that may occur as a result of the proposed work. For existing projects, ensure that operation and maintenance programs use any opportunities available to improve the physical and chemical characteristics of surface waters.

Management Measure 2: Instream and Riparian Habitat Restoration: Correct or prevent detrimental changes to instream and riparian habitat from the impacts of channelization and channel modification projects, both proposed and existing.

Dams (Chapter 4)

Because of their instream locations, any construction activities associated with dams have the potential to introduce sediment and other pollutants into adjacent waterbodies. Construction activities, chemical spills during dams operation or maintenance, and changes in the quantity and quality of water held and released by a dam may alter the nature of the waterbody. The management measures for dams are intended to be applied to the construction of new dams, as well as any construction activities associated with the maintenance of existing dams. They can also be applied to dam operations that result in the loss of desirable surface water quality, and instream and riparian habitat.

Management Measure 3: Erosion and Sediment Control: Prevent sediment from entering surface waters during the construction or maintenance of dams.

Management Measure 4: Chemical and Pollutant Control: Prevent downstream contamination from pollutants associated with dam construction and operation and maintenance activities.

Management Measure 5: Protection of Surface Water Quality and Instream and Riparian Habitat: Protect the quality of surface waters and aquatic habitat in reservoirs and in the downstream portions of rivers and streams that are influenced by the quality of water contained in the releases (tailwaters) from reservoir impoundments.

Streambank and Shoreline Erosion (Chapter 5)

NPS pollution might result from the rapid increase in erosion of streambanks caused by increased flow rates associated with urbanization in a watershed. Not only is the land adjacent to these eroding streambanks unnaturally carried away, but these eroded soils are carried downstream and deposited in often undesirable locations. Shorelines erode more severely as the result of poorly planned and implemented shoreline protection projects located nearby. Habitats can be buried and wetlands can be filled. As runoff upstream increases, more erosion results on downstream streambanks. The streambank and shoreline erosion management measure promotes the necessary actions required to correct streambank and shoreline erosion where it must be controlled. Because erosion is a natural process, this management measure is not intended to be applied to all erosion occurring on streambanks and shorelines.

> **Management Measure 6: Eroding Streambanks and Shorelines:** Protect streambanks and shorelines from erosion and promote institutional measures that establish minimum setback requirements or measures that allow a buffer zone to reduce concentrated flows and promote infiltration of surface water runoff in areas adjacent to the shoreline.

Channelization and channel modification and dams represent forms of hydromodification that are direct results of human activities—someone performs a construction activity directly in or along a stream, river, or shoreline. For example, a town constructs concrete lined channels along a stream passing through the city limits to reduce stream meandering and prevent flooding. Another example is the construction (many years ago) of a dam in a stream for hydropower at a grist mill. Streambank and shoreline erosion are forms of hydromodification that result from direct and indirect human activities. For example, a streambank is eroding at a much faster rate because of recent development activities on shore that result in increased runoff, which is causing increased bank erosion. Another example is a concrete seawall that is protecting property at one location, but causing increased erosion on adjacent properties.

This distinction between forms of hydromodification and impacts from hydromodification is important when contrasting the relationship between Chapter 3 (Channelization and Channel Modification) and Chapter 5 (Streambank and Shoreline Erosion). Many of the operation and maintenance solutions presented in Chapter 3 are also practices that can be used to stabilize streambanks and shorelines as presented in Chapter 5. For example, a stream channel that has been hardened with vertical concrete walls to prevent local flooding and limit the stream to its existing channel (to protect property built along the stream channel), may benefit from operation and maintenance practices that use opportunities to replace the concrete walls with an appropriate vegetative or combined vegetative and non-vegetative structures along the streambank when possible. These same practices may be applicable to stabilize downstream streambanks that are eroding and creating a nonpoint source pollution problem because of the upstream development and hardened streambanks.

Chapter 2: Background

There are differing views on defining the stability of a stream channel and other waterbodies. From a navigation perspective, a stream channel is considered stable if shipping channels are maintained to enable safe movement of vessels. Landowners with property adjacent to a stream or shoreline might consider the waterbody to be stable if it does not flood and erosion is minimal. Ecologists might find some erosion of streambanks and meandering channels to be a part of natural evolution (i.e., changes that are not induced by humans) and consider long-term changes like these to be quite acceptable (Watson et al., 1999). In any case, new and existing channelization projects, construction and maintenance of dams, and streambank and shoreline erosion problems should be evaluated with these differing perspectives in mind and a balance of these perspectives should be taken into account when constructing or maintaining a project. Often, multiple priorities can be maintained with good up-front planning and communication among the different stakeholders involved.

Key Geomorphic Functions of Streams

Discharge, Slope, and Sinuosity

Figure 2.1 is a cross-section of a typical stream channel. The thalweg is the deepest part of the channel. The sloped bank is known as the scarp. The term discharge is used to describe the volume of water moving down the channel per unit time (usually described in the United States as cubic foot per second (cfs)). Discharge is the product of the area through which the water is flowing (in square feet) and the average velocity of the water (in feet per second). If discharge in a channel increases or decreases, there must be a corresponding change in streamflow velocity and/or flow area.

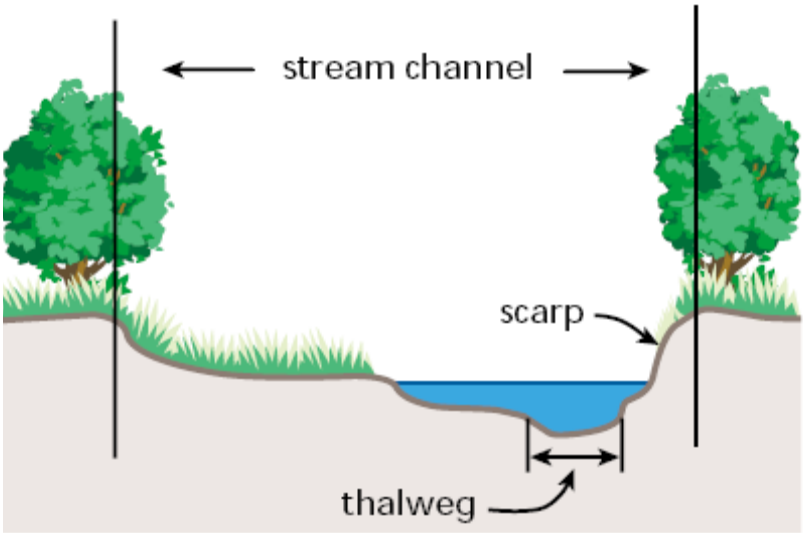

Figure 2.1 Cross-section of a Stream Channel (FISRWG, 1998)

Channel slope is an especially key concept when dealing with hydromodification projects. It is the difference in elevation between two points in the stream divided by the stream length

between the two points. Stream sinuosity greatly affects stream slope. Sinuosity is the stream length between two points on a stream divided by the valley length between the two points. A meandering stream moving through a valley has a lower slope than a straight stream.

Erosion, Transport, and Deposition of Sediment

All streams accomplish three basic geomorphic tasks:

- *Erosion*—the detachment of soil particles along the stream bed and banks
- *Sediment transport*—the movement of eroded soil particles in streamflow
- *Sediment deposition*—the settling of eroded soil particles in the water or on land as water recedes

These processes largely determine the size and shape of the channel, both laterally and longitudinally. The ability to accomplish these geomorphic tasks is related to stream power, the product of slope and discharge. Slope directly affects flow velocity. Consequently, a shallow, meandering stream with low slope generates less stream power, and has lower erosion and sediment-transport capacity, than a deep, straight stream.

In addition to sinuosity, roughness along the boundaries of a stream area is also important in determining streamflow velocity and stream power. The rougher the channel bottom and banks, the more they are able to slow down the flow of water. The level of roughness is determined by many conditions including:

- Type and spacing of bank vegetation
- Size and distribution of sediment particles
- Bedforms
- Bank irregularities
- Other miscellaneous obstructions

Tractive stress, also known as shear stress, describes the lift and drag forces that work to create erosion along the stream bed and banks. In general, the larger the sediment particle, the more stream power is needed to dislodge it and transport it downstream. When stream power decreases in the channel, larger sediment particles are deposited back to the stream bed.

Dynamic Equilibrium

One of the primary functions of a stream is to move particles out of the watershed. Erosion, sediment transport, and deposition occur all the time at both large and small scales within a channel. A channel is considered stable when the average tractive stress maintains a stable streambed and streambanks. That is, sediment particles that erode and are transported downstream from one area are replaced by particles of the same size and shape that have originated in areas upstream. Lane (1955) qualitatively described this relationship as:

$$Qs * D \propto Qw * S$$

Where: Qs = Sediment discharge, D = Sediment particle size, Qw = Streamflow, S = Stream slope

When all four variables are in balance, the channel is stable, or in dynamic equilibrium.

Lane's channel variable relationships can be visualized as a pan balance with sliding weights (Figure 2.2). Sediment discharge is placed on one pan and streamflow on the other. The hook holding the sediment load pan can slide back and forth based on changes in sediment size. Likewise, the hook holding the streamflow can slide according to changes in slope.

If a disturbance or stream modification occurs that causes a variable to change, one or more of the other variables must change in order to maintain the balance. During an imbalanced phase, the scale indicator will point to either degradation or aggradation. This indicates that the channel will try to adjust and regain equilibrium by either increasing sediment discharge by scouring the bottom or eroding its banks (degradation) or decreasing sediment discharge by depositing sediment on the bottom (aggradation), depending on the circumstance.

For example, if stream slope is decreased and streamflow remains the same (i.e., streamflow pan slides toward the center), the balance will tip and aggradation will occur (Figure 2.3). Alternatively, if streamflow increases and slope remains the same (i.e., more weight on the streamflow pan), degradation will occur. No matter the scenario, this basic relationship between the variables will hold true and aggradation or degradation will cease only when the system reaches equilibrium. This can occur naturally over time, or through management practices designed to deal with the "balancing" issue.

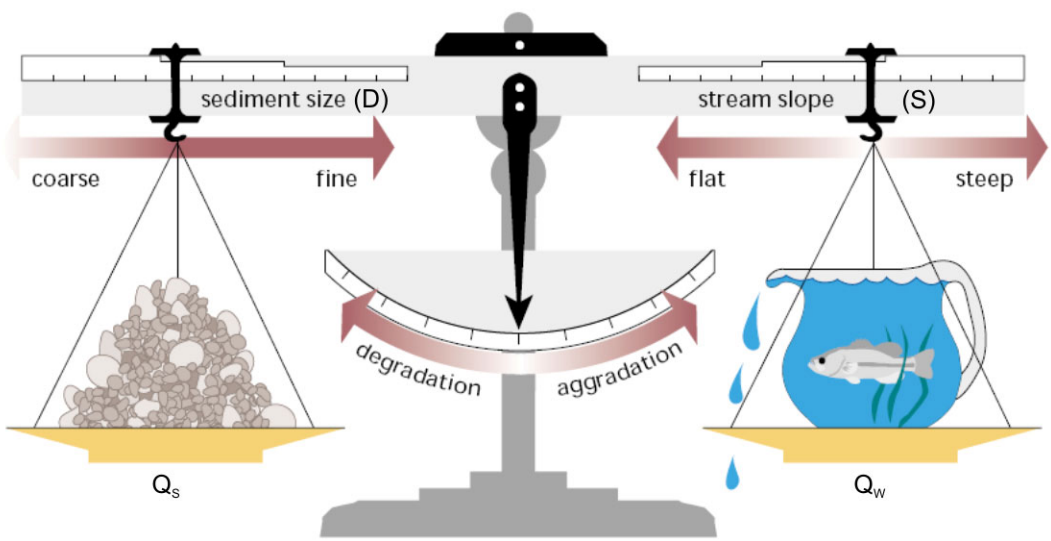

Figure 2.2 Factors Affecting Channel Degradation and Aggradation (FISRWG, 1998)

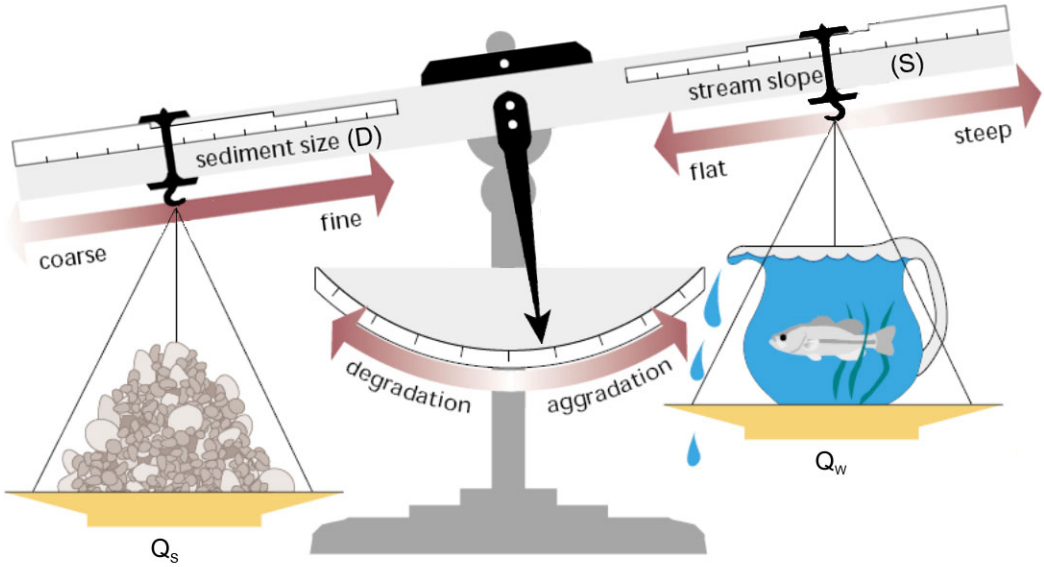

Figure 2.3 Example of Aggradation (Adapted from FISRWG, 1998)

Longitudinal View of Channels

The geomorphic processes that define the size and shape of channels can be observed in large and small scale longitudinal views. The overall longitudinal view of many streams can be divided into three general zones (Schumm, 1977):

- *Headwater zone*—characterized by steep slopes with sediment erosion as the most dominant geomorphic process.
- *Transfer zone*—characterized by more sinuous channel patterns and wider floodplains with sediment transfer as the most dominant geomorphic process.
- *Deposition zone*—characterized by lower slope and higher channel sinuosity than the other zone and is the primary deposition area for watershed sediment.

Key characteristics of each zone are summarized in Figure 2.4.

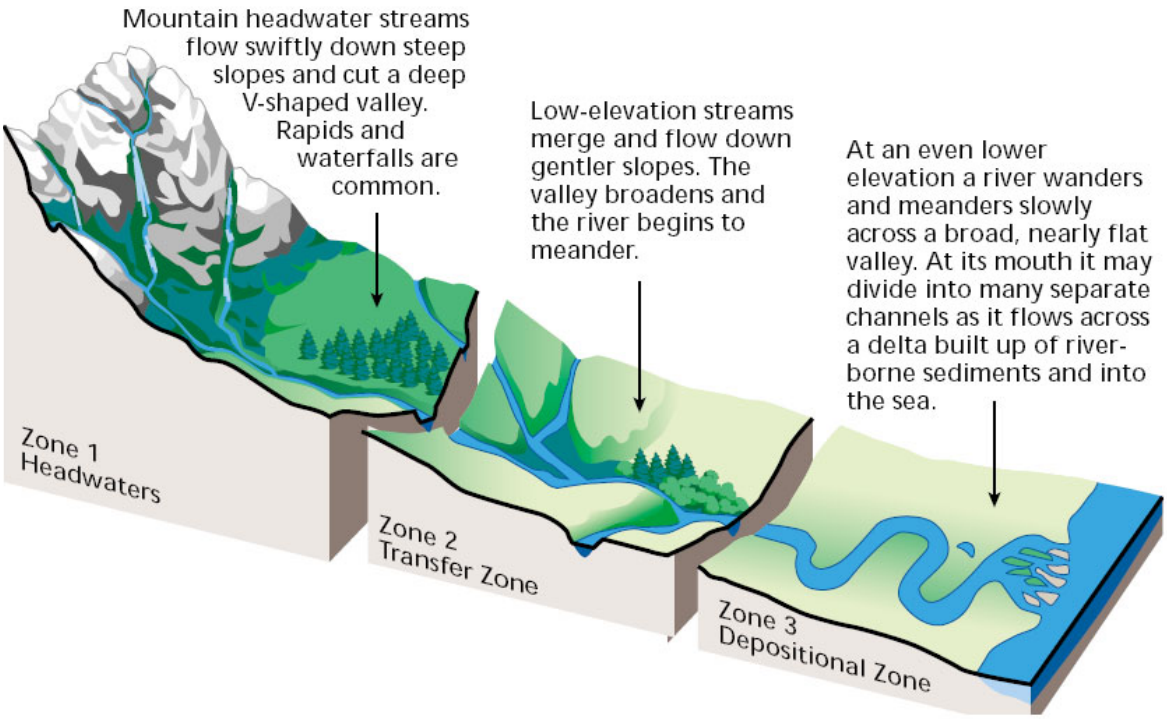

Figure 2.4 Three Longitudinal Profile Zones (FISRWG, 1998)

At a smaller scale, natural-forming channels are usually characterized by a series of riffles, pools, and runs. These structures are primarily associated with the thalweg, which meanders within the channel (Figure 2.5). Riffles are shallow, turbulent, and swiftly flowing stretches of water that flow over partially or totally submerged rocks. Deeper areas at stream bends are the pools and can be classified as large-shallow, large-deep, small-shallow, and small-deep. Runs are the sections of a stream with little or no surface turbulence that connect pools and riffles.

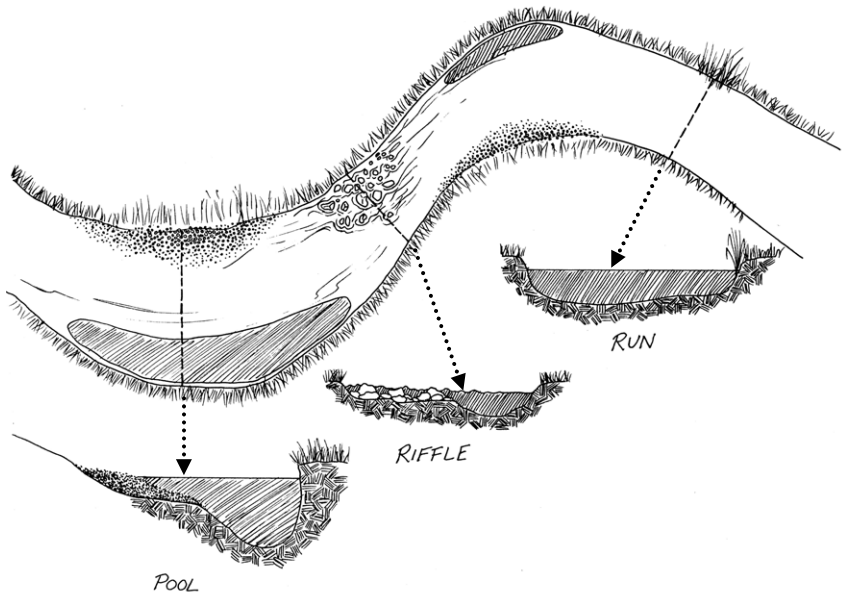

Figure 2.5 Overview of a Pool, Riffle, and Run (USEPA, 1997b)

The distribution in streamflow velocity and stream power throughout the riffle/pool/run sequence impact the geomorphic tasks. The stream bottom of a riffle is at a higher

elevation than the stream areas surrounding it. Consequently, the water flowing in a run from riffle to pool has the highest velocity near the center of the channel just under the surface (i.e., away from the roughness associated with channel boundaries). On reaching a bend, angular momentum forces the highest velocity flow to the outside of the bend and, given enough tractive stress, causes erosion to the bank (cutbanks). Meanwhile on the inside of the bend deposition often occurs because of decreasing flow velocity. Importantly, these and other characteristics of the riffle/pool/run sequence create unique habitats which allow different species to live, reproduce, and feed.

Disruption of Dynamic Equilibrium

Changes caused by (or exacerbated by) hydromodification projects and other human activities can lead to a disruption of the dynamic equilibrium of the stream channel. If, for example, a modification occurs that causes a change in sediment discharge, channel slope, or streamflow, one or more of the other variables will be imbalanced and the channel will usually try to adjust and regain equilibrium by either increasing sediment discharge by scouring the bottom or eroding its banks (degradation) or decreasing sediment discharge by depositing sediment on the bottom (aggradation) (Biedenharn et al., 1997; Watson et al., 1999). In some cases, alterations to a stream channel can result in local or system-wide channel instability (FISRWG, 1998).

General Impacts of Channelization and Channel Modifications

Channelization and channel modifications are undertaken for many purposes including flood control, navigation, drainage improvement, and reduction of channel migration potential. Modifications also occur in association with the installation of culverts and bridges, urbanization of the watershed, and agricultural drainage. These changes may result in several physical and chemical impacts.

Physical Impacts

The most significant physical impact of channelization and channel modifications is the movement or deposition of sediment. Sediment erodes from stream banks and beds, is washed downstream in faster moving water, deposited in areas of slower flows, and transported into new areas of streams or other receiving waters. Critical habitat can be changed when channelization or channel modification projects alter the dynamic equilibrium of a stream and change sediment transport or deposition characteristics. Re-establishing equilibrium may take some time to occur and have long-lasting effects to habitat and water quality conditions.

Channel modification and channelization can lead to increased erosion in some areas of the stream, which produces sediment. Sediment can be dislodged and transported directly from the waterbody's shoreline, bank, or bottom. Sediment being transported by a stream is referred to as the sediment load, which is further classified as the bed load (those particles moving on or near the bed, or bottom of the channel) and the suspended load (those particles moving in the water column). Hydromodification typically results in more uniform channel cross-sections, steeper stream gradients, and reduced average pool depths.

An increase in the sediment load could lead to increased turbidity, which then may cause an increase in stream temperature because the darker sediment particles absorb heat (USEPA, 1997b). Changes in water temperature can influence several abiotic chemical processes, such as dissolved oxygen concentrations, sorption of chemicals onto particles, and volatilization rates. Water temperature influences reaeration rates of oxygen from the atmosphere. Dissolved oxygen concentrations in water are inversely related to temperature; solubility of oxygen decreases with increasing water temperature. In addition, sorption of chemicals to particulate matter and volatilization rates are influenced by changes in water temperature. Sorption often decreases with increasing temperature and volatilization increases with increasing temperature (University of Texas, 1998).

An increased sediment load that contains significant organic matter can increase the sediment oxygen demand (SOD). The SOD is the total of all biological and chemical processes in sediment that consume oxygen (USEPA, 2003a). These processes occur at or just below the sediment-water interface. Most of the SOD at the surface of the sediment is due to the biological decomposition of organic material and the bacterially facilitated nitrification of ammonia, while the SOD several centimeters into the sediment is often dominated by the chemical oxidation of species such as iron, manganese, and sulfide (Walker and Snodgrass, 1986 from USGS, 1997; Wang, 1980). Increases in SOD can lead to lower levels of dissolved oxygen, which can be harmful to aquatic life.

A channel that is deepened or widened can result in slower and/or shallower flow. Reduced stream velocities can result in more sediment deposits to a stream segment. When more sediment is deposited in an area of a stream, critical habitats can be buried, channels may become unstable, and flooding increases. In tidal areas, channel modification activities, such as deepening a channel to allow for larger ships to access a shoreline, may require frequent maintenance to remove accumulating sediment because of changes in flow patterns.

Chemical Impacts

A variety of chemicals can be introduced into surface waters when channelization and channel modification activities alter flow and sediment transport characteristics. Nutrients, metals, toxic organic compounds, pesticides, and organic materials can enter the water in eroding soils along banks and move throughout a stream as flow characteristics change. Changing temperatures and dissolved oxygen levels may lead to alterations in the bioavailability of metals and toxic organics. Complex chemical conditions can significantly change when stream flow and sedimentation characteristics change, resulting in new and/or potentially harmful forms of chemicals affecting instream or benthic organisms.

It is important to remember that many of the physical and chemical changes are interrelated. For a more detailed discussion of the impacts associated with chemical and physical changes to surface waters, see *Restoration of Aquatic Ecosystems* (NRC, 1992). The following discussion provides examples of impacts that may be present as a result of different kinds of channelization. For a more detailed discussion of types of channelization projects and potential impacts, see Watson et al. (1999).

Biological and Habitat Impacts

Pools, riffles, and runs create a mixture of flows and depths and provide a variety of habitats to support fish and invertebrate life (USEPA, 1997b). The shallow, turbulent, and swiftly flowing stretches of riffle water are well oxygenated and have a "patchy distribution of organisms," which means that different types of organisms are naturally found in different parts of the riffle. Pools can also be large or small and shallow or deep and support a wide variety of aquatic species. Sediments can deposit in pools, which can lead to the formation of islands, shoals, or point bars.

Changes in habitat and biological communities following hydromodification of a channel can be highly site-specific and complex. The physical and chemical alterations resulting from channelization impact various habitats and biological communities, including instream algae, fish, macroinvertebrate populations, and bank or floodplain vegetation. Mathias and Moyle (1992) compared unchannelized and channelized sections of the same stream and found a much higher diversity of many organisms, including aquatic invertebrates, fish, and riparian vegetation, in the unchannelized sections of the stream. Adams and Maughan (1986) compared the benthic community in a small headwater stream, prior to and after channelization. They found that the pathways of organic input shifted from materials associated with leaf fall and runoff to materials associated with periphyton production. Accompanying this change was a shift of the assemblage from shredder domination to grazer domination and a decrease in diversity. Biological and habitat impacts caused by channelization can result from increased stream velocity, decreases in pool and riffle habitat complex, decrease in canopy cover, increase in the solar radiation reaching the channel, channel incision, and increases in sediment.

Channelization of a stream may increase velocity due to increased channel slope and decreased friction with the bank and bed material. Changes in the velocity may cause an impact to organisms within the channel. For example, fish may have to expend more energy to stay in swifter currents and their source of food may be swept downstream. Studies have demonstrated that fisheries associated with channelized streams can be far less productive that those of non-channelized streams (Jackson, 1989). Increased rates of erosion as a result of increased velocities downstream of a channelization feature can also create unstable streambanks, which could lead to increased streambank erosion, higher risks of flooding, and ultimately negative impacts to aquatic organisms.

Channelization can result in a more uniform stream channel that is void of the pool and riffle habitat complex or obstructions, such as woody debris inputs. As repeatedly observed, this can result in changes to the biological community. Negishi et al. (2002) observed a decrease in the total density of macroinvertebrates in the middle of a channelized stream and a decrease in taxon richness in the middle and edge of a channelized stream. An overall reduction in habitat heterogeneity is likely responsible for the reduction in species diversity and the increased abundance of those species favored by the altered flows that is typically observed (Allan, 1995). On medium-sized, unregulated rivers, Benke (2001) found that habitat-specific invertebrate biomass was highest on snags, followed by the main channel and then the floodplain. It was concluded that invertebrate productivity from these habitats has likely been significantly diminished as a result of snag removal, channelization, and floodplain drainage (Benke, 2001).

The survival of the Gulf Coast walleye (*Stizostedion vitreum*) relies on the availability of appropriate spawning habitat, such as large woody debris, that locally reduce current velocity. Channelization and the removal of structures have been identified as activities of concern that could threaten the survival of the species (VanderKooy and Peterson, 1998). In one experiment, an assessment of water quality using environmental indices, such as macroinvertebrate communities, found that channelization and deforestation resulted in a completely different and less varied biocommunity (Bis et al., 2000). A lower persistence of the macroinvertebrate assemblage in the channelized stream was attributed to the lower availability of flow such as backwaters and inundated habitats (Negishi et al., 2002). In a study by Kubecka and Vostradovsky (1995), low fish populations were attributed to channelization of the riverbed.

The channelization of a river can also result in a decrease in canopy cover and an increase in the solar radiation reaching the channel. Bis et al. (2000) found that an increase in incident radiation on a river resulted in increased algal productivity and a significant decrease in scrapers, a macroinvertebrate that feeds on periphyton or algae growing on plant surfaces. Increased water temperatures can also lead to a shift in the algal community to predominately planktonic algal communities, which disrupts the aquatic food chain (Galli, 1991). The combination of increased water temperatures and loss of riparian vegetation falling into the stream (which provides both food and cover) may be responsible for the decrease in macroinvertebrates. Increased solar radiation on a channelized stream can act to decrease productivity by reaching the level of photoinhibition; a decrease in productivity due to excessive amounts of solar radiation. The temperature of the water can also be increased to the extent that it adversely impacts organisms. Elevated temperatures disrupt aquatic organisms that have narrow temperature limits, such as trout, salmon, and many aquatic insects.

Incision of a channel, a common impact of channelization, disconnects the channel from the floodplain by lowering the riverbed relative to the floodplain and decreasing the occurrence of overbank flow. Channel incision or downcutting has rarely been found to directly affect the biotic ecosystem, but indirect changes in habitat conditions are significant. Channel incision decreases habitat heterogeneity and, as a result, biodiversity (Tachet, 1997). An analysis of forest overstory, understory, and herbaceous strata along a channelized and unchannelized stream showed that there was a difference in terms of size-class structure and woody debris quantity (Franklin et al., 2001). Loss of woody vegetation along riparian zones on a channel that is incised because of upstream channelization was attributed to a decrease in over bank flooding and a lowering of the water table as the stream became incised (Steiger et al., 1998). A comparison of a regulated and an unregulated river in Colorado's Green River Basin found a difference in riparian vegetation composition. The regulated river supported banks with wetland species that survive in anaerobic soils and terraces with desert species adapted to xeric soil conditions. The unregulated river supported riparian vegetation that changed along a more gradual environmental continuum from a river channel to a high floodplain (Merritt and Cooper, 2000).

Sediment affects the use of water in many ways. When the rate of erosion changes, transport and deposition of sediment also changes. Excessive quantities of sediment can bury benthic organisms and the habitat of fish and waterfowl. Suspended solids in the water reduce the amount of sunlight available to aquatic plants, cover fish spawning areas and food supplies, fill

rearing pools, reduce beneficial habitat structure in stream channels, smother coral reefs, clog the filtering capacity of filter feeders, and clog and harm the gills of fish. Those fish species that rely on visual means to get food may be restricted by increased turbidity. Sedimentation effects combine to reduce fish, shellfish, coral, and plant populations and decrease the overall productivity of lakes, streams, estuaries, and coastal waters.

Impacts Associated with Specific Hydromodification Actions

Channel Straightening and Deepening

Channels are straightened for a multitude of reasons, such as directing water away from a particular structure or area and reducing local flooding. Channelization that involves straightening of the stream channel increases the slope of the channel, which results in higher discharge velocities. Impacts associated with increased water velocities include more streambank and streambed erosion, higher sediment loads, changes in pools, riffle, and run structure, and increased transport of nutrients and other pollutants (FISRWG, 1998; Simons and Senturk, 1992).

Channelization can also result in alterations to the base level of the stream, including channel downcutting or incision of a section of the stream, which raise the height of the floodplain relative to the riverbed and decrease the frequency of overbank flow. When streams reach flood stage and flow into the floodplain, velocities decrease. The reduction in overbank flow reduces sediment deposition and the sediment storage potential of the floodplain (Wyzga, 2001). A change in the downstream base level of a stream can create an unstable stream system (Biedenharn et al., 1997).

Headcutting is the deepening of a waterway caused by channelization or localized stream-bed mining. Headcutting severely impacts the physical integrity of a stream, as streambanks become unstable and are more prone to eroding and sloughing. Bank failures may result, removing streamside vegetation and introducing significant amounts of sediment into the waterway. As sediments build on the stream bottom, natural substrate is covered and stream depth decreases. Water quality often diminishes as temperatures rise due to less shading by riparian vegetation and increased water surface area with decreased depth. The rapid alteration to stream habitat caused by headcutting is usually detrimental to aquatic wildlife. Various organizations, such as the U.S. Army Corps of Engineers, the Natural Resources Conservation Service (NRCS), and the Missouri Department of Conservation, are involved in projects to reduce headcutting (CSU, n.d.; MDC, 2007; USGS, 2000).

Channel Lining

The sides of channels can be lined with materials such as metal sheeting, concrete, wood, or stone to prevent erosion of a particular section of stream channel or stream bank. The artificially lined areas can reduce the friction between the channel and flowing water, leading to an increase in velocity. The increased velocity and thus the increased erosive potential of the flowing water are not able to erode the artificially lined channel area and can result in augmented erosion downstream as well as increased downstream flooding (Brookes, 1998). Lining the channel also removes aquatic habitat and important substrates that are essential to aquatic life.

Channel Narrowing

Narrowing of a stream channel often occurs when flood control measures such as levees and floodwalls are implemented. By narrowing a stream channel, the water is forced to flow through a more confined area and thus travels at an increased velocity (FISRWG, 1998). The increased velocity in turn increases the stream's erosive potential and ability to transport sediment. This can lead to increased erosion of the streambank and shoreline in downstream locations.

When a channel is made narrower, the water depth increases and the surface area exposed to the solar radiation and ambient temperature decreases, especially in the warmer months. This can cause a decrease in the water temperature. Increased depth may also reduce the surface area of the water in contact with the atmosphere and affect the transfer of oxygen into the water.

In a naturally flowing stream, floods are responsible for such processes as redistributing sediment from the river bottom to form sandbars and point bar deposits. Stream channel modifications to reduce flood damage, such as levees and floodwalls, often narrow the stream width, increasing the velocity of the water and thus its erosive potential. This can lead to increased erosion of the streambank and shoreline in downstream locations (FISRWG, 1998).

Channel Widening

Channel widening is often performed to increase a channel's ability to transport a larger volume of water. The design is often based on volumes of water that occur during flood events. The design of a channel modification project to increase the channel's ability to transport a large volume of water will determine the characteristic of the water flow. The widening of a channel can result in a channel with a capacity to transport water that far exceeds the typical daily discharge. This results in a typical flow that is shallow and wide. As a result of increased contact with the streambed and streambank, there is increased friction and a decreased water velocity. The decrease in velocity causes sediment to settle out of the water column and accumulate within the stream channel. This accumulation of sediment can decrease the capacity of the stream channel. The decreased depth and increased surface area of the water exposed to solar radiation and ambient air temperatures can lead to an increase in water temperature. A change in water temperature can influence dissolved oxygen concentrations as dissolved oxygen solubility decreases with increasing water temperature.

Where tidal flow restrictors cause impoundments, there may be a loss of streamside vegetation, disruption of riparian habitat, changes in the historic plant and animal communities, and decline in sediment quality. Restricted flows can impede the movement of fish or other aquatic life. Flow alteration can reduce the level of tidal flushing and the exchange rate for surface waters within coastal embayments, with resulting impacts on the quality of surface waters and on the rates and paths of sediment transport and deposition.

Culverts and Bridges

The presence of culverts and bridges along a channel can have an impact on the physical and chemical qualities of the water. A culvert can be in the form of an arch over a channel or a pipe that encircles a channel, and it functions to direct flow below a roadway or other land use. A culvert or the supports of a bridge can confine the width of a channel forcing the water to flow in a smaller area and thus at a higher velocity. Impacts associated with a higher flow velocity

include increased erosion. An arch culvert maintains the natural integrity of the stream bottom. In addition, as compared with the natural substrate that can be found using an arch culvert without concrete inverts (floors), a pipe culvert may create less friction with the water flow and result in an increased flow velocity. The chemical and physical changes associated with increased erosion and sediment transport capacity would then result.

The culvert acts as a fixed point with a fixed elevation within the stream channel and as the stream attempts to adjust over time, the culvert remains stationary. Placement of this type of structure disturbs the natural equilibrium of a channel. A culvert sometimes may have beneficial attributes when it acts as a grade control structure, and as such, may serve to prevent upstream migrating incision (headcutting) from moving further up the channel. Depending on the watershed processes, the culvert may act to preserve the natural equilibrium of a channel.

Urbanization

As humans develop watersheds, the proportions of pervious and impervious land within the watershed change (most often increasing impervious areas and decreasing pervious areas). Development also results in reductions in vegetative cover in exchange for increases in houses, buildings, roads, and other non-vegetative cover. The result is a change in the fate of water from rainfall events. Generally, as imperviousness increases and vegetative cover is lost:

- Runoff increases
- Soil percolation decreases
- Evaporation decreases
- Transpiration decreases

Increased volumes of runoff resulting from some types of watershed development can result in hydraulic changes in downstream areas including bank scouring, channel modifications, and flow alterations (Anderson, 1992; Schueler, 1987). The resulting changes to the distribution, amount, and timing of flows caused by flow alterations can affect a wide variety of living resources. As urbanization occurs, changes to the natural hydrology of an area are inevitable. During urbanization, pervious spaces, including vegetated and open forested areas, are converted to land uses that usually have increased areas of impervious surface, resulting in increased runoff volumes and pollutant loadings. Hydrologic and hydraulic changes occur in response to site clearing, grading, and change in landscape. Water that previously infiltrated the ground and was slowly released runs off quickly into stream networks. Development, with corresponding increases in imperviousness, can lead to:

- Increased magnitude and frequency of bankfull and subbankfull floods
- Dimensions of the stream channel that are no longer in equilibrium with its hydrologic regime
- Enlargement of channels
- Highly modified stream channels (from human activity)
- Upstream channel erosion that contributes greater sediment load to the stream
- Reduced dry weather flow to the stream
- Decreased wetland perimeter of the stream
- Degraded in-stream habitat structure

- Reduced large woody debris
- Increased stream crossings and potential fish barriers
- Fragmented riparian forests that are narrower and less diverse
- Decline in water quality
- Increased summer stream temperatures
- Reduced aquatic diversity

The hydraulic changes associated with urbanization have often been addressed with channelization and channel modification as a solution. Evaluating impacts from urbanization on a watershed scale and planning solutions on the same watershed scale can often prevent the transference of upstream problems to downstream locations. There are a variety of management activities that can reduce the impacts associated with urban development. When these urban impacts are reduced, additional hydromodification impacts, such as channelization and channel modification or streambank and shoreline erosion effects, may be reduced. Changes in urban development practices that result in reduced sediment in runoff can enhance reservoir quality and lessen the need for management activities to reduce nonpoint source impacts associated with the operation of dams.[1]

Agricultural Drainage

Some activities, including channelization and channel modification, that take place within a watershed, can lead to unintended adverse effects on watershed hydrology. Even when the intended effect of the watershed activity is to reduce pollution or erosion for an area within a watershed, the impact of the project to the entire watershed's hydrology should be evaluated. Since hydrology is important to the detachment, transport, and delivery of pollutants, better understanding of these effects can lead to reduction of nonpoint source pollution problems (USEPA, 2003b).

One example of an activity that has been shown to provide localized nonpoint source benefits, but can negatively affect the hydrology of a watershed, is an agricultural drainage system. The main purpose of agricultural drainage is to provide a root environment suitable for plant growth, but it can also be used as a means of reducing erosion and improving water quality. Despite the localized positive effects of drainage, when drainage water is poor in quality or contains elevated levels of pollutants, adverse impacts may occur downstream within a watershed. Concentrations of salts, nutrients, and other crop-related chemicals, such as fertilizers and pesticides can damage downstream aquatic ecosystems. Many agricultural drainage systems include drain tiles placed strategically throughout a field to create a network of gravity fed drains. The drain tiles empty into a collection pipe that drains to a waterbody nearby. With the drain system in place and operating, water will leave the affected area quicker and at one or more focused points. Water from the drainage system may erode the banks of unlined surface drains, contribute to flashier runoff events in the receiving water or downstream, and increase the load of sediment in drainage water (USEPA, 2003b).

[1] For additional information on hydrologic problems associated with urbanization and management practices that address urbanization issues, refer to *National Management Measures to Control Nonpoint Source Pollution from Urban Areas* (USEPA, 2005d): http://www.epa.gov/owow/nps/urbanmm/index.html.

Because of these adverse effects, drainage planners should analyze effluents from these systems for nutrients and pesticides to determine possible downstream impacts. Care should also be taken with drainage water so that it does not negatively alter the hydrology of a watershed (FAO, 1997). The degree to which management activities, such as agricultural drainage systems, affect watersheds beyond their intended purpose should be evaluated. In some cases, a thorough assessment and thoughtful discussion with key stakeholders is enough to evaluate the potential impacts of a project on hydrology. However, in many instances, some form of modeling is probably needed to integrate various small and large impacts of watershed activities. For more information on agricultural drainage and management practices related to agricultural drainage, refer to *National Management Measures for the Control of Nonpoint Pollution from Agriculture* (USEPA, 2003b).[2]

Shorelines

A shoreline is defined as the areas between low tide and the highest land affected by storm waves. The shape and position of shorelines are constantly being modified by the processes of erosion and deposition by waves and currents (Tarbuck and Lutgens, 2005). NOAA's Coastal Services Center defines shoreline as "the line of contact between the land and a body of water. On Coast and Geodetic Survey nautical charts and surveys the shoreline approximates the mean high water line" (NOAA, 2006).

The shoreline can be divided into three major areas:

1) *Coast*—the land inland from the base of the sea cliff (produced by the undercutting of bedrock at sea level by wave erosion).
2) *Beach (shore)*—the area between low tide level and dunes, sea cliff, or permanent vegetation. This can be separated into backshore and foreshore.
3) *Offshore*—the area continuously underwater, which can include a wave build platform.

Shoreline Processes

As mentioned above, the shape and position of shorelines are constantly modified by erosion and deposition by waves and currents. Waves are agents of erosion, transportation, and deposition of sediments. Waves can be formed by the following processes (Tulane University, n.d.; University of Alabama, 2006):

- *Wind-generated waves*—formed by shear stress between water and air when the wind speed is higher than about 3 km/hr. Factors that determine the size of waves are wind velocity, wind duration, and fetch (distance the wind blows over a continuous water surface).
- *Displacement of water*—can be caused by activities such as landslides.
- *Displacement of seafloor*—can be caused by faulting and volcanic eruptions.

[2] Available online at: http://www.epa.gov/owow/nps/agmm/index.html.

Wave refraction occurs where wave fronts approach the shore at an angle, but are bent to become more parallel to the shoreline by frictional drag on the bottom. The part of the wave in shallow water slows down because of bottom friction, while the part in the deep water keeps moving at regular speed. Wave refraction causes headland erosion and deposition in bays (Tulane University, n.d.; University of Alabama, 2006).

Nearshore currents occur in the area from the shoreline to beyond the surf zone and consist of (Tulane University, n.d.; University of Alabama, 2006):

- *Longshore currents* move parallel to shore in the same general direction as the approaching waves. They are produced by the movement of oblique waves in the surf zone, and can transport large amounts of sediment by longshore drift.
- *Rip currents* are strong, narrow currents of surface water that flow seaward through the surf into deeper water. The currents develop in areas with lower wave heights (deeper water depths).

Deposition and Erosion

Wave erosion and rivers that open into the ocean or lakes can deposit sediment, transported by longshore currents, developing the following depositional features (Tulane University, n.d.; University of Alabama, 2006):

1) *Beaches*—Any strip of sediment that extends from the low-water line inland to a cliff or zone of permanent vegetation, which is built of material eroded by waves from the headlands, and material brought down by rivers that carry the products of weathering and erosion from the land masses. Beaches are protected from the full force of water waves but are continually modified by wave and current erosion.
2) *Spits*—A narrow ridge or embankment of sediment forming a finger-like projection from the shore into the open ocean. Spits typically develop when the sediment being carried by long-shore drift is deposited where water becomes deeper, such as the mouth of a bay.
3) *Baymouth bars*—Sand bars that form as a result of longshore drift and completely cross a bay, sealing it off from the open ocean.
4) *Tombolo*—A ridge of sand that connects two islands or an island with the mainland, formed as the result of wave refraction around an island.
5) *Tidal inlet*—A break in a spit or baymouth bar, caused by storm erosion, through which tidal currents rush.
6) *Barrier islands*—Low offshore ridges of sediments that parallel the coast and are separated from the mainland by lagoons.

Wave erosion can also wear away land features, causing the following types of features to form (Tulane University, n.d.; University of Alabama, 2006):

1) *Sea cliffs*—formed by storm wave erosion which undercuts higher land, making it susceptible to mass wasting. Sea cliffs can erode very slowly or rapidly, depending on the rock type and wave energy.
2) *Wave-cut terrace or platform*—produced by the retreat of a sea cliff which slopes gently in a seaward direction.

3) *Headlands*—occur due to the seaward projections of shore eroded by wave refraction.

Common Natural and Anthropogenic Causes of Coastal Land Loss

Primary causes of coastal land loss, including both natural and anthropogenic causes, are summarized in Table 2.1 below (USGS, 2004).

Table 2.1 Common Causes of Coastal Land Loss

Agent	Examples
Natural Causes	
Erosion	Waves and currents, storms, landslides
Sediment reduction	Climate change, stream avulsion, source depletion
Submergence	Land subsidence, sea-level rise
Wetland deterioration	Herbivory, freezes, fires, saltwater intrusion
Anthropogenic Causes	
Transportation	Boat wakes, altered water circulation
Coastal construction	Sediment deprivation (bluff retention), coastal structures (jetties, groins, seawalls)
River modification	Control and diversion (dams, levees)
Fluid extraction	Water, oil, gas, sulfur
Climate alteration	Global warming and ocean expansion, increased frequency and intensity of storms
Excavation	Dredging (canals, pipelines, drainage), mineral extraction (sand, shell, heavy mines)
Wetland destruction	Pollutant discharge, traffic, failed reclamation, burning

Shorelines can also experience increased rates of erosion as a result of hydromodification activities. Alterations to the sediment sources for beaches can result in erosion. The sediment supplied to beaches or shorelines can come from a variety of sources including rivers, cliff and rocky foreshores, the seafloor, or windblown dune materials. Beaches and shorelines at the mouth of a river are often replenished by fluvial sediment. When changes within the river system decrease the sediment load carried to the mouth of the river, the result may be decreased sediment supplies to the shoreline or beach. While the design of each hydromodification system determines the impacts that will ensue, streambank and shoreline erosion is a common consequence.

Impacts Associated with Dams

The physical presence and operation of dams can result in changes in water quality and quantity. Some of the water quality impacts include changes in erosion, sedimentation, temperature, dissolved gases, and water chemistry. Examples of biological and habitat impacts, which may result from a combination of physical and chemical changes, include loss of habitat for existing or desirable fish, amphibian, and invertebrate species; changes from cold water to warm water species (or inversely, changes from warm water to cold water species); blockage of fish passage; or loss of spawning or necessary habitat.

The impacts associated with dams occur above (upstream) and below (downstream) the dam. Upstream impacts occur primarily in the impoundment/reservoir created by the presence and operation of the dam. The area and depth of the impoundment will determine the extent and

complexity of the upstream and downstream impacts. For example, small, low-head dams with little impounded areas will exhibit different impacts than large storage dams. Sedimentation and fish passage issues at the smaller, low-head dam contrast with sedimentation, temperature, fish passage, flow regulation, and water quality issues that may be associated with the larger storage dam. The existence of the dam and associated impoundment results in much different water quality interactions than those associated with the preexisting naturally flowing streams or rivers.

Above dams, activities within the watershed can have significant impacts on water quality within impoundments and in releases from dams to downstream areas. Watershed activities, such as agricultural land use, unpaved rural roads, forestry harvesting, or urbanization can lead to changes in runoff water quantity and quality. Agricultural and forestry practices that lead to sediment-laden runoff may result in increased sediment accumulation within an impoundment. Chemicals (e.g., pesticides and nutrients) that are applied on agricultural crops can be carried with sediment in runoff. Increases in urbanization that result in more impervious areas within a watershed often result in dramatic changes in the quantity and timing of runoff flows. These external sources are integrated by the dam and may result in short- and long-term water quality changes within an impoundment and dam releases.

Water quality in reservoirs and releases from dams are closely linked and scrutinized to uses of the water. Often, there are multiple potential users who may have differing quality needs and perceptions. Management of dams includes balancing dam operations, watershed activities, reservoirs, and downstream water and uses. Dortch (1997) provides an excellent assessment on water quality considerations in *Reservoir Management*. Dortch (1997) notes the following about water quality:

- *Temperature* regulates biotic growth rates and life stages and defines fishery habitat (warm, cool, and cold water).
- *Oxygen* sustains aquatic life.
- *Turbidity* affects light transmission and clarity.
- *Nutrient enrichment* is linked to primary productivity (algal growth) and can cause oxygen depletion, poor taste, and odor problems.
- *Organic chemicals and metals* may be toxic and accumulate when bound to sediment that settles in the reservoir.
- *Total dissolved solids* may be problematic for water supplies and other users.
- *Total suspended solids* are a transport mechanism for nutrients and contaminants. Solids may settle in reservoirs and displace water storage volume.
- *pH* regulates many chemical reactions.
- *Dissolved iron, manganese, and sulfide* can accumulate in reservoir hypolimnions that are depleted of oxygen and can cause water quality problems in the reservoir and release water.
- *Pathogens* include bacteria, viruses, and protozoa that can cause public health problems.

Water uses include water supply, flood control, hydropower, navigation, fish and wildlife conservation, and recreation (Dortch, 1997). All of the uses have varying water quality requirements, ranging from almost none for flood control to high quality needs for water supply, fish and wildlife conservation, and recreation.

Dams act as a barrier to the flow of water, as well as to materials being transported by the water. This can impact water quality both in the impoundment/reservoir created by the dam and downstream of the dam. Alteration to the chemical and physical qualities of water held behind a dam is often a function of the retention time of a reservoir or the amount of time the water is retained and not able to flow downstream. Water held in a small basin behind a run-of-river dam may undergo minimal alteration. In contrast, water stored for months or even years behind a large storage dam can undergo drastic changes that impact the downstream environment when released (McCully, 2001). A storage dam that impounds a large reservoir of water for an extended time period will cause more extensive impacts to the physical and chemical characteristics of the water than a smaller dam with little storage capacity.

Several physical changes are possible when dams are introduced into a stream or river, including changes in:

- Instream water velocities
- Timing and duration of flows
- Flow rates
- Sediment transport capacities
- Turbidity
- Temperature
- Dissolved gasses

Similarly, changes to water chemistry are possible as a result of damming rivers and streams, including changes to:

- Nutrients
- Alkalinity and pH
- Metals and other toxic pollutants
- Organic matter

The nature and severity of impacts will depend on the location in the river or stream, in relation to the upstream or downstream side of the dam, the storage time of the impounded water, and the operational practices at the dam. Many of the above impacts are also interrelated. For example, changes in temperature may result in changes in dissolved oxygen levels or changes to pH may result in changes to nutrient dynamics and the solubility of metals.

Water Quality in the Impoundment/Reservoir

As water approaches a dam from upstream, the stream velocity slows down considerably, creating a lake-like environment. The water builds up behind the dam and forms a basin (i.e., impoundment, reservoir) that is deeper than the previous stream flow. The height of the dam and its operational characteristics will determine how much water is stored and the length of storage. The extent of impacted stream area above the dam is influenced by the size of the dam installed, how much water is released, and how often water is released. For example, a small run-of-the river dam constructed to divert water for a millrace will have minimal storage capacity and may only store water for several hours or less. In this case, instream water velocities may decrease,

but with minimal upstream and downstream effects. Thus, the length of upstream channel that is impacted should be relatively small.

In contrast, a large flood control dam and reservoir may have many months of storage and severely alter instream velocities for long distances upstream. Topography surrounding the original stream channel and storage volume will be important parameters determining the length of stream channel affected by the large dam. The volume and frequency of discharges from the dam will also determine how much of the upstream channel is impacted with lower instream velocities as a result of the dam.

Dams act as a physical barrier to the movement of suspended sediments and nutrients downstream (McCully, 2001). When the stream flow behind a dam slows, the sediment carrying capacity of the water decreases and the suspended sediment settles onto the reservoir bottom. Any organic compounds, nutrients, and metals that are absorbed to the sediment also settle and can accumulate on the reservoir bottom.

Turbidity associated with sediment varies, depending on particle sizes of the sediment and the length of time water is held. Longer holding times in the reservoir could result in periodic episodes of high turbidity from upstream storm events that carry sediment rich stormwater, especially if the sediment is predominantly very fine clay particles. Turbidity may also increase as a result of planktonic algal growth in a reservoir.

The increased depth of the water in reservoirs reduces the volume of water exposed to solar radiation and ambient temperatures. Once the flow is controlled by the operation of the dam and the reservoir is mixed primarily by winds, temperature variations can become established within the reservoir. This can cause thermal stratification where, compared to the bottom, surface layers become warmer in the summer and cooler in the winter. In deeper reservoirs, the deepest layers may become nearly constant in temperature throughout the year. Changes in temperature can impact water quality and biological processes in the reservoir, including changes in predominant fish species. Since the density of water is a function of water temperature, thermal stratification creates density gradients within the impoundment. As density gradients become established, exchanges of gases and chemicals between gradients decrease. In a stratified impoundment well aerated surface waters often do not mix with hypolimnetic water and result in poorly oxygenated strata below the surface waters.

Nutrient transport is affected by dams, which can trap the nutrients in the impoundment/reservoir. When nutrients accumulate, the reservoir might become nutrient enriched (i.e., eutrophic). In warmer seasons, concentrated nutrients in waters exposed to light can promote growth of algae and other aquatic plants, which consume nutrients and release oxygen (during photosynthesis) and carbon dioxide (during respiration). When algae and other aquatic plants complete their growth cycles, they die and sink to the bottom of an impoundment. Microbial decomposition of the highly organic dead plant materials may release nutrients back into the water column. Microbial decomposition of the dead plant and algal cells in aerobic conditions consumes oxygen, which can rapidly deplete bottom waters of dissolved oxygen. Under anaerobic conditions, microbial decomposition can produce potentially toxic concentrations of gases, such as hydrogen sulfide.

The operational characteristics of a dam will influence nutrient levels in water releases. For example, water released from the surface of an impoundment may contain seasonally varying forms and levels of nutrients. During periods of algal growth, releases may contain lower levels of dissolved nutrients and higher levels of organic materials (algae) containing nutrients. When algal growth is not occurring, releases may contain higher levels of dissolved nutrients.

Anaerobic (oxygen-depleted) environments, which are typical of deeper waters in reservoirs, can result in several changes to the water chemistry. For example, as by-products of organic matter decomposition in an anaerobic environment, ammonia and hydrogen sulfide concentrations can become elevated (Freeman, 1977; Pozo et al., 1997). Highly acidic (or highly alkaline) waters tend to convert insoluble metal sulfides to soluble forms, which can increase the concentration of toxic metals in reservoir waters (FISRWG, 1998).

Changes in one water quality parameter in a reservoir/impoundment can impact other water quality parameters, causing a cycling of events to occur. For example, increased sedimentation (from internal or external sources) can lead to more organic matter remaining in the reservoir, resulting in more biochemical oxygen demand, potentially lower dissolved oxygen, and other changes to water chemistry, such as pH and metal solubility. Periodic growth and then die-off of aquatic plants and algae creates additional variable cycling of organic matter in the reservoir. The following references may provide additional detail on the complex water quality changes that can occur in impoundments and reservoirs:

- Holdren, C., W. Jones, and J. Taggart. 2001. *Managing Lakes and Reservoirs*. North American Lake Management Society and Terrene Institute, in cooperation with the Office of Water, Assessment and Watershed Protection Division, U.S. Environmental Protection Agency, Madison, WI.
- Thornton, K.W., B.L. Kimmel, and F.E. Payne. 1990. *Reservoir Limnology: Ecological Perspectives*. John Wiley & Sons, Inc., New York.
- U.S. Army Corps of Engineers. N.d. *The WES Handbook on Water Quality Enhancement Techniques for Reservoirs and Tailwaters*. U.S. Army Corps of Engineer Research and Development Center Waterways Experiment Station, Vicksburg, MS.

Water Quality Downstream of a Dam

The physical and chemical changes that occur to the water quality in an impoundment/reservoir have a large impact on the water released downstream of a dam. As previously stated, the presence of a dam can alter water velocities above and below the dam. In smaller dams with little storage capacity, velocities may slow locally and recover to an undisturbed state shortly downstream from the dam. When dams store large volumes of water in a reservoir, the operation of the dam will have a major impact on the downstream velocities and flows. Unless the dam is operated to consistently release water at flows near pre-dam levels, downstream areas will have flows and velocities that are directly related to the volume of water released in a given time period. The downstream flow characteristics will become a function of the operation of the dam, including the timing and duration of releases, the depth of reservoir intakes, and other physical characteristics of the release.

On the Columbia River, research found that prior to construction of dams, average water temperatures fluctuated more diurnally with cooler nighttime temperatures as compared with the existing average water temperatures. With the dams in place, cooler weather tends to cool the free flowing river but have little effect on the average temperature of the impounded river (USEPA, 2003c).

When dams trap sediment upstream, water released from the dam may be starved of sediment and have an increase in erosive capacity. Along with trapping sediment, nutrients may also be trapped above the dam. When the nutrients are trapped and unavailable, sensitive downstream habitats and populations may be affected.

Whether the water is released from the surface or bottom of the reservoir can have a large impact on the characteristics of the water. The impacts of water outflows below a dam are an outcome of the seasonal temperature fluctuations and the outflow positioning. Seasonal temperature profiles in reservoirs are highly variable and dependent upon a complex set of factors including tributary inflow, basin morphometry, drawdown and discharge characteristics, and the degree of stratification (Wetzel, 2001). Compared to natural temperatures, in summer elevated temperatures in surface water releases can increase downstream river temperatures, whereas bottom water releases can be expected to decrease water temperatures. The opposite effect is generally observed in the winter due to changes in the water temperature gradient (USACE, 1999 in Fidler and Oliver, 2001).

Suspended Sediment and Reduced Discharge

Whether the release water originates from the surface or the bottom of the reservoir, the suspended sediment has typically settled out of the water column and thus the water released from behind the dam is usually relatively free from sediment (Simons and Senturk, 1992). This sediment-free water can easily pick up and carry a sediment load and have an increase in erosive capacity. Because of the rock lined channels of bank stabilization and navigation projects that usually occur below these reservoirs, the only place that the clear waters can find the sediments they need is in the streambed or navigation channel. This leads to channel deepening or bed degradation, which in turn lowers water tables and drains floodplain channels and backwaters (Rasmussen, 1999). Streambed and streambanks will continue to erode until an equilibrium suspended sediment load is established. Without sediment from upstream sources, downstream streambanks, streambeds, sandbars, and beaches can erode away more quickly (FISRWG, 1998).

A reduction in the discharge and sediment load generally results in degradation of the channel close to the dam and sedimentation downstream due to the increased supply from the erosion near the dam. Degradation may eventually migrate downstream, but is typically most dramatic the first few years following construction of the dam (Biedenharn et al., 1997). In addition, the physical impact of the discharge will depend, in part, on the channel substrate. A fine silt and sand channel bottom may experience more extensive erosion than a bed rock or cobble substrate.

Lower flow conditions below a dam within a tidally influenced basin can lead to changes in water chemistry. The impact of lower freshwater flow into estuaries was extensively studied in San Francisco Bay. Nichols et al. (1986) provide a detailed history of changes to freshwater inflows to San Francisco Bay. They also provide a summary of the impacts, which include the ecological and water quality effects. A study comparing an unregulated river and a dam regulated river found a significant difference in the water quality chemistry, including an analysis of levels of sodium, potassium, calcium, phosphorus, electrical conductivity, and pH in the middle and lower reaches of the rivers. These differences were attributed to increased tidal influence as a result of lower outflow volumes of fresh water from the dam (Colonnello, 2001). In addition, a decreased discharge from the dam and increased tidal influence can prolong the flushing time or the time it takes water to move through a system. This causes the nutrients and pollutants within the water to remain concentrated in areas below the dam near an estuary.

Biological and Habitat Impacts

The presence of a dam may cause physical and chemical changes to the water quality. These, in turn, can have an impact on the entire biological community including fish, macroinvertebrates, algae, and streamside vegetation. Impacts to the biological community differ upstream and downstream of a dam. Dams may disrupt spawning, increase mortalities from predation, change instream and riparian habitat, and alter plant and benthic communities. Resulting fish populations after dam construction may thrive and become well established, but could be very different than populations prior to installing the dam. For example, upstream of the dam, a fish population may change from a cold-water salmonid fishery to one that is dominated by cool- or warm-water species. A once thriving native trout population may become a largemouth bass (*Micropterus salmoides*) and bluegill (*Lepomis macrochirus*) dominated system. Similarly, downstream conditions may also change. In southern states, streams that once supported catfish and other tolerant warm-water species may now be able to support a trout fishery because of cold-water releases from bottom waters behind a dam. Although the trout fishery may be viewed as positive by some, the displaced native warmwater species may not be perceived as beneficial.

Dams prevent the movement of organisms throughout the river system (Morita and Yamamoto, 2002). Researchers found that fragmenting habitat by damming a river caused the disappearance of a fish species in several upstream locations and further disappearances were predicted (Morita and Yamamoto, 2002). Recently, some individual cases involving movement of invasive, non-native aquatic species note the presence of dams as a positive factor. In these cases, dams have blocked the movement of potentially harmful invasive species.

Flood control and hydropower projects influence a river's hydrograph. For example, in some regions normal river hydrographs featured a rise in water level elevation corresponding to spring

rains. Other geographic areas had stream hydrographs corresponding to snowmelt in the mountains, or fall rainfall. Native species evolved under these scenarios and used such water level rises to trigger spawning movements onto floodplains and in the case of birds, for nesting on islands. Additionally, the stream water level fluctuations were important in providing feeding and resting areas for spring and fall waterfowl migrations. Under managed scenarios for commercial navigation, river water level elevations are raised in the spring and held stable throughout the navigation season, virtually eliminating the triggering mechanisms native species used to reproduce and complete their life cycles. Because of this, many native riverine species often fail to spawn or nest, and are becoming increasingly threatened (Rasmussen, 1999). Additionally, stabilization of periodic flooding has also lead to the loss of ephemeral wetlands and may lead to the accumulation of sediments in nearshore areas, thus negatively affecting fish spawning areas (NRC, 1992).

Dams may lead to increased predation of fish in several ways. A dam may cause populations of fish to concentrate on the upstream and downstream sides, which might lead to the likelihood of increased predation. Changes in the habitat adjacent to a dam can make conditions more suitable to predation. Dams may cause the migration process to be delayed, which also leads to increased predation (Larinier, 2000).

The physical and chemical changes to water released from a dam, including reduced streamflow variability and decreased sediment loads, may also impact benthic communities. Increased water clarity and reduced streamflow variability just below a dam may result in a greater abundance of periphyton or other plants as compared with other locations in the river (Stanford and Ward, 1996). A slowed stream flow velocity with decreased turbulence can also encourage the growth of phytoplankton blooms (Décamps et al., 1988). In contrast, the operation of some hydroelectric dams with large, sudden releases of water may scour the bottom of the downstream channel to the extent that there is a nearly complete removal of the plant communities (Allan, 1995).

Impacts Associated with Dam Removal

Removing a dam affects the flow of water, movement of sediment and chemical constituents, and the overall channel morphology (Academy of Natural Sciences, 2002) on the waterway where the dam was located. The impacts of removing a dam differ for the upstream and downstream sections of a waterway.

Changes in the biological community following the removal of a dam are difficult to generalize, as they are highly site specific and can vary in recovery time from a few months to

The effects of river damming were evaluated in a study comparing a regulated river to an unregulated river in the Green River Basin in Colorado. Prior to installation of the dam in Green River in 1962, Green River and the Yampa River were similar in riparian vegetation and fluvial processes. Comparison of the now regulated Green River and the free-flowing Yampa River found distinctive vegetation differences between the parks that surround the rivers. The channel form of Green River has undergone three stages of morphologic change that have transformed the historically deep river into a shallow braided channel. The Yampa River has remained relatively unchanged. The land surrounding the Green River now consists of marshes with anaerobic soil that supports wetland species and terraces with desert species adapted to xeric soil conditions. The meandering Yampa River has maintained its original surroundings. Its frequently flooded bars and high floodplains provide a wide range of habitats for succession of riparian vegetation (Merritt and Cooper, 2000).

more than a decade. With the removal of a dam, there are changes in the vegetative community surrounding the stream channel and changes in the biological community within the stream itself.

Physical Changes: Upstream Impacts

The removal of a dam allows the water formerly held behind the dam to flow and will likely cause the extent of the impoundment area or reservoir area to decrease. As a dam is removed and the water recedes, sediment is scoured from the bottom and a stream channel returns sometimes to its pre-dam pathway and sometimes to a newly carved channel. As a channel is formed, areas that were formerly beneath the impoundment area become exposed. This can leave large areas of unvegetated and unstable land exposed, which makes these areas likely to undergo erosion and gully development, increasing the sediment load to the stream.

In time, vegetation will stabilize the newly formed stream banks, reducing erosion and allowing sediment transport levels to return to natural levels. The nutrient and metal constituents associated with the sediment will also return to natural levels. As the newly established channel-like flow develops and the stagnant and deep conditions are removed, the natural temperature and oxygen levels will be reestablished.

Physical Changes: Downstream Impacts

Once the physical barrier of the dam is removed, a river can flow unrestricted. As the channel is reformed, the water discharge volume and the stream channel can reach equilibrium. As a result, a more natural stream flow rate is maintained.

With the removal of a dam, the fate of the trapped sediments is of concern because flooding and downstream pollution problems can result. On a short-term time scale, the redistribution of the fine silt and sand sediments that accumulated behind the dam wall may cause an increase in turbidity and water quality problems. In addition, the impact can be greater if the sediments contain toxic pollutants, such as metals or bioaccumulative compounds such as mercury or PCBs. On a short-term time scale, the redistribution of the fine silt and sand sediments increases the turbidity and can damage spawning grounds, water quality, habitat, and food quality (American Rivers, 2002a). Suspended sediment loads can have a negative impact on a biological community and reach lethal levels during dam removal if preventive measures are not implemented (Doyle et al., 2000).

After a dam is removed and the sediment that has been trapped behind the dam is redistributed, natural sediment transport levels return. As a result, the constituents typically sorbed to sediment, including nutrients and metals, are no longer found localized in excess. Normal sediment transport levels typically result in a river bottom with a higher percentage of rocky substrate. Gravel and cobblestones located below the sediment may be exposed or may be transported from upstream locations as the flow rate of the river increases. This unrestricted flow and transport of sediment and gravel may also play a key role in restoring sediments to downstream locations and coastal beaches (USDOI, 1995). The removal of a dam and the return of natural flow rates should also help to restore a river's natural water temperature range and oxygen levels.

Short-term chemical changes to the water quality, including the possibility of supersaturation of nitrogen gas directly following the removal of a dam, can cause aquatic animals to experience

adverse conditions. This can include gas bubble disease, in which nitrogen bubbles form in the blood and tissues and block capillaries by embolism (Colt, 1984; Soderberg, 1995). Adverse effects can be seen when the dissolved nitrogen level reaches 102% and at 105% widespread fish mortalities are possible (Dryden Aqua, 2002). Supersaturation was an issue in the 1992 removal of Little Goose Dam on the Snake River (American Rivers, 2002a). If a reservoir is drawn down slowly, the severity of the impact of supersaturation on aquatic organisms can be lessened (American Rivers, 2002a).

Biological Changes: Upstream Impacts

Following the removal of a dam, a return to the normal temperature range, flow rates, and oxygen levels supports the return of native aquatic vegetation species. Still water impoundments support aquatic vegetation that is free floating or that does not need to be strongly rooted, while free-flowing systems support plants that are rooted strongly enough to resist being uprooted by the water current (WRM, 2000).

As the water recedes and the formerly impounded area becomes exposed, vegetation can begin to colonize the area. Sometimes, the exposed area may be colonized by invasive plant species, which are able to remain for several years and prevent other vegetation from becoming established.

The removal of a dam and the subsequent drawdown of water from the impoundment area can affect the wetlands formerly bordering the impoundment area. As the dam is removed, the water table typically begins to drop. The elevation of the wetlands and the extent of the water table drawdown determine whether the wetland areas dry up and what changes will occur in the wetland species composition. Wetlands that develop alongside the newly carved channel are likely to be different than the wetlands formerly bordering the impoundment area in terms of plant and animal species composition.

The biological changes associated with the removal of a dam can be described in phases, as the waterbody makes the transition from reservoir to river. This includes a pattern of relatively rapid recovery for invertebrates or short-lived taxa, followed by a second phase of slower recovery for fish or longer-lived taxa if the dam removal is not an especially large or disruptive event. Overall, the initial impacts, such as colonization by invasive species, typically determine the ecological recovery that follows (Doyle et al., 2000).

Dam removal can allow for improved fish passage and unrestricted fish movement that provides access to spawning habitat upstream. For coastal rivers, the removal of a dam may enable tidal waters to reach upper portions of the stream that were formerly cut off by the dam, creating a spawning environment preferred by certain fish species. Access to upstream sections is particularly beneficial for some anadromous fish that live most of their lives in saltwater and swim upstream toward freshwater to spawn (Massachusetts River Restore Program, 2002).

A dam can also act as a barrier between upstream and downstream fish populations. If a downstream community of fish is an invasive fish species the dam serves as a physical barrier to separate the invasives from the upstream community (American Rivers, 2002a). Thus, the removal of the dam can negatively impact the ecosystem if it allows for the movement of a

population of an invasive species that was previously prevented from traveling to a section of the stream because of the presence of a dam.

Biological Changes: Downstream Impacts

Downstream of the former dam, wetlands are likely to reappear along side the stream channel where they occurred prior to the construction of the dam (WRM, 2000). Revegetation of river beds and banks typically occurs within one growing season, following removal of a dam (Massachusetts River Restore Program, 2002).

Recolonization of the stream banks by vegetation affects the biological community within the stream by providing shade, reducing water temperatures, and supplying a source of woody debris and organic matter to the stream.

As streamside vegetation begins to recover and suitable habitat is restored, fish begin to return. Changes in flow as a result of dam removal lead to the development of side channels and ponds that provide habitat for fish and wildlife. Increased flow rates also allow for the transport of larger debris, including gravel and logs, which create spawning beds and pool and riffle habitat (River Recovery, 2001). In addition, the rocky substrate environment, which is typically exposed as a result of dam removal, provides habitat for aquatic insects and spawning fish. In the long term, the return to natural stream temperatures, oxygen levels, and flow rates all contribute to the reestablishment of a healthy aquatic and riparian ecosystem.

Chapter 3: Channelization and Channel Modification

Channelization and channel modification describe river and stream channel engineering undertaken for flood control, navigation, drainage improvement, and reduction of channel migration potential. Activities that fall into this category include straightening, widening, deepening, or relocating existing stream channels and clearing or snagging operations. These forms of hydromodification typically result in more uniform channel cross-sections, steeper stream gradients, and reduced average pool depths. Channelization and channel modification also refer to the excavation of borrow pits, canals, underwater mining, or other practices that change the depth, width, or location of waterways, or embayments within waterways.

Channelization and channel modification activities can play a critical role in nonpoint source pollution by increasing the downstream delivery of pollutants and sediment that enter the water. Some channelization and channel modification activities can also cause higher flows, which increase the risk of downstream flooding.

Channelization and channel modification can:

- Disturb stream equilibrium
- Disrupt riffle and pool habitats
- Create changes in stream velocities
- Eliminate the function of floods to control channel-forming properties
- Alter the base level of a stream (streambed elevation)
- Increase erosion and sediment load

Many of these impacts are related. For example, straightening a stream channel can increase stream velocities and destroy downstream pool and riffle habitats. As a result of less structure in the stream to retard velocities, downstream velocities may continue to increase and lead to more frequent and severe erosion.

Management Measure 1: Physical and Chemical Characteristics of Channelized or Modified Surface Waters

Management Measure 1
1) Evaluate the potential effects of proposed channelization and channel modification on the physical and chemical characteristics of surface waters. 2) Plan and design channelization and channel modification to reduce undesirable impacts. 3) Develop an operation and maintenance program for existing modified channels that includes identification and implementation of opportunities to improve physical and chemical characteristics of surface waters in those channels.

This management measure applies to proposed channelization or channel modification projects and is intended to occur concurrently with the implementation of Management Measure 2 (Instream and Riparian Habitat Restoration). The intent of the management measure is for project planners to consider potential changes in surface water characteristics when evaluating proposed channelization or channel modification projects. Also, for existing modified channels, the planning process can include consideration of opportunities to improve the surface water characteristics necessary to support desired fish and wildlife.

The purpose of the management measure is to ensure that the planning process for new hydromodification projects addresses changes to physical and chemical characteristics of surface waters that may occur as a result of proposed work. For existing projects, this management measure can be used to ensure the operation and maintenance program uses any opportunities available to improve the physical and chemical characteristics of the surface waters.

Changes created by channelization and channel modification activities are problematic if they unexpectedly alter environmental parameters to levels outside normal or desired ranges. The physical and chemical characteristics of surface waters that may be influenced by channelization and channel modification include sedimentation, turbidity, salinity, temperature, nutrients, dissolved oxygen, oxygen demand, and contaminants. Changes in natural sediment supplies, reduced freshwater availability, and accelerated delivery of pollutants are examples of the types of changes that can be associated with channelization and channel modification.

Published case studies of existing channelization and channel modification projects describe alterations to physical and chemical characteristics of surface waters (Burch et al., 1984; Petersen, 1990; Reiser et al., 1985; Roy and Messier, 1989; Sandheinrich and Atchison, 1986; Sherwood et al., 1990; Shields et al., 1995). Frequently, the post-project conditions are intolerable to desirable fish and wildlife. The literature also describes instream benefits for fish and wildlife that can result from careful planning of channelization and channel modification

projects (Bowie, 1981; Los Angeles River Watershed, 1973; Sandheinrich and Atchison, 1986; Shields et al., 1990; Swanson et al., 1987; USACE, 1989).

Management Practices for Management Measure 1

Implementation of this management measure should begin during the planning process for new projects. For existing projects, implementation of this management measure can be included as part of a regular operation and maintenance program. The approach is two-pronged and should include:

1. *Planning and evaluation*, with numerical models for some situations, of the types of nonpoint source (NPS) pollution related to instream changes and watershed development.

2. *Operation and maintenance programs that apply* a combination of nonstructural and structural practices to address some types of NPS problems stemming from instream changes or watershed development.

Planning and Evaluation

In planning-level evaluations of proposed hydromodification projects, it is critical to understand that the surface water quality and ecological impact of the proposed project will be driven primarily by the alteration of physical transport processes. In addition, it is critical to realize that the most important environmental consequences of many hydromodification projects will occur over a long-term time scale of years to decades.

> Use models/methodologies as one means to evaluate the effects of proposed channelization and channel modification projects on the physical and chemical characteristics of surface waters. Evaluate these effects as part of watershed plans, land use plans, and new development plans.

The key element in the selection and application of models for the evaluation of the environmental consequences of hydromodification projects is the use of appropriate models to adequately characterize circulation and physical transport processes. Appropriate surface water quality and ecosystem models (e.g., salinity, sediment, cultural eutrophication, oxygen, bacteria, fisheries, etc.) are then selected for linkage with the transport model to evaluate the environmental impact of the proposed hydromodification project. There are several sophisticated two-dimensional (2D) and three-dimensional (3D) time-variable hydrodynamic models available for environmental assessments of hydromodification projects. Two-dimensional depth or laterally averaged hydrodynamic models can be routinely applied to assist with environmental assessments of beneficial and adverse effects on surface water quality by knowledgeable teams of physical scientists and engineers (Hamilton, 1990). Three-dimensional hydrodynamic models are also beginning to be more widely applied for large-scale environmental assessments of aquatic ecosystems (e.g., EPA/USACE-WES Chesapeake Bay 3D hydrodynamic and surface water quality model).

Refer to Chapter 8 for a list of some models available for studying the effects of channelization and channel modification activities (Table 8.1). Chapter 8 also provides examples of channelization and channel modification activities and associated models that can be used in the planning process.

Operation and Maintenance Programs

Several management practices can be implemented to avoid or mitigate the physical and chemical impacts generated by hydromodification projects. Many of these practices have been engineered and used for several decades, not only to mitigate human-induced impacts but also to rehabilitate hydrologic systems degraded by natural processes.

In cases where existing channelization or channel modification projects can be changed to enhance instream or streamside characteristics, several practices can be included as a part of regular operation and maintenance programs. New channelization and channel modification projects that are predicted to cause unavoidable physical or chemical changes in surface waters can also use one or more practices to mitigate the undesirable changes. Some of the types of practices include:

- Grade control structures
- Levees, setback levees, and floodwalls
- Noneroding roadways
- Streambank protection and instream sediment load controls
- Vegetative cover

Grade Control Structures

There are two basic types of grade control structures. The first type can be referred to as a bed control structure because it is designed to provide a hard point in the streambed that is capable of resisting the erosive forces of the degradational zone. The second type can be referred to as a hydraulic control structure because it is designed to function by reducing the energy slope along the degradational zone to the point where the stream is no longer capable of scouring the bed. The distinction between the operating processes of these two types is important whenever grade control structures are considered (Biedenharn and Hubbard, 2001).

Design considerations for siting of grade control structures include determining the type, location, and spacing of structures along the stream, along with the elevation and dimensions of structures. Siting grade control structures can be considered a simple optimization of hydraulics and economics. However, these factors alone are usually not sufficient to define optimum siting conditions. Hydraulic considerations must be integrated with a host of other factors that can vary from site to site to determine the final structure plan. Some of the more important factors to be considered when siting grade control structures are discussed more specifically in the U.S. Army Corps of Engineers' *Design Consideration for Siting Grade Control Structures* (Biedenharn and Hubbard, 2001).

When carefully applied, grade control structures can be highly versatile in establishing human and environmental benefits in stabilized channels. To be successful, application of grade control structures should be guided by analysis of the stream system both upstream and downstream from the area to be reclaimed (CASQA, 2003).

In some cases, grade control structures can be designed to allow fish passage. However, some grade control structures can obstruct fish passage. In many instances, fish passage is a primary consideration and may lead engineers to select several small fish passable structures in lieu of

one or more high drops that would restrict fish passage. In some cases, particularly when drop heights are small, fish are able to migrate upstream past a structure during high flows. In situations where structures are impassable, and where the migration of fish is an important concern, openings, fish ladders, or other passageways must be incorporated into the structure's design (Biedenharn and Hubbard, 2001). Fish passage practices are described in Chapter 7.

A type of grade control structure is a check dam. Refer to Chapter 7 for more information about this practice.

Levees, Setback Levees, and Floodwalls

Levees are embankments or shaped mounds constructed for flood control or hurricane protection (USACE, 1981). Setback levees and floodwalls are longitudinal structures used to reduce flooding and minimize sedimentation problems associated with fluvial systems. These practices can be used to reduce the impacts of channelization and channel modification. A more detailed discussion of levees, setback levees, and floodwalls is available in Chapter 7.

Noneroding Roadways

Disturbances along the streambank that result from activities associated with operation and maintenance of channelization projects can lead to additional nonpoint source pollution impacts to the stream. An example of human-induced activities is erosion associated with roadways. Rural road construction, streamside vehicle operation, and stream crossings usually result in significant soil disturbance and create a high potential for increased erosion processes and sediment transport to adjacent streams and surface waters. Erosion during and after construction of roadways can contribute large amounts of sediment and silt to runoff waters, which can deteriorate water quality and lead to fish kills and other ecological problems (USEPA, 1995b).

Road construction involves activities such as clearing of existing native vegetation along the road right-of-way; excavating and filling the roadbed to the desired grade; installation of culverts and other drainage systems; and installation, compaction, and surfacing of the roadbed.

Although most erosion from roadways occurs during the first few years after construction, significant impacts may result from maintenance operations using heavy equipment, especially when the road is located adjacent to a waterbody. In addition, improper construction and lack of maintenance may increase erosion processes and the risk for road failure. To minimize erosion and prevent sedimentation impacts on nearby waterbodies during construction and operation periods, streamside roadway management needs to combine proper design for site-specific conditions with appropriate maintenance practices. A discussion of how roadways can impact fish habitat and passage is available from EPA's *National Management Measures to Control Nonpoint Source Pollution from Forestry* (USEPA, 2005a).

More information about suggested practices to consider during design, construction, operation and maintenance, and general maintenance of noneroding roadways, is available from EPA's *National Management Measures to Control Nonpoint Source Pollution from Forestry* (USEPA, 2005a). This EPA guidance document also provides some suggested permanent control BMPs that may be used to prevent erosion from roadways. Additional information about noneroding roadways is available in Chapter 7 and the Resources section of this document.

Streambank Protection and Instream Sediment Load Controls

Streambank erosion is a natural process that occurs in fluvial systems. Streambank erosion can also be induced or exaggerated as a result of human activities. There are several factors within a watershed that can contribute to human induced streambank erosion. Accelerated streambank erosion related to human activity can typically be attributed to three major causes including channel modifications, reservoir construction, and land use changes (Henderson, 1986). When possible, streambank erosion problems should be addressed in the context of the entire watershed, using a systems approach that considers and accommodates natural stream processes. Approaches to addressing streambank erosion problems associated with channelization and channel modification activities can involve efforts to identify and address all significant contributing factors in addition to treating the immediate symptom, bank erosion.

In general, the design of streambank protection may involve the use of several techniques and materials. Nonstructural or programmatic management practices for the prevention of streambank failures include:

- Protection of existing vegetation along streambanks
- Careful use or regulation of irrigation near streambanks, such as rerouting of overbank drainage
- Minimization of loads on top of streambanks (such as prevention of building within a defined distance from the streambed)

Several structural practices are used to protect or rehabilitate eroded banks. These practices are usually implemented in combination to provide stability of the stream system, and they can be grouped into direct and indirect methods. Direct methods place protecting material in contact with the bank to shield it from erosion. Indirect methods function by deflecting channel flows away from the bank or by reducing the flow velocities to nonerosive levels (Henderson, 1986; Henderson and Shields, 1984). Indirect bank protection requires less bank grading and tree and snag removal. However, some structural methods like stone toe protection, as discussed below, can be placed with minimal disturbance to existing slope, habitat, and vegetation.

Feasibility of the practices at a site depends on the engineering design of the structure, availability of the protecting material, extent of the bank erosion, and specific site conditions such as the flow velocity, channel depth, inundation characteristics, and geotechnical characteristics of the bank. The use of vegetation alone or in combination with other structural practices, when appropriate, could further reduce the engineering and maintenance efforts.

Vegetation can be considered with respect to site-specific characteristics. When vegetation is combined with low cost building materials or engineered structures, numerous techniques can be created for streambank erosion control. It is important to consider the assets and limitations when planning to use planted vegetation for streambank protection. Advantages of vegetation include the following (Allen and Leech, 1997):

- Reinforces soil (increases bank stability).
- Increases resistance to flow and reduces flow velocities (from exposed stalks), causing the flow to dissipate energy against the plant (rather than the soil).

- Intercepts water.
- Enhances water infiltration.
- Depletes soil water by uptake and transpiration.
- Acts as a buffer against the abrasive effect of transported materials.
- Induces sediment deposition (from close-growing vegetation).
- Reduces costs, in some cases, when compared to most structural methods.
- Improves conditions for fisheries and wildlife.
- Improves water quality.
- Protects cultural/archeological resources.

Limits of vegetation include failure to grow; being subject to undermining; being uprooted by wind, water, and the freezing and thawing of ice; ingestion by wildlife or livestock; and maintenance requirements. Chapter 3 of *Bioengineering for Streambank Erosion Control* discusses plant acquisition, handling, and timing of planting (Allen and Leech, 1997).

Streambanks can be protected or restored either by increasing resistance of the bank to erosion or by decreasing the energy of the water at the point of contact with the bank, for example by deflecting or interrupting flows (Henderson, 1986). Instream sediment can be controlled by using several structural, vegetative, or bioengineered practices, depending on the management objective and the source of sediment. Streambank protection and channel stabilization practices, including various types of revetments, grade control structures, and flow restrictors, have been effective in controlling sediment production caused by streambank erosion. Designs should match the protection capability of the treatment to the erosion potential of each stream zone. For example, riprap may be needed at the toe of a slope to protect it from undercutting combined with tree revetments to deflect flows and provide protection for live stakings that will develop permanent support. The growing body of research indicates management techniques that emulate nature and work with natural stream processes are more successful and economical.

Significant amounts of instream sediment deposition can be prevented by controlling bank erosion processes and streambed degradation. Channel stabilization structures can also be designed to trap sediment and decrease the sediment delivery to desired areas by altering the transport capacity of the stream and creating sediment storage areas. In regulated streams, alteration of the natural streamflow, particularly the damping of peak flows caused by surface water regulation and diversion projects, can increase streambed sediment deposits by impairing the stream's transport capacity and its natural flushing power. Sediment deposits and reduced flow alter the channel morphology and stability, the flow area, the channel alignment and sinuosity, and the riffle and pool sequence. Such alterations have direct impacts on the aquatic habitat and the fish populations in the altered streams (Reiser et al., 1985).

Vegetative Cover

Streambank protection using vegetation is a commonly used practice, particularly in areas of low water velocities. Vegetative cover, also used in combination with structural practices, is often relatively easy to establish and maintain, and is visually attractive (USACE, 1983). Emergent vegetation provides two levels of protection. First, the root system helps hold soil together and increases overall bank stability by forming a binding network. Second, the exposed stalks, stems, branches, and foliage provide resistance to streamflow, causing the flow to lose part of its energy

by deforming the plants rather than by removing the soil particles. Above the waterline, vegetation protects against rainfall impact on the banks and reduces the velocity of the overland flow during storm events.

Vegetative controls are not suitable for all sites, especially those sites with severe erosion due to high flow rates or channel velocities. Refer to the Washington State Department of Transportation's (WSDOT's) *Hydraulics Manual*, Chapter 4[1] for information on calculating flow rates or channel velocities. Stabilization measures should only be implemented after a careful evaluation of the stream and the surrounding area. A knowledgeable fluvial geomorphologist may be helpful with this evaluation. In addition, plant species should be selected with care; native plant species should be used whenever possible. Appropriate species can be determined by consulting horticulturalists and botanists for plant selection assistance. The USDA-Forest Service guide, *A Soil Bioengineering Guide for Streambank and Lakeshore Stabilization*[2] provides a list of plants for soil bioengineering associated systems. The International Erosion Control Association (IECA)[3] publishes a products and services directory listing sources of plant material and professional assistance.

In addition to bank stabilization, vegetation can also offer pollutant filtering capacity. Pollutants and sediment transported by overland flow may be partly removed as a result of a combination of processes including reduction in flow pattern and transport capacity, settling and deposition of particulates, and eventual nutrient uptake by plants.

Summary of Physical and Chemical Practices

All of the following practices can be used to address the effects of channelization and channel modification activities on the physical and chemical characteristics of a waterbody:

- Bank shaping and planting
- Branch packing
- Brush layering
- Brush mattressing
- Bulkheads and seawalls
- Check dams
- Coconut fiber roll
- Dormant post plantings
- Erosion and Sediment Control (ESC) Plans
- Joint plantings
- Levees, setback levees, and floodwalls
- Live cribwalls
- Live fascines
- Live staking
- Noneroding roadways
- Return walls

[1] http://www.wsdot.wa.gov/eesc/design/hydraulics/Manual/Rev3Publications/Chapter%204.pdf
[2] http://www.fs.fed.us/publications/soil-bio-guide
[3] http://ieca.org

- Revetments
- Riprap
- Root wad revetments
- Rosgen's Stream Classification Method
- Setbacks
- Toe protection
- Tree revetments
- Vegetated buffers
- Vegetated gabions
- Vegetated geogrids
- Vegetated reinforced soil slope (VRSS)
- Wing deflectors

Additional information about each of the above practices is available in Chapter 7. The Additional Resources section provides a number of sources for obtaining information about the effectiveness, limitations, and cost estimates for these practices.

Management Measure 2: Instream and Riparian Habitat Restoration

Management Measure 2
1) Evaluate the potential effects of proposed channelization and channel modification on instream and riparian habitat. 2) Plan and design channelization and channel modification to reduce undesirable impacts. 3) Develop an operation and maintenance program for existing modified channels that includes identification and implementation of opportunities to restore instream and riparian habitat in those channels.

Implementation of this management measure is intended to occur concurrently with the implementation of the Management Measure for Physical and Chemical Characteristics of Channelized or Modified Surface Waters (see previous management measure discussion). This management measure pertains to surface waters where channelization and channel modification have altered or have the potential to alter instream and riparian habitat, such that historically present plants, fish, or wildlife are adversely affected. This management measure is intended to apply to any proposed channelization or channel modification project to determine changes in instream and riparian habitat and to existing modified channels to evaluate possible improvements to instream and riparian habitat. The purpose of this management measure is to correct or prevent detrimental changes to instream and riparian habitat from the impacts of channelization and channel modification projects.

Management Practices for Management Measure 2

Implementation of this management measure should begin during the planning process for new projects. For existing projects, implementation of this management measure can be included as part of a regular operation and maintenance program. Ensuring the involvement and participation of all partners is a place to start on any restoration project. Determining the extent of the restoration activity can help identify potential partners and other interested stakeholders. Each stakeholder may bring a certain expertise, historical information and data, and possibly funding to a project. Development of a stream corridor restoration plan can help organize the group, set goals for implementation of management practices, secure funding or other types of support, and facilitate the sharing of ideas and accomplishments within the group and to others in the community. The approach is two-pronged and should include:

1. *Planning and evaluation*, with numerical models for some situations, of the types of NPS pollution related to instream and riparian habitat changes and watershed development.

2. *Operation and maintenance* activities that restore habitat through the application of a combination of nonstructural and structural practices to address some types of NPS problems stemming from instream and riparian habitat changes or watershed development.

Planning and Evaluation

Several tools can be used to evaluate the instream and riparian health of a stream system. These approaches include:

- Biological methods/models
- Temperature restoration practices
- Geomorphic assessment techniques
- Expert judgment and checklists

Biological Methods/Models

To assess the biological impacts of channelization, it is necessary to evaluate both physical and biological attributes of the stream system. Assessment studies should be performed before and after channel modification, with samples being collected upstream from, within, and downstream from the modified reach to allow characterization of baseline conditions. It also may be desirable to identify and sample a reference site within the same ecoregion as part of the rapid bioassessment procedures discussed below.

> Use models/methodologies to evaluate the effects of proposed channelization and channel modification projects on instream and riparian habitat and to determine the effects after such projects are implemented.

There are a number of different methods that can be used to assess the biological impacts of channelization. Rapid Bioassessment Protocols (RBPs) were developed as inexpensive screening tools for determining whether a stream is supporting a designated aquatic life use (Barbour et al., 1999; Plafkin et al., 1989). One component of these protocols is an instream habitat assessment procedure that measures physical characteristics of the stream reach (Barbour and Stribling, 1991). An assessment of instream habitat quality based on 12 instream habitat parameters is performed in comparison to conditions at a "reference" site, which represents the "best attainable" instream habitat in nearby streams similar to the one being studied. The RBP habitat assessment procedure has been used in a number of locations across the United States. A small field crew of one or two persons typically can perform the procedure in approximately 20 minutes per sampling site.

Rapid Bioassessment Protocols (Barbour et al., 1999; Plafkin et al., 1989) were designed to be scientifically valid and cost-effective and to offer rapid return of results and assessments. Protocol III (RBP III) focuses on quantitative sampling of benthic macroinvertebrates in riffle/run habitats or on other submerged, fixed structures (e.g., boulders, logs, bridge abutments, etc.) where such riffles may not be available. The data collected are used to calculate various metrics pertaining to benthic community structure, community balance, and functional feeding groups. The metrics are assigned scores and compared to biological conditions as described by either an ecoregional reference database or reference sites chosen to represent the "best attainable" biological community in similarly sized streams. In conjunction with the instream

habitat quality assessment, an overall assessment of the biological and instream habitat quality at the site is derived. RBP III can be used to determine spatial and temporal differences in the modified stream reach. Application of RBP III requires a crew of two persons; field collections and lab processing require 4 to 7 hours per station and data analysis about 3 to 5 hours, totaling 7 to 12 hours per station. The RBP III has been extensively applied across the United States. More information about biological assessments is available from EPA's Biological Assessment Web site.[4]

Karr et al. (1986) describes an Index of Biological Integrity (IBI), which includes 12 metrics in three major categories of fish assemblage attributes: species composition, trophic composition, and fish abundance and condition. Data are collected at each site and compared to those collected at regional reference sites with relatively unimpacted biological conditions. A numerical rating is assigned to each metric based on its degree of agreement with expectations of biological condition provided by the reference sites. The sum of the metric ratings yields an overall score for the site. Application of the IBI requires a crew of two persons; field collections require 2 to 15 hours per station and data analysis about 1 to 2 hours, totaling 3 to 17 hours per station. The IBI, which was originally developed for Midwestern streams, can be readily adapted for use in other regions. It has been used in several states across the country to assess a wide range of impacts in streams and rivers.

Habitat Evaluation Procedures (HEPs) can be used to document the quality and quantity of available habitat, including aquatic habitat, for selected wildlife species. HEPs provide information for two general types of instream and riparian habitat comparisons:

- The relative value of different areas at the same point in time
- The relative value of the same area at future points in time

By combining the two types of comparisons, the impact of proposed or anticipated land and water use changes on instream and riparian habitat can be quantified (Ashley and Berger, 1997).

Additional information about the assessment methods discussed above, as well as other methods for assessing biological impacts is available in Table 8.2 of Chapter 8.

Temperature Restoration Practices

Channelization and channel modification activities can greatly impact stream temperature. All other factors remaining unchanged, when a channel is narrowed, the water depth increases and the surface area exposed to solar radiation and ambient temperature decreases. This can decrease water temperature. When a channel is widened, the opposite occurs; shallower depths and increased temperatures occur. Temperature may also be increased from increased turbidity because the sediment particles absorb heat. It is important to model how temperature will change in a stream, as a result of channelization and channel modification activities, to determine what other changes and impacts might occur in the stream.

[4] http://www.epa.gov/owow/monitoring/bioassess.html

Stream temperature has been widely studied, and heat transfer is one of the better-understood processes in natural watershed systems. Most available approaches use energy balance formulations based on the physical processes of heat transfer to describe and predict changes in stream temperature.

More information about temperature restoration models and practices is provided in Chapter 8 (Modeling).

Geomorphic Assessment Techniques

Fluvial geomorphology is the study of stream form and function. Geomorphic assessment focuses on qualitative and quantitative observations of stream form. It provides a "moment-in-time" characterization of the existing morphology of the stream. In addition, geomorphic assessment includes a stability component. Stability assessments place the stream in the context of past, present, and anticipated adjustment processes. Geomorphic assessments can be useful in predicting changes that could be created by channelization and channel modification activities.

Stream classification is a technique that is used to show the relationship between streams and their watersheds. There are several techniques for stream classification, all of which have advantages and limitations. Advantages of geomorphic assessment include (adapted from FISRWG, 1998):

- Promotes communication.
- Enables extrapolation of data collected on a few streams to a number of channels over a broader geographical area.
- Helps the restoration practitioner consider the landscape context and determine expected ranges of parameters.
- Enables practitioners to interpret the channel-forming or dominant processes active at the site.
- Uses reference reaches as the desired outcome of restoration.
- Provides an important cross-check to verify if the selected design values are within a reasonable range.

Limitations of geomorphic assessment include (adapted from FISRWG, 1998):

- Determination of bankfull or channel-forming flow depth may be difficult or inaccurate.
- The dynamic condition or the stream is not indicated in stream classification systems.
- River response to a perturbation or restoration action is normally not determined by classifying it alone.
- Biological health is not directly determined.
- Classifying a stream should not be used alone to determine the type, location, and purpose of restoration activities.

Schumm (1960) identified straight, meandering, and braided channels and related both channel pattern and stability to modes of sediment transport. Schumm recognized that stable straight and meandering channels have mostly suspended sediment loads and cohesive bank materials, as opposed to unstable braided streams characterized by mostly bedload sediment transport and

wide sandy channels with noncohesive bank materials. Meandering mixed-load channels are found at an intermediate condition (FISRWG, 1998).

Montgomery and Buffington (1993) proposed a classification system similar to Schumm for alluvial, colluvial, and bedrock streams in the Pacific Northwest. This system addresses channel response to sediment inputs throughout the drainage network. Six classes of alluvial channels were identified—cascade, step-pool, plane-bed, riffle-pool, regime, and braided. The stream types are differentiated based on channel response to sediment inputs. For example, steeper channels maintain their morphology while transporting sediment. Streams with lower gradients make more morphological adjustments with increased sediment loads (FISRWG, 1998).

A conceptual model of channel evolution in response to channelization (CEM-channel evolution model) was developed by Simon and Hupp (1986, 1987), Hupp and Simon (1986, 1991), and Simon (1989a, 1989b). The model identifies six geomorphic stages of channel response and was developed and extensively applied to predict empirical stream channel changes following large-scale channelization projects in western Tennessee. Data required for model application include bed elevation and gradient, channel top-width, and channel length before, during, and after modification. Gauging station data can be used to evaluate changes through time of the stage-discharge relationship and bed-level trends. Riparian vegetation is dated to provide ages of various geomorphic surfaces and thereby to deduce the temporal stability of a reach.

A component of Simon and Hupp's (1986, 1987) channel response model is the identification of specific groups of woody plants associated with each of the six geomorphic channel response stages. Their findings for western Tennessee streams suggest that the site preference or avoidance patterns of selected tree species allow their use as indicators of specific bank conditions. This method might require calibration for specific regions of the United States to account for differences in riparian zone plant communities, but it would allow simple vegetative reconnaissance of an area to be used for a preliminary estimate of stream recovery stage (Simon and Hupp, 1987).

Restoring or maintaining streams to a stable form through natural channel design requires detailed information about surface water hydrology and the interactions between rainfall and overland flow or runoff. The Rosgen classification system, developed by David L. Rosgen, and presented in *Applied River Morphology*, is currently the most comprehensive and widely used quantitative assessment method for geomorphology. It represents a compilation of much of the early work in applied fluvial geomorphology and relies largely on the identification of bankfull field indicators. The bankfull discharge is the flow event that fills a stable alluvial channel up to the elevation of the active floodplain (Rosgen, 1996). Dunne and Leopold (1978) first developed hydraulic geometry relationships for the bankfull stage, also called regional curves. Most river engineers and hydrologists work under the assumption that the bankfull discharge is equivalent to the channel forming or dominant discharge in geomorphic classification and in analog and empirical design methods. The bankfull discharge is the only discharge that can be easily identified in the field using physical indicators; therefore it is one of the most commonly used in natural channel design. Additional information about Rosgen is available in Chapter 7.

Moment-in-time stream classifications provide insights into the existing form of the stream and can help to define design parameters and understand potential modifications in reference to existing conditions. Stream classification offers a way to categorize streams based on channel morphology. The older classification systems were largely qualitative descriptions of stream features and landforms and were difficult to apply universally. In 1994, Rosgen published *A Classification of Natural Rivers*. Because of its relative simplicity and usefulness in stream restoration, the Rosgen classification system has become popular among hydrologists, engineers, geomorphologists, and biologists working to restore the biological function and stability of degraded streams. The classification consists of 41 major stream types for which stream channel stability and stream bank erosion potential can be assessed. From the assessment, structures for in-stream and stream bank restoration or modification can be selected. When planning stream restoration projects, it is important for the planning team to use a multidisciplinary approach that includes consideration of hydraulics, hydrology, water quality, geomorphological processes, and biological interactions to develop and implement a successful restoration. Chapter 7 provides additional detailed information on stream classification practices.

In site selection, geomorphic assessments can determine if a site is unstable and in need of some form of restoration activity. During design, geomorphic assessments can be used in combination with hydrologic, hydraulic, and/or sediment transport analyses to define design elements such as channel slope and hydraulic geometry.

Sediment transport analysis in rivers and streams is used to approximate the amount of sediment being moved by flow event scenarios and to determine where it will be deposited. Modeling the sediment transport capacity of a channel and its predicted sediment deposition patterns are important for assessing existing and proposed channel design projects to estimate potential project impacts. Sediment transport analysis is also useful for determining restoration opportunities in existing channelization and channel modification projects. Sediment transport analysis is often coupled with stable channel analyses methods to refine channel geometries to estimate optimal scour and deposition characteristics (Schulte et al., 2000). A good source of technical information on sediment transport analysis can be found in *River Engineering for Highway Encroachments* (FHWA, 2001).

Sediment transport analysis has been used in many projects, including:

- Channel design projects (Schulte et al., 2000)
- Stream restoration design (Copeland et al., 2001; Shields et al., 2003)
- Flood control projects (USACE, 1994)
- Highway projects that include stream crossings (FHWA, 2001)

In the design of new channelization projects and analysis of existing projects, channels are typically evaluated using channel stability methods and then the analysis is refined using sediment transport models. Sediment transport analysis is used to refine geometry so that scour and deposition are minimized. It is also used to determine the optimum grade control structure elevation and placement and to find the excavation depths in depositional zones to minimize operational costs for maintaining the channel geometry (Schulte et al., 2000).

The methods and techniques used to accomplish a geomorphic assessment should be project-specific and conducted by personnel trained in applied fluvial geomorphology. Geomorphic assessment of streams has evolved rapidly over the past 10–15 years. Initial methodologies tended to be tailored for localized applications and required extensive data collection and validation. Rosgen's methodology provides a more universal approach to stream classification that represents trade-offs between data collection needs and ease of application for many different stream types. The challenge to this type of modeling and assessment has always been to balance the complexity and need for extensive data collection with ease of use and reliability of the results. The key is that the geomorphic assessment must provide a fundamental understanding of the linkage between river form and process. The assessment should provide insight into where the stream has been, is now, and in what direction it is moving. It should also place the project reach in the context of broader system wide adjustment processes. Geomorphic assessment can be used to select sites for restoration and develop designs.

Expert Judgment and Checklists

Approaches using expert judgment and checklists developed based on experience acquired in previous projects and case studies may be very helpful in integrating environmental goals into project development. The USACE used this concept of incorporating environmental goals into project design (Shields and Schaefer, 1990) in the development of a computer-based system for the environmental design of waterways (ENDOW). The ENDOW system is composed of three modules: a streambank protection module, a flood control channel module, and a streamside levee module. The three modules require the definition of the pertinent environmental goals to be considered in the identification of design features. Depending on the environmental goals selected for each module, ENDOW will display a list of comments or cautions about anticipated impacts and other precautions to be taken into account in the design.

Another example of using expert judgment is the Proper Functioning Condition (PFC) technique. PFC was developed by the Bureau of Land Management (BLM) to rapidly assess whether a stream riparian area is functioning properly in terms of hydrology, landform/soils, channel characteristics, and vegetation. The assessment is performed by an interdisciplinary team and involves completing a checklist evaluating 17 factors concerning hydrology, vegetation, and erosional/depositional characteristics. The PFC field technique is not quantitative, but with adequate training, results are reproducible to a high degree (FISRWG, 1998).

Operation and Maintenance Activities

Implementation practices for instream and riparian habitat restoration in planned or existing modified channels are consistent with those management practices for physical and chemical characteristics of channelized or modified surface waters. To prevent future impacts to instream or riparian habitat or to solve current problems caused by channelization or channel modification projects, include one or more of the following practices to mitigate the undesirable changes:

- Bank shaping and planting
- Branch packing
- Brush layering
- Brush mattressing
- Bulkheads and seawalls

- Check dams
- Coconut fiber roll
- Dormant post plantings
- Erosion and Sediment Control (ESC) Plans
- Establish and protect stream buffers
- Joint plantings
- Levees, setback levees, and floodwalls
- Live cribwalls
- Live fascines
- Live staking
- Marsh creation and restoration
- Noneroding roadways
- Return walls
- Revetments
- Riparian improvements
- Riprap
- Root wad revetments
- Rosgen's Stream Classification Method
- Setbacks
- Toe protection
- Tree revetments
- Vegetated buffers
- Vegetated gabions
- Vegetated geogrids
- Vegetated reinforced soil slope (VRSS)
- Wing deflectors

Additional information about each of the above practices is available in Chapter 7. The Additional Resources section provides a number of sources for obtaining information about the effectiveness, limitations, and cost estimates for these practices.

Operation and maintenance programs should weigh the benefits of including practices such as those for mitigating any current or future impairments to instream or riparian habitat. Additional information about these practices can be found in Chapter 7. Also, Fischenich and Allen (2000) provide a comprehensive summary of practices that can be evaluated for use in operation and maintenance programs.

Chapter 4: Dams

Dams are a common form of hydromodification. The National Research Council estimated that there were more than 2.5 million dams in the United States in 1992 (NRC, 1992). These dams range in size from berms across small streams that create farm ponds to large concrete structures across major rivers for hydropower and flood control. The USACE estimates (of these 2.5 million dams in the United States) about 79,000 are large enough to be included in the National Inventory of Dams (USACE, n.d.b.).[1]

Dams generally were built to store and provide water for mechanical power generation (e.g., waterwheels to mill grain), industrial cooling, hydroelectric power generation, agricultural irrigation, municipal water supplies for human consumption, and impoundment-based recreation (e.g., boating and sport fishing). Dams are also used for flood control and to maintain channel depths for barge transportation.

Dams can be associated with a number of effects, including changes to hydrology, water quality, habitat, and river morphology. Lakes and reservoirs integrate many processes that take place in their contributing watersheds, including processes that contribute energy (heat), sediment, nutrients, and toxic substances. Human activities, such as agricultural and urban land use, contribute to contaminant and sediment loads to reservoirs. The presence and operation of dams can determine the fate of these pollutants in a reservoir or impoundment and potentially downstream as water is released from the dam. For example, the presence of a dam may lead to sediment accumulation in a reservoir. However, there are management practices that can mitigate this integrative effect of a reservoir. One example is selective withdrawals, which are an operational technique that can be used by some dam operators to provide water quality and temperatures necessary to sustain downstream fish populations.

When dams are built, depending on size and design, they may alter the river system structure, causing it to change from a river (flowing) to lake (static) and back to a river (flowing) system.

[1] With the National Dam Inspection Act (P.L. 92-367) of 1972, Congress authorized the U.S. Army Corps of Engineers (USACE) to inventory U.S. dams. The Water Resources Development Act of 1986 (P.L 99-662) authorized USACE to maintain and periodically publish an updated National Inventory of Dams (NID).

Dams with large storage capacities will, by design, retain water longer than those with little storage. This can change system flow patterns, which can affect water quality and habitat upstream and downstream of the dam. Most effects from dams are observed downstream. Table 4.1 provides a description of several common types of dams.

Table 4.1 Types of Dams (FEMA, 2003)

Type of Dam	Description
Ambursen dam	A buttress dam in which the upstream part is a relatively thin, flat slab usually made of reinforced concrete
Arch dam	A concrete, masonry, or timber dam with the alignment curved upstream so as to transmit the major part of the water load to the abutments
Buttress dam	A dam consisting of a watertight part supported at intervals on the downstream side by a series of buttresses
Crib dam	A gravity dam built up of boxes, crossed timbers, or gabions, filled with earth or rock
Diversion dam	A dam built to divert water from a waterway or stream into a different watercourse
Double curvature arch dam	An arch dam that is curved both vertically and horizontally
Earth dam	An embankment dam in which more than 50% of the total volume is formed of compacted earth layers that are generally smaller than 3-inch size
Embankment dam	Any dam constructed of excavated natural materials, such as both earthfill and rockfill dams, or of industrial waste materials, such as a tailings dam
Gravity dam	A dam constructed of concrete and/or masonry, which relies on its weight and internal strength for stability
Hollow gravity dam	A dam constructed of concrete and/or masonry on the outside but having a hollow interior and relying on its weight for stability
Hydraulic fill dam	An earth dam constructed of materials, often dredged, which are conveyed and placed by suspension in flowing water
Industrial waste dam	An embankment dam, usually built in stages, to create storage for the disposal of waste products from an industrial process
Masonry dam	Any dam constructed mainly of stone, brick, or concrete blocks pointed with mortar
Mine tailings dam (or tailings dam)	An industrial waste dam in which the waste materials come from mining operations or mineral processing
Multiple arch dam	A buttress dam comprised of a series of arches for the upstream face
Overflow dam	A dam designed to be overtopped
Regulating dam (or afterbay dam)	A dam impounding a reservoir from which water is released to regulate the flow downstream
Rock-fill dam	An embankment dam in which more than 50% of the total volume is comprised of compacted or dumped cobbles, boulders, rock fragments, or quarried rock generally larger than 3-inch size
Roller compacted concrete dam	A concrete gravity dam constructed by the use of a dry mix concrete transported by conventional construction equipment and compacted by rolling, usually with vibratory rollers
Rubble dam	A stone masonry dam in which the stones are unshaped or uncoursed
Saddle dam (or dike)	A subsidiary dam of any type constructed across a saddle or low point on the perimeter of a reservoir

Siting, construction, operation, maintenance, and removal of dams can lead to nonpoint source (NPS) effects. For example, siting of dams can result in inundation of wetlands, riparian areas, and fastland in areas upstream of the dam. During construction or maintenance, erosion and soil loss occurs. Proper siting and design help prevent erosion prone areas from being developed. For dams actively controlled by human operators, dam operation and the amount of water released can affect downstream areas when flood waters necessary to deliver sediment are restricted, or when controlled releases from dams change the timing, quantity, or quality of downstream flow. While removal of dams can lead to physical and biological impacts, such as temporary increased turbidity from redistribution of sediment previously stored behind the dam or displacement of warm-water species that prefer lake-like conditions, dam removal has many biological and habitat benefits, such as allowing for easier fish movement and a return of natural stream temperatures and dissolved oxygen. Sometimes, however, dams limit passage of undesirable invasive species. Therefore, a comprehensive evaluation of the benefits and limitations resulting from the presence of a dam should be completed when evaluating operation and maintenance procedures, as well as options for removal. A more detailed discussion of water quality, biological, habitat, physical, and chemical changes from dam removal is provided in Chapter 2.

One opportunity to evaluate and address the NPS impacts of some larger dams that are used for hydropower occurs during the licensing/relicensing process. The Federal Power Act (FPA) requires all nonfederal hydropower projects located on navigable waters to be licensed. The FPA (16 U.S.C. 791-828c) was originally enacted as the Federal Water Power Act in 1920 and was made part of the FPA in 1935. The Federal Energy Regulatory Commission (FERC) is the independent regulatory agency within the Department of Energy that has exclusive authority, under the FPA, to license such projects. The hydropower dam relicensing process offers an opportunity to assess the balance between natural resources and the generation of electricity and to address some areas that are determined to be problematic. Stakeholders, including dam owners and operators, local governments, environmental groups, and the public, often have different interests to be balanced. Through the FPA and the relicensing process, these varied interests can be evaluated and a balanced outcome can be derived. In conjunction with FPA licensing requirements, states and authorized tribes certify that discharges (including those that originate from dams) meet water quality standards under section 401 of the Clean Water Act (CWA).

The FPA also requires relicensing to be conducted in light of recent laws and regulations that are in effect at the time of renewal. As regulations related to hydropower dams change, it is possible that many dams that were previously licensed and are up for relicensing may no longer be in compliance with current regulatory standards. For example, many dams were built prior to the CWA, which includes regulatory requirements for protecting and maintaining designated uses (such as protecting desired aquatic life or maintaining bacterial water quality that is protective of human health for all recreational activities). Other regulatory requirements that may be evaluated during relicensing include protections for wetlands, aquatic habitat, and endangered species.[2]

[2] Additional information about FERC and hydropower licensing/relicensing is available at http://www.ferc.gov.

Management Measure 3: Erosion and Sediment Control for the Construction of New Dams and Maintenance of Existing Dams

Management Measure 3
1) Reduce erosion and, to the extent practicable, retain sediment onsite during and after construction. 2) Prior to land disturbance, prepare and implement an approved erosion and sediment control plan or similar administrative document that contains erosion and sediment control provisions.

The purpose of this management measure is to prevent sediment from entering surface waters during the construction or maintenance of dams. This management measure emphasizes the importance of minimizing sediment loss to surface waters during both dam construction and maintenance. It is essential that proper erosion and sediment control practices be used to protect surface water quality because of the high potential for sediment loss directly to surface waters. Sediment and erosion control practices can be borrowed from other applications, such as urban development and construction activities.

Two broad performance goals constitute this management measure: minimizing erosion and maximizing the retention of sediment onsite. These performance goals allow for site-specific flexibility in specifying practices appropriate for local conditions. Regular inspections of a dam are valuable opportunities for dam owners to identify erosion problems and implement sediment controls to protect the integrity of the dam. Since the number of new dam construction projects is relatively small compared to the number of existing dams, operation and maintenance activities offer significantly more opportunities to prevent NPS problems associated with erosion and sediment control.

Dam owners are encouraged to establish a program of regular safety inspection of the dam's infrastructure and dam maintenance. Safety inspection of a dam is a program of regular visual inspection using simple equipment and techniques. These inspections are often an economical means of ensuring the long-term safety and survival of a dam structure. By regularly monitoring the condition and performance of the dam and its surroundings, adequate warning of potentially unsafe conditions will enable timely maintenance. Being able to recognize the signs of potential problems and failure, as well as what to do and whom to contact, is vital. Partial or total failure of a dam may cause extensive damage to downstream areas, including loss of life, property damage, and impacts to wetlands, riparian areas, stream channels, and other ecologically important lands, for which the owner may be held liable. There are also potentially expensive repair costs and lost income that may result from failures or poorly maintained dam structures.

The primary areas of dam structural failure are:

- Loss of clay soils used in berms and other earthen structures
- Seepage and leakage at the base or along pipes
- Erosion, including wave action, stock damage and spillways
- Cracking and movement of structural components
- Defects in associated structures
- Vegetation, including catchment protection and weed control

Operation and maintenance should be applied to small, as well as large dams. Many owners of small dams, like those on farm ponds, should regularly inspect their dams for maintenance needs. Local NRCS staff can provide technical assistance to small dam owners for operation and maintenance activities.[3]

Regular operation and maintenance efforts can lead to some dams being in need of repairs and/or upgrades. Designs for repairs and upgrades can involve replacing reinforced concrete risers and impact basins, replacing rusted out corrugated metal pipe principal spillways, raising the top of the dams, widening the auxiliary spillways, and removing sediment from the flood pools. Examples of project costs for these types of maintenance activities reported in Ohio have ranged from $175,000 on a small dam to $775,000 on the largest dam (Brate, 2004).

At the state and local levels, this measure can be incorporated into existing erosion and sediment control (ESC) programs. This measure can also be effectively implemented as part of safety inspection requirements. Erosion and sediment control is also intended to be part of a comprehensive land use or watershed management program.

Management Practices for Management Measure 3

The management measure can be implemented by applying one or more management practices appropriate to the source, location, and climate. The practices described below can be applied successfully to implement the management measure for erosion and sediment control for construction of new dams and maintenance of existing dams.

Erosion Control Practices

Successful control of erosion and sedimentation from construction and maintenance activities can involve a system of management practices that targets each stage of the erosion process. The most efficient approach involves minimizing the potential sources of sediment from the onset. This means limiting the extent and duration of land disturbance to the minimum needed, and protecting surfaces once they are exposed. The second stage of the management practice system involves controlling the amount of runoff and its ability to carry sediment by diverting incoming flows and impeding internally generated flows. The third stage involves retaining sediment that is picked up on the project site through the use of sediment-capturing devices. On most sites

[3] Contact your local USDA Service Center (http://offices.sc.egov.usda.gov/locator/app) to access NRCS in your community.

successful erosion and sedimentation control requires a combination of structural and vegetative practices. All of these stages are better performed using advanced planning and good scheduling.

The timing of land disturbing activities and installation of erosion control measures must be coordinated to minimize water quality impacts. For large scale activities, the management practice system is typically installed in reverse order, starting with sediment capturing devices, followed by key runoff control measures and runoff conveyances, and then land clearing activities. Often, construction or maintenance activities that generate significant off-site sediment have failed to sequence activities in the proper order.

Erosion controls reduce the amount of sediment lost during dam construction and prevent sediment from entering surface waters. Erosion control is based on (1) minimizing the area and time of land disturbance and (2) quickly stabilizing disturbed soils to prevent erosion.

The effectiveness of erosion control practices can vary based on land slope, the size of the disturbed area, rainfall frequency and intensity, wind conditions, soil type, use of heavy machinery, length of time soils are exposed and unprotected, and other factors. In general, a system of erosion and sediment control practices can more effectively reduce offsite sediment transport than a single practice. Numerous nonstructural measures such as protecting natural or newly planted vegetation, minimizing the disturbance of vegetation on steep slopes and other highly erodible areas, maximizing the distance eroded material must travel before reaching the drainage system, and locating roads away from sensitive areas may be used to reduce erosion.

The following practices have proven to be useful in controlling erosion and can be incorporated into ESC plans and used during dam construction as appropriate. These practices can be used during and after construction and throughout ongoing maintenance activities.

- Bank shaping and planting
- Branch packing
- Brush layering
- Brush mattressing
- Bulkheads and seawalls
- Check dams
- Coconut fiber roll
- Construct runoff intercepts
- Construction management
- Dormant post plantings
- Erosion and sediment control (ESC) plans
- Erosion control blankets
- Joint planting
- Live cribwalls
- Live fascines
- Live staking
- Locate potential land disturbing activities away from critical areas
- Mulching

- Noneroding roadways
- Phase construction
- Preserve onsite vegetation
- Retaining walls
- Revegetate
- Revetment
- Riparian improvements
- Riprap
- Rootwad revetments
- Scheduling projects
- Sediment fences
- Seeding
- Site fingerprinting
- Sodding
- Soil protection
- Surface roughening
- Training—erosion and sediment control
- Tree armoring, fencing, and retaining walls or tree walls
- Tree revetments
- Vegetated buffers
- Vegetated filter strips
- Vegetated gabions
- Vegetated geogrids
- Vegetated reinforced soil slope (VRSS)
- Wildflower cover
- Wind erosions controls

A more detailed discussion of each of the above practices is provided in Chapter 7.

Runoff Control

To prevent the entry of sediment used during construction into surface waters, these precautionary steps should be followed:

- Identify areas with steep slopes, unstable soils, inadequate vegetation density, insufficient drainage, or other conditions that give rise to a high erosion potential.
- Identify measures to reduce runoff from such areas if disturbance of these areas cannot be avoided (Hynson et al., 1985).

Runoff diversions are structures that channel upslope runoff away from erosion source areas, divert sediment-laden runoff to appropriate traps or stable outlets, or capture runoff before it leaves the site, diverting it to locations where it can be used or released without erosion or flood damage. Diversions can be either temporary or permanent in nature.

Runoff control measures, mechanical sediment control measures, grassed filter strips, mulching, and/or sediment basins could be used to control runoff from the construction site. Scheduling

construction during drier seasons, exposing areas for only the time needed for completion of specific activities, and avoiding stream fording also help to reduce the amount of runoff created during construction.

The largest surface water pollution problem during construction is suspended sediment resulting from aggregate processing, excavation, and concrete work. Preventing the entry of these materials above and/or below a dam is always the preferable alternative because runoff due to these types of construction activities can add more sediment to a reservoir, harm aquatic life above and below the dam, or affect habitat in streams below a dam. Filtration and gravitational settling during detention are the main processes used to remove sediment from construction site runoff. Methods used to control runoff and associated sedimentation from construction sites include:

- Check dams
- Constructing runoff intercepts
- Locate potential land disturbing activities away from critical areas
- Preserve onsite vegetation
- Retaining walls
- Sediment basins/rock dams
- Sediment fences
- Sediment traps
- Vegetated buffers
- Vegetated filter strips

A more detailed discussion of each of the above practices is provided in Chapter 7.

Erosion and Sediment Control (ESC) Plans

ESC plans can be used to control erosion and sediment and incorporate such control in planning. Some states call for specific requirements to be included in state ESC plans. Table 4.2 provides examples of several state ESC plan requirements. Additional detail about ESC plans, including general objectives, and management techniques for ensure proper administration of plans, is available in Chapter 7.

Table 4.2 Examples of Erosion and Sediment Control Plan Requirements for Select States

Location	General Requirements for ESC Plan
Delaware	ESC plans required for sites over 5,000 ft^2. Temporary or permanent stabilization must occur within 14 days of disturbance.
Florida	ESC plans required on all sites that need a runoff management permit.
Georgia	ESC plan required for all land-disturbing activities.
Indiana	ESC plan required for sites over 5 acres.
Maine	ESC plans required for sites adjacent to a wetland or waterbody. Stabilization must occur at completion or if no construction activity is to occur for 7 days. If temporary stabilization is used, permanent stabilization must be implemented within 30 days.
Maryland	ESC plans required for sites over 5,000 ft^2 or 100 yd^3.
Michigan	ESC plans required for sites over 1 acre or within 500 ft of a waterbody. Permanent stabilization must occur within 15 days of final grading. Temporary stabilization is required within 30 days if construction ceases.

Location	General Requirements for ESC Plan
Minnesota	ESC plans required for land development over 1 acre.
New Jersey	ESC plans required for sites over 5,000 ft^2.
North Carolina	ESC plans required for sites over 1 acre. Controls must retain sediment on-site. Stabilization must occur within 30 days of completion of any phase of development.
Ohio	ESC plans required for sites over 5 acres. Permanent stabilization must occur within 7 days of final grading or when there is no construction activity for 45 days.
Oklahoma	ESC plans required for sites over 5 acres.
Pennsylvania	ESC plans required for all sites, but the state reviews only plans for sites over 25 acres. Permanent stabilization must occur as soon as possible after final grading. Temporary stabilization is required within 70 days if construction ceases for more than 30 days. Permanent stabilization is required if the site will be inactive for more than 1 year.
South Carolina	ESC plans required for all sites unless specifically exempted. Perimeter controls must be installed. Temporary or permanent stabilization is required for topsoil stockpiles and all other areas within 7 days of disturbance.
Virginia	For areas within the jurisdiction of the Chesapeake Bay Preservation Act, no more land is to be disturbed than necessary for the project. Indigenous vegetation must be preserved to the greatest extent possible.
Washington	ESC provisions are incorporated into the state runoff management plan.
Wisconsin	ESC plans required for all sites over 4,000 ft^3. Temporary or permanent stabilization is required within 7 days.

(Adapted from Environmental Law Institute, 1998; USEPA, 1993)

Management Measure 4: Chemical and Pollutant Control at Dams

Management Measure 4
1) Limit application, generation, and migration of toxic substances. 2) Ensure the proper storage and disposal of toxic materials. 3) Apply nutrients at rates necessary to establish and maintain vegetation without causing significant nutrient runoff to surface waters.

This management measure is intended to be applied to the construction of new dams, as well as to construction activities associated with the maintenance of dams. This management measure addresses fuel and chemical spills associated with dam construction and operation and maintenance activities, as well as concrete washout and related construction activities. The purpose of this management measure is to prevent downstream contamination from pollutants associated with dam construction and maintenance activities.

Although suspended sediment is the major pollutant generated at a construction site, other pollutants that may be present around dams (especially during construction and operation and maintenance activities) include:

- Petroleum products—fuels and lubricants, specifically gasoline, diesel oil, kerosene, lubricating oils, grease, and asphalt
- Pesticides—insecticides, herbicides, fungicides, and rodenticides
- Fertilizers
- Construction chemicals—acids, soil additives, and concrete-curing compounds
- Wastewater—aggregate wash water, herbicide wash water, concrete-curing water, core-drilling wastewater, or clean-up water from concrete mixers
- Solid wastes—paper, wood, metal, rubber, plastic, and roofing materials
- Garbage
- Sanitary wastes
- Cement
- Lime

This management measure is important because most erosion and sediment control practices are ineffective at retaining soluble NPS pollutants on a construction site. Many of the NPS pollutants, other than suspended sediment, generated at a construction site are carried offsite in solution or attached to clay particles in runoff. Some metals (e.g., manganese, iron, and nickel) attach to larger sediment particles and usually can be retained onsite. Other metals (e.g., copper, cobalt, and chromium) attach to fine clay particles and have greater potential to be carried offsite. Insoluble pollutants (e.g., oils, petrochemicals, and asphalt) form a surface film on runoff water and can be easily washed away (USEPA, 1973; USEPA, 2002b; USEPA, 2005d). Factors that influence the pollution potential of construction chemicals include:

- The nature of the construction and maintenance activity
- The physical characteristics of the construction site
- The characteristics of the receiving water

Dam construction sites are particularly sensitive areas and have the potential to severely impact surface waters with runoff containing construction chemical pollutants. Because dams are located on rivers or streams, pollutants generated at these construction sites have a much shorter distance to travel before entering surface waters. Therefore, chemicals and other NPS pollutants generated at a dam construction site should be controlled.

Management Practices for Management Measure 4

The management measure generally will be implemented by applying one or more management practices appropriate to the source, location, and climate. The practices described below can be applied successfully to implement the control of chemicals and pollutants at dams. This includes dam construction as well as routine maintenance. Practices for controlling chemicals and pollutants include the following:

- Equipment runoff control
- Fuel and maintenance staging areas
- Locate potential land disturbing activities away from critical areas
- Pesticide and fertilizer management
- Pollutant runoff control
- Spill prevention and control program

A more detailed discussion of each of the above practices is provided in Chapter 7.

Management Measure 5: Protection of Surface Water Quality and Instream and Riparian Habitat

Management Measure 5
Develop and implement a program to manage the operation of dams that includes an assessment of: 1) Surface water quality and instream and riparian habitat and potential for improvement. 2) Significant nonpoint source pollution problems that result from excessive surface water withdrawals.

This management measure is intended to be applied to dam operation, maintenance, and removal activities that result in the loss of desirable surface water quality, and of desirable instream and riparian habitat.

The purpose of the management measure is to protect the quality of surface waters and aquatic habitat (including riparian habitat) in the portion of rivers and streams that are impacted by dams. Operation, maintenance, and dam removal activities can be assessed to determine opportunities for potential improvements in water quality and aquatic habitat. These activities, as well as actions within the watershed, that contribute NPS pollutants to an impoundment should be collectively and periodically evaluated to help identify opportunities for cost-effective change.

The recommended overall programmatic approach is to evaluate a set of practices that can be applied individually or in combination to protect and improve surface water quality and aquatic habitat in reservoirs, as well as in areas downstream of dams. Then, a program can be implemented using the most cost-effective operation, maintenance, and removal activities to protect and improve surface water quality and aquatic and riparian habitat.

The individual application of any particular technique, such as aeration, change in operational procedure, restoration of an aquatic or riparian habitat, or implementation of a watershed protection best management practice (BMP), will, by itself, probably not improve water quality to an acceptable level within the reservoir impoundment or in tailwaters flowing through downstream areas. The individual practices discussed in this portion of the guidance may have to be implemented in some combination in order to improve water quality in the impoundment or in tailwaters to acceptable levels.

Selection of the management measure for the protection of surface water and instream and riparian habitat was based on:

- The availability and demonstrated effectiveness of practices to improve water quality in impoundments and in tailwaters of dams.

- The level of improvement in water quality of impoundments and tailwaters that can be measured from implementation of engineering practices, operational procedures, watershed protection approaches, or aquatic or riparian habitat improvements.

Successful implementation of the management measure should generally involve the following categories of practices undertaken individually or in combination to improve water quality and aquatic and riparian habitat in reservoir impoundments and in tailwaters:

- Artificial destratification and hypolimnetic aeration of reservoirs with deep withdrawal points that do not have multilevel outlets to improve dissolved oxygen (DO) levels in the impoundment and to decrease levels of other types of NPS pollutants, such as manganese, iron, hydrogen sulfide, methane, ammonia, and phosphorus in reservoir releases.

- Aeration of reservoir releases, through turbine venting, injection of air into turbine releases, installation of reregulation weirs, use of selective withdrawal structures, or modification of other turbine start-up or pulsing procedures.

- Providing both minimum flows to enhance the establishment of desirable instream habitat and scouring flows as necessary to maintain instream habitat.

- Establishing adequate fish passage or alternative spawning ground and instream habitat for fish species.

- Improving watershed protection by installing and maintaining BMPs in the drainage area above the dam to remove phosphorus, suspended sediment, and organic matter and otherwise improve the quality of surface waters flowing into the impoundment.

- Removing dams, which are unsafe, unwanted, or obsolete, after careful consideration of alternatives.

Since the presence and operation of a dam have the potential to cause impacts, periodic assessments of reservoir water quality, watershed activities, and operational practices may provide valuable information for evaluating management strategies. The types and severity of the impacts can serve as an indicator of the frequency and magnitude of the assessments. There are a variety of assessment tools that are available to assist decision-makers in the evaluation of impacts associated with dams. Watershed-related impacts and management activities can be evaluated with a variety of models. EPA supports several models that may be useful for watershed assessments, such as BASINS.[4]

[4] More information about EPA-supported watershed assessment tools can be found at http://www.epa.gov/waterscience/wqm.

Reservoir water quality can also be assessed with various models. Table 8-1 in this document provides a list of models that may be used to assess reservoir water quality. Also presented in Table 8-1 are models that could be used to evaluate downstream impacts of dams.[5]

Management Practices for Management Measure 5

The management measure generally can be implemented by applying one or more management practices appropriate to the source, location, and climate. Management practices that can be used to achieve the management measure include practices to improve water quality, restore or maintain aquatic and riparian habitat, and maintain fish passage, as well as possible removal of dams. The subsection on dam removal includes planning and evaluation considerations, descriptions of the removal process, permitting requests, sediment removal techniques, descriptions of changes associated with dam removal, and a discussion of potential biological impacts.

Practices for Improving Water Quality

Management practices for improving water quality associated with the operation and maintenance of dams can be categorized as:

- Watershed Protection Practices—activities to reduce NPS pollution that take place within the watershed surrounding a dam. Reduced NPS pollutant inputs, such as sediment or nutrients, can have a significant, positive effect on water quality within a reservoir and often in reservoir releases, as well.

- Practices for Aeration of Reservoir Water—aeration activities within the reservoir. The primary goal for aerating a large portion of reservoir water is to increase oxygen levels throughout the reservoir. Other water quality factors may also improve, including levels of dissolved metals and nutrients, destratification of the water column, and improved oxygen levels in releases.

- Practices for Aeration of Reservoir Releases — a variety of aeration techniques for improving water quality, specifically dissolved oxygen levels, are presented.

Management practices to protect surface water quality and instream and riparian habitat are discussed in the following subsections:

- Improving Water Quality
  - Watershed Protection
  - Aeration of Reservoir Water
  - Aeration of Reservoir Releases
- Improving Aquatic Habitat
- Maintaining Fish Passage
- Dam Removal

Improving water quality in impoundments and tailwaters often requires consideration of the interaction of several different factors. For example, achievement of desired DO levels at specific projects may require evaluation of several different technologies and management activities. The U.S. Army Corps of Engineers created a computer-modeling program, AERATE, that performs calculations to

[5] The USACE Environmental Laboratory develops and supports several models, such as QUAL2E, Bathtub, and CE-QUAL-RI that can be found at http://el.erdc.usace.army.mil/products.cfm?Topic=none.

evaluate several direct (e.g., active aeration technologies) and indirect (e.g., activities such as watershed management to reduce nitrogen and phosphorous runoff, which result in improved DO) reservoir aeration techniques. The program considers the following aeration techniques: improving water quality in the reservoir, modifying the withdrawal outlet location (and thereby changing which water is withdrawn and released from the reservoir), treating the release water to eliminate the poor quality as the flow passes through the outlet structure, and treating the release water in the tail water area (Wilhelms and Yates, 1995).

Watershed Protection Practices

Many NPS pollution problems in reservoirs and dam tailwaters frequently result from sources in the contributing watershed (e.g., sediment, nutrients, metals, and toxics). Management of pollution sources from a watershed has been found to be a cost-effective solution for improving reservoir and dam tailwater water quality (TVA, 1988). Watershed protection practices can be effective in producing long-term water quality benefits and lack the high operation and maintenance costs associated with structural controls.

> Additional information about watershed protection, specifically developing and implementing watershed plans, is available from EPA's draft *Handbook for Developing Watershed Plans to Restore and Protect Our Waters*. The handbook is available at http://www.epa.gov/nps.

Watershed protection is a technique that provides long-term water quality benefits, and many states and local communities have adopted this practice. Numerous state and local governments have already legislated and implemented detailed watershed planning programs that are consistent with this management measure. For example, Oregon, New Jersey, Delaware, and Florida have passed legislation that requires county and municipal governments to adopt comprehensive plans, including requirements to direct future development away from sensitive areas. Many municipalities and regions have adopted land use and growth controls, including the towns of Amherst and Norwood and the Cape Cod region of Massachusetts; Narragansett, Rhode Island; King County, Washington; and many others.

Watershed protection management practices fall under the following four categories:

- Encourage drainage protection—includes descriptions and applications of zoning techniques that can be used to limit development density or redirect density to less environmentally sensitive areas.
- Establish and protect stream buffers—describes important steps for protecting or establishing riparian buffer zones to enhance water quality and pollutant removal.
- Identify and address NPS contributions—involves identifying potential upstream sources of nonpoint source pollution, as well as providing solutions to minimize those impacts.
- Identify and preserve critical areas—entails identifying properties that if preserved or enhanced could maintain or improve water quality and reduce the impacts of urban runoff, as well as, preserving environmentally significant areas (includes land acquisition, easements, and development restrictions of various types).

Refer to Chapter 7 for additional information about each of the above practices.

Reservoir Aeration Practices

Systems that have been developed and tested for reservoir aeration rely on atmospheric air, compressed air, or liquid oxygen to increase DO concentrations in reservoir waters. Mixing of reservoir water to destratify warmer, oxygen rich, epilimnion and cooler, oxygen poor, hypolimnion waters can be used. However, this practice has not been used at large hydropower reservoirs because of the associated cost in deep, large volume reservoirs. Refer to Chapter 7 for additional information about reservoir aeration practices.

Practices to Improve Oxygen Levels in Tailwaters

Aeration of water as it passes through the dam or through the portion of the waterway immediately downstream from the dam is another approach to improving DO in water releases from dams. The systems in this category rely on agitation and turbulence to mix the reservoir releases with atmospheric air. One approach involves the increased use of spillways, which release surface water to prevent it from overtopping the dam. An alternative approach is to install barriers called weirs in the downstream areas. Weirs are designed to allow water to overtop them, which can increase DO through surface agitation and increased surface area contact. Some of these downstream systems create supersaturation of dissolved gases and may require additional modifications to prevent supersaturation, which may be harmful to aquatic organisms.

The quality of reservoir releases can be improved through adjustments in the operational procedures at dams. These include scheduling of releases or of the duration of shutoff periods, instituting procedures for the maintenance of minimum flows, making seasonal adjustments in the pool levels or in the timing and variation of the rate of drawdown, selecting the turbine unit that most increases DO (often increasing the DO levels by 1 mg/L), and operating more units simultaneously (often increasing DO levels by about 2 mg/L). The magnitude and duration of reservoir releases also should be evaluated to determine impacts to the salinity regime in coastal waters, which could be substantially altered from historical patterns.

Two factors should be considered when evaluating the suitability of hydraulic structures such as spillways and weirs for their application in raising the DO concentration in waterways:

- Most of the measurements of DO increases associated with hydraulic structures have been collected at low-head facilities. The effectiveness of these devices may be limited as the level of discharge increases (Wilhelms, 1988).

- The hydraulic functioning of these types of structures should be carefully considered since undesirable flow conditions may occur in some instances (Wilhelms, 1988).

Practices that improve oxygen levels in tailwaters include:

- Gated conduits
- Labyrinth weirs
- Modifying operational procedures
- Reregulation weirs
- Selective withdrawal

- Spillway modifications
- Turbine operation
- Turbine venting
- Water conveyances

Additional information about each of these practices is available in Chapter 7.

Practices to Restore or Maintain Aquatic and Riparian Habitat

Several options are available for the restoration or maintenance of aquatic and riparian habitat in the area of a reservoir impoundment or in portions of the waterway downstream from a dam. One set of practices is designed to augment existing flows that result from normal operation of the dam. These include operation of the facility to produce flushing flows, minimum flows, or turbine pulsing. Another approach to producing minimum flows is to install small turbines that operate continuously. Installation of reregulation weirs in the waterway downstream from the dam can also achieve minimum flows. Finally, riparian improvements are discussed for their importance and effectiveness in restoring or maintaining aquatic and riparian habitat in portions of the waterway affected by the location and operation of a dam.

A 2004 report from the National Academies' National Research Council (NRC, 2004) illustrates the importance of maintaining instream flows and critical wildlife habitat in streams where dams are present and notes that areas along Nebraska's Platte River are properly designated as "critical habitats" for the river's endangered whooping crane and threatened piping plover. A series of dams and reservoirs have been constructed in the river basin for flood control and to provide water for farm irrigation, power generation, recreation, and municipal use. The alterations to the river and surrounding land caused by this extensive water-control system, however, resulted in habitat changes that were at odds with the protection of the listed species.

Conflicts over the protection of federally listed species and water management in the Platte River Basin have existed for more than 25 years. In recent years, the Fish and Wildlife Service of the U.S. Department of the Interior issued a series of biological opinions indicating that new water depletions would have to be balanced by mitigation measures, and a lawsuit forced the designation of "critical habitat" for the piping plover. These and other controversies prompted the Department of the Interior and the Governance Committee of the Platte River Endangered Species Partnership to request that the National Research Council examine whether the current designations of "critical habitat" for the whooping crane and piping plover are supported by existing science. The National Research Council was also asked to assess whether current habitat conditions are affecting the survival of listed species or limiting their chances of recovery, and to examine the scientific basis for the department's instream-flow recommendations, habitat-suitability guidelines, and other decisions. The report concludes that in most instances habitat conditions are indeed affecting the likelihood of species survival and recovery.

Additional information about the following practices to restore or maintain aquatic and riparian habitat are available in Chapter 7:

- Constructed spawning beds
- Flow augmentation

- Riparian improvements
- Spillway modifications

Practices to Maintain Fish Passage

Migrating fish populations may be unable to travel up or downstream because of the presence of a dam or suffer losses when passing through the turbines of hydroelectric dams at facilities that have not been equipped with special design features to accommodate fish passage. The effect of dams and hydraulic structures on migrating fish has been studied since the early 1950s in an effort to develop systems or identify operating conditions that would minimize mortality rates. Selecting a device or management strategy for optimal fish passage in a stream or river with a dam requires careful analysis of a variety of factors, such as species, type and operational strategy of the dam, and the physical characteristics of the river system.

Larinier (2000) reports that devices such as fish ladders and bypass channels can help fish travel past dams, but may result in increased mortality due to the hardship and stress involved with passing through these structures. In addition, the fish passage structures have to be placed in a suitable entrance location, have a flow that is attractive to the species of concern, be continually maintained, and possess the hydraulic conditions necessary for the target species (Larinier, 2000). With all of these requirements, the success of a fish ladder or similar device is often uncertain. Passage through the hydraulic turbines of a hydropower dam can cause increased stress as a result of changes in velocity or pressure and the possibility of electric shocks from the turbines and can lead to increased mortality (Larinier, 2000).

The safe passage of fish either upstream or downstream through a dam requires a balance between operation of the facility for its intended uses and implementation of practices that will ensure safe passage of fish. The United States Congress' Office of Technology Assessment (OTA) report on fish passage technologies at hydropower facilities provides an excellent overview of fish passage technologies and discusses some of the economic considerations associated with the safe passage of fish (OTA, 1995).

The U.S. Fish and Wildlife Service and its partners have created a database that makes information about barriers to fish passage in the United States available to policy makers and the public. The database, known as the Fish Passage Decision Support System (FPDSS),[6] is part of the U.S. Fish and Wildlife Service's National Fish Passage Program.[7]

Available fish-protection systems for hydropower facilities fall into one of four categories based on their mode of action (Stone and Webster, 1986): behavioral barriers, physical barriers, collection systems, and diversion systems. These are discussed in separate sections below, along with additional practices that have been successfully used to maintain fish passage: spill and water budgets, fish ladders, fish lifts, advanced hydroelectric turbines, transference of fish runs, and constructed spawning beds.

[6] https://ecos.fws.gov/fpdss/index.do
[7] http://www.fws.gov/fisheries/fwma/fishpassage

Upstream fish passage systems have been constructed at approximately 10 percent of the FERC licensed hydropower plants. Upstream fish passage systems such as fish ladders and lifts are considered adequately developed for anadromous species such as salmon, American shad (*Alosa sapidissima*), alewives (*Alosa pseudoharengus*), and blueback herring (*Alosa aestivalis*). Fish passage systems for riverine fish have not been specifically designed, although some of these species will use fish passage systems designed for anadromous species (OTA, 1995).

Practices include:

- Advanced hydroelectric turbines
- Behavioral barriers
- Collection systems
- Fish ladders
- Fish lifts
- Physical barriers
- Spill and water budgets
- Transference of fish runs

Additional information about the above practices is available in Chapter 7.

Removal of Dams

The removal of dams has become an accepted practice for dam owners to deal with unsafe, unwanted, or obsolete dams. Dam removal may be necessary as dams deteriorate, sediments accumulate behind dams in reservoirs, human needs shift, and economics dictate (NRC, 1992). Dams serve a variety of important social and environmental purposes (e.g., water supply, flood control, power generation, wildlife habitat, and recreation). As a result, dam removal is often infrequent.

Dam Removal Resource

American Rivers is a nonprofit organization focusing on the health of U.S. river systems, fish, and wildlife. American Rivers' website hosts a variety of information related to hydromodification, including past and recent estimates of dam removals in the United States. http://www.americanrivers.org

Migratory fish passage throughout United States rivers and streams is obstructed by over 2 million dams and many other barriers such as blocked, collapsed, and perched culverts. The National Oceanic and Atmospheric Administration (NOAA) is expanding its community-based approach to restoring fish habitat through the recently developed Open Rivers Initiative (ORI).[8] Administered by NOAA Fisheries Service Office of Habitat Conservation, ORI is designed to help communities correct fish passage problems by focusing financial and technical resources on the removal of obsolete dams and other blockages. ORI strives to restore vital habitat for migrating fish like salmon, striped bass, sturgeon, and shad, as well as improve community safety and stimulate economic revitalization of riverfront communities. Through its more broadly focused Community-based Restoration Program (CRP), NOAA Fisheries Service has opened over 700 miles of stream habitat with financial and technical assistance provided to fish passage

[8] http://www.nmfs.noaa.gov/habitat/restoration/ORI

projects. Examples of successfully completed CRP projects that fit the Open Rivers Initiative model include:

- Culvert removal in the John Smith Creek (Mendocino County, CA)
- Mt. Scott Creek dam removal (Happy Valley, OR)
- Wyomissing Creek dam removal (Reading, PA)
- Town Brook dam removal and fish ladder (Plymouth, MA)
- Sennebec dam removal (Union, ME)

There are many things to consider when removing a dam, one of which is the function(s) of the dam and the status of that function (active vs. inactive). As discussed above, dams are used for various purposes, including water supply, hydroelectric power, recreation, and flood control benefits. When proposals are made to remove a dam with one or more of these active functions, the way in which these functions and benefits will be replaced or mitigated must be addressed (FOR, 1999). An example of this process can be seen with the Jackson Street Dam, located on Bear Creek in Medford, Oregon. The dam diverted water from the creek into the irrigation canals of Rogue River Valley Irrigation District (RRVID). Since the dam created a partial barrier to migratory fish, a loss of stream habitat, and an algae-filled impoundment near the city park, a consensus was reached that removing the dam was the most cost-efficient means of eliminating the problem. However, since the dam was currently providing irrigation diversion, another cost-efficient diversion had to be devised for RRVID. The decision was made to replace the old dam with a less damaging diversion structure. The new structure is approximately one-fourth the height of the Jackson Street Dam (about 3 feet) and is located 1,200 feet upstream. The new structure is also removed at the end of the irrigation season, which coincides with the time of the year when most upstream migration occurs. When the new structure is in place during the irrigation season, it allows fish to migrate (by well-designed fish ladders and screens), and it was designed so that little water will back up behind it. It is also equipped with fish screens to keep fish out of the irrigation canal (FOE et al., 1999).

It is also important to consider the cost of removing a dam, and who will pay for the removal. Removal costs can vary from tens of thousands of dollars to hundreds of millions of dollars, depending on the size and location of the dam. Who pays for dam removal can be a complex issue. Removal in the past has often been financed by the dam owner; local, state, and federal government; and in some cases agreements where multiple stakeholders cover the costs (American Rivers, n.d.a.). A guide to selected funding sources (*Paying for Dam Removal: A Guide to Selected Funding Sources)*[9] is available from American Rivers.

> Dam owners are responsible to keep the dam safe. When a dam begins to fail or breach, a decision must be made as to whether to keep or repair the structure. When a dam generates no revenue, the long-term costs of liability insurance, dam and impoundment maintenance, and operation weigh heavily on the side of dam removal. On average, dam removal costs 3–5 times less than repair.
>
> Source: Delaware Riverkeeper, n.d.

[9] http://www.americanrivers.org/site/DocServer/pdr-color.pdf?docID=727

In the case of the Jackson Street Dam, the most cost-effective alternative to solving the problems associated with the dam was to remove it. However, since it was currently functioning, an alternative means to provide that function was needed. In some instances, it is not more beneficial to remove the dam if it is functioning. For example, USACE expressed concern over the costs of air pollution created by fuel-burning power plants needed to replace the lost power from dams in the debate over the removal of the Snake River dams (Lee, 1999). There was much controversy over whether it was more cost-efficient to remove the dams, especially due to the functions the dams provided. USACE found that replacing the dams would be costly, both monetarily and ecologically. The estimated costs to replace the lower Snake hydropower were between $180 million to $380 million a year for 100 years (Lee, 1999). In addition, the cost of the resulting increase in pollution due to natural gas or coal replacement plants was very high, yet an actual amount was not determined.

Evaluations made by the USACE found that the costs associated with removing the Snake River dams greatly exceeded the costs of maintaining, improving, and keeping them (Associated Press, 2002). Therefore, the dams along the Snake River remain and have been repaired. USACE plans to pursue technical and operational changes at the Snake River dams to improve fish survival, in addition to barging or trucking juvenile salmon around the dams (Associated Press and the Herald Staff, 2002).

The entire decision-making process is a delicate balance that involves many stakeholders. One important step in this process is to decide if the ecological benefits of removing the dam outweigh the benefits of maintaining the dam.

When deciding whether to remove a dam, interested parties should collect as much information as possible about the potential removal project. American Rivers has published a fact sheet (*Data Collection: Researching Dams and Rivers Prior to Removal*),[10] which contains a variety of sources to help begin researching the particular dam that might be removed and the river on which it is located (American Rivers, n.d.b.).

American Rivers and Trout Unlimited have published a guide to help decide whether to remove a dam or not, *Exploring Dam Removal: A Decision-Making Guide* (American Rivers and Trout Unlimited, 2002).[11]

Repercussions of Unsafe Dams (American Rivers, 1999)

Unsafe dams may result in:

1. Loss of life from surging flows if a dam fails
2. Destruction of property
3. Harm to the downstream river environment (e.g., erosion)
4. Release of toxic sediments (e.g., dioxins, PCBs)
5. Risk to users of the river (i.e., users may not be able to avoid life threatening hazards if in close approximation to a failing dam)
6. Jeopardizing delivery of critical services to communities (e.g., power generation, flood control)

The decision-making process related to dam removal is often complex with inputs from stakeholders with opposing desired outcomes. Additional resources related to dam removal are available in the Resources chapter.

[10] http://www.americanrivers.org/site/DocServer/Reseaching_a_Dam_Data_Collection.pdf?docID=981
[11] http://www.americanrivers.org/site/DocServer/Exploring_Dam_Removal-A_Decision-Making_Guide.pdf?docID=3641

Chapter 5: Streambank and Shoreline Erosion

Figure 5.1 Shoreline Erosion: Before and After Photos (SEAS, 2007)

Streambanks and shorelines naturally erode. Water flowing along (parallel to) streambanks dislodges sediment and other materials that constitute the streambank. Similarly, water flowing perpendicular to shorelines, due to waves or tides, transports sediment and other materials away from the shoreline. Anthropogenic influences change the natural erosion processes, often increasing erosion locally and sedimentation downstream, along adjacent shorelines, or offshore. Many human activities change the hydraulic characteristics of stream flows or transfer energy to adjacent shorelines and contribute to increased streambank and shoreline erosion, for example:

- *Urbanization* that leads to changes in imperviousness creates changes in the hydraulics of water during wet weather events. Increased imperviousness can result in flashier runoff events that are shorter in duration with greater flow rates and more erosive force.
- *Agricultural practices*, such as drainage ditches, can change the characteristics of subsurface water flows into receiving streams. These changes result in less subsurface water storage and often increase stream flows during and after storms.
- *Livestock grazing* may reduce vegetative cover, which can result in more erosion on uplands and increased sediment and other pollutant loads in streams. Livestock that are allowed direct access to streams can significantly increase streambank erosion and destroy important riparian habitat.
- *Roads* built in rural areas, such as forest and recreational roads, alter the natural landscape and can destroy riparian habitat. If not properly installed and maintained, these types of roads erode and supply increased sediment and pollutants to adjacent streams. Additionally, roads may increase imperviousness, which leads to flashier runoff events. Stream crossings associated with rural roads can block fish passage, trap debris during storms, and lead to increased streambank erosion in nearby areas.
- *Marinas* can alter local wave and tidal flow patterns, resulting in transference of wave and tidal energy to adjacent shorelines.
- *Channelization or channel straightening* sometimes results in an increase in the slope of a channel, which causes an increase in stream flow velocities. Channel modifications to reduce flood damage, such as levees and floodwalls, often narrow the stream width, increasing the velocity of the water and thus its erosive potential. In addition, newly

constructed banks are generally more prone to erosion than "seasoned" banks and are more likely to require bank stabilization.

- *Dams* alter the flow of water, sediment, organic matter, and nutrients, resulting in both direct physical and indirect biological effects. The impact of a dam on a stream corridor can vary, depending on the purposes of the dam and its size in relation to stream flow. Varying discharges released from a hydropower dam can be a significant factor increasing streambank erosion. When dams are a barrier to the flow of sediment and organic materials, the decreased suspended sediment load in release waters may lead to scouring of downstream streambeds and streambanks.

In summary, these anthropogenic factors can affect the state of equilibrium in streams or along shorelines. The typical chain of events that follows the disturbance to a stream corridor or shoreline can be described as changes in:

- Hydrology
- Stream hydraulics
- Morphology
- Factors such as sediment transport and storage
- Alterations to the biological community
- Impervious cover

Management Measure 6: Eroding Streambanks and Shorelines

Management Measure 6
1) Where streambank or shoreline erosion is a nonpoint source (NPS) pollution problem, streambanks and shorelines should be stabilized. Vegetative methods are strongly preferred unless structural methods are more effective, considering the severity of stream flow discharge, wave and wind erosion, and offshore bathymetry, and the potential adverse impact on other streambanks, shorelines, and offshore areas. 2) Protect streambank and shoreline features with the potential to reduce NPS pollution. 3) Protect streambanks and shorelines from erosion due to uses of either the shorelands or adjacent surface waters.

Typically, several streambank and shoreline stabilization techniques may be used to effectively control erosion wherever it is a source of nonpoint pollution. Often a combination of techniques may be necessary to effectively control conditions that are causing the increased erosion. Techniques involving marsh creation and vegetative bank stabilization ("soil bioengineering") will usually be effective at sites with limited exposure to strong currents or wind-generated waves. In cases with increased erosional forces, an integrated approach that employs the use of structural systems in combination with soil bioengineering techniques can be utilized. The use of harder, more structural approaches, including beach nourishment and coastal or riparian structures, may need to be considered in areas facing severe water velocities or wave energy. In addition to controlling the sources of sediment contributed to surface waters, which are causing nonpoint source (NPS) pollution, these techniques can halt the destruction of wetlands and riparian areas located along the shoreline. Once affected streambanks and shorelines are protected, they can serve as a filter for surface water runoff from upland areas, or as a temporary sink for nutrients, contaminants, or sediment already present as NPS pollution in surface waters.

Stabilization practices involving vegetation or engineering structures should be properly designed and installed. These techniques should be applied only when there will be no adverse effects to aquatic or riparian habitat, or to the stability of adjacent shorelines. In addition to activities that are applied directly to an eroding streambank or shoreline, there may be opportunities to promote institutional measures that establish minimum setback requirements or a buffer zone to reduce concentrated flows and promote infiltration of surface water runoff in areas adjacent to the shoreline.

Stream-friendly Project Tips

Before Construction
Involve your neighbors to increase project success
Get the necessary permits
Flag and avoid disturbing wetlands
Preserve existing native trees and shrubs
Cut trees and shrubs rather than ripping them out of the ground (many may resprout)
Make a plan to replant disturbed areas and use native plants
Install sediment-control practices (e.g., coffer dams)

During Construction
Stockpile fertile topsoil for later use for plants
Use hand equipment rather than heavy equipment
If using heavy equipment, use wide-tracks or rubberized tires
Work from the streambank, preferably on the higher, non-wetland side
Avoid instream work except as authorized by your local fishery and wildlife authority
Stay 100 feet away from water when refueling or adding oil
Avoid using wood treated with creosote or copper compounds

After Construction
Keep out people and livestock during plant establishment
Check project after high flows
Water plants during *droughts*
Control grass until trees and shrubs overtop grass, usually two to three years

Source: SWCD. No date. *Protecting Streambanks from Erosion: Tips for Small Acreages in Oregon*. Washington County Soil and Water Conservation District and the Small Acreage Steering Committee, Oregon Association of Conservation Districts. http://www.or.nrcs.usda.gov/news/factsheets/fs4.pdf. Accessed June 2003.

Initially project planners can consider whether a complete removal or reversal of the causative effects is possible. For example, when evaluating restoration sites affected by upstream armoring and urbanization, rather than adding armoring to the downstream site that is eroding, the planning team may consider whether changes to operations up stream can be made. Next, activities to improve existing erosion damage may be examined. The alteration of operation approaches in combination with management and restoration efforts can reduce future impacts. Similarly, removal of channelization structures may allow for a greater recovery of the integrity of a stream corridor. If feasible, the objective of a restoration design should be to eliminate or moderate disruptive influences to allow for equilibrium (NRC, 1992). If this is not possible, restoration may have limited effectiveness in the long term or may require a closer look at an entire watershed to determine alternate restoration activities. See Chapter 6 for additional information on watershed planning and restoration information.

A glossary of stream restoration terms is available from U.S. Army Corps of Engineers' Ecosystem Management and Restoration Research Program at http://el.erdc.usace.army.mil/elpubs/pdf/sr01.pdf.

This management measure was selected for the following reasons:

- Many anthropogenic activities can destabilize streambanks and shorelines, resulting in erosion that contributes significant amounts of NPS pollution in surface waters.
- The loss of coastal land and streambanks due to shoreline and streambank erosion results in reduction of riparian areas and wetlands that have NPS pollution abatement potential.
- A variety of activities related to use of shorelands or adjacent surface waters can result in erosion of land along coastal bays or estuaries and loss of land along rivers and streams.

Preservation and protection of shorelines and streambanks can be accomplished through many approaches, but preference in this guidance is for vegetative practices, such as soil bioengineering and marsh creation, where their use is appropriate.

Management Practices for Management Measure 6

The management measure generally will be implemented by applying one or more management practices appropriate to the source, location, and climate. A variety of vegetative and structural practices are presented and are examples of activities that can be used as a single practice or in combination with other practices to achieve the desired project goals. An example of a source of information is the USACE publication *Stream Management* (Fischenich and Allen, 2000), which provides a good summary of vegetative and structural practices as well as a comprehensive review of processes related to stream and streambank erosion. The document also presents a thorough overview of planning activities for approaching streambank erosion issues.

The types of practices that can be used to accomplish the elements of Management Measure 6, including the following groups of practices:

- Vegetative practices
- Structural practices
- Integrated systems
- Planning and regulatory approaches

Vegetative Practices

Vegetative practices have a long history of use in Europe for streambank and shoreline protection and for slope stabilization. Prior to the 1980s, they have been practiced in the United States only to a limited extent, primarily because other engineering options, such as the use of riprap, have been more commonly accepted practices (Allen and Klimas, 1986). The use of vegetative streambank and shoreline stabilization practices have become more common in the United States over the past several decades as their implementation has shown to be physically and ecologically successful. Economically, less costly alternatives of stabilization, such as vegetative practices, are being pursued as alternatives to engineering structures for controlling erosion of streambanks and shorelines.

Vegetative practices, sometimes referred to as soil bioengineering, refer to the installation of plant materials as a main structural component in controlling problems of land instability where

erosion and sedimentation are occurring (USDA-NRCS, 1992). Vegetative practices can be defined as, "the use of live and dead plant materials, in combination with natural and synthetic support materials, for slope stabilization, erosion reduction, and vegetative establishment" (FISRWG, 1998).

Basic principles of soil bioengineering include the following (USDA-NRCS, 1992):

- Fit the soil bioengineering system to the site
  - Topography and exposure (e.g., note the degree of slope, presence of moisture)
  - Geology and soils (e.g., determine soil depth and type)
  - Hydrology (e.g., calculate peak flows in the project area)
- Retain existing vegetation whenever possible
- Limit removal of vegetation
- Stockpile and protect topsoil
- Protect areas exposed during construction
- Divert, drain, or store excess water

Additionally, vegetative approaches have the advantage of providing food, cover, and instream and riparian habitat for fish and wildlife and result in a more aesthetically appealing environment than traditional engineering approaches (Allen and Klimas, 1986). Many planners of vegetative practices try to utilize native plants and materials that can be obtained from local stands of species. These plants are already well adapted to the climate and soil conditions of the area and thus have an increased chance of becoming established and surviving. The use of locally available plants also cuts the costs of a restoration project (Gray and Sotir, 1996). Vegetative systems that use locally available plants have the added advantage of blending in with natural vegetation over time.

Additional benefits of using bioengineering methods include (USEPA, 2003c):

- Designed to be low maintenance or maintenance-free in the long run
- Enhance habitat not only by providing food and cover sources, but by serving as a temperature control for aquatic and terrestrial animals
- If successful, can stabilize slopes effectively in a short period of time (e.g., one growing season)
- Self-repairing after establishment
- Filter overland runoff, increase infiltration, and attenuate flood peaks

The limitations of vegetative practices include the need for skilled laborers and the difficulty of locating plant materials, particularly during the dormant season, which is the optimal time for installation. To properly establish a soil bioengineering planting, orientation, on-site training, and careful supervision of the labor crews are required. Another limitation, which is avoidable, is that projects that promote the growth of thick vegetation may increase roughness values or increase friction and raise floodwater elevations. This should be taken into consideration during the planning stages of a project and prevented.

Additional information about soil bioengineering principles is available from the *Engineering Field Handbook, Chapter 18* (USDA-NRCS, 1992).[1] Local agencies, such as the USDA Natural Resources Conservation Service (NRCS) and the Cooperative Extension Service, can be useful sources of information on appropriate native plant species to consider in bioengineering projects.

The USDA Forest Service has published *A Soil Bioengineering Guide for Streambank and Lakeshore Stabilization*,[2] which provides information on how to successfully plan and implement a soil bioengineering project, including the application of soil bioengineering techniques. The guide also provides specific tips for using soil bioengineering techniques successfully.

Specific vegetative practices include (USDA-NRCS, 1992):

- Branch packing
- Brush layering
- Brush mattressing
- Coconut fiber roll
- Dormant post plantings
- Live fascines
- Live staking
- Marsh creation and restoration
- Tree revetments
- Vegetated buffers

Refer to Chapter 7 for additional information about the above practices. The Additional Resources section provides a number of sources for obtaining information about the effectiveness, limitations, and cost estimates for these practices.

Structural Approaches

Soil bioengineering alone is not suitable in all instances. When considering an approach to streambank or shoreline stabilization, it is important to take several factors into account. For example, it is inappropriate to stabilize slopes with vegetative systems in areas that would not support plant growth, such as those areas with soils that are toxic to plants, areas of high water velocity, or where there is significant wave action (Gray and Sotir, 1996). Shores subject to wave erosion will usually require structures or beach nourishment to dampen wave or stream flow energy.

Properly designed and constructed shoreline and streambank erosion control structures are used in areas where higher water velocity or wave energy make vegetative stabilization and marsh creation ineffective. In addition to careful consideration of the engineering design, the proper planning for a shoreline or streambank protection project will include a thorough evaluation of

[1] The soil bioengineering chapter of the handbook is available at http://www.info.usda.gov/CED/ftp/CED/EFH-Ch18.pdf.
[2] Available at http://www.fs.fed.us/publications/soil-bio-guide.

the physical processes causing the erosion. To complete the analysis of physical factors, the following steps are suggested (Hobbs et al., 1981):

- Determine the limits of the shoreline reach
- Determine the rates and patterns of erosion and accretion and the active processes of erosion within the reach
- Determine, within the reach of the sites of erosion-induced sediment supply, the volumes of that sediment supply available for redistribution within the reach, as well as the volumes of that sediment supply lost from the reach
- Determine the direction of sediment transport and, if possible, estimation of the magnitude of the gross and net sediment transport rates
- Estimate factors such as ground-water seepage or surface water runoff that contribute to erosion

Some of the most widely accepted alternative engineering practices for streambank or shoreline erosion control are described below. These practices will have varying levels of effectiveness depending on the strength of waves, tides, streamflow, or currents at the project site. They will also have varying degrees of suitability at different sites and may have varying types of secondary impacts. One important impact that must always be considered is secondary effects, such as the transfer of wave or streamflow energy, which can cause erosion elsewhere, either offshore or alongshore. Finding a satisfactory balance between these three factors (effectiveness, suitability, and secondary impacts) is often the key to a successful streambank or shoreline erosion control project.

Examples of structural approaches include:

- Beach nourishment
- Breakwaters
- Bulkheads and seawalls
- Check dams
- Groins
- Levees, setback levees, and floodwalls
- Return walls
- Revetment
- Riprap
- Toe protection
- Wing deflectors

Refer to Chapter 7 for additional information about the above practices. The Additional Resources section provides a number of sources for obtaining information about the effectiveness, limitations, and cost estimates for these practices.

Integrated Systems

The use of structural systems alone may raise concern because these systems lack vegetation, which can be effective at stabilizing soils in most conditions. Additionally, vegetated systems

can help to restore damaged habitat along shorelines and streambanks. Integrated systems, which combine structural systems and vegetation, can be very effective in many settings where vegetation adds support and habitat to structural systems. An example of an integrated system is the use of stones for toe protection (structural) and soil bioengineering techniques (vegetative) for the upper banks of a waterway. Integrated slope protection designs that employ the traditional structural methods and the soil bioengineering techniques have proven to be more cost effective than either method independently. Where construction methods are labor-intensive and labor costs are reasonable, the combination of methods may be especially cost effective (Gray and Sotir, 1996).

Integrated systems include:

- Bank shaping and planting
- Joint planting
- Live cribwalls
- Riparian improvements
- Root wad revetments
- Vegetated gabions
- Vegetated geogrids
- Vegetated reinforced soil slope (VRSS)

Refer to Chapter 7 for additional information regarding the above practices. The Additional Resources section provides a number of sources for obtaining information about the effectiveness, limitations, and cost estimates for these practices.

Planning and Regulatory Approaches

In addition to the vegetative, structural, and integrated practices discussed above, another group of practices that can be used to protect streambanks and shorelines includes planning and regulatory approaches. The variety of planning activities include practices in waters adjacent to eroding streambanks and shorelines (e.g., evaluating the erosion potential) and on land areas adjacent to eroding streambanks and shorelines (e.g., watershed planning processes). There are also a variety of local policy and regulatory activities that can be used to protect sensitive or eroding streambanks and shorelines ranging from setback requirements and vegetated buffer minimum widths to requirements for erosion and sediment control plans for various types of construction activities. The following are examples (with complete descriptions located in Chapter 7) of planning and regulatory protection activities that could be used to protect vulnerable streambanks or shorelines:

- Erosion and sediment control plans
- Establishment and protection of stream buffers
- Rosgen's stream classification method
- Setbacks
- Shoreline sensitivity assessment

Chapter 6: Guiding Principles

Many of the management measures and practices recommended by EPA to reduce the nonpoint source (NPS) pollutant impacts associated with hydromodification activities stress the need to incorporate planning as a tool. States, local governments, or community groups should begin the planning process early when trying to determine how to address a particular NPS issue associated with a new or existing hydromodification project. The planning process should bring key stakeholders together so that a variety of options can be explored to adequately define the problem and potential solutions. Once the issues are identified according to the various perspectives, project goals can be established to solve one or more environmental problems.

One important part of the planning process is the identification of the goals of the different stakeholders. Once these goals, which are sometimes different for the different groups of stakeholders, are identified and defined, the planning team can strive to achieve a balance among the needs of the various stakeholders. Often restoration compromises can be made to meet differing goals of the stakeholders to achieve a balance of the needs of the different groups. For example, changes in hydroelectric dam operation may be possible to produce minimum base flows downstream from the dam to support a variety of aquatic habitats, while still providing energy in a profitable manner. In addition, solutions that only allow for complete removal of the dam and restoration to preexisting stream conditions may not be possible because of other changes in the watershed (e.g., urbanization, other hydromodification projects, or the need for affordable and environmentally friendly electricity). A compromise solution that enables the dam to continue to operate while minimizing environmental impacts and to enhance critical downstream habitats that support a desirable fish population may be the best solution.

Part of the planning process and achievement of balance when evaluating techniques for restoring areas impacted by NPS pollution associated with hydromodification activities can be termed “creating opportunities.” For example, an opportunity may be found by working with stakeholders such as local homeowners who are concerned about the unsightly algae present in a community reservoir. Reducing runoff containing an abundant supply of nitrogen and phosphorous pollutants from lawns surrounding the reservoir may lead to reductions in the algal bloom. Changes in land use that result in increasing the permeability of land adjacent to a channelized stream can reduce the overall volume and velocity of water in the stream. As flooding conditions are reduced, “hard” structures like bulkheads can be replaced with softer, vegetative solutions along the stream channel. The combination of reduced scouring flows associated with the greater stream velocities and vegetated channel banks can lead to improved instream ecological conditions. There are many other possible opportunities waiting to be found and implemented when projects are evaluated at the watershed level.

Project planning and analysis are essential parts of success when trying to reduce the impact of NPS pollution from new or existing hydromodification activities. One example of a planning process is explained in the EPA document *Ecological Restoration: A Tool to Manage Stream Quality* (USEPA, 1995a). This document outlines the key steps in the ecological restoration decision framework as:

- Identification of impaired or threatened watersheds

- Inventory of the watershed
- Identification of the restoration goals
- Selection of candidate restoration techniques
- Implementation of selected restoration techniques
- Monitoring

Other EPA guidance documents offer similar approaches to the restoration planning process, including *Community-Based Environmental Protection: A Resource Book for Protecting Ecosystems and Communities* (USEPA, 1997a). Both guidance documents offer a variety of case studies to provide readers with examples of the frameworks as they are applied to real-world situations. EPA's *Draft Handbook for Developing Watershed Plans to Restore and Protect Our Waters* (USEPA, 2005c) also provides useful planning information related to watershed plans.

The Natural Resources Conservation Service (NRCS) is also a source of information for planning. NRCS provides assistance through their Watershed Protection and Flood Prevention Program, whose purpose is to assist federal, state, local agencies, local government sponsors, tribal governments, and program participants to protect and restore watersheds from damage caused by erosion, floodwater, and sediment; to conserve and develop water and land resources; and to solve natural resource and related economic problems on a watershed basis. The program provides technical and financial assistance to local people or project sponsors, builds partnerships, and requires local and state funding contribution.[1]

NRCS uses locally-led conservation programs, which are an extension of the agency's traditional assistance to individual farmers and ranchers, for planning and installing conservation practices for soil erosion control, water management, and other purposes. Through this effort, local people, generally with the leadership of conservation districts along with NRCS technical assistance, will assess their natural resource conditions and needs, set goals, identify ways to solve resource problems, utilize a broad array of programs to implement solutions, and measure their success.

When planning any new development activities or restoration of already developed or impacted activities, it is important to account for the guiding principles:

- Using a watershed approach
- Smart growth principles
- Project design principles
- Monitoring and maintenance of structures

Each of these principles is discussed in more detail below.

[1] Additional information about this program, as well as contact information is available at http://www.nrcs.usda.gov/programs/watershed.

Using a Watershed Approach

EPA recommends the use of a watershed approach as the key framework for dealing with problems caused by runoff and other sources that impair surface waters (USEPA, 1998). The watershed protection approach is a comprehensive planning process that considers all natural resources in the watershed, as well as social, cultural, and economic factors. Using a watershed approach, multiple stakeholders integrate regional and locally-led activities with local, state, tribal, and federal environmental management programs. EPA works with federal agencies, states, tribes, local communities, and non-governmental sectors to make a watershed approach the key coordinating framework of planning, restoration, and protection efforts to achieve "clean and safe" water and healthy aquatic habitat.

The watershed approach framework can be applied to address impacts caused by hydromodification activities throughout a watershed. Additionally, the watershed approach can help to identify and address problems within a watershed that increase NPS pollution associated with hydromodification activities.

Major elements of successful watershed approaches include:

- Focusing on hydrologically-defined areas—watersheds and aquifers have hydrologic features that converge to a common point of flow; watersheds range in size from very large (e.g., the Mississippi River Basin) to a drainage basin for a small creek.

- Using an integrated set of tools and programs (regulatory and voluntary, federal/state/tribal/local and non-governmental sectors) to address the myriad problems facing the Nation's water resources, including NPS and point source pollution, habitat degradation, invasive species, and air deposition of pollutants (e.g., mercury and nutrients).

- Involving all parties that have a stake or interest in developing collaborative solutions to a watershed's water resource problems.

- Using an iterative planning or adaptive management process of assessment and setting environmental, water quality, and habitat goals (e.g., water quality standards).

- Planning, implementation, and monitoring to ensure that plans and implementation actions are revised to reflect new data.

- Breaking down barriers between plan development and implementation to enhance prospects for success.

A key attribute of the watershed approach is that it can be applied with equal success to large- and small-scale watersheds. Federal agencies, states, interstate commissions, and tribes usually apply the approach on larger scales, such as in watersheds greater than 100 square miles in size.

However, local agencies and urban communities can apply the approach to watersheds as small as several acres in size.

Although specifics may vary from large scale to small scale, the basic goals of the watershed approach remain the same—protecting, maintaining, and restoring water resources, based on the geomorphology, ecology, and other natural characteristics of the waterbody. Local runoff management program officials must be especially conscious of watershed scale when planning and implementing specific management practices. For example, programmatic practices, such as stream protection ordinances and public education campaigns, are usually applied community wide. Consequently, the results benefit many small watersheds. In contrast, structural practices, such as vegetative approaches, usually provide direct benefits to a single stream. Regional structural management practices such as headland breakwater systems for larger watersheds can be used, but they do not protect smaller contributing streams. Given limited resources, program officials must often analyze cost and benefits and choose between large- and small-scale practices. Often, a combination of nonstructural and structural practices implemented across the watershed and at regional and local levels is the most cost effective approach.

An example of the watershed approach being used for hydromodification activities is the South Myrtle Creek Ditch Project. South Myrtle Creek, which flows into the South Umpqua River in Oregon, was historically populated with cutthroat trout (*Oncorhynchus clarki*) and coho salmon (*Oncorhynchus kisutch*). However, since the early 20th century, diversion structures, used primarily to provide water for irrigating agricultural crops, have blocked the passage of fish through creek waters (USEPA, 2002c). One example of the diversion structures was a diversion dam with a concrete apron, which was installed in a portion of South Myrtle Creek to raise the water level in an impoundment to provide irrigation water for adjacent and downstream landowners. During the summer, water levels in the creek would elevate 14 feet above natural levels and were diverted into a 2.5 mile irrigation ditch. Ultimately, hydromodification of this stream caused flow modifications and high stream temperatures, which degraded water quality for the native trout and salmon populations.

9 Elements of Watershed Planning

EPA has identified a minimum of nine elements that are critical for achieving improvements in water quality. EPA requires that these nine elements be addressed for section 319-funded watershed plans and strongly recommends that they be included in all other watershed plans that are intended to remediate water quality impairments. Additional information is available from FY 2004 Guidelines for the Award of Section 319 Nonpoint Source Grants to States and Territories *at* http://www.epa.gov/owow/nps/cwact.html*. The nine elements are listed below:*

a. Identification of causes of impairment and pollutant sources or groups of similar sources that need to be controlled to achieve needed load reductions, and any other goals identified in the watershed plan. Sources that need to be controlled should be identified at the significant subcategory level along with estimates of the extent to which they are present in the watershed (e.g., X linear miles of eroded streambank needing remediation).

b. An estimate of the load reductions expected from management measures.

c. A description of the nonpoint source management measures that will need to be implemented to achieve load reductions and a description of the critical areas in which those measures will be needed to implement this plan.

d. Estimate of the amounts of technical and financial assistance needed, associated costs, and/or the sources and authorities that will be relied upon to implement this plan.

e. An information and education component used to enhance public understanding of the project and encourage their early and continued participation in selecting, designing, and implementing the nonpoint source management measures that will be implemented.

f. Schedule for implementing the nonpoint source management measures identified in this plan that is reasonably expeditious.

g. A description of interim measurable milestones for determining whether nonpoint source management measures or other control actions are being implemented.

h. A set of criteria that can be used to determine whether loading reductions are being achieved over time and substantial progress is being made toward attaining water quality standards.

i. A monitoring component to evaluate the effectiveness of the implementation efforts over time, measured against the criteria established under item h immediately above.

In 1998 one of the landowners initiated a project to restore flow and improve water quality in South Myrtle Creek. The project used the guiding principles of the watershed approach to restore the health of the creek.

- *Partnership*. The project was a collaborative effort of landowners, who donated services and supplies. The project received funding and support from government agencies, such as the U.S. Fish and Wildlife Service, the Oregon Water Resources Department, the Oregon Watershed Enhancement Board, the Bureau of Land Management, the Natural Resources Conservation Service, and the Douglas County Watermaster.

- *Geographic focus*. Resource management activities were directed specifically to the creek and the drainage ditch, where flow restoration and improved water quality were desired.

- *Sound management techniques based on strong science and data*. An assessment of South Myrtle Creek identified water quality problems from flow modification and high stream temperatures as the priority problems in the creek. The diversion dam and concrete apron were found to be causing the problems. Landowners, the Water Resources Department, and the Watershed Enhancement Board developed a plan, the goal of which was to restore flow and improve water quality in the creek. The plan was implemented by removing the diversion dam and concrete apron. The irrigation system was switched to a sprinkler type system, which is more efficient than the original ditch irrigation. In addition, the denuded riparian area was revegetated to help lower stream temperatures and new seedlings were protected with fencing to keep away livestock.

With the cooperation of the landowners, the county and state governments, and other interested parties, the South Myrtle Creek Ditch Project was a success. Water temperatures have improved and flows have increased by 2.5 cubic feet per second during the summer. Restoration of the streambed to its historical level has allowed passage of salmon and trout to the 10 miles of stream above the dam (USEPA, 2002c).[2]

Smart Growth

Smart growth practices cover a range of development and conservation strategies that are environmentally sensitive, economically viable, community-oriented, and sustainable. Environmental impacts of development can be reduced with techniques that include compact development, reduced impervious surfaces and improved water detention, safeguarding of environmentally sensitive areas, mixing of land uses (e.g., homes, offices, and shops), transit accessibility, and better pedestrian and bicycle amenities.

Through smart growth approaches that enhance neighborhoods and involve local residents in development decisions, these communities are creating vibrant places to live, work, and play. The high quality of life in these communities makes them economically competitive, creates business opportunities, and improves the local tax base. Smart growth practices have also been shown to help protect water quality by reducing the amount of paved surfaces and allowing natural lands to filter rainwater and runoff before it reaches downstream areas.

Based on the experience of communities around the nation that have used smart growth approaches to create and maintain great neighborhoods, the Smart Growth Network[3] developed a set of ten basic principles:

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[2] Additional information about the project is available at http://www.epa.gov/owow/nps/Section319III/OR.htm.
[3] Smart Growth Network (SGN) is a partnership of government, business, and civic organizations that support smart growth. The SGN Web site, Smart Growth Online (http://www.smartgrowth.org/Default.asp?res=1024), features an extensive array of smart growth-related news, events, information, research, presentations, and publications.

1. Mix land uses
2. Take advantage of compact building design
3. Create a range of housing opportunities and choices
4. Create walkable neighborhoods
5. Foster distinctive, attractive communities with a strong sense of place
6. Preserve open space, farmland, natural beauty, and critical environmental areas
7. Strengthen and direct development towards existing communities
8. Provide a variety of transportation choices
9. Make development decisions predictable, fair, and cost effective
10. Encourage community and stakeholder collaboration in development decisions

EPA offers help to communities through the EPA smart growth program to improve development practices and get the type of development they want. They work with local, state, and national experts to discover and encourage successful, environmentally sensitive development strategies. EPA is engaged in conducting research, publishing reports and other publications,[4] showcasing outstanding communities, working with communities through grants[5] and technical assistance (Smart Growth Implementation Assistance Program),[6] and bringing together diverse interests to encourage better growth and development.[7]

Low Impact Development

Low Impact Development (LID) is an innovative stormwater management approach. The goal of LID is to mimic a site's predevelopment hydrology by using design techniques that infiltrate, filter, store, evaporate, and detain runoff close to its source (Low Impact Development Center, Inc., n.d.).

LID is based on the paradigm that stormwater management should not be viewed as stormwater disposal and that numerous opportunities exist within the developed landscape to control stormwater runoff close to the source. These principles include (NRDC, n.d.):

- Integrate stormwater management early in site planning activities
- Use natural hydrologic functions as the integrating framework
- Focus on prevention rather than mitigation
- Emphasize simple, low-tech, and low cost methods
- Manage as close to the source as possible
- Distribute small-scale practices throughout the landscape
- Rely on natural features and processes
- Create a multifunctional landscape

[4] http://www.epa.gov/piedpage/publications.htm
[5] http://www.epa.gov/piedpage/grants/index.htm
[6] http://www.epa.gov/piedpage/sgia.htm
[7] Links to technical assistance, tools, partnerships and grants and other funding are at "Making Smart Growth Happen" at http://www.epa.gov/piedpage/sg_implementation.htm.

The use of LID practices offers both economic and environmental benefits. LID measures result in less disturbance of the development area and conservation of natural features, and they can be less cost intensive than traditional stormwater control mechanisms. Cost savings for control mechanisms are not only for construction, but also for long-term maintenance and life cycle cost considerations (USEPA, 2000).

Ten common LID practices are the following (NRDC, n.d.):

- Impervious surface reduction and disconnection
- Permeable pavers
- Pollution prevention and good housekeeping
- Rain barrels and cisterns
- Rain gardens and bioretention
- Roof leader disconnection
- Rooftop gardens
- Sidewalk storage
- Soil amendments
- Tree preservation
- Vegetated swales, buffers, and strips

Project Design Considerations

General Design Factors

When designing any type of restoration project, it is important to consider the watershed as a whole as well as the specific site where restoration will occur. A watershed survey, or visual assessment, evaluates an entire watershed and can be used to help identify and verify pollutants, sources, and causes of impairments that lead to changes in streambank erosion. Additional monitoring of chemical, physical, and biological conditions may be necessary to determine if water quality is actually being affected by observed pollutants and sources. Watershed surveys can provide an accurate picture of what is occurring in the watershed. EPA's *Volunteer Stream Monitoring: A Methods Manual*[8] provides a watershed survey visual assessment form that may be used. In addition to EPA's method, a variety of visual assessment protocols have been developed by states and agencies. Designers of watershed restoration plans should look for assessment protocols that are already being used in their state or local area (USEPA, 2005c). Another general resource for planning and implementing restoration projects associated with hydromodification activities is EPA's *National Management Measures to Protect and Restore Wetlands* (USEPA, 2005b).

Photographs may also be a powerful tool that can be incorporated into watershed surveys. Photos serve as a visual reference for the site and provide before and after pictures that may be used to analyze restoration or remediation activities. In addition to taking individual photographs, aerial photographs may also provide important before and after information and can be obtained from

[8] http://www.epa.gov/owow/monitoring/volunteer/stream/vms32.html

USGS (Earth Science Information Center), USDA (Consolidated Farm Service Agencies, Aerial Photography Field Office), and other agencies (USEPA, 2005c). Refer to EPA's draft *Handbook for Developing Watershed Plans to Restore and Protect Our Waters* (USEPA, 2005c) for more information about watershed assessments.

Assessment

Tools to analyze channels on a site-by-site basis may include geomorphic assessments such as the methodology developed by Rosgen. Geomorphic assessments help to determine river and stream characteristics such as channel dimensions, reach slope, and channel enlargement and stability. This information about stream physical characteristics might help the restoration team to understand current stream conditions and may be evaluated over time to describe degradation or improvements in the stream. Geomorphic assessment may also be useful for predicting future stream conditions, which can help in selecting suitable restoration or protection approaches (USEPA, 2005c).

The Rosgen geomorphic assessment approach groups streams into different geomorphic classes, based on a set of criteria that include entrenchment ratio, width/depth ratio, sinuosity, channel slope, and channel materials. Assessment methodologies, such as Rosgen's Stream Classification System, can help identify streams at different levels of impairment, determine the types of hydrologic and physical factors affecting stream morphologic conditions, and choose appropriate management measures to implement if needed.[9] Another common geomorphic assessment method is the Modified Wolman Pebble Count (Harrelson et al., 1994), which characterizes the texture (particle size) in the stream or riverbeds of flowing surface waters. It can be used alone or with Rosgen-type assessments. The composition of the streambed can provide information about the characteristics of the stream, including effects of flooding, sedimentation, and other physical impacts on a stream (USEPA, 2005c). Other assessment methods may be available from state agencies or environmental organizations.

The physical conditions of a site can provide important information about factors affecting overall stream integrity, such as agricultural activities and urban development. Runoff from cropland and feedlots can carry sediment into streams, clog existing habitat, and change geomorphological characteristics. An understanding of stream physical conditions can facilitate identification of sources and pollutants and allow for designing and implementing more effective restoration and protection strategies. Physical characterization should also extend beyond the streambanks or shore and include a look at conditions in riparian areas (USEPA, 2005c).

Before choosing a practice to restore an area impacted by hydromodification activities, it is also important to determine what biological endpoints are desired and to consider other environmental or water quality goals. Biological endpoints may include metrics such as the number of fish surviving, number of offspring produced, impairment of reproductive capability, or morbidity. Biological endpoints can be used to evaluate the effectiveness of treatment schemes and can serve as a design parameter during restoration planning. Water quality goals, such as increasing low dissolved oxygen levels, reducing nitrogen or phosphorous pollutant

[9] More information about the Rosgen Stream Classification System is available at http://www.epa.gov/watertrain/stream_class/index.htm.

levels, or decreasing turbidity, are also important to consider when planning restoration. For example, if turbidity is a major problem in the waterbody, planners will want to choose a method of restoration that prevents erosion, is efficient at trapping sediment before it enters the waterbody, or one that will help sediment to settle in desired locations of the stream or river. Looking at endpoints and goals before designing the method of restoration can help planners and stakeholders achieve the desired results.

Engineering Considerations

When choosing from the various alternatives of engineering practices for addressing impacts associated with hydromodification, such as protecting and restoring eroding streambanks and shorelines, the following factors should be taken into consideration:

- Foundation conditions
- Level of exposure to erosive forces
- Availability of materials
- Initial and annual costs
- Past performance

Foundation conditions may have a significant influence on the selection of the specific practice or combination of practices to be used for restoring areas impacted by hydromodification, including shoreline or streambank stabilization. Foundation characteristics at the site must be compatible with the structure that is to be installed for erosion control. A structure such as a bulkhead, which must penetrate through the existing substrate for stability, will generally not be suitable for shorelines with a rocky bottom. Where foundation conditions are poor or where little penetration is possible, a gravity-type structure such as a stone revetment may be preferable. However, all vertical protective structures (revetments, seawalls, and bulkheads) built on sites with soft or unconsolidated bottom materials can experience scouring as incoming waves are reflected off the structures. In the absence of additional toe protection in these circumstances, the level of scouring and erosion of bottom sediments at the base of the structure may be severe enough to contribute to structural failure at some point in the lifetime of the installation.

Along streambanks, the erosive force of the current during periods of high streamflow will influence the selection of bank stabilization techniques and details of the design. For shorelines, the levels of wave exposure at the site will also generally influence the selection of shoreline stabilization techniques and details of the design. In areas of severe levels of exposure to erosive forces, such as strong wave action or currents, light structures such as vegetative techniques, timber cribbing, or light riprap revetment may not provide adequate protection. The effects of winter ice along the shoreline or streambank may also need to be considered in the selection and design of erosion control projects.

The availability of materials is another key factor influencing the selection of suitable techniques for protecting and restoring areas affected by hydromodification activities. For a vegetative approach, availability of plant materials of sufficient quantity and quality is an important design consideration. A particular type of bulkhead, seawall, or revetment may not be economically feasible if materials are not readily available near the construction site. Installation methods may also preclude the use of specific structures in certain situations. For instance, the installation of

bulkhead pilings in coastal areas near wetlands may not always be permissible due to disruptive impacts in locating pile-driving equipment at the project site.

Costs should also be included in the decision making process for implementing hydromodification practices. The total cost of a project should be viewed as including both the initial costs (materials, labor, and planning) and the annual costs of operation and maintenance. To the extent possible, practices should be compared by their total costs. Although a particular practice may be cheaper initially, it could have operation and maintenance costs that make it more expensive in the long run. For example, in some parts of the country, the initial costs of timber bulkheads may be less than the cost of stone revetments. However, stone structures typically require less maintenance and have a longer life than timber structures. Other types of structures whose installation costs are similar may actually have a wide difference in overall cost when annual maintenance and the anticipated lifetime of the structure are considered (USACE, 1984). Environmental benefits, such as creation of habitat, should also be factored into cost evaluations.

An example of a valuable resource that provides specific cost information for practices to protect or reduce streambank and shoreline erosion is your local USDA Service Center, which makes available services provided by the NRCS.[10]

The engineering designers should also evaluate similar existing projects and practice designs to determine how well they performed compared to design specifications. An important consideration for determining past performance is to compare the physical, water quality, and biological endpoints specified in the design with the corresponding endpoints that were observed in the monitoring results. For example, if an operation and maintenance program for an urban channelization project incorporates establishment of vegetative cover along many of the low energy areas of an urban stream, the long-term performance of the vegetative cover can be evaluated with metrics such as:

- Percent of riparian area with erosion problems
- Number of recreationally important fish species present
- Annual operation and maintenance costs
- Changes in important water quality parameter values (e.g., dissolved oxygen, turbidity)

Incorporating Monitoring and Maintenance of Structures

Generally, the monitoring program will help to determine how well the project is performing with respect to the design goals and the extent of any maintenance activities needed (NRC, 1992). The project monitoring plan should be an integral part of the overall design and will be an important consideration for developing long-term project costs and resource needs. Once the project's goals are established, performance indicators are then matched to the goals to create the

[10] A list of USDA Service Centers is available at http://offices.sc.egov.usda.gov/locator/app. A list of regional and state NRCS offices is available at http://www.nrcs.usda.gov/about/organization/regions.html#state.

monitoring program (NRC, 1992). The monitoring program should also be appropriate to the scope of the project (NRC, 1992) by including considerations such as:

- The area covered by the monitoring compared to the area of the overall project—both should be similar.
- The frequency and intensity of sampling to provide reliable assessments of the performance indicators.
- The cost and resources required for monitoring should reflect the overall cost and resources of the project.
- The performance indicators provide information to enable effective assessments of the project goals and decision-making for project maintenance activities.

Each project will have unique goals and corresponding monitoring needs. Chapter 3 of The National Research Council's document *Restoration of Aquatic Ecosystems* (NRC, 1992) provides detailed advice on considerations for planning a monitoring program for restoration activities such as those associated with hydromodification activities. Some additional monitoring considerations can be found in the USDA Forest Service document *A Soil Bioengineering Guide for Streambank and Lakeshore Stabilization* (USDA-FS, 2002):

- Keeping track of where plants were harvested—is there a correlation between growth rate of certain cuttings and the "mother" plants?
- Is the installation functioning as designed?
- Which areas are maturing more rapidly than others?
- Are seeds sprouting in the newly formed beds?
- Which plants have invaded the site through natural succession?
- What has sprouted in the second season?
- Which areas are experiencing difficulty and why?
- Is the bank stabilizing or washing away and why?
- Is something occurring that is unexpected?
- Which techniques are succeeding?
- Are any of the structures failing?

USDA NRCS' *The Practical Streambank Bioengineering Guide*[11] (Bentrup and Hoag, 1998) provides an example monitoring form. The monitoring sheet is also available in Appendix C of *A Soil Bioengineering Guide for Streambank and Lakeshore Stabilization* (USDA-FS, 2002).[12]

During the first few years after installation, maintenance is necessary until vegetation becomes established and the bank stabilizes. Structures may shift or you may notice something that was left undone. Once vegetation is established, projects should become self-sustaining and require little or no maintenance. Be sure the site is managed to give the treatment every chance to be effective over a long period of time (USDA-FS, 2002).

[11] http://www.engr.colostate.edu/~bbledsoe/CE413/idpmcpustguid.pdf
[12] http://www.fs.fed.us/publications/soil-bio-guide/guide/appendices.pdf

Common maintenance tasks include (USDA-FS, 2002; Bentrup and Hoag, 1998):

- Remove debris and weeds that may shade and compete with cuttings
- Secure stakes, wire, twine, etc.
- Control weeds
- Repair weakened or damaged structures (including fences)
- Replant and reseed as necessary (it is not uncommon for a flood to occur days after installation)

Planting success varies from project to project. Bentrup and Hoag (1998) provide the following potential growth success rates:

Pole Plantings	*70-100%*
Live Fascines	*20-50%*
Brush Layering	*10-70%*
Post Plantings	*50-70%*

It is beneficial to inspect the project every other week for the first 2 months after installation, once a month for the next 6 months, and then every other month for 2 years, at least. One should also inspect the project after heavy precipitation, flooding, snowmelt, drought, or any extraordinary occurrence. Assess damage from flooding, wildlife, grazing, boat wakes, trampling, drought, and high precipitation (USDA-FS, 2002). Additional information about monitoring is available from USDA NRCS' *The Practical Streambank Bioengineering Guide* (Bentrup and Hoag, 1998).

Plan and design all streambank, shoreline, and navigation structures so that they do not transfer erosion energy or otherwise cause visible loss of surrounding streambanks or shorelines.

Maintenance varies with the structural type. For stone revetments, the replacement of stones that have been dislodged is necessary; timber bulkheads need to be backfilled if there has been a loss of upland material, and broken sheet pile should be replaced as necessary. Gabion baskets should be inspected for corrosion failure of the wire, usually caused either by improper handling during construction or by abrasion from the stones inside the baskets. Baskets should be replaced as necessary since waves will rapidly empty failed baskets.

Steel, timber, and aluminum bulkheads should be inspected for sheet pile failure due to active earth pressure or debris impact and for loss of backfill. For all structural types not contiguous to other structures, lengthening of flanking walls may be necessary every few years. Through periodic monitoring and required maintenance, a substantially greater percentage of coastal structures will perform effectively over their design life. Since streambank or shoreline protection projects can transfer energy from one area to another, which causes increased erosion in the adjacent area, the possible effects of erosion control measures on adjacent properties should be routinely monitored.

Chapter 7: Practices for Implementing Management Measures

Many of the operation and maintenance solutions presented in Chapter 3 (Channelization and Channel Modification) are also practices that can be used to stabilize streambanks and shorelines as presented in Chapter 5 (Streambank and Shoreline Erosion). For example, a stream channel that has been hardened with vertical concrete walls to prevent local flooding and limit the stream to its existing channel (to protect property built along the stream channel), may benefit from operation and maintenance practices that use opportunities to replace the concrete walls with appropriate vegetative or combined vegetative and non-vegetative structures along the streambank when possible. These same practices may be applicable to stabilize downstream streambanks that are eroding and creating a nonpoint source (NPS) pollution problem because of the upstream development and hardened streambanks.

The following practices apply to one or more management measures. The descriptions and illustrations presented in this chapter are intended to provide a starting point for stakeholders and decision-makers for selecting possible practices to address NPS pollution problems associated with hydromodification activities. Table 7.1 provides a cross-reference of the practices with possible applications for the various hydromodification management measure components (e.g., instream and riparian restoration corresponds to the second component of Management Measures 1 and 2 described in detail in Chapter 3). Users of the information provided in the following table and descriptions evaluate the attributes of the possible practices with site-specific conditions in mind.

Table 7.1 Practices for Hydromodification Management Measures

	Channelization		Dams								Streambanks				Shorelines			
	Physical & chemical	Instream/riparian restoration	Erosion control	Runoff control	Chemical/pollutant control	Watershed protection	Aerate reservoir water	Improve tailwater oxygen	Restore/maintain habitat	Maintain fish passage	Vegetative	Structural	Integrated	Planning & regulatory	Vegetative	Structural	Integrated	Planning & regulatory
Practices	MM1	MM2	MM3		MM4	MM5					MM6							
Advanced Hydroelectric Turbines (7-7)										●								
Bank Shaping and Planting (7-9)	●	●	●										●				●	
Beach Nourishment (7-10)												●				●		
Behavioral Barriers (7-12)										●								
Branch Packing (7-14)	●	●	●								●							
Breakwaters (7-15)																●		
Brush Layering (7-17)	●	●	●								●							
Brush Mattressing (7-19)	●	●	●								●							
Bulkheads and Seawalls (7-21)	●	●	●									●				●		
Check Dams (7-22)	●	●	●	●								●						
Coconut Fiber Roll (7-23)	●	●	●								●							
Collection Systems (7-25)										●								
Construct Runoff Intercepts (7-26)			●	●														
Constructed Spawning Beds (7-27)									●									
Construction Management (7-28)			●															
Dormant Post Plantings (7-29)	●	●	●								●				●			

	Channelization		Dams								Streambanks				Shorelines			
	Physical & chemical	Instream/riparian restoration	Erosion control	Runoff control	Chemical/pollutant control	Watershed protection	Aerate reservoir water	Improve tailwater oxygen	Restore/maintain habitat	Maintain fish passage	Vegetative	Structural	Integrated	Planning & regulatory	Vegetative	Structural	Integrated	Planning & regulatory
Encourage Drainage Protection (7-30)						●												
Equipment Runoff Control (7-31)					●													
Erosion and Sediment Control (ESC) Plans (7-32)	●	●	●											●				●
Erosion Control Blankets (7-35)			●															
Establish and Protect Stream Buffers (7-37)		●				●								●				
Fish Ladders(7-38)										●								
Fish Lifts (7-40)										●								
Flow Augmentation (7-41)									●									
Fuel and Maintenance Staging Areas (7-43)					●													
Gated Conduits (7-44)								●										
Groins (7-45)																●		
Identify and Address NPS Contributions (7-46)						●												
Identify and Preserve Critical Areas (7-48)						●												
Joint Planting (7-50)	●	●	●										●					
Labyrinth Weir (7-51)								●										
Levees, Setback Levees, and Floodwalls (7-52)	●	●										●				●		

	Channelization		Dams								Streambanks				Shorelines			
	Physical & chemical	Instream/riparian restoration	Erosion control	Runoff control	Chemical/pollutant control	Watershed protection	Aerate reservoir water	Improve tailwater oxygen	Restore/maintain habitat	Maintain fish passage	Vegetative	Structural	Integrated	Planning & regulatory	Vegetative	Structural	Integrated	Planning & regulatory
Live Cribwalls (7-54)	●	●	●										●					
Live Fascines (7-56)	●	●	●								●							
Live Staking (7-58)	●	●	●								●							
Locate Potential Land Disturbing Activities Away from Critical Areas (7-60)			●	●	●													
Marsh Creation and Restoration (7-61)		●									●				●			
Modifying Operational Procedures (7-62)								●										
Mulching (7-63)			●															
Noneroding Roadways (7-64)	●	●	●															
Pesticide and Fertilizer Management (7-67)					●													
Phase Construction (7-69)			●															
Physical Barriers (7-70)										●								
Pollutant Runoff Control (7-72)					●													
Preserve Onsite Vegetation (7-73)			●	●														
Reregulation Weir (7-74)								●										
Reservoir Aeration (7-75)							●											
Retaining Walls (7-77)			●	●														
Return Walls (7-78)	●	●										●				●		
Revegetate (7-79)			●															

	Channelization		Dams								Streambanks				Shorelines			
	Physical & chemical	Instream/riparian restoration	Erosion control	Runoff control	Chemical/pollutant control	Watershed protection	Aerate reservoir water	Improve tailwater oxygen	Restore/maintain habitat	Maintain fish passage	Vegetative	Structural	Integrated	Planning & regulatory	Vegetative	Structural	Integrated	Planning & regulatory
Revetment (7-80)	●	●	●									●				●		
Riparian Improvements (7-82)		●	●						●				●				●	
Riprap (7-83)	●	●	●									●				●		
Root Wad Revetments (7-84)	●	●	●										●					
Rosgen's Stream Classification Method (7-86)	●	●												●				
Scheduling Projects (7-88)			●															
Sediment Basins/Rock Dams (7-89)				●														
Sediment Fences (7-91)			●	●														
Sediment Traps (7-92)				●														
Seeding (7-93)			●															
Selective Withdrawal (7-94)								●										
Setbacks (7-95)	●	●												●				●
Shoreline Sensitivity Assessment (7-97)																		●
Site Fingerprinting (7-99)			●															
Sodding (7-100)			●															
Soil Protection (7-101)			●															
Spill and Water Budgets (7-102)										●								
Spill Prevention and Control Program (7-103)					●													
Spillway Modifications (7-104)								●	●									
Surface Roughening (7-105)			●															

	Channelization		Dams								Streambanks				Shorelines			
	Physical & chemical	Instream/riparian restoration	Erosion control	Runoff control	Chemical/pollutant control	Watershed protection	Aerate reservoir water	Improve tailwater oxygen	Restore/maintain habitat	Maintain fish passage	Vegetative	Structural	Integrated	Planning & regulatory	Vegetative	Structural	Integrated	Planning & regulatory
Toe Protection (7-106)	●	●										●				●		
Training—ESC (7-107)			●															
Transference of Fish Runs (7-108)										●								
Tree Armoring, Fencing, and Retaining Walls or Tree Wells (7-109)			●															
Tree Revetments (7-110)	●	●	●								●				●			
Turbine Operation (7-112)								●										
Turbine Venting (7-113)								●										
Vegetated Buffers (7-114)	●	●	●	●							●				●			
Vegetated Filter Strips (7-115)			●	●														
Vegetated Gabions (7-116)	●	●	●										●				●	
Vegetated Geogrids (7-118)	●	●	●										●				●	
Vegetated Reinforced Soil Slope (VRSS) (7-120)	●	●	●										●				●	
Water Conveyances (7-121)								●										
Wildflower Cover (7-122)			●															
Wind Erosion Controls (7-123)			●															
Wing Deflectors (7-124)	●	●										●				●		

Advanced Hydroelectric Turbines

Channelization
- ☐ Physical & chemical
- ☐ Instream/riparian restoration

Dams
- ☐ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☑ Maintain fish passage

Erosion
- ☐ Streambanks ☐ Shorelines
  - ☐ Vegetative
  - ☐ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

Hydroelectric turbines can be designed to reduce impacts to juvenile fish passing through the turbine as it operates. Most research on advanced hydroelectric turbines is being carried out by power producers in the Columbia River basin (U.S. Army Corps of Engineers (USACE) and public utility districts) who are looking to improve the survival of hydroelectric turbine-passed juvenile fish by modifying the operation and design of turbines. Development of low impact turbines is also being pursued on a national scale by the U.S. Department of Energy (DOE) (Cada, 2001).

In the last few years, field studies have shown that improvements in the design of turbines have increased the survival of juvenile fish. Researchers continue to examine the causes and extent of injuries from turbine systems, as well as the significance of indirect mortality and the effects of turbine passage on adult fish. Overall, improvements in turbine design and operation, and new field, laboratory, and modeling techniques to assess turbine-passage survival, are contributing towards improving downstream fish passage at hydroelectric power plants (Cada, 2001).

The redesign of conventional turbines for fish passage has focused on strategies to reduce obstructions and to narrow the gaps between moveable elements of the turbine that are thought to injure fish. The effects of changes in the number, size, orientation, or shape of the blades that make up the runner (the rotating element of a turbine which converts hydraulic energy into mechanical energy) are being investigated (Cada, 2001).

The USACE has put considerable resources into improving turbine passage survival. The USACE Turbine Passage Survival Program (TSP) was developed to investigate means to improve the survival of juvenile salmon as they pass through turbines located at Columbia and Snake River dams. The TSP is organized along three functional elements that are integrated to achieve the objectives (Cada, 2001):[1]

- Biological studies of turbine passage at field sites
- Hydraulic model investigations
- Engineering studies of the biological studies, hydraulic components, and optimization of turbine operations

DOE supports development of low impact turbines under the Advanced Hydropower Turbine System (AHTS) Program. The AHTS program explores innovative concepts for turbine design that will have environmental benefits and maintain efficient electrical generation. The AHTS program awarded contracts for conceptual designs of advanced turbines to different firms/companies. Early in the development of conceptual designs, it became clear that there were

[1] Additional information about USACE efforts with advanced hydroelectric turbines is available at http://hydropower.inel.gov/turbines/pdfs/amfishsoc-fall2001.pdf.

significant gaps in the knowledge of fish responses to physical stresses (injury mechanisms) experienced during turbine passage. Consequently, the AHTS program expanded its activities to include studies to develop biological criteria for turbines (Cada, 2001).[2]

[2] Additional information about DOE efforts with advanced hydroelectric turbines is available at http://hydropower.inel.gov/turbines/pdfs/amfishsoc-fall2001.pdf.

Bank Shaping and Planting

Channelization
- ☑ Physical & chemical
- ☑ Instream/riparian restoration

Dams
- ☑ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☑ Streambanks ☑ Shorelines
  - ☐ Vegetative
  - ☐ Structural
  - ☑ Integrated
  - ☐ Planning & regulatory

Bank shaping and planting involve regrading a streambank to establish a stable slope angle, placing topsoil and other material needed for plant growth on the streambank, and selecting and installing appropriate plant species on the streambank. This design is most successful on streambanks where moderate erosion and channel migration are anticipated. Reinforcement at the toe of the bank is often required, particularly where flow velocities exceed the tolerance range for plantings and where erosion occurs below base flows. To determine the appropriate slope angle, slope stability analyses that take into account streambank materials, groundwater fluctuations, and bank loading conditions are recommended (FISRWG, 1998).

Additional Resources

- FISRWG. 1998. *Stream Corridor Restoration: Principles, Processes, and Practices*. Federal Interagency Stream Restoration Working Group. http://www.nrcs.usda.gov/technical/stream_restoration/PDFFILES/APPENDIX.pdf.

- Mississippi State University, Center for Sustainable Design. 1999. *Water Related Best Management Practices in the Landscape: Bank Shaping and Vegetating.* Created for United States Department of Agriculture, Natural Resource Conservation Service, Watershed Science Institute. http://www.abe.msstate.edu/csd/NRCS-BMPs/pdf/streams/bank/bankshaping.pdf.

Beach Nourishment

Channelization
- ☐ Physical & chemical
- ☐ Instream/riparian restoration

Dams
- ☐ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☑ Streambanks ☑ Shorelines
  - ☐ Vegetative
  - ☑ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

The creation or nourishment of existing beaches provides protection to the eroding area and can also provide a riparian habitat function, particularly when portions of the finished project are planted with beach or dune grasses (Woodhouse, 1978). Beach nourishment (Figures 7.1 through 7.4) requires a readily available source of suitable fill material that can be effectively transported to the erosion site for reconstruction of the beach (Hobson, 1977). Dredging or pumping from offshore deposits is the method most frequently used to obtain fill material for beach nourishment. A second possibility is the mining of suitable sand from inland areas and overland hauling and dumping by trucks. To restore an eroded beach and stabilize it at the restored position, fill is placed directly along the eroded sector (USACE, 1984). In most cases, plans must be made to periodically obtain and place additional fill on the nourished beach to replace sand that is carried offshore into the zone of breaking waves or alongshore in littoral drift (Houston, 1991; Pilkey, 1992).

One important task that should not be overlooked in the planning process for beach nourishment projects is the proper identification and assessment of the ecological and hydrodynamic effects of obtaining fill material from nearby submerged coastal areas. Removal of substantial amounts of bottom sediments in coastal areas can disrupt populations of fish, shellfish, and benthic organisms (Atlantic States Marine Fisheries Commission, 2002). Grain size analysis should be performed on sand from both the borrow area and the beach area to be nourished. Analysis of grain size should include both size and size distribution, and fill material should match both of these parameters (Stauble, 2005). Fill materials should also be analyzed for the presence of contaminants, and contaminated sediment should not be used (CA Department of Boating and Waterways and State Coastal Conservancy, 2002). Turbidity levels in the overlying waters can also be raised to undesirable levels (EUCC, 1999). Certain

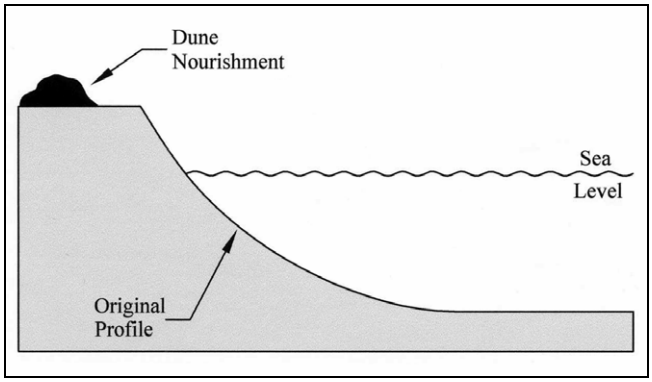

Figure 7.1 Dune Nourishment (CA Dept. of Boating and Waterways and State Coastal Conservancy, 2002)

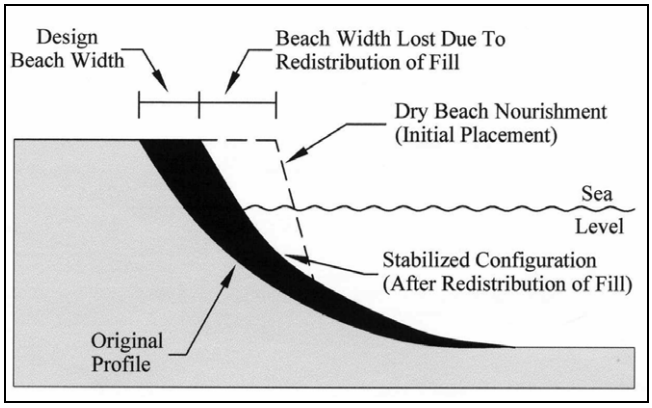

Figure 7.2 Dry Beach Nourishment (CA Dept. of Boating and Waterways and State Coastal Conservancy, 2002)

areas may have seasonal restrictions on obtaining fill from nearby submerged areas (TRB, 2001). Timing of nourishment activities is frequently a critical factor since the recreational demand for beach use frequently coincides with the best months for completing the beach nourishment. These may also be the worst months from the standpoint of impacts to aquatic life and the beach community such as turtles seeking nesting sites.

Design criteria should include proper methods for stabilizing the newly created beach and provisions for long-term monitoring of the project to document the stability of the newly created beach and the recovery of the riparian habitat and wildlife in the area.

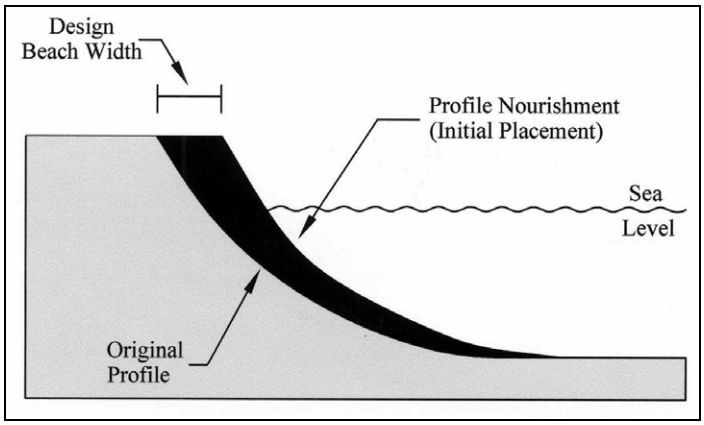

Figure 7.3 Profile Nourishment (CA Dept. of Boating and Waterways and State Coastal Conservancy, 2002)

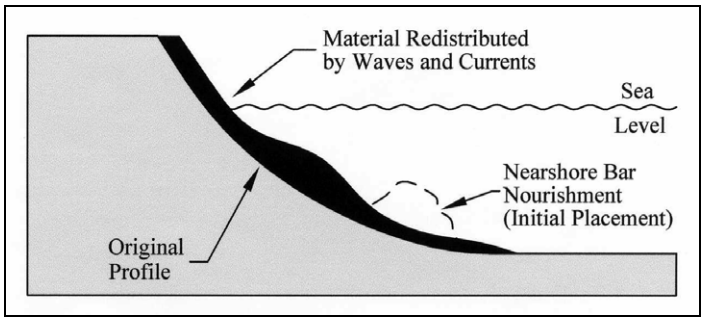

Figure 7.4 Nearshore Bar Nourishment (CA Dept. of Boating and Waterways and State Coastal Conservancy, 2002)

Additional Resources

- Barber, D. No date. *Beach Nourishment Basics.* http://www.brynmawr.edu/geology/geomorph/beachnourishmentinfo.html.
- NOAA. No date. *Beach Nourishment: A Guide for Local Government Officials.* U.S. Department of Commerce, NOAA Coastal Services Center. http://www.csc.noaa.gov/beachnourishment.
- Scottish National Heritage. No date. *A Guide to Managing Coastal Erosion in Beach/Dune Systems: Beach Nourishment.* http://www.snh.org.uk/publications/on-line/heritagemanagement/erosion/appendix_1.7.shtml.

Behavioral Barriers

Channelization
- ☐ Physical & chemical
- ☐ Instream/riparian restoration

Dams
- ☐ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☑ Maintain fish passage

Erosion
- ☐ Streambanks ☐ Shorelines
  - ☐ Vegetative
  - ☐ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

Behavioral barriers use fish responses to external stimuli to keep fish away from intakes or to attract them to a bypass. Since fish behavior is notably variable both within and among species, behavioral barriers cannot be expected to prevent all fish from entering hydropower intakes. Environmental conditions such as high turbidity levels can obscure some behavioral barriers, such as lighting systems and curtains. Competing behaviors such as feeding or predator avoidance can also be a factor influencing the effectiveness of behavioral barriers at a particular time.

Electric screens, bubble and chain curtains, light, sound, and water jets have been evaluated in laboratory or field studies and show mixed results. Despite numerous studies, very few permanent applications of behavioral barriers have been realized (EPRI, 1999). Some authors suggest using behavioral barriers in combination with physical barriers (Mueller et al., 1999).

Electrical screens keep fish away from structures and guide them into bypass areas for removal. Fish seem to respond to the electrical stimulus best when water velocities are low. Tests of an electrical guidance system at the Chandler Canal diversion (Yakima River, Washington) showed efficiency ranging from 70 to 84 percent for velocities of less than 1 ft/sec. Efficiencies decreased to less than 50 percent when water velocities were higher than 2 ft/sec (Pugh et al., 1971). Success of electrical screens may be specific to species and fish size. An electrical field strength suitable to deter small fish may result in injury or death to large fish, since total fish body voltage is directly proportional to fish body length (Stone and Webster, 1986). Electrical screens require constant maintenance of electrodes and associated underwater hardware to maintain effectiveness. Surface water quality can affect the life and performance of electrodes.

Bubble and chain curtains are created by pumping air through a diffuser to create a continuous, dense curtain of bubbles, which can cause an avoidance response. Many factors affect fish response to the curtains, including temperature, turbidity, light, and water velocity. Bubbler systems should be constructed from corrosion-resistant materials and be installed with adequate positioning of the diffuser away from areas where siltation might clog the air ducts. Hanging chains provide a physical, visible obstacle that fish avoid. They are species-specific and lifestage-specific. Efficiency of hanging chains is affected by such variables as velocity, instream flow, turbidity, and illumination levels. Debris can limit their performance. In particular, buildup of debris can deflect chains into a nonuniform pattern and disrupt hydraulic flow patterns.

Strobe lights repel fish by producing an avoidance response. A strobe light system at Saunders Generating Station in Ontario, Canada was found to be 67 to 92 percent effective at repelling or diverting eels (EPRI, 1999). Turbidity levels can affect strobe light efficiency. The intensity and duration of the flash can also affect the response of the fish; for instance, an increase in flash duration has been associated with less avoidance. Strobe lights have the potential for far-field

fish attraction, since they can appear to fish as a constant light source due to light attenuation over a long distance (Stone and Webster, 1986). Strobe lights at Hiram M. Chittenden Locks in Seattle, Washington were examined to determine how fish respond, depending on strobe light distance. Vertical avoidance was 90 to 100 percent when lights were 0.5 meters away, 45 percent when 2.5 meters away, and 19 percent when 4.5 to 6.5 meters away (EPRI, 1999).

Mercury lights have successfully attracted fish to passage systems and repelled them from dams. Studies suggest their effectiveness is species-specific; alewives (*Alosa pseudoharengus*) were attracted to mercury light, whereas coho salmon (*Oncorhynchus kisutch*) and rainbow trout (*Oncorhynchus mykiss*) displayed no attraction to the light (Stone and Webster, 1986). In a test on the Susquehanna River (Maryland, Pennsylvania, and New York), mercury lights attracted gizzard shad (OTA, 1995). Although results have been mixed, low overall cost of the systems has led to continued research on their effectiveness (Duke Engineering & Services, Inc., 2000).

Underwater sound, broadcast at different frequencies and amplitudes, has been effective in attracting fish away from dams or repelling fish from dangers around dams, although the results of field tests are not consistent. Fish have been attracted, repelled, or guided by the sound. A study prepared for DOE showed that low-frequency, high particle motion was effective at invoking flight and avoidance responses in salmonids (Mueller et al., 1998). These finding agree with Knudsen et al. (1994), who found that low frequencies are efficient for evoking awareness reactions and avoidance responses in juvenile Atlantic salmon. Not all fish possess the ability to perceive sound or localized acoustical sources (Harris and Van Bergeijk, 1962). Fish also frequently seem to become habituated to the sound source.

Poppers are pneumatic sound generators that create a high-energy acoustic output to repel fish. Poppers have effectively repelled warm-water fish from water intakes. Laboratory and field studies in California indicate avoidance by several freshwater species such as alewives (*Alosa pseudoharengus*), perch, and smelt. Salmonids do not seem to be effectively repelled (Stone and Webster, 1986). Operation and maintenance considerations include frequent replacement of "O" rings, air entrainment in water inlets, and vibration of structures associated with the inlets.

Water jet curtains create hydraulic conditions that repel fish. Effectiveness is influenced by the angle at which water is jetted. Although effectiveness averages 75 percent (Stone and Webster, 1986), not enough is known to determine what variables affect performance of water jet curtains. Important operation and maintenance concerns would be clogging of the jet nozzles by debris or rust and the acceptable range of stream flow conditions, which contribute to effective results.

Hybrid barriers or combinations of different barriers can enhance the effectiveness of individual behavioral barriers. Laboratory studies showed a chain net barrier combined with strobe lights to be up to 90 percent effective at repelling some species and sizes of fish. Tests of combining rope-net and chain-rope barriers have shown good results. Barriers with horizontal and vertical components in the water column are more effective than those with vertical components alone. Barriers with a large diameter are more effective than those with a small diameter, and thicker barriers are more effective than thinner barriers. Effectiveness of hanging chains was increased when used in combination with strobe lights. Effectiveness also increased when strobe lights were added to air bubble curtains and poppers (Stone and Webster, 1986).

Branch Packing

Channelization
- ☑ Physical & chemical
- ☑ Instream/riparian restoration

Dams
- ☑ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☑ Streambanks ☐ Shorelines
  - ☑ Vegetative
  - ☐ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

Branch packing consists of alternating layers of live branch cuttings and compacted backfill to repair small, localized slumps and holes in slopes (Figure 7.5). Live branch cuttings may range from 0.5 to 2 inches in diameter. They should be long enough to touch undisturbed soil at the back of the trench and extend slightly outward from the rebuilt slope face. Wooden stakes should be 5 to 8 feet long, depending on the depth of the slump or hole being repaired. Stakes should also be made from poles that are 3 to 4 inches in diameter or 2 by 4 feet lumber. Live posts can be substituted. As plant tops begin to grow, the branch packing system becomes more effective in retarding runoff and reducing surface erosion. Trapped sediment refills the localized slumps or holes, while roots spread throughout the backfill and surrounding earth to form a unified mass. Branch packing is not effective in slump areas greater than 4 feet deep or 5 feet wide (USDA-NRCS, 1992). Installation guidelines are available from the USDA-FS Soil Bioengineering Guide (USDA-FS, 2002) and the USDA Natural Resources Conservation Service's (NRCS's) *Engineering Field Handbook, Chapter 18* (USDA-NRCS, 1992).

Additional Resources

- FISRWG. 1998. *Stream Corridor Restoration: Principles, Processes, and Practices*. Federal Interagency Stream Restoration Working Group. http://www.nrcs.usda.gov/technical/stream_restoration/PDFFILES/APPENDIX.pdf.

- ISU. 2006. *How to Control Streambank Erosion: Branchpacking.* Iowa State University. http://www.ctre.iastate.edu/erosion/manuals/streambank/branchpacking.pdf.

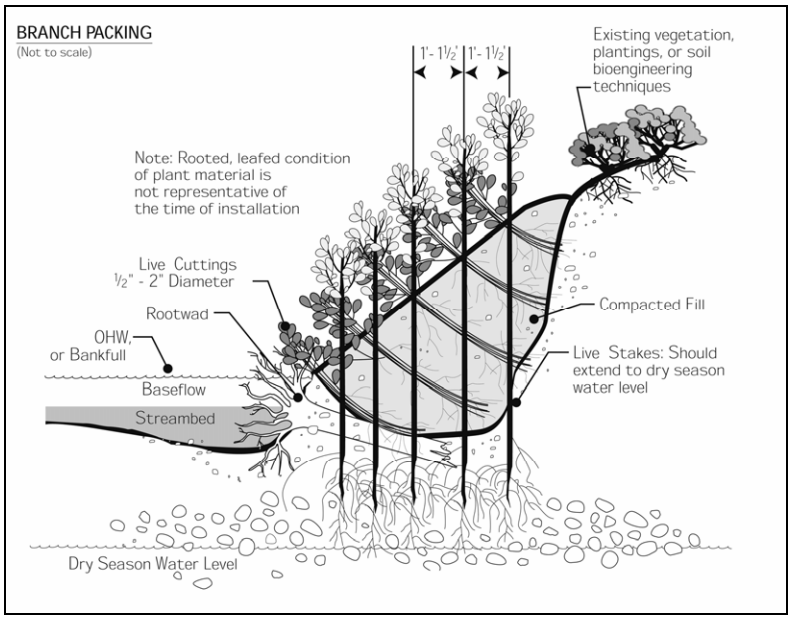

Figure 7.5 Branch Packing (USDA-FS, 2002)

Breakwaters

Channelization
- ☐ Physical & chemical
- ☐ Instream/riparian restoration

Dams
- ☐ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☐ Streambanks ☑ Shorelines
  - ☐ Vegetative
  - ☑ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

Breakwaters are wave energy barriers designed to protect the land or nearshore area behind them from the direct assault of waves. Breakwaters have traditionally been used only for harbor protection and navigational purposes; in recent years, however, designs of shore-parallel segmented breakwaters have been used for shore protection purposes (Fulford, 1985; Hardaway and Gunn, 1989; Hardaway and Gunn, 1991; USACE, 1990). Segmented breakwaters can be used to provide protection over longer sections of shoreline than is generally affordable through the use of bulkheads or revetments. Wave energy is able to pass through the breakwater gaps, allowing for the maintenance of some level of longshore sediment transport, as well as mixing and flushing of the sheltered waters behind the structures. The cost per foot of shore for the installation of segmented offshore breakwaters is generally competitive with the costs of stone revetments and bulkheads (Hardaway et al., 1991).

Figure 7.6 provides a view of breakwaters off the coast of Pennsylvania and Figure 7.7 illustrates single and multiple breakwaters.

Figure 7.6 Breakwaters – View of Presque Isle, Pennsylvania (USACE, 2003)

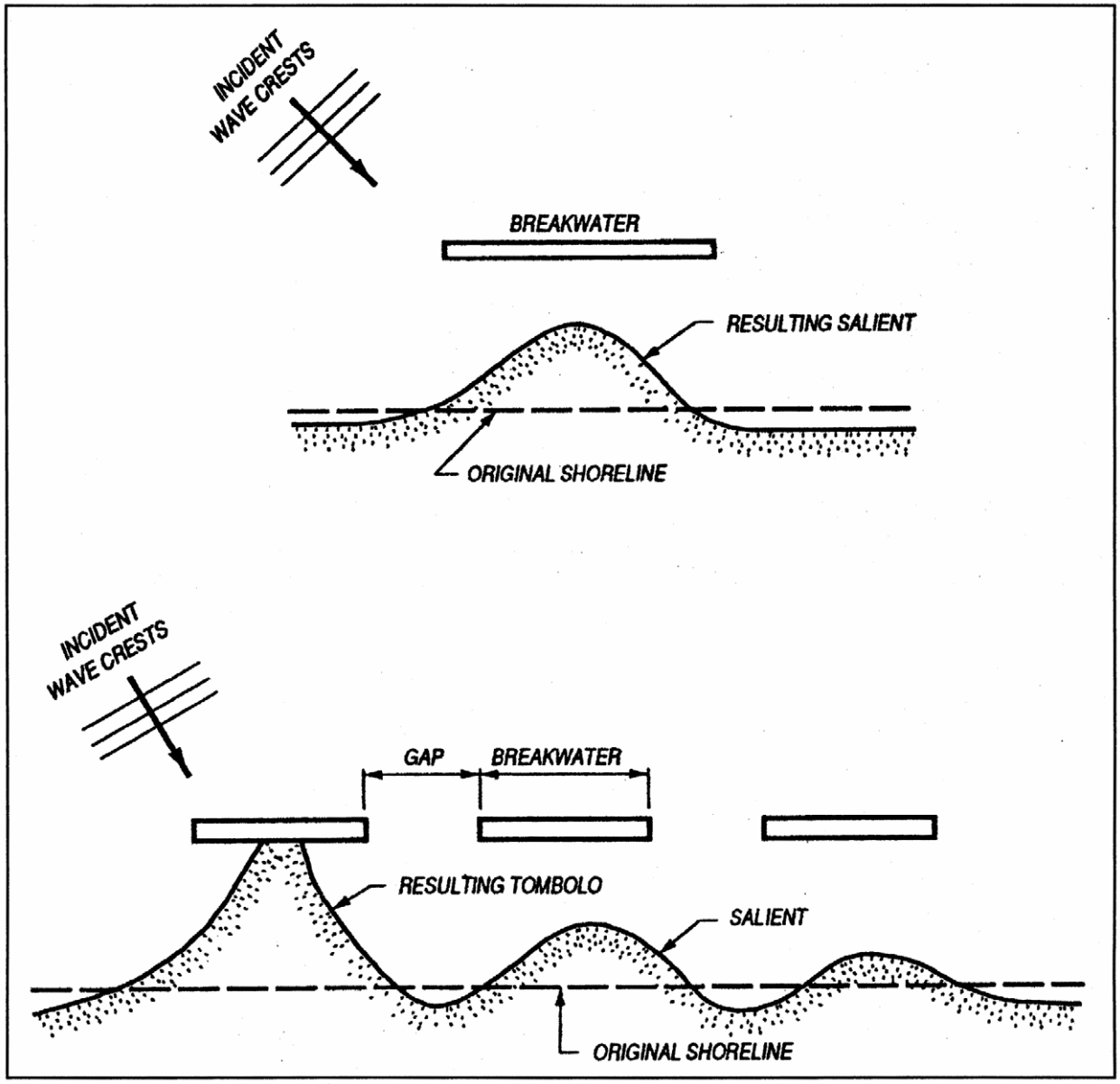

Figure 7.7 Single and Multiple Breakwaters (USACE, 2003)

Additional Resource

- USACE. No date. *Breakwaters.* http://www.usna.edu/NAOE/courses/en420/bonnette/breakwater_design.html.

Brush Layering

Channelization
- ☑ Physical & chemical
- ☑ Instream/riparian restoration

Dams
- ☑ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☑ Streambanks ☐ Shorelines
  - ☑ Vegetative
  - ☐ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

Brush layering consists of placing live branch cuttings interspersed between layers of soil on cut slopes or fill slopes (Figures 7.8 and 7.9). These systems are recommended on slopes up to 2:1 in steepness and not to exceed 15 feet in vertical height. Branch cuttings, which are placed in a crisscross or overlapping pattern, should be long enough to reach the back of the bench and still protrude from the bank (growing tips facing the outside of the slope). The portions of the brush that protrude from the slope face assist in retarding runoff and reducing surface erosion. Backfill is then placed on the branches and compacted.

Brush layering can be used to stabilize a slope against shallow sliding or mass wasting, as well as to provide erosion protection. Brush layers can stabilize and reinforce the outside edge or face of drained earthen buttresses placed against cut slopes or embankment fills. Brush layering works better on fill slopes than cut slopes, because much longer stems can be used in fill (Mississippi State University, 1999). It is most applicable for areas subjected to cut or fill operations or areas that are highly disturbed and/or eroded (ECY, 2007)

Brush layering is somewhat similar to live fascine systems because both involve the cutting and placement of live branch cuttings on slopes. The two techniques differ principally in the orientation of the branches and the depth to which they are placed in the slope. In brush layering, the cuttings are oriented more or less perpendicular to the slope contour. In live fascine systems, the cuttings are oriented more or less parallel to the slope contour. The perpendicular orientation is more effective from the point of view of earth reinforcement and mass stability of the slope (USDA-NRCS, 1992). Thus, brush layering is more effective than live fascines in terms of earth reinforcement and mass stability (Mississippi State University, 1999). When used on a fill slope, brush layering is similar to vegetated geogrids, except the technique does not use geotextile fabric (USDA-FS, 2002).

Brush layering can disrupt native soils. Therefore, installation should be completed in phases and no more area should be excavated than is necessary (ECY, 2007).

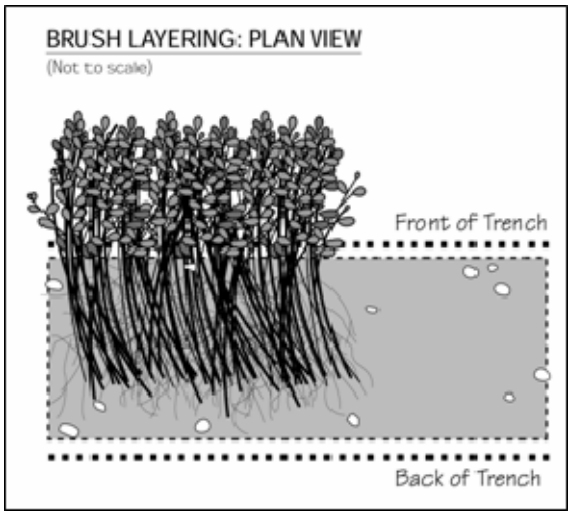

Figure 7.8 Brush Layering: Plan View (USDA-FS, 2002)

Additional Resources

- Mississippi State University, Center for Sustainable Design. 1999. *Water Related Best Management Practices in the Landscape: Brush Layering.* Created for United States Department of Agriculture, Natural Resource Conservation Service, Watershed Science Institute. http://www.abe.msstate.edu/csd/NRCS-BMPs/pdf/streams/bank/brushlayer.pdf.

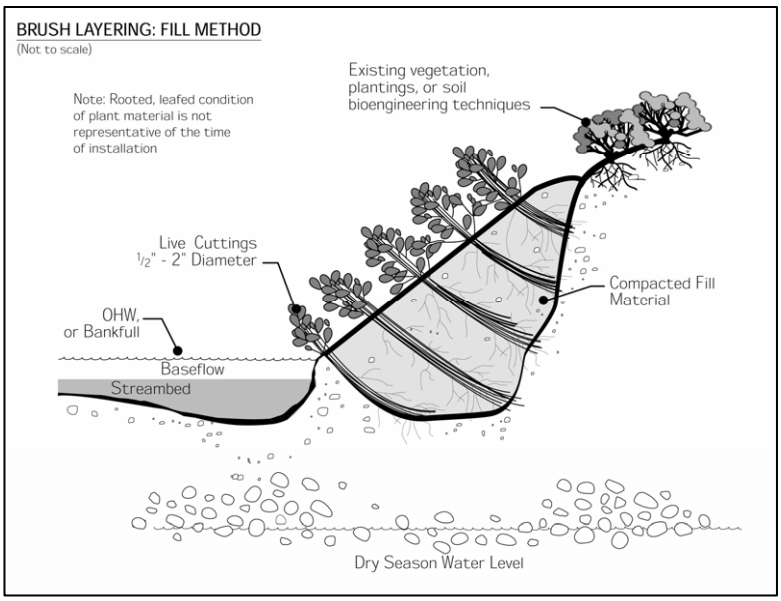

Figure 7.9 Brush Layering: Fill Method (USDA-FS, 2002)

- Myers, R.D. 1993. *Slope Stabilization and Erosion Control Using Vegetation: A Manual of Practice for Coastal Property Owners: Brush Layering.* Shorelands and Coastal Zone Management Program, Washington Department of Ecology. Olympia, WA. Publication 93-30. http://www.ecy.wa.gov/programs/sea/pubs/93-30/brush.html.

- Walter, J., D. Hughes, and N.J. Moore. 2005. *Streambank Revegetation and Protection: A Guide for Alaska. Revegetation Techniques: Brush/Hedge – Brush Layering.* Revised Edition. Alaska Department of Fish and Game, Division of Sport Fish. http://www.sf.adfg.state.ak.us/SARR/restoration/techniques/hedgebrush.cfm.

Brush Mattressing

Channelization
- ☑ Physical & chemical
- ☑ Instream/riparian restoration

Dams
- ☑ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☑ Streambanks ☐ Shorelines
  - ☑ Vegetative
  - ☐ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

Brush mattressing is commonly used in Europe for streambank protection (Figure 7.10). It involves digging a slight depression on the bank and creating a mat or mattress from woven wire or single strands of wire and live, freshly cut branches from sprouting trees or shrubs. Branches approximately 1 inch in diameter are normally cut 6 to 9 feet long (the height of the bank to be covered) and laid in criss-cross layers with the butts in alternating directions to create a uniform mattress with few voids. The mattress is then covered with wire secured with wooden stakes 2.5 to 4 feet long. It is then covered with soil and watered repeatedly to fill voids with soil and facilitate sprouting; however, some branches should be left partially exposed on the surface. The structure may require protection from undercutting by placement of stones or burial of the lower edge. Brush mattresses are generally resistant to waves and currents and provide protection from the digging out of plants by animals. Disadvantages include possible burial with sediment in some situations and difficulty in making later plantings through the mattress.

Installation guidelines are available from the USDA-FS Soil Bioengineering Guide (USDA-FS, 2002). Under the Ecosystem Management and Restoration Research Program (EMRRP), the USACE has presented research on brush mattresses in a technical note (*Brush Mattresses for Streambank Erosion Control*).[3]

Additional Resources

- Allen, H.H. and C. Fischenich. 2001. *Brush Mattresses for Streambank Erosion Control.* U.S. Army Corps of Engineers, Ecosystem Management and Restoration Research Program. http://el.erdc.usace.army.mil/elpubs/pdf/sr23.pdf.

- FISRWG. 1998. *Stream Corridor Restoration: Principles, Processes, and Practices*. Federal Interagency Stream Restoration Working Group. http://www.nrcs.usda.gov/technical/stream_restoration/PDFFILES/APPENDIX.pdf.

- ISU. 2006. *How to Control Streambank Erosion*: *Brushmattress.* Iowa State University. http://www.ctre.iastate.edu/erosion/manuals/streambank/brushmattress.pdf.

- Mississippi State University, Center for Sustainable Design. 1999. *Water Related Best Management Practices in the Landscape: Brush Mattress.* Created for United States Department of Agriculture, Natural Resource Conservation Service, Watershed Science Institute. http://www.abe.msstate.edu/csd/NRCS-BMPs/pdf/streams/bank/brushmattress.pdf.

[3] http://el.erdc.usace.army.mil/elpubs/pdf/sr23.pdf

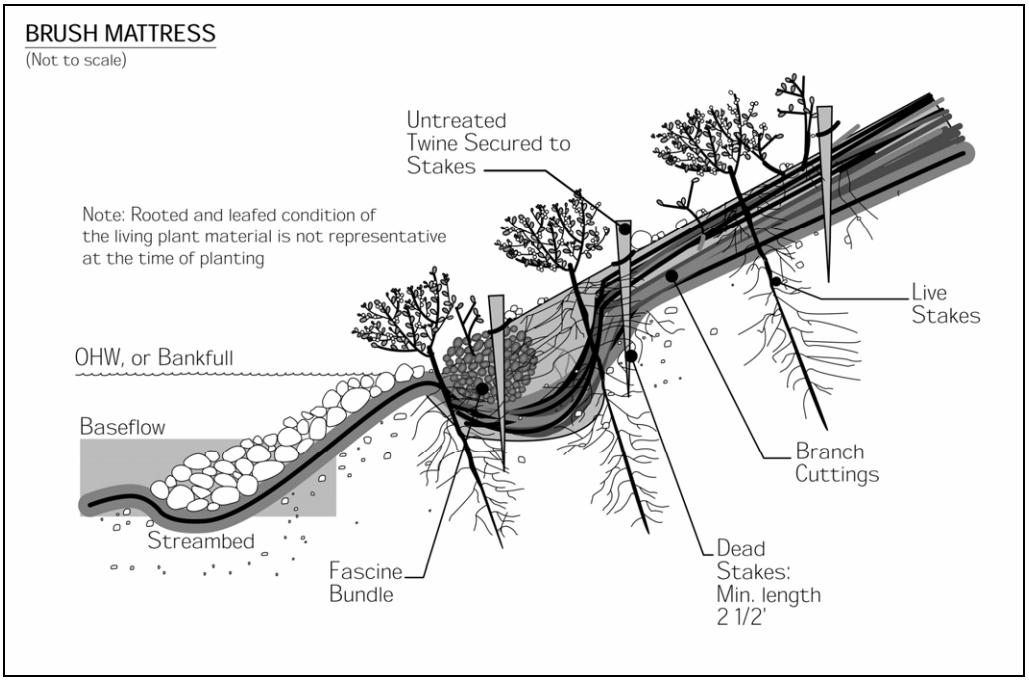

Figure 7.10 Brush Mattress (USDA-FS, 2002)

Bulkheads and Seawalls

Channelization
- ☑ Physical & chemical
- ☑ Instream/riparian restoration

Dams
- ☑ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☑ Streambanks ☑ Shorelines
  - ☐ Vegetative
  - ☑ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

Bulkheads (Figure 7.11) are primarily soil-retaining structures designed to also resist wave attack. Seawalls are principally structures designed to resist wave attack, but they also may retain some soil (USACE, 1984). Both bulkheads and seawalls may be built of many materials, including steel, timber, or aluminum sheet pile, gabions, or rubble-mound structures. Although bulkheads and seawalls protect the upland area against further erosion and land loss, they often create a local problem. Downward forces of water, produced by waves striking the wall, can produce a transfer of wave energy and rapidly remove sand from the wall (Pilkey and Wright, 1988). A stone apron is often necessary to prevent scouring and undermining. With vertical protective structures built from treated wood, there are also concerns about the leaching of chemicals used in the wood preservatives. Chromated copper arsenate (CCA), the most popular chemical used for treating the wood used in docks, pilings, and bulkheads, contains elements of chromium, copper, and arsenic that are toxic above trace levels (CSWRCB, 2005; Kahler et al., 2000).

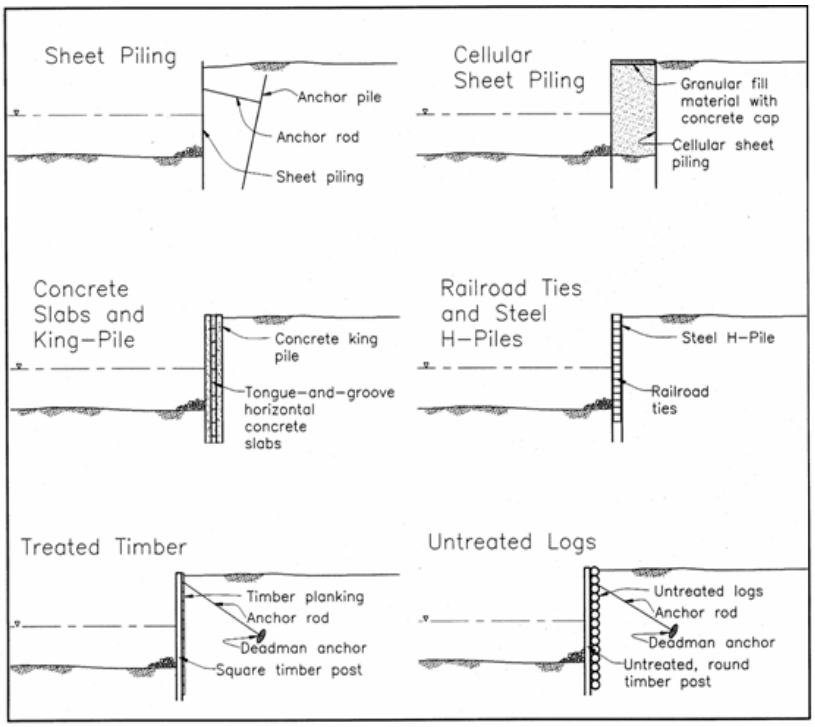

Figure 7.11 Typical Bulkhead Types (USACE, 2003)

Additional Resources

- Scottish National Heritage. No date. *A Guide to Managing Coastal Erosion in Beach/Dune Systems: Seawalls.* http://www.snh.org.uk/publications/on-line/heritagemanagement/erosion/appendix_1.12.shtml.
- USACE. No date. *Bulkheads and Seawalls.* http://www.usna.edu/NAOE/courses/en420/bonnette/Seawall_Design.html.

Check Dams

Channelization
- ☑ Physical & chemical
- ☑ Instream/riparian restoration

Dams
- ☑ Erosion control
- ☑ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☑ Streambanks ☐ Shorelines
  - ☐ Vegetative
  - ☑ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

Check dams, a type of grade control structure, are small dams constructed across an influent, intermittent stream, or drainageway to reduce channel erosion by restricting flow velocity. They can serve as emergency or temporary measures in small eroding channels that will be filled or permanently stabilized at a later date. Check dams can be installed in eroding gullies as permanent measures that fill up with sediment over time. In permanent usage, when the impounded area is filled, a relatively level surface or delta is formed over which water flows at a noneroding gradient. The water then cascades over the dam through a spillway onto a hardened apron. A series of check dams may be constructed along a stream channel of comparatively steep slope or gradient to create a channel consisting of a succession of gentle slopes with cascades in between.

Check dams can be nonporous (constructed from concrete, sheet steel, or wet masonry) or porous (using available materials such as straw bales, rock, brush, wire netting, boards, and posts). Porous dams release part of the flow through the structure, decreasing the head of flow over the spillway and the dynamic and hydrostatic forces against the dam. Nonporous dams are durable, permanent, and more expensive, while porous dams are simpler, more economical to construct, and temporary. Maintenance of check dams is important, especially the areas to the sides of the dam. Regular inspections, particularly after high flow events, should be performed to observe and repair erosion at the sides of the check dams. Excessive erosion could dislodge the check dam, create additional channel erosion, and add more sediment to the streambed.

Additional Resources

- CASQA. 2003. *California Stormwater BMP Construction Handbook*: *Check Dams.* California Stormwater Quality Association, Sacramento, CA. http://www.cabmphandbooks.com/Documents/Construction/SE-4.pdf.
- ISU. 2006. *Iowa Construction Site Erosion Control Manual: Check Dam.* Iowa State University. http://www.ctre.iastate.edu/erosion/manuals/construction/3.3_check_dam.pdf.
- Mississippi State University, Center for Sustainable Design. 1999. *Water Related Best Management Practices in the Landscape: Check Dam.* Created for United States Department of Agriculture, Natural Resource Conservation Service, Watershed Science Institute. http://www.abe.msstate.edu/csd/NRCS-BMPs/pdf/water/erosion/checkdam.pdf.
- SMRC. No date. *Stream Restoration: Grade Control Practices.* The Stormwater Manager's Resource Center. http://www.stormwatercenter.net/Assorted%20Fact%20Sheets/Restoration/grade_control.htm.
- Tennessee Department of Environment and Conservation. 2002. *Erosion and Sediment Control Handbook: Check Dams*. Tennessee Department of Environment and Conservation, Nashville, TN. http://state.tn.us/environment/wpc/sed_ero_controlhandbook/cd.pdf.

Coconut Fiber Roll

Channelization
- ☑ Physical & chemical
- ☑ Instream/riparian restoration

Dams
- ☑ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☑ Streambanks ☐ Shorelines
  - ☑ Vegetative
  - ☐ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

The coconut fiber roll technique consists of cylindrical structures composed of coconut husk fibers held together with twine woven from coconut material (Figures 7.12 and 7.13). The fiber rolls are typically manufactured in 12-inch diameters and lengths of 20 feet, which serves to protect slopes from erosion, trap sediment, and as a result, encourage plant growth within the fiber roll. The system is typically installed near the toe of the streambank with dormant cuttings and rooted plants inserted into holes cut into the fiber rolls. Once installed, the system provides a good substrate for promoting plant growth and is appropriate where short-term moderate toe stabilization is needed. Installation of this design requires minimal site disturbance and is ideal for sites that are especially sensitive to disturbance. A limitation of this system is that it cannot withstand high velocities or large ice buildup, and it can be fairly expensive to construct. Coconut fiber rolls have an effective life of 6 to 10 years. In some locations, similar and abundant locally available materials, such as corn stalks, are being used instead of coconut materials (FISRWG, 1998).

Installation guidelines are available from the USDA-FS Soil Bioengineering Guide (USDA-FS, 2002). Under EMRRP, the USACE has presented research on coconut rolls in a technical note (*Coir Geotextile Roll and Wetland Plants for Streambank Erosion Control*), which is available at http://el.erdc.usace.army.mil/elpubs/pdf/sr04.pdf.

Figure 7.12 Coconut Fiber Roll (Montgomery Watson, 2001)

Additional Resources

- CASQA. 2003. *California Stormwater BMP Construction Handbook: Fiber Rolls.* California Stormwater Quality Association, Sacramento, CA. http://www.cabmphandbooks.com/Documents/Construction/SE-5.pdf.
- FISRWG. 1998. *Stream Corridor Restoration: Principles, Processes, and Practices*. Federal Interagency Stream Restoration Working Group. http://www.nrcs.usda.gov/technical/stream_restoration/PDFFILES/APPENDIX.pdf.
- ISU. 2006. *How to Control Streambank Erosion: Coconut Fiber Rolls.* Iowa State University. http://www.ctre.iastate.edu/erosion/manuals/streambank/coconut_fiber.pdf.

- Mississippi State University, Center for Sustainable Design. 1999. *Water Related Best Management Practices in the Landscape: Coconut Fiber Roll.* Created for United States Department of Agriculture, Natural Resource Conservation Service, Watershed Science Institute. http://www.abe.msstate.edu/csd/NRCS-BMPs/pdf/streams/bank/coconutfiberroll.pdf.

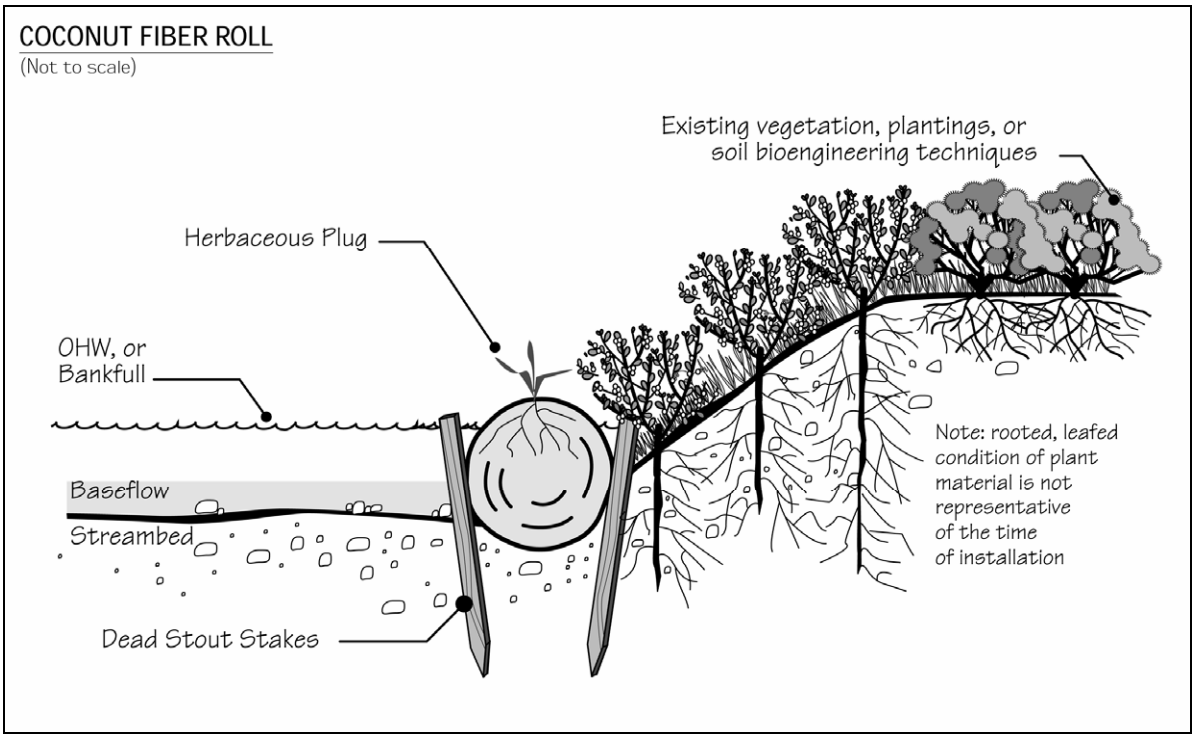

Figure 7.13 Coconut Fiber Roll (USDA-FS, 2002)

Collection Systems

Channelization
- ☐ Physical & chemical
- ☐ Instream/riparian restoration

Dams
- ☐ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☑ Maintain fish passage

Erosion
- ☐ Streambanks ☐ Shorelines
  - ☐ Vegetative
  - ☐ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

Collection systems involve capture of fish by screening and/or netting followed with transport by truck or barge to a downstream location. Since the late 1970s, the USACE has successfully implemented a program that takes juvenile salmon from the uppermost dams in the Columbia River system (Pacific Northwest) and transports them by barge or truck to below the last dam. The program improves the travel time of fish through the river system, reduces most of the exposure to reservoir predators, and eliminates the mortality associated with passing through a series of turbines (van der Borg and Ferguson, 1989). Survivability rates for the collected fish are in excess of 95 percent, as opposed to survival rates of about 60 percent when the fish remain in the river system and pass through the dams (Dodge, 1989). However, the collection efficiency can range from 70 percent to as low as 30 percent. At the McNary Dam on the Columbia River, spill budgets are also implemented to improve overall passage (discussed in greater detail below) when the collection rate achieves less than 70 percent efficiency (Dodge, 1989).

Additional Resource

- Chelan County Public Utility District. No date. *Juvenile Fish Bypass*. http://www.chelanpud.org/juvenile-fish-passage.html.

Construct Runoff Intercepts

Channelization
- ☐ Physical & chemical
- ☐ Instream/riparian restoration

Dams
- ☑ Erosion control
- ☑ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☐ Streambanks ☐ Shorelines
  - ☐ Vegetative
  - ☐ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

Benches, terraces, or ditches break up a slope by providing areas of low slope in the reverse direction. This keeps water from proceeding down the slope at increasing volume and velocity. Instead, the flow is directed to a suitable outlet or protected drainage system. The frequency of benches, terraces, or ditches will depend on the erodibility of the soils, steepness and length of the slope, and rock outcrops. This practice can be used if there is a potential for erosion along the slope.

Earth dikes, perimeter dikes or swales, or diversions can intercept and convey runoff from above disturbed areas to undisturbed areas or drainage systems. An earth dike is a temporary berm or ridge of compacted soil that channels water to a desired location. A perimeter dike/swale or diversion is a swale with a supporting ridge on the lower side that is constructed from the soil excavated from the adjoining swale (Delaware DNREC, 2003). These practices can intercept flow from denuded areas or newly seeded areas and keep clean runoff away from disturbed areas. The structures can be stabilized within 14 days of installation. A pipe slope drain, also known as a pipe drop structure, is a temporary pipe placed from the top of a slope to the bottom of the slope to convey concentrated runoff down the slope without causing erosion (Delaware DNREC, 2003).

Additional Resources

- CASQA. 2003. *California Stormwater BMP Construction Handbook*: *Earth Dikes and Drainage Swales.* California Stormwater Quality Association, Sacramento, CA. http://www.cabmphandbooks.com/Documents/Construction/EC-9.pdf.

- Fifield, J. 2000. *Design and Implementation of Runoff Control Structures: Diversion Dikes and Swales.* http://www.forester.net/ec_0001_design.html#diversion.

- Lake Superior/Duluth Streams. 2005. *Grassed Swales.* http://www.duluthstreams.org/stormwater/toolkit/swales.html.

Constructed Spawning Beds

Channelization
- ☐ Physical & chemical
- ☐ Instream/riparian restoration

Dams
- ☐ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☑ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☐ Streambanks ☐ Shorelines
  - ☐ Vegetative
  - ☐ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

When a dam adversely affects the aquatic habitat of an anadromous fish species, one option may be to construct replacement spawning beds. Additional facilities such as electric barriers, fish ladders, or bypass channels would be required to channel the fish to these spawning beds.

Merz et al., (2004) tested whether spawning bed enhancement increases survival and growth of Chinook salmon (*Oncorhynchus tshawytscha*) embryos in a regulated stream with a gravel deficit. The authors also examined a dozen physical parameters correlated with spawning sites (e.g., stream velocity, average turbidity, distance from the dam) and how they predicted survival and growth of Chinook salmon and steelhead (*Oncorhynchus mykiss*). The results suggest that spawning bed enhancement can improve embryo survival in degraded habitat. Measuring observed physical parameters before and after spawning bed manipulation can also accurately predict benefits. The National Oceanic and Atmospheric Administration's (NOAA's) S*tatus Review of Chinook Salmon from Washington, Idaho, Oregon, and California* (1998) states that artificial spawning beds for ocean-type Chinook salmon operated near three different dams was discontinued because of high pre-spawning mortality in adult fish and poor egg survival in the spawning beds. Success of constructed spawning beds in increasing survival and development of fish varies and often depends on the site.

Construction Management

Channelization
- ☐ Physical & chemical
- ☐ Instream/riparian restoration

Dams
- ☑ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☐ Streambanks ☐ Shorelines
  - ☐ Vegetative
  - ☐ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

Construction areas can be managed properly to control erosion by stabilizing entrances and proper traffic routing. A construction entrance is a pad of gravel or rock over filter cloth located where traffic enters and leaves a construction site. As construction vehicles drive over the gravel, mud and sediment are collected from the vehicles' wheels. To maximize effectiveness, the rock pad should be at least 50 feet long and 10 to 12 feet wide. The gravel should be 1- to 2-inch aggregate 6 inches deep laid over a layer of filter fabric. Maintenance might include pressure washing the gravel to remove accumulated sediment and adding more rock to maintain thickness. Runoff from this entrance should be treated before exiting the site. This practice can be combined with a designated truck wash-down station to ensure sediment is not transported off-site.

Where possible, construction traffic should be directed to avoid existing or newly planted vegetation. Instead, it should be directed over areas that must be disturbed for other construction activity. This practice reduces the net total area that is cleared and susceptible to erosion.

Additional Resources

- CASQA. 2003. *California Stormwater BMP Construction Handbook*: *Stabilized Construction Entrance/Exit.* California Stormwater Quality Association, Sacramento, CA. http://www.cabmphandbooks.com/Documents/Construction/TR-1.pdf.

- ISU. 2006. *Iowa Construction Site Erosion Control Manual: Stabilized Construction Entrance.* Iowa State University. http://www.ctre.iastate.edu/erosion/manuals/construction/3.14_stabilized_entrance.pdf.

Dormant Post Plantings

Channelization
- ☑ Physical & chemical
- ☑ Instream/riparian restoration

Dams
- ☑ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☑ Streambanks ☑ Shorelines
  - ☑ Vegetative
  - ☐ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

Dormant post plantings include planting of either cottonwood, willow, poplar, or other sprouting species embedded vertically into streambanks to increase channel roughness, reduce flow velocities near the slope face, and trap sediment (Figure 7.14). Dormant posts are made up of large cuttings installed in streambanks in square or triangular patterns. Live posts should be 7 to 20 feet long and 3 to 5 inches in diameter. This method is effective for quickly establishing riparian vegetation particularly in arid regions. By decreasing near bank flow velocities, this design causes sediment deposition and reduces streambank erosion. This design is more resistant to erosion than live staking or similar designs that use smaller cuttings. Success of this design is most likely on streambanks that are not gravel dominated and where ice build up is not common. The exclusion of certain herbivores aids in the success of this design. This method should be combined with other soil bioengineering techniques to achieve a comprehensive streambank restoration design (FISRWG, 1998). Installation guidelines are available from the USDA-FS Soil Bioengineering Guide (USDA-FS, 2002).

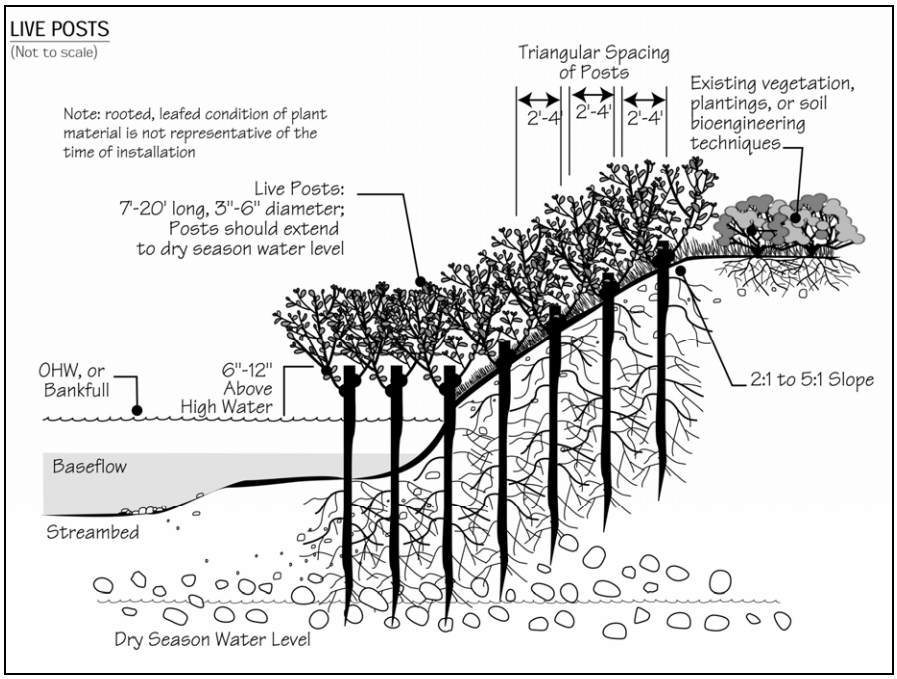

Figure 7.14 Live Posts (USDA-FS, 2002)

Additional Resources

- FISRWG. 1998. *Stream Corridor Restoration: Principles, Processes, and Practices*. Federal Interagency Stream Restoration Working Group. http://www.nrcs.usda.gov/technical/stream_restoration/PDFFILES/APPENDIX.pdf.
- ISU. 2006. *How to Control Streambank Erosion: Dormant Post Plantings.* Iowa State University. http://www.ctre.iastate.edu/erosion/manuals/streambank/dormant_post.pdf.

Encourage Drainage Protection

Channelization
- ☐ Physical & chemical
- ☐ Instream/riparian restoration

Dams
- ☐ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☑ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☐ Streambanks ☐ Shorelines
  - ☐ Vegetative
  - ☐ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

A complete understanding of watershed protection should include the implementation of practices that guide future development and land use activities. This will not only help to identify existing sources of NPS pollution but also to prevent future impairments that may impact dam construction or operations and reservoir management. Watershed protection practices can include zoning for natural resource protection. Several zoning techniques are:

- Use cluster zoning and planned unit development
- Consider resource protection zones
- Practice performance-based zoning
- Establish overlay zones
- Establish bonus or incentive zoning
- Consider large lot zoning
- Practice agricultural protection zoning
- Use watershed-based zoning
- Delineate urban growth boundaries

More details about these techniques and case studies can be found in *Protecting Wetlands: Tools for Local Governments in the Chesapeake Bay Region* (Chesapeake Bay Program, 1997).

Equipment Runoff Control

Channelization
- ☐ Physical & chemical
- ☐ Instream/riparian restoration

Dams
- ☐ Erosion control
- ☐ Runoff control
- ☑ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☐ Streambanks ☐ Shorelines
  - ☐ Vegetative
  - ☐ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

During construction and maintenance activities at dams, equipment and machinery can be a potential source of pollution to the surface and ground water. Thinners or solvents should not be discharged into sanitary or storm sewer systems or into surface water systems, when cleaning machinery. Use alternative methods for cleaning larger equipment parts, such as high-pressure, high-temperature water washes or steam cleaning. Equipment-washing detergents can be used and wash water appropriately discharged. Small parts should be cleaned with degreasing solvents that can be reused or recycled. Washout from concrete trucks should never be dumped directly into surface waters or into a drainage leading to surface waters but can be disposed of into:

- A designated area that will later be backfilled
- An area where the concrete wash can harden, can be broken up, and can then be appropriately disposed
- A location not subject to surface water runoff and more than 50 feet away from a receiving water

Erosion and Sediment Control (ESC) Plans

Channelization
- ☑ Physical & chemical
- ☑ Instream/riparian restoration

Dams
- ☑ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☑ Streambanks ☑ Shorelines
  - ☐ Vegetative
  - ☐ Structural
  - ☐ Integrated
  - ☑ Planning & regulatory

ESC plans are important for controlling the adverse impacts of dam construction. ESC plans ensure that provisions for control measures are incorporated into the site planning stage of development. ESC plans also provide for prevention of erosion and sediment problems and accountability if a problem occurs (MDEP, 1990). In many municipalities, ESC plans are required under ordinances enacted to protect water resources. These plans describe the activities construction and maintenance personnel will use to reduce soil erosion and contain and treat runoff that is carrying eroded sediments. ESC plans typically include descriptions and locations of soil stabilization practices, perimeter controls, and runoff treatment facilities that will be installed and maintained before and during construction activities. In addition to special area considerations, the full ESC plan review inventory should include:

- Topographic and vicinity maps
- Site development plan
- Construction schedule
- Erosion and sedimentation control plan drawings
- Detailed drawings and specifications for practices
- Design calculations
- Vegetation plan
- Detailed drawings and specifications for control or management practices

Some erosion and soil loss is unavoidable during land-disturbing activities. Although proper siting and design help prevent areas prone to erosion from being developed, construction activities invariably produce conditions where erosion can occur. To reduce the adverse impacts associated with construction activities at dams, the construction management measure suggests a system of nonstructural and structural ESCs for incorporation into an ESC plan.

Nonstructural controls address erosion control by decreasing erosion potential, whereas structural controls are both preventive and mitigative because they control erosion and sediment movement. Brown and Caraco (1997) identified several general objectives that should be addressed in an effective ESC plan:

- *Minimize clearing and grading* – clearing and grading should occur only where absolutely necessary to build and provide access to structures and infrastructure. Clearing should be done immediately before construction, rather than leaving soils exposed for months or years (SQI, 2000).
- *Protect waterways and stabilize drainage ways* – all natural waterways within a development site should be clearly identified before construction activities begin. Clearing should generally be prohibited in or adjacent to waterways. Sediment control

practices such as check dams might be needed to stabilize drainage ways and retain sediment on-site.

- *Phase construction to limit soil exposure* – construction phasing is a process where only a portion of the site is disturbed at any one time to complete the required building in that phase. Other portions of the site are not cleared and graded until exposed soils from the earlier phase have been stabilized and the construction nearly completed.
- *Stabilize exposed soils immediately* – seeding or other stabilization practices should occur as soon as possible after grading. In colder climates, a mulch cover is needed to stabilize the soil during the winter months when grass does not grow or grows poorly.
- *Protect steep slopes and cuts* - wherever possible, clearing and grading of existing steep slopes should be completely avoided. If clearing cannot be avoided, practices should be implemented to prevent runoff from flowing down slopes.
- *Install perimeter controls to filter sediments* – perimeter controls are used to retain sediment-laden runoff or filter it before it exits the site. The two most common perimeter control options are silt fences and earthen dikes or diversions.
- *Employ advanced sediment-settling controls* – traditional sediment basins are limited in their ability to trap sediments because fine-grained particles tend to remain suspended and the design of the basin themselves is often simplistic. Sediment basins can be designed to improve trapping efficiency through the use of perforated risers; better internal geometry; the installation of baffles, skimmers, and other outlet devices; gentler side slopes; and multiple-cell construction.

ESC plans ensure that provisions for control measures that are incorporated into the site planning stage of development help to reduce the incidence of erosion and sediment problems, and improve accountability if a problem occurs. An effective plan for runoff management on construction sites controls erosion, retains sediments on-site to the extent practicable, and reduces the adverse effects of runoff. Climate, topography, soils, drainage patterns, and vegetation affect how erosion and sediment should be controlled on a site (Washington State Department of Ecology, 1989).

ESC plans should be flexible to account for unexpected events that occur after the plans have been approved, including:

- Discrepancies between planned and as-built grades
- Weather conditions
- Altered drainage
- Unforeseen construction requirements

Changes to an ESC plan should be made based on regular inspections that identify whether the ESC practices were appropriate or properly installed or maintained. Inspecting an ESC practice after storm events shows whether the practice was installed or maintained properly. Such inspections also show whether a practice requires cleanout, repair, reinforcement, or replacement with a more appropriate practice. Inspecting after storms is the best way to ensure that ESC practices remain in place and effective at all times during construction activities.

Because funding for ESC programs is not always dedicated, budgetary and staffing constraints may thwart effective program implementation. Brown and Caraco (1997) recommend several management techniques to ensure that ESC programs are properly administered:

- Local leadership committed to the ESC program
- Redeployment of existing staff from the office to the field or training room
- Cross-training of local review and inspection staff
- Submission of erosion prevention elements for early planning reviews.
- Prioritization of inspections based on erosion risk
- Requirement of designers to certify the initial installation of ESC practices
- Investment in contractor certification and private inspector programs
- Use of public-sector construction projects to demonstrate effective ESC controls
- Enlistment of the talents of developers and engineering consultants in the ESC program
- Revision and update of the local ESC manual

An allowance item that acts as an additional "insurance policy" for complying with the erosion and sediment control plan can be added to bid or contract documents (Deering, 2000a). This allowance covers costs to repair storm damage to ESC measures as specified in the ESC plan. This allowance does not cover storm damage to property that is not related to the ESC plan, because this would be covered under traditional liability insurance. Damage caused by severe and continuous rain events, windblown objects, fallen trees or limbs, or high-velocity, short-term rain events on steep slopes and existing grades would be covered by the allowance, as would deterioration from exposure to the elements or excessive maintenance for silt removal. The contractor is responsible for being in compliance with the ESC plan by properly implementing and maintaining all specified measures and structures. The allowance does not cover damage to practices caused by improper installation or maintenance.

Additional Resources

- ISU. 2006. *Iowa Construction Site Erosion Control Manual: Infiltration Basin and Trench.* Iowa State University. http://www.ctre.iastate.edu/erosion/manuals/construction/4.1_infiltration.pdf.

- Milwaukee River Basin Partnership. 2003. *Detention & Infiltration Basins.* http://clean-water.uwex.edu/plan/drbasins.htm.

- Tennessee Department of Environment and Conservation. 2002. *Erosion and Sediment Control Handbook: Vegetative Practices*. Tennessee Department of Environment and Conservation, Nashville, TN. http://state.tn.us/environment/wpc/sed_ero_controlhandbook/2.%20Vegetative%20Practices.pdf.

Erosion Control Blankets

Channelization
- ☐ Physical & chemical
- ☐ Instream/riparian restoration

Dams
- ☑ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☐ Streambanks ☐ Shorelines
  - ☐ Vegetative
  - ☐ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

Turf reinforcement mats (TRMs) combine vegetative growth and synthetic materials to form a high-strength mat that helps prevent soil erosion in drainage areas and on steep slopes (Figure 7.15) (USEPA, 1999). TRMs enhance vegetation's natural ability to protect soil from erosion. They are composed of interwoven layers of nondegradable geosynthetic materials (e.g., nylon, polypropylene) stitched together to form a three-dimensional matrix. They are thick and porous enough to allow for soil filling and retention. In addition to providing scour protection, the mesh netting of TRMs is designed to enhance vegetative root and stem development. By protecting the soil from scouring forces and enhancing vegetative growth, TRMs can raise the threshold of natural vegetation to withstand higher hydraulic forces on stabilization slopes, streambanks, and channels. In addition to reducing flow velocities, natural vegetation removes particulates through sedimentation and soil infiltration and improves site aesthetics. In general, TRMs should not be used for the following:

- To prevent deep-seated slope failure due to causes other than surficial erosion
- If anticipated hydraulic conditions are beyond the limits of TRMs and natural vegetation
- Directly beneath drop outlets to dissipate impact force (can be used beyond impact zone)
- Where wave height might exceed 1 foot (can protect areas upslope of wave impact zone)

The performance of a TRM-lined conveyance system depends on the duration of the runoff event. For short-term events, TRMs are typically effective at flow velocities of up to 15 feet per second and shear stresses of up to 8 lb/ft^2. However, specific high-performance TRMs may be effective under more severe hydraulic conditions. Practitioners should check with manufacturers for specifications and performance limits of different products. Factors influencing the cost of TRMs include the type of material required, site conditions (e.g., underlying soils, slope steepness), and installation-specific factors (e.g., local construction costs). TRMs typically cost considerably less than concrete and riprap solutions.

Figure 7.15 Erosion Control Blanket (Conwed Fibers, n.d.)

Additional Resources

- Barr Engineering Company. 2001. *Minnesota Urban Small Sites BMP Manual: Stormwater Best Management Practices for Cold Climates. Soil Erosion Control: Mulches, Blankets and Mats.* Prepared for the Metropolitan Council by Barr Engineering Company, St. Paul, MN. http://www.metrocouncil.org/Environment/Watershed/BMP/CH3_RPPSoilMulch.pdf.

- CASQA. 2003. *California Stormwater BMP Construction Handbook: Geotextiles and Mats.* California Stormwater Quality Association, Sacramento, CA. http://www.cabmphandbooks.com/Documents/Construction/EC-7.pdf.

- California Department of Transportation. 1999. *Soil Stabilization Using Erosion Control Blankets.* Construction Storm Water Pollution Prevention Bulletin. Vol. 3, No. 8. California Department of Transportation, Division of Environmental Analysis, Sacramento, CA. http://www.dot.ca.gov/hq/env/stormwater/publicat/const/Aug_1999.pdf.

- Matthews, M. 1998. *What are RECPs? Soil Stabilization Using Erosion Control Blankets*. Erosion Control Technology Council, St. Paul, MN. http://www.ectc.org/what.html.

- North American Green. 2004. *Green Views: Turn Reinforcement Mats as an Alternative to Rock Riprap*. North American Green, Evansville, IN. http://www.nagreen.com/resources/literature/GV_AltToRockRiprap.pdf.

- Tennessee Department of Environment and Conservation. 2002. *Erosion and Sediment Control Handbook: Vegetative Practices: Erosion Control Blanket/Matting*. Tennessee Department of Environment and Conservation, Nashville, TN. http://state.tn.us/environment/wpc/sed_ero_controlhandbook/2.%20Vegetative%20Practices.pdf.

Establish and Protect Stream Buffers

Channelization
- ☐ Physical & chemical
- ☑ Instream/riparian restoration

Dams
- ☐ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☑ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☑ Streambanks ☐ Shorelines
  - ☐ Vegetative
  - ☐ Structural
  - ☐ Integrated
  - ☑ Planning & regulatory

Riparian buffers and wetlands can provide long-term pollutant removal capabilities without the comparatively high costs usually associated with constructing and maintaining structural controls. Conservation or preservation of these areas is important to water quality protection. Land acquisition programs help to preserve areas considered critical to maintaining surface water quality. Adequate buffer strips along streambanks provide protection for stream ecosystems, help stabilize the stream, and can prevent streambank erosion (Holler, 1989). Buffer strips can also protect and maintain near-stream vegetation that attenuates the release of sediment into stream channels. Levels of suspended solids have been shown to increase at a slower rate in stream channel sections with well-developed riparian vegetation (Holler, 1989).

Stream buffers should be protected and preserved as a conservation area because these areas provide many important functions and benefits, including:

- Providing a "right-of-way" for lateral movement
- Conveying floodwaters
- Protecting streambanks from erosion
- Treating runoff and reducing drainage problems from adjacent areas
- Providing nesting areas and other wildlife habitat functions
- Mitigating stream warming
- Protecting wetlands
- Providing recreational opportunities and aesthetic benefits
- Increasing adjacent property values

Specific stream buffer practices could include:

- Establishing a stream buffer ordinance
- Developing vegetative and use strategies within management zones
- Establishing provisions for stream buffer crossings
- Integration of structural runoff management practices where appropriate
- Developing stream buffer education and awareness programs

More information on establishing and protecting stream buffers is available from EPA's *National Management Measures to Control Nonpoint Source Pollution from Urban Areas*,[4] a document for use by state, local, and tribal managers in the implementation of nonpoint source pollution management programs. It contains a variety of practices and management activities for reducing pollution of surface and ground water from urban areas (USEPA, 2005d).

[4] http://www.epa.gov/owow/nps/urbanmm/index.html

Fish Ladders

Channelization
- ☐ Physical & chemical
- ☐ Instream/riparian restoration

Dams
- ☐ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☑ Maintain fish passage

Erosion
- ☐ Streambanks ☐ Shorelines
  - ☐ Vegetative
  - ☐ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

Fish ladders have been a commonly used structure to enable the safe upstream and downstream passage of mature fish (see Figure 7.16). There are four basic designs: pool-weir, Denil, vertical slot, and steeppass.

Pool-weir fish ladders are one of the oldest and most commonly designed fish passage structures, which consists of stepped pools and weirs that allow fish to pass from pool to pool over the weirs that separate each. Pool-weir fish ladders are normally used on slopes of about 10-degrees. Some pool-weir fish ladders can be modified to increase the possible number of fish that are passed by including submerged orifices that allow fish to pass the fish ladder without cresting the weirs.

Pool-weir fish ladders will pass many different species of fish if they are designed correctly for the environment in which they are employed. OTA (1995) provides details on design and operation of various forms of fish ladders.

Figure 7.16 Fish Ladder at Feather River Hatchery, Oroville Dam, CA (Feather River, n.d.)

Denil fish ladders are elongated rectangular channels that use internal baffles to dissipate flow energy and allow fish passage. They are widely used in the eastern United States due to their ability to pass a wide range of species (from salmonids to riverine) over a wider range of flows than pool-weir ladders. Denil ladders can be used on slopes from 10 to 25 degrees although 10 to 15 degrees is optimal. Most Denil fish ladders are 2–4 feet wide and 4–8 feet deep. This fish ladder design allows fish to pass at a preferred depth instead of through a jumping action. Denil ladders do not have resting areas and therefore fish must either be able to pass the ladder in one burst or resting pools must be provided between sections. Resting pools should be provided every 16 to 50 feet depending upon the species being passed. The high flow rates and turbulence

associated with Denil fish ladders reduces the demand for attraction flow, which is commonly added to insure good attraction over varying flow rates.

Vertical slot fish ladders are elongated rectangular channels that use regularly spaced baffles to create steps and resting pools. The vertically oriented slots in the baffles allow fish to pass through the ladder at a preferred depth. Unlike Denil fishways, vertical slot fishways provide a resting area behind each baffle allowing fish to pass in a "burst-rest" manner instead of one sustained motion. The channel created by the baffles is off-center making the baffles on one side of the ladder wider than the opposing side. Eddies that form behind longer baffles allow fish to rest and end the need for resting areas. Although vertical slot ladders are usually operated at slopes of about 10 degrees, they can be operated over a larger variety of flows. The vertical slots create a water jet that is regulated by the pool on the downstream side of it. This creates a uniform, level flow throughout the ladder.

The steeppass fish ladder, often referred to as the "Alaska steeppass," is a modified Denil fish ladder most commonly used in remote areas for the passage of salmonids. Steeppass fish ladders are usually constructed of lightweight materials such as aluminum and can operate on slopes up to 33 percent. The construction materials and design allow this type of fish ladder to be deployed as a single unit to remote areas. The baffles used in steeppass ladders are more aggressively designed, which allow the ladder to more effectively control water flow. The steeppass ladder is not without its limitations. Due to their narrow design, steeppass ladders are more susceptible to clogging due to debris and changes in flow upstream or downstream of the ladder.

Although fish ladders can be extremely efficient at passing fish, small changes in design have been shown to significantly improve their functionality. A good example of this is the John Day Dam located on the Columbia River. The original design focused on the passage of salmonids and therefore only passed about 17 percent of the American shad (*Alosa sapidissima*) using the ladder. Research indicated that simple design changes could allow for the passage of riverine species such as American shad. By changing the placement of the weirs within the fish ladder, the fish ladder was able to pass 94 percent of the salmonids, and American shad passage increased to 74 percent (Monk et al., 1989).

According to the USACE, Portland District (1997), the success rate for adults negotiating fish ladders at dams in the Columbia River Basin is about 95 percent. The U.S. Fish and Wildlife Agency designs fishways assuming a 90 percent efficiency rate. Few studies document actual efficiency of fish ladders, but it is recognized that not all fishways are equally effective (for various reasons, such as predation or physical damage to passing fish). Some fishways installed in the last 20 years are less effective than newer ones (when federal licenses began to include fish passage requirements). Maine Department of Marine Resources (DMR) estimates efficiency between 75 and 90 percent (Presumpscot River Plan Steering Committee, 2002).

Additional Resource

- Michigan DNR. No date. *What is a fish ladder?* Michigan Department of Natural Resources, Lansing, MI. http://www.michigan.gov/dnr/0,1607,7-153-10364_19092-46291--,00.html.

Fish Lifts

Channelization
- ☐ Physical & chemical
- ☐ Instream/riparian restoration

Dams
- ☐ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☑ Maintain fish passage

Erosion
- ☐ Streambanks ☐ Shorelines
  - ☐ Vegetative
  - ☐ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

Fish lifts describe both fish elevators and locks, which are used to capture fish at the downstream side of a structure and then move them above the structure. Like fish ladders, these systems require sufficient attraction flow to move fish into the lift area. Lift systems can be advantageous because they are not species or flow specific. They can also be employed at structures too tall for fish ladders and to pass species with reduced swimming ability.

Lift systems have the potential to move large numbers of fish if they are operated efficiently. These systems can be automated to allow operation much like fish ladders. Fish lift systems do require additional operation and maintenance costs and are subject to mechanical failures not associated with fish ladders.

Most lift systems require either an active or passive bypass system to move fish far enough upstream to avoid entrainment in the flow through the dam. Passive bypass systems may include constructed waterways or pipes that discharge passed fish sufficiently up-steam of the structure. Active bypass systems include trucking and pumping operations that discharge the fish safely upstream of the structure. Active bypass systems, especially pumping systems, have come under scrutiny for fish behavior and health reasons. During the pumping process, fish may be subject to descaling and/or death due to overcrowding. After release, the fish may have orientation problems and therefore be subject to higher rates of predation mortality. Due to these concerns the United States Fish and Wildlife service has generally opposed the use of fish pumps (OTA, 1995).

Flow Augmentation

Channelization
- ☐ Physical & chemical
- ☐ Instream/riparian restoration

Dams
- ☐ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☑ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☐ Streambanks ☐ Shorelines
  - ☐ Vegetative
  - ☐ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

Operational procedures such as flow regulation, flood releases, or fluctuating flow releases all have the potential for detrimental impacts on downstream aquatic and riparian habitat. When evaluating solutions associated with degraded aquatic and riparian habitat, stakeholders must balance operational procedures to address the needs of downstream aquatic and riparian habitat with the requirements of dam operation. There are often legal and jurisdictional requirements for an operational procedure at a particular dam that should also be considered (USDOI, 1988).

A flushing flow is a high-magnitude, short-duration release for the purpose of maintaining channel capacity and the quality of instream habitat by scouring the accumulation of fine-grained sediments from the streambed. Availability of suitable instream habitat is a key factor limiting spawning success. Flushing flows wash away the sediments without removing the gravel. Flushing flows also prevent the encroachment of riparian vegetation.

However, it is important to keep in mind that flushing flows are not recommended in all cases. Flushing flows of a large magnitude may cause flooding in the old floodplain or depletion of gravel below a dam. Flushing flows are more efficient and predictable for small, shallow, high-velocity mountain streams unaltered by dams, diversions, or intensive land use. Routine maintenance generally requires a combination of practices including high flows coupled with sediment dams or channel dredging, rather than simply relying on flushing or scouring flows (Nelson et al., 1988).

Several options exist for creating minimum flows in the tailwaters below dams. The selection of any particular technique as the most cost-effective is site-specific and depends on several factors including adequate performance to achieve the desired instream and riparian habitat characteristic, compatibility with other requirements for operation of the hydropower facility, availability of materials, and cost.

Sluicing is the practice of releasing water through the sluice gate rather than through the turbines. For portions of the waterway immediately below the dam, the steady release of water by sluicing provides minimum flows with the least amount of water expenditure. At some facilities, this practice may dictate that modifications be made to the existing sluice outlets to maintain continuous low releases. Continuous low-level sluice releases at Eufala Lake and Fort Gibson Lake (Oklahoma) provided minimum flows needed to sustain downstream fish populations. The sluicing also had the benefit of improving DO levels in tailwaters downstream of these two dams such that fish mortalities, which had been experienced in the tailwaters below these two dams prior to initiating this practice, no longer occurred (USDOE, 1991).

Turbine pulsing is a practice involving the release of water through the turbines at regular intervals to improve minimum flows. In the absence of turbine pulsing, water is released from large hydropower dams only when the turbines are operating, which is typically when the demand for power is high.

A study undertaken at the Douglas Dam (French Broad River, Tennessee) suggests some of the site-specific factors that should be considered when evaluating the advantages of practices such as turbine pulsing, sluicing, or other alternatives for providing minimum flows and improving dissolved oxygen (DO) levels in reservoir releases. Two options for maintaining minimum flows (turbine pulsing and sluicing), and two aeration alternatives (operation of surface water pumps and diffusers) were evaluated for their effectiveness, advantages, and disadvantages in providing minimum flows and aeration of reservoir releases. Computer modeling indicated that either turbine pulsing or sluicing could improve DO concentrations in releases by levels ranging from 0.7 to 1.5 mg/L. This is slightly below the level of improvement that might be expected from operation of a diffuser system for aeration. A trade-off can also be expected at this facility between water saved by frequent short-release pulses and the higher maintenance costs due to operating turbines on and off frequently (Hauser et al., 1989). Hauser et al. (1989) found that schemes of turbine pulsing ranging from 15-minute intervals to 60-minute intervals every 2 to 6 hours were found to provide fairly stable flow regimes after the first 3 to 8 miles downstream at several Tennessee Valley Authority (TVA) projects. However, at points farther downstream, less overall flow would be produced by sluicing than by pulsing. Turbine pulsing may also cause waters to rise rapidly, which could endanger people wading or swimming in the tailwaters downstream of the dam (TVA, 1990).

Fuel and Maintenance Staging Areas

Proper maintenance of equipment and installation of proper stream crossings will further reduce pollution of water by these sources. Vehicles need to be inspected for leaks. To prevent runoff, fuel and maintain vehicles on site only in a bermed area or over a drip pan. Fuel tanks should be protected and have containment systems. Stream crossings can be minimized through proper planning of access roads. This will help to keep potential sources of pollution away from direct contact with surface waters.

Channelization
- ☐ Physical & chemical
- ☐ Instream/riparian restoration

Dams
- ☐ Erosion control
- ☐ Runoff control
- ☑ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☐ Streambanks ☐ Shorelines
  - ☐ Vegetative
  - ☐ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

Gated Conduits

Gated conduits are hydraulic structures that divert the flow of water under the dam. They are designed to create turbulent mixing to enhance oxygen transfer. Gates are used to control the cross-sectional area of flow. Gated conduits have been extensively analyzed for their performance and effectiveness (Wilhelms and Smith, 1981), although the available data are mostly from high-head projects (Wilhelms, 1988). An example of the effectiveness found that gated conduit structures were able to achieve 90 percent aeration and a minimum DO standard of 5 mg/L (Wilhelms and Smith, 1981).

Channelization
- ☐ Physical & chemical
- ☐ Instream/riparian restoration

Dams
- ☐ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☑ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☐ Streambanks ☐ Shorelines
  - ☐ Vegetative
  - ☐ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

Groins

Channelization
- ☐ Physical & chemical
- ☐ Instream/riparian restoration

Dams
- ☐ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☐ Streambanks ☑ Shorelines
  - ☐ Vegetative
  - ☑ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

Groins are structures that are built perpendicular to the shore and extend into the water. Examples of possible planform shapes for groins are illustrated in Figure 7.17. They are generally constructed in series, referred to as a groin field, along the entire length of shore to be protected. Groins trap sand in littoral drift and halt its longshore movement along beaches. The sand trapped by each groin acts as a protective barrier that waves can attack and erode without damaging previously unprotected upland areas. Unless the groin field is artificially filled with sand from other sources, sand is trapped in each groin by interrupting the natural supply of sand moving along the shore in the natural littoral drift. This frequently results in an inadequate natural supply of sand to replace the sand carried away from beaches located farther along the shore in the direction of the littoral drift. If "downdrift" beaches are kept starved of sand for long periods of time, severe beach erosion in unprotected areas can result. As with bulkheads and revetments, the most durable materials for construction of groins are timber and stone. Less expensive techniques for building groins use sand- or concrete-filled bags or tires. It must be recognized that the use of lower-cost materials in the construction of bulkheads, revetments, or groins frequently results in less durability and reduced project life. Figure 7.18 illustrates transition from a groin field to a natural shoreline.

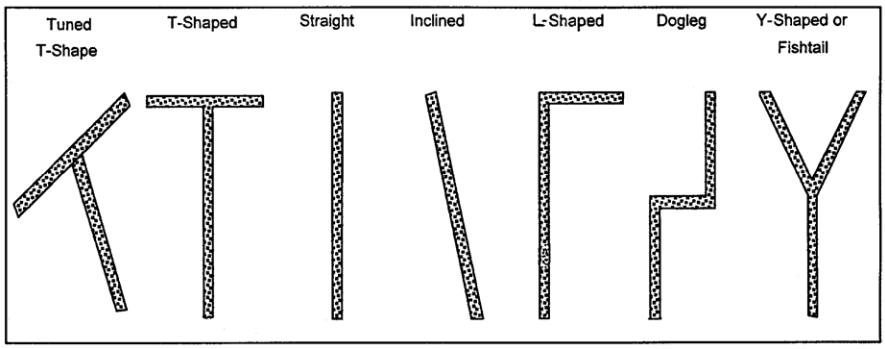

Figure 7.17 Possible Planform Shapes for Groins (USACE, 2003)

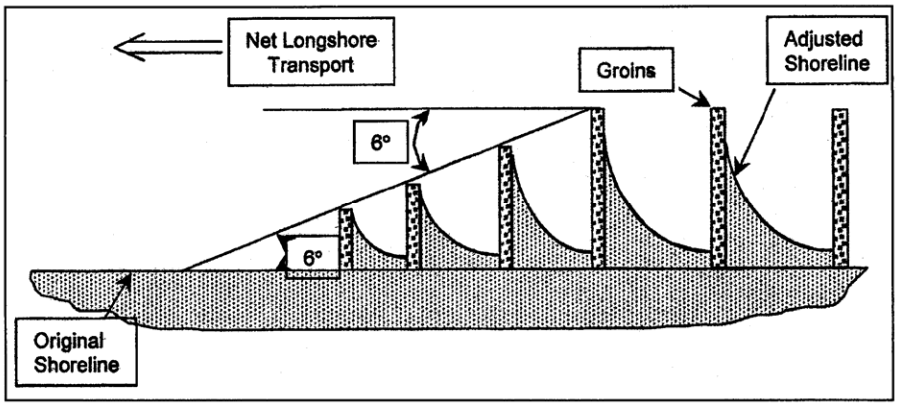

Figure 7.18 Transition from Groin Field to Natural Shoreline (USACE, 2003)

Additional Resource

- USACE. No date. *Groins.* U.S. Army Corps of Engineers, Coastal & Hydraulics Laboratory. http://chl.erdc.usace.army.mil/chl.aspx?p=s&a=ARTICLES!188.

Identify and Address NPS Contributions

Channelization
- ☐ Physical & chemical
- ☐ Instream/riparian restoration

Dams
- ☐ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☑ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☐ Streambanks ☐ Shorelines
  - ☐ Vegetative
  - ☐ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

Another watershed protection practice involves the evaluation of the total NPS pollution contributions in the watershed. NPS contributions can stem from different land use activities upstream from a dam. For example, the analysis and interpretation of stereoscopic color infrared aerial photographs can be used to find and map specific areas of concern where a high probability of NPS pollution exists from septic tank systems, animal wastes, soil erosion, and other similar types of NPS pollution (TVA, 1988). Other remote sensing techniques, such as analysis of satellite imagery, can be used to map areas of concern within a watershed. Historically, TVA has used analysis of aerial photography images to survey about 25 percent of the Tennessee Valley to identify sources of nonpoint pollution in a period of less than 5 years at a cost of a few cents per acre (TVA, 1988). Modern geographic information systems (GIS) enable watershed planners and modelers to rapidly assess large watersheds in a cost-effective manner.

The development of Total Maximum Daily Loads (TMDLs) in watersheds with impaired waterbodies is a way to identify all sources of pollution. TMDLs are planning documents that provide load allocations, for both point and nonpoint sources, and identify potential contributions of pollutants to an impaired waterbody. TMDLs often include the involvement of stakeholders throughout the watershed, in not only the development, but also with implementation of specific activities within the watershed. TMDL documents can provide a plan for addressing pollution sources throughout a watershed.

Different practices can be used to control NPS pollution once sources have been identified. These practices may include the following:

Soil Erosion Control

Soil erosion has been determined to be the major source of suspended solids, nutrients, organic wastes, pesticides, and sediment that combined form the most problematic form of NPS pollution (TVA, 1988). Soil erosion and runoff controls have been addressed throughout earlier management measures in this document.

Mine Reclamation

Abandoned mines may have the potential to contribute significant sediment, metals, acidified water, and other pollutants to reservoirs (TVA, 1988). Old mines need to be located and reclaimed to reduce NPS pollutants emanating from them. Revegetation is a cost-effective method of reclaiming denuded strip-mined lands, and agencies such as the Natural Resource Conservation Service (NRCS) can provide technical insight for revegetation practices.

Animal Waste Control

A major contributor to reservoir pollution in some watersheds is waste from animal confinement facilities. TVA (1988) estimated that in the Tennessee Valley, farms produced about six times the organic wastes of the population of the valley. EPA also has available the *National Management Measures to Control Nonpoint Source Pollution from Agriculture*,[5] which is a technical guidance and reference document for use by state, local, and tribal managers in the implementation of NPS pollution management programs. It contains information on a variety of practices and management strategies for reducing pollution of surface and ground water from agriculture (USEPA, 2003b).

Correcting Failing Septic Systems

The objective of this practice is to protect waterbodies from pollutants discharged by onsite sewage disposal systems (OSDS). They should be sited, designed, and installed so that impacts to waterbodies will be reduced to the extent practicable. Factors such as soil type, soil depth, depth to water table, rate of sea level rise, and topography should be considered. The installation of OSDS should be prevented in areas where soil absorption systems will not provide adequate treatment of effluents containing solids, phosphorus, pathogens, nitrogen, and nonconventional pollution prior to entry into surface waters and ground water. Setbacks, separation distances, and maintenance requirements should be established.

Failing septic tank or OSDS are another source of NPS pollution in reservoirs. TVA has found septic tank failures to be a problem in some of its reservoirs and has identified them through an aerial survey (TVA, 1988). Additional guidance on OSDS is available from EPA's *Onsite Wastewater Treatment Systems Manual* (EPA 625-R-00-008), which is available through EPA's National Service Center for Environmental Publications.[6]

Land Use Planning

Land use plans that establish guidelines for permissible uses of land within a watershed serve as a guide for reservoir management programs addressing NPS pollution (TVA, 1988). Watershed land use plans identify suitable uses for land surrounding a reservoir, establish sites for economic development and natural resource management activities, and facilitate improved land management (TVA, 1988). Land use plans must be flexible documents that account for the needs of the landowners, state and local land use goals, the characteristics of the land and its ability to support various uses, and the control of NPS pollution (TVA, 1988).

Comprehensive planning is an effective nonstructural tool to control NPS pollution. Where possible, growth should be directed toward areas where it can be sustained with minimal impact on the environment (Meeks, 1990). Poorly planned growth and development have the potential to degrade and destroy natural drainage systems and surface waters (Mantell et al., 1990). Proper planning and zoning decisions allow water quality managers to direct development and land disturbance away from areas that drain to sensitive waters. Land use designations and zoning laws can also be used to protect environmentally sensitive areas such as riparian corridors and wetlands.

[5] http://www.epa.gov/owow/nps/pubs.html
[6] http://www.epa.gov/ncepihom

Identify and Preserve Critical Areas

Channelization
- ☐ Physical & chemical
- ☐ Instream/riparian restoration

Dams
- ☐ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☑ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☐ Streambanks ☐ Shorelines
  - ☐ Vegetative
  - ☐ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

Protection of sensitive areas and areas that provide water quality benefits (e.g., natural wetlands and riparian areas) is integral to maintaining or minimizing the impacts of development on receiving waters and associated habitat. Without a comprehensive planning approach that includes the use of riparian buffers, open space, bioretention, and structural controls to maintain the predevelopment hydrologic characteristics of the site, significant water quality and habitat impacts are likely. The experience of various communities has shown that the use of structural controls in the absence of adequate local land use planning and zoning often does not adequately protect water quality and might even cause detrimental effects, such as increased temperature.

An initial step for incorporating targeted land conservation into a runoff management program is to identify critical conservation areas on a watershed map and superimpose this information on a tax map. Owners of potential conservation lands could include a mix of individuals, corporations or other business entities, homeowner associations, government agencies, and land trusts.

Land conservation includes more than simply preserving land in its current state. It also means that an individual or organization should take responsibility for restoration of areas of the property that are contributing to runoff problems or have been adversely affected by runoff. Stewardship activities for land conservation might include:

- Resource monitoring
- General maintenance
- Control of exotic species
- Installation of structural runoff management practices and maintenance

There are several options for landowners who would like to retain ownership of the parcel but relinquish stewardship and conservation management to another organization. These nonexclusive management options, discussed below, include establishing conservation easements, leases, deed restrictions, covenants, or transfer of development rights (TDRs).

Conservation Easements

A conservation easement is a legal agreement that transfers specific rights concerning the use of land by sale or donation to a government agency (municipal, county, or state), a qualified nonprofit organization (e.g., land trust or conservancy), or other legal entity without transferring title of the land (Cwikiel, 1996).

Leases

Even though government agencies, land trusts, and other nonprofit organizations would prefer that conservation lands be acquired by donation or that conservation easements be placed on the property, some lands hold so much value as conservation areas that leasing is worth the expense and effort. Leasing a property allows the agency, trust, or organization to actively manage the land for conservation.

Deed Restrictions

Restrictions can be included in deeds for the purpose of constraining use of the land. In theory, deed restrictions are designed to perform functions similar to those of conservation easements. In practice, however, deed restrictions have proven to be much weaker substitutes because unlike conservation easements, deed restrictions do not necessarily designate or convey oversight responsibilities to a particular agency or organization to enforce protection and maintenance provisions. Also, deed restrictions can be relatively easy to modify or vacate through litigation. Modifying or nullifying an easement is difficult, especially if tax benefits have already been realized. For these reasons, conservation easements are generally preferred over deed restrictions.

Covenants

A covenant is similar to a deed restriction in that it restricts activities on a property, but it is in the form of a contract between the landowner and another party. The term *mutual covenants* is used to describe a situation where one or more nearby or adjacent landowners are contracted and covered by the same restrictions.

Transfer of Development Rights (TDRs)

The concept of TDRs as a watershed protection tool is based on the premise that ownership of land includes a “bundle” of property rights. One of these rights is the right to develop the property to its “highest and best use.” Although this right can be restricted by zoning building codes, environmental constraints, and other types of restrictions, the basic right to develop remains. A TDR system creates an opportunity for property owners to transfer development potential or density at one property, called a sending area to another property, called a receiving area. In the context of watershed planning objectives, TDR programs can be an effective way to transfer development potential from sensitive subwatersheds to subwatersheds that can better deal with increased imperviousness.

Joint Planting

Channelization
- ☑ Physical & chemical
- ☑ Instream/riparian restoration

Dams
- ☑ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☑ Streambanks ☐ Shorelines
  - ☐ Vegetative
  - ☐ Structural
  - ☑ Integrated
  - ☐ Planning & regulatory

Joint planting (or vegetated riprap) involves tamping live cuttings of rootable plant material into soil between the joints or open spaces in rocks that have previously been placed on a slope (Figure 7.19). Alternatively, the cuttings can be tamped into place at the same time that rock is being placed on the slope face. Joint planting is useful where rock riprap is required or already in place. It is successful 30 to 50 percent of the time, with first year irrigation improving survival rates. Live cuttings must have side branches removed and bark intact. They should range from 0.5 to 1.5 inches in diameter and be long enough to extend well into the soil, reaching into the dry season water level. Installation guidelines are available from the USDA-FS Soil Bioengineering Guide (USDA-FS, 2002) and the USDA NRCS *Engineering Field Handbook, Chapter 18* (USDA-NRCS, 1992).

Additional Resources

- FISRWG. 1998. *Stream Corridor Restoration: Principles, Processes, and Practices*. Federal Interagency Stream Restoration Working Group. http://www.nrcs.usda.gov/technical/stream_restoration/PDFFILES/APPENDIX.pdf.

- ISU. 2006. *How to Control Streambank Erosion: Joint Planting.* Iowa State University. http://www.ctre.iastate.edu/erosion/manuals/streambank/joint_planting.pdf.

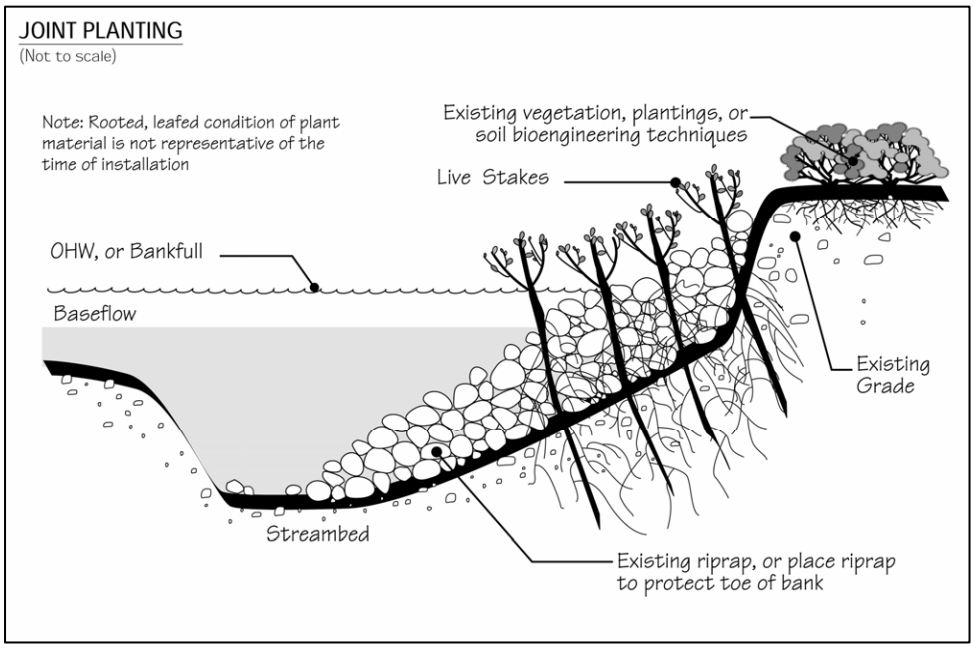

Figure 7.19 Joint Planting (USDA-FS, 2002)

Labyrinth Weir

Labyrinth weirs have extended crest length and are usually W-shaped. These weirs spread the flow out to prevent dangerous undertows in the plunge pool. A labyrinth weir at South Holston Dam (Tennessee) was constructed for the dual purpose of providing minimum flows and improving DO in reservoir releases. The weir aerates to up to 60 percent of the oxygen deficit. For instance, projected performance at the end of the summer is an increase in the DO from 3 mg/L to 7 mg/L (or an increase of 4 mg/L) (Hauser, 1992). Actual increases in the DO will depend on the temperature and the level of DO in the incoming water.

Channelization
- ☐ Physical & chemical
- ☐ Instream/riparian restoration

Dams
- ☐ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☑ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☐ Streambanks ☐ Shorelines
  - ☐ Vegetative
  - ☐ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

Levees, Setback Levees, and Floodwalls

Channelization
- ☑ Physical & chemical
- ☑ Instream/riparian restoration

Dams
- ☐ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☑ Streambanks ☑ Shorelines
  - ☐ Vegetative
  - ☑ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

Many valuable techniques can be used, when applied correctly, to protect, operate, and maintain levees (Hynson et al., 1985). Evaluation of site-specific conditions and the use of best professional judgment are the best methods for selecting the proper levee protection and operation and maintenance plan. According to Hynson and others (1985), maintenance activities generally consist of vegetation management, burrowing animal control, upkeep of recreational areas, and levee repairs.

Care must be taken during construction to prevent disturbing the natural channel vegetation, cross section, or bottom slope. No immediate instream effects from sedimentation are usually caused by implementing this type of modification. The potential for long-term channel adjustments can be evaluated using methods outlined in *Channel Stability Assessment for Flood Control Projects* (USACE, 1994).

Methods to control vegetation include mowing, grazing, burning, and using chemicals. Selection of a vegetation control method should consider the existing and surrounding vegetation, desired instream and riparian habitat types and values, timing of controls to avoid critical periods, selection of livestock grazing periods, and timing of prescribed burns to be consistent with historical fire patterns. Additionally, a balance between the vegetation management practices for instream and riparian habitat and engineering considerations should be maintained to avoid structural compromise. Animal control methods are most effective when used as a part of an integrated pest management program and might include instream and riparian habitat manipulation or biological controls. Recreational area management includes upkeep of planted areas, disposal of solid waste, and repairing of facilities (Hynson et al., 1985).

The prevention of floods by dams and levees can eliminate or diminish essential ecological functions. Dams, levees and channel training structures have dramatically altered or eliminated the frequency, duration, magnitude, and timing of periodic high flows. These projects significantly reduce the likelihood of floodplain inundation, block the transfer of organic matter and nutrients between river and floodplain, block plant succession, eliminate fish access to spawning areas, and rob rivers of the erosive power to restore and create a diversity of habitats (Environmental Defense, 2002). Levees have had several impacts on the Snake River in Wyoming. Anthony (1998) found habitat losses, including changes in vegetation (including losses of cottonwood and riparian habitats from 1956) and changes in channel and floodplain complexity from a braided to a single channel pattern.

Siting of levees and floodwalls should be addressed prior to design and implementation of these types of projects. Proper siting of such structures can avoid several types of problems. First, construction activities should not disturb the physical integrity of adjacent riparian areas and/or

wetlands. Second, by setting back the structures (offsetting them from the streambank), the relationship between the channel and adjacent riparian areas can be preserved. Proper siting and alignment of proposed structures can be established based on hydraulic calculations, historical flood data, and geotechnical analysis of riverbank stability.

Additional Resource

- LSU AgCenter. 1999. *Floodwalls*. Louisiana State University Agricultural Center, Louisiana Cooperative Extension Service. http://www.louisianafloods.org/NR/rdonlyres/7A01F7C8-703B-47D1-BCCD-63CD0A57721F/2995/pub2745Floodwall6.pdf.

Live Cribwalls

Channelization
- ☑ Physical & chemical
- ☑ Instream/riparian restoration

Dams
- ☑ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☑ Streambanks ☐ Shorelines
  - ☐ Vegetative
  - ☐ Structural
  - ☑ Integrated
  - ☐ Planning & regulatory

A live cribwall is used to rebuild a bank in a nearly vertical setting. It consists of a hollow, box-like interlocking arrangement of untreated log or timber members (Figure 7.20). The structure is filled with suitable backfill material and layers of live branch cuttings, which root inside the crib structure and extend into the slope. Logs or untreated timbers should range from 4 to 6 inches in diameter. Lengths will vary with the size of the crib structure. Fill rock should be 6 inches in diameter. Live branch cuttings should be 0.5 to 2.5 inches in diameter and long enough to reach the back of the wooden crib structure. Once the live cuttings root and become established, the subsequent vegetation gradually takes over the structural functions of the wood members. Live cribwalls are appropriate where space is limited and at the base of a slope where a low wall may be required to stabilize the toe of the slope and to reduce its steepness. They are also appropriate above and below the water level where stable streambeds exist. They are not designed for or intended to resist large, lateral earth stress. Installation guidelines are available from the USDA-FS Soil Bioengineering Guide (USDA-FS, 2002) and the USDA NRCS *Engineering Field Handbook, Chapter 18* (USDA-NRCS, 1992).

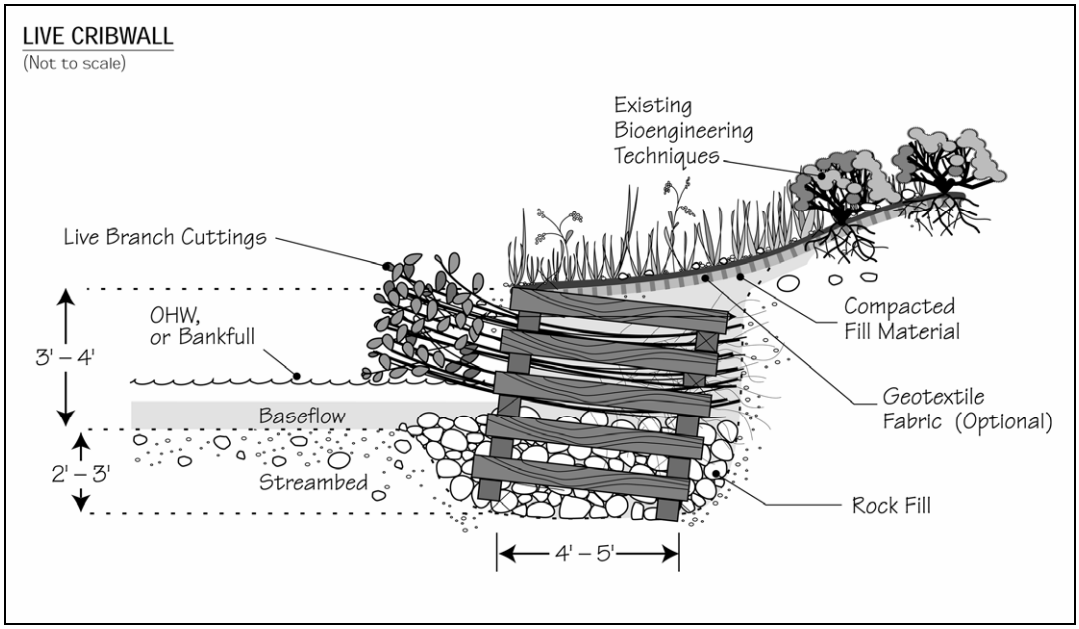

Figure 7.20 Live Cribwall (USDA-FS, 2002)

Additional Resources

- FISRWG. 1998. *Stream Corridor Restoration: Principles, Processes, and Practices*. Federal Interagency Stream Restoration Working Group. http://www.nrcs.usda.gov/technical/stream_restoration/PDFFILES/APPENDIX.pdf.

- ISU. 2006. *How to Control Streambank Erosion: Live Cribwall.* Iowa State University. http://www.ctre.iastate.edu/erosion/manuals/streambank/live_cribwall.pdf.

- Mississippi State University, Center for Sustainable Design. 1999. *Water Related Best Management Practices in the Landscape: Live Cribwall.* Created for United States Department of Agriculture, Natural Resource Conservation Service, Watershed Science Institute. http://www.abe.msstate.edu/csd/NRCS-BMPs/pdf/streams/bank/livecribwall.pdf.

- Ohio DNR. No date. *Ohio Stream Management Guide: Live Cribwalls.* Ohio Department of Natural Resources. http://www.ohiodnr.com/water/pubs/fs_st/stfs17.htm.

Live Fascines

Channelization
- ☑ Physical & chemical
- ☑ Instream/riparian restoration

Dams
- ☑ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☑ Streambanks ☐ Shorelines
  - ☑ Vegetative
  - ☐ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

Live fascines are long bundles of branch cuttings bound together in a cylindrical structure (Figure 7.21). They are suited to steep, rocky slopes, where digging is difficult (USDA-NRCS, 1992). When cut from appropriate species (e.g., young willows or shrub dogwoods) that root easily and have long straight branches, and when properly installed, they immediately begin to stabilize slopes. The cuttings (0.5 to 1.5 inches in diameter) form live fascine bundles that vary in length from 5 to 10 feet or longer, depending on site conditions and handling limitations. Completed bundles should be 6 to 8 inches in diameter. The goal is for natural recruitment to follow once slopes are secured. Live fascines should be placed in shallow contour trenches on dry slopes and at an angle on wet slopes to reduce erosion and shallow face sliding. Live fascines should be applied above ordinary high-water mark or bankfull level except on very small drainage area sites. In arid climates, they should be used between the high and low water marks on the bank. This system, installed by a trained crew, does not cause much site disturbance.

Installation guidelines are available from the USDA-FS Soil Bioengineering Guide (USDA-FS, 2002) and the USDA NRCS *Engineering Field Handbook, Chapter 18* (USDA-NRCS, 1992). Under their Ecosystem Management and Restoration Research Program (EMRRP), the U.S. Army Corps of Engineers presents research on live fascines in a technical note (*Live and Inert Fascine Streambank Erosion Control*).[7]

Additional Resources

- Massachusetts DEP. 2006. *Massachusetts Nonpoint Source Pollution Management Manual: Live Fascines.* Massachusetts Department of Environmental Protection, Boston, MA. http://projects.geosyntec.com/NPSManual/Fact%20Sheets/Live%20Fascines.pdf.

- Greene County Soil & Water Conservation District. No date. *Construction Specification VS-01: Live Fascines.* http://www.gcswcd.com/stream/library/pdfdocs/vs-01.pdf.

- ISU. 2006. *How to Control Streambank Erosion: Live Fascine.* Iowa State University. http://www.ctre.iastate.edu/erosion/manuals/streambank/live_fascine.pdf.

- Mississippi State University, Center for Sustainable Design. 1999. *Water Related Best Management Practices in the Landscape: Live Fascine.* Created for United States Department of Agriculture, Natural Resource Conservation Service, Watershed Science Institute. http://abe.msstate.edu/csd/NRCS-BMPs/pdf/streams/bank/livefacine.pdf.

[7] http://el.erdc.usace.army.mil/elpubs/pdf/sr31.pdf

- Ohio DNR. No date. *Ohio Stream Management Guide: Live Fascines.* Ohio Department of Natural Resources. http://www.ohiodnr.com/water/pubs/fs_st/stfs14.pdf.

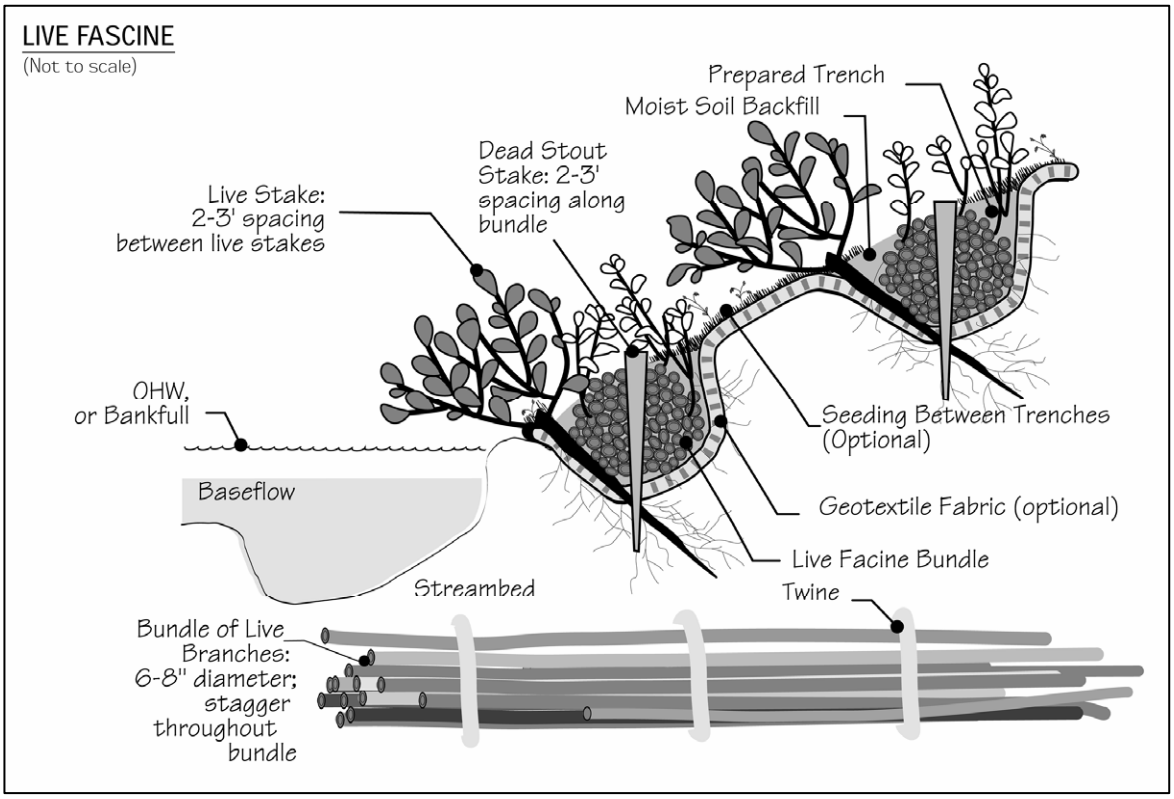

Note: OHW (Ordinary High Water) is the mark along a streambank where the waters are common and usual. This mark is generally recognized by the difference in the character of the vegetation above and below the mark or the absence of vegetation below the mark (USDA-FS, 2002).

Figure 7.21 Live Fascine (USDA-FS, 2002)

Live Staking

Channelization
- ☑ Physical & chemical
- ☑ Instream/riparian restoration

Dams
- ☑ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☑ Streambanks ☐ Shorelines
  - ☑ Vegetative
  - ☐ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

Live staking (Figure 7.22) is appropriate for relatively uncomplicated site conditions when construction time is limited. It can also be used to stabilize intervening areas between other soil bioengineering techniques (USDA-NRCS, 1992). Live staking involves the insertion and tamping of live, rootable vegetative cuttings into the ground. If correctly prepared and placed, the live stake will root and grow. A system of stakes creates a living root mat that stabilizes the soil by reinforcing and binding soil particles together and by extracting excess soil moisture. Stakes are generally 1 to 2 inches in diameter and 2 to 3 feet long. Specific site requirements and available cutting source will determine size. Vegetation selected should be able to withstand the degree of anticipated inundation, provide year round protection, have the capacity to become well established under sometimes adverse soil conditions, and have root, stem, and branch systems capable of resisting erosive flows. Most willow species are ideal for live staking because they root rapidly and begin to dry out a slope soon after installation. Sycamore and cottonwood are also species commonly used for live staking. This is an appropriate technique for repair of small earth slips and slumps that are frequently wet. Installation guidelines are available from the USDA-FS Soil Bioengineering Guide (USDA-FS, 2002) and the USDA NRCS *Engineering Field Handbook, Chapter 18* (USDA-NRCS, 1992).

Additional Resources

- ISU. 2006. *How to Control Streambank Erosion: Live Stakes.* Iowa State University. http://www.ctre.iastate.edu/erosion/manuals/streambank/live_stakes.pdf.

- Myers, R.D. 1993. *Slope Stabilization and Erosion Control Using Vegetation: A Manual of Practice for Coastal Property Owners. Live Staking.* Shorelands and Coastal Zone Management Program, Washington Department of Ecology. Olympia. Publication 93-30. http://www.ecy.wa.gov/programs/sea/pubs/93-30/livestaking.html.

- Walter, J., D. Hughes, and N.J. Moore. 2005. *Streambank Revegetation and Protection: A Guide for Alaska. Revegetation Techniques: Live Staking.* Revised Edition. Alaska Department of Fish and Game, Division of Sport Fish. http://www.sf.adfg.state.ak.us/SARR/restoration/techniques/livestake.cfm.

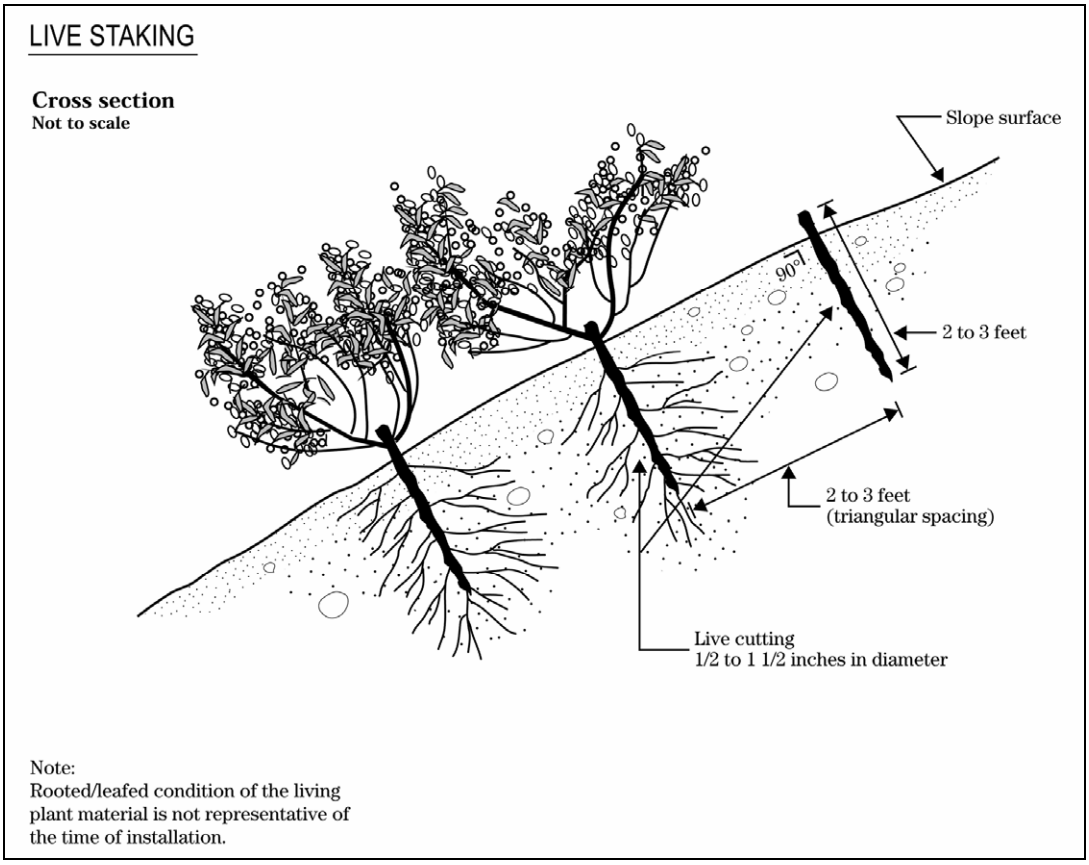

Figure 7.22 Live Staking (USDA-NRCS, 1992)

Locate Potential Land Disturbing Activities Away from Critical Areas

Material stockpiles, borrow areas, access roads, and other land-disturbing activities can often be located away from critical areas such as steep slopes, highly erodible soils, and areas that drain directly into sensitive waterbodies.

Channelization
- ☐ Physical & chemical
- ☐ Instream/riparian restoration

Dams
- ☑ Erosion control
- ☑ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☐ Streambanks ☐ Shorelines
  - ☐ Vegetative
  - ☐ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

Marsh Creation and Restoration

Channelization
- ☐ Physical & chemical
- ☑ Instream/riparian restoration

Dams
- ☐ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☑ Streambanks ☑ Shorelines
  - ☑ Vegetative
  - ☐ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

Marsh creation and restoration is a useful vegetative technique that can address problems with erosion of shorelines. Marsh plants perform two functions in controlling shore erosion (Knutson, 1988). First, their exposed stems form a flexible mass that dissipates wave energy. As wave energy is diminished, the offshore transport and longshore transport of sediment are reduced. Ideally, dense stands of marsh vegetation can create a depositional environment, causing accretion of sediments along the intertidal zone rather than continued shore erosion. Second, marsh plants form a dense mat of roots, which can add stability to the shoreline sediments. The basic approach for marsh creation is to plant a shoreline area in the vicinity of the tide line with appropriate marsh grass species. Suitable fill material may be placed in the intertidal zone to create a wetlands planting terrace of sufficient width (at least 18 to 25 feet) if such a terrace does not already exist at the project site. For shoreline sites that are highly sheltered from the effects of wind, waves, or boat wakes, the fill material is usually stabilized with small structures, similar to groins, which extend out into the water from the land. For shorelines with higher levels of wave energy, the newly planted marsh can be protected with an offshore installation of stone that is built either in a continuous configuration or in a series of breakwaters.

Additional Resource

- Maryland Department of the Environment. 2006. *Shore Erosion Control Guidelines: Marsh Creation*. http://www.mde.state.md.us/assets/document/wetlandswaterways/Shoreerosion.pdf.

Modifying Operational Procedures

Channelization
- ☐ Physical & chemical
- ☐ Instream/riparian restoration

Dams
- ☐ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☑ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☐ Streambanks ☐ Shorelines
  - ☐ Vegetative
  - ☐ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

A useful tool for evaluating the effects of operational procedures on the quality of tailwaters is computer modeling. For instance, computer models can describe the vertical withdrawal zone that would be expected under different scenarios of turbine operation (Smith et al., 1987). Zimmerman and Dortch (1989) modeled release operations for a series of dams on a Georgia river and found that procedures that were maintaining cool temperatures in summer were causing undesirable decreases in DO and increases in dissolved iron in autumn. The suggested solution was a seasonal release plan that is flexible, depending on variations in the in-pool water quality and predicted local weather conditions. Care should be taken with this sort of approach to accommodate the needs of both the fishery resource and reservoir recreationalists, particularly in late summer.

Modeling has also been undertaken for a variety of TVA and USACE facilities to evaluate the downstream impacts on DO and temperature that would result from changes in several operational procedures, including (Hauser et al., 1990a; Hauser et al., 1990b; Higgins and Kim, 1982; Nestler et al., 1986):

- Maintenance of minimum flows
- Timing and duration of shutoff periods
- Seasonal adjustments to the pool levels
- Timing and variation of the rate of drawdown

Mulching

Channelization
- ☐ Physical & chemical
- ☐ Instream/riparian restoration

Dams
- ☑ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☐ Streambanks ☐ Shorelines
  - ☐ Vegetative
  - ☐ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

Newly established vegetation does not have as extensive a root system as existing vegetation and therefore is more prone to erosion, especially on steep slopes. Additional stabilization should be considered during the early stages of seeding. This extra stabilization can be accomplished using mulches or mulch mats, which are applied to disturbed soil surfaces and can protect the area while vegetation becomes established.

Mulches and mulch mats include tacked straw, wood chips, and jute netting and are often covered by blankets or netting. Mulching alone should be used only for temporary protection of the soil surface or when permanent seeding is not feasible. The useful life of mulch varies with the material used and the amount of precipitation, but, generally, is approximately 2 to 6 months. Mulching and/or sodding may be necessary as slopes become moderate to steep, as soils become more erosive, and as areas become more sensitive. During the times of the year when vegetation cannot be established, mulch can be applied to moderate slopes and soils that are not highly erodible. On steep slopes or highly erodible soils, mulching may need to be reapplied if washed away.

Additional Resources

- Barr Engineering Company. 2001. *Minnesota Urban Small Sites BMP Manual: Stormwater Best Management Practices for Cold Climates. Soil Erosion Control: Mulches, Blankets and Mats.* Prepared for the Metropolitan Council by Barr Engineering Company, St. Paul, MN. http://www.metrocouncil.org/Environment/Watershed/BMP/CH3_RPPSoilMulch.pdf.

- CASQA. 2004. *California Stormwater BMP Construction Handbook*: *Hydraulic Mulch.* California Stormwater Quality Association, Sacramento, CA. http://www.cabmphandbooks.com/Documents/Construction/EC-3.pdf.

- ISU. 2006. *Iowa Construction Site Erosion Control Manual: Mulching.* Iowa State University. http://www.ctre.iastate.edu/erosion/manuals/construction/2.3_mulching.pdf.

Noneroding Roadways

Channelization
- ☑ Physical & chemical
- ☑ Instream/riparian restoration

Dams
- ☑ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☐ Streambanks ☐ Shorelines
  - ☐ Vegetative
  - ☐ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

General Road Construction Considerations

Road design and construction activities that are tailored to topography and soils and take into consideration the overall drainage pattern in the watershed where the road is being constructed can prevent road-related water quality problems. Lack of adequate consideration of watershed and site characteristics, road system design, and construction techniques appropriate to the site can result in mass soil movements, extensive surface erosion, and severe sedimentation in nearby waterbodies. The effect that a road network has on stream networks largely depends on the extent to which the networks are interconnected. Road networks can be hydrologically connected to stream networks where road surface runoff is delivered directly to stream channels (at stream crossings or via ditches or gullies that direct flow off the road into a stream) and where road cuts transform subsurface flow into surface flow (in road ditches or on road surfaces that deliver sediment and water to streams much more quickly than without a road present). The combined effects of these drainage network connections are increased sedimentation and peak flows that are higher and arrive more quickly after storms. This can lead to increased instream erosion and stream channel changes, especially in small watersheds (USEPA, 2005a).

Site characteristics should be considered during construction planning. On-site verification of information from topographic maps, soil maps, and aerial photos can ensure that locations where roads are to be cut into slopes or built on steep slopes or where skid trails, landings, and equipment maintenance areas are to be located are appropriate to the use. If an on-site visit indicates that construction changes can reduce the risk of erosion, the project manager can make these changes prior to construction, and in some cases as the project progresses (USEPA, 2005a).

Road drainage features tailored to the site prevent water from pooling or collecting on road surfaces. This prevents saturation of the road surface, which can lead to rutting, road slumping, and channel washout. Many roads associated with channelization projects are temporary or seasonal-use roads, and their construction should not involve the high level of disturbance generated by construction of permanent, high-standard roads. However, these types of roads still need to be constructed and maintained to prevent erosion and sedimentation (USEPA, 2005a).

Erosion control practices need to be applied while a road is being constructed, when soils are most susceptible to erosion, to minimize soil loss to waterbodies. Since sedimentation from roads often does not occur incrementally and continuously, but in pulses during large rainstorms, it is important that road, drainage structure, and stream crossing design take into consideration a sufficiently large design storm that has a good chance of occurring during the life of the project. Such a storm might be the 10-year, 25-year, 50-year, or even 100-year, 12- to 24-hour return period storm. Sedimentation cannot be completely prevented during or after road construction,

but the process is exacerbated if the road construction and design are inappropriate for the site conditions or if the road drainage or stream crossing structures are insufficient (USEPA, 2005a).

When constructing a new road, it is useful to consider road surface shape and composition, slope stabilization, and wetlands. A more detailed discussion of these topics is provided below. More information about potential impacts to fish habitat and passage are provided in EPA's *National Management Measures to Control Nonpoint Source Pollution from Forestry*.[8]

Road Shape and Composition

The shape of a road is an important runoff control component. Road drainage and runoff control are obtained by shaping the road surface to be insloping, outsloping, or crowned. Insloping roads can be effective where soils are highly erodible and directing runoff directly to the fill slope would be detrimental. Outsloped roads tend to dissipate runoff more than insloped roads, which concentrate runoff at cross drain locations, and are useful where erosion of backfill or ditch soil might be a problem. Crowned roads are suited to two lane roads and to steep single-lane roads that have frequent cross drains or ditches and ditch relief culverts (USEPA, 2005a). These road surface shapes are illustrated in Figure 7.23. Maintain one of these shapes to ensure good drainage. Crowns, inslopes, and outslopes will quickly lose effectiveness if not maintained frequently, due to ruts created by traffic when the road surface is damp or wet (USEPA, 2005a).

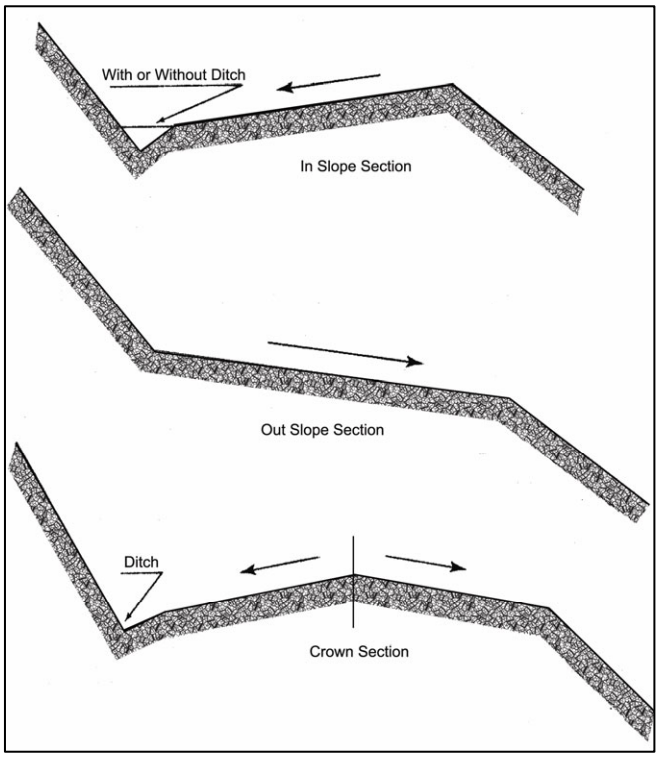

Figure 7.23 Types of Road Surface Shapes (USEPA, 2005a)

Road surface composition can effectively control erosion from road surfaces and slopes. It is important to choose a surface that is suitable to the topography, soils, and intended use. Surface protection of the roadbed and cut-and-fill slopes with a suitable material can minimize soil losses during storms, reduce frost heave erosion production, restrain downslope movement of soil slumps, and minimize erosion from softened roadbeds (USEPA, 2005a).

Slope Stabilization

Road cuts and fills can be a large source of sediment when constructing a rural road. Stabilizing back slopes and fill slopes as they are constructed is important in minimizing erosion from these areas. Combined with gravel or other surfacing, establishing grass or another form of slope stabilization can significantly reduce soil loss from road construction. If constructing on an unstable slope is necessary, consider consulting with an engineering geologist or geotechnical

[8] Available online at http://www.epa.gov/owow/nps/forestrymgmt.

engineer for recommended construction methods and to develop plans for the road segment. Unstable slopes that threaten water quality should be considered unsuitable for road building.

Planting grass on cut-and-fill slopes of new roads can effectively reduce erosion, and placing forest floor litter or brush barriers on downslopes in combination with establishing grass is also effective for reducing downslope sediment transport. Grass-covered fill is generally more effective than mulched fill in reducing soil erosion from newly constructed roads because of the roots that hold the soil in place, which are lacking with other cover. Because grass needs some time to establish itself, a combination of straw mulch with netting to hold it in place can be used to cover a seeded area and effectively reduce erosion while grass is growing. The mulch and netting provide immediate erosion control and promote grass growth (USEPA, 2005a).

Wetland Road Considerations

Sedimentation is a concern when considering road construction through wetlands. It is better to avoid putting a road through a wetland when an alternative route exists. If no alternative exists, make sure to implement best management practices (BMPs) suggested by the state. Road construction or maintenance for certain farming, forestry, or mining activities might be exempt under Clean Water Act (CWA) section 404. However, to qualify for the exemption, the roads must be constructed and maintained following application of specific BMPs designed to protect the aquatic environment (USEPA, 2005a).

Pesticide and Fertilizer Management

Channelization
- ☐ Physical & chemical
- ☐ Instream/riparian restoration

Dams
- ☐ Erosion control
- ☐ Runoff control
- ☑ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☐ Streambanks ☐ Shorelines
  - ☐ Vegetative
  - ☐ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

Chemicals used in dam management include pesticides (insecticides, herbicides, and fungicides) and fertilizers. Since pesticides can be toxic, they have to be mixed, transported, loaded, and applied correctly and their containers disposed properly to prevent potential nonpoint source pollution. Since fertilizers can also be toxic or can damage the ecosystem, it is important that they be handled and applied properly, according to label instructions.

Even though a limited number of applications might be made at a specific dam site, consider that throughout a watershed many sites could receive applications of fertilizers and pesticides, which can accumulate in soils and in waterbodies. Application techniques also partly determine the potential risk to the aquatic environment from infrequent applications of pesticides and fertilizers. These chemicals can directly enter surface waters through five major pathways—direct application, drift, mobilization in ephemeral streams, overland flow, and leaching. Direct application is the most important source of increased chemical concentrations and is also one of the most easily controlled.

Some more specific implementation practices for pesticide maintenance include:

- Apply pesticides during favorable atmospheric conditions. Do not apply pesticides when wind conditions increase the likelihood of significant drift. It is also best to avoid pesticide application when temperatures are high or relative humidity is low because these conditions influence the rate of evaporation and enhance losses of volatile pesticides.
- Ensure that pesticide users abide by the current pesticide label, which might specify whether users be trained and certified in the proper use of the pesticide; allowable use rates; safe handling, storage, and disposal requirements; and whether the pesticide may be used under the provisions of an approved State Pesticide Management Plan.
- Locate mixing and loading areas, and clean all mixing and loading equipment thoroughly after each use, where pesticide residues will not enter streams or other waterbodies.
- Dispose of pesticide wastes and containers according to state and federal laws.
- Consider the use of pesticides as only one part of an overall program to control pest problems. Integrated Pest Management (IPM) strategies have been developed to control pests without total reliance on chemical pesticides.
- Base selection of pesticide on site factors and pesticide characteristics. These factors include vegetation height, target pest, adsorption (attachment) to soil organic matter, persistence or half-life, toxicity, and type of formulation.
- Check all equipment carefully, particularly for leaking hoses and connections and plugged or worn nozzles. Calibrate spray equipment periodically to achieve uniform pesticide distribution and rate.

- Always use pesticides in accordance with label instructions, and adhere to all federal and state policies and regulations governing pesticide use.

Specific implementation practices for fertilizer maintenance include:

- Apply slow-release fertilizers when possible. This practice reduces potential nutrient leaching to ground water, and it increase the availability of nutrients for plant uptake.
- Apply fertilizer during favorable atmospheric conditions. Do not apply fertilizer when wind conditions increase the likelihood of significant drift.
- Apply fertilizers during maximum plant uptake periods to minimize leaching.
- Base fertilizer type and application rate on soil and/or foliar analysis.

Phase Construction

Channelization
- ☐ Physical & chemical
- ☐ Instream/riparian restoration

Dams
- ☑ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☐ Streambanks ☐ Shorelines
  - ☐ Vegetative
  - ☐ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

Construction site phasing involves disturbing only small portions of a site at a time to prevent erosion from dormant parts (CWP, 1997c). Grading activities and construction are completed and soils are effectively stabilized on one part of the site before grading and construction commence at another. This is different from the more traditional practice of construction site sequencing, in which construction occurs at only one part of the site at a time but site grading and other site-disturbing activities typically occur all at once, leaving portions of the disturbed site vulnerable to erosion. To be effective, construction site phasing must be incorporated into the overall site plan early. Elements to consider when phasing construction activities include (CWP, 1997c):

- Managing runoff separately in each phase
- Determining whether water and sewer connections and extensions can be accommodated
- Determining the fate of already completed downhill phases
- Providing separate construction and residential accesses to prevent conflicts between residents living in completed stages of the site and construction equipment working on later stages

A comparison of sediment loss from a typical development and from a comparable phased project showed a 42 percent reduction in sediment export in the phased project (CWP, 1997c). Phasing can also provide protection from complete enforcement and shutdown of the entire project. If a contractor is in noncompliance in one phase or zone of a site, that will be the only zone affected by enforcement. This approach can help to minimize liability exposure and protect the contractor financially (Deering, 2000b).

Physical Barriers

Channelization
- ☐ Physical & chemical
- ☐ Instream/riparian restoration

Dams
- ☐ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☑ Maintain fish passage

Erosion
- ☐ Streambanks ☐ Shorelines
  - ☐ Vegetative
  - ☐ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

Physical barriers are diversion systems that lead or force fish to bypasses that transport them above or below the dam (FAO, 2001). Physical diversion structures deployed at dams include angled screens, drum screens, inclined plane screens, louvers, and traveling screens. The success and effectiveness of physical barriers has been found to be specific to individual hydropower facilities (Mattice, 1990).

Angled screens are used to guide fish to a bypass by guiding them through the channel at some angle to the flow. Coarse-mesh angled screens have been shown to be highly effective with numerous warm- and cold-water species at adult life stages. Fine-mesh angled screens have been shown in laboratory studies to be highly effective in diverting larval and juvenile fish to a bypass with resultant high survival. Performance of angled screens can vary by species, stream velocity, fish length, screen mesh size, screen type, and temperature (Stone and Webster, 1986). Clogging from debris and fouling organisms is a maintenance problem associated with angled screens.

Angled rotary drum screens oriented perpendicular to the flow direction have been used extensively to lead fish to a bypass. Angled rotary drum screens tend not to experience the major operational and maintenance clogging problems of stationary screens, such as angled vertical screens. Maintenance of angled rotary drum screens typically consists of routine inspection, cleaning, lubrication, and periodic replacement of the screen mesh (Stone and Webster, 1986).

An inclined plane screen is used to divert fish upward in the water column into a bypass. Once concentrated, the fish are transported to a release point below the dam. An inclined plane pressure screen at the T.W. Sullivan Hydroelectric Project (Willamette Falls, Oregon) is located in the penstock of one unit. The design is effective in diverting fish, with a high survival rate. However, this device has been linked to injuries in some species of migrating fish, and it has not been accepted for routine use (Stone and Webster, 1986).

Louvers consist of an array of evenly spaced, vertical slats aligned across a channel at an angle leading to a bypass. The turbulence they create is sensed and avoided by the fish (Stone and Webster, 1986). Louver systems rely on a fish's instincts to use senses other than sight to move around obstacles. Once the louver is sensed, the fish tend to reverse their head first downstream orientation (to head upstream, tail to the louver) and move laterally along it until they reach the bypass (OTA, 1995).

Submerged traveling screens are used to divert downstream migrating fish out of turbine intakes to adjoining gatewell structures, where the fish are concentrated for release downstream. This device has been tested extensively at hydropower facilities on the Snake and Columbia Rivers. Because of their complexity, submerged traveling screens must be continually maintained. The

screens must be serviced seasonally, depending on the debris load, and trash racks and bypass orifices must be kept free of debris (Stone and Webster, 1986).

Physical barrier fish diversion systems have been found to work best when specifically designed to the structure and fish being passed. Small differences in design, such as the spacing or depth of the louvers, can mean the difference in success and failure. A successful louver system has been installed at the Holyoke Hydroelectric Power Station, on the Connecticut River. This partial depth louver system was installed in the intake channel at the power plant and successfully passed 86 percent of the juvenile clupeids and 97 percent of the Atlantic salmon (*Salmo salar*) smolts (Marmulla, 2001). Another partial depth louver system on the same river has experienced less successful results. The system installed at the Vernon Dam on the Connecticut River is successfully passing about 50 percent of the Atlantic salmon smolts (OTA, 1995).

Pollutant Runoff Control

Store, cover, and isolate construction materials, refuse, garbage, sewage, debris, oil and other petroleum products, mineral salts, industrial chemicals, and topsoil to prevent runoff of pollutants and contamination of ground water.

Channelization
- ☐ Physical & chemical
- ☐ Instream/riparian restoration

Dams
- ☐ Erosion control
- ☐ Runoff control
- ☑ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☐ Streambanks ☐ Shorelines
  - ☐ Vegetative
  - ☐ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

Preserve Onsite Vegetation

Channelization
- ☐ Physical & chemical
- ☐ Instream/riparian restoration

Dams
- ☑ Erosion control
- ☑ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☐ Streambanks ☐ Shorelines
  - ☐ Vegetative
  - ☐ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

Preserving onsite vegetation retains soil and limits runoff of water, sediment, and pollutants. The destruction of existing onsite vegetation can be minimized by initially surveying the site to plan access routes, locations of equipment storage areas, and the location and alignment of the dam. Construction workers can be encouraged to limit activities to designated areas only. Reducing the disturbance of vegetation also reduces the need for revegetation after construction is completed, including the required fertilization, replanting, and grading that are associated with revegetation. Additionally, as much natural vegetation as possible should be left next to the waterbody where construction is occurring. This vegetation provides a buffer to reduce the NPS pollution effects of runoff originating from areas associated with the construction activities.

Additional Resource

- CASQA. 2004. *California Stormwater BMP Construction Handbook*: *Preservation of Existing Vegetation.* California Stormwater Quality Association, Sacramento, CA. http://www.cabmphandbooks.com/Documents/Construction/EC-2.pdf.

Reregulation Weir

Channelization
- ☐ Physical & chemical
- ☐ Instream/riparian restoration

Dams
- ☐ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☑ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☐ Streambanks ☐ Shorelines
  - ☐ Vegetative
  - ☐ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

Reregulation weirs have been constructed from stone, wood, and aggregate. In addition to increasing the levels of DO in the tailwaters, reregulation weirs result in a more constant rate of flow farther downstream during periods when turbines are not in operation. A reregulation weir constructed downstream of the Canyon Dam (Guadalupe River, Texas) increased DO levels in waters leaving the turbine from 3.3 mg/L to 6.7 mg/L (EPRI, 1990).

The USACE Waterways Experiment Station (Wilhelms, 1988) has compared the effectiveness with which various hydraulic structures accomplished the reaeration of reservoir releases. The study concluded that, whenever operationally feasible, more discharge should be passed over weirs to improve DO concentrations in releases. Results indicated that overflow weirs aerate releases more effectively than low-sill spillways (Wilhelms, 1988).

Reservoir Aeration

Channelization
- ☐ Physical & chemical
- ☐ Instream/riparian restoration

Dams
- ☐ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☑ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☐ Streambanks ☐ Shorelines
  - ☐ Vegetative
  - ☐ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

Some techniques for reservoir aeration include:

- Air injection systems
- Diffused air systems
- Oxygen injection systems
- U-tube design

Air injection systems mix water from different strata in the impoundment by using air or pure oxygen injected into a pumping system. Air injection systems are categorized as partial air lift systems and full air lift systems. In the partial air lift system, compressed air is injected at the bottom of the unit; then the air and water are separated at depth and the air is vented to the surface. In the full air lift system, compressed air is injected at the bottom of the unit (as in the partial air lift system), but the air-water mixture rises to the surface. The full air lift design has a higher efficiency than the partial-air lift and has a lesser tendency to elevate dissolved nitrogen levels (Thornton et al., 1990).

Diffused air systems provide effective transfer of oxygen to water by forcing compressed air through small pores in diffuser systems to form bubbles. One diffuser system test in the Delaware River near Philadelphia, Pennsylvania in 1969–1970 demonstrated the efficiency of this practice. Coarse-bubble diffusers were deployed at depths ranging from 13 to 38 feet. Depending on the depth of deployment, the oxygen transfer efficiency varied from 1 to 12 percent. When compared with other systems discussed below, this efficiency rate is rather low. But the results of this test determined that river aeration was more economical than advanced wastewater treatment as a strategy for improving the levels of DO in the river (EPRI, 1990). Another type of oxygen injection system, which pumps gaseous oxygen into the hypolimnion through diffusers, has effectively improved DO levels in the reservoir behind the Richard B. Russell Dam (Savannah River, on the Georgia-South Carolina border). The system is operated 1 mile upstream of the dam, with occasional supplemental injection of oxygen at the dam face when DO levels are especially low. The system has successfully maintained DO levels above 6 mg/L in the releases, with an average oxygen transfer efficiency of 75 percent (EPRI, 1990; Gallagher and Mauldin, 1987).

The diffused air system has been found to be a cost-effective method to raise low DO levels within a reservoir (Henderson and Shields, 1984). However, the costs of air diffuser operation may be high for deep reservoirs because of hydraulic pressures that must be overcome. Destratification that results from deployment of an air diffuser system may also mix nutrient-rich waters located deep in the impoundment into layers located closer to the surface, increasing the potential for stimulation of algal populations. Barbiero et al. (1996), in a study on the effects of artificial circulation on a small northeastern impoundment, found that artificial circulation ultimately had no effect on the magnitude of summer phytoplankton populations. However, the authors note that intermittent mixing events tend to promote increased transport of phosphorus

into the epilimnion. While this had no effect on phytoplankton populations in the studied lake, it demonstrates the potential of artificial circulation to impact water quality and the need for careful evaluation of potential impacts.

Oxygen injection systems use pure oxygen to increase levels of dissolved oxygen in reservoirs. One type of design, termed side stream pumping, carries water from the impoundment onto the shore and through a piping system into which pure oxygen is injected. After passing through this system, the water is returned to the impoundment (EPRI, 1990).

The U-tube design, in which water from deep in the impoundment is pumped to the surface layer, provides a means to aerate reservoir waters. Oxygen transfer is increased as a mixture of water and oxygen gas is subjected to greater hydrostatic pressure. Water moves down the U-tube and pressure increases as a function of depth, dissolving the oxygen gas into the water. The oxygenated water then travels back up through the system and is released to the waterway (Jones and Stokes, 2004). The inducement of artificial circulation through aeration of the impoundment may also provide the opportunity for a "two-story" fishery, reduce internal phosphorus loading, and eliminate problems with iron and manganese in drinking water (Thornton et al., 1990).

If the principal objective is to improve DO levels only in the reservoir releases and not throughout the entire impoundment, then aeration can be applied selectively to discrete layers of water immediately surrounding the intakes or as water passes through release structures such as hydroelectric turbines. Localized mixing is a practice to improve releases from thermally stratified reservoirs by destratifying the reservoir in the immediate vicinity of the outlet structure. This practice differs from the practice of artificial destratification, where mixing is designed to destratify all or most of the reservoir volume (Holland, 1984). Localized mixing is provided by forcing a jet of high-quality surface water downward into the hypolimnion. Pumps used to create the jet generally fall into two categories, axial flow propellers and direct drive mixers (Price, 1989). Axial flow pumps usually have a large-diameter propeller (6 to 15 feet) that produces a high-discharge, low-velocity jet. Direct drive mixers have small propellers (1 to 2 feet) that rotate at high speeds and produce a high-velocity jet. The axial flow pumps are suitable for shallow reservoirs because they can force large quantities of water down to shallow depths. The high-momentum jets produced by direct drive mixers are necessary to penetrate deeper reservoirs (Price, 1989).

Additional Resource

- Thornton, K.W., B.L. Kimmel, and F.E. Payne. 1990. *Reservoir Limnology: Ecological Perspectives*. John Wiley & Sons, Inc., New York.

Retaining Walls

Channelization
- ☐ Physical & chemical
- ☐ Instream/riparian restoration

Dams
- ☑ Erosion control
- ☑ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☐ Streambanks ☐ Shorelines
  - ☐ Vegetative
  - ☐ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

Retaining walls are used in areas where soils are unstable, where slopes are steeper than the angle of repose, and where the horizontal distance is limited. They help stabilize slopes and can decrease the steepness of a slope. If the steepness of a slope is reduced, the runoff velocity is decreased and, therefore, the erosion potential is decreased.

According to the *Iowa Construction Site Erosion Control Manual*, a variety of materials can be used for construction of retaining walls, including concrete masonry, concrete cribbing, steel piling, gabions, precast stone, rock riprap, reinforced earth, stone drywall, and treated wood timbers. Costs vary by the material selected for construction. When designing a retaining wall, the following factors should be taken into account: drainage, bearing value of the soil, wall thickness, stress, foundation design, and wall height.

Additional Resources

- ISU. 2006. *Iowa Construction Site Erosion Control Manual: Retaining Wall.* Iowa State University. http://www.ctre.iastate.edu/erosion/manuals/construction/3.13_retaining_wall.pdf.

- Leposky, R.E. 2004. *Retaining Walls: What You See and What You Don't.* http://www.forester.net/ecm_0401_retaining.html.

Return Walls

Channelization
- ☑ Physical & chemical
- ☑ Instream/riparian restoration

Dams
- ☐ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☑ Streambanks ☑ Shorelines
  - ☐ Vegetative
  - ☑ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

Whenever shorelines or streambanks are "hardened" through the installation of bulkheads, seawalls, or revetments, the design process must include consideration that waves and currents can continue to dislodge the substrate at both ends of the structure, resulting in very concentrated erosion and rapid loss of fastland. This process is called flanking. To prevent flanking, return walls should be provided at either end of a vertical protective structure and should extend landward for a horizontal distance consistent with the local erosion rate and the design life of the structure.

Additional Resource

- USACE. 1985. *Coastal Engineering Technical Note: Determining Lengths of Return Walls*. U.S. Army Engineer Waterways Experiment Station. http://chl.erdc.usace.army.mil/library/publications/chetn/pdf/cetn-iii-25.pdf.

Revegetate

Channelization
- ☐ Physical & chemical
- ☐ Instream/riparian restoration

Dams
- ☑ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☐ Streambanks ☐ Shorelines
  - ☐ Vegetative
  - ☐ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

Revegetation of construction sites during and after construction is the most effective way to permanently control erosion (Hynson et al., 1985). To select the right plants for your bioengineering project, note what native plant communities grow in the area. Avoid planting noxious or invasive grasses, such as reed canary grass or ryegrass. Remove invasive plants such as yellow starthistle, English ivy, deadly nightshade, field morning glory, scotch broom, cheatgrass, and purple loosestrife. Use more of the same native plants in the bioengineering design, as these plants are most likely adapted to conditions to the area.

Plants like willow, red osier dogwood, alder, ash, and cottonwood can be well suited for bioengineering. They establish easily, grow quickly, and have thick root systems. Cuttings are available from native plant nurseries. They may also be collected next to the project site, if the area is well vegetated (Oregon Association of Conservation Districts, 2004).

Ecological and vegetational areas vary throughout the country. Therefore, other plant materials may be more suitable for a project. Contact local cooperative extension services for more plant information.[9]

Additional Resources

- Barr Engineering Company. 2001. *Minnesota Urban Small Sites BMP Manual: Stormwater Best Management Practices for Cold Climates. Soil Erosion Control: Vegetative Methods.* Prepared for the Metropolitan Council by Barr Engineering Company, St. Paul, MN. http://www.metrocouncil.org/environment/Watershed/BMP/CH3_RPPSoilVeget.pdf.

- Ohio DNR. No date. *Ohio Stream Management Guide: Restoring Streambanks with Vegetation.* Ohio Department of Natural Resources. http://www.ohiodnr.com/water/pubs/fs_st/stfs07.htm.

[9] http://www.csrees.usda.gov/qlinks/partners/state_partners.html

Revetment

Channelization
- ☑ Physical & chemical
- ☑ Instream/riparian restoration

Dams
- ☑ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☑ Streambanks ☑ Shorelines
  - ☐ Vegetative
  - ☑ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

A revetment (Figure 7.24) is a type of vertical protective structure used for shoreline protection. One revetment design contains several layers of randomly shaped and randomly placed stones, protected with several layers of selected armor units or quarry stone. The armor units in the cover layer should be placed in an orderly manner to obtain good wedging and interlocking between individual stones. The cover layer may also be constructed of specially shaped concrete units (USACE, 1984). Sometimes gabions (stone-filled wire baskets) or interlocking blocks of precast concrete are used in the construction of revetments. In addition to the surface layer of armor stone, gabions, or rigid blocks, successful revetment designs also include an underlying layer composed of either geotextile filter fabric and gravel or a crushed stone filter and bedding layer. This lower layer functions to redistribute hydrostatic uplift pressure caused by wave action in the foundation substrate. Precast cellular blocks, with openings to provide drainage and to allow vegetation to grow through the blocks, can be used in the construction of revetments to stabilize banks. Vegetation roots add additional strength to the bank. In situations where erosion can occur under the blocks, fabric filters can be used to prevent the erosion. Technical assistance should be obtained to properly match the filter and soil characteristics. Typically blocks are hand placed when mechanical access to the bank is limited or costs need to be minimized. Cellular block revetments have the additional benefit of being flexible to conform to minor changes in the bank shape (USACE, 1983).

Additional Resource

- Ohio DNR. No date. *Ohio Stream Management Guide: Riprap Revetments.* Ohio Department of Natural Resources. http://www.ohiodnr.com/water/pubs/fs_st/stfs16.pdf.

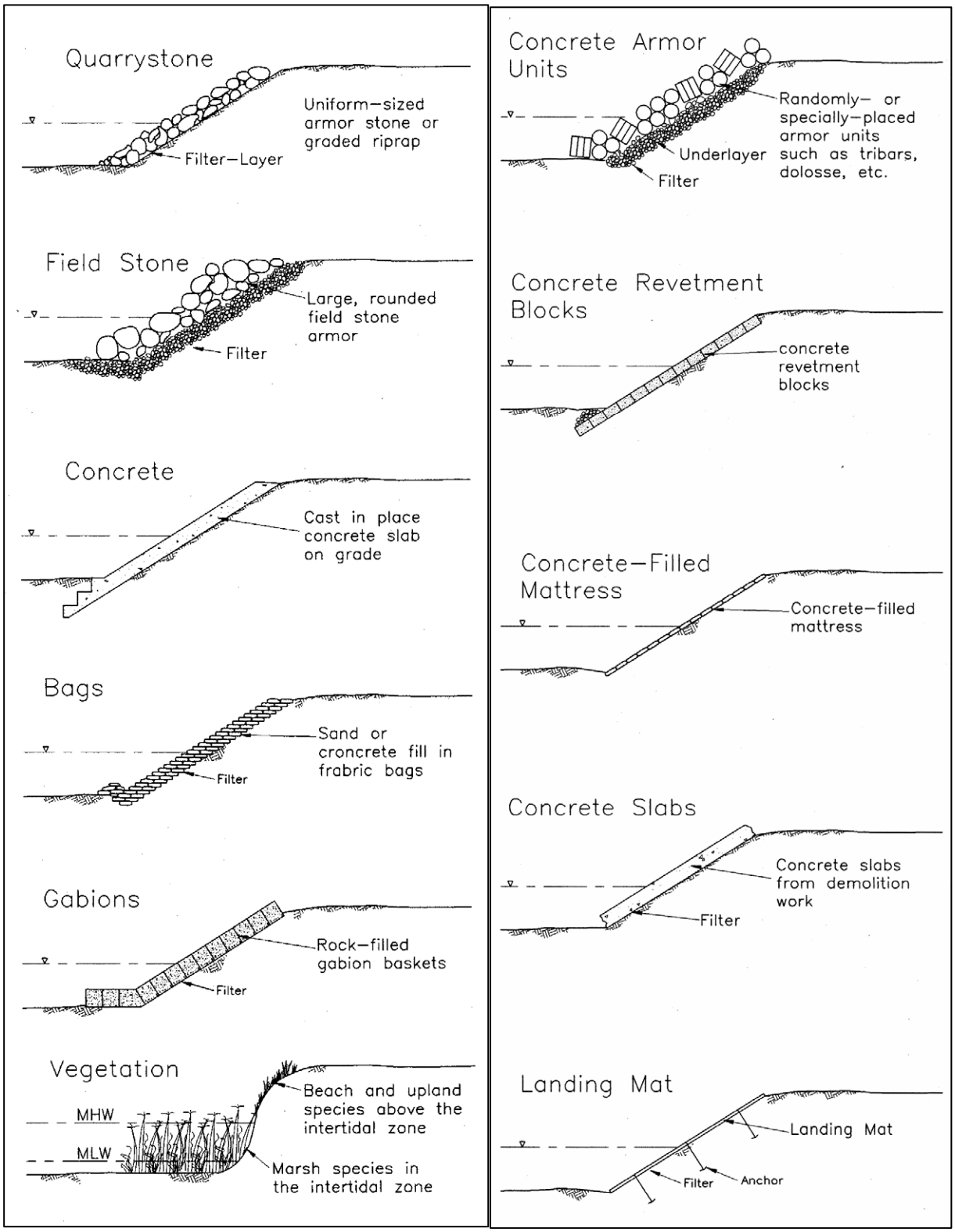

Figure 7.24 Revetment Alternatives (USACE, 2003)

Riparian Improvements

Channelization
- ☑ Physical & chemical
- ☑ Instream/riparian restoration

Dams
- ☑ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☑ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☑ Streambanks ☑ Shorelines
  - ☐ Vegetative
  - ☐ Structural
  - ☑ Integrated
  - ☐ Planning & regulatory

Riparian improvements are another strategy that can be used to restore or maintain aquatic and riparian habitat around reservoir impoundments or along the waterways downstream from dams. In fact, Johnson and LaBounty (1988) found that riparian improvements were more effective, in some cases, than flow augmentation for protection of instream habitat. In the Salmon River (Idaho), a variety of instream and riparian habitat improvements have been recommended to improve the indigenous stocks of Chinook salmon (*Oncorhynchus tshawytscha*). These improvements include reducing sediment loading in the watershed, improving riparian vegetation, eliminating barriers to fish migration (see sections discussing this practice below), and providing greater instream and riparian habitat diversity (Andrews, 1988).

Maintaining and improving riparian areas upstream of a dam may also be an important consideration for reducing flow-related impacts to dams. Riparian areas along brooks and smaller streams are sometimes altered in a manner that impairs their ability to detain and absorb floodwater and stormwater (e.g., removal of forest cover or increased imperviousness). The cumulative impact of the riparian changes results in the smaller streams discharging increased volumes and velocities of water, which then result in more severe downstream flooding and increased storm damage and/or maintenance to existing structures (such as dams). These downstream impacts may occur even though main stem floodplains and riparian areas are safeguarded and remain close to their natural condition (Cohen, 1997).

Riprap

Channelization
- ☑ Physical & chemical
- ☑ Instream/riparian restoration

Dams
- ☑ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☑ Streambanks ☑ Shorelines
  - ☐ Vegetative
  - ☑ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

Riprap is a layer of appropriately sized stones designed to protect and stabilize areas subject to erosion, slopes subject to seepage, or areas with poor soil structure. Riprap extends from the toe of the slope to a height needed for long term durability (Figure 7.25).

Riprap can be used where vegetation cannot be established or in combination with vegetative approaches. This method is suitable where stream flow velocity is high or where there is a threat to life or property. This method can be expensive, particularly if materials are not locally available. This method should be combined with soil bioengineering techniques, particularly revegetation efforts, to achieve a comprehensive streambank restoration design (FISRWG, 1998).

Additional Resources

- FISRWG. 1998. *Stream Corridor Restoration: Principles, Processes, and Practices*. Federal Interagency Stream Restoration Working Group. http://www.nrcs.usda.gov/technical/stream_restoration/PDFFILES/APPENDIX.pdf.

- ISU. 2006. *Iowa Construction Site Erosion Control Manual: Riprap.* Iowa State University. http://www.ctre.iastate.edu/erosion/manuals/construction/3.15_riprap.pdf.

- Tennessee Department of Environment and Conservation. 2002. *Erosion and Sediment Control Handbook: Riprap*. Tennessee Department of Environment and Conservation, Nashville, TN. http://state.tn.us/environment/wpc/sed_ero_controlhandbook/rr.pdf.

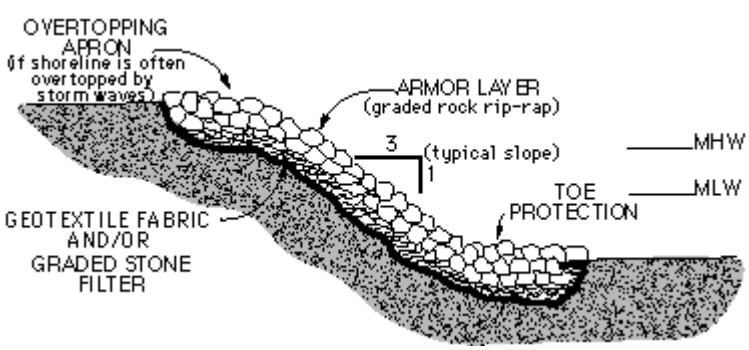

Proper riprap placement (MHW=mean high water, MLW=mean low water).

Figure 7.25 Riprap Diagram (http://www.extension.umn.edu/distribution/naturalresources/components/DD6946g.html)

Root Wad Revetments

Channelization
- ☑ Physical & chemical
- ☑ Instream/riparian restoration

Dams
- ☑ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☑ Streambanks ☐ Shorelines
  - ☐ Vegetative
  - ☐ Structural
  - ☑ Integrated
  - ☐ Planning & regulatory

Root wads armor a bank by keeping faster moving currents away from the bank (Figures 7.26 and 7.27). They are most useful for low energy streams that meander and have out-of-bank flow conditions. Root wads should be used in combination with other soil bioengineering techniques to stabilize a bank and ensure plant establishment on the upper portions of the streambank. Stabilizing the bank will reduce streambank erosion, trap sediment, and improve habitat diversity. There are a number of ways to install root wads. The trunk can be driven into the bank, laid in a deep trench, or installed as part of a log and boulder revetment. Use tree wads that have brushy top and durable wood, such as Douglas fir, oak, hard maple, juniper, spruce, cedar, red pine, white pine, larch, or beech. Ponderosa pine and aspen are too inflexible, and alder decomposes rapidly.

With the added support of a log and boulder revetment, root wads can stabilize banks of high-energy streams. Root wad span should be approximately 5 feet with numerous root protrusions. The trunk should be at least 8 to 12 feet long. Boulders should be as large as possible, but at least one and a half times the log's diameter. They should also have an irregular surface. Logs are to be used as footers or revetments and should be over 16 inches in diameter.

When logs and root wads are well anchored, this design will tolerate high boundary shear stress. However, local scour and erosion is possible. Varying with climate and tree species used, the decomposition of the logs and rootwads will limit the life span of this design. If colonization of streambank vegetation does not take place, replacement may be required. The project site must be accessible to heavy equipment. Locating materials may be difficult in some locations and this method can be expensive (FISRWG, 1998).

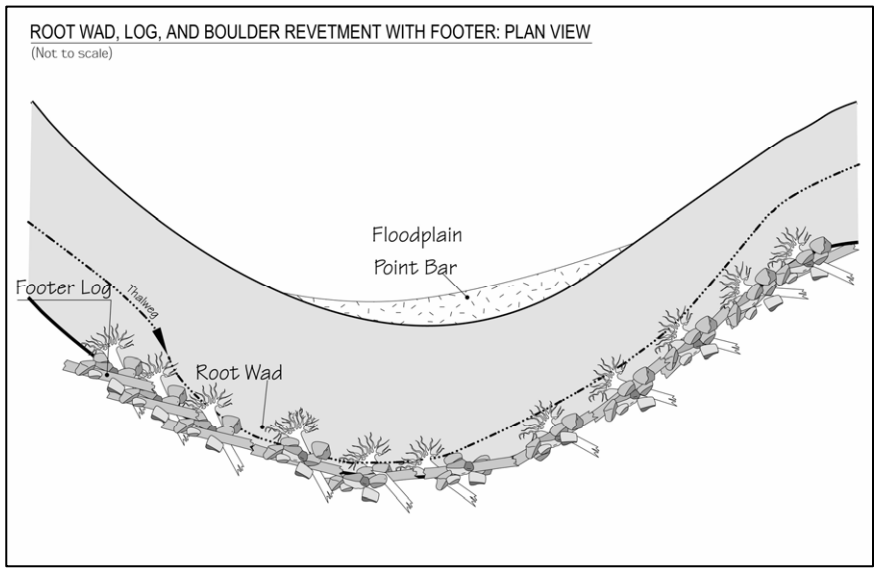

Figure 7.26 Root Wad, Log, and Boulder Revetment with Footer: Plan View (USDA-FS, 2002)

Installation guidelines are available from the USDA-FS Soil Bioengineering Guide (USDA-FS, 2002). Under EMRRP, the USACE has presented research on rootwad composites in a technical note (*Rootwad Composites for Streambank Erosion Control and Fish Habitat Enhancement*).[10]

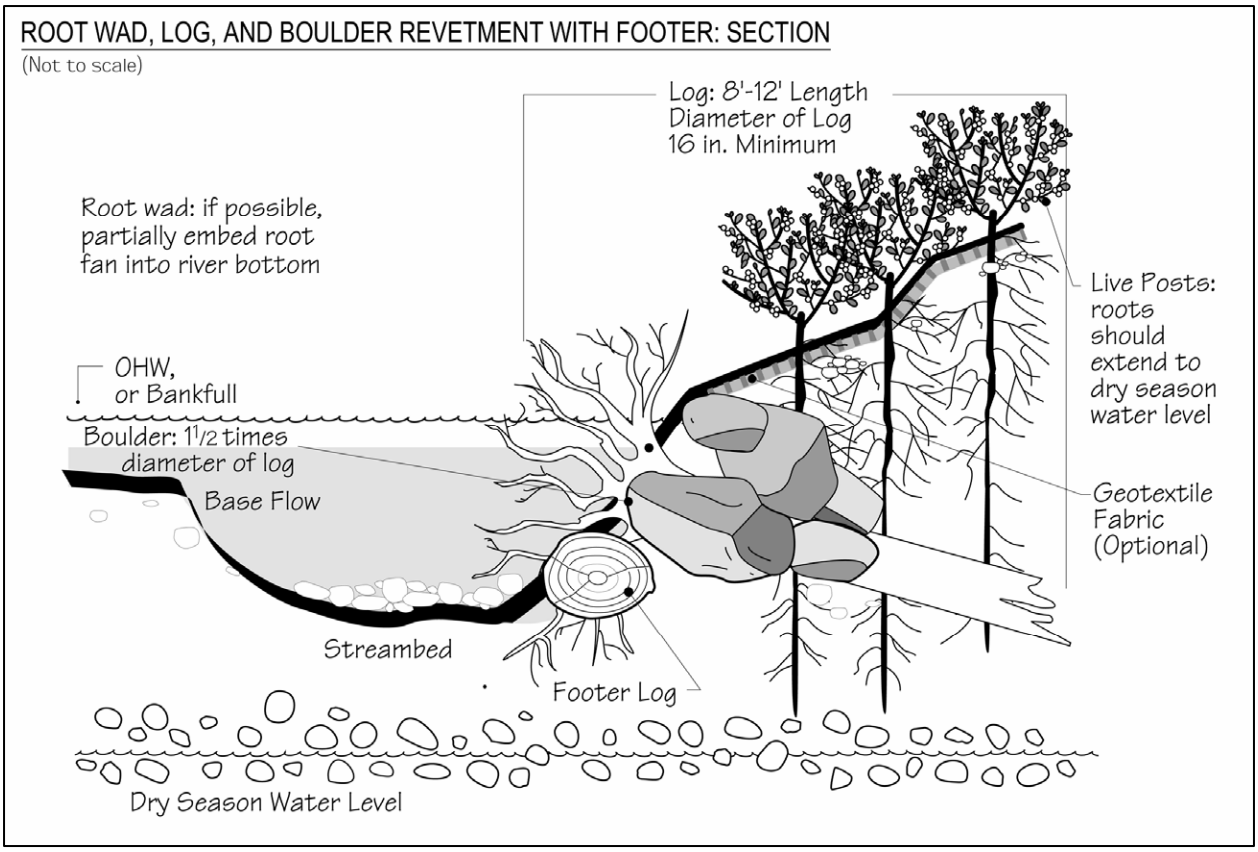

Figure 7.27 Rootwad, Log, and Boulder Revetment with Footer: Section (USDA-FS, 2002)

Additional Resources

- FISRWG. 1998. *Stream Corridor Restoration: Principles, Processes, and Practices*. Federal Interagency Stream Restoration Working Group. http://www.nrcs.usda.gov/technical/stream_restoration/PDFFILES/APPENDIX.pdf.

- Harmon, W.A. and R. Smith. 2000. *Using Root Wads and Rock Vanes for Streambank Stabilization.* River Course Fact Sheet Number 4. North Carolina Cooperative Extension Service. http://www.bae.ncsu.edu/programs/extension/wqg/sri/rv-crs-4.pdf.

- Walter, J., D. Hughes, and N.J. Moore. 2005. *Streambank Revegetation and Protection: A Guide for Alaska. Revegetation Techniques: Root Wads.* Revised Edition. Alaska Department of Fish and Game, Division of Sport Fish. http://www.sf.adfg.state.ak.us/SARR/restoration/techniques/rootwad.cfm.

[10] http://el.erdc.usace.army.mil/elpubs/pdf/sr21.pdf

Rosgen's Stream Classification Method

Channelization
- ☑ Physical & chemical
- ☑ Instream/riparian restoration

Dams
- ☐ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☑ Streambanks ☐ Shorelines
  - ☐ Vegetative
  - ☐ Structural
  - ☐ Integrated
  - ☑ Planning & regulatory

Rosgen's stream channel stability method provides a sequence of steps for the field practitioner to use in reaching final conclusions and making recommendations for management, stream design, or restoration. The field practitioner uses field-measured variables to assess:

- Stream state or channel condition variables
- Vertical stability (degradation/aggradation)
- Lateral stability
- Channel patterns
- Stream profile and bed features
- Channel dimension factor
- Channel scour/deposition (with competence calculations of field verified critical dimensionless shear stress and change in bed and bar material size distribution)
- Stability ratings adjusted by stream type
- Dimensionless ratio sediment rating curves by stream type and stability ratings
- Selection of position in stream type evolutionary scenario as quantified by morphological variables by stream type to determine state and potential of stream reach.

The stability assessment is conducted on a reference reach and a departure analysis is performed when compared to an unstable reach of the same stream type. Changes in the variables controlling river channel form, primarily streamflow, sediment regime, riparian vegetation, and direct physical modifications can cause stream channel instability. Separating the differences between anthropogenic versus geologic processes in channel adjustment is a key to prevention, mitigation, and restoration of disturbed systems.

Rosgen (1996) has also created a river inventory hierarchy involving four levels that would allow a stream assessment to be conducted at various levels, ranging from broad qualitative descriptions to detailed quantitative descriptions. The idea is to provide documented measurements, coupled with consistent, quantitative indices of stability, to make the approach to stream assessments less subjective and more consistent and reproducible. Level I and Level II are used to do the initial stratification of a reach by valley and stream type. Level III is used to predict stability. Level IV is used for validation, and requires the greatest amount of detail over a longer time period. For example, vertical stability and bank erosion can be estimated at Level III. But, in a Level IV assessment, permanent cross-sections are revisited over time to verify shifts in bed elevation and measure actual erosion that occurred.

The four hierarchal levels, and the measurements and determinations they include, are shown below along with their objectives.

Level I—Geomorphic characterization: Used to describe generalized fluvial features using remote sensing and existing inventories of geology, landform evolution, valley morphology, depositional history and associated river slopes, relief and patterns utilized for generalized categories of major stream types, and associated interpretations.

Level II—Morphological description: To delineate homogeneous stream types that describe specific slopes, channel materials, dimensions and patterns from reference reach measurements and provide a more detailed level of interpretation than Level I. Includes measurements such as sinuosity, width/depth ration, slope, entrenchment ratio, and channel patterns and material.

Level III—Stream "state" or condition: The "state" of streams further describes existing conditions that influence the response of channels to imposed change and provide specific information for prediction methodologies (such as stream bank erosion calculations). Provides for very detailed descriptions and associated interpretation and predictions. Includes such measurements and/or characterizations of vegetation, deposition, debris, meander patterns, channel stability index, and flow regime.

Level IV—Reach specific studies (validation level): Provides reach-specific information on channel processes. Used to evaluate prediction methodologies; to provide sediment, hydraulic and biological information related to specific stream types; and to evaluate effectiveness of mitigation and impact assessments for activities by stream type. Involves direct measurements of sediment transport, bank erosion rates, aggradation/degradation, hydraulics, and biological data.

Rosgen's stream classification methodologies can assist in stream restoration design by:

- Enabling more precise estimates of quantitative hydraulic relationships associated with specific stream and valley morphologies.
- Establishing guidelines for selecting stable stream types for a range of dimensions, patterns, and profiles that are in balance with the river's valley slope, valley confinement, depositional materials, streamflow, and sediment regime of the watershed.
- Providing a method for extrapolating hydraulic parameters and developing empirical relationships for use in the resistance equations and hydraulic geometry equations needed for restoration design.
- Developing a series of meander geometry relationships that are uniquely related to stream types and their bankfull dimensions.
- Identifying the stable characteristics for a given stream type by comparing the stable form to its unstable or disequilibrium condition.

Refer to *Applied River Morphology* (Rosgen, 1996) for more information on this stream classification system and potential applications.

Scheduling Projects

Channelization
- ☐ Physical & chemical
- ☐ Instream/riparian restoration

Dams
- ☑ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☐ Streambanks ☐ Shorelines
  - ☐ Vegetative
  - ☐ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

Often clearing and grading for a project can be scheduled during the time of year that the erosion potential of the site is relatively low. In many parts of the country, there is a certain period of the year when erosion potential is relatively low and construction scheduling could be very effective. For example, in the Pacific region if construction can be completed during the 6-month dry season (e.g., May 1 to October 31), temporary erosion and sediment controls might not be needed. In some parts of the country erosion potential is very high during certain parts of the year, such as the spring thaw in northern and high-elevation areas. During that time of year, snowmelt generates a constant runoff that can erode soil. In addition, construction vehicles can easily turn the soft, wet ground into mud, which is more easily washed off-site. Therefore, in the north, limitations could be placed on clearing and grading during the spring thaw (Goldman et al., 1986).

Additional Resource

- CASQA. 2004. *California Stormwater BMP Construction Handbook: Scheduling.* California Stormwater Quality Association, Sacramento, CA. http://www.cabmphandbooks.com/Documents/Construction/EC-1.pdf.

Sediment Basins/Rock Dams

Channelization
- ☐ Physical & chemical
- ☐ Instream/riparian restoration

Dams
- ☐ Erosion control
- ☑ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☐ Streambanks ☐ Shorelines
  - ☐ Vegetative
  - ☐ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

An earthen or rock embankment that is located to capture sediment from runoff and retain it on the construction site.

Sediment basins, also known as silt basins, are engineered impoundment structures that allow sediment to settle out of the urban runoff. They are installed prior to full-scale grading and remain in place until the disturbed portions of the drainage area are fully stabilized. They are generally located at the low point of sites, away from construction traffic, where they will be able to trap sediment-laden runoff. Basin dewatering is achieved either through a single riser and drainage hole leading to a suitable outlet on the downstream side of the embankment or through the gravel of the rock dam. In both cases, water is released at a substantially slower rate than would be possible without the control structure.

The following are general specifications for sediment basin design criteria as presented in Schueler (1997):

- Provide 1,800 to 3,600 ft^3 of storage per contributing acre (a number of states, including Maryland, Pennsylvania, Georgia, and Delaware, recently increased the storage requirement to 3,600 ft^3 or more [CWP, 1997b]).
- Surface area equivalent to 1 percent of drainage area (optional, seldom required).
- Riser with spillway capacity of 0.2 ft^3/s/ac of drainage area (peak discharge for 2-year storm with 1-foot freeboard).
- Length-to-width ratio of 2 or greater.
- Basin side slopes no steeper than 2:1 (h:v).
- Safety fencing, perforated riser, dewatering (optional, seldom required).

Sediment basins can be classified as either temporary or permanent structures, depending on the length of service of the structure. If they are designed to function for less than 36 months, they are classified as temporary; otherwise, they are considered permanent. Temporary sediment basins can also be converted into permanent runoff management ponds. When sediment basins are designed as permanent structures, they must meet all standards for wet ponds. It is important to note that even the best-designed sediment basin seldom exceeds 60 to 75 percent total suspended solids (TSS) removal, which should be considered when selecting a sediment control practice.

Basins are most commonly used at the outlets of diversions, channels, slope drains, or other runoff conveyances that discharge sediment-laden water.

Additional Resources

- CASQA. 2003. *California Stormwater BMP Construction Handbook*: *Sediment Basin.* California Stormwater Quality Association, Sacramento, CA. http://www.cabmphandbooks.com/Documents/Construction/SE-2.pdf.

- ISU. 2006. *Iowa Construction Site Erosion Control Manual: Sediment Basin.* Iowa State University. http://www.ctre.iastate.edu/erosion/manuals/construction/3.17_sediment_basin.pdf.

- Michigan Department of Environmental Quality. 1992. *SESC Training Manual*: *Sedimentation Basin*. Michigan Department of Environmental Quality, Lansing, MI. http://www.deq.state.mi.us/documents/deq-swq-nps-sb.pdf.

- Tennessee Department of Environment and Conservation. 2002. *Erosion and Sediment Control Handbook: Sediment Basin*. Tennessee Department of Environment and Conservation, Nashville, TN. http://state.tn.us/environment/wpc/sed_ero_controlhandbook/sb.pdf.

Sediment Fences

Channelization
- ☐ Physical & chemical
- ☐ Instream/riparian restoration

Dams
- ☑ Erosion control
- ☑ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☐ Streambanks ☐ Shorelines
  - ☐ Vegetative
  - ☐ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

Silt fence, also known as filter fabric fence, is available in several mesh sizes from many manufacturers. Sediment is filtered out as runoff flows through the fabric. Such fences should be used only where there is sheet flow (no concentrated flow), and the maximum drainage area to the fence should be 0.5 acre or less per 100 feet of fence. To ensure sheet flow, a gravel collar or level spreader can be used upslope of the fence. Many types of fabrics are available commercially. The characteristics that determine a fence's effectiveness include filtration efficiency, permeability, tensile strength, tear strength, ultraviolet resistance, pH effects, and creep resistance. The longevity of silt fences depends heavily on proper installation and maintenance, however they typically last 6 to 12 months. CWP (1997d) identified several conditions that increase the effectiveness of silt fences:

- The length of the slope does not exceed 50 feet for slopes of 5 to 10 percent, 25 feet for slopes of 10 to 20 percent, or 15 feet for slopes greater than 20 percent.
- The silt fence is aligned parallel to the slope contours.
- Edges of the silt fence are curved uphill, which does not allow flow to bypass the fence.
- The contributing length to the fence is less than 100 feet.
- The fence has reinforcement if receiving concentrated flow.
- The fence was installed above an outlet pipe or weir.
- The fence is down slope of the exposed area and alignment considers construction traffic.
- Sediment is not allowed to accumulate behind the fence (increases capacity and decreases breach potential).
- Alignment of the silt fence mirrors the property line or limits of disturbance.

Additional Resources

➢ CASQA. 2003. *California Stormwater BMP Construction Handbook: Straw Bale Barrier.* California Stormwater Quality Association, Sacramento, CA. http://www.cabmphandbooks.com/Documents/Construction/SE-9.pdf.

➢ ISU. 2006. *Iowa Construction Site Erosion Control Manual: Sediment Barrier.* Iowa State University. http://www.ctre.iastate.edu/erosion/manuals/construction/3.16_sediment_barrier.pdf.

➢ Missouri Department of Natural Resources. 2006. *Protecting Water Quality, A Construction Site Water Quality Field Guide: Sediment Fence*. Missouri Department of Natural Resources. http://www.dnr.mo.gov/env/wpp/field-guide/fg05_06_sedimentcontrol.pdf.

➢ Tennessee Department of Environment and Conservation. 2002. *Erosion and Sediment Control Handbook: Silt Fence*. Tennessee Department of Environment and Conservation, Nashville, TN. http://state.tn.us/environment/wpc/sed_ero_controlhandbook/sf.pdf.

Sediment Traps

Sediment traps are small impoundments that allow sediment to settle out of runoff water. They are typically installed in a drainage way or other point of discharge from a disturbed area. Temporary diversions can be used to direct runoff to the sediment trap. Sediment traps are ideal for sites 1 acre and smaller and should not be used for areas greater than 5 acres. They typically have a useful life of approximately 18 to 24 months. A sediment trap should be designed to maximize surface area for infiltration and sediment settling. This design increases the effectiveness of the trap and decreases the likeliness of backup during and after periods of high runoff intensity. The approximate storage capacity of each trap should be at least 1,800 ft^3/acre of disturbed land draining into the trap (Smolen et al., 1988).

Channelization
- ☐ Physical & chemical
- ☐ Instream/riparian restoration

Dams
- ☐ Erosion control
- ☑ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☐ Streambanks ☐ Shorelines
  - ☐ Vegetative
  - ☐ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

Additional Resources

- British Columbia Ministry of Agriculture, Food and Fisheries. 2004. *Constructed Ditch Fact Sheet: Sediment Traps.* No. 9. http://www.agf.gov.bc.ca/resmgmt/publist/600Series/641310-1.pdf.

- CASQA. 2003. *California Stormwater BMP Construction Handbook*: *Sediment Traps.* California Stormwater Quality Association, Sacramento, CA. http://www.cabmphandbooks.com/Documents/Construction/SE-3.pdf.

- Tennessee Department of Environment and Conservation. 2002. *Erosion and Sediment Control Handbook: Sediment Trap*. Tennessee Department of Environment and Conservation, Nashville, TN. http://www.state.tn.us/environment/wpc/sed_ero_controlhandbook/st.pdf.

Seeding

Channelization
- ☐ Physical & chemical
- ☐ Instream/riparian restoration

Dams
- ☑ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☐ Streambanks ☐ Shorelines
  - ☐ Vegetative
  - ☐ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

Seeding establishes a vegetative cover on disturbed areas and is very effective in controlling soil erosion once a dense vegetative cover has been established. Seeding establishes permanent erosion control in a relatively short amount of time and has been shown to decrease solids load by 99 percent (CWP, 1997a). The three most common seeding methods are (1) broadcast seeding, in which seeds are scattered on the soil surface; (2) hydroseeding, in which seeds are sprayed on the surface of the soil with a slurry of water; and (3) drill seeding, in which a tractordrawn implement injects seeds into the soil surface. Broadcast seeding is most appropriate for small areas and for augmenting sparse and patchy grass covers. Hydroseeding is often used for large areas (in excess of 5,000 square feet) and is typically combined with tackifiers, fertilizers, and fiber mulch. Drill seeding is expensive and is cost-effective only on sites greater than 2 acres. For best results, bare soils should be seeded or otherwise stabilized within 15 calendar days after final grading. Denuded areas that are inactive and will be exposed to rain for 15 days or more can also be temporarily stabilized, usually by planting seeds and establishing vegetation during favorable seasons in areas where vegetation can be established. In very flat, nonsensitive areas with favorable soils, stabilization may involve simply seeding and fertilizing. The Soil Quality Institute (SQI, 2000) recommends that soils that have been compacted by grading should be broken up or tilled before vegetating.

To establish a vegetative cover, it is important to use seeds from adapted plant species and varieties that have a high germination capacity. Supplying essential plant nutrients, testing the soil for toxic materials, and applying an adequate amount of lime and fertilizer can overcome many unfavorable soil conditions and establish adequate vegetative cover. Specific information about seeds, various species, establishment techniques, and maintenance can be obtained from *Erosion Control & Conservation Plantings on Noncropland* (Landschoot, 1997) or a local Cooperative State Research, Education, and Extension Service[11] or Natural Resources Conservation Service[12] office.

Additional Resources

- CASQA. 2003. *California Stormwater BMP Construction Handbook: Hydroseeding.* California Stormwater Quality Association, Sacramento, CA. http://www.cabmphandbooks.com/Documents/Construction/EC-4.pdf.

- Wisconsin Department of Natural Resources. 2003. *Seeding for Construction Site Erosion Control.* Wisconsin Department of Natural Resources, Madison, WI. http://dnr.wi.gov/org/water/wm/nps/pdf/stormwater/techstds/erosion/Seeding%20For%20Construction%20Site%20Erosion%20Control%20_1059.pdf.

[11] http://www.csrees.usda.gov
[12] http://www.nrcs.usda.gov

Selective Withdrawal

Channelization
- ☐ Physical & chemical
- ☐ Instream/riparian restoration

Dams
- ☐ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☑ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☐ Streambanks ☐ Shorelines
  - ☐ Vegetative
  - ☐ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

Temperature control in reservoir releases depends on the volume of water storage in the reservoir, the timing of the release relative to storage time, and the level from which the water is withdrawn. Dams capable of selectively releasing waters of different temperatures can provide cooler or warmer water temperatures downstream at times that are critical for other instream resources, such as during periods of fish spawning and development of fry (Fontane et al., 1981; Hansen and Crumrine, 1991). Stratified reservoirs are operated to meet downstream temperature objectives such as to enhance a cold-water or warm-water fishery or to maintain preproject stream temperature conditions. Release temperature may also be important for irrigation (Fontane et al., 1981).

Multilevel intake devices in storage reservoirs allow selective withdrawal of water based on temperature and DO levels. These devices minimize the withdrawal of surface water high in blue-green algae, or of deep water enriched in iron and manganese. Care should be taken in the design of these systems not to position the multilevel intakes too far apart because this will increase the difficulty with which withdrawals can be controlled, making the discharge of poor-quality hypolimnetic water more likely (Howington, 1990; Johnson and LaBounty, 1988; Smith et al., 1987).

Setbacks

Channelization
- ☑ Physical & chemical
- ☑ Instream/riparian restoration

Dams
- ☐ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☑ Streambanks ☑ Shorelines
  - ☐ Vegetative
  - ☐ Structural
  - ☐ Integrated
  - ☑ Planning & regulatory

Where setbacks have been implemented to reduce the hazard of coastal land loss, they have also included requirements for the relocation of existing structures located within the designated setback area. Setbacks can also include restrictions on uses of waterfront areas that are not related to the construction of new buildings (Davis, 1987). Upland drainage from development should be directed away from bluffs and banks so as to avoid accelerating slope erosion.

In most cases, states have used the local unit of government to administer the program on either a mandatory or voluntary basis. This allows local government to retain control of its land use activities and to exceed the minimum state requirements if this is deemed desirable (NRC, 1990).

Technical standards for defining and delineating setbacks also vary from state to state. One approach is to establish setback requirements for any "high hazard area" eroding at greater than 1 foot per year. Another approach is to establish setback requirements along all erodible shores because even a small amount of erosion can threaten homes constructed too close to the streambank or shoreline. Several states have general setback requirements that, while not based on erosion hazards, have the effect of limiting construction near the streambank or shoreline.

The basis for variations in setback regulations between states seems to be based on several factors, including (NRC, 1990):

- The language of the law being enacted
- The geomorphology of the coast
- The result of discretionary decisions
- The years of protection afforded by the setback
- Other variables decided at the local level of government

From the perspective of controlling NPS pollution resulting from erosion of shorelines and streambanks, the use of setbacks has the immediate benefit of discouraging concentrated flows and other impacts of storm water runoff from new development in areas close to the streambank or shoreline. In particular, the concentration of storm water runoff can aggravate the erosion of shorelines and streambanks, leading to the formation of gullies, which are not easily repaired. Therefore, drainage of storm water from developed areas and development activities located along the shoreline should be directed inland to avoid accelerating slope erosion.

The most significant NPS benefits are provided by setbacks that not only include restrictions on new construction along the shore but also contain additional provisions aimed at preserving and protecting coastal features such as beaches, wetlands, and riparian forests. This approach

promotes the natural infiltration of surface water runoff before it passes over the edge of the bank or bluff and flows directly into the coastal waterbody. Setbacks also help protect zones of naturally occurring vegetation growing along the shore. As discussed in the section on "bioengineering practices," the presence of undisturbed shoreline vegetation itself can help to control erosion by removing excess water from the bank and by anchoring the individual soil particles of the substrate.

Almost all states and territories with setback regulations have modified their original programs to improve effectiveness or correct unforeseen problems (NRC, 1990). Experiences have shown that procedures for updating or modifying the setback width need to be included in the regulations. For instance, application of a typical 30-year setback standard in an area whose rate of erosion is 2 feet per year results in the designation of a setback width of 60 feet. This width may not be sufficient to protect the beaches, wetlands, or riparian forests whose presence improves the ability of the streambank or shoreline to respond to severe wave and flood conditions, or to high levels of surface water runoff during extreme precipitation events. A setback standard based on the landward edge of streambank or shoreline vegetation is one alternative that has been considered (NRC, 1990; Davis, 1987).

From the standpoint of NPS pollution control, an approach that designates streambanks, shorelines, wetlands, beaches, or riparian forests as a special protective feature, allows no development on the feature, and measures the setback from the landward side of the feature is recommended (NRC, 1990). In some cases, provisions for soil bioengineering, marsh creation, beach nourishment, or engineering structures may also be appropriate since the special protective features within the designated setbacks can continue to be threatened by uncontrolled erosion of the shoreline or streambank. Finally, setback regulations should recognize that some special features of the streambank or shoreline will change position. For instance, beaches and wetlands can be expected to migrate landward if water levels continue to rise. Alternatives for managing these situations include flexible criteria for designating setbacks, vigorous maintenance of beaches and other special features within the setback area, and frequent monitoring of the rate of streambank or shoreline erosion and corresponding adjustment of the setback area.

Shoreline Sensitivity Assessment

Currently there are no complete, universal assessment methodologies that apply to all shorelines and assess erosion vulnerabilities in various types of lakes, reservoirs, estuaries, and coasts. The methods presented by NOAA and the U.S. Geological Survey (USGS) were originally developed for other purposes and are being applied for other shoreline assessments:

- Environmental Sensitivity Mapping
- USGS Coastal Classification (Coastal & Marine Geology Program)
- Coastal Vulnerability Index (CVI) (focus is on SLR—the "erosion" factor may be the only relevant factor in CVI)

Channelization
- ☐ Physical & chemical
- ☐ Instream/riparian restoration

Dams
- ☐ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☐ Streambanks ☑ Shorelines
  - ☐ Vegetative
  - ☐ Structural
  - ☐ Integrated
  - ☑ Planning & regulatory

Environmental Sensitivity Mapping

The Environmental Sensitivity Index (ESI) was originally created for NOAA to prioritize areas for environmental cleanup (mainly oil-spills), to assist spill-response coordinators in evaluating the potential impact of oil along a shoreline, and to facilitate the allocation of resources during and after a spill.

ESI maps are comprised of three general types of information (NOAA, 1997):

- Shoreline Classification—ranked according to a scale relating to sensitivity, natural persistence of oil, and ease of cleanup.
- Biological Resources—including oil-sensitive animals and rare plants as well as habitats that are used by oil-sensitive species or are themselves sensitive to oil spills, such as submersed aquatic vegetation and coral reefs.
- Human-Use Resources—specific areas that have added sensitivity and value because of their use, such as beaches, parks and marine sanctuaries, water intakes, and archaeological sites.

The standardized ESI shoreline guideline rankings include estuarine, lacustrine, riverine, and palustrine habitats (NOAA, 1997). The classification scheme is based on an understanding of the physical and biological character of the shoreline environment, not just the substrate type and grain size. Relationships among physical processes, substrate type, and associated biota produce specific geomorphic/ecologic shoreline types, sediment transport patterns, and predictable patterns in oil behavior and biological impact. The concepts relating natural factors to the relative sensitivity of coastline, mostly developed in the estuarine setting, were slightly modified for lakes and rivers. The sensitivity ranking is controlled by the following factors:

- Relative exposure to wave and tidal energy
- Shoreline slope

- Substrate type (grain size, mobility, penetration and/or burial, and trafficability)
- Biological productivity and sensitivity

ESI maps have proven to have a long-term use, and they are excellent tools for studying shoreline change and its effects on the distribution and concentration of plants and animals living near the coast. Environmental sensitivity mapping is still evolving, and NOAA researchers are working with federal, state, and private industry partners to improve the ESI mapping system to extend beyond spill response.

USGS Coastal Classification (Coastal & Marine Geology Program)

The objective of the Coastal Classification Map is to determine the hazard vulnerability of an area. The coastal geomorphic classification scheme utilizes morphology and human modifications of the coast as the primary basis for hazard assessment. It emphasizes physical factors that influence erosion, overwash of sandy beaches and barrier islands, and landward sediment transport during storms along and across those features (USGS, 2004).

USGS National Assessment of Coastal Vulnerability to Sea-Level Rise

The USGS Coastal and Marine Geology Program's National Assessment, seeks to determine the relative risks due to future sea-level rise for the U.S. Atlantic, Pacific, and Gulf of Mexico coasts USGS, 2002). Through the use of a CVI, the relative risk that physical changes will occur as sea-level rises is quantified based on the following criteria: tidal range, wave height, coastal slope, shoreline change, geomorphology, and historical rate of relative sea-level rise. This approach combines a coastal system's susceptibility to change with its natural ability to adapt to changing environmental conditions, and yields a relative measure of the system's natural vulnerability to the effects of sea-level rise.

In 2001, USGS in partnership with the National Park Service (NPS) Geologic Resources Division, began conducting hazard assessments and creating map products to assist the NPS in managing vulnerable coastal resources. One of the most important and practical issues in coastal geology is determining the physical response of coastal environments to water-level changes.

Additional Resources

- NOAA. 1997. *Environmental Sensitivity Index Guidelines (Version 3)* Chapter 2. Seattle, WA. http://response.restoration.noaa.gov/book_shelf/876_chapter2.pdf.

- USGS. 2002. *Vulnerability of US National Parks to Sea-Level Rise and Coastal Change*. U.S. Geological Survey. http://pubs.usgs.gov/fs/fs095-02/fs095-02.html.

- USGS. 2004. *Coastal Classification Mapping Project*. U.S. Geological Survey, Coastal & Marine Geology Program. http://coastal.er.usgs.gov/coastal-classification/class.html.

Site Fingerprinting

Channelization
- ☐ Physical & chemical
- ☐ Instream/riparian restoration

Dams
- ☑ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☐ Streambanks ☐ Shorelines
  - ☐ Vegetative
  - ☐ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

Often areas of a construction site are unnecessarily cleared. The total amount of disturbed area can be reduced with site fingerprinting, which involves placing development in the most environmentally sound locations on the site and minimizing the size of disturbed area. With site fingerprinting, only those areas essential for completing construction activities are cleared. The remaining area is left undisturbed.

Fingerprinting places development away from environmentally sensitive areas (wetlands, steep slopes, etc.), areas for future open space and restoration, areas where trees are to be saved, and temporary and permanent vegetative buffer zones.

The proposed limits of land disturbance can be physically marked off to ensure that only the land area required for buildings, roads, and other infrastructure is cleared. Existing vegetation, especially vegetation on steep slopes, can be avoided.

Sodding

Channelization
- ☐ Physical & chemical
- ☐ Instream/riparian restoration

Dams
- ☑ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☐ Streambanks ☐ Shorelines
  - ☐ Vegetative
  - ☐ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

Sodding permanently stabilizes an area with a thick vegetative cover. Sodding provides immediate stabilization of an area and can be used in critical areas or where establishing permanent vegetation by seeding and mulching would be difficult. Sodding is also a preferred option when there is high erosion potential during the period of vegetative establishment from seeding. According to the Soil Quality Institute (SQI, 2000), soils that have been compacted by grading should be broken up or tilled before placing sod.

Additional Resources

- Barr Engineering Company. 2001. *Minnesota Urban Small Sites BMP Manual: Stormwater Best Management Practices for Cold Climates. Soil Erosion Control: Vegetative Methods.* Prepared for the Metropolitan Council by Barr Engineering Company, St. Paul, MN. http://www.metrocouncil.org/environment/Watershed/BMP/CH3_RPPSoilVeget.pdf.

- ISU. 2006. *Iowa Construction Site Erosion Control Manual: Sodding.* Iowa State University. http://www.ctre.iastate.edu/erosion/manuals/construction/2.6_sodding.pdf.

Soil Protection

Unprotected stockpiles are very prone to erosion, and they must be protected. Small stockpiles can be covered with a tarp to prevent erosion. Large stockpiles can be stabilized by erosion blankets, seeding, or mulching.

Because of the high organic content of topsoil, it is not recommended for use as fill material or under pavement. After a site is cleared, the topsoil is typically removed. Since topsoil is essential to establish new vegetation, it should be stockpiled and then reapplied to the site for revegetation, if appropriate. Although topsoil salvaged from the existing site can often be used, it must meet certain standards, and topsoil might need to be imported onto the site if the existing topsoil is not adequate for establishing new vegetation.

Channelization
- ☐ Physical & chemical
- ☐ Instream/riparian restoration

Dams
- ☑ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☐ Streambanks ☐ Shorelines
  - ☐ Vegetative
  - ☐ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

Spill and Water Budgets

Channelization
- ☐ Physical & chemical
- ☐ Instream/riparian restoration

Dams
- ☐ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☑ Maintain fish passage

Erosion
- ☐ Streambanks ☐ Shorelines
  - ☐ Vegetative
  - ☐ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

Although often used together, spill and water budgets are independent methods of facilitating downstream fish migration. Spill budgets provide alternative methods for fish passage that are less dangerous than passage through turbines. Spillways are used to allow fish to leave the reservoir by passing over the dam rather than through the turbines. The spillways must be designed to ensure that hydraulic conditions do not induce injury to the passing fish from scraping and abrasion, turbulence, rapid pressure changes, or supersaturation of dissolved gases in water passing through plunge pools (Stone and Webster, 1986).

In the Columbia River basin (Pacific Northwest), the USACE provides spill on a limited basis to pass fish around specific dams to improve survival rates. At key dams, spill is used in special operations to protect hatchery releases or provide better passage conditions until bypass systems are fully developed or, in some cases, improved (van der Borg and Ferguson, 1989). The cost of this alternative depends on the volume of water lost for power production (Mattice, 1990). Analyses of this practice, using a USACE model called FISHPASS, historically has shown that application of spill budgets in the Columbia River basin is consistently the most costly and least efficient method of improving overall downstream migration efficiency (Dodge, 1989).

In 1995 the National Marine Fisheries Service (NMFS) released a draft biological opinion to save Columbia River Basin salmon. The opinion was issued after concluding that current operations of the hydropower system were jeopardizing Columbia Basin salmon. The opinion addresses safer passage for young fish through the dams and modification to a number of hydropower operations and facilities. It calls for using as much water as possible during fish-passage season to improve flow for fish moving through the system. Specifically the draft called for spilling water over dams to increase passage of juvenile salmon via non-turbine routes to at least 80 percent. The USACE now runs the Juvenile Fish Transportation Program in cooperation with NMFS (NOAA, 1995; USACE, 2002b).

Water budgets increase flows through dams during the out-migration of anadromous fish species. They are used to speed smolt migration through reservoirs and dams. Water normally released from the impoundment during the winter period to generate power is instead released in May or June, when it can be sold only as secondary energy. This concept has been used in some regions of the United States, although quantification of the overall benefits is lacking (Dodge, 1989).

The volume of a typical water budget is generally not adequate to sustain minimum desirable flows for fish passage during the entire migration period. The Columbia Basin Fish and Wildlife Authority has proposed replacement of the water budget on the Columbia River system with a minimum flow requirement to prevent problems of inadequate water volume in discharge during low-flow years (Muckleston, 1990).

Spill Prevention and Control Program

Channelization
- ☐ Physical & chemical
- ☐ Instream/riparian restoration

Dams
- ☐ Erosion control
- ☐ Runoff control
- ☑ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☐ Streambanks ☐ Shorelines
  - ☐ Vegetative
  - ☐ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

Spill procedure information can be posted, and persons trained in spill handling should be onsite or on call at all times. Materials for cleaning up spills can be kept onsite and easily available. Spills should be cleaned up immediately and the contaminated material properly disposed.

In general, a spill prevention, control, and countermeasure (SPCC) plan can include guidance to site personnel on:

- Proper notification when a spill occurs
- Site responsibility with respect to addressing the cleanup of a spill
- Stopping the source of a spill
- Cleaning up a spill
- Proper disposal of materials contaminated by the spill
- Location of spill response equipment programs
- Training program for designated on-site personnel

A periodic spill "fire drill" can be conducted to help train personnel on proper responses to spill events and to keep response actions fresh in the minds of personnel. It is important to maintain an adequate spill and cleaning kit, which could include the following:

- Detergent or soap, hand cleaner, and water
- Activated charcoal, adsorptive clay, vermiculite, kitty litter, sawdust, or other adsorptive materials
- Lime or bleach to neutralize pesticides or other spills in emergency situations
- Tools such as a shovel, broom, and dustpan and containers for disposal
- Proper protective clothing

Spillway Modifications

Channelization
- ☐ Physical & chemical
- ☐ Instream/riparian restoration

Dams
- ☐ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☑ Improve tailwater oxygen
- ☑ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☐ Streambanks ☐ Shorelines
  - ☐ Vegetative
  - ☐ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

Spill at hydroelectric dams is routinely required during periods of high runoff when the river discharge exceeds what can be passed through the powerhouse turbines. In some cases, spill has been associated with gas supersaturation problems. The USACE has proposed several practices for solving the gas supersaturation problem. These include (1) passing more headwater storage through turbines, installing new fish bypass structures, and installing additional power units to reduce the need for spill; (2) incorporating "flip-lip" deflectors in spillway-stilling basins, transferring power generation to high-dissolved-gas-producing dams, and altering spill patterns at individual dams to minimize nitrogen mass entrainment; and (3) collecting and transporting juvenile salmonids around affected river reaches. Only a few of these practices have been implemented (Tanovan, 1987). As more attention is being paid to maintaining minimum flows in rivers for fish passage and spawning, mangers are balancing the need for spills with the potential impacts of gas supersaturation (Anderson, 2004; Anderson, 1995; DeHart, 2003; USFWS, 2001; Van Holmes and Anderson, 2004). For example, the U.S. Fish and Wildlife Service has routinely monitored gas supersaturation in reaches below Bonneville Dam (Columbia River, Oregon) to protect migrating salmon, many of which are endangered species (USFWS, 2001).

Surface Roughening

Roughening is the scarifying of a bare sloped soil surface with horizontal grooves or benches running across the slope. Roughening aids the establishment of vegetative cover, improves water infiltration, and decreases runoff velocity.

Additional Resource

- Tennessee Department of Environment and Conservation. 2002. *Erosion and Sediment Control Handbook: Surface Roughening*. Tennessee Department of Environment and Conservation, Nashville, TN. http://www.state.tn.us/environment/wpc/sed_ero_controlhandbook/sr.pdf.

Channelization
- ☐ Physical & chemical
- ☐ Instream/riparian restoration

Dams
- ☑ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☐ Streambanks ☐ Shorelines
  - ☐ Vegetative
  - ☐ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

Toe Protection

Channelization
- ☑ Physical & chemical
- ☑ Instream/riparian restoration

Dams
- ☐ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☑ Streambanks ☑ Shorelines
  - ☐ Vegetative
  - ☑ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

A number of qualitative advantages are to be gained by providing toe protection for vertical bulkheads. Toe protection usually takes the form of a stone apron installed at the base of the vertical structure to reduce wave reflection and scour of bottom sediments during storms. The installation of rubble toe protection should include filter cloth and perhaps a bedding of small stone to reduce the possibility of rupture of the filter cloth. Ideally, the rubble should extend to an elevation such that waves will break on the rubble during storms.

Additional Resources

- Massachusetts DEP. 2006. *Massachusetts Nonpoint Source Pollution Management Manual: Stone Toe Protection.* Massachusetts Department of Environmental Protection, Boston, MA. http://projects.geosyntec.com/NPSManual/Fact%20Sheets/Stone%20Toe%20Protection.pdf.

- Wisconsin Department of Natural Resources. 2006. *Vegetated Armoring Erosion Control Methods.* http://dnr.wi.gov/org/water/fhp/waterway/erosioncontrol-vegetated.html.

Training—ESC

Channelization
- ☐ Physical & chemical
- ☐ Instream/riparian restoration

Dams
- ☑ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☐ Streambanks ☐ Shorelines
  - ☐ Vegetative
  - ☐ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

Provide education and training opportunities for designers, developers, and contractors. One of the most important factors determining whether ESCs will be properly installed and maintained on a construction site is the knowledge and experience of the contractor and onsite personnel. Many communities require certification for key on-site employees who are responsible for implementing the ESC plan. Certification can be accomplished through municipally sponsored training courses; more informally, municipalities can hold mandatory preconstruction or prewintering meetings and conduct regular and final inspection visits to transfer information to contractors (Brown and Caraco, 1997). Information that can be covered in training courses and meetings includes the importance of ESC for water quality protection; developing and implementing ESC plans; the importance of proper installation, regular inspection, and diligent maintenance of ESC practices; and record keeping for inspections and maintenance activities.

Transference of Fish Runs

Channelization
- ☐ Physical & chemical
- ☐ Instream/riparian restoration

Dams
- ☐ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☑ Maintain fish passage

Erosion
- ☐ Streambanks ☐ Shorelines
  - ☐ Vegetative
  - ☐ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

Transference of fish runs involves inducing anadromous fish species to use different spawning grounds in the vicinity of an impoundment. To implement this practice, the nature and extent of the spawning grounds that were lost due to the blockage in the river need to be assessed, and suitable alternative spawning grounds need to be identified. The feasibility of successfully collecting the fish and transporting them to alternative tributaries also needs to be carefully determined.

One strategy for mitigating the impacts of diversions on fisheries is the use of ephemeral streams as conveyance channels for all or a portion of the diverted water. If flow releases are controlled and uninterrupted, a perennial stream is created, along with new instream and riparian habitat. However, the biota that had been adapted to preexisting conditions in the ephemeral stream will probably be eliminated.

Tree Armoring, Fencing, and Retaining Walls or Tree Wells

Tree armoring protects tree trunks and natural vegetation from being damaged by construction equipment. Fencing can also protect tree trunks, but it should be placed at the tree's drip line so that construction equipment is kept away from the tree. A tree's drip line is the minimum area around the tree in which the tree's root system should not be disturbed by cut, fill, or soil compaction caused by heavy equipment. When cutting or filling must be done near a tree, a retaining wall or tree well can be used to minimize the cutting of the tree's roots or the quantity of fill placed over the tree's roots. It is recommended that cutting or filling be done only when absolutely necessary. Fill placement over the tree root flare or within the dripline will eventually kill the tree.

Channelization
- ☐ Physical & chemical
- ☐ Instream/riparian restoration

Dams
- ☑ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☐ Streambanks ☐ Shorelines
  - ☐ Vegetative
  - ☐ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

Tree Revetments

Channelization
- ☑ Physical & chemical
- ☑ Instream/riparian restoration

Dams
- ☑ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☑ Streambanks ☑ Shorelines
  - ☑ Vegetative
  - ☐ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

Tree revetments consist of a row of interconnected trees anchored to the toe of the streambank or to the upper streambank (Figures 7.28 and 7.29). This serves to reduce flow velocities along eroding streambanks, trap sediment, and provide a substrate for plant establishment and erosion control. This design relies on the installation of an adequate anchoring system and is best suited for streambank heights under 12 feet and bankfull velocities under 6 feet per second. In addition, this structure should occupy no more than 15 percent of the channel at bankfull. Toe protection is needed to accompany this design if scour is anticipated and upper bank soil bioengineering techniques are recommended to ensure streamside regeneration. This design allows for the use of local materials if they are readily available. Decay resistant species are recommended for the logs to extend the life of the structure and thus the ability of vegetation to become established. Due to decomposition, these structures have a limited life and might require periodic replacement. It is considered beneficial that decomposition of the logs over time allows the streambank to return to a natural state with protection provided by mature streambank vegetation. There is a potential for the logs to dislodge, and these structures should not be located upstream of bridges or other structures sensitive to damage. Tree revetments are susceptible to damage by ice (FISRWG, 1998). Installation guidelines are available from the USDA-FS Soil Bioengineering Guide (USDA-FS, 2002).

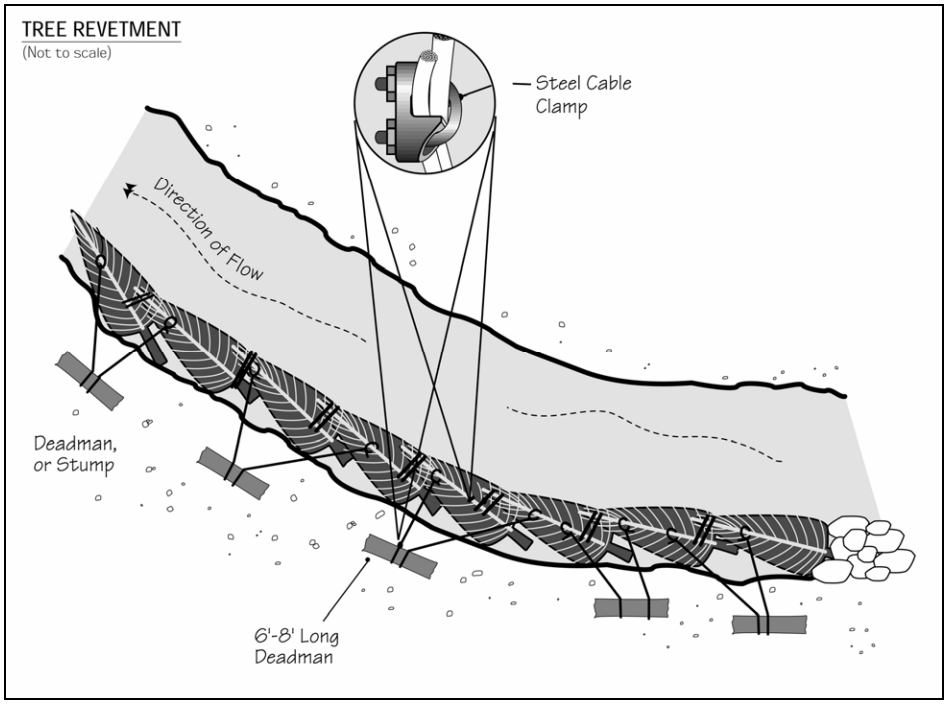

Figure 7.28 Tree Revetment (USDA-FS, 2002)

Additional Resources

- Alaska Department of Fish and Game. 2005. *Spruce Tree Revetment.* http://www.sf.adfg.state.ak.us/sarr/restoration/techniques/images/csbs_strevet.pdf.

- FISRWG. 1998. *Stream Corridor Restoration: Principles, Processes, and Practices*. Federal Interagency Stream Restoration Working Group. http://www.nrcs.usda.gov/technical/stream_restoration/PDFFILES/APPENDIX.pdf.

- Goard, D. 2006. *Riparian Forest Best Management Practices: Tree Revetments.* Kansas State University, Manhattan, KS. http://www.oznet.ksu.edu/library/forst2/MF2750.pdf.

- Gough, S. 2004. *Tree Revetments for Streambank Revitalization.* Missouri Department of Conservation, Fisheries Division, Jefferson City, MO. http://mdc.mo.gov/fish/streams/revetmen/.

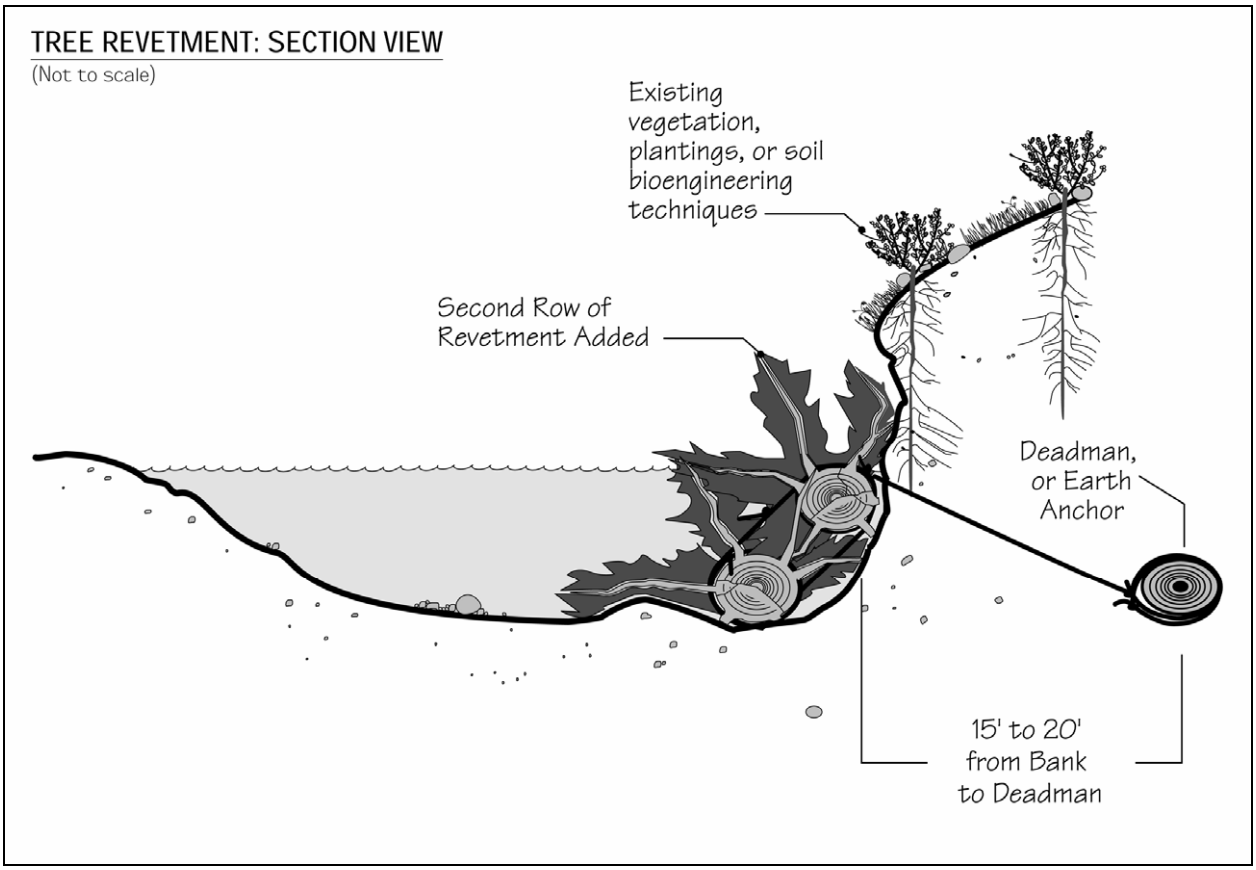

Figure 7.29 Tree Revetment: Section View (USDA-FS, 2002)

Turbine Operation

Implementation of changes in the turbine start-up procedures can also enlarge the zone of withdrawal to include more of the epilimnetic waters in the downstream releases. Monitoring of the releases at the Walter F. George lock and dam (Chattahoochee River, Georgia), showed levels of DO declined sharply at the start-up of hydropower production. The severity and duration of the DO drop were found to be reduced by starting up all the generator units within a minute of each other (Findley and Day, 1987).

Channelization
- ☐ Physical & chemical
- ☐ Instream/riparian restoration

Dams
- ☐ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☑ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☐ Streambanks ☐ Shorelines
  - ☐ Vegetative
  - ☐ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

Turbine Venting

Channelization
- ☐ Physical & chemical
- ☐ Instream/riparian restoration

Dams
- ☐ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☑ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☐ Streambanks ☐ Shorelines
  - ☐ Vegetative
  - ☐ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

Turbine venting is the practice of injecting air into water as it passes through a turbine. If vents are provided inside the turbine chamber, the turbine will aspirate air from the atmosphere and mix it with water passing through the turbine as part of its normal operation. In early designs, the turbine was vented through existing openings, such as the draft tube opening or the vacuum breaker valve in the turbine assembly. Air forced by compressors into the draft tube opening enriched reservoir waters with little detectable DO to concentrations of 3 to 4 mg/L. Overriding the automatic closure of the vacuum breaker valve (at high turbine discharges) increased DO by only 2 mg/L (Harshbarger, 1987).

Turbine venting uses the low-pressure region just below the turbine wheel to aspirate air into the discharges (Wilhelms, 1984). Autoventing turbines are constructed with hub baffles, or deflector plates placed on the turbine hub upstream of the vent holes to enhance the low-pressure zone in the vicinity of the vent and thereby increase the amount of air aspirated through the venting system. Turbine efficiency relates to the amount of energy output from a turbine per unit of water passing through the turbine. Efficiency decreases as less power is produced for the same volume of water. In systems where the water is aerated before passing through the turbine, part of the water volume is displaced by the air, thus leading to decreased efficiency. Hub baffles have also been added to autoventing turbines at the Norris Dam (Clinch River, Tennessee) to further improve the DO levels in the turbine releases (Jones and March, 1991).

Developments in autoventing turbine technology show that it may be possible to aspirate air with no resulting decrease in turbine efficiency. In one test of an autoventing turbine at the Norris Dam, the turbine efficiency increased by 1.8 percent (March et al., 1991; Waldrop, 1992). Technologies like autoventing turbines are very site-specific and outcomes will vary considerably.

Vegetated Buffers

Channelization
- ☑ Physical & chemical
- ☑ Instream/riparian restoration

Dams
- ☑ Erosion control
- ☑ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☑ Streambanks ☑ Shorelines
  - ☑ Vegetative
  - ☐ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

Like filter strips, vegetated buffers provide a physical separation between a construction site and a waterbody. The difference between a filter strip and a vegetated buffer area is that a filter strip is an engineered device, whereas a buffer is a naturally occurring filter system. Vegetated buffers remove nutrients and other pollutants from runoff, trap sediments, and shade the waterbody to optimize light and temperature conditions for aquatic plants and animals (Welsch, n.d.). Preservation of vegetation for a buffer can be planned before any site-disturbing activities begin so as to minimize the impact of construction activities on existing vegetation. Trees can be clearly marked at the dripline to preserve them and to protect them from ground disturbances around the base of the tree.

Proper maintenance of buffer vegetation is important. Maintenance requirements depend on the plant species chosen, soil types, and climatic conditions. Maintenance activities typically include fertilizing, liming, irrigating, pruning, controlling weeds and pests, and repairing protective markers (e.g., fluorescent fences and flags).

Additional Resources

- CASQA. 2003. *California Stormwater BMP Construction Handbook: Vegetated Buffer Strips.* California Stormwater Quality Association, Sacramento, CA. http://www.cabmphandbooks.com/Documents/Development/TC-31.pdf.

- Ohio DNR. No date. *Ohio Stream Management Guide: Forested Buffer Strips.* Ohio Department of Natural Resources. http://www.ohiodnr.com/water/pubs/fs_st/stfs13.htm.

- River Alliance of Wisconsin. No date. *Benefits of Vegetated Buffers.* River Alliance of Wisconsin, Madison, WI. http://www.wisconsinrivers.org/documents/policy/Fact%20Sheet%20-%20Benefits%20of%20Vegetated%20Buffers.pdf.

- Tennessee Department of Environment and Conservation. 2002. *Erosion and Sediment Control Handbook: Vegetative Practices*. Tennessee Department of Environment and Conservation, Nashville, TN. http://state.tn.us/environment/wpc/sed_ero_controlhandbook/2.%20Vegetative%20Practices.pdf.

Vegetated Filter Strips

Channelization
- ☐ Physical & chemical
- ☐ Instream/riparian restoration

Dams
- ☑ Erosion control
- ☑ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☐ Streambanks ☐ Shorelines
  - ☐ Vegetative
  - ☐ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

Vegetated filter strips are low-gradient vegetated areas that filter overland sheet flow. Runoff must be evenly distributed across the filter strip. Channelized flows decrease the effectiveness of filter strips. Level spreading devices are often used to distribute the runoff evenly across the strip (Dillaha et al., 1989).

Vegetated filter strips should have relatively low slopes and adequate length to provide optimal sediment control and should be planted with erosion-resistant plant species. The main factors that influence the removal efficiency are the vegetation type, soil infiltration rate, and flow depth and travel time. These factors are dependent on the contributing drainage area, slope of strip, degree and type of vegetative cover, and strip length. Maintenance requirements for vegetated filter strips include sediment removal and inspections to ensure that dense, vigorous vegetation is established and concentrated flows do not occur. For more information on vegetated filter strips, refer to EPA's *National Management Measures to Protect and Restore Wetlands and Riparian Areas for the Abatement of Nonpoint Source Pollution* (USEPA, 2005b).

Additional Resources

- ISU. 2006. *Iowa Construction Site Erosion Control Manual: Vegetative Filter Strip.* Iowa State University. http://www.ctre.iastate.edu/erosion/manuals/construction/2.8_veg_filter_strip.pdf.

- Leeds, R., L.C. Brown, M.R. Sulc, and L. VanLieshout. No date. *Vegetative Filter Strips: Application, Installation and Maintenance*. The Ohio State University, Food, Agriculture and Biological Engineering, Columbus, OH. http://ohioline.osu.edu/aex-fact/0467.html.

- USDA. 2003. *Grass Filter Strips.* U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.oh.nrcs.usda.gov/programs/Lake_Erie_Buffer/filter_strips.html.

Vegetated Gabions

Channelization
- ☑ Physical & chemical
- ☑ Instream/riparian restoration

Dams
- ☑ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☑ Streambanks ☑ Shorelines
  - ☐ Vegetative
  - ☐ Structural
  - ☑ Integrated
  - ☐ Planning & regulatory

Vegetated gabions (Figure 7.30) start with wire-mesh, rectangular baskets filled with small to medium rock and soil. The baskets are then laced together to form a structural toe or sidewall. Live branches (0.5 to 1 inch in diameter) are then placed on each consecutive layer between the rock filled baskets to take root, join together the structure, and bind it to the slope. This method is effective for protecting steep slopes where scouring or undercutting is occurring. However, this method is not appropriate in streams with heavy bed load or where severe ice damage occurs. This method provides moderate structural support and should be placed at the base of a slope to stabilize the slope and reduce slope steepness. A stable foundation is required for the installation of these structures. When the rock size needed is not locally available, this design is effective because smaller rocks can be used. A limiting factor of this method is that it is expensive to install and to replace. These structures are relatively expensive to construct and frequently require costly repairs. This method should be combined with other soil bioengineering techniques, particularly revegetation efforts, to achieve a comprehensive streambank restoration design (FISRWG, 1998). There is often opposition to these structures based on their inability to blend in with natural settings and their general lack of aesthetically pleasing qualities (Gore, 1985).

Installation guidelines are available from the USDA NRCS *Engineering Field Handbook, Chapter 18* (USDA-NRCS, 1992). Under EMRRP, the USACE has presented research on vegetated gabions in a technical note (*Gabions for Streambank Erosion Control*).[13]

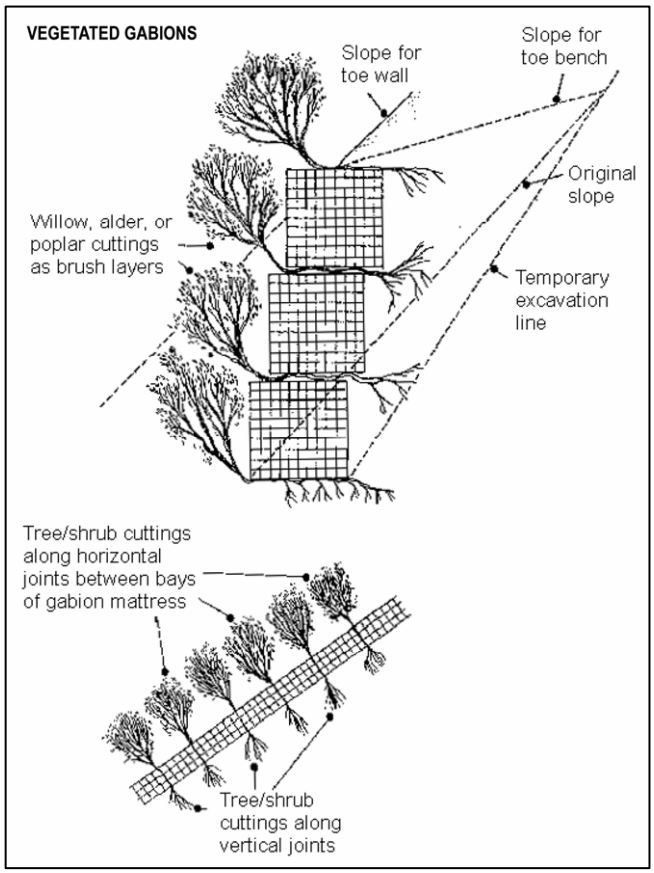

Figure 7.30 Vegetated Gabion (Allen and Leech, 1997)

[13] http://el.erdc.usace.army.mil/elpubs/pdf/sr22.pdf

Additional Resources

- FISRWG. 1998. *Stream Corridor Restoration: Principles, Processes, and Practices*. Federal Interagency Stream Restoration Working Group. http://www.nrcs.usda.gov/technical/stream_restoration/PDFFILES/APPENDIX.pdf.

- ISU. 2006. *Iowa Construction Site Erosion Control Manual: Gabion.* Iowa State University. http://www.ctre.iastate.edu/erosion/manuals/construction/3.8_gabion.pdf.

- Mississippi State University, Center for Sustainable Design. 1999. *Water Related Best Management Practices in the Landscape: Vegetated Rock Gabions/Gabions.* Created for United States Department of Agriculture, Natural Resource Conservation Service, Watershed Science Institute. http://www.abe.msstate.edu/csd/NRCS-BMPs/pdf/streams/bank/veg_rockgabions.pdf.

- MMG Civil Engineering Systems, Ltd. 2001. *Vegetated Gabions*. MMG Civil Engineering Systems, Ltd., St. Germans, Kings Lynn, Norfolk, England. http://www.verdantsolutions.ltd.uk/acrobat/vegsod.pdf.

- Ohio DNR. No date. *Ohio Stream Management Guide: Gabion Revetments.* Ohio Department of Natural Resources. http://www.ohiodnr.com/water/pubs/fs_st/stfs15.htm.

- Tennessee Department of Environment and Conservation. 2002. *Erosion and Sediment Control Handbook: Gabion*. Tennessee Department of Environment and Conservation, Nashville, TN. http://state.tn.us/environment/wpc/sed_ero_controlhandbook/ga.pdf.

Vegetated Geogrids

Channelization
- ☑ Physical & chemical
- ☑ Instream/riparian restoration

Dams
- ☑ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☑ Streambanks ☑ Shorelines
  - ☐ Vegetative
  - ☐ Structural
  - ☑ Integrated
  - ☐ Planning & regulatory

Vegetated geogrids consist of layers of live branch cuttings and compacted soil with natural or synthetic geotextile materials wrapped around each soil layer (Figure 7.31). This serves to rebuild and vegetate eroded streambanks, particularly on outside bends where erosion can be a problem. This system is designed to capture sediment providing a substrate for plant establishment and if properly designed and installed, these systems help to quickly establish riparian vegetation. Its benefits are similar to those of brush layering (e.g., dries excessively wet sites, reinforces soil as roots develop, which adds significant resistance to sliding or shear displacement). Due to the strength of this design and the higher initial tolerance to flow velocity, these systems can be installed on a 1:1 or steeper streambank or lakeshore. Limitations of this design include the complexity involved with constructing this system and the fairly high expense (FISRWG, 1998). When constructing this type of system, use live branch cuttings that are brushy and root readily. Also use cuttings that are 0.5 to 2 inches in diameter and 4 to 6 feet long. This type of system requires biodegradable erosion control fabric. Installation guidelines are available from the USDA-FS Soil Bioengineering Guide (USDA-FS, 2002).

Additional Resources

- FISRWG. 1998. *Stream Corridor Restoration: Principles, Processes, and Practices*. Federal Interagency Stream Restoration Working Group. http://www.nrcs.usda.gov/technical/stream_restoration/PDFFILES/APPENDIX.pdf.

- Massachusetts DEP. 2006. *Massachusetts Nonpoint Source Pollution Management Manual: Vegetated Geogrids.* Massachusetts Department of Environmental Protection, Boston, MA. http://projects.geosyntec.com/NPSManual/Fact%20Sheets/Vegetated%20Geogrids.pdf.

- ISU. 2006. *How to Control Streambank Erosion: Vegetated Geogrids.* Iowa State University. http://www.ctre.iastate.edu/erosion/manuals/streambank/vegetated_geogrids.pdf.

- Mississippi State University, Center for Sustainable Design. 1999. *Water Related Best Management Practices in the Landscape: Vegetated Geogrids.* Created for United States Department of Agriculture, Natural Resource Conservation Service, Watershed Science Institute. http://www.abe.msstate.edu/csd/NRCS-BMPs/pdf/streams/bank/vegegeogrids.pdf.

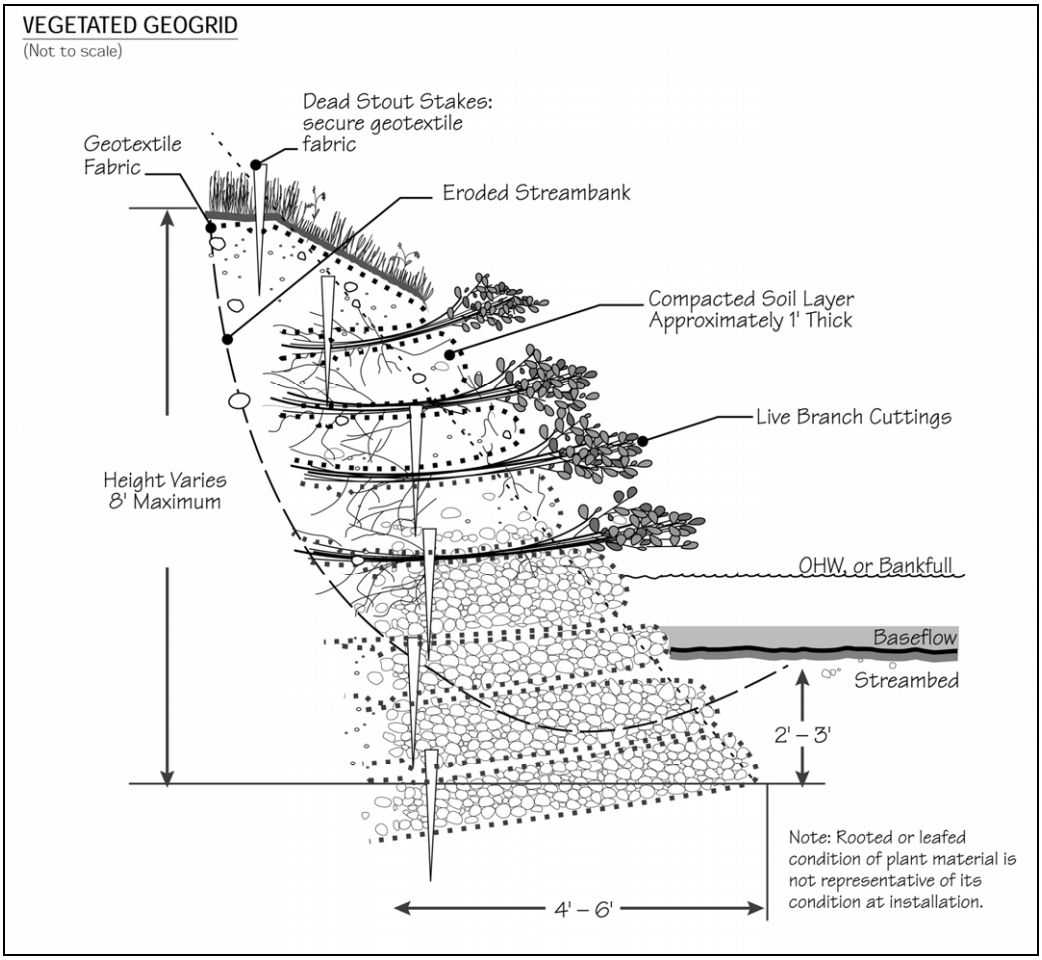

Figure 7.31 Vegetated Geogrid (USDA-FS, 2002)

Vegetated Reinforced Soil Slope (VRSS)

Channelization
- ☑ Physical & chemical
- ☑ Instream/riparian restoration

Dams
- ☑ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☑ Streambanks ☑ Shorelines
  - ☐ Vegetative
  - ☐ Structural
  - ☑ Integrated
  - ☐ Planning & regulatory

The vegetated reinforced soil slope (VRSS) soil system (Figures 7.32 and 7.33) is an earthen structure constructed from living, rootable, live-cut, woody plant material branches, bare root, tubling or container plant stock, along with rock, geosynthetics, geogrids, and/or geocomposites. The VRSS system is useful for immediately repairing or preventing deeper failures, providing a structurally sound system with soil reinforcement, drainage, and erosion control (typically on steepened slope sites with limited space). Living cut branches and plants grow and perform additional soil reinforcement via the roots and surface protection via the top growth (Sotir and Fischenich, 2003).

Live vegetation is typically installed from just above baseflow elevation and up the face of the reconstructed streambank, acting to protect the bank through immediate soil reinforcement and confinement, drainage, and, in the toe area, with rock. The system extends below the depth of scour, typically with rock, which improves infiltration and supports the riparian zone. Internal systems (e.g., rock, live cut branches) can be configured to act as drains that redirect or collect internal bank seepage and transport water to the stream via a rock toe (Sotir and Fischenich, 2003).

Figure 7.32 VRSS Structure After Construction
(Sotir and Fischenich, 2003)

Plants may be selected to provide color, texture, and other attributes to add a natural landscape appearance. Examples of plants include dogwood, willow, hybiscus, and *Viburnum* spp. Check with your local NRCS office to make sure these are appropriate for the location. If a compound channel cross section is desirable near or just below the baseflow elevation, a step-back terrace may be incorporated to offer an enhanced riparian zone where emergent aquatic plants may invade over time. Although the total mass uptake may be small, they assimilate contaminants within the water column. Aquatic wetland plants that may be installed adjacent to the stream include blueflag, monkey flower, and pickerelweed. Again, check with your local NRCS office to ensure these are appropriate. VRSS systems can be constructed on slopes ranging from 1V on 2H (1:2) to 1:0.5. When constructed in step or terrace fashion, they improve pollutant control by intercepting sediment and attached pollutants during overbank flows (Sotir and Fischenich, 2003). Additional information about VRSS systems is available from USACE's *Vegetated Reinforced Soil Slope Streambank Erosion Control*.[14]

Figure 7.33 Established VRSS Structure (Sotir and Fischenich, 2003)

[14] http://el.erdc.usace.army.mil/elpubs/pdf/sr30.pdf

Water Conveyances

Channelization
- ☐ Physical & chemical
- ☐ Instream/riparian restoration

Dams
- ☐ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☑ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☐ Streambanks ☐ Shorelines
  - ☐ Vegetative
  - ☐ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

These are the open or closed channel, conduit, or drop structure used to convey water from a reservoir. The USACE has studied the performance of spillways and overflow weirs at its facilities to determine the importance of these structures in improving DO levels. For example, data have been analyzed for the test spill done in 1999 at Canyon Ferry Dam in Montana, which found that allowing a portion of the releases to go over the spillways resulted in a significant increase in DO in the river downstream of the dam. Initially the use of spillways appeared to be a viable solution to the problem of low dissolved oxygen in the river below the dam. However, there was a problem with nitrogen supersaturation.

The operation of some types of hydraulic structures has been linked to problems of the supersaturation. An unexpected fish kill occurred in spring 1978 due to supersaturation of nitrogen gas in the Lake of the Ozarks (Missouri) within 5 miles of Truman Dam, caused by water plunging over the spillway and entraining air. The vertical drop between the spillway crest and the tailwaters was only 5 feet. The maximum total gas saturation was 143 percent, which is well above desired saturation levels. In this case, the spillway was modified by cutting a notch to prevent water from plunging directly into the stilling basin (ASCE, 1986).

Wildflower Cover

Channelization
- ☐ Physical & chemical
- ☐ Instream/riparian restoration

Dams
- ☑ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☐ Streambanks ☐ Shorelines
  - ☐ Vegetative
  - ☐ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

Because of the hardy, drought-resistant nature of wildflowers, they may be more beneficial as an erosion control practice than turf grass. Though not as dense as turfgrass, wildflower thatches and associated grasses are expected to be as effective in erosion control and contaminant absorption. An additional benefit of wildflower thatches is that they provide habitat for wildlife, including insects and small mammals. Because thatches of wildflowers do not need fertilizers, pesticides, or herbicides and watering is minimal, implementation of this practice may result in cost savings.

A wildflower stand requires several years to become established, but maintenance requirements are minimal once established. Prices vary greatly, from less than $15 (Stock Seed Farms, n.d.) to $40 (Albright Seed Company, 2002) a pound, for wildflower seed mixes. The amount of wildflower seeds applied depends on the desired coverage of wildflowers. However, Stock Seed Farms recommends that one pound of seed can cover 3,500 ft^2 (Stock Seed Farms, n.d.). Keep in mind that species selection should focus on those wildflowers and grasses native to the given area or appropriate to the site.

Wind Erosion Controls

Wind erosion controls limit the movement of dust from disturbed soil surfaces and include many different practices. Wind barriers block air currents and are effective in controlling soil blowing. Many different materials can be used as wind barriers, including solid board fences, snow fences, and bales of hay. Sprinkling moistens the soil surface with water and must be repeated as needed to be effective for preventing wind erosion (Delaware DNREC, 2003); however, applications must be monitored to prevent excessive runoff and erosion.

Channelization
- ☐ Physical & chemical
- ☐ Instream/riparian restoration

Dams
- ☑ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☐ Streambanks ☐ Shorelines
  - ☐ Vegetative
  - ☐ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

Wing Deflectors

Channelization
- ☑ Physical & chemical
- ☑ Instream/riparian restoration

Dams
- ☐ Erosion control
- ☐ Runoff control
- ☐ Chemical/pollutant control
- ☐ Watershed protection
- ☐ Aerate reservoir water
- ☐ Improve tailwater oxygen
- ☐ Restore/maintain habitat
- ☐ Maintain fish passage

Erosion
- ☑ Streambanks ☑ Shorelines
  - ☐ Vegetative
  - ☑ Structural
  - ☐ Integrated
  - ☐ Planning & regulatory

Wing deflectors are structures that protrude from either streambank but do not extend entirely across a channel. The structures are designed to deflect flows away from the bank, and create scour pools by constricting the channel and accelerating flow. The structures can be installed in series on alternative streambanks to produce a meandering thalweg and stream diversity. The most common design is a rock and rock-filled log crib deflector structure. The design bases the size of the structure on anticipated scour. These structures need to be installed far enough downstream from riffle areas to avoid backwater effects that could drown out or damage the riffle. This design should be employed in streams with low physical habitat diversity, particularly channels that lack pool habitats. Construction on a sand bed stream may be susceptible to failure and should be constructed with the use a filter layer or geotextile fabric beneath the wing deflector structure (FISRWG, 1998).

Additional Resources

- FISRWG. 1998. *Stream Corridor Restoration: Principles, Processes, and Practices*. Federal Interagency Stream Restoration Working Group. http://www.nrcs.usda.gov/technical/stream_restoration/PDFFILES/APPENDIX.pdf.

- Massachusetts DEP. 2006. *Massachusetts Nonpoint Source Pollution Management Manual: Wing Deflectors.* Massachusetts Department of Environmental Protection, Boston, MA. http://projects.geosyntec.com/NPSManual/Fact%20Sheets/Wing%20Deflectors.pdf.

- Mississippi State University, Center for Sustainable Design. 1999. *Water Related Best Management Practices in the Landscape: Single Wing Deflector.* Created for United States Department of Agriculture, Natural Resource Conservation Service, Watershed Science Institute. http://www.abe.msstate.edu/csd/NRCS-BMPs/pdf/streams/bank/singlewing.pdf.

- Mississippi State University, Center for Sustainable Design. 1999. *Water Related Best Management Practices in the Landscape: Double Wing Deflector.* Created for United States Department of Agriculture, Natural Resource Conservation Service, Watershed Science Institute. http://abe.msstate.edu/csd/NRCS-BMPs/pdf/streams/bank/doublewing.pdf.

- Ohio DNR. No date. *Ohio Stream Management Guide: Deflectors.* Ohio Department of Natural Resources. http://www.ohiodnr.com/water/pubs/fs_st/stfs19.pdf.

- SMRC. No date. *Stream Restoration: Flow Deflection/Concentration Practices.* The Stormwater Manager's Resource Center. http://www.stormwatercenter.net/Assorted%20Fact%20Sheets/Restoration/flow_deflection.htm.

Chapter 8: Modeling Information

Physical and chemical effects of hydraulic and hydrologic changes to streams, rivers, or other surface water systems can often be estimated with models and past experience (expert judgment). Several different models are available that can simulate many of the complex physical, chemical, and biological interactions that occur when hydraulic changes are imposed on surface water systems. Additionally, models can sometimes be used to determine a combination of practices to mitigate the unavoidable effects that occur even when a project is properly planned. Models, however, cannot be used independently of expert judgment gained through past experience. When properly applied models are used in conjunction with expert judgment, the effects of hydromodification activities (both potential and existing projects) can be evaluated and many undesirable effects prevented or eliminated. Models combined with expert judgment can also be used to evaluate existing hydromodification activities as part of operation and maintenance programs to identify possible opportunities to reduce or eliminate water quality impacts.

In the U.S. Army Corps of Engineers' (USACE's) report, *Review of Watershed Water Quality Models*[1] (Deliman et al., 1999), the authors compare and evaluate existing hydrologic and watershed water quality models, make recommendations for base model(s) for predicting nonpoint source (NPS) pollution, and identify areas for model improvement. The authors review commonly used and well validated models used in urban or nonurban settings. Users of the models can use the report to obtain basic model information and to review how well the models simulate NPS pollution and where the authors think improvements could be made. This information might be useful to readers who are trying to select the best model for analyzing how to reduce NPS pollution in their watersheds (Deliman et al., 1999).

Tables 8.1 and 8.2 below provided example of models and assessment approaches that could be used to determine the effects of hydromodification activities.

[1] http://el.erdc.usace.army.mil/elpubs/pdf/trw99-1.pdf

Available Models and Assessment Approaches

Table 8.1 lists some of the models available for studying the effects of channelization and channel modification activities, as well as models to analyze watershed runoff and to assess BMPs and low impact development to reduce impacts (of hydromodification activities.) The table also provides a quick description of each model and the dimension in which it models, as well as source and contact information.

Table 8.1 Models Applicable to Hydromodification Activities

Model	Dimension	Description	Model Resources
Channelization and Channel Modification Models			
BRANCH	1	The Branch-Network Dynamic Flow Model is used to simulate steady state flow in a single open channel reach or throughout a system of branches connected in a dendritic or looped pattern. The model is typically applied to assess flow and transport in upland rivers where flows are highly regulated or backwater effects are evident, or in coastal networks of open channels where flow and transport are governed by the interaction of freshwater inflows, tidal action, and meteorological conditions. (Last updated: 1997)	http://water.usgs.gov/cgi-bin/man_wrdapp?branch
CE-QUAL-RIV1	1	CE-QUAL-RIV1 is a one-dimensional (cross-sectionally averaged) hydrodynamic and water quality model, meaning that the model resolves longitudinal variations in hydraulic and quality characteristics and is applicable where lateral and vertical variations are small. CE-QUAL-RIV1 consists of two parts, a hydrodynamic code (RIV1H) and a water quality code (RIV1Q). The hydrodynamic code is applied first to predict water transport and its results are written to a file, which is then read by the quality model. It can be used to predict one-dimensional hydraulic and water quality variations in streams and rivers with highly unsteady flows, although it can also be used for prediction under steady flow conditions.	http://www.wes.army.mil/el/elmodels/riv1info.html

Model	Dimension	Description	Model Resources
CE-QUAL-W2	2	CE-QUAL-W2 is a two-dimensional, laterally averaged, finite difference hydrodynamic and water quality model for rivers, reservoirs, and estuaries. Because the model assumes lateral homogeneity, it is best suited for relatively long and narrow waterbodies exhibiting longitudinal and vertical water quality gradients. Branched networks can be modeled. The model accommodates variable grid spacing (segment lengths and layer thicknesses) so that greater resolution in the grid can be specified where needed.	http://smig.usgs.gov/cgi-bin/SMIC/model_home_pages/model_home?selection=cequalw2 http://www.ce.pdx.edu/w2
CH3D-SED	1, 2, or 3	The CH3D numerical modeling system can be used to investigate sedimentation on bendways, crossings, and distributaries. Applications address dredging, channel evolution, and channel training structure evaluations.	http://chl.erdc.usace.army.mil/chl.aspx?p=s&a=Software;22
EFDC	1, 2, or 3	The Environmental Fluid Dynamics Code is a single source, three-dimensional, finite-difference modeling system having hydrodynamic, water quality-eutrophication, sediment transport and toxic contaminant transport components linked together.	John Hamrick developed this at the Virginia Institute of Marine Science 1990-1991. Dr. John Hamrick, Tetra Tech, Inc. 10306 Eaton Place, Suite 340 Fairfax, VA 22030
EFM	1	Ecosystem Functions Model (EFM) is a planning tool that analyzes ecosystem response to changes in flow regime. EFM allows environmental planners, biologists, and engineers to determine whether proposed alternatives (e.g., reservoir operations, levee alignments) would maintain, enhance, or diminish ecosystem health. Project teams can use EFM software to visualize existing ecologic conditions, highlight promising restoration sites, and assess and rank alternatives according to the relative enhancement (or decline) of ecosystem aspects. The hydraulic modeling portion of the EFM process is performed by existing independent software, such as HEC-RAS.	http://el.erdc.usace.army.mil/elpubs/pdf/smartnote04-4.pdf

Model	Dimension	Description	Model Resources
FESWMS-2DH	2	FESWMS-2DH is a finite element surface water modeling system for two-dimensional flow in a horizontal plane. The model can simulate steady and unsteady surface water flow and is useful for simulating two-dimensional flow where complicated hydraulic conditions exist (e.g., highway crossings of streams and flood rivers). It can also be applied to many types of steady or unsteady flow problems. (Last updated: 1995)	http://water.usgs.gov/cgi-bin/man_wrdapp?feswms-2dh
HEC-6	1	HEC-6 is a one-dimensional, moveable boundary, open channel flow numeric model designed to simulate and predict changes in river profiles resulting from scour and deposition over moderate time periods, typically years. Latest revision occurred in 1993.	http://www.hec.usace.army.mil/software/legacysoftware/hec6/hec6.htm
HEC-HMS	1	The HEC-HMS model is designed to simulate the precipitation-runoff processes of dendritic watershed systems. It is applicable in a wide range of geographic areas for solving the widest possible range of problems, including large river basin water supply and flood hydrology, and small urban or natural watershed runoff. Hydrographs produced by the program are used directly or in conjunction with other software for studies of water availability, urban drainage, flow forecasting, future urbanization impact, reservoir spillway design, flood damage reduction, floodplain regulation, and systems operation.	http://www.hec.usace.army.mil/software/hec-hms/index.html http://el.erdc.usace.army.mil/elpubs/pdf/smartnote04-3.pdf

Model	Dimension	Description	Model Resources
HEC-RAS	1	HEC-RAS is an integrated system of software, designed for interactive use in a multi-tasking, multi-user network environment. The system is comprised of a graphical interface (GUI), separate hydraulic analysis components, data storage and management capabilities, graphics and reporting facilities. The model performs one-dimensional steady flow, unsteady flow, and sediment transport calculations. The key element is that all three components will use a common geometric data representation and common geometric and hydraulic computation routines. In addition to the three hydraulic analysis components, the system contains several hydraulic design features that can be invoked once basic water surface profiles are computed. The HEC-RAS modeling system was developed as a part of the Hydrologic Engineering Center's "Next Generation" (NexGen) of hydrologic engineering software. The NexGen project encompasses several aspects of hydrologic engineering, including: rainfall-runoff analysis; river hydraulics; reservoir system simulation; flood damage analysis; and real-time river forecasting for reservoir operations.	http://www.hec.usace.army.mil/software/hec-ras
HIVEL2D	1, 2	HIVEL2D is a free-surface, depth averaged model designed specifically to simulate flow in typical high-velocity channels.	http://chl.erdc.usace.army.mil/CHL.aspx?p=s&a=Software;6
RiverWare™	1	RiverWare™ is a reservoir and river modeling software decision support tool. With RiverWare™, users can model the topology, physical processes and operating policies of river and reservoir systems, and make better decisions about how to operate these systems by understanding and evaluating the trade-offs among the various management objectives. Water management professionals can improve their management of river and reservoir systems by using the software. The Bureau of Reclamation, the Tennessee Valley Authority, and the USACE sponsor ongoing RiverWare™ research and development.	http://cadswes.colorado.edu/riverware

Model	Dimension	Description	Model Resources
SAM	1	The model calculates the width, depth, slope and n-values for stable channels in alluvial material. SAM can be used to evaluate erosion, entrainment, transportation, and deposition in alluvial streams. Channel stability can be evaluated, and the evaluation used to determine the cost of maintaining a constructed project. The model is currently being improved and enhanced at WES.	http://chl.erdc.usace.army.mil/CHL.aspx?p=s&a=Software;2
SIAM	N/A	SIAM is a model designed to simulate the movement of sediment through a drainage network from source to outlet. It allows for evaluation of numerous sediment management alternatives relatively quickly. The model provides an intermediate level of analysis more quantitative than a conventional geomorphic evaluation, but less specific than a numerical, mobile-boundary simulation. SIAM is to be incorporated into a future release of HEC-RAS.	http://www.usbr.gov/pmts/sediment/model/srhsiam/index.html http://www.wes.army.mil/rsm/pubs/pdfs/RSM-2-WS04.pdf
SMS (RMA2 and RMA4)	1, 2	The Surface-Water Modeling System is a generalized numerical modeling system for open-channel flows, sedimentation, and constituent transport.	http://chl.erdc.usace.army.mil/CHL.aspx?p=s&a=Software;4
TABS-MD (RMA2, RMA4, RMA10, SED2D)	1, 2, or 3	The multi-dimensional numerical modeling system is a collection of generalized computer programs and utility codes, designed for studying multidimensional hydrodynamics in rivers, reservoirs, bays, and estuaries. The models can be applied to study project impacts of flows, sedimentation, constituent transport, and salinity.	http://chl.erdc.usace.army.mil/CHL.aspx?p=s&a=Software;10
WASP	1, 2, or 3	Water Quality Analysis Simulation Program. Framework for modeling contaminant fate and transport in surface waters. The WASP framework can be used to model biochemical oxygen demand and dissolved oxygen dynamics, nutrients and eutrophication, bacterial contamination, and organic chemical and heavy metal contamination.	http://www.epa.gov/athens/wwqtsc/html/wasp.html

Model	Dimension	Description	Model Resources
Models to Analyze Watershed Runoff and Assess Practices to Reduce Impacts of Hydromodification			
BMP Decision Support System (BMP-DSS)	1	BMP-DSS is a decision-making tool for placement of BMPs/LID practices at strategic locations in urban watersheds based on integrated data collection and hydrologic/hydraulic/water quality modeling. The system uses GIS technology, integrates BMP processes simulation models, and applies system optimization techniques for BMP placement and selection. The system also provides interfaces for BMP placement, BMP attribute data input, and decision optimization management. The system includes a stand-alone BMP simulation and evaluation module, which complements both research and regulatory nonpoint source control assessment efforts and allows flexibility in examining various BMP design alternatives.	Developed by the EPA and Prince George's County Department of Environmental Resources. Contact Dr. Mow-Soung Cheng at 301-883-5836 for more information.
HSPF	1	Hydrological Simulation Program——FORTRAN (HSPF) is a comprehensive package for simulation of watershed hydrology and water quality for both conventional and toxic organic pollutants. HSPF incorporates watershed-scale ARM and NPS models into a basin-scale analysis framework that includes fate and transport in one dimensional stream channels. It is the only comprehensive model of watershed hydrology and water quality that allows the integrated simulation of land and soil contaminant runoff processes with In-stream hydraulic and sediment-chemical interactions. The result of this simulation is a time history of the runoff flow rate, sediment load, and nutrient and pesticide concentrations, along with a time history of water quantity and quality at any point in a watershed. HSPF simulates three sediment types (sand, silt, and clay) in addition to a single organic chemical and transformation products of that chemical.	http://www.epa.gov/ceampubl/swater/hspf/index.htm

Model	Dimension	Description	Model Resources
LSPC	1	LSPC is the Loading Simulation Program in C++, a watershed modeling system that includes streamlined Hydrologic Simulation Program Fortran (HSPF) algorithms for simulating hydrology, sediment, and general water quality on land as well as a simplified stream transport model. LSPC is derived from the Mining Data Analysis System (MDAS), which was developed by EPA Region 3 and has been widely used for mining applications and TMDLs. A key data management feature of this system is that it uses a Microsoft Access database to manage model data and weather text files for driving the simulation. The system also contains a module to assist in TMDL calculation and source allocations. For each model run, it automatically generates comprehensive text-file output by subwatershed for all land-layers, reaches, and simulated modules, which can be expressed on hourly or daily intervals. Output from LSPC has been linked to other model applications such as EFDC, WASP, and CE-QUAL-W2.	http://www.epa.gov/ATHENS/wwqtsc/html/lspc.html
Program for Predicting Polluting Particle Passage through Pits, Puddles, and Ponds—Urban Catchment Model (P8–UCM)	1	P8–UCM is a model for predicting the generation and transport of stormwater pollutants in urban watersheds. Continuous water balance and mass balance calculations are performed on a user-defined system consisting of watersheds, devices (runoff storage/treatment areas, BMPs), particle classes, and water quality components. Simulations are driven by continuous hourly rainfall and daily air temperature time series data. The model simulates pollutant transport and removal in a variety of treatment devices (BMPs).	http://wwwalker.net/p8

Model	Dimension	Description	Model Resources
Storm Water Management Model (SWMM)	1	SWMM is a dynamic rainfall-runoff simulation model used for single event or long-term (continuous) simulation of runoff quantity and quality from primarily urban areas. The runoff component of SWMM operates on a collection of subcatchment areas that receive precipitation and generate runoff and pollutant loads. The routing portion of SWMM transports this runoff through a system of pipes, channels, storage/treatment devices, pumps, and regulators. SWMM tracks the quantity and quality of runoff generated within each subcatchment, and the flow rate, flow depth, and quality of water in each pipe and channel during a simulation period comprised of multiple time steps.	http://www.epa.gov/ednnrmrl/models/swmm/index.htm

Table 8.2 lists some of the available assessment models and approaches for assessing the biological impacts of channelization. The table also provides a quick description of the model or approach, as well as sources of additional information.

Table 8.2 Assessment Models and Approaches

Model or Assessment Approach	Description	Model Resources
Assessment Models		
AQUATOX	A freshwater ecosystem simulation model designed to predict the fate of various pollutants such as nutrients and organic toxicants and their effects on the ecosystem, including fish, invertebrates, and aquatic plants (including periphyton).	http://epa.gov/waterscience/models/aquatox
Cornell Mixing Zone Expert System (CORMIX)	A water quality modeling and decision support system designed for environmental impact assessment of mixing zones resulting from wastewater discharge from point sources. The system emphasizes the role of boundary interaction to predict plume geometry and dilution in relation to regulatory mixing zone requirements.	http://www.epa.gov/waterscience/models/cormix.html
HEC-HMS, Hydrologic Modeling System	A system designed to simulate the precipitation-runoff processes of dendritic watershed systems. In addition to unit hydrograph and hydrologic routing options, capabilities include a linear quasi-distributed runoff transform (ModClark) for use with gridded precipitation, continuous simulation with either a one-layer or more complex five-layer soil moisture method, and a versatile parameter estimation option.	http://www.hec.usace.army.mil/software/hec-hms/index.html
HEC-RAS, River Analysis System	The HEC-RAS system is used to calculate water surface profiles for both steady and unsteady gradually varied flow. The system can handle a full network of channels, a dendritic system, or a single river reach.	http://www.hec.usace.army.mil/software/hec-ras/hecras-hecras.html http://www.wsi.nrcs.usda.gov/products/W2Q/H&H/Tools_Models/Ras.html

Model or Assessment Approach	Description	Model Resources
Physical Habitat Simulation Model (PHABSIM)	A set of computer programs designed to predict the microhabitat (depth, velocities, channel indices) conditions in rivers at different flow levels and the relative suitability of those conditions for different life stages of aquatic life. (Serves as the key microhabitat simulation component of IFIM.)	http://www.fort.usgs.gov/Products/Software/PHABSIM
Riverine Community Habitat Assessment and Restoration Concept (RCHARC)	A simulation approach using computer models to compare hydraulic conditions and microhabitats of a reference reach to alternative study reach(es).	Nestler, J., T. Schneider, and D. Latka. 1993. RCHARC: A new method for physical habitat analysis. *Engineering Hydrology*, 294-99.
RiverWare™	RiverWare™ is a reservoir and river modeling software decision support tool. With RiverWare™, users can model the topology, physical processes, and operating policies of river and reservoir systems, and make better decisions about how to operate these systems by understanding and evaluating the trade-offs among the various management objectives. Water management professionals can improve their management of river and reservoir systems by using the software. The Bureau of Reclamation, the Tennessee Valley Authority, and the Army Corps of Engineers sponsor ongoing RiverWare™ research and development.	http://cadswes.colorado.edu/riverware
Salmonid Population Model (SALMOD)	A computer model that simulates the dynamics (spawning, growth, movement, and mortality) of freshwater salmonid populations, both anadromous and resident, under various habitat quality and capacities.	http://www.fort.usgs.gov/Products/Software/SALMOD
Assessment Approaches		
A Procedure to Estimate the Response of Aquatic Systems to Changes in Phosphorus and Nitrogen Inputs	A simple tool to estimate the responsiveness of a waterbody to changes in the loading of phosphorus and nitrogen using a dichotomous key that classifies it according to key characteristics.	ftp://ftp.wcc.nrcs.usda.gov/downloads/wqam/aqusens.pdf

Model or Assessment Approach	Description	Model Resources
EPA Volunteer Stream Monitoring Methods	A series of methods geared for volunteer monitoring programs offering simple to advanced techniques for monitoring macroinvertebrates, habitat, water quality, and physical conditions.	http://www.epa.gov/owow/monitoring/volunteer/stream
Habitat Evaluation Procedures/Habitat Suitability Index (HEP/HSI)	HEP is an evaluation method that determines the suitability of available habitat for select aquatic and terrestrial wildlife species and measures the impact of proposed land or water use changes on that habitat. HSI is a measure of habitat suitability.	http://policy.fws.gov/870fw1.html http://www.fort.usgs.gov/Products/Software/HEP http://www.fort.usgs.gov/Products/Software/HSI
Index of Biological Integrity (IBI)	An aquatic ecosystem health index using measures of total native fish species composition, indicator species composition, pollutant intolerant and tolerant species composition, and fish condition.	http://www.epa.gov/owow/wetlands/wqual/bio_fact/fact5.html
Indicators of Hydrologic Alteration (IHA)	A method for assessing the degree of hydrologic alteration attributable to human impacts within an ecosystem. The method takes daily stream flow values and calculates indices relating to the five components of flow regime critical for ecological processes: magnitude, frequency, duration, timing, and rate of change of hydrologic conditions.	http://www.nature.org/initiatives/freshwater/conservationtools/art17004.html
Instream Flow Incremental Methodology (IFIM)	A river network analysis that incorporates fish habitat, recreational opportunity, and woody vegetation responses to alternative water management schemes. Information is presented as a time series of flow and habitat at select points within the network.	http://www.fort.usgs.gov/Products/Software/IFIM
Invertebrate Community Index (ICI)	An invertebrate community health index using ten structural and compositional invertebrate community metrics including number of mayfly, caddisfly, and dipteran taxa.	http://www.epa.state.oh.us/dsw/bioassess/BioCriteriaProtAqLife.html

Model or Assessment Approach	Description	Model Resources
(Modified) Index of Well-Being (IWB)	The IWB is a fish community health index using measures of fish species abundance and diversity estimates. The *modified* index of well being factors out 13 pollutant tolerant species of fish from certain calculations to prevent false high readings on polluted streams which have large populations of pollutant tolerant fish.	http://www.epa.state.oh.us/dsw/bioassess/BioCriteriaProtAqLife.html
Rapid Bioassessment Protocols (RBP)	A set of protocols that offer cost-effective techniques of varying complexity to characterize the biological integrity of streams and rivers using the collection and analysis of biological, physical, and chemical data. It focuses on periphyton, benthic macroinvertebrates, and fish assemblages, and on assessing the quality of the physical habitat.	http://www.epa.gov/owow/monitoring/rbp
Rapid Channel Assessment (RCA)	A reference stream/integrated ranking approach to evaluate the physical condition of a stream channel based on channel geometry, percent channel-bank scour, sediment size distribution and embeddedness, large wood debris, and thalweg profiles.	CWP. 1998. *Rapid Watershed Planning Handbook: A Comprehensive Guide for Managing Urbanizing Watersheds*. Center for Watershed Protection, Ellicott City, MD. For a copy contact: The Center for Watershed Protection, 8391 Main Street Ellicott City, MD 21043, email: center@cwp.org.
Rapid Stream Assessment Technique (RSAT)	A reference stream/integrated ranking approach to evaluate steam health based on chemical stability, channel scouring/sediment deposition, physical instream habitat, water quality, riparian habitat, and biological indicators.	CWP. 1998. *Rapid Watershed Planning Handbook: A Comprehensive Guide for Managing Urbanizing Watersheds*. Center for Watershed Protection, Ellicott City, MD. For a copy contact: The Center for Watershed Protection, 8391 Main Street Ellicott City, MD 21043, email: center@cwp.org. http://www.stormwatercenter.net
Rosgen's Stream Classification Method	A classification method that uses morphological stream characteristics to organize streams into relatively homogeneous stream types to predict stream behavior and to apply interpretive information.	Reference: Rosgen, D. 1996. *Applied River Morphology*. Wildland Hydrology, Pagosa Springs, CO. For a copy contact: Wildland Hydrology Books, 1481 Stevens Lake Road, Pagosa Springs, CO 81147.

Model or Assessment Approach	Description	Model Resources
Stream Network/Stream Segment Temperature Models (SNTEMP/SSTEMP)	Developed to help predict the consequences of stream manipulation on water temperatures, these computer models simulate mean daily water temperatures for streams and rivers from data describing the stream's geometry, meteorology, and hydrology. SNTEMP is for a stream network with multiple tributaries for multiple time periods. SSTEMP is a scaled down version suitable for single (to a few) reaches and single (to a few) time periods.	http://www.fort.usgs.gov/Products/Software/SNTEMP
Stream Visual Assessment Protocol (SVAP)	A simple procedure to evaluate the condition of a stream based on visual characteristics. It also identifies opportunities to enhance biological value and conveys information on how streams function.	ftp://ftp.wcc.nrcs.usda.gov/downloads/wqam/svapfnl.pdf
Systems Impact Assessment Model (SIAM)	An integrated set of models used to aid the evaluation of water management alternatives, it address significant interrelationships among selected physical (temperature, microhabitat), chemical (dissolved oxygen, water temperature), and biological variables (young-of-year Chinook salmon production), and stream flow. Developed for the Klamath River in northern California.	http://www.fort.usgs.gov/Products/Software/SIAM
Time-Series Library (TSLIB)	A set of DOS-based computer programs to create monthly or daily habitat time-series and habitat-duration curves using the habitat-discharge relationship produced by PHABSIM. (Can serve as the hydraulic component of IFIM).	http://www.fort.usgs.gov/Products/Software/TSLIB
TR-20, Computer Program for Project Formulation Hydrology	A physically based watershed scale runoff event model that computes direct runoff and develops hydrographs resulting from any synthetic or natural rainstorm. Developed hydrographs are routed through stream and valley reaches as well as through reservoirs.	http://www.wsi.nrcs.usda.gov/products/W2Q/H&H/Tools_Models/WinTR20.html
TR-55, Urban Hydrology for Small Watersheds	Simplified procedures to calculate storm runoff volume, peak rate of discharge, hydrographs, and storage volumes required for floodwater reservoirs.	http://www.info.usda.gov/CED/ftp/CED/tr55.pdf

Examples of Channel Modification Activities and Associated Models/Practices

Modeling for Impoundments

A low-complexity option for modeling impoundments is to use simple models like the Bathtub model to simulate the waterbody. Compared to more complex multi-dimensional models, which use multiple computational cells to estimate volumetric and contaminant fluxes between the cells, Bathtub-type models typically use a single cell. This single cell, while a simplification of the system, may be appropriate if the system is fully mixed in both the horizontal and vertical dimensions. This approach can also be economically developed using spreadsheets (such as Excel) to calculate the results. However, a Bathtub-type model has limited utility if the water body is stratified or if results are required at more than one location in the system.

Another example of a modeling tool that has the ability to simulate impoundments is CE-QUAL-W2, a two-dimensional hydrodynamic water quality model. CE-QUAL-W2 provides results for either a horizontal or cross-sectional, two-dimensional plane. Because the model assumes a vertically or horizontally-mixed environment, it is best suited for relatively long and narrow water bodies (rivers, lakes, reservoirs, and estuaries) that exhibit longitudinal or vertical water quality stratification. The water quality portion of CE-QUAL-W2 includes the major processes of eutrophication kinetics and a single algal compartment. The bottom sediment compartment stores settled particles, releases nutrients to the water column, and exerts sediment oxygen demand based on user-supplied fluxes; a full sediment diagenesis (i.e., the process of chemical and physical change in deposited sediment during its conversion to rock) model is under development.

The Environmental Fluid Dynamics Code (EFDC) is a general-purpose modeling package for simulating one- or multi-dimensional flow, transport, and bio-geochemical processes in surface water systems including rivers, lakes, estuaries, reservoirs, wetlands, and coastal regions. The EFDC model was originally developed by Hamrick in 1992 at the Virginia Institute of Marine Science for estuarine and coastal applications and is considered public domain software. This model is now EPA-supported as a component of EPA Region 2's PRVI BASINS software system and EPA's TMDL Toolbox,[2] and has been used extensively to support TMDL development throughout the country. In addition to hydrodynamic, salinity, and temperature transport simulation capabilities, EFDC is capable of simulating cohesive and non-cohesive sediment transport, near field and far field discharge dilution from multiple sources, eutrophication processes, the transport and fate of toxic contaminants in the water and sediment phases, and the transport and fate of various life stages of finfish and shellfish.

Modeling for Estuary Tidal Flow Restrictions

Artificial hydraulic structures have the ability to alter natural flow patterns (hydrodynamic) in an estuary, which may modify erosion patterns, salinity regimes, and the fate and transport of pollutants. Some examples of artificial hydraulic structures include culverts, bridges, tide gates,

[2] http://www.epa.gov/athens/wwqtsc/html/efdc.html

and weir structures. Installation or removal of these structures may cause a significant change in local hydrodynamics, and tools may be used to estimate the impacts prior to the modification.

The EFDC model, as described above, allows modelers to evaluate the impacts of hydraulic structures, such as culverts, bridges, tide gates, and weirs. Due to the flexibility of EFDC, each of these structures can also be conceptually represented in a variety of ways. For example, the weir equation can be applied to locations in the modeling grid to estimate water surface-dependent flow through one or more grid cells. This enables a modeler to evaluate the effect of placement of structures that modify surface flow patterns (such as a weir). Structures such as piers and impermeable barriers (e.g. jetties, breakwaters) can also be simulated using this code.

Another modeling tool that can address estuary tidal flow restrictions is the Finite Element Surface Water Modeling System (FESWMS) model. This modeling code was developed by the Federal Highway Administration (FHA) and is distributed by the U.S Geological Survey (USGS). FESWMS is a hydrodynamic modeling code that simulates two-dimensional, depth-integrated, steady or unsteady surface-water flows. It supports both super and subcritical flow analysis, and area wetting and drying. FESWMS is also suited for modeling regions involving flow control structures, such as are encountered at the intersection of roadways and waterways. Specifically, the FESWMS model allows the user to include weirs, culverts, drop inlets, and bridge piers into a standard two-dimensional finite element model. FESWMS does not have three-dimensional capabilities.

Modeling for Estuary Flow Regime Alterations

A number of structures or processes can alter the flow regime of a system. Flow contributions to an estuary can be altered by upstream rediversions or basin transfers, dams and dam releases, or other channel modifications. For example, when freshwater flows patterns are altered by the presence and operation of a dam, EFDC can be used to model the impact to downstream estuaries. EFDC can provide modelers with a time series representation of flow that is withdrawn from a simulated reservoir/dam system. Coupling the time series flow projections with hydrodynamic analysis of the receiving esturay enables modelers to determine potential impacts of altered flow patterms and to evaluate various spill options for the dam operation. Structures within the estuary that may alter the flow patterns include marinas, piers, jetties, and other similar type structures. Flow regime alterations due to these structures can be simulated using the same modeling tools described in the Flow Restrictions section above. Flow restrictions are the cause of most changes in the flow regime, so the simulation of the causes of restriction using a process-based modeling tool produces the desired flow alterations. Therefore, EFDC and FESWMS can be utilized in the same manner to obtain flow regime results.

Temperature Restoration Practices

Several computer models that predict instream water temperature are currently available. These models vary in the complexity of detail with which site characteristics, including meteorology, hydrology, stream geometry, and riparian vegetation, are described. The U.S. Fish and Wildlife Service developed an instream surface water temperature model (Theurer et al., 1984) to predict mean daily temperature and diurnal fluctuations in surface water temperatures throughout a stream system. The model, Stream Network Temperature Model (SNTEMP), can be applied to any size watershed or river system. This predictive model uses either historical or synthetic

hydrological, meteorological, and stream geometry characteristics to describe the ambient conditions. The purpose of the model is to predict the longitudinal temperature and its temporal variations. The instream surface water temperature model has been used satisfactorily to evaluate the impacts of riparian vegetation, reservoir releases, and stream withdrawal and returns on surface water temperature. In the Upper Colorado River Basin, the model was used to study the impact of temperature on endangered species (Theurer et al., 1982). It also has been used in smaller ungauged watersheds to study the impacts of riparian vegetation on salmonid habitat.[3]

The Stream Segment Temperature Model (SSTEMP) is a much-scaled down version of the SNTEMP model developed by the USGS Biological Resource Division. Unlike the large network model (SNTEMP), this program only handles single stream segments for a single time period (e.g., month, week, day) for any given "run." Initially designed as a training tool, SSTEMP may be used satisfactorily for a variety of simple cases that one might face on a day-to-day basis. It is especially useful to perform sensitivity and uncertainty analysis. The model predicts minimum 24-hour temperatures, mean 24-hour temperatures, and maximum 24-hour stream temperatures for a given day, as well as a variety of intermediate values. The SSTEMP model identifies current stream and/or watershed characteristics that control stream temperatures. The model also quantifies the maximum loading capacity of the stream to meet water quality standards for temperature. This model is important for estimating the effect of changing controls or factors (such as riparian grazing, stream channel alteration, and reduced streamflow) on stream temperature. The model can also be used to help identify possible implementation activities to improve stream temperature by targeting those factors causing impairment to the stream. Good input data and an awareness of the model's assumptions are critical to obtaining reliable predictions. SSTEMP may be used to evaluate alternative reservoir release proposals, analyze the effects of changing riparian shade or the physical features of a stream, and examine the effects of different withdrawals and returns on instream temperature.[4]

Selecting Appropriate Models

Although a wide range of adequate hydrodynamic and surface water quality models are available, the central issue in selecting appropriate models for evaluating hydromodification projects is the appropriate match of the financial and geographical scale of the proposed project with the cost required to perform a credible technical evaluation of the projected environmental impact. It is highly unlikely, for example, that a proposal for a relatively small stream channel modification project, such as installing culverts in a stream segment, would be expected or required to contain a state-of-the-art hydrodynamic and surface water quality analysis that requires one or more person-years of effort. In such projects, a simplified, desktop approach (e.g., HEC-RAS Model) requiring less time and money would most likely be sufficient (USACE, 2002a). In contrast, substantial technical assessment of the long-term environmental impacts would be expected for channelization proposed as part of construction of a major harbor facility or as part of a system of navigation and flood control locks and dams. The assessment should

[3] For more information or to download SNTEMP, see the U.S. Geological Survey Web site: http://www.fort.usgs.gov/Products/Software/SNTEMP.
[4] More information about the model is available on the U.S. Geological Survey Web site: http://www.mesc.usgs.gov/products/software/default.asp (navigate to Stream Network Temperature Model and Stream Segment Temperature Model).

incorporate the use of detailed 2D or 3D hydrodynamic models coupled with sediment transport and surface water quality models.

In general, six criteria can be used to review available models for potential application in a given hydromodification project:

1. Time and resources available for model application
2. Ease of application
3. Availability of documentation
4. Applicability of modeled processes and constituents to project objectives and concerns
5. Hydrodynamic modeling capabilities
6. Demonstrated applicability to size and type of project

The Center for Exposure Assessment Modeling (CEAM),[5] EPA Environmental Research Laboratory, Athens, Georgia, provides continual support for several hydrodynamic and surface water quality models, such as HSCTM2D, HSPF, PRZM3, and SED3D. Another source of information and technical support is the Waterways Experiment Station, USACE, Vicksburg, Mississippi.[6] Although a number of available models are in the public domain, costs associated with setting up and operating these models may exceed the project's available resources. For a simple to moderately difficult application, the approximate level of effort varies, but could range from 1 to 12 person-months.

Several factors need to be considered in the application of mathematical models to predict impacts from hydromodification projects including:

- Variations and uncertainties in the accuracy of these models when they are applied to the short- and long-term response of natural systems.
- Availability of relevant information (data collection) to derive the simulations and validate the modeling results.

The cost of a given modeling project depends on a number of factors. Questions need to be asked prior to the start of a modeling project to determine the purpose and future use of the model, and/or its results. For example, the modeler needs to know if the model results are to be used deterministically (the model assumes there is only one possible result that is known for each alternative course or action), or if the model is to be used for a heuristic (involving or serving as an aid to learning, discovery, or problem-solving by experimental and especially trial-and-error methods) scoping exercise to identify data gaps in a system. In a deterministic study, the results are traditionally compared to observed data in an effort regarded as calibration and validation. The model must therefore be rigorous enough to represent the system accurately. The complexity of the system under study is also a consideration that must be made prior to the project. The complexity of the system generally correlates well with the level of complexity of the model required to simulate it. Likewise, the more complex the model is, the more intensive it is to develop and run, and the more costly the modeling project is.

[5] http://www.epa.gov/ceampubl
[6] http://www.erdc.usace.army.mil

A number of approaches are available to model a given system, and the discussion above only highlights a few of the modeling tools currently available. The cost to set up a model for a given system varies tremendously, based not only on the modeling code selected, but also on what the modeler decides to simulate. For example, a modeler may aim to obtain flow results for an estuary using a given model. In reality, surface winds in that estuary may or may not be influencing the flow regime. If observed wind data is available from a weather station nearby, the modeler may choose to incorporate these data into the model to better represent that influence. The modeler may also choose not to incorporate these data, or the data may not be available. Although the modeler is utilizing the same modeling code, the decision regarding whether or not to simulate the wind conditions is not only a question regarding the model's purpose, but also what the development of this model will cost.

Modeling tools can range from simple spreadsheet tools using "back of the envelope" type calculations, to complex processed based models that must be run on high performance computing systems. As discussed previously, the tool selected for a given modeling project needs to be chosen with a number of questions in mind. As a result, each system can be modeled in a number of different ways with a number of different modeling codes. Therefore, the range in cost for even a single estuary or impoundment may range tenfold depending on the model's purpose. Typically, the cost of developing a model may range from a few thousand dollars for a simple spreadsheet model, to in excess of one million dollars for a more robust modeling system.

Chapter 9: Dam Removal Requirements, Process, and Techniques

Chapter 2 provided a discussion of specific impacts from dams, water quality above and below the dam, suspended sediment and recharge issues, and biological and habitat impacts. Chapter 4 then provided a discussion of types of dams, Federal Energy Regulatory Commission (FERC) requirements, management measures and practices that can be used to mitigate for some of the effects of dams, and information to consider when contemplating removing a dam. Chapter 9 focuses on what occurs after the decision has been made to remove a dam. This chapter provides a more detailed discussion on some permitting requirements for removing dams, the dam removal process, and sediment removal techniques to consider when removing a dam.

Requirements for Removing Dams

Removing a dam may require evaluations and permits from state, federal, and local authorities. These requirements are typically to ensure that the removal is done is a manner that is safe and minimizes short and long term impacts to the river and floodplain. States and local governments have different requirements. The following federal requirements may apply to dam removal:

- Rivers and Harbors Act Permit
- FERC License Surrender or Non-power License Approval
- National Environmental Policy Act (NEPA) Review
- Federal Consultations (Endangered Species Act Section 7 Consultation, Magnuson-Stevenson Act Consultation, National Historic Preservation Act Compliance)
- State Certifications (Water Quality Certification, Coastal Zone Management Act Certification)

The following state requirements might apply to dam removal:

- Clean Water Act (CWA) Section 404 Dredge and Fill Permit
- Waterway Development Permits
- Dam Safety Permits
- State Environmental Policy Act Review
- Historic Preservation Review
- Resetting the Floodplain
- State Certifications

Demolition and building permits may also be required for dam removal. Individual state and local governments may have additional requirements as well.

Tips for a Successful Permitting Process (American Rivers, 2002b)

Dam removal is relatively new and the permitting process can be difficult. Most state and federal agencies are not yet practiced at moving dam removal through the permitting process. The relevant permitting requirements were designed for more destructive activities, and dam removal does not easily fit into the requirements. Tips to help make the process smoother include:

Schedule Time

- *Expect dam removal projects to take longer than construction efforts.*
- *Schedule more lead-time into the permitting process to avoid delays and frustrations.*

Establish a Relationship with the Permitting Agencies

- *Hold a pre-application meeting with key agency staff once your project is well thought out.*
- *Do not attempt to circumvent the process and stick with the permitting timeline.*
- *Do not provide inconsistent information.*
- *A single point of contact for the group applying for the permit will help avoid confusion and maintain communication.*

Providing Information about the Proposed Project

- *Create clear and simple descriptions and drawings (to scale) of the proposed project.*
- *Be sure to identify complicating conditions, schedules, seasonal constraints, etc.*
- *Provide and discuss alternatives, but make it clear why the chosen approach should be used.*
- *Assume the reviewers know nothing about your project.*

Dam Removal Process

The complexity of the removal process of a dam is specific to each particular case of removal. There are two major components of the removal process: the stakeholders involved in the decision-making process of removing the dam and the actual physical removal of the dam itself. The authorities that govern dams are numerous, yet overlapping. These entities include: USACE, Bureau of Reclamation, FERC, and other federal agencies; interest groups; and state and local governments. There are also various state programs that have been created to keep dams safe and environmentally friendly, as well as to help owners finance dam removal. A study by the Aspen Institute (2002) provides a list of priority issues to consider when dam removal may be a possibility. Among the considerations listed are dam and public safety, economics, environmental concerns, risk, social values and community interests, scientific information, and stakeholder participation. This report suggests that success of dam removal is dependent upon a thorough analysis of these competing factors and input from all interested parties (Aspen Institute, 2002). Often, the dam owner makes the decision to remove a dam, deciding that the costs of continuing operation and maintenance are greater than the cost of removing the dam. However, state dam safety offices can order for a dam to be removed if there are safety concerns; FERC can order removal of dams under their jurisdiction for environmental and safety reasons (American Rivers, n.d.a.).

State governments have authority over the dams in their jurisdiction. Other state and local government agencies dealing with issues such as water quality, water rights, and fish and wildlife protection can also play a role in overseeing dams within their jurisdiction if they so choose

(FOE et al., 1999). Certain states have implemented stringent rules for dams that are and are not regulated by FERC or USACE. For example, the state of Wisconsin has a Dam Safety Inspection Program that requires dams to be inspected every 10 years by the Wisconsin Department of Natural Resources (WDNR) (Doyle et al., 2000). Any dam that fails to meet safety requirements set by WDNR must be repaired or removed. The state of Pennsylvania has implemented a law that was written under the order of the Pennsylvania Fish and Boat Commission that states that any newly constructed or existing dam that requires a state permit for construction or modification must also include provisions for fish passage (Doyle et al., 2000).

Some states have programs that aid dam owners in the process of removing their structures. The Pennsylvania Department of Environmental Protection (DEP) has adopted procedures to make it easier and less expensive for dam owners to remove unsafe, unused, or unwanted dams. In this process, owners of dams on third order or larger streams are contacted and asked if they are interested in removing their dams. If they are, then all the landowners affected by the removal are contacted, and a public meeting is held if interest warrants one. After public comments, an engineering design is created, followed by an environmental assessment, then sediment and erosion control (ESC) plans are established, and finally approval is sought by the USACE. This program was used in the removal of seven dams on Conestoga River and also in the removal of the Williamsburg Station Dam on the Juniata River. This approval process takes between 12 and 18 weeks (FOE et al., 1999). However, the physical decommissioning and removing of a dam can still be a lengthy and diversified process.

Sediment Removal Techniques

Large dams can trap thousands to millions of cubic yards of sediment over time, eliminating the flood control or storage capacity of the dam. Removal or control of sediment behind a dam can represent a large portion of the cost and planning effort of a dam removal project. There are several methods available to project planners and dam owners that target different pollution concerns and budgetary limitations (International Rivers Network, 2003). The options in terms of sediment removal range from complete removal and relocation of all accumulated material from the inundated regions; removing sediment only from the anticipated channel of the river, or allowing the river to erode a new channel through the sediment (Wunderlich et al., 1994).

If the sediment is basically clean and the main concern is turbidity and clogging downstream streambed spawning areas, gradual incremental drawdowns of the reservoir behind the dam allow the sediment to be transported downstream in smaller portions and avoids the release one large, lethal volume of sediment. If contaminated sediment is the main concern, dredging is an option that can be used. While the use of silt curtains can minimize turbidity during dredging, silt curtains do not contain dissolved substances such as metals, which can pose a threat to downstream ecosystems (EMC2, 2001). Another option for contaminated sediments is to stabilize the sediment in place within the stream. This can be accomplished by leaving a portion of the dam in place to hold back an area of sediment that is of concern. The strategic placement of boulders can also contain the sediment from moving downstream.

For more information on issues associated with dam removal, see the Additional Resources section of this document.

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Additional Resources

The following are additional resources that may be used to obtain supplementary information for topics presented in this document.

Background on Streams, Restoration, and Hydrology

The following are basic references regarding stream ecology, restoration, and hydrology:

Allan, J.D. 1995. *Stream Ecology—Structure and Function of Running Waters*. Chapman and Hall, New York.

Brookes, A. and F.D. Shields, eds. 1999. *River Channel Restoration: Guiding Principles for Sustainable Projects*. John Wiley and Sons, Chichester, U.K.

Cooke, G.D., E.B. Welch, S.A. Peterson, and P.R. Newroth. 1993. *Restoration and Management of Lakes and Reservoirs*. 2nd ed. Lewis Publishers, Boca Raton, FL.

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Gordon, N.D., T.A. McMahon, and B.L. Finlayson. 1992. *Stream Hydrology: An Introduction for Ecologists*. John Wiley and Sons, Chichester, U.K.

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Kondolf, G.M., and E.R. Micheli. 1995. Evaluating stream restoration projects. *Environmental Management* 19(1):1-15.

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Poff, N., J.D. Allan, M.B. Bain, J.R. Karr, K.L. Prestegaard, B.D. Richter, R.E. Sparks, and J.C. Stromberg. 1997. The natural flow regime: A paradigm for river conservation and restoration. *BioScience* 47:769-784.

Ponce, V.M. 1989. *Engineering Hydrology: Principles and Practices*. Prentice-Hall, Englewood Cliffs, New Jersey.

Rosgen, D.L. 1996. *Applied River Morphology*. Wildland Hydrology, Colorado.

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Detailed Information for Practices to Achieve Management Measures

Additional information about practices, their effectiveness, limitations, and cost estimates are available from a number of sources, including:

Allen, H.H. and J.R. Leech. 1997. *Bioengineering for Streambank Erosion Control: Report 1 Guidelines*. U.S. Army Corps of Engineers, Environmental Impact Research Program, Technical Report EL-97-8. http://el.erdc.usace.army.mil/elpubs/pdf/trel97-8.pdf.

American Society of Civil Engineers and the U.S. Environmental Protection Agency (ASCE and USEPA). 2007. *International Stormwater Best Management Practices (BMPs) Database*. http://www.bmpdatabase.org.

Center for Watershed Protection (CWP). 2007. *The Stormwater Manager's Resource Center*. http://www.stormwatercenter.net.

Federal Interagency Stream Restoration Working Group (FISRWG). 1998. *Stream Corridor Restoration: Principles, Processes, and Practices*. http://www.nrcs.usda.gov/technical/stream_restoration.

Fischenich, J. C. and H. Allen. 2000. *Stream Management*. ERDC/EL SR-W-00-1, U.S. Army Engineer Research and Development Center, Vicksburg, MS. http://el.erdc.usace.army.mil/elpubs/pdf/srw00-1/srw00-1.pdf. Accessed October 2004.

Knutson, P.L., and M.R. Inskeep. 1982. *Shore Erosion Control with Salt Marsh Vegetation*. Coastal Engineering Technical Aid No. 82-3. U.S. Army Corps of Engineers Coastal Engineering Research Center, Vicksburg, MS.

National Association of Home Builders (NAHB). 1995. *Storm Water Runoff & Nonpoint Source Pollution Control Guide for Builders and Developers*. National Association of Home Builders, Washington, DC. http://www.nahbrc.org.

Oregon Association of Conservation Districts. 1999. *Protecting Streambanks from Erosion: Tips for Small Acreages in Oregon*. http://www.or.nrcs.usda.gov/news/factsheets/fs4.pdf.

Urban Drainage and Flood Control District. 1999. *Urban Storm Drainage Criteria Manual: Volume 3—Best Management Practices*. Urban Drainage and Flood Control District, Denver, CO. http://www.udfcd.org.

U.S. Army Corps of Engineers (USACE). 2007. *Engineer Research and Development Center (ERDC) Web site*. http://www.erdc.usace.army.mil.

U.S. Department of Agriculture, Forest Service (USDA-FS). 2002. *A Soil Bioengineering Guide for Streambank and Lakeshore Stabilization*. http://www.fs.fed.us/publications/soil-bio-guide.

U.S. Environmental Protection Agency (USEPA). 2002. *Development Document for Proposed Effluent Guidelines and Standards for the Construction and Development Category*. EPA-821-R-02-007. http://www.epa.gov/waterscience/guide/construction/devdoc.htm.

U.S. Environmental Protection Agency (USEPA). 2007. *National Menu of Stormwater Best Management Practices*. http://cfpub.epa.gov/npdes/stormwater/menuofbmps/menu.cfm.

Additional information about hydromodification, soil bioengineering, and restoration is available from the following:

- *Ann Riley, Urban Stream Restoration: A Video Tour of Ecological Restoration Techniques* (http://www.noltemedia.com/nm/urbanstream): This video, which can be ordered online, is a documentary tour of six urban stream restoration sites. It provides background information on funding, community involvement, and the history and principles of restoration. The demonstration includes examples of stream restoration in very urbanized areas, re-creating stream shapes and meanders, creek daylighting, soil bioengineering, and ecological flood control projects. Ann Riley, a nationally known hydrologist, stream restoration professional, and executive director of the Waterways Restoration Institute in Berkley, California, leads the tour.

- *California Forest Stewardship Program*. Bioengineering to Control Streambank Erosion (http://ceres.ca.gov/foresteward/html/bioengineering.html): This fact sheet discusses various bioengineering techniques applicable to California streams.

- *Lower American River Corridor River Management Plan* (http://www.safca.com): The plan provides information on aquatic habitat management goals, including restoration to improve aquatic habitat impaired by low flows from channel modification of the Lower American River.

- *Natural Resources Conservation Service, Watershed Technology Electronic Catalog* (http://www.wcc.nrcs.usda.gov/wtec/wtec.html): This online catalog is a source of technical guidance on a variety of restoration techniques and management practices, to provide direction for watershed managers and restoration practitioners. The site is focused on providing images and conceptual diagrams.

- *North Delta Improvements Project* (http://ndelta.water.ca.gov/index.html): The North Delta Improvements Project (NDIP), which is under the California Department of Water Resources, presents unique opportunities for synergy in achieving flood control and ecosystem restoration goals.

- *Ohio Department of Natural Resources*. Stream Management Guide Fact Sheets (http://www.dnr.state.oh.us/water/pubs/fs_st/streamfs.htm): This is a compilation of fact sheets offering technical guidance for streambank and instream practices, general stream management, and stream processes.

- *Sacramento River Riparian Habitat Program* (http://www.sacramentoriver.ca.gov): The Sacramento River Riparian Habitat Program is working to ensure that riparian habitat management along the river addresses the dynamics of the riparian ecosystem and the reality of the local agricultural economy.

- Schueler, T. 1987. *Controlling Urban Runoff: A Practical Manual for Planning and Designing Urban BMPs*. Metropolitan Washington Council of Governments, Washington, DC.

- *South Delta Improvements Program* (http://baydeltaoffice.water.ca.gov/sdb/sdip/index_sdip.cfm): The purpose of the South Delta Improvements Program (SDIP) is to incrementally maximize diversion capability into Clifton Court Forebay, while providing an adequate water supply for diverters within the South Delta Water Agency and reducing the effects of State Water Project exports on both aquatic resources and direct losses of fish in the South Delta.

- *South Sacramento County Streams Project* (http://www.spk.usace.army.mil): South Sacramento County Streams Project provides flood damage reduction to the urban areas of the Morrison Creek and Beach Stone Lake drainage basins in the southern area of Sacramento, as well as around the Sacramento Regional Waste Water Treatment Plant. The project will fund stream restoration in southern Sacramento County.

- *USDA Natural Resources Conservation Service, Stream Visual Assessment Protocol* (http://www.nrcs.usda.gov/technical/ECS/aquatic/svapfnl.pdf): This document outlines methods for field conservationists and landowners to evaluate stream ecological conditions.

- *Washington State Department of Transportation, Soil Bioengineering Web site* (http://www.wsdot.wa.gov/eesc/design/roadside/sb.htm): This is a comprehensive Web site, with information on cost, specifications for project design, funding, and case studies.

- *WATERSHEDSS:Water, Soil and Hydro-Environmental Decision Support System* (http://www.water.ncsu.edu/watershedss): The "Educational Component" of this Web site contains fact sheets with information on a variety of techniques for management practices, including soil bioengineering and structural streambank stabilization.

Resources for Dams

Thornton, K.W., B.L. Kimmel, and F.E. Payne, eds. 1990. *Reservoir Limnology: Ecological Perspectives*. John Wiley and Sons, Inc., New York, NY.

U.S. Army Corps of Engineers. No date. *The WES Handbook on Water Quality Enhancement Techniques for Reservoirs and Tailwaters*. U.S. Army Engineer Research and Development Center Waterways Experiment Station, Vicksburg, MS.

Web sites for dam removal include the following:

- American Rivers' Rivers Unplugged Program: http://www.americanrivers.org/site/PageServer?pagename=AMR_content_1270
- Association of State Dam Safety Officials: http://www.damsafety.org
- Friends of the Earth's River Restoration: http://www.foe.org/camps/reg/nw/river/index.html
- International River Network's River Revival Program: http://www.irn.org/revival/decom
- Massachusetts Department of Fisheries, Wildlife, and Environmental Law Enforcement River Restore Program: http://www.mass.gov/dfwele/river/programs/riverrestore/riverrestore.htm
- National Performance of Dams Program Stanford University: http://www.stanford.edu/group/strgeo/researchcenters.html
- New Hampshire Department of Environmental Services: http://www.des.state.nh.us/dam.htm
- Pennsylvania Department of Environmental Protection, Division of Dam Safety, Dam Safety Program: http://www.dep.state.pa.us/dep/deputate/watermgt/we/damprogram/Main.htm
- Pennsylvania Fish & Boat Commission: http://www.fish.state.pa.us
- River Recovery—Restoring Rivers through Dam Decommissioning: http://www.recovery.bcit.ca/index.html
- United States Society on Dams: http://www.ussdams.org
- Wisconsin Department of Natural Resources: http://www.dnr.state.wi.us/org/water/wm/dsfm/dams/removal.html

Additional information about dam removal is available from the following resources:

- ASCE. 1997. *Guidelines for the Retirement of Hydroelectric Facilities*. American Society of Civil Engineers.
- Bednarek, A.T. 2001. Undamming rivers: A review of the ecological impacts of dam removal. *Environmental Management* 27(6):803-814.
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- Born, S.M., et al. 1998. Socioeconomic and institutional dimensions of dam removals: The Wisconsin experience. *Environmental Management* 22(3):359-370.

- Hart, D.D. and N.L. Poff. 2002. A special section on dam removal and river restoration. *BioScience* 52:653-655.
- Heinz Center. 2002. *Dam Removal: Science and Decision Making*. Available at: http://www.heinzctr.org/Programs/SOCW/dam_removal.htm.
- International Rivers Network: http://www.irn.org/pubs/wrr.
- Niemi, G.J., et al. 1990. Overview of case studies on recovery of aquatic systems from disturbance. *Environmental Management* 14(5):571-587.
- United States Society on Dams Publications: http://www.ussdams.org/pubs.html.
- University of Wisconsin-Madison/Extension. 1996. *The Removal of Small Dams: An Institutional Analysis of the Wisconsin Experience*. Extension Report 96-1, May. Department of Urban and Regional Planning.
- Wisconsin Department of Natural Resources Projects: http://www.dnr.state.wi.us/org/gmu/sidebar/iem/lowerwis/index.htm#baraboo or http://www.dnr.state.wi.us/org/gmu/lowerwis/baraboo.htm; http://www.dnr.state.wi.us/org/gmu/sidebar/iem/milw/index.htm; http://www.dnr.state.wi.us/org/gmu/sidebar/iem/superior/index.htm; http://www.dnr.state.wi.us/org/gmu/sidebar/iem/sheboygan/index.htm

Noneroding Roadways

The following sources may be used to obtain additional information on noneroding roadways:

- *Controlling Nonpoint Source Runoff Pollution from Roads, Highways, and Bridges* http://www.epa.gov/owow/nps/roads.html
- *Erosion, Sediment, and Runoff Control for Roads and Highways* http://www.epa.gov/owow/nps/education/runoff.html
- *Gravel Roads: Maintenance and Design Manual*—the purpose of the manual is to provide clear and helpful information for doing a better job of maintaining gravel roads. The manual is designed for the benefit of elected officials, mangers, and grader operators who are responsible for designing and maintaining gravel roads. http://www.epa.gov/owow/nps/gravelroads
- *Low-Volume Roads Engineering Best Management Practices Field Guide* http://zietlow.com/manual/gk1/web.doc
- *Massachusetts Unpaved Roads BMP Manual* http://berkshireplanning.org/4/download/dirt_roads.pdf
- *Planning Considerations for Roads, Highways, and Bridges* http://www.epa.gov/owow/nps/education/planroad.html
- *Pollution Control Programs for Roads, Highways, and Bridges* http://www.epa.gov/owow/nps/education/control.html
- *Recommended Practices Manual: A Guideline for Maintenance and Service of Unpaved Roads* http://www.epa.gov/owow/nps/unpavedroads.html
- The "Road Maintenance Video Set" is a five-part video series developed for USDA Forest Service equipment operators that focuses on environmentally sensitive ways of maintaining low volume roads. http://www.epa.gov/owow/nps/maint_videoset.html

Additional Information

Barbour, M.T., J. Gerritsen, B.D. Snyder, and J.B. Stribling. 1999. *Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates and Fish*, Second Edition. EPA 841-B-99-002. U.S. Environmental Protection Agency; Office of Water; Washington, D.C. http://www.epa.gov/owow/monitoring/rbp/ Accessed July 2007.

International Commission on Large Dams
http://www.icold-cigb.org

International Rivers Network
http://www.irn.org

U.S. Army Corps of Engineers, Engineer Research and Development Center
http://www.erdc.usace.army.mil

U.S. Department of Agriculture, Farm Service Agency
http://www.fsa.usda.gov/pas

U.S. Department of Agriculture, Natural Resources Conservation Service
http://www.nrcs.usda.gov

U.S. Department of the Interior, Bureau of Reclamation
http://www.usbr.gov

U.S. Department of the Interior, National Park Service
http://www.nps.gov

U.S. Department of the Interior, U.S. Fish and Wildlife Service
http://www.fws.gov

U.S. Department of the Interior, U.S. Geological Survey
http://www.usgs.gov

USEPA. 1994. *A State and Local Government Guide to Environmental Program Funding Alternatives*. EPA 841-K-94-001. http://www.epa.gov/owow/nps/MMGI/funding.html

USEPA. 1994. *A Tribal Guide to the Section 319(h) Nonpoint Source Grant Program*. EPA 841-S-94-003.

USEPA. 1994. *Section 319 Success Stories: Volume I*. EPA 841-S-94-004.
http://www.epa.gov/owow/nps/Success319

USEPA. *Catalog of Federal Funding Sources for Watershed Protection*
http://cfpub.epa.gov/fedfund

USEPA. 1997. *Section 319 Success Stories: Volume II—Highlights of State and Tribal Nonpoint Source Programs*. EPA 841-R-97-001.
http://www.epa.gov/owow/nps/Section319II

USEPA. 2002. *Section 319 Success Stories: Volume III*.
http://www.epa.gov/owow/nps/Section319III

USEPA Clean Lakes Program
http://www.epa.gov/owow/lakes/cllkspgm.html

USEPA Environmental Finance Information Network (EFIN)
http://www.epa.gov/efinpage/efin.htm

USEPA Nonpoint Source Pollution Control Program Homepage
http://www.epa.gov/OWOW/NPS

USEPA Surf Your Watershed
http://www.epa.gov/surf

USEPA Watershed Academy
http://www.epa.gov/owow/watershed/wacademy

Watershedss, (Water, Soil, and HydroEnvironmental Decision Support System)—North Carolina State University
http://www.water.ncsu.edu/watershedss

Appendix A
U.S. Environmental Protection Agency Contacts

This appendix provides wetlands contacts, nonpoint source regional contacts, and Clean Water State Revolving Fund Contacts.

U.S. Environmental Protection Agency Contacts

EPA is grouped into 10 Regions. For questions about a particular state, contact the appropriate EPA Regional Coordinator listed below.

EPA Region	Wetland Contact	Nonpoint Source Regional Coordinators	Clean Water State Revolving Fund Regional Coordinators
Region 1: CT, MA, ME, NH, RI, VT http://www.epa.gov/region01/	U.S. EPA-Region 1 Wetlands Protection Unit One Congress Street Boston, MA 02114-2023 http://www.epa.gov/region01/topics/ecosystems/wetlands.html	U.S. EPA-Region 1 Nonpoint Source Coordinator One Congress Street, Boston, MA 02114-2023 http://www.epa.gov/region01/topics/water/npsources.html	U.S. EPA-Region 1 SRF Program Contact One Congress Street Boston, MA 02114-2023 http://www.epa.gov/ne/cwsrf/index.html
Region 2: NJ, NY, PR, VI http://www.epa.gov/Region2	U.S. EPA-Region 2 Water Programs Branch Wetlands Section 290 Broadway New York, NY 10007-1866 http://www.epa.gov/region02/water/wetlands/	U.S. EPA-Region 2 Water Programs Branch Nonpoint Source Coordinator 290 Broadway New York, NY 10007-1866 http://www.epa.gov/region02/water/npspage.htm	U.S. EPA-Region 2 Water Programs Branch SRF Program Contact 290 Broadway New York, NY 10007-1866 http://www.epa.gov/Region2/water/wpb/staterev.htm
Region 3: DC, DE, MD, PA, VA, WV http://www.epa.gov/region03	U.S. EPA-Region 3 Wetlands Protection Section 1650 Arch Street (3WP12) Philadelphia, PA 19103 http://www.epa.gov/reg3esd1/hydricsoils/index.htm	U.S. EPA-Region 3 Nonpoint Source Coordinator 1650 Arch Street (3WP12) Philadelphia, PA 19103 http://www.epa.gov/reg3wapd/nps/	U.S. EPA-Region 3 Construction Grants Branch SRF Program Contact 1650 Arch Street (3WP12) Philadelphia, PA 19103 http://www.epa.gov/reg3wapd/srf/index.htm
Region 4: AL, FL, GA, KY, MS, NC, SC, TN http://www.epa.gov/region4/	U.S. EPA-Region 4 Wetlands Section 61 Forsyth Street, SW Atlanta, GA 30303 http://www.epa.gov/region4/water/wetlands/	U.S. EPA-Region 4 Nonpoint Source Coordinator 61 Forsyth Street, SW Atlanta, GA 30303 http://www.epa.gov/region4/water/nps/	U.S. EPA-Region 4 Surface Water Permits & Facilities SRF Program Contact 61 Forsyth St. Atlanta GA, 30303 http://www.epa.gov/Region4/water/gtas/grantprograms.html
Region 5: IL, IN, MI, MN, OH, WI http://www.epa.gov/region5/	U.S. EPA-Region 5 Watersheds and Wetlands Water Division (W-15J) 77 West Jackson Blvd. Chicago, IL 60604 http://www.epa.gov/region5/water/wshednps/topic_wetlands.htm	U.S. EPA-Region 5 Nonpoint Source Coordinator Water Division (W-15J) 77 West Jackson Blvd. Chicago, IL 60604 http://www.epa.gov/region5/water/wshednps/topic_nps.htm	U.S. EPA-Region 5 SRF Program Contact Water Division (W-15J) 77 West Jackson Blvd. Chicago, IL 60604 http://www.epa.gov/region5/business/fs-cwsrf.htm

EPA Region	Wetland Contact	Nonpoint Source Regional Coordinators	Clean Water State Revolving Fund Regional Coordinators
Region 6: AR, LA, NM, OK, TX http://www.epa.gov/region6	U.S. EPA-Region 6 Marine and Wetlands Section 1445 Ross Ave., Suite 1200 Dallas, TX 75202 http://www.epa.gov/region6/water/ecopro/index.htm	U.S. EPA-Region 6 Nonpoint Source Coordinator 1445 Ross Ave., Suite 1200 Dallas, TX 75202 http://www.epa.gov/region6/water/ecopro/watershd/nonpoint/	U.S. EPA-Region 6 SRF Program Contact 1445 Ross Ave., Suite 1200 Dallas, TX 75202 http://www.epa.gov/Arkansas/6en/xp/enxp2c4.htm
Region 7: IA, KS, MO, NE http://www.epa.gov/region7	U.S. EPA-Region 7 Wetlands Protection Section (ENRV) 901 N. 5th St. Kansas City, KS 66101 http://www.epa.gov/region7/wetlands/index.htm	U.S. EPA-Region 7 Nonpoint Source Coordinator 901 N. 5th St. Kansas City, KS 66101	U.S. EPA-Region 7 SRF Program Contact 901 N. 5th St. Kansas City, KS 66101 http://www.epa.gov/Region7/water/srf.htm
Region 8: CO, MT, ND, SD, UT, WY http://www.epa.gov/region8	U.S. EPA-Region 8 Wetlands Program 999 18th Street, Suite 500 Denver, CO 80202-2405 http://www.epa.gov/region8/water/wetlands/wetlands.html	U.S. EPA-Region 8 Nonpoint Source Coordinator 999 18th Street, Suite 300 Denver, CO 80202-2405 http://www.epa.gov/region8/water/nps/contacts.html	U.S. EPA-Region 8 SRF Program Contact 999 18th Street, Suite 300 Denver, CO 80202-2405
Region 9: AZ, CA, HI, NV, Pacific Islands http://www.epa.gov/region9/	U.S. EPA-Region 9 Water Division, Wetlands 75 Hawthorne Street San Francisco, CA 94105 http://www.epa.gov/region09/water/wetlands/index.html	U.S. EPA-Region 9 Nonpoint Source Coordinator 75 Hawthorne Street San Francisco, CA 94105 http://www.epa.gov/region09/water/nonpoint/index.html	U.S. EPA-Region 9 Construction Grants Branch SRF Program Contact 75 Hawthorne Street San Francisco, CA 94105 http://www.epa.gov/region9/funding/
Region 10: AK, ID, OR, WA http://www.epa.gov/region10/	U.S. EPA-Region 10 Wetlands Section 1200 Sixth Ave. Seattle, WA 98101 http://yosemite.epa.gov/R10/ECOCOMM.NSF/webpage/Wetlands	U.S. EPA-Region 10 Nonpoint Source Coordinator 1200 Sixth Ave. Seattle, WA 98101	U.S. EPA-Region 10 Ecosystems & Communities SRF Program Contact 1200 Sixth Ave. Seattle, WA 98101 http://yosemite.epa.gov/r10/ecocomm.nsf/webpage/Clean+Water+State+Revolving+Fund+in+Region+10
General Program Information	U.S. EPA Wetlands Division (4502F) Mail Code RC-4100T 1200 Pennsylvania Ave., NW Washington, DC 20460 http://www.epa.gov/owow/wetlands/	U.S. EPA Nonpoint Source Control Branch (4503-T) Ariel Rios Bldg. 1200 Pennsylvania Ave., NW Washington, DC 20460 http://www.epa.gov/owow/nps	U.S. EPA The Clean Water State Revolving Fund Branch (4204M) 1201 Constitution Ave., NW Washington, DC 20004 http://www.epa.gov/owm/cwfinance/cwsrf/index.htm

Watershed-based National Pollutant Discharge Elimination System (NPDES) Permitting Technical Guidance

August 2007

U.S. Environmental Protection Agency
Office of Wastewater Management
Water Permits Division
1200 Pennsylvania Avenue, NW
Washington, DC 20460

EPA 833-B-07-004

WATERSHED-BASED NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMITTING TECHNICAL GUIDANCE

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August 2007

U.S. Environmental Protection Agency
Office of Wastewater Management
Water Permits Division
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Foreword

Watershed-based NPDES permitting provides potential for flexibility and innovation to achieve new efficiencies and environmental progress in watersheds. This technical guidance is a follow up to the 2003 *Watershed-based National Pollutant Discharge Elimination System (NPDES) Permitting Implementation Guidance* and provides greater detail concerning a number of permit development and issuance questions not addressed previously. It is designed to help NPDES authorities develop and issue NPDES permits that fit into an overall watershed planning and management approach with input from watershed stakeholders.

Benjamin H. Grumbles
Assistant Administrator for Water

Disclaimer

This Guidance expresses the United States Environmental Protection Agency's (EPA's) support for watershed-based National Pollutant Discharge Elimination System (NPDES) permitting, including development of multisource watershed-based permits. Implementation of watershed-based permitting will be governed by existing requirements of the Clean Water Act (CWA) and EPA's NPDES implementing regulations. CWA provisions and regulations contain legally binding requirements. This document does not substitute for those provisions or regulations. The recommendations in this Guidance are not binding; the permitting authority may consider other approaches consistent with the CWA and EPA regulations. The use of non-mandatory words like "should," "could," "would," "may," "might," "recommend," "encourage," "expect," and "can" in this Guidance means solely that something is suggested or recommended and not that it is legally required or that the suggestion or recommendation imposes legally binding requirements, or that following the suggestion or recommendation necessarily creates an expectation of EPA approval. When EPA makes a permitting decision, it will make each decision on a case-by-case basis and will be guided by the applicable requirements of the CWA and implementing regulations, taking into account comments and information presented at that time by interested persons regarding the appropriateness of applying these recommendations to the particular situation. This Guidance incorporates, and does not modify, existing EPA policy and guidance on watershed-based permitting. EPA may change this Guidance in the future.

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Glossary of Terms

This glossary includes definitions or explanations of some of the terms used in this Guidance. Where there is a definition or explanation in the federal regulations for a term included in the glossary, that definition or explanation, or a portion thereof, is included with an appropriate citation. The citations also note instances where the regulatory definition or explanation is not used verbatim, but has been adapted or modified to be consistent with the format of the glossary. To the extent that a definition or explanation provided in this glossary differs from that found in EPA regulations or other official documents, it is intended for use in understanding this Guidance only.

Baseline: A term used in water quality trading to denote the pollutant control requirements that apply to buyers and sellers in the absence of trading. Sellers must first achieve their applicable baselines before entering the trading market to sell credits. Buyers can purchase credits to achieve their applicable baselines.

Bedload: Portion of sediment load transported downstream by sliding, rolling, and bouncing along the channel bottom. Generally consists of particles more than one millimeter in diameter.

Best Management Practices (BMPs): Schedules of activities, prohibitions of practices, maintenance procedures, and other treatment controls and pollutant removal devices (structural and nonstructural) to prevent or reduce the discharge of pollutants to waters of the United States. BMPs also include treatment requirements, operating procedures, and activities to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage [Title 40 of the *Code of Federal Regulations* (40 CFR) 122.2]. Treatment controls may also include systems of controls (e.g., a series of devices designed to progressively reduce the discharge of pollutants to waters of the United States. For nonpoint sources, BMPs are defined as methods, measures or practices selected by an agency to meet its nonpoint source control needs. BMPs include but are not limited to structural and nonstructural controls and operation and maintenance procedures. BMPs can be applied before, during and after pollutant-producing activities to reduce or eliminate the introduction of pollutants into receiving waters [40 CFR 130.2(m)].

Composite Sample: Sample composed of two or more discrete aliquots (samples). The aggregate sample will reflect the average water quality of the compositing or sample period.

Co-Permittee: A term used in this Guidance to refer to one of a group of wastewater dischargers who all are covered by the same NPDES permit.

Credit: A measured or estimated unit of pollutant reduction representing a level of control beyond that needed from a particular source to meet a baseline requirement (a water quality based effluent limitation for an NPDES permittee or allocation for a nonpoint source) and which may be exchanged in a trading program.

Discharge Monitoring Report: The forms used (including any subsequent additions, revisions, or modifications) by NPDES permittees to report self-monitoring results [see 40 CFR 122.2].

Flow-Proportional Composite Sample: A composite sample in which the volume or timing of the individual aliquots is based on discharge flow.

Grab Sample: A sample taken from a wastestream on a one-time basis without consideration of the flow rate of the wastestream and without consideration of time of sampling.

Load: The amount of matter or amount of thermal energy that is introduced into a receiving water. Loading may be either human-caused (pollutant loading) or natural (background loading) [40 CFR 130.2(e)].

Load Allocation: The portion of a receiving water's loading capacity that is attributed either to one of its existing or future nonpoint sources of pollution or to natural background sources. Load allocations are best estimates of the loading, which may range from reasonably accurate estimates to gross allotments, depending on the availability of data and appropriate techniques for predicting the loading. Wherever possible, natural and nonpoint source loads should be distinguished [40 CFR 130.2(g)].

National Pollutant Discharge Elimination System: As authorized by the Clean Water Act, the National Pollutant Discharge Elimination System (NPDES) permit program controls water pollution by regulating point sources that discharge pollutants into waters of the United States.

Nonpoint Source: Diffuse pollution sources (i.e., without a single point of origin or not introduced into a receiving stream from a specific outlet). The pollutants are generally carried off the land by storm water. Atmospheric deposition and hydromodification are also sources of nonpoint source pollution.

Nutrients: Chemical elements and compounds found in the environment that plants and animals need to grow and survive. Nutrients include compounds of nitrogen (nitrate, nitrite, ammonia, organic nitrogen) and phosphorus (orthophosphate and others), both natural and man-made.

Permitting Authority: EPA or a state, tribe, or territory that is authorized to administer the NPDES permit program. Forty-five states and one territory (the Virgin Islands) are authorized to administer the NPDES permit program.

Point Source: Any discernible, confined, and discrete conveyance including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation (CAFO), landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural stormwater runoff [40 CFR 122.2].

Pollutant Loading Cap or Cap: A term used in this Guidance to refer to cumulative pollutant loadings for all point and nonpoint sources established and assigned to different watersheds or waterbodies through a TMDL or other watershed analysis.

Technology-based Effluent Limitation (TBEL): An effluent limitation for a pollutant that is based on the capability of a treatment method to reduce the pollutant to a certain concentration. TBELs for POTWs are derived from the secondary treatment regulations at 40 CFR Part 133. TBELs for non-POTWs are derived from national Effluent Limitations Guidelines and Standards (effluent

guidelines) for specific industries, or on a case-by-case basis from the best professional judgment of the permit writer [see 40 CFR 122.44(a)(1)].

Time-Proportional Composite Sample: A composite sample in which the sample volume of each aliquot and the time between sampling individual aliquots are constant.

Total Maximum Daily Load (TMDL): The sum of individual WLAs for point sources and load allocations for nonpoint sources and natural background [40 CFR 130.2(i)]. TMDLs often include a margin of safety in addition to WLAs and load allocations.

Total Nitrogen: The sum of organic, nitrite, nitrate and ammonia species of nitrogen in water or wastewater. For compliance determination and reporting purposes, total nitrogen is calculated as the sum of the Total Kjeldahl Nitrogen (TKN) and the nitrite and nitrate nitrogen.

Total Phosphorus: The sum of organic and inorganic forms of phosphorus.

Trading: An arrangement where a pollutant source, typically a point source discharger, compensates another party in exchange for pollutant reduction credits and uses those credits to meet an applicable regulatory obligation. A buyer or user of credits in a trade compensates another party for creating this overcontrol and uses the resulting pollutant reductions, typically to meet its regulatory obligation. A seller or provider of credits in a trade has controlled pollutant loadings beyond what is needed to meet its baseline requirement and can receive compensation from a buyer wishing to use the surplus reductions.

Trading Ratio: A ratio developed to either discount or normalize the value of pollutant credits between a buyer and seller in a trade or between a source and a downstream waterbody. Trading ratios may be used to account for pollutant attenuation because of fate and transport, watershed characteristics, distance, time, different forms of a pollutant, uncertainty, or a desire to *retire* credits. For example, a location ratio is used to convert the amount of pollutant discharged at a specific point to the amount that reaches the waterbody of concern in a TMDL or watershed analysis. For additional information, see EPA's *Water Quality Trading Toolkit for Permit Writers*.

Wasteload Allocation (WLA): The proportion of a receiving water's total maximum daily load that is allocated to one of its existing or future point sources of pollution [40 CFR 130.2(h)].

Water Quality-based Effluent Limitation (WQBEL): An effluent limitation that is designed to achieve an applicable water quality standard, including those that are based on a WLA specified in an approved TMDL [see 40 CFR 122.44(d)].

Watershed Analysis: A term used in this Guidance to refer to an analysis of pollutant sources and loadings (similar to a TMDL) completed for a waterbody where a TMDL is not required or where a TMDL has not been performed. A watershed analysis is used to determine appropriate WQBELs for the point sources in the watershed.

List of Abbreviations

AML	average monthly limitation
AWL	average weekly limitation
BMPs	best management practices
CFR	*Code of Federal Regulations*
CWA	Clean Water Act
DMR	Discharge Monitoring Report
ELGs	effluent limitations guidelines and standards or effluent guidelines
EPA	U.S. Environmental Protection Agency
lbs	pounds
lbs/day	pounds per day
MDL	maximum daily limitation
MG	million gallons
MGD	million gallons per day
mg/L	milligrams per liter
NPDES	National Pollutant Discharge Elimination System
POTW	publicly owned treatment works
TBEL	technology-based effluent limitation
TMDL	total maximum daily load
TSD	*Technical Support Document for Water Quality-based Toxics Control*
WLA	wasteload allocation
WQBEL	water quality-based effluent limitation
U.S.C.	United States Code

Introduction: EPA and Watershed-based Permitting

For more than a decade, the U.S. Environmental Protection Agency (EPA) has supported and encouraged a watershed approach to addressing water quality problems. Awareness and understanding of this approach has grown over time, but with demonstrated gaps in implementation. On December 3, 2002, the EPA Office of Water Assistant Administrator issued a policy memo entitled, *Committing EPA's Water Program to Advancing the Watershed Approach* (Mehan 2002). This policy memo not only reaffirmed EPA's commitment to the watershed approach, but also re-energized efforts to ensure that the Agency as a whole fully integrates the approach into its programs and supports regulatory authorities that implement water programs on a watershed basis.

In December 2003, EPA issued the *Watershed-based National Pollutant Discharge Elimination System (NPDES) Permitting Implementation Guidance* (Implementation Guidance) (USEPA 2003c) that describes EPA's recommended steps and ideas for watershed-based permitting implementation under the NPDES permit program. This approach, aimed at achieving new efficiencies and environmental results through the NPDES program, provides a process for considering all stressors within a hydrologically defined drainage basin or other geographic area (e.g., municipality), rather than addressing individual pollutant sources on a discharge-by-discharge basis. The December 2003 guidance followed a long series of EPA guidance, policy, and training supporting a watershed-based approach to addressing water quality concerns.

Purpose of this Document

This document, the *Watershed-based National Pollutant Discharge Elimination System (NPDES) Permitting Technical Guidance* (Technical Guidance), is a supplement to the 2003 Implementation Guidance and provides greater detail concerning a number of permit development and issuance questions not addressed previously. This document is focused on helping NPDES authorities develop and issue NPDES permits that fit into an overall watershed planning and management approach with input from watershed stakeholders. It consists of three chapters, each of which is summarized below.

- Chapter 1 is *Approaches to Water Quality Management Using an NPDES Watershed Framework*. This Chapter discusses the role of the NPDES program in an overall watershed approach and presents a tool called the NPDES Watershed Navigator (Navigator). The Navigator is simply a series of questions to guide permitting authorities and others through the process of analyzing watershed data and determining how to develop a framework for structuring and managing implementation of the NPDES program so that the entire watershed is considered in the permit development process.
- Chapter 2 is *Guide for Multisource Watershed-based NPDES Permitting.* One of the potential outcomes of the process described in Chapter 1 is a decision to develop a multisource watershed-based permit, which is a permit that would allow point sources in a watershed to apply for and obtain permit coverage under the same permit for one or more pollutants. Chapter 2 presents permitting options designed to ensure that sources achieve and maintain WQBELs derived from applicable water quality standards while providing opportunities for reducing implementation costs and improving administrative efficiencies using a watershed-based approach. The options presented give the permitting

authority maximum flexibility to customize a multisource watershed-based permit while meeting federal, state or local requirements and site-specific concerns.

- In Chapter 3, *Watershed-based NPDES Permitting Case Studies,* EPA has developed a series of case studies describing how watershed approaches have been implemented across the country.

It is important to note that many of the NPDES implementation options discussed in this document (e.g., synchronizing permit issuance or expiration dates or water quality trading), as well as implementation of other water resource programs that may be used to meet watershed goals (e.g., water quality standards assessment or watershed management planning under the CWA section 319 nonpoint source program), are addressed in other guidance or training provided by EPA and other agencies. Although most of the approaches and programs discussed in this document are not new, this is the first time that EPA has developed an integrated guidance regarding their relationship to the NPDES program within a watershed framework. Where appropriate, this document points readers to existing resources that provide additional technical assistance in implementing specific watershed-based approaches. For example, EPA's *Water Quality Trading Toolkit for Permit Writers* (USEPA 2007) complements this Guidance and helps facilitate incorporating water quality trading into NPDES permits. Also, EPA's Watershed Academy provides a variety of training related to watershed planning and management (see EPA's Watershed Academy Web site at **http://www.epa.gov/owow/watershed/wacademy/**).

Chapter 1: Approaches to Water Quality Management Using an NPDES Watershed Framework

Although significant water quality improvements have been made through CWA programs during the past 35 years, the complex mix of remaining water quality problems and sources of pollution, including both point and nonpoint sources, calls for an integrated environmental management approach that can provide creative, comprehensive solutions. EPA and its state partners continue to promote a watershed approach to water quality management as a way to meet this need. This Chapter helps permitting authorities and others involved in the NPDES permitting process work through the analytical process of developing and applying an NPDES watershed framework as part of an overall watershed approach.

Section One: The NPDES Program and a Watershed Approach

As EPA and state partners have worked to implement a watershed approach, one significant finding is that a true watershed approach should begin to identify opportunities for environmental program integration at a watershed-level. Integrating implementation of CWA programs on a watershed-basis, rather than focusing on individual programs, pollutant sources, and waterbody segments, will enhance all stakeholders' efforts to protect watersheds from the cumulative impacts of a multitude of activities. The potential role of the NPDES program will be an important part of any discussion of program integration on a watershed-basis. The remainder of this section reviews the concept of a watershed approach, discusses the role of the NPDES program in a watershed approach, and considers how the NPDES program might be integrated into a watershed approach.

What is a Watershed Approach?

As defined in the *Watershed Approach Framework* (USEPA 1996a), "[T]he watershed approach is a coordinating framework for environmental management that focuses public and private sector efforts to address the highest priority problems within hydrologically defined geographic areas, taking into consideration both ground and surface water flow." A watershed approach has three basic components:

> *Geographic Focus*: Watersheds are nature's boundaries. They are the land areas that drain to surface waterbodies, and they generally include lakes, rivers, estuaries, wetlands, streams, and the surrounding landscape. Ground water recharge areas are also considered.
>
> *Sound Management Techniques Based on Strong Science and Data*: Sound scientific data, tools, and techniques are critical to inform the process. Actions taken include characterizing priority watershed problems and solutions, developing and implementing action plans, and evaluating their effectiveness within the watershed.
>
> *Partnerships/Stakeholder Involvement*: Watersheds transcend political, social, and economic boundaries. Therefore, it is important to involve all the affected interests in designing and implementing goals for the watershed. Watershed teams may include representatives from all levels of government, public interest groups, industry, academic institutions, private landowners, concerned citizens, and others.

EPA has promoted the use of a watershed approach to manage, protect, and restore water resources through implementing an iterative, dynamic watershed management planning process. This process involves a series of steps to characterize existing conditions, identify problems and set priorities, define management objectives, develop protection or remediation strategies, and implement and adapt selected actions as necessary. The outcomes of this process are often documented or referenced in a watershed management plan. The watershed planning process includes participation from a variety of stakeholders in the watershed to develop goals and objectives, as well as to assist with the implementation of the plan.

What is the role of the NPDES program in a watershed approach?

EPA believes that the NPDES program is an important part of an integrated watershed approach, and several Agency guidance documents and policy statements highlight and describe the NPDES program's role in implementing such an approach.

Exhibit 1-1. The watershed management process (Davenport 2002)

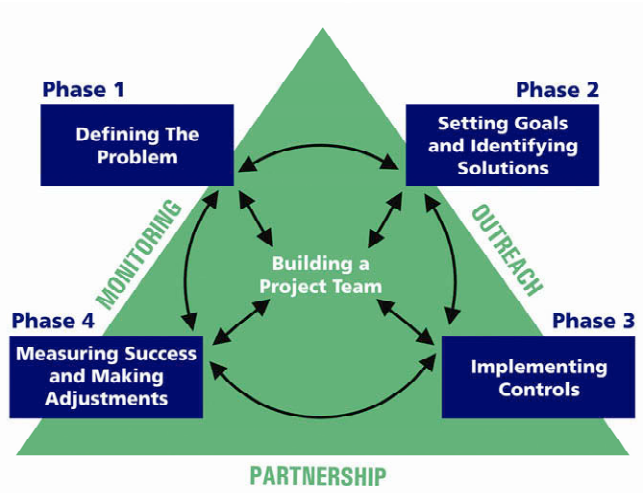

The *NPDES Watershed Strategy* (USEPA 1994a) supports using a watershed approach for NPDES permitting in conjunction with other CWA programs. The NPDES program is both a key customer and an essential partner in supporting other Office of Water program activities and achieving many of EPA's broader water quality goals. For example:

- NPDES permits implement portions of TMDLs and other watershed plans
- Water quality standards decisions affect the content of NPDES permits and decisions that point sources must make about treatment or process changes; point source discharges might impact the hydrology of a stream and the structure of an aquatic community
- Sources of pollutants are either subject to NPDES program requirements (e.g., municipal and industrial stormwater) or represent potential nonpoint source trading partners for point sources in a water quality trading program and
- NPDES permit conditions may be written specifically to protect sources of drinking water.

Over the past several years, EPA has continued to advance an NPDES watershed framework as described in the *NPDES Watershed Strategy*. In addition to the December 2002 policy memorandum *Committing EPA's Water Program to Advancing the Watershed Approach* (Mehan 2002), which provides direction to EPA program offices for implementation of a watershed approach, on January 7, 2003, EPA released the *Watershed-based NPDES Permitting Policy Statement* (Mehan 2003). This statement communicates EPA's policy on implementing NPDES permitting activities on a watershed basis, discusses the benefits of watershed-based permitting,

presents an explanation of the process and several mechanisms to implement watershed-based permitting, and outlines actions to encourage watershed-based permitting. It is both a formal commitment and a strategy for fully integrating the NPDES permitting program into the watershed approach.

As noted in the introduction, in December 2003, the Office of Water issued the *Watershed-based National Pollutant Discharge Elimination System (NPDES) Permitting Implementation Guidance* (EPA 2003c) to more fully describe the concept of and the process for developing and issuing NPDES permits on a watershed basis.

How is the NPDES program integrated into a watershed approach?

Integrating NPDES permits and the NPDES program into a watershed approach means developing and using a watershed-based analysis as part of the permitting process and using that analysis to identify a range of NPDES implementation options and, potentially, other program options to achieve watershed goals. A *watershed permitting analytical approach* is the data gathering and analysis performed to support development and issuance of NPDES permits (and complementary activities) that consider the diverse pollutant sources and stressors within a defined geographic area (i.e., watershed boundaries). The primary difference between a watershed permitting analytical approach and the more common, historical approach to permitting is that a watershed permitting analytical approach explicitly considers the impact of multiple pollutant sources and stressors, including nonpoint source contributions, when developing point source permits. A watershed permitting analytical approach also considers watershed goals during the permitting process. In many ways, a watershed permitting analytical approach is similar to the analysis undertaken to develop a TMDL. Elements 1 and 2 of the *Navigator*, introduced later in this Chapter, serve as a guide to a watershed permitting analytical approach.

Once a permitting authority has completed a watershed permitting analytical approach, it can begin to construct an NPDES watershed framework. This framework could consist of a variety of watershed-based permitting implementation options and tools or other water program tools appropriate for a specific watershed. For example, NPDES implementation options might include coordinating individual permits; issuing municipal permits that include integration of multiple programmatic requirements (e.g., wastewater treatment plant, stormwater, and combined sewer overflow requirements); issuing multisource watershed-based permit; or implementing a water quality trading program. Other program options might include approaches such as developing monitoring consortiums to support a watershed study or TMDL development; implementing a rotating basin approach; or supporting source water protection plan development.

The permitting authority and other stakeholders in the watershed would coordinate implementation of watershed-based permitting options and other tools according to their priorities. The set of priority options selected for implementation would constitute what this document refers to as an *NPDES watershed framework* for the watershed. The specific options and tools selected for short-term and longer-term implementation will depend on the characteristics of the watershed and the permitting context. For example, in an urban area the best option may be integration of wet-weather programs and permitting within the watershed. A watershed where there are water quality impacts from multiple point source nutrient discharges

could be well suited to a point source water quality trading program. If nonpoint sources also are significant contributors within the watershed, the water quality trading program could be expanded to include nonpoint sources. In many cases, it might be advantageous to use a multisource watershed-based permit as a mechanism for implementing a water quality trading program. In a watershed where there are many sources of a common pollutant, but the contributions of those sources are not well quantified, a watershed-based permit or trading program might not be feasible. However, it still might be appropriate to address some aspects of NPDES permitting in the watershed on a watershed basis or to take actions involving related clean water programs. For example, coordinating point source and ambient monitoring in the watershed could help provide a better picture of the relationships between sources and their pollutant contributions. These are just a few examples of approaches to implementing the NPDES program that may be included in an overall NPDES watershed framework for a specific watershed. Element 3 of the *Navigator* in Section 3 of this Chapter describes some of these permitting options and discusses tools for and examples of setting priorities for implementation. Stakeholders in different watersheds across the country have developed a variety of frameworks targeted to address specific pollutant or stressor types and water quality concerns. Chapter 3 of this Technical Guidance is a collection of watershed-based permitting case studies that highlight specific watershed frameworks implemented to address a pollutant, stressor, or water quality concern in various watersheds around the country.

Section Two: Why Should a Permitting Authority Consider a Watershed Framework?

Implementing the NPDES program within a watershed framework could initially require additional time and effort on the part of the permit writer, the permittee, and other stakeholders. However, there are potential environmental and administrative benefits to this process. Developing comprehensive and simultaneous solutions to water quality problems, as well as setting priorities for implementing those solutions, should result in better and, potentially, faster water quality improvements for the resources invested. Several permitting options under an NPDES watershed framework have the potential to streamline the administration of the NPDES permitting process with the promise of reducing administrative costs over time. The drivers and potential benefits associated with an NPDES watershed approach are discussed below.

What factors lead to consideration of an NPDES watershed framework?

There are several factors that lead to consideration of a watershed approach to NPDES permitting, depending on the issues and concerns in a watershed. In some watersheds, environmental conditions are the catalyst. In others, regulatory and programmatic factors can influence the permit writer or other stakeholders to consider using a watershed approach. In most cases, these drivers are related to efforts to effectively and efficiently achieve water quality goals. Some of the factors that might motivate consideration of an NPDES watershed approach are provided below.

- **Waterbody Impairment and TMDL Development and Implementation**. Waterbodies that do not meet water quality standards are placed on a state's list of impaired waters, and the development of a TMDL usually is required. TMDL development involves determining the amount of a pollutant the waterbody can receive while still attaining water quality standards and assigning a portion of that load to each source in the

watershed. A watershed permitting approach considers all sources in the watershed when determining permit provisions. Thus, a watershed-based permit could be an effective way of implementing the TMDL, particularly if the watershed-based permit were designed to match the geographic scope of the TMDL and address all facilities for which the TMDL and WLAs were developed. An NPDES watershed framework likely will be a more effective way to implement TMDL WLAs for certain sources. Multisource watershed-based permits might also be useful in situations prior to TMDL development. The Chesapeake Bay is an example of a watershed using an NPDES watershed approach to address water quality impairments before developing TMDLs. In addition, permitting authorities can provide data from a watershed permitting analysis to assist in TMDL development and implementation. This type of approach was used in the Passaic River Basin in New Jersey to develop TMDLs for segments impaired by phosphorus. Finally, a multisource watershed-based permit could obviate the need for a TMDL in situations where the only causes of impairment are point sources, and the permit establishes controls on the point sources that will result in attainment of water quality standards.

- **Upstream Pollutant Contributions**. Many waterbody segments experience water quality problems attributable to upstream sources rather than just local discharges. Traditional approaches to NPDES permitting often provide little consideration of upstream sources except as background concentrations of a pollutant. Often attainment of water quality standards and other water quality goals is dependent on addressing upstream pollutant contributions. A watershed permitting approach accounts for upstream pollutant contributions and also promotes early and continuous involvement of parties responsible for upstream sources.
- **Nonpoint Source Challenges**. Achieving water quality standards and goals in most watersheds requires pollutant load reductions not only from point sources, but also nonpoint sources. Involving nonpoint sources in efforts to improve water quality can be challenging given the lack of regulatory mechanisms. A watershed permitting approach can include nonpoint source pollutant loadings in the overall watershed analysis; involve nonpoint source representatives in the process; and be used to coordinate, prioritize, and provide incentives for addressing nonpoint source reductions.
- **Local Support for Water Quality Improvements**. An NPDES watershed framework can be used to achieve local goals in a watershed where there is local support and interest. Where watershed stakeholders have already put time, effort, and other resources into watershed planning, an NPDES watershed framework could be a logical extension of those efforts and benefit from the watershed analyses already completed and local implementation efforts already underway. Permit writers should ensure that NPDES permits are consistent with watershed plans by complementing community efforts, such as smart growth and sustainable development, supporting the protection of critical areas identified in the watershed plan, and addressing priority pollutants identified in the watershed plan.
- **Large Financial Investments**. Capital costs and operation and maintenance investments in clean water and drinking water infrastructure are significant. An NPDES watershed framework can address disparities between project needs and current spending on clean water and drinking water infrastructure by simultaneously considering all needs and setting priorities on the basis of potential water quality outcomes. An NPDES watershed framework promotes (1) better infrastructure management, (2) more efficient water use,

(3) full cost pricing for revenue and conservation, and (4) watershed-based approaches to infrastructure planning.

- **Multiple Regulatory Challenges**. Many communities face the challenge of meeting multiple regulatory requirements at the federal, state, tribal, and local levels. Regulatory requirements may overlap, be redundant, or, in some instances, conflict (e.g., increasing water use efficiency to meet a local water use reduction requirement might conflict with meeting concentration-based NPDES effluent limitations). As a result, the regulated community might feel burdened by uncoordinated regulatory activities, and regulators have the associated burden of administering multiple regulatory programs. Through an NPDES watershed framework, it is possible to coordinate and streamline regulatory requirements, producing programmatic efficiencies and ensuring compliance with measurable environmental results.

What are the potential benefits of applying an NPDES watershed approach?

EPA has promoted using an NPDES watershed approach for more than a decade. Real-world applications of an NPDES watershed framework help highlight associated benefits to water quality to permitting authorities, permittees, and other stakeholders; however, some of the potential benefits of applying an NPDES watershed framework remain theoretical. Presented below is a discussion of potential and observed benefits of using an NPDES watershed framework.

- **Water Quality Benefits**. The primary benefit of an NPDES watershed framework is that it can more effectively and efficiently improve water quality than uncoordinated, single-source oriented water resource management programs. Using a watershed permitting approach can adjust the focus of the NPDES program from the "end of the pipe" to broader watershed considerations such as ambient monitoring, permit conditions that more directly consider upstream and downstream impacts, and pollutant loadings from all stressors (e.g., nonpoint sources as well as point sources). Applying an NPDES watershed framework will not only help to achieve improvements in water quality, but can also expedite these improvements. Many current water quality goals have a time-sensitive component (e.g., achieving a percent reduction in a pollutant load by the year 2015). The potential to achieve significant water quality improvements in the near term is one of the most compelling benefits of applying an NPDES watershed framework.
- **Benefits for the Permitting Authority**. NPDES permitting authorities are facing significant permit backlogs and other challenges related to developing and issuing NPDES permits. As a result, permitting authorities are working to improve the integrity, efficiency, and environmental results of their NPDES programs. Applying an NPDES watershed framework has the potential to streamline the permitting process, if not in the initial permit issuance, then certainly in subsequent reissuances. For example, for sources in a watershed where developing and issuing watershed-based permits is a viable option, permitting authorities have the option of developing one permit to cover multiple sources or discharges rather than developing and issuing multiple permits. A watershed permitting approach might initially require a greater investment of time and resources, but, in the long run, it has the potential to cut down on the time necessary to write a permit and to conduct the associated administrative activities, such as planning and facilitating public hearings.

- **Benefits for Permittees**. An NPDES watershed framework includes opportunities to consolidate actual permits or permit requirements, such as monitoring and reporting. In addition, an NPDES watershed framework could assist dischargers who wish to set priorities for potential solutions (e.g., determine which pollutants and which sources to focus on first to achieve the greatest water quality improvements). The end result would be implementation of strategies and approaches that could generate both cost savings and improved environmental conditions.

Section Three: Navigating the Watershed Permitting Process

As discussed in Section 2 above, a number of factors might lead an NPDES permit writer or other stakeholders to select a candidate watershed for application of an NPDES watershed approach—but what kind of analysis and decision making are needed, and what is the outcome of this process? EPA has developed a basic decision-making tool called the NPDES Watershed Navigator (the Navigator) to help those involved in the NPDES program work through a watershed permitting analytical approach and construct an NPDES watershed framework in a watershed. The Navigator consists of a series of questions that facilitates analysis of watershed data and determines how best to structure and manage implementation of the NPDES program in a way that considers the entire watershed. The Navigator consists of three elements:

- **Element 1: Create Watershed and Source Data Inventories**. This element identifies the types of data recommended to conduct a watershed permitting analysis. The process outlined in this section results in watershed and source data inventories that can be used in Element 2.
- **Element 2: Apply a Watershed Permitting Analytical Approach**. Using the watershed and source data inventories, this element presents several ways to analyze the data to identify implementation options that could form an NPDES watershed framework. Such options might include establishing a monitoring consortium, developing a water quality trading program, or issuing a multisource, watershed-based permit, among many others. The approaches that could be applied in a given watershed will depend on the data available, the nature of the water quality concerns, the sources of pollutants or stressors, and the relationships among those sources.
- **Element 3: Construct an NPDES Watershed Framework**. Through Element 2 of the Navigator, a permitting authority and other stakeholders are likely to identify several implementation options that, together, would constitute an NPDES watershed framework. This element discusses these options in more detail and presents an example of priority-setting. Chapter 3 of this Technical Guidance presents case examples of how NPDES watershed frameworks were applied in different permitting contexts.

Each element of the Navigator has a goal, specific activities to be undertaken, and a specific set of results to help readers make decisions in the remaining elements. Exhibit 1-2 illustrates the goal, questions, and anticipated results for each Navigator element. Although stakeholder involvement is not specifically listed as an element of the Navigator, it is a key step in conducting a watershed permitting analytical approach and applying an NPDES watershed framework within a watershed. EPA encourages stakeholder involvement in all stages of the Navigator process. Early stakeholder involvement will strengthen the overall NPDES watershed framework by empowering stakeholders and enabling their participation in the process.

Exhibit 1-2. Goals, questions, and results associated with Navigator elements

Identify Opportunities for Stakeholder Involvement

NAVIGATOR ELEMENT

1 Create Watershed and Source Data Inventories

Goal

To collect and sort available watershed data to understand watershed conditions relative to water quality standards and watershed goals.

Questions

1. What types of data should be gathered?
2. How are gaps in the watershed and source data assessed?
3. How is a data inventory organized?

Results

- Inventory of watershed data for each candidate watershed
- Inventory of pollutant source data for each candidate watershed
- List of data gaps for each candidate watershed

NAVIGATOR ELEMENT

2 Apply a Watershed Permitting Analytical Approach

Goal

To conduct a targeted and iterative analysis of data to identify a suite of potential watershed-based NPDES approaches to attaining water quality goals.

Questions

1. Are there common stressors or sources of pollutants of concern in the watershed?
2. Are pollutants and stressors common to sources in the watershed best addressed at a watershed level?
3. What are critical environmental conditions for the pollutants or stressors of concern?
4. In what quantities or to what degree do point and nonpoint sources contribute pollutants or stressors in the watershed?
5. How are point and nonpoint sources related spatially and temporally?

Results

- List of potential implementation options

NAVIGATOR ELEMENT

3 Construct an NPDES Watershed Framework

Goal

To set priorities for potential watershed-based NPDES approaches identified in Element 2 and develop an overall implementation strategy.

Questions

1. What are the implementation options to consider in constructing an NPDES watershed framework?
2. How should prioritites for implementing the components of an NPDES watershed framework be set?

Results

- Criteria for permitting priorities
- List of implementation options arranged by priority

A discussion on stakeholder involvement in a watershed permitting analytical approach and an NPDES watershed framework is provided in **Appendix A**. The remainder of this section guides the reader through the three elements of the Navigator.

Navigator Element 1: Create Watershed and Source Data Inventories

Once a candidate watershed has been selected for a watershed permitting analytical approach, the permitting authority and other stakeholders should begin to collect and sort available data. The challenge at this point is determining which data will help stakeholders understand conditions in the watershed in relation to water quality standards and watershed goals. In addition, data gaps should be identified. Carefully studying the drivers for considering a watershed permitting approach should help the permitting authority and other stakeholders focus on the most relevant types and sources of data for the watershed and avoid spending time and money gathering data that are not useful. The permitting authority should be careful, however, not to prematurely dismiss a watershed concern or set of watershed or source data when conducting a watershed permitting analytical approach. If time and budgets permit, analyzing a more comprehensive data set in Element 2 might point to potential watershed issues or implementation options that stakeholders had not yet considered.

Question #1: What types of data should be gathered?

The types of data gathered for this element of the Navigator fall into two broad categories: watershed data and pollutant source data. Watershed data include data on the physical and natural features of the watershed and information about watershed goals and conditions. Pollutant source data include data on locations and characteristics of both point and nonpoint sources. These data are analyzed in Element 2 of the Navigator to help identify specific implementation options under an NPDES watershed framework that would be most effective in the watershed. Exhibit 1-3 below identifies the types of data that might be collected for watershed and pollutant source data inventories and some typical uses of these data. Again, note that the more clearly and narrowly the driver for using an NPDES watershed approach in a particular watershed is defined, the more focused the effort of creating watershed and source data inventories can become.

If a watershed assessment or characterization has been developed to support an earlier project in the watershed, much of the information listed in Exhibit 1-3 might have already been gathered into one place (e.g., a TMDL study, a nonpoint source watershed plan). Otherwise, the permitting authority, in cooperation with other stakeholders, should collect and sort available data that are relevant to the issues of concern in the watershed. In addition to using these data in Element 2, some data might be used for environmental indicators to measure performance (see Section Four of this Chapter).

Exhibit 1-3. Potential data inventory data types, uses, and sources

Data type	Typical uses	Sources
Watershed data		
Watershed boundaries	▪ Delineating geographic boundaries for evaluation and coordinating activities ▪ Defining scale for additional data collection	U.S. Geological Survey Elevation Derivatives for National Application (EDNA) database and interactive map: http://edna.usgs.gov
Hydrology	▪ Defining locations of waterbodies and tributaries ▪ Providing an understanding of how water flows through the watershed ▪ Defining flows at critical conditions (low and high flows) and variations in flow for water quality modeling	U.S. Geological Survey's National Water Information System web site (NWISWeb): http://waterdata.usgs.gov/nwis/
Topography	▪ Deriving slopes of stream segments and watershed areas for estimating nonpoint source loads and water quality modeling ▪ Evaluating altitude changes and the effect on projected precipitation for runoff characterization	U.S. Department of Agriculture's Natural Resources Conservation Service: http://www.ncgc.nrcs.usda.gov/products/datasets/elevation/index.html
Soils	▪ Identifying areas with potentially high erosion rates and poor drainage for estimating nonpoint source loads	Natural Resources Conservation Service's State Soil Geographic Database (STATSGO) and Soil Survey Geographic Database (SSURGO): http://www.ncgc.nrcs.usda.gov/products/datasets/statsgo/ http://www.ncgc.nrcs.usda.gov/products/datasets/ssurgo/
Climate	▪ Correlating loading conditions and in-stream data (e.g., elevated in-stream concentrations during storm events) ▪ Providing data for wet-weather watershed modeling	National Climatic Data Center (NCDC), maintained by the National Oceanic and Atmospheric Administration (NOAA): http://www.ncdc.noaa.gov/oa/ncdc.html
Aquatic life and habitat	▪ Identifying areas that support aquatic life and areas that are impaired or are at risk of impairment ▪ Defining stressors that might contribute to impairment ▪ Identifying lack of shade or riparian cover ▪ Assessing the general health of the watershed through biological criteria and biological assessments ▪ Identifying potential habitat protection areas	U.S. Geological Survey National Water-Quality Assessment (NAWQA) Program's ecological studies: http://water.usgs.gov/nawqa/ http://infotrek.er.usgs.gov/pls/htmldb/f?p=mdc:mdc_home:4392457933367716 State water quality agency information: http://cfpub2.epa.gov/npdes/stateinfo.cfm http://www.epa.gov/waterscience/standards/regions.htm http://www.epa.gov/waters/305b/index.html http://www.epa.gov/owow/tmdl/ Watershed organizations
Wildlife	▪ Identifying wildlife species for special protection ▪ Identifying potential sources of bacteria and nutrients	State or local wildlife agencies: http://offices.fws.gov/statelinks.html
Land use and land cover	▪ Identifying potential point and nonpoint sources (e.g., land use, impervious surfaces) ▪ Simulating loadings in watershed water quality models	Multi-Resolution Land Characteristics (MRLC) Consortium: http://www.mrlc.gov/index.asp
Demographics	▪ Projecting potential future waterbody uses and potential population growth in the watershed ▪ Identifying potential environmental justice concerns	U.S. Census Bureau: http://www.census.gov/ Watershed organizations Local planning agencies

Data type	Typical uses	Sources
Watershed data		
Water quality standards	▪ Identifying designated uses and criteria that apply to waterbodies and waterbody segments in the watershed ▪ Identifying water quality standards implementation policies (e.g., critical flows, mixing zones)	State water quality agency information: http://www.epa.gov/waterscience/standards/regions.htm
Water quality assessments and impaired waters	▪ Determining the condition and the water quality status of water bodies (e.g., impaired, threatened, attaining standards) ▪ Identifying potential causes and sources of impairment	EPA's STORET database: http://www.epa.gov/STORET/index.html State water quality agency information: http://www.epa.gov/waters/305b/index.html http://www.epa.gov/owow/tmdl/
TMDLs	▪ Identifying waterbody impairments, sources, pollutant loads, and reductions needed for attainment	State water quality agency information: http://www.epa.gov/waters/305b/index.html http://www.epa.gov/owow/tmdl/ EPA Regional offices: http://cfpub2.epa.gov/npdes/stateinfo.cfm
Source Water Protection Plans	▪ Identifying source waters areas for special protection	State water quality agency information: http://cfpub2.epa.gov/npdes/stateinfo.cfm State departments of health State source water protection contacts: http://cfpub.epa.gov/safewater/sourcewater/
Source Data		
Point sources	▪ Locating point sources within the watershed ▪ Identifying existing permit conditions for point sources ▪ Characterizing point sources and point source pollutant loadings ▪ Establishing the relationships (e.g., geographic, water quality impact) between point sources and among point and nonpoint sources in the watershed (e.g., for trading)	EPA's Permit Compliance System (PCS): http://www.epa.gov/enviro/html/pcs/index.html EPA's Integrated Compliance Information System (ICIS): http://www.epa.gov/compliance/data/systems/modernization/timeline.html State water quality agency information: http://cfpub2.epa.gov/npdes/stateinfo.cfm eNOI registrations (for states where EPA is the NPDES authority): http://cfpub.epa.gov/npdes/stormwater/enoi.cfm
Nonpoint sources	▪ Identifying types or categories of nonpoint sources ▪ Identifying locations of specific nonpoint sources ▪ Identifying existing nonpoint source management measures ▪ Characterizing nonpoint sources and nonpoint source pollutant loadings ▪ Establishing the relationships (e.g., geographic, water quality impact) among nonpoint sources and between nonpoint and point sources in the watershed (e.g., for trading)	U.S. Department of Agriculture's Census of Agriculture (livestock and cropland) MRLC (land use categories) Natural Resources Conservation Service Local conservation districts Watershed organizations U.S. Census Bureau (septic tank use): http://quickfacts.census.gov National Small Flows Clearinghouse (failing septic systems in the nation by county): http://www.nesc.wvu.edu/nsfc/nsfc_index.htm Bureau of Land Management (silviculture sources): http://www.blm.gov/wo/st/en/info/directory.2.html

Source: USEPA 2005a

Question #2. How are gaps in the watershed and source data assessed?

As previously stated, the inventory should focus on the most relevant types and sources of data necessary to address specific issues of concern in the watershed. Once these critical data types are determined, the Watershed and Source Data Gap Assessment Worksheet found in **Appendix B**, or a similar tool, will assist in assessing the availability, source, format, and quality of any existing data needed for the approach, and determine what additional types of data should be sought. If necessary, the permitting authority could alter the worksheet to include those data types relevant to a specific watershed.

Question #3. How is a data inventory organized?

After completing the data gap assessment, the permitting authority should organize detailed information about the available data in a formal data inventory using either a text document, spreadsheet, or database. The organizational structure will depend on the type and amount of data sources, as well as the ultimate use of the inventory. If it is necessary to query the data, the data could be entered into a searchable database (e.g., Access). The inventory should be updated as needed as additional data are assembled to ensure that a complete summary of data is available to stakeholders in the watershed.Section 5.10 of EPA's *Handbook for Developing Watershed Plans to Restore and Protect Our Waters* (USEPA 2005a) provides detailed guidance on creating a comprehensive monitoring and watershed data inventory.

Navigator Element 2: Apply a Watershed Permitting Analytical Approach

After collecting and sorting watershed data and pollutant source data, the permitting authority should begin the process of analyzing these data. The goal of this process is to conduct a targeted and iterative analysis of the data that will allow stakeholders to identify a suite of potential watershed-based NPDES approaches to attaining water quality goals in Element 3. The Navigator approaches this analysis by asking five critical questions about the stressors, pollutants, and sources:

1. Are there common stressors or sources of pollutants of concern in the watershed?
2. Are pollutants and stressors common to sources in the watershed best addressed at a watershed level?
3. What are critical environmental conditions for the pollutants or stressors of concern?
4. In what quantities or to what degree do point and nonpoint sources contribute pollutants or stressors in the watershed?
5. How are point and nonpoint sources related spatially and temporally?

These questions and potential implementation options arising from the answers to these questions are discussed below. More detailed descriptions of the implementation options are provided under Element 3 of the Navigator.

Question #1. Are there common stressors or sources of pollutants of concern in the watershed?

The first task in analyzing the available data for a candidate watershed is to sort the data to narrow the scope of the analysis, if this task was not already performed as part of the data collection and sorting process. This task involves identifying relationships among existing NPDES permits, nonpoint sources, and pollutants or stressors of concern that might appropriately be addressed under an NPDES watershed framework. Exhibit 1-4, below, presents an example of how such information might be arrayed in a simple matrix.

Exhibit 1-4. Example permit analysis matrix

Permit Number or Nonpoint Source	Pollutant or Stressor: Total Nitrogen	Nitrate	Total Phosphorus	Soluble Phosphorus	Temperature	Copper	Total Suspended Solids
ST0000001	✔		✔	✔		✔	✔
ST0000002	✔	✔	✔	✔			✔
ST0000003					✔		
ST0000004	✔		✔	✔			✔
ST0000005	✔	✔			✔	✔	✔
ST0000006					✔	✔	
NPS1	✔		✔				✔

Pollutants or stressors under consideration in this part of the analysis might include pollutants limited through existing NPDES permits, pollutants discharged by a point source and considered during the permitting process but not limited in the permit, pollutants contributed by nonpoint sources, and stressors on the waterbody or watershed (e.g., lack of riparian buffer resulting in excessive nutrient runoff, hydrologic modifications that reduce dissolved oxygen levels). This type of matrix is a quick and easy approach that highlights commonalities among sources and allows broad groupings of sources, pollutants, and stressors for further analysis. For example, considering Exhibit 1-4, one might decide to further analyze a grouping of permits ST0000001, ST0000002, ST0000004, and ST0000005 and nonpoint source NPS 1 with the pollutants total nitrogen, total phosphorus, and total suspended solids. While not every point source in the grouping is contributing every pollutant in the grouping to the waters in the watershed (for example, the point source holding permit ST0000005 does not discharge phosphorus), the overlap of common sources and pollutants indicates the potential for addressing these sources and pollutants under an NPDES watershed framework. At this point, a permit writer could proceed by asking the remaining four questions about the selected grouping of sources and pollutants or stressors.

In addition to allowing the scope of the watershed analysis to be narrowed, this basic approach to sorting data could also lead to identification of critical data gaps not previously recognized. For example, consider a watershed where nutrient loadings are a concern that is driving consideration of a watershed approach, but when available data are sorted, no effluent data for nutrients is found for one or more point sources in the watershed that might be expected to be discharging nutrients (e.g., publicly owned treatment works). A data gap has been identified. This data gap may point to a specific implementation option under an NPDES watershed framework, such as modifying the monitoring requirements in the permits or developing a watershed-wide or regional monitoring program to ensure that sufficient watershed-wide nutrient data are available.

IMPLEMENTATION OPTIONS BASED ON POTENTIAL ANSWERS TO QUESTION #1

- Several urban wet-weather sources identified
  - » Wet-weather integration
  - » Indicator development for stormwater management
- Few common pollutants across sources
  - » Permit synchronization
- Common stressors unknown because of lack of data
  - » Monitoring consortium development
- Several common sources and stressors
  - » Continue to Question #2 – additional watershed-based approaches are possible

Question #2. Are pollutants and stressors common to sources in the watershed best addressed at a watershed level?

The second question in this element of the Navigator examines the nature of the pollutants or stressors common to the sources in the grouping, identified through Question #1 above, to determine if they could be addressed at a watershed or regional level. This determination is important in deciding how to proceed with implementing an NPDES watershed approach because, for such an approach to be useful, pollutants of concern within the watershed should have more than just localized effects that can be addressed through the permitting authority's normal process for developing WQBELs in individual permits.

The question of whether common pollutants and stressors may be addressed at a watershed level actually is answered in two parts: (1) by determining whether these pollutants and stressors have watershed-wide, regional, or far-field effects and (2) by determining whether the form of the pollutant or stressor is the same or if the effects of different pollutants or stressors can be equated across the grouping of sources.

To understand the first issue, the presence or absence of far-field effects, it is important to consider the difference between localized effects and far-field effects. Localized effects, or near-field effects, are impacts that are evident within a smaller, more immediate area close to the source of the pollutant or stressor. On the other hand, far-field effects are those impacts felt in a wider area and where there potentially are cumulative impacts from multiple sources.

In most cases one could address pollutants with localized effects (e.g., acute and chronic effects of pollutants such as cyanide or chlorine) by controlling and monitoring them through individual permits or nonpoint source controls that apply effluent limitations or practices reflecting individual controls designed to ensure attainment of water quality standards in the immediate

vicinity of the discharge. Where several point source dischargers experience problems with localized effects of specific pollutants, however, a watershed permitting approach might be helpful. For instance, a monitoring consortium could be established to quantify pollutant sources, assess the impacts of pollutant discharges, and develop site-specific water quality criteria for the waterbody.

Nutrient discharges from point and nonpoint sources often present both near-field and far-field concerns. For example, a state might have water quality criteria for nutrients to protect waters in the immediate vicinity of each source, but the fate and transport of nutrients discharged throughout the watershed could affect a downstream lake. If the state has water quality criteria or goals for nutrients in the lake, these could be translated into necessary nutrient loading reductions throughout the watershed (see Question #5).

The second issue, determining whether the form of the pollutant or stressor is the same or whether a common measurement can be applied across the grouping of sources, recognizes the fact that some pollutants are discharged in more than one form (e.g., phosphorus, nitrogen, oxygen demand). For an NPDES watershed approach to be most effective, it should be possible to limit or measure the pollutant or stressor of concern in the same form or to convert different forms to a common measurement.

After determining whether pollutants common to dischargers within the watershed have known watershed-wide or regional effects – or are likely to have such effects – and can be limited or measured in a common form, appropriate groups of permits and pollutants or stressors can be considered at a watershed level. EPA's *Water Quality Trading Assessment Handbook* (USEPA 2004), provides a methodology for determining the suitability of pollutants for development of a trading program. Many of the same questions and procedures considered in the *Water Quality Trading Assessment Handbook* are more generally applicable to determining the suitability of a pollutant for any watershed-based NPDES approach.

For those pollutants likely to have only localized effects or in cases in which measurements cannot be converted to a common form across dischargers, WQBELs should be determined using the procedures in EPA's *Technical Support Document for Water Quality-based Toxics Control* (USEPA 1991), modified as necessary for conventional and nonconventional pollutants, or similar state procedures for individual permit development.

IMPLEMENTATION OPTIONS BASED ON POTENTIAL ANSWERS TO QUESTION #2

- Common pollutants or stressors are not best addressed at the watershed level
  - » Permit synchronization
- Common pollutants and stressors lend themselves to being addressed at a watershed level
  - » Continue to Question #3—additional watershed-based approaches are possible

Key References:

- Applicable Water Quality Standards, TMDLs, or watershed goals that set loading targets
- *Technical Support Document for Water Quality-based Toxics Control* (USEPA 1991) or similar state procedures

- *Water Quality Trading Assessment Handbook* (USEPA 2004) (see especially "The Six Step Suitability Analysis")

Question #3. What are the critical environmental conditions for the pollutants or stressors of concern?

The next question a permitting authority should consider when analyzing watershed and source data is what the critical environmental conditions are for the pollutants or stressors of concern. Critical environmental conditions are environmental conditions in the waterbody where controls designed to protect those conditions will ensure attainment of water quality standards and goals for all other conditions. These conditions could include a combination of factors (e.g., stream flow, temperature) and might actually occur infrequently. Depending on the pollutant or stressor of concern and the sources of those pollutants and stressors, critical conditions might occur during low stream flow, runoff events, rainfall events, or hot and dry periods.

The permitting authority, and other stakeholders, might first look to the applicable water quality standards or written water quality goals for the waterbody for information about critical conditions. Water quality standards generally define critical conditions for those pollutants subject to numeric water quality criteria, usually a critical low flow (e.g., a 1Q10 low flow, which is the lowest 1-day average flow that occurs, on average, once every 10 years or a 7Q10 low flow) for streams and rivers for aquatic life criteria and some measure of low flow or mean flow (e.g., harmonic mean) for human health criteria. In addition, the applicable water quality criteria could be dependent upon characteristics of the receiving water, such as pH or hardness. This information will define one set of critical conditions, typically related to prevention of localized impacts in a water column. If a TMDL has been completed for a pollutant, the critical conditions might be adequately identified for that pollutant for both near-field and far-field effects. For other pollutants, however, the permitting authority should examine the nature of the pollutant or stressor, its impacts, and potential sources to ensure an understanding of critical conditions. For instance, EPA's *Protocol for Developing Pathogen TMDLs* (USEPA 2001) states that critical conditions for bacteria depend on the source behavior. That is, sources of bacteria are diverse and could include a combination of sources; therefore, there might be multiple sets of critical conditions. Pollutant sources and stressors could be evaluated under various conditions to determine the scenario where the greatest impacts are likely. Are conditions most critical during the wet season? The dry season? During certain wet-weather events or

IMPLEMENTATION OPTIONS BASED ON POTENTIAL ANSWERS TO QUESTION #3

- Critical environmental conditions unknown because of insufficient data
  - » Monitoring consortium development
- Critical conditions are well defined, but vary by pollutant
  - » Consider narrowing the scope of the watershed analysis
  - » Continue to Question #4—additional watershed-based approaches possible
- Critical conditions are well defined and consistent for pollutants of concern
  - » Wet-weather integration (if wet-weather conditions are critical)
  - » Indicator development for watershed-based stormwater management (if wet-weather conditions are critical)
  - » Continue to Question #4—additional watershed-based approaches are possible

low flow conditions? Are the critical conditions the same throughout the year? EPA's technical protocols for TMDL development provide helpful background information on potential critical conditions for various pollutants. In addition to the pathogen TMDL protocol, see EPA's *Protocol for Developing Sediment TMDLs* (USEPA 1999a) and *Protocol for Developing Nutrient TMDLs* (USEPA 1999b) for additional background information.

Understanding critical conditions helps to ensure that all key sources of the pollutants of concern have been identified and provides an indication of the level of complexity that might be involved in further analysis of the watershed. For example, if critical conditions for some pollutants occur during the wet season while critical conditions for other pollutants of concern occur only during low flow or dry conditions, the permitting authority should consider pursuing a more complex analysis of the watershed that considers a range of conditions (i.e., wet and dry) or, alternatively, simplifying the analysis by focusing on a single set of conditions and, therefore, potentially reducing the number of pollutants addressed through a watershed-based NPDES approach. It is possible to proceed without defining critical conditions, but potential implementation options under an NPDES watershed framework might be limited to administrative options, such as permit synchronization, or developing permit conditions that promote additional data gathering.

Key References:

- Applicable water quality standards
- State impaired waters on the section 303(d) list
- Draft or completed TMDLs
- Regional or watershed monitoring data
- *Protocol for Developing Sediment TMDLs* (USEPA 1999a)
- *Protocol for Developing Nutrient TMDLs* (USEPA 1999b)
- *Protocol for Developing Pathogen TMDLs* (USEPA 2001)
- Data collected and sorted in Navigator Element 2

Question #4. In what quantities or to what degree do point and nonpoint sources contribute pollutants or stressors in the watershed?

After defining critical conditions in the watershed, the permitting authority and other stakeholders should analyze the available data to determine whether point and nonpoint source contributions of pollutants of concern at critical conditions have been quantified through monitoring or have been modeled. If a TMDL has been developed, this information should be available. When a TMDL has not been developed for a particular pollutant, contributions from continuous point sources would be quantifiable using data available through NPDES permits, Discharge Monitoring Reports (DMRs), and other permit records, such as permit applications, fact sheets, or statements of basis. Because monitoring is not always required for discharges from noncontinuous point sources, such as stormwater or concentrated animal feeding operations (CAFOs), models or estimates of these contributions might be needed. Similarly, nonpoint source contributions of pollutants that are not measured may be modeled or otherwise estimated. Methodologies for estimating or modeling contributions for individual nonpoint sources may differ from watershed to watershed and from state to state and will vary in complexity, depending on the available data and the individual watershed's needs or desired programmatic outcomes. A simple method for estimating individual nonpoint source loads could involve

determining the load attributable to all nonpoint sources in the watershed (for example, by subtracting the known loading from point sources from a known overall loading) and estimating the load from each individual nonpoint source on the basis of relative percent land cover. If more certainty is needed in the estimate, a modeling tool, such as EPA's BASINS (Better Assessment Science Integrating Point & Nonpoint Sources) available online at **http://www.epa.gov/waterscience/BASINS/** could be used. In addition, the state's TMDL program might provide guidance on acceptable methods for estimating nonpoint source contributions to overall pollutant loads. Finally, some agencies, like the U.S. Geological Survey's National Water Quality Assessment (NAWQA) program, are beginning to systematically monitor nonpoint source contributions to water quality problems in some watersheds. (NAWQA data are available online at **http://water.usgs.gov/nawqa/index.html**.)

Quantifying relative contributions of sources within the watershed allows stakeholders to assess the feasibility of various watershed-based approaches to NPDES permitting. For example, the contributions of the various sources in the watershed should be quantified to determine whether supply and demand of water quality credits are reasonably aligned so that a trading program is viable. EPA's *Water Quality Trading Assessment Handbook* (USEPA 2004) provides more detail on quantifying various source contributions to assess the feasibility of establishing a trading program in a watershed. If this task of quantifying and estimating various source contributions has not been completed, it should be considered as a potential implementation option under an NPDES watershed framework.

Understanding the relative contributions of point and nonpoint sources within the watershed also is necessary for answering a key question at this point in the analysis: *Do point sources in the watershed contribute enough of the pollutant load, relative to nonpoint sources, to warrant continuing with an NPDES watershed approach?* In other words, if the majority of the pollutant load in the watershed is contributed by nonpoint sources, most implementation options under an NPDES watershed framework may not be effective means of attaining water quality standards and goals in the watershed. An exact accounting of contributions from each individual source should not be necessary to answer this question. Rather, the question could be answered with a rough estimate of relative contributions from the different types of sources. With input from stakeholders, criteria for what constitutes a significant contribution from point sources should be developed. These criteria

IMPLEMENTATION OPTIONS BASED ON POTENTIAL ANSWERS TO QUESTION #4

- Relative contributions unknown because of insufficient data
  - Monitoring consortium development
  - Watershed management plan development
  - TMDL development and implementation support
  - Statewide rotating basin planning
- Pollutants predominantly contributed by nonpoint sources
  - State-approved watershed management plan development and implementation
  - Section 319 nonpoint source management program and watershed planning
- Point sources are significant contributors
  - NPDES permit development on a watershed basis
  - Water quality trading
  - Permit synchronization
  - Continue to Question #5—additional watershed-based approaches are possible

can depend on a variety of considerations, including the specific type of pollutant, priorities for protecting specific uses, or the resources available to the regulatory authority for addressing point sources and nonpoint sources. If only a small percentage of the total contributions of a pollutant in the watershed is from point sources, WQBELs may be considered for that pollutant using standard permitting procedures for individual point sources and federal or state nonpoint source programs (e.g., Section 319 Nonpoint Source Management Programs) may be used to address nonpoint sources.

Key References:

- State impaired waters on the section 303(d) list
- Draft or completed TMDLs
- Regional or watershed monitoring data
- EPA guidance documents on nonpoint source funding at **www.epa.gov/owow/nps/funding.html**
- Data collected and sorted in Navigator Element 2 (permits, DMRs, permit supporting documentation)
- *Technical Support Document for Water Quality-based Toxics Control* (USEPA 1991) or similar state procedures

Question #5. How are pollutant sources and stressors spatially and temporally related?

Finally, consideration should be given to defining the spatial and temporal relationships among contributing sources. An understanding of the spatial and temporal relationships among multiple point sources will foster a robust watershed analysis, allowing consideration of the widest possible range of options for watershed-based NPDES approaches. Understanding relationships among sources is especially important for implementing a successful trading program. For pollutants with watershed-wide or regional effects, contributions at one point in a watershed are not necessarily equivalent to contributions at another point in the watershed in terms of their overall impact on the watershed.

Consider the example of a lake that has experienced nuisance aquatic plant growth and dissolved oxygen sags resulting from nutrient enriched water. Total phosphorus has been identified as a pollutant of concern. Nine sources of phosphorus have been shown to contribute loads to the basin. These sources are along the river that feeds the lake. One of the sources, a publicly owned treatment works (POTW), is a permitted point source upstream of the lake, but 20 miles downstream of an irrigation return flow to the river. A farm, an agricultural nonpoint source, is the only source discharging phosphorus to the irrigation return ditch. In addition, there is an agriculture diversion that diverts 75 percent of the river flow between the farm and the POTW. Total phosphorus discharges from the farm and the POTW would not have the same relative impact on the downstream lake. First, the phosphorus is likely to be in different forms—soluble from the POTW and non-soluble from the farm. Second, the distance between the farm and the POTW and the significant agricultural diversion between the two sources mean that even phosphorus discharges from the two sources that are in the same form would not have equal impact on the lake. The regulatory authority would need to quantify the relationship between the effects of a pound of phosphorus discharged by the farm and a pound of phosphorus discharged by the POTW to determine an approach for effectively managing water quality in the lake.

It might be helpful to use equations and models that have been developed to estimate the decay rate, or attenuation, of water quality pollutants to account for spatial relationships in calculating the relative contributions of various sources in a watershed. For example:

- EPA provides information on calculating pathogen die-off rates in its *Protocol for Developing Pathogen TMDLs* (USEPA 2001).
- Various approaches to evaluating the relationships between nutrient sources and water quality responses are evaluated in EPA's *Protocol for Developing Nutrient TMDLs* (USEPA 1999b).
- *Principles of Surface Water Quality Modeling and Control* (Thomann and Mueller 1987) is a popular reference text that presents comprehensive discussions of fate and transport and modeling techniques for a variety of pollutants in different types of aquatic systems.

IMPLEMENTATION OPTIONS BASED ON POTENTIAL ANSWERS TO QUESTION #5

- Spatial and temporal relationships unknown because of insufficient data
  - » NPDES permit development on a watershed basis
  - » Monitoring consortium development
  - » TMDL development and implementation support
  - » Statewide rotating basin planning
  - » Permit synchronization
- Spatial and temporal relationships well defined
  - » NPDES permit development on a watershed basis
  - » Water quality trading
  - » Permit synchronization
  - » Statewide rotating basin planning

An example of a watershed-based permitting solution that accounts for spatial relationships is Connecticut's General Permit for Nitrogen Discharges. Connecticut issued a permit for the 79 POTWs within the Long Island Sound watershed that discharge at least 20 pounds of total nitrogen per day. The permit addresses only nitrogen discharges and supplements permits issued to each facility for the discharge of non-nitrogen pollutants. The permit covers all 79 POTWs but functions in a manner similar to individual permits in that each POTW has an individual, end-of-pipe limitation for total nitrogen. Connecticut assigned each discharge a total annual nitrogen allocation on the basis of discharge volume to reduce nitrogen loading and raise dissolved oxygen levels in western Long Island Sound. To facilitate a trading program, however, end-of-pipe nitrogen loads had to be related to one another in a way that accounted for attenuation on the basis of the location of each POTW in the watershed and its relative effect on dissolved oxygen in the Long Island Sound. Total nitrogen reductions at points close to the low dissolved oxygen zone in the Long Island Sound are considered more valuable than total nitrogen reductions from more distant sources that are naturally attenuated.

In addition to spatial variation, loadings from various sources could fluctuate daily, monthly, seasonally, or year-to-year. For example, certain beef cattle operations confine animals only for a few weeks in the spring for calving. The sediment, nutrient, and pathogen loadings for such a facility can be higher during these seasonal periods of confinement than would be expected during the remainder of the year when the cattle remain on pasture. Temporal fluctuations in pollutant contributions would also be expected from industrial facilities with variable production cycles, from all wet-weather sources, from recreational areas that experience seasonal use

fluctuations, from wastewater lagoon systems that discharge for a few days each year, from crop agriculture, and from any other source where activity is not constant over time. Likewise, the water quality effects of some pollutants might also show temporal variability. For example, biochemical oxygen demand (BOD) has a greater effect on dissolved oxygen levels during warmer months. Permits for point source BOD contributors often include seasonal effluent limitations for oxygen-depleting substances to account for this fact. These temporal fluctuations could be important in determining how loadings from different sources within the watershed will affect indicators of water quality. For example, if nutrient loadings are of concern to a downstream lake, short-term fluctuations in loadings might be relatively unimportant. But if nutrient loadings contribute to depressed dissolved oxygen concentrations in a stream segment near the source, nutrient discharges over a shorter period of time could be of greater concern.

Key References:

- Water quality models (e.g., BASINS, QUAL2K, AQUATOX, CORMIX, WASP6, HSPF) recommended in TMDL Protocol documents
- *Monitoring Guidance for Determining the Effectiveness of Nonpoint Source Controls* (USEPA 1997a)
- *Water Quality Trading Policy* (USEPA 2003a)
- *Water Quality Trading Toolkit for Permit Writers* (USEPA 2007)
- *Principles of Surface Water Quality Modeling and Control* (Thomann and Mueller 1987)
- *Protocol for Developing Sediment TMDLs* (USEPA 1999a)
- *Protocol for Developing Nutrient TMDLs* (USEPA 1999b)
- *Protocol for Developing Pathogen TMDLs* (USEPA 2001)

Navigator Element 3: Construct an NPDES Watershed Framework

Element 2 of the Navigator presented five key questions to help assess the current conditions in the watershed and identify potential watershed-based approaches for achieving water quality standards and goals. Given the unique conditions characterizing each watershed and the variety of tools available through the CWA and state laws, a wide variety of possible approaches could be identified through this analysis. For a given watershed, a permitting authority may choose to implement all or only a subset of these approaches according to the permitting authority's and other stakeholders' priorities. Element 3 of the Navigator describes a range of possible implementation options that could form an NPDES watershed framework for a specific watershed. This Element also suggests a simple method of setting priorities for applying these approaches in an overall implementation strategy.

Question #1. What are the implementation options to consider in constructing an NPDES watershed framework?

An NPDES watershed framework might encompass a variety of tools and approaches for implementing the NPDES program on the basis of the results of the watershed permitting analytical approach. Although an NPDES watershed framework should focus primarily on programs and approaches directly related to NPDES program implementation and activities, other water programs influence NPDES implementation and may also be included.

Implementation options to consider under an NPDES watershed framework include the following:

- NPDES Permit Development and Issuance on a Watershed-basis
- Water Quality Trading
- Wet-Weather Integration
- Indicator Development for Watershed-based Stormwater Management
- TMDL Development and Implementation Support
- Monitoring Consortium Development
- Permit Synchronization
- Statewide Rotating Basin Planning Approach
- State-Approved Watershed Management Plan Development and Implementation
- Section 319 Nonpoint Source Management Program and Watershed Planning
- Source Water Protection Plan Development and Implementation.

Stakeholders might identify and desire to implement only one or two of these approaches or, in some cases, stakeholders could design a comprehensive framework that incorporates a suite of these approaches. A discussion of each of these potential approaches follows.

NPDES Permit Development and Issuance on a Watershed Basis

The watershed permitting analytical approach might show that the conditions in the watershed are well understood, that there are common stressors or pollutants of concern among sources in the watershed, and that point sources have a significant impact in the watershed. In this case, the NPDES permit writer, along with point source dischargers and other watershed stakeholders, might determine that developing and issuing NPDES permits on a watershed basis is an appropriate approach for addressing point source loads of one or more pollutants. The types of permits that might be considered for a watershed will vary depending on the specific conditions and types of dischargers within a watershed. These permit types include coordinated individual permits, integrated municipal permits, and multisource watershed-based permits. Each of these permit types is discussed in greater detail below.

Watershed characteristics leading to consideration of this option: common stressors or sources of pollutants of concern; critical environmental conditions are defined; point and nonpoint source contributions are understood, at least for the pollutant(s) of concern; point sources contribute a notable portion of the pollutant load or there are significant differences among the loadings contributed by various point sources, or there are a number of point sources with similar types of discharges.

Coordinated Individual Permits. This permitting approach is the closest to traditional NPDES permitting in that each discharger receives an individual permit. The difference is that WQBELs and other conditions of coordinated individual permits are developed using a holistic analysis of the watershed conditions rather than being established to ensure attainment of water quality standards on a permit-by-permit basis. Collectively, the individual permits are designed to meet watershed-specific goals (e.g., comprehensive watershed monitoring, nutrient reduction,

management of biosolids or manure). The permitting authority may issue permits to single dischargers or modify existing single discharger permits. To strengthen the coordination among individual permits, the permitting authority could consider synchronizing their expiration and reissuance or effective dates (see discussion on "Permit Synchronization" below).

Integrated Municipal NPDES Permit Coverage. This approach may bundle a number of point source permit requirements for a municipality (POTWs, combined sewer overflows (CSOs), biosolids, pretreatment, and stormwater, including municipally owned industrial activities such as public works and utility yards) into a single permit. In cases where the treatment plants, stormwater, CSOs (if applicable), and other municipally controlled point source activities are all under single ownership, the permitting authority could consider one permit that covers and integrates all NPDES requirements. Ideally, these activities would take place within the boundaries of the same watershed. This approach may reduce the administrative burden for both the permittee and permitting authority (e.g., one application, one public notice and public hearing, one compliance report) and allow the permitting authority to develop permit conditions (limitations and monitoring requirements) that specifically address existing watershed goals and watershed management plans. The Clean Water Services integrated municipal NPDES permit in the Tualatin Watershed in Oregon is an example of this type of permit. For more detailed information on related approaches, see the discussion under "Wet-Weather Integration" in this section.

Multisource Watershed-based Permit. This type of permitting approach is also a single permit and would cover multiple sources included in the same watershed, watershed plan, or TMDL. It would allow several point sources in a watershed to apply for and obtain permit coverage under the same permit. This type of permit might be appropriate in situations where a watershed plan or TMDL identifies the need to address a specific pollutant. A watershed plan or TMDL implementation plan might include agreed-upon controls necessary to achieve watershed goals. Stakeholders could then identify point sources that would be logical to group under a single permit. Some permitting authorities have chosen to issue a single watershed-based permit that supplements or overlays the existing individual permits for the covered facilities. This approach allows the permitting authority to focus effluent limitations, monitoring requirements, trading provisions, and other special permit conditions that are developed on a watershed basis in a single permit and clearly links the permitted facilities in a way that simply incorporating watershed-based permit conditions into individual permits does not accomplish. The permit would identify all point sources that have agreed to the controls and the individual specific requirements for each point source. An example is a permit that includes control requirements for nutrients issued to all POTWs in the watershed and requires specific nutrient reductions that reflect agreed-upon goals and, possibly, trades. This permit might be issued in addition to the existing individual permits and, if so, would include limitations or controls to address only the watershed-specific common pollutant or pollutants. Other pollutants would continue to be addressed through each facility's individual permit. This approach is similar to the approach used to permit wastewater treatment plant discharges in North Carolina contributing nutrients to the Neuse River watershed or to Connecticut's Long Island Sound nitrogen permit.

Another type of multisource watershed-based permit might address all pollutants of concern in the watershed for similar types of discharges. For example, a single permit might implement a comprehensive watershed plan with each facility regulated as a co-permittee. Assuming the watershed plan included procedures for addressing a number of stressors and identified specific

point sources, the permit might include controls for the point sources and all requirements that would otherwise be found in individual permits for the point sources.

In addition to using individual permits, NPDES permit writers might also consider using general permits as multisource watershed-based permits. These permits would be similar to many existing general permits, except that the watershed boundary (in addition to type of discharge) would be a criterion defining eligibility for coverage or the applicability of certain conditions in the permit. The permit might include requirements that reflect watershed-specific goals (e.g., comprehensive watershed monitoring, nutrient reduction, management of biosolids or manure). Point sources would request coverage through a Notice of Intent (NOI) once the permit is issued rather than through the application process used for individual permits. A general permitting approach could be further refined on the basis of the category or source of discharger and would allow coverage of common sources (e.g., all POTWs, CAFOs, or stormwater) in the watershed. The limitations and requirements within a category or subcategory of sources would largely be the same, but specific limitations and requirements might differ among categories or subcategories.

Multisource watershed-based permits may facilitate water quality trading and provide a vehicle for cooperative efforts (such as watershed-wide monitoring) necessary for meeting watershed goals. This approach also focuses public participation on a single permit.

Chapter 2 of this Technical Guidance provides more detail on writing multisource watershed-based permits.

Water Quality Trading

EPA's *Water Quality Trading Policy* (USEPA 2003a) encourages using voluntary trading programs to achieve water quality improvements at reduced costs on a watershed basis. The policy discusses water quality trading as a market-based approach that increases flexibility to meet water quality goals while increasing efficiencies. The policy recognizes the connections between water quality trading and the NPDES Program, as well as other CWA programs and requirements. According to the policy, "Provisions for water quality trading should be aligned with and incorporated into core water quality programs … by incorporating provisions for trading into TMDLs and NPDES permits" (USEPA 2003a).

Watershed characteristics leading to consideration of this option: common stressors or sources of pollutants of concern; critical environmental conditions are defined; point and nonpoint source contributions are understood; disparities exist between sources in ease or cost of reducing loads, providing the potential for cost efficiencies.

The watershed permitting analytical approach described in Element 2 might reveal that the relationship among point sources or between point and nonpoint source contributions in a watershed is conducive to trading. Watersheds that have one or more TMDLs or an equivalent pollutant budget with allocations made to point sources and, if applicable, nonpoint sources might consider water quality trading to achieve water quality standards and goals. Water quality trading will allow point sources to identify opportunities to purchase lower cost, environmentally equivalent or superior pollutant reductions from one or more trading partners. Water quality trading might be considered on a watershed-wide scale or on a smaller scale through site-specific offsets or intraplant trades. The appropriate type of water quality trading activities might not be

immediately apparent from the results of the NPDES watershed analytical approach, so stakeholders may conduct additional analysis to determine the feasibility of water quality trading at different scales. EPA's *Water Quality Trading Assessment Handbook* (USEPA 2004) provides a process for assessing the likely viability of watershed-scale trading in the context of a TMDL.

As water quality trading activities increase, EPA expects that there will be an increase in the number of NPDES permits that incorporate or allow for water quality trades. A trading program should be reflected in the NPDES permits for facilities involved in the program. EPA identifies several flexible approaches for incorporating provisions for trading into NPDES permits, including the "use of watershed general permits, where appropriate, to establish pollutant-specific limitations for a group of sources in the same or similar categories to achieve net pollutant reductions or water quality goals" (USEPA 2003a).

To assist NPDES permitting authorities in developing and implementing water quality trades, EPA has developed a toolkit for NPDES permitting authorities and other interested stakeholders entitled *Water Quality Trading Toolkit for Permit Writers* (USEPA 2007). Through the toolkit, users can obtain technical information on how to develop an NPDES permit that contains effective limitations and conditions for implementing water quality trades.

Wet-Weather Integration

Watershed characteristics leading to consideration of this option: identified critical conditions occur during wet weather; predominantly urban or urbanizing watershed, or watershed with multiple wet-weather problems competing for the same resources.

Watersheds characterized by municipalities with wet-weather discharges (e.g., stormwater, CSOs, sanitary sewer overflows, peak excess flows at POTWs, nonpoint sources) may identify wet-weather integration as a potential programmatic outcome of an NPDES watershed analysis. Municipal wet-weather discharges are currently addressed through various EPA and state regulatory and policy frameworks that reflect different statutory and policy mandates. Wet-weather integration is an approach to addressing wet-weather discharges in a holistic manner to provide for greater efficiency, more comprehensive planning, less redundancy among permitting requirements, and, most importantly, better water quality outcomes.

Municipal wet-weather discharges share a number of common characteristics. Besides being driven by rainfall and snowmelt events, they discharge similar types of pollutants: pathogens, floatable material, nutrients, sediment and suspended solids, metals, oxygen-demanding substances, as well as other conventional and toxic pollutants. In addition, they may be hydraulically connected such that controlling one source has impacts elsewhere in the system. Because of this connectivity, focusing on one programmatic area, such as CSO control, may lead to or ignore problems related to discharges from storm sewers. For example, sewer separation as a CSO control often increases the amount of flow and pollutant load in separate storm sewers unless management practices are used that reduce the overall flow to both the combined and separate systems.

Integrating individual municipal wet-weather programs under a single or coordinated program is the centerpiece of this approach. It is focused on urban areas and an urban footprint that encompasses permitted wastewater treatment facilities and sewer systems. Integrated evaluation and priority setting for water quality issues and coordination among different water quality

programs should not only expedite the resolution of water quality impairments, but should significantly enhance the protection of unimpaired resources. EPA recommends that all relevant information on wet-weather programs be shared and stored in a single system and a process put in place that provides for a single decision-making nexus for all programs. Wet-weather integration might involve both NPDES permit programs and other programs and includes:

- Unifying individual NPDES permits and programs, and consolidating and streamlining their overlapping requirements
- Coordinating with water quality standards programs and enforcement and compliance programs across an urban area (municipal footprint)
- Coordinating with the development and implementation of TMDLs
- Considering the water quality goals and objectives of existing watershed management plans and the resources needed to address pollutant loads and setting priorities
- Planning and developing solutions across all municipal wet-weather programs to achieve the best environmental benefits at a reasonable or lower cost.

Wet-weather integration has the potential not only to produce a single local program that consolidates individual municipal wet-weather programs, but also to consolidate the separate NPDES permits into one integrated wet-weather permit similar to the integrated municipal permit discussed above under "NPDES Permit Development and Issuance on a Watershed Basis." An integrated wet-weather permit provides permitting authorities and permittees the opportunity to manage all the consequences of rainfall within the urban area, considering the unique characteristics of a municipality's infrastructure.

Wet-weather management focuses on both quantity and quality of stormwater. In fact, managing quantity is an important facet of this approach. In all wet-weather programs, the quantity of water discharging via collection systems (including nonpoint source runoff) has a profound effect on receiving water quality. Therefore, managing wet-weather with a focus on reducing stormwater quantity in sewer systems will have a ripple effect on all wet-weather discharges. A guiding principle for the integration of wet-weather permitting programs is reducing the volume of water entering sewer systems (sanitary, combined, and storm sewers). Achieving net reductions in volume of water that enters sewer systems can provide many benefits including the following:

- Better management of separate, combined and storm sewer systems and permit programs
- Preservation of sewer system conveyance capacity
- Reduction of stress on existing infrastructure
- Reduction in CSOs and sanitary sewer overflows (SSOs)
- Reduction in stormwater volume and pollutant load
- Relief from localized or downstream flooding
- Reduction in erosion, scour and other hydrologic and hydraulic impairments that accompany stormwater discharges
- Less impairment attributable to urban runoff and sewer overflows
- Better effluent quality on average from POTWs due to lower loads during wet-weather
- In many cases, improved ground water recharge.

Municipalities undertaking wet-weather integration and focusing on reducing the amount of rainfall entering the sewer systems might find it necessary to shift from traditional wet-weather management approaches to more innovative approaches. Conventional approaches to managing stormwater focus on effectively and efficiently conveying and either managing or treating stormwater using end-of-pipe technologies. Innovative approaches to stormwater management focus on reducing inflow and infiltration to sewer systems through design techniques that promote management of rainfall at the source through natural infiltration (e.g., low impact development (LID) and smart growth), proper sewer system maintenance and operation, and water conservation techniques. Addressing the quantity of stormwater entering sewer systems might involve a combination of management practices, similar to the combination of practices required under the NPDES Stormwater Program (e.g., Phase II municipal separate storm sewer system (MS4) six minimum control measures) and the CSO Policy (e.g., nine minimum controls and capacity, management, operation, and maintenance activities).

A discussion of each type of innovative wet-weather management approach focused on reduced inflow and infiltration to the sewer system is presented below.

Promoting Natural Infiltration: Low Impact Development/Green Infrastructure and Smart Growth. Innovative techniques that promote natural infiltration are increasingly considered as alternatives to conventional approaches to managing runoff. Techniques under the umbrella of LID/green infrastructure focus on using small, cost-effective landscape features, such as rain gardens, permeable pavement, and green roofs, that allow a developed site to maintain its predevelopment hydrology by retaining rainfall on site. EPA has highlighted opportunities to increase the development and use of these *green infrastructure* techniques in water program implementation in a memorandum from Assistant Administrator for Water, Benjamin H. Grumbles, to the EPA Regional Administrators. The memorandum notes that, "green infrastructure can be both a cost effective and an environmentally preferable approach to reduce stormwater and other excess flows entering combined or separate sewer systems in combination with, or in lieu of, centralized hard infrastructure solutions" (Grumbles 2007).

Another approach that promotes natural infiltration is *smart growth*, a type of growth management strategy that emphasizes the preservation of open space and redevelopment of urban areas as opposed to new development in outlying areas. Preserving open space and undertaking redevelopment promote natural infiltration by limiting the spread of impervious surfaces as well as promoting the preservation of an area's natural hydrologic function. For more information about smart growth and LID, visit EPA's web pages at **http://www.epa.gov/smartgrowth** and **http://www.epa.gov/nps/lid**, respectively. Resources on LID and smart growth are available from the Low Impact Development Center at **www.lowimpactdevelopment.org** and Smart Growth Online at **www.smartgrowth.org**.

Maintaining and Operating Sewer Systems to Reduce Inflow. Another strategy for wet-weather management is to improve maintenance and operation of sewer systems as a means of reducing inflow. The concept of developing and implementing operation and maintenance (O&M) programs for separate and combined sewer systems to reduce inflow and infiltration (I/I) is not new. In fact, proper operation and regular maintenance programs for the sewer system is the first of the Nine Minimum Controls under EPA's *Combined Sewer Overflow Control Policy* (USEPA 1994b). Focusing O&M programs on inflow and infiltration reduction is a strategy for managing wet weather. Similar to the concept of promoting natural infiltration, developing and

implementing O&M programs to reduce I/I is a form of source control that will limit the volume of water entering the system and allow the system to operate more efficiently and effectively. O&M is one of many management practices used to address CSOs and SSOs. The concept of wet-weather integration could also use a combination of management practices similar to those required under the CSO Nine Minimum Controls or SSO Capacity, Management, Operation and Maintenance activities.

Given the age and condition of infrastructure across the country, effective O&M programs are only part of the solution to reducing I/I. In a growing number of communities, aging sewer systems are in need of rehabilitation and replacement to effectively control I/I. The *Clean Watersheds Needs Survey 2000 Report to Congress* (USEPA 2003b) presents the financial needs for publicly owned municipal wastewater collection and treatment, as well as CSO correction, municipal stormwater management, and nonpoint source control. According to this report, facilities participating in the survey need approximately $8.2 billion for correcting I/I to the sewer system and $16.8 billion for sewer rehabilitation or replacement (USEPA 2003b).

Practicing Water Conservation. Water conservation is an important tool for reducing the amount of water entering sewer systems. WaterSense, EPA's voluntary partnership program, promotes water conservation in agricultural, residential, municipal, industrial, commercial, and landscaping uses. In addition, EPA has issued guidelines for public water systems in states that require development of water conservation plans as a condition for receiving a loan under the Drinking Water State Revolving Fund. Economics can play an important role in conservation; thus, EPA has incorporated the concept of full-cost pricing as a pillar of action in the Agency's sustainable water infrastructure initiative to encourage conservation and maintain infrastructure. Full-cost pricing factors in all past and future operation, maintenance, and capital costs and uses a rate structure that promotes conservation, such as time-of-day pricing or seasonal rates. EPA provides a wide range of resources on water conservation and full-cost pricing through the Agency's Water Use Efficiency Program Web site at **http://www.epa.gov/owm/water-efficiency.html**. For more information about EPA's sustainable water infrastructure initiative and the full-cost pricing pillar, visit **http://www.epa.gov/waterinfrastructure/**.

Indicator Development for Watershed-based Stormwater Management

Watershed characteristics leading to consideration of this option: multiple sources of pollutant loads; critical conditions identified and occur during wet weather.

Excessive stormwater runoff is often the cause for aquatic life impairment because of the relationship among stormwater runoff volume, pollutant loadings, and habitat degradation. The connections between these stressors are very complex, posing a unique challenge for effectively managing stormwater and tracking progress toward water quality standards attainment. As a result, EPA and some states are considering the development of stormwater/hydrologic targets, or indicators, for use in developing and implementing stormwater TMDLs. Indicators might include a percent reduction in annual surface runoff volume or a percent reduction in peak runoff rates for a specific design storm. Using stormwater/hydrologic indicators is based on the premise that the hydrologic condition of a watershed where streams have aquatic life impairments related to stormwater is a surrogate for the pollutant and non-pollutant stressors contributing to those impairments.

The state of Vermont has developed a site-specific approach for calculating stormwater/hydrologic indicators for use as surrogate TMDL targets. The approach provides a tailored estimation of target stormwater runoff volumes and stream characteristics using reference watersheds to define the hydrologic conditions that represent the stream channel conditions and pollutant loadings necessary to meet aquatic life criteria. In addition to providing a tailored target for TMDLs, this site-specific approach will also generate information to support the development of stormwater permit limitations on a watershed basis. The approach developed by Vermont to generate watershed-based stormwater/hydrologic TMDL targets involves the following activities:

- Watershed delineation of both impaired and unimpaired streams
- Calculation of stormwater runoff volume from watershed and climate data
- Generation and comparison of flow duration curves for both impaired and unimpaired streams (using fairly simple models, such as the Generalized Watershed Loading Functions)
- Calculation of percent stormwater runoff volume reductions needed to attain water quality standards (USEPA 2005b).

The recommended steps to developing and implementing a stormwater TMDL using site-specific stormwater/hydrologic indicators are:

1. Express the TMDL target using a surrogate measurement of stormwater impairments, such as percent impervious cover or stormwater runoff volume
2. Calculate reductions in loadings for use as a stormwater WLA for a category of discharges rather than individual end-of-pipe loading requirements
3. Implement the TMDL by outlining state and local approaches to
   a. applying BMPs strategically using a phased program addressing smaller, more frequent storms in the most sensitive areas first
   b. conducting regular ambient monitoring to measure response to BMP implementation
   c. comparing monitoring results to water quality standards.

Innovative TMDLs that use stormwater indicators provide information for a watershed-based approach to NPDES stormwater permitting. Calculating percent impervious cover or runoff volume reduction as a single categorical stormwater loading promotes implementation using an adaptive, watershed-based approach. Consequently, a watershed-based stormwater permit could be an effective mechanism for implementing this phased program for attaining water quality standards. The permit could require development and implementation of the phased BMP program and periodic plan updates. The monitoring program required by the permit might include stormwater effluent monitoring, where appropriate, but also could focus on cooperative ambient monitoring (e.g., a monitoring consortium) by the regulated community. The ambient monitoring could include biological monitoring, with follow-up stressor identification analysis to verify the appropriateness of selected BMPs.

TMDL Development and Implementation Support

Pollutants with watershed-wide or regional effects might impair one or more waterbodies or segments of waterbodies within the candidate watershed. A state's list of impaired waterbodies developed pursuant to CWA section 303(d) identifies impaired waterbodies or segments of water

bodies and the pollutants causing impairment. If a TMDL for the impaired water has not been developed or is not already in process, the state might consider development of the TMDL as the core of its watershed approach. In fact, a permitting authority might determine that TMDL development is the highest priority implementation effort within the watershed and that other potential watershed-based permitting approaches should follow completion of scheduled TMDLs. EPA has produced a series of technical and policy guidance documents addressing TMDL development. Additional information on TMDLs and these guidance documents can be found at **http://www.epa.gov/owow/tmdl/**.

Watershed characteristics leading to consideration of this option: impaired segment(s) in watershed; pollutants with watershed-wide or regional effects; point sources contributing pollutants of concern.

On the other hand, in cases where a TMDL has been developed or is in process, the permitting authority should consider possible watershed-based permitting approaches in addition to the use of traditional individual permits to implement the TMDL. Examples of such approaches include trading programs, multisource watershed-based permits, and watershed-based conditions in permits that address pollutants not covered by a TMDL.

Even when TMDL development is the highest priority and other watershed-based approaches are delayed, the NPDES program can adopt an immediate watershed focus by including, as appropriate, conditions in permits that will contribute to TMDL development (e.g., ambient monitoring requirements). EPA has developed guidance on establishing monitoring consortiums within a watershed (see subsection below). These consortiums could be able to provide a unique, watershed-based method of implementing monitoring requirements to support TMDL development.

Monitoring Consortium Development

Identifying and implementing effective watershed management strategies requires quality, watershed-level, ambient monitoring data. Application of the watershed analytical approach might highlight gaps in existing ambient monitoring data for a watershed and point to the need for additional data collection. Watershed-level ambient data, if they exist, are most likely collected by the state as part of its overall water quality management responsibilities for use in activities such as TMDL development and permitting. Where there are data gaps, developing and implementing watershed-level monitoring programs might be the highest priority activity under an NPDES watershed framework.

Watershed characteristics leading to consideration of this option: data gaps relative to defining critical environmental conditions, point and nonpoint source contributions, temporal, and spatial relationships; need for long-term coordinated evaluation of management measures to determine implementation effectiveness.

More importantly, even once a framework for implementing water programs is in place, long-term monitoring to evaluate the effectiveness of those programs is pivotal. Without good data on which to base ongoing management decisions, even the best watershed-based program cannot realize its full potential.

To ensure a watershed-based approach to collecting new ambient monitoring data, stakeholders should consider a cooperative data collection effort by sources within the watershed. A group

using a coordinated, cooperative approach to collecting water quality data is referred to as a monitoring consortium. EPA has developed guidance on establishing monitoring consortiums within watersheds titled *Monitoring Consortiums: A Cost-Effective Means to Enhancing Watershed Data Collection and Analysis* (USEPA 1997b).

A consortium offers a watershed-based method of implementing many monitoring needs (e.g., TMDL development, water quality trading, watershed-bounded multi-source permit development). In addition, monitoring consortiums assist participants in pooling funds and sharing expertise while collecting data to identify trends, evaluate attainment of water quality standards, develop management strategies, and improve data consistency and comprehensiveness.

Permit Synchronization

Another implementation option to consider under an NPDES watershed framework is permit synchronization. This implementation option focuses on coordinating expiration and reissuance of existing NPDES permits within a specified watershed. This option might be part of the rotating basin approach described below. The schedule for permit reissuance for a watershed is based on a predetermined timetable, often following a rotating basin approach. The state of Michigan uses this approach. According to the Michigan Department of Environmental Quality, permit synchronization has several benefits including coordination of NPDES support activities such as biological and water quality surveys, industrial pretreatment inspections, and compliance inspections that provide up-to-date information at the time of permit issuance. An important benefit of this approach is that watershed-based needs, such as monitoring requirements or WLAs, are reflected equitably in all permits even within the standard individual permit approach, because all permits in a watershed are being considered simultaneously.

Watershed characteristics leading to consideration of this option: some overlap in pollutants discharged by sources within the watershed that present the opportunity to achieve efficiencies by simultaneously analyzing watershed data for the same pollutant(s).

While permit synchronization is driven by watershed data analysis, this option is also related to program administration. Therefore, in addition to the five questions posed under Element 2 of the Navigator, the feasibility of permit synchronization as an implementation option might depend on answers to the following questions:

1. What types of permits (e.g., general or individual) currently are issued to dischargers in the watershed?
2. What is the current timing of permits in the watershed?
3. Is it necessary to delay issuance of some permits to synchronize permit issuance on a watershed basis? Are all stakeholders in support of the synchronization concept and the process to achieve synchronization?

Several states are using permit synchronization (e.g., Michigan, Maryland, West Virginia). Pennsylvania, on the other hand, has tried and discontinued permit synchronization. To obtain more information on permit synchronization lessons learned, contact a state's Permitting for Environmental Results NPDES Program Integrity point of contact found on EPA's Web site at **www.epa.gov/npdes/pubs/per_contacts.pdf**.

Statewide Rotating Basin Planning Approach

Watershed characteristics leading to consideration of this option: data gaps relative to defining critical environmental conditions, point and nonpoint source contributions, temporal, and spatial relationships; need for long-term coordinated evaluation of management measures to determine implementation effectiveness.

Watersheds in which a watershed permitting analytical approach shows a lack of adequate watershed data might also benefit from a statewide rotating basin planning approach. This implementation option entails delineating state watershed boundaries and grouping the watersheds into basin management units, usually by the state water pollution control agency. After delineating and grouping the basin management units, states then implement a watershed management process according to a statewide rotating schedule. The process, which varies from state to state, usually comprises five activities: (1) data collection and monitoring, (2) assessment, (3) strategy development, (4) basin plan review, and (5) implementation. This implementation option has the potential to generate the data necessary to support future activities under an NPDES watershed framework, such as the development and issuance of NPDES permits on a watershed basis. A number of states use a rotating basin planning approach including Delaware, Florida, Georgia, Massachusetts, Michigan, North Carolina, Ohio, Tennessee, Texas, Utah, and Washington. More information on developing and implementing a statewide rotating basin planning approach is available from EPA, including *Watershed Protection: A Statewide Approach* (USEPA 1995) and *A Review of Statewide Watershed Management Approaches* (USEPA 2002b).

State-Approved Watershed Management Plan Development and Implementation

Watershed characteristics leading to consideration of this option: multiple sources of pollutants or causes of environmental degradation; point and nonpoint contributions understood; local interest in protecting high quality watersheds.

Watershed management planning is an iterative process for documenting watershed goals; known, suspected, and potential pollutant sources and loadings; potential management strategies; and evaluation tools. Many local watershed organizations develop watershed management plans to provide a roadmap for their site-specific water restoration and protection activities. Depending on the level of technical detail, watershed management plans can often serve as the basis for grant-funded projects (see "Section 319 Nonpoint Source Management Program" below).

Elements 1 and 2 of the Navigator might reveal that a watershed could benefit from a formal process or approach to guide future management activities, which may or may not include developing and issuing NPDES permits on a watershed basis. The need might be evident because of the variety of watershed data collected by multiple, uncoordinated stakeholders and projects (i.e., duplicative efforts or large gaps in watershed data), or because of a well-defined set of problems that require formal goals and actions. These scenarios point to a watershed that might benefit from the development and implementation of a watershed management plan. Through a watershed management planning process, one that either follows a state recommended approach or is less formal in nature, watershed stakeholders have the opportunity to formulate goals, identify data needs, and evaluate potential pollutant control strategies. The information collected, organized, and analyzed to support the development of a watershed management plan can serve as the foundation for future implementation options under an NPDES watershed framework. EPA's web-based Watershed Academy presents a module on watershed management planning at

www.epa.gov/watertrain/planning/index.htm. EPA has developed additional resources to aid watershed management planning. The *Handbook for Developing Watershed Plans to Restore and Protect Our Waters* (USEPA 2005a) is a comprehensive document that addresses each phase of the watershed management planning process. A Watershed Plan Builder Tool, an interactive, web-based tool, is also available. This tool, available at **http://iaspub.epa.gov/watershedplan/watershedPlanning.do?pageId=48&navId=35**, complements the handbook and is designed to help local watershed organizations develop integrated watershed plans to meet state and EPA requirements and promote water quality improvement. The tool walks practitioners through the key planning steps and produces a customized watershed plan that is tailored for a particular watershed and populated with relevant links to EPA, other federal agencies, and state water programs.

Section 319 Nonpoint Source Management Program and Watershed Planning

Watershed characteristics leading to consideration of this option: critical environmental conditions defined; point and nonpoint source contributions understood; contributions dominated by nonpoint sources.

No matter how stringent permit requirements are for point sources, conditions in some watersheds simply will not improve without reductions in nonpoint source pollutant contributions. Watersheds that have significant nonpoint source pollutant contributions, identified under Question #4 of Element 2, might benefit from incentives that promote voluntary nonpoint source participation. Section 319 of the CWA provides grant funding authority to solve water quality problems in watersheds affected by nonpoint source pollution, especially those that are impaired. Funding provided through the section 319 grant program (and other associated funding programs such as Farm Bill programs for agricultural nonpoint sources) can play a significant role in achieving necessary nonpoint source pollutant reductions.

EPA recently published section 319 grant guidelines that contain nine elements for developing effective watershed plans for threatened and impaired waters. The guidelines include a focus on estimating pollutant load reductions that are (1) necessary to achieve watershed goals and (2) associated with selected nonpoint source pollution control management measures. For more information about the section 319 guidelines, see EPA's *Supplemental Guidelines for the Award of Section 319 Nonpoint Source Grants to States and Territories in FY 2003* (USEPA 2002c). Although the focus of the nine elements is on nonpoint source pollution control, the information compiled and analyzed to meet the nine elements can facilitate future implementation options under an NPDES watershed framework, such as water quality trading and development of multisource watershed-based permits. Development of a watershed plan that meets the section 319 guidelines might also provide a mechanism for obtaining grant funding necessary to address nonpoint source pollution control, providing a much needed incentive for nonpoint source participation. EPA's *Draft Handbook for Developing Watershed Plans to Restore and Protect Our Waters* (USEPA 2005a) provides a step-by-step approach for developing a watershed plan that addresses each of the nine elements.

Source Water Protection Plan Development and Implementation

The watershed data inventory under Element 1 would reveal whether a watershed contains surface water intakes or ground water wells that supply public drinking water. If one or both types of drinking water supplies are present within the watershed boundaries, developing and

Watershed characteristics leading to consideration of this option: watershed contains source of public drinking water.

implementing source water protection plans are significant implementation options under an NPDES watershed framework. The 1996 Safe Drinking Water Act Amendments required states to develop and implement Source Water Assessment Programs that establish a process for identifying potential sources of contamination to public drinking water supplies. The assessment process was to be completed as of 2003, although some states required additional time to complete the assessments. The assessment process varied from state to state, but included the following basic activities:

- Delineating source water protection areas (also referred to as protection zones)
- Conducting contaminant source inventories
- Determining the susceptibility of the public water supply to contamination from the inventoried sources
- Sharing the assessment information with the public

Operators of public water systems and other stakeholders involved in source water protection efforts can use the assessment information to develop and implement source water protection strategies. Strategies can range from creating buffer zones using conservation easements to collecting household hazardous waste. In the context of an NPDES watershed framework, this potential implementation option could be used in a number of ways. The information collected for purposes of a source water assessment could aid in the watershed permitting analytical approach by contributing to the watershed data inventory. In terms of source water protection activities, NPDES permitting authorities might consider the proximity of point sources to surface water intake structures when developing permit limitations. For example, to decrease risk, permit writers might generate more stringent permit limitations for the point sources in the source water protection zone closest to the surface water intake structures than for those in the protection zone farthest from the intake structures. Information on source water protection is available on EPA's Web site at **http://cfpub.epa.gov/safewater/sourcewater/**.

Question #2. How should priorities for implementing the components of an NPDES watershed framework be set?

A wide range of approaches might be available under an NPDES watershed framework to address a pollutant, stressor, or water quality concern. In some watersheds, one particular watershed-based tool might clearly be the most effective in achieving watershed goals and gaining water quality improvements. Most watersheds, however, are likely to require a suite of tools to address pollutant loadings or stressors and make strides towards water quality improvements. Below is an example of an approach to setting priorities for implementation options under an NPDES watershed framework. The example assumes that the permitting authority and other stakeholders have identified the following implementation options for this specific NPDES watershed framework:

- Watershed-based multisource permit development
- Water quality trading
- Wet-weather integration
- Indicator development and tracking for watershed-based stormwater management

- TMDL development and implementation support
- Monitoring consortium development (including additional watershed and point source data collection)

The first step in the suggested approach is to determine whether and how to group implementation options for priority setting. Three initial groupings to consider in this example are (1) watershed analysis, (2) pollutant source analysis, and (3) permitting. These groupings represent three major activities that could be undertaken in implementing an NPDES watershed approach that focuses on watershed-based permitting as the primary implementation option. Grouping implementation options in this manner allows assessment of the implementation options in a process-oriented manner. Potential implementation options can also be grouped under other categories, such as TMDL development and implementation or data collection. In some cases, there might not be any obvious groupings, so it will make sense to assess each potential implementation option individually. For the sake of this example, the potential implementation options listed above have been organized in this process-oriented manner.

Implementation Option Grouping Example

Watershed Analysis

- Additional watershed data collection
- Monitoring consortium development
- TMDL development support
- Indicator development and tracking for watershed-based stormwater management

Pollutant Source Analysis

- Additional source data collection
- Monitoring consortium development
- TMDL development support

Permitting

- TMDL implementation support
- Water quality trading
- Wet-weather integration
- Watershed-based multisource permit

Once potential implementation options are listed and grouped, the permitting authority, with input from other stakeholders as appropriate, should consider establishing criteria for setting priorities and determining the manner in which the criteria will be used to evaluate potential options or groups of options. Criteria could consider factors such as environmental impact, availability of resources, and current planning priorities. It is at this point in developing an NPDES watershed framework that the permitting authority and other stakeholders might need to look beyond technical feasibility and environmental impact to include administrative criteria (e.g., availability of funding) to set priorities among the possible implementation options.

One screening level method for priority setting is to develop a scoring process for all potential implementation options. For example, a scoring scale from one to three for a series of criteria could be used to evaluate each implementation option on how it compares to each criterion. The criteria can be weighted, with those most important to stakeholders receiving a higher weighting factor than others. Implementation options with the highest weighted total scores would be initially identified as potentially higher priority approaches. Such a procedure does not provide mathematical precision in ranking potential implementation options. It simply helps stakeholders get a general sense of which approach seems to best fit the group's multiple and, sometimes, competing priorities. The group could use the results of such an analysis to further refine its selection of the highest priority projects or approaches.

Exhibit 1-5 provides an example of how such an analysis might work in ranking six hypothetical watershed permitting projects or approaches. The scoring criteria, their definitions, and scores

are illustrative only. EPA encourages stakeholders to work together to establish an agreeable set of criteria and a system for applying them to potential approaches.

Exhibit 1-5. Priority setting to construct an NPDES watershed framework

Project or Approach	Sequence in standards to permits process	Environmental consequences	Staffing and technical expertise	Cost and available funding	Stakeholder priority and interest	Consistency with strategic plan	Total	Weighted total
	*1.5**	*3.0*	*2.0*	*3.0*	*1.5*	*0.5*		
1	1	2	2	2	1	1	9	**19.5**
2	1	1	3	1	2	2	10	**17.5**
3	3	2	2	3	3	2	15	**29**
4	2	3	1	1	1	3	11	**20**
5	2	1	1	1	1	1	9	**13**
6	2	1	2	1	2	1	9	**16.5**

*Note: Weighting factors in *italics*

Example Scoring Criteria Definitions: The scores above are based on the example scoring criteria defined below. These criteria were selected and weighted by watershed stakeholders. Each potential project or approach that could be part of an NPDES watershed framework is evaluated against each criterion using the scoring definitions below and is assigned a score of 3, 2, or 1 accordingly.

Sequence in Standards to Permits Process:

3 = On the basis of the current cycle of standards to permits activities in the watershed (e.g., data collection and monitoring, assessment, standards development or modification, permitting), the implementation option represents the next logical step with other potential projects dependent on the results of this project.

2 = On the basis of the current cycle of standards to permits activities in the watershed, the implementation option is somewhat out of sequence, but could still be completed and likely would yield benefits such as informing decision-making in other critical elements of the cycle.

1 = On the basis of the current cycle of standards to permits activities in the watershed, the implementation option is completely out of sequence; key information to complete the project is missing or other projects must be completed first.

Environmental Consequences:

3 = The implementation option is highly likely to yield tangible environmental benefits that might not be realized using a more traditional approach to the permitting process.

2 = The implementation option will potentially yield environmental benefits over a more traditional approach to the permitting process, but those benefits could be difficult to quantify or define.

1 = The ability of the implementation option to yield environmental benefits is questionable.

Staffing and Technical Expertise:

3 = Staff are available for the implementation option and have the specific expertise needed to complete it.

2 = Either staff time or expertise are not available to fully implement the implementation option; additional staff training or some shifting of staff time to the project would be necessary.

1 = Neither staff time or expertise are available to fully implement the implementation option; implementation would require major shifts in staffing priorities.

Cost and Available Funding:

3 = Costs for the implementation option have been accurately determined, and the current budget provides funding to cover the cost.

2 = Costs for the implementation option can be or have been accurately determined, and some budget revisions might be necessary to fund the project.

1 = Either the cost for the implementation option is undetermined, or it cannot be funded under the current budget.

Stakeholder Priorities and Interest:

3 = Key stakeholders have expressed a specific interest in this implementation option and will provide resources and expertise to assist with its completion.

2 = Key stakeholders have expressed a specific interest in this implementation option but may not have resources or expertise to assist with its completion.

1 = Key stakeholders have expressed little interest in the implementation option or have responded negatively to the implementation option.

Consistency with Strategic Plan:

3 = The implementation option would fulfill specific goals in the organization's strategic plan.

2 = The implementation option generally fits within the framework of the organization's strategic plan.

1 = The implementation option is unrelated to the goals and framework of the organization's strategic plan.

Section Four: How is Performance Measured Under an NPDES Watershed Approach?

Measuring success under an NPDES watershed approach is potentially challenging because it encompasses a wide range of existing programs with their own specific set of metrics. As a result, performance of an NPDES watershed approach can involve drawing upon the existing measures of success related to each of the implementation options or developing a specific set of new performance measures. Each program will play an important role in meeting *environmental* performance goals such as progress toward attaining water quality criteria; moving waters from impaired or threatened status to full attainment of designated uses and not threatened; or improvement of waters in relation to biological indicators. EPA, states, tribes, and territories might already have established specific measures of environmental performance and environmental performance goals and these may be appropriate environmental performance measures for an NPDES watershed approach. Exhibit 1-6 presents examples of outcome-based environmental performance measures based on EPA's *National Water Program Fiscal Year 2007 Guidance* (USEPA 2006b). These measures assume performance is measured statewide. A permitting authority would need to adapt these performance measures or add other measures in order to apply them to a specific watershed where the permitting authority is implementing an NPDES watershed framework. For example, under aquatic life protection, the permitting authority could adapt the measure for percentage of river miles and lake acres with improved water quality and increased fish consumption in Exhibit 1-6 to simply track progress toward attainment of aquatic life uses and associated water quality criteria for a specific watershed or waterbody. The permitting authority might also add to this list performance measures that are not a direct measure of environmental performance, but indirectly indicate environmental improvement, such as progress toward meeting a pollutant load reduction goal.

Appropriate *programmatic* measures of success will depend on the final suite of implementation options under an NPDES watershed framework for a specific watershed. As with environmental performance measures and goals, EPA, states, tribes, and territories might already have some programmatic measures and goals in place. Exhibit 1-7 presents potential programmatic performance measures for tracking the progress of implementation options under an NPDES watershed framework.

Exhibit 1-6. Example watershed environmental performance measures based on EPA's *National Water Program Fiscal Year 2007 Guidance*

Environmental goal	Environmental performance measure
Source water protection	Percent of source water areas for community water systems that will achieve minimized risk to public health
Aquatic life protection	Percentage of river miles and lake acres identified as having a fish consumption advisory in 2002 for which water and sediment quality have improved and allow for increased consumption of safe fish
	Percentage of shellfish-growing acres monitored that are approved or conditionally approved for use
Waters safe for swimming	Percentage of waters identified in 2000 as unsafe for swimming that have been restored
	Percent of days of the beach season that beaches monitored by beach safety programs will be open and safe for swimming
Overall watershed protection	The number of watersheds where water quality standards are met in at least 80 percent of assessed water segments
	The number of watersheds where all water segments maintain their water quality and at least 20 percent of assessed water segments show improvement of conditions since 2002

Exhibit 1-7. Example watershed program performance measures by NPDES watershed framework implementation option

Implementation option	Program performance measure
Watershed-bounded multisource permit development	▪ Number of individual NPDES permits developed and issued using a watershed permitting analytical approach ▪ Number of general NPDES permits developed and issued using a watershed permitting analytical approach
Water quality trading	▪ Number of point source-to-nonpoint source trades ▪ Number of point source-to-point source trades
Wet-weather integration	▪ Number of NPDES wet-weather permits incorporating runoff volume reduction strategies that are based on a watershed analysis
Indicator development and tracking	▪ Number of watersheds with indicator development projects ▪ Number of watershed-based indicators developed to serve as TMDL stormwater targets
TMDL development and implementation	▪ Number of TMDLs implemented through NPDES permits that incorporate permit limitations developed using a watershed-based analysis
Monitoring consortium development	▪ Number of watersheds with monitoring consortia ▪ Number of NPDES permits developed using data collected by watershed monitoring consortia
Permit synchronization	▪ Number of watersheds or sub-watersheds with synchronized permit expiration and reissuance
Statewide rotating basin planning approach	▪ Number of water quality programs using data from a rotating basin planning approach
Watershed management plan development and implementation	▪ Number of watershed management plans initiated as a result of the watershed permitting analytical approach
Section 319 nonpoint source management program	▪ Number of watersheds analyzed through a watershed permitting analytical approach with significant nonpoint source pollutant load contributions that initiate section 319 watershed management plans
Source Water Protection Plan development and implementation	▪ Number of watersheds with surface water intakes with protective NPDES permit limitations for sources based on proximity to the source water

Chapter 2: Guide for Multisource Watershed-based NPDES Permitting

Chapter 1 of this Technical Guidance helps permitting authorities construct an NPDES watershed framework by analyzing watershed data and determining how best to structure and manage implementation of the NPDES program so that the entire watershed is considered in the permit development process. An NPDES watershed framework might include actions such as issuing permits to single dischargers, modifying existing single discharger permits to incorporate watershed-based provisions, or synchronizing permit reissuance dates or effective dates to facilitate consideration of watershed-wide concerns during permit development. One of the potential implementation options within an NPDES watershed framework is a multisource watershed-based permit, which is a permit that would allow point sources in a watershed to apply for and obtain permit coverage under the same permit for one or more pollutants.

This Chapter describes the concept of multisource watershed-based permitting and presents approaches for developing each component of a multisource watershed-based permit. Section One answers some basic questions about multisource watershed-based permits and the remaining sections are organized to correspond with the major components of an NPDES permit. For each NPDES permit component, the Chapter presents an overview of issues related to watershed-based permitting, key questions for permitting authorities to consider, and, for some permit components, example NPDES permit text.

Section One: Multisource Watershed-based Permits

Where a permitting authority chooses to issue a multisource watershed-based permit, EPA recommends that it first determine the geographic scope of the permit, then determine which facilities within that geographic area will be covered by the permit and how the permit will be administered.

What is the geographic scope of the multisource watershed-based permit?

By the time a permitting authority has decided to issue a multisource watershed-based permit, EPA expects that the geographic scope of that permit would be relatively well defined. The Navigator tool presented in Chapter 1 leads permitting authorities through a series of questions about the pollutants of concern and pollutant sources in a watershed that help identify whether a multisource watershed-based permit would be an effective permitting approach in a candidate watershed. These questions also help to refine the geographic scope of the permit. Typical approaches to defining the geographic scope of a permit, in terms of both watershed and jurisdictional boundaries, include:

- **Single watershed in a state** (one watershed in the jurisdiction of one state). Choosing this option would result in a permit for specific dischargers within a particular watershed or river basin. It would not account for situations where a watershed crossed state boundaries. This approach is likely the most straightforward type of permit to issue and manage of the two options presented here because of its narrow geographic scope.
- **State-wide permit with watershed-specific requirements** (multiple watersheds located in one state). This option would produce, in effect, a statewide watershed-based approach

for developing and issuing permits. Under this option, the NPDES permitting authority might issue a single statewide permit that covers multiple watersheds or basins within the state's boundaries or create permit *bubbles* within such a permit. Unlike most statewide general permits, each watershed might have watershed-specific permitting requirements. For example, the permitting authority might create a permit bubble by assembling all point sources between a basin's headwaters to a defined point downstream, such as the first segment impaired for the pollutant of concern. The permitting authority might then establish pollutant loading caps for each bubble or basin. These caps would be implemented through individual facility allocations and effluent limitations for individual discharges and any requirements governing interactions among sources within or across permit bubbles or basins (e.g., trading). This approach would provide a broad geographic scope for potential trading within the permit.

Who is covered by the multisource watershed-based permit?

A multisource watershed-based permit addresses the point source dischargers of concern within the defined watershed or geographic area (e.g., state, basin, permit bubble). It also might address an entity, such as a watershed association, engaged to help administer such a permit. For example, a multisource watershed-based permit might be developed to cover:

- **Specified dischargers within a defined area as co-permittees** (hereinafter *permit for co-permittees*) where the permitting authority issues a watershed-based permit that applies to multiple individual dischargers within a specified geographic region.
- **Specified dischargers under the control of a single entity** (hereinafter *permit for facilities controlled by single entity*) where the permitting authority issues a permit to a single entity with control of multiple sources.

In a permit for co-permittees, the co-permittees might choose to develop an association to function as an administrative body. The individual dischargers ultimately would be responsible for meeting all permit requirements, but they would have the opportunity to take advantage of membership in the association to accomplish some administrative functions more efficiently. For example, the permit might specify that the association could undertake certain tasks such as tracking interim compliance, compiling reported data, and facilitating any trading. In addition, under this option, the permit might include an overall pollutant loading cap for the permittees making up the association and facility-specific effluent limitations for each facility based on facility-specific WLAs. Together, the individual facility WLAs would meet the cap. Trading or offsets might be allowed between sources within the association in order to meet the overall loading cap, but EPA recommends that the permit should clearly define the responsibilities of individual dischargers if the cap is exceeded.

Where there is no association or corporate entity to work with the dischargers seeking coverage under a watershed-based permit, the permitting authority might issue such a permit to the group of dischargers as a permit for co-permittees without specifying a role for an association. Without an association, the permit might serve as the only mechanism linking the individual dischargers. The permit could still include both a cap and facility-specific WLAs and the permitting authority, rather than an association, would aggregate the individual discharger data. EPA recommends that the permit also clearly define the responsibilities of the individual dischargers if the cap is exceeded. The permit might allow trading among co-permittees, but EPA

recommends that both the permittees and the permitting authority clearly understand responsibilities for the administration of trades.

A permit for facilities controlled by a single entity might function much like a permit for co-permittees that are part of an association. Where all of the facilities are controlled by a single entity, an overall pollutant loading cap might be assigned to the single entity controlling the individual facilities. Technology-based standards and protection of receiving waters in the immediate vicinity of each discharge would be unique to each facility and, therefore, would be addressed through facility-specific effluent limitations in such a permit as required in 40 CFR 122.44 (a) and (d). The single entity, however, potentially has the opportunity to trade loading allocations among its own facilities as long at it meets the overall loading cap and does not exceed any individual facility limitations that may not be met through trading. An example of this type of permit is an integrated municipal permit, which might bundle a number of point source requirements for a municipality (publicly owned treatment works (POTWs), combined sewer overflows (CSOs), biosolids, pretreatment, and stormwater, including municipally owned industrial activities such as public works and utility yards) into a single permit.

How is a multisource watershed-based permit administered?

A permitting authority might administer NPDES permits for multiple dischargers as either individual permits or as a general permit, depending on state regulations, practice, and preference. General permits are subject to specific requirements addressing coverage area, sources regulated, and water quality-based limitations (see 40 CFR 122.28). For example, general permits typically are used to address a category or subcategory of facilities with similar operations and similar wastes, discharging within some common geographic, political, or other appropriate boundary, and that require the same or similar effluent limitations and the same or similar monitoring requirements. In addition, a facility usually applies for coverage under a general permit by submitting a NOI to obtain coverage after the permit is issued. In contrast, an individual permit usually is issued to a specific facility with limitations based on a site-specific characterization of the effluent discharged and its impact on the receiving water. An individual permit is developed in response to a permit application submitted by the facility.

In many cases, a multisource watershed-based permit might be administered as an individual permit issued to multiple permitted entities. Though administratively similar to an individual permit, such a permit would share some characteristics with general permits. These characteristics would include coverage of multiple discharges in the same geographic area and effluent limitations that, while not necessarily the same for each facility, would be for the same parameters and would be based on the same WLA formula. Such a permit could also incorporate limitations for point sources based on a trading scheme. Note that a multisource watershed-based permit might also be issued directly to existing dischargers (i.e., no separate application may be required) given that the permitting authority already could have the necessary information for permit development through the existing application process.

As discussed in Chapter 1, some permitting authorities, such as Connecticut, have issued a single watershed-based permit that supplements or overlays existing individual permits for covered facilities. Connecticut's permit limits nitrogen discharges from POTWs in the Long Island Sound watershed. This approach allows the permitting authority to focus the effluent limitations, monitoring requirements, trading provisions, and other special permit conditions that are

developed on a watershed basis in a single permit and clearly links the permitted facilities in a way that simply incorporating watershed-based permit conditions into separate individual permits does not accomplish. Of course, as noted above, permitting authorities might consider modifying existing individual facility permits to incorporate watershed-based permit conditions, consistent with applicable regulations.

How might trading be considered in a multisource watershed-based permit?

Point source-point source trading involves matching a discharger seeking to purchase water quality credits, in lieu of installing new technology to meet applicable WQBELs, with a discharger that has reduced its pollutant load below its baseline requirement, thus generating a credit. Point source-nonpoint source trading involves a point source purchasing credits from a nonpoint source that has generated credits pursuant to approved criteria. A multisource watershed-based permit potentially serves as a good mechanism for implementing water quality trading.

As previously discussed, EPA's January 13, 2003, *Water Quality Trading Policy* (Trading Policy) (USEPA 2003a) encourages the development and implementation of water quality-based trading frameworks and programs that are consistent with the CWA and its implementing regulations. In the Trading Policy, EPA states that it believes market-based approaches, such as water quality trading, provide greater flexibility and have potential to achieve water quality and environmental benefits greater than would otherwise be achieved under more traditional regulatory approaches. It recommends that water quality trading be integrated into core water quality programs by incorporating provisions into NPDES permits and TMDLs.

The Trading Policy provides details on the characteristics of water quality trading programs (e.g., type of pollutant, impaired versus unimpaired water quality conditions) that EPA supports. For example, it expresses EPA's support for trading nutrient (e.g., total phosphorus, total nitrogen) and sediment load reductions. It also recognizes the potential for environmental benefits from trading pollutants other than nutrients and sediments but says that these trades may warrant more scrutiny. The Trading Policy does not support any trading activity that would cause a toxic effect, exceed a human health criterion, or cause an impairment of water quality. It also states that EPA does not support trading of persistent bioaccumulative toxics (PBTs) at this time but would consider a limited number of pilot projects to obtain more information regarding trading of PBTs.

The Trading Policy supports trading used as a means to maintain water quality in unimpaired waters and supports trading in impaired waters where it is consistent with a TMDL or used to achieve progress toward attaining water quality standards before TMDL development. It also states that EPA does not support trading that delays implementation of an approved TMDL.

RECOMMENDED ELEMENTS OF A TRADING PROGRAM FROM EPA'S TRADING POLICY:

- Water quality trading that is consistent with CWA requirements, specifically including water quality program requirements
- Trading that occurs pursuant to adequate legal authority and mechanisms, including legislation, rule making, provisions for trading in NPDES permits, a TMDL or watershed plan and private or third-party contracts
- Trading provisions that establish clear units of trade compatible with permit limitations
- Clear criteria for the creation and duration of credits (e.g., At what point are credits available for trading? Is there a start-up period for a new technology or best management practice (BMP) before credits are generated? Do credits expire, such as when a BMP becomes less effective over time?)
- Standardized protocols for quantifying the generation, use and reporting of credits and for addressing uncertainty, including uncertainty associated with estimating nonpoint loads and reductions
- Trading that is subject to effective compliance and enforcement provisions, including record-keeping, monitoring, reporting and inspection requirements, as well as compliance audits when appropriate and periodic accounting and reconciliation periods. Compliance and enforcement provisions that include clear enforceable mechanisms consistent with NPDES regulations and address actions taken in the event of default by a source generating credits (e.g., How will a potential buyer's effluent limitations be enforced in the event that a trade fails?)
- Public participation and access to information regarding the program

In addition to the recommended elements of a trading program described in the Trading Policy, EPA recommends that trading program identify who is eligible to trade with whom, what can be traded (e.g., which, if any, limitations may be satisfied through trading), when trades can occur, and conditions under which trades cannot occur (e.g., when they would result in localized exceedances of water quality standards).

There are both formal and informal state trading programs. A formal program often is established pursuant to legislation, such as the programs in Virginia (see, *Chesapeake Bay Watershed Nutrient Credit Exchange Program*, Code of Va., sec. 62.1-44.19:12 through 19:19) and Connecticut (Public Act 01-180: *An Act Concerning Nitrogen Reduction in Long Island Sound*). Typically, such programs establish a trading infrastructure or agent (e.g., the Virginia Nutrient Credit Exchange Association in Virginia or the Nitrogen Credit Exchange in Connecticut). These programs, which can be referenced in NPDES permits, specify the basic framework for trading. A more informal program might rely on general or existing state authority or regulations to conduct trading and might address some of the elements listed above through permits.

EPA's Trading Policy is flexible in the approaches it supports for incorporating provisions for trading into NPDES permits. The Trading Policy supports using general permits to authorize trading and describe appropriate conditions and restrictions. It also recognizes that state law, regulation, or a formal state trading program may define what trades are eligible to fulfill NPDES permit requirements. Where authorized, necessary, and appropriate, the Trading Policy also recognizes that it is possible that a state could issue a multisource watershed-based permit

with no formal trading program in place and that the permit itself could specify conditions for trading.

To provide additional guidance and support for trading, EPA issued, in November 2004, the *Water Quality Trading Assessment Handbook* (USEPA 2004). This document is designed to help determine where and when trading might be used in watersheds to make cost-effective pollutant reductions that achieve water quality standards and goals.

EPA's *Water Quality Trading Toolkit for Permit Writers* (USEPA 2007) assists NPDES permitting authorities and other interested stakeholders that want to facilitate point source-point source and point source-nonpoint source water quality trading through NPDES permits. The Toolkit fully describes various approaches for developing and incorporating permit conditions and limitations to support five water quality trading scenarios: (1) single point source-single point source trading; (2) multiple–facility, point source trading; (3) point source credit exchange; (4) point source-nonpoint source trading; and (5) nonpoint source credit exchange. Through the Toolkit, NPDES permitting authorities obtain a comprehensive discussion and analysis of key concepts of water quality trading addressed in the 2003 Trading Policy and information to facilitate permit development for the different trading scenarios. The Toolkit provides both real-world examples of water quality trading, as well as hypothetical case studies to illustrate the permit development process for each trading scenario. Refer to the Section Six of this Chapter, as well as the Toolkit, for additional information on issues related to implementing water quality trading through NPDES permits.

Section Two: Cover Page

The cover page is a standard element of an NPDES permit. It typically contains the name and location of the permittee, a statement authorizing the discharge, the name of the receiving waters, and the effective date of the permit.

This section provides two examples of a cover page. Of course, the NPDES permitting authority will determine the appropriate cover page format and content based on state requirements and any standard text. The examples given highlight the kinds of information that will be included in this part of the permit and the differences in what is included in a cover page based on how the permit is administered.

Key Technical Questions

What information is included on the permit cover page?

The information on the cover page of a multisource watershed-based permit reflects a number of important decisions made by the NPDES permitting authority that affect the overall permit, including who has permit coverage, the type of permit used to provide coverage, the geographic scope of the permit, and the pollutants addressed by the permit.

In developing a multisource watershed-based permit, the permitting authority considers factors such as the geographic area within which the permitted dischargers are located, similarities in characteristics of the discharges, and the establishment of appropriate effluent limitations, monitoring, and reporting requirements for the permitted entities. These decisions would be

reflected in information provided on the cover page such as the specific facilities and pollutants covered by the permit.

How does the method of administering the permit affect the cover page?

Where the permitting authority chooses to implement a multisource watershed-based permit as an individual permit issued to multiple sources, it might already have the required information in-hand through individual permit applications to determine which facilities will be covered by the permit (i.e., permit applicability). The cover page would likely include basic information about the permit and the facilities covered.

Where a permitting authority chooses to implement the multisource watershed-based permit as a general permit, EPA recommends that the permitting authority provide notification to entities that are eligible for coverage under the general permit. Such entities may need to file NOIs to obtain coverage under a general permit. EPA also recommends that these requirements, as well as information regarding the applicability of the general permit and conditions of coverage under the permit (e.g., ability of the permitting authority to require, upon notice, application for an individual permit) be reflected on the cover page.

Example NPDES permit text is provided below. Exhibit 2-1 is a sample cover page for several co-permittees, or an association with co-permittees, administered as an individual permit. Exhibit 2-2 is for a multisource watershed-based permit administered as a general permit.

Exhibit 2-1. Example of a cover page for a watershed-based permit administered as an individual permit issued to an individual discharger or to co-permittees

COVER PAGE

AUTHORIZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of the Clean Water Act, as amended, (33 U.S.C. 1251 et seq, the "Act"),

<Insert name and address of permittee or co-permittees, including association name if applicable>

is/are authorized to discharge <**pollutant(s)**> through discharge serial number(s):

<**list facilities and corresponding outfall numbers**>

to receiving waters in <**watershed name**>, in accordance with effluent limits, monitoring requirements and other conditions set forth herein.

This permit will become effective on _____

This permit and the authorization to discharge will expire at midnight, **<five (5) years after effective date>**

Signed this day of

_____

<**Signatory**>, Director
<Permitting Authority>

Exhibit 2-2. Example of a cover page for a watershed-based permit administered as a general permit

COVER PAGE

AUTHORIZATION TO DISCHARGE UNDER THE
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of the Clean Water Act, 33 U.S.C. Section 1251 et seq. (the "Act") eligible dischargers are authorized to discharge wastewater in accordance with the effluent limits, monitoring requirements, and other requirements set forth herein. The authorization to discharge wastewater under this permit will be valid only for eligible discharges for which an administratively complete and acceptable Notice of Intent (NOI) has been submitted**.**

The **<name of permit issuing agency>** may deny coverage under this permit and require submittal of an application for an individual NPDES permit based on a review of the NOI or other information. The authorization is for the discharge of **<pollutant(s)>,** as defined in this permit, from facilities listed in **Attachment 1** to this permit that have submitted an administratively complete and acceptable NOI discharging to the receiving waters listed in **Attachment 1.** This permit authorizes these facilities to discharge in accordance with conditions set forth in Parts A and B hereof.

NOI REQUIREMENTS
[This example does not address specific application/NOI requirements, but they could be minimal (e.g., a simple notice of intent to be covered under the permit). In some cases, the permitting authority may require all facilities identified for coverage under a watershed-based permit to automatically be subject to permit limits and conditions. Some jurisdictions may develop acknowledgment requirements where a facility submits a form or letter acknowledging their coverage under a watershed-based permit.]

LIMITS ON COVERAGE

Point source discharges are not covered by this permit when one or more of the following conditions exist:

1. **<Add any applicable limits on coverage here>**

CONDITIONS

The authority granted by this permit is subject to the following conditions:

1. Any discharge from a facility authorized by this permit may, following notice by the permitting authority, be required to apply for and obtain an individual NPDES permit. Any interested person may petition **<name of permit issuing agency>** to take action under this paragraph. The **<name of permit issuing agency>** will require any owner or operator authorized to discharge under this permit to apply for a separate, individual NPDES permit only after the owner or operator has been notified in writing that a permit application is required. The applicant must submit the individual permit application or, at the discretion of **<name of permit issuing agency>**, information to supplement the existing permit application within 90 days of receipt of notice. This notice must include the following: (1) a brief statement of the reasons for this decision, (2) an application form or instructions for submitting information to supplement the existing application, (3) a statement setting a deadline for the owner or operator to file the application or submit the supplemental information, and (4) a statement that on the effective date of the individual NPDES permit, as it applies to the individual permittee, coverage under this permit will automatically terminate. The **<name of permit issuing agency>** may grant additional time to submit the application upon written request from the applicant. If an owner or operator fails to submit, in a timely matter, an individual NPDES permit application or supplemental information required by the **<name of permit issuing agency>** under this paragraph, then the applicability of this permit to the permittee is automatically terminated at the end of the day specified for application submittal.

Exhibit 2-2 (continued): Example of a cover page for a watershed-based permit administered as a general permit

2. Any owner or operator potentially authorized to discharge by this permit may request to be excluded from the coverage of this permit by applying for an individual permit. The owner or operator must submit an individual application on approved NPDES application forms or, at the discretion of **<name of permit issuing agency>**, information to supplement its existing individual permit application, with reasons supporting the request, to the **<name of permit issuing agency>**.

3. **<Add others as necessary>**

[For facilities not covered under this permit, the permitting authority likely would modify the facility's existing individual permit to include any effluent limits for the pollutants of concern and other requirements that otherwise would have been addressed in this permit.]

Signed this day of

_____
<**Signatory**>, Director
<**Permitting Authority**>

Section Three: Effluent Limitations

EPA recommends that permitting authorities consider several technical issues when developing effluent limitations for a watershed-based permit. How these issues are resolved is central to how a multisource watershed-based permit will be structured and can influence other permit requirements (e.g., monitoring, reporting, compliance, and special conditions, including trading). These issues are presented as a series of technical questions and are discussed below. Following this discussion, Exhibit 2-3 provides example permit text as guidance for establishing effluent limitations.

Key Technical Questions

What types of effluent limitations might be included in a multisource watershed-based permit?

NPDES federal regulations at 40 CFR Part 122 require that NPDES permits include both TBELs and WQBELs, as appropriate. The permitting authority develops effluent limitations that meet any applicable technology-based requirements and are protective of the receiving water quality as required by water quality standards. These limitations are included as the final limitations in the NPDES permit.

The federal technology-based requirements for POTWs are based on secondary treatment standards and include standards for biochemical oxygen demand (BOD), total suspended solids (TSS), and pH. Effluent limitations guidelines and standards (ELGs or effluent guidelines) for non-POTWs include technology-based limitations for a variety of pollutants, including conventional, toxic, and nonconventional pollutants (40 CFR 405 through 499). In addition, the federal NPDES regulations include the authority to develop technology-based limitations for non-POTWs on a case-by-case basis using best professional judgment (40 CFR 125.3(c)). Water quality standards are established by states, territories, and tribes and are approved by EPA.

Which stressors or pollutants might be addressed through a multisource watershed-based permit, and how might the permit express effluent limitations?

The Navigator tool, discussed in detail in Chapter 1 of this Guidance, includes a series of questions that help a permitting authority identify a suite of watershed-based implementation approaches to the NPDES program. One of these potential approaches is, of course, a multisource watershed-based permit. Important factors in determining that this type of permit is appropriate in a watershed are identifying common stressors or sources of pollutants of concern in the watershed that are best addressed at the watershed level and understanding the relationships between those sources. Where a stressor, pollutant, or group of stressors or pollutants is common to multiple sources in a watershed and the relationships between those sources are well understood, that stressor or pollutant might be addressed by the permitting authority through a multisource watershed-based permit.

The NPDES regulations at 40 CFR 122.45(d) require that all permit limitations for continuous discharges be expressed, *unless impracticable*, as both average monthly limitations (AMLs) and maximum daily limitations (MDLs) for all discharges other than POTWs, and as AMLs and average weekly limitations (AWLs) for POTWs. In certain circumstances, as described below, EPA has indicated that these averaging periods may not be appropriate for all types of pollutants.

EPA recommends that permitting authorities consider the following examples of types of pollutants or stressors and corresponding effluent limitations when drafting a watershed-based permit.

- **Toxic Pollutants**. Many NPDES permits include effluent limitations for toxic pollutants. In most cases, the primary concern related to toxic pollutant discharges is short-term toxic effects in the water column near the point of discharge. EPA's 1991 *Technical Support Document for Water Quality-based Toxics Control* (TSD) (USEPA 1991) states that water quality-based effluent limitations should typically be expressed as MDLs and AMLs for all types of dischargers. The TSD notes that toxic pollutant concentration peaks could be missed and the discharger's potential for causing acute toxic effects could be missed by considering a weekly average rather than a daily maximum. Therefore, the TSD notes that permit writers should use MDLs in lieu of the AWL for toxic pollutants for all dischargers, including POTWs, because using AWLs is impracticable.
- **Nutrients**. In many cases, nutrients are well suited to being addressed through a multisource watershed-based permit. Also, different forms of nutrients can be converted to a common form. For example, if the pollutant of concern in the watershed is total nitrogen, the permit writer might consider establishing effluent limitations for total nitrogen in a watershed-based permit. A discharger subject to the permit may be required to measure total nitrogen or, in cases where a particular form or forms of nitrogen also are of concern, the discharger may be required to monitor TKN, nitrate, and nitrite (as N) and then calculate its total nitrogen discharge. Finally, many nutrient pollution issues are best addressed on a watershed-basis, and the spatial and temporal relationships between nutrient discharges can be defined.

  The long-term nature of many of the impacts of nutrients, especially in downstream waterbodies such as lakes and estuaries, leads to questions about whether and when it is appropriate to establish effluent limitations on nutrients with longer averaging periods. EPA has provided some direction on answering these questions. EPA supported using

annual limitations, rather than MDLs, AWLs, and AMLs, to meet criteria for nutrients in the Chesapeake Bay and its tidal tributaries in a memorandum from James Hanlon, Director of the EPA Office of Wastewater Management, to EPA Region 3 and the Chesapeake Bay Program Office, dated March 3, 2004 (*Annual Permit Limits for Nitrogen and Phosphorus for Permits Designed to Protect Chesapeake Bay and its Tidal Tributaries from Excess Nutrient Loading under the National Pollutant Discharge Elimination System* (Hanlon 2004)). In this memorandum, EPA affirmed that because of the long exposure period for nutrient loadings to the Chesapeake Bay and its tidal tributaries, the focus on the far-field effects of such nutrients (rather than the immediate vicinity of the discharge) and concerns specific to the average pollutant load rather than the maximum load, it is impracticable to express effluent limitations for nitrogen and phosphorus discharges in the Bay watershed developed to address nutrient criteria for the Bay and its tidal tributaries in terms of average monthly, average weekly, or maximum daily limitations.

The circumstances in the Chesapeake Bay that make annual limitations appropriate are not necessarily unique. For other areas of the country, the memorandum states that "The establishment of an annual limit with a similar finding of 'impracticability' pursuant to 40 CFR 122.45(d) may be appropriate for the implementation of nutrient criteria in other watersheds when: attainment of the criteria is dependent on long-term average loadings rather than short-term maximum loadings; the circumstances match those [in the Chesapeake Bay and its tidal tributaries]; annual limits are technically supportable with robust data and modeling…and appropriate safeguards to protect applicable water quality standards are employed." EPA recommends that annual effluent limitations be used only in these limited circumstances. Most pollutants, other than nutrients, and certainly any toxic pollutants with localized short-term effects, generally have limitations with shorter averaging periods. When considering annual limitations or other longer-term limitations, the permitting authority should confirm that such limitations are consistent with state regulations.

Even for nutrients, the behavior of the pollutant and the type of criteria will affect whether longer-term limitations are appropriate or necessary. For example, in free-flowing streams where there are no impoundments, annual limitations for phosphorus might not be needed or appropriate. Certain forms of phosphorus removal are not temperature dependent, and monthly average limitations might be most appropriate to protect water quality. Furthermore, in cases where nutrient water quality criteria and WLAs to protect those criteria are expressed on a shorter-term basis (generally to protect against local nutrient impacts in rivers or streams), EPA recommends that effluent limitations derived from those criteria or allocations be expressed on a shorter-term basis, such as MDLs or AMLs, during sensitive parts of the year.

- **Bacteria**. EPA's current bacteria criteria recommendations are based on geometric mean density and single sample maximum density of enterococci and *E. coli* bacteria. Where these criteria have been adopted into approved water quality standards, EPA has recommended permit limitation derivation procedures in its May 2002 Draft *Implementation Guidance for Ambient Water Quality Criteria for Bacteria* (USEPA 2002d). Some permitting authorities continue to use fecal coliform criteria for effluent limitations in addition to limitations based on enterococci and *E. coli* or in cases where fecal coliform is still the indicator criteria in the approved water quality standards. Urban

wet weather sources can be significant contributors to bacteria in waterbodies and are potential candidates for a multisource watershed-based permit that addresses bacteria. Bacteria contributions can come from both point and nonpoint sources. A multisource watershed-based permit that addresses bacteria might give urban areas a more efficient tool for managing their discharges by considering all point source contributions and providing the permittee with the flexibility to focus on the most significant sources.

- **Sediment**. Sediment is the fragmented material that originates from weathering and erosion of rocks or unconsolidated deposits and is transported by, suspended in, or deposited by water. Most sediment discharges are from soil erosion carried by surface runoff and discharged via point sources (e.g., stormwater) or nonpoint sources (e.g., cropping without buffer zones) and within-channel erosion of banks and bedload sediments.

  Some states have narrative criteria for sediments or use turbidity as a surrogate and some have total suspended solids or settleable solids numeric criteria. TBELs to address sediment often are expressed as concentration or loading limitations (generally for total suspended solids). In addition, a TMDL or another watershed analysis may be developed to address sediments so that the waterbody meets water quality standards. Most technology-based requirements or requirements based on numeric criteria for TSS, settleable solids, or turbidity would likely be maximum daily or monthly average values. TMDLs might establish longer-term targets. In many watersheds, the point sources with the greatest potential contribution to excessive sediment loads would be stormwater sources that would be controlled largely through BMPs.

- **Temperature**. NPDES permits might need to establish effluent limitations that control the discharges of heat to meet water quality standards. Effluent limitations on temperature often are MDLs or AMLs and may be seasonal, with the most stringent required reductions in discharge temperature required during the summer months. Both point and nonpoint sources of temperature impacts are controllable and, therefore, present opportunities for point-point and point-nonpoint source trading under a multisource watershed-based permit.
- **Oxygen Demand**. Dissolved oxygen is a candidate for coverage under a multisource watershed-based permit. Low dissolved oxygen levels instream might be traced to the effects of pollutants such as nutrients or sediment. A TMDL or watershed analysis could identify one or more pollutants and multiple sources contributing to low dissolved oxygen levels. Effluent limitations might be expressed as MDLs, AWLs, AMLs, or longer-term limitations depending on the nature of the pollutants and impacts (see, for example, the discussion of nutrients above).

When might mass-based or concentration-based effluent limitations be included in a multisource watershed-based permit?

While the NPDES regulations at 40 CFR 122.45(f) require that limitations generally be expressed in terms of mass, these regulations also allow a permit writer to express limitations in other units (e.g., concentration units) where the applicable standards are in other units or to supplement mass units. Where limitations are expressed in more than one unit, the permittee must comply with both. Mass-based limitations are particularly useful when addressing cumulative or watershed-wide impacts, such as the impacts of multiple, upstream sources on a

downstream lake. Mass-based limitations might be expressed as an average mass loading (e.g., lbs/day as a monthly average) or as a cumulative loading over a longer period of time (e.g., total pounds per year). Concentration-based limitations would likely be used in a multisource watershed-based permit to implement a minimum or floor level of treatment (e.g., a concentration-based effluent guideline, secondary treatment standards, or a state treatment standard) or to protect local water quality in accordance with water quality standards for receiving water in the immediate vicinity of the discharge.

If trading is allowed and occurs within the scope of the watershed-based permit, what effect will that have on effluent limitations?

At the permitting authority's discretion, trading may be allowed through, or in conjunction with, a watershed-based permit. Trading can occur in several ways and have different impacts on effluent limitations. For example, trading could be reflected in the relevant effluent limitations in the permit. Changing effluent limitations in the permit is a modification that requires public notice and the opportunity for comment. More likely, trading would be incorporated into NPDES permits through limitations that recognize the potential for trading during the permit term and express an alternate set of effluent limitations based on the quantity of credits purchased or sold. This approach does not involve repeatedly modifying the limitations in the permit. For more detailed information on effluent limitations that incorporate trading and methods for tracking trades, see *Water Quality Trading Toolkit for Permit Writers* (USEPA 2007).

While a multisource watershed-based permit may have more complex permitting requirements, because it may include aggregate limitations, provisions for trading, and conditions applicable only to specific discharges, each permitted discharger is always responsible for meeting the conditions of its permit (40 CFR 122.41(a)).

What are location and delivery ratios and what is their relationship to effluent limitations?

The water quality of a lake, reservoir, or estuary is affected by pollutants differently than one of its tributaries receiving a discharge. For example, because of degradation and removal in its travel time, a pound of pollutant discharged to an upstream tributary might not result in a pound of that pollutant entering the lake, reservoir, or estuary. A location ratio accounts for this difference for a specific facility and is used when calculating an effluent limitation for an upstream facility on the basis of potential downstream impacts on a lake, reservoir, or estuary. A location ratio allows credits to be traded between sources by converting their loadings or reductions into credits needed or available at the waterbody of concern.

A delivery ratio accounts for the distance between trading partners and any unique watershed features that will affect pollutant fate and transport between trading partners. Trading partners that are in close proximity to one another with fewer intervening hydrological features are likely to have a lower delivery ratio than facilities that are farther apart with significant intervening hydrological features (e.g., an agricultural diversion) between them.

EPA recommends that permits using location or delivery ratios describe them in the fact sheet and, if multiple facilities and trading partners are possible, as part of the effluent limitations section of the permit. More detailed information on location and delivery ratios (and other trading ratios) is available in *Water Quality Trading Toolkit for Permit Writers* (USEPA 2007).

What is a pollutant loading cap and how might such a cap be used in a multisource watershed-based permit?

A pollutant loading cap is the total loading requirement for a specific pollutant and could be applied to a group of point source dischargers. The cap represents the total pollutant load from the permitted dischargers within a watershed that will meet the loading requirement derived from water quality standards. If there is a TMDL for a waterbody, EPA recommends that the pollutant loading cap for point sources in the watershed-based permit be based on the TMDL and consist of the sum of the point source WLAs in the TMDL.

A multisource watershed-based permit does not have to specifically include a pollutant loading cap in addition to facility-specific limitations that meet CWA requirements; however, a cap can be used in combination with facility-specific limitations to provide compliance flexibility. For example, a watershed-based permit might include a provision stating that a facility is deemed to be in compliance with the permit provided that the facility either meets its facility-specific effluent limitations or the group of permittees (e.g., through an association) meets the applicable cap. A pollutant loading cap is most effective when a third party, such as a watershed association, can facilitate and track compliance with the cap. Exhibit 2-3 provides an example of effluent limitations for nutrients in a multisource watershed-based permit and recommends including an appendix in the permit that lists specific mass limitations for each co-permittee and an aggregate limitation (cap) for the group.

Are there other effluent limitations that could be considered for use in a multisource watershed-based permit?

As discussed in Section 1 of this Chapter, a multisource watershed-based permit might be administered as an individual permit issued to multiple permitted entities. Such a watershed-based permit would be administered as a supplement or overlay to the existing individual permits for the covered facilities (e.g., Connecticut's Long Island Sound nitrogen permit). This approach allows the permitting authority to focus the effluent limitations, monitoring requirements, trading provisions, and other special permit conditions that are developed on a watershed basis in a single permit and clearly links the permitted facilities in a way that simply incorporating watershed-based permit conditions into individual permits does not accomplish. Although such a permit might address protection of water quality of a downstream waterbody, such as a lake, reservoir, or estuary, WQBELs for certain dischargers designed to address local criteria (for example in waters that are tributaries to the lake, reservoir or estuary) might be necessary to ensure that the discharge of pollutants is limited to levels that will not cause or contribute to an excursion of any applicable water quality standard.

Regardless of how a multisource watershed-based permit is structured, the effluent limitations section of the permit likely will have the same basic characteristics. If a large number of co-permittees are to be covered under the permit, the permitting authority might consider using an appendix or schedule to display all applicable effluent limitations and other permit conditions (e.g., allocations and delivery ratios if trading is allowed).

Exhibit 2-3 contains an example effluent limitations table for a multisource watershed-based permit. This example addresses nutrients and includes both shorter-term (monthly average) and longer-term (annual loading) effluent limitations. The attachment referred to in Exhibit 2-3, would include a list of dischargers and their effluent limitations. **See Appendix C** of this

Technical Guidance for an example of such an attachment. Location ratios and delivery ratios (if applicable) could be added to the table to facilitate trading.

Exhibit 2-3. Example effluent limitations and monitoring requirements for nutrients

During the period beginning on the effective date of this permit, each **<permittee, co-permittee>** is authorized to discharge wastewater to **<receiving water name(s)>** provided the discharge meets the effluent limits and monitoring requirements set forth herein.

Parameter	Units	Effluent Limitations			Monitoring Frequency *(C)*	Sample Type *(D)*
		Total Annual	Total Monthly	Average Monthly		
Flow Rate	MGD	NA	NA	Report	Continuous	Meter
Flow Volume	MG	Report	Report	NA	Calculated	Calculated
Total Nitrogen	mg/L	NA	NA	X mg/L	1 / week	8-hour composite
Total Nitrogen (mass) *(A)*	lbs	*(B)*	Report	NA	Calculated	Calculated
	lbs/day	NA	NA	*Permit writer calculates based on conc. limit and flow*		
Total Phosphorus	mg/L	NA	NA	X mg/L	1 / week	8-hour Composite
Total Phosphorus (mass) *(A)*	lbs	*(B)*	Report	NA	Calculated	Calculated
	lbs/day	NA	NA	*Permit writer calculates based on conc. limit and flow*		

Report – monitor only, no limit
NA – not applicable

Total Nitrogen = Total Kjeldahl Nitrogen + Nitrite Nitrogen + Nitrate Nitrogen
Annual Total Nitrogen (N)/Phosphorus (P) Mass Load (lbs/year) = Sum of Jan. through Dec. Monthly Total N/P Mass Loads
(or sum of last 12 months mass loads for a rolling 12-month limit)
Monthly Total N/P Mass Load =
N/P Concentration (mg/L) for Monitoring Period * Total Flow for Monitoring Period (MGD) * 8.34 * # of days in Monitoring Period
(e.g., if monitoring is 1/week, determine total flow for the week and use 7 as the number of days in monitoring period; if more than one sample is taken during a monitoring period, the sample concentrations may be averaged and the average concentration used as the concentration for that monitoring period)
Monthly Average Total N/P Mass Load =
Sum of Daily Discharges of Total N/P / Number of Daily Discharges Measured During the Calendar Month

(A) Permit writer could express mass limitations in pounds or kilograms.
(B) Permit writer would insert total annual mass loading limitations for each co-permittee as calculated from a watershed analysis or refer the reader to an attachment (see Appendix C of this Guidance for an example) that might include a list of total annual loading limits for TN and TP for each co-permittee along with an aggregate limit for an association with co-permittees; delivery factors; and corresponding pounds delivered.
(C) Permit writer determines monitoring frequency by type of discharger and coordinated with existing permits and permitting authority rules.
(D) Permit writer would determine sample type.

Section Four: Monitoring Requirements

EPA recommends that the monitoring requirements section of a multisource watershed-based permit, like other NPDES permits, detail requirements for pollutant parameter sampling, flow measurement and analytical test procedures. The NPDES regulations at 40 CFR 122.48(b) require that all NPDES permits, at a minimum, specify monitoring requirements that include the type, interval, and frequency of monitoring sufficient to yield data that are representative of the monitored activity (see also 40 CFR 122.41(j)(1)). Further, 40 CFR 122.44(i) specifies that NPDES permit monitoring requirements be established to assure compliance with effluent limitations, and include the following:

- Monitor the mass (or other measurement specified in the permit) for each pollutant limited in the permit
- Monitor the volume of effluent discharged from each outfall
- Establish other measurements as appropriate and needed to implement applicable regulations and requirements
- Require use of approved analytical methods specified at 40 CFR Part 136 of the NPDES regulations
- Generally require reporting of monitoring results at a frequency established through the permit on a case-by-case basis but in no case less than once per year [see Section Five of this Chapter for a discussion of reporting requirements].

State rules might require monitoring conditions in permits that are more stringent than federal regulations.

The NPDES permit establishes monitoring and reporting requirements to implement applicable federal and state requirements and any state monitoring strategies. The permitting authority might consider adjusting or adding monitoring requirements to a facility's individual NPDES permit through permit reissuance or modification or including them in a separate overlay permit that includes monitoring requirements in addition to those in the facility's individual permit. For either approach, EPA recommends that the permit writer carefully consider the existing monitoring requirements in a facility's individual permit and coordinate the type and frequency of the additional monitoring with the existing monitoring requirements. Furthermore, the monitoring location should be consistent with the compliance point specified in the permit in order to be able to accurately measure compliance with effluent limitations and fulfill the requirement that monitoring yield data representative of the monitored activity.

Monitoring conditions for a permit issued to an association with co-permittees or a permit issued to co-permittees not part of an association are similar to those for individual permits because all permitted facilities must conduct monitoring as needed to assure compliance with effluent limitations (40 CFR 122.44(h)(1)). A watershed-based permit might also include ambient monitoring. EPA recommends that monitoring requirements be coordinated with the effluent limitations, reporting, compliance, and trading components of the watershed-based permit and that permitting authorities examine each of the following key technical questions and related options when developing the monitoring requirements for a watershed-based permit.

Key Technical Questions

Who is required to conduct monitoring?

A permit must require representative monitoring to assure compliance with permit limitations (40 CFR 122.41(j)(1)). EPA recommends that the permit make it clear that the individual co-permittees ultimately are responsible for ensuring that effluent monitoring is completed and reported to the permitting authority and that any enforcement actions for failure to monitor and report will be against the individual co-permittee. As required by 40 CFR 122.41, the permitting authority must ensure that monitoring allow permittees and agency compliance personnel to gauge whether dischargers are meeting their individual effluent limitations and any other requirements (e.g., conditions for trading).

With respect to ambient monitoring, EPA recommends that the permitting authority consider only one study or monitoring program per waterbody. The authority could do this by contacting all facilities that discharge into the waterbody and encourage them to jointly work to conduct the study. For further discussion of ambient monitoring consortiums, see EPA's Watershed Academy Information Transfer Series document titled *Monitoring Consortiums: A Cost-Effective Means to Enhancing Watershed Data Collection and Analysis* (USEPA 1997).

What sampling locations are specified in the permit for compliance monitoring?

EPA recommends that the permitting authority consider whether the sampling location for compliance with limitations in a watershed-based permit should be established by reference to the sampling location in each facility's individual permit or whether the watershed-based permit should specifically list the monitoring location for each permittee or co-permittee (see Exhibit 2-4).

Exhibit 2-4. Options for establishing appropriate sampling locations

Sampling Location

Option 1—Example of referencing sampling location in each facility's individual NPDES permit

Monitoring for compliance with effluent limitations must be at a location identical to that used to determine compliance with effluent limits established in its individual NPDES permit:
<list facilities and permit numbers>.

Option 2—Example of establishing sampling location within the multisource permit

Monitoring for compliance with effluent limitations established in the permit is required at the following locations:
<**list each facility and monitoring location—e.g., following the effluent flow meter and prior to the point of discharge to the** <**receiving water name**>>.

What additional sampling locations could be specified in the permit?

EPA recommends that the permitting authority consider whether the permit should identify additional sampling locations, such as sampling locations for ambient monitoring or in-plant monitoring. For example, the permit might specify the sampling points to monitor the influent

and effluent to determine treatment efficiency. Ambient monitoring might be considered based on a state's waterbody assessment methodology or, in some cases, a discharger association might propose an ambient monitoring network. For additional discussion of ambient and in-plant monitoring, see Section Six of this Chapter, which addresses Special Conditions.

What monitoring frequency is specified in the permit?

Monitoring frequency in a permit generally is established on the basis of the number of samples needed for adequate monitoring of overall treatment system performance with respect to the parameters of concern. In making a final determination regarding monitoring frequency, EPA recommends that the permitting authority consider the following:

- Characteristics of the treatment system, the effluent, and the receiving stream
- Flow rate and variability
- Seasonality
- Factors unique to sampling, including analytical methods.

EPA recommends that monitoring be coordinated with existing individual NPDES permits, state rules, and any EPA or state guidance or monitoring strategy.

What types of samples are required?

Samples may be collected as grab samples or composite samples as required by the test procedures listed in 40 CFR Part 136 and based on effluent concentration and flow variability. Permits generally require flow monitoring to calculate the mass of a pollutant discharged as authorized by 40 CFR 122.44(i)(1) and 122.48(b). Mass loadings are then used to determine compliance with mass-based limitations. For example, to characterize the total load over a given time period, the sample concentration (or average concentration for multiple samples) is multiplied by the flow volume for the monitoring period. Therefore, accurate flow monitoring for the monitored period is critical.

How are tiered monitoring requirements used?

As an alternative to establishing a single monitoring frequency for all discharges covered by a permit, the permitting authority could incorporate tiered monitoring requirements into a watershed-based permit consistent with state regulations or policy. The tiered monitoring requirements for a watershed-based permit could be based upon the following:

- differences in facility design flows
- industrial and municipal sources
- seasonal variability in flow or discharges
- location of facility in the watershed (e.g., tidal or non-tidal areas).

For example, facilities with high actual or design flows (e.g., facilities with a flow of 10 MGD or greater) might be required to monitor more frequently than facilities with lower actual or design flows (e.g., facilities with flows less than 10 MGD). This approach would afford the permitting authority more data to adequately characterize the pollutant loads from the largest dischargers.

Which analytical methods are used to measure various pollutants?

According to 40 CFR 122.44(i)(1)(iv), samples collected as part of a self-monitoring program required under an NPDES permit must be analyzed in accordance with EPA approved analytical methods specified in 40 CFR Part 136 (*Guidelines for Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act*) or other method specified in the permit where approved methods are not available.

Section Five: Reporting and Recordkeeping Requirements

This section of a multisource watershed-based permit includes the requirements for reporting and recordkeeping and would be similar to the corresponding section of an individual permit. Federal regulations at 40 CFR 122.41(l)(4) require permitting authorities to include in permits requirements for permittees to submit self-monitoring results at intervals specified in the NPDES permit. Further, 40 CFR 122.41(l)(4)(i) requires that monitoring results be reported using the Discharge Monitoring Report (DMR) or other form specified by the NPDES permitting authority.

The NPDES permitting authority will determine the appropriate content and frequency for reporting and recordkeeping requirements consistent with any state requirements. Furthermore, EPA recommends that the permit coordinate reporting and recordkeeping requirements with effluent limitations, monitoring, compliance, and trading requirements. In developing reporting and recordkeeping requirements for watershed-based permits, EPA recommends that permit writers consider several key technical issues.

Key Technical Questions

How should monitoring results be reported?

EPA recommends that the permitting authority consider whether to require the facility to submit a modified DMR that incorporates watershed-based effluent limitations or to submit a separate DMR for the watershed-based permit that is independent of the DMR required by the existing individual NPDES permit. Requiring a modified DMR is recommended only where watershed-based permit limitations are incorporated into an existing individual NPDES permit.

Submitting a separate DMR is recommended for multisource watershed-based permits that replace or overlay existing individual permits. These permits will have different permit numbers than the existing individual NPDES permits. The DMR required by an additional or overlay permit would be independent of the DMR submitted in compliance with existing individual NPDES permits, so overall compliance and enforcement would be tracked separately for each permit. EPA's Permit Compliance System (PCS) and Integrated Compliance Information System (ICIS) do not have the capability to track compliance for an existing individual NPDES permit and an overlay permit that would be submitted on the same DMR form. Example supplemental DMR forms for nutrient effluent limitations accommodating trading are provided in **Appendix D**.

What is the appropriate reporting frequency?

The NPDES regulations at 40 CFR 122.48 state that permits should specify monitoring types, intervals, and frequency sufficient to yield data representative of the monitored activity and

reporting requirements determined on the basis of the impact of the regulated activity. EPA recommends that multisource watershed-based permits require monthly reporting at a minimum. The permitting authority can require more frequent reporting depending on the nature and effect of the discharge (40 CFR 122.48(c)). The permitting authority should establish a reporting frequency consistent with existing individual NPDES permit requirements or develop reporting requirements on the basis of how effluent limitations, monitoring, and compliance determinations are expressed. There are exceptions to this recommendation, however. For example, even if effluent limitations are established as annual limitations, such as annual loading limitations, EPA recommends that the permitting authority strongly consider requiring monthly reporting of monitoring results to ensure timely review of progress toward achieving the total annual limitation. In addition to monthly reporting, the watershed-based permit could include a requirement for an annual summary or for reporting cumulative (year-to-date) loading to facilitate evaluating compliance with total annual loading limitations. Exhibit 2-5 provides example permit text for reporting requirements.

What are the recordkeeping requirements for a watershed-based permit?

As required by 40 CFR 122.41(j)(2), permits must include requirements for permittees to retain records for at least three years. The permitting authority may extend this time period by request and might wish to do so in some cases (e.g., where a trading agreement lasts for a full five-year permit term). Monitoring records must be representative of the discharge (40 CFR 122.41(j)) and include the following:

- Date, place, and time of sampling
- Individual(s) who performed the sampling
- Date of analysis
- Individual(s) who performed the analysis
- Analytical methods used
- Analytical results.

If trading is allowed and occurs within the scope of a permit, what effect will that have on reporting?

In addition to the standard reporting and recordkeeping requirements for monitoring results, EPA recommends that the NPDES permitting authority consider whether to include reporting and recordkeeping requirements specifically related to trading in the permit. For example, the permitting authority might consider requiring a permittee to submit a supplemental trading form when trades are conducted. For further discussion of recommended reporting and recordkeeping requirements for trading and an example of a trade reporting form, see *Water Quality Trading Toolkit for Permit Writers* (USEPA 2007).

Exhibit 2-5. Example permit text for reporting requirements

Standard Reporting Requirements

Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms approved by the permitting authority. [40 CFR 122.41(l)(4)(i)]

DMRs must be submitted monthly to the permitting authority, signed and certified as required by the standard provisions. If trading was conducted during the month, a trading report must also be submitted (see reporting requirements for trading).

Monthly reports are due on the 1st day of the second month following the end of each calendar month of monitoring. Annual compliance reports are due on February 1 following each calendar year.

For each measurement or sample taken pursuant to the requirements of this permit, the following information shall be recorded:

- The date, exact location, and time of sampling or measurements
- The name of the individual who performed the sampling or measurements
- The date(s) analyses were performed
- The name of the individual who performed the analyses
- The analytical techniques or methods used, including the current method detection limit (MDL)
- The results of the analyses

The <**permittee or co-permittees>** must arrange all reported data in tabular form so that the specified information is readily discernible. The data must be summarized in such a manner as to clearly illustrate whether the facility is operating in compliance with discharge requirements.

Calculations for all limits that require averaging of measurements must use an arithmetic mean unless otherwise specified by the permitting authority.

Special Reporting Requirements ***(example for annual limits included in a permit)***

In addition to regular monthly reporting, at the end of the calendar year, **<permittee or co-permittees>** will submit an annual compliance summary report to **<name of permit issuing agency>**. In this report, the facility's <**pollutant**> loadings will be presented as monthly, quarterly, and total annual loads. If the annual load discharged is greater than the annual load limit for <**pollutant**>, **<permittee or co-permittees>** will provide a description of the specific additional actions or activities that will be undertaken during the next quarter to achieve compliance. **<When trading program is available: <permittee or co-permittees> will describe the means by which credits will be acquired to achieve compliance.>**

Plans required by this subsection must be submitted to the permitting authority with the DMR for the last month of the quarterly reporting period.

If trading is being conducted in accordance with Section <**X**> of this permit, **<permittee or co-permittees>** must submit, along with the DMR, a trade summary for the period covered by the DMR using the **<state>** Trade Summary Table.

Section Six: Special Conditions

There are a number of requirements, such as BMPs or preventive requirements, that are addressed through special conditions in NPDES permits. These conditions are not included in the effluent limitations section of this discussion of multisource watershed-based permits because they are not specific numeric limitations. They may, however, be related to or impact the effluent limitations section of the permit. This section addresses considerations for NPDES permit writers developing special conditions for watershed-based permits.

Key Technical Questions

What programs or unique circumstances require special conditions in the permit?

EPA recommends that the special conditions section of an NPDES watershed-based permit include additional conditions such as trading requirements and specific provisions that allow the permit to be reopened. The permitting authority might also consider whether to add special conditions to account for growth in the watershed by specifying requirements for adding new facilities to the watershed-based permit or expanding existing facilities. Each of these potential types of special conditions is discussed below.

Trading. A watershed-based permit that authorizes trading might provide a flexible and cost-effective means of protecting water quality and maintaining loading provisions in a TMDL or other watershed plan. For example, a permit condition might say that, to meet the effluent limitations, dischargers may employ treatment technologies, pollution prevention, or operational measures at their facilities or buy credits. For some facilities in a watershed, incorporating new technology to meet WQBELs might not be as cost-effective as buying credits. The basic premise of trading is simple: within a specified geographic area, a pollutant loading cap is distributed among dischargers as facility WLAs, which are translated into effluent limitations in an NPDES permit. The dischargers within the geographic area then buy or sell credits from each other or from another source (e.g., nonpoint source or through a credit exchange) to meet their effluent limitations, provided they do not, as a group, exceed the cap.

EPA recommends that the permitting authority consider whether trading provisions in watershed-based permits should be relatively simple statements authorizing trading among specified trading partners or more complex permit conditions that include equations for calculating credits, conditions for trading with nonpoint sources, the timing of credit use and generation, special reporting requirements, and other details. EPA recommends that permitting authorities without a formal trading program incorporate as many specific trading provisions that the permitting authority deems necessary in the permit itself. For permitting authorities with a formal trading program, the authority might consider referencing the trading program in the permit instead of including detailed trading provisions. EPA recommends that trading requirements identify the legal authority to conduct trades; potential trading partners; the types of trades that may be conducted; how credits may be generated, bought and sold; how trades are reported and tracked; and provisions for compliance and enforcement. The specifics of how trading is conducted and reflected in NPDES permits may vary. For more detailed information on incorporating trading provisions in NPDES permits, see *Water Quality Trading Toolkit for Permit Writers* (USEPA 2007).

New or Expanded Facilities. EPA recommends that a watershed-based permit account for growth in the watershed from the construction of new dischargers or expansions of existing dischargers. In some cases, a TMDL or watershed plan may have a point source load reserve. The permitting authority might also consider whether to incorporate provisions to address growth in a watershed by reducing WLAs to existing dischargers or requiring a new or expanded discharge to offset the new or increased load through mitigation. For example, the permit might require new or expanded facilities to offset their new or increased loads by acquiring facility credits from one or more permitted facilities in the same tributary or from nonpoint sources generating credits through the use of BMPs.

Reopener. Under 40 CFR 122.41 and 122.62, an NPDES permit may be modified, revoked and reissued, or terminated for cause. NPDES permitting authorities might wish to include a reopener condition to address unique situations potentially posed by a watershed-based permit. Such situations may include adjustments to the WLA specified in the permit on the basis of new or revised water quality modeling results, or revisions to a TMDL or watershed plan that affect the overall loading requirement for the waterbody and the individual requirements on the covered facilities. Although a reopener condition might not be required to modify a watershed permit focused on a limited number of pollutants, such a permit condition may be useful to specifically identify those contingent conditions where changes may be warranted. Exhibit 2-6 presents example permit text for a permit reopener.

Exhibit 2-6. Example permit reopener

The issuance of this permit does not prohibit the permit issuing authority from reopening and modifying, revoking and reissuing, suspending, or terminating the permit as authorized Title 40 of the *Code of Federal Regulations*, Parts 122 and 123 <**or the state equivalent of these provisions**>, as applicable.

This permit may be reopened **<specify date or timing>** to adjust the WLA and corresponding effluent limit(s) specified in **<specify section and or appendix>** on the basis of **<new water quality modeling results; revisions to a relevant TMDL or watershed plan**>.

What special monitoring requirements might be included in the permit?

EPA recommends that the permitting authority consider whether to include in the special conditions any requirements for ambient monitoring or other special monitoring it deems necessary in order to gather data for use in other watershed activities or to ensure that trading is not causing localized exceedances of water quality standards. This monitoring is separate from, and in addition to, the routine compliance monitoring required by an NPDES permit. EPA recommends that the permitting authority carefully assess the need for such requirements. Factors to consider include what needs would be fulfilled by the data gathered and the potential burden on permittees.

Ambient monitoring. In addition to traditional discharge monitoring requirements, the permitting authority might consider whether ambient monitoring should be used to determine if water quality standards and pollutant reduction requirements and goals are being achieved. Ambient monitoring might be considered for certain dischargers at specific locations throughout the watershed or could be coordinated with existing watershed ambient monitoring efforts. Permitting authorities might

want to refer to EPA's 1996 *Interim Guidance for Performance-based Reductions of NPDES Monitoring Frequencies* (USEPA 1996b) to explore how to reduce monitoring burden. This document can be found at **http://www.epa.gov/npdes/pubs/perf-red.pdf**. Exhibit 2-7 presents sample permit text for ambient monitoring.

Exhibit 2-7. Example permit text for ambient monitoring

<Permittee or co-permittees> must conduct ambient monitoring to ensure that reductions in <**pollutant**> discharged to <**waterbody>** are producing the expected reductions at <**point of concern in the watershed**.> Sampling must be conducted as follows: <**sample type, frequency, etc.**> Sampling must be conducted at the location approved by the permitting authority.

<Permittee or co-permittees> also must conduct ambient monitoring at designated locations in the <**downstream waterbody**> to determine whether water quality standards are being met. Sampling must be conducted as follows: <**sample type, frequency, etc.**>. Sampling must be conducted at monitoring locations approved by the permitting authority.

In-plant monitoring (if applicable). The permitting authority should consider whether in-plant monitoring should be required to ensure the proper operation and maintenance of the facility and its controls. Such monitoring is especially useful for permits that allow trading between a facility's outfalls (i.e., intraplant trading). Monitoring results could be used to detect changes in waste loads, characterize effluent, and assess treatment efficiency.

BMP Monitoring. Finally, the permitting authority should consider whether BMP monitoring requirements should be specified for point sources employing BMPs or trading with nonpoint sources that use BMPs to generate credits purchased by point sources. Such monitoring results would be used to measure BMP effectiveness and ensure proper installation, operation, and maintenance of the BMP.

Section Seven: Public Notice

The public notice is an important part of the NPDES permitting process and is required by law at 40 CFR 124.10. It is the primary method of advising all interested parties of a proposed action with respect to an NPDES permit or the contents of a draft NPDES permit. The goal of the public notice of a draft permit is to solicit public review and comments on the draft permit. The permitting authority may decide to hold a public hearing if there is significant public interest expressed during the 30-day comment period following issuance of the draft permit or if an issue needs to be clarified during the permitting process (40 CFR 124.12(a)(1),(2)).

The federal regulations at 40 CFR 124.10 require the public notice to contain the following, at a minimum:

- Name and address of the office processing the permit action
- Name and address of the permittee or applicant and, if different, of the facility regulated by the permit
- A brief description of the business conducted at the facility and activity described in the permit application or the draft permit

- Name, address, and telephone number of a contact from whom interested persons may obtain additional information
- A brief description of the comment procedures
- For EPA-issued permits, the location and availability of the administrative record
- A general description of the location of each existing or proposed discharge point and the name of the receiving water and the sludge use disposal practices
- Any additional information considered necessary.

In many ways, a multisource watershed-based permit can help streamline the public notice process by grouping the public notice process for many facilities under one public notice action. NPDES permitting authorities also may consider using innovative outreach approaches in conjunction with traditional public notice methods to ensure that all affected stakeholders have the opportunity to comment on a draft permit. The geographic scope and type of permit will generally drive the decision on which public notice methods are most appropriate. EPA recommends that the permitting authority consider the following technical issues when developing a public notice for a watershed-based permit.

Key Technical Questions

When must public notice be provided?

The federal regulations at 40 CFR 124.10 require public notice of a proposal to issue a permit. The notice should be given within the geographic area of the proposed or existing discharge following completion of a draft permit. The permitting authority must allow at least 30 days for the public to submit comments on the draft permit. If public interest warrants a public hearing or other public meeting, the permitting authority must also provide public notice of the hearing or meeting as specified at 40 CFR 124.10. States should already have public notice procedures in place that comply with NPDES regulatory requirements.

States should anticipate significant public interest when issuing a multisource watershed-based permit, especially if the permit allows trading as a means to comply with effluent limitations. EPA recommends that states consider using aggressive outreach approaches for watershed-based permits and seek to ensure meaningful stakeholder involvement during the comment period. For example, the permitting authority could hold a series of meetings before, during, and after the public comment period. The meetings could be open to the public, but targeted to reach key stakeholder groups in the watershed. See **Appendix A** for more detailed information on stakeholder involvement.

How should permitting authorities effectively and efficiently provide public notice of a watershed-based permit?

Public notice of watershed-based permits must meet the minimum federal requirements. EPA recommends that permitting authorities go beyond those minimum requirements to get the state's stakeholders (private and nonprofit organizations, local government units, and citizens) involved in the process. To effectively and efficiently provide notice, in addition to the traditional legal notice in a newspaper, the permitting authority could use its existing database lists of stakeholders. The permitting authority might also identify and partner with organizations that

currently conduct outreach in the watershed to improve involvement among stakeholders. Furthermore, the permitting authority could identify the most commonly used channels of communication among stakeholders and select the most appropriate method for providing an effective public notice of permit actions. EPA recommends that the permitting authority be prepared to use a variety of communication tools to ensure that all stakeholders are notified of the watershed-based permitting actions and have the opportunity to provide meaningful input to the process.

Will the type of permit affect the public notice process?

The type of permit used and the geographic scope could have a direct impact on the procedures for public notice. For example, if the permit is being issued to multiple co-permittees, the permitting authority could issue one public notice for the permit. If separate individual permits with watershed-based provisions are used, public notices would have to be issued for each permit. To streamline the public notice process and increase stakeholder involvement, the permitting authority could coordinate issuance of the individual permits and then group the public notices for each permit under one public notice action.

What additional information should a public notice for a watershed-based permit contain?

In addition to the minimum requirements at 40 CFR 124.10, EPA recommends that the public notice contain the following to facilitate watershed-based permitting:

- Description of the geographic scope of the permit
- Explanation of the concept of a watershed-based permit
- Description and explanation of any planned trading activities
- Where to obtain additional information on the watershed-based permitting process
- Graphics to illustrate the relationship of the watershed and facilities to local jurisdictional boundaries and other familiar landmarks.

What other permit-related actions might trigger the need for public notice?

If trading is allowed and occurs within the context of the watershed-based permit, the permitting authority may have to provide public notice of certain actions (i.e., if incorporating a trade requires more than a minor modification, such as a trade that results in changes to effluent limitations). Public notice may also be required for other actions, such as addition of facilities to or removal of facilities from a multisource watershed-based permit.

Chapter 3: Watershed-based Permitting Case Studies

In watersheds across the country, permitting authorities and other watershed stakeholders have constructed a variety of NPDES watershed frameworks to address specific pollutant or stressor types and water quality concerns. EPA has developed a series of watershed-based permitting case studies to highlight real-world examples of implementing an NPDES watershed framework and to illustrate the concepts presented in Chapters 1 and 2.

There are currently eight case studies highlighted in this Chapter. Others are under development and will be added as they are completed. The case studies are available in their entirety on EPA's NPDES Web site at **http://www.epa.gov/npdes/watersheds**.These case studies illustrate a variety approaches implemented as part of an NPDES watershed framework including, in some instances, development of a multisource watershed-based permit.

A brief description of each completed case study is provided below, and the full text of each of these case studies is available at the above EPA Web site.

Big Darby Creek Watershed, Ohio: Construction Watershed-based General Permit

The Big Darby Creek watershed is in central Ohio, draining agricultural areas and suburbs to the northwest and west of Columbus. The Big and Little Darby Creeks have been designated as State and National Scenic Rivers, and the watershed is known to provide habitat for several state and federally listed endangered species. Two major policy and planning documents justified the need for a construction general permit in the Big Darby watershed: the Big Darby Creek TMDL, approved by EPA on March 31, 2006, and the regional 208 Water Quality Management Plan (i.e., *Central Scioto Plan Update* or CSPU). The state issued a construction general permit for the Big Darby watershed on September 12, 2006 (effective October 27, 2006).

This case study focuses on using a watershed general permit to require control measures and BMPs for construction stormwater that address recommendations from the TMDL.

Chesapeake Bay Watershed, Virginia: Watershed-based General Permit for Nutrient Discharges and Nutrient Trading

In March 2003, the Chesapeake Bay Program (CBP) adopted new nutrient reduction goals as part of the Chesapeake 2000 Agreement. The CBP established nutrient allocations for each of the eight tributary basins (i.e., subwatersheds), and each state within the Chesapeake Bay drainage then developed tributary strategies to achieve the nutrient reduction goals for each subwatershed. To facilitate meeting the nutrient load reduction goals of the Chesapeake Bay Agreement in Virginia, on March 24, 2005, the Governor of Virginia signed legislation authorizing the creation of the Chesapeake Bay Watershed Nutrient Credit Exchange Program (Exchange Program).

Virginia's Exchange Program requires Virginia Pollutant Discharge Elimination System (VPDES) permitted facilities on the CBP Significant Discharger List as well as new and expanding facilities, to register for coverage under a new associated General Permit to collectively meet annual nutrient allocations established for the Chesapeake Bay subwatersheds. The General Permit establishes annual effluent loading limits for nitrogen and phosphorus for all

dischargers and establishes the conditions by which credits (the difference in pounds between the facility's limit and the mass actually discharged) may be exchanged. In addition, nutrient credits may be purchased by existing facilities whose proposed expansion would otherwise cause the facilities to exceed their allocation or by new and expanded facilities that do not have an assigned WLA. Facilities can make these nutrient credit transactions through the Nutrient Credit Exchange Association or independently with facilities located in the same subwatershed.

This case study focuses on the tributary strategy components of the General Permit issued to significant and new/expanding dischargers as part of Virginia's Exchange Program.

Lake Lewisville Watershed, Texas: City of Denton Watershed Protection Program

The Lake Lewisville watershed has been experiencing significant development pressures, so in 2001, the City of Denton, Texas, the largest city in the watershed, developed several watershed-based programs to address water quality concerns and storm water permitting requirements. While Lake Lewisville is not currently listed as impaired under the state's CWA section 303(d) list, the city has taken some proactive measures to protect the water quality of the lake. The city has leveraged multiple funding sources for this. Specifically, Denton has implemented a water quality monitoring program, employed land use planning and management tools, and disseminated critical information to the public aimed at changing residential land use practices.

This case study focuses on an overall watershed approach in the Lake Lewisville watershed that affects implementation of the NPDES program for municipal and industrial sources. The program also provides information and analysis for future watershed-based permitting efforts such as development of a multisource watershed-based permit and water quality trading.

Michigan Statewide Watershed-based MS4 Stormwater General Permit

For approximately 20 years before implementing a watershed-based permitting approach in the Rouge River watershed, the Michigan Department of Environmental Quality (MDEQ) had been seeking ways to bring communities together under either a voluntary or regulatory approach to achieve water quality goals. Using a watershed-based permitting approach in the Rouge River as a test case, MDEQ learned that a watershed-based regulatory program could be achieved if it were offered as an alternative to some other regulatory mechanism. The voluntary, watershed-based permit developed in the Rouge River was reissued as a statewide, watershed-based National Pollutant Discharge Elimination System (NPDES) general permit for stormwater Phase II in 2002 and was renamed the Watershed-based Permit.

The goal of the statewide permit is to provide a watershed-based approach for implementing and coordinating stormwater Phase II compliance efforts. Municipal Separate Storm Sewer Systems (MS4s) regulated under Phase II may choose to participate in the watershed approach under the general Watershed-based Permit, or they may opt to seek coverage under MDEQ's more traditional MS4 stormwater general permit, called the Jurisdictional Permit.

This case study focuses on development of the Rouge River watershed-based stormwater permit and its adaptation for use as a statewide permit. The discussion includes the process for adapting requirements to address watershed-specific needs.

Neuse River Watershed, North Carolina: Neuse River Compliance Association Watershed-based Permit

The Neuse River is classified as a Nutrient Sensitive Water because of the long-term eutrofication of its estuary. In 1996, the North Carolina General Assembly passed House Bill 1339, which set a goal of reducing nitrogen loads to the estuary by 30 percent by 2003 (with 1995 as the baseline year). In 1997, the Neuse River Nutrient Sensitive Waters Management Strategy (Strategy) was developed to meet this goal and included a set of permanent rules (the Rules) to support implementation of the Strategy and meet the reduction goal.

One of the Rules passed by the General Assembly, the Wastewater Discharge Rule (Rule T15 NCAC 2B.0234), establishes specific nutrient control requirements for point source dischargers in the watershed and includes a provision which allows point sources to form a compliance association to work collectively to meet the combined TN WLA [1.64 million pounds of total nitrogen (TN) per year at the estuary]. This WLA was established in a Phase I TMDL (1999). In 2002, the North Carolina Department of Environment and Natural Resources Division of Water Quality issued a watershed-based permit to a group of dischargers organized as the Neuse River Compliance Association to regulate the discharge of total nitrogen into the Neuse River.

This case study focuses on the components of the watershed-based permit issued to the Association and the group compliance mechanisms used by the co-permittees.

North Carolina Statewide Approach: Basinwide Planning and Permitting

The North Carolina Division of Water Quality (DWQ) employs a basinwide approach to protecting the state's water resources; it undertakes planning, monitoring, modeling, permitting, and compliance assessment activities at the basin scale. DWQ prepares basinwide plans on a 5-year cycle. The purposes of the plans are to frame a number of water quality factors, including current conditions, potential and existing threats, short- and long-range protection goals, and management options for both point and nonpoint sources of pollutants.

This case study focuses on the history of North Carolina's basinwide planning program and the planning process used along with the benefits of implementing that process.

Sand Creek Watershed, Colorado: Watershed-based Selenium Standard

Suncor Energy (U.S.A.), Inc., formerly Conoco Denver Refinery, convened the Selenium Stakeholder Group to discuss the scientific merit and feasibility of implementing Colorado's proposed lower selenium standard for point sources discharging to the South Platte River and its tributaries, specifically Sand Creek. Members of the group predicted that applying the lower standard would result in Sand Creek being inappropriately placed on Colorado's CWA section 303(d) list of impaired waters because ambient background selenium concentrations would exceed the lower standard.

The dischargers worked with state and federal agencies to develop a proposal in which the dischargers would collect the biological, chemical, and physical data necessary to justify a higher selenium standard for western plains stream ecosystems. Pending the results of the study, the Colorado Department of Public Health and Environment granted a temporary modification of the selenium standard for Sand Creek and Segment 15 of the South Platte River. The goal of the

program is to develop a science-based water quality standard for selenium that is protective of, and appropriate for, western plains stream ecosystems. The approach allows for adaptive implementation in which stakeholders work cooperatively and proactively to solve problems outside the regulatory arena.

This case study focuses on NPDES dischargers in the Sand Creek watershed working together using a watershed approach to develop a site-specific water quality criterion.

Tualatin River Watershed, Oregon: Clean Water Services Integrated Municipal Permit

Clean Water Services (CWS) is a public utility (special services district) that operates four municipal wastewater treatment facilities, each with its own permit under the National Pollutant Discharge Elimination System (NPDES). CWS also, has two industrial stormwater permits and is a co-permittee in a Municipal Separate Storm Sewer System (MS4). The Tualatin River is the receiving stream for each of the above permitted discharges. Oregon's Department of Environmental Quality (OR DEQ) issued TMDLs for the Tualatin River for ammonia, phosphorus, temperature, bacteria, and tributary dissolved oxygen (DO). In February 2004, OR DEQ issued a single watershed-based, integrated municipal permit to CWS. This permit incorporates the NPDES requirements for all four of CWS's advanced wastewater treatment facilities, its two industrial storm water permits, and its MS4 permit. A significant feature of the integrated permit is its inclusion of provisions for water quality credit trading involving temperature (thermal load), biochemical oxygen demand (BOD), and ammonia.

The watershed-based permit has resulted in various benefits to CWS, the permitting authority, and the environment. For both CWS and OR DEQ, one permit is easier to administer and implement. The integrated permit provides economies of scale for both CWS and OR DEQ in terms of resource use. Both organizations are now better able to focus their resources on the most critical resource problems, and the integrated permit provides greater protections for the environment than what might have been realized under the previous array of permits. Since the integrated watershed based permit was issued, CWS has planted nearly 10 miles of riparian shading, preventing 101 million kilocalories (Kcal) per day of thermal energy from impacting the Tualatin River.

This case study focuses on the components of the watershed-based permit issued to CWS. It also summarizes key components of CWS's thermal load trading program.

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APPENDIX A

STAKEHOLDER INVOLVEMENT IN A WATERSHED PERMITTING ANALYTICAL APPROACH AND AN NPDES WATERSHED FRAMEWORK

Identifying Stakeholders and Facilitating their Participation

Throughout the *NPDES Watershed-based Permitting Implementation Guidance*, EPA emphasizes the importance of providing stakeholders with opportunities to participate in watershed-based permitting. The introduction to the NPDES Watershed Navigator reiterates that stakeholder involvement is key to conducting a watershed permitting analytical approach and applying an NPDES watershed framework within a watershed.

> **Why Involve Stakeholders?**
>
> Stakeholders are more than just *the public*—they are representatives of communities, organizations, agencies, institutions, and households that can significantly impact the watershed-based permitting process. By supplying data, financial resources, technical expertise, or a personal opinion, stakeholders can make contributions that will enrich both the process and the final strategy. In some cases, they might even be the catalysts for this process. Give stakeholders the opportunity to share their time and talents—and let them know that they are heard.

Early and continuous stakeholder involvement can result in a core of supporters that have ownership over the watershed permitting analytical approach and an NPDES watershed framework. Ideally stakeholder involvement will result in empowered stakeholders who are willing to implement the results of the process. Although incorporating stakeholder involvement is important, it is not always easy. Stakeholder involvement arguably requires additional time and resources for any project, particularly when the project involves contentious issues such as developing new permit limitations or seeking collaboration from unregulated entities in the watershed. Emphasis on intensive stakeholder involvement might raise concerns among individuals interested in integrating a watershed approach into NPDES permitting. Questions demonstrating these concerns include the following:

- How will the need for comprehensive stakeholder involvement affect the timely issuance of NPDES permits?
- How will a breakdown in stakeholder involvement during the process affect the final outcome?
- How can a watershed permitting analytical approach and an NPDES watershed framework continue without full support of all watershed stakeholders?

A well thought-out plan for stakeholder involvement that includes an emphasis on outreach has the potential to alleviate these concerns. The remainder of this section focuses on developing and implementing a stakeholder involvement and outreach strategy for use in the context of conducting a watershed permitting analytical approach and applying an NPDES watershed framework.

Developing the Stakeholder Involvement and Outreach Strategy

A stakeholder strategy is a plan of action for education and participation that goes beyond basic regulatory requirements, such as public notices and public hearings. Because every watershed is composed of unique stakeholders, the details of a strategy will also be unique to a specific watershed. Yet, each strategy is likely to share basic components that are essential to generating meaningful stakeholder input. These basic components might include a comprehensive list of

stakeholders, an assessment of stakeholders' characteristics, tailored educational materials, and a suite of participation opportunities. A strategy that reflects the interests and concerns of stakeholders within the watershed is likely to generate meaningful participation. Some of the activities associated with the development of the stakeholder involvement and outreach strategy are:

- Identifying a comprehensive list of stakeholders
- Assessing stakeholder awareness of watershed issues
- Educating stakeholders on watershed issues, the watershed approach, and NPDES permitting
- Identifying opportunities for stakeholders to participate in steps throughout the watershed permitting analytical approach and an NPDES watershed framework

This section provides a detailed discussion of the suggested activities and anticipated results, as well as a list of helpful resources for undertaking this step. Each activity recommended for stakeholder strategy development and implementation is discussed below.

What Motivates Stakeholders to Take Action?

Successful strategies for stakeholder involvement build upon an understanding of stakeholders' attitudes, values, concerns, and beliefs to motivate participation. Meaningful stakeholder involvement results from stakeholders obtaining information on problems and potential solutions and deciding that there is need for them to take action. Those actions could range from attending regular meetings to obtaining and sharing watershed data. Without understanding the process and the role that they can play, stakeholders are unlikely to participate. Therefore, raising awareness and educating stakeholders are important precursors to action. Illustrating how problems or issues relate to something stakeholders care about is also essential to motivating stakeholders to take action. No matter how glossy or fun educational materials might be, outreach messages have to reflect stakeholders' values, beliefs, and concerns and demonstrate potential benefits to prompt stakeholders to take action.

Activity: Identify Comprehensive List of Stakeholders

Initiating a very broad stakeholder strategy will help ensure that anyone directly or indirectly impacted by the watershed permitting analytical process and an NPDES watershed framework has an invitation to participate. In some cases, stakeholders might actually initiate the process, which might ensure initial stakeholder involvement to a degree. Even if stakeholders do initiate the process, EPA encourages the permitting authority to ensure that the reach of stakeholder participation is extended to capture all potential interested parties. The scope of interested stakeholders can gradually focus over time as the overall project scope becomes focused.

Techniques for Obtaining Information From and About Stakeholders

Observation. This technique involves watching the activities and interactions of stakeholders. The focus is on listening and recording information on opinions and relationships.

Interview. An interview helps with understanding what a representative stakeholder thinks about specific issues. It generates very detailed information and can establish an interpersonal connection.

Focus Group. This technique is essentially a group interview. The goal is for participants to state what they think about a series of questions and to serve as a catalyst for generating thoughts and observations that they might not have thought of individually.

Survey. This approach is useful for acquiring detailed information on perception and values from a broad audience. It might vary in length and question type, depending on where and how it is to be administered and the type of information it is

Identifying stakeholders is an iterative process. The process might begin with a small group of individuals who are knowledgeable about the watershed and could result in a comprehensive network of individuals and organizations that represent the diverse interests within the watershed. Individuals responsible for initiating the process (e.g., permitting authority, group of point sources, watershed organization) might also initiate the stakeholder identification process, tapping into local contacts that are familiar with the watershed. Together, this small group could brainstorm a list of the usual suspects—individuals and organizations that are active within a watershed and are obvious stakeholders. Using this initial list, the permitting authority can identify less obvious, but equally important, stakeholders such as long-time watershed residents and frequent water resource users. To expand the list of stakeholders, the permitting authority might use one or more techniques such as questionnaires, focus groups, and personal interviews. This formal process could continue until all potential interests within the watershed make it onto the comprehensive list. Compiling and maintaining a list of active stakeholders will help to manage this process. It is important to check with local environmental organizations because they may have gone through a similar exercise for other projects that require stakeholder involvement and could be willing to share their contact list for this process.

Activity: Assess Stakeholder Awareness of Watershed Issues

While compiling the stakeholder list and establishing an initial connection with stakeholders, the permitting authority might use that interaction as an opportunity to gather more than just contact information. For example, such interaction could be used to assess what stakeholders know, and do not know, about issues in the watershed and the NPDES permitting process. As mentioned earlier in this section, action is predicated on awareness and education. Finding out just how

aware stakeholders are about watershed issues will help to determine if more education is necessary or if launching immediately into action is appropriate.

EPA recommends that the permitting authority try to capture the concerns, issues, and perceptions of stakeholders; this type of information will play a significant role throughout the process, particularly in developing effective educational materials, planning involvement opportunities, and generating a feasible strategy. Using the theory that perception is reality, understanding the attitudes and beliefs of stakeholders will help identify potential challenges related to:

- Stakeholder collaboration (e.g., one interest group believes that another interest group is responsible for problems within the watershed and will work together only under certain conditions)
- Watershed permitting analytical approach implementation (e.g., nonpoint source interest groups do not think that nonpoint source pollution is causing water quality impairment, therefore, these groups do not agree to install recommended best management practices)

There are a number of recommended tools and techniques for assessing stakeholders' level of awareness, concerns, values, and perceptions. An in-depth discussion of these tools and techniques are available in existing EPA resources such as Getting In Step: A Guide for Conducting Watershed Outreach Campaigns (USEPA 2003a) and Community Culture and the Environment: A Guide to Understanding a Sense of Place (USEPA 2002).

Activity: Educate Stakeholders on Watershed Issues and the NPDES Permitting Process

Tailored educational materials are an important component of an overall stakeholder involvement strategy. These materials are important tools for increasing awareness and encouraging action; therefore, it is important that they contain clear, succinct, and meaningful information tailored to a specific audience. If stakeholders within the watershed have conducted watershed-level education and outreach, appropriate educational materials on basic watershed issues might already exist. If there are not educational partners within the watershed, it might be helpful to develop materials specific to a watershed approach and how the NPDES permitting process fits into that approach.

When developing educational materials, EPA recommends that the permitting authority should use information about stakeholders such as demographics, knowledge of watershed issues, and information distribution channels to determine what the educational materials should contain, how to present information, and how the final product will reach the target audience(s). Information contained in EPA's *Getting In Step: A Guide for Conducting Watershed Outreach Campaigns* provides a detailed approach for conducting effective outreach that incorporates social marketing techniques (USEPA 2003a).

In addition, the Nonpoint Source Outreach Toolbox, intended for use by state and local agencies and other organizations interested in educating the public on nonpoint source pollution or stormwater runoff, is available at **http://www.epa.gov/nps/toolbox**. The toolbox contains a variety of resources to help develop an effective and targeted outreach campaign, including a searchable catalog of nearly 800 print, radio, and TV ads and outreach materials.

Activity: Identify and Implement Opportunities for Stakeholders to Participate

Public involvement includes not only identifying stakeholder concerns, but also the mechanisms for stakeholders to express ideas and become a part of the overall process. Early and continuous involvement is important because stakeholders will play an important role throughout the process, including implementation. There are opportunities for stakeholders to participate in every step of the watershed permitting analytical approach and an NPDES watershed framework. EPA recommends that a permitting authority consider how much stakeholder involvement can realistically occur given time and financial constraints. Keep in mind, the more stakeholders are involved in the process, the more likely they are to be involved when it comes time for implementation—the time when stakeholder involvement is imperative for success!

When identifying opportunities for stakeholder participation, the permitting authority might look for activities that will meet regulatory requirements and even activities that go beyond these requirements. Public meetings can be an effective mechanism for stakeholders to voice their concerns and perspectives, while becoming educated on the problems, process, and potential solutions. Beyond public meetings, stakeholders can participate in a number of ways ranging from conducting specific research assignments on watershed issues to planning and hosting watershed site visits. Provided below are details related to planning and conducting public meetings, as well as creative ideas for stakeholder action.

Planning and Conducting Public Meetings

There is a range of public meeting styles and formats that can both engage stakeholders and generate the outcomes necessary to move the process forward. The key is integrating the goals and interests of stakeholders into the goals of the process. Initial public meetings can establish relationships among stakeholders and the individuals responsible for managing the process. Other meetings can provide stakeholders with the opportunity to identify scenarios, exchange ideas, evaluate options, and achieve consensus. The goal of each meeting will influence the meeting format and structure (e.g., brainstorming session, small group meetings, forum, public hearing), important considerations when planning and facilitating.

To initiate planning, articulate the goals and objectives of each public meeting to determine the appropriate meeting format, agenda, location, and facilitation approach. Described below are a few examples of public meeting formats and suggestions for using these formats.

- **Brainstorming sessions**. This type of meeting is effective for exchanging ideas, concerns, and perspectives and generating options without passing judgment. Brainstorming sessions should make participants feel comfortable and generate a high level of participation. Stakeholders can participate in brainstorming sessions as a large group or in multiple small groups with report out sessions to the larger group.
- **Small working groups**. Through this type of meeting, stakeholders can establish relationships with other members of the group while problem solving. Small working groups are useful for tackling discrete problems, such as evaluating scenarios that might prove too difficult to accomplish in a large group setting. Small groups can work on the same problem or scenario, or have different issues to address with report-out sessions at the end of the meeting.

- **Public hearings**. This is the most formal type of public meeting, often used to generate a formal public record that captures the issues and concerns of stakeholders. Public hearings generally consist of presentations followed by a question and answer session. These meetings, which may be required at certain points in the permitting process, are useful for capturing the varying perspectives of stakeholders and identifying recommended alternatives.
- **Open houses**. This type of meeting is useful for generating interest and conducting initial education. Open houses are very informal, often consisting of information booths and agency representatives that circulate through the meeting room. These relaxed meetings can serve as a way for stakeholders to get more information on watershed issues and determine if they would like to participate in future activities.
- **"Sunshine" meetings**. These meetings often take place after the commencement of a watershed management process as a way to update stakeholders on progress and activities. They are an interactive progress reporting mechanism, as opposed to printed updates, to keep stakeholders actively involved and interested. Sunshine meetings not only keep stakeholders informed of recent activities and challenges, but also ensure that lines of communication remain open and perspectives have not changed during the course of the process.

Public meetings can integrate several of the formats described above, depending on the stated goals and objectives. In addition, several of these formats, such as brainstorming sessions and sunshine meetings, could lend themselves to integration into regularly scheduled meetings of one or more stakeholder groups. Permitting authorities can take advantage of these meetings to add NPDES permitting topics to the existing meeting agenda. These meetings provide the opportunity for the permitting authority to go to the stakeholders rather than always requiring the stakeholders to go to the permitting authority. Meeting format becomes even more important when the goal is to achieve consensus among stakeholders. Achieving consensus among all stakeholders can prove difficult for many reasons, including size of the group, polarization of views, and insufficient time on the agenda. Using the appropriate meeting format can alleviate some of the challenges associated with consensus-based decisionmaking. EPA's guide titled *Getting In Step: Engaging and Involving Stakeholders in Your Watershed* provides tips and techniques for planning and facilitating stakeholder meetings (USEPA 2003b).

The activities described above should produce the following resources:

- Comprehensive list of stakeholders
- Plan for developing targeted educational materials
- Plan for conducting public meetings and other stakeholder involvement activities

These resources are essential to developing and implementing a stakeholder involvement strategy throughout the watershed permitting analytical approach and an NPDES watershed framework.

Resources for Identifying Stakeholders and Facilitating their Participation

USEPA (U.S. Environmental Protection Agency). 2002. *Community Culture and the Environment: A Guide to Understanding a Sense of Place.* Washington, DC. Available at www.epa.gov/ecocommunity/pdf/ccecomplete.pdf

USEPA (U.S. Environmental Protection Agency). 2003a. *Getting in Step: A Guide for Conducting Watershed Outreach Campaigns.* Washington, DC. Available at www.epa.gov/owow/watershed/outreach/documents/getnstep.pdf

USEPA (U.S. Environmental Protection Agency). 2003b. *Getting in Step: Engaging and Involving Stakeholders in Your Watershed.* Washington, DC. Available at www.epa.gov/owow/watershed/outreach/documents/stakeholderguide.pdf

APPENDIX B

WATERSHED AND SOURCE DATA GAP ASSESSMENT WORKSHEET

Watershed and Source Data Gap Assessment Worksheet	
Instructions: **For each data type, using the key below indicate the status of the data and any basic information available about the data sources and data quality. Additional details should be cataloged in a spreadsheet or database to facilitate queries and more complex data analyses.**	
Data Status Key: ✓+ Data exist and has been obtained ✓ Data exist, source is known, but has not been obtained U Existence or source of data Unknown X Data do not exist NA Data not applicable	
Watershed Data	
Status	**Data Type & Supplemental Information**
	Watershed boundaries
	Data description:
	Source:
	Format (circle one): Hard copy Electronic Software
	Location (Web site, file name, address):
	Quality of data:
	Hydrology
	Data description:
	Source:
	Format (circle one): Hard copy Electronic Software
	Location (Web site, file name, address):
	Quality of data:

Status	Data Type & Supplemental Information
	Topography
	Data description:
	Source:
	Format (circle one): Hard copy Electronic Software
	Location (Web site, file name, address):
	Quality of data:
	Soils
	Data description:
	Source:
	Format (circle one): Hard copy Electronic Software
	Location (Web site, file name, address):
	Quality of data:
	Climate
	Data description:
	Source:
	Format (circle one): Hard copy Electronic Software
	Location (Web site, file name, address):
	Quality of data:

Status	Data Type & Supplemental Information
	Land Use & Land Cover
	Data description:
	Source:
	Format (circle one): Hard copy Electronic Software
	Location (Web site, file name, address):
	Quality of data:
	Demographics
	Data description:
	Source:
	Format (circle one): Hard copy Electronic Software
	Location (Web site, file name, address):
	Quality of data:
	Aquatic Life & Habitat
	Data description:
	Source:
	Format (circle one): Hard copy Electronic Software
	Location (Web site, file name, address):
	Quality of data:
	Wildlife
	Data description:
	Source:
	Format (circle one): Hard copy Electronic Software
	Location (Web site, file name, address):
	Quality of data:

Status	Data Type & Supplemental Information
	Water Quality Standards
	Data description:
	Source:
	Format (circle one): Hard copy Electronic Software
	Location (Web site, file name, address):
	Quality of data:
	Water Quality Assessment and Impaired Waters
	Data description:
	Source:
	Format (circle one): Hard copy Electronic Software
	Location (Web site, file name, address):
	Quality of data:
	TMDLs
	Data description:
	Source:
	Format (circle one): Hard copy Electronic Software
	Location (Web site, file name, address):
	Quality of data:
	Source Water Protection Plans
	Data description:
	Source:
	Format (circle one): Hard copy Electronic Software
	Location (Web site, file name, address):
	Quality of data:

Point Source Data	
Status	**Data Type & Supplemental Information**
	Location of Point Sources
	Data description:
	Source:
	Format (circle one): Hard copy Electronic Software
	Location (Web site, file name, address):
	Quality of data:
	Point Source Permit Conditions
	Data description:
	Source:
	Format (circle one): Hard copy Electronic Software
	Location (Web site, file name, address):
	Quality of data:
	Point Source Monitoring Data
	Data description:
	Source:
	Format (circle one): Hard copy Electronic Software
	Location (Web site, file name, address):
	Quality of data:
	Point Source Compliance Data
	Data description:
	Source:
	Format (circle one): Hard copy Electronic Software
	Location (Web site, file name, address):
	Quality of data:

Nonpoint Source Data	
Status	**Data Type & Supplemental Information**
	Location of nonpoint sources
	Data description:
	Source:
	Format (circle one): Hard copy Electronic Software
	Location (Web site, file name, address):
	Quality of data:
	Location of BMPs
	Data description:
	Source:
	Format (circle one): Hard copy Electronic Software
	Location (Web site, file name, address):
	Quality of data:
	Nonpoint Source Pollutant Loading
	Data description:
	Source:
	Format (circle one): Hard copy Electronic Software
	Location (Web site, file name, address):
	Quality of data:

APPENDIX C

EXAMPLE SUPPLEMENTAL EFFLUENT LIMIT TABLE FOR CO-PERMITTEES (INCLUDES ANNUAL LOAD LIMIT, LOCATION RATIO, AND ASSOCIATION POLLUTANT LOADING CAP)

Example Supplemental Effluent Limit Table for Co-Permittees
(Includes Annual Load Limit, Location Ratio, and Association Pollutant Loading Cap)

NPDES Permit No.	Facility Name	Total Annual Load Limit (TN lbs/yr)	Location Ratio	(lbs/yr) of TN Delivered to Waterbody of Concern	Total Annual Load Limit (TP lbs/yr)	Location Ratio	(lbs/yr) of TP Delivered to Waterbody of Concern

Aggregate TN Limitation (lbs/yr)		Aggregate TP Limitation (lbs/yr)	

APPENDIX D

EXAMPLE SUPPLEMENTAL DISCHARGE MONITORING REPORT FORMS FOR NUTRIENT EFFLUENT LIMITATIONS ACCOMMODATING TRADING

National Pollutant Discharge Elimination System (NPDES) DISCHARGE MONITORING REPORT
Watershed-Based Permit

PERMITTEE NAME
PERMITTEE ADDRESS

NPDES PERMIT NUMBER	DISCHARGE SERIAL NUMBER

FACILITY LOCATION

RECEIVING WATER

	MONITORING PERIOD						
	YEAR	MONTH	DAY		YEAR	MONTH	DAY
FROM				TO			

Parameter	Effluent Limitations	Quantity or Loading		Units		Quality or Concentration			Units	Frequency of Analysis
		AVERAGE	TOTAL	AVERAGE	TOTAL	AVERAGE	MAXIMUM			
<Flow>										
<Phosphorus>										
<Nitrogen>										

Summary of Trade Transactions Made

Parameter	Trading Partner	Actual Discharge (see above)	Delivery Ratio	Adjusted Quantity of Credits Purchased (i.e., accounting for Delivery Ratio)	Load Used for Compliance Determination[1]		Adjusted Quantity of Credits Sold (i.e., accounting for Delivery Ratio)	Load for Compliance Determination[2]	Source of Credits Generated
<Phosphorus>									
<Nitrogen>									

1 Actual Discharge - (Delivered Credits Purchased - Delivered Credits Retired)
2 Actual Discharge + (Delivered Credits Sold)

Summary of Transactions to Offset (e.g., Restoration) Funds

EFFLUENT-MONTHLY

National Pollutant Discharge Elimination System (NPDES) DISCHARGE MONITORING REPORT
Watershed-Based Permit

PERMITTEE NAME	**NPDES PERMIT NUMBER**	**DISCHARGE SERIAL NUMBER**
PERMITTEE ADDRESS		

		CUMULATIVE PERIOD						
FACILITY LOCATION		YEAR	MONTH	DAY		YEAR	MONTH	DAY
	FROM				TO			
RECEIVING WATER								

Cumulative Reporting

	Cumulative Discharged Load by Month											
Parameter	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
<Phosphorus>												
<Nitrogen>												

Summary of Trade Transactions - CUMULATIVE TO DATE

Parameter	**Trading Partner**	**Actual Cumulative Discharge**	**Delivery Ratio**	**Adjusted Quantity of Credits Purch. (accounting for Delivery Ratio)**	**Load Used for Compliance Determination[1]**		**Adjusted Quantity of Credits Sold (accounting for Delivery Ratio)**	**Load for Compliance Determination[2]**	**Summary: Sources of Credits Generated**
<Phosphorus>									
<Nitrogen>									

1 Actual Discharge - (Delivered Credits Purchased - Delivered Credits Retired)

2 Actual Discharge + (Delivered Credits Sold)

Summary of Transactions to Offset (e.g., Restoration) Funds - CUMULATIVE TO DATE

CUMULATIVE REPORT

National Pollutant Discharge Elimination System (NPDES) DISCHARGE MONITORING REPORT
Watershed-Based Permit

PERMITTEE NAME	**NPDES PERMIT NUMBER**	**INTERNAL LOCATION**
PERMITTEE ADDRESS		

		MONITORING PERIOD						
FACILITY LOCATION		YEAR	MONTH	DAY		YEAR	MONTH	DAY
	FROM				TO			
RECEIVING WATER								

Parameter	**Permit Limits**	**Quantity or Loading**		**Units**		**Quality or Concentration**		**Units**	**Frequency of Analysis**
		AVERAGE	MAXIMUM	AVERAGE	MAXIMUM	AVERAGE	MAXIMUM		
<Flow>									
<Phosphorus>									
<Nitrogen>									

IMPLANT MONITORING

National Pollutant Discharge Elimination System (NPDES) DISCHARGE MONITORING REPORT
Watershed-Based Permit

PERMITTEE NAME
PERMITTEE ADDRESS

NPDES PERMIT NUMBER

RECEIVING WATER LOCATION*

RECEIVING WATER

RECEIVING WATER MONITORING LOCATION

	MONITORING PERIOD						
	YEAR	MONTH	DAY		YEAR	MONTH	DAY
FROM				TO			

Parameter	Quality or Concentration	Units	Frequency of Analysis
<Total Suspended Solids>			
<Phosphorus>			
<Nitrogen>			
<Conductivity>			
<Turbidity>			

*"Receiving Water Location" refers to a location upstream and/or downstream of the discharge point. Separate forms would be submitted for individual locations.

RECEIVING WATER

National Pollutant Discharge Elimination System (NPDES) DISCHARGE MONITORING REPORT
Watershed-Based Permit

PERMITTEE NAME
PERMITTEE ADDRESS

NPDES PERMIT NUMBER	DISCHARGE SERIAL NUMBER

FACILITY LOCATION

YEAR:

RECEIVING WATER

Parameter	Effluent Limitations
<Flow>	
<Phosphorus>	
<Nitrogen>	

Cumulative Reporting

Parameter	Cumulative Load Discharged by Month											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<Phosphorus>												
<Nitrogen>												

Summary of Trade Transactions

Parameter	Trading Partner	Delivery Ratio		1st Quarter Net Credits*		2nd Quarter Net Credits*		3rd Quarter Net Credits*		4th Quarter Net Credits*		ANNUAL Adjusted Net Credits* After Delivery Ratio

*Net Credits = (Delivered Credits Purchased) - (Credits Retired) - (Credits Sold)

Summary of Transactions to Offset (e.g., Restoration) Funds or Other Method of Credit Generation (e.g, treatment, BMPs)

ANNUAL SUMMARY

050861

Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices

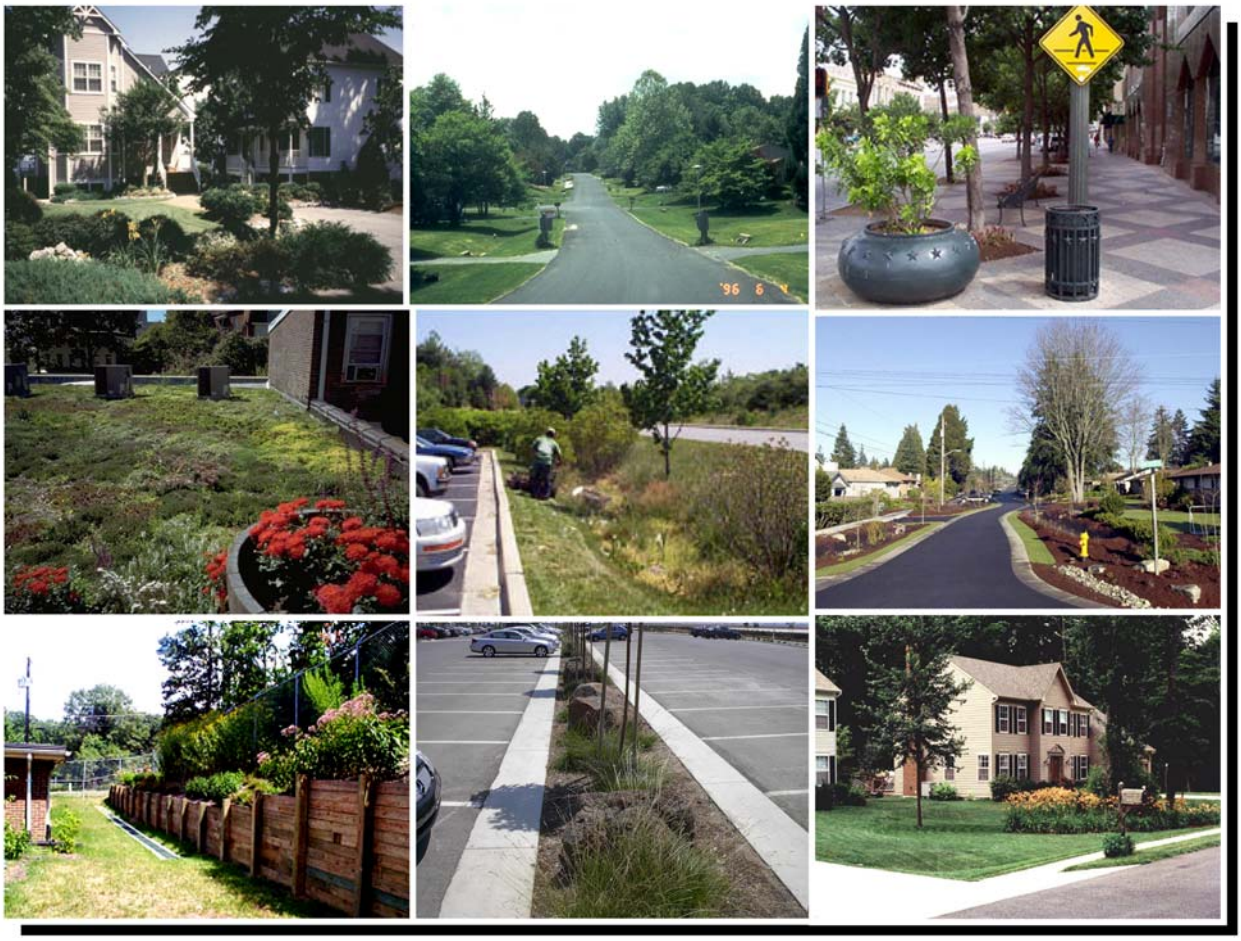

Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices

December 2007

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Nonpoint Source Control Branch (4503T)

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Washington, DC 20460

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FOREWORD

One of the most exciting new trends in water quality management today is the movement by many cities, counties, states, and private-sector developers toward the increased use of Low Impact Development (LID) to help protect and restore water quality. LID comprises a set of approaches and practices that are designed to reduce runoff of water and pollutants from the site at which they are generated. By means of infiltration, evapotranspiration, and reuse of rainwater, LID techniques manage water and water pollutants at the source and thereby prevent or reduce the impact of development on rivers, streams, lakes, coastal waters, and ground water.

Although the increase in application of these practices is growing rapidly, data regarding both the effectiveness of these practices and their costs remain limited. This document is focused on the latter issue, and the news is good. In the vast majority of cases, the U.S. Environmental Protection Agency (EPA) has found that implementing well-chosen LID practices saves money for developers, property owners, and communities while protecting and restoring water quality.

While this study focuses on the cost reductions and cost savings that are achievable through the use of LID practices, it is also the case that communities can experience many amenities and associated economic benefits that go beyond cost savings. These include enhanced property values, improved habitat, aesthetic amenities, and improved quality of life. This study does not monetize and consider these values in performing the cost calculations, but these economic benefits are real and significant. For that reason, EPA has included a discussion of these economic benefits in this document and provided references for interested readers to learn more about them.

Readers interested in increasing their knowledge about LID and Green Infrastructure, which encompasses LID along with other aspects of green development, should see www.epa.gov/npdes/greeninfrastructure and www.epa.gov/nps/lid. It is EPA's hope that as professionals and citizens continue to become more knowledgeable about the effectiveness and costs of LID, the use of LID practices will continue to increase at a rapid pace.

EXECUTIVE SUMMARY

This report summarizes 17 case studies of developments that include Low Impact Development (LID) practices and concludes that applying LID techniques can reduce project costs and improve environmental performance. In most cases, LID practices were shown to be both fiscally and environmentally beneficial to communities. In a few cases, LID project costs were higher than those for conventional stormwater management practices. However, in the vast majority of cases, significant savings were realized due to reduced costs for site grading and preparation, stormwater infrastructure, site paving, and landscaping. Total capital cost savings ranged from 15 to 80 percent when LID methods were used, with a few exceptions in which LID project costs were higher than conventional stormwater management costs.

EPA has identified several additional areas that will require further study. First, in all cases, there were benefits that this study did not monetize and did not factor into the project's bottom line. These benefits include improved aesthetics, expanded recreational opportunities, increased property values due to the desirability of the lots and their proximity to open space, increased total number of units developed, increased marketing potential, and faster sales. Second, more research is also needed to quantify the environmental benefits that can be achieved through the use of LID techniques and the costs that can be avoided. Examples of environmental benefits include reduced runoff volumes and pollutant loadings to downstream waters, and reduced incidences of combined sewer overflows. Finally, more research is needed to monetize the cost reductions that can be achieved through improved environmental performance, reductions in long-term operation and maintenance costs, and/or reductions in the life cycle costs of replacing or rehabilitating infrastructure.

INTRODUCTION

BACKGROUND

Most stormwater runoff is the result of the man-made hydrologic modifications that normally accompany development. The addition of impervious surfaces, soil compaction, and tree and vegetation removal result in alterations to the movement of water through the environment. As interception, evapotranspiration, and infiltration are reduced and precipitation is converted to overland flow, these modifications affect not only the characteristics of the developed site but also the watershed in which the development is located. Stormwater has been identified as one of the leading sources of pollution for all waterbody types in the United States. Furthermore, the impacts of stormwater pollution are not static; they usually increase with more development and urbanization.

Extensive development in the United States is a relatively recent phenomenon. For the past two decades, the rate of land development across the country has been twice the rate of population growth. Approximately 25 million acres were developed between 1982 and 1997, resulting in a 34 percent increase in the amount of developed land with only a 15 percent increase in population.[1,2] The 25 million acres developed during this 15-year period represent nearly 25 percent of the total amount of developed land in the contiguous states. The U.S. population is expected to increase by 22 percent from 2000 to 2025. If recent development trends continue, an additional 68 million acres of land will be developed during this 25-year period.[3]

Water quality protection strategies are often implemented at three scales: the region or large watershed area, the community or neighborhood, and the site or block. Different stormwater approaches are used at different scales to afford the greatest degree of protection to waterbodies because the influences of pollution are often found at all three scales. For example, decisions about where and how to grow are the first and perhaps most important decisions related to water quality. Growth and development can give a community the resources needed to revitalize a downtown, refurbish a main street, build new schools, and develop vibrant places to live, work, shop, and play. The environmental impacts of development, however, can pose challenges for communities striving to protect their natural resources. Development that uses land efficiently and protects undisturbed natural lands allows a community to grow and still protect its water resources.

Strategies related to these broad growth and development issues are often implemented at the regional or watershed scale. Once municipalities have determined where to grow and where to preserve, various stormwater management techniques are applied at the neighborhood or community level. These measures, such as road width requirements, often transcend specific development sites and can be applied throughout a neighborhood. Finally, site-specific stormwater strategies, such as rain gardens and infiltration areas, are incorporated within a particular development. Of course, some stormwater management strategies can be applied at several scales. For example, opportunities to maximize infiltration can occur at the neighborhood and site levels.

Many smart growth approaches can decrease the overall amount of impervious cover associated with a development's footprint. These approaches include directing development to already degraded land; using narrower roads; designing smaller parking lots; integrating retail, commercial, and residential uses; and designing more compact residential lots. These development approaches, combined with other techniques aimed at reducing the impact of development, can offer communities superior stormwater management.

Stormwater management programs have struggled to provide adequate abatement and treatment of stormwater at the current levels of development. Future development will create even greater challenges for maintaining and improving water quality in the nation's waterbodies. The past few decades of stormwater management have resulted in the current convention of control-and-treatment strategies. They are largely engineered, end-of-pipe practices that have been focused on controlling peak flow rate and suspended solids concentrations. Conventional practices, however, fail to address the widespread and cumulative hydrologic modifications within the watershed that increase stormwater volumes and runoff rates and cause excessive erosion and stream channel degradation. Existing practices also fail to adequately treat for other pollutants of concern, such as nutrients, pathogens, and metals.

LOW IMPACT DEVELOPMENT

Low Impact Development (LID)[4] is a stormwater management strategy that has been adopted in many localities across the country in the past several years. It is a stormwater management approach and set of practices that can be used to reduce runoff and pollutant loadings by managing the runoff as close to its source(s) as possible. A set or system of small-scale practices, linked together on the site, is often used. LID approaches can be used to reduce the impacts of development and redevelopment activities on water resources. In the case of new development, LID is typically used to achieve or pursue the goal of maintaining or closely replicating the predevelopment hydrology of the site. In areas where development has already occurred, LID can be used as a retrofit practice to reduce runoff volumes, pollutant loadings, and the overall impacts of existing development on the affected receiving waters.

In general, implementing integrated LID practices can result in enhanced environmental performance while at the same time reducing development costs when compared to traditional stormwater management approaches. LID techniques promote the use of natural systems, which can effectively remove nutrients, pathogens, and metals from stormwater. Cost savings are typically seen in reduced infrastructure because the total volume of runoff to be managed is minimized through infiltration and evapotranspiration. By working to mimic the natural water cycle, LID practices protect downstream resources from adverse pollutant and hydrologic impacts that can degrade stream channels and harm aquatic life.

It is important to note that typical, real-world LID designs usually incorporate more than one type of practice or technique to provide integrated treatment of runoff from a site. For example, in lieu of a treatment pond serving a new subdivision, planners might incorporate a bioretention area in each yard, disconnect downspouts from driveway surfaces, remove curbs, and install grassed swales in common areas. Integrating small

practices throughout a site instead of using extended detention wet ponds to control runoff from a subdivision is the basis of the LID approach.

When conducting cost analyses of these practices, examples of projects where actual practice-by-practice costs were considered separately were found to be rare because material and labor costs are typically calculated for an entire site rather than for each element within a larger system. Similarly, it is difficult to calculate the economic benefits of individual LID practices on the basis of their effectiveness in reducing runoff volume and rates or in treating pollutants targeted for best management practice (BMP) performance monitoring.

The following is a summary of the different categories of LID practices, including a brief description and examples of each type of practice.

Conservation designs can be used to minimize the generation of runoff by preserving open space. Such designs can reduce the amount of impervious surface, which can cause increased runoff volumes. Open space can also be used to treat the increased runoff from the built environment through infiltration or evapotranspiration. For example, developers can use conservation designs to preserve important features on the site such as wetland and riparian areas, forested tracts, and areas of porous soils. Development plans that outline the smallest site disturbance area can minimize the stripping of topsoil and compaction of subsoil that result from grading and equipment use. By preserving natural areas and not clearing and grading the entire site for housing lots, less total runoff is generated on the development parcel. Such simplistic, nonstructural methods can reduce the need to build large structural runoff controls like retention ponds and stormwater conveyance systems and thereby decrease the overall infrastructure costs of the project. Reducing the total area of impervious surface by limiting road widths, parking area, and sidewalks can also reduce the volume of runoff that must be treated. Residential developments that incorporate conservation design principles also can benefit residents and their quality of life due to increased access and proximity to communal open space, a greater sense of community, and expanded recreational opportunities.

Examples of Conservation Design

- Cluster development
- Open space preservation
- Reduced pavement widths (streets, sidewalks)
- Shared driveways
- Reduced setbacks (shorter driveways)
- Site fingerprinting during construction

Infiltration practices are engineered structures or landscape features designed to capture and infiltrate runoff. They can be used to reduce both the volume of runoff discharged from the site and the infrastructure needed to convey, treat, or control runoff. Infiltration practices can also be used to recharge ground water. This benefit is especially important in areas where maintaining drinking water supplies and stream baseflow is of special concern because of limited precipitation or a high ratio of withdrawal to recharge rates. Infiltration of runoff can also help to maintain stream temperatures because the infiltrated water that moves laterally to replenish stream baseflow typically has a lower temperature than overland flows, which might be subject

Examples of Infiltration Practices

- Infiltration basins and trenches
- Porous pavement
- Disconnected downspouts
- Rain gardens and other vegetated treatment systems

to solar radiation. Another advantage of infiltration practices is that they can be integrated into landscape features in a site-dispersed manner. This feature can result in aesthetic benefits and, in some cases, recreational opportunities; for example, some infiltration areas can be used as playing fields during dry periods.

Runoff storage practices. Impervious surfaces are a central part of the built environment, but runoff from such surfaces can be captured and stored for reuse or gradually infiltrated, evaporated, or used to irrigate plants. Using runoff storage practices has several benefits. They can reduce the volume of runoff discharged to surface waters, lower the peak flow hydrograph to protect streams from the erosive forces of high flows, irrigate landscaping, and provide aesthetic benefits such as landscape islands, tree boxes, and rain gardens. Designers can take advantage of the void space beneath paved areas like parking lots and sidewalks to provide additional storage. For example, underground vaults can be used to store runoff in both urban and rural areas.

Examples of Runoff Storage Practices

- Parking lot, street, and sidewalk storage
- Rain barrels and cisterns
- Depressional storage in landscape islands and in tree, shrub, or turf depressions
- Green roofs

Runoff conveyance practices. Large storm events can make it difficult to retain all the runoff generated on-site by using infiltration and storage practices. In these situations, conveyance systems are typically used to route excess runoff through and off the site. In LID designs, conveyance systems can be used to slow flow velocities, lengthen the runoff time of concentration, and delay peak flows that are discharged off-site. LID conveyance practices can be used as an alternative to curb-and-gutter systems, and from a water quality perspective they have advantages over conventional approaches designed to rapidly convey runoff off-site and alleviate on-site flooding. LID conveyance practices often have rough surfaces, which slow runoff and increase evaporation and settling of solids. They are typically permeable and vegetated, which promotes infiltration, filtration, and some biological uptake of pollutants. LID conveyance practices also can perform functions similar to those of conventional curbs, channels, and gutters. For example, they can be used to reduce flooding around structures by routing runoff to landscaped areas for treatment, infiltration, and evapotranspiration.

Examples of Runoff Conveyance Practices

- Eliminating curbs and gutters
- Creating grassed swales and grass-lined channels
- Roughening surfaces
- Creating long flow paths over landscaped areas
- Installing smaller culverts, pipes, and inlets
- Creating terraces and check dams

Filtration practices are used to treat runoff by filtering it through media that are designed to capture pollutants through the processes of physical filtration of solids and/or cation exchange of dissolved pollutants. Filtration practices offer many of the same benefits as infiltration, such as reductions in the volume of runoff transported off-site, ground water recharge, increased stream baseflow, and reductions in thermal impacts to receiving waters. Filtration practices also have the added advantage of providing increased pollutant removal benefits. Although pollutant build-up and removal may be of concern, pollutants are typically captured in the upper soil horizon and can be removed by replacing the topsoil.

Examples of Filtration Practices

- Bioretention/rain gardens
- Vegetated swales
- Vegetated filter strips/buffers

Low impact landscaping. Selection and distribution of plants must be carefully planned when designing a functional landscape. Aesthetics are a primary concern, but it is also important to consider long-term maintenance goals to reduce inputs of labor, water, and chemicals. Properly preparing soils and selecting species adapted to the microclimates of a site greatly increases the success of plant establishment and growth, thereby stabilizing soils and allowing for biological uptake of pollutants. Dense, healthy plant growth offers such benefits as pest resistance (reducing the need for pesticides) and improved soil infiltration from root growth. Low impact landscaping can thus reduce impervious surfaces, improve infiltration potential, and improve the aesthetic quality of the site.

Examples of Low Impact Landscaping

- Planting native, drought-tolerant plants
- Converting turf areas to shrubs and trees
- Reforestation
- Encouraging longer grass length
- Planting wildflower meadows rather than turf along medians and in open space
- Amending soil to improve infiltration

EVALUATIONS OF BENEFITS AND COSTS

To date, the focus of traditional stormwater management programs has been concentrated largely on structural engineering solutions to manage the hydraulic consequences of the increased runoff that results from development. Because of this emphasis, stormwater management has been considered primarily an engineering endeavor. Economic analyses regarding the selection of solutions that are not entirely based on pipes and ponds have not been a significant factor in management decisions. Where costs have been considered, the focus has been primarily on determining capital costs for conventional infrastructure, as well as operation and maintenance costs in dollars per square foot or dollars per pound of pollutant removed.

Little attention has been given to the benefits that can be achieved through implementing LID practices. For example, communities rarely attempt to quantify and monetize the pollution prevention benefits and avoided treatment costs that might accrue from the use of conservation designs or LID techniques. To be more specific, the benefits of using LID practices to decrease the need for combined sewer overflow (CSO) storage and conveyance systems should be factored into the economic analyses. One of the major factors preventing LID practices from receiving equal consideration in the design or selection process is the difficulty of monetizing the environmental benefits of these practices. Without good data and relative certainty that these alternatives will work and not increase risk or cost, current standards of practice are difficult to change.

This report is an effort to compare the projected or known costs of LID practices with those of conventional development approaches. At this point, monetizing the economic and environmental benefits of LID strategies is much more difficult than monetizing traditional infrastructure costs or changes in property values due to improvements in existing utilities or transportation systems. Systems of practices must be analyzed to determine net performance and monetary benefits based on the capacity of the systems to both treat for pollutants and reduce impacts through pollution prevention. For example, benefits might come in the form of reduced stream channel degradation, avoided stream restoration costs, or reduced drinking water treatment costs.

One of the chief impediments to getting useful economic data to promote more widespread use of LID techniques is the lack of a uniform baseline with which to compare the costs and benefits of LID practices against the costs of conventional stormwater treatment and control. Analyzing benefits is further complicated in cases where the environmental performance of the conservation design or LID system exceeds that of the conventional runoff management system, because such benefits are not easily monetized. The discussion below is intended to provide a general discussion of the range of economic benefits that may be provided by LID practices in a range of appropriate circumstances.

OVERVIEW OF BENEFITS

The following is a brief discussion of some of the actual and assumed benefits of LID practices. Note that environmental and ancillary benefits typically are not measured as part of development projects, nor are they measured as part of pilot or demonstration projects, because they can be difficult to isolate and quantify. Many of the benefits described below are assumed on the basis of limited studies and anecdotal evidence.

The following discussion is organized into three categories: (1) environmental benefits, which include reductions in pollutants, protection of downstream water resources, ground water recharge, reductions in pollutant treatment costs, reductions in the frequency and severity of CSOs, and habitat improvements; (2) land value benefits, which include reductions in downstream flooding and property damage, increases in real estate value, increased parcel lot yield, increased aesthetic value, and improvement of quality of life by providing open space for recreation; and (3) compliance incentives.

Environmental Benefits

Pollution abatement. LID practices can reduce both the volume of runoff and the pollutant loadings discharged into receiving waters. LID practices result in pollutant removal through settling, filtration, adsorption, and biological uptake. Reductions in pollutant loadings to receiving waters, in turn, can improve habitat for aquatic and terrestrial wildlife and enhance recreational uses. Reducing pollutant loadings can also decrease stormwater and drinking water treatment costs by decreasing the need for regional stormwater management systems and expansions in drinking water treatment systems.

Protection of downstream water resources. The use of LID practices can help to prevent or reduce hydrologic impacts on receiving waters, reduce stream channel degradation from erosion and sedimentation, improve water quality, increase water supply, and enhance the recreational and aesthetic value of our natural resources. LID practices can be used to protect water resources that are downstream in the watershed. Other potential benefits include reduced incidence of illness from contact recreation activities such as swimming and wading, more robust and safer seafood supplies, and reduced medical treatment costs.

Ground water recharge. LID practices also can be used to infiltrate runoff to recharge ground water. Growing water shortages nationwide increasingly indicate the need for water resource management strategies designed to integrate stormwater, drinking water, and wastewater programs to maximize benefits and minimize costs. Development pressures typically result in increases in the amount of impervious surface and volume of runoff. Infiltration practices can be used to replenish ground water and increase stream baseflow. Adequate baseflow to streams during dry weather is important because low ground water levels can lead to greater fluctuations in stream depth, flows, and temperatures, all of which can be detrimental to aquatic life.

Water quality improvements/reduced treatment costs. It is almost always less expensive to keep water clean than it is to clean it up. The Trust for Public Land[5] noted Atlanta's tree cover has saved more than $883 million by preventing the need for stormwater retention facilities. A study of 27 water suppliers conducted by the Trust for Public Land and the American Water Works Association[6] found a direct relationship between forest cover in a watershed and water supply treatment costs. In other words, communities with higher percentages of forest cover had lower treatment costs. According to the study, approximately 50 to 55 percent of the variation in treatment costs can be explained by the percentage of forest cover in the source area. The researchers also found that for every 10 percent increase in forest cover in the source area, treatment and chemical costs decreased approximately 20 percent, up to about 60 percent forest cover.

Reduced incidence of CSOs. Many municipalities have problems with CSOs, especially in areas with aging infrastructure. Combined sewer systems discharge sanitary wastewater during storm events. LID techniques, by retaining and infiltrating runoff, reduce the frequency and amount of CSO discharges to receiving waters. Past management efforts typically have been concentrated on hard engineering approaches focused on treating the total volume of sanitary waste together with the runoff that is discharged to the combined system. Recently, communities like Portland (Oregon), Chicago, and Detroit have been experimenting with watershed approaches aimed at reducing the total volume of runoff generated that must be handled by the combined system. LID techniques have been the primary method with which they have experimented to reduce runoff. A Hudson Riverkeeper report concluded, based on a detailed technical analysis, that New York City could reduce its CSO's more cost-effectively with LID practices than with conventional, hard infrastructure CSO storage practices. [7]

Habitat improvements. Innovative stormwater management techniques like LID or conservation design can be used to improve natural resources and wildlife habitat, maintain or increase land value, or avoid expensive mitigation costs.

Land Value and Quality of Life Benefits

Reduced downstream flooding and property damage. LID practices can be used to reduce downstream flooding through the reduction of peak flows and the total amount or volume of runoff. Flood prevention reduces property damage and can reduce the initial capital costs and the operation and maintenance costs of stormwater infrastructure. Strategies designed to manage runoff on-site or as close as possible to its point of generation can reduce erosion and sediment transport as well as reduce flooding and downstream erosion. As a result, the costs for cleanups and streambank restoration can be reduced or avoided altogether. The use of LID techniques also can help protect or restore floodplains, which can be used as park space or wildlife habitat.[8]

Real estate value/property tax revenue. Homeowners and property owners are willing to pay a premium to be located next to or near aesthetically pleasing amenities like water features, open space, and trails. Some stormwater treatment systems can be beneficial to developers because they can serve as a "water" feature or other visual or recreational amenity that can be used to market the property. These designs should be visually attractive and safe for the residents and should be considered an integral part of planning the development. Various LID projects and smart growth studies have shown that people are willing to pay more for clustered homes than conventionally designed subdivisions. Clustered housing with open space appreciated at a higher rate than conventionally designed subdivisions. EPA's *Economic Benefits of Runoff Controls*[9] describes numerous examples where developers and subsequent homeowners have received premiums for proximity to attractive stormwater management practices.

Lot yield. LID practices typically do not require the large, contiguous areas of land that are usually necessary when traditional stormwater controls like ponds are used. In cases where LID practices are incorporated on individual house lots and along roadsides as part of the landscaping, land that would normally be dedicated for a stormwater pond or other large structural control can be developed with additional housing lots.

Aesthetic value. LID techniques are usually attractive features because landscaping is an integral part of the designs. Designs that enhance a property's aesthetics using trees, shrubs, and flowering plants that complement other landscaping features can be selected. The use of these designs may increase property values or result in faster sale of the property due to the perceived value of the "extra" landscaping.

Public spaces/quality of life/public participation. Placing water quality practices on individual lots provides opportunities to involve homeowners in stormwater management and enhances public awareness of water quality issues. An American Lives, Inc., real estate study found that 77.7 percent of potential homeowners rated natural open space as "essential" or "very important" in planned communities.[10]

Compliance Incentives

Regulatory compliance credits. Many states recognize the positive benefits LID techniques offer, such as reduced wetland impacts. As a result, they might offer regulatory compliance credits, streamlined or simpler permit processes, and other incentives similar to those offered for other green practices. For example, in Maryland the volume required for the permanent pool of a wet pond can be reduced if rooftop runoff is infiltrated on-site using LID practices. This procedure allows rooftop area to be subtracted from the total impervious area, thereby reducing the required size of the permanent pool. In addition, a LID project can have less of an environmental impact than a conventional project, thus requiring smaller impact fees.

COST CONSIDERATIONS

Traditional approaches to stormwater management involve conveying runoff off-site to receiving waters, to a combined sewer system, or to a regional facility that treats runoff from multiple sites. These designs typically include hard infrastructure, such as curbs, gutters, and piping. LID-based designs, in contrast, are designed to use natural drainage features or engineered swales and vegetated contours for runoff conveyance and treatment. In terms of costs, LID techniques like conservation design can reduce the amount of materials needed for paving roads and driveways and for installing curbs and gutters. Conservation designs can be used to reduce the total amount of impervious surface, which results in reduced road and driveway lengths and reduced costs. Other LID techniques, such as grassed swales, can be used to infiltrate roadway runoff and eliminate or reduce the need for curbs and gutters, thereby reducing infrastructure costs. Also, by infiltrating or evaporating runoff, LID techniques can reduce the size and cost of flood-control structures. Note that more research is needed to determine the optimal combination of LID techniques and detention practices for flood control.

It must be stated that the use of LID techniques might not always result in lower project costs. The costs might be higher because of the costs of plant material, site preparation, soil amendments, underdrains and connections to municipal stormwater systems, and increased project management.

Another factor to consider when comparing costs between traditional and LID designs is the amount of land required to implement a management practice. Land must be set aside for both traditional stormwater management practices and LID practices, but the former require the use of land *in addition to* individual lots and other community areas, whereas bioretention areas and swales can be incorporated into the landscaping of yards, in rights-

of-way along roadsides, and in or adjacent to parking lots. The land that would have been set aside for ponds or wetlands can in many cases be used for additional housing units, yielding greater profits.

Differences in maintenance requirements should also be considered when comparing costs. According to a 1999 EPA report, maintenance costs for retention basins and constructed wetlands were estimated at 3 to 6 percent of construction costs, whereas maintenance costs for swales and bioretention practices were estimated to be 5 to 7 percent of construction costs.[11] However, much of the maintenance for bioretention areas and swales can be accomplished as part of routine landscape maintenance and does not require specialized equipment. Wetland and pond maintenance, on the other hand, involves heavy equipment to remove accumulated sediment, oils, trash, and vegetation in forebays and open ponds.

Finally, in some circumstances LID practices can offset the costs associated with regulatory requirements for stormwater control. In urban redevelopment projects where land is not likely to be available for large stormwater management practices, developers can employ site-dispersed BMPs in sidewalk areas, in courtyards, on rooftops, in parking lots, and in other small outdoor spaces, thereby avoiding the fees that some municipalities charge when stormwater mitigation requirements cannot otherwise be met. In addition, stormwater utilities often provide credits for installing runoff management practices such as LID practices.[12]

CASE STUDIES

The case studies presented below are not an exhaustive list of LID projects nationwide. These examples were selected on the basis of the quantity and quality of economic data, quantifiable impacts, and types of LID practices used. Economic data are available for many other LID installations, but those installations often cannot be compared with conventional designs because of the unique nature of the design or the pilot status of the project. Table 1 presents a summary of the LID practices employed in each case study.

Table 1. Summary of LID Practices Employed in the Case Studies

Name	LID Techniques							
	Biore-tention	Cluster Building	Reduced Impervious Area	Swales	Permeable Pavement	Vegetated Landscaping	Wetlands	Green Roofs
2nd Avenue SEA Street	✓		✓	✓				
Auburn Hills	✓		✓	✓		✓	✓	
Bellingham Parking Lot Retrofits	✓							
Central Park Commercial Redesigns	✓			✓				
Crown Street	✓		✓	✓				
Gap Creek			✓			✓		
Garden Valley	✓	✓		✓	✓		✓	
Kensington Estates		✓	✓		✓	✓	✓	
Laurel Springs	✓	✓	✓	✓				
Mill Creek		✓	✓	✓				
Poplar Street Apartments	✓			✓			✓	
Portland Downspout Disconnection*			✓					
Prairie Crossing	✓		✓	✓		✓		
Prairie Glen	✓	✓	✓	✓		✓	✓	
Somerset	✓			✓				
Tellabs Corporate Campus	✓			✓		✓	✓	
Toronto Green Roofs								✓

*Although impervious area stays the same, the disconnection program reduces directly connected impervious area.

The case studies contain an analysis of development costs, which are summarized in Table 2. Note that some case study results do not lend themselves well to a traditional vs.

LID cost comparison and therefore are not included in Table 2 (as noted). *Conventional development cost* refers to costs incurred or estimated for a traditional stormwater management approach, whereas *LID cost* refers to costs incurred or estimated for using LID practices. *Cost difference* is the difference between the conventional development cost and the LID cost. *Percent difference* is the cost savings relative to the conventional development cost.

Table 2. Summary of Cost Comparisons Between Conventional and LID Approaches[a]

Project	Conventional Development Cost	LID Cost	Cost Difference[b]	Percent Difference[b]
2nd Avenue SEA Street	$868,803	$651,548	$217,255	25%
Auburn Hills	$2,360,385	$1,598,989	$761,396	32%
Bellingham City Hall	$27,600	$5,600	$22,000	80%
Bellingham Bloedel Donovan Park	$52,800	$12,800	$40,000	76%
Gap Creek	$4,620,600	$3,942,100	$678,500	15%
Garden Valley	$324,400	$260,700	$63,700	20%
Kensington Estates	$765,700	$1,502,900	–$737,200	-96%
Laurel Springs	$1,654,021	$1,149,552	$504,469	30%
Mill Creek[c]	$12,510	$9,099	$3,411	27%
Prairie Glen	$1,004,848	$599,536	$405,312	40%
Somerset	$2,456,843	$1,671,461	$785,382	32%
Tellabs Corporate Campus	$3,162,160	$2,700,650	$461,510	15%

[a] The Central Park Commercial Redesigns, Crown Street, Poplar Street Apartments, Prairie Crossing, Portland Downspout Disconnection, and Toronto Green Roofs study results do not lend themselves to display in the format of this table.
[b] Negative values denote increased cost for the LID design over conventional development costs.
[c] Mill Creek costs are reported on a per-lot basis.

2ND AVENUE SEA STREET, SEATTLE, WASHINGTON

The 2nd Avenue Street Edge Alternative (SEA) Street project was a pilot project undertaken by Seattle Public Utilities to redesign an entire 660-foot block with a number of LID techniques. The goals were to reduce stormwater runoff and to provide a more "livable" community. Throughout the design and construction process, Seattle Public Utilities worked collaboratively with street residents to develop the final street design.[13]

The design reduced imperviousness, included retrofits of bioswales to treat and manage stormwater, and added 100 evergreen trees and 1,100 shrubs.[14] Conventional curbs and gutters were replaced with bioswales in the rights-of-way on both sides of the street, and the street width was reduced from 25 feet to 14 feet. The final constructed design reduced imperviousness by more than 18 percent. An estimate for the final total project cost was $651,548. A significant amount of community outreach was involved, which raised the level of community acceptance. Community input is important for any project, but because this was a pilot study, much more was spent on communication and redesign than what would be spent for a typical project.

The costs for the LID retrofit were compared with the estimated costs of a conventional street retrofit (Table 3). Managing stormwater with LID techniques resulted in a cost savings of 29 percent. Also, the reduction in street width and sidewalks reduced paving costs by 49 percent.

Table 3. Cost Comparison for 2nd Avenue SEA Street [15]

Item	Conventional Development Cost	SEA Street Cost	Cost Savings*	Percent Savings*	Percent of Total Savings*
Site preparation	$65,084	$88,173	–$23,089	–35%	–11%
Stormwater management	$372,988	$264,212	$108,776	29%	50%
Site paving and sidewalks	$287,646	$147,368	$140,278	49%	65%
Landscaping	$78,729	$113,034	–$34,305	–44%	–16%
Misc. (mobilization, etc.)	$64,356	$38,761	$25,595	40%	12%
Total	$868,803	$651,548	$217,255	—	—

* Negative values denote increased cost for the LID design over conventional development costs.

The avoided cost for stormwater infrastructure and reduced cost for site paving accounted for much of the overall cost savings. The nature of the design, which included extensive use of bioswales and vegetation, contributed to the increased cost for site preparation and landscaping. Several other SEA Street projects have been completed or are under way, and cost evaluations are expected to be favorable.

For this site, the environmental performance has been even more significant than the cost savings. Hydrologic monitoring of the project indicates a 99 percent reduction in total potential surface runoff, and runoff has not been recorded at the site since December 2002, a period that included the highest-ever 24-hour recorded rainfall at Seattle-Tacoma Airport.[16] The site is retaining more than the original design estimate of 0.75 inch of rain. A modeling analysis indicates that if a conventional curb-and-gutter system had been installed along 2nd Avenue instead of the SEA Street design, 98 times more stormwater would have been discharged from the site.[17]

Auburn Hills Subdivision, Southwestern Wisconsin

Auburn Hills in southwestern Wisconsin is a residential subdivision developed with conservation design principles. Forty percent of the site is preserved as open space; this open space includes wetlands, green space and natural plantings, and walking trails. The subdivision was designed to include open swales and bioretention for stormwater management. To determine potential savings from using conservation design, the site construction costs were compared with the estimated cost of building the site as a conventional subdivision.[18] Reduced stormwater management costs accounted for approximately 56 percent of the total cost savings. A cost comparison is provided in Table 4. Other savings not shown in Table 4 were realized as a result of reduced sanitary sewer, water distribution, and utility construction costs.

Table 4. Cost Comparison for Auburn Hills Subdivision [19]

Item	Conventional Development Cost	Auburn Hills LID Cost	Cost Savings*	Percent Savings*	Percent of Total Savings*
Site preparation	$699,250	$533,250	$166,000	24%	22%
Stormwater management	$664,276	$241,497	$422,779	64%	56%
Site paving and sidewalks	$771,859	$584,242	$187,617	24%	25%
Landscaping	$225,000	$240,000	–$15,000	-7%	-2%
Total	$2,360,385	$1,598,989	$761,396	—	—

* Negative values denote increased cost for the LID design over conventional development costs.

The clustered design used in the development protected open space and reduced clearing and grading costs. Costs for paving and sidewalks were also decreased because the cluster design reduced street length and width. Stormwater savings were realized primarily through the use of vegetated swales and bioswales. These LID practices provided stormwater conveyance and treatment and also lowered the cost of conventional stormwater infrastructure. The increase in landscaping costs resulted from additional open space present on-site compared to a conventional design, as well as increased street sweeping. Overall, the subdivision's conservation design retained more natural open space for the benefit and use of the homeowners and aided stormwater management by preserving some of the site's natural hydrology.[20]

Bellingham, Washington, Parking Lot Retrofits

The City of Bellingham, Washington, retrofitted two parking lots—one at City Hall and the other at Bloedel Donovan Park—with rain gardens in lieu of installing underground vaults to manage stormwater.[21] At City Hall, 3 parking spaces out of a total of 60 were used for the rain garden installation. The Bloedel Donovan Park retrofit involved converting to a rain garden a 550-square-foot area near a catch basin. Both installations required excavation, geotextile fabric, drain rock, soil amendments, and native plants. Flows were directed to the rain gardens by curbs. An overflow system was installed to accommodate higher flows during heavy rains.

The City compared actual rain garden costs to estimates for conventional underground vaults based on construction costs for similar projects in the area ($12.00 per cubic foot of storage). Rain garden costs included labor, vehicle use/rental, and materials. Table 5 shows that the City Hall rain garden saved the City $22,000, or 80 percent, over the underground vault option; the Bloedel Donovan Park installation saved $40,000, or 76 percent.

Table 5. Cost Comparison for Bellingham's Parking Lot Rain Garden Retrofits[22]

Project	Conventional Vault Cost	Rain Garden Cost	Cost Savings	Percent Savings
City Hall	$27,600	$5,600	$22,000	80%
Bloedel Donovan Park	$52,800	$12,800	$40,000	76%

Central Park Commercial Redesigns, Fredericksburg, VA (A Modeling Study)

The Friends of the Rappahannock undertook a cost analysis involving the redesign of site plans for several stores in a large commercial development in the Fredericksburg, Virginia, area called Central Park.[23,24] Table 6 contains a side-by-side analysis of the cost additions and reductions for each site for scenarios where LID practices (bioretention areas and swales) were incorporated into the existing, traditional site designs. In five of the six examples, the costs for the LID redesigns were higher than those for the original designs, although they never exceeded $10,000, or 10 percent of the project. One example yielded a $5,694 savings. The fact that these projected costs for LID were comparable to the costs for traditional designs convinced the developer to begin incorporating LID practices into future design projects.[25]

Table 6. Site Information and Cost Additions/Reductions Using LID Versus Traditional Designs

Name	Total BMP Area (ft^2)	Total Impervious Area Treated (ft^2)	Percent of Impervious Area Treated	Cost Additions[a]	Cost Reductions[b]	Change in Cost After Redesign
Breezewood Station Alternative 1	4,800	64,165	98.4%	$36,696	$34,785	+ $1,911
Breezewood Station Alternative 2	3,500	38,775	59.5%	$24,449	$21,060	+ $3,389
Olive Garden	1,780	31,900	59.1%	$14,885	$11,065	+ $3,790
Kohl's, Best Buy, & Office Depot	14,400	354,238	56.3%	$89,433	$80,380	+ $9,053
First Virginia Bank	1,310	20,994	97.7%	$6,777	$1,148	+ $5,629
Chick-Fil-A[c]	1,326	28,908	82.2%	$6,846	$12,540	– $5,694

[a] Additional costs for curb, curb blocks, storm piping, inlets, underdrains, soil, mulch, and vegetation as a result of the redesign.
[b] Reduced cost for curb, storm piping, roof drain piping, and inlets as a result of the redesign.
[c] Cost reduction value includes the cost of a Stormceptor unit that is not needed as part of the redesign.

Crown Street, Vancouver, British Columbia

In 1995 the Vancouver City Council adopted a Greenways program that is focused on introducing pedestrian-friendly green space into the City to connect trails, environmental areas, and urban space. As a part of this program, the City has adopted strategies to manage stormwater runoff from roadways. Two initiatives are discussed here.

The Crown Street redevelopment project, completed in 2005, retrofitted a 1,100-foot block of traditional curb-and-gutter street with a naturalized streetscape modeled after the Seattle SEA Street design. Several LID features were incorporated into the design. The total imperviousness of the street was decreased by reducing the street width from 28 feet to 21 feet with one-

way sections of the road narrowed to 10 feet. Roadside swales that use vegetation and structural grass (grass supported by a grid and soil structure that prevents soil compaction and root damage) were installed to collect and treat stormwater through infiltration.[26]

Modeling predicts that the redesigned street will retain 90 percent of the annual rainfall volume on-site; the remaining 10 percent of runoff will be treated by the system of vegetated swales before discharging.[27,28] The City chose to use the LID design because stormwater runoff from Crown Street flows into the last two salmon-bearing creeks in Vancouver.[29] Monitoring until 2010 will assess the quality of stormwater runoff and compare it with both the modeling projections and the runoff from a nearby curb-and-gutter street.

The cost of construction for the Crown Street redevelopment was $707,000. Of this, $311,000 was attributed to the cost of consultant fees and aesthetic design features, which were included in the project because it was the first of its kind in Vancouver. These added costs would not be a part of future projects. Discounting the extra costs, the $396,000 construction cost is 9 percent higher than the estimated $364,000 conventional curb-and-gutter design cost.[30] The City has concluded that retrofitting streets that have an existing conventional stormwater system with naturalized designs will cost marginally more than making curb-and-gutter improvements, but installing naturalized street designs in new developments will be less expensive than installing conventional drainage systems.[31,32]

One goal of Vancouver's Greenways program is to make transportation corridors more pedestrian-friendly. A method used to achieve this goal is to extend curbs at intersections out into the street to lessen the crossing distance and improve the line of sight for pedestrians. When this initiative began, the City relocated stormwater catch basins that would have been enclosed within the extended curb. Now, at certain intersections, the City uses the new space behind the curb to install "infiltration bulges" to collect and infiltrate roadway runoff. The infiltration bulges are constructed of permeable soils and vegetation. (The City of Portland, Oregon, has installed similar systems, which they call "vegetated curb extensions.") The catch basins are left in place, and any stormwater that does not infiltrate into the soil overflows into the storm drain system.[33]

The infiltration bulges have resulted in savings for the City. Because the stormwater infiltration bulges are installed in conjunction with planned roadway improvements, the only additional costs associated with the stormwater project are the costs of a steel curb insert to allow stormwater to enter the bulge and additional soil excavation costs. These additional costs are more than offset by the $2,400 to $4,000 cost that would have been required to relocate the catch basins. To date, the City has installed nine infiltration bulges, three of which are maintained by local volunteers as part of a Green Streets program in which local residents adopt city green space.[34]

GAP CREEK SUBDIVISION, SHERWOOD, ARKANSAS

Gap Creek's original subdivision plan was revised to include LID concepts. The revised design increased open space from the originally planned 1.5 acres to 23.5 acres. Natural drainage areas were preserved and buffered by greenbelts. Traffic-calming circles were used, allowing the developer to reduce street widths from 36 to 27 feet. In addition, trees were kept close to the curb line. These design techniques allowed the development of 17 additional lots.

The lots sold for $3,000 more and cost $4,800 less to develop than comparable conventional lots. A cost comparison is provided in Table 7. For the entire development, the combination of cost savings and lot premiums resulted in an additional profit to the developer of $2.2 million.[35,36]

Table 7. Cost Comparison for Gap Creek Subdivision[37]

Total Cost of Conventional Design	Gap Creek LID Cost	Cost Savings	Percent Savings	Savings per Lot
$4,620,600	$3,942,100	$678,500	15%	$4,800

GARDEN VALLEY, PIERCE COUNTY, WASHINGTON (A MODELING STUDY)

The Garden Valley subdivision is a 9.7-acre site in Pierce County, Washington. A large wetland on the eastern portion of the site and a 100-foot buffer account for 43 percent of the site area. Designers evaluated a scenario in which roadway widths were reduced and conventional stormwater management practices were replaced with swales, bioretention, and soil amendments. The use of these LID elements would have allowed the cost for stormwater management on the site to be reduced by 72 percent. A cost comparison is provided in Table 8.[38] Other costs expected with the LID design were a $900 initial cost for homeowner education with $170 required annually thereafter. Annual maintenance costs for the LID design (not included above) were expected to be $600 more than those for the conventional design, but a $3,000 annual savings in the stormwater utility bill was expected to more than offset higher maintenance costs.

Table 8. Cost Comparison for Garden Valley Subdivision[39]

Item	Conventional Development Cost	Garden Valley LID Cost	Cost Savings*	Percent Savings*
Stormwater management	$214,000	$59,800	$154,200	72%
Site paving	$110,400	$200,900	–$90,500	–82%
Total	$324,400	$260,700	$63,700	—

* Negative values denote increased cost for the LID design over conventional development costs.

The design incorporated the use of narrower roadways coupled with Grasscrete parking along the roadside, which increased the overall site paving costs. However, this added cost was more than offset by the savings realized by employing LID for stormwater management. The LID practices were expected to increase infiltration and reduce stormwater discharge rates, which can improve the health and quality of receiving streams.

Kensington Estates, Pierce County, Washington (A Modeling Study)

A study was undertaken to evaluate the use of LID techniques at the Kensington Estates subdivision, a proposed 24-acre development consisting of single-family homes on 103 lots. The study assumed that conventional stormwater management practices would be replaced entirely by LID techniques, including reduced imperviousness, soil amendments, and bioretention areas. The design dictated that directly connected impervious areas on-site were to be minimized. Three wetlands and an open space tract would treat stormwater discharging from LID installations. Open space buffers were included in the design. The LID proposal also included rooftop rainwater collection systems on each house.[40,41]

The proposed LID design reduced effective impervious area from 30 percent in the conventional design to approximately 7 percent, and it was approximately twice as expensive as the traditional design. A cost comparison is provided in Table 9.

Table 9. Cost Comparison for Kensington Estates Subdivision[42]

Item	Conventional Development Cost	Kensington Estate LID Cost	Additional Cost
Stormwater management	$243,400	$925,400	$ 682,000
Site paving	$522,300	$577,500	$55,200
Total	$765,700	$1,502,900	$737,200

Although the study assumed that roadways in the LID design would be narrower than those in the conventional design, site paving costs increased because the LID design assumed that Grasscrete parking would be included along the roadside to allow infiltration. The use of Grasscrete increased the overall site paving costs.

The avoidance of conventional stormwater infrastructure with the use of LID afforded significant cost savings. The LID measures eliminated the need for a detention pond and made more lots available for development. The significant cost for the rooftop rainwater collection systems was assumed to be offset somewhat by savings on stormwater utility bills.[43]

The study also anticipated that the use of LID would reduce stormwater peak flow discharge rates and soil erosion. Furthermore, greater on-site infiltration increases ground water recharge, resulting in increased natural baseflows in streams and a reduction in dry channels. Proposed clustering of buildings would allow wetlands and open space to be preserved and create a more walkable community. The reduced road widths were anticipated to decrease traffic speeds and accident rates.

Laurel Springs Subdivision, Jackson, Wisconsin

The Laurel Springs subdivision in Jackson, Wisconsin, is a residential subdivision that was developed as a conservation design community. The use of cluster design helped to preserve open space and minimize grading and paving. The use of bioretention and vegetated swales lowered the costs for stormwater management.

The costs of using conservation design to develop the subdivision were compared with the estimated cost of developing the site with conventional practices (Table 10).[44] The total savings realized with conservation design were just over $504,469, or approximately 30 percent of the estimated conventional construction cost. Savings from stormwater management accounted for 60 percent of the total cost savings. Other project savings were realized with reduced sanitary sewer, water distribution, and utility construction costs.

Table 10. Cost Comparison for Laurel Springs Subdivision[45]

Item	Conventional Development Cost	Laurel Springs LID Cost	Cost Savings	Percent Savings	Percent of Total Savings
Site preparation	$441,600	$342,000	$99,600	23%	20%
Stormwater management	$439,956	$136,797	$303,159	69%	60%
Site paving and sidewalks	$607,465	$515,755	$91,710	15%	18%
Landscaping	$165,000	$155,000	$10,000	6%	2%
Total	$1,654,021	$1,149,552	$504,469	—	—

In addition to preserving open space and reducing the overall amount of clearing and grading, the cluster design also reduced street lengths and widths, thereby lowering costs for paving and sidewalks. Vegetated swales and bioswales largely were used to replace conventional stormwater infrastructure and led to significant savings. Each of these factors helped to contribute to a more hydrologically functional site that reduced the total amount of stormwater volume and managed stormwater through natural processes.

MILL CREEK SUBDIVISION, KANE COUNTY, ILLINOIS

The Mill Creek subdivision is a 1,500-acre, mixed-use community built as a conservation design development. Approximately 40 percent of the site is identified as open space; adjacent land use is mostly agricultural. The subdivision was built using cluster development. It uses open swales for stormwater conveyance and treatment, and it has a lower percentage of impervious surface than conventional developments. An economic analysis compared the development cost for 40 acres of Mill Creek with the development costs of 30 acres of a conventional development with similar building density and location.[46]

When compared with the conventional development, the conservation site design techniques used at Mill Creek saved approximately $3,411 per lot. Nearly 70 percent of these savings resulted from reduced costs for stormwater management, and 28 percent of the savings were found in reduced costs for site preparation. A cost comparison is provided in Table 11. Other savings not included in the table were realized with reduced construction costs for sanitary sewers and water distribution.

Table 11. Cost Comparison for Mill Creek Subdivision[47]

Item	Conventional Development Cost per Lot	Mill Creek LID Cost per Lot	Cost Savings per Lot	Percent Savings per Lot	Percent of Total Savings
Site preparation	$2,045	$1,086	$959	47%	28%
Stormwater management	$4,535	$2,204	$2,331	51%	68%
Site paving and sidewalks	$5,930	$5,809	$121	2%	4%
Total	$12,510	$9,099	$3,411	—	—

The use of cluster development and open space preservation on the site decreased site preparation costs. The majority of the cost savings were achieved by avoiding the removal and stockpiling of topsoil. In addition to cost savings from avoided soil disturbance, leaving soils intact also retains the hydrologic function of the soils and aids site stormwater management by reducing runoff volumes and improving water quality. The site's clustered design was also responsible for a decrease in costs for paving and sidewalks because the designers intentionally aimed to decrease total road length and width.

The designers used open swales as the primary means for stormwater conveyance. Coupled with other site techniques to reduce runoff volumes and discharge rates, significant savings in stormwater construction were avoided because of reduced storm sewer installation; sump pump connections; trench backfill; and catch basin, inlet, and cleanout installation.

In addition to the cost savings, the conservation design at Mill Creek had a positive effect on property values: lots adjacent to walking/biking trails include a $3,000 premium, and lots adjacent to or with views of open space include a $10,000 to $17,500 premium. The

600 acres of open space on the site include 127 acres of forest preserve with quality wetlands, 195 acres of public parks, and 15 miles of walking/biking trails.[48]

Poplar Street Apartments, Aberdeen, North Carolina

The use of bioretention, topographical depressions, grass channels, swales, and stormwater basins at the 270-unit Poplar Street Apartment complex improved stormwater treatment and lowered construction costs. The design allowed almost all conventional underground storm drains to be eliminated from the design. The design features created longer flow paths, reduced runoff volume, and filtered pollutants from runoff. According to the U.S. Department of Housing and Urban Development, use of LID techniques resulted in a $175,000 savings (72 percent).[49]

Portland Downspout Disconnection Program, Portland, Oregon

The City of Portland, Oregon, implemented a Downspout Disconnection Program as part of its CSO elimination program. Every year, billions of gallons of stormwater mixed with sewage pour into the Willamette River and Columbia Slough through CSOs. When roof runoff flows into Portland's combined sewer system, it contributes to CSOs. The City has reduced the frequency of CSOs to the Columbia Slough and hopes to eliminate 94 percent of the overflows to the Willamette River by 2011.[50]

The Downspout Disconnection Program gives homeowners, neighborhood associations, and community groups the chance to work as partners with the Bureau of Environmental Services and the Office of Neighborhood Involvement to help reduce CSOs. Residents of selected neighborhoods disconnect their downspouts from the combined sewer system and allow their roof water to drain to gardens and lawns. Residents can do the work themselves and earn $53 per downspout, or they can have community groups and local contractors disconnect for them. Community groups earn $13 for each downspout they disconnect. (Materials are provided by the City.)

More than 44,000 homeowners have disconnected their downspouts, removing more than 1 billion gallons of stormwater per year from the combined sewer system. The City estimates that removing the 1 billion gallons will result in a $250 million reduction in construction costs for an underground pipe to store CSOs by reducing the capacity needed to handle the flows. The City has spent $8.5 million so far to implement this program and will continue to encourage more homeowners and businesses to disconnect their downspouts to achieve additional CSO and water quality benefits.

PRAIRIE CROSSING SUBDIVISION, GRAYSLAKE, ILLINOIS

The Prairie Crossing subdivision is a conservation development on 678 acres, of which 470 acres is open space. The site was developed as a mixed-use community with 362 residential units and 73 acres of commercial property, along with schools, a community center, biking trails, a lakefront beach, and a farm. The site uses bioretention cells and vegetated swales to manage stormwater.[51]

A cost analysis was performed to compare the actual construction costs of Prairie Crossing with the estimated costs of a conventional design on the site with the same layout. Cost savings with conservation design were realized primarily in four areas: stormwater management, curb and gutter installation, site paving, and sidewalk installation. The total savings were estimated to be almost $1.4 million, or nearly $4,000 per lot (Table 12). Savings from stormwater management accounted for approximately 15 percent of the total savings. The cost savings shown are relative to the estimated construction cost for the items in a conventional site design based on local codes and standards.

Table 12. Cost Comparison for Prairie Crossing Subdivision[52]

Item	Cost Savings	Percent Savings
Reduced Road Width	$178,000	13%
Stormwater Management	$210,000	15%
Decreased Sidewalks	$648,000	47%
Reduced Curb and Gutter	$339,000	25%
Total	$1,375,000	—

Reduced costs for sidewalks accounted for nearly half of the total cost savings. This savings is attributed in part to the use of alternative materials rather than concrete for walkways in some locations. In addition, the design and layout of the site, which retained a very high percentage of open space, contributed to the cost savings realized from reducing paving, the length and number of sidewalks, and curbs and gutters. The use of alternative street edges, vegetated swales, and bioretention and the preservation of natural areas all reduced the need for and cost of conventional stormwater infrastructure.[53] Benefits are associated with the mixed-use aspect of the development as well: residents can easily access schools, commercial areas, recreation, and other amenities with minimal travel. Proximity to these resources can reduce traffic congestion and transportation costs. Also, mixed-use developments can foster a greater sense of community and belonging than other types of development. All of these factors tend to improve quality of life.

PRAIRIE GLEN SUBDIVISION, GERMANTOWN, WISCONSIN

The Prairie Glen subdivision is nationally recognized for its conservation design approach. A significant portion of the site (59 percent) was preserved as open space. Wetlands were constructed to manage stormwater runoff, and the open space allowed the reintroduction of native plants and wildlife habitat. The site layout incorporated hiking trails, which were designed to allow the residents to have easy access to natural areas.[54]

To evaluate the cost benefits of Prairie Glen's design, the actual construction costs were compared with the estimated costs of developing the site conventionally. When compared with conventional design, the conservation design at Prairie Glen resulted in a savings of nearly $600,000. Savings for stormwater management accounted for 25 percent of the total savings. Table 13 provides a cost comparison. Other savings not included in the table were realized with reduced sanitary sewer, water distribution, and utility construction costs.

Table 13. Cost Comparison for Prairie Glen Subdivision[55]

Item	Conventional Development Cost	Prairie Glen LID Cost	Cost Savings*	Percent Savings*	Percent of Total Savings*
Site preparation	$277,043	$188,785	$88,258	32%	22%
Stormwater management	$215,158	$114,364	$100,794	47%	25%
Site paving and sidewalks	$462,547	$242,707	$219,840	48%	54%
Landscaping	$50,100	$53,680	–$3,580	–7%	–1%
Total	$1,004,848	$599,536	$405,312	—	—

* Negative values denote increased cost for the LID design over conventional development costs.

The cluster design and preservation of a high percentage of open space resulted in a significant reduction in costs for paving and sidewalks. These reduced costs accounted for 54 percent of the cost savings for the overall site. Reduced costs for soil excavation and stockpiling were also realized. The use of open-channel drainage and bioretention minimized the need for conventional stormwater infrastructure and accounted for the bulk of the savings in stormwater management. Landscaping costs increased due to the added amount of open space on the site.

SOMERSET SUBDIVISION, PRINCE GEORGE'S COUNTY, MARYLAND

The Somerset subdivision, outside Washington, D.C., is an 80-acre site consisting of nearly 200 homes. Approximately half of the development was built using LID techniques; the other half was conventionally built using curb-and-gutter design with detention ponds for stormwater management. Bioretention cells and vegetated swales were used in the LID portion of the site to replace conventional stormwater infrastructure. Sidewalks were also eliminated from the design. To address parking concerns, some compromises were made: because of local transportation department concern that roadside parking would damage the swales, roads were widened by 10 feet.[56] (Note that there are alternative strategies to avoid increasing impervious surface to accommodate parking, such as installing porous pavement parking lanes next to travel lanes.)

Most of the 0.25-acre lots have a 300- to 400-square-foot bioretention cell, also called a rain garden. The cost to install each cell was approximately $500—$150 for excavation and $350 for plants. The total cost of bioretention cell installation in the LID portion of the site was $100,000 (swale construction was an additional cost). The construction cost for the detention pond in the conventionally designed portion of the site was $400,000, excluding curbs, gutters, and sidewalks.[57,58] By eliminating the need for a stormwater pond, six additional lots could be included in the LID design. A comparison of the overall costs for the traditional and LID portions of the site is shown in Table 14.

Table 14. Cost Comparison for Somerset Subdivision

Conventional Development Cost	Somerset LID Cost	Cost Savings	Percent Savings	Savings per Lot
$2,456,843	$1,671,461	$785,382	32%	$4,000

In terms of environmental performance, the LID portion of the subdivision performed better than the conventional portion.[59] A paired watershed study compared the runoff between the two portions of the site, and monitoring indicated that the average annual runoff volume from the LID watershed was approximately 20 percent less than that from the conventional watershed. The number of runoff-producing rain events in the LID watershed also decreased by 20 percent. Concentrations of copper were 36 percent lower; lead, 21 percent lower; and zinc, 37 percent lower in LID watershed runoff than in conventional watershed runoff. The homeowners' response to the bioretention cells was positive; many perceived the management practices as a free landscaped area.

TELLABS CORPORATE CAMPUS, NAPERVILLE, ILLINOIS

The Tellabs corporate campus is a 55-acre site with more than 330,000 square feet of office space. After reviewing preliminary planning materials that compared the costs of conventional and conservation design, the company chose to develop the site with conservation design approaches. Because the planning process included estimating costs for the two development approaches, this particular site provides good information on commercial/industrial use of LID.[60]

Development of the site included preserving trees and some of the site's natural features and topography. For stormwater management, the site uses bioswales, as well as other infiltration techniques, in parking lots and other locations. The use of LID techniques for stormwater management accounted for 14 percent of the total cost savings for the project. A cost comparison is provided in Table 15. Other cost savings not shown in Table 15 were realized with reduced construction contingency costs, although design contingency costs were higher.

Table 15. Cost Comparison for Tellabs Corporate Campus[61]

Item	Conventional Development Cost	Tellabs LID Cost	Cost Savings	Percent Savings	Percent of Total Savings
Site preparation	$2,178,500	$1,966,000	$212,500	10%	46%
Stormwater management	$480,910	$418,000	$62,910	13%	14%
Landscape development	$502,750	$316,650	$186,100	37%	40%
Total	$3,162,160	$2,700,650	$461,510	—	—

Savings in site preparation and landscaping had the greatest impact on costs. Because natural drainage pathways and topography were maintained to the greatest extent possible, grading and earthwork were minimized; 6 fewer acres were disturbed using the conservation design approach. Landscaping at the site maximized natural areas and restored native prairies and wetland areas. The naturalized landscape eliminated the need for irrigation systems and lowered maintenance costs when compared to turf grass, which requires mowing and regular care. In the end, the conservation approach preserved trees and open space and provided a half acre of wetland mitigation. The bioswales used for stormwater management complemented the naturalized areas and allowed the site to function as a whole; engineered stormwater techniques augmented the benefits of the native areas and wetlands.[62]

TORONTO GREEN ROOFS, TORONTO, ONTARIO (A MODELING STUDY)

Toronto is home to more than 100 green roofs. To evaluate the benefits of greatly expanded use of green roofs in the city, a study was conducted using a geographic information system to model the effects of installing green roofs on all flat roofs larger than 3,750 square feet. (The model assumed that each green roof would cover at least 75 percent of the roof area.) If the modeling scenario were implemented, 12,000 acres of green roofs (8 percent of the City's land area) would be installed.[63] The study quantified five primary benefits from introducing the green roofs: (1) reduced stormwater flows into the separate storm sewer system, (2) reduced stormwater flows into the combined sewer system, (3) improved air quality, (4) mitigation of urban heat island effects, and (5) reduced energy consumption.[64]

The study predicted economic benefits of nearly $270 million in municipal capital cost savings and more than $30 million in annual savings. Of the total savings, more than $100 million was attributed to stormwater capital cost savings, $40 million to CSO capital cost savings, and nearly $650,000 to CSO annual cost savings. The cost of installing the green roofs would be largely borne by private building owners and developers; the cost to Toronto would consist of the cost of promoting and overseeing the program and would be minimal. Costs for green roof installations in Canada have averaged $6 to $7 per square foot. The smallest green roof included in the study, at 3,750 square feet, would cost between $22,000 and $27,000. The total cost to install 12,000 acres of green roofs would be $3 billion to $3.7 billion.[65,66] Although the modeled total costs exceed the monetized benefits, the costs would be spread across numerous private entities.

CONCLUSION

The 17 case studies presented in this report show that LID practices can reduce project costs and improve environmental performance. In most cases, the case studies indicate that the use of LID practices can be both fiscally and environmentally beneficial to communities. As with almost all such projects, site-specific factors influence project outcomes, but in general, for projects where open space was preserved and cluster development designs were employed, infrastructure costs were lower. In some cases, initial costs might be higher because of the cost of green roofs, increased site preparation costs, or more expensive landscaping practices and plant species. However, in the vast majority of cases, significant savings were realized during the development and construction phases of the projects due to reduced costs for site grading and preparation, stormwater infrastructure, site paving, and landscaping. Total capital cost savings ranged from 15 to 80 percent when LID methods were used, with a few exceptions in which LID project costs were higher than conventional stormwater management costs.

EPA has identified several additional areas that will require further study. First, in all the cases, there were benefits that this study did not monetize and factor into the project's bottom line. These benefits include improved aesthetics, expanded recreational opportunities, increased property values due to the desirability of the lots and their proximity to open space, increased number of total units developed, the value of increased marketing potential, and faster sales.

Second, more research is also needed to quantify the environmental benefits that can be achieved through the use of LID techniques and the costs that can be avoided by using these practices. For example, substantial downstream benefits can be realized through the reduction of the peak flows, discharge volumes, and pollutant loadings discharged from the site. Downstream benefits also might include reductions in flooding and channel degradation, costs for water quality improvements, costs of habitat restoration, costs of providing CSO abatement, property damage, drinking water treatment costs, costs of maintaining/dredging navigable waterways, and administrative costs for public outreach and involvement.

Finally, additional research is needed monetize the cost reductions that can be achieved through improved environmental performance, reductions in long-term operation and maintenance costs and/or reductions in the life cycle costs of replacing or rehabilitating infrastructure.

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identified practices seeks to maintain and use vegetation and open space, optimize natural hydrologic processes to reduce stormwater volumes and discharge rates, and use multiple treatment mechanisms to remove a large range of pollutants. In the context of this report, case studies ascribing to one of the above, or similar, labels were evaluated, and these terms are used interchangeably throughout the report.

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EPA
United States Environmental Protection Agency and the EPA Region III states of Pennsylvania, Maryland, Delaware, District of Columbia, Virginia and West Virginia

Evaluating the Effectiveness of Municipal Stormwater Programs

050898

EPA 833-F-07-010

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Introduction

NPDES Stormwater Management Programs

EPA stormwater regulations require National Pollutant Discharge Elimination Program (NPDES) permits for stormwater discharges from many municipal separate storm sewer systems (MS4s). Phase I of the stormwater permit program generally addresses municipalities with greater than 100,000 in population, while Phase II addresses smaller jurisdictions within urban areas. Additional information on EPA's stormwater program is available at **www.epa.gov/npdes/stormwater.**

Stormwater Phase II programs address the following program components:

- Public education and outreach
- Public involvement
- Illicit discharge detection and elimination
- Construction Site Runoff Control
- Post-Construction Runoff Control
- Pollution Prevention/Good Housekeeping for Municipal Operations

In addition to the programs above, Stormwater Phase I programs also must address stormwater runoff from industrial facilities.

Operators of regulated MS4s are required to develop a stormwater management plan (SWMP) that includes measurable goals and to implement needed stormwater management controls (BMPs). The process of developing a plan, implementing the plan, and evaluating the plan is a dynamic, iterative process that helps move communities toward achievement of their goals (Figure 1).

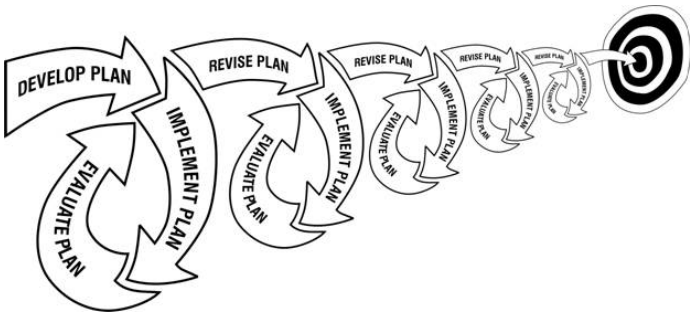

Figure 1. The iterative process of stormwater management (Develop, implement, evaluate, repeat).

40 CFR 122.26(d)(2)(v) and 122.34(g) requires MS4s to assess controls and the effectiveness of their stormwater programs. Municipal stormwater programs are also required to reduce the discharge of pollutants to the "maximum extent practicable" and satisfy the water quality requirements of the Clean Water Act. In addition, a number of government and scientific reports have found that better water quality data is needed if MS4s are to evaluate the effectiveness of their program in meeting water quality goals (NRC, 2004; Schwarzenback, et. al, 2006; Vaux, 2005).

This document discusses three approaches to evaluation of municipal SWMP effectiveness:

- Assessing program operations;
- Evaluating social indicators; and
- Monitoring water quality.

Other guidance is available to assist managers in evaluating overall implementation of the SWMP to the maximum extent practicable, e.g., EPA's MS4 *Program Evaluation Guidance* (**www.epa.gov/npdes/pubs/ms4guide_withappendixa.pdf**).

Purposes of Program Evaluation

- **Meet regulatory requirements.** EPA stormwater regulations require that the effectiveness of the SWMP be evaluated, including assessment of SWMP implementation, evaluation of BMP effectiveness, and the extent to which improvements in stormwater outfall discharge quality have occurred.
- **Document progress toward water quality goals.** Evaluation of SWMP effectiveness is essential to measure progress toward meeting benchmark conditions, complying with water quality standards, or restoring beneficial uses.
- **Justify commitment of resources.** Knowledge of program effectiveness can help justify SWMP expenditures to decision-makers and to the public, and help improve cost-effective implementation and management of the SWMP.
- **Provide feedback to the management program.** Stormwater management is an iterative process and knowledge of program effectiveness is essential for the permit renewal process and for mid-course corrections to improve the program.
- **Assess reductions in pollutants of concern.** If a waterbody is impaired, it may be helpful to assess the effectiveness of the SWMP in reducing the pollutants of concern.

Stormwater Management Goals

Setting Goals for SWMPs

Stormwater management plans must be guided by specific measurable water quality-based goals, but also typically include, programmatic, BMP-implementation, and social goals. NPDES permit conditions often serve as minimum goals for a SWMP, but an MS4 may have other goals for restoration or protection of water quality that go beyond minimum permit conditions and reflect local understanding of the storm drain system and receiving water conditions. Guidance on setting measurable goals for SWMPs can be found in EPA's *Measurable Goals Guidance for Phase II Small MS4s* (**www.epa.gov/npdes/pubs/measurablegoals.pdf**).

Programmatic goals might address education and outreach to a range of audiences, establishment of partnerships with business owners, or adoption of ordinances. BMP implementation goals may call for some number of practices to be installed in key locations according to a certain schedule. Goals for public involvement could include targets for number of participants in clean-up or tree-planting activities, number and quality of responses to attitude surveys, or changes in the use of lawn fertilizer.

The ultimate goal of any NPDES stormwater management program is to reduce pollutant discharges to the maximum extent practical, prohibit illicit discharges to the MS4, and protect water quality. Water quality goals may pertain to pollution prevention (reduction of potential pollutants at the source), improvements in stormwater outfall discharge quality, reduction of pollutant loads to receiving waters (e.g., a TMDL), restoration of aquatic resources (e.g., stream channel stabilization, fishery restoration), compliance with water quality standards, or restoration of beneficial uses. Intermediate benchmarks that indicate progress toward meeting water quality standards are important elements of successful long-term SWMPs.

Matching Evaluation to Management Goals

Evaluation of the effectiveness of a SWMP must relate directly to its goals. Two central questions are: *Are we meeting the municipal SWMP goals?* and *Are we meeting NPDES stormwater regulatory requirements?* If a goal is to keep a swimming beach open, it is often necessary to determine the extent to which water quality criteria for bacteria are being met. If a goal is to reduce nutrient loads by 40% from a watershed, it is then necessary to measure nutrient loads and compare measured loads against the goal. Meeting your water quality goals is the ultimate sign of program success, however, meeting programmatic or social goals can also be indicators of a successful program. Information on how these goals are met will serve as critical feedback in the iterative process of stormwater management.

Evaluating Stormwater Management Program Effectiveness

Stormwater program evaluation must be more than an exercise in collecting and tabulating data; evaluation data must be analyzed, interpreted, and reported so that results can be applied to such purposes as documenting effectiveness of BMPs, reporting information to government or the public, and planning future management activities.

Stormwater programs address multiple objectives and program evaluation can focus on a variety of desired outcomes that parallel these objectives. Approaches to the evaluation of stormwater program effectiveness may therefore fall on a continuum from basic verification of compliance with regulatory requirements to assessing changes in knowledge and behavior to detecting changes in receiving water quality (Figure 2). The NPDES stormwater evaluation program in Baltimore County, Maryland (**www.baltimorecountymd.gov/Agencies/environment/watersheds/epnpdesmain.html**) is a good example of effective evaluation of an MS4 program.

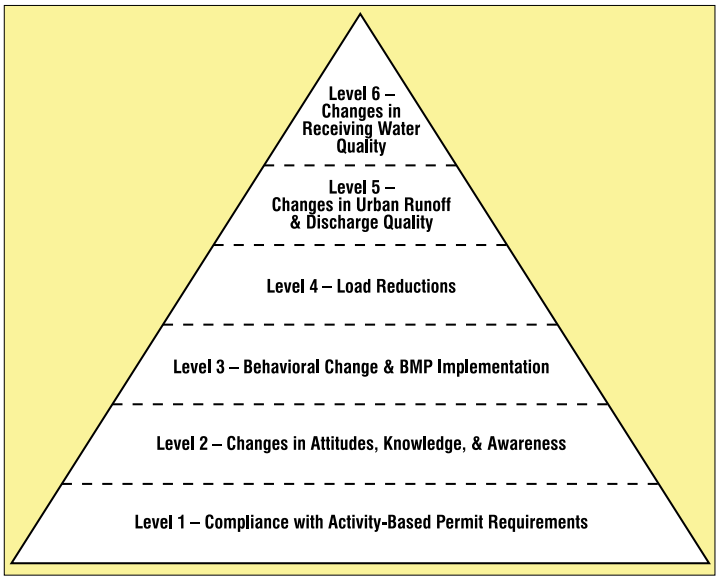

Figure 2. Approaches to evaluation of stormwater program effectiveness. (Source: CASQA, 2007)

In this document, we consider the range of evaluation approaches in three groups: program operations, social indicators, and water quality. Every evaluation approach must contain appropriate water quality measures to be meaningful.

Assess program operations

Assessment of stormwater program operations and activities verifies basic compliance with permit requirements and, more importantly, documents that tangible efforts have been made to reduce the impacts of urban stormwater. This approach to program evaluation can be applied to all of the components of a SWMP.

Track structural BMP implementation. Tracking the type and number of structural BMPs installed provides managers with direct feedback on how implementation is progressing and whether goals set forth in the permit are being achieved. Data on BMP specifications, location, date of completion, compliance with permit conditions, and ongoing operation and maintenance may be important to record. See USEPA **Techniques for Tracking, Evaluating, and Reporting the Implementation of Nonpoint Source Control Measures: Urban (www.epa.gov/owow/nps/urban.pdf)** for more information on the topic of tracking BMPs implemented in your jurisdiction.

Document management activities. Documenting management activities and pollutant source reduction efforts can be as important as tracking structural BMPs. How much material has been collected through street-sweeping and parking lot maintenance? How many site inspections were conducted and what were the results? How many and what type of illicit discharges were identified and eliminated? How many trainings and outreach activities were conducted, and how many people were reached? Baltimore City, Maryland, focuses limited stormwater management resources in a small highly urbanized watershed to demonstrate how making communities more livable can improve water quality. An important part of this effort is to document management activities so that both managers and residents can easily follow progress.

Evaluate social indicators

Social indicators—changes in knowledge, attitudes, and behavior of people—are important for two reasons. First, some SWMPs may have goals for increasing knowledge and awareness and changing attitudes among groups such as residents, business owners, and municipal employees. Second, social indicators—especially behavior changes—are important intermediate benchmarks in a successful SWMP when many years are needed to measure a water quality response. For more information, see *Developing a Social Component for the NPS Evaluation Framework* (**www.uwex.edu/ces/regionalwaterquality/Flagships/Indicators.htm**). This approach to program evaluation is typically applied to the public education and public participation components of a SWMP.

Gauge the effects of public education efforts. Changes in awareness, knowledge, and attitudes can be measured effectively using statistically valid surveys or questionnaires; for example see *Stormwater Knowledge, Attitude and Behaviors: A 2005 Survey of North Carolina Residents* (**www.ncstormwater.org/pdfs/stormwater_survey_12506.pdf**). Other approaches include monitoring attendance at public meetings, tracking requests for information, and counting hits on web sites. Keep in mind that simply reporting the number of meetings held or the number of brochures printed is not an effective method to document changes in stormwater knowledge.

Assess behavior changes. Measurement of change in pollution-generating behavior in a watershed can be an important indicator of progress toward achieving SWMP goals. Examples include: changes in lawn fertilizer sales in response to a publicity campaign, pounds of hazardous waste turned in at collection events, participation in streambank clean-up events, and sign-ups for environmental action pledges.

Monitor water quality

Water quality monitoring is the most direct—and usually the best—approach to evaluating the effectiveness of a SWMP. Program evaluation through water quality monitoring can apply to several of the SWMP components, including illicit discharge detection, construction site runoff control and post-construction runoff control. The collection of water quality data (along with BMP performance data) would be especially useful for discharges to an impaired water body with an approved TMDL. (For more information about the TMDL program, visit **www.epa.gov/owow/tmdl**). Detailed guidance on design and operation of monitoring is available elsewhere, e.g., *USDA-NRCS National Handbook of Water Quality Monitoring* **(ftp://ftp.wcc.nrcs.usda.gov/downloads/wqam/wqm1.pdf)** and *EPA Monitoring Guidance for Determining the Effectiveness of Nonpoint Source Controls* (Sept. 1997, EPA 841-B-96-004).

Water quality monitoring approaches range from qualitative observations to highly quantitative measurements, covering areas as small as individual BMPs to large receiving waters such as lakes or estuaries. A good monitoring program for evaluation of SWMP effectiveness will probably contain several elements at various levels of detail and scale. Before embarking on new monitoring, however, it is important to collect and evaluate historic and current data from existing monitoring activities. Data from state 305(b) assessments, 303(d) lists, and published TMDLs, ongoing state and federal agency monitoring programs, water supply intake testing, and watershed volunteer groups, for example, can be useful both in designing a monitoring program and in supplementing program results.

Monitoring can focus on **biological** (e.g., *E. coli*, fish), **physical** (e.g., flow, suspended sediment, streambank stability), or **chemical** (e.g., phosphorus, trace metals) dimensions of the water resource. Measured water quality variables should be directly linked to both the pollutant sources and the BMPs being implemented. In general, a monitoring program should focus on selecting a few good water quality variables to measure well, rather than trying to track a long list of indicators. For example, for a swimming beach impaired by bacteria, it would be appropriate to monitor the swimming area, nearby storm drain outfalls, and tributary flows for *E. coli*. If stream channel blow-outs are an issue and BMPs addressing excessive flows are implemented, monitoring of streamflow and channel cross-section conditions would be a good choice. For algal blooms, monitoring of nutrient concentrations and loads to the receiving water might be appropriate.

Water quality monitoring must take hydrologic variation into account. Most stormwater pollution processes are driven by rainfall that varies from year to year. If several dry years follow

implementation of a SWMP, the program may appear to be highly effective in reducing pollutant loads simply because runoff is unusually low. Conversely, several years of wet weather could result in higher pollutant loads simply because of increased runoff volume despite BMP implementation. Consequently, it is important to monitor precipitation and streamflow to help interpret results from all but a few highly qualitative monitoring approaches.

MS4s can take a variety of monitoring approaches to evaluate their SWMP effectiveness. Several common approaches that can be implemented for physical, chemical, and biological dimensions of water quality are listed at the end of this document.

Feedback: The Iterative Approach to Stormwater Management

Management of stormwater programs is an iterative process, beginning with planning, progressing through implementation and program evaluation, and then returning to the beginning of the cycle with feedback to further program planning. Effectiveness evaluation assesses how well implementation is working and estimates benefits derived from the program for the primary purpose of assessing progress toward program goals and compliance with regulatory requirements. Results can also be used to make practical changes in management strategies. Effective program feedback will enable local governments to guide decisions on shifting priorities to achieve goals more cost-effectively, including modification of activities that need improvement, expansion of effective activities, and cessation of efforts that are no longer productive. Results of SWMP evaluation should be presented to decision-makers in a clear manner that addresses the questions formulated when the evaluation plan was designed.

Reporting

Annual reports are a good place to summarize evaluation results and to take stock of what is working and what is not. Data gathered throughout the year should be used to answer critical questions such as:

- What is the current status in meeting stormwater goals and NPDES regulatory requirements?
- What are the estimated load reductions and other benefits of BMP implementation?
- What are the costs associated with program implementation?
- How do the costs of program implementation relate to water quality changes?
- What stormwater program changes are necessary to meet the stated goals?

The Baltimore City, Maryland MS4 2005 NPDES permit, for example, requires the permittee to provide an annual narrative summary describing the results and analyses of program data, including monitoring data accumulated throughout the reporting year. Identification of water quality improvements or degradation is a key part of this requirement.

Fourth-year reports are a good opportunity to use data gathered under the entire permit period to guide future management direction. Continuation of a NPDES permit typically requires the permittee to submit with its permit renewal application a summary of its SWMP describing how water quality goals are being achieved. Information in the application would include measured pollutant load reductions resulting from SWMP implementation and achievement of other benchmarks or water quality standards. Analysis of evaluation data is also used to justify or support changes in the permit and SWMP.

Feedback to the stormwater management program

NPDES regulations require assessment and revision of the stormwater management program in order to continue, to the maximum extent practicable, to not cause or contribute to water quality standards exceedances. As part of the iterative management process, stormwater program activities should be adjusted based on the results of an effectiveness evaluation. If a management goal has been achieved, effort in this area might be reduced to a maintenance level and resources reallocated to another pollutant or goal. If a goal has not been achieved, or satisfactory progress has not been made, additional resources can be applied and new strategies implemented. Such adjustments provide the direction for a municipality's permit renewal and will ensure progress toward program goals.

Effectiveness evaluation can also apply to ongoing stormwater programs through the process of adaptive management. Through this, evaluation results on program operations, social or water quality can provide rapid feedback to guide management activities. For example, an MS4 might establish dry weather action levels—or targets—for water quality constituents such as turbidity, phosphorus, and trace metals in tributaries draining to receiving water. Exceedance of an action level in samples taken from a tributary during dry weather would trigger an immediate investigation upstream to find and eliminate illicit connections and illegal discharges. Dry weather action levels would be reviewed and updated annually based on monitoring data and progress toward meeting SWMP goals.

In another example (Figure 3), coastal beaches and storm drains discharging near them are monitored for fecal bacteria. When compared against storm drain action levels for bacteria (sampled at the storm drain) and bacteria water quality criteria for body contact recreation (sampled in the open coastal receiving water), results of the paired samples guide management decisions on actions needed to protect the beach and follow up on sources of high bacteria counts.

Multi-faceted stormwater management programs can be evaluated as well. Baltimore City's NPDES stormwater permit requires it to restore a watershed or combination of watersheds containing 10% of the City's total impervious area during each five-year permit. The City conducts comprehensive watershed assessments and goals for restoration are developed based on

		Beach	
		Meets bacteria criteria	Fails to meet bacteria criteria
Storm drain discharge	Below bacteria action level	No action required	Storm drain discharge not causing beach impairment; continue to monitor and investigate other sources
	Above bacteria action level	Storm drain discharge not causing beach impairment; investigate storm drain sources	Storm drain discharge causing beach impairment; investigate storm drain sources ASAP

Figure 3. Decision table for storm drain and beach bacteria levels.

severity of water quality problems, input form local watershed associations, the possibility for inter-jurisdictional cooperation, and the availability of restoration opportunities. One restoration priority is Watershed 263 (**www.cwp.org/RR_Photos/Baltimore_City_profile_sheet.pdf**) where Baltimore City plans to restore a degraded stream system and simultaneously address other social and economic problems associated with older urban environments. The goals in this watershed include; replacing school yard asphalt with green infrastructure to filter stormwater; replacement of sidewalk sections with trees to remove nutrients and reduce the "heat island" effect; conversion of vacant abandoned lots into gardens for local residents to use; reduce the buildup of trash and litter through increased municipal street sweeping; and installing innovative ultra-urban BMPs wherever possible. A catch basin downstream of all of these activities will be monitored for water quality and compared to a similar watershed in the City with no controls. Since the installation of BMPs will be progressive, monitoring data will show the effectiveness of differing management strategies. Information will be fed back into future management plans for this watershed and others across the City to ensure that stormwater is being controlled to the maximum extent practicable.

In summary, a municipal stormwater management program needs to set clear goals and identify appropriate monitoring methods to evaluate those goals in order to assess the effectiveness of the stormwater program in protecting water quality.

Additional Resources

Monitoring/Evaluation Guidance or References

California Stormwater Quality Association (CASQA), 2007, *Municipal Stormwater Program Effectiveness Assessment Guidance*. Available at **www.casqa.org**

Southern California Coastal Water Research Project, *Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California*. **ftp://ftp.sccwrp.org/pub/download/PDFs/419_smc_mm.pdf**

EPA, 1992, NPDES Stormwater Sampling Guidance Document, EPA 833-B-92-001. **www.epa.gov/npdes/pubs/owm0093.pdf**

Center for Watershed Protection, *Smart Watershed Benchmarking Tool*. Available at **www.cwp.org**

Chesapeake Bay Program, *BMP Efficiencies and Definitions*. **www.chesapeakebay.net/pubs/subcommittee/nsc/uswg/BMP_Pollutant_Removal_Efficiencies.pdf**

International Stormwater BMP Database, *Development of Performance Measures: Determining Urban Stormwater Best Management Practice Removal Efficiencies* (**www.bmpdatabase.org/docs/task3_1.pdf**) and *Urban Stormwater BMP Performance Monitoring: A Guidance Manual for Meeting the National Stormwater BMP Database Requirements* (**www.bmpdatabase.org/docs/Urban%20Stormwater%20BMP%20Performance%20Monitoring.pdf**)

Stormwater Manager's Resource Center, *Environmental Indicator Profile Sheet: BMP Performance Monitoring*. **www.stormwatercenter.net/monitoring%20and%20assessment/ind%20profiles/IndPros25.pdf**

State/Municipal examples of monitoring/evaluation programs

Baltimore County, *Watershed Management and Monitoring*. **www.baltimorecountymd.gov/Agencies/environment/watersheds/ep_watershed_monitoring.html**

City of Hialeah, FL *Stormwater Utility Monitoring Program*. **http://hialeahfl.gov/dept/streets/stormwater/plans/monitoring**

Maryland Watershed Restoration Action Strategy. **www.dnr.state.md.us/watersheds/surf/proj/wras.html**

Ventura, California, MS4 Permit **www.swrcb.ca.gov/rwqcb4/html/programs/stormwater/venturaMs4.html**

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NOTE: This document is not law or regulation; it provides recommendations and explanations that MS4s may consider in determining how to comply with requirements of the CWA and NPDES permit requirements.

Useful Water Quality Monitoring Approaches for Evaluation of SWMPs

Visual observations. Some water quality conditions can be assessed by visual (qualitative) observations of controls, outfalls or receiving waters. Searching for and correcting illicit discharges through observation of oil and grease sheens, floatables, or odors at outfalls is one example. Progress in streambank stabilization and channel restoration might be monitored by regular photography of critical locations. In general, qualitative observations should be supplemented by quantitative measurements where possible, such as with dry weather sampling at outfalls or regular surveys of representative stream cross-sections. The City of Albuquerque MS4 Floatable & Gross Pollutant Study (**www.cabq.gov/flood/pdf/FINALREPORT-OCTOBER2005.pdf**) is an example of a systematic approach to qualitative observations of water quality conditions. Examples of survey techniques for streambank assessment can be found in the Maryland Stream Corridor Assessment Survey (**www.dnr.maryland.gov/streams/pubs/surveyprotocols2.pdf**) and the USACE/USEPA Review of protocols for stream assessment (**www.mitigationactionplan.gov/Physical%20Stream%20Assessment%20Sept%2004%20Final.pdf**).

BMP performance monitoring. Monitoring of individual BMP performance provides a direct measure of pollutant reduction efficiency of these key components of a SWMP. Conceptually, BMP input/output monitoring is simple—measure pollutant concentrations or loads entering and leaving a wet pond for example, and compute the difference. In practice, BMP monitoring is more complex, requiring careful collection of data concerning storm and runoff characteristics and information on BMP attributes, as well as water quality information. There are several sources of information on BMP performance and on protocols for collecting, storing, analyzing, and reporting BMP monitoring data, including the National Stormwater BMP Database (**www.bmpdatabase.org**) and the USEPA and ASCE *Urban Stormwater BMP Performance Monitoring Manual*. Some examples of individual BMP monitoring studies can be found at the Villanova Urban Stormwater Partnership (**www3.villanova.edu/VUSP/index.html**).

Probability monitoring. Monitoring sites can be selected across a broad geographic area according to some statistical design to broadly characterize water quality conditions in a watershed or to identify possible contamination hotspots. Site selection could be random to achieve wide spatial coverage or stratified to focus monitoring on particular environment types or represent specific target populations. Data from a statistical sample of stream riffle sites across a watershed could be used to assess the overall condition of watershed macroinvertebrate communities. A monitoring program addressing sediment toxicity in a bay might geographically direct sampling to ensure that sediments in different depositional environments or with different physical characteristics are sampled, or that samples are collected within the areas affected by discharges from major tributaries. Results of probability monitoring can be used to guide SWMP implementation efforts and to assess long-term trends in response to SWMP implementation. An example of a probability design applied to evaluating sediment toxicity is found in the NOAA report Magnitude and Extent of Contaminated Sediment and Toxicity in Chesapeake Bay (**ccma.nos.noaa.gov/publications/NCCOSTM47.pdf**).

Short-term extensive network monitoring. Short-term grab-sampling at the outlets of numerous small watersheds or other drainages within a large MS4 can identify impaired waters and rank areas for implementation priority. Data collected simultaneously across the MS4 can help characterize the geographical distribution of pollutant sources. The City of Los Angeles monitors a network of shoreline stations in Santa Monica Bay for bacteria to identify stormwater impacts on recreational uses of the bay. This approach can apply not only to streams draining small watersheds but also to storm drains during both wet-weather and dry-weather conditions. If continued over several years, this kind of monitoring can be a good opportunity for volunteer groups to participate in the SWMP evaluation process. Data collected by volunteers could be reported separately or incorporated within "official" data sets used for regulatory purposes depending upon the methods used and level of training provided to volunteers.

Site-specific monitoring. High-value resources such as popular swimming beaches, important shellfish beds, or high-priority habitats could require specific monitoring to regularly assess the status of use support. Similarly, known high-priority pollutant sources or hotspots of impairment like contaminated aquatic sediments, an eroding stream channel threatening property, or a stream reach with a degraded fish population could be monitored to assess progress in restoration. Depending on the situation, such monitoring can be done in the critical area itself to assess its condition or upstream and downstream of the area to evaluate changes in pollutant stressors. Fairfax County's MS4 program conducts an Industrial and High-Risk Runoff monitoring program to identify and investigate industrial and other high-risk sites to determine if they are contributing substantial pollutant loadings to the MS4. The San Diego Bay MS4 permittees operate a Toxic Hot Spots Monitoring Program to locate and track areas of aquatic sediment contamination related to discharges from MS4s around the Bay.

Long-term fixed stations. Permanent monitoring stations at major discharges from an MS4 or on a receiving water above and below an MS4 can be used to measure changes in pollutant loads discharged from the MS4. Such stations are usually located where it is easy to measure flow and collect representative samples. Accurate load measurement requires consideration of many factors including patterns of hydrologic variation, seasonal patterns of pollutant concentrations, and desired statistical power; it is advisable to consult a monitoring expert before setting up a sample program to monitor pollutant loads. Flow, concentration, and load data from long-term fixed stations can be used for many purposes, including assessing compliance with water quality standards, collection of representative data from drainage areas that are undergoing similar activities and where the discharges are expected to be of similar quality as required in some MS4s under Phase I rules, documenting water quality trends, and marking progress toward meeting pollutant load goals, e.g., for a TMDL. The Los Angeles County stormwater monitoring program operates a system of mass emissions stations (**www.ladpw.com/WMD/npdes/Int_report/Section_1.pdf**) to update estimated pollutant loads to the ocean and to document long-term trends in pollutant concentrations. The San Diego region urban runoff monitoring program maintains similar long-term mass loading stations (**www.projectcleanwater.org/pdf/science_mon/2003-2004_monitoring_summary.pdf**) that regular assessment of the biological communities as well as chemical pollutant loads in major drainages.

Receiving water monitoring. Protection of a water body receiving discharges from an MS4 is often the ultimate goal of stormwater management. However, an MS4 may not be the only stormwater discharge into a water body, and achievement of the MS4's discharge quality goals may not eliminate the impairment in the receiving water. It may nevertheless be important to monitor water quality in the river, lake, estuary, or bay that receives its discharge, especially if localized impacts can be identified. Evaluation of the effectiveness of a SWMP on maintaining recreational benefits, for example, might involve monitoring both storm drains and swimming beaches for *E. coli*. If a goal of a SWMP is to reduce the impacts of toxic materials delivered in stormwater, a program monitoring a combination of water and sediment chemistry, sediment toxicity, and benthic communities in the receiving water might be appropriate.

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Managing Wet Weather with Green Infrastructure

Municipal Handbook

Funding Options

Managing Wet Weather with Green Infrastructure

Municipal Handbook

Funding Options

The Municipal Handbook is a series of documents
to help local officials implement green infrastructure in their communities.

September 2008

EPA-833-F-08-007

Front Cover Photos
Top: rain garden; permeable pavers; rain barrel; planter; tree boxes.
Large photo: High Pointe Neighborhood, Seattle WA

Funding Options

Introduction

Securing adequate, sustainable sources of funding for managing wet weather presents a significant challenge for towns and cities across the United States, and financial constraints frequently hinder the implementation of effective programs and practices at the local level. This situation is often especially true for green infrastructure approaches, not necessarily because they are more expensive than traditional management approaches (in fact often they are less expensive), but because they do not necessarily fit existing funding frameworks. In many cases, green infrastructure is simply another item on the community "to-do" list that can not (and will not) be addressed without developing alternative funding mechanisms.

Fortunately, a growing number of communities have overcome financial barriers with funding strategies that are sustainable and effective. Many communities pay for green infrastructure projects by drawing from general funds, while others set up new fees, taxes and other directed charges to help pay for public infrastructure repairs and improvements. Often, these fees are applied to new development and other land use alterations and may appear as plan review and permitting fees, or special assessment fees that discourage building in particular locations – like green fields – by exacting an additional charge for projects located in sensitive areas. Some communities are charging private properties a "fee-in-lieu" of on-site water quality treatment, wherein developers no longer implement on-site water quality treatment practices, but instead pay into a fund that the municipality can use to finance green infrastructure projects in priority areas. Capital cost recovery fees, impact fees, and real estate taxes are further examples of the many different ways that local governments are generating reliable funding for green infrastructure practices that will result not only in better stormwater management, but in a wide range of additional community benefits as well.

This chapter identifies and discusses the two most common funding options communities are using for green stormwater infrastructure – stormwater fees and loan programs.

A third source of funding – grant programs – is also available in limited amounts to support green infrastructure projects. The amount of grant money currently available on a national basis is only sufficient enough to fund small, local projects, and is not enough to sustain large multi-year wet weather programs. Grants, such as those provided under Clean Water Act Section 319 or through the Department of Housing and Urban Development's Community Development Block Grant Program (CDBG), can be useful in building demonstration projects or as seed money for building local political and community support for green infrastructure practices. However, grant money is not considered a reliable, long-term source of funding for establishing sustainable green infrastructure policies or programs.

A number of national groups are currently working to increase the amount of grant money available for green infrastructure projects, and if and when such funds become available this chapter will be updated. However, some grant money may be currently available for communities interested in funding small demonstration projects, and information on existing grant programs is available at http://www.epa.gov/npdes/greeninfrastructure.

Stormwater Fees

What is a stormwater fee?

Stormwater fees are used to generate a revenue stream to address the increasing investment most communities will have to make to control both combined sewer overflows and stormwater runoff. Some municipalities require additional funding for the new infrastructure required to meet the demands of growth and development, while other, often older communities need extra revenue to repair and maintain existing storm sewer systems. Smart growth planning and updated development codes can help offset the financial impact of new infrastructure costs, but most municipalities have extensive off-site stormwater systems that require ever increasing public investment.

Why have user fees as opposed to other collection methods?

Stormwater user fees are often considered a fair, equitable method for charging the people that benefit from stormwater infrastructure. Traditionally, the cost of stormwater management was paid for through general tax funds (such as a property tax) or was included as a line-item on monthly water bills. However, stormwater user fees are increasingly used to direct the costs for stormwater management towards those properties that generate the most runoff.

In addition to being more equitable, stormwater fees are also easier for municipalities to set-up and implement. In many communities, new taxes require a vote of approval by the public, while a fee is a charge that municipalities have the authority to leverage for the services they provide. Also, many properties can be exempt from taxes. In Washington DC, for example, the federal government contributes to 35% of the District's overall impervious surfaces. These properties are exempt from paying a stormwater tax, but could be required to pay a fee for stormwater management services, just as they pay for electricity and water.

Minneapolis Central Library Green Roof. Image courtesy The Kestrel Design Group, Inc.

Fee Collection

As a community decides to create a stormwater user fee, it is important to determine which entity will be responsible for collecting and managing the funds that are generated. Most municipalities set up a new stormwater utility to manage the billing process and incoming revenue. The utility may be managed through an enterprise fund or special account separate from general funds. If an independent entity is not created, existing departments, such as a department of environment or department of public works, are often tasked with the responsibility of managing fee collection and spending. For ease of collection, the stormwater fee can be added to water, sewer or utility bills; however a few cities charge the user fee as a monthly or annual tax. In San Jose for

instance, the Santa Clara County Tax Collector's Office collects the Storm Sewer Service Charge through the annual property tax roll.

It is equally important to consider how revenue from the fee will be spent. By creating new utilities, municipalities are able to control and prioritize stormwater projects on city-owned property. User fee revenue can be used for a wide variety of purposes, but most communities allocate these funds to demonstration projects, capital improvements, and operations and maintenance of stormwater facilities.

An increasingly common method for calculating a stormwater user fee is an impervious surface based billing system. Because runoff from impervious areas is the primary contributor to the storm sewer system, this is seen as a more equitable determination for fees than a meter-based fee, which charges by water consumption. For example, a parking lot uses no potable water but creates significantly more runoff than a small restaurant that consumes a large amount of potable water.

The calculation can differentiate by zoning or property use types. Currently, municipalities are setting flat rates for residential units because limitations in technology make it administratively costly to calculate actual imperviousness for each residential lot throughout the city. Instead of actual impervious lot calculations, cities will set up equivalent residential unit (ERU) or equivalent stormwater unit (ESU) charges. These approximate measures provide differential rates based on total lot size, which gets closer to actual values of impervious surface calculations. In Minneapolis a three-tiered system differentiates between overall parcel sizes of single family properties, with a standard ESU at 1530 square feet of imperviousness which results in a charge of $8.72 per month.

Table 1: Minneapolis's Stormwater Charge for Single-Family Residential Properties

Tier	ESU	Stormwater Charge
High	1.25	$10.90
Medium	1.00	$8.72
Low	0.75	$6.54

Non-residential properties vary much more in gross size and total imperviousness than residential parcels and are more frequently based on their actual contribution of stormwater runoff. Cities such as Philadelphia, Pennsylvania, Lenexa, Kansas and Portland, Oregon calculate user fees for commercial, multi-family residential and industrial properties by their total lot size and percentage of imperviousness. These rates are measured through GIS and flyover image data that accurately accounts for the stormwater runoff inputs of these large customer parcels.

Fee Discounts and Credits

When incentives are tied to stormwater fees, they encourage retrofits of existing properties and implementation of green infrastructure in new developments. Fee discounts and credits provide an opportunity for property owners to reduce the cost of their stormwater fees by using green infrastructure techniques that limit impervious cover and reduce the amount of runoff generated. The public system clearly benefits when property owners manage stormwater runoff on site. If less water enters the sewer system, less money needs to be spent on treatment, maintenance, and operation expenditures. Further, discounts and credits support the fee-for-service system because property owners can reduce the amount they pay by reducing the service they receive.

There are a number of options for reducing fees, but there must be a balance between the base charge and the type of incentive that is used. The fee must be costly enough to encourage avoidance, while credit standards must be reasonable enough that owners want to seek the credit in lieu of paying the fee in full.

Before setting the credit standard, municipalities should first determine the types of stormwater management goals they wish to achieve (e.g. reduce impervious cover, increase infiltration, increase green roofs, etc.). Once these management goals are defined, officials must then decide how to credit private property owners for the action(s) being incentivized. Table 2 outlines several common stormwater management goals and identifies the mechanisms and processes that can be used to meet these goals. Some cities give a percent discount for level of performance, primarily for stormwater quantity reduction and in lesser cases for pollution reduction. Discounts are also offered for impervious surface reductions, whether for total area or by the square foot. Finally, credits can be based on particular practices, such as rain gardens, green roofs or even tree canopy. Portland, Oregon, for instance, gives specific credits for sites with ecoroofs or trees over 15 feet tall. Credit amounts vary based on the practice and the goals the municipality has for private stormwater management.

Depending on the billing cycle, these discounts can be incorporated into the next charge or retroactively for past payment. In almost all cases, the fee reduction is permanent, especially for impervious surface reductions, but may be contingent on proper maintenance for credits granted for specific practices or tree planting/preservation.

Table 2: Framework for Stormwater Fee Discount Programs

Goal of Discount	Mechanism for Fee Reduction	Process for Implementation
Reduce Imperviousness	• Percent fee reduction • Per-square-foot credit	• Percent reduction in imperviousness • Square feet of pervious surfaces
On-site Management	• Percent fee reduction • Quantity/Quality credits (performance-based)	• List of practices with various credits • Total area (square feet) managed
Volume Reduction	• Percent fee reduction • Performance-based quantity reduction	• Percent reduction in imperviousness • Performance-based • Total area (square feet) managed • Practices based on pre-assigned performance values
Use of Specific Practices	• Percent fee reduction • One time credit	List of practices with various credits

Drawbacks and Limitations

Stormwater fees can be a fair, efficient way for communities to recover the cost of maintaining and improving stormwater infrastructure. However, to be an effective and sustainable source of funding, stormwater fees must be thoroughly planned and thoughtfully implemented. When new fees are hastily imposed, they can lead to unexpected consequences that often cause more harm than good.

When charging the people that use and benefit from stormwater infrastructure, it is critical that the greatest costs are directed towards those who create the most runoff. Following this logic, most stormwater fees should be structured so that properties with the large amounts of impervious area – such as commercial and industrial facilities – pay higher fees than residential and other small-meter properties which generally have less impervious cover.

When too much of the cost burden is placed on residential customers, stormwater fees can quickly lose traction and support. In Detroit, for example, an increase in residential stormwater fees left many of the city's low-income families unable to pay their monthly water bill. As a result, many of these residents had their water turned off. This was clearly not the intent of the city's stormwater fee, but it serves as an example of what can happen when the cost allocation of stormwater fees is not carefully thought out. To address this problem, cities have developed a variety of assistance programs to help low-income customers pay their stormwater bills. The City of Portland, Oregon, for example, offers bill discounts, crisis vouchers (good for up to $150), and zero interest loans for qualified customers.

In addition to ensuring a fair cost allocation, stormwater fees must also provide enough capital to maintain and enhance existing stormwater infrastructure. On the one hand, a stormwater fee that is too high will likely meet opposition from overburdened customers. On the other hand, a stormwater fee that is too low is virtually useless. The District of Columbia, for example, charges a $7 annual stormwater fee to all single-family homes – a charge that covers only a fraction of the District's actual infrastructure costs. It is important to remember that stormwater fees are designed to offset the costs of infrastructure expenditures. To be truly effective, these fees must therefore generate enough funds to pay for infrastructure maintenance and upgrades.

Tanner Springs Park in Portland, Oregon includes a constructed wetland for managing runoff from nearby buildings

Case Study: Philadelphia, Pennsylvania

Like many large cities, Philadelphia has witnessed a significant increase in stormwater management costs over the past several years. In an effort to comply with state and federal regulations, the city has

incurred substantial capital expenditures and operating costs to maintain its aging stormwater infrastructure. In addition, the city will need to invest hundreds of millions of dollars over the next decade to reduce the frequency of combined sewer overflows.

To help offset these tremendous costs, the Philadelphia Water Department recently decided to revise its stormwater fees. For years, the Water Department recovered the costs of operating and maintaining stormwater infrastructure through a service charge collected from metered customers. Under this system, properties with larger water meters - such as commercial and industrial facilities - paid a higher service charge. While this fee structure may seem reasonable, it has one major drawback in that non-metered properties such as parking lots and utility right-of-ways have not had to pay a stormwater fee.

The Water Department convened a Citizens Advisory Council to make recommendations for improving the city's stormwater fee. This group of stakeholders recognized that impervious cover is the primary factor in determining the amount of runoff a property will generate. As a result, 80 percent of the city's new stormwater fee is based upon a property's impervious area, with the remaining 20 percent based upon the property's gross area. In this way, stormwater fees will reach non-metered customers such as rail lines, parking lots and utility right-of-ways that account for significant impervious space (and stormwater runoff) within the city.

Philadelphia offers a stormwater fee discount for customers who reduce impervious cover using green infrastructure practices, including rain gardens, infiltration trenches, porous pavements, vegetated swales, and green roofs. If a property is retrofitted with any of these features, the Water-Department will re-calculate that property's stormwater fee based on the 80/20 impervious/gross area formula.

Philadelphia's new impervious-based fee encourages retrofits of large impervious sites, such as the Wissahickon Charter School (above), which now intercepts all parking lot runoff with rain gardens.

The Water Department is planning to implement this new fee among its large-meter non-residential customer base over a four year period beginning in FY 2009. However, for residential and other small-meter customers, the City recognized that a detailed analysis of each of the City's 450,000 residential properties would be administratively complex and have chosen not to implement this level of detail for an impervious-based billing program at this time. As a result, all residential properties have been combined and treated as a single land parcel with the total costs of the 80/20 calculation divided equally among all households. Under this new fee system, stormwater costs will be spread out and shared over a larger customer base, and calculations show that the majority of customers will see a reduction or otherwise minor impact on the stormwater component of their water and sewer bills. For those customers that experience a noticeable increase in their fees, the Water

Department will provide site-design recommendations that will decrease the amount of impervious area on their properties and thus decrease their stormwater fees.

For more information about Philadelphia's new stormwater fee, contact:

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Case Study: Portland, Oregon

The City of Portland has one of the most well-developed stormwater fee and discount programs in the nation. The City Council first established a stormwater utility charge based on impervious surfaces in 1977 and has continued to update the program as local regulations and state funding sources change. The most drastic change came in 2000 when the City Council adopted a new split charge on the utility bill, with 35% for on-site and 65% for off-site stormwater management. The on-site portion is based on the pollutant loads and volumes created by a given property's impervious surfaces, while the off-site portion of the fee covers costs for street drainage, combined sewers and other conveyance and disposal infrastructure. Portland currently has the highest average monthly fee for stormwater in the U.S., at $16.82 per month based on a rate of $7.22 per 1,000 square feet of imperviousness.

At the same time that the new split stormwater charge appeared on utility bills in 2000, the City adopted a discount program for the on-site portion of the fee. Itemization of the bill was motivated by a desire to improve public awareness about stormwater and the role of individual property owners and runoff created by impervious surfaces like roofs and parking areas. It also set a convenient cap for the stormwater discount so that the program creates the revenue necessary to cover costs for large infrastructure maintenance and updates, such as several ongoing combined sewer overflow (CSO), or "Big Pipe" projects.

Clean River Rewards is the most recently updated version of the stormwater discount program. Launched in 2006, it provides discounts to property owners based on the extent and effectiveness of on-site stormwater management practices that control flow rate, pollution and disposal. Because the on site portion of the stormwater bill is only 35%, this is the maximum discount received for full on site management. Different forms and requirements apply to two ratepayer categories, either single-family homes or commercial, industrial, and multi-family homes. The process for registering is very simple and straightforward, can be done entirely online and requires only the property owner's signature for certification.

Single-family homes are given a stormwater discount based on roof runoff management. Property owners are given a checklist to choose what type of on-site management qualifies them for the discount. For example, different percentage discounts are given for disconnecting downspouts and depending on the type of practice collecting runoff, such as a drywell, swale or rain barrel. Partial credit is also given for ecoroofs, four or more trees over 15 feet tall and for properties with less than 1,000 square feet of imperviousness. To date, over 35,000 residential participants have registered for Clean River Rewards.

Commercial, industrial, and multi-family home discounts are based on runoff managed not only for roof areas, but for paved areas as well. Property owners are asked to calculate the square footage of impervious area that drains to an acceptable stormwater management practice listed on the form. Over 2,000 commercial, industrial and multi-family home properties have registered for the discount program.

Bureau of Environmental Services staff are granted access to inspect properties and verify that stormwater facilities are properly maintained and operated. The City imposes civil penalties and recovers stormwater discounts in situations where management practices are not in proper working order. Staff members also provide technical assistance to a range of property types, with special attention to schools, hospitals, nonprofits and government properties to help them become eligible for the discount. Overall participation is expected to reach 110,000 of the 176,000 ratepayers in Portland.
For more information on Portland's stormwater charge and Clean River Rewards, contact:

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The Oregon Convention Center saves $15,600 annually on its stormwater bill by managing roof runoff in rain gardens along the side of the building.

Case Study: Toledo, Ohio

The City of Toledo implemented their stormwater utility as a way to pay for the increasing costs of managing and maintaining their sewer system. In 1999, the City created a utility that charged fees based upon the amount of impervious surface area of all the landowners within their jurisdiction. To establish a framework for the utility, city officials worked with the University of Toledo and private consultants to measure the amounts of impervious surface within the city.

In 2001, the city also instituted a stormwater fee discount program as a way for non-residential property owners to reduce their stormwater service fee. The credit program was developed based on research and evaluation of 15 other communities with existing Stormwater Utilities. The program identifies several different practices that property owners can install to reduce stormwater runoff and pollution and establishes different discount percentages for each practice. For example, a property owner can receive a 10% discount for brownfield reuse, and a 30% discount for installing a forested buffer or swale. The current guidelines of the program are as follows:

- Credits are available only for non-residential property owners who pay a stormwater fee.
- The maximum credit receivable is 50%.

- Credit is awarded only for fully constructed and functional practices.
- The credit is applicable only to the impervious area that is controlled by the practice.

Currently, the credit program is evolving and being refined. The city wants to add rain gardens and bioretention units as credit worthy practices, and public schools are working with the city and other partners to install bioretention on school facilities as a means of receiving stormwater credits.

For more information on Toledo's utility, contact:

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Case Study: Lenexa, Kansas

Lenexa, Kansas is a growing suburb in metropolitan Kansas City that faces increasing pressure from the impacts of new development, including more homes, roads and other impervious surfaces that create more runoff volume. In an effort to protect local water quality, as well as prevent flooding and improve the quality of life for local residents, Lenexa's 20 year comprehensive plan, Vision 2020, outlines a number of policies and programs to protect land from future development and introduce new green infrastructure practices that limit imperviousness and manage runoff on site. Part of the 2020 process involved establishing sustainable funding at the local level to purchase lands for open space preservation and to pay for new and expanded stormwater management programs.

Lenexa is leveraging funds to incorporate green infrastructure into major capital projects, ranging from updates to existing wet weather infrastructure to development and redevelopment of roads, parks and other facilities. Funding for these major projects and for the day-to-day staffing and management of a watershed protection program, Rain to Recreation, comes from four primary sources:

1. *Sales Tax*

Lenexa taxpayers voted for a ballot in 2000 to add a 1/8 of a cent sales tax levy to support building stormwater facilities that repair existing infrastructure problems and protect against future flooding events. The sales tax passed by a 78% margin. It generated $7.2 million between 2000 and 2005 and sunsets in 2010. The sales tax levy supports a frontloaded capital improvement program.

2. *Utility Charge*

Lenexa established a stormwater utility and charge to provide comprehensive sustainable funding for its new programs. The stormwater utility charge is based on the amount of runoff surface on each parcel of land. Each property is charged $5.50 (in 2008) per equivalent dwelling unit (EDU), which is measured at 2750 square feet, or about the average runoff surface area of a house with a driveway. The minimum charge for stormwater management for all residential properties is one EDU. Commercial and non-residential properties are charged based upon amount of storm water runoff generated and rates are calculated by dividing total runoff surface area by the number of square feet in an EDU (2750) to more closely charge these larger properties by runoff contributions to the public system. The stormwater utility charges are collected through annual property tax roles administered by the County. The City offered a 25% credit for the first three years of the utility to those rate payers that converted

their dry bottom detention to wet bottom detention to encourage greater water quality improvement from existing basins. There was no demonstrated interest at the time and thus the credit was discontinued to date.

3. *New Development Charge*
In 2004, the Lenexa City Council adopted the Systems Development Charge to require new development to pay a one-time fee at the time of building permit as a means for recovering costs for capital improvement activities within the Rain to Recreation program so that growth pays for growth. Although all public projects incorporate water quality treatment and protection into all new city facilities, the focus of this fee is to systemically address water quantity needs through construction of regional retention facilities and necessary capital improvements to streamways, many of which are protected by the City's stream setback ordinance. Some other cities refer to this as a "fee in lieu" of requiring developers to construction detention areas on new development sites (and in this case detention of the 100 year (1% storm) event), and instead directs the money towards projects that have wider public benefit beyond just water quality treatment. Because new developments are contributing to the problems of water quantity, Lenexa has required that they pay into the pool of funds used to build new projects, including the construction of regional watershed management, multi-use lakes, wetlands and stream restorations.

Lenexa, Kansas uses revenue from their stormwater utility fee to purchase land that protects natural resources and serves as public park and educational areas.

4. *Existing Sources*
Continued grants from state and federal sources, such as Clean Water Act Section 319 Nonpoint Source monies for park construction and Surface Transportation Project (STP) funding for roadway projects, have assisted with capital and demonstration projects that helped establish Lenexa's Rain to Recreation program. Other sources of funding also support Lenexa's stormwater program, including Johnson County Stormwater Management Advisory Council (SMAC) funding supported by a 1/10th cent sales tax and basic permitting fees charged to developers.

For more information on Lenexa's programs, contact:
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Loan Programs

In situations where the creation of a stormwater utility is impractical, loan programs provide another funding option for communities looking to finance green infrastructure projects. There are currently a variety of federal and state loan programs that can be used to help pay for stormwater infrastructure. One of the largest, most readily available sources of funding for green infrastructure implementation is the US Environmental Protection Agency (EPA) Clean Water State Revolving Fund (CWSRF).

Background

The CWSRF is a powerful financing program that provides funding for wastewater treatment, stormwater management, nonpoint source abatement and estuary protection projects. Today, all 50 states and Puerto Rico operate successful CWSRF programs that have provided over $63 billion in financial assistance since 1988, with funding generally provided in the form of low interest loans. In 2007 alone, $5.3 billion was provided to fund a wide variety of projects that protect or improve national water quality. At present, only a small percentage of the CWSRF has been used for green infrastructure projects; however a growing number of states are beginning to implement green stormwater technologies with CWSRF loans.

The working framework of the CWSRF is relatively simple. Each year, funds to establish or capitalize the CWSRF program are provided to states through EPA grants. In addition, states add matching funds which are then loaned to a wide variety of water quality improvement projects. Although there is no federal requirement to do so, these loans are usually paid off over 20 years or the useful life of the project - which ever is less - with repayment commencing within one year of project completion. To complete the cycle, loan payments, interest and new capitalization grants are reincorporated into the fund and used for new projects. This is the basis of the revolving funding program.

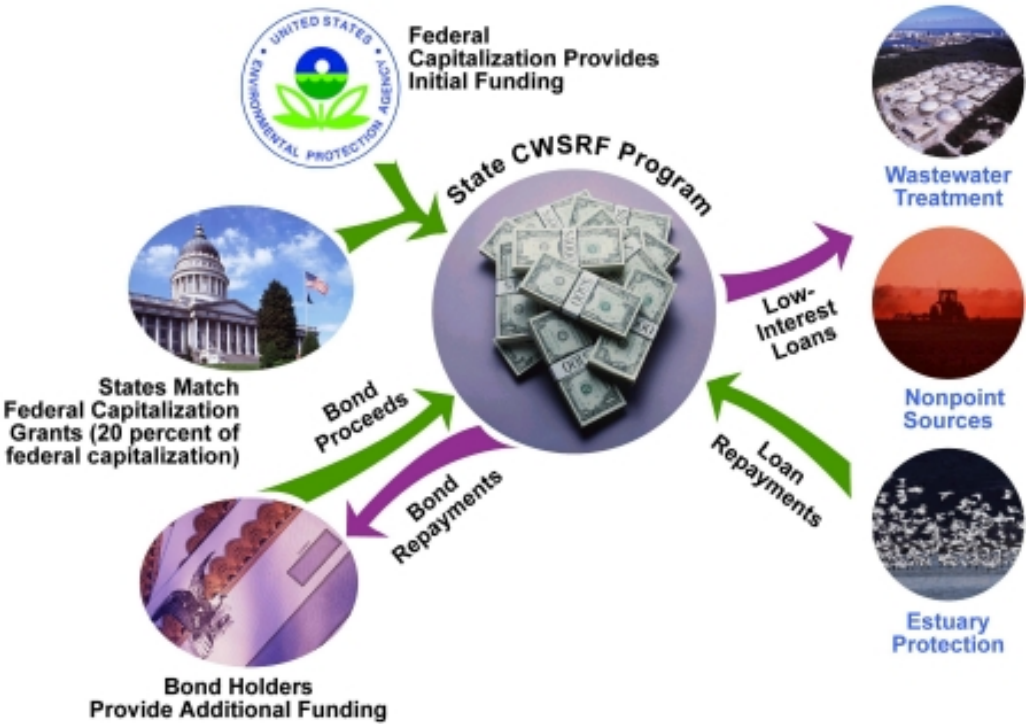

Benefits

The CWSRF is an attractive financing option for a number of reasons. For one, CWSRF money is readily available and can be used for a wide variety of projects, both large and small. State managers of the CWSRF program are very innovative and can often leverage available resources to meet the fluctuating demand for funding. In addition, the CWSRF is also an affordable way to finance projects that improve water quality. Though the money provided is not free, CWSRF loans can have interest rates as low as 0%, and repayment can begin up to one year after a project is complete. Even better, CWSRF loans can cover 100% of a project's costs with no matching requirement on behalf of the borrower. Finally, the CWSRF is a very flexible program. There are countless ways to structure funding agreements, and states have wide latitude to set interest rates and repayment terms. In many cases, funds to repay CWSRF loans are generated by the project itself. For instance, wastewater user fees can be used to repay loans to publicly owned treatment works (POTWs). That said, funds do not necessarily have to come directly from the project, and it is perfectly acceptable for loan repayment to come from unrelated funding sources, such as:

- Stormwater Fees
- Homeowner Fees
- Recreational or License Fees
- Dedicated Portion of State, County, Town, or Special District Fees or Taxes
- Donations or Membership Dues made to Nonprofit Organizations
- Individual or Business Revenues

Eligibility

The CWSRF has broad authority to fund watershed projects directly related to (1) POTWs, (2) implementation of a state's Nonpoint Source Management Plan, and (3) development and implementation of a National Estuary's Comprehensive Conservation Management Plan (CCMP). The key to eligibility is determining which of these three authorities apply to a project, if any. Of prime concern for green infrastructure projects is whether the project is located in a community that is regulated under the National Pollutant Discharge Elimination System (NPDES) stormwater program and, if so, identifying what the NPDES permit specifically requires of the community.

Permitted Communities: If a community is permitted for stormwater, it is considered a point source, and therefore projects may be funded as POTWs. These types of projects must be publicly owned. If a community is permitted and the project is not specifically required by a draft or final NPDES permit, it may be funded as a nonpoint source project if it is consistent with a state's Nonpoint Source Management Plan. Nonpoint source projects may be publicly or privately owned.

Non-Permitted Communities: If a community does not have a draft or final NPDES stormwater permit or is exempt from permitting, the project may be funded as a nonpoint source project under a state's Nonpoint Source Management Plan and can include publicly or privately owned projects. Additionally, any public or private project may be funded as an estuary project if the project is located in a National Estuary's watershed and is sanctioned by the Estuary's CCMP.

Green Infrastructure Funding

Under current regulations, the CWSRF can fund only the "capital costs" of a water quality improvement project. However, the CWSRF's definition of capital costs is very broad. In addition to traditional infrastructure expenditures on pipes, pumps and treatment plants, capital costs also include things like land conservation, tree plantings, equipment purchases, environmental cleanups and even

the development and initial delivery of environmental education programs. One of the few things the CWSRF cannot fund is the operation and maintenance costs of a project, such as periodic cleaning of pervious pavement.

Some examples of green infrastructure projects that are eligible for CWSRF assistance include:

Land Conservation	Wetland Restoration
Reforestation	Parks & Greenways
Tree Boxes	Rain Gardens & Bioinfiltration Practices
Cisterns & Rain Barrels	Permeable Pavements
Downspout Disconnections	Green Roofs

In addition to providing funding for green infrastructure projects, the CWSRF can also help reduce the risk associated with the performance of green infrastructure practices. Some communities may be reluctant to try these relatively new stormwater management technologies because of concerns that they may fail to perform as expected. Fortunately, there is a simple way to ease these concerns. Many states currently charge additional fees on their CWSRF loans, known as non-program income, which can be used for a wide range of purposes. Using this additional source of income, states may pay for insurance that can cover the risk associated with the performance of newer green technologies. If there is sufficient non-program income, states can also use these funds to replace a particular technology that fails to perform adequately.

Helpful Hint: By incorporating green infrastructure into traditional stormwater infrastructure projects, POTWs can use CWSRF funds to pay for land acquisitions in public right-of-ways that would not otherwise be authorized. Here is how:

Under current regulations, POTWs cannot receive CWSRF funding for land, including right-of-ways, unless that land is integral to the wastewater treatment process. However, percolation of stormwater through the soil matrix is often essential to the operation of green infrastructure practices, many of which can be conveniently located in public right-of-ways. Thus, because green infrastructure practices can utilize the soils and plants in a right-of-way to clean and infiltrate stormwater, the land in that right-of-way becomes integral to the treatment process and is therefore eligible for CWSRF funding.

Case Study: Ohio CWSRF Program

The Ohio CWSRF program recently provided over $1.1 million in low interest loans to Hidden Creek, Ltd., a residential development company, to fund the installation of a variety of green infrastructure practices that protect the Big Darby Creek watershed – one of the highest-quality aquatic ecosystems in the United States. Home to 25 rare or endangered species, this watershed encompasses 557 square miles in central Ohio and has been recognized as one of The Nature Conservancy's "Last Great Places" in the western hemisphere.

When a large tract of highly sensitive agricultural land within this watershed was put up for sale, Hidden Creek Ltd. bought the property and designed a housing project to demonstrate that development can be both environmentally sensitive and financially profitable.

With the help of CWSRF funds, a comprehensive set of actions were taken to limit the amount of runoff generated from the development project, including the construction of vegetated swales for stormwater treatment, restoration of wooded stream buffers, and the establishment of emergent wetland habitat. In addition, 230 acres of the riparian stream corridor within the development have been protected via a conservation easement held by the Natural Resources Conservation Service. A program has also been developed to educate homeowners and housing contractors about watershed protection and related deed restrictions attached to each property. Hidden Creek, Ltd. received a national wetland award for land stewardship and development from the Environmental Law Institute for their watershed protection efforts, and has repaid the CWSRF loans with revenues from the sale of the housing lots.

The Big Darby Creek watershed provides habitat for 86 species of fish, 35 species of reptiles, and 170 species of birds.

Resources

University of Maryland, Environmental Finance Center.
http://www.efc.umd.edu/

Florida Stormwater Association, *Establishing a Stormwater Utility*.
http://www.florida-stormwater.org/manual.html

National Association of Flood and Stormwater Management Agencies, *Guidance for Municipal Stormwater Funding.*
http://www.nafsma.org/Guidance%20Manual%20Version%202X.pdf

Black and Veatch Stormwater Utility Survey 2007
http://www.bv.com/Downloads/Resources/ems_brochures/rsrc_2007StormwaterUtilitySurvey.pdf

EPA's Financial Assistance Comparison Tool (FACT)
www.epa.gov/owm/cwfinance/cwsrf/fact.htm

EPA's Guidebook of Financial Tools
www.epa.gov/efinpage/guidebook.htm

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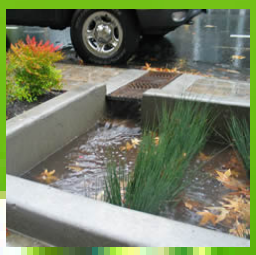

Managing Wet Weather with Green Infrastructure

Municipal Handbook

Green Infrastructure Retrofit Policies

Managing Wet Weather with Green Infrastructure

Municipal Handbook

Green Infrastructure Retrofit Policies

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The Municipal Handbook is a series of documents
to help local officials implement green infrastructure in their communities.

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Front Cover Photos
Top: rain garden; permeable pavers; rain barrel; planter; tree boxes.
Large photo: bioretention and permeable concrete, Olympia WA

Green Infrastructure Retrofit Policies

Introduction

Existing development, especially in urbanized and urbanizing areas, is responsible for currently degraded water quality and stream conditions. Changes in land cover and the increased imperviousness of the urban environment have resulted in larger volumes of runoff traveling at faster velocities. This has caused serious streambank erosion and has compromised aquatic habitat. Many of these areas were developed without adequate stormwater controls and must be addressed if urban streams are to be restored and water quality is to be improved nationwide. It should be noted that most stormwater regulations are intended to limit the increases in pollution associated with new development, or to curb flooding, but do not specifically address the hydrologic modifications associated with runoff from existing development.

Nationally, 40% of assessed waters fail to meet water quality standards and urban streams have tended to fare worse than the national averages.[1] USGS studies of urban streams find that concentrations of total phosphorus exceed EPA's goal for nuisance growth in 70% of streams, insecticides are usually at a higher concentration than in agricultural areas, and fecal coliform bacteria commonly exceed recommended standards for water recreation.[2] In addition, combined sewer systems in nearly 750 municipalities deliver 850 billion gallons of untreated overflows to urban waters each year.[3]

Retrofits to stormwater infrastructure will be necessary to reduce runoff and pollution, but the capital investment is daunting. Upgrades to stormwater and combined sewer systems, like other utilities, are capital intensive projects. EPA estimates current wastewater infrastructure needs an investment in excess of $200 billion, with $10 billion needed for stormwater management and $60 billion needed for combined sewer overflow (CSO) correction.[4] While this needed investment presents a significant economic burden, it also presents an opportunity to re-evaluate the most efficient way to invest in infrastructure and environmental programs.

Using green infrastructure for urban stormwater retrofits can reduce stormwater pollution while simultaneously reducing the burden and demand on existing infrastructure. However, water quality and quantity benefits are not the only advantages green infrastructure has to offer. Green infrastructure enhances communities by bringing aspects of the natural environment into inhabited space. Trees provide shade, act as wind breaks and noise barriers, and improve air quality. In many instances, green infrastructure has been found to be less costly than or cost competitive with traditional infrastructure. Green infrastructure provides additional environmental and economic benefits for the investment rather than traditional stormwater management approaches that literally bury the investments out of sight. The additional benefits that green infrastructure provides include:

- Green infrastructure effectively counteracts urban heat island by substituting soils and vegetation for hard, heat absorbing materials common in urban areas, creating shade, and emitting water vapor.
- Green roofs and other vegetation incorporated on and around buildings, help shade and insulate buildings from wide temperature swings, decreasing the energy needed for heating and cooling.
- Green infrastructure improves air quality as vegetation absorbs gaseous air pollutants and adsorbs particulates.
- Research indicates that property values increase when street trees are planted and vacant lots are greened, providing private benefits to homeowners, increased property tax revenue, and more livable communities.

The distributed green infrastructure network is designed to limit the conversion of precipitation to runoff by capturing rainwater where it falls, managing stormwater at the surface, and maximizing soil and vegetation contact during treatment. This combination allows green infrastructure to reduce stormwater volumes, peak flow rates, and pollutant concentrations.

Traditional stormwater controls have focused almost exclusively on reducing pollution without addressing the increased volume of stormwater discharged from urbanized areas. The benefits gained from removing pollutants are often overshadowed by the magnitude of the runoff volume. Even with stormwater controls and high rates of pollutant removal, absent volume reductions, urban areas will contribute more pollution than pre-development conditions making it difficult to achieve water quality standards. Table 1 highlights this condition with the familiar example of the runoff from a one-acre meadow and one-acre parking lot after one-inch of rain.

Table 1. Runoff Volume and Pollutant Load from One-Acre Parking Lot with Treatment and Meadow for a One-Inch Rain Event.[5, 6]

Land Use	Pollutant	Concentration (mg/L)	% Removal	Effluent Concentration (mg/L)	Runoff Volume (gal)	Pollutant Load (lbs)
Paved Parking Lot with Treatment	TSS	130	80	26	25,800	5.6
Meadow		25	0	25	1,600	0.34

Table 1 demonstrates that even when treatment measures are able to achieve pollutant concentrations similar to pre-development conditions, the large difference in runoff volume produces a pronounced increase in pollutant load from urbanized areas. And with the lack of any controls in many urban areas, the pollutant loadings are much greater than displayed in Table 1. Green infrastructure's ability to reduce both stormwater volumes and pollutant concentrations is critical to reducing pollutant loads from urban areas and improving water quality.

This paper will explore the policies and incentives that municipalities have used to facilitate the use of green infrastructure within their stormwater programs. While the benefits of green infrastructure are increasingly understood, incorporating green retrofits into municipal infrastructure has presented institutional and regulatory challenges. The solutions to overcome these barriers are often dependent upon the water quality objectives and technologies employed. The policies are presented in this paper by technology type, but often approaches used for one green infrastructure practice are applicable to another or there is overlap among goals and outcomes.

Green Roof Retrofit Policy

There are two types of public policy currently in place concerning the implementation of green roofs for retrofit applications: incentives and regulations. Although many jurisdictions are currently using incentives alone in the early stages of garnering widespread municipal support for green roofs, these two policy approaches work well in tandem. An incentive program can initiate a green roof regulation by introducing the technology and its application on private property before implementing a mandate.

A combination of both incentives and regulation has been effective in Basel-City, Switzerland. Their incentive program had good publicity and raised awareness of green roof benefits such as energy savings and biodiversity protection, issues that were important to the community. Consequently, their green roof regulations did not meet resistance.[7]

Excerpt from the City of Toronto Green Roofs Pilot Program
Green Roof Incentive Pilot Program

Program goals

The Green Roof Incentive Pilot Program supports the City's stormwater plan known as the Wet Weather Flow Master Plan. The overall goal of the Green Roof Pilot Program is to encourage green roof construction in the City. In addition, the program will:

- Result in the construction of a variety of green roof types which could be used for education and promotional purposes.
- Provide an opportunity to showcase various green roof technologies and planting styles.
- Provide a grant of $50 per square meter of eligible green roof area up to a maximum of $10,000 for single family homes and a maximum of $100,000 for all other property owners in the City of Toronto.

Who is eligible

Any private property owner in the City of Toronto with a water account with the City is eligible, regardless of building size and type, so long as the building is capable of supporting a green roof that meets the specifications and requirements. Each green roof applicant must demonstrate that the proposed green roof:

- Has a continuous coverage of growing media over at least 50% of the roof footprint (roof area) of the building.
- Has a vegetation mix as opposed to a monoculture and a sustainable organic growing medium that replenishes nutrients and retains moisture.
- Has a maximum slope of 10 percent.
- Has a depth of at least 150 mm (6 inches) for a new building. The depth will permit greater flexibility in terms of the type and variety of vegetation that can be incorporated and will help ensure greater survival of plants (existing buildings with a lesser growing medium thickness may be considered for the pilot program if the applicant (or manufacturer) submits test data indicating the performance of the system with respect to water runoff coefficient and plant survival ability.
- Is installed over heated spaces (non-heated spaces, such as underground garages will not be considered for the pilot program).

Incentives

A green roof can have up to twice the lifespan of a conventional roof, making the long-term cost of the two comparable.[8] However, since the initial cost of a green roof is significant, a policy that focuses on alleviating that initial cost burden appears to be most successful.

Subsidy

The most common way to reduce the initial cost burden is through a subsidy program. Subsidies are usually provided per square foot of green roof area, up to an established maximum amount or percent of the total cost. For example, the City of Toronto's Green Roof Incentive Pilot Program will fund $50 per square meter of green roof up to a maximum of $10,000 for single family homes and $100,000 for other building types (Canadian dollar values).[9]

The funding for subsidy programs often comes from stormwater fees collected by the municipality to mitigate for post-construction levels of runoff quantity and pollutants. By investing in green roofs, the municipality is eliminating runoff before it enters the municipal stormwater system. The use of public money on private land is validated because of the reduced municipal facility cost, size, and maintenance burden.

After the first year of Toronto's Green Roofs Pilot Program, the incentive offered for building green roofs was found to not be high enough to attract broad interest.[10] Consequently, the financial incentive was raised from $10 (CAD) to the current $50 (CAD) per square meter. However, this amount is more than the cost of the stormwater benefit to the city and alternative funding sources have to be found in order to sustain the program. Since green roofs also reduce energy use in buildings making more energy available for other users and delaying the need for capacity upgrades, Toronto is considering funding the Green Roof Incentives Program with energy conservation funds as well as stormwater management funds.[11]

Local market development is an additional benefit of financial incentives. As more property owners elect to build green roofs, the demand for local green roof services will increase and the cost of the technology will eventually decrease as a result of a competitive market. This may eventually reduce or eliminate the need for a financial incentives program.

Excerpt from the City of Minneapolis Stormwater Utility Fee

Applying for Stormwater Quantity Credits

Property owners can apply for either the "Standard Quantity Reduction Credit" or the "Additional Quantity Reduction Credit."

- **Standard Quantity Reduction Credit.** The Standard Quantity Reduction Credit is a 50 percent credit on a property's stormwater fee. The "Standard Quantity" credit is based on a property's stormwater quantity management tools/practices being able to retain the *10-year, 24-hour type II SCS* storm event to pre-developed conditions. To qualify for this credit, the property owner must demonstrate that stormwater from the property is controlled with an on-site constructed stormwater quantity management tool/practice (BMP).
- **Additional Quantity Reduction Credit.** The Additional Quantity Reduction Credit is a 100 percent credit on a property's stormwater fee. To be eligible for the "Additional Quantity" credit, a property's stormwater quantity management tools/practices must be able to retain the *100-year, 24-hour type II SCS* storm event to pre-developed conditions. To qualify for this credit, the property owner must demonstrate that stormwater from the property is controlled with an on-site constructed stormwater quantity management tool/practice (BMP).

Consultation

Lack of information about the site-specific costs, maintenance needs, and benefits of a green roof can discourage property owners considering retrofitting an existing roof. Providing a free consultation with a green roof professional can allow property owners who are interested in green roof retrofits to overcome initial uncertainty. Stuttgart, Germany has a financial incentives program, and also provides free consultations and informative brochures that detail benefits, weight, waterproofing issues, and maintenance considerations.[12]

Fee Reduction

An incentive that can be used to ensure the long-term effectiveness of a green roof is a stormwater fee reduction. In areas where stormwater utility fees are in place, credit for reducing impervious area, and thereby runoff volume, can be given to property owners who install and maintain green roofs. In Minneapolis, Minnesota, 50% of the stormwater fee can be waived if the property owner can demonstrate that the runoff from a 10-year, 24-hour storm event can be managed on site. If a property owner can demonstrate that the runoff from a 100-year, 24-hour storm event can be managed on site, the entire stormwater fee is waived.[13]

Regulation

There are very few cities in North America that directly mandate the use of green roofs. The City of Chicago has requirements in place to mitigate urban heat island effects by addressing the solar reflectance of roofs. These requirements set a minimum reflectance for low and medium sloped roofs. However, green roofs are exempt. By installing a green roof, the solar reflectance requirements are met.

Excerpt from the City of Chicago Energy Conservation Code Revised January 9, 2003.
303 URBAN HEAT ISLANDS

18-13-303.1 Roof Reflectance. To minimize the undesirable "urban heat islands effect," low and medium sloped roofs shall comply with the following requirements when tested in accordance with ASTM E408. The roof surface of low sloped roofs (2:12 or less) shall have an initial solar reflectance greater than or equal to 0.65 and shall maintain a reflectance equal to greater than 0.50 for three years after installation. Medium-sloped roofs (greater than 2:12 and less than or equal to 5:12) shall have a solar reflectance equal to or greater than 0.15 initially and for three years after installation. Minimum emissivity shall be 0.9.

Exception: Roofs or portions of roofs that utilize photovoltaic, solar thermal or roof garden systems.

Urban heat island provisions. The reflectance and emittance requirements of Sections 18-13-303.1 through 18-13-303.2.1 are intended to minimize the urban heat island effect, as defined in Section 18-13-202, Definitions.

1. The portion of the roof that is covered by a rooftop deck covering 1/3 or less of the aggregate area of the roof, or a rooftop garden, or a green roof, is exempted from the requirements of this section.
2. An area including and adjacent to rooftop photovoltaic and solar thermal equipment, totaling not more than three times the area that is covered with such equipment, may be exempted from the requirements of this section.

18-13-303.2 Solar Reflectance. All roof exterior surfaces shall have a minimum solar reflectance as specified in 18-13-303.2.1 when tested in accordance with ASTM E903, ASTM E1918 or by testing with a portable reflectometer at near ambient conditions.

18-13-303.2.1 Roofing materials used in roofs with slopes of 0 in 12 to 2 in 12 shall meet the following requirements:

1. Roofs installed prior to and including 12/31/08 shall have a minimum solar reflectance, both initial and weathered, of 0.25.
2. Roofs installed after 12/31/08 shall utilize roofing products that meet or exceed the minimum criteria to qualify for an Energy Star label as designated by the USEPA Energy Star program.

Downspout and Impervious Cover Disconnection Retrofit Policy

There are various reasons why municipalities pursue a downspout or impervious cover disconnection program. Disconnection refers to the practice of breaking the direct link between impervious areas such as roofs or paved surfaces and the storm or combined sewer system. Disconnection can reduce combined sewer system overflows; reduce potable water demand when the runoff from roofs is used for applications such as landscape irrigation and toilet flushing; recharge ground water, helping to restore the natural hydrologic cycle; reduce stormwater discharges to waterways; and reduce or eliminate the need for large, municipally owned stormwater management facilities.

Using a combination of incentives, compliance assistance and regulations seems to be very effective at obtaining a high rate of retrofit disconnection. The regulation sets the timeframe for compliance. Incentives and assistance programs make compliance easily attainable for the target audience.

Incentives

Fast-track Project Review

Philadelphia has implemented a fast track review process for redevelopment projects with 95% or more of the impervious area disconnected from the combined or separate storm sewer. The Philadelphia Water Department will review the stormwater management portion of a project submittal within five business days for projects that qualify for the Green Project Review.[14] This is a low or no cost program for the City and it provides the project with a time savings that usually also translates into a financial savings. Because of the low cost of implementing this program, it is not subject to budget cuts or lapses in grant funding, and is not likely to be met with tax payer opposition.

City of Philadelphia Stormwater Management Guidance Manual Version 2.0

4.2.1 Green Project Review

PWD (Philadelphia Water Department) offers a Green Project Review for redevelopment projects that are able to disconnect 95% or more of the impervious area in the post construction condition. When performing a Green Project Review, PWD is committed to providing review of the stormwater management component within 5 business days of receipt of a complete project submittal. A Green Project Review may not necessarily include review of additional elements outside stormwater management such as Private Cost or Act 537 review. To be eligible for a Green Project Review a project must meet the following criteria**:**

- Project is redevelopment;
- 95% or more of the post construction impervious area is disconnected;
- Project may not adversely impact or further exacerbate rates and quality of runoff contributing to public infrastructure; and
- Public Health and Safety issues may preclude a project from a Green Project Review.

The submittee **MUST** identify their project as eligible for a Green Project Review in the letter of transmittal sent with the technical submittal. PWD may not be able to provide review comments within 5 business days without this notification.

Stormwater Utility Fee Discount
Portland, Oregon uses a stormwater utility fee discount as an incentive to encourage residential and commercial property owners to manage stormwater on site. Property owners with disconnected downspouts are able to apply for fee discounts. For example, residential property owners pay a monthly stormwater charge of $17.33. A discount of $6.07 applies to properties with disconnected downspouts, reducing the monthly charge to $11.26. A Residential Discount Calculator and a Commercial Discount Calculator can be found on the Clean River Rewards website.[15]

Compliance Assistance
The cities of Bremerton, Washington and Portland, Oregon elected to implement similar compliance assistance programs to achieve retrofit disconnection.

Reimbursement
Bremerton developed brochures and self-help videos describing how to separate roof drain leaders from the sewer system and offered free site assessments and technical assistance. In addition, Bremerton simplified their permit process and eliminated the fees for work done to disconnect downspouts. They also reimbursed residential property owners ($25 to $500) for materials used in the disconnection effort.[16]

As a result, 417,000 square feet of impervious area were disconnected. The program lasted 34 months and cost $270,000. The city obtained a grant for $150,000 from Washington Department of Ecology, and used $120,000 of its stormwater and wastewater utility funds. The use of wastewater utility funds was easily justified because the disconnection project reduced combined sewer overflows by 99%; the grant money was earmarked for public projects so the utility money was directed towards private property.[17] The program also reduced, and in some situations eliminated, the need for large scale, municipally owned stormwater management facilities, further justifying the use of stormwater and wastewater utility funds. Bremerton estimates that the cost per gallon of stormwater removed was $1.04 for a one inch rain event, whereas the cost of municipally owned stormwater management facilities is $5-$10 per gallon.[18]

Free Disconnection
Portland, Oregon implemented a similar compliance assistance program that offered reimbursement of $53 per disconnected downspout for property owners wanting to disconnect their own downspouts. Alternatively, property owners could apply to the City to do the disconnection work for free.[19] This flexibility provides compensation for property owners who want to do the work themselves, and free disconnection service for those who can not or do not want to. Portland's program is responsible for

successfully disconnecting over 50,000 downspouts and removing 1.5 billion gallons of stormwater a year from the combined sewer system.[20]

Portland City Code
Chapter 17.37.050 Disconnection Reimbursement in Voluntary and Mandatory Program Areas

(Amended by Ordinance No. 170113, effective May 15, 1996.) Disconnection reimbursement will be paid in the following manner:

A. Disconnection reimbursement will be made for the least expensive method of disconnection that will be effective, as determined by the Director. Reimbursements will not be processed until the new disposal system has been inspected and approved. Owners will not be reimbursed for downspouts disconnected prior to receiving official notification from the Downspout Disconnection Program that they are eligible for downspout disconnection reimbursement. Reimbursement will only be provided within the target areas identified in section 17.37.030 B.1. and 2.

B. Downspout disconnection to surface systems will be reimbursed as follows:

1. Owners who complete the disconnection work themselves or use their own contractor and receive a satisfactory inspection will be compensated according to the following unit costs per downspout:

a. $25 per downspout disconnected for supplies;

b. $13 per downspout for time and effort;

c. $15 per downspout for landscaping and miscellaneous;

Owners who receive free supplies from the City for their disconnection work will not receive the $25 amount for supplies.

Regulation

Both the Bremerton and Portland programs were successful in part because they required that downspouts be disconnected by a specified future date. Portland's regulations require that downspouts be disconnected one year after notification from the City.[21] This provides the incentive for property owners to participate in the compliance assistance program. In Bremerton, the regulations required that property owners disconnect their downspouts by 2005.[22] Their compliance assistance program began around 2001 giving property owners time to become informed about the issue, get involved in the compliance assistance program, and comply with the regulation before the disconnection requirement date.

Portland City Code
Chapter 17.37.030 Establishment of Downspout Disconnection Program

B.3. Owners of eligible property located in mandatory program areas are required to disconnect their downspouts within one year following written notice from the City. For purposes of this section, notice shall be deemed to have been received upon the mailing of said notice by first class mail or upon delivery of the notice in person.

Chapter 17.37.090 Enforcement Charges

(Added by Ordinance No. 170113, effective May 15, 1996.) In the event that the City needs to enforce the terms of the Code Hearings Officer's order referred to in Section 17.37.080, an administration fee of $300 for each occurrence shall be made a lien on the property in accordance with the provisions of Chapter 22.06.

Bremerton Municipal Code Title 15.04.130
ELIMINATION OF IMPROPER STORMWATER INFLOW TO THE WASTEWATER SYSTEM.

(a) Purpose.
The purpose of this section is to significantly reduce improper stormwater inflow to the wastewater system in order to eliminate or reduce instances of combined sewer overflow events and surcharged sanitary sewers due to the improper inflows, which are detrimental to public health and welfare; and to maximize efficient operation of the wastewater collection system and treatment plant.

(b) Disconnection Required by 2005.
Disconnection of all improper stormwater inflow to the wastewater system shall be made by January 1, 2005, unless continued connection is authorized by the Director where no practicable alternative for elimination of the improper stormwater inflow is available.

(c) Director's Authority to Order Early Disconnection.
(1) Purpose. The Director has the authority to order the disconnection of improper stormwater inflow to the wastewater system prior to January 1, 2005, where that disconnection is necessary to meet combined sewer overflow reduction plans and for elimination of sanitary sewer surcharging. The Order of Early Disconnection will generally be in target areas as defined elsewhere in this section.
(2) Notice. Notice of a Director's Order for Early Disconnection will be provided in writing. The notice will establish an effective date by which the improper stormwater inflow shall be discontinued. The effective date shall be no sooner than ninety (90) days from the date of the letter. The effective date may be extended in writing by the Director.

(d) Target Areas.
The Director may identify target areas within the wastewater service area (sewer or storm drainage basins or subbasins) which have the highest priority for reduction of improper stormwater inflow to the wastewater system based upon combined sewer overflow events and sanitary sewer surcharge problems.

Permeable Pavement Retrofit Policy

With so many paved surfaces in the urban environment, there are plenty of opportunities to retrofit sidewalks, driveways, parking lots, plazas, roads, and alleys with permeable materials. Paved surfaces fall into two categories from a retrofit policy perspective: paved surfaces on private property and publicly owned paved surfaces.

Public Property Retrofit

Publicly owned paved surfaces account for a large portion of the impermeable cover in urban areas. The City of Chicago, for example, has over 1,900 miles of alleys. Because many of these alleys were not built with connections to the combined or storm sewer system, stormwater pools on paved surfaces, often flooding nearby garages and basements.[23]

The Chicago Green Alley Handbook
About the Green Alley Program

While one solution to this problem is to install expensive connections to the City sewer system, the Green Alley Program also looks at other more sustainable solutions. In particular, where soil conditions are appropriate, water is allowed to infiltrate into the soils through permeable pavement or infiltration basins, instead of being directed into the sewer system or onto adjacent property. This not only solves a persistent problem, but it also provides an environmental benefit by cleaning and recharging the ground water. Furthermore, by not sending additional water to the combined sewer system a green alley can help alleviate basement and other flooding issues.

In 2006, Chicago piloted the Green Alley Program using permeable pavers, permeable concrete, and permeable asphalt to manage stormwater and recharge groundwater. Approximately 20 alleys are resurfaced each year. Costs vary depending on material use, soil type, and size of the paved area. The sometimes higher cost of construction is offset by the avoided costs of maintenance and sewer improvements that would have been needed if the alleys were redesigned and resurfaced with impermeable pavement. In addition, the cost of alternative paving materials is decreasing as they become more common. The 2008 cost of permeable concrete in Chicago is about $100 less per cubic yard than it was when the program began in 2006.[24]

In addition to water quality and quantity benefits, the use of light colored pavers and concrete reduces both the urban heat island effect and smog levels, improving outdoor air quality. The program also uses recycled materials, reducing the burden on landfills and conserving natural resources. For these reasons, the Green Alley Program was given the Chicago Innovation Award in 2007, sponsored by the *Chicago Sun-Times* and Kuczmarski & Associates.[25]

Philadelphia Code § 14-1603.2. Environmental Controls for the Wissahickon Watershed

(4) *Special Environmental Controls.* The following special environmental controls are imposed (in addition to any applicable provisions of Section 1603.1) to regulate: setbacks from water courses, construction and earth moving activity on slopes, impervious cover, and, earth moving plans.

(a) *Setbacks from Water Courses Within the Watershed.* There shall be no new impervious ground cover constructed or erected within 200 feet of the bank of a surface water body or within 50 feet of the center line of a swale within the Watershed

(b) ….

(c) *Impervious Coverage.*

(.1) *Basic Impervious Coverage.* No building, paving, street or other impervious ground cover shall be constructed or placed on any property within the Watershed in excess of the requirements of the following categories as designated on Map "B" cited in Paragraph (4)(c)(.4):

Category 1: There shall be no impervious ground coverage in excess of twenty (20) percent of the lot area or subdivision.

Category 2: There shall be no impervious ground coverage in excess of twenty-seven (27) percent of the lot area or subdivision.

Category 3: There shall be no impervious ground coverage in excess of thirty-five (35) percent of the lot area or subdivision.

Category 4: There shall be no impervious ground coverage in excess of forty-five (45) percent of the lot area or subdivision.

Category 5: There shall be no percentage limitation of impervious ground coverage on land deemed to be developed or otherwise disturbed from its natural state, provided that parcels in excess of one-half acre may be further developed only as follows:

(.a) The increased surface water runoff leaving the site shall not adversely affect adjacent property.

(.b) The method of handling runoff on the site shall be in accord with sound engineering practices and shall not significantly accelerate on-site erosion.

(.c) Such development shall not significantly diminish the infiltration capacity of the site.

Private Property Retrofit

As Chicago "greens" its alleys in the public right-of-way, it invites residents to participate in "greening" the City by retrofitting their properties through The Chicago Green Alley Handbook.

The handbook describes the environmental benefits of recycling, composting, planting trees, and using native landscaping. It also explains the benefits, costs and uses of rain gardens, rain barrels, permeable pavement and green roofs. The American Society of Landscape Architects gave the handbook a 2007 Communications Honor Award for its clear and user-friendly content and graphics.

As residents experience environmental improvements in their neighborhood, awareness increases. In addition, exposure to stormwater management increases the likelihood that residents will consider the use of other complementary practices such as rain barrels and rain gardens on their property.

Chicago Green Alley.
Photo: Chicago Department of Transportation

While Chicago has taken a "lead by example" approach to private property retrofits, Philadelphia requires limited imperviousness by way of local code. Property owners in the Wissahickon Watershed are required to meet impervious ground cover percentage maximums based on location. Since impervious cover includes buildings and pavement, the requirement acts as an incentive to reduce impervious cover through whatever means work best for the site. For example, a property owner may install permeable pavement if new paved surfaces are desired, or retrofit impermeable paved surfaces with permeable pavement in order to increase building size. The code allows for additional impervious coverage if stormwater is managed such that the infiltration capacity of the site is not diminished and runoff leaving the property does not have negative impacts off site. Because Philadelphia's impervious coverage regulation does not specify the manner of compliance, it leaves room for flexibility and creative solutions while achieving the desired environmental performance.

Philadelphia Code § 14-1603.2.(4)
Environmental Controls for the Wissahickon Watershed

(.1) …

(.2) *Additional Impervious Coverage.* Additional impervious coverage shall be permitted by the City Planning Commission, after review and comments by the Water Department and other appropriate City agencies according to the standards and regulations adopted by the Commission and the Water Department. Such standards and regulations shall assure that:

(.a) Storm water leaving the property shall be substantially similar in effect to that under the basic impervious coverage limitation.

(.b) Countermeasures shall not require excessive or significant maintenance.

(.c) Design of countermeasures shall take account of storm water runoff that enters the property from adjacent land.

(.d) The method of handling runoff on the site shall be in accord with sound engineering practices and shall not significantly accelerate on-site erosion.

(.e) Such development shall not significantly diminish the infiltration capacity of the site.

(.3) …

(.4) The map designated as "Impervious Coverage Categories" shall define the areas where the restrictions imposed under this Section shall apply and is made part of this ordinance (Map "B"). Where a parcel crosses category lines, each portion of the parcel shall be governed by the controls applicable to that portion.

Bioretention Retrofit Policy

Bioretention retrofit applications fit largely into two categories: those aimed at treating runoff from private property such as roofs and driveways, and those focused on treating runoff from the public right-of-way such as roadways. The policy approaches are different based on the constraints and opportunities of each. Policies governing public right-of-ways tend to be in the form of regulation and policies used for private property more often takes the form of incentives.

When implementing bioretention in the right-of-way, the constraint is most often space. The advantages are easy access and adequate authority. So while a narrow, linear space may be difficult to retrofit, a municipality usually has ample access, both physically and legally, to the property. Bioretention practices, such as rain gardens on private property usually have fewer space limitations. However, gaining access to build or maintain rain gardens on private property is a constraint.

Public Property Runoff Retrofit

Public Right-of-Way Retrofits

The Green Street Policy adopted in Portland, Oregon defines a "Green Street" as one that manages stormwater on site through the use of vegetated practices that provide water quality benefit and infiltration capacity. The policy requires that infrastructure projects incorporate these practices or be subject to an off-site project or off-site management fee requirement.[26]

Portland's Green Streets have been successful in many respects. The SW 12th Avenue retrofit project that introduced bioretention planter boxes into the landscaping strip between the sidewalk and the street, manages 180,000 gallons of runoff annually. The planters reduce the peak flow of a 25-year storm event by 70%.[27]. And at a cost of only $30,000 for the construction of the SW 12th Avenue bioretention planters, the project demonstrates a cost-effective solution. For these reasons, the American Society of Landscape Architects awarded the project the General Design Award of Honor as part of the 2006 Professional Awards.[28]

Portland Streetside Infiltration Planters.
Photo: Martina Frey.

Using Easements

Burnsville, Minnesota solved a similar problem of managing road runoff in a slightly different way. Lacking space in the right-of-way to implement bioretention practices, Burnsville launched a one month long public outreach campaign in an effort to get residents involved in the solution. Eighty-five percent of the residents agreed to participate in the rain garden retrofit project and allow the city to build rain gardens on the edge of their property to treat road runoff. The city obtained an $117,000 grant from the Metropolitan Council and contributed $30,000 of the City's funds to build the rain gardens. Each rain garden cost $7,500: $500 for plants, $8.00/square foot for construction, and $4.50/square foot for education, design and construction supervision. The City has easements to maintain the rain gardens, which have been successful at reducing runoff by 90%.[29]

City of Portland, Oregon
Green Streets Policy

Goal: City of Portland will promote and incorporate the use of green street facilities in public and private development.

City elected officials and staff will:

1. Infrastructure Projects in the Right of Way:
   a. Incorporate green street facilities into all City of Portland funded development, redevelopment or enhancement projects as required by the City's September 2004 (or updated) Stormwater Management Manual. Maintain these facilities according to the May 2006 (or updated) Green Streets Maintenance Policy.

      If a green street facility (infiltrating or flow through) is not incorporated into the Infrastructure Project, or only partial management is achieved, then an off site project or off site management fee will be required.

   b. Any City of Portland funded development, redevelopment, or enhancement project, that does not trigger the Stormwater Manual but requires a street opening permit or occurs in the right of way, shall pay into a "% for Green" Street fund. The amount shall be 1% of the construction costs for the project.
   c. …

   d. …

   e. Develop standards and incentives (such as financial and technical resources, or facilitated permit review) for Green Streets projects that can be permitted and implemented by the private sector. These standards and incentives should be designed to encourage incorporation of green street facilities into private development, redevelopment, and enhancement projects.

Findings

A "Green Street":

- Handles stormwater on site through use of vegetated facilities;
- Provides water quality benefits and replenishes groundwater (if an infiltration facility);
- Creates attractive streetscapes that enhance neighborhood livability by enhancing the pedestrian environment and introducing park-like elements into neighborhoods;
- Serves as an urban greenway segment that connects neighborhoods, parks, recreation facilities, schools, mainstreets, and wildlife habitats; and
- Meets broader community goals by providing pedestrian and where appropriate bicycle access.

Private Property Runoff Retrofit

Grant Program

In an effort to protect Lake Michigan and increase the number of rain gardens in Milwaukee County, the Milwaukee Metropolitan Sewerage District launched the Lake Michigan Rain Gardens Initiative. Grants are offered to property owners who are interested in planting their own rain garden. Grantees receive appropriate plants at a "two for one" discounted price. Applicants apply in January and, if awarded the grant, pick up their plants in June. An additional incentive is available for those who provide the total square footage of their roof, number of downspouts, and number of downspouts to be redirected. Their application is fast-tracked and they may be awarded early grant approval.[30]

This program not only encourages the creation of more rain gardens by reducing the cost to homeowners, but also provides a useful mechanism for tracking the size of rain gardens and the amount of impervious area that is disconnected within the watershed.

Excerpt from the Milwaukee Metropolitan Sewerage District
Rain Garden Grant Information

WHAT DOES THE GRANT PROVIDE?

Grants will be awarded in the form of plants for your rain garden. For every 2.5 inch plant purchased at $3.60, grantees will receive a second plant for free, about a 50% discount compared to retail prices. The number of plants required is typically one per square foot of rain garden installed.

EXAMPLE: the application is for a 10 x 10 foot rain garden, or 100 square feet. The number of plants needed is 100. The applicant orders 50 plants from GMF at a price of $3.60 each. The grantee receives 100 plants and pays $180.00.

There are no cash awards.

Costs for planning, design and construction of the rain garden are not grant eligible.

Voluntary Offset Program

The Mt. Airy Rain Catchers program is a pilot project administered by U.S. EPA as part of an effort to better understand the effectiveness of incentive programs. The objective of this voluntary offset program is to provide the largest benefit to the environment for the least amount of money spent. Participation in this unique program is voluntary and the offset (monetary compensation) received is determined by the individual property owner.

The pilot program is being conducted in the Shepherd Creek Watershed of Cincinnati, Ohio. Since residential roofs and driveways account for 50% to 72% of the total impervious area in the relevant subwatersheds, rain barrels and rain gardens are the desired solution.[31] Using an auction-based method, property owners place a bid for a rain garden or rain barrels to be installed on their property for free, and a dollar value they would like to be compensated for accepting these practices on their property. The bids are weighted according to cost, soils, and percent imperviousness of the site. Then the bids are ranked according to least cost and largest environmental benefit, and projects are awarded until available money is expended. In the summer of 2007, 50 rain gardens and 101 rain barrels were installed. They will be maintained for the property owner until 2010. Homeowners received an owner's manual and will continue to receive quarterly emails during the establishment phase explaining maintenance protocols. This helps the homeowners become familiar with the activities they will become responsible for in 2010.[32] The program also has a user-friendly web page that keeps residents up to date by providing seasonally appropriate information.

The program held a second auction in May 2008 followed by installation of the second phase of rain barrels and rain gardens. Most applicants did not request monetary compensation in exchange for theses practices being installed on their property.[33] The program has been successful in implementing rain barrels and rain gardens on private property at a low cost.

Excerpt from the Mt. Airy Rain Catchers Brochure
U.S. EPA is offering Mt. Airy homeowners a free rain garden and rain barrel!

U.S. EPA is sponsoring a limited number of rain gardens and rain barrels in the Mt. Airy neighborhood. Interested households must bid in an auction to receive them. Houses will be chosen based on **lowest bids** coupled with some environmental factors.

Bid forms will be coming in the mail next week. Send in bid-forms early! **Put in a low bid to increase your chances of receiving a free rain garden and/or rain barrel.** Winning households will receive their bid amount as a one-time payment after the installation is complete. U.S. EPA's contractor Tetra Tech, Inc., and its partner Horticultural Management, Inc., will **install** and **maintain** the gardens and barrels for three years.

This unique opportunity is a one-time offer only for Mt. Airy homeowners in the spring of 2007. During this summer and for the next three summers, U.S. EPA will monitor local streams for changes in runoff quantity and water quality resulting from the combined effects of individual rain gardens and rain barrels.

Visit the model rain garden planted at the bottom

Green Lot Retrofit Policy

Part of the difficulty in implementing green infrastructure practices in dense urban environments is finding the space and having the influence to make changes in a static built environment. One way around this dilemma is the conversion of vacant lots into "Green Lots." Green Lots are vacant or abandoned lots that have had debris and paved surfaces removed and vegetation and trees added to deliver economic, social, and environmental benefits.

Vacant lots can attract dumping, harbor toxic chemicals, depress property values, and attract criminal activity.[34] In contrast, Green Lots can increase property values, reduce urban heat island effect, improve air quality, provide habitat for small wildlife, increase infiltration, and recharge groundwater.

Vacant Lot Stabilization

Philadelphia began the process of vacant lot transformation in 1995 when the Pennsylvania Horticultural Society (PHS) partnered with the New Kensington Community Development Corporation to address the 1,100 parcels of abandoned land in the New Kensington neighborhood. The strategies included stabilizing vacant lots with grass, trees, and wood fencing; creating community gardens; planting trees; renovating parks; and transferring vacant lots to adjacent homeowners for private use. Funded by the City's Office of Housing and Community Development, with support from the Pew Charitable trusts and the William Penn Foundation, from 1995 through 2002, 480 new trees were planted, 145 side yards were settled, 217 lots were stabilized, and 15 community gardens were created.[35]

While the intangible benefits can often be hard to quantify, a study done by the Wharton School of the University of Pennsylvania evaluated the economic value of Philadelphia's Green Lot pilot project in New Kensington. *The Determinants of Neighborhood Transformation in Philadelphia: Identification and Analysis—The New Kensington Pilot Study* by Professor Susan Wachter found that Green Lots increased adjacent property values by as much as 30%. Tree plantings increased the collective value of property in the community by $4 million and lot improvements by $12 million. In addition,

Excerpt from the Vacant Land Management Pennsylvania Horticultural Society

There are two basic ways in which the City contracts with Philadelphia Green to revitalize vacant spaces. The first is known as the *Vacant Land Stabilization Program.* Philadelphia Green begins stabilization by cleaning and mowing the grounds, laying topsoil, planting seeds, and adorning the area with new trees and fencing. In the past six years, nearly 4 million square feet of land have undergone this treatment and continue to receive care.

The second approach is a project called *Community LandCare*, in which vacant land receives routine cleaning and mowing, but isn't refurbished with topsoil, trees, or fencing. Nine community groups oversee the maintenance of vacant land in 16 Philadelphia neighborhoods. Currently 4 million square feet are regularly cleaned through this program.

the more desirable the neighborhood becomes, the more people will move in to the community, providing a higher tax base for the City.[36]

Concerns about how to keep the lots clean remained after the initial effort to transform vacant properties into Green Lots. A maintenance program was established by hiring and training community residents. This not only provides local jobs, but also provides informal community education as employees tell neighbors about their work.

Excerpt from the article "Seeing Green: Study Finds Greening is a Good Investment" on the Pennsylvania Horticultural Society webpage (taken July 7, 2008)

Key Findings of the Wharton School Study

- Cleaning and greening of vacant lots can increase adjacent property values by as much as 30%.
- Planting a tree within 50 feet of a house can increase its value by about 9%.
- Location of a house within 1/4 mile from a park increased values by 10%.
- Neighborhood blocks with higher concentrations of unmanaged vacant lots displayed lower house prices, about 18%.

Before and after conditions of a lot in Philadelphia treated under the Vacant Land Stabilization program.
Photo: Cooperative Conservation America.

Before: Lot at 2300 North 3rd Street Green Lot, Philadelphia, PA.
Photo: The Pennsylvania Horticultural Society

After: Lot at 2300 North 3rd Street Green Lot, Philadelphia, PA.
Photo: The Pennsylvania Horticultural Society

Stormwater Offsets

The Maryland Chesapeake and Atlantic Coastal Bays Critical Area 10% Rule Guidance Manual allows abandoned lots to be converted to Green Lots, and set aside in perpetuity as mitigation for development projects elsewhere in the watershed that can not treat their stormwater on site. The Manual defines an offset as "structures or actions that compensate for undesirable impacts"[37] and lists four options, one of which is reducing the imperviousness of an existing property. This means that as compensation for adding impervious area elsewhere in the watershed, an abandoned lot can be restored to a Green Lot by removing impermeable pavement and revegetating the site, returning it to its natural hydrologic function within the watershed. The Green Lot remains a permanent open space. Green Lots provide a creative way to use abandoned properties to restore infiltration rates in the watershed and address urban runoff quantity and quality.

Excerpt from the Maryland Chesapeake and Atlantic Coastal Bays Critical Area 10% Rule Guidance Manual Option 4: Reducing the Imperviousness of an Existing Property

Some older waterfront areas are so intensely developed that there is no available land for most offset options. As an alternative, these jurisdictions may consider the option of reducing or eliminating impervious cover on publicly or privately owned lands. Some jurisdictions have acquired tax-delinquent properties within the Critical Area. These abandon properties may be purchased by a developer seeking an offset and can be subsequently converted to vegetated open space and maintained in a perpetual easement. Developers also have the option of purchasing private land for this purpose.

Conclusions and Recommendations

Regardless of whether a community expects high rates of growth in the future or very little growth, existing development and its impervious surfaces will continue to dominate water quality and quantity problems in urban areas. Just as green infrastructure approaches should be pivotal components of all new and redevelopment, policies that focus on retrofitting the built environment with green infrastructure should be a major element in any community's plans for addressing urban stormwater challenges.

Because green infrastructure provides benefits in many arenas, such as climate change, air quality, water quality and quantity, urban heat island effect reduction, and energy conservation, creative solutions can be found through cross-disciplinary partnerships. As organizations with different focuses come together to resolve their concerns through a common solution, funding and other resources can be leveraged to accomplish multiple goals.

Two common themes seem to arise from successful green infrastructure retrofit policy: removing obstacles and creating incentives. As demonstrated by the examples discussed in this paper, when selecting a retrofit policy option, the first step involves determining the most significant barriers to implementation and using an incentive program, a compliance assistance program, or regulation to target and overcome that obstacle.

Overcoming Green Infrastructure Retrofit Obstacles

1. Determine the actual, local obstacles to green infrastructure implementation.

There can be perceived obstacles and/or real obstacles. Obstacles may be common to many locations or specific to a particular location. Consequently, taking the time to accurately identify the biggest local obstacle to implementation will give credibility to an incentive or compliance assistance program when seeking approval or funding since the likelihood of success will be greater. (See "Determining Green Infrastructure Retrofit Goals")

2. Determine what will bridge the gap.

Once the biggest obstacle is known, a creative solution to fill the gap between the current rate of installation and the desired rate of installation can be invented. (See "Steps to Creating a Successful Green Infrastructure Retrofit Policy")

3. Establish funding sources for the incentive or compliance assistance program.

Since Green Infrastructure helps achieve many environmental, social and economic objectives, there are diverse funding options that may be possible. Some include:

- Stormwater Utility Fees
- Sanitary Sewer Fees (where the program addresses CSOs)
- Flood Control District funds
- Grants
- Energy Companies (where the green infrastructure practice reduces energy demand)

4. Conduct a pilot test.

Obstacles can only be overcome by an incentive program if the program is targeting the right obstacle and to the right degree. For this reason, a short term pilot that implements the incentive in a limited area or to a limited audience for a limited amount of time, helps determine if the incentive program is worthy of more funding or if it needs to be modified to accomplish the environmental goals.

5. Assess the success of the incentive or compliance assistance program.

The use of the pilot program should be measured to determine if the rate of green infrastructure installation is increasing to the level necessary to meet the environmental or watershed goals.

6. Modify, continue, or expand.

After the pilot period, based on the results of the use of the implementation program, either the incentive program may need to be modified to better fill the implementation gap, continued because it is successful, or expanded to cover an even broader audience or wider area of application.

Retrofit policies can gain greater community support when they directly address local needs or concerns. For example, if water supply is a local concern, the infiltration capacity of green infrastructure practices to recharge groundwater and/or the benefits of rainwater harvesting in conserving potable water sources should be emphasized. If energy costs are a local concern, energy savings associated with green roofs should be clearly communicated.

To date, green infrastructure retrofit policies have largely been driven by municipalities' immediate regulatory concerns with CSOs and stormwater runoff. However, future programs to encourage retrofits should capitalize more fully on the multiple benefits provided by green infrastructure. Chicago's Energy Conservation Code is a good example of this approach. By granting an exception for green roofs from the reflectance and urban heat island provisions, the City is simultaneously encouraging broader adoption of green roofs and recognizing the multiple benefits they provide.

In addition to water quality problems, municipalities will be increasingly challenged by sustainably managing infrastructure and addressing potential impacts of climate change. More than 700 mayors have signed on to the Mayors Climate Protection Agreement with the goal of a local 7% reduction in carbon dioxide emissions compared to 1990 levels. That goal, coupled with multi-billion dollar infrastructure

needs, creates a challenging environment in which to craft policy. Future policies should look beyond the compartmentalization of traditional media and establish criteria for urban sustainability.

Green infrastructure implementation can be encouraged by establishing codes and regulations that mandate reductions in both energy usage and discharges of stormwater. This integrated approach would lead to a more comprehensive system of environmental management but would also require coordination across departments to facilitate funding and compliance assurance. This approach would also more fully establish a policy framework that recognizes the relationship between water conveyance and treatment, energy, and climate.

Setting Green Infrastructure Retrofit Goals

1. Identify watershed goals.

Identifying the watershed goals that green infrastructure will be used to meet helps determine which practices to use and how many will need to be implemented in order to achieve the environmental goals. This ensures that the green infrastructure retrofit policy being created is focused on real environmental improvement, from the outset. Watershed goals can include obtaining a particular level of:

- Volume reduction
- Pollutant load reduction
- Reduced flooding
- Groundwater recharge
- Water supply/ reduced energy demand

2. Identify applicable green infrastructure practices.

Land use is a critical criterion for selecting appropriate practices. Some green infrastructure practices are better suited for urban application, and some are more appropriate for rural use. Also, some are better at removing certain pollutants than others, and some allow for infiltration, whereas others don't. A particular green infrastructure practice, or combination of practices, can be selected depending upon the goals and application conditions.

3. Determine the level of implementation that will meet the watershed goals.

Once the most applicable green infrastructure practices have been selected, the degree of implementation that will accomplish the environmental goals should be determined. For example, how many square feet of green roofs need to be installed to accomplish the volume reduction necessary to protect the receiving water? Or, how many square feet of bioretention practices are needed in order to maintain natural groundwater aquifer levels?

4. Measure goal attainment.

The most important measure of green infrastructure retrofit success is evidence of beneficial impacts in the environment (e.g., healthy groundwater aquifers, healthy stream habitat, or reduced pollutant levels in receiving waters). A method to measure environmental improvement should be a part of a green infrastructure retrofit effort. If a green infrastructure retrofit incentive program or regulation is not resulting in measurable environmental improvement, the program and/or regulation should be reevaluated and modified to better achieve the watershed goals. In addition, it is useful to compile the number of green infrastructure practices installed or number of square feet of functioning green infrastructure practices in order to determine the effectiveness of the retrofit incentive program or regulation at increasing the number. However, success in implementing green infrastructure practices should not be mistaken for the importance of confirming the achievement of watershed goals.

Policies should also make use of the economic advantages that green infrastructure provides. Simultaneously addressing several environmental requirements with one program uses municipal resources more efficiently; reducing the burden on infrastructure can limit additional capital investments. These savings can be incorporated into incentive programs. Tax abatements have been used to encourage development in economically distressed urban areas. This concept could also be applied to green redevelopment efforts. A predetermined period of tax abatement could be provided to projects that meet certain green infrastructure requirements. The reductions in tax revenue from this type of policy can be justified by the decreased demand on municipal services provided by green infrastructure.

Each jurisdiction has its own set of unique challenges and opportunities, and successful green infrastructure retrofit policies capitalize on those opportunities to develop creative and sustainable solutions.

Steps to Creating a Successful Green Infrastructure Retrofit Policy

1. Establish the local green infrastructure objectives.

Determine which green infrastructure practices should be implemented, and to what extent, in order to meet local watershed goals for stream health. (See "Setting Green Infrastructure Retrofit Goals")

2. Identify the biggest implementation obstacle.

There is often more than one obstacle to implementation. However, by targeting the most prevalent obstacle, the largest audience is reached. Taking the time to understand the real, local obstacle is important as each community has different perceptions about green infrastructure and different levels of available resources, such as funding, technical expertise, and local contractors. (See "Overcoming Green Infrastructure Retrofit Obstacles")

3. Target the biggest implementation obstacle with an incentive or compliance assistance program.

Create an incentive program that targets the biggest obstacle to implementation. Where the biggest obstacle is initial investment, the incentive program should provide money for installation costs. Where the biggest obstacle is technical knowledge, providing technical expertise would be an appropriate incentive. Operating the incentive program Years 1 through 3 allows time for the program to be publicized, and modifications to be made if the incentives aren't effective, and also provides enough time for people to take advantage of the incentives before the regulation takes effect.

4. Check local regulations or ordinances for internal obstacles.

Before launching an incentive program or a compliance assistance program, local regulations and ordinances may need to be modified to allow compliance. For example, if the incentive program involves disconnecting downspouts and under the current requirements a permit is needed to do the work, a solution such as creating a waiver and/or eliminating the permit fee may help the incentive program operate as intended.

5. Create regulations that become effective at a future date.

Creating regulations that go into effect in Year 5 provides the ultimate incentive to take advantage of the opportunities for early implementation.

6. Publicize the incentive or compliance assistance program and regulation.

Use targeted outreach, as well as press releases, to ensure that the regulations, and the incentive program that helps people meet the regulations, is known and utilized by a broad audience. Targeted outreach helps reach those most likely to utilize the incentive program. For example, giving a presentation about a rain garden incentive program to Garden Club members who are likely to be interested in utilizing gardens for rainwater treatment can help jump start the program so that it can spread by word of mouth. Other mechanisms, such a press releases that may result in newspaper articles, communicate the purpose and benefits of the program and regulations to a wider audience and increase awareness about program and future requirements.

7. Monitor the success of the incentive or compliance assistance program, and modify if necessary.

A true incentive program provides an actual "incentive" to implement the green infrastructure practice. If an incentive program is underutilized, either the "incentive" is not enough, or not enough people are aware of the program. After a year of implementing the incentive program, the success of the program should be evaluated. If the program goals have not been met, the incentive program should be modified to better meet the program goals in Year 2.

Where to Start (or Starting on Public Property)

Starting green infrastructure retrofitting on public property such as community centers, public parking lots, plazas, schools, City Hall, public libraries, public roads and sidewalks can provide benefits, including:

1. The public develops familiarity with green infrastructure practices.

By implementing green infrastructure practices in the public realm, members of the community have an opportunity to come in contact with them, perhaps frequently, and even learn about the practices from educational signs. Public areas provide high visibility locations for green infrastructure applications. As the public is exposed to these practices and can witness them functioning through out the changing seasons, they become more familiar and more comfortable with the practices.

2. The private sector can monitor success of green infrastructure applications.

Individuals or organizations interested in installing green infrastructure practices on their property, but unsure of its level of effectiveness or maintenance needs can observe or inquire about applications they see installed on public space.

3. Costs decrease as a local market for green infrastructure is created.

As more and more green infrastructure practices are installed, efficiencies and improvements to the process bring cost savings and often a better product. For example, as Chicago DOT utilized more porous concrete, the price decreased making it a more viable alternative for private property owners to install.

4. Growing local supplies and local business.

As the public sector invests in green infrastructure, it is investing in local, green businesses. This allows those businesses to grow and provide an even better product with more experienced installers.

5. Giving the municipality first hand experience with design, construction, and maintenance before requiring it of others.

As municipalities begin to require green infrastructure practices in their jurisdictions, property owners will ask questions about design, construction, and maintenance related to local climate, soil types, local suppliers and labor, and other local or regional variables. If the municipality has green infrastructure applications that they own, operate, and maintain, they will be able to answer questions and help private property owners to successfully implement green infrastructure approaches.

6. Easy access for monitoring and tours.

Public property applications of green infrastructure practices are easily accessible to the public for monitoring by students or tours by those interested in implementing something similar in their community or on their property.

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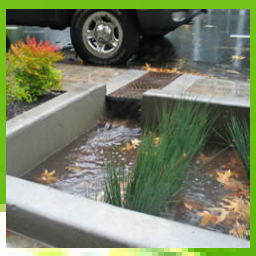

Managing Wet Weather with Green Infrastructure

Municipal Handbook

Green Streets

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The Municipal Handbook is a series of documents
to help local officials implement green infrastructure in their communities.

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Front Cover Photos
Top: rain garden; permeable pavers; rain barrel;
planter; tree boxes.
Large photo: green alley in Chicago

Green Streets

Introduction

By design and function, urban areas are covered with impervious surfaces: roofs, roads, sidewalks, and parking lots. Although all contribute to stormwater runoff, the effects and necessary mitigation of the various types of surfaces can vary significantly. Of these, roads and travel surfaces present perhaps the largest urban pollution sources and also one of the greatest opportunities for green infrastructure use.

The Federal Highway Administration (FHA) estimates that more than 20% of U.S. roads are in urban areas.[1] Urban roads, along with sidewalks and parking lots, are estimated to constitute almost two-thirds of the total impervious cover and contribute a similar ratio of runoff.[2] While a significant source of runoff, roads are also a part of the infrastructure system, conveying stormwater along gutters to inlets and the buried pipe network. Effective road drainage, translated as moving stormwater into the conveyance system quickly, has been a design priority while opportunities for enhanced environmental management have been overlooked especially in the urban environment.

Table 1. Examples of Stormwater Pollutants Typical of Roads.[3, 4]

Pollutant	Source	Effects
Trash	---	Physical damage to aquatic animals and fish, release of poisonous substances
Sediment/solids	Construction, unpaved areas	Increased turbidity, increased transport of soil bound pollutants, negative effects on aquatic organisms reproduction and function
Metals • Copper • Zinc • Lead • Arsenic	 • Vehicle brake pads • Vehicle tires, motor oil • Vehicle emissions and engines • Vehicle emissions, brake linings, automotive fluids	Toxic to aquatic organisms and can accumulate in sediments and fish tissues
Organics associated with petroleum (e.g., PAHs)	Vehicle emissions, automotive fluids, gas stations	Toxic to aquatic organisms
Nutrients	Vehicle emissions, atmospheric deposition	Promotes eutrophication and depleted dissolved oxygen concentrations

The altered flow regime from traditional roadways, increased runoff volume, more frequent runoff events, and high runoff peak flows, are damaging to the environment and a risk to property downstream. These erosive flows in receiving streams will cause down cutting and channel shifting in some places and excessive sedimentation in others. The unnatural flow regime destroys stream habitat and disrupts aquatic systems.

Compounding the deliberate rapid conveyance of stormwater, roads also are prime collection sites for pollutants. Because roads are a component of the stormwater conveyance system, are impacted by atmospheric deposition, and exposed to vehicles, they collect a wide suite of pollutants and deliver them into the conveyance system and ultimately receiving streams (See Table 1). The metals, combustion by-products, and automotive fluids from vehicles can present a toxic mix that combines with the ubiquitous nutrients, trash, and suspended solids.

While other impervious surfaces can be replaced, for example using green roofs to decrease the amount of impervious roof surface, for the most part, impervious roads will, for some time to come, constitute a significant percentage of urban imperviousness because of their current widespread existence. Reducing road widths and other strategies to limit the amount of impervious surface are critical, but truly addressing road runoff requires mitigating its effects.

Green Streets achieve multiple benefits, such as improved water quality and more livable communities, through the integration of stormwater treatment techniques which use natural processes and landscaping.

Roads present many opportunities for green infrastructure application. One principle of green infrastructure involves reducing and treating stormwater close to its source. Urban transportation right-of-ways integrated with green techniques are often called "green streets". Green streets provide a source control for a main contributor of stormwater runoff and pollutant load. In addition, green infrastructure approaches complement street facility upgrades, street aesthetic improvements, and urban tree canopy efforts that also make use of the right-of-way and allow it to achieve multiple goals and benefits. Using the right-of-way for treatment also links green with gray infrastructure by making use of the engineered conveyance of roads and providing connections to conveyance systems when needed.

Green streets are beneficial for new road construction and retrofits. They can provide substantial economic benefits when used in transportation applications. Billions of dollars are spent annually on road construction and rehabilitation, with a large percentage focused on rehabilitation especially in urban areas. Coordinating green infrastructure installation with broader transportation improvements can significantly reduce the marginal cost of stormwater management by including it within larger infrastructure improvements. Also, and not unimportantly, right-of-way installations allow for easy public maintenance. A large municipal concern regarding green infrastructure use is maintenance; using roads and right-of-ways as locations for green infrastructure not only addresses a significant pollutant source, but also alleviates access and maintenance concerns by using public space.

In urban areas, roads present many opportunities for coordinated green infrastructure use. Some municipalities are capitalizing on the benefits gained by introducing green infrastructure in transportation applications. This paper will evaluate programs and policies that have been used to successfully integrate green infrastructure into roads and right-of-ways.

Green Street Designs

Green streets can incorporate a wide variety of design elements including street trees, permeable pavements, bioretention, and swales. Although the design and appearance of green streets will vary, the functional goals are the same: provide source control of stormwater, limit its transport and pollutant conveyance to the collection system, restore predevelopment hydrology to the extent possible, and provide environmentally enhanced roads. Successful application of green techniques will encourage soil and vegetation contact and infiltration and retention of stormwater.

Alternative Street Designs (Street Widths)

A green street design begins before any BMPs are considered. When building a new street or streets, the layout and street network must be planned to respect the existing hydrologic functions of the land (preserve wetlands, buffers, high-permeability soils, etc.) and to minimize the impervious area. If retrofitting or redeveloping a street, opportunities to eliminate unnecessary impervious area should be explored.

Implementation Hurdles
Many urban and suburban streets, sized to meet code requirements for emergency service vehicles and provide a free flow of traffic, are oversized for their typical everyday functions. The Uniform Fire Code requires that streets have a *minimum 20 feet of unobstructed width;* a street with parking on both sides would require a width of at least 34 feet. In addition to stormwater concerns, wide streets have many detrimental implications on neighborhood livability, traffic conditions, and pedestrian safety.[5]

Oregon State Code Granting Authority for Street Standards to Local Government

ORS 92.044 - Local governments shall *supersede and prevail over any specifications and standards for roads and streets set forth in a uniform fire code adopted by the State Fire Marshal, a municipal fire department or a county firefighting agency....* Local governments shall consider the needs of the fire department or fire-fighting agency when adopting the final specifications and standards.

The Transportation Growth and Management Program of Oregon, through a Stakeholder Design Team, developed a guide for reducing street widths titled the *Neighborhood Street Design Guidelines.*[6] The document provides a helpful framework for cities to conduct an inclusive review of street design profiles with the goal of reducing widths. Solutions for accommodating emergency vehicles while minimizing street widths are described in the document. They include alternative street parking configurations, vehicle pullout space, connected street networks, prohibiting parking near intersections, and smaller block lengths.

Figure 1. The street-side swale and adjacent porous concrete sidewalk are located in the High Point neighborhood of Seattle, WA
(Source: Abby Hall, US EPA).

In 1997, Oregon, which has adopted the *Uniform Fire Code,* specifically granted local government the authority to establish alternative street design standards but requires them to consult with fire departments before standards are adopted. Table 2 provides examples of alternative street widths allowed in U.S. jurisdictions.[7]

Swales

Swales are vegetated open channels designed to accept sheet flow runoff and convey it in broad shallow flow. The intent of swales is to reduce stormwater volume through infiltration, improve water quality through vegetative and soil filtration, and reduce flow velocity by increasing channel roughness. In the simple roadside grassed form, they have been a common historical component of road design. Additional benefit can be attained through more complex forms of swales, such as those with amended soils, bioretention soils, gravel storage areas, underdrains, weirs, and thick diverse vegetation.

Implementation Hurdles
There is a common misconception of open channel drainage being at the bottom of a street development hierarchy in which curb and gutter are at the top. Seattle's Street Edge Alternative Project and other natural drainage swale pilot projects have demonstrated that urban swales not only mitigate stormwater impacts, but they can also enhance the urban environment.[8]

Table 2. Examples of Alternative Street Widths

Jurisdiction	Street Width	Parking Condition
Phoenix, AZ	28'	parking both sides
Santa Rosa, CA	30' 26'-28' 20' 20'	parking both sides, <1000ADT parking one side no parking neck downs @ intersection
Orlando, FL	28' 22'	parking both sides, res. Lots<55' wide parking both sides, res. Lots>55' wide
Birmingham, MI	26' 20'	parking both sides parking one side
Howard County, MD	24'	parking unregulated
Kirkland, WA	12' 20' 24' 28'	alley parking one side parking both sides – low density only parking both sides
Madison, WI	27' 28'	parking both sides, <3DU/AC parking both sides, 3-10 DU/AC

ADT: Average Daily Traffic DU/AC: dwelling units per acre

Bioretention Curb Extensions and Sidewalk Planters

Bioretention is a versatile green street strategy. Bioretention features can be tree boxes taking runoff from the street, indistinguishable from conventional tree boxes. Bioretention features can also be attractive attention grabbing planter boxes or curb extensions. Many natural processes occur within bioretention cells: infiltration and storage reduces runoff volumes and attenuates peak flows; biological and chemical reactions occur in the mulch, soil matrix, and root zone; and stormwater is filtered through vegetation and soil.

Figure 2. This bioretention area takes runoff from the street through a trench drain in the sidewalk as well as runoff from the sidewalk through curb cuts
(Source: Abby Hall, US EPA).

Implementation Hurdles

A few municipal DOT programs have instituted green street requirements in roadway projects, but as of yet, specifications for street bioretention have not yet been incorporated into municipal DOT specifications. Many cities do have street bioretention pilot projects; two of the well documented programs are noted in the table. Several concerns and considerations have prevented standard implementation of bioretention by DOTs.

Table 3. Municipalities with Swale Specifications and Standard Details

Municipality	Document	Section Title	Section #
City of Austin[9]	Standard Specifications and Standard Details	Grass-Lined Swale and Grass-Lined Swale with Stone Center	627S
City of Seattle[10]	2008 Standard Specifications for Municipal Construction	Natural Drainage Systems	7-21

Table 4. Municipalities with Bioretention Pilot Projects in the Right-of-Way

Municipality	Bioretention Type	Document
Maplewood, MN	Rain gardens	*Implementing Rainwater in Urban Stormwater Management* [11]
Portland, OR	• Curb extensions • Planters • Rain gardens	*2006 Stormwater Management Facility Monitoring Report* [12]

The diversity of shapes, sizes, and layouts bioretention can take is a significant obstacle to their incorporation with DOT specifications and standards. Street configurations, topography, soil conditions, and space availability are some of the factors that will influence the design of the bioretention facility. These variables make documentation of each new bioretention project all the more important. By building a menu of templates from local bioretention projects, future projects with similar conditions will be easier to implement and cost less to design. The documentation should include copies of the details and specifications for the materials used. A section on construction and operation issues, costs, lessons learned, and recommendations for similar designs should also be included in project documentation. Portland's Bureau of Environmental Services has proven adept at documenting each of its Green Streets projects and making them accessible online.[13]

Utilities are a chief constraint to implementing bioretention as a retrofit in urban areas. The Prince George's County, MD Bioretention Design Specifications and Criteria manual recommends applying the same clearance criteria recommended for storm drainage pipes.[14] Municipal design standards should specify the appropriate clearance from bioretention or allowable traversing.

Prince George's County, MD - 2.12.1.16 Utility Clearance

Utility clearances that apply to storm drainage pipe and structure placement also apply to bioretention. Standard utility clearances for storm drainage pipes have been established at 1' vertical and 5' horizontal. However, bioretention systems are shallow, non-structural IMP's consisting of mostly plant and soil components, (often) with a flexible underdrain discharge pipe. For this reason, other utilities may traverse a bioretention facility without adverse impact. Conduits and other utility lines may cross through the facility but construction and maintenance operations must include safeguard provisions. In some instances, bioretention could be utilized where utility conflicts would make structural BMP applications impractical.

Plants are another common concern of municipal staff, whether it is maintenance, salt tolerance, or plant height with regard to safety and security. Cities actively implementing LID practices in public spaces maintain lists of plants which fit the vegetated stormwater management practice niche. These are plants that flourish in the regional climate conditions, are adapted to periodic flooding, are low maintenance, and, if in cold climates, salt tolerant. Most often these plants are natives, but sometimes an approved non-native will best fit necessary criteria. A municipal plant list should be periodically updated based on maintenance experience, and vegetation health surveys.

Permeable Pavement

Permeable pavement comes in four forms: permeable concrete, permeable asphalt, permeable interlocking concrete pavers, and grid pavers. Permeable concrete and asphalt are similar to their impervious counterparts but are open graded or have reduced fines and typically have a special binder added. Methods for pouring, setting, and curing these permeable pavements also differ from the impervious versions. The concrete and grid pavers are modular systems. Concrete pavers are installed with gaps between them that allow water to pass through to the base. Grid pavers are typically a durable plastic matrix that can be filled with gravel or vegetation. All of the permeable pavement systems have an aggregate base in common which provides structural support, runoff storage, and pollutant removal through filtering and adsorption. Aside from a rougher unfinished surface, permeable concrete and asphalt look very similar to their impervious versions. Permeable concrete and asphalt and certain permeable concrete pavers are ADA compliant.

Implementation Hurdles

Of all the green streets practices, municipal DOTs have been arguably most cautious about implementing permeable pavements, though it should be noted that some DOTs have, for decades, specified open-graded asphalt for low use roadways because of lower cost; to minimize vehicle hydroplaning; and to reduce road noise. The reticence to implement on a large-scale, however, is understandable given the lack of predictability and experience behind impervious pavements. However, improved technology, new and ongoing research, and a growing number of pilot projects are dispelling common myths about permeable pavements.

Figure 3. Pervious pavers used in the roadway of a neighborhood development in Wilsonville, OR *(Source: Abby Hall, US EPA).*

The greatest concern among DOT staff seems to be a perceived lack of long-term performance and maintenance data. Universities and DOTs began experimenting with permeable pavements in parking lots, maintenance yards, and pedestrian areas as early as twenty years ago in the U.S., even earlier in Europe. There is now a wealth of data on permeable pavements successfully used for these purposes in nearly every climate region of the country. In recent years, the cities of Portland, OR, Seattle, WA, and Waterford, CT and several private developments have constructed permeable pavement pilots within the roadway with positive results.

> Permeable pavement concerns in the roadway often raise concerns of safety, maintenance, and durability. Municipalities can replace impervious surfaces in other non-critical areas such as sidewalks, alleys, and municipal parking lots. These types of applications help municipalities build experience and a market for the technology.

The two typical maintenance activities are periodic sweeping and vacuuming. The City of Olympia, WA has experimented with several methods of clearing debris from permeable concrete sidewalks. Each of the methods was evaluated on the ease of use, debris removal, and the performance pace. The cost analysis by Olympia, WA found that the maintenance cost for pervious pavement was still lower than the traditional pavement when the cost of stormwater management was considered.

Table 5. Municipalities with Permeable Pavement Specifications and Standard Details

Municipality	Document	Section Title	Section #
Portland	2007 Standard Construction Specifications	Unit Pavers (includes permeable pavers)	00760
Olympia	WSDOT Specification	Pervious Concrete Sidewalks	8-30

Freeze/thaw and snow plows are the major concerns for permeable pavements in cold climate communities. However, these concerns have proven to be generally unwarranted when appropriate design and maintenance practices are employed. A well designed permeable pavement structure will always drain and never freeze solid. The air voids in the pavement allow plenty of space for moisture to freeze and ice crystals to expand. Also, rapid drainage through the pavement eliminates the occurrence of freezing puddles and black ice. Cold climate municipalities will need to make adjustments to snow plowing and deicing programs for permeable pavement areas. Snow plow blades must be raised enough to prevent scraping the surface of permeable pavements, particularly paver systems. Also, sand should not be applied.

Table 6. A Study in Olympia, WA Comparison of the cost of permeable concrete sidewalks to the cost of traditional impervious sidewalks[15]

Traditional Concrete Sidewalk		Permeable Concrete Sidewalk	
Construction Cost	Maintenance Cost	Construction Cost	Maintenance Cost
$5,003,000*	$156,000	$2,615,000*	$147,000
Total = $5,159,000 $101.16 per square yard		Total = $2,762,000 $54.16 per square yard	

*The cost of stormwater management (stormwater pond) for the added impervious surface is factored into the significantly higher cost of constructing the traditional concrete sidewalk. Maintenance of the stormwater pond is also factored into the traditional concrete sidewalk maintenance cost.

Sidewalk trees and tree boxes

From reducing the urban heat island effect and reducing stormwater runoff to improving the urban aesthetic and improving air quality, much is expected of street trees. Street trees are even good for the economy. Customers spend 12% more in shops on streets lined with trees than on those without trees.[16] However, most often street trees are given very little space to grow in often inhospitable environments. The soil around street trees often becomes compacted during the construction of paved surfaces and minimized as underground utilities encroach on root space. If tree roots are surrounded by compacted soils or are deprived of air and water by impervious streets and sidewalks, their growth will be stunted, their health will decline, and their expected life span will be cut short. By providing adequate soil volume and a good soil mixture, the benefits obtained from a street tree multiply. To obtain a healthy soil volume, trees can simply be provided larger tree boxes, or structural soils, root paths, or "silva cells" can be used under sidewalks or other paved areas to expand root zones. These allow tree roots the space they need to grow to full size. This increases the health of the tree and provides the benefits of a mature sized tree, such as shade and air quality benefits, sooner than a tree with confined root space.

Figure 4. Trees planted at the same time but with different soil volumes, Washington DC
(Source: Casey Trees)

Table 7. Healthy Tree Volume and Permeable Pavement Specifications and Standard Details

Jurisdictions	Minimum Soil Volume		Section Title	Section #
Prince William County, VA	Large tree Medium tree Small tree	970 cf 750 cf 500 cf	Design Construction Manual (Sec 800)	Table 8-8
Alexandria, VA		300 cf	Landscape Guidelines	II.B. (2)

Implementation Hurdles

Providing an adequate root volume for trees comes down to a trade off between space in the right-of-way and added construction costs. The least expensive way to obtain the volume needed for roots to grow to full size is providing adequate space unhindered by utilities or other encroachments. However, it is often hard to reserve space dedicated just to street trees in an urban right-of-way with so many other uses competing for the room they need. As a result, some creative solutions, though they cost more to install, have become useful alternatives in crowded subsurface space. Structural soils, root paths, and "silva cells" leave void space for roots and still allow sidewalks to be constructed near trees.

Root Paths can be used to increase tree root volume by connecting a small tree root volume with a larger subsurface volume nearby. A tunnel-like system extends from the tree underneath a sidewalk and connects to an open space on the other side.

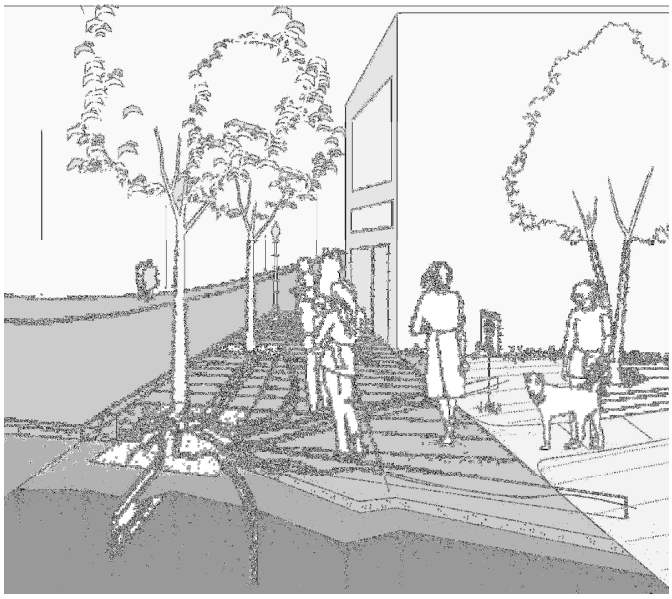

Figure 5. Root Paths direct tree roots under paving and into better soil areas for tree root growth
(Source: Arlington County, VA).

Silva Cells[17] are another option for supporting sidewalks near trees while still providing enough space for roots to grow. These plastic milk crate-like frames fit together and act as a supporting structure for a sidewalk while leaving room for uncompacted soil and roots inside the frame.

Permeable pavement sidewalks are another enhancement to the root space. They provide moisture and air to roots under sidewalks. Soils under permeable pavements can still become compacted. Structural soils[18] are a good companion tree planting practice to permeable pavement. When planting a tree in structural soils an adequate tree root volume is excavated and filled with a mix of stone and soil that still provides void space for healthy roots and allows for sidewalks, plazas or other paved surfaces to be constructed over them.

Case Studies

Portland, OR: Green Street Pilot Projects

Portland, Oregon is a national leader in developing green infrastructure. Portland's innovation in stormwater management was necessitated by the need to satisfy a Combined Sewer Overflow consent decree, Safe Drinking Water Act requirements, impending Total Maximum Daily Load limitations, Superfund cleanup measures and basement flooding. Through the 1990s, over 3 billion gallons of combined sewer overflow discharged to the Willamette River every year.[19] All of these factors plus leadership and local desires to create green solutions and industries compelled the city to implement green infrastructure as a complement to adding capacity to the sewer system with large pipe overflow interceptors. Despite gaps in long-term performance data, Portland took a proactive approach in implementing green infrastructure pilot projects.

Portland's green infrastructure pilot projects have their roots in the city's 2001 Sustainable Infrastructure Committee. The committee, consisting of representatives from Portland's three infrastructure management Bureaus, documented the city's ongoing efforts toward sustainable infrastructure, gathered research on green infrastructure projects from around the country, and identified opportunities for local pilots.[20, 21, 22]

Figure 6. Silva cell structures support the sidewalk while providing root space for street trees
(Source: Deep Root Partners, LP).

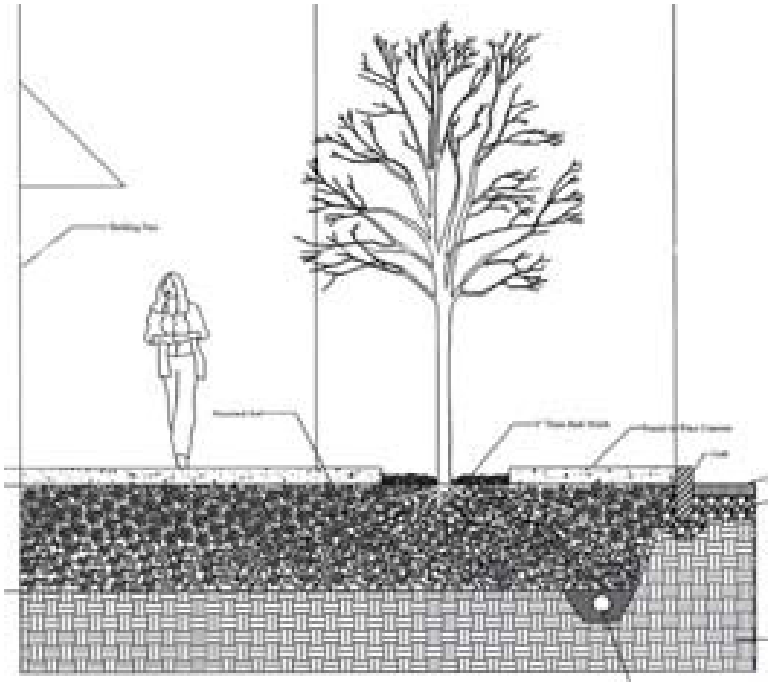

Figure 7. Structural soils provide void space for root growth and load-bearing for sidewalk
(Source: Urban Horticulture Institute, Cornell University).

One of the Bureau of Environmental Services' (BES) earliest green infrastructure retrofit projects within the right-of-way was a set of two stormwater curb extensions on NE Siskiyou Street. Portland had been retrofitting many streets with curb extensions for the purpose of pedestrian safety, but this was the first done for the purpose of treating street runoff. In a simulated 25-year storm event flow test, the curb extensions captured 85% of the runoff volume that would be discharged to the combined sewer system and reduced peak flow by 88%.[23]

Between 2003 and 2007, Portland designed and implemented a variety of Green Street pilots. Funding sources for these projects have come from BES, Portland Department of Transportation, U.S. EPA, and an Innovative Wet Weather Fund. BES combined funds with an EPA grant to create the Innovative Wet Weather Fund. In 2004, nearly $3 million from the Innovative Wet Weather Fund was budgeted for a long list of projects from city green roofs, public-private projects, and a number of pilot projects within the right-of-way.[24] Several pilots have been cost competitive with or less costly than conventional upgrades. The Bureau recognizes that costs will decrease once these projects become more routine. Many of the pilot project costs included one time costs such as the development of outreach materials and standard drawings.

Figure 8: NE Siskiyou Vegetated Curb Extensions
Source: City of Portland – Bureau of Environmental Services

Table 8. Portland, OR - Green Street Pilot Projects

Location	Design	Year Completed	Cost
NE Siskiyou b/w NE 35th Pl. and NE 36th Ave	Stormwater curb extension	2003	$20,000
3 blocks of the Westmoreland Neighborhood	Permeable Pavers in parking lanes and curb to curb	2004	$412,000
SE Ankeny b/w SE 56th and SE 57th Ave.	Stormwater curb extensions	2004	$11,946
NE Fremont b/w NE 131st and 132nd Av	Stormwater curb extension	2005	$20,400
SW 12th Ave b/w SW Montgomery and Mill	Stormwater planters	2005	$34,850
East Holladay Park	Pervious paver parking lot	2005	$165,000
4 blocks of North Gay Avenue b/w N Wygant and N Sumner	Porous concrete in curb lanes and curb to curb; porous asphalt in curb lanes and curb to curb	2005	--
SW Texas	Stormwater wetlands and swales	2007	$2.3 million
Division St. – New Seasons Market	Stormwater planters and swales	--	--
SE Tibbetts and SE 21st Ave.	Stormwater curb extension and planters	--	--

Source: Portland Bureau of Environmental Services, 2008
http://www.portlandonline.com/bes/index.cfm?c=44463&

Each of the pilot projects have been well documented by BES. A consistent format has been used to describe pilot background, features, engineering design, landscaping, project costs, maintenance, monitoring, and, most importantly, lessons learned. These case studies as well as other Green Street documentation can be found on BES's Sustainable Stormwater webpage, http://www.portlandonline.com/BES/index.cfm?c=34598. Due to physical factors (drainage, slope, soil, existing utilities, multiple uses) and development factors (retrofit, redevelopment, and new construction), there will be many variations on Green Streets. As part of the program, a continually updated Green Street Profile Notebook will catalog the successful green street projects. Users can use the Notebook for permitting guidance, to identify green streets facilities appropriate for various factors, but the document is not a technical document with standard details.

The Green Streets Team

The City of Portland, OR is widely acknowledged for long term, forward thinking, and comprehensive transportation and environmental planning. Portland recognized the fact that 66% of the City's total runoff is collected from streets and the right-of-way.[25] The city also saw the potential for transportation corridors to meet multiple objectives, including:

- Comprehensively address numerous City goals for neighborhood livability, sustainable development, increased green spaces, stormwater management, and groundwater protection;
- Integrate infrastructure functions by creating "linear parks" along streets that provide both pedestrian/bike areas and stormwater management;
- Avoid the key impacts of unmanaged stormwater whereby surface waterbodies are degraded, and water quality suffers;
- Manage stormwater with investments citizens can support, participate in, and see;
- Manage stormwater as a resource, rather than a waste;
- Protect pipe infrastructure investments (extend the life of pipe infrastructure, limit the additional demand on the combined sewer system as development occurs);
- Protect wellhead areas by managing stormwater on the surface; and
- Provide increased neighborhood amenities and value.

In a two phased process from 2005 to 2007, the Green Streets Team, a cross agency and interdisciplinary team, developed a comprehensive green streets policy and a way forward for the green streets agenda. Phase 1 identified challenges and issues and began a process for addressing them. Barriers to the public initiation of green street projects included a code and standards that would disallow or discourage green street strategies, long term performance unknowns, and maintenance responsibilities. To address these barriers, the Green Streets Team organized into subgroups focusing on outreach, technical guidance, infrastructure, maintenance, and resources.

Phase 2 of the Green Streets project synthesized the opportunities and solutions identified in Phase 1 into a citywide Green Streets Program. The first priority for this phase was the drafting of a binding citywide policy. The resolution was adopted by the Portland City Council in March 2007.

Prior to the start of the Portland effort, 90% of implemented green street projects were issued by private permits rather than city initiated projects.

Six Approaches to Implementing Green Streets	
Pathway	**Implementation**
City-initiated street improvement projects	City designs, manages, maintains
City-initiated stormwater retrofits	City designs, manages, maintains
Neighborhood-initiated LIDs	
Developer-initiated subdivisions with public streets	Developer designs and builds via City permit and review process, then turns over new right of way to the City after warranty period
Developer-initiated subdivisions with private streets	Developer designs and builds via City permit and review process, and turns over to home-owner association
Developer-related initiated frontage improvements on existing public streets	Developer designs and builds new sidewalks and curbs via City permit and review process, usually because the City required it via a building permit or via a land division

Source: Portland Green Streets, Phase 1

Portland City Council Approved Green Streets Policy

Goal: City of Portland will promote and incorporate the use of green street facilities in public and private development.

City elected officials and staff will:

1. Infrastructure Projects in the Right of Way:
   a. Incorporate green street facilities into all City of Portland funded development, redevelopment or enhancement projects as required by the City's September 2004 (or updated) Stormwater Management Manual. Maintain these facilities according to the May 2006 (or updated) Green Streets Maintenance Policy.

      If a green street facility (infiltrating or flow through) is not incorporated into the Infrastructure Project, or only partial management is achieved, then an off site project or off site management fee will be required.

   b. Any City of Portland funded development, redevelopment or enhancement project, that does not trigger the Stormwater Manual but requires a street opening permit or occurs in the right of way, shall pay into a "% for Green" Street fund. The amount shall be 1% of the construction costs for the project.
      Exceptions: Emergency maintenance and repair projects, repair and replacement of sidewalks and driveways, pedestrian and trail replacement, tree planting, utility pole installation, street light poles, traffic, signal poles, traffic control signs, fire hydrants, where this use of funds would violate contracted or legal restrictions.
2. Project Planning and Design:
   a. Foster communication and coordination among City Bureaus to encourage consideration of watershed health and improved water quality through use of green street facilities as part of planning and design of Bureau projects.
   b. Coordinate Bureau work programs and projects to implement Green Streets as an integrated aspect of City infrastructure.
   c. Plan for large-scale use of Green Streets as a means of better connecting neighborhoods, better use of the right of way, and enhancing neighborhood livability.
   d. Strive to develop new and innovative means to cost-effectively construct new green street facilities.
   e. Develop standards and incentives (such as financial and technical resources, or facilitated permit review) for Green Streets projects that can be permitted and implemented by the private sector. These standards and incentives should be designed to encourage incorporation of green street facilities into private development, redevelopment and enhancement projects.
3. Project and Program Funding:
   a. Seek opportunities to leverage the work and associated funding of projects in the same geographic areas across Bureaus to create Green Street opportunities.
   b. Develop a predictable and sustainable means of funding implementation and maintenance of Green Street projects.
4. Outreach:
   a. Educate citizens, businesses, and the development community/industry about Green Streets and how they can serve as urban greenways to enhance, improve, and connect neighborhoods to encourage their support, demand and funding for these projects.
   b. Establish standard maintenance techniques and monitoring protocols for green street facilities across bureaus, and across groups within bureaus.
5. Project Evaluation:
   a. Conduct ongoing monitoring of green street facilities to evaluate facility effectiveness as well as performance in meeting multiple City objectives for:
      - Gallons managed;
      - Projects distributed geographically by watershed and by neighborhood; and

The second priority for Phase 2 was developing communication and planning procedures for incorporating multi-bureaus plans into the scheduled Portland DOT Capital Improvement Program (CIP). Three timeframes for green street project planning were recommended. In the short term, the CIP Planning Group, backed by the citywide policy directive, will shift to a focus on "identifying and evaluating opportunities to partner." For example, coordinating Water Bureau and BES pipe replacement

projects with DOT maintenance, repair, and improvement projects. The mid-term approach is more proactive and involves forecasting potential green street projects using existing bureau data and GIS tools. As for the long term, green street objectives will be incorporated into the citywide systems plan which guides city bureaus for the next 20 years.

The Green Street Team methodology propelled Portland's early green street pilot projects into a comprehensive, citywide multi-bureau program. The program built on previous efforts by the Sustainable Infrastructure Committee as well as other efforts such as the 2005 Portland Watershed Management Plan, established a City Council mandated policy, and institutionalized green street development. The outcome of this approach is multi-agency buy-in and responsibility for the effort. For instance, because of their knowledge of plant maintenance, Portland Parks and Recreation is responsible for the maintenance of some DOT installations.

Chicago, IL: Green Alleys Program

The City of Chicago, Illinois has an alley system that is perhaps the largest in the world. These 13,000 publicly owned alleys result in 1,900 miles, or 3,500 acres, of impermeable surfaces in addition to the street network. Because the alley system was not originally paved, there are no sewer connections as part of the original design. Over time the alleys were paved and flooding in garages and basements began to occur as a result of unmanaged stormwater runoff. Since the city already spends $50 million each year to clean and upgrade 4,400 miles of sewer lines and 340,000 related structures, the preferred solution to the flooded alleys is one that doesn't put more stress on an already overburdened and expensive sewer system.[26]

In 2003, the Chicago Department of Transportation (CDOT) used permeable pavers and French drain pilot applications to remedy localized flooding problems in alleys in the 48th Ward.[27] These applications proved to be successful and by 2006, CDOT launched its Green Alley Program with the release of the Chicago Green Alley Handbook (Handbook).[28]

The Chicago Green Alley Program is unique because it marries green infrastructure practices in the public right-of-way with green infrastructure efforts on private property. The user-friendly Handbook, which describes both facets of the program including the design techniques and their benefits, is an award winning document. The American Society of Landscape Architects awarded the creators of the Handbook the 2007 Communications Honor Award for the clear graphics and simple, yet effective, message.[29] The Handbook explains to the residents why green infrastructure is important, how to be good stewards of the Green Alley in their neighborhood, and what sorts of "green" practices they can implement on their property to reduce waste, save water, and help manage stormwater wisely.

While the initial impetus behind the Green Alley Program was stormwater management, Chicago decided to use this opportunity to address other environmental concerns as well as reducing the urban heat island effect, recycling, energy conservation, and light pollution.

Green Infrastructure in the Right-of-Way

Chicago's Green Alley Program uses the following five techniques in the public right-of-way to "green" the alley:

1. Changing the grade of the alley to drain to the street rather than pond water in the alley or drain toward garages or private property.
2. Using permeable pavement that allows water to percolate into the ground rather than pond on the surface.
3. Using light colored paving material that reflects sunlight rather than adsorbing it, reducing urban heat island effect.

4. Incorporating recycled materials into the pavement mix to reduce the need for virgin materials and reduce the amount of waste going into the landfill.

5. Using energy efficient light fixtures that focus light downward, reducing light pollution.

Figure 9: Permeable Asphalt Installation Using Ground Tire Rubber.
Source: Chicago Department of Transportation, Sustainable Development Initiatives; Streetscape and Urban Design Program, CDOT Division of Project Development.

Four design approaches were created using these techniques. Based on the local conditions, the most appropriate approach is selected. In areas where soils are well-draining, permeable pavement is used. In areas where buildings come right up to the edge of pavement and infiltrated water could threaten foundations, impermeable pavement strips are used on the outside with a permeable pavement strip down the middle. In areas where soils do not provide much infiltration capacity, the alley is regraded to drain properly and impermeable pavement made with recycled materials is used. Another approach utilizes an infiltration trench down the middle of the alley. Light colored (high albedo) pavement, recycled materials, and energy efficient, glare reducing lights are a part of each design approach.

Green Infrastructure on Private Property
The Handbook also describes actions that property owners can take to "green" their own piece of Chicago. The Handbook describes the costs, benefits, and utility of the following practices:

- Recycling;
- Composting;
- Planting a tree;
- Using native landscape vegetation;
- Constructing a rain garden;
- Installing a rain barrel;
- Using permeable pavement for patios;
- Installing energy efficient lighting; and
- Utilizing natural detention.

By bringing this wide range of "green" practices to the attention of homeowners, the positive impacts of the Green Alley Program spread beyond the boundaries of the right-of-way, increasing awareness and providing practical resources to help community members be a part of the solution.

Chicago Green Alley Cost Considerations
When the program began in 2006, repaving the alleys with impermeable pavement ranged in cost from $120,000 to $150,000, whereas a total Green Alley reconstruction was more along the lines of $200,000 to $250,000.[30] While less expensive conventional rehabilitation options may seem more attractive, they don't provide a solution to the localized flooding issues or the combined sewer system overflow problems. Sewer system connections could be established to solve the localized flooding problem, but it would add to the already overburdened sewer system and increase the cost of the reconstruction to that of the impermeable alley option. Consequently, the higher priced Green Alley option proved to be the best investment as it has multiple benefits in addition to solving localized flooding and reducing flow into the combined sewer system. The additional benefits of the Green Alley Program include not only urban heat

island effect reduction, material recycling, energy conservation, and light pollution reduction, but also the creation of a new market.

In 2006, when the Green Alley Program began, the city paid about $145 per cubic yard of permeable concrete. Just one year later, the cost of permeable concrete had dropped to only $45 per cubic yard. Compared with the cost of ordinary concrete, $50 per cubic yard, permeable concrete may have seemed like an infeasible option in the past to customers wanting to purchase concrete.[31] After the city's initial investment in the local permeable concrete market, the product cost has come down making permeable concrete a more affordable option for other consumers besides the city. This has resulted in an increased application of permeable concrete throughout the region.

Figure 10: Permeable Pavers and Permeable Concrete Chicago Alleys
(Source: Abby Hall, US EPA)

The success of the Chicago Green Alley Program is evident. Not only are the alleys been "greened" as a result of the program, the surrounding properties and even the surrounding neighborhoods are experiencing the positive impacts of the program's implementation.

Conclusions and Recommendations

Incorporating green streets as a feature of urban stormwater management requires matching road function with environmental performance. Enhancing roads with green elements can improve their primary function as a transportation corridor while simultaneously mitigating their negative environmental impacts. In theory and practice many municipalities are not far removed from dedicated green streets programs. Street tree and other greenscaping programs are often identified and promoted along urban transportation corridors. Adapting them to become fully functional green streets requires minor design modifications and an evaluation of how to maximize the benefits of environmental systems.

Portland's green streets program demonstrates how common road and right-of-way elements (e.g., traffic calming curb extensions, tree boxes) can be modified and optimized to provide stormwater management in addition to other benefits. The curb cuts and design variations to allow runoff to enter the vegetated areas are subtle changes with a significant impact and demonstrate how stormwater can be managed successfully at the source. One of the biggest successes of the program was reassessing common design features and realizing that environmental performance can be improved by integrating stormwater management.

Where Portland used vegetation, Chicago's Green Alley Program similarly demonstrates that hardscape elements can be an integral part of a greening program. By incorporating permeable pavements that simulate natural infiltration, Chicago enhances the necessary transportation function of alleys while enhancing infrastructure and environmental management. Portland also contrasts the "soft" and "hard"

elements of green streets by using both permeable pavements and vegetated elements. The green options available demonstrate the flexibility of green infrastructure to satisfy road function and environmental objectives and highlight why transportation corridors are well suited for green infrastructure.

Elements necessary for a successful green streets program:

- **Pilot projects are critical.** The most successful municipal green street programs to date all began with well documented and monitored pilot projects. These projects have often been at least partially grant funded and receive the participation of locally active watershed groups working with the city infrastructure programs. The pilot projects are necessary to demonstrate that green streets can work in the local environment, can be relied upon, and fit with existing infrastructure. Pilot projects will help to dispel myths and resolve concerns.
- **Leadership in sustainability from the top.** The cities with the strongest green streets programs are those with mayors and city councils that have fully bought into sustainable infrastructure. Council passed green policies and mayoral sustainability mandates or mission statements are needed to institutionalize green street approaches and bring it beyond the token green project.
- **Buy-in from all municipal infrastructure departments.** By their nature, green streets cross many municipal programs. Green street practices impact stormwater management, street design, underground utilities, public lighting, green space planning, public work maintenance, and budgeting. When developing green streets, all of the relevant agencies must be represented. Also, coordination between the agencies on project planning is important for keeping green infrastructure construction costs low. Superior green street design at less cost occurs when sewer and water line replacement projects can be done in tandem with street redevelopment. These types of coordination efforts must happen at the long-term planning stage.
- **Documentation.** Green street projects need to be documented on two levels, the design and construction level and on a citywide tracking level. Due to the different street types and siting conditions, green street designs will take on many variations. By documenting the costs, construction, and design, the costs of similar future projects can be minimized and construction or design problems can be avoided or addressed. Tracking green street practices across the city is crucial for managing maintenance and quantifying aggregate benefits.
- **Public outreach.** Traditional pollution prevention outreach goes hand in hand with green street programs. Properly disposing of litter, yard waste, and hazardous chemicals and appropriately applying yard chemicals will help prolong the life of green street practices. An information campaign should also give the public an understanding of how green infrastructure works and the benefits and trade offs. In many cases, remedial maintenance of green street practices will be performed by neighboring property owners; they need to know how to maintain the practices to keep them performing optimally.

As public spaces, roads are prime candidates for green infrastructure improvements. In addition to enabling legislation, and technical guidance, developing a green streets program requires an institutional re-evaluation of how right-of-ways are most effectively managed. This process typically includes:

- Assessing the necessary function of the road and selecting the minimum required street width to reduce impervious cover;
- Enhancing streetscaping elements to manage stormwater and exploring opportunities to integrate stormwater management into roadway design; and
- Integrating transportation and environmental planning to capitalize on economic benefits.

The use of green streets offers the capability of transforming a significant stormwater and pollutant source into an innovative treatment system. Green streets optimize the performance of public space easing maintenance concerns and allowing municipalities to coordinate the progression and implementation of stormwater control efforts. In addition, green streets optimize the performance of both the transportation and water infrastructure. Effectively incorporating green techniques into the transportation network provides significant opportunity to decrease infrastructure demands and pollutant transport.

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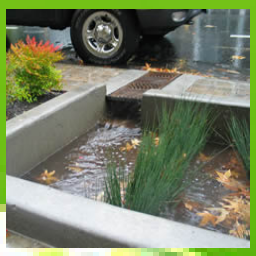

Managing Wet Weather with Green Infrastructure

Municipal Handbook

Rainwater Harvesting Policies

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prepared by

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Low Impact Development Center

The Municipal Handbook is a series of documents
to help local officials implement green infrastructure in their communities.

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Front Cover Photos
Top: rain garden; permeable pavers; rain barrel; planter; tree boxes.
Large photo: cisterns in the Wissahickon Charter School's Harmony Garden in Philadelphia

Rainwater Harvesting Policies

Introduction

From the last half of the 20th century, the U.S. has enjoyed nearly universal access to abundant supplies of potable water. But as witnessed by the recent serious and sustained droughts in the Southeast and Southwest, this past luxury is not something that can be expected for the long term. Future population growth will exert more demand on water systems while climate change is predicted to decrease available supplies because of decreased snow pack and drier regional climatic patterns. The U.S. has been identified as a country that faces imminent water shortages and a Government Accountability Office (GAO) survey found that water managers in 36 states anticipate water shortages during the first two decades of this century.[1] These challenges will require a more sustainable approach to using water resources, looking at not only how much water is used, but also the quality of water needed for each use.

The overwhelming majority of the water used in the U.S. comes from freshwater supplies of surface and groundwater. Water extracted for public systems is treated to potable standards as defined by the Safe Drinking Water Act. Access to high quality water has greatly benefited public health, but it has also resulted in our current system that utilizes potable water for virtually every end use, even when lesser quality water would be sufficient. In addition to conservation methods, using alternative sources of water will be necessary for more efficient use of water resources.

Rainwater harvesting, collecting rainwater from impervious surfaces and storing it for later use, is a technique that has been used for millennia. It has not been widely employed in industrialized societies that rely primarily on centralized water distribution systems, but with limited water resources and stormwater pollution recognized as serious problems and the emergence of green building, the role that rainwater harvesting can play for water supply is being reassessed. Rainwater reuse offers a number of benefits.[2]

- Provides inexpensive supply of water;
- Augments drinking water supplies;
- Reduces stormwater runoff and pollution;
- Reduces erosion in urban environments;
- Provides water that needs little treatment for irrigation or non-potable indoor uses;
- Helps reduce peak summer demands; and
- Helps introduce demand management for drinking water systems.

Rainwater harvesting has significant potential to provide environmental and economic benefits by reducing stormwater runoff and conserving potable water, though several barriers exist that limit its application. The U.S. uses more water per capita than any other country, with potable water delivered for the majority of domestic and commercial applications. Typical domestic indoor per capita water use, shown in Table 1, is 70 gallons per day (gpd); however outdoor water use can constitute 25% to 58% of overall domestic demand, increasing per capita domestic use up to 165 gpd.

Table 1. Typical Domestic Daily per Capita Water Use.[3]

Use	Gallons per Capita	% of Daily Total
Potable indoor uses		
• Showers	11.6	7.0%
• Dishwashers	1.0	0.6%
• Baths	1.2	0.8%
• Faucets	10.9	6.6%
• Other uses, leaks	11.1	6.7%
Subtotal	**35.8**	**21.7%**
Non-potable indoor uses		
• Clothes washers	15.0	9.1%
• Toilets	18.5	11.2%
Subtotal	**33.5**	**20.3%**
Outdoor uses	**95.7**	**58.0%**

While potable water is used almost exclusively for domestic uses, almost 80% of demand does not require drinkable water. Similar trends exist for commercial water use. Table 2 provides examples of daily commercial water usage.

Table 2. Typical Daily Water Use for Office Buildings and Hotels.[4]

Use	Office Buildings % of Daily Total	Hotels % of Daily Total
Potable indoor uses		
Showers	---	27%
• Faucets	1%	1%
• Kitchen	3%	10%
• Other uses	10%	19%
Subtotal	**14%**	**57%**
Non-potable indoor uses		
• Toilets/urinals	25%	9%
• Laundry	---	14%
• Cooling	23%	10%
Subtotal	**48%**	**33%**
Outdoor uses	**38%**	**10%**

Both the domestic and commercial water use statistics show that potable water is often being utilized for end uses that could be satisfied with lesser quality water. The statistics also indicate that nearly all water is used in a one-time pass through manner, with little attempt at reuse. Rainwater harvesting offers an alternative water supply that can more appropriately match water use to the quality of water supplied.

Rainwater harvesting systems typically divert and store runoff from residential and commercial roofs. Often referred to as 'clean' runoff, roof runoff does contain pollutants (metals or hydrocarbons from roofing materials, nutrients from atmospheric deposition, bacteria from bird droppings), but they are generally in lower concentrations and absent many of the toxics present in runoff from other impervious surfaces. Installing a rainwater collection system requires diverting roof downspouts to cisterns or rain barrels to capture and store the runoff. Collection containers are constructed of dark materials or buried to prevent light penetration and the growth of algae.[5] From the storage container, a dual plumbing system is needed for indoor uses and/or a connection to the outdoor irrigation system.

Regulations

Although a few states and local jurisdictions have developed standards or guidelines for rainwater harvesting, it is largely unaddressed by regulations and codes. Neither the Uniform Plumbing Code

(UPC) nor International Plumbing Code (IPC) directly address rainwater harvesting in their potable or stormwater sections. Other reuse waters are covered by codes. The UPC's Appendix J addresses reclaimed water use for water closets and urinals and the IPC's Appendix C addresses graywater use for water closets and urinals along with subsurface irrigation.[6] Both sections focus on treatment requirements, measures necessary to prevent cross-contamination with potable water, and appropriate signage and system labeling. However, because of a general lack of specific rainwater harvesting guidance some jurisdictions have regulated harvested rainwater as reclaimed water, resulting in more stringent requirements than necessary. These issues have led to confusion as to what constitutes harvested rainwater, graywater, or reclaimed water.[7]

The confusion among waters for reuse and the lack of uniform national guidance has resulted in differing use and treatment guidelines among state and local governments and presents an impediment to rainwater reuse. Texas promotes harvested rainwater for any use including potable uses provided appropriate treatment is installed; Portland, like many other jurisdictions, generally recommends rainwater use to the non-potable applications of irrigation, hose bibbs, water closets, and urinals.

UPC Definitions – Waters for Reuse[8]

- *Graywater* – untreated wastewater that has not come in to contact with black water (sewage). Graywater includes used water from bathtubs, showers, lavatories, and water from clothes washing machines.
- *Reclaimed water* – water treated to domestic wastewater tertiary standards by a public agency suitable for a controlled use, including supply to water closets, urinals, and trap seal primers for floor drains and floor sinks. Reclaimed water is conveyed in purple pipes (California's purple pipe system is one of the better known water reclamation systems).
- *Harvested rainwater* – stormwater that is conveyed from a building roof, stored in a cistern and disinfected and filtered before being used for toilet flushing. It can also be used for landscape irrigation.

To develop general or national guidance for rainwater harvesting, several factors must be considered. While potable use is possible for harvested rainwater, necessary on-site treatment and perceived public health concerns will likely limit the quantity of rainwater used for potable demands. Irrigation and the non-potable uses of water closets, urinals and HVAC make-up are the end uses that are generally the best match for harvested rainwater. A lesser amount of on-site treatment is required for these uses and, as seen from the use statistics presented above, these uses constitute a significant portion of residential and commercial demand. Focusing harvested rainwater on irrigation and selected non-potable indoor uses can significantly lower demand while allowing a balance and public comfort level between municipal potable water and reused rainwater.

Guidance for the reuse of harvested stormwater will be similar to reclaimed water and graywater but will differ because of lower levels of initial contamination and targeted end uses. The primary concerns of indoor rainwater reuse are cross-contamination of the potable supply and human contact with bacteria or pathogens that may be present in the collected rainwater. Portland's Rainwater Harvesting One and Two Family Dwelling Specialty Code provides a good example of specific rainwater reuse stipulations. Although the code doesn't address multi-family residential or non-residential applications, rainwater reuse is permitted for these facilities, but due to the unique design of each system, commercial reuse systems are considered on a case by case basis. In addition, multi-family residential units and sleeping portions of hotels are allowed to use rainwater for irrigation only; non-residential buildings are permitted to use rainwater for irrigation, water features, water closets and urinals. In these applications, water provided for water closets and urinals must be treated with filters and UV and/or chlorinating.[9]

Tucson Rainwater Harvesting Requirements

Tucson, Arizona became the first city in the country to require rainwater harvesting for landscaping use. Beginning June 1, 2010, 50% of a commercial property's irrigation water must be supplied from rainwater. In addition to cisterns, the regulations allow berms and contoured slopes to be used to direct rainwater to trees and landscaped areas.

Portland's code permits rainwater reuse for potable uses at family dwellings only through an appeals process. In addition, rainwater used only for outdoor irrigation is not covered by the code and needs no treatment prior to use. Acceptable indoor non-potable uses are hose bibbs, water closets, and urinals. The code illuminates several important issues that need to be considered when developing rainwater harvesting code.

- *Water quality* – Water quality and its impact on human health is a primary concern with rainwater harvesting. This issue is comprised of two components: end use of the rainwater and treatment provided. Rainwater used for residential irrigation (on the scale of rain barrel collection) does not typically require treatment. Commercial applications and non-potable indoor uses require treatment but the type of use will determine the extent of treatment. Each jurisdiction will need to assess the level of treatment with which it is comfortable, but limiting rainwater reuse to water closets, urinals and hose bibbs presents little human health risk. Each system will require some level of screening and filtration to prevent particles and debris from traveling through the plumbing system, and most jurisdictions require disinfection with UV or chlorination because of bacterial concerns. Table 3 provides an example of minimum water quality guidelines and suggested treatment methods for collected rainwater.

Excerpts of General Requirements
Portland Rainwater Harvesting Code Guide

General

- Harvested rainwater may only be used for water closets, urinals, hose bibbs, and irrigation.
- Rainwater can only be harvested from roof surfaces.
- The first 10 gallons of roof runoff during any rain event needs to be diverted away from the cistern to an Office of Planning & Development Review (OPDR) approved location.

Rainwater Harvesting System Components

- Gutters – All gutters leading to the cistern require leaf screens with openings no larger than 0.5 inches across their entire length including the downspout opening.
- Roof washers – Rainwater harvesting systems collecting water from impervious roofs are required to have a roof washer for each cistern. Roof washers are not required for water collected from green roofs or other pervious surfaces. The roof washer is required to divert at least the first 10 gallons of rainfall away from the cistern and contain 18 inches of sand, filter fabric, and 6 inches of pea gravel to ensure proper filtration.
- Cisterns – Material of construction shall be rated for potable water use. Cisterns shall be able to be filled with rainwater and the municipal water system. Cross-contamination of the municipal water system shall be prevented by the use of (1) a reduced pressure backflow assembly or (2) an air gap. Cisterns shall be protected from direct sunlight.
- Piping – Piping for rainwater harvesting systems shall be separate from and shall not include any direct connection to any potable water piping. Rainwater harvesting pipe shall be purple in color and labeled "CAUTION: RECLAIMED WATER, DO NOT DRINK" every four feet in length and not less than once per room.
- Labeling – Every water closet or urinal supply, hose bibb or irrigation outlet shall be permanently identified with an indelibly marked placard stating: "CAUTION: RECLAIMED WATER, DO NOT DRINK."
- Inspections – Inspections are required of all elements prior to being covered.
- Maintenance – Property owner is responsible for all maintenance.

A review of treatment standards among various jurisdictions shows a wide range of requirements from minimal treatment to reclaimed water standards. A recent memorandum of understanding from the City and County of San Francisco allows rainwater to be used for toilet flushing without being treated to potable standards. Texas requires filtration and disinfection for non-potable indoor uses, and Portland requires filtration for residential non-potable indoor uses, but requires filtration and disinfection for multi-family and commercial applications. Treatment requirements ultimately come down to risk exposure with risk of bacterial exposure determining the most stringent levels of treatment. However, San Francisco's Memorandum or Understanding indicates a belief in a low exposure risk with rainwater when used for toilet flushing. Likewise, testing conducted in Germany demonstrated that the risk of *E. coli* contact with the human mouth from toilet flushing was virtually non-existent, resulting in the

recommendation that special disinfection measures were unnecessary for rainwater dedicated to non-potable uses.[10]

The level of treatment required by each municipality can influence the number of harvesting systems installed. Filtration and disinfection are not expensive treatment requirements but each treatment requirement adds a cost to the system. Simplifying the treatment requirements when there is not a threat to public health lowers the cost for private entities to install systems and encourages broader adoption of the practice.

- *Cross-contamination* – Cross-contamination of the potable water system is a critical concern for any water reuse system. Cross-contamination measures for rainwater reuse systems will be similar to those for reclaimed and graywater systems. When rainwater is integrated as a significant supply source for a non-potable indoor use, a potable make-up supply line is needed for dry periods and when the collected rainwater supply is unable to meet water demands. The make-up supply to the cistern is the point of greatest risk for cross-contamination of the potable supply. Codes will require a backflow prevention assembly on the potable water supply line, an air gap, or both. In addition to backflow prevention, the use of a designated, dual piping system is also necessary. Purple pipes, indicating reused water, are most often used to convey rainwater and are accompanied by pipe stenciling and point-of-contact signage that indicates the water is non-potable and not for consumption.
- *Maintenance and inspection* – The operation and maintenance of rainwater harvesting systems is the responsibility of the property owner. Municipal inspections occur during installation and inspections of backflow prevention systems are recommended on an annual basis. For the property owner, the operation of a rainwater harvesting system is similar to a private well. Especially for indoor uses annual water testing to verify water quality is recommended as well as regular interval maintenance to replace treatment system components such as filters or UV lights. The adoption and use of rainwater harvesting systems will add to the inspection responsibilities of the municipal public works department, but the type of inspection, level of effort, and documentation required will be similar to those of private potable water systems and should be readily integrated into the routine of the inspection department.

Table 3. Minimum Water Quality Guidelines and Treatment Options for Stormwater Reuse.[11]

Use	Minimum Water Quality Guidelines	Suggested Treatment Options
Potable indoor uses	• Total coliforms – 0 • Fecal coliforms – 0 • Protozoan cysts – 0 • Viruses – 0 • Turbidity < 1 NTU	• Pre-filtration – first flush diverter • Cartridge filtration – 3 micron sediment filter followed by 3 micron activated carbon filter • Disinfection – chlorine residual of 0.2 ppm or UV disinfection
Non-potable indoor uses	• Total coliforms < 500 cfu per 100 mL • Fecal coliforms < 100 cfu per 100 mL	• Pre-filtration – first flush diverter • Cartridge filtration – 5 micron sediment filter • Disinfection – chlorination with household bleach or UV disinfection
Outdoor uses	N/A	Pre-filtration – first flush diverter

*cfu – colony forming units
*NTU – nephelometric turbidity units

Institution Issues and Barriers

Although stormwater reuse offers environmental and economic benefits, its use has remained relatively limited. This is caused by a number of perceived and actual barriers. The high rate of water consumption in the U.S. is coupled with water cost rates that are among the lowest. For example, U.S. water use is approximately twice that of Europe, but the annual cost of household water bills are roughly equal. The cost of water in the U.S. ranges from $0.70 to $4 per thousand gallons, with the national average cost

slightly more than $2 for a thousand gallons. Price, therefore, creates little incentive for conservation or the use of alternative sources.[12]

Residential rain barrels are an inexpensive and easy retrofit that reduces stormwater runoff and provides irrigation water. *Photo at left: District of Columbia Water & Sewer Authority; Photo at right: Ann English.*

San Francisco Rainwater Harvesting MOU

In 2008, San Francisco's Public Utilities Commission (SFPUC), Department of Building Inspection (DBI), and Department of Public Health (DPH) signed a Memorandum of Understanding for the permitting requirements for rainwater harvesting systems located within the City and County of San Francisco. The MOU encourages rainwater harvesting and its reuse for non-potable applications without requiring treatment to potable water standards. It also defines the roles of the participating agencies. From the MOU:

- The SFPUC will create and distribute guidance and material on rainwater harvesting. The material will cover system design, system components, allowable uses, owner responsibilities, and permitting requirements. The SFPUC will encourage all rainwater harvesters to notify the SFPUC with the design specifications of their systems for research purposes.
- DBI will issue permits for construction of properly designed rainwater harvesting systems for non-potable uses that meet the minimum criteria described in the MOU and in guidance materials prepared by the SFPUC. DBI will be responsible for review of permit applications and inspection of rainwater harvesting systems that require permits.
- DPH will review rainwater harvesting projects that propose any residential indoor uses of rainwater other than toilet flushing to assure the protection of public health.

It also stipulates that system design, maintenance, and use are the responsibility of the system owner.

The MOU classifies rain barrels and cisterns and defines the allowable uses of harvested rainwater. Water from rain barrels may be used for irrigation and vehicle washing; it is prohibited to connect rain barrels to indoor or outdoor plumbing. Water from cisterns connected to indoor plumbing may be used for irrigation, vehicle washing, heating and cooling, and toilet flushing. If a cistern is not connected to indoor plumbing it cannot be used for toilet flushing.

The MOU also includes safety and maintenance requirements, required system components, labeling requirements, and DBI permit requirements.

To better manage natural resources and water infrastructure, EPA has advocated four pillars of sustainable infrastructure, one of which is full cost pricing of water. Full cost pricing would result in water rates that reflect the entire suite of costs associated with water delivery: past, present, and future capital costs and operations and maintenance. Full cost pricing would ideally also include the external costs associated with the environmental damage and resource depletion created by water use.[13, 14] However, user fees and other funding sources are insufficient in 29% of water utilities to cover the cost of providing service, let alone including external costs.[15] Insufficient pricing is a significant barrier to collection and reuse.

Water needed for sanitation, cleaning, and cooking is less responsive to price than discretionary uses such as landscaping, but overall, water generally displays inelastic demand. A 10% increase in domestic prices decreases demand 2 to 4%; a 10% increase in commercial prices decreases demand 5 to 8%.[16] While studies show that price has limited effect on demand, they also do not consider the option of a low-cost alternative source of water. Increased prices may not significantly diminish water use, but may be sufficient to encourage the use of lower cost alternatives. When faced with sufficiently priced potable water, the investment in a low cost alternative that provides continued savings becomes increasingly favorable.

Albuquerque-Bernalillo County Building Standards

In 2008, the Water Utility Authority of Albuquerque-Bernalillo County instituted new standards that require rainwater harvesting systems for new homes. Buildings larger than 2,500 square feet are required to have a cistern and pump, while smaller buildings can use cisterns, rain barrels, or catchment basins. All rainwater harvesting systems need to capture the runoff from at least 85% of the roof area.

The standards also include a requirement for high efficiency toilets and prohibitions against installing turf on slopes steeper than 5:1 and sprinkler irrigating areas smaller than 10 feet in any dimension.

Regulations and codes also inhibit rainwater collection. Plumbing codes have been identified as a common barrier. Whether they make no provisions for rainwater reuse or require downspouts to be connected to the stormwater collection system, thereby eliminating the possibility of intervening to intercept roof runoff, code changes are often a necessary first step to enabling rainwater harvesting. Other regulations complicate the implementation of rainwater harvesting. Western water rights and the doctrine of "first in time, first in line" access to water can present a barrier to rainwater harvesting. Colorado interprets its Western water rights laws as prohibiting rainwater harvesting. The state's interpretation that cisterns and rain barrels prevent runoff from reaching rivers and thereby decrease a downstream user's allotted water right has been questioned, but it currently prohibits rainwater capture and reuse.

Rainwater Harvesting in the West

Western water rights can be an impediment to rainwater harvesting efforts because the doctrine of prior appropriation has created ambiguity about the legality of intercepting and storing rainwater. In the strictest interpretation, diverting rainwater to a collection system is a taking of a water previously appropriated.

This issue has been overlooked for many community rain barrel initiatives, because the individual storage units are relatively small. The City of Seattle, however, obtained a citywide water-right permit to ensure the legality of water harvesting efforts.

State legislation may ultimately be necessary to ensure the legality of rainwater harvesting and establish the upper capacity limit for rainwater systems. Any efforts should fully assess the watershed impacts of rainwater harvesting efforts. Colorado law, for instance has assumed that all rainfall eventually reaches groundwater or surface waters and is therefore appropriated. In the dry regions of the state, however, a study has found that the majority of rainfall on undeveloped lands is lost to evaporation and transpiration and only a small fraction actually reaches surface waters.

Likewise, rainwater harvesting is a water conservation practice which will reduce the overall withdrawal and use of water, making a greater quantity of water available for downstream users. Harvested rainwater used for irrigation or other outdoor uses reapplies the water in a manner similar to normal precipitation. Rainwater used for non-potable indoor uses is collected in the sanitary system and eventually returned to receiving streams and available for downstream use.

Energy and Climate

In addition to the natural resources impacts that water use imparts, water collection, treatment, and distribution has energy and climate consequences. The connection between water and energy is often overlooked but the process of extracting water from surface or groundwater supplies, bringing it to treatment facilities, treating it to drinking water standards, and delivering it to residential and commercial customers expends energy primarily because of pumping and treatment costs. The water sector consumes 3% of the electricity generated in the U.S. and electricity accounts for approximately one-third of utilities' operating costs.[17] Reducing potable water demand by 10% could save approximately 300 billion kilowatt-hours of energy each year.[18] Water reuse systems, like rainwater harvesting, supplant potable water and reduce demand. The reduced water demand provided by rainwater harvesting systems translates directly to energy savings. Table 4 presents estimates of the energy required to deliver potable water to consumers.

Table 4. Estimated Energy Consumption for Water Treatment and Distribution.[19]

Activity	Energy Consumption kWh/MG
Supply and conveyance	150
Water Treatment	100
Distribution	1,200
Total	**1,450**

Decreasing potable water demand by 1 million gallons can reduce electricity use by nearly 1,500 kWh. An inch of rainfall produces 600 gallons of runoff per 1,000 square feet of roof. Coordinated residential applications and large-scale non-residential rainwater harvesting systems offer an alternative method of reducing energy use.

Limiting energy demand is significant but the impact that decreased energy demand has on carbon dioxide emissions is critical. Carbon dioxide emissions associated with electricity generation vary according to the fossil fuel source. Rough estimates suggest that reducing potable water demand by 1 million gallons can reduce carbon dioxide emissions 1 to 1½ tons when fossil fuels are used for power generation (Table 5).

Table 5. Carbon Dioxide Emissions from Electric Power Generation.[20]

Fuel Type	CO_2 Output Rate Pounds CO_2/kWh	CO_2 Output per MG Water Delivered (x 1,450 kWh)
Coal	2.117	3,070 lbs
Petroleum	1.915	2,775 lbs
Natural gas	1.314	1,905 lbs

The carbon reductions associated with rainwater harvesting are admittedly not on the order of magnitude required to significantly impact climate change. However, the connection between potable water use and energy demand is important to recognize in the broader context of sustainable water management. It is critical to assess water use not only from a resource availability and protection standpoint, but also with the aim of improving overall sustainability of which energy is a critical component. As municipalities are faced with the anticipated CO_2 reductions that will be required over the coming decades, decreased potable water demand (along with other measures such as increased energy efficiency and conservation) represent the "low hanging fruit" that may provide the quickest and easiest reductions. Rainwater harvesting along with graywater and reclaimed water reuse represent an integrated water management approach that can not only limit contributions to climate change, but also protect and conserve limited water resources developing resiliency to the uncertain effects of climate change.

Conclusions and Recommendations

Encouraging rainwater harvesting and reuse requires enabling the practice through codes and regulations and providing incentives. State or municipal codes need to address public health concerns by stipulating water quality and cross-contamination requirements. Similar to reclaimed and graywater, specific rainwater harvesting codes need to be developed. Codes should establish acceptable uses for rainwater and corresponding treatment requirements. Disinfection of rainwater for reuse has been the standard, but recent research and policies should encourage jurisdictions to evaluate lesser requirements for non-potable uses in water closets and urinals. The simplification of the on-site treatment process and associated cost savings could broaden the use of rainwater harvesting without increasing exposure risks.

In addition to code development, incentives for rainwater harvesting should be instituted. The incentives should recognize that rainwater is a resource and that the use of potable water carries and environmental and economic cost. Current water policies and rates do not promote sustainability, with a structure that inadequately accounts for the value of water and does not promote conservation. Municipalities should review their water rates to see if they appropriately account for the full cost of water. Pricing alternatives such as increasing block rates, which increase the price of water with increased use, create an incentive to conserve potable water. An increased price of potable water would encourage investment in rainwater harvesting systems because they offer a long-term inexpensive supply of water after the initial capital investment. The combined actions of establishing certain requirements for rainwater harvesting systems and increasing the currently underpriced cost of water creates a complementary system that can encourage the use of alternative water sources.

Commercially sized cistern at the Chicago Center for Green Technology. *Photo: Abby Hall, EPA.*

Considerations when Establishing a Municipal Rainwater Harvesting Program

1. Establish specific codes or regulations for rainwater harvesting
   - Building and plumbing codes are largely silent on rainwater harvesting. Consequently, graywater requirements are often used to govern rainwater harvesting systems, resulting in requirements that are more stringent than necessary. Codes should define rainwater harvesting and establish its position as an acceptable stormwater management/water conservation practice.
2. Identify acceptable end uses and treatment standards
   - Each municipality will need to consider and identify acceptable uses for harvested rainwater and the required treatment for specified uses. Rainwater is most commonly used for non-potable applications and segregated by indoor and outdoor uses.
     - Typical outdoor uses:
       1. Irrigation; and
       2. Vehicle washing.
     - Typical indoor uses:
       1. Toilet flushing;
       2. Heating and cooling; and
       3. Equipment washing.
   - Non-potable uses typically require minimal treatment. Outdoor uses normally need only prescreening to limit fouling of the collection system. Indoor non-potable uses do not necessarily require treatment beyond screening, although some municipalities have adopted a conservative approach and require filtration and disinfection prior to reuse.
   - Harvested rainwater can be used for potable applications although a special permitting process should be established to ensure that proper treatment (e.g., filtration and disinfection) is provided and maintained.
3. Detail required system components
   - Jurisdictions often delineate between rain barrels and cisterns because of the size and potential complexity of the systems. Rain barrels collect relatively small quantities of water and generally only require mosquito prevention, proper overflow, and an outlet for outdoor uses. Cisterns can be 100 to several thousand gallons in size and may be connected to various indoor plumbing and mechanical systems. Needed system requirements include:
     - Pre-filtration – Filtration prior to the rain barrel or cistern should be provided to remove solids and debris.
     - Storage containers – Rain barrels and cisterns should be constructed of a National Sanitation Foundation approved storage container listed for potable water use.
     - Back-flow prevention – For cisterns that require a potable water make-up for operation, back flow prevention in the form of an air gap or backflow assembly must be provided.
     - Duel piping system – a separate piping system must be provided for harvested rainwater distribution. The pipe should be labeled and color coded to indicate non-potable water. Purple piping indicating reclaimed water is often used for rainwater harvesting systems. Cross connections with the potable water supply system are prohibited.
     - Signage – permanent signage should be provided at every outlet and point of contact indicating non-potable water not for consumption. In addition, biodegradable dyes can be injected to indicate non-potable water.
4. Permitting
   - Rain barrels should not need to be permitted provided that they are installed correctly and direct overflow to a proper location. A permit application process should be instituted for cistern systems used for non-potable uses. If harvested rainwater is used for potable water, the collection and treatment system should be inspected and approved by the public health department.
5. Maintenance
   - Adequate design and maintenance of the cistern and piping system is the responsibility of the cistern owner.
6. Rates of reuse
   - For harvesting systems to be efficient stormwater retention systems, the collected rainwater needs to be used in a timely matter to ensure maximum storage capacity for subsequent rain events. Cistern systems generally supply uses with significant demands, ensuring timely usage of the collected water. Outreach and education is a critical component of rain barrel programs, however, because of the more episodic and less structured use of this collected water. Municipalities should inform homeowners of the steps needed to maximize the effectiveness of their rain barrels. Harvesting programs targeting susceptible combined sewer areas have used slow draw down of the rain barrels to delay stormwater release to the sewer system, yet ensure maximum storage capacity for subsequent rain events.

Case Studies

King Street Center, Seattle

The King Street Center in Seattle uses rainwater for toilet flushing and irrigation. Rainwater from the building's roof is collected in three 5,400 gallon cisterns. Collected rainwater passes through each tank and is filtered prior to being pumped to the building's toilets or irrigation system through a separate piping system. When needed, potable makeup water is added to the cisterns. The collection and reuse system is able to provide 60% of the annual water needed for toilet flushing, conserving approximately 1.4 million gallons of potable water each year.[21]

The Solaire, Battery Park City, New York

The 357,000 square foot, 27 floor building was the first high-rise residential structure to receive LEED® Gold certification. The Solaire was designed to comply with Battery Park City's progressive water and stormwater standards; more than 2 inches of stormwater must be treated on site to meet the standards. Rainwater is collected in a 10,000 gallon cistern located in the building's basement. Collected water is treated with a sand filter and chlorinated according to New York City Standards prior to being reused for irrigating two green roofs on the building. Treated and recycled blackwater is used for toilet flushing and make-up water. Water efficient appliances and the rainwater and blackwater reuse system have decreased potable water use in the building by 50%.[22] Because of its innovative environmental features, the Solaire earned New York State's first-ever tax credit for sustainable construction.[23, 24]

Philip Merrill Building, Annapolis, MD

The Chesapeake Bay Foundation's headquarters is a LEED® Version 1 Platinum certified building. Rainwater from the roof is collected in three exposed cisterns located above the entrance.[25] Roof runoff passes through roof washers before entering the cisterns; following the cisterns the water is treated with a sand filter, chlorination, static mixer, and carbon filter prior to reuse. The building uses composting toilets, so the reused water is used for bathroom and mop sinks, gear washing, irrigation, fire suppression, and laundry. The building's design allows for a 90% reduction in potable water use with 73% of the water used within the building supplied by the cistern collection system.[26, 27, 28]

Cisterns at CBF headquarters. Photo: *Chesapeake Bay Foundation.*

Alberici Corporate Headquarters, Overland, Missouri

Alberici Corporation, a construction company, chose to relocate its corporate headquarters to a 14-acre site in the St. Louis suburbs in 2004. The site renovation included refurbishing a 150,000 square foot former metal fabrication facility into a LEED® platinum certified office building. The building design includes a rainwater collection and reuse system. Rainwater is collected from 60% of the garage roof area and stored in a 38,000 gallon cistern. The collected water is filtered and chlorinated and used for toilet flushing and the building's cooling tower. The stormwater reuse system saves 500,000 gallons of water each year, reducing potable water demand by 70%.[29, 30]

Lazarus Building, Columbus, Ohio

After Federated Department Stores closed the 750,000 square foot retail store in 2002, it donated the building to the Columbus Downtown Development Corporation. The building renovation completed in 2007 achieved LEED® Gold certification and the building's largest tenant is Ohio EPA. The renovated building includes a rainwater collection and reuse system. The system makes use of an existing 40,000

gallon tank on the building's roof and a new 50,000 gallon tank installed in the basement. The collected rainwater is used for toilet flushing, irrigation, and HVAC makeup. A biodegradable blue dye is added to the water used for toilet flushing to visually identify it as non-potable water. The system reduces potable water use in the building by several million gallons a year.[31, 32]

Stephen Epler Hall, Portland State University

PSU's 62,500 square foot mixed-use student housing facility (classrooms and academic office space are located on the first floor) was completed in 2003 and is LEED® Silver Certified. The stormwater management system was designed to be engaging to the public; rain from the roofs of Epler Hall and neighboring King Albert Hall is diverted to several river rock "splash boxes" in the public plaza.[33] The water then travels through channels in the plaza's brick pavers to planter boxes where it infiltrates and is filtered before being collected in an underground cistern. UV light is used to treat the water prior to its reuse for toilet flushing in the first floor restroom and irrigation. Placards located in the water closets indicate that the non-potable toilet flushing water is not for consumption. The stormwater collection and reuse system conserves approximately 110,000 gallons of potable water annually, providing a savings of $1,000 each year.[34, 35]

Natural Resources Defense Council's Robert Redford Building, Santa Monica

NRDC's renovation of a 1920s-era structure in downtown Santa Monica achieved LEED® New Construction, Version 2 Platinum certification. The innovative water systems in the 15,000 square foot building are a key component of the project's sustainability. The plumbing system delivers potable water only to locations where drinking water is needed, such as faucets and showers. Water from the showers and sinks is collected in graywater collection tanks and treated on-site. The treated graywater is reused for toilet flushing and landscaping. Rainwater from the building is collected in outdoor cisterns, which were installed beneath planters adjacent to the building. The collected rainwater is filtered prior to being added to the graywater collection tank as part of the water reuse system. The graywater/rainwater reuse system and high-efficiency features such as duel-flush toilets, waterless urinals, and drought-tolerant plants reduce potable water demand by 60%. Each waterless urinal, for instance, saves 40,000 gallons of water each year.[36]

Rainwater cistern at NRDC's Santa Monica Office (inset photo after planter planting). *Photo: NRDC.*

The City's plumbing code complicated the installation of many of the building's water features. The plumbing code prohibited waterless toilets or urinals, requiring a resolution that allowed the waterless urinals to be installed with water supply stubbed out behind the wall if needed for future use. The City is now seeking a change to City Code to allow for waterless urinals to be installed without an available water supply. Similarly, California's graywater ordinance did not contain a provision for rainwater collection; an agreement was negotiated with the County Health Department after which the City's Building and Safety Division agreed to sign off on the plans.[37, 38]

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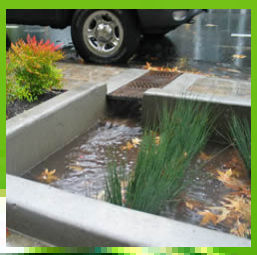

Managing Wet Weather with Green Infrastructure

Municipal Handbook

Incentive Mechanisms

Managing Wet Weather with Green Infrastructure

Municipal Handbook

Incentive Mechanisms

The Municipal Handbook is a series of documents
to help local officials implement green infrastructure in their communities.

June 2009

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Front Cover Photos

Top: rain garden; permeable pavers; rain barrel; planter; tree boxes.

Large photo: large bioretention in Portland, Oregon

Incentive Mechanisms

Incentives are a creative tool local governments can use to encourage the use of green infrastructure practices on private property. Incentive mechanisms allow municipalities to act beyond the confines of their regulatory authorities to improve wet weather management on properties that may not fall under updated stormwater requirements or other state and municipal policies, codes and ordinances. These incentives can be applied to both new developments and existing developments. For new development projects, incentives can be incorporated into the development processes, such as building permits and stormwater permits or other development codes and requirements, to creatively encourage green infrastructure. In already developed areas, incentives can be designed to encourage private property owners to retrofit their properties to include green infrastructure practices where they do not already exist. Examples of local incentive mechanisms can include stormwater fee discounts, expedited permitting, grants, rebate and installation financing, and awards and recognition.

This chapter includes a list of incentive mechanisms currently being used by municipalities around the United States. The incentives have been organized categorically by type of incentive. The following are the primary types of green infrastructure incentives:

- Stormwater Fee Discount: Require a stormwater fee that is based on impervious surface area. If property owners reduce need for service by reducing impervious area and the volume of runoff discharged from the property, the municipality reduces the fee.

- Development Incentives: Offered to developers during the process of applying for development permits. Examples include: zoning upgrades, expedited permitting, reduced stormwater requirements and increases in floor area ratios.

- Grants: Provide direct funding to property owners and/or community groups for implementing a range of green infrastructure projects and practices.

- Rebates & Installation Financing: Provide funding, tax credits or reimbursements to property owners who install specific practices. Often focused on practices needed in certain areas or neighborhoods

- Awards & Recognition Programs: Provide marketing opportunities and public outreach for exemplary projects. May include monetary awards.

Incentive mechanisms can be easy to implement and afford local decision makers the flexibility and creativity to tailor programs to specific priorities or to particular geographic areas in a community. For example, as seen in Figure 1, Portland's downspout disconnection program is defined by the areas of the City with a combined sewer system. By offering an incentive of $53 to disconnect a downspout, the City of Portland is encouraging private property owners in the defined program area to reduce the runoff that enters the combined sewer system. This geographically-specific approach allows a municipality to focus resources and program efforts on a more manageable scale and can be an opportunity to pilot new incentives to determine the potential for municipality-wide application. Similarly, the City of Seattle's Green Factor

landscaping program is designed to increase the quantity and quality of planted areas in Seattle. The Green Factor is limited to downtown business districts because of the economic development potential of improved green space in the urban core and also because it allows the City to pilot the program in a defined area before applying it to other areas and zoning types in the city. Furthermore, incentive programs are voluntary, which creates less resistance from stakeholder groups and allows policy makers to test and refine programs that may one day develop into mandates or requirements.

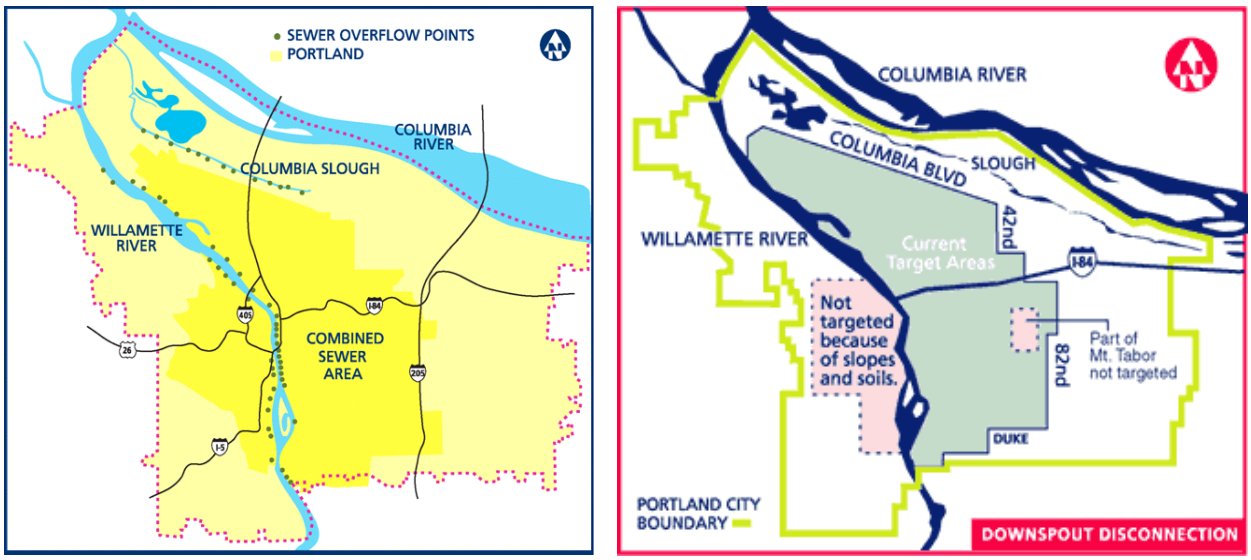

Figure 1: The map on the left shows Portland's combined sewer area and the map on the right shows the same geographic area outlined as neighborhoods targeted to receive incentives for disconnecting downspouts. Directing incentives to specific zones with water quality issues can help achieve measurable results.

Descriptions of Incentive Types

<u>Stormwater Fee Discount</u>

Incentives tied to stormwater fees encourage retrofits of existing properties and implementation of green infrastructure in new developments. In cities of varying sizes across the United States, fee discounts and credits provide an opportunity for property owners to reduce the amount of stormwater fees they pay by decreasing impervious surfaces or by using green infrastructure techniques that reduce the amount of stormwater runoff. In turn, public infrastructure is less burdened when private property owners manage their own stormwater runoff on-site. Discounts also support the fee-for-service system because property owners can reduce the amount they pay by reducing the service received.

Before setting the credit standard or discount, whether for the use of green infrastructure or reductions in impervious surfaces, municipalities should set appropriate management goals and determine how to credit private property owners for whatever action is being incentivized. Table

1 outlines common frameworks for setting goals and developing the process for implementing fee discounts.

Some cities provide a percent discount for level of performance. This discount is primarily given for stormwater quantity reductions and in fewer cases for pollution reduction for water quality purposes. Discounts are also offered for impervious surface reductions, whether for total area or by the square foot. A credit system can be based on the implementation of specific practices, such as rain gardens, green roofs or even tree canopy area. In some cases, credits vary based on the practice and the goals the municipality has for private lands.

Table 1: Framework for Stormwater Fee Discount Programs

Goal of Discount	Mechanism for Fee Reduction	Process for Implementation
Reduce Imperviousness	• Percent fee reduction • Per-square-foot credit	• Percent reduction in imperviousness • Square feet of pervious surfaces
On-site Management	• Percent fee reduction • Quantity/Quality credits (performance-based)	• List of practices with associated credits • Total area (square feet) managed
Volume Reduction	• Percent fee reduction • Performance-based quantity reduction	• Percent reduction in imperviousness • Performance-based • Total area (square feet) managed • Practices based on pre-assigned performance values
Use of Specific Practices	• Percent fee reduction • One time credit	List of practices with associated credits

Development Incentives

Development incentives apply to private developers that take initiative by using more sustainable site design and green building practices. These incentives are typically provided within the framework of existing land use or development regulations and often remove or decrease fees, requirements, or steps in the permit process. Chicago's Green Permit Program reviews permits much faster, even in as few as 30 days, for projects that meet certain LEED (Leadership in Energy and Environmental Design) criteria that include better stormwater management practices. Portland's Floor Area Ratio (FAR) Bonus increases a building's allowable area in exchange for adding an ecoroof/greenroof. Portland has seen over $225 million in additional private development through this program, and more than 120 ecoroofs have been built in the center city district. These incentives can be used to improve environmental performance and support economic development. Development incentives also can be used to encourage green infrastructure beyond the site scale by encouraging infill development, aesthetically pleasing and walkable neighborhoods, and compact, mixed use community designs.

Grants

Grant programs can be used to disburse money directly to individual homeowners, other property owners and community groups for stormwater-related projects and can help a city or county add green infrastructure projects to the landscape. Grants can be used to encourage both site-specific green infrastructure practices such as rain gardens, street retrofits, green roofs, and cisterns, as well as neighborhood and municipal scale projects such as wetland construction or stream restoration projects. Santa Monica provides $160,000 per year in Landscape Grants to develop sites with native landscaping that reduce water consumption and absorb runoff. Chicago's Green Roof Grant program has helped this former industrial city add over 2.5 million square feet of green roofs across the City. The program grants $5000 awards to residential and small commercial buildings that meet criteria based on location, visibility and environmental benefit. Green infrastructure grant programs provide awards and savings to developers and properties that take extra steps to add greener stormwater management practices to both new and existing sites.

Rebates and Installation Financing

Communities offer rebates and installation financing to provide incentives for property owners to install green infrastructure practices on their property. These rebates and financing opportunities are often targeted to specific areas with the greatest need for green infrastructure, most often combined sewer areas. However, these programs may also be developed to achieve a range of water quality goals and implement community livability initiatives. For example, subsidies might be provided in neighborhoods with a high percentage of imperviousness or limited access to public green space.

Rebates and financing tools are also commonly used to encourage the use of specific practices based on priority environmental and community goals such as cisterns for water conservation, rain gardens to improve groundwater recharge, and green roofs to mitigate urban heat island effects.

Rebates and installation financing are also an effective means of educating the public about the benefits of green infrastructure and how it can be applied to a variety of property types and settings.

Awards and Recognition Programs

Awards and recognition programs highlight successful examples of green infrastructure in a community. Award winners often include businesses and property owners as well as non-profit organizations, community organizations, individuals, schools or government agencies. Awards are provided to recognize innovations in green infrastructure practices and design, and may include projects or plans that focus on water conservation and reuse, stormwater mitigation and management, landscaping and site design, watershed restoration and other sustainable strategies for water quality protection.

Granting awards to local projects gives valuable recognition to innovators that help to drive the field forward. At the same time, awards increase public awareness about local projects and the ways that stormwater can be used as a valuable resource. Adding signage to award-winning projects can help further educate the public and help the public recognize its impacts and connection to the local watershed.

Stormwater Incentive Examples

The following table provides a compendium of known examples of local incentives for green infrastructure organized by municipality and type of incentive. Clicking on the blue check marks will direct the reader to more information about the specific municipal examples, including the program name, description, the incentive beneficiary and a reference for finding out more information.

Table 2: Examples of local incentives for green infrastructure					
	Stormwater Fee Discounts	Development Incentives	Grants	Rebate/ Installation Financing	Awards/ Recognition
CA: Santa Monica			✓	✓	
CA: Palo Alto				✓	
CO: Denver	✓				
DC: Washington				✓	
FL: Gainesville	✓				
FL: Maitland				✓	
FL: Orlando	✓				
FL: Sarasota County		✓			
GA: Gwinnett County	✓				
GA: Henry County	✓				
IL: Chicago		✓	✓	✓	✓
IL: Rock Island				✓	
KS: Wichita	✓				
KY: Louisville/Jefferson County	✓				
KY: Sanitation District No. 1	✓				
MA: Reading	✓				
MD: Montgomery County				✓	
MN: Burnsville				✓	
MN: Maplewood				✓	
MN: Minneapolis	✓			✓	
MN: New Brighton	✓				
MN: Saint Paul	✓				
MO: Kansas City	✓				
NC: Charlotte	✓				
NC: Durham	✓				
NC: Raleigh	✓				
NY: New York		✓			
OH: Columbus	✓				
OH: Cincinnati				✓	
OK: Tulsa	✓				
OR: Portland	✓	✓	✓	✓	✓
OR: Sandy	✓				
PA: Philadelphia	✓	✓			✓
SC: Beaufort County	✓				
TN: Knox County		✓			
TX: Austin	✓			✓	
U.S. Virgin Islands			✓		
VA: Chesapeake	✓				
VA: Prince William County	✓				
WA: Bellevue	✓				
WA: King County	✓		✓		✓
WA: Marysville	✓				
WA: Seattle	✓	✓	✓	✓	

Case Study Examples

Stormwater Fee Discounts

CO: Denver

Incentive Type: Stormwater Fee Discount

Program Name: Stormwater fee equitability

Description: Fees are based on actual impervious area at each site as determined by aerial photography, so the less impervious surface, the lower the fee charged.

Beneficiary: All properties

Reference(s): http://www.semswa.org/fees.htm#surface

FL: Gainesville

Incentive Type: Stormwater Fee Discount

Program Name: Stormwater Management Utility Exemption

Description: Gainesville's Stormwater Management Utility reduces monthly fees for nonresidential properties with privately maintained, onsite stormwater management retention systems. The utility's base fee is established according to the property's impervious area and one-half its pervious parking areas. Credits of up to 100% are available based on the volume of onsite retention provided. Detention volume is not considered because that stormwater is discharged. Most credits range from 15% to 35%.

Beneficiary: Nonresidential properties

Reference(s): http://www.cityofgainesville.org/Portals/0/pw/pw_StormWater_MgtUtility.pdf

Doll, A., and G. Lindsey. 1999. Credits Bring Economic Incentives for Onsite Stormwater Management. Watershed and Wet Weather Technical Bulletin, January 1999, Water Environment Federation. http://stormwaterfinance.urbancenter.iupui.edu/PDFs/LindseyDoll.pdf

FL: Orlando

Incentive Type: Stormwater Fee Discount

Program Name: Stormwater Utility Discount

Description: Orlando's stormwater utility provides a lower rate for commercial and multi-family residential properties with onsite stormwater management facilities. Properties with approved onsite retention or detention get a 42% credit on the rate charged per equivalent residential unit.

Beneficiary: Commercial and multi-family residential

Reference(s): Overview of Stormwater Utility Fee Billing: http://www.cityoforlando.net/public_works/Stormwater/fee.htm

Flow Chart for Rate Determination: http://www.cityoforlando.net/public_works/Stormwater/Utility%20Fee/FLOWCHART%20FOR%202008%20BILLING%20YEAR.pdf

FAQs: http://www.cityoforlando.net/public_works/Stormwater/faq.htm#04.3

GA: Gwinnett County

Incentive Type: Stormwater Fee Discounts

Program Name: Stormwater Credits Program

Description: The County provides stormwater credit to landowners who install four types of practices: watershed stewardship, water quality, peak flow and channel protection. The total maximum credit for any property is 40%. Watershed stewardship practices include: public participation, low impact parcels, farmland deep tillage, stream restoration / streambank stabilization, watershed improvement project participation, conservation easements, conservation use valuation, assessment (CUVA) properties, county approved training programs, stream buffers that exceed 75' standards, fencing livestock out of streams, rain barrels, automatic sprinkler sensors, direct discharges, septic tank maintenance, and connection to sanitary sewers. Water quality credits of up to 10% are earned by property owners who install facilities that capture pollutants, thereby providing treatment of stormwater before it enters streams. There are several practices to accomplish this available to all property owners. Porous pavement, roof gardens and green roofs are acceptable practices to receive this credit. Residential property owners can install rain gardens to earn this credit. Channel protection credit (maximum 10%) is earned by property owners who provide protection of stream channels from bank and stream bed erosion by detaining and reducing the volume of stormwater from their properties. Peak flow credit (maximum 10%) is earned by property owners who install basins that delay the highest flows from reaching the drainage system, thereby protecting downstream properties.

Beneficiary: Property owner in Gwinnett County.

Reference(s): http://www.gwinnettcounty.com/cgi-bin/gwincty/egov/ep/gcbrowse.do?channelId=-24201&pageTypeId=536880236

GA: Henry County

Incentive Type: Stormwater Fee Discount

Program Name: Utility fee credit

Description: Credits are available for eligible properties that install, alter, or conduct activities that reduce the costs of services provided by the County. A 10% reduction of the stormwater fee is allowed for property owners; a 1% reduction is allowed for each percent of stormwater directed to rain garden. If all stormwater is treated on site, no fee is charged.

Beneficiary: All properties

Reference(s): Contact the Stormwater Management Department at (770) 288-7246 or visit http://www.co.henry.ga.us/Stormwater/FAQs.shtml

KS: Wichita

Incentive Type: Stormwater Fee Discount

Program Name:

Description: Wichita's stormwater utility offers two types of credits only for properties with 50 or more equivalent residential units. Up to a 40% credit is available for detention that equals or exceeds the city's new development standards, which are based on a 100-year storm. An 80% credit is available for retention of all runoff

from the site. Wichita has not issued any credits, because the standards are difficult to achieve.

Beneficiary: Residential

Reference(s): Source: Doll, A., and G. Lindsey. 1999. Credits Bring Economic Incentives for Onsite Stormwater Management. Watershed and Wet Weather Technical Bulletin, January 1999, Water Environment Federation. http://stormwaterfinance.urbancenter.iupui.edu/PDFs/LindseyDoll.pdf

KY: Louisville/Jefferson County

Incentive Type: Stormwater Fee Discount

Program Name: Drainage Charge Credit

Description: The Louisville and Jefferson County Metropolitan Sewer District (MSD) provides credits primarily for commercial properties with onsite detention for controlling peak flows. The credit amount depends on how the detention basin functions. Basins must be sized for 2-, 10-, or 100-year storms, and limit discharges to predevelopment runoff rates. Credits are available for each type of storm, with an 82% maximum credit if all criteria are met. Currently, MSD is evaluating ways to incorporate stormwater quality measures into its credit approach.

Beneficiary: Commercial

Reference(s): http://www.msdlouky.org/pdfs/msdrates09.pdf

KY: Sanitation District No. 1

Incentive Type: Stormwater Fee Discount

Program Name: Storm Water Surcharge Credit

Description: Any non-residential property owner who has either installed an approved on-site post-construction storm water control facility, implemented an approved best management practice (BMP), or developed and implemented an approved education program, may apply for a reduction of the Surcharge applied to that specific parcel. The District will evaluate each case individually in determining the appropriate level of credit. A total maximum of an 80% credit against the Surcharge may be granted:

- The credit is applied by reducing the number of billable equivalent residential units.
- The property parcel can qualify for both water quantity and water quality credits.
- The maximum allowable water quantity credit percentage = 35%.
- The maximum allowable water quality credit percentage = 50%

Beneficiary: Commercial

Reference(s): Stormwater Credit Policy overview: http://www.sd1.org/stormwater/credit.asp

MA: Reading

Incentive Type: Stormwater Fee Discounts

Program Name: Stormwater Enterprise Fund Fee Abatement

Description: The City allows single and two-family residential properties to abate up to 50% of the total fee if they install and maintain infiltration systems or other means to reduce runoff. Commercial/industrial/multi-family properties are allowed this abatement if they install and maintain "state-of-the-art" stormwater treatment and infiltration systems. Typical devices that qualify are drywells, infiltration chambers, detention ponds. Drinking water filtration systems and rain barrels do not qualify. The stormwater abatement continues as long as the impervious surface does not change.

Beneficiary: Property owner in Reading, Massachusetts.

Reference(s): http://www.ci.reading.ma.us/Pages/ReadingMA_Engineering/faq

MN: Minneapolis

Incentive Type: Stormwater Fee Discount

Program Name: Stormwater Quality Credit

Description: Residential storm water fee credit determined by the percent of a property's impervious area that drains to a stormwater management tool/practice (BMP). The maximum credit allowed is equal to 50% of the total percentage of impervious area draining to a BMP.

Beneficiary: Residential

Reference(s): Overview:
http://www.ci.minneapolis.mn.us/stormwater/fee/stormwaterQualityCredits.asp

Credit Application Form:
http://www.ci.minneapolis.mn.us/stormwater/docs/Stormwater_QualityChklstApp_Instruct.pdf

MN: Minneapolis

Incentive Type: Stormwater Fee Discount

Program Name: Stormwater Quantity Credit

Description: The Standard Quantity Reduction Credit is a 50% credit on a property's stormwater fee, based on a property's stormwater quantity management tools/practices being able to retain the 10-year, 24-hour type II SCS storm event to pre-developed conditions. To qualify for this credit, the property owner must demonstrate that all stormwater from the property is controlled with an on-site BMP. The Additional Quantity Reduction Credit is a 100% credit on a property's stormwater fee if the property's stormwater quantity management tools/practices can retain the 100-year, 24-hour type II SCS storm event to pre-developed conditions.

Beneficiary: Commercial

Reference(s): http://www.ci.minneapolis.mn.us/stormwater/fee/stormwaterQualityCredits.asp

Credit Application Form:
http://www.ci.minneapolis.mn.us/stormwater/docs/Stormwater_QualityChklstApp_Instruct.pdf

MN: New Brighton

Incentive Type: Stormwater Fee Discount

Program Name: Stormwater Utility Credits

Description: City allows property owners discounts on utility fee based upon the property's average runoff depth and how that depth compares to the mean depth for the property's class type. For every percentage point the property's runoff depth is below 20% of the average class type flow, the property owner gets a percentage point discount. Additional discounts are given if the property's peak outflow rate is less then predevelopment for the five and 100 year storms, if a property's wet pond meets Nationwide Urban Runoff Program (NURP) standards, or if a residential property owner installs and maintains a biorention/raingarden.

Beneficiary: Property owner in New Brighton, Minnesota.

Reference(s): City Code

http://www.ci.new-brighton.mn.us/index.asp?Type=B_BASIC&SEC={935DAF6C-8103-4A58-832F-26F917416992}&DE={0196EBC2-26B7-4AFA-8692-73F29EF10707}

MN: Saint Paul

Incentive Type: Stormwater Fee Discount

Program Name: Rate of Discharge Credit

Description: St. Paul provides a rate of discharge credit for nonresidential properties, which is based on parcel acreage and a standardized peak runoff rate determined for selected land-use classifications. Where the peak stormwater runoff rate from a parcel is limited by onsite facilities such as detention ponds owned and maintained by the property owner, a credit of up to 25% is available. A 10% credit is given for parcels that provide onsite storage for 5-year storms and also limit discharge to a maximum of 0.11 m3/ha/s (1.64 ft3/ac/s). An additional 15% credit is allowed for parcels that provide onsite storage for 100-year storms and limit discharge to a maximum of 0.11 m3/ha/s (1.64 ft3/ac/s). Both new developments and redevelopment projects may apply for the credit. Existing nonresidential properties can retrofit their systems to provide onsite storage for 5-year storms for a 10% credit. Most credits were provided in the first few years after the program was established. Currently, approximately three to four credits are approved annually. In St. Paul, the credit approach increased the political acceptability of the storm sewer system charge.

Beneficiary: Nonresidential properties

Reference(s): Source: Doll, A., and G. Lindsey. 1999. Credits Bring Economic Incentives for Onsite Stormwater Management. Watershed and Wet Weather Technical Bulletin, January 1999, Water Environment Federation. http://stormwaterfinance.urbancenter.iupui.edu/PDFs/LindseyDoll.pdf

MO: Kansas City

Incentive Type: Stormwater Fee Discount

Program Name: Stormwater Fee Ratio Credit

Description: Properties with a large amount of pervious area (e.g. grass, gravel), when compared to the amount of impervious area, may qualify. The Ratio Credit is a 50% credit that is granted to parcels where the ratio of the Total Parcel Area to

the Runoff Surface area is at least 30: 1. Property owners do not need to apply for this credit as it is automatically determined and applied by computer processes.

Beneficiary: Residential

Reference(s): http://www.kcmo.org/water.nsf/web/ordinances?opendocument

MO: Kansas City

Incentive Type: Stormwater Fee Discount

Program Name: Detention Basin Credit

Description: Properties served by a privately owned, and properly maintained, detention structure will be granted a stormwater fee credit. A 10% credit of the monthly stormwater fee is allowed if greater than 50% of the stormwater runoff from impervious surfaces is detained in the detention basin. 50% credit is the maximum allowable, only if 100% of stormwater runoff is detained in detention basin.

Beneficiary: Residential and Commercial

Reference(s): http://www.kcmo.org/water.nsf/web/ordinances?opendocument

NC: Charlotte

Incentive Type: Stormwater Fee Discount

Program Name: Storm Water Services Credit

Description: A credit toward reducing a ratepayer's storm water user fee. The storm water fee is proportional to the amount of impervious area on a given property. The credit is also developed to be proportional to the effective reduction in impervious area. The credit is allowed for all properties except single-family residential properties, except in extraordinary situations. Credit will only be allowed for properties that maintain their structural controls in fully functional condition and according to maintenance criteria and BMP standards. Credit will be allowed for previously constructed controls. A maximum of 100 percent of the user fee can be granted in credit with a maximum of 40% for peak reduction and 60% for volume reduction.

Beneficiary: Commercial and Some Residential

Reference(s): http://www.charmeck.org/Departments/StormWater/Storm+Water+Fee/Can+I+reduce+my+storm+water+fee%3f.htm

Fee Credit Manual: http://www.charmeck.org/NR/rdonlyres/ez47jvb2blxko5opj7tx2d5ok7wwdl45ydx7invbiiert5nzr3kqcgaf6v3knodp27k7fv54gyisgbajiszvxladiwd/FeeCreditManualJune2008.pdf

NC: Charlotte

Incentive Type: Stormwater Fee Discount

Program Name: Stormwater Credit Fee

Description: Charlotte provides one or more credits to commercial, industrial, institutional, and multifamily residential properties and homeowner associations that provide stormwater management measures. Eligibility for credits is proportional to the extent that the measures address the impacts of peak discharge, total runoff

volume, and annual pollutant loading from the site. Up to 100% credit is available as follows:

- Up to 50% credit for reducing peak discharge from a 10-year, 6-hour storm;
- Up to 25% credit for reducing total runoff volume from a 2-year, 6-hour storm; and
- Up to 25% credit for reducing annual pollutant loading.

Each credit is conditional on continued compliance with the Charlotte-Mecklenburg Land Development Standards Manual and may be rescinded for noncompliance with those standards.

Beneficiary: Commercial, industrial, institutional, multifamily residential

Reference(s): http://www.charmeck.org/Departments/StormWater/Storm+Water+Fee/Can+I+reduce+my+storm+water+fee%3f.htm

Fee Credit Manual: http://www.charmeck.org/NR/rdonlyres/ez47jvb2blxko5opj7tx2d5ok7wwdl45ydx7invbiiert5nzr3kqcgaf6v3knodp27k7fv54gyisgbajiszvxladiwd/FeeCreditManualJune2008.pdf

NC: Durham

Incentive Type: Stormwater Fee Discount

Program Name: Stormwater credit

Description: Durham provides up to a 25% pollution credit for selected structural stormwater controls on nonresidential properties. The city first offered credits for onsite retention basins based on the pool volume for retention. Later, the city offered credits for onsite extended detention and extended detention-retention basins based on drawdown time. Currently, the maximum pollution credit goes to standard basin designs that achieve maximum pollutant removal efficiency under North Carolina's performance standards. For other structural controls listed in the state's standards, the city's pollution credit is linearly variable, with a maximum 25% credit for a removal efficiency of 85% of total suspended solids. The city recently approved the use of sand filters in addition to approved onsite basin designs, but no pollution credits have been established yet for their use. Durham receives few applications for credits.

Beneficiary: Nonresidential properties

Reference(s): Source: Doll, A., and G. Lindsey. 1999. Credits Bring Economic Incentives for Onsite Stormwater Management. Watershed and Wet Weather Technical Bulletin, January 1999, Water Environment Federation. http://stormwaterfinance.urbancenter.iupui.edu/PDFs/LindseyDoll.pdf

NC: Raleigh

Incentive Type: Stormwater Fee Discount

Program Name: Stormwater Facility Credit

Description: A maximum 50% credit against stormwater fees for installing Stormwater Facilities exceeding City requirements specified in the Stormwater Ordinance. To qualify, customers must demonstrate that their existing Stormwater or New Stormwater Facility manages stormwater generated from their immediate property and/or upstream tributary areas.

Beneficiary: Commercial

Reference(s): http://www.raleighnc.gov/portal/server.pt/gateway/PTARGS_0_2_306_202_0_43/http%3B/pt03/DIG_Web_Content/category/Resident/Stormwater/Utility_Information/Cat-FAQ-20041129-154204-Stormwater_Fee_Credit.html

NC: Raleigh

Incentive Type: Stormwater Fee Discount

Program Name: NPDES Credit

Description: Customers holding National Pollution Discharge Elimination System (NPDES) MS4 permits are eligible for a Credit of an amount to be determined by the City on a case-by-case basis and not to exceed 15%. The Credit will be determined based on a comparison between the City's NPDES program and the Customer's NPDES program. Credit will be given for elements of the programs that are similar to those offered by the City.

Beneficiary: Commercial

Reference(s): http://www.raleighnc.gov/portal/server.pt/gateway/PTARGS_0_2_306_202_0_43/http%3B/pt03/DIG_Web_Content/category/Resident/Stormwater/Utility_Information/Cat-FAQ-20041129-154204-Stormwater_Fee_Credit.html

OH: Columbus

Incentive Type: Stormwater Fee Discount

Program Name: Stormwater Peak Flow Credit

Description: A reduction in a portion of stormwater service fees available by reducing the peak flow of runoff from your property through the use of stormwater detention or retention. The credit ranges from 20% to 80% of the stormwater fee.

Beneficiary: Commercial

Reference(s): Source: Metropolitan Sewer District of Greater Cincinnati, Hamilton County, Ohio, Cincinnati, Ohio, and their respective Legal Counsel. 2007. Green infrastructure program: A report evaluating the concept of a major storm water minimization program, utilizing green infrastructure and related methods. http://www.msdgc.org/wetweather/greenreport.htm.

OH: Columbus

Incentive Type: Stormwater Fee Discount

Program Name: Stormwater Maintenance Credit

Description: A reduction in a portion of stormwater service fees available by performing your own maintenance on the part of the public, open channel stormwater system that goes through your property. The credit is given on a dollar per linear foot per year basis of two channel types and cannot exceed 100% of the fee.

Beneficiary: Commercial

Reference(s): Source: Metropolitan Sewer District of Greater Cincinnati, Hamilton County, Ohio, Cincinnati, Ohio, and their respective Legal Counsel. 2007. Green infrastructure program: A report evaluating the concept of a major storm water minimization program, utilizing green infrastructure and related methods. http://www.msdgc.org/wetweather/greenreport.htm.

OK: Tulsa

Incentive Type: Stormwater Fee Discount

Program Name:

Description: Tulsa's stormwater drainage system service charge incorporates credits for private maintenance of approved onsite detention or retention facilities. The credit amount varies depending on what the estimated cost would be to the city to provide maintenance. The maximum credit is 60%, because approximately that percentage of Tulsa's stormwater utility budget goes to maintenance. To be approved, an onsite facility must provide at least 50% more detention than required by the city. If an onsite facility is found to be performing inadequately, the property owner must pay the typical stormwater drainage service charge.

Beneficiary:

Reference(s): http://www.cityoftulsa.org/media/17773/Title11A_000.pdf

OR: Portland

Incentive Type: Stormwater Fee Discount

Program Name: Clean River Rewards Incentive and Discount Program

Description: Provides financial incentives to property owners who manage stormwater on their site through a discount on their monthly stormwater utility charge. The Portland City Council instituted a two-part rate—35% of the charge for providing drainage services to the property and 65% of the charge to provide drainage services to the public right of way that served the property. Not only did the charge breakdown reinforce that street drainage is an issue the City must deal with, it also allowed a portion of the rate to be discounted for properties providing onsite stormwater management. So with 35% of the stormwater rate up for a potential discount, some properties could be encouraged to make retrofit changes. The CRID has a simplified discount program for residential properties based on volume control, and a more complex commercial property program that requires water quality and flow control for the full discount.

Beneficiary: Residential and Commercial

Reference(s): http://www.portlandonline.com/BES/index.cfm?c=41976

OR: Sandy

Incentive Type: Stormwater Fee Discount

Program Name: Credit Program

Description: Sandy's incentive program is intended to encourage property owners to utilize source control facilities on new development or redevelopment, or to make improvements to existing properties to mitigate stormwater discharges. Credits under the incentive program are given on the basis of Equivalent Residential Units (ERUs) mitigated. The maximum credit allowed is 1/3 (33%) of the total number of ERUs. Additional credits may be available for property owners that completely eliminate impervious surfaces on their property.

Beneficiary: Commercial, industrial, and multi-family properties

Reference(s): http://www.ci.sandy.or.us/index.asp?Type=B_BASIC&SEC={A9D3CDDE-3BA0-42DE-BE30-4E321A155AA8}

PA: Philadelphia

Incentive Type: Stormwater Fee Discount

Program Name: Stormwater Fee Reduction and Retrofit Assistance

Description: Yet to be adopted. A 50% discount would be offered for residents and businesses to decrease directly connected impervious areas using rain gardens, porous asphalt and sidewalks, swales, and green roofs.

Beneficiary: Residential and commercial properties

Reference(s): http://ddoe.dc.gov/ddoe/frames.asp?doc=/ddoe/lib/ddoe/stormwaterdiv/Phila._Water_Dep.pdf, see slide 64 of 75

SC: Beaufort County

Incentive Type: Stormwater Fee Discounts

Program Name: User Fee Credit Program

Description: The County provides six options for property owners to get credits towards reducing stormwater user fees – 1) The Integrated Non-Structural BMP Program Credit: A 10% credit adjustment may be applied if 6 of the 9 BMPs have been met on the site - Educational Program, On-Site Refuse Control Program, On-Site Stormwater System Maintenance and Cleaning Program, Paved Area Sweeping Program, Used Motor Oil Recycling Program, Sanitary Sewer/Storm Sewer Cross-Connection Inventory, Landscaping for Run-Off Rate Control and Water Quality, Storm Drain Stenciling Program, and Designated Vehicle Washing Area. 2) NPDES Industrial Stormwater Permit Credit: A 5% credit adjustment may be applied at a non-residential facility if that facility is covered by a NPDES industrial stormwater permit, is in compliance with all permit requirements and discharges wastewater which is 10% below all applicable effluent discharge limits. The sample results must be submitted to the County. 3) Other Non-Structural BMP Credit: A maximum of 5% credit may be given to nonresidential customers who implement a unique approach to improving water quality. 4) Education Credit: Schools can be given credit for providing education to students and employees in water quality awareness and protection. 5) Stormwater Quality Control Structural BMP Credit: Credit (up to 20%) can be given for the installation of approved BMPs to treat stormwater. 6) Stormwater Volume Control Credit: Credit may be given for the installation of approved BMPs or the preservation of vegetated open spaces to reduce stormwater volume at a site.

Beneficiary: Non-residential property owners and other privately owned stormwater facility operators in Beaufort County, South Carolina.

Reference(s): **Manual**

http://www.bcgov.net/Stormwater/documents/AdjustmentandCreditManaul9-5-07.pdf

TX: Austin

Incentive Type: Stormwater Fee Discount

Program Name: Reduced Drainage Charge

Description: Austin's Drainage Utility provides a 50% credit to commercial property owners that construct and maintain approved onsite detention facilities. The user of a non-residential benefited property with an on-site detention or water-quality pond

that receives storm water runoff from the property must register the pond to be entitled to request a reduced drainage charge. The city inspects these onsite facilities annually to ensure proper maintenance.

Beneficiary: Nonresidential property

Reference(s): http://www.amlegal.com/nxt/gateway.dll/Texas/austin/thecodeofthecityofaustin texas?f=templates$fn=default.htm$3.0$vid=amlegal: austin_tx$anc=

VA: Chesapeake

Incentive Type: Stormwater Fee Discount

Program Name: Stormwater Utility Credit

Description: Stormwater utility fee credits are available by providing water quality improvements and/or water quantity improvements (reduced peak discharge). In order to qualify for one or both of these credits, an application form must be submitted which shows compliance with this policy. The credit system consists of a two-part credit where each part allows for a 20% reduction in the stormwater utility fee for privately owned and operated systems. Any credits provided, water quality or water quantity, shall be reduced by half (50%) if a public facility is used to accomplish the reduction. This reduction in credit is necessary since the City must maintain the system. The 50% reduction applies only to the credit and not the total stormwater fee. The percentage of credit for both quantity and quality varies based on the contribution to the City's stormwater system as determined by the City's Drainage Engineer based on information contained in the application.

Beneficiary: Non-residential property owners, although multi-family residential properties are included

Reference(s): http://www.chesapeake.va.us/services/depart/pub-wrks/pdffiles/BMP-Credit-App.pdf

VA: Prince William County

Incentive Type: Stormwater Fee Discounts

Program Name: Partners for Water Quality

Description: The County's Department of Public Works presents quarterly stormwater management educational sessions and by enrolling annually in the program, businesses and non-profits can earn a 10 percent rebate on their previous year's storm water management bill. Businesses and non-profits can earn an additional 10% for providing proof of implementation of a Great 'Scapes Nutrient Management Plan from Virginia Cooperative Extension and conduct parking lot or common area clean-up once a year. Another 10% can be deducted for conducting a site clean-up in cooperation with agencies such as Prince William Soil and Water Conservation District (Adopt-a-Stream), Clean Community Council (Adopt-a-Spot), or other pre-approved site clean-ups in the community.

Beneficiary: Businesses or non-profits in Prince William County, Virginia.

Reference(s): http://www.pwcgov.org/default.aspx?topic=020008001920001183

WA: Bellevue

Incentive Type: Stormwater Fee Discount

Program Name:

Description: Bellevue's Storm and Surface Water Utility's rate structure classifies each property according to its percentage of developed land. A reduction of one development classification is given for installation and maintenance of approved onsite detention facilities. The approach has worked well to get approved detention facilities built on large residential and commercial plats.

Beneficiary:

Reference(s): Source: Doll, A., and G. Lindsey. 1999. Credits Bring Economic Incentives for Onsite Stormwater Management. Watershed and Wet Weather Technical Bulletin, January 1999, Water Environment Federation. http://stormwaterfinance.urbancenter.iupui.edu/PDFs/LindseyDoll.pdf

WA: King County

Incentive Type: Stormwater Fee Discount

Program Name: Stormwater Facility Discount

Description: Surface Water Mgmt. fee reduction to one rate category lower for operating one or more stormwater flow control or water quality treatment facilities approved to be functioning properly within County standards. Facility inspection occurs annually by engineers. Residential parcels meeting this condition will receive a discount equal to half the residential fee, or $51.00. Both residential and commercial properties are eligible. Discount may not be combined with other runoff mitigation discounts.

Beneficiary: Residential / Commercial

Reference(s): http://www.kingcounty.gov/environment/wlr/surface-water-mgt-fee/discount.aspx

WA: King County

Incentive Type: Stormwater Fee Discount

Program Name: Sixty-Five-Ten Discount

Description: Discount on fee assessment if your property is at least 65% forested, has no more than 10% effective impervious area and BMP for dispersing and infiltrating runoff are being met. Other conditions may apply and at least one site visit will be required for approval, but qualification for this discount would lower your assessment by one-rate category. Residential parcels meeting this condition will receive a discount equal to half the residential fee, or $51.00. Both residential and commercial properties are eligible. This discount may not be combined with other runoff mitigation discounts

Beneficiary: Residential / Commercial

Reference(s): http://www.kingcounty.gov/environment/wlr/surface-water-mgt-fee/discount.aspx

WA: King County

Incentive Type: Stormwater Fee Discount

Program Name: Pervious Surface Absorption Discount

Description: 25% discount on fee assessment if implement county-approved flow control BMPs and at least 10% of the impervious surface is served by these practices. Not eligible for discount if already receive another runoff mitigation discount. Only commercial properties are eligible.

Beneficiary: Commercial

Reference(s): http://www.kingcounty.gov/environment/wlr/surface-water-mgt-fee/discount.aspx

WA: Marysville

Incentive Type: Stormwater Fee Discount

Program Name: Surface Water Utility Reductions

Description: The surface water utility rate can be reduced by a minimum of 10 percent for any new or remodeled commercial building that uses a permissive rainwater harvesting system properly sized to use the available roof surface of the building. Rate reductions in excess of 10 percent will be considered dependent upon the amount of rainwater harvested divided by the mean annual runoff volume generated by the total impervious surface area at the parcel. Additionally, properties using low impact development techniques as recommended in the Marysville Municipal Code may be eligible for a reduction in their surface water utility rate.

Beneficiary: Commercial properties

Reference(s): Chapter 14.19.080 of http://www.codepublishing.com/wa/marysville/

WA: Seattle

Incentive Type: Stormwater Fee Discount

Program Name: Rainwise Incentive Program

Description: The City of Seattle is currently working on an incentive program called Rainwise, which would offer drainage rate reductions for owners who use sustainable stormwater management techniques. While this program is not yet implemented, developers who are putting in infrastructure now can benefit from the rate reductions in the future.

Beneficiary: Property owners

Reference(s): http://www.seattle.gov/dpd/cms/groups/pan/@pan/@plan/@proj/documents/Web_Informational/cos_005050.pdf

Development Incentives

FL: Sarasota County

Incentive Type: Development Incentives

Program Name: Green Building and Green Development Program

Description: Green buildings or green developments shall qualify for expedited permitting and priority inspections. Green buildings and developments shall be defined and certified as appropriate by the U.S. Green Building Council (i.e. Leadership in Energy and Environmental Design (LEED) certification) or the Florida Green Building Coalition. The County discontinued the permit fee rebate previously offered to these projects as well on December 28, 2007.

Beneficiary: Qualified developer in Sarasota County.

Reference(s): https://building.scgov.net/OSG/Sarasota/Green%20Building/GreenBuilding.htm

IL: Chicago

Incentive Type: Development Incentives

Program Name: Green Permit Program

Description: Chicago's Department of Construction and Permits (DCAP) has created an incentive that encourages inclusion of environmentally conscious design elements by promising developers savings of both time and money. Architects, developers and building owners can be part of an expedited permit process by adding elements of green building strategies and technologies from a menu of items created by DCAP. Projects admitted into the Green Permit Program can receive permits in less than 30 business days as opposed to the 60 to 90 that are normally allotted for permit issuance. Participants that display a particularly high level of green strategy can possibly have consultant code review fees waived as well. A team of green building design experts compiled by the city help applicants navigate the permit process to ensure timely implementation of these technologies.

Beneficiary: Architects, developers, and building owners

Reference(s): http://www.chicagocodes.com/display_news.cfm?news_id=252

IL: Chicago

Incentive Type: Development Incentives

Program Name: Zoning Bonus Ordinance

Description: The Chicago Department of Zoning states, "A floor area premium shall be granted for a roof that is covered with plants that reduce the 'urban heat island' effect and storm-water runoff of buildings in the central business district. To qualify for a floor area premium, a minimum of 50 % of the roof area at the level of the green roof or a minimum of 2000 square feet (whichever is greater) shall be covered by vegetation and shall meet..." certain standards.

Beneficiary: High-density districts in the downtown area

Reference(s): Source: http://www.greenroofs.com/Greenroofs101/industry_support.htm

NY: New York

Incentive Type: Development Incentive

Program Name: Green Roof Tax Abatement

Description: Building owners in New York City can apply for a one-time tax credit of up to $100,000 for the installation of a green roof. The green roof must be on at least 50% of available rooftop space. The credit would be equal to $4.50 per square foot of roof area that is planted with vegetation. It is a state program for New York City residents only and is administered by the city. The program sunsets in 2013 unless extended by the state legislature. The program will begin accepting applications on January 1, 2009.

Beneficiary: Building owners in New York City, New York.

Reference(s): Not yet available.

PA: Philadelphia

Incentive Type: Development Incentives

Program Name: Green Roofs Tax Credit

Description: Business owners may receive a credit for a green roof covering at least fifty percent (50%) of the building's rooftop or seventy-five percent (75%) of eligible roof top space. They may claim a tax credit of twenty-five percent (25%) of all costs actually incurred to construct the green roof, provided that total tax credits for a green roof do not exceed $100,000. The tax credit is applied against the applicant's total business privilege tax liability for the Tax Year during which the applicant certifies completion of the green roof, provided that any unused credits may be carried forward until fully used.

Beneficiary: Commercial businesses

Reference(s): http://webapps.phila.gov/council/attachments/3533.pdf

OR: Portland

Incentive Type: Development Incentives

Program Name: Floor Area Ratio Bonus

Description: Projects that install ecoroofs in the Central City Plan District are eligible for a floor area ratio bonus, which increases the building's allowable area, and can use ecoroofs to conform to the Central City Design Guidelines. Buildings can receive bonus FAR based on three ranges of ecoroof coverage in relation to the building's footprint: 10-30%, 30-60% and 60% or greater earns one, two and three square feet of additional floor area per square foot of ecoroof respectively.

Beneficiary: Commercial buildings in the Central City area of Portland.

Reference(s): http://www.portlandonline.com/osd/index.cfm?a=114728&c=42113

http://www.portlandonline.com/shared/cfm/image.cfm?id=53363, see 510-28

TN: Knox County

Incentive Type: Development Incentives

Program Name: Stream and Vegetated Buffers Credit

Description: Credit may be granted when stormwater runoff is effectively treated by a stream buffer or other vegetated buffer. Effective treatment constitutes treating runoff as overland sheet flow through an appropriately vegetated and forested buffer.

Beneficiary: Developer

Reference(s): http://www.knoxcounty.org/stormwater/pdfs/vol2/5-2%20Water%20Quality%20Volume%20Credits.pdf

TN: Knox County

Incentive Type: Development Incentives

Program Name: Use of Vegetated Channels

Description: This credit may be granted when vegetated (grass) channels are used for water quality treatment. Site designers will be able to subtract the areas draining to a grass channel and the channel area itself from the total site area when computing water quality volume requirements.

Beneficiary: Developer

Reference(s): http://www.knoxcounty.org/stormwater/pdfs/vol2/5-2%20Water%20Quality%20Volume%20Credits.pdf

TN: Knox County

Incentive Type: Development Incentives

Program Name: Impervious Area Disconnection

Description: This credit may be granted when impervious areas are disconnected from the stormwater control system via overland flow filtration/infiltration (i.e., pervious) zones. These pervious areas are incorporated into the site design to receive runoff from rooftops or other small impervious areas. If impervious areas are adequately disconnected in accordance with the criteria listed below, they can be deducted from the total site area when computing the water quality volume requirements.

Beneficiary: Developer

Reference(s): http://www.knoxcounty.org/stormwater/pdfs/vol2/5-2%20Water%20Quality%20Volume%20Credits.pdf

TN: Knox County

Incentive Type: Development Incentives

Program Name: Water Quality Volume Credits (General term for all specific credits)

Description: Allows for a reduction in the water quality treatment volume (WQv). The credit system directly translates into cost savings to the developer by reducing the size of structural stormwater control and conveyance facilities. If a developer incorporates one or more of the credited practices in the design of the site, the requirement for capture and treatment of the WQv will be reduced. Site designers are encouraged to utilize as many credits as they can on a site. Greater reductions in stormwater storage volumes can be achieved when many credits are combined (e.g., disconnecting rooftops and protecting natural conservation areas).

Beneficiary: Developer

Reference(s): http://www.knoxcounty.org/stormwater/pdfs/vol2/5-2%20Water%20Quality%20Volume%20Credits.pdf

WA: Seattle

Incentive Type: Development Incentives

Program Name: Density Bonus Incentive

Description: The Density Bonus incentive offers downtown commercial, residential and mixed-use developments greater height and/or floor area if a green building standard of LEED Silver or higher is met.

Beneficiary: Commercial

Reference(s): http://www.seattle.gov/dpd/GreenBuilding/OurProgram/PublicPolicyInitiatives/DevelopmentIncentives/

Grants

CA: Santa Monica

Incentive Type: Grants

Program Name: Sustainable Landscape Grant Program

Description: Grants are awarded for up to 50% of the cost of the project, not to exceed $5,000, including a maximum of $3,500 for qualified irrigation equipment and a

maximum of $1,500 for climate-appropriate plants defined as very low, low, and medium water use plants. No turf or high water using plants or invasive plants will be funded. In addition to the $5,000, applicants may also apply for rebates for specific irrigation equipment including weather-based irrigation controllers, rotary nozzles for sprinklers and synthetic turf. The grant is a reimbursement grant, paid upon completion of the approved project. Invoices to substantiate costs will be required for all reimbursements. This grant is a first come, first served program available until funds run out. Projects in the parkway will receive priority funding. Projects must be completed within 180 days of grant award to receive funding. Partial funding for incomplete projects will not be permitted.

Beneficiary: Individuals, property owners, businesses, non-governmental organizations and public agencies who are water customers in Santa Monica; new construction and major remodel projects are not eligible.

Reference(s): http://www.smgov.net/epd/residents/Water/Landscape_Grant.htm

IL: Chicago

Incentive Type: Grants

Program Name: Green Roof Improvement Fund

Description: A one year pilot redevelopment program to provide financial assistance for the installation of Green Roofs on certain eligible commercial facilities. Eligible Applicants can receive a grant for up to 50% of Eligible Costs, with a maximum assistance of $100,000 per project and per applicant. All grants shall be in the form of reimbursement funding to be awarded only after the Green Roof is installed and all other requirements for funding are met.

Beneficiary: Commercial

Reference(s): http://egov.cityofchicago.org/city/webportal/portalContentItemAction.do?contentOID=536943451andcontenTypeName=COC_EDITORIALandtopChannelName=DeptandchannelId=0andprogramId=0andentityName=Planning+And+DevelopmentanddeptMainCategoryOID=-536884767

OR: Portland

Incentive Type: Grants

Program Name: Ecoroof Grant Program

Description: The City of Portland offers grants as incentives to property owners and developers to add more ecoroofs. The incentive program is part of Portland's Grey to Green initiative to increase sustainable stormwater management practices, control non-native, invasive plants, and protect sensitive natural areas. The grants fund up to $5 per square foot of an ecoroof project. Installation costs for ecoroofs in Portland range from $5 to $20 per square foot.

Beneficiary: Property owners and developers

Reference(s): http://www.portlandonline.com/bes/index.cfm?c=48724

OR: Portland

Incentive Type: Grants

Program Name: Community Watershed Stewardship Grants

Description: Watershed stewardship grants provide up to $10,000 to schools, churches, businesses and other community organizations for projects that protect and enhance watershed health at the local level. Groups can use grant money for supplies, materials, equipment, room rentals, feasibility studies or technical assistance. Past projects include education and monitoring, ecoroofs, stormwater features, restoration, and naturescaping.

Beneficiary: Community organizations

Reference(s): http://www.portlandonline.com/BES/index.cfm?c=43077

OR: Portland

Incentive Type: Grants

Program Name: Willamette Stormwater Control Program

Description: Provides technical and financial assistance for a limited number of pilot projects that control stormwater runoff. Funded 15 demonstration projects to retrofit existing sites in targeted areas. Up to $30,000 was available for design and construction for projects that were part of an existing development, located in the city's combined sewer target area, and removed runoff from at least 10,000 ft^2 of paved or roof area.

Beneficiary: Commercial

Reference(s): http://www.nrdc.org/water/pollution/storm/chap12.asp

U.S. Virgin Islands

Incentive Type: Grants

Program Name: Non-Point Source Pollution Conservation Schools

Description: Through the program, "Youth Putting a LID On Non-Point Source Pollution," schools are encouraged to manage resources on their school grounds and surrounding areas, in ways that will help mitigate Non-Point Source Pollution through Low Impact Development. The objective of the program is to increase the level of environmental awareness among public schools and the community at large. Grants may be awarded to schools willing to participate in the program. Awards of $1,000 to $4,000 will be available to schools or individual classes. Schools that participate will be considered as a "NPS Pollution Conservation School."

Beneficiary: Schools

Reference(s): http://www.dpnr.gov.vi/dep/pubs/2005_9_18_nps_schools.htm

WA: King County

Incentive Type: Grants

Program Name: Impervious Surface Cost Share and Credit Program

Description: As an incentive to reduce impervious surface, the county is making funds available for sharing the costs of converting impervious surface to (1) native-vegetated landscape, (2) compost-amended lawn or (3) grassed, modular-grid pavement. To qualify, a plot plan, technical information and description must be submitted to county engineers who will work with the customer to develop the plan. 50% of costs up to $20K will be reimbursed after the job is complete and

inspected. Reducing impervious surface could potentially place the property into a lower rate category, reducing the surface water fee.

Beneficiary: Commercial

Reference(s): http://dnr.metrokc.gov/wlr/surface-water-mgt-fee/swm-discount.htm

WA: King County

Incentive Type: Grants

Program Name: King County Green Building Grants

Description: The King County LEED Grants Program provides funding to projects built in King County, outside of the City of Seattle, that meet stringent criteria for resource conservation, and help educate the public about the importance of green building. Public, private, and not-for-profit organizations seeking LEED certification for building projects are eligible and encouraged to apply. Grant awards range from $20,000 to $30,000 depending on performance level achieved.

Beneficiary: Commercial

Reference(s): http://your.kingcounty.gov/solidwaste/greenbuilding/incentives/commercial.asp

WA: Seattle

Incentive Type: Grants

Program Name: Aquatic Habitat Matching Grant

Description: Seattle Public Utilities provides matching grants for individuals or groups to help improve Seattle's aquatic habitat along creeks and shorelines. Award amounts begin at $2,000 per project, with $300,000 in total awards available. Projects require a one-to-one match. Projects considered are those that improve, preserve, and/or restore aquatic habitat and/or ecological diversity and enhancement; address water flow and/or quality; or improve/prevent impacts from the City's drainage system.

Beneficiary: Individuals or groups

Reference(s): http://www.seattle.gov/util/Services/Drainage_&_Sewer/Get_Involved/Aquatic_Habitat_Grants/index.asp

WA: Seattle

Incentive Type: Grants

Program Name: Environmental Grants (Neighborhood Improvement Grants, etc)

Description: The Watershed Climate Action Grant will provide volunteer groups one to three weeks of support by EarthCorps, a service organization that engages young adults in restoring key ecological sites around Puget Sound. They will provide tailored support to your volunteer group that could include removing invasive plants, providing plants and mulch, and planting and caring for new trees.

Beneficiary: Volunteer groups

Reference(s): http://www.seattle.gov/util/Services/Drainage_&_Sewer/Get_Involved/Environmental_Grants/index.asp

Rebate/Installation Financing

CA: Santa Monica

Incentive Type: Rebate/Installation Financing

Program Name: Rain Gutter Downspout Redirect Rebate, Rain Barrel Rebate, Cistern Rebate

Description: 1. Rain Gutter Downspout Redirect Rebate (rainwater percolation): Up to $40 per qualified rain gutter downspout (up to and including all downspouts on one's property), includes labor and materials. Rebates are available for the cost of redirecting rain gutter downspouts to permeable surfaces, such as landscaped areas.

2. Rain Barrel Rebate (rainwater storage): Rebates up to $100 per barrel (limited to 125 gallon maximum capacity), includes design, labor and materials.

3. Cistern Rebate (rainwater storage): Up to $500 per cistern (limited to cisterns over 500 gallons each), includes design, labor and materials.

Beneficiary: Any property owner (resident, institution or business) in the City of Santa Monica and any tenant of said property with the permission of the owner.

Reference(s): http://www.smgov.net/epd/residents/Urban_Runoff/rain_harvest_rebates.htm

CA: Palo Alto

Incentive Type: Rebate/Installation Financing

Program Name: City of Palo Alto Innovative Stormwater Measures Rebate Program

Description: 1. Rain Barrel Rebate: $50 rebate for purchase and installation of a rain barrel to collect and harvest rainwater runoff from rooftops.

2. Permeable Pavement Rebate: Rebate of $1.50 per square foot for installation of permeable pavement (porous asphalt concrete, pervious Portland cement concrete, or permeable interlocking concrete pavers) to reduce storm water runoff from driveways, walkways, patios, and parking lots.

3. Cistern Rebate: Rebate of 15 cents per gallon for purchase and installation of a cistern to collect and harvest rainwater runoff from rooftops and site runoff

4. Green Roof Rebate: Rebate of $1.50 per square foot for the installation of a green (vegetated) roof to minimize storm runoff from rooftops.

Rebates are limited to a maximum of $1,000 per single-family residential property and $10,000 for commercial/industrial and multi-family residential properties.

Beneficiary: Residential, commercial, or governmental property owner in the City of Palo Alto, California.

Reference(s): http://www.cityofpaloalto.org/stormwater

DC: Washington

Incentive Type: Rebate/Installation Financing

Program Name: River Smart Homes

Description: This program offers incentives to homeowners interested in reducing stormwater pollution from their properties. Homeowners receive up to $1,200 to adopt one or

more landscape enhancements, including shade trees, above-ground cisterns/rain barrels, permeable/porous pavers, rain gardens, and BayScaping.

Beneficiary: Residential properties

Reference(s): http://ddoe.dc.gov/ddoe/cwp/view,a,1209,q,497794.asp

FL: Maitland

Incentive Type: Rebate/Installation Financing

Program Name: City of Maitland Incentive Programs

Description: The City has three stormwater/water quality incentive programs. Through the Shoreline Revegatation Program, the City will reimburse qualified residents up to 50% of the cost to purchase and install aquatic plants along their property shoreline. A maximum one-time reimbursement of $200 is being offered. The Wetland Tree Planting Program provides lakefrond homeowners up to three, 8-10 foot tall, bald cypress trees at a cost of only $25 per tree. A City representative works with the homeowner to establish the ideal location for the trees to ensure that the trees will benefit the lake and the shoreline. Finally the City has an Environmental Swale Program which pays for 20% of the cost to grade and sod a swale, or $500 per property whichever is less. A City representative helps establish the best location for the swale to ensure that the lakes/canals have maximum water quality benefit.

Beneficiary: Property owner in Maitland, Florida

Reference(s): http://www.ci.maitland.fl.us/pubworks_lakesFaq.asp

IL: Chicago

Incentive Type: Rebate/Installation Financing

Program Name: Green Roof Grants

Description: Residential and small commercial building owners can qualify for $5,000 for a green roof project.

Beneficiary: Residential and commercial properties

Reference(s): http://www.cityofchicago.org/city/webportal/portalContentItemAction.do?BV_SessionID=@@@@1021838484.1229132155@@@@&BV_EngineID=ccccadefmdlgmfecefecelldffhdfif.0&contentOID=536932287&contenTypeName=COC_EDITORIAL&topChannelName=Dept&blockName=Environment%2FGreen+Roof+%26+Cool+Roof+Grants+Programs%2FI+Want+To&context=dept&channelId=0&programId=0&entityName=Environment&deptMainCategoryOID=-536887205

IL: Chicago

Incentive Type: Rebate/Installation Financing

Program Name: Roll Out the Barrel Events

Description: Events held where rain barrels sold at discounted prices ($15 - $20) to residents. Barrels were built by the City's ex-offender job training program by retrofitting recycled 55-gallon plastic barrels. City provided information on installing and maintaining rain barrels, as well as information on stormwater management and water conservation. Pilot program cost ~$40K excluding city labor.

Beneficiary: Residential

Reference(s): http://www.cityofchicago.org/city/webportal/portalContentItemAction.do?blockName=Conserve+Chicago+Together%2f2004%2fI+Want+ToanddeptMainCategoryOID=-536890176andchannelId=0andprogramId=0andentityName=Conserve+Chicago+TogetherandtopChannelName=SubAgencyandcontentOID=536913711andFailed_Reason=Invalid+timestamp,+engine+has+been+restartedandcontenTypeName=COC_EDITORIALandcom.broadvision.session.new=YesandFailed_Page=%2fwebportal%2fportalContentItemAction.doandcontext=dept

IL: Rock Island

Incentive Type: Rebate/Installation Financing

Program Name: Rain Gardens for Rock Island

Description: City reimburses residents $4/square foot of rain garden space and if a rain is incorporated into the design the City will supply one for free. The City must approve the design prior to installation and inspect the rain garden upon completion prior to paying the incentive payment.

Beneficiary: Residential property owner in Rock Island, Illinois.

Reference(s): http://www.rigov.org/citydepartments/publicworks/raingarden.html

MD: Montgomery County

Incentive Type: Rebate/Installation Financing

Program Name: RainScapes Rewards

Description: Up to $1,200 is offered per single-family lot or up to $5,000 per multi-family or commercial lot for installation of rain gardens, cisterns green roofs, native plants, shade trees and permeable pavement.

Beneficiary: Residential and commercial properties

Reference(s): http://www.stormwaterpartners.org/PDF/RainScapesRewardsApplication.pdf

MN: Burnsville

Incentive Type: Rebate/Installation Financing

Program Name: Rain Garden Retrofit Project

Description: $150K project to target homeowners in a specific neighborhood near Crystal Lake in an effort to compel residents to build rain gardens in their yards to reduce stormwater runoff. An architect met w/ residents free of charge to design the gardens and residents helped to build them. The city installed 6-ft. curb cuts w/ 2-ft. tapering sections on either side to direct stormwater off the streets and into the gardens. The project reduced runoff by 90% compared to neighboring control area. Homeowners maintain gardens w/ city assistance if needed.

Beneficiary: Residential

Reference(s): Source: Metropolitan Sewer District of Greater Cincinnati, Hamilton County, Ohio, Cincinnati, Ohio, and their respective Legal Counsel. 2007. Green infrastructure program: A report evaluating the concept of a major storm water minimization program, utilizing green infrastructure and related methods. http://www.msdgc.org/wetweather/greenreport.htm.

MN: Maplewood

Incentive Type: Rebate/Installation Financing

Program Name: Street Redesign and Reconstruction

Description: As part of large-scale redesign of existing streets and utilities, the City offered to construct standard-size rain gardens in the public boulevard right-of-way on the front edge of residential properties. These gardens handle drainage from yards, rooftops, driveways and some runoff from the street. Residents volunteer to have the garden built by the City and are responsible for planting the provided plants and maintaining the gardens with free technical assistance from the City.

Beneficiary: Residential

Reference(s): http://www.ci.maplewood.mn.us/DocumentView.asp?DID=246

RESOLVE. 2007. Public Funding Incentives for Private Residential and Commercial Watershed Protection Projects: Report on Key Case Studies and Community Workshop. http://www.resolv.org/rainscapesworkshop/Report.pdf.

MN: Minneapolis

Incentive Type: Rebate/Installation Financing

Program Name: Rain Barrel Discount Program

Description: 2,000 rain barrels made available to Minneapolis households at a reduced cost ($45). Barrels made available thanks to a $100,000 grant from the EPA's Region 5 Great Cities Program and in partnership w/ Minnesota/Metro Blooms and the Green Institute.

Beneficiary: Residential

Reference(s): Source: Metropolitan Sewer District of Greater Cincinnati, Hamilton County, Ohio, Cincinnati, Ohio, and their respective Legal Counsel. 2007. Green infrastructure program: A report evaluating the concept of a major storm water minimization program, utilizing green infrastructure and related methods. http://www.msdgc.org/wetweather/greenreport.htm.

MN: Minneapolis

Incentive Type: Rebate/Installation Financing

Program Name: Ramsey-Washington Metro Watershed's BMP Cost Share Program

Description: The Ramsey-Washington Metro Watershed District (RWMWD) BMP Cost Share Program offers financial assistance to efforts that protect and improve water and natural resources within the watershed. BMP Cost Share assistance may be used by public or private landowners implementing programs and projects that (1) Promote actions that prevent flooding or lessens the effect of drought; (2) Improve water quality or increases the capacity of the watershed to store water; (3) Preserve, protect, and restore native plant and wildlife communities, especially lakes, rivers and wetlands; (4) Protect and preserves groundwater quality and quantity; and/or (5) Treat the natural environment as intrinsically valuable in land use decisions.

The RWMWD has allocated $250,000 for the BMP Cost Share program and projects for 2009. The RWMWD will provide applications year round until funds are depleted for the year. The minimum grant amount available is $100.00. The

maximum grant amount is residential: $2,000.00, commercial and government: $30,000.00. Funds are a reimbursement of 50% match for materials and labor. The funds must be used within one year of receiving grant approval.

Beneficiary: Residential, commercial, and government properties

Reference(s): http://www.rwmwd.org/index.asp?Type=B_BASIC&SEC={E5745966-78DF-4558-8C39-431D6D450673}&DE=

OH: Cincinnati

Incentive Type: Rebate/Installation Financing

Program Name: Mt. Airy Rain Catchers

Description: Reverse auction to encourage the installation of rain barrels and rain gardens. Bids were received from qualified residents which outlined what rain catcher projects they agreed to have installed and the incentive payment they requested to do so. The bids were selected based upon the project(s) they agreed to install, their scoring within an Environment Benefit Index and the amount of the incentive payment requested. The selected project(s) were installed for free and the residents were paid the bid amount as a one-time incentive payment. The first round of the reverse auction in 2007 resulted in 50 rain gardens and 100 rain barrels installed at 67 of the approximately 350 residential properties in the watershed. In 2008, the auction was repeated and an additional 35 rain gardens and 74 rain barrels were installed.

Beneficiary: Residential property owner in the Shepherd Creek watershed.

Reference(s): http://www.epa.gov/nrmrl/pubs/600r08129/600r08129.htm

OR: Portland

Incentive Type: Rebate/Installation Financing

Program Name: Downspout Disconnection Program

Description: Targets property owners to disconnect roof downspouts onto lawns and flowerbeds, or use onsite stormwater mgmt. facilities such as drywells and soakage trenches. The City's Plumbing division works directly with homeowners to disconnect downspouts without the homeowner having to get a plumbing permit. A target area of CSO basins is selected and Disconnection Program staff go to work, door-to-door canvassing to get voluntary agreement from property owners to complete the disconnection. Owners then complete the disconnection themselves and receive a $53 per downspout incentive, or have the City complete the disconnection for them free of charge. The program is funded primarily by a mixture of capital and operating funds due to this ability to remove enough stormwater from the CSO system, that collection pipes may be able to be downsized providing significant pipe construction cost savings.

Beneficiary: Residential

Reference(s): http://www.portlandonline.com/bes/index.cfm?c=43081

TX: Austin

Incentive Type: Rebate/Installation Financing

Program Name: Rain Barrel Sales Program

Description: City of Austin water customers may purchase rain barrels from Austin Water Conservation at a discounted price of $61 per barrel.

Beneficiary: Residential

Reference(s): http://www.ci.austin.tx.us/watercon/rbsales.htm

TX: Austin

Incentive Type: Rebate/Installation Financing

Program Name: Rainwater Harvesting Rebates

Description: The City offers a rebate of up to $500 on the cost of installing a larger capacity rainwater harvesting system (over 300 gallons). Rainwater harvesting systems must collect a minimum of 300 gallons. Life expectancy of the system should be a minimum of 20 years. Applicants must agree to open the site to the public if so requested.

Beneficiary: Applicants must receive 100% of their water from the Austin Water Utility or qualifying municipal utility.

Reference(s): Contact: Department of Water Quality at (512) 974-2550 or visit http://www.ci.austin.tx.us/watercon/rwrebates.htm

WA: Seattle

Incentive Type: Rebate/Installation Financing

Program Name: Seattle Rain Barrels

Description: The Seattle Conservation Corps (SSC), a work-training program for homeless adults, and Seattle Public Utilities (SPU) partner to offer SPU customers discounted rain barrels. SSC piloted the program in 2003, selling 1,500 barrels in just a few hours. The Corps subsequently formed a partnership with SPU to establish an ongoing program, which SPU advertises on its Website. The Corps assembles the rain barrels out of shipping containers (usually for olives or peppers from the Mediterranean) sent to them from packing plants around the U.S. and handles all sales. SPU and SCC handle marketing jointly. The current program offers homeowners in SPU's direct service area the opportunity to buy rain barrels at a cost of $59, about $20 less than barrels of comparable quality sold elsewhere. SCC sells the rain barrels for $69, but SPU customers pay $59 and SPU pays $10 as a subsidy for their customers, to encourage participation by keeping customer costs low. Residents call the SCC to order a barrel and either pick up the barrel(s) at a central location, or can have barrels delivered for an additional fee of $15 for the first barrel, and $5 for each additional barrel. SPU offers discounts on barrel purchases and delivery to low-income families. There is no limit on barrel purchases. The program sold approximately 5,000 barrels in 2005, and about 1,500 in 2006.

Beneficiary: Residents

Reference(s): http://www.seattle.gov/util/Services/Yard/Natural_Lawn_&_Garden_Care/BuyCompostBinsRainBarrels/index.htm

Awards/Recognition

IL: Chicago

Incentive Type: Awards and Recognition Programs

Program Name: Mayor Daley's GreenWorks Awards

Description: Mayor Daley's GreenWorks Awards promote a green city by recognizing businesses, non-profits, schools and government agencies whose buildings, practices, and products or services are environmentally responsible. The GreenWorks Awards are presented annually.

Beneficiary: Projects/buildings must be located in the city of Chicago. The award program is open to businesses, non-profits, schools, and government agencies.

Reference(s): http://www.cityofchicago.org/city/webportal/portalDeptCategoryAction.do?BV_SessionID=@@@@1791384520.1225235751@@@@&BV_EngineID=cccdadefieleijdcefecelldffhdfhk.0&deptCategoryOID=-536895154&contentType=COC_EDITORIAL&topChannelName=Dept&entityName=Environment&deptMainCategoryOID=-536887204

OR: Portland

Incentive Type: Awards and Recognition Programs

Program Name: Businesses for an Environmentally Sustainable Tomorrow (BEST)

Description: Since 1993, the BEST Awards have been presented annually to Portland area companies demonstrating excellence in business practices that promote economic growth and environmental benefits. The BEST Awards recognize businesses with significant and unique achievements in the following categories: (1) BEST Practices for Sustainability for Small, Medium and Large companies, (2) Sustainable Products or Services, (3) Innovations in Resource Conservation, (4) Green Building, and (4) Sustainable Food Systems.

Beneficiary: Local businesses

Reference(s): http://www.portlandonline.com/OSD/index.cfm?c=41891

OR: Portland

Incentive Type: Awards/Recognition

Program Name: Eco-logical Business Program

Description: A certification and recognition program to highlight environmentally friendly businesses. After a certification visit, participating shops receive a shop display package, press coverage, listing on the program web site, and promotion on the radio and at public events.

Beneficiary: Commercial

Reference(s): http://www.ecobiz.org/

PA: Philadelphia

Incentive Type: Awards and Recognition Programs

Program Name: Philadelphia Sustainability Awards

Description: Projects are granted recognition awards for sustainability in a variety of categories, including water efficiency/conservation, pollution prevention,

landscaping/greening, habitat protection, best management practices, stormwater management, and green building elements, among many others.

Beneficiary: Businesses, non-profits, community organizations, individuals, schools and government agencies in the Greater Philadelphia region

Reference(s): http://www.philadelphiasustainabilityawards.org/

PA: Philadelphia

Incentive Type: Awards and Recognition Programs

Program Name: Stormwater BMP Recognition Program

Description: The BMP Recognition Program recognizes innovative stormwater Best Management Practices (BMPs) in the southeastern region of Pennsylvania. The program is looking for projects such as rain gardens, green roofs, infiltration swales, and treatment wetlands. Those who are recognized will receive a certificate and/or award from top officials of the Department of Environmental Protection (DEP) and the City of Philadelphia; recognition at an awards ceremony; and region-wide media exposure, such as in partner newsletters and the PWD newsletter, which reaches over half a million households and businesses in the region, in addition to acknowledgment on the PWD website.

Beneficiary: Landscape architects, engineers, developers, university students, neighborhood residents and others

Reference(s): http://www.stormwaterbmp.org/stormwaterbmp/

WA: King County

Incentive Type: Awards/Recognition

Program Name: Businesses for Clean Water

Description: The Businesses for Clean Water program recognizes companies that successfully prevent storm water pollution at their sites.

Beneficiary: Commercial

Reference(s): http://www.envirostars.com/news/articles/detail.cfm?Article=3andCategory=4andList=30,16,26,25,9,3

WA: King County

Incentive Type: Awards and Recognition Programs

Program Name: Greening In Place Awards

Description: Annual awards that honor the planning and design teams of public facilities that reflect environmental sustainability.

Beneficiary: Planning and design teams

Reference(s): http://www.estormwater.com/King-County-Wash-Presents-Greening-in-Place-Awards-newsPiece16766

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Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act

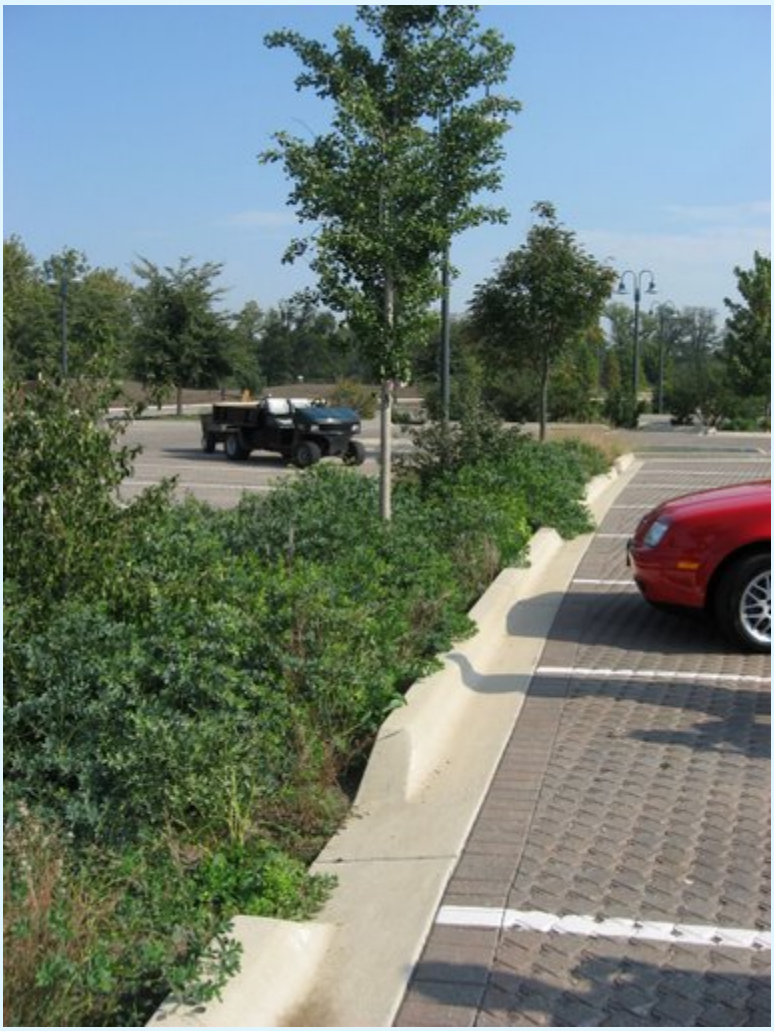

Foreword

Stormwater runoff in urban and developing areas is one of the leading sources of water pollution in the United States. In recognition of this issue, Congress enacted Section 438 of the Energy Independence and Security Act of 2007 (EISA) to require federal agencies to reduce stormwater runoff from federal development projects to protect water resources. More recently, the President signed Executive Order 13514 on "Federal Leadership in Environmental, Energy, and Economic Performance" calling upon all federal agencies to "lead by example" to address a wide range of environmental issues, including stormwater runoff. The Executive Order required the U.S. Environmental Protection Agency (EPA), in coordination with other federal agencies, to publish this Technical Guidance.

EPA worked closely with many federal agencies to develop this Technical Guidance to help federal agencies in implementing EISA Section 438. The guidance provides a step-by-step framework that will help federal agencies maintain pre-development site hydrology by retaining rainfall on-site through infiltration, evaporation/transpiration, and re-use to the same extent as occurred prior to development. The Technical Guidance provides background information, key definitions, case studies, and guidance on meeting the new requirements.

Federal agencies can comply with Section 438 by using a variety of stormwater management practices often referred to as "green infrastructure" or "low impact development" practices, including, for example, reducing impervious surfaces, using vegetative practices, porous pavements, cisterns and green roofs.

One of the most exciting new trends in water quality management today is the movement by many cities, counties, states, and private sector developers toward the increased use of this next generation stormwater management practices to help protect and restore water quality. Many federal agencies, including EPA, are already using a full spectrum of stormwater management practices to reduce the impact of federal facilities on local watersheds. These projects have produced results such as reductions in site runoff volumes and increased stormwater quality, which ultimately lead to more sustainable facilities.

EPA enjoyed the opportunity to work with a number of federal agencies to develop this state-of-the art, technical guidance and appreciate all their input. We look forward to continuing the dialogue as we all work to implement this guidance.

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Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act

INTRODUCTION

In December 2007, Congress enacted the Energy Independence and Security Act of 2007. Section 438 of that legislation establishes strict stormwater runoff requirements for federal development and redevelopment projects. The provision reads as follows:

> **"Storm water runoff requirements for federal development projects.** The sponsor of any development or redevelopment project involving a Federal facility with a footprint that exceeds 5,000 square feet shall use site planning, design, construction, and maintenance strategies for the property to maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow."

The intent of Section 438 of the Energy Independence and Security Act of 2007 (EISA) is to require federal agencies to develop and redevelop applicable facilities in a manner that maintains or restores stormwater runoff to the maximum extent technically feasible. Until recently, stormwater programs established to address water quality objectives have been designed to control traditional pollutants that are commonly associated with municipal and industrial discharges, e.g., nutrients, sediment, and metals. Increases in runoff volume and peak discharge rates have been regulated through state and local flood control programs. Although these programs have merit, knowledge accumulated during the past 20 years has led stormwater experts to the conclusion that conventional approaches to control runoff are not fully adequate to protect the nation's water resources (National Research Council, 2008).

Implementation of Section 438 of the EISA can be achieved through the use of the green infrastructure/low impact development (GI/LID) infrastructure tools described in this guidance. The intention of the statute is to maintain or restore the pre-development site hydrology during the development or redevelopment process. To be more specific, this requirement is intended to ensure that receiving waters are not negatively impacted by changes in runoff temperature, volumes, durations and rates resulting from federal projects. It should also be noted that a performance-based approach was selected in lieu of a prescriptive requirement in order to provide site designers maximum flexibility in selecting control practices appropriate for the site.

Section 14 of the Executive Order 13514, Federal Leadership in Environmental, Energy, and Economic Performance

On October 5, 2009, President Barack Obama signed Executive Order 13514, "Federal Leadership in Environmental, Energy, and Economic Performance." Section 14 of the Executive Order provides:

> Stormwater Guidance for Federal Facilities. Within 60 days of the date of this order, the Environmental Protection Agency, in coordination with other Federal agencies as

> appropriate, shall issue guidance on the implementation of section 438 of the Energy Independence and Security Act of 2007 (42 U.S.C. 17094).

This provision contains two significant elements. First, for the first time, EPA is formally assigned the responsibility to write and issue the Section 438 guidance, in coordination with other federal agencies. Second, it establishes a deadline for EPA to do so by December 5, 2009.

Purpose and Organization of this Guidance

The purpose of this document is to provide technical guidance and background information to assist federal agencies in implementing EISA Section 438. Each agency or department is responsible for ensuring compliance with EISA Section 438. The document contains guidance on how compliance with Section 438 can be achieved, measured and evaluated. In addition, information detailing the rationale for the stormwater management approach contained herein has been included.

This document is intended solely as guidance. This document is not a regulation nor does it substitute for statutory provisions or regulations. This guidance does not impose any legally binding requirements on federal agencies and does not confer any legal rights or impose legal obligations upon any member of the public. This document does not create a cause of action against the EPA, other federal agencies, or the United States.

The following information is presented within this document:

Part I: Implementation Framework

A. Background
B. Benefits and outcomes of the new stormwater performance requirements
C. Applicability and definitions
D. Tools to implement the requirements of Section 438
E. Calculating the 95th percentile rainfall event

Part II: Case Studies on Capturing the 95th Percentile Storm Using Onsite Management Practices

Case studies representing typical federal installations have been included. The case studies were selected to demonstrate the feasibility of providing adequate stormwater control for a range of site conditions and building designs. To the maximum extent technically feasible, each case study includes a description of a method that can be used to determine the design objectives of the project based on retaining the 95th percentile storm. Examples of onsite technologies and practices have also been provided. The case studies are intended to provide examples of modeling procedures that can be used to quantify treatment system performance and processes for assessing sites and determining appropriate control techniques to the maximum extent technically feasible.

Part I: Implementation Framework

A. BACKGROUND

This section contains background on the causes and consequences of stormwater discharges, solutions that can be used to address the causes and consequences of stormwater discharges and how to implement those solutions to comply with Section 438 of EISA.

Alterations to Natural Hydrology and the Impact on Stormwater Runoff
In the natural, undisturbed environment rain that falls is quickly absorbed by trees, other vegetation, and the ground. Most rainfall that is not intercepted by leaves infiltrates into the ground or is returned to the atmosphere by the process of evapotranspiration. Very little rainfall becomes stormwater runoff in permeable soil, and runoff generally only occurs with larger precipitation events. Traditional development practices cover large areas of the ground with impervious surfaces such as roads, driveways, sidewalks, and buildings. Under developed conditions runoff occurs even during small precipitation events that would normally be absorbed by the soil and vegetation. The collective force of the increased runoff scours streambeds, erodes stream banks, and causes large quantities of sediment and other entrained pollutants to enter the water body each time it rains (Shaver, et al., 2007; Booth testimony, 2008).

As watersheds are developed and impervious surfaces increase in area, the hydrology of the watersheds fundamentally changes over time which results in degraded aquatic ecosystems. In recognition of these problems, stormwater managers employed extended detention approaches to mitigate the impacts of increased peak runoff rates. However, wet ponds and similar practices are not fully adequate to protect downstream hydrology because of the following inherent limitations of these conventional practices (National Research Council, 2008; Shaver, et al., 2007):

- Poor peak control for small, frequently-occurring storms;
- Negligible volume reduction; and
- Increased duration of peak flow.

Detention storage targets relatively large, infrequent storms, such as the two and 10-year/24-hour storms for peak flow rate control. As a result of this design limitation, flow rates from smaller, frequently-occurring storms typically exceed those that existed onsite before land development occurred and these increases in runoff volumes and velocities typically result in flows erosive to stream channel stability (Shaver, et al., 2007). Section 438 is intended to address the inadequacies of the historical detention approach to managing stormwater and promote more sustainable practices that have been selected to maintain or restore predevelopment site hydrology.

A 2008 National Research Council report on urban stormwater confirmed that current stormwater control efforts are not fully adequate. Three of the report's findings on stormwater management approaches are particularly relevant (National Research Council, 2008).

1. Individual controls on stormwater discharges are inadequate as the sole solution to stormwater in urban watersheds;
2. Stormwater control measures such as product substitution, better site design, downspout disconnection, conservation of natural areas, and watershed and land-use planning can dramatically reduce the volume of runoff and pollutant load from new development; and
3. Stormwater control measures that harvest, infiltrate, and evapotranspire stormwater are critical to reducing the volume and pollutant loading of small storms.

Pre-development Hydrology. *Courtesy of C. May, University of Washington.*

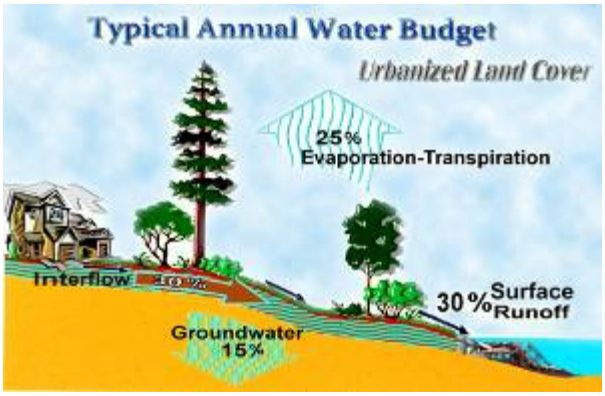

Post-Development Hydrology. *Courtesy of C. May, University of Washington.*

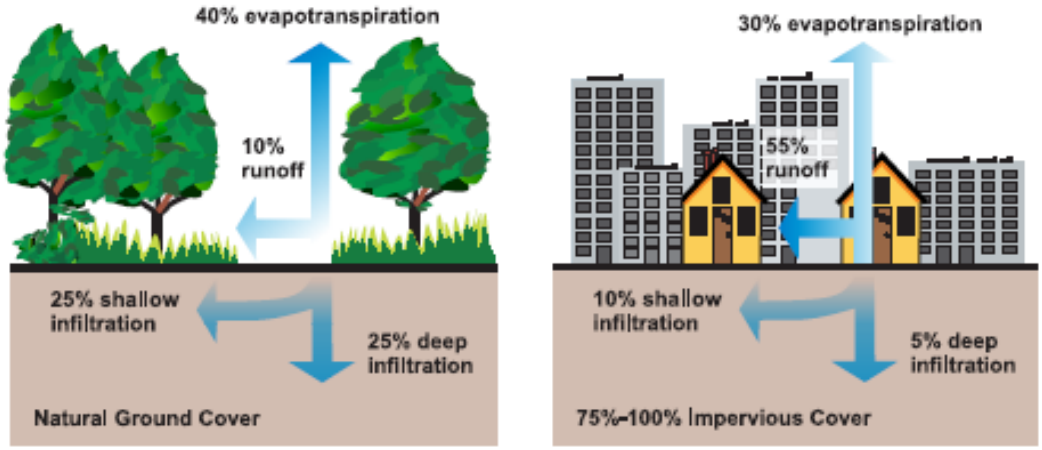

Figure 1. Pre-Development and Post-Development Hydrology. (USDA).

Figure 1 contains two sets of diagrams depicting the water balances at undeveloped and developed sites. Runoff patterns will vary based on factors such as geographic location, local meteorological conditions, vegetative cover and soils. The first set of figures represents conditions in the Pacific Northwest where storms have a long duration and low intensity, i.e., the volume of rain in an individual storm is small. The second set of figures from the U.S. Department of Agriculture represents a more generalized set of conditions, but was included to illustrate that heavily urbanized areas typically cause large increases in runoff.

Land cover changes that result from site development include increased imperviousness, soil compaction, loss of vegetation, and loss of natural drainage patterns, which result in increased runoff volumes and peak runoff rates. The cumulative impacts of the land cover changes result in alterations of the natural hydrology of a site, which disrupts the natural water balance and changes water flow paths. The consequences of these impacts include:

1. *Increased volume of runoff*. With decreased area for infiltration and evapotranspiration due to development, a greater amount of rainfall is converted to overland runoff which results in larger stormwater discharges.
2. *Increased peak flow of runoff*. Increased impervious surface area and higher connectivity of impervious surfaces and stormwater conveyance systems increase the flow rate of stormwater discharges and increase the energy and velocity of discharges into the stream channel.
3. *Increased duration of discharge*. Detention systems generate greater flow volumes and rates. These prolonged higher discharge rates can undermine the stability of the stream channel and induce erosion, channel incision and bank cutting.
4. *Increased pollutant loadings*. Impervious areas are a collection site for pollutants. When rainfall occurs these pollutants are mobilized and transported directly to stormwater conveyances and receiving streams via these impervious surfaces.
5. *Increased temperature of runoff*. Impervious surfaces absorb and store heat and transfer it to stormwater runoff. Higher runoff temperatures may have deleterious effects on receiving streams. Detention basins magnify this problem by trapping and discharging runoff that is heated by solar radiation (Galli, 1991; Schueler and Helfrich, 1988).

The resulting increases in volume, peak flow, and duration are illustrated in the hydrograph in Figure 2, which is a representation of a site's stormwater discharge with respect to time. The hydrograph illustrates the impacts of development on runoff volume and timing of the runoff. Individual points on the curve represent the rate of stormwater discharge at a given time. The graph illustrates that development and corresponding changes in land cover result in greater discharge rates, greater volumes, and shorter discharge periods. In a natural condition, runoff rates are slower than those on developed sites and the discharges occur over a longer time period. The predevelopment peak discharge rate is also much lower than the post-development peak discharge rate due to attenuation and absorption by soils and vegetation. In the post-development condition there is generally a much shorter time before runoff begins because of increased impervious surface area, a higher degree of connectivity of these areas and the loss of soils and vegetative cover that slow or reduce runoff.

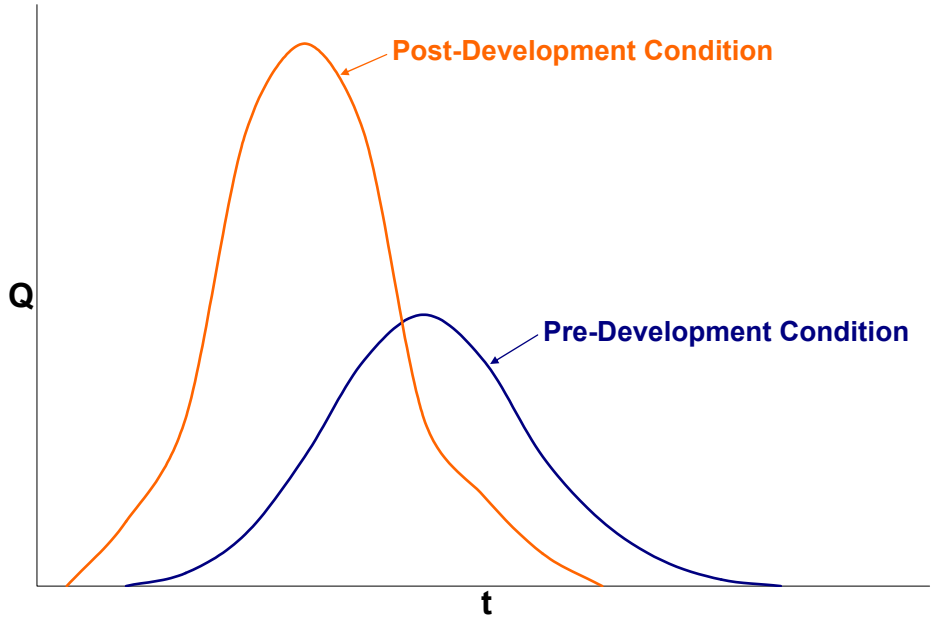

Figure 2. Post-Development Hydrograph.
(Q = volumetric flow rate; t = time)

Figure 3. Stream Displaying the Effects of Stormwater Runoff and Channel Downcutting.

The Solution: Preserving and Restoring Hydrology

A new approach has evolved in recent years to eliminate or reduce the amount of water and pollutants that run off a site and ultimately are discharged into adjacent water bodies.

The fundamental principle is to employ systems and practices that use or mimic natural processes to: 1) infiltrate and recharge, 2) evapotranspire, and/or 3) harvest and use precipitation near to where it falls to earth.

GI/LID practices include a wide variety of practices that utilize these mechanisms. These practices can be used at the site, neighborhood and watershed/regional scales. In this document the focus is on site-level practices, which is most consistent with the terms used in Section 438: "project," "facility," and "property." Although these performance requirements apply at the project site-level, flexibility exists to utilize nearby areas or areas directly adjacent to the facility to manage the runoff, i.e., evapotranspirate, infiltrate or harvest and use. Where justifiable, it also may be appropriate to evapotranspirate, infiltrate or harvest and use an equivalent or greater amount of runoff offsite as long as the runoff is discharged or used in the same receiving subwatershed or watershed.

The purpose of EISA Section 438 is to replicate the pre-development hydrology to protect and preserve both the water resources onsite and those downstream. For example, if prior to development, twenty five (25) percent of the annual rainfall runs directly into the stream and the remainder infiltrates into the ground or is evapotranspired into the air, then the post-development goal should be to limit runoff to twenty five (25) percent of the annual precipitation while maintaining the correct aquifer recharge rate. This has the benefit, in most cases, of delivering water to the stream at approximately the same rate, volume, duration and temperature as the stream had naturally evolved to receive prior to development. The result will be to eliminate or minimize the erosion of streambeds and streambanks, significantly reduce the delivery of many pollutants to water bodies, and retain historical instream temperatures.

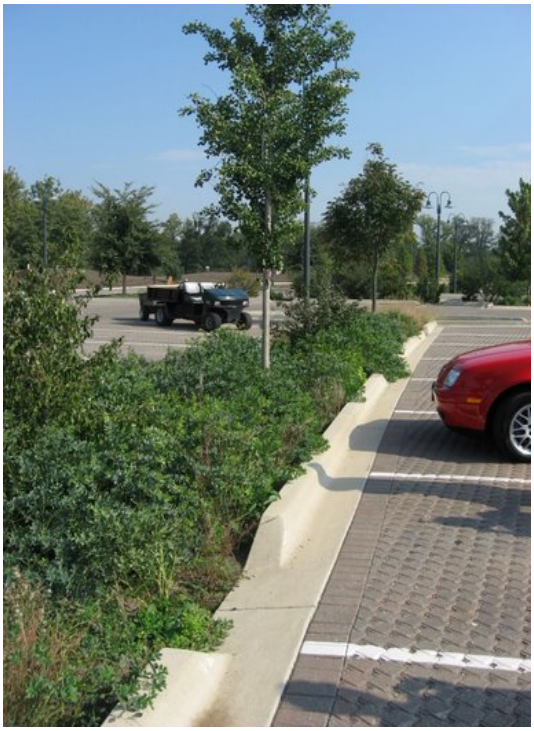

Figure 4. Parking lot bioswale and permeable pavers in Chicago.

Restoring or maintaining pre-development hydrology has emerged as a control approach for several reasons. Most importantly, this approach is intended to directly address the root cause of impairment. Current control approaches have been selected in an attempt to control the symptoms (peak flow, and excess pollutants), but this strategy is not fully adequate because of the scale of the problem, the cumulative impacts of multiple developments and the need to manage both site and watershed level impacts. With current approaches, it is also difficult to adequately protect and improve water quality because the measures employed are not addressing the main problem which is a hydrologic imbalance.

Designing facilities based on the goal of maintaining or restoring pre-development hydrology provides a site specific basis and an objective methodology with which to determine appropriate practices to protect the receiving environment.

Using pre-development hydrology as the guiding control principal also allows the designer to consider climatic and geologic variability and tailor the solutions to the project location. Thus the need for a one size fits all approach is rendered unnecessary since the design objective is dictated by the pre-development site conditions and other technicalities of the project site and facility. Instead of prescribed approaches dictating discharge volumes or flow rates, site assessments of historical infiltration and runoff rates will inform the designer and provide the basis for a suitable design. The use of this approach will minimize compliance complications that may arise from prescriptive design approaches which do not account for the variability of precipitation frequencies, rainfall intensities and pre-development land cover and soil conditions that influence infiltration and runoff.

B. Benefits and Outcomes of the New Stormwater Performance Requirements

Implementation of these new stormwater performance requirements in EISA Section 438 provides numerous environmental and economic benefits in addition to reducing the volume of stormwater runoff:

Benefits to Water Resources:

- *Cleaner Water.* The use of plants, soils and water harvesting and use practices can reduce stormwater runoff volumes and pollutant loadings and the frequency and magnitude of combined sewer overflows (volume and pollutant loading reductions). These practices are part of a larger set of practices called green infrastructure/low impact development.
- *Clean and Adequate Water Supplies.* GI/LID approaches using soil based vegetated infiltration systems can be used to recharge ground water and maintain stream base flow. By recharging ground water aquifers, aquatic ecosystem health is maintained and base flows are increased which helps ensure more constant flows for drinking water withdrawals. Harvesting and reusing rainwater also reduces the need to use potable water for all uses and can reduce both the infrastructure and energy needed to treat and transport both drinking water and stormwater.
- *Source Water Protection.* GI/LID practices provide pollutant removal benefits, thereby providing some protection for both ground water and surface water sources of drinking water. In addition, GI/LID provides ground water recharge benefits.

GI/LID approaches are a set of management approaches and technologies that utilize and/or mimic the natural hydrologic cycle processes of infiltration, evapotranspiration and use. GI/LID practices include green roofs, trees and tree boxes, rain gardens, vegetated swales, pocket wetlands, infiltration planters, porous and permeable pavements, vegetated median strips, reforestation and revegetation and protection of riparian buffers and floodplains. These practices can be used almost anywhere soil and vegetation can be worked into the urban or suburban landscape. They include decentralized harvesting approaches such as rain barrels and cisterns that can be used to capture and re-use rainfall for watering plants or flushing toilets.

Other Social and Environmental Benefits:

- *Cleaner Air.* Trees and vegetation improve air quality by filtering many airborne pollutants and can help reduce the amount of respiratory illness (Vingarzan and Taylor, 2003).
- *Reduced Urban Temperatures.* Summer city temperatures can average 10ºF higher than nearby suburban temperatures (Casey Trees, 2007). High temperatures are also linked to higher ground level ozone concentrations. Vegetation creates shade, reduces the amount of heat absorbing materials and emits water vapor – all of which cool hot air (Grant, et al., 2003). Reductions in impervious surface and the use of light colored pervious surfaces (e.g., permeable concrete) also can mitigate urban temperatures.
- *Moderate the Impacts of Climate Change.* Climate change impacts and effects vary regionally, but GI/LID techniques can provide adaptation benefits for a wide array of circumstances. They can be used to conserve, harvest and use water, to recharge ground waters and to reduce surface water discharges that could contribute to flooding. In addition, there are mitigation benefits such as reduced energy demand and carbon sequestration by vegetation.
- *Increased Energy Efficiency.* Green space helps lower ambient temperatures and, when incorporated on and around buildings, helps shade and insulate buildings from wide temperature swings, decreasing the energy needed for heating and cooling. Diverting stormwater from wastewater collection, conveyance and treatment systems can reduce the amount of energy needed to pump and treat the water. Energy efficiency not only reduces costs, but also reduces generation of greenhouse gases.
- *Community Benefits.* Trees and plants improve urban aesthetics and community livability by providing recreational and wildlife areas. Studies show that property values are higher when trees and other vegetation are present. Increased green space also has public health benefits and has been shown to reduce crime and the associated stresses of urban living.

Figure 5. Rain water cistern.

C. APPLICABILITY AND DEFINITIONS

Applicability

1. Who is a "**Sponsor**" of a project?

Section 438 applies to the "**sponsor** of any development or redevelopment project involving a Federal facility . . ." Section 438 requires that the "sponsor . . . shall use . . . strategies for the property to maintain or restore . . . the predevelopment hydrology. . ." The "sponsor" should

generally be regarded as the federal department or agency that owns, operates, occupies or is the primary user of the facility and has initiated the development or redevelopment project. If the federal agency hires another entity to perform activities such as site construction or maintenance, the agency should nonetheless be regarded as the sponsor and be responsible to assure compliance with the requirements of Section 438. The agency sponsor is free to contract out various duties and responsibilities that are associated with achieving compliance.

2. What is a "**Federal facility**"?

Section 438 provides that its requirements apply to the "sponsor of any development or redevelopment project involving a **Federal facility** . . ." Section 401(8) of EISA states: "The term `Federal facility' means any building that is constructed, renovated, leased, or purchased in part or in whole for use by the Federal Government."

3. What is a **"footprint**"?

Section 438 applies to a federal facility "with a **footprint** that exceeds 5,000 square feet." For the purposes of this guidance, any project involving a federal facility that disturbs 5,000 square feet or more of ground area is covered by this guidance. Existing facilities that have an overall **footprint** of 5,000 square feet or greater that disturb less than 5,000 square feet of land area as part of any single development or redevelopment project are not subject to Section 438 requirements. Consistent with the purpose of Section 438 to preserve or restore pre-development hydrology, the term "footprint" includes all land areas that are disturbed as part of the project.

4. What is "**the property**"?

Section 438 provides that the project sponsor "shall use site planning, design, construction, and maintenance strategies for the **property** to maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the **property."** This clause has been interpreted to mean that the land surrounding the project site is available to implement the appropriate GI/LID practices where optimal.

Although the performance requirements of EISA Section 438 apply only to the project footprint, the flexibility exists to utilize the entire federal property in implementing the stormwater strategies for the project.

Definitions

95th percentile rainfall event. The 95th percentile rainfall event represents a precipitation amount which 95 percent of all rainfall events for the period of record do not exceed. In more technical terms, the 95th percentile rainfall event is defined as the measured precipitation depth accumulated over a 24-hour period for the period of record that ranks as the 95th percentile rainfall depth based on the range of all daily event occurrences during this period.

The 24-hour period is typically defined as 12:00:00 am to 11:59:59 pm. In general, at least a 20-30 year period of rainfall record is recommended for such an analysis. This raw data is readily

available and collected by most airports across the county. Small rainfall events that are 0.1 of an inch or less are excluded from the percentile analysis because this rainfall generally does not result in any measureable runoff due to absorption, interception and evaporation by permeable, impermeable and vegetated surfaces. Many stormwater modelers and hydrologists typically exclude rainfall events that are 0.1 inch or less from calculations of rainfall events of any storm from their modeling analyses of rainfall event frequencies. See, for example, the Center for Watershed Protection's Urban Subwatershed Restoration Manual 3 (available at www.cwp.org).

Federal facility. The term "federal facility" means any buildings that are constructed, renovated, leased, or purchased in part or in whole for use by the federal government as defined in section 401(8) of the Energy Independence and Security Act.

Development or re-development. For the purposes of this provision this term applies to any action that results in the alteration of the landscape during construction of buildings or other infrastructure such as parking lots, roads, etc, (e.g., grading, removal of vegetation, soil compaction, etc.) such that the changes affect runoff volumes, rates, temperature, and duration of flow. Examples of projects that would fall under "re-development" include structures or other infrastructure that are being reconstructed or replaced and the landscape is altered. Typical patching or resurfacing of parking lots or other travel areas would not fall under this requirement.

D. TOOLS TO IMPLEMENT THE REQUIREMENTS OF SECTION 438

Section 438 of the Energy Independence and Security Act of 2007 reads as follows:

> **Section 438. Storm water runoff requirements for federal development projects.** The sponsor of any development or redevelopment project involving a Federal facility with a footprint that exceeds 5,000 square feet shall use site planning, design, construction, and maintenance strategies for the property to maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow.

The intention of EISA Section 438 is to preserve or restore the hydrology of the site during the development or redevelopment process. To be more specific, this requirement is intended to ensure that aquatic biota, stream channel stability, and historical aquifer recharge rates of receiving waters are not negatively impacted by changes in runoff temperature, volumes, durations and rates resulting from federal projects. A performance based approach was selected in lieu of a prescriptive requirement in order to provide site designers maximum flexibility in selecting control practices appropriate for the site.

To meet these performance objectives, technically feasible stormwater control practices that are effective in reducing the volume of stormwater discharge should be used. To implement EISA Section 438, this guidance recommends that the federal facility use all known, available and reasonable methods of stormwater retention and/or use to the maximum extent technically feasible (METF). Tools to implement the requirements of Section 438 are described below and illustrated in Figure 8.

Establishing Section 438 Performance Design Objectives

Described below are options site designers can use to comply with Section 438. There may be situations where Option 1 (retaining the 95th percentile rainfall event) is not protective enough to maintain or restore the predevelopment hydrology of the project (for example, in some headwater streams). In these cases, Option 2 (site-specific hydrologic analysis) could be used to determine the types of stormwater practices necessary to preserve predevelopment runoff conditions. Option 2 could also be used if predevelopment runoff conditions can be maintained by retaining less than the 95th percentile rainfall event. Because a performance based approach was selected in lieu of a prescriptive requirement in order to provide site designers maximum flexibility in selecting control practices appropriate for the site, Option 2 was provided in recognition that there are established methodologies that can be utilized to estimate the volume of infiltration and evapotranspiration based on site-specific hydrology and thus establish the predevelopment hydrology performance design objectives.

Option 1: Retain the 95th Percentile Rainfall Event

One approach to establishing the performance design objectives is to design, construct, and maintain stormwater management practices that manage rainfall onsite, and prevent the off-site discharge of the precipitation from all rainfall events less than or equal to the 95th percentile rainfall event to the maximum extent technically feasible (METF). This objective should be accomplished by the use of practices that infiltrate, evapotranspire and/or harvest and use rainwater. The 95th percentile rainfall event is the event whose precipitation total is greater than or equal to 95 percent of all storm events over a given period of record. For example, to determine what the 95th percentile storm event is in a specific location, all 24 hour storms that have recorded values over a 30 year period would be tabulated and a 95th percentile storm would be determined from this record, i.e., 5% of the storms would be greater than the number determined to be the 95th percentile storm. Thus the 95th percentile storm would be represented by a number such as 1.5 inches, and this would be the design storm (example 95th percentile storm events for selected cities are presented in Table 1). The designer would then select a system of practices, to the METF, that infiltrate, evapotranspire or harvest and use this volume multiplied by the total area of the facility/project footprint. Methods and data used to estimate the 95th percentile event are discussed in Part II of this document.

For the purposes of this guidance, retaining all storms up to and including the 95th percentile storm event is analogous to maintaining or restoring the pre-development hydrology with respect to the volume, flow rate, duration and temperature of the runoff for most sites. This 95th percentile approach was identified and recommended because this storm size represents the volume that appears to best represent the volume that is fully infiltrated in a natural condition and thus should be managed onsite to restore and maintain this pre-development hydrology for duration, rate and volume of stormwater flows. In general, only large storms generate significant runoff. In addition, this approach was identified because it employs natural treatment and flow attenuation methods that are presumed to have existed on the site before construction of infrastructure (e.g., building, roads, parking lots, driveways,) and is intended to infiltrate or evapotranspirate the full volume of the 95th percentile storm. Because this approach necessitates the use of practices that generally preclude extended detention, it will also typically address the

issue of maintaining predevelopment temperatures. However, in cases where there are discharges to cool water streams or other sensitive receiving waters, additional strategies may be needed to ensure that stormwater discharges do not result in greater thermal impacts than would occur in pre-development conditions (Schueler and Helfrich, 1988).

Where technically feasible, the goal of Option 1 is that one hundred percent (100%) of the volume of water from storms less than or equal to the 95th percentile event over the footprint of the project should not be discharged to surface waters. In some cases, runoff can be harvested and used and ultimately may be discharged to surface waters or a sanitary treatment system; such direct or indirect discharges must be authorized or allowed by the regulatory authority. For example, if runoff is captured for nonpotable uses such as toilet flushing or other uses that are not irrigation related, these waters potentially could be discharged into the sanitary sewer system. Preferred mechanisms for retaining discharges from storms greater than the 95th percentile event are through overflow or diversion for the volume that exceeds the 95th percentile amount. Because standard underdrains typically discharge from smaller storms as well, underdrain designs, if employed, should ensure adequate retention capacity for the 95th percentile event volume. For structures such as roofs and paved surfaces that can increase the temperature of stormwater runoff, materials that minimize temperature increases (e.g., concrete vs. asphalt; vegetated roofs) should be considered and used as appropriate.

Retaining 100 percent of all rainfall events equal to or less than the 95th percentile rainfall event was identified as Option 1 because small, frequently-occurring storms account for a large proportion of the annual precipitation volume, and the runoff from those storm events also significantly alters the discharge frequency, rate and temperature of the runoff.

Figure 6. Bioretention facility in Oregon.

The runoff produced by these small storms and the initial portion of larger storms has a strong negative cumulative impact on receiving water hydrology and water quality. In areas that have been developed, runoff is generated from almost all storms, both small and large, due to the impervious surfaces associated with development and the loss of soils and vegetation. In contrast, natural or undeveloped areas discharge little or no runoff from small storms because the rain is absorbed by the landscape and vegetation. Studies have shown that increases in runoff event frequency, volume and rate can be diminished or eliminated through the use of GI/LID designs and practices, which infiltrate, evapotranspire and capture and use stormwater.

Option 1 was identified because it is a simplified approach to meet the intent of Section 438 in contrast to Option 2 which requires the designer to conduct a hydrologic analysis of the site based on site-specific conditions.

Table 1. Example 95th Percentile Storm Events for Select U.S. Cities (adapted from Hirschman and Kosco, 2008).

City	95th Percentile Event Rainfall Total (in)	City	95th Percentile Event Rainfall Total (in)
Atlanta, GA	1.8	Kansas City, MO	1.7
Baltimore, MD	1.6	Knoxville, TN	1.5
Boston, MA	1.5	Louisville, KY	1.5
Buffalo, NY	1.1	Minneapolis, MN	1.4
Burlington, VT	1.1	New York, NY	1.7
Charleston, WV	1.2	Salt Lake City, UT	0.8
Coeur D'Alene, ID	0.7	Phoenix, AZ	1.0
Cincinnati, OH	1.5	Portland, OR	1.0
Columbus, OH	1.3	Seattle, WA	1.6
Concord, NH	1.3	Washington, DC	1.7
Denver, CO	1.1		

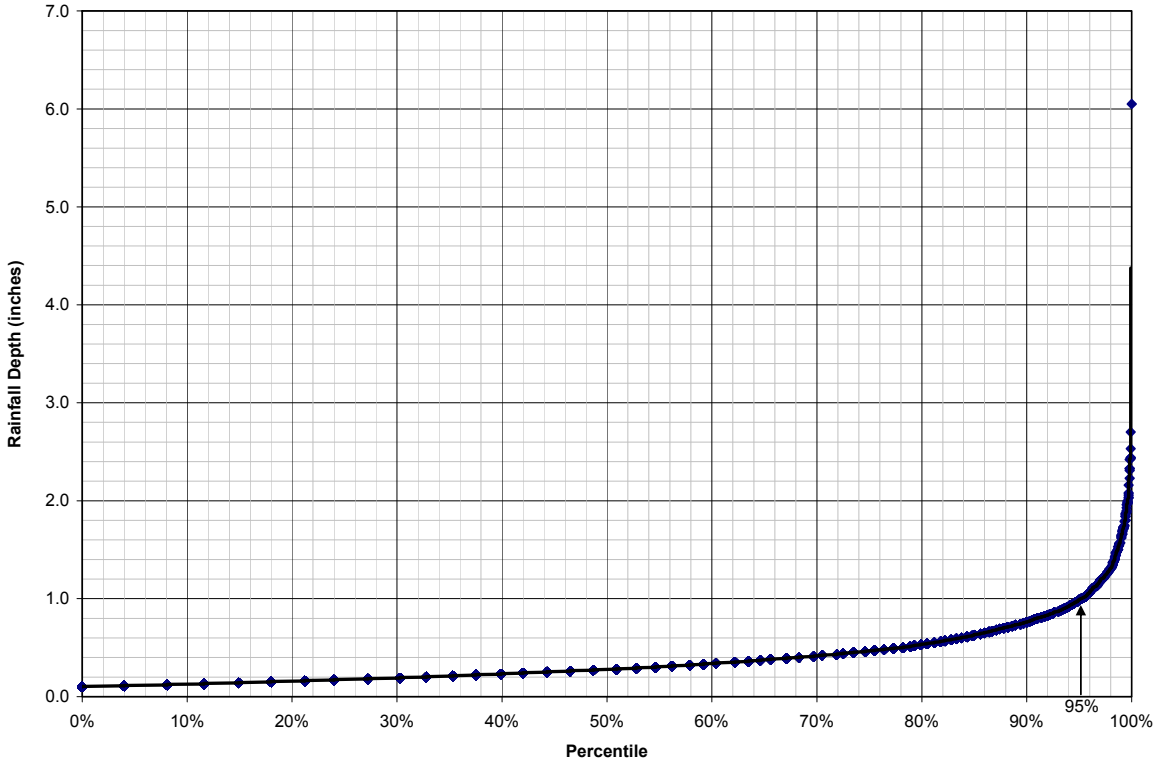

Figure 7. Rainfall Frequency Spectrum showing the 95th percentile rainfall event for Portland, OR (~1.0 inches)

Calculating the 95th Percentile Rainfall Event

Section E of this guidance contains information on how to calculate the 95th percentile rainfall event for a specific area. A long-term record of daily rainfall amounts (ideally, at least 30 years) is needed to calculate the 95th percentile rainfall.

Designers opting to use Option 1 need to do the following:

1) calculate or verify the precipitation amount from the 95th percentile storm event (this number would be typically expressed in inches, e.g., 1.5", and

2) employ onsite stormwater management controls to the METF that infiltrate, evapotranspire or harvest and use the appropriate design volume.

The 95th percentile event can be calculated by using the following procedures below (summarized from Hirschman and Kosco, 2008, *Managing Stormwater in Your Community: A Guide for Building an Effective Post-Construction Program*, Center for Watershed Protection):

- Obtain a long-term rainfall record from a nearby weather station (daily precipitation is fine, but try to obtain at least 30 years of daily record). Long-term rainfall records can be obtained from many sources, including NOAA at http://cdo.ncdc.noaa.gov/pls/plclimprod/poemain.accessrouter?datasetabbv=SOD&countryabbv=&georegionabbv=.
- Remove data for small rainfall events that are 0.1 inch or less and snowfall events that do not immediately melt from the data set. These events should be deleted since they do not typically cause runoff and could potentially cause the analyses of the 95th percentile storm runoff volume to be inaccurate.
- Using a spreadsheet or simple statistical package, sort the rainfall events from highest to lowest. In the next column, calculate the percentage of rainfall events that are less than each ranked event (event number/total number of events). For example, if there were 1,000 rainfall events and the highest rainfall event was a 4" event, then 999 events (or a percentile of 999/1000, or 99.9%) are less than the 4" rainfall event.
- Use the rainfall event at 95% as the 95th percentile storm event.

Option 2: Site-Specific Hydrologic Analysis

Another approach to establishing the performance design objective is to design, construct, and maintain stormwater management practices that preserve the pre-development runoff conditions following construction. Option 2 allows the designer to conduct a site-specific hydrologic analysis to determine the pre-development runoff conditions instead of using the estimated volume approach of Option 1. Under Option 2, the pre-development hydrology would be determined based on site-specific conditions and local meteorology by using continuous simulation modeling techniques, published data, studies, or other established tools. If the designer elects to use Option 2, the designer would then identify the pre-development condition of the site and quantify the post-development runoff volume and peak flow discharges that are equivalent to pre-development conditions. The post-construction rate, volume, duration and

temperature of runoff should not exceed the pre-development rates and the predevelopment hydrology should be replicated through site design and other appropriate practices to the maximum extent technically feasible. These goals should be accomplished through the use of infiltration, evapotranspiration, and/or rainwater harvesting and use. Defensible and consistent hydrological assessment tools should be used and documented. Additional discussions of appropriate methodologies to use in assessing site hydrology have been included in the technical sections of this document. See, for example, the discussion of spreadsheet versions or curve numbers based on the Natural Resource Conservation Service Technical Release 55 (TR-55) Method in Appendix A of this document.

Development
The pre-development hydrologic condition of the site is the combination of runoff, infiltration and evapotranspiration rates and volumes that typically existed on the facility site before "development" on a greenfields site (meaning any construction of infrastructure on undeveloped land such as meadows or forests). In practice, determining the pre-development hydrology of a given site can be difficult if there is no suitable reference site. As a result, reference conditions for typical land cover types in the locality often are used to approximate what fraction of the precipitation ran off, soaked into the ground or was evaporated from the landscape. The use of reference conditions can be problematic if suitable data are not available or unique site conditions exist that do not fit within a typical land use cover type for the area, e.g., meadow or forest. In cases where suitable data from comparable conditions cannot be found or is otherwise inadequate to be used in conducting an Option 2 analysis for the specific area being considered for development or redevelopment, the project sponsor should use the Option 1 analytical framework.

Re-development
For re-development sites, existing site conditions and uses of the site can influence the amount of runoff that can be managed on site through infiltration, evapotransporation and harvest and use and thus the performance design objective. In these cases the design process in Figure 8 and Scenario 9 illustrate the decision processes that can be used.

In the context of some re-development projects, fully restoring predevelopment hydrology can be difficult to achieve and Congress recognized this potential difficulty by including the METF language in the statute. In these cases, Congressional intent can be best carried out by using a systematic METF analysis to determine what practices can be implemented at the site to maintain or store the hydrologic condition of the site. Scenarios 1-8 provide examples of METF analyses that demonstrate that pre-development hydrology can be achieved. Scenario 9 provides an example of an METF analysis that demonstrates that pre-development hydrology cannot be fully achieved and illustrates the extent to which pre-development hydrology can be restored.

Note: *It should also be emphasized that the performance based approach in Option 1 is intended to be a surrogate for determining the pre-development reference condition and this standard is intended to be used in cases where it is more practical, cost effective, and/or expeditious than Option 1, or where it is difficult or infeasible to identify the relevant reference conditions for the site.*

Determination of Maximum Extent Technically Feasible

Compliance with Section 438 requires that stormwater management measures are implemented to the maximum extent technically feasible (METF) to maintain or restore the pre-development hydrology conditions specifically with respect to temperature, rate, volume, and duration of flow.

Performance or design goals based on the pre-development hydrology can be established by using options such as the following: Retention of the 95th percentile rainfall event (Option 1), or through a site-specific hydrologic analysis that estimates the volume of infiltration, evapotranspiration or onsite stormwater harvesting and use based on site-specific hydrologic conditions (Option 2).

Technical Infeasibility

For projects where technical infeasibility exists, the federal agency or department sponsoring the project should document and quantify that stormwater strategies, such as infiltration, evapotranspiration, and harvesting and use have been used to the METF, and that full employment of these types of controls are infeasible due to site constraints. Some western states place restrictions on harvesting and use due to water rights, however, these requirements do not necessarily preclude the sponsor of the project from implementing strategies such as infiltration and evapotranspiration. Documentation of technical infeasibility should include, but may not be limited to, engineering calculations, geologic reports, hydrologic analyses, and site maps. A determination that the performance design goals cannot be met on site should include analyses that rule out the use of an adequate combination of infiltration, evapotranspiration, and use measures. Examples of where site conditions may prevent the full employment of appropriate management techniques to the METF include a combination of:

- The conditions on the site preclude the use of infiltration practices due to the presence of shallow bedrock, contaminated soils, near surface ground water or other factors such as underground facilities or utilities.
- The design of the site precludes the use of soil amendments, plantings of vegetation or other designs that can be used to infiltrate and evapotranspirate runoff.
- Water harvesting and use are not practical or possible because the volume of water used for irrigation, toilet flushing, industrial make-up water, wash-waters, etc. is not significant enough to warrant the design and use of water harvesting and use systems.
- Modifications to an existing building to manage stormwater are not feasible due to structural or plumbing constraints or other factors as identified by the facility owner/operator.
- Small project sites where the lot is too small to accommodate infiltration practices adequately sized to infiltrate the volume of runoff from impervious surfaces,
- Soils that cannot be sufficiently amended to provide for the requisite infiltration rates,
- Situations where site use is inconsistent with the capture and use of stormwater or other physical conditions on site that preclude the use of plants for evapotranspiration or bioinfiltration.
- Retention and/or use of stormwater onsite or discharge of stormwater onsite via infiltration has a significant adverse effect on the site or the down gradient water balance of surface waters, ground waters or receiving watershed ecological processes.

- State and local requirements or permit requirements that prohibit water collection or make it technically infeasible to use certain GI/LID techniques.
- Compliance with the Section 438 requirements would result in the retention and/or use of stormwater on the site such that an adverse water balance impact may occur to the receiving surface waterbody or ground water.

Please note that a single one of these characteristics is very unlikely to preclude meeting the performance standard, but a combination of factors may.

In cases where the facility has a defensible showing of technical infeasibility and can provide adequate documentation of site conditions or other factors that preclude full implementation of the performance design goal, the facility should still install stormwater practices to infiltrate, evapotranspire and/or harvest and use onsite the maximum amount of stormwater technically feasible. Note: Facilities must still comply with all other applicable federal, state and local requirements.

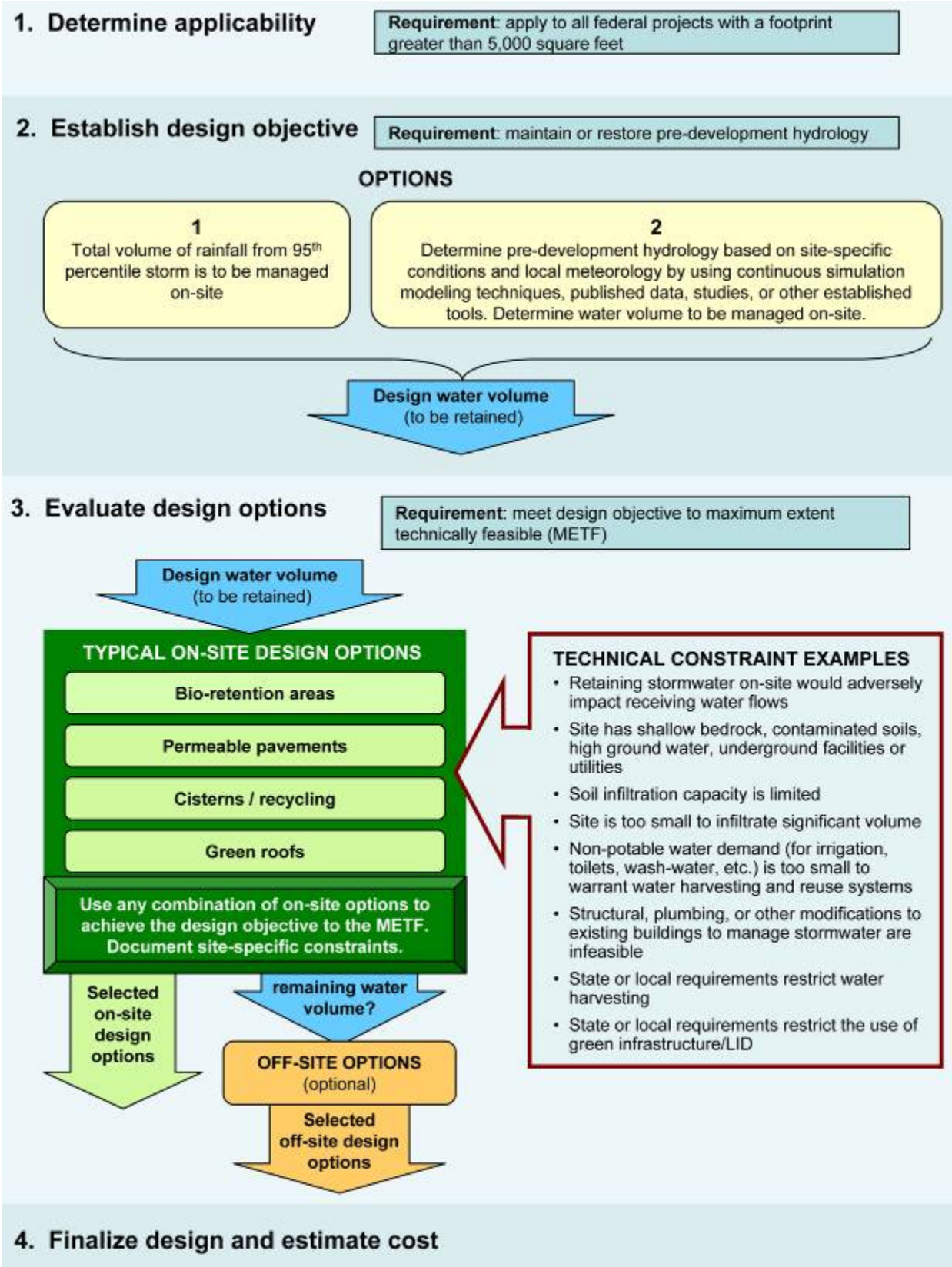

Figure 8. Section 438 Implementation Process

Documenting EISA Section 438 Implementation
Each agency or department is responsible for ensuring compliance with Section 438. It is recommended that: 1) the final design and as-built drawings of each facility shall be reviewed by a registered professional engineer and 2) the agency or department develop and maintain documentation of the following design criteria for each project subject to Section 438:

- Site evaluation and soils analysis
- Calculations for the 95th percentile rainfall event or the pre-development runoff volumes and rates to identify the volume of stormwater requiring management
- Documentation of modifications to the performance design objective based on technical constraints (site-specific METF determination)
- The site design and stormwater management practices employed on the site
- Design calculations for each stormwater management practice employed
- The respective volume of stormwater managed by each practice and the system as a whole
- Operations and maintenance protocols for the stormwater management system

The information should provide the necessary documentation and detail to demonstrate compliance and operation of stormwater management practices for the entire site.

Common Green Infrastructure/Low Impact Development Tools to Implement Section 438
Although Congress did not prescribe specific practices to be used to implement Section 438 it can be inferred that one of the goals of the Act was to promote the use of innovative stormwater management approaches, designs and practices that better protect receiving water quality, flow regimes and provide other important environmental benefits. GI/LID are preferred practices, to be supplemented with or replaced with conventional controls when site specific conditions dictate.

The GI/LID management approaches and technologies that federal agencies would typically use enhance and/or mimic the natural hydrologic cycle processes of infiltration, evapotranspiration, and use. Federal agencies can also use footprint reduction practices (e.g., building up instead of out) to reduce their stormwater impact. GI/LID approaches include biological systems and engineered systems. These include but are not necessarily limited to:

- Rain gardens, bioretention, and infiltration planters
- Porous pavements
- Vegetated swales and bioswales
- Green roofs
- Trees and tree boxes
- Pocket wetlands
- Reforestation/revegetation using native plants
- Protection and enhancement of riparian buffers and floodplains
- Rainwater harvesting for use (e.g., irrigation, HVAC make-up, non-potable indoor uses).

GI/LID practices are recommended to implement EISA Section 438 for the following reasons:

- cost savings in many cases

- overall environmental performance
- pollutant loading reduction capability
- pollution prevention focus
- effectiveness in managing runoff volumes and rates
- energy efficient and energy conservative
- appropriate in a wide range of site condition and locations
- appropriate for new development and redevelopment projects
- appropriate at multiple scales of development, e.g., site, neighborhood, region

For more information on specific GI/LID practices and how they function, visit: www.epa.gov/greeninfrastructure and www.epa.gov/nps/lid.

Figure 9. Disconnected downspout discharging to planter box.

Cost of Compliance

The cost of complying with Section 438 may require the use of approaches and techniques that initially may be more costly to design and implement. It is anticipated that as the expertise of the implementing agency or department increases and the demand for GI/LID materials and equipment increases that the overall costs of the projects will be lower or equivalent to the costs of constructing conventional stormwater practices. Initial studies conducted by EPA and others suggest that the use of GI/LID practices can be cost competitive. Recent evaluations of GI/LID projects have identified opportunities for cost savings because of reduced infrastructure and site preparation demands. In addition, longer term studies have indicated that GI/LID practices are continuing to gain cost efficiency as they are adopted more widely and with greater frequency thus reducing overall implementation costs.

In *Reducing Stormwater Costs through LID Strategies and Practices* (EPA 841-F-07-006, December 2007 - available for download at www.epa.gov/nps/lid), EPA examined 17 case studies in which conventional development costs were compared to GI/LID costs. In the great majority of cases, the GI/LID approach was between 15 and 80 percent less expensive than conventional control measures because implementation of GI/LID practices can offset costs of conventional construction and stormwater management approaches. Significant cost savings that were identified in the report include:

- Elimination or reduction of detention ponds
- Elimination or reductions of stormwater and CSO treatment and conveyance systems such as pipes, storage structures, stormwater treatment devices, and other related stormwater infrastructure
- Narrower streets with reduced material demands

- Fewer square yards of sidewalks
- Reduced land purchases for stormwater control structures

In addition, other benefits were achieved through the use of GI/LID such as more beneficial uses of land previously dedicated to stormwater devices, increased livability and higher property values.

There are many different combinations of practices that can be employed at particular sites to achieve pre-development hydrology. In selecting the appropriate set of practices to be used at the site, project sponsors should consider a broad range of factors, including cost-effectiveness of particular combinations of practices as applied to the site, as well as the potential for ancillary cost savings or community benefits (e.g., elimination or reduction of infrastructure costs, or the creation of attractive green spaces). EPA encourages project sponsors to include these factors in the planning and design phases of their projects so as to maximize triple bottom-line (economic, environmental, and social) results.

E. CALCULATING THE 95TH PERCENTILE RAINFALL EVENT

A long period of precipitation records, i.e., a minimum of 10 years of data, is needed to determine the 95th percentile rainfall event for a location. Thirty years or more of monitoring data are desirable to conduct an unbiased statistical analysis. The National Climatic Data Center (NCDC) provides long-term precipitation data for many locations of the United States. You can download climate data from their Web site (www.ncdc.noaa.gov) or by ordering compact discs (NOTE: The NCDC charges a fee for access to their precipitation data). Local airports, universities, water treatment plants, or other facilities might also maintain long-term precipitation records. Data reporting formats can vary based on the data sources. In general, each record should include the following basic information:

- Location (monitoring station)
- Recording time (usually the starting time of a time-step)
- Total precipitation depth during the time-step

In addition to the above information, a status flag is sometimes included to indicate data monitoring errors or anomalies. Typical NCDC flags include A (end accumulation), M (missing data), D (deleted data), or I (incomplete data). If there are no flags, the record has passed the quality control as prescribed by the NCDC and has been determined to be a valid data point.

There are several data processing steps to determine the 95th percentile rainfall event using a spreadsheet. These steps are summarized below:

1. Obtain a long-term 24-hr precipitation data set for a location of interest (i.e., from the NCDC website).

2. Import the data into a spreadsheet. In MS Excel [Data / Import External Data / Import Data]

3. Rearrange all of the daily precipitation records into one column if the original data set has multiple columns of daily precipitation records.

	A	B	C	D
1	Date	Prcp		
2	1/2/1921	0.05		
3	1/3/1921	0		
4	1/4/1921	0		
5	1/5/1921	0.33		
6	1/6/1921	0.08		
7	1/7/1921	0.08		
8	1/8/1921	0.19		
9	1/9/1921	0		

4. Review the records to identify if there are early periods with a large number of flagged data points (e.g., erroneous data points). Select a long period of good recording data that represents, ideally, 30 years or more of data. Remove all of the extra data (if not using the entire dataset).

5. Remove all flagged data points (i.e., erroneous data points) from the selected data set for further analysis.

6. Remove small rainfall events (typically less than 0.1 inches), which may not contribute to rainfall runoff. These small events are categorized as depressional storage, which, in general, does not produce runoff from most sites.

	A	B	C	D
1	Date	Prcp		
2	1/5/1921	0.33		
3	1/8/1921	0.19		
4	1/14/1921	1.04		
5	2/6/1921	0.12		
6	2/11/1921	0.63		
7	2/20/1921	1.33		
8	2/28/1921	0.43		
9	3/3/1921	0.13		

Note: Steps 4 through 6 can be processed by applying data sort, delete and re-sort spreadsheet functions. In MS Excel [Data / Sort]

7. Calculate the 95th percentile rainfall amount by applying the PERCENTILE spreadsheet function at a cell. In MS Excel [=PERCENTILE(precipitation data range,95%)]

	A	B	C	D	E	F
1	Date	Prcp				
2	1/5/1921	0.33		=PERCENTILE(B:B,95%)		
3	1/8/1921	0.19		1.52		
4	1/14/1921	1.04				
5	2/6/1921	0.12				
6	2/11/1921	0.63				
7	2/20/1921	1.33				
8	2/28/1921	0.43				

Note: The PERCENTILE function returns the nth percentile of value in the entire precipitation data range. This function can be used to determine the 95th percentile storm event that captures all but the largest 5% of storms.

8. The 95th percentile was calculated in the previous step. However, if the user would like to see this information represented graphically and get a relative sense of where individual storm percentiles fall in terms of rainfall depths, the following methodology can be used. Derive a table showing percentile versus rainfall depth to draw a curve as shown below. The PERCENTILE spreadsheet function can be used for each selected percent. It is recommended to include at least 6 points between 0% and 100% (several points should be between 80% and 100% to draw an accurate curve).

	A	B	C	D	E	F	G
1	Date	Prcp		Percentile	Rainfall		
2	1/5/1921	0.33		0%	=PERCENTILE(B:B,D2)		
3	1/8/1921	0.19		10%	=PERCENTILE(B:B,D3)		
4	1/14/1921	1.04		20%	=PERCENTILE(B:B,D4)		
5	2/6/1921	0.12		30%	=PERCENTILE(B:B,D5)		
6	2/11/1921	0.63		40%	=PERCENTILE(B:B,D6)		

	A	B	C	D	E
1	Date	Prcp		Percentile	Rainfall
2	1/5/1921	0.33		0%	0.1
3	1/8/1921	0.19		10%	0.13
4	1/14/1921	1.04		20%	0.17
5	2/6/1921	0.12		30%	0.22
6	2/11/1921	0.63		40%	0.28
7	2/20/1921	1.33		50%	0.36
8	2/28/1921	0.43		60%	0.46
9	3/3/1921	0.13		70%	0.6
10	3/9/1921	0.31		80%	0.79
11	3/13/1921	0.46		85%	0.93
12	3/25/1921	0.47		90%	1.16
13	3/28/1921	0.12		93%	1.35
14	4/1/1921	0.36		94%	1.44
15	4/9/1921	0.69		95%	1.52
16	4/15/1921	0.24		96%	1.65
17	4/17/1921	0.32		97%	1.82
18	4/18/1921	0.55		98%	2.068
19	4/23/1921	0.69		99%	2.508
20	4/24/1921	0.19		99.5%	3.049
21	4/30/1921	1.44		100%	7.06

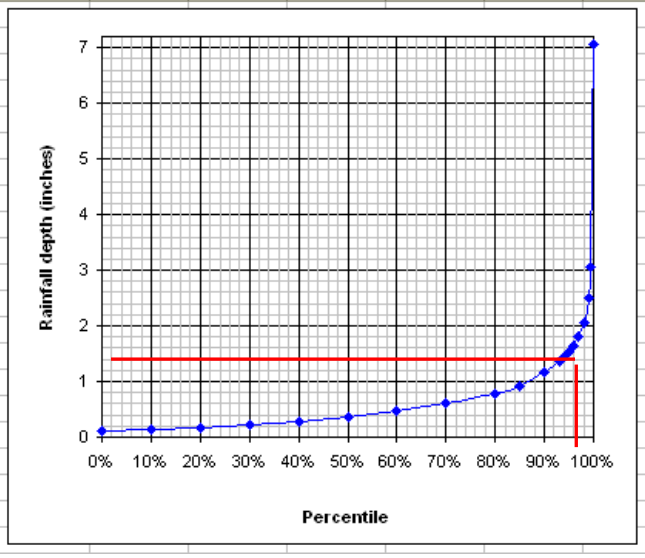

Use the spreadsheet software to create of plot of rainfall depth versus percentile, as shown above. The 95th percentile storm event should correlate to the rainfall depth calculated in step 7, however the graph can be used to calculate rainfall depths at other percentiles (e.g., 50%, 90%).

Part II: Case Studies on Capturing the 95th Percentile Storm Using Onsite Management Practices

INTRODUCTION

This section contains nine case studies that are intended to be representative of the range of projects that are subject to the requirements legislated in Section 438 of the Energy Independence and Security Act. The facility examples in the case studies were selected to illustrate project scenarios for differing geographic locations, site conditions, and project sizes and types. As noted in Part I, all projects with a footprint greater than 5,000 square feet must comply with the provisions of Section 438. What this means is that both new development and redevelopment projects should be designed to infiltrate, evapotranspirate, and/or harvest and use runoff to the maximum extent technically feasible (METF) to maintain or restore the pre-development hydrology of the site. Scenarios 1-8 are examples of sites where it was technically feasible to design the stormwater management system to retain the 95th percentile storm onsite. Scenario 9, however, was provided as an example of an METF analysis where site constraints allowed the designers to retain only 75% of the 95th percentile storm.

Given the site-specific nature of individual projects, the case study scenarios described herein do not include site specific design features such as runoff routing, specific site infiltration rates, the structural loading capacity of buildings, etc. in terms of stormwater practice selection.

It should be noted that an example of Option 2, which requires a site-specific hydrologic analysis, has not been provided in this document because of the complexity of factors and the lack of general applicability such an analysis would have.

Background

Numerous approaches exist for determining the volume of runoff to be treated through stormwater management. Retaining stormwater runoff from all events up to and including the 95th percentile rainfall event was identified as Option 1 because small, frequently-occurring storms account for a large proportion of the annual precipitation volume. Using GI/LID practices to retain both the runoff produced by small storms and the first part of larger storms can reduce the cumulative impacts of altered flow regimes on receiving water hydrology, e.g., channel degradation and diminished baseflow. For the purposes of this guidance, retaining all storms up to and including the 95th percentile storm event is analogous to maintaining or restoring the pre-development hydrology with respect to the volume, flow rate, duration and temperature of the runoff for most sites.

Determination of the 95th Percentile Rainfall Event

The 95th percentile rainfall rainfall event was determined using the long-term daily precipitation records from the National Climate Data Center (NCDC, 2007). By analyzing the frequency and rainfall depths from daily rainfall records over 24-hour periods, the 95th percentile storm event can be determined. From a frequency analysis viewpoint, the 95th percentile event is the storm event that is greater than or equal to 95% of all storms that occur within a given period of time. Regional climate conditions and precipitation vary across the U.S. Because of local values, it is essential that the implementing agency or department establish the 95th percentile storm event for

the project site since the control volume may vary depending on local weather patterns and conditions.

Onsite Stormwater Management Practice Determinations

For the purposes of the case study scenarios, the following four categories of practices were selected as the most appropriate practices for implementing Section 438 requirements: bioretention, permeable pavements and pavers, cisterns, and green roofs. These practices were selected based on known performance data and cost. For each case study, the same hierarchy of selection criteria was used, i.e., the most cost effective practices were considered before other practices were considered. Bioretention practices were considered first because these systems generally have the lowest cost per unit of stormwater treated (Hathaway and Hunt, 2007). Thus, if the bioretention system could not be designed to adequately capture the desired runoff volume, permeable pavement and pavers, cisterns, and green roofs were considered in that order based on relative cost. In most cases a combination of practices was selected as part of an integrated treatment system. It should be noted that all treatment systems were designed to accomplish the goal of capturing the 95th percentile rainfall event onsite. Examples of onsite stormwater management practices selected for each site are presented in the results section. For the Boston, MA site, it was assumed that bioretention was not feasible in order to simulate a situation where space was severely limited; as a result, interlocking modular pavers were selected as the most cost-effective stormwater management to capture the requisite design volume. To further illustrate the range of site conditions designers may encounter, and how site conditions impact the selection of appropriate control options, Scenario #3 (Cincinnati, OH) was re-analyzed as Scenario #8. In Scenario #8, it was assumed that the site had clay soils and low infiltrative capacity. Given these site conditions, the range of potential control options was more limited and a combination of modular paving blocks, a green roof, and cisterns was ultimately selected based on cost and site suitability factors.

For purposes of these modeling exercises, a number of assumptions were associated with each category of practice. These assumptions are not necessarily an endorsement of a particular design paradigm, but rather were used to keep a somewhat conservative cap on the scenarios in order to demonstrate the feasibility of the approach. For example, bioretention retrofits can and should often be located in prior impervious locations; however, in all modeled scenarios bioretention was restricted to currently landscaped areas. The assumptions were:

- **Bioretention areas**: On-lot retention of stormwater through the use of vegetation, soils, and microbes to capture, treat and infiltrate runoff.

  It is assumed bioretention practices would be installed within currently landscaped pervious areas or that pervious areas would be created for bioretention cells. While termed bioretention, these systems are designed to provide infiltration as well as temporary storage. Bioretention areas would be designed to accept up to a depth of 10 inches of water across the surface of the bioretention cell (see Appendix A). The conceptual design of this storage depth would occur within the media and/or could be included as ponded storage. Further design storage beyond the 10 inches would be acceptable (and encouraged) above the media on a site-by-site basis with ponded depth generally not to exceed 12 inches.

Uniform infiltration was assumed across the entire base of the bioretention cell. No additional media underneath the amended soils were included in the designs with infiltration rates in this layer governed by the *in situ* soils. Underdrains were not modeled directly but could be applied at the point of storage overflow such that no overflow occurs until the design depth of 10 inches is saturated. This approach was selected to maximize the storage and infiltration benefits of these systems. Designs utilizing underdrains at the base of the bioretention cell do not store the requisite volumes because the media is permeable and the underdrain conveys the runoff offsite through the underdrain before it can be infiltrated. Because standard underdrains typically discharge from smaller storms as well, underdrain designs, if employed, should ensure adequate retention capacity for the 95th percentile event volume.

The bioretention footprint for modeling purposes was calculated as one uniform area that did not include side slopes. There is an expectation that actual bioretention cell construction would be distributed throughout the site with targeted locations based on hydrology (natural flow paths) and soils with greater infiltrative capacity. Side slopes may increase the surface excavation area required to accommodate the footprint and freeboard of these systems depending on the design or the bioretention system.

- **Porous/permeable pavement**: Transportation surfaces constructed of asphalt, concrete or permeable pavers that are designed to infiltrate runoff.

  Infiltration was modeled for the entire porous pavement area with drainage pipes used only as overflow outlets. This design was chosen to maximize infiltration capabilities of the system. While many types of porous pavement systems can be used, modular block type pavers were generally applied in this design category under the assumption that they typically include sufficient volumetric storage in the media layer. [Note: Other types of porous pavement applications are available that support heavy loads and can be designed to temporarily store and infiltrate runoff beneath the surface of the pavement.]

  For these systems, an equivalent of 2 inches of design storage depth was assumed. This design depth could be achieved by specifying 10 inches of media depth that had 20% void space. Similarly, this could be achieved by designing six inches of media depth above the bottom surface, with specified media containing 33% void space. This alternative would have the overflow outlet at the 6 inch depth providing an equivalent water storage depth of 2 inches.

  The soils under the paver blocks may require or be subjected to some compaction for engineering stability. As a result, infiltration into underlying soils was modeled conservatively by applying the minimum infiltration rate for each soil type (see Appendix A).

  Generally, porous pavement is not recommended for high traffic areas or loading bays Because of this the scenarios assumed that only a percentage of total parking and road areas on a site can be converted to porous pavement. The assumed maximum percentage

applied in the scenarios was set at 60% of the total paved area. Guidance on porous pavements is available at: http://cfpub.epa.gov/npdes/greeninfrastructure/technology.cfm#permpavements

- **Cistern**: Containers or vessels that are used to store runoff for future use.

  Cisterns were modeled in cases where green roofs were not feasible or where it was necessary to include additional storage volume to meet the goal of onsite rainfall runoff capture. The sizes of cisterns would be calculated based on site-specific rainfall, site-specific spatial and structural conditions, use opportunities and rates, and consideration of cost per volume of storage. For simplicity, cistern volume was reported as a total volume. This total volume could be subdivided into any number of cisterns to provide the total necessary storage but should be based on the impervious area and runoff quantities which will flow to the cistern. The most efficient cost per volume storage would need to be considered on a site-by-site basis (see Appendix A).

- **Green roof**: Roof designed with light weight soil media and planted with vegetation.

  Frequently, green rooftop area is limited by structural capacity. In addition, other rooftop equipment may need to be accommodated in this space including HVAC systems and air handlers. For this reason, and to provide a somewhat conservative rate of application, it was assumed for these modeling analyses that up to 30% of a roof's impervious area could be converted into a green roof. Green roof area was assumed to have 1 inch of total effective stormwater storage, i.e., a 2.5 inch media depth with 40% void space (see Appendix A).

General Approach

Using site aerial photos, spatial analysis should be conducted to estimate the land cover types and areas for each site. The surface conditions of each site can be digitized using geographic information systems (GIS) techniques. Alternatively, computer-aided design (CAD) drawings can be used to estimate the surface area of each land cover type. The schematic in Figure 10 illustrates the processes used for selecting and determining the overall size of stormwater management practices for each site.

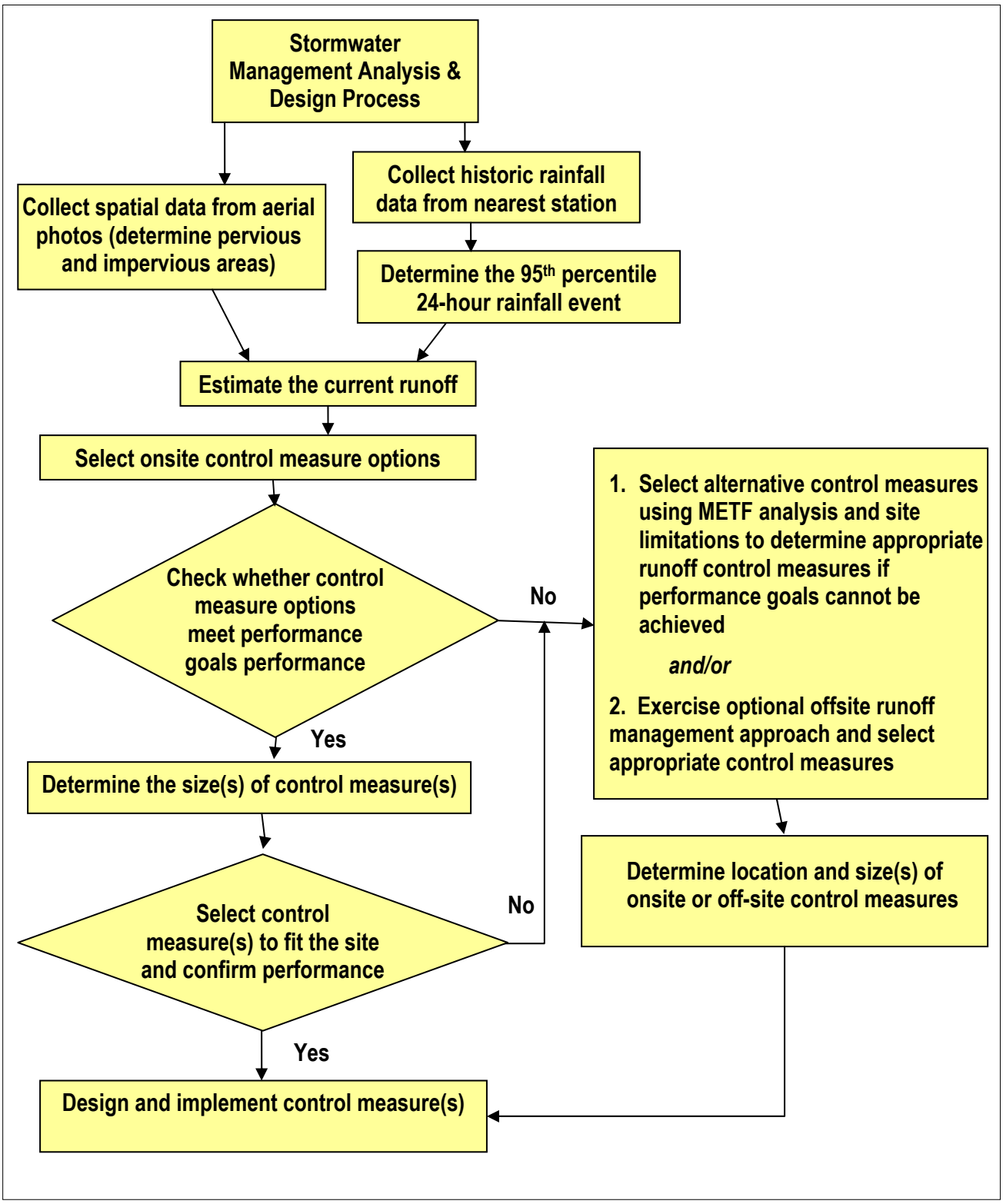

Figure 10. Flow chart depicting the process for determining control measures using the 95th percentile, 24-hour, annual rainfall event.

The following steps provide more detailed information on acquiring and calculating the necessary data to complete the processes indicated in Figure 10. This methodology was used in the scenario analyses that follow.

Collecting spatial data for a site

1. Collect an aerial orthophotograph for the desired site.
2. Digitize land use/land cover conditions using GIS techniques. If CAD drawings of the site exist, they can be used to estimate land cover area (pervious, impervious).
3. Categorize the digitized or planned land use/land cover based on surface hydrologic conditions, e.g., rooftop, pavement, and pervious/landscaped area.
4. Estimate the size of each land use/land cover category (by polygon).

Determining the 95th percentile, 24-hr rainfall event

1. Obtain a long-term 24-hr precipitation data set for the location of interest (i.e., from the NCDC Web site or other source).
2. Import the data into a spreadsheet. *In MS Excel* [Data / Import External Data / Import Data]
3. Rearrange all of the daily precipitation records into one column if the original data set has multiple columns of daily precipitation records.
4. Remove all flagged data points (i.e., erroneous data points) from the selected data set for further analysis.
5. Remove small rainfall events (typically less than 0.1 inches) that may not contribute to rainfall runoff. These small storms often produce little if any appreciable runoff from most sites and for modeling purposes are typically considered as volume captured in surface depression storage.
6. Calculate the 95th percentile rainfall volume by applying the PERCENTILE spreadsheet function to a range of data cells. The PERCENTILE function returns the nth percentile value in the specified precipitation data range. This function can be used to determine the 95th percentile storm event that captures all but the largest 5% of storms. *In MS Excel* [PERCENTILE(precipitation data range,95%)]

Estimating Current Runoff and Placing onsite control measures to capture the 95th percentile rainfall event

1. Collect spatial data for a site, e.g., rooftop, pavement, and pervious areas as above.
2. Check soil type (USDA mapping, borings, or onsite testing) for the site to determine infiltration parameters. For this modeling, many of the assumptions that pertain to generalized soils groups and their infiltration properties come from the EPA Stormwater Management Model (SWMM 4.x) manual (see Appendix A).
3. Determine the current runoff volume that would occur during a 24 hour period by applying the 95th percentile rainfall to the existing site conditions (land use and soil properties) as above using a hydrologic model (such as TR-55 or SWMM). For this analysis, it is assumed that the rainfall amount is distributed over a 24 hour period. Actual rainfall event duration (and intensity) was not considered for determining rainfall runoff (however, timing was considered when modeling infiltration).
4. Determine flow paths so that management practice placements are in locations where flows can be intercepted and routed to practices. Because this is a site specific effort and may require detailed topographic information or further surveys this would be a task to be

completed onsite and therefore is not included as a part of the modeling scenario exercise.

5. Select onsite control practices to capture the current 95th percentile runoff event; base the selection of appropriate options on site conditions, areas available for treatment options, and other factors such as site use and other constraints.

Note: The steps above have been generalized for the purposes of this guidance. It is recommended that a qualified professional engineer determine or verify that stormwater management practices are sized, placed, and designed correctly. It should also be noted that the methodology to determine rainfall amount used a 24 hour time period based on daily records. Actual rainfall events may have occurred over shorter or longer time periods. Similarly, for modeling purposes, the 24 hour rainfall amount was distributed to pervious and impervious areas (and management practices) as a uniform event occurring during a 24-hour period. A large dataset (greater than 50 years) was used to reasonably represent rainfall depth on a daily bases. It stands to reason that more frequent, shorter duration precipitation events are better represented than less frequent, longer duration precipitation events.

Scenarios

Eight locations were selected for the 9 case studies as shown in Figure 11 and Table 2. Case study numbers 3 and 8 were both developed based on the Cincinnati, Ohio facility, although the site parameters were altered to represent differing site conditions and design constraints. Annual average rainfall depths for these locations range from 7.5 inches to 48.9 inches. Analyses of the 95th percentile rainfall events for these locations produced rainfall depths that range from 1.00 inch to 1.77 inches (Table 2).

Figure 11. Locations for Analyzing Onsite Control Measures.

The government facilities in the 8 case study locations were selected because they represent generic sites from the major climatic regions of the U.S. These facilities also were selected because the sites have a range of site characteristics that can be used to illustrate different site designs and stormwater management options, e.g., pervious, roof, and pavement areas (Table 3). Site sizes ranged from 0.7 to 27 acres with percent site imperviousness area ranging from 47% to 95% of the site. Aerial photos of the sites are included along with site specific rainfall runoff and soil results.

Table 2. Summary of Rainfall Data for the Seven Locations.

No	Location	NCDC Daily Precipitation Data		Rainfall Depth (inches)	
		Period of record	Coverage	Annual average	95th percentile rainfall event
1	Charleston, WV	1/1/1948 - 12/31/2006 (59 yrs)	99%	43.0	1.23
2	Denver, CO	1/1/1948 - 12/31/2006 (59 yrs)	96%	15.2	1.07
3	Cincinnati, OH	1/1/1948 - 12/31/2006 (59 yrs)	96%	36.5	1.45
4	Portland, OR	1/1/1941 - 12/31/2006 (66 yrs)	98%	35.8	1.00
5	Phoenix, AZ	1/1/1948 - 12/31/2006 (59 yrs)	99%	7.5	1.00
6	Boston, MA	1/1/1920 - 12/31/2006 (87 yrs)	99%	41.9	1.52
7	Atlanta, GA	1/1/1930 - 12/31/2006 (77 yrs)	100%	48.9	1.77
8	Norfolk, VA	1/1/1957 - 12/31/2006 (50 yrs)	99%	45.4	1.68

The results of the spatial analyses were summarized and divided into three land cover categories; rooftop, pavement, and pervious area, as shown in Table 3.

Table 3. Summary of Land-use Determinations of the Study Sites.

No	Location	Facility Spatial Info (acres)				Site Imperviousness
		Rooftop	Pavement	Pervious	Total	
1	Charleston, WV	0.1	0.4	0.2	0.7	73%
2	Denver, CO	0.5	1.9	2.0	4.5	55%
3	Cincinnati, OH	1.6	8.0	9.4	19	51%
4	Portland, OR	8.8	16.9	1.3	27	95%
5	Phoenix, AZ	0.2	0.7	1.1	2	47%
6	Boston, MA	0.9	1.5	1.1	3.5	69%
7	Atlanta, GA	3.9	10.8	6.2	21	70%
8	Norfolk, VA	0.9	0.55	0.15	1.6	91%

Methods for Determining Runoff Volume

Direct Determination of Runoff Volume

Runoff from each land cover was estimated using a simplified volumetric approach based on the following equation:

$$Runoff = Rainfall - Depression\ Storage - Infiltration\ Loss$$

Again, this methodology does not consider routing of runoff; therefore slope is not considered when calculating on a volumetric basis.

Infiltration loss is calculated only in pervious areas (e.g., there is no infiltration in impervious areas). In this analysis, infiltration was estimated using Horton's equation:

$$F_t = f_{min} + (f_{max} - f_{min})\, e^{-kt}$$

where, F_t= infiltration rate at time t (in/hr)
f_{min} = minimum or saturated infiltration rate (in/hr)
f_{max} = maximum or initial infiltration rate (in/hr)
k = infiltration rate decay factor (/hr) and
t = time (hr) measured from time runoff first discharged into infiltration area

Infiltration loss for the 24-hr rainfall duration was estimated by the following equation with assumptions of a half hour Δt and uniform rainfall distribution in time:

$$Infiltration\ Loss = \sum (f \cdot \Delta t)$$

To more accurately describe the dynamic process of infiltration associated with Horton's equation, infiltration loss was integrated over a 24-hour period using a half hour time step while applying the maximum and minimum infiltration rates (in/hr) with time using the appropriate soil decay factor. The results of this process are further illustrated in Appendix A.

Once runoff from each land cover was estimated, the total runoff from a site can be obtained using an area-weighted calculation as shown below:

$$Runoff_{site} = \{(Runoff_{roof} \times A_{roof}) + (Runoff_{pavement} \times A_{pavement}) + (Runoff_{pervious} \times A_{pervious})\} / A_{site}$$

Where $Runoff_{site}$ = total runoff from the site (inches); A_{site} = site area (acres); $Runoff_{roof}$ = runoff from rooftop (inches); A_{roof} = rooftop area (acres); $Runoff_{pavement}$ = runoff from pavement area (inches); $A_{pavement}$ = pavement area (acres); $Runoff_{pervious}$ = runoff from pervious area (inches); and $A_{pervious}$ = pervious area (acres).

An example demonstrating how to calculate runoff by applying the Direct Determination method is presented below using the Charleston, WV (Scenario #1) site condition presented in Tables 2 and 3.

$Runoff_{roof}$ = *95th Rainfall – Depression Storage*
= 1.23 – 0.1 = 1.13 inches

$Runoff_{pavement}$ = *95th Rainfall – Depression Storage*
= 1.23 – 0.1 = 1.13 inches

$Runoff_{pervious}$ = *95th Rainfall – Depression Storage – Infiltration Loss*
= 1.23 – 0.1 – 9.73 = 0 inches (i.e., no runoff because the result is a negative number)

$$Runoff_{site} = \{(Runoff_{roof} \times A_{roof}) + (Runoff_{pavement} \times A_{pavement}) + (Runoff_{pervious} \times A_{pervious})\} / A_{site}$$
$$= \{(1.13 \times 0.10) + (1.13 \times 0.41) + (0 \times 0.19)\} / 0.7 = 0.82 \text{ inches}$$

Infiltration loss was estimated based on soil type B by applying the Horton equation as described above. Because the volume removed from surface runoff through infiltration was substantial, no runoff occurred from the pervious area.

In cases where sites had limited physical space available for stormwater management, a series of practices was used (e.g., treatment train) to simulate the runoff and infiltrative behavior of the system. For example, if there was inadequate area and infiltrative capacity to infiltrate 100 percent of the 95th percentile storm event within a bioretention system another onsite management practice was selected to manage the runoff that could provide the necessary capacity. In this manner, excess runoff was routed to another management practice in the series of treatment cells where possible.

Two types of soils were considered for every site: hydrologic soil group B and C (except for scenario 8 in which hydrologic soil group D was used). Group B soils typically have between 10 percent and 20 percent clay and 50 percent to 90 percent sand and either loamy sand or sandy loam textures with some loam, silt loam, silt, or sandy clay loam soil textures placed in this group if they are well aggregated, of low bulk density, or contain greater than 35 percent rock fragments. Group C soils typically have between 20 percent and 40 percent clay and less than 50 percent sand and have loam, silt loam, sandy clay loam, clay loam, and silty clay loam soil textures with some clay, silty clay, or sandy clay textures placed in this group if they are well aggregated, of low bulk density, or contain greater than 35 percent rock fragments (USDA-NRCS, 2007). The application of these hydrologic soil groups was intended to give reasonable and somewhat conservative estimates of infiltration capacity.

General hydrologic parameters in this analysis were assumed as follows (see Appendix A for citations of assumptions):

- Depression storage (or initial abstraction)
    - Rooftop: 0.1 inches
    - Pavement: 0.1 inches
    - Pervious area: 0.2 inches

- Horton Infiltration parameters
    - Hydrologic Soil Group B
        - Maximum infiltration rate: 5 in/hr
        - Minimum infiltration rate: 0.3 in/hr
        - Decay factor: 2 /hr

    - Hydrologic Soil Group C
        - Maximum infiltration rate: 3 in/hr
        - Minimum infiltration rate: 0.1 in/hr
        - Decay factor: 3.5 /hr

- Design storage assumptions of control measures
    - Bioretention: up to 10 inches (but variable based on balancing necessary storage volume, media depth for plant survivorship, and surface area limitations)
    - Green roof: 1 inch (2.5 inches deep media with 40% void space)
    - Porous pavement: 4 inches (10 inches deep media with 40% void space)

Other Methods for Estimating Runoff Volume

Runoff from a site after applying the 95th percentile storm can be estimated by using a number of empirical, statistical, or mathematical methods. Several methods were considered in this analysis. The Rational Method can be used to estimate peak discharge rates and the Modified Rational Method can be used to develop a runoff hydrograph. The NRCS TR-55 model can be used to predict runoff volume and peak discharge. TR-55 can also be used to develop a runoff hydrograph. The EPA Stormwater Management Model (SWMM) can be used to simulate rainfall-runoff, pollutant build-up and wash-off, transport-storage-treatment of stormwater flow and pollutants, backwater effects, etc. for a wide range of temporal and spatial scales. The SWMM model can be fit to model a small site with a distributed system. Hydrologic Simulation Program – Fortran (HSPF, USDA) is a watershed and land use based lumped model that can be used to compute the movement of water and pollutants when evaluating the effects of land use change, reservoir operations, water quality control options, flow diversions, etc. In general, regionally calibrated modeling parameters are incorporated into HSPF. QUALHYMO is a complete hydrologic and water quality model, which can be used to factor in snowmelt or soil moisture conditions or to simulate system behavior based on infiltration and ET, ground water storage tracking, baseflow and deep volumetric losses, and other variables.

Many of the existing tools for analyzing distributed systems use some part or all of the principles or formulae of the modeling approaches highlighted above. For example, the Emoryville spreadsheet control measure model (Emoryville, CA) uses a runoff coefficient (i.e., Rational Method) for analyzing lot-level to neighborhood-scale control measure sizing. The Green Calculator (Center for Neighborhood Technologies) estimates the benefit of onsite GI/LID options on a neighborhood-scale by applying the curve numbers (i.e., TR-55) and the Modified Rational Method. The Northern Kentucky Spreadsheet Tool uses a TR-55 based approach for control measure sizing on neighborhood or site level spatial scales. The WWHM (Western Washington Hydrology Model) is a regionally calibrated HSPF model intended for use in sizing stormwater detention and water quality facilities to meet the Washington State Department of Ecology standards. WBM-QUALHYMO is a Canadian model used in conjunction with the Water Balance Model (WBM). This model can be used to continuously simulate stormwater storage routing, stream erosion, drainage area flow routing, and snowmelt runoff (and ultimately freeze-thaw). Table 4 contains a summary of these different methods based on generic modeling features.

Table 4. Potential Methods for Analyzing Control Measures.

Model Considerations		Rational Method	TR-55	SWMM	Direct Determination	HSPF	QUALHYMO
Temporal scale	Single Event	Yes	Yes	Yes	Yes	Yes	Yes
	Continuous Simulation	No	No	Yes	Possible	Yes	Yes
Spatial scale	Lot-level	Yes	Yes[b]	Yes	Yes	No	No
	Neighborhood	Yes	Yes	Yes	Yes	Possible	Possible
	Regional	Yes	Yes[c]	Yes	No	Yes	Yes
Outputs	Peak Discharge	Yes	Yes	Yes	No	Yes	Yes
	Runoff Volume	Yes	Yes	Yes	Yes	Yes	Yes
	Hydrograph	Yes[a]	Yes	Yes	No	Yes	Yes
	Water Quality	No	No	Yes	Possible	Yes	Yes

[a] Modified Rational Method

[b] No less than 1 acre.

[c] No more than 25 square miles (up to 10 subareas).

From the viewpoint of modeling both lot-level and neighborhood scale projects, the Rational Method, NRCS TR-55, SWMM, and Direct Determination approaches were selected for use in scenario analyses. Strength and weakness of these methods are presented below:

Table 5. Comparison of approaches for determining runoff volume.

Method	Strengths	Weaknesses
Direct Determination	• Methodology for runoff determination is same as SWMM • Models basic hydrologic processes directly (explicit) • Simple spreadsheet can be used	• Direct application of Horton's method may estimate higher infiltration loss, especially at the beginning of a storm • Does not consider flow routing
Rational Method	• Method is widely used • Simple to use and understand	• Cannot directly model storage-oriented onsite control measures
TR-55	• Method is widely used • Simple to use and understand	• May not be appropriate for estimating runoff from small storm events because depression storage is not well accounted for
SWMM	• Method is widely used • Can provide complete hydrologic and water quality process dynamics in stormwater analysis	• Needs a number of site-specific modeling parameters • Generally requires more extensive experience and modeling skills

Each method requires specific parameters for estimating runoff from a site. Runoff coefficients for the Rational Method are assumed to be 0.9 for rooftop and pavement areas, and 0.1 and 0.135 for Group B and C soil pervious areas, respectively (Caltrans, 2003). The slope of the pervious area was assumed to be an average of 2%. Applying these runoff coefficients for each surface, the overall area-weighted runoff coefficient can be determined.

When applying the NRCS TR-55 method, Curve Numbers (CNs) should be determined for each drainage area. For rooftop and pavement areas the CN was assumed to be 98, and pervious area CN was determined on the basis of the hydrologic soil group and the status of grass cover condition. Curve numbers for pervious areas were assumed to be 61 and 74 for Group B and C soils, respectively, with an assumption of over 75% grass cover. The overall CN can be estimated by using an area-weighted calculation (USDA-SCS, 1986).

In SWMM modeling, infiltration was modeled using Horton's equation. The same infiltration parameters and depression storage values used in the direct determination method of runoff treatment volume described earlier were applied to the SWMM analyses. The average slope of the pervious area was again assumed to be 2%. The same uniform rainfall distribution and time step was applied for the SWMM model runs.

Runoff Methodology Results

Stormwater management practice sizes (and depth) were determined using the Direct Determination approach to capture the volume of runoff generated in a 95th percentile rainfall event at each location. Total acreage, impervious area, the 95th percentile rainfall event, the current expected runoff for the 95th percentile rainfall event, and the future runoff with stormwater management controls were reported for each site. Results were summarized for the two soil types (three soil types for scenarios #3 and #8 in Cincinnati). The spatial location of onsite control measures was also illustrated in the site aerial photo figures. Note that site practices were placed only on undeveloped or landscaped areas without regard for true flow paths or technical feasibility. It may be preferred to place practices in existing impervious areas, if possible. For the purposes of this modeling exercise, the least cost and most practical solutions were used, i.e., locating bioretention systems on undeveloped or landscaped areas. On an actual site, flow paths would be determined and berms and swales might be used to route runoff to areas that are most suitable for infiltration. In other cases, areas that are currently impervious could be modified to accept runoff, e.g., impermeable pavements removed and replaced by permeable, sidewalks could be redesigned to include sidewalk bioretention cells and streets could be designed with flow through or infiltration curb bumpouts/raingardens.

To compare other approaches of runoff estimation, alternate methodologies were also employed for three scenarios. TR-55 was used for Scenario #1 (Atlanta), the Rational Method was applied to Scenario #2 (Denver), and the SWMM was run for Scenario #7 (Charleston).

Although flood control is not the focus of this guidance, most localities have flood control requirements that will need to be considered in designing control measures to comply with Section 438. For flood control purposes, TR-55 was used to model the 10 year frequency design storm for each site under the assumption that all stormwater management practices were in place. The 10-year design storms were selected from the NRCS TR-55 Manual (USDA, 1986) for both the Eastern U.S. and the Western U.S. Precipitation Frequency Maps (www.wrcc.dri.edu/pcpnfreq.html). The 10-year frequency design storm was selected because it represents a common design standard used by state and local governments in order to manage peak rates of runoff and prevent flooding.

COST ESTIMATES FOR SELECTED SCENARIOS

Scenarios #2 and 7 include cost estimates comparing the capital costs for a design to comply with Section 438 (retention of the 95th percentile rainfall event) and capital costs for a traditional stormwater management design (e.g., typical curb and gutter, off-site pond for stormwater management). These costs are based on average unit costs to construct both traditional and GI/LID controls.

Scenario #1 - Charleston, WV

A 0.7-acre site with 73% impervious area was selected from Charleston, West Virginia (Figure 12). If the 95th percentile rainfall event (1.23 inches) occurred on the existing site (i.e., with no control measures), 0.82 inches of runoff using the Direct Determination method would be generated and require management. The runoff from the 95th percentile rainfall event could be retained by the installation of bioretention systems totaling 0.03 acres if hydrologic soil group B is present, or 0.06 acres if hydrologic soil group C (Table 6) is the predominant soil type on the site. Assuming that bioretention practices are placed in areas that are currently pervious or landscaped, a total of 0.2 acres of pervious area would be available for the placement of bioretention systems. The effective design storage depth within the designated bioretention area was 8 inches.

Figure 12. Actual Site and Onsite Control Measures (Charleston, WV)

Table 6. Estimated Sizes of Onsite Control Measures for Scenario #1 (Charleston, WV)

Total Area (acres)		0.7	
Estimated Imperviousness (%)		73%	
95th Percentile Rainfall Event (inches)		1.23	
Expected Runoff for the 95th Percentile Rainfall Event (inches)		0.82	
Stormwater Management Area Required		Hydrologic Soil Group	
		B	C
Bioretention estimated by Direct Determination method (acres)		0.03	0.06
Bioretention estimated by SWMM (acres)		0.03	0.05
Off-site storage necessary to control the 10-yr event of 3.9 inches (acre-ft)	With onsite controls	0.10	0.12
	Without onsite controls	0.16	0.17

Note: The two hydrologic methods used (direct determination and SWMM) estimated similar bioretention sizes.

Scenario #2 - Denver, CO

A 4.5-acre site with 55% impervious area was selected from Denver, Colorado (Figure 13). If the 95th percentile rainfall event (1.07 inches) occurred on the existing site (i.e., with no control measures), 0.53 inches of runoff from the site would be generated and require management. The runoff from the 95th percentile rainfall event could be retained by the installation of bioretention systems totaling 0.16 acres if the hydrologic soil group B is present or 0.3 acres if hydrologic soil group C (Table 7) is the predominant soil type on the site. Assuming that bioretention practices are only placed in areas that are currently pervious or landscaped, a total of 2 acres of pervious area is available for the placement of bioretention systems. The design storage depth of media within the designated bioretention area was 6 inches.

Figure 13. Actual Site and Onsite Control Measures (Denver, CO)

Table 7. Estimated Sizes of Onsite Control Measures for Scenario #2 (Denver, CO)

Total Area (acres)		4.5	
Estimated Imperviousness (%)		55%	
95th Percentile Rainfall Event (inches)		1.07	
Expected Runoff for the 95th Percentile Rainfall Event (inches)		0.53	
Stormwater Management Area Required		Hydrologic Soil Group	
		B	C
Bioretention estimated by the Direct Determination method (acres)		0.16	0.3
Bioretention estimated by Rational Method (acres)		0.16	0.28
Off-site storage necessary to control the 10-yr event of 3.2 inches (acre-ft)	With onsite controls	0.35	0.52
	Without onsite controls	0.64	0.64

Cost estimates were also developed for this scenario (Table 8) to compare the costs of installing onsite control measures to retain the 95th percentile rainfall event versus the costs to install traditional stormwater management controls (e.g., curbs and gutters combined with off-site retention such as extended detention wet ponds). In a GI/LID scenario, the bioretention cell would occupy a specified area. This same area in a traditional design would be covered in turf since the pond would typically be offsite and not occupy the area planted in turf. Table 8 includes this cost under the traditional column. Note: typical land development practices involve mass clearing and grading so little or no pre-existing vegetation is typically retained. It is also assumed that the use of GI/LID practices would require less underground infrastructure because the traditional design typically routes stormwater underground to an off-site pond via pipes or culverts while GI/LID practices are designed to manage runoff onsite and as close to its source as possible. They are also dispersed across the site and routing occurs through surface drainage via bioswales and overland flow. As a result GI/LID practices do not require as much or any hard or grey infrastructure. The cost estimates were developed for Hydrologic Soil Group B.

Table 8. Estimated Costs for Scenario #2 (Denver, CO)

Sizes of Onsite Control Practices			
		Controls for 95th Percentile Event	Traditional Stormwater Controls
Rainfall depth (in)		1.07	
Bioretention (acres)		0.1	
Paver blocks (acres)		0	
Green roof (acres)		0	
Off-site Pond	WQV (ac-ft)	-	0.18
	10-Yr Fld Cntr (ac-ft)	0.15	0.14
Total Off-Site Requirement (ac-ft)		0.15	0.32
Land Area (assumes avg 3 ft depth)		0.05	0.11
% of the site		2.8%	
Costs of Onsite Control Practices			
Biorention/alternative		$32,495	$4,187
Off-site Pond	WQV (ac-ft)		$14,833
	10-Yr Fld Cntr (ac-ft)	$10,073	$9,527
Infrastructure	Pipe	$8.990	$16,982
	Inlet	$9.920	$14,880
Land Area (assumes $300K/acre)		$14,500	$31,500
Sum		**$75,978**	**$91,909**
% difference from Traditional		**-17.3%**	

Scenario #3 - Cincinnati, OH

A 19-acre site with 51% impervious area was selected in Cincinnati, Ohio (Figure 14). If the 95th percentile rainfall event (1.45 inches) occurred on the existing site (i.e., no control measures were in place), 0.68 inches of runoff from the site would be generated and require management. The runoff from the 95th percentile rainfall event could be retained by the installation of bioretention systems totaling 0.8 acres if the hydrologic soil group B is present or 1.3 acres if hydrologic soil group C (Table 9) is the predominant soil type on the site. Assuming that bioretention practices are only placed in areas that are currently pervious or landscaped, a total of 9.4 acres of pervious area is available for the placement of bioretention systems. The design storage depth of media within the designated bioretention area was 8 inches.

Figure 14. Actual Site and Onsite Control Measures (Cincinnati, OH)

Table 9. Estimated Sizes of Onsite Control Measures for Scenario #3 (Cincinnati, OH)

Total Area (acres)		19	
Estimated Imperviousness (%)		51%	
95th Percentile Rainfall Event (inches)		1.45	
Expected Runoff for the 95th Percentile Rainfall Event (inches)		0.68	
Stormwater Management Area Required		Hydrologic Soil Group	
		B	C
Bioretention estimated by the Direct Determination (acres)		0.8	1.3
Off-site storage necessary to control the 10-yr event of 4.2 inches (acre-ft)	With onsite controls	2.42	3.24
	Without onsite controls	3.29	3.73

Scenario #4 - Portland, OR

A 27-acre site with 95% impervious area was selected in Portland, Oregon (Figure 15). If the 95th percentile rainfall event (1.0 inches) occurred on the existing site (i.e., no control measures), 0.86 inches of runoff would be generated and require management. This site has the greatest imperviousness among the 7 sites.

Given these site conditions, there is not enough pervious area to manage the entire runoff volume discharged by the 95th percentile rainfall event with bioretention. As a result, other practices were evaluated and selected. The practices integrated into the design included a green roof, cisterns, and porous pavement. Based on the technical considerations of constructing and maintaining control measures at the site, it was assumed that approximately 30% of the available pervious area could be converted into bioretention cells; 20% of total rooftop area could be converted into green roofs; 40% of paved area could be converted into paver blocks; and 50,000 gallons of total volume could be captured in cisterns for use on this urbanized site. Using this system of four different practices, all runoff for the 95th percentile rainfall event would be retained (Table 10).

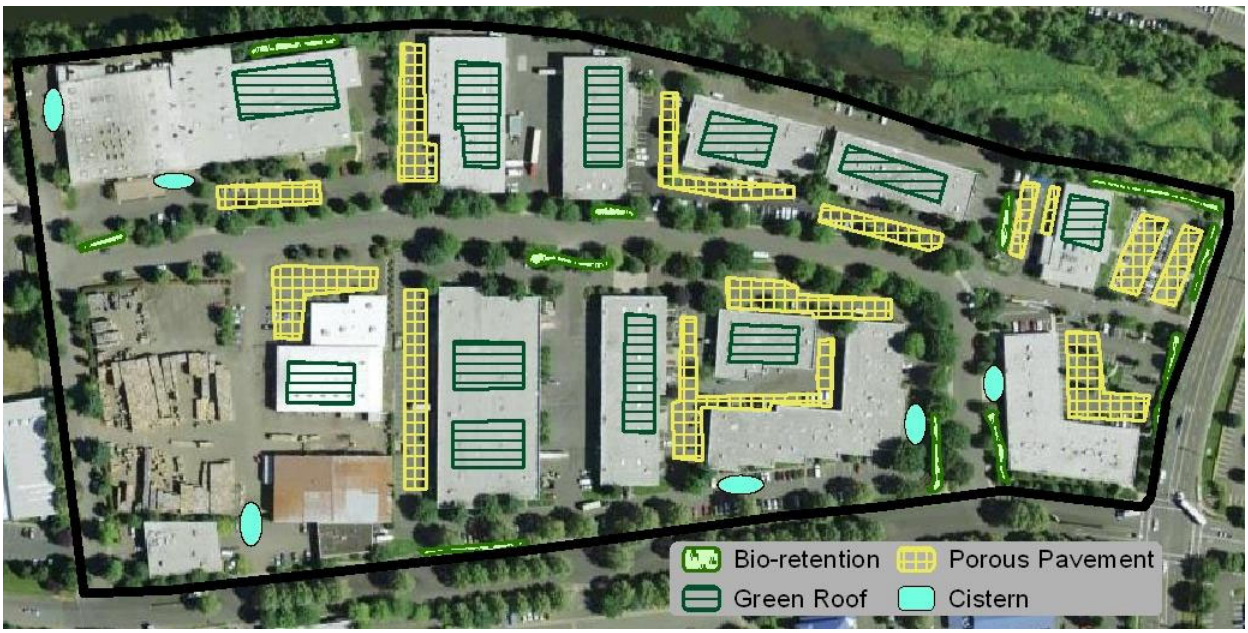

Figure 15. Actual Site and Onsite Control Measures (Portland, OR)

Table 10. Estimated Sizes of Onsite Control Measures for Scenario #4 (Portland, OR)

Total Area (acres)		27	
Estimated Imperviousness (%)		95%	
95th percentile Rainfall Event (inches)		1.00	
Expected Runoff for the 95th Percentile Rainfall Event (inches)		0.86	
Stormwater Management Area Required		Hydrologic Soil Group	
		B	C
Paver block area estimated by Direct Determination (acres)		1.4	3.5*
Bioretention estimated by Direct Determination (acres)		0.4	
Green Roof estimated by Direct Determination (acres)		1.7	
Cistern volume estimated by Direct Determination (gallons)		50,000	
Off-site storage necessary to control the 10-yr event of 3.7 inches (acre-ft)	With onsite controls	5.37	5.62
	Without onsite controls	7.70	7.71

*The size of porous pavement area was increased because the other control options were maximized based on

A total of 1.3 acres of the site is pervious area or landscaped of which, 0.4 acres (30% of the pervious area) could be converted to bioretention cells that have a storage depth of 10 inches. Of the 8.8 acres of current rooftop area, 1.7 acres (20% of the rooftop area) could be retrofitted into green roof areas. Of the 16.9 acres of paved area, 1.4 acres (8% of the paved area) for hydrologic soil group B, or 3.5 acres (20% of the paved area) for hydrologic soil group C, of paver block systems could be implemented. One or more cisterns (as indicated in Figure 15) could be used to capture up to 50,000 gallons of runoff from rooftop areas. Note: The high percentage of imperviousness of the site (95%) requires that all infiltration designs be based on resident soil type and design volumes, or with adequate sub-bases or amended soils.

Scenario #5 – Near Phoenix, AZ

A 2-acre site with 47% impervious area was selected near Phoenix, Arizona (Figure 16). If the 95th percentile rainfall event (1.0 inches) occurred on the existing site (i.e., with no control measures), 0.42 inches of runoff would be generated and require management. The runoff from the 95th percentile rainfall event could be retained by installing bioretention systems totaling 0.06 acres if the hydrologic soil group B is present or 0.1 acres if hydrologic soil group C (Table 11) is the predominant soil type on the site. Assuming that bioretention practices are only placed in areas that are currently pervious or landscaped, a total of 1.1 acres of pervious area is available for the placement of these practices. The design storage depth of media within the designated bioretention area was 6 inches. Note: If the design storage depth were increased to 10 inches, the off-site storage necessary for the 10-year event could be reduced to 0.03 acre-ft for type B soils and 0.08 acre-ft for type C soils.

Figure 16. Actual Site and Onsite Control Measures (Phoenix, AZ)

Table 11. Estimated Sizes of Onsite Control Measures for Scenario #5 (Phoenix, AZ)

Total Area (acres)		2	
Estimated Imperviousness (%)		47%	
95th Percentile Rainfall Event (inches)		1.00	
Expected Runoff for the 95th Percentile Rainfall Event (inches)		0.42	
Stormwater Management Area Required		Hydrologic Soil Group	
		B	C
Bioretention estimated by the Direct Determination (acres)		0.06	0.1
Off-site storage necessary to control the 10-yr event of 2.4 inches (acre-ft)	With onsite controls	0.05	0.12
	Without onsite controls	0.18	0.18

Scenario #6 - Boston, MA

A 3.5-acre site with 69% impervious area was selected in Boston, Massachusetts (Figure 17). If the 95th percentile rainfall event (1.52 inches) occurred on the existing site (i.e., with no control measures), 0.98 inches of runoff would be generated and require management. Given these site characteristics, there is adequate area to place appropriately sized bioretention cells to capture the 95th percentile storm event. However, for the purposes of this analysis, unspecified conditions preclude the use of bioretention. As a result, a paver block system was selected as the best onsite control measure and the system was designed such that the necessary design parameters could be achieved by storing some of the volume in the paver media and by infiltrating the remainder of the volume. The runoff from the 95th percentile rainfall event could be retained by installing a paver block area totaling 0.4 and 0.8 acres assuming soil types B and C, respectively (Table 12). For the purposes of this case study, a total of 1.5 acres of parking lot was made available to accommodate the paver block system. The area retrofitted with paver blocks would primarily be dedicated for use as parking stalls.

Figure 17. Actual Site and Onsite Control Measures (Boston, MA)

Table 12. Estimated Sizes of Onsite Control Measures for Scenario #6 (Boston, MA)

Total Area (acres)		3.5	
Estimated Imperviousness (%)		69%	
95th Percentile Rainfall Event (inches)		1.52	
Expected Runoff for the 95th Percentile Rainfall Event (inches)		0.98	
Stormwater Management Area Required		Hydrologic Soil Group	
		B	C
Paver block area estimated by Direct Determination (acres)		0.4	0.8
Off-site storage necessary to control 10-yr event of 4.5 inches (acre-ft)	With onsite controls	0.59	0.71
	Without onsite controls	0.89	0.96

Scenario #7 - Atlanta, GA

A 21-acre site with 70% impervious area was selected in Atlanta, Georgia (Figure 18). If the 95th percentile rainfall event (1.77 inches) occurred on the existing site (i.e., with no control measures), 1.17 inches of runoff would be generated and require management. The runoff from the 95th percentile rainfall event could not be adequately retained solely with bioretention systems. Based on the technical considerations of constructing and maintaining control measures at the site, it was assumed that up to 15% of the pervious area could be converted into bioretention cells and up to 40% of paved area could be converted into a paver block system. If the stormwater management techniques used on the site includes both bioretention and paver blocks as presented in Table 13, then all runoff for the 95th percentile rainfall event would be controlled.

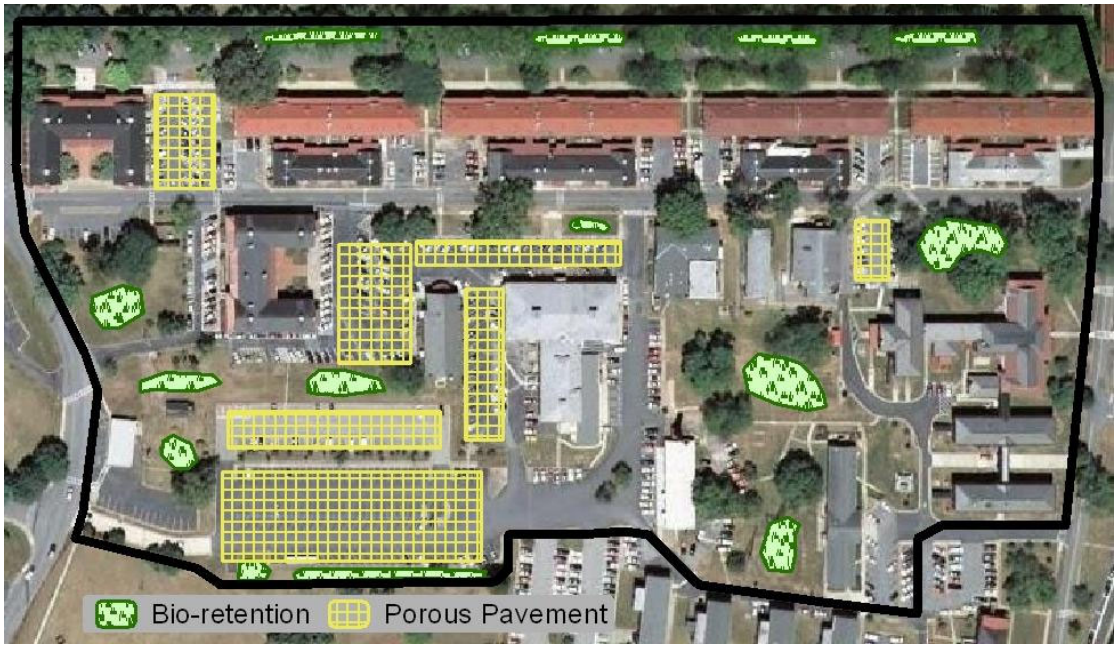

Figure 18. Actual Site and Onsite Control Measures (Atlanta, GA)

Table 13. Estimated Sizes of Onsite Control Measures for Scenario #7 (Atlanta, GA)

Total Area (acres)		21	
Estimated Imperviousness (%)		70%	
95th Percentile Rainfall Event (inches)		1.77	
Expected Runoff for the 95th Percentile Rainfall Event (inches)		1.17	
Stormwater Management Area Required		Hydrologic Soil Group	
		B	C
Bioretention estimated by the Direct Determination (acres)		0.9	
Paver block area estimated by the Direct Determination (acres)		0.9	3.2*
Bioretention estimated by TR-55		0.8**	0.9
Paver block area estimated by TR-55		0**	1.84
Off-site storage necessary to control 10-yr event of 6.0 inches (acre-ft)	With onsite controls	5.85	6.62
	Without onsite controls	7.25	8.49

*The size of porous pavement was increased because the bioretention already reached its maximum size based on the site-specific design assumptions.

**Because TR-55 estimated smaller runoff in this scenario, bioretention can retain all of the 95th percentile runoff if the site has soil group B.

For the example site in Atlanta, GA, areas of 1.8 acres for hydrologic soil group B, and 4.1 acres for hydrologic soil group C, would be required to manage the runoff discharged from a 95th percentile rainfall event. Assuming that bioretention practices are only placed in areas that are currently pervious or landscaped, a total of 6.2 acres of pervious area is available for the placement of bioretention systems. The design storage depth of media within the designated bioretention area was 10 inches. Permeable pavement systems could be used to treat the remaining volume on the 10.8 acres of existing paved area.

In applying the TR-55 model, the overall curve numbers for the site were 87 and 91 for Group B and C soils, respectively. TR-55 was used to estimate 0.73 inches of runoff for soil group B and 0.97 inches for soil group C, which are smaller numbers than the 1.17 inches of runoff estimated by the Direct Determination method. As a result, the sizes of the onsite control measures designed using the TR-55 model were smaller than those designed using the Direct Determination method. Note: It is recommended that caution be exercised when using TR-55 to model storms less than 0.5 inches per event. See application of TR-55 in Table 5.

Cost estimates were also developed for this scenario (Table 14) to compare the costs to install onsite control measures to retain the 95th percentile rainfall event, and costs to install traditional stormwater management controls (e.g., primarily curb and gutter with off-site retention). The cost estimates were developed for Hydrologic Soil Group B.

Table 14. Estimated Costs for Scenario #7 (Atlanta, GA)

Sizes of Onsite Control Practices			
		Controls for 95th Percentile Event	Traditional Stormwater Controls
Rainfall depth (in)		1.77	
Bioretention (acres)		0.94	
Paver blocks (acres)		0.86	
Off-site Pond	WQV (ac-ft)	-	1.75
	10-Yr Fld Cntr (ac-ft)	0.84	0.0
Total Off-Site Requirement (ac-ft)		0.84	1.75
Land Area (assumes avg 3 ft depth)		0.28	0.58
% of the site		8.5%	
Costs of Onsite Control Practices			
Biorention/alternative		$232,923	$30,617
Paver block/alternative		$236,878	$88,409
Off-site Pond	WQV (ac-ft)	$0	$72,888
	10-Yr Fld Cntr (ac-ft)	$39,648	$0
Infrastructure	Pipe	$54,827	$191,095
	Inlet	$52,080	$79,360
Land Area (assumes $300K/acre)		$84,000	$175,000
Sum		**$700,356**	**$637,368**
% difference from Traditional		**9.9%**	

Scenario #8 - Cincinnati, OH

A 19-acre site with 51% impervious area was selected in Cincinnati, Ohio (Figure 19). If the 95th percentile rainfall event (1.45 inches) occurred on the existing site (i.e., with no control measures), 0.68 inches of runoff would be generated and require management. The runoff from the 95th percentile rainfall event could be retained by the installation of bioretention systems totaling 0.8 acres if the hydrologic soil group B is present or 1.3 acres if hydrologic soil group C (Table 9) is the predominant soil type on the site. Assuming that bioretention practices are only placed in areas that are currently pervious or landscaped, a total of 9.4 acres of pervious area is available for the placement of bioretention systems. The design storage depth of media within the designated bioretention area was 8 inches.

Scenario #8 represents an alternative to the Cincinnati, scenario in #3 (Figure 14). In this case, hydrologic soil group D was selected to represent the soil characteristics present for the entire site. Alternatively, simulations could have been run under the assumption that the use of infiltration practices were precluded by contaminated soils or high ground water tables. Under these site conditions, bioretention options are severely limited and cannot be used to adequately capture the entire 95th percentile storm event. As a result, options such as cisterns and green roofs were considered. In the absence of management practices, the 95th percentile rainfall event discharges 1.45 inches of stormwater and 0.53 inches of this runoff is captured by onsite depression storage. The difference, 0.92 inches of runoff, would then require capture and management. Based on the technical considerations of constructing and maintaining controls at the site, it was assumed that up to 20% of pervious area can be converted into bioretention areas; up to 30% of paved area can be converted into porous pavement; and up to 30% of the rooftop area can be converted into green roofs. Cisterns can be added to the system if additional storage volume is required. It should be noted that green roofs were selected lowest in the hierarchy of practices evaluated because of cost and potential structural issues associated with design and placement on existing buildings. By using the four onsite control options as presented in Table 15, all runoff for the 95th percentile rainfall event would be retained. From a management perspective, it was assumed that the design storage depth within the designated bioretention area was 6 inches because of the low infiltration rates adopted for this scenario.

Figure 19. Actual Site and Onsite Control Measures (Cincinnati, OH)

Table 15. Estimated Sizes of Onsite Control Measures for Scenario #8 (Cincinnati, OH)

Total Area (acres)	19
Estimated Imperviousness (%)	51%
95th Percentile Rainfall Event (inches)	1.45
Expected Runoff for the 95th Percentile Rainfall Event (inches)	0.92
Stormwater Management Applied	Hydrologic Soil Group D
Bioretention estimated by Direct Determination (acres)	1.9
Paver block area estimated by Direct Determination (acres)	2.4
Green Roof estimated by Direct Determination (acres)	0.5
Cisterns estimated by Direct Determination (gallons)	13,000

This site contains a total of 9.4 acres of pervious area, 8.0 acres of paved area, and 1.6 acres of rooftop area. If 1.9 acres (20%) of the pervious area were converted to bioretention cells; 2.4 acres (30%) of parking lot converted to paver blocks; and 0.5 acres (30%) of rooftop area were retrofitted to green roof areas for this site, then 97% of stormwater runoff from the 95th percentile storm would be captured on site. By also adding one or more cisterns (as indicated in Figure 19), an additional 13,000 gallons could be captured, thus illustrating that 100% of the rainfall from the 95th percentile event can be managed onsite with GI/LID practices.

Scenario #9 – Norfolk, VA

A 1.6 acre site with 91% impervious area was selected from Norfolk, Virginia. Table 16 contains the land use categories for the site. Figure 20 depicts the site and associated facilities. Site specific factors based on an METF analysis allow management of 75 % of the 95th percentile storm onsite (1.27 inches). The remaining portion of the 95th percentile rainfall event (0.41 inches would be discharged off of the site.

Table 16. Land Use Determination After Redevelopment

Land Use	Acres	Site Coverage Percent
Building	0.90	56.3
Parking	0.35	21.9
Streets/Sidewalks	0.20	12.5
Undeveloped	0.15	9.3
Total	**1.60**	**100%**

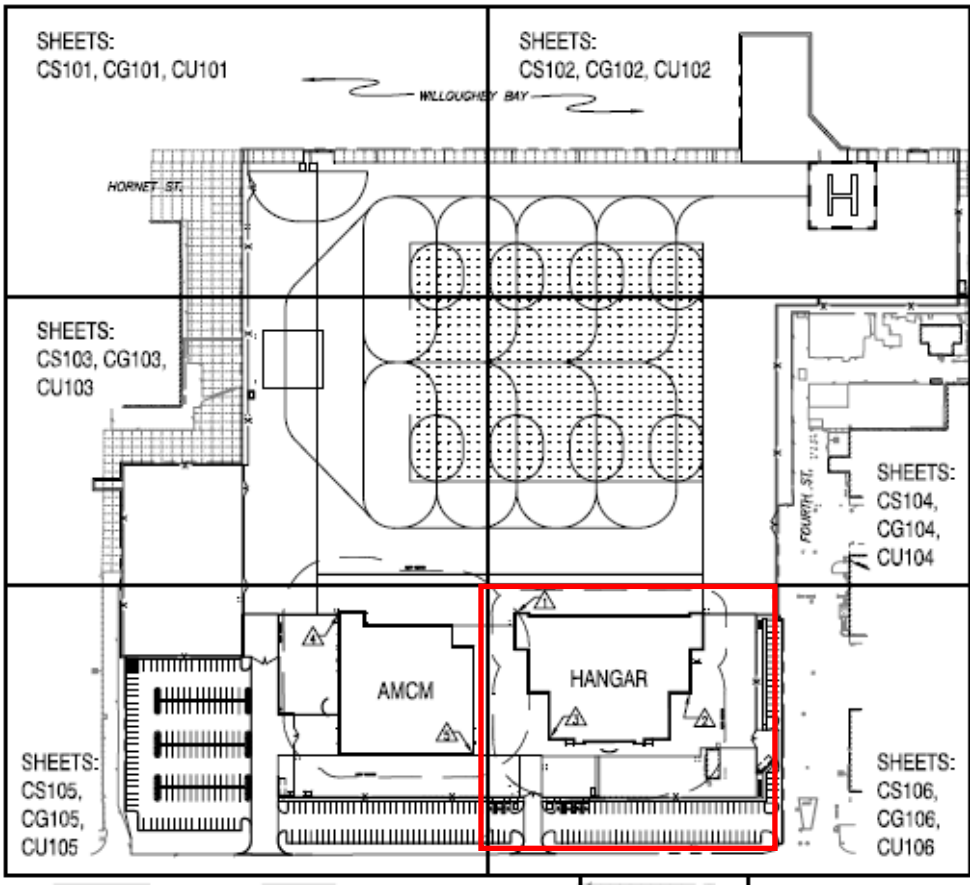

Figure 20. Proposed Redevelopment Scenario

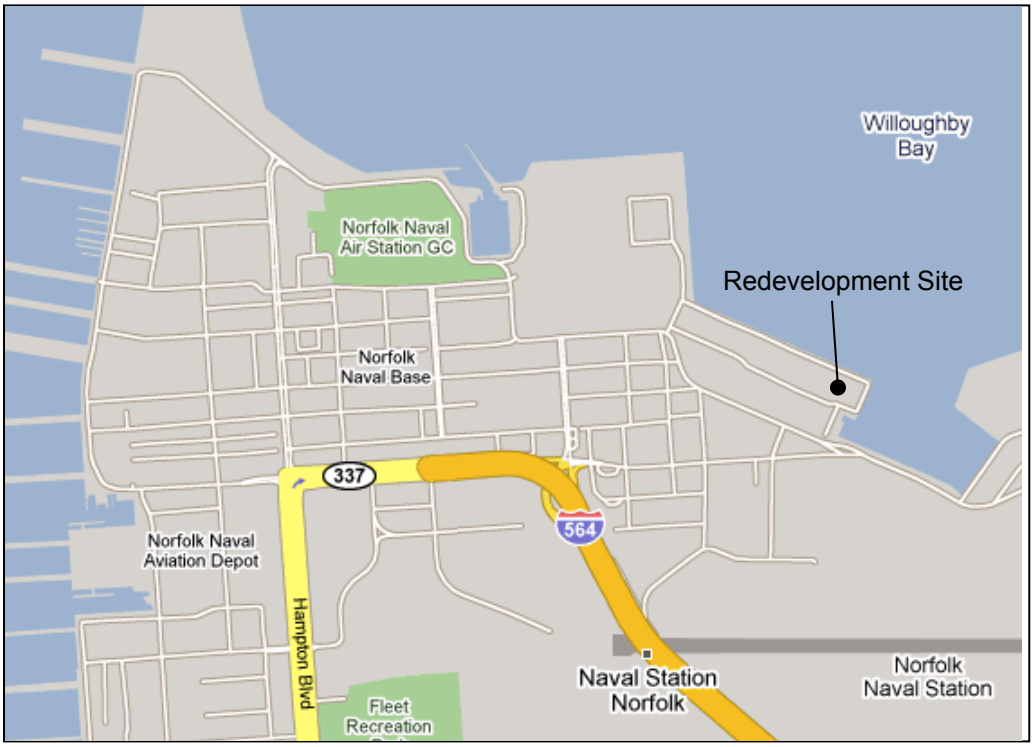

Figure 21. Location of Facility (Norfolk, VA)

Site conditions and intended uses limited the number of practices that were technically feasible to use onsite to manage runoff. For example, the use of a green roof was not feasible because the project includes the construction of an airplane hanger which lacks the structural strength to support a green roof. Cisterns were also not included in the set of suitable practices based on the analysis, which considered the number of people and amount of daily water use at the site, i.e., 40 people x 3.5 toilet flushes per day would use only 280 gallons of runoff per day or 2,000 gallons per week. Stormwater use for HVAC make-up would also be negligible based on the typical cooling system design. To put things in perspective, if the hanger rooftop covers the entire building footprint, 41,000 gallons of runoff would be generated from a 1.68 inch rainfall. Assuming a drawdown of 2,000 gallons per week based on toilet flushing, the users would only use 5% of the 95th percentile event. Because of the relatively large volume of water that would need to be collected and used, cisterns were not considered a feasible option to manage a significant volume of runoff at the site.

However, site conditions did allow for the use of both permeable pavement and bioretention practices. Approximately 0.15 acres (6,500 sf) of the proposed site is undeveloped and available for bioretention. Based on Department of Defense facility requirements, ten percent of the parking area is designed with landscaping, usually around the perimeter and in landscaped islands. If this ten percent were designed as bioretention cells, then 0.035 acres of bioretention would be achieved. If bioretention cells were also placed in about 30% of the undeveloped area of the project, then an additional 0.045 acres of bioretention could be implemented. Note: not all undeveloped land was assumed to be available for bioretention because of conflicts with site

utilities, security and anti-terrorism requirements and slopes that limited the use of infiltration practices directly adjacent to the hanger.

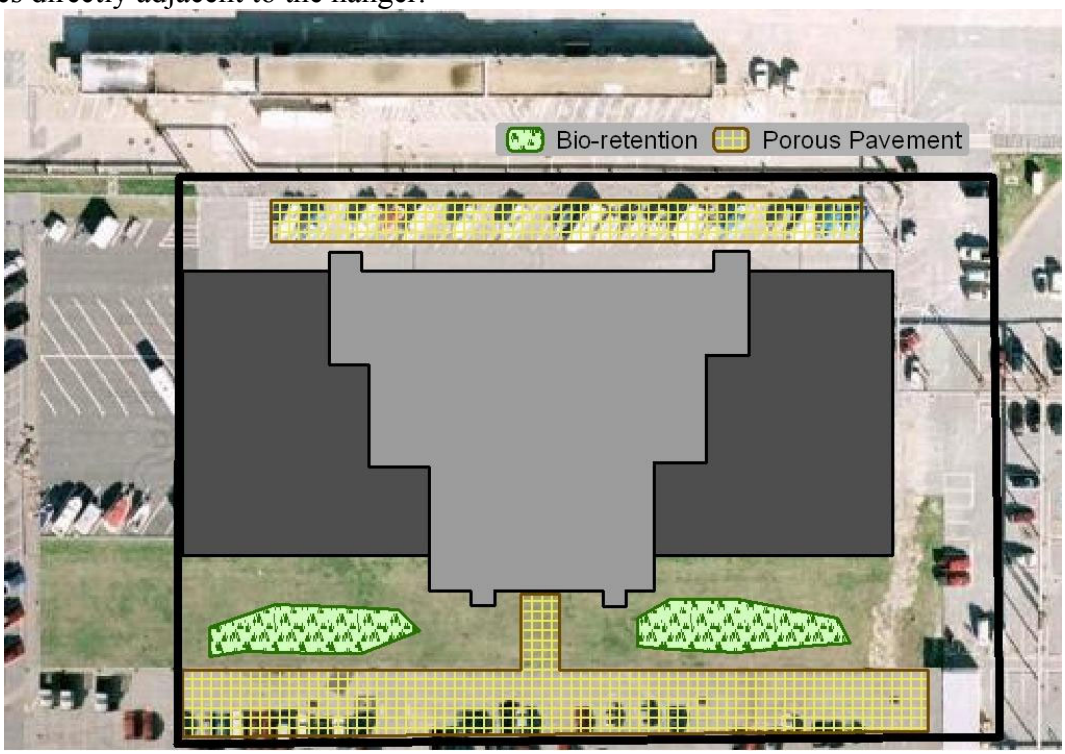

Figure 22. Actual Site and Onsite Control Measures (Norfolk, VA)

Table 17. Estimated Sizes of Onsite Control Measures for Scenario #9 (Norfolk, VA)

Total Area (acres)	1.6
Estimated Imperviousness (%)	91%
95th Percentile Rainfall Event (inches)	1.68
Expected Runoff for the 95th Percentile Rainfall Event (inches)	1.50
Stormwater Management Area Required	Hydrologic Soil Group D
Porous Pavement estimated by Direct Determination method (acres)	0.21
Bioretention estimated by Direct Determination method (acres)	0.08

The bioretention cells were designed with an effective storage depth of 10 inches, which included a depth from media surface to outlet of 10 inches. In this case study, state regulations precluded the project from taking credit for the storage potential provided by the void space within the bioretention cell media. Similarly, approximately 0.55 acres of the proposed site is impervious due to parking lots, streets, and sidewalks. Due to manufacturer's recommendations that permeable pavement materials not be used in applications subject to heavy loads and potential pollutant exposure the access roads and parking lot access isles were assumed to be constructed from conventional impervious concrete or asphalt. Thus 60% of the parking area (primarily parking stalls and sidewalks), which is about 38% of the entire paved area, is assumed to be suitable for paver blocks. A high water table at the site limited the modeled net storage depth under paver blocks placed in the parking areas and sidewalks to four inches. This storage was calculated using the assumption that the pavement sub-base of 12 inches would have a minimum void space of approximately 30%.

COMPARISON OF THE RUNOFF ESTIMATION METHODS

As illustrated in each of the case studies above, runoff of the 95th percentile storm was estimated in order to size onsite control measures. These estimates were produced by applying four different methods: the Direct Determination method, the Rational Method, the NRCS TR-55, and the EPA SWMM. The results comparing each of these methods for scenarios 1-7 are presented in Table 18.

Table 18. Comparison of the estimated runoff (unit: inches)

Method		Direct Determination		Rational Method		TR-55		SWMM	
Soil Groups		B	C	B	C	B	C	B	C
1	Charleston, WV	0.82	0.82	0.83	0.84	0.36	0.53	0.82	0.83
2	Denver, CO	0.53	0.53	0.57	0.59	0.12	0.26	0.53	0.53
3	Cincinnati, OH	0.68	0.68	0.73	0.76	0.26	0.46		
4	Portland, OR	0.86	0.86	0.86	0.86	0.63	0.71		
5	Phoenix, AZ	0.42	0.42	0.46	0.48	0.06	0.17		
6	Boston, MA	0.98	0.98	0.99	1.00	0.51	0.70		
7	Atlanta, GA	1.17	1.17	1.17	1.19	0.73	0.97	1.19	1.23

As shown in the above table, the estimated runoff results from direct determination, the Rational Method, and SWMM are relatively similar. Runoff volumes using TR-55 are lower than the other estimates. SWMM modeling results using NRCS 24-hour rainfall distributions were nearly identical to the results based on uniform distribution.

Table 19. Applicability of the methods for analyzing onsite control measures

Purpose	Direct Determination	Rational Method	TR-55*	SWMM
Planning Tool	Applicable	Applicable	Applicable	Applicable
Preliminary Design	Applicable	Applicable	Applicable	Applicable
Detailed Design	Not applicable	Not applicable	Not applicable	Applicable
Actual Assessment (Long-term)	Not applicable	Not applicable	Not applicable	Applicable
Water Quality	Not applicable	Not applicable	Not applicable	Applicable

*Use with caution when applying this method for small storms

CONCLUSIONS

Although sites varied in terms of climate and soil conditions, in most of the scenarios selected, the 95th percentile storm event could be managed onsite with GI/LID systems. There are other infiltration, evapotranspiration and capture and use stormwater management options available than those used in these analyses. These options provide site managers additional flexibility to choose appropriate systems and practices to manage site runoff.

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APPENDIX A: Runoff Methodology Parameter Assumptions

Runoff from each land cover was estimated by the following equation:

$$Runoff = Rainfall - Depression\ Storage - Infiltration\ Loss \quad (1)$$

Depression Storage

Reference depression storage (inches)

Reference	Impervious	Pervious
1	0.05 - 0.1	0.1 - 0.3
2	0.01 - 0.11	0.02 - 0.6
3	0.1	0.2

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Based on the above reference data, depression storage (or initial abstraction, the rainfall required for the initiation of runoff) to the direct determination method was assumed as follows:

- Rooftop: 0.1 inches
- Pavement: 0.1 inches
- Pervious area: 0.2 inches

Infiltration

Infiltration loss occurs only in pervious areas. In this analysis, infiltration was estimated by Horton's equation:

$$F_t = f_{min} + (f_{max} - f_{min})\, e^{-kt} \quad (2)$$

where, F_t = infiltration rate at time t (in/hr),
f_{min} = minimum or saturated infiltration rate (in/hr),
f_{max} = maximum or initial infiltration rate (in/hr),
k = infiltration rate decay factor (/hr), and
t = time (hr) measured from time runoff first discharged into infiltration area

Reference infiltration parameters

Maximum infiltration rate (in.hr), f_{max}

Infiltration (in/hr)	Partially dried out with		Dry soils with	
	No vegetation	Dense vegetation	No vegetation	Dense vegetation
Sandy	2.5	5	5	10
Loam	1.5	3	3	6
Clay	0.5	1	1	2

Reference: Huber, W. C. and Dickinson, R. (1988). *Storm Water Management Model User's Manual, Version 4*. EPA/600/3-88/001a (NTIS PB88-236641/AS), U.S. Environmental Protection Agency, Athens, GA.

Minimum infiltration rate (in/hr), f_{min}

Hydrologic Soil Group	Infiltration (in/hr)
A	0.45 - 0.30
B	0.30 - 0.15
C	0.15 - 0.05
D	0.05 - 0

A: well drained sandy; D: poorly drained clay
Reference: Huber, W. C. and Dickinson, R. (1988). *Storm Water Management Model User's Manual, Version 4*. EPA/600/3-88/001a (NTIS PB88-236641/AS), U.S. Environmental Protection Agency, Athens, GA.

Decay coefficient, k

Soils	k (sec^{-1})	k (hr^{-1})
Sandy	0.00056	2
⇕	0.00083	3
	0.00115	4
Clay	0.00139	5

Reference: Huber, W. C. and Dickinson, R. (1988). *Storm Water Management Model User's Manual, Version 4*. EPA/600/3-88/001a (NTIS PB88-236641/AS), U.S. Environmental Protection Agency, Athens, GA.

Based on the above reference data, infiltration parameters to the direct determination method were assumed as follows:

- Hydrologic Soil Group B
  - Maximum infiltration rate: 5 in/hr
  - Minimum infiltration rate: 0.3 in/hr
  - Decay factor: 2 /hr
- Hydrologic Soil Group C
  - Maximum infiltration rate: 3 in/hr
  - Minimum infiltration rate: 0.1 in/hr
  - Decay factor: 3.5 /hr
- Hydrologic Soil Group D
  - Maximum infiltration rate: 1 in/hr
  - Minimum infiltration rate: 0.02 in/hr
  - Decay factor: 5 /hr

Infiltration loss for the 24-hr rainfall duration was estimated by the following equations with assumptions of a half hour Δt:

$$\textit{Infiltration Loss at the } n^{\text{th}} \textit{ time-step} = (f \cdot \Delta t) = \{(f_{n-1} + f_n)/2) \cdot \Delta t\} \quad (3)$$

$$\textit{Integrated Infiltration Loss for 24 hours} = \sum (f \cdot \Delta t) \quad (4)$$

Integrating infiltration loss during 24 hours with a half hour Δt

time-step	t (hr)	Infiltration rate (in/hr) [a]			Infiltration volume (inches) [b]		
		Soil B	Soil C	Soil D	Soil B	Soil C	Soil D
0	0	5	3	1	0	0	0
1	0.5	2.03	0.60	0.100	1.757	0.901	0.275
2	1	0.94	0.19	0.027	0.741	0.198	0.032
3	1.5	0.53	0.12	0.021	0.368	0.076	0.012
4	2	0.39	0.10	0.02	0.230	0.054	0.01
5	2.5	0.33	0.1	0.02	0.179	0.05	0.01
6	3	0.31	0.1	0.02	0.161	0.05	0.01
7	3.5	0.30	0.1	0.02	0.154	0.05	0.01
8	4	0.3	0.1	0.02	0.15	0.05	0.01
9	4.5	0.3	0.1	0.02	0.15	0.05	0.01
10	5	0.3	0.1	0.02	0.15	0.05	0.01
11	5.5	0.3	0.1	0.02	0.15	0.05	0.01
12	6	0.3	0.1	0.02	0.15	0.05	0.01
13	6.5	0.3	0.1	0.02	0.15	0.05	0.01
14	7	0.3	0.1	0.02	0.15	0.05	0.01
15	7.5	0.3	0.1	0.02	0.15	0.05	0.01
16	8	0.3	0.1	0.02	0.15	0.05	0.01
17	8.5	0.3	0.1	0.02	0.15	0.05	0.01
18	9	0.3	0.1	0.02	0.15	0.05	0.01
19	9.5	0.3	0.1	0.02	0.15	0.05	0.01
20	10	0.3	0.1	0.02	0.15	0.05	0.01
21	10.5	0.3	0.1	0.02	0.15	0.05	0.01
22	11	0.3	0.1	0.02	0.15	0.05	0.01
23	11.5	0.3	0.1	0.02	0.15	0.05	0.01
24	12	0.3	0.1	0.02	0.15	0.05	0.01
25	12.5	0.3	0.1	0.02	0.15	0.05	0.01
26	13	0.3	0.1	0.02	0.15	0.05	0.01
27	13.5	0.3	0.1	0.02	0.15	0.05	0.01
28	14	0.3	0.1	0.02	0.15	0.05	0.01
29	14.5	0.3	0.1	0.02	0.15	0.05	0.01
30	15	0.3	0.1	0.02	0.15	0.05	0.01
31	15.5	0.3	0.1	0.02	0.15	0.05	0.01
32	16	0.3	0.1	0.02	0.15	0.05	0.01
33	16.5	0.3	0.1	0.02	0.15	0.05	0.01
34	17	0.3	0.1	0.02	0.15	0.05	0.01
35	17.5	0.3	0.1	0.02	0.15	0.05	0.01
36	18	0.3	0.1	0.02	0.15	0.05	0.01
37	18.5	0.3	0.1	0.02	0.15	0.05	0.01
38	19	0.3	0.1	0.02	0.15	0.05	0.01
39	19.5	0.3	0.1	0.02	0.15	0.05	0.01
40	20	0.3	0.1	0.02	0.15	0.05	0.01
41	20.5	0.3	0.1	0.02	0.15	0.05	0.01
42	21	0.3	0.1	0.02	0.15	0.05	0.01
43	21.5	0.3	0.1	0.02	0.15	0.05	0.01
44	22	0.3	0.1	0.02	0.15	0.05	0.01

45	22.5	0.3	0.1	0.02	0.15	0.05	0.01
46	23	0.3	0.1	0.02	0.15	0.05	0.01
47	23.5	0.3	0.1	0.02	0.15	0.05	0.01
48	24	0.3	0.1	0.02	0.15	0.05	0.01
Sum: Infiltration loss during 24 hours [c]					9.743	3.430	0.769

[a] Calculated infiltration rate at each time by Equation (2)
[b] Calculated infiltration volume from the previous time to the current time by Equation (3)
[c] Integrated infiltration volume for 24 hours with a half hour Δt by Equation (4)

Based on the above calculation, 24-hr infiltration losses for pervious areas and bioretention areas were modeled as follows:

- Soil Group B: 9.743 inches
- Soil Group C: 4.430 inches
- Soil Group D: 0.769 inches

Infiltrations of underlying soils at paver blocks were modeled conservatively by applying the minimum infiltration rate for each soil type (Infiltration loss = $f_{min} \cdot 24$) because the soils under the paver blocks may require or be subjected to some compaction for engineering stability. The estimated infiltration losses for each soil are presented below:

- Soil Group B: (0.3 in/hr) · (24 hrs) = 7.2 inches
- Soil Group C: (0.1 in/hr) · (24 hrs) = 2.4 inches
- Soil Group D: (0.02 in/hr) · (24 hrs) = 0.48 inches

Design Storage of Management Practices

Bioretention

Reference	Ponding (inches)[1]	Mulch (inches)	Soil media (ft)	Soil Media Porosity	Underdrain
1	up to 12	2 - 4 (optional)	1 - 1.5	about 40%	bioretention systems utilize infiltration rather than an underdrain
2	6 - 12	2 - 3	2.5 - 4	about 40%	recommended, especially if initial testing infiltration rate < 0.52 in/hr
3	6 - 12		2 - 4		
4		2 - 3	1.5 - 4		if necessary
5	up to 6		1.5 - 2	30 - 40%	Optional
6	6 - 18	as needed	2 - 4		if necessary

1. State of New Jersey. (2004). *New Jersey Stormwater Best Management Practices Manual* www.nj.gov/dep/stormwater/tier_A/pdf/NJ_SWBMP_9.1 print.pdf.
2. Maryland Department of the Environment (MDE), (2000). *2000 Maryland Stormwater Design Manual, Volumes I & II*, prepared by the Center for Watershed Protection and the Maryland Department of the Environment, Water Management Administration, Baltimore, MD. www.mde.state.md.us/Programs/WaterPrograms/SedimentandStormwater/stormwater_design/index.asp.

[1] Ponding is a measure of retention capacity

3. Clar, M. L. and R. Green, (1993). *Design Manual for Use of Bioretention in Storm Water Management*, prepared for the Department of Environmental Resources, Watershed Protection Branch, Prince George's County, MD, prepared by Engineering Technologies Associates, Inc. Ellicott City, MD, and Biohabitats, Inc., Towson, MD.
4. U.S. Environmental Protection Agency. (1999). *Storm Water Technology Fact Sheet: Bioretention*. EPA 832-F-99-012. Office of Water. US Environmental Protection Agency. Washington, D.C. www.epa.gov/owm/mtb/biortn.pdf.
5. Prince George's County. *Bioretention Design Specifications and Criteria*. Prince George's County, Maryland. www.co.pg.md.us/Government/AgencyIndex/DER/ESG/Bioretention/pdf/bioretention_design_manual.pdf.
6. City of Indianapolis. (2008). *Indianapolis Stormwater Design Manual*. www.sustainindy.org/assets/uploads/4_05_Bioretention.pdf.

Paver Blocks

Reference	Media (inches)	Void Space
1	12 or more	40%
2	9 or more	40%
3	12 - 36	40%

1. Univ. of California at Davis. (2008). Low Impact Development Techniques: Pervious Pavement. http://extension.ucdavis.edu/unit/center_for_water_and_land_use/pervious_pavement.asp.
2. AMEC Earth and Environmental, Center for Watershed Protection, Debo and Associates, Jordan Jones and Goulding, and Atlanta Regional Commission. (2001). Georgia Stormwater Management Manual Volume 2: Technical Handbook www.georgiastormwater.com/.
3. Subsurface Infiltration Bed. www.tredyffrin.org/pdf/publicworks/CH2 - BMP4 Infiltration Bed.pdf.

Green Roofs

Reference	Media (inches)
1	3 - 4
2	1 - 6
3	2 - 6

1. Charlie Miller. (2008). Extensive Green Roofs. Whole Building Design Guide (WBDG). www.wbdg.org/resources/greenroofs.php.
2. Great Lakes WATER Institute. Green Roof Project: Green Roof Installation. www.glwi.uwm.edu/research/genomics/ecoli/greenroof/roofinstall.php.
3. Paladino & Company. (2004). Green Roof Feasibility Review. King County Office Project. http://your.kingcounty.gov/solidwaste/greenbuilding/documents/KCGreenRoofStudy_Final.pdf.

Based on the above reference data, design storages to the direct determination method were assumed as follows:

- Bioretention: up to 10 inches (depending on practice used, site conditions, etc.)
- Green roof: 1 inch (2.5 inches deep media with 40% void space)
- Porous pavement: 4 inches (10 inches deep media with 40% void space)

Factors that influence total storage available include, ponding depth, available media void space, and supplemental storage if the system is designed with gravel or open pipes underneath the media.

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MS4 Permit Improvement Guide

U.S. ENVIRONMENTAL PROTECTION AGENCY

OFFICE OF WATER

OFFICE OF WASTEWATER MANAGEMENT

WATER PERMITS DIVISION

APRIL 2010

EPA 833-R-10-001

051077

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

APR 14 2010

OFFICE OF WATER

Dear NPDES Stormwater Managers,

I am pleased to announce that the Environmental Protection Agency (EPA) has completed the "Municipal Separate Storm Sewer System Permit Improvement Guide." The primary purpose of this guidance document is to assist National Pollutant Discharge Elimination System (NPDES) permit writers in strengthening municipal separate storm sewer system (MS4) permits.

This Guide contains examples of permit conditions and supporting rationale that could be used in fact sheets that accompany NPDES permits. The Guide also includes recommendations for permit writers on how to tailor the language depending on the type of permit. For example, permits covering traditional municipalities may contain different permit provisions than those covering non-traditional entities like departments of transportation, universities, and prisons.

I ask that permit writers review the permit language and corresponding discussion presented in this Guide and consider how to incorporate this, or similar, language into their MS4 permits. Some modification of the language may be necessary to make it suitable for use with specific MS4 permits, and to better tailor it to meet the needs and goals of the various permitting authorities.

The permit language suggested in this Guide is not intended to override already existing, more stringent or differently-worded provisions that are equally as protective in meeting the applicable regulations. EPA expects the permitting authority to continue to make significant progress and ensure that the intent of the regulations or more stringent requirements is captured in the permit.

In addition, EPA would like to particularly stress the following key principles:

- Permit provisions should be clear, specific, measurable, and enforceable. Permits should include specific deadlines for compliance, incorporate clear performance standards, and include measurable goals or quantifiable targets for implementation.
- Permits should contain a performance standard for post-construction that is based on the objective of maintaining or restoring stable hydrology to protect water quality of receiving waters or another mechanism as effective.

EPA has begun a rulemaking to strengthen the stormwater program. Using this Guide to improve permits represents the direction that EPA is taking to strengthen the program. This Guide is a living document that will be updated as new information for improving the stormwater program is obtained.

I appreciate your continued efforts in strengthening the NPDES municipal stormwater program. If you have any questions about this Guide or suggestions for further improvements, please contact Rachel Herbert of my staff at herbert.rachel@epa.gov or call her at 202-564-2649.

Sincerely,

Linda Y. Boornazian

Linda Y. Boornazian, Director
Water Permits Division

CC: State Stormwater Coordinators
Association of State and Interstate Water Pollution Control Administrators

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INTRODUCTION & GETTING STARTED

Purpose

The primary purpose of the MS4 Permit Improvement Guide (Guide) is to assist National Pollutant Discharge Elimination System (NPDES) permit writers in strengthening municipal separate storm sewer system (MS4) stormwater permits. The objective of the Guide is to facilitate the creation of MS4 permits which are clear, consistent with applicable regulations, and enforceable. This Guide contains examples of permit conditions and supporting rationale that could be used in fact sheets that accompany NPDES permits. Permit language should include controls that identify specific actions permittees must perform to comply with the Permit Requirements.

This Guide focuses in large part on permits for small (Phase II) MS4s. However, while the contents of the Guide are generally organized consistent with the six minimum control measures (40 CFR 123.34(b)) applicable to Phase II MS4 permits, however, permit writers may find this Guide useful for Phase I MS4 permits. In addition, the Guide specifically addresses Phase I MS4 Permit Requirements with regard to the industrial program elements set forth in the Phase I regulations at 40 CFR 122.26(d)(2)(ii) and (iv)(C). These are addressed in Chapter 7. The Guide may also be useful for "non-traditional" MS4 permittees, such as departments of transportation (DOTs), universities and prisons.

EPA has developed a Stormwater Phase II Final Rule Fact Sheet Series (www.epa.gov/npdes/stormwater/swfinal) to assist permitting authorities and permittees in understanding the Phase II regulations. Further, EPA has developed the National Menu of Stormwater Best Management Practices (www.epa.gov/npdes/stormwater/menuofbmps) which provides descriptive information in fact sheets about various best management practices associated with the Phase II six minimum control measures.

The Guide was created by reviewing numerous MS4 permits and fact sheets from around the country. Some of the example permit and fact sheet language presented in this Guide has been adapted from these permits; in those instances where existing language that meets the purpose of this document was not available, EPA has crafted new language.

Contents of this Guide

This document is divided into parts, as noted above, based largely on the six minimum control measures required in the Phase II stormwater regulations (see 40 CFR 122.34(b)). Chapters 1 -6 address development and implementation of a stormwater management program (SWMP) and the six minimum control measures that must be included in the SWMP. Chapter 7 addresses industrial facilities programs relevant for Phase I MS4 permits. Chapter 8, Overall Evaluation and Adaptive Management, discusses reporting, evaluation, and tracking requirements. This Guide does not focus on the water quality provisions of the Clean Water Act, which may require more stringent requirements than those programmatic elements specified here.

Each chapter opens with an introduction providing a brief overview of relevant regulatory requirements pertaining to the subject of the chapter. Each chapter is then divided into sections in which the following topics are addressed:

- *Example Permit Provision* – This section includes example MS4 permit language. The language has been formatted and numbered in such a way that each section corresponds directly to a permit structured in accordance with the chapter sequence of this Guide. EPA developed these examples by first surveying existing EPA and State MS4 permit language and drawing upon agency experience in implementing permits. EPA has identified the source of the language (in footnotes) if adapted from specific permits.
- *Example Permit Requirement Rationale for the Fact Sheet* – This section describes the rationale for the example permit provision. This language can assist the permit writer in developing the fact sheet, which accompanies all NPDES permits; however, it is up to the permit writer to ensure that a complete and customized version of the fact sheet accompanies the permit. Example Permit Requirement Rationale for the Fact Sheet sections often describe "requirements" or steps that "must" be taken. To the extent this language is used in these sections, it is intended to describe requirements included in the example permit provisions. It does not mean that all permits "must" include the specific "requirement" described.
- *Recommendations for the Permit Writer* (included where appropriate) – This section discusses issues the permit writer should consider in determining how to use the example permit provisions.

How to Use this Guide

This guidance includes "example" MS4 permit language for specific program elements, but is not intended to be definitive or comprehensive for all MS4 Permit Requirements.[1] EPA recommends that permit writers review the example permit language presented in this guide and consider how to incorporate this, or similar, language into MS4 permits as appropriate. Each state may have different NPDES requirements along with varied experience overseeing MS4 programs, and MS4 permittees vary widely in storm water management experience and sophistication, size, topography, precipitation patterns, land use, receiving water conditions and other factors. In most instances, EPA anticipates that permit writers will modify the language to make it suitable for specific MS4 permits, and to tailor example provisions to meet the various needs and goals that apply.

When possible, this Guide has tried to provide examples that can be used for both Phase I and Phase II permits. However, in some instances EPA has provided suggestions for how the language can be tailored to better fit within the context of a Phase I or Phase II permit. In addition, EPA acknowledges that some language presented in this Guide may be more suitable for an individual permit rather than a general permit. While EPA has presented a discussion for ways the language could be altered to fit these scenarios in Recommendations for the Permit Writer sections, it is up to the permit writer to determine the best use of the material for the permit being crafted.

[1] For example, the guide does not explicitly address provisions for compliance with CWA section 402(p)(3)(B)(ii), water quality standards, applicable wasteload allocations in TMDLs or such other conditions as the permitting authority deems necessary. For information on integrating TMDLs into stormwater permits see USEPA's DRAFT TMDLs to Stormwater Handbook (www.epa.gov/owow/tmdl/stormwater)

The example permit language in this Guide has been written as if the permit is a reissued permit and not an initial permit, since most MS4 permittees have been subject to NPDES permits for at least one permit term. Requirements to develop the initial SWMP are not included in this Guide since they would have been included in the first permit term. It is important that permit writers consider the different stages in the development and implementation of SWMPs when establishing permit conditions as well as the experience learned from other more advance programs. So, for example, this Guide includes brackets to indicate the place for an appropriate schedule or deadline rather than indicating specific timeframes in all instances. These examples are available to the permit writer, along with other resources such as the permittee's draft or existing SMWP document, annual reports, prior permit experience, receiving water quality information and the permit writer's best professional judgment, to issue permits suitable for their specific MS4s.

The permit language suggested in this Guide is not intended to override already existing, more stringent or differently-worded provisions that are equally as compliant in meeting the applicable regulations and protective of water quality standards. EPA expects the permitting authority to ensure that the intent of all applicable regulations is captured in the permit. States with more stringent permit provisions should continue to strengthen these provisions as the permits are reissued. This Guide includes suggestions on how to develop permit language for MS4 permittees. This Guide does not impose any new legally binding requirements on EPA, States, or the regulated community, and does not confer legal rights or impose legal obligations upon any member of the public. In the event of a conflict between the discussion in this Guide and any statute, regulation, or permit the statute, regulation or permit controls.

Terminology: SWMP and SWMP Document
This guide uses the term SWMP to refer to the stormwater management program that is required by the Phase I and Phase II regulations to be developed by MS4 permittees. The SWMP document is the written plan that is used to describe the various control measures and activities the permittee will undertake to implement the stormwater management program.

Preparing to Write an MS4 Permit

Most Phase II MS4 permittees are regulated under a general permit (with some exceptions where individual permits have been used for Phase II and non-traditional MS4 permittees). Phase I MS4 permittees are regulated under individual permits, and can include multiple co-permittees. EPA regulations require that initial MS4 permits (i.e. first permit term) set the foundation of the permittee's SWMP. For Phase II MS4 the focus is on the six minimum control measures in 40 C.F.R. 122.34(b), while the Phase I MS4 permittees are informed by the regulations at 40 C.F.R. 122.26(d). See Chapter 1 of this Guide.

As the permit writer prepares to reissue an MS4 permit, regardless of whether the permit is an individual or general permit, EPA recommends that the permit writer review, at a minimum, the following sources of information:

Past annual reports
For currently regulated MS4s, annual reports submitted by the permittee can include information that will help permit writers develop more specific and measurable Permit Requirements. The most recent annual report is usually the most helpful to review, but additional annual reports can be reviewed if time allows. If the permit writer is developing a general permit, a broad selection of

annual reports from various permittees should be reviewed. In particular, EPA recommends that the permit writer review, at a minimum, the following specific information:

Areas of obvious strengths or weaknesses in the SWMP

- For example, is the permittee vague about specific activities (often an indicator of a weak program area), or is the permittee clearly meeting the requirements of the permit and/or going above and beyond the minimum requirements?

Trends or common compliance problems

- For example, does the permittee analyze the data to assess the most common compliance problems, and then modify their controls/programs to address these problems? For example, do they use the common compliance issues identified to target their training and outreach/education efforts for construction operators?

Level of implementation of SWMP activities (e.g., frequency and numbers of inspections, frequency of catch basin cleaning, street sweeping)

- Does the permittee report the total universe when reporting the quantity of an activity achieved? For example, if the MS4 is required to conduct industrial inspections, does it report it did 100 inspections (which may be good or bad, depending on how many it was required to inspect), or that it did 100 out of 5,000 (only 2% of the total)?

Water quality priorities for the permittee (e.g. impaired waters, TMDLs, high quality waters)

- Does the permittee's annual report describe priority pollutants for impaired waters and other water quality programs and what was done to reduce and/or eliminate their contact with stormwater? Does the SWMP target both impaired and high quality waters?

Specific sources or pollutants of concern permittee is currently focusing on

- Does the SWMP target pollutants of concern in its activities?

Level and type of enforcement currently being used by permittee

- Does the annual report provide data and summary information on the different types of enforcement actions taken (how many verbal warnings, written notes, fines, etc)?

Any trends (i.e. water quality, compliance, control measure implementation levels) being reported by Permittees which indicate success or failure of particular SWMP components

- Does the permittee analyze the data, or just report the data in the MS4 annual report?

Types of measurable goals being applied and achieved by permittees

- Has the permittee met the measurable goals stated in the permit and SWMP?

Stormwater management program (SWMP)
Review the most current SWMP documents for potential gaps that may need to be specifically addressed in the reissued MS4 permit. EPA's *MS4 Program Evaluation Guidance* (available at www.epa.gov/npdes/pubs/ms4guide_withappendixa.pdf) can be used to assess the key elements in a SWMP.

NPDES MS4 audit reports, construction/industrial/commercial site inspection reports
Review the findings from any MS4 audits conducted during the past permit term to help identify key issues that should be addressed in the next permit. For example, if the audits identified weak or missing program elements and other controls, these should be addressed in the reissuance of the permit. Construction, industrial, and/or commercial site inspection reports for facilities within the MS4's boundary should be reviewed to determine if there are common compliance issues that should be addressed in the MS4 permit (for example, more training, more frequent inspections, more complete inventory or prioritization, etc.).

Monitoring/Information on Quality of Receiving Waters
Review any monitoring data collected by the permittee or any other entity that has collected useful monitoring data to identify potential pollutants of concern. In addition, the most recent information on impaired waters and total maximum daily loads (TMDLs) for the permit area should be reviewed. If there are waste load allocations (WLAs) applicable to the permittee, these should be addressed in the permit. If no WLA has been assigned to the MS4, the permit writer should still consider pollutants of concern identified in 303(d) lists and TMDLs when developing Permit Requirements. Such information will help identify whether more targeted permit conditions are needed to reduce the discharge of these pollutants. This Guide does not specifically address the inclusion of TMDL requirements in MS4 permits.

Permit renewal application data or past notice of intent (NOI) information
Review any permit renewal applications or NOIs submitted to establish coverage for the previous permit term. Permit writers should consider the recommendations made in the EPA "Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems" (www.epa.gov/npdes/pubs/owm0125.pdf) published in 1996 (40 CFR Part 122; Federal Register, Volume 61, Number 155). This document provides information which clarifies the MS4 reapplication requirements and explains that MS4 permit applicants and NPDES permit writers have discretion to customize appropriate and streamlined reapplication requirements on a case-by-case basis.

Previous MS4 permit
Finally, review any past MS4 permits to identify where permit language should be revised or completely rewritten, for example, because language was vague. This MS4 permit improvement Guide should be used help strengthen key areas in the permit.

Note that if the MS4 permit is being issued for the first time, some of the above information will not exist yet, such as past annual reports or old SWMP documents.

MS4 Permit Writing Tips

There are a few general tips to keep in mind when writing MS4 permits. First, and most importantly, permit provisions should be clear, specific, measurable, and enforceable. Permits should include specific

deadlines for compliance, incorporate clear performance standards, and include measurable goals or quantifiable targets for implementation. Doing so will allow permitting authorities to more easily assess compliance, and take enforcement actions as necessary.

For example, the following permit provision could be strengthened: "The permittee shall demonstrate compliance with this Permit through the timely implementation of control measures and other actions to reduce pollutants in discharges to the maximum extent practicable in accordance with their SWMP…" This permit provision does not define what "timely implementation" is, allowing the permittee to determine what is timely. Timely implementation could be, although it probably was not intended to be, interpreted as meaning up to five years, or it could mean that implementation must occur within six months. In addition, "other actions" are mentioned in this provision, but they are never described. If a permit requires "other actions," these actions should be specifically described in the permit. Finally, it is important to strike a balance of providing specific Permit Requirements while still allowing the permittee come up with innovative controls.

In addition, vague phrases such as "as feasible" and "as possible" should be avoided because they result in inconsistent implementation by permittees and difficulties in permit authority oversight and enforcement. The permit writer's role is to determine what is necessary to achieve in a permit term, and to develop clear, enforceable language that conforms to these determinations. Accordingly, the permit should set forth objective standards, criteria or processes, which will aid the permittee in complying with the permit, as well as the permitting authority in determining compliance in the MS4 permit.

In order for permit language to be clear, specific, measurable and enforceable, each Permit Requirement will ideally specify:

- *What* needs to happen
- *Who* needs to do it
- *How much* they need to do
- *When* they need to get it done
- *Where* it is to be done

For each Permit Requirement: "What" is usually the stormwater control measure or activity required. "Who" in most cases is implied as the permittee (although in some cases the permitting authority may need to specify who exactly will carry out the requirement if there are co-permittees). "How much" is the performance standard the permittee must meet (e.g., how many inspections). "When" is a specific time (or a set frequency) when the stormwater control measure or activity must be completed. "Where" indicates the specific location or area (if necessary). These questions will help determine compliance with the permit requirement.

The Use of Partnerships in MS4 Permits

Since the Phase II Rule applies to all small MS4s within an urbanized area regardless of political boundaries it is very likely that multiple governments and agencies within a single geographic area are subject to MS4 permitting requirements. For example, a city government that operates a small MS4 within an urbanized area may obtain permit coverage under a general Phase II permit while other MS4s in the same vicinity (such as a county, other cities, or a state DOT) may have individual Phase I MS4 permits. All permittees are responsible for permit compliance in their permitted area. Given the

potential for overlapping activities in close proximity, EPA encourages permittees in a geographic area to establish cooperative agreements in implementing their stormwater programs. Partnerships and agreements between permittees and/or other agencies can minimize unnecessarily repeating activities and result in using available resources as efficiently as possible. Using existing tools and programs instead of creating new ones can allow permittees to focus resources on high priority program components instead. In addition by forming partnerships, water quality can be examined and improved on a larger, consolidated scale rather than on a piece-meal, site-by-site basis.

In addition to requiring MS4 permittees to maintain records of program implementation such as inspection forms, monitoring data, dry weather screening reports, and notices of violation, EPA recommends that MS4 permits include requirements for permittees to summarize and analyze data and submit the analysis to the permitting authority. For example, as permittees are required to evaluate program compliance and appropriateness of best management practices, the permit could require permittees to address in annual reports questions such as:

- For illicit discharge data, what are the most prevalent sources and pollutants in the illicit discharge data, and where are these illicit discharges occurring? How many illicit discharges have been identified, and how many of those have been resolved? How many outfalls or screening points were visually screened, how many had dry weather discharges or flows, at how many were field analyses completed and for what parameters, and at how many were samples collected and analyzed? Does the permittee need to conduct more inspections in these areas, or develop more specific outreach targeting these sources and pollutants?
- For the construction data, what are the most common construction violations, and are there any trends in the data (e.g., construction operators who receive more violations than others, areas of the MS4 with more violations, need to refine guidance or standards to more clearly address common violations) How has the permittee responded to these trends? Over the last year, how many construction site SWPPP reviews were completed and approved? How many inspections were conducted, how many noncompliant sites were identified, and how many enforcement actions (and of what type) were taken?

Also, although the stormwater Phase II rule requires reports, after the first permit term, reports are required to be submitted only in years two and four of the permit term. EPA strongly encourages annual reports for all permittees. (See 40 CFR 122.34(g)(3))

CHAPTER 1: ESTABLISHMENT OF THE STORMWATER MANAGEMENT PROGRAM

Introduction

Included Concepts

- Requirement to develop a stormwater management program
- Necessary legal authority
- Enforcement Measures and Tracking
- Adequate resources

An over-arching legal authority framework must be established in order for the SWMP to be effective. Ensuring that the permittee has established the legal authority to meet the requirements of the permit, created a well described enforcement response plan (ERP), and allocated adequate resources will set a necessary foundation for the SWMP.

Legal Authority

Permittees must have the authority to carry out all aspects of their stormwater management programs, including requiring the control of pollutants flowing into the MS4 system, having access to inspect sources of pollutant discharges, and being able to compel compliance and issue citations in the event of violations. Legal authority is especially critical for construction site runoff control, post-construction/permanent runoff control, industrial and commercial inspections, and illicit discharge detection and elimination programs. (See 40 CFR 122.26(d)(2)(i) and 40 CFR 122.34(b)(3)(ii)(B), (b)(4)(ii)(A), and (b)(5)(ii)(B))

A permittee seeking permit coverage under individual permits is required to describe the legal authority it has to implement and enforce the SWMP. EPA recommends that general permits also require regulated MS4s to describe their applicable legal authority in their Notices of Intent (NOIs) (40 CFR 122.26(d)(2)(i), 122.33(b)). This legal authority is typically established through the adoption of one or more ordinances, or by modifying existing ordinances to provide the necessary authority. In some cases, a permittee might already have codified water quality provisions to address previous MS4 Permit Requirements; in this case, the permittee should be required to review existing codes and ordinances and prepare a statement detailing any necessary changes required to address the new MS4 permit requirements. Some permittees, such as, DOTs, universities, and prisons, may not have the authority to create and enforce ordinances. For these entities other mechanisms and authorities that they do possess should be utilized (e.g. DOT right-of-way permits).

Enforcement Measures and Tracking

Permittees are required by the Phase I and Phase II regulations to include in their ordinance, or other regulatory mechanism, penalty provisions to ensure compliance with construction and industrial requirements, to require the removal of illicit discharges, and to address noncompliance with post-construction requirements. In complying with these requirements, EPA recommends the use of enforcement responses that vary with the type of permit violation, and escalate if violations are repeated or not corrected. EPA recommends that the permittee be required to develop and implement an enforcement response plan (ERP), which clearly describes the action to be taken for common violations associated with the construction program, industrial and commercial program, or other SWMP programs. A well-written ERP provides guidance to inspectors on the different enforcement

responses available, actions to address general permit non-filers, when and how to refer violators to the State, and how to track enforcement actions.

Adequate Resources

Each permittee will fund its SWMP differently; therefore, in order to assess whether adequate resources have been allocated to carry out the requirements of the MS4 permit, the permitting authorities should require their permittees to submit an accounting of stormwater-related budgets, costs, and staffing resources updated annually. The fiscal analysis should document and explain changes to budgets from year to year and describe how each type of funding can and cannot be used for stormwater program activities. (See 40 CFR 122.26(d)(2)(vi)).

1.1 Requirement to Develop a Stormwater Management Program

Example Permit Provision

1.1.1 Requirement to Develop Program – The permittee must revise and update its written stormwater management program (SWMP) document and submit the SWMP to the [*insert name of Permitting Authority*] for review by [*insert deadline, e.g., within one year of permit issuance*]. The permittee must continue to implement the current SWMP until the revised SWMP is submitted. The SWMP does not contain effluent limitations; the limitations are contained in Parts [*insert relevant part of the permit*] of the permit.

1.1.2 Contents of the SWMP document – At a minimum, the permittee must include the following information in its SWMP document:

a. Ordinances, or other regulatory mechanisms, providing the legal authority necessary to implement and enforce the requirements of this permit (see Part 1.1);

b. Statement by the permittee's legal counsel certifying to adequacy of legal authority (see Part 1.2);

c. Written procedures describing how the permittee will implement provisions described in Parts 2-8.

1.1.3 Modifications to the SWMP document – The [*insert applicable name of permitting authority*]may notify the permittee of the need to modify the SWMP document to be consistent with the permit, in which case the permittee will have [*insert deadline, e.g. 90 days*] to finalize such changes to the program. The permittee is required to keep the SWMP document up to date during the term of the permit. Where the permittee determines that modifications are needed to address any procedural, protocol, or programmatic change, such changes must be made as soon as practicable, but not later than [*insert deadline, e.g. 90 days*].

Example Permit Requirement Rationale for the Fact Sheet

The permittee is required to develop a SWMP document that describes how the permittee will meet the control requirements in the permit. (See 40 CFR 122.26(d)(2)(iv), 122.34(a)). The SWMP document is a consolidation of all of the permittee's relevant ordinances or other regulatory requirements, the description of all programs and procedures (including standard forms to be used for reports and inspections) that will be implemented and enforced to comply with this permit and to document the selection, design, and installation of all stormwater control measures. The permittee is required to submit its SWMP document to the permitting authority. If modifications to the SWMP are necessary then the permitting authority will notify the permittee.

Recommendation for the Permit Writer

The permit writer should include in this section the relevant parts of the permit that require specific descriptions or justifications to be included in the SWMP document. Also, permit writers may need to include an additional requirement regarding the submittal of the SWMP document since some information contained in the SWMP document is required to be submitted prior to the permittee obtaining permit coverage. In addition, permit writers should refer to the memo entitled *Interim Guidance on Implementation of NPDES Regulations for Storm Water Phase II for Small Municipal Separate Storm Sewer Systems in Response to Recent Ninth Circuit Decision in Environmental Defense Center, et al. v. EPA, No. 00-70014 & consolidated cases (9th Cir.)* for additional guidance on the implementation of regulations for Phase II MS4s (www.epa.gov/npdes/pubs/interim_guidelines_memo_final.pdf).

1.2 Requirement to Develop Adequate Legal Authority to Implement and Enforce Stormwater Management Program

Example Permit Provision

1.2.1 Within [*insert deadline, e.g., one year from permit issuance*] the permittee must review and revise its relevant ordinances or other regulatory mechanisms, or adopt any new ordinances or other regulatory mechanisms that provide it with adequate legal authority to control pollutant discharges into and from its MS4, and to meet the requirements of this permit.

1.2.2 To be considered adequate, this legal authority must, at a minimum, address the following:

a. Authority to Prohibit Illicit Discharges – Prohibit and eliminate illicit connections and discharges to the MS4. Illicit connections include pipes, drains, open channels, or other conveyances that have the potential to allow an illicit discharge to enter the MS4. Illicit discharges include all non-stormwater discharges except fire fighting discharges, discharges from NPDES permitted industrial sources and discharges not otherwise authorized under Part 1.2.2.b. of this permit.

b. Allowable Non-Stormwater Discharges –Exceptions to the prohibition in Part 1.2.2.a. may include the following, only if they are considered non-significant contributors of pollutants: water line flushing, landscape irrigation, diverted stream flows, rising ground waters, uncontaminated ground water infiltration (as defined at 40 CFR 35.2005(20)) to separate storm sewers, uncontaminated pumped ground water, discharges from potable water sources, foundation drains, air conditioning condensation, irrigation water, springs, water from crawl space pumps, footing drains, lawn watering, individual residential car washing, flows from riparian habitats and wetlands, dechlorinated swimming pool discharges, and street wash water.

c. Authority to Prohibit Spills or Other Releases – Control the discharge of spills, and prohibit dumping or disposal of materials other than stormwater into the MS4.

d. Authority to Require Compliance – Require compliance with conditions in the permittee's ordinances, permits, contracts, or orders (i.e., hold dischargers accountable for their contributions of pollutants and flows).

e. Authority to Require Installation, Implementation, and Maintenance of Control Measures – Require owners/operators of construction sites, new or redeveloped land, and industrial and commercial facilities to minimize the discharge of pollutants to the MS4 through the installation, implementation, and maintenance of stormwater control measures consistent with [*insert references to applicable stormwater control measure manuals, guidance documents, etc.*].

f. Authority to Receive and Collect Information – The permittee must have the authority to request from operators of construction sites, new or redeveloped land, and industrial and commercial facilities information such as stormwater plans, inspection reports, and monitoring results, and other information deemed necessary to assess compliance with this permit. The permittee must also have the authority to review designs and proposals for new development and redevelopment to determine whether adequate stormwater control measures will be installed, implemented, and maintained.

g. Authority to Inspect – The permittee must have the authority to enter private property for the purpose of inspecting at reasonable times any facilities, equipment, practices, or operations related to stormwater discharges to determine whether there is compliance with local stormwater control ordinances/standards or requirements in this Permit.

h. Response to Violations – The permittee must have the ability to promptly require that violators cease and desist illicit discharges or discharges of stormwater in violation of any ordinance or standard and/or cleanup and abate such discharges, including the ability to:

    1. Effectively require the discharger to abate and clean up their discharge, spill, or pollutant release within [*insert deadline, e.g. 48 hours*] of notification; or

    2. For uncontrolled sources of pollutants that could pose an environmental threat, require abatement within [*insert timeframe, e.g. 30 days of notification*]; or,

3. Perform the clean up and abatement work and bill the responsible party, if necessary.
4. If a situation persists where pollutant-causing sources or activities are not abated, provide the option to order the cessation of activities until such problems are adequately addressed.
5. When all parties agree that clean-up activities cannot be completed within the timeframe provided, determine a new timeframe and notify the [*insert name of permitting authority*].

i. Monetary Penalties – The permittee must have the ability to:
   1. Levy citations or administrative fines against responsible parties either immediately at the site, or within a few days.
   2. Require recovery and remediation costs from responsible parties.

j. Civil/Criminal Penalties – The permittee must have the ability to impose more substantial civil or criminal sanctions (including referral to a city or district attorney) and escalate corrective response, consistent with its enforcement response plan developed pursuant to Part 1.3, for persistent non-compliance, repeat or escalating violations, or incidents of major environmental harm.

k. Interagency Agreements – Control of the contribution of pollutants from one portion of the shared MS4 to another portion of the MS4 through interagency agreements or other similar agreements with other owners of the MS4, such as [*insert other applicable permittees*].

1.2.3 The permittee must include as part of its written SWMP document a statement certified by its chief legal counsel that the permittee has taken the necessary steps to obtain and maintain full legal authority to implement and enforce each of the requirements contained in this permit. This statement must include:

a. Identification of all departments within the permittee's jurisdiction that conduct stormwater-related activities and their roles and responsibilities under this permit. Include an up-to-date organizational chart specifying these departments, key personnel, and contact information.

b. Identification of the local administrative and legal procedures and ordinances available to mandate compliance with stormwater-related ordinances and therefore with the conditions of this permit.

c. A description of how stormwater related-ordinances are implemented and appealed.

d. A description of whether the municipality can issue administrative orders and injunctions, or whether it must go through the court system for enforcement actions.

Example Permit Requirement Rationale for the Fact Sheet

Adequate legal authority is required to implement and enforce most parts of the SWMP. (See 40 CFR 122.26(d)(2)(i) and 40 CFR 122.34(b)(3)(ii)(B), (b)(4)(ii)(A), and (b)(5)(ii)(B)). Without

adequate legal authority the MS4 would be unable to perform many vital SWMP functions such as performing inspections and requiring installation of control measures. In addition, the permittee would not be able to penalize and/or attain remediation costs from violators.

Recommendations for the Permit Writer

A major difference between a traditional MS4 and a non-traditional MS4 (such as a DOT, military base, or university) is often the scope of legal authority available to the MS4. Non-traditional MS4 permittees often cannot pass "ordinances" nor do they have enforcement authority like a typical municipality, so legal authority may consist of policies, standards, or specific contract language. Non-traditional MS4 permittees also do not generally have the authority to impose a monetary penalty. Although these differences exist, just like traditional MS4s, non-traditional MS4s must have the legal authority to develop, implement, and enforce the program. Moreover, the scope of legal authority that may be exercised by MS4 operators that are municipalities may vary from state to state. Therefore, permit writers should tailor the legal authority section depending on the types of permittees covered and the scope of authority that may be exercised by the permittee. For example, non-traditional MS4 permittees often have authority over what their contracts require. Therefore, the permit could require that contracts for construction and maintenance activities include specific stormwater requirements that ensure the permittee's requirements are met. In addition, cooperative agreements could be maintained with those permittees that do possess the legal authorities to enforce stormwater measures within the permittee's MS4 boundary.

The discharge prohibitions listed in Part 1.2.2 are taken from the Phase II regulations and are the minimum requirements. Note that, unlike Phase II MS4s, Phase I MS4 permittees are required to address the sources of non-stormwater discharges in Part 1.2.2.b. when they are identified as sources of pollutants in stormwater discharges. (See 40 CFR 122.26(d)(2)(iv)(B)). The permit writer may choose to apply additional or more stringent prohibitions. For example, some states have chosen to prohibit discharges from street washing activities as they can be significant sources of pollutants such as oil and grease and heavy metals.

1.3 Enforcement Measures and Tracking

Example Permit Provision

1.3.1 The permittee must continue to implement, and revise within [*specify deadline for completion, e.g. 12 months of permit issuance*] if necessary, an enforcement response plan (ERP), which sets out the permittee's potential responses to violations and addresses repeat and continuing violations through progressively stricter responses as needed to achieve compliance. The ERP must describe how the permittee will use each of the following types of enforcement responses based on the type of violation:

a. Verbal Warnings – Verbal warnings are primarily consultative in nature. At a minimum, verbal warnings must specify the nature of the violation and required corrective action.

b. Written Notices – Written notices of violation (NOVs) must stipulate the nature of the violation and the required corrective action, with deadlines for taking such action.

c. Escalated Enforcement Measures – The Permittee must have the legal ability to employ any combination of the enforcement actions below (or their functional equivalent), and to escalate enforcement responses where necessary to address persistent non-compliance, repeat or escalating violations, or incidents of major environmental harm:

1. Citations (with Fines) – The ERP must indicate when the permittee will assess monetary fines, which may include civil and administrative penalties.
2. Stop Work Orders – The permittee must have the authority to issue stop work orders that require construction activities to be halted, except for those activities directed at cleaning up, abating discharge, and installing appropriate control measures.
3. Withholding of Plan Approvals or Other Authorizations – Where a facility is in non-compliance, the ERP must address how the permittee's own approval process affecting the facility's ability to discharge to the MS4 can be used to abate the violation.
4. Additional Measures – The permittee may also use other escalated measures provided under local legal authorities. The permittee may perform work necessary to improve erosion control measures and collect the funds from the responsible party in an appropriate manner, such as collecting against the project's bond or directly billing the responsible party to pay for work and materials.

1.3.2 Enforcement Tracking – The Permittee must track instances of non-compliance either in hard-copy files or electronically. The enforcement case documentation must include, at a minimum, the following:

a. Name of owner/operator of facility or site of violation
b. Location of stormwater source (i.e., construction project, industrial facility)
c. Description of violation
d. Required schedule for returning to compliance
e. Description of enforcement response used, including escalated responses if repeat violations occur or violations are not resolved in a timely manner
f. Accompanying documentation of enforcement response (e.g., notices of noncompliance, notices of violations)
g. Any referrals to different departments or agencies
h. Date violation was resolved.

1.3.3 Recidivism Reduction – The permittee is required to identify chronic violators of any SWMP component and reduce the rate of noncompliance recidivism. The permittee

must summarize inspection results by these chronic violators and include incentives, disincentives, or an increased inspection frequency at the operator's sites. [2]

Example Permit Requirement Rationale for the Fact Sheet

The permit requires permittees to have an established, escalating enforcement policy that clearly describes the action to be taken for common violations. The policy must describe the procedures to ensure compliance with local ordinances and standards, including the sanctions and enforcement mechanisms that will be used to ensure compliance. (See 40 CFR 122.26(d)(2)(i)). It is critical that the MS4 have the authority to initiate a range of enforcement actions to address the variability and severity of noncompliance. Enforcement responses to individual violations must consider criteria such as magnitude and duration of the violation, effect of the violation on the receiving water, compliance history of the operator, and good faith of the operator in compliance efforts. Particularly for construction sites, enforcement actions must be timely in order to be effective.

Recommendations for the Permit Writer

Typical enforcement mechanisms include verbal warnings, written NOVs, administrative fines and orders, stop work orders, and civil or criminal penalties. Some non-traditional MS4 permittees, such as DOTs and universities, may not have the authority to use the mechanisms described above. Therefore the enforcement requirements in the permit should take the permittee's enforcement limitations and abilities into consideration, allow for alternative mechanisms such as related contract obligations or right-of-way permits, and/or require entities that cannot enforce to coordinate with those entities that can. For example, if a DOT discovers an illicit discharge to the right-of-way, a mechanism should be in place for the DOT to communicate with the adjacent municipality to eliminate the discharge in a timely manner.

Some permit writers include specific language as to when permittees can refer violations of NPDES permits to the permitting authority. Because of the often similar control measures required in MS4 construction programs and NPDES CGP SWPPP requirements, permit writers want the permittee to make an honest effort at achieving compliance with their local requirements before referring a violator to the NPDES permitting authority. An example of permit language on NPDES referrals, which require the MS4 permittee to make a good faith effort at ensuring compliance by conducting at least two inspections and notices of violation, follows:

> NPDES Permit Referrals–For those construction projects or industrial facilities subject to the [*insert name of applicable NPDES general construction/industrial permit*], the permittee must:

[2] Adapted from 2009 San Francisco Bay Municipal Regional Stormwater Permit (Order No. R2-2009-0074; www.swrcb.ca.gov/sanfranciscobay/board_decisions/adopted_orders/2009/R2-2009-0074.pdf) and the Los Angeles MS4 Permit (Part 3; www.swrcb.ca.gov/rwqcb4/water_issues/programs/stormwater/municipal/ms4_permits/los_angeles/2001-2007/LA_MS4_Permit2001-2007.pdf)

a. Refer non-filers (i.e., those facilities that cannot demonstrate that they obtained permit coverage) to the [*insert name of permitting authority*] within [*insert number of days, e.g. 30 days*] of making that determination. In making such referrals, the permittee must include, at a minimum, the following documentation:

   1. Construction project or industrial facility location.
   2. Name of owner or operator.
   3. Estimated construction project size or type of industrial activity (including SIC code if known).
   4. Records of communication with the owner or operator regarding filing requirements.

b. Refer violations to the [*insert name of permitting authority*] provided that the permittee has made a good faith effort of progressive enforcement to achieve compliance with its own ordinances. At a minimum, the permittee's good faith effort must include documentation of two follow-up inspections and two warning letters or notices of violation. In making such referrals, the permittee must include, at a minimum, the following documentation:

   1. Construction project or industrial facility location
   2. Name of owner or operator
   3. Estimated construction project size or type of industrial activity (including SIC code if known)
   4. Records of communication with the owner or operator regarding the violation, including at least two follow-up inspections, two warning letters or notices of violation, and any response from the owner or operator

It is important to note that a referral to the permitting authority does not relieve the MS4 from its enforcement obligations. The MS4 must continue to work with the permitting authority, using all available enforcement authority in order to gain compliance.

1.4 Requirement to Ensure Adequate Resources to Comply with MS4 Permit

Example Permit Provision

1.4.1 Secure Resources – The permittee must secure the resources necessary to meet all requirements of this permit.

1.4.2 Annual Fiscal Analysis – The permittee must conduct an annual analysis of the capital and operation and maintenance expenditures needed, allocated, and spent as well as the necessary staff resources needed and allocated to meet the requirements of this permit, including any development, implementation, and

enforcement activities required. The analysis must include estimated expenditures for the reporting period, the preceding period, and the next reporting period and be submitted with the annual report.

a. Each analysis must include a description of the source of funds that are proposed to meet the necessary expenditures, including legal restrictions on the use of such funds.
b. Each analysis must include a narrative description of circumstances resulting in a [*insert percentage, e.g. 25 percent or greater*] annual change for any budget line items.
c. Each analysis must include a description of the staff resources necessary to meet the requirements of this permit.

Example Permit Requirement Rationale for the Fact Sheet

The annual fiscal analysis will show the allocated resources, expenditures, and staff resources necessary to comply with the permit, and implement and enforce the permittee's SWMP. (See 40 CFR 122.26(d)(2)(vi). The annual analysis is necessary to show that the permittee has adequate resources to meet all Permit Requirements. The analysis can also show year-to-year changes in funding for the stormwater program. A summary of the annual analysis must be reported in the annual report (see Section 8.4 and Appendix A). This report will help the Permitting Authority understand the resources that are dedicated to compliance with this permit, and to implementation and enforcement of the SWMP, and track how this changes over time.

Recommendations for the Permit Writer

Permit writers should be specific when requesting financial analysis information from the permittee. The Annual Report Template provided in this Guide includes basic questions that should be adequate for Phase II MS4s. However, more detailed information may be warranted from more established programs and larger Phase I MS4s.

Because stormwater is a component in many different program areas, it can often be difficult to get an accurate accounting of costs. For example, inspection staff may have multiple responsibilities in addition to stormwater inspections. Is it appropriate to count an entire inspector's time (i.e. full-time equivalent (FTE)) as a stormwater cost if the inspector is also doing building inspections? Also, some permittees count street sweeping as a stormwater compliance cost, while others consider their street sweeping costs as an aesthetic or air quality cost. Permittees should provide a detailed breakdown of costs, along with background or additional discussion so the permit writer knows what the costs include.

CHAPTER 2: PUBLIC EDUCATION AND OUTREACH/PUBLIC INVOLVEMENT

Introduction

The Phase II Regulations require MS4 permittees to develop programs to educate the public about the impact of stormwater discharges on local waterways and the steps that citizens, businesses, and other organizations can take to reduce the contamination of stormwater (40 CFR 122.34(b)(1),(2)). Phase I MS4 permittees were also required to describe their proposed public education programs as part of their initial permit application, but the regulations are not as specific as Phase II. (See 40 CFR 122.26(d)(2)(iv) (B), (D)(4) and (A)(6)).

Included Concepts

- Developing a comprehensive stormwater education/ outreach program
- Involving the public in planning and implementing the SWMP

As the public gains a greater understanding of the benefits of stormwater management, an MS4 is likely to gain more support for the SWMP (including financial support) and increased compliance with the applicable regulatory requirements as the public understands how their actions impact water quality. Education and awareness programs help change human behavior with respect to reducing the amount of pollution generated from stormwater sources within the MS4 system. In addition to education, encouraging public participation in local stormwater programs can lead to program improvement as well as enabling people to identify and report a pollution-causing activity, such as spotting an illicit discharge.

2.1 Developing a Comprehensive Stormwater Education/Outreach Program

Example Permit Provision

2.1.1 The permittee must:

a. Continue to implement, and revise if necessary within [*specify the time when the development of the program must be completed, e.g., within the first year after permit issuance*], a comprehensive stormwater education/outreach program. The program must, at a minimum:

1. Define the goals and objectives of the program based on at least three high priority, community-wide issues (e.g. reduction of nitrogen in discharges from the MS4, promoting pervious techniques used in the MS4);
2. Identify and analyze the target audience(s);
3. Create an appropriate message(s) based on at least three targeted residential issues and three targeted industrial/commercial issues from the suggested list below (or three issues deemed more appropriate to the MS4):

Residential Community

- Residential car washing and auto maintenance control measures
- Off-pavement automobile parking
- Home and garden care activities (pesticides, herbicides, and fertilizers)
- Disposal of household hazardous waste (e.g. paints, cleaning products)
- Snow removal activities
- Using techniques that keep water onsite and/or reduce imperviousness (rain barrels, rain gardens, porous pavers, permeable concrete, porous asphalt, etc.)
- Litter prevention
- Importance of native vegetation for preventing soil erosion
- Public reporting of water quality issues
- Community activities (monitoring programs, environmental protection organization activities, etc.)
- Pet and other animal wastes

Industrial/Commercial Community

- Automobile repair and maintenance Control measures
- Control measure installation and maintenance
- Lawful disposal of vacuum truck and sweeping equipment waste
- Pollution prevention and safe alternatives
- Snow removal activities
- Using techniques that keep water onsite and/or reduce imperviousness (rain barrels, rain gardens, porous pavers, permeable concrete, porous asphalt, etc.)
- Equipment and vehicle maintenance and repair
- Importance of good housekeeping (e.g. sweeping impervious surfaces instead of hosing)
- Illicit discharge detection and elimination observations and follow-up during daily work activities
- Water quality impacts associated with land development (including new construction and redevelopment)
- Water quality impacts associated with road resurfacing and repaving

4. Develop appropriate educational materials (e.g. the materials can utilize various media such as printed materials, billboard and mass transit advertisements, signage at select locations, radio advertisements, television advertisements, websites);
5. Determine methods and process of distribution;
6. Evaluate the effectiveness of the program; and
7. Utilize public input (e.g., the opportunity for public comment, or public meetings) in the development of the program.

b. During the term of the permit, the permittee must distribute the educational materials, using whichever methods and procedures determined appropriate by the permittee, in such a way that is designed to convey the program's message to [*insert percentage or other appropriate numeric threshold, e.g., 20%*] of the target audience each year.

c. Within [*insert deadline, e.g., within the permit term*], the permittee must assess changes in public awareness and behavior resulting from the implementation of the program such as using a statistically valid survey and modify the education/outreach program accordingly.

d. The permittee must assess its stormwater education/outreach program annually as specified in Part 8.3 of this permit. The permittee must adjust its educational materials and the delivery of such materials to address any shortcomings found as a result of this assessment.

e. Written procedures for implementing this program must be incorporated into the SWMP document.

Example Permit Requirement Rationale for the Fact Sheet

Without a focused and comprehensive program, outreach and education efforts will likely be poorly coordinated and possibly ineffective. The permit the permittee to develop an education/outreach program that addresses the six steps listed and also found in EPA's *Getting In Step: A Guide to Effective Outreach in Your Watershed (www.epa.gov/watertrain/gettinginstep/)*. This guide explains the steps in developing an outreach plan, presents information on creating outreach materials, and provides tips in working with the media. The permittee is encouraged to follow this guide in developing its outreach strategy.

The public education and outreach program must be tailored and targeted to specific water quality issues of concern in the relevant community. These community-wide and targeted issues must then guide the development of the comprehensive outreach program, including the creation of appropriate messages and educational materials. The permit includes a list of potential residential and commercial issues, but the permittee may also choose other issues that contribute significant pollutant loads to stormwater.

The permittee is encouraged to use existing public educational materials in its program. Examples of public educational materials for stormwater are available at EPA's *Nonpoint Source Outreach Toolbox (www.epa.gov/nps/toolbox)*. The permittee is also encouraged to leverage resources with other agencies and municipalities with similar public education goals.

Finally, the underlying principle of any public education and outreach effort is to change behaviors. The permittee must develop a process to assess how well its public education and outreach programs is changing public awareness and behaviors and to determine what changes are necessary to make its public education program more effective. This assessment of public education programs is typically conducted via phone surveys, but other assessment methods that quantify results can be used. The permittee is encouraged to use a variety of assessment methods to evaluate the effectiveness of different public education activities. The permit requires that the first evaluation assessment be conducted before the final year of the permittee's coverage under this permit, before the next permit is issued. The allows the permittee to make changes as appropriate before the next permit application is due, EPA's *Getting In Step: A Guide to Effective Outreach in Your Watershed (www.epa.gov/watertrain/gettinginstep/)* can provide useful information on setting up and conducting the evaluations.

Recommendations for the Permit Writer

EPA recommends that the requirement to identify high priority community-wide issues and targeted issues be set at least 3 to 6 months before the stormwater education/outreach program is to be implemented, so the permitting authority can review the issues and provide any feedback before the plan is completed.

The permit can be a means for increasing public awareness and understanding of stormwater impacts on local watersheds, including high quality watersheds that need protecting. EPA recommends that the permit writer consider requiring permittees to identify and describe issues, such as specific pollutants, the sources of those pollutants, impacts on biology, and the physical attributes of stormwater runoff, in their education/outreach program, which affect local watershed(s). Where applicable, the education/outreach program should identify and describe high quality watersheds in need of protection and the issues that may threaten the quality of these waters.

The list in Part 2.1.1.a(3) is not all-inclusive. Therefore, EPA recommends that the permit be written to allow the permittee to indentify priority issue(s) not listed that may contribute a significant pollutant load to stormwater. For Phase I, individual permits, it may be appropriate for the permit writer to specify the priority issues based on known issues, monitoring data, historical trends, etc. Phase II general permits will likely need to allow for more flexibility in selecting priority issues.

In addition, the permit writer will need to consider that DOTs and other “non-traditional” MS4s will likely have different priority concerns than the ones identified in the categories above. In fact, the categories (residential and commercial/industrial) may also need to be changed. In these instances, the permit writer may want to consider having the non-traditional permittees work together with any local government MS4s in their area to maximize the program and cost effectiveness of the outreach.

The permit writer may consider specifying the mechanism the permittee is required to use to measure the awareness of and behavior related to issues concerning stormwater runoff by the general public, or targeted audiences within the general public. Examples of evaluations could include:

- Direct Evaluations
- Surveys
- Tracking the number of attendees
- Interviews
- Review of media clippings
- Tracking the number of stormwater-related calls/emails/letters received

Permit writers should consider whether it is appropriate to require a baseline assessment of the public’s awareness of stormwater issues, for example in the second year of the permit term, so that comparisons may be drawn in reference to the baseline. This would likely require the permittee to conduct two assessments in the first permit term that the assessment is required.

2.2 Involving the Public in Planning and Implementing the SWMP

Example Permit Provision

2.2.1 The permittee is required to involve the public in the planning and implementation of activities related to the development and implementation of the SWMP. At a minimum, the permittee must:

a. Establish a citizen advisory group or utilize existing citizen organizations. The permittee may establish a stand-alone group or utilize an existing group or process. The advisory group must consist of a balanced representation of all affected parties, including residents, business owners, and environmental organizations in the MS4 area and/or affected watershed. The permittee must invite the citizen advisory group to participate in the development and implementation of all parts of the community's SWMP.

b. Create opportunities for citizens to participate in the implementation of stormwater controls (e.g., stream clean-ups, storm drain stenciling, volunteer monitoring, and educational activities).

c. Ensure the public can easily find information about the permittee's SWMP.

2.2.2 Written procedures for implementing this program must be incorporated into the SWMP document.

Example Permit Requirement Rationale for the Fact Sheet

Stormwater management programs can be greatly improved by involving the community throughout the entire process of developing and implementing the program. Involving the public benefits both the permittee itself as well as the community. B y listening to the public's concerns and coming up with solutions together, the permittee will gain the public's support and the community will become invested in the program. The permittees will likewise gain even more insight into the most effective ways to communicate their messages.

This permit requires the involvement of the public, which includes a citizen advisory group or process to solicit feedback on the stormwater program, and opportunities for citizens to participate in implementation of the stormwater program. The citizen advisory group should meet with the local land use planners and provide input on land use code or ordinance updates so that land use requirements incorporate provisions for better management of stormwater runoff and watershed protection. Public participation in implementation of the stormwater program can include many different activities such as stream clean-ups, storm drain markings, and volunteer monitoring.

Permittees are encouraged to work together with other entities that have an impact on stormwater (for example, schools, homeowner associations, DOTs, other MS4 permittees). Permittees are also encouraged to use existing advisory groups or processes in order to implement these public involvement requirements.

Recommendations for the Permit Writer

Especially for Phase I permittees, permit writers may consider requiring more specific information such as requiring at least one contact that the public can reach (including phone number and/or e-mail address) be clearly posted on the website. The contact may be a general contact or a specific person. The permitting authority may want the MS4 to have a mechanism for the public to comment year round, not just at public meetings. This could be facilitated by a webpage and email or a stormwater hotline.

Some Phase II permittees may find it more difficult to establish and maintain a formal citizen advisory group simply because they tend to have smaller populations. The permit writer may want to provide flexibility for the Phase II permittees to utilize the public involvement mechanism which best suits their individual community. For example, groups which are already involved with other aspects of municipal governance or established events where input could be solicited (i.e. farmers markets, festivals) may serve to meet the objective of this section.

CHAPTER 3: ILLICIT DISCHARGE DETECTION AND ELIMINATION

Introduction

Phase I (see 40 CFR 122.26 (d)(1)(v)(B) and (d)(1)(iv)(B)) and Phase II stormwater management programs (see 40 CFR 122.26(d)(2)(iv)(B)) are required to address illicit discharges into the MS4 system. An illicit discharge is defined as any discharge to a municipal separate storm sewer system that is not composed entirely of stormwater, except allowable discharges pursuant to an NPDES permit (40 CFR 122.26(b)(2)). In addition to requiring permittee to have the legal authority to prohibit non-stormwater discharges from entering storm sewers (CWA Section 402(p)(3)(B)) (see Chapter I), MS4 permits must also require the development of a comprehensive, proactive Illicit Discharge Detection Elimination (IDDE) program.

Included Concepts

- IDDE program development
- MS4 mapping
- Identification of priority areas
- Field screening
- IDDE source investigations and elimination
- Public reporting of non-stormwater discharges and spills
- Illicit discharge education and training

An effective IDDE program is more than just a program to respond to complaints about illicit discharges or spills. Permittees must proactively seek out illicit discharges, or activities that could result in discharges, such as illegal connections to the storm sewer system, improper disposal of wastes, or dumping of used motor oil or other chemicals.

In order to trace the origin of a suspected illicit discharge or connection, the permittee must have an updated map of the storm drain system and a formal plan of how to locate illicit discharges and how to respond to them once they are located or reported. The permittee must provide a mechanism for public reporting of illicit discharges and spills, as well as an effective way for staff to be alerted to such reports. Regular field screening of outfalls for non-stormwater discharges needs to occur in areas determined to have a higher likelihood for illicit discharges and illegal connections. Proper investigation and enforcement procedures must be in place to eliminate the sources of the discharges, as well. Finally, in order for the permittee to adequately detect and eliminate sources of illicit discharges, both field and office staff must be properly trained to recognize and report the discharges to the appropriate parties.

EPA recommends that permittees refer to the Center for Watershed Protection's guide on *Illicit Discharge Detection and Elimination (IDDE): A Guidance Manual for Program Development and Technical Assistance* (IDDE Manual, available at www.cwp.org) when developing an IDDE program.

3.1 IDDE Program Development

Example Permit Provision

3.1.1 The permittee must continue to implement a program to detect, investigate, and eliminate non-stormwater discharges (see Part 1.2.2), including illegal dumping, into its system. The IDDE program must include the following:

a. An up-to-date storm sewer system map (see Part 3.2).
b. Procedures for identifying priority areas within the MS4 likely to have illicit discharges, and a list of all such areas identified in the system (see Part 3.3)
c. Field screening to detect illicit discharges (see Part 3.4)
d. Procedures for tracing the source of an illicit discharge (see Part 3.5)
e. Procedures for removing the source of the discharge (see Part 3.5)
f. Procedures for program evaluation and assessment (see Part 8.3)
g. Procedures to prevent and correct any on-site sewage disposal systems that discharge into the MS4. [3]

3.1.2 In implementing the IDDE program, the permittee may conduct such investigations, contract for investigation, coordinate with storm drain investigation activities of others, or use any combination of these approaches.

3.1.3 For non-traditional MS4 permittees, if illicit connections or illicit discharges are observed related to another operator's municipal storm sewer system then the permittee must notify the other operator within [*insert applicable deadline, e.g., within 48 hours*] of discovery.

3.1.4 If another operator notifies the permittee of an illegal connection or illicit discharge to the municipal separate storm sewer system then the permittee must follow the requirements specified in Part 3.5.4.

3.1.5 Written procedures for implementing this program, including those components described in Parts 3.1 – 3.7 must be incorporated into the SWMP document.

Example Permit Requirement Rationale for the Fact Sheet

EPA stormwater regulations define "illicit discharge" as "any discharge to a municipal separate storm sewer that is not composed entirely of stormwater" except discharges resulting from fire fighting activities and discharges from NPDES permitted sources (see 122.26(b)(2)). The applicable regulations state that the following non-stormwater discharges may be allowed if they are not determined to be a significant source of pollutants to the MS4 : water line flushing, landscape irrigation, diverted stream flows, rising ground waters, uncontaminated ground water infiltration (as defined at 40 CFR 35.2005(20)), uncontaminated pumped ground water, discharges from potable water sources, foundation drains, air conditioning condensation, irrigation water, springs, water from crawl space pumps, footing drains, lawn watering, individual residential car washing, flows from riparian habitats and wetlands, dechlorinated swimming pool discharges, and street wash water. If, however, these discharges are determined to be a significant source of pollution then they are prohibited.

Examples of common sources of illicit discharges in urban areas include apartments and homes, car washes, restaurants, airports, landfills, and gas stations. These so called "generating sites" discharge sanitary wastewater, septic system effluent, vehicle wash water, washdown from

[3] Vermont Phase II General Permit (www.vtwaterquality.org/stormwater/htm/sw_ms4.htm)

grease traps, motor oil, antifreeze, gasoline and fuel spills, among other substances. Although these illicit discharges can enter the storm drain system in various ways, they generally result from either direct connections (e.g., wastewater piping either mistakenly or deliberately connected to the storm drains) or indirect connections (e.g., infiltration into the storm drain system, spills, or "midnight dumping"). Illicit discharges can be further divided into those discharging continuously and those discharging intermittently.

One way of locating these dry weather discharges is to perform field screening of outfalls. If no rain has occurred prior to the screening then it is likely that any flow observed at an outfall is either groundwater or an illicit discharge. It is important to utilize resources effectively and to target field screening activities in priority areas that are the most common sources of illicit discharges. For example, municipalities with older neighborhoods should prioritize those areas for targeted investigation due to the likelihood of cross connections with the sanitary sewer. Older parts of the storm drain system may also be deteriorating and require repair or replacement.

In addition, it is important that permittees establish clear policies and procedures for tracing and eliminating illicit discharges to ensure that individual incidents are addressed consistently. These policies should include procedures to notify neighboring localities if a discharge is discovered either originating on or discharging to the neighboring storm sewer system.

Additional information is available in the Center for Watershed Protection's *IDDE Manual.*

Recommendations for the Permit Writer

In some instances the permit writer may choose to include more specific requirements. For example, if the priority areas are already known, then Part 3.1.1.a may be more specifically worded. In addition, regulations governing Phase I MS4 permits have somewhat different requirements including specific field screening procedures (40 CFR 122.26(d)(1)(iii)(D) and 122.26(d)(2)(iii)) and a program to detect and remove illicit discharges and improper disposal into the storm sewer (40 CFR 122.26(d)(2)(iv)(B).

3.2 MS4 Mapping

Example Permit Provision

3.2.1 The permittee must maintain an up-to-date and accurate storm sewer system map.

a. The storm sewer system map must show the following, at a minimum:

1. The location of all MS4 outfalls and drainage areas contributing to those outfalls that are operated by the permittee, and that discharge within the permittee's jurisdiction to a receiving water
2. The location (and name, where known to the permittee) of all waters receiving discharges from those outfall pipes. Each mapped outfall must be given an individual alphanumeric identifier, which must be noted on the map. When possible, the outfalls must be located using a geographic

position system (GPS) and photographs should be taken to provide baseline information and track operation & maintenance needs over time.[4]

3. Priority areas identified under Part 3.3
4. Field screening stations identified under Part 3.4.2.a

b. A copy of the storm sewer system map must be available onsite for review by the permitting authority.

Example Permit Requirement Rationale for the Fact Sheet

In order to trace the origin of a suspected illicit discharge or connection, the permittee must have an up-to-date map of its storm drain system. This is critical in order to isolate the potential source of the non-stormwater discharges and the areas of potential impact. Ideally, the information would be available as a geographic information system (GIS) layer in a geo-locational database, however, paper maps are sufficient providing they have the necessary reference information.

The permit primarily requires the mapping of outfalls, drainage areas contributing to those outfalls, and receiving waters. The municipal facility inventory created to comply with the pollution prevention/good housekeeping requirements (see Part 6.1) must also be included either on this sewer system map or on a separate MS4 map.

Recommendations for the Permit Writer

Both Phase I and Phase II regulations require permittees to develop a map indicating outfalls and the waters that receive the MS4 discharges. This map is to be used to identify priority areas that have a reasonable potential for illicit discharges. The mapping requirements should be adjusted based on any existing mapping of the MS4 that has already been completed. For example, Phase I mapping should have been initiated during the initial permit application process. This map should not be static, however, since it would need to be updated as development patterns change and new collection and discharge components of the MS4 are added. The mapping requirement could be supplemented by adding a requirement to "modify existing maps to clearly identify all receiving waters."

3.3 Identification of Priority Areas

Example Permit Provision

3.3.1 The permittee must continue to identify the following as priority areas [*insert areas that may be more applicable to the jurisdiction*]:

a. Areas with older infrastructure that are more likely to have illicit connections;

[4] New Jersey Phase II General Permit (www.state.nj.us/dep/dwq/pdf/Tier_A_final.pdf), with modifications

b. Industrial, commercial, or mixed use areas;
c. Areas with a history of past illicit discharges;
d. Areas with a history of illegal dumping;
e. Areas with onsite sewage disposal systems;
f. Areas with older sewer lines or with a history of sewer overflows or cross-connections; and
g. Areas upstream of sensitive waterbodies.

3.3.2 The permittee must document the basis for its selection of each priority area and create a list of all priority areas identified in the system. This priority area list must be updated [*insert frequency, e.g., annually*] to reflect changing priorities and be available for review by the permitting authority.

Example Permit Requirement Rationale for the Fact Sheet

The permit requires an evaluation of the permittee's neighborhoods and land uses to identify areas that are more likely to have illicit discharges. These areas must be prioritized for more frequent screening and investigations. Each permittee will have a different set of priority areas: newer communities with modern infrastructure are less likely to have sewer cross-connections and illegal connections to the storm drain system, whereas towns with rural areas may place an emphasis on illegal dumping and onsite sewage disposal systems. Prioritization must be based not only on land use but also on prior history and frequency of problems.

The identification of priority areas must include "hotspots" or areas where dumping, spills, or other illicit discharges are a common occurrence. These hotspots will help identify potential field screening locations and may help target educational activities. For example, if evidence of motor oil dumping is found quite frequently and traced to the same apartment complex, information about motor oil disposal could be distributed to residents in response.

Recommendations for the Permit Writer

Phase I permittees should have been documenting information regarding high priority areas for several permit terms. In these instances the permit writer should require the permittee to continually evaluate and update the priority areas as development patterns change or new "hotspot" areas are found. If the permit writer has information regarding priority areas which are specific to the Phase I permittee (e.g. certain high priority watersheds or land use types which typically discharge a pollutant of concern) then those specific areas should be specified as high priority.

3.4 Field Screening

Example Permit Provision

3.4.1 The permittee must continue to implement and revise if necessary within [*specify deadline for completion*] a written dry weather field screening and analytical monitoring procedures to detect and eliminate illicit discharges to the MS4. These procedures must be included as part of the IDDE program, and incorporated into the permittee's SWMP document. Dry weather field screening and analytical monitoring consists of (1) field observations; (2) field screening monitoring; and (3) analytical monitoring at selected stations.

3.4.2 Conduct dry weather field screening and analytical monitoring. At a minimum, the permittee must:

a. Identify a minimum of [*specify number*] stations within the priority areas it identified in Part 3.3.1 at which field screening and analytical monitoring will take place. In addition, if the permittee is made aware of non-stormwater discharges that occur during the permit term outside of the priority areas, the permittee must include field screening stations in those areas;

b. Conduct dry weather field screening and analytical monitoring at each station identified above at least once [*insert timeframe for dry part of year, or specify annually*].

c. Sample runoff according to requirements outlined in (1) and (2) below if flow or ponded runoff is observed at a field screening station and there has been at least seventy-two (72) hours of dry weather. The permittee must also record general information such as time since last rain, quantity of last rain, site descriptions (e.g., conveyance type, dominant watershed land uses), flow estimation (e.g., width of water surface, approximate depth of water, approximate flow velocity, flow rate), and visual observations (e.g., odor, color, clarity, floatables, deposits/stains, vegetation condition, structural condition, and biology).

1. Field screening requirements: The permittee is required to conduct a field screening analysis for the following constituents. Samples must be collected and analyzed consistent with the procedures required by 40 CFR Part 136.

   [*insert specific indicator pollutants that the permittee is required to monitor for.]*

2. Analytical monitoring requirements: In addition to field screening, the permittee is required to collect samples for analytical laboratory analysis of the following constituents for a minimum of [*insert percentage*] of the samples taken. Samples must be collected and analyzed consistent with the procedures required by 40 CFR Part 136.

   [*insert specific pollutants of concern that the permittee is required to monitor for*]

3. Develop benchmark concentration levels for dry weather field screening and analytical monitoring results whereby exceedance of the benchmark will

require follow-up investigations to be conducted to identify and eliminate the source causing the exceedance of the benchmark.

d. Conduct a follow-up investigation under Part 4.5 if the benchmarks associated with the constituents listed above in Part 3.4.2.c(1) and (2) are exceeded; and

e. Make and record all applicable observations and select another station from the list of alternate stations for monitoring if, after two subsequent field screening tests have been completed, the field screening station is dry (i.e., no flowing or ponded runoff).

3.4.3 The permittee must assess its IDDE program every [*specify deadline for completion, e.g., once per permit term*] to determine if updates are needed. Where updates are found to be necessary, the permittee must make such changes [*insert deadline for finalizing changes*].

Example Permit Requirement Rationale for the Fact Sheet

The permit requires the development of a dry weather field screening and analytical monitoring program. The program must identify stations (e.g., outfalls) within the identified "priority areas" where the field screening will be conducted. At a frequency set by the permitting authority, the permittee must screen outfalls during dry weather and, if flow or ponded water is observed, collect a sample for field screening and analytical monitoring.

Visually screening outfalls during dry weather and conducting field tests, where flow is occurring, of selected chemical parameters as indicators of the discharge source will assist permittees in determining the source of illicit discharges. For example, the presence of surfactants is an indicator that sewage could be present in the discharge (e.g., soaps being discharged into sewer system as an indicator that wastewater is being discharged). Specific conductivity, fluoride and/or hardness concentration, ammonia and/or potassium concentration, surfactant and/or fluorescence concentration, chlorine concentration, pH, and other chemicals may similarly be indicative of industrial sources.

The permit requires the permittee to develop benchmarks for dry weather screening and analytical monitoring results. An exceedance of the benchmark concentration level indicates the need to conduct a follow-up investigation. The results will help the permittee narrow down the possible sources causing the benchmark to be exceeded so that they can then be eliminated. This is a common protocol to trigger additional monitoring and/or implementation of BMPs at stormwater discharges (e.g. MSGP has sector-specific benchmark monitoring requirements).

Recommendations for the Permit Writer

There are many options for field screening programs available to the permit writer that will meet the requirements of the regulations. Phase I regulations require that permittees conduct initial field screening of the entire MS4 during the permit application process as well as on-going field screening activities during the life of the permit. Based on this historical information and data, permit writers may want to specify in Phase I individual permits which priority areas must be screened. They may

also want to specify how many outfalls or what percentage of the outfalls should be inspected during the permit term.

In addition, for new Phase II permittees, permit writers may want to require screening of all priority areas during the first permit term and then require on-going screening in the areas where illicit discharges were identified.

This permit language includes analytical monitoring at dry weather field screening locations. The monitoring required during field screening (Part 3.4.2.c.1.) should include appropriate indicator pollutants, i.e. pollutants that will indicate the presence of some sort of illicit discharge. For example, Phase II NPDES regulations suggest sampling for specific conductivity, ammonia, surfactant and/or fluorescence concentration, pH and other chemicals indicative of industrial sources.

Permit writers should select the additional pollutants to be monitored based upon specific pollutants of concern for the receiving water(s) and/or specific indicator pollutants which can assist the MS4 in the location of particular discharges of concern and the potential water quality impact of the discharge. For example, the Phase I San Diego MS4 Permit requires that permittees monitor the following parameters during field screening: total hardness, oil and grease, diazinon and chlorpyrifos, cadmium (dissolved), lead (dissolved), zinc (dissolved), copper (dissolved), Enterococcus bacteria, total coliform bacteria, and fecal coliform bacteria.

Permit writers should encourage or even require permittees to use the CWP *IDDE Manual* and/ or EPA's 2008 Multi-Sector General Permit (www.epa.gov/npdes/stormwater/msgp) to develop benchmarks for each parameter.

In the *IDDE Manual* it is strongly recommended that benchmarks be developed specifically for each area. As an example, the *IDDE Manual* lists the following benchmark concentrations (Table 3-1) to identify industrial discharges:

Table 3-1. Benchmark concentrations to identify Industrial Discharges (from CWP IDDE Manual, Table 45)

Indicator Parameter	Benchmark Concentration
Ammonia	>= 50 mg/L
Color	>= 500 units
Conductivity	>= 2,000 µS/cm
Hardness	<= 10 mg/L as CaCO3 or >= 2,000 mg/L as CaCO3
pH	<= 5
Potassium	>= 20 mg/L
Turbidity	>= 1,000 NTU

For comparison purposes, the chemical fingerprint for different flow types in Alabama is presented in Table 3-2. The chemical fingerprint for each flow type can differ regionally, so permittees should develop their own "fingerprint" library by sampling each flow type.

Table 3-2. Comparative "Fingerprint" (Mean Values) of Flow Types (from CWP IDDE Manual, Table 1)

Flow Type	Hardness (mg/L as CaCO3)	NH3 (mg/L)	Potassium (mg/L)	Conductivity (µS/cm)	Fluoride (mg/L)	Detergents (mg/L)
Sewage	50 (0.26)	25 (0.53)	12 (0.21)	1215 (0.45)	0.7 (0.1)	9.7 (0.17)
Septage	57 (0.36)	87 (0.4)	19 (0.42)	502 (0.42)	0.93 (0.39)	3.3 (1.33)

Table 3-2. Comparative "Fingerprint" (Mean Values) of Flow Types (from CWP IDDE Manual, Table 1)						
Laundry Washwater	45 (0.33)	3.2 (0.89)	6.5 (0.78)	463.5 (0.88)	0.85 (0.4)	758 (0.27)
Car Washwater	71 (0.27)	0.9 (1.4)	3.6 (0.67)	274 (0.45)	1.2 (1.56)	140 (0.2)
Plating Bath (Liquid Industrial Waste)	14330 (0.32)	66 (0.66)	1009 (1.24)	10352 (0.45)	5.1 (0.47)	6.8 (0.68)
Radiator Flushing (Liquid Industrial Waste)	5.6 (1.88)	26 (0.89)	2801 (0.13)	3280 (0.21)	149 (0.16)	15 (0.11)
Tap Water	52 (0.27)	<0.06 (0.55)	1.3 (0.37)	140 (0.07)	0.94 (0.07)	0 (NA)
Groundwater	38 (0.19)	0.06 (1.35)	3.1 (0.55)	149 (0.24)	0.13 (0.93)	0 (NA)
Landscape Irrigation	53 (0.13)	1.3 (1.12)	5.6 (0.5)	180 (0.1)	0.61 (0.35)	0 (NA)
The number in parentheses after each concentration is the Coefficient of Variation. Source: Robert Pitt data from CWP IDDE Manual						

The permit writer may also want to require the permittee to analyze a certain number of discharge samples to characterize the concentration of certain pollutants in the different drainage areas. This characterization sampling would be in addition to any characterization sampling completed for the Phase I permit application. This type of sampling would not necessarily aid in the elimination of the source of the discharge, however, the data would be useful in characterizing the discharge from the MS4.

For those areas that have ponding or flow during dry weather, permit writers may consider allowing permittees the flexibility to look for indicators of an illicit discharge before conducting water quality tests due to baseline flow (e.g. baseflow, groundwater flow, irrigation return flows) in certain areas. In these cases, permit writers could require that sensory indicators (i.e. odor, color, turbidity, and floatables) be evaluated.

For additional guidance on field screening, the *IDDE Manual* describes an outfall reconnaissance inventory (ORI) to assess outfalls and conduct indicator monitoring to help identify illicit discharges.

Regardless of the field screening scheme, it is also very important to emphasize in the permit conditions that monitoring must be done in compliance with 40 CFR 136.

3.5 IDDE Source Investigation and Elimination

Example Permit Provision

3.5.1 The permittee is required to develop written procedures for conducting investigations into the source of all identified illicit discharges, including approaches to requiring such discharges to be eliminated.

3.5.2 Minimum Investigation Requirements – At a minimum, the permittee is required to conduct an investigation(s) to identify and locate the source of any continuous or

intermittent non-stormwater discharge within [*specify time period*] of becoming aware of the illicit discharge.

a. Illicit discharges suspected of being sanitary sewage and/or significantly contaminated must be investigated first.

b. Investigations of illicit discharges suspected of being cooling water, wash water, or natural flows may be delayed until after all suspected sanitary sewage and/or significantly contaminated discharges have been investigated, eliminated and/or resolved.

c. The permittee must report immediately the occurrence of any dry weather flows believed to be an immediate threat to human health or the environment to [*insert state water quality emergency contact phone number*].

d. The permittee must track all investigations to document at a minimum the date(s) the illicit discharge was observed; the results of the investigation; any follow-up of the investigation; and the date the investigation was closed.

3.5.3 Determining the Source of the Illicit Discharge –The permittee is required to determine and document through its investigations, carried out in Part 3.5.1, the source of all illicit discharges. If the source of the illicit discharge is found to be a discharge authorized under [*insert NPDES discharge permit reference*] of an NPDES permit, no further action is required.

a. If an illicit discharge is found, but within six (6) months of the beginning of the investigation neither the source nor the same non-stormwater discharge has been identified/observed, then the permittee must maintain written documentation for review by the permitting authority.

b. If the observed discharge is intermittent, the permittee must document that a minimum of three (3) separate investigations were made to observe the discharge when it was flowing. If these attempts are unsuccessful, the Permittee must maintain written documentation for review by the permitting authority. However, since this is an ongoing program, the Permittee should periodically recheck these suspected intermittent discharges.[5]

3.5.4 Corrective Action to Eliminate Illicit Discharge – Once the source of the illicit discharge has been determined, the permittee must immediately notify the responsible party of the problem, and require the responsible party to conduct all necessary corrective actions to eliminate the non-stormwater discharge within [*specify deadline*]. Upon being notified that the discharge has been eliminated, the permittee must conduct a follow-up investigation and field screening, consistent with Part 3.4, to verify that the discharge has been eliminated. The permittee is required to document its follow-up investigation. The permittee may seek recovery and remediation costs from responsible parties consistent with Part 1.2, or require compensation for the cost of field screening and investigations. Resulting enforcement actions must follow the SWMP ERP.

[5] New Jersey Phase II Permit (www.state.nj.us/dep/dwq/pdf/Tier_A_final.pdf)

Example Permit Requirement Rationale for the Fact Sheet

The Clean Water Act, section 402(p)(3)(B)(ii) requires MS4 permits to "effectively prohibit non-stormwater discharges into the storm sewers." The permit implements this requirement, in part by requiring the development of procedures to investigate and eliminate illicit discharges. The permittee must develop a clear, step-by-step procedure for conducting the investigation of illicit discharges. The procedure must include an investigation protocol that clearly defines what constitutes an illicit discharge "case" and when a case is considered "closed." In many circumstances, sources of intermittent, illicit discharges are very difficult to locate, and these cases may remain unresolved. The permit requires that each case be conducted in accordance with the SOPs developed to locate the source and conclude the investigation, after which the case may be considered closed. A standard operating procedure (SOP) document is required in order to provide investigators with guidance and any necessary forms to ensure that consistent investigations occur for every illicit discharge incident.

Physical observations and field testing can help narrow the identification of potential sources of a non-stormwater discharge; however it is unlikely that either will pinpoint the exact source. Therefore, the permittee will need to perform investigations "upstream" to identify illicit connections to systems with identified problem outfalls.

Once the source of the non-stormwater discharge is determined through investigation, corrective action is required to eliminate the problem source. Resulting enforcement actions must follow the SWMP ERP. The permittee may conduct remediation activities on its own, in which case the permittee must require compensation for any and all costs related to eliminating the non-stormwater discharge. Non-traditional MS4 permittees may be limited in their ability to seek recovery.

Recommendations for the Permit Writer

Both Phase I and Phase II regulations require permittees to develop a process to trace the source of illicit discharges and eliminate them. The regulations also state that appropriate enforcement procedures and actions must be included in this process.

3.6 Public Reporting of Non-Stormwater Discharges and Spills

Example Permit Provision

3.6.1 The permittee must promote, publicize, and facilitate public reporting of illicit discharges or water quality impacts associated with discharges into or from MS4s through a central contact point, including phone numbers for complaints and spill reporting, and publicize to both internal permittee staff and the public. If 911 is selected, the permittee must also create, maintain, and publicize a staffed, non-emergency phone number with voicemail, which is checked daily.

3.6.2 The permittee must develop a written spill/dumping response procedure, and a flow chart or phone tree, or similar list for internal use, that shows the procedures for responding to public notices of illicit discharges, the various responsible agencies

and their contacts, and who would be involved in illicit discharge incidence response, even if it is a different entity other than the permittee.

3.6.3 The permittee must conduct reactive inspections in response to complaints and follow-up inspections as needed to ensure that corrective measures have been implemented by the responsible party to achieve and maintain compliance.[6]

Example Permit Requirement Rationale for the Fact Sheet

This provision serves to implement, in part, the statutory requirement that MS4 permits effectively prohibit non-stormwater discharges. Spills, leaks, sanitary sewer overflows, and illicit dumping or discharges can introduce a range of stormwater pollutants into the storm system. Prompt response to these occurrences is the best way to prevent or reduce negative impacts to waterbodies. The permittee must develop a spill response SOP that includes an investigation procedure similar to or in conjunction with the investigation SOP developed for illicit discharges in general (see Section 3.5). Often, a different entity might be responsible for spill response in a community (i.e. fire department), therefore, it is imperative that adequate communication exists between stormwater and spill response staff to ensure that spills are documented and investigated in a timely manner.

A stormwater hotline can be used to help permittees become aware of and mitigate spills or dumping incidents. Spills can include everything from an overturned gasoline tanker to sediment leaving a construction site to a sanitary sewer overflow entering into a storm drain. Permittees must set up a hotline consisting of any of the following (or combination thereof): a dedicated or non-dedicated phone line, E-mail address, or website.

Recommendations for the Permit Writer

Spills which occur due to municipal staff activities are considered illicit discharges, but, spill prevention could also be addressed in the municipal operations/good-housekeeping portion of the permit as in this Guide (Chapter 6).

Facilitating public reporting of illicit discharges is specifically required in the Phase I regulations and as a part of the plan to detect and address illicit discharge, EPA recommends that Phase II permittees also develop a venue to promote, publicize, and facilitate public reporting of these discharges.

It is also noteworthy that smaller Phase II MS4s may utilize outside agency resources for spill response and/or they may use a neighboring locality. In this case, permittees will need to coordinate with these agencies to ensure appropriate spill response occurs and the necessary documentation is completed.

[6] San Francisco Municipal Regional Stormwater permit (www.swrcb.ca.gov/sanfranciscobay/board_decisions/adopted_orders/2009/R2-2009-0074.pdf), with modifications

3.7 Illicit Discharge Education & Training

Example Permit Requirement

*3.*7.1 The permittee must continue to implement a training program for all municipal field staff, who, as part of their normal job responsibilities, may come into contact with or otherwise observe an illicit discharge or illicit connection to the storm sewer system. Contact information, including the procedure for reporting an illicit discharge, must be included in the permittee's fleet vehicles that are used by field staff. Training program documents must be available for review by the permitting authority.

3.7.2 By no later than [*insert applicable deadline, e.g., 6 months after permit authorization*], the permittee must train all staff identified in Section 3.7.1 above on the identification of an illicit discharge or connection, and on the proper procedures for reporting and responding to the illicit discharge or connection. Follow-up training must be provided as needed to address changes in procedures, techniques, or staffing. The permittee must document and maintain records of the training provided and the staff trained. [7]

Example Permit Requirement Rationale for the Fact Sheet

The permit requires the permittee to train field staff, who may come into contact or observe illicit discharges, on the identification and proper procedures for reporting illicit discharges. Field staff to be trained may include, but are not limited to, municipal maintenance staff, inspectors, and other staff whose job responsibilities regularly take them out of the office and into areas within the MS4 area. Permittee field staff are out in the community every day and are in the best position to locate and report spills, illicit discharges, and potentially polluting activities. With proper training and information on reporting illicit discharges easily accessible, these field staff can greatly expand the reach of the IDDE program.

Recommendations for the Permit Writer

Permit writers may wish to require training of office staff (or all permittee staff), as well as field staff, as they can act as additional "eyes and ears" since they typically live in the community. The training should consist of how to identify illicit discharges and dumping, as well as the appropriate people to contact based on the type of discharge that is occurring.

Existing permittees (Phase I and Phase II) may have been training staff for several permit terms. For this reason, the permit writer may want the permittee to focus on annual "refresher" trainings for existing staff and new employees within a certain time of their hire date.

[7] Washington State Phase I Permit (www.ecy.wa.gov/programs/wq/stormwater/municipal/phaseIpermit/MODIFIEDpermitDOCS/PhaseIpermitSIGNED.pdf)

CHAPTER 4: CONSTRUCTION

Introduction

MS4 permits must address construction-related requirements (and often more specific state requirements) found in the following Federal regulations – Phase I MS4 Regulations 40 CFR 122.26(d)(2)(iv)(D) and Phase II MS4 Regulations 40 CFR 122.34(b)(4). Specific Permit Requirements should vary based on state requirements, rainfall amounts or other site-specific factors, but, in general, the requirements imposed on MS4 permittees for stormwater management of discharges associated with construction activities consist of several common requirements.

Included Concepts

- Construction requirements and control measures
- Construction site inventory
- Construction plan review procedures
- Construction site inspections and enforcement
- MS4 staff training
- Construction site operator education and public involvement

Permits must require that the permittee enact, to the extent allowed by State, Tribal or local law, an ordinance or other regulatory mechanism as part of the construction program that controls runoff from construction sites with a land disturbance of greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale. As part of the ordinance or other regulatory mechanism, the permittee should provide commonly understood and legally binding definitions. These terms should be defined consistently across other related guidance and regulatory documents. Note that EPA's recommended definitions addressing this requirement are included in Appendix B.

Permits must require that MS4 permittees ensure that construction site operators select and implement appropriate erosion and sediment control measures to reduce or eliminate the impacts to receiving waters. The permit can require that permittees develop their own standards and specifications, but often it is preferable to require the permittees to utilize existing guidance that is approved by the permitting authority.

The permit must require that the permittee establish review procedures for construction site plans to determine potential water quality impacts and ensure the proposed controls are adequate. These procedures must include the review of individual pre-construction site plans to ensure consistency with local sediment and erosion control requirements. In addition, the permit must include requirements for inspection and enforcement of erosion and sediment control measures once construction begins.

Finally, Phase I MS4 permits must require the development of educational materials and training for construction site operators, and EPA recommends that training on stormwater controls for construction site operators be mandated in Phase II MS4 permits as well. Training should address site requirements for control measures, local stormwater requirements, enforcement activities, and penalties for non-compliance.

4.1 Construction Requirements and Control Measures

Example Permit Provision

4.1.1 The permittee must continue to implement a program which requires operators of public or private "construction activities" to select, install, implement, and maintain stormwater control measures that comply with [*Insert reference to documents including any and all applicable erosion and sediment control, pollution prevention, and other stormwater requirements, including applicable CGP, State, and local requirements*.] "Construction activity" for this permit includes, at a minimum, all public and private construction sites that result in a total land disturbance of [*insert disturbance threshold – either one or more acres or that result in a total land disturbance of less than one acre if part of a larger common plan or development or sale, or an alternative threshold that includes disturbances of less than one acre*]. Written procedures for implementing this program, including the components described in Parts 4.2 – 4.6, must be incorporated into the SWMP document. The permittee's construction program must ensure the following minimum requirements are effectively implemented for all construction activity discharging to its MS4:

[*Insert specific minimum requirements, such as:*

a. **Erosion and Sediment Controls**. Design, install and maintain effective erosion controls and sediment controls to minimize the discharge of pollutants. At a minimum, such controls must be designed, installed and maintained to:

(1) Control stormwater volume and velocity within the site to minimize soil erosion;

(2) Control stormwater discharges, including both peak flowrates and total stormwater volume, to minimize erosion at outlets and to minimize downstream channel and streambank erosion;

(3) Minimize the amount of soil exposed during construction activity;

(4) Minimize the disturbance of steep slopes;

(5) Minimize sediment discharges from the site. The design, installation and maintenance of erosion and sediment controls must address factors such as the amount, frequency, intensity and duration of precipitation, the nature of resulting stormwater runoff, and soil characteristics, including the range of soil particle sizes expected to be present on the site;

(6) Provide and maintain natural buffers around surface waters, direct stormwater to vegetated areas to increase sediment removal and maximize stormwater infiltration, unless infeasible; and

(7) Minimize soil compaction and, unless infeasible, preserve topsoil.

b. **Soil Stabilization**. Stabilization of disturbed areas must, at a minimum, be initiated immediately whenever any clearing, grading, excavating or other earth disturbing activities have permanently ceased on any portion of the site, or temporarily ceased on any portion of the site and will not resume for a period exceeding 14 calendar days. Stabilization must be completed within a period of

time determined by the permittee. In arid, semiarid, and drought-stricken areas where initiating vegetative stabilization measures immediately is infeasible, alternative stabilization measures must be employed as specified by the permittee.

c. **Dewatering**. Discharges from dewatering activities, including discharges from dewatering of trenches and excavations, are prohibited unless managed by appropriate controls.

d. **Pollution Prevention Measures**. Design, install, implement, and maintain effective pollution prevention measures to minimize the discharge of pollutants. At a minimum, such measures must be designed, installed, implemented and maintained to:

(1) Minimize the discharge of pollutants from equipment and vehicle washing, wheel wash water, and other wash waters. Wash waters must be treated in a sediment basin or alternative control that provides equivalent or better treatment prior to discharge;

(2) Minimize the exposure of building materials, building products, construction wastes, trash, landscape materials, fertilizers, pesticides, herbicides, detergents, sanitary waste and other materials present on the site to precipitation and to stormwater; and

(3) Minimize the discharge of pollutants from spills and leaks and implement chemical spill and leak prevention and response procedures.

e. **Prohibited Discharges**. The following discharges are prohibited:

(1) Wastewater from washout of concrete, unless managed by an appropriate control;

(2) Wastewater from washout and cleanout of stucco, paint, from release oils, curing compounds and other construction materials;

(3) Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance; and,

(4) Soaps or solvents used in vehicle and equipment washing.

f. **Surface Outlets**. When discharging from basins and impoundments, utilize outlet structures that withdraw water from the surface, unless infeasible.

Example Permit Requirement Rationale for the Fact Sheet

Stormwater discharges from construction sites generally includes sediment and other pollutants such as phosphorus and nitrogen, turbidity, pesticides, petroleum derivatives, construction chemicals, and solid wastes that may become mobilized when land surfaces are disturbed. The permit requires MS4 permittees to require construction site operators at defined sites to meet certain minimum stormwater requirements relating to erosion and sediment control and pollution prevention, and to meet other restrictions imposed on them by the State, or local regulations. These minimum requirements clearly specify the expectations for addressing

erosion control, sediment control, and pollution prevention control measures at construction sites.

EPA's Effluent Limitations Guidelines and Standards for the Construction and Development Point Source Category (74 FR 62996, December 1, 2009) require construction site owners and operators to implement a range of erosion and sediment control measures and pollution prevention practices to control pollutants in discharges from construction sites. These standards will be required in state construction general permits as they are reissued. These standards are broadly applicable to all construction activity disturbing one or more acres. They provide an objective means of describing appropriate erosion and sediment control best management practices, pollution prevention controls on construction site waste and storage of building materials and other reasonable components of the permittee's program to reduce pollutants to the maximum extent practicable in stormwater from construction sites that discharge through the MS4.

Recommendations for the Permit Writer

The Phase II stormwater regulations require permittees to develop a construction site program addressing "land disturbance of greater than or equal to one acre." However, some states may have more stringent requirements that apply to some permittees, or the permit writer may have discretion to lower the one acre threshold if this threshold is too high for particular permittees. For example, smaller, built-out cities may have many small redevelopment projects that fall below the one acre threshold. In such cases, controlling construction site stormwater entering the MS4 to the maximum extent practicable may require stormwater controls at smaller sites. Permit writers should review available construction and planning data from the MS4 to determine an appropriate project size threshold.

The example permit provision's list of minimum requirements for erosion controls, sediment controls, and pollution prevention measures is intended to establish specific requirements to implement the broader requirements in the Phase II rule (40 CFR 122.24(b)(4)). The list of minimum requirements in the example permit provision are from EPA's Construction and Development Effluent Guidelines (published December 1, 2009) which will eventually be required in all NPDES stormwater permits issued to construction site operators. At a minimum, the permit should reference the applicable state standards and, where appropriate, any local standards as well. Permit writers may wish to modify these specific requirements based on current standards or guidance on construction site stormwater controls in the State.

4.2 Construction Site Inventory

Example Permit Provision

4.2.1 The permittee must continue to maintain an inventory of all active public and private construction sites that result in a total land disturbance of [*insert disturbance threshold from Part 4.1.1.*]. The inventory must be continuously updated as new projects are permitted and projects are completed. The inventory must contain

relevant contact information for each project (e.g., name, address, phone, etc.), the size of the project and area of disturbance, whether the project has submitted for permit coverage under [*insert name of applicable NPDES general construction permit*], the date the permittee approved the [*insert name of local erosion and sediment control/stormwater plan]* in accordance with Part 4.3, and the permit tracking number issued by [*insert name of permitting authority*]. The permittee must make it available to the permitting authority upon request.

Example Permit Requirement Rationale for the Fact Sheet

To effectively conduct inspections, the permittee must know where construction activity is occurring. A construction site inventory tracks information such as project size, disturbed area, distance to any waterbody or flow channel, when the erosion and sediment control/stormwater plan was approved by the Permittee, and whether the project is covered by the permitting authority's construction general permit. This inventory will allow the permittee to track and target its inspections.

Recommendations for the Permit Writer

Because of state or local construction permitting requirements, many permittees have some system in place to track construction activity in their jurisdiction. If this is the first MS4 permit issued to the permittee, the permit writer should include a deadline for the development of the initial inventory.

Permit writers may want to request electronic copies of the inventory quarterly or yearly, if that information will be used by the State permitting or inspection staff.

4.3 Construction Plan Review Procedures

Example Permit Provision

4.3.1 The permittee must continue to require each operator of a construction activity to prepare and submit a [*insert name of local erosion and sediment control/stormwater plan*] prior to the disturbance of land for the permittee's review and written approval prior to issuance of a [*insert appropriate permit, i.e. grading or construction*]. The permittee must make it clear to operators of construction activity that they are prohibited from commencing construction activity until they receive receipt of written approval of the the plans. If the [*insert name of local erosion and sediment control/stormwater plan*] is revised, the permittee must review and approve those revisions.

4.3.2 The permittee must continue to implement site plan review procedures that meet the following minimum requirements:

a. The permittee must not approve any [*insert name of local erosion and sediment*

control/stormwater plan] unless it contains appropriate site-specific construction site control measures that meet the minimum requirements in Part 4.1.1 of this permit.

b. The stormwater pollution prevention plan (SWPPP) developed pursuant to [*insert name of applicable NPDES general construction permit*] may substitute for the [*insert name of local erosion and sediment control/stormwater plan*] for projects where a SWPPP is developed. The permittee is responsible for reviewing those portions of the SWPPP that comply with the [*insert name of local erosion and sediment control/stormwater plan*].

c. The [*insert name of local erosion and sediment control/stormwater plan*] must include the rationale used for selecting control measures, including how the control measure protects a waterway or stormwater conveyance.

d. The permittee must use qualified individuals, knowledgeable in the technical review of [*insert name of local erosion and sediment control/stormwater plan*] to conduct such reviews.

e. The permittee must document its review of each [*insert name of local erosion and sediment control/stormwater plan*] using a checklist or similar process. [8]

Example Permit Requirement Rationale for the Fact Sheet

The permit requires the review and prior approval of all local erosion and sediment control plans/stormwater plans to ensure that construction activities adhere to the permittee's minimum stormwater control requirements. Adequate review of erosion and sediment control/stormwater plans is necessary to verify compliance with all applicable requirements in the permittee's ordinance or other regulatory mechanism, as well as compliance with control measure standards and specifications. A formalized review procedure ensures consistent review of plans by specifying the requirements for plans being submitted, the schedule for review, and general conditions for approval. The site plan review process also provides a way to track construction activities and enforce standards.

A good site plan review process provides the permittee with the opportunity to comment – early and often – on a project's proposed number, type, location, and sizing of stormwater control measures that will be in place prior to, during, and at the conclusion of active construction. It is important to keep in mind that a site plan is a "living document" that may change during the life of the project; however, it is critical that the site plan be adequately reviewed and initially based on established policy, guidelines, and standards. The plan is the framework for stormwater control implementation, as well as the basis of any enforcement action on a project site.

The permit requires the permittee to review plans before construction activity begins to ensure that the plans are consistent with the standards specified in Part 4.1.1. The permit language also includes some key requirements during the plan review process:

[8] 2009 Ventura County, CA Phase I MS4 Permit (www.swrcb.ca.gov/rwqcb4/water_issues/programs/stormwater/municipal/ventura_ms4/09-0057/Transmittal%20Letter%20and%20MS4%20Permit%20Order%20No%2009%200057.pdf)

- If a SWPPP is developed for the State construction general permit, that plan may substitute for the local plan if it also includes/addresses the local requirements.
- The plan must include the rationale used for selecting or rejecting control measures (for example, why a silt fence was selected or why a sediment trap was not included).
- Finally, plan reviewers must be trained and must document their review. For example, this can be done by using a checklist or similar process.

Recommendations for the Permit Writer

Some MS4 permits include a requirement that, prior to approval of local permits, the permittee must verify that the construction site operator has existing coverage under the State's Construction General Permit, if necessary. This requirement helps to reduce the number of non-filers for the State general permit by providing a check for NPDES CGP permit coverage at the local level.

4.4 Construction Site Inspections and Enforcement

Example Permit Provision

4.4.1 The permittee must continue to implement procedures for inspecting public and private construction projects in accordance with the frequency specified in Table 4-1 below:

Table 4-1: Inspection Frequencies

Site	Inspection Frequency
a. All sites [*insert a size threshold that is considered large for the MS4 if large projects are common, e.g. 5 acres*] or larger in size	Inspection must occur within [*insert number of days/hours, e.g. 48 hours] of a [insert significant rain event size, e.g. ½ inch rain event] and no less than biweekly (every 2 weeks)*]
b. All sites one (1) acre or larger that discharge to a tributary listed by the state/tribe as an impaired water for sediment or turbidity under the CWA section 303(d)	
c. Other sites one (1) acre or more determined by the permittee or permitting authority to be a significant threat to water quality*	
d. All other construction sites with one (1) acre or more of soil disturbance not meeting the criteria specified in (A),(B), or (C) above	Inspection must occur at least monthly
e. Construction sites less than one (1) acre in size	Inspection must occur as needed based on the evaluation of the factors that are a threat to water quality*
*In evaluating the threat to water quality, the following factors must be considered: soil erosion potential; site slope; project size and type; sensitivity of receiving waterbodies; proximity to receiving waterbodies; non-stormwater discharges; past record of non-compliance by the operators of the construction site; and [*insert other factors relevant to particular MS4*].	

4.4.2 The permittee must adequately inspect all phases of construction.

a. Prior to Land Disturbance: Prior to allowing an operator to commence land disturbance, the permittee must perform an inspection to ensure all necessary erosion and sediment controls are in place.

b. During Active Construction: During active construction, the permittee is required to conduct inspections in accordance with the frequencies specified in Table 4-1 in Part 4.4.1.

c. Following Active Construction: At the conclusion of the project, the Permittee must inspect all projects to ensure that all graded areas have reached final stabilization and that all temporary control measures are removed (e.g., silt fence).

4.4.3 The permittee must have trained and qualified inspectors (See Part 4.5). The permittee must also continue to follow, and revise as necessary, written procedures outlining the inspection and enforcement procedures. Inspections of construction sites must, at a minimum:

a. Check for coverage under the [*insert name of applicable NPDES general construction permit*] by requesting a copy of any application or Notice of Intent (NOI) or other relevant application form during initial inspections.

b. Review the applicable [*insert name of local erosion and sediment control/stormwater plan*] and conduct a thorough site inspection to determine if control measures have been selected, installed, implemented, and maintained according to the plan.

c. Assess compliance with the permittee's ordinances and permits related to stormwater runoff, including the implementation and maintenance of designated minimum control measures.

d. Assess the appropriateness of planned control measures and their effectiveness.

e. Visually observe and record non-stormwater discharges, potential illicit connections, and potential discharge of pollutants in stormwater runoff.

f. Provide education and outreach on stormwater pollution prevention, as needed.

g. Provide a written or electronic inspection report generated from findings in the field

4.4.4 The permittee must track the number of inspections for the inventoried construction sites throughout the reporting period to verify that the sites are inspected at the minimum frequencies required. Inspection findings must be documented and maintained for review by the permitting authority.

4.4.5 Based on site inspection findings, the permittee must take all necessary follow-up actions (i.e., re-inspection, enforcement) to ensure compliance in accordance with the permittee's enforcement response plan required in Part 1.3. These follow-up and enforcement actions must be tracked and maintained for review by the permitting authority. [9]

[9] 2007 San Diego Phase I MS4 Permit (www.swrcb.ca.gov/rwqcb9/water_issues/programs/stormwater/docs/sd_permit/r9_2007_0001/2007_0001final.pdf)

Example Permit Requirement Rationale for the Fact Sheet

The permit requires inspections of construction sites based on a prioritized ranking of sites (see 40 CFR 122.26(d)(2)(iv)(D)(3) and 122.34(b)(4)(ii)(F)). Larger construction sites and sites that discharge to a sediment impaired waterbody are inspected more frequently than small sites. In addition to inspections at a regular interval, inspections are required within a certain timeframe after a rain event.

Inspections are required before land disturbance to ensure erosion and sediment controls are in place and a plan has been developed, during active construction, and after the site has been stabilized. The permit language also contains specific requirements on what the inspection must include (such as a comparison of control measures in the approved plan to measures installed in the field).

Without adequate implementation and maintenance, stormwater controls will not function as designed. In order to ensure proper implementation and maintenance by site operators, a rigorous inspection protocol is necessary. This protocol must include a written SOP for site inspections and enforcement to ensure inspections and enforcement actions are conducted in a consistent manner. The SOP must include steps to identify priority sites for inspection and enforcement based on the nature and extent of the construction activity, slope of the site, proximity to receiving waters, the characteristics of soils, and the water quality status of the receiving water. This will allow inspection resources and staff time to be used most effectively. Documentation of inspections is critical to track noncompliance and enforcement. Regularly scheduled inspections, as well as post-storm event inspections, are necessary to be sure that regular maintenance occurs as well as repairs after storm events.

Recommendations for the Permit Writer

Selecting an appropriate inspection frequency is, by necessity, a case-by-case exercise. Inspection frequencies for one permittee will not necessarily be appropriate for other permittees. For example, appropriate inspection frequencies may vary among different permittees depending on such factors as topography and rainfall patterns, including whether the MS4 is located in a wet or arid region and/or has distinct wet and dry seasons. Appropriate inspection frequencies may also vary seasonally or geographically within a single MS4 based on seasonal variations in rainfall or snowfall, or differing topographical or geographic conditions in different parts of the MS4 area.

For individual MS4 permits, permit writers should consider seasonal rainfall patterns, the presence and location of impaired streams or sensitive habitats, soils, topography, and other MS4-specific factors. In addition, permit writers should review current inspection frequencies, as well as inspection and enforcement records.

The permit writer should also note that the permit language will need to be modified if the permittee was not previously required to develop written procedures for the inspection and enforcement conducted at construction sites.

4.5 MS4 Staff Training

Example Permit Provision

4.5.1 The permittee must ensure that all staff whose primary job duties are related to implementing the construction stormwater program, including permitting, plan review, construction site inspections, and enforcement, are trained to conduct these activities. The training can be conducted by the permittee or outside training can be attended, however, this training must include, at a minimum:

a. Erosion and Sediment Control/Stormwater Inspectors:
   1. Initial training, held within the first permit year, regarding proper control measure selection, installation, implementation, and maintenance, as well as administrative requirements such as inspection reporting/tracking and use of the permittee's enforcement responses; and
   2. Annual refresher training for existing inspection staff to update them on preferred controls, regulation changes, permit updates, and policy or standards updates. Throughout the year, e-mails and/or memos must be sent out to update the inspectors as changes happen.

b. Other Construction Inspectors: Initial training must be held within the first permit year, on general stormwater issues, basic control measure implementation information, and procedures for notifying the appropriate personnel of noncompliance. Refresher training held at least once every two years.

c. Plan Reviewers:
   1. Initial training, held within the first permit year, regarding control measure selection, design standards, and review procedures; and
   2. Annual training regarding new control measures, innovative approaches, permit updates, regulation changes, and policy or standard updates.

d. Third-Party Inspectors and Plan Reviewers: If the permittee utilizes outside parties to conduct inspections and/or review plans, these outside staff must be trained per the requirements listed in Part 4.5.1.a (above).

Example Permit Requirement Rationale for the Fact Sheet

By setting up training for the permittee staff, the permittee can ensure that the erosion and sediment control requirements are understood and consistently applied since all staff will have been trained on the same information. The permit requires staff whose primary job duties are related to implementing the construction stormwater program to be trained. The training requirements vary by the type of staff. F or example, erosion and sediment control inspectors must be trained annually on a range of topics, while other construction inspectors (such as building inspectors) will receive more general training.

The permittee can conduct the training or the training can be provided by another entity (such as a State erosion and sediment control class). Ideally, the training should include classroom presentations, in-field training, and follow-up evaluations to determine whether the training was effective.

Also, the permittee should consider providing training to other in-field municipal staff so that problems associated with flooding and sedimentation from construction sites can be properly reported and addressed.

4.6 Construction Site Operator Education & Public Involvement

Example Permit Provision

4.6.1 Construction Operator Education. The permittee must develop and distribute educational materials to construction site operators as follows:

a. Each year, the permittee must either provide information on existing training opportunities or develop new training for construction operators on control measure selection, installation, implementation, and maintenance as well as overall program compliance.

b. The permittee must develop or utilize existing outreach tools (i.e. brochures, posters, website, plan notes, manuals etc.) aimed at educating construction operators on appropriate selection, installation, implementation, and maintenance of stormwater controls, as well as overall program compliance.

c. The permittee must make available appropriate outreach materials to all construction operators who will be disturbing land within the MS4 boundary. The permittees' contact information and website must be included in these materials.

d. The permittee must include information on appropriate selection, installation, implementation, and maintenance of controls, as well as overall program compliance, on the permittee's existing website.

4.6.2 Public Involvement.

a. The permittee must adopt and implement procedures for receipt and consideration of information submitted by the public regarding construction projects. This includes, but is not limited to, the public reporting mechanisms described in Part 3.6.

b. The permittee must hold public meetings for all public projects that have planned disturbance greater than or equal to an acre. [10]

[10] Eastern Washington MS4 Phase II Permit (Part 2 only) (www.ecy.wa.gov/programs/wq/stormwater/municipal/phaseiiEwa/MODIFIEDpermitDOCS/EWpermitMODsigned.pdf)

Example Permit Requirement Rationale for the Fact Sheet

Education of construction site operators regarding stormwater management and regulatory requirements is an essential part of controlling stormwater discharges from construction sites. Making brochures, guidance documents and trainings available will increase the knowledge of operators and compliance in the field and can help them choose the correct structural control and processes, correctly install the controls, and successfully implement control measures. The permit requires the permittee to provide appropriate outreach materials to construction site operators. These materials can be made available during the normal course of business (i.e. in BMP manuals, in plan notes, during meetings) or via brochures or websites. In addition, the permittee must either provide training or notify the operators of available training opportunities.

Public involvement requirements include the development of a hotline or other telephone number for the public to call regarding stormwater concerns at construction sites.

CHAPTER 5: POST-CONSTRUCTION OR PERMANENT/LONG-TERM STORMWATER CONTROL MEASURES

Introduction

Phase I MS4s are required to address new development and significant redevelopment in their SWMPs through controls to reduce pollutants in stormwater discharges after construction is completed. See 40 CFR 122.26(d)(2)(iv)(A)(2).

Included Concepts

- ► Post-construction stormwater management program
- ► Site performance standards
- ► Site plan review
- ► Long-term maintenance of post-construction stormwater control measures
- ► Watershed protection
- ► Tracking of post-construction stormwater control measures
- ► Inspections and enforcement
- ► Retrofit plan

The Phase II regulations require regulated small MS4 operators to develop, implement, and enforce a program to address stormwater discharges from new development and redevelopment sites that disturb greater than or equal to one acre to the MS4 (including projects that disturb less than one acre that are part of a larger common plan of development or sale). The regulations also require that the MS4 ensure that control measures are installed and implemented that prevent or minimize water quality impacts. See 40 CFR 122.34(b)(5)(i)

As part of these Phase II requirements, the MS4 must:

- Develop and implement approaches to addressing post-construction stormwater discharges that include a combination of structural and/or non-structural controls;
- Adopt adequate legal authority to enable the MS4 to address post-construction stormwater discharges from new development and redeveloped sites; and
- Ensure adequate long-term operation and maintenance of applicable post-construction control measures. See 40 CFR 122.34(b)(5)(ii).

As of April 2010, most MS4 permits only require permittees to adopt a post-construction program with enforceable requirements designed to reduce stormwater impacts from new development and redevelopment, without specifying a performance standard. To meet this requirement many MS4s have adopted criteria in ordinances or other legally enforceable mechanisms based on already promulgated flood-control based standards (i.e., focused only on discharge rates). However, performance standards can be a very useful and meaningful mechanism in the post-construction toolbox to ensure that water quality objectives are met.

The example permit provisions that follow present the current thinking on how to strengthen the effectiveness of the permittee's stormwater program by preventing the harmful effects of increased stormwater flows and pollutant loads from new development and redeveloped sites on receiving waterbodies. EPA recognizes that there are a wide variety of approaches that some states have already

taken to control discharges from new development and redeveloped sites, some of which are more stringent than the permit language recommended below. The language below includes components that EPA believes would provide focus and enforceability, and would bring about significant improvements in stormwater controls on site. However, the "maximum extent practicable" may be greater than is reflected in the example permit language below for some MS4s, and EPA encourages states, where possible, to go beyond these example provisions and to achieve even better watershed planning and water quality outcomes. For these reasons, this chapter presents the minimum permit provisions EPA currently recommends to be included in permits in order for permittees to reduce their discharges to the maximum extent practicable as well as the optional, more stringent, requirements.

5.1 Post-Construction Stormwater Management Program

Example Permit Provision

5.1.1 The permittee must continue to implement a program to control stormwater discharges from new development and redeveloped sites that disturb at least one acre (including projects that disturb less than one acre that are part of a larger common plan of development or sale) that discharge into an MS4 [*or insert smaller alternative size*]. The program must apply to private and public development sites, including roads.

5.1.2 The program must require that controls are in place that will infiltrate, evapotranspire, or harvest and use stormwater from the site to meet the performance standards in Part 5.2 to protect water quality.

5.1.3 Written procedures for implementing this program, including the components described in Parts 5.2 – 5.8, must be incorporated into the SWMP document.

Example Permit Requirement Rationale for the Fact Sheet

The stormwater regulations require that an MS4 develop and implement a program to address post-construction discharges from new development and redeveloped sites, and ensure the long-term operation and maintenance of these controls (see Part 5.4 for the maintenance requirements). (See 40 CFR 122.34(b)(5)). The permit requires the use of specific stormwater controls, i.e., those that infiltrate, evapotranspire, or harvest and use stormwater, with the aim of maintaining or restoring the pre-development stormwater runoff conditions at the site.

Many traditional stormwater management practices, and the permit language that drives them, fail to address the hydrologic modifications that increase the quantity of stormwater discharges, and cause excessive erosion and stream channel degradation. Frequently the volume, duration, and velocity of stormwater discharges cause degradation to aquatic systems. Protecting and restoring the physical, chemical and biological integrity of receiving waters must be a central issue in stormwater permits. The recent report of the National Research Council (*Urban Stormwater Management in the United States*, National Academies Press, 2008, www.epa.gov/npdes/pubs/nrc_stormwaterreport.pdf) recommends that the NPDES stormwater

program examine the impacts of stormwater flow, treat flow as a surrogate for other pollutants, and includes the necessary control requirements in stormwater permits. Specifically the report recommends that the volume retention practices of infiltration, evapotranspiration and rainwater harvesting be used as primary stormwater management mechanisms. For this reason, EPA recommends use of a permit condition that is based on maintaining or restoring predevelopment hydrology although other forms of this permit condition maybe appropriate as well.

Additional information on the development of a post-construction program for Phase II permittees can be found in the Center for Watershed Protection's *Managing Stormwater In Your Community: A Guide for Building an Effective Post-Construction Program* (available at www.cwp.org/postconstruction). Also, EPA's green infrastructure website includes information on post-construction controls and programs (see www.epa.gov/greeninfrastructure).

5.2 Site Performance Standards

Example Permit Provision

5.2.1 The permittee must establish, implement and enforce a requirement that owners or operators of new development and redeveloped sites discharging to the MS4, which disturb greater than or equal to one acre (including projects that disturb less than one acre that are part of a larger common plan of development or sale), design, install, implement, and maintain stormwater control measures that infiltrate, evapotranspire, harvest, and use stormwater discharges.

5.2.2 Within [*insert deadline, e.g., 12 months, 24 months, etc.*] the permittee must require that stormwater discharges from such new development and redevelopment sites be managed such that post-development hydrology does not exceed the pre-development hydrology at the site, in accordance with the performance standard set forth in this paragraph. The SWMP must describe the site design strategies, control measures, and other practices deemed necessary by the permittee to maintain or improve pre-development hydrology.[11] [*Insert a new development performance standard, such as one or a combination of the following:*

Basis for Performance Standard	***Description***	***Performance Standard***
Rainfall	*Minimum storm volume to be retained on site.*	*Design, construct, and maintain stormwater management practices that manage rainfall on-site, and prevent the off-site discharge of the precipitation from [insert standards, such as "the first one inch of rainfall from a 24-hour storm preceded by 48 hours of no measurable precipitation"]. Discharge volume reduction can be achieved by canopy interception, soil amendments, evaporation, rainfall harvesting, engineered infiltration, extended filtration and/or evapotranspiration and any combination of the aforementioned practices. This first one inch of rainfall*

[11] *Big Darby Creek Watershed CGP, Part III.G.2.d. (web.epa.ohio.gov/dsw/permits/DarbyStormWater_Final_GP_sep06.pdf)*

		must be 100% managed with no discharge to surface waters, except when the permittee chooses to implement the conditions in Part 5.2.5.d below.[12]
Rainfall	*Minimum storm size to be retained on site.*	*Design, construct, and maintain stormwater management practices that manage rainfall on-site, and prevent the off-site discharge of the precipitation from all rainfall events less than or equal to [insert standards, such as "the 95th percentile rainfall event"]. This objective must be accomplished by the use of practices that infiltrate, evapotranspire and/or harvest and reuse rainwater. The 95th percentile rainfall event is the event whose precipitation total is greater than or equal to 95 percent of all storm events over a given period of record.*[13]
Recharge/Runoff	*Hydrologic analysis.*	*Design, construct, and maintain stormwater management practices that preserve the pre-development runoff conditions following construction. The post-construction rate, volume, duration and temperature of discharges must not exceed the pre-development rates and the pre-development hydrograph for 1, 2, 10, 25, 50 and 100 year storms must be replicated through site design and other appropriate practices. These goals must be accomplished through the use of infiltration, evapotranspiration, and/or rainwater harvesting and reuse practices. Defensible and consistent hydrological assessments and modeling methods must be used and documented.* [14]
Recharge	*Groundwater recharge requirement.*	*Any "major development" project, which is one that disturbs [insert standards, such as at least one (1) acre of land or creates at least 0.25 acres of new or additional impervious surface], must comply with one of the following two groundwater recharge requirements:* • *Demonstrate through hydrologic and hydraulic analysis that the site and its stormwater management measures maintain 100 percent of the average annual pre-construction groundwater recharge volume for the site; or* • *Demonstrate through hydrologic and hydraulic analysis that the increase of stormwater discharges volume from pre-construction to post-construction for the two-year storm is infiltrated.*[15]
Impervious Cover	*Limiting total impermeable surface (or effective impermeable surface)*	*Minimize total impervious cover resulting from new development and redevelopment to [insert standards, such as <10% of disturbed land cover and/or limit total amount of effective impervious surface to no more than 5% of the landscape].*

[12] *West Virginia Small MS4 Permit (www.wvdep.org/Docs/17444_SW_WV%20MS4%20permit%202009.pdf)*
[13] *Section 438, Energy Independence & Security Act (EISA) Guidance (www.epa.gov/owow/NPS/lid/section438/pdf/final_sec438_eisa.pdf)*
[14] *Section 438, Energy Independence & Security Act (EISA) Guidance (www.epa.gov/owow/NPS/lid/section438/pdf/final_sec438_eisa.pdf)*
[15] *New Jersey Stormwater Management Rules, N.J.A.C. 7:8 (www.nj.gov/dep/rules/adoptions/2004_0202_njpdes.pdf)*

5.2.3 Incentives for Redeveloped Sites. When considered at the watershed scale, certain types of developed sites can either reduce existing impervious surfaces, or at least create less 'accessory' impervious surfaces. The Permittee may develop a program to allow adjustments to the performance standard for new development or redevelopment sites that qualify. A reduction of [*insert the amount of stormwater the Permittee can reduce for utilizing redevelopment principles, e.g. 0.2 inches from the one inch runoff reduction standard*] may be applied to any of the following types of development. Reductions are additive up to a maximum reduction of [*insert amount, such as 0.75 inches*] for a project that meets four or more criteria. The permittee may choose to be more restrictive and allow a reduction of less than [*insert amount, such as 0.75 inches*] if they choose. In no case will the reduction be greater than [*insert amount, such as 0.75 inches*].

1. Redeveloped sites
2. Brownfield redeveloped site
3. High density (>7 units per acre)
4. Vertical Density, (Floor to Area Ratio (FAR) of 2 or >18 units per acre)
5. Mixed use and Transit Oriented Development (within ½ mile of transit)[16]

5.2.4 Additional Requirements and Exceptions: The permittee must implement the following additional requirements where applicable:

a. A site that is a potential hot spot with the reasonable potential for contaminating underground sources of drinking water must provide treatment for associated pollutants (e.g., petroleum hydrocarbons at a vehicle fueling facility).

b. A site that discharges or proposes to discharge to any surface water or ground water that is used as a source of drinking water must comply with all applicable requirements relating to source water protection and must not cause an exceedance of drinking water standards.[17]

c. Sites may not infiltrate stormwater in areas of soil contamination.

d. For projects that cannot meet 100% of the performance standard in Part 5.2.2 on site, two alternatives are available: off-site mitigation and payment in lieu. If these alternatives are chosen, then the permittee must develop and fairly apply criteria for determining the circumstances under which these alternatives will be available and establish reasonable schedules for mitigation and require payment in lieu of prior to project inception. A determination that standards cannot be met on site must include multiple criteria that would rule out fully meeting the performance standard in Part 5.2.2, such as: too small a lot outside of the building footprint to create the necessary infiltrative capacity even with amended soils; soil instability as documented by a thorough geotechnical

[16] *West Virginia Small MS4 Permit (Section C.b.5.a.ii.A.3) (www.wvdep.org/Docs/17444_SW_WV%20MS4%20permit%202009.pdf)*
[17] *West Virginia Small MS4 Permit (Section C.b.5.a.ii.A.2) (www.wvdep.org/Docs/17444_SW_WV%20MS4%20permit%202009.pdf)*

analysis; a site use that is inconsistent with capture and reuse of stormwater; or too much shade or other physical conditions that preclude adequate use of plants. Sites must still maximize stormwater retention on-site, before applying the remaining stormwater to one of the alternatives. In instances where alternatives are chosen, technical justification as to the infeasibility of on site management is required to be documented.[18]

Example Permit Requirement Rationale for the Fact Sheet

Developed land changes the hydrology of sites, leading to higher stormwater discharge volumes and higher pollutant loads. The purpose of this standard is to maintain or restore stable hydrology in receiving waters thereby protecting water quality by having post-construction hydrology mimic the natural hydrology of the area.

A simpler, but reasonably approximate 'mimicking the natural hydrograph' approach can typically be accomplished by retaining (as opposed to detaining stormwater for later discharge) on a developed site the volume of water that was retained prior to development, through the mechanisms of infiltration, evapotranspiration, and capture and use. By significantly reducing the volume of stormwater discharges, these mechanisms significantly reduce the discharge of pollutants in stormwater, making discharge volumes the ideal all-around focus and metric for stormwater management. These provisions must be clear about the retention requirement, e.g., an underdrained rain garden likely functions more as a detention and filtration system than an infiltration system.

In Part 5.2.3, the five types of development which qualify for incentives are redevelopment, brownfield redevelopment, high density, vertical density, and mixed use with transit oriented development. Redeveloping already degraded sites can reduce regional land consumption and minimize new land disturbance. Minimizing land disturbance and impervious cover is critical to maintaining watershed health. In addition to water quality benefits, cleaning up and reinvesting in brownfield properties increases local tax bases, facilitates job growth, utilizes existing infrastructure, takes development pressures off of undeveloped, open land, and both improves and protects the environment. The effect of low-density urbanization on watersheds and the hydrologic cycle is substantial. High-density development, including vertical density, slows land consumption rates and accommodates more land uses on a smaller footprint. Finally, mixing land uses and promoting transit-oriented development can directly reduce runoff since mixed-use developments have the potential to use surface parking lots and transportation infrastructure more efficiently, requiring less pavement.[19]

In Part 5.2.4.d, the permittee must establish clear and stringent criteria for the conditions under which payment in lieu and off-site mitigation could be used. These criteria must be related to physical constraints such as a combination of soils which limit infiltration opportunities, space or light limited situations restricting the amount of vegetation that can be used, and a land use that is not conducive to capture and use of stormwater. Further, appropriate schedules for

[18] *West Virginia Small MS4 Permit (Section C.b.5.a.ii.A.4) (www.wvdep.org/Docs/17444_SW_WV%20MS4%20permit%202009.pdf)*
[19] Adapted from the WV Phase II MS4 Fact Sheet (www.dep.wv.gov/WWE/Programs/stormwater/MS4/permits/Pages/default.aspx)

payment and implementation of mitigation measures must be established to ensure stormwater impacts are addressed in a timely manner.

Recommendations for Permit Writer

Many communities have adopted criteria based on already promulgated flood-control based standards (i.e., focused only on discharge rates). This example permit language instead promotes the concept that effective standards should be based on the objective of maintaining or restoring stable hydrology to protect the quality of receiving waters by having post-construction hydrology mimic the natural hydrology of the area. The permit language provides a number of example standards that can be used to achieve this objective.

Performance standards should take into account the wide variability in hydrologic conditions in different areas. Ideally, standards should reflect the local naturally-occurring hydrology with respect to runoff, infiltration, evapotranspiration, and storage – that is, the water balance that would be present in the absence of development. Key parameters, such as rainfall patterns, soil characteristics, and topography, can be used to establish likely 'natural' hydrology. Where maintaining or reestablishing such hydrologic conditions is infeasible, off-site mitigation, payment-in-lieu, or fee programs may be used. Based on current (2010) information, EPA recommends that permits allow for a combination of techniques that utilize infiltration, capture and use, and evapotranspiration as appropriate, rather than relying only on infiltration or some other technique alone to meet performance standards.

The permit writer could include a performance standard that stipulates that predevelopment hydrographs match post-development hydrographs. In order for this type of performance standard to be effective, the permit writer should make sure that the permit clearly spells out all variables of the hydrograph (volume, rate, duration, frequency) to be matched, and not just the discharge rate. Many current pre-post hydrology standards focus only on discharge rate, which is primarily a flood control approach. In addition, a pre-development condition should also be defined, and that condition should be one that is reasonably 'natural', rather than simply the conditions (perhaps already fairly impervious) that existed immediately prior to the current developed site. A calculator tool based on key hydrologic parameters (soil, rainfall, slope, and vegetation) or an on-site rainfall retention standard that is appropriate for that area can help the permittee determine what constitutes pre-development hydrology and the means by which it may be matched.

As contemplated in the example permit provisions, permit writers may want to consider the difference between new development and redevelopment sites, as well as differences among some types of developed sites, in establishing performance standards. From the standpoint of imperviousness at a watershed scale, redeveloped sites are usually more desirable than new development sites, which replace relatively naturally functioning green spaces with impervious surfaces such as roads, and parking lots. Certain types of development generate less impervious surfaces than others. For example, typically, there is little or no increase in net stormwater discharges when redeveloping underused properties such as vacant properties, brownfield sites, or greyfield sites, since new impervious cover replaces existing impervious cover. The net discharge increase from already developed properties would likely be zero since the site was already predominately impervious cover. In many cases, redeveloped sites break up or remove some portion of the impervious cover, converting it to pervious cover and allowing for some stormwater infiltration. Redevelopment sites can produce a net improvement in regional water quality by decreasing total impervious area and its

associated stormwater discharges. Redeveloped sites can also reduce regional land consumption. By building on underused, already degraded land, the pressure to convert previously undeveloped land is reduced. Therefore differential standards for new development and redeveloped sites, as well as for different types of developed sites, may be reasonable. However, they should be crafted to minimize creation of imperviousness at the watershed scale, and still include some reasonable level of stormwater management at the site scale.

Redevelopment is the act of improving by renewing or restoring any developed property that results in the land disturbance of one acre or greater, and that has one of the following characteristics:

- Land that currently has an existing structure, such as buildings or houses, or
- Land that is currently covered with an impervious surface, such as a parking lot or roof, or
- Land that is currently degraded and is covered with sand, gravel, stones, or other non-vegetative covering.

Infiltration may not be appropriate in all cases. For example, a site that is a potential hot spot with the reasonable potential for significant pollutant loading(s) may not be appropriate for stormwater infiltration. Hot spots may include commercial, industrial, institutional, municipal, or transportation related operations that may produce higher levels of stormwater pollutants, and/or present a higher level or risk for spills, leaks, or illicit discharges such as: gas stations, petroleum wholesalers, vehicle maintenance and repair, auto recyclers, recycling centers and scrap yards, landfills, solid waste facilities, wastewater treatment plants, airports, railroad stations and associated maintenance facilities, and highway maintenance facilities.

In addition, the permit writer may want to consider what type of flexibility to afford sites where the owner/operator is not able to meet the performance standard on site. For instance, if a site is constrained by size or previous impervious surfaces, such that the use of control measures that infiltrate stormwater is severely limited, the permit could allow alternatives for meeting the performance standard in other ways such as payment in lieu and off-site mitigation within the same watershed.

Off-site mitigation and payment in lieu programs are options that can be used in these instances. Off-site mitigation generally means that control measures may be implemented at another location, in the same sewershed/watershed as the original project, and as approved by the regulatory agency. Payment in lieu programs generally mean that the developer pays a fee to the permittee which will then be applied to a stormwater control project, in lieu of installing the required control measures.

If the permit writer chooses to include an off-site mitigation or payment in lieu program in the permit, the permit writer could specify that the programs meet several criteria, for example, those described in the 2009 West Virginia Phase II General Permit Fact Sheet (www.dep.wv.gov/WWE/Programs/stormwater/MS4/permits/Pages/default.aspx):

1. The permittee must establish clear and stringent criteria for the conditions under which these options are available that must be related to real physical constraints such as a combination of soils limiting infiltration opportunities, space or light limited situations restricting the amount of vegetation that can be used, and a land use that is not conducive to capture and use of

stormwater. While one or two of these characteristics should not be adequate to qualify for the alternative, the combination of multiple constraints could;

2. A minimal requirement for at least [*0.4 inch*] of stormwater managed on-site;

3. A [*1:1.5 ratio*] of the amount of requisite stormwater not managed on site to the amount of stormwater required to be mitigated at another site, or for which in-lieu payments must be made;

4. If demonstrated to the permittee that it is completely infeasible to manage the remainder [*0.4 inches*], then the ratio for this unmanaged portion is [*1:2*].

5. The necessary tracking systems for both types of programs, including the necessary inventory of public and retrofit projects for off-site mitigation; and,

6. The establishment of a credible valuation structure for payment in lieu, i.e., what is the actual cost for the permittee to provide retrofits for the necessary amount of stormwater, not just a token payment. The purpose of these provisions is to disincentivize the use of alternatives unless really needed, but also to provide a financial foundation for implementation of public stormwater management projects, including retrofits where those needs have been identified.

Additional justification for the development types which qualify for these incentives can be seen in the West Virginia Phase II MS4 Permit Fact Sheet (www.dep.wv.gov/WWE/Programs/stormwater/MS4/permits/Pages/default.aspx).

5.3 Site Plan Review

Example Permit Provision

5.3.1 To ensure that all applicable new development and redeveloped sites conform to the performance standards required in Part 5.2, the permittee must continue to implement project review, approval, and enforcement procedures that include:

a. Procedures for the site plan review and approval process(es) that include inter-departmental consultations, as needed, and a required re-approval process when changes to an approved plan are desired; and

b. A requirement for submittal of 'as-built' certifications within 90 days of completion of a project.

5.3.2 The permittee must conduct site plan reviews, using the procedures described in Part 5.3.1, of all new development and redeveloped sites which will disturb greater than or equal to one acre [*or a smaller threshold as set by the permitting authority*] and discharge to the MS4 (including sites that disturb less than one acre that are part of a larger common plan of development or sale). The site plan review must specifically address how the project applicant meets the performance standards in Part 5.2 and how the project will ensure long-term maintenance as required in Part 5.4.

Example Permit Requirement Rationale for the Fact Sheet

Specific standards are a critical component of a stormwater management program. However, even the best requirements need to be supported by a review program to ensure that the standards are met. The example permit provision would require permittees to fully implement a comprehensive site plan review and approval program. To meet this requirement, the permittee must have the authority to withhold approvals when standards are not met.

Recommendations for the Permit Writer

The permit writer may want to consider adding a requirement for a pre-application concept plan meeting to occur (in addition to the requirement for the project applicant to submit a site plan for review). During this meeting the project land owner or developer, the project design engineer, and municipal planning staff could discuss the conceptual designs that would be used to ensure that they meet the performance standards. This meeting would ensure that stormwater and performance standards are addressed early in the development process. However, if this pre-application concept plan meeting is not consistent with local planning procedures, the permit writer could consider omitting this requirement.

5.4 Long-Term Maintenance of Post-Construction Stormwater Control Measures

Example Permit Provision

5.4.1 All structural stormwater control measures installed and implemented to meet the performance standards of Part 5.2 must be maintained in perpetuity. The permittee must ensure the long-term maintenance of structural stormwater control measures installed according to this Part through one, or both, of the following approaches:

a. Maintenance performed by the Permittee. See part 6.4.

b. Maintenance performed by the owner or operator of a new development or redeveloped site under a maintenance agreement. The permittee must require the owner or operator of any new development or redeveloped site subject to the performance standards in Part 5.2 to develop and implement a maintenance agreement addressing maintenance requirements for any structural control measures installed on site to meet the performance standards. The agreement must allow the permittee, or its designee, to conduct inspections of the structural stormwater control measures and also account for transfer of responsibility in leases and/or deeds. The agreement must also allow the permittee, or its designee, to perform necessary maintenance or corrective actions neglected by the property owner/operator, and bill or recoup costs from the property owner/operator when the owner/operator has not performed the necessary maintenance within thirty (30) days of notification by the permittee or its designee.

5.4.2 Verification of maintenance responsibilities. The permittee must require that property owners or operators of any new development or redeveloped site subject to the performance standards in Part 5.2 provide verification of maintenance for the approved structural stormwater control measures used to comply with the performance standards. Verification must include one or more of the following as applicable:

a. The owner/operator's signed statement accepting responsibility for maintenance with a provision for transferring maintenance responsibility if the property is legally transferred to another party; and/or

b. Written conditions in the sales or lease agreement that require the recipient to assume responsibility for maintenance; and/or

c. Written conditions in project conditions, covenants and restrictions for residential properties assigning maintenance responsibilities to a home owner's association, or other appropriate group, for maintenance of structural and treatment control stormwater management practices; and/or

d. Any other legally enforceable agreement that assigns permanent responsibility for maintenance of structural or treatment control stormwater management practices.

Example Permit Requirement Rationale for the Fact Sheet

Appropriate operation and maintenance are critical aspects to the function of any suite of controls. In many cases, controls may be located on private property, and it is necessary to establish some provision to assure responsibility and accountability for the operation and maintenance of these controls.

The permittee must ensure maintenance of all structural stormwater control measures. In this Guide, structural controls also include many green infrastructure practices such as rainwater harvesting, rain gardens, permeable pavement, and vegetated swales.

Recommendations for the Permit Writer

Most non-traditional MS4 permittees will probably not have the legal authority to recoup costs where the owner/operator has not completed necessary maintenance. Permit writers may want to be more specific in this requirement to include other options for non-traditional MS4 permittees.

5.5 Watershed Protection

Example Permit Provision

5.5.1 When the Permittee revises its General Plan (or equivalent) or other relevant plans (e.g. Transportation Master, or Community Plan) they must include effective water

quality and watershed protection elements that require implementation of consistent water quality protection measures for new development and redeveloped sites within [*insert deadline*]. Examples of water quality and watershed protection elements to be considered include the following: [*insert principles and/or policies which are appropriate for the watershed such as,*

- Minimize the amount of impervious surfaces (roads, parking lots, roofs, etc.) within each watershed, by minimizing the creation, extension and widening of parking lots, roads and associated development.
- Preserve, protect, create and restore ecologically sensitive areas that provide water quality benefits and serve critical watershed functions. These areas may include, but are not limited to; riparian corridors, headwaters, floodplains and wetlands.
- Implement management practices that prevent or reduce thermal impacts to streams, including requiring vegetated buffers along waterways, and disconnecting discharges to surface waters from impervious surfaces such as parking lots.
- Prevent disturbances of natural waterbodies and natural drainage systems caused by development, including roads, highways, and bridges.
- Avoid development in areas that are particularly susceptible to erosion and sediment loss.
- Implement standards to protect trees, and other vegetation with important evapotranspirative qualities.
- Implement policies to protect native soils, prevent topsoil stripping, and prevent compaction of soils.
- Implement water conservation policies that will reduce both stormwater and non- stormwater discharges via storm sewer systems.[20]
- Implement policies that encourage stormwater practices close to the source of the runoff rather than downstream and lower in the watershed.]

Example Permit Requirement Rationale for the Fact Sheet

Imperviousness has been shown to correlate with water quality impacts. In order to minimize water quality impacts, the permittee must examine their planning principles to manage the creation of impervious surfaces at the watershed level, such as reducing the footprint of streets and parking lots. Also, ecologically sensitive areas can protect water quality by acting both as filters that reduce pollutants in stormwater discharges and as sponges to reduce the impact on the ecosystem's hydrology. Thermal pollution is also a concern that can impact biota in waterways. Stormwater discharges from impervious surfaces are often characterized by higher temperatures than natural, pervious surfaces. Reducing the chances of further increasing this temperature by preserving, protecting, and restoring natural features that provide shading for the waterway can further help reduce thermal pollution. Whenever possible natural waterways

[20] *West Virginia Small MS4 Permit (www.wvdep.org/Docs/17444_SW_WV%20MS4%20permit%202009.pdf)*

must be protected and not disturbed by stormwater from developed sites. For example, areas that have a high potential for erosion must be avoided for development when possible. Protecting vegetation, native soils, and conserving water can also help ensure the hydrologic qualities of the site remain intact.

Consideration of stormwater impacts from development is critical during the planning phases of development. This not only includes planning on the site-level, but also with respect to discharges from the MS4 on the watershed level. To the extent possible, stormwater management must be an integral part of higher level planning documents that determine where and how development that will result in stormwater discharges to the MS4 should occur since these decisions affect water quality. Using land efficiently can result in better stormwater management by putting development where it is most appropriate. For example, by directing and concentrating new development in areas targeted for growth, communities can reduce or remove development pressure on undeveloped parcels and protect sensitive natural lands and recharge areas. Another strategy is redeveloping already degraded sites such as abandoned shopping centers or underutilized parking lots. In this case, the net increase in discharges from developed sites would likely be zero, and it would likely decrease, depending on the on-site infiltration practices used. Also, by allowing or encouraging denser development, less land is converted overall, and less total impervious area created.

Recommendations for the Permit Writer

Examining stormwater on a watershed basis and including watershed principles is an important part of protecting waterways in a holistic manner. Climate change may increase the size and frequency of storms in some area of the nation. Including watershed-type assessments and considerations as Permit Requirements will help the permittee better focus their efforts to ensure the best water protection outcomes for existing conditions and those anticipated future conditions. Therefore, permit writers should consider including watershed protection principles. Newer programs may not be ready for permit writers to include the exact example permit provision provided. If possible, permit writers should be as specific as possible for the needs of the watershed where the MS4 permittee is located. Permittees should be careful when installing new stormwater BMPs to ensure that there are not any negative, unintended consequences.

5.6 Tracking of Post-Construction Stormwater Control Measures

Example Permit Provision

5.6.1 Inventory of Post-Construction Stormwater Control Measures. The permittee must continue to maintain an inventory of all post-construction structural stormwater control measures installed and implemented at new development and redeveloped sites, including both public and private sector sites located within the permit area. The inventory must be searchable by property location (either on paper or electronic). New entries to the inventory must be made during the site plan review and approval process in Part 5.3.1.

5.6.2 Tracking Information. Each entry to the inventory must include basic information on each project, such as project name, owner's name and contact information, location, start/end date, etc. In addition, inventory entries must include the following for each project:

a. Short description of each stormwater control measure (type, number, design or performance specifications);
b. Latitude and longitude coordinates of each stormwater control measure;
c. Short description of maintenance requirements (frequency of required maintenance and inspections); and
d. Inspection information (date, findings, follow up activities, prioritization of follow-up activities, compliance status).

Based on inspections conducted under Part 5.7, the permittee must update the inventory as appropriate where changes occur in property ownership or the specific control measures implemented at the site. This inventory must be maintained and available for review by the permitting authority.

Example Permit Requirement Rationale for the Fact Sheet

Creating an inventory of post-construction structural stormwater control measures, including tracking of specific information, will first enable permittees to know what control measures they are responsible for. Without this information the permittee will not be protecting water quality to their full potential since inspections, maintenance, and follow-up changes cannot be performed. Tracking information such as the latitude/longitude, maintenance and inspection requirements and follow-up will allow the permittee to be able to better allocate their resources for those activities that are immediately necessary. Although not required, including photographs will help the permittee assess how the control measure has changed since it was first created and will likely aid in determining proper maintenance and/or retrofitting opportunities if the measure is no longer providing the water quality benefits it was originally designed.

Recommendations for the Permit Writer

Permit writers may wish to specifically define the types of structural controls that must be included in the inventory. For example, rain barrels may be considered a structural control, but the MS4 likely does not need latitude and longitude coordinates of the rain barrels.

5.7 Inspections and Enforcement

Example Permit Provision

5.7.1 Inspection Frequency. To ensure that all stormwater control measures are operating correctly and are being maintained as required consistent with its applicable maintenance agreement, the permittee must conduct inspections of each project site covered under Part 5.2 performance standards, [*insert inspection frequency, e.g., at least one time during the permit term, 20% of sites per year, etc.*]. The inspections must be in accordance with those specified in the [*insert State manual that describes the maintenance of control measures*]. A description of inspection procedures must be included in the SWMP document.

5.7.2 Post-Construction Inspection. Within [*insert deadline, e.g., 1 week, 2 weeks, etc.*] of completion of construction of any project required to meet the Section 5.2 performance standards, the permittee must conduct a post-construction inspection to verify that the permittee's performance standards have been met. The permittee must include in its SWMP a procedure for being notified by construction operators/owners of their completion of active construction so that the post-construction inspection may be conducted.

5.7.3 Inspection Reports. The permittee must document its inspection findings in an inspection report. Each inspection report must include:

a. Inspection date;

b. Name and signature of inspector;

c. Project location (street address, latitude/longitude, etc.) and inventory reference number (from inventory established in Section 5.6.1)

d. Current ownership information (for example, name, address, phone number, fax, and email)

e. A description of the condition of the structural stormwater control measure including the quality of: vegetation and soils; inlet and outlet channels and structures; embankments, slopes, and safety benches; catch basins; spillways, weirs, and other control structures; and sediment and debris accumulation in storage and forebay areas as well as in and around inlet and outlet structures;

f. Photographic documentation of all critical structural stormwater control measure components; and

g. Specific maintenance issues or violations found that need to be corrected by the property owner or operator along with deadlines and reinspection dates.

The permittee must document and maintain records of inspection findings and enforcement actions and make them available for review by the permitting authority.

Example Permit Requirement Rationale for the Fact Sheet

Inspection of post-construction control measures is key to ensuring the protection of water quality. If control measures are not inspected and maintained they could become sources of pollution rather than reducing pollution. By including detailed information in the inspection report, the permittee can better determine if maintenance is required and the permittee can have a snapshot of sorts to know the status of their control measures to prioritize funding.

Recommendations for the Permit Writer

Permit writers should clearly specify the requirements for inspections. Inspecting and properly maintaining structural stormwater controls to ensure they are working as designed is just as important as installing them in the first place. By having specific requirements, permittees will be reminded that they must allocate resources to ensure control measures are properly maintained and functioning. The permit writer may also want to add a prioritization scheme to the requirement to help the permittee determine what maintenance activities are priorities for protecting water quality and which ones are minor changes.

5.8 Retrofit Plan

Example Permit Provision

5.8.1 The permittee must develop a plan to retrofit existing developed sites that are impacting water quality. The retrofit plan must be developed within [*insert deadline, such as within two years of permit issuance*] and must emphasize controls that infiltrate, evapotranspire, or harvest and use stormwater discharges. The plan must include[21]:

a. An inventory of potential retrofit locations, which considers, at a minimum:

- Locations that contribute pollutants of concern to an impaired waterbody
- Locations that contribute to receiving waters that are significantly eroded
- Locations that are tributary to a sensitive ecosystem or protected area
- Locations that are tributary to areas prone to flooding

[21] Orange County Municipal Stormwater Permit (Section F.3.d) (www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/oc_stormwater.shtml)

b. An evaluation and ranking of the inventoried locations to prioritize retrofitting which includes, at a minimum:
   - Feasibility
   - Cost effectiveness
   - Pollutant removal effectiveness
   - Impervious area potentially treated
   - Maintenance requirements
   - Landowner cooperation
   - Neighborhood acceptance
   - Aesthetic qualities, and
   - Efficacy at addressing concern.

Example Permit Requirement Rationale for the Fact Sheet

It is clear that we cannot protect the nation's waters without also addressing degradation caused by stormwater discharges from existing developed sites. For that reason stormwater programs must include substantive retrofit provisions.

It is possible and reasonable to significantly improve water quality in many urban receiving waters. This requires more than just a new development and redeveloped sites program, however, which at best can only hold the line. To actually improve the quality of receiving waters it is necessary to mitigate discharges from existing developed sites, which generally means implementation of measures to bring about the retrofit the stormwater control measures at existing sites to retain most stormwater on site.

In addition, research indicates that most streambank restoration projects that actively stabilize eroding channels should not be implemented until after hydrologic retrofits have been completed that restore the hydrologic regime not concurrently with the implementation of the retrofits.

Municipal projects, such as traffic calming sites could also include stormwater retrofit components, such as curb bump outs that include bioretention features, rain gardens, and curb cuts.

Information on retrofit options and the development of a retrofit plan can be found in the Center for Watershed Protection's guidance on Urban Stormwater Retrofit Practices (available at www.cwp.org as Manual No. 3 under the Urban Subwatershed Restoration Manual Series).

Recommendations for the Permit Writer

Permittees may need a permit term or two to adequately develop and implement a retrofit plan. Some permittees may not be ready to have retrofit plans as part of their requirements. It is up to the permit writer to make this determination based on the specific information they have available on current programs. A retrofit plan should assess the areas where retrofitting is appropriate and will result in increased water quality protection and restoration. The permit writer should determine

the appropriate timeframe and language for a retrofit plan. For example, if the permittee was already required to develop a retrofit plan in a previous permit term the permit may specify a schedule for implementation rather than development.

CHAPTER 6: POLLUTION PREVENTION/GOOD HOUSEKEEPING

Introduction

Federal stormwater regulations (see 40 CFR 122.34(b)(6) and 40 CFR 122.26(d)(2)(iv)(A)) require the operator of a regulated MS4 community to develop a program to:

- Prevent or reduce the amount of stormwater pollution generated by municipal operations and conveyed into receiving waters.
- Train employees on how to incorporate pollution prevention/good housekeeping techniques into municipal operations.
- Identify appropriate control measures and measurable goals for preventing or reducing the amount of stormwater pollution generated by municipal operations.

Included Concepts

- ► Municipal facility and control inventory
- ► Facility assessment
- ► Development of facility-specific stormwater management SOPs and Implementation of facility stormwater controls
- ► Storm sewer system maintenance activities
- ► Flood management
- ► Pesticide, herbicide, and fertilizer application and management
- ► Training and education
- ► Contractor requirements and oversight

The first step for the permittee is to evaluate and assess the areas and municipal facilities that it controls in order to determine which activities may currently have a negative impact on water quality and to find solutions for these activities. The simplest solution is to limit the number of activities that are conducted outside and exposed to stormwater.

Storm sewer systems need maintenance to ensure that structures within the storm sewer that are meant to reduce pollutants do not become sources of pollution. Regularly maintaining catch basins and cleaning storm sewer pipes prevent the accumulation of pollutants that are later released during rain events as well as blockages, backups, and flooding. Most permittees have an existing program to maintain the storm sewer infrastructure. EPA notes, however, that some of these programs have tended to focus on flood avoidance and complaint response rather than reducing water quality impacts from stormwater discharges.

The MS4 permit must require that the system be maintained to prevent the discharge of pollutants into receiving waters. System mapping and a schedule of regular maintenance are key to a successful pollution prevention program. EPA recommends establishing a tiered maintenance schedule for the entire storm sewer system area, with the highest priority areas being maintained at the greatest frequency. Priorities should be driven by water quality concerns and can be based on the land use within the MS4 area, the condition of the receiving water, the amount and type of material that typically accumulates in an area, or other location-specific factors. It is also advisable to use spill and illicit discharge data to track areas that may require immediate sewer infrastructure maintenance. It is also important for material that is collected to be disposed of in a responsible manner.

The procedures for storm sewer system operation and maintenance must be documented in the permittee's SOPs or similar type of documents, which are part of the permittee's SWMP. Employee training to carry out these pollution prevention measures is a required component of the program. The pollution prevention/good housekeeping/maintenance activities should be documented and, where possible, quantified (e.g., number and location of inspections and clean-outs, type and quantity of materials removed). Having permittees characterize the quantity, location, and composition of pollutants removed from catch basins can provide useful data that can later be used to assess the program's overall effectiveness, identify illicit discharges, and help the permittee better prioritize implementation activities in the future.

Specific pollution prevention requirements related to pollutant-generating activities such as landscaping techniques (including the application of pesticides, herbicides, and fertilizer) and operating and maintaining public streets, should also be included in the permit where applicable. For example, typical pollutants associated with street repair and maintenance include heavy metals, chlorides, hydrocarbons (e.g., benzene, toluene, ethylbenzene, xylene), concrete dust, sand, deicers, sediment, and trash. The permitting authority should consider requiring alternative landscaping practices such as integrated pest management (IPM), xeriscaping, or mechanical (non-chemical) removal of unwanted plants. Other landscaping controls, such as mulch management, chemical storage, reduction of soil compaction, and erosion control, should also be considered. Training and educating municipal and contracted staff is also important to ensure that everyone is knowledgeable and proficient in the newest and most effective approaches to minimizing pollutant discharges from municipal facilities and activities.

Additionally, permits should require that water quality be considered when designing flood management projects, and that existing structural flood control devices are evaluated to determine if retrofitting the device to remove/reduce pollutants from stormwater is necessary and practicable.

6.1 Municipal Facility and Control Inventory

Example Permit Provision

6.1.1 Development of a Municipal Facility and Stormwater Control Inventory – The permittee must continue to update and maintain an inventory of municipally-owned or operated facilities and stormwater controls, including but not limited to the following:

- Composting facilities
- Equipment storage and maintenance facilities
- Fuel farms
- Hazardous waste disposal facilities
- Hazardous waste handling and transfer facilities
- Incinerators
- Landfills
- Landscape maintenance on municipal property
- Materials storage yards

- Pesticide storage facilities
- Public buildings, including schools, libraries, police stations, fire stations, municipal buildings, and similar buildings
- Public parking lots
- Public golf courses
- Public swimming pools
- Public works yards
- Recycling facilities
- Salt storage facilities
- Solid waste handling and transfer facilities
- Street repair and maintenance sites
- Vehicle storage and maintenance yards
- Municipally-owned and/or maintained structural stormwater controls

6.1.2 Documentation– The list of municipally-owned or operated facilities and stormwater controls must be maintained and available for review by the permitting authority.

6.1.3 Mapping – On a map of the area covered by the MS4 permit, the permittee must identify where the municipally-owned or operated facilities and stormwater controls are located. The map must identify the stormwater outfalls corresponding to each of the facilities as well as the receiving waters to which these facilities discharge. The permittee must also identify the manager of each facility and their contact information. The map must be maintained and updated regularly and be available for review by the permitting authority.

Example Permit Requirement Rationale for the Fact Sheet

Municipally-owned or operated facilities serve as hubs of activity for a variety of municipal staff from many different departments. Some municipalities will have one property at which all activities take place (e.g., the municipal maintenance yard), whereas others will have several specialized facilities such as those listed above. A comprehensive list and map of such facilities will help staff responsible for stormwater compliance build a better awareness of their locations within the MS4 service area and their potential to contribute stormwater pollutants. The facility inventory will also serve as a basis for setting up periodic facility assessments (see Part 6.2) and developing, where necessary, facility stormwater pollution prevention plans (see Part 6.3).

Recommendations for the Permit Writer

Permit writers should tailor the facilities listed in the assessment as best they can to include the facilities most likely to be owned or operated by the permittee. It is highly likely that some of the facilities listed in the Permit Requirement would not apply to most non-traditional and/or non-municipal MS4s.

6.2 Facility Assessment

Permit Requirement

6.2.1 Municipally-owned or operated facility assessment:

a. Comprehensive Assessment of Pollutant Discharge Potential –The permittee must review, reassess, and update the comprehensive assessment of all municipally-owned or operated facilities identified in Part 6.1 [*insert frequency, e.g., annually*] for their potential to discharge in stormwater the following typical urban pollutants: sediment, nutrients, metals, hydrocarbons (e.g., benzene, toluene, ethylbenzene and xylene), pesticides, chlorides, and trash. Other pollutants may be associated with, but not generated directly from, the municipally-owned or operated facilities, such as bacteria, chlorine, organic matter, etc. Therefore, the permittee must determine additional pollutants associated with its facilities that could be found in stormwater discharges. A description of the assessment process must be included in the SWMP document.

b. Identification of "High Priority" Facilities – Based on the Part 6.2.1.a comprehensive assessment, the permittee must identify as "high-priority" those facilities that have a high potential to generate stormwater pollutants. Among the factors that must be considered in giving a facility a high priority ranking is the amount of urban pollutants stored at the site, the identification of improperly stored materials, activities that must not be performed outside (e.g., changing automotive fluids, vehicle washing), proximity to waterbodies, poor housekeeping practices, and discharge of pollutant(s) of concern to impaired water(s). High priority facilities must include the permittee's maintenance yards, hazardous waste facilities, fuel storage locations, and any other facilities at which chemicals or other materials have a high potential to be discharged in stormwater.

c. Documentation of Comprehensive Assessment Results – The permittee must document the results of the assessments and maintain copies of all site evaluation checklists used to conduct the comprehensive assessment. The documentation must include the results of the permittee's initial assessment, any identified deficiencies and corrective actions taken, and a list of the "high priority" facilities identified per Part 6.2.1.b.

Example Permit Requirement Rationale for the Fact Sheet

The initial ("first time") comprehensive assessment is necessary to identify which of the municipality's facilities are most likely to contribute stormwater pollutants and which are in need of stormwater controls. The assessments will involve a detailed site inspection that can identify improperly stored materials, activities that should not be performed outside (e.g., changing automotive fluids, vehicle washing), and poor housekeeping practices.

Recommendations for the Permit Writer

If the permitting authority has an established site inspection protocol to be used in the comprehensive assessment, it should be included and referenced here. The list of pollutants in this section should be modified or expanded based on pollutants of concern in the permitting authority's jurisdiction.

6.3 Development of Facility-Specific Stormwater Management SOPs and Implementation of Facility Stormwater Controls

Example Permit Provision

6.3.1 Facility-specific Stormwater Management SOPs for "High Priority" Facilities:

a. For each "high priority" facility or operation identified in Part 6.2, the permittee must develop a site-specific SOP that identifies stormwater controls (i.e., structural and non-structural controls, and operational improvements) to be installed, implemented, and maintained to minimize the discharge of pollutants in stormwater. At a minimum, the facility-specific SOP must include the stormwater control measures described below in Part 6.3.2, as well as inspection and visual monitoring procedures and schedules described in Part 6.3.3.

b. A copy of the facility-specific stormwater management SOP must be maintained and be available for review by the permitting authority. The SOP must be kept on-site at each of the municipally-owned or operated facilities' offices for which it was completed. The SOP must be updated as necessary.

c. The permittee must install, implement, and maintain all stormwater controls required per Part 6.3.2 of this permit and included in the facility's site-specific SOP.

6.3.2 Stormwater Controls for "High Priority" Facilities – The following stormwater controls must be implemented at all "high priority" municipally-owned or operated facilities identified in Part 6.2. A description of any controls included in this part and any standard operating procedures developed to comply with this part must be included as part of the of each facility's SOP:

a. General good housekeeping – The following good housekeeping practices must be implemented for all facilities identified as "high priority":

1. The permittee must keep all municipally-owned or operated facilities neat and orderly, minimizing pollutant sources through good housekeeping procedures and proper storage of materials.

2. Materials exposed to stormwater must be covered where feasible (without creating additional impervious surfaces, if possible).

b. De-icing material storage – The permittee must store salt and other de-icing materials in a permanent storage structure, unless stormwater runoff from the storage piles is not discharged, or if discharges from the piles are authorized under another stormwater permit. If a permanent storage structure is required but does not exist, one must be built within [*insert timeframe*], and seasonal

tarping must be used as an interim control measure until the permanent structure is completed. If a permanent storage facility is not feasible, the permittee must provide a rationale to the permitting authority as to why and what alternate BMPs will be utilized instead.

Where a permanent storage structure is present, the permittee must perform regular maintenance and inspections of the permanent storage structure.

c. Fueling operations – The permittee must continue to implement standard operating procedures for vehicle fueling and receiving of bulk fuel deliveries at municipally-owned or operated facilities with the goal of reducing the likelihood of spills, and providing spill controls in the event that accidental spills do occur.

d. Vehicle maintenance – The permittee must continue to implement a standard operating procedure for vehicle maintenance and repair activities that occur at municipally-owned or operated facilities with the goal of reducing the likelihood of spills or releases and providing controls in the event that accidental spills do occur. The standard operating procedures must include regular inspections of all maintenance areas and activities.

e. Equipment and vehicle washing – The discharge of equipment and vehicle wash wastewater to the MS4 or directly to receiving waters from municipal facilities is prohibited. The permittee may meet this requirement by either installing a vehicle wash reclaim system, capturing and hauling the wastewater for proper disposal, connecting to sanitary sewer (where applicable and approved by local authorities), ceasing the activity, and/or applying for and obtaining a separate stormwater permit.[22]

6.3.3 Inspections and Visual Monitoring:

a. Weekly visual inspections – The permittee must perform weekly visual inspections to ensure materials and equipment are clean and orderly, and to minimize the potential for pollutant discharge. The permittee must look for evidence of spills and immediately clean them up to prevent contact with precipitation or runoff. The weekly inspections must be tracked in a log for every facility, and records kept with the SWMP document. The inspection report must also include any identified deficiencies and the corrective actions taken to fix the deficiencies.

b. Quarterly comprehensive inspections – At least once per quarter, a comprehensive inspection of "high priority" facilities, including all stormwater controls, must be performed, with specific attention paid to waste storage areas, dumpsters, vehicle and equipment maintenance/fueling areas, material handling areas, and similar potential pollutant-generating areas. The quarterly inspection results must be documented and records kept with the SOP document. This inspection must be done in accordance with the developed SOPs. The inspection report must also include any identified deficiencies and the corrective actions taken to fix the deficiencies.

[22] New Jersey Tier A Phase II MS4 Permit (NJ0141852) (www.state.nj.us/dep/dwq/pdf/Tier_A_final.pdf)

c. Quarterly visual observation of stormwater discharges – At least once per quarter, the permittee must visually observe the quality of the stormwater discharges from the "high priority" facilities (unless climate conditions preclude doing so, in which case the permittee must attempt to evaluate the discharges four times during the wet season). Any observed problems (e.g., color, foam, sheen, turbidity) that can be associated with pollutant sources or controls must be remedied within three days or before the next storm event, whichever is sooner. Visual observations must be documented, and records kept with the SOP document. This inspection must be done in accordance with the developed SOPs. The inspection report must also include any identified deficiencies and the corrective actions taken to fix the deficiencies.

Example Permit Requirement Rationale for the Fact Sheet

Each municipal facility will require a different set of control measures depending on the nature of activities that occur there and the types of materials that are stored and used. Developing and maintaining a site-specific SOP for each facility will help to ensure that employees responsible for facility operation are aware of the stormwater controls required for the site.

There are a number of storage areas and activities that are common at municipal facilities that have a high potential for polluting stormwater:

- Deicing materials, particularly road salt, are easily liberated and transported by rainfall, and constituents such as chloride are not removed by most stormwater controls.
- Fueling and vehicle maintenance and storage areas are prone to spills and drips of various automotive fluids.
- Equipment and vehicle washing areas are designed to mix water with dirt and hydrocarbons, requiring special treatment of the wastewater (including pretreatment and diversion to the sanitary sewer, if allowed) and protection of wash areas from rainfall and runoff.

The best way to avoid pollutant discharges from these sources is to keep precipitation and runoff from coming into contact with stored chemicals and activity areas that use chemicals and materials, which can become sources of stormwater pollutants. For example, the permittee must cover stockpiles, create dedicated structures for stored materials, build berms around areas of pavement to prevent clean runoff from contacting contaminated areas, and maintain a minimum distance between stockpiles and stormwater infrastructure and receiving waters. These are just a few of the ways in which these potential pollutant sources can be protected from precipitation and runoff.

The permit requires that comprehensive site inspections be conducted quarterly, which is an appropriate frequency to ensure that material stockpiles that might be moved or utilized on a seasonal basis are protected from precipitation and runoff. Also, quarterly inspections will allow inspectors to observe different types of operations that occur at different times of the year (e.g., landscape maintenance crews are less active in the winter). Quarterly visual observations are required so that inspectors can see in real time the qualitative nature of the

stormwater discharge and so that corrective action can be taken where necessary to improve on-site stormwater controls.

The permit also specifies that inspection procedures, results, and controls for each facility be documented to ensure that the site inspections are consistent and that maintenance of stormwater controls remains part of the municipality's standard operating procedures. The requirement for an inspection log will allow the permitting authority to verify that periodic site inspections have been performed.

Recommendations for the Permit Writer

Neither Phase I nor Phase II regulations specifically require that MS4 permittees develop facility-specific stormwater management SOPs. However, both Phase I and Phase II require that permittees prevent or reduce pollutant discharge in stormwater from municipal facilities and activities. Requiring permittees to assess high priority facilities and develop appropriate controls for each is an effective way of requiring permittees to address potential sources of pollutants at facilities.

When setting frequency for facility inspections (see Part 6.3.3), the permit writer should consider the number of facilities and the size/complexity of the sites to ensure that enough time is available to complete the assessments.

The list of specific stormwater controls for municipal facilities will vary from place to place based on local and watershed priorities and climate considerations. The permit writer should specify stormwater controls that are appropriate for the local conditions. For example, if a permittee uses satellite locations for temporary storage of deicing materials during snow events, the permit writer may want to consider options other than the permanent storage requirement if the permittee uses the piles within a certain time frame and the piles are covered by temporary tarping or a similar control.

6.4 Storm Sewer System Maintenance Activities

Example Permit Provision

6.4.1 MS4 catch basin maintenance

a. Assessment/prioritization of catch basins – The permittee must assign a priority to each of its catch basin inlets within its jurisdiction as one of the following:

- Priority A – Catch basins that are designated as consistently generating the highest volumes of trash and/or debris
- Priority B – Catch basins that are designated as consistently generating moderate volumes of trash and/or debris
- Priority C – Catch basins that are designated as generating low volumes of trash and/or debris

The permittee must use information compiled from citizen complaints/reports to help in the determination of the appropriate priority level. A description of

the prioritization scheme must be included in the SWMP.

b. Catch basin inspection and cleaning

1. Based on the priorities assigned in Part 6.4.1.a., the permittee must inspect and clean catch basins in accordance with the following schedule:

   - Priority A – [*Insert cleanout frequency, e.g., 3 times per year*]
   - Priority B – [*Insert cleanout frequency, e.g., 2 times per year*]
   - Priority C – [*Insert cleanout frequency, e.g., 1 time per year*]

   The permittee must develop a catch basin cleaning schedule based on the frequency specified in this permit, along with a list of each of its catch basins and the priority assigned to them per Part 6.4.1.a.

2. In addition to catch basin cleanings performed above, the permittee must ensure that any catch basin that is inspected and found to be between one third and one half full of trash and/or debris must be cleaned within [*Insert cleanout frequency e.g., 1 week of discovery*].[23] The permittee must maintain a log of all maintenance performed.

3. The permittee must document that it has performed all required catch basin cleanings in a log that is to be made available for review by the permitting authority upon request.

c. Catch basin labeling – The permittee must ensure that each catch basin includes a legible stormwater awareness message (e.g., a label, stencil, marker, or pre-cast message such as "drains to the creek" or "only rain in the drain"). Catch basins with illegible or missing labels must be recorded and re-labeled within [*insert number of days*] of inspection.

d. Maintenance of surface drainage structures – The permittee must visually monitor permittee-owned open channels and other drainage structures for debris at least [*specify frequency, e.g., once per year*] and identify and prioritize problem areas, such as those with recurrent illegal dumping, for inspection at least [*specify frequency, e.g., three times per year*]. Removal of trash and debris from open channels and other drainage structures must occur [*insert frequency of open channel/drainage structure cleaning, e.g., annually*]. The permittee must document its drainage structure maintenance in a log that is to be made available for review by the permitting authority upon request.

e. Disposal of waste materials – The permittee must develop a procedure to dewater and dispose of materials extracted from catch basins. This procedure must ensure that water removed during the catch basin cleaning process and waste material will not reenter the MS4.

6.4.2 Municipal activities and operations

a. Assessment of municipal activities and operations

[23] EPA's Office of Research and Development documented a threshold sump level of ½ as a break point where solids retainage was either erratic or negative (Catchbasin Technology Overview and Assessment #EPA-600/2-77-051 1977).

1. The permittee must maintain and revise as necessary the operation and maintenance (O&M) activity assessment. The following municipal O&M activities must be included in the assessment for their potential to discharge pollutants in stormwater:
   - Road and parking lot maintenance, including pothole repair, pavement marking, sealing, and re-paving
   - Bridge maintenance, including re-chipping, grinding, and saw cutting
   - Cold weather operations, including plowing, sanding, and application of deicing compounds and maintenance of snow disposal areas
   - Right-of-way maintenance, including mowing, herbicide and pesticide application, and planting vegetation
   - Municipally-sponsored events such as large outdoor festivals, parades, or street fairs
2. The permittee must identify all materials that could be discharged from each of these O&M activities. Typical pollutants associated with these activities include metals, chlorides, hydrocarbons (e.g. benzene, toluene, ethylbenzene, xylene), sediment, and trash.
3. The permittee must develop a set of pollution prevention measures that, when applied during municipal O&M activities, will reduce the discharge of pollutants in stormwater. These pollution prevention measures must include, at a minimum:
   - Replacing materials/chemicals with more environmentally benign materials or methods (e.g., use mechanical methods vs. herbicides, or use water-based paints or thermoplastics rather than solvent-based paints for stripping)
   - Changing operations to minimize the exposure or mobilization of pollutants (e.g., mulch, compost or landfill grass clippings) to prevent them from entering surface waters
   - Placing barriers around or conducting runoff away from deicing chemical storage areas to prevent discharge into surface waters), consistent with Part 6.3.2.b

   [*If available in your particular State or the municipality, insert relevant section of SWMP, or other relevant document, that includes specific stormwater controls that must be used*.]
4. The permittee must develop and implement a schedule for instituting the pollution prevention measures. At a minimum, with respect to all roads, highways, and parking lots with more than 5,000 square feet of pollutant-generating impervious surface area that are owned, operated, or maintained, the permittee must implement all pollution prevention measures by [*insert deadline*].
5. The results of the assessments and pollution prevention measures, including schedules for implementation, must be documented and made available for review by the permitting authority upon request.

b. Inspection of pollution prevention measures – All pollution prevention measures implemented at municipal facilities must be visually inspected [*insert frequency, e.g., monthly or quarterly*] to ensure they are working properly; a log of inspections must be maintained and made available for review by the permitting authority upon request.

6.4.3 Street Sweeping and Cleaning

a. The permittee must continue to evaluate and rate all municipally-owned streets, roads, and public parking lots within their jurisdiction. The permittee must include in the evaluation the sweeping frequency, timing, and efficiency of existing street sweeping programs. The street sweeping frequency must be based on land use, trash and stormwater pollutant levels generated. At a minimum, the following areas must be regarded as "high priority," for sweeping activities while the "medium priority" and "low priority" areas are recommended:

- High priority – Streets, road segments, and public parking lots designated as high priority include, but are not limited to, high traffic zones, commercial and industrial districts, shopping malls, large schools, high-density residential dwellings, sport and event venues, and plazas. This designation must include areas that consistently accumulate high volumes of trash, debris, and other stormwater pollutants.
- Medium priority – Streets, road segments and public parking lots designated as medium priority include, but are not limited to, medium traffic zones; warehouse districts; and light, small-scale commercial and industrial areas.
- Low priority – Streets and road segments designated as low priority include, but are not limited to, light traffic zones and residential zones.

b. The permittee must show on a map of its service area how the streets, roads, and public parking lots have been rated in accordance with Part 6.4.3.a.

c. Implementing sweeping schedules – The permittee must sweep streets/roads/public parking lots in accordance with the following frequency:

- High priority – average of at least [*insert frequency, e.g., twice per month*]
- Medium priority – average of at least [*insert frequency, e.g., once per month*]
- Low priority – [*insert frequency, e.g., twice per year*]

If a permittee's existing overall street sweeping effort provides equivalent or greater street sweeping frequency relative to the requirements above, the permittee may continue to implement its existing street sweeping program.

d. For areas where street sweeping is technically infeasible (e.g., streets without curbs), the permittee must increase implementation of other trash/litter control procedures to minimize pollutant discharges to storm drains and creeks. The permittee must show on its Part 6.4.3.b map the location of these areas.

e. Sweeping equipment selection and operation

1. When replacing existing sweeping equipment, the permittee must select and operate high-performing sweepers that are efficient in removing pollutants,

including fine particulates, from impervious surfaces.

2. The permittee must follow equipment design performance specifications to ensure that street sweeping equipment is operated at the proper equipment design speed with appropriate verification, and that it is properly maintained.
3. The permittee must operate sweepers to optimize pollutant removal by permitting sweepers access to the curb through the use of parking restrictions that clear the curb or through effective public outreach to inform citizens of sweeping days and times so that voluntary curb clearing can occur.

f. Sweeper Waste Material Disposal – The permittee must develop a procedure to dewater and dispose of street sweeper waste material. This procedure must ensure that water and material will not reenter the MS4.

g. Operator training – Street sweeper operators must be trained to enhance operations for water quality benefit.

h. The permittee must include the following in the SWMP and update as changes are made:

1. A description of the street sweeping frequency and any significant changes in the sweeping frequency map, along with the basis for those changes
2. The types of sweepers used
3. A summary of the proper sweeping operation verification results and street sweeping methods, including the way in which the permittee specifies and confirms the rate or speed at which street miles are covered by sweeper operators
4. The use of additional resources in sweeping seasonal leaves or pick-up of other material
5. A description of the methods for addressing areas identified in Part 6.4.3, considered infeasible for street sweeping

6.4.4 Maintenance of municipally-owned and/or maintained structural stormwater controls

a. The permittee must inspect at least [*insert frequency, e.g., yearly*], and maintain if necessary, all municipally-owned or maintained structural stormwater controls. The permittee must also maintain all green infrastructure practices through regularly scheduled maintenance activities.

Example Permit Requirement Rationale for the Fact Sheet

MS4 Maintenance

Traditional municipal storm drain systems were designed to quickly collect and convey runoff to receiving waters. The purpose of catch basin, inlet, and storm drain cleanouts is to prevent blockages, flooding, and reduce pollution.

Fine particles and pollutants from run-on, atmospheric deposition, vehicle emissions, breakup of street surface materials, littering, and sanding can accumulate along the curbs of roads in between rainfall events. This results in the accumulation of pollutants such as sediment, nutrients, metals, hydrocarbons, bacteria, pesticides, trash and other toxic chemicals. Storm drain maintenance is often the last opportunity to remove pollutants before they enter the storm drain system. Because they effectively trap solids, they need to be cleaned out periodically to prevent those materials from being transported by high stormwater flows. By doing so the MS4 will prevent trash and litter from ultimately becoming sources of marine debris, which is any man-made, solid material that enters waterways either directly or indirectly.

The permit includes a priority ranking approach for catch basins so that municipal resources are directed to the areas and structures that generate the most pollutants. A priority ranking system is required because some catch basins will accumulate pollutants faster than others based on the nature of the drainage area and whether controls are present upstream of the catch basin. Catch basins with the highest accumulations will need to be cleaned more often than those with low accumulations. The permit language also includes a requirement that triggers catch basin cleaning when a catch basin is one-third full.

Proper storm drain system cleanout includes vacuuming or manually removing debris from catch basins; vacuuming or flushing pipes to increase capacity and remove clogs; removing sediment, debris, and overgrown vegetation from open channels; and repairing structures to ensure the integrity of the drainage system. It is important to conduct regular inspections of all storm sewer infrastructure and perform maintenance as necessary. Though these activities are intended to ensure that the sewer system is properly maintained and that any accumulated pollutants are removed prior to discharge, if not properly executed, cleanout activities can result in pollutant discharges. In selecting maintenance practices, the permittee must carefully evaluate each with an eye towards stormwater pollution potential to minimize unintended pollutant discharges, such as the use of flushing storm drain pipes to remove debris without recapturing the debris further down the pipe.

The materials removed from catch basins may not reenter the MS4. The material must be dewatered in a contained area and the water treated with an appropriate and approved control measure or discharged to the sanitary sewer. The solid material will need to be stored and disposed of properly to avoid discharge during a storm event. Some materials removed from storm drains and open channels may require special handling and disposal, and may not be authorized to be disposed of in a landfill.

Street Sweeping and Cleaning

Street and parking lot sweeping is a practice that most municipalities initially conducted for aesthetic purposes. However, the water quality benefits are now widely recognized. Street sweeping also prevents particulate matter associated with road dust from accumulating on public streets and washing into storm drains.

The permit language addresses a number of important factors that impact the effectiveness of a street sweeping program. The first factor is the type of equipment used; the permit language stipulates that when equipment needs to be replaced, high-performance sweepers are purchased preferentially. Street sweeping has traditionally been more effective at removing large-sized particles, but new equipment has been developed to remove smaller, fine-grained particles. Mechanical sweepers (broom-type) are usually the least expensive and are better suited to pick up

large-grained sediment. Vacuum and regenerative air sweepers are better at removing fine-grained sediment particles, but they are more expensive. Removal efficiency can be improved through tandem sweeping (i.e., two sweepers sweeping the same route, with one following the other to pick up missed material), or if the street sweeper makes multiple passes on a street.

The second factor influencing street sweeping effectiveness is the way in which the equipment is operated; the permit specifies that equipment be operated according to the manufacturers' operating instructions by operators who have been trained to sweep in accordance with the Permit Requirements in order to protect water quality.

The third determining factor is the degree to which parked cars block sweeper access to the curb; one of the best ways to ensure access to the curb is to establish parking restrictions based on sweeping schedules and to inform residents of the schedule so they can voluntarily move their cars. The permit requires that the permittee institute parking restrictions and/or a public outreach campaign requesting that cars be parked elsewhere to accommodate sweeping schedules.

Because not all streets are suitable for sweeping (e.g., those that don't have a curb and gutter), source controls can be used in place of sweeping in those areas.

The permittee is required to maintain documentation of sweeping events and characterize the quantity and composition of pollutants removed from roadways. Street sweeping data are relatively easy to track and maintain, so the permit includes requirements for reporting and assessment of the effectiveness of the sweeping activities based on equipment used, miles swept, and the amount of materials collected.

The street sweeping material may not reenter the MS4. The material must be dewatered in a contained area and the water treated with an appropriate and approved control measure or discharged to the sanitary sewer. The solid material will need to be stored and disposed of properly to avoid discharge during a storm event. Some materials may require special handling and disposal, and my not be authorized to be disposed of in a landfill.

Recommendations for the Permit Writer

MS4 Maintenance

MS4s should have a specific schedule to clean out their storm drains since it will ensure that the debris that is trapped in the system will not move into waterbodies and ultimately become marine debris in the ocean. For additional information to include on marine debris go to the EPA's Marine Debris website (www.epa.gov/owow/oceans/debris).

The frequency and timing of visual assessments and cleaning of storm drains and open channels can be tailored to local climate conditions. For example, one approach would be to require that visual observations and cleanings be conducted before the start of the wet season or before spring snowmelt.

The permitting authority should review and approve dewatering and disposal methods for materials removed from catch basins.

Catch basin labeling is believed to be an effective mechanism for educating residents since it involves a direct reminder that that water or other materials which flow into storm drains is not

treated in any way, but instead drains directly to nearby waterways. There are many methods for labeling catch basins and the permit writer should work with the permittee to determine the most feasible and cost effective method of delivering the "drains to stream" message.

Street Sweeping and Cleaning

Street sweeping frequency and timing can be based on climate conditions and seasonal variation in pollution loading. For example, in cold climates where sand is used for winter road maintenance, the permit language could specify increased sweeping during the winter and prior to the spring snowmelt. In areas with a rainy season, sweeping might be timed to occur before the rainy season starts.

In the fall, sweepers can be used to pick up leaves, as they can contribute 25 percent of nutrient loadings in catch basins. If more substantial piles of leaves are found in the community during the fall, street sweeping activities should be coordinated with leaf pick-up. Equally important is an early spring sweeping before rains begin to pick up sand, de-icing material, and winter debris. More frequent sweeping may reduce the need for catch basin cleaning.

The prioritization of sweeping activities (high, medium, low) should be based on standard categories that are based on traffic frequencies and used to determine service levels for the roadways. The example provided in the permit language is based on specific information for the location.

The permitting authority should review and approve dewatering and disposal methods for street sweeping material.

6.5 Flood Management

Example Permit Provision

6.5.1 Flood Management Projects – Within [*insert deadline, such as two years*] of permit issuance, the permittee must develop and implement a process to assess the water quality impacts in the design of all new flood management projects that are associated with the permittee or that discharge to the MS4. This process must include consideration of controls that can be used to minimize the impacts to site water quality and hydrology while still meeting the project objectives. Beginning [*insert deadline, such as three years*] from date of permit issuance, the permittee must assess at least [*insert number of projects to be evaluated, such as two*] existing flood management projects per year to determine whether changes or additions should be made to improve water quality. [24] A description of this process must be included in the SWMP document.

[24] Eastern Washington Phase II MS4 Permit (www.ecy.wa.gov/programs/wq/stormwater/municipal/phaseiiEwa/MODIFIEDpermitDOCS/EWpermitMODsigned.pdf)

Example Permit Requirement Rationale for the Fact Sheet

This permit requires that existing flood management projects be prioritized and a set number be evaluated to identify opportunities for water quality retrofits. This is because the focus of stormwater management in the past had been to control flooding and mitigate property damage, with less emphasis on water quality protection. These structures may handle a significant amount of stormwater and therefore offer an opportunity to modify their design to include water quality features for less than the cost of building new controls. This requirement applies not only to new flood control projects, but also to existing structures.

6.6 Pesticide, Herbicide, and Fertilizer Application and Management

Example Permit Provision

6.6.1 Landscape maintenance

a. The permittee must evaluate the materials used and activities performed on public spaces such as parks, schools, golf courses, easements, public rights of way, and other open spaces for pollution prevention opportunities. Maintenance activities for the turf landscaped portions of these can include mowing, fertilization, pesticide application, irrigation, etc. Typical pollutants include sediment, nutrients, hydrocarbons, pesticides, herbicides and organic debris.

b. The permittee must implement the following practices to minimize landscaping-related pollutant generation:

1. Educational activities, permits, certifications, and other measures for municipal applicators and distributors.
2. Integrated pest management measures that rely on non-chemical solutions, including
   - Use of native plants, xeriscaping in arid/semi-arid regions (reduces water usage and fertilization)
   - Keeping clippings and leaves away from waterways and out of the street using mulching, composting, or landfilling
   - Limiting application of pesticides and fertilizers if precipitation is forecasted within 24 hours or as specified in label instructions
   - Limiting or replacing pesticide use (e.g., manual weed and insect removal)
   - Limiting or eliminating the use of fertilizers, or, if necessary, prohibiting application within 5 feet of pavement, 25 feet of a storm drain inlet, or 50 feet of a waterbody
   - Reducing mowing of grass to allow for greater pollutant removal, but not jeopardizing motorist safety
3. Schedules for chemical application that minimize the discharge of such constituents due to irrigation and expected precipitation.

4. The collection and proper disposal of unused pesticides, herbicides, and fertilizers.[25]

Example Permit Requirement Rationale for the Fact Sheet

The permit focuses on requiring source controls to reduce the amount of chemicals used. The permit specifies the use of integrated pest management, selection of native vegetation that is naturally adapted to local conditions and therefore requires fewer chemical and water inputs, reducing exposure of the chemicals to water by scheduling application according to weather forecasts and plant needs, and ensuring that municipal employees who are responsible for storing and handling these materials are educated about their use, disposal, and possible impacts.

Recommendations for the Permit Writer

EPA is currently developing a general permit to control discharges from the application of pesticides to or over, including near, waters of the U.S. EPA is working closely with state NPDES and pesticide control authorities, the regulated community, and environmental organizations to develop its permit that will be required for such discharges beginning in April 2011. It is important to note that some of the permit language in this section may need to be altered to be consistent with the pesticide permit once it is finalized. For up-to-date information, go to EPA's website (www.epa.gov/npdes/agriculture).

6.7 Training and Education

Example Permit Provision

6.7.1 Employee Training Requirements – Permittees must develop an annual employee training program for appropriate employees involved in implementing pollution prevention and good housekeeping practices in the preceding Parts. All new hires must receive training within the first year of their hire date. This annual training must include a general stormwater education component, any new technologies, operations, or responsibilities that arise during the year, and the Permit Requirements that apply to the staff being trained. A description of the program must be maintained for review by the permitting authority. The permittee must also identify and track all personnel requiring training and records must be maintained. Training must begin [*insert deadline*] from the effective date of permit authorization.

[25] San Diego Phase I MS4 Permit (CAS0108758) (www.swrcb.ca.gov/rwqcb9/water_issues/programs/stormwater/docs/oc_permit/updates_8_13_09/R9-2009-0002_12Aug09.pdf)

Example Permit Requirement Rationale for the Fact Sheet

The regulations found at 40 CFR 122.34(b)(6) specifically requires that the permittee develop a "training component" that trains employees "to prevent and reduce stormwater pollution from activities such as park and open space maintenance, fleet and building maintenance, new construction and land disturbances, and storm water system maintenance." This permit requires employee training for existing and new employees who are involved in performing pollution prevention and good housekeeping practices. All training must include a general stormwater educational component, including an overview of the requirements with which the municipality needs to comply. The permittee is responsible for identifying which staff must attend trainings based on the applicability of the topics listed, and they are required to conduct refresher training on an annual basis.

Recommendations for the Permit Writer

The topics included in the trainings should take into consideration the types of activities in which the municipality engages and the extent to which such activities are performed in-house or contracted.

6.8 Contractor Requirements and Oversight

Example Permit Provision

6.8.1 Requirements for Contractors:

a. Any contractors hired by the permittee to perform municipal maintenance activities must be contractually required to comply with all of the stormwater control measures, good housekeeping practices, and facility-specific stormwater management SOPs described above.

b. The permittee must provide oversight of contractor activities to ensure that contractors are using appropriate control measures and SOPs. Oversight procedures must be described in the SWMP document.

Example Permit Requirement Rationale for the Fact Sheet

Many municipalities use third-party contractors to conduct municipal maintenance activities in lieu of using municipal employees. Contractors performing activities that can affect stormwater quality must be held to the same standards as the permittee. Not only must these expectations be defined in contracts between the permittee and its contractors, but the permittee is responsible for ensuring, through contractually-required documentation or periodic site visits, that contractors are using stormwater controls and following standard operating procedures.

CHAPTER 7: INDUSTRIAL STORMWATER SOURCES

Introduction

Phase I MS4 permittees are required to develop and implement an inspection and oversight program to monitor and control pollutants in stormwater discharges to the MS4 from industrial facilities. Regulations addressing industrial stormwater management in Phase I MS4 permits is found at 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv). Requirements to regulate the stormwater discharges from commercial facilities are found at 40 CFR 122.26(d)(2)(iv)(A).

Included Concepts

- Facility inventory
- Industrial facility stormwater control measures
- Industrial and commercial facility inspections
- Staff training

This program component typically applies only to Phase I MS4 permittees as Phase II federal regulations (40 CFR 122.34(b)) do not specifically address stormwater discharges from industrial facilities and commercial businesses (other than as part of the education and outreach program). However, EPA recommends that permit writers consider including requirements pertaining to stormwater discharges to the MS4 from industrial sources in Phase II permits to further reduce stormwater pollutants from the MS4.

Phase I MS4 regulations specify that several key elements be included in Phase I MS4 stormwater management programs. These elements include: adequate legal authority to require compliance and inspect sites, inspection of priority industrial and commercial facilities, establishing control measure requirements for facilities that may pose a threat to water quality, and enforcing stormwater requirements. In order to implement these requirements, MS4 permits require the development of an inventory of facilities and prioritization protocol and adequate staff training to ensure proper inspection and enforcement of requirements.

7.1 Facility Inventory

Example Permit Provision

7.1.1 Source Identification

a. The permittee must continue to maintain an inventory of all industrial and commercial sites/sources within its jurisdiction (regardless of ownership) that could discharge pollutants in stormwater to the MS4. The inventory must be updated [*insert frequency, e.g. annually*] and available for review by the permitting authority upon request.

b. The inventory must include the following minimum information for each industrial and commercial site/source:

1. Name

2. Address
3. Physical location of storm drain receiving discharge
4. Name of receiving water
5. Pollutants potentially generated by the site/source
6. Identification of whether the site/source is (1) tributary to an impaired water body segment (i.e., whether it is listed under Section 303(d) of the Clean Water Act) and (2) whether it generates pollutants for which the water body segment is impaired
7. A narrative description including standard industrial classification (SIC) codes, which best reflects the principal products or services provided by each facility.

The use of a geolocational database system is highly recommended.

c. At a minimum, the following sites/sources must be included in the inventory:

1. Commercial Sites/Sources:

[*insert commercial sources that are a priority such as*

- Airplane repair, maintenance, fueling, or cleaning
- Animal facilities
- Automobile and other vehicle body repair or painting
- Automobile (or other vehicle) parking lots and storage facilities
- Automobile repair, maintenance, fueling, or cleaning
- Boat repair, maintenance, fueling, or cleaning
- Building material retailers and storage
- Cement mixing or cutting
- Eating or drinking establishments (e.g., restaurants), including food markets
- Equipment repair, maintenance, fueling, or cleaning
- Golf courses, parks and other recreational areas/facilities
- Landscaping
- Marinas
- Masonry
- Mobile automobile or other vehicle washing
- Mobile carpet, drape or furniture cleaning
- Nurseries and greenhouses
- Painting and coating
- Pest control services
- Pool and fountain cleaning
- Portable sanitary services

- Power washing services
- Retail or wholesale fueling]

2. Industrial Sites/Sources:
   - Industrial Facilities, as defined at 40 CFR § 122.26(b)(14), including those subject to the Multi Sector General Permit or individual NPDES permit
   - Facilities subject to Title III of the Superfund Amendments and Reauthorization Act (SARA)
   - Hazardous waste treatment, disposal, storage and recovery facilities
3. All other commercial or industrial sites/sources tributary to an impaired water body segment, where the site/source generates pollutants for which the water body segment is impaired
4. All other commercial or industrial sites/sources that the permittee determines may contribute a significant pollutant load to the MS4[26]

Example Permit Requirement Rationale for the Fact Sheet

The permit requires the permittee to develop an inventory of all potential commercial and industrial sites/sources that could contribute pollutants to the MS4. A list of specific commercial and industrial sites/sources is included in the permit, and additional sites/sources can be added if they are likely to discharge a pollutant of concern to an impaired waterbody or they are contributing a significant pollutant load to the MS4.

The inventory information will provide the permittee with information on potential pollutant sources that contribute to its MS4 system, and at what locations in the system into which they discharge. This information will also allow the permittee to prioritize inspections and tailor education and outreach efforts, which will best assist the facility in implementing appropriate pollution prevention practices or other on-site stormwater controls. In addition, the inventory data will allow the permittee to determine whether the facilities may discharge pollutants of concern into impaired waters. Finally, the information contained in the inventory will enable permittees to characterize these facilities and prioritize them based on their potential impact on stormwater quality. By prioritizing facilities in such a manner, the permittee may then establish a targeted approach towards conducting inspections (see Part 7.3 for a discussion of inspection frequency).

In addition, data from NPDES pretreatment programs within the MS4 boundary on significant industrial users (SIUs) could also be used to identify and prioritize the industrial sites in the stormwater program.

[26]San Diego MS4 Permit (www.swrcb.ca.gov/rwqcb9/water_issues/programs/stormwater/docs/sd_permit/r9_2007_0001/2007_0001final.pdf), with modifications.

Recommendations for the Permit Writer

The example permit provision lists specific commercial and industrial sources to be included in the inventory, but permit writers should customize this list to meet specific issues in their area. For example, some permittees may have large industrial areas with few commercial businesses, while others may have a large number of restaurants and retail businesses but no industrial facilities at all. Other permittees may have had past water quality problems at certain types of commercial or industrial sites, in which case such facilities should be included in their inventories.

7.2 Industrial Facility Stormwater Control Measures

Example Permit Provision

7.2.1 The permittee must require industrial and commercial facilities included in the Part 7.1 inventory to select, install, implement, and maintain stormwater control measures. At a minimum, these control measures must:

a. Minimize Exposure – Industrial/commercial facilities must minimize the exposure of manufacturing, processing, and material storage areas (including loading and unloading, storage, disposal, cleaning, maintenance, and fueling operations) to rain, snow, snowmelt, and runoff by either locating these industrial materials and activities inside or protecting them with storm resistant coverings (although significant enlargement of impervious surface area is not recommended). The facilities must consider, where appropriate:

1. Using grading, berming, or curbing to prevent runoff of contaminated flows and divert run-on away from these areas
2. Locating materials, equipment, and activities so that leaks are contained in existing containment and diversion systems (confine the storage of leaky or leak-prone vehicles and equipment awaiting maintenance to protected areas)
3. Cleaning up spills and leaks promptly using dry methods (e.g., absorbents) to prevent the discharge of pollutants
4. Using drip pans and absorbents under or around leaky vehicles and equipment or store indoors where feasible
5. Using spill/overflow protection equipment
6. Draining fluids from equipment and vehicles prior to on-site storage or disposal
7. Performing all cleaning operations indoors, under cover, or in bermed areas that prevent runoff and run-on and also that capture any overspray
8. Ensuring that all wash water drains to a proper collection system (i.e., not the stormwater drainage system)

b. Follow Good Housekeeping Practices – Industrial/commercial facilities must keep clean all exposed areas that are potential sources of pollutants, using such

measures as sweeping at regular intervals, keeping materials orderly and labeled, and storing materials in appropriate containers.

c. Conduct Maintenance – Industrial/commercial facilities must regularly inspect, test, maintain, and repair all industrial equipment and systems to avoid situations that may result in leaks, spills, and other releases of pollutants in stormwater discharged to receiving waters.

d. Implement Spill Prevention and Response Procedures – Industrial/commercial facilities must minimize the potential for leaks, spills and other releases that may be exposed to stormwater and develop plans for effective response to such spills if or when they occur. At a minimum, the facilities must implement:

    1. Procedures for plainly labeling containers (e.g., "Used Oil," "Spent Solvents," "Fertilizers and Pesticides,") that could be susceptible to spillage or leakage to encourage proper handling and facilitate rapid response if spills or leaks occur
    2. Preventative measures such as barriers between material storage and traffic areas, secondary containment provisions, and procedures for material storage and handling
    3. Procedures for expeditiously stopping, containing, and cleaning up leaks, spills, and other releases. Employees who may cause, detect, or respond to a spill or leak must be trained in these procedures and have necessary spill response equipment available.
    4. Procedures for notification of appropriate facility personnel, emergency response agencies, and regulatory agencies [*Insert appropriate contacts for reporting*]

e. Implement Erosion and Sediment Controls – Industrial/commercial facilities must stabilize exposed areas and contain runoff using structural and/or non-structural control measures to minimize onsite erosion and sedimentation, and the resulting discharge of pollutants.

f. Manage Runoff – Industrial/commercial facilities must divert, infiltrate, reuse, contain, or otherwise reduce stormwater runoff, to minimize pollutants in discharges.

g. Address Salt Storage Piles or Piles Containing Salt – Industrial/commercial facilities must enclose or cover storage piles of salt, or piles containing salt, used for deicing or other commercial or industrial purposes, including maintenance of paved surfaces. If a permanent storage structure is required but does not exist, one must be built within [*insert timeframe*], and seasonal tarping must be used as an interim control until the permanent structure is completed. Facilities must implement appropriate measures (e.g., good housekeeping, diversions, containment) to minimize exposure resulting from adding to or removing materials from the pile. Piles do not need to be enclosed or covered if stormwater runoff from the piles is not discharged or if discharges from the piles are authorized under another NPDES permit.

h. Conduct Employee Training – All facility employees who work in areas where industrial materials or activities are exposed to stormwater, or who are

responsible for implementing activities necessary to manage stormwater must be trained. Training must be conducted [*insert frequency, e.g. at least annually*].

i. Address Non-Stormwater Discharges – Industrial/commercial facilities must eliminate non-stormwater discharges not authorized by an applicable NPDES permit.

j. Control Waste, Garbage and Floatable Debris – Facilities must ensure that waste, garbage, and floatable debris are not discharged to receiving waters by keeping exposed areas free of such materials or by intercepting them before they are discharged.

k. Control Dust Generation and Vehicle Tracking of Industrial Materials – Industrial/commercial facilities must minimize generation of dust and off-site tracking of raw, final, or waste materials.[27]

7.2.2 Within the [*insert deadline, e.g. first two years of permit term*], the permittee must notify the owner/operator of each industrial and commercial site/source of the stormwater requirements for control measures in Part 7.2.1.

7.2.3 As necessary to minimize any pollutants causing the applicable receiving waterbody to be listed as impaired, the permittee must require implementation of additional controls for industrial and commercial sites/sources that are tributary to the impaired water body segments and that are likely to generate such impairment pollutants.[28]

Example Permit Requirement Rationale for the Fact Sheet

The permittee is required to ensure that the minimum control measures are implemented, as applicable, at every industrial/commercial facility included in its inventory. The minimum measures outlined, when properly selected, designed and implemented, promote prevention and source control, before treatment.

The control measures in this permit are consistent with the control measure requirements found in EPA's 2008 Multi-Sector General Permit (MSGP) for stormwater discharges from industrial activities. The permit writer should ensure that these requirements are consistent with the State's industrial stormwater permit. The control measures in this permit describe specific activities that the permittee must require industrial facilities and commercial sites to implement to minimize stormwater pollution. Another control measure is simply preventing pollutants from coming into contact with precipitation in the first place since this will ensure they are not carried into nearby waterways. General good housekeeping and maintenance procedures are also required. Additional control measures address spill prevention and response, erosion and sediment controls, managing runoff, and controlling discharges from salt storage piles.

[27] 2008 MSGP (Section 2) (www.epa.gov/npdes/pubs/msgp2008_finalpermit.pdf), with modifications
[28] San Diego MS4 Permit (www.swrcb.ca.gov/rwqcb9/water_issues/programs/stormwater/docs/sd_permit/r9_2007_0001/2007_0001final.pdf), with modifications

The control measures must also include employee training, controlling non-stormwater discharges, addressing waste, garbage and floatable debris, and addressing dust generation and vehicle tracking.[29]

The permittee is required to notify industrial and commercial sites of the control measure requirements and their responsibility to implement and comply with the requirements.

Facilities that discharge into impaired waterbodies may be required to implement additional controls as necessary to prevent the discharge of the associated pollutants of concern.

7.3 Industrial and Commercial Facility Inspections

Example Permit Provision

7.3.1 Industrial and Commercial Site Inspection Program

a. The permittee must continue to implement a program to inspect all commercial and industrial facilities included in its Part 7.1(a) inventory. The permittee must describe how this will occur in the SWMP.

b. The inspection program must:

1. Prioritize all facilities into high, medium, and low categories on the basis of the potential for water quality impact using criteria such as pollutant sources on site, pollutants of concern, proximity to a water body, and violation history of the facility. The different priority categories will be assigned different inspection frequencies, with the highest priority facilities receiving more frequent inspections. Describe the process for prioritizing inspections and frequency of inspections. If any geographical areas are to be targeted for inspections due to high potential for stormwater pollution, these areas must be listed in the Inspection Plan.

3. Explain how the priority assigned to any one facility may be modified based on the site inspection findings and the facility's potential to discharge pollutants.

7.3.2 Minimum Inspection Requirements

a. Inspection Frequency – The permittee is required to conduct inspections at the following frequencies, at a minimum:

1. Facilities with high potential for water quality impact must be inspected [*insert frequency, e.g. annually*].

2. Facilities with medium potential for water quality impact must be inspected at least [*insert frequency, e.g. once every three years*].

3. Facilities with low potential for water quality impact must be inspected at least [*insert frequency, e.g. once every 5 years*].

[29] 2008 MSGP Fact Sheet (www.epa.gov/npdes/pubs/msgp2008_finalfs.pdf), with modifications

4. Facilities with either a [*insert violation type*] written violation occurring in the previous year must be inspected at least [*insert frequency, e.g. annually*] until compliance is achieved.
5. For facilities with no exposure of commercial or industrial activities to stormwater, no inspections are required. However, the permittee must continue to track these facilities for significant change in the exposure of their operations to stormwater.

b. Scope of Inspection – Inspections must at a minimum:
   1. Evaluate the facility's compliance with the Part 7.2 requirement to select, design, install, and implement stormwater control measures.
   2. Conduct a visual observation for evidence of unauthorized discharges, illicit connections, and potential discharge of pollutants to stormwater.
   3. Verify whether the facility is required to be authorized under the [*insert applicable NPDES general industrial stormwater permit*], and whether the facility has in fact obtained such permit coverage.[30]
   4. Evaluate the facility's compliance with any other relevant local stormwater requirements.

c. Documentation Requirements – At a minimum, the permittee must document the following for each inspection:

   The inspection date and time;

   The name(s) and signature(s) of the inspector(s);

   1. Weather information and a description of any discharges occurring at the time of the inspection;
   2. Any previously unidentified discharges of pollutants from the site;
   3. Any control measures needing maintenance or repairs;
   4. Any failed control measures that need replacement;
   5. Any incidents of noncompliance observed; and
   6. Any additional control measures needed to comply with the Permit Requirements.

d. Track Inspections – Inspection findings must be tracked to ensure inspections are conducted at the frequency specified in Part 7.3.2.b., highlight and document the recidivism of noncompliant facilities, and aid follow up and enforcement activities.

7.3.3 Enforcement – The permittee must ensure that all necessary follow up and enforcement activities are conducted as necessary to require necessary implementation and maintenance of the control measures described in Part 7.2. The permittee is required to utilize the approved ERP for all enforcement actions.

[30] San Francisco Bay Region Municipal Regional Stormwater NPDES Permit (www.swrcb.ca.gov/sanfranciscobay/board_decisions/adopted_orders/2009/R2-2009-0074.pdf), with modifications

Example Permit Requirement Rationale for the Fact Sheet

The permittee must design an inspection program that facilitates more frequent inspections of the highest priority facilities. (See 40 CFR 122.26(d)(iv)(C)(1)). This will help maximize use of the permittee's existing inspection resources and ensure that the permittee inspectors are the most visible and the most familiar with the facilities with the highest potential for water quality impact.

The permittee must develop a process for prioritizing inspections and designating all facilities in the industrial and commercial inventory as either a high, medium or low priority. The designation could occur by individual facility or by facility type. The prioritization for individual facilities may be adjusted after the first, or any subsequent, inspection (for example, if a facility is a high priority facility and the inspection reveals it has little potential for stormwater pollution, then the facility could be reprioritized as a low priority facility).

It is important that inspections be conducted in a thorough and consistent manner in accordance with a formal protocol for conducting an inspection. This protocol should be the basis for inspector training as well. Inspections should include a thorough walk-through of the facility.

The documentation of inspections is very important, not only when tracking noncompliance, but also to facilitate effective enforcement action when needed. A timeline of noncompliance and subsequent enforcement action is critical when escalating measures to gain compliance. Typically, the use of inspection forms facilitates complete and consistent documentation among inspectors and over time.

Recommendations for the Permit Writer

The permit writer may choose to define what criteria the permittee will use to determine the priority of each facility on its inventory. For example, the Phase I Los Angeles County MS4 permit specifies which facilities are Tier 1 and Tier 2 and provides the required inspection frequency for each. The permit writer could also automatically designate certain sets of industries to a certain priority category (e.g., all facilities subject to the State's Industrial General Permit could be designated as high priority facilities in the permit). If the permit does not define what criteria are to be used when prioritizing facilities, the permittee should be required to develop this protocol and submit it to the permitting authority for review.

The permit writer should review available industrial and commercial inventories to determine if more specific inspection frequencies should be set. For example, an MS4 with only 10 facilities in the inventory could probably inspect those facilities annually. However, an MS4 with over 2,000 facilities in the inventory may need to set the inspection frequency at a less frequent interval.

7.4 Staff Training

Example Permit Provision

7.4.1 The permittee must ensure that all staff whose primary job duties are implementing the industrial stormwater program is trained to conduct facility inspections. The training must cover what is required under this permit in terms of stormwater control measures, the requirements of other applicable Industrial Stormwater general permits or other related local requirements, the permittee's site inspection and documentation protocols, and enforcement procedures. Follow-up training must be provided every other year to address changes in procedures, techniques, or staffing. Permittees must document and maintain records of the training provided and the staff trained.[31]

Example Permit Requirement Rationale for the Fact Sheet

Inspectors responsible for conducting inspections at industrial/commercial facilities must be trained on the applicable stormwater requirements for the different types of facilities (i.e., industrial, commercial, other). Training must include a summary of federal, state, and local stormwater regulations that may apply to industrial/commercial facilities. Inspectors must be familiar with various types of stormwater control measures commonly used at the types of facilities typically found in the MS4 area and must be able to educate facility operators about such stormwater control measures. In addition, inspectors must understand and use the permittee's established enforcement response plan (see Chapter 1 of this Guide) to gain compliance as necessary. The inspection staff must be proficient in the enforcement escalation procedure and must properly document all enforcement actions accordingly per the ERP.

[31] Western Washington Phase I MS4 Permit (www.ecy.wa.gov/programs/wq/stormwater/municipal/phaseIpermit/MODIFIEDpermitDOCS/PhaseIpermitSIGNED.pdf), with modifications

CHAPTER 8: MONITORING, EVALUATION, AND REPORTING

Introduction

Phase I MS4s are required to conduct discharge characterization, field screening and develop a monitoring program. Phase I MS4s are also required to conduct an assessment of controls. See 40 CFR 122.26(d)(1)(iii), (d)(2)(iii), and (d)(2)(v).

Phase II MS4 regulations allow, but do not specifically require, monitoring. Phase II MS4s are required to evaluate program compliance, the appropriateness of identified control measures, and progress toward achieving identified measurable goals. See 40 CFR 122.34(g).

Included Concepts

- Consolidated information tracking system
- Development of a comprehensive monitoring and assessment program
- Evaluation of overall program effectiveness
- Requirements for annual reporting of MS4 activities

There are many components involved in monitoring and evaluating the effectiveness of a municipal stormwater program. Any comprehensive monitoring program should have clear monitoring objectives to help determine compliance and water quality impacts. Each monitoring program is unique and should be customized to the specific waterbodies, impairments, and pollutant sources of the MS4.

Evaluating the overall effectiveness of the municipal stormwater program should be done using information from the monitoring program, progress toward meeting measurable goals, and other indicators. Without assessing the effectiveness of the stormwater management program the permittee will not know which parts of the program need to be modified to protect and/or improve water quality and instead will essentially be operating blindly. Establishing a comprehensive monitoring and assessment program will enable the permittee to track progress in complying with permit provisions and implementing a program to protect water quality.

8.1 Consolidated Information Tracking System

Example Permit Provision

8.1.1 Within the first [*insert time frame which corresponds to the development of the monitoring program e.g. first two years of permit*], the permittee must develop a tracking system to track the information required in the permit as well as the information required to be reported in the annual report (see Part 8.4).

Example Permit Requirement Rationale for the Fact Sheet

An important part of any municipal stormwater program is to document and track information on activities the permittee undertakes to comply with the Permit Requirements. Tracking should be integrated into each of the minimum measures. For example, tracking the location of illicit discharges may indicate that a specific area has a high incidence of motor oil being dumped into storm drains. Investigations may reveal that homeowners are changing the motor oil in their cars, but not properly disposing it. Therefore, the permittee will need to educate the homeowners in that area regarding proper disposal.

The permittee must develop a tracking system to monitor implementation of its various programs in order to document the permittee's compliance with its Permit Requirements, such as the number of construction sites and industrial facilities inspected. In addition, the tracking system will allow the permitee to monitor the compliance status of those entities within its jurisdiction, such as construction sites and industrial facilities, and to ensure compliance of municipally-owned and operated facilities.

Any tracking system should be coordinated with the monitoring and evaluation programs developed by the permittee. Ideally, a monitoring and evaluation program will link the "actions" (e.g., the inspections, maintenance, education and other activities the permittee implements) with the "results" (e.g., water quality monitoring data, improvements in environmental indicators) of the monitoring program.

In addition, adequate tracking is necessary to generate and provide reports of program progress not only to the permitting authority, but to a permittee's internal management for planning and funding purposes. Ideally, a MS4 permittee will have at least one person in charge of overall coordination, including tracking. While many departments or agencies might implement various stormwater program components, it is helpful for a single person or department to gather and analyze applicable data. This can be accomplished in a number of ways and will vary based on existing data tracking mechanisms used by a permittee, the data being captured and the reporting requirements the permittee must comply with. Ideally, the program would have a database accessible by all parties which specifies the required data. Lacking this, the permittee will need to coordinate all responsible parties. The permittee will need to ensure that responsible parties "mine" all data necessary to adequately represent the program and permit compliance, and specify adequate internal reporting deadlines to guarantee that the data is available in a timely manner for program planning, effectiveness assessments and permit reporting. Some permittees create reporting forms for program component managers to complete and submit by internal deadlines. Regardless of how the permittee coordinates the effort internally, without adequate tracking of data the permittees will not be able to submit annual reports to the permitting authority that provide the necessary information to determine permit compliance.

Recommendations for the Permit Writer

To assist the permittee in ensuring appropriate data is gathered and analyzed, the permitting authority should be very clear regarding annual reporting requirements. In addition, the text for this section should be tailored depending on the permittee. For example, some permittees may be able to develop a GIS-based system complete with the option to upload pictures and inspection reports versus a spreadsheet. In the text provided either system would meet the requirements, but more detailed information can be obtained with the GIS-based system.

8.2 Development of a Comprehensive Monitoring & Assessment Program

Example Permit Provision

8.2.1 The permittee must continue to implement, and revise as necessary, a comprehensive monitoring and assessment program. A description of this program must be included in the SWMP document. The monitoring and assessment program must be designed to meet the following objectives:

a. Assess compliance with this permit;

b. Measure the effectiveness of the permittee's stormwater management program;

c. Assess the chemical, physical, and biological impacts to receiving waters resulting from stormwater discharges;

d. Characterize stormwater discharges;

e. Identify sources of specific pollutants;

f. Detect and eliminate illicit discharges and illegal connections to the MS4; and

g. Assess the overall health and evaluate long-term trends in receiving water quality.

NOTE: Because monitoring programs and requirements are very specific to the MS4 and local water quality impairments, permit writers are directed to the "Recommendations to the Permit Writer" section below for examples of comprehensive monitoring program Permit Requirements.

Example Permit Requirement Rationale for the Fact Sheet

Without clear monitoring objectives and a detailed monitoring plan, it will be difficult for permittees and permitting authorities to evaluate the effectiveness of the municipal stormwater program.

There are numerous factors that should be examined while setting up the water quality monitoring portion of the comprehensive program. Understanding and considering climatic conditions such as precipitation patterns, temperature, and seasonal variations will ensure the study design will collect data that are representative of typical storms in the area and that sampling occurs during times of the year when it is most logical to do so. Acknowledging the different types of land uses within the area will also help the permittee to prioritize monitoring efforts based on the areas most likely to be impacted by stormwater. The type of waterbody monitored must also be considered when selecting sampling locations since pollutants behave differently depending on the environment thereby impacting sampling protocols. For example, sampling in a freshwater lake involves different protocols than monitoring in a tidally influenced river or a first order stream. Waterbody type can also influence the data results and conclusions (e.g. freshwater wetlands typically have high denitrification rates that will likely impact the results of nitrate sampling).

Selection of specific sampling locations is also very important. If particular sites are of concern, then monitoring both above and below the sites to figure out their contributions to the overall water quality issues may make sense. Also, the actual location in the waterbody is important to specify for consistency. For example, should samples be taken close to the stream bank or in the center of the waterbody, in riffles or pools? The answers to these questions, of course, depend on the goals of the monitoring and the constituents (biological, chemical, hydrological) being examined.

In addition, the number and frequency of samples collected and stream assessments performed will determine how robust the data will be (see page 287 in *National Research Council's Report Urban Stormwater Management in the United States (2009*) available at www.epa.gov/npdes/pubs/nrc_stormwaterreport.pdf). Monitoring may or may not be tied to specific wet weather events (i.e. within 72 hours after a rainfall event). A combination of specific wet weather samples and dry weather samples may be appropriate.

Establishing objectives with associated indicators (environmental or administrative) for each minimum measure can help put each component into perspective when considering the overall program. Indicators are one way to evaluate the success of the program from the overall program level. Developing standard environmental indicators is a critical step to evaluate the SWMP. Permittees need practical tools, such as these indicators, in order to determine if their stormwater programs are working, and that help elucidate where additional efforts may be most critical. Environmental indicators should be selected based on the type (estuarine/freshwater/brackish) and condition (impaired/non-impaired) of the waterbody to which stormwater is discharged as well as the intended use of the area where the stormwater is discharged (source water protection area, etc.).

In addition, permittees should document certain administrative efforts associated with developing and implementing their SWMPs. In this context 'administrative' is considered quite broad, including such things as control measures, inspection programs, policies and rules, MS4 system scope and condition, educational efforts and any other variable or outcome that could reflect on the quality of a stormwater program other than the actual environmental quality outcomes, which are covered under 'Environmental Indicators'.

Good administrative indicators are numerous, and good suites of indicators will vary from one community to another. More information can be obtained on each of the environmental and administrative indicators listed by going to the Stormwater Manager's Resource Center (www.stormwatercenter.net) and selecting "Monitor/Assess" on the left navigation bar.

Several protocols have been developed to assess the effectiveness of stormwater control measures:

- Guidance for Evaluating Emerging Stormwater Treatment Technologies, Technology Assessment Protocol - Ecology (TAPE) www.ecy.wa.gov/biblio/0210037.html . This guidance document's primary purpose is to establish a testing protocol and process for evaluating and reporting on the performance and appropriate uses of emerging stormwater treatment technologies.

- Technology Acceptance Reciprocity Partnership (TARP) Protocol for Stormwater Best Management Practice Demonstrations www.dep.state.pa.us/dep/deputate/pollprev/techservices/tarp/pdffiles/Tier2protocol.pdf . The purpose of the TARP

Protocol is to provide a uniform method for demonstrating stormwater technologies and developing test quality assurance (QA) plans for certification or verification of performance claims.

- BMP Performance Verification Checklist. This is a tool that helps permittees provide a consistent set of questions for applicants proposing to use manufactured and proprietary BMP. It is available as Tool # 8 of the Center for Watershed Protection's *Managing Stormwater in Your Community*. The checklist is accompanied by an explanation and instructions for using the checklist, technical appendices, and a matrix that compares existing verification protocols, such as TARP and TAPE.

Additional monitoring resources include:

- CWP, 2008, *Monitoring to Demonstrate Environmental Results: Guidance to Develop Local Stormwater Monitoring Studies Using Six Example Study Designs* (www.cwp.org)
- Geosyntec Consultants and Wright Water Engineers, 2009, *Urban Stormwater BMP Performance Monitoring*, (bmpdatabase.org/MonitoringEval.htm)
- CASQA, 2007, *Municipal Stormwater Program Effectiveness Assessment Guidance* (www.casqa.org)

Recommendations for the Permit Writer

Because of the site-specific nature and variability of these monitoring programs between permittees, the detailed requirements should be provided by each permit writer. For example, the Phase I regulations included specific monitoring requirements while the Phase II regulations allow, but do not specifically require monitoring. To assist permit writers, several examples of monitoring requirements from existing MS4 permits are listed below:

- Baltimore County, MD Phase I MS4 permit (issued 2005); see the watershed assessment and planning requirements (Part II.F) and assessment of controls (Part II.H) www.mde.state.md.us/assets/document/sedimentStormwater/MSSPermit/BA%20final%20permit.pdf
- Southern California Regional Bioassessment Monitoring Program (this is a regional monitoring program involving coastal counties in Southern California) www.socalsmc.org/Docs/SMC-DesignofBioassessmentRegionalMonitoringProgram.pdf
- San Diego, CA Phase I MS4 Permit (issued 2007); see Receiving Waters and Urban Runoff Monitoring and Reporting Program. www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/docs/sd_permit/r9_2007_0001/2007_0001final.pdf

The permit writer could consider the role of partnerships among the MS4s in establishing and implementing the monitoring programs so that any data collected is robust, useful, and meaningful. In addition, communities may benefit more by working with local organizations and/or neighboring communities who are already collecting similar data. By doing so resources may be used more efficiently and results of testing may be more robust.

The permit writer should also require the permittee to assess the effectiveness of the SWMP in meeting applicable Permit Requirements. The sampling protocols developed must support the goals of the monitoring program. The monitoring and assessment program must include water quality monitoring as well as an assessment of environmental and administrative indicators. Along these lines, the permit writer could also add requirements such as the ones provided below:

Water Quality Monitoring

a. *The Permittee must develop a water quality monitoring program that includes [insert specific monitoring programs and requirements, such as:*

- Ambient receiving water monitoring,
- Biological monitoring,
- Control measure performance monitoring, or
- Discharge (wet weather) monitoring

Because the detailed monitoring program requirements are very unique to each MS4, the permitting authority should insert here the specific details of the relevant monitoring program, such as monitoring type, frequency, location, etc.]

b. When determining water quality monitoring components, the permittee must examine and consider a variety of factors, including, but not limited to:

- Climatic conditions, including precipitation patterns, temperature, and seasonal variations
- Land uses in the MS4
- Waterbody type

c. The permittee must consider and address specific sampling quality assurance/quality control protocols, including, but not limited to:

- Specific chemical constituents (pollutants), biological stream indicators, and physical stream indicators that will be monitored to best achieve the purpose of the monitoring
- Sampling locations
- Number and frequency of sample collection and assessments
- Timing of sample collection

d. The permittee must determine if any similar monitoring is occurring within the MS4 and if it is logical to link efforts.

Environmental Indicators

As part of the comprehensive monitoring and assessment program, the permittee must identify and track at least [*insert number of indicators to be tracked*] environmental

indicators from each category listed below (physical and hydrologic indicators; biological indicators; water quality indicators). The indicators must be appropriate to assess if the SWMP is meeting goals and objectives:

Physical and hydrological indicators

- Stream widening/ downcutting
- Physical habitat quality
- Impacted dry weather flows
- Increased flooding frequency
- Stream temperature monitoring

Biological indicators

- Fish assemblage analysis
- Macro-invertebrate assemblage
- Single species indicator
- Composite indicators
- Other biological indicators

Water quality indicators

- Water quality pollutant constituent monitoring
- Toxicity testing
- Non-point source loadings
- Exceedance frequencies of water quality standards
- Sediment contamination
- Human health criteria

Administrative indicators

As part of the comprehensive monitoring and assessment program, the permittee must identify and track at least [*insert number of indicators to be tracked*] administrative indicator from each category listed below (social indicators; programmatic indicators; site indicators). The indicators must be appropriate to assess if the SWMP is meeting goals and objectives:

Social indicators

- Public attitude surveys
- Industrial/commercial pollution prevention
- Public involvement and monitoring
- User perception

Programmatic indicators

- Number of illicit connections identified and corrected
- Number of control measures installed, inspected, and maintained
- Permitting and compliance
- Growth and development

Site indicators

- Control measure performance monitoring
- Industrial site compliance monitoring

Performance Monitoring of Stormwater Controls

When monitoring the performance of stormwater controls, EPA recommends that percent removal efficiencies are not calculated and compared since results can be misleading because the percentages may be based on differing levels of the influent concentration (see cfpub.epa.gov/npdes/stormwater/urbanbmp/bmptopic.cfm#percentremoval for further discussion; also see *National Research Council's Report Urban Stormwater Management in the United States (2009*) available at www.epa.gov/npdes/pubs/nrc_stormwaterreport.pdf).

Modeling can also be a useful tool to quantify the impacts of municipal stormwater management. The following resources provide summaries and reviews of different types of models available to

determine existing loading from an MS4 as well as the effects expected from various stormwater controls.

1. USEPA Handbook for Developing Watershed Plans to Restore and Protect Our Waters
   www.epa.gov/nps/watershed_handbook/

   Chapter 8 of this document focuses on methods for estimating pollutant loads, including the use of watershed models. This chapter provides assistance in selecting and applying watershed models to estimate pollutant loads from existing conditions.

2. USEPA TMDL Model Evaluation and Research Needs
   www.epa.gov/nrmrl/pubs/600r05149/600r05149.htm

   This report documents the review of more than 60 available watershed and receiving water models. It discusses model selection on the basis of model capabilities and provides a series of tables rating the capabilities or applicability the models using the categories of TMDL endpoints, general land and water features, special land processes, special water processes, and application considerations including the selection of appropriate best management practices and their water quality impacts. The document also provides individual fact sheets for each reviewed model.

8.3 Evaluation of Overall Program Effectiveness

Example Permit Provision

8.3.1 *Annual Effectiveness Assessment* – The annual effectiveness assessment must:

a. Use the monitoring and assessment data described in Part 8.2 to specifically assess the effectiveness of each of the following:
   1. Each significant activity/control measures or type of activity/control measure implemented;
   2. Implementation of each major component of the Stormwater Management Program (Public Education/Involvement, Illicit Discharges, Construction, Post-Construction, Good Housekeeping); and
   3. Implementation of the Stormwater Management Program as a whole.

b. Identify and use measurable goals, assessment indicators, and assessment methods for each of the items listed in Part 8.3.1.a above.

c. Document the permittee's compliance with permit conditions.

8.3.2 Based on the results of the effectiveness assessment, the permittee must annually review its activities or control measures to identify modifications and improvements needed to maximize SWMP effectiveness, as necessary to achieve compliance with this permit. The permittee must develop and implement a plan and schedule to address the identified modifications and improvements. Municipal activities/control

measures that are ineffective or less effective than other comparable municipal activities/control measures must be replaced or improved upon by implementation of more effective municipal activities/control measures.

8.3.3 As part of its Annual Reports, the permittee must report on its SWMP effectiveness assessment as implemented under Part 8.3.1 above.

Example Permit Requirement Rationale for the Fact Sheet

A key requirement in the stormwater Phase II rule is a report (40 CFR 122.34(g)(3)) that includes "the status of compliance with permit conditions, an assessment of the appropriateness of identified [control measures] and progress towards achieving identified measurable goals for each of the minimum control measures." This assessment is critical to the stormwater program framework which uses the iterative approach of implementing controls, conducting assessments, and designating refocused controls leading toward attainment of water quality standards.

Building on the monitoring and assessment program developed in Part 8.2, the permittee must conduct an annual effectiveness assessment to assess the effectiveness of significant control measures, SWMP components, and the SWMP as a whole. The California Stormwater Quality Association's (CASQA) *Municipal Stormwater Program Effectiveness Guidance* describes strategies and methods for assessing effectiveness, including examples of effectiveness assessment for each SWMP program component. The CASQA Effectiveness Guidance is available at www.casqa.org for purchase. A two-hour EPA webcast focusing on the CASQA Guide is also available (available at www.epa.gov/npdes/training under "Assessing the Effectiveness of Your Municipal Stormwater Program"). A resources document from the webcast includes a 10 page summary of the Guide and example pages from the municipal chapter (www.epa.gov/npdes/outreach_files/webcast/jun0408/110961/municipal_resources.pdf).

The *Municipal Stormwater Program Effectiveness Assessment Guidance* synthesizes information on designing and conducting program effectiveness assessments. The document also explains how to select certain methods based on programmatic outcomes and goals. The reader is led through a series of questions and case studies to demonstrate how proper assessments are selected. Techniques are related to different level of outcomes: level one – documenting activities, level two – raising awareness, level 3 – changing behavior, level 4 – reducing loads from sources, level 5 – improving runoff quality, and level 6 – protecting receiving water quality. The Guide includes fact sheets for all six NPDES program elements, outlining methods and techniques for assessing effectiveness of each program.

Recommendations for the Permit Writer

Adaptive management is the appropriate process for assessing new opportunities for improving program effectiveness in controlling stormwater pollution. The permit writer should require the permittee to use adaptive management throughout the permit term to assess options for improving controls on stormwater discharges as compared with measurable goals and demonstrated by monitoring and assessment protocols. The permit writer should have the permittee monitor and

assess the data and analyses required under the permit as well as applicable information from other sources in the adaptive management process.

In addition, the permit writer should have the permittee assess and modify, as necessary, any or all existing SWMP components and adopt new or revised SWMP components to optimize reductions in stormwater pollutants through an iterative process. This iterative process should include routine assessment of the need to further improve water quality and protect beneficial uses, review of available technologies and practices to accomplish the needed improvement, and evaluate resources available to implement the technologies and practices.

8.4 Requirements for Annual Reporting of MS4 Activities

Example Permit Provision

8.4.1 Summary Annual Report - The Permittee must submit annual reports on or before [*specify deadline, e.g., the anniversary date of this permit*] for the reporting period [*specify the reporting period, e.g., July 1-June 30*]. The Permittee must use the Summary MS4 Annual Report template in Appendix A to document a summary of the past year activities. All of the information required on this form must be completed.

8.4.2 Detailed Annual Report - The Permittee must also submit a detailed annual report that addresses, for the activities described in the SWMP document required in Part 1.1, the following:

- A summary of past year activities, including where available, specific quantities achieved and summaries of enforcement actions. See Part 8.4.3 for required information specific to certain SWMP areas.
- A description of the effectiveness of each SWMP program component or activity (see Part 8.3); and
- Planned activities and changes for the next reporting period, for each SWMP program component or activity.
- Detailed fiscal analysis described in Part1.4.2.

8.4.3 [*Specify any additional information and/or data pertaining to implementation of priority activities the Permitting Authority would like to see in Annual Reports, e.g. a list of green roofs (with square footage) installed in the MS4, a summary of water quality monitoring data collected for a specific waterbody, etc*.]

The Annual Report must clearly refer to the Permit Requirements, and describe in quantifiable terms, the status of activities undertaken to comply with each requirement.

Example Permit Requirement Rationale for the Fact Sheet

In general, an annual report must document and summarize implementation of the SWMP during the previous year and evaluate program results and describe planned changes towards continuous improvement. The annual report also can serve as a "state of the SWMP" report for the general public or other stakeholders in the community. While records are to be kept and made available to the public, the annual report is an excellent summary document to provide as well.

Recommendations for the Permit Writer

EPA recommends using its Summary Annual Report Template (see Appendix A) in this guidance in order to obtain summary information about the status of MS4 programs. In addition to the summary annual report template, permittees must also submit a more detailed annual report.

The permit writer may determine that additional, more detailed, information is needed to determine compliance with the Permit Requirements. Even if these reporting details are not required within the permit, the permitting authority and enforcement officials can still request them at any time or during a program audit.

MS4 permits should require permittees to summarize and analyze data concerning the effectiveness of the SWMP and submit the analysis to the permitting authority. For example, the permittees should address such questions as:

- For illicit discharge data, what are the most prevalent sources and pollutants in the illicit discharge data, and where are these illicit discharges occurring? How many illicit discharges have been identified, and how many of those have been resolved? How many outfalls or screening points were visually screened, how many had dry weather discharges or flows, at how many were field analyses completed and for what parameters, and at how many were samples collected and analyzed? Does the MS4 need to conduct more inspections in these areas, or develop more specific outreach targeting these sources and pollutants?

- For the construction data, what are the most common construction violations, and are there any trends in the data (e.g., construction operators who receive more violations than others, areas of the MS4 with more violations, need to refine guidance or standards to more clearly address common violations). How has the permittee responded to these trends? Over the last year, how many construction site plan reviews were completed and approved? How many inspections were conducted, how many noncompliant sites were identified, and how many enforcement actions (and of what type) were taken?

At a minimum, the permit should require that the annual report clearly illustrate three key items for each SWMP area:

- **Summary of the Year's Activities**. The summary should describe and quantify program activities for each SWMP component. Responsible persons, agencies, departments or co-permittees should be included. Each activity should be described in relation to achievement of established goals or performance standards.

- **Description of SWMP Effectiveness**. An annual report should not only describe the previous year's activities, but should also highlight the SMWP's effectiveness (see Part 8.3) using the indicators required in Part 8.2.

- **Planned Activities and Changes**. The annual report should describe activities planned for the next year highlighting any changes made to improve control measures or program effectiveness.

Also, although the stormwater Phase II rule requires reports, after the first permit term, to be submitted in only years two and four of the permit term, EPA strongly encourages annual reports for all permittees.

APPENDIX A: SUMMARY ANNUAL REPORT TEMPLATE

National Pollutant Discharge Elimination System Stormwater Program
Small MS4 Report Form

The purpose of this report is to contribute information to an evaluation of the NPDES small municipal separate storm sewer system (MS4) permit program. Consistent with 40 CFR §122.37 the U.S. Environmental Protection Agency is assessing the status of the program nation-wide. A "no" answer to a question does not necessarily mean noncompliance with your permit or with the federal regulations. In order to establish the range of variability in the program it is necessary to ask questions along a fairly broad performance continuum. Your permitting authority may use some of this information as one component of a compliance evaluation.

1. MS4 Information

_____
Name of MS4

_____ _____ _____
Name of Contact Person (First) (Last) (Title)

_____ _____
Telephone (including area code) Email

_____
Mailing Address

_____ ____ _____
City State ZIP code

What size population does your MS4 serve? _____ NPDES number _____

What is the reporting period for this report? (mm/dd/yyyy) From _____ to _____

2. Water Quality Priorities

A. Does your MS4 discharge to waters listed as impaired on a state 303(d) list? ☐ Yes ☐ No

B. If yes, identify each impaired water, the impairment, whether a TMDL has been approved by EPA for each, and whether the TMDL assigns a wasteload allocation to your MS4. Use a new line for each impairment, and attach additional pages as necessary.

Impaired Water	Impairment	Approved TMDL		TMDL assigns WLA to MS4	
		☐ Yes	☐ No	☐ Yes	☐ No
		☐ Yes	☐ No	☐ Yes	☐ No
		☐ Yes	☐ No	☐ Yes	☐ No
		☐ Yes	☐ No	☐ Yes	☐ No
		☐ Yes	☐ No	☐ Yes	☐ No
		☐ Yes	☐ No	☐ Yes	☐ No
		☐ Yes	☐ No	☐ Yes	☐ No
		☐ Yes	☐ No	☐ Yes	☐ No

C. What specific sources contributing to the impairment(s) are you targeting in your stormwater program?

_____

D. Do you discharge to any high-quality waters (e.g., Tier 2, Tier 3, outstanding natural resource waters, or other state or federal designation)? ☐ Yes ☐ No

E. Are you implementing additional specific provisions to ensure their continued integrity? ☐ Yes ☐ No

3. Public Education and Public Participation

A. Is your public education program targeting specific pollutants and sources of those pollutants? ☐ Yes ☐ No

B. If yes, what are the specific sources and/or pollutants addressed by your public education program?

_____

C. Note specific successful outcome(s) (e.g., quantified reduction in fertilizer use; NOT tasks, events, publications) fully or partially attributable to your public education program during this reporting period.

_____

D. Do you have an advisory committee or other body comprised of the public and other stakeholders that provides regular input on your stormwater program? ☐ Yes ☐ No

4. Construction

A. Do you have an ordinance or other regulatory mechanism stipulating:

Erosion and sediment control requirements? ☐ Yes ☐ No

Other construction waste control requirements? ☐ Yes ☐ No

Requirement to submit construction plans for review? ☐ Yes ☐ No

MS4 enforcement authority? ☐ Yes ☐ No

B. Do you have written procedures for:

Reviewing construction plans? ☐ Yes ☐ No

Performing inspections? ☐ Yes ☐ No

Responding to violations? ☐ Yes ☐ No

C. Identify the number of active construction sites ≥ 1 acre in operation in your jurisdiction at any time during the reporting period. _____

D. How many of the sites identified in 4.C did you inspect during this reporting period? _____

E. Describe, on average, the frequency with which your program conducts construction site inspections.

_____

F. Do you prioritize certain construction sites for more frequent inspections? ☐ Yes ☐ No

If Yes, based on what criteria? _____

G. Identify which of the following types of enforcement actions you used during the reporting period for construction activities, indicate the number of actions, or note those for which you do not have authority:

☐ Yes	Notice of violation	#_____	No Authority ☐
☐ Yes	Administrative fines	#_____	No Authority ☐
☐ Yes	Stop Work Orders	#_____	No Authority ☐
☐ Yes	Civil penalties	#_____	No Authority ☐
☐ Yes	Criminal actions	#_____	No Authority ☐
☐ Yes	Administrative orders	#_____	No Authority ☐
☐ Yes	Other _____	#_____	

H. Do you use an electronic tool (e.g., GIS, data base, spreadsheet) to track the locations, inspection results, and enforcement actions of active construction sites in your jurisdiction? ☐ Yes ☐ No

I. What are the 3 most common types of violations documented during this reporting period?

_____

J. How often do municipal employees receive training on the construction program? _____

5. Illicit Discharge Elimination

A. Have you completed a map of all outfalls and receiving waters of your storm sewer system? ☐ Yes ☐ No

B. Have you completed a map of all storm drain pipes and other conveyances in the storm sewer system? ☐ Yes ☐ No

C. Identify the number of outfalls in your storm sewer system. _____

D. Do you have documented procedures, including frequency, for screening outfalls? ☐ Yes ☐ No

E. Of the outfalls identified in 5.C, how many were screened for dry weather discharges during this reporting period?

_____

F. Of the outfalls identified in 5.C, how many have been screened for dry weather discharges at any time since you obtained MS4 permit coverage? _____

G. What is your frequency for screening outfalls for illicit discharges? Describe any variation based on size/type.

_____

H. Do you have an ordinance or other regulatory mechanism that effectively prohibits illicit discharges? ☐ Yes ☐ No

I. Do you have an ordinance or other regulatory mechanism that provides authority for you to take enforcement action and/or recover costs for addressing illicit discharges? ☐ Yes ☐ No

J. During this reporting period, how many illicit discharges/illegal connections have you discovered? _____

K. Of those illicit discharges/illegal connections that have been discovered or reported, how many have been eliminated?

_____

L. How often do municipal employees receive training on the illicit discharge program? _____

6. Stormwater Management for Municipal Operations

A. Have stormwater pollution prevention plans (or an equivalent plan) been developed for:

All public parks, ball fields, other recreational facilities and other open spaces ☐ Yes ☐ No

All municipal construction activities, including those disturbing less than 1 acre ☐ Yes ☐ No

All municipal turf grass/landscape management activities ☐ Yes ☐ No

All municipal vehicle fueling, operation and maintenance activities ☐ Yes ☐ No

All municipal maintenance yards ☐ Yes ☐ No

All municipal waste handling and disposal areas ☐ Yes ☐ No

Other _____

B. Are stormwater inspections conducted at these facilities? ☐ Yes ☐ No

C. If Yes, at what frequency are inspections conducted? _____

D. List activities for which operating procedures or management practices specific to stormwater management have been developed (e.g., road repairs, catch basin cleaning).

_____

E. Do you prioritize certain municipal activities and/or facilities for more frequent inspection? ☐ Yes ☐ No

F. If Yes, which activities and/or facilities receive most frequent inspections? _____

G. Do all municipal employees and contractors overseeing planning and implementation of stormwater-related activities receive comprehensive training on stormwater management? ☐ Yes ☐ No

H. If yes, do you also provide regular updates and refreshers? ☐ Yes ☐ No

I. If so, how frequently and/or under what circumstances? _____

7. Long-term (Post-Construction) Stormwater Measures

A. Do you have an ordinance or other regulatory mechanism to require:

Site plan reviews for stormwater/water quality of all new and re-development projects? ☐ Yes ☐ No

Long-term operation and maintenance of stormwater management controls? ☐ Yes ☐ No

Retrofitting to incorporate long-term stormwater management controls? ☐ Yes ☐ No

B. If you have retrofit requirements, what are the circumstances/criteria?

_____

C. What are your criteria for determining which new/re-development stormwater plans you will review (e.g., all projects, projects disturbing greater than one acre, etc.) _____

D. Do you require water quality or quantity design standards or performance standards, either directly or by reference to a state or other standard, be met for new development and re-development? ☐ Yes ☐ No

E. Do these performance or design standards require that pre-development hydrology be met for:

Flow volumes ☐ Yes ☐ No

Peak discharge rates ☐ Yes ☐ No

Discharge frequency ☐ Yes ☐ No

Flow duration ☐ Yes ☐ No

F. Please provide the URL/reference where all post-construction stormwater management standards can be found.

_____

G. How many development and redevelopment project plans were reviewed during the reporting period to assess impacts to water quality and receiving stream protection? _____

H. How many of the plans identified in 7.G were approved? _____

I. How many privately owned permanent stormwater management practices/facilities were inspected during the reporting period? _____

J. How many of the practices/facilities identified in I were found to have inadequate maintenance? _____

K. How long do you give operators to remedy any operation and maintenance deficiencies identified during inspections?

_____

L. Do you have authority to take enforcement action for failure to properly operate and maintain stormwater practices/facilities? ☐ Yes ☐ No

M. How many formal enforcement actions (i.e., more than a verbal or written warning) were taken for failure to adequately operate and/or maintain stormwater management practices? _____

N. Do you use an electronic tool (e.g., GIS, database, spreadsheet) to track post-construction BMPs, inspections and maintenance? ☐ Yes ☐ No

O. Do all municipal departments and/or staff (as relevant) have access to this tracking system? ☐ Yes ☐ No

P. How often do municipal employees receive training on the post-construction program? _____

8. Program Resources

A. What was the annual expenditure to implement MS4 permit requirements this reporting period? _____

B. What is next year's budget for implementing the requirements of your MS4 NPDES permit? _____

C. This year what is/are your source(s) of funding for the stormwater program, and annual revenue (amount or percentage) derived from each?

Source: _____ Amount $_____ OR %_____

Source: _____ Amount $_____ OR %_____

Source: _____ Amount $_____ OR %_____

D. How many FTEs does your municipality devote to the stormwater program (specifically for implementing the stormwater program; not municipal employees with other primary responsibilities)? _____

E. Do you share program implementation responsibilities with any other entities? ☐ Yes ☐ No

Entity	Activity/Task/Responsibility	Your Oversight/Accountability Mechanism

9. Evaluating/Measuring Progress

A. What indicators do you use to evaluate the overall effectiveness of your stormwater management program, how long have you been tracking them, and at what frequency? These are not measurable goals for individual management practices or tasks, but large-scale or long-term metrics for the overall program, such as macroinvertebrate community indices, measures of effective impervious cover in the watershed, indicators of in-stream hydrologic stability, etc.

Indicator	Began Tracking (year)	Frequency	Number of Locations

B. What environmental quality trends have you documented over the duration of your stormwater program? Reports or summaries can be attached electronically, or provide the URL to where they may be found on the Web.

10. Additional Information

In the space below, please include any additional information on the performance of your MS4 program. If providing clarification to any of the questions on this form, please provide the question number (e.g., 2C) in your response.

Certification Statement and Signature

I certify that all information provided in this report is, to the best of my knowledge and belief, true, accurate and complete. ☐ Yes

Federal regulations require this application to be signed as follows: **For a municipal, State, Federal, or other public facility**: by either a principal executive or ranking elected official.

_____ _____

Name of Certifying Official, Title Date (mm/dd/yyyy)

Submit

APPENDIX B: DEFINITIONS

Commencement of Construction – the initial disturbance of soils associated with clearing, grading, or excavating activities or other construction-related activities (e.g., stockpiling of fill material). (Source: 2008 CGP)

Control Measure – any best management practice (BMP) or other method used to prevent or reduce the discharge of pollutants to waters of the United States. (Source: 2008 CGP)

Discharge – when used without qualification means the "discharge of a pollutant." (Source: 2008 CGP)

Discharge of Stormwater Associated with Construction Activity – as used in this permit, refers to a discharge of pollutants in stormwater from areas where soil disturbing activities (e.g., clearing, grading, or excavation), construction materials or equipment storage or maintenance (e.g., fill piles, borrow area, concrete truck chute washdown, fueling), or other industrial stormwater directly related to the construction process (e.g., concrete or asphalt batch plants) are located. (Source: 2008 CGP)

Illicit Discharge - any discharge to a municipal separate storm sewer that is not composed entirely of storm water except discharges pursuant to a NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer) and discharges resulting from fire fighting activities. (Source: 40 CFR 122.26)

Large Construction Activity – is defined at 40 CFR §122.26(b)(14)(x) and incorporated here by reference. A large construction activity includes clearing, grading, and excavating resulting in a land disturbance that will disturb equal to or greater than five acres of land or will disturb less than five acres of total land area but is part of a larger common plan of development or sale that will ultimately disturb equal to or greater than five acres. Large construction activity does not include routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of the site. (Source: 2008 CGP)

Non-Structural Controls – preventative actions that involve management and source controls. Refer also to 40 CFR 122.34(b)(5)(c)(iii). (Source: 40 CFR 122.26)

Qualified Personnel – A person knowledgeable in the principles and practice of erosion and sediment controls who possesses the skills to assess conditions at the construction site that could impact stormwater quality and to assess the effectiveness of any sediment and erosion control measures selected to control the quality of stormwater discharges from the construction activity. (Source: EPA's 2008 Construction General Permit)

Receiving Water – the "Water of the United States" as defined in 40 CFR §122.2 into which the regulated stormwater discharges. (Source: 2008 CGP)

Small Construction Activity –includes clearing, grading, and excavating resulting in a land disturbance that will disturb equal to or greater than one (1) acre and less than five (5) acres of land or will disturb

less than one (1) acre of total land area but is part of a larger common plan of development or sale that will ultimately disturb equal to or greater than one (1) acre and less than five (5) acres. Small construction activity does not include routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of the site. (Source: 2008 CGP)

Stormwater control measure – see control measure.

Structural Control - physically designed, installed, and maintained practices used to prevent or reduce the discharge of pollutants in stormwater, to minimize erosion, and/or to minimize the impacts of stormwater on waterbodies.

Wasteload Allocation – the portion of a receiving water's loading capacity that is allocated to one of its existing or future point sources of pollution. Wasteload allocations constitute a type of water quality-based effluent limitation. (40 CFR 130.2)

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GREEN RESERVE

The **American Recovery and Reinvestment Act (ARRA), Green Project Reserve** of 2009, through the State Revolving Fund, provided funding for a wide variety of qualifying projects in the categories of: ***green infrastructure, energy efficiency, water efficiency, and other innovative projects***.

Green Infrastructure in Arid and Semi-Arid Climates

Adapting innovative stormwater management techniques to the water-limited West.

Forward-thinking communities in water-limited regions are increasingly recognizing green infrastructure as a cost-effective approach to stormwater management that conserves water.

In arid and semi-arid regions, many green infrastructure practices may not be "green" at all!

When rain falls on natural landscapes, much of it either soaks into the ground or is returned to the atmosphere by plants or evaporation. Rain that is not absorbed into the soil flows into nearby washes, arroyos, creeks, or streams. By armoring landscapes with parking lots, roads, and rooftops, we dramatically change this water balance. Much less precipitation is absorbed into the soil, and much more flows across the land, gathering oils, pesticides, animal waste, and trash along the way. Gray stormwater infrastructure relies on storm sewers to drain this water and its pollutants to the nearest body of water—increasing flooding, pollutant loads, and erosion, and degrading water quality and habitat.

Green infrastructure refers to a set of practices that mimic natural processes to retain and use stormwater. By promoting infiltration, evapotranspiration, and harvesting throughout the landscape, green infrastructure preserves and restores the natural water balance. Though many green infrastructure practices were first developed and applied in temperate regions, green infrastructure is perhaps

even more relevant in arid and semi-arid climates. Communities, researchers, and design professionals in these water-limited regions are increasingly recognizing green infrastructure as a cost-effective approach not only to stormwater management, but to water conservation as well. This guide discusses the drivers, applications, and design of green infrastructure in arid and semi-arid regions.

In the 1920s, approximately 5% of precipitation in the Los Angeles region flowed to the sea. Today, extensive impervious cover and massive stormwater conveyance systems deliver 50% of the rain falling in the region to the sea, even as more than 80% of the city's water demand is met by costly imports from distant locations. [3, 4]

BENEFITS OF GREEN INFRASTRUCTURE

Although this guide views green infrastructure through the lens of stormwater management, green infrastructure can provide many environmental, social, and economic benefits. Green infrastructure not only reduces runoff, but can conserve water, recharge groundwater, conserve energy, and improve air quality. These environmental benefits create more sustainable cities and towns, and translate into significant social and economic gains. This section reviews the multiple benefits of green infrastructure.

ENVIRONMENTAL BENEFITS

- **Reduces flooding:** Increasing infiltration, evapotranspiration, and storage where precipitation falls will reduce runoff and flooding.
- **Improves water quality:** Reducing runoff and allowing runoff to be treated by soils and vegetation will reduce pollutant loads to receiving water bodies.
- **Provides habitat:** Native and drought-adapted plants that thrive on infrequent precipitation can provide habitat for native birds and insects.
- **Reduces the urban heat island effect:** Removing pavement and planting vegetation can cool and shade urban neighborhoods in the hot summer months.
- **Improves air quality:** Urban vegetation removes pollutants from the air and can mitigate smog formation by reducing temperatures.
- **Mitigates global warming:** By sequestering carbon dioxide in soils and plant biomass, urban vegetation can reduce carbon dioxide concentrations and mitigate global warming.
- **Increases groundwater recharge:** In many cities and towns in the arid and semi-arid West, impervious cover and engineered conveyance systems reduce the amount of precipitation that enters the groundwater store. Green infrastructure practices that reduce impervious cover and enhance infiltration can increase the flow of water to the groundwater. The Los Angeles Basin Water Augmentation Study (WAS), for instance, estimates that the installation of green infrastructure practices that infiltrate the first ¾" of rainfall on each parcel could increase groundwater recharge in the Los Angeles region from 16% of annual rainfall to 48%.[5] Local conditions will shape the effect of green infrastructure on groundwater recharge in each region, but the impact of extensive implementation can be substantial.

SOCIAL BENEFITS

- **Improves public health:** Cooler summer temperatures and cleaner air can dramatically improve health, particularly for children and the elderly. More pedestrian-friendly landscapes can also promote physical activity.
- **Beautifies neighborhoods:** Private gardens and public rights-of-way irrigated with passive and active rainwater harvesting can create beautiful landscapes.

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BENEFITS OF GREEN INFRASTRUCTURE
CONT.

- **Calms traffic:** By reducing street widths and introducing curves, green street techniques can slow traffic.
- **Builds communities:** By beautifying neighborhoods and creating a unique sense of place, green infrastructure practices can increase neighborhood interaction. Neighbors may even work together to integrate green infrastructure into their neighborhood.

ECONOMIC BENEFITS

- **Reduces landscape maintenance costs:** Passive rainwater harvesting and drought adapted plants will require less irrigation and maintenance than conventional, turf-based landscaping.
- **Increases groundwater resources:** Groundwater provides ~40% of the Nation's public water supply, and even more in arid and semi-arid regions with limited surface water supplies.[8,9] Green infrastructure practices that increase groundwater recharge can provide significant cost savings by averting increased pumping costs or increased water imports. The Los Angeles WAS concluded that infiltration-based practices distributed across the region could increase groundwater recharge by 384,000 acre-feet per year—more than 1.5 times the volume captured by centralized spreading grounds. Based on the cost of the current water supply, the study estimated the corresponding value at approximately $310 million per year.
- **Reduces water imports:** Many cities and towns in the West depend on costly imports of water from great distances to meet their water demand. Green infrastructure practices that manage stormwater through passive and active rainwater harvesting can reduce the demand for municipal water and reduce water imports.
- **Reduces energy use:** The energy required to import, treat, and distribute municipal water could be significantly reduced by using precipitation where it falls. The energy and cost savings would not be trivial. The Natural Resources Defense Council (NRDC) estimates that transportation and treatment of water consumes 19% of all electricity in the state of California.[7]

In Los Angeles, enhancing groundwater recharge through green infrastructure practices could supply approximately $310 million worth of water per year.

The green roof installed by EPA Region 8 provides welcome open space in the heart of the city. *Photo courtesy of Greg Davis.*

051198

APPLICATIONS OF GREEN INFRASTRUCTURE

Green infrastructure is a versatile approach to stormwater management that can be applied in a range of climates and at a range of different scales. This section discusses the many practices that can be applied in arid and semi-arid regions, from the scale of a single building to the scale of a neighborhood or watershed.

Active rainwater harvesting in Tucson, AZ.

Passive rainwater harvesting in Tucson, AZ. *Photo courtesy of Watershed Management Group.*

Subsurface infiltration basin in Rancho Mirage, CA. *Photo courtesy of RGA Landscape Architects.*

RAIN GARDENS

Rain gardens (or bioretention cells) are vegetated depressions that retain and treat runoff from rooftops, sidewalks, and streets. Unlike conventional gardens, rain gardens receive most of their water from precipitation. In the arid and semi-arid West, where landscape irrigation accounts for about 40% of municipal water demand, rain gardens can play an important role in both water conservation and stormwater management.

Rain garden design is based on three simple components: a drainage area that collects rainwater, a distribution system that connects the drainage area to the receiving area, and a receiving area that retains and infiltrates the rainwater.

Rain gardens should be sited to treat as much impervious area as possible, and sized to match the volume of soil storage with the extent of the drainage area. Excavation may be required to increase soil storage and accommodate plant roots, and soil amendments may be required to increase soil water retention and maintain healthy plants. In arid and semi-arid regions, rain garden design must be conscious of the limited water supply. The following section discusses techniques for selecting and maintaining vegetation in water-limited regions.

SWALES

Swales are vegetated or mulched earthen channels that retain and treat runoff from rooftops, sidewalks, and streets. Though similar to rain gardens, swales are linear features designed to convey runoff downslope. As runoff flows through the swale, it is slowed by the vegetation or mulch, and may be infiltrated into the soil. Again, techniques for selecting and maintaining vegetation in arid and semi-arid regions are discussed in the following section.

For more information on passive rainwater harvesting with rain gardens, swales, and other landscape features, see the City of Tucson's comprehensive Water Harvesting Guidance Manual, available at http://dot.tucsonaz.gov/stormwater/education/waterharvest.php

POROUS PAVEMENT

Porous pavement reduces runoff volumes and contaminant loads by allowing more precipitation to infiltrate into the soil. Porous pavement systems generally consist of a permeable surface (often porous asphalt, porous concrete, or interlocking concrete pavers) and several layers of bedding. Water that drains through the surface and layers of bedding infiltrates into the soil below. Studies have shown that porous pavement treats the water that passes through the system by retaining oils and heavy metals.[2] Porous pavement, therefore, provides a direct water quality benefit by removing the contaminants associated with streets and parking lots, as well as an indirect water quality benefit by reducing the volume of runoff. Porous pavement may also reduce irrigation demand by providing water to trees with extensive root systems.

RAIN BARRELS OR CISTERNS

Rain barrels, cisterns, or tanks reduce stormwater runoff and municipal water demand by storing rainwater from rooftops and other impervious areas for later use. The appropriate storage volume will depend on the roof area, rainfall, available space, and other site conditions, as well as the system objectives. Whereas smaller rain barrels can provide modest reductions in runoff volume and irrigation demand, larger rain cisterns or

APPLICATIONS OF GREEN INFRASTRUCTURE
CONT.

tanks can capture most rooftop runoff and supply much of the irrigation demand. A 2007 study prepared for the Colorado Water Conservation Board, for instance, found that a 5,000-gallon cistern paired with water-wise landscaping could provide 50% of the irrigation demand for a 7,000-square-foot lot in Douglas County, CO.[1] The cost of these systems, however, increases significantly with storage volume—particularly for underground storage construction. In sizing rainwater harvesting systems, site owners must balance the multiple benefits of stormwater retention and water conservation against the costs of construction.

Green roof atop the EPA Region 8 office in Denver, CO. *Photo courtesy of Greg Davis.*

Green street in Tucson, AZ. *Photo courtesy of Watershed Management Group.*

GREEN ROOFS

As in temperate regions, green roofs in arid and semi-arid regions reduce and treat stormwater runoff. The green roof installed atop the EPA Region 8 Office in Denver, Colorado, for instance, retains more than 80% of the rainfall it receives.

When designed appropriately, green roofs may offer a water-efficient approach to urban stormwater management in arid and semi-arid regions. Though green roofs in these regions will require irrigation throughout their lifetimes, water efficiency can be significantly increased by adapting green roof designs. Irrigation requirements can be reduced by increasing growing media depth, planting native and drought-adapted species, and applying drip irrigation. Municipal water demand can be further reduced by installing systems that irrigate green roofs with harvested stormwater runoff and/or AC condensate.

When installed in appropriate settings, green roofs may also represent a cost-effective approach to urban stormwater management. The cost-effectiveness of a given green roof installation depends on the benefits offered by the green roof, as well as the value placed upon those benefits. Green roofs not only retain and treat stormwater, but conserve energy, reduce heating and cooling costs, reduce the urban heat island effect, sequester CO2, provide habitat, and extend the lifetime of the roof. While conventional roofs typically require replacement every 10-20 years, green roofs typically require replacement every 40-50 years.[6] In dense, urban settings, green roofs also provide valuable recreational space and can reduce stormwater management costs by reducing or eliminating the need for stormwater vaults or ponds. EPA Region 8's green roof, for instance, reduced the cost of the below-ground stormwater detention vault from about $363,800 to $150,000.

GREEN STREETS

The principles of green infrastructure are most effective when designed as a system and applied across a neighborhood or watershed. Green streets are one example of a neighborhood-scale system. Green streets integrate rain gardens and swales into the street design to retain and treat stormwater while beautifying streets and slowing traffic. Rain gardens can be installed in rights-of-way, medians, traffic circles, and chicanes, and rainwater can be directed into these areas by introducing curb cuts or installing curbs flush with the ground.

RIPARIAN BUFFERS

Riparian buffers are one example of a watershed-scale approach to green infrastructure. Riparian buffers restrict development in the land adjacent to washes, arroyos, creeks, or streams to reduce erosion and preserve channel form and function. When applied throughout a watershed, riparian buffers can provide multiple environmental and social benefits. By preserving an interconnected network of habit, riparian buffers can increase wildlife diversity in urban areas. Many communities designate recreational trails within riparian buffers. These trails can provide access to nature as well as opportunities for physical activity.

051200

SELECTING AND MAINTAINING VEGETATION IN ARID AND SEMI-ARID CLIMATES

To establish green infrastructure in arid and semi-arid climates, particular care must be given to the selection and maintenance of vegetation. Though some planners have expressed skepticism about the viability of vegetated practices in water-limited regions, appropriately designed practices will not only be effective and sustainable, but will conserve water resources as well. The key to selecting and maintaining vegetation in water-limited regions is to follow the principles of xeriscaping.

This section reviews these principles and discusses their application to particular green infrastructure practices.

1. **Create a plan.** The first step in designing landscape features that can remain healthy and attractive with limited irrigation is to create a plan balancing water supply and demand. By preparing a site water budget, designers can choose the plant species and densities that best meet their aesthetic objectives while reducing water demand.

   The information required to prepare a site water budget include annual or monthly precipitation, mature plant size, and annual or monthly plant water needs. Annual water budgets will generally be appropriate for landscapes consisting of native plants at native densities, while monthly water budgets will be more effective for landscapes with exotic plants and higher plant densities.

   Comprehensive lists of plant water requirements for Arizona plants are provided by Brad Lancaster's *Rainwater Harvesting for Drylands and Beyond, Volume 1* and the Arizona Municipal Water Users Association's *Landscape Plants for the Arizona Desert*. In other areas, landscape designers may consult the local Cooperative Extension office, local chapter of American Society of Landscape Architects, local association of landscape contractors, native plant societies, or nurseries.

Plant selection for rain gardens:
Bear in mind the potential for occasional inundation. Though standing water should last no more than 72 hours, plants located at the lowest elevations should be able to tolerate inundation.

Rain gardens fed by passive rainwater harvesting border the buildings and parking lots of the TAXI redevelopment project in Denver, CO. The rain gardens beautify the site, reduce the urban heat island effect, and provide habitat, while reducing runoff to the nearby South Platte River. *Photo courtesy of Wenk Associates.*

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SELECTING AND MAINTAINING VEGETATION IN ARID AND SEMI-ARID CLIMATES CONT.

2. **Use low water use plants.** Native and drought-tolerant plants can drastically reduce, if not eliminate, the irrigation requirements of green infrastructure practices. Note that low water use plants do not exclude trees. On the contrary, drought-adapted trees thrive on deep, infrequent watering, and are particularly suitable for green infrastructure practices.

> ***Plant selection for green roofs:*** *Bear in mind the hot, windy environment, the difficulty of accessing most rooftops, and the importance of maintaining the roof structure. Green roof plants should be low growing, self shading, and self-propagating, and should have shallow root systems.*

3. **Use efficient irrigation systems.** Irrigation systems will be most efficient when plants are grouped according to their water needs, and when the frequency and depth of irrigation is adjusted according to plant type, plant maturity, and season. Irrigation schedules should be adjusted at least four times per year, and in warm months, irrigation should take place during the night or early morning. Drip or low flow irrigation techniques will minimize evaporation, runoff, and weed growth.
4. **Consider soil amendments.** Healthy soils are essential to retain soil moisture, sustain vegetation, and treat stormwater runoff. Poor site soils can be amended with organic material.
5. **Use mulch.** Organic mulch can increase water retention and pollutant removal while building soil structure and suppressing weeds. Note, however, that many desert trees and shrubs react poorly when their trunks come in contact with mulch.
6. **Maintenance.** All landscapes require maintenance, and xeriscaping is no exception.

When applied to rain gardens, swales, green roofs, and green streets, these principles will produce sustainable green infrastructure practices that require minimal irrigation. Because these practices will often replace very water intensive conventional landscaping, the net effect will be a dramatic decline in water use.

This rainwater cistern installed at a residence in Tucson, Arizona supplies water for citrus trees and a small vegetable garden, as well as native plants. *Photo courtesy of Technicians for Sustainability.*

051202

NAVIGATING WATER RIGHTS LAW IN THE ARID AND SEMI-ARID WEST

Green infrastructure approaches in the arid and semi-arid West must recognize and adapt to the complex legal landscape associated with water rights law. In most western states, water law is based on the doctrine of prior appropriation. According to this doctrine, the diversion and use of state waters requires a water right, and water rights are allocated based on the time of appropriation ("first in time, first in right").

This doctrine does not affect most green infrastructure practices, but the application of this doctrine to rainwater harvesting does raise several questions. Does the state have jurisdiction over precipitation? Does active rainwater harvesting require a water right? Each state offers its own answers, and in many states, these answers continue to evolve. While some states have developed laws and policies that promote rainwater harvesting, others are extremely restrictive, and still others have no formal policy at all.

The table below summarizes the present stance of 11 western states toward rainwater harvesting. The table:

- Identifies the agency responsible for the administration and enforcement of state water law;
- Indicates whether the state has jurisdiction over atmospheric rainwater;
- Indicates whether a permit would be required to harvest and use rainwater; and
- Identifies who may apply for rainwater harvesting permits if they are required.

State	Responsible Agency	Jurisdiction over Atmospheric Water?	Permit Required?	Who May Apply for Permit
Arizona	Arizona Department of Water Resources	No	No	NA
California	California Environmental Protection Agency, Division of Water Rights	No	No	NA
Colorado	Colorado Division of Water Resources	Yes	Yes. Colorado law identifies properties that may apply for a permit	1. Residential properties that are supplied by a well (or could qualify for a well permit) and are not served by a municipality or water district 2. Developers wishing to apply for approval to be one of 10 statewide pilot projects
Idaho	Idaho Department of Water Resources	No	No	NA
Montana	Montana Department of Natural Resources & Conservation, Water Resources Division, Water Rights Bureau	Yes	Yes	No formal policy
Nevada	State of Nevada, Department of Conservation & Natural Resources, Division of Water Resources	Yes	Technically, yes	Applications not accepted
New Mexico	New Mexico Office of the State Engineer	No	No	NA
Oregon	Water Resources Department	Yes	No. Oregon law exempts "the collection of precipitation water from an artificial impervious surface" from permit requirements	NA
Utah	Utah State Engineer	Possibly	Yes	No formal policy
Washington	Washington Department of Ecology	Possibly	No	NA
Wyoming	Wyoming State Engineer and Board of Control	Yes	Technically, yes, but residential rainwater harvesting is regarded as de minimus	No formal policy

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NAVIGATING WATER RIGHTS LAW IN THE ARID AND SEMI-ARID WEST
CONT.

Many states and municipalities recognize the vast gains in water efficiency that rainwater harvesting can provide, and are playing an active role in promoting this practice. The table below reviews innovative policies and incentives that western states and municipalities have developed to expand rooftop rainwater harvesting.

State	State/Municipal Policies and Incentives
Arizona	A state tax credit is available for plumbing stub outs and water conservation systems (including rainwater harvesting) through 2011. The city of Tucson mandates that commercial developments meet 50% of their landscaping water requirements with harvested rainwater. A Bernalillo County ordinance requires builders to employ certain water conservation measures. Two of the measures builders may select are active and passive rainwater harvesting.
California	A draft Los Angeles ordinance would require builders to employ rainwater storage tanks, permeable pavement, infiltration swales, or curb bumpouts to manage 100% of the runoff from a 3/4" storm, or pay a mitigation fee.
New Mexico	The New Mexico State Engineer issued a Rainwater Harvesting Policy encouraging "the harvesting, collection, and use of rainwater from residential and commercial roof surface for on-site landscape irrigation and other on-site domestic uses." Santa Fe County's Water Harvesting Ordinance mandates the use of rain barrels, cisterns, or catchments for small residences, and the use of buried or partially buried cisterns for large residences and commercial buildings. The Albuquerque Bernalillo County Water Utility Authority offers rebates for rainwater harvesting systems based on the amount of water that can be stored.
Oregon	Building Code OPSC 08-01 allows rainwater harvesting systems for residential potable uses as a statewide alternative method.
Washington	The Washington Department of Ecology issued an Interpretive Policy Statement clarifying that a water right is not required for rooftop harvested rainwater used on site. Washington law states that commercial buildings that utilize active rainwater harvesting systems must receive a 10% reduction in any municipal stormwater management fees. Kitsap County offers a 50% reduction in stormwater management fees to new or remodeled commercial buildings that utilize rainwater harvesting.

The policies above represent a few of the actions that local and state governments can take to remove barriers to green infrastructure and provide incentives for its adoption. As communities across the West struggle to allocate limited water resources among growing populations, green infrastructure can play an important role in preserving water quality while conserving water supply.

Green infrastructure offers a versatile, simple, and cost-effective solution to several of the arid and semi-arid West's most pressing environmental concerns.

Additional green infrastructure resources are available at www.epa.gov/greeninfrastructure and www.epa.gov/smartgrowth.

References:

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National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document

June 2010

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM TEST OF SIGNIFICANT TOXICITY IMPLEMENTATION DOCUMENT

An Additional Whole Effluent Toxicity Statistical Approach for Analyzing Acute and Chronic Test Data

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NOTICE AND DISCLAIMER

This document provides the basis for implementing the Test of Significant Toxicity (TST) approach under the National Pollutant Discharge Elimination System (NPDES) for permitting authorities (states and Regions) and persons interested in analyzing whole effluent toxicity (WET) test data using the traditional hypothesis testing approach as part of the NPDES Program under the Clean Water Act (CWA). This document describes what the U.S. Environmental Protection Agency (EPA) believes is another statistical option to analyze valid WET test data for NPDES WET reasonable potential and permit compliance determinations. The document does not, however, substitute for the CWA, an NPDES permit, or EPA or state regulations applicable to permits or WET testing; nor is this document a permit or a regulation itself. The TST approach does not result in changes to EPA's WET test methods promulgated at Title 40 of the *Code of Federal Regulations* Part 136. The document does not and cannot impose any legally binding requirements on EPA, states, NPDES permittees, or laboratories conducting or using WET testing for permittees (or for states in evaluating ambient water quality). EPA could revise this document without public notice to reflect changes in EPA policy and guidance. Finally, mention of any trade names, products, or services is not and should not be interpreted as conveying official EPA approval, endorsement, or recommendation.

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EXECUTIVE SUMMARY

The U.S. Environmental Protection Agency (EPA or the Agency) has developed a new statistical approach that assesses the whole effluent toxicity (WET) measurement of wastewater effects on specific test organisms' ability to survive, grow, and reproduce. The new approach is called the Test of Significant Toxicity (TST) and is a statistical method that uses hypothesis testing techniques based on research and peer-reviewed publications. The TST approach examines whether an effluent, at the critical concentration (e.g., in-stream waste concentration or IWC, as recommended in EPA's Technical Support Document (TSD) (USEPA 1991) and implemented under EPA's WET National Pollutant Discharge Elimination System (NPDES) permits program and the control within a WET test differ by an unacceptable amount (the amount that would have a measured detrimental effect on the ability of aquatic organisms to thrive and survive). EPA Regions and their NPDES states can still use EPA's TSD approaches. The TST approach is another statistical option to analyze valid WET test data.

Since the inception of EPA's NPDES WET Program in the mid 1980s, the Agency has striven to advance and improve its application and implementation under the NPDES Program. The TST approach explicitly incorporates test power (the ability to correctly classify the effluent as non-toxic, also see reference in the glossary under power) and provides a positive incentive to generate valid, high quality WET data to make informed decisions regarding NPDES WET reasonable potential (RP) and permit compliance determinations. Once the WET test has been conducted (using multiple effluent concentrations and other requirements as specified in the EPA WET test methods), the TST approach can be used to analyze the WET test results to assess whether the effluent discharge is toxic at the critical concentration. Performing the EPA WET test where the minimum five required test concentrations (pursuant to the EPA WET test methods) can establish a concentration-response curve. The TST approach is designed to be used for a two concentration data analysis of the IWC or a receiving water concentration (RWC) compared to a control concentration. Using the TST approach, permitting authorities will have more confidence when making NPDES determinations as to whether a permittee's effluent discharge is toxic or non-toxic. Use of the TST approach does not result in any changes to EPA's WET test methods; however, a facility might desire to modify its future WET tests by increasing the number of replicates over the minimum required (USEPA 1995, 2002a, 2002b, 2002c) by the approved EPA WET test method to increase test power, which is the probability of declaring an effluent *non-toxic* if the organism response at the IWC is truly acceptable. If WET tests have already been performed, the WET data generated cannot be modified to increase the number of test replicates because the TST analysis is done on valid WET data generated within a WET test.

The TST approach was developed on the basis of extensive analyses and detailed research. EPA used valid WET data from *more than 2,000* WET tests to develop and evaluate the TST approach. The TST approach was tested using *nine different* WET test methods comprising *twelve biological endpoints* (e.g., reproduction, growth, survival) and representing most of the different types of WET test designs currently in use. *More than one million* computer simulations were also used to select error rates achieving EPA's regulatory management decisions for the TST approach.

Background

In the NPDES Program, an effluent sample is declared toxic relative to a permitted WET limit if the no observed effect concentration (NOEC) is less than the permitted IWC using a hypothesis statistical approach. In that traditional hypothesis approach, the question being answered is, "Is the mean response of the organisms the same in the control and at the IWC?" The hypothesis testing approach has four possible outcomes: (1) the IWC is truly toxic and is declared toxic, (2) the IWC is truly non-toxic and is declared non-toxic, (3) the IWC is truly toxic but is declared non-toxic, and (4) the IWC is truly non-toxic but is declared toxic. The latter two possible outcomes represent decision errors that can occur with any hypothesis testing approach. In the NPDES WET Program, those two types of errors can occur when test control replication is very good (i.e., test is very precise) so that a very small difference between IWC and control is declared toxic (outcome [4] above), and when test control replication is poor (i.e., the test is very imprecise) so that *even large differences in organism response between the IWC and control cannot be distinguished as statistically different, and the effluent is incorrectly classified as non-toxic (outcome [3] above).*

Organism responses to the IWC and control are unlikely to be exactly the same. The difference might be so small that even if statistically significant, it would be considered biologically negligible. Another approach for assessing an effluent's toxicity on the basis of collected WET data might be to rephrase the question, "Does the mean WET test response in the control and the IWC differ by a defined biological amount?" That approach is known as the *test of bioequivalence*, which the Food and Drug Administration has successfully used to evaluate drugs, as have many researchers in other biological fields. Using the TST approach, the question is, "Is the organism response at the IWC less than or equal to a fixed fraction of the control response (e.g., 75 percent of the control mean response)?" That fixed fraction, expressed as a decimal between 0.00 and 1.00, is termed "*b*" in the TST approach. Thus, the hypothesis being tested is written as follows: mean response [IWC] $\leq b \times$ mean response [control].

The TST approach requires defining what is considered toxic. For *chronic* testing (i.e., for both lethal and sublethal toxicity test endpoints) in EPA's NPDES WET Program, the *b* value in the TST analysis is set at 0.75, which means that a 25 percent effect (or more) is considered evidence of unacceptable *chronic* toxicity. IWC responses substantially less than a 25 percent effect would be interpreted to have a lower risk potential. The regulatory management decision (RMD) for *acute* WET methods is set at 0.80, which means that a 20 percent effect (or more) is considered evidence of unacceptable *acute* toxicity. The acute RMD toxicity threshold is higher than that for chronic WET methods because of the severe environmental implications of acute toxicity (lethality or organism death). For more discussion on the *b* values of 0.75 (chronic toxicity) and 0.80 (acute toxicity), see Section 2.1 of this document.

EPA's RMDs using the TST approach identify true toxicity in WET tests most of the time when it occurs, while also minimizing the probability that the IWC is declared toxic when in fact it is not. That objective requires additional RMDs regarding acceptable maximum false positive *(β or beta using a TST approach) and false negative rates (α or alpha using a TST approach*). In the TST approach, the RMDs are defined as (1) declare a sample toxic at least 75 percent of the time (alpha, $\alpha \leq 0.25$) when there is unacceptable toxicity (20 percent effect for acute and 25 percent effect for chronic test methods), and (2) declare an effluent non-toxic no more than 5 percent

(beta, $\beta \leq 0.05$) of the time when the mean effect at the critical effluent concentration is ≤ 10 percent for both acute and chronic WET tests (including for sublethal endpoints). For more discussion on the RMDs, see Section 2.1 of this document.

On the basis of EPA's analyses, the alpha levels shown in Table ES-1 are recommended for the nine WET test methods examined using the TST approach. An important feature of the TST approach is that the false negative error rate (rate of declaring a toxic effluent to be non-toxic) is established, which, under the traditional hypothesis testing approach, had not been established by EPA previously. For more discussion on the inclusion of the beta error rate in the TST approach, see Section 1.2 of this document and Section 1.1 on the current approach in EPA's 1991 TSD. A demonstrated benefit of the TST approach is that increasing within-test replication (the test power) results in a *lower* rate of WET tests being declared toxic using the TST approach when the IWC is truly non-toxic.

Results obtained from the TST analyses using the *nine* EPA test methods should be applicable to other EPA WET methods not examined. For example, results generated under this project for the fish *Pimephales promelas* survival and growth test is extrapolated to other EPA fish survival and growth tests (e.g., *Menidia* sp., *Cyprinus variegatus*, *Atherinops affinis*) because those test methods use a similar test design (e.g., number of replicates, number of organisms tested) and measure the same endpoints.

Summary

More than 2,000 WET test results and more than one million simulations were conducted to develop the technical basis for the TST approach. The approach builds on the strengths of the traditional hypothesis testing approach, including use of robust statistical analyses and published EPA documents regarding WET data analysis and interpretation. The TST approach yields a rigorous statistical interpretation of valid WET data by incorporating transparent RMDs and established alpha and beta error rates, which can provide incentives to generate test results having greater test power. Because the approach considers statistical test power, its use will result in greater confidence in WET regulatory decisions. In addition, the TST approach provides a positive incentive for the permittee to generate valid, high quality WET data by either increasing the number of test replicates for the IWC and the control within a test and/or achieving better precision within a test through improved WET test method performance (e.g., a high level of quality assurance and quality control).

Permitting authorities should consider the practical programmatic shift from the traditional hypothesis testing approach to the TST approach by opening a dialogue with their regulated community. In addition, they might want to begin to identify what changes might be needed to assimilate the TST approach into any regulations, policy, guidance, and training in their respective NPDES WET Programs. Again, the traditional hypothesis testing approach under EPA's TSD is still considered valid as applied; however, that approach can now be advanced through the TST approach by providing new incentives to permittees to provide valid, high quality WET data.

Table ES-1. Summary of alpha (α) levels or false negative rates recommended for different WET test methods using the TST approach

EPA WET test method	*b* value	Probability of declaring a toxic effluent non-toxic False negative (α) error[a]
Chronic Freshwater and East Coast Methods		
Ceriodaphnia dubia (water flea) survival and reproduction	0.75	0.20
Pimephales promelas (fathead minnow) survival and growth	0.75	0.25
Selenastrum capricornutum (green algae) growth	0.75	0.25
Americamysis bahia (mysid shrimp) survival and growth	0.75	0.15
Arbacia punctulata (Echinoderm) fertilization	0.75	0.05
Cyprinodon variegatus (Sheepshead minnow) and *Menidia beryllina* (inland silverside) survival and growth	0.75	0.25
Chronic West Coast Marine Methods		
Dendraster excentricus and *Strongylocentrotus purpuratus* (Echinoderm) fertilization	0.75	0.05
Atherinops affinis (topsmelt) survival and growth	0.75	0.25
Haliotis rufescens (red abalone), *Crassostrea gigas (oyster), Dendraster excentricus, Strongylocentrotus purpuratus* (Echinoderm) and *Mytilus sp* (mussel) larval development methods	0.75	0.05
Macrocystis pyrifera (giant kelp) germination and germ-tube length	0.75	0.05
Acute Methods		
Pimephales promelas (fathead minnow), *Cyprinodon variegatus* (Sheepshead minnow), *Atherinops affinis* (topsmelt), *Menidia beryllina* (inland silverside) acute survival[b]	0.80	0.10
Ceriodaphnia dubia, *Daphnia magna, Daphnia pulex*, *Americamysis bahia* acute survival[b]	0.80	0.10

Notes:

a. (1) declare a sample toxic at least 75 percent of the time (alpha ≤ 0.25) when there is unacceptable toxicity (20 percent effect for acute and 25 percent effect for chronic test methods) and (2) declare an effluent non-toxic no more than 5 percent of the time (beta ≤ 0.05) when the mean effect at the critical effluent concentration is 10 percent for both acute and chronic WET tests (including sublethal endpoints). For more discussion on the RMDs, see Section 2.1 of this document.

b. Based on four replicate test design

In addition, EPA recommends the following:

- Permitting authorities should decide up front which approach (the EPA's 1991 TSD approach, the TST approach, or another scientifically defensible approach that is sufficient to meet the statutory and regulatory requirements) they will follow (including for their RP procedures) and use the selected approach consistently in all their state NPDES permits. Permitting authorities should ensure that the most environmentally protective approach is consistently used across all permits when assessing valid WET data (e.g., WET RP) for

NPDES permit requirements (e.g., WET limits, monitoring frequencies, toxicity identification evaluation/toxicity reduction evaluation) and avoid selecting the approach that underestimates the true toxicity of the permitted effluent discharge.

- Where a *small data set* exists (fewer than four valid WET tests performed and reported in the previous 5 years), permitting authorities should use the TSD approach for determining RP. With small WET data sets, the TSD's RP multiplying factor is more conservative for environmental water quality protection purposes than the TST. The TST approach is intended for larger data sets (four or more) because it does not use an RP multiplying factor.
- If WET tests have already been performed, the WET data generated cannot be modified to increase the number of test replicates within a test. The decision to increase the number of within test replicates is a decision that needs to be made before conducting the WET tests.
- Where a permittee has concerns about WET data quality, EPA recommends increasing the number of replicates in tests, even if the permitting authority has not yet adopted the TST approach.

ACRONYMS AND ABBREVIATIONS

CFR	Code of Federal Regulations
CV	coefficient of variation
CWA	Clean Water Act
DMR	discharge monitoring report
EC	effect concentration
EPA	U.S. Environmental Protection Agency
IC25	25 percent inhibition concentration
IWC	in-stream waste concentration
LC50	50 percent lethal concentration
LOEC	lowest observed effect concentration
MDL	maximum daily limit
NOEC	no observed effect concentration
NPDES	National Pollutant Discharge Elimination System
QA/QC	quality assurance/quality control
RMD	regulatory management decision
RP	reasonable potential
RPMF	reasonable potential multiplying factor
RWC	receiving water concentration
SWAMP	Surface Water Ambient Monitoring Program (California)
TAC	test acceptability criteria
TIE	toxicity identification evaluation
TRE	toxicity reduction evaluation
TSD	Technical Support Document for Water Quality-Based Toxics Control
TST	Test of Significant Toxicity
TU	toxicity unit
WET	whole effluent toxicity

GLOSSARY

Acute Toxicity Test is a test to determine the concentration of effluent or ambient waters that causes an adverse effect (usually mortality) on a group of test organisms during a short-term exposure (e.g., 24, 48, or 96 hours). Acute toxicity is determined using statistical procedures (e.g., point estimate techniques or a t-test).

Ambient Toxicity is measured using a toxicity test on a sample collected from a receiving waterbody.

Chronic Toxicity Test is a short-term test in which sublethal effects (e.g., reduced growth or reproduction) are usually measured in addition to lethality.

Coefficient of Variation (CV) is a standard statistical measure of the relative variation of a distribution or set of data, defined as the standard deviation divided by the mean. The CV can be used as a measure of precision within and between laboratories, or among replicates for each treatment concentration.

Confidence Interval is the numerical interval constructed around a point estimate of a population parameter.

Effect Concentration (EC) is a point estimate of the toxicant concentration that would cause an observable adverse effect (e.g., mortality, fertilization). EC25 is a point estimate of the toxicant concentration that would cause an observable adverse effect in 25 percent of the test organisms.

False Negative is when the in-stream waste concentration is declared non-toxic but in fact is truly toxic. In the traditional hypothesis approach, false negative error rate is denoted by Beta (β). In the TST approach, false negative error rate is denoted as Alpha (α), which applies when the percent effect in the critical effluent concentration is $\geq$ 25% for a given test.

False Positive is when the in-stream waste concentration is declared toxic but in fact is truly non-toxic. In the traditional hypothesis approach, false positive error rate is denoted by Alpha (α). In the TST approach, false positive error rate is denoted as Beta (β), which applies when the percent effect in the critical effluent concentration is $\leq$ 10% for a given test.

Hypothesis Testing is a statistical approach (e.g., Dunnett's procedure) for determining whether a test concentration is statistically different from the control. Endpoints determined from hypothesis testing are no observed effect concentration and lowest observed effect concentration (LOEC). The two hypotheses commonly tested in WET are:

> **Null hypothesis (Ho)**: The effluent is non-toxic.
>
> **Alternative hypothesis (Ha)**: The effluent is toxic.

Inhibition Concentration (IC) is a point estimate of the toxicant concentration that would cause a given percent reduction in a nonlethal biological measurement (e.g., reproduction or growth), calculated from a continuous model (i.e., Interpolation Method). IC25 is a point estimate of the toxicant concentration that would cause a 25 percent reduction in a nonlethal biological measurement.

In-stream Waste Concentration (IWC) is the concentration of a toxicant or effluent in the receiving water after mixing. The IWC is the inverse of the dilution factor. It is sometimes referred to as the receiving water concentration (RWC).

Lethal Concentration, 50 percent (LC50) is the toxicant or effluent concentration that would cause death to 50 percent of the test organisms.

Lowest Observed Effect Concentration (LOEC) is the lowest concentration of an effluent or toxicant that results in statistically significant adverse effects on the test organisms (i.e., where the values for the observed endpoints are statistically different from the control).

No Observed Effect Concentration (NOEC) is the highest tested concentration of an effluent or toxicant that causes no observable adverse effect on the test organisms (i.e., the highest concentration of toxicant at which the values for the observed responses are not statistically different from the control).

National Pollutant Discharge Elimination System (NPDES) is the national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under the Clean Water Act sections 307, 318, 402, and 405.

Power (or test power) in the context of the Test of Significant Toxicity approach, is the probability of correctly declaring an effluent non-toxic when, in fact, it has an acceptably low level of toxicity.

Precision is a measure of reproducibility (which is a statistical term about the ability to reproduce similar results across test replicates with in a test treatment) within a data set. Precision can be measured both within a laboratory (within-laboratory) and between laboratories (between-laboratory) using the same test method and toxicant.

Quality Assurance (QA) is a practice in toxicity testing that addresses all activities affecting the quality of the final effluent toxicity data. QA includes practices such as effluent sampling and handling, source and condition of test organisms, equipment condition, test conditions, instrument calibration, and replication, use of reference toxicants, recordkeeping, and data evaluation.

Quality Control (QC) is the set of more focused, routine, day-to-day activities carried out as part of the overall QA program.

Reasonable Potential (RP) is where an effluent is projected or calculated to cause an excursion above a water quality standard based on a number of factors including the four factors listed in Title 40 of the *Code of Federal Regulations* Part 122.44(d)(1)(ii).

Reference Toxicant Test is a check of the sensitivity of the test organisms and suitability of the test methodology using the reference toxicant required by the EPA WET test methods. Reference toxicant data are part of a routine QA/QC program to evaluate the performance of laboratory personnel and the robustness and sensitivity of the test organisms.

Regulatory Management Decision (RMD) is the decision that represents the maximum allowable error rates and thresholds for toxicity and non-toxicity that would result in an acceptable risk to aquatic life.

Replicate is two or more independent organism exposures of the same treatment (i.e., effluent concentration) within a WET test. Replicates are typically separate test chambers with organisms, each having the same effluent concentration**.**

Sample is defined as a representative portion of a specific environmental matrix that is used in toxicity testing. For this document, environmental matrices could include effluents, surface waters, groundwater, stormwater, and sediment.

Significant Difference is defined as a statistically significant difference (e.g., 95 percent confidence level) in the means of two distributions of sampling results.

Statistic is a computed or estimated quantity such as the mean, standard deviation, or coefficient of variation.

Test Acceptability Criteria (TAC) are test method-specific criteria for determining whether toxicity test results are acceptable. The effluent and reference toxicant must meet specific criteria as defined in the test method (e.g., for the *Ceriodaphnia dubia* survival and reproduction test, the criteria are as follows: the test must achieve at least 80 percent survival and an average of 15 young per surviving female in the control and at least 60% of surviving organisms must have three broods).

t-test (formally Student's t-Test) is a statistical analysis comparing two sets of replicate observations—in the case of WET, only two test concentrations (e.g., a control and IWC). The purpose of this test is to determine if the means of the two sets of observations are different (e.g., if the IWC or ambient concentration differs from the control [i.e., the test result is pass or fail]).

Type I Error (alpha α) is the error of rejecting the null hypothesis (H_o) that should have been accepted.

Type II Error (beta β) is the error of accepting the null hypothesis (H_o) that should have been rejected.

Toxicity Test is a procedure to determine the toxicity of a chemical or an effluent using living organisms. A toxicity test measures the degree of effect on exposed test organisms of a specific chemical or effluent.

Welch's t-test is an adaptation of Student's t-test intended for use with two samples having unequal variances.

Whole Effluent Toxicity (WET) is the total toxic effect of an effluent measured directly with a toxicity test.

1.0 INTRODUCTION

Whole effluent toxicity (WET) test methods are laboratory procedures that measure biological effects (e.g., survival, growth, reproduction) on aquatic organisms exposed to effluents or storm water discharged to receiving waters in implementing the National Pollutant Discharge Elimination System (NPDES) Program under the Clean Water Act (CWA) section 402. Since the publication of EPA's *Technical Support Document for Water Quality-based Toxics Control* (TSD) (USEPA 1991), permitting authorities have requested alternative approaches for analyzing WET test data that would provide increased confidence in the data assessment and simplify the NPDES permit decision-making process with respect to WET. In response to those requests, EPA developed the TST approach as another statistical option to analyze valid WET test data. This document presents the NPDES programmatic features of the TST statistical approach for analyzing valid WET data and how it can be used to support permitting authorities and permittees when analyzing and interpreting WET test data. Use of the TST approach does not result in any changes to EPA's WET test methods, nor does it preclude the use of EPA's TSD approaches for analyzing valid WET data, or another scientifically defensible approach that is sufficient to meet the statutory and regulatory requirements.

1.1 Terminology and Concepts

This section briefly summarizes the major statistical concepts and terminology involved in WET analysis so as to give the reader a context with which to understand the TST approach and how it differs from current statistical approaches used to analyze valid WET data. This TST implementation document is not intended to provide a detailed discussion of WET test methods, data interpretation, or statistics, and it is assumed that the reader will consult EPA's TSD, WET test method documents, and other WET-related documents (e.g., *Understanding and Accounting for Method Variability in Whole Effluent Toxicity Applications*, USEPA 2000).

In the NPDES Program, WET tests examine organism responses to effluent, typically along a dilution series (USEPA 1995, 2002a, 2002b, 2002c). Acute WET methods measure the lethal response of test organisms exposed to effluent (USEPA 2002c). The principal response endpoints for those methods are the effluent concentration that is lethal to 50 percent of the test organisms (LC50) or the effluent concentration at which survival is significantly lower than the control. Chronic WET methods often measure both lethal and sublethal responses of test organisms. The statistical endpoints used in chronic WET testing are the no observed effect concentration (NOEC) and the 25 percent inhibition concentration (IC25). The NOEC endpoint is determined using a hypothesis testing approach that identifies the maximum effluent concentration at which the response of test organisms is not significantly different from the control. From a regulatory perspective, an effluent sample is declared toxic if the NOEC is less than the in-stream waste concentration (IWC) specified through the WET limitations in the permit. The IC25, by contrast, is a point estimation approach. It identifies the concentration at which the response of test organisms is 25 percent below that observed in the control concentration, and it interpolates the effluent concentration at which this magnitude of response is expected to occur. From a regulatory perspective, an effluent sample is declared toxic if the IC25 is less than the IWC specified through the WET limitations in the permit. This document focuses only on the hypothesis testing approach and not on point estimation approaches for analyzing and interpreting WET data.

In any hypothesis testing approach, two hypotheses are stated: the null hypothesis and the alternative hypothesis. The statistical concepts associated with the traditional hypothesis testing approach currently used in WET analysis are summarized in Table 1. Using that approach, the null hypothesis is that the IWC is non-toxic (i.e., the organism response at the IWC is equal to or better than the response in the test control). The alternative hypothesis is that the IWC is toxic (i.e., the organism response is worse in the IWC than in the control). With any hypothesis testing approach, two types of decision errors occur: (1) conclude that the null hypothesis is correct when in fact it is not or (2) conclude that the null hypothesis is incorrect (i.e., reject the null hypothesis) and thereby declare that the alternative hypothesis is correct, when in fact the null hypothesis is correct. In WET testing, the first type of error above is referred to as a *false negative*, meaning that the *IWC is declared non-toxic when in fact it is toxic*. The second type of error above is referred to as a *false positive* in WET testing, meaning that the *IWC is declared toxic when in fact it is not*.

In the traditional hypothesis testing approach summarized in Table 1, statisticians have assigned Greek letters to the two types of errors identified above. Alpha (or α) refers to the false positive error rate. Beta (or β) refers to the rate of false negatives. In the EPA WET test methods supporting the NPDES WET Program (USEPA 1995, 2002a, 2002b), α was established but β was not. Therefore, the application of α from the EPA test methods and implemented under EPA's TSD, recommended that the maximum rate of false positives that should be observed should be low (no more than 5 percent or $\alpha = 0.05$), but the rate of false negatives was not similarly controlled and is not currently evaluated in WET testing. As a result, the rate of false negatives in the NPDES WET Program has not been controlled. Put another way, the statistical power of these tests, the ability to correctly classify the IWC as toxic (where power is defined as $1-\beta$, Table 1) has not been controlled.

As noted previously in this section, a hypothesis testing approach determines whether the organism response at the IWC is significantly worse than that in the control. In practice, this statistical approach relies on two properties of the data: the average values in the control and the IWC (e.g., average fish weight in each test concentration), and the variability observed among replicates (i.e., organisms' responses from multiple replicates) within the IWC and the control. Whether the IWC is considered toxic depends on both of those data properties, which in many cases results in a well-established, statistically rigorous way to evaluate WET data. However, there are two types of situations in which the traditional hypothesis testing approach can yield equivocal results in WET testing: (1) in tests where within-test variability is high and (2) in tests where within-test variability is exceptionally low. In the first case, because within-test variability is high, it will be difficult to determine statistically whether the organism response to the IWC is worse than the control. That could result in more false negatives than would otherwise be the case. In the second case above, because within-test variability is very low, it will be relatively easy to show statistically significant differences in organism response between the IWC and the control. That could result in more false positives (as defined in the TST approach) than would otherwise be the case.

Table 1. Expression of null and alternative hypotheses used in traditional hypothesis testing and relationships between error rates and resulting decisions based on this approach. Entries correspond to the probability decision given in parentheses. The probability of a false positive (i.e., rejecting a null hypothesis that should not have been rejected) is represented by α and the probability a false negative (i.e., failing to reject the null hypothesis when it should have been rejected) is represented by β.

	True condition	
Decision	**Null hypothesis** Treatment mean ≥ Control mean **Sample is non-toxic**	**Alternative hypothesis** Treatment mean < Control mean **Sample is toxic**
Treatment mean ≥ Control mean **Sample is non-toxic**	Correct decision (1-α)	False negative (β)
Treatment mean < Control mean **Sample is toxic**	False positive (α)	Correct decision (1 – β) (power)

1.2 Background on the TST Approach

The TST is an alternative statistical approach for analyzing and interpreting valid WET data that also uses a hypothesis testing approach but in a different way, building on previous work conducted by EPA in the NPDES WET Program (USEPA 2000) and other researchers (Erickson and McDonald 1995; Shukla et al. 2000; Berger and Hsu 1996). The TST approach is based on a type of hypothesis testing referred to as *bioequivalence testing*. Bioequivalence is a statistical approach that has long been used in evaluating clinical trials of pharmaceutical products (Anderson and Hauck 1983) and by the Food and Drug Administration (Hatch 1996; Aras 2001; Streiner 2003). The approach has also been used to evaluate the attainment of soil cleanup standards for contaminated sites (USEPA 1989) and to evaluate effects of pesticides in experimental ponds (Stunkard 1990). In the context of the NPDES WET Program, the TST approach assesses whether the response of test organisms at the IWC (e.g., fish weight or number of neonates per female) is less than a predetermined proportion of the control response that is considered unacceptably toxic. *Once the WET test has been conducted (using multiple effluent concentrations and other requirements have been met as specified in the EPA methods), the TST approach is designed to be used for a two concentration data analysis of the in-stream waste concentration (IWC) or a receiving water concentration (RWC) compared to a control concentration.*

The null hypothesis using the TST approach is that the IWC is significantly more toxic (i.e., results in a worse organism response) compared to the control (see Table 2). The alternative hypothesis using the TST approach is that the IWC is non-toxic. Thus, the null and alternative hypotheses using the TST approach are opposite of what they are under the traditional hypothesis testing approach described in Section 1.1. In addition, the meaning of α and β are also opposite from what they represent in the traditional hypothesis approach. Under the TST approach, α is associated with false negatives, and β is associated with false positives. Statistical power using the TST approach is the ability to correctly classify the IWC as non-toxic (Table 2). The proportion or fraction of the control response that represents the toxicity threshold is denoted as *b* in the equations in Table 2 and is expressed as a decimal between 0.00 and 1.00. For example,

a *b* value set at 0.85 would mean that a response at the IWC that is at least 85 percent of the control response in the test (i.e., no more than a 15 percent effect) would be considered a lower risk for environmental impacts.

Using the TST hypothesis approach in the NPDES WET Program has several benefits. By incorporating *b* in the hypothesis equation, using the TST approach, there is explicit acknowledgement of the fact that the organism response at the IWC can be less than the control organism response by a certain amount and still be considered acceptable (i.e., non-toxic). In that way, truly non-toxic samples (as defined in the TST approach) can be addressed in a clearer manner than is possible with the traditional hypothesis testing approach as practiced in the NPDES WET Program. A low false positive rate in the TST approach is further addressed by having a low β ($\beta \leq 0.05$), which means more statistical power to identify an acceptable effluent (as defined by EPA's regulatory management decisions [RMDs]) as non-toxic in the NPDES WET Program. In addition, because the null hypothesis in the TST approach is opposite to what is used in the traditional hypothesis testing approach, false negatives are explicitly addressed (α in the TST approach addresses the false negative rate). As mentioned previously, the current NPDES WET Program does not control for false negatives. Thus, the TST approach allows permitting authorities to minimize the occurrence of false negatives (i.e., declaring the IWC non-toxic when it is actually exhibiting unacceptable toxicity), while also minimizing the occurrence of false positives (i.e., declaring the IWC toxic when it is actually acceptable). The TST approach has the added advantage of providing permittees with a clear incentive to improve the precision of test results (e.g., decrease within-test variability and/or use more replicates within a WET test than the minimum required in the EPA WET test method) to reach a definitive conclusion as to whether unacceptable toxicity is observed in a test. Thus, using the TST approach, a permittee can in fact *prove a negative*, i.e., that their effluent is acceptable (non-toxic).

Table 2. Expression of null and alternative hypotheses using the TST approach and relationships between error rates and resulting decisions based on this approach. Entries correspond to the probability decision given in parentheses. The probability of a false positive (i.e., rejecting a null hypothesis that should not have been rejected) is represented by α and the probability a false negative (i.e., failing to reject the null hypothesis when it should have been rejected) is represented by β.

	True condition	
Decision	**Null hypothesis** Treatment mean ≤ b × Control mean **Sample is toxic**	**Alternative hypothesis** Treatment mean > b × Control mean **Sample is non-toxic**
Treatment mean ≤ b × Control mean **Sample is toxic**	Correct decision (1-α)	False positive (β)
Treatment mean > b × Control mean **Sample is non-toxic**	False negative (α)	Correct decision (1-β) (power)

2.0 TST METHODOLOGY

2.1 Regulatory Management Decisions for the TST Approach

Toxicity is not an absolute quantity but rather an effect that is determined relative to a control or reference sample using a given WET test method. In the TST approach, what is considered unacceptable or acceptable toxicity are explicit RMDs. For *chronic* testing in EPA's NPDES WET Program, the *b* value in the TST null hypothesis is set at 0.75, which means that a 25 percent effect (or more) is considered a demonstration of unacceptable toxicity in a given WET test. Using a 25 percent effect threshold as the *b* coefficient is consistent with EPA's use of a 25 percent inhibition concentration (IC25) as an acceptable WET endpoint for examining chronic WET data. Responses substantially less than a 25 percent effect would be interpreted as a lower risk potential. The unacceptable toxicity RMD threshold for acute WET methods is set higher than that for chronic WET methods because of the severe environmental implications of acute toxicity (lethality or organism death). Therefore, for *acute* WET tests, the *b* value in the TST approach is set at 0.80 (i.e., ≥ 20 percent effect in the effluent in acute WET tests is considered unacceptable).

For both acute and chronic WET test methods, the low-risk RMD threshold is set at a 10 percent mean effect at the IWC within a WET test. Thus, one can *prove the negative* (i.e., an effluent is *acceptable or considered non-toxic under NPDES*) if that condition is met in a WET test. For mean effect levels greater than 10 percent but less than the unacceptable toxicity RMD threshold (20 percent for acute and 25 percent for chronic WET tests), the TST approach will still declare the IWC non-toxic depending on within-test variability: the lower the variability in the WET test, the more likely the sample will be declared non-toxic on the basis of the mean responses observed under these test conditions.

EPA's RMDs using the TST approach are used to specify unacceptable toxicity in WET tests most of the time when it occurs (i.e., a low false negative rate). As mentioned previously, under the traditional hypothesis testing approach currently used in the NPDES WET Program, the false negative rate was not controlled. Using the TST approach, the false negative rate RMD is $0.05 \leq \alpha \leq 0.25$, which translates to at least 75 percent probability that an effluent causing unacceptable toxicity will be declared toxic. As noted in the previous paragraph, the unacceptable toxicity RMD threshold is defined as ≥ 20 percent effect of the IWC in acute WET tests and ≥ 25 percent effect of the IWC in chronic WET tests.

EPA also desires to minimize the probability that the IWC is declared toxic when in fact it is acceptable (i.e., low false positive rate). Under the traditional hypothesis testing approach currently used in the NPDES WET Program, the false positive rate is set at 0.05 or 5 percent. Therefore, in the TST approach, the desired false positive rate is also set at 0.05 or 5 percent ($\beta \leq 0.05$). A $\beta = 0.05$ in the TST approach means that 95 percent of the time, a truly acceptable effluent (≤ 10 percent mean effect at the IWC) will be declared non-toxic in the NPDES WET Program. Depending on the minimum WET test design required in the EPA methods (e.g., number of replicates and number of organisms per test concentration) and achievable laboratory control precision for a WET test method, α will be set between 0.05 and 0.25 while still

maintaining a $\beta \leq 0.05$. Extensive analyses were used to identify the lowest α for a given WET test method for which $\beta = 0.05$ and all other RMDs are met.

The RMD thresholds above represent boundaries in terms of desired α and β rates. An $\alpha = 0.20$ for a chronic test method, for example, means that the Type I error rate will be approximately 20 percent at a mean effect of 25 percent. At higher levels of effect in the IWC, actual Type I error rates would be lower; at lower mean effect levels in the IWC, Type I error rate would be somewhat higher, depending on the test method. Therefore, at mean effect levels between the 10 percent non-toxic RMD boundary and the unacceptable toxicity RMD boundary (20 percent for acute and 25 percent for chronic WET test methods), there are differing probabilities of an effluent being declared toxic depending on within-test variability and the difference in mean responses observed between control and IWC. As a result, there will be some instances in which TST will declare a test toxic, whereas the traditional hypothesis approach would declare that test non-toxic (particularly when within-test variability is high or the mean effect at the IWC is near 25 percent, as explained in Section 1.1). Similarly, there will be some instances in which TST will declare an effluent non-toxic but the traditional hypothesis approach would declare that test toxic (when within-test variability is low and the mean effect at the IWC is less than the 20 percent toxicity RMD threshold for acute test methods or 25 percent for chronic toxicity test methods, as explained in Section 1.1).

WET test design and the types of WET endpoints measured influence test sensitivity (e.g., control coefficient of variation or CV). Therefore, TST α error rates are identified for different types of test designs. For example, all fish chronic WET test methods that use a similar test design and have the same type of test endpoints (e.g., growth and survival) would have the same α value. Varying α by WET test design is appropriate for the TST approach. Given the way that the hypotheses are formulated in the TST approach (see Table 2), α represents what is considered β in the traditional hypothesis testing approach, and an acceptable β error was not identified in the current EPA TSD's approach to the EPA NPDES WET Program. Setting α as well as β in the TST approach addresses both false positives and false negatives.

2.2 Setting the Test Method-Specific Alpha Level

Several types of analyses were conducted to determine the appropriate α level for each WET test method. First, representative effluent and reference toxicant data meeting EPA WET test method's test acceptability criteria (TAC) were obtained from several state databases, which included multiple laboratories and wastewater effluents. Valid effluent WET data that met the following data selection requirements were considered to be a representative sample.

- Cover a range of NPDES permitted facility types, including both industrial and municipal permittees
- Represent many facilities for a given EPA WET test method (i.e., no one facility dominates the data for a given WET test method)
- Cover a range of target (design) effluent dilutions on which WET reasonable potential (RP) and NPDES permit compliance are based, ranging from 10 percent to 100 percent effluent concentrations
- Generated by several laboratories for a given EPA WET test method

- Cover a range of observed effluent toxicity for each EPA WET test method (e.g., NOECs range from < 10 percent to 100 percent effluent)

For each of the nine EPA WET test methods examined, control precision was calculated on the basis of valid WET data compiled in this project. A similar analysis was performed for the control response for each of the nine test methods (e.g., mean number of offspring per female in the chronic *Ceriodaphnia dubia* test method) to characterize typical achievable test performance in terms of control response.

A Monte Carlo simulation analysis (a statistical method) was used to estimate the percentage of WET tests that would be declared toxic using the TST approach as a function of different α levels, within-test variability (control and effluent variability), and different effect levels. That analysis identified probable false positive error rates (i.e., declaring an effluent toxic when in fact it is not) under all WET test scenarios encountered. Using the RMDs defined above, an appropriate α level was then identified for each WET test design given a desired β error of $\leq$ 5 percent (0.05) when there is a 10 percent mean effect at the IWC. By simulating thousands of WET tests for a given scenario (mean percent effect and control CV), the percentage of tests declared toxic under a given effluent assessment scenario could be calculated and compared with other scenarios.

3.0 USING THE TST APPROACH IN WET DATA ANALYSES

3.1 Summary of Test Method-Specific Alpha Values

On the basis of all the analyses conducted in this project, EPA recommends the following alpha levels when using the TST approach in a two concentration (i.e., two treatments) data analysis comparison (e.g., IWC and control) (see Table 3).

Table 3. Summary of alpha (α) levels or false negative rates recommended for different WET test methods using the TST approach

EPA WET test method	*b* value	Probability of declaring a toxic effluent non-toxic False negative (α) error[a]
Chronic Freshwater and East Coast Methods		
Ceriodaphnia dubia (water flea) survival and reproduction	0.75	0.20
Pimephales promelas (fathead minnow) survival and growth	0.75	0.25
Selenastrum capricornutum (green algae) growth	0.75	0.25
Americamysis bahia (mysid shrimp) survival and growth	0.75	0.15
Arbacia punctulata (Echinoderm) fertilization	0.75	0.05
Cyprinodon variegatus (Sheepshead minnow) and *Menidia beryllina* (inland silverside) survival and growth	0.75	0.25
Chronic West Coast Marine Methods		
Dendraster excentricus and *Strongylocentrotus purpuratus* (Echinoderm) fertilization	0.75	0.05
Atherinops affinis (topsmelt) survival and growth	0.75	0.25
Haliotis rufescens (red abalone), *Crassostrea gigas (oyster), Dendraster excentricus, Strongylocentrotus purpuratus* (Echinoderm) and *Mytilus sp* (mussel) larval development methods	0.75	0.05
Macrocystis pyrifera (giant kelp) germination and germ-tube length	0.75	0.05
Acute Methods		
Pimephales promelas (fathead minnow), *Cyprinodon variegatus* (Sheepshead minnow), *Atherinops affinis* (topsmelt), *Menidia beryllina* (inland silverside) acute survival[b]	0.80	0.10
Ceriodaphnia dubia, *Daphnia magna, Daphnia pulex*, *Americamysis bahia* acute survival[b]	0.80	0.10

Notes:

a. (1) declare a sample toxic at least 75 percent of the time (alpha $\leq$ 0.25) when there is unacceptable toxicity (20 percent effect for acute and 25 percent effect for chronic test methods) and (2) declare an effluent non-toxic no more than 5 percent of the time (beta $\leq$ 0.05) when the mean effect at the critical effluent concentration is 10 percent for both acute and chronic WET tests (including sublethal endpoints). For more discussion on the RMDs, see Section 2.1 of this document.

b. Based on four replicate test design

3.2 Calculating Statistics for Valid WET Data Using the TST Approach

Appendix A includes a step-by-step guide for using the TST approach to analyzing WET test data. The appendix also includes a statistical flowchart and several examples. Note that the WET test method should follow the test condition requirements as specified in EPA's approved WET methods (USEPA 1995, 2002a, 2002b, 2002c).

The TST approach is used to statistically compare organism responses from two concentrations (i.e., treatments) of the WET test, the IWC and the control. Percent data (quantal data), such as percent survival or percent germination from a WET test, is first transformed as required in the EPA WET test manuals. Other types of WET data (e.g., growth or reproduction data) are not transformed. Data are then analyzed using Welch's t-test, a well-known modification of the standard t-test (Zar 1996), which is appropriate for the TST approach (see Appendix A).

Appendix B lists the critical *t* values that apply to WET testing using the TST approach given the number of degrees of freedom and the α level that applies for a given WET test method from Table 3 of this document. If the calculated *t* value for the WET test is greater than the critical *t* value (see Table B-1), the null hypothesis is rejected, i.e., the test result is *Pass* and **the effluent is declared *non-toxic***. If the calculated *t* value is less than the critical *t* value in Appendix B, the null hypothesis is not rejected, i.e., the test result is *Fail* and **the effluent *is* declared toxic.** Appendix A contains examples that demonstrate the formulae used in the TST approach and are designed to illustrate how the outcome is influenced by within-test variability and the mean effect of the IWC using the TST approach. Four different case examples are presented, three of which have equal variances between control and IWC: (1) *Ceriodaphnia* reproduction data having relatively high within-test variability, (2) *Ceriodaphnia* reproduction data having relatively low within-test variability and the same effect as in Example 1, (3) growth data from two fathead minnow chronic WET tests, both with relatively high within-test variability but small mean effect at the IWC; one test was conducted with the minimum number of replicates required in the EPA WET test method (four replicates) and the other test was conducted a priori with six replicates per concentration; and (4) calculations using the TST approach for an acute fathead minnow WET test.

Case Example #1 in Appendix A: ***Demonstrates a benefit of the TST approach by addressing false negatives***. A WET test that has relatively high within-test variability for a given WET test method and has an effect at the IWC approaching the RMD threshold (25 percent in this case because it is a chronic WET test) *is declared toxic* using the TST approach. Using the traditional hypothesis testing approach as recommended in the TSD, such test data typically lead to a conclusion that the effluent is not toxic (i.e., a false negative).

Case Example #3 in Appendix A: ***Demonstrates the benefits of increased within-test replication using the TST approach***. Increasing the replication before conducting the test, which thereby improves the precision and power of the WET test, increases the chances of rejecting the null hypothesis and declaring a truly acceptable effluent as *non-toxic* using the TST approach. That increases the ability to *prove the negative*, i.e., that an effluent is declared not toxic.

The TST approach can also be used for ambient toxicity (i.e., receiving water) tests and stormwater toxicity testing programs because the TST approach compares two treatments (for application of the TST approach to ambient toxicity testing, see Appendix C).

4.0 IMPLEMENTING THE TST APPROACH IN WET NPDES PERMITS

The TST approach is an alternative approach for analyzing and interpreting valid WET data. Use of the TST approach does not result in any changes to EPA's WET test methods. WET limits are simpler to communicate and understand (for example permit language for acute and chronic WET monitoring using the TST statistical analysis approach, see Appendix D) than the TSD approach. EPA recommends that permitting authorities decide up front which approach (the 1991 TSD approach, the TST approach, or another scientifically defensible approach that is sufficient to meet the statutory and regulatory requirements) they will incorporate and consistently use in their state's NPDES implementation procedures, including their RP procedures. The permitting authority should use the selected WET statistical approach consistently in all of their state NPDES permits.

4.1 Reasonable Potential (RP) WET Analysis

NPDES permitting authorities conducting an RP analysis must follow Title 40 of the *Code of Federal Regulations* (CFR) section 122.44(d)(1) to determine whether a discharge will "cause, have the [RP] to cause, or contribute to" an excursion of a numeric criterion or a narrative WET criterion. Some states have state-specific WET RP approaches in their water quality control plan or other NPDES policy or guidance.

For RP calculations using the TST approach, EPA recommends that permitting authorities use all valid WET test data generated during the current permit term and any additional valid data that are submitted as part of the permit renewal application. The TST RP approach necessitates having at least a minimum of four valid WET tests to address effluent representativeness (see EPA's TSD, Chapter 3, p. 57, under Step 2 in the section *Steps in Whole Effluent Characterization Process*). EPA also recommends that states request that their permittees provide the actual test endpoint responses for the control (i.e., control mean) and IWC concentration (i.e., IWC mean) for each WET test conducted to make it easier for permit writers to find the necessary WET test results when determining WET RP. WET test data are then analyzed according to the TST approach using the IWC and control test concentrations for all the valid WET test data available. For data sets with fewer than four valid WET data points, RP should be assessed using EPA's TSD RP approach because it addresses small WET data sets by incorporating an RP multiplying factor (see Section 3.3.2 of the TSD, p. 54) to account for effluent variability in small WET data sets. If WET test data are available and the TST statistical approach indicates that the IWC is toxic in any WET test, RP has been demonstrated (40 CFR 122.44(d)(1)(i)). Similar to the TSD approach, the TST approach can establish the existence of RP for WET even when no tests have been declared toxic using the TST to address concerns regarding the "potential to cause or contribute to toxicity." Appendix E presents the approach used to determine RP using the TST approach.

Note that using the TST approach might be to the permittee's advantage. If the permittee decides to incorporate additional replicates for the control and the IWC within a WET test, beyond the minimum required in the WET test method, the test power is increased. More test replicates increases test power, which means a higher probability of declaring a sample as non-toxic using the TST approach *if the effluent is truly non-toxic*. A demonstration is provided in Appendix A (Case Example #3), which illustrates that as an intended consequence of the TST approach

methodology. Thus, using the TST approach, a permittee has a greater ability to *prove the negative* (i.e., their effluent does not have RP).

In those cases where the WET RP outcome is *yes*, a WET limit is expressed in the permit. In those situations where the RP outcome is *no*, WET monitoring requirements should still be incorporated in the permit. Also in the permit, a test result of *Fail* (i.e., sample declared toxic) during monitoring, would trigger additional steps in the permit. In either of those situations—either a WET limit or a WET monitoring requirement, if toxicity is demonstrated—states should specify an approach to address toxicity in the permit. Doing so often includes increased frequency of WET testing and additional permit requirements to perform a toxicity reduction evaluation.

4.2 NPDES WET Permit Limits

Using the TST approach, WET NPDES permit limits would be expressed as *no significant toxicity of the effluent at the IWC using the TST analysis approach*. A test result of *Pass* is when the calculated *t* value is greater than *the critical t value*. A test result of *Fail* is when the calculated *t* value is less than *the critical t value*.

Beyond assessing WET data for the NPDES Program, WET tests are used to assess toxicity of receiving water (watershed assessment for CWA section 303(d) determinations) and stormwater samples. Often as a first assessment of receiving or stormwater toxicity, researchers test a control and a single concentration (e.g., 100 percent receiving water or stormwater). In such cases, the TST approach can be used in the same way a t-test is used. Such analysis is used to determine whether organism response in a specified ambient concentration is significantly different than the control organism response (for further information, see Appendix C).

5.0 RECOMMENDATIONS FOR NPDES IMPLEMENTATION OF THE TST APPROACH

5.1 EPA Regions and NPDES States (Permitting Authorities)

Permitting authorities should consider adding the TST approach to their implementation procedures for analyzing valid WET data for their current NPDES WET Program. Permitting authorities should consider the practical programmatic shift from the traditional hypothesis testing approach to the TST approach by opening a dialogue with their regulated community. In addition, they might want to begin to identify what changes might be needed to assimilate the TST approach into any regulations, policy, guidance, and training within their respective NPDES WET Programs. EPA also recommends that permitting authorities decide up front which RP approach (the 1991 TSD approach, the TST approach, or another scientifically defensible approach that is sufficient to meet the statutory and regulatory requirements) the permitting authority will incorporate and consistently use in their state's NPDES implementation procedures. The permitting authority should then use the WET statistical approach (either the TSD approaches or the TST data analysis approach) selected throughout all its state NPDES permits. Again, the traditional hypothesis testing approach recommended in EPA's TSD is still considered valid as applied; however, that approach can now be advanced through the TST approach by providing new incentives to permittees to generate valid, high quality WET data.

The RMDs incorporated into the TST approach were selected on the basis of considerable research and analysis involving several of the EPA WET test methods. Lower *b* values (i.e., for chronic test methods using a 0.70 instead of 0.75 *b* is unacceptable) are not recommended because it would mean that a lower fraction of test control response (i.e., greater effect at the IWC) is considered acceptable. EPA chose the acute and chronic *b* values to minimize effects on aquatic ecosystems. Likewise, the alpha values identified by EPA using the TST approach were determined on the basis of the predetermined *b* values and therefore should *not* be altered.

The permitting authority should consider carefully how the TST approach will be implemented in NPDES permits. Example permit language is shown in Appendix D. In consideration of maintaining NPDES WET Program implementation consistency, the TST approach should be used in place of, *and not in addition to*, the traditional hypothesis testing (NOEC) approach for WET analysis.

5.2 NPDES Permittees

One of the intended benefits of the TST approach is that increasing the precision and power of the WET test increases the chances of declaring a truly *acceptable effluent as non-toxic*. The permittee has greater control over the interpretation of WET test results using the TST approach because the RMDs are transparent, and the level of WET data quality needed to obtain unequivocal results can be determined beforehand. For example, conducting tests with more test replicates improves the power of the WET test, which can then support and provide a defensible basis for a permittee's demonstration that its effluent is *acceptable (i.e., in compliance with the permit*) if the mean effect is truly within the RMDs as defined in the TST approach. Using the TST approach, there is a *lower* rate of WET tests declared toxic for tests that are truly acceptable because of the increased power of the WET test when the permittee increases its number of

replicates in a WET test or achieves better replication within a test through improved test method performance. Thus, the TST approach increases the ability of the permittee to *prove the negative*, that the effluent is *non-toxic* if it is truly *acceptable*. Where a permittee has concerns about WET data quality, EPA recommends increasing the number of replicates in tests, even if the permitting authority has not yet adopted the TST approach.

6.0 SUMMARY OF THE TST APPROACH

EPA's TSD approaches are valid and can still be used by EPA Regions and their NPDES states. The TST approach is another statistical option for analyzing valid WET test data. The TST approach can be applied to acute (survival) and chronic (sublethal) endpoints and is appropriate to use for both freshwater and marine EPA WET test methods. The TST approach requires no more time or expertise than is presently expended when using the TSD hypothesis testing statistical approach and can be used with a well-recognized statistical test. Below is a brief outline of both the TST and TSD hypothesis testing approaches relevant to the information in this document and a short list of the benefits derived when using the TST approach.

TST Approach

- Considered additional guidance only—TST is a statistical approach for analyzing WET test data as an alternative option to the traditional hypothesis testing approach provided in EPA's TSD
- Expresses NPDES WET permit limit "as no significant toxicity of the effluent at the in-stream waste concentration" using the TST analysis approach
- Provides a positive incentive to NPDES permittees to generate valid, high quality WET data to the permitting authority by improving test performance or increasing the number of replicates within a WET test (which increases statistical power of WET test)
- Addresses both false negative (declared non-toxic when actually toxic) and false positive (declared toxic when actually non-toxic) error rates in a WET test

Traditional Hypothesis Test (EPA TSD)

- Existing approaches remain valid and can still be used by NPDES permitting authorities
- In existing guidance, WET permit limits are expressed as *no observed effect concentration (NOEC)* at the IWC
- Provides relatively less incentive to permittees to generate high quality valid, WET data or to increase the number of replicates within a WET test to increase statistical power of a WET test
- False negative error rate in a WET test is not addressed

Benefits When Using the TST Approach in WET Data Analysis

- ***The TST approach*** is similar to statistical concepts used in other EPA programs and at other federal agencies
- ***Transparent RMDs.*** RMDs are transparent because they are incorporated into the WET data analysis process, e.g., what effect level is considered toxic and what effect level is considered acceptable.
- ***WET test method-specific alpha and beta error rates.*** Both error rates are directly incorporated into the TST statistical approach, thereby increasing confidence in WET test interpretation.
- ***High quality WET test data incentive.*** Provides a positive incentive for the permittee to generate valid, high quality WET data; better test performance (lower within-test

variability) helps ensure appropriate WET decisions using the TST approach (e.g., a truly acceptable effluent will be declared non-toxic).

- ***Streamlined, simpler statistical analysis.*** Flowchart for analyzing valid WET data under the TST approach is much simpler because fewer statistical tests are needed.
- ***RP analysis is simpler.*** Because the calculation of the individual test result, using the TST statistical approach, incorporates both error rates in the analysis, the RP determinations can rely on a direct calculation of the percent effect at the IWC. Thus, the RP procedures are much simpler to use than the RP statistical procedures recommended in the TSD.

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APPENDIX A

STEP-BY-STEP PROCEDURES FOR ANALYZING VALID WHOLE EFFLUENT TOXICITY DATA USING THE TEST OF SIGNIFICANT TOXICITY APPROACH

APPENDIX A: STEP-BY-STEP PROCEDURES FOR ANALYZING VALID WET DATA USING THE TST APPROACH

The following is a step-by-step guide for using the TST approach to analyze valid WET data for the NPDES Program. This guide is applicable for a two-concentration valid WET data analysis of an in-stream waste concentration (IWC) or a receiving water concentration (RWC) compared to a control concentration. For further information regarding conducting WET tests and proper quality assurance/quality control needed, see the EPA WET test method manuals. Refer to the flowchart shown in Figure A-1 in this appendix as you proceed through this guide.

Step 1: Conduct WET test following procedures in the appropriate EPA WET test method manual. That includes following all test requirements specified in the method (USEPA 1995 for chronic west coast marine methods, USEPA 2002a for chronic freshwater test methods, USEPA 2002b for chronic east coast marine test methods, and USEPA 2002c for acute freshwater and marine WET test methods).

Step 2: For each test endpoint specified in the WET test method manual (e.g., survival and reproduction for the *Ceriodaphnia* chronic WET test method), follow Steps 3–7 below. Note that the guide refers to an effluent concentration tested, which is assumed to be the IWC as specified in the permit or a receiving water concentration for ambient testing. For example, if no mixing zone is allocated, the IWC is 100 percent effluent.

Note: If there is no variance (i.e., zero variance) in the endpoint in both concentrations being compared (i.e., all replicates in each concentration have the same exact response), then skip the remaining steps in the flowchart and do the following. Compute the percent difference between the control and the other concentration (e.g., IWC) and compare the percent difference against the RMD values of 25% for chronic and 20% for acute endpoints. Percent mean effect is calculated as:

$$\%\ \text{Effect at IWC} = \frac{\text{Mean Control Response} - \text{Mean Response at IWC}}{\text{Mean Control Response}} \times 100$$

If the percent mean response is $\geq$ the RMD, the sample is declared toxic and the test is "*Fail*". If the percent mean response is < the RMD, the sample is declared non-toxic and the test is "*Pass*".

Step 3: For data consisting of proportions from a binomial (response/no response; live/dead) response variable, the variance within the ith treatment is proportional to $P_i\ (1 - P_i)$, where P_i is the expected proportion for the treatment. That clearly violates the homogeneity of variance assumption required by parametric procedures such as the TST procedure because the existence of a treatment effect implies different values of P_i for different treatments, i. Also, when the observed proportions are based on small samples, or when P_i is close to zero or one, the normality assumption might be invalid. The arcsine square root (arcsine $\sqrt{P}$) transformation is used for such data to stabilize the variance and satisfy the normality requirement. The square root of percent data (e.g., percent survival, percent fertilization), expressed as a decimal fraction (where 1.00 = 100 percent) for each treatment, is first calculated. The square root value is then

arcsine transformed before analysis in Step 4. Note: Excel and most statistical software packages can calculate arcsine values.

Step 4: Conduct Welch's t-test (Zar 1996) using Equation 1:

Equation 1

$$t = \frac{\overline{Y_t} - b \times \overline{Y_c}}{\sqrt{\frac{S_t^{\,2}}{n_t} + \frac{b^2 S_c^{\,2}}{n_c}}}$$

where

$\overline{Y_c}$ = Mean for the control

$\overline{Y_t}$ = Mean for the IWC

s_c^2 = Estimate of the variance for the control

s_t^2 = Estimate of the variance for the IWC

n_c = Number of replicates for the control

n_t = Number of replicates for the IWC

b = 0.75 for chronic test methods; 0.80 for acute test methods

Note on the use of Welch's t-test: Welch's t-test is appropriate to use when there are an unequal number of replicates between control and the IWC. When sample sizes of the control and treatment are the same (i.e., $n_t = n_c$), Welch's t-test is equivalent to the usual Student's t-test (Zar 1996).

Step 5: Adjust the degrees of freedom (df) using Equation 2:

Equation 2

$$\upsilon = \frac{\left(\frac{S_t^{\,2}}{n_t} + \frac{b^2 S_c^{\,2}}{n_c}\right)^2}{\frac{\left(\frac{S_t^{\,2}}{n_t}\right)^2}{n_t - 1} + \frac{\left(\frac{b^2 S_c^{\,2}}{n_c}\right)^2}{n_c - 1}}$$

For tests using Welch's t-test, df is the value obtained for *v* in Equation 2 above. Because *v is* most likely a non-integer, round *v* to the next smallest integer, and that number is the df.

Step 6: Using the calculated *t* value from Step 4, compare that *t* value with the critical *t* value table in Appendix B using the test method-specific alpha values shown in Table A-1. To obtain the correct critical *t* value, look across the table for the alpha value that corresponds to the WET test method (for the alpha value, see Appendix A, Table A-1) and then look down the table for the appropriate df.

Step 7: If the calculated *t* value is less than the critical *t* value, the IWC is declared toxic and the test result is *Fail*. If the calculated *t* value is greater than the critical *t* value, the IWC is not declared toxic and the test result is *Pass*.

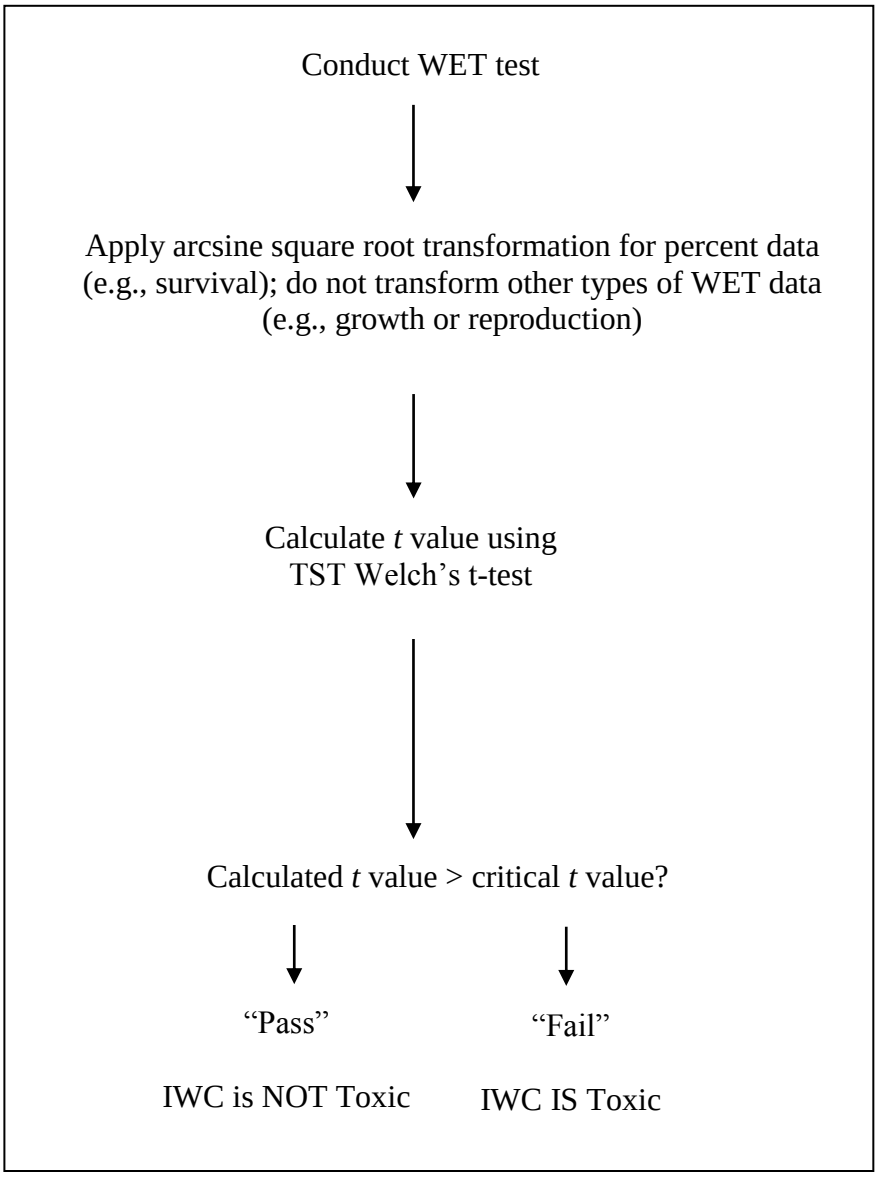

Figure A-1. Statistical flowchart for analyzing valid WET data using the TST approach for control and the IWC, receiving water, or stormwater.

Table A-1. Summary of alpha (α) levels or false negative rates recommended for different WET test methods using the TST approach

EPA WET test method	*b* value	Probability of declaring a toxic effluent non-toxic False negative (α) error[a]
Chronic Freshwater and East Coast Methods		
Ceriodaphnia dubia (water flea) survival and reproduction	0.75	0.20
Pimephales promelas (fathead minnow) survival and growth	0.75	0.25
Selenastrum capricornutum (green algae) growth	0.75	0.25
Americamysis bahia (mysid shrimp) survival and growth	0.75	0.15
Arbacia punctulata (Echinoderm) fertilization	0.75	0.05
Cyprinodon variegatus (Sheepshead minnow) and *Menidia beryllina* (inland silverside) survival and growth	0.75	0.25
Chronic West Coast Marine Methods		
Dendraster excentricus and *Strongylocentrotus purpuratus* (Echinoderm) fertilization	0.75	0.05
Atherinops affinis (topsmelt) survival and growth	0.75	0.25
Haliotis rufescens (red abalone), *Crassostrea gigas (oyster), Dendraster excentricus, Strongylocentrotus purpuratus* (Echinoderm) and *Mytilus sp* (mussel) larval development methods	0.75	0.05
Macrocystis pyrifera (giant kelp) germination and germ-tube length	0.75	0.05
Acute Methods		
Pimephales promelas (fathead minnow), *Cyprinodon variegatus* (Sheepshead minnow), *Atherinops affinis* (topsmelt), *Menidia beryllina* (inland silverside) acute survival[b]	0.80	0.10
Ceriodaphnia dubia, *Daphnia magna, Daphnia pulex*, *Americamysis bahia* acute survival[b]	0.80	0.10

Notes:

a. (1) declare a sample toxic at least 75 percent of the time (alpha ≤ 0.25) when there is unacceptable toxicity (20 percent effect for acute and 25 percent effect for chronic test methods) and (2) declare an effluent non-toxic no more than 5 percent of the time (beta ≤ 0.05) when the mean effect at the critical effluent concentration is 10 percent for both acute and chronic WET tests (including sublethal endpoints). For more discussion on the RMDs, see Section 2.1 of this document.

b. Based on four replicate test design

Case Example 1: Chronic *Ceriodaphnia* Reproduction Test with High Within-Test Variability

Step 1: Conduct WET test

Replicate/statistic	Control	Treatment
1	27	32
2	38	28
3	27	25
4	34	28
5	37	20
6	35	15
7	30	27
8	31	31
9	36	31
10	39	30
Mean	33.4	26.7
Std. deviation	4.402	5.417
N (# of replicates)	**10**	**10**

Step 2: Follow Steps 3–7 for each endpoint required in the test method

The following example is for chronic *Ceriodaphnia dubia* reproduction endpoint only.

Step 3: Transform data using an arcsine square root transformation, if necessary

Not necessary because reproduction is not percent data.

Step 4: Conduct Welch's t-test

$$t = \frac{\overline{Y}_t - b * \overline{Y}_c}{\sqrt{\frac{S_t^{\,2}}{n_t} + \frac{b^2 S_c^{\,2}}{n_c}}} = \frac{26.7 - (0.75 \times 33.4)}{\sqrt{\frac{29.34}{10} + \frac{(0.75)^2\,(19.38)}{10}}} = 0.82$$

Step 5: Adjust the df

$$v = \frac{\left(\frac{S_t^{\,2}}{n_t} + \frac{b^2 S_c^{\,2}}{n_c}\right)^2}{\frac{\left(\frac{S_t^{\,2}}{n_t}\right)^2}{n_t - 1} + \frac{\left(\frac{b^2 S_c^{\,2}}{n_c}\right)^2}{n_c - 1}} = \frac{\left(\frac{29.34}{10} + \frac{(0.75)^2 (19.38)}{10}\right)^2}{\frac{\left(\frac{29.34}{10}\right)^2}{10 - 1} + \frac{\left(\frac{(0.75)^2\,(19.38)}{10}\right)^2}{10 - 1}} = 15$$

Step 6: Calculated *t* value > critical *t* value? 15 df and test method alpha = 0.20 (Table A-1)

Critical *t* value = 0.87

0.82 < 0.87

Step 7: Declare effluent toxic or not

Calculated *t* < critical *t* value. Therefore, ***effluent is declared toxic; test result is FAIL***.

Case Example 2: Chronic *Ceriodaphnia* Reproduction Test with Low Within-Test Variability

Step 1: Conduct WET test

Replicate/statistic	Control	Treatment
1	29	31
2	38	28
3	31	25
4	34	28
5	36	22
6	35	21
7	30	27
8	31	26
9	36	29
10	34	30
Mean	33.4	26.7
Std. deviation	2.989	3.268
N (# of replicates)	10	10

Step 2: Follow Steps 3–7 for each endpoint required in the test method

The following example is for chronic *Ceriodaphnia dubia* reproduction endpoint only.

Step 3: Transform data using an arcsine square root transformation, if necessary

Not necessary because reproduction is not percent data.

Step 4: Conduct Welch's t-test

$$t = \frac{\overline{Y}_t - b \times \overline{Y}_c}{\sqrt{\frac{S_t^{\,2}}{n_t} + \frac{b^2 S_c^{\,2}}{n_c}}} = \frac{26.7 - (0.75 \times 33.4)}{\sqrt{\frac{10.68}{10} + \frac{(0.75)^2\,(8.93)}{10}}} = 1.32$$

Step 5: Adjust the df

$$v = \frac{\left(\frac{S_t^{\,2}}{n_t} + \frac{b^2 S_c^{\,2}}{n_c}\right)^2}{\frac{\left(\frac{S_t^{\,2}}{n_t}\right)^2}{n_t - 1} + \frac{\left(\frac{b^2 S_c^{\,2}}{n_c}\right)^2}{n_c - 1}} = \frac{\left(\frac{10.68}{10} + \frac{(0.75)^2 (8.93)}{10}\right)^2}{\frac{\left(\frac{10.68}{10}\right)^2}{10 - 1} + \frac{\left(\frac{(0.75)^2\,(8.93)}{10}\right)^2}{10 - 1}} = 16$$

Step 6: Calculated *t* value > critical *t* value? 16 df and test method alpha = 0.20 (Table A-1)

Critical *t* value = 0.86

1.32 > 0.86

Step 7: Declare effluent toxic or not

Calculated *t* > critical *t* value. Therefore, ***effluent is declared Non-Toxic; test result is PASS***.

Case Example 3: Benefit of Increased Replication in Chronic Fish Growth Test with Low Mean Effect and High Within-Test Variability

Step 1: Conduct WET test

Replicate/statistic	Control	Treatment
1	0.366	0.303
2	0.399	0.379
3	0.354	0.311
4	0.422	0.236
Mean	0.385	0.307
Std. deviation	0.031	0.058
N (# of replicates)	**4**	**4**

Step 2: Follow Steps 3–7 for each endpoint required in the test method

Step 3: Transform data using an arcsine square root transformation, if necessary

Not necessary because growth is not percent data.

Step 4: Conduct Welch's t-test

$$t = \frac{\overline{Y}_t - b \times \overline{Y}_c}{\sqrt{\frac{S_t^2}{n_t} + \frac{b^2 S_c^2}{n_c}}}$$

$$= \frac{0.307 - (0.75 \times 0.385)}{\sqrt{\left(\frac{0.00342}{4} + \frac{(0.75)^2\,(0.00096)}{4}\right)}} = 0.58$$

Step 5: Adjust the df

$$v = \frac{\left(\frac{S_t^2}{n_t} + \frac{b^2 S_c^2}{n_c}\right)^2}{\frac{\left(\frac{S_t^2}{n_t}\right)^2}{n_t - 1} + \frac{\left(\frac{b^2 S_c^2}{n_c}\right)^2}{n_c - 1}}$$

$$= \frac{\left(\frac{0.00342}{4} + \frac{(0.75)^2\,(0.00096)}{4}\right)^2}{\frac{\left(\frac{0.00342}{4}\right)^2}{4-1} + \frac{\left(\frac{(0.75)^2\,(0.00096)}{4}\right)^2}{4-1}} = 4$$

Step 6: Calculated *t* value > critical *t* value? 4 df, alpha = 0.25 (Table A-1); Critical *t* value = 0.74

0.58 < 0.74

Step 7: *Effluent is declared toxic, test result is FAIL.*

Step 1: Conduct WET test

Replicate/statistic	Control	Treatment
1	0.366	0.303
2	0.399	0.379
3	0.354	0.311
4	0.422	0.236
5	0.343	0.364
6	0.407	0.247
Mean	0.382	0.307
Std. deviation	0.032	0.058
N (# of replicates)	**6**	**6**

Step 2: Follow Steps 3–7 for each endpoint required in the test method

Step 3: Transform data using an arcsine square root transformation, if necessary

Not necessary because growth is not percent data.

Step 4: Conduct Welch's t-test

$$t = \frac{\overline{Y}_t - b \times \overline{Y}_c}{\sqrt{\frac{S_t^2}{n_t} + \frac{b^2 S_c^2}{n_c}}}$$

$$= \frac{0.307 - (0.75 \times 0.382)}{\sqrt{\frac{0.00342}{6} + \frac{(0.75)^2 (0.00101)}{6}}} = 0.79$$

Step 5: Adjust the df

$$v = \frac{\left(\frac{S_t^2}{n_t} + \frac{b^2 S_c^2}{n_c}\right)^2}{\frac{\left(\frac{S_t^2}{n_t}\right)^2}{n_t - 1} + \frac{\left(\frac{b^2 S_c^2}{n_c}\right)^2}{n_c - 1}}$$

$$= \frac{\left(\frac{0.00342}{6} + \frac{(0.75)^2\,(0.00101)}{6}\right)^2}{\frac{\left(\frac{0.00342}{6}\right)^2}{6-1} + \frac{\left(\frac{(0.75)^2\,(0.00101)}{6}\right)^2}{6-1}} = 7$$

Step 6: Calculated *t* value > critical *t* value? 7 df, alpha = 0.25 (Table A-1); Critical *t* value = 0.71

0.79 > 0.71

Step 7: *Effluent is declared Non-Toxic; test result is PASS.*

Case Example 4: Fish Acute Toxicity Test Example

Step 1: Conduct WET test

Replicate/statistic	Control	Treatment
1	10	10
2	10	8
3	10	9
4	10	8
Mean	10	8.75
Variance	0.000	0.917
N (# of replicates)	**4**	**4**

Step 2: Follow Steps 3–7 for each endpoint required in the test method

The following example is for acute *Pimephales promelas* survival endpoint only.

Step 3: Transform data using an arcsine square root transformation

Replicate/statistic	Control	Treatment
1	1.412	1.412
2	1.412	1.107
3	1.412	1.249
4	1.571	1.107
Mean	1.412	1.218
Variance	0.000	0.021
N (# of replicates)	**4**	**4**

Step 4: Conduct Welch's t-test

$$t = \frac{\overline{Y}_t - b \times \overline{Y}_c}{\sqrt{\frac{S_t^{\,2}}{n_t} + \frac{b^2 S_c^{\,2}}{n_c}}} = \frac{1.218 - (0.80 \times 1.412)}{\sqrt{\frac{0.021}{4} + \frac{(0.80)^2\ (0.000)}{4}}} = 1.2297$$

Step 5: Adjust the df

$$v = \frac{\left(\frac{S_t^{\,2}}{n_t} + \frac{b^2 S_c^{\,2}}{n_c}\right)^2}{\frac{\left(\frac{S_t^{\,2}}{n_t}\right)^2}{n_t - 1} + \frac{\left(\frac{b^2 S_c^{\,2}}{n_c}\right)^2}{n_c - 1}} = \frac{\left(\frac{0.021}{4} + \frac{(0.80)^2\ (0.000)}{4}\right)^2}{\frac{\left(\frac{0.021}{4}\right)^2}{4-1} + \frac{\left(\frac{(0.80)^2\ (0.000)}{4}\right)^2}{4-1}} = 3$$

Step 6: Calculated *t* value > critical *t* value? 3 df, alpha = 0.10 (Table A-1)

Critical *t* value = 1.64

1.229 < 1.64

Step 7: Declare effluent toxic or not

Therefore, ***effluent is declared toxic; test result is FAIL***.

Literature Cited

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APPENDIX B

CRITICAL *t* VALUES FOR THE TEST OF SIGNIFICANT TOXICITY APPROACH

Table B-1. Critical values of the *t* distribution. One tail probability is assumed.

Degrees of freedom			Alpha		
	0.25	**0.20**	**0.15**	**0.10**	**0.05**
1	1	1.3764	1.9626	3.0777	6.3138
2	0.8165	1.0607	1.3862	1.8856	2.92
3	0.7649	0.9785	1.2498	1.6377	2.3534
4	0.7407	0.941	1.1896	1.5332	2.1318
5	0.7267	0.9195	1.1558	1.4759	2.015
6	0.7176	0.9057	1.1342	1.4398	1.9432
7	0.7111	0.896	1.1192	1.4149	1.8946
8	0.7064	0.8889	1.1081	1.3968	1.8595
9	0.7027	0.8834	1.0997	1.383	1.8331
10	0.6998	0.8791	1.0931	1.3722	1.8125
11	0.6974	0.8755	1.0877	1.3634	1.7959
12	0.6955	0.8726	1.0832	1.3562	1.7823
13	0.6938	0.8702	1.0795	1.3502	1.7709
14	0.6924	0.8681	1.0763	1.345	1.7613
15	0.6912	0.8662	1.0735	1.3406	1.7531
16	0.6901	0.8647	1.0711	1.3368	1.7459
17	0.6892	0.8633	1.069	1.3334	1.7396
18	0.6884	0.862	1.0672	1.3304	1.7341
19	0.6876	0.861	1.0655	1.3277	1.7291
20	0.687	0.86	1.064	1.3253	1.7247
21	0.6864	0.8591	1.0627	1.3232	1.7207
22	0.6858	0.8583	1.0614	1.3212	1.7171
23	0.6853	0.8575	1.0603	1.3195	1.7139
24	0.6849	0.8569	1.0593	1.3178	1.7109
25	0.6844	0.8562	1.0584	1.3163	1.7081
26	0.684	0.8557	1.0575	1.315	1.7056
27	0.6837	0.8551	1.0567	1.3137	1.7033
28	0.6834	0.8546	1.056	1.3125	1.7011
29	0.683	0.8542	1.0553	1.3114	1.6991
30	0.6828	0.8538	1.0547	1.3104	1.6973
inf	0.6745	0.8416	1.0364	1.2816	1.6449

APPENDIX C

APPLICATION OF THE TEST OF SIGNIFICANT TOXICITY APPROACH TO AMBIENT TOXICITY PROGRAMS

APPENDIX C: APPLICATION OF THE TST APPROACH TO AMBIENT TOXICITY PROGRAMS

In ambient and stormwater toxicity testing, a laboratory control and a single concentration (i.e., 100 percent ambient water or stormwater) are often tested. In these two-concentration WET tests, the objective is to determine if a given sample or site water is toxic, as indicated by a significantly different organism response compared to the control. In the WET testing design, the determination of Pass or Fail (i.e., non-toxic or toxic) is ascertained using a traditional t-test (USEPA 2002c). EPA test methods recommend (USEPA 1995, 2002a, 2002b, 2002c) that the statistical significance (i.e., Pass/Fail) of a two-sample test design for ambient and stormwater toxicity testing be determined only using either a modified t-test (if homogeneity of variance is not achieved) or a traditional t-test (if homogeneity of variance is achieved).

To demonstrate the value of the TST approach in ambient toxicity programs, ambient toxicity test data from California's Surface Water Ambient Monitoring Program (SWAMP) was used for 409 chronic tests for *Ceriodaphnia dubia* and 256 chronic tests for *Pimephales promelas* using EPA's 2002 WET test methods (USEPA 2002a). Valid WET data for each EPA WET test method were subjected to the same statistical analyses as described in Section 2 of this document.

Chronic *Ceriodaphnia dubia* Ambient Toxicity Tests

Table C-1 summarizes results of the 409 *Ceriodaphnia dubia* ambient toxicity tests analyzed and an $\alpha = 0.20$ for this test method. Although the majority of the tests examined resulted in the same decision using either the TST or the traditional t-test approach, approximately 6 percent of the tests (24 tests) would have been declared non-toxic using the traditional t-test approach with mean effect levels $\geq$ 25 percent. In addition, 2 percent of the tests (7 tests) would have been declared toxic using the traditional t-test approach at mean effect levels < 15 percent and as low as 7 percent.

Table C-1. Comparison of results of chronic *Ceriodaphnia* ambient toxicity tests using the TST approach and the traditional t-test analysis. $\alpha = 0.20$ and *b* value = 0.75 for the TST approach. $\alpha = 0.05$ for the traditional hypothesis testing approach

Both approaches declare toxic	Only TST declares toxic	Only traditional approach declares toxic	Both approaches declare non-toxic
19.8%	5.9%	1.7%	72.6%

Figure C-1 shows ranges of CV values observed in *Ceriodaphnia dubia* ambient toxicity tests for those samples declared toxic using either the TST approach or the traditional t-test, but not both approaches. As expected, within-test variability was relatively high (higher CVs) for those tests found non-toxic using a t-test but toxic using the TST approach. The results demonstrate the lack of control of false negative rates using the traditional hypothesis testing approach when control variability is relatively high. Under those conditions, the traditional t-test did not have the power to detect toxicity when it was present. Figure C-1 also demonstrates that the TST approach recognizes a negligible effect as non-toxic when within-test variability is relatively low and the

mean percent effect is well below the risk management level of 25 percent. Under such conditions, the traditional t-test declared some samples toxic using this WET test method, even when the mean effect was as little as 7 percent. The TST approach, however, declared all such samples non-toxic using the recommended $\alpha = 0.20$. Thus, the TST approach reduces the number of tests declared as toxic when effects are actually well below the risk management decision.

Chronic *Ceriodaphnia* ambient WET tests that are identified as non-toxic (Pass) using the traditional hypothesis approach (NOEC) generally have high within-test variability (high control CVs) as compared to using the TST approach.

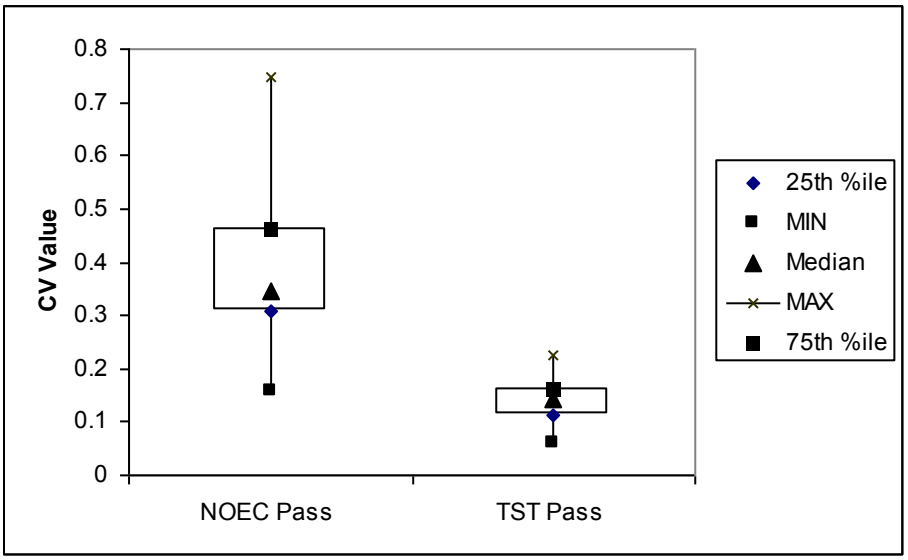

Figure C-1. Range of CV values observed in chronic *C. dubia* ambient toxicity tests for samples that were found to be non-toxic using the standard t-test but toxic using the TST approach (NOEC Pass) and for those samples declared toxic using t-test but not the TST approach (TST Pass). California's SWAMP WET test data.

Similar to the *Ceriodaphnia* ambient test data, within-test variability was higher in those chronic fathead minnow ambient tests found *non-toxic* using a t-test but toxic using the TST approach (Figure C-2). Similarly, those tests declared *non-toxic* by the TST approach but toxic using t-test had lower within-test variability and mean effect levels < 25 percent (Figure C-2). Thus, similar to the chronic *Ceriodaphnia* ambient tests, data from chronic fathead minnow ambient tests demonstrate that the TST approach can provide as much protection as the traditional t-test approach while also identifying those samples that are truly acceptable from a regulatory management decision.

Fish ambient WET tests that are identified as non-toxic using the traditional hypothesis approach (NOEC) generally have high within-test variability (high control CVs) as compared to using the TST approach.

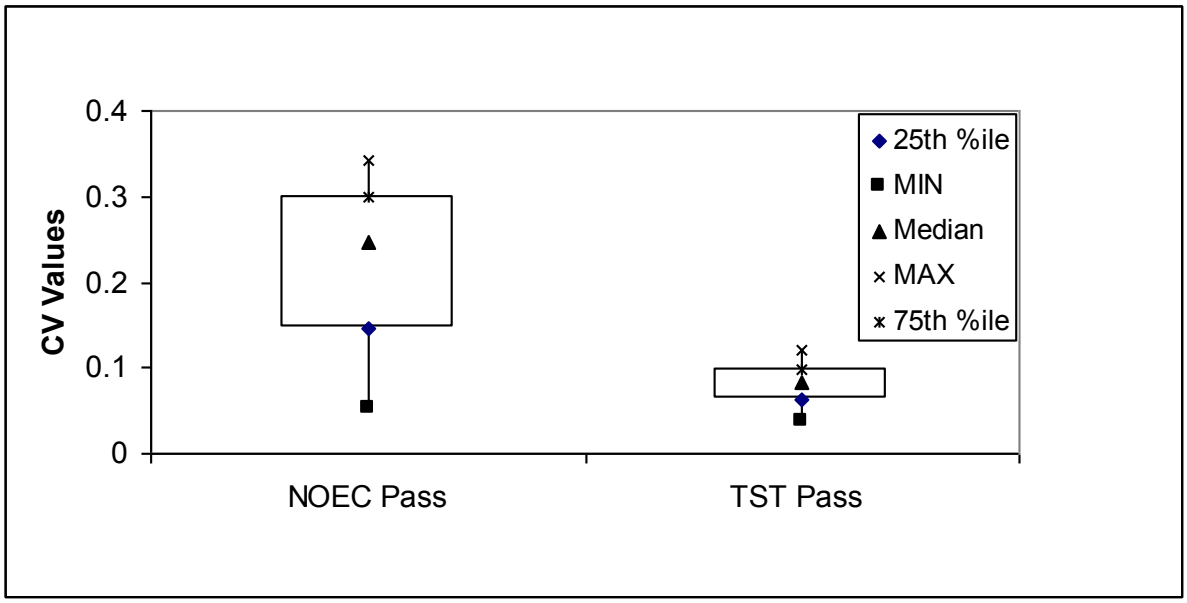

Figure C-2. Range of CV values observed in chronic *P. promelas* ambient toxicity tests for samples that were declared to be non-toxic using the standard t-test but toxic using the TST approach (NOEC Pass) and for those samples declared toxic using t-test but not the TST approach (TST Pass). California's SWAMP WET test data.

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APPENDIX D

EXAMPLE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMIT LANGUAGE USING THE TEST OF SIGNIFICANT TOXICITY APPROACH

APPENDIX D: EXAMPLE NPDES PERMIT LANGUAGE USING THE TST APPROACH

ACUTE WHOLE EFFLUENT TOXICITY (WET) NPDES PERMIT LANGUAGE

xx. <u>Acute Whole Effluent Toxicity (WET) Requirements</u>

1. Monitoring Frequency

The permittee must conduct ***monthly/quarterly/semiannual*** acute toxicity tests on 24-hour composite effluent samples. Once each calendar year, at a different time of year from the previous years, the permittee must split a 24-hour composite effluent sample and concurrently conduct two toxicity tests using a fish and an invertebrate species; the permittee must then continue to conduct routine ***monthly/quarterly/semiannual*** toxicity testing using the single, most sensitive species.

Acute toxicity test samples must be collected for each point of discharge at the designated NPDES sampling station for the effluent (i.e., downstream from the last treatment process and any in-plant return flows where a representative effluent sample can be obtained). During years ***1, 2, 3, 4, and 5*** of the permit, a split of each sample must be analyzed for all other monitored parameters at the minimum frequency of analysis specified by the effluent monitoring program.

2. Freshwater Species and WET Test Methods

Species and short-term WET test methods for estimating the acute toxicity of NPDES effluents are in the fifth edition of *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms* (EPA/821/R-02/012, 2002; Table IA, 40 CFR Part 136). The permittee must conduct 96-hour static renewal toxicity tests with the following vertebrate and invertebrate species, respectively:

- ***Vertebrate:*** The fathead minnow, *Pimephales promelas* (Acute Toxicity Test Method 2000.0)
- ***Invertebrate:*** The daphnid, *Ceriodaphnia dubia* (Acute Toxicity Test Method 2002.0)

3. Acute WET Permit Triggers

a. There are no acute toxicity effluent limits for this discharge. For this permit, the determination of Pass or Fail from a multiple-effluent concentration acute toxicity test at the IWC is determined using the Test of Significant Toxicity (TST) approach that is described in the *National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document* (EPA/833/R-10-003). The acute WET permit trigger is any one WET test where a test result is *Fail* (during the monthly reporting period) at the acute in-stream waste concentration (IWC). For this discharge, the IWC is **XXX** percent (e.g., either is 100 percent or an effluent at the mixing zone to be determined at the time of permit issuance) effluent. To calculate

either a Pass or Fail of a multiple-effluent concentration acute toxicity test at the IWC, follow the instructions in Appendix A in the *National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document*. A *Pass* result indicates no toxicity of the multiple-effluent concentration test at the IWC, and a *Fail* result indicates toxicity of the multiple-effluent concentration test at the IWC. The permittee must report either a *Pass* or a *Fail* on the Discharge Monitoring Report (DMR) form. If a result is reported as Fail, the permittee must follow Section 6 (Accelerated Toxicity Testing and TRE/TIE Process) of this permit.

- OR -

3. Acute WET Permit Limit

b. There is an acute toxicity effluent limit for this discharge. For this permit, the determination of Pass or Fail from a multiple-effluent concentration acute toxicity test at the IWC is determined using the Test of Significant Toxicity (TST) approach which is described in the *National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document* (EPA/833-R-10-003). The acute WET permit trigger is any one WET test where a test result is *Fail* (during the monthly reporting period) at the chronic in-stream waste concentration (IWC). For this discharge, the IWC is **XXX** percent (e.g., either is 100 percent or an effluent at the mixing zone to be determined at time of permit issuance) effluent. To calculate either a Pass or Fail of the multiple-effluent concentration acute toxicity test at the IWC, follow the instructions in Appendix A in the *National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document*. A Pass result indicates no toxicity of the multiple-effluent concentration at the IWC and a Fail result indicates toxicity of the multiple-effluent concentration test at the IWC. The permittee must report either a *Pass* or a *Fail* on the DMR form. If a result is reported as Fail, the permittee must follow Section 6 (Accelerated Toxicity Testing and TRE/TIE Process) of this permit.

4. Quality Assurance – EPA WET Test Methods

a. Quality assurance measures, instructions, and other recommendations and requirements are in the EPA 2002 WET test methods manual previously referenced.

b. This permit is subject to a determination of Pass or Fail from a multiple-effluent concentration acute toxicity test at the IWC (for statistical flowchart and procedures, see Appendix A, Figure A-1 of the *National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document*). The acute in-stream waste concentration (IWC) for this discharge is **XXX** percent effluent.

c. Effluent dilution water and control water should be prepared and used as specified in the EPA WET test methods manual *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms* (EPA/821/R-02/012, 2002).

d. If organisms are not cultured in-house, concurrent testing with a reference toxicant must be conducted. If organisms are cultured in-house, monthly reference toxicant testing is sufficient. Reference toxicant tests and effluent toxicity tests must be conducted using the same test conditions (e.g., same test duration).

e. If either the reference toxicant or effluent toxicity tests do not meet all test acceptability criteria in the EPA WET test methods manual, the permittee must resample and retest within 14 days.

f. If the discharged effluent is chlorinated, chlorine must not be removed from the effluent sample before toxicity testing without written approval by the permitting authority.

5. Initial Investigation TRE Work Plan

Within 90 days of the permit effective date, the permittee must prepare and submit to the permitting authority a copy of its Initial Investigation Toxicity Reduction Evaluation (TRE) Work Plan (1–2 pages) for review. That plan must include steps the permittee intends to follow if toxicity is measured above an acute WET permit limit or trigger and should include the following, at minimum:

a. A description of the investigation and evaluation techniques that would be used to identify potential causes and sources of toxicity, effluent variability, and treatment system efficiency.

b. A description of methods for maximizing in-house treatment system efficiency, good housekeeping practices, and a list of all chemicals used in operations at the facility.

c. If a Toxicity Identification Evaluation (TIE) is necessary, an indication of who would conduct the TIEs (i.e., an in-house expert or outside contractor).

6. Accelerated Toxicity Testing and TRE/TIE Process

a. If an acute WET permit limit or trigger is exceeded and the source of toxicity is known (e.g., a temporary plant upset), the permittee must conduct one additional toxicity test using the same species and EPA WET test method. This WET test must begin within 14 days of receipt of WET test results exceeding an acute WET permit limit or trigger. If the additional toxicity test does not exceed an acute WET permit limit or trigger, the permittee may return to the regular testing frequency.

b. If an acute WET permit limit or trigger is exceeded and the source of toxicity is not known, the permittee must conduct six additional toxicity tests using the same species and EPA WET test method, approximately every two weeks, over a 12-week period. This testing must begin within 14 days of receipt of WET test results exceeding an acute WET permit limit or trigger. If none of the additional toxicity tests exceed an acute WET permit limit or trigger, the permittee may return to the regular testing frequency.

c. If one of the additional toxicity tests (in paragraphs 6.a or 6.b) exceeds an acute WET permit limit or trigger, within 14 days of receipt of this WET test result, the permittee must initiate a TRE using, according to the type of treatment facility, EPA WET TRE manual, *Toxicity Reduction Evaluation Guidance for Municipal Wastewater Treatment Plants* (EPA/833/B-99/002, 1999) or EPA WET TRE manual, *Generalized Methodology for Conducting Industrial Toxicity Reduction Evaluations* (EPA/600/2-88/070, 1989). In conjunction, the permittee must develop and implement a Detailed TRE Work Plan that must consist of the following: further actions undertaken by the permittee to investigate, identify, and correct the causes of toxicity; actions the permittee will take to mitigate the effects of the discharge and prevent the recurrence of toxicity; and a schedule for such actions.

d. The permittee may initiate a TIE as part of a TRE to identify the causes of toxicity using the same species and EPA WET test method and, as guidance, EPA WET TIE/TRE method manuals: *Methods for Aquatic Toxicity Identification Evaluations: Phase I Toxicity Characterization Procedures* (EPA/600/6-91/003, 1991); *Methods for Aquatic Toxicity Identification Evaluations, Phase II Toxicity Identification Procedures for Samples Exhibiting Acute and Chronic Toxicity* (EPA/600/R-92/080, 1993); *Methods for Aquatic Toxicity Identification Evaluations, Phase III Toxicity Confirmation Procedures for Samples Exhibiting Acute and Chronic Toxicity* (EPA/600/R-92/081, 1993).

7. Reporting of Acute Toxicity Monitoring Results

a. The permittee must submit a full laboratory report for all toxicity testing as an attachment to the Discharge Monitoring Report (DMR) for the month in which the toxicity test was conducted; the laboratory report must contain the following: the toxicity test results, the dates of sample collection and initiation of each toxicity test; all results for effluent parameters monitored concurrently with the toxicity test(s); and progress reports on TRE/TIE investigations.

b. The permittee must provide the actual test endpoint responses for the control (i.e., control mean) and IWC concentration (i.e., IWC mean) for each WET test conducted to make it easier for permit writers to find the necessary WET test results when determining WET RP.

c. The permittee must notify the permitting authority in writing within 14 days of exceedance of an acute WET permit limit or trigger. Such notification must describe actions the permittee has taken or will take to investigate, identify, and correct the causes of toxicity; the status of actions required by this permit; and schedule for actions not yet completed; or reason(s) that no action has been taken.

8. Permit Reopener for Acute Toxicity

In accordance with 40 CFR Parts 122 and 124, this permit may be modified to include effluent limitations or permit conditions to address acute toxicity in the effluent or receiving waterbody, as a result of the discharge; or to implement new, revised, or newly interpreted water quality standards applicable to acute toxicity.

CHRONIC WET NPDES PERMIT LANGUAGE

xx. Chronic Whole Effluent Toxicity (WET) Requirements

1. Monitoring Frequency

The permittee must conduct ***monthly/quarterly/semiannual*** chronic toxicity tests on 24-hour composite effluent samples. Once each calendar year, at a different time of year from the previous years, the permittee must split a 24-hour composite effluent sample and concurrently conduct three toxicity tests using a fish, an invertebrate, and an alga species; the permittee must continue to conduct routine ***monthly/quarterly/semiannual*** toxicity testing using the single, most sensitive species.

Chronic toxicity test samples must be collected for each point of discharge at the designated NPDES sampling station for the effluent (i.e., downstream from the last treatment process and any in-plant return flows where a representative effluent sample can be obtained). During years ***1, 2, 3, 4, and 5*** of the permit, a split of each sample must be analyzed for all other monitored parameters at the minimum frequency of analysis specified by the effluent monitoring program.

2. Freshwater Species and EPA WET Test Methods

Species and short-term EPA WET test methods for estimating the chronic toxicity of NPDES effluents are in the fourth edition of *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms* (EPA/821/R-02/013, 2002; Table IA, 40 CFR Part 136). The permittee must conduct static renewal toxicity tests with the following:

- Fathead minnow, *Pimephales promelas* (Larval Survival and Growth Test Method 1000.0)
- Daphnid, *Ceriodaphnia dubia* (Survival and Reproduction Test Method 1002.0);
- Green alga, *Selenastrum capricornutum* (also named *Raphidocelis subcapitata*) (Growth Test Method 1003.0).

3. Chronic WET Permit Triggers

a. There are no chronic toxicity effluent limits for this discharge. The chronic WET permit trigger is any one WET test (either biological endpoint of survival or sublethal) where a test result is *Fail* (during the monthly reporting period) at the chronic in-stream waste concentration (IWC). For this discharge, the IWC is **XXX** percent (e.g., either is 100 percent or an effluent at the mixing zone to be determined at time of permit issuance) effluent. To calculate either a Pass or Fail of the multiple-effluent concentration chronic toxicity test at the IWC, follow the instructions in Appendix A in the *National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document* (EPA/833-R-10-003). A Pass result indicates no toxicity at the IWC, and a Fail result indicates toxicity at the IWC. The

permittee must report either a Pass or a Fail on the DMR form. If a result is reported as Fail, the permittee must follow Section 7 (Reporting of Chronic Toxicity Monitoring Results) of this permit.

- OR -

3. Chronic WET Permit Limits

b. There is a chronic toxicity effluent limit for this discharge. The chronic WET permit trigger is any one WET test (either biological endpoint of survival or sublethal) where a test result is *Fail* (during the monthly reporting period) at the chronic in-stream waste concentration (IWC). For this discharge, the IWC is **XXX** percent (e.g., either is 100 percent or an effluent at the mixing zone to be determined at time of permit issuance) effluent. To calculate either a Pass or Fail of the multiple-effluent concentration chronic toxicity test at the IWC, follow the instructions in Appendix A in the *National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document* (EPA/833-R-10-003). A Pass result indicates no toxicity at the IWC, and a Fail result indicates toxicity at the IWC. The permittee must report either a Pass or a Fail on the DMR form. If a result is reported as Fail, the permittee must follow Section 7 (Reporting of Chronic Toxicity Monitoring Results) of this permit.

4. Quality Assurance – EPA WET Test Methods

a. Quality assurance measures, instructions, and other recommendations and requirements are in the EPA WET test methods manual previously referenced in this permit.

b. This permit is subject to a determination of Pass or Fail from a multiple-effluent concentration chronic toxicity test at the IWC (for statistical flowchart and procedures, see *National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document*, Appendix A, Figure A-1). The chronic in-stream waste concentration (IWC) for this discharge is **XXX** percent (e.g., either is 100 percent or an effluent at the mixing zone to be determined) effluent.

c. Effluent dilution water and control water should be standard synthetic dilution water as described in the EPA WET test methods manual, *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms* (EPA/821/R-02/013, 2002). If the dilution water is different from test organism culture water, a second control using culture water must also be used.

d. If organisms are not cultured in-house, concurrent testing with a reference toxicant must be conducted. If organisms are cultured in-house, monthly reference toxicant testing is sufficient. Reference toxicant tests and effluent toxicity tests must be conducted using the same test conditions (e.g., same test duration).

e. If either the reference toxicant or effluent toxicity tests do not meet all test acceptability criteria in the EPA WET test methods manual, the permittee must resample and retest within 14 days.

f. Following Paragraph 10.2.6.2 of the freshwater EPA WET test methods manual, all chronic toxicity test results from the multi-concentration tests required by this permit must be reviewed and reported according to EPA guidance on the evaluation of concentration-response relationships in *Method Guidance and Recommendations for Whole Effluent Toxicity (WET) Testing (40 CFR Part 136)* (EPA/821/B-00-004, 2000).

g. If the discharged effluent is chlorinated, chlorine must not be removed from the effluent sample before toxicity testing without written approval by the permitting authority.

5. Initial Investigation TRE Work Plan

Within 90 days of the permit effective date, the permittee must prepare and submit to the permitting authority a copy of its Initial Investigation Toxicity Reduction Evaluation (TRE) Work Plan (1–2 pages) for review. That plan must contain steps the permittee intends to follow if toxicity is measured above a chronic WET permit limit or trigger and should include the following, at minimum:

a. A description of the investigation and evaluation techniques that would be used to identify potential causes and sources of toxicity, effluent variability, and treatment system efficiency.

b. A description of methods for maximizing in-house treatment system efficiency, good housekeeping practices, and a list of all chemicals used in operations at the facility.

c. If a Toxicity Identification Evaluation (TIE) is necessary, an indication of who would conduct the TIEs (i.e., an in-house expert or outside contractor).

6. Accelerated Toxicity Testing and TRE/TIE Process

a. If a chronic WET permit limit or trigger is exceeded and the source of toxicity is known (e.g., a temporary plant upset), the permittee must conduct one additional toxicity test using the same species and EPA WET test method. This WET test must begin within 14 days of receipt of WET test results exceeding a chronic WET permit limit or trigger. If the additional toxicity test does not exceed a chronic WET permit limit or trigger, the permittee may return to their regular testing frequency.

b. If a chronic WET permit limit or trigger is exceeded and the source of toxicity is not known, the permittee must conduct six additional toxicity tests using the same species and EPA WET test method, approximately every two weeks, over a 12 week period. This testing must begin within 14 days of receipt of WET test results exceeding a chronic WET permit limit or trigger. If none of the additional toxicity tests exceed a chronic WET permit limit or trigger, the permittee may return to their regular testing frequency.

c. If one of the additional toxicity tests (in paragraphs 6.a or 6.b) exceeds a chronic WET permit limit or trigger, within 14 days of receipt of this WET test result, the permittee must initiate a TRE using as guidance, according to the type of treatment facility, the EPA TRE manual, *Toxicity Reduction Evaluation Guidance for Municipal Wastewater Treatment Plants* (EPA/ 833/B-99/002, 1999) or EPA TRE manual, *Generalized Methodology for Conducting Industrial Toxicity Reduction Evaluations* (EPA/600/2-88/070, 1989). In conjunction, the permittee must develop and implement a Detailed TRE Work Plan that must contain the following: further actions undertaken by the permittee to investigate, identify, and correct the causes of toxicity; actions the permittee will take to mitigate the effects of the discharge and prevent the recurrence of toxicity; and a schedule for such actions.

d. The permittee may initiate a TIE as part of a TRE to identify the causes of toxicity using the same species and EPA WET test method and, as guidance, EPA WET TIE/TRE method manuals: *Toxicity Identification Evaluation: Characterization of Chronically Toxic Effluents, Phase I* (EPA/600/6-91/005F, 1992); *Methods for Aquatic Toxicity Identification Evaluations, Phase II Toxicity Identification Procedures for Samples Exhibiting Acute and Chronic Toxicity* (EPA/600/R-92/080, 1993); *Methods for Aquatic Toxicity Identification Evaluations, Phase III Toxicity Confirmation Procedures for Samples Exhibiting Acute and Chronic Toxicity* (EPA/600/R-92/081, 1993).

7. Reporting of Chronic Toxicity Monitoring Results

a. The permittee must submit a full laboratory report as an attachment to the DMR for all toxicity testing for the month in which the toxicity test was conducted; the laboratory report must contain the following: the toxicity test results, the dates of sample collection and initiation of each toxicity test; all results for effluent parameters monitored concurrently with the toxicity test(s); and progress reports on TIE/TRE investigations.

b. The permittee must provide the actual test endpoint responses for the control (i.e., control mean) and IWC concentration (i.e., IWC mean) for each WET test conducted to make it easier for permit writers to find the necessary WET test results when determining WET RP.

c. The permittee must notify the permitting authority in writing within 14 days of exceedance of a chronic WET permit limit or trigger. The notification must describe actions the permittee has taken or will take to investigate, identify, and correct the causes of toxicity; the status of actions required by this permit; and schedule for actions not yet completed; or reason(s) that no action has been taken.

8. Permit Reopener for Chronic Toxicity

In accordance with 40 CFR Parts 122 and 124, this permit may be modified to include effluent limitations or permit conditions to address chronic toxicity in the effluent or receiving waterbody, as a result of the discharge; or to implement new, revised, or newly interpreted water quality standards applicable to chronic toxicity.

APPENDIX E

WHOLE EFFLUENT TOXICITY REASONABLE POTENTIAL ANALYSIS USING THE TEST OF SIGNIFICANT TOXICITY APPROACH

APPENDIX E: WET RP ANALYSIS USING THE TST APPROACH

For reasonable potential (RP) calculations using the TST approach, EPA recommends that permitting authorities use all the valid WET test data generated during the current permit term and any additional valid data that are submitted as part of the permit renewal application. The permitting authority should be using at least a minimum of four valid WET tests to address effluent representativeness using the TST RP approach. WET test data are then analyzed according to the TST approach using the IWC and control test concentrations for all valid WET test data available. For the RP approach, data sets with fewer than four valid WET data points should be assessed using EPA's Technical Support Document (TSD) RP approach because it addresses small WET data sets by incorporating an RP multiplying factor (see Section 3.2.2 of the TSD, p. 54) to account for effluent variability in small WET data sets.

EPA also recommends that states request that their permittees provide the actual test endpoint responses for the control (i.e., mean of control) and IWC concentration (i.e., mean of IWC) for each WET test conducted to make it easier for permit writers to find the necessary data with which to calculate WET RP with this approach. EPA recommends that permitting authorities decide up front which approach (the 1991 TSD approach, the TST approach, or another scientifically defensible approach that is sufficient to meet the statutory and regulatory requirements) they will incorporate and consistently use in their state's NPDES implementation procedures, including for their RP procedures. Permitting authorities should consistently use the selected WET statistical approach in all the state NPDES permits.

All valid WET test data are then analyzed according to the TST approach using the IWC and control test concentrations. If WET test data are available and the TST statistical approach indicates that the IWC is toxic in any WET test ("effluent **cause(s)** toxicity"), RP has been demonstrated (40 CFR 122.44(d)(1)(i)). For example, if results of five WET tests are available using the TST approach and the results are Pass, Pass, Fail, Pass, Pass, because at least one test was a Fail (i.e., TST declared the effluent toxic in at least one test), RP has been demonstrated.

To address concerns regarding the "**potential** to cause or contribute to toxicity," a second assessment is applied to determine whether the effluent has RP even if all test results are *Pass* using the TST approach.

The current TST approach results in four outcomes with respect to RP at the IWC:

1. **Caused (effluent is toxic):** RP is demonstrated if any one test using the TST approach indicates a test result is *Fail* (i.e., using the statistical test (Appendix A) and *t* table (Appendix B), the test result is *Fail*; see Example A below in Table E-1);
2. **Potential to Cause:** Effluent has reasonable potential to cause (RP is demonstrated) if any test exhibits a mean effect at the IWC > 10 percent as compared to the mean control response, even if the test result is *Pass* using TST (see examples B-D, Table E-1); and
3. **No RP (effluent is non-toxic at the IWC):** Effluent does not cause or have reasonable potential to cause if the tests are each a *Pass* using the TST approach and the mean effect at the IWC is always $\leq$ 10 percent.

4. **Insufficient valid WET data (fewer than 4 tests or no data):** If fewer than four valid WET data are available, follow the TSD RP procedure for WET.

The second outcome is where the determination of RP is critical to demonstrate that the discharge has the reasonable *potential* to cause an excursion above the state toxicity water quality standards. In the TST approach, the regulatory management decision threshold for non-toxicity in WET tests under the NPDES WET Program is 10 percent mean effect at the IWC. At or below that mean effect level, the TST approach is designed to declare a WET test as non-toxic (i.e., *Pass*) most (at least 95 percent) of the time to help control for false positives. For purposes of RP assessment then, a 10 percent mean effect level at the IWC is used as a threshold, above which potential to cause is indicated, and the effluent has demonstrated RP. Any test with a mean effect at the IWC > 10 percent would demonstrate a potential for RP even if the TST test result is *Pass*. Equation E-1 below demonstrates how the effluent effect is calculated at the IWC.

$$\%\,\text{Effect at IWC} = \frac{\text{Mean Control Response} - \text{Mean Response at IWC}}{\text{Mean Control Response}} \times 100 \qquad \textbf{Equation E-1}$$

Table E-1. Examples illustrating the reasonable potential approach using TST and data from *Ceriodaphnia* chronic survival and reproduction WET tests

Example	Pass/Fail based on TST analysis	Mean control response	Mean response @ IWC	% effect at IWC	Reasonable potential?
A	Fail	26.3	17.0	35.4%	Yes
B	Pass	26.3	23.4	11.0%	Yes
C	Pass	28.6	22.0	23.1%	Yes
D	Pass	22.4	20.9	6.7%	No

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National Pollutant Discharge Elimination System Test of Significant Toxicity Technical Document

June 2010

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM TEST OF SIGNIFICANT TOXICITY TECHNICAL DOCUMENT

An Additional Whole Effluent Toxicity Statistical Approach for Analyzing Acute and Chronic Test Data

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NOTICE AND DISCLAIMER

This document provides the technical basis for the Test of Significant Toxicity (TST) approach under the National Pollutant Discharge Elimination System (NPDES) for permitting authorities (states and Regions) and persons interested in analyzing valid whole effluent toxicity (WET) test data using the traditional hypothesis testing approach as part of the NPDES Program under the Clean Water Act (CWA). This document describes what the U.S. Environmental Protection Agency (EPA) believes is another statistical option to analyze valid WET test data for NPDES WET reasonable potential and permit compliance determinations. The document does not, however, substitute for the CWA, an NPDES permit, or EPA or state regulations applicable to permits or WET testing; nor is this document a permit or a regulation itself. The TST approach does not result in changes to EPA's WET test methods promulgated at Title 40 of the *Code of Federal Regulations* Part 136. The document does not and cannot impose any legally binding requirements on EPA, states, NPDES permittees, or laboratories conducting or using WET testing for permittees (or for states in evaluating ambient water quality). EPA could revise this document without public notice to reflect changes in EPA policy and guidance. Finally, mention of any trade names, products, or services is not and should not be interpreted as conveying official EPA approval, endorsement, or recommendation.

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EXECUTIVE SUMMARY

The U.S. Environmental Protection Agency (EPA or the Agency) has developed a new statistical approach that assesses the whole effluent toxicity (WET) measurement of wastewater effects on specific test organisms' ability to survive, grow, and reproduce. This new approach is called the Test of Significant Toxicity (TST) and is a statistical method that uses hypothesis testing techniques based on research and peer-reviewed publications. The hypothesis test under the TST approach examines whether an effluent, at the critical concentration (e.g., in-stream waste concentration or IWC), as recommended in EPA's Technical Support Document (TSD; USEPA 1991) and implemented under EPA's WET National Pollutant Discharge Elimination System (NPDES) permits program, and the control within a WET test differ by an unacceptable amount (the amount that would have a measured detrimental effect on the ability of aquatic organisms to thrive and survive).

Since the inception of EPA's NPDES WET program in the mid 1980s, the Agency has striven to advance and improve its application and implementation under the NPDES WET Program. The TST approach explicitly incorporates test power, which, using the TST approach, is the ability to correctly classify the effluent as acceptable under the NPDES WET Program (i.e., non-toxic). The TST approach also provides a positive incentive to generate high quality, valid WET data to make informed decisions regarding NPDES WET reasonable potential (RP) and permit compliance determinations. Once the WET test has been conducted (using multiple effluent concentrations and other requirements as specified in the WET test methods), the TST approach can be used to analyze valid WET test results to assess whether the effluent discharge is toxic. The TST approach is designed to be used for a two concentration data analysis of the IWC or a receiving water concentration (RWC) as compared to a control concentration.

Background

In the NPDES WET Program, an effluent sample is declared toxic relative to a permitted WET limit if the no observed effect concentration (NOEC) is less than the permitted IWC using a hypothesis statistical approach. In such an approach, the question being answered is, "Is the mean response of the organisms the same or worse in the control than at the IWC?" The hypothesis testing approach has four possible outcomes: (1) the IWC is truly toxic and is declared toxic, (2) the IWC is truly non-toxic and is declared non-toxic, (3) the IWC is truly toxic but is declared non-toxic, and (4) the IWC is truly non-toxic but is declared toxic. The latter two possible outcomes represent decision errors that can occur with any hypothesis testing approach. In the NPDES WET Program, those two types of errors occur when either test control replication is poor (i.e., the within-test variability is high) so that even large differences in organism response between the IWC and control are incorrectly classified as non-toxic (outcome [3] above) or, test control replication is very good (i.e., the within-test variability is low) so that a very small difference between IWC and control is declared toxic (outcome [4] above). That former outcome stems from the fact that in the NPDES WET Program, the hypothesis approach established and controls the false positive error rate (i.e., Type I or alpha) but not the false negative error rate (i.e., Type II or beta). Establishing the beta error rate determines the power of the test (power = 1-beta), which is the probability of correctly detecting an actual toxic effect using the traditional hypothesis testing approach (i.e., declaring an effluent toxic when, in fact, it is toxic). By not establishing an appropriate beta error rate and test power in the NPDES WET

Program, the permittee has no incentive to generate more precise data within a test using the traditional hypothesis approach, and, in fact, is at a disadvantage for achieving a high level of precision.

What is the Test of Significant Toxicity Approach?

Organism responses to the effluent and control are unlikely to be exactly the same, even if no toxicity is present. They might differ by such a small amount that even if statistically significant, it would be considered negligible biologically. A more useful approach could be to rephrase the null hypothesis, "Is the mean response in the effluent less than a defined biological amount?" the Food and Drug Administration has successfully used that approach for many years to evaluate drugs, as have many researchers in other biological fields. In that approach, the null hypothesis is stated as the organism response in the effluent is less than or equal to a fixed fraction (*b*) of the control response (e.g., 0.75 of the control mean response):

$$\text{Null hypothesis: Treatment mean} \leq b \times \text{Control mean}$$

In the NPDES WET Program, to reject the null hypothesis above means the effluent is considered non-toxic. To accept the null hypothesis means the effluent is toxic. That test has been adapted for the NPDES WET Program and is referred to as the *Test of Significant Toxicity* (TST).

Before the TST null hypothesis expression could be used in the NPDES WET Program, certain decisions were needed, including what effect level in the effluent is considered unacceptably toxic and the desired frequency of declaring a truly negligible effect within a test non-toxic. Such decisions are referred to as Regulatory Management Decisions (RMDs).

What are the RMDs for TST?

In the TST approach, the *b* value in the null hypothesis represents the threshold for unacceptable toxicity. For *chronic* testing in EPA's NPDES WET Program, the *b* value in the TST analysis is set at 0.75, which means that a 25 percent effect (or more) at the IWC is considered evidence of unacceptable *chronic* toxicity. IWC responses substantially less than a 25 percent effect would be interpreted to have a lower risk potential. The RMD for *acute* WET methods is set at 0.80, which means that a 20 percent effect (or more) at the IWC is considered evidence of unacceptable *acute* toxicity. The acute RMD toxicity threshold is higher (i.e., more strict) than that for chronic WET methods because of the severe environmental implications of acute toxicity (lethality or organism death).

EPA's RMDs using the TST approach are intended to identify unacceptable toxicity in WET tests most of the time when it occurs, while also minimizing the probability that the IWC is declared toxic when in fact it is truly acceptable. This objective requires additional RMDs regarding acceptable maximum false positive (**β using a TST approach)** and false negative rates (**α using a TST approach)**. In the TST approach, the RMDs are defined as (1) declare a sample toxic between 75–95 percent of the time ($0.05 \leq \alpha \leq 0.25$) when there is unacceptable toxicity (20 percent effect for acute and 25 percent effect for chronic tests), and (2) declare an effluent non-toxic no more than 5 percent of the time ($\beta \leq 0.05$) when the effluent effect at the critical effluent concentration is 10 percent. Table ES-1 summarizes the difference in Type I and II error

expressions between the TST approach and the traditional hypothesis approach currently used in the NPDES WET Program.

Table ES-1. Definition of the Type I and Type II error under the traditional hypothesis testing approach and the TST approach.

	Traditional hypothesis approach	TST
Type I (alpha)	Set at 0.05	Set at 0.05 to 0.25 given a *b* value of 0.80 or 0.75 depending on whether the WET test method is acute or chronic, respectively
	Effluent is considered safe but declared *toxic*	Effluent is considered toxic, but declared *safe*
	Permittee concern	Regulatory concern
Type II (beta)	Not established	Set at 0.05
	Effluent is considered toxic but declared *safe*	Effluent is considered safe but declared *toxic*
	Regulatory concern	Permittee concern

How was the TST approach developed?

EPA used valid WET data from approximately 2,000 WET tests to develop and evaluate the TST approach. The TST approach was tested using nine different WET test methods comprising twelve biological endpoints (e.g., reproduction, growth, survival) and representing most of the different types of WET test designs in use. More than one million computer simulations were used to select appropriate alpha error rates for each test method that also achieved EPA's other RMDs for the TST approach.

Once the alpha error rates were established, the results of the TST approach were compared to those obtained using the traditional hypothesis testing approach for a range of test results. The alpha values identified in this project build on existing information (such as data sources and analyses examining ability to detect toxic effects) on WET published and peer reviewed by EPA, including *Understanding and Accounting for Method Variability in WET Applications Under the NPDES Program* (USEPA 2000).

This document outlines the recommended TST approach and presents the following:

- How an appropriate alpha value was identified for several common WET test methods on the basis of desired beta error rates, various effect levels, and within-test control variability.
- The degree of protectiveness of TST compared to the traditional hypothesis testing approach. In this report, *as protective as* is defined as an equal ability to declare a sample toxic at or above the regulatory management level.

Because TST is a form of hypothesis testing, analyses in this document focus on comparing results of TST to the traditional hypothesis testing approach and not to point estimate techniques such as linear interpolation (i.e., IC25). Therefore, this document does not discuss point estimate procedures.

Data analysis approach

EPA assembled a comprehensive database to analyze the utility of the TST approach with data obtained from EPA Regions, several states, and private laboratories, which represent a widespread sampling of typical laboratories and test methods for approximately 2,000 tests. Nine commonly tested WET methods were examined. For each test method, control precision (coefficient of variation [CV]) was calculated on the basis of valid WET test data compiled in the project. Cumulative frequency plots were used to identify percentiles of observed method-specific CVs (e.g., 25th, 50th, 75th percentiles). The measures were calculated to update previous EPA analyses (USEPA 2000) using more recent valid WET test data and to characterize typical, achievable test performance in terms of within-test control variability. A similar analysis was performed for the control response for each of the nine test methods (e.g., mean offspring per female in the *Ceriodaphnia dubia* test method) to characterize typical achievable test performance in terms of control response.

Monte Carlo simulation analysis was used to estimate the percentage of WET tests that would be declared toxic using TST as a function of different α levels, within-test control variability, and mean percent effect level. The simulation analysis identified expected beta error rates (i.e., declaring an effluent toxic when in fact it is acceptable under TST) for a broad range of possible test scenarios. Using the RMDs above, an appropriate α level was then identified for a given WET test design that also yielded a β error rate ≤ 0.05 when there was a 10 percent mean effect. By simulating thousands of WET tests for a given scenario (mean percent effect and control CV), the percentage of tests declared toxic could be calculated and compared among scenarios, and between TST and the traditional hypothesis approach.

Results of the analysis

Results of all analyses indicate that TST is a suitable alternative to the traditional hypothesis approach for analyzing two-concentration WET data (i.e., IWC and control) in the NPDES WET Program. A demonstrated benefit of the TST approach is that increasing the precision and power of the test increases the chances of declaring an effluent non-toxic when there is $\leq$ 10 percent mean effect in the effluent. Increasing test replication (and thereby the power of the test) results in a *lower* rate of tests declared toxic using TST but a *higher* rate of tests declared toxic using the traditional hypothesis approach (see Figure ES-1). Using TST, a permittee has the ability to demonstrate that its effluent is acceptable, by improving the quality of test data (e.g., decreasing within-test variability, and/or increasing replication), if indeed the mean effect at the IWC is less than the regulatory management decision (25 percent [chronic] or 20 percent [acute]).

On the basis of EPA's analyses, the alpha levels shown in Table ES-2 are recommended for the nine EPA WET test methods examined using the TST approach. An important feature of the TST approach is that the TST's alpha is analogous to beta under the traditional hypothesis testing approach, which had not been established by EPA previously for the NPDES WET Program.

Table ES-2. Summary of alpha (α) levels or false negative rates recommended for different EPA WET test methods using the TST approach.

EPA WET test method	*b* value	Probability of declaring a toxic effluent non-toxic False negative (α) error[a]
Chronic Freshwater and East Coast Methods		
Ceriodaphnia dubia (water flea) survival and reproduction	0.75	0.20
Pimephales promelas (fathead minnow) survival and growth	0.75	0.25
Selenastrum capricornutum (green algae) growth	0.75	0.25
Americamysis bahia (mysid shrimp) survival and growth	0.75	0.15
Arbacia punctulata (Echinoderm) fertilization	0.75	0.05
Cyprinodon variegatus (Sheepshead minnow) and *Menidia beryllina* (inland silverside) survival and growth	0.75	0.25
Chronic West Coast Marine Methods		
Dendraster excentricus and *Strongylocentrotus purpuratus* (Echinoderm) fertilization	0.75	0.05
Atherinops affinis (topsmelt) survival and growth	0.75	0.25
Haliotis rufescens (red abalone), *Crassostrea gigas (oyster), Dendraster excentricus, Strongylocentrotus purpuratus* (Echinoderm) and *Mytilus sp* (mussel) larval development methods	0.75	0.05
Macrocystis pyrifera (giant kelp) germination and germ-tube length	0.75	0.05
Acute Methods		
Pimephales promelas (fathead minnow), *Cyprinodon variegatus* (Sheepshead minnow), *Atherinops affinis* (topsmelt), *Menidia beryllina* (inland silverside) acute survival[b]	0.80	0.10
Ceriodaphnia dubia, *Daphnia magna, Daphnia pulex*, *Americamysis bahia* acute survival[b]	0.80	0.10

Notes:
a. α levels shown are the probability of declaring an effluent toxic when the mean effluent effect = 25% for chronic tests or 20% for acute tests and the false positive rate (β) is $\leq$ 0.05 (5%) when mean effluent effect = 10%.
b. Based on a four replicate test design

Results obtained from the TST analyses using the nine EPA WET test methods should be applicable to other EPA WET methods not examined. For example, results generated under this project for the fish *Pimephales promelas* survival and growth test is extrapolated to other EPA fish survival and growth tests (e.g., *Menidia* sp., *Cyprinus variegatus*, *Atherinops affinis*) because the test methods use a similar test design (e.g., number of replicates, number of organisms tested) and measure the same endpoints.

Figure ES-1 illustrates that conducting tests with more replicates (a priori) can assist a permittee to demonstrate that the effluent is acceptable. Conversely, increasing the number of replicates in a test does not assist a permittee using the current hypothesis testing approach.

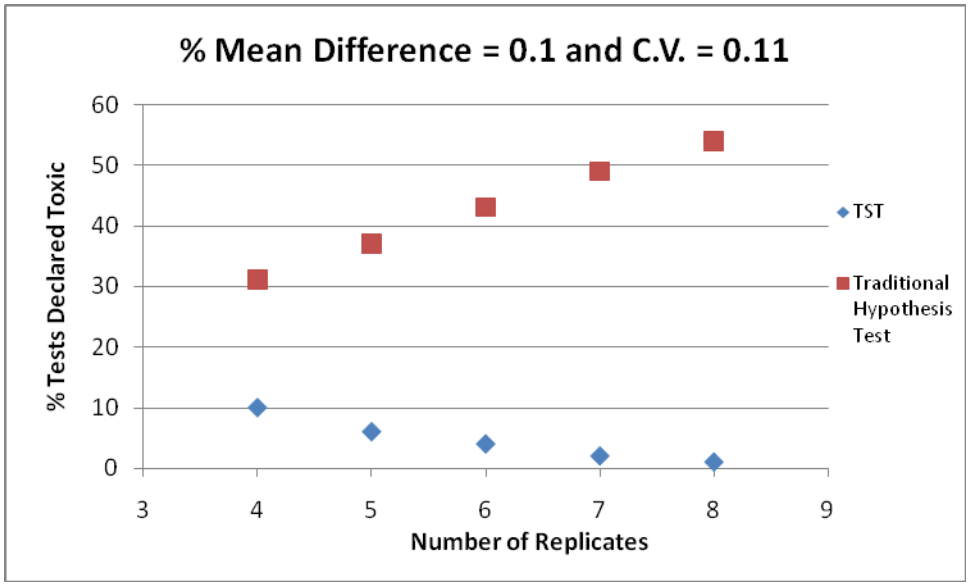

Figure ES-1. Percent of chronic fathead minnow WET tests declared toxic using TST having a mean effluent effect of 10 percent, above average control variability (CV = 0.11 or 11 percent) and an α = 0.25, as a function of the number of within-test replicates. Results using the traditional hypothesis test are shown as well.

Summary

Results of nearly 2,000 valid WET tests and thousands of simulations were conducted to develop the technical basis for the TST approach. That approach builds on the strengths of the traditional hypothesis testing approach, including use of robust statistical analyses, to determine whether an effluent sample is acceptable in WET testing. Specific benefits of using TST in WET analysis include the following:

- Provides transparent RMDs, which are incorporated into the data analysis process
- Incorporates statistical power directly into the statistical process by controlling for both alpha and beta errors, thereby, increasing the confidence in the WET test result
- Provides a positive incentive for the permittee to generate valid, high quality WET data
- Applicable to both NPDES WET permitting and 303(d) watershed assessment programs

Results of this project indicate that the TST is a viable additional statistical approach for analyzing valid acute and chronic WET test data. Using the explicit RMD and test method-specific alpha values, TST provides similar protection as the traditional hypothesis testing approach when there is unacceptable toxicity while also providing a transparent methodology for demonstrating whether an effluent is acceptable under the NPDES WET Program.

In summary, the TST approach provides another option for permitting authorities and permittees to use for analyzing WET test data. The TST approach provides a positive incentive to generate valid, high quality WET data to make informed decisions regarding NPDES WET reasonable

potential (RP) and permit compliance determinations. Using TST, permitting authorities will be better able to identify toxic or acceptable samples.

ACRONYMS AND ABBREVIATIONS

CETIS®	Comprehensive Environmental Toxicity Information System
CFR	Code of Federal Regulations
CV	coefficient of variation
WDNR	Wisconsin Department of Natural Resources
EPA	U.S. Environmental Protection Agency
IC25	25 percent inhibition concentration
IWC	in-stream waste concentration
LOEC	lowest observed effect concentration
LC50	50 percent lethal concentration
MSD	minimum significant difference
NOEC	no observed effect concentration
NPDES	National Pollutant Discharge Elimination System
QA/QC	quality assurance/quality control
RMD	regulatory management decision
RP	reasonable potential
RWC	receiving water concentration
SWAMP	Surface Water Ambient Monitoring Program (California)
TAC	Test acceptability criteria
TMDL	total maximum daily load
TSD	Technical Support Document for Water Quality-Based Toxics Control
TST	Test of Significant Toxicity
WET	whole effluent toxicity

GLOSSARY

Acute Toxicity Test is a test to determine the concentration of effluent or ambient waters that causes an adverse effect (usually mortality) on a group of test organisms during a short-term exposure (e.g., 24, 48, or 96 hours). Acute toxicity is determined using statistical procedures (e.g., point estimate techniques or a t-test).

Ambient Toxicity is measured by a toxicity test on a sample collected from a receiving waterbody.

Chronic Toxicity Test is a short-term test in which sublethal effects (e.g., reduced growth or reproduction) are usually measured in addition to lethality.

Coefficient of Variation (CV) is a standard statistical measure of the relative variation of a distribution or set of data, defined as the standard deviation divided by the mean. The CV can be used as a measure of precision within and between laboratories, or among replicates for each treatment concentration.

Effect Concentration (EC) is a point estimate of the toxicant concentration that would cause an observable adverse effect (e.g., mortality, fertilization). EC_{25} is a point estimate of the toxicant concentration that would cause observable 25% adverse effect as compared to the control test organisms.

False Negative is when the in-stream waste concentration is declared non-toxic but in fact is truly toxic. In the traditional hypothesis approach, false negative error rate is denoted by Beta (β). In the TST approach, false negative error rate is denoted as Alpha (α), which applies when the percent effect in the critical effluent concentration is $\geq$ 25% for a given test.

False Positive is when the in-stream waste concentration is declared toxic but in fact is truly non-toxic. In the traditional hypothesis approach, false positive error rate is denoted by Alpha (α). In the TST approach, false positive error rate is denoted as Beta (β), which applies when the percent effect in the critical effluent concentration is $\leq$ 10% for a given test.

Hypothesis Testing is a statistical approach (e.g., Dunnett's procedure) for determining whether a test concentration is statistically different from the control. Endpoints determined from hypothesis testing are no observed effect concentration (NOEC) and lowest observed effect concentration (LOEC). The two hypotheses commonly tested in WET are

- **Null hypothesis (H_o)**: The effluent is non-toxic.
- **Alternative hypothesis (H_a)**: The effluent is toxic.

Inhibition Concentration (IC) is a point estimate of the toxicant concentration that would cause a given, percent reduction in a non-lethal biological measurement (e.g., reproduction or growth), calculated from a continuous model (i.e., Interpolation Method). E.g., IC_{25} is a point estimate of the toxicant concentration that would cause a 25 percent reduction in a non-lethal biological measurement.

In-stream Waste Concentration (IWC) is the concentration of a toxicant or effluent in the receiving water after mixing. The IWC is the inverse of the dilution factor. It is sometimes referred to as the receiving water concentration (RWC).

LC50 (lethal concentration, 50 percent) is the toxicant or effluent concentration that would cause death to 50 percent of the test organisms.

Lowest Observed Effect Concentration (LOEC) is the lowest concentration of an effluent or toxicant that results in statistically significant adverse effects on the test organisms (i.e., where the values for the observed endpoints are statistically different from the control).

Minimum Significant Difference (MSD) is the magnitude of difference from control where the null hypothesis is rejected in a statistical test comparing a treatment with a control. MSD is based on the number of replicates, control performance, and power of the test.

No Observed Effect Concentration (NOEC) is the highest tested concentration of an effluent or toxicant that causes no observable adverse effect on the test organisms (i.e., the highest concentration of toxicant at which the values for the observed responses are not statistically different from the control).

National Pollutant Discharge Elimination System (NPDES) is the national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under sections 307, 318, 402, and 405 of Clean Water Act.

Power is the probability of correctly rejecting the null hypothesis (i.e., declaring an effluent toxic when, in fact, it is toxic using the traditional hypothesis test approach).

Precision is a measure of reproducibility within a data set. Precision can be measured both within a laboratory (within-laboratory) and between laboratories (between-laboratory) using the same test method and toxicant.

Quality Assurance (QA) is a practice in toxicity testing that addresses all activities affecting the quality of the final effluent toxicity data. QA includes practices such as effluent sampling and handling, source and condition of test organisms, equipment condition, test conditions, instrument calibration, replication, use of reference toxicants, recordkeeping, and data evaluation.

Quality Control (QC) is the set of more focused, routine, day-to-day activities carried out as part of the overall QA program.

Reasonable Potential (RP) is where an effluent is projected or calculated to cause an excursion above a water quality standard on the basis of a number of factors including the four factors listed in Title 40 of the *Code of Federal Regulations* (CFR) 122.44(d)(1)(ii).

Reference Toxicant Test is a check of the sensitivity of the test organisms and the suitability of the test methodology. Reference toxicant data are part of a routine QA/QC program to evaluate the performance of laboratory personnel and the robustness and sensitivity of the test organisms.

Regulatory Management Decision (RMD) is the decision that represents the maximum allowable error rates and thresholds for toxicity and non-toxicity that would result in an acceptable risk to aquatic life.

Replicate is two or more independent organism exposures of the same treatment (i.e., effluent concentration) within a whole effluent toxicity test. Replicates are typically separate test chambers with organisms, each having the same effluent concentration**.**

Sample is a representative portion of a specific environmental matrix that is used in toxicity testing. For this document, environmental matrices could include effluents, surface waters, groundwater, stormwater, and sediment.

Significant Difference is a statistically significant difference (e.g., 95 percent confidence level) in the means of two distributions of sampling results.

Statistic is a computed or estimated quantity such as the mean, standard deviation, or Coefficient of Variation.

Test Acceptability Criteria (TAC) are test method-specific criteria for determining whether toxicity test results are acceptable. The effluent and reference toxicant must meet specific criteria as defined in the test method (e.g., for the *Ceriodaphnia dubia* survival and reproduction test, the criteria are as follows: the test must achieve at least 80 percent survival and an average of 15 young per surviving female in the control and at least 60% of surviving organisms must have three broods).

t-test (formally Student's t-Test) is a statistical analysis comparing two sets of replicate observations, in the case of WET, only two test concentrations (e.g., a control and IWC). The purpose of this test is to determine if the means of the two sets of observations are different (e.g., if the 100-percent effluent or ambient concentration differs from the control [i.e., the test passes or fails]).

Type I Error (alpha α) is the error of rejecting the null hypothesis (H_o) that should have been accepted.

Type II Error (beta β) is the error of accepting the null hypothesis (H_o) that should have been rejected.

Toxicity Test is a procedure to determine the toxicity of a chemical or an effluent using living organisms. A toxicity test measures the degree of effect on exposed test organisms of a specific chemical or effluent.

Welch's t-test is an adaptation of Student's t-test intended for use with two samples having unequal variances.

Whole Effluent Toxicity (WET) is the total toxic effect of an effluent measured directly with a toxicity test.

1.0 INTRODUCTION

1.1 Summary of Current EPA Recommended WET Analysis Approaches

Within the National Pollutant Discharge Elimination System (NPDES) Program, freshwater and marine acute and chronic whole effluent toxicity (WET) tests are used in conjunction with other analyses to evaluate and assess compliance of wastewater and surface waters with water quality standards of the Clean Water Act. In the NPDES WET Program, WET tests examine organism responses to effluent, typically along a dilution series (USEPA 1995, 2002a, 2002b). Acute WET test methods measure the lethal response of test organisms exposed to effluent (USEPA 2002c). The principal response endpoints for such methods are the effluent concentration that is lethal to 50 percent of the test organisms (LC50) or the effluent concentration at which survival is significantly lower than the control (e.g., t-test). Chronic WET test methods often measure both lethal and sublethal responses of test organisms. The statistical endpoints that are used in chronic WET testing in the NPDES WET Program are the no observed effect concentration (NOEC), and the 25 percent inhibition concentration (IC25). The NOEC endpoint is determined using a traditional hypothesis testing approach that identifies the maximum effluent concentration tested at which the response of test organisms is not significantly worse from the control. From a regulatory perspective, an effluent sample is declared toxic relative to a permitted WET limit if the NOEC is less than the permitted in-stream waste concentration (IWC), as recommended in EPA's Technical Support Document (TSD) (USEPA 1991) and implemented under EPA's WET NPDES permits program. The IC25, by contrast, is a point-estimation approach. It identifies the concentration at which the response of test organisms is 25 percent below that observed in the control concentration and interpolates the effluent concentration at which this magnitude of response is expected to occur. From a regulatory perspective, an effluent sample is declared toxic relative to a permitted WET limit if the IC25 is less than the permitted IWC. This document focuses on another statistical option with respect to the traditional hypothesis testing approach for analyzing and interpreting valid WET data.

1.2 Advantages and Disadvantages of Recommended Traditional Hypothesis Testing Approach

The hypotheses traditionally used in WET statistical comparisons of a biological measure (survival, growth, reproduction) in control water versus a particular effluent sample are the following:

$$\begin{aligned} &\textit{Null Hypothesis}: && \mu_T \geq \mu_C \\ &\textit{Alternative Hypothesis}: && \mu_T < \mu_C \end{aligned}$$

where μ_C refers to the true mean for the biological measure in the control water and μ_T refers to the true mean for this measure in the effluent sample. *True mean* here refers to the mean for a theoretical statistical population of results from indefinite repetition of toxicity tests on the same control water and effluent sample. In contrast, the mean for the biological measure for a single toxicity test would be referred to as the *sample mean*, and random variation among organisms might cause a sample mean for an effluent to be less than the control even if the effluent is actually non-toxic. The traditional WET hypothesis thus assumes that the effluent sample is non-toxic. For an individual test, there must be a statistical test to determine if the null hypothesis is

rejected in favor of the alternative hypothesis; i.e., that any apparent toxicity based on the sample means is real and not simply reflective of random variation. Such a statistical test is part of current recommended practice in WET testing.

Table 1-1 summarizes the correctness of results from such statistical testing, contrasting the true condition of whether the effluent sample is toxic to the result of the statistical test. Two types of errors can occur in the statistical test result. A false positive occurs when the effluent is actually non-toxic, but the statistical test infers that it is toxic. For the statistical hypotheses here, that is a Type I error (the null hypothesis is rejected when it is true) and the probability of this error is typically designated by the variable α, so that the correct decision occurs with probability $1 - \alpha$. The other type of error, a false negative, occurs when the effluent truly is toxic, but the statistical test infers that it is non-toxic. For the statistical hypotheses here, that is a Type II error (the null hypothesis is accepted when it is false) and the probability of the error is typically designated by the variable β, so that the probability of the correct decision is $1 - \beta$, which is also referred to as the test power.

Table 1-1. Error terminology for traditional WET hypothesis methodology

Statistical test result	**True condition**	
	$\mu_T \geq \mu_C$ (sample is non-toxic)	**$\mu_T < \mu_C$ (sample is toxic)**
$\mu_T \geq \mu_C$ (Sample is non-toxic)	Correct Decision (probability=1–α)	False Negative Type II Error (probability=β)
$\mu_T < \mu_C$ (Sample is toxic)	False Positive Type I Error (probability=α)	Correct decision Test Power (1-β)

It is important to note that β does not have a single value but rather is a function of how toxic the sample actually is (i.e., there is a greater chance of incorrectly saying an effluent is non-toxic if it is only slightly toxic than if it is highly toxic). Similarly, given that the null hypothesis is an inequality, α also does not have a single value, because if effluent characteristics actually improve the biological measure, the probability with which a non-toxic effluent is called toxic will be a function of the extent of this beneficial effect. Although there is a designated single value for α in the statistical test calculations (e.g., 0.05), this error probability applies only when the true condition is exactly at $\mu_T = \mu_C$.

This variation of α and β can be better understood using Figure 1-1, which depicts the probability of declaring an effluent toxic versus the true toxicity of the effluent, expressed as the ratio of the true biological measure in the effluent to the true biological measure in the control (μ_T / μ_C). The curves on this figure are for a hypothetical statistical analysis of hypothetical toxicity tests, but exemplify performance curves that could be drawn for *any* statistical analysis of *any* toxicity test under the traditional WET hypotheses provided above. The solid line is for a toxicity test with large variability so that it is less likely that the statistical test will detect toxicity, and the dashed line is for a toxicity test with low variability. Such curves provide a useful and complete summary of the basic information desired from WET testing. How

effectively will the testing detect toxicity for different levels of true toxicity? How often will non-toxic effluents mistakenly be declared toxic? Although test performance can be appreciated from such curves without addressing specific types of statistical errors, the behavior of those errors can be illustrated using the curves. The portion of the curve with $\mu_T / \mu_C \geq 1$ gives values for α (i.e., the effluent is truly non-toxic so that calling it toxic, a false positive, is a Type I error under the traditional null hypothesis). In accordance with WET hypothesis test procedures, the example curves have $\alpha = 0.05$ when μ_T / μ_C is exactly at 1.0. The portion of the curve with $\mu_T / \mu_C < 1$ is the *power curve* for the test (i.e., $1-\beta$, the probability of calling an effluent toxic when it truly is toxic). This illustrates how test power is very low (approaching 0.05) when the effluent is only slightly toxic, but it increases as the true toxicity increases. The two different curves illustrate how this increase in test power depends on test uncertainty—i.e., higher within-test variability in the toxicity test results in less power for the statistical analysis.

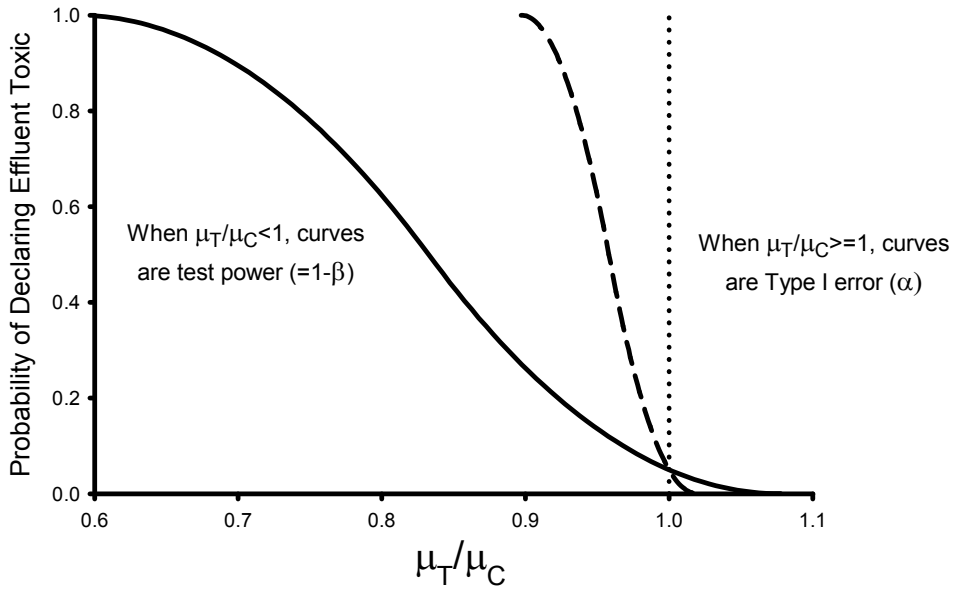

Figure 1-1. Example test performance curves for traditional WET hypothesis tests. The dotted line marks where the true mean biological measure in the effluent equals that in the control. The solid curve is for a high variability test, while the dashed curve is for a low variability test.

Various researchers have reported several advantages and disadvantages of the traditional hypothesis testing approach as currently used in the NPDES WET Program (Grothe et al. 1996). Two common limitations cited are (1) if the test control replication is very good (i.e., test is very precise), an effluent might be considered toxic when in fact its toxicity is low enough to be considered acceptable, and (2) if test control replication is poor (i.e., the test is very imprecise), a highly toxic effluent might be incorrectly classified as non-toxic. For example, the more precise test in Figure 1-1 would declare an effluent with only 5 percent toxicity to be toxic about 60 percent of the time, whereas the less precise test in Figure 1-1 would declare 20 percent toxicity to be non-toxic about 40 percent of the time. The first limitation arises because the null hypothesis is defined around $\mu_T = \mu_C$, so the goal is to call an effluent toxic if $\mu_T < \mu_C$, no matter

how small the difference. The second limitation arises from the fact that the NPDES WET Program hypothesis testing approach does not address the false negative error rate (i.e., Type II error, β) and thus does not address requirements regarding the power of the test to detect substantial levels of toxicity. By not establishing an appropriate β and test power in the NPDES WET Program, the permittee has no incentive to increase the precision of a WET test when using the traditional hypothesis approach. As illustrated in Figure 1-1, greater precision simply results in more samples being declared toxic and can lead to high rejection rates for effluents with low levels of toxicity that might be considered acceptable. Although EPA has made improvements in statistical procedures, such as including a test review step of the percent minimum significant differences (i.e., to minimize within-test variability), it is desirable to further improve the hypothesis testing approach. Such improvement is the focus of this report and a general approach for this, the Test of Significant Toxicity (TST), is discussed next.

1.3 Test of Significant Toxicity

The TST is an alternative statistical approach for analyzing and interpreting valid WET test data that also uses a hypothesis testing approach but in a different way, building on previous work conducted by EPA in the NPDES WET Program (USEPA 2000) as well as other researchers (Erickson and McDonald 1995; Shukla et al. 2000; Berger and Hsu 1996). The TST approach is based on a type of hypothesis testing referred to as *bioequivalence testing*. Bioequivalence is a statistical approach that has long been used in evaluating clinical trials of pharmaceutical products (Anderson and Hauck 1983) and by the Food and Drug Administration (Hatch 1996; Aras 2001; Streiner 2003). The approach has also been used to evaluate the attainment of soil cleanup standards for contaminated sites (USEPA 1988, 1989) and to evaluate effects of pesticides in experimental ponds (Stunkard 1990).

For the NPDES WET Program, the TST approach changes the hypotheses to the following:

Null Hypothesis: $\mu_T \leq b \times \mu_C$

Alternative Hypothesis: $\mu_T > b \times \mu_C$

The TST hypotheses thus incorporate two important differences from the traditional WET hypotheses. First, a specific value for the ratio μ_T / μ_C, designated *b*, is included to delineate unacceptable and acceptable levels of toxicity, allowing a risk management decision about what level of toxicity should be allowed if the true means were known, other than the absence of any toxicity as specified by the traditional hypothesis. Second, the inequalities are reversed so that it is assumed that the effluent sample has an unacceptable level of toxicity until demonstrated otherwise. As a result of this reversal of the inequalities, the meanings of α and β under the TST hypotheses (Table 1-2) are reversed from those under the traditional hypothesis approach (Table 1-1). Under the TST approach, α is associated with false negatives, β is associated with false positives, and statistical test power using the TST approach in the NPDES WET Program is the ability to correctly conclude that true toxicity levels are acceptable. In addition, an effluent sample would be considered acceptable under the TST approach when the null hypothesis is rejected; in contrast, a sample is considered unacceptable under the traditional hypothesis approach when the null hypothesis is rejected.

Table 1-2. Error terminology for TST WET hypothesis methodology

Statistical test result	**True condition**	
	$\mu T \leq b \times \mu C$ (Toxicity is unacceptable)	**$\mu T > b \times \mu C$ (Toxicity is acceptable)**
$\mu_T \leq b \times \mu_C$ (Toxicity is unacceptable)	Correct Decision (1–α)	False Positive Type II Error (β)
$\mu_T > b \times \mu_C$ (Toxicity is acceptable)	False Negative Type I Error (α)	Correct Decision Test Power (1–β)

Figure 1-2 provides illustrative examples of test performance under the TST approach and illustrates advantages of this approach over the traditional hypotheses. This figure shows the same basic type of performance curve as in Figure 1-1: the probability of calling an effluent unacceptably toxic versus the true toxicity in the effluent. Incorporating *b* in the hypotheses explicitly recognizes that the true mean for the organism response in an effluent can be less than that in the control by a certain amount and still be considered acceptable, and it keeps the false negative rate for this amount of toxicity constant regardless of test variability (Figure 1-2). As mentioned previously, the current NPDES WET Program does not control the false negative rate, which varies markedly at any given level of toxicity as test precision varies (Figure 1-1). By reversing the inequalities and referencing them to *b*, the TST approach also results in more precise tests having lower false positive errors (Figure 1-2); i.e., effluents with true levels of toxicity that are acceptably low are declared toxic with less frequency as precision increases, a desirable attribute for the method. That provides permittees with a clear incentive to improve the precision of test results. Thus, using the TST approach, a permittee has to demonstrate with some confidence that their effluent has toxicity in an acceptable range, but can also improve testing procedures as needed to do so (i.e., increase replicates or decrease within-test variability or both).

1.4 Regulatory Management Decisions for TST

Regulatory management decisions (RMDs) are incorporated into the TST methodology by selecting values for *b*, the dividing point between acceptable and unacceptable toxicity, and α, the false negative error rate when $\mu_T = b \times \mu_C$.

The selection of *b* should reflect what is considered acceptable if the true biological response means for the effluent and control were actually known, especially because precise tests might have performances closely approaching this ideal. For all chronic WET test methods, the RMD is to set *b* to 0.75. This *b* value (25 percent toxic effect) is consistent with EPA's use of the IC25 in point estimation methods for examining chronic WET data. Chronic effects less than 25 percent would be considered to have an acceptably low risk potential. Because of the more severe environmental implications of acute toxicity (organism death), the RMD for acute WET test methods is to set *b* higher than that for chronic WET test methods, at 0.80.

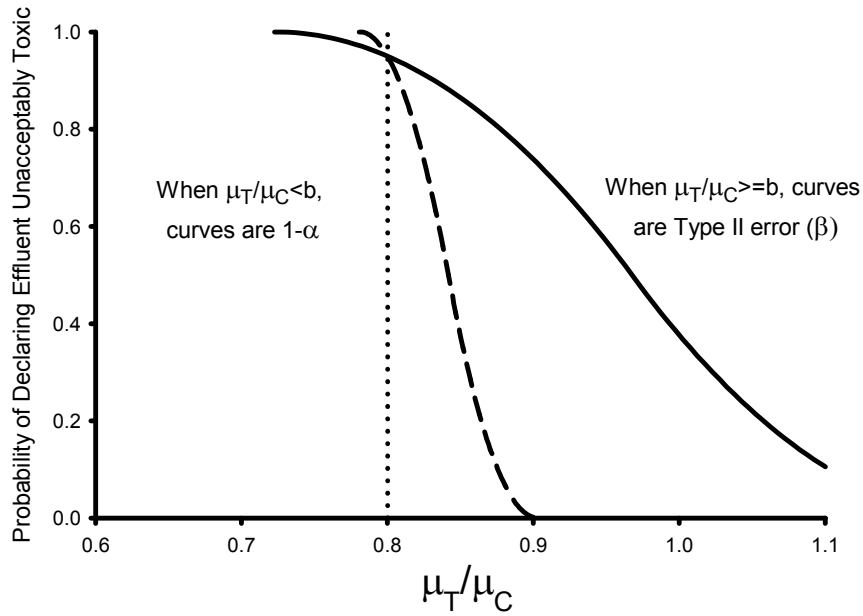

Figure 1-2. Example test performance curves for TST WET hypothesis tests. For this example, *b* is set to 0.8 (denoted by dotted line), with α = 0.05. The two curves represent test performance for tests with high (solid line) and low (dashed line) variability.

For a given test precision and value for *b*, selecting a value for α completely determines both false negative and false positive error rates at all toxicity levels, such as the curves in Figure 1-2. However, the value selected for α does not have to be based just on consideration of the desired error rate when $\mu_T = b \times \mu_C$. Rather, α can be selected on the basis of balancing goals regarding this false negative error rate with goals for false positive error rates at lower levels of toxicity. Therefore, a different α can be assigned for different types of WET toxicity tests based on test precision and on specific goals regarding false positive and false negative rates.

With regard to false negative rates, EPA's general goal is to identify unacceptable toxicity in WET tests most of the time when it occurs. It would be preferred to set α at the typical 0.05 level (i.e., if μ_T=b × μ_C, the effluent will be declared unacceptable 95 percent of the time). However, for tests with low precision, this could result in a high rate of false positives (declaring effluents unacceptable) when toxicity is low or absent (e.g., Figure 1-2). Therefore, values of α up to 0.25 will be allowed, as needed to meet the goal regarding false positive rates discussed in the next paragraph. Thus, the false negative rate RMD is $0.05 \leq \alpha \leq 0.25$, so that there is at least a 0.75 probability that an effluent with unacceptable toxicity ($\mu_T \leq b \times \mu_C$) will be declared toxic.

With regard to false positive error probabilities, EPA's general goal is that they be low when toxicity is negligible. It is necessary to define *negligible* as a second, smaller level of effect than *acceptable* because the latter includes toxicity as high as that represented by *b*, at which point the false positive error rate always will approach $1 - \alpha$, so cannot be low. With regard to this, EPA defines negligible as 10 percent toxicity or less, and specifies that the false positive error

probability be no higher than 0.05 at 10 percent toxicity. Thus, the false positive RMD is $\beta \leq 0.05$ at $\mu_T/\mu_C=0.90$, provided this is achievable with $\alpha \leq 0.25$ (if α is at this maximum, this false positive RMD no longer applies). It should be emphasized that this RMD relates to only one point in the range of toxicity considered acceptable, and that false positives will vary widely within this range (e.g. Figure 1-2). False positive rates will be lower when toxicity is lower than 10 percent, dropping to near zero when toxicity is absent, and will be higher when toxicity values are greater than negligible but still acceptable, rising to $1-\alpha$ as the toxicity approaches the unacceptable level.

Therefore, the overall RMD for α (the false negative rate when $\mu_T / \mu_C = b$) is to set it to the lowest value that results in $\beta \leq 0.05$ (the false positive rate) when the true toxicity is at $\mu_T / \mu_C = 0.90$, but that α will be no lower than 0.05 and no higher than 0.25. This selection will be primarily a function of test method within-test variability (e.g., control coefficient of variation or CV), but cannot and should not be done on an individual test basis. Rather, TST alphas are assigned for different types of WET tests on the basis of simulations that address how TST method performance is affected by the test design and types of endpoints measured, and the associated CVs.

1.5 Document Objectives

This document presents TST as a useful alternative data analysis approach for valid WET test data that may be used in addition to the approaches currently recommended in EPA's Technical Support Document (USEPA 1991) and EPA's WET test method manuals. In adapting the TST for use in evaluating WET test data, analyses were conducted to identify an appropriate Type I error rate (α) for several common EPA WET methods given certain RMDs. Once alpha error rates were established, results of the TST approach were compared to those obtained using the traditional hypothesis testing approach and a range of test results.

This document outlines the recommended TST approach and presents the following:

- How an appropriate alpha value was identified for several common EPA WET test methods on the basis of desired alpha and beta error rates using explicit RMDs (i.e., effect levels) and considering a range of within-test control variability observed in valid WET tests.
- The degree of protectiveness of TST compared to the traditional hypothesis testing approach. In this report, *as protective as* is defined as an equal ability to declare a sample toxic at or above the regulatory management decision.

In this project, emphasis was placed on comparing results of TST to traditional hypothesis testing approaches and not to point estimate techniques such as linear interpolation (i.e., IC25). Therefore, this document does not discuss linear interpolation techniques. In addition, this document discusses the TST approach only with regard to comparing individual effluent samples to a control, and does not evaluate extensions of the TST approach to simultaneous multiple comparisons such as in Erickson and McDonald (1995).

The focus of this document is on chronic WET test methods and sublethal endpoints because many different types of alternative analysis procedures have been proposed for these tests.

Applying the TST methodology to the acute fish and *Ceriodaphnia* WET test method is also included. This document provides a summary of the recommended TST method, α values for several common WET methods, and results of comprehensive analyses supporting EPA recommendations.

2.0 METHODS

Methods used to evaluate the TST approach and determine how it should be applied for WET test analysis in the NPDES WET Program proceeded using several general steps as follows:

Step 1: WET test methods and endpoints were selected for analysis in the TST evaluation. A range of the more common EPA WET test methods were identified in this step.

Step 2: WET data were compiled from several state and EPA sources to determine current WET test method performance in terms of control response and within-test control variability.

Step 3: Simulation analyses were conducted using data characteristics obtained from Step 2 to guide the types of simulated data analyzed in this project and to set test method-specific α levels.

The following sections describe in more detail each of the steps.

2.1 Test Methods and Endpoints Evaluated

Table 2-1 summarizes the nine EPA WET test methods evaluated in this project. Preference was given to valid WET data generated using the EPA 1995 WET test methods for the EPA West Coast marine species (USEPA 1995) and for all other species the 2002 EPA WET test methods (USEPA 2002a, 2002b). Examining the inter-laboratory reference toxicant data for *C. dubia* by year indicated significantly more precise data from 1996 on as compared to pre-1995 (Figure 2-1). Similar results were observed for the fathead minnow and chronic mysid test methods as well. This result is not unexpected because the EPA chronic WET test methods were substantially refined as of 1995 and laboratories had more experience with the chronic test methods by this time. Within-test control 90th percentile CVs were not significantly different among years following 1995. Therefore, only post-1995 data were used in analyses for all EPA WET test methods.

All of the WET test methods listed in Table 2-1 are commonly used by regulatory authorities in making regulatory decisions such as determining WET reasonable potential (RP) or to determine compliance with acute and chronic WET limits or monitoring triggers. These nine test methods are representative of the range of EPA WET test methods commonly required of permittees in terms of types of toxicity endpoints written into NPDES permits and test designs followed by permittee's testing laboratories. Results obtained using these nine EPA test methods should be applicable to other EPA WET test methods not examined. For example, results of this project for the fish *Pimephales promelas* survival and growth test is extrapolated to other EPA fish survival and growth tests (e.g., *Menidia sp*., *Cyprinus variegatus*, *Atherinops affinis*) because those test methods use a similar test design (e.g., number of replicates, number of organisms tested) and measure the same endpoints. Previous analyses conducted by EPA (Denton and Norberg-King 1996; Denton et al. 2003) found comparable effect sizes for a given power among similar experimental designs and test endpoints. Similarly, the acute freshwater fish WET test analyzed in this project can be extrapolated to other fish acute test methods because they use a similar test design and measure mortality or immobility. The use of both EPA saltwater and freshwater WET tests ensured that there was adequate representation of different types of discharge situations and laboratories.

Table 2-1. Summary of test condition requirements and test acceptability criteria for each EPA WET test method evaluated in TST analyses

EPA method	Organism with scientific name	Endpoint type	Test type	Minimum # per test chamber	Minimum # of rep per conc.	Minimum # effluent conc.	Test duration	Test acceptance criteria (TAC)
2000.0	Fathead minnow *(Pimephales promelas)*	Survival	Acute	10	2	5	48–96 hours	≥ 90% survival in controls
1000.0	Fathead minnow *(Pimephales promelas)*	Survival and growth (larval)	Chronic	10	4	5	7 days	≥ 80% survival in controls; average dry weight per surviving organism in control chambers equals or exceeds 0.25 mg
1002.0	Water flea *(Ceriodaphnia dubia)*	Survival and reproduction	Chronic	1	10	5	Until 60% of surviving control organisms have 3 broods (6–8 days)	≥ 80% survival and an average of 15 or more young per surviving female in the control solutions. 60% of surviving control organisms must produce three broods
1007.0	Mysid shrimp *(Americamysis bahia)*	Survival and growth	Chronic	5	8	5	7 days	≥ 80% survival; average dry weight ≥ 0.20 mg in controls
1016.0	Purple urchin *(Strongylocentro-tus purpuratus)* or Sand dollar *(Dendraster excentricus)*	Fertilization	Chronic	100	4	4	40 min (20 min plus 20 min)	≥ 70% egg fertilization in controls; %MSD < 25%; and appropriate sperm counts
1017.0	Giant kelp *(Macrocystis pyrifera*	Germination and germ-tube length	Chronic	100 for germination 10 for germ-tube length	5	4	48 hours	≥ 70% germination in controls; ≥ 10 μm germ-tube lengths in controls; %MSD of < 20% for both germination and germ-tube length NOEC must be below 35 μg/L in reference toxicant test
1014.0	Red abalone (*Haliotis rufescens*)	Larval development	Chronic	100	5	4	48 hours	≥ 80% normal larval development in controls Statistical significance @ 56 μg/L zinc % MSD < 20%

Table 2-1. continued.

EPA method	Organism with scientific name	Endpoint type	Test type	Minimum # per test chamber	Minimum # of rep per conc.	Minimum # effluent conc.	Test duration	Test acceptance criteria (TAC)
2002.0	Water flea (*Ceriodaphnia dubia)*	Survival	Acute	5	4	5	24, 48, or 96 hours	≥ 90% survival in controls
1003.0	Green algae (*Selenastrum capricornutum*)	Growth (cell counts, chlorophyll fluorescence, absorbance, or biomass)	Chronic	10,000cells/ mL	4	5	96 hour	Mean cell density of at least 1 X 10^6 cells/mL in the controls; variability (CV%) among control replicates less than or equal to 20%

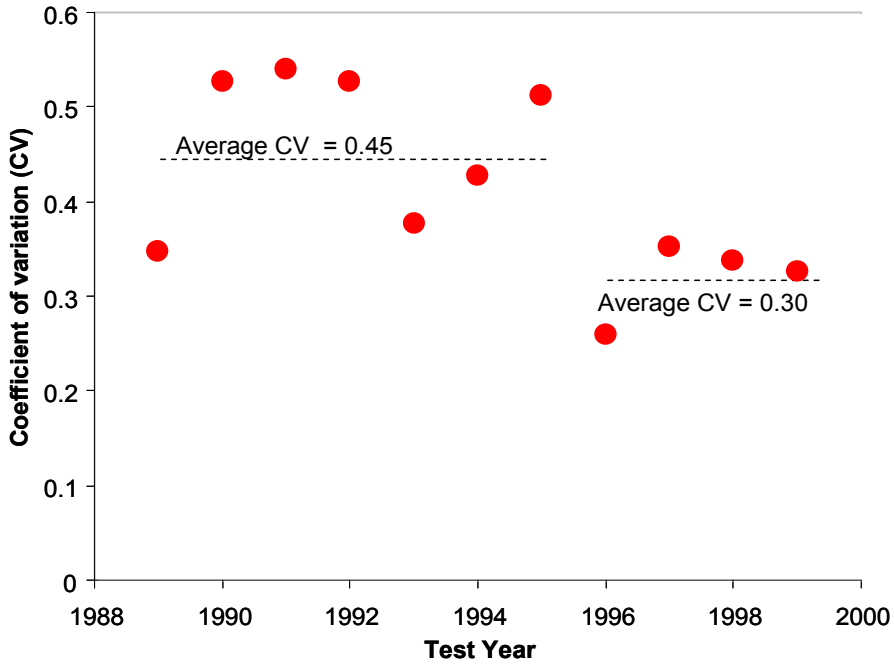

Figure 2-1. Summary of test variability (expressed as the control 90th percentile coefficient of variation or CV) observed between 1989 and 2000 for the chronic *Ceriodaphnia dubia* EPA WET test. This figure illustrates and supports the basis for using test data post 1995, as test precision improved from an average 90th percentile CV of 0.47 to 0.30.

2.2 Data Compilation

Data Sources

WET data were received from several reliable sources to identify baseline test method statistics (e.g., control CV percentiles, mean response percentiles) that were used in simulation analyses (see Section 2.4) and to help identify appropriate α values for each test method. The sources included Washington State Department of Ecology, EPA's Office of Science and Technology, North Carolina Department of the Environment and Natural Resources, California State Water Resources Control Board, and Virginia Department of Environmental Quality. Data acceptance criteria and types of WET test data desired were identified and documented in the Data Management Plan and the Quality Assurance Project Plan for this project. Nearly 2,000 valid WET tests of interest were incorporated, representing many permittees and laboratories (Table 2-2). Only data from WET tests meeting EPA's test acceptability criteria were used in the analyses.

For each set of test data received, additional metadata information was required including the following:

- Permittee name and NPDES permit number (coded for anonymity)
- Laboratory name and location (coded for anonymity)
- Design effluent concentration in the receiving water (expressed as percent effluent upon complete mix) used by the regulatory authority
- EPA test method version used (cited EPA number)
- Information indicating that all EPA test method's test acceptability criteria were met

In addition to the above effluent test data and metadata, two other sources of toxicity data were compiled in this project, which were used to help calculate the range of control organism response by endpoint for each EPA WET test method in Table 2-1. The first source of data was reference toxicant test data previously compiled for the EPA document, *Understanding and Accounting for Method Variability in Whole Effluent Toxicity Application Under the NPDES Program* (USEPA 2000). A second source of additional WET test data used in this project was data generated in ambient toxicity tests by the California State Water Resources Control Board. These data were useful in supplying information on control responses for the freshwater test methods in Table 2-1. Many states routinely conduct ambient toxicity tests as part of 305(b) monitoring; Total Maximum Daily Loads (TMDLs), and other programs (e.g., California's Surface Water Ambient Monitoring program (SWAMP), Washington Department of Ecology's ambient program, Wisconsin Department of Natural Resources' (WDNR) ambient monitoring program).

Table 2-2. Summary of WET test data analyzed

EPA WET test method	Number of tests		Number of laboratories	Number of permittees
	Effluent	Ref Tox		
Ceriodaphnia dubia (water flea) Survival and Reproduction[a]	554	238	44	68
Pimephales promelas (fathead minnow) Acute Survival[b]	347	0	15	101
Pimephales promelas (fathead minnow) Survival and Growth[b]	275	197	28	50
Americamysis bahia (mysid shrimp) Survival and Growth[c]	74	136	20	6
Dendraster excentricus and *Strongylocentrotus purpuratus* (Echinoderm) Fertilization[c]	83	94	11	10
Macrocystis pyrifera (giant kelp) Germination and Germ-tube length[d]	0	135	11	--
Haliotis rufescens (red abalone) Larval Development[c]	0	136	10	--
Ceriodaphnia dubia (water flea) Survival	7	232	27	2
Selenastrum capricomutum (green algae)	139	84	14	44

Notes:
a. Freshwater invertebrate
b. Freshwater vertebrate
c. Saltwater invertebrate
d. Saltwater algae

Representativeness of WET Data

The usefulness of the results obtained in this project depended on having valid, representative WET test data for each of the EPA WET test methods examined. Representativeness was characterized in this project as having data that met the following:

- Cover a range of NPDES permitted facility types, including both industrial and municipal permittees

- Represent many facilities for a given EPA WET test method (i.e., no one facility dominates the data for a given WET test method)
- Cover a range of target (design) effluent dilutions upon which WET RP and compliance are based, ranging from perhaps 10 percent to 100 percent effluent
- Generated by several laboratories for a given EPA WET test method
- Cover a range of observed effluent toxicity for each EPA WET test method (e.g., NOECs range from < 10 percent to 100 percent effluent)

Efforts were made to ensure that no one laboratory or permittee had > 10 percent of the test data for a given test type. The summary information presented in Table 2-2 demonstrates that WET test data were received from numerous laboratories and facilities for all EPA WET test methods analyzed under this project.

Data Processing

Processing of raw WET test data began with identifying the contents of each data package and recording the data source, test type, and related information as described in the previous section. Each valid WET test was assigned a unique code, and each laboratory was uniquely coded. A tracking system was used to help evaluate whether WET test data were needed for certain types of EPA WET test methods and to help increase representativeness of laboratories or types of facilities for a method.

Data were received in a variety of formats and compiled by test type in the database program CETIS® (Comprehensive Environmental Toxicity Information System; Tidepool Software, v. 1.0). The CETIS program is designed to analyze, store, and manage WET test data. WET test data received in either ToxCalc® or CETIS were imported directly into the CETIS database dedicated to this project. WET test data received in Excel or other spreadsheet formats were also directly imported into CETIS. In cases where the source organizations had not yet entered its WET test data electronically, they were supplied with a template so the data could be readily transferred to CETIS to minimize transcription errors. Data in CETIS were checked on 10 percent of the tests received from each source to document proper data transfer.

WET test data received as copies of bench sheets were first checked to ensure that all EPA WET method test acceptance criteria were met, as well as several other requirements discussed in the previous section. Those tests meeting all requirements were input into the CETIS database directly using the double entry mode and a comparison of entries to ensure accuracy of data input. All WET test data used in analyses originated from tests conducted with the minimum number of treatment replicates as required according to the specific EPA WET test methods (e.g., 10 replicates in chronic *Ceriodaphnia* tests). Tests using a different number of replicates per treatment were not used in analyses to generate percentiles of CV or mean response.

2.3 Setting the Test Method-Specific α Level

Monte Carlo simulation analysis was used to estimate the percentage of WET tests that would be declared toxic using TST as a function of different α levels, within-test control variability, and mean percent effect level. This analysis identified probable beta error rates (i.e., declaring an effluent toxic when in fact it is acceptable) as a function of α, mean effect at the IWC, and control CV. Using the RMDs discussed in Section 1.4, the lowest α level (with 0.05 being the

lowest α level used) was then identified for a given WET test design that also resulted in a β = 0.05 at a 10 percent mean effect in the effluent sample.

For each of the nine test methods examined, control CV was calculated on the basis of WET test data compiled as described in Section 2.2. Cumulative frequency plots were used to identify various percentiles of observed method-specific CVs (e.g., 25th, 50th, 75th percentiles). These measures were calculated to characterize typical achievable test performance in terms of control variability. A similar analysis was performed for the control endpoint responses for each of the nine test methods (e.g., mean offspring per female in the chronic *Ceriodaphnia dubia* test method) to characterize typical achievable test performance in terms of control response. The following describes the simulation analysis used to help identify appropriate alpha levels for each WET test method examined.

2.3.1 Simulation Analyses

In simulation analyses, sets of effluent and control WET test data were constructed having known properties with respect to different mean effect percentages and control CV as described below. Control CVs examined were based on CV percentiles observed in actual WET test data for a given WET test method. All simulation analyses were based on normally distributed WET test data and equal variances between the effluent and control for each scenario examined. These data were then analyzed using the one-tailed t-test published by Erickson and McDonald (1995) for bioequivalence testing (and mathematically defended in Erickson 1992 for normally distributed equal variance data) and the one-tailed traditional hypothesis t-test formulation (see Equations 1 and 2 below) to determine whether a given effluent was declared toxic using each approach at a specified α value. By simulating thousands of WET tests for a given scenario (mean percent effect and control CV and α level), the percentage of tests declared toxic could be calculated and compared among scenarios, and between the TST and the traditional hypothesis testing approach.

Equation 1: TST t-test assuming equal variances

$$t = \frac{\overline{Y_t} - b \times \overline{Y_c}}{S_p \sqrt{\frac{1}{n_t} + \frac{b^2}{n_c}}}$$

$$S_p = \sqrt{\frac{S_t^{\,2} \times (n_t - 1) + S_c^{\,2} \times (n_c - 1)}{(n_t + n_c - 2)}}$$

Equation 2: Traditional t-test assuming equal variances

$$t = \frac{\overline{Y_c} - \overline{Y_t}}{S_p \sqrt{\frac{1}{n_t} + \frac{1}{n_c}}}$$

$$S_p = \sqrt{\frac{S_t^{\,2} \times (n_t - 1) + S_c^{\,2} \times (n_c - 1)}{(n_t + n_c - 2)}}$$

It is understood that using normally distributed data and equal variances is a simplification for some WET test methods that are prone to non-normally distributed data and heterogeneous variances (e.g., acute fathead minnow test method). Additional analyses suggested that the bioequivalence t-test of Erickson and McDonald (1995) results in a very small (< 0.01) departure of the nominal α error rate using TST with data that have even a nine-fold difference between control and effluent variances (which is greater than most variance ratios observed in nearly 2,000 WET tests) and with data that were non-normally distributed (Appendix A). Thus, results of simulation analyses should be applicable to the types of non-normality and variance heterogeneity encountered in WET tests. This was further supported by additional research showing that WET test data distributions are typically not highly skewed or long-tailed because of the way in which the tests are designed and because there are boundaries on test acceptability criteria that truncate the data within a test and the difference in variance one observes between control and an effluent treatment. A review of the statistical literature as well as additional analyses in developing the TST approach confirmed that Welch's t-test is appropriate for the types of non-normal data distributions encountered in actual effluent WET tests as well as for normally distributed data (see Appendix A).

Probabilities of accepting the null hypothesis for the traditional and TST approaches will differ according to different settings for a number of parameters, including population variances, test sample size, and effect size (i.e., fraction of the control response). Each of these factors was varied in simulation analysis as follows:

Population Variances: Population variances were defined by test method (control CVs in a large number of actual WET tests for a given method). The population mean was set to the median value of observed control mean values from actual effluent tests, and the CV value ranged from approximately the 10th to 90th percentile of the observed control CV range. N samples (representing the minimum number of replicates required in the test method) from the control population were selected for each simulation.

Effect Size: Population mean for the treatment group was defined by a specified effect size. Five different effect sizes (from 10 percent to 30 percent of the control mean) were evaluated for each treatment group. For example, when the control mean = 25 and the effect size = 10 percent, N samples (corresponding to the minimum number of replicates required in the test method) were picked at random from a population with mean = 25 × ([100 – 10] percent).

Sample Size (N): For certain WET test methods, sample size for each test method was increased up to double the minimum number of replicates required for a given test method. For example, number of replicates for the chronic *C. dubia* test ranged from 10 to 20 in simulation analyses. This analysis provided useful information indicating potential benefits to a permittee if they conducted a WET test method with additional replicates, given a specified mean percent effect level and control CV observed, and a specified α level.

Alpha Error: The maximum allowable Type I error (α) in TST was specified at different levels ranging from 0.05 to 0.30 (6 values). Results of these analyses indicated potential β error rates (probability of declaring a sample toxic when it is acceptable) given a specified mean percent effect in the effluent and control CV. These results were also compared with results using the traditional hypothesis testing approach and an $\alpha = 0.05$ (the EPA-recommended α level using the

traditional hypothesis testing approach) to compare β error rates using both approaches. While comparison of results between TST and the traditional approach were not used to set test method α levels, this analysis was useful in documenting whether the TST approach was as protective as the traditional approach using a given α level.

After N samples of control and effluent were randomly selected from specified populations, the traditional hypothesis testing approach and TST were conducted as specified in equations 1 and 2 above. The one tail probabilities of declaring the test toxic using the traditional hypothesis testing approach and the TST approach were calculated and saved. This simulation was repeated 10,000 times for each combination of effect levels, CV, and alpha level. The percent of tests declared toxic was then calculated for each simulation setting.

Once β error rates were identified for a WET method given different α levels, control CVs, and percent mean effect levels, bivariate plots were used to compare the percentage of tests declared toxic as a function of α and the ratio of effluent mean: control mean at various within-test variability percentiles (e.g., 25th, 50th, 75th) and the RMD effect thresholds identified as either toxic (25 percent effect for chronic and 20 percent for acute) or negligible (10 percent mean effect). The results were then used to identify an appropriate α error rate for a test method given the RMDs noted in Section 1.4.

Finally, where there was sufficient effluent test data available, an analysis of actual effluent data was conducted using TST and the α level identified for the test method, and using the traditional hypothesis testing approach. Results of that analysis were used to estimate potential results if TST was used in the NPDES WET Program and to compare those results with those using the traditional hypothesis testing approach.

3.0 RESULTS

3.1 Chronic *Ceriodaphnia dubia* Reproduction Test

On the basis of actual WET data (N = 792 tests), the mean control reproduction ranged from 15.0 to 51.7, with a median mean value of 25.5 (Table 3-1). Control CVs ranged from 0.04 to 1.22 with a median value of 0.15 (Table 3-1). Using these data, simulation analyses were conducted to evaluate the percentages of tests declared toxic (i.e., failure to reject the null hypothesis) by TST at various alpha error rates (between 0.05 and 0.30), CVs, and percent mean effect in reproduction between the control and effluent concentration.

Table 3-1. Summary of mean control reproduction and control CV derived from analyses of 792 chronic *Ceriodaphnia dubia* WET tests

Percentile	Mean control reproduction	Control CV	Control SD
10th	17.7	0.08	2.07
25th	21.2	0.10	2.64
50th	25.5	0.15	3.79
70th	28.4	0.22	5.27
75th	29.4	0.24	5.82
85th	31.6	0.31	7.24
90th	33.3	0.35	8.41
95th	35.6	0.40	10.25

Identifying Test Method-Specific α

A summary of the simulation results is shown graphically in Figure 3-1. An alpha level of 0.20 satisfies both RMDs of (1) ensuring at least a 75 percent probability of declaring a 25 percent mean effect as toxic regardless of within-test control variability (denoted as effluent mean: control mean value of 0.75 on the x-axis of each graph in Figure 3-1), and (2) ensuring that a negligible effect (10 percent mean effect denoted as effluent mean: control mean value of 0.90) is declared toxic $\leq$ 5 percent of the time. Lower α levels (e.g., $\alpha = 0.10$) resulted in > 5 percent tests declared toxic when there was a 10 percent effect under average within-test CV values (i.e., $\beta > 0.05$). Note that using an $\alpha = 0.20$, a *Ceriodaphnia* test having a 20 percent mean effect at the IWC (effluent mean:control mean = 0.8) and median control variability (control CV = 0.15) will be declared toxic approximately 50 percent of the time using TST (Figure 3-1). Thus, as discussed in Section 1.3 and shown in Figure 1.2, some percentage of tests having an effluent mean effect less than the RMD threshold of 25 percent will be declared toxic using TST, even when the test control responds acceptably. Likewise, at an $\alpha = 0.20$, a *Ceriodaphnia* test exhibiting a 10 percent mean effect in the effluent (0.9 on the x-axis in Figure 3-1) and relatively high control variability (control CV = 0.25, 75th percentile for this WET test method) will have approximately a 25 percent probability of being declared toxic (Figure 3-1), even though a 10 percent mean effect is considered acceptable using TST.

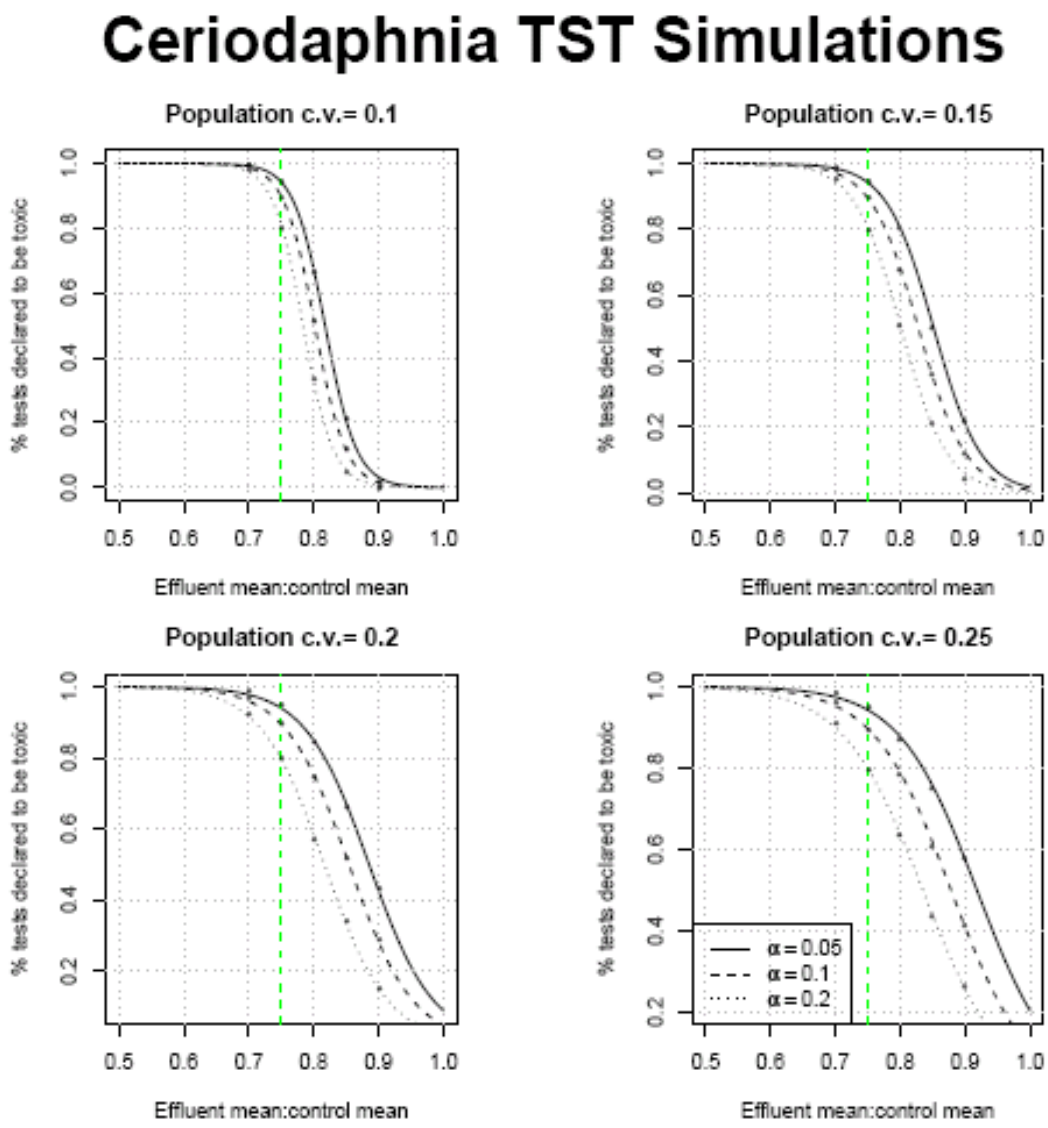

Figure 3-1. Power curves showing the percentage of tests declared toxic as a function of the ratio of effluent mean to control mean response and α level categorized by the level of control within-test variability. CVs of 0.1, 0.15, 0.2, and 0.25 correspond to the approximate 25th, 50th, 70th, and 75th percentiles for the chronic *Ceriodaphnia* WET method. The dashed line indicates the 75 percent mean effect level, which is the decision threshold for chronic tests.

The above results illustrate two features of the TST approach that should be understood: (1) At mean effect levels < the RMD toxicity threshold, there are differing probabilities of an effluent being declared toxic (i.e., different actual α error rates) depending on within-test variability and the difference in mean responses observed between control and IWC (see Figure 1-2). An effluent with a mean effect substantially lower than the RMD threshold of 25 percent will have some probability of being declared toxic. (2) For this WET test method and some others examined in this project, there is some probability of declaring a test non-toxic when the mean effect in the effluent exceeds the RMD threshold of 25 percent; e.g., at an α = 0.20 and relatively

high within-test variability, a 30 percent mean effect in the effluent might not be declared toxic as much as 10 percent of the time.

The following examples give representative results of the simulation analysis, illustrating the effect of different alpha levels in terms of meeting RMDs for TST.

In the first example, there is a 10 percent mean effect in the effluent and a median level of within-test control precision (50th percentile CV of 0.15). Use of alpha levels ranging from 0.05 to 0.30 resulted in failure to reject the null hypothesis in ~20 percent to ~5 percent of tests, respectively, with α levels $\geq$ 0.20 meeting the RMD of $\beta \leq 0.05$ at a 10 percent mean effect level (Figure 3-2).

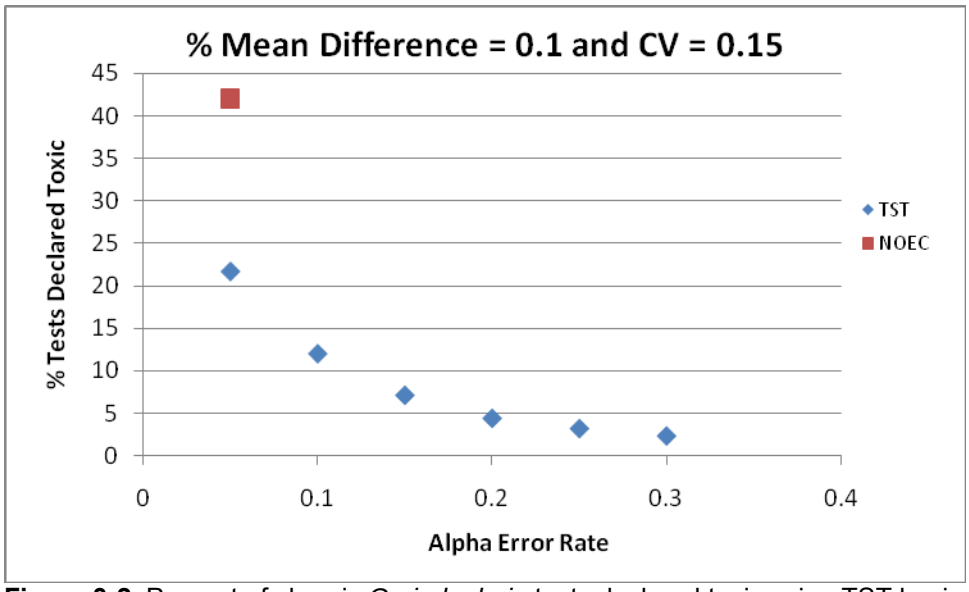

Figure 3-2. Percent of chronic *Ceriodaphnia* tests declared toxic using TST having a mean effluent effect of 10 percent and average control variability as a function of α error rate. Result using the traditional hypothesis approach (α = 0.05) is shown as well.

In a second example, the effluent has a mean effect of 25 percent and above average control CV (75th percentile). At α levels < 0.25, the percentage of tests declared toxic is $\geq$ 75 percent, meeting the RMD for false negative rate (α).

The rate at which tests were declared toxic was evaluated using both the traditional hypothesis testing approach with an alpha error rate of 0.05 (as recommended in the EPA WET test methods) and the TST approach with different alpha error rates. At a 50th percentile CV (0.15) and a mean effect of 10 percent, use of the TST approach results in fewer declared toxic tests relative to the traditional hypothesis approach at all alpha error rates examined (Figure 3-2). For tests with the same mean effect (10 percent) but higher control variability (CV = 0.25), TST yields a higher rate of tests declared toxic at alpha error rates of 0.05, 0.10, and 0.15 and approximately equivalent percent toxic tests at alpha error rates of 0.20 and 0.25 (Figure 3-2). Those results are in keeping with the RMD that tests with negligible (10 percent) mean effect in

the effluent are declared non-toxic most of the time but are declared to be toxic more frequently as test precision is poorer.

Tests with a mean effect of 25 percent and above average precision (CV = 0.25) result in a higher rate of tests declared toxic using TST than using the traditional hypothesis approach (Figure 3-3). This result is a direct consequence of the RMDs defined for TST but illustrate disincentives to collect more precise data using the traditional hypothesis approach currently used.

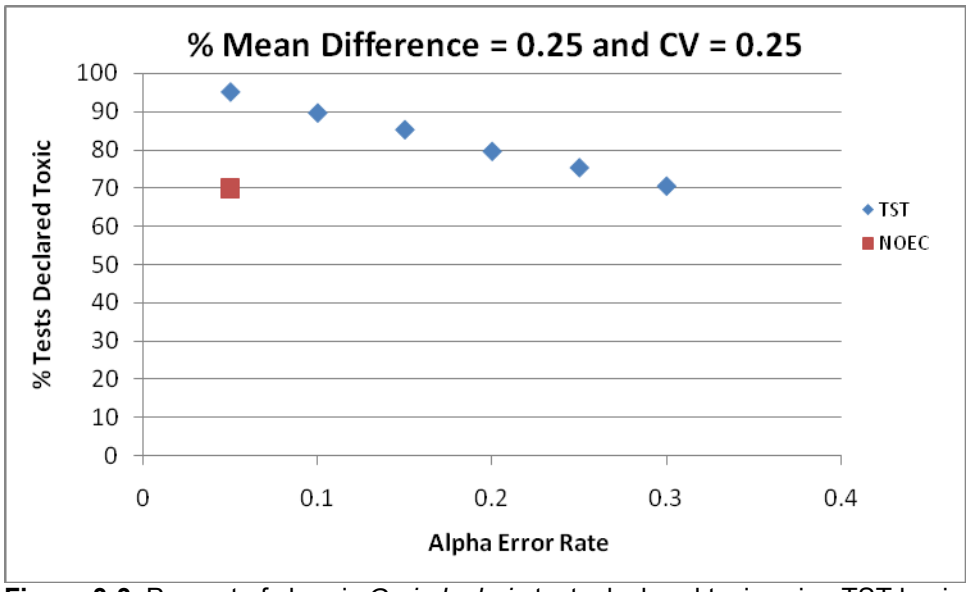

Figure 3-3. Percent of chronic *Ceriodaphnia* tests declared toxic using TST having a mean effluent effect of 25 percent and high control variability as a function of α error rate. Result using the traditional hypothesis approach (α = 0.05) is shown as well.

Effect of Increased Number of Within-Test Replicates

One of the intended benefits of the TST approach is that increasing the precision and power of the test increases the chances of rejecting the null hypothesis and declaring a sample non-toxic when it meets the RMD for acceptability. This increases the ability of the permittee to *prove the negative* that a sample is acceptable. To demonstrate this benefit, the effect of increasing test replication on the TST β error rate (declaring a sample toxic when it is not) was explored using simulated data.

Increasing test replication with this method (and thereby the power of the test) results in a *higher* rate of tests declared toxic using the traditional hypothesis testing approach and a *lower* rate of tests declared toxic using the TST approach (e.g., Figure 3-4). For tests with a mean effect of 10 percent and a control CV of 0.25 (approximately 75th percentile for this method), slightly more tests will be declared toxic using the TST approach as compared to the traditional hypothesis testing approach when the minimum test design of 10 replicates is used for this WET method. If the number of within-test replicates is increased, the TST approach demonstrates an improved ability to declare such a test as acceptable. As the mean effect at the effluent approaches 25 percent, the percentage of tests declared toxic is less affected by increased replication using TST because the *b* value and α value were selected to identify a 25 percent mean effect in the IWC as

toxic ≥ 75 percent of the time. However, the percentage of tests declared toxic continues to increase using the traditional hypothesis approach even when there is a negligible effect (10 percent effect) of the effluent as defined by TST (Figure 3-5). Thus, increasing test replication increases TST's ability to confirm that an effluent is acceptable in tests with mean effect less than 25 percent.

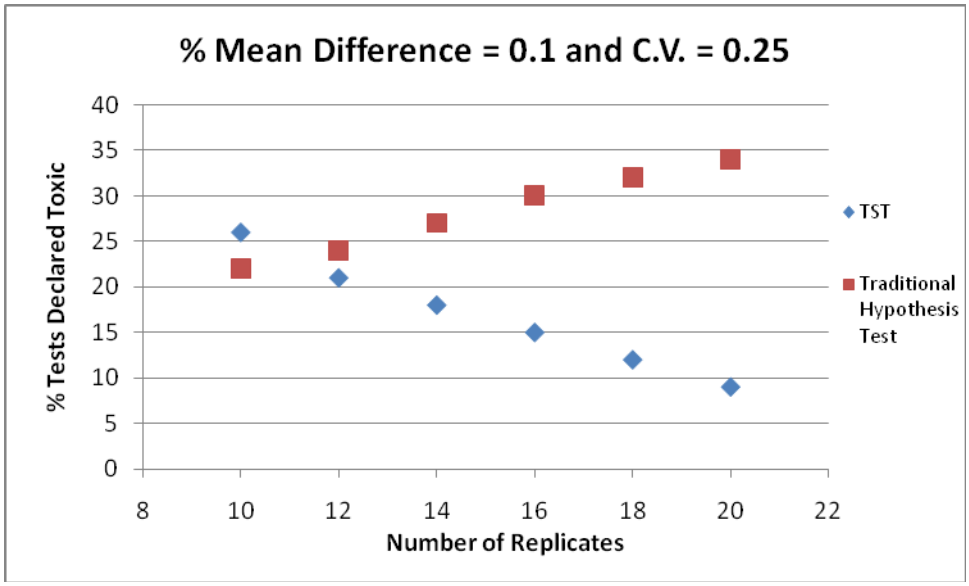

Figure 3-4. Percent of chronic *Ceriodaphnia* tests declared toxic using TST having a mean effluent effect of 10 percent and above average control variability and α = 0.20, as a function of the number of test replicates. Result using the traditional hypothesis approach (α = 0.05) is shown as well.

Effluent Data Results

Results from actual effluent tests were compared between TST and the traditional hypothesis testing approach for those tests having control CV between 0.15–0.24 (Table 3-2). At a mean effect of 10–15 percent at the IWC (N = 48), TST declared a lower percentage of tests toxic than the traditional hypothesis testing approach. This result is consistent with the RMD that a 10 percent mean effect should be declared acceptable much (95 percent) of the time. However, when the mean effect was greater than 25 percent (N = 303), TST declared 100 percent of the tests toxic while the traditional hypothesis testing approach did not. This result is also consistent with the TST goal that as the mean effect approaches 25 percent at least 75 percent of the tests should be declared toxic. This result also indicates that given the effluent data available, TST is at least as protective as the traditional hypothesis approach currently used.

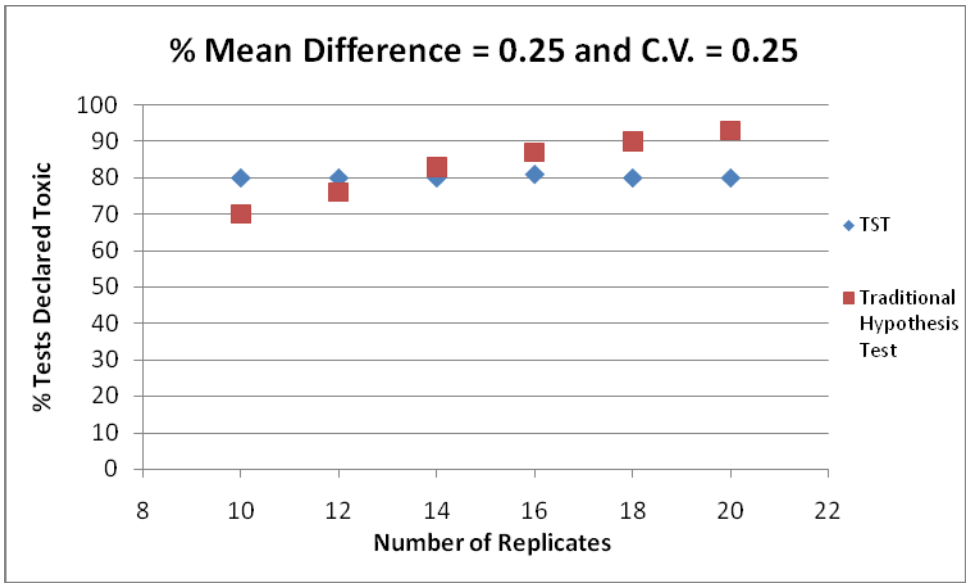

Figure 3-5. Percent of *Ceriodaphnia* tests declared toxic using TST having a mean effluent effect of 25 percent and above average control variability (α = 0.20) as a function of the number of test replicates. Result using the traditional hypothesis approach (α = 0.05) is shown as well.

Table 3-2. Comparison of the percentage of chronic effluent *Ceriodaphnia* tests declared toxic using TST versus the traditional hypothesis testing approach

% Mean effect	N	% tests toxic using TST	% Tests toxic using traditional hypothesis testing approach
10–15	48	6.2	18.7
20–30	48	100	87.5
> 25	303	100	95.2

3.2 Chronic *Pimephales promelas* Growth Test

On the basis of actual WET data (N = 472 tests), the mean control growth ranged from 0.31 to 1.30, with a median mean value of 0.62 (Table 3-3). Control CVs ranged from 0.03 to 0.50 with a median value of 0.09 (Table 3-3). Using these data, simulation analyses were conducted to evaluate the percentages of tests declared toxic (i.e., failure to reject the null hypothesis) by TST at various alpha error rates (between 0.05 and 0.30), CVs, and percent mean effect in growth between the control and effluent concentration.

Identifying Test Method-Specific α

On the basis of all simulation results (Figure 3-6), an alpha error rate of 0.25 is appropriate for use in applying the TST approach to analysis of two concentration chronic *P. promelas* data because using that alpha error rate satisfies both RMDs of (1) ensuring at least an 75 percent probability of declaring a 25 percent mean effect as toxic and (2) ensuring that a negligible effect ($\leq$ 10 percent mean effect) is declared toxic $\leq$ 5 percent of the time.

Table 3-3. Summary of mean control growth and control CV derived from analyses of 472 chronic *Pimephales promelas* WET tests

Percentile	Mean control growth	Control CV	Control SD
10th	0.34	0.04	0.02
25th	0.43	0.06	0.03
50th	0.62	0.09	0.05
70th	0.76	0.12	0.07
75th	0.79	0.13	0.08
85th	0.86	0.16	0.10
90th	0.89	0.17	0.11
95th	0.94	0.21	0.13

As noted for the *Ceriodaphnia* chronic test in Section 3.1, the Type I error rate will vary from the RMD Type I error rate of 0.25 depending on the level of toxicity observed in the effluent and control variability within a test. When toxicity is > 25 percent mean effect in the effluent, the Type I error rate is lower. However, as noted in Section 1.3, there is some probability (< 10 percent) that a mean effect > 25 percent in the IWC will be declared non-toxic depending on within-test variability. Likewise, a reasonable percentage (as much as 50 percent) of tests having a mean effect = 15 percent in the effluent will be declared toxic using the TST approach, again depending on within-test variability: the greater the within-test variability the greater the probability of declaring toxicity at mean effect levels below the toxicity decision threshold of 25 percent.

For example, at a 10 percent mean effect in the effluent and above average within-test control variability (between the 50th and 75th percentile, CV of 0.11), use of an alpha level of 0.25 results in failure to reject the null hypothesis ~5 percent of the time (Figure 3-7). Lower alpha levels resulted in a higher percentage of tests declared toxic at that mean effect level and CV range (Figure 3-6). That indicates that using an alpha = 0.25 for this test method, TST achieves the RMD of correctly identifying an acceptable sample (based on the RMD that a 10 percent mean effect is negligible). However, less precise tests (but still well within normal test method performance) result in less ability to reject the null hypothesis that the sample is toxic and the rate of tests declared toxic increases even at a percent mean effect of 10 percent (Figure 3-6). For tests with a mean effect of 25 percent (the RMD toxicity threshold) and alpha error rate of 0.25, 75 percent of the tests are declared toxic as expected (Figure 3-8).

Effect of Increased Number of Within-Test Replicates

As expected, increasing test replication (and thereby the power of the test) results in a *higher* rate of tests declared toxic using the traditional hypothesis testing approach and a *lower* rate of tests declared toxic using the TST approach and chronic *P. promelas* test data (e.g., Figure 3-9). For tests with a mean effect of 10 percent in the effluent and a control CV of 0.15 (slightly greater than the 75th percentile for this method), slightly more tests are declared toxic using the TST approach as compared to the traditional hypothesis testing approach when the minimum test design of four replicates is used for this WET endpoint. If replicates are added to the test design, the TST approach demonstrates an increased ability to declare the results acceptable. As the mean effect approaches 25 percent, the percentage of tests declared toxic is less affected by

increased replication using TST because a 25 percent effect is the RMD used to define *b* and the null hypothesis. However, the percentage of tests declared toxic continues to increase using the traditional hypothesis testing approach even when there is a 10 percent effect of the effluent. Thus, increasing test replication increases TST's ability to confirm an acceptable effluent when the mean effect is less than 25 percent in the effluent.

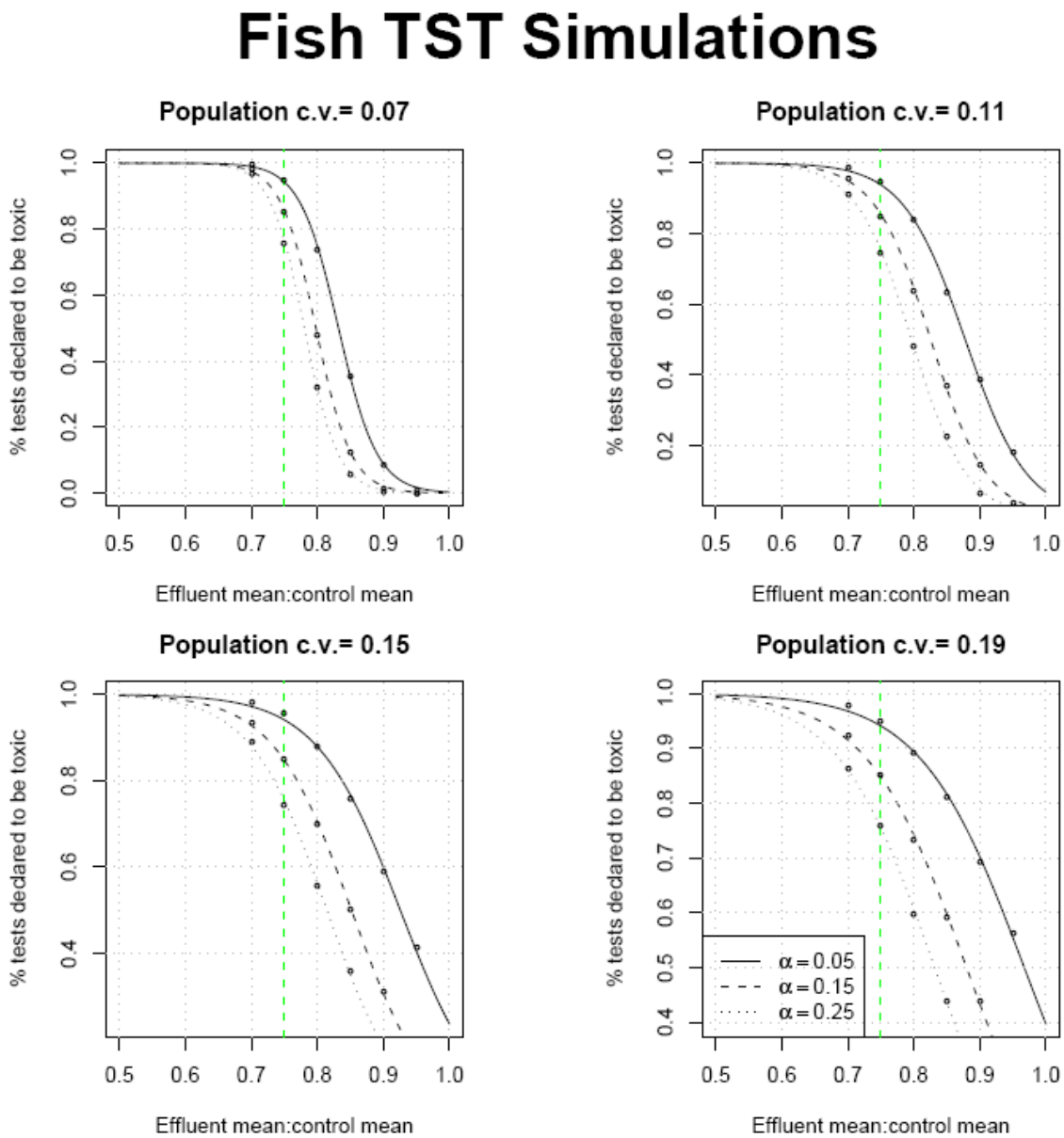

Figure 3-6. Power curves showing the percentage of tests declared toxic as a function of the ratio of effluent mean to control mean response and α level categorized by the level of control within-test variability. CVs correspond to the 25th, 50th, 75th, and 90th percentiles for the chronic fathead minnow WET method. The dashed line indicates the 75 percent mean effect level, which is the decision threshold for chronic tests.

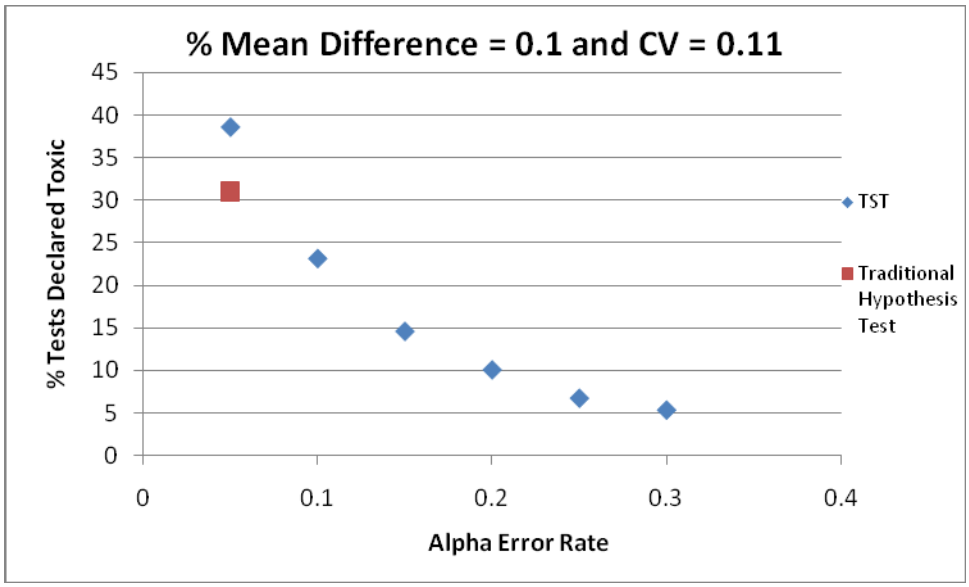

Figure 3-7. Percent of chronic fathead minnow tests declared toxic using TST having a mean effluent effect of 10 percent and average control variability as a function of α error rate. Result using the traditional approach (α = 0.05) is shown as well.

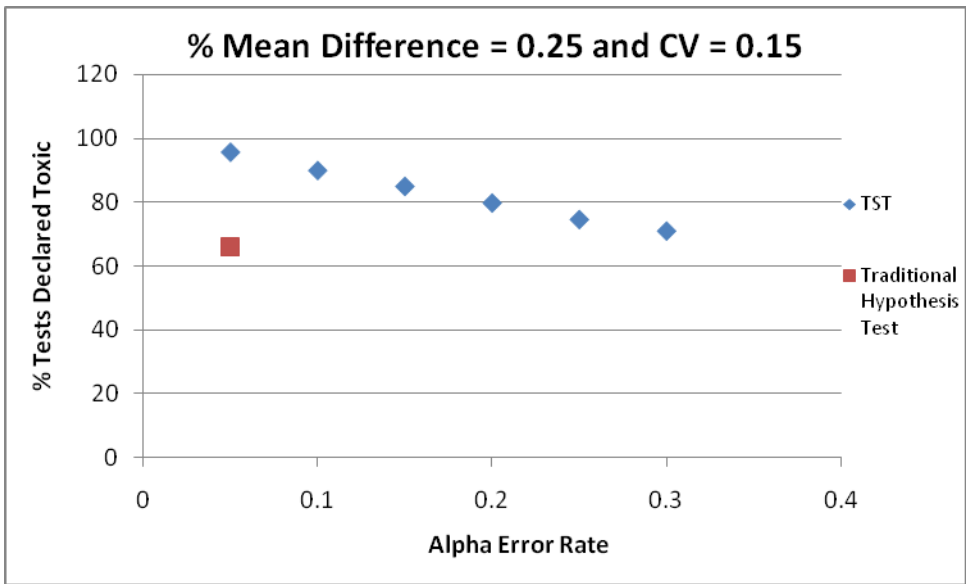

Figure 3-8. Percent of chronic fathead minnow tests declared toxic using TST having a mean effluent effect of 25 percent and above average control variability as a function of α error rate. Result using the traditional approach (α = 0.05) is shown as well.

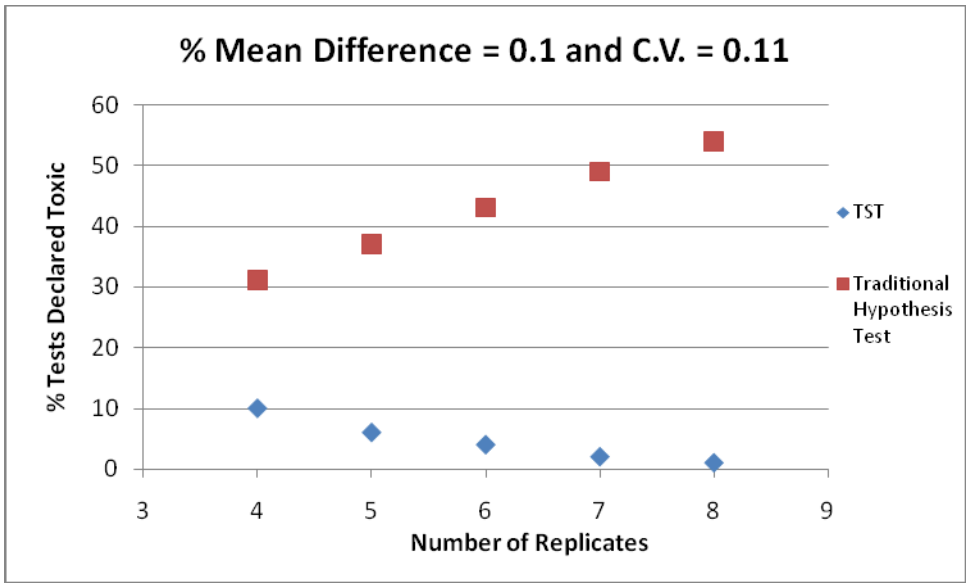

Figure 3-9. Percent of chronic fathead minnow tests declared toxic using TST having a mean effluent effect of 10 percent and average control variability and an α = 0.25, as a function of the number of test replicates. Result using the traditional approach (α = 0.05) is shown as well.

Effluent Data Results

Results from actual effluent tests were compared between TST and the traditional hypothesis testing approach for those tests having control CV between 0.09–0.13 (Table 3-4). At a mean effect of 10–15 percent (N = 58), TST declared none of the tests toxic while the traditional hypothesis testing approach declared nearly all of the tests toxic. However, if the mean effect is greater than 25 percent (N = 136), both approaches declared 100 percent of the tests toxic. Those results indicate that TST is as protective as the current hypothesis testing approach for those tests when the TST RMD threshold for toxicity is exceeded.

Table 3-4. Comparison of the percentage of chronic effluent fathead minnow tests declared toxic using TST versus the traditional hypothesis testing approach

% Mean effect	N	% tests toxic using TST	% tests toxic using traditional hypothesis testing approach
10–15	58	0	98
> 25	136	100	100

3.3 Chronic *Americamysis bahia* Growth Test

On the basis of actual WET data (N = 210 tests), the mean control growth ranged from 0.20 to 0.66, with a median value of 0.30 (Table 3-5). Control CVs ranged from 0.07 to 0.87 with a median value of 0.14 (Table 3-5). Using those data, simulation analyses were conducted to evaluate the percentages of tests declared toxic (i.e., failure to reject the null hypothesis) by TST at various alpha error rates (between 0.05 and 0.30), CVs, and percent mean effect in growth between the control and effluent concentration.

Table 3-5. Summary of mean control growth and control CV derived from analyses of 210 chronic *Americamysis bahia* WET tests

Percentile	Mean control growth	Control CV	Control SD
10th	0.22	0.08	0.02
25th	0.25	0.10	0.03
50th	0.30	0.14	0.04
70th	0.36	0.17	0.06
75th	0.38	0.18	0.06
85th	0.41	0.22	0.07
90th	0.43	0.27	0.08
95th	0.47	0.35	0.11

Identifying Test Method-Specific α

On the basis of all simulation results (Figure 3-10), an alpha error rate of 0.15 is appropriate for use in applying the TST approach to analysis of chronic mysid data because using this alpha error rate satisfies both RMDs of (1) ensuring at least an 75 percent probability of declaring a 25 percent mean effect as toxic and (2) ensuring that a negligible effect ($\leq$ 10 percent mean effect) is declared toxic $\leq$ 5 percent of the time under average or better than average test performance.

For example, at a 10 percent mean effect in effluent and an approximate median level of precision (50th percentile CV of 0.14), an alpha level of 0.15 or greater resulted in failure to reject the null hypothesis in ≤ 5 percent of tests (Figure 3-11). For tests with a mean effect of 25 percent, the rate of tests declared toxic > 75 percent is achieved for alpha values ≤ 0.25 (Figure 3-12).

At a ~50th percentile CV (0.13) and a mean effect of 10 percent, use of the TST approach results in significantly fewer toxic tests relative to the traditional hypothesis testing approach at all alpha error rates (Figure 3-11). For tests with the same mean effect (10 percent) but lower control precision (CV = 0.18), TST yields a higher rate of tests declared toxic at an alpha error rate of 0.05 and approximately equivalent percent toxic tests at a alpha error rate of 0.10.

Tests with a mean effect of 25 percent and above average precision (CV = 0.18) result in a high rate of tests declared toxic (Figure 3-12). The results are in agreement with the RMDs of the TST: As the mean effect approaches 25 percent, a greater proportion of the tests are determined to be toxic. Further, the less precise the test control data, the greater the rate of tests declared toxic (i.e., fail to reject the null hypothesis).

Effect of Increased Number of Within-Test Replicates

As expected, increasing test replication (and thereby the power of the test) results in a *higher* rate of tests declared toxic using the traditional hypothesis testing approach and a *lower* rate of tests declared toxic using the TST approach at a negligible effect of 10 percent, as shown in the example using chronic *A. bahia* test data (e.g., Figure 3-13). If replicates are added to the test design, the TST approach demonstrates an increased ability to declare such a test as non-toxic. As the mean effect approaches 25 percent, the percentage of tests declared toxic is less affected by increased replication using TST because a 25 percent effect is the RMD toxicity threshold identified in TST. However, the percentage of tests declared toxic continues to increase using the

traditional hypothesis testing approach even when there is a negligible effect (10 percent effect as defined by TST) of the effluent. Thus, increasing test replication increases TST's ability to confirm an acceptable level of toxicity in tests with mean effect less than 25 percent.

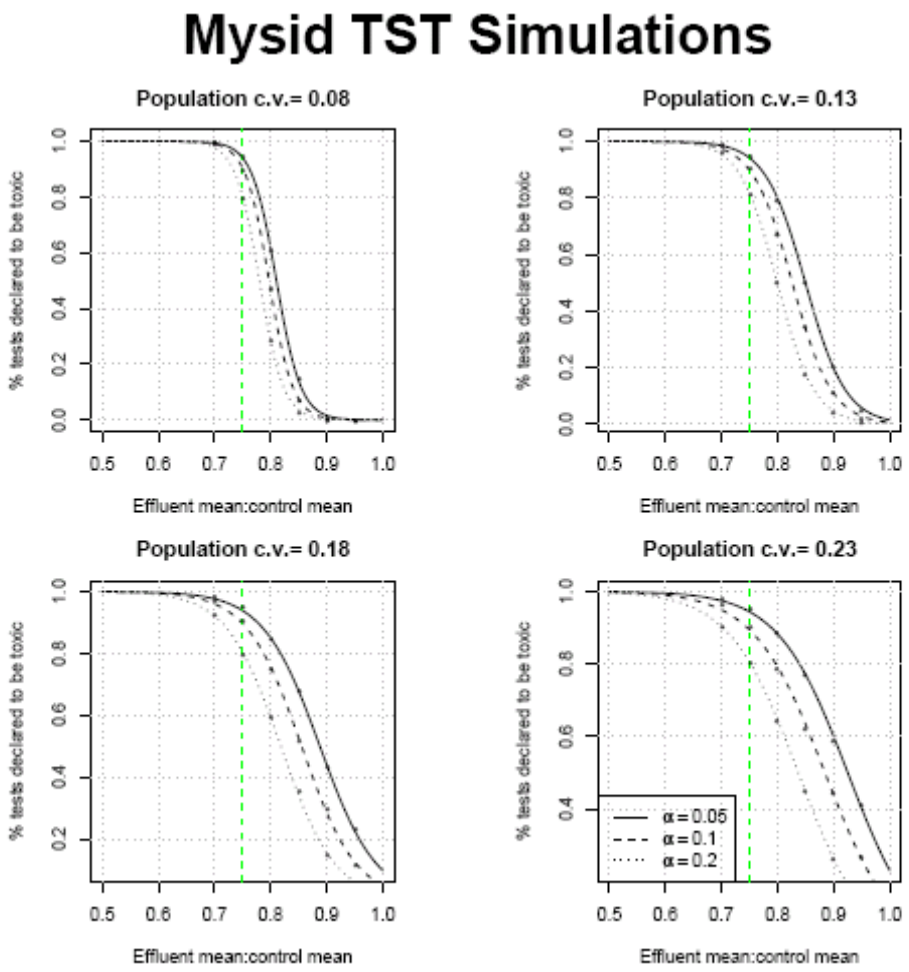

Figure 3-10. Power curves showing the percentage of tests declared toxic as a function of the ratio of effluent mean to control mean response and α level categorized by the level of control within-test variability. CVs correspond to the 25th, 50th, 70th, and 90th percentiles for the chronic mysid WET method. The dashed line indicates the 75 percent mean effect level, which is the decision threshold for chronic tests.

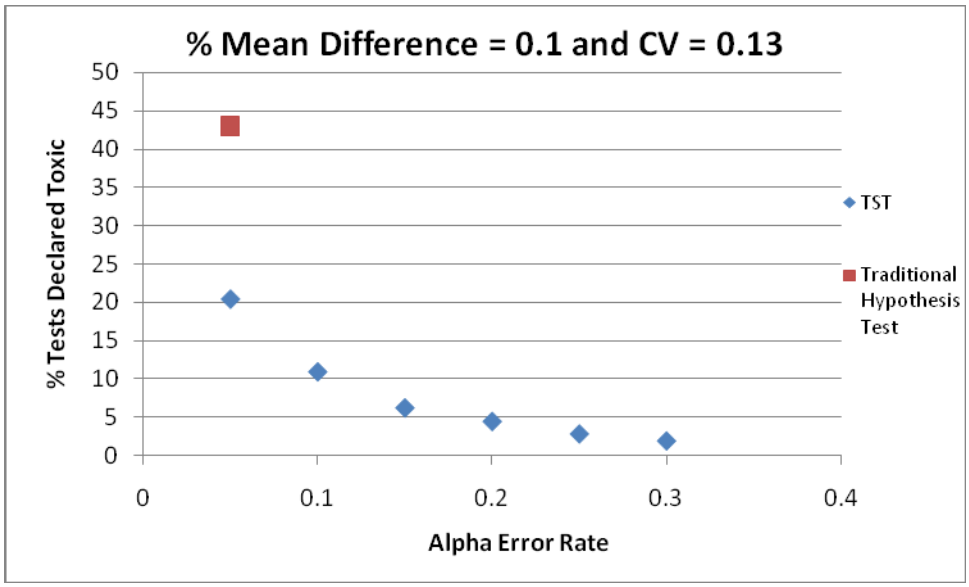

Figure 3-11. Percent of chronic mysid tests declared toxic using TST having a mean effluent effect of 10 percent and average control variability as a function of the α error rate. Result using the traditional hypothesis approach (α = 0.05) is shown as well.

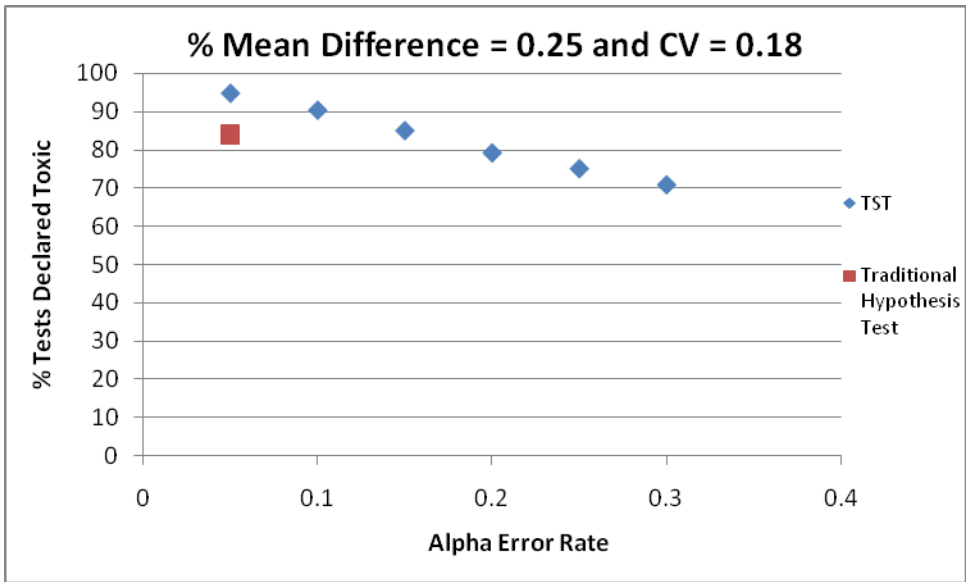

Figure 3-12. Percent of chronic mysid tests declared toxic using TST having a mean effluent effect of 25 percent and average control variability as a function of the α error rate. Result using the traditional hypothesis approach (α = 0.05) is shown as well.

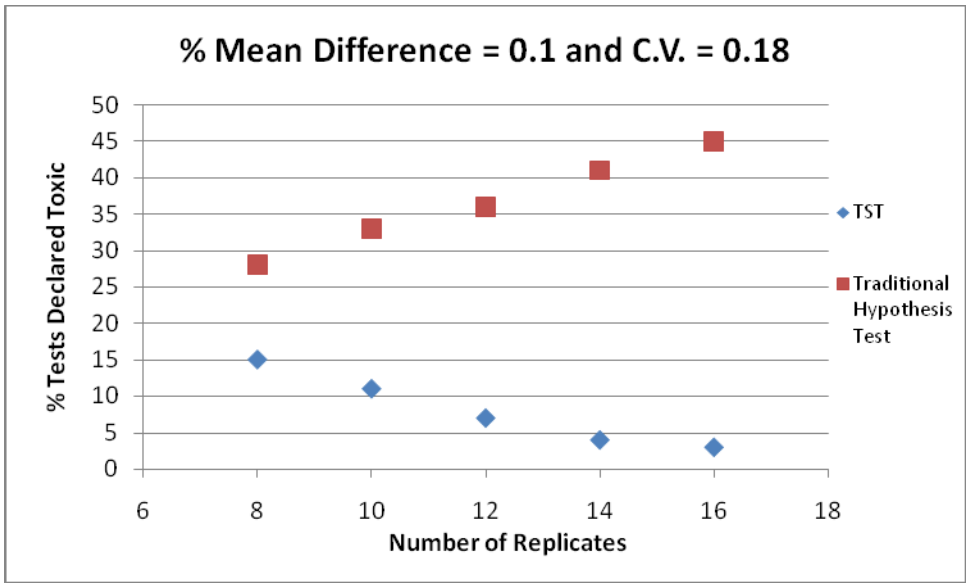

Figure 3-13. Percent of chronic mysid tests having a mean effluent effect of 10 percent and above average control variability declared toxic using TST and an α = 0.15, as a function of the number of test replicates. Results using the traditional hypothesis approach (α = 0.05) are shown as well.

Effluent Data Results

Results from actual effluent tests were compared between TST and the traditional hypothesis testing approach for those tests having control CV between 0.14–0.26 (75th – 90th percentile; Table 3-6). At a mean effect of 5–15 percent (N = 52), TST declared a lower percentage of tests toxic than the traditional hypothesis approach. That is expected because 10 percent mean effect in the effluent is considered negligible. However, when the mean effect in the effluent is greater than 25 percent (N = 95), both approaches declared 100 percent of the tests toxic.

Table 3-6. Comparison of percentage of chronic effluent mysid shrimp tests declared toxic using TST versus the traditional hypothesis testing approach

% Mean effect	N	% tests toxic using TST	% tests toxic using traditional hypothesis testing approach
5-15	52	1.9	11.5
> 25	95	100	100

3.4 Chronic *Haliotis rufescens* Larval Development Test

From actual WET data (N = 136 reference toxicant tests), mean control larval development ranged from 0.800 to 1.000, with a median mean value of 0.938 (Table 3-7). Control CVs ranged from 0.000 to 0.333 with a median value of 0.03 (Table 3-7). Using those data, simulation analyses were conducted to evaluate the percentages of tests declared toxic (i.e., failure to reject the null hypothesis) by TST at various alpha error rates (between 0.05 and 0.30), CVs, and percent mean effect in larval development between the control and effluent concentration.

Identifying Test Method-Specific α

On the basis of simulation results and power analyses (Figure 3-14), an alpha error rate of 0.05 is appropriate for use in applying the TST approach to analysis of chronic *H. rufescens* data because using this alpha error rate satisfies both RMDs of (1) ensuring at least an 75 percent probability of declaring a 25 percent mean effect as toxic and (2) ensuring that a negligible effect (≤ 10 percent mean effect) is declared toxic ≤ 5 percent of the time (Figure 3-14). Note that higher alpha levels would also satisfy the above RMDs; however, as noted in Section 1.4, the Type I error rate is set as close to 0.05 as practicable given routine control performance.

Table 3-7. Summary of mean control larval development and control CV derived from analyses of 136 chronic red abalone WET tests

Percentile	Mean control larval development	Control CV	Control SD
10th	0.839	0.02	0.01
25th	0.900	0.02	0.02
50th	0.938	0.03	0.03
70th	0.961	0.04	0.04
75th	0.968	0.05	0.04
85th	0.977	0.06	0.05
90th	0.982	0.06	0.06
95th	0.988	0.07	0.07

At a 10 percent mean effect in the effluent, for example, and ~80th percentile CV of 0.05, alpha levels ranging from 0.05 to 0.30 result in failure to reject the null hypothesis in none of the tests (Figure 3-15). The rate of rejection of the null hypothesis using TST decreases only slightly with increasing CV. This result is indicative of the low within-test control variability routinely achieved using this WET test method.

For tests with a mean effect of 25 percent, the rate of tests declared toxic ranges from ~95 to ~70 percent, at approximately the 80th percentile CV value for alpha levels ranging from 0.05 to 0.30, respectively (Figure 3-16). Thus, at an alpha = 0.05, the rate of tests declared toxic at a 25 percent mean effect in the effluent meets the RMD.

At ~80th percentile CV (0.05) and a mean effect of 10 percent, use of the TST approach results in significantly fewer toxic tests relative to the traditional hypothesis approach at all alpha error rates (Figure 3-15). Those results are in keeping with the RMD of the TST approach; tests with a negligible (10 percent) mean effect of the effluent are declared non-toxic 95 percent of the time when test control data have average precision.

Tests with a mean effect of 25 percent and above average precision (CV = 0.05) resulted in an equivalent rate of tests declared toxic as the traditional hypothesis approach when the TST α = 0.05 (Figure 3-16). The results further support the selection of TST α = 0.05 for this test method.

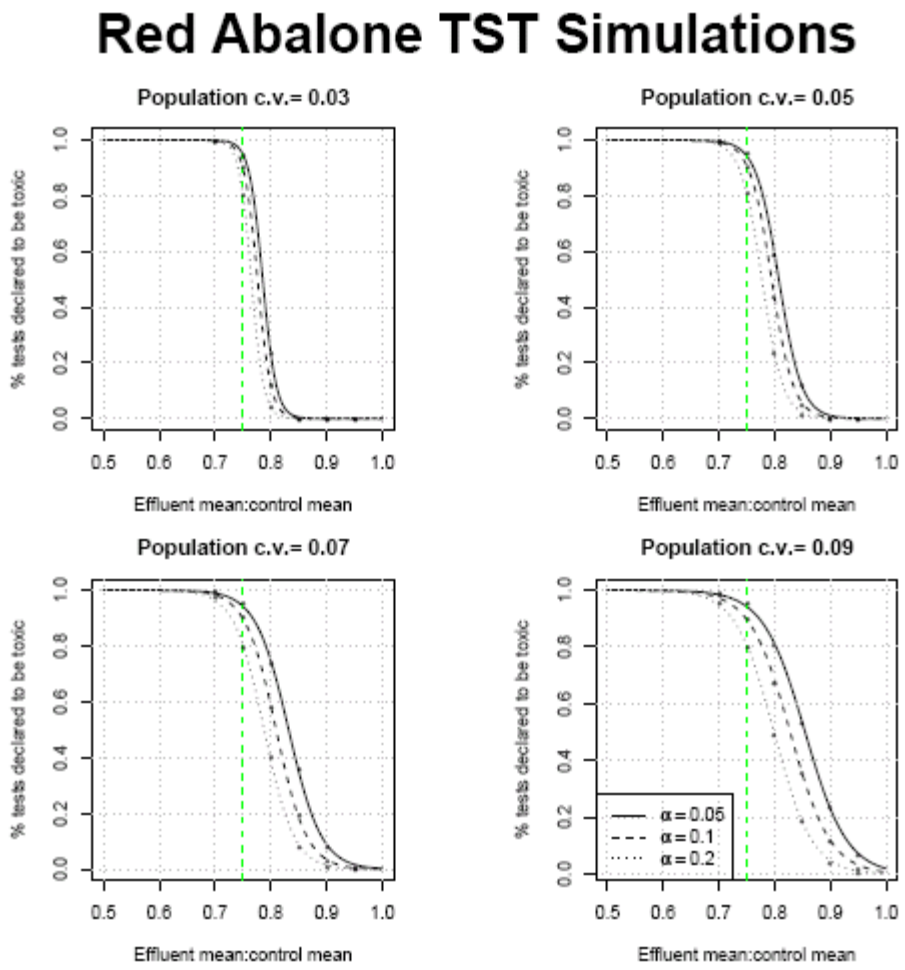

Figure 3-14. Power curves showing the percentage of tests declared toxic as a function of the ratio of effluent mean to control mean response and α level categorized by the level of control within-test variability. CVs correspond to the 25th, 50th, 75th, and 98th percentiles for the chronic red abalone WET method. The dashed line indicates the 75 percent mean effect level, which is the decision threshold for chronic tests.

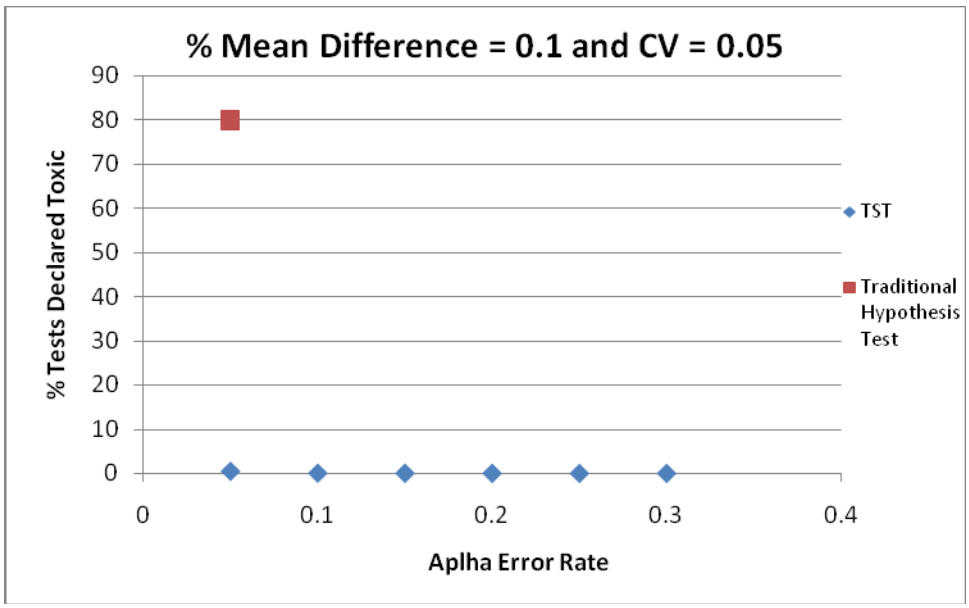

Figure 3-15. Percent of chronic red abalone tests declared toxic using TST having a mean effluent effect of 10 percent and average control variability as a function of the α error rate. Result using the traditional hypothesis approach (α = 0.05) is shown as well.

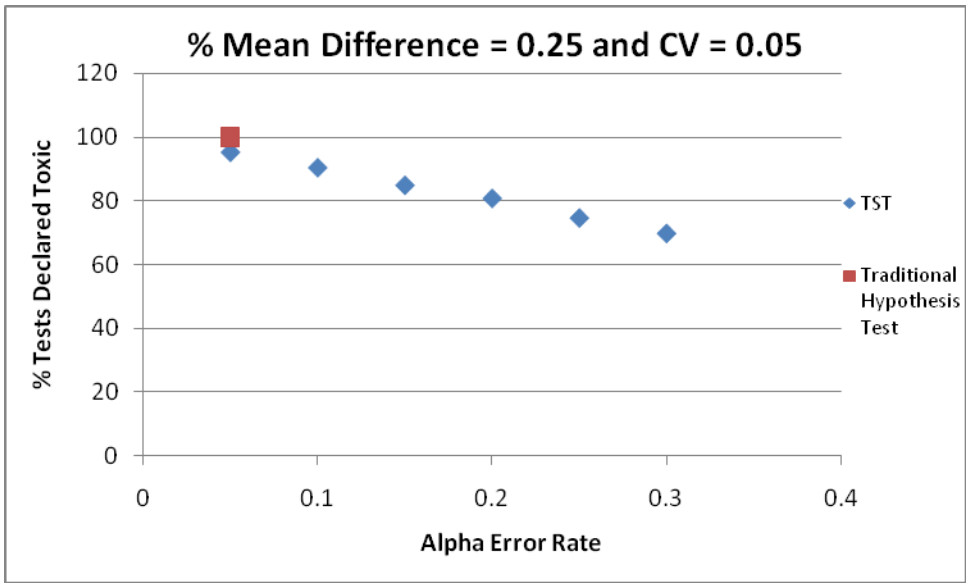

Figure 3-16. Percent of chronic red abalone tests declared toxic using TST having a mean effluent effect of 25 percent and average control variability as a function of the α error rate. Result using the traditional hypothesis approach (α = 0.05) is shown as well.

3.5 Chronic *Macrocystis pyrifera* Germination Test

On the basis of actual WET data (N = 135 reference toxicant tests), mean control germination ranged from 0.700 to 0.985, with a median mean value of 0.908 (Table 3-8). Control CVs ranged

from 0.006 to 0.560 with a median value of 0.04 (Table 3-8). Using that data, simulation analyses were conducted to evaluate the percentages of tests declared toxic (i.e., failure to reject the null hypothesis) by TST at various alpha error rates (between 0.05 and 0.30), CVs, and percent mean effect in germination between the control and effluent concentrations.

Table 3-8. Summary of mean control germination and control CV derived from analyses of 135 chronic giant kelp WET tests

Percentile	Mean control germination	Control CV	Control SD
10th	0.783	0.02	0.02
25th	0.859	0.03	0.02
50th	0.908	0.04	0.03
70th	0.936	0.05	0.04
75th	0.940	0.05	0.05
85th	0.958	0.07	0.06
90th	0.965	0.07	0.06
95th	0.973	0.10	0.09

Identifying Test Method-Specific α

On the basis of all simulation results (Figure 3-17), an alpha error rate of 0.05 is appropriate for use in applying the TST approach to analysis of chronic *M. pyrifera* germination data because using this alpha error rate satisfies both RMDs of (1) ensuring at least an 75 percent probability of declaring a 25 percent mean effect as toxic and (2) ensuring that a negligible effect ($\leq$ 10 percent mean effect) is declared toxic $\leq$ 5 percent of the time under average test performance. As noted above for the Abalone test method, higher alpha levels also satisfy the above RMDs; however, an alpha level of 0.05 is selected because it is more protective at effect levels > 25 percent.

At a 10 percent mean effect in the effluent for example, and routine, achievable control precision (~75th percentile CV of 0.05), alpha levels ranging from 0.05 to 0.30 resulted in failure to reject the null hypothesis in none of tests (Figure 3-18). Thus, for this test endpoint, low within-test control variability is routinely achieved.

For tests with a mean effect of 25 percent, the rate of tests declared toxic ranges from ~95 percent to ~70 percent, at alpha levels ranging from 0.05 to 0.30, respectively, and approximately the 75th percentile CV level (Figure 3-19). All alpha levels < 0.25 achieved the RMD that a 25 percent mean effect is declared toxic at least 75 percent of the time.

At ~75th percentile CV (0.05) and a mean effect of 10 percent, use of the TST approach results in significantly fewer tests declared toxic relative to the traditional hypothesis approach at all alpha error rates (Figure 3-18). Those results are because the RMD for effluent acceptability (10 percent mean effect) is designed to be met ≥ 95 percent of the time.

Tests with a mean effect of 25 percent and above average precision (CV = 0.05) result in a similar rate of tests declared toxic (Figure 3-19) as the traditional hypothesis approach when the TST $\alpha = 0.05$. The results further support the selection of TST $\alpha = 0.05$ for this test endpoint.

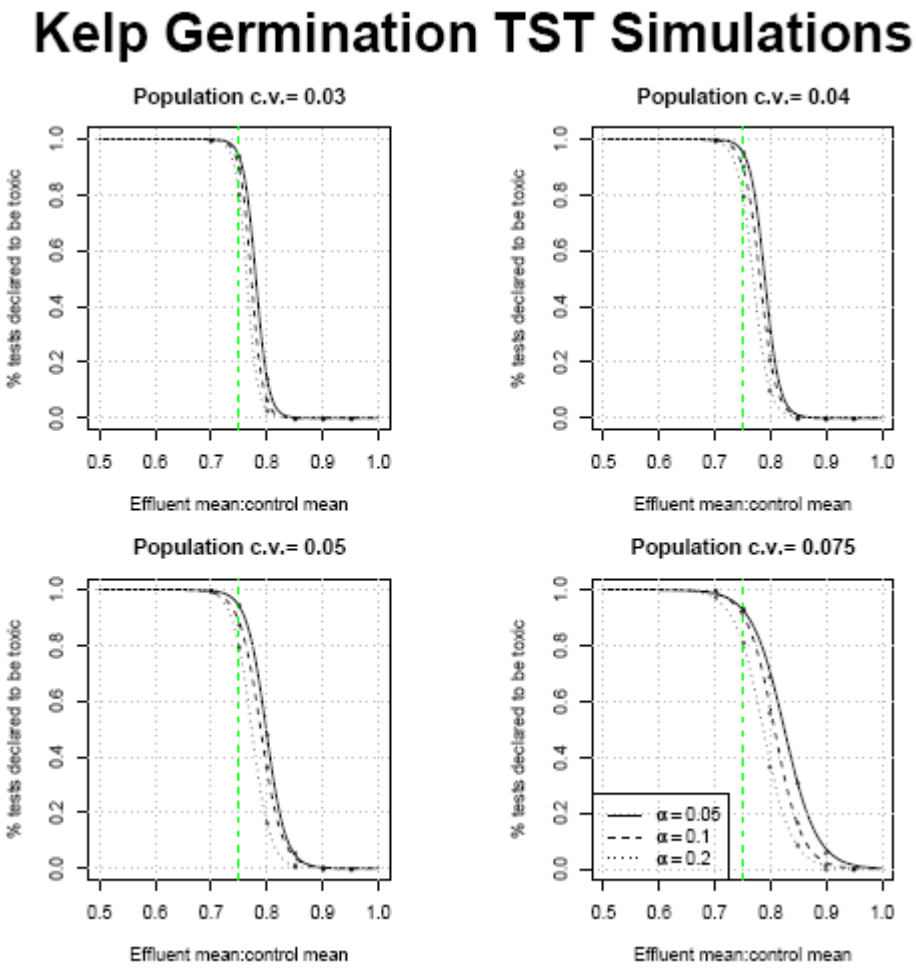

Figure 3-17. Power curves showing the percentage of tests declared toxic as a function of the ratio of effluent mean to control mean response and α level categorized by the level of control within-test variability. CVs correspond to the 25th, 50th, 75th, and 95th percentiles for the chronic giant kelp germination WET method. The dashed line indicates the 75 percent mean effect level, which is the decision threshold for chronic tests.

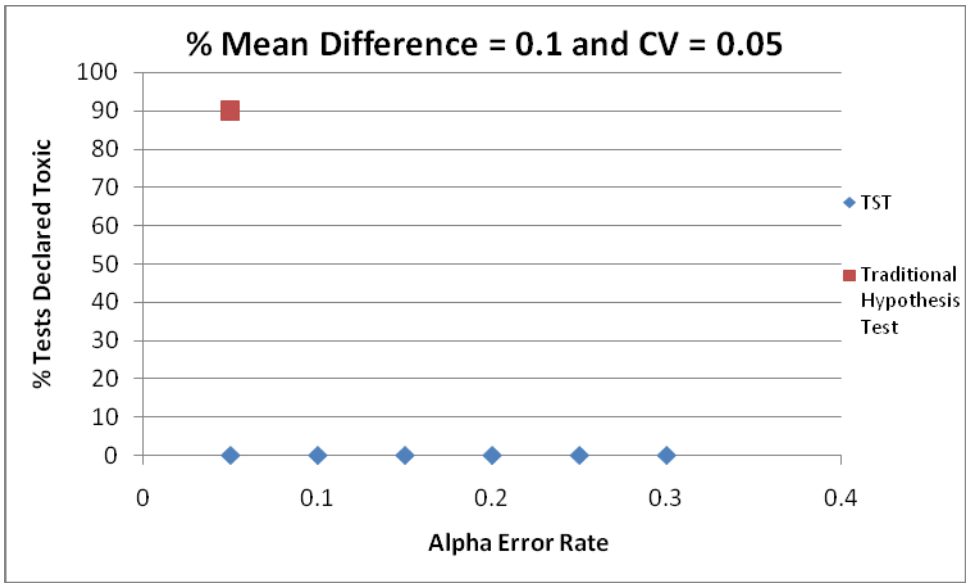

Figure 3-18. Percent of chronic giant kelp germination tests declared toxic using TST having a mean effluent effect of 10 percent and average control variability as a function of the α error rate. Result using the traditional hypothesis approach (α = 0.05) is shown as well.

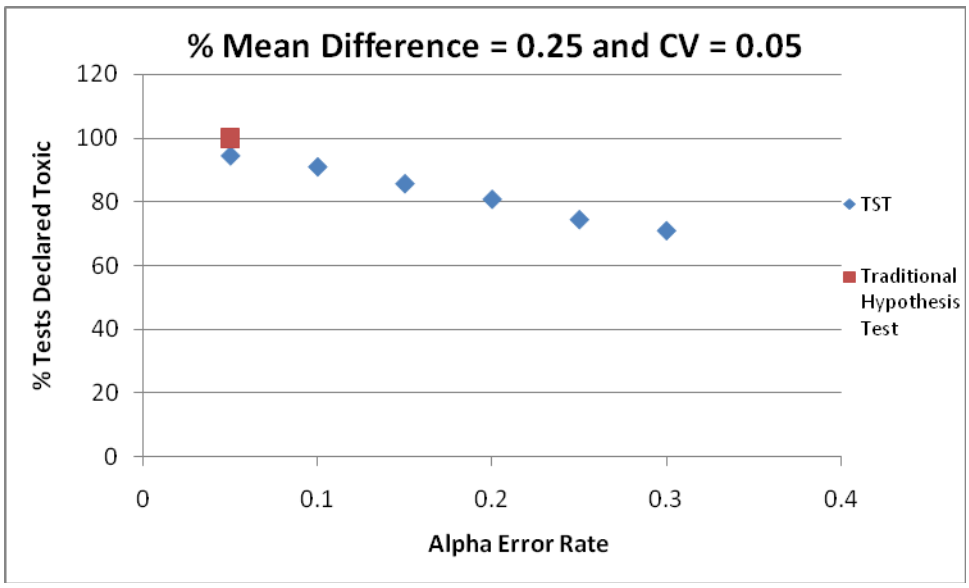

Figure 3-19. Percent of chronic giant kelp germination tests declared toxic using TST having a mean effluent effect of 25 percent and average control variability as a function of the α error rate. Result using the traditional hypothesis approach (α = 0.05) is shown as well.

3.6 Chronic *Macrocystis pyrifera* Germ-tube Length Test

On the basis of actual WET data (N = 135 reference toxicant tests), the mean control germ-tube length ranged from 10.200 to 20.778, with a median mean value of 14.014 (Table 3-9). Control CVs ranged from 0.009 to 0.189 with a median value of 0.073 (Table 3-9). Using that data, simulation analyses were conducted to evaluate the percentages of tests declared toxic (i.e., failure to reject the null hypothesis) by TST at various alpha error rates (between 0.05 and 0.30), CVs, and percent mean effect in germ-tube length between the control and effluent concentration.

Table 3-9. Summary of mean control germ-tube length and control CV derived from analyses of 135 chronic *Macrocystis pyrifera* WET tests

Percentile	Mean control germ-tube length	Control CV	Control SD
10th	11.965	0.03	0.46
25th	12.704	0.05	0.71
50th	14.014	0.07	1.04
70th	15.210	0.09	1.22
75th	15.554	0.09	1.29
85th	16.848	0.11	1.54
90th	17.568	0.12	1.74
95th	18.694	0.14	1.89

Identifying Test Method-Specific α

On the basis of all simulation results (Figure 3-20), an alpha error rate of 0.05 is appropriate for use in applying the TST approach to analysis of chronic *M. pyrifera* tube-length data because using that alpha error rate satisfies both RMDs of (1) ensuring at least a 75 percent probability of declaring a 25 percent mean effect as toxic and (2) ensuring that a negligible effect ($\leq$10 percent mean effect) is declared toxic $\leq$ 5 percent of the time under average test performance. As noted for the germination endpoint of this species above, higher alpha levels would also satisfy these RMDs; however, in such cases, the lowest alpha ≥ 0.05 is selected.

At a 10 percent mean effect in the effluent for example and ~50th percentile CV of 0.07, alpha levels ranging from 0.05 to 0.30 resulted in failure to reject the null hypothesis in almost none of the tests (Figure 3-21). For tests with a mean effect of 25 percent, the rate of tests declared toxic ranged from ~95 to ~70 percent, at alpha error rates ranging from 0.05 to 0.30, respectively, and the 75th percentile CV value (Figure 3-22). Thus, alpha levels < 0.25 achieved the RMD that a 25 percent mean effect is declared toxic at least 75 percent of the time.

At ~50th percentile CV (0.07) and a mean effect of 10 percent, use of the TST approach results in significantly fewer tests declared toxic relative to the traditional hypothesis approach at all alpha error rates examined (Figure 3-21). These results are because of the RMDs of the TST approach; tests with a small (10 percent) mean effect of the effluent are declared non-toxic most of the time when test control data are average or better.

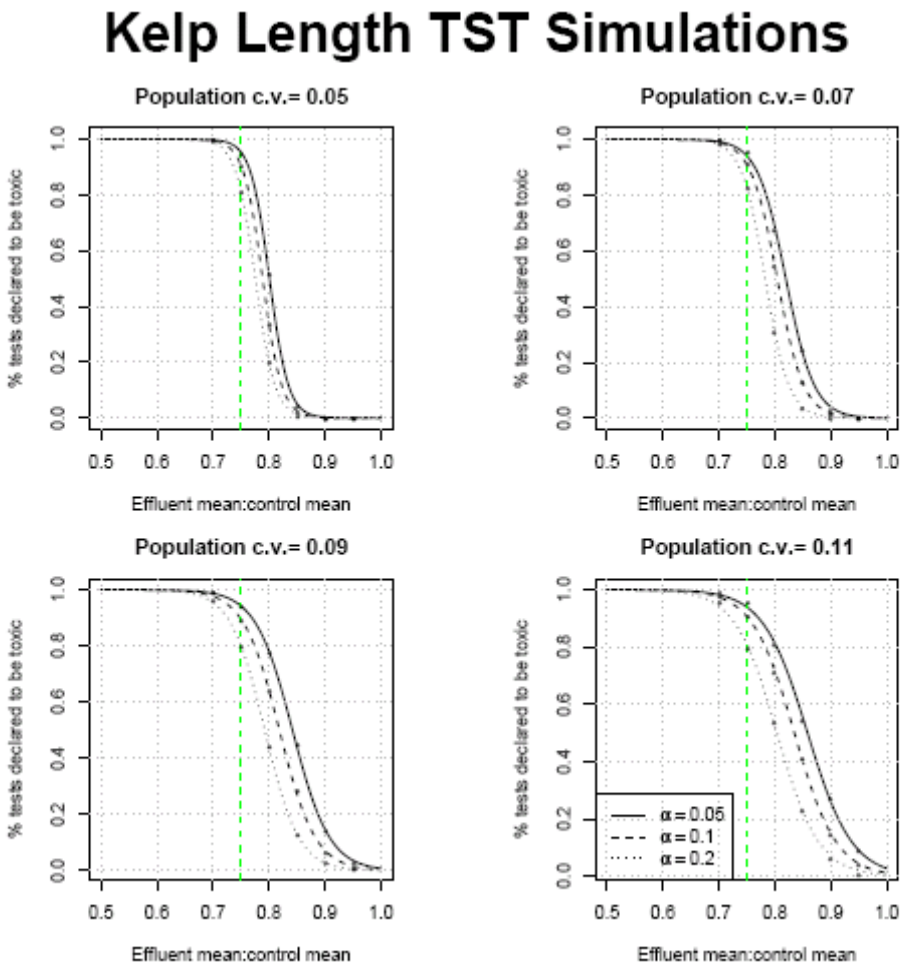

Figure 3-20. Power curves showing the percentage of tests declared toxic as a function of the ratio of effluent mean to control mean response and α level categorized by the level of control within-test variability. CVs correspond to the 25th, 50th, 75th, and 90th percentiles for the chronic giant kelp germ-tube length WET method. The dashed line indicates the 75 percent mean effect level, which is the decision threshold for chronic tests.

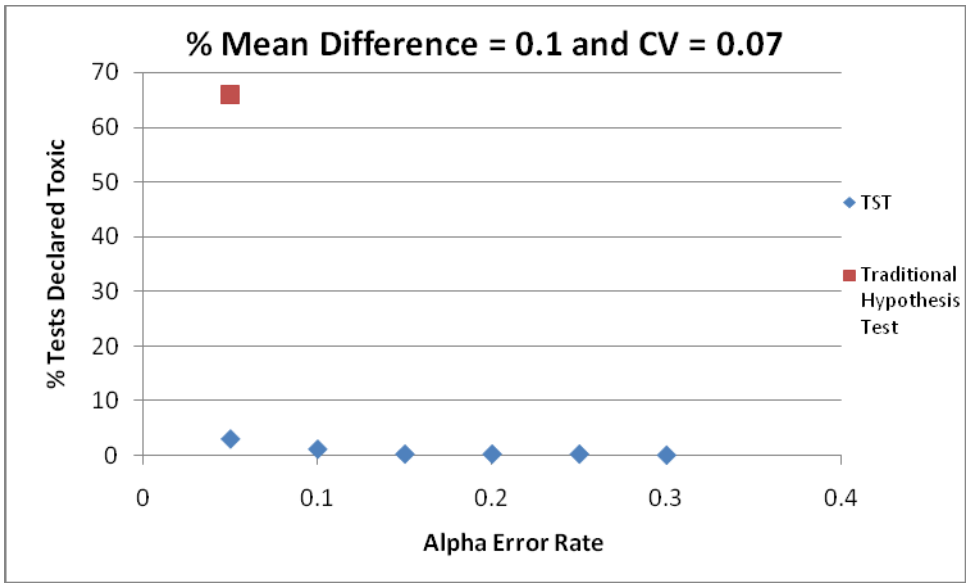

Figure 3-21. Percent of chronic giant kelp germ-tube length tests declared toxic using TST having a mean effluent effect of 10 percent and average control variability as a function of the α error rate. Result using the traditional hypothesis approach (α = 0.05) is shown as well.

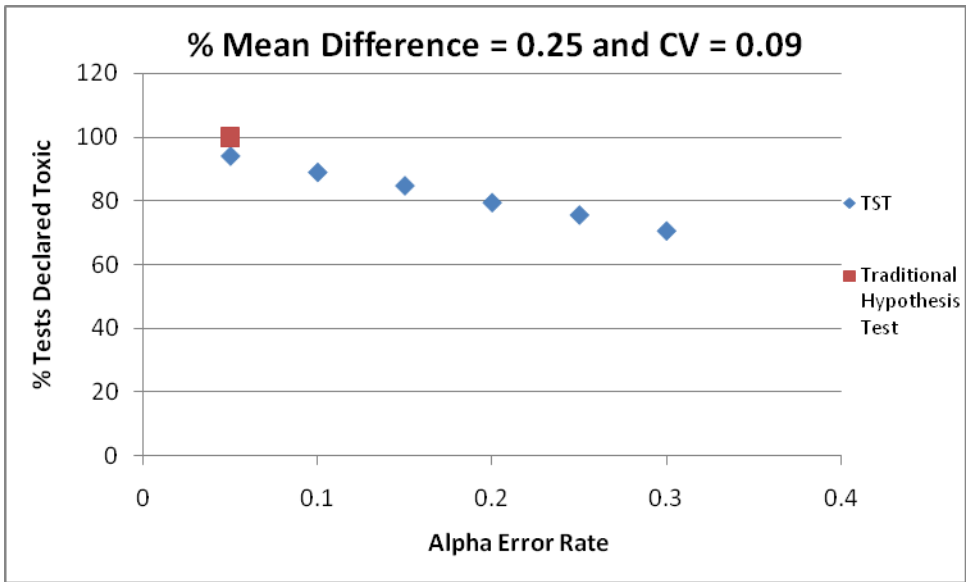

Figure 3-22. Percent of chronic giant kelp germ-tube length tests declared toxic using TST having a mean effluent effect of 25 percent and above average control variability as a function of the α error rate. Result using the traditional hypothesis approach (α = 0.05) is shown as well.

Tests with a mean effect of 25 percent and above average precision (CV = 0.09) result in a similar rate of tests declared toxic as the traditional approach when alpha = 0.05 (Figure 3-22). These results further support the selection of 0.05 as the alpha value under TST for this WET endpoint.

3.7 Chronic Echinoderm Fertilization Test

On the basis of actual WET data (N = 177 tests), mean control fertilization ranged from 0.538 to 1.000, with a median mean value of 0.953 (Table 3-10). Control CVs ranged from 0.000 to 0.667 with a median value of approximately 0.03 (Table 3-10). Using that data, simulation analyses were conducted to evaluate the percentages of tests declared toxic (i.e., failure to reject the null hypothesis) by TST at various alpha error rates (between 0.05 and 0.3), CVs, and percent mean effect in reproduction between the control and effluent concentration of concern.

Table 3-10. Summary of mean control fertilization and control CV derived from analyses of 177 chronic *Dendraster excentricus and Strongylocentrotus purpuratus* WET tests

Percentile	Mean control fertilization	Control CV	Control SD
10th	0.826	0.01	0.58
25th	0.875	0.01	1.16
50th	0.953	0.03	2.45
70th	0.975	0.05	4.32
75th	0.978	0.07	5.97
85th	0.990	0.09	7.44
90th	0.993	0.11	9.32
95th	0.996	0.14	11.00

Identifying Test Method-Specific α

On the basis of all simulation results (Figure 3-23), an alpha error rate of 0.05 is appropriate for use in applying the TST approach to analysis of chronic *D. excentricus* and *S. purpuratus* data because using this alpha error rate satisfies both RMDs of (1) ensuring at least an 75 percent probability of declaring a 25 percent mean effect as toxic and (2) ensuring that a negligible effect (≤ 10 percent mean effect) is declared toxic ≤ 5 percent of the time under average test performance. As with the other West Coast chronic WET test methods, higher alpha values also satisfy the above RMDs. In these cases, the alpha value ≥ 0.05 that satisfies the RMDs is used.

At a 10 percent mean effect in the effluent for example, and ~50th percentile CV of 0.03, alpha levels ranging from 0.05 to 0.30 result in failure to reject the null hypothesis in none of the tests (Figure 3-24). For tests with a mean effect of 25 percent, the rate of tests declared toxic ranged from ~95 to ~70 percent, at alpha error rates ranging from 0.05 to 0.30, respectively, and approximately the 80th percentile CV value (Figure 3-25). Thus, alpha levels < 0.25 achieved the RMD that a 25 percent mean effect in the effluent is declared toxic at least 75 percent of the time regardless of within-test variability.

At ~50th percentile CV for this test endpoint (0.03) and a mean effect of 10 percent in the effluent, TST resulted in significantly fewer tests declared toxic relative to the traditional hypothesis approach at all alpha error rates (Figure 3-24). This results from the fact that the RMD is that tests with a negligible (10 percent) mean effect in the effluent are declared non-toxic most of the time when test control data are average or better.

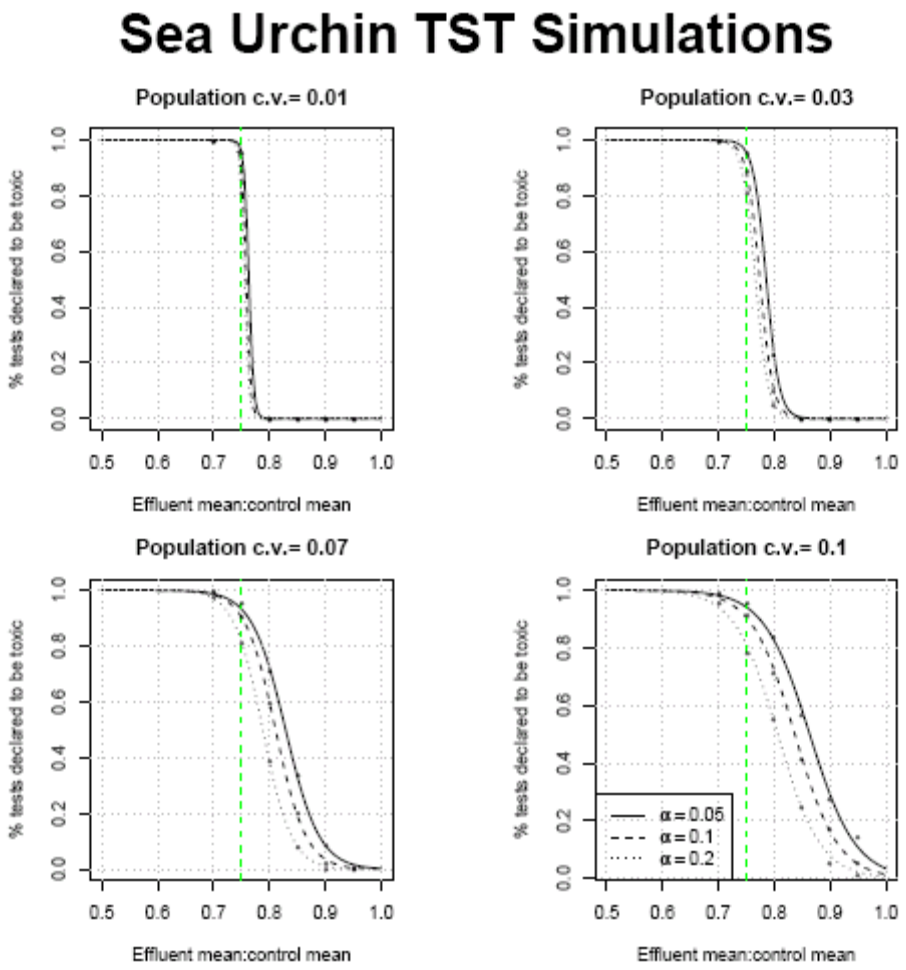

Figure 3-23. Power curves showing the percentage of tests declared toxic as a function of the ratio of effluent mean to control mean response and α level categorized by the level of control within-test variability. CVs correspond to the 25th, 50th, 75th, and 90th percentiles for the chronic echinoderm fertilization WET method. The dashed line indicates the 75 percent mean effect level, which is the decision threshold for chronic tests.

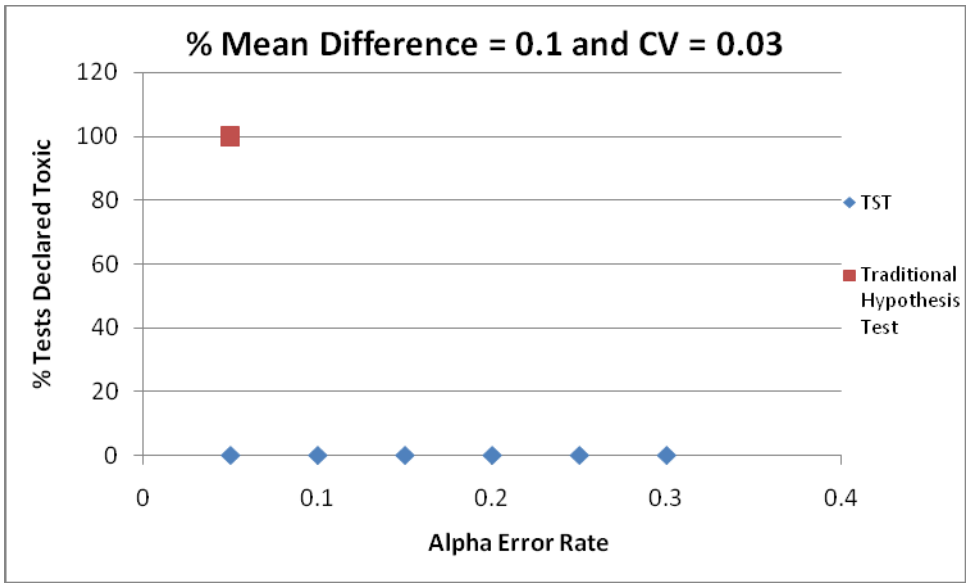

Figure 3-24. Percent of chronic echinoderm tests declared toxic using TST having a mean effluent effect of 10 percent and average control variability as a function of the α error rate. Result using the traditional hypothesis approach (α = 0.05) is shown as well.

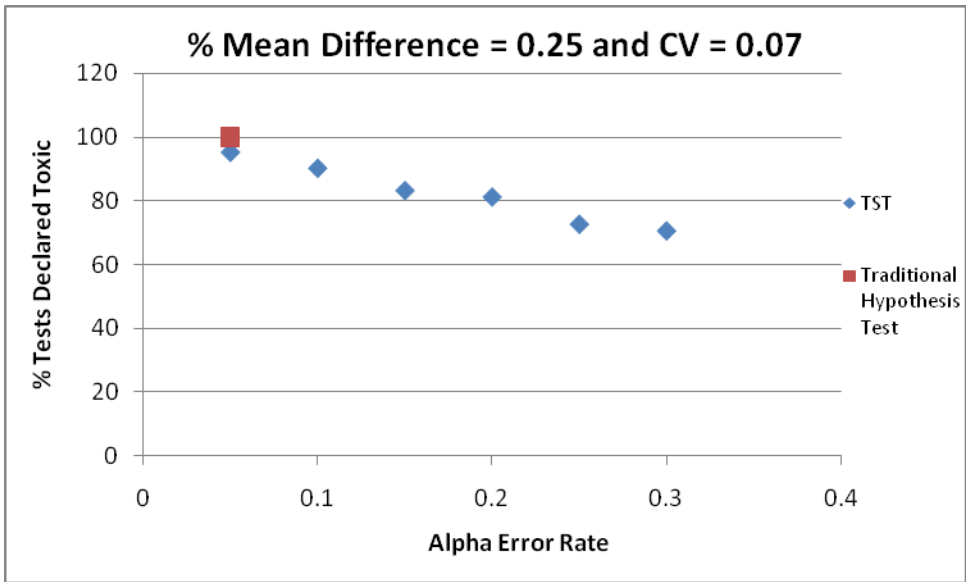

Figure 3-25. Percent of chronic echinoderm tests declared toxic using TST having a mean effluent effect of 25 percent and above average control variability as a function of α error rate. Result using the traditional hypothesis approach (α = 0.05) is shown as well.

Tests with a mean effect of 25 percent and above average precision (CV = 0.07) result in a similar rate of tests declared toxic as the traditional hypothesis approach when alpha = 0.05 (Figure 3-25). The results further support the selection of alpha = 0.05 for this WET test endpoint.

3.8 Acute *Pimephales promelas* Survival Test

As noted in the RMD discussion in Section 2.1, acute toxicity (i.e., mortality or immobility of organisms) needs to be tightly controlled because of the potential environmental implications of acute toxicity. Therefore, the RMD toxicity threshold for acute WET methods is set higher than that for the chronic WET methods, with the acute WET method *b* value = 0.80, rather than 0.75 as in the chronic methods. Consequently, the following analyses and results incorporated a *b* value of 0.80.

On the basis of actual WET data (N = 347 tests), mean control survival ranged from 0.900 to 1.000, with a median mean value of 1.000 (Table 3-11). Control CVs ranged from 0.000 to 0.185 with a median value of 0.00 (Table 3-11). The very low control variability observed is expected because of the strength and repeatability of the test endpoint (survival) and the fact that test acceptability criteria for acute WET methods require no less than 90 percent survival in controls. Using that data, simulation analyses were conducted to evaluate the percentages of tests declared toxic (i.e., failure to reject the null hypothesis) by TST at various alpha error rates (between 0.05 and 0.20), a range of CVs corresponding to between the 75th to the 90th percentiles, and percent mean effect in reproduction between the control and effluent concentration.

Table 3-11. Summary of mean control survival and control CV derived from analyses of 347 acute *Pimephales promelas* WET tests

Percentile	Mean control survival	Control CV	Control SD
10th	0.95	0.00	0.00
25th	1.00	0.00	0.00
50th	1.00	0.00	0.00
70th	1.00	0.00	0.00
75th	1.00	0.00	0.00
85th	1.00	0.09	0.15
90th	1.00	0.12	0.18
95th	1.00	0.19	0.23

Identifying Test Method-Specific α

On the basis of all simulation results (Figure 3-26), an alpha error rate of 0.10 is appropriate for use in applying the TST approach to analysis of acute *P. promelas* data because using this alpha error rate satisfies both RMDs of (1) ensuring at least a 75 percent probability of declaring a 20 percent mean effect as toxic and (2) ensuring that a negligible effect ($\leq$ 10 percent mean effect) is declared toxic $\leq$ 5 percent of the time under average control performance.

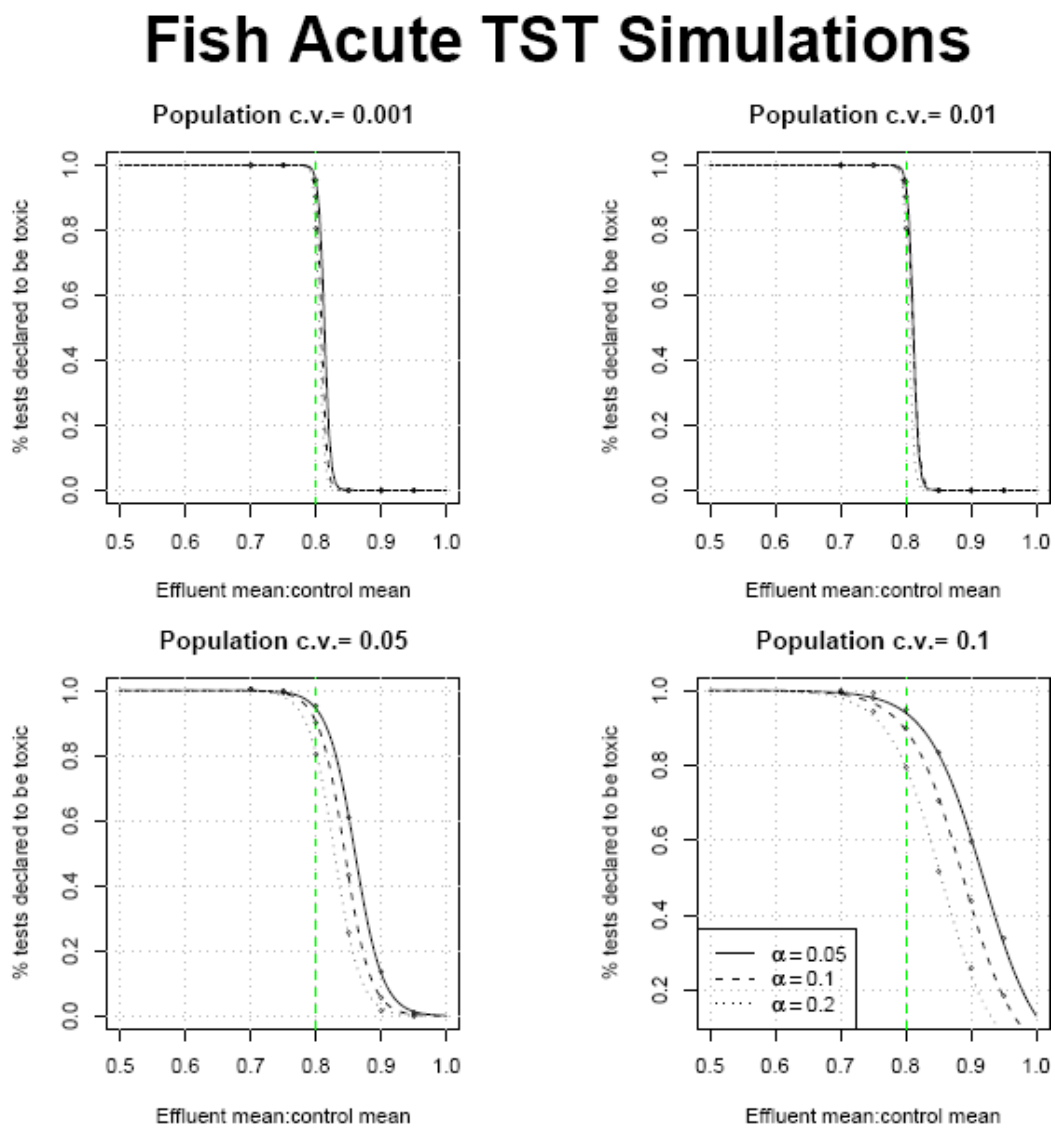

Figure 3-26. Power curves showing the percentage of tests declared toxic as a function of the ratio of effluent mean to control mean response and α level categorized by the level of control within-test variability. CVs correspond to the 75th, 80th, 85th, and 88th percentiles for the acute fathead minnow WET method. The dashed line indicates the 80 percent mean effect level, which is the decision threshold for acute tests.

At a 10 percent mean effect in the effluent and a CV of 0.001 (slightly higher than the 75th percentile), alpha levels ranging from 0.05 to 0.20 resulted in failure to reject the null hypothesis in none of the tests (Figure 3-27). At the 88th percentile CV of 0.10 and a mean effect of 10 percent, alpha levels ranging from 0.05 to 0.20 resulted in declaring between 60 and 25 percent of the tests toxic, respectively. At more moderate CVs (85th percentile), an alpha of 0.10 results in 5 percent of the tests declared toxic. A lower alpha has a higher percentage of tests declared toxic.

For tests with a mean effect of 20 percent, the rate of tests declared toxic ranged from ~100 percent to ~80 percent, at alpha levels ranging from 0.05 to 0.20, respectively, and above average

CV values (Figure 3-28). The rates of tests declared toxic are consistent with the RMD that a 20 percent mean effect in the effluent is declared toxic at least 75 percent of the time. With more routine test performance, an alpha = 0.10 results in 95 percent of the tests declared toxic at a mean effect of 20 percent.

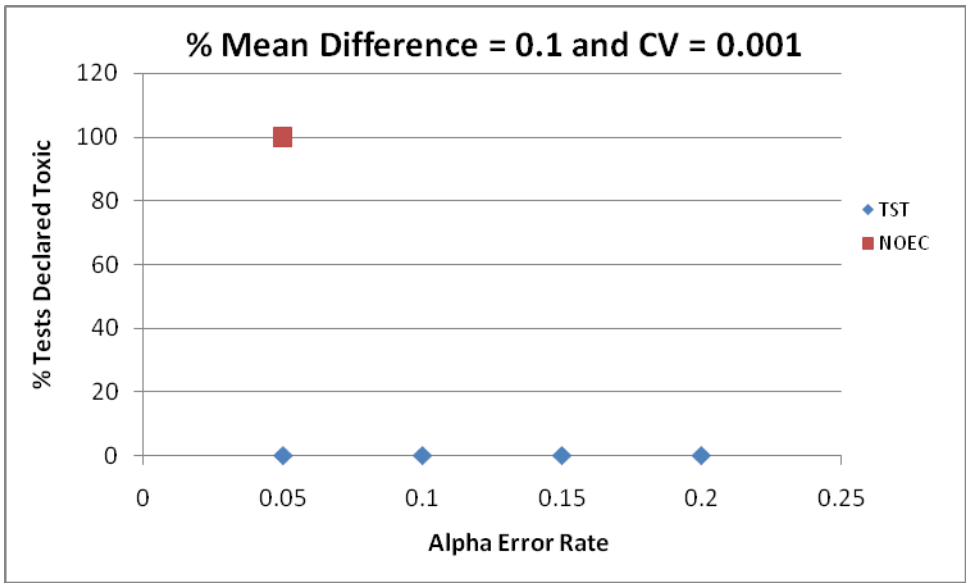

Figure 3-27. Percent of acute fathead minnow tests declared toxic using TST having a mean effluent effect of 10 percent and average control variability as a function of α error rate. Result using the traditional hypothesis approach (α = 0.05) is shown as well.

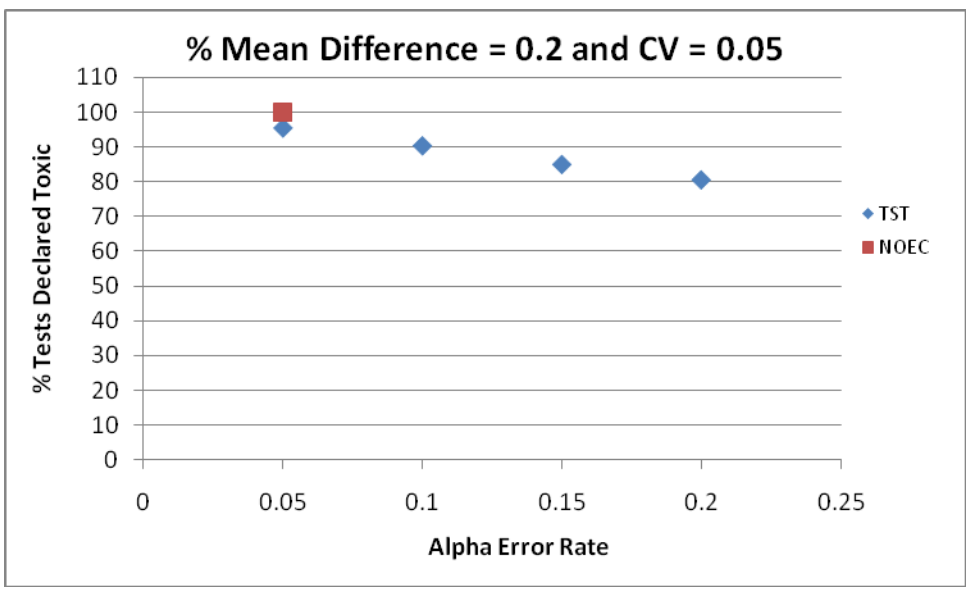

Figure 3-28. Percent of acute fathead minnow tests declared toxic using TST having a mean effluent effect of 20 percent and above average control variability as a function of α error rate. Result using the traditional hypothesis approach (α = 0.05) is shown as well.

At a CV of 0.001 and a mean effect of 10 percent, use of the TST approach results in significantly fewer toxic tests relative to the traditional hypothesis approach at all alpha levels (Figure 3-27). These results are due to the RMD that tests with a 10 percent mean effect at the IWC are declared non-toxic most of the time.

Tests with a mean effect of 20 percent and a CV of 0.05 (85th percentile) result in a similar rate of tests declared toxic at alpha = 0.05 and 10 percent fewer tests declared toxic (90 percent of tests) at alpha = 0.10 (Figure 3-28). Because all the results noted above, an alpha = 0.10 is considered appropriately protective for this WET test method.

Effect of Increased Number of Within-Test Replicates

As expected, increasing test replication from two (the minimum allowed in the EPA WET test methods for acute fish tests) to four replicates results in a *higher* rate of tests declared toxic using the traditional hypothesis testing approach and a *lower* rate of tests declared toxic using the TST approach at a 10 percent effect using *P. promelas* acute test data. For tests with a mean effect of 10 percent and a control CV of 0.05 (corresponding to between the 75th and 90th percentile), if replicates are added to the test design, the TST approach demonstrates an increased ability to declare such a test as non-toxic (Table 3-12). As the mean effect approaches 20 percent, the percentage of tests declared toxic is less affected by increased replication using TST because a 20 percent effect in the effluent is the toxicity threshold using TST. However, the percentage of tests declared toxic continues to increase with increased replication using the traditional hypothesis approach, even when there is a negligible effect (10 percent effect as defined by TST) of the effluent. Thus, increasing test replication increases TST's ability to confirm an acceptable effluent test with mean effect less than 20 percent.

Table 3-12. Percent of fathead minnow acute tests declared toxic using TST and a *b* value = 0.8 as a function of percent mean effect, number of replicates (2 or 4 replicates), and different alpha or Type I error levels

B value	CV	% effect	# reps	Alpha			
				0.05	0.1	0.15	0.2
0.8	0.05	0.10	2	57	33	21	13
0.8	0.05	0.20	2	95	91	85	80
0.8	0.05	0.10	4	14	5	3	1
0.8	0.05	0.20	4	95	90	85	80

3.9 Chronic *Selenastrum capricornutum* Growth Test

On the basis of actual WET data (N = 223 tests), the mean control growth ranged from 1,019,250 cells to 14,109,450 cells, with a median value of 3,331,250 cells (Table 3-13). Control CVs ranged from 0.00 to 0.20 with a median value of 0.06 (Table 3-13). Using those data, simulation analyses were conducted to evaluate the percentages of tests declared toxic (i.e., failure to reject the null hypothesis) by TST at various alpha error rates (between 0.05 and 0.25), CVs, and percent mean effect in growth between the control and effluent concentration. In addition, WET

test data (N = 173), in which EDTA was added to the controls, as required in the 2002 *Selenastrum* method, were evaluated independently and compared to the simulation results. For those tests the mean control growth ranged from 1,019,250 cells to 14,109,450 cells, with a median value of 3,430,000 cells (Table 3-13). Control CVs from those tests ranged from 0.00 to 0.20 with a median value of 0.06, similar to the results observed for all 223 tests (Table 3-13).

Table 3-13. Summary of mean control growth, CV and standard deviation derived from the analyses of all chronic *Selenastrum capricornutum* WET test data and compared with the analysis of only the chronic *Selenastrum capricornutum* WET test in which it was assumed that EDTA was added to the controls.

All Tests (N = 223)				Only Tests With EDTA Addition (N = 173)			
Percentile	Mean Cell Density	Control CV	Control SD	Percentile	Mean Cell Density	Control CV	Control SD
10th	1233050.0	0.02	44928.62	10th	1554500.0	0.02	43664.06
25th	2245833.5	0.04	108449.85	25th	2502500.0	0.03	135154.20
50th	3331250.0	0.06	277653.90	50th	3430000.0	0.06	309232.90
70th	4869000.0	0.10	407505.12	70th	5581650.0	0.10	417361.66
75th	6179667.0	0.11	444887.25	75th	8220000.0	0.11	447446.50
85th	9265500.0	0.13	545764.05	85th	9785000.0	0.14	543717.8
90th	9888000.0	0.16	599644.32	90th	10048000.0	0.16	583299.40
95th	10149500.0	0.18	751884.62	95th	10279000.0	0.18	669780.04

Identifying Test Method-Specific α

On the basis of all simulation results (Figure 3-29), an alpha error rate of 0.25 is appropriate, for both tests with EDTA addition and tests with no EDTA addition, for use in applying the TST approach to analysis of chronic *Selenastrum* data. Using this alpha error rate addresses both RMDs of (1) ensuring at least a 75 percent probability of declaring a 25 percent mean effect as toxic and (2) ensuring that a negligible effect ($\leq$ 10 percent mean effect) is declared toxic $\leq$ 5 percent of the time under average or better than average test performance.

For example, at a 10 percent mean effect and a low level of precision (~70th percentile for all tests, CV of 0.10), an alpha level of 0.25 resulted in failure to reject the null hypothesis in $\leq$ 5 percent of tests with or without EDTA addition (Figure 3-29). For all tests with a mean effect of 25 percent, and a similar precision, the rate of tests declared toxic is 75 percent at an alpha value of 0.25, consistent with RMDs (Figure 3-29).

At ~70th percentile CV (0.10) and a mean effect of 10 percent, for both tests with and without EDTA addition, use of the TST approach results in fewer toxic tests relative to the traditional hypothesis testing approach at all alpha error rates, including the alpha error rate of 0.25 which declared less than 5 percent of the tests toxic (Figure 3-30).

Tests with a mean effect of 25 percent, regardless of precision (CV = 0.10 or 0.15), result in a 75 percent or greater rate of tests declared toxic, which is significantly more than that using the traditional hypothesis testing approach using any alpha value between 0.05 and 0.25 (Figure 3-31). The percent of tests found to be toxic using the TST approach with a mean effect of 25 percent was not significantly affected by the change in CV values.

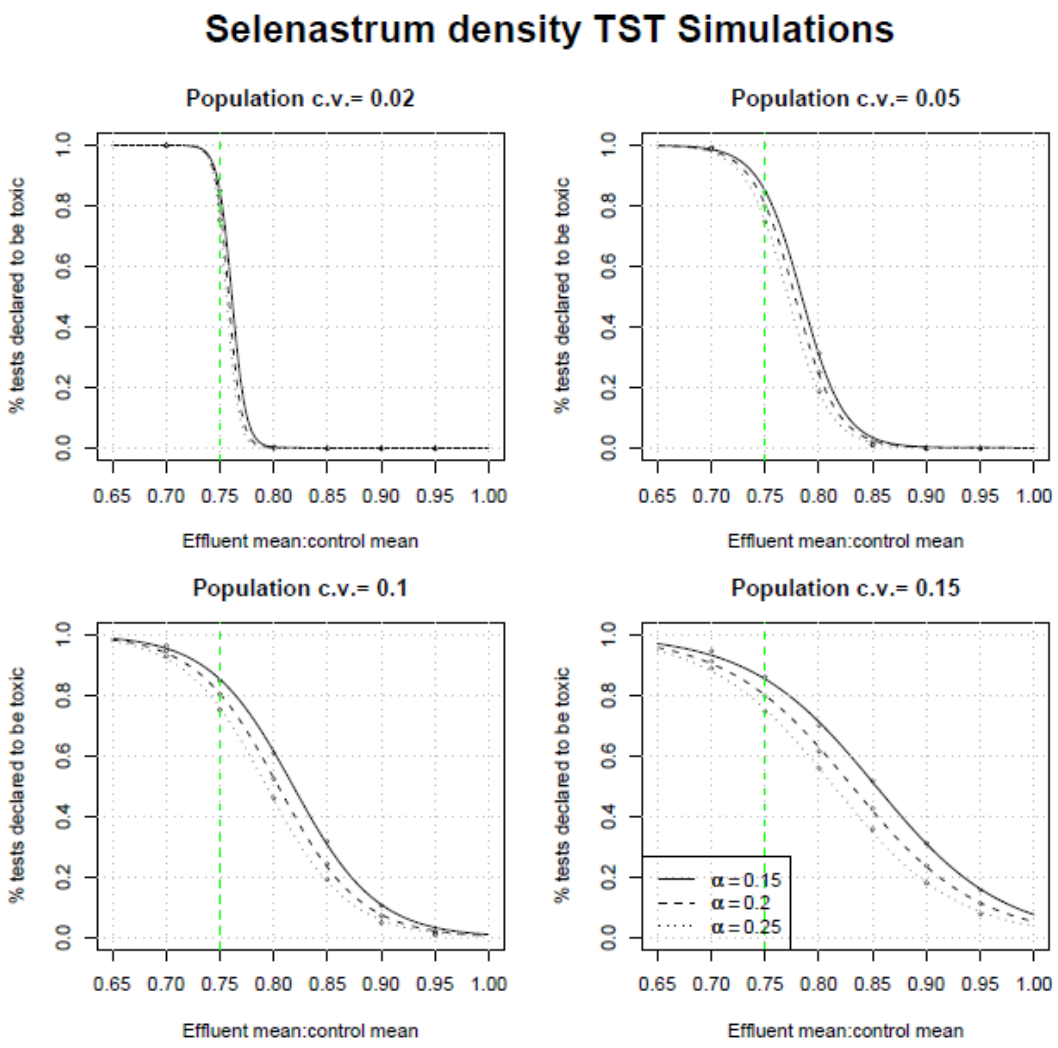

Figure 3-29. Power curves showing the percentage of tests declared toxic as a function of the ratio of effluent mean to control mean response and α level categorized by the level of control within-test variability. CVs correspond to the 10th, 40th, 70th, and 85th percentiles for the chronic *Selenastrum* WET method. The dashed line indicates the 75 percent mean effect level, which is the decision threshold for chronic tests.

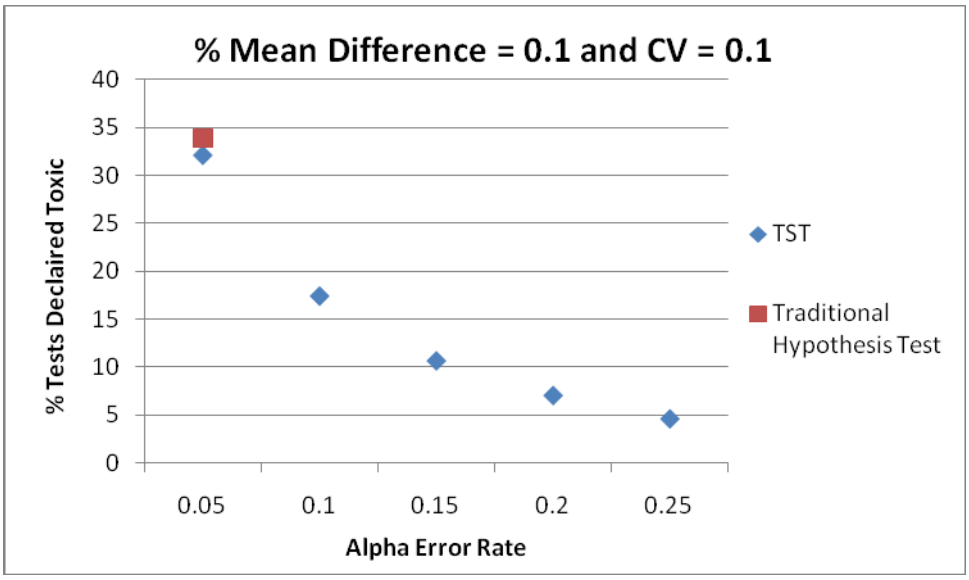

Figure 3-30. Percent of *Selenastrum* tests declared toxic using TST having a mean effluent effect of 10 percent and average control variability as a function of α error rate. Result using the traditional hypothesis approach (α = 0.05) is shown as well.

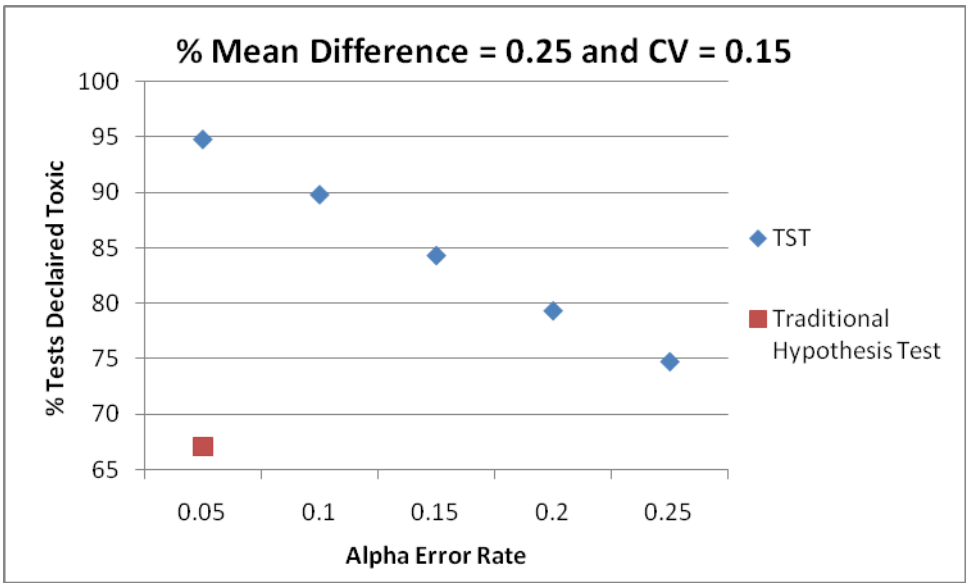

Figure 3-31. Percent of *Selenastrum* tests declared toxic using TST having a mean effluent effect of 25 percent and above average control variability as a function of α error rate. Result using the traditional hypothesis approach (α = 0.05) is shown as well.

Effluent Data Results

Results from actual effluent tests were compared between TST and the traditional hypothesis testing approach for all control CV's (Table 3-14). At a mean effect of 10–15 percent (N = 25),

TST declared none of the tests toxic while the traditional hypothesis testing approach declared 67 percent of the tests toxic. However, if the mean effect is greater than 25 percent (N = 97), TST declared 100 percent of the tests toxic, while the traditional hypothesis testing approach declared 98 percent of the tests toxic. These results indicate that TST is as protective as the current hypothesis testing approach for those tests when the TST RMD threshold for toxicity is exceeded.

Table 3-14. Comparison of the percentage of chronic *Selenastrum* tests declared toxic using TST versus the traditional hypothesis testing approach

% Mean effect	N	% tests toxic using TST	% tests toxic using traditional hypothesis testing approach
10–15	25	0	67
> 25	97	100	98

3.10 Acute *Ceriodaphnia dubia* Survival Test

Acute toxicity (i.e., mortality or immobility of organisms) needs to be tightly controlled because of the potential environmental implications of acute toxicity. Therefore, the RMD toxicity threshold for acute WET methods is set higher than that for the chronic WET methods, with the acute WET method *b* value = 0.80, rather than 0.75 as in the chronic methods. Consequently, the following analyses and results incorporated a *b* value of 0.80.

On the basis of actual WET data (N = 239 tests), mean control survival ranged from 0.900 to 1.000, with a median mean value of 1.000 (Table 3-15). Control CVs ranged from 0.00 to 0.22 (the minimum and maximum levels obtainable using the test acceptability criteria) with a median value of 0.00 (Table 3-15). The very low control variability observed is expected because of the strength and repeatability of the test endpoint (survival) and the fact that test acceptability criteria for acute WET methods stipulate no less than 90 percent survival in the controls. Using that data, simulation analyses were conducted to evaluate the percentages of tests declared toxic (i.e., failure to reject the null hypothesis) by TST at various alpha error rates (between 0.05 and 0.30), a range of CVs, and percent mean effect in survival between the control and effluent concentration.

Table 3-15. Summary of mean control growth, CV and standard deviation derived from analyses of 239 acute *Ceriodaphnia dubia* WET tests.

Percentile	Mean Survival (%)	Control CV	Control SD
10th	0.95	0.00	0.00
25th	1.00	0.00	0.00
50th	1.00	0.00	0.00
70th	1.00	0.00	0.00
75th	1.00	0.00	0.00
85th	1.00	0.00	0.00
90th	1.00	0.11	0.10
95th	1.00	0.11	0.10

Identifying Test Method-Specific α

On the basis of all simulation results (Figure 3-32), an alpha error rate of 0.10 is appropriate for use in applying the TST approach to analysis of acute *Ceriodaphnia dubia* data because using this alpha error rate best satisfies both RMDs of (1) ensuring at least a 75 percent probability of declaring a 20 percent mean effect as toxic and (2) ensuring that a negligible effect (≤ 10 percent mean effect) is declared toxic ≤ 5 percent of the time under average control performance.

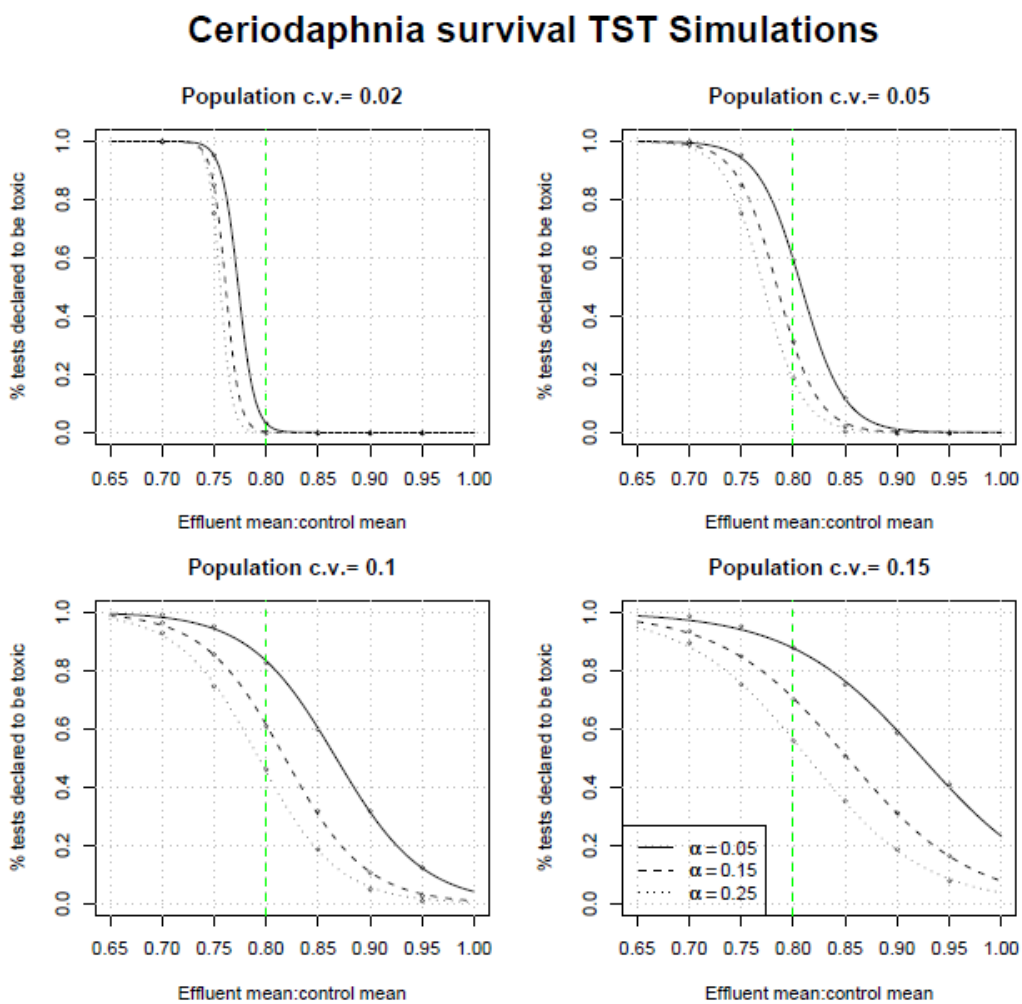

Figure 3-32. Power curves showing the percentage of tests declared toxic as a function of the ratio of effluent mean to control mean response and α level categorized by the level of control within-test variability. The first two CVs correspond to the 85th percentile, and the following two correspond to the 95th and ~98th, respectively for the acute *Ceriodaphnia dubia* WET method. The dashed line indicates the 80 percent mean effect level, which is the decision threshold for acute tests.

For example, at a 10 percent mean effect in the effluent and a CV of 0.02 (slightly higher than the 85th percentile), alpha levels ranging from 0.05 to 0.25 resulted in failure to reject the null hypothesis in ≤ 5 percent of the tests (Figure 3-32). However, at the 90th and 95th percentile CVs of 0.10 and a mean effect of 10 percent, the alpha level of 0.25 resulted in 19 percent of the tests

found toxic. For tests with a mean effect of 20 percent, and ~85th percentile precision (CV of 0.02), 75 percent of the tests are declared toxic, achieving the RMD using an alpha value of 0.25 (Figure 3-32).

For tests with a mean effect of 20 percent, the rate of tests declared toxic ranged from ~95 percent to ~75 percent, at alpha levels ranging from 0.05 to 0.25, respectively, using all CV values that correspond to ≤ 95th percentile. (Figure 3-32). The rates of tests declared toxic are consistent with the RMD that a 20 percent mean effect in the effluent is declared toxic at least 75 percent of the time. With more routine test performance, an alpha of 0.10 results in 90 percent of the tests declared toxic at a mean effect of 20 percent.

At a CV of 0.02 (~85th percentile) and a mean effect of 10 percent, use of the TST approach results in no toxic tests, while the traditional hypothesis approach results in 100 percent toxic tests at all alpha levels (Figure 3-33).

Tests with a mean effect of 20 percent and a range of within-test control precision values (CV of 0.02 to 0.15) result in at least 75 percent of the tests declared toxic using an alpha = 0.10 (Figure 3-34). In contrast fewer tests are declared toxic at a 20% effect when using the traditional hypothesis testing approach and any alpha value between 0.05 and 0.25 (Figure 3-34). Thus, the percent of tests found to be toxic using the TST approach with a mean effect of 20 percent was not significantly affected by the change in CV values.

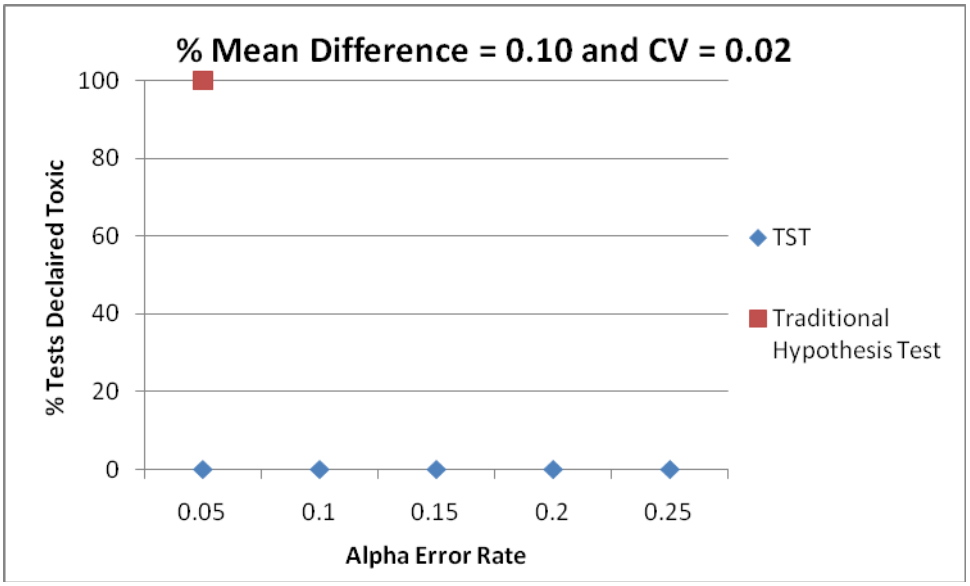

Figure 3-33. Percent of acute *C. dubia* tests declared toxic using TST having a mean effluent effect of 10 percent and average control variability as a function of α error rate. Result using the traditional hypothesis approach (α = 0.05) is shown as well.

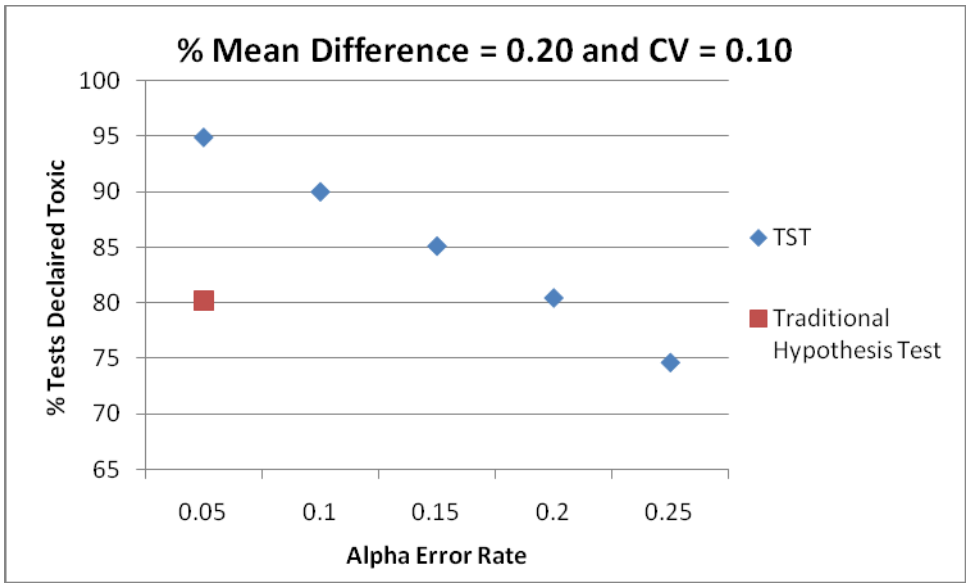

Figure 3-34. Percent of acute *C. dubia* tests declared toxic using TST having a mean effluent effect of 20 percent and above average control variability as a function of α error rate. Result using the traditional hypothesis approach (α = 0.05) is shown as well.

Effect of Increased Number of Within-Test Replicates

As with the fathead minnow acute method, increasing test replication from four (the minimum allowed in the EPA WET test methods for acute *Ceriodaphnia dubia* tests) to six replicates results in a *higher* rate of tests declared toxic using the traditional hypothesis testing approach and a *lower* rate of tests declared toxic using the TST approach at a 10 percent mean effect using *C. dubia* acute test data. For tests with a mean effect of 10 percent and a control CV of 0.06 (corresponding to between the 85th and 90th percentile), if replicates are added to the test design, the TST approach demonstrates an increased ability to declare such a test as non-toxic (Table 3-16). As the mean effect approaches 20 percent, the percentage of tests declared toxic is less affected by increased replication using TST because a 20 percent effect in the effluent is the RMD using TST. However, the percentage of tests declared toxic continues to increase with increased replication using the traditional hypothesis approach, even when there is a negligible effect (10 percent effect as defined by TST) of the effluent. Thus, increasing test replication increases TST's ability to confirm an acceptable effluent test with mean effect less than 20 percent.

Table 3-16. Percent of *Ceriodaphnia dubia* acute tests declared toxic using TST and a *b* value = 0.8 as a function of percent mean effect, number of replicates (4 or 6 replicates), and different alpha or Type I error levels

B value	CV	% effect	# reps	Alpha			
				0.05	0.1	0.15	0.2
0.8	0.06	0.10	4	23	12	7	5
0.8	0.06	0.20	4	95	90	85	80
0.8	0.06	0.10	6	8	4	3	2
0.8	0.06	0.20	6	95	90	85	80

4.0 SUMMARY OF RESULTS AND IMPLEMENTING TST

4.1 Summary of Test Method-Specific Alpha Values

On the basis of all the analyses conducted in this project, the test method-specific alpha levels summarized in Table 4-1 are used with the TST approach. The method-specific alpha values apply to all test endpoints for a given EPA WET test method (e.g., survival and reproduction for the *Ceriodaphnia* chronic WET test method). As noted in Section 2.3.1, alpha values were selected on the basis of simulation analyses using normally distributed data and equal variances in the control and the effluent. While additional analyses indicate that the alpha levels identified are robust to the type of heterogeneous variances and non-normal data observed in WET test data (see Appendix A), this issue is still acknowledged as a potential uncertainty.

The alpha values identified above provide as much protection under most circumstances as the current approved WET test analysis methods when the mean effect at the IWC exceeds the toxicity threshold of the TST approach.

At the chronic toxicity regulatory management threshold of 25 percent mean effect of the effluent and lower within-test control CVs (< 50th percentile), TST declares a greater percentage of tests non-toxic than the traditional hypothesis approach for some of the chronic WET test methods examined (e.g., fathead minnow chronic WET test) because of the higher alpha levels assigned to those test methods. At either higher within-test CVs or higher mean effect levels, results are more similar between the two approaches, as explained in Section 1.4 of this document. With more extreme within-test variability (≥ 80th percentile CV), results tend to be reversed with TST declaring a higher percentage of tests toxic at 25 percent mean effect of the effluent as compared to the traditional hypothesis approach; e.g., for the *Ceriodaphnia* reproduction endpoint, at the 80th percentile CV, TST declares ~20 percent of the tests non-toxic at a 25 percent mean effect, while the traditional approach declares 24 percent of the tests non-toxic. If test data are non-normal (a somewhat frequent condition for some WET endpoints such as acute and chronic survival, or when a high level of toxicity is observed in certain effluent concentrations within a test), additional research has indicated that use of Welch's t-test results in a lower rejection rate (i.e., is more conservative) using the TST approach, resulting in a higher percentage of tests declared toxic when the effluent effect $\geq b \times$ control mean (Appendix A). For the acute fathead minnow test method, at the acute toxicity regulatory management threshold of 20 percent mean effect of the effluent, both approaches had a similarly low percentage of tests declared non-toxic over all within-test CVs. Results of this comparison also demonstrate that for all WET test methods, the TST approach declares a lower percentage of tests as toxic at a 10 percent mean effect in the effluent, for most WET tests (i.e., within-test CV ≤ 75th percentile for a given WET test method). If within-test variability is lower (control data has greater precision), the result is further accentuated; i.e., an even greater percentage of tests are declared toxic at a 10 percent effect using the traditional hypothesis approach and an even lower percentage of tests declared toxic using TST.

Table 4-1. Summary of alpha (α) levels or false negative rates recommended for different EPA WET test methods using the TST.

EPA WET test method	*b* value	Probability of declaring a toxic effluent non-toxic False negative (α) error[a]
Chronic Freshwater and East Coast Methods		
Ceriodaphnia dubia (water flea) survival and reproduction	0.75	0.20
Pimephales promelas (fathead minnow) survival and growth	0.75	0.25
Selenastrum capricornutum (green algae) growth	0.75	0.25
Americamysis bahia (mysid shrimp) survival and growth	0.75	0.15
Arbacia punctulata (Echinoderm) fertilization	0.75	0.05
Cyprinodon variegatus (Sheepshead minnow) and *Menidia beryllina* (inland silverside) survival and growth	0.75	0.25
Chronic West Coast Marine Methods		
Dendraster excentricus and *Strongylocentrotus purpuratus* (Echinoderm) fertilization	0.75	0.05
Atherinops affinis (topsmelt) survival and growth	0.75	0.25
Haliotis rufescens (red abalone), *Crassostrea gigas (oyster), Dendraster excentricus, Strongylocentrotus purpuratus* (Echinoderm) and *Mytilus sp* (mussel) larval development methods	0.75	0.05
Macrocystis pyrifera (giant kelp) germination and germ-tube length	0.75	0.05
Acute Methods		
Pimephales promelas (fathead minnow), *Cyprinodon variegatus* (Sheepshead minnow), *Atherinops affinis* (topsmelt), *Menidia beryllina* (inland silverside) acute survival[b]	0.80	0.10
Ceriodaphnia dubia, *Daphnia magna, Daphnia pulex*, *Americamysis bahia* acute survival[b]	0.80	0.10

Notes:
a α levels shown are the probability of declaring an effluent toxic when the mean effluent effect = 25% for chronic tests or 20% for acute tests and the false positive rate (β) is ≤ 0.05 (5%) when mean effluent effect = 10%.
b. Based on a four replicate test design

4.2 Calculating Statistics for Valid WET Data Using the TST Approach

Appendix B includes a step-by-step guide for using the TST approach to analyze valid WET data. The appendix also includes a statistical flowchart. Note that the WET test method should follow the test condition requirements as specified in EPA's approved WET methods (USEPA 1995, 2002a, 2002b, 2002c).

The TST approach is used to statistically compare organism responses from two treatments of the WET test, the IWC and the control. Percent data (quantal data), such as percent survival or percent germination from a WET test, is first transformed as recommended in the EPA WET test manuals. Other types of WET data (e.g., growth or reproduction data) are not transformed (for

the rationale, see Appendix A). Data are then analyzed using Welch's t-test, a well-known modification of the traditional t-test (Zar 1996), which is appropriate for the TST approach (see Appendix A).

Appendix C lists the critical t values that apply to WET testing using the TST approach given the number of degrees of freedom and the α level that applies for a given WET test method from Table 4-1 of this document. If the calculated t value for the WET test is greater than the critical t value (given in Appendix C), the null hypothesis is rejected, i.e., the test result is a *pass* and **the effluent is declared *non-toxic***. If the calculated t value is less than the critical t value in Appendix C, the null hypothesis is not rejected, i.e., the test result is a *fail* and **the effluent *is* declared toxic**.

4.3 Benefits of Increased Replication Using TST

One of the intended benefits of the TST approach is that increasing the precision and power of the test increases the chances of rejecting the null hypothesis and declaring a truly acceptable sample as non-toxic. This increases the permittee's ability to demonstrate that a sample is acceptable. Results for the *Ceriodaphnia*, fathead minnow, and mysid chronic test methods presented in Section 3 indicate the benefits of increased replication within a test, especially when the mean effect of the sample is below about 20 percent in the case of chronic tests and about 15 percent for acute tests. As expected, increasing test replication (and thereby the power of the test) results in a *higher* rate of tests declared toxic using the traditional hypothesis testing approach but a *lower* rate of tests declared toxic using the TST approach.

Conducting tests with more replicates can help a permittee demonstrate that the effluent is acceptable if the mean effect at the IWC is truly less than the RMDs as defined by TST (25 percent effect for chronic and 20 percent for acute). Conversely, increasing replicates does not assist a permittee using the traditional hypothesis testing approach.

4.4 Applying TST to Ambient Toxicity Programs

In ambient and stormwater toxicity testing, a laboratory control and a single concentration (i.e., 100 percent ambient water or stormwater) are often tested. In those two-concentration WET tests, the objective is to determine if a sample or site water is toxic, as indicated by a significantly worse organism response compared to the control. In this WET testing design, the determination of pass or fail (i.e., toxic or non-toxic) is ascertained using a traditional t-test (USEPA 2002c). EPA WET test methods recommend that the statistical significance (i.e., pass/fail) of a two-sample test design for ambient and stormwater toxicity testing be determined by using only a modified t-test (if homogeneity of variance is not achieved) or a traditional t-test (if homogeneity of variance is achieved).

To demonstrate the value of the TST approach in ambient toxicity programs, ambient toxicity test data from California's SWAMP was used for 409 chronic tests for *Ceriodaphnia dubia* and 256 chronic tests for *Pimephales promelas* using EPA's 2002 WET test methods (USEPA 2002a). WET test data for each WET test method were subjected to the same statistical analyses as described in Section 2 of this document.

Chronic *Ceriodaphnia dubia* Ambient Toxicity Tests

Table 4-2 summarizes results from the 409 *Ceriodaphnia dubia* ambient toxicity tests analyzed and a $\alpha = 0.20$ for this test method. Although the majority of the tests examined resulted in the same decision using either the TST or the traditional t-test approach, approximately 6 percent of the tests (24 tests) would have been declared non-toxic using the traditional t-test approach with mean effect levels > 25 percent. In addition, 2 percent of the tests (7 tests) would have been declared toxic at mean effect levels < 15 percent and as low as 7 percent.

Table 4-2. Comparison of results of chronic *Ceriodaphnia* ambient toxicity tests using the TST approach and the traditional t-test analysis. $\alpha = 0.2$ and *b* value = 0.75 for the TST approach. $\alpha = 0.05$ for the traditional hypothesis testing approach

Both approaches declare toxic	Only TST declares toxic	Only traditional approach declares toxic	Both approaches declare non-toxic
19.8%	5.9%	1.7%	72.6%

Figure 4-1 shows ranges of CV values observed in *Ceriodaphnia dubia* ambient toxicity tests for those samples declared toxic using either the TST approach or the traditional t-test but not both approaches. As expected, within-test variability was relatively high (higher CVs) for those tests found non-toxic using a t-test but toxic using the TST approach. The results again demonstrate a limitation of the traditional hypothesis testing approach when control variability is relatively high. Under those conditions, the t-test did not have the power to detect toxicity when it was present. Figure 4-1 also demonstrates that the TST approach is superior to the traditional t-test when within-test variability is relatively low and the mean percent effect is well below the risk management level of 25 percent. Under such conditions, the traditional t-test declared some samples toxic using this WET test method, even when the mean effect was as little as 7 percent. The TST approach, however, declared all such samples non-toxic using the recommended $\alpha = 0.20$. Thus, the TST approach reduces the number of tests classified as toxic when effects are actually well below risk management levels of concern.

Similar to the *Ceriodaphnia* ambient test data, within-test variability was higher in those chronic fathead minnow ambient tests found non-toxic using a t-test but toxic using the TST approach (Figure 4-2). Similarly, those tests declared non-toxic by the TST approach but toxic using t-test had lower within-test variability and mean effect levels < 25 percent (Figure 4-2). Thus, as with the chronic *Ceriodaphnia* ambient tests, data from chronic fathead minnow ambient tests demonstrate that the TST approach provides better protection than the traditional t-test approach while also identifying those samples that are truly acceptable from a regulatory management perspective.

4.5 Implementing TST in WET Permitting under NPDES

The TST approach is an alternative statistical approach for analyzing and interpreting valid WET data; it is not an alternative approach to developing NPDES permit WET limitations. Using the TST approach does not result in any changes to EPA's WET test methods.

Chronic *Ceriodaphnia* ambient WET tests that are identified as non-toxic (pass) using the traditional hypothesis approach (t-test) generally have poor test sensitivity (high control CVs), masking effects, as compared to using the TST approach.

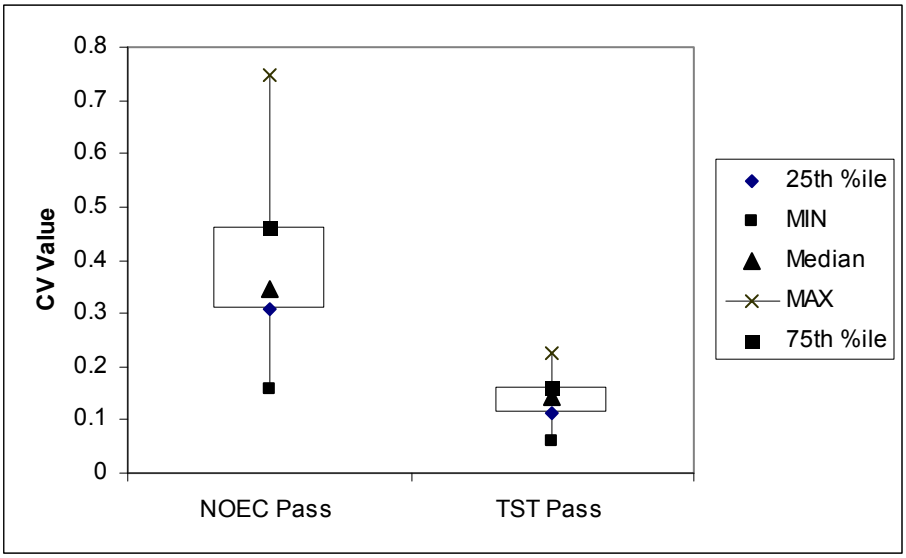

Figure 4-1. Range of CV values observed in chronic *C. dubia* ambient toxicity tests for samples that were found to be non-toxic using the traditional t-test but toxic using the TST approach (*NOEC Pass*) and for those samples declared toxic using t-test but not the TST approach (*TST Pass*). California's SWAMP WET test data.

Fish ambient WET tests that are identified as non-toxic using the traditional hypothesis approach (t-test) generally have poor test sensitivity (high control CVs), masking effects, as compared to using the TST approach.

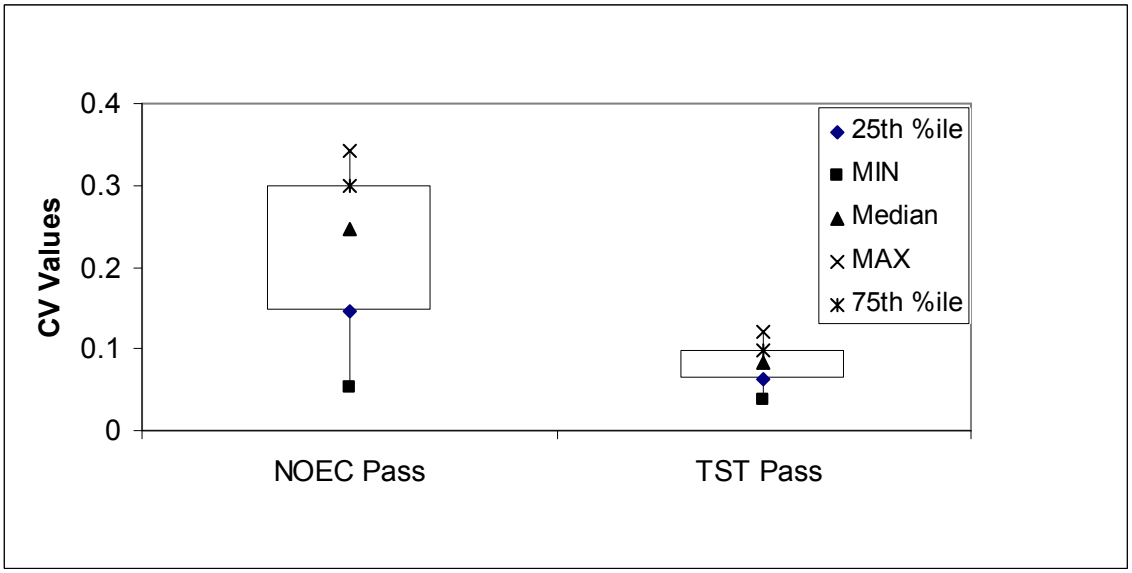

Figure 4-2. Range of CV values observed in chronic *P. promelas* ambient toxicity tests for samples that were declared to be non-toxic using the traditional t-test but toxic using the TST approach (*NOEC Pass*) and for those samples declared toxic using t-test but not the TST approach (*TST Pass*). California's SWAMP WET test data.

4.6 Reasonable Potential (RP) WET Analysis

NPDES permitting authorities conducting an RP analysis must follow 40 CFR 122.44(d)(1) to determine whether a discharge will, "cause, have the reasonable potential to cause, or contribute to" an excursion of a numeric criterion or a narrative WET criterion. Some states have state-specific WET RP approaches in their water quality control plan or other NPDES policy or guidance.

For RP calculations using the TST approach, EPA recommends that permitting authorities use all valid WET test data generated during the current permit term and any additional valid data that are submitted as part of the permit renewal application. The TST RP approach necessitates having at least a minimum of four valid WET tests to address effluent representativeness (see EPA's TSD, Chapter 3, pg. 57, under Step 2 in the section *Steps in Whole Effluent Characterization Process*). EPA also recommends that states request that their permittees provide the actual test endpoint responses for the control (i.e., control mean) and IWC concentration (i.e., IWC mean) for each WET test conducted to make it easier for permit writers to find the necessary WET test results when determining WET RP. WET test data are then analyzed according to the TST approach using the IWC and control test concentrations for all the valid WET test data available. If fewer than four valid WET test data points are available, permitting authorities should follow EPA's TSD RP approach because it addresses small WET data sets by incorporating an RP multiplying factor (see section 3.3.2 of the TSD, pg. 54) to account for effluent variability in small WET data sets. If sufficient, valid WET test data are available and the TST statistical approach indicates that the IWC is toxic in any WET test, RP has been demonstrated (40 CFR 122.44(d)(1)(i)). To address concerns regarding the "potential to cause or contribute to toxicity," an analysis of the mean effect at the IWC is also conducted to determine whether the effluent has RP, even if all test results are declared a *pass* using the TST approach (for more details, see EPA's *TST Implementation Document* EPA 833-R-10-003).

Note that using the TST approach might be to the permittee's advantage. If the permittee decides to incorporate additional test replicates for the control and the IWC when conducting the WET test, above the minimum required in the EPA WET test methods, the test power is increased. More test replicates increases test power, which means a lower probability of a false positive using the TST approach *if the effluent is truly non-toxic based on the RMDs in the TST approach*. Thus, using the TST approach, a permittee has a greater ability to *prove the negative* (i.e., its effluent does not have RP).

In those cases where the WET RP outcome is *yes*, a WET limit is expressed in the permit. In situations where the RP outcome is *no*, WET monitoring requirements should still be incorporated in the permit. A *fail* test result during monitoring could trigger additional steps if described in the permit. In either of those situations, if toxicity is demonstrated, states should specify an approach to address toxicity in the permit. This often includes initially accelerated toxicity tests (i.e., increased frequency of testing) and permit requirements to perform a toxicity reduction evaluation.

4.7 NPDES WET Permit Limits

Using the TST approach, WET NPDES permit limits would be expressed as *no significant toxicity of the effluent at the IWC using the TST analysis approach*. A test result of *Pass* is when

the calculated *t* value is greater than *the critical t value*. A test result of *Fail* is when the calculated *t* value is less than *the critical t value*.

Beyond assessing WET data for the NPDES Program, WET tests are used to assess toxicity of receiving water (watershed assessment for CWA section 303(d) determinations) and stormwater samples. Often as a first assessment of receiving or stormwater toxicity, researchers test a control and a single concentration (e.g., 100 percent receiving water or stormwater). In such cases, the TST approach can be used in the same way a t-test is used. Such analysis is used to determine whether organism response in a specified ambient concentration is significantly different than the control organism response.

5.0 CONCLUSIONS

Results of this project indicate that the TST is a viable additional option for analyzing valid acute and chronic WET test data. Given the RMDs and test-method specific alpha values specified in the TST approach, TST provides a transparent methodology for demonstrating whether an effluent truly is acceptable under the NPDES WET Program. The advantage of the TST approach is that it provides a structure in which it is easier to express, understand, and implement regulatory management goals. The alpha values identified in this project build on existing statistical information (such as data sources and analysis examining ability to detect toxic effects) on WET previously published by EPA, including *Understanding and Accounting for Method Variability in WET Applications Under the NPDES Program* (USEPA 2000).

More than 2,000 valid WET test results and thousands of simulations were conducted to develop the technical basis for the TST approach. This approach builds on the strengths of the traditional hypothesis testing approach, including using robust statistical analyses to determine whether an effluent is toxic (i.e., Welch's t-test), as well as published EPA documents regarding WET analysis and interpretation and the statistical literature. The TST approach yields a rigorous statistical interpretation of valid WET data by incorporating the transparent RMDs, established alpha and beta error rates, and thereby test power. Because this approach incorporates statistical test power, using TST will result in greater confidence in WET regulatory decisions. Additional benefits of using TST in WET analysis include the following:

- It provides a positive incentive for the permittee to generate high quality WET data to the permitting authority.
- It provides the ability to analyze a two-concentration test design (e.g., IWC versus control; stormwater and watershed assessments) using a streamlined statistical analysis flowchart. It is applicable to both NPDES WET permitting and section 303(d) watershed assessment programs.

In summary, the TST approach provides another option for permitting authorities and permittees to use in analyzing valid WET test data. The TST provides a positive incentive to generate high quality WET data to make informed decisions regarding NPDES WET RP and permit compliance determinations. By using TST, permitting authorities will be better able to identify toxic or non-toxic samples.

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APPENDIX A

RATIONALE FOR USING WELCH'S T-TEST IN TST ANALYSIS OF WET DATA FOR TWO-SAMPLE COMPARISONS

APPENDIX A

RATIONALE FOR USING WELCH'S T-TEST IN TST ANALYSIS OF WET DATA FOR TWO-SAMPLE COMPARISONS

This appendix demonstrates that the Welch modification of the t-test is suitable for WET test data and applicable to the TST approach. It also provides the evaluation and justification for certain WET test data that do not strictly adhere to the assumptions of the Welch t-test.

The Welch t-test accounts for different variances in two groups and assumes data are normally distributed (Welch 1938, 1947; Moser et al. 1989; Coombs et al. 1996; Zar 1996). For non-normal data that have skewed, long-tailed distributions, the Welch's t-test is known to have poor coverage (Zimmerman 2006). (By poor coverage, EPA means that the realized error rate, alpha, under the null hypothesis, is greater than the intended, nominal value of alpha). It is demonstrated below that WET data to which the TST will be applied typically have moderately unequal variances in the control and the IWC. That fact motivates use of the Welch t-test rather than the t-test (which assumes equal variances). It is also demonstrated that WET test data are typically non-normal but in a way that does not substantially compromise coverage of the Welch test—the data are leptokurtic and typically held within some range by the test design of the EPA WET test methods. Such data are known to have little effect on coverage for the Welch t-test (Zimmerman 2006; Zar 1996).

So as not to rely on previous literature alone, simulations were conducted to demonstrate that the Welch t-test applied to the TST is suitable for WET test data. Simulated data were generated, having variances and non-normal distributions similar to WET test data for control and IWC groups. It is demonstrated that (a) moderately unequal variances (similar to WET data) have little effect on coverage of the t-test or Welch t-test (for normally-distributed data), and (b) for non-normally distributed data (similar in distribution to WET data) representing control and IWC groups, the TST using the Welch t-test has close to nominal coverage, on the basis of simulations with up to a nine-fold difference in variance between IWC and control (a relatively high difference in variances on the basis of observed WET test data).

Therefore, published studies provide ample evidence, the analysis of WET data and simulations described here, that the Welch t-test can be applied with confidence using the TST approach.

Characterization of WET Data

Because various WET test methods have a different experimental design, and thus could represent different distribution functions, a range of WET test methods (six) was examined to determine the frequency and magnitude of unequal variances between control and IWC as well as the frequency and type of non-normality in these methods. In addition, standard data transformations were used for tests when data were non-normal to see whether transformed data would meet assumptions of normality.

Unequal Variances

Standard F-tests ($p = 0.01$) were conducted for each valid WET test (IWC and control) to determine whether variances were unequal. Some WET test methods and endpoints demonstrated a higher frequency of unequal variances than other test methods (Table A-1).

Table A-1. Number (and percent) of tests with non-normal distribution and unequal variances for different types of WET tests, as well as the effect of data transformation on distribution, including skew and kurtosis

Test name	Number of tests	Data transformation	# (%) of non-normal tests ($p < 0.01$)	# (%) tests failing f-test for unequal variances ($p \leq 0.01$)	Range of skewness statistic for non-normal tests	# (%) tests failing D'Agostino test for skewness ($p \leq 0.01$)	Range of kurtosis statistic for non-normal tests	# (%) tests failing Anscombe test for kurtosis ($p \leq 0.01$)
C. dubia reproduction	1,382	Raw	285 (20.6)	390 (28.2)	-1.529 – -0.26	33 (2.4)	3.821 – 6.571	159 (11.5)
		Sqrt trans	418 (30.2)	545 (39.4)	-1.790 – -0.385	89 (6.4)	4.013 – 7.45	268 (19.4)
		Log +1	525 (37.9)	630 (45.6)	-2.058 – -0.564	143 (10.3)	4.06 – 8.43	343 (24.9)
Fish growth	108	Raw	2 (1.9)	18 (16.7)	-1.253 – 1.250	0 (0)	3.261 – 4.213	0 (0)
Mysid growth	907	Raw	10 (1.1)	37 (4.0)	-0.423 – 1.443	1 (0.1)	2.52 – 4.912	7 (0.77)
Kelp growth	100	Raw	9 (9.0)	22 (22)	-1.478 – 1.548	0 (0)	4.025 – 5.456	6 (6)
		Log+1	8 (8.0)	30 (30)	-1.571 – 1.234	0 (0)	4.25 – 6.080	8 (8)
		sqrt	9 (9.0)	29 (29)	-1.625 – 1.381	0 (0)	4.238 – 6.068	8 (8)
Kelp germination	100	Raw	3 (3.0)	15 (15)	-0.9 – 1.281	0 (0)	3.465 – 4.697	3 (3)
		arcsin(sqrt)	1 (1.0)	9 (9)	-0.872 – 1.04	0 (0)	3.465 – 4.698	0 (0)
Fish survival	108	percent	44 (40.7)	61 (56.5)	-1.633 – 0.654	0 (0)	2 – 4.67	3 (2.8)
		arcsin(sqrt)	42 (38.9)	61 (56.5)	-1.633 – 0	0 (0)	2 – 4.67	3 (2.8)

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For example, over half of the *P. promelas* (fish) acute survival tests had unequal variances. That result is expected because control acute survival typically has little or no variance (i.e., all control replicates display 100 percent survival). *Ceriodaphnia* reproduction had the next highest frequency of tests with unequal variances (28.2 percent). The giant kelp growth or germination, and *P. promelas* (fish) chronic growth WET endpoints each had a lower frequency of tests with unequal variances (15–22 percent) while the mysid growth endpoint had the lowest frequency of unequal variances of the six test endpoints evaluated (4 percent). Using the *Ceriodaphnia* test method as an example of a WET method having a higher frequency of heterogeneous variances, the variance ratio between IWC and control was generally < 9:1 (95th percentile ratio) with a median variance ratio of 2.5. Examination of data using other growth/reproduction methods indicates that most tests have a variance ratio < 10:1 (95th percentile) and median variance ratio < 3.0. Percent data (germination) are subject to higher variance ratios (20~30:1); however, the fish acute test method has a variance ratio generally < 6.2:1 (95th percentile).

Non-Normality

Shapiro's normality test was used to evaluate if WET test data were normally distributed. A measure of skewness was then used and Pearson's measure of kurtosis (R moments package) to examine if skewness or kurtosis or both are the major sources of non-normality. The critical values of those moments for a normal distribution are shown in Table A-2. A skewness measure significantly less than 0 indicates that the sample comes from a population that is skewed to the left, and a skewness measure significantly larger than 0 indicates that the distribution is skewed to the right. A kurtosis measure significantly larger than the median value (50th percentile) for a given test design in Table A-2 indicates an underlying leptokurtic distribution. EPA also used the D'Agostino test of skewness (D'Agostino 1970) and Anscombe–Glynn test of kurtosis (Anscombe and Glynn 1983) for hypothesis testing.

Table A-2. Distribution of critical skewness and kurtosis ranges for different sample size (N) based on 1,000,000 simulation runs. N = 20 corresponds to *C. dubia* reproduction test (10 replicates in IWC and control); N = 16 corresponds to the Mysid chronic test (8 replicates per treatment); N = 10 corresponds to the two giant kelp chronic test endpoints (5 replicates per treatment); N = 8 corresponds to fathead minnow acute and chronic tests (four replicates per treatment)

		Percentiles						
N	**Statistic**	**1%**	**5%**	**10%**	**50%**	**90%**	**95%**	**99%**
20	Skewness	-1.152	-0.771	-0.587	0	0.588	0.772	1.155
	Kurtosis	1.645	1.831	1.951	2.551	3.667	4.151	5.361
16	Skewness	-1.244	-0.834	-0.635	0	0.635	0.833	1.247
	Kurtosis	1.562	1.746	1.866	2.477	3.629	4.126	5.351
10	Skewness	-1.407	-0.956	-0.729	0	0.726	0.953	1.404
	Kurtosis	1.387	1.563	1.679	2.289	3.463	3.940	4.972
8	Skewness	-1.453	-0.998	-0.766	0	0.766	0.997	1.450
	Kurtosis	1.318	1.470	1.583	2.173	3.319	3.731	4.567

The number of tests failing the hypothesis tests at 1 percent probability is reported in Table A-1. About 21 percent of the *Ceriodaphnia* reproduction tests (285 out of 1,382 cases) failed Shapiro's normality test (Table A-1). Both square root transformation and logarithm

transformation did not correct the non-normal distribution problem and instead increased the total number of tests failing the normality test (Table A-1). The D'Agostino test of skewness indicated that 33 tests (< 3 percent) were highly skewed. A test of kurtosis found 11 percent of tests (160) had significantly leptokurtic distribution (Table A-1). Apparently, most of the *Ceriodaphnia* test data failed the normality test because of kurtosis (leptokurtic distribution) and that occasional asymmetric distribution was mostly from outliers (Figure A-1). In general, most WET test growth data (i.e., *Pimephales promelas* growth, mysid growth, or kelp growth) were normally distributed. Both fish and mysid growth data exhibited non-normal distribution in only a very few cases (< 2 percent) and those were generally related to leptokurtic distributions that were short-tailed. Almost half of the acute fish survival tests had non-normally distributed data. Zero variance in many tests for either the control (34 cases) or IWC (26 cases) were the main cause of failing the normality test. Non-normality in acute fish survival data was because of leptokurtic data distribution (Table A-1).

The above analyses indicate that WET data in general do not have the distribution characteristics indicative of when Welch's t-test would be inappropriate (long-tail, highly skewed distribution).

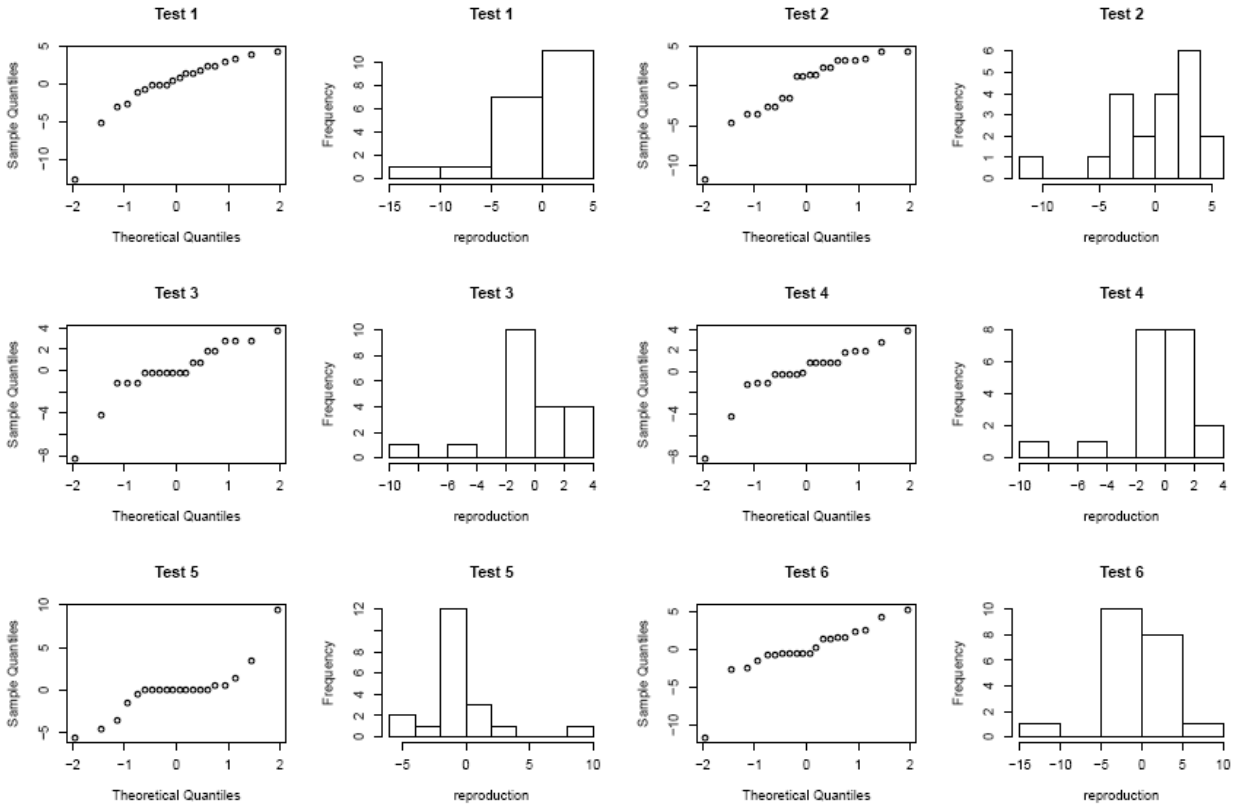

Figure A-1. Probability plots and histograms of examples of *Ceriodaphinia* chronic reproduction test data showing non-normal distribution and especially leptokurtic distribution.

Simulations

Unequal Variances

Various simulations were conducted using the chronic *Ceriodaphnia* test method as an example, to examine alpha error rate using either the traditional hypothesis t-test or Welch's t-test with data having different relationships between control and effluent variance. From analyses of more than 2,000 WET tests presented in Table A-1, a variance ratio (IWC/control) of 9:1 (95th percentile of variance ratio) is a reasonable upper limit. Therefore, simulation scenarios examined included (1) equal variances and no mean difference between control and effluent; (2) IWC with 9 times the control variance and no mean difference; (3) equal variance and a 25 percent mean effect of the IWC; and (4) IWC with 9 times the control variance and a 25 percent mean effect. Equal sample size (N = 10 using *Ceriodaphnia* chronic test method as the example) was assumed for both control and treatment group which is most often the case in WET analyses. Results are shown in Table A-3.

Table A-3. Results of Monte Carlo simulations evaluating alpha error rate using either the traditional t-test or Welch's t-test with data having different relationships between control and effluent variances. S_c^2 = control variance, S_t^2 = IWC variance, μ_c = control mean, and μ_t = IWC mean. Results are based on 1,000,000 simulation runs per scenario.

		$\mu_c = \mu_t$		$\mu_t = 0.75\ \mu_c$	
	Alpha	**T-test**	**Welch t-test**	**T-test**	**Welch t-test**
$S_c^2 = S_t^2$	0.010	0.0098	0.0093	0.0099	0.0095
	0.050	0.0498	0.0490	0.0497	0.0491
	0.100	0.0996	0.0988	0.1000	0.0992
	0.150	0.1493	0.1486	0.1501	0.1506
	0.200	0.1996	0.1991	0.2000	0.1997
	0.250	0.2498	0.2493	0.2502	0.2498
$S_c^2 = S_t^2/9$	0.010	0.0132	0.0105	0.0204	0.0103
	0.050	0.0550	0.0503	0.0725	0.0503
	0.100	0.1050	0.1001	0.1269	0.1002
	0.150	0.1543	0.1501	0.1774	0.1499
	0.200	0.2037	0.2003	0.2260	0.1999
	0.250	0.2526	0.2499	0.2732	0.2499

When there are equal variances and the true difference is equal to 0, the observed error rates from both the traditional t-test and Welch's t-test are very close to the expected error rates. When control and treatment groups have unequal variance, (effluent variance = 9 times the control variance), the traditional t-test has a slightly higher Type I error rate, but Welch's t-test has a Type I error rate similar to the expected value. When the true response at the IWC is 0.75 × control mean, and both populations have equal variances, alpha error rates are very similar to expected using both the traditional t-test and Welch's t-test. When the true response at the IWC is 0.75 × control mean and population variances are not equal (i.e., effluent variance is 9 times

the control variance), the error rates are about 2–3 percent higher than expected using the traditional t-test but are similar to expected alphas using Welch's t-test.

While the specific results pertain to the *Ceriodaphnia* reproduction endpoint, the general conclusions of this analysis would apply to all WET methods and endpoints. Such results confirm that Welch's t-test has better coverage than the traditional t-test using the TST approach when variances are unequal.

Non-Normality

The objective of the simulations was to confirm that the alpha error rate is relatively stable against deviations from non-normal distribution when variances are unequal as well for both the traditional hypothesis test and Welch's t-test.

EPA examined the distribution of control and effluent reproduction data from 281 *C. dubia* multiple concentration tests (Figure A-2). While most tests indicate that control reproduction follows a normal distribution (mean = 24.5, standard deviation = 5.56), effluent data tend to deviate from a normal distribution: effluents with low toxicity have less skewed data, while effluents with data that have high toxicity are more likely to deviate from normal distribution. To address this observation, two populations were simulated on the basis of the shape of the frequency distribution in the highest effluent concentration in each *C. dubia* test (Figure A-3). The first simulated effluent population had a mean = 25 (equal to the population mean for the control group) and a standard deviation = 7.7, while the second one had a population mean of $b \times 25$ (where $b = 0.75$ for chronic test methods), resulting in an effluent mean of 18.75. The variance of those two effluent populations was the same. Random samples taken from these two populations were used to compare with the control population data (mean = 25, standard deviation = 5.56).

Simulation results (Table A-4) indicate that when the two populations had the same mean but had a different distribution shape as compared to a normal distribution (control population), the alpha error rate using the traditional t-test was about 1 percent higher than expected. Welch's modified t-test slightly corrected the error rate (Table A-4). When the true population mean difference between control and effluent is 25 percent of the control mean and when the effluent population is not normally distributed, the alpha error rate is almost identical to the expected value using traditional t-test (Table A-4). Welch's t-test resulted in a decrease in the nominal alpha error rate by 2–3 percent using the TST approach. That is, when data are extremely non-normal (for WET test data) and variances are heterogeneous between control and effluent, Welch's t-test is less likely to reject the null hypothesis and slightly more likely to declare a sample toxic than expected (i.e., the analysis will be more conservative). As data approach a normal distribution, α error rates using Welch's t-test will be closer to nominal values.

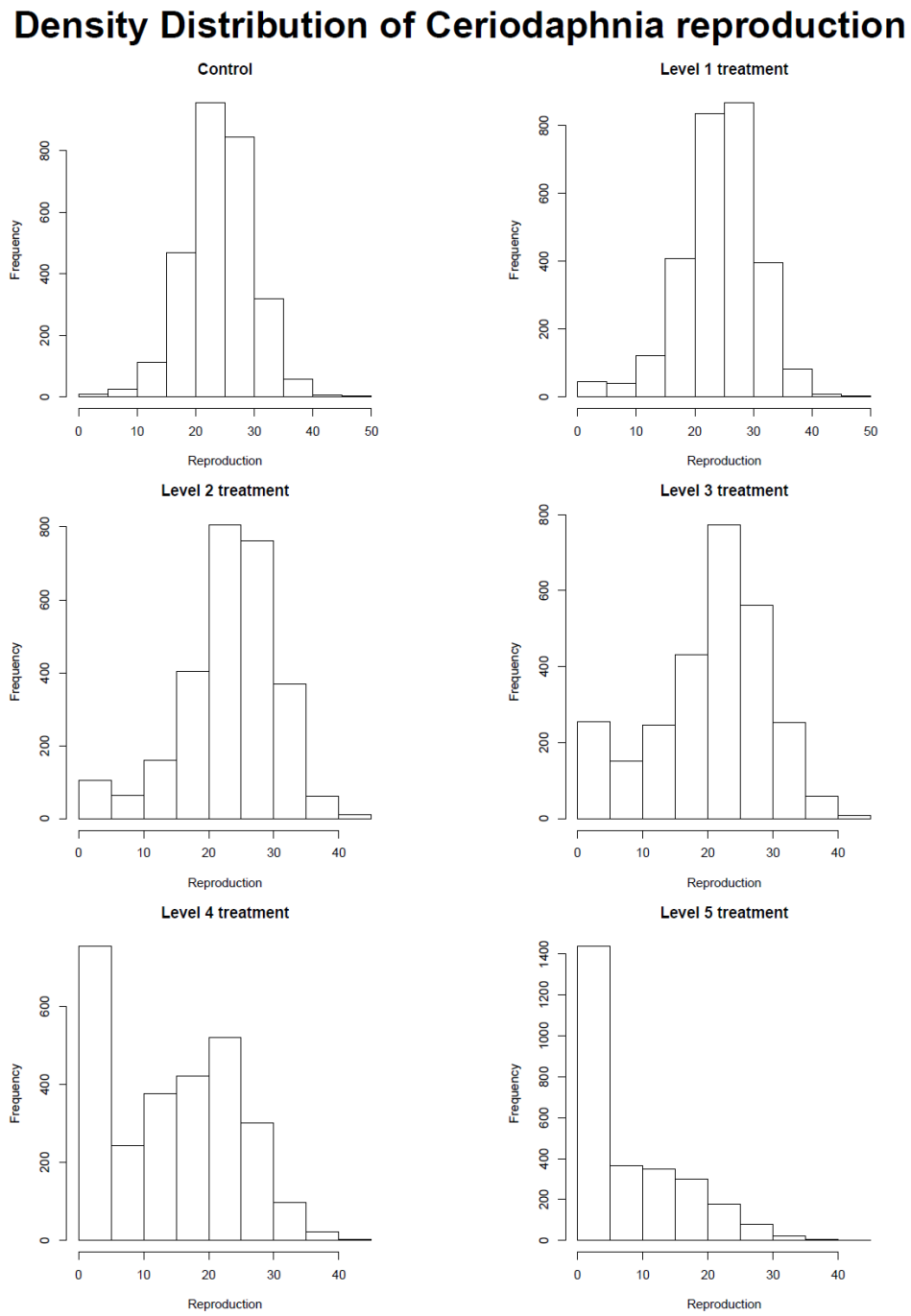

Figure A-2. Histogram of observed *Ceriodaphnia* reproduction at different level of effluent concentrations based on 281 multiple concentration tests.

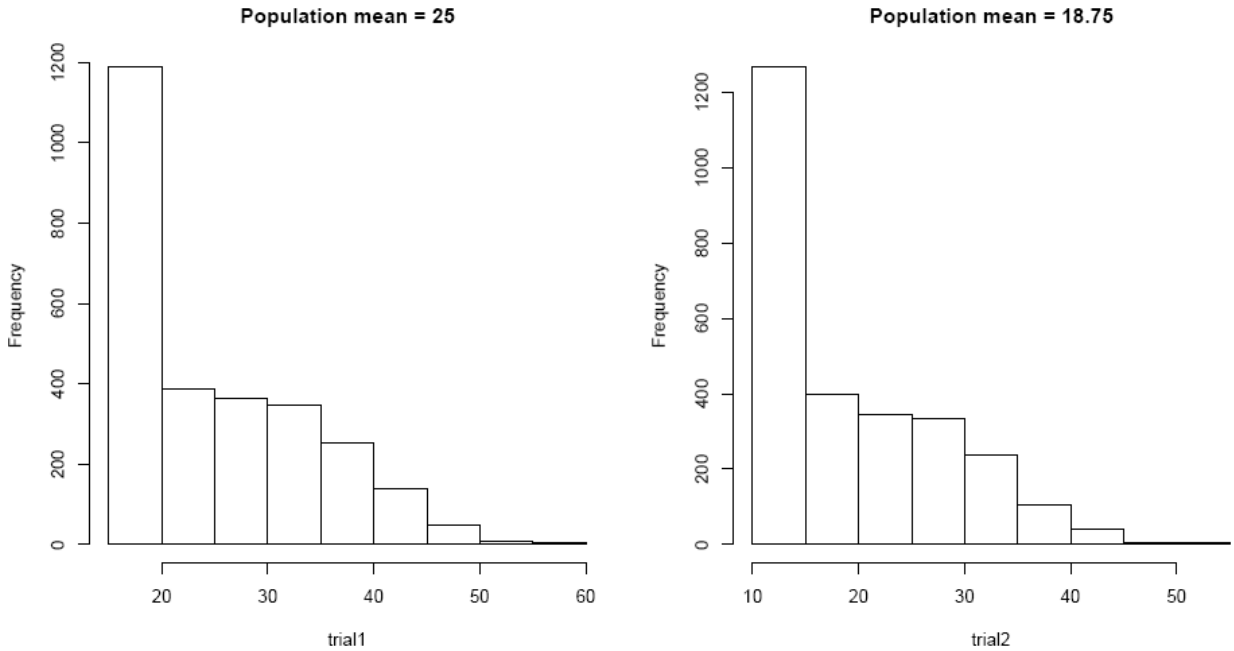

Figure A-3. Simulated frequency distributions of Ceriodaphnia reproduction data with two populations having non-normal data and different means. Both populations have a standard deviation of 7.7.

Table A-4. Results of Monte Carlo simulation analyses (100,000 simulations per scenario) indicating alpha error rates based on comparisons between two non-normally distributed populations and a normal distribution (control population, mean = 25, standard deviation = 5.65). The population means are 25 and 18.75, respectively, and the standard deviation is 7.7 in both populations.

Alpha	Welch's (μ = 25)	Traditional t (μ = 25)	TST t-test (μ = 18.75, b = 0.75)	TST Welch's (μ = 18.75, b = 0.75)
0.05	0.053	0.059	0.043	0.031
0.10	0.104	0.108	0.090	0.074
0.15	0.151	0.155	0.140	0.122
0.20	0.199	0.203	0.191	0.173

Although the simulated population does not necessarily represent the true population of effluent groups, EPA's examination of sample distribution indicates that effluent populations with low toxicity are less likely to deviate from normal distribution. The simulation also indicates that the alpha error rate using Welch's t-test under severely non-normal distributions and heterogeneous variances is less than the expected/critical values. That is, Welch's t-test is more conservative when toxicity is high (a desirable attribute for WET analysis) than when effluent toxicity is low. When effluent toxicity is low, results of analyses using *Ceriodaphnia* reproduction WET test data indicate that the effluent data are less likely to be non-normally distributed, and the observed alpha error rate approaches the expected error rate. On the basis of the foregoing results, the type of non-normal distribution observed in WET tests should not affect the overall performance of simulation analyses used to derive test method alpha values for the TST approach.

Rationale/Conclusions

When population variances are not equal or test samples are non-normally distributed (or both), concerns could be raised in using the two concentration t-test or the bioequivalence t-test (Erickson and McDonald 1995) because statistical assumptions might not be met. EPA WET test methods specify that if the data fail Shapiro-Wilks's normality test or Bartlett's homoscedasticity test (or both), a non-parametric test such as Wilcoxon Rank sum test should be used in such situations. Extension of such nonparametric tests to TST is, however, complicated because the null hypothesis for those tests is that results from control and effluent are from same population. This is stated as the null hypothesis of no difference among treatments. Because an effect size 1–($b \times \mu_0$) is specified in the TST approach that is related to the control population mean, a non-parametric equivalent to a t-test approach using a bioequivalence formulation (such as with the TST approach), has been difficult to demonstrate (Zimmerman and Zumbo 1993; Manly 2004).

Data compiled from more than 2,000 valid WET tests in this project confirmed that the type of distributions exhibited by most test data do not seriously compromise the use of a t-test. The data can be dealt with appropriately using Welch's t-tests for unequal variances, as shown in simulation analyses. Use of Welch's t-test for TST analysis is supported on the basis of analysis of actual WET test data, which indicate that the majority of WET test data are normally distributed or have a leptokurtic distribution with short tails such that the use of Welch's t-test produces Type I error rates very close to expected error rates. Statistical literature indicates that actual power of the t-test (and by extension Welch's t-test) is *greater* when populations are leptokurtic, especially for small sample sizes (Zar 1996).

WET test data are biologically expected to have short-tailed distributions supporting the use of Welch's t-test because of the test method's required test acceptability criteria and test termination times, which constrain the range of endpoint responses encountered. For example, a chronic *Ceriodaphnia dubia* test must have 80 percent or greater survival and an average of 15 or more young per surviving female in the control for the test to meet the required test acceptability criteria (i.e., a valid test). Additionally, test termination is prescribed in the method as the time at which at least 60 percent or more of the surviving control females generate at least three broods, which can be 6–8 days (maximum is 8 days), also a test requirement. That results in a lower distribution bound (e.g., reproduction responses in controls start at 15). In addition, the upper part of the distribution cannot go to infinity, even if populations were to survive and reproduce beyond the prescribed test requirements because of biological constraints. Similar test method and biological constraints apply to all other WET test endpoints (e.g., growth, survival).

Furthermore, Welch's t-test is robust to non-normal distributions when the underlying distribution is symmetric and skewness is low, especially with sample sizes > 10 (Tiku 1971; Lee and D'Agostino 1976; Tiku and Akkaya 2004). For the West Coast WET methods examined and the *Ceriodaphnia* and Mysid chronic WET method evaluated, those conditions are met. Therefore, at least for those WET methods and others with similarly large sample sizes, Welch's t-test should not result in a substantial underestimation of the Type I error rate.

In addition, the Type I error rate using TST for several WET methods is set ≥ 0.05. The higher α levels include WET test methods that have smaller sample sizes such as the fathead minnow acute test. For those methods, the slight overestimation of the nominal Type I error rate that can occur using Welch's t-test when WET test data are not normally distributed is insignificant given

the higher nominal α levels established. For the West Coast WET test methods that have α levels set at 0.05, effect size examined in those test methods is large and, in many cases, data are normally distributed even without data transformation (e.g., giant kelp germination and tube-length endpoints, Table A-1).

The observed sample distribution from 281 *C. dubia* multiple concentration tests indicates that test populations at low effluent concentrations are less likely to deviate from normal distribution. A similar trend is expected for other WET endpoints such as growth. The simulation based on the distribution shape of the high effluent concentration population also indicates that the alpha error rate using Welch's t-test is less than expected. That is, Welch's t-test is more conservative when toxicity is high. Therefore, the type of non-normal distribution observed in WET tests should not negatively affect the outcome of TST analyses.

Analyses used to develop the TST analysis approach indicate that data transformation (log or square root) does not help the non-normality issue for WET test data (Table A-1). That is usually because of the leptokurtic distribution observed rather than because of skewness of data (Table A-2). Therefore, data transformation before TST analysis is not recommended except for percent data, which should be arcsine square root transformed before TST analysis (consistent with current EPA analysis recommendations). This precaution is suggested because percent data (especially acute percent survival) is most prone to non-normality.

In conclusion, given the leptokurtic and short-tailed distribution of most WET test data, as well as the other factors noted above, Welch's t-test is appropriate to use for one-tailed, two-sample comparisons using TST. Furthermore, because Welch's t-test performs as effectively as the t-test in terms of Type I error when data are normally distributed and variances are equal (Moser et al. 1989; Coombs et al. 1996), Welch's t-test should be used for all WET test data analysis using TST. Furthermore, many researchers have shown that the combination of using a preliminary variance test (e.g., F-test) plus a t-test does not control Type I error rates as well as simply always performing an unequal variance t-test such as Welch's t-test (Gans 1992; Moser and Stevens 1992). That is one reason why it is generally unwise to decide whether to perform one statistical test on the basis of the outcome of another (Smith 1936; Markowski and Markowski 1990; Zimmerman 2004).

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APPENDIX B

STEP-BY-STEP PROCEDURES FOR ANALYZING VALID WET DATA USING THE TST APPROACH

APPENDIX B

STEP-BY-STEP PROCEDURES FOR ANALYZING VALID WET DATA USING THE TST APPROACH

The following is a step-by-step guide for using the TST approach to analyze valid WET data for the NPDES WET Program. This guide is applicable for a two-concentration data analysis of an IWC or a receiving water concentration compared to a control concentration. For further information regarding conducting WET tests and proper quality assurance/quality control needed, see the EPA WET method manuals. As you proceed through this guide, refer to the flowchart shown in Figure B-1 of this appendix.

Step 1: Conduct WET test following procedures in the appropriate EPA WET test method manual. This includes following all test requirements specified in the method (USEPA 1995 for chronic West Coast marine methods, USEPA 2002a for chronic freshwater WET methods, USEPA 2002b for chronic East Coast marine WET methods, and USEPA 2002c for acute freshwater and marine methods).

Step 2: For each test endpoint specified in the WET test method manual (e.g., survival and reproduction for the *Ceriodaphnia* chronic WET test method), follow Steps 3–7 below. Note that the guide refers to an effluent concentration tested, which is assumed to be the IWC as specified in the permit or a receiving water concentration for ambient testing. For example, if no mixing zone is allocated, the IWC is 100 percent effluent.

Note: If there is no variance (i.e., zero variance) in the endpoint in both concentrations being compared (i.e., all replicates in each concentration have the same exact response), then skip the remaining steps in the flowchart and do the following. Compute the percent difference between the control and the other concentration (e.g., IWC) and compare the percent difference against the RMD values of 25% for chronic and 20% for acute endpoints. Percent mean effect is calculated as:

$$\%\ \text{Effect at IWC} = \frac{\text{Mean Control Response} - \text{Mean Response at IWC}}{\text{Mean Control Response}} \times 100$$

If the percent mean response is ≥ the RMD, the sample is declared toxic and the test is "*Fail*". If the percent mean response is < the RMD, the sample is declared non-toxic and the test is "*Pass*".

Step 3: For data consisting of proportions from a binomial (response/no response; live/dead) response variable, the variance within the *i*th treatment is proportional to $P_i\ (1 - P_i)$, where P_i is the expected proportion for the treatment. That clearly violates the homogeneity of variance assumption required by parametric procedures such as the TST procedure because the existence of a treatment effect implies different values of P_i for different treatments, *i*. Also, when the observed proportions are based on small samples, or when P_i is close to zero or one, the normality assumption might be invalid. The arcsine square root (arcsine $\sqrt{P}$) transformation is used for such data to stabilize the variance and satisfy the normality requirement. The square root of percent data (e.g., percent survival, percent fertilization), expressed as a decimal fraction (where 1.00 = 100 percent) for each treatment, is first calculated. The square root value is then

arcsine transformed before analysis in Step 4. Note: Excel and most statistical software packages can calculate arcsine values.

Step 4: Conduct Welch's t-test (Zar 1996) using Equation 1:

Equation 1

$$t = \frac{\overline{Y_t} - b \times \overline{Y_c}}{\sqrt{\frac{S_t^{\,2}}{n_t} + \frac{b^2 S_c^{\,2}}{n_c}}}$$

where

$\overline{Y_c}$ = Mean for the control

$\overline{Y_t}$ = Mean for the IWC

s_c^2 = Estimate of the variance for the control

s_t^2 = Estimate of the variance for the IWC

n_c = Number of replicates for the control

n_t = Number of replicates for the IWC

b = 0.75 for chronic tests; 0.80 for acute tests

Note on the use of Welch's t-test: Welch's t-test is appropriate to use when there are an unequal number of replicates between control and the IWC. When sample sizes of the control and treatment are the same (i.e., $n_t = n_c$), Welch's t-test is equivalent to the usual Student's t-test (Zar 1996).

Step 5: Adjust the degrees of freedom (df) using Equation 2:

Equation 2

$$\upsilon = \frac{\left(\frac{S_t^{\,2}}{n_t} + \frac{b^2 S_c^{\,2}}{n_c}\right)^2}{\frac{\left(\frac{S_t^{\,2}}{n_t}\right)^2}{n_t - 1} + \frac{\left(\frac{b^2 S_c^{\,2}}{n_c}\right)^2}{n_c - 1}}$$

Using Welch's t-test, df is the value obtained for *v* in Equation 2 above. Because *v is* most likely a non-integer, round *v* to the next smallest integer, and that number is the df.

Step 6: Using the calculated t value from Step 4, compare that *t* value with the critical *t* value table in Appendix C using the test method-specific alpha values shown in Table 4-1. To obtain the correct *t* value, look across the table for the alpha value that corresponds to the WET test method (for the appropriate alpha value, see Table 4-1 of this document) and then look down the table for the appropriate df.

Step 7: If the calculated *t* value is less than the critical *t* value, the IWC is declared toxic, and the test result is *Fail*. If the calculated *t* value is greater than the critical *t* value, the IWC is not declared toxic and the test result is *Pass*.

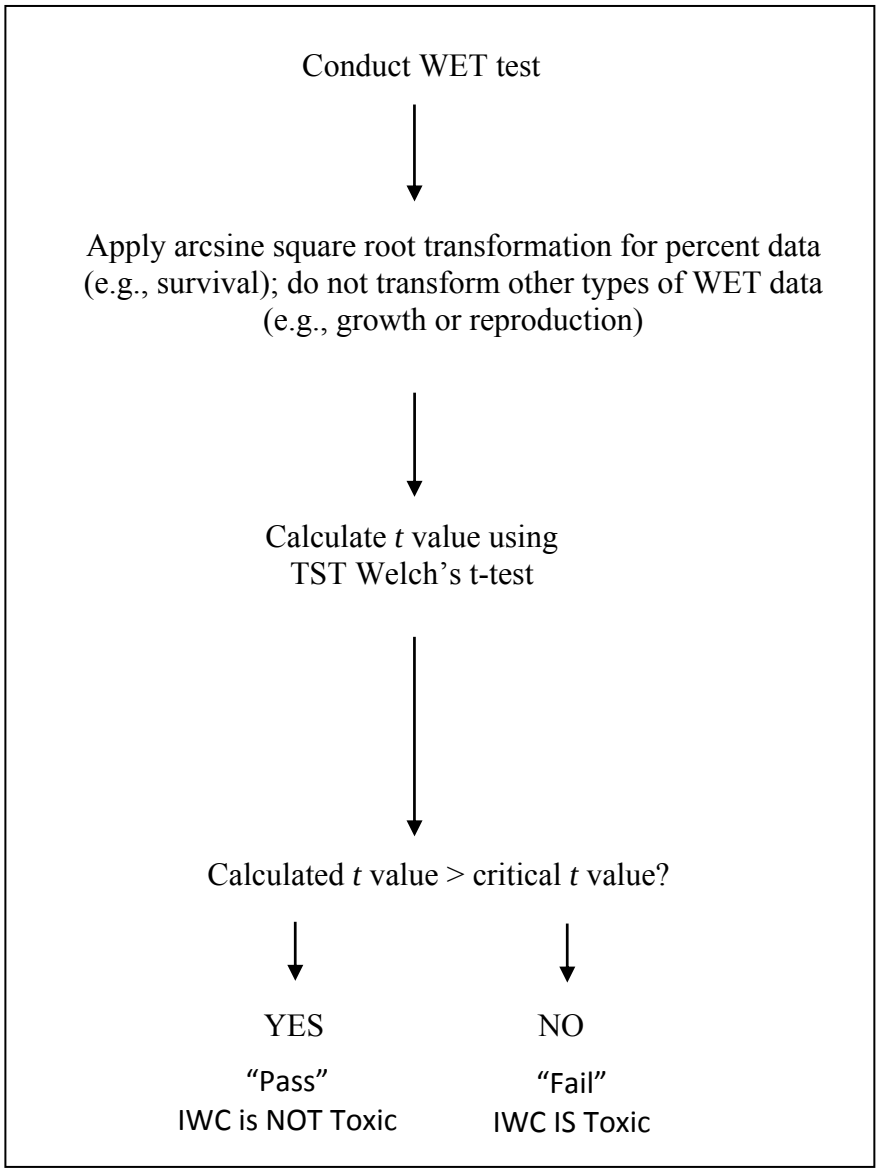

Figure B-1. Statistical flowchart for analyzing valid WET data using the TST approach for control and the IWC, receiving water, or stormwater.

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APPENDIX C

CRITICAL *t* VALUES FOR THE TEST OF SIGNIFICANT TOXICITY APPROACH

Table C-1. Critical values of the *t* distribution. One tail probability is assumed.

	Alpha				
Degrees of freedom	**0.25**	**0.20**	**0.15**	**0.10**	**0.05**
1	1	1.3764	1.9626	3.0777	6.3138
2	0.8165	1.0607	1.3862	1.8856	2.92
3	0.7649	0.9785	1.2498	1.6377	2.3534
4	0.7407	0.941	1.1896	1.5332	2.1318
5	0.7267	0.9195	1.1558	1.4759	2.015
6	0.7176	0.9057	1.1342	1.4398	1.9432
7	0.7111	0.896	1.1192	1.4149	1.8946
8	0.7064	0.8889	1.1081	1.3968	1.8595
9	0.7027	0.8834	1.0997	1.383	1.8331
10	0.6998	0.8791	1.0931	1.3722	1.8125
11	0.6974	0.8755	1.0877	1.3634	1.7959
12	0.6955	0.8726	1.0832	1.3562	1.7823
13	0.6938	0.8702	1.0795	1.3502	1.7709
14	0.6924	0.8681	1.0763	1.345	1.7613
15	0.6912	0.8662	1.0735	1.3406	1.7531
16	0.6901	0.8647	1.0711	1.3368	1.7459
17	0.6892	0.8633	1.069	1.3334	1.7396
18	0.6884	0.862	1.0672	1.3304	1.7341
19	0.6876	0.861	1.0655	1.3277	1.7291
20	0.687	0.86	1.064	1.3253	1.7247
21	0.6864	0.8591	1.0627	1.3232	1.7207
22	0.6858	0.8583	1.0614	1.3212	1.7171
23	0.6853	0.8575	1.0603	1.3195	1.7139
24	0.6849	0.8569	1.0593	1.3178	1.7109
25	0.6844	0.8562	1.0584	1.3163	1.7081
26	0.684	0.8557	1.0575	1.315	1.7056
27	0.6837	0.8551	1.0567	1.3137	1.7033
28	0.6834	0.8546	1.056	1.3125	1.7011
29	0.683	0.8542	1.0553	1.3114	1.6991
30	0.6828	0.8538	1.0547	1.3104	1.6973
inf	0.6745	0.8416	1.0364	1.2816	1.6449

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U.S. Environmental Protection Agency

NPDES Permit Writers' Manual

U.S. Environmental Protection Agency
Office of Wastewater Management, Water Permits Division
State and Regional Branch

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United States
Environmental Protection
Agency

Office of Water
Washington, DC

United States Environmental Protection Agency

National Pollutant Discharge Elimination System (NPDES) Permit Writers' Manual

This guidance was developed by staff within the U.S. Environmental Protection Agency's (EPA's) Office of Wastewater Management and addresses development of wastewater discharge permits under the National Pollutant Discharge Elimination System (NPDES). NPDES permit development is governed by existing requirements of the Clean Water Act (CWA) and the EPA NPDES implementing regulations. CWA provisions and regulations contain legally binding requirements. This document does not substitute for those provisions or regulations. Recommendations in this guidance are not binding; the permitting authority may consider other approaches consistent with the CWA and EPA regulations. When EPA makes a permitting decision, it will make each decision on a case-by-case basis and will be guided by the applicable requirements of the CWA and implementing regulations, taking into account comments and information presented at that time by interested persons regarding the appropriateness of applying these recommendations to the situation. This guidance incorporates, and does not modify, existing EPA policy and guidance on developing NPDES permits. EPA may change this guidance in the future.

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5. Incidental Vessel Discharges—Smithsonian Environmental Research Center, National Ballast Information Clearinghouse
6. Non-Municipal (Industrial)—EPA
7. Construction Stormwater—Barry Tonning, Tetra Tech, Inc.
8. Combined Sewer Overflow—EPA

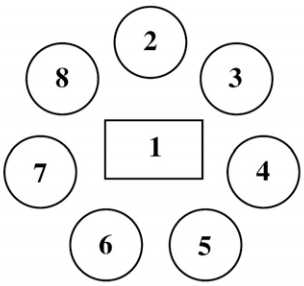

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Introduction to the Manual

This manual reviews the statutory and regulatory framework of the National Pollutant Discharge Elimination System (NPDES) program and examines technical considerations for developing NPDES permits for wastewater discharges. The manual is designed, primarily, for new permit writers becoming acquainted with the NPDES program and the process of permit writing, but can also serve as a reference for experienced permit writers or anyone interested in learning about the legal and technical aspects of developing NPDES permits. This manual replaces the *1996 U.S. EPA NPDES Permit Writers' Manual*[1] <www.epa.gov/npdes/pubs/owm0243.pdf>, which updated the *1993 Training Manual for NPDES Permit Writers*[2] <www.epa.gov/npdes/pubs/owm0339.pdf>.

To assist the reader, acronyms and abbreviations are defined for the first use in each chapter and in Appendix A of the manual. Endnotes are provided at the end of each chapter.

Purpose of this Manual

The purpose of this *NPDES Permit Writers' Manual* (manual) is to provide a general reference for permitting authorities that outlines and explains the core elements of the NPDES permit program. The core elements form the foundation of the NPDES program on which guidance for specific areas of the program (e.g., stormwater, concentrated animal feeding operations) can be built. While the guidance for these core program areas will be applicable in many cases, the U.S. Environmental Protection Agency (EPA) recognizes that each EPA Regional Office or authorized state, territory, or tribe (hereafter *state*) will tailor specific aspects of its NPDES permitting procedures to address state and local laws and site-specific concerns and conditions.

The specific objectives and functions of this manual are as follows:

- Provide an overview of the scope and the statutory and regulatory framework of the NPDES program.
- Describe the essential components of a permit and provide an overview of the permitting process.
- Describe the different types of effluent limitations and the legal and technical considerations involved in developing effluent limitations.
- Describe the legal and technical considerations involved in developing other permit conditions including
  - Monitoring and reporting requirements.
  - Special conditions.
  - Standard conditions.
- Describe other permitting considerations including
  - Variances.
  - Anti-backsliding.
  - Other applicable statutes.

- Explain the administrative process for issuing, modifying, revoking and terminating NPDES permits.

This manual is not intended to be a standalone reference document. Rather, it establishes the framework for NPDES permit development and should be supplemented, where necessary, by additional EPA and state regulations, policy, and detailed guidance applicable to specific types of dischargers and circumstances. To that end, this manual identifies and references relevant regulations, policy, and other guidance documents throughout the text.

Publications Referenced

This manual provides links to publications available online that supplement the information in the manual. All documents available electronically were accessed and available as of the date of this manual's publication. Some documents are not available in an electronic format. In those instances, readers should check the following sources to determine the availability of and to obtain printed copies of the documents:

- Office of Water Resource Center (OWRC) <www.epa.gov/safewater/resource/>
  OWRC is a contractor-operated facility providing document delivery, information/referral, and reference services to public users and EPA staff interested in Office of Water Program information
  phone: 202-566-1729 or 800-832-7828, fax: 202-566-1736, e-mail: <center.water-resource@epa.gov>.
- EPA Library Services and Repositories <www.epa.gov/natlibra/libraries.htm>
  EPA's library services and repositories provide access to information about the environment and related scientific, technical, management, and policy information. Library services <www.epa.gov/natlibra/library_services.html> are delivered through the National Library Network <www.epa.gov/natlibra/index.html>.
- National Service Center for Environmental Publications (NSCEP) <www.epa.gov/ncepihom/>
  NSCEP, formerly NCEPI, maintains and distributes EPA publications in hardcopy, CD ROM and other multimedia formats. The publication inventory includes more than 7,000 titles
  phone: 513-489-8190 or 800-490-9198, fax: 513-489-8695, e-mail: ncepimal@one.net.
- National Technical Information Service (NTIS) <www.ntis.gov/>
  NTIS is the largest central resource for government-funded scientific, technical, engineering, and business related information covering more than 350 subject areas from more than 200 federal agencies
  phone: 703-605-6050 or 888-584-8332, fax: 703-605-6900, e-mail: customerservice@ntis.gov.

Legislative and Regulatory Citations

There are a number of different conventions used to cite legislation and regulations. In this manual, the following conventions have been used:

- When citing the *United States Code*, the abbreviation U.S.C. is used. The abbreviation is preceded by the Title of the U.S.C. and then followed by the section number.
  Example: 16 U.S.C. 1531 *et seq*. and 33 U.S.C. §§ 1251-1387.

- When citing the Clean Water Act, the abbreviation CWA is used. The abbreviation is followed by the word *section* and then the section number.
  Example: CWA section 402 and CWA section 402(o).
- When citing the *Code of Federal Regulations* (CFR), the convention depends on the location of the reference. For first references, the abbreviation CFR is preceded by the title number of the CFR and followed either by the word *Part* (if it is a part—a whole number) or the number of the subsection (if it is a subpart/subsection). For subsequent references, the title and CFR are omitted and just the word *Part* or the section symbol (§) is used.
  Example: First citation: 40 CFR Part 136 or 40 CFR 122.44
  Subsequent citations: Part 136 or § 122.44.

Almost all the regulatory citations in this manual are for Title 40 of the CFR (with the exception of the other federal laws referenced in section 11.1 of this manual). Any other Titles are explicitly referenced and in the format for the first regulatory citation (e.g., 50 CFR Part 402).

Electronic NPDES Information

Websites and electronically stored publications and data are available to help permit writers draft NPDES permits. Tools have been created to assist permit writers with specific aspects of permit development and are discussed in their respective sections. The electronic tools listed below apply to all aspects of permit development and serve as valuable references for the permit writer.

NPDES Website and Resources

The Water Permits Division (WPD) within the EPA Office of Water (OW), Office of Wastewater Management, has developed a comprehensive NPDES Website <www.epa.gov/npdes> with technical and regulatory information about the NPDES permit program, information on related programs and initiatives, and documents published by WPD. Where applicable, this manual references the NPDES Website and provides links to relevant documents on that site. This manual also references other EPA and non-EPA websites that contain information that might be helpful to NPDES permit writers. Note, however, that EPA is not responsible for information provided on websites outside the EPA Website <www.epa.gov>.

WPD also has prepared several websites and other resources to help permit writers draft permits. This manual references those websites and resources in the appropriate section of this manual.

Electronic Permitting Tools

Many EPA Regions and authorized states have developed tools to help them manage the permit issuance process. Electronic permitting tools range from spreadsheets and word processing applications to sophisticated Web-based systems that enable permitting authorities to manage their entire environmental program. For example, some states have built systems that enable dischargers to electronically sign and submit discharge reports; create, track, and store permit documents; and manage enforcement, compliance, and inspections related to permits. As technologies continue to evolve, many permitting authorities are likely to begin using more information technology applications to manage the process of permitting.

ICIS-NPDES

Together with OW, the Office of Enforcement and Compliance Assurance (OECA) is responsible for oversight of implementation of the NPDES program. OW is responsible for the NPDES implementing regulations and oversight of permit issuance by states and EPA Regions. OECA, along with its regional, state, tribal and local counterparts, is responsible for tracking and maintaining enforcement and compliance activities, monitoring and enforcement and compliance status of the regulated community, and reviewing and evaluating program performance. OECA also maintains national data systems to support program management and oversight of the NPDES program.

The Permit Compliance System (PCS), one of two national NPDES electronic databases, supports the management and oversight of the NPDES program. Since the last modernization of PCS in 1985, the NPDES program has evolved significantly to include additional program requirements, such as the NPDES program for stormwater and implementation of the Combined Sewer Overflow Control Policy. Because of limitations to PCS, OECA is working to phase out this system and move to a more modern data management system described below.

The Integrated Compliance Information System for NPDES permits (ICIS-NPDES) <https://icis.epa.gov/icis>, the successor to PCS, provides an updated system that enables national program management and oversight activities such as

- Permit tracking and management.
- Compliance monitoring.
- NPDES program management.
- Enforcement actions.

ICIS-NPDES is a Web-based system with an electronic database capable of handling the large amount of data generated by and about the NPDES program. Section 11.5.1.1 of this manual provides more information on ICIS-NPDES as it relates to NPDES permit compliance.

Hyperlinks in this Document

Where a website provides supplementary information or is referenced in this manual, the actual site or higher level site address appears in the symbols < > so that readers will have a reference to the address even in a printed version of this document. In the electronic version of the manual, the text in carats is also the hyperlink to the referenced website. Care has been taken to provide the correct Web addresses and hyperlinks; however, these references can change or become outdated after this manual's publication.

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[1] U.S. Environmental Protection Agency. 1996. *U.S. EPA NPDES Permit Writers' Manual*. EPA-833-B-96-003. U.S. Environmental Protection Agency, Office of Water, Washington, DC. <www.epa.gov/npdes/pubs/owm0243.pdf>. Separate sections of this document are also available on the NPDES Website by going to <www.epa.gov/npdes>, clicking on Publications and entering NPDES Permit Writers' Manual in the Search box.

[2] U.S. Environmental Protection Agency. 1993. *Training Manual for NPDES Permit Writers*. EPA-833-B-93-003. U.S. Environmental Protection Agency, Office of Wastewater Management, Washington, DC. <www.epa.gov/npdes/pubs/owm0339.pdf>.

CHAPTER 1. Development of the Clean Water Act and the NPDES Program

This chapter presents an overview of the history of water pollution control in the United States and the evolution and accomplishments of the National Pollutant Discharge Elimination System (NPDES) Program.

1.1 History of Water Pollution Control in the United States

Major water pollution control legislation in the United States dates back to the end of the 19th century. Exhibit 1-1 presents a summary of key legislative and executive actions in the history of clean water program development in the United States.

Exhibit 1-1 Important milestones of clean water program development

1899 Rivers and Harbors Act
1948 Federal Water Pollution Control Act (FWPCA)
1965 Water Quality Act
1970 Executive Order–U.S. Environmental Protection Agency (EPA) established
1970 Refuse Act Permit Program (RAPP)
1972 FWPCA Amendments
1977 Clean Water Act (CWA)
1987 Water Quality Act (WQA)

The first major water pollution control statute was the **1899 Rivers and Harbors Act**, which established permit requirements to prevent unauthorized obstruction or alteration of any navigable water of the United States. That act focused on navigation rather than water quality.

The **1948 Federal Water Pollution Control Act (FWPCA)** initiated the federal government's involvement in water pollution control for public health protection. The act allotted funds to state and local governments for water pollution control and emphasized the states' role in controlling and protecting water resources with few federal limitations or guidelines. The act, however, did charge the U.S. Surgeon General with developing comprehensive programs to eliminate or reduce the pollution of interstate waters.

Over the next two decades, Congress became increasingly interested in the problem of water quality degradation. From 1956 through 1966, it enacted four major laws to strengthen the federal role in water pollution control, including the FWPCA Amendments of 1956 and the FWPCA Amendments of 1961. Those statutes focused primarily on providing funding to municipalities to construct wastewater treatment plants.

Just a few years later, Congress further strengthened federal water pollution control laws by enacting the **1965 Water Quality Act**. This law created the Federal Water Pollution Control Administration and

represented a major regulatory advancement in water pollution control by requiring states to develop water quality standards for interstate waters by 1967. The Water Quality Act also called for states to quantify the amount of pollutants that each discharger could release without exceeding the water quality standards (i.e., pollutant loadings). Despite escalating public concern and increased public spending, only about half of the states developed water quality standards by 1971. Furthermore, enforcement of the federal statute was minimal because the regulatory agencies had to demonstrate a direct link between a discharge and a health or water quality problem, and the scientific data to make such demonstrations were often lacking. Finally, there were no criminal or civil penalties for violations of statutory requirements.

Growing concern about the environment prompted President Nixon to form the **U.S. Environmental Protection Agency (EPA**) in 1970 to enforce environmental compliance and consolidate federal pollution control activities. That year, the President also created the **Refuse Act Permit Program (RAPP)** through Executive Order 11574 and under the authority of section 13 of the 1899 Rivers and Harbors Act (a section also known as the Refuse Act). This new permitting program was focused on controlling industrial water pollution. EPA and the U.S. Army Corps of Engineers (Corps) would prepare the program requirements and the Corps would administer the program. EPA was tasked with developing *guidelines on effluent quality* for 22 different categories of sources. A discharger would apply for a permit, and the Corps would ask EPA if the proposed effluent levels were consonant with state water quality standards and with the newly developed guidelines on effluent quality. States would be asked to examine permit applications and advise EPA whether existing or proposed treatment processes would ensure that established water quality standards would be met. EPA would review the state's response for interstate waters and instruct the Corps whether to issue the permit. However, the U.S. District Court for the District of Columbia struck down RAPP (*Kalur v. Resor*, Civ. Action No. 1331-71 [D.D.C. Dec. 21, 1971]) because the program would allow the issuance of permits to discharge refuse to non-navigable tributaries of navigable waterways, which the Court said exceeded the authority given in the Act, and because the regulations implementing the program did not require compliance with certain procedural requirements of the National Environmental Policy Act.

Because of the perceived need for a discharge permit program, and to rectify the problems encountered in earlier water pollution control legislation, Congress enacted the **FWPCA Amendments of 1972**. This legislation, which was passed over a Presidential veto in November 1972, provided a comprehensive re-codification and revision of past federal water pollution control law. The 1972 amendments marked a distinct change in the philosophy of water pollution control in the United States and marked the beginning of the present water programs, including the NPDES permit program. Under those amendments, the federal government assumed a major role in directing and defining water pollution control programs. In establishing the basis for clean water programs, Congress sought a balance between economics (considering both the costs and benefits of cleanup) and ecology (setting deadlines and ambitious requirements for reducing discharges and restoring water quality).

The FWPCA Amendments of 1972 established a series of goals in section 101. Perhaps the most notable goal was that the discharge of pollutants into navigable waters be eliminated by 1985. Although that goal remains unmet, it underlies the CWA approach to establishing the technology standards that are implemented through technology-based effluent limitations (TBELs) in NPDES permits. The FWPCA Amendments of 1972 also set an interim goal of achieving, "water quality [that] provides for the protection and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water" by July 1, 1983. That goal is commonly referred to as the *fishable, swimmable* goal of the act and is one

of the factors that states must consider in the development of their water quality standards. The water quality standards are implemented in NPDES permits through water quality-based effluent limitations (WQBELs). By prohibiting the discharge of a pollutant or pollutants from a point source to waters of the United States—except as in compliance with the statute, the FWPCA Amendments of 1972 also established the important principle that the discharge of pollutants to navigable waters is not a right.

Since 1972, the FWPCA has been further amended on several occasions, including the **1977 Clean Water Act** (CWA), which is now the name for the statute, and the **1987 Water Quality Act** (WQA). Both of these statutes are discussed further in section 1.2 below with regard to their impact on the evolution of the NPDES program. Exhibit B-1, Index to Sections of the CWA, in Appendix B of this document matches the key sections of the CWA to their appropriate reference in the *United States Code* (U.S.C.). This information is at U.S.C., Title 33 (Navigation and Navigable Waters), Chapter 26 (Water Pollution Prevention and Control), 1251-1387 (33 U.S.C. §§ 1251-1387) <www.epa.gov/lawsregs/laws/cwa.html>.

1.2 Evolution of the NPDES Program

Section 402 of Title IV of the FWPCA, Permits and Licenses, created today's system for permitting wastewater discharges, known as the NPDES program. Under the requirements of the program, a point source may be authorized to discharge pollutants into waters of the United States by obtaining a permit. Section 1.3 below discusses this basic statutory framework in detail. A permit provides two types of control: technology-based limitations (based on the technological and economic ability of dischargers in the same category to control the discharge of pollutants in wastewater) and water quality-based limitations (to protect the quality of the specific waterbody receiving the discharge).

The FWPCA Amendments of 1972 established several important requirements and deadlines. Municipal facilities were required to meet secondary treatment standards by July 1, 1977. Industrial facilities were required to meet two levels of technology standards: *Best Practicable Control Technology Currently Available* (BPT) and *Best Available Technology Economically Achievable* (BAT), which would bring them further toward the goal of eliminating the discharge of all pollutants. [CWA section 301 (b)(2)(A)]. Compliance deadlines for BPT and BAT were established as of July 1, 1977, and July 1, 1983, respectively.

In addition to BPT and BAT requirements for industrial categories, the 1972 FWPCA Amendments established *new source performance standards* (NSPS) or best available demonstrated control technology including where practicable a standard permitting no discharge of pollutants [CWA section 306(a)]. The Legislative History indicates that Congress believed that technologies would be more affordable for new dischargers who could plan control technologies at the design phase. The standards represent state-of-the-art control technologies for new sources because the permittees have the opportunity to install the most efficient production processes and the latest in treatment technologies during construction. NSPS are effective on the date the facility begins operation, and the facility must demonstrate compliance within 90 days of start-up.

EPA tried to set national, uniform effluent limitations guidelines and standards (effluent guidelines) as a basis for technology-based limitations; however, most effluent guidelines were not in place when the first set of permits was issued between 1973 and 1976. About 75 percent of the first round permits were issued

under a section of the act that allows a permit writer to use his or her best professional judgment to establish case-by-case limitations. Using that approach, a single permit writer developed effluent limitations for a specific facility using his or her knowledge of the industry and the specific discharge, rather than using a set of national standards and limitations developed by EPA for the entire industry.

This first round of permitting focused on *conventional pollutants*, which generally are found in sanitary waste from households, businesses, and industries. CWA section 304(a)(4) and Title 40 of the *Code of Federal Regulations* (CFR) 401.16 designate the conventional pollutants with oil and grease added to § 401.16 in 1979. The following are formally designated as conventional pollutants:

- Five-day Biochemical Oxygen Demand (BOD_5).
- Total Suspended Solids (TSS).
- pH.
- Fecal Coliform.
- Oil and Grease.

The 1972 FWPCA Amendments, however, also required that EPA publish a list of toxic pollutants within 90 days and propose effluent standards for those pollutants 6 months later. EPA was not able to meet those requirements because of the lack of information on treatability. The Natural Resources Defense Council (NRDC) sued EPA, resulting in a court supervised *consent decree* (*NRDC et al. v. Train, 8 E.R.C. 2120*, DDC 1976) that identified the following:

- Toxic (priority) pollutants to be controlled.
- Primary industries for technology-based control.
- Methods for regulating toxic discharges through the authorities of the FWPCA Amendments.

The provisions of the consent decree were incorporated into the framework of the 1977 FWPCA Amendments, formally known as the CWA. This statute shifted the emphasis of the NPDES program from controlling conventional pollutants to controlling toxic pollutant discharges. CWA section 307(a)(1) required EPA to publish a list of toxic pollutants or combination of pollutants. Those pollutants often are called the priority pollutants and are listed in § 401.15. The terms *toxic pollutant* and *priority pollutant* are used interchangeably throughout this document.

CWA section 307(a) originally identified 65 toxic pollutants and classes of pollutants for 21 major categories of industries (known as *primary industries*). That list was later further defined as the current list of 126 toxic pollutants. The priority pollutants are listed in Appendix C of this document and in Appendix A of Part 423. Note that the list goes up to 129; however, there are only 126 priority pollutants because 017, 049, and 050 were deleted.

The 1977 CWA adjusted technology standards to reflect the shift toward control of toxics, clarified and expanded the concept of BAT controls, created a new level of control for conventional pollutants, and made changes to strengthen the industrial pretreatment program. The 1977 law created a new pollutant category, nonconventional pollutants, that included pollutants (such as chlorine and ammonia) not specifically categorized as conventional or toxic. The CWA clarified that BAT covers both toxic and nonconventional pollutants, extended the compliance deadline for BAT for toxic pollutants to July 1, 1984, established a three-year deadline for compliance with BAT for newly listed toxics, and gave industries until as late as July 1, 1987 to meet BAT requirements for nonconventional pollutants. In addition, conventional pollutants, controlled by BPT and BAT in the first round of permitting, were now

subject to a new level of control termed *Best Conventional Pollutant Control Technology* (BCT). The CWA established a compliance deadline for BCT of July 1, 1984. BCT was not an additional performance standard, but replaced BAT for the control of conventional pollutants. Finally, among other changes, the 1977 CWA authorized EPA to approve local pretreatment programs and required authorized states to modify their programs to provide for local pretreatment program oversight.

The 1977 CWA recognized that the technology-based limitations were not able to prevent the discharge of toxic substances in toxic amounts in all waterways. To complement its work on technology-based limitations, EPA initiated a national policy in February 1984 to control toxics using a water quality approach. On February 4, 1987, Congress amended the CWA with the 1987 WQA that outlined a strategy to accomplish the goal of meeting state water quality standards. The 1987 WQA required all states to identify waters that were not expected to meet water quality standards after technology-based controls on point source were imposed. Each state then had to prepare individual control strategies to reduce toxics from point and nonpoint sources to meet the water quality standards. Among other measures, those plans were expected to address control of pollutants beyond technology-based levels.

The 1987 WQA further extended the compliance deadline for BAT- and BCT-based effluent limitations, this time to a new deadline of March 31, 1989. The 1987 WQA also established new schedules for issuing NPDES permits to industrial and municipal stormwater dischargers. In addition to meeting water quality-based standards, industrial stormwater discharges must meet the equivalent of BAT and BCT effluent quality standards. *Municipal separate storm sewer systems* (MS4s) were required to have controls to reduce pollutant discharges to the *maximum extent practicable* (MEP), including management practices, control techniques and system design and engineering methods, and such other provisions as the Administrator deems appropriate for the control of such pollutants [CWA section 402(p)(3)(B)]. The 1987 WQA also required EPA to identify toxics in sewage sludge and establish numeric limitations to control such toxics. A statutory *anti-backsliding* requirement in the WQA specified the circumstances under which an existing permit can be modified or reissued with less stringent effluent limitations, standards, or conditions than those already imposed.

Since 1987, there have been minor revisions to the CWA (e.g., Combined Sewer Overflow program requirements). However, the basic structure of the NPDES program remains unchanged from the framework established in the 1972 FWPCA Amendments.

1.3 NPDES Statutory Framework

As noted in section 1.2 above, under the NPDES program any point source that discharges or proposes to discharge pollutants into waters of the United States is required to obtain an NPDES permit. Understanding how each of these terms (i.e., permit, pollutant, waters of the United States, and point source) is defined is the key to defining the scope of the NPDES program.

1.3.1 Permit

A permit is a license, issued by the government to a person or persons granting permission to do something that would otherwise be illegal without the permit. An NPDES permit typically is a license for a facility to discharge a specified amount of a pollutant into a receiving water under certain conditions; however, NPDES permits can also authorize facilities to process, incinerate, landfill, or beneficially use

biosolids (sewage sludge). A discharger does not have a right to receive a permit, and permits may be revoked for cause such as noncompliance with the conditions of the permit.

1.3.2 Pollutant

The term *pollutant* is defined in CWA section 502(6) and § 122.2. The statute defines pollutant very broadly and includes any type of industrial, municipal, or agricultural waste (including heat) discharged into water. For regulatory purposes, pollutants are grouped into three categories under the NPDES program: conventional, toxic, and nonconventional.

- **Conventional** pollutants are those defined in CWA section 304(a)(4) and § 401.16 (BOD_5, TSS, fecal coliform, pH, and oil and grease).
- **Toxic (priority)** pollutants are those defined in CWA section 307(a)(1) (and listed in § 401.15 and Appendix A of Part 423) and include 126 metals and manmade organic compounds (see Exhibit C-1 in Appendix C of this document).
- **Nonconventional** pollutants are those that do not fall under either of the above categories (conventional or toxic pollutants) and include parameters such as chlorine, ammonia, nitrogen, phosphorus, chemical oxygen demand (COD), and whole effluent toxicity (WET).

Sewage from vessels and, under certain conditions, water, gas, or other material injected into wells to facilitate production of oil or gas or water derived in association with oil and gas production and disposed of in a well are specifically excluded from the definition of pollutant under the NPDES program.

1.3.3 Waters of the United States

The CWA regulates discharges to *navigable waters*. CWA section 502(7) defines navigable waters as "waters of the United States, including the territorial seas." NPDES regulations define *waters of the United States* to mean,

- Waters that are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including waters subject to the ebb and flow of the tide.
- Interstate waters including interstate *wetlands*.
- Other waters that could affect interstate or foreign commerce.
- Impoundments of waters of the United States.
- Tributaries of the above categories of waters.
- Territorial seas.
- Wetlands adjacent to other waters (except wetlands themselves) in the above categories.

Wetlands are further defined in § 122.2. In addition, the definition of waters of the United States contains exclusions for waste treatment systems (other than certain cooling ponds) designed to meet the requirements of the CWA and also for *prior converted croplands*, which is mostly relevant to the CWA section 404 permitting program administered by the Corps.

Waters of the United States covers a broad range of surface waters. The CWA does not give EPA the authority to regulate ground water quality through NPDES permits. If a discharge of pollutants to ground water reaches waters of the United States, however, it could be a discharge to the surface water (albeit indirectly via a direct hydrological connection, i.e., the ground water) that needs an NPDES permit.

The scope of waters of the United States has been the subject of several U.S. Supreme Court cases (the most recent as of the time of publication of this manual being a decision from 2006 in the combined Rapanos/Carabell wetland cases) and numerous lower court cases. The court cases often have been difficult to interpret, resulting in much litigation and an evolving understanding of the exact scope of waters subject to CWA jurisdiction. Also, permit writers should keep in mind that discharges through non-jurisdictional features that reach waters of the United States may need a permit even if the discharge is not directly to a jurisdictional waterbody. EPA Regional wetlands staff have significant expertise in jurisdictional issues related to the scope of waters of the United States. Some Regions have interoffice teams to address jurisdictional issues that come up in the different CWA programs. In addition, guidance on waters of the United States is on EPA's Office of Wetlands, Oceans, and Watersheds Website <www.epa.gov/wetlands/guidance/CWAwaters.html>.

1.3.4 Point Source

Pollutants can enter water via a variety of pathways including agricultural, domestic and industrial sources. For regulatory purposes, these sources generally are categorized as either point sources or nonpoint sources. The term *point source* is defined in CWA section 502(14) and § 122.2 to include any discernible, confined, and discrete conveyance from which pollutants are or may be discharged. Point source discharges include discharges from publicly owned treatment works (POTWs), industrial process wastewater discharges, runoff conveyed through a storm sewer system, and discharges from concentrated animal feeding operations (CAFOs), among others (see Exhibit 1-2). Return flows from irrigated agriculture and agricultural stormwater runoff specifically are excluded from the definition of a point source.

Pollutant contributions to waters of the United States may come from both direct and indirect discharges. Direct discharge (which is synonymous with *discharge of a pollutant*) is defined by the NPDES regulations at § 122.2 to include any addition of any pollutant or combination of pollutants to a water of the United States from any point source. An *indirect discharger* is defined as, "a nondomestic discharger introducing pollutants to a POTW." Under the national program, NPDES permits are issued only to direct dischargers. The National Pretreatment Program controls industrial and commercial indirect dischargers (for more on pretreatment, see section 2.3.1.2 of this manual).

Exhibit 1-2 Common point source discharges of pollutants to waters of the United States

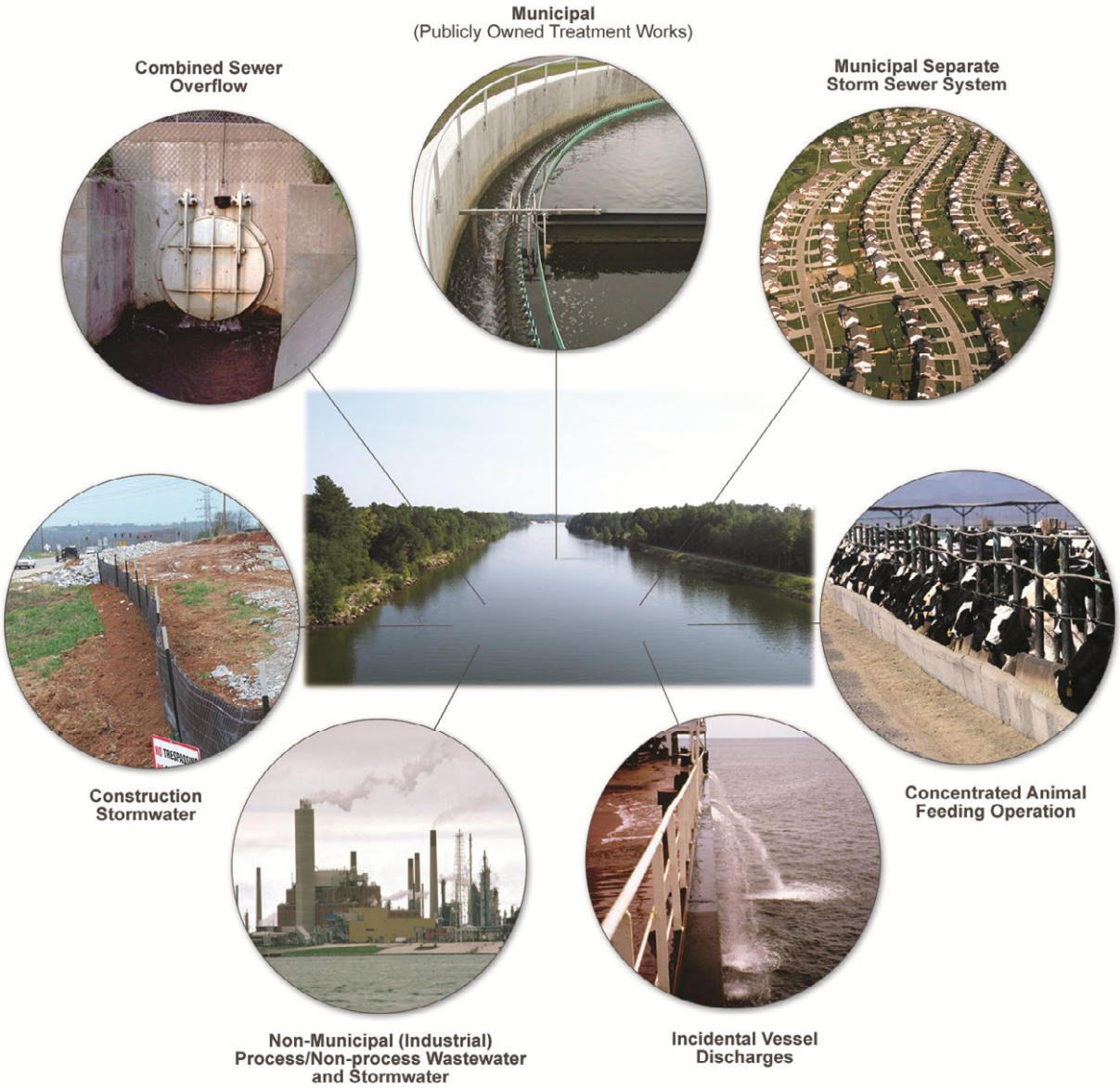

CHAPTER 2. Regulatory Framework and Program Areas of the NPDES Program

This chapter discusses the regulatory framework of the National Pollutant Discharge Elimination System (NPDES) program, identifies the types of activities regulated under the NPDES program, describes the roles and responsibilities of federal and state governments, and presents the program areas that address the various types of regulated activities.

2.1 Regulatory Framework of the NPDES Program

Chapter 1 discussed how Congress, in Clean Water Act (CWA) section 402, required the U.S. Environmental Protection Agency (EPA) to develop and implement the NPDES permit program. While Congress' intent was established in the CWA, EPA was required to develop specific regulations to carry out the congressional mandate. The regulations developed by EPA to implement and administer the NPDES program primarily are in Title 40 of the *Code of Federal Regulations* (CFR) Part 122 <www.epa.gov/lawsregs/search/40cfr.html>.

The CFR is an annual codification of the general and permanent rules published in the *Federal Register* (FR) by the executive departments and agencies of the federal government. The CFR is divided into 50 titles that represent broad areas subject to federal regulation. Title 40 covers protection of the environment. The FR is a legal publication that contains federal agency regulations; proposed rules and notices; and executive orders, proclamations and other presidential documents. The National Archives and Records Administration, an independent federal agency responsible for managing all federal records, publishes the FR and CFR. The text of all final regulations is found in the CFR. The background and implementation information related to these regulations, however, are found in the preamble to the regulations contained in the FR. This information is important to permit writers because it explains the legal, technical, and scientific bases on which regulatory decisions are made.

Exhibit 2-1 lists regulations in 40 CFR that are related to the NPDES program, and Exhibit 2-2 is an outline of the federal NPDES regulations from Part 122. The regulations at § 123.25 should be referenced for information applicable to state NPDES programs. Exhibit B-2 in Appendix B of this document is an Index to NPDES Regulations that provides regulatory citations by topic area.

Exhibit 2-1 Regulations related to the NPDES program

Regulation (40 CFR)	Subject
Part 121	State certification
Part 122	The federal NPDES permit program
Part 123	State program requirements
Part 124	Procedures for decision making
Part 125	Technology standards
Part 129	Toxic pollutant effluent standards
Part 130	Water quality planning and management
Part 131	Water quality standards
Part 133	Secondary treatment regulations
Part 135	Citizen suits
Part 136	Analytical procedures
Part 257	State sludge disposal regulations
Part 401	General provisions for effluent limitations guidelines and standards (effluent guidelines)
Part 403	General pretreatment regulations
Parts 405-471	Effluent guidelines
Part 501	State sewage sludge management program requirements
Part 503	Standards for use or disposal of sewage sludge

2.2 Federal and State Responsibilities

This section discusses the relationship between federal and state governments in the administration of the NPDES program and the process by which a state can become *authorized*.

2.2.1 State NPDES Program Authority

EPA may authorize qualified state, territorial, or tribal government agencies to implement all or parts of the NPDES program. States, territories, or tribes (hereafter *states*) are authorized through a process defined by the CWA section 402(b) and NPDES regulations Part 123. A state wanting to be authorized to administer the NPDES program submits to EPA a letter from the governor requesting review and approval of its program submission, a Memorandum of Agreement (MOA), a Program Description, a Statement of Legal Authority (also known as an *Attorney General's Statement* or *AG Statement*), and the underlying state laws and regulations. EPA determines whether the package is complete within 30 days of receipt. Within 90 days of receipt, EPA renders a decision to approve or disapprove the program. The time for review can be extended by agreement. The process of authorization includes a public review and comment period, and a public hearing.

States may apply for the authority to issue one or more of the following five types of NPDES authorization:

- NPDES Base Program for individual municipal and industrial facilities.
- General Permit Program.
- Pretreatment Program.
- Federal Facilities Program.
- Biosolids (Sewage Sludge) Program.

Exhibit 2-2 Federal NPDES regulations (40 CFR Part 122)

Subpart A–Definitions and General Program Requirements

§ 122.1 Purpose and scope
§ 122.2 Definitions
§ 122.3 Exclusions
§ 122.4 Prohibitions
§ 122.5 Effect of a permit
§ 122.6 Continuation of expiring permits
§ 122.7 Confidentiality of information

Subpart B–Permit Application and Special NPDES Program Requirements

§ 122.21 Applications
§ 122.22 Signatories to permit applications and reports
§ 122.23 Concentrated animal feeding operations
§ 122.24 Concentrated aquatic animal production
§ 122.25 Aquaculture projects
§ 122.26 Stormwater discharges
§ 122.27 Silviculture activities
§ 122.28 General permits
§ 122.29 New sources and new dischargers
§ 122.30-122.37 MS4s

Subpart C–Permit Conditions

§ 122.41 Standard conditions applicable to all permits
§ 122.42 Standard conditions applicable to specified categories of permits
§ 122.43 Establishing permit conditions
§ 122.44 Establishing limitations, standards, and other permit conditions

(a) Technology basis
(b) Other basis (not WQ)
(c) Reopeners
(d) Water quality basis
(e) Toxic (priority) pollutants
(f) Notification levels
(g) 24 Hour reporting
(h) Duration of permits
(i) Monitoring
(j) Pretreatment program
(k) Best management practices (BMPs)
(l) Anti-backsliding
(m) Privately owned treatment works
(n) Grants
(o) Sewage sludge
(p) Coast Guard
(q) Navigation
(r) Great Lakes
(s) Qualifying programs

§ 122.45 Calculating limitations

(a) Outfalls and discharge points
(b) Production basis
(c) Metals
(d) Continuous discharges
(e) Non-continuous discharges
(f) Mass limitations
(g) Pollutants in intake water
(h) Internal waste streams
(i) Discharge into wells, into publicly owned treatment works or by land application

§ 122.46 Duration of permits
§ 122.47 Schedules of compliance
§ 122.48 Requirements for recording and reporting of monitoring results
§ 122.49 Consideration under federal law
§ 122.50 Disposal into wells, into publicly owned treatment works or by land application

Subpart D–Transfer, Modification, Revocation and Reissuance, and Termination of Permit

§ 122.61 Transfer of permits
§ 122.62 Modification or revocation and reissuance of permits
§ 122.63 Minor modifications of permits
§ 122.64 Termination of permits

A state can receive authorization for one or more of the NPDES program components. For example, a state might receive authorization for the NPDES Base Program, General Permit Program, and Pretreatment Program, but not the Federal Facilities Program or Biosolids Program. In such a case, EPA continues to issue permits to federal facilities (e.g., facilities on military installations, federal lands) for discharges originating within the state and continues to implement the Biosolids Program. (Section 2.2.2 below provides additional discussion of Biosolids Program implementation.)

If EPA approves a program, the state assumes permitting authority in lieu of EPA. All new permit applications would then be submitted to the state agency for NPDES permit issuance. Certain permits issued before authorization might continue under EPA administration as set forth in the MOA. Even after a state receives NPDES authorization, EPA continues to issue NPDES permits on tribal lands within the boundaries of the state (if the tribe is not administering its own approved NPDES program). Following authorization, EPA also continues its national program management responsibilities by ensuring that state programs meet applicable federal requirements. If EPA disapproves the program, EPA remains the permitting authority for that state.

The State Program Status Website <www.epa.gov/npdes/authorization> provides the current authorization status for the states.

2.2.2 Roles and Responsibilities of the Federal and State Authorities

Until a state program is authorized, EPA is the permitting authority that issues all permits, conducts all compliance and monitoring activities, and enforces all program requirements.

As noted above, if a state has only partial authority, EPA will implement the other program activities. For example, where a state has an approved NPDES program but has not received EPA approval of its state sewage sludge management program, the EPA Region is responsible for including conditions to implement the Part 503 Standards for the Use or Disposal of Sewage Sludge in permits issued to treatment works treating domestic sewage (TWTDS) in that state. EPA could issue a separate permit with the applicable sewage sludge standards and requirements, or collaborate with the state on joint issuance of NPDES permits containing the Part 503 sewage sludge standards. The same process also applies where a state has not received approval of its pretreatment program or federal facilities program. One exception to that process is where an NPDES-authorized state is not approved to implement the general permit program. In such cases, EPA may not issue a general permit in that state as clarified in the memorandum *EPA's Authority to Issue NPDES General Permits in Approved NPDES States*[1] <www.epa.gov/npdes/pubs/owm0444.pdf>.

Once a state is authorized to issue permits, EPA generally is precluded from issuing permits in the state; however, EPA must be provided with an opportunity to review certain permits and may formally object to elements that conflict with federal requirements. If the permitting agency does not satisfactorily address the points of objection, EPA will issue the permit directly. Once a permit is issued through a government agency, it is enforceable by the approved state and federal agencies (including EPA) with legal authority to implement and enforce the permit. Private citizens may also bring a civil action in federal court against an alleged violator or against the EPA Administrator for alleged failure to enforce NPDES permit requirements. Exhibit 2-3 presents a summary of federal and state roles before and after program authorization.

Exhibit 2-3 Summary of federal and state/territorial/tribal roles in the NPDES permitting program

Before state/territorial/tribal program approval:
- EPA issues permits
- EPA conducts compliance and monitoring activities
- EPA enforces
- State/territory/tribe reviews permits and grants CWA section 401 certification

After state/territorial/tribal program approval:
- State/territory/tribe issues permits
- State/territory/tribe conducts compliance and monitoring activities
- State/territory/tribe enforces
- EPA provides administrative, technical and legal support
- EPA ensures state program meets federal requirements
- EPA offers NPDES program training
- EPA oversees grants to states (e.g., CWA section 106)
- EPA reviews permits and, as necessary, comments or objects
- EPA oversees and, as necessary, assumes enforcement of permits

2.3 NPDES Program Areas

NPDES permittees can be broadly classified as municipal (publicly owned treatment works [POTWs] and related discharges) and non-municipal facilities. Federal facilities fall into the broader category of non-municipal facilities. Within those broad categories, there might also be specific types of activities that are subject to unique programmatic requirements in the NPDES regulations. Exhibit 2-4 provides an overview of the different activities related to municipal and non-municipal sources; identifies the NPDES program areas that address these activities; and identifies the applicable regulations for each NPDES program area.

2.3.1 NPDES Program Areas Applicable to Municipal Sources

The NPDES regulations establish technology-based effluent requirements applicable to discharges from POTWs. In addition to effluent requirements, the NPDES regulations establish other programmatic requirements applicable to other POTW activities (e.g., sewage sludge disposal and management, stormwater discharges from the treatment plant site) or activities that may be conducted by a municipality (e.g., municipal separate storm sewer systems, combined sewer overflows). A description of those programs and how they relate to NPDES permits is provided in the following sections.

2.3.1.1 Publicly Owned Treatment Works (POTWs)

The federal regulations at § 403.3 define a POTW as a treatment works (as defined in CWA section 212) that is owned by a state or municipality [as defined in CWA section 502(4)]. The definition includes any devices and systems used in the storage, treatment, recycling, and reclamation of municipal sewage or industrial wastes of a liquid nature. It also includes sewers, pipes, and other conveyances only if they convey wastewater to a POTW. Finally, the term also means the municipality that has the jurisdiction over the indirect discharges to and the discharges from the treatment works. Federally owned treatment works, privately owned treatment works, and other treatment plants not owned by a state or municipality are not considered POTWs.

Exhibit 2-4 NPDES program areas and applicable regulations

Source	Program areas	Applicable regulations (40 CFR)
Municipal	Municipal (POTWs) effluent discharges	Part 122 Part 125 Part 133
	Indirect non-municipal discharges (Pretreatment)	Part 122 Part 403 Parts 405-471
	Biosolids (sewage sludge) use and disposal	Part 122 Part 257 Part 501 Part 503
	Combined sewer overflow (CSO) discharges	Part 122 Part 125
	Sanitary sewer overflow (SSO) discharges	Part 122
	Municipal separate storm sewer systems (MS4s) discharges	Part 122 Part 125
Non-municipal (Industrial)	Process wastewater discharges	Part 122 Part 125 Parts 405-471
	Non-process wastewater discharges	Part 122 Part 125
	Stormwater discharges associated with industrial activity	Part 122 Part 125
	Stormwater discharges from construction activities*	Part 122 Part 125
	Cooling water intake structures (CWIS)	Part 122 Part 125 Part 401
	Concentrated animal feeding operations (CAFOs)	Part 122 Part 123 Part 125 Part 412
	Concentrated aquatic animal production (CAAP) facilities	Part 122 Part 125 Part 451
	Vessel Discharges	Part 122

* Though stormwater discharges from construction activity resulting in disturbance of 5 or more acres of total land area technically are considered, "stormwater discharges associated with industrial activity" as defined by §122.26(b)(14)(x), these discharges are commonly referred to as stormwater discharges from *large* construction activities.

POTWs receive, primarily, domestic sewage from residential and commercial customers. Larger POTWs also typically receive and treat wastewater from industrial facilities (indirect dischargers) connected to the collection system. The types of pollutants treated by a POTW always include conventional pollutants and may include nonconventional and toxic pollutants, depending on the characteristics of the sources discharging to the POTW. The treatment provided by a POTW typically produces a treated effluent and a biosolids (sewage sludge) residual.

2.3.1.2 The National Pretreatment Program

The National Pretreatment Program <www.epa.gov/npdes/pretreatment> regulates the introduction of nondomestic (i.e., industrial and commercial) wastewater to POTWs. Because such discharges are treated by the POTW before release to a water of the United States, they are termed *indirect discharges*. The

pretreatment program prohibits industrial and commercial indirect dischargers from discharging pollutants to a POTW that will pass through the POTW to receiving waters or interfering with POTW treatment processes or contaminating sewage sludge. The federal program also requires certain indirect dischargers to meet technology-based requirements developed specifically for such POTW users that are similar to those for direct dischargers.

EPA's pretreatment regulations require certain POTWs to develop a pretreatment program, the requirements of which are generally included as conditions of a POTW's NPDES permit. The federal regulations specifying which POTWs must have pretreatment programs, and the authorities and procedures that must be developed by the POTW before program approval, are in Part 403. The requirement to develop and implement a local pretreatment program typically is included as a special condition in the POTW's NPDES permit. Section 9.2.1 of this manual includes a discussion on incorporating pretreatment special conditions into permits.

2.3.1.3 Biosolids (Sewage Sludge)

In 1987 Congress amended CWA section 405 to establish a comprehensive sewage sludge program <www.epa.gov/OW-OWM.html/mtb/biosolids/index.htm>. The program regulates the use and disposal of sewage sludge by POTWs and by other TWTDS. TWTDS include facilities that generate sewage sludge, provide commercial treatment of sewage sludge, manufacture a product derived from sewage sludge, or provide disposal of sewage sludge. CWA section 405 required EPA to develop technical standards that establish sewage sludge management practices and acceptable levels of toxic pollutants in sewage sludge. The terms *biosolids*, *sewage sludge*, and *municipal sludge* are used interchangeably throughout this document.

Regulations for state sewage sludge program approval are at Part 123 or Part 501 (depending on whether the state wishes to administer the sewage sludge program under its NPDES program or under another program, e.g., a solid waste program). The technical standards governing sewage sludge use and disposal are in Part 503. TWTDS not otherwise subject to the NPDES permit requirements under CWA section 402 must apply for and receive a permit addressing standards for use and disposal of sewage sludge in Part 503. Details of this rule are described in *A Plain English Guide to the EPA Part 503 Biosolids Rule*[2] <www.epa.gov/owm/mtb/biosolids/503pe/>. Where applicable, sewage sludge management requirements may be included as a special condition in permits issued to POTWs. Section 9.2.2 of this manual includes a discussion on incorporating special conditions that address sewage sludge requirements.

2.3.1.4 Combined Sewer Overflows (CSOs)

An additional concern for some older POTWs may be combined *sewer systems* (CSS), which are wastewater collection systems owned by a state or municipality [as defined by CWA section 502(4)] that convey sanitary wastewater (domestic, commercial and industrial wastewaters) and stormwater through a single-pipe system to a POTW [as defined by § 403.3(q)]. EPA estimates that CSSs serve about 40 million people in 772 communities nationwide <www.epa.gov/npdes/cso/csodem>. During dry weather, CSSs collect and convey domestic, commercial, and industrial wastewater to a POTW; however, during periods of rainfall, snowmelt, and other forms of precipitation, the systems can become overloaded. When that overloading occurs, the CSS can overflow at designed relief points and discharge a combination of untreated sanitary wastewater and stormwater directly to a surface waterbody.

A combined sewer overflow (CSO) <www.epa.gov/npdes/cso> is the discharge from a CSS at a point before the POTW. CSOs can be a major source of water pollution in communities served by CSSs. CSOs often contain high levels of suspended solids (SS), pathogenic microorganisms, toxic pollutants, floatables, nutrients, oxygen-demanding organic compounds, oil and grease, and other pollutants, causing water quality standards to be exceeded.

To address CSOs, EPA issued the National CSO Control Strategy (54 FR 37370, September 8, 1989). While implementation of the 1989 strategy has resulted in progress toward controlling CSOs, significant public health and water quality risks remain. To expedite compliance with the CWA, and to elaborate on the 1989 strategy, EPA, after collaboration with other CSO stakeholders (communities with CSSs, state water quality authorities, and environmental groups), published the CSO Control Policy <www.epa.gov/npdes/cso/controlpolicy> (59 FR 18688, April 19, 1994). The 1994 CSO policy represents a comprehensive national strategy to ensure that municipalities, permitting authorities, water quality standards authorities, and the public engage in a comprehensive and coordinated planning effort to achieve cost-effective CSO controls that ultimately meet appropriate health and environmental objectives. The Wet Weather Water Quality Act of 2000 stipulates that NDPES permits, enforcement orders, or decrees must conform to the 1994 CSO Policy [CWA section 402(q)].

Before issuing a permit with conditions that address CSOs, permit writers should consult the CSO Control Policy and associated guidance. Section 9.2.3 of this manual includes a discussion on incorporating appropriate CSO permit conditions.

2.3.1.5 Sanitary Sewer Overflows (SSOs)

Properly designed, operated, and maintained sanitary sewer systems are meant to collect and transport all the sewage that flows into them to a POTW; however, occasional, unintentional spills of raw sewage from municipal sanitary sewers occur in almost every system. Such types of releases are called sanitary sewer overflows (SSOs) <www.epa.gov/npdes/sso>.

SSOs have a variety of causes including severe weather, improper system operation and maintenance, and vandalism. EPA estimates that over 40.000 SSO events occur per year in the United States (excluding basement backups). Overflows of untreated wastewater can present risks of human exposure when released to certain areas, such as streets, private property, basements, and receiving waters used for drinking water, fishing and shellfishing, or contact recreation. A description of the extent of human health and environmental impacts caused by releases of untreated sewage, along with other information, is provided in the *Report to Congress on the Impacts and Control of CSOs and SSOs*[3] <www.epa.gov/npdes/csossoreport2004>. That 2004 report shows that NPDES permit requirements establishing clear reporting, record keeping, third party notification of overflows from municipal sewage collection systems, and clear requirements to properly operate and maintain the collection system, are critical to effective program implementation.

EPA has developed a draft fact sheet <www.epa.gov/npdes/pubs/sso_fact_sheet_model_permit_cond.pdf> and draft model permit conditions <www.epa.gov/npdes/pubs/sso_model_permit_conditions.pdf> that explain how NPDES permitting authorities can better address SSOs and sanitary sewer collection systems. Section 9.2.4 of this manual discusses incorporation of conditions to address SSOs in NPDES permits.

2.3.1.6 Municipal Separate Storm Sewer Systems (MS4s)

Stormwater from major metropolitan areas is a significant source of pollutants discharged to waters of the United States. While rainfall and snow are natural events, the nature of stormwater discharges and their impact on receiving waters are greatly affected by human activities and land use. Stormwater from lands modified by human activities, such as metropolitan areas and urban streets, can affect surface water resources by modifying natural flow patterns or by elevating pollution concentrations and loadings.

To address such concerns, the 1987 amendments to the CWA added section 402(p), a provision that directed EPA to establish phased NPDES requirements for stormwater discharges. Phase I of the stormwater program addresses permits for discharges from medium and large MS4s serving a population of 100,000 or more, as well as certain categories of industrial activity, including construction activity disturbing greater than 5 acres. Phase II expanded the stormwater program to include small MS4s and construction activity disturbing between 1–5 acres.

The MS4 stormwater application regulations (Phase I) established requirements for a two-part permit application that allowed large and medium local governments to help define priority pollutant sources in the municipality and to develop and implement appropriate controls for such discharges to MS4s (55 FR 47990, November 16, 1990). Part II of the application requires municipal applicants to propose municipal stormwater management programs to control pollutants to the *maximum extent practicable* (MEP) and to effectively prohibit non-stormwater discharges to the municipal system. Medium and large MS4 operators are required to submit comprehensive permit applications and are issued individual permits.

Phase II of the stormwater program extended the NPDES permitting program to small MS4s in urbanized areas (64 FR 68722, December 8, 1999). The Phase II MS4 regulations require small MS4s to develop a program to address six *minimum control measures* that include BMPs and measurable goals for each BMP. Permit writers have the option of permitting regulated small MS4 operators using an individual permit, a general permit, or a modification of an existing Phase I MS4's individual permit (although the vast majority of small MS4s have been covered under general permits).

Municipal stormwater management programs combine source controls and management practices that address targeted sources in the boundaries of the municipal system. For example, a municipality that expects significant new development may focus more on proposing requirements for new development and construction. On the other hand, a municipality that does not expect significant new development could focus more on municipal activities that affect stormwater quality such as: maintenance of leaking sanitary sewers, road de-icing and maintenance, operation of municipal landfills, flood control efforts, and control of industrial contributions of stormwater.

MEP is not precisely defined so as to allow maximum flexibility in MS4 permitting to optimize reductions in stormwater pollutants on a location-by-location basis (64 FR 68754, December 8, 1999). Therefore, permit writers must rely on application requirements specified in the regulations and the applicant's proposed management program when developing appropriate permit conditions. The stormwater Phase II rule was challenged in the courts, with the U.S. Court of Appeals for the Ninth Circuit generally upholding the Phase II rule but remanding three issues back to EPA. EPA issued guidance on April 16, 2004 for how new general permits should address the remanded issues of public availability of notices of intent (NOIs), opportunity for public hearings, and permitting authority reviews of NOIs titled *Implementing the Partial Remand of the Stormwater Phase II Regulations Regarding*

Notices of Intent & NPDES General Permitting for Phase II MS4s[4] <www.epa.gov/npdes/pubs/hanlonphase2apr14signed.pdf>.

In addition to information on the Stormwater Discharges From Municipal Separate Storm Sewer Systems (MS4s) Website <www.epa.gov/npdes/stormwater/municipal>, EPA has developed the following guidance documents and memoranda to help permit writers and permittees implement the municipal stormwater program:

- *Guidance Manual for the Preparation of Part 2 of the NPDES Permit Applications for Discharge from Municipal Separate Storm Sewer Systems*[5] <www.epa.gov/npdes/pubs/owm0246.pdf>.
- *Interim Permitting Approach for Water Quality-Based Effluent Limitations in Stormwater Permits*[6] <www.epa.gov/npdes/pubs/swpol.pdf>.
- *Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs*[7] <www.epa.gov/npdes/pubs/final-wwtmdl.pdf>.
- *MS4 Program Evaluation Guidance*[8] <www.epa.gov/npdes/pubs/ms4guide_withappendixa.pdf>.
- *MS4 Permit Improvement Guide*[9] <www.epa.gov/npdes/pubs/ms4permit_improvement_guide.pdf>.

The application requirements for stormwater discharges from MS4s serving a population greater than 100,000 and for stormwater discharges from small MS4s are discussed in sections 4.3.10 and 4.3.11 of this manual.

2.3.2 NPDES Program Areas Applicable to Non-Municipal Sources

Non-municipal sources include industrial and commercial facilities, industrial stormwater (including large construction activities), and discharges from small construction activity, concentrated animal feeding operations (CAFOs) and concentrated aquatic animal production (CAAP) facilities. Unlike municipal sources, the types of raw materials, production processes, treatment technologies used and pollutants discharged at industrial facilities vary widely and are dependent on the type of industry and specific facility characteristics. The operations, however, generally are carried out within a more clearly defined area; thus, the collection systems are less complex than POTW collection systems. In addition, unlike biosolids at POTWs, the NPDES program does not regulate residuals (sludge) generated by non-municipal facilities.

Non-municipal facilities can have discharges of stormwater that might be contaminated through contact with manufacturing activities or raw material and product storage, or they can have non-process wastewater discharges such as non-contact cooling water. In addition, some non-municipal facilities take in cooling water. Those discharges and intakes may be regulated under an NPDES permit in addition to any process wastewater.

2.3.2.1 Process Wastewater

Industrial and commercial facilities often use water in the manufacture and processing of products. The regulations at § 122.2 define process wastewater as, "[a]ny water which, during manufacturing or processing, comes into direct contact with, or results from the production or use of any raw material, intermediate product, finished product, byproduct, or waste product."

Process wastewater can contain pollutants at levels that could affect the quality of receiving waters. The NPDES permit program establishes specific requirements for discharges of process wastewater from industrial and commercial sources. If a facility discharges directly to surface water, it would require an individual or general NPDES permit. An industrial or commercial facility also may discharge wastewater to a municipal sewer system, which would be covered under the NPDES pretreatment program. Many types of industrial facilities, whether they discharge directly to surface water or to a municipal sewer system, are covered by effluent guidelines and standards (see section 5.2 of this manual). The stormwater that runs off the property of an industrial or commercial facility or from a construction site might require an NPDES permit under the industrial stormwater program (see section 2.3.2.3 below).

2.3.2.2 Non-Process Wastewater

Industrial and commercial facilities often use water for purposes other than processing products, such as using non-contact cooling water for heat exchange, and may discharge wastewater from sources such as sanitary or cafeteria wastes. Like process wastewater, non-process wastewater is regulated under the NPDES program. Non-process wastewater might also be important to the permit writer when drafting monitoring conditions for facilities where the non-process wastewater dilutes the concentration of pollutants of concern in process wastewater. The permit writer must ensure that specified monitoring locations ensure accurate measurement for compliance with all effluent limitations.

2.3.2.3 Stormwater Associated with Industrial Activity

To minimize the impact of stormwater discharges from industrial facilities, the NPDES program includes an industrial stormwater permitting component. Operators of industrial facilities included in 1 of the 11 categories of stormwater discharges associated with industrial activity that discharge or propose to discharge stormwater to an MS4 or directly to waters of the United States require authorization under an NPDES industrial stormwater permit. EPA published permit regulations and permit application requirements for stormwater discharges associated with industrial activity in 55 FR 48063, November 16, 1990.

Permit Regulations for Stormwater Associated with Industrial Activity

The regulations define stormwater discharges associated with industrial activity as discharges from any conveyance used for collecting and conveying stormwater and that is directly related to manufacturing, processing, or raw materials storage areas at an industrial plant. The regulations at § 122.26(b)(14)(i - xi) identify the following 11 industrial categories required to apply for NPDES permits for stormwater discharges:

- Facilities subject to stormwater effluent guidelines, new source performance standards, or toxic pollutant effluent standards under Parts 400-471 (Subchapter N).
- Certain heavy manufacturing facilities (lumber, paper, chemicals, petroleum refining, leather tanning, stone, clay, glass, concrete, ship construction).
- Active and inactive mining operations and oil and gas operations with contaminated stormwater.
- Hazardous waste treatment, storage, or disposal facilities, including Resource Conservation and Recovery Act (RCRA) Subtitle C facilities.
- Landfills, land application sites, open dumps, and RCRA Subtitle D facilities.

- Recycling facilities, including metal scrap yards, battery reclaimers, salvage yards, and automotive junkyards.
- Steam electric power generating facilities, including coal-handling sites.
- Transportation facilities that have vehicle maintenance shops, equipment cleaning operations, or airport deicing operations.
- Major POTW sludge handling facilities, including on-site application of sewage sludge.
- Construction activities that disturb five acres or more (see subsection below).
- Light industrial manufacturing facilities.

Operators of industrial facilities that are federally, state- or municipally owned or operated that meet the above descriptions must also submit applications.

EPA issued a final rule for Phase II of the stormwater program in 64 FR 68722, December 8, 1999. That rule clarified that stormwater discharges from industrial facilities that have *no exposure* of industrial activities or materials to stormwater may be conditionally excluded from the stormwater permitting program. To qualify for the no exposure exclusion, the industrial operator must complete a no exposure certification form and submit this to EPA once every 5 years. For more information, see the Conditional No Exposure Exclusion Website <www.epa.gov/npdes/stormwater/noexposure>.

Generally, EPA- or state-issued general permits regulate stormwater discharges from industrial, construction and Phase II municipal sources, while Phase I municipal sources usually are issued individual permits. In some cases, stormwater conditions may be incorporated into a comprehensive individual NPDES permit for a facility or a stormwater-specific individual NPDES permit. Incorporating permit conditions to address stormwater discharges associated with industrial and construction activities into an individual facility permit is discussed in the subsections below. For more information regarding the scope of the NPDES stormwater program, see the NPDES Stormwater Program Website <www.epa.gov/npdes/stormwater>.

Permit Conditions for Stormwater Discharges Associated with Industrial Activity

All stormwater discharges associated with industrial activity that discharge stormwater through a separate MS4 or discharge directly to waters of the United States are required to obtain an NPDES permit. Because of the large number of facilities requiring permits, EPA and most NPDES-authorized states choose to issue general permits to regulate stormwater discharges. The Phase I rule in 1990 established the concept of a permitting exemption for industrial facilities with little or no likelihood of discharging contaminated stormwater; however, this exemption was not well-defined or required to be submitted to the NPDES permitting authority. The Phase II rule in December 1999 clarified and expanded the no exposure certification requirement to require industrial facilities with no exposure of industrial processes to stormwater to submit a written certification notifying EPA or the authorized state that the facility wishes to be excluded from the NPDES program.

Each industrial facility covered under an EPA-issued stormwater general permit must meet the numeric and non-numeric effluent limitations established in the general permit. Industrial facilities can meet those effluent limitations by implementing control measures, including BMPs, that control the discharge of stormwater associated with industrial activity.

The EPA- and state-issued stormwater general permits generally require the facility to develop and implement a site-specific *stormwater pollution prevention plan* (SWPPP). The SWPPP describes the control measures, whether structural or nonstructural, which are used for controlling stormwater discharges from the industrial facility. The special conditions component of EPA's stormwater general permits identifies the requirements that must be documented in the SWPPP, including the following:

- A description of potential pollutant sources at the facility, including the following:
  - A map of the facility indicating the drainage areas of the site and the industrial activities that occur in each drainage area.
  - An inventory of materials that could be exposed to stormwater.
  - A description of the likely sources of pollutants from the site and a prediction of the pollutants likely to be present in the stormwater.
  - The history of spills and leaks of toxic and hazardous materials over the past 3 years.
- The measures and controls that will be implemented to prevent or minimize pollution of stormwater, including the following:
  - Good housekeeping or upkeep of industrial areas exposed to stormwater.
  - Preventive maintenance of stormwater controls and other facility equipment.
  - Spill prevention and response procedures.
  - Testing of outfalls to ensure that there are no illicit discharges.
  - Employee training on pollution prevention measure and controls, and record keeping.

A permit writer's best sources of information for developing appropriate special conditions for stormwater control measures are other stormwater general permits. Using existing general permits as the basis for special conditions is encouraged because doing so will reduce duplication of effort. A listing of individual and general permits (stormwater and non-stormwater) issued by EPA and authorized states is on the View NPDES Individual and General Permits Website <www.epa.gov/npdes/permitsearch>. In addition to the Stormwater Discharge From Industrial Facilities Website <www.epa.gov/npdes/stormwater/indust>, EPA published *Developing Your Stormwater Pollution Prevention Plan: A Guide for Industrial Operators*[10] <www.epa.gov/npdes/pubs/industrial_swppp_guide.pdf> to help permit writers identify components of SWPPPs and BMPs and to help permittees develop their own plans. Section 4.3.8 of this manual discusses Form 2F and individual permit requirements for stormwater discharges associated with industrial activity.

Permit Conditions for Stormwater Discharges associated with Construction Activities

EPA and most NPDES-authorized states have issued NPDES general stormwater permits for discharges associated with construction activity that are separate from the industrial stormwater general permits. The Phase I stormwater regulations require permit coverage for all construction activity that results in the disturbance of five acres or greater of the total land area. This includes disturbance of less than five acres of total land area that is part of larger common plan of development or sale if the larger common plan will ultimately disturb five acres of more. The Phase II stormwater regulations require permit coverage for all construction activity that result in land disturbance of equal to or greater than one acre and less than five acres. This includes the disturbance of less than one acre of total land area that is part of a larger common plan of development or sale if the larger common plan will ultimately disturb equal to or greater than one and less than five acres. Since March 2003, most construction activity disturbing one to five acres has been required to comply with the conditions of the relevant NPDES permit (typically under the relevant construction general permit for stormwater discharges), though states have the option of not requiring the submittal of NOIs for stormwater discharges associated with small construction activity.

EPA and NPDES-authorized state permitting authorities may include permit conditions that incorporate qualifying state or local erosion and sediment control program requirements by reference. A qualifying state or local erosion and sediment control program is one that includes the requirements at § 122.44(s). Once EPA or an NPDES authorized state identifies and incorporates a qualifying local program in their NPDES construction general permit, operators can follow the erosion and sediment control requirements of the qualifying local program. By incorporating the qualifying local program by reference the permitting authority can avoid duplicative or conflicting erosion and sediment control requirements between the local program requirements and the NPDES general permit control requirements addressing stormwater discharges associated with construction activity. Operators that are engaged in construction activity within a qualifying program must still submit an NOI under the appropriate construction general permit and comply with all other permit conditions.

The permit requirements in a construction general permit may be similar to those in an industrial general permit, including the development of a SWPPP. In addition to the Stormwater Discharges from Construction Activities Website <www.epa.gov/npdes/stormwater/construction>, EPA also developed the Stormwater Pollution Prevention Plans for Construction Activities Website <www.epa.gov/npdes/swpppguide>. Section 4.3.9 of this manual discusses individual permit requirements for stormwater discharges associated with construction activity.

2.3.2.4 Cooling Water Intake Structures

CWA section 316(b) provides that any standard established pursuant to CWA sections 301 or 306 and applicable to a point source will require that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact. This CWA provision is unique because it addresses the *intake* of water, in contrast to other provisions that regulate the discharge of pollutants into waters of the United States. EPA has established national performance standards under CWA section 316(b) designed to reduce the impingement and entrainment of fish and other aquatic organisms as they are drawn into a facility's cooling water intake structure(s). Impingement occurs when organisms are trapped against cooling water intake structures by the force of water being drawn through the intake structure. Entrainment occurs when organisms are drawn through a cooling water intake structure into a cooling system, through the heat exchanger, and then pumped back out into the waterbody. For more information, see section 4.3.12 of this manual.

In April 1976, EPA published regulations at Part 402 to address cooling water intake structures. Fifty-eight electric utility companies challenged the final rule. The U.S. Court of Appeals for the Fourth Circuit remanded the rule in 1977, and in 1979, EPA withdrew Part 402. Beginning in 1977, NPDES permit authorities made decisions implementing CWA section 316(b) on a case-by-case basis using best professional judgment (BPJ) (§§ 125.90(b) and 401.14).

In the 1990s, EPA began developing CWA section 316(b) regulations establishing national standards. EPA divided the rulemaking into three phases:

- Phase I addressed new facilities and was completed in December 2001 (Part 125, Subpart I).
- Phase II addressed existing electric generating plants that use at least 50 million gallons per day (mgd) of cooling water was completed in July 2004 (Part 125, Subpart J).

- Phase III addressed other existing facilities, including small existing electric generating plants that use less than 50 mgd of cooling water, manufacturers, and new offshore and coastal oil and gas extraction facilities.

The Phase III regulations, finalized in June 2006, establish national standards only for new offshore and coastal oil and gas extraction facilities (Part 125, Subpart N). EPA decided that other Phase III industrial facilities withdrawing water for cooling purposes would not be covered by national standards but would continue to be subject to CWA section 316(b) requirements set by the NPDES Permitting Director on a case-by-case, BPJ basis (§§ 125.90(b) and 401.14).

All three regulations were subject to judicial challenges. While the Phase I rule was largely upheld, the court reviewing the Phase II regulation rejected a number of its provisions. Under remands from the reviewing courts, EPA is reevaluating the Phase II regulation and the decision in the Phase III regulation not to establish national standards for existing Phase III facilities. In the interim, as noted above, NPDES permits must include CWA section 316(b) conditions developed on a case-by-case basis. For the most current information on regulatory requirements, see the Cooling Water Intake Structure Program Website <www.epa.gov/waterscience/316b/>, and for additional Cooling Water Intake Structures regulatory requirements, see section 4.3.12 of this manual.

2.3.2.5 Concentrated Animal Feeding Operations (CAFOs)

Animal feeding operations (AFOs) are agricultural facilities where animals are kept and raised in confined situations. AFOs typically maintain animals, feed, and manure and have production operations in a limited land area. Manure and wastewater from AFOs have the potential to contribute pollutants such as nitrogen and phosphorus, organic matter, sediments, pathogens, heavy metals, hormones, antibiotics, and ammonia to the environment. An AFO is a lot or facility (other than an aquatic animal production facility) where the following conditions are met:

- Animals have been, are, or will be stabled or confined and fed or maintained for a total of 45 days or more in any 12-month period.
- Crops, vegetation, forage growth, or post-harvest residues are not sustained in the normal growing season over any portion of the lot or facility.

AFOs that meet the regulatory definition of a CAFO, or that are designated as CAFOs by the permitting authority, and that discharge or propose to discharge are required to be permitted under the NPDES permitting program.

An animal operation must meet the definition of an AFO [§ 122.23(b)(1)] before it can be considered a CAFO. To be defined as a CAFO, an AFO must meet the regulatory definition [§§ 122.23(b)(4) or 122.23(b)(6)] of a large or medium CAFO or must be designated by the permitting authority [§ 122.23(c)]. Only CAFOs that discharge or propose to discharge are subject to NPDES permitting requirements.

CAFOs are subject to requirements that limit discharges from the production area and requirements applicable to land application areas under the control of the CAFO operator. Large CAFOs are subject to a no discharge requirement for production areas, whereas other CAFOs are subject to BPJ requirements for their production areas. One of the principal substantive pollution control conditions in any CAFO

permit is the requirement to implement the terms of the nutrient management plan (NMP) incorporated into the permit when permit authorization is granted. For more information, see the Animal Feeding Operations Website <www.epa.gov/npdes/cafo>. In addition, section 4.3.4 of this manual discusses application requirements for CAFOs.

2.3.2.6 Concentrated Aquatic Animal Production (CAAP) Facilities

CAAP facilities also are regulated under the NPDES program. In 2004 EPA promulgated new effluent guidelines that address CAAP facilities. The effluent guidelines apply to CAAP facilities (flow-through, recirculating, and net pen) that directly discharge wastewater and have annual production equal to or greater than 100,000 pounds of aquatic animals. The rule requires a BMP plan and implementation of measures, including recordkeeping and reporting requirements, to minimize discharges of solids, to prevent spills of drugs, feed, and chemicals that could result in discharges to waters of the United States, and to ensure proper maintenance of the facility. A facility that does not meet the effluent guideline threshold might still need an NPDES permit if it meets the CAAP facilities thresholds established in the NPDES regulations at § 122.24(b) or if it is designated as a CAAP facility under the designation authority in § 122.24(c). For more information, see the Aquatic Animal Production Industry Effluent Guidelines Website <www.epa.gov/guide/aquaculture/>.

2.3.2.7 Vessel Discharges

On March 30, 2005, the U.S. District Court for the Northern District of California (in *Northwest Environmental Advocates et al. v. EPA*) ruled that the EPA regulation excluding discharges incidental to the normal operation of a vessel from NPDES permitting exceeded the Agency's authority under the CWA. On September 18, 2006, the Court issued an order revoking this regulation [40 CFR 122.3(a)] as of September 30, 2008. EPA appealed the District Court's decision, and on July 23, 2008, the Ninth Circuit upheld the decision, leaving the September 30, 2008, *vacatur* date in effect. In response to the Court order, EPA developed two proposed permits to regulate discharges from vessels. The district court ultimately extended the date of *vacatur* to February 6, 2009.

In July 2008, Congress amended the CWA (P.L. No. 110-288) to add a new section 402(r), which excludes discharges incidental to the normal operation of a recreational vessel from NPDES permitting. Instead, it directs EPA to regulate those discharges under a newly created CWA section 312(o). As a result of the law, EPA did not finalize the previously proposed Recreational Vessel General Permit and is instead undertaking rulemaking to develop BMPs for these vessels under the authority of CWA section 312(o).

In July 2010 P.L. 111-215 (Senate Bill S. 3372) was signed into law. This law amends P.L. 110-299 (Senate Bill S. 3298), which generally imposes a moratorium during which time neither EPA nor states may require NPDES permits for discharges incidental to the normal operation of commercial fishing vessels and other non-recreational vessels less than 79 feet. As a result, of P.L. 110-299, the Vessel General Permit (VGP) does not cover vessels less than 79 feet, or commercial fishing vessels, unless they have ballast water discharges. P.L. 111-215 extended the expiration date of the moratorium from July 31, 2010, to December 18, 2013.

As a result of the court ruling, EPA issued the VGP on December 18, 2008. The 2008 VGP regulates discharges incidental to the normal operation of vessels operating in a capacity as a means of transportation. The VGP includes the following:

- general effluent limits applicable to all discharges.
- general effluent limits applicable to 26 specific discharge streams.
- narrative water-quality based effluent limits.
- inspection, monitoring, recordkeeping, and reporting requirements.
- additional requirements applicable to certain vessel types.

EPA estimates that approximately 61,000 domestically flagged commercial vessels and approximately 8,000 foreign flagged vessels could be affected by this permit.

Because this area of the NPDES permit program is relatively new and continues to evolve, for the most current information, see EPA's Vessel Discharges Website <www.epa.gov/npdes/vessels>.

2.4 Major/Minor Facility Designation

In addition to categorizing facilities as municipal and non-municipal, EPA has also developed criteria to determine which of the sources should be considered *major facilities*. The distinction was made initially to assist EPA and states in setting priorities for permit issuance and reissuance. The regulations at § 122.2 define major facility as, "any NPDES *facility or activity* classified as such by the Regional Administrator, or in the case of *approved state programs*, the Regional Administrator in conjunction with the [s]tate Director." All facilities that are not designated as *majors* are considered *minor* facilities.

Through policy, including the memoranda *Procedures for Revising the Major Permit List*[11] <www.epa.gov/npdes/pubs/owm0364.pdf> and *Delegation of Updates to Major/Minor Lists*[12] <www.epa.gov/npdes/pubs/owm0142.pdf>, EPA has established working definitions for POTW and non-municipal major facilities. For POTWs, major facilities are those that have a design flow of one million gallons per day or greater or serve a population of 10,000 or more or cause significant water quality impacts. Non-POTW discharges are classified as major facilities on the basis of the number of points accumulated using the NPDES Permit Rating Work Sheet <www.epa.gov/npdes/pubs/owm0116.pdf>. The worksheet evaluates the significance of a facility using several criteria, including toxic pollutant potential, flow volume, and water quality factors such as impairment of the receiving water or proximity of the discharge to coastal waters.

2.5 Growth and Change in the NPDES Program

The basic structure of the NPDES program has remained the same since the 1972 Federal Water Pollution Control Act amendments, but as EPA develops new regulations, policies, and guidance or modifies existing program requirements and guidance, the existing program is refined and new aspects of the program can emerge. To stay informed about the most recent program developments, permit writers should visit EPA's NPDES Program Website <www.epa.gov/npdes/> frequently.

[1] Prothro, M. 1983. *EPA's Authority to Issue NPDES General Permits in Approved NPDES States.* U.S. Environmental Protection Agency, Office of Water. Memorandum, July 11, 1983. <www.epa.gov/npdes/pubs/owm0444.pdf>.

[2] U.S. Environmental Protection Agency. 1994. *A Plain English Guide to the EPA Part 503 Biosolids Rule.* EPA/832/R-93/003. U.S. Environmental Protection Agency, Office of Wastewater Management, Washington, DC. <www.epa.gov/owm/mtb/biosolids/503pe/>.

[3] U.S. Environmental Protection Agency. 2004. *Report to Congress on the Impacts and Control of CSOs and SSOs.* EPA 833-R-04-001. U.S. Environmental Protection Agency, Office of Water, Washington, DC. <www.epa.gov/npdes/csossoreport2004>.

[4] Hanlon, J.A. 2004. *Implementing the Partial Remand of the Stormwater Phase II Regulations Regarding Notices of Intent & NPDES General Permitting for Phase II MS4s*. U.S. Environmental Protection Agency, Office of Wastewater Management. Memorandum, April 16, 2004. <www.epa.gov/npdes/pubs/hanlonphase2apr14signed.pdf>.

[5] U.S. Environmental Protection Agency. 1992. *Guidance Manual for the Preparation of Part 2 of the NPDES Permit Application for Discharges from Municipal Separate Storm Sewer Systems*. EPA-833/B-92-002. U.S. Environmental Protection Agency, Office of Water, Washington, DC. <www.epa.gov/npdes/pubs/owm0246.pdf>.

[6] Perciasepe, R. 1996. *Interim Permitting Approach for Water Quality-Based Effluent Limitations in Stormwater Permits*. U.S. Environmental Protection Agency, Office of Water. Memorandum, September 1, 1996. <www.epa.gov/npdes/pubs/swpol.pdf>.

[7] Wayland, R.H., III, and J.A. Hanlon. 2002. *Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs.* U.S. Environmental Protection Agency, Office of Wetlands, Oceans and Watersheds and Office of Wastewater Management. Memorandum, November 22, 2002. <www.epa.gov/npdes/pubs/final-wwtmdl.pdf>.

[8] U.S. Environmental Protection Agency. 2007. *MS4 Program Evaluation Guidance.* EPA-833-R-07-003. U.S. Environmental Protection Agency, Office of Wastewater Management. Washington, DC. <www.epa.gov/npdes/pubs/ms4guide_withappendixa.pdf>.

[9] U.S. Environmental Protection Agency. 2010. *MS4 Permit Improvement Guide*. EPA833-R-10-001. U.S. Environmental Protection Agency. Office of Water, Washington, DC. <www.epa.gov/npdes/pubs/ms4permit_improvement_guide.pdf>

[10] U.S. Environmental Protection Agency. 2009. *Developing Your Stormwater Pollution Prevention Plan: A Guide for Industrial Operators*. EPA 833-B-09-002. U.S. Environmental Protection Agency, Office of Water, Washington, DC. <www.epa.gov/npdes/pubs/industrial_swppp_guide.pdf>.

[11] Dougherty, Cynthia. 1988. *Procedures for Revising the Major Permit List.* U.S. Environmental Protection Agency, Permits Division. Memorandum, December 28, 1988. <www.epa.gov/npdes/pubs/owm0364.pdf>.

[12] Pendergast, James F. 1995. *Delegation of Updates to Major/Minor Lists.* U.S. Environmental Protection Agency, Office of Wastewater Management. Memorandum, February 6, 1995. <www.epa.gov/npdes/pubs/owm0142.pdf>.

CHAPTER 3. Overview of the NPDES Permitting Process

This chapter presents an overview of the different types of National Pollutant Discharge Elimination System (NPDES) permits, the major permit components, and the permit development and issuance process. The permit process is illustrated by flow charts. The tasks identified within the flow charts are described in detail in subsequent chapters.

3.1 Types of Permits

The two basic types of NPDES permits are individual and general permits. These permit types share the same components but are used under different circumstances and involve different permit issuance processes.

3.1.1 Individual Permits

An individual permit is a permit specifically tailored to an individual facility. Upon receiving the appropriate application form(s), the permitting authority develops a permit for that facility on the basis of information from the permit application and other sources (e.g., previous permit requirements, discharge monitoring reports, technology and water quality standards, total maximum daily loads, ambient water quality data, special studies). The permitting authority then issues the permit to the facility for a specific period not to exceed 5 years, with a requirement to reapply before the expiration date.

3.1.2 General Permits

A permitting authority develops and issues a general permit to cover multiple facilities in a specific category of discharges or of sludge use or disposal practices. General permits can be a cost-effective option for agencies because of the large number of facilities that can be covered under a single permit. According to Title 40 of the *Code of Federal Regulations* (CFR) 122.28(a)(2), general permits may be written to cover stormwater point sources or other categories of point sources having the following common elements:

- Sources that involve the same or substantially similar types of operations.
- Sources that discharge the same types of wastes or engage in the same types of sludge use or disposal.
- Sources that require the same effluent limitations or operating conditions, or standards for sewage sludge use or disposal.
- Sources that require the same monitoring where tiered conditions may be used for minor differences within a class (e.g., size or seasonal activity).
- Sources that are more appropriately regulated by a general permit.

The regulations at § 122.28(a)(1) provide for general permits to cover dischargers within an area corresponding to specific geographic or political boundaries such as the following:

- Designated planning area.
- Sewer district.
- City, county, or state boundary.

- State highway system.
- Standard metropolitan statistical area.
- Urbanized area.

The regulation also allows a general permit to cover any other appropriate division or combination of such boundaries. For example, EPA has issued general permits that cover multiple states, territories, and tribes where EPA is the permitting authority.

Where a large number of similar facilities require permits, a general permit allows the permitting authority to allocate resources in a more efficient manner and to provide more timely permit coverage than issuing an individual permit to each facility. In addition, using a general permit ensures consistent permit conditions for comparable facilities.

3.2 Major Components of a Permit

All NPDES permits consist, at a minimum, of five sections:

- **Cover Page:** Contains the name and location of the permittee, a statement authorizing the discharge, and a listing of the specific locations for which a discharge is authorized.
- **Effluent Limitations:** The primary mechanism for controlling discharges of pollutants to receiving waters. A permit writer spends the majority of his or her time, when drafting a permit, deriving appropriate effluent limitations on the basis of applicable technology and water quality standards.
- **Monitoring and Reporting Requirements:** Used to characterize wastestreams and receiving waters, evaluate wastewater treatment efficiency, and determine compliance with permit conditions.
- **Special Conditions:** Conditions developed to supplement numeric effluent limitations. Examples include additional monitoring activities, special studies, best management practices (BMPs), and compliance schedules.
- **Standard Conditions:** Pre-established conditions that apply to all NPDES permits and delineate the legal, administrative, and procedural requirements of the NPDES permit.

In addition to the components of the permit, a fact sheet or statement of basis explaining the rationale for permit conditions makes up part of the documentation that supports a draft permit. Section 11.2 of this manual includes additional discussion of permit documentation and the required elements of a fact sheet or statement of basis.

Although the major sections of a permit listed above are part of all permits, the contents of some sections vary depending on the nature of the discharge (e.g., municipal effluent, industrial process wastewater, stormwater, vessel discharges) and whether the permit is issued to an individual facility or to multiple dischargers (i.e., a general permit). Exhibit 3-1 shows the components of a permit and highlights some distinctions between the contents of NPDES permits for municipal (i.e., POTW) and industrial facilities. Permit writers should note that it is common for different permitting authorities to use different names for each section of a permit.

Exhibit 3-1 Permit components

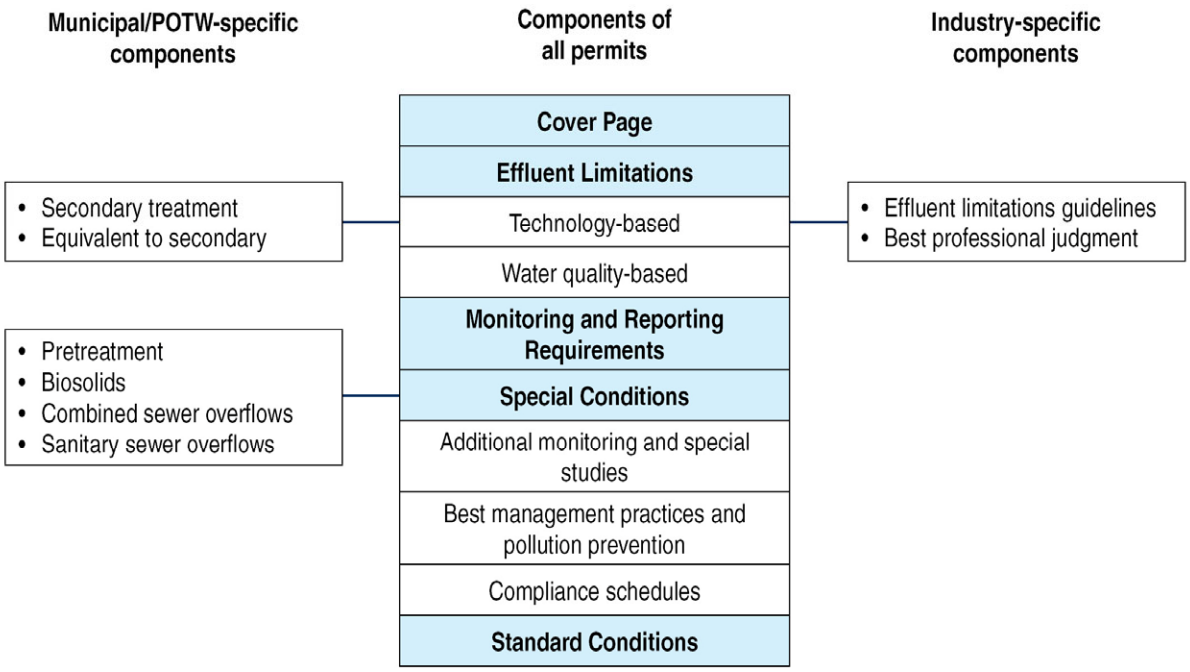

3.3 Overview of the Development and Issuance Process for NPDES Individual Permits

While the limitations and conditions in NPDES individual permits are unique to each permittee, the process used to develop the limitations and conditions and issue each permit generally follows a common set of steps. Exhibit 3-2 illustrates the major steps to develop and issue NPDES individual permits and also serves as an index for the subsequent chapters of this manual by identifying which chapter presents more detailed information on each step.

For individual permits, the permitting process generally begins when a facility operator submits an application. After receiving the application and making a decision to proceed with the permit, the permit writer reviews the application for completeness and accuracy. When the permit writer determines that the application is complete and has any additional information needed to draft the permit, the permit writer develops the draft permit and the justification for the permit conditions (i.e., the fact sheet or statement of basis).

The first major step in the permit development process is deriving technology-based effluent limitations (TBELs). Following that step, the permit writer derives effluent limitations that are protective of state water quality standards (i.e., water quality-based effluent limitations [WQBELs]) as needed. The permit writer then compares the TBELs with the WQBELs and, after conducting an anti-backsliding analysis if necessary, applies the final limitations in the NPDES permit. The permit writer must document the decision-making process for deriving limitations in the permit fact sheet. It is quite possible that a permit will have limitations that are technology-based for some parameters and water quality-based for others. For example, a permit could contain effluent limitations for total suspended solids (TSS) based on national effluent limitations guidelines and standards (effluent guidelines) (technology-based), limitations for ammonia based on preventing toxicity to aquatic life (water quality-based), and limitations for 5-day

biochemical oxygen demand (BOD_5) that have different bases, such as an average monthly limitation based on effluent guidelines and a maximum daily limitation based on water quality standards.

Exhibit 3-2 Major steps to develop and issue NPDES individual permits

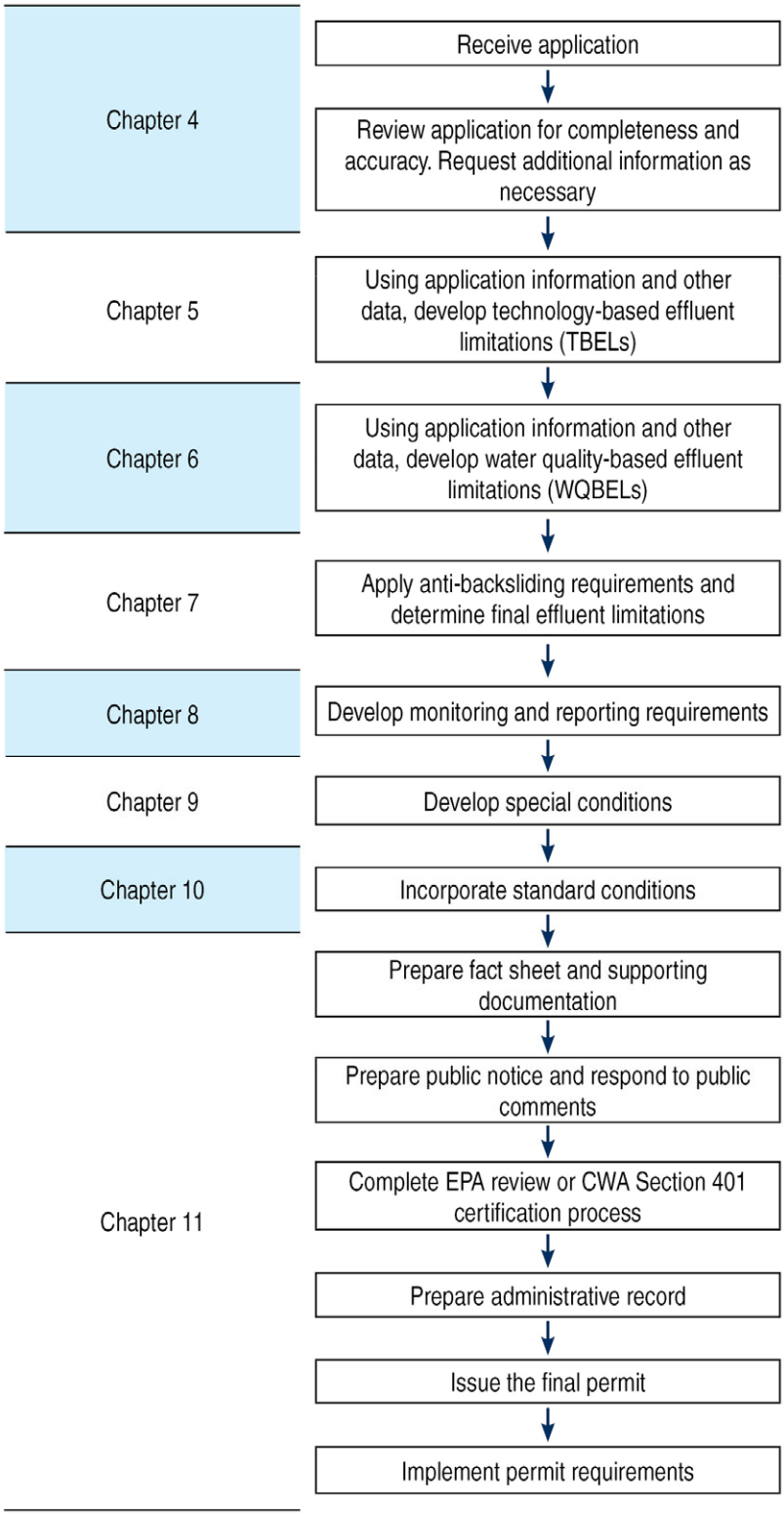

After effluent limitation development, the permit writer develops appropriate monitoring and reporting requirements and facility-specific special conditions. The permit writer then adds standard conditions, which are the same for all permits.

The next step is to provide an opportunity for public participation in the permit process and EPA review of the permit or, in the case of an EPA-issued permit, certification under CWA section 401 by the state with jurisdiction over the receiving water that the permit will comply with its water quality standards. The permitting authority issues a public notice announcing the draft permit and inviting interested parties to submit comments. If there is significant public interest, the permitting authority can hold a public hearing. Taking into consideration the public comments, the permitting authority then produces a final permit, with careful attention to documenting the process and decisions for the administrative record, and issues the final permit to the facility. The permitting authority might decide to make significant changes to the draft permit according to public comment and then provide another opportunity for public review and comment on the revised permit. Section 11.3 of this manual discusses items to address before final permit issuance in more detail.

3.4 Overview of the Development and Issuance Process for NPDES General Permits

The process for developing and issuing NPDES general permits is similar to the process for individual permits; however, there are some differences in the sequence of events. Exhibit 3-3 illustrates the major steps to develop and issue NPDES general permits.

Exhibit 3-3 Major steps to develop and issue NPDES general permits

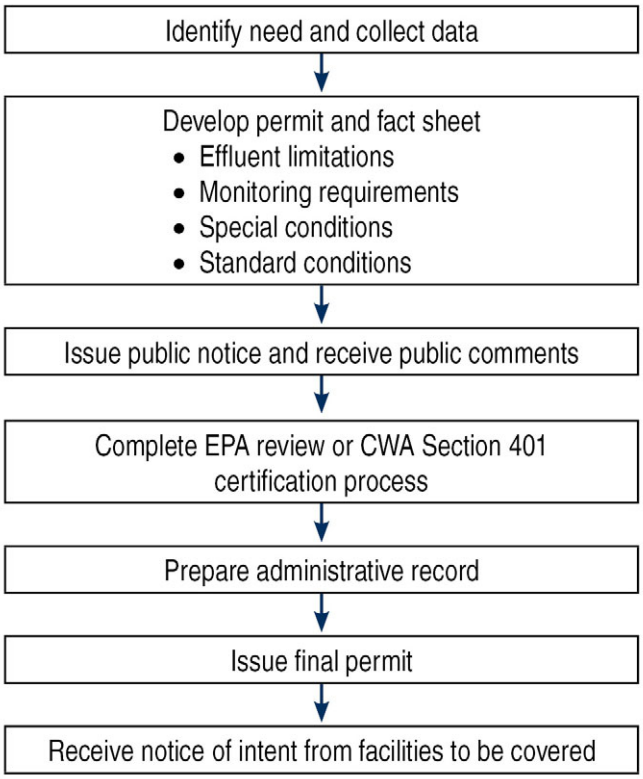

For general permits, the permitting authority first identifies the need for a general permit and collects data that demonstrate that a group or category of dischargers has similarities that warrant a general permit. In deciding whether to develop a general permit, permitting authorities consider whether

- A large number of facilities will be covered.
- The facilities have similar production processes or activities.
- The facilities generate similar pollutants.
- Whether uniform WQBELs (where necessary) will appropriately implement water quality standards.

The remaining steps of the permit process are the same as for individual permits. The permitting authority develops a draft permit that includes effluent limitations, monitoring conditions, special conditions, and standard conditions. The permitting authority then issues a public notice and addresses public comments, completes the EPA review or CWA section 401 certification process, develops the administrative record, and issues the final permit. The final permit will also establish the requirements for the specific information that must be submitted by a facility that wishes to be covered under the general permit.

After the final general permit has been issued, facilities that wish to be covered under the general permit typically submit a Notice of Intent (NOI) to the permitting authority. After receiving the NOI, the permitting authority can request additional information describing the facility, notify the facility that it is covered by the general permit, or require the facility to apply for an individual permit.

The following chapters in this manual describe steps in the permitting process in detail. In general, the chapters focus on the steps necessary to develop and issue an individual permit, but much of the technical discussion applies equally to general permit development.

CHAPTER 4. NPDES Permit Application Process

This chapter describes the National Pollutant Discharge Elimination System (NPDES) permit application process, including the permit writer's role in reviewing the application and evaluating background information about the applicant. Through this process the permit writer gains an understanding of the circumstances of the discharge and the characteristics of the proposed effluent, which is necessary to develop appropriate permit limitations and conditions.

4.1 Who Applies for an NPDES Permit?

The NPDES regulations at Title 40 of the *Code of Federal Regulations* (CFR) 122.21(a) require that any person, except persons covered by general permits under § 122.28, who discharges pollutants or proposes to discharge pollutants to waters of the United States must apply for a permit. Further, § 122.21(e) prohibits the permitting authority from issuing an individual permit until and unless a prospective discharger provided a complete application. This regulation is broadly inclusive and ties back to the Clean Water Act (CWA) section 301(a) provision that, except as in compliance with the act, "…the discharge of any pollutant by any person shall be unlawful."

In most instances, the permit applicant will be the owner (e.g., corporate officer) of the facility. However, the regulations at § 122.21(b) require that when a facility or activity is owned by one person but is operated by another person, it is the operator's duty to obtain a permit. The regulations also require the application to be signed and certified by a high-ranking official of the business or activity. The signatory and certification requirements are at § 122.22.

Permits (and applications) are required for most discharges or proposed discharges to waters of the United States; however, NPDES permits are not required for some activities as specified under the *Exclusions* provision in § 122.3. Exceptions include the following:

- Discharge of dredged or fill materials into waters of the United States which are regulated under CWA section 404.
- The introduction of sewage, industrial wastes or other pollutants into publicly owned treatment works (POTWs) by indirect dischargers.
- Any discharge in compliance with the instructions of an On-Scene Coordinator pursuant to Part 300 (The National Oil and Hazardous Substances Pollution Contingency Plan) or 33 CFR 153.10(e) (Pollution by Oil and Hazardous Substances).
- Any introduction of pollutants from nonpoint source agricultural and silvicultural activities, including stormwater runoff from orchards, cultivated crops, pastures, range lands, and forest lands, but not discharges from concentrated animal feeding operations as defined in § 122.23, discharges from concentrated aquatic animal production facilities as defined in § 122.24, discharges to aquaculture projects as defined in § 122.25, and discharges from silvicultural point sources as defined in § 122.27.
- Return flows from irrigated agriculture.

- Discharges into a privately owned treatment works, except as the Director may otherwise require under § 122.44(m).

While those types of discharges have been excluded from permitting requirements under the NPDES program, they might be subject to controls under other federal or state regulatory programs.

As of the date of this manual's publication, the exclusion for certain discharges incidental to the normal operation of a vessel is still in the CFR. Similarly, discharges from the application of pesticides consistent with all relevant requirements under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) (i.e., those relevant to protecting water quality) are excluded from NPDES permit coverage in the following two circumstances: (1) the application of pesticides directly to waters of the United States to control pests, and (2) the application of pesticides to control pests that are present over waters of the United States, including near such waters, where a portion of the pesticides will unavoidably be deposited to waters of the United States to target the pests effectively. However, because of court decisions, the exclusions for vessels and pesticides are vacated as of February 6, 2009, and April 9, 2011, respectively. The effect of the *vacaturs* on the exclusions in § 122.3 is presented in Exhibit 4-1.

Exhibit 4-1 Effect of court decisions on § 122.3

Exclusion	Issue
Vessel Discharges (www.epa.gov/npdes/vessels)	The Court's ruling does not affect vessel discharge exemptions from permitting that are specifically provided for in the CWA itself. For example, § 502(6)(A) excludes from the act's definition of *pollutant* sewage from vessels (including graywater in the case of commercial vessels operating on the Great Lakes) and discharges incidental to the normal operation of a vessel of the Armed Forces within the meaning of CWA section 312. As another example, the CWA section 502(12)(B) provides that discharges from vessels (i.e., discharges other than those when the vessel is operating in a capacity other than as a means of transportation) do not constitute the, "discharge of a pollutant" when such discharges occur beyond the limit of the 3-mile territorial sea. Because both *a pollutant* and a *discharge of a pollutant* are prerequisites to the requirement to obtain an NPDES permit, those two statutory provisions have the effect of exempting the vessel discharges they address from the requirement to obtain an NPDES permit. In addition, in July 2008, Congress amended the CWA to add a new section 402(r) to the act, which excludes discharges incidental to the normal operation of a recreational vessel from NPDES permitting. For more information, see section 2.3.2.7 of this manual.
Pesticides (www.epa.gov/npdes/aquaticpesticides)	On January 7, 2009, the 6th Circuit Court vacated the final rule in *The National Cotton Council of America et al. v. United States Environmental Protection Agency*. The court held that while an NPDES permit is not required for chemical pesticide applications that leave no residuals, an NPDES permit is required for discharges (1) from chemical pesticide applications to or over, including near water, where there is a residual, or excess pesticide, in the water following the application, and (2) from all biological pesticide applications regardless of whether a residual is left. On June 8, 2009, the court granted a request from the U.S. Department of Justice for a 2-year stay of its decision, until April 9, 2011, to provide time for EPA and the states to develop and issue NPDES general permits for the discharge of pollutants from the application of pesticides. Before April 9, 2011, permits are not required for discharges from these applications when applied in accordance with the product's FIFRA label. Certain related activities continue to be exempt from permitting under the CWA (i.e., irrigation return flow and agricultural stormwater runoff).

4.2 Application Deadlines

The regulations at § 122.21(c) and (d) specify the time to apply for NPDES permits. Exhibit 4-2 summarizes the application deadline requirements for dischargers to be covered by an NPDES permit.

Exhibit 4-2 When to apply for an NPDES permit

Type of permit	Type of discharge	Schedule*
Individual	New	At least 180 days before the date on which the discharge is to commence
	Existing	At least 180 days before expiration date of existing permit
	Construction Stormwater	At least 90 days before the date on which construction is to commence
General	New	Specified in general permit
	Existing	X number of days following issuance of permit (specified in the general permit)

* Authorized states may use more stringent deadlines.

Anyone proposing a new discharge must apply to the permitting authority no later than 180 days before the expected commencement of the discharge if applying for an individual permit. Any person with an currently effective individual permit must submit an application to the permitting authority at least 180 days before the expiration of its existing individual permit unless permission for a later date has been granted in accordance with § 122.21(d). For general permits, the deadline for new dischargers to apply is specified in the general permit. A general permit also may specify a number of days after the general permit's issuance that operators of existing facilities are given to apply for coverage. Authorized states may have different schedules for permit applications, but their schedules may be no less stringent than the federal deadlines. The State Director or the Regional Administrator may allow an individual application to be submitted at dates later than those specified in the regulations, but not later than the expiration date of the existing permit.

Note that, according to § 122.6, the conditions of an expired NPDES permit remain in effect until the new permit is issued, as long as the discharger submitted a complete application in accordance with the timeframes prescribed in the regulations (or in accordance with state law, in the case of state-administered NPDES programs). If state law does not allow expired permits to remain in effect until a permit is reissued, or if the permit application is not on time and complete, the facility may be considered to be discharging without a permit from the time the permit expired until the effective date of the new permit.

4.3 Application Forms and Requirements for Individual Permits

When a facility needs an individual NPDES permit, it must submit a permit application. Application forms and requirements are specific to the type of facility and discharge. NPDES permit application requirements are in Part 122, Subpart B and identified on forms developed by the U.S. Environmental Protection Agency (EPA). Authorized states are not required to use the EPA application forms; however, any alternative form used by an authorized state must include the federal requirements at a minimum.

Exhibit 4-3 provides an overview of the types of dischargers required to submit NPDES application forms, identifies the forms that must be submitted, and references the corresponding NPDES regulatory citation. In some cases, a facility might need to file more than one application form. For example, an

existing industrial facility (i.e., renewal) discharging stormwater combined with process and non-process wastewater might need to submit Form 1, Form 2C, and Form 2F. Section 2.3 of this manual discusses the NPDES program areas that have application requirements presented below.

Exhibit 4-3 EPA application requirements for NPDES individual permits

Type of facility or program area	Status	Forms	Regulatory citations and additional application requirements (40 CFR)
Municipal facilities • POTWs with design flows greater than or equal to 0.1 million gallons per day (mgd)	New and existing	**Form 2A**, Parts A, B and C; Parts D, E, F, or G as applicable	• § 122.21(a)(2)(i)(B) • § 122.21(j)
• POTWs with design flows less than 0.1 mgd	New and existing	**Form 2A**, Parts A and C; Parts D, E, F, or G as applicable	• § 122.21(a)(2)(i)(B) • § 122.21(j)
TWTDS (sewage sludge)	New and existing	**Form 2S**	• § 122.21(a)(2)(i)(H) • § 122.21(q)
Concentrated animal production facilities • Concentrated animal feeding operations • Concentrated aquatic animal production facilities	New and existing	**Form 1** and **Form 2B**	• § 122.21(a)(2)(i)(A) and (C) • § 122.21(f) and (i)
Industrial facilities • Manufacturing facilities • Commercial facilities • Mining activities • Silvicultural activities	Existing	**Form 1** and **Form 2C**	• § 122.21(a)(2)(i)(A) and (D) • § 122.21(f) and (g)
	New (process wastewater)	**Form 1** and **Form 2D**	• § 122.21(a)(2)(i)(A) and (E) • § 122.21(f) and (k)
	New and existing (non-process wastewater)	**Form 1** and **Form 2E**	• § 122.21(a)(2)(i)(A) and (F) • § 122.21(f) and (h)
Stormwater discharges associated with industrial activities (except stormwater discharges associated with construction activity)	New and existing	**Form 1** and **Form 2F**	• § 122.21(a)(2)(i)(A) and (G) • § 122.21(f) • § 122.26(c)
Stormwater discharges associated with construction activity	New and existing	**Form 1**	• § 122.21(a)(2)(i)(A) • § 122.21(f) • § 122.26(c)(1)(ii)
Stormwater discharges from MS4s serving a population greater than 100,000	New and existing	None	• § 122.26(d)
Stormwater discharges from small MS4s	New and existing	None	• § 122.33 • § 122.21(f)
Cooling water intake structures	New and existing	None	• § 122.21(r)

4.3.1 Form 1: General Information

All facilities applying for an individual NPDES permit, with the exception of POTWs, treatment works treating domestic sewage (TWTDS), and municipal separate storm sewer systems (MS4s) applying for a municipal stormwater permit, must submit Form 1 <www.epa.gov/npdes/pubs/form_1.pdf>. The type of general facility information required by Form 1 is specified in §§ 122.21(a)(2)(i)(A) and 122.21(f) and includes the following:

- Name, mailing address, facility contact, and facility location.
- Standard industrial classification (SIC) code and a brief description of the nature of the business.
- Topographic map showing the location of the existing or proposed intake and discharge structures.

4.3.2 Form 2A: New and Existing POTWs

All new and existing POTWs must submit Form 2A <www.epa.gov/npdes/pubs/final2a.pdf>. EPA issued a final rule amending permit application requirements and application forms for POTWs and other TWTDS (64 FR 42433, August 4, 1999). The rule consolidated POTW application requirements, expanded toxic monitoring requirements for POTWs, and revised the forms used to submit permit applications. POTWs must also submit the form for permit renewals. Form 2A replaces Standard Form A and Short Form A.

POTWs with design influent flows equal to or greater than 100,000 gallons per day (gpd) (0.1 mgd) must submit Parts A, B, and C of Form 2A. POTWs with design flows of less than 100,000 gpd must submit Parts A and C of Form 2A. Parts A, B and C are referred to as Basic Application Information:

- Part A of Form 2A contains basic application information for all applicants:
  - Facility and applicant information.
  - Collection system type, areas served, and total population served.
  - Discharges and other disposal methods.
  - If the treatment works discharges effluent to waters of the United States, a description of outfalls, receiving waters, and treatment and effluent testing information.
- Part B of Form 2A collects additional information for applicants with a design flow greater than or equal to 0.1 mgd, including inflow and infiltration estimates, a topographic map, process flow diagram, and effluent testing data for additional parameters.
- Part C is a certification that all applicants must complete.

Form 2A also includes Supplemental Application Information (Parts D–G). POTWs complete these additional forms, as applicable, depending on the characteristics of the municipal discharge:

- Part D requests expanded effluent testing data for metals, volatile organic compounds, acid-extractable compounds, and base-neutral compounds. A POTW that discharges effluent to waters of the United States and meets one or more of the following criteria must complete Part D:
  - Has a design flow rate greater than or equal to 1 mgd.
  - Is required to have a pretreatment program (or has one in place).
  - Is otherwise required by the permitting authority to provide the information.

- A POTW that meets one or more of the following criteria must complete Part E (Toxicity Testing Data):
  - Has a design flow greater than or equal to 1 mgd.
  - Is required to have a pretreatment program (or has one in place).
  - Is otherwise required by the permitting authority to submit results of toxicity testing.
- A POTW that accepts process wastewater from any significant industrial users (SIUs) or receives Resource Conservation and Recovery Act (RCRA) or Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) or other remedial wastes must complete Part F. SIUs are defined as:
  - All industrial users subject to Categorical Pretreatment Standards under § 403.6 and 40 CFR Chapter I, Subchapter N.
  - Any other industrial user for which any of the following is true
    - Discharges an average of 25,000 gpd or more of process wastewater to the POTW (excluding sanitary, non-contact cooling, and boiler blowdown wastewater).
    - Contributes a process wastestream that makes up 5 percent or more of the average dry-weather hydraulic or organic capacity of the treatment plant.
    - Is designated an SIU by the control authority on the basis that it has a reasonable potential for adversely affecting the POTWs operation or for violating any pretreatment standard or requirement.
  - The control authority can determine that an industrial user subject to categorical pretreatment standards is a nonsignificant categorical industrial user, rather than an SIU, on a finding that it never discharges more than 100 gpd of total categorical wastewater and if:
    - Before that finding, the industrial user has consistently complied with all applicable categorical pretreatment standards and requirements.
    - The industrial user annually submits a certification statement required in § 403.12(q) and any information necessary to support the certification statement.
    - The industrial user never discharges any untreated concentrated wastewater.
  - If an industrial user meets one of the other criteria for determining that it is an SIU (i.e., discharges an average of 25,000 gpd of process wastewater), but the control authority finds that it has no reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standards or requirement, the control authority can determine that the industrial user is not an SIU.
- A POTW that has a combined sewer system must complete Part G. Information that must be provided in the section includes a system map and diagram, and descriptions of outfalls, combined sewer overflow (CSO) events, receiving waters, and operations.

4.3.3 Form 2S: New and Existing TWTDS

New TWTDS and TWTDS with effective NPDES permits must submit a new or renewal permit application, respectively, using new Form 2S <www.epa.gov/npdes/pubs/final2s.pdf>. Part 1 of Form 2S is to be completed by *sludge-only* facilities; that is, facilities that do not have, and are not applying for, an NPDES permit for a direct discharge to surface water. Part 1 collects background information on the facility, including identification information, quantities of sewage sludge handled, pollutant concentrations, treatment methods, and use and disposal information.

Part 2 is used by facilities that already have or are applying for an NPDES permit. It includes five sections:

- All applicants using Part 2 must complete the general information collected by **section A**.
- Applicants who either generate sewage sludge or derive a material from sewage sludge must complete **section B**.
- Applicants who either apply sewage sludge to the land or generate sewage sludge that is applied to the land by others (unless the sludge from the facility meets certain exemption criteria) must complete **section C**.
- Applicants who own or operate a surface disposal site must complete **section D**.
- Applicants who own or operate a sewage sludge incinerator must complete **section E**.

4.3.4 Form 2B: New and Existing Concentrated Animal Feeding Operations (CAFOs) and Concentrated Aquatic Animal Production (CAAP) Facilities

In addition to Form 1, owners of new and existing CAFOs (defined in § 122.23) and CAAP facilities (defined in § 122.24) must submit Form 2B <www.epa.gov/ne/npdes/2010RevisedCafoFedRegstrForm2b.pdf>. Form 2B was significantly modified as part of the final CAFO Rules (68 FR 7176, February 12, 2003, and 73 FR 70418, November 20, 2008). The type of information required by Form 2B consists of the following:

- For CAFOs
  - The name of the owner or operator.
  - The facility location and mailing addresses.
  - Latitude and longitude of the production area.
  - A topographic map of the geographic area in which the CAFO is located.
  - Specific information about the number and type of animals.
  - The type of containment and total capacity for storage (tons/gallons).
  - The total number of acres under control of the applicant available for land application.
  - Estimated amounts of manure, litter, and process wastewater generated and amounts transferred to other persons per year.
  - A nutrient management plan (NMP) that satisfies the requirements of § 122.42(e).
- For CAAP facilities
  - The maximum daily and average monthly flow from each outfall.
  - The number of ponds, raceways, and similar structures.
  - The name of the receiving water and the source of intake water.
  - For each species of aquatic animals, the total yearly and maximum harvestable weight.
  - The calendar month of maximum feeding and the total mass of food fed during that month.

Note that recent revisions to the NPDES regulations require that a CAFO seeking coverage under a permit submit its NMP with its application for an individual permit or notice of intent (NOI) to be authorized under a general permit. Permitting authorities are required to review the plan and provide the public with an opportunity for meaningful public review and comment. Permitting authorities also are required to incorporate terms of the NMP as NPDES permit conditions. For more information on the revisions to the CAFO regulations, see the Animal Feeding Operations Website <www.epa.gov/npdes/cafo>.

Sections 2.3.2.5 and 2.3.2.6 of this manual provide additional information on CAFOs and CAAP facilities, respectively.

4.3.5 Form 2C: Existing Manufacturing, Commercial, Mining, and Silvicultural Discharges

In addition to Form 1, operators of existing (i.e., currently permitted) manufacturing, commercial, mining, and silvicultural discharges must submit Form 2C <www.epa.gov/npdes/pubs/3510-2C.pdf>. The type of information required in Form 2C includes:

- Outfall locations.
- A line drawing of the water flow through the facility.
- Flow characteristics, sources of pollution, treatment technologies.
- Production information (if applicable).
- Improvements (if applicable).
- Intake and effluent characteristics for conventional, nonconventional and toxic (priority) pollutants.
- Potential discharges not covered by analysis.
- Biological testing data.
- Contract laboratory information.
- Certification and signature.

Quantitative effluent data requirements for existing industrial dischargers vary depending on the industrial category of the facility, the facility's discharge characteristics and the types of pollutants expected to be present in the discharge.

4.3.6 Form 2D: New Manufacturing, Commercial, Mining, and Silvicultural Discharges of Process Wastewater

In addition to Form 1, operators of new manufacturing, commercial, mining, and silvicultural discharges of process wastewater must submit Form 2D <www.epa.gov/npdes/pubs/3510-2D.pdf>. *New* dischargers are those that have not previously obtained permits for a discharge and have not commenced operation. The type of information required in Form 2D includes the following:

- Expected outfall locations.
- Date of expected commencement of discharge.
- Expected flow characteristics.
- Sources of pollutants.
- Treatment technologies.
- Production information (if applicable).
- Expected intake and effluent characteristics.

4.3.7 Form 2E: Manufacturing, Commercial, Mining, and Silvicultural Facilities that Discharge Only Non-Process Wastewater

In addition to Form 1, operators applying for an individual NPDES permit for manufacturing, commercial, mining, and silvicultural facilities that are not regulated by effluent limitations guidelines and standards (effluent guidelines) or new source performance standard, and that discharge only

non-process wastewaters, must submit Form 2E <www.epa.gov/npdes/pubs/3510-2E.pdf>. *Non-process wastewater* includes sanitary wastes, restaurant or cafeteria wastes, and non-contact cooling water, but it does not include stormwater. Stormwater is specifically excluded from the definition of non-process wastewater. Form 2E also may not be used for discharges by educational, medical, or commercial chemical laboratories or by POTWs. The type of information required in Form 2E includes the following:

- Outfall locations.
- Type of waste discharged.
- Effluent characteristics, including quantitative data for selected parameters.
- Flow characteristics.
- Treatment technologies.

4.3.8 Form 2F: Stormwater Discharges Associated with Industrial Activities

In addition to Form 1, operators applying for an individual NPDES permit for discharges composed entirely of stormwater associated with industrial activity must submit Form 2F <www.epa.gov/npdes/pubs/3510-2F.pdf>. Applicants whose discharge is composed of stormwater and non-stormwater must also submit Form 2C, 2D, or 2E as appropriate. The type of information required in Form 2F includes the following:

- A topographic map and estimates of impervious surface area.
- Descriptions of material management practices and control measures.
- A certification that outfalls have been evaluated for non-stormwater discharges.
- Descriptions of past leaks and spills.
- Analytical data from each outfall for several specified parameters.

EPA developed the *Guidance Manual For the Preparation of NPDES Permit Applications For Stormwater Discharges Associated With Industrial Activity*[1] <www.epa.gov/npdes/pubs/owm0241.pdf> to assist operators of facilities that discharge stormwater associated with industrial activity in complying with the requirements for applying for an NPDES permit.

4.3.9 Stormwater Discharges Associated with Construction Activity

Most stormwater discharges associated with construction activities that result in the disturbance of one acre or more are covered under a general permit issued by EPA or the authorized state. In cases that a general permit does not cover the discharge or the discharger decides that an individual permit is necessary for stormwater discharges associated with construction activity, the discharger is required to submit Form 1, along with a narrative description of the following:

- The location (including a map) and the nature of the construction activity.
- The total area of the site and the area of the site that is expected to undergo excavation during the life of the permit.
- Proposed measures, including best management practices (BMPs), to control pollutants in stormwater discharges during construction, including a brief description of applicable state and local erosion and sediment control requirements.

- Proposed measures to control pollutants in stormwater discharges that will occur after construction operations have been completed, including a brief description of applicable state or local erosion and sediment control requirements.
- An estimate of the runoff coefficient of the site and the increase in impervious area after the construction addressed in the permit application is completed, the nature of fill material and existing data describing the soil or the quality of the discharge.
- The name of the receiving water.

4.3.10 Stormwater Discharges from MS4s Serving a Population Greater than 100,000

The stormwater application regulations (55 FR 47990, November 16, 1990) require operators of large or medium MS4s to submit two-part applications. Part 1 application information was required to be submitted by large MS4s (serving a population greater than 250,000) by November 18, 1991, and by medium MS4s (serving a population greater than 100,000 but less than or equal to 250,000) by May 18, 1992. Part 2 application information was required to be submitted by large MS4s by November 16, 1992, and by medium MS4s by May 17, 1993. Those applications could be submitted on a system- or jurisdiction-wide basis. Key requirements of each part of the application include [and are further addressed in § 122.26(d)] the following:

- Part 1
  - General information (e.g., name, address).
  - Existing legal authorities to control discharges to the storm sewer system and any additional authority that might be required.
  - Source identification information (e.g., storm sewer outfalls, land use information).
  - Discharge characterization, including monthly precipitation estimates, average number of storm events, and results from dry-weather flow screening.
  - Characterization plan, including identification of 5 to 10 representative outfalls for stormwater sampling.
  - Description of existing stormwater management practices.
  - Descriptions of existing budget and resources available to complete Part 2 of the application and implement the stormwater program.
- Part 2
  - Demonstration of adequate legal authority.
  - Identification of any major storm sewer outfalls not included in Part 1 of the application.
  - Discharge characterization data from three representative storm events.
  - Proposed stormwater management program.
  - Assessment of controls, including expected reductions in pollutant loadings.
  - Fiscal analysis, including necessary capital and operation and maintenance expenditures for each year of the permit.

Under the NPDES regulations, permittees are required to reapply for a new NPDES permit before the expiration of their existing permit; however, in the case of stormwater permits for MS4s, Part 1 and Part 2 application requirements described above were intended only for the initial issuance of an MS4 permit and specific requirements for reapplication have not been defined in the regulations. On May 17, 1996, EPA issued a policy that sets forth a streamlined approach for reapplication requirements for operators of

MS4s (61 FR 41698, August 9, 1996) that allows municipalities to use recommended changes submitted in their fourth year annual report required under § 122.42(c)(2), as the principal component of their reapplication package. It also encourages changes to monitoring programs to make them appropriate and useful to stormwater management decisions. With the policy, EPA seeks to improve municipal stormwater management efforts by allowing municipalities to target their resources for the greatest environmental benefit.

4.3.11 Stormwater Discharges from Small MS4s

The application requirements for small MS4s are addressed in § 122.33. Most states have issued general permits for small MS4s; however, regulated small MS4s may seek authorization to discharge under an individual permit. The application requirements are different depending on whether the MS4 will implement a program under § 122.34 (i.e., a program that follows EPA's six minimum control measures) or a program that varies from § 122.34. EPA anticipates that most MS4s will follow the § 122.34 requirements.

Regulated small MS4s seeking an individual permit and wishing to implement a program under § 122.34 (the six minimum control measures) must submit an application to their NPDES permitting authority that includes the following:

- The information required under §§ 122.21(f) and 122.34(d).
- An estimate of square mileage served by the small MS4.
- Any additional information that the NPDES permitting authority requests.

A storm sewer map that satisfies the requirement of § 122.34(b)(3)(i) will also satisfy the map requirement in § 122.21(f)(7).

Regulated small MS4s seeking an individual permit and wishing to implement a program that is different from the program under § 122.34 must comply with the permit application requirements of § 122.26(d) (for additional information, see section 4.3.10 above). Under § 122.33, the regulated small MS4 is required to submit both parts of the application requirements in §§ 122.26(d)(1) and (2) by March 10, 2003. Small MS4s are not required to submit the information required by §§ 122.26(d)(1)(ii) and (d)(2) regarding their legal authority, unless they intend for the permit writer to take such information into account when developing their other permit conditions. Regulated small MS4s may jointly apply with another regulated entity consistent with the same requirements.

Additionally, another regulated entity may seek a modification of an existing MS4 permit to include a regulated small MS4 as a co-permittee. In such a case, the regulated small MS4 must apply consistent with § 122.26 rather than § 122.34. Application requirements of §§ 122.26(d)(1)(iii) and (iv) and (d)(2)(iii) do not apply and compliance with §§ 122.26(d)(1)(v) and (d)(2)(iv) can be met by referring to the other MS4's stormwater management program.

4.3.12 Cooling Water Intake Structures

Phase I of the CWA section 316(b) rule was finalized on December 18, 2001, in 66 FR 65256. The Phase I Rule (Part 125, Subpart I) implements CWA section 316(b) for most new facilities. The rule applies to new facilities that use cooling water intake structures to withdraw water from waters of the United States and that have or require an NPDES permit. This rule includes new facilities that have a design intake flow of greater than 2 mgd and that use at least 25 percent of water withdrawn for cooling purposes. For other

new facilities that have or require an NPDES permit but do not meet the 2-mgd intake flow threshold or use less than 25 percent of their water for cooling water purposes, the permit authority must implement CWA section 316(b) on a case-by-case basis, using best professional judgment (BPJ) (§§ 125.90(b) and 401.14).

Phase II of the CWA section 316(b) rule was finalized on July 9, 2004, in 69 FR 41576. In 2007 EPA suspended the rule following remand of a number of its provisions by the U.S. Court of Appeals for the Second Circuit. CWA section 316(b) requirements for such facilities must be developed on a case-by-case basis.

Phase III of the CWA section 316(b) rule was finalized on June 16, 2006, in 71 FR 35006. The Phase III rule (Part 125, Subpart N) implements CWA section 316(b) for new offshore oil and gas extraction facilities that use cooling water intake structures to withdraw water from waters of the United States and that have or require an NPDES permit. The rule includes facilities with a design intake flow of greater than 2 mgd and that use at least 25 percent of water withdrawn for cooling purposes.

EPA has not established national standards for existing Phase III facilities and is reevaluating its decisions in both Phase II and Phase III because of court remands. In the interim, for Phase III facilities not regulated under national categorical standards, the permitting authority must implement CWA section 316(b) on a case-by-case basis, using BPJ (§§ 125.90(b) and 401.14). For the most current information on regulatory requirements, see the Cooling Water Intake Structure Program Website <www.epa.gov/waterscience/316b/>.

4.4 Requirements for NPDES General Permits

As previously discussed in section 3.1.2 of this manual, general permits (§ 122.28) are permits developed for a specific category of dischargers within a specified geographic or political boundary. Using a general permit could simplify the permitting process for both EPA and the discharger. Owners/operators may seek coverage under a general permit only if one has been issued that is applicable to the type of facility for which coverage is sought and the permit covers the facility's activities. In addition, the permitting authority may determine that a general permit is not appropriate for a facility seeking coverage under the general permit and can require the facility to apply for an individual permit. Furthermore, a facility that otherwise qualifies for a general permit may opt to apply for an individual permit.

In most cases, a facility or activity seeking coverage under a general permit must seek coverage by submitting an NOI. The information that must be provided by the facility or activity in the NOI is specified in the general permit and must include, at a minimum, the following:

- Legal name and address of the owner or operator.
- Name and address of the facility.
- Type of facility or discharges.
- The receiving stream(s).

EPA has developed the Electronic NOI (eNOI) for construction sites and industrial facilities that need to apply for coverage under EPA's Construction General Permit (CGP) or Multi-Sector General Permit (MSGP), respectively. EPA's Electronic Stormwater Notice of Intent (eNOI) Website <www.epa.gov/npdes/stormwater/enoi> presents additional information about eNOI.

4.5 Application Review

The contents of individual NPDES permits are based, in part, on the information included in the application. Thus, the application must be complete and accurate before a permit writer can properly develop a permit. Exhibit 4-4 depicts the general process for reviewing a permit application, based on a chart provided in the *Washington Department of Ecology's Permit Writers' Manual*[2].

Exhibit 4-4 Permit application review process

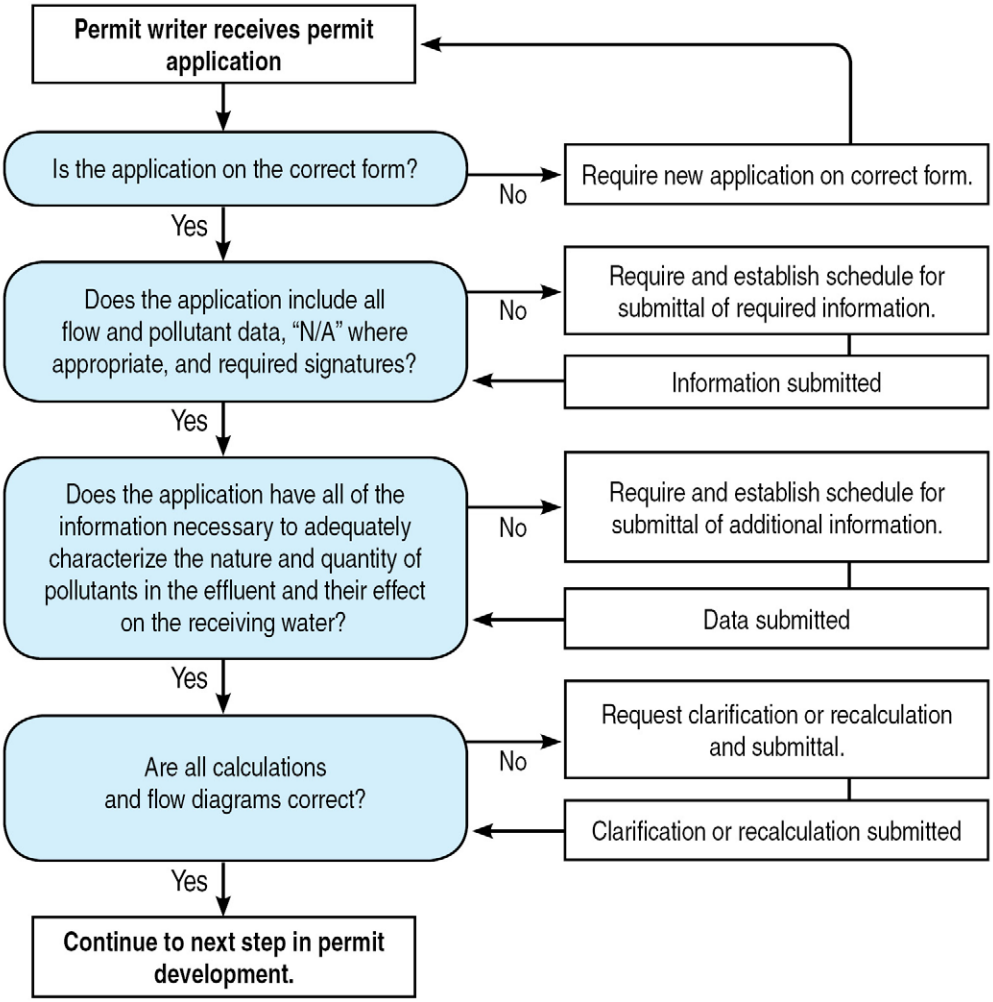

After the initial application review, the permit writer may request that an applicant submit other information needed to decide whether to issue a permit and for permit development. The requested information could include the following:

- Additional information, quantitative data, or recalculated data.
- Submission of a new form (if an inappropriate form was used).
- Resubmission of the application (if incomplete or outdated information was initially submitted).

In some situations, a considerable amount of correspondence might be required before the permit writer obtains all the information that he or she believes is necessary to draft the permit.

4.5.1 The Complete Application

The regulations at § 122.21(e) state that the Director, "[must] not issue a permit before receiving a complete application..." At a minimum, the application form must have all applicable spaces filled in. Instructions for the application form state that all items must be completed and that applicants use the statement *not applicable* (N/A) to indicate that the item had been considered. Blanks on a form can occur for a number of reasons, such as the following:

- The response was inadvertently omitted.
- The applicant had difficulty determining the correct response and rather than provide misleading or incorrect information, left the space blank.
- The applicant was unwilling to provide the response.

A permit writer must obtain a response to the blank items by contacting the facility in writing or, in some cases, by telephone. Only minor changes should be handled by telephone and even minor items should be documented in writing in the permit file. Under no circumstances should a permit writer edit or modify the application, which is a legal document that has been signed and certified by the applicant. The original application, any subsequent clarifications, and any supplemental information provided by the applicant should be clearly identified in the file. The information will become part of the administrative record (§ 124.9) for the permit (see section 11.2.1 of this manual), which is critical if any legal challenges regarding permit decisions arise. If the changes or corrections to any application are extensive, the permit writer may require the permit applicant to submit a new application.

The permit writer may also require supplementary information, such as more detailed production information or maintenance and operating data for a treatment system, to process the permit. According to § 122.21(e), an application is considered complete when the permitting authority is satisfied that all required information has been submitted. Supplementary information also can be obtained later when the permit writer is actually drafting the permit. The applicant may submit additional information voluntarily or be required to do so under CWA section 308 or under a similar provision of state law.

4.5.2 Common Omissions in Applications

This section identifies some of the most common omissions and errors found in NPDES permit applications and provides examples of ways to identify missing information and verify the accuracy of certain data.

One of the most commonly omitted items from NPDES permit applications is a topographic map of the area around the discharge, which is required as an attachment to Form 1, Form 2A, and Form 2S. Other industry- or municipality-specific information is also often omitted. For example, industrial applicants sometimes fail to submit a line drawing of the water flow through the facility required by Part II-A of Form 2C. The line drawing is important for ensuring that the location and description of the outfalls and the description of processes (Parts I and II-B of Form 2C) provided by the applicant are accurate.

Sometimes applicants do not properly submit the effluent data necessary to characterize the facility. Below are some required data elements that are commonly omitted from permit applications:

- Valid whole effluent toxicity (WET) testing data, required from POTWs with design flows greater than 1 mgd or those with a pretreatment program. This requirement may be satisfied if the

expiring permit contains a requirement for effluent characterization of WET. The permit writer should note the use of this option on the fact sheet.

- Biosolids (sewage sludge) monitoring data; a description of biosolids use and disposal procedures; annual biosolids production volumes; and information on the suitability of the site and a description of the site management for land application sites from POTWs and other TWTDS. A land application plan is required for any sites not identified in the application.
- Expected toxics and other pollutants. Non-municipal dischargers categorized as *primary industries* have some mandatory testing requirements for toxic pollutants (see § 122.21, Appendix D, Table I and Table II and also listed in Application Form 2C).
- Production rates and flow data from industrial facilities that are subject to production- or flow-based effluent guidelines. Applicants must use units of measure corresponding to applicable effluent guidelines to allow calculation of effluent limitations.
- Appropriate sample types for all required pollutants and parameters being analyzed (Part 136) (see sections 8.1.4 and 8.3 of this manual for more information). For example, only grab samples or continuous monitoring may be used for pH, total residual chlorine, and temperature, and only grab samples may be used for total phenols and volatile organics.

Exhibit 4-5 presents three examples of the types of questions that the permit writer should consider to determine whether an application is complete.

Exhibit 4-5 Considerations for an application to be complete

Example 1:

A plastics processor submits Form 1 and Form 2C but fails to indicate *testing required* for any gas chromatograph/mass spectrometer (GC/MS) fractions in section V.C. of Form 2C and does not provide any data for these pollutants.

Question:
Did the applicant provide all the required data for the toxic organic pollutants in Form 2C?

Answer:
No. The plastics processor is required to indicate *testing required* (in the check box) and provide data from at least one sample for each pollutant in the volatile GC/MS fraction (Table 2C-2 in the application form instructions and § 122.21(g)(7)(v)(A) of the NPDES regulations).

Example 2:

A soap and detergent manufacturing facility in the liquid detergents subcategory submits Form 1 and Form 2C but marks thallium and beryllium as *believed absent* in section V.C. of Form 2C and did not provide any data for these pollutants.

Question:
Is it appropriate for this applicant to mark *believed absent* in this section of Form 2C?

Answer:
No. Although an applicant that manufactures liquid detergents is not expected to discharge thallium and beryllium, page 2C-3 of the application form instructions and § 122.21(g)(7)(v)(B) require testing for all listed metals by all applicants in a primary industry category, such as soap and detergent manufacturers. The indication of *believed absent* is incorrect. The applicant should have indicated *testing required* and provided the results of at least one sample per pollutant. Occasionally, unexpected contaminants could be present in a wastestream.

Exhibit 4-5 Considerations for an application to be complete (continued)

Example 3:
An integrated slaughterhouse and meat processing facility submits Form 1 and Form 2C and indicates that zinc is *believed absent* from its wastewater.

Question:
Is *believed absent* a proper indication for zinc for this wastewater?

Answer:
Possibly. After consulting the effluent guidelines development documents for the Meat and Poultry Products Point Source Category, the permit writer determines that metals, including zinc, are often used as feed additives and in sanitation products and might be present in the effluent, even though there are no effluent limitations specified for zinc in the applicable effluent guideline. The permit writer should contact the applicant and clarify whether zinc would be expected to be present in the discharge.

The comprehensive testing requirements that apply to the various categories of industry are designed to determine whether any contaminants (some expected, some unexpected) are present in significant quantities and to determine levels of pollutants that are known to be present. Exhibit 4-6 presents an example of how a permit writer makes the determination of pollutant data required in the application.

Exhibit 4-6 Example of required testing during application review

Consider the plastics processor and the liquid detergents manufacturer mentioned above, and answer the following questions:

Question:
What pollutant data are needed to characterize the industries above?

- For which toxic organic pollutants are they required to test?
- For which heavy metals are they required to test?
- Which metals would you expect to find in their wastewaters regardless of whether testing is required?

Answer:
The application form in Table 2C-2 and § 122.21(g)(7)(ii)(A) of the NPDES regulations require testing of the volatile GC/MS fraction by the plastics processor and the volatile, acid, and base/neutral fractions by the liquid detergent manufacturer. Page 2C-3 of the application instructions and § 122.21(g)(7)(ii)(B) require testing of all the metals listed in item V, Part C1 of the application form as well as cyanide and total phenols by both of these primary industry facilities. For information on which, if any, metals might be expected in wastewater discharged by these applicants, see the effluent guidelines development documents.

4.5.3 The Accurate Application

All information submitted on a permit application must be accurate. Although it might be difficult to detect certain inaccuracies, a number of common mistakes can be readily detected. When mistakes are detected, they must be corrected. Generally, any correction or edit to the application should be obtained from the applicant in writing and will become a part of the administrative record for the permit.

In most cases, errors in the application will be inadvertent because of the length and complexity of the form. Note, however, that the application certification statement indicates, "…that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." If the permit writer believes that falsification has occurred, he or she should refer the findings to the agency's enforcement staff.

Some of the most common mistakes on permit applications include failing to provide the correct long-term average and daily maximum values, reporting quantified values below known detection limits, and using misplaced decimal points or incorrect concentration units. Exhibit 4-7 presents three examples of the types of questions that the permit writer should consider while reviewing the permit application for accuracy. Additional guidance from EPA might be available to assist permit writers in reviewing applications for some of these common errors. For example, an August 23, 2007, memorandum *Analytical Methods for Mercury in National Pollutant Discharge Elimination System (NPDES) Permits*[3] <www.epa.gov/npdes/pubs/mercurymemo_analyticalmethods.pdf> describes when a method for mercury is sufficiently sensitive for purposes of permit applications and monitoring under a permit. In the memorandum, EPA strongly recommends that a permitting authority determine that a permit application that lacks effluent data analyzed with a sufficiently sensitive EPA-approved method (such as Method 1631E) is incomplete unless and until the facility supplements the original application with data analyzed with such a method.

4.6 Facility Information Review

In addition to the submitted application form, the permit writer should assemble other information that could be used to develop permit limitations and conditions.

4.6.1 Permit File Review

Before developing the draft permit and fact sheet, the permit writer should assemble and review any additional background information on the facility. If the permit writer is reissuing an existing permit, much of the information should be available in the permit file. Such information would typically include

- The current permit.
- The fact sheet or statement of basis for the current permit.
- Discharge monitoring reports (DMRs).
- Compliance inspection reports.
- Engineering reports.
- Correspondence or information on changes in plant conditions, problems, and compliance issues.

Much of this information, particularly DMR data, is stored in automated data tracking systems such as

- Permit Compliance System (PCS) or state databases.
- Integrated Compliance Information System (ICIS)-NPDES <https://icis.epa.gov>.
- Online Tracking Information System (OTIS) <www.epa.gov/idea/otis/>.
- Envirofacts Warehouse <www.epa.gov/enviro/>.

The permit writer can check with other permit writers who have permitted similar types of facilities to see if there are any special considerations related to the type of facility to be permitted. A permit writer might also wish to discuss compliance issues, changes, or history of complaints with compliance personnel who conducted previous inspections of the facility or with permit writers for other media (e.g., air, solid waste). Examples of some other sources of information that the permit writer could use for permit development include the following:

- Receiving water quality data from databases such as the EPA STOrage and RETrieval database (STORET) <www.epa.gov/STORET/>.

Exhibit 4-7 Considerations for an application to be accurate

Example 1:

An industrial applicant provides a daily maximum effluent flow value of 50,000 gpd in its permit application Form 2C. However, a review of historical water usage records and an old permit application indicate estimated wastewater flows ranged from 100,000 to 150,000 gpd. The applicant had not instituted any water use reduction measures, significantly changed its process operations, or decreased its number of employees.

Question:
Are reported values consistent with historical information?

Answer:
No. An inspection of the facility revealed two separate water meters (one for sanitary and one for process water); the applicant had overlooked the sanitary meter. Further, the process water meter was found to be defective. Subsequent flow monitoring of the actual total wastestream recorded a flow of 125,000 gpd. A new water meter was installed, and concurrent wastestream flow monitoring and water meter readings resulted in the following water balances:

- **Water In** (based on both water meter readings):
  148,000 gpd (131,000 gpd process line and 17,000 gpd sanitary line).
- **Water Out** (based on effluent flow monitoring):
  125,000 gpd total treated effluent discharged to the receiving water.
  Evaporative and consumption losses were estimated at 23,000 gpd (15% of total water usage).

The permit writer should require the applicant to submit a signed and certified letter with the revised flow estimates and a new water balance diagram or submit a revised application.

Example 2:

An applicant reported its maximum daily flow as 1.2 mgd, the maximum daily suspended solids concentration as 23 milligrams per liter (mg/L), and the maximum daily mass discharge as 690 pounds per day (lbs/day).

Question:
Do the concentration, mass, and flow values correspond?

Discussion:
No. Even in the unlikely event that the maximum daily flow and the maximum daily concentration occurred on the same day, the mass discharged would be well below the reported value of 690 lbs/day. Using the calculation below, the mass discharge that corresponds to the solids concentration (23 mg/L) and flow (1.2 mgd) would be 230 lbs/day:

$$23 \text{ mg/L} \times 1.2 \text{ mgd} \times \underbrace{8.34 \text{ (lbs)(L)/(mg)(millions of gallons)}}_{\text{(conversion factor)}} = 230 \text{ lbs/day}$$

Because the applicant reported a maximum mass discharge of 690 lbs/day, a significant discrepancy is indicated. The permit writer should contact the applicant to resolve the discrepancy. The applicant should submit a signed and certified letter clarifying the correct maximum daily mass discharge of suspended solids or submit a revised application.

Example 3:

The results submitted in the application for total cyanide are all reported as < 1,000 micrograms per liter (µg/L). When asked, the applicant indicated that total cyanide was analyzed using EPA Method 335.3 (Color, Auto).

Question:
Do concentration values correspond with published method detection limits for the method used?

Answer:
No. EPA Method 335.3 for total cyanide has a published method detection limit (MDL) of 5 µg/L. The applicant should be able to quantify results for total cyanide at values well below 1,000 µg/L using this method. The applicant has most likely used Standard Method 4500-CN (titrimetric) for total cyanide, rather than the testing procedure indicated. If total cyanide is expected to be present in the discharge and would be of concern at effluent concentrations below 1,000 µg/L, the permit writer should require the applicant to retest for total cyanide using the more sensitive method and to submit the results in a signed, certified letter.

- Supporting documentation collected by EPA for effluent guidelines and categorical pretreatment standards for a variety of industrial categories.
- Reference textbooks and technical documents that provide information about manufacturing processes and wastestreams for specific industry categories, which are available from libraries such as
  - National Technical Information Service (NTIS) <www.ntis.gov>.
  - EPA libraries <www.epa.gov/natlibra/libraries.htm>.
  - Office of Water Resource Center (OWRC) <www.epa.gov/safewater/resource/>.
  - National Service Center for Environmental Publications (NSCEP) <www.epa.gov/ncepihom/>.
- Related environmental permits that could provide site-specific background information about the types of pollutants and wastestreams at a facility, including, for example
  - RCRA permits, which regulate the management of hazardous waste by owners and operators of treatment, storage, and disposal facilities.
  - Clean Air Act permits, which regulate the discharge of atmospheric pollutants.
- EPA's *Treatability Manual*[4], which is a five-volume guidance manual that provides detailed descriptions of industrial processes, potential pollutants from each process, appropriate treatment technologies, and cost estimating procedures.
- The Toxic Release Inventory (TRI) <www.epa.gov/tri/>, which is accessible on EPA's mainframe and through a public online service. The TRI contains information on more than 300 listed toxic chemicals released by specific facilities, including chemical identification, quantity of chemicals released to various environmental media, off-site waste transfer, and waste treatment and minimization information.

If the permit writer must address special conditions in a permit for a municipal discharger to develop or implement a pretreatment program or to address discharges other than the wastewater treatment plant discharge, he or she should obtain the information needed to develop these special conditions. For example, the permit writer might need information on pretreatment program implementation, combined sewer overflows (CSOs), sanitary sewer overflows (SSOs), sewage sludge use or disposal, or stormwater discharges relevant to the facility. Such information is in

- Annual pretreatment reports, pretreatment compliance inspections and audits.
- CSO reports.
- Bypass notifications or SSO reports.
- Stormwater discharge applications or NOIs for a general permit.

4.6.2 Facility Site Visits

Facility site visits are an invaluable way to update information on manufacturing processes; obtain information about the facility's operations, equipment or management; and verify application information. A site visit also acquaints the permit writer with the people who will be operating under the permit and participating in the permit development process.

Site visits can also allow the permit writer to gain a better understanding of more complex facilities. Site visits are especially warranted if significant pollution control or treatment improvements will be required, if there have been frequent problems in complying with the existing permit, if there are known problems

with spills or leaks or with contaminated surface runoff, or if there are other unique on-site activities that could affect the characteristics of the discharge from the facility.

The site visit should include a detailed review of production processes to evaluate the types of toxic or hazardous substances that might be present in raw materials, products, and by-products. The permit writer should review the water uses, the resulting wastewater streams, and any in-process pollution controls. This review is needed to assist in selecting toxic and other pollutants to be limited and in evaluating possible in-process control improvements.

In addition, the site visit should include a review of the performance and operation and maintenance practices of wastewater treatment facilities. The review is useful in evaluating the adequacy of existing treatment performance and assessing the feasibility of improvements in performance. The permit writer should examine effluent monitoring points, sampling methods, and analytical techniques to identify any needed changes to monitoring requirements and to evaluate the quality of DMR data.

Raw material and product storage and loading areas, sludge storage and disposal areas, hazardous waste management facilities, including on-site disposal areas, and all process areas should be observed to determine the need for controls on surface runoff and specific BMPs. Information from other environmental programs (e.g., CERCLA or RCRA) might be important in this regard.

While on-site, the permit writer should note any housekeeping problems or the need for spill prevention actions, which are not usually detectable from permit applications. If allowed, photographs of problem areas should be taken for future use during permit preparation. If necessary, the permit writer should meet with management to ask questions or clarify information provided on the permit application. If any inaccuracies in the application were found because of the site visit, that is the time for the permit writer to request corrected information.

The time required to conduct a site visit will vary according to the complexity of the facility. For facilities with only a few basic processes, one main waste treatment system, limited in-process controls, few surface runoff outfalls, and limited on-site management of sludge or hazardous wastes, an adequate site visit can most likely be completed in one day. Visits to complex, larger plants with several treatment systems, numerous outfalls, and extensive ancillary activities may require several days.

Time spent on site visits often results in time savings during permit preparation. However, time and travel resources might not be adequate to allow visits to all facilities to be permitted. In such cases, the permit writer might be able to obtain much of the desired information from facility compliance inspections and should try to coordinate the timing of compliance inspections with the timing of permit development.

Aerial photographs may provide much of the needed information on the potential for contamination of surface runoff and on ancillary activities without a site visit or inspection. In addition, comparing aerial photographs with site and process diagrams provided with the application can provide the permit writer with a complete visual description of the facility. Aerial photographs are available from a variety of sources, including the U.S. Geological Survey Earth Resources Observation and Science Center <eros.usgs.gov/#/Find_Data>; TerraServer <www.terraserver.com>; Google Earth <earth.google.com>; and other private contractors.

4.7 Confidential Information

In accordance with Part 2, information submitted to EPA pursuant to the NPDES permitting regulations under Part 122 may be claimed as confidential; however, EPA has determined that the following information will not be held confidential (§ 122.7):

- Name and address of the applicant.
- Permit applications and information submitted with applications.
- Permits.
- Effluent data.

Information that may be claimed as confidential includes material related to manufacturing processes unique to the applicant, or information that might adversely affect the competitive position of the applicant if released to the public. Under such circumstances, the permit writer will be required to treat the information as confidential in accordance with the requirements in Part 2. Any claims of confidentiality must be made at the time of submission or the information will not be considered confidential.

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[1] U.S. Environmental Protection Agency. 1991. *Guidance Manual For the Preparation of NPDES Permit Applications For Stormwater Discharges Associated With Industrial Activity.* EPA-505/8-91-002. U.S. Environmental Protection Agency, Office of Water, Washington DC, <www.epa.gov/npdes/pubs/owm0241.pdf>.

[2] Bailey, Gary. 2008. *Water Quality Program Permit Writer's Manual*. Publication Number 92-109. Washington State Department of Ecology, Water Quality Program, Olympia, WA. <www.ecy.wa.gov/pubs/92109.pdf>

[3] Hanlon, James A. 2007. *Analytical Methods for Mercury in National Pollutant Discharge Elimination System (NPDES) Permits.* U.S. Environmental Protection Agency, Office of Wastewater Management. Memorandum, August 23, 2007. <www.epa.gov/npdes/pubs/mercurymemo_analyticalmethods.pdf>.

[4] U.S. Environmental Protection Agency. 1980. *Treatability Manual: Vol. I. Treatability Data* (EPA-600/8-80-042a) publications available on NEPIS Website <www.epa.gov/nscep/> as document 600880042A*; Vol. II. Industrial Descriptions* (EPA-600/8-80-042b) as document 600880024B*; Vol. III. Technologies* (EPA-600/8-80-042c) as document 600880024C*; Vol. IV. Cost Estimating* (EPA-600/8-80-042d) as document 600880042d; *Vol. V. Summary* (EPA-600/8-80-042e) as document 600880024E. U.S. Environmental Protection Agency, Office of Research and Development, Washington, DC.

CHAPTER 5. Technology-Based Effluent Limitations

One of the major strategies of the Clean Water Act (CWA) in making "reasonable further progress toward the national goal of eliminating the discharge of all pollutants" is to require effluent limitations based on the capabilities of the technologies available to control those discharges. Technology-based effluent limitations (TBELs) aim to prevent pollution by requiring a minimum level of effluent quality that is attainable using demonstrated technologies for reducing discharges of pollutants or pollution into the waters of the United States. TBELs are developed independently of the potential impact of a discharge on the receiving water, which is addressed through water quality standards and water quality-based effluent limitations (WQBELs). The NPDES regulations at Title 40 of the *Code of Federal Regulations* (CFR) 125.3(a) require NPDES permit writers to develop technology-based treatment requirements, consistent with CWA section 301(b), that represent the minimum level of control that must be imposed in a permit. The regulation also indicates that permit writers must include in permits additional or more stringent effluent limitations and conditions, including those necessary to protect water quality. As described in Chapter 7 of this manual, the permit writer might also need to apply anti-backsliding requirements to determine the final effluent limitations for the NPDES permit.

This chapter discusses development of TBELs for publicly owned treatment works (POTWs) and industrial (non-POTW) dischargers. Chapter 6 discusses development of WQBELs. Exhibit 5-1 illustrates the relationship between TBELs and WQBELs in an NPDES permit and the determination of final effluent limitations.

Exhibit 5-1 Developing effluent limitations

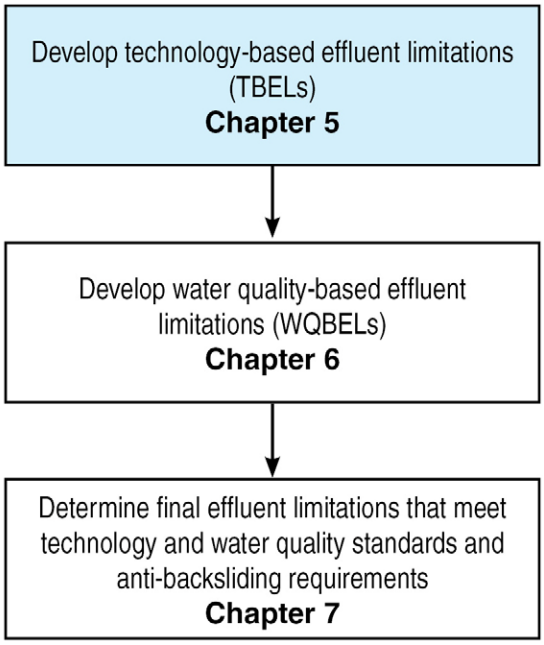

5.1 Technology-based Effluent Limitations for POTWs

The largest category of dischargers requiring individual NPDES permits is POTWs. The federal regulations at § 403.3(q) define a POTW as a treatment works (as defined in CWA section 212) that is owned by a state or municipality [as defined in CWA section 502(4)]. Under § 403.3(q), that definition includes "any devices and systems used in the storage, treatment, recycling and reclamation of municipal sewage or industrial wastes of a liquid nature." The definition also includes "sewers, pipes, and other conveyances only if they convey wastewater to a POTW Treatment Plant," as defined in § 403.3(r). Under § 403.3(q), the term POTW "also means the municipality as defined in section 502(4) of the Act, which has jurisdiction over the Indirect Discharges to and the discharges from such a treatment works."

CWA section 304(d) required the U.S. Environmental Protection Agency (EPA) to publish information on the degree of effluent reduction attainable through the application of secondary treatment. Under CWA section 301(b)(1)(B), in general, POTWs in existence on July 1, 1977, were required to meet discharge limitations based on secondary treatment (or any more stringent limitations established under state law, including those necessary to meet state water quality standards). On the basis of those statutory provisions, EPA developed secondary treatment regulations, which are specified in Part 133. Later amendments to CWA section 304(d) called for EPA to develop alternative standards for certain types of POTWs. Those standards are referred to as "equivalent to secondary treatment" standards.

5.1.1 Secondary and Equivalent to Secondary Treatment Standards

Several regulations implement the statutory requirements for developing standards and discharge limitations based on secondary treatment. EPA has promulgated regulations in Part 133 establishing secondary treatment standards, equivalent to secondary treatment standards, and a number of special considerations applied on a case-by-case basis. In addition, § 122.44(a)(1) requires that NPDES permits include applicable technology-based limitations and standards, while regulations at § 125.3(a)(1) state that TBELs for POTWs must be based on secondary treatment standards (which includes the "equivalent to secondary treatment standards") specified in Part 133.

5.1.1.1 Secondary Treatment Standards

In Part 133, EPA published secondary treatment standards based on an evaluation of performance data for POTWs practicing a combination of physical and biological treatment to remove biodegradable organics and suspended solids. The regulation applies to all POTWs and identifies the technology-based performance standards achievable based on secondary treatment for 5-day biochemical oxygen demand (BOD_5), total suspended solids (TSS), and pH. Exhibit 5-2 summarizes the standards.

Exhibit 5-2 Secondary treatment standards

Parameter	30-day average	7-day average
BOD_5	30 mg/L (or 25 mg/L $CBOD_5$)	45 mg/L (or 40 mg/L $CBOD_5$)
TSS	30 mg/L	45 mg/L
BOD_5 and TSS removal (concentration)	not less than 85%	--
pH	within the limits of 6.0–9.0*	

* unless the POTW demonstrates that: (1) inorganic chemicals are not added to the waste stream as part of the treatment process; and (2) contributions from industrial sources do not cause the pH of the effluent to be less than 6.0 or greater than 9.0

mg/L = milligrams per liter

The regulation also includes an alternate set of standards that apply to certain facilities employing waste stabilization ponds or trickling filters as the principal process. Those standards are called equivalent to secondary treatment standards.

5.1.1.2 Equivalent to Secondary Treatment

Some biological treatment technologies, such as trickling filters or waste stabilization ponds, are capable of achieving significant reductions in BOD_5 and TSS but might not consistently achieve the secondary treatment standards for these parameters. Congress recognized that unless alternate limitations were set for facilities with trickling filters or waste stabilization ponds, which often are in small communities, such facilities could be required to construct costly new treatment systems to meet the secondary treatment standards even though their existing treatment technologies could achieve significant biological treatment. To prevent requiring upgrades where facilities were achieving their original design performance levels, Congress included provisions in the 1981 amendments to the Clean Water Act Construction Grants program (*Public Law 97-117, Section 23*) that required EPA to make allowances for alternative biological treatment technologies, such as a trickling filters or waste stabilization ponds. In response to that requirement, in 1984, EPA promulgated regulations at § 133.105 that include alternative standards that apply to facilities using "equivalent to secondary treatment." A facility must meet the criteria in § 133.101(g) to qualify for application of those alternative standards.

Equivalent to Secondary Standards

The equivalent to secondary treatment standards, as specified in § 133.105, are shown in Exhibit 5-3.

Exhibit 5-3 Equivalent to secondary treatment standards

Parameter	30-day average	7-day average
BOD_5	not to exceed 45 mg/L (or not to exceed 40 mg/L $CBOD_5$)	not to exceed 65 mg/L (or not to exceed 60 mg/L $CBOD_5$)
TSS	not to exceed 45 mg/L	not to exceed 65 mg/L
BOD_5 and TSS removal (concentration)	not less than 65%	--
pH	within the limits of 6.0–9.0*	

* unless the POTW demonstrates that: (1) inorganic chemicals are not added to the waste stream as part of the treatment process; and (2) contributions from industrial sources do not cause the pH of the effluent to be less than 6.0 or greater than 9.0

Criteria to Qualify for Equivalent to Secondary Standards

To be eligible for discharge limitations based on equivalent to secondary standards, a POTW must meet all three of the following criteria:

Criterion #1—Consistently Exceeds Secondary Treatment Standards: The first criterion that must be satisfied to qualify for the equivalent to secondary standards is demonstrating that the BOD_5 and TSS effluent concentrations consistently achievable through proper operation and maintenance of the treatment works exceed the secondary treatment standards set forth in §§ 133.102(a) and (b). The regulations at § 133.101(f) define "effluent concentrations consistently achievable through proper operation and maintenance" as

- (f)(1): For a given pollutant parameter, the 95th percentile value for the 30-day average effluent quality achieved by a treatment works in a period of at least 2 years, excluding values attributable to upsets, bypasses, operational errors, or other unusual conditions.
- (f)(2): A 7-day average value equal to 1.5 times the value derived under paragraph (f)(1).

Some facilities might meet this criterion only for the BOD_5 limitations or only for the TSS limitations. EPA believes that it is acceptable for the permit writer to adjust the limitations for only one parameter (BOD_5 or TSS) if the effluent concentration of only one of the parameters is demonstrated to consistently exceed the secondary treatment standards.

Criterion #2—Principal Treatment Process: The second criterion that a facility must meet to be eligible for equivalent to secondary standards is that its principal treatment process must be a trickling filter or waste stabilization pond (i.e., the largest percentage of BOD and TSS removal is from a trickling filter or waste stabilization pond system).

Criterion #3—Provides Significant Biological Treatment: The third criterion for applying equivalent to secondary standards is that the treatment works provides significant biological treatment of municipal wastewater. The regulations at § 133.101(k) define *significant biological treatment* as using an aerobic or anaerobic biological treatment process in a treatment works to consistently achieve a 30-day average of at least 65 percent removal of BOD_5.

A permit writer should consider each facility on a case-by-case basis to determine whether it meets those three criteria. To apply the criteria, the permit writer should assemble enough influent, effluent, and flow data from the facility to adequately characterize the facility's performance or require the discharger to provide an appropriate analysis. If the facility has made substantial changes in its operations or treatment processes during the current permit term, the permit writer, using his or her best professional judgment (BPJ), may elect to use data for a period that is representative of the discharge at the time the permit is being drafted. Facilities that do not meet all three criteria do not qualify as equivalent to secondary treatment facilities. For such facilities, the secondary treatment standards apply. EPA noted in its December 1985 *Draft Guidance for NPDES Permits and Compliance Personnel—Secondary Treatment Redefinition*[1] that a treatment works operating beyond its design hydraulic or organic loading limit is not eligible for application of equivalent to secondary standards. If overloading or structural failure is causing poor performance, the solution to the problem is construction, not effluent limitations adjustment.

5.1.2 Adjustments to Equivalent to Secondary Standards

In addition to providing secondary treatment standards and equivalent to secondary treatment standards, the federal regulations allow states to make adjustments to the standards and to apply those adjusted standards on a case-by-case basis.

5.1.2.1 Adjusted TSS Requirements for Waste Stabilization Ponds

In accordance with regulations adopted by EPA in 1977 and revised in 1984, states can adjust the maximum allowable TSS concentration for waste stabilization ponds upward from those specified in the equivalent to secondary treatment standards to conform to TSS concentrations achievable with waste stabilization ponds. The regulation, found at § 133.103(c), defines "SS concentrations achievable with waste stabilization ponds" as the effluent concentration achieved 90 percent of the time within a state or

appropriate contiguous geographical area by waste stabilization ponds that are achieving the levels of effluent quality for BOD_5 specified in § 133.105(a)(1) (45 milligrams per liter [mg/L] as a 30-day average). To qualify for an adjustment up to as high as the maximum concentration allowed, a facility must use a waste stabilization pond as its principal process for secondary treatment and its operations and maintenance data must indicate that it cannot achieve the equivalent to secondary standards. EPA has published approved alternate TSS requirements in 49 *Federal Register* (FR) 37005, September 20, 1984. Exhibit 5-4 is a summary from the FR notice of the adjusted TSS requirements for each state.

Exhibit 5-4 State-specific adjusted TSS requirements*

Location	Alternate TSS limitation (30-day average) (mg/L)	Location	Alternate TSS limitation (30-day average) (mg/L)
Alabama	90	Nebraska	80
Alaska	70	North Carolina	90
Arizona	90	North Dakota	
Arkansas	90	• North and east of Missouri R.	60
California	95	• South and west of Missouri R.	100
Colorado		Nevada	90
• Aerated ponds	75	New Hampshire	45
• All others	105	New Jersey	None
Connecticut	None	New Mexico	90
Delaware	None	New York	70
District of Columbia	None	Ohio	65
Florida	None	Oklahoma	90
Georgia	90	Oregon	
Guam	None	• East of Cascade Mountains	85
Hawaii	None	• West of Cascade Mountains	50
Idaho	None	Pennsylvania	None
Illinois	37	Puerto Rico	None
Indiana	70	Rhode Island	45
Iowa		South Carolina	90
• Controlled discharge, 3 cell	Case-by-case but not greater than 80	South Dakota	120
• All others	80	Tennessee	100
Kansas	80	Texas	90
Kentucky	None	Utah	None
Louisiana	90	Vermont	55
Maine	45	Virginia	
Maryland	90	• East of Blue Ridge Mountains	60
Massachusetts	None	• West of Blue Ridge Mountains	78
Michigan: Controlled seasonal discharge		• East slope counties: Loudoun, Fauquier, Rappahannock, Madison, Green, Albemarle, Nelson, Amherst, Bedford, Franklin, Patrick.	Case-by-case application of 60/78 limits
• Summer	70	Virgin Islands	None
• Winter	40	Washington	75
Minnesota	40	West Virginia	80
Mississippi	None	Wisconsin	80
Missouri	80	Wyoming	100
Montana	100	Trust Territories and N. Marianas	None

* (49 FR 37005, September 20, 1984)

5.1.2.2 Alternative State Requirements (ASRs)

To further address the potential variations in facility performance arising from geographic, climatic, or seasonal conditions in different states, the revised secondary treatment regulations (adopted in 1984) also included provisions in § 133.105(d) for ASRs. The ASR provisions give states flexibility to modify the maximum allowable concentrations of both BOD_5 and TSS for trickling filter facilities and for BOD_5 for waste stabilization pond facilities. ASRs are set at levels consistently achievable through proper operation and maintenance [§ 133.101(f)] by the median facility in a representative sample of facilities within a state or appropriate continuous geographical area that meet the definition of facilities eligible for treatment equivalent to secondary treatment. Qualifying facilities are eligible to receive limitations up to the concentrations specified by the ASRs.

5.1.3 Applying Secondary Treatment Standards, Equivalent to Secondary Treatment Standards, and Adjusted Standards

Determining whether secondary treatment standards or equivalent to secondary standards apply to a POTW and determining the specific discharge limitations for the facility based on either set of standards and any other special considerations that might apply can be a complex process. Permit writers should remember that compliance with limitations must be measurable and percent removal limitations require influent monitoring (for more on establishing monitoring conditions, see section 8.1 of this manual). This section presents a step-by-step procedure to establishing technology-based effluent limitations for POTWs as shown in Exhibit 5-5.

Exhibit 5-5 Steps to establish technology-based discharge limitations for POTWs

Step 1.	Determine whether secondary treatment standards or equivalent to secondary treatment standards or adjusted standards apply
Step 2.	Calculate effluent limitations based on secondary treatment standards or
Step 3.	Calculate effluent limitations based on equivalent to secondary standards or
Step 4.	Calculate effluent limitations based on adjusted standards
Step 5.	Apply special considerations for further adjustments
Step 6.	Document the application of secondary or equivalent to secondary treatment standards or adjusted standards and all special considerations in the fact sheet

5.1.3.1 Step 1: Determine Whether Secondary Treatment Standards or Equivalent to Secondary Treatment Standards or Adjusted Standards Apply

The first step for permit writers to develop TBELs for municipal dischargers is to determine whether secondary treatment standards (discussed in section 5.1.1 above), equivalent to secondary standards (discussed in section 5.1.1.2 above), or some adjustments to the equivalent to secondary standards (discussed in section 5.1.2 above) apply to the POTW.

An important consideration for permitting authorities is how to treat new POTW discharges that use a waste stabilization pond or trickling filter, or a combination of the two. New facilities or new discharges from trickling filters or waste stabilization ponds often are capable of achieving secondary treatment standards. In the preamble to the secondary treatment regulation (49 FR 37002, September 20, 1984) and in § 133.105(f)(2), EPA noted that when developing permits for new trickling filter and waste

stabilization pond facilities, permitting authorities should consider the ultimate design capability of the treatment process, geographical and climatic conditions, and the performance capabilities of recently constructed facilities in similar situations.

After determining whether secondary treatment standards or equivalent to secondary treatment standards apply to a facility or a discharge, the permit writer applies the appropriate standards to develop effluent limitations. Section 5.1.3.2 below (Step 2) details development of effluent limitations for facilities or discharges where secondary treatment standards apply; section 5.1.3.3 below (Step 3) details development of limitations for facilities that qualify for equivalent to secondary standards; and section 5.1.3.4 below (Step 4) details development of limitations for facilities where adjusted standards apply. It is possible that a facility with multiple biological treatment processes could have limitations based on a combination of the standards (see section 5.1.3.5 below [Step 5]); therefore, those sections are presented as separate steps.

5.1.3.2 Step 2: Calculate Effluent Limitations Based on Secondary Treatment Standards

If the facility being permitted is subject to the secondary treatment standards, the permit writer should complete Step 2. Otherwise, he or she should move to Step 3 in section 5.1.3.3 below.

Applying the secondary treatment standards in NPDES permits is straightforward. Where secondary treatment standards apply, the permit should include effluent limitations in the permit as presented in Exhibit 5-6 below, consistent with the secondary treatment standards and the regulatory requirements in § 122.45(d)(2).

Exhibit 5-6 Effluent limitations calculated from secondary treatment standards

Parameter	Average monthly limitation	Average weekly limitation
BOD_5	30 mg/L (or 25 mg/L $CBOD_5$)	45 mg/L (or 40 mg/L $CBOD_5$)
TSS	30 mg/L	45 mg/L
BOD_5 and TSS removal (concentration)	not less than 85%	N/A
pH	Within the range of 6.0–9.0 standard units at all times (or expressed as instantaneous minimum and maximum limitations)*	

* unless the POTW demonstrates that: (1) inorganic chemicals are not added to the waste stream as part of the treatment process; and (2) contributions from industrial sources do not cause the pH of the effluent to be less than 6.0 or greater than 9.0

Certain provisions in the EPA regulations warrant some clarification.

First, the secondary treatment standards are stated as 30-day and 7-day averages, whereas § 122.45(d)(2) requires that effluent limitations for POTWs be expressed, unless impracticable, as average monthly and average weekly limitations. The NPDES regulations in § 122.2 define average monthly and average weekly limitations on a calendar period basis. Therefore, EPA recommends that permit writers apply the 30-day and 7-day average secondary treatment standards directly as average monthly (calendar month) and average weekly (calendar week) discharge limitations.

Second, § 122.45(f)(1) requires that all permit limitations, standards, or prohibitions be expressed in terms of mass except in any of the following cases:

- For pH, temperature, radiation or other pollutants that cannot appropriately be expressed by mass limitations.

- When applicable standards and limitations are expressed in terms of other units of measure.
- If in establishing permit limitations on a case-by-case basis under § 125.3, limitations expressed in terms of mass are infeasible because the mass of the pollutant discharged cannot be related to a measure of operation, and permit conditions ensure that dilution will not be used as a substitute for treatment.

The first condition applies to pH requirements established by secondary treatment standards. In addition, because the 30-day and 7-day average requirements for BOD_5 and TSS, including percent removal, are expressed in terms of concentration, the second condition applies to the standards. Thus, mass-based discharge limitations are not specifically required to implement secondary treatment standards; however, permit writers can choose to include mass-based limitations in a permit. In general, regulations at § 122.45(b)(1) require using the design flow rate of the POTW to calculate limitations. To calculate a mass-based limitation for a POTW (in pounds per day [lbs/day]) a permit writer would use the equation and follow the example calculations in Exhibit 5-7.

Exhibit 5-7 POTW mass based limitation calculation equation and example calculations

POTW design flow in million gallons per day (mgd)	x	**Concentration-based limitation** in milligrams per liter (mg/L)	x	**Conversion factor** 8.34 with units of (lbs)(L) / (mg)(millions of gallons)

A POTW with a design flow of 2.0 mgd would have mass-based limitations calculated from secondary treatment standards as follows:

Mass-based limitation*	=	**POTW design flow** x **Concentration-based limitation** x **Conversion factor**		
BOD_5				
Average monthly	=	2.0 mgd x 30 mg/L x 8.34 (lbs)(L) / (mg)(millions of gallons)	=	**500 lbs/day**
Average weekly	=	2.0 mgd x 45 mg/L x 8.34 (lbs)(L) / (mg)(millions of gallons)	=	**750 lbs/day**
TSS				
Average monthly	=	2.0 mgd x 30mg/L x 8.34 (lbs)(L) / (mg)(millions of gallons)	=	**500 lbs/day**
Average weekly	=	2.0 mgd x 45mg/L x 8.34 (lbs)(L) / (mg)(millions of gallons)	=	**750 lbs/day**

* calculated to 2 significant figures

5.1.3.3 Step 3: Calculate Effluent Limitations Based on Equivalent to Secondary Standards

If a facility being permitted is subject to the equivalent to secondary standards without any further adjustments by the state (e.g., ASRs), the permit writer should complete Step 3. Otherwise, he or she should move to Step 4 in section 5.1.3.4 below.

For facilities that qualify for equivalent to secondary standards, effluent limitations must meet the requirements specified in § 133.105 and summarized above in Exhibit 5-3 (not accounting for any further approved adjustments). It is important to note that the equivalent to secondary standards specify the maximum allowable discharge concentration of BOD_5 and TSS and a minimum percent removal requirement for qualified facilities. The regulations at § 133.105(f) require a permitting authority to include more stringent limitations when it determines that the 30-day average and 7-day average BOD_5 and TSS concentrations are achievable through proper operation and maintenance of the treatment works

(based on an analysis of the past performance for an existing facility or considering the design capability of the treatment process and geographical and climatic conditions for a new facility) would enable the treatment works to achieve more stringent limitations than the least stringent effluent quality allowed by the equivalent to secondary standards. As noted above, the regulations at § 133.101(f) define, "effluent concentrations consistently achievable through proper operation and maintenance" as the 95th percentile value for the 30-day average effluent quality achieved by a treatment works in a period of at least 2 years, excluding values attributable to upsets, bypasses, operational errors, or other unusual conditions. The 7-day average value is set equal to 1.5 times the 30-day average value.

If an existing facility does not have sufficient data to establish past performance, the permit writer could include the limitations from the previous permit in the new permit and require monitoring to generate the necessary data. In addition, the permit writer could choose to include a provision allowing the permitting authority to reopen and, if necessary, modify the permit after reviewing the additional data collected by the discharger.

As with limitations based on secondary treatment standards (shown in Exhibit 5-6 above), limitations based on equivalent to secondary standards are expressed as average monthly (calendar month) and average weekly (calendar week) limitations. Mass-based limitations can be calculated using the procedures outlined above.

5.1.3.4 Step 4: Calculate Effluent Limitations Based on Adjusted Standards

If a facility being permitted is subject to the adjusted standards as described in section 5.1.2 above, the permit writer should complete Step 4. Otherwise, he or she should move to section 5.1.3.5 below (Step 5).

As discussed in sections 5.1.2.1 and 5.1.2.2 above, the federal regulations at § 133.103(c) allow states to adjust the maximum allowable discharge concentration of TSS for waste stabilization ponds upward from what would otherwise be required by the equivalent to secondary standards, and the regulations at § 133.105(d) give states flexibility to adopt ASRs that modify equivalent to secondary requirements for both BOD_5 and TSS for trickling filter facilities and BOD_5 requirements for waste stabilization pond facilities. Where one or more of the adjusted standards apply, average monthly limitation(s) generally should be set at the lower of the following:

- The 30-day average concentration of the pollutant that could be achievable through proper operation and maintenance of the treatment works.
- The maximum concentration of the pollutant that would be allowed under the adjusted standard.

Permit writers should note, however, that if the state has developed an adjusted TSS standard for waste stabilization ponds consistent with § 133.103(c), the regulations would allow uniform application of that standard to POTWs where waste stabilization ponds are the principal process used for secondary treatment and operation and maintenance data indicate that the equivalent to secondary treatment standards for TSS cannot be achieved.

The average weekly limitation can be set equal to 1.5 times the average monthly limitation and mass-based limitations may be calculated using the procedures outlined above.

5.1.3.5 Step 5: Apply Special Considerations for Further Adjustments

Part 133 allows a permit writer to make further adjustments when calculating effluent limitations derived from secondary treatment standards or equivalent to secondary standards based on several special considerations. The permit writer should determine whether any of the special considerations outlined in this section apply and, as appropriate, make any further adjustments to the concentration limitations or percent removal requirements. The calculated limitations, after making such adjustments, are the final technology-based effluent limitations for the POTW.

Substitution of $CBOD_5$ for BOD_5

Wastewater contains carbonaceous oxygen demanding substances and nitrogenous oxygen demanding substances. A $CBOD_5$ test measures the 5-day carbonaceous biochemical oxygen demand while the BOD_5 test measures the both carbonaceous biochemical oxygen demand and nitrogenous biochemical oxygen demand. During nitrification, nitrifying bacteria use a large amount of oxygen to consume nitrogenous oxygen demanding substances (unoxidized nitrogen and ammonia-nitrogen) and convert these to oxidized nitrate. For wastewaters with significant nitrogen content, basing permit limitations on $CBOD_5$ instead of BOD_5 eliminates the impact of nitrification on discharge limitations and compliance determinations. EPA recognizes that the $CBOD_5$ test can provide accurate information on treatment plant performance in many cases and, in Part 133, allows permit writers to use $CBOD_5$ limitations in place of BOD_5 limitations to minimize false indications of poor facility performance as a result of nitrogenous oxygen demand.

EPA has established $CBOD_5$ standards for cases where secondary treatment standards or equivalent to secondary treatment standards are applied:

- **Secondary Treatment:** The $CBOD_5$ secondary treatment performance standards specified by the regulations are as follows:
  - 25 mg/L as a 30-day average.
  - 40 mg/L as a 7-day average.
- The EPA-approved test procedures in Part 136 include a $CBOD_5$ (nitrogen inhibited) test procedure. Subject to any state-specific requirements, a permit writer can specify these $CBOD_5$ limitations along with $CBOD_5$ monitoring requirements in any POTW permit requiring performance based on secondary treatment standards [§ 133.102(a)(4)].
- **Equivalent to Secondary Treatment:** The $CBOD_5$ equivalent to secondary treatment performance standards specified by the regulations are as follows:
  - No greater than 40 mg/L as a 30-day average.
  - No greater than 60 mg/L as a 7-day average.
- Where data are available to establish $CBOD_5$ limitations, and subject to any state-specific requirements, a permit writer may substitute $CBOD_5$ for BOD_5 and specify $CBOD_5$ limitations and monitoring requirements when applying equivalent to secondary standards.

Substitution of COD or TOC for BOD_5

Chemical oxygen demand (COD) and total organic carbon (TOC) laboratory tests can provide an accurate measure of the organic content of wastewater in a shorter time frame than a BOD_5 test (i.e., several hours versus five days). The regulations at § 133.104(b) allow a permit writer to set limitations for COD or TOC instead of BOD_5 if a long-term BOD_5:COD or BOD_5:TOC correlation has been demonstrated.

Adjustments for Industrial Contributions

Under § 133.103(b), treatment works receiving wastes from industrial categories with effluent limitations guidelines and standards (effluent guidelines) requirements or new source performance standards for BOD_5 or TSS, which are less stringent than the secondary treatment standards or, if applicable, the equivalent to secondary treatment standards in Part 133, can qualify to have their 30-day BOD_5 or TSS limitations adjusted upward provided that the following are true:

- The adjusted 30-day limitations are not greater than the limitations in effluent guidelines or new source performance standards, as applicable, for the industrial category.
- The flow or loading of BOD_5 or TSS introduced by the industrial category exceeds 10 percent of the design flow or loading to the POTW.

When making this adjustment, the Part 133 values for BOD_5 and TSS should be adjusted proportionately. Accordingly, a permit writer should make the adjustment using a flow-weighted or loading-weighted average of the two concentration limitations (i.e., the limitations developed from effluent guidelines for the industrial facility and the secondary or equivalent to secondary limitations).

Adjustments to Percent Removal Requirements

The 85 percent removal requirement (for a 30-day average) in secondary treatment standards was originally established to achieve two basic objectives:

- To encourage municipalities to remove high quantities of infiltration and inflow (I/I) from their sanitary sewer systems.
- To prevent intentional dilution of influent wastewater.

In facilities with dilute influent that is not attributable to high quantities of I/I or intentional dilution, the percent removal requirement could result in forcing *advanced treatment* rather than the intended secondary treatment. Advanced treatment generally refers to treatment processes following secondary treatment (e.g., filtration, chemical addition, or two-stage biological treatment). Advanced treatment can achieve significantly greater pollutant removals than secondary treatment processes but at a higher cost.

The regulations at §§ 133.103(a), (d) and (e) provide that, under certain circumstances, permit writers may set less stringent limitations for BOD_5 and TSS percent removal. The specific circumstances and the potential adjustments to the percent removal requirement are as follows:

- **Treatment works that receive less concentrated wastes from combined sewer systems** are eligible to have less stringent monthly percent removal limitations during wet-weather events [§ 133.103 (a)] and, under certain conditions, less stringent percent removal requirements or a mass loading limitation instead of a percent removal requirement during dry weather [§ 133.103 (e)]. The permit writer must determine on a case-by-case basis whether any attainable percentage removal level can be defined during wet weather and, if so, what the level should be. To qualify for a less stringent percent removal requirement or substitution of a mass limitation during dry weather, the discharger must satisfactorily demonstrate the following:

  1. <u>The facility is consistently meeting, or will consistently meet, its permit effluent concentration limitations, but cannot meet its percent removal limitations because of less concentrated influent</u>. A permitting authority should consider establishing criteria for

documenting what constitutes consistently meeting concentration limitations and what constitutes being unable to meet percent removal limitations because of less concentrated influent.

2. To meet the percent removal requirements, the facility would have to achieve significantly more stringent effluent concentrations than would otherwise be required by the concentration-based standards. Each permitting authority also should consider establishing criteria for demonstrating that this condition is met (e.g., because of dilute influent, X percent of the time a discharger would be forced to meet concentration requirements that are X percent more stringent than the concentration limitations otherwise applicable to satisfy the percent removal requirements).

3. The less concentrated influent wastewater does not result from either excessive infiltration or clear water industrial discharges during dry weather periods. The determination of whether the less concentrated wastewater results from excessive infiltration is discussed in regulations at § 35.2005(b)(28). This regulation defines nonexcessive infiltration as the quantity of flow that is less than 120 gallons per capita per day (domestic base flow and infiltration) or the quantity of infiltration that cannot be economically and effectively eliminated from a sewer system as determined in a cost-effectiveness analysis. The regulations at § 133.103(e) include the additional criterion that either 40 gallons per capita per day or 1,500 gallons per inch diameter per mile of sewer may be used as the threshold value for that portion of dry-weather base flow attributed to infiltration. If the less concentrated influent wastewater is the result of clear water industrial discharges, then the treatment works must control such discharges pursuant to Part 403.

- **Treatment works that receive less concentrated wastes from separate sewer systems** can qualify to have less stringent percent removal requirement or receive a mass loading limitation instead of the percent removal requirement provided the treatment plant demonstrates all of the following [§ 133.103(d)]:

  1. The facility is consistently meeting or will consistently meet its permit effluent concentration limitations but cannot meet its percent removal limitations because of less concentrated influent wastewater. For additional detail on this criterion, see discussion above for combined sewers during dry weather.

  2. To meet the percent removal requirements, the facility would have to achieve significantly more stringent limitations than would otherwise be required by the concentration-based standards. For additional detail on this criterion, see the discussion above for combined sewers during dry weather.

  3. The less concentrated influent wastewater does not result from excessive infiltration and inflow (I/I). The regulation indicates that the determination of whether the less concentrated wastewater is the result of excessive I/I will use the definition of excessive I/I at § 35.2005(b)(16), plus the additional criterion that flow is nonexcessive if the total flow to the POTW (i.e., wastewater plus inflow plus infiltration) is less than 275 gallons per capita per day. The regulation at § 35.2005(b)(16) defines excessive I/I as the quantities of I/I that can be economically eliminated from a sewer system as determined in a cost-effectiveness analysis that compares the costs for correcting the I/I conditions to the total costs for

transportation and treatment of the I/I. This regulation also refers to definitions of nonexcessive I/I in §§ 35.2005(b)(28) and 35.2005(b)(29).

Secondary Treatment Variance for Ocean Discharge—CWA Section 301(h) Variance

CWA section 301(h) provides for variances from secondary treatment standards for POTWs that discharge into ocean waters if the modified requirements do not interfere with attainment or maintenance of water quality. Permit writers should note that the deadline to apply for a CWA section 301(h) variance (December 29, 1982) has passed, thus no new facilities may apply for this variance.

Eligible POTW applicants meeting the set of environmentally stringent criteria in CWA section 301(h) receive a modified NPDES permit waiving the secondary treatment requirements for the conventional pollutants of BOD_5, TSS, and pH. EPA issued regulations, developed the *Amended Section 301(h) Technical Support Document*[2], and prepared a website titled Amendments to Regulations Issued, the Clean Water Act Section 301 (h) Program <www.epa.gov/owow/oceans/discharges/301h.html>. EPA has promulgated specific regulations pertaining to CWA section 301(h) that are provided in Part 125, Subpart G.

All CWA section 301(h) variance modified permits must contain the following specific permit conditions:

- Effluent limitations and mass loadings that will assure compliance with Part 125, Subpart G.
- Requirements for pretreatment program development, a nonindustrial toxics control program, and control of combined sewer overflows.
- Monitoring program requirements that include biomonitoring, water quality, and effluent monitoring.
- Reporting requirements that include the results of the monitoring programs.

No new or substantially increased discharges from the point source of the affected pollutant can be released above that volume of discharge specified in the permit.

5.1.3.6 Step 6: Document the Application of Secondary or Equivalent to Secondary Treatment Standards and all Adjustments and Considerations in the Fact Sheet

Permit writers need to document their application of secondary or equivalent to secondary treatment standards in the NPDES permit fact sheet for municipal facilities. The permit writer should clearly identify the data and information used to determine whether secondary treatment standards or equivalent to secondary treatment standards or adjusted standards apply and how that information was used to derive effluent limitations for the permit. The permit writer should also note all adjustments and special considerations in the fact sheet. The information in the fact sheet should provide the NPDES permit applicant and the public a transparent, reproducible, and defensible description of how the NPDES permit properly incorporates secondary treatment standards.

5.2 Technology-Based Effluent Limitations for Industrial (Non-POTW) Dischargers

EPA is required to promulgate technology-based limitations and standards that reflect pollutant reductions that can be achieved by categories, or subcategories, of industrial point sources using specific

technologies (including process changes) that EPA identifies as meeting the statutorily prescribed level of control under the authority of CWA sections 301, 304, 306, 307, 308, 402, and 501 (33 *United States Code* [U.S.C.] 1311, 1314, 1316, 1318, 1342, and 1361). Those national industrial wastewater controls are called effluent limitations guidelines and standards (effluent guidelines). Unlike other CWA tools, such as water quality standards, effluent guidelines are national in scope and establish performance standards for all facilities within an industrial category or subcategory.

For point sources that introduce pollutants directly into the waters of the United States (direct dischargers), the effluent guidelines promulgated by EPA are implemented through NPDES permits as authorized in CWA sections 301(a), 301(b), and 402. For sources that discharge to POTWs (indirect dischargers), EPA promulgates pretreatment standards that apply directly to those sources and are enforced by POTWs and state and federal authorities as authorized in CWA sections 307(b) and (c).

When developing TBELs for industrial (non-POTW) facilities, the permit writer must consider all applicable technology standards and requirements for all pollutants discharged. Without applicable effluent guidelines for the discharge or pollutant, permit writers must identify any needed TBELs on a case-by-case basis, in accordance with the statutory factors specified in CWA sections 301(b)(2) and 304(b). The site-specific TBELs reflect the BPJ of the permit writer, taking into account the same statutory factors EPA would use in promulgating a national effluent guideline regulation, but they are applied to the circumstances relating to the applicant. The permit writer also should identify whether state laws or regulations govern TBELs and might require more stringent performance standards than those required by federal regulations. In some cases, a single permit could have TBELs based on effluent guidelines, BPJ, and state law, as well as WQBELs based on water quality standards.

Sections 5.2.1 and 5.2.2 below provide an overview of effluent guidelines and development of TBELs in NPDES permits using the effluent guidelines. Section 5.2.3 below discusses the development of TBELs in the absence of effluent guidelines (i.e., case-by-case limitations developed using BPJ).

5.2.1 Effluent Guidelines

Congress saw the creation of a single national pollution control requirement for each industrial category, based on the best technology the industry could afford, as a way to reduce the potential creation of *pollution havens* and to attain a high-level water quality in the nation's waters. Consequently, EPA's goal in establishing effluent guidelines is to ensure that industrial facilities with similar characteristics will meet similar effluent limitations representing the best pollution control technologies or pollution prevention practices regardless of their location or the nature of the receiving water into which the discharge is made. In establishing the effluent guidelines, EPA must consider the industry-wide economic achievability of implementing the technology and the incremental costs in relation to the pollutant-reduction benefits.

Effluent guidelines can include numeric and narrative limitations, including best management practices (BMPs), to control the discharge of pollutants from categories of point sources. The limitations are based on data characterizing the performance of technologies available and, in some cases, from modifying process equipment or the use of raw materials. Although the regulations do not require the use of any particular treatment technology, they do require facilities to achieve effluent limitations that reflect the proper operation of the *model* technologies selected as the basis for the effluent guidelines and from which the performance data were obtained to generate the limitations. Therefore, each facility has the

discretion to select any technology design and process changes necessary to meet the performance-based discharge limitations and standards specified by the effluent guidelines.

As of the date of this manual's publication, EPA has issued effluent guidelines for 56 industrial categories, which apply to between 35,000 and 45,000 facilities that discharge directly to waters of the United States and another 12,000 facilities that discharge into POTWs. The regulations prevent the discharge of more than 1.2 billion pounds of toxic (priority) and nonconventional pollutants each year. EPA's Effluent Guidelines Program Website <www.epa.gov/guide/> provides information on existing effluent guidelines, current effluent guidelines rulemaking, and the effluent guidelines planning process.

5.2.1.1 Statutory Foundation for Effluent Guidelines

The CWA directs EPA to promulgate effluent guidelines reflecting pollutant reductions that can be achieved by existing facilities in categories or subcategories of industrial point sources using specific control technologies. In addition, EPA is required to develop effluent guidelines for new sources. Those levels of control are summarized below and in Exhibit 5-8.

Exhibit 5-8 Summary of CWA technology levels of control

Type of sites regulated	BPT	BCT	BAT	NSPS	PSES	PSNS
Existing Direct Dischargers	X	X	X			
New Direct Dischargers				X		
Existing Indirect Dischargers					X	
New Indirect Dischargers						X
Pollutants regulated	**BPT**	**BCT**	**BAT**	**NSPS**	**PSES**	**PSNS**
Conventional Pollutants	X	X		X		
Nonconventional Pollutants	X		X	X	X	X
Toxic (Priority) Pollutants	X		X	X	X	X

Best Practicable Control Technology Currently Available (BPT)

BPT is the first level of technology-based effluent controls for direct dischargers and it applies to all types of pollutants (conventional, nonconventional, and toxic). The Federal Water Pollution Control Act (FWPCA) amendments of 1972 require that when EPA establishes BPT standards, it must consider the industry-wide cost of implementing the technology in relation to the pollutant-reduction benefits. EPA also must consider the age of the equipment and facilities, the processes employed, process changes, engineering aspects of the control technologies, non-water quality environmental impacts (including energy requirements), and such other factors as the EPA Administrator deems appropriate [CWA section 304(b)(1)(B)]. Traditionally, EPA establishes BPT effluent limitations on the basis of the average of the best performance of well-operated facilities in each industrial category or subcategory. Where existing performance is uniformly inadequate, BPT may reflect higher levels of control than currently in place in an industrial category if the Agency determines that the technology can be practically applied. See CWA sections 301(b)(1)(A) and 304(b)(1)(B).

Best Conventional Pollutant Control Technology (BCT)

The 1977 CWA requires EPA to identify effluent reduction levels for conventional pollutants associated with BCT for direct discharges from existing industrial point sources. As with BPT, when establishing BCT the Agency considers the age of the equipment and facilities, the processes employed, process changes, engineering aspects of the control technologies, non-water quality environmental impacts (including energy requirements), and such other factors as the EPA Administrator deems appropriate [CWA section 304(b)(4)(B)]. In addition, EPA also considers a two-part *cost reasonableness* test, as required by CWA section 304(b)(4)(B), which includes (1) consideration of the reasonableness of the relationship between the costs of attaining a reduction in effluent and the effluent reduction benefits derived and (2) a comparison of the cost and level of reduction of such pollutants from the discharge from POTWs to the cost and level of reduction of such pollutants from a class or category of industrial sources. EPA explained its methodology for developing BCT limitations in detail in 51 FR 24974, July 9, 1986 <www.epa.gov/npdes/pubs/fr_bct_1986.pdf>. See CWA sections 301(b)(2)(E) and 304(b)(4).

Best Available Technology Economically Achievable (BAT)

For the direct discharge of toxic and non-conventional pollutants, EPA promulgates effluent guidelines based on BAT. The FWPCA amendments of 1972 require EPA to consider the cost of achieving effluent reductions when defining BAT; however, they do not specifically require EPA to balance the cost of implementation against the pollution reduction benefit. The technology selected for BAT must be economically achievable [CWA section 301(b)(2)(A)]. EPA generally defines BAT on the basis of the performance associated with the best control and treatment measures that facilities in an industrial category are capable of achieving. Like BPT and BCT, other factors EPA must consider in assessing BAT include the age of equipment and facilities involved, the process employed, process changes, non-water quality environmental impacts, including energy requirements, and other such factors as the EPA Administrator deems appropriate [CWA section 304(b)(2)(B)]. The Agency retains considerable discretion in assigning the weight accorded to these factors. BAT limitations may be based on effluent reductions attainable through changes in a facility's processes and operations. Where existing performance is uniformly inadequate, BAT may reflect a higher level of performance than is currently being achieved within a subcategory on the basis of technology transferred from a different subcategory or category. BAT may be based on process changes or internal controls, even when those technologies are not common industry practice. See CWA sections 301(b)(2)(A), (C), (D) and (F) and 304(b)(2).

New Source Performance Standards (NSPS)

NSPS reflect effluent reductions that are achievable by direct dischargers based on the best available demonstrated control technology. New sources have the opportunity to install the best and most efficient production processes and wastewater treatment technologies at the time of construction. As a result, NSPS should represent the most stringent controls attainable through the application of the best available demonstrated control technology for all pollutants (i.e., conventional, nonconventional, and toxic pollutants). In establishing NSPS, EPA is directed to take into consideration the cost of achieving the effluent reduction and any non-water quality environmental impacts and energy requirements. See CWA section 306.

Pretreatment Standards for Existing Sources (PSES)

PSES are designed to prevent the discharge of pollutants that pass through, interfere with, or are otherwise incompatible with the operation of POTWs, including incompatibility with the POTW's chosen biosolids (sewage sludge) disposal methods. The categorical pretreatment standards for existing indirect dischargers are technology-based and are analogous to BAT. The general pretreatment regulations, which set forth the framework for the implementation of national pretreatment standards, are at Part 403. See CWA section 307(b).

Pretreatment Standards for New Sources (PSNS)

Like PSES, PSNS are designed to prevent the discharges of pollutants that pass through, interfere with, or are otherwise incompatible with the operation of POTWs. PSNS are to be issued at the same time as NSPS. New indirect dischargers have the opportunity to incorporate into their facilities the best available demonstrated technologies at the time of construction. The Agency considers the same factors in promulgating PSNS as it considers in promulgating NSPS. See CWA section 307(c).

EPA typically does not establish pretreatment standards for conventional pollutants (e.g., BOD_5, TSS, oil and grease) because POTWs are designed to treat such pollutants, but EPA has exercised its authority to establish categorical pretreatment standards for conventional pollutants as surrogates for toxic or nonconventional pollutants or to prevent interference. For example, EPA established categorical pretreatment standards for new and existing sources with a one-day maximum concentration of 100 mg/L oil and grease in the Petroleum Refining Point Source Category in Part 419 based on "the necessity to minimize [the] possibility of slug loadings of oil and grease being discharged to POTWs."[3]

The final statutory deadline for meeting BPT requirements was July 1, 1977, and the final statutory deadline for meeting BCT and BAT requirements was March 31, 1989. When applying applicable effluent guidelines, permit writers should note that they do not have the authority to extend the statutory deadlines in an NPDES permit; thus, all applicable technology-based requirements (i.e., effluent guidelines and case-by-case limitations based on BPJ) must be applied in NPDES permits without the benefit of a compliance schedule. In addition, though NSPS do not have specific dates as compliance deadlines, they are effective on the date the new source begins discharging. The facility must demonstrate compliance with NSPS within 90 days of discharge [see § 122.29(d)]. For more information on determining whether a discharge is subject to NSPS, see Appendix D of this manual. For additional information on the statutory and regulatory history of the NPDES program, see section 1.2 of this manual.

5.2.1.2 EPA's Development of Effluent Guidelines

EPA establishes national effluent guidelines for a specific industrial sector by regulation after considering an in-depth engineering and economic analysis of the industrial sector. EPA's Industrial Regulations Website <www.epa.gov/guide/industry.html> provides development documents for some specific industry categories (e.g., Iron and Steel Manufacturing and Metal Products and Machinery). Those documents contain additional information on how EPA develops effluent guidelines.

For each industrial sector, EPA assesses the performance and availability of the best pollution control technologies and pollution prevention practices that are available for an industrial category or subcategory. The effluent guidelines are promulgated for various industrial categories in 40 CFR, Chapter I, Subchapter N - Effluent Guidelines and Standards - Parts 400-471 <www.epa.gov/lawsregs/search/40cfr.html>.

In promulgating effluent guidelines, EPA may divide an industrial point source category into groupings of subcategories to provide a method for addressing variations between products, raw materials, processes, and other factors that result in distinctly different characteristics. Regulation of an industrial category using subcategories allows each subcategory to have a uniform set of requirements that take into account technological achievability and economic impacts unique to that subcategory. Grouping similar facilities into subcategories increases the likelihood that the regulations are practicable and diminishes the need to address variations between facilities within a category through a variance process. For more on variances, see section 5.2.2.7 below. EPA considers a number of different subcategorization factors during an effluent guidelines rulemaking, including the following:

- Manufacturing products and processes.
- Raw materials.
- Wastewater characteristics.
- Facility size.
- Geographical location.
- Age of facility and equipment.
- Wastewater treatability.

For each possible treatment technology option for an industry, EPA conducts an analysis of industry-wide incremental compliance costs, pollutant loadings and removals, and related non-water quality effects. The Agency also performs an economic analysis to assess the financial impact on the industry of implementing each option. That entire process involves data collection, rigorous data review, engineering analysis, and public comment. EPA selects a technology to serve as the *model* technology for pollutant removal for each required level of control (i.e., BPT, BCT, BAT, NSPS, PSES, and PSNS). Limitations and other requirements in the effluent guidelines for each level of control are based on application of the model technology to the category or subcategory of facilities.

Effluent guidelines are not always established for every pollutant present in a point source discharge. In many instances, EPA promulgates effluent guidelines for an *indicator* pollutant. Industrial facilities that comply with the effluent guidelines for the indicator pollutant will also control other pollutants (e.g., pollutants with a similar chemical structure). For example, EPA may choose to regulate only one of several metals present in the effluent from an industrial category, and compliance with the effluent guidelines will ensure that similar metals present in the discharge are adequately controlled. Additionally, for each industry sector EPA typically considers whether a pollutant is present in the process wastewater at treatable concentrations and whether the model technology for effluent guidelines effectively treats the pollutant. For example, see Figure 6-1 Pollutant of Concern Methodology <www.epa.gov/guide/cwt/final/develop/ch6.pdf> on page 6-4 of the *Centralized Waste Treatment category Technical Development Document*.

The CWA requires EPA to annually review existing effluent guidelines for both direct and indirect dischargers. CWA section 304(m) also requires EPA to publish an effluent guidelines program plan every 2 years. As part of the development of the biennial plan, the public is provided an opportunity to comment on a *preliminary* plan before it is finalized. The preliminary plan is published in odd-numbered years, and the final plan is published in even-numbered years. EPA encourages permit writers to participate in the effluent guidelines planning process and comment on the preliminary effluent guidelines program plans presented on the Effluent Guidelines Biennial Plan Website <www.epa.gov/guide/304m/index.html>.

5.2.1.3 Types of Limitations in Effluent Guidelines

Although the requirements in effluent guidelines generally are numeric limitations on the mass or concentration of a pollutant that can be discharged directly into waters of the United States, CWA section 502(11) defines *effluent limitation* broadly. This section describes several types of possible expressions for the limitations found in effluent guidelines. The permit writer should note that the limitations in effluent guidelines might need to be translated into an appropriate form to be included as effluent limitations in an NPDES permit. That process is discussed further in section 5.2.2 below.

Mass- or Concentration-based Numeric Limitations

Limitations in effluent guidelines generally are expressed as numeric values, which are upper bounds of the amount of pollutant that may be discharged. For most pollutants, these limitations are mass-based or concentration-based values. They are, in effect, measures of how well the production, wastewater treatment, and pollution prevention processes must be operated. In the course of developing effluent guidelines regulations, EPA uses data on a number of different pollutants from facilities with the selected model technologies to determine the appropriate numeric limitations. The limitations generally consist of upper bounds (maximum values) established for both the daily discharge and for the average monthly discharge.

In developing numeric limitations in effluent guidelines, EPA first determines an average performance level (the *long-term average*) that a facility with well-designed and operated model technologies reflecting the appropriate level of control is capable of achieving. That long-term average is calculated from data taken from facilities using the model technologies that were selected as a basis for the limitations. EPA expects that all facilities subject to the limitations will design and operate their treatment systems to achieve the long-term average performance level consistently because facilities with well-designed and operated model technologies have demonstrated that it can be done. The technical development document for the effluent guidelines usually identifies the long-term average for the model technologies; however, they generally are not part of the limitations in the effluent guidelines or TBELs in the permit. The limitations generally are expressed as *maximum daily* and *average monthly limitations* (see definitions in Exhibit A-2 in Appendix A of this document) that include an allowance for variability around the long-term average.

EPA acknowledges that process and treatment systems have inherent variability and, therefore, incorporates an allowance for this variation into the limitations specified in the effluent guidelines. That allowance is based on statistical analysis of the data from facilities using the model technologies. The limitations included in effluent guidelines incorporate all components of variability including shipping, sampling, storage, and analytical variability. By accounting for those reasonable excursions above the long-term average, the limitations in effluent guidelines generally are well above the actual long-term averages. If a facility operates its treatment system to meet the long-term average, EPA expects the facility will be able to meet the limitations specified in the effluent guidelines based on that long-term average.

EPA has different objectives in establishing maximum daily and average monthly limitations in effluent guidelines. In establishing maximum daily limitations, EPA's objective is to restrict the discharges on a daily basis at a level that is achievable for a facility that targets its treatment at the long-term average. In establishing average monthly limitations, EPA's objective is to provide an additional restriction to help

ensure that facilities target their average discharges in a manner that will achieve the long-term average. The average monthly limitation requires continuous dischargers to provide ongoing control on a monthly basis that complements controls imposed by the maximum daily limitation. To meet the average monthly limitation, a facility must counterbalance a value near the maximum daily limitation with one or more values well below the maximum daily limitation. To achieve compliance, the values must result in an average monthly value at or below the average monthly limitation. As explained below, EPA uses a smaller percentile basis for the average monthly limitation than the maximum daily limitation to encourage facilities to target their systems to a value closer to the long-term average.

EPA generally uses statistical procedures to determine the values of the limitations specified in the effluent guidelines. Those procedures involve fitting effluent data to distributions and using estimated upper percentiles of the distributions. EPA defines the maximum daily limitation as an estimate of the 99th percentile of the distribution of the daily measurements. The average monthly limitation is an estimate of the 95th percentile of the distribution of the monthly averages of the daily measurements. EPA bases its limitations on percentiles chosen with the intention that they be high enough above the long-term average to accommodate reasonably anticipated variability within control of the facility. In conjunction with the statistical methods, EPA performs an engineering review to verify that the limitations are reasonable on the basis of the design and expected operation of the control technologies and the facility process conditions. Such limitations are translated into effluent limitations in a facility's NPDES permit. Facilities must comply with the effluent limitations in their permits at all times. EPA has prevailed in several judicial challenges to its selection of percentiles and on other issues related to limitations specified in effluent guidelines. [See, for example, *Chemical Manufacturers Association v. U.S. Environmental Protection Agency*, 870 F.2d 177, 230 (5th Cir. 1989) and *National Wildlife Federation, et al v. Environmental Protection Agency*, 286 F.3d 554 (D.C. Cir. 2002)]

Exhibit 5-9 depicts an example of TSS data for a facility that is operating around a required long-term average level for TSS. The dots represent daily measurements, and the reference lines show the values for the long-term average (LTA), the maximum daily limitation (L1), and the average monthly limitation (L30). The facility has demonstrated compliance with both the maximum daily and average monthly limitations. Daily measurements include values both above and below the long-term average; however, all the data values are below the maximum daily limitation. Some individual daily values exceed the average monthly limitation; however, within each month, the average of the daily values is less than the average monthly limitation.

EPA generally exercises four basic alternatives in setting mass- or concentration-based numeric limitations specified in effluent guidelines:

- Mass-based, production-normalized limitations (e.g., the pollutant discharge is not to exceed 1 pound per 1,000 pounds of production).
- Mass-based, flow-normalized limitations (e.g., the pollutant discharge is not to exceed the mass determined by multiplying the process wastewater flow subject to the effluent guideline by the concentration requirement in the guideline).
- Concentration-based limitations (e.g., the pollutant discharge is not to exceed 1 mg of pollutant per liter of wastewater).
- Limitations requiring *zero discharge* of specific pollutants or all pollutants.

Exhibit 5-9 Visual example of TSS LTA, maximum daily limitation and average monthly limitation

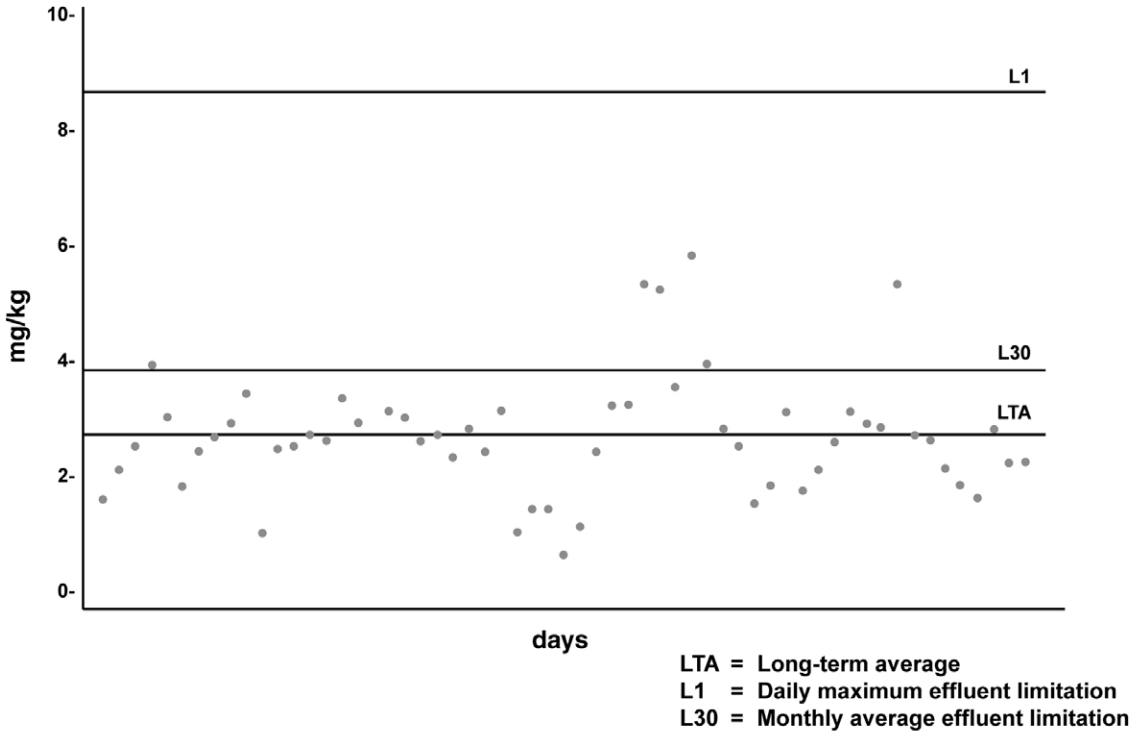

Except where a limitation requiring *zero discharge* of pollutants is applicable, EPA generally prefers setting production-normalized, mass-based limitations specified in effluent guidelines, where feasible, because production normalized limitations can reflect some expectation that the facility will conserve water and can reduce any potential for substituting dilution for treatment. EPA generally establishes concentration-based effluent guidelines when production and achievable wastewater flow cannot be correlated nationally. For example, in the Metal Finishing point source Category (Part 433), the Agency considered but decided against expressing the effluent guidelines as production-normalized mass-based effluent guidelines, "With the wide range of operations, product quality requirements, existing process configurations, and difficulties in measuring production, no consistent production normalizing relationship could be found. Concentration-based limits, however, can be consistently attained throughout the industry." [See 47 FR 38465, 31 August 1982.]

Numeric Limitations Established at Minimum Levels

Using percentile estimates to set limitations in effluent guidelines is not a requirement under the CWA. In some cases, the model technology for treating a pollutant might be capable of removing that pollutant to levels that cannot be reliably measured with existing analytical methods. EPA sometimes sets a requirement in the effluent guidelines that the concentration of a pollutant in the discharge must be below a *minimum level* or ML. The ML is the lowest level at which the entire analytical system must give a recognizable signal and an acceptable calibration point for the pollutant being analyzed. Where a limitation in the effluent guidelines is set at *less than the ML*, the value of the ML is specified in the effluent guidelines regulation on the basis of the analytical methods that EPA used to chemically analyze wastewaters in developing the regulation. For example, in the Pulp, Paper, and Paperboard point source

category (Part 430) the Daily Maximum BAT effluent guideline for the Tetrachlorodibenzofuran (TCDF) congener of dioxin is expressed as <*ML* for papergrade sulfite (Subpart E) mills, which means "less than the minimum level specified in part 430.01(i)" (i.e., 10 picograms/liter for TCDF). If, in the future, analytical methods become more sensitive with lower MLs, EPA would determine whether the technologies for reducing the amount of the pollutant in the discharge are capable of achieving more stringent limitations and, thus, whether it would be appropriate to modify the requirements of the effluent guideline.

EPA has not established average monthly limitations in effluent guidelines when the maximum daily limitation is an ML limitation. The purpose of an average monthly limitation is to require continuous dischargers to provide better control, on a monthly basis, than required by the maximum daily limitation. However, for these pollutants, the data were determined by analytical methods that could not measure below the ML specified in the regulations. Thus, even if a permitting authority requires monitoring for the pollutants more frequently than once a month, average monthly limitations would still be expressed as *less than the ML* or < *ML*.

Other Expressions for Numeric Limitations

EPA also promulgates effluent guidelines for pollutants that cannot be expressed in terms of mass or concentration (e.g., pH, temperature, radiation) or are better expressed through other means (e.g., unitless ratios). For example, pH is generally expressed as an acceptable range (e.g., 6.0–9.0 standard pH units).

Nonnumeric Effluent Limitations

In some cases, EPA includes nonnumeric or narrative effluent limitations rather than, or in addition to, numeric limitations in effluent guidelines. Nonnumeric effluent limitations might include specific BMPs or requirements to minimize or eliminate discharges. CWA sections 304(e), 308(a), 402(a), and 501(a) authorize the Administrator to prescribe BMPs as part of effluent guidelines and as part of an NPDES permit. CWA section 304(e) authorizes EPA to include supplemental BMPs in effluent guidelines for toxic or hazardous pollutants for the purpose of controlling "plant site runoff, spillage or leaks, sludge or waste disposal, and drainage from raw material storage." Several effluent guidelines include BMPs as requirements. Some effluent guidelines, such as the Concentrated Aquatic Animal Production point source category (Part 451), include the BMPs requirement exclusively. Section 9.1.2 of this manual further discusses BMPs.

CWA section 402(a)(1) and (2) and the NPDES regulations at § 122.44(k) also authorize BMPs in NPDES permits to control or abate the discharge of pollutants when numeric effluent limitations are infeasible, or when the practices are reasonably necessary to achieve effluent limitations and standards or to carry out the purposes and intent of the CWA.

Once EPA establishes effluent guidelines, the permit writer is responsible for translating the limitations and other requirements of the effluent guidelines into TBELs and other conditions appropriate for inclusion in an NPDES permit. Section 5.2.2 below discusses a step-by-step approach for applying effluent guidelines through NPDES permits.

5.2.2 Applying Effluent Guidelines through NPDES Permits

Permit writers need to have a detailed knowledge of the industrial facility applying for a new or reissued NPDES permit to identify applicable effluent guidelines and know how to use them to derive TBELs. This section provides a step-by-step procedure for applying effluent guidelines to direct discharges through NPDES permits as shown in Exhibit 5-10.

Exhibit 5-10 Steps for applying effluent guidelines to direct discharges

Step 1.	Learn about the industrial discharger
Step 2.	Identify the applicable effluent guidelines category(ies)
Step 3.	Identify the applicable effluent guidelines subcategory(ies)
Step 4.	Determine whether existing or new source standards apply
Step 5.	Calculate TBELs from the effluent guidelines
Step 6.	Account for overlapping or multiple effluent guidelines requirements
Step 7.	Apply additional regulatory considerations in calculating TBELs
Step 8.	Apply additional effluent guidelines requirements
Step 9.	Document the application of effluent guidelines in the fact sheet

5.2.2.1 Step 1: Learn About the Industrial Discharger

To write a defensible permit, the permit writer should have a solid understanding of the facility's operations. The permit writer should gather sufficient information to identify applicable effluent guidelines and derive TBELs. Facility-specific information the permit writer is likely to need includes the following:

- Industrial processes and raw materials.
- Products and services.
- Amount of manufacturing production or servicing.
- Number of production and non-production days.
- Current pollution prevention practices and wastewater treatment technology(ies).
- Discharge location of the wastewater pollutants and potential compliance sampling points.
- The source and characteristics of the wastewaters (including flow) and pollutants that are being discharged or have the potential to be discharged from the facility.

Sources of information include the facility's permit application, the current permit and fact sheet (if the facility is permitted), discharge monitoring reports, site visits, site inspections (such as compliance evaluation inspections for an existing permit), and other information submitted by the facility. The permit writer also should identify any information that would assist in determining whether the facility or part of the facility is considered a new source (e.g., age of facility and equipment).

5.2.2.2 Step 2: Identify the Applicable Effluent Guidelines Category(ies)

As noted above, EPA's effluent guidelines are at 40 CFR, Chapter I, Subchapter N - Effluent Guidelines and Standards, Parts 400–471 <www.epa.gov/lawsregs/search/40cfr.html>. A summary of promulgated effluent guidelines is presented on EPA's Industrial Regulations Website <www.epa.gov/guide/industry.html> and in Exhibit 5-11 below.

Exhibit 5-11 Table of existing point source categories (June 2010)

Industry category (listed alphabetically)	40 CFR Part	Industry category (listed alphabetically)	40 CFR Part
Aluminum Forming	467	Meat and Poultry Products	432
Asbestos Manufacturing	427	Metal Finishing	433
Battery Manufacturing	461	Metal Molding and Casting	464
Canned and Preserved Fruits and Vegetable Processing	407	Metal Products and Machinery	438
Canned and Preserved Seafood Processing	408	Mineral Mining and Processing	436
Carbon Black Manufacturing	458	Nonferrous Metals Forming and Metal Powders	471
Cement Manufacturing	411	Nonferrous Metals Manufacturing	421
Centralized Waste Treatment	437	Oil and Gas Extraction	435
Coal Mining	434	Ore Mining and Dressing	440
Coil Coating	465	Organic Chemicals, Plastics, and Synthetic Fibers	414
Concentrated Animal Feeding Operations (CAFOs)	412	Paint Formulating	446
Concentrated Aquatic Animal Production	451	Paving and Roofing Materials (Tars and Asphalt)	443
Copper Forming	468	Pesticide Chemicals	455
Dairy Products Processing	405	Petroleum Refining	419
Electrical and Electronic Components	469	Pharmaceutical Manufacturing	439
Electroplating*	413	Phosphate Manufacturing	422
Explosives Manufacturing	457	Photographic	459
Ferroalloy Manufacturing	424	Plastic Molding and Forming	463
Fertilizer Manufacturing	418	Porcelain Enameling	466
Glass Manufacturing	426	Pulp, Paper, and Paperboard	430
Grain Mills	406	Rubber Manufacturing	428
Gum and Wood Chemicals	454	Soaps and Detergents Manufacturing	417
Hospitals	460	Steam Electric Power Generating	423
Ink Formulating	447	Sugar Processing	409
Inorganic Chemicals	415	Textile Mills	410
Iron and Steel Manufacturing	420	Timber Products Processing	429
Landfills	445	Transportation Equipment Cleaning	442
Leather Tanning and Finishing	425	Waste Combustors	444

* This category contains only categorical pretreatment standards (no effluent guidelines for direct dischargers).

The following sources of information might be helpful in identifying applicable effluent guidelines for a facility:

- **CFR titles and applicability section of the effluent guidelines**. This is first place to look for information for identifying applicable effluent guidelines. Each effluent guidelines regulation includes an applicability section for the category or each subcategory of the industry. The applicability section gives a general description of the types of facilities regulated by the effluent guidelines. The applicability sections often define certain industrial operations or other criteria (e.g., production or process wastewater flow thresholds) that identify whether a facility is regulated by the effluent guidelines.

- **North American Industry Classification System (NAICS) and Standard Industrial Classification (SIC)**. The current NAICS <www.census.gov/epcd/www/naics.html> and former SIC codes <www.census.gov/epcd/www/naicstab.htm> could be helpful to determine the appropriate industrial category(ies) for a facility. NAICS and SIC codes were developed and are maintained by the federal government as a way to classify establishments by type of activity for comparing economic and other types of facility-specific data. Although SIC codes provide a helpful starting point for categorizing a facility, permit writers should be cautious of relying exclusively on SIC codes for determining the appropriate industrial category. SIC codes were not developed using EPA's industrial classification scheme, or vice versa, and, therefore, the codes might not always correspond exactly with the categorization process. In addition, more than one SIC code might apply to a single facility. Item V-II of NPDES Application Form l requires that the applicant provide the SIC code for the activity covered by the permit application. In some instances, the SIC code will identify both the industrial category and the subcategory of a facility. Sometimes the SIC code might identify the appropriate industrial category but not the subcategory. Exhibit 5-12 presents two examples of how a permit writer might identify the applicable effluent guidelines using the facilities SIC codes.

Exhibit 5-12 Examples of identifying applicable effluent guidelines using SIC codes

Example 1

A facility that performs the primary smelting and refining of copper reports SIC code 3331 in its NPDES permit application. By scanning the list of industrial point source categories, the permit writer can determine that the facility is regulated by effluent guidelines in the Nonferrous Metals Manufacturing point source category (Part 421). In this case, the SIC code also indicates that the facility is likely regulated by effluent guidelines in the Primary Copper Smelting Subcategory.

Example 2

A facility that manufactures ethyl acrylate and 2-ethylhexyl acrylate (acrylic acid esters) reports the SIC code 2869 (Industrial Organic Chemicals, Not Elsewhere Classified) in its NPDES permit application. By scanning the list of industrial point source categories, the permit writer can determine that facility is likely regulated by effluent guidelines in the Organic Chemicals, Plastics, and Synthetic Fibers (OCPSF) category (Part 414).

- **EPA's Development Documents and Compliance Guides**. EPA produces a number of documents that will aid permit writers in identifying applicable effluent guidelines and incorporating them into NPDES permits. In particular, development documents summarize the data and information EPA used to develop the effluent guidelines. Such documents are extremely useful in identifying the applicability of the effluent guidelines and how to incorporate the effluent guidelines into NPDES permits. EPA may also publish a compliance guide for permit writers and industry. EPA's Effluent Guidelines Website <www.epa.gov/guide/> provides available documents for specific industrial categories.

- **FR Notices**. The preamble text to the FR notices containing the proposed and final effluent guidelines rulemakings also provide additional insight into applicability of the effluent guidelines. EPA's Effluent Guidelines Website <www.epa.gov/guide/> provides FR notices for specific industrial categories. For example, the preambles to recently promulgated effluent guidelines typically list the SIC and NAICS codes for the potentially regulated facilities. Each Part in the CFR identifies the relevant FR notices. For example, § 419.11 (i.e., specialized definitions for

Subpart [subcategory] A for the Petroleum Refining point source category) identifies 47 FR 46446, October 18, 1982, as amended at 50 FR 28522, July 12, 1985, as its source.

- **EPA Industry Experts**. EPA has a number of subject matter experts <www.epa.gov/guide/contacts.html> at its headquarters office in Washington, D.C. that are available to answer questions on specific effluent guidelines. EPA's NPDES Contacts in Regional Offices <www.epa.gov/npdes/regionalcontacts> also offer assistance in sorting through the different effluent guidelines and NPDES regulations.
- **EPA's Effluent Guidelines Planning Support Documents.** EPA's Effluent Guidelines Biennial Plan Website <http://water.epa.gov/lawsregs/lawsguidance/cwa/304m/> provides technical support documents and other information supporting EPA's biennial effluent guidelines program plans.
- **EPA's Sector Notebooks.** EPA's Sector Notebooks <www.epa.gov/compliance/resources/publications/assistance/sectors/notebooks/index.html> describe specific U.S. industries and governments and provide a holistic approach by integrating processes, applicable regulations, and other relevant environment information.
- **Other Sources**. Other sources of information include resources identified below in Exhibit 5-23, BPJ Permitting Tools. Permit and fact sheet and information from similar facilities might aid in identifying applicable effluent guidelines. However, the permit writer should not assume that a similar facility was correctly categorized in its permit and should examine the rationale for how the other permit writer identified any applicable effluent guidelines before relying on another permit to identify the applicable category.

Permit writers should be aware that effluent guidelines from two or more industrial point source categories might apply to a single facility. Step 6 below, provides additional information on overlapping or multiple effluent guidelines requirements.

5.2.2.3 Step 3: Identify the Applicable Effluent Guidelines Subcategory(ies)

In promulgating effluent guidelines, EPA may divide an industrial point source category into groupings called *subcategories* to provide a method for addressing variations between products, raw materials, processes, and other factors that result in distinctly different effluent characteristics or treatment options. Some effluent guidelines categories cover a variety of industrial sectors (e.g., the Nonferrous Metals Manufacturing point source category has 31 subcategories). It is important for the permit writer to correctly identify the applicable subcategory to derive TBELs.

The process of identifying the applicable effluent guidelines requires close review and comparison of information obtained from Step 1 and Step 2 above. Just as effluent guidelines from two or more industrial categories can apply to a single facility, it also is true that requirements from two or more subcategories could apply to a single facility.

Exhibit 5-13 presents two examples of how a permit writer can identify the subcategory containing the applicable effluent guidelines using information from the NPDES permit application.

Exhibit 5-13 Examples of identifying the subcategory with the applicable effluent guidelines

Example 1

A permit writer has identified the facility from Example 2 in Exhibit 5-12 above as potentially regulated by the effluent guidelines in the OCPSF point source category (Part 414) <www.epa.gov/guide/ocpsf/>. The permit writer can determine from a further review of the industrial categorization discussion in the *OCPSF Development Document* and the guidance document that the facility is likely subject to effluent guidelines in Subpart G (Bulk Organic Chemicals). Specifically, the applicability criteria section in Subpart G (§ 414.70) states, "The provisions of this subpart are applicable to the process wastewater discharges resulting from the manufacture of the following: SIC 2865 and 2869 bulk organic chemicals and bulk organic chemical groups." Further, acrylic acid esters are listed in § 414.70 as an OCPSF product group.

Example 2

A large poultry slaughterhouse annually produces 200 million pounds of whole, halved, quarter or smaller meat cuts and reports SIC Code 2015 in its NPDES permit application. The permit writer reviewed the list of effluent guidelines and identified that the facility is likely regulated by effluent guidelines in the Meat and Poultry Products point source category (Part 432) <www.epa.gov/guide/mpp/>. The permit writer reviewed the preamble to the final effluent guidelines rule and the rule's development document. In that effluent guidelines regulation, EPA used NAICS codes to assist in applicability decisions. See 69 FR 54475, September 8, 2004. The permit writer used the U.S. Census Bureau's SIC to NAICS crosswalk website <www.census.gov/epcd/www/naicstab.htm> to identify the NAICS code (311615). Using the NAICS code, the permit writer can narrow the list of potentially applicable subcategories to the Poultry First Processing (Subpart K) or the Poultry Further Processing (Subpart L) subcategories. After reviewing the applicability criteria of both subcategories, the permit writer determined that only the effluent guidelines in Subpart K are likely applicable because the facility performs slaughtering operations, which are not regulated by Subpart L. Finally, the permit writer also needed to compare the average annual production of the facility (200 million pounds) with the production threshold in the effluent guidelines (100 million pounds per year). Because the facility produces more than the production threshold, the effluent guidelines in Subpart K are applicable to this facility. See §§ 432.112 and 432.113. In this example the permit writer would use the effluent guidelines for ammonia (as N), BOD_5, fecal coliform, oil and grease (as HEM), TSS, and total nitrogen to derive effluent limitations as detailed in section 5.2.2.5 below.

5.2.2.4 Step 4: Determine whether Existing or New Source Standards Apply

Section 5.2.1.1 above defines the different control technologies that apply to direct dischargers: BPT, BCT, BAT, and NSPS. The first three apply to existing direct dischargers, and the fourth to new sources. To determine whether existing source standards (i.e., BPT, BCT, and BAT) or NSPS apply to the facility, the permit writer must determine whether the facility or any part of the facility is a new source. A new source is defined in § 122.2 as a building, structure, facility, or installation that discharges pollutants or could discharge pollutants and for which construction began after promulgation of the applicable effluent guidelines or after proposal of the applicable effluent guidelines, but only if the effluent guidelines are promulgated within 120 days. Thus, the discharger's entire facility could be subject to new source standards (e.g., a brand new facility). Permit writers should note that the new source date for indirect dischargers is the date on which the pretreatment standard for new sources is proposed. See §403.3(m)(1).

Additional criteria for determining whether a discharge is a new source are defined in § 122.29(b) to cover situations where a facility is adding a new building or process line that results in a discharge to the waters of the United States. Such an addition would result in a new source if any of the following is true for the source:

- Is constructed at a site at which no other source is located.
- Totally replaces the process causing the discharge from an existing source.
- Has processes that are substantially independent of an existing source at the same site.

Furthermore, some effluent guidelines, such as the effluent guidelines for the Pulp, Paper, and Paperboard Point Source Category in Part 430, include additional criteria for making new source determinations. See § 430.01(j).

Appendix D of this manual provides the applicable new source dates used in making new source determinations by effluent guideline category as provided in Appendix B of the EPA memorandum *New Source Dates for Direct and Indirect Dischargers*[4] <www.epa.gov/npdes/pubs/newsource_dates.pdf> sent by the directors of the Water Permits Division and the Engineering and Analysis Division to the Regional Water Division Directors. Permit writers can use Appendix D of this manual to find the date for determining whether a facility or part of a facility is subject to NSPS.

Where a new source is the result of a new installation of process equipment at an existing facility, part of the facility might be subject to existing source standards and other parts of the facility subject to new source standards. Permit writers should identify whether the facility has installed any process equipment after the last issuance of the NPDES permit and apply the criteria from § 122.29(b) on a case-by-case basis to new construction or new processes, while applying existing source requirements to the existing portions of the facility. Sometimes it can be difficult to distinguish between a new source and a modification or alteration of an existing source, especially when modifications have occurred slowly over time. The permit writer should consult the effluent guidelines regulation to determine if it defines more specifically what constitutes a new source.

It is important to remember that after the effective date of a new source standard, the CWA stipulates that it is unlawful for any owner or operator to operate such a source in violation of those standards. See 33 U.S.C. 1316(e) and 1317(d). EPA's regulations specify that a new source "[must] install and have in operating condition, and [must] *start up* all pollution control equipment" required to meet applicable standards before beginning to discharge. The regulations also indicate that the owner or operator of a new source must meet all applicable standards within "the shortest feasible time (not to exceed 90 days)." See § 122.29(d)(4).

In addition to the requirement to meet NSPS upon beginning to discharge, an EPA-issued NPDES permit for a new source is a federal action subject to the requirements of the National Environmental Policy Act (NEPA), 33 U.S.C. 1371(c)(1). For more information on NEPA and the NPDES program, see section 11.1.2 of this manual.

For existing facilities and existing sources (where NSPS do not apply), existing source standards (i.e., BPT, BCT, BAT) apply. The permit writer would use the more stringent technology level of control for each pollutant. For example, the BPT level of control in the Veneer Subcategory of the Timber Products Processing category (Part 429, Subpart B) allows a discharge of process wastewater and identifies effluent guidelines for BOD_5 and pH, while the BAT level of control bans the direct discharge of process wastewater. Consequently, the NPDES permit for a facility regulated by the Veneer Subcategory must use the more stringent BAT requirements and prohibit the direct discharge of process wastewater. The effluent guidelines for the Renderers subcategory of the Meat and Poultry Products point source category (Subpart J, Part 432) provide another example. In those effluent guidelines, the BCT requirements for BOD_5, oil and grease, and TSS are more stringent than the corresponding BPT requirements. Accordingly, the permit writer would use the more stringent BCT requirements, rather than the BPT requirements, to derive numeric permit limitations for an existing renderer.

5.2.2.5 Step 5: Calculate TBELs from the Effluent Guidelines

Once a permit writer has identified the effluent guidelines that apply to a facility, he or she then uses those effluent guidelines to calculate applicable TBELs.

EPA's regulations at § 122.45(f)(1) stipulate that all pollutants limited in permits must have limitations, standards or prohibitions expressed in terms of mass except under any of the following conditions:

- For pH, temperature, radiation, or other pollutants that cannot appropriately be expressed by mass limitations.
- When applicable standards or limitations are expressed in terms of other units of measure.
- If in establishing technology-based permit limitations on a case-by-case basis, limitations based on mass are infeasible because the mass or pollutant cannot be related to a measure of production (e.g., discharges of TSS from certain mining operations). The permit conditions must ensure that dilution will not be used as a substitute for treatment.

Thus, the type of limitation (i.e., mass, concentration, or other units) calculated for a specific pollutant at a facility will depend on the type of pollutant and the way limitations are expressed in the applicable effluent guideline. Generally, effluent guidelines include both maximum daily and monthly average limitations for most pollutants. Though the effluent guidelines use different terms for monthly effluent limitations (e.g., monthly average, maximum for monthly average, average of daily values for 30 consecutive days), the requirements are expressed in NPDES permits as average monthly limitations as defined in § 122.2.

As stated in Steps 1 and 2 above, the permit writer would use many sources of information to calculate TBELs. From those sources, the permit writer should identify the source and characteristics of the wastewaters (including flow) and pollutants being discharged, or that have the potential to be discharged, and whether and how those pollutants are regulated by effluent guidelines. In particular, the permit writer should identify the following:

- The appropriate permit compliance point(s) (which might be specified in the effluent guidelines).
- Wastewaters subject to the applicable effluent guidelines and whether they are commingled with other wastewaters not regulated by effluent guidelines (e.g., sanitary wastewaters before the permit compliance point).
- Reasonable measure of the facility's actual long-term daily production and average number of production days per year regulated by effluent guidelines (necessary for derived effluent limitations from production-normalized effluent guidelines).
- Average daily facility flows at the compliance point(s) regulated by effluent guidelines.
- Average daily facility flows at the compliance point(s) not regulated by effluent guidelines.

That information is used in conjunction with the effluent guidelines for TBEL calculations as discussed below.

Calculating Mass-based TBELs from Production-Normalized Effluent Guidelines

Most effluent guidelines requirements are mass-based and expressed in terms of allowable pollutant discharge per unit of production or some other measure of production (i.e., production normalized). Permit writers incorporate such production-normalized effluent guidelines into NPDES permits as mass-based TBELs by using a reasonable measure of the permittee's actual long-term daily production. The objective in determining the production for a facility is to develop a single estimate of the long-term average daily production that can reasonably be expected to prevail during the next term of the permit (i.e., not the design production rate). Permit writers may establish such a production rate using the past 3 to 5 years of facility data. For example, the permit writer might wish to use the average daily production rate calculated using the highest annual production from the previous 3 to 5 years. Whatever value is selected, the permit writer should ensure that the production rate used in deriving mass-based effluent limitations is representative of the actual production likely to prevail during the next term of the permit.

The examples in Exhibit 5-14 illustrate the application of production-based effluent guidelines using the approach where annual production data are available. In Example 1 in Exhibit 5-14, the highest annual production rate during the past 5 years was used as the estimate of production. If historical trends, market forces, company plans to decrease production, or plant designs and capital expenditures for an increase in production indicated that a different level of production would prevail during the permit term, the permit writer could consider a different basis for estimating production or establish tiered discharge limitations, as discussed in section 5.2.2.7 below.

Calculating Mass-based TBELs from Flow-Normalized Effluent Guidelines

In some cases, permit writers are directed to calculate mass-based TBELs from flow-normalized effluent guidelines that are expressed as concentrations. For example, the Organic Chemicals, Plastics, and Synthetic Fibers (OCPSF) effluent guidelines <www.epa.gov/waterscience/guide/ocpsf/> in Part 414 state that facilities "must achieve discharges not exceeding the quantity (mass) determined by multiplying the process wastewater flow subject to [the effluent guideline] times the concentration listed in the [effluent guideline]…" The *Development Document for Effluent Limitations Guidelines and Standards for the Organic Chemicals, Plastics and Synthetic Fibers Point Source Category*[5] <www.epa.gov/waterscience/guide/ocpsf/#guidance> directs the permit writer to "use a reasonable estimate of process wastewater discharges and the concentration limitations [in the effluent guideline] to develop mass limitations for the NPDES permit." Thus, the process for calculating the TBELs is similar to the process used with production-normalized effluent guidelines, but rather than using a reasonable measure of the actual daily production, the permit writer would use a reasonable measure of the actual daily flow rate as the basis for calculating the TBELs.

As with estimating production to calculate TBELs, the objective in determining a flow estimate for a facility is to develop a single estimate of the actual daily flow rate (in terms of volume of process wastewater per day), which can reasonably be expected to prevail during the next term of the permit (i.e., not the design flow rate). Permit writers can establish that flow rate using the past 3 to 5 years of facility data in a manner similar to the method used to determine production. For example, the permit writer might wish to use the highest average daily flow rate from the average daily flows calculated for each of the past 3 to 5 years. The value selected should be representative of the actual flow likely to prevail during the next term of the permit.

Exhibit 5-14 Example of calculating mass-based effluent limitation from production-normalized effluent guidelines[6]

Example 1

Facility A has produced 331,000 tons, 301,500 tons, 321,500 tons, 330,000 tons, and 331,500 tons of product per year for the previous 5 years operating 255 days per year.

Question:
What would be a reasonable measure of production for permitting purposes?

Answer:
Using the highest year of production (331,500 tons per year) might be an appropriate and reasonable measure of production, if this figure is representative of the actual production expected to occur over the next term of the permit. Permit writers also should check to see if the maximum yearly value is within a certain percentage (e.g., 20 percent–see section 5.2.2.7 below) of the average value. In evaluating gross production figures, the number of production days should be considered. If the number of production days per year is not comparable, the permit writer would need to convert the numbers to production per day before comparing them. In this example, all the yearly production figures were based on 255 days per year of production, so they may be compared directly. The 331,500 tons per year figure is the maximum for the past 5 years, which is only 2.6 percent above the average annual production of 323,100 tons. Therefore, 331,500 tons is a reasonable measure of the annual production for the facility.

Example 2

For the same facility in Example 1 above with an annual production of 331,500 tons, the production-normalized effluent guidelines for zinc are 0.1 lbs/1,000 lbs as monthly average and 0.15 lbs/1,000 lbs as daily maximum.

Question:
What are the resulting zinc technology-based effluent limitations for the NPDES permit?

Answer:
The annual production would be converted to an average daily production rate to apply the effluent guidelines. To convert from the annual production rate to an average daily rate, divide the annual production rate by the number of production days per year. To determine the number of production days, subtract the total number of normally scheduled non-production days from the total days in a year. Because Company A normally has 255 production days per year, the annual production rate of 331,500 tons per year would yield an average production daily rate of 1,300 tons per day.

Monthly average discharge limitation for zinc*:

1,300 tons/day	x	2,000 lbs/ton	x	0.10 lbs/1,000 lbs	=	**260 lbs/day**

Daily maximum discharge limitation for zinc*:

1,300 tons/day	x	2,000 lbs/ton	x	0.15 lbs/1,000 lbs	=	**390 lbs/day**

* calculated to 2 significant figures

Calculating TBELs from Concentration-based Effluent Guidelines

Permit writers might want to develop mass-based limitations for facilities with concentration-based effluent guidelines (e.g., for a facility does not have adequate water conservation practices). Mass-based permit effluent limitations encourage water conservation (e.g., minimize the potential for diluting process wastewaters by non-process wastewater, more efficient use of water) and pollution prevention (e.g., reduce waste loads to wastewater treatment facilities by physically collecting solid materials before using water to clean equipment and facilities). Additionally, for facilities with on-site wastewater treatment systems, the combination of water-reduction technologies and practices and well-operated wastewater treatment will reduce the volume and mass of discharged wastewater pollution (i.e., after treatment). Another benefit of mass-based permit effluent limitations is that they provide the permittee with more flexibility. Permittees may elect to control their wastewater discharges through more efficient wastewater control technologies and pollution-prevention practices that result in lower pollutant concentrations in the

discharged wastewater, or more efficient water conservation practices that result in less wastewater volume discharged from industrial operations), or both.

"EPA strongly supports water conservation and encourages all sectors, including municipal, industrial, and agricultural, to achieve efficient water use. EPA does not intend for its regulations to present a barrier to efficient water use in any industrial sector." See final 2006 Effluent Guidelines Program Plan in 71 FR 76655, December 21, 2006.

When calculating mass-based effluent limitations, the permit writer should use a conversion factor and document in the fact sheet the conversion factors used to calculate the permit limitations (e.g., concentration [mg/L] × flow [mgd] × 8.34 [conversion factor] = permit limitation [lbs/day]).

Additionally, guidance for implementing concentration-based limitations in effluent guidelines may direct permit writers to develop mass-based TBELs. For example, the *Permit Guidance Document Transportation Equipment Cleaning Point Source Category (40 CFR 442)*[7] industry states:

> The effluent limitations guidelines and standards for the TEC industry are concentration-based and adhere to the *building block* concept. Each regulated wastestream in an outfall is typically assigned a mass-based discharge allowance based on a calculation of its applicable concentration-based limitation and annual average flow. The sum of the allowances is the total mass discharge allowance for the outfall. In other words, the applicable permit limitations for facilities in more than one subcategory is the sum of the mass loadings based upon production in each subcategory and the respective subcategory effluent limitations guidelines. Mass-based limitations for unregulated or dilution wastewater streams at direct discharging facilities are established using [BPJ].

Where a permit writer cannot determine a reasonable measure of actual flow for a regulated discharge, concentration-based TBELs may be determined by directly applying the concentration-based limitations in effluent guidelines to the regulated flow and accounting for non-regulated flows at the point of compliance for the TBELs.

Supplementing Mass-based TBELs with Concentration Limitations

Even where effluent guidelines require permit writers to calculate mass-based TBELs, a permit writer may determine that it is beneficial to include concentration-based limitations to supplement the mass-based limitations. Where effluent limitations are expressed in terms of mass, a provision at § 122.45(f)(2) allows the permit writer, at his or her discretion, to express limitations in additional units (e.g., concentration units). Where limitations are expressed in more than one unit, the permittee must comply with both. The permit writer may determine that expressing limitations in terms of both concentration and mass encourages the proper operation of a treatment facility at all times.

Supplementing mass-based limitations with concentration-based limitations may be especially appropriate where the requirements in the effluent guidelines are flow-normalized (i.e., the effluent guidelines includes a concentration requirement but directs the permit writer to calculate a mass-based TBEL using the concentration requirement and the wastewater flow). The permit writer may determine that if the permit includes only mass-based limitations derived from the concentration-based limitations in the effluent guidelines, a permittee could increase its effluent pollutant concentrations above the applicable concentration requirements during low flow periods (i.e., reduce the efficiency of the wastewater

treatment) and still meet its mass-based permit limitations. Supplementing the mass-based TBELs with concentration limitations would discourage the reduction in treatment efficiency during low-flow periods and require proper operation of treatment units at all times.

Incorporating Narrative Requirements from Effluent Guidelines

The permit writer should also ensure that any applicable narrative effluent guidelines controls or requirements are included in the permit. For example, the effluent guidelines for Concentrated Aquatic Animal Production facilities (Part 451) consist of narrative requirements implemented through BMPs. Another example, related to monitoring and compliance rather than effluent limitations, is found in the Metal Finishing effluent guidelines. The effluent guidelines allow a facility to make a statement regarding total toxic organics (TTO) in lieu of monitoring for toxic organics. Exhibit 5-15 provides an example narrative requirement representing BPT performance standards for Concentrated Aquatic Animal Production facilities, Subpart A (flow through and recirculating systems) § 455.11(a).

Exhibit 5-15 Example narrative requirement from the Concentrated Aquatic Animal Production effluent guideline—Subpart A [§ 455.11(a)]

Except as provided in [§§] 125.30 through 125.32, any existing point source subject to this subpart must meet the following requirements, expressed as practices (or any modification to these requirements as determined by the permitting authority based on its exercise of its best professional judgment) representing the application of BPT:

(a) Solids control. The permittee must:

(1) Employ efficient feed management and feeding strategies that limit feed input to the minimum amount reasonably necessary to achieve production goals and sustain targeted rates of aquatic animal growth in order to minimize potential discharges of uneaten feed and waste products to waters of the [United States]

(2) In order to minimize the discharge of accumulated solids from settling ponds and basins and production systems, identify and implement procedures for routine cleaning of rearing units and off-line settling basins, and procedures to minimize any discharge of accumulated solids during the inventorying, grading and harvesting aquatic animals in the production system.

(3) Remove and dispose of aquatic animal mortalities properly on a regular basis to prevent discharge to waters of the [United States], except in cases where the permitting authority authorizes such discharge in order to benefit the aquatic environment.

5.2.2.6 Step 6: Account for Overlapping or Multiple Effluent Guidelines Requirements

There are instances when one facility includes both new and existing sources, produces multiple products or services, or includes production or services belonging to more than one category or subcategory. In such cases, the permit writer must examine the applicable effluent guidelines closely to ensure that (1) one guideline does not supersede another; and (2) the effluent guidelines are properly applied.

Superseding Effluent Guidelines

EPA tries to minimize the overlap of different effluent guidelines by providing exclusions in the applicability sections. The effluent guidelines in the Metal Finishing point source category (Part 433) are an example of where EPA has tried to minimize the overlap of multiple effluent guidelines for certain wastewater discharges. Exhibit 5-16 presents the applicability section in Part 433 [§ 433.10(b)], which specifically excludes certain wastewaters from the Metal Finishing effluent guidelines. Another example

is the preamble to the OCPSF effluent guidelines. The preamble identifies numerous circumstances where the OCPSF regulations are superseded by effluent guidelines for other industrial categories. Exhibit 5-17 presents excerpts from the preamble (52 FR 42523, November 5, 1987) to illustrate the point.

Exhibit 5-16 Exclusion of wastewaters in metal finishing effluent guidelines

In some cases, effluent limitations and standards for the following industrial categories might be effective and applicable to wastewater discharges from the metal finishing operations listed above [in paragraph (a)]. In such cases these Part 433 limitations shall not apply and the following regulations shall apply: [emphasis added]

- Nonferrous metal smelting and refining (40 CFR part 421)
- Coil coating (40 CFR Part 465)
- Porcelain enameling (40 CFR Part 466)
- Battery manufacturing (40 CFR Part 461)
- Iron and steel (40 CFR Part 420)
- Metal casting foundries (40 CFR Part 464)
- Aluminum forming (40 CFR Part 467)
- Copper forming (40 CFR Part 468)
- Plastic molding and forming (40 CFR Part 463)
- Nonferrous forming (40 CFR Part 471)
- Electrical and electronic components (40 CFR Part 469)

Exhibit 5-17 Excerpts from preamble to OCPSF effluent guidelines regarding applicability of effluent guidelines

- For the purposes of this regulation, OCPSF process wastewater discharges are defined as discharges from all establishments or portions of establishments that manufacture products or product groups listed in the applicability sections of this regulation, and are included within the following U.S. Department of Commerce Bureau of the Census Standard Industrial Classification (SIC) major groups:
  - SIC 2865: Cyclic Crudes and Intermediates, Dyes, and Organic Pigments.
  - SIC 2869: Industrial Organic Chemicals, not Elsewhere Classified.
  - SIC 2821: Plastic Materials, Synthetic Resins, and Nonvulcanizable Elastomers.
  - SIC 2823: Cellulosic Man-Made Fibers.
  - SIC 2824: Synthetic Organic Fibers, Except Cellulosic.

  The OCPSF regulation does not apply to process wastewater discharges from the manufacture of organic chemical compounds solely by extraction from plant and animal raw materials or by fermentation processes.
- The OCPSF regulation does not apply to discharges from OCPSF product/process operations [that] are covered by the provisions of other categorical industry effluent limitations guidelines and standards if the wastewater is treated in combination with the non-OCPSF industrial category regulated wastewater. (Different processes manufacture some products or product groups and some processes with slight operation condition variations give different products. EPA uses the term *product/process* to mean different variations of the same basic process to manufacture different products as well as to manufacture the same product using different processes.)
- The process wastewater discharges by petroleum refineries and pharmaceutical manufacturers from production of organic chemical products specifically covered by 40 CFR Part 419 Subparts C and E and Part 439 Subpart C, respectively, that are treated in combination with other petroleum refinery or pharmaceutical manufacturing wastewater, respectively, are not subject to the OCPSF regulation no matter what SIC code they use to report their products.
- Today's OCPSF category regulation applies to plastics molding and forming processes when plastic resin manufacturers mold or form crude intermediate plastic material for shipment off-site. The regulation also applies to the extrusion of fibers. Plastics molding and forming processes, other than those described above are regulated by the Plastics Molding and Forming effluent guidelines and standards (40 CFR Part 463).

Exhibit 5-17 Excerpts from preamble to OCPSF effluent guidelines regarding applicability of effluent guidelines (continued)

- Public comments requested guidance relating to the coverage of OCPSF research and development facilities, standalone OCPSF research and development, pilot plant, technical service, and laboratory bench scale-operations are not covered by the OCSPF regulation. However, wastewater from such operations conducted in conjunction with and related to existing OCPSF manufacturing operations at OCPSF facilities is covered by the OCPSF regulation because these operations would most likely generate wastewater with characteristics similar to the commercial manufacturing facility. Research and development, pilot plant technical service, and laboratory operations [that] are unrelated to existing OCPSF plant operations, even though conducted on-site, are not covered by the OCPSF regulation because they may generate wastewater with characteristic dissimilar to that from the commercial OCPSF manufacturing facility.
- Finally, as described in the following paragraphs, this regulation does not cover certain production that has historically been reported to the Bureau of Census under a non-OCPSF SIC subgroup heading, even if such production could be reported under one of the five SIC code groups covered by today's regulation.

Multiple Effluent Guidelines Requirements

NPDES permit writers often find that a facility employs multiple processes each with its own effluent guidelines requirement. In addition, sometimes effluent guidelines from multiple categories and subcategories apply to wastewaters for a single facility. When a facility is subject to effluent guidelines for two or more processes in a subcategory or to effluent guidelines from two or more categories or subcategories, the permit writer must apply each of the applicable effluent guidelines to derive TBELs. In applying multiple effluent guidelines, the permit writer should use measures of actual production or flow that are reasonable with respect to operation of multiple processes at the same time. For example, if maximum production for one process can occur only when there is reduced production for a second process, it might not be reasonable to assume maximum production levels for both processes at the same time when applying the effluent guidelines. If all wastewaters regulated by effluent guidelines are treated separately but are combined before the discharge, the permit writer may establish internal outfalls and separately apply the effluent guidelines at the respective internal outfall as discussed in § 122.45(h) and in Step 7 below.

More commonly, wastewater streams regulated by effluent guidelines are combined during or before treatment. In such a case, the permit writer combines the allowable pollutant loadings from each set of requirements or from each set of effluent guidelines to arrive at a single TBEL for the facility using a *building block* approach. The building block approach as applied to a facility with multiple processes in the Primary Tungsten subcategory of the Primary Nonferrous Metals Manufacturing point source category (Part 421, Subpart J) is presented in Exhibit 5-18. The same principles illustrated in the exhibit would apply to a facility with processes subject to requirements from multiple subcategories or categories that are combined before or during treatment.

Exhibit 5-18 Building block approach for applying effluent guidelines

A facility is subject to Part 421, Subpart J (Primary Tungsten). The facility uses a tungstic acid rinse, an acid leach wet air pollution control system, and an alkali leach wash in its manufacturing process.

The Maximum daily production rate for the facility is:
4.7 million pounds per day of Tungstic Acid (as W)
3.5 million pounds per day of Sodium Tungstate (as W)

Question:
What is the technology-based effluent limit for lead at the facility?

Answer:
BPT calculation for lead (§ 421.102):

a) **Tungstic acid rinse:**
(4.7 million lbs/day) × (17.230 lbs/million lbs) = 80.981 lbs/day

b) **Acid leach wet air pollution control:**
(4.7 million lbs/day) × (15.040 lbs/million lbs) = 70.688 lbs/day

c) **Alkali leach wash:**
(3.5 million lbs/day) × (0.000 lbs/million lbs) = 0.000 lbs/day

d) **Total allowable discharge** = 80.981 + 70.688 + 0.000 = 151.669 = **152 lbs/day**

BAT calculation for lead (§ 421.103):

a) **Tungstic acid rinse:**
(4.7 million lbs/day) × (11.490 lbs/million lbs) = 54.003 lbs/day

b) **Acid leach wet air pollution control:**
(4.7 million lbs/day) × (1.003 lbs/million lbs) = 4.7141 lbs/day

c) **Alkali leach wash:**
(3.5 million lbs/day) × (0.000 lbs/million lbs) = 0.000 lbs/day

d) **Total allowable discharge** = 54.003 + 4.7141 + 0.000 = 58.7171 = **59 lbs/day***

The technology-based maximum daily limitation for lead at the facility is the BAT limitation of **59 lbs/day**. That value is compared with the water quality-based effluent limitation for lead, to ensure that all applicable standards are implemented through the final effluent limitations.

* calculated to 2 significant figures

The building block approach is applied in other circumstances as well, such as

- **Mixture of mass-based and concentration-based requirements:** The limitations in effluent guidelines for some pollutants are mass-based, production-normalized limitations in some subparts and concentration-based limitations in other subparts. When all the wastewater streams go to the same treatment system, the permit writer would need to convert the concentration-based limitations to mass-based limitations so they could be combined with the mass-based, production-normalized limitations and applied to the combined wastewater streams.
- **Mixture of different concentration-based requirements:** Some facilities could have multiple operations that are each subject to different concentration-based requirements for the same pollutant but with wastewater streams that combine before treatment. In such a case, the permit writer can establish a flow-weighted concentration-based limitation as the TBEL for the combined wastewater streams or convert the concentration-based requirements to equivalent mass-based requirements using flow data and then combine the mass-based requirements into a single limitation for the combined wastewater streams.

- **Mixture of regulated and unregulated wastewater streams:** In some cases, wastewater streams containing a pollutant regulated by the applicable effluent guidelines requirements can combine with other wastewater streams that do not have effluent guidelines requirements that regulate the pollutant. In such a case, the permit writer could use BPJ to establish a TBEL for the unregulated wastewater stream(s) (see section 5.2.3 below) and, as appropriate, calculate a final TBEL for the combined wastewater streams. For example, if one of the wastewater streams contributing to an industrial facility's discharge is sanitary wastewater, the permit writer might use BPJ to apply the treatment standards for domestic wastewater and calculate BOD_5 limitations for that wastewater stream. The secondary treatment standards, discussed in section 5.1 above, could be used to calculate mass-based limits for the sanitary wastewater using the concentration-based requirements and an estimate of flow rate that is expected to represent the flow rate during the proposed permit term. A final TBEL for BOD_5 could be calculated for the combined sanitary and process wastewater streams by combining the two mass limitations using the building block approach.
- **Mixture of wastewater streams containing a pollutant with wastewater streams not containing the pollutant:** If a wastewater stream that does not contain a pollutant is combined with another wastewater stream that contains the pollutant (and has applicable requirements in the effluent guidelines or requirements determined by the permit writer using BPJ), the permit writer must ensure that the non-regulated waste stream does not dilute the regulated waste stream to the point where the pollutant is not analytically detectable. If that occurs, the permit writer will most likely need to establish internal outfalls, as allowed under § 122.45(h) and in Step 7 below.

For examples of addressing combined wastewater streams, see section 15.3.3 on page 15-10 of EPA's *Technical Development Document for the Final Effluent Limitations Guidelines and Standards for the Meat and Poultry Products Point Source Category (40 CFR 432)*[8] <www.epa.gov/waterscience/guide/mpp/final/tdd15.pdf>.

Facilities with Both New and Existing Sources

Finally, as noted above, if effluent guidelines are applicable to an existing facility, and that facility adds a new production line, which becomes a *new source*, the permit writer should calculate TBELs for the subsequent permit using BPT, BCT, and BAT standards for the existing production line and NSPS for the new production line, as discussed in section 5.2.2.4 above.

5.2.2.7 Step 7: Apply Additional Regulatory Considerations in Calculating TBELs

The permit writer must consider several additional requirements when deriving TBELs from effluent guidelines. Those additional requirements consist of evaluating or accounting for the following:

- Expected significant increases or decreases in production during the permit term for tiered discharger limitations.
- Internal outfalls.
- Requests for a variance from effluent guidelines.

The following sections provide an overview of those topics.

Tiered Discharge Limitations

If production rates are expected to change significantly during the life of the permit, the permit writer can include tiered (alternate) TBELs as allowed by § 122.45(b)(2)(ii)(A)(i). Tiered TBELs would apply to mass-based effluent limitations and would become effective when production or flow (or some other measure of production) exceeded a threshold value, such as during seasonal production variations. Generally, up to a 20 percent fluctuation in production is considered to be within the range of normal variability, while changes in production higher than 20 percent could warrant consideration of tiered limitations. Exhibit 5-19 illustrates application of tiered limitations.

Exhibit 5-19 Example of tiered discharge limitations

Plant B produced approximately 40 tons per day of product during spring and summer months (i.e., March through August) and 280 tons per day during fall and winter months during the previous 5 years. Production during the fall and winter months is significantly higher than during the off-season, and the discharger has made a plausible argument that production is expected to continue at that level. The effluent guidelines requirements for Pollutant Z are 0.08 lbs/1,000 lbs for the average monthly limitation and 0.14 lbs/1,000 lbs for the maximum daily limitation.

Question:
What are appropriate tiered effluent limitations for Plant B?

Answer:
The first tier or lower limitations would be based on a production rate of 40 tons per day. The limitations would apply between March and August.

Monthly average limitation:
40 tons/day × 2,000 lbs/ton x 0.08 lbs/1,000 lbs = **6.4 lbs/day***

Daily maximum limitation:
40 tons/day × 2,000 lbs/ton x 0.14 lbs/1,000 lbs = 11.2 lbs/day = **11 lbs/day***

The second tier or higher limitations would be based on a production rate of 280 tons per day. Those limitations would apply between September and February.

Monthly average limitation:
280 tons/day × 2,000 lbs/ton x 0.08 lbs/1,000 lbs = 44.8 lbs/day = **45 lbs/day***

Daily maximum limitation
280 tons/day × 2,000 lbs/ton x 0.14 lbs/1,000 lbs = 78.4 lbs/day = **78 lbs/day***

* calculated to 2 significant figures

Permit writers should include tiered limitations in a permit only after careful consideration of production data and only when a substantial increase or decrease in production is likely to occur. In the example above, the lower limitations would be in effect when production was at low levels (March through August). During periods of significantly higher production (September through February), the higher limitations would be in effect. In addition, a tiered or alternate set of limitations might be appropriate in the case of special processes or product lines that operate during certain times only.

Permit writers could base thresholds for tiered limitations on an expected increase in production during the term of the permit that will continue through the duration of the permit term. For example, if a facility plans to add a process line and significantly expand production in year 3 of the permit term, the permit could specify a higher tier of limitations that go into effect when the facility reports reaching a production level specified in the permit.

Permit writers must detail in the permit the thresholds and time frames when each tier applies, measures of production, and special reporting requirements. Special reporting requirements include provisions such as the following:

- The facility notifying the permitting authority a specified number of business days before the month it expects to be operating at a higher level of production and the duration this level of production is expected to continue.
- The facility reporting, in the discharge monitoring report, the level of production and the limitation and standards applicable to that level.

A detailed discussion of the rationale and requirements for any tiered limitations should be provided in the fact sheet for the permit.

Internal Outfalls

The NPDES regulations at § 122.45(h) give NPDES permit writers the authority to identify internal outfalls when effluent limitations at the final outfall are impractical or infeasible. These internal compliance points might be necessary to ensure proper treatment of persistent, bioaccumulative, and toxic pollutants that are discharged in concentrations below analytic detection levels at the final effluent outfall or other pollutants that may be diluted by flows (e.g., cooling water) not containing the pollutant. Some effluent guidelines may *require* the use of internal outfalls unless the effluent limitations are adjusted based on the dilution ratio of the process wastewater to the wastewater flow at the compliance point. Examples of effluent guidelines with required internal compliance points include the Metal Finishing effluent guidelines (Part 433) and the Pulp, Paper, and Paperboard effluent guidelines (Part 430). Accordingly, the permit writer should identify any internal outfall monitoring that might be required by the applicable effluent guidelines and include monitoring requirements in the final permit.

Effluent Guidelines Variances

The CWA and federal regulations provide limited mechanisms for variances from requirements in effluent guidelines. An NPDES permit applicant must meet very specific data and variance application deadline requirements before a variance may be granted. A variance provides a unique exception to a particular requirement, and the permit writer should not expect to routinely receive variance requests. Nevertheless, the permit writer should be aware of the major types of variances and the basic requirements for each, because the permit writer will most likely be the person to conduct the initial reviews of such requests before submitting them for review to the State Director (if applicable) or to EPA.

Variance applications are submitted by the NPDES permit applicant and must be submitted before the close of the public comment period of the permit, except for Fundamentally Different Factors (FDF) variance requests, which must be requested by the NPDES permit applicant within 180 days of the effluent guidelines publication. The permit writer should consult § 124.62 for the specific procedures for decisions regarding various types of variances. Exhibit 5-20 lists the available variances from effluent guidelines.

Exhibit 5-20 Variances from effluent guidelines

Legislation (CWA section)	Type	Regulation (40 CFR)	Approval authority	Application deadline
301(g)	Nonconventional Pollutant	Part 125, Subpart F (Reserved)	EPA Region HQ delegated authority	During permit comment period
301(n)	Fundamentally Different Factors (FDF)	Part 125, Subpart D	EPA Region HQ delegated authority	180 days from the date the limitation or standard is published in the FR
—	Net Intake or Net/Gross	§ 122.45(g)	NPDES state or EPA Region in absence of approved state NPDES program	During permit comment period

The following paragraphs further discuss the variances listed in Exhibit 5-20 and the factors that are considered in a technical review of a variance request.

Nonconventional Pollutant—CWA Section 301(g) Variance

CWA section 301(g) and the regulations at § 122.21(m)(2) provide for a variance from new or revised BAT effluent guidelines for certain nonconventional pollutants because of local environmental factors, so long as the discharger demonstrates that it is meeting BPT and that the discharge does not prevent attainment of water quality standards and would not result in additional requirements on other point or nonpoint sources. The pollutants for which a facility may request a CWA section 301(g) variance are ammonia, chlorine, color, iron, and phenols (as measured by the colorimetric 4-aminoantipyrine [4AAP] method). The CWA also provides a process to petition to include additional pollutants on this list. Industries with facilities that have applied for CWA section 301(g) variances include Iron and Steel Manufacturing (Part 420), Steam Electric Power Generating (Part 423), Inorganic Chemicals Manufacturing (Part 415), Nonferrous Metals Manufacturing (Part 421), Aluminum Forming (Part 467), and Pesticides Chemicals (Part 455) facilities.

In addition to meeting the application deadline, the discharger must file a variance application that meets the following requirements:

- The proposed modified requirements must result in compliance with BPT and water quality standards of the receiving stream.
- No additional treatment will be required of other point or nonpoint source dischargers as a result of the variance approval.
- The modified requirements will not interfere with attainment or maintenance of water quality to protect public water supplies, or with protection and propagation of a balanced population of shellfish, fish, and wildfowl, and will allow recreational activities in and on the water.
- The modified requirements will not result in quantities of pollutants that can reasonably be anticipated to pose an unacceptable risk to human health or the environment, cause acute or chronic toxicity, or promote synergistic properties.

The permit writer should review the request to ensure that it complies with each of the requirements for this type of variance. This variance request can involve a great deal of water quality assessment, including aquatic toxicity, mixing zone and dilution model analysis, and possible site-specific criterion development. In addition, it might be necessary to assess many complex human health effects, including carcinogenicity, teratogenicity, mutagenicity, bioaccumulation, and synergistic propensities. Permit writers may use EPA's *Draft Technical Guidance Manual for the Regulations Promulgated Pursuant to Section 301(g) of the Clean Water Act of 1977 40 CFR Part 125 (Subpart F)* <www.epa.gov/npdes/pubs/owm0008.pdf> to assess a completed variance request.

Fundamentally Different Factors—FDF Variance

Alternative effluent limitations or standards different from the otherwise applicable requirements in effluent guidelines may be authorized by EPA if an individual facility is fundamentally different with respect to factors considered in establishing the limitations or standards otherwise applicable to that facility's industrial category. Such a modification is known as a *fundamentally different factors* (FDF) variance.

Facilities must submit all FDF variance applications to the appropriate Director, as defined at § 122.2, no later than 180 days from the date the limitations or standards are published in the FR [see CWA section 301(n)(2) and § 122.21(m)(1)(i)(B)(2)]. An FDF variance is not available to a new source subject to NSPS.

EPA regulations at Part 125, Subpart D, authorizing the EPA Regional Administrators to establish alternative limitations and standards, further detail the substantive criteria used to evaluate FDF variance requests for direct dischargers. The regulations at § 125.31(d) identify six factors that may be considered in determining if a facility is fundamentally different:

- Nature or quality of pollutants contained in the raw process wastewater.
- Volume of the process wastewater and effluent discharged.
- Non-water quality environmental impact of control and treatment of the raw wasteload.
- Energy requirements of the application of control and treatment technology.
- Age, size, land availability, and configurations of discharger's equipment or facilities as well as processes employed, process changes, and engineering aspects of the application of control technology.
- Cost of compliance with required control technology.

The Agency must determine whether, on the basis of one or more of those six factors, the facility in question is fundamentally different from the facilities and factors considered by EPA in developing the nationally applicable effluent guidelines. The regulation also lists four other factors that may not provide a basis for an FDF variance:

- Infeasibility of installation within the time allowed by the CWA.
- Assertion that the national limitations cannot be achieved with the appropriate waste treatment facilities installed (if the assertion is not based on one or more of the six FDF factors above).
- A discharger's ability to pay for the required water treatment.

- The impact of a discharge on local receiving water quality.

In addition, under § 125.31(b)(3), a request for limitations less stringent than the national limitation may be approved only if compliance with the national limitations would result in either of the following:

- Removal cost wholly out of proportion to the removal cost considered during development of the national limitations.
- Non-water quality environmental impact (including energy requirements) fundamentally more adverse than the impact considered during development of the national limitations.

The conditions for approval of a request to modify applicable pretreatment standards and factors considered are the same as those for direct dischargers.

The legislative history of CWA section 301(n) underscores the necessity for the FDF variance applicant to establish eligibility for the variance. EPA's regulations at § 125.32(b)(1) are explicit in imposing that burden on the applicant. The applicant must show that the factors relating to the discharge controlled by the applicant's permit, which are claimed to be fundamentally different are, in fact, fundamentally different from those factors considered by the EPA in establishing the applicable effluent guidelines. The pretreatment regulations incorporate a similar requirement at § 403.13(h)(9).

Intake Allowance or Net/Gross Variance

Some facilities might be unable to comply with effluent guidelines because of pollutants in their intake water. Under certain circumstances, the NPDES regulations allow credit for pollutants in intake water. Specifically, permit writers are authorized to grant net credits for the quantity of pollutants in the intake water where (1) the applicable effluent guidelines specify that the guidelines are to be applied on a net basis; or (2) the pollution control technology would, if properly installed and operated, meet applicable effluent guidelines without the pollutants in the intake waters. The following requirements are included in § 122.45(g) for establishing net limitations:

- Credit for conventional pollutants, such as BOD_5 or TSS, are only authorized where the constituents resulting in the effluent BOD_5 and the TSS are similar between the intake water and the discharge.
- Credit is authorized only up to the extent necessary to meet the applicable limitation or standard, with a maximum value equal to the influent concentration.
- Intake water must be taken from the same body of water into which the discharge is made.
- Net credits do not apply to the discharge of raw water clarifier sludge generated during the treatment of intake water.

Permit writers must include influent monitoring in the permit when this type of variance is granted.

Thermal Discharge—CWA Section 316(a) Variance

CWA section 316(a) and the regulations at § 122.21(m)(6) provide for variances from thermal effluent limitations in NPDES permits. EPA has only promulgated thermal limitations in effluent guidelines for two industrial sectors: Beet Sugar Processing Subcategory of the Sugar Processing Point Source Category (Part 409 Subpart A) and the Cement Manufacturing Point Source Category (Part 411, Subparts A and B).

Most thermal limitations are based on water quality standards, so most thermal variances actually are not true *technology-based* variances. Dischargers must apply for a thermal discharge variance with its permit application if the thermal effluent limitation is based on an effluent guideline or during the permit comment period if the thermal effluent limitation is based on a WQBEL.

Regulations for submitting and reviewing thermal discharge variance requests are promulgated at Part 125, Subpart H. The approval authority for a thermal discharge variance request is the state permitting authority or the EPA Region if there is no approved state NPDES program. Less stringent alternative thermal effluent limitations may be included in permits if the discharger properly demonstrates that such effluent limitations are more stringent than necessary to assure the protection and propagation of a balanced, indigenous community of shellfish, fish and wildlife in and on the body of water into which the discharge is made, taking into account the cumulative impact of its thermal discharge together with all other significant impacts on the species affected. Once a variance is granted, the discharger must still reapply for the variance each permit term. The majority of thermal variance requests are from power plants seeking relief from water-quality based effluent limitations.

Climate Change Considerations

Evaluation of requests for variances under CWA section 316(a) requires consideration of the change to the ambient water temperature because of an effluent discharge. The studies provided by applicants to support their requests frequently include historical thermal data for the receiving water. Permitting authorities should be aware that the effects of global climate change could alter the thermal profile of some receiving waters making the historical record of thermal conditions less representative of future conditions. Where appropriate, water quality models should take these potential changes into account.

5.2.2.8 Step 8: Apply Additional Requirements in Effluent Guidelines

The effluent guidelines could provide additional requirements for permit writers to consider when applying them in NPDES permits.

Industrial Stormwater

Industrial stormwater is sometimes regulated by effluent guidelines. In particular, effluent guidelines often regulate stormwater for industrial activities that are unsheltered (e.g., mining, outdoor processing, outside storage of product materials). Examples of contaminated stormwater regulated by effluent guidelines include the Concentrated Animal Feeding Operations (Part 412), Fertilizer Manufacturing (Part 418), Petroleum Refining (Part 419), Iron and Steel Manufacturing (Part 420), Pulp, Paper, and Paperboard (Part 430), Metal Products and Machinery (Part 438), and Ore Mining and Dressing (Part 440) point source categories. The permit writer should identify any specific stormwater controls that may be required by the applicable effluent guidelines accordingly.

Stormwater not regulated by effluent guidelines that is commingled with process wastewater will require the adjustment of the effluent limitations as discussed in Step 6 above. Section 2.3.2.3 of this manual provides additional information about stormwater discharges associated with industrial activities.

Identify the Analytical Methods for Measuring Compliance with TBELs

The permit writer should ensure that the permit specifies the use of the correct analytical methods for demonstrating compliance with TBELs derived from effluent guidelines. The effluent guidelines often require specific analytical methods. For example, the *General Definitions* section of the Meat and Poultry Products effluent guidelines [§ 432.2(l)] states, "The approved methods of analysis for the following six parameters [Ammonia (as N), BOD_5, Oil and Grease (O&G), O&G as hexane extractable material (HEM), Total Nitrogen, TSS] are found in Table 1B in [§] 136.3. The nitrate/nitrite part of total nitrogen may also be measured by EPA Method 300.0 (incorporated by reference, see § 432.5)." Section 8.3 of this manual provides additional information on analytical methods in the NPDES permitting process.

Documentation and Recordkeeping Requirements

Specific documentation and recordkeeping requirements (e.g., solvent management plans, BMP plans, alternative monitoring requirements) may be included in the applicable effluent guidelines. The permit writer should ensure that the documentation and recordkeeping requirements are included in the NPDES permit. For example, to use the alternative monitoring compliance method for controlling toxic organics in the Metal Finishing effluent guidelines, the NPDES permit applicant must not only make a certification statement (see Exhibit 5-15), but must also "submit a solvent management plan that specifies to the satisfaction of the permitting authority (or, in the case of indirect dischargers, the control authority) the toxic organic compounds used; the method of disposal used instead of dumping, such as reclamation, contract hauling, or incineration; and procedures for ensuring that toxic organics do not routinely spill or leak into the wastewater" as required by § 433.12(b). Other examples of such documentation and recordkeeping requirements include the BMP Plans used in the Oil and Gas Extraction (Part 435) and the Concentrated Aquatic Animal Production effluent guidelines (Part 451), the pollution prevention alternative in the Pesticide Chemicals effluent guidelines (Part 455), and alternative monitoring requirements (e.g., certification in lieu of monitoring for chloroform, in the Pulp, Paper, and Paperboard effluent guidelines (Part 430).

5.2.2.9 Step 9: Document the Application of Effluent Guidelines in the Fact Sheet

Permit writers need to document their application of effluent guidelines in the NPDES permit fact sheet. The permit writer should clearly identify the data and information used to determine the applicable effluent guidelines and how that information was used to derive effluent limitations for the permit. The information in the fact sheet should provide the NPDES permit applicant and the public a transparent, reproducible, and defensible description of how the NPDES permit properly incorporates effluent guidelines.

Similarly, permit writer should also document the rationale for concluding that there are no applicable effluent guidelines for a discharge or pollutant. In such cases, TBELs may be determined by the permit writer on a case-by-case basis as discussed in section 5.2.3 below.

5.2.3 Case-by-Case TBELs for Industrial Dischargers

As previously stated, § 125.3(a) indicates that technology-based treatment requirements under CWA section 301(b) represent the minimum level of control that must be imposed in an NPDES permit.

Where EPA-promulgated effluent guidelines are not applicable to a non-POTW discharge, such requirements are established on a case-by-case basis using BPJ.

5.2.3.1 Legal Authority to Establish Case-by-Case TBELs

Case-by-case TBELs are developed pursuant to CWA section 402(a)(1), which authorizes the EPA Administrator to issue a permit that will meet either all applicable requirements developed under the authority of other sections of the CWA (e.g., technology-based treatment standards, water quality standards, ocean discharge criteria) or, before taking the necessary implementing actions related to those requirements, "such conditions as the Administrator determines are necessary to carry out the provisions of this Act." The regulation at § 125.3(c)(2) specifically cites this section of the CWA, stating that technology-based treatment requirements may be imposed in a permit "on a case-by-case basis under section 402(a)(1) of the Act, to the extent that EPA-promulgated effluent limitations are inapplicable." Further, § 125.3(c)(3) indicates that "where promulgated effluent limitations guidelines only apply to certain aspects of the discharger's operation, or to certain pollutants, other aspects or activities are subject to regulation on a case-by-case basis to carry out the provisions of the Act." When establishing case-by-case effluent limitations using BPJ, the permit writer should cite in the fact sheet or statement of basis both the approach used to develop the limitations, which is discussed further below, and how the limitations carry out the intent and requirements of the CWA and the NPDES regulations.

5.2.3.2 Identifying the Need for Case-by-Case TBELs

As noted above, case-by-case TBELs are established in situations where EPA promulgated effluent guidelines are inapplicable. That includes situations such as the following:

- When EPA has not yet promulgated effluent guidelines for the point source category to which a facility belongs (e.g., a facility that produced distilled and blended liquors [SIC code 2085] and is part of the miscellaneous foods and beverages category, which does not now have any applicable effluent guidelines).
- When effluent guidelines are available for the industry category, but no effluent guidelines are available for the facility subcategory (e.g., discharges from coalbed methane wells are not now regulated by effluent guidelines; however, EPA considers the coalbed methane industrial sector as a potential new subcategory of the existing Oil and Gas Extraction point source category [Part 435] because of the similar industrial operations performed [i.e., drilling for natural gas extraction]).
- When effluent guidelines are available for the industry category but are not applicable to the NPDES permit applicant (e.g., facilities that do not perform the industrial operation triggering applicability of the effluent guidelines or do not meet the production or wastewater flow cutoff applicability thresholds of the effluent guidelines). For example, assume that the poultry slaughterhouse in Example 2 of Exhibit 5-13 above produces 50 million pounds of whole, halved, quarter or smaller meat cuts annually. In that case, any TBELs for the facility would be case-by-case limitations developed using BPJ because the facility is below the annual production threshold of 100 million pounds listed in the effluent guideline (Part 432, Subpart K).
- When effluent guidelines are available for the industry category, but no effluent guidelines requirements are available for the pollutant of concern (e.g., a facility is regulated by the effluent guidelines for Pesticide Chemicals [Part 455] but discharges a pesticide that is not regulated by

these effluent guidelines). The permit writer should make sure that the pollutant of concern is not already controlled by the effluent guidelines and was not considered by EPA when the Agency developed the effluent guidelines.

Generally, case-by-case limitations are appropriate when at least one of the conditions listed above applies and the pollutant is present, or expected to be present, in the discharge in amounts that can be treated or otherwise removed (e.g., implementation of pollution prevention measures). The resources listed in sections 5.2.2.2 above and 5.2.3.4 below will help the permit writer in making such determinations. For example, EPA's effluent guidelines planning support documents on EPA's Effluent Guidelines Biennial Plan Website <http://water.epa.gov/lawsregs/lawsguidance/cwa/304m/> identify facilities and industrial sectors that currently are not regulated by effluent guidelines.

5.2.3.3 Factors Considered When Developing Case-by-Case TBELs

The NPDES regulations at § 125.3(c)(2) require that permit writers developing case-by-case effluent limitations consider the following:

- The appropriate technology for the category class of point sources of which the applicant is a member, based on all available information.
- Any unique factors relating to the applicant.

The regulations also require that, in setting case-by-case limitations, the permit writer consider several specific factors established in § 125.3(d) to select a model treatment technology and derive effluent limitations on the basis of that treatment technology. That process and the factors considered by the permit writer are the same factors required to be considered by EPA in developing effluent guidelines and, therefore, are often referred to as the CWA section 304(b) factors. The factors are summarized below in Exhibit 5-21. The permit writer evaluates case-by-case limitations based on BPT, BCT, and BAT and uses the more stringent technology level of control for each pollutant of concern.

Exhibit 5-21 Summary of factors considered when developing case-by-case TBELs

For BPT requirements (all pollutants)
- The age of equipment and facilities involved*
- The process(es) employed*
- The engineering aspects of the application of various types of control techniques*
- Process changes*
- Non-water quality environmental impact including energy requirements*
- The total cost of application of technology in relation to the effluent reduction benefits to be achieved from such application

For BCT requirements (conventional pollutants)
- All items in the BPT requirements indicated by an asterisk (*) above
- The reasonableness of the relationship between the costs of attaining a reduction in effluent and the derived effluent reduction benefits
- The comparison of the cost and level of reduction of such pollutants from the discharge of POTWs to the cost and level of reduction of such pollutants from a class or category of industrial sources

For BAT requirements (toxic and non-conventional pollutants)
- All items in the BPT requirements indicated by an asterisk (*) above
- The cost of achieving such effluent reduction

The CWA also gives the permit writer the authority to consider process changes to evaluate case-by-case limitations. As previously stated, technology-based controls in NPDES permits are performance-based measures. EPA incorporates technology-based controls in NPDES permits that correspond to the application of an identified technology (including process changes) but does not require dischargers to install the identified technology. Therefore, EPA leaves to each facility the discretion to select the technology design or process changes necessary to meet the TBELs specified in the NPDES permit.

The permit writer might need to establish a monitoring-only requirement in the current NPDES permit to identify pollutants of concern and potential case-by-case limitations for the subsequent NPDES permit renewal.

5.2.3.4 Resources for Developing Case-by-Case TBELs

There are numerous resources for identifying candidates for model technologies or process changes and developing case-by-case TBELs using BPJ. Exhibit 5-22 lists some example references that permit writers can use to derive such limitations.

5.2.3.5 Statistical Considerations When Establishing Case-by-Case TBELs

The quality of the effluent from a treatment facility will normally vary over time. If, for example, BOD_5 data for a typical treatment plant were plotted against time, one would observe day-to-day variations of effluent concentrations. Some of that behavior can be described by constructing a frequency-concentration plot. From the plot, one could observe that for most of the time, BOD_5 concentrations are near some average value. Any treatment system can be described using the mean concentration of the parameter of interest (i.e., the long-term average) and the variance (or coefficient of variation) and by assuming a particular statistical distribution (usually lognormal).

When developing a case-by-case limitation, permit writers can use an approach consistent with the statistical approach EPA has used to develop effluent guidelines. Specifically, the maximum daily limitation could be calculated by multiplying the long-term average achievable by implementation of the model technology or process change by a daily variability factor determined from the statistical properties of a lognormal distribution. The average monthly limitation can be calculated similarly except that the variability factor corresponds to the distribution of monthly averages instead of daily concentration measurements. The daily variability factor is a statistical factor defined as the ratio of the estimated 99th percentile of a distribution of daily values divided by the mean of the distribution. Similarly, the monthly variability factor is typically defined as the estimated 95th percentile of the distribution of monthly averages divided by the mean of the distribution of monthly averages.

A modified delta-lognormal distribution could be fit to concentration data and variability factors computed for the facility distribution. The modified delta-lognormal distribution models the data as a mixture of measured values and observations recorded as values less than the detectable level. This distribution often is selected because the data for many analytes consist of such a mixture of measured values and results below the detectable level. The modified delta-lognormal distribution assumes that all non-detected results have a value equal to the detection limitations and that the detected values follow a lognormal distribution.

Exhibit 5-22 Tools for developing case-by-case TBELs using BPJ

Permit file information
- Current and previous NPDES application forms.
- Previous NPDES permit and fact sheet.
- Discharge monitoring reports.
- Compliance inspection reports.

Information from existing facilities and permits
- NPDES Individual and General Permits for other NPDES permits issued to facilities in the same region or state, or that include case-by-case limitations for the same pollutants.
- Toxicity reduction evaluations for selected industries.
- Other media permit files (e.g., Resource Conservation and Recovery Act [RCRA] permit applications and Spill Prevention Countermeasure and Control [SPCC] plans.
- ICIS-NPDES <https://icis.epa.gov/icis> data.
- Literature (e.g., technical journals and books).

Effluent guidelines development and planning information
- Industry experts within EPA headquarters, EPA Regions, and states <www.epa.gov/guide/contacts.html>.
- Development Documents, CWA section 308 questionnaires, screening and verification data, proposed and final regulations, contractor's reports, and project officer contacts <www.epa.gov/guide>.
- EPA's Technical Support Documents <http://water.epa.gov/lawsregs/lawsguidance/cwa/304m/> and records supporting EPA's biennial effluent guidelines program plans also provide additional useful information. In particular, such resources provide a sample of the current limitation and latest developments in industrial pollutant prevention, water conservation, and wastewater treatment. The Technical Support Documents also identify industrial sectors not currently regulated by effluent guidelines.

Statistical guidance
- Effluent Guidelines Technical Development Support Documents, such as the Development Document for Final Effluent Limitations Guidelines and Standards for the Iron and Steel Manufacturing Point Source Category <www.epa.gov/guide/>.

Economics guidance
- *Protocol and Workbook for Determining Economic Achievability for NPDES Permits*[9] <www.epa.gov/npdes/pubs/protocol_npdespermits.pdf> and <www.epa.gov/npdes/pubs/workbook_econ_permits.pdf>.
- *BCT Cost Test Guidance* <www.epa.gov/npdes/pubs/owm0009.pdf>.

Guidance for BMP-based limitations
- *Guidance Manual for Developing Best Management Practices (BMPs)*[10] <www.epa.gov/npdes/pubs/owm0274.pdf>.
- *Storm Water Management for Industrial Activities: Developing Pollution Prevention Plans and BMPs*[11] <www.epa.gov/npdes/pubs/contents_indguide.pdf>.
- National Menu of Stormwater Best Management Practices <www.epa.gov/npdes/stormwater/menuofbmps>.

For more details on EPA's use of statistical methods for developing effluent guidelines, refer to *Development Document for Final Effluent Limitations Guidelines and Standards for the Iron and Steel Manufacturing Point Source Category* <www.epa.gov/guide/ironsteel/reg/tdd.htm>.

5.2.3.6 Documenting Case-by-Case TBELs in the Permit Fact Sheet

Permit writers will need to document the development of case-by-case limitations in the NPDES permit fact sheet. The permit writer should clearly identify the data and information used in developing these effluent limitations and how that information was used. The permit writer also should document the rationale for concluding that there are no applicable effluent guidelines for the industrial wastewater or pollutant discharge. The information in the fact sheet should provide the NPDES permit applicant and the public a transparent, reproducible, and defensible description of how the BPJ limitations comply with the CWA and EPA regulations.

[1] U.S. Environmental Protection Agency. 1985. *Draft Guidance for NPDES Permits and Compliance Personnel—Secondary Treatment Redefinition.* U.S. Environmental Protection Agency. Office of Water Enforcement and Permits. Washington, DC.

[2] U.S. Environmental Protection Agency. 1994. *Amended Section 301(h) Technical Support Document*. EPA-842-B-94-007. U.S. Environmental Protection Agency. Office of Wetlands Oceans and Watersheds, Washington, DC.

[3] U.S. Environmental Protection Agency. 1977. *Interim Final Supplement for Pretreatment to the Development Document for the Petroleum Refining Industry Existing Point Source Category*, EPA-440-1-76-083A. Page 92. U.S. Environmental Protection Agency, Office of Water and Hazardous Materials, Washington, DC. Publication available on NEPIS Website <www.epa.gov/nscep/> as document 440176083A.

[4] Boornazian, Linda and Mary Smith. 2006. *New Source Dates for Direct and Indirect Dischargers*. U.S. Environmental Protection Agency, Office of Water Memorandum. September 28, 2006. <www.epa.gov/npdes/pubs/newsource_dates.pdf>.

[5] U.S. Environmental Protection Agency. 1987. *Development Document for Effluent Limitations Guidelines and Standards for the Organic Chemicals, Plastics and Synthetic Fibers Point Source Category*. EPA 440-1-87-009. Page IX-9. <www.epa.gov/waterscience/guide/ocpsf/#guidance>.

[6] Jordan, J.W. 1984. *Calculations of Production-Based Effluent Limits*. U.S. Environmental Protection Agency, Office of Water, Washington, DC. Memorandum, December 18, 1984. <www.epa.gov/npdes/pubs/owm0427.pdf>.

[7] U.S. Environmental Protection Agency. 2001. *Permit Guidance Document: Transportation Equipment Cleaning Point Source Category (40 CFR 442)*, p. 30. EPA-821-R-01-021. U.S. Environmental Protection Agency, Office of Water, Washington, DC. <www.epa.gov/waterscience/guide/teci/tecguid.pdf>.

[8] U.S. Environmental Protection Agency. 2004. *Technical Development Document for the Final Effluent Limitations Guidelines and Standards for the Meat and Poultry Products Point Source Category (40 CFR 432),* EPA-821-R-04-011. U.S. Environmental Protection Agency, Office of Water, Washington, DC. <www.epa.gov/waterscience/guide/mpp/final/tdd15.pdf>.

[9] Putnam, Hayes and Bartlett, Inc. 1982. *Protocol and Workbook for Determining Economic Achievability for National Pollutant Discharge Elimination System Permits*. U.S. Environmental Protection Agency, Permits Division, Washington, DC. <www.epa.gov/npdes/pubs/protocol_npdespermits.pdf.> and <www.epa.gov/npdes/pubs/workbook_econ_permits.pdf>

[10] U.S. Environmental Protection Agency. 1993. *Guidance Manual for Developing Best Management Practices (BMP)*. EPA 833-B-93-004. U.S. Environmental Protection Agency, Office of Water, Washington, DC. <www.epa.gov/npdes/pubs/owm0274.pdf>.

[11] U.S. Environmental Protection Agency. 1992. *Storm Water Management for Industrial Activities: Developing Pollution Prevention Plans and BMPs*. EPA 832-R-92-006. U.S. Environmental Protection Agency, Office of Water, Washington, DC. <www.epa.gov/npdes/pubs/contents_indguide.pdf>.

CHAPTER 6. Water Quality-Based Effluent Limitations

When drafting a National Pollutant Discharge Elimination System (NPDES) permit, a permit writer must consider the impact of the proposed discharge on the quality of the receiving water. Water quality goals for a waterbody are defined by state water quality standards. By analyzing the effect of a discharge on the receiving water, a permit writer could find that technology-based effluent limitations (TBELs) alone will not achieve the applicable water quality standards. In such cases, the Clean Water Act (CWA) and its implementing regulations require development of water quality-based effluent limitations (WQBELs). WQBELs help meet the CWA objective of restoring and maintaining the chemical, physical, and biological integrity of the nation's waters and the goal of water quality that provides for the protection and propagation of fish, shellfish, and wildlife and recreation in and on the water (*fishable/swimmable*).

WQBELs are designed to protect water quality by ensuring that water quality standards are met in the receiving water. On the basis of the requirements of Title 40 of the *Code of Federal Regulations* (CFR) 125.3(a), additional or more stringent effluent limitations and conditions, such as WQBELs, are imposed when TBELs are not sufficient to protect water quality. Exhibit 6-1 illustrates the relationship between TBELs and WQBELs in an NPDES permit, as well as the determination of final effluent limitations.

Exhibit 6-1 Developing effluent limitations

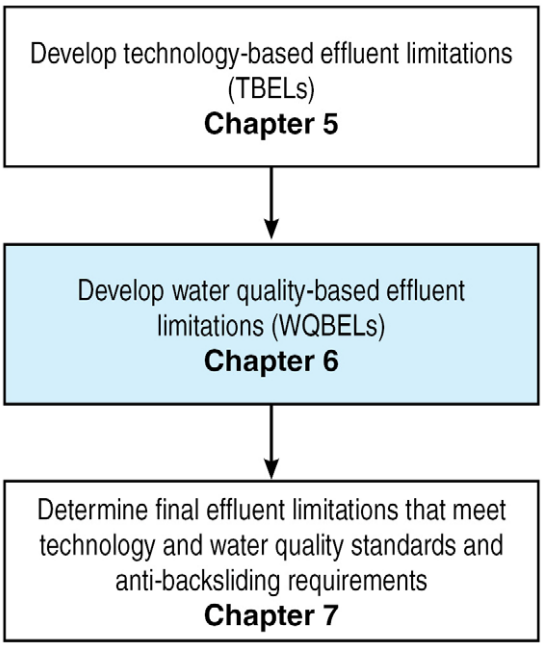

CWA section 301(b)(1)(C) requires that permits include any effluent limitations necessary to meet water quality standards. As illustrated above, to satisfy that requirement, permit writers implement a process to determine when existing effluent limitations (e.g., TBELs) and existing effluent quality are not sufficient to comply with water quality standards and to, where necessary, develop WQBELs. Exhibit 6-2 illustrates the four basic parts of the *standards-to-permits* process used to assess the need for and develop WQBELs.

After completing that process, the permit writer determines the final effluent limitations, includes any compliance schedules and interim effluent limitations, as appropriate, and documents all his or her decisions and calculations.

Exhibit 6-2 Standards-to-permits process

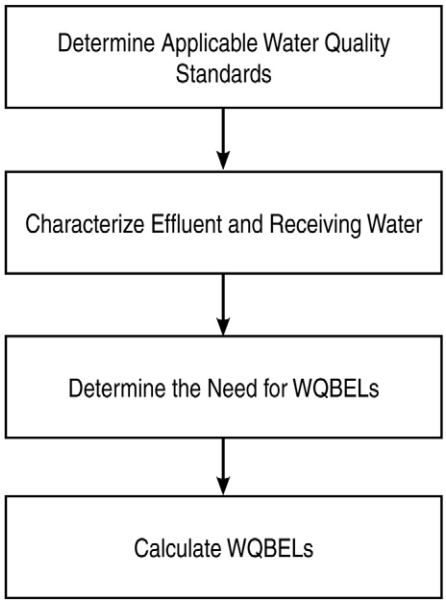

This chapter provides basic information on the standards-to-permits process. For more detailed information on water quality standards and water quality-based permitting, and some of the specific topics discussed in this chapter, refer to the NPDES Website <www.epa.gov/npdes> and Water Quality Standards Website <www.epa.gov/waterscience/standards>.

6.1 Determine Applicable Water Quality Standards

CWA section 303(c) and Part 131 establish the framework for water quality standards. The CWA and implementing regulations require states to develop and, from time to time, revise water quality standards applicable to waters of the United States, or segments of such waterbodies, that are in the jurisdiction of the state. States must review their water quality standards at least once every 3 years and revise them as appropriate. Wherever attainable, water quality standards should protect water quality that provides for the protection and propagation of fish, shellfish and wildlife, and recreation in and on the water (i.e., the CWA section 101(a)(2) *fishable/swimmable* goal). In establishing standards, states must consider the use and value of their waters for public water supplies, propagation of fish and wildlife, recreation, agriculture and industrial purposes, and navigation. The U.S. Environmental Protection Agency (EPA) has provided information regarding procedures for developing water quality standards in the Water Quality Standards Regulation at Part 131 and EPA's *Water Quality Standards Handbook: Second Edition*[1] <www.epa.gov/waterscience/library/wqstandards/handbook.pdf.> (hereafter *WQS Handbook*). Under CWA section 510, states may develop water quality standards that are more stringent than those required by the CWA.

EPA Regions review and approve or disapprove new and revised water quality standards adopted by states. The purpose of EPA's review is to ensure that the new and revised water quality standards meet the requirements of the CWA and the Water Quality Standards Regulation. Water quality standards adopted and submitted to EPA after May 30, 2000, must be approved by EPA before they may be used to implement the CWA (e.g., used in NPDES permitting). If an EPA Region disapproves a submitted new or revised state water quality standard, and the state does not adopt the necessary changes within 90 days of notification of the disapproval, EPA must promptly propose and promulgate a replacement standard [see § 131.22(a)].

When writing an NPDES permit, the permit writer must identify and use the state water quality standards in effect for CWA purposes. EPA maintains a compilation of current state water quality standards on the Water Quality Standards: State, Tribal, & Territorial Standards Website <www.epa.gov/waterscience/standards/wqslibrary/>. In addition, EPA's Water Quality Standards: Laws and Regulations Website <www.epa.gov/waterscience/standards/rules/> provides federally promulgated standards applicable to specific states. The remainder of this section provides permit writers with a general overview of water quality standards and how they are implemented in NPDES permits.

6.1.1 Components of Water Quality Standards

Water quality standards comprise three parts:

- Designated uses.
- Numeric and/or narrative water quality criteria.
- Antidegradation policy.

Each of those three components, along with general policies that also may be included in state water quality standards, is described below.

6.1.1.1 Designated Uses (§ 131.10)

The first part of a state's water quality standards is a classification system for waterbodies based on the expected uses of those waterbodies. The uses in this system are called *designated uses*. The regulations at § 131.10(a) describe various uses of waters that are considered desirable and that must be considered when establishing water quality standards. Those uses include public water supplies, propagation of fish, shellfish, and wildlife, recreation in and on the water, agricultural, industrial, and other purposes including navigation. The regulations allow states to designate more specific uses (e.g., cold water aquatic life) [see § 131.10(c)] or uses not specifically mentioned in the CWA, with the exception of waste transport and assimilation, which are not acceptable designated uses [see § 131.10(a)]. States must also consider and ensure the attainment and maintenance of the water quality standards of downstream waters when establishing designated uses [see § 131.10(b)].

The regulations in § 131.10(j) effectively establish a *rebuttable presumption* that the uses in CWA section 101(a)(2) (fishable/swimmable) are attainable. If a state fails to designate a given waterbody for such uses, or wishes to remove such uses, it must provide appropriate documentation demonstrating why such uses are not attainable. This analysis is commonly called a *Use Attainability Analysis* (UAA) (see § 131.3(g) and section 6.1.2.1 below).

6.1.1.2 Water Quality Criteria (§ 131.11)

The second part of a state's water quality standards is the set of water quality criteria sufficient to support the designated uses of each waterbody. EPA's Water Quality Standards Regulation at § 131.11(a) requires states to adopt water quality criteria using sound scientific rationale and to include sufficient parameters or constituents to protect the designated use. If a waterbody has multiple use designations, the criteria must support the most sensitive use. The regulation at § 131.11(b) allows states to adopt both numeric and narrative water quality criteria. Numeric water quality criteria are developed for specific parameters to protect aquatic life and human health and, in some cases, wildlife from the deleterious effects of pollutants. States establish narrative criteria where numeric criteria cannot be established, or to supplement numeric criteria. Criteria newly adopted or revised on or after May 30, 2000, do not become effective for purposes of the CWA until approved by EPA [see § 131.21(c)].

CWA section 304(a) directs EPA to develop, publish, and, from time to time, revise criteria for water quality accurately reflecting the latest scientific knowledge on the following:

- The kind and extent of all identifiable effects on health and welfare, including effects on aquatic life and recreational uses, that may be expected from the presence of pollutants in any body of water.
- The concentration and dispersal of pollutants or their byproducts through biological, physical, and chemical processes.
- The effects of pollutants on biological community diversity, productivity, and stability.

EPA's recommended criteria developed under CWA section 304(a) assist states in developing their water quality standards. EPA's numeric criteria are ambient levels of individual pollutants or parameters or they describe conditions of a waterbody that, if met, generally will protect the CWA section 101(a)(2) fishable and swimmable uses. EPA's recommended criteria developed under CWA section 304(a) do not reflect consideration of economic impacts or the technological feasibility of meeting the chemical concentrations in ambient water. EPA provides a table of the nationally recommended CWA section 304(a) criteria on the National Recommended Water Quality Criteria Website <www.epa.gov/waterscience/criteria/wqctable/>. The regulation at § 131.11(b)(1) indicates that, in establishing numeric criteria, states may (1) adopt EPA's recommended criteria published under CWA section 304(a), (2) adopt those criteria modified to reflect site-specific conditions, or (3) adopt criteria based on other scientifically defensible methods.

CWA section 303(c)(2)(B) specifically requires states to adopt numeric criteria for CWA section 307(a) toxic (priority) pollutants for which EPA has published recommended criteria if the discharge or presence of the pollutant can reasonably be expected to interfere with designated uses. Furthermore, § 131.11(a)(2) requires states to review water quality data and information on discharges to identify specific water bodies where toxic pollutants might be adversely affecting water quality or attainment of designated uses or where levels of toxic pollutants would warrant concern and to adopt criteria for such toxic pollutants applicable to the waterbody that are sufficient to protect the designated use. As discussed in section 1.2 and presented in Exhibit C-1 in Appendix C of this manual, the CWA section 307(a) list contains 65 compounds and families of compounds, which EPA has interpreted to include 126 toxic (priority) pollutants.

Numeric Criteria—Aquatic Life

Numeric criteria for the protection of aquatic life are designed to protect aquatic organisms, including both plants and animals. EPA's aquatic life criteria address both short-term (acute) and long-term (chronic) effects on both freshwater and saltwater species. Each of those criteria generally consists of three components:

- **Magnitude:** The level of pollutant (or pollutant parameter), usually expressed as a concentration, that is allowable.
- **Duration:** The period (averaging period) over which the in-stream concentration is averaged for comparison with criteria concentrations.
- **Frequency:** How often criteria may be exceeded.

Are criteria and effluent limitations expressed in the same terms?

Generally, criteria and effluent limitations are not expressed in the same terms. As discussed above, criteria are generally expressed as a magnitude, duration and frequency. Effluent limitations in NPDES permits are generally expressed as a magnitude (e.g., milligrams per liter, micrograms per liter) and an averaging period (e.g., maximum daily, average weekly, average monthly). A permit writer should be aware of the procedures used by his or her permitting authority to appropriately reflect the magnitude, duration, and frequency components of aquatic life criteria when determining the need for and calculating effluent limitations for NPDES permits. Typically, the components of the criteria are addressed in water quality models through the use of statistically derived receiving water and effluent flow values that ensure that criteria are met under *critical conditions* (see section 6.2 below).

Exhibit 6-3 is an example of freshwater aquatic life criteria for cadmium from the National Recommended Water Quality Criteria Website <www.epa.gov/waterscience/criteria/wqctable/> and at 66 FR 18935, April 12, 2001, Notice of Availability of 2001 Update: Aquatic Life Criteria Document for Cadmium <www.epa.gov/EPA-WATER/2001/April/Day-12/w9056.htm>.

Exhibit 6-3 Aquatic life criteria example: Cadmium (dissolved)

Except possibly where a locally important species is unusually sensitive, freshwater aquatic organisms and their uses should not be affected unacceptably if

Chronic criterion:
The 4-day average concentration (in micrograms per liter [µg/L]) does not exceed the numerical value given by $e^{(0.7409[\ln(\text{hardness})]-4.719)}$ (1.101672 – [(ln hardness)(0.041838)]) more than once every 3 years on average.

Acute criterion:
The 24-hour average concentration (in µg/L) does not exceed the numerical value given by $e^{(1.0166[\ln(\text{hardness})]-3.924)}$ (1.136672 – [(ln hardness)(0.041838)]) more than once every 3 years on average.

It is apparent that the acute and chronic aquatic life criteria for cadmium are not simply single numbers. Rather, they are expressed as a magnitude, a duration (4-day average or 24-hour average), and a frequency (not more than once every 3 years). Furthermore, the magnitude is expressed by a formula that is hardness-dependent, as is the case for most criteria for metals.

The magnitude of other aquatic life criteria can vary according to other conditions in the water or even based on the presence or absence of certain aquatic life. For example, EPA's 1999 recommended ammonia criteria vary according to pH, temperature, the presence or absence of salmonid species, and the presence or absence of early life stages of fish. A permit writer must be aware of the applicable criteria and any state regulations, policies, and procedures for interpreting numeric criteria and for implementing the criteria in NPDES permits. The durations of aquatic life criteria vary as well. For example, EPA's criteria recommendations for ammonia include a 30-day average chronic criterion. Also, many acute criteria for toxic pollutants are expressed as a 1-hour average. The frequency component of most aquatic life criteria specifies that they should be exceeded no more than once every three years.

Some states have adopted numeric criteria for nutrients as part of their water quality standards. EPA has developed nutrient criteria recommendations that are numeric values for both causative (phosphorus and nitrogen) and response (chlorophyll *a* and turbidity) variables associated with the prevention and assessment of eutrophic conditions. EPA's recommended nutrient criteria are different from most of its other recommended criteria, such as the criteria for cadmium and ammonia. First, EPA's recommended nutrient criteria are *ecoregional* rather than nationally applicable criteria, and they can be refined and localized using nutrient criteria technical guidance manuals. Second, the recommended nutrient criteria represent conditions of surface waters that have minimal impacts caused by human activities rather than values derived from laboratory toxicity testing. Third, the recommended nutrient criteria are do not include specific duration or frequency components; however, the ecoregional nutrient criteria documents indicate that states may adopt seasonal or annual averaging periods for nutrient criteria instead of the 1-hour, 24-hour, or 4-day average durations typical of aquatic life criteria for toxic pollutants. The ecoregional nutrient criteria documents, technical guidance manuals, and other information on EPA's nutrient criteria recommendations, are available on the Water Quality Criteria for Nitrogen and Phosphorus Pollution Website <www.epa.gov/waterscience/criteria/nutrient/>.

Water quality standards also typically include aquatic life criteria for parameters such as temperature and pH that are not chemical constituents. Criteria for pH generally are expressed as an acceptable pH range in the waterbody. Temperature criteria might be expressed as both *absolute temperature values* (e.g., temperature may not exceed 18 degrees Celsius [°C]) and restrictions on causing *changes in temperature* in the waterbody (e.g., discharges may not warm receiving waters by more than 0.5 °C).

In addition to criteria for individual pollutants or pollutant parameters, many states include in their water quality standards criteria for dissolved oxygen. Often, criteria for dissolved oxygen are addressed by modeling and limiting discharges of oxygen-demanding pollutants such as biochemical oxygen demand (BOD), chemical oxygen demand (COD), and nutrients (phosphorus and nitrogen).

Finally, states could also include in their water quality standards numeric criteria to address the effect of mixtures of pollutants. For example, whole effluent toxicity (WET) criteria protect the waterbody from the aggregate and synergistic toxic effects of a mixture of pollutants. WET is discussed in detail later in this chapter.

Numeric Criteria—Human Health

Human health criteria for toxic pollutants are designed to protect people from exposure resulting from consumption of fish or other aquatic organisms (e.g., mussels, crayfish) or from consumption of both water and aquatic organisms. These criteria express the highest concentrations of a pollutant that are not

expected to pose significant long-term risk to human health. Exhibit 6-4 is an example of human health criteria for dichlorobromomethane.

Exhibit 6-4 Human health criteria example: Dichlorobromomethane

For the protection of human health from the potential carcinogenic effects of dichlorobromomethane through ingestion of water and contaminated aquatic organisms, the ambient water criterion is determined to be 0.55 µg/L.
For the protection of human health from the potential carcinogenic effects of dichlorobromomethane through ingestion contaminated aquatic organisms alone, the ambient water criterion is determined to be 17 µg/L.
These values were calculated based on a national default freshwater/estuarine fish consumption rate of 17.5 grams per day.

Other criteria for protection of human health (e.g., bacteria criteria) consider a shorter-term exposure through uses of the waterbody such as contact recreation. EPA's current bacteria criteria recommendations use enterococci and *Escherichia coli* bacteria as indicators and include two components: a geometric mean value and a single sample maximum value. EPA has developed information on implementing those criteria in water quality standards on the Microbial (Pathogen) Water Quality Criteria Website <www.epa.gov/waterscience/criteria/humanhealth/microbial/>.

Other Numeric Criteria

In addition to aquatic life and human health criteria, some state water quality standards include other forms of numeric criteria, such as wildlife, sediment, and biocriteria.

Wildlife criteria are derived to establish ambient concentrations of chemicals that, if not exceeded, will protect mammals and birds from adverse impacts resulting from exposure to those chemicals through consumption of aquatic organisms and water. EPA established four numeric criteria to protect wildlife in the Great Lakes system in its *Final Water Quality Guidance for the Great Lakes System* <www.epa.gov/EPA-WATER/1995/March/Day-23/pr-82.html> (60 FR 15387, March 23, 1995).

In a healthy aquatic community, sediments provide a habitat for many living organisms. Controlling the concentration of pollutants in the sediment helps to protect bottom-dwelling species and prevents harmful toxins from moving up the food chain and accumulating in the tissue of animals at progressively higher levels. For more information on this topic, see EPA's Suspended and Bedded Sediments Website <www.epa.gov/waterscience/criteria/sediment/>.

The presence, condition and numbers of types of fish, insects, algae, plants, and other organisms are data that, together, provide direct, accurate information about the health of specific bodies of water. Biological criteria (biocriteria) are narrative or numeric expressions that describe the reference biological integrity (structure and function) of aquatic communities inhabiting waters of a given designated aquatic life use. Biocriteria are based on the numbers and kinds of organisms present and are regulatory-based biological measurements. They are used as a way of describing the qualities that must be present to support a desired condition in a waterbody, and they serve as the standard against which biological assessment results are compared. EPA's Biocriteria: Uses of Data in NPDES Permits Website <www.epa.gov/waterscience/biocriteria/watershed/npdes.html> provides more information on the use of bioassessment information.

Narrative Criteria

All states have adopted narrative water quality criteria to supplement numeric criteria. Narrative criteria are statements that describe the desired water quality goal for a waterbody. Narrative criteria, for example, might require that discharges be "free from toxics in toxic amounts" or be "free of objectionable color, odor, taste, and turbidity." Narrative criteria can be the basis for limiting specific pollutants for which the state does not have numeric criteria [§ 122.44(d)(1)(vi)] or they can be used as the basis for limiting toxicity using WET requirements where the toxicity has not yet been traced to a specific pollutant or pollutants [§ 122.44(d)(1)(v)]. For toxic pollutants, EPA's Water Quality Standards Regulation at § 131.11(a)(2) requires states to develop implementation procedures for toxics narrative criteria that address how the state intends to regulate point source discharges of toxic pollutants to water quality limited segments.

6.1.1.3 Antidegradation Policy (§ 131.12)

The third part of a state's water quality standards is its antidegradation policy. Each state is required to adopt an antidegradation policy consistent with EPA's antidegradation regulations at § 131.12. A state's antidegradation policy specifies the framework to be used in making decisions about proposed activities that will result in changes in water quality. Antidegradation policies can play a critical role in helping states protect the public resource of water whose quality is better than established criteria levels and ensure that decisions to allow reductions in water quality are made in a public manner and serve the public good. Along with developing an antidegradation policy, each state must identify the method it will use to implement the policy. It is important for permit writers to be familiar with their state's antidegradation policy and how that policy is to be implemented in NPDES permits.

A state's antidegradation policy provides three levels of protection from degradation of existing water quality:

- **Tier 1:** This tier requires that existing uses, and the level of water quality necessary to protect the existing uses, be maintained and protected.
- **Tier 2:** Where the quality of waters exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water (sometimes referred to as *high-quality waters*), Tier 2 requires that this level of water quality be maintained and protected unless the state finds, after full satisfaction of the intergovernmental coordination and public participation provisions of the state's continuing planning process, that allowing lower water quality is necessary to accommodate important economic or social development in the area where the waters are located. In allowing any such degradation or lower water quality, the state must assure water quality adequate to protect existing uses fully and must assure that there will be achieved the highest statutory and regulatory requirements for all new and existing point sources and all cost-effective and reasonable best management practices for nonpoint source control.
- **Tier 3:** This tier requires that the water quality of *outstanding national resources waters* (ONRWs) be maintained and protected.

States take a variety of approaches to implementing antidegradation policies. Some states designate their waters as Tier 1, Tier 2 (high-quality water) or Tier 3 waters in their antidegradation implementation methods, while others designate a waterbody as a Tier 2 or high-quality water only when activities that would degrade water quality are proposed. In some cases, states may have classified the waterbody as

receiving a tier of protection for all pollutant-related parameters, whereas in other cases, tiers of protection have been determined on a parameter-by-parameter basis.

6.1.1.4 General Policies (§ 131.13)

In addition to the three required components of water quality standards, states may, at their discretion, include in their standards policies that generally affect how the standards are applied or implemented. Examples of such policies include mixing zone policies, critical low flows at which criteria must be achieved, and the availability of variances. Some general policies are discussed in more detail later in this chapter. As with the other components of water quality standards, general policies are subject to EPA review and approval if they are deemed to be new or revised water quality standards (i.e., if they constitute a change to designated use(s), water quality criteria, antidegradation requirements, or any combination).

Additional and more detailed information on water quality standards is available in the WQS Handbook.

6.1.2 Water Quality Standards Modifications

Permit writers should be aware of several types of modifications to water quality standards that could permanently or temporarily change the standards and, thus, change the fundamental basis of WQBELs. Those modifications, described below, are as follows:

- Designated use reclassification.
- Site-specific water quality criteria modification.
- Water quality standard variance.

6.1.2.1 Designated Use Reclassification

Once a use has been designated for a particular waterbody or segment, that use may not be removed from the water quality standards except under specific conditions. To remove a designated use, the state demonstrates that attaining that use is not feasible because of any one of the six factors listed in § 131.10(g). The regulations at § 131.10(j) specifically require a state to conduct a UAA if the designated uses for a waterbody do not include the uses in CWA section 101(a)(2) (i.e., fishable/swimmable uses); if the state wishes to remove designated uses included in CWA section 101(a)(2) from its water quality standards; or if the state wishes to adopt subcategories of CWA section 101(a)(2) uses with less stringent criteria. The WQS Handbook discusses UAAs and removing designated uses in detail. Reclassifying a waterbody's designated uses, as supported by a UAA, is a permanent change to both the designated use(s) and the water quality criteria associated with that (those) use(s).

States may conduct a UAA and remove a designated use but not if it is an existing use. Existing uses are defined in § 131.3 as those uses actually attained in the waterbody on or after November 28, 1975 (the date of EPA's initial water quality standards regulation at 40 *Federal Register* 55334, November 28, 1975). At a minimum, uses are deemed attainable if they can be achieved by the implementing effluent limits required under CWA sections 301(b) and 306 and by implementing cost effective and reasonable best management practices (BMPs) for nonpoint source control. EPA's Water Quality Standards: UAA Website <www.epa.gov/waterscience/standards/uses/uaa/index.htm> provides additional information and some example UAAs.

6.1.2.2 Site-Specific Water Quality Criteria Modification

As noted above, CWA sections 303(a)–(c) require states to adopt water quality criteria sufficient to protect applicable designated uses. In some cases, a state might find that the criteria it has adopted to protect a waterbody or segment of a waterbody do not adequately account for site-specific conditions. In such cases, states have the option of modifying water quality criteria on a site-specific basis. Setting site-specific criteria might be appropriate where, for example, a state has adopted EPA's CWA section 304(a) criteria recommendations and finds that physical or chemical properties of the water at a site affect the bioavailability or toxicity of a chemical, or the types of local aquatic organisms differ significantly from those actually tested in developing the EPA-recommended criteria. Site-specific criteria modifications change water quality criteria permanently while continuing to support the current designated uses.

Development of site-specific criteria for aquatic life is discussed in section 3.7 of the WQS Handbook for cases when (1) there might be relevant differences in the toxicity of the chemical in the water at the site and laboratory dilution water (Water-Effect Ratio Procedure) and (2). the species at the site are more or less sensitive than those used in developing the natural criteria (Species Recalculation Procedure). EPA's Office of Science and Technology (OST) has developed the Interim Guidance on Determination and Use of Water-Effect Ratios for Metals <www.epa.gov/waterscience/standards/handbook/handbookappxL.pdf> in Appendix L of the WQS Handbook and the *Streamlined Water-Effect Ratio Procedure for Discharges of Copper*[2] <www.epa.gov/waterscience/criteria/copper/copper.pdf>. In addition, pages 90-97 of Appendix L provide guidance for using the Species Recalculation Procedure. States may also consider establishing aquatic life criteria based on *natural background* conditions. Further information can be found in the memo *Establishing Site Specific Aquatic Life Criteria Equal to Natural Background*[3] <www.epa.gov/waterscience/library/wqcriteria/naturalback.pdf>.

6.1.2.3 Water Quality Standard Variance

Water quality standard variances are changes to water quality standards and have similar substantive and procedural requirements as what are required to remove a designated use. Unlike use removal, variances are time-limited and do not permanently remove the current designated use of a waterbody. Variances are usually discharger- and pollutant-specific, though some states have adopted *general variances*. Where a state has adopted a general variance, the analyses necessary for the variance have been completed on a watershed-wide or statewide basis and, therefore, the process of obtaining a variance is simplified for individual dischargers in that watershed or state.

A variance might be appropriate where the state believes that the existing standards are ultimately attainable and that, by retaining the existing standards rather than changing them, the state would ensure that further progress is made in improving the water quality toward attaining the designated uses while the variance is in effect. State-adopted variances have been approved by EPA where, among other things, the state's standards allow variances and the state demonstrates that meeting the applicable criteria is not feasible on the basis of one or more of the factors outlined in § 131.10(g). A variance typically is granted for a specified period and must be reevaluated at least once every 3 years as reasonable progress is made toward meeting the standards [see section 5.3 of the WQS Handbook and § 131.20(a)].

Modifications of water quality standards could affect effluent limitations in permits in several ways. Specifically, the modifications can change the fundamental basis for WQBELs, potentially affecting an assessment of the need for WQBELs and possibly resulting in either more or less stringent WQBELs than

would otherwise be required. It is the permit writer's responsibility to ensure that any EPA-approved modification of water quality standards is properly reflected in an affected NPDES permit.

6.1.3 Water Quality Standards Implementation

As previously noted, CWA section 301(b)(1)(C) requires NPDES permits to establish effluent limitations as necessary to meet water quality standards. Effluent limitations and other conditions in NPDES permits may be based on a parameter-specific approach or a WET testing approach to implementing water quality standards. A third approach to implementing water quality standards, using biocriteria or bioassessment, is not directly accomplished through NPDES permit effluent limitations but can lead to effluent limitations for specific parameters or for WET. Each of those approaches to implementing water quality standards is discussed briefly below.

What procedures should permit writers use to implement water quality standards?

The terminology used and procedures described in this manual when discussing both assessing the need for and calculating WQBELs are based on the procedures in EPA's *Technical Support Document for Water Quality-Based Toxics Control*[4] <www.epa.gov/npdes/pubs/owm0264.pdf> (hereafter *TSD*). Those procedures were developed specifically to address toxic pollutants but have been appropriately used to address a number of conventional and nonconventional pollutants as well. Permit writers should be aware that most permitting authorities have developed their own terminology and procedures for water quality-based permitting, often derived from, but with variations on, EPA's guidance. For example, EPA itself promulgated *Final Water Quality Guidance for the Great Lakes System* (60 FR 15387, March 23, 1995) with minimum water quality criteria, antidegradation policies, and implementation procedures, including permitting procedures based on the TSD. Under the CWA, Illinois, Indiana, Michigan, Minnesota, New York, Ohio, Pennsylvania, and Wisconsin were required to adopt procedures for the Great Lakes system that are consistent with that guidance. Permit writers should always consult the applicable permitting regulations, policy, and guidance for the approved water quality-based permitting procedures in their state.

6.1.3.1 Parameter-Specific Approach

The parameter-specific approach uses parameter-specific criteria for protection of aquatic life, human health, wildlife, and sediments, as well as any other parameter-specific criteria adopted into a state's water quality standards. The criteria are the basis for analyzing an effluent, deciding which parameters need controls, and deriving effluent limitations that will control those parameters to the extent necessary to achieve water quality standards in the receiving water. Parameter-specific WQBELs in NPDES permits involve a site-specific evaluation of the discharge (or proposed discharge) and its potential effect on the receiving water or an evaluation of the effects of multiple sources of a pollutant on the receiving water (e.g., through a total maximum daily load [TMDL] analysis). The parameter-specific approach allows for controlling individual parameters, (e.g., copper, BOD, total phosphorus) before a water quality impact has occurred or for helping return water quality to a level that will meet designated uses.

6.1.3.2 Whole Effluent Toxicity (WET) Approach

WET requirements in NPDES permits protect aquatic life from the aggregate toxic effect of a mixture of pollutants in the effluent. WET tests measure the degree of response of exposed aquatic test organisms to an effluent. The WET approach is useful for complex effluents where it might be infeasible to identify

and regulate all toxic pollutants in the effluent or where parameter-specific effluent limitations are set, but the combined effects of multiple pollutants are suspected to be problematic. The WET approach allows a permit writer to implement numeric criteria for toxicity included in a state's water quality standards or to be protective of a narrative "no toxics in toxic amounts" criterion. Like the parameter-specific approach, the WET approach allows permitting authorities to control toxicity in effluents before toxic impacts occur or may be used to help return water quality to a level that will meet designated uses.

6.1.3.3 Bioassessment Approach

The biocriteria approach is used to assess the overall biological integrity of an aquatic community. As discussed in section 6.1.1.2 above, biocriteria are numeric values or narrative statements that describe the biological integrity of aquatic communities inhabiting waters of a given designated aquatic life use. When incorporated into state water quality standards, biocriteria and aquatic life use designations serve as direct endpoints for determining aquatic life use attainment. Once biocriteria are developed, the biological condition of a waterbody can be measured through a biological assessment, or bioassessment.

A bioassessment is an evaluation of the biological condition of a waterbody using biological surveys and other direct measurements of resident biota in surface waters. A biological survey, or biosurvey, consists of collecting, processing, and analyzing representative portions of a resident aquatic community to determine the community structure and function. The results of biosurveys can be compared to the reference waterbody to determine if the biocriteria for the designated use of the waterbody are being met. EPA issued guidance on this approach in *Biological Criteria: National Program Guidance for Surface Waters*[5] <www.epa.gov/bioindicators/html/biolcont.html>. As previously discussed, biocriteria generally are not directly implemented through NPDES permits but could be used in assessing whether a waterbody is attaining water quality standards. Nonattainment of biocriteria could lead to parameter-specific effluent limitations where the permitting authority is able to identify specific pollutant(s) and source(s) contributing to that nonattainment (see EPA's Biocriteria: Uses of Data – Identify Stressors to a Waterbody Website <www.epa.gov/waterscience/biocriteria/uses/stressors.html>) or could lead to WET limitations where the permitting authority identifies sources of toxicity to aquatic life. EPA's Biocriteria: Uses of Data - NPDES <www.epa.gov/waterscience/biocriteria/watershed/npdes.html> provides examples on the use of bioassessment information in the NPDES permitting process.

Sections 6.2–6.4 below discuss, in detail, implementing water quality standards using the parameter-specific approach to assess the need for and develop effluent limitations in NPDES permits. Section 6.5 below provides additional detail on WET requirements in NPDES permits.

6.2 Characterize the Effluent and the Receiving Water

After identifying the most current, approved, water quality standards that apply to a waterbody, a permit writer should characterize both the effluent discharged by the facility being permitted and the receiving water for that discharge. The permit writer uses the information from those characterizations to determine whether WQBELs are required (section 6.3 below) and, if so, to calculate WQBELs (section 6.4 below). Characterizing the effluent and receiving water can be divided into five steps as shown in Exhibit 6-5 and discussed in detail below.

Exhibit 6-5 Steps for characterizing the effluent and receiving water

Step 1.	Identify pollutants of concern in the effluent
Step 2.	Determine whether water quality standards provide for consideration of a dilution allowance or mixing zone
Step 3.	Select an approach to model effluent and receiving water interactions
Step 4.	Identify effluent and receiving water critical conditions
Step 5.	Establish an appropriate dilution allowance or mixing zone

6.2.1 Step 1: Identify Pollutants of Concern in the Effluent

There are several sources of information for and methods of identifying pollutants of concern for WQBEL development. For some pollutants of concern, the permit writer might not need to conduct any further analysis and could, after characterizing the effluent and receiving water, proceed directly to developing WQBELs (section 6.4 below). For other pollutants of concern, the permit writer uses the information from the effluent and receiving water characterization to assess the need for WQBELs (section 6.3 below). The following subsections identify five categories of pollutants of concern for WQBEL development.

6.2.1.1 Pollutants with Applicable TBELs

One category of pollutants of concern includes those pollutants for which the permit writer has developed TBELs based on national or state technology standards or on a case-by-case basis using best professional judgment. By developing TBELs for a pollutant, the permit writer has already determined that there will be some type of final limitations for that pollutant in the permit and must then determine whether more stringent limitations than the applicable TBELs are needed to prevent an excursion above water quality standards in the receiving water (see Exhibit 6-1 above). A permit writer can determine whether the TBELs are sufficiently protective by either proceeding to calculate WQBELs as described in section 6.4 below and comparing them to the TBELs or by assuming that the maximum daily TBEL calculated is the maximum discharge concentration in the water quality assessments described in section 6.3 below.

6.2.1.2 Pollutants with a Wasteload Allocation from a TMDL

Pollutants of concern include those pollutants for which a *wasteload allocation* (WLA) has been assigned to the discharge through a TMDL. Under CWA section 303(d), states are required to develop lists of impaired waters. Impaired waters are those that do not meet the water quality standards set for them, even after point sources of pollution have installed the minimum required levels of pollution control technology. The law requires that those jurisdictions establish priority rankings for waters on their CWA section 303(d) list and develop TMDLs for those waters.

What is a WLA?

The term WLA refers to the portion of a receiving water's loading capacity that is allocated to one of its existing or future point sources of pollution [see § 130.2(h)]. The WLA could be allocated through an EPA-approved TMDL, an EPA or state watershed loading analysis, or a facility-specific water quality modeling analysis.

A TMDL is a calculation of the maximum amount of a single pollutant that a waterbody can receive and still meet water quality standards and an allocation of that amount to the pollutant's sources. The portions of the TMDL assigned to point sources are WLAs, and the portions assigned to nonpoint sources and background concentrations of the pollutant are called *load allocations* (LAs). The calculation must include a margin of safety to ensure that the waterbody can be used for the purposes designated in the water quality standards, to provide for the uncertainty in predicting how well pollutant reduction will result in meeting water quality standards, and to account for seasonal variations. A TMDL might also include a reserve capacity to accommodate expanded or new discharges in the future. Exhibit 6-6 depicts the parts of a TMDL.

Exhibit 6-6 Parts of a TMDL

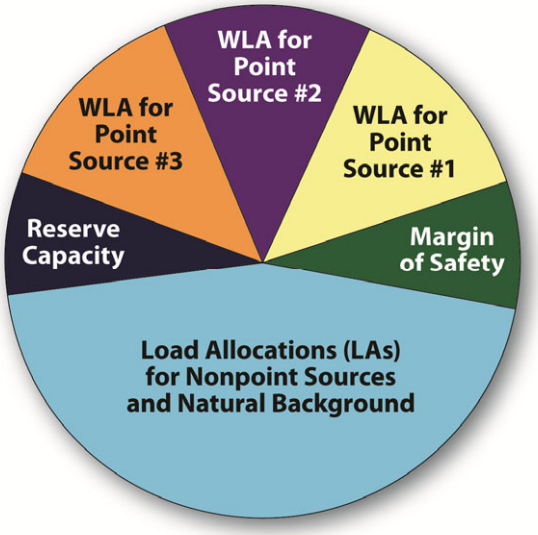

TMDL = ΣWLA + ΣLA + Margin of Safety + Reserve Capacity

The NPDES regulations at § 122.44(d)(1)(vii)(B) require that NPDES permits include effluent limitations developed consistent with the assumptions and requirements of any WLA that has been assigned to the discharge as part of an approved TMDL. Thus, any pollutant for which a WLA has been assigned to the permitted facility through a TMDL is a pollutant of concern.

Permit writers might also choose to consider any pollutant associated with an impairment of the receiving water a pollutant of concern, regardless of whether an approved TMDL has been developed for that pollutant, a WLA has been assigned to the permitted facility, or the permitted facility has demonstrated that the pollutant is present in its effluent. Permitting authorities might consider monitoring requirements to collect additional data related to the presence or absence of the impairing pollutant in a specific discharge to provide information for further analyses.

6.2.1.3 Pollutants Identified as Needing WQBELs in the Previous Permit

Another category of pollutants of concern includes those pollutants that were identified as needing WQBELs in the discharger's previous permit. Permit writers must determine whether the conditions leading to a decision to include WQBELs for the pollutant in the previous permit continue to apply. Where those conditions no longer apply, the permit writer would need to complete an anti-backsliding

analysis to determine whether to remove the WQBELs from the reissued permit. Chapter 7 of this manual provides additional information on anti-backsliding requirements of the CWA and NPDES regulations. In addition, the permit writer might need to conduct an antidegradation analysis if the revised limitation would allow degradation of the quality of the receiving water.

6.2.1.4 Pollutants Identified as Present in the Effluent through Monitoring

Pollutants of concern also include any pollutants identified as present in the effluent through effluent monitoring. Effluent monitoring data are reported in the discharger's NPDES permit application, discharge monitoring reports and special studies. In addition, the permitting authority might collect data itself through compliance inspection monitoring or other special study. Permit writers can match information on which pollutants are present in the effluent to the applicable water quality standards to identify parameters that are candidates for WQBELs.

6.2.1.5 Pollutants Otherwise Expected to be Present in the Discharge

A final category of pollutants of concern includes those pollutants that are not in one of the other categories but are otherwise expected to be present in the discharge. There might be pollutants for which neither the discharger nor the permitting authority have monitoring data but, because of the raw materials stored or used, products or by-products of the facility operation, or available data and information on similar facilities, the permit writer has a strong basis for expecting that the pollutant could be present in the discharge. Because there are no analytical data to verify the concentrations of these pollutants in the effluent, the permit writer must either postpone a quantitative analysis of the need for WQBELs and generate, or require the discharger to generate, effluent monitoring data, or base a determination of the need for WQBELs on other information, such as the effluent characteristics of a similar discharge. A discussion on determining the need for WQBELs without effluent monitoring data is provided in section 6.3.3 below.

6.2.2 Step 2: Determine Whether Water Quality Standards Provide for Consideration of a Dilution Allowance or Mixing Zone

Many state water quality standards have general provisions allowing some consideration of mixing of effluent and receiving water when determining the need for and calculating WQBELs. Depending on the state's water quality standards and implementation policy, such a mixing consideration could be expressed in the form of a *dilution allowance* or *regulatory mixing zone*. A dilution allowance typically is expressed as the flow of a river or stream, or a portion thereof. A regulatory mixing zone generally is expressed as a limited area or volume of water in any type of waterbody where initial dilution of a discharge takes place and within which the water quality standards allow certain water quality criteria to be exceeded. Section 6.2.5 below discusses dilution allowances and mixing zones in greater detail.

State water quality standards or implementation policies might indicate specific locations or conditions (e.g., breeding grounds for aquatic species or bathing beaches) or water quality criteria (e.g., pathogens, pH, bioaccumulative pollutants, or narrative criteria) for which consideration of a dilution allowance or mixing zone is not allowed or is otherwise considered inappropriate.

6.2.3 Step 3: Select an Approach to Model Effluent and Receiving Water Interactions

Where consideration of a dilution allowance or mixing zone is not permitted by the water quality standards or is not appropriate, the relevant water quality criterion must be attained at the point of discharge. In such cases, there is no need for a water quality model to characterize the interaction between the effluent and receiving water. In this situation effluent limitations are based on attaining water quality criteria at the "end of the pipe."

Where a dilution allowance or mixing zone is permitted, however, characterizing the interaction between the effluent and receiving water generally requires using a water quality model. In the majority of situations, and in all of the examples provided in this manual, permit writers will use a steady-state water quality model to assess the impact of a discharge on its receiving water. Steady-state means that the model projects the impact of the effluent on the receiving water under a single or *steady* set of design conditions. Because the model is run under a single set of conditions, those conditions generally are set at *critical conditions* for protection of receiving water quality as discussed in section 6.2.4 below. The permit writer would determine the amount of the dilution allowance or the size of the mixing zone that is available under these critical conditions as provided in section 6.2.5 below.

6.2.4 Step 4: Identify Effluent and Receiving Water Critical Conditions

Where steady-state models are used for water quality-based permitting, an important part of characterizing the effluent and receiving water is identifying the critical conditions needed as inputs to the water quality model. Permit writers should discuss selection of critical conditions with water quality modelers or other water quality specialists. Identifying the right critical conditions is important for appropriately applying a water quality model to assess the need for WQBELs and to calculate WQBELs. Some key effluent and receiving water critical conditions are summarized below.

What if I am not a water quality modeler?

Permit writers are not always water quality modelers, nor do they necessarily need to be experts in this field. Many permitting authorities have a team of water quality specialists who model point source discharges to provide data required for permit writers to assess the need for and develop WQBELs. In some cases, this team might even calculate WQBELs directly for the permit writers, who then only need to compare them to TBELs and determine the final effluent limitations for the NPDES permit. Permit writers should, at a minimum, familiarize themselves with water quality modeling concepts presented in this manual, particularly the identification of critical conditions input to a steady-state water quality model, and should consult water quality modelers or other water quality specialists as needed in the process of NPDES permit development.

6.2.4.1 Effluent Critical Conditions

In most any steady-state water quality model there will be at least two basic critical conditions related to the effluent: flow and pollutant concentration.

Effluent Flow

Effluent flow (designated Q_d in the water quality modeling equations used in this manual) is a critical design condition used when modeling the impact of an effluent discharge on its receiving water. A permit writer should be able to obtain effluent flow data from discharge monitoring reports or a permit application. Permitting authority policy or procedures might specify which flow measurement to use as the critical effluent flow value(s) in various water quality-based permitting calculations (e.g., the maximum daily flow reported on the permit application, the maximum of the monthly average flows from discharge monitoring reports for the past three years, the facility design flow). Permit writers should follow existing policy or procedures for determining critical effluent flow or, if the permitting authority does not specify how to determine this value, look at past permitting practices and strive for consistency.

Effluent Pollutant Concentration

Permit writers can determine the critical effluent concentration of the pollutant of concern (designated C_d) by gathering effluent data representative of the discharge. To establish the critical effluent pollutant concentration from the available data, EPA has recommended considering a concentration that represents something close to the maximum concentration of the pollutant that would be expected over time. In most cases, permit writers have a limited effluent data set and, therefore, would not have a high degree of certainty that the limited data would actually include the maximum potential effluent concentration of the pollutant of concern. In addition, the NPDES regulations at § 122.44(d)(1)(ii) require that permit writers consider the variability of the pollutant in the effluent when determining the need for WQBELs. To address those concerns, EPA developed guidance for permit writers on how to characterize effluent concentrations of certain types of pollutants using a limited data set and accounting for variability. This guidance is detailed in EPA's TSD.

By studying effluent data for numerous facilities, EPA determined that daily pollutant measurements of many pollutants follow a *lognormal distribution*. The TSD procedures allow permit writers to project a critical effluent concentration (e.g., the 99th or 95th percentile of a lognormal distribution of effluent concentrations) from a limited data set using statistical procedures based on the characteristics of the lognormal distribution. These procedures use the number of available effluent data points for the measured concentration of the pollutant and the coefficient of variation (or CV) of the data set, which is a measure of the variability of data around the average, to predict the critical pollutant concentration in the effluent. Exhibit 6-7 provides an example of a lognormal distribution of effluent pollutant concentrations and projection of a critical effluent pollutant concentration (C_d). For additional details regarding EPA's guidance, see Chapter 3 of the TSD. Many permitting authorities have developed procedures for estimating a critical effluent pollutant concentration that are based on or derived from those procedures. For pollutants with effluent concentrations that *do not* follow a lognormal distribution, permit writers would rely on alternative procedures developed by their permitting authority for determining the critical effluent pollutant concentration.

Exhibit 6-7 Example of lognormal distribution of effluent pollutant concentrations and projection of critical concentration (C_d)

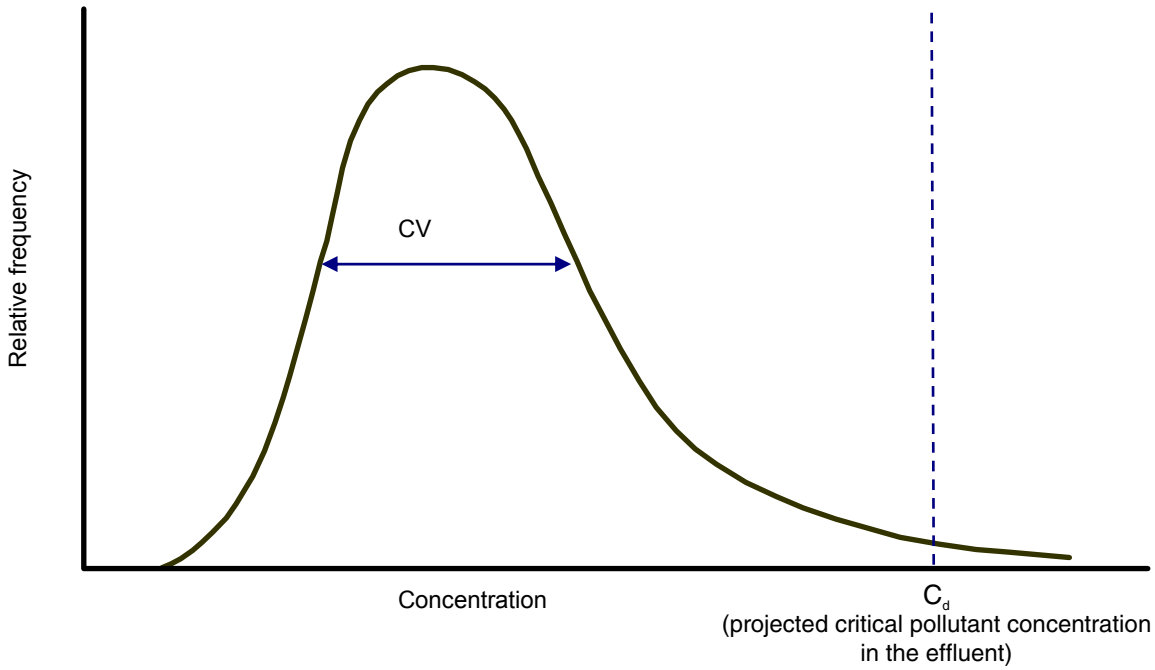

6.2.4.2 Receiving Water Critical Conditions

As with the effluent, flow (for rivers and streams) and pollutant concentration are receiving water critical conditions used in steady-state water quality models. In addition, depending on the waterbody and pollutant of concern, there could be additional receiving water characteristics that permit writers need to consider in a water quality model.

Receiving Water Upstream Flow

For rivers and streams, an important critical condition is the stream flow upstream of the discharge (designated Q_s). That critical condition generally is specified in the applicable water quality standards and reflects the duration and frequency components of the water quality criterion that is being addressed. For most pollutants and criteria, the critical flow in rivers and streams is some measure of the low flow of that river or stream; however, the critical condition could be different (for example, a high flow, where wet weather sources are a major problem). If a discharge is controlled so that it does not cause water quality criteria to be exceeded in the receiving water at the critical flow condition, the discharge controls should be protective and ensure that water quality criteria, and thus designated uses, are attained under all receiving water flow conditions.

Examples of typical critical hydrologically based low flows found in water quality standards include the 7Q10 (7-day average, once in 10 years) low flow for chronic aquatic life criteria, the 1Q10 low flow for acute aquatic life criteria, and the harmonic mean flow for human health criteria for toxic organic pollutants. The permit writer might examine stream flow data from the state or the U.S. Geological

Survey to determine the critical flow at a point upstream of the discharge. The permit writer might also account for any additional sources of flow or diversions between the point where a critical low flow has been calculated and the point of discharge. EPA also has developed a biologically based flow method that directly uses the durations and frequencies specified in the water quality criteria.

Climate Change Considerations

As noted in this section, the receiving water upstream flow is an important factor in modeling the interaction between the effluent discharge and a river or stream. In most instances, state water quality standards or implementation policies establish the critical low flows that should be used in modeling this interaction. The most common source of upstream flow data for water quality modelers is historical flow gage data available through the U.S. Geological Survey. Modelers should be aware that the effects of climate change could alter historical flow patterns in rivers and streams, making these historical flow records less accurate in predicting current and future critical flows. Where appropriate, water quality modelers should consider alternate approaches to establishing critical low flow conditions that account for these climatic changes.

Receiving Water Background Pollutant Concentration

In addition to determining the critical effluent concentration of the pollutant of concern, the permit writer also should determine the critical background concentration of the pollutant of concern in the receiving water before the discharge (designated C_s) to ensure that any pollutant limitations derived are protective of the designated uses. Permitting authority policies or procedures often address how to determine that critical background concentration value for the pollutant. For example, using ambient data or working with the discharger to obtain reliable ambient data, the permit writer might use the maximum measured background pollutant concentration or, perhaps, an average of measured concentrations as the critical condition. Ambient data will provide the most reliable characterization of receiving water background pollutant concentration. EPA encourages permitting authorities to collect and use actual ambient data, where possible. Where data are not available, however, the state might have other procedures, such as establishing that without valid and representative ambient data, no dilution or mixing will be allowed (i.e., criteria end-of-pipe), or using a percentage of an applicable water quality criterion or a detection, quantitation, or other reporting level. The permit writer should consult the permitting authority's policies and procedures or, if there are no policies or procedures available, look at past permitting practices and maintain consistency with those practices when determining the critical receiving water background concentrations.

Other Receiving Water Characteristics

For waterbodies other than free-flowing rivers and streams, there might be critical environmental conditions that apply rather than flow (e.g., tidal flux, temperature). In addition, depending on the pollutant of concern, the effects of biological activity and reaction chemistry might be important in assessing the impact of a discharge on the receiving water. In such situations, additional critical receiving water conditions that might be used in a steady-state water quality model include conditions such as pH, temperature, hardness, or reaction rates, and the presence or absence of certain fish species or life stages of aquatic organisms, to name a few.

Sections 6.3 and 6.4 below provide further discussion of how critical conditions are applied in a water quality model to determine the need for and calculate WQBELs.

6.2.5 Step 5: Establish an Appropriate Dilution Allowance or Mixing Zone

Following verification of whether the applicable water quality standards allow any consideration of effluent and receiving water mixing and, for a steady-state modeling approach, the critical conditions that apply to the effluent and receiving water, permit writers can determine how the effluent and the receiving water mix under critical conditions. Based on this determination, permit writers can then establish the maximum dilution allowance or mixing zone allowed by the water quality standards for each pollutant of concern.

6.2.5.1 Type of Mixing Under Critical Conditions

On the basis of requirements in the water quality standards, the dilution allowance or mixing zone used in water quality models and calculations are likely to vary depending on whether there is rapid and complete mixing or incomplete mixing of the effluent and receiving water under critical conditions. Thus, the permit writer needs to understand something about *how* the effluent and receiving water mix under critical conditions.

Rapid and complete mixing is mixing that occurs when the lateral variation in the concentration of a pollutant in the direct vicinity of the outfall is small. The applicable water quality standards might specify certain conditions under which a permit writer could *assume* that rapid and complete mixing is occurring, such as the presence of a diffuser. Some standards may also allow a *demonstration* of rapid and complete mixing in cases where the conditions for simply assuming rapid and complete mixing are not met. For example, the applicable water quality standards might specify a distance downstream of a discharge point by which the pollutant concentration across the stream width must vary by less than a certain percentage to assume that there is rapid and complete mixing.

If the permit writer cannot assume rapid and complete mixing and there has been no demonstration of rapid and complete mixing, the permit writer should assume that there is incomplete mixing. Under incomplete mix conditions, mixing occurs more slowly and higher concentrations of pollutants are present in-stream near the discharge as compared to rapid and complete mixing. Thus, an assumption of incomplete mixing is more conservative than an assumption of rapid and complete mixing. For waterbodies other than rivers and streams (e.g., lakes, bays, and the open ocean) the permit writer usually would assume incomplete mixing.

6.2.5.2 Maximum Dilution Allowance or Mixing Zone Size

Once a permit writer determines whether the applicable water quality standards allow consideration of some ambient dilution or mixing and determines the type of mixing taking place (rapid and complete mixing versus incomplete mixing), he or she would again consult the water quality standards to determine the maximum size of the dilution allowance or mixing zone that may be considered in water quality modeling calculations.

Dilution Allowances in Rapid and Complete Mix Situations

The maximum permissible dilution allowance for rivers and streams under conditions of rapid and complete mixing should be indicated in the water quality standards or standards implementation policy. For example, some water quality standards allow a permit writer to use up to 100 percent of the critical low flow of a river or stream as a dilution allowance in water quality models and calculations when there is rapid and complete mixing. In some cases, water quality standards implement a factor of safety by permitting only a percentage of the critical low flow to be used as a dilution allowance, even when there is rapid and complete mixing under critical conditions. Water quality standards might incorporate such a factor of safety to account for any uncertainty related to other conditions in the waterbody or to ensure that some assimilative capacity is retained downstream of the discharge being permitted. Recall as well that for some pollutants (e.g., pathogens in waters designated for primary contact recreation, bioaccumulative pollutants), the water quality standards or implementing procedures might not authorize any dilution allowance, even where the effluent and receiving water mix rapidly and completely.

Dilution Allowances and Regulatory Mixing Zones in Incomplete Mix Situations

In an incomplete mixing situation, the water quality standards or implementation policies might allow some consideration of ambient dilution. Rather than permitting as much as 100 percent of the critical low flow as a dilution allowance, however, they will likely specify either a limited dilution allowance (such as a percentage of the critical low flow) or the maximum size of a regulatory mixing zone. A regulatory *mixing zone* is a limited area or volume of water where initial dilution of a discharge takes place and within which the water quality standards allow certain water quality criteria to be exceeded. While the criteria may be exceeded within the mixing zone, the use and size of the mixing zone must be limited such that the waterbody as a whole will not be impaired and such that all designated uses are maintained as discussed in section 6.2.5.3 below. Exhibit 6-8 is a diagram illustrating the concept of a regulatory mixing zone. The mixing zone often is a simple geometric shape inside of which a water quality criterion may be exceeded. The geometric shape does not characterize how mixing actually occurs. Actual mixing is described using field studies and a water quality model.

Exhibit 6-8 Regulatory mixing zones for aquatic life criteria

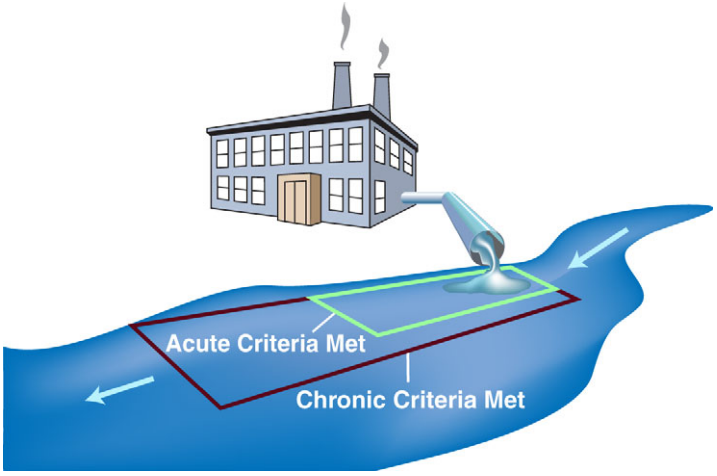

Note that Exhibit 6-8 above illustrates two different mixing zones, one for an acute aquatic life criterion and one for a chronic aquatic life criterion. The water quality standards could specify different maximum mixing zones sizes for different pollutants, different types of criteria, and different waterbody types. Exhibit 6-9 provides examples of different maximum mixing zone sizes and dilution allowances.

Exhibit 6-9 Examples of maximum mixing zone sizes or dilution allowances under incomplete mixing conditions by waterbody type*

For rivers and streams:
- Mixing zones cannot be larger than 1/4 of the stream width and 1/4 mile downstream
- Mixing must be less than 1/2 stream width with a longitudinal limit of 5 times the stream width
- Dilution cannot be greater than 1/3 of the critical low flow

For lakes and the ocean:
- Mixing zones for lakes cannot be larger than 5% of the lake surface
- A maximum of 4:1 dilution is available for lake discharges
- A maximum of 10:1 dilution is available for ocean discharges
- The maximum size mixing zone for the ocean is a 100-foot radius from the point of discharge

* Examples were adapted from state standards and procedures and do not reflect EPA guidance or recommendations.

Permit writers should always check the applicable water quality standards to see if mixing zones are permitted and determine the maximum mixing zone size for the waterbody type, pollutant of concern, and specific criterion being considered.

6.2.5.3 Restrictions on Dilution Allowance or Mixing Zone Size

In addition to specifying the maximum dilution allowance or mixing zone size allowed under both rapid and complete mixing conditions and incomplete mixing conditions, the water quality standards or implementation policies generally include constraints that could further limit the available dilution allowance or mixing zone size to something less than the absolute maximum allowed. For example, one restriction on the size of the acute mixing zone could be that it must be small enough to ensure that the potential time of exposure of aquatic organisms to a pollutant concentration above the acute criterion is very short, and organisms passing through that acute mixing zone will not die from exposure to the pollutant. Such a restriction might lead the permitting authority to give a discharger an acute mixing zone for a specific pollutant that is smaller than the maximum size allowed by the water quality standards or to not allow any acute mixing zone at all. Other possible restrictions on dilution and mixing zone size include preventing impairment of the integrity of the waterbody as a whole and preventing significant risks to human health. For example, a permitting authority might restrict the size of a mixing zone for a human health criterion to prevent the mixing zone from overlapping a drinking water intake.

6.3 Determine the Need for WQBELs

After determining the applicable water quality standards and characterizing the effluent and receiving water, a permit writer determines whether WQBELs are needed. This section provides an overview of that process.

6.3.1 Defining Reasonable Potential

EPA regulations at § 122.44(d)(1)(i) state, "Limitations must control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines are or may be discharged at a level that will *cause*, have the *reasonable potential to cause*, or *contribute* to an excursion above any [s]tate water quality standard, including [s]tate narrative criteria for water quality." [emphasis added] Because of that regulation, EPA and many authorized NPDES states refer to the process that a permit writer uses to determine whether a WQBEL is required in an NPDES permit as a *reasonable potential analysis*. Wording the requirements of the regulation another way, a reasonable potential analysis is used to determine whether a discharge, alone or in combination with other sources of pollutants to a waterbody and under a set of conditions arrived at by making a series of reasonable assumptions, could lead to an excursion above an applicable water quality standard. The regulation also specifies that the reasonable potential determination must apply not only to numeric criteria, but also to narrative criteria (e.g., *no toxics in toxic amounts*, *presence of pollutants or pollutant parameters in amounts that would result in nuisance algal blooms*). A permit writer can conduct a reasonable potential analysis using effluent and receiving water data and modeling techniques, as described above, or using a non-quantitative approach. Both approaches are discussed below.

6.3.2 Conducting a Reasonable Potential Analysis Using Data

When determining the need for a WQBEL, a permit writer should use any available effluent and receiving water data as well as other information pertaining to the discharge and receiving water (e.g., type of industry, existing TBELs, compliance history, stream surveys), as the basis for a decision. The permit writer might already have data available from previous monitoring or he or she could decide to work with the permittee to generate data before permit issuance or as a condition of the new permit. EPA recommends that monitoring data be generated before effluent limitation development whenever possible. Monitoring should begin far enough in advance of permit development to allow sufficient time to conduct chemical analyses. Where data are generated as a condition of the permit (for example for a new permittee), it might be appropriate for the permit writer to include a reopener condition in the permit to allow the incorporation of a WQBEL if the monitoring data indicate that a WQBEL is required.

A reasonable potential analysis conducted with available data can be divided into four steps as shown in Exhibit 6-10 and discussed in detail below.

Exhibit 6-10 Steps of a reasonable potential analysis with available data

Step 1.	Determine the appropriate water quality model
Step 2.	Determine the expected receiving water concentration under critical conditions
Step 3.	Answer the question, "Is there reasonable potential?"
Step 4.	Document the reasonable potential determination in the fact sheet

6.3.2.1 Step 1: Determine the Appropriate Water Quality Model

Steady-state or dynamic water quality modeling techniques can be used in NPDES permitting. As discussed in section 6.2.3 above, the examples in this manual consider only steady-state modeling techniques, which consider the impact of a discharge on the receiving water modeled under a single set of critical conditions.

The specific steady-state model used will depend on the pollutant or parameter of concern and whether there is rapid and complete mixing or incomplete mixing of the effluent and the receiving water under critical conditions. For example, to model dissolved oxygen in a river, the permit writer might choose the Streeter-Phelps equation. For modeling heavy metals in an incomplete mix situation, the permit writer might choose the CORMIX model. For pollutants such as BOD, nutrients, or non-conservative parameters, the effects of biological activity and reaction chemistry should be modeled, in addition to the effects of dilution, to assess possible impacts on the receiving water. This manual focuses only on dilution of a pollutant discharged to the receiving water and does not address modeling biological activity or reaction chemistry in receiving waters. For additional information, permit writers should discuss modeling that accounts for biological activity or reaction chemistry with water quality modelers or other water quality specialists as needed and consult EPA's Water Quality Models and Tools Website <www.epa.gov/waterscience/models/>.

For many pollutants such as most toxic (priority) pollutants, conservative pollutants, and pollutants that can be treated as conservative pollutants when near-field effects are of concern, if there is rapid and complete mixing in a river or stream, the permit writer could use a simple mass-balance equation to model the effluent and receiving water. The simple mass-balance equation as applied to a hypothetical facility, ABC, Inc., discharging Pollutant Z to a free-flowing stream called Pristine Creek is presented in Exhibit 6-11 below.

Exhibit 6-11 Simple mass-balance equation

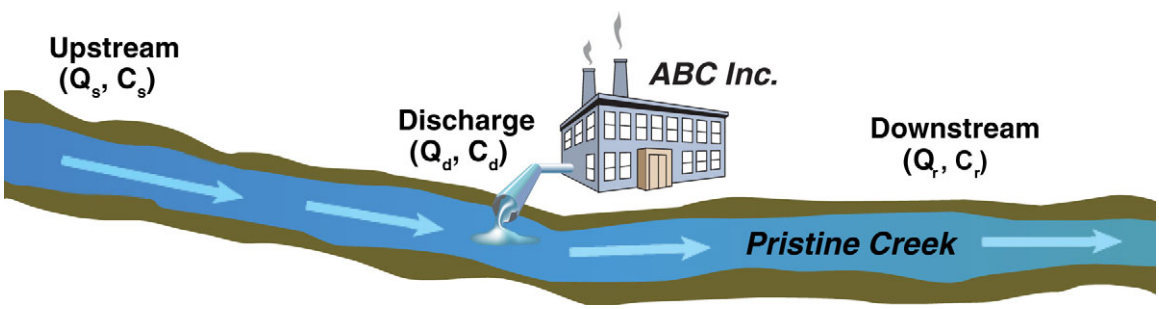

Mass	=	**Flow** (Q) in million gallons per day (mgd) or cubic feet per second (cfs)	X	**Pollutant concentration** (C) in milligrams per liter (mg/L)

$$Q_sC_s + Q_dC_d = Q_rC_r$$

where

Q_s	=	stream flow in mgd or cfs above point of discharge
C_s	=	background in-stream pollutant concentration in mg/L
Q_d	=	effluent flow in mgd or cfs
C_d	=	effluent pollutant concentration in mg/L
Q_r	=	resultant in-stream flow, after discharge in mgd or cfs
C_r	=	resultant in-stream pollutant concentration in mg/L (after complete mixing occurs)

6.3.2.2 Step 2: Determine the Expected Receiving Water Concentration under Critical Conditions

When using a steady-state model, the permit writer, or water quality modeler, determines the impact of the effluent discharge on the receiving water under critical conditions. This step examines how this steady-state analysis is conducted in situations where there is incomplete mixing and then provides a detailed discussion of this analysis for situations where there is rapid and complete mixing.

How are *critical conditions* defined?

When using a steady-state water quality model, permit writers generally input values that reflect critical conditions. State permitting procedures should guide permit writers in this task. When characterizing the effluent and receiving water for water quality-based permitting, the permit writer should follow the permitting authority's policies and procedures for selecting the critical conditions to use in a steady-state model. The discussion in section 6.2.4 above provides a discussion of how those values might be selected.

Permit writers generally would input into a steady-state model for a reasonable potential analysis the critical conditions identified in the effluent and receiving water characterization discussed in section 6.2.4 above. Recall that critical conditions include the following:

- Effluent critical conditions
  - Flow.
  - Pollutant concentration.
- Receiving water critical conditions
  - Flow (for rivers and streams).
  - Pollutant concentration.
  - Other receiving water characteristics such as tidal flux, temperature, pH, or hardness (depending on the waterbody and pollutant of concern)

As discussed in section 6.2.4.1 above, EPA and other permitting authorities have developed guidance for determining those critical conditions. Permit writers should rely on their permit authority's policies and procedures or past practices to determine values for all other critical conditions.

Expected Receiving Water Concentration in an Incomplete Mixing Situation

Exhibit 6-12 illustrates a situation where there is incomplete mixing of a discharge from a hypothetical facility, Acme Co., with the receiving water, the Placid River. The concentration of the pollutant of concern discharged by Acme Co. (Pollutant Y) is highest nearest the point of discharge and gradually decreases until the pollutant is completely mixed with the receiving water. To determine expected receiving water concentrations resulting from the Acme Co.'s discharge of Pollutant Y to the Placid River, the permit writer, or water quality modeler, would use the appropriate incomplete mixing model, calibrated to actual observations from field studies or dye studies, to simulate mixing under critical conditions. In Step 3 below, the concentrations of the pollutant of concern in the receiving water, as predicted by the water quality model, will be overlaid by a regulatory mixing zone established by the applicable water quality standard to determine whether WQBELs are needed.

Exhibit 6-12 Example of receiving water concentrations in an incomplete mixing situation determined using an incomplete mixing water quality model

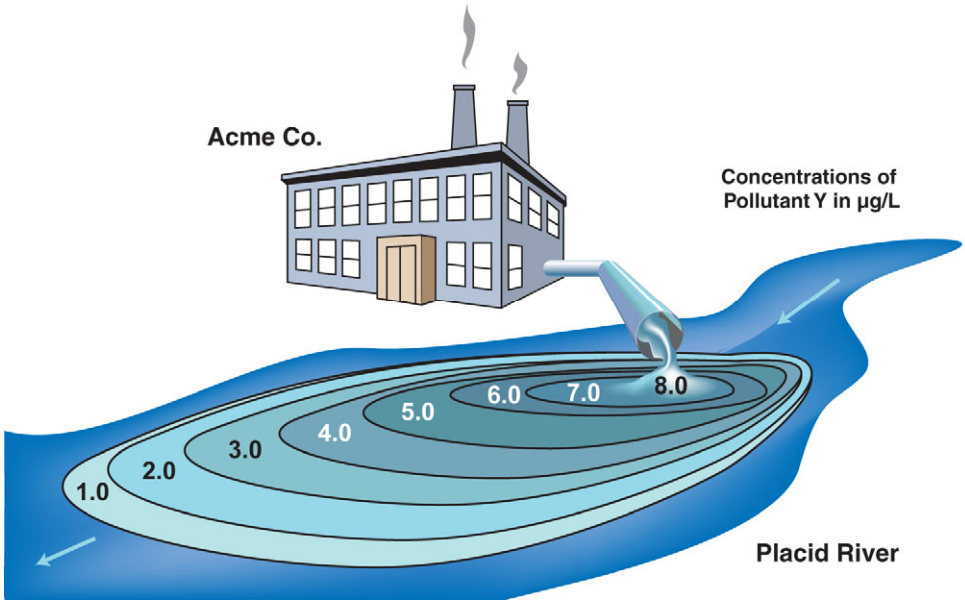

Expected Receiving Water Concentration in Rapid and Complete Mixing Situation

For many pollutants, if there is rapid and complete mixing in a river or stream, the permit writer could use the simple mass-balance equation presented in Exhibit 6-11 above to determine the expected receiving water concentration of the pollutant of concern under critical conditions. As noted previously, the simple mass-balance equation is a very basic steady-state model that can be used for most toxic pollutants, conservative pollutants, and other pollutants for which near-field effects are the primary concern. In Exhibit 6-13, that equation is applied to ABC Inc.'s, discharge of Pollutant Z (a conservative pollutant) to Pristine Creek under conditions of rapid and complete mixing. The mass-balance equation is rearranged to show how it would be used in a reasonable potential analysis.

To use the simple mass-balance equation to predict receiving water impacts for a reasonable potential analysis, the permit writer needs to input one value for each variable and solve the equation for C_r, the downstream concentration of the pollutant. Because this model, like other steady-state models, uses a single value for each variable, the permit writer should be sure that the values selected reflect critical conditions for the discharge and the receiving water. In Exhibit 6-14, those critical conditions have been identified and the equation has been solved for C_r.

It is important for permit writers to remember that, in some situations, the selected steady-state model could be more complex than the simple mass-balance equation shown. For example, there could be other pollutant sources along the stream segment; the pollutant might not be conservative (e.g., BOD); or the parameter to be modeled might be affected by multiple pollutants (e.g., dissolved oxygen affected by BOD and nutrients). For illustrative purposes, this example focuses on a situation where using a simple mass-balance equation is sufficient (i.e., rapid and complete mixing of a conservative pollutant in a river or stream under steady-state conditions).

Exhibit 6-13 Mass-balance equation for reasonable potential analysis for conservative pollutant under conditions of rapid and complete mixing

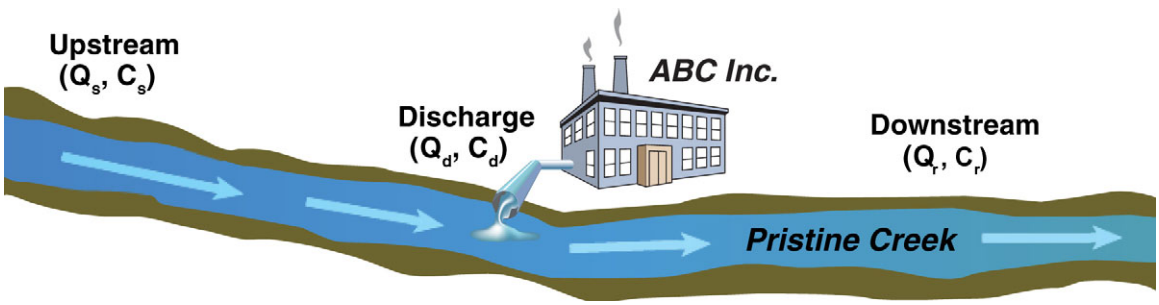

The mass-balance equation can be used to determine whether the discharge from ABC Inc., would cause, have the reasonable potential to cause, or contribute to an excursion above the water quality standards applicable to Pristine Creek. The equation is used to predict the concentration of Pollutant Z, a conservative pollutant, in Pristine Creek under critical conditions. The predicted concentration can be compared to the applicable water quality criteria for Pollutant Z. Assume the discharge mixes rapidly and completely with Pristine Creek.

Mass	=	**Flow** (Q) in million gallons per day (mgd) or cubic feet per second (cfs)	X	**Pollutant concentration** (C) in milligrams per liter (mg/L)

$$Q_sC_s + Q_dC_d = Q_rC_r$$

where

Q_s	=	critical stream flow in mgd or cfs above point of discharge
C_s	=	critical background in-stream pollutant concentration in mg/L
Q_d	=	critical effluent flow in mgd or cfs
C_d	=	critical effluent pollutant concentration in mg/L
Q_r	=	resultant in-stream flow, after discharge in mgd or cfs ($Q_r = Q_s + Q_d$)
C_r	=	resultant in-stream pollutant concentration in mg/L (after complete mixing occurs)

Rearrange the equation to determine the concentration of Pollutant Z in the waterbody downstream of a discharge under critical conditions:

$$C_r = \frac{(Q_d)(C_d) + (Q_s)(C_s)}{Q_r}$$

Exhibit 6-14 Example of applying mass-balance equation to conduct reasonable potential analysis for conservative pollutant under conditions of rapid and complete mixing

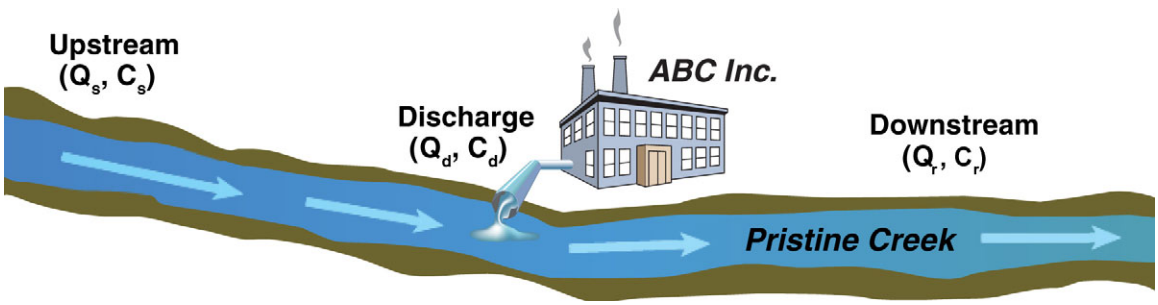

Mass-Balance Equation: $Q_sC_s + Q_dC_d = Q_rC_r$

Dividing both sides of the mass-balance equation by Q_r gives the following:

$$C_r = \frac{(Q_d)(C_d) + (Q_s)(C_s)}{Q_r}$$

where C_r is the receiving water concentration downstream of the discharge

The following values are known for ABC Inc. and Pristine Creek:

Q_s = critical upstream flow (water quality standards allow a dilution allowance of up to 100% of 1Q10 low flow for rapid and complete mixing)	= 1.20 cfs
C_s = critical upstream concentration of Pollutant Z in Pristine Creek	= 0.75 mg/L
Q_d = critical discharge flow	= 0.55 cfs
C_d = statistically projected critical discharge concentration of Pollutant Z	= 2.20 mg/L
Q_r = downstream flow = $Q_d + Q_s$	= 0.55 + 1.20 = 1.75 cfs
Acute aquatic life water quality criterion for Pollutant Z in Pristine Creek	= 1.0 mg/L

Find the projected downstream concentration (C_r) by inserting the given values into the equation as follows:

$$C_r = \frac{(0.55\,\text{cfs})(2.20\,\text{mg/L}) + (1.20\,\text{cfs})(0.75\,\text{mg/L})}{(1.75\,\text{cfs})}$$

C_r = 1.2 mg/L of Pollutant Z*

* calculated to 2 significant figures

6.3.2.3 Step 3: Answer the Question, Is There Reasonable Potential?

The next step in the reasonable potential analysis is to consider the results of water quality modeling to answer the question, *Is there reasonable potential?*

- For most pollutants, if the receiving water pollutant concentration projected by a steady-state model (e.g., a simple mass-balance equation or a more complex model) exceeds the applicable water quality criterion, there is *reasonable potential*, and the permit writer must calculate WQBELs. (Note that for dissolved oxygen, reasonable potential would occur if the water quality model indicates that the projected effluent concentration of the oxygen-demanding pollutants would result in depletion of dissolved oxygen below acceptable values in the receiving water).
- If the projected concentration is equal to or less than the applicable criterion, there is no reasonable potential and, thus far, there is no demonstrated need to calculate WQBELs.

Reasonable Potential Determination in an Incomplete Mixing Situation

To determine whether there is reasonable potential in an incomplete mixing situation, the permit writer would compare the projected concentration of the pollutant of concern at the edge of the regulatory mixing zone or after accounting for the available dilution allowance, with the applicable water quality criterion. Exhibit 6-15 illustrates the reasonable potential determination for Acme Co. in a situation where the regulatory mixing zone is described by a geometric shape. In the example, the water quality criterion for Pollutant Y being considered is 2.0 micrograms per liter (µg/L). The illustration shows that at many points along the edge of the regulatory mixing zone specified by the water quality standards, which is represented by the rectangle, the concentration of Pollutant Y exceeds 2.0 µg/L. Therefore, there is reasonable potential, and the permit writer must calculate WQBELs for Pollutant Y for Acme Co.

Exhibit 6-15 Reasonable potential determination in an incomplete mixing situation

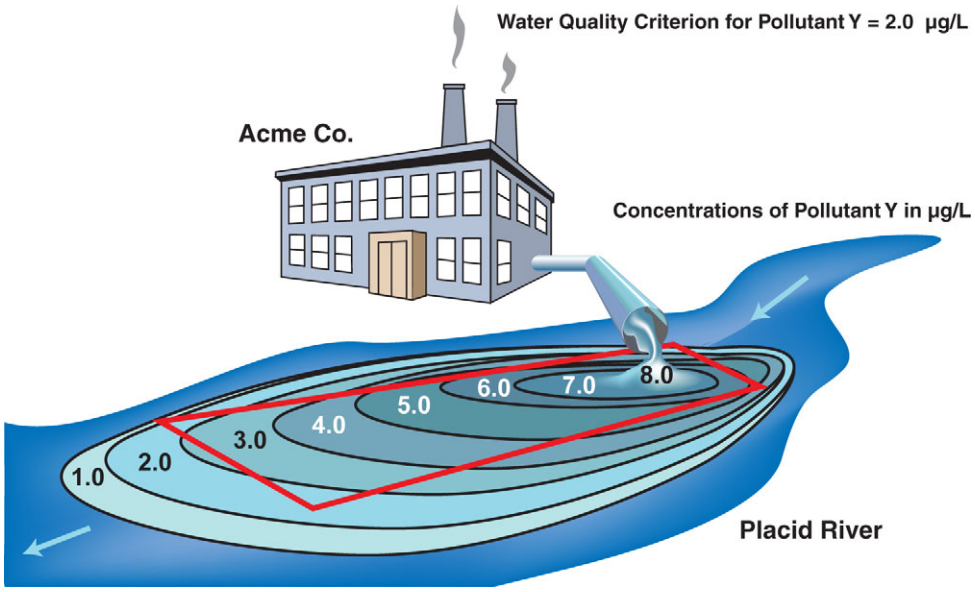

Reasonable Potential Determination in a Rapid and Complete Mixing Situation

In the rapid and complete mixing example for ABC, Inc., shown in Exhibit 6-14 above, a projected downstream concentration (C_r) of 1.2 mg/L of Pollutant Z was calculated. The permit writer would compare the calculated concentration to the acute aquatic life water quality criterion of 1.0 mg/L for Pollutant Z in Pristine Creek presented in Exhibit 6-14. Because 1.2 mg/L > 1.0 mg/L, the projected downstream concentration exceeds the water quality criterion; therefore, there is a reasonable potential for the water quality criterion to be exceeded, and the permit writer must calculate WQBELs for Pollutant Z.

A permit writer should repeat the reasonable potential analysis for all applicable criteria for the pollutant of concern and must remember that the critical conditions could differ depending on the criterion being evaluated. For example, the critical stream flow used when considering the acute aquatic life criterion might be the 1Q10 low flow, whereas the critical stream flow used when considering the chronic aquatic life criterion might be the 7Q10 low flow. If calculations demonstrate that the discharge of a pollutant of concern would cause, have the reasonable potential to cause, or contribute to an excursion of *any one* of the applicable criteria for that pollutant, the permit writer must develop WQBELs for that pollutant.

In addition, it is important for permit writers to remember that they must repeat the reasonable potential analysis for each pollutant of concern and calculate WQBELs where there is reasonable potential. For each pollutant for which there is no reasonable potential, the permit writer should consider whether there are any existing WQBELs in the previous permit and whether they should be retained. The permit writer would complete an anti-backsliding analysis (see Chapter 7 of this manual) to determine whether it is possible to remove any existing WQBELs from the reissued permit.

6.3.2.4 Step 4: Document the Reasonable Potential Determination in the Fact Sheet

As a final step, permit writers need to document the details of the reasonable potential analysis in the NPDES permit fact sheet. The permit writer should clearly identify the information and procedures used to determine the need for WQBELs. The goal of that documentation is to provide the NPDES permit applicant and the public a transparent, reproducible, and defensible description of how each pollutant was evaluated, including the basis (i.e., reasonable potential analysis) for including or not including a WQBEL for any pollutant of concern.

6.3.3 Conducting a Reasonable Potential Analysis without Data

State implementation procedures might allow, or even require, a permit writer to determine reasonable potential through a qualitative assessment process without using available facility-specific effluent monitoring data or when such data are not available. For example, as noted in section 6.2.1.2 above, where there is a pollutant with a WLA from a TMDL, a permit writer must develop WQBELs or other permit requirements consistent with the assumptions of the TMDL. Even without a TMDL, a permitting authority could, at its own discretion, determine that WQBELs are needed for any pollutant associated with impairment of a waterbody. A permitting authority might also determine that WQBELs are required for specific pollutants for all facilities that exhibit certain operational or discharge characteristics (e.g., WQBELs for pathogens in all permits for POTWs discharging to contact recreational waters).

Types of information that the permit writer might find useful in a qualitative approach to determining reasonable potential include the following:

- Effluent variability information such as history of compliance problems and toxic impacts.
- Point and nonpoint source controls such as existing treatment technology, the type of industry, POTW treatment system, or BMPs in place.
- Species sensitivity data including in-stream data, adopted water quality criteria, or designated uses.
- Dilution information such as critical receiving water flows or mixing zones.

The permit writer should always provide justification for the decision to require WQBELs in the permit fact sheet or statement of basis and *must* do so where required by federal and state regulations. A thorough rationale is particularly important when the decision to include WQBELs is not based on an analysis of effluent data for the pollutant of concern.

After evaluating all available information characterizing the nature of the discharge without effluent monitoring data for the pollutant of concern, if the permit writer is not able to decide whether the discharge causes, has the reasonable potential to cause, or contributes to an excursion above a water

quality criterion, he or she may determine that effluent monitoring should be required to gather additional data. The permit writer might work with the permittee to obtain data before permit issuance, if sufficient time exists, or could require the monitoring as a condition of the newly issued or reissued permit. The permit writer might also include a clause in the permit that would allow the permitting authority to reopen the permit and impose an effluent limitation if the required monitoring establishes that there is reasonable potential that the discharge will cause or contribute to an excursion above a water quality criterion.

6.4 Calculate Parameter-specific WQBELs

If a permit writer has determined that a pollutant or pollutant parameter is discharged at a level that will cause, have reasonable potential to cause, or contribute to an excursion above any state water quality standard, the permit writer must develop WQBELs for that pollutant parameter. This manual presents the approach recommended by EPA's TSD for calculating WQBELs for toxic (priority) pollutants. Many permitting authorities apply those or similar procedures to calculate WQBELs for toxic pollutants and for a number of conventional or nonconventional pollutants with effluent concentrations that tend to follow a lognormal distribution. Permit writers should consult permitting authority policies and procedures to determine the methodology specific to their authorized NPDES permitting program, including the approach for pollutants with effluent concentrations that do not follow a lognormal distribution.

6.4.1 Calculating Parameter-specific WQBELs from Aquatic Life Criteria

The TSD process for calculating WQBELs from aquatic life criteria follows five steps as shown in Exhibit 6-16 and discussed in detail below.

Exhibit 6-16 Calculating parameter-specific WQBELs from aquatic life criteria

Step 1.	Determine acute and chronic WLAs
Step 2.	Calculate long-term average (LTA) concentrations for each WLA
Step 3.	Select the lowest LTA as the performance basis for the permitted discharger
Step 4.	Calculate an average monthly limitation (AML) and a maximum daily limitation (MDL)
Step 5.	Document the calculation of WQBELs in the fact sheet.

6.4.1.1 Step 1: Determine Acute and Chronic WLAs

Before calculating a WQBEL, the permit writer will first need to determine the appropriate WLAs for the point source discharge based on both the acute and chronic criteria. A WLA may be determined from a TMDL or calculated for an individual point source directly. Where an EPA-approved TMDL has been developed for a particular pollutant, the WLA for a specific point source discharger is the portion of that TMDL that is allocated to that point source, as discussed in section 6.2.1.2 above. Where no TMDL is available, a water quality model generally is used to calculate a WLA for the specific point source discharger. The WLA is the loading or concentration of pollutant that the specific point source may discharge while still allowing the water quality criterion to be attained downstream of that discharge. Of course, the WLA calculation should take into account any reserve capacity, safety factor, and contributions from other point and nonpoint sources as might be required by the applicable water quality standards regulations or implementation policies.

When a WLA is not given as part of a TMDL or where a separate WLA is needed to address the near-field effects of a discharge on water quality criteria, permit writers will, in many situations, use a steady-state water quality model to determine the appropriate WLA for a discharge. As discussed in section 6.3 above, steady-state models generally are run under a single set of critical conditions for protection of receiving water quality. If a permit writer uses a steady-state model with a specific set of critical conditions to assess reasonable potential, he or she generally may use the same model and critical conditions to calculate a WLA for the same discharge and pollutant of concern.

As with the reasonable potential assessment, the type of steady-state model used to determine a WLA depends on the type of mixing that occurs in the receiving water and the type of pollutant or parameter being modeled. As discussed in section 6.3.2 above, permit writers can use the mass-balance equation as a simple steady-state model for many pollutants, such as most toxic (priority) pollutants or any pollutant that can be treated as a conservative pollutant when considering near-field effects, if there is rapid and complete mixing in the receiving water. For pollutants or discharge situations that do not have those characteristics (e.g., non-conservative pollutants, concern about effects on a downstream waterbody), a water quality model other than the mass-balance equation would likely be more appropriate.

The mass-balance equation is presented again in Exhibit 6-17. In the exhibit, the equation is rearranged to show how it would be used to calculate a WLA for a conservative pollutant discharged to a river or stream under conditions of rapid and complete mixing.

6.4.1.2 Step 2: Calculate LTA Concentrations for Each WLA

The requirements of a WLA generally must be interpreted in some way to be expressed as an effluent limitation. The goal of the permit writer is to derive effluent limitations that are enforceable, adequately account for effluent variability, consider available receiving water dilution, protect against acute and chronic impacts, account for compliance monitoring sampling frequency, and assure attainment of the WLA and water quality standards. In developing WQBELs, the permit writer develops limitations that require a facility to perform in such a way that the concentration of the pollutant of concern in the effluent discharged is nearly always below the WLA.

To accomplish that goal, EPA has developed a statistical permit limitation derivation procedure to translate WLAs into effluent limitations *for pollutants with effluent concentration measurements that tend to follow a lognormal distribution*. EPA believes that this procedure, discussed in Chapter 5 of the TSD, results in defensible, enforceable, and protective WQBELs for such pollutants. In addition, a number of states have adopted procedures based on, but not identical to, EPA's guidance that also provide defensible, enforceable, and protective WQBELs. Permit writers should always use the procedures adopted by their permitting authority. In addition, permit writers should recognize that alternative procedures would be used to calculate effluent limitations for pollutants with effluent concentrations that cannot generally be described using a lognormal distribution.

Exhibit 6-17 Example of applying mass-balance equation to calculate WLAs for conservative pollutant under conditions of rapid and complete mixing

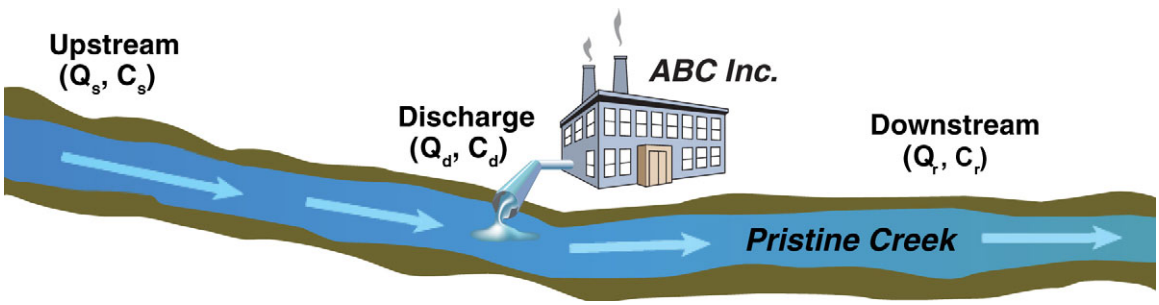

Mass Balance Equation: $Q_sC_s + Q_dC_d = Q_rC_r$

where

Q_s	=	background stream flow in mgd or cfs above point of discharge
C_s	=	background in-stream pollutant concentration in mg/L
Q_d	=	effluent flow in mgd or cfs
C_d	=	effluent pollutant concentration in mg/L **= WLA**
Q_r	=	resultant in-stream flow, after discharge in mgd or cfs
C_r	=	resultant in-stream pollutant concentration in mg/L (after complete mixing occurs)

Rearrange the equation to determine the WLA (C_d) for ABC Inc., necessary to achieve the acute water quality criterion for Pollutant Z in Pristine Creek (C_r) downstream of the discharge:

$$C_d = \frac{Q_rC_r - Q_sC_s}{Q_d}$$

The following values are known for ABC Inc., and Pristine Creek:

Q_s = critical upstream flow (water quality standards allow a dilution allowance of up to 100% of 1Q10 low flow for rapid and complete mixing)	= 1.20 cfs
C_s = upstream concentration of Pollutant Z in Pristine Creek	= 0.75 mg/L
Q_d =discharge flow	= 0.55 cfs
Q_r = downstream flow = $Q_d + Q_s$	= 0.55 + 1.20 = 1.75 cfs
C_r = acute water quality criterion for Pollutant Z in Pristine Creek	= 1.0 mg/L

Determine the WLA for ABC Inc., by inserting the given values into the equation as follows:

$$\text{WLA for ABC Inc.} = C_d = \frac{(1.75\text{ cfs})(1.0\text{ mg/L}) - (1.20\text{ cfs})(0.75\text{ mg/L})}{(0.55\text{ cfs})}$$

C_d = 1.5 mg/L of Pollutant Z*

* calculated to 2 significant figures

For those pollutants with effluent concentrations that do follow a lognormal distribution, the distribution can be described by determining a long-term average (or LTA) that ensures that the effluent pollutant concentration remains nearly always below the WLA and by the CV, a measure of the variability of data around the LTA. Exhibit 6-18 illustrates a lognormal distribution with the LTA, CV, and WLA highlighted.

When applying aquatic life criteria, a permit writer generally establishes a WLA based on the acute aquatic life criterion and a WLA based on the chronic aquatic life criterion. Thus, the permit writer determines two LTAs—one that would ensure that an effluent concentration is nearly always below the acute WLA and one that would ensure that an effluent concentration nearly always below the chronic WLA. Each LTA, acute and chronic, would represent a different performance expectation for the discharger.

Exhibit 6-18 Example of lognormal distribution of effluent pollutant concentrations and calculation of LTA

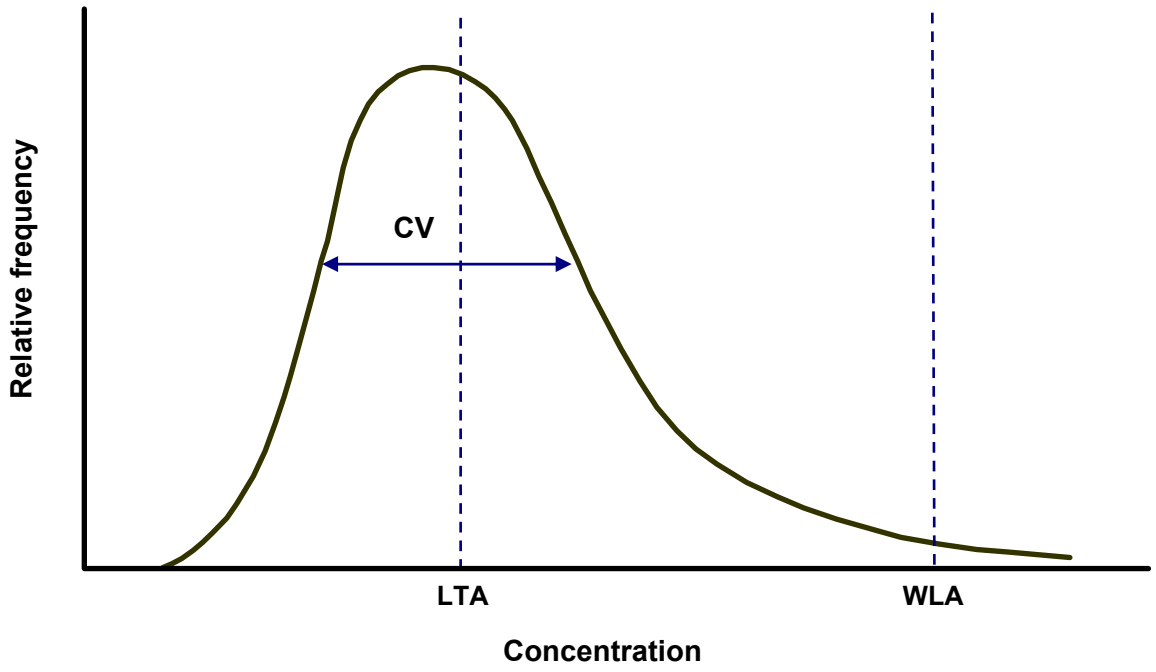

6.4.1.3 Step 3: Select the Lowest LTA as the Performance Basis for the Permitted Discharger

EPA recommends that WQBELs be based on a single performance expectation for a facility; therefore, once a permit writer has calculated LTA values for each WLA, he or she would select only one of those LTAs to define the required performance of the facility and serve as the basis for WQBELs. Because WQBELs must assure attainment of all applicable water quality criteria, the permit writer would select the lowest LTA as the basis for calculating effluent limitations. Selecting the lowest LTA would ensure that the facility's effluent pollutant concentration remains below all the calculated WLAs nearly all the time. Further, because WLAs are calculated using critical receiving water conditions, the limiting LTA would also ensure that water quality criteria are fully protected under nearly all conditions.

6.4.1.4 Step 4: Calculate an Average Monthly Limitation (AML) and a Maximum Daily Limitation (MDL)

The NPDES regulations at § 122.45(d) require that all effluent limitations be expressed, unless impracticable, as both AMLs and MDLs for all discharges other than POTWs and as both AMLs and average weekly limitations (AWLs) for POTWs. The AML is the highest allowable value for the average of daily discharges over a calendar month. The MDL is the highest allowable daily discharge measured during a calendar day or 24-hour period representing a calendar day. The AWL is the highest allowable value for the average of daily discharges over a calendar week. For pollutants with limitations expressed in units of mass, the daily discharge is the total mass discharged over the day. For limitations expressed in other units, the daily discharge is the average measurement of the pollutant over the period of a day.

In the TSD, EPA recommends establishing an MDL, rather than an AWL, for discharges of toxic pollutants from POTWs. That approach is appropriate for at least two reasons. First, the basis for the AWL for POTWs is the secondary treatment requirements discussed in section 5.1.1.1 of this manual and is not related to the need for assuring attainment of water quality standards. Second, an AWL, which could be the average of up to seven daily discharges, could average out peak toxic concentrations and, therefore, the discharge's potential for causing acute toxic effects might be missed. An MDL would be more likely to identify potential acutely toxic impacts.

Chapter 5 of the TSD includes statistical tools for calculating MDLs and AMLs from the LTA value selected in Step 3 above. Again, note that those procedures apply to *pollutants with effluent concentration measurements that tend to follow a lognormal distribution*. EPA has not developed guidance on procedures for calculating effluent limitations for pollutants with effluent concentrations that generally cannot be described using a lognormal distribution. For such pollutants, permit writers should use other procedures as recommended by their permitting authority in its policies, procedures, or guidance.

Whether using the TSD procedures or other procedures for calculating WQBELs, the objective is to establish limitations calculated to require treatment plant performance levels that, after considering acceptable effluent variability, would have a very low statistical probability of exceeding the WLA and, therefore, would comply with the applicable water quality standards under most foreseeable conditions.

6.4.1.5 Step 5: Document Calculation of WQBELs in the Fact Sheet

Permit writers should document in the NPDES permit fact sheet the process used to develop WQBELs. The permit writer should clearly identify the data and information used to determine the applicable water quality standards and how that information, or any applicable TMDL, was used to derive WQBELs and explain how the state's antidegradation policy was applied as part of the process. The information in the fact sheet should provide the NPDES permit applicant and the public a transparent, reproducible, and defensible description of how the permit writer properly derived WQBELs for the NPDES permit.

6.4.2 Calculating Chemical-specific WQBELs based on Human Health Criteria for Toxic Pollutants

Developing WQBELs for toxic pollutants affecting human health is somewhat different from calculating WQBELs for other pollutants because (1) the exposure period of concern is generally longer (e.g., often a lifetime exposure) and (2) usually the average exposure, rather than the maximum exposure, is of concern. EPA's recommended approach for setting WQBELs for toxic pollutants for human health protection is to set the AML equal to the WLA calculated from the human health toxic pollutant criterion and calculate the MDL from the AML. Section 5.4.4 of the TSD describes statistical procedures used for such calculations for pollutants with effluent concentrations that follow a lognormal distribution. Once again, for pollutants with effluent concentrations that do not follow a lognormal distribution, permit writers should use other procedures as specified by their permitting authority.

If the permit writer calculates chemical-specific WQBELs from human health criteria, he or she should compare the limitations to any other calculated WQBELs (e.g., WQBELs based on aquatic life criteria) and TBELs and apply antidegradation and anti-backsliding requirements to determine the final limitations that meet all technology and water quality standards. As discussed above, that process should be documented in the fact sheet for the NPDES permit.

6.5 Calculate Reasonable Potential and WQBELs for WET

WET tests measure the degree of response of exposed aquatic test organisms to an effluent mixed in some proportion with control water (e.g., laboratory water or a non-toxic receiving water sample). WET testing is used as a second approach, in addition to the chemical-specific approach, to implementing water quality standards in NPDES permits. This section provides a brief introduction to WET testing and WET limitations.

Test of Significant Toxicity (TST)

At the time of the writing of this guidance manual, EPA had recently published a new statistical approach that assesses the whole effluent toxicity (WET) measurement of wastewater effects on specific test organisms' ability to survive, grow, and reproduce. This new approach is called the Test of Significant Toxicity (TST) and is a statistical method that uses hypothesis testing techniques based on research and peer-reviewed publications. The hypothesis test under the TST approach examines whether an effluent, at the critical concentration (e.g., in-stream waste concentration [IWC]), and the control within a WET test differ by an unacceptable amount (the amount that would have a measured detrimental effect on the ability of aquatic organisms to thrive and survive). The TST implementation document and the TST technical document are available at the NPDES WET Website <www.epa.gov/npdes/wet>.

6.5.1 Types of WET Tests

In many WET tests, the effluent and control water are mixed in varying proportions to create a dilution series. Exhibit 6-19 is an example of a typical dilution series used in WET testing.

Exhibit 6-19 Example of typical dilution series

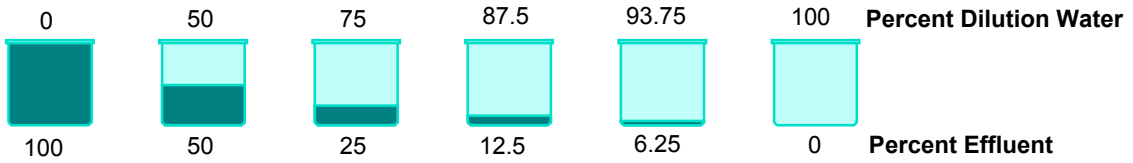

There are two types of WET tests: acute and chronic. An acute toxicity test usually is conducted over a short time, generally 96 hours or less, and the endpoint measured is mortality. The endpoint for an acute test is often expressed as an LC_{50} (i.e., the percent of effluent that is lethal to 50 percent of the exposed test organisms). A chronic toxicity test is usually conducted during a critical life phase of the organism and the endpoints measured are mortality and sub-lethal effects, such as changes in reproduction and growth. A chronic test can occur over a matter of hours or days, depending on the species tested and test endpoint. The endpoint of a chronic toxicity test often is expressed in one of the following ways:

- No observed effect concentration (NOEC), the highest concentration of effluent (i.e., highest percent effluent) at which no adverse effects are observed on the aquatic test organisms.
- Lowest observed effect concentration (LOEC), the lowest concentration of effluent that causes observable adverse effects in exposed test organisms.

- Inhibition concentration (IC), a point estimate of the effluent concentration that would cause a given percent reduction in a biological measurement of the test organisms.
- Effect concentration (EC), a point estimate of the effluent concentration that would cause an observable adverse effect in a given percentage of test organisms.

For additional information on WET monitoring and WET test methods, see section 8.2.4 of this manual.

6.5.2 Expressing WET Limitations or Test Results

There are two options for expressing WET limitations or test results. First, WET limitations or test results can be expressed directly in terms of the WET test endpoints discussed above (e.g., LC_{50}, NOEC, and IC_{25}). Alternatively, the limitations or test results can be expressed in terms of *toxic units* (TUs). A TU is the inverse of the sample fraction, calculated as 100 divided by the percent effluent. Exhibit 6-20 presents example TUs for expressing acute and chronic test results.

Exhibit 6-20 Example of toxic units

If an **acute test** result is a LC_{50} of 60 percent, that result can be expressed as

$$\frac{100}{60} = 1.7 \text{ acute toxic units} = 1.7\ TU_a$$

If a **chronic test** result is an IC_{25} of 40 percent effluent, that result can be expressed as

$$\frac{100}{40} = 2.5 \text{ chronic toxic units} = 2.5\ TU_c$$

It is important to distinguish acute TUs (TU_a) from chronic TUs (TU_c). The difference between TU_a and TU_c can be likened to the difference between miles and kilometers. Both miles and kilometers are used to measure distance, but a distance of 1.0 mile is not the same as a distance of 1.0 kilometer. Likewise, both TU_a and TU_c are expressions of the toxicity of an effluent, but 1.0 TU_a is not the same as 1.0 TU_c. It is possible, however, to determine the relationship between the acute toxicity of an effluent and the chronic toxicity of that same effluent, just as it is possible to determine the relationship between miles and kilometers (i.e., through a conversion factor). Unlike the conversion between miles and kilometers that remains constant, the conversion factor between acute and chronic toxic units varies from effluent to effluent.

For an effluent, the permit writer could develop a conversion factor that would allow conversion of TU_a into equivalent TU_c or vice versa. This conversion factor is known as an acute-to-chronic ratio (ACR) for that effluent. The ACR for an effluent may be calculated where there are at least 10 sets of paired acute and chronic WET test data available. The ACR is determined by calculating the mean of the individual ACRs for each pair of acute and chronic WET tests. Where there are not sufficient data to calculate an ACR for an effluent (i.e., less than 10 paired sets of acute and chronic WET test data), EPA recommends a default value of ACR = 10. Exhibit 6-21 presents examples showing how the ACR converts TU_a into TU_c, how to calculate an ACR from existing data, and how, once an ACR is calculated, a permit writer could estimate the chronic toxicity of an effluent sample from its measured acute toxicity or vice versa.

Exhibit 6-21 Using the ACR

The ACR is expressed

$$ACR = \frac{\text{Acute Endpoint}}{\text{Chronic Endpoint}} = \frac{LC_{50}}{IC_{25}}$$

A TU is the inverse of the sample fraction. Therefore, by definition

$$TU_a = \frac{100}{LC_{50}} \qquad TU_c == \frac{100}{IC_{25}}$$

Consequently, toxicity as percent sample, may be expressed

$$LC_{50} = \frac{100}{TU_a} \qquad IC_{25} = \frac{100}{TU_c}$$

Substituting into the original equation gives

$$ACR = \frac{LC_{50}}{IC_{25}} = \frac{\frac{100}{TU_a}}{\frac{100}{TU_c}} = \frac{TU_c}{TU_a}$$

Example 1
Given: LC_{50} = 28%, IC_{25} = 10%

$$ACR = \frac{LC_{50}}{IC_{25}} = \frac{28\%}{10\%} = 2.8$$

Example 2
Given: TU_a = 3.6, TU_c = 10.0

$$ACR = \frac{TU_c}{TU_a} = \frac{10.0}{3.6} = 2.8$$

Example 3
Given: Toxicity data for a facility's effluent for *C. dubia*. as presented in the table to the right.

LC_{50} (% effluent)	IC_{25} (% effluent)	ACR
62	10	6.2
18	10	1.8
68	25	2.7
61	10	6.1
63	25	2.5
70	25	2.8
17	5	3.4
35	10	3.5
35	10	3.5
35	25	1.4
47	10	4.7
Mean		**3.5**

The ACR in the third column is calculated using the following equation:

$$ACR = \frac{LC_{50}}{IC_{25}}$$

Example 4
Given: TU_a = 1.8, ACR = 3.5

$$ACR = \frac{TU_c}{TU_a} \qquad TU_c = ACR \times TU_a$$

$$\text{Estimated } TU_c = ACR \times TU_a = 3.5 \frac{TU_c}{TU_a} \times 1.8\ TU_a = 6.3\ TU_c$$

6.5.3 Determining the Need for WET Limitations

If a state has numeric criteria for WET, a permit writer could use the results of WET tests to project acute or chronic toxicity in the receiving water after accounting for the applicable dilution allowance or mixing zone made available in the water quality standards. The permit writer would compare the projected toxicity of the receiving water to the applicable water quality criterion for WET. If the projected toxicity exceeds the applicable numeric water quality criterion for WET, the discharge would cause, have the reasonable potential to cause, or contribute to an excursion above the applicable water quality standards, and the permit writer must develop a WQBEL for WET [see § 122.44(d)(1)(iv)]. In that way, numeric criteria for WET can be treated similarly to chemical-specific criteria. Exhibit 6-22 provides an example of how the mass-balance equation is used to conduct a reasonable potential analysis for WET.

Exhibit 6-22 Example of mass-balance equation for a WET reasonable potential analysis

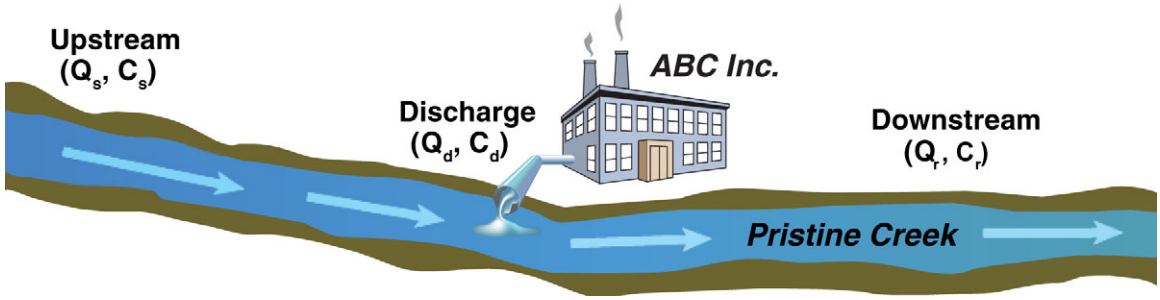

The mass-balance equation can be used to determine whether the discharge from ABC Inc. would cause, have the reasonable potential to cause, or contribute to toxicity in Pristine Creek that exceeds the numeric water quality criteria for acute or chronic toxicity. Assume the discharge mixes rapidly and completely with Pristine Creek.

Mass-Balance Equation: $Q_sC_s + Q_dC_d = Q_rC_r$

Dividing both sides of the mass-balance equation by Q_r gives the following:

$$C_r = \frac{(Q_d)(C_d) + (Q_s)(C_s)}{Q_r}$$

The following values are known for ABC Inc. and Pristine Creek:

Q_s = Critical upstream flow (1Q10 for acute protection)	= 23.6 cfs
(7Q10 for chronic protection)	= 70.9 cfs
C_s = Upstream toxicity in Pristine Creek (acute)	= 0 TU_a
(chronic)	= 0 TU_c
Q_d = Discharge flow	= 7.06 cfs
C_d = Discharge toxicity (acute)	= 2.50 TU_a
(chronic)	= 8.00 TU_c
Q_r = Downstream flow	= $Q_d + Q_s$
Acute Water Quality Criterion in Pristine Creek	= 0.3 TU_a
Chronic Water Quality Criterion in Pristine Creek	= 1.0 TU_c

Find the downstream concentration (C_r) by inserting the given values into the equation as follows:

For acute toxicity:

$$C_r = \frac{(7.06\text{ cfs})(2.5\text{ TU}_a) + (23.6\text{ cfs})(0\text{ TU}_a)}{7.06\text{ cfs} + 23.6\text{ cfs}} = 0.58\text{ TU}_a$$

The downstream concentration (C_r) exceeds the water quality criterion for acute toxicity of 0.3 TU_a.

For chronic toxicity:

$$C_r = \frac{(7.06\text{ cfs})(8.00\text{ TU}_c) + (70.9\text{ cfs})(0\text{ TU}_c)}{7.06\text{ cfs} + 70.9\text{ cfs}} = 0.72\text{ TU}_c$$

The downstream concentration (C_r) does not exceed the water quality criterion for chronic toxicity of 1.0 TU_c.

In Exhibit 6-22 above, the downstream concentration under critical conditions for the acute water quality criterion (C_r = 0.58 TU_a) exceeds the water quality criterion for acute toxicity (0.3 TU_a); therefore there is reasonable potential and WET limitations are required. WET limitations would be calculated in much the same way as limitations on specific chemicals. The limitations would be calculated to ensure that WET criteria are not exceeded after any available dilution or at the edge of the applicable mixing zone.

Where state water quality standards do not include numeric criteria for WET, a permit writer could evaluate the need for WQBELs for WET on the basis of narrative criteria; specifically, a narrative criterion stating that waterbodies must be free from *toxics in toxic amounts*. To make it easier for a permit writer to readily establish WET limitations in this situation, the permitting authority should have a policy for implementing the narrative criterion. Following the permitting authority's policy, if the permit writer determines that a discharge causes, has the reasonable potential to cause, or contributes to an in-stream excursion above a narrative criterion, the regulations at § 122.44(d)(1)(v) require that the permit include WQBELs for WET unless the permit writer demonstrates that parameter-specific limitations for the effluent are sufficient to attain and maintain applicable numeric and narrative water quality criteria. In other words, the permit must include WET limitations unless the permit writer is able to determine the specific pollutants that are the source of toxicity and include parameter-specific limitations for those pollutants that assure, and will continue to assure, attainment of water quality standards. If there are no criteria in the state water quality standards for the specific parameters causing the toxicity, the permit writer can establish WQBELs using one of three approaches outlined in § 122.44(d)(1)(vi):

- Use EPA's national recommended criteria.
- Calculate a numeric criterion that will attain and maintain the applicable narrative criterion.
- Control the pollutant using an indicator parameter for the pollutant of concern.

A permit also could include a requirement to conduct a toxicity identification evaluation and toxicity reduction evaluation (TIE/TRE) as a special condition in an NPDES permit. (Chapter 9 of this manual presents more information on special conditions.) A TIE/TRE is a site-specific study designed to systematically investigate and identify the causes of effluent toxicity problems, isolate the sources of that toxicity, identify and implement appropriate toxicity control options, and confirm the effectiveness of those control options and the reduction in toxicity. The permit writer might require a TIE/TRE when WET limitations are exceeded or, if there are no WET limitations in the permit, where WET testing demonstrates an unacceptable level of effluent toxicity. Because WET testing indicates the degree of toxicity of an effluent, but does not specifically identify the cause of that toxicity or ways to reduce toxicity, a TIE/TRE is necessary to achieve compliance with effluent limitations or other effluent toxicity requirements in NPDES permits. If a TIE/TRE is not required through the special conditions section of the permit, it could be required via a CWA section 308 letter, a CWA section 309 administrative order, or a consent decree.

6.6 Antidegradation Review

Early in the permit development process, a permit writer should check the state's antidegradation policy and implementation methods to determine what tier(s) of protection, if any, the state has assigned to the proposed receiving water for the parameter(s) of concern. The regulations concerning antidegradation and each of the tiers are described above in section 6.1.1.3. The tier of antidegradation protection is important for determining the required process for developing the water quality-based permit limits and conditions. In some cases, where a waterbody is classified as Tier 3 for antidegradation purposes, the permit writer might find that it is not possible to issue a permit for the proposed activity.

If the state has not specified the tier, the permit writer will need to evaluate, in accordance with the state's implementation procedures, whether the receiving waterbody is of high water quality for the parameters of concern, and thus will require Tier 2 protection. After identifying the tier(s) of protection for the

proposed receiving waterbody and parameter(s) of concern, the permit writer should consult the state's antidegradation implementation procedures relevant to the tier(s).

The following sections provide methods permit writers should consider for implementing, through the WQBEL development process, the three levels of protection typically found in a state's antidegradation policy. Implementation of the state's antidegradation policy could have a significant effect on the calculation of WQBELs.

6.6.1 Tier 1 Implementation

All waterbodies receive at least Tier 1 protection. Tier 1 protection means that the permit writer must include limits in the permit sufficient to maintain and protect water quality necessary to protect existing uses. In practice, for a Tier 1 receiving waterbody, the permit writer typically calculates the WQBELs on the basis of the applicable criteria because the state's designated uses and criteria to protect those uses must be sufficient to protect the existing uses. If a Tier 1 waterbody is impaired for a parameter that would be present in the proposed discharge, the permit writer should identify and consult any relevant TMDLs to determine what quantity of pollutant (if any) is appropriate.

6.6.2 Tier 2 Implementation

For new or increased discharges that could potentially lower water quality in high-quality waters, Tier 2 protection provides the state with a framework for making decisions regarding the degree to which it will protect and maintain the high water quality. A new or expanded discharge permit application typically triggers a Tier 2 antidegradation review. Depending on the outcome of the review, the permit could be written to maintain the existing high water quality or could be written to allow some degradation.

Each state's antidegradation policy or implementation procedures should describe the Tier 2 antidegradation review process. Though the process varies among states, EPA's antidegradation regulation at § 131.12 outlines the common elements of the process. To permit a new or increased discharge that would lower water quality, the state is required to make a finding on the basis of the following:

- The state must find that allowing lower water quality is necessary for important social or economic development in the area in which the waters are located.
  - The state would perform an alternatives analysis to evaluate whether the proposed discharge is actually *necessary* (i.e., whether there are less degrading feasible alternatives) and that might include consideration of a wide range of alternatives (e.g. non-discharging options, relocation of discharge, alternative processes, and innovative treatments).
  - The state should provide a justification of important social or economic development (or both) that would occur as a result of permitting the proposed discharge.
- The state's finding must be made after full satisfaction of its own intergovernmental coordination and public participation provisions.
- The state must assure that the highest statutory and regulatory requirements for all new and existing point sources will be achieved.
- The state must assure that all cost-effective and reasonable BMPs for nonpoint source control will be achieved.

- The state must assure that water quality will still protect existing uses.

If, after fulfilling the above conditions of the Tier 2 antidegradation review process, the state makes a determination to allow a new or increased discharge that would lower water quality, the permit writer may include such limitations in the NPDES permit for that discharge provided the limitations meet all other applicable technology and water quality standards.

6.6.3 Tier 3 Implementation

States identify their own ONRWs for Tier 3 protection, which requires that the water quality be maintained and protected. This is the most stringent level of protection. ONRWs often include waters in national or state parks, wildlife refuges, and waters of exceptional recreational or ecological significance. Waterbodies can be given Tier 3 protection regardless of their existing level of water quality. Some states implement Tier 3 by prohibiting any new or increased discharges to ONRWs or their tributaries that would result in lower water quality, with the exception of some limited activities such as those that would result in temporary changes in water quality ultimately resulting in restoration. Some states allow increased discharges as long as they are offset by equivalent or greater reductions elsewhere in the waterbody.

In addition to Tiers 1, 2, and 3, some states have a class of waters considered outstanding to the state and for which the state might have specific antidegradation requirements. Such waterbodies are sometimes referred to as *Tier 2 ½* waters because implementation of the antidegradation policy for them affords a greater degree of protection than Tier 2 but more flexibility than Tier 3.

Chapter 4 of EPA's WQS Handbook and the *Water Quality Standards Regulation Advance Notice of Proposed Rulemaking* (64 FR 36742, July 7, 1998) include additional information on implementing antidegradation policies. The permit writer should clearly explain the antidegradation analysis and how it affects calculation of WQBELs in the fact sheet or statement of basis for the permit.

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[1] U.S. Environmental Protection Agency. 1994. *Water Quality Standards Handbook: Second Edition* (WQS Handbook). EPA 823-B-94-005a. U.S. Environmental Protection Agency, Office of Water, Washington DC. <www.epa.gov/waterscience/standards/handbook/>.

[2] U.S. Environmental Protection Agency. 2001. *Streamlined Water-Effect Ratio Procedure for Discharges of Copper*. EPA-822-R-01-005. U.S. Environmental Protection Agency, Office of Science and Technology, Washington, DC. <www.epa.gov/waterscience/criteria/copper/copper.pdf>.

[3] Davies, Tudor T. 1997. *Establishing Site Specific Aquatic Life Criteria Equal to Natural Background.* U.S. Environmental Protection Agency, Office of Science and Technology, Washington, DC. <www.epa.gov/waterscience/library/wqcriteria/naturalback.pdf>.

[4] U.S. Environmental Protection Agency. 1991. *Technical Support Document for Water Quality-Based Toxics Control* (TSD). EPA-505/2-90-001. U.S. Environmental Protection Agency, Office of Water, Washington, DC. <www.epa.gov/npdes/pubs/owm0264.pdf>.

[5] U.S. Environmental Protection Agency. 1990. *Biological Criteria: National Program Guidance for Surface Waters*. EPA-440/5-91-004. U.S. Environmental Protection Agency, Office of Science and Technology, Washington, DC. <www.epa.gov/bioindicators/html/biolcont.html>.

CHAPTER 7. Final Effluent Limitations and Anti-backsliding

As illustrated in Exhibit 7.1, after calculating applicable technology-based effluent limitations (TBELs) and water quality-based effluent limitations (WQBELs), the permit writer must determine the final effluent limitations that will be included in the National Pollutant Discharge Elimination System (NPDES) permit for each pollutant or pollutant parameter. For reissued permits, that determination must also include an assessment of whether the revised effluent limitations are consistent with the Clean Water Act (CWA) requirements and NPDES regulations related to anti-backsliding.

Exhibit 7-1 Developing effluent limitations

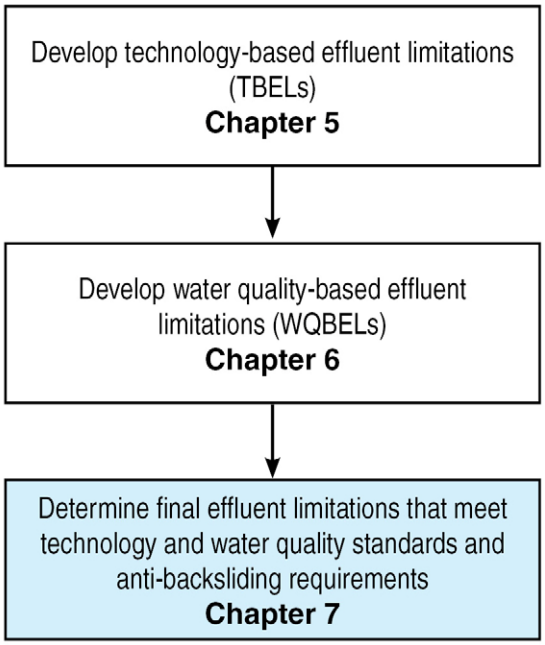

7.1 Determining Final Effluent Limitations

When determining the final effluent limitations, the permit writer must ensure that all applicable statutory and regulatory requirements, including technology and water quality standards, are fully implemented.

- The permit writer determines the calculated limitations (TBELs, WQBELs, or some combination of the calculated limitations) that will ensure that all applicable CWA standards are met.
- As noted above, for reissued permits, if any of the limitations are less stringent than limitations on the same pollutant in the previous NPDES permit, the permit writer then conducts an anti-backsliding analysis and, if necessary, revises the limitations accordingly. A detailed discussion of the anti-backsliding provisions of the CWA and the NPDES regulations is included below in Section 7.2.

In addition, the permit writer should clearly explain in the fact sheet for the permit how the final limitations in the permit were determined and how those limitations meet both technology and water quality standards (including antidegradation) and, where appropriate, how an anti-backsliding analysis was applied to the final effluent limitations.

7.2 Applying Anti-backsliding Requirements

As noted in Section 7.1, after selecting the calculated effluent limitations for a pollutant that ensure that all CWA standards are met, the permit writer applies anti-backsliding requirements, as necessary, to determine the final effluent limitations. In general, the term anti-backsliding refers to statutory and regulatory provisions that prohibit the renewal, reissuance, or modification of an existing NPDES permit that contains effluent limitations, permit conditions, or standards less stringent than those established in the previous permit. There are, however, exceptions to the prohibition, and determining the applicability and circumstances of the exceptions requires familiarity with both the statutory and regulatory provisions that address anti-backsliding.

7.2.1 Anti-backsliding Statutory Provisions

Clean Water Act (CWA) section 402(o) expressly prohibits backsliding from certain existing effluent limitations. CWA section 402(o) consists of three main parts: (1) a prohibition on specific forms of backsliding, (2) exceptions to the prohibition, and (3) a *safety clause* that provides an absolute limitation on backsliding.

7.2.1.1 Statutory Prohibition Against Backsliding

First, CWA section 402(o)(1) prohibits the relaxation of effluent limitations for two situations:

- To revise an existing TBEL that was developed on a case-by-case basis using best professional judgment (BPJ) to reflect subsequently promulgated effluent limitations guidelines and standards (effluent guidelines) that would result in a less stringent effluent limitation.
- Relaxation of an effluent limitation that is based on state standards, such as water quality standards or treatment standards, unless the change is consistent with CWA section 303(d)(4). Section 303(d)(4) may be applied independently of section 402(o).

The prohibition against relaxation of effluent limitations is subject to the exceptions in CWA section 402(o)(2) and, for limitations based on state standards, the provisions of CWA section 303(d)(4). Those exceptions are outlined further in the following sections.

7.2.1.2 Exceptions for Case-by-Case TBELs

CWA section 402(o)(2) outlines specific exceptions to the general prohibition against revising an existing TBEL that was developed on a case-by-case basis using BPJ to reflect subsequently promulgated, less stringent effluent guidelines in a renewed, reissued, or modified permit. CWA section 402(o)(2) provides that relaxed limitations may be allowed where

- There have been material and substantial alternations or additions to the permitted facility that justify the relaxation.

- New information (other than revised regulations, guidance, or test methods) is available that was not available at the time of permit issuance and that would have justified a less stringent effluent limitation. If the effluent limitation was based on water quality standards, any changes must result in a decrease in pollutants discharged.
- Technical mistakes or mistaken interpretations of the law were made in issuing the permit under CWA section 402(a)(1)(b).
- Good cause exists because of events beyond the permittee's control (e.g., natural disasters) and for which there is no reasonably available remedy.
- The permit has been modified under CWA sections 301(c), 301(g), 301(h), 310(i), 301(k), 301(n), or 316(a).
- The permittee has installed and properly operated and maintained required treatment facilities but still has been unable to meet the effluent limitations (relaxation may be allowed only to the treatment levels actually achieved).

7.2.1.3 Exceptions for Limitations Based on State Standards

EPA has consistently interpreted CWA section 402(o)(1) to allow relaxation of WQBELs and effluent limitations based on state standards if the relaxation is consistent with the provisions of CWA section 303(d)(4) or if one of the exceptions in CWA section 402(o)(2) is met. The two provisions constitute independent exceptions to the prohibition against relaxation of effluent limitations. If either is met, relaxation is permissible.

CWA section 303(d)(4) has two parts: paragraph (A), which applies to *nonattainment waters*, and paragraph (B), which applies to *attainment waters*.

- **Nonattainment water:** CWA section 303(d)(4)(A) allows the establishment of a less stringent effluent limitation when the receiving water has been identified as not meeting applicable water quality standards (i.e., a *nonattainment water*) if the permittee meets two conditions. First, the existing effluent limitation must have been based on a total maximum daily load (TMDL) or other wasteload allocation (WLA) established under CWA section 303. Second, relaxation of the effluent limitation is only allowed if attainment of water quality standards will be ensured or the designated use not being attained is removed in accordance with the water quality standards regulations. This subsection does not provide an exception for establishing less stringent limitations where the original limitation was based on state permitting standards (e.g., state treatment standards) and was not based on a TMDL or WLA.
- **Attainment water:** CWA section 303(d)(4)(B) applies to waters where the water quality equals or exceeds levels necessary to protect the designated use, or to otherwise meet applicable water quality standards (i.e., an *attainment water*). Under CWA section 303(d)(4)(B), a limitation based on a TMDL, WLA, other water quality standard, or any other permitting standard may only be relaxed where the action is consistent with state's antidegradation policy.

Although the statute also identifies six exceptions in section 402(o)(2) where effluent limitations otherwise subject to the prohibition in section 402(o)(1) may be relaxed, the exceptions for technical mistakes or mistaken interpretations and permit modification, which are described above, would not apply to WQBELs.

7.2.1.4 Exception Safety Clause

CWA section 402(o)(3) is a *safety clause* that provides an absolute limitation on backsliding. This section of the CWA prohibits the relaxation of effluent limitations in all cases if the revised effluent limitation would result in a violation of applicable effluent guidelines or water quality standards, including antidegradation requirements. Thus, even if one or more of the backsliding exceptions outlined in the statute is applicable and met, CWA section 402(o)(3) acts as a floor and restricts the extent to which effluent limitations may be relaxed. The requirement affirms existing provisions of the CWA that require effluent limitations, standards, and conditions to ensure compliance with applicable technology and water quality standards.

7.2.2 Anti-backsliding Regulatory Provisions

Anti-backsliding regulations are found at Title 40 of the *Code of Federal Regulations* (CFR) 122.44(l). The regulations do not specifically address backsliding where a permittee seeks relaxation of an effluent limitation that is based on a state treatment standard or water quality standard [i.e., based on CWA section 301(b)(1)(C), 303(d) or 303(e)]. They do, however, address all other forms of backsliding.

First, the regulations at § 122.44(l)(1) restrict the relaxation of *final effluent limitations* and the relaxation of *standards or conditions* contained in existing permits. Thus, this regulation, in effect, addresses all types of backsliding not addressed in the CWA provisions (e.g., backsliding from limitations derived from effluent guidelines, from new source performance standards, from existing case-by-case limitations to new case-by-case limitations, and from conditions such as monitoring requirements that are not effluent limitations). Under the regulation, a permittee must meet one of the causes for modification under § 122.62 for the reissued permit to allow relaxation of such limitations, standards, or conditions.

Second, the regulations at § 122.44(l)(2)(i) directly reflect the specific prohibition imposed by CWA section 402(o) on backsliding where a permittee seeks to revise an existing case-by-case TBEL developed using BPJ to reflect a subsequently promulgated effluent guideline that is less stringent than the case-by-case requirement. The regulations include the same exceptions to this prohibition that are in CWA section 402(o)(2) and the same *safety clause* in CWA section 402(o)(3).

Thus, if the permit condition being considered for relaxation is either a case-by-case effluent limitation developed using BPJ or is any other limitation, standard, or condition other than an effluent limitation based on a state standard, the permit writer can apply the requirements in § 122.44(l). For effluent limitations based on state standards, the permit writer should apply the provisions of CWA sections 402(o) and 303(d)(4) directly. Exhibit 7-2 illustrates the process of applying the statutory and regulatory provisions addressing anti-backsliding.

Exhibit 7-2 Application of anti-backsliding requirements

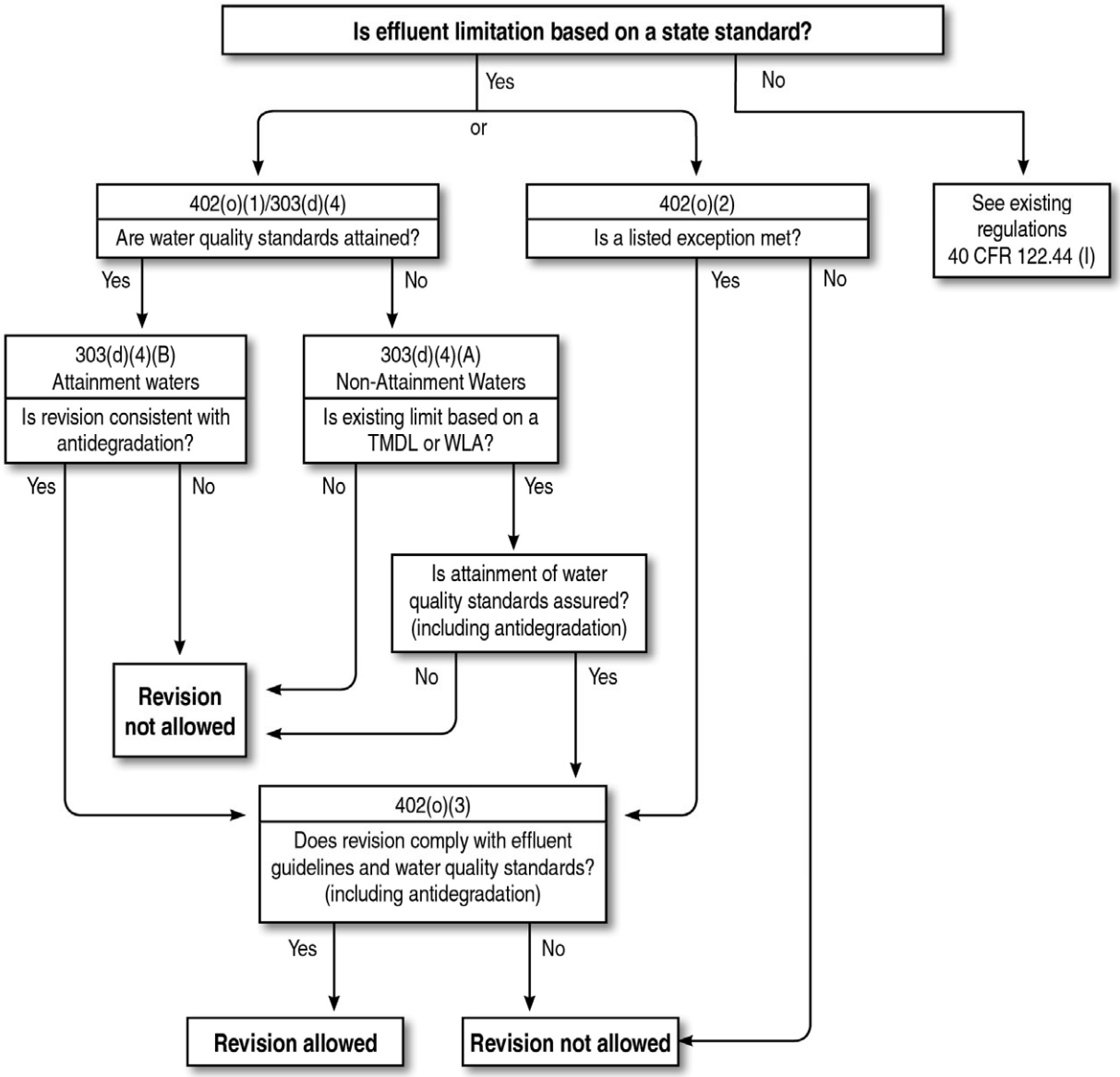

Exhibit 7-3 presents some examples of situations when backsliding might be a factor in effluent limitation development.

Exhibit 7-3 Backsliding examples

Example 1

- A publicly owned treatment works (POTW) seeks to relax its WQBEL for Pollutant X
- The current effluent limitation for Pollutant X is based on a TMDL and WLA for the POTW developed in accordance with § 130.7.
- The POTW is in compliance with its existing effluent limitation, and the applicable water quality standards for Pollutant X are attained.
- The POTW has developed new models with new river flow information. The models indicate that the water quality standards for Pollutant X would be maintained with a relaxed permit limitation.

Question:
May the effluent limitation for Pollutant X be relaxed?

Answer:
Possibly. Under the interpretation discussed above, WQBELs may be relaxed where one of the exceptions in CWA sections 402(o)(1) or (2) are met. In this case, although the new information from the models might meet the exception requirements criteria under CWA section 402(o)(2)(B)(i), CWA section 402(o)(2) will not justify the request unless the state reduces the pollutant loadings from other point sources or nonpoint sources of pollution. That is because, as discussed in Section 7.1 above, CWA section 402(o)(2) restricts the use of new information to cases where there is a decrease in the amount of pollutants being discharged.

The CWA section 402(o)(1) exceptions, on the other hand, might justify the request. In this case, the reference to CWA section 303(d)(4)(B) in CWA section 402(o)(1) is the relevant exception. CWA section 303(d)(4)(B) provides that, for receiving waters that meet water quality standards, permit limitations based on a TMDL or other WLA or other permit standard may be relaxed if the state's antidegradation policy requirements are met.

Example 2

- The state has established a technology-based treatment standard for fecal coliform pursuant to CWA section 301(b)(1)(C).
- The state later relaxes the standard in a revised regulation.
- A POTW, which has been in violation of its effluent limitation for fecal coliform based on the old standard, requests a revision of the limitation to reflect the new standard.
- Water quality standards for fecal coliform are not being attained.
- There was no TMDL or WLA developed. The basis of the effluent limitation was a state technology-based treatment standard.

Question:
May the fecal coliform effluent limitation be relaxed?

Answer:
No. Under CWA section 402(o)(1), the applicable provision is CWA section 303(d)(4)(A). This subsection does not authorize backsliding in this case (i.e., nonattainment waters) because it applies only to permit limitations based on a TMDL or other WLA. Here, the limitation in question is based on a state technology-based treatment standard.

Furthermore, if the permit sought to apply the exceptions in CWA section 402(o)(2), the new information provision would not allow the revision. For purposes of this section of the CWA, new information does not include *revised regulations*.

Exhibit 7-3 Backsliding examples (continued)

Example 3

- The state has a narrative water quality criterion of *no toxics in toxic amounts*.
- On the basis of WET testing data or other information, the state found that the discharge would cause, have the reasonable potential to cause, or contribute to an excursion of the water quality standards in the receiving water—specifically the narrative water quality criterion.
- The permitting authority imposed a WET limitation under § 122.44(d)(1)(v).
- The permittee determines that Pollutant Z is the cause of WET measured in its discharge.
- The permittee can demonstrate through sufficient data (including WET testing data) that an effluent limitation for Pollutant Z will assure compliance with the narrative water quality criterion as well as the state's numeric criteria for Pollutant Z, as required by § 122.44(d)(1)(v).

Question:
May the state modify the permit to delete the WET limitation and to add the effluent limitation for Pollutant Z?

Answer:
Possibly. CWA section 303(d)(4) might justify the action. The applicable provision is CWA section 303(d)(4)(B) because the narrative water quality criterion is currently attained. The permittee is complying with the existing WET limitation to attain and maintain the criterion. Under CWA section 303(d)(4)(B), the existing effluent limitation may be relaxed as long as antidegradation requirements are met and the relaxed limitation will not cause a violation of any effluent guidelines or water quality standards applicable to the discharge. In this case, it appears likely that a relaxation would be permissible because the permittee can demonstrate that the new limitation for Pollutant Z will assure compliance with both the narrative and numeric water quality criteria; however, the permit writer might consider continuing WET monitoring to identify other potential sources of toxicity in the future.

Example 4

- An industrial permittee seeks to revise its WQBEL of 60 mg/L for total suspended solids (TSS) to 100 mg/L, which is its actual discharge level.
- The current effluent limitation is based on a WLA from a TMDL developed in accordance with § 130.7.
- The water quality standards are not being attained. The ambient concentration of TSS exceeds the applicable water quality criteria.
- An effluent limitation of 100 mg/L is consistent with applicable effluent guidelines.
- New modeling information shows that the water quality standards will be attained with an effluent limitation of 75 mg/L TSS.

Question:
May the effluent limitation for TSS be revised from 60 mg/L to 100 mg/L?

Answer:
No; however, the effluent limitation could be relaxed to 75 mg/L under either CWA sections 402(o)(1) or (2) exceptions.

The water quality standards are not being attained because of TSS. Therefore, under CWA section 402(o)(1), the applicable exception is CWA section 303(d)(4)(A). In this case, the permitting authority may allow backsliding to 75 mg/L because the existing effluent limitation is based on a WLA from a TMDL, and the data show that attainment of the water quality standards is assured with an effluent limitation of 75 mg/L (but not with a limitation of 100 mg/L).

CHAPTER 8. Monitoring and Reporting Conditions

This chapter describes the monitoring and reporting conditions that a permit writer establishes in a National Pollutant Discharge Elimination System (NPDES) permit. The monitoring and reporting conditions require the permittee to conduct routine or episodic self-monitoring of permitted discharges and internal operations (where applicable) and report the analytical results to the permitting authority with the information necessary to evaluate discharge characteristics and compliance status. Periodic monitoring and reporting establish an ongoing record of the permittee's compliance status and, where violations are detected, create a basis for any necessary enforcement actions.

The monitoring and reporting conditions section of an NPDES permit generally includes specific requirements for the following items:

- Monitoring locations.
- Monitoring frequencies.
- Sample collection methods.
- Analytical methods.
- Reporting and recordkeeping requirements.

The following sections provide an overview of the considerations involved in determining appropriate monitoring, reporting, and recordkeeping requirements, and how to properly incorporate the appropriate requirements in an NPDES permit.

8.1 Establishing Monitoring Conditions

The NPDES regulations require facilities discharging pollutants to waters of the United States to periodically evaluate compliance with the effluent limitations established in their permits and provide the results to the permitting authority. A permit writer should consider several factors when determining the specific requirements to be included in the NPDES permit. Inappropriate or incomplete monitoring requirements can lead to inaccurate compliance determinations. Factors that could affect sampling location, sampling method, and sampling frequency include the following:

- Applicability of effluent limitations guidelines and standards (effluent guidelines).
- Wastestream and process variability.
- Access to sample locations.
- Pollutants discharged.
- Effluent limitations.
- Discharge frequencies (e.g., continuous versus intermittent).
- Effect of flow or pollutant load or both on the receiving water.
- Characteristics of the pollutants discharged.
- Permittee's compliance history.

8.1.1 Purposes of Monitoring

Monitoring is performed to determine compliance with effluent limitations established in NPDES permits, establish a basis for enforcement actions, assess treatment efficiency, characterize effluents and characterize receiving water.

Regulations requiring the establishment of monitoring and reporting conditions in NPDES permits are at Title 40 of the *Code of Federal Regulations* (CFR) 122.44(i) and 122.48. Regulations at § 122.44(i) require permittees to monitor pollutant mass (or other applicable unit of measure) and effluent volume and to provide other measurements (as appropriate) using the test methods established at Part 136. That subpart also establishes that NPDES permits (with certain specific exceptions as discussed in section 8.1.3 below) must require permittees to monitor for all limited pollutants and report data at least once per year.

Regulations at § 122.48 stipulate that all permits must specify requirements concerning the proper use, maintenance, and installation of monitoring equipment or methods (including biological monitoring methods when appropriate). NPDES permits must also specify the monitoring type, intervals, and frequency sufficient to yield data that are representative of the activity. The following sections focus on developing permit monitoring conditions that properly address these regulatory requirements.

8.1.2 Monitoring Location

The permit writer should specify the appropriate monitoring location in an NPDES permit to ensure compliance with the permit limitations and provide the necessary data to determine the effects of an effluent on the receiving water. The NPDES regulations do not prescribe exact monitoring locations; rather, the permit writer is responsible for determining the most appropriate monitoring location(s) and indicating the location(s) in the permit. Ultimately, the permittee is responsible for providing a safe and accessible sampling point that is representative of the discharge [§ 122.41(j)(1)].

The permit writer should consider the following questions when selecting a monitoring location:

- Is the monitoring location on the facility's property?
- Is the monitoring location accessible to the permittee and the permitting authority?
- Will the results be representative of the targeted wastestream?
- Is monitoring at internal points needed?

Permit writers should establish monitoring locations where the wastewater is well mixed, such as near a Parshall flume or at a location in a sewer with hydraulic turbulence. Weirs tend to enhance the settling of solids immediately upstream and the accumulation of floating oil or grease immediately downstream. Such locations should be avoided for sampling.

The permit writer can specify monitoring locations with either a narrative description or a diagram of the permittee's facility. Exhibit 8-1 provides examples of how to specify monitoring locations in a permit either by narrative or by diagram.

Exhibit 8-1 Examples of specifying monitoring locations in permits

Narrative

A. Monitoring Locations

1. Discharge from the Chemistry-Fine Arts Building must be sampled at the Parshall flume before the discharge point for Outfall 001.
2. Discharge from the Physics Building must be sampled at the Parshall flume before the discharge point for Outfall 002.
3. Discharge from the Research Lab No. 1 must be sampled at the Parshall flume before the discharge point for Outfall 003.

Diagram

A. Monitoring Locations

Outfall	Description
001	Discharge Pipe: Discharge of wastewater generated by all regulated metal finishing processes at the facility. Samples must be collected at the point indicated on the diagram below.

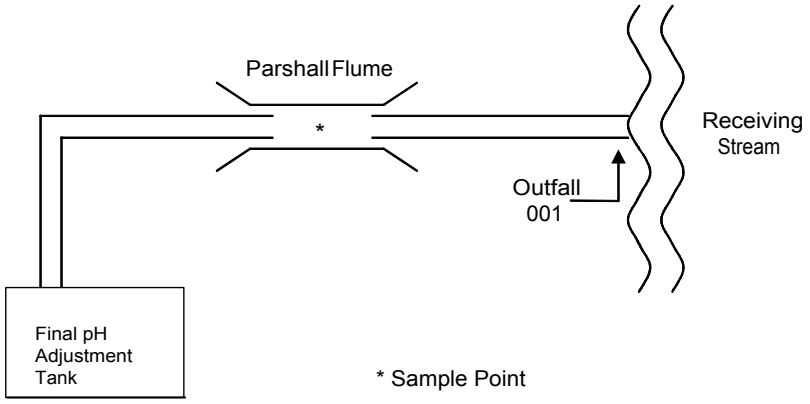

The monitoring location will vary depending on the type of monitoring required. The following sections discuss monitoring location considerations for each monitoring type.

8.1.2.1 Influent and source water monitoring locations

Influent monitoring is monitoring of a wastestream before that wastestream receives treatment. The permit writer should require influent monitoring when a characterization of the influent is needed to determine compliance with a permit condition, such as the 5-day biochemical oxygen demand (BOD_5) and total suspended solids (TSS) percent removal limitations required by the secondary treatment standards for publicly owned treatment works (POTWs).

Source water monitoring is the monitoring of source water before use as process water (e.g., river water used as contact cooling water). The permit writer should require source water monitoring if intake credits are established as specified in § 122.45(g).

Influent and source water monitoring locations should ensure a representative sample of raw intake water before any processes or treatment that could alter the properties of the intake water.

8.1.2.2 Internal monitoring locations

Internal monitoring is the monitoring of wastestreams at a location within the facility before discharge to waters of the United States. The NPDES regulations at § 122.45(h) allow internal monitoring points to be established when needed to determine compliance with a standard and in cases where setting an external monitoring location is not feasible. The permit writer may require internal monitoring to determine compliance with technology-based effluent limitations (TBELs) for a wastestream before commingling with other process or non-process wastestreams. Internal monitoring is generally not appropriate for determining compliance with water quality-based effluent limitations (WQBELs) unless final effluent monitoring is impractical (e.g., the final discharge point is submerged or inaccessible).

Examples of reasons for requiring designation of internal monitoring locations include the following:

- **Ensuring compliance with effluent guidelines (at non-POTW facilities):** When non-process wastewaters dilute process wastewaters subject to effluent guidelines, monitoring the combined discharge might not accurately allow determination of whether the facility is complying with the effluent guidelines. Under such circumstances, the permit writer might consider requiring monitoring for compliance with TBELs before the process wastewater is combined with non-process wastewater.
- **Ensuring compliance with secondary treatment standards (for POTWs only):** Some POTWs include treatment processes that do not address pollutants regulated by secondary treatment standards and that could interfere with the ability to accurately monitor for compliance with secondary treatment standards. Under such circumstances, the permit writer could consider requiring monitoring for compliance with limitations derived from secondary treatment standards before such processes. For example, the permit could require effluent monitoring for compliance with limitations derived from secondary treatment standards after secondary clarification but before disinfection.
- **Allowing detection of a pollutant:** Instances could arise where the combination of process and non-process wastewaters result in dilution of a pollutant of concern such that it would not be detectable using approved analytical methods. Internal monitoring would enable characterization of the pollutant before dilution with other wastewaters.

Where the permit writer determines that internal monitoring is necessary, § 122.45(h)(2) states that limitations on internal wastestreams may be imposed only where the permit fact sheet sets forth the exceptional circumstances requiring application of limitations at those locations.

8.1.2.3 Effluent monitoring locations

Effluent monitoring is monitoring of the final effluent after all treatment processes. The permit writer should require effluent monitoring to determine compliance with final effluent limitations established in the permit. Effluent monitoring also can be used to provide data to assess the possible impact of the discharge on the receiving water.

Effluent monitoring locations should provide a representative sample of the effluent being discharged into the receiving water. Effluent monitoring locations should be established after all industrial uses and treatment processes. Most importantly, the point where a final effluent limitation applies and the point

where monitoring is required must be the same. A logical effluent monitoring point is just before discharge to the receiving water. This is particularly true for ensuring compliance with WQBELs.

8.1.3 Monitoring Frequency

The permit writer should establish monitoring frequencies sufficient to characterize the effluent quality and to detect events of noncompliance, considering the need for data and, as appropriate, the potential cost to the permittee. Monitoring frequency should be determined on a case-by-case basis, and decisions for setting monitoring frequency should be described in the fact sheet. Some states have their own monitoring guidelines that can help a permit writer determine an appropriate monitoring frequency.

To establish a monitoring frequency, the permit writer should consider the variability of the concentration of various parameters by reviewing effluent data for the facility (e.g., from discharge monitoring reports [DMRs]) or, without actual data, information from similar dischargers. A highly variable discharge should require more frequent monitoring than a discharge that is relatively consistent over time (particularly in terms of flow and pollutant concentration). Other factors that should be considered when establishing appropriate monitoring frequencies include the following:

- **Design capacity of the treatment facility.** The monitoring frequency might need to be increased at facilities where the treatment facility is nearing design capacity. For example, at equivalent average flow rates, a large lagoon system that is not susceptible to bypasses would require less frequent monitoring than an overloaded treatment facility that experiences fluctuating flow rates from infiltration or large batch discharges from an industrial user system. The lagoon should have a relatively low variability compared to the facility receiving batch discharges.
- **Treatment method used.** The monitoring frequency will be similar for similar treatment processes. The type of wastewater treatment used by the facility might affect the frequency of effluent monitoring. An industrial facility employing biological treatment would have a similar monitoring frequency as a secondary treatment plant with the same units used for wastewater treatment. If the treatment method is appropriate and achieving high pollutant removals on a consistent basis, monitoring could be less frequent than for a plant with little or insufficient treatment.
- **Compliance history.** The monitoring frequency might need to be adjusted to reflect the compliance history of the facility. A facility with problems achieving compliance generally should be required to perform more frequent monitoring to characterize the source or cause of the problems or to detect noncompliance.
- **Cost of monitoring relative to permittee's capabilities.** The monitoring frequency should not be excessive and should be what is necessary to provide sufficient information about the discharge.
- **Location of the discharge.** The monitoring frequency could be increased if the discharge is to sensitive waters or is near a public water supply.
- **Nature of the pollutants.** To accurately characterize the discharge, the monitoring frequency might be increased for wastewaters with highly toxic pollutants or where the nature of the pollutants varies.

- **Frequency of the discharge.** The monitoring frequency for a wastewater discharged in batches infrequently should differ from that for a continuous discharge of highly concentrated wastewater or a wastewater containing a pollutant that is found infrequently and at very low concentrations. The production schedule of the facility (e.g., seasonal, daily), the plant washdown schedule, and other similar factors should be considered.
- **Number of monthly samples used in developing effluent limitations.** When establishing monitoring frequency, the permit writer should consider the number of monthly samples used in developing average monthly WQBELs. If the discharger monitors less frequently than the monthly monitoring frequency assumed when developing applicable effluent guidelines or in calculating a WQBEL, it could be more difficult for the discharger to comply with its average monthly effluent limitations. For example, if an average monthly limitation is established assuming a monitoring frequency of four times per month (i.e., the limit is the expected average of four samples taken during a month), a discharger taking only one sample per month would statistically have a greater chance of exceeding its average monthly limit than if it sampled at least four times per month.
- **Tiered limitations.** The monitoring frequency requirements should correspond to the applicable tiers in cases where the permit writer has included tiered limitations. If a facility has seasonal discharge limitations, it might be appropriate to increase the monitoring frequency during the higher production season, and reduce the frequency during the off-season.
- **Other Considerations.** To ensure representative monitoring, permit conditions could be included to require monitoring on the same day, week, or month for parameters that might be correlated in some way. For example, coordinating the monitoring requirements for parameters such as pathogens and chlorine or metals and pH can provide information for both compliance assessment and determination of treatment efficacy.

A permit writer could also establish a tiered monitoring schedule that reduces or increases the monitoring frequency during a permit cycle. Tiered monitoring might be appropriate for discharges where the initial sampling shows compliance with effluent limitations, justifying a reduction in monitoring frequency over time. Conversely, if problems are found during the initial sampling, more frequent sampling and more comprehensive monitoring can be applied. This step-wise approach could lead to lower monitoring costs for permittees while still providing the data needed to demonstrate compliance with effluent limitations.

In 1996 EPA issued *Interim Guidance for Performance-Based Reductions of NPDES Permit Monitoring Frequencies* <www.epa.gov/npdes/pubs/perf-red.pdf>. Under the guidance, NPDES reporting and monitoring requirements may be reduced on the basis of a demonstration of excellent historical performance. Facilities can demonstrate that historical performance by meeting a set of compliance and enforcement criteria and by demonstrating their ability to consistently discharge pollutants below the levels necessary to meet their existing NPDES permit limitations. Reductions are determined parameter-by-parameter, on the basis of the existing monitoring frequency and the percentage below the limitation at which the parameter is being discharged. The reductions are incorporated when the permit is reissued. To remain eligible for the reductions, permittees are expected to maintain the parameter performance levels and good compliance on which the reductions were based.

8.1.4 Sample Collection

The permit writer must specify the sample collection method for all parameters required to be monitored in the permit. The permit writer should determine the sample collection method on the basis of the characteristics of each specific discharge. Certain sample collection and storage requirements are identified as part of the analytical methods specified in Part 136. (Section 8.3 below presents more on analytical methods.) The two most frequently used sampling methods are grab and composite. For more detailed information on sample collection methods, permit writers should refer to Chapter 5 (Sampling) of the NPDES Compliance Inspection Manual[1] <www.epa.gov/compliance/resources/publications/monitoring/cwa/inspections/npdesinspect/npdesmanual.html>.

8.1.4.1 Grab Samples

Grab samples are individual samples collected over a period not exceeding 15 minutes and that are representative of conditions at the time the sample is collected. Grab samples are appropriate when the flow and characteristics of the wastestream being sampled are relatively constant. The sample volume depends on the type and number of analyses to be performed. A grab sample is appropriate when a sample is needed to

- Monitor an effluent that does not discharge on a continuous basis.
- Provide information about instantaneous concentrations of pollutants at a specific time.
- Allow collection of a variable sample volume.
- Corroborate composite samples.
- Monitor parameters not amenable to compositing (e.g., temperature).

Grab samples can also be used to determine the spatial variability of a parameter or information on variability over a short period. They also are useful for monitoring intermittent wastewater flows from well-mixed batch process tanks.

8.1.4.2 Composite Samples

Composite samples are collected over time, either by continuous sampling or by mixing discrete samples, and represent the average characteristics of the wastestream during the sample period. Composite samples might provide a more representative measure of the discharge of pollutants over a given period than grab samples, and are used when any of the following is true:

- A measure of the average pollutant concentration during the compositing period is needed.
- A measure of mass loadings per unit of time is needed.
- Wastewater characteristics are highly variable.

Composite samples can be discrete samples (see discussion of sequential sampling in section 8.1.4.3 below) or a single combined sample and are collected either manually or with automatic samplers. There are two general types of composite sampling: time-proportional and flow-proportional. The permit writer should clearly express which type is required in the permit.

Time-proportional composite sample: This method collects a fixed volume (V) of discrete sample aliquots in one container at constant time intervals (t) as shown in Exhibit 8-2.

Exhibit 8-2 Visual interpretation of time-proportional composite monitoring

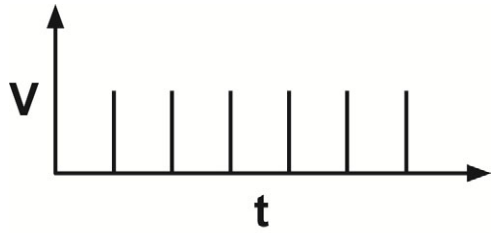

Time-proportional composite monitoring is appropriate when the flow of the sampled stream is constant (flow rate does not vary more than ±10 percent of the average flow rate) or when flow-monitoring equipment is not available. Automatically timed composited samples are usually preferred over manually collected composites. Composite samples collected by hand are appropriate for infrequent analyses and screening or if the subsamples have a fixed volume at equal time intervals.

Flow-proportional composite sample: There are two methods used for this type of sample: constant-volume when the interval time varies between samples, or constant-time when the interval volume collected varies between samples as shown in Exhibit 8-3.

Exhibit 8-3 Visual interpretation of flow-proportional composite monitoring

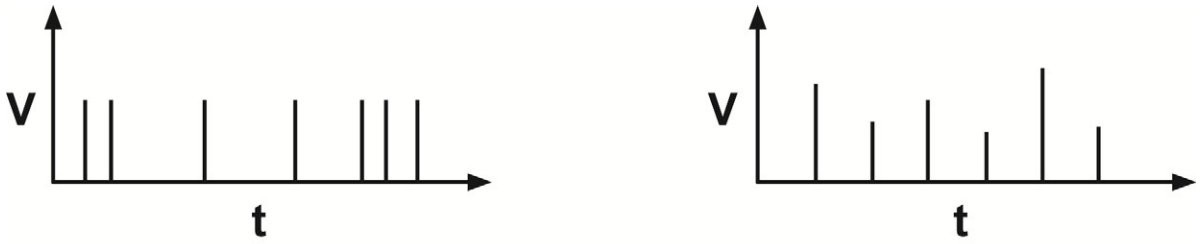

The constant-volume, flow-proportional, composite monitoring method collects a constant sample volume at varying time intervals proportional to stream flow (e.g., 200 milliliters sample collected for every 5,000 gallons of flow). The constant-time, flow-proportional, composite monitoring method collects the sample by adjusting the volume of each aliquot as the flow varies, while maintaining a constant time interval between the aliquots.

Flow-proportional composite sampling is usually preferred over time-proportional composite sampling when the effluent flow volume varies appreciably over time. If there is no flow-measuring device, effluent samples can be manually composited using the influent flow measurement without any correction for time lag. The error in the influent and effluent flow measurement is insignificant except in those cases where large volumes of water are impounded, as in equalization basins.

If a sampling protocol is not specified in the regulations, the permit writer should establish the duration of the compositing period and frequency of aliquot collection. The permit writer should also establish the time frame within which the sample is to be collected and the number of individual aliquots in the composite.

There are instances where composite samples are inappropriate. For example, the permit application regulations at § 122.21(g)(7) indicate that grab samples must be used for sampling several parameters that may change during the time it takes to composite the sample. Composite samples can be used for whole effluent toxicity (WET) testing; however, if there is concern that there are toxicity spikes or that the toxicant is a parameter for which composite sampling is not appropriate, grab samples for WET testing could be specified in the permit.

8.1.4.3 Sequential and Continuous Monitoring

Sequential monitoring refers to collecting discrete samples in individual containers in regular succession, such as timed intervals or discharge increments. Sequential grab samples provide a characteristic of the wastestream over a given time. Automatic sequential monitoring may be done with a special type of automatic sampling device that collects relatively small amounts of a sampled wastestream with the interval between sampling proportioned based on either time or effluent flow. Unlike a combined composite sampler, the sequential sampling device automatically retrieves a sample and holds it in a bottle separate from other automatically retrieved samples. Many individual samples can be stored separately in the unit rather than combining aliquots in a common bottle.

Continuous monitoring is another option for a limited number of parameters such as flow, total organic carbon (TOC), temperature, pH, conductivity, residual chlorine, fluoride, and dissolved oxygen. When establishing continuous monitoring requirements, the permit writer should be aware that the NPDES regulations concerning pH limitations allow for a period of excursion when the effluent is being continuously monitored (§ 401.17). The reliability, accuracy, and cost of continuous monitoring vary with the parameter monitored. The permit writer should consider the environmental significance of the variation of any of these parameters in the effluent and the cost of continuous monitoring before establishing continuous monitoring requirements in the permit.

8.2 Additional Monitoring Requirements and WET Testing

A variety of discharges other than traditional POTW or industrial wastewater discharges, including biosolids (sewage sludge), combined sewer and sanitary sewer overflows, and stormwater, are regulated under the NPDES permit program. In addition, many permits include requirements for WET testing. As discussed in this section, a permit writer should account for such unique discharges and testing requirements in establishing monitoring requirements.

8.2.1 Biosolids (Sewage Sludge)

The purpose of monitoring sewage sludge is to ensure safe use or disposal of the sludge. Sewage sludge regulations specified in Part 503 require monitoring of sewage sludge that is applied to land, placed on a surface disposal site, or incinerated. The frequency of monitoring is based on the annual amount of sewage sludge that is used or disposed of by those methods. POTWs that provide the sewage sludge to another party for further treatment (such as composting) must provide that party with the information necessary to comply with regulations at Part 503. Sewage sludge disposed of in a municipal solid waste landfill unit must meet the criteria for municipal solid waste landfills in the regulations at Part 258.

Exhibit 8-4 shows the minimum monitoring requirements established in Part 503 for sewage sludge before use and disposal. More frequent monitoring for any of the required or recommended parameters is appropriate when the POTW has any of the following:

- A highly variable influent load of toxics or organic solids.
- A significant industrial load.
- A history of process upsets due to toxics, or of adverse environmental impacts due to sludge use or disposal activities.

Exhibit 8-4 Minimum requirements for sewage sludge monitoring, based on method of sludge use or disposal

Method	Monitoring requirements	Frequency	Citation (40 CFR)
Land application	• Sludge weight and percent total solids • Metals: As, Cd, Cu, Pb, Hg, Mo, Ni, Se, and Zn • Pathogen Density • Vector Attraction Reduction	Based on dry weight of sludge in metric tons per year: • > zero but < 290: annually • = or > 290 but < 1,500: quarterly • = or > 1,500 but < 15,000: bimonthly • = or > 15,000: monthly	§ 503.16
Co-disposal in municipal solid waste landfill	• Sludge weight and percent total solids • Passes Paint-Filter Liquid Test • Suitability of sludge used as cover • Characterize in accordance with hazardous waste rules	Monitoring requirements or frequency not specified by Part 503. Determined by local health authority or landfill owner/operator.	Part 258
Surface disposal: lined sites with leachate collection and unlined sites	• Sludge weight and percent total solids • Metals: As, Cr, Ni (Unlined sites only) • Pathogen Density • Vector Attraction Reduction	Based on dry weight of sludge in metric tons per year: • > zero but < 290: annually • = or > 290 but < 1,500: quarterly • = or > 1,500 but < 15,000: bimonthly • = or > 15,000: monthly	§ 503.26
	• Methane gas	• Continuously	
Incineration	• Sludge weight and percent total solids • Metals: As, Cd, Cr, Pb, and Ni	Based on dry weight of sludge in metric tons per year: • > zero but < 290: annually • = or > 290 but < 1,500: quarterly • = or > 1,500 but < 15,000: bimonthly • = or > 15,000: monthly	§ 503.46
	• Be and Hg (National Emissions Standards)	• As required by permitting authority (local air authority)	
	• THC or O_2, moisture, combustion temperatures	• Continuously	
	• Air pollution control device operating parameters	• As required by permitting authority	

Notes:
Monitoring frequencies required by Part 503 may be reduced after 2 years of monitoring, but in no case may be less than once per year.
A successful land application program could necessitate sampling for other constituents of concern (such as nitrogen) in determining appropriate agronomic rates. The permit writer will determine additional monitoring requirements.

The sampling and analysis methods specified in § 503.8 and Part 136 should be followed for monitoring the required parameters. Without any specific methods in Part 503, guidance on appropriate methods is in the following documents:

- *Part 503 Implementation Guidance*[2] <www.epa.gov/npdes/pubs/owm0237.pdf>.
- *POTW Sludge Sampling and Analysis Guidance Document*[3] <www.epa.gov/npdes/pubs/owm012.pdf>.
- *Control of Pathogens and Vector Attraction in Sewage Sludge*[4] <www.epa.gov/ORD/NRMRL/pubs/625r92013/625r92013.htm>.

8.2.2 Combined Sewer Overflows (CSOs) and Sanitary Sewer Overflows (SSOs)

EPA's Combined Sewer Overflow (CSO) Control Policy (59 FR 18688, April 19, 1994) requires monitoring to characterize the combined sewer system, assist in developing a Long-Term Control Plan (LTCP), and show compliance with permit requirements. The permit writer should ensure the following:

- Monitoring is done to develop an initial system characterization as part of the nine minimum controls to reduce CSOs and their effect on receiving water quality. Such monitoring includes analyzing existing data on precipitation events, on the combined sewer system and CSOs, on water quality, and conducting field inspections.
- As part of the LTCP, a permittee is required to develop a more complete characterization of the sewer system through monitoring and modeling.
- To show compliance with the permit requirements and ultimately the attainment of water quality standards, the permittee is required to conduct a post-construction compliance monitoring program. Specific monitoring requirements of the post-construction compliance monitoring program will be unique to each permittee's LTCP and should be established as specific monitoring conditions in the individual NPDES permit.

These monitoring conditions should require monitoring of certain key parameters during a representative number of CSOs from a representative number of wet-weather events along with ambient water quality monitoring to ascertain attainment of water quality standards. EPA has prepared a guidance manual on monitoring entitled *Combined Sewer Overflows: Guidance for Monitoring and Modeling*[5] <www.epa.gov/npdes/pubs/sewer.pdf>.

A facility's permit might also contain monitoring requirements for sanitary sewer overflows (SSOs). SSO monitoring requirements would be developed on a case-by-case basis.

8.2.3 Stormwater Monitoring Considerations

Stormwater monitoring requirements vary according to the type of permit regulating the stormwater discharge and the activity. Municipal separate storm sewer systems (MS4s) serving more than 100,000 people (and some serving less than 100,000) are typically issued individual NPDES permits with monitoring requirements that are specific to the MS4. Smaller MS4s regulated under the stormwater Phase II rule are typically not required to conduct water quality monitoring as a condition in their NPDES general permit, though evaluation of measurable goals may include monitoring. EPA's multi-sector general permit (MSGP) for stormwater discharges from industrial facilities includes analytical monitoring requirements based on the type of industrial activity. Finally, operators of construction activity regulated under the

construction general permit are typically not required to conduct water quality monitoring; however, some states and EPA Regions do require monitoring if the construction activity will discharge to a water impaired by sediment.

Specific monitoring conditions for the federal general stormwater permits are detailed in the most recent Construction General Permit or MSGP issued by EPA (available on the EPA Stormwater Program Website <www.epa.gov/npdes/stormwater>). Additional documents on stormwater monitoring are:

- *Urban Stormwater BMP Performance: A Guidance Manual for Meeting the National Stormwater BMP Database Requirements*[6] <www.epa.gov/npdes/pubs/montcomplete.pdf>.
- *Guidance Manual for the Monitoring and Reporting Requirements of the NPDES Stormwater Multi-Sector General Permit (MSGP)*[7] <www.epa.gov/npdes/pubs/dmr-fin.pdf>.

8.2.4 WET Monitoring

The use of WET testing to evaluate the toxicity in a receiving stream is discussed in section 6.4 of this manual and on the NPDES WET Website <www.epa.gov/npdes/wet>. The WET (or biomonitoring) test procedures were promulgated in § 136.3 (60 FR 53529, October 16, 1995). EPA revised the WET methods in 67 FR 69951, November 19, 2002. WET monitoring conditions included in permits should specify the particular biomonitoring test to be used, the test species, required test endpoints, and quality assurance/quality control procedures.

To support permitting agencies in implementing WET methods, EPA has revised and published manuals for toxicity test protocols:

- *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms*. 5th ed.[8] <www.epa.gov/waterscience/WET/disk2/atx.pdf>.
- *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms*. 4th ed.[9] <www.epa.gov/waterscience/WET/disk3/ctf.pdf>.
- *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms*. 3rd ed.[10] <www.epa.gov/waterscience/WET/disk1/ctm.pdf>.
- *NPDES Compliance Monitoring Inspector Training: Biomonitoring*[11] (No Link).

WET testing samples could be composite or grab samples. Twenty-four hour composite samples are suggested except when any of the following are true:

- The effluent is expected to be more toxic at a certain time of day.
- Toxicity may be diluted during compositing.
- The size of the sample needed exceeds the composite sampler volume.

WET tests are relatively expensive compared to single parameter tests. Therefore, a permit writer should carefully consider the appropriate frequency for WET testing. A discharge with highly variable flow or observed toxicity should have more frequent monitoring than a discharge that is relatively consistent over time. As with other parameters, factors that a permit writer should consider when establishing appropriate WET monitoring frequencies include the following:

- Type of treatment process.

- Environmental significance and nature of the toxicity.
- Past compliance record or history.
- Cost of monitoring relative to financial capabilities.
- Number of monthly samples used in developing the permit limitation.
- The frequency of intermittent discharges.

Samples should be evenly spaced throughout the year so that seasonal variability can be ascertained.

8.3 Analytical Methods

The permit writer must specify the analytical methods to be used for monitoring. EPA's Office of Science and Technology's Clean Water Act Analytical Methods Website <www.epa.gov/waterscience/methods/> contains information about analytical methods.

The standard conditions of the permit [§§ 122.41(j)(4) and 122.44(i)] require that, when available, permittees use test procedures specified in Part 136 <www.epa.gov/waterscience/methods/basic.htm>. The analytical methods contained in Part 136 are established for conventional, toxic (priority), and some nonconventional pollutants. Without analytical methods for a parameter, the permit writer should specify the analytical method to be used. There are also procedures to apply for approval of alternative test methods in accordance with § 136.4.

While Part 136 identifies the analytical methods approved for use in the NPDES program, additional methods information is available through the National Environmental Methods Index (NEMI) <www.nemi.gov/>. NEMI is a Web-based, searchable clearinghouse of methods supported by the U.S. Geological Survey and EPA's Office of Water. NEMI contains summaries of more than 1,100 methods and describes them by their performance characteristics and their regulatory status, relative cost, detection level, detection level type, accuracy, precision, spiking level, instrumentation, lab equipment, and the *greenness* of analytic methods. Permit writers might find that information useful in comparing the features of Part 136 methods that will be used for assessing compliance with the calculated effluent limitations.

When establishing effluent limitations for a specific parameter (based on technology or water quality regulatory requirements), it is possible for the value of the calculated limit to fall below the method detection limit (MDL) and the minimum level (ML) established by the approved analytical method(s). Regardless of whether current analytical methods are available to detect and quantify the parameter at the concentration of the calculated limitation, the limitation must be included in the permit as calculated.

In some instances, there might be two or more approved Part 136 analytical methods available for the analysis of a parameter. In such cases, the permit should determine whether there is a need to select one of the approved methods and to include a requirement in the permit mandating the use of only the selected method. That approach might be necessary where an effluent limit is established at a level that is quantifiable by one approved method but is below the ML of another approved method.

Such a situation often occurs where a permit contains a WQBEL for mercury. To clarify the EPA's position with respect to effluent monitoring for mercury, EPA developed a memo *Analytical Methods for Mercury in National Pollutant Discharge Elimination System (NPDES) Permits*[12] <www.epa.gov/npdes/pubs/mercurymemo_analyticalmethods.pdf>.

Sufficiently Sensitive Methods

At the time of the writing of this manual, EPA had proposed regulations at §§ 122.21(e), 122.44(i), and Part 136, to require the use of sufficiently sensitive methods for analyses conducted for NPDES permit applications and for compliance monitoring (75 FR 35712, June 23, 2010). To ensure that appropriate analytical methods are required and performed, see the most current version of these federal regulations and applicable state analytical method regulations and policy.

8.4 Reporting Monitoring Results

The NPDES regulations require the permittee to maintain records and periodically report on monitoring activities. The regulations at § 122.41(l)(4)(i) require that monitoring results must be reported on a DMR <www.epa.gov/npdes/pubs/dmr.pdf>. Data reported include both data required by the permit and any additional data the permittee has collected consistent with permit requirements. All facilities must submit reports (on discharges and sludge use or disposal) at least annually, as required by § 122.44(i)(2). POTWs with pretreatment programs must submit a pretreatment report at least annually as required by § 403.12(i). However, the NPDES regulation states that monitoring frequency and reporting should be dependent on the nature and effect of the discharge or sludge use or disposal. Thus, the permit writer can require reporting more frequent than annually.

8.5 Recordkeeping Requirements

Generally, the permit writer is required by § 122.41(j) to include in the permit the requirement to retain records for at least three years, subject to extension by the State Director. Recordkeeping requirements for sewage sludge [§ 122.41(j)] and the CAFO program [§ 122.42(e)(2)] require records be kept five years or longer if required by the State Director. The permit writer should designate in the permit where records should be kept.

Monitoring records must include the following:

- Date, place, time of sampling.
- Name of sampler.
- Date of analysis.
- Name of analyst.
- Analytical methods used.
- Analytical results.

According to § 122.41(j), monitoring records must be representative of the discharge. Monitoring records, which must be retained, include continuous strip chart recordings, calibration data, copies of all reports for the permit, and copies of all data used to compile reports and applications.

Sewage sludge regulations under §§ 503.17, 503.27, and 503.47 establish recordkeeping requirements that vary depending on the use and disposal method for the sewage sludge. The same recordkeeping requirements should be applied to other sludge monitoring parameters not regulated by the Part 503 rule.

[1] U.S. Environmental Protection Agency. 2004. *NPDES Compliance Inspection Manual*. EPA-305-X-03-001. U.S. Environmental Protection Agency, Office of Enforcement and Compliance Assurance, Washington, DC. <www.epa.gov/compliance/resources/publications/monitoring/cwa/inspections/npdesinspect/npdesinspect.pdf>.

[2] U.S. Environmental Protection Agency. 1995. *Part 503 Implementation Guidance*. EPA 833-R-95-001. U.S. Environmental Protection Agency, Office of Water, Washington, DC. <www.epa.gov/npdes/pubs/owm0237.pdf>.

[3] U.S. Environmental Protection Agency. 1989. *POTW Sludge Sampling and Analysis Guidance Document*. EPA-833-B-89-100. U.S. Environmental Protection Agency, Office of Water, Washington, DC. <www.epa.gov/npdes/pubs/owm012.pdf>.

[4] U.S. Environmental Protection Agency. 1992. *Control of Pathogens and Vector Attraction in Sewage Sludge*. EPA-625/R-92-013. U.S. Environmental Protection Agency, Office of Research and Development, Washington, DC. <www.epa.gov/ORD/NRMRL/pubs/625r92013/625r92013.htm>.

[5] U.S. Environmental Protection Agency. 1999. *Combined Sewer Overflows–Guidance for Monitoring and Modeling*. EPA-832-B-99-002. U.S. Environmental Protection Agency, Office of Water, Washington, DC. <www.epa.gov/npdes/pubs/sewer.pdf>.

[6] U.S. Environmental Protection Agency. 2002. *Urban Stormwater BMP Performance: A Guidance Manual for Meeting the National Stormwater BMP Database Requirements*. EPA-821-B-02-001. U.S. Environmental Protection Agency, Office of Water, Washington, DC. <www.epa.gov/npdes/pubs/montcomplete.pdf>.

[7] U.S. Environmental Protection Agency. 1999. *Guidance Manual for the Monitoring and Reporting Requirements of the NPDES Stormwater Multi-Sector General Permit (MSGP).* U.S. Environmental Protection Agency, Office of Water, NPDES Program Branch, Washington, DC. <www.epa.gov/npdes/pubs/dmr-fin.pdf>.

[8] U.S. Environmental Protection Agency. 2002. *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, Fifth Edition.* EPA-821-R-02-012. U.S. Environmental Protection Agency, Office of Water, Washington, DC <www.epa.gov/waterscience/WET/disk2/atx.pdf>.

[9] U.S. Environmental Protection Agency. 2002. *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, Fourth Edition*. EPA-821-R-02-013. U.S. Environmental Protection Agency, Office of Water, Washington, DC. <www.epa.gov/waterscience/WET/disk3/ctf.pdf>.

[10] U.S. Environmental Protection Agency. 1994. *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms, Third Edition*. EPA821-R-02-014. U.S. Environmental Protection Agency, Office of Water, Washington, DC. <www.epa.gov/waterscience/WET/disk1/ctm.pdf>.

[11] U.S. Environmental Protection Agency. 1990. *NPDES Compliance Monitoring Inspector Training: Biomonitoring*. U.S. Environmental Protection Agency, Office of Water Enforcement and Permits, Washington, DC. NTIS # PB91-145854. (No Link)

[12] Hanlon, James A. 2007. *Analytical Methods for Mercury in National Pollutant Discharge Elimination System (NPDES) Permits.* U.S. Environmental Protection Agency, Office of Wastewater Management. Memorandum, August 23, 2007. <www.epa.gov/npdes/pubs/mercurymemo_analyticalmethods.pdf>.

CHAPTER 9. Special Conditions

Special conditions in National Pollutant Discharge Elimination System (NPDES) permits supplement numeric effluent limitations and require the permittee to undertake activities designed to reduce the overall quantity of pollutants being discharged to waters of the United States, to reduce the potential for discharges of pollutants, or to collect information that could be used in determining future permit requirements.

There are many different reasons to incorporate special conditions into a permit including:

- To address unique situations, such as facilities discharging pollutants for which data are absent or limited, making development of technology- or water quality-based effluent limitations (TBELs or WQBELs) more difficult or impossible.
- To incorporate preventive requirements, such as requirements to install process control alarms, containment structures, good housekeeping practices, and the like.
- To address foreseeable changes to discharges, such as planned changes to process, products, or raw materials that could affect discharge characteristics.
- To incorporate compliance schedules to provide the time necessary to comply with permit conditions.
- To incorporate other NPDES programmatic requirements (e.g., pretreatment, sewage sludge).
- To impose additional monitoring requirements that provide the permit writer with data to evaluate the need for changes in permit limitations.
- To increase or decrease monitoring requirements, depending on monitoring results or changes in processes or products.
- To impose requirements for special studies such as ambient stream surveys, toxicity identification evaluations (TIEs) and toxicity reduction evaluations (TREs), bioaccumulation studies, sediment studies, mixing or mixing zone studies, pollutant reduction evaluations, or other such information-gathering studies.

Section 9.1 below addresses several types of special conditions that apply to both municipal and non-municipal facilities. Section 9.2 addresses special conditions unique to municipal facilities.

9.1 Special Conditions Potentially Applicable to Any Type of Discharger

This section discusses several types of special conditions that could be included in any NPDES permit (i.e., municipal or non-municipal). Those special conditions can be thought of as the *ABCs* of special conditions and include the following:

- **A**dditional monitoring and special studies.
- **B**est management practices (BMPs).
- **C**ompliance schedules.

A summary of the use of those special conditions follows.

9.1.1 Additional Monitoring and Special Studies

Additional monitoring requirements, beyond those required under the effluent limitations section of the permit, and special studies are useful for collecting data that were not available to the permit writer for consideration during permit development. Additional monitoring requirements and special studies generally are used to supplement numeric effluent limitations or support future permit development activities. Examples of the types of special studies that could be required in an NPDES permit include the following:

- **Treatability studies:** Might be required in a permit when insufficient treatability information for a pollutant or pollutants would hinder a permit writer from developing defensible TBELs. Treatability studies can also be required when the permit writer suspects that a facility might not be able to comply with an effluent limitation.
- **Toxicity identification evaluation/toxicity reduction evaluation (TIE/TRE):** Could be required in a permit when wastewater discharges are found to be toxic using whole effluent toxicity (WET) tests. The purpose of those evaluations is to identify and control the sources of toxicity in an effluent. Further guidance related to U.S. Environmental Protection Agency (EPA) recommended TIE/TRE procedures and requirements is found in the following guidance manuals:
  - *Toxicity Reduction Evaluation Guidance for Municipal Wastewater Treatment Plants*[1] <www.epa.gov/npdes/pubs/tre.pdf>.
  - *Clarifications Regarding Toxicity Reduction and Identification Evaluations in the National Pollutant Discharge Elimination System Program*[2] <www.epa.gov/npdes/pubs/owmfinaltretie.pdf>.
  - *Generalized Methodology for Conducting Industrial Toxicity Reduction Evaluations*[3] (No link—see the endnote for ordering instructions).
  - *Methods for Aquatic Toxicity Identification Evaluations: Phase I Toxicity Characterization Procedures*. 2nd ed[4] <www.epa.gov/npdes/pubs/owm0330.pdf>.
  - *Toxicity Identification Evaluation: Characterization of Chronically Toxic Effluents, Phase I*[5] <www.epa.gov/npdes/pubs/owm0255.pdf>.
  - *Methods for Aquatic Toxicity Identification Evaluations: Phase II Toxicity Identification Procedures for Samples Exhibiting Acute and Chronic Toxicity*[6] <www.epa.gov/npdes/pubs/owm0343.pdf>.
  - *Methods for Aquatic Toxicity Identification Evaluations: Phase III Confirmation Procedures for Samples Exhibiting Acute and Chronic Toxicity*[7] <www.epa.gov/npdes/pubs/owm0341.pdf>.
- **Mixing or mixing zone studies:** Might be required in a permit to assist in determining how effluent and receiving water mix and in establishing a regulatory mixing zone that can be applied when developing WQBELs.
- **Sediment monitoring:** Could be included in a permit if a permit writer suspects that pollutants contained in wastewater discharges accumulate in the sediments of the receiving water.
- **Bioaccumulation studies:** Might be required in a permit to determine whether pollutants contained in wastewater discharges bioaccumulate in aquatic organisms (e.g., fish, invertebrates). Such studies could be required when water quality criteria are expressed in terms of fish tissue levels. Additional guidance related to evaluating the bioaccumulation potential of a pollutant can

be found in the *EPA Great Lakes Water Quality Initiative Technical Support Document for the Procedure to Determine Bioaccumulation Factors*[8] (No link—see the endnote for ordering instructions).

When establishing additional monitoring or special studies, permit writers must ensure that any requirements related to the study (e.g., special sampling or analytical procedures) are specified in the appropriate permit condition. In addition, permit writers should establish a reasonable schedule for completion and submission of the study or monitoring program. If the anticipated timeline is longer than one year, an interim progress report during the study is advisable.

9.1.2 Best Management Practices (BMPs)

In general, BMPs are actions or procedures to prevent or reduce the discharge of pollution to waters of the United States. Title 40 of the *Code of Federal Regulations* (CFR) section 122.2 includes the following in the definition of BMPs:

- Schedules of activities.
- Prohibitions of practices.
- Maintenance procedures.
- Treatment requirements.
- Operating procedures and practices to control
  - Plant site runoff.
  - Spillage or leaks.
  - Sludge or waste disposal.
  - Drainage from raw material storage areas.

9.1.2.1 When to Use BMPs

Clean Water Act (CWA) section 304(e) authorizes EPA to require BMPs as part of effluent limitations guidelines and standards (effluent guidelines) to control plant site runoff, spillage or leaks, sludge or waste disposal, and drainage from raw material storage that it determines are associated with or ancillary to the industrial manufacturing or treatment process and can contribute significant amounts of pollutants to navigable waters. Where effluent guidelines require specific control measures, including BMPs or development of a BMP plan, permit writers must include such requirements in permits. In addition, CWA section 402(p)(3)(B)(iii) states that permits for discharges from municipal storm sewers must require controls, including management practices, to reduce the discharge of pollutants. Finally, CWA sections 402(a)(1) and (2) give the permitting authority the ability to include BMPs in permits on a case-by-case basis to carry out the provisions of the CWA.

The NPDES regulations at § 122.44(k) track the statutory provisions cited above. This section of the regulations provides that permits must contain BMPs (when applicable) to control or abate the discharge of pollutants when any of the following are true:

- They are authorized under CWA section 304(e).
- They are authorized under CWA section 402(p) for the control of stormwater discharges.
- Numeric effluent limitations are infeasible.
- The practices are necessary to achieve effluent limitations and standards or carry out the purpose and intent of the CWA.

Circumstances under which numeric effluent limitations might be infeasible include the following:

- Regulating a pollutant for which limited treatability or aquatic impact data are available to allow development of numeric TBELs or WQBELs.
- Regulating discharges when the types of pollutants vary greatly over time.

In addition, a permit writer should consider using BMPs under any of the following circumstances:

- When chemical analyses are inappropriate or impossible.
- When there is a history of leaks and spills or when housekeeping is sloppy.
- When a complex facility lacks data for a pollutant or pollutants.

9.1.2.2 BMPs in NPDES Permits

Permit writers include BMP requirements in permits using two approaches: (1) site-, process-, or pollutant-specific BMPs, or (2) a requirement to develop a BMP plan. Site-, process-, or pollutant-specific BMPs might be appropriate in the case of an individual permit where a permit writer has the opportunity to review the circumstances at the facility. On the other hand, it might not be appropriate to include site-, process-, or pollutant-specific BMPs as conditions in a general permit, a permit for a particularly complex facility, or a permit for a facility with operations not familiar to the permit writer. Instead, complicated facilities and discharges covered under a general permit could be required to develop a BMP plan that requires the permittee to determine appropriate BMPs on the basis of circumstances at its facility.

Specific BMPs

Specific BMPs are designed to address conditions particular to a type of facility or to a specific site, process, or pollutant. Specific BMPs might be used in a permit when

- They are needed to address ancillary activities that could result in the discharge of pollutants to waters of the United States.
- Numeric effluent limitations for a specific process are otherwise infeasible and BMPs serve as effluent limitations for that process.
- They are required to supplement and ensure compliance with effluent limitations in the permit.

To select a specific BMP, the permit writer could

- Review the industry profiles or the specific facility to determine the applicable and appropriate management practices.
- Evaluate whether the BMP would help to achieve effluent limitations or other environmental objectives for that facility.
- Use information from other permits, pollution prevention sources, and EPA guidance documents to identify applicable and appropriate BMPs.

Specific BMPs frequently are required for certain types of dischargers such as concentrated animal feeding operations (CAFOs), combined sewer overflows (CSOs), and stormwater discharges.

BMP Plans

The *Guidance Manual for Developing Best Management Practices*[9] <www.epa.gov/npdes/pubs/owm0274.pdf> describes the activities and materials at an industrial or municipal facility that are best addressed by BMPs. The manual also describes how BMPs work and gives examples of types of BMPs.

If a permit writer requires a BMP plan, it is the facility's responsibility to develop, implement, and evaluate the success or shortfalls of its own plan. Often, a BMP committee (i.e., a group of individuals within the plant organization) is responsible for developing the BMP plan and assisting the plant management in implementing and updating the BMP plan.

EPA has identified several recommended components of effective BMP plans and detailed each component in the *Guidance Manual for Developing Best Management Practices*. The minimum suggested components of a general BMP plan are presented below:

- General Provisions
  - Name and location of facility.
  - Statement of BMP policy and objective.
  - Review by plant manager.
- Specific Provisions
  - BMP committee.
  - Risk identification and assessment.
  - Reporting of BMP incidents.
  - Materials compatibility.
  - Good housekeeping.
  - Preventive maintenance.
  - Inspections and records.
  - Security.
  - Employee training.

BMP plans used to supplement effluent limitations or to describe how the discharger plans to meet effluent limitations can be submitted to the regulatory agency or be kept on-site and made available to the permitting authority upon request. A general schedule for BMP plan development can be included in the permit (e.g., complete and submit the plan within six months of permit issuance and begin implementing the plan within nine months of permit issuance).

Exhibit 9-1 presents example permit text for a requirement to develop and implement a BMP plan and should be adapted as necessary to reflect conditions at the individual facility.

Exhibit 9-1 Example BMP plan requirement

The following is example text for requiring development and implementation of a BMP plan through an NPDES permit. The text should be crafted and changed as necessary to meet the individual facility's needs and the permitting authority's goals. The bracketed text should be updated to be specific to the permit.

1. Implementation.

[IF A BMP PLAN DOES NOT EXIST:]
The permittee, must develop and implement a best management practices (BMP) plan that achieves the objectives and the specific requirements listed below. A copy of the plan must be submitted to the U.S. Environmental Protection Agency (EPA) **[AND/OR STATE AGENCY]** within six months of the effective date of this permit. The plan must be implemented as soon as possible but no later than nine months from the effective date of the permit. The permittee must update and amend the plan as needed.

[IF A BMP PLAN ALREADY EXISTS:]
The permittee must during the term of this permit operate the facility in accordance with the BMP plan **[CITE EXISTING PLAN]** and in accordance with subsequent amendments to the plan. The permittee must amend the plan to incorporate practices to achieve the objectives and specific requirements listed below, and a copy of the amended plan must be submitted to the U.S. Environmental Protection Agency (EPA) **[AND/OR STATE AGENCY]** within three months of the effective date of this permit. The amended plan must be implemented as soon as possible but not later than six months from the effective date of the permit.

2. Purpose

Through implementation of the BMP plan the permittee must prevent or minimize the generation and the potential for the release of pollutants from the facility to the waters of the United States through normal operations and ancillary activities.

3. Objectives

The permittee must develop and amend the BMP plan consistent with the following objectives for the control of pollutants.

a. The number and quantity of pollutants and the toxicity of effluent generated, discharged, or potentially discharged at the facility must be minimized by the permittee to the extent feasible by managing each influent waste stream in the most appropriate manner.
b. Under the BMP plan, and any Standard Operating Procedures (SOPs) included in the plan, the permittee must ensure proper operation and maintenance of the treatment facility as required by § 122.41(e).
c. The permittee must establish specific objectives for the control of pollutants by conducting the following evaluations.
    1. Each facility component or system must be examined for its waste minimization opportunities and its potential for causing a release of significant amounts of pollutants to waters of the United States because of equipment failure, improper operation, and natural phenomena such as rain or snowfall, etc. The examination must include all normal operations and ancillary activities including material storage areas, plant site runoff, in-plant transfer, process and material handling areas, loading or unloading operations, spillage or leaks, sludge and waste disposal, or drainage from raw material storage. **[NOTE THAT ONLY THE APPLICABLE AREAS SHOULD BE INCLUDED IN THE PREVIOUS LIST.]**
    2. Where experience indicates a reasonable potential for equipment failure (e.g., a tank overflow or leakage), natural condition (e.g., precipitation), or other circumstances that may result in significant amounts of pollutants reaching surface waters, the program should include a prediction of the direction, rate of flow and total quantity of pollutants that could be discharged from the facility as a result of each condition or circumstance.

4. Requirements

The BMP Plan must be consistent with the objectives in the Objectives section above and the general guidance contained in the publication entitled *Guidance Manual for Developing Best Management Practices (BMPs)*, EPA 833-B-93-004, <www.epa.gov/npdes/pubs/owm0274.pdf> or any subsequent revisions to the guidance document. The BMP plan must

a. Be documented in narrative form, must include any necessary plot plans, drawings or maps, and must be developed in accordance with good engineering practices. The BMP plan must be organized and written with the following structure:
    1. Name and location of the facility.
    2. Statement of BMP policy.
    3. Structure, functions, and procedures of the BMP Committee.
    4. Specific management practices and standard operating procedures to achieve the above objectives, including the following:

Exhibit 9-1 Example BMP plan requirement (continued)

a. Modification of equipment, facilities, technology, processes, and procedures.
b. Reformulation or redesign of products.
c. Substitution of materials.
d. Improvement in management, inventory control, materials handling or general operational phases of the facility.

5. Risk identification and assessment.
6. Reporting of BMP incidents.
7. Materials compatibility.
8. Good housekeeping.
9. Preventative maintenance.
10. Inspections and records.
11. Security.
12. Employee training.

b. Include the following provisions concerning BMP plan review:
   1. Review by plant engineering staff and the plant manager.
   2. Review and endorsement by the permittee's BMP Committee.
   3. A statement that the above reviews have been completed and that the BMP plan fulfills the requirements set forth in this permit. The statement must include the dated signatures of each BMP Committee member as certification of the reviews.

c. Establish specific BMPs to meet the objectives identified in the Objectives section above, addressing each component or system capable of generating or causing a release of significant amounts of pollutants, and identifying specific preventive or remedial measures to be implemented.

d. Establish specific BMPs or other measures that ensure that the following specific requirements are met:
   1. Ensure proper management of solid and hazardous waste in accordance with regulations promulgated under the Resource Conservation and Recovery Act (RCRA). Management practices required under RCRA regulations must be referenced in the BMP plan.
   2. Reflect requirements for Spill Prevention, Control, and Countermeasure (SPCC) plans under Clean Water Act (CWA) section 311 and 40 CFR Part 112 and may incorporate any part of such plans into the BMP plan by reference.
   3. Reflect requirements for stormwater control under CWA section 402(p) and the regulations at 40 CFR 122.26 and 122.44, and otherwise eliminate to the extent practicable, contamination of stormwater runoff.

   etc.

[NOTE: SECTION d. ABOVE COULD BE TAILORED TO EACH FACILITY BY THE PERMIT WRITER AND MAY INCLUDE PROCESSES OR AREAS OF THE FACILITY WITH HOUSEKEEPING PROBLEMS, NONCOMPLIANCE, SPILLS/LEAKS, OR OTHER PROBLEMS THAT COULD BE REMEDIED THROUGH A BMP. IF THERE IS A KNOWN SOLUTION TO THE PROBLEM (E.G., MORE FREQUENT INSPECTIONS, PREVENTIVE MAINTENANCE, ETC.), THIS REMEDY COULD ALSO BE INCLUDED AS A PART OF THE BMP PLAN REQUIREMENTS. TO GATHER IDEAS FOR SUCH REQUIREMENTS, THE PERMIT WRITER MAY WANT TO CONTACT THE PERMITTEE, COMPLIANCE PERSONNEL, FACILITY INSPECTORS, OPERATIONS OFFICE PERSONNEL, AND STATE AGENCY COUNTERPARTS. THE PERMIT WRITER MIGHT ALSO WANT TO CHECK REQUIREMENTS IN OTHER PERMITS AND BMP PLANS FOR SIMILAR FACILITIES.]

5. Documentation

The permittee must maintain a copy of the BMP plan at the facility and must make the plan available to EPA **[AND/OR STATE AGENCY]** upon request. All offices of the permittee, which are required to maintain a copy of the NPDES permit, must also maintain a copy of the BMP plan.

6. BMP Plan Modification

The permittee must amend the BMP plan whenever there is a change in the facility, or in the operation of the facility, that materially increases the generation of pollutants or their release or potential release to the receiving waters. The permittee must also amend the plan, as appropriate, when plant operations covered by the BMP plan change. Any such changes to the BMP plan must be consistent with the objectives and specific requirements listed above. All changes in the BMP plan must be reported to EPA **[AND/OR STATE AGENCY]** in writing.

7. Modification for Ineffectiveness

If at any time the BMP plan proves to be ineffective in achieving the general objective of preventing and minimizing the generation of pollutants and their release and potential release to the receiving waters and/or the specific requirements above, the permit and/or the BMP plan must be subject to modification to incorporate revised BMP requirements.

9.1.2.3 Pollution Prevention in BMPs

BMPs are, by their nature, pollution prevention practices. Traditionally, BMPs have focused on good housekeeping measures and good management techniques that attempt to avoid contact between pollutants and water as a result of leaks, spills, and improper waste disposal. However, on the basis of the authority granted under the regulations, BMPs may include a range of pollution prevention options, including production modifications, operational changes, materials substitution, and materials and water conservation.

When developing BMPs, permit writers should be familiar with the fundamental principles of pollution prevention:

- Pollution should be prevented or reduced at the source, whenever feasible (*Reduce*).
- Pollution that cannot be prevented should be reused or recycled in an environmentally safe manner, whenever feasible (*Reuse-Recycle*).
- Pollution that cannot be prevented or recycled should be treated in an environmentally safe manner, whenever feasible (*Treat*).
- Disposal or other release into the environment should be employed only as a last resort and should be conducted in an environmentally safe manner (*Dispose of*).

When writing an NPDES permit, a permit writer who has familiarity with a certain type of processes might identify pollution prevention practices that are not used at a facility and that would help that facility achieve its pollution prevention goals. Where the pollution prevention practices are necessary to carry out the purposes and intent of the CWA, the permit writer may develop BMPs to implement those practices.

9.1.3 Compliance Schedules

The NPDES regulations at § 122.47 allow permit writers to establish schedules of compliance to give permittees additional time to achieve compliance with the CWA and applicable regulations. Schedules developed under this provision must require compliance by the permittee *as soon as possible*, but may not extend the date for final compliance beyond compliance dates established by the CWA. Thus, compliance schedules in permits are not appropriate for every type of permit requirement. Specifically, a permit writer may not establish a compliance schedule in a permit for TBELs because the statutory deadlines for meeting technology standards (i.e., secondary treatment standards and effluent guidelines) have passed. This restriction applies to both existing and new dischargers. Permit writers should note, however, that § 122.29(d)(4) allows a new source or new discharger up to 90 days to *start-up* its pollution control equipment and achieve compliance with its permit conditions (i.e., provides for up to a 90-day period to achieve compliance).

Examples of requirements for which a compliance schedule in an NPDES permit might be appropriate include:

- Pretreatment program development.
- Sludge use and disposal program development and implementation.
- BMP plan development and implementation.
- Effluent limitations derived from new or revised water quality standards.

An EPA Administrator's decision specifically addresses compliance schedules for effluent limitations derived from new or revised water quality standards. In the decision *In the Matter of Star-Kist Caribe, Inc*., documented in the memorandum *Order Denying Modification Request With Respect to the Administrator's 1990 Decision in Star-Kist Caribe, Inc. (NPDES Appeal No. 88-5)*[10] <www.epa.gov/npdes/pubs/owm0121.pdf>, the EPA Administrator interpreted CWA section 301(b)(1)(C) to mean that 1) after July 1, 1977, permits may not contain compliance schedules for effluent limitations based on water quality standards adopted before July 1, 1977, and 2) compliance schedules are allowed for effluent limitations based on standards adopted after that date *only* if the state has clearly indicated in its water quality standards or implementing regulations that it intends to allow them.

In May 2007, the Director of EPA's Office of Wastewater Management issued a memorandum to EPA Region 9 that clarified the requirements of § 122.47 as they relate to WQBELs [see *Compliance Schedules for Water Quality-Based Effluent Limitations in NPDES Permits*[11] <www.epa.gov/npdes/pubs/memo_complianceschedules_may07.pdf>. Permit writers should consider the principles outlined in this memo when assessing whether a compliance schedule for achieving a WQBEL is consistent with the CWA and its implementing regulations and when documenting the basis for a compliance schedule in a permit. Considerations outlined in the memo include the following:

- Demonstrate that the permittee cannot immediately comply with the new effluent limitation on the effective date of the permit.
- Include an enforceable *final* effluent limitation and a date for achievement in the permit.
- Justify and document the *appropriateness* of the compliance schedule; factors relevant to a determination that a compliance schedule is appropriate include how much time the discharger had to meet the WQBEL under prior permit(s), whether there is any need for modifications to treatment facilities, operations, or other measures and, if so, how long it would take to implement such modifications.
- Justify and demonstrate that compliance with the final WQBEL is required *as soon as possible*; factors relevant to a determination that a compliance is required as soon as possible include the steps needed to modify or install treatment facilities, operations, or other measures and the time those steps would take.
- Include an enforceable sequence of events leading to compliance with interim milestones for schedules longer than one year.
- Recognize that a schedule solely to provide time to develop a total maximum daily load (TMDL) or to conduct a use attainability analysis (UAA) is not appropriate.

Many of the principles outlined in the memo could be more generally applied to compliance schedules for requirements other than WQBELs.

9.2 Special Conditions for Municipal Facilities

This section explains several common special conditions that are applicable only to municipal facilities. These conditions reflect requirements for publicly owned treatment works (POTWs) to implement and enforce local pretreatment programs for their industrial users; biosolids (sewage sludge) disposal requirements; CSO requirements; SSO requirements; and municipal separate storm sewer system (MS4) requirements.

9.2.1 The National Pretreatment Program

CWA section 402(b)(8) requires that certain POTWs receiving pollutants from significant industrial sources (subject to CWA section 307(b) standards) establish a pretreatment program to ensure compliance with these standards. The implementing regulations at § 403.8(a) state that:

> Any POTW (or combination of POTWs operated by the same authority) with a total design flow greater than 5 million gallons per day (mgd) and receiving from industrial users pollutants which pass through or interfere with the operation of the POTW or are otherwise subject to pretreatment standards will be required to establish a POTW pretreatment program unless the NPDES state exercises its option to assume local responsibilities as provided in § 403.10(e).

As specified in § 403.8(a), the Regional Administrator or Director of an authorized state may require a POTW with a design flow of 5 mgd or less to develop a POTW pretreatment program. Program development could be determined to be necessary to prevent interference with or pass through of the POTW based on the nature, or volume, of the industrial influent, a history of treatment process upsets and violations of POTW effluent limitation(s), and contamination of municipal sludge.

Since 1978, approximately 1,500 POTWs have been required to develop and implement pretreatment programs through special conditions of NPDES permits. The pretreatment program was developed to control industrial discharges to POTWs and to meet the following objectives:

- To prevent pass through of pollutants.
- To prevent interference with POTW processes, including interference with the use or disposal of municipal sludge.
- To improve opportunities to recycle and reclaim municipal and industrial wastewater and sludges.

The pretreatment program also helps ensure POTW personnel health and safety.

As authorized by the pretreatment regulations at §§ 403.8(c), 403.8(d) and 403.8(e) and the NPDES regulations at § 122.44(j)(2), the requirements to develop and implement a POTW pretreatment program are included as enforceable conditions in the POTW's NPDES permit. NPDES permits drive the development and implementation of pretreatment programs by requiring the following:

- Adequate legal authority.
- Maintenance of an industrial user inventory.
- Development and implementation of local limits.
- Control mechanisms issued to significant industrial users (SIUs).
- Compliance monitoring activities.
- Swift and effective enforcement.
- Data management and recordkeeping.
- Reporting to the approval authority (EPA or state).
- Public participation.

Through the NPDES permit, the POTW is required to develop and implement a pretreatment program. The POTW is required to submit an approvable program that meets the requirements in § 403.9(b). A more detailed description of these required program elements is in § 403.8(f). The POTW must have the legal authority enabling it to do the following:

- Deny or condition new or increased contributions of pollutants, or changes in nature of pollutants, to the POTW by industrial users.
- Require compliance with applicable pretreatment standards and requirements by industrial users.
- Control through a permit, order, or similar means the contribution to the POTW by each industrial user to ensure compliance with applicable pretreatment standards and requirements. These control mechanisms must have certain conditions as laid out in § 403.8(f)(1)(iii) and be enforceable.
- Require the development of compliance schedules where necessary by each industrial user for the installation of technology required to meet applicable pretreatment standards and requirements, and submission of all notices and self-monitoring reports to assess and ensure compliance.
- Carry out all inspection, surveillance, and monitoring procedures necessary to determine compliance with applicable pretreatment standards and requirements independent of information submitted by the industrial user (including the authority to enter the premises of the industrial user).
- Obtain remedies for noncompliance (e.g., injunctive relief, penalties).
- Comply with confidentiality requirements.

Further, at a minimum, the POTW must have procedures to do the following:

- Identify and locate all possible industrial users that might be subject to the POTW pretreatment program.
- Identify the character and volume of pollutants contributed to the POTW by the industrial users.
- Notify industrial users of applicable pretreatment standards and applicable requirements under CWA sections 204(b) and 405 and RCRA Subtitles C and D.
- Receive and analyze self-monitoring reports.
- Conduct sampling, inspections and other surveillance activities to determine compliance with applicable pretreatment standards and requirements independent of information supplied by the industrial user.
- Investigate instances of noncompliance.
- Comply with public participation requirements, including annual public notice of industrial users determined to be in significant noncompliance during the previous 12-month period.

Also, as part of the POTW pretreatment program, POTWs must have adequate resources and funding to implement the program, evaluate the need for and, as necessary, develop local limits and develop an enforcement response plan.

The NPDES permit should include the conditions specified in § 403.9, including that the POTW be required to submit the program documentation, detailing the authority and procedures to be implemented, along with other information about the program. The permit will allow the POTW up to one year, from the time when written notification from the approval authority determined the need for a pretreatment program, to develop and submit a program for approval as stated in § 403.8(b). Once the permitting authority reviews and approves the program, the requirement to implement the approved program is then incorporated into the permit.

The permit writer generally incorporates the requirement to develop a pretreatment program at the time of permit reissuance. The requirement, however, may also be incorporated through a modification of the permit if there is *cause*, as defined in detail in § 403.8(e), to make such a modification. The permit writer must follow procedures outlined by § 122.62 related to modifications when including the requirement to develop a pretreatment program in an NPDES permit

During the life of the permit, it might be necessary for the POTW to modify its approved pretreatment program (changes to local limits, changes to the ordinance, and such). The changes can be brought about by the POTW's desire to change the way the program operates, or they can be the result of changes that are necessary to address deficiencies in the program found during inspections or audits done by the permitting authority. Whatever the reason for the modification, the permitting authority must review and approve any modification to the approved program that is considered substantial, as required by § 403.18. All substantial program modifications to the POTW's approved pretreatment program require minor modifications to the NPDES permit and are subject to the procedural requirements in §§ 122.63(g) and 403.18. In addition, incorporating the requirement for a previously approved pretreatment program for the purpose of making the implementation of the program an enforceable part of the permit is also considered a minor modification to the NPDES permit.

The majority of POTWs that need pretreatment program requirements in their permits currently have them in place. In addition, an NPDES state or an EPA region will often designate a pretreatment coordinator to serve as the pretreatment expert to review the annual report from the POTW and recommend any action to be taken. The state or EPA regional pretreatment coordinator is a key resource on pretreatment issues, particularly at the time of NPDES permit reissuance. EPA regions and approved states have developed standard pretreatment development or implementation conditions (with minor modifications made to tailor the conditions to the specific discharger) that are placed in all applicable NPDES permits in that region or state. The permit writer can usually obtain examples of these NPDES pretreatment conditions from the EPA or state pretreatment coordinators. The permit writer might need to update or modify pretreatment implementation language or initiate corrective action related to the pretreatment program.

EPA has developed the Pretreatment Program Website <www.epa.gov/npdes/pretreatment> and prepared a number of guidance manuals for POTWs on how to implement their local pretreatment programs that are accessible through this website. In addition, EPA prepared the *Introduction to the National Pretreatment Program*[12] <www.epa.gov/npdes/pubs/final99.pdf> as a reference for anyone interested in understanding the basics of pretreatment program requirements and to provide a roadmap to additional and more detailed guidance materials for those trying to implement specific elements of the pretreatment program.

Pretreatment program information and monitoring data obtained through the POTW's pretreatment program are useful to the permit writer in identifying possible modifications to the pretreatment program's local limits or procedures, or the need for water quality-based controls. The permit writer should obtain such data with the aid of the pretreatment coordinator. Permits must include conditions requiring a POTW to provide a written technical evaluation of the need to revise local limits under § 403.5(c)(1) following permit issuance or reissuance [§ 122.44(j)(2)(ii)]. In addition, POTWs with a design flow greater than or equal to one mgd and with an approved pretreatment program or required to develop a pretreatment program must sample and analyze their effluent for priority (toxic) pollutants listed in Part 122, Appendix J, Table 2 as part of the permit application process [see § 122.21(j)(4)(iv)]. Those data and information also are useful for determining the need for WQBELs.

9.2.2 Biosolids (Sewage Sludge)

CWA section 405(d) requires that EPA regulate the use and disposal of sewage sludge to protect public health and the environment from any reasonably anticipated adverse effects of these practices. In the CWA, Congress directed EPA to develop technical standards for municipal sludge use and disposal options and enacted strict deadlines for compliance with these standards. Within one year of promulgation of the standards, compliance was required unless construction of new pollution control facilities was necessary, in which case compliance was required within two years.

EPA promulgated Part 503, Standards for the Use or Disposal of Sewage Sludge in 58 *Federal Register* (FR) 9248, February 19, 1993, with amendments in 59 FR 9095, February 19, 1994 and 60 FR 54764, October 25, 1995. These regulations address four sludge use and disposal practices: land application, surface disposal, incineration, and disposal in a municipal solid waste landfill. The standards for each end use and disposal method consist of general requirements, numeric effluent limitations, operational standards, and management practices, as well as monitoring, recordkeeping, and reporting requirements. Unlike technology standards, which are based on the ability of treatment technologies to reduce the level of pollutants, EPA's sewage sludge standards are based on health and environmental risks. Part 503 imposes requirements on four groups:

- Persons who prepare sewage sludge or material derived from sewage sludge.
- Land appliers of sewage sludge.
- Owners/operators of sewage sludge surface disposal sites.
- Owners/operators of sewage sludge incinerators.

Details of that rule are described in *A Plain English Guide to the EPA Part 503 Biosolids Rule*[13] <www.epa.gov/owm/mtb/biosolids/503pe/>.

The risk assessment for the Part 503 rule that governs the land application of biosolids took nearly 10 years to complete and had extensive rigorous review and comment. The risk assessment evaluated and established limitations for a number of pollutants. These limitations are in chapter 4 of *A Guide to the Biosolids Risk Assessments for the EPA Part 503 Rule*[14] <www.epa.gov/owm/mtb/biosolids/503rule/>.

The regulation is largely self-implementing, and anyone who engages in activities covered by the regulation must comply with the appropriate requirements on or before the compliance deadlines. A person who violates Part 503 requirements is subject to administrative, civil, and criminal enforcement actions.

CWA section 405(f) requires the inclusion of sewage sludge use or disposal requirements in any NPDES permit issued to a Treatment Works Treating Domestic Sewage (TWTDS) and authorizes the issuance of sewage sludge-only permits to non-discharging TWTDS. In response, EPA promulgated revisions to the NPDES permit regulations at Parts 122 and 124 in 54 FR 18716, May 2, 1989, to address inclusion of sewage sludge use and disposal standards in NPDES permits and NPDES permit issuance to treatment works that do not have an effluent discharge to waters of the United States, but are involved in sewage sludge use or disposal as preparers, appliers, or owners/operators. TWTDS includes all sewage sludge generators and facilities, such as blenders, that change the quality of sewage sludge.

EPA recognizes that implementation of Part 503 requirements is a source of confusion for permit writers and permittees who might already have NPDES permits with special conditions addressing sewage sludge requirements. EPA has provided several guidance documents to help clarify NPDES permitting expectations, and explain the requirements of Part 503:

- *Part 503 Implementation Guidance*[15] <www.epa.gov/npdes/pubs/owm0237.pdf>.
- *Land Application of Sewage Sludge—A Guide for Land Appliers on the Requirements of the Federal Standards for the Use or Disposal of Sewage Sludge Management in 40 CFR Part 503*[16] <www.epa.gov/npdes/pubs/sludge.pdf>.
- *Surface Disposal of Sewage Sludge—A Guide for Owners/Operators of Surface Disposal Facilities on the Monitoring, Recordkeeping, and Reporting Requirements of the Federal Standards for the Use or Disposal of Sewage Sludge in 40 CFR Part 503*[17] <No Link–see the endnote for ordering instructions>.
- *Preparing Sewage Sludge for Land Application or Surface Disposal—A Guide for Preparers of Sewage Sludge on the Monitoring, Record Keeping, and Reporting Requirements of the Federal Standards for the Use or Disposal of Sewage Sludge in 40 CFR Part 503*[18] <No Link–see the endnote for ordering instructions>.
- *Domestic Septage Regulatory Guidance, A Guide to the EPA 503 Rule*[19] <www.epa.gov/npdes/pubs/owm0026.pdf>.
- *Control of Pathogens and Vector Attraction in Sewage Sludge*[20] <www.epa.gov/nrmrl/pubs/625r92013/625R92013.pdf>.

The permit writer should refer to the *Part 503 Implementation Guidance* and EPA Region and state guidelines or policies for instructions on how to implement the applicable Part 503 standards into the permit. The permit writer will need to determine the type of sewage sludge use or disposal practice(s) used by the discharger and apply the appropriate Part 503 standards. In general, conditions will need to be established to address the following:

- Pollutant concentrations or loading rates.
- Operational standards (such as pathogen and vector attraction reduction requirements for land application and surface disposal and total hydrocarbons (THC) concentrations for incinerators).
- Management practices (e.g., siting restrictions, design requirements, operating practices).
- Monitoring requirements (e.g., pollutants to be monitored, sampling locations, frequency, and sample collection and analytical methods).

- Recordkeeping requirements.
- Reporting requirements (e.g., contents of reports and frequency or due dates for submission of reports).
- General requirements (e.g., specific notification requirements before land application, submission of closure and post closure plan for surface disposal sites).

In addition to any specific applicable Part 503 standards, three boilerplate conditions must be written in the NPDES permit where applicable. These consist of the following:

- Text requiring the POTW/TWTDS to comply with all existing requirements for sewage sludge use and disposal, including the Part 503 standards [see § 122.44(b)(2)].
- A reopener clause, which authorizes reopening a permit to include technical standards if the technical standards are more stringent or more comprehensive than the conditions in the permit [see § 122.44(c)].
- A notification provision requiring the permittee to give notice to the permitting authority when a significant change in the sewage sludge use or disposal practice occurs (or is planned) [see standard conditions in § 122.41(l)(1)(iii)].

If permit conditions based on existing regulations are insufficient to protect public health and the environment from adverse effects that could occur from toxic pollutants in sewage sludge, permit conditions should be developed on a case-by-case basis using best professional judgment (BPJ) to fulfill the statutory requirement. The *Part 503 Implementation Guidance* contains information to assist permit writers in developing effluent limitations and management practice requirements on a case-by-case basis to protect public health and the environment from adverse effects that could occur from toxic pollutants in sewage sludge. For more information on biosolids, see section 2.3.1.3 of this manual and the Biosolids Website <www.epa.gov/owm/mtb/biosolids/index.htm>

9.2.3 Combined Sewer Overflows (CSOs)

Combined sewer systems were designed and built in the 19th and early 20th centuries to collect sanitary and industrial wastewater and stormwater runoff. During dry weather, combined sewers carry sanitary wastes and industrial wastewater to a treatment plant. In periods of heavy rainfall, however, stormwater is combined with untreated wastewater, which can overflow and discharge directly to a waterbody without being treated. These overflows are called combined sewer overflows (CSOs).

EPA published a CSO Control Policy in 59 FR 18688, April 19, 1994. That policy represents a comprehensive national strategy to ensure that municipalities, permitting authorities, water quality standards authorities, and the public engage in a comprehensive and coordinated planning effort to achieve cost-effective CSO controls that ultimately meet appropriate health and environmental objectives.

The CSO Control Policy includes expectations for NPDES permitting authorities. In general, EPA envisioned a phased permit approach, including initial requirements to implement Nine Minimum CSO Controls (NMC) and develop a Long-Term CSO Control Plan (LTCP), followed by requirements to implement the controls in the approved LTCP. The Wet Weather Water Quality Act of 2000 amended the CWA to add section 402(q), which required that CSO permits be issued in conformance with the CSO Control Policy.

CSOs are point source discharges subject to both the technology-based requirements of the CWA and applicable state water quality standards. Under the CWA, CSOs must comply with Best Available Technology Economically Achievable (BAT) for nonconventional and toxic pollutants and Best Conventional Technology (BCT) for conventional pollutants. However, there are no promulgated BAT or BCT limitations in effluent guidelines for CSOs. As a result, permit writers must use BPJ in developing technology-based permit requirements for controlling CSOs. Permit conditions also must achieve compliance with applicable water quality standards.

The 1994 CSO Control Policy contains the recommended approach for developing and issuing NPDES permits to control CSOs. In addition, EPA has developed the following CSO guidance documents to help permit writers and permittees implement the CSO Control Policy:

- *Combined Sewer Overflows–Guidance for Long-Term Control Plan*[21] <www.epa.gov/npdes/pubs/owm0272.pdf>.
- *Combined Sewer Overflows–Guidance for Nine Minimum Controls*[22] <www.epa.gov/npdes/pubs/owm0030.pdf>.
- *Combined Sewer Overflows–Guidance for Screening and Ranking*[23] <www.epa.gov/npdes/cso>.
- *Combined Sewer Overflows–Guidance for Monitoring and Modeling*[24] <www.epa.gov/npdes/pubs/sewer.pdf>.
- *Combined Sewer Overflows–Guidance for Financial Capability Assessment and Schedule Development*[25] <www.epa.gov/npdes/pubs/csofc.pdf>.
- *Combined Sewer Overflows–Guidance for Funding Options*[26] <www.epa.gov/npdes/pubs/owm0249.pdf>.
- *Combined Sewer Overflows–Guidance for Permit Writers*[27] <www.epa.gov/npdes/cso>.
- *Combined Sewer Overflows–Guidance: Coordinating Combined Sewer Overflow Long-Term Planning with Water Quality Standards Reviews*[28] <www.epa.gov/npdes/pubs/wqs_guide_final.pdf>.

Combined Sewer Overflows–Guidance for Permit Writers[24] contains guidance and example permit language that permit writers can use. Controlling CSOs typically requires substantial long-term planning, construction, financing and continuous reassessment; therefore, the implementation of CSO controls will probably occur over several permit cycles. The guidance explains a phased permitting approach to CSOs. Exhibit 9-2 depicts this phased permitting approach and the types of permit conditions that should be developed for each phase.

Exhibit 9-2 Categories of CSO permitting conditions

NPDES permit	Phase I	Phase II	Post phase II
A. Technology-based	• NMC, at a minimum	• NMC, at a minimum	• NMC, at a minimum
B. Water Quality-based	• Narrative	• Narrative + performance-based standards	• Narrative + performance-based standards + numeric WQBELs (as appropriate)
C. Monitoring	• Characterization, monitoring, and modeling of CSS	• Monitoring to evaluate water quality impacts • Monitoring to determine effectiveness of CSO controls	• Post-construction compliance monitoring
D. Reporting	• Documentation of NMC implementation • Interim LTCP deliverables	• Implementation of CSO controls (both NMC and long-term controls)	• Report results of post-construction compliance monitoring
E. Special conditions	• Prohibition of dry weather overflows (DWO) • Development of LTCP	• Prohibition of DWO • Implementation of LTCP • Reopener clause for water quality standards violations • Sensitive area reassessment	• Prohibition of DWO • Reopener clause for water quality standards violations

Depending on the permittee's situation, a permit may contain both Phase I and Phase II elements. Phase I permits require demonstration of implementation of the NMC, shown in Exhibit 9-3.

Exhibit 9-3 Nine minimum CSO controls

1. Proper operation and regular maintenance programs for the sewer system and the CSOs
2. Maximum use of the collection system for storage
3. Review and modification of pretreatment requirements to ensure that CSO impacts are minimized
4. Maximization of flow to the POTW for treatment
5. Prohibition of CSOs during dry weather
6. Control of solid and floatable materials in CSOs
7. Establishment of pollution prevention programs
8. Public notification to ensure that the public receives adequate notification of CSO occurrences and CSO impacts
9. Monitoring to effectively characterize CSO impacts and the efficacy of CSO controls

In the Phase I permit issued/modified to reflect the CSO Control Policy, the NPDES authority should at least require permittees to

- Immediately implement BAT/BCT, which at a minimum includes the NMC, as determined on a BPJ basis by the permitting authority.
- Develop and submit a report documenting the implementation of the NMC within 2 years of permit issuance/modification.

- Comply with applicable water quality standards, no later than the date allowed under the state's water quality standards expressed in the form of a narrative limitation.
- Develop and submit, consistent with the CSO Control Policy and based on a schedule in an appropriate enforceable mechanism, an LTCP, as soon as practicable, but generally within 2 years after the effective date of the permit issuance/modification. Permitting authorities may establish a longer timetable for completion of the long-term CSO control plan on a case-by-case basis to account for site-specific factors that could influence the complexity of the planning process. Exhibit 9-4 shows the minimum elements of the LTCP.

Exhibit 9-4 Elements of the long-term CSO control plan

1. Characterization, monitoring, and modeling of the combined sewer system
2. Public participation
3. Consideration of sensitive areas
4. Evaluation of alternatives
5. Cost/performance considerations
6. Operational plan
7. Maximizing treatment at the existing POTW treatment plant
8. Implementation schedule
9. Post-construction compliance monitoring program

Phase II permits require the implementation of an LTCP. The Phase II permit should contain the following:

- Requirements to implement the technology-based controls including the NMC determined on a BPJ basis.
- Narrative requirements that ensure that the selected CSO controls are implemented, operated and maintained as described in the LTCP.
- Water quality-based effluent limits under §§ 122.44(d)(1) and 122.44(k), requiring, at a minimum, compliance with, no later than the date allowed under the state's water quality standards, the numeric performance standards for the selected CSO controls, based on average design conditions specifying at least one of the following:
  - A maximum number of overflow events per year for specified design conditions consistent with II.C.4.a.i of the CSO Control Policy.
  - A minimum percentage capture of combined sewage by volume for treatment under specified design conditions consistent with II.C.4.a.ii of the CSO Control Policy.
  - A minimum removal of the mass of pollutants discharged for specified design conditions consistent with II.C.4.a.iii of CSO Control Policy.
  - Performance standards and requirements that are consistent with II.C.4.b of the CSO Control Policy.
- A requirement to implement, with an established schedule, the approved post-construction water quality assessment program including requirements to monitor and collect sufficient information to demonstrate compliance with water quality standards and protection of designated uses as well as to determine the effectiveness of CSO controls.

- A requirement to reassess overflows to sensitive areas in those cases where elimination or relocation of the overflow is not physically possible and economically achievable.
- Conditions establishing requirements for maximizing the treatment of wet-weather flows at the POTW, as appropriate, consistent with section II.C.7. of the CSO Policy.
- A reopener clause authorizing the NPDES authority to reopen and modify the permit upon determination that the CSO controls fail to meet water quality standards or protect designated uses.

Reviewing the permittee's LTCP and consultations with other staff involved in the CSO control process and the permittee are important steps in the process of determining the appropriate Phase II permit conditions. Water quality-based controls in Phase II generally are expressed as narrative requirements and performance standards for the combined sewer system. Finally, post Phase II permit conditions would address continued implementation of the NMC, long-term CSO controls, and post-construction compliance monitoring. There may also be numeric WQBELs when there are sufficient data to support their development.

LTCP implementation schedules were expected to include project milestones and a financing plan for design and construction of necessary controls as soon as practicable. The CSO Control Policy expected permitting authorities to undertake the following:

- Review and revise, as appropriate, state CSO permitting strategies developed in response to the National CSO Control Strategy.
- Develop and issue permits requiring CSO communities to immediately implement the NMC and document their implementation and develop and implement an LTCP.
- Promote coordination among the CSO community, the water quality standards authority, and the general public through LTCP development and implementation.
- Evaluate water pollution control needs on a watershed basis and coordinate CSO control with the control of other point and nonpoint sources of pollution.
- Recognize that it might be difficult for some small communities to meet all the formal elements of LTCP development, and that compliance with the NMC and a reduced scope LTCP might be sufficient.
- Consider sensitive areas, use impairment, and a CSO community's financial capability in the review and approval of implementation schedules.

Communities must develop and implement LTCPs to meet water quality standards, including the designated uses and criteria to protect those uses for waterbodies that receive CSO discharges. The CSO Control Policy recognized that substantial coordination and agreement among the permitting authority, the water quality standards authority, the public, and the CSO community would be required to accomplish this objective. The CSO Control Policy also recognized that the development of the LTCP should be coordinated with the review and appropriate revision of water quality standards and their implementation procedures.

In developing permit requirements to meet technology-based requirements and applicable state water quality standards, the permit writer, in conjunction with staff involved in water quality standards and the

permittee, should identify the appropriate site-specific considerations that will determine the CSO conditions to be established in the permit. EPA believes that the following information will be particularly relevant in developing the appropriate conditions:

- CSO Discharge
  - Flow, frequency, and duration of the CSO discharge.
  - Available effluent characterization data on the CSO discharge.
  - Available information and data on the impacts of the CSO discharge(s) (e.g., CWA section 305(b) reports, ambient survey data, fish kills, CWA section 303(d) lists of impaired waters).
  - Compliance history of the CSO owner, including performance and reliability of any existing CSO controls.
  - Current NPDES permit and NPDES permit application.
  - Facility planning information from the permittee that addresses CSOs.
- Technologies
  - Performance data (either from the manufacturer or from other applications) for various CSO technologies that may be employed, including equipment efficiency and reliability.
  - Cost information associated with the installation, operation and maintenance of CSO technologies.
  - Reference materials on various types of CSO.

For more information on CSOs, see section 2.3.1.4 of this manual and the Combined Sewer Overflows Website <www.epa.gov/npdes/cso>.

9.2.4 Sanitary Sewer Overflows (SSOs)

EPA's *Report to Congress on the Impacts and Control of CSOs and SSOs*[29] <www.epa.gov/npdes/csossoreport2004> shows that NPDES permit requirements establishing clear reporting, recordkeeping and third party notification of overflows from municipal sewage collection systems, as well as clear requirements to properly operate and maintain the collection system, are critical to effective program implementation. NPDES authorities should be improving NPDES permit requirements for SSOs and sanitary sewer collection systems, which could lead to improved performance of municipal sanitary sewer collection systems and improved public notice for SSO events.

The NPDES regulations provide standard conditions that are to be in NPDES permits for POTWs as discussed in Chapter 10 of this manual. Standard conditions in a permit for a POTW apply to portions of the collection system for which the permittee has ownership or has operational control. When reissued, permits for POTW discharges should clarify how key standard permit conditions apply to SSOs and sanitary sewer collection systems. On August 20, 2007, EPA circulated a draft fact sheet, NPDES Permit Requirements for Municipal Sanitary Sewer Collection Systems and SSOs <www.epa.gov/npdes/pubs/sso_fact_sheet_model_permit_cond.pdf>, which explains the ways NPDES permitting authorities should be improving implementation of NPDES permit requirements to address SSOs and sanitary sewer collection systems.

The draft fact sheet indicates that clarifications should address the particular application of standard permit conditions to SSOs and municipal sanitary sewer collection systems as discussed below.

- **Immediate reporting.** Permits should clarify that the permittee is required to notify the NPDES authority of an overflow that could endanger health or the environment from portions of the collection system over which the permittee has ownership or operational control as soon as practicable but within 24 hours of the time the permittee becomes aware of the overflow. [See § 122.41(l)(6)].
- **Written reports**. Permits should clarify that the permittee is required to provide the NPDES authority a written report within 5 days of the time it became aware of any overflow that is subject to the immediate reporting provision. [See § 122.41(l)(6)(i).] In addition, permits should clarify that any overflow that is not immediately reported as indicated above, should be reported in the discharge monitoring report. [See § 122.41(l)(7)].
- **Third party notice.** Permits should establish a process for requiring the permittee or the NPDES authority to notify specified third parties of overflows that could endanger health because of a likelihood of human exposure; or unanticipated bypass and upset that exceeds any effluent limitation in the permit or that could endanger health because of a likelihood of human exposure. Permits should clarify that the permittee is required to develop, in consultation with appropriate authorities at the local, county, or state level (or any combination), a plan that describes how, under various overflow (and unanticipated bypass and upset) scenarios, the public, and other entities, would be notified of overflows that may endanger health. The plan should identify all overflows that would be reported, to whom they should be reported, the specific information that would be reported, a description of lines of communication, and the identities of responsible officials. [See § 122.41(l)(6)].
- **Recordkeeping**. Permits should clarify that the permittee is required to keep records of overflows. Clarified permit language for recordkeeping should require the permittee to retain the reports submitted to the NPDES authority and other appropriate reports that could include work orders associated with investigation of system problems related to an overflow, that describes the steps taken or planned to reduce, eliminate, and prevent reoccurrence of the overflow. [See § 122.41(j)].
- **Capacity, management, operation and maintenance programs.** Permits should clarify requirements for proper operation and maintenance of the collection system. [See §§ 122.41(d) and 122.41(e)]. This may include requiring the development and implementation of capacity, management, operation and maintenance (CMOM) programs. EPA's Region 4 has developed materials and guidance that can help a municipality with its CMOM program on the Management, Operation and Maintenance (MOM) Programs Project Website <www.epa.gov/region4/water/wpeb/momproject/>. The CMOM program may use a process for self-assessment and information management techniques for ongoing program improvement and may develop and implement emergency response procedures to overflows. In addition, the CMOM permit condition may specify appropriate documentation requirements, including the following:
  - CMOM program summary. Permittees may be required to develop a written summary of their CMOM programs, which would be available to the NPDES authority and public on request. The program summary would give an overview of the management program and summarize major implementation activities.

- Program audit report. Permittees may be required to conduct comprehensive audits of their programs during the permit cycle, and submit a copy of the audit report to the NPDES authority with the application for permit renewal. EPA's Sanitary Sewer Overflow Toolbox Website <www.epa.gov/npdes/sso/ssotoolbox> provides information on CMOM.
- System evaluation and capacity assurance plan. Capacity assurance refers to a process to identify, characterize and address hydraulic deficiencies in a sanitary sewer collection system. The permit may require the permittee to implement a program to assess the current capacity of the collection system and treatment facilities that they own or over which they have operational control to ensure that discharges from unauthorized locations do not occur. Where peak flow conditions contribute to an SSO discharge or to noncompliance at a treatment plant, the permittee may be required to prepare and implement a system evaluation and capacity assurance plan. In some instances, the permittee may already be under an enforceable obligation and schedule, in which case this permit provision would be redundant and, thus, unnecessary.

Section 2.3.1.5 of this manual and EPA's Sanitary Sewer Overflows Website <www.epa.gov/npdes/sso> provide more information on SSOs.

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Endnotes for this chapter continued on the next page.

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[17] U.S. Environmental Protection Agency. 1994. *Surface Disposal of Sewage Sludge—A Guide for Owner/Operators of Surface Disposal Facilities on the Monitoring, Record Keeping, and Reporting Requirements of the Federal Standards for the Use or Disposal of Sewage Sludge in 40 CFR Part 503*. EPA-831/B-93-002c. U.S. Environmental Protection Agency, Office of Water, Washington, DC. Publication available on NEPIS Website <www.epa.gov/nscep/> as document 831B93002c.

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Endnotes for this chapter continued on the next page.

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CHAPTER 10. Standard Conditions of NPDES Permits

This chapter describes standard conditions, sometimes called *boilerplate* conditions, that must be incorporated in National Pollutant Discharge Elimination System (NPDES) permits. Standard conditions, specified in Title 40 of the *Code of Federal Regulations* (CFR) 122.41 and 122.42, play an important supporting role to effluent limitations, monitoring and reporting requirements, and special conditions because they delineate various legal, administrative, and procedural requirements of the permit. Standard conditions cover various topics, including definitions, testing procedures, records retention, notification requirements, penalties for noncompliance, and other permittee responsibilities. The conditions provided in § 122.41 apply to all types and categories of NPDES permits and must be included in all permits (see § 123.25 for applicability to state NPDES permits). The conditions provided in § 122.42 apply only to certain categories of NPDES facilities. Any permit issued to a facility in one of the categories listed in § 122.42 must contain the additional conditions, as applicable.

The use of standard conditions helps ensure uniformity and consistency of all NPDES permits issued by authorized states or the U.S. Environmental Protection Agency (EPA) Regional Offices. Permit writers need to be aware of the contents of the standard conditions because it might be necessary to explain portions of the conditions to a discharger. The permit writer should keep abreast of any changes in EPA's standard conditions set out in §§ 122.41 and 122.42. According to § 122.41, standard conditions may be incorporated into a permit either expressly (verbatim from the regulations) or by reference to the regulations. It generally is preferable for permit writers to attach the standard conditions expressly because permittees might not have easy access to the regulations. Some states have developed an attachment for NPDES permits that includes the federal standard conditions.

10.1 Types of Standard Conditions

A brief summary of the § 122.41 standard conditions that must be included in all types of NPDES permits follows:

- **Duty to Comply** § 122.41(a): The permittee must comply with all conditions of the permit. Noncompliance is a violation of the Clean Water Act (CWA) and is grounds for enforcement action, changes to or termination of the permit, or denial of a permit renewal application.
- **Duty to Reapply** § 122.41(b): A permittee wishing to continue permitted activities after the permit expiration date must reapply for and obtain a new permit.
- **Need to Halt or Reduce Activity not a Defense** § 122.41(c): The permittee may not use as a defense in an enforcement action the reasoning that halting or reducing the permitted activity is the only way to maintain compliance.
- **Duty to Mitigate** § 122.41(d): The permittee is required to take all reasonable steps to prevent any discharge or sludge use or disposal in violation of the permit that has a reasonable likelihood of adversely affecting human health or the environment.
- **Proper Operation and Maintenance** § 122.41(e): The permittee must properly operate and maintain all equipment and treatment systems used for compliance with the terms of the permit.

The permittee must provide appropriate laboratory controls and quality assurance procedures. Operation of backup systems is required only when needed to ensure compliance.

- **Permit Actions** § 122.41(f): The permit may be modified, revoked and reissued, or terminated for cause. A request by the permittee for a permit modification, revocation or reissuance, termination, or a notification of planned changes or anticipated noncompliance does not suspend the permittee's obligation to comply with all permit conditions.
- **Property Rights** § 122.41(g): The permit does not convey any property rights of any sort, or any exclusive privilege.
- **Duty to Provide Information** § 122.41(h): The permittee must furnish, within a reasonable time, any information needed to determine compliance with the permit or to determine whether there is cause to modify, revoke and reissue, or terminate the permit. The permittee also must furnish, on request, copies of records that must be kept as required by the permit.
- **Inspection and Entry** § 122.41(i): The permittee must, upon presentation of valid credentials by the Director or his or her representative, allow entry into the premises where the regulated activity or records are present. The Director must have access to and be able to make copies of any required records; inspect facilities, practices, operations, and equipment; and sample or monitor at reasonable times.
- **Monitoring and Records** § 122.41(j): Samples must be representative of the monitored activity. The permittee must retain records for 3 years (5 years for sewage sludge activities) subject to extension by the Director. Monitoring records must identify the sampling dates and personnel, the sample location and time, and the analytical techniques used and corresponding results. Wastewater and sludge measurements must be conducted in accordance with Parts 136 or 503 or other specified procedures. Falsification of results is a violation under the CWA.
- **Signatory Requirement** § 122.41(k): The permittee must sign and certify applications, reports, or information submitted to the Director in accordance with the requirements in § 122.22. Knowingly making false statements, representations, or certifications is punishable by fines or imprisonment.
- **Planned Changes** § 122.41(l)(1): Notice must be given to the Director as soon as possible of planned physical alterations or additions to the facility (or both) that could meet the criteria for determining whether the facility is a new source under § 122.29(b); result in changes in the nature or quantity of pollutants discharged; or significantly change sludge use or disposal practices.
- **Anticipated Noncompliance** § 122.41(l)(2): The permittee must give advance notice of any planned changes that could result in noncompliance.
- **Permit Transfers** § 122.41(l)(3): The permit is not transferable except after written notice to the Director. The Director may require modification or revocation and reissuance, as necessary.
- **Monitoring Reports** § 122.41(l)(4): Monitoring results must be reported at the frequency specified in the permit and be reported on a discharge monitoring report (DMR) or forms provided or specified by the Director for reporting results of monitoring sludge use or disposal practices. Monitoring for any pollutant that occurs more frequently than is required by the permit and uses approved test procedures or test procedures specified in the permit must also be reported. Calculations requiring averaging must use an arithmetic mean unless otherwise specified in the permit.

- **Compliance Schedules** § 122.41(l)(5): Reports of compliance or noncompliance or any progress report must be submitted no later than 14 days following the interim or final compliance date specified in a compliance schedule.
- **Twenty-Four Hour Reporting** § 122.41(l)(6): The permittee must orally report any noncompliance that might endanger human health or the environment within 24 hours after becoming aware of the circumstances. Within 5 days of becoming aware of the circumstances, the permittee must provide a written submission including a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times; the anticipated time the noncompliance is expected to continue (if not already corrected); and steps taken to reduce, eliminate, or prevent reoccurrence unless the Director waives the requirement. In addition, 24-hour reporting is required for an unanticipated bypass exceeding effluent limits; an upset exceeding effluent limits; and a violation of a maximum daily effluent limitation for pollutants listed in the permit for 24-hour reporting.
- **Other Noncompliance** § 122.41(l)(7): The permittee must report all instances of noncompliance not reported under other specific reporting requirements at the time monitoring reports are submitted.
- **Other Information** § 122.41(l)(8): If the permittee becomes aware that it failed to submit any relevant facts in its application, or submitted incorrect information in its application or other reports, it must promptly submit such facts or information.
- **Bypass** § 122.41(m): The intentional diversion of wastestreams from any portion of a treatment facility. Bypass is prohibited unless the bypass does not cause the effluent to exceed limits and is for essential maintenance to assure efficient operation (no notice or 24-hour reporting is required in such a case). All other bypasses are prohibited, and the Director of the NPDES program may take enforcement action against a permittee for a bypass, unless the bypass was unavoidable to prevent loss of life, personal injury, or severe property damage, there was no feasible alternative, and the proper notification was submitted.
- **Upset** § 122.41(n): An upset (i.e., an exceptional incident in which there is unintentional and temporary noncompliance with technology-based effluent limits because of factors beyond the permittee's control) can be used as an affirmative defense in actions brought against the permittee for noncompliance. An upset does not include noncompliance to the extent caused by operational error, improperly designed or inadequate treatment facilities, lack of preventative maintenance, or careless or improper operation. The permittee (who has the burden of proof to demonstrate that an upset has occurred) must have operational logs or other evidence that shows
  - When the upset occurred and its causes.
  - The facility was being operated properly.
  - Proper notification was made.
  - Remedial measures were taken.

10.2 Other Standard Conditions

In addition to standard conditions specified in § 122.41 that are applicable to all permittees, § 122.42 includes additional conditions applicable to certain categories of NPDES permits. Below are summaries of these additional standard conditions applicable to various types of NPDES permits.

Non-Municipal (Industrial) Permits: Additional standard conditions applicable to non-municipal permits are found in § 122.42(a) and specify that the permittee must notify the Director as soon as it knows or has reason to believe that the discharge has or will exceed certain notification levels specified in §§ 122.42(a)(1) and (2). In addition, § 122.44(f) allows the Director to establish alternate notification levels upon petition by the permittee or by his or her own initiative.

Publicly Owned Treatment Work (POTW) Permits: Additional standard conditions applicable to POTWs are found in § 122.42(b). The standard conditions specify that the permittee must provide adequate notice to the Director of the new introduction of certain pollutants into the POTW from an indirect discharger and of substantial changes in the volume or character of pollutants introduced into the POTW. That notice must include information on the quality and quantity of effluent introduced to the POTW and information on the impact to the quality and quantity of the POTW's effluent.

Municipal Separate Storm Sewer Systems: Additional standard conditions applicable to large, medium or EPA-designated municipal separate storm sewer systems are in § 122.42(c). Those standard conditions require that the permittee submit an annual report addressing the status, and changes to, the stormwater management program, water quality data and other information specified in §§ 122.42(c)(1)-(6).

Individual Stormwater Permits: Initial permits for discharges composed entirely of stormwater and permitted under § 122.26(e)(7) must require compliance no later than 3 years after permit issuance.

Concentrated Animal Feeding Operations (CAFO) Permits: The regulations at § 122.42(e) specify conditions that must be included in all permits for CAFOs.

CHAPTER 11. NPDES Permit Administration

Previous discussions in this manual focused on the process of developing National Pollutant Discharge Elimination System (NPDES) permit conditions and effluent limitations. This chapter describes the administrative process associated with the issuance of an NPDES permit including a discussion of the other federal laws that might affect the development or issuance of NPDES permits.

11.1 Other Federal Laws Applicable to NPDES Permits

This section addresses other federal laws, besides the Clean Water Act (CWA), that permit writers should consider when drafting an NPDES permit. The requirements imposed under these statutes only apply to federal actions (i.e., U.S. Environmental Protection Agency [EPA] issuance of permits). Permits issued by states authorized to administer the NPDES program are not subject to the requirements of these statutes. However, many states may have enacted state legislation that is modeled on federal law and, therefore, it is prudent to review state law in these areas before preparing an NPDES permit.

The following sections briefly discuss the other federal laws and contain links to other websites for more information. Because these laws are implemented by other federal agencies, many of the links provided below are to websites outside EPA, and EPA is not responsible for the information provided on those websites. The NPDES regulations at Title 40 of the *Code of Federal Regulations* (CFR) 122.49 also include a discussion of how some of the laws relate to the federal NPDES program. Exhibit 11-1 presents the other federal laws that are applicable to NPDES permits and includes the legislative citations from the *United States Code* (U.S.C.) and the implementing regulations in the CFR.

Exhibit 11-1 Other federal laws applicable to NPDES permits

Federal law	Year	Federal agency	Legislative citations	Implementing regulations
Endangered Species Act (ESA)	1973	FWS, NMFS	16 U.S.C. 1531 et seq.	50 CFR Part 402
National Environmental Policy Act (NEPA)	1969	CEQ	42 U.S.C. 4321 et seq.	40 CFR Part 6
National Historic Preservation Act (NHPA)	1992	ACHP	16 U.S.C. 470 et seq.	36 CFR Part 800
Coastal Zone Management Act (CZMA)	1972	NOAA	16 U.S.C. 1451 et seq.	15 CFR Part 930
Wild and Scenic Rivers Act	1968	Various	16 U.S.C. 1271 et seq.	36 CFR Part 297
Fish and Wildlife Coordination Act (FWCA)	1934	FWS	16 U.S.C. 661 et seq.	--
Essential Fish Habitat Provisions (EFH)	1996	NOAA	16 U.S.C. 1855(b)(2)	50 CFR Part 600

11.1.1 Endangered Species Act

This section discusses procedures intended to protect endangered species that apply only to permits issued by EPA. The 1973 Endangered Species Act (ESA) <www.fws.gov/endangered/esa-library/pdf/ESAall.pdf>, 16 U.S.C. 1531 *et seq.*, was enacted to protect and conserve endangered and threatened species and critical habitat. The Fish and Wildlife Service (FWS) <www.fws.gov/endangered/> of the Department of the Interior and the National Marine Fisheries Service (NMFS) <www.nmfs.noaa.gov/pr/> of the National

Oceanic and Atmospheric Administration (NOAA) within the Department of Commerce (collectively *the Services*) share primary responsibility for administration of the ESA.

ESA section 7 requires that federal agencies consult with the Services to ensure that any action authorized, funded, or carried out by the agencies that could affect a listed species or critical habitat and to ensure that their actions are not likely to jeopardize the continued existence of any endangered species or threatened species, or result in the destruction or adverse modification of critical habitat of such species. The ESA section 7 regulations are in 50 CFR Part 402. FWS/NMFS published the ESA Section 7 Consultation Handbook <www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF> to address the major consultation processes pursuant to ESA section 7.

Consultation may be either informal or formal. An informal consultation determines if an action is or is not likely to adversely affect the species. A formal consultation is required if the findings from the informal consultation show that there is a likelihood for adverse impacts and evaluates whether the proposed action is likely to jeopardize the continued existence of the species. It is EPA's responsibility to ensure that consultation occurs; however, a nonfederal representative (i.e., the discharger) may be designated for the informal consultation.

On February 22, 2001, EPA entered into a National Memorandum of Agreement (*National MOA*) <www.epa.gov/fedrgstr/EPA-SPECIES/2001/February/Day-22/e2170.pdf> with the Services that outlines the process for consulting on federally issued NPDES permits. In addition, because consultation is not required for state-issued permits, the National MOA includes a process for coordinating with the Services on state-issued permits. EPA permit writers should review the ESA consultation regulations and the ESA section 7 Consultation Handbook, and coordinate with the Region's ESA coordinator (if such a position has been established in a Region) and the Service office(s) nearest to the site.

11.1.2 National Environmental Policy Act

This section discusses environmental review procedures that apply only when EPA issues permits to *new sources* (dischargers subject to New Source Performance Standards). The 1969 National Environmental Policy Act (NEPA) <www.epa.gov/compliance/basics/nepa.html>, 42 U.S.C. 4321 *et seq*., requires that agencies perform environmental impact reviews and prepare an *Environmental Impact Statement* (EIS) for major federal actions significantly affecting the quality of the human environment [see section 102(2)(C)]. The President's Council on Environmental Quality (CEQ) <www.whitehouse.gov/ceq/> coordinates federal environmental efforts to comply with NEPA.

Within EPA, the Office of Federal Activities under the Office of Enforcement and Compliance Assurance (OECA) is responsible for EPA's implementation of NEPA <www.epa.gov/compliance/nepa/>. EPA's NEPA regulations are at 40 CFR Part 6. With respect to NPDES permits, CWA section 511 establishes that only EPA-issued permits to new sources are subject to NEPA's environmental review procedures before permit issuance. States may have their own state law versions of NEPA. Federal permit writers should coordinate efforts with the Office of Federal Activities and document all NEPA activities in the permit file and fact sheet.

11.1.3 National Historic Preservation Act Amendments

Section 106 of the 1992 National Historic Preservation Act (NHPA) <www.achp.gov/nhpa.html>, 16 U.S.C. 470 *et seq.*, as amended, and implementing regulations 36 CFR Part 800 require the Regional Administrator, before issuing a license (permit), to identify the area of potential effect of a permitted discharge and, if historic or cultural resources within that area would be adversely affected by the discharge, to adopt measures when feasible to mitigate potential adverse effects of the licensed activity and properties listed or eligible for listing in the National Register of Historic Places.

The Act's requirements are to be implemented in cooperation with State Historic Preservation Officers <www.achp.gov/shpo.html>, and upon notice to, and when appropriate, in consultation with the Advisory Council on Historic Preservation <www.achp.gov/>, which provides national oversight for the NHPA. A decision by the D.C. Circuit in 2003 concluded that NHPA consultation is not required for state-issued permits (*National Mining Ass'n v. Fowler*, 324 F.3d 752 (D.C. Cir. 2003) <caselaw.findlaw.com/us-dc-circuit/1169695.html>).

Federal permit writers should evaluate potential effects of NHPA and submit written documentation of the evaluation to the State Historic Preservation Office and to the permit file.

11.1.4 Coastal Zone Management Act

The 1972 Coastal Zone Management Act (CZMA) <www.coastalmanagement.noaa.gov/czm/czm_act.html>, 16 U.S.C. 1451 *et seq.*, was enacted to manage the nation's coastal zone and is implemented through a state-federal partnership. Section 307 of the CZMA (16 U.S.C. 1456 and 15 CFR Part 930) prohibits the issuance of federal NPDES permits for activities affecting land or water use in coastal zones unless the permit applicant certifies that the proposed activity complies with the state Coastal Zone Management Program and the relevant state either concurs with the applicant's certification or the state's concurrence is conclusively presumed as a result of the state's failure to concur or non-concur. *Coastal States*, according to the CZMA, include those states and territories adjacent to the Atlantic, Pacific, or Arctic oceans; the Gulf of Mexico; or one or more of the Great Lakes. Any of those states that have completed the development of its management program is required, as a condition of receipt of federal grant money under the CZMA, to adopt coastal management plans, which designate boundaries, identify areas of particular concern, and establish inventories of permitted uses and enforcement policies. Beach access, emergency planning, and erosion control also must be addressed in such plans.

The Office of Ocean and Coastal Resource Management <www.coastalmanagement.noaa.gov/>, which is part of NOAA within the Department of Commerce, oversees the CZMA. The CZMA implementing regulations are at 15 CFR Part 930. EPA and other federal agencies must coordinate their activities on coastal lands with state CZMA plans. Federal permit writers should document all activities relating to CZMA in the permit file.

11.1.5 Wild and Scenic Rivers Act

The 1968 Wild and Scenic Rivers Act (WSRA) <www.rivers.gov/publications/wsr-act.pdf>, 16 U.S.C. 1271 *et seq.*, established a National Wild and Scenic Rivers System (System) and prescribed the process by which additional rivers may be added to this System. Rivers may be added by act of Congress [WSRA section 2(a)(i)] or by the Secretary of the Interior at the initiative of a state governor [WSRA section 2(a)(ii)]. Under WSRA section 7(a), EPA is prohibited from assisting, by license or otherwise, in the construction

of any water resources project that would have a direct and adverse effect on the values for which a national wild and scenic river was established. The WSRA regulations are codified at 36 CFR Part 297.

Federal permit writers should verify whether the receiving water is part of the System and document all activities related to the Act in the permit file and fact sheet. For detailed explanation of WSRA section 7, refer to Wild and Scenic Rivers Act: Section 7 <www.rivers.gov/publications/section-7.pdf>, a technical report of the Interagency Wild and Scenic Rivers Coordinating Council. Permit writers may also refer to Water Quantity and Quality as Related to the Management of Wild and Scenic Rivers <www.rivers.gov/publications/water.pdf>, a technical report of the Interagency Wild and Scenic Rivers Coordinating Council.

11.1.6 Fish and Wildlife Coordination Act

The 1934 Fish and Wildlife Coordination Act (FWCA) <www.fws.gov/habitatconservation/fwca.html>, 16 U.S.C. 661 *et seq.*, requires mitigation for the loss of wildlife habitat due to the construction of federal water resources projects. The FWCA requires designers of federal dams, reservoirs, and irrigation works to include the costs and benefits to fish and wildlife when determining the benefit/cost ratio of a project and requires that EPA and other federal agencies consult with state and federal wildlife and fisheries agencies to minimize the impacts of the activity on fish and wildlife. The FWCA specifically calls for ongoing studies by the U.S. Department of the Interior on the effects of domestic sewage and industrial wastes on fish and wildlife (16 U.S.C. 665).

No implementing regulations directly related to the FWCA and NPDES permits exist. However, the FWCA describes actions taken or compelled by the affected federal agencies. The Water Resources Development under the Fish and Wildlife Coordination Act manual <www.fws.gov/habitatconservation/fwca.pdf> provides the FWS guidance on implementing the FWCA. Federal permit writers should note any FWCA consultation activities in the permit file.

11.1.7 Essential Fish Habitat Provisions

The 1996 Essential Fish Habitat (EFH) provisions of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act or MSA) promote the protection of essential fish habitat in any federal action authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken, by such agency that might adversely affect such habitat identified under the MSA [16 U.S.C. 1855(b)(2)]. The MSA requires that federal agencies, such as EPA, consult with the NMFS for any EPA-issued permits that might adversely affect essential fish habitat identified under the MSA. The regulations applicable to federal agencies' coordination and consultation under the MSA are codified at 50 CFR 600.905 through 600.930, and other EFH information can be found on the NMFS EFH Website <www.habitat.noaa.gov/protection/efh/index.html>. Federal permit writers should note any EFH determinations and consultation activities in the permit file.

11.2 Documentation for Development of the Draft Permit

EPA regulations at 40 CFR 124.2 define a draft permit as a document that indicates the Director's tentative decision to issue or deny, modify, revoke and reissue, terminate, or reissue a permit. After the permit is issued, the fact sheet and supporting documentation (administrative record) are the primary support for defending the permit in the administrative appeals process. Documenting the permit requires

the permit writer to be organized and logical throughout the permit development process. Some of the content of the fact sheet and administrative record is specified by federal and state regulation, and the remainder is dictated by good project management. Permit writers should recognize the importance of

- Developing a thorough permit in a logical fashion.
- Meeting legal requirements for preparation of an administrative record, fact sheet, and statement of basis.
- Substantiating permit decisions and providing a sound basis for the derivation of permit terms, conditions, and limitations if challenges are made.
- Establishing a permanent record of the basis of the permit for use in future permit actions.

Exhibit 11-2 presents reasons for good documentation in the permit file and fact sheet.

Exhibit 11-2 Reasons for good documentation

- Streamlines the permit reissuance/ compliance monitoring process
- Establishes a permanent record of the basis for the permit
- Explains the legal and technical basis of the permit
- Provides a sound basis for future modifications and permits
- Requires the permit writer to be organized and logical throughout permit development process

Exhibits 11-3 and 11-4 provide flow diagrams of the NPDES permit administrative process. In general, the administrative process includes the following:

- Documenting all permit decisions.
- Coordinating EPA and state review of the draft (or proposed) permit.
- Providing public notice, conducting hearings (if appropriate), and responding to public comments.
- Defending the permit and modifying it (if necessary) after issuance.

Note that Exhibit 11-3 provides the general framework for the administrative process where EPA is the NPDES permitting authority and Exhibit 11-4 provides a typical framework for the administrative process where a state is the permitting authority. State requirements need not be identical to federal regulatory requirements, provided they are at least as stringent. Some authorized states have slightly different processes for developing and issuing NPDES permits. The same holds true for the appeal process. This manual presents EPA's procedure; state procedures for NPDES permit hearings and appeals vary according to state law.

Exhibit 11-3 Administrative process for EPA-issued NPDES permits

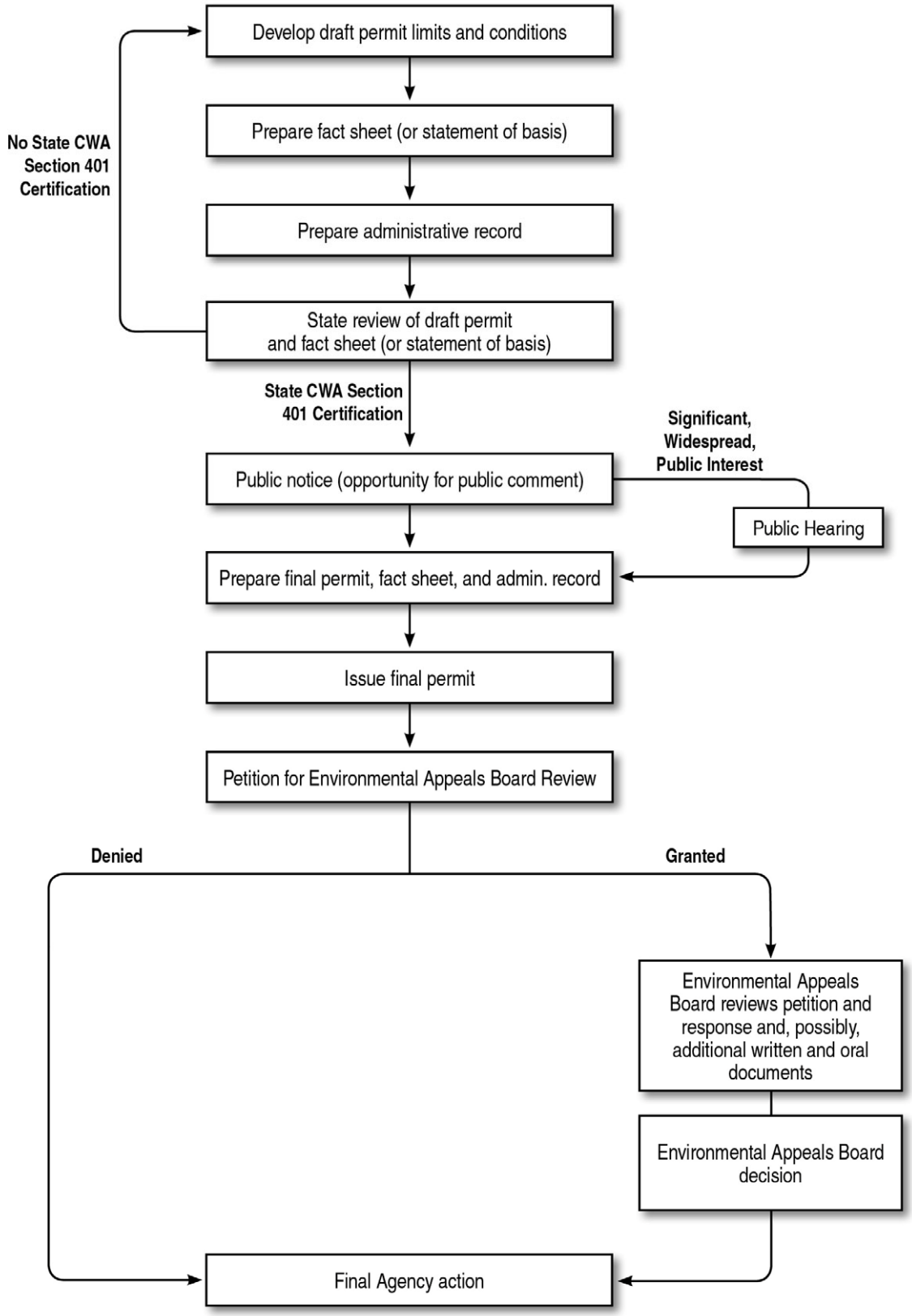

Exhibit 11-4 Typical administrative process for state-issued NPDES permits*

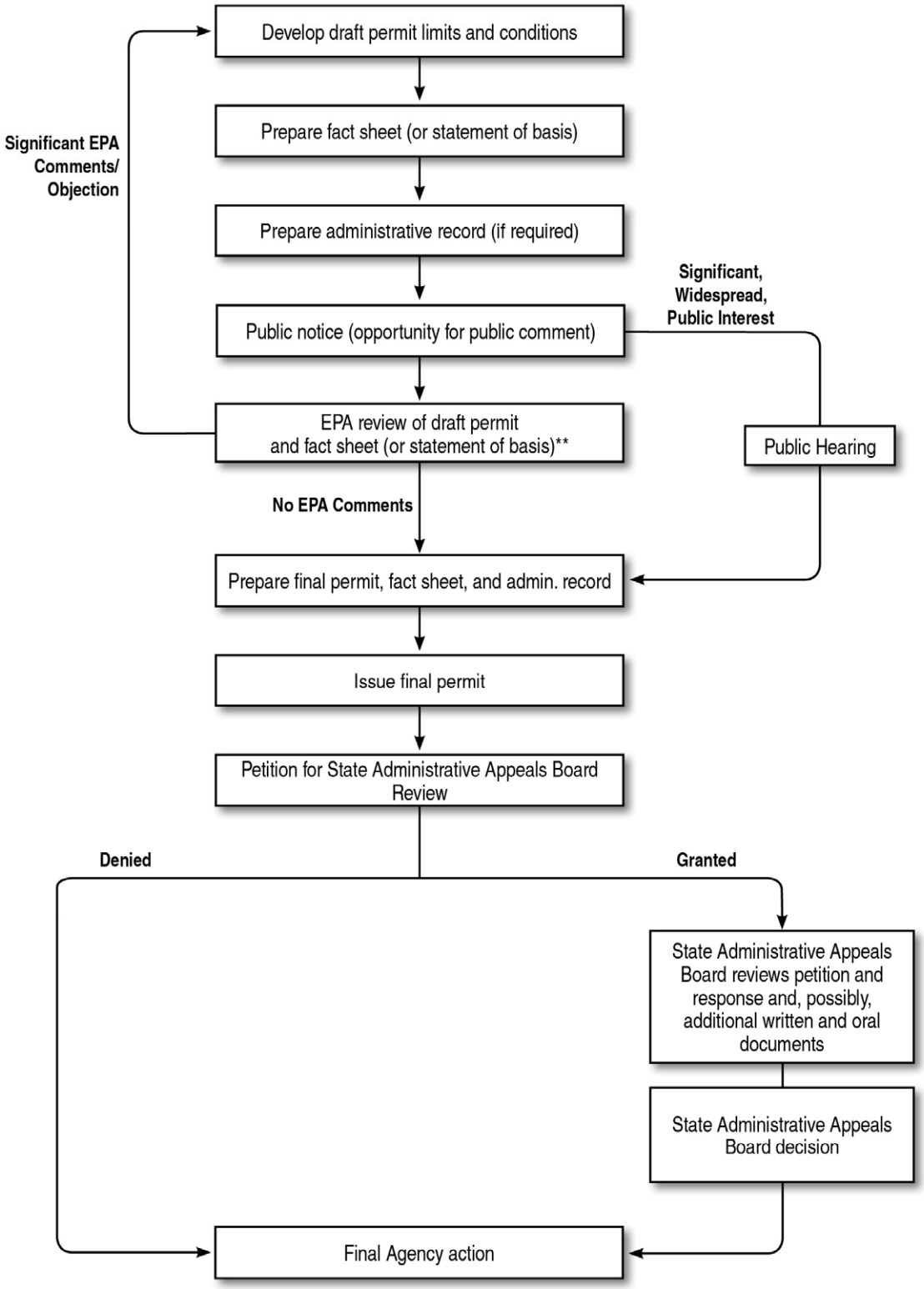

* State statutes and regulations govern the specific steps of the state administrative process, which may differ from the process outlined in this exhibit.
** Under State/EPA MOA, EPA may review draft or proposed permit.

11.2.1 Administrative Record

The administrative record should be considered the foundation that supports the NPDES permit. If EPA issues the permit, the contents of the administrative record are prescribed by regulation, with § 124.9 identifying the required content of the administrative record for a draft permit and § 124.18 describing the requirements for final permits. Regardless of whether a state or EPA issues the permit, all supporting materials must be made available to the public at any time and may be examined during the public comment period and any subsequent public hearing. The importance of maintaining the permit records in a neat, orderly, complete, and retrievable form cannot be over emphasized. The record allows personnel from the permitting agency to reconstruct the justification for a given permit and defend the permit during any legal proceedings regarding the permit.

The administrative record for a draft permit consists, at a minimum, of the specific documents shown in Exhibit 11-5. Materials that are readily available in the permit issuing office or published material that is generally available do not need to be physically included with the record as long as they are specifically referred to in the fact sheet or statement of basis. If EPA issues a draft permit for a new source, the administrative record should include any EISs or *Environmental Assessments* (EAs) performed in accordance with § 122.29(c).

Exhibit 11-5 Elements of the administrative records for a draft permit

- Permit application and supporting data
- Draft permit
- Statement of basis or fact sheet
- All items cited in the statement of basis or fact sheet, including calculations used to derive the permit limitations
- Meeting reports
- Correspondence with the applicant and regulatory personnel
- All other items in the supporting file
- For new sources, any EA, draft/final EIS, or other such background information, such as a Finding of No Significant Impact (only applies if EPA issues the permit)

The administrative record should include all meeting reports and correspondence with the applicant and other regulatory agency personnel, trip reports, and records of telephone conversations. All correspondence, notes, and calculations should be dated and indicate the name of the writer and all other persons involved. Because correspondence is subject to public scrutiny, references or comments that do not serve an objective purpose should be avoided. Finally, the presentation of calculations and documentation of decisions should be organized in such a way that they can be reconstructed and the logic supporting the calculation or decisions can easily be found.

11.2.2 Fact Sheets and Statements of Basis

A fact sheet is a document that briefly sets forth the principal facts and the significant factual, legal, methodological, and policy questions considered in preparing the draft permit. When the permit is in the draft stage, the fact sheet and supporting documentation serve to explain the rationale and assumptions used in deriving the limitations to the discharger, the public, and other interested parties.

The NPDES regulations at § 124.8(a) stipulate that every EPA and state-issued permit must be accompanied by a fact sheet if the permit

- Involves a major facility or activity.
- Incorporates a variance or requires an explanation under § 124.56(b) (toxic pollutants, internal waste stream, and indicator pollutants and for privately owned waste treatment facilities).
- Is an NPDES general permit.
- Is subject to widespread public interest.
- Is a Class I sludge management facility.
- Includes a sewage sludge land application plan.

A well-documented rationale for all permit decisions reduces the work necessary to reissue a permit by eliminating conjecture concerning the development of those permit conditions that are being carried forward to the next permit. That is also true if a modification is initiated during the life of the permit. The required contents of a fact sheet, as specified in §§ 124.8 and 124.56, are listed in Exhibit 11-6.

Exhibit 11-6 Required elements of a fact sheet

Required element	Regulatory citation (40 CFR)
General facility information • Description of the facility or activity • Sketches or a detailed description of the discharge location • Type and quantity of waste/pollutants discharged	 § 124.8 § 124.56 § 124.8
Summary rationale of permit conditions • Summary of the basis for the draft permit conditions • References to the applicable statutory or regulatory provisions • References to the administrative record	§ 124.8

Detailed rationale of permit conditions
• Explanation and calculation of effluent limitations and conditions
• Specific explanations of
  – Toxic pollutant limitations
  – Limitations on internal wastestreams
  – Limitations on indicator pollutants
  – Case-by-case requirements
  – Decisions to regulate non-publicly owned treatment works (POTWs) under a separate permit
• For EPA-issued permits, the requirements of any state certification
• For permits with a sewage sludge land application plan, a description of how all required elements of the land application plan are addressed in the permit
• Reasons why any requested variances do not appear justified, if applicable
	§ 124.56
	
	§ 124.8

Administrative Requirements
• A description of the procedures for reaching a final decision on the draft permit, including
  – Public comment period beginning and ending dates
  – Procedures for requesting a hearing
  – Other procedures for public participation
• Name and telephone number of the person to contact for additional information
	§ 124.8

The fact sheet should include detailed discussions of the development of permit limitations for each pollutant, including the following:

- Calculations and assumptions related to production and flow.
- Type of limitations (i.e., limitations based on secondary treatment standards, effluent limitations guidelines and standards (effluent guidelines), case-by-case determinations, or water quality standards).
- Whether the effluent guidelines used were Best Practicable Control Technology Currently Available (BPT), Best Available Technology Economically Achievable (BAT), Best Conventional Pollutant Control Technology (BCT), or New Source Performance Standards (NSPS).
- The water quality standards or criteria used.
- Whether any parameters were used as indicators for other pollutants.
- Citations to appropriate wasteload allocation or total maximum daily load studies, guidance documents, other references.

Often, decisions to include certain requirements lead to a decision to exclude other requirements. It is just as important to keep a thorough record of items that were not included in the draft permit as it is to keep a record of included items. Such records might include the following:

- Why were secondary treatment standards, case-by-case determinations, or effluent guidelines used as the basis for final effluent limitations rather than water quality standards (i.e., demonstrate that the limitations checked to see that water quality standards would be attained)?
- Why was biomonitoring not included?
- Why were pollutants that were reported as present in the permit application not specifically limited in the permit?
- Why is a previously limited pollutant no longer limited in the draft permit?

Finally, the fact sheet should address the logistics of the permit issuance process, including the beginning and ending dates of the public comment period, procedures for requesting a hearing, and other means of public involvement in the final decision.

A statement of basis, as described in § 124.7, is required for EPA-issued permits that are not required to have a fact sheet. A statement of basis describes the derivation of the effluent limitations and the reasons for special conditions. However, a prudent permit writer will develop the detailed rationale required in a fact sheet for any permit that includes complex calculations or special conditions (e.g., case-by-case effluent limitations based on best professional judgment [BPJ]) even if a fact sheet is not required by regulation.

11.3 Items to Address before Issuing a Final Permit

This section describes the public participation activities that must be conducted in the permit issuance process. These include providing public notices, collecting and responding to public comments, and holding public hearings as necessary.

11.3.1 Public Notice

The public notice is the vehicle for informing all interested parties and members of the general public of the contents of a draft NPDES permit or other significant actions with respect to an NPDES permit or permit application. The basic intent of this requirement is to ensure that all interested parties have an opportunity to comment on significant actions of the permitting agency with respect to NPDES permits. The exact scope, required contents, and methods for effecting public notices are found in § 124.10. The NPDES permit-related actions for which public notice is required are shown in Exhibit 11-7.

Exhibit 11-7 Actions for which public notice is required

- Tentative denial of an NPDES permit application (not necessarily applicable to state programs)
- Preparation of a draft NPDES permit, including a proposal to terminate a permit
- Scheduling of a public hearing
- An appeal has been granted by the Environmental Appeals Board
- Major permit modifications (after permit issuance)
- New Source determinations (EPA only)

The permit writer should be particularly concerned with the first three items in Exhibit 11-7. It is important to note that no public notice is required when a request for a permit modification, revocation, reissuance, or termination is denied.

Public notice of NPDES permit-related activities should be provided using the following methods:

- For major permits, publication of a notice in daily or weekly newspaper within the area affected by the facility or activity.
- For general permits issued by EPA, publication in the FR.
- For all permits, direct mailing to various interested parties. This mailing list should include the following:
  - The applicant.
  - Any interested parties on the mailing list.
  - Any other agency that has issued or is required to issue a Resource Conservation and Recovery Act (RCRA), Underground Injection Control (UIC), Prevention of Significant Deterioration (PSD) (or other permit under the Clean Air Act), NPDES, CWA section 404, sludge management, or ocean dumping permit under the Marine Research Protection and Sanctuaries Act for the same facility or activity.
  - Federal and state agencies with jurisdiction over fish, shellfish, and wildlife resources and over coastal zone management plans, the Advisory Council on Historic Preservation, State Historic Preservation Officers, including any affected states and tribes.
  - State agencies conducting area-wide and continuing planning under CWA sections 208(b)(2), 208(b)(4) or 303(e) and the FWS, NMFS, and the U.S. Army Corps of Engineers.
  - Users identified in the permit application of a privately owned treatment work.
  - Persons on any mailing lists developed by including those who request inclusion in writing and persons solicited for *area lists* from participants in past permit proceedings in the area.
  - Any local government having jurisdiction over the locality of the facility.

A public notice must contain the information shown in Exhibit 11-8.

Exhibit 11-8 Contents of the public notice

- Name and address of the office processing the permit action
- Name and address of the permittee or applicant and, if different, of the facility or activity regulated by the permit
- A brief description of the business conducted at the facility or activity described in the permit
- Name, address, and telephone number of a contact from whom interested persons can obtain additional information
- A brief description of the comment procedures required, the time and place of any hearing to be held including procedures to request a hearing
- For EPA-issued permits, the location and availability of the administrative record and the times at which the record will be open for public inspection and a statement that all data submitted by the applicant is available as part of the administrative record
- A description of the location of each existing or proposed discharge point and the name of the receiving water and the sludge use and disposal practice(s) and the location of each sludge treatment works treating domestic sewage and use or disposal sites known at the time of permit application
- Requirements applicable to a thermal variance under CWA section 316(a)
- Requirements applicable to cooling water intake structures under CWA section 316(b)
- Any additional information considered necessary

The regulatory agency preparing the permit must provide public notice of the draft permit (including a notice of intent to deny a permit application), and it must provide at least 30 days for public comment. The draft permit is usually submitted for public notice after it has undergone internal review by the regulatory agency that is issuing the permit. State-issued permits typically undergo public notice after EPA has reviewed and commented on the draft permit. In the special case of those EPA-issued permits that require an EIS, public notice is not given until after a draft EIS is issued.

11.3.2 Public Comments

Public notice of a draft permit might elicit comments from concerned individuals or agencies. Frequently, such comments are simply requests for additional information. However, some comments are of a substantive nature and suggest modifications to the draft permit or indicate that the draft permit is inappropriate for various reasons. In such cases, commenters must submit all reasonable arguments and factual material in support of their positions and comments by the close of the public comment period, and the permitting authority must consider those comments in making final decisions. If the approach is technically correct and clearly stated in the fact sheet, it will be difficult for commenters to find fault with the permit. Commenters can always suggest alternatives, however. In addition, an interested party may also request a public hearing.

To the extent possible, it is desirable to respond to all public comments as quickly as possible. In some cases, it might be possible to diffuse a potentially controversial situation by providing further explanation of permit terms and conditions. Additionally, permit writers should also consider notifying commenters that their comments have been received and are being considered.

The permitting agency must respond to all significant comments, in accordance with § 124.17, at the time a final permit decision is reached (in the case of EPA-issued permits) or at the same time a final permit is

actually issued (in the case of state-issued permits). The response should incorporate the following elements:

- Changes in any of the provisions of the draft permit and the reasons for the changes.
- Description and response to all significant comments on the draft permit or the permit application raised during the public comment period or during any hearing.

If any information is submitted during the public comment period raises substantial new questions about the draft permit, one of the following actions can occur:

- A new draft permit with a revised fact sheet or statement of basis is prepared.
- A revised statement of basis, a fact sheet, or revised fact sheet is prepared, and the comment period is reopened.
- The comment period is reopened but is limited to new findings only.

If any of those actions is taken, a new public notice, as described earlier, must be given.

For EPA-issued permits, any documents cited in the response to comments must be included in the administrative record. If new points are raised or new material is supplied during the public comment period, EPA may document its response to these new materials by adding new materials to the administrative record.

11.3.3 Public Hearings

Any interested party may request a public hearing. The request should be in writing and should state the nature of the issues proposed to be raised during the hearing. However, a request for a hearing does not automatically necessitate that a hearing be held. A public hearing should be held when there is a significant amount of interest expressed during the public comment period or when it is necessary to clarify the issues involved in the permit decision.

Thus, the decision of whether to hold a public hearing is actually a judgment call. Such decisions are usually made by someone other than the permit writer. However, the permit writer will be responsible for ensuring that all the factual information in support of the draft permit is well documented.

Public notice of a public hearing must be given at least 30 days before the public meeting. Public notice of the hearing may be given at the same time as public notice of the draft permit, and the two notices may be combined. The public notice of the hearing should contain the following information:

- Brief description of the nature and purpose of the hearing, including the applicable rules and procedures.
- Reference to the dates of any other public notices relating to the permit.
- Date, time, and place of the hearing.

Scheduling a hearing automatically extends the comment period until at least the close of the hearing [§ 124.12(c)] and the public comment period may be extended by request during the hearing. Anyone may submit written or oral comments concerning the draft permit at the hearing. A presiding officer is responsible for scheduling the hearing and maintaining orderly conduct, including setting reasonable time

limitations for oral statements. Note that a transcript or recording of the hearing must be available to interested persons.

11.3.4 Environmental Justice Considerations

Environmental justice (EJ) is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. EPA has this goal for all communities and persons across U.S. It will be achieved when everyone enjoys the same degree of protection from environmental and health hazards and equal access to the decision-making process to have a healthy environment in which to live, learn, and work.

In NPDES permits, the public participation process provides opportunities to address EJ concerns by providing appropriate avenues for public participation, seeking out and facilitating involvement of those potentially affected, and including public notices in more than one language where appropriate.

11.3.5 EPA and State/Tribal Roles in Reviewing Draft Permits

The CWA and the NPDES regulations include review roles for EPA and for states, tribes, and territories (states) depending on whether EPA or a state is issuing an NPDES permit.

11.3.5.1 State-issued Permits

Each authorized state administering an NPDES program must transmit to the EPA Region copies of permit applications received and copies of draft or proposed permits [§ 123.43(a)]. The state and the EPA Region execute a Memorandum of Agreement (MOA) under § 123.24 that addresses administration and enforcement of the state's regulatory program. The MOA may specify that EPA will review draft permits rather than proposed permits [§ 123.44(j)] and specify the classes or categories of permit applications and draft or proposed permits that the state will send to the EPA Region for review, comment, and, where applicable, objection. In addition, the MOA specifies classes or categories of permits for which EPA will waive its right to review the draft or proposed permit. EPA cannot waive its right to review classes or categories of permits for the following:

- Discharges into the territorial seas.
- Discharges that could affect waters of a state other than the one in which the discharge originates.
- Discharges proposed to be regulated by general permits.
- Discharges from a POTW with a daily average discharge exceeding 1 million gallons per day.
- Discharges of uncontaminated cooling water with a daily average discharge exceeding 500 million gallons per day.
- Discharges from any major discharger or from any NPDES primary industry category.
- Discharges from other sources with a daily average discharge exceeding 500,000 gallons per day (however, EPA may waive review for non-process wastewater).

The MOA provides a period up to 90 days from receipt of a permit during which the EPA Region can make general comments on, objections to, or recommendations with respect to the permit. If the EPA

Region objects to a permit, within 90 days of receiving the permit it must transmit to the state a statement of the reasons for the objection and the actions that the state must take to eliminate the objection [§ 123.44(a)-(b)]. Specific causes for objection are outlined in the regulations at § 123.44(c). Any interested party can request a public hearing on an objection by the EPA Region. After such a hearing, the Region can affirm the objection, modify the terms of the objection, or withdraw the objection and notify the state of that decision. If the EPA Region does not withdraw the objection, the state then has 30 days to resubmit a permit revised to meet the objection. If the state does not do so, exclusive authority to issue the permit passes to the EPA Region. If no public hearing on the objection is held, the time frame for the state to resubmit a revised permit is 90 days from receipt of the objection.

11.3.5.2 EPA-issued Permits

Permits issued by EPA require an opportunity for state review and certification under CWA section 401. The state in which a discharge originates or will originate is provided the opportunity to review an application or a draft permit and certify that the discharge will comply with the applicable water quality standards. This process also has the benefits of ensuring that state initiatives or policies are addressed in EPA-issued NPDES permits and promoting consistency between state-issued and EPA-issued permits where not all permits within the state are issued by the same agency.

Regulations at §§ 124.53 (State Certification) and 124.54 (Special provisions for state certification and concurrence on applications for CWA section 301(h) variances) describe procedures an EPA permit writer should follow to obtain state certification. Under CWA section 401(a)(1), EPA may not issue a permit until a certification is granted or waived. If EPA is preparing the draft permit, state certification can be accomplished by allowing states to review and certify the application before draft permit preparation. Under § 124.53, if EPA has not received a state certification by the time the draft permit is prepared, EPA must send the state a copy of the draft permit along with a notice requesting state certification.

If the state does not respond within a specified reasonable time, which cannot exceed 60 days, it is deemed to have waived its right to certify. If the state chooses to certify the draft permit, it may include any conditions more stringent than those in the draft permit necessary to ensure compliance with the applicable provisions of the CWA or state law, and must cite the CWA or state law references that support the changes. In addition, the state is required to include a statement of the extent to which each condition of the draft permit can be made less stringent without violating the requirements of state law, including water quality standards. Failure to provide this statement for any condition waives the right to certify or object to any less stringent condition that might be established during the EPA permit issuance process. When a permit applicant requests a CWA section 301(h) variance (§ 124.54), the state certification process is very similar to the process described above. For more on CWA section 301(h) variances, see section 5.1.3.5 of this manual.

11.3.6 Schedule for Final Permit Issuance

The final permit may be issued after the close of the public notice period and after state certification has been received (for permits issued by EPA). The public notice period consists of the following:

- A 30-day period that gives notice of intent to issue or deny the permit.
- A 30-day period advertising a public hearing (if applicable).
- Any extensions or reopening of the comment period.

Final EPA permit decisions are effective immediately upon issuance unless comment were received on the draft permit, in which case, the effective date of the permit is 30 days after issuance (or a later date if specified in the permit). In addition, permit decisions will not be immediately effective if review is requested on the permit under § 124.19. As discussed earlier, any comments that are received must be answered at the time of final permit issuance (in the case of NPDES states or tribes) or after a final decision is reached (in the case of EPA). The administrative record for the final permit consists of the items in Exhibit 11-9.

Exhibit 11-9 Elements of the administrative records for a final permit

- All elements for the draft permit administrative record (see Exhibit 11-5)
- All comments received during the comment period
- The tape or transcript of any public hearing
- Any materials submitted at a hearing
- Responses to comments
- For NPDES new source permits, the draft or final EIS
- The final permit

11.4 Administrative Actions after Final Permit Issuance

Once the final permit has been issued, the issuing authority should enter the permit limitations and any special conditions into the Integrated Compliance Information System for the NPDES program (ICIS-NPDES) (for more on ICIS-NPDES, see the introduction to this manual and section 11.5.1.1 below). Entering permit information into ICIS-NPDES will ensure that the facility's performance will be tracked and the permitting agency will be alerted to the need for corrective action if violations of permit limitations, terms, or conditions occur.

After final permit issuance, interested parties have opportunities to change the permit through permit appeals, major/minor permit modifications, termination and revocation, or transfer. Those administrative procedures are described below.

11.4.1 Permit Appeals

Throughout the process of developing a permit and during the public notice period, the permit writer should carefully consider all legitimate concerns of the applicant/permittee and any other interested party. Nevertheless, there will inevitably be situations in which a permit is issued in spite of the objections of the permittee or a third party. In such instances, the permittee or interested party can choose to legally contest or appeal the NPDES permit, as provided in § 124.19. Permit appeals are the process by which any person that filed comments on the draft permit may contest the final limitations and conditions in a permit.

Appeals of EPA-issued permits consist of petitioning the Environmental Appeals Board (EAB) for review. Such review must be requested within 30 days of issuance of the final permit, and challenges must be limited to issues raised during the draft permit's public comment or hearing processes, although persons not participating in these processes may seek review of changes in the permit from draft to final permit. During the appeals process, only those conditions of an existing permit that are being contested

are stayed. Within a reasonable time following the filing of the petition for review, the EAB must grant or deny the petition. Only individual permits may be appealed to the EAB; general permits may be challenged in court or an individual permit may be sought and appealed.

Many states have similar administrative appeal procedures designed to resolve challenges to the conditions of a permit. For the sake of convenience, such procedures, which could be known by different names (e.g., evidentiary hearing, administrative appeal), are hereafter *permit appeals*. Permit writers will, from time to time, be involved in permit appeals and will need to address the types of issues discussed below.

Aside from preparing the administrative record and notices, the permit writer might not be involved in the procedural matters relating to permit appeals. All requests for permit appeals are coordinated through the office of the EPA Regional Counsel or the appropriate state legal counsel. The permit writer's first involvement with the appeals process will likely come as a result of designation of the appeals staff, and his or her role will be limited to that of a technical advisor to legal counsel and, where a state uses an evidentiary hearing procedure, possibly a witness.

11.4.1.1 Deposition and Testimony

In a state hearing procedure, a permit writer might be required to give a deposition during which the appellant attorney conducts the questioning that would otherwise occur in the hearing. The deposition is transcribed and presented as evidence. The appellant attorney may ask some of the same questions at the hearing.

To prepare for a deposition and testimony, the permit writer should first consult with his or her general counsel to become familiar with laws, regulations, and policies that could affect the permit. The permit writer should also be thoroughly familiar with the technical basis for the permit conditions. For example, if final effluent limitations are based on water quality standards, the permit writer should thoroughly study the applicable water quality standards, water quality models, and procedures used to develop the effluent limitations and be prepared to defend all assumptions and decisions made in the effluent limitation calculations. For case-by-case limitations based on BPJ, the permit writer should carefully review all applicable data and procedures used to calculate the effluent limitations and should be sure that the information on which case-by-case limitations are based is unimpeachable, the limitations were derived from the data in a logical manner in accordance with established procedures, and the limitations are technically sound and meet applicable standards for economic reasonableness.

A permit appeal before the EAB relies on the information presented in the petitions and briefs, and possibly includes oral argument, but typically does not use depositions and direct testimony.

11.4.1.2 The Permit Writer's Role in the Appeals Process

As technical advisor to legal counsel, the permit writer's most important function is to develop support for contested permit conditions. A permit writer should not attempt to support technically indefensible conditions. Contested permit conditions that are not technically defensible and are not based on any legal requirement should be brought to counsel's attention, with advice that EPA or the state withdraw those conditions.

The second most important advisory function of the permit writer is assisting counsel in identifying weaknesses in the appellant's arguments. That process could include developing questions for cross-examination of opposing witnesses in a state permit appeal that involves a hearing. Questions should be restricted to the subject material covered by the witness' direct testimony and should be designed to elicit an affirmative or negative response, rather than an essay-type response.

Finally, the permit writer should remember that when a person petitions for EAB review or requests a hearing for a state-issued permit, the permit writer should refrain from any discussion about the case without first consulting with legal counsel.

In the role of technical advisor or witness, the permit writer should do the following:

- Cultivate credibility.
- Never imply or admit weakness in his or her area of expertise.
- Never attempt to testify about subjects outside his or her area of expertise.
- Always maintain good communication with counsel.

The EAB generally will attempt to resolve permit appeals in the initial stage of granting review. If that is not possible, the EAB conducts formal review of the contested conditions and publishes a written opinion (an Environmental Administrative Decision). The result of an EAB or state permit appeal might be relief from certain permit conditions, validation or strengthening of contested permit conditions, or a combination of these two outcomes. Under certain circumstances, decisions of the EAB can be appealed in federal court. Authorized state's permit appeal procedures typically provide for further appeal of administrative decisions regarding contested permit conditions in state court when all administrative steps have been fulfilled.

11.4.2 Modification or Revocation and Reissuance of Permits

In most cases, a permit will not need to be modified (or revoked and reissued) during the term of the permit if the facility can fully comply with permit conditions. However, under certain circumstances, it might be necessary to modify the permit before its expiration date. A permit modification could be triggered in several ways. For example, a representative of the regulatory agency might inspect the facility and identify a need for the modification (i.e., the improper classification of an industry), or information submitted by the permittee might suggest the need for a change. Of course, any interested person may make a request for a permit modification.

Modifications differ from revocations and reissuance. In a permit modification, only the conditions subject to change are reconsidered while all other permit conditions remain in effect. Conversely, the entire permit could be reconsidered when it is revoked and reissued.

Except where the permittee requests or agrees, permit modifications are limited to specific *causes* identified in §§ 122.62(a) and 122.62(b) and summarized in Exhibit 11-10. Most NPDES permit modifications require EPA or the state to conduct the public notice and participation activities of Part 124, similar to the issuance or reissuance of the permit; however, only those specific conditions being modified are open to review and comment. The permitting authority may revoke and reissue a permit during its term for the causes identified in § 122.62(b) (i.e., the final two bulleted items in Exhibit 11-10).

Exhibit 11-10 Causes for permit modification

- **Alterations**: When there are material and substantial alterations or changes to the permitted facility or activity occur that justify new conditions that are different from the existing permit.
- **New information**: When information is received that was not available at the time of permit issuance.
- **New regulations**: Under limited circumstances, when standards or regulations on which the permit was based have been changed by the modification, withdrawal or promulgation of amended standards or regulations or by judicial decision.
- **Compliance schedules**: To modify the compliance schedule when good cause exists, such as an act of God, strike, or flood.
- **Variance requests**: When requests for variances or fundamentally different factors are filed within the specified time but not granted until after permit issuance.
- **Toxics**: To insert CWA section 307(a) toxic effluent standard or prohibition.
- **Reopener**: Conditions in the permit that require it to be reopened under certain circumstances.
- **Net limits**: Upon request of a permittee who qualifies for effluent limitations on a net basis under § 122.45(g) or when a permittee is no longer eligible for net limitations, as provided in § 122.45(g)(1)(ii).
- **Pretreatment**: As necessary under § 403.8 (e) to put a compliance schedule in place for the development of a pretreatment program or to change the schedule for program development.
- **Failure to notify**: Upon failure of an approved state to notify another state whose waters may be affected by a discharge from the approved state.
- **Non-limited pollutants**: When the level of any pollutant that is not limited in the permit exceeds the level that can be achieved by the technology-based treatment requirements appropriate to the permit.
- **Notification levels**: To establish notification levels for toxic pollutants as provided in §122.44(f).
- **Compliance schedules for innovative or alternative facilities**: To modify the compliance schedule in light of the additional time that might be required to construct such a facility.
- **Small municipal separate storm sewer system (MS4) minimum control measures**: For a small MS4 to include required minimum control measures when the permit does not include such measure(s) based on the determination that another entity was responsible for implementation and the other entity fails to fulfill its responsibility to implement such measure(s).
- **Technical mistakes**: To correct technical mistakes or mistaken interpretations of law made in developing the permit conditions.
- **Failed BPJ compliance**: When BPJ technology is installed and properly operated and maintained but the permittee is unable to meet its limitations, the limitations may be reduced to reflect actual removal; however, they may not be less than the limitations in the effluent guidelines. If BPJ operation and maintenance costs are extremely disproportionate to the costs considered in a subsequent effluent guideline, the permittee may be allowed to backslide to the limitations in the effluent guideline.
- **Land application plans**: When required by a permit condition to incorporate a land application plan for beneficial reuse of sewage sludge, to revise an existing land application plan, or to add a land application plan.
- **Cause exists for termination**: Cause exists under § 122.64, and the Director determines that modification is appropriate.
- **Notification of proposed transfer**: Director may modify the permit upon receipt of ownership transfer notification.

There are certain minor modifications that, upon consent of the permittee, may be processed by the permitting authority without following the procedures for public notice in Part 124. Minor modifications are generally non-substantive changes (e.g., typographical errors) and are exempt from the administrative procedures; that is, a draft permit and public review are not required. The specific permit changes that can be processed as minor modifications, described in § 122.63, are to

- Correct typographical errors.
- Incorporate more frequent monitoring or reporting.
- Revise an interim compliance date in the schedule of compliance, provided the new date is not more than 120 days after the date specified in the permit and does not interfere with attainment of the final compliance date requirement.
- Allow for a change of ownership, provided no other change is necessary (see section 11.4.4 below).
- Change the construction schedule for a new source discharger.
- Delete a point source outfall when that outfall is terminated and does not result in discharge of pollutants from other outfalls except in accordance with permit limits.
- Incorporate an approved local pretreatment program.

11.4.3 Permit Termination

Situations could arise during the life of the permit that are causes for termination of the permit. Such circumstances, described in § 122.64(a), include the following:

- Noncompliance by the permittee with any condition of the permit.
- Misrepresentation or omission of relevant facts by the permittee.
- Determination that the permitted activity endangers human health or the environment, and can be regulated to acceptable levels only by permit modification or termination.
- A change in any condition that requires either a temporary or permanent reduction or elimination of a discharge (e.g., plant closure).

Terminations are used to retract a permittee's privileges to discharge during the permit term. A notice of intent to terminate a permit is a type of draft permit that follows the same procedures as any draft permit prepared under § 124.6. Administrative procedures, such as public notice, must be followed in permit termination proceedings. If a facility with a terminated permit wishes to obtain permit coverage, it would have to submit an application and apply for a new permit.

The regulations at § 122.64(b) do provide one exception to the more formal permit termination process described above. Where the entire discharge is permanently terminated by elimination of the flow or by connection to a POTW (but not by land application or disposal into a well) the permit can be terminated by notice to the permittee, and the Part 124 administrative process is not required. However, if the permittee objects to such an expedited termination, the Permitting Authority must then proceed in accordance with the administrative procedures described above.

11.4.4 Permit Transfer

Regulatory agencies occasionally receive notification of a change in ownership of a facility covered by an NPDES permit. Such changes require that a permit be transferred by one of two provisions:

- **Transfer by modification or revocation**: The transfer may be made during the process of a major or minor permit modification. It may also be addressed by revoking and subsequently reissuing the permit.
- **Automatic transfer**: A permit may automatically be transferred to a new permittee if three conditions are met:
  - The current permittee notifies the Director 30 days in advance of the transfer date.
  - The notice includes a written agreement between the old and new owner that contains the specific date for transfer of permit responsibility, coverage, and liability between them.
  - The Director of the regulatory agency does not notify the old permittee and the proposed new permittee that the subject permit will be modified or revoked and reissued.

11.5 Permit Compliance and Enforcement

EPA's OECA is responsible for nationally managing EPA's compliance and enforcement programs for all media including the CWA and NPDES. EPA uses a mix of tools including compliance assistance, incentives, and monitoring and enforcement. EPA and state environmental agencies authorized to administer the NPDES program seek to achieve and maintain a high level of compliance with environmental laws and regulations. Enforcement provides a powerful incentive for NPDES permittees to comply, and the way in which an NPDES permit is written directly affects its enforceability. Each permit must be written clearly and unambiguously so that compliance can be tracked effectively and the permit can be enforced if violations occur.

The permit writer could become actively involved with the compliance monitoring and enforcement of the terms and conditions of the NPDES permits that he or she has written. The extent of the permit writer's involvement will usually depend on the organizational structure of the regulatory agency. Larger, centrally organized agencies typically have separate personnel responsible for enforcing the terms of NPDES permits. In other organizations, the individual who writes the permit will also be responsible for such enforcement activities as discharge monitoring report (DMR) tracking, facility inspections, and enforcement recommendations. If a civil judicial enforcement action occurs, the permit writer might be called on to testify regarding the specific requirements of the permit or its basis.

Regardless of a regulatory agency's organizational structure, the permit writer should have an appreciation for the various aspects of a meaningful NPDES compliance enforcement program. The following sections address compliance monitoring reviews and inspections and data in the national ICIS-NPDES (formerly the Permit Compliance System or PCS) database, which provides the basis for evaluating compliance. This section concludes with a brief description of the enforcement actions available to facilitate permit compliance. For more information about CWA enforcement, see OECA's Clean Water Act Enforcement Website <www.epa.gov/compliance/civil/cwa/index.html>.

11.5.1 Compliance Monitoring

Compliance monitoring is a broad term that includes all activities that federal or state regulatory agencies take to ascertain a permittee's compliance with the conditions specified in an NPDES permit. Compliance monitoring data collected as part of the NPDES program are used to evaluate compliance and support enforcement actions. The process includes receiving, reviewing, and entering data into the ICIS-NPDES database, conducting on-site inspections, identifying violators, and determining an appropriate response.

A primary function of the compliance monitoring program is to verify compliance with permit conditions, including effluent limitations and compliance schedules. Compliance verification is achieved through

- **Compliance review**: A review of all written reports and other material relating to the status of a permittee's compliance.
- **Compliance inspections**: Field-related regulatory activities (i.e., facility inspections, effluent sampling) to determine compliance.

11.5.1.1 Compliance Review

Compliance and enforcement personnel use two primary sources of information to carry out compliance reviews:

- Permit/compliance files.
- The ICIS-NPDES database.

Permit/compliance files include the permit, application, fact sheet, compliance schedule reports, compliance inspection reports, DMRs, enforcement actions, and correspondence (e.g., summaries of telephone calls, copies of warning letters). Compliance personnel periodically review that information and use it to determine if enforcement is necessary and, if so, what level of enforcement is appropriate.

The ICIS-NPDES database <https://icis.epa.gov/icis> is the national database for tracking compliance with NPDES requirements and is discussed further in this manual's introduction. Information in ICIS-NPDES includes facility and discharge characteristics, self-monitoring data, compliance schedules, permit conditions, inspections, and enforcement actions. Permittees are required to submit effluent monitoring data, and compliance and status information, via Compliance Schedule Reports and DMRs. EPA Regions and NPDES states enter such information into ICIS-NPDES and evaluate permittees on compliance with NPDES permit requirements. Inspection and enforcement information is collected and entered by Regions or authorized states or both. Quarterly, EPA reviews the ICIS-NPDES system data and generates a *quarterly noncompliance report* (QNCR) for all major facilities following the requirements of § 123.45.

ICIS-NPDES supports compliance and enforcement actions and assists EPA staff in evaluation and oversight of the NPDES program. The database also promotes national consistency and uniformity in permit and compliance evaluations. NPDES permits must be written so that compliance can be tracked using ICIS-NPDES. Situations might arise in which permit limitations and monitoring conditions are not initially compatible with ICIS-NPDES entry and tracking. In such cases, the permit writer should alert the state or EPA Regional staff responsible for entering ICIS-NPDES codes and work with them to resolve any coding issues. To assist ICIS-NPDES coders in accurately interpreting and entering the permit into ICIS-NPDES and to assist enforcement personnel in reviewing permittee's self-monitoring data and

reports in a timely manner, permit writers should follow the compliance inspection procedures discussed in the next section.

11.5.1.2 Compliance Inspections

Compliance inspections refer to all field-related regulatory activities conducted to determine permit compliance. Such field activities can include compliance evaluation inspections (non-sampling), sampling inspections, other specialized inspections, and remote sensing. Certain inspections, such as diagnostic inspections and performance audit inspections, aid the regulatory agency in evaluating the facility's problems in addition to providing information to support enforcement action. Biomonitoring inspections are specifically targeted at facilities with effluent suspected or identified as causing toxicity problems that threaten the ecological balance of the receiving waters.

Compliance inspections are undertaken to fulfill one or more of the following purposes:

- Establish a regulatory presence to deter noncompliance.
- Ensure that permit requirements are being met or determine if permit conditions are adequate.
- Check the completeness and accuracy of a permittee's performance and compliance records.
- Assess the adequacy of the permittee's self-monitoring and reporting program including on-site laboratory functions.
- Determine the progress or completion of corrective action.
- Obtain independent compliance data on a facility's discharge.
- Evaluate the permittee's operation and maintenance activities.
- Observe the status of construction required by the permit.

11.5.2 Quarterly Noncompliance Reports

EPA Regional offices and NPDES states are required by the regulations at § 123.45 to report quarterly on major facilities that are not in compliance with the terms and conditions of their permit or enforcement order (i.e., that meet the criteria for *reportable noncompliance* [RNC] for effluent limitation, schedules, and reporting violations).

The regulations in § 123.45 establish requirements for listing facility violations and resulting regulatory enforcement action on QNCRs. The regulation establishes reporting requirements for violations that meet specific, quantifiable reporting criteria, as well as for violations that are more difficult to quantify but are of sufficient concern to be considered reportable. The regulation also specifies the format that the reports must follow and the schedule for their submission.

Only major facilities that meet RNC criteria must be reported on the QNCR. RNC consists of several general types of violations as established in § 123.45:

- Effluent limitations
  - Monthly average effluent limitations (see below for more).
  - Other effluent limitations with water quality or health impacts.

- Schedule: Violations of compliance schedule milestones by 90 days or more.
- Reporting: Reports late by 30 days or more.

A violation of any monthly average limitation should be evaluated for magnitude by comparing the measured amount in the DMR to the product of the monthly average limitation times the Technical Review Criteria (TRC) for that pollutant or parameter. The TRC is 1.4 for Group I (conventional) pollutants and 1.2 for Group II (generally toxic) pollutants. Appendix A to Part 123 contains a list of pollutants in each Group. RNC includes violations of a given Group I or Group II pollutant or parameter that equals or exceeds the product of the TRC times the monthly average limitation for any 2 or more months during a 6-month reporting period. RNC also includes violations of a Group I or Group II parameter by any amount (not necessarily TRC times the limitation or greater) for 4 months during the 6-month reporting period.

A subset of instances of RNC that appear on the QNCR could be noted as *significant noncompliance* (SNC). This distinction is used solely for management accountability purposes as a means of tracking trends in compliance and evaluating the relative timeliness of enforcement response toward priority violations.

The definition of SNC is not regulatory and can change as the NPDES program evolves to encompass new enforcement priorities. For example, in September 1995, EPA revised the definition of SNC to include violations of non-monthly average permit limitations by major facilities. Many permits for NPDES major facilities lacked required monthly average limitations and, thus, were not evaluated for SNC violations and follow-up formal enforcement action. The new definition became effective as of October 1, 1996. EPA's SNC policy is described in the memorandum Revision of NPDES Significant Noncompliance (SNC) Criteria to Address Violations of Non-Monthly Average Limits[1] <www.epa.gov/compliance/resources/policies/civil/cwa/revisedsncmemo.pdf>.

Generally, the designation of SNC indicates a violation is of sufficient magnitude or duration or both to be considered among EPA's priorities for regulatory review or response. The categories of SNC are

- Effluent limitations: The effluent limitation SNC criteria are the same as for QNCR discussed above.
- Schedule: The schedule SNC criteria are the same as for QNCR discussed above.
- Reporting: The reporting SNC criteria are the same as for QNCR discussed above.
- Order requirements: Violation of requirements in administrative or judicial orders.

The instance of SNC is considered resolved when the SNC criteria are no longer met during the review period, or when the permittee formerly in SNC exhibits compliance for all 3 months of the most recent 3-month reporting period. A permittee with SNC violations under a compliance schedule that is meeting its deadlines for corrective actions is in *resolved pending* status.

Any major permittee that is listed on the QNCR for two consecutive 3-month reporting periods for the same instance of SNC (e.g., same outfall point, same parameter, same category of violation) is expected to return to compliance or to be addressed with an appropriate enforcement action before the reporting deadline for the second QNCR. If the facility is in SNC after the second QNCR, and no enforcement

action has been taken, the facility is placed on the Watch List. The Watch List is a management tool that identifies and tracks facilities with serious violations and no apparent formal enforcement response.

11.5.3 Enforcement

EPA's NPDES compliance and enforcement principles and recommendations are described in the NPDES Enforcement Management System (EMS)[2] <www.epa.gov/compliance/resources/policies/civil/cwa/emscwa-jensen-rpt.pdf>. By choosing an appropriate enforcement response to CWA violations, EPA tries to achieve several goals:

- Correction of the violation as soon as possible.
- Deterrence of future violations by the same permittee or other permittees.
- Equal treatment of the regulated community through use of a uniform approach to selecting enforcement responses (i.e., similar violations are treated similarly).
- Assessment of an appropriate penalty.
- Protection of human health and the environment.

Once a facility has been identified as having potential CWA violations, EPA or the NPDES state reviews the facility's compliance history. The review includes an assessment of the magnitude, frequency, and duration of violations. The permitting authority identifies significant violations and makes a determination of the appropriate enforcement response. CWA section 309 authorizes the Agency to bring civil or criminal action against facilities that discharge pollutants without a permit or discharge in violation of NPDES permit conditions and judicial penalties up to $32,500 per day per violation.

EPA Regions and authorized states have specific procedures for reviewing self-monitoring and inspection data and for deciding what type of enforcement action is warranted. EPA recommends an escalating response to continuing noncompliance. The range of enforcement responses includes the following:

- Informal action (e.g., *notice of violation* [NOV]).
- Formal action.
- Administrative compliance order.
- Administrative order with or without an administrative penalty order (up to $157,500).
- Civil judicial action that imposes injunctive relief seeking compliance or penalty or both.
- Criminal prosecution.

Considerations when making determinations on the level of the enforcement response include the following:

- The duration of the violation.
- The severity of the violation.
- The degree of economic benefit obtained through the violation.
- Compliance history and previous enforcement actions taken against the violator.
- The degree of culpability.
- The deterrent effect of the response on similarly situated permittees.

Equally important considerations may include fairness and equity, national consistency, and the integrity of the NPDES program.

Citizens can participate in the enforcement process in a number of ways. Under the Freedom of Information Act, citizens have the right to request certain facility-specific compliance information from EPA's ICIS-NPDES database. In addition, under NPDES regulations, interested citizens can intervene in any federal civil judicial action to enjoin any threatened or continuing violation of program requirements or permit conditions, and to recover civil penalties in court. Citizens also have the opportunity to review and comment on any proposed consent decree to resolve a state or federal civil judicial enforcement action.

CWA section 505 allows any citizen to begin a civil judicial enforcement action on his or her own behalf. In certain circumstances, citizens may not begin suit if EPA or the state is diligently prosecuting a civil or criminal judicial action or an administrative action to obtain a penalty under CWA section 309(g) or a comparable provision of state law. Citizens must also give EPA, the state, and the alleged violator 60 days' notice of the alleged violation before beginning a citizen suit.

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[1] Herman, S.A. 1995. *Revision of NPDES Significant Noncompliance (SNC) Criteria to Address Violations of Non-Monthly Average Limits.* U.S. Environmental Protection Agency, Office of Enforcement and Compliance Assurance. Memorandum, September 21, 1995. <www.epa.gov/compliance/resources/policies/civil/cwa/revisedsncmemo.pdf>.

[2] U.S. Environmental Protection Agency. 1989. *The Enforcement Management System: National Pollutant Discharge Elimination System (Clean Water Act)*. EC-G-1998-11b. U.S. Environmental Protection Agency, Office of Water, Washington, DC. <www.epa.gov/compliance/resources/policies/civil/cwa/emscwa-jensen-rpt.pdf>.

Appendix A. Acronyms, Abbreviations and Glossary

This appendix contains two tables for permit writers to more easily navigate through the acronyms and the terms that are mentioned throughout this manual. The first table, *Acronyms and Abbreviations*, provides the full text of the acronyms and abbreviations used throughout and indicates whether they are defined in the *Glossary* (the second table), which provides definitions of terms used in the Clean Water Act and NPDES permit program. It provides a reference to the source of the definitions, where available.

A.1 Acronyms and Abbreviations

Exhibit A-1 presents the abbreviations used in the *NPDES Permit Writers' Manual*.

Exhibit A-1 Acronyms and abbreviations

Acronym or abbreviation	Full phrase	Glossary
1Q10	1-day, 10-year Low Flow	
7Q10	7-day, 10-year Low Flow	
4AAP	4-Aminoantipyrine (used for detecting phenolic compounds colorimetrically)	
ACHP	Advisory Council on Historic Preservation	
ACR	Acute-to-Chronic Ratio	
AFO	Animal Feeding Operation	x
AML	Average Monthly Limitation	x
ASR	Alternative State Requirement	
AWL	Average Weekly Limitation	x
BA	Biological Assessment	
BAT	Best Available Technology Economically Achievable	x
BCT	Best Conventional Pollutant Control Technology	x
BE	Biological Evaluation	
BMP	Best Management Practice	x
BOD	Biochemical Oxygen Demand	x
BOD_5	5-day Biochemical Oxygen Demand	
BPJ	Best Professional Judgment	x
BPT	Best Practicable Control Technology Currently Available	x
CAAP	Concentrated Aquatic Animal Production	
CAFO	Concentrated Animal Feeding Operation	x
CBOD	Carbonaceous Biochemical Oxygen Demand	x
$CBOD_5$	5-day Carbonaceous Biochemical Oxygen Demand	
CEQ	Council on Environmental Quality	
CERCLA	Comprehensive Environmental Response, Compensation and Liabilities Act	
CFR	*Code of Federal Regulations*	x
cfs	Cubic Feet per Second	
CGP	Construction General Permit	
CMOM	Capacity, Management, Operation and Maintenance	

Exhibit A-1 Acronyms and abbreviations (continued)

Acronym or abbreviation	Full phrase	Glossary
COD	Chemical Oxygen Demand	x
CSO	Combined Sewer Overflow	x
CSS	Combined Sewer System	x
CV	Coefficient of Variation	
CWA	Clean Water Act	x
CWIS	Cooling Water Intake Structure	
CZMA	Coastal Zone Management Act	
DMR	Discharge Monitoring Report	x
DWO	Dry Weather Overflow	
EA	Environmental Assessment	
EAB	Environmental Appeals Board	
EC	Effect Concentration	
EFH	Essential Fish Habitat	
EIS	Environmental Impact Statement	
ELG	Effluent Limitations Guidelines or Effluent Guidelines	x
EMS	Enforcement Management System	
eNOI	Electronic Notice of Intent	
EPA	U.S. Environmental Protection Agency	
ESA	Endangered Species Act	
FDF	Fundamentally Different Factors	x
FR	*Federal Register*	
FWCA	Fish and Wildlife Coordination Act	
FWPCA	Federal Water Pollution Control Act	
FWS	U.S. Fish and Wildlife Service	
GC/MS	Gas Chromatography/Mass Spectroscopy	
gpd	Gallons per Day	
HEM	Hexane Extractable Material	
IC	Inhibition Concentration	
ICIS	Integrated Compliance Information System	
I/I	Infiltration/Inflow	
LA	Load Allocation	
lbs/day	Pounds per Day	
LC_{50}	Lethal Concentration to 50% of test organisms	
LOEC	Lowest Observed Effect Concentration	
LTA	Long-Term Average	
LTCP	Long-Term Control Plan	
MDL	Method Detection Limit	x
MDL	Maximum Daily Effluent Limitation	x
MEP	Maximum Extent Practicable	
µg/L	Micrograms per Liter	
mg/L	Milligrams per Liter	
mgd	Million Gallons per Day	x
ML	Minimum Level	x

Exhibit A-1 Acronyms and abbreviations (continued)

Acronym or abbreviation	Full phrase	Glossary
MOA	Memorandum of Agreement	
MS4	Municipal Separate Storm Sewer System	x
MSA	Magnuson-Stevens Act	
MSGP	Multi-Sector General Permit	
N/A	Not Applicable	
NAICS	North American Industrial Classification System	x
NEMI	National Environmental Methods Index	
NEPA	National Environmental Policy Act	
NHPA	National Historic Preservation Act	
NMC	Nine Minimum CSO Controls	
NMFS	National Marine Fisheries Service	
NMP	Nutrient Management Plan	
NOAA	National Oceanic and Atmospheric Administration	
NOEC	No Observable Effect Concentration	
NOI	Notice of Intent	
NOV	Notice of Violation	
NPDES	National Pollutant Discharge Elimination System	x
NRDC	Natural Resources Defense Council	
NSCEP	National Service Center for Environmental Publications	
NSPS	New Source Performance Standards	
NTIS	National Technical Information Service	
O&G	Oil and Grease	
OCPSF	Organic Chemicals, Plastics, and Synthetic Fibers Point Source Category	
OECA	EPA Office of Enforcement and Compliance Assurance	
ONRW	Outstanding National Resources Waters	
OTIS	Online Tracking Information System	
OW	Office of Water	
OWRC	Office of Water Resource Center	
PCS	Permit Compliance System	
POTW	Publicly Owned Treatment Works	x
PSD	Prevention of Significant Deterioration	
PSES	Pretreatment Standards for Existing Sources	
PSNS	Pretreatment Standards for New Sources	
QNCR	Quarterly Noncompliance Report	
RAPP	Refuse Act Permit Program	
RCRA	Resource Conservation and Recovery Act	
RNC	Reportable Noncompliance	
SIC	Standard Industrial Classification	x
SIU	Significant Industrial User	x
SNC	Significant Noncompliance	
SOP	Standard Operating Procedure	
SPCC	Spill Prevention Control and Countermeasure	x
SS	Suspended Solids	x

Exhibit A-1 Acronyms and abbreviations (continued)

Acronym or abbreviation	Full phrase	Glossary
SSO	Sanitary Sewer Overflow	x
STORET	EPA Storage and Retrieval Database	x
SWPPP	Stormwater Pollution Prevention Plan	
TBEL	Technology-Based Effluent Limit(s)	x
TCDF	Tetrachlorodibenzofuran	
TEC	Transportation Equipment Cleaning Point Source Category	
THC	Total Hydrocarbons	
TIE	Toxicity Identification Evaluation	
TMDL	Total Maximum Daily Load	x
TOC	Total Organic Carbon	x
TRC	Technical Review Criteria	
TRE	Toxicity Reduction Evaluation	x
TRI	Toxic Release Inventory	
TSD	Technical Support Document [for Water Quality-based Toxics Control]	
TSS	Total Suspended Solids	x
TTO	Total Toxic Organics	
TU	Toxic Units	
TUa	Toxic Units – Acute	
TUc	Toxic Units – Chronic	
TWTDS	Treatment Works Treating Domestic Sewage	x
UAA	Use Attainability Analysis	
UIC	Underground Injection Control	
U.S.C.	*United States Code*	
WET	Whole Effluent Toxicity	x
VGP	Vessel General Permit	
WLA	Waste Load Allocation	x
WPD	EPA Water Permits Division	
WQA	Water Quality Act of 1987	
WQBEL	Water Quality-Based Effluent Limit(s)	x
WQS	Water Quality Standard(s)	x
WSRA	Wild and Scenic Rivers Act	

A.2 Glossary

Exhibit A-2 includes definitions of terms used in the *NPDES Permit Writers' Manual*. For terms that have a definition in the federal regulations, that definition is included with an appropriate citation. The citations also indicate where this guidance manual has paraphrased or modified the regulatory definitions for consistency with the format of the glossary. For terms that do not have a regulatory definition, but that are defined in another published EPA document, the citation to the relevant EPA document is provided.

Note that the definitions provided in the Glossary do not constitute EPA's official use of terms and phrases for regulatory purposes, and nothing in this document should be construed to alter or supplant any

other federal document. Official terminology is in the laws and related regulations as published in such sources as the Congressional Record, *Federal Register*, and elsewhere.

Exhibit A-2 Glossary

Term	Definition	Citation
401(a) Certification	A requirement of CWA section 401(a) that all federally issued permits be certified by the state in which the discharge occurs. The state certifies that the proposed permit will comply with state water quality standards and other state requirements.	1996 U.S. EPA NPDES Permit Writers' Manual (1996 PWM) <www.epa.gov/npdes/pubs/owm0243.pdf>
Acute Effect	The effect of a stimulus severe enough to rapidly induce an effect; in aquatic toxicity tests, an effect generally observed in 96 hours or less is typically considered acute. When referring to aquatic toxicology or human health, an acute effect is not always measured in terms of lethality.	1996 PWM
Animal Feeding Operation (AFO)	Lot or facility (other than an aquatic animal production facility) where the following conditions are met: • Animals (other than aquatic animals) have been, are, or will be stabled or confined and fed or maintained for a total of 45 days or more in any 12-month period. • Crops, vegetation, forage growth, or post-harvest residues are not sustained in the normal growing season over any portion of the lot or facility.	§ 122.23(b)(1)
Anti-backsliding	In general, a statutory provision that prohibits the renewal, reissuance, or modification of an existing NPDES permit that contains effluent limitations, permit conditions, or standards that are less stringent than those established in the previous permit. For more information on anti-backsliding, see Chapter 7 of this manual.	CWA section 402(o)
Antidegradation	A policy developed and adopted as part of a state's water quality standards that ensures protection of existing uses and maintains the existing level of water quality where that water quality exceeds levels necessary to protect fish and wildlife propagation and recreation on and in the water. This policy also includes special protection of water designated as Outstanding National Resource Waters.	Adapted from 1996 PWM
Authorized Program or Authorized State	A state, territorial, tribal, or interstate NPDES program that has been approved or authorized by EPA under Part 123.	1996 PWM
Average Monthly Discharge Limitation	The highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during that month divided by the number of daily discharges measured during that month.	§ 122.2
Average Weekly Discharge Limitation	The highest allowable average of daily discharges over a calendar week, calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week.	§ 122.2
Best Available Technology Economically Achievable (BAT)	Technology standard established by the CWA as the most appropriate means available on a national basis for controlling the direct discharge of toxic and nonconventional pollutants to navigable waters. BAT limitations in effluent guidelines, in general, represent the best existing performance of treatment technologies that are economically achievable within an industrial point source category or subcategory.	Adapted from 1996 PWM

Exhibit A-2 Glossary (continued)

Term	Definition	Citation
Best Conventional Pollutant Control Technology (BCT)	Technology-based standard for the discharge from existing industrial point sources of conventional pollutants including BOD, TSS, fecal coliform, pH, oil and grease. The BCT is established in light of a two-part cost reasonableness test, which compares the cost for an industry to reduce its pollutant discharge with the cost to a POTW for similar levels of reduction of a pollutant loading. The second test examines the cost-effectiveness of additional industrial treatment beyond BPT. EPA must find limits which are reasonable under both tests before establishing them as BCT.	1996 PWM
Best Management Practice (BMP)	Schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of *waters of the United States*. BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.	§ 122.2
Best Practicable Control Technology Currently Available (BPT)	The first level of technology standards established by the CWA to control pollutants discharged to waters of the U.S. BPT limitations in effluent guidelines are generally based on the average of the best existing performance by plants within an industrial category or subcategory.	Adapted from 1996 PWM
Best Professional Judgment (BPJ)	The method used by permit writers to develop technology-based NPDES permit conditions on a case-by-case basis using all reasonably available and relevant data.	1996 PWM
Bioassay	A test used to evaluate the relative potency of a chemical or a mixture of chemicals by comparing its effect on a living organism with the effect of a standard preparation on the same type of organism.	1996 PWM
Biochemical Oxygen Demand (BOD)	A measurement of the amount of oxygen used by the decomposition of organic material, over a specified time (usually 5 days) in a wastewater sample; it is used as a measurement of the readily decomposable organic content of a wastewater.	1996 PWM
Biosolids	See *Sewage Sludge*.	--
Bypass	The intentional diversion of waste streams from any portion of a treatment facility. This definition applies to both direct and indirect discharges.	§ 122.41(m)(1)(i) and § 403.17
Carbonaceous Biochemical Oxygen Demand (CBOD)	The biochemical oxygen demand of carbonaceous sources. This differs from BOD in that BOD measures both nitrogenous and carbonaceous sources, whereas CBOD excludes nitrogenous sources (e.g., nitrifying bacteria) from determination through the addition of a nitrification inhibitor.	--
Categorical Industrial User (CIU)	An industrial user subject to national categorical pretreatment standards.	1996 PWM
Categorical Pretreatment Standards	National pretreatment standards , expressed as Pretreatment Standards for Existing Sources (PSES) or Pretreatment Standards for New Sources (PSNS), specifying quantities or concentrations of pollutants or pollutant properties that may be discharged to a POTW by existing or new industrial users in specific industrial subcategories established as separate regulations under the appropriate subpart of 40 CFR chapter I, subchapter N.	Adapted from § 403.6

Exhibit A-2 Glossary (continued)

Term	Definition	Citation
Chemical Oxygen Demand (COD)	A measure of the oxygen-consuming capacity of inorganic and organic matter present in wastewater. COD is expressed as the amount of oxygen consumed in mg/L. Results do not necessarily correlate to the biochemical oxygen demand (BOD) because the chemical oxidant can react with substances that bacteria do not stabilize.	Adapted from 1996 PWM
Chronic Effect	The effect of a stimulus that lingers or continues for a relatively long period, often one-tenth of the life span or more. The measurement of a chronic effect can be reduced growth, reduced reproduction, and such, in addition to lethality.	1996 PWM
Clean Water Act (CWA)	The Clean Water Act is a statute passed by the U.S. Congress to control water pollution. It was formerly referred to as the Federal Water Pollution Control Act of 1972 or Federal Water Pollution Control Act Amendments of 1972 (Public Law 92-500), 33 U.S.C. 1251 *et seq.*, as amended by: Public Law 96-483; Public Law 97-117; Public Laws 95-217, 97-117, 97-440, and 100-04.	1996 PWM
Code of Federal Regulations (CFR)	A codification of the final rules published daily in the *Federal Register*. Title 40 of the CFR contains regulations for the protection of the environment.	1996 PWM
Combined Sewer Overflow (CSO)	A discharge of untreated wastewater from a combined sewer system at a point before the headworks of a publicly owned treatment works. CSOs generally occur during wet weather (rainfall or snowmelt). During periods of wet weather, these systems become overloaded, bypass treatment works, and discharge directly to receiving waters at designed overflow points.	1996 PWM
Combined Sewer System (CSS)	A wastewater collection system that conveys sanitary wastewaters (domestic, commercial and industrial wastewaters) and stormwater through a single pipe to a publicly owned treatment works for treatment before discharge to surface waters.	1996 PWM
Compliance Schedule (or Schedule of Compliance)	A schedule of remedial measures included in a permit, including an enforceable sequence of interim requirements (for example, actions, operations, or milestone events) leading to compliance with the CWA and regulations.	§ 122.2
Composite Sample	Sample composed of two or more discrete aliquots (samples). The aggregate sample will reflect the average water quality of the compositing or sample period.	--
Conventional Pollutants	Pollutants typical of municipal sewage, and for which publicly owned treatment works typically are designed to remove; defined by Federal Regulation (§ 401.16) as BOD, TSS, fecal coliform bacteria, oil and grease, and pH.	1996 PWM
Daily Discharge	The *discharge of a pollutant* measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurement, the daily discharge is calculated as the average measurement of the pollutant over the day.	§ 122.2

Exhibit A-2 Glossary (continued)

Term	Definition	Citation
Designated Uses	Those uses specified in water quality standards for each waterbody or segment whether they are being attained (§ 131.3). Examples of designated uses include cold and warm water fisheries, public water supply, and irrigation.	Adapted from EPA. Terms of Environment: Glossary, Abbreviations, Acronyms. <www.epa.gov/OCEPAterms/dterms.html>
Development Document	A report prepared during development of an effluent guideline by EPA that provides the data and methodology used to develop effluent guidelines and categorical pretreatment standards for an industrial category.	Adapted from 1996 PWM
Director	The Regional Administrator or the State Director, as the context requires, or an authorized representative. When there is no *approved state program*, and there is an EPA-administered program, *Director* means the Regional Administrator. When there is an approved state program, Director normally means the State Director. In some circumstances, however, EPA retains the authority to take certain actions even when there is an approved state program. (For example, when EPA has issued an NPDES permit before the approval of a state program, EPA may retain jurisdiction over that permit after program approval, see § 123.1.) In such cases, Director means the Regional Administrator and not the State Director.	§ 122.2
Discharge Monitoring Report (DMR)	The EPA uniform national form, including any subsequent additions, revisions, or modifications for the reporting of self-monitoring results by permittees. DMRs must be used by *approved states* as well as by EPA. EPA will supply DMRs to any approved state upon request. The EPA national forms may be modified to substitute the state agency name, address, logo, and other similar information, as appropriate, in place of EPA's.	§ 122.2
Draft Permit	A document prepared under § 124.6 indicating the Director's tentative decision to issue, deny, modify, revoke and reissue, terminate, or reissue a *permit.* A notice of intent to terminate a permit, and a notice of intent to deny a permit, as discussed in § 124.5, are types of *draft permits*. A denial of a request for modification, revocation and reissuance, or termination, as discussed in § 124.5, is not a draft permit. A *proposed permit* is not a draft permit.	§ 122.2
Effluent Limitation	Any restriction imposed by the Director on quantities, discharge rates, and concentrations of *pollutants* which are *discharged* from *point sources* into waters of the United States, the waters of the *contiguous zone*, or the ocean.	§ 122.2
Effluent Limitations Guidelines (Effluent Guidelines or ELG)	A regulation published by the Administrator under CWA section 304(b) to adopt or revise *effluent limitations*.	§ 122.2
Existing Uses	Those uses actually attained in the waterbody on or after November 28, 1975, whether they are included in the water quality standards.	§ 131.3

Exhibit A-2 Glossary (continued)

Term	Definition	Citation
Fact Sheet	A document that must be prepared for all draft individual permits for NPDES major dischargers, NPDES general permits, NPDES permits that contain variances, NPDES permits that contain sewage sludge land application plans and several other classes of dischargers. The document summarizes the principal facts and the significant factual, legal, methodological and policy questions considered in preparing the draft permit and explains how the public may comment (§§ 124.8 and 124.56). Where a fact sheet is not required, a statement of basis must be prepared (§ 124.7).	1996 PWM
Fundamentally Different Factors (FDF)	Those components of a petitioner's facility that are determined to be so unlike those components considered by EPA during the effluent guidelines and pretreatment standards rulemaking that the facility is worthy of a variance from the effluent guidelines or categorical pretreatment standards that would otherwise apply.	Adapted from 1996 PWM
General Permit	An NPDES permit issued under § 122.28 that authorizes a category of discharges under the CWA within a geographical area. A general permit is not specifically tailored for an individual discharger.	1996 PWM
Grab Sample	A sample taken from a wastestream on a one-time basis without consideration of the flow rate of the wastestream and without consideration of time.	Adapted from 1996 PWM
Hazardous Substance	Any substance—as designated under Part 116 pursuant to CWA section 311—that presents an imminent and substantial danger to the public health or welfare, including fish, shellfish, wildlife, shorelines, and beaches, upon discharge to navigable waters of the United States.	Adapted from § 122.2 and CWA section 311(b)(2)(A)
Indirect Discharger	A nondomestic discharger introducing *pollutants* to a publicly owned treatment works.	40 CFR 122.2
Instantaneous Maximum Limit	The maximum allowable concentration or other measure of a pollutant determined from the analysis of any discrete or composite sample collected, independent of the flow rate and the duration of the sampling event.	1996 PWM
Instantaneous Minimum Limit	The minimum allowable concentration or other measure of a pollutant determined from the analysis of any discrete or composite sample collected, independent of the flow rate and the duration of the sampling event.	--
Load Allocation	The portion of a receiving water's loading capacity that is attributed either to one of its existing or future nonpoint sources of pollution or to natural background sources. Load allocations are best estimates of the loading, which may range from reasonably accurate estimates to gross allotments, depending on the availability of data and appropriate techniques for predicting the loading. Wherever possible, natural and nonpoint source loads should be distinguished.	§ 130.2
Local Limits	Where specific prohibitions or limits on pollutants or pollutant parameters are developed by a POTW in accordance with § 403.4(c), such limits must be deemed Pretreatment Standards for the purposes of CWA section 307(d).	Adapted from § 403.4(d)

Exhibit A-2 Glossary (continued)

Term	Definition	Citation
Major Facility	Any NPDES facility or activity classified as such by the Regional Administrator, or in the case of approved state programs, the Regional Administrator in conjunction with the State Director (§ 122.2). Major municipal dischargers include all facilities with design flows of greater than one million gallons per day and facilities with EPA/state approved industrial pretreatment programs. Major industrial facilities are determined based on specific ratings criteria developed by EPA or are classified as such by EPA in conjunction with the state.	1996 PWM
Method Detection Limit (MDL)	The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix containing the analyte.	§ 136 - Appendix B
Maximum Daily Effluent Limitation (MDL)	The highest allowable daily discharge of a pollutant. (Chapter 6)	--
Million Gallons per Day (or mgd)	A unit of flow commonly used for wastewater discharges. One million gallon per day is equivalent to 1.547 cubic feet per second.	1996 PWM
Minimum Level (ML)	The level at which the entire analytical system must give a recognizable signal and acceptable calibration point. It is equivalent to the concentration of the lowest calibration standard, assuming that all method-specified sample weights, volumes, and cleanup procedures have been employed.	§ 136 - Appendix A
Mixing Zone	An area where an effluent discharge undergoes initial dilution and is extended to cover the secondary mixing in the ambient waterbody. A mixing zone is an allocated impact zone where water quality criteria can be exceeded as long as acutely toxic conditions are prevented.	Technical Support Document for Water Quality-based Toxics Control <www.epa.gov/npdes/pubs/owm0264.pdf>
Municipal Separate Storm Sewer System (MS4)	A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): a. Owned or operated by a state, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to state law) having jurisdiction over disposal of sewage, industrial wastes, stormwater, or other wastes, including special districts under state law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under CWA section 208 that discharges to waters of the United States. b. Designed or used for collecting or conveying stormwater. c. [That] is not a combined sewer. d. [That] is not part of a Publicly Owned Treatment Works (POTW) as defined at § 122.2.	§ 122.26(b)(8)
Municipal Sludge	See *Sewage Sludge*.	--

Exhibit A-2 Glossary (continued)

Term	Definition	Citation
National Pollutant Discharge Elimination System (NPDES)	The national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under CWA sections 307, 318, 402, and 405. The term includes *approved program*. NPDES permits regulate discharges of pollutants from point sources to waters of the United States. Such discharges are illegal unless authorized by an NPDES permit.	Adapted from § 122.2
National Pretreatment Standard or Pretreatment Standard	Any regulation promulgated by EPA in accordance with CWA sections 307(b) and 307(c) that applies to a specific category of industrial users and provides limitations on the introduction of pollutants into publicly owned treatment works. The term includes the prohibited discharge standards under § 403.5.	Adapted from § 403.3(l)
New Discharger	Any building, structure, facility, or installation: a. From which there is or may be a discharge of pollutants. b. That did not begin the discharge of pollutants at that site before August 13, 1979. c. That is not a new source. d. That has never received a finally effective NPDES permit for discharges at that site. This definition includes an *indirect discharger* that begins discharging into waters of the United States after August 13, 1979. It also includes any existing mobile point source (other than an offshore or coastal oil and gas exploratory drilling rig or a coastal oil and gas developmental drilling rig) such as a seafood processing rig, seafood processing vessel, or aggregate plant, that begins discharging at a *site* for which it does not have a permit; and any offshore or coastal mobile oil and gas exploratory drilling rig or coastal mobile oil and gas developmental drilling rig that commences the discharge of pollutants after August 13, 1979, at a site under EPA's permitting jurisdiction for which it is not covered by an individual or general permit and which is in an area determined by the Regional Administrator in the issuance of a final permit to be an area or biological concern. In determining whether an area is an area of biological concern, the Regional Administrator must consider the factors specified in §§ 125.122(a)(1) - 125.122(a)(10). An offshore or coastal mobile exploratory drilling rig or coastal mobile developmental drilling rig will be considered a *new discharger* only for the duration of its discharge in an area of biological concern.	Adapted from § 122.2

Exhibit A-2 Glossary (continued)

Term	Definition	Citation
New Source	Any building, structure, facility, or installation from which there is or could be a discharge of pollutants, the construction of which commenced: a. After promulgation of standards of performance under CWA section 306, which are applicable to such source; or b. After proposal of standards of performance in accordance with CWA section 306, which are applicable to such source but only if the standards are promulgated in accordance with CWA section 306 within 120 days of their proposal. Additional Criteria: Except as otherwise provided in an applicable new source performance standard, a source is a *new source* if it meets the definition in § 122.2; and i. It is constructed at a site at which no other source is located; or ii. It totally replaces the process or production equipment that causes the discharge of pollutants at an existing source; or iii. Its processes are substantially independent of an existing source at the same site. In determining whether these processes are substantially independent, the Director shall consider such factors as the extent to which the new facility is integrated with the existing plant; and the extent to which the new facility is engaged in the same general type of activity as the existing source.	Adapted from § 122.2 and § 122.29(b)(1)
New Source Performance Standards (NSPS)	Technology standards for facilities that qualify as new sources under § 122.2 and § 122.29. Standards consider that the new source facility has an opportunity to design operations to more effectively control pollutant discharges.	1996 PWM
Nonconventional Pollutants	All pollutants that are not included in the list of conventional or toxic pollutants in Part 401. Includes pollutants such as chemical oxygen demand (COD), total organic carbon (TOC), nitrogen, and phosphorus.	1996 PWM
Nonpoint Source	Diffuse pollution sources (i.e., without a single point of origin or not introduced into a receiving stream from a specific outlet). The pollutants are generally carried off the land by stormwater. Atmospheric deposition and hydromodification are also sources of nonpoint source pollution.	--
North American Industrial Classification System (NAICS)	The North American Industry Classification System (NAICS) is the standard used by federal statistical agencies in classifying business establishments for the purpose of collecting, analyzing, and publishing statistical data related to the U.S. business economy.	Retrieved from <www.census.gov/epcd/www/naics.html>
Nutrients	Chemical elements and compounds found in the environment that plants and animals need to grow and survive. Nutrients include compounds of nitrogen (nitrate, nitrite, ammonia, organic nitrogen) and phosphorus (orthophosphate and others), both natural and man-made.	--
Permitting Authority	The agency authorized to issue and enforce specific requirements of the NPDES permit program. The permitting authority may be EPA, or a state, territorial, or tribal agency that has been authorized under CWA section 402(b) to administer the NPDES program within its jurisdiction.	--

Exhibit A-2 Glossary (continued)

Term	Definition	Citation
pH	A measure of the hydrogen ion concentration of water or wastewater; expressed as the negative log of the hydrogen ion concentration in mg/L. A pH of 7 is neutral. A pH less than 7 is acidic, and a pH greater than 7 is basic.	1996 PWM
Point Source	Any discernible, confined, and discrete conveyance, including any pipe, ditch, channel, tunnel, conduit, well, discrete fixture, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharged. The term does not include return flows from irrigated agriculture or agricultural stormwater runoff.	Adapted from § 122.2
Pollutant	Dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials (except those regulated under the Atomic Energy Act of 1954, as amended [42 U.S.C. 2011 *et seq.*)], heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water. It does not mean a. Sewage from vessels. b. Water, gas, or other material that is injected into a well to facilitate production of oil or gas, or water derived in association with oil and gas production and disposed of in a well, if the well used either to facilitate production or for disposal purposes is approved by authority of the state in which the well is located, and if the state determines that the injection or disposal will not result in the degradation of ground or surface water resources.	§ 122.2
Pollutant, Conservative	Pollutants that do not readily degrade in the environment and that are mitigated primarily by dilution after entering receiving waters (e.g., metals, total suspended solids).	Adapted from 1996 PWM
Pollutant, Non-Conservative	Pollutants that are mitigated by natural biodegradation or other environmental decay or removal processes in the receiving water after mixing and dilution have occurred (e.g., biochemical oxygen demand, pH, volatile organic compounds).	Adapted from 1996 PWM
Pretreatment	The reduction of the amount of pollutants, the elimination of pollutants, or the alteration of the nature of pollutant properties in wastewater prior to or in lieu of discharging or otherwise introducing such pollutants into a POTW.	§ 403.3(s)
Primary Industry Category	Any industry category listed in the NRDC settlement agreement (*Natural Resources Defense Council et al. v. Train,* 8 E.R.C. 2120 [D.D.C. 1976], modified 12 E.R.C. 1833 [D.D.C. 1979]); also listed in Appendix A of Part 122.	§ 122.2
Primary Treatment	The practice of removing some portion of the suspended solids and organic matter in wastewater through sedimentation. Common usage of this term also includes preliminary treatment to remove wastewater constituents that may cause maintenance or operational problems in the system (i.e., grit removal, screening for rags and debris, oil and grease removal, etc.).	1996 PWM
Priority Pollutants	Those pollutants considered to be of principal importance for control under the CWA based on the NRDC Consent Decree (*NRDC et al. v. Train,* 8 E.R.C. 2120 [D.D.C. 1976], modified 12 E.R.C. 1833 [D.D.C. 1979]); a list of the pollutants is provided as Appendix A to 40 CFR Part 423.	1996 PWM

Exhibit A-2 Glossary (continued)

Term	Definition	Citation
Process Wastewater	Any water [that], during manufacturing or processing, comes into direct contact with, or results from the production or use of any raw material, intermediate product, finished product, by-product, or waste product.	§ 122.2
Production-Based Standard	A discharge standard expressed in terms of pollutant mass allowed per unit of product manufactured or some other measure of production.	1996 PWM
Proposed Permit	A state NPDES *permit* prepared after the close of the public comment period (and when applicable, any public hearing and administrative appeals) [that] is sent to EPA for review before final issuance by the state. A *proposed permit* is not a *draft permit*.	§ 122.2
Publicly Owned Treatment Works (POTW)	A treatment works as defined by CWA section 212, which is owned by a state or municipality [as defined by CWA section 502(4)]. This definition includes any devices and systems used in the storage, treatment, recycling, and reclamation of municipal sewage or industrial wastes of a liquid nature. It also includes sewers, pipes, and other conveyances only if they convey wastewater to a POTW. The term also means the municipality as defined in CWA section 502(4), which has jurisdiction over the indirect discharges to and the discharges from such a treatment works.	§ 403.3(q)
Sanitary Sewer	A pipe or conduit (sewer) intended to carry wastewater or water-borne wastes from homes, businesses, and industries to the POTW.	1996 PWM
Sanitary Sewer Overflows (SSO)	Untreated or partially treated sewage overflows from a sanitary sewer collection system.	1996 PWM
Secondary Industry Category	Any industry category, which is not a *primary industry category*.	§ 122.2
Secondary Treatment	Technology-based requirements for direct discharging POTWs. Standard is based on the expected performance of a combination of physical and biological processes typical for the treatment of pollutants in municipal sewage. Standards are expressed as a minimum level of effluent quality in terms of: BOD_5, total suspended solids (TSS), and pH (except as provided by treatment equivalent to secondary treatment and other special considerations).	Adapted from 1996 PWM
Section 304(a) Criteria	Developed by EPA under authority of CWA section 304(a) based on the latest scientific information on the relationship that the effect of a constituent concentration has on particular aquatic species and/or human health. This information is issued periodically to the states as guidance for use in developing criteria.	§ 131.3(c)
Self-Monitoring	Sampling and analyses performed by a facility to determine compliance with effluent limitations or other regulatory requirements.	1996 PWM

Exhibit A-2 Glossary (continued)

Term	Definition	Citation
Sewage Sludge	Any solid, semi-solid, or liquid residue removed during the treatment of municipal waste water or domestic sewage. Sewage sludge includes solids removed during primary, secondary, or advanced wastewater treatment, scum, septage, portable toilet pumpings, type III marine sanitation device pumpings (33 CFR Part 159), and sewage sludge products. Sewage sludge does not include ash generated during the firing of sewage sludge in a sewage sludge incinerator or grit and screenings generated during preliminary treatment of domestic sewage in a treatment works.	Adapted from § 122.2 and Part 503
Significant Industrial User (SIU)	An indirect discharger that is the focus of control efforts under the National Pretreatment Program. SIUs include [with exceptions provided under § 403.3(v)]: i. All Industrial Users subject to Categorical Pretreatment Standards under § 403.6 and Chapter 1, Subchapter N. ii. Any other Industrial User that: discharges an average of 25,000 gallons per day or more of process wastewater to the POTW (excluding sanitary, noncontact cooling and boiler blowdown wastewater); contributes a process wastestream that makes up 5 percent or more of the average dry weather hydraulic or organic capacity of the POTW; or is designated as such by the Control Authority on the basis that the Industrial User has a reasonable potential for adversely affecting the POTW's operation or for violating any Pretreatment Standard or requirement [in accordance with § 403.8(f)(6)].	Adapted from § 403.3(v)
Spill Prevention Control and Countermeasure Plan (SPCC)	A plan prepared by a facility to minimize the likelihood of a spill and to expedite control and cleanup activities if a spill occurs. Such plans are required for certain facilities under the Oil Pollution Prevention Regulations at 40 CFR Part 112.	Adapted from 1996 PWM
Standard Industrial Classification (SIC) Code	A code number system used to identify various types of industries. A particular industry may have more than one SIC code if it conducts several types of commercial or manufacturing activities onsite. An online version of the 1987 SIC Manual <www.osha.gov/pls/imis/sic_manual.html> is available courtesy of the Occupational Safety & Health Administration (OSHA).	Adapted from 1996 PWM
Statement of Basis	A document prepared for every draft NPDES permit for which a fact sheet is not required. A statement of basis briefly describes how permit conditions were derived and the reasons the conditions are necessary for the permit.	1996 PWM
STORET	EPA's computerized STOrage and RETrieval water quality data base that includes physical, chemical, and biological data measured in waterbodies throughout the United States.	1996 PWM
Storm Water (or Stormwater)	Stormwater runoff, snow melt runoff, and surface runoff and drainage.	§ 122.26(b)(13)
Technology-Based Effluent Limitation (TBEL)	An effluent limit for a pollutant that is based on the capability of a treatment method to reduce the pollutant to a certain concentration or mass loading level. TBELs for POTWs are derived from the secondary treatment regulations in Part 133 or state treatment standards. TBELs for non-POTWs are derived from effluent guidelines, state treatment standards, or by the permit writer on a case-by-case basis using best professional judgment.	Adapted from 1996 PWM

Exhibit A-2 Glossary (continued)

Term	Definition	Citation
Tiered Permit Limits	Permit limits that apply to the discharge only when a certain threshold (e.g., production level), specific circumstance (e.g., batch discharge), or time frame (e.g., after 6 months, during the months of May through October) triggers their use.	Adapted from 1996 PWM
Total Maximum Daily Load (TMDL)	The sum of the individual wasteload allocations (WLAs) for point sources and load allocations (LAs) for nonpoint sources and natural background. If a receiving water has only one point source discharger, the TMDL is the sum of that point source WLA plus the LAs for any nonpoint sources of pollution and natural background sources, tributaries, or adjacent segments. TMDLs can be expressed in terms of either mass per time, toxicity, or other appropriate measure. If best management practices (BMPs) or other nonpoint source pollution controls make more stringent load allocations practicable, then wasteload allocations can be made less stringent. Thus, the TMDL process provides for nonpoint source control tradeoffs.	40 CFR § 130.2(i)
Total Suspended Solids (TSS)	A measure of the filterable solids present in a sample, as determined by the method specified in Part 136.	1996 PWM
Toxic Pollutant	Any pollutant listed as toxic under CWA section 307(a)(1) or, in the case of *sludge use or disposal practices*, any pollutant identified in regulations implementing CWA section 405(d).	§ 122.2
Toxicity Reduction Evaluation (TRE)	A site-specific study conducted in a step-wise process designed to identify the causative agent(s) of effluent toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in effluent toxicity.	1996 PWM
Toxicity Test	A procedure to determine the toxicity of a chemical or an effluent using living organisms. A toxicity test measures the degree of effect on exposed test organisms of a specific chemical or effluent.	1996 PWM
Trading (or Water Quality Trading)	An innovative approach to achieve water quality goals more efficiently. Trading is based on the fact that sources in a watershed can face very different costs to control the same pollutant. Trading programs allow facilities facing higher pollution control costs to meet their regulatory obligations by purchasing environmentally equivalent (or superior) pollution reductions from another source at lower cost, thus achieving the same water quality improvement at lower overall cost.	Water Quality Trading Fact Sheet: <www.epa.gov/owow/watershed/trading/handbook/factsheet.html>
Treatability Manual	Five-set library of EPA guidance manuals that contain information related to the treatability of many pollutants. The manual may be used in developing effluent limitations for facilities and pollutants, which, at the time of permit issuance, are not subject to industry-specific effluent guidelines. The five volumes that comprise this series consist of Vol. I – Treatability Data (EPA-600/8-80-042a); Vol. II – Industrial Descriptions (EPA-600/8-80-042b); Vol. III – Technologies (EPA-600/8-80-042c); Vol. IV – Cost Estimating (EPA-600/8-80-042d); and Vol. V – Summary (EPA-600/8-80-042e).	1996 PWM
Treatment Works Treating Domestic Sewage (TWTDS)	A POTW or any other sewage sludge or waste water treatment devices or systems, regardless of ownership (including federal facilities), used in the storage, treatment, recycling, and reclamation of municipal or domestic sewage, including land dedicated for the disposal of sewage sludge. This definition does not include septic tanks or similar devices. For purposes of this definition, *domestic sewage* includes waste and waste water from humans or household operations that are discharged to or otherwise enter a treatment works.	Adapted from § 122.2

Exhibit A-2 Glossary (continued)

Term	Definition	Citation
Upset	An exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.	§ 122.41(n)
Use Attainability Analysis	A structured scientific assessment of the factors affecting the attainment of the use that [can] include physical, chemical, biological, and economic factors as described in § 131.10(g).	§ 131.3
Variance	Any mechanism or provision under CWA sections 301 or 316 or under 40 CFR Part 125, or in the applicable *effluent limitations guidelines*, which allows modification to or waiver of the generally applicable effluent limitation requirements or time deadlines of the CWA. This includes provisions, [that] allow the establishment of alternative limitations based on fundamentally different factors or on CWA sections 301(c), 301(g), 301(h), 301(i), or 316(a).	§ 122.2
Wasteload Allocation (WLA)	The portion of a receiving water's loading capacity that is allocated to one of its existing or future point sources of pollution.	Adapted from § 130.2(h)
Water Quality Criteria	Elements of state water quality standards, expressed as constituent concentrations, levels, or narrative statements, representing a quality of water that supports a particular use. When criteria are met, water quality will generally protect the designated use.	§ 131.3(b)
Water Quality Limited Segment	Any segment where it is known that water quality does not meet applicable water quality standards, and/or is not expected to meet applicable water quality standards, even after the application of the technology-based effluent limitations required by CWA sections 301(b) and 306.	§ 131.3
Water Quality Standards (WQS)	Provisions of state or federal law that consist of a designated use or uses for the waters of the United States and water quality criteria for such waters based on such uses. Water quality standards are to protect the public health or welfare, enhance the quality of water, and serve the purposes of the CWA.	Adapted from §131.3
Water Quality-Based Effluent Limitation (WQBEL)	An effluent limitation determined by selecting the most stringent of the effluent limits calculated using all applicable water quality criteria (e.g., aquatic life, human health, wildlife, translation of narrative criteria) for a specific point source to a specific receiving water.	Adapted from 1996 PWM

Exhibit A-2 Glossary (continued)

Term	Definition	Citation
Waters of the United States	Means a. All waters [that] are currently used, were used in the past, or [could] be susceptible to use in interstate or foreign commerce, including all waters [that] are subject to the ebb and flow of the tide. b. All interstate waters, including interstate *wetlands*. c. All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, *wetlands*, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce including any such waters 1. [That] are or could be used by interstate or foreign travelers for recreational or other purposes. 2. From which fish or shellfish are or could be taken and sold in interstate or foreign commerce or 3. [That] are used or could be used for industrial purposes by industries in interstate commerce. d. All impoundments of waters otherwise defined as waters of the United States under this definition. e. Tributaries of waters identified in paragraphs (a) through (d) of this definition. f. The territorial sea and g. Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition. [see additional notes in § 122.2]	§ 122.2
Whole Effluent Toxicity (WET)	The aggregate toxic effect of an effluent measured directly by a toxicity test.	§ 122.2

Appendix B. Index to the CWA and NPDES Regulations

This appendix provides two tables to help permit writers navigate Clean Water Act (CWA) legislation and National Pollutant Discharge Elimination System (NPDES) regulations. The first table provides key sections of the CWA and the second table provides an index to NPDES regulations.

B.1 Index to Sections of the CWA

Title 33 of the *United States Code* (U.S.C.) includes the statutes and amendments to the CWA. Exhibit B-1 matches key sections of the CWA to the appropriate reference in the U.S.C. This latest version, dated December 20, 2004, was provided by the New England Interstate Water Pollution Control Commission.

Exhibit B-1 Index to sections of the CWA

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Exhibit B-1 Index to sections of the CWA (continued)

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1292	Definitions	**212**
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B.2 Index to NPDES Regulations

The index to NPDES regulations table presented in Exhibit B-2 was created by Sylvia Kawabata of EPA Region 10 on February 1, 1986, and is maintained by Doug Corb of EPA Region 1.

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CWA section 301(c) – Modification of Timetable	§ 122.21(m)(2) Part 125, Subpart E (reserved)
CWA section 301(g) – Modifications for Certain Nonconventional Pollutants	§ 122.21(m)(2) Part 125, Subpart F (reserved) *Technical Guidance Manual for the Regulations Promulgated Pursuant to section 301(g) of the Clean Water Act of 1977 and 40 CFR Part 125 (Subpart F); August 22, 1984.* <www.epa.gov/npdes/pubs/owm0008.pdf>
CWA section 301(h) – Secondary Treatment Waiver	§ 122.21(n)(1) Part 125, Subpart G
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Coast Guard (Discharges from Transportation Over Water)	§ 122.44(p)
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Computation of Time	§ 124.20
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Flow Monitoring Requirement	§ 122.44(i)(1)(ii)
Fundamentally Different Factors (FDF)	§ 122.21(m)(1) § 122.44(d)(8) Part 125, Subpart D
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Toxics – Application and Testing	§ 122.21(g)(7) § 122.21(g)(9) § 122.21(g)(11)
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WET Testing With Permit Application (POTWs)	§ 122.21(j)
Wild and Scenic Rivers Act	§ 122.49(a)
Withdrawal Of State Program	§§ 123.63 - 123.64

Appendix C. Priority Pollutants

Exhibit C-1 presents the list of 126 priority (toxic) pollutants from 40 CFR Part 423 Appendix A, which are further discussed in sections 1.2 and 6.1.1.2 of this manual. Note that the list goes up to 129 because numbers 017, 049, and 050 were deleted.

Exhibit C-1 Priority pollutants from 40 CFR Part 423, Appendix A

#	Pollutant name	#	Pollutant name
001	Acenaphthene	067	Butyl benzyl phthalate
002	Acrolein	068	Di-N-Butyl Phthalate
003	Acrylonitrile	069	Di-n-octyl phthalate
004	Benzene	070	Diethyl Phthalate
005	Benzidine	071	Dimethyl phthalate
006	Carbon tetrachloride (tetrachloromethane)	072	1,2-benzanthracene (benzo(a) anthracene
007	Chlorobenzene	073	Benzo(a)pyrene (3,4-benzo-pyrene)
008	1,2,4-trichlorobenzene	074	3,4-Benzofluoranthene (benzo(b) fluoranthene)
009	Hexachlorobenzene	075	11,12-benzofluoranthene (benzo(b) fluoranthene)
010	1,2-dichloroethane	076	Chrysene
011	1,1,1-trichloreothane	077	Acenaphthylene
012	Hexachloroethane	078	Anthracene
013	1,1-dichloroethane	079	1,12-benzoperylene (benzo(ghi) perylene)
014	1,1,2-trichloroethane	080	Fluorene
015	1,1,2,2-tetrachloroethane	081	Phenanthrene
016	Chloroethane	082	1,2,5,6-dibenzanthracene (dibenzo(,h) anthracene)
018	Bis(2-chloroethyl) ether	083	Indeno (,1,2,3-cd) pyrene (2,3-o-pheynylene pyrene)
019	2-chloroethyl vinyl ether (mixed)	084	Pyrene
020	2-chloronaphthalene	085	Tetrachloroethylene
021	2,4, 6-trichlorophenol	086	Toluene
022	Parachlorometa cresol	087	Trichloroethylene
023	Chloroform (trichloromethane)	088	Vinyl chloride (chloroethylene)
024	2-chlorophenol	089	Aldrin
025	1,2-dichlorobenzene	090	Dieldrin
026	1,3-dichlorobenzene	091	Chlordane (technical mixture and metabolites)
027	1,4-dichlorobenzene	092	4,4-DDT
028	3,3-dichlorobenzidine	093	4,4-DDE (p,p-DDX)
029	1,1-dichloroethylene	094	4,4-DDD (p,p-TDE)
030	1,2-trans-dichloroethylene	095	Alpha-endosulfan
031	2,4-dichlorophenol	096	Beta-endosulfan
032	1,2-dichloropropane	097	Endosulfan sulfate
033	1,2-dichloropropylene (1,3-dichloropropene)	098	Endrin
034	2,4-dimethylphenol	099	Endrin aldehyde
035	2,4-dinitrotoluene	100	Heptachlor
036	2,6-dinitrotoluene	101	Heptachlor epoxide (BHC-hexachlorocyclohexane)
037	1,2-diphenylhydrazine	102	Alpha-BHC
038	Ethylbenzene	103	Beta-BHC
039	Fluoranthene	104	Gamma-BHC (lindane)
040	4-chlorophenyl phenyl ether	105	Delta-BHC (PCB-polychlorinated biphenyls)

Exhibit C-1 Priority pollutants from 40 CFR Part 423, Appendix A (continued)

#	Pollutant name	#	Pollutant name
041	4-bromophenyl phenyl ether	106	PCB-1242 (Arochlor 1242)
042	Bis(2-chloroisopropyl) ether	107	PCB-1254 (Arochlor 1254)
043	Bis(2-chloroethoxy) methane	108	PCB-1221 (Arochlor 1221)
044	Methylene chloride (dichloromethane)	109	PCB-1232 (Arochlor 1232)
045	Methyl chloride (dichloromethane)	110	PCB-1248 (Arochlor 1248)
046	Methyl bromide (bromomethane)	111	PCB-1260 (Arochlor 1260)
047	Bromoform (tribromomethane)	112	PCB-1016 (Arochlor 1016)
048	Dichlorobromomethane	113	Toxaphene
051	Chlorodibromomethane	114	Antimony
052	Hexachlorobutadiene	115	Arsenic
053	Hexachloromyclopentadiene	116	Asbestos
054	Isophorone	117	Beryllium
055	Naphthalene	118	Cadmium
056	Nitrobenzene	119	Chromium
057	2-nitrophenol	120	Copper
058	4-nitrophenol	121	Cyanide, Total
059	2,4-dinitrophenol	122	Lead
060	4,6-dinitro-o-cresol	123	Mercury
061	N-nitrosodimethylamine	124	Nickel
062	N-nitrosodiphenylamine	125	Selenium
063	N-nitrosodi-n-propylamin	126	Silver
064	Pentachlorophenol	127	Thallium
065	Phenol	128	Zinc
066	Bis(2-ethylhexyl) phthalate	129	2,3,7,8-tetrachloro-dibenzo-p-dioxin (TCDD)

Appendix D. New Source Dates by Effluent Guideline Category

This appendix provides the applicable new source dates used in making new source determinations by effluent guideline category as provided in Appendix B of the U.S. Environmental Protection Agency (EPA) memorandum *New Source Dates for Direct and Indirect Dischargers*[1] <www.epa.gov/npdes/pubs/newsource_dates.pdf> sent by the directors of EPA's Water Permits Division and the Engineering and Analysis Division to the Regional Water Division Directors on September 28, 2006. Section 5.2.2.4 of this manual discusses the determination of whether existing or new source standards apply.

EPA has promulgated regulations under the Clean Water Act (CWA) that establish effluent limitations guidelines for existing sources, standards of performance for new sources and pretreatment standards for new and existing sources. EPA has codified these regulations at Title 40 of the *Code of Federal Regulations* (CFR) Subchapter N. As discussed in section 5.2.1 of this manual, EPA has published effluent guidelines for 56 major industrial categories (over 450 subcategories) since the passage of the 1972 CWA. Those regulations limit the discharge of pollutants to surface waters by point source dischargers (*direct dischargers*). The regulations also limit the introduction of pollutants into publicly owned treatment works (POTWs) by industrial users (*indirect dischargers*). The CWA and EPA regulations define when a source is a *new source*. A discharger is defined as a new source in CWA sections 306(a)(2) and 307(c) and §§ 122.2 (for direct dischargers) and 403.3(m) (for indirect dischargers). In general, a facility is a new source if it begins construction after either the date of promulgation of new source performance standards applicable to the direct dischargers or the date of publication of a proposed new source performance standard applicable to an indirect discharger.

Exhibit D-1 lists new source dates for direct or indirect dischargers based on regulatory definitions. In some cases, effluent guidelines in 40 CFR Chapter I, Subchapter N, specify New Source Dates, and these dates are reported in the table below. If dates are not specified in the rule language, EPA based the date on the regulatory definitions of new source, which are cited above. EPA's General Pretreatment Regulations provide that an indirect source is a new source if construction of the source began after the publication of proposed pretreatment standards for new sources if the proposed standard is later finalized [§ 403.3(m)]. For direct dischargers, § 122.2 states that the New Source date is the proposal date if the standard is finalized within 120 days after its proposal; otherwise, the New Source date is the *promulgation date*. EPA's regulations establish the time and date of EPA's actions for purposes of determining when the action is subject to judicial review. The regulations, in the case of the CWA, define the date of an EPA promulgation action as two weeks after the rule appears in the *Federal Register* (see § 23.2). Before February 1985, the date on which the final rule was published was considered the promulgation date.

This document is not a regulation itself, nor does it substitute for any requirements under the CWA or EPA's regulations. Thus, it does not impose legally binding requirements on EPA, states or the regulated community. While EPA has made every effort to ensure the accuracy of this table, dischargers' obligations are determined, in the case of direct dischargers, by the terms of their NPDES permit and the CWA and EPA's regulations, and, in the case of indirect dischargers, by permits or equivalent control

mechanisms issued to POTW industrial users and the CWA and EPA regulations. Nothing in this document changes any statutory or regulatory requirement. If the discussion in this memorandum conflicts with any permit or regulation, this document would not be controlling.

Exhibit D-1 New source dates by effluent category

40 CFR Part	Category	New source date for direct dischargers		New source date for indirect dischargers	
467	Aluminum Forming	Subparts A-F:	10/24/83	Subparts A-F:	11/22/82
427	Asbestos Manufacturing	Subparts A-K:	10/30/73[2]	Not Applicable	
461	Battery Manufacturing	Subparts A-G:	03/09/84	Subparts A-G	11/10/82
407	Canned and Preserved Fruits and Vegetables Processing	Subparts A-H:	03/21/74	Not Applicable	
408	Canned and Preserved Seafood Processing	Subparts A-J, N: Subparts O-AG:	06/26/74 12/01/75	Not Applicable	
458	Carbon Black Manufacturing	Subparts A-D:	01/09/78	Subparts A-D:	05/18/76
411	Cement Manufacturing	Subparts A-C:	02/20/74	Not Applicable	
437	Centralized Waste Treatment (CWT)	Subparts A-D:	01/05/01	Subparts A-D:	01/13/99
434	Coal Mining	Subparts B-E, H: Subpart G:	05/04/84[3] 02/22/02[4]	Not Applicable	
465	Coil Coating	Subparts A-C: Subpart D:	12/01/82 11/17/83	Subparts A-C: Subpart D:	01/12/81 02/10/83
412	Concentrated Animal Feeding Operations (CAFO)	Subparts A-B: Subparts C-D:	02/14/74 04/14/03[5]	Subpart B:	09/07/73
451	Concentrated Aquatic Animal Production	Subparts A-B:	09/07/04	Not Applicable	
468	Copper Forming	Subpart A:	08/15/83	Subpart A:	11/12/82
405	Dairy Products Processing	Subparts A-L:	05/28/74	Not Applicable	
469	Electrical and Electronic Components	Subparts A-B: Subparts C-D:	04/08/83 12/14/83	Subparts A-B: Subparts C-D:	08/24/82 03/09/83
413	Electroplating	Not Applicable[6]		See Metal Finishing[7]	
457	Explosives Manufacturing	Not Applicable		Not Applicable	
424	Ferroalloy Manufacturing	Subparts A-C:	02/22/74	Not Applicable	
418	Fertilizer Manufacturing	Subparts A-D: Subpart E: Subparts F-G:	04/08/74 01/16/76 10/07/74[8]	Subparts A-D[9]: Subpart E: Subparts F-G:	12/07/73 01/16/76 10/07/74
426	Glass Manufacturing	Subpart A: Subparts B-D: Subparts E-G: Subparts H, J-M:	01/22/74 02/14/74 02/14/74 01/16/75	Subparts H, K-M:	08/21/74
406	Grain Mills	Subparts A-J:	12/04/73[10]	Subpart A:	12/04/73
454	Gum and Wood Chemicals	Not Applicable		Not Applicable	
460	Hospitals	Not Applicable		Not Applicable	
447	Ink Formulating	Subpart A:	07/28/75	Subpart A:	02/26/75

Exhibit D-1 New source dates by effluent category (continued)

40 CFR Part	Category	New source date for direct dischargers		New source date for indirect dischargers	
415	Inorganic Chemicals	Subparts B-F, H, K-N, P, Q, T, V, W, AJ [$CuSO_4$ manufacturing], AH, AP, AU [$NiSO_4$ manufacturing], BB: Subparts AJ [except $CuSO_4$ manufacturing], AU [except $NiSO_4$ manufacturing], BL - BO:	06/29/82 08/22/84	Subparts B-F, H, K-N, P, Q, V, AH, AJ [$CuSO_4$ manufacturing], AP, AU [$NiSO_4$ manufacturing], BB: Subparts T, AA, AC, AE, AI, AJ [except $CuSO_4$ manufacturing], AL, AN, AQ, AR, AU [except $NiSO_4$ manufacturing], AX, BC, BH, BK-BO:	07/24/80 10/25/83
420	Iron and Steel Manufacturing	Subparts A-B: Subpart C: Subpart D, Semi-Wet: Subpart D, Other: Subparts E-L: Subpart M:	11/18/02[11] 05/27/82 10/31/02 05/27/82 05/27/82 10/31/02	Subparts A-B: Subpart C: Subpart D, Semi-Wet: Subpart D, Other: Subparts E-F, H-J,L: Subpart M:	11/18/02[12] 01/07/81 12/27/00 01/07/81 01/07/81 12/27/00
445	Landfills	Subparts A-B:	02/02/00	Not Applicable	
425	Leather Tanning and Finishing	Subparts A, B, D-I: Subpart C:	11/23/82 04/04/88	Subpart A, B, D-I: Subpart C:	07/02/79 01/21/87
432	Meat and Poultry Products	Subparts A-D, Small Facilities: Subparts A-D, Other: Subparts E-I, Small Facilities: Subparts E-I, Other: Subpart J-L:	02/28/74[13] 09/22/04 01/03/75[14] 09/22/04 09/22/04	Not Applicable	
433	Metal Finishing	Subpart A:	07/15/83	Subpart A:	08/31/82
464	Metal Molding and Casting	Subparts A-D:	11/13/85	Subparts A-D:	11/15/82
438	Metal Products and Machinery	Subpart A:	06/12/03[15]	Not Applicable	
436	Mineral Mining and Processing	Not Applicable		Not Applicable	
471	Nonferrous Metals Forming and Metal Powders	Subparts A-J:	09/06/85	Subparts A-J:	03/05/84
421	Nonferrous Metal Manufacturing	Subparts B-I (except molybdenum acid plants), K-M: Subparts N-AE, molybdenum acid plants in subpart I: Subpart J:	03/08/84 10/04/85 02/04/88	Subparts B-I (except molybdenum acid plants), K-M: Subparts N-AE, molybdenum acid plants in subpart I: Subpart J:	02/17/83 06/27/84 01/22/87
435	Oil and Gas Extraction[16]	Subparts C (Onshore), D (Coastal), and E (Agriculture & Wildlife): Subparts A and D (Synthetic-Based Drilling Fluids):	03/04/93 02/05/01	Subpart D:	02/17/95
440	Ore Mining and Dressing	Subparts A-F, J, M:	12/03/82	Not Applicable	

Exhibit D-1 New source dates by effluent category (continued)

40 CFR Part	Category	New source date for direct dischargers		New source date for indirect dischargers	
414	Organic Chemicals, Plastics, and Synthetic Fibers	Subparts B-H:	11/19/87	Subparts B-H:	03/21/83
446	Paint Formulating	Subpart A:	07/28/75	Subpart A:	02/26/75
443	Paving and Roofing Materials (Tars and Asphalt)	Subparts A-D:	07/28/75	Subparts A-D:	01/10/75
455	Pesticide Chemicals	Subparts A-B: Subparts C, E:	10/12/93 11/20/96	Subparts A-B: Subparts C, E:	04/10/92 04/14/94
419	Petroleum Refining	Subparts A-E:	10/18/82	Subparts A-E:	12/21/79
439	Pharmaceutical Manufacturing	Subparts A-D:	11/20/98[17]	Subparts A-D:	05/02/95
422	Phosphate Manufacturing	Subparts D-F:	06/23/76	Not Applicable	
459	Photographic	Not Applicable		Not Applicable	
463	Plastics Molding and Forming	Subparts A-C:	12/17/84	Not Applicable	
466	Porcelain Enameling	Subparts A-D:	11/24/82	Subparts A-D:	01/27/81
430	Pulp, Paper, and Paperboard	Subparts B, E: Subparts A, C, D, F, G, I-L:	06/15/98[18] 11/18/82	Subparts B, E: Subparts A, C, D, F, G, I-L:	12/17/93 01/06/81
428	Rubber Manufacturing	Subparts A-D: Subparts E-J:	02/21/74 01/10/75	Subparts E-K:	08/23/74
417	Soap and Detergents Manufacturing	Subparts A-S:	4/12/74	Subpart Q: Subparts O, P, R:	12/26/73 02/20/75
423	Steam Electric Power Generation		11/19/82[19]		10/14/80
409	Sugar Processing	Subpart A: Subparts B, C:	1/31/74 12/07/73[20]	Not Applicable	

[1] Boornazian, Linda and Mary Smith. 2006. *New Source Dates for Direct and Indirect Dischargers*. U.S. Environmental Protection Agency, Office of Water Memorandum. September 28, 2006. <www.epa.gov/npdes/pubs/newsource_dates.pdf>.

[2] The rule was finalized within 120 days of its October 30, 1973, proposal (38 FR 22606).

[3] The New Source date is specified in 40 CFR 434.11(j)(1).

[4] The New Source date is specified in 40 CFR 434.11(j)(1).

[5] New Source date derived from the 10-year protection period [see 40 CFR 412.35(d) and 412.43(d)].

[6] Direct dischargers formerly regulated under Part 413 are now regulated under Part 433 (metal finishing).

[7] Pretreatment categorical standards in Part 413 currently apply only to job shop electroplaters and independent printed circuit board manufacturers that were in existence before the New Source date for Part 433 (metal finishing). Job shop electroplaters and independent printed circuit board manufacturers that are "New Sources" must comply with PSNS in Part 433. Except for these "existing" job shop electroplaters and independent printed circuit board manufacturers, all other operations formerly subject to Part 413 are now subject to Part 433.

[8] The rule was finalized within 120 days of its October 7, 1974, proposal.

[9] Section 41 8.46 (the PSNS under Subpart D) was suspended until further notice, at 40 FR 26275, June 23, 1975, effective July 20, 1975.

[10] The rule was finalized within 120 days of its December 4, 1973, proposal (38 FR 33438).

Endnotes for this chapter continued on the next page.

[11] Date specified in 40 CFR 420.14(a)(2), 420.16(a)(2), 420.24(b), and 420.26(a)(2).

[12] See previous footnote.

[13] The 2004 Amendment did not revise NSPSs for small meat products facilities in Subparts A-I, so the 2004 New Source date does not affect these facilities.

[14] See previous footnote.

[15] Date specified in 40 CFR 438.15.

[16] See promulgated standards at 40 CFR 58 FR 12505 and 66 FR 6850 for complete information on the applicability of New Source standards.

[17] New Source date derived from the 10-year protection period [see 40 CFR 439.15(c), 439.35(c), and 439.45(b)].

[18] Date specified in 40 CFR 430.25(b) and 430.55(b). Refer to these sections for additional information regarding the applicability of NSPSs.

[19] NSPS promulgated were not removed via the 1982 regulation; therefore wastewaters generated by Part 423-applicable sources that were New Sources under the 1974 regulations are subject to the 1974 NSPS. The New Source date for the 1974 regulations was 10/8/1974.

[20] The rule was finalized within 120 days of its December 7, 1973, proposal (38 FR 33846).

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

NOV 1 2 2010

OFFICE OF WATER

MEMORANDUM

SUBJECT: Revisions to the November 22, 2002 Memorandum "Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs"

FROM: James A. Hanlon, Director
Office of Wastewater Management

Denise Keehner, Director
Office of Wetlands, Oceans and Watersheds

TO: Water Management Division Directors
Regions 1 - 10

This memorandum updates aspects of EPA's November 22, 2002 memorandum from Robert H. Wayland, III, Director of the Office of Wetlands, Oceans and Watersheds, and James A. Hanlon, Director of the Office of Wastewater Management, on the subject of "Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs" (hereafter "2002 memorandum").

Background

Section III of the 2002 memorandum "affirm[ed] the appropriateness of an iterative, adaptive management best management practices (BMP) approach" for improving stormwater management over time as permitting agencies, the regulated community, and other involved stakeholders gain more experience and knowledge. Since 2002, States and EPA have obtained considerable experience in developing TMDLs and WLAs that address stormwater sources. The technical capacity to monitor stormwater and its impacts on water quality has increased. In many areas, monitoring of the impacts of stormwater on water quality has become more sophisticated and widespread. Better information on the effectiveness of stormwater controls to reduce pollutant loadings and address water quality impairments is now available. In many parts of the country, permitting agencies have issued several rounds of permits for Phase I municipal separate storm sewer systems (MS4s), Phase II MS4s, and stormwater discharges associated with industrial activity, including stormwater from construction activities. Notwithstanding these developments, stormwater discharges remain a significant cause of water quality

impairment in many places, highlighting a continuing need for more useful WLAs and better NPDES permit provisions to restore impaired waters to their beneficial uses.

With this additional experience in mind, EPA is updating and revising the following four elements of the 2002 memorandum to better reflect current practices and trends in permits and WLAs for stormwater discharges:

- Providing numeric water quality-based effluent limitations in NPDES permits for stormwater discharges;
- Disaggregating stormwater sources in a WLA;
- Using surrogates for pollutant parameters when establishing targets for TMDL loading capacity; and
- Designating additional stormwater sources to regulate and treating load allocations as wasteload allocations for newly regulated stormwater sources.

EPA is currently reviewing other elements of the 2002 memorandum and will consider making appropriate revisions in the future.

Providing Numeric Water Quality-Based Effluent Limitations in NPDES Permits for Stormwater Discharges

In today's memorandum, EPA is revising the 2002 memorandum with respect to water quality-based effluent limitations (WQBELs) in stormwater permits. Since 2002, many NPDES authorities have documented the contributions of stormwater discharges to water quality impairment and have identified the need to include clearer permit requirements in order to address these impairments. Numeric WQBELs in stormwater permits can clarify permit requirements and improve accountability and enforceability. For the purpose of this memorandum, numeric WQBELs use numeric parameters such as pollutant concentrations, pollutant loads, or numeric parameters acting as surrogates for pollutants, such as such as stormwater flow volume or percentage or amount of impervious cover.

The CWA provides that stormwater permits for MS4 discharges shall contain controls to reduce the discharge of pollutants to the "maximum extent practicable" and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants. CWA section 402(p)(3)(B)(iii). Under this provision, the NPDES permitting authority has the discretion to include requirements for reducing pollutants in stormwater discharges as necessary for compliance with water quality standards. *Defenders of Wildlife v. Browner*, 191 F.3d 1159, 1166 (9th Cir. 1999).

Where the NPDES authority determines that MS4 discharges have the reasonable potential to cause or contribute to a water quality standard excursion, EPA recommends that, where feasible, the NPDES permitting authority exercise its discretion to include numeric effluent limitations as necessary to meet water quality standards. The 2002

memorandum stated "EPA expects that most WQBELs for NPDES-regulated municipal and small construction stormwater discharges will be in the form of BMPs, and that numeric limitations will be used only in rare instances." Those expectations have changed as the stormwater permit program has matured. EPA now recognizes that where the NPDES authority determines that MS4 discharges and/or small construction stormwater discharges have the reasonable potential to cause or contribute to water quality standards excursions, permits for MS4s and/or small construction stormwater discharges should contain numeric effluent limitations where feasible to do so. EPA recommends that NPDES permitting authorities use numeric effluent limitations where feasible as these types of effluent limitations create objective and accountable means for controlling stormwater discharges.

The Clean Water Act (CWA) requires that permits for stormwater discharges associated with industrial activity comply with section 301 of the Act, including the requirement under section 301(b)(1)(C) to contain WQBELs for any discharge that the permitting authority determines has the reasonable potential to cause or contribute to a water quality standard excursion. CWA section 402(p)(3)(A), 40 CFR 122.44(d)(1)(iii). When the permitting authority determines, using the procedures specified at 40 CFR 122.44(d)(1)(ii) that the discharge causes or has the reasonable potential to cause or contribute to an in-stream excursion of the water quality standards, the permit must contain effluent limits for that pollutant. EPA recommends that NPDES permitting authorities use numeric effluent limitations where feasible as these types of effluent limitations create objective and accountable means for controlling stormwater discharges.

Where WQBELs in permits for stormwater discharges from MS4s, small construction sites or industrial sites are expressed in the form of BMPs, the permit should contain objective and measurable elements (e.g., schedule for BMP installation or level of BMP performance). The objective and measureable elements should be included in permits as enforceable provisions. Permitting authorities should consider including numeric benchmarks for BMPs and associated monitoring protocols or specific protocols for estimating BMP effectiveness in stormwater permits. These benchmarks could be used as thresholds that would require the permittee to take additional action specified in the permit, such as evaluating the effectiveness of the BMPs, implementing and/or modifying BMPs, or providing additional measures to protect water quality.

If the State or EPA has established a TMDL for an impaired water that includes WLAs for stormwater discharges, permits for either industrial stormwater discharges or MS4 discharges must contain effluent limits and conditions consistent with the requirements and assumptions of the WLAs in the TMDL. See 40 CFR § 122.44(d)(1)(vii)(B). Where the WLA of a TMDL is expressed in terms of a surrogate pollutant parameter, then the corresponding permit can generally use the surrogate pollutant parameter in the WQBEL as well. Where the TMDL includes WLAs for stormwater sources that provide numeric pollutant load or numeric surrogate pollutant parameter objectives, the WLA should, where feasible, be translated into numeric WQBELs in the applicable stormwater permits.

The permitting authority's decision as to how to express the WQBEL(s), either as numeric effluent limitations or BMPs, including BMPs accompanied by numeric benchmarks, should be based on an analysis of the specific facts and circumstances surrounding the permit, and/or the underlying WLA, including the nature of the stormwater discharge, available data, modeling results or other relevant information. As discussed in the 2002 memorandum, the permit's administrative record needs to provide an adequate demonstration that, where a BMP-based approach to permit limitations is selected, the BMPs required by the permit will be sufficient to implement applicable WLAs. Improved knowledge of BMP effectiveness gained since 2002 should be reflected in the demonstration and supporting rationale that implementation of the BMPs will attain water quality standards and WLAs.

EPA's regulations at 40 CFR § 122.47 govern the use of compliance schedules in NPDES permits. Central among the requirements is that the effluent limitation(s) must be met "as soon as possible." 40 CFR 122.47(a)(1). EPA expects the permitting authority to include in the permit record a sound rationale for determining that any compliance schedule meets this requirement. Where a TMDL has been established and there is an accompanying implementation plan that provides a schedule for an MS4 to implement the TMDL, the permitting authority should consider the schedule as it decides whether and how to establish enforceable interim requirements and interim dates in the permit.

Lastly, NPDES permits must specify monitoring requirements necessary to determine compliance with effluent limitations. See CWA section 402(a)(2); 40 C.F.R. 122.44(i). Where WQBELs are expressed as BMPs, the permit must require adequate monitoring to determine if the BMPs are performing as necessary. When developing monitoring requirements, the NPDES authority should consider the variable nature of stormwater as well the availability of reliable and applicable field data describing the treatment efficiencies of the BMPs required and supporting modeling analysis.

Disaggregating Stormwater Sources in a WLA

As stated in the 2002 memorandum, EPA expects TMDL authorities will make separate aggregate allocations to NPDES-regulated storm water discharges (in the form of WLAs) and unregulated storm water (in the form of LAs). EPA also recognized that the available data and information usually are not detailed enough to determine waste load allocations for NPDES-regulated storm water discharges on an outfall-specific basis.

EPA still recognizes that decisions about allocations of pollutant loads within a TMDL are driven by quantity and quality of existing and readily available water quality data. However, today, TMDL writers may have better data or better access to data and, over time, may have gained more experience since 2002 in developing TMDLs and WLAs in a less aggregated manner. Moreover, since 2002, EPA has noted the difficulty of establishing clear, effective, and enforceable NPDES permit limitations for sources covered by WLAs that are expressed as single categorical or aggregated wasteload allocations.

Accordingly, for all these reasons, EPA recommends that WLAs for NPDES-regulated stormwater discharges should be disaggregated into specific categories (e.g., separate WLAs for MS4 and industrial stormwater discharges) to the extent feasible based on available data and/or modeling projections. In addition, these disaggregated WLAs should be defined as narrowly as available information allows (e.g., for MS4s, separate WLAs for each one; and, for industrial sources, separate WLAs for different sources or types of industrial sources or discharges.)

Where appropriate, EPA encourages permit writers to assign specific shares of the wasteload allocation to specific permittees during the permitting process.

Using Surrogate for Pollutant Parameters When Establishing Targets for TMDL Loading Capacity

Many waterbodies affected by stormwater discharges are listed as impaired under Section 303(d) due to biological degradation or habitat alteration, rather than for specific pollutants (e.g., metals, pathogens, sediment). Impairment can be due to pollutants where hydrologic changes such as quantity of flow and variation in flow regimes are important factors in their transport. Since the stormwater-source impairment is usually the result of the cumulative impact of multiple pollutants and physical effects, it may be difficult to identify a specific pollutant (or pollutants) causing the impairment. Using a surrogate parameter in developing wasteload allocations for waters impaired by stormwater sources may, at times, be the appropriate approach for restoring the waterbodies.

In the 2009 report *Urban Stormwater Management in the United States,* the National Research Council suggests: "A more straightforward way to regulate stormwater contributions to waterbody impairment would be to use flow or a surrogate, like impervious cover, as a measure of stormwater loading . . . Efforts to reduce stormwater flow will automatically achieve reductions in pollutant loading. Moreover, flow is itself responsible for additional erosion and sedimentation that adversely impacts surface water quality."

Therefore, when developing TMDLs for receiving waters where stormwater sources are the primary source of impairment, it may be suitable to establish a numeric target for a surrogate pollutant parameter, such as stormwater flow volume or impervious cover, that would be expected to provide attainment of water quality standards. This is consistent with the TMDL regulations that specify that TMDLs can be expressed in terms of mass per time, toxicity or other appropriate measure (40 C.F.R. §130.2(i)).

Where a surrogate parameter is used, the TMDL document must demonstrate the linkage between the surrogate parameter and the documented impairment (e.g., biological degradation). In addition, the TMDL should provide supporting documentation to indicate that the surrogate pollutant parameter appropriately represents stormwater pollutant loadings. Monitoring is an essential undertaking to ensure that compliance with the effluent limitations occurs.

Recent examples of TMDLs using flow or impervious cover as surrogates for pollutants in setting TMDL loading targets include: the Eagleville Brook (CT) TMDL and the Barberry Creek (ME) TMDL which used impervious cover as a surrogate; and, the Potash Brook (VT) TMDL which used stormwater flow volume as a surrogate.

Designating Additional Stormwater Sources to Regulate and Treating Load Allocations as Wasteload Allocations for Newly Regulated Stormwater Sources

The 2002 memorandum states that "stormwater discharges from sources that are not currently subject to NPDES regulation may be addressed by the load allocation component of a TMDL." Section 402(p)(2) of the Clean Water Act (CWA) requires industrial stormwater sources, certain municipal separate storm sewer systems, and other designated sources to be subject to NPDES permits. Section 402(p)(6) provides EPA with authority to identify additional stormwater discharges as needing a permit.

In addition to the stormwater discharges specifically identified as needing an NPDES permit, the CWA and the NPDES regulations allow for EPA and NPDES authorized States to designate, additional stormwater discharges for regulation. See 40 CFR 122.26 (a)(9)(i)(C), (a)(9)(i)(D), (b)(4)(iii), (b)(7)(iii), (b)(15)(ii) and 122.32(a)(2). Since 2002, EPA has become concerned that NPDES authorities have generally not adequately considered exercising these authorities to designate for NPDES permitting stormwater discharges that are currently not required to obtain permit coverage but that are significant enough to be identified in the load allocation component of a TMDL. Accordingly, EPA encourages permitting authorities to consider designation of stormwater sources in situations where coverage under NPDES permits would afford a more effective mechanism to reduce pollutants in stormwater discharges than available nonpoint source control methods.

In situations where a stormwater source addressed in a TMDL's load allocation is not currently regulated by an NPDES permit but may be required to obtain an NPDES permit in the future, the TMDL writer should consider including language in the TMDL explaining that the allocation for the stormwater source is expressed in the TMDL as a "load allocation" contingent on the source remaining unpermitted, but that the "load allocation" would later be deemed a "wasteload allocation" if the stormwater discharge from the source were required to obtain NPDES permit coverage. Such language, while not legally required, would help ensure that the allocation is properly characterized by the permit writer should the source's regulatory status change. This will help ensure that effluent limitations in a NPDES permit applicable to the newly permitted source are consistent with the requirements and assumptions of the TMDL's allocation to that source.

Such recharacterization of a load allocation as a wasteload allocation would not automatically require resubmission of the TMDL to EPA for approval. However, if the TMDL's allocation for the newly permitted source had been part of a single aggregated or gross load allocation for all unregulated stormwater sources, it may be appropriate for the NPDES permit authority to determine a wasteload allocation and corresponding

effluent limitation specific to the newly permitted stormwater source. Any additional analysis used to refine the allocation should be included in the administrative record for the permit. In such cases, the record should describe the basis for
(1) recharacterizing the load allocation as a wasteload allocation for this source and
(2) determining that the permit's effluent limitations are consistent with the assumptions and requirements of this recharacterized wasteload allocation. For purposes of this discussion, it is assumed that the permit writer's additional analysis or recharacterization of the load allocation as a wasteload allocation does not change the TMDL's overall loading cap. Any change in a TMDL loading cap would have to be resubmitted for EPA approval.

If you have any questions please feel free to contact us or Linda Boornazian, Director of the Water Permits Division or Benita Best-Wong, Director of the Assessment and Watershed Protection Division.

cc: Association of State and Interstate Water Pollution Control Administrators
Water Quality Branch Chiefs, Regions 1 – 10
Permits Branch Chiefs, Regions 1 – 10

NPDES Permit No. DC0000221

AUTHORIZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM MUNICIPAL SEPARATE STORM SEWER SYSTEM PERMIT

In compliance with the provisions of the Clean Water Act, 33 U.S.C. §§ 1251 *et seq.*

Government of the District of Columbia
The John A. Wilson Building
1350 Pennsylvania Avenue, N.W.
Washington, D.C. 20004

is authorized to discharge from all portions of the municipal separate storm sewer system owned and operated by the District of Columbia to receiving waters named:

Potomac River, Anacostia River, Rock Creek and stream segments tributary to each such water body

in accordance with the Stormwater Management Program(s) dated February 19, 2009, subsequent updates, and related reports, strategies, effluent limitations, monitoring requirements and other conditions set forth in Parts I through IX herein.

The effective issuance date of this permit is: October 7, 2011.

This permit and the authorization to discharge shall expire at midnight, on: October 7, 2016.

Signed this 30th day of September, 2011.

Jon M. Capacasa, Director
Water Protection Division
U.S. Environmental Protection Agency
Region III

PERMIT FOR THE DISTRICT OF COLUMBIA MUNICIPAL SEPARATE STORM SEWER SYSTEM

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9. PERMIT DEFINITIONS

1. DISCHARGES AUTHORIZED UNDER THIS PERMIT

1.1 Permit Area

This permit covers all areas within the jurisdictional boundary of the District of Columbia served by, or otherwise contributing to discharges from, the Municipal Separate Storm Sewer System (MS4) owned or operated by the District of Columbia. This permit also covers all areas served by or contributing to discharges from MS4s owned or operated by other entities within the jurisdictional boundaries of the District of Columbia unless those areas have separate NPDES MS4 permit coverage or are specifically excluded herein from authorization under the District's stormwater program. Hereinafter these areas collectively are referred to as "MS4 Permit Area".

1.2 Authorized Discharges

This permit authorizes all stormwater point source discharges to waters of the United States from the District of Columbia's MS4 that comply with the requirements of this permit. This permit also authorizes the discharge of stormwater commingled with flows contributed by process wastewater, non-process wastewater, or stormwater associated with industrial activity provided such discharges are authorized under separate NPDES permits.

This permit authorizes the following non-stormwater discharges to the MS4 when appropriate stormwater activities and controls required through this permit have been applied and which are: (1) discharges resulting from clear water flows, roof drainage, dechlorinated water line flushing, landscape irrigation, ornamental fountains, diverted stream flows, rising ground waters, uncontaminated ground water infiltration to separate storm sewers, uncontaminated pumped ground water, discharges from potable water sources, foundation drains, air conditioning condensation, irrigation waters, springs, footing drains, lawn watering, individual resident car washing, flows from riparian habitats and wetlands, dechlorinated swimming pool discharges, wash water, fire fighting activities, and similar types of activities; and (2) which are managed so that water quality is not further impaired and that the requirements of the federal Clean Water Act, 33 U.S.C. §§ 1251 *et seq.*, and EPA regulations are met.

1.3 Limitations to Coverage

1.3.1 Non-stormwater Discharges

The permittee, as defined herein, shall effectively prohibit non-stormwater discharges into the MS4, except to the extent such discharges are regulated with an NPDES permit.

1.3.2 Waivers and Exemptions

This permit does not authorize the discharge of any pollutant from the MS4 which arises from or is based on any existing waivers and exemptions that may otherwise apply and are not consistent with the Federal Clean Water Act and other pertinent guidance, policies, and regulations. This narrative prohibition on the applicability of such waivers and exemptions extends to any activity that would otherwise be authorized under District law, regulations or

ordinance but which impedes the reduction or control of pollutants through the use of stormwater control measures and/or prevents compliance with the narrative /numeric effluent limits of this permit. Any such discharge not otherwise authorized may constitute a violation of this permit.

1.4 Discharge Limitations

The permittee must manage, implement and enforce a stormwater management program (SWMP) in accordance with the Clean Water Act and corresponding stormwater NPDES regulations, 40 C.F.R. Part 122, to meet the following requirements:

1.4.1. Effectively prohibit pollutants in stormwater discharges or other unauthorized discharges into the MS4 as necessary to comply with existing District of Columbia Water Quality Standards (DCWQS);

1.4.2. Attain applicable wasteload allocations (WLAs) for each established or approved Total Maximum Daily Load (TMDL) for each receiving water body, consistent with 33 U.S.C. § 1342(p)(3)(B)(iii); 40 C.F.R. § 122.44(k)(2) and (3); and

1.4.3. Comply with all other provisions and requirements contained in this permit, and in plans and schedules developed in fulfillment of this permit.

Compliance with the performance standards and provisions contained in Parts 2 through 8 of this permit shall constitute adequate progress toward compliance with DCWQS and WLAs for this permit term.

2. LEGAL AUTHORITY, RESOURCES AND STORMWATER PROGRAM ADMINSTRATION

2.1 Legal Authority

2.1.1 The permittee shall use its existing legal authority to control discharges to and from the Municipal Separate Storm Sewer System in order to prevent or reduce the discharge of pollutants to achieve water quality objectives, including but not limited to applicable water quality standards. To the extent deficiencies can be addressed through regulation or other Executive Branch action, the permittee shall remedy such deficiencies within 120 days. Deficiencies that can only be addressed through legislative action shall be remedied within 2 years of the effective date of this permit, except where otherwise stipulated, in accordance with the District's legislative process. Any changes to or deficiencies in the legal authority shall be explained in each Annual Report.

2.1.2 No later than 18 months following the effective date of this permit, the District shall update and implement Chapter 5 of Title 21 of District of Columbia Municipal Regulations (Water Quality and Pollution) ("updated DC Stormwater Regulations"), to address the control of stormwater throughout the MS4 Permit Area. Such regulations shall be consistent with this

permit, and shall be at least as protective of water quality as the federal Clean Water Act and its implementing regulations require.

2.1.3 The permittee shall ensure that the above legal authority in no way restricts its ability to enter into inter-jurisdictional agreements with other District agencies and/or other jurisdictions affected through this permit.

2.1.4 Review and revise, where applicable, building, health, road and transportation, and other codes and regulations to remove barriers to, and facilitate the implementation of the following standards: (1) standards resulting from issuance of District stormwater regulations required by Section 2.1, paragraph 1 herein; and (2) performance standards required by this permit.

2.2 Fiscal Resources

The permittee, including all agencies and departments of the District as specified in section 2.3 below, shall provide adequate finances, staff, equipment and support capabilities to implement the existing Stormwater Management Program (SWMP) and the provisions of this permit. For the core program the District shall provide a dedicated funding source. Each annual report under Part 6 of this permit shall include a demonstration of adequate fiscal capacity to meet the requirements of this permit.

2.3 Stormwater Management Program Administration/Permittee Responsibilities

2.3.1 The Government of the District of Columbia is the permittee, and all activities of all agencies, departments, offices and authorities of the District must comply with the requirements of this permit. The permittee has designated the District Department of the Environment (DDOE) as the agency responsible for managing the MS4 Stormwater Management Program and all activities necessary to comply with the requirements of this permit and the Comprehensive Stormwater Management Enhancement Amendment Act of 2008 by coordinating and facilitating a collaborative effort among other city agencies and departments including but not limited to departments designated as "Stormwater Agencies" by the Comprehensive Stormwater Management Enhancement Amendment Act of 2008:

District Department of Transportation (DDOT);
Department of Public Works (DPW);
Office of Planning (OP);
Office of Public Education Facilities Modernization (OPEFM);
Department of Real Estate Services (DRES);
Department of Parks and Recreation; and
DC Water and Sewer Authority (also known as and hereinafter referred to as DC Water).

Each named entity is responsible for complying with those elements of the permit within its jurisdictional scope and authorities.

2.3.2 DDOE shall coordinate, and all agencies, offices, departments and authorities shall implement provisions of the existing MS4 Task Force Memorandum of Understanding (MOU) dated 2000, updated matrix of responsibilities (January 2008), any subsequent updates, and other institutional agreements to coordinate compliance activities among agency partners to implement the provisions of this permit. DDOE's major responsibilities under these MOUs and institutional agreements shall include:

1. Convening regular meetings and communication with MS4 Task Force agencies and other committees established to implement this permit to budget, assign and implement projects, and monitor, inspect and enforce all activities required by the MS4 permit.

2. Providing technical and administrative support for the MS4 Task Force and other committees established to implement this permit

3. Evaluating, assessing, and synthesizing results of the monitoring and assessment programs and the effectiveness of the implementation of management practices and coordinating necessary adjustments to the stormwater management program in order to ensure compliance.

4. Coordinating the completion and submission of all deliverables required by the MS4 Permit.

5. Projecting revenue needs to meet MS4 Permit requirements, overseeing the District's stormwater fees to fulfill revenue needs, and coordinating with DC Water to ensure the District's stormwater fee is collected.

6. Making available to the public and other interested and affected parties, the opportunity to comment on the MS4 stormwater management program.

2.3.3 Within 180 days of permit issuance, the permittee shall complete an assessment of additional governmental agencies and departments, non-governmental organizations, watershed groups or other community organizations in the District and adjacent states to partner with to administer required elements of the permit. Intra- and inter-agency agreements between relevant governmental and nongovernmental organizations shall be established to ensure successful coordination and implementation of stormwater management activities in accordance with the requirements of this permit. Additional government and nongovernmental organizations and programs to consider include; land use planning, brownfields redevelopment, fire department, building and safety, public health, parks and recreation, and federal departments and agencies, including but not limited to, the National Park Service, Department of Agriculture, Department of Defense, and General Services Administration, responsible for facilities in the District.

3. STORMWATER MANAGEMENT PROGRAM (SWMP) PLAN

The permittee shall continue to implement, assess and upgrade all of the controls, procedures and management practices, described in this permit, and in the SWMP dated

February 19, 2009, and any subsequent updates. This Program has been determined to reduce the discharge of pollutants to the maximum extent practicable. The Stormwater Management Program is comprised of all requirements in this permit. All existing and new strategies, elements, initiatives, schedules or programs required by this permit must be documented in the SWMP Plan, which shall be the consolidated document of all stormwater program elements. Updates to the plan shall be consistent with all compliance deadlines in this permit. A current plan shall be posted on the District's website at an easily accessible location at all times.

New Stormwater Management Program strategies, elements, initiatives and plans required to be submitted to EPA for review and approval are included in Table 1.

TABLE 1
Elements Requiring EPA Review and/or Approval

Element	**Submittal Date (from effective date of this permit)**
Anacostia River Watershed Trash Reduction Calculation Methodology (4.10)	1 year
Catch Basin Operation and Maintenance Plan (4.3.5.1)	18 months
Outfall Repair Schedule (4.3.5.3)	18 months
Off-site Mitigation/Payment-in-Lieu Program (4.1.3)	18 months
Retrofit Program (4.1.6)	2 years
Consolidated TMDL Implementation Plan (4.10.3)	2 years
Revised Monitoring Program (5.1)	2 years
Revised Stormwater Management Program Plan (3)	4 years

No later than 3 years from the issuance date of this permit the permittee shall public notice a fully updated Plan including all of the elements required in this permit. No later than 4 years from the issuance date of this permit the permittee shall submit to EPA the fully updated plan for review and approval, as part of the application for permit renewal.

The measures required herein are terms of this permit. These permit requirements do not prohibit the use of 319(h) funds for other related activities that go beyond the requirements of this permit, nor do they prohibit other sources of funding and/or other programs where legal or contractual requirements preclude direct use for stormwater permitting activities.

TABLE 2
Legal Authority for Selected Required Program Stormwater Elements

Required Program Application Element	**Regulatory References**
Adequate Legal Authority	40 C.F.R. § 122.26(d)(2)(I)(C)-(F)

Green technology stormwater management practices, which incorporate technologies and practices across District activities.	Chapter 5 of Title 21 of District of Columbia Municipal Regulations (Water Quality and Pollution)
Existing Structural and Source Controls	40 C.F.R. § 122.26(d)(2)(iv)(A)(1)
Roadways	40 C.F.R. § 122.26(d)(2)(iv)(A)(3)
Pesticides, Herbicides, and Fertilizers Application	40 C.F.R. § 122.26(d)(2)(iv)(A)(6)
Municipal Waste Sites	40 C.F.R. § 122.26(d)(2)(iv)(A)(5)
Spill Prevention and Response	40 C.F.R. § 122.26(d)(2)(iv)(B)(4)
Infiltration of Seepage	40 C.F.R. § 122.26(d)(2)(iv)(B)(7)
Stormwater Management Program for Commercial and Residential Areas	40 C.F.R. § 122.26(d)(2)(iv)(A)
Manage Critical Source Areas	40 C.F.R. § 122.26(d)(iii)(B)(6)
Stormwater Management for Industrial Facilities	40 C.F.R. § 122.26(d)(2)(iv)(C)
Industrial and High Risk Runoff	40 C.F.R. § 122.26(d)(2)(iv)(C), (iv)(A)(5)
Identify Priority Industrial Facilities	40 C.F.R. § 122.26(d)(2)(iv)(C)(1)
Illicit Discharges and Improper Disposal	40 C.F.R. § 122.26(d)(2)(iv)(B)(1)-(5), (iv)(B)(7)
Flood Control Projects	40 C.F.R. § 122.26(d)(2)(iv)(A)(4)
Public Education and Participation	40 C.F.R. § 122.26(d)(2)(iv)(A)(6), (iv)(B)(5), (iv)(B)(6)

Monitoring and Assessment and Reporting	40 C.F.R. § 122.26(d)(2)(iv)(D)(v)
Monitoring Program	40 C.F.R. § 122.26(d)(2)(iv)(B)(2), (iii), iv(A), (iv)(C)(2)
Characterization Data	40 C.F.R. § 122.26(d)(2)(iii)(B)-(D), 40 C.F.R. § 122.21(g)(7)
Reporting	40 C.F.R. § 122.41(l)

4. IMPLEMENTATION OF STORMWATER CONTROL MEASURES

4.1 Standard for Long-Term Stormwater Management

The permittee shall continue to develop, implement, and enforce a program in accordance with this permit and the permittee's updated SWMP Plan that integrates stormwater management practices at the site, neighborhood and watershed levels that shall be designed to mimic pre-development site hydrology through the use of on-site stormwater retention measures (e.g., harvest and use, infiltration and evapotranspiration), through policies, regulations, ordinances and incentive programs

4.1.1 Standard for Stormwater Discharges from Development

No later than 18 months following issuance of this permit, the permittee shall, through its Updated DC Stormwater Regulations or other permitting or regulatory mechanisms, implement one or more enforceable mechanism(s) that will adopt and implement the following performance standard for all projects undertaking development that disturbs land greater than or equal to 5,000 square feet:

Require the design, construction and maintenance of stormwater controls to achieve on-site retention of 1.2" of stormwater from a 24-hour storm with a 72-hour antecedent dry period through evapotranspiration, infiltration and/or stormwater harvesting and use for all development greater than or equal to 5,000 square feet.

The District may allow a portion of the 1.2" volume to be compensated for in a program consistent with the terms and requirements of Part 4.1.3.

4.1.2 Code and Policy Consistency, Site Plan Review, Verification and Tracking

By the end of this permit term the District must review and revise, as applicable, stormwater, building, health, road and transportation, and other codes and regulations to remove barriers to, and facilitate the implementation of the retention performance standard required in

Section 4.1.1. The District must also establish/update and maintain a formal process for site plan reviews and a post-construction verification process (e.g., inspections, submittal of as-builts) to ensure that standards are appropriately implemented. The District must also track the on-site retention performance of each project subject to this regulatory requirement.

4.1.3 Off-Site Mitigation and/or Fee-in Lieu for all Facilities

Within 18 months of the effective date of this permit the District shall develop, public notice, and submit to EPA for review and comment an off-site mitigation and/or fee-in-lieu program to be utilized when projects will not meet stormwater management performance standard as defined in Section 4.1.1. The District has the option of implementing an off-site mitigation program, a fee-in-lieu program, or both. Any allowance for adjustments to the retention standard shall be defined in the permittee's regulations. The program shall include at a minimum:

1. Establishment of baseline requirements for on-site retention and for mitigation projects. On-site volume plus off-site volume (or fee-in-lieu equivalent or other relevant credits) must equal no less than the relevant volume in Section 4.1.1;
2. Specific criteria for determining when compliance with the performance standard requirement for on-site retention cannot technically be met based on physical site constraints, or a rationale for why this is not necessary;
3. For a fee-in-lieu program, establishment of a system or process to assign monetary values at least equivalent to the cost of implementation of controls to account for the difference in the performance standard, and the alternative reduced value calculated; and
4. The necessary tracking and accounting systems to implement this section, including policies and mechanisms to ensure and verify that the required stormwater practices on the original site and appropriate required off-site practices stay in place and are adequately maintained.

The program may also include incentives for achieving other important environmental objectives such as ongoing measurable carbon sequestration, energy savings, air quality reductions in green house gases, or other environmental benefits for which the program can develop methods for quantifying and documenting those outcomes. Controls implemented to achieve those outcomes are subject to the same level of site plan review, inspection, and operation and maintenance requirements as stormwater controls.

District-owned transportation right-of-way projects are subject to a similarly stringent process for determining an alternate performance volume, but for the duration of this permit term need not conduct off-site mitigation or pay into a fee-in-lieu program to compensate for the difference.

4.1.4 Green Landscaping Incentives Program

No later than one year following permit issuance, the permittee shall develop an incentive program to increase the quantity and quality of planted areas in the District while allowing flexibility for developers and designers to meet development standards. The Incentive Program

shall use such methods as a scoring system to encourage green technology practices such as larger plants, permeable paving, green roofs, vegetated walls, preservation of existing trees, and layering of vegetation along streets and other areas visible to the public.

4.1.5 Retrofit Program for Existing Discharges

4.1.5.1 Within two years of the effective date of this permit the District shall develop, public notice, and submit to EPA for review and approval a program that establishes performance metrics for retrofit projects. The District shall fully implement the program upon EPA approval. The starting point for the performance metrics shall be the standard in Section 4.1.1. Performance metrics may be established generally for all retrofit projects, or for categories of projects, e.g., roads, sidewalks, parking lots, campuses. Specific site conditions may constitute justifications for setting a performance standard at something less than the standard in Section 4.1.1, and a similar calculator or algorithm process may be used in conjunction with a specific site analysis.

4.1.5.2 The District, with facilitation assistance from EPA Region III, will also work with major Federal landholders, such as the General Services Administration and the Department of Defense, with the objective of identifying retrofit opportunities, documenting federal commitments, and tracking pollutant reductions from relevant federal actions.

4.1.5.3 For each retrofit project estimate the potential pollutant load and volume reductions achieved through the DC Retrofit program by major waterbody (Rock Creek, Potomac, Anacostia) for the following pollutants: Bacteria (E. coli), Total Nitrogen, Total Phosphorus, Total Suspended Solids, Cadmium, Copper, Lead, Zinc, and Trash. These estimates shall be included in the annual report following implementation of the project.

4.1.5.4 The DC Retrofit Program shall implement retrofits for stormwater discharges from a minimum of 18,000,000 square feet of impervious surfaces during the permit term. A minimum of 1,500,000 square feet of this objective must be in transportation rights-of-way.

4.1.5.5 No later than 18 months following issuance of this permit, the permittee shall, through its Updated DC Stormwater Regulations or other permitting or regulatory mechanisms, implement an enforceable mechanism that will adopt and implement stormwater retention requirements for properties where less than 5,000 square feet of soil is being disturbed but where the buildings or structures have a footprint that is greater than or equal to 5,000 square feet and are undergoing substantial improvement. Substantial improvement, as consistent with District regulations at 12J DCMR § 202, is any repair, alteration, addition, or improvement of a building or structure, the cost of which equals or exceeds 50 percent of the market value of the structure before the improvement or repair is started. The characteristics of these types of projects may constitute justifications for setting a performance standard at something less than the standard in Section 4.1.1.

4.1.5.6 The permittee shall ensure that every major renovation/rehabilitation project for District-owned properties within the inventory of DRES and OPEFM (e.g., schools and school administration buildings) includes on-site stormwater retention measures, including but not

limited to green roofs, stormwater harvest/reuse, and/or other practices that can achieve the retention performance standard.

4.1.6 Tree Canopy

4.1.6.1 No later than one year following issuance of this permit, the District shall develop and public notice a strategy to reduce the discharge of stormwater pollutants by expanding tree canopy throughout the city. The strategy shall identify locations throughout the District where tree plantings and expanded tree boxes are technically feasible and commit to specific schedules for implementation at locations throughout the District, with highest priority given to projects that offer the greatest stormwater retention potential. The strategy shall also include the necessary elements to achieve the requirements of Section 4.1.6.2.

4.1.6.2 The District shall achieve a minimum net annual tree planting rate of 4,150 plantings annually within the District MS4 area, with the objective of a District-wide urban tree canopy coverage of 40% by 2035. The annual total tree planting shall be calculated as a net increase, such that annual mortality is also included in the estimate. The District shall ensure that trees are planted and maintained, including requirements for adequately designed and sized tree boxes, to achieve optimal stormwater retention and tree survival rate. Trees shall be planted in accordance with the Planting Specifications issued by the International Society of Arboriculture as appropriate to the site conditions.

4.1.6.3 The District shall annually document the total trees planted and make an annual estimate of the volume of stormwater that is being removed from the MS4 (and combined system, as relevant) in a typical year of rainfall as a result of the maturing tree canopy over the life of the MS4 permit. Also report annually on the status of achieving 40% canopy District-wide.

4.1.7 Green Roof Projects

4.1.7.1 Complete a structural assessment of all District properties maintained by DRES and slated for redevelopment to determine current roof conditions and the feasibility for green roof installation. These assessments shall be performed on an ongoing basis for all properties as they are considered for redevelopment. Based on the structural assessment and other factors, identify all District-owned properties where green roof projects are technically feasible and commit to specific schedules for implementing these projects. Highest priority shall be given to projects that offer the greatest stormwater capture potential.

4.1.7.2 The permittee shall install at a minimum 350,000 square feet of green roofs on District properties during the term of the permit (including schools and school administration buildings).

4.1.7.3 Document the square footage of green roof coverage in the District, whether publicly or privately owned, report any incentive programs implemented during the permit term, and estimate the volume of stormwater that is being removed from the MS4 (and combined

system, as relevant) in a typical year of rainfall as a result of the combined total green roof facilities in the District.

4.2 Operation and Maintenance of Stormwater Capture Practices

4.2.1 District Owned and Operated Practices.

Within two years of the effective date of this permit, develop and implement operation and maintenance protocols and guidance for District-owned and operated on-site retention practices (development and retrofits) to include maintenance needs, inspection frequencies, estimated maintenance frequencies, and a tracking system to document relevant information. Provide training to all relevant municipal employees and contractors, with regular refreshers, as necessary.

4.2.2 Non-District Owned and Operated Practices.

In conjunction with updating of relevant ordinances and policies, develop accountability mechanisms to ensure maintenance of stormwater control measures on non-District property. Those mechanisms may include combinations of deed restrictions, ordinances, maintenance agreements, or other policies deemed appropriate by the District. The District must also include a long-term verification process of O&M, which may include municipal inspections, 3rd party inspections, owner/operator certification on a frequency deemed appropriate by the District, and/or other mechanisms. The District must continue to maintain an electronic inventory of practices on private property to include this information.

4.2.3 Stormwater Management Guidebook and Training

4.2.3.1 No later than 18 months from the permit issuance date, the permittee shall finalize a Stormwater Management Guidebook to be available for wide-spread use by land use planners and developers. The Stormwater Management Guidebook shall provide regular updates, as applicable, in a format that facilitates such regular updates, and shall include objectives and specifications for integration of stormwater management technologies, including on site retention practices, in the areas of:

a. Site Assessment.
b. Site Planning and Layout.
c. Vegetative Protection, Revegetation, and Maintenance.
d. Techniques to Minimize Land Disturbance.
e. Techniques to Implement Measures at Various Scales.
f. Integrated Water Resources Management Practices.
g. Designing to meet the required performance standard(s).
h. Flow Modeling Guidance.
i. Hydrologic Analysis.
j. Construction Considerations.
k. Operation and Maintenance

4.2.3.2 The permittee shall continue to provide key industry, regulatory, and other stakeholders with information regarding objectives and specifications of green infrastructure practices contained in the Stormwater Management Guidebook through a training program. The Stormwater Management training program will include at a minimum the following:

a. Stormwater management/green technology practices targeted sessions and materials for builders, design professionals, regulators, resource agencies, and stakeholders.
b. Materials and data from stormwater management/green technology practices pilot projects and demonstration projects including case studies.
c. Design and construction methods for integration of stormwater management/green technology practices measures at various project scales.
d. Guidance on performance and cost of various types of stormwater management/green technology practices measures in the District.

4.3 Management of for District Government Areas

Procedures to reduce the discharge of pollutants in stormwater runoff shall include, but not be limited to:

4.3.1 Sanitary Sewage System Maintenance Overflow and Spill Prevention Response

The permittee shall coordinate with DC Water to implement an effective response protocol for overflows of the sanitary sewer system into the MS4. The response protocol shall clearly identify agencies responsible and telephone numbers and e-mail for any contact and shall contain at a minimum, procedures for:

1. Investigating any complaints received within 24 hours of the incident report.
2. Responding within two hours to overflows for containment.
3. Notifying appropriate sewer, public health agencies and the public within 24 hours when the sanitary sewer overflows to the MS4.

This provision in no way authorizes sanitary sewer overflow discharges either directly or via the MS4.

4.3.2 Public Construction Activities Management

The permittee shall implement and comply with the Development and Redevelopment and the Construction requirements in Part 4.6 of this permit at all permittee-owned or operated public construction projects.

The permittee shall obtain discharge authorization under the applicable EPA Construction General permit for construction activities and comply with provisions therein.

4.3.3 Vehicle Maintenance/Material Storage Facilities/ Municipal Operations.

The permittee shall implement stormwater pollution prevention measures at all permittee-owned, leased facilities and job sites including but not limited to vehicle/ equipment maintenance facilities, and material storage facilities.

For vehicle and equipment wash areas and municipal facilities constructed, redeveloped, or replaced, the permittee shall eliminate discharges of wash waters from vehicle and equipment washing into the MS4 by implementing any of the following measures at existing facilities with vehicle or equipment wash areas:

1. Self-contain, and haul off-site for disposal;
2. Equip with a clarifier; or
3. Equip with an alternative pre-treatment device.

4.3.4 Landscape and Recreational Facilities Management, Pesticide, Herbicide, Fertilizer and Landscape Irrigation

4.3.4.1 The permittee shall further reduce pollutants and pollutant discharges associated with the storage and application of pesticides, fertilizers, herbicides, the use of other toxic substances and landscape irrigation according to an integrated pest management program (IPM). The IPM shall be an ecosystem based strategy that focuses on long-term prevention of pests or their damage through a combination of techniques such as biological control, habitat manipulation, modification of cultural practices, use of resistant varieties, and use of low or no chemical and irrigation input landscapes, in accordance with the provisions of this permit, procedures and practices described in the SWMP and regulations.

The permittee shall further utilize IPM controls to reduce pollutants related to the storage and application of pesticides, herbicides, and fertilizers applied by employees or contractors, to public rights-of-way, parks, and other District property to ensure that:

a. Pesticides are used only if monitoring indicates they are needed according to established guidelines;

b. Fertilizers are used only when soil tests indicate that they are necessary, and only in minimum amounts and for needed purposes (e.g., seed germination).

c. Treatments are made with the purpose of removing only the target organism;

d. Pest controls are selected and applied in a manner that minimizes risks to human health, beneficial, non-target organisms, and the environment;

e. No pesticides or fertilizers are applied to an area immediately prior to an expected rain event, or during or immediately following a rain event, or when water is flowing off the area;

f. No banned or unregistered pesticides are stored or applied;

g. All staff applying pesticides are certified or are under the direct supervision of a pesticide applicator certified in the appropriate category;

h. Procedures are implemented to encourage the retention and planting of native and/or non-invasive, naturalized vegetation to reduce water, pesticide and fertilizer needs;

i. Pesticides and fertilizers are stored indoors or under cover on paved surfaces or enclosed in secondary containment and storage areas inspected regularly to reduce the potential for spills; and

j. Landscapes that maximize on-site retention of stormwater, while minimizing mowing, chemical inputs and irrigation are given preference for all new landscape installation.

4.3.4.2 The District shall coordinate internally among departments for the purpose of ensuring that pesticide and fertilizer use within its jurisdiction does not threaten water quality.

4.3.4.3 The District shall partner with other organizations to ensure that pesticide and fertilizer use within their jurisdiction does not threaten water quality.

4.3.4.4 The District shall continue to conduct education and outreach, as well as provide incentives, to curtail the use of turf-grass fertilizers for the purpose of reducing nitrogen and phosphorous discharges to surface waters. The program shall incentivize the use of vegetative landscapes other than turf grass and other measures to restrict the use of turf grass fertilizers.

4.3.4.5 The District shall use GIS layers of public land and sewersheds, as well as background data, to identify priority areas for a targeted strategy to reduce the sources of pesticides, herbicides, and fertilizers that contaminate the stormwater runoff, and report progress toward completing the screening characterization in the next Updated SWMP.

4.3.4.6 The District shall include in each Annual Report a report on the implementation of the above application procedures, a history of the improvements in the control of these materials, and an explanation on how these procedures will meet the requirements of this permit.

4.3.5 Storm Drain System Operation and Management and Solids and Floatables Reduction

4.3.5.1 Within 18 months of the effective date of this permit, the District shall complete, public notice and submit to EPA for review and approval a plan for optimal catch basin inspections, cleaning and repairs. The District shall fully implement the plan upon EPA approval.

4.3.5.2 Until such time as the catch basin maintenance study has been completed and approved, the permittee shall ensure that each catch basin within the DC MS4 Permit Area is cleaned at least once annually during the life of the permit. The permittee shall continue to use strategies for coordinated catch basin cleaning and street-sweeping that will optimize reduction of stormwater pollutants.

4.3.5.3 Within 18 months of the effective date of this permit, and consistent with the 2006 Outfall Survey, the District shall complete, public notice and submit to EPA for review and approval an outfall repair schedule to ensure that approximately 10% of all outfalls needing repair are repaired annually, with the overall objective of having all outfalls in good repair by 2022. This schedule may be combined with the catch basin maintenance study outlined in 4.3.5.1. The repair schedule shall be fully implemented upon EPA approval.

4.3.5.4 The permittee shall comply with the Anacostia River Trash TMDL implementation provisions in Part 4.10 of this permit and apply the technologies and other activities developed in the Anacostia River Watershed Trash TMDL throughout the entire MS4 Permit Area. The permittee shall continue to report the progress of trash reduction in the Consolidated Annual Report.

4.3.6 Streets, Alleys and Roadways

4.3.6.1 Street sweeping shall be conducted on no less than 641 acres of roadway in the MS4 area annually in accordance with the following schedule:

TABLE 3
Street Sweeping

Area/Street Classification	Frequency
Arterials-heavily developed commercial and central business districts with considerable vehicular and pedestrian traffic	At least nine (9) times per year
Industrial areas	At least six (6) times per year
Residential-residential areas with limited throughway and pedestrian traffic AND neighborhood streets which are used for local purposes only	At least four (4) times per year
Central Business District/Commercial-neighborhood business districts and main streets with moderate vehicular and pedestrian traffic	At least one (1) time every two weeks
Environmental hot spots in the	At least two (2) times per month

Anacostia River Watershed	March through October

4.3.6.2 Standard road repair practices shall include limiting the amount of soil disturbance to the immediate area under repair. Stormwater conveyances which are denuded shall be resodded, reseeded and mulched, or otherwise stabilized for rapid revegetation, and these areas should have effective erosion control until stabilized.

4.3.6.3 The permittee shall continue to evaluate and update the use, application and removal of anti-icers, chemical deicers, salt, sand, and/or sand/deicer mixtures in an effort to minimize the impact of these materials on water quality. The permittee shall investigate and implement techniques available for reducing pollution from deicing salts in snowmelt runoff and runoff from salt storage facilities. The permittee shall evaluate and implement the use of porous/permeable surfaces that require less use of deicing materials and activities. This evaluation shall be made a part of an overall investigation of ways to meet the requirements of the Clean Water Act and reported in each Annual Report.

4.3.6.4 The permittee shall continue to implement and update a program to ensure that excessive quantities of snow and ice control materials do not enter the District's water bodies. The permittee shall report its progress in implementing the program in each Annual Report. Except during a declared Snow Emergency when the permittee determines that the foremost concern of snow removal activities is public health and safety, it shall avoid snow dumping or storage in areas adjacent to water bodies, wetlands, and areas near public or private drinking water wells which would ultimately reenter the MS4.

4.3.7 Infrastructure Maintenance/Pollution Source Control Maintenance

The permittee shall continue to implement an operation and maintenance program that incorporates good housekeeping components at all municipal facilities located in the DC MS4 Permit Area, including but not limited to; municipal waste water treatment facility, potable drinking water facility, municipal fleet operations, maintenance garages, parks and recreation, street and infrastructure maintenance, and grounds maintenance operations, libraries and schools. The permittee shall document the program in the Annual Report, as required at Section 6.2 herein. The permittee shall, at a minimum:

1. Continue to implement maintenance standards at all municipal facilities that will protect the physical, chemical and biological integrity of receiving waters.

2. Continue to implement an inspection schedule in which to perform inspections to determine if maintenance standards are being met. Inspections shall be performed no less than once per calendar year and shall provide guidance in Stormwater Pollution Prevention Plan development and implementation, where needed.

3. Continue to implement procedures for record keeping and tracking inspections and maintenance at all municipal facilities.

4. Continue to implement an inspection and maintenance program for all permittee-owned management practices, including post-construction measures.

5. Continue to ensure proper operation of all treatment management practices and maintain them as necessary for proper operation, including all post-construction measures.

6. Ensure that any residual water following infrastructure maintenance shall be self-contained and disposed of legally in accordance with the Clean Water Act.

4.3.8 Public Industrial Activities Management/Municipal and Hazardous Facilities

For any municipal activity associated with industrial activity, as defined by 40 C.F.R. § 122.26, which discharges stormwater to, from and through the DC MS4, the permittee shall obtain separate coverage under either: (1) the EPA Multi-Sector General Permit for Stormwater Discharges Associated with Industrial Activity (MSGP) (As modified May 27, 2009); or (2) an individual permit.

4.3.9 Emergency Procedures

The permittee may conduct repairs of essential public service systems and infrastructure in emergency situations. An emergency includes only those situations included as conditions necessary for demonstration of an upset at 40 C.F.R. 122.41(n). For each claimed emergency, the permittee shall submit to the Permitting Authority a statement of the occurrence of the emergency, an explanation of the circumstances, and the measures that were implemented to reduce the threat to water quality, no later than required by applicable Clean Water Act regulations.

4.3.10 Municipal Official Training

The permittee shall continue to implement an on-going training program for those employees specified below, and any other employees whose job functions may impact stormwater program implementation. The training program shall address the importance of protecting water quality, the requirements of this permit, design, performance, operation and maintenance standards, inspection procedures, selecting appropriate management practices, ways to perform their job activities to prevent or minimize impacts to receiving waters, and procedures for tracking, inspecting and reporting, including potential illicit discharges. The permittee shall provide follow-up and refresher training at a minimum of once every twelve months, and shall include any changes in procedures, techniques or requirements.

The training program shall include, but is not limited to, those employees who work in the following areas:

1. Municipal Planning
2. Site plan review

3. Design
4. Construction
5. Transportation planning and engineering
6. Street/sewer and right-of-way construction and maintenance
7. Water and sewer departments
8. Parks and recreation department
9. Municipal water treatment and waste water treatment
10. Fleet maintenance
11. Fire and police departments
12. Building maintenance and janitorial
13. Garage and mechanic crew
14. Contractors and subcontractors who may be contracted to work in the above described
15. areas
16. Personnel responsible for answering questions about the permittee's stormwater program,
17. including persons who may take phone calls about the program
18. Any other department of the permittee that may impact stormwater runoff

4.4 Management of Commercial and Institutional Areas

The District shall establish and implement policies and procedures to reduce the discharge of pollutants in stormwater runoff from all commercial and institutional (including federal) areas covered by this permit.

The permittee shall ensure maintenance of all stormwater management controls in commercial and institutional land areas in accordance with the following provisions:

1. Tracking all controls;
2. Inspecting all controls on a regular basis, according to an inspection schedule;
3. Ensure compliance with the MS4 permit and municipal ordinances at commercial and institutional facilities.

4.4.1 Inventory of Critical Sources and Source Controls

4.4.1.1 The permittee shall continue to maintain a watershed-based inventory or database of all facilities within its jurisdiction that are critical sources of stormwater pollution. Critical sources to be tracked shall include the following:

a. Automotive service facilities, *e.g.*, service, fueling and salvage facilities;
b. Industrial activities, as defined at 40 C.F.R. §§ 122.26(b)(14); and
c. Construction sites exceeding one acre, or sites under one acre that are part of a larger common plan of development.
d. Dry cleaners
e. Any other facility the District has identified as a Critical Source

4.4.1.2 The permittee shall include the following minimum fields of information for each industrial and commercial facility identified as a critical source:

a. Name of facility and name of owner/ operator;
b. Address of facility;
c. Size of facility; and
d. Activities conducted at the facility that could impact stormwater.
e. Practices and/or measures to control pollutants.
f. Inspection and maintenance schedules, dates and findings.

4.4.1.3 The permittee shall update its inventory of critical sources at least annually. The update may be accomplished through collection of new information obtained through field activities or through other readily available inter and intra-agency informational databases (*e.g.*, business licenses, pretreatment permits, sanitary sewer hook-up permits, and similar information).

4.4.2 Inspection of Critical Sources

The permittee shall continue to inspect all commercial facilities identified in Part 4.4.1. herein and any others found to be critical sources twice during the five-year term of the permit. A minimum interval of six months between the first and the second mandatory compliance inspection is required, unless a follow-up inspection to ensure compliance must occur sooner.

4.4.3 Compliance Assurance.

At each facility identified as a critical source, the permittee's inspector(s) shall verify that the operator is implementing a control strategy necessary to protect water quality. Where the permittee determines that existing measures are not adequate to protect water quality, the permittee shall require additional site-specific controls sufficient to protect water quality.

4.5 <u>Management of Industrial Facilities and Spill Prevention</u>

4.5.1 The District shall continue to implement a program to monitor and control pollutants in stormwater discharged from Industrial Facilities located within the MS4 Permit Area, as defined herein, pursuant to the requirements in 40 C.F.R. § 122.26(d)(2)(iv)(C). These facilities shall include, but are not limited to:

a. Private Solid Waste Transfer Stations
b. Hazardous Waste Treatment, Disposal, and/or Recovery Plants
c. Industrial Facilities subject to SARA or EPCRA Title III
d. Industrial Facilities with NPDES Permits
e. Industrial facilities with a discharge to the MS4

4.5.2 The District shall continue to maintain and update the industrial facilities database.

4.5.3 The District shall continue to perform or provide on-site assistance/inspections and outreach focused on the development of stormwater pollution prevention plans and NPDES permit compliance.

4.5.4 The District shall continue to refine and implement procedures to govern the investigation of facilities suspected of contributing pollutants to the MS4, including at a minimum: (i) a review, if applicable, of monitoring data collected by the facility pursuant to its NPDES permit; and (ii) wet weather screening as required by Part 5.2.1 herein (including collecting data on discharges from industrial sites). These procedures shall be submitted as part of each Annual Report required by Part 6.2 herein.

4.5.5 The District shall continue to implement the prohibition against illicit discharges, control spills, and prohibit dumping. Continue to implement a program to prevent, contain, and respond to spills that may discharge to the MS4, and report on such implementation submitted in each Annual Report. The spill response program may include a combination of spill response actions by the permittee and/or another public or private entity.

4.5.6 The District shall report progress in developing and carrying out industrial-related programs in each Annual Report required by Section 6 herein. Provide an explanation as to how the implementation of these procedures will meet the requirements of the Clean Water Act.

4.6 Stormwater Management for Construction Sites

4.6.1 Continue implementation of the Program that reduces the discharge of pollutants from construction sites. In each Annual Report, the permittee shall evaluate and report to determine if the existing practices meet the requirements of 40 C.F.R. § 122.26(d)(2)(iv)(A) and (D).

4.6.2 Continue the review and approval process of the sediment and erosion control plans under this program. Also, the permittee shall ensure that all construction projects impacting one acre or greater, or less than one acre when part of a larger common plan of development or sale equal to or larger than one acre, are not authorized until documentation is provided that they have received EPA NPDES Construction General Permit Coverage.

4.6.3 Continue to implement inspection and enforcement procedures, including but not limited to inspection of permitted construction sites that disturb more than 5,000 square feet of soil as follows:

1. First inspection prior to ground disturbing activities to review planned sediment and erosion control measures;
2. Second inspection to verify proper installation and maintenance of sediment and erosion control measures;
3. Third inspection to review planned installation and maintenance of stormwater BMPs;

4. Fourth inspection to verify proper installation of stormwater management practices following final stabilization of the project site; and
5. Other inspections as necessary to ensure compliance with relevant standards and requirements.

4.6.4 When a violation of local erosion and sediment control ordinances occurs, the permittee shall follow existing enforcement procedures and practices using standardized reports as part of the inspection process to provide accurate record keeping of inspections of construction sites. The permittee shall use a listing of all violations and enforcement actions to assess the effectiveness of the Enforcement Program in each Annual Report.

4.6.5 Continue with educational measures for construction site operators (Section 4.9 of this permit) that consist, at a minimum, of providing guidance manuals and technical publications.

4.6.6 Report progress in developing and carrying out the above construction-related programs in each Annual Report required by Parts 6.2 herein, including: (i) an explanation as to how the implementation of these procedures will meet the requirements of the Clean Water Act; (ii) an explanation as to how the implementation of these procedures, particularly with regard to District "waivers and exemptions", will meet the requirements of the Clean Water Act; and (iii) discussion of progress toward meeting TMDL and the District Watershed Implementation Plan deadlines.

4.7 Illicit Discharges and Improper Disposal.

4.7.1 The District shall continue to implement an ongoing program to detect illicit discharges, pursuant to the SWMP, and Part 4 of this permit, and to prevent improper disposal into the storm sewer system, pursuant to 40 C.F.R. § 122.26(d)(2)(iv)(B)(1). Such program shall include, at a minimum the following:

a. An updated schedule of procedures and practices to prevent illicit discharges, as defined at 40 C.F.R. § 122.26(b)(2), and, pursuant to 40 C.F.R. § 122.26(d)(2)(iv)(B)(1), to detect and remove illicit discharges as defined herein;

b. An updated inventory (organized by watershed) of all outfalls that discharge through the MS4 including any changes to the identification and mapping of existing permitted outfalls. Such inventory shall include, but not be limited to, the name and address, and a description (such as SIC code) which best reflects the principal products or services provided by each facility which may discharge to the MS4;

c. Continue to implement an illicit connection detection and enforcement program to perform dry weather flow inspections in target areas;

d. Visual inspections of targeted areas;

e. Issuance of fines, tracking and reporting illicit discharges, and reporting progress on stopping targeted illicit discharges, and in appropriate cases, chemical testing immediately after discovery of an illicit discharge;

f. Enforcement procedures for illicit discharges set forth in Part 4 herein;

g. All necessary inspection, surveillance, and monitoring procedures to remedy and prevent illicit discharges. The permittee shall submit an inspection schedule, inspection criteria, documentation regarding protocols and parameters of field screening, and allocation of resources as a part of each Annual Report.

h. The permittee shall continue to implement procedures to prevent, contain, and respond to spills that may discharge into the MS4. The permittee shall provide for the training of appropriate personnel in spill prevention and response procedures.

i. The permittee shall report the accomplishments of this program in each Annual Report.

4.7.2 The District shall continue to ensure the implementation of a program to further reduce the discharge of floatables (e.g. litter and other human-generated solid refuse). The floatables program shall include source controls and, where necessary, structural controls.

4.7.3 The District shall continue to implement the prohibition against the discharge or disposal of used motor vehicle fluids, household hazardous wastes, grass clippings, leaf litter, and animal waste into separate storm sewers. The permittee shall ensure the implementation of programs to collect used motor vehicle fluids (at a minimum oil and anti-freeze) for recycle, reuse, and proper disposal and to collect household hazardous waste materials (including paint, solvents, pesticides, herbicides, and other hazardous materials) for recycle, reuse, or proper disposal. The permittee shall ensure that such programs are readily available within the District, and that they are publicized and promoted on a regular basis, pursuant to Public Education provisions in this permit at Part 4.9 herein.

4.7.4 The District shall continue to work with members of the Metropolitan Police Department to enhance illegal dumping enforcement.

4.7.5 The District shall implement the District's ban on coal tar pavement products, including conducting outreach and enforcement activities.

4.7.6 The District shall implement the Anacostia Clean Up and Protection Act of 2009, to ban the use of disposable non-recyclable plastic carryout bags and restrict the use on disposable carryout bags in certain food establishments.

4.8 <u>Flood Control Projects</u>

4.8.1 The District shall update the impervious surface analysis of floodplains six months after the approval of the revised Flood Insurance Rate Maps by the Federal Emergency Management Agency.

4.8.2 The District shall assess potential impacts on the water quality and the ability of the receiving water to support beneficial uses for all flood management projects. Evaluate the feasibility of retrofitting existing flood control devices to provide additional pollutant and volume removal from stormwater. Report results of such assessment, mapping program, and feasibility studies in the Annual Report (Part 6.2 herein).

4.8.3 The District shall review all development proposed in flood plain areas to ensure that the impacts on the water quality of receiving water bodies have been properly addressed. Information regarding impervious surface area located in the flood plains shall be used (in conjunction with other environmental indicators) as a planning tool. The permittee shall collect data on the percentage of impervious surface area located in flood plain boundaries for all proposed development beginning six months after the effective date of this permit. The permittee shall collect similar data for existing development in flood plain areas, in accordance with the mapping program and other activities designed to improve water quality. Critical unmapped areas shall be prioritized by the permittee with an emphasis on developed and developing acreage. Reports of this work shall be summarized in the Annual Report.

4.9 Public Education and Public Participation

The District shall continue to implement a public education program including but not limited to an education program aimed at residents, businesses, industries, elected officials, policy makers, planning staff and other employees of the permittee. The purpose of education is to reduce or eliminate behaviors and practices that cause or contribute to adverse stormwater impacts. Education initiatives may be developed locally or regionally.

4.9.1 Education and Outreach.

4.9.1.1 The District shall continue to implement its education and outreach program for the area served by the MS4 that was established during the previous permit cycle. The outreach program shall be designed to achieve measurable improvements in the target audience's understanding of stormwater pollution and steps they can take to reduce their impacts.

4.9.1.2 The permittee shall assess current education and outreach efforts and identify areas where additional outreach and education are needed. Audiences and subject areas to be considered include:

a. General public

1) General impacts of stormwater flows into surface waters
2) Impacts from impervious surfaces
3) Source control practices and environmental stewardship actions and opportunities in the areas of pet waste, vehicle maintenance, landscaping, and rain water reuse.

4) A household hazardous waste educational and outreach program to control illicit discharges to the MS4 as required herein
5) Information and education on proper management and disposal of used oil, other automotive fluids, and household chemicals
6) Businesses, including home-based and mobile businesses
7) Management practices for use and storage of automotive chemicals, hazardous cleaning supplies, carwash soaps and other hazardous materials
8) Impacts of illicit discharges and how to report them including information for industries about stormwater permitting and pollution prevention plans and the requirement that they develop structural and non-structural control systems

b. Homeowners, landscapers and property managers

1) Use of low or no phosphorus fertilizers, alternatives to fertilizers, alternative landscaping requiring no fertilizers
2) Landscape designs to reduce runoff and pollutant loadings
3) Car washing alternatives with the objective of eliminating phosphorus detergent discharges
4) Yard care techniques that protect water quality
5) Management practices for use and storage of pesticides and fertilizers
6) Management practices for carpet cleaning and auto repair and maintenance
7) Runoff Reduction techniques, including site design, on-site retention, pervious paving, retention of forests and mature trees
8) Stormwater pond maintenance

c. Engineers, contractors, developers, review staff and land use planners

1) Technical standards for construction site sediment and erosion control
2) Runoff Reduction techniques, including site design, on-site reduction, pervious pavement, alternative parking lot design, retention of forests and mature trees
3) Stormwater treatment and flow control controls
4) Impacts of increased stormwater flows into receiving water bodies

4.9.2 Measurement of Impacts.

The permittee shall continue to measure the understanding and adoption of selected targeted behaviors among the targeted audiences. The resulting measurements shall be used to direct education and outreach resources most effectively, as well as to evaluate changes in adoption of the targeted behaviors.

4.9.3 Recordkeeping.

The permittee shall track and maintain records of public education and outreach activities.

4.9.4 Public Involvement and Participation.

The permittee shall continue to include ongoing opportunities for public involvement through advisory councils, watershed associations and/or committees, participation in developing updates to the stormwater fee system, stewardship programs, environmental activities or other similar activities. The permittee shall facilitate opportunities for direct action, educational, and volunteer programs such as riparian planting, volunteer monitoring programs, storm drain marking or stream clean up programs.

4.9.4.1 The permittee shall continue to create opportunities for the public to participate in the decision making processes involving the implementation and update of the permittee's SWMP. The permittee shall continue to implement its process for consideration of public comments on their SWMP.

4.9.4.2 The permittee shall continue to establish a method of routine communication to groups such as watershed associations and environmental organizations that are located in the same watershed(s) as the permittee, or organizations that conduct environmental stewardship projects located in the same watershed(s) or in close proximity to the permittee. This is to make these groups aware of opportunities for their direct involvement and assistance in stormwater activities that are in their watershed.

4.9.4.3 The permittee shall make all draft and approved MS4 documents required under this permit available to the public for comment. The current draft and approved SWMP and the MS4 annual reports deliverable documents required under this permit shall be posted on the permittee's website.

4.9.4.4 The permittee shall continue to develop public educational and participation materials in cooperation and coordination with other agencies and organizations in the District with similar responsibilities and objectives. Progress reports on public education shall be included in the Annual Report. An explanation shall be provided as to how this effort will reduce pollution loadings to meet the requirements of this permit.

4.9.4.5 The permittee shall periodically, and at least annually, update its website.

4.10 Total Maximum Daily Load (TMDL) Wasteload Allocation (WLA) Planning and Implementation

4.10.1 Anacostia River Watershed Trash TMDL Implementation

The permittee shall attain removal of 103,188 pounds of trash annually, as determined in the Anacostia River Watershed Trash TMDL, as a specific single-year measure by the fifth year of this permit term.

Reductions must be made through a combination of the following approaches:

1. Direct removal from waterbodies, e.g., stream clean-ups, skimmers
2. Direct removal from the MS4, e.g., catch basin clean-out, trash racks

3. Direct removal prior to entry to the MS4, e.g., street sweeping
4. Prevention through additional disposal alternatives, e.g., public trash/recycling collection
5. Prevention through waste reduction practices, regulations and/or incentives, e.g., bag fees

At the end of the first year the permittee must submit the trash reduction calculation methodology with Annual Report to EPA for review and approval. The methodology should accurately account for trash prevention/removal methods beyond those already established when the TMDL was approved, which may mean crediting a percentage of certain approaches. The calculation methodology must be consistent with assumptions for weights and other characteristics of trash, as described in the 2010 Anacostia River Watershed Trash TMDL.

Annual reports must include the trash prevention/removal approaches utilized, as well as the overall total weight (in pounds) of trash captured for each type of approach.

The requirements of this Section, and related elements as appropriate, shall be included in the Consolidated TMDL Implementation Plan (Section 4.10.3).

4.10.2 Hickey Run TMDL Implementation

The permittee shall implement and complete the proposed replacement/rehabilitation, inspection and enforcement, and public education aspects of the strategy for Hickey Run as described in the updated Plan to satisfy the requirements of the oil and grease wasteload allocations for Hickey Run. If monitoring or other assessment determine it to be necessary, the permittee shall install or implement appropriate controls to address oil & grease in Hickey Run no later than the end of this permit term. As appropriate, any requirement of this Section not completed prior to finalization of the Consolidated TMDL Implementation Plan (Section 4.10.3) shall be included in that Plan.

4.10.3 Consolidated TMDL Implementation Plan

For all TMDL wasteload allocations assigned to District MS4 discharges, the District shall develop, public notice and submit to EPA for review and approval a consolidated TMDL Implementation Plan within 2 years of the effective date of this permit. This Plan shall include, at a minimum, the following TMDLs and any subsequent updates:

1. TMDL for Biochemical Oxygen Demand (BOD) in the Upper and Lower Anacostia River (2001)
2. TMDL for Total Suspended Solids (TSS) in the Upper and Lower Anacostia River (2002)
3. TMDL for Fecal Coliform Bacteria in the Upper and Lower Anacostia River (2003)
4. TMDL for Organics and Metals in the Anacostia River and Tributaries (2003)
5. TMDL for Fecal Coliform Bacteria in Kingman Lake (2003)
6. TMDL for Total Suspended Solids, Oil and Grease and Biochemical Oxygen Demand in Kingman Lake (2003)

7. TMDL for Fecal Coliform Bacteria in Rock Creek (2004)
8. TMDL for Organics and Metals in the Tributaries to Rock Creek (2004)
9. TMDL for Fecal Coliform Bacteria in the Upper, Middle and Lower Potomac River and Tributaries (2004)
10. TMDL for Organics, Metals and Bacteria in Oxon Run (2004)
11. TMDL for Organics in the Tidal Basin and Washington Ship Channel (2004)
12. TMDL for Sediment/Total Suspended Solids for the Anacostia River Basin in Maryland and the District (2007) [pending resolution of court vacature, Anacostia Riverkeeper, Inc. v. Jackson, No. 09-cv-97 (RCL)]
13. TMDL for PCBs for Tidal Portions of the Potomac and Anacostia Rivers in the District of Columbia, Maryland and Virginia (2007)
14. TMDL for Nutrients/Biochemical Oxygen Demand for the Anacostia River Basin in Maryland and the District (2008)
15. TMDL for Trash for the Anacostia River Watershed, Montgomery and Prince George's Counties, Maryland and the District of Columbia (2010)
16. TMDL for Nitrogen, Phosphorus and Sediment for the Chesapeake Bay Watershed (2010)

This Plan shall place particular emphasis on the pollutants in Table 4, but shall also evaluate other pollutants of concern for which relevant WLAs exist. The District shall fully implement the Plan upon EPA approval. This Plan shall preempt any existing TMDL implementation plans for the relevant WLAs. For any new or revised TMDL approved during the permit term with wasteload allocations assigned to District MS4 discharges, the District shall update this Plan within six months and include a description of revisions in the next regularly scheduled annual report. The Plan shall include:

1. A specified schedule for compliance with each TMDL that includes numeric benchmarks that specify annual pollutant load reductions and the extent of control actions to achieve these numeric benchmarks.
2. Interim numeric milestones for TMDLs where final attainment of applicable waste load allocations requires more than one permit cycle. These milestones shall originate with the third year of this permit term and every five years thereafter.
3. Demonstration using modeling of how each applicable WLA will be attained using the chosen controls, by the date for ultimate attainment.
4. The Consolidated TMDL Implementation Plan elements required in this section will become enforceable permit terms upon approval of such Plans, including the interim and final dates in this section for attainment of applicable WLAs.
5. Where data demonstrate that existing TMDLs are no longer appropriate or accurate, the Plan shall include recommended solutions, including, if appropriate, revising or withdrawing TMDLs.

4.10.4 Adjustments to TMDL Implementation Strategies

If evaluation data, as outlined in the monitoring strategy being developed per Part 5.1, indicate insufficient progress towards attaining any WLA covered in 4.10.1, 4.10.2 or 4.10.3, the

permittee shall adjust its management programs within 6 months to address the deficiencies, and document the modifications in the Consolidated TMDL Implementation Plan. The Plan modification shall include a reasonable assurance demonstration of the additional controls to achieve the necessary reductions. Annual reports must include a description of progress as evaluated against all implementation objectives, milestones and benchmarks, as relevant, outlined in Part 4.10.

4.11 Additional Pollutant Sources

For any additional pollutant sources not addressed in sections 4.1 through 4.9, the permittee shall continue to compile pertinent information on known or potential pollution sources, including significant changes in:

1. land use activities,
2. population estimates,
3. runoff characteristics,
4. major structural controls,
5. landfills,
6. publicly owned lands, and
7. industries impacting the MS4.

For purposes of this section, "significant changes" are changes that have the potential to revise, enhance, modify or otherwise affect the physical, legal, institutional, or administrative characteristics of the above-listed potential pollution sources. This information shall be submitted in each of the Annual Reports submitted to EPA pursuant to the procedures in Part 6.2 herein. For the Stormwater Model, analysis of data for these pollution sources shall be reported according to Part 7 herein.

The permittee shall implement controls to minimize and prevent discharges of pollutants from additional pollutant sources, including but not limited to Bacteria (*E. coli*), Total Nitrogen, Total Phosphorus, Total Suspended Solids, Cadmium, Copper, Lead, Zinc, and Trash, to receiving waters. Controls shall be designed to prevent and restrict priority pollutants from coming into contact with stormwater, *e.g.*, restricting the use of lawn fertilizers rather than end-of-pipe treatment. These strategies shall include program priorities and a schedule of activities to address those priorities and an outline of which agencies will be responsible for implementing those strategies. The strategies used to reduce or eliminate these pollutants shall be documented in updates to the Stormwater Management Program Plan.

5. MONITORING AND ASSESSMENT OF CONTROLS

5.1 Revised monitoring program

5.1.1 Design of the Revised Monitoring Program

Within two years of the effective date of this permit the District shall develop, public notice and submit to EPA for review and approval a revised monitoring program. The District shall fully implement the program upon EPA approval. The revised monitoring program shall meet the following objectives:

1. Make wet weather loading estimates of the parameters in Table 4 from the MS4 to receiving waters. Number of samples, sampling frequencies and number and locations of sampling stations must be adequate to ensure data are statistically significant and interpretable.

2. Evaluate the health of the receiving waters, to include biological and physical indicators such as macroinvertebrates and geomorphologic factors. Number of samples, frequencies and locations must be adequate to ensure data are statistically significant and interpretable for long-term trend purposes (not variation among individual years or seasons).

3. Include any additional necessary monitoring for purposes of source identification and wasteload allocation tracking. This strategy must align with the Consolidated TMDL Implementation Plan required in Part 4.10.3 For all pollutants in Table 4 monitoring must be adequate to determine if relevant WLAs are being attained within specified timeframes in order to make modifications to relevant management programs, as necessary.

Table 4
Monitoring Parameters

Parameter
E. coli
Total nitrogen
Total phosphorus
Total Suspended Solids
Cadmium
Copper
Lead
Zinc
Trash

4. All chemical analyses shall be performed in accordance with analytical methods approved under 40 C.F.R. Part 136. When there is not an approved analytical method, the applicant may use any suitable method as described in Section 5.7 herein, but must provide a description of the method.

5.1.2 Utilization of the Revised Monitoring Program

The permittee must use the information to evaluate the quality of the stormwater program and the health of the receiving waters at a minimum to include:

1. The permittee shall estimate annual cumulative pollutant loadings for pollutants listed in Table 4. Pollutant loadings and, as appropriate, event mean concentrations, will be reported in DMRs and annual reports on TMDL implementation for pollutants listed in Table 4 in discharges from the monitoring stations in Table 5.

2. The permittee shall perform the following activities at least once during the permit term, but no later than the fourth year of this permit:

   a. Identify and prioritize additional efforts needed to address water quality exceedances, and receiving stream impairments and threats;

   b. Identify water quality improvements or degradation

Upon approval of the Revised Monitoring Program by EPA Region III, or 2 years from the effective date of this permit, whichever comes first, the permittee shall begin implementation of the Revised Monitoring Program.

5.2 Interim Monitoring

Until such time as EPA has approved the Revised Monitoring Program, the permittee shall implement the following monitoring program:

5.2.1 Wet Weather Discharge Monitoring

The permittee shall monitor for the parameters identified in Table 4 herein, at the locations listed in Table 5 herein. Monitoring frequency for chemical/physical parameters shall be taken by at least three times per year at a minimum. This does not include a geomorphologic assessment and/or physical habitat assessment. The permittee shall conduct sampling as provided in 40 C.F.R. § 122.21(g)(7).

The permittee shall monitor and provide an annual Discharge Monitoring Report for the period of interim monitoring.

TABLE 5
Monitoring Stations

A. Anacostia River Sub Watershed Monitoring Sites
1. Gallatin Street & 14th Street N.E. across from the intersection of 14th St. and Gallatin St. in

an outfall (MS-2)
2. Anacostia High School/Anacostia Recreation Center – Corner of 17th St and Minnesota Ave SE
B. Rock Creek Subwatershed Monitoring Sites
1. Walter Reed -- Fort Stevens Drive -- 16th Street and Fort Stevens Road, N.W. at an outfall (MS-6)
2. Soapstone Creek -- Connecticut Avenue and Ablemarle Street N.W. at an outfall (MS-5)
C. Potomac River Subwatershed Monitoring Sites
1. Battery Kemble Creek-49th and Hawthorne Streets, N.W. at an outfall (MS-4)
2. Oxon Run-Mississippi Avenue and 15th Street, S.E. into Oxon Run via an outfall (MS-1)

The District may revise this list of sites in accordance with its revised monitoring program in Section 5.1 herein. Otherwise, changes to the above MS4 monitoring stations and/or sites for any reason shall be considered a major modification to the permit subject to the reopener clause.

During the interim monitoring period for the pollutants listed in Table 4, demonstration of compliance will be calculated using the procedures identified in the SWMP, the approved Anacostia River TMDL Implementation Plan, and/or other appropriate modeling tools and data on management practices efficiencies. The annual report will provide all monitoring data, and a brief synthesis of whether the data indicate that relevant wasteload allocations and other relevant targets are being achieved.

5.2.2 Storm Event Data

In addition to the parameters listed above, the permittee shall continue to maintain records of the date and duration (in hours) of the storm events sampled; rainfall measurements or estimates (in inches) of the storm event which generated the sampled runoff; the duration (in hours) between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event; and a calculated flow estimate of the total volume (in gallons) and nature of the discharge sampled.

5.2.3 Sample Type, Collection, and Analysis

The following requirements apply only to samples collected for Part 5.2.1, Representative Monitoring.

1. For discharges from holding ponds or other impoundments with a retention period greater than 24 hours, (estimated by dividing the volume of the detention pond by the estimated volume of water discharged during the 24 hours previous to the time that the sample is collected) a minimum of one sample shall be taken for pollutants listed in Table 4 including temperature, DO, pH and specific conductivity. For all parameters, data shall be reported for the entire event of the discharge pursuant to 40 C.F.R. § 122.26(d)(2)(iii).

2. All such samples shall be collected from the discharge resulting from a storm event that is greater than 0.1 inches in magnitude and that occurs at least 72 hours from the previously measurable (greater than 0.1 inch rainfall) storm event. Samples may be taken with a continuous sampler or as a combination of a minimum of three sample aliquots taken in each hour of discharge for the entire discharge, with each aliquot being separated by a minimum period of fifteen minutes.

3. Analysis and collection of samples shall be done in accordance with the most recent EPA approved laboratory methods and procedures specified at 40 C.F.R. Part 136 and its subsequent amendments.

5.2.4 Sampling Waiver

When a discharger is unable to collect samples due to adverse climatic conditions, the discharger must submit in lieu of sampling data a description of why samples could not be collected, including available documentation of the event.

Adverse climatic conditions which may prohibit the collection of samples includes weather conditions that create dangerous conditions for personnel (such as local flooding, high winds, hurricane, tornadoes, electrical storms, etc.).

5.3 Dry Weather Monitoring

5.3.1 Dry Weather Screening Program

The permittee shall continue with ongoing efforts to detect the presence of illicit connections and improper discharges to the MS4 pursuant to the District SWMP. The permittee shall perform the following: (1) continue to screen known problem sewersheds within the District based on past screening activities; (2) continue to inventory all MS4 outfalls in the District and inspect all outfalls by the end of the permit term; and (3) ensure that the dry weather screening program has addressed all watersheds within the permit term. The screening shall be sufficient to estimate the frequency and volume of dry weather discharges and their environmental impact.

5.3.2 Screening Procedures

Screening may be developed and/or modified based on experience gained during actual field screening activities. The permittee shall establish a protocol which requires screening to ensure that such procedures are occurring, but such protocol need not conform to the procedures published at 40 C.F.R. § 122.26(d)(1)(iv)(D). The permittee shall describe the protocol actually used in each Annual Report with a justification for its use. The procedures described in the SWMP shall be used as guidance.

5.3.3 Follow-up on Dry Weather Screening Results

The permittee shall continue to implement its enforcement program for locating and ensuring elimination of all suspected sources of illicit connections and improper disposal identified during dry weather screening activities. The permittee shall report the results of such implementation in each Annual Report.

5.4. Area and/or Source Identification Program

The permittee shall continue to implement a program to identify, investigate, and address areas and/or sources within its jurisdiction that may be contributing excessive levels of pollutants to the MS4 and receiving waters, including but not limited to those pollutants identified in Table 4 herein.

5.5 Flow Measurements

The permittee shall continue to select and use appropriate flow measurement devices and methods consistent with accepted scientific practices to ensure the accuracy and reliability of measurements of the volume of monitored discharges. The devices shall be installed, calibrated, and maintained to insure that the accuracy of the measurements is consistent with the accepted capability of that type of device.

5.6 Monitoring and Analysis Procedures

5.6.1 Monitoring must be conducted according to laboratory and test procedures approved under 40 C.F.R. Part 136 and subsequent amendments, unless other test procedures have been specified in the permit.

5.6.2 The permittee is authorized to use a more current or sensitive (i.e., lower) detection method than the one identified in 40 C.F.R. Part 136 exists for a particular parameter, including but not limited to PCBs (Method 1668B) and mercury (Method 1631E). If used, the permittee shall report using the more current and/or more sensitive method for compliance reporting and monitoring purposes.

5.6.3 EPA reserves the right to modify the permit in order to require a more sensitive method for measuring compliance with any pollutant contamination levels, consistent with 40 CFR, Part 136, should it become necessary.

5.7 Reporting of Monitoring Results

The permittee shall continue to report monitoring results annually in a Discharge Monitoring Report. If NetDMR (http://www.epa.gov/netdmr/) is unavailable to any of the following then the original and one copy of the Report are to be submitted at the following addresses:

NPDES Permits Branch
U.S. EPA Region III
(3WP41)
Water Protection Division
1650 Arch Street
Philadelphia, PA 19103-2029

National Marine Fisheries Service/Northeast Region
Protected Resource Division
55 Great Republic Drive
Gloucester, Massachusetts
01930-2276

Monitoring results obtained during the previous year shall be summarized and reported in the Annual Report.

5.8 Additional Monitoring by the Permittee

If the permittee monitors (for the purposes of this permit) any pollutant more frequently than required by this permit, using laboratory and test procedures approved under 40 C.F.R. Part 136 and subsequent amendments or as specified in this permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the annual Discharge Monitoring Report. Such frequency shall also be indicated.

5.9 Retention of Monitoring Information

The permittee shall continue to retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation for a period of at least five(5) years from the date of the sample, measurement or report. This period may be extended by request of EPA at any time.

5.10 Record Content

Records of monitoring information shall include:

1. The date, exact location, time and methods of sampling or measurements;
2. The individual(s) who performed the sampling or measurements;
3. The date(s) analyses were performed;
4. The individual(s) who performed the analyses;
5. The analytical techniques or methods used; and

6. The results of such analyses.

6. REPORTING REQUIREMENTS

The permittee shall comply with the reporting requirements identified in this section, including but not limited to the deliverables identified in Table 6 below.

TABLE 6
Reporting Requirements

Submittal	Deadline
Discharge Monitoring Report	Each year on the anniversary of the effective date of the permit (AEDOP)
Annual Report	Each year on the AEDOP.
MS4 Permit Application	Six months prior to the permit expiration date.

6.1 Discharge Monitoring Reports

The permittee shall provide discharge monitoring reports per Part 5.7 of this permit on the quality of stormwater discharges from the MS4 for all analytical chemical monitoring stipulated in Part 5 of this permit.

6.2 Annual Reporting

The permittee shall submit an Annual Report to EPA on or by the effective yearly date of the permit for the duration of the permitting cycle. At the same time the Annual Report it submitted to EPA it shall also be posted on the District's website at an easily accessible location. If the annual report is subsequently modified per EPA approval (part 6.2.3 of this permit) the updated report shall be posted on the District's website.

6.2.1 Annual Report.

The Annual Report shall follow the format of the permit as written, address each permit requirement, and also include the following elements:

a. A review of the status of program implementation and compliance (or non-compliance) with all provisions and schedules of compliance contained in this permit, including documentation as to compliance with performance standards and other provisions and deliverables contained in Section 4 herein;
b. A review of monitoring data and any trends in estimated cumulative annual pollutant loadings, including TMDL WLAs and TMDL implementation activities;

c. An assessment of the effectiveness of controls established by the SWMP;

d. An assessment of the projected cost of SWMP implementation for the upcoming year (or longer) and a description of the permittee's budget for existing stormwater programs, including: (i) an overview of the permittee's financial resources and budget, (ii) overall indebtedness and assets, (iii) sources for funds for stormwater programs; and (iv) a demonstration of adequate fiscal capacity to meet the requirements of this permit, subject to the (a) the federal Anti-Deficiency Act, 31 U.S.C. §§ 1341, 1342, 1349, 1351, (b) the District of Columbia Anti-Deficiency Act, D.C. Official Code §§ 47-355.01-355.08 (2001), (c) D.C. Official Code § 47-105 (2001), and (d) D.C. Official Code § 1-204.46 (2006 Supp.), as the foregoing statutes may be amended from time to time;

e. A summary describing the number and nature of enforcement actions, inspections, and public education programs and installation of control systems;

f. Identification of water quality improvements or degradation through application of a measurable performance standard as stated throughout this permit;

g. Results of storm and water quality modeling and its use in planning installation of control systems and maintenance and other activities;

h. An assessment of any SWMP modifications needed to meet the requirements of this permit;

i. Revisions, if necessary, to the assessments of controls and the fiscal analysis reported in the permit application under 40 C.F.R. § 122.26(d)(2)(iv) and (v);

j. Methodology to assess the effects of the Stormwater Management Program (SWMP);

k. Annual expenditures and budget for the year following each annual report;

l. A summary of commitments for the next year and evaluation of the commitments from the previous year;

m. A summary of the monitoring data for stormwater and ambient sampling that is collected in the previous year and the plan, including identification of monitoring locations, to collect additional data for the next year;

n. The amount of impervious cover within the District, and within the three major watersheds in the District (Anacostia, Potomac and Rock Creek);

o. The percentage of effective impervious cover reduced annually, including but not limited to the number and square footage of green roofs installed in the District, including the square footage of drainage managed by practices that meet the performance standard in 4.1.1; and

p. An analysis of the work to be performed in the next successive year, including performance measures for those tasks. In the following year, progress with those performance measures shall be part of the Annual Report. The basis for each of the performance standards, which will be used as tools for evaluating environmental results and determining the success of each MS4 activity, shall be described incorporating an integrated program approach that considers all programs and projects which have a direct as well as an indirect affect on stormwater management quantity and quality within the District. The report shall also provide an update of the fiscal analysis for each year of the permit as required by 40 C.F.R. § 122.26(d)(2)(vi).

6.2.2 Annual Report Meeting

Within 12 months of the effective date of this permit the District shall convene an annual report meeting with EPA to present annual progress and plans for the following year. In conjunction with this meeting the annual written report may consist of presentation materials summarizing all required elements of the annual report rather than a lengthy written report, as long as all required elements are included. Following this first annual reporting meeting EPA and the District shall determine if the meeting and associated presentation materials constitute an effective reporting mechanism. With the agreement of both EPA and the District the annual reporting meeting and the use of summarized presentation materials in lieu of a lengthy written report may be extended for the remainder of the permit term.

6.2.3 Annual Report Revisions

Each Annual Report may be revised with written approval by EPA. The revised Report will become effective after its approval.

6.2.4 Signature and Certification

The permittee shall sign and certify the Annual Report in accordance with 40 C.F.R §122.22(b), and include a statement or resolution that the permittee's governing body or agency (or delegated representative) has reviewed or been appraised of the content of such submissions. The permittee shall provide a description of the procedure used to meet the above requirement.

6.2.5 EPA Approval

In reviewing any submittal identified in Table 1 or 6, EPA may approve or disapprove each submittal. If EPA disapproves any submittal, EPA shall provide comments to the permittee. The permittee shall address such comments in writing within thirty (30) days of receipt of the disapproval from EPA. If EPA determines that the permittee has not adequately addressed the disapproval/comments, EPA may revise that submittal or portions of that submittal. Such revision by EPA is effective thirty (30) days from receipt by the permittee. Once approved by EPA, or in the event of EPA disapproval, as revised by EPA, each submission shall be an enforceable element of this permit.

6.3 MS4 Permit Application

The permittee develop a permit Application based on the findings presented in each of the Annual SWMP Reports submitted during the permitting cycle to be submitted six months prior to the expiration date of the permit. The permit application shall define the next iterative set of objectives for the program and provide an analysis to demonstrate that these objectives will be achieved in the subsequent permit term.

7. STORMWATER MODEL

The permittee shall continue to update and report all progress made in developing a Stormwater Model and Geographical Information System (GIS) to EPA on an annual basis as an attachment to each Annual Report required herein.

On an annual basis, the permittee shall report on pollutant load reductions throughout the area covered by this permit using the statistical model developed by DDOE or other appropriate model. In the annual update, the permittee shall include, at a minimum, other applicable components which are not only limited to those activities identified in Section 6 herein, but which are necessary to demonstrate the effectiveness of the permittee's Stormwater Management Program toward implementing a sustainable strategy for reducing stormwater pollution runoff to the impaired waters of the District of Columbia.

Assess performance of stormwater on-site retention projects through monitoring, modeling and/or estimating storm retention capacity to determine the volume of stormwater removed from the MS4 in a typical year of rainfall as a result of implementing stormwater controls. This provision does not require all practices to be individually monitored, only that a reasonable evaluation strategy must provide estimates of overall volume reductions by sewershed.

8. STANDARD PERMIT CONDITIONS FOR NPDES PERMITS

8.1 Duty to Comply

The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act and may result in an enforcement action; permit termination, revocation and reissuance, or modification; and denial of a permit renewal application.

8.2 Inspection and Entry

The permittee shall allow EPA, or an authorized representative, and/or the District's contractor(s)/subcontractor(s), upon the presentation of credentials and other documents as may be required by law, to:

1. Enter upon the permittee's premises at reasonable times where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;

2. Have access to and copy, at reasonable times, any records that must be maintained under the conditions of this permit;

3. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), processes, or operations regulated or required under this permit; and

4. Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the Clean Water Act, any substances or parameters at any location.

8.3 Civil and Criminal Penalties for Violations of Permit Conditions

Nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance.

The Clean Water Act provides that any person who violates Sections 301, 302, 306, 307, 308, 318, or 405 of the Clean Water Act, or any permit condition or limitation implementing such section, or any requirement imposed in an approved pretreatment program and any person who violates any Order issued by EPA under Section 301(a) of the Act, shall be subject to a civil penalty not to exceed $25,000 per day for each violation, Pursuant to the Civil Monetary Penalty Inflation Adjustment Rule, EPA has raised the statutory maximum penalty for such violations to $37,500 per day for each such violation. 74 Fed. Reg. 626 (Jan. 7, 2009). The Clean Water Act also provides for an action for appropriate relief including a permanent or temporary injunction.

Any person who negligently violates Section 301, 302, 305, 307, 308, 318, or 405 of the Clean Water Act, any permit condition or limitation implementation any such section, shall be punished by a criminal fine of not less than $5,000 nor more than $50,000 per day of such violation, or by imprisonment for not more than 3 years, or by both. Any person who knowingly violates any permit condition or limitation implementing Section 301, 302, 305, 307, 308, 318, or 405 of the Clean Water Act, and who knows at the time that he thereby places another person in imminent danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of not more than $250,000, or by imprisonment of not more than 15 years, or by both.

8.4 Duty to Mitigate

The permittee shall take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this permit.

In the event that the permittee or permitting authority determines that discharges are causing or contributing to a violation of applicable WQS, the permittee shall take corrective action to eliminate the WQS exceedance or correct the issues and/or problems by requiring the party or parties responsible for the alleged violation(s) comply with Part I.C.1 (Limitations to Coverage) of this permit. The methods used to correct the WQS exceedances shall be documented in subsequent annual reports and in revisions to the Stormwater Management Program Plan.

8.5 Permit Actions

This permit may be modified, revoked and reissued, or terminated for cause including, but not limited to, the following:

1. Violation of any terms or conditions of this permit;

2. Obtaining this permit by misrepresentation or failure to disclose fully all relevant facts;

3. A change in any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge;

4. Information newly acquired by the Agency, including but not limited to the results of the studies, planning, or monitoring described and/or required by this permit;

5. Material and substantial facility modifications, additions, and/or expansions;

6. Any anticipated change in the facility discharge, including any new significant industrial discharge or changes in the quantity or quality of existing industrial discharges that will result in new or increased discharges of pollutants; or

7. A determination that the permitted activity endangers human health or the environment and that it can only be regulated to acceptable levels by permit modification or termination.

The effluent limitations expressed in this permit are based on compliance with the District of Columbia's water quality standards in accordance with the Clean Water Act. In the event of a revision of the District of Columbia's water quality standards, this document may be modified by EPA to reflect this revision.

The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition. When a permit is modified, only conditions subject to modification are reopened.

8.6 Retention of Records

The permittee shall continue to retain records of all documents pertinent to this permit not otherwise required herein, including but not limited copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five (5) years from the expiration date of this permit. This period may be extended by request of EPA at any time.

8.7 Signatory Requirements

All Discharge Monitoring Reports, plans, annual reports, certifications or information either submitted to EPA or that this permit requires be maintained by the permittee shall be signed by either a principal executive officer or ranking elected official, or a duly authorized representative of that person. A person is a duly authorized representative only if: (i) the

authorization is made in writing by a person described above and submitted to EPA; and (ii) the authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of manager, operator, superintendent, or position of equivalent responsibility or an individual or position having overall responsibility for environmental matters for an agency. (A duly authorized representative may thus be either a named individual or any individual occupying a named position).

If an authorization is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new notice satisfying the requirements of this paragraph must be submitted to EPA prior or together with any reports, information, or applications to be signed by an authorized representative.

8.8 Oil and Hazardous Substance Liability

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under Section 311 of the Act, 33 U.S.C. § 1321.

8.9 District Laws, Regulations and Ordinances

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable District law, regulation or ordinance identified in the SWMP. In the case of "exemptions and waivers" under District law, regulation or ordinance, Federal law and regulation shall be controlling.

8.10 Property Rights

The issuance of this permit does not convey any property rights of any sort, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations.

8.11 Severability

The provisions of this permit are severable, and if any provisions of this permit, or the application of any provision of this permit to any circumstances is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

8.12 Transfer of Permit

In the event of any change in ownership or control of facilities from which the authorized discharge emanates, the permit may be transferred to another person if:

1. The current permittee notifies the EPA, in writing of the proposed transfer at least 30 days in advance of the proposed transfer date;

2. The notice includes a written agreement between the existing and new permittee containing a specific date for transfer of permit responsibility, coverage, and liability between them; and

3. The EPA does not notify the current permittee and the new permittee of intent to modify, revoke and reissue, or terminate the permit and require that a new application be submitted.

8.13 Construction Authorization

This permit does not authorize or approve the construction of any onshore or offshore physical structures or facilities or the undertaking of any work in any navigable waters.

8.14 Historic Preservation

During the design stage of any project by the Government of the District of Columbia within the scope of this permit that may include ground disturbance, new and existing or retrofit construction, or demolition of a structure, the Government of the District of Columbia shall notify the Historic Preservation liaison and provide the liaison planning documents for the proposed undertaking. The documents shall include project location; scope of work or conditions; photograph of the area/areas to be impacted and the methods and techniques for accomplishing the undertaking. Depending on the complexity of the undertaking, sketches, plans and specifications shall also be submitted for review. The documentation will enable the liaison to assess the applicability of compliance procedures associated with Section 106 of the National Historic Preservation Act. Among the steps in the process are included:

1. The determination of the presence or absence of significant historic properties (architectural, historic or prehistoric). This can include the evaluation of standing structures and the determination of the need for an archaeological survey of the project area.

2. The evaluation of these properties in terms of their eligibility for nomination to the National Register of Historic Places.

3. The determination of the effect that the proposed undertaking will have on these properties.

4. The development of mitigating measures in conjunction with any anticipated effects.

All such evaluations and determinations will be presented to the Government of the District of Columbia for its concurrence.

If an alternate Historic Preservation procedure is approved by EPA in writing during the term of this permit, the alternate procedure will become effective after its approval.

8.15 Endangered Species

The U.S. Fish and Wildlife Service (FWS) has indicated that Hay's Spring Amphipod, a Federally listed endangered species, occurs at several locations in the District of Columbia. The National Oceanic and Atmospheric Administration National Marine Fisheries Service (NOAA Fisheries) has indicated that the endangered shortnose sturgeon occurs in the Potomac River drainage and may occur within the District of Columbia. The FWS and NOAA Fisheries indicate that at the present time there is no evidence that the ongoing stormwater discharges covered by this permit are adversely affecting these Federally-listed species. Stormwater discharges, construction, or any other activity that adversely affects a Federally-listed endangered or threatened species are not authorized under the terms and conditions of this permit.

The monitoring required by this permit will allow further evaluation of potential effects on these threatened and endangered species once monitoring data has been collected and analyzed. EPA requires that the permittee submit to NOAA Fisheries, at the same time it submits to EPA, the Annual Outfall Discharge Monitoring Report of the monitoring data which will be used by EPA and NOAA Fisheries to further assess effects on endangered or threatened species. If this data indicates that it is appropriate, requirements of this NPDES permit may be modified to prevent adverse impacts on habitats of endangered and threatened species.

The above-referenced Report of monitoring data is required under this permit to be sent on an annual basis to:

The United States Environmental Protection Agency
Region III (3WP41)
Water Protection Division
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

National Marine Fisheries Service/Northeast Region
Protected Resource Division
55 Great Republic Drive
Gloucester, Massachusetts 01930-2276

8.16 Toxic Pollutants

If a toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is established under section 307(a) of the Act, 33 U.S.C. § 1317(a), for a toxic pollutant which is present in the discharge and such standard or prohibition is more stringent than any limitation for such pollutant in this permit, the permittee shall comply with such standard or prohibition even if the permit has not yet been modified to comply with the requirement.

8.17 Bypass

8.17.1 Bypass not exceeding limitations. In accordance with 40 C.F.R. § 122.41(m), the permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation.

8.17.2 Notice

1. Anticipated bypass. If the permittee knows in advance of the need for a bypass, it must submit prior notice at least ten days before the date of the bypass. See 40 C.F.R. § 122.41(m)(3)(i).

2. Unanticipated bypass. The permittee must submit notice of an unanticipated bypass as required by 40 C.F.R. § 122.41(l)6) (24-hour notice). See 40 C.F.R. § 122.41(m)(3)(ii).

8.17.3 Prohibition of bypass. See 40 C.F.R. § 122.41(m)(4).

1. Bypass is prohibited, and EPA may take enforcement action against the permittee for bypass, unless:

    a. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage as defined herein;

    b. There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and

    c. The permittee submitted notices as required herein.

2. EPA may approve an anticipated bypass, after considering its adverse effects, if EPA determines that it will meet the three conditions listed above.

8.18 <u>Upset</u>

Effect of an upset: An upset constitutes an affirmative defense to an action brought for noncompliance with such technology-based permit effluent limitations if the requirements of 40 C.F.R. § 122.41(n) are met.

8.19 <u>Reopener Clause for Permits</u>

The permit may be modified or revoked and reissued, including but not limited to, any of the following reasons:

1. To incorporate any applicable effluent standard or limitation issued or approved under Sections 301, 304, or 307 of the Clean Water Act, and any other applicable provision, such as provided for in the Chesapeake Bay Agreements based on water quality considerations, and if the effluent standard or limitation so issued or approved:

    a. Contains different conditions or is otherwise more stringent than any effluent limitation in the permit; or

    b. Controls any pollutant not limited in the permit. The permit, as modified or reissued under this paragraph, shall also contain any other requirements of the Act then applicable; or

2. To incorporate additional controls that are necessary to ensure that the permit effluent limits are consistent with any applicable TMDL WLA allocated to the discharge of pollutants from the MS4; or

3. As specified in 40 C.F.R. §§ 122.44(c), 122.62, 122.63, 122.64, and 124.5.

8.20 Duty to Reapply

If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, it must apply for and obtain a new permit. The application shall be submitted at least 180 days before the expiration date of this permit. EPA may grant permission to submit an application less than 180 days in advance but no longer than the permit expiration date. In the event that a timely and complete reapplication has been submitted and EPA is unable through no fault of he permittee, to issue a new permit before the expiration date of this permit, the terms and conditions of this permit are automatically continued and remain fully effective and enforceable.

9. PERMIT DEFINITIONS

Terms that are not defined herein shall have the meaning accorded them under section 502 of the Clean Water Act, 33 U.S.C. §§ 1251 *et seq.*, or its implementing regulations, 40 C.F.R. Part 122.

"Annual Report" refers to the consolidated Annual Report that the permittee is required to submit annually.

"Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. See 40 C.F.R. § 122.41(m)(1)(i).

"CWA" means Clean Water Act (formerly referred to as the Federal Water Pollution Control Act or Federal Water Pollution Control Act Amendments of 1972) Pub.L. 92-500, as amended Pub. L. 95-217, Pub. L. 95-576, Pub. L. (6-483 and Pub. L. 97-117, 33 U.S.C. §§ 1251 *et seq.*

"Development" is the undertaking of any activity that disturbs a surface area greater than or equal to 5,000 square feet, including new development projects and redevelopment projects. For purposes of Parts 4.1.1 through 4.1.4 of the permit the requirements apply to discharges from sites for which design or construction commenced after 18 months from the effective date of this permit or as required by District of Columbia law, whichever is sooner. The District may exempt development projects receiving site plan approval prior to this date from these requirements.

"Director" means the Regional Administrator of USEPA Region 3 or an authorized representative.

"Discharge" for the purpose of this permit, unless indicated otherwise, refers to discharges from the Municipal Separate Storm Sewer System (MS4).

"Discharge Monitoring Report", "DMR" or "Outfall Discharge Monitoring Report" includes the monitoring and assessment of controls identified in Section 5 herein.

"EPA" means USEPA Region 3.

"Green Roof" is a low-maintenance roof system that stores rainwater where the water is taken up by plants and/or transpired into the air.

"Green Technology Practices" means stormwater management practices that are used to mimic pre-development site hydrology by using site design techniques that retain stormwater on-site through infiltration, evapotranspiration, harvest and use.

"Guidance" means assistance in achieving a particular outcome or objective.

"Illicit connection" means any man-made conveyance connecting an illicit discharge directly to a municipal separate storm sewer.

"Illicit discharge" means any discharge to a municipal separate storm sewer that is not composed entirely of stormwater except discharges pursuant to an NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer) and discharges resulting from fire fighting activities, pursuant to 40 C.F.R. § 122.26(b)(2).

"Impaired Water" (or "Water Quality Impaired Water" or "Water Quality Limited Segment"): A water is impaired for purposes of this permit if it has been identified by the District or EPA pursuant to Section 303(d) of the Clean Water Act as not meeting applicable State water quality standards (these waters are called "water quality limited segments" under 40 C.F.R. 30.2(j)). Impaired waters include both waters with approved or established TMDLs, and those for which a TMDL has not yet been approved or established.

"Landfill" means an area of land or an excavation in which wastes are placed for permanent disposal, and which is not a land application unit (i.e., an area where wastes are applied onto or incorporated into the soil surface [excluding manure spreading operations] for treatment or disposal), surface impoundment, injection well, or waste pile.

"Large or Medium municipal separate storm sewer system" means all municipal separate storm sewers that are either: (1) located in an incorporated place (city) with a population of 100,000 or more as determined by the latest Decennial Census by the Bureau of Census (these cities are listed in Appendices F and G of 40 C.F.R. Part 122); or (2) located in the counties with unincorporated urbanized populations of 100,000 or more, except municipal separate storm sewers that are located in the incorporated places, townships or towns within such counties (these counties are listed in Appendices H and I of 40 C.F.R. Part 122); or (3) owned or operated by a municipality other than those described in paragraph (i) or (ii) and that are designated by the Director as part of the large or medium municipal separate storm sewer system.

"MS4" refers to either a Large or Medium Municipal Separate Storm Sewer System.

"Municipal Separate Storm Sewer" means a conveyance, or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (1) owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State Law) having jurisdiction over disposal of sewage, industrial wastes, stormwater, or other wastes; (2) Designed or used to collect or convey stormwater (including storm drains, pipes, ditches, etc.); (3) not a combined sewer; and (4) not part of a Publicly-Owned Treatment Works as defined at 40 C.F.R. § 122.2.

"Offset" means a unit of measurement, either used as monetary or non-monetary compensation, as a substitute or replacement for mitigation of a stormwater control practice that has been determined to be impracticable to implement.

"Performance measure" means for purposes of this permit, a minimum set of criteria for evaluating progress toward meeting a standard of performance.

"Performance standard" means for purposes of this permit, a cumulative measure or provision for attainment of an outcome or objective.

"Permittee" refers to the Government of the District of Columbia and all subordinate District and independent agencies, such as the District of Columbia Water and Sewer Authority, directly accountable and responsible to the City Council and Mayor as authorized under the Stormwater Permit Compliance Amendment Act of 2000 and any subsequent amendments for administrating, coordinating, implementing, and managing stormwater for MS4 activities within the boundaries of the District of Columbia.

"Point Source" means any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other

floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural stormwater runoff.

"Pollutant of concern" means a pollutant in an MS4 discharge that may cause or contribute to the violation of a water quality criterion for that pollutant downstream from the discharge.

"Pre-Development Condition" means the combination of runoff, infiltration and evapotranspiration rates, volumes, durations and temperatures that typically existed on the site with natural soils and vegetation before human-induced land disturbance occurred. In the context of requirements in this permit the environmental objective is a stable, natural hydrologic site condition that protects or restores to the degree relevant for that site, stable hydrology in the receiving water, which will not necessarily be the hydrologic regime of that receiving water prior to any human disturbance in the watershed.

"Retention" means the use of soils, vegetation, water harvesting and other mechanisms and practices to retain a target volume of stormwater on a given site through the functions of: pore space and surface ponding storage; infiltration; reuse, and/or evapotranspiration.

"Retrofit" means improvement in a previously developed area that results in reduced stormwater discharge volumes and pollutant loads and/or improvement in water quality over current conditions.

"Stormwater" means the flow of surface water which results from, and which occurs immediately following, a rainfall event, snow melt runoff, and surface runoff and drainage.

"Stormwater management" means (1) for quantitative control, a system of vegetative or structural measures, or both, which reduces the increased volume and rate of surface runoff caused by man-made changes to the land; and (2) for qualitative control, a system of vegetative, structural, and other measures which reduce or eliminate pollutants which might otherwise be carried by surface runoff.

"SWMP" is an acronym for Stormwater Management Program. For purposes of this permit, the term includes all stormwater activities described in the District's SWMP Plan updated February 19, 2009, or any subsequent update, and all other strategies, plans, documents, reports, studies, agreements and related correspondences developed and used pursuant to the requirements of this permit.

"Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production. See 40 C.F.R. § 122.41(m)(1)(ii).

"Total Maximum Daily Load (TMDL) Units" means for purposes of this permit, the sum of individual waste load allocations (WLAs) and natural background. Unless specifically permitted otherwise in an EPA-approved TMDL report covered under the permit, TMDLs are expressed in

terms of mass per time, toxicity or other appropriate measure such as pollutant pounds of a total average annual load.

"TMDL Implementation Plan" means for purposes of this permit, a plan and subsequent revisions/updates to that plan that are designed to demonstrate how to achieve compliance with applicable waste load allocations as set forth in the permit requirements described in Section 8.1.4.

"Stormwater Management Program (SWMP)" is a modified and improved SWMP based on the existing SWMP and on information in each of the Annual Reports/Discharge Monitoring Reports. The purpose of the SWMP is to describe the list of activities that need to be done to meet the requirements of the Clean Water Act, an explanation as to why these activities will meet the Clean Water Act requirements, and a schedule for those activities.

"Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond reasonable control. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. See 40 C.F.R. § 122.41(n)(1).

"Waste pile" means any non-containerized accumulation of solid, nonflowing waste.

"Water quality standards" refers to the District of Columbia's Surface and Ground Water Quality Standards codified at Code of District of Columbia Regulations §§ 21-1100 *et seq.*, which are effective on the date of issuance of the permit and any subsequent amendments which may be adopted during the life of this permit.

"Waters of the United States" is defined at 40 C.F.R. § 122.2.

FACT SHEET

National Pollutant Discharge Elimination System (NPDES)
Municipal Separate Storm Sewer System (MS4)
Permit No. DC0000221 (Government of the District of Columbia)

NPDES PERMIT NUMBER: DC0000221 (Reissuance)

FACILITY NAME AND MAILING ADDRESS:

Government of the District of Columbia
The John A. Wilson Building
1350 Pennsylvania Avenue, N.W.
Washington, D.C. 20004

MS4 ADMINISTRATOR NAME AND MAILING ADDRESS:

Director, District Department of the Environment
1200 First Street, N.E., 6th Floor
Washington, D.C. 20002

FACILITY LOCATION:

District of Columbia's Municipal Separate Storm Sewer System (MS4)

RECEIVING WATERS:

Potomac River, Anacostia River, Rock Creek, and Stream Segments Tributary
To Each Such Water Body

INTRODUCTION:

Today's action finalizes reissuance of the District of Columbia Municipal Separate Storm Sewer System (MS4) Permit. In the Final Permit EPA has continued to integrate the adaptive management approach with enhanced control measures to address the complex issues associated with urban stormwater runoff within the corporate boundaries of the District of Columbia, where stormwater discharges via the Municipal Separate Storm Sewer System (MS4).

Since the United States Environmental Protection Agency, Region III (EPA) issued the District of Columbia (the District) its first MS4 Permit in 2000, the Agency has responded to a number of legal challenges involving both that Permit (as well as amendments thereto) and the second-round MS4 Permit issued in 2004. For the better part of ten years, the Agency has worked with various parties in the litigation, including the District and two non-governmental organizations, Defenders of Wildlife and Friends of the Earth, to address the concerns of the various parties. The Agency has engaged in both litigation and negotiation, including formal

mediation.[1] These activities ultimately led to an enhanced stormwater management strategy in the District, consisting of measurable outputs for addressing the issues raised during the litigation and mediation process.

FACILITY BACKGROUND AND DESCRIPTION:

The Government of the District of Columbia owns and operates its own MS4, which discharges stormwater from various outfall locations throughout the District into its waterways.[2]

On April 21, 2010 EPA public noticed the Draft Permit. The Draft Fact Sheet published with that Draft Permit contains more extensive permit background information, and the reader is referred to that document for the history of the District of Columbia MS4 permit.

The public comment period closed on June 4, 2010. EPA received comments from 21 individual commenters and an additional 53 form letters. The Draft Permit, Draft Fact Sheet, and comments received on those documents are all available at: http://www.epa.gov/reg3wapd/npdes/draft_permits.html. The Final Permit reflects many of the comments received. EPA is simultaneously releasing a responsiveness summary responding to these comments.

ACTION TO BE TAKEN:

EPA is today reissuing the District of Columbia NPDES MS4 Permit. The Final Permit replaces the 2004 Permit, which expired on August 18, 2009 and has been administratively extended since that time. The Final Permit incorporates concepts and approaches developed from studies and pilot projects that were planned and implemented by the District under the 2000 and 2004 MS4 permits and modifying Letters of Agreement, and implements Total Maximum Daily Loads (TMDLs) that have been finalized since the prior permit was issued, including the Chesapeake Bay TMDL. A number of applicable measurable performance standards have been incorporated into the Final Permit. These and other changes between the 2004 Permit and today's Final Permit are reflected in a Comparison Document that is part of today's Permit issuance.

WATER QUALITY IN DISTRICT RECEIVING WATERS:

The District's *2008 Integrated Report to the Environmental Protection Agency and U.S. Congress Pursuant to Sections 305(b) and 303(d) Clean Water Act*[3] documents the serious water

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1 A procedural history of Permit appeals can be viewed at the EPA Environmental Appeals Board web: http://yosemite.epa.gov/oa/EAB_Web_Docket.nsf/77355bee1a56a5aa8525711400542d23/b5e5b68e89edabe98525714f00731c6f!OpenDocument&Highlight=2,municipal.

2 Portions of the District are served by a combined sanitary and storm sewer system. The discharges from the combined sewer system are not subject to the MS4 permit, but are covered under NPDES Permit No. xxxx issued to the District of Columbia Water and Sewer Authority.

3 District Department of the Environment, *The District of Columbia Water Quality Assessment, 2008 Integrated Report to the Environmental Protection Agency and U.S. Congress Pursuant to Sections 305(b) and 303(d) Clean Water Act* (hereinafter "2008 Integrated Report").

quality impairments in the surface waters in and around the District. A number of the relevant designated uses are not being met, *e.g.*, aquatic life, fish consumption, and full body contact, and there are a number of specific pollutants of concern that have been identified (for additional discussion on relevant TMDLs *see* Section 4.10 of this Final Fact Sheet).

Commenters on the Draft Permit expressed some frustration over very slow progress or even lack of progress after a decade of implementation of the MS4 program and even longer for other water quality programs. EPA appreciates this concern. Although the District's receiving waters are affected by a range of discharge sources, discharges from the MS4 are a significant contributor of pollutants and cause of stream degradation. EPA also recognizes, however, that stormwater management efforts that achieve a reversal of the ongoing degradation of water quality caused by urban stormwater discharges entail a long term, multi-faceted approach.

Consistent with the federal stormwater regulations for characterizing discharges from the MS4 (40 C.F.R. §122.26(d)(2)(iii)), the first two permit terms for the District's MS4 program required end-of-pipe monitoring to determine the type and severity of pollutants discharging via the system. The monitoring program was not designed to evaluate receiving water quality *per se*, therefore detection of trends or patterns was not reasonably possible. Today's Final Permit includes requirements for a Revised Monitoring Program, and one of the objectives for the program is to use a suite of approaches and indicators to evaluate and track water quality over the long-term (*see* discussion of Section 5.1 in this Final Fact Sheet).
There have been identified improvements in some areas. For example the *2008 Integrated Report* noted improvements in the diversity of submerged aquatic vegetation in the Potomac River, as well as improvements in fish species richness in Rock Creek. Biota metrics are often the best indicators of the integrity of any aquatic system.

EPA also notes that there are a variety of indirect measures indicative of improvement. The federal stormwater regulations foresaw the difficulty, especially in the near-term, of detecting measurable improvement in receiving waters, and relied instead on indirect measures, such as estimates of pollutant load reductions (40 C.F.R. §122.26(d)(2)(v)). The District documents these types of indirect measures in its annual reports, *e.g.*, tons of solids collected from catch basin clean-outs, amount of household hazardous waste collected, number of trees planted, square footage of green roofs installed, and many other measures of success.[4]

EPA believes that documenting trends in water quality, whether improvements, no change, or even further degradation, is an important element of a municipal water quality program. Today's Final Permit recognizes this principle, both in the types of robust measures required as well as the transition to new monitoring paradigms. EPA encourages all interested parties to provide the District with input during the development of these program elements.

THIS FACT SHEET:

(http://ddoe.dc.gov/ddoe/frames.asp?doc=/ddoe/lib/ddoe/information2/water.reg.leg/DC_IR_2008_Revised_9-9-2008.pdf

4 District MS4 Annual Reports can be found at: http://ddoe.dc.gov/ddoe/cwp/view,a,1209,q,495855.asp

This Final Fact Sheet is organized to correspond with the chronological organization and numbering in today's Final Permit. Where descriptions or discussions may be relevant to more than one element of the Final Permit the reader will be referred to the relevant section(s).

To keep today's Final Fact Sheet of readable length, many of the elements included in the fact sheet published with the Draft Permit (Draft Fact Sheet) on April 21, 2010 have not been repeated, but are referenced. Readers are referred to the Draft Fact Sheet published with the Draft Permit for additional discussion on provisions that have been finalized as proposed.[5] The Final Fact Sheet does discuss significant changes since the 2004 Permit (even if discussed in the Draft Fact Sheet). The Final Fact Sheet also contains additional explanation of the Final Permit where commenters requested additional clarification. In addition, this Final Fact Sheet explains modifications to the Final Permit where provisions were changed in response to comments.

In many cases EPA made a number of very simple modifications to the Final Permit, *e.g.*, a word, phrase, or minor reorganization, simply for purposes of clarification. These modifications were not intended to change the substance of the permit provisions, only to clarify them. Most of those types of edits are not discussed in this Final Fact Sheet, but EPA has provided a Comparison Document of the Draft and Final Permits for readers who would like that level of detail.

Many commenters noted that the Draft Permit was not logically organized. EPA agrees. The major reorganization principles include:

1) There is a new Section 3, Stormwater Management Program (SWMP) Plan consolidating the various plans, strategies and other documents developed in fulfillment of permit requirements.
2) All implementation measures, *i.e.*, those stipulating management measures and implementation policies, are included in Section 4 of today's Final Permit. This includes "Source Identification" elements (Section 3 in the Draft Permit) and "Other Applicable Provisions" elements (Section 8 in the Draft Permit), which included TMDL requirements.
3) All monitoring requirements are consolidated in Section 5 of the Final Permit.
4) All reporting requirements are consolidated in Section 6 of the Final Permit.

EPA also refers readers to the Responsiveness Summary released today along with the Final Permit and Final Fact Sheet, for responses to comments and questions received on the Draft Permit. That document contains additional detailed explanations of the rationale for changes made to the Draft Permit in the Final Permit.

Finally, EPA made significant effort to avoid appending or incorporating by reference other documents containing permit requirements into the Final Permit. In the interest of clarity

5 The Permit and Fact Sheet proposed on April 21, 2010 can be viewed at: http://www.epa.gov/reg3wapd/npdes/draft_permits.html

and transparency EPA, to the extent possible, has included all requirements directly in the permit. Thus, EPA reviewed a variety of documents with relevant implementation measures, *e.g.*, TMDL Implementation Plans and the 2008 Modified Letter of Agreement to the 2004 permit[6], and translated elements of those plans and strategies into specific permit requirements that are now contained in the Final Permit. This Fact Sheet provides an explanation of the sources of provisions that are significant and are a direct result of one of those strategies.

1. DISCHARGES AUTHORIZED UNDER THIS PERMIT

(1.2 Authorized Discharges): The Final Permit authorizes certain non-stormwater discharges, including discharges from water line flushing. One commenter noted that many of these discharges, especially from potable water systems, contain concentrations of chlorine that may exceed water quality standards. EPA agrees, and has therefore clarified that dechlorinated water line flushing is authorized to be discharged under the Final Permit.

(1.4 Discharge Limitations): Comments on the language in Part 1.4 varied widely. Some commenters did not believe it was reasonable to require discharges to meet water quality standards. Other commenters believed this to be an unambiguous requirement of the Clean Water Act.

Today's Final Permit is premised upon EPA's longstanding view that the MS4 NPDES permit program is both an iterative and an adaptive management process for pollutant reduction and for achieving applicable water quality standard and/or total maximum daily load (TMDL) compliance. *See generally*, "National Pollutant Discharge Elimination System Permit Application Regulations for Stormwater Discharges," 55 F.R. 47990 (Nov. 16, 1990).

EPA is aware that many permittees, especially those in highly urbanized areas such as the District, likely will be unable to attain all applicable water quality standards within one or more MS4 permit cycles. Rather the attainment of applicable water quality standards as an incremental process is authorized under section 402(p)(3)(B)(iii) of the Clean Water Act, 33 U.S.C. § 1342(p)(3)(B)(iii), which requires an MS4 permit "to reduce the discharge of pollutants to the maximum extent practicable" (MEP) "and such other provisions" deemed appropriate to control pollutants in municipal stormwater discharges. To be clear, the goal of EPA's stormwater program is attainment of applicable water quality standards, but Congress expected that many municipal stormwater dischargers would need several permit cycles to achieve that goal.

Specifically, the Agency expects that attainment of applicable water quality standards in waters to which the District's MS4 discharges, requires staged implementation and increasingly more stringent requirements over several permitting cycles. During each cycle, EPA will continue to review deliverables from the District to ensure that its activities constitute sufficient progress toward standards attainment. With each permit reissuance EPA will continue to increase

6 District Department of the Environment, *Modification to the Letter of Agreement dated November 27, 2007 for the NPDES Municipal Separate Storm Sewer (MS4) Permit DC0000222* (2008) http://www.epa.gov/reg3wapd/npdes/pdf/DCMS4/Letter.PDF

stringency until such time as standards are met in all receiving waters. Therefore today's Final Permit is clear that attainment of applicable water quality standards and consistency with the assumptions and requirements of any applicable WLA are requirements of the Permit, but, given the iterative nature of this requirement under CWA Section 402(p)(3)(B)(iii), the Final Permit is also clear that "compliance with all performance standards and provisions contained in the Final Permit shall constitute adequate progress toward compliance with DCWQS and WLAs for this permit term" (Section 1.4).

EPA believes that permitting authorities have the obligation to write permits with clear and enforceable provisions and thus the determination of what is the "maximum extent practicable" under a permit is one that must be made by the permitting authority and translated into provisions that are understandable and measurable. In this Final Permit EPA has carefully evaluated the maturity of the District stormwater program and the water quality status of the receiving waters, including TMDL wasteload allocations. In determining whether certain measures, actions and performance standards are practicable, EPA has also looked at other programs and measures around the country for feasibility of implementation. Therefore today's Final Permit does not qualify any provision with MEP thus leaving this determination to the discretion of the District. Instead each provision has already been determined to be the maximum extent practicable for this permit term for this discharger.

EPA modified the language in the Final Permit to provide clarity on the expectations consistent with the preceding explanation. Specifically Section 1.4.2 of the Final Permit requires that discharges 'attain' applicable wasteload allocations rather than just 'be consistent' with them, since the latter term is somewhat ambiguous.

In addition, the general discharge limitation 'no increase in pollutant loadings from discharges from the MS4 may occur to receiving waters' was removed because of the difficulty in measuring, demonstrating and enforcing this provision. Instead, consistent with EPA's belief that the Final Permit must include all of the enforceable requirements that would achieve this principle, the following discharge limitation is substituted: "comply with all other provisions and requirements contained in this permit, and in plans and schedules developed in fulfillment of this permit."

In addition, EPA made the following modifications: "Compliance with <u>the</u> performance standards and provisions contained in <u>Parts 2 through 8 of</u> this permit shall constitute adequate progress towards compliance with DCWQS <u>and WLAs for this permit term</u>" (*underlined text added*) (Section 1.4 of the Final Permit). EPA eliminated circularity with the addition of "Parts 2 through 8", clarifying that this requirement does not circle back to include the statements in 1.4.1 and 1.4.2, but rather interprets them. Also, although WLAs are a mechanism for attainment of water quality standards, EPA added the specific language "and WLAs" to make this concept explicit rather than just implicit. In addition this revised language emphasizes that the specific measures contained in the Final Permit, while appropriate for this permit term, will not necessarily constitute full compliance in subsequent permit terms. It is the expectation that with each permit reissuance, additional or enhanced requirements will be included with the objective

of ensuring that MS4 discharges do not cause or contribute to an exceedance of applicable water quality standards, including attainment of relevant WLAs.

2. LEGAL AUTHORITY, RESOURCES, AND STORMWATER PROGRAM ADMINISTRATION

(2.1 Legal Authority): Several commenters pointed out that there were a number of requirements in the Draft Permit without clear compliance schedules or deadlines, or with deadlines that did not correspond well to others in the permit. In the Final Permit, EPA has made several revisions to address these comments. For example, EPA changed a requirement that deficiencies in legal authority must be remedied "as soon as possible" to a 120-day requirement for deficiencies that can be addressed through regulation, and two years for deficiencies that require legislative action (Section 2.1.1). Also, EPA increased the compliance schedule for updating the District's stormwater regulation from twelve months to eighteen months, *id.*, so that this action could be adequately coordinated with the development of the District's new offsite mitigation/payment-in-lieu program (for more discussion see Section 4.1.3 below).

(2.2 Fiscal Resources): One commenter suggested eliminating the reference to the District's Enterprise Fund since funding was likely to come from a number of different budgets within the District. EPA agrees with this comment and has removed this reference.

On the other hand, many commenters noted that the implementation costs of the District's stormwater program will be significant. EPA agrees. The federal stormwater regulations identify the importance of adequate financial resources [40 C.F.R. §122.26(d)(1)(vi) and (d)(2)(vi)]. In addition, after seeing notable differences in the caliber of stormwater programs across the country, EPA recognizes that dedicated funding is critical for implementation of effective MS4 programs.[7,8,9] In 2009 the District established, and in 2010 revised, an impervious-based surface area fee for service to provide core funding to the stormwater program[10] (understanding that stormwater-related financing may still come from other sources as they fulfill multiple purposes, *e.g.*, street and public right-of-way retrofits). In conjunction with the 2010 rule-making to revise the fee the District issued a Frequently Asked Questions document[11] that indicates the intent to restrict this fee to its original purpose, *i.e.*, dedicated funding to implement the stormwater program and comply with MS4 permit requirements. EPA believes this action is essential, and he expects that the District will maintain a dedicated source of funding for the stormwater program.

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7 National Research Council, *Urban Stormwater Management in the United States* (2009) National Academy of Sciences http://www.nap.edu/catalog.php?record_id=12465

8 National Association of Flood and Stormwater Agencies, Funded by EPA, *Guidance for Municipal Stormwater Funding* (2006) http://www.nafsma.org/Guidance%20Manual%20Version%202X.pdf

9 EPA, *Funding Stormwater Programs* (2008) http://www.epa.gov/npdes/pubs/region3_factsheet_funding.pdf

10 District of Columbia, Rule 21-566 Stormwater Fees, http://www.dcregs.dc.gov/Gateway/RuleHome.aspx?RuleID=474056

11 District of Columbia, FAQ Document *Changes to the District's Stormwater Fee* (2010) http://ddoe.dc.gov/ddoe/frames.asp?doc=/ddoe/lib/ddoe/information2/water.reg.leg/Stormwater_Fee_FAQ_10-5-10_-final.pdf

3. STORMWATER MANAGEMENT PROGRAM (SWMP) PLAN

A number of commenters were confused by the wide variety of plans, strategies and other written documents required by the Draft Permit. A number of commenters were also concerned about public access to several of these documents.

In today's Final Permit EPA is clarifying that any written study, strategy, plan, schedule or other element, existing or new, is part of the District Stormwater Management Program Plan. It is EPA's intent that all elements of the program be described in this central 'Plan'. This does not mean that the Plan cannot consist of separate documents. EPA understands that stand-alone elements may aid in implementation in certain situations. However, EPA is clarifying that all such documents are inherent components of the Plan.

To address the accessibility issue EPA is also requiring that the most current version of the Plan be posted on the District website. As such, all elements that may be documented in separate documents and deliverables must be posted at this location (a hyperlink to any element of the program in a different document is sufficient).

Moreover, today's Final Permit requires the District to public notice a fully updated Plan (to include all existing and new elements required by the Final Permit) within three years of the effective date of this Final Permit, and to then submit that Plan to EPA within four years of the effective date of the Final Permit. This schedule will enable this evaluation of the Plan to be part of EPA's evaluation of the Districts stormwater management program in preparation for the next reissuance of the permit.

The Final Permit requires the District to develop a number of new initiatives. Many commenters raised concerns about the rigor and suitability of these new elements in the absence of a requirement for public input, and in the absence of EPA review and approval. In light of those concerns EPA reviewed all elements of the Draft Permit, and where appropriate has added requirements to the Final Permit both for public notice and opportunity to comment and for submittal to EPA for review and approval. Not every new element has been subjected to this requirement. However, EPA agrees that the opportunity for the public and EPA to review new program elements that will become major components of the stormwater management program is reasonable. Thus, for provisions that EPA believes will be important foundations of the program in years to come, EPA has added a requirement for public notice and EPA review and approval. A new Table 1 in the Final Permit summarizes the elements that must now be submitted to EPA for review and approval.

TABLE 1
Elements Requiring EPA Review and Approval

Element	Submittal Date (from effective date of this permit)
Anacostia River Watershed Trash Reduction Calculation Methodology (4.10)	1 year
Catch Basin Operation and Maintenance Plan (4.3.5.1)	18 months
Outfall Repair Schedule (4.3.5.3)	18 months
Off-site Mitigation/Payment-in-Lieu Program (4.1.3)	18 months
Retrofit Program (4.1.6)	2 years
Consolidated TMDL Implementation Plan (4.10.3)	2 years
Revised Monitoring Program (5.1)	2 years
Revised Stormwater Management Program Plan (3)	4 years

4. IMPLEMENTATION OF STORMWATER CONTROL MEASURES

(4.1 Standard for Long-Term Stormwater Management): One of the fundamental differences between today's Final Permit and earlier permits is the inclusion of measurable requirements for green technology practices, sometimes referred to as "low-impact development" or "green infrastructure." These requirements, which include green roofs, enhanced tree plantings, permeable pavements, and a performance standard to promote practices such as bioretention and water harvesting, are designed to increase the effectiveness of stormwater controls by reducing runoff volumes and associated pollutant loads.[12,13] In past years, stormwater management requirements in permits did not include clear performance goals, numeric requirements or environmental objectives. Today's Final Permit stipulates a specific standard for newly developed and redeveloped sites, and also emphasizes the use of "green infrastructure" controls to be used to meet the performance standard. These permit requirements are intended to improve the permit by providing clarity regarding program performance and promoting the use of technologies and strategies that do not rely solely on end-of-pipe detention measures to manage runoff. EPA notes that much of this emphasis is based on changing paradigms in stormwater science, technology and policy (see discussion below), but also points out that the groundwork for this framework was laid during the prior permit term, and all of the green infrastructure elements agreed to in the 2008 Modified Letter of Agreement to the 2004 Permit.[14]

In the natural, undisturbed environment precipitation is quickly intercepted by trees and other vegetation, or absorbed by soils and humic matter on the surface of the ground where it is

12 The performance of green infrastructure control measures is well-established through numerous studies and reports, many of which are available at http://cfpub2.epa.gov/npdes/greeninfrastructure/research.cfm#research

13 Jay Landers, *Stormwater Test Results Permit Side-by-Side Comparisons of BMPs* (2006) Civil Engineering News http://www.unh.edu/erg/civil_eng_4_06.pdf

14 District Department of the Environment, *Modification to the Letter of Agreement dated November 27, 2007 for the NPDES Municipal Separate Storm Sewer (MS4) Permit DC0000222*, (2008) http://www.epa.gov/reg3wapd/npdes/pdf/DCMS4/Letter.PDF

used by plants, becomes baseflow (shallow groundwater feeding waterways) or infiltrates more deeply to aquifers. During most storms very little rainfall becomes stormwater runoff where the landscape is naturally vegetated or in cases where there are permeable soils. Runoff generally only occurs with larger precipitation events, which constitute a very small proportion of the storms that occur in Washington, DC. In contrast to natural settings, traditional development practices cover large areas of the ground with impervious surfaces such as roads, driveways, sidewalks, and buildings. In addition, the remaining soils are often heavily compacted and are effectively impervious. Under developed conditions, stormwater runs off or is channeled away even during small precipitation events. The collective force of the increased stormwater flows entering the MS4 and discharging through outfalls into receiving streams scours streambeds, erodes stream banks, and causes large quantities of sediment and other entrained pollutants, such as metals, nutrients and trash, to enter the water body each time it rains[15,16,17]. Stormwater research generally shows a high correlation between the level of imperviousness in a watershed and the degree of overall degradation of water quality and habitat. This principle is so well-settled that EPA has not included individual study results here, but refers interested readers to an excellent compendium of relevant studies compiled by the Maryland Department of Natural Resources at http://www.dnr.state.md.us/irc/bibs/effectsdevelopment.html.

To date stormwater management approaches generally have been focused primarily on flood management, in particular extended detention controls, such as wet ponds or dry detention basins, or on in-pipe or end-of-pipe treatment systems. Extended detention approaches are intended to reduce downstream flooding to the extent necessary to protect the public safety and private and public property. End-of-pipe systems are intended to filter or settle specific pollutants, but typically do not reduce the large suite of pollutants in storm water, nor do anything to address degradation attributable to increased discharge volumes. These approaches occurred largely by default since stormwater permits and regulations, including those with water quality objectives, did not stipulate specific, measurable standards or environmental objectives. In addition, water quality was not the primary concern during the early evolution of stormwater management practices.

There are multiple potential problems with extended detention as a water quality management practice, including the fact that receiving stream dynamics are generally based on balances of much more than just discharge rates.[18] Stream stability, habitat protection and water quality are not necessarily protected by the use of extended detention practices and systems. In fact the use of practices such as wet detention basins often results in continued stream bank

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15 National Research Council, *Urban Stormwater Management in the United States* (2009) National Academy of Sciences http://www.nap.edu/catalog.php?record_id=12465

16 Schueler, Thomas R., *The Importance of Imperviousness* (2000) Center for Watershed Protection, http://yosemite.epa.gov/R10/WATER.NSF/840a5de5d0a8d1418825650f00715a27/159859e0c556f1c988256b7f007525b9/$FILE/The%20Importance%20of%20Imperviousness.pdf

17 E. Shaver, R. Horner, J. Skupien, C. May, and G. Ridley. *Fundamentals of Urban Runoff Management: Technical and Institutional Issues – 2nd Edition*, (2007) North American Lake Management Society, Madison, WI. http://www.deq.state.ms.us/mdeq.nsf/0/A8E8B82B89DCDDCE862573530049EEE0/$file/Fundamentals_full_manual_lowres.pdf?OpenElement

18 Low Impact Development Center, *A Review of Low Impact Development Policies: Removing Institutional Barriers to Adoption* (2007) http://pepi.ucdavis.edu/mapinfo/pdf/CA_LID_Policy_Review_Final.pdf

destabilization and increased pollutant loadings of sediment, phosphorus and other pollutants due to bank and channel erosion. Numerous studies have documented the physical, chemical and biological impairments of receiving waters caused by increased volumes, rates, frequencies, and durations of stormwater discharges, and the critical importance of managing stormwater flows and volumes to protecting and restoring our nation's waters[19,20].

Traditional stormwater management is very heavily focused on extended detention approaches, *i.e.*, collecting water short-term (usually in a large basin), and discharging it to the receiving water over the period of one to several days, depending on the size of the storm. Extended detention practices are first and foremost designed to prevent downstream flooding and not to protect downstream channel stability and water quality. For decades, water quality protection has been a secondary goal, or one omitted entirely during the design of these facilities. Over time it has become apparent through research and monitoring that these traditional practices do not effectively protect the physical, chemical or biological integrity of receiving waters[21]. Furthermore, operation and maintenance of these systems to ensure they perform as designed requires a level of managerial and financial commitment that is often not provided, further diminishing the effectiveness of these practices from a water quality performance perspective. A number of researchers have documented that extended detention practices fail to maintain water quality, downstream habitat and biotic integrity of the receiving waters.[22,23,24,25] As a result, today's Final Permit shifts the District's practices from extended detention approaches to water quality protection approaches based on retention of discharge volumes and reduced pollutant loadings.

(4.1.1 Standard for Stormwater Discharges from Development): The 2008 National Research Council Report (NRC Report) on urban stormwater confirmed that current stormwater control efforts are not fully adequate. Three of the NRC Report's findings on stormwater management approaches are particularly relevant:

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19 Daren M Carlisle, David M Wolock, and Michael R Meador , *Alteration of streamflow magnitudes and potential ecological consequences: a multiregional assessment*, , Front Ecol Environ, (2010)

20 National Research Council, *Urban Stormwater Management in the United States* (2009) National Academy of Sciences http://www.nap.edu/catalog.php?record_id=12465

21 EPA, *Protecting Water Quality from Urban Runoff* (2003) http://www.epa.gov/npdes/pubs/nps_urban-facts_final.pdf

22 C.R. MacRae, *Experience from Morphological Research on Canadian Streams: Is Control of the Two Year Frequency Runoff Event the Best Basis for Stream Channel Protection?* (1997) in Effects of Watershed Development and Management on Aquatic Ecosystems, ASCE

23 R. Horner, C. May, E. Livingston, D. Blaha, M. Scoggins, J. Tims & J. Maxted, *Structural and Nonstructural BMPs for Protecting Streams* (2002) Seventh Biennial Stormwater Research & Watershed Management Conference http://www.p2pays.org/ref/41/40364.pdf

24 D.B. Booth & C.R. Jackson, *Urbanization of Aquatic Systems – Degradation Thresholds, Stormwater Detention and the Limits of Mitigation* (1997) Journal of the American Water Resources Association 22(5) http://clear.uconn.edu/projects/TMDL/library/papers/BoothJackson_1997.pdf

25 E. Shaver, R. Horner, J. Skupien, C. May, and G. Ridley. *Fundamentals of Urban Runoff Management: Technical and Institutional Issues – 2nd Edition*, (2007) North American Lake Management Society, Madison, WI. http://www.deq.state.ms.us/mdeq.nsf/0/A8E8B82B89DCDDCE862573530049EEE0/$file/Fundamentals_full_manual_lowres.pdf?OpenElement

1) Individual controls on stormwater discharges are inadequate as the sole solution to stormwater impacts in urban watersheds;
2) Stormwater control measures such as product substitution, better site design, downspout disconnection, conservation of natural areas, and watershed and land-use planning can dramatically reduce the volume of runoff and pollutant loadings from new development; and
3) Stormwater control measures that harvest, infiltrate, and evapotranspire stormwater are critical to reducing the volume and pollutant loading of storms.

The NRC Report points out the wisdom of managing stormwater flow not just for the hydrologic benefits as described above, but because it serves as an excellent proxy for pollutants, *i.e.*, by reducing the volume of stormwater discharged, the amount of pollutants typically entrained in stormwater will also be reduced. Reductions in the number of concentrated and erosive flow events will result in decreased mobilization and transport of sediments and other pollutants into receiving waters. The NRC Report also noted that it is generally easier and less expensive to measure flow than the concentration or load of individual pollutant constituents. For all of these reasons EPA has chosen to use flow volume as the management parameter to implement policies, strategies and approaches.

The objective of effective stormwater management is to replicate the pre-development hydrology to protect and preserve both the water resources onsite and those downstream by eliminating or reducing the amount of both water and pollutants that run off a site, enter the MS4, and ultimately are discharged into adjacent water bodies. The fundamental principle is to employ systems and practices that use or mimic natural processes to: 1) infiltrate and recharge, 2) evapotranspire, and/or 3) harvest and use precipitation near to where it falls to earth.

Retaining the volume of all storms up to and including the 95th percentile storm event is approximately analogous to maintaining or restoring the pre-development hydrology with respect to the volume, rate, and duration of the runoff for most sites. In the mid-Atlantic region the 95th percentile approach represents a volume that appears to reasonably represent the volume that is fully infiltrated in a natural condition and thus should be managed onsite to restore and maintain this pre-development hydrology for the duration, rate and volume of stormwater flows. This approach also employs and/or mimics natural treatment and flow attenuation methods, *i.e.*, soil and vegetation, that existed on the site before the construction of infrastructure (*e.g.*, building, roads, parking lots, driveways). The 95th percentile volume is not a “magic” number; there will be variation among sites based on site-specific factors when replicating predevelopment hydrologic conditions. However, this metric represents a good approximation of what is protective of water quality on a watershed scale, it can be easily and fairly incorporated into standards, and can be equitably applied on a jurisdictional basis.

In the Draft Permit EPA proposed two sets of performance standards to be implemented by the District: on-site retention of the 90th percentile volume, or 1.2” for all non-federal projects, and on-site retention of the 95th percentile volume, or 1.7” for all federal projects.

In determining ‘maximum extent practicable’ for discharges from development involving

federal facilities EPA considered several factors in the Draft Permit:

1) Energy Independence and Security Act (EISA) Section 438 and EPA Guidance[26]: Entitled "Storm water runoff requirements for federal development projects," EISA section 438 provides: "The sponsor of any development or redevelopment project involving a Federal facility with a footprint that exceeds 5,000 share feet shall use site planning, design, construction, and maintenance strategies for the property to maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow."

   Guidance for federal agencies to implement EISA section 438 has been in place since December 2009, and sets forth two optional approaches to meeting the statutory requirements: a performance objective to retain the volume from the 95th percentile storm on site for any federally sponsored new development or redevelopment project and a site-specific hydrologic analysis to determine the pre-development runoff conditions and to develop the site such that the post-development hydrology replicates those conditions "to the maximum extent technically feasible."

2) Executive Orders:
   a. Executive Order 13508 - Chesapeake Bay Protection and Restoration: Calling the Chesapeake Bay a national treasure, E,O. 13508, issued May 12, 2009, establishes a mandate for federal leadership, action and accountability in restoring the Bay. Among the provisions of the Executive Order, section 202(c) directs the strengthening of stormwater management practices at Federal facilities and on Federal lands within the Chesapeake Bay watershed. In addition, section 501 directs federal agencies to implement controls as expeditiously as practicable on their own properties. As required by section 502, EPA issued guidance for federal land management practices to protect and restore the Bay, which includes guidance for managing existing development, as well as redevelopment, new development Thus federal agencies have an executive directive to be leaders in stormwater management in the District and throughout the Chesapeake Bay watershed.[27]

   b. Executive Order 13514 - Federal Leadership in Environmental, Energy, and Economic Performance E.O 13514, issued Oct. 5, 2009, directs the federal government to "lead by example" and includes a requirement for federal agencies to implement EPA's EISA Section 438 guidance (see Sections 2(d)(iv)[28] and 14).

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26 EPA, *Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act* (2009) http://www.epa.gov/owow_keep/nps/lid/section438/

27 EPA, *Guidance for Federal Land Management in the Chesapeake Bay Watershed*, Chapter 3. Urban and Suburban, (2010) 841-R-10-002 (http://www.epa.gov/owow_keep/NPS/chesbay502/pdf/chesbay_chap03.pdf)

28 Sec. 2. Goals for Agencies. In implementing the policy set forth in Section 1 of this order, and preparing and implementing the Strategic Sustainability Performance Plan called for in Section 8 of this order, the head of each agency shall: . . . (d) improve water use efficiency and management by: . . . (iv) implementing and

3) Water Quality**:** These performance standards are aappropriate as water quality-based effluent limitations in the Final Permit. In order to meet the necessary water quality requirements of the Clean Water Act, and to be consistent with the assumptions and requirements of the wasteload allocations for the Chesapeake Bay TMDL, EPA has determined that this performance standard is necessary. In fact, the District's final Phase I WIP acknowledges reasonable assurance demonstration for meeting its obligations to implement the Chesapeake Bay TMDL on an expectation that federal new development and redevelopment projects will achieve a 1.7" stormwater retention objective[29].

EPA concluded in the Draft Permit, and maintains in the Final Permit, that in this first permit in which a performance standard is being required, a retention standard of 1.2" represents the "maximum extent practicable" (MEP) for the District to implement at this time. In the District of Columbia area the 90th percentile event volume is estimated at 1.2 inches. This volume was calculated from 59 years (1948-2006) of rainfall data collected at Reagan National Airport using the methodology detailed in the Energy Independence and Security Act (EISA) Section 438 Guidance[30]. EPA expects that the performance objective shall be accomplished largely by the use of practices that infiltrate, evapotranspire and/or harvest and use rainwater.

EPA's MEP determination included evaluating what has been demonstrated to be feasible in the mid-Atlantic region as well as in other parts of the country. Because on-site retention of the 90th percentile rainfall event volume and analogous approaches have been successfully implemented in other locations across the nation as requirements of stormwater permits, state regulations and local standards [31,32,33,34,35,36,37,38,39] and under a wide variety of climates and

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achieving the objectives identified in the stormwater management guidance referenced in Section 14 of this order. Sec. 14. Stormwater Guidance for Federal Facilities. Within 60 days of the date of this order, the Environmental Protection Agency, in coordination with other Federal agencies as appropriate, shall issue guidance on the implementation of Section 438 of the Energy Independence and Security Act of 2007 (42 U.S.C. 17094).

29 District of Columbia Department of Environment, *Chesapeake Bay TMDL Watershed Implementation Plan* (2010) http://ddoe.dc.gov/ddoe/frames.asp?doc=/ddoe/lib/ddoe/tmdl/Final_District_of_Coluimbia_WIP_Bay_TMDL.pdf

30 EPA, *Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act* (2009) http://www.epa.gov/owow_keep/nps/lid/section438/

31 EPA, *The Municipality of Anchorage and the Alaska Department of Transportation and Public Facilities Municipal Separate Storm Sewer System Permit*, NPDES No. AKS052558 (2010) http://yosemite.epa.gov/r10/water.nsf/NPDES+Permits/MS4+requirements+-+Region+10/$FILE/ATTCZX11/AKS052558%20FP.pdf

32 California Regional Water Quality Control Board Los Angeles Region, *Ventura County Municipal Separate Storm Sewer System Permit*, NPDES No. CAS004002 (2009) http://www.waterboards.ca.gov/losangeles/water_issues/programs/stormwater/municipal/ventura_ms4/Final_Ventura_County_MS4_Permit_Order_No.09-0057__01-13-2010.pdf

33 Montana Department of Environmental Quality, *General Permit for Stormwater Discharge Associated with Small Municipal Separate Storm Sewer System*, NPDES No. MTR040000 (2010) http://www.deq.mt.gov/wqinfo/mpdes/StormWater/ms4.mcpx

34 Tennessee Department of Environment and Conservation, *General Permit for Discharges from Small Municipal Separate Storm Sewer Systems*, NPDES No. TNS000000, (2010) http://state.tn.us/environment/wpc/stormh2o/finals/tns000000_ms4_phase_ii_2010.pdf

conditions, EPA considers this performance standard to be proven and therefore 'practicable' at this point in time. EPA believes that application of this performance standard will result in a significant improvement to the *status quo* and that it will provide notable water quality benefits. This approach will also provide a sound foundation and framework for future management approaches, strategies, measures and practices as the program evolves over subsequent permit cycles. In this context, EPA notes that there may be a need to improve upon this standard in the future, and expects to evaluate implementation success, performance of practices and the overall program, and water quality in the receiving waters when determining whether or not to modify this requirement in a future permit cycle.

EPA received a number of comments on these proposed development performance standards. Many commenters supported this approach. A few were opposed, largely to the numbers rather than the retention framework. Only one federal agency, the Department of Defense, to whom the 95th percentile standard would apply, opposed this provision, on the basis that they should not be subject to the higher standard.

In response to comments EPA revised the Final Permit to require the District to implement a performance standard of on-site retention of 1.2" for all development projects, regardless of who owns or operates the development. EPA's rationale for including a single performance standard for all development projects is based on the fact that this permit is issued to the District of Columbia and the MEP determination must be based on what is practicable for that permittee even though certain property owners discharging to the District's MS4 may have the ability as well as the mandate to achieve more. EPA concludes that it would be not be inappropriate to include the 1.7" performance standard in a permit to a federal permittee. This permit, however, is being issued to a non-federal permittee.

Therefore today's Final Permit includes a performance standard for stormwater discharges from development that disturbs an area of land greater than or equal to 5,000 square feet. The requirement must be in effect 18 months from today. The Permit requires the design, construction, and maintenance of stormwater management practices to retain rainfall onsite, and

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35 West Virginia Department of Environmental Protection, General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems, NPDES WV0116025 (2009) http://www.dep.wv.gov/WWE/Programs/stormwater/MS4/permits/Documents/WV%20MS4%202009%20General%20Permit.pdf

36 North Carolina Department of Environment and Natural Resources, *General Permit to Construct Operate and Maintain Impervious Areas and BMPs Associated with a Residential Development Disturbing Less than 1 Acre*, State Permit No. SWG050000 (2008) http://portal.ncdenr.org/c/document_library/get_file?uuid=724171cc-c208-4f39-a68c-b4cd84022cd9&groupId=38364

37 State of Maryland, *Stormwater Management Act of 2007*, Environment Article 4 §201.1 and §203 http://www.mde.state.md.us/programs/Water/StormwaterManagementProgram/Pages/Programs/WaterPrograms/SedimentandStormwater/swm2007.aspx

38 City of Philadelphia, *Stormwater Regulations*, §600.0 Stormwater Management (2006) http://www.phillyriverinfo.org/WICLibrary/StormwaterRegulations.pdf

39 EPA, See Chapter 3, *Green Infrastructure Case Studies: Municipal Policies for Managing Stormwater with Green Infrastructure* (2010) http://www.epa.gov/owow/NPS/lid/gi_case_studies_2010.pdf

prevent the off-site discharge of the rainfall volume from all events less than or equal to the 90th percentile rainfall event.

The District's Phase I Watershed Implementation Plan (WIP) for the Chesapeake Bay TMDL[40] based its proposed nutrient and sediment reductions, and the associated reasonable assurance demonstration, on these performance standards, i.e., 1.2" for non-federal projects and 1.7" for federal projects. In establishing the Chesapeake Bay TMDL, EPA used the information in the Bay jurisdictions' final Phase I WIPs, including that of the District, where possible. Thus the wasteload allocations (WLAs) in the TMDL[41] are based, in part, on the expectation that all development in the District will be subject to these standards.

EPA notes that all federal facilities still must comply with the EISA requirements. The District will track the performance of federal development projects subject to the District's stormwater regulations, and therefore document those achieving better than 1.2" onsite retention. However, the District cannot, nor should they be expected to, enforce the EISA requirements.

EPA dropped the option for determination of the predevelopment runoff conditions based on a full hydrologic and hydraulic analysis of the site. EISA guidance had provided this option to federal facilities and EPA did not want to provide an *a priori* limitation to federal projects in the Draft Permit, but rather provide the District with the flexibility to include it if they determined it to be administratively feasible. However, since the Final Permit no longer includes an additional requirement for federal facilities, this provision is no longer necessary to provide federal facilities options consistent with EISA. With respect to non-federal facilities, in the seventeen months since the Draft Permit was proposed the District has continued with the process of finalizing their stormwater regulations, and has determined that inclusion of this option is not necessary or reasonable, and EPA concurs.

Several commenters raised the issue of costs associated with implementation of the performance standard. EPA has responded by noting that there are many locations where this stormwater management framework has already been implemented (*see* footnote 22), and also where costs have been well documented to be competitive or instances where infrastructure costs were less expensive because of avoided costs, *e.g.*, reduced infrastructure, narrower roads and otherwise fewer impervious surfaces, reduced or eliminated curbs and gutters, no or fewer buried storm sewers. In addition, where cost-benefit analyses have been conducted, green infrastructure practices are even more cost effective because of the wide array of additional benefits[42] that do not accrue when traditional stormwater management practices are used.[43,44,45,46,47,48,49,50,51,52,53,54]

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40 District of Columbia Department of Environment, *Chesapeake Bay TMDL Watershed Implementation Plan* (2010) http://ddoe.dc.gov/ddoe/frames.asp?doc=/ddoe/lib/ddoe/tmdl/Final_District_of_Coluimbia_WIP_Bay_TMDL.pdf

41 EPA, *Chesapeake Bay Total Maximum Daily Load for Nitrogen, Phosphorus and Sediment* (2010) http://www.epa.gov/reg3wapd/tmdl/ChesapeakeBay/tmdlexec.html

42 EPA, Managing Wet Weather with Green Infrastructure website, Benefits: (http://cfpub2.epa.gov/npdes/home.cfm?program_id=298)

43 LimnoTech, *Analysis of the Pollution Reduction Potential of DC Stormwater Standards* (2009)

44 EPA, *Reducing Stormwater Costs through Low Impact Development Strategies and Practices* (2007)

Several commenters took issue with the inclusion of any numeric performance standard for discharges from development. As discussed above EPA believes that stormwater discharge permits should include clear and enforceable standards, and where feasible, numeric limits are preferred. As discussed above, for the purpose of requiring the permittee to ensure adequate management of discharges from development, a numeric performance standard is a proven means of establishing a clear and enforceable requirement. EPA recognizes that there will be development projects that may not be able to meet the performance standard on site because of site conditions or site activities that preclude the use of extensive green infrastructure practices. Thus as proposed in the Draft Permit, the Final Permit requires the District to develop an alternative means of compliance for development projects under these circumstances (*see* discussion of Section 4.1.3 Off-Site Mitigation and/or Fee-in-Lieu for all Facilities).

In July 2010 EPA Region III issued *Urban Stormwater Approach for the Mid-Atlantic Region and the Chesapeake Bay Watershed*.[55] This document provides direction to all NPDES permitting authorities in the Region and establishes expectations for the next generation of MS4 permits. Based on many of the reasons already articulated in this Final Fact Sheet, EPA directed states to incorporate performance-based standards into permits and regulations with the objective of maintaining or restoring a pre-development hydrologic site condition for newly developed and redeveloped sites. In fact most states with authorized NPDES permit programs in the Chesapeake

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http://www.epa.gov/owow/NPS/lid/costs07/

45 Report to Natural Resources Defense Council and Waterkeeper Alliance, *Economic Costs, Benefits and Achievability of Stormwater Regulations for Construction and Development Activities* (2008)

46 Meliora Environmental Design LLC, *Comparison of Environmental Site Design for Stormwater Management for Three Redevelopment Sites in Maryland* (2008)

47 City of Portland Environmental Services, *Cost-Benefit Evaluation of Ecoroofs* (2008) http://www.portlandonline.com/bes/index.cfm?a=261053&c=50818

48 Natural Resources Defense Council, *Rooftops to Rivers, Green Strategies for Controlling Stormwater and Combined Sewer Overflows* (2006) http://www.nrdc.org/water/pollution/rooftops/rooftops.pdf

49 Riverkeeper, *Sustainable Raindrops* (2006) http://www.riverkeeper.org/wp-content/uploads/2009/06/Sustainable-Raindrops-Report-1-8-08.pdf

50 City of Philadelphia Water Department, *A Triple Bottom Line Assessment of Traditional and Green Infrastructure Options for Controlling CSO Events in Philadelphia's Watersheds* (2009) http://www.epa.gov/npdes/pubs/gi_phil_bottomline.pdf

51 Richard R. Horner, *Investigation of the Feasibility and Benefits of Low-Impact Site Design Practices for Ventura County,* and *Initial Investigation of the Feasibility and Benefits of Low-Impact Site Development Practices for the San Francisco Bay Area,* and *Supplementary Investigation of the Feasibility and Benefits of Low-Impact Site Development Practices for the San Francisco Bay Area,* (2007) http://docs.nrdc.org/water/files/wat_09081001b.pdf

52 J. Hathaway and W.F. Hunt. *Stormwater BMP Costs*. (2007) www.bae.ncsu.edu/stormwater/PublicationFiles/DSWC.BMPcosts.2007.pdf.

53 Center for Neighborhood Technology and American Rivers, *The Value of Green Infrastructure: A Guide to Recognizing Its Economic, Environmental and Social Benefits* (2010) http://www.cnt.org/repository/gi-values-guide.pdf

54 J. Gunderson, R. Roseen, T. Janeski, J. Houle, M. Simpson. *Cost-Effective LID in Commercial and Residential Development* (2011) Stormwater http://www.stormh2o.com/march-april-2011/costeffective-lid-development-1.aspx

55 EPA, *Urban Stormwater Approach for the Mid-Atlantic Region and the Chesapeake Bay Watershed* (2010) http://www.epa.gov/reg3wapd/pdf/pdf_chesbay/MS4GuideR3final07_29_10.pdf

Bay Watershed have incorporated numeric on-site retention standards into final or draft regulations or permits.

In addition, this provision is consistent with the 2008 Modified Letter of Agreement to the 2004 Permit[56] in which the District committed to promulgate stormwater regulations that implement "Low Impact Development", *i.e.*, measures that infiltrate, evapotranspire and harvest stormwater.

(4.1.2 Code and Policy Consistency, Site Plan Review, Verification and Tracking): In Region III's *Urban Stormwater Approach for the Mid-Atlantic Region and the Chesapeake Bay Watershed*, EPA emphasized the importance of establishing accountability measures around performance measures. The best standards will not provide the necessary environmental outcomes if they are not properly implemented, and the only way to ensure proper implementation is to ensure that stormwater control measures are properly designed and installed.

Today's Final Permit requires the District to ensure that all codes and policies are consistent with the standards in the Final Permit, and to establish and maintain adequate site plan review procedures, and a post-construction verification process (such as inspections or submittal of as-builts) to ensure that controls are properly installed.

Ensuring that local codes, ordinances and other policies are consistent with the requirements of the permit is critical element of success. A number local governments attempting to implement green infrastructure measures have found their own local policies to be one of the most significant barriers[57], *e.g.*, parking codes that require over-sized parking lots, plumbing codes that don't allow rainwater harvesting for indoor uses, or street design standards that prohibit the use of porous/pervious surfaces. EPA has published a document, the *Water Quality Scorecard*, to assist local governments in understanding and identifying these local policy barriers and also provides options for eliminating them.[58] EPA is not requiring the District to use the *Scorecard* or any other specific method, but recommends a systematic assessment of local policies in the context of the requirements of the Final Permit in order to comply with the provisions of this Section.

EPA and others have long recognized the importance of site plan review in ensuring that development projects are designed according to standards and regulations, and a verification process following construction that projects were constructed as designed and approved.[59,60,61,62]

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56 District Department of Environment, *Modification to the Letter of Agreement dated November 27, 2007 for the NPDES Municipal Separate Storm Sewer (MS4) Permit DC0000222* (2008) http://www.epa.gov/reg3wapd/npdes/pdf/DCMS4/Letter.PDF

57 National Research Council, *Urban Stormwater Management in the United States* (2009) National Academy of Sciences http://www.nap.edu/catalog.php?record_id=12465

58 EPA, *Water Quality Scorecard, Incorporating Green Infrastructure Practices and the Municipal, Neighborhood and Site Scales* (2009) http://www.epa.gov/smartgrowth/pdf/2009_1208_wq_scorecard.pdf

59 EPA, *Post-Construction Plan Review*, Menu of BMPs http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=factsheet_results&view=specific&bmp=123

Most local governments, including the District, already have some form of site plan review and post-construction verification process for development projects. Today's Final Permit includes them as critical accountability elements of the District stormwater program.

In addition, today's Final Permit requires the District to track volume reductions from all projects. This is a critical element of determining whether wasteload allocations are being achieved.

One commenter noted that EPA had not imposed a clear compliance schedule for this requirement. The Final Permit includes a deadline of the end of the permit term for full compliance with this requirement, acknowledging that updating codes, ordinances and other policies may be a time-consuming process that typically requires consultation and support from elected officials, coordination amongst multiple departments and agencies, e.g., the Office of Planning, the Department of Transportation and the Department of the Environment, as well as public involvement.

(4.1.3 Off-Site Mitigation and/or Fee-in Lieu for all Facilities): Today's Final Permit requires the District to establish a program for Off-site Mitigation and/or Fee-In-Lieu within 18 months of the effective date of the Final Permit. The Final Permit provides the District flexibility to develop a program with either one of those elements or both. Specifically the Permit states:

The program shall include at a minimum:

1) Establishment of baseline requirements for on-site retention and for mitigation projects. On-site volume plus off-site volume (or fee-in-lieu equivalent or other relevant credits) must equal no less than the relevant volume in Section 4.1.1;
2) Specific criteria for determining when compliance with the baseline requirement for on-site retention cannot technically be met based on physical site constraints, or a rationale for why this is not necessary;
3) For a fee-in-lieu program, establishment of a system or process to assign monetary values at least equivalent to the cost of implementation of controls to account for the difference in the performance standard, and the alternative reduced value calculated; and
4) The necessary tracking and accounting systems to implement this section, including policies and mechanisms to ensure and verify that the required stormwater practices on the original site and appropriate required off-site practices stay in place and are adequately maintained.

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60 Center for Watershed Protection, *Managing Stormwater in Your Community, A Guide for Building an Effective Post-Construction Program* (2008) http://www.cwp.org/documents/cat_view/76-stormwater-management-publications/90-managing-stormwater-in-your-community-a-guide-for-building-an-effective-post-construction-program.html

61 EPA, *MS4 Permit Improvement Guide* (2010) http://www.epa.gov/npdes/pubs/ms4permit_improvement_guide.pdf

62 National Research Council, *Urban Stormwater Management in the United States* (2009) National Academy of Sciences http://www.nap.edu/catalog.php?record_id=12465

This provision is included in today's Final Permit in acknowledgement that meeting the performance standard in 4.1.1 may be challenging in some situations. The NRC Report noted that an offset system is critical to situations when on-site stormwater control measures are not feasible.[63] In cases where a full complement of onsite controls is not feasible, offsite practices should be employed that result in net improvements to watershed function and water quality at the watershed scale. The *Urban Stormwater Approach for the Mid-Atlantic Region and the Chesapeake Bay Watershed* contemplates offsets in MS4 programs.[64] EPA has also articulated expectations in the Chesapeake Bay TMDL that it expects the Bay jurisdictions to account for growth via offset programs that are consistent with Section 10 and Appendix S of the Chesapeake Bay TMDL.[65]

EPA received numerous comments on this provision. No commenter was opposed to an offset program *per se*, but there were various opinions on how it should function. Because there was so much general interest in how this program would be shaped, EPA is responding to these comments by requiring the program be subject to public notice followed by submittal to and review by EPA. EPA believes this provides all of those with an interest in this program the opportunity to provide meaningful input. EPA will also review the program to ensure that it has adequate tracking and enforceability components, and meets the water quality objectives of the Final Permit. It is EPA's expectation that these mechanisms will be described by the permittee in the proposed implementation scheme. EPA emphasizes that accountability measures (*e.g.*, inspections, maintenance, tracking) will be critical to ensure the success of the program, and therefore the District's plan will be closely scrutinized for those measures prior to implementation.

The Final Permit includes an option for the District to include incentives for other environmental objectives, e.g., carbon sequestration, in the offset program. As noted, because of the wide array of opinions EPA feels that consideration of some of these other environmental objectives deserve a full vetting by the community. The District is not required to include any incentives or credits along these lines in the program. If it chooses to do so, anything implemented to achieve those other environmental objectives must be subject to the same level of site plan review, inspection, and operation and maintenance requirements as stormwater controls implemented in fulfillment of other permit requirements.

Finally, for the duration of this permit term, the Final Permit exempts District owned and operated transportation rights-of-way projects from the requirement to mitigate stormwater off-site or pay into a fee-in-lieu program for development projects where the on-site performance standard cannot be met. This decision was based on the District request for short-term relief while the District Department of Transportation develops new stormwater management design, construction, and operation and maintenance processes, protocols, requirements and

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63 National Research Council, *Urban Stormwater Management in the United States* (2009) National Academy of Sciences http://www.nap.edu/catalog.php?record_id=12465

64 EPA, *Urban Stormwater Approach for the Mid-Atlantic Region and the Chesapeake Bay Watershed* (2010) http://www.epa.gov/reg3wapd/pdf/pdf_chesbay/MS4GuideR3final07_29_10.pdf

65 EPA, *Chesapeake Bay Total Maximum Daily Load for Nitrogen, Phosphorus and Sediment* (2010) http://www.epa.gov/reg3wapd/tmdl/ChesapeakeBay/tmdlexec.html

specifications for transportation systems and public rights of way. EPA notes that this exemption does not apply to other District owned projects.

(4.1.4 Green Landscaping Incentives Program): Green infrastructure regulatory and incentive programs are becoming common across the country.[66,67] Landscaping requirements that provide flexibility and a suite of options from which to select appropriate green infrastructure practices and systems, e.g. Seattle's Green Factor[68], have proven to be quite popular with developers, land owners and municipal officials.

The green landscaping provision is consistent with the 2008 Modified Letter of Agreement to the 2004 Permit[69] that articulated a long list of specific green infrastructure measures to be implemented, coupled with the commitment by the District to develop green infrastructure policies and incentives. Because these green landscaping provisions fill an important gap in the District's suite of green infrastructure-related policies, EPA specifically identified landscaping as an important area for development of incentives.

Other than general support EPA received little comment on this provision, thus the Final Permit has not been modified from the Draft Permit.

(4.1.5 Retrofit Program for Existing Discharges): Changes in land cover that occurred when urban and urbanizing areas were developed have changed both the hydrology and pollutant loadings to receiving waters and have led to water quality problems and stream degradation. In order to protect and restore receiving waters in and around the District stormwater volume and pollutant loadings from sites with existing development must be reduced. Due to historical development practices, most of these areas were developed without adequate stormwater pollutant reduction or water quality-related controls. To compensate for the lack of adequate stormwater discharge controls in these areas, EPA is requiring the District to include retrofit elements in the stormwater management program.[70,71,72]

EPA has acknowledged the importance of including retrofit requirements in MS4 permits.[73,74] The Chesapeake Bay TMDL allocations are founded on the expectation of

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66 EPA, *Green Infrastructure Incentive Mechanisms*, Green Infrastructure Municipal Handbook Series, (2009) http://www.epa.gov/npdes/pubs/gi_munichandbook_incentives.pdf

67 EPA, *Green Infrastructure Case Studies: Municipal Policies for Managing Stormwater with Green Infrastructure* (2010) http://www.epa.gov/owow/NPS/lid/gi_case_studies_2010.pdf

68 City of Seattle, *Seattle Green Factor*, http://www.seattle.gov/dpd/Permits/GreenFactor/Overview/

69 District Department of Environment, *Modification to the Letter of Agreement dated November 27, 2007 for the NPDES Municipal Separate Storm Sewer (MS4) Permit DC0000222* (2008) http://www.epa.gov/reg3wapd/npdes/pdf/DCMS4/Letter.PDF

70 National Research Council, *Urban Stormwater Management in the United States* (2009) National Academy of Sciences http://www.nap.edu/catalog.php?record_id=12465

71 Schueler, Thomas. *Urban Subwatershed Restoration Manual No. 1: An Integrated Framework to Restore Small Urban Watersheds* (2005)

72 EPA, *Green Infrastructure Retrofit Policies*, Managing Wet Weather with Green Infrastructure Municipal Handbook Series (2008) http://www.epa.gov/npdes/pubs/gi_munichandbook_retrofits.pdf

73 EPA, *MS4 Permit Improvement Guide* (2010) EPA 833-R-10-001,

stormwater retrofits in the District (*see* Section 8 of the TMDL[75]), based on actions outlined in the District's final Phase I WIP developed for the Chesapeake Bay TMDL.[76]

EPA received quite a few comments on this set of requirements. Some commenters strongly approved of the retrofit provisions in the Draft Permit, while others expressed concerns.

Today's Final Permit requires the District to develop performance metrics for retrofits, using the performance standard in Section 4.1.1 as the starting point, *i.e.*, if projects can meet the environmental objectives specified in Part 4.1.1 they should. However, understanding the challenges associated with retrofitting some sites, the Final Permit allows that the performance metrics for retrofit projects may vary from the performance standard in 4.1.1, *e.g.*, different requirements may apply to differing sets of circumstances, site conditions or types of projects. EPA believes the most important first step in a robust retrofit program is to set stringent environmental objectives, thus the requirement to develop clear and specific performance standards. EPA fully expects the District to utilize this permit term to develop design, construction and operation and maintenance protocols to meet the requisite performance standards.

Several modifications were made to this provision:

1) Because there was so much interest in this provision EPA added a requirement for public notice.
2) Because there were so many opinions on how this program should function, EPA removed some of the criteria in the Final Permit to allow the community to shape the program. In exchange EPA included a requirement that the relevant performance metrics be submitted to EPA for review and approval.
3) The compliance schedule for development, public notice and submittal to EPA of performance metrics for a retrofit program has been extended from one year to 18 months at the request of the District. EPA believes the additional time will allow better coordination of the offset program with the District's stormwater regulations (also with an 18 month compliance schedule), and allow adequate time for a public notice process and an EPA review.

Also included in the permit is a requirement that the District must work with federal agencies to document federal commitments to retrofitting their properties. Consistent with Executive Order 13508 on the Chesapeake Bay, the federal strategies developed pursuant thereto, and in fulfillment of the Chesapeake Bay TMDL, federal agencies have obligations to

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http://www.epa.gov/npdes/pubs/ms4permit_improvement_guide.pdf

74 EPA, *Urban Stormwater Approach for the Mid-Atlantic Region and the Chesapeake Bay Watershed* (2010) http://www.epa.gov/reg3wapd/pdf/pdf_chesbay/MS4GuideR3final07_29_10.pdf

75 EPA, *Chesapeake Bay Total Maximum Daily Load for Nitrogen, Phosphorus and Sediment* (2010) http://www.epa.gov/reg3wapd/tmdl/ChesapeakeBay/tmdlexec.html

76 District of Columbia Department of Environment, *Chesapeake Bay TMDL Watershed Implementation Plan* (2010) http://ddoe.dc.gov/ddoe/frames.asp?doc=/ddoe/lib/ddoe/tmdl/Final_District_of_Coluimbia_WIP_Bay_TMDL.pdf

implement substantive stormwater controls. In order to accurately account for loads from federal lands that discharge through the District MS4 system, the District needs to be able to track the pollutant reductions resulting from federal actions. To do so the District will need to identify federal facilities and properties and work with federal agencies to identify retrofit opportunities on federal lands and properties and track progress in retrofitting these lands and properties.

In addition, the Final Permit requires the District to make pollutant load and volume reduction estimates for all retrofit projects for the nine pollutants in Table 4, and by each of the major District watersheds (Anacostia River, Rock Creek, Potomac River).

The Final Permit requires the District to implement retrofits to manage runoff from 18,000,000 square feet of impervious surfaces during the permit term. Of that total, 1,500,000 square feet must be in transportation rights-of-way. Although these initial drainage area objectives are not especially aggressive, EPA believes that a strong foundation for the retrofitting program must first be established. EPA can then set more aggressive drainage area objectives in subsequent permits. In its comments on the Draft Permit the District contended that the requirement in the Draft Permit for the retrofitting of 3,600,000 square feet of impervious surfaces in transportation rights-of-way was more than it could accomplish in a single permit term. The District suggested 1,500,000 square feet, almost 60% less than what was required in the Draft Permit would be achievable. In consideration of these comments, the total square footage of retrofitted impervious surfaces that must be in transportation rights-of-way is 1,500,000 square feet. EPA notes that the total square footage retrofit requirement is unchanged. EPA believes that this requirement will establish a strong foundation for the implementing a retrofitting program overall and in transportation rights-of-way, which can be followed in subsequent permits with more aggressive drainage area objectives. In addition, the Final Permit includes an additional provision that is intended to enhance the District's retrofit opportunities (*see* next paragraph).

The Final Permit establishes a requirement for the District to adopt and implement stormwater retention requirements for properties where less than 5,000 square feet of soil is being disturbed but where the buildings or structures have a footprint that is greater than or equal to 5,000 square feet and are undergoing substantial improvement. Substantial improvement, as consistent with District regulations at 12J DCMR § 202, is any repair, alteration, addition, or improvement of a building or structure, the cost of which equals or exceeds 50 percent of the market value of the structure before the improvement or repair is started. Although this specific element was not included in the Draft Permit, it reflects the fact that the District has already considered this provision in their proposed stormwater regulations, and is consistent with the overall retrofit approach in the Draft Permit. Both the District and EPA believe this will promote retrofitting on smaller sites that would not otherwise be subject to the performance standard in the stormwater regulations.

This section of the Final Permit also requires the District to ensure that every major renovation/ rehabilitation project for District-owned properties within the inventory of Department of Real Estate Services (DRES) and Office of Public Education Facilities Modernization (OPEFM) includes on-site retention measures to manage stormwater. This

requirement is based in part on EPA's understanding that these two agencies have control over most District buildings and renovation projects in the District. This provision was in Section 4.2 Operation and Maintenance of Stormwater Capture Practices of the Draft Permit, and was moved to Section 4.1.5 of the Final Permit since it is a retrofit requirement rather than a maintenance requirement.

(4.1.6 Tree Canopy): Several studies have documented the capacity for planting additional trees in the District and quantified the benefits.[77,78,79,80] The District commitments to the tree planting requirements of the Final Permit are documented in the 2008 Modified Letter of Agreement to the 2004 Permit,[81] and the District's Chesapeake Bay TMDL WIP.[82] The number was derived from the District Urban Tree Canopy Goal[83] of planting 216,300 trees over the next 25 years, an average of 8,600 trees per year District-wide. Adjusting this number for the MS4 area of the District, the Final Permit requires the District to develop a strategy to plant new trees at a rate of at least 4,150 annually.

There was some interest from commenters in providing input to the tree canopy strategy, thus the Final Permit includes a requirement for the District to public notice this strategy. Also, in response to several comments, EPA has clarified the annual number as a net increase in order to account for mortality.

(4.1.7 Green Roof Projects): Quite a few studies have documented the water quality benefits of green roofs.[84,85,86] The Green Build-out Model, a project specifically carried out to

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77 Casey Trees, *The Green Build-out Model: Quantifying the Stormwater Management Benefits of Trees and Green Roofs in Washington, DC* (2007) (http://www.caseytrees.org/planning/greener-development/gbo/index.php).

78 University of Vermont and the U.S. Forest Service, A Report on Washington D.C.'s Existing and Potential Tree Canopy (2009) http://www.caseytrees.org/geographic/key-findings-data-resources/urban-tree-canopy-goals/documents/UnivofVermontUTCReport4-17-09.pdf

79 Casey Trees, et al. *See* several District tree inventories: http://www.caseytrees.org/geographic/tree-inventory/community/index.php

80 Casey Trees, *The Green Build-out Model: Quantifying the Stormwater Management Benefits of Trees and Green Roofs in Washington, D.C.* (2007) http://www.caseytrees.org/planning/greener-development/gbo/documents/GBO_Model_Full_Report_20051607.pdf

81 District Department of Environment, *Modification to the Letter of Agreement dated November 27, 2007 for the NPDES Municipal Separate Storm Sewer (MS4) Permit DC0000222* (2008) http://www.epa.gov/reg3wapd/npdes/pdf/DCMS4/Letter.PDF

82 District of Columbia Department of Environment, *Chesapeake Bay TMDL Watershed Implementation Plan* (2010) http://ddoe.dc.gov/ddoe/frames.asp?doc=/ddoe/lib/ddoe/tmdl/Final_District_of_Coluimbia_WIP_Bay_TMDL.pdf

83 Casey Trees, Urban Tree Canopy Goal website: http://www.caseytrees.org/geographic/key-findings-data-resources/urban-tree-canopy-goals/index.php

84 EPA, *Green Roofs for Stormwater Runoff Control* (2009) http://www.epa.gov/nrmrl/pubs/600r09026/600r09026.pdf

85 E. Oberndorfer et al, *Green Roofs as Urban Ecosystems: Ecological Structures, Functions, and Services* (2007) BioScience 57(10):823-833 http://www.bioone.org/doi/full/10.1641/B571005

86 M. Hathaway, W.F. Hunt, G.D. Jennings, *A Field Study of Green Roof Hydrologic and Water Quality Performance* (2008) Transactions of American Society of Agricultural and Biological Engineers, Vol. 51(1): 37-44 http://www.bae.ncsu.edu/people/faculty/jennings/Publications/ASABE%20Hathaway%20Hunt%20Jennings.pdf

evaluate the potential in the District for using green roofs and other green infrastructure measures to reduce flows and pollutants from the District's wet weather systems, documented significant opportunities for green roof implementation.[87]

The District commitments to green roof implementation are documented in the 2008 Modified Letter of Agreement to the 2004 Permit,[88] and the District Chesapeake Bay TMDL Watershed Implementation Plan.[89] The District is required to evaluate the feasibility of installing green roofs on District-owned buildings, and to install at least 350,000 square feet of green roof during the permit term.

(4.2 Operation and Maintenance of Retention Practices): Operation and maintenance, required pursuant to 40 C.F.R. 122.26(d)(2)(iv)(A)(*1*) and (*3*), is critical for the continued performance of stormwater control measures.[90,91] EPA has consistently noted the importance of operation and maintenance in regulatory guidance.[92,93,94] Today's Final Permit requires the District to ensure adequate maintenance of all stormwater control measures, both publicly and privately owned and operated.

The District has two years from the effective date of the Final Permit to develop and implement operation and maintenance protocols for all District owned and operated stormwater management practices. The District is also required to provide regular and ongoing training to all relevant contractors and employees.

The District is required to develop operation and maintenance mechanisms to ensure that stormwater practices are maintained and operated to meet the objectives of the program and that they continue to function over multiple permit cycles to provide the water quality benefits intended by design. Such mechanisms may include deed restrictions, ordinances and/or maintenance agreements to ensure that all non-District owned and operated stormwater control measures are adequately maintained. In addition the District must develop and/or refine

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87 Casey Trees, *The Green Build-out Model: Quantifying the Stormwater Management Benefits of Trees and Green Roofs in Washington, D.C.* (2007) http://www.caseytrees.org/planning/greener-development/gbo/documents/GBO_Model_Full_Report_20051607.pdf

88 District Department of Environment, *Modification to the Letter of Agreement dated November 27, 2007 for the NPDES Municipal Separate Storm Sewer (MS4) Permit DC0000222* (2008) http://www.epa.gov/reg3wapd/npdes/pdf/DCMS4/Letter.PDF

89 District of Columbia Department of Environment, *Chesapeake Bay TMDL Watershed Implementation Plan* (2010) http://ddoe.dc.gov/ddoe/frames.asp?doc=/ddoe/lib/ddoe/tmdl/Final_District_of_Coluimbia_WIP_Bay_TMDL.pdf

90 National Research Council, *Urban Stormwater Management in the United States* (2009) National Academy of Sciences http://www.nap.edu/catalog.php?record_id=12465

91 EPA Website: Stormwater Control Operation and Maintenance. http://www.epa.gov/owow/NPS/ordinance/stormwater.htm

92 EPA, *MS4 Permit Improvement Guide* (2010) EPA 833-R-10-001, http://www.epa.gov/npdes/pubs/ms4permit_improvement_guide.pdf

93 EPA, *MS4 Program Evaluation Guidance* (2007) EPA-833-R-07-003, http://www.epa.gov/npdes/pubs/ms4guide_withappendixa.pdf

94 EPA, *Urban Stormwater Approach for the Mid-Atlantic Region and the Chesapeake Bay Watershed*, (2010) http://www.epa.gov/reg3wapd/pdf/pdf_chesbay/MS4GuideR3final07_29_10.pdf

verification mechanisms, such as inspections, and an electronic inventory system to ensure the long-term integrity of stormwater controls in the District.

In addition the District is required to develop a Stormwater Management Guidebook and associated training within eighteen months of the effective date of the Final Permit. This requirement is based on commitments in the 2008 Modified Letter of Agreement to the 2004 Permit[95]. Completion of the Guidebook has been delayed pending finalization of the District's revised stormwater regulations. However EPA expects Guidebook completion to parallel finalization of the District's revised stormwater regulations, which incorporate the standards and requirements of the Final Permit.

(4.3 Management of District Government Areas): Requirements in this section of the Final Permit largely continue provisions in the 2004 Permit. EPA received few comments on most elements of this section of the Draft Permit. The following revisions were made:

1) The District now must notify not only public health agencies within 24-hours in the event of a sanitary sewer overflow, but also ensure adequate public notification procedures within that same time period (Section 4.3.1 of the Final Permit). EPA emphasizes that this provision in no way authorizes sanitary sewer overflow discharges either directly or via the MS4. Those discharges are expressly prohibited.
2) Within 18 months of the effective date of the Final Permit, the District shall complete, public notice and submit to EPA for review and approval a plan for optimal catch basin inspections, cleaning and repairs. The District shall fully implement the plan upon EPA approval. This revision is based on comments that the catch basin maintenance provisions on the Draft Permit were vague and not within the context of a comprehensive plan (Section 4.3.5.1 of the Final Permit).
3) Section 3.2 of the Draft Permit required the District to update its outfall inventory. One commenter noted that the District's 2006 Outfall Survey had already essentially accomplished this, and that meanwhile many of these outfalls were in severe disrepair, thus contributing to increased sediment loading to receiving waters. EPA agrees this is a serious concern, and has thus modified the Final Permit to require the District to undertake the following: within 18 months of the effective date of the Final Permit, and consistent with the 2006 Outfall Survey, the District shall complete, public notice and submit to EPA for review and approval an outfall repair schedule to ensure that approximately 10% of all outfalls needing repair are repaired annually, with the overall objective of having all outfalls in good repair by 2022 (Section 4.3.5.3 of the Final Permit).
4) Consistent with the District's *Enhanced Street Sweeping and Fine Particle Removal Strategy*,[96] an additional element has been included in Table 3, Street Sweeping. The

95 District Department of Environment, *Modification to the Letter of Agreement dated November 27, 2007 for the NPDES Municipal Separate Storm Sewer (MS4) Permit DC0000222* (2008) http://www.epa.gov/reg3wapd/npdes/pdf/DCMS4/Letter.PDF

96 District Department of the Environment, *Municipal Separate Storm Sewer System Program Annual Report* (2010)

table now documents that environmental hotspots in the Anacostia River Watershed will now be swept at least two times per month from March through October.

(4.6 Management of Construction Activities): Requirements in this Section of the Final Permit largely continue provisions in the 2004 Permit. Several commenters suggested that these provisions needed to be significantly improved, including specifying more stringent effluent limitations, in order to address the impairments attributable to sediment.

While permitting authorities have a fair amount of latitude to modify many elements of a permit based on public comments, inclusion of a *de novo* numeric effluent limitation, when neither the Draft Permit nor the Draft Fact Sheet suggested such an option would require further public notice. Therefore, this Final Permit does not include a numeric effluent limitation for sediment discharged in stormwater from active construction sites.

However, EPA agrees that construction activities cause serious water quality problems, and has revised this section to require more robust oversight of construction stormwater controls. A significant cause of water quality problems caused by construction activities is the failure of construction site operators to comply with existing regulations. Thus, EPA expects increased inspections and enforcement activity to result in improved compliance and therefore reduced sediment loads.[97] Therefore the Final Permit includes construction site inspection frequency requirements to ensure compliance with the District erosion and sediment requirements.

(4.8 Flood Control Projects): Requirements in this Section of the Final Permit largely continue provisions in the 2004 Permit. EPA received few comments on this section. The following revision was made: a start date of six months after the effective date of the Final Permit was added for the requirement to collect data on the percentage of impervious surface area located in flood plain boundaries for all proposed development.

(4.10 Total Maximum Daily Load (TMDL) Wasteload Allocation (WLA) Planning and Implementation): There are several TMDLs with wasteload allocations that either directly or indirectly affect the District's MS4 discharges. The following are those that EPA has determined to be relevant for purposes of implementation via the Final Permit:

1. TMDL for Biochemical Oxygen Demand (BOD) in the Upper and Lower Anacostia River (2001)
2. TMDL for Total Suspended Solids (TSS) in the Upper and Lower Anacostia River (2002)
3. TMDL for Fecal Coliform Bacteria in the Upper and Lower Anacostia River (2003)
4. TMDL for Organics and Metals in the Anacostia River and Tributaries (2003)
5. TMDL for Fecal Coliform Bacteria in Kingman Lake (2003)
6. TMDL for Total Suspended Solids, Oil and Grease and Biochemical Oxygen Demand in Kingman Lake (2003)

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97 EPA, *Office of Enforcement and Compliance Assurance Accomplishments Report* (2008) http://www.epa.gov/compliance/resources/reports/accomplishments/oeca/fy08accomplishment.pdf

7. TMDL for Fecal Coliform Bacteria in Rock Creek (2004)
8. TMDL for Organics and Metals in the Tributaries to Rock Creek (2004)
9. TMDL for Fecal Coliform Bacteria in the Upper, Middle and Lower Potomac River and Tributaries (2004)
10. TMDL for Organics, Metals and Bacteria in Oxon Run (2004)
11. TMDL for Organics in the Tidal Basin and Washington Ship Channel (2004)
12. TMDL for Sediment/Total Suspended Solids for the Anacostia River Basin in Maryland and the District (2007) [pending resolution of court vacature, Anacostia Riverkeeper, Inc. v. Jackson, No. 09-cv-97 (RCL)]
13. TMDL for PCBs for Tidal Portions of the Potomac and Anacostia Rivers in the District of Columbia, Maryland and Virginia (2007)
14. TMDL for Nutrients/Biochemical Oxygen Demand for the Anacostia River Basin in Maryland and the District (2008)
15. TMDL for Trash for the Anacostia River Watershed, Montgomery and Prince George's Counties, Maryland and the District of Columbia (2010)
16. TMDL for Nitrogen, Phosphorus and Sediment for the Chesapeake Bay Watershed (2010)

On July 25, 2011, in connection with a challenge by the Anacostia Riverkeeper and other environmental organizations, the U.S. District Court for the District of Columbia vacated EPA's approval of a total maximum daily load (TMDL) for sediment in the Anacostia River. While the court ruled in EPA's favor on a number of issues of significant importance to the TMDL program and that the TMDL adequately would achieve the designated aquatic life use, the court held that EPA's decision record did not adequately support EPA's determination that the TMDL would lead to river conditions that would support the primary (swimming) and secondary (boating) contact recreation and aesthetic designated uses. Based on its holding regarding the recreational and aesthetic uses, the court vacated the TMDL, but stayed its vacatur for one year to give EPA sufficient time to address the court's concerns. This TMDL is included in the above list (#12), because EPA expects this vacatur to be resolved within the time frame for TMDL efforts outlined in this permit. However, District planning and implementation efforts on this TMDL are not required until such time as the legal challenge is resolved and the TMDL is established.

Most EPA developed TMDLs for the District, as well as all District developed and EPA approved TMDLs can be found at the following website: http://www.epa.gov/reg3wapd/tmdl/dc_tmdl/index.htm.

The Chesapeake Bay TMDL for nitrogen, phosphorus and sediment is available at: http://www.epa.gov/reg3wapd/tmdl/ChesapeakeBay/tmdlexec.html.

The District also has a number of TMDL-related documents on its website: http://ddoe.dc.gov/ddoe/cwp/view,a,1209,q,495456.asp.

In addition, the tidal Anacostia River is listed as impaired for TSS and BOD, and the Upper Potomac River is listed as impaired for pH. TMDL establishment by EPA is pending for both.

As part of permit reissuance EPA has reviewed several existing TMDL implementation plans, including those for the Potomac River, Anacostia River and Rock Creek. EPA has identified the relevant implementation actions from those Plans and included them as requirements of the Final Permit, *e.g.*, green roofs, tree plantings. This approach provides more clarity for the District and the general public, and is also consistent with the obligation of NPDES permit writers to articulate enforceable provisions in permits to implement TMDL WLAs.

EPA took the same approach with the Anacostia River Watershed Trash TMDL[98] (Trash TMDL) (Part 4.10.1 of the Final Permit), which was finalized in September 2010. This TMDL was well-developed with quantifiable information about the sources and causes of impairment. The Trash TMDL assigned a specific WLA to MS4 discharges: removal of 103,188 pounds of trash annually. The Final Permit requires the District to attain this WLA as a specific single-year measure by the fifth year of this permit term. The Final Permit provision is based on the annual trash WLA for the District MS4. In the TMDL, annual WLAs were divided by 365 days to obtain daily WLAs. Given the fact that the daily and annual WLAs are congruent with each other, use of the annual WLA as the permit metric is consistent with the assumptions and requirements of the TMDL and is a more feasible measure for monitoring purposes.

Because the Anacostia River Watershed Trash TMDL provided a solid foundation for action, EPA determined the implementation requirements and included them in the Final Permit rather than require the District to develop a separate implementation plan. The Permit requires the District to determine a method for estimating trash reductions and submit that to EPA for review and approval within one year of the effective date of the Final Permit. In addition, the District must annually report the trash prevention/removal approaches utilized, and the overall total weight (in pounds) of trash captured for each type of approach.

On December 29, 2010, the U.S. Environmental Protection Agency established the Chesapeake Bay TMDL[99] to restore clean water in the Chesapeake Bay Watershed. The TMDL identifies the necessary reductions of nitrogen, phosphorus and sediment from Delaware, Maryland, New York, Pennsylvania, Virginia, West Virginia and the District of Columbia that, when attained, will allow the Bay to meet applicable water quality standards. EPA based the TMDL allocations, where possible, on information provided by the Bay jurisdictions in their final Phase I WIPs. The TMDL requires the Bay jurisdictions to have in place by 2017 the necessary controls to attain 60% of the reductions called for in the TMDL, and to have all controls in place by 2025. EPA has committed to hold jurisdictions accountable for results along the way, including ensuring that NPDES permits contain provisions and limits that are consistent with the assumptions and requirements of the relevant WLAs.

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98 Maryland Department of the Environment and District of Columbia Department of Environment, *Total Maximum Daily Loads of Trash for the Anacostia River Watershed, Montgomery and Prince George's Counties, Maryland and the District of Columbia* (2010) http://www.epa.gov/reg3wapd/pdf/AnacostiaTMDLPortfolio.pdf

99 EPA, *Chesapeake Bay Total Maximum Daily Load for Nitrogen, Phosphorus and Sediment* (2010) http://www.epa.gov/reg3wapd/tmdl/ChesapeakeBay/tmdlexec.html

The District's final Phase I Chesapeake Bay WIP proposed very aggressive targets for pollutant reductions in its MS4 program.

Pollutant of Concern	% Reductions in Urban Runoff Loads by 2025 from 2009 Baseline	Reductions in Urban Runoff Loads by 2025 from 2009 Baseline
Total Nitrogen	17	29,310 lbs/yr
Total Phosphorus	33	7,740 lbs/yr
Sediment	35	2,192 tons/yr

These numbers are from the District's final input deck to the Chesapeake Bay Model in association with the final Phase I WIP.

The Final Permit requires a very robust set of measures, based on a determination that these measures are necessary to ultimately achieve the specified reductions. EPA took a similar approach with the Chesapeake Bay TMDL as it did with the aforementioned TMDLs, and incorporated specific implementation measures into the Final Permit. Although EPA did not finalize the Chesapeake Bay TMDL until December 2010, EPA had a reasonably clear understanding of what would be needed even prior to publishing the Draft Permit because of the significant amount of data, modeling output and other information available in advance of its finalization, as well as many months of ongoing discussions with the District about the elements of its final Phase I WIP.[100] Based on the final TMDL , EPA is assured that the Final Permit is consistent with the assumptions and requirements of the WLAs in the TMDL.

In partial fulfillment of attaining the Chesapeake Bay WLAs, the Final Permit contains: a new performance standard for development, a requirement for an offset program for development, numeric requirements for tree plantings and green roof installation, numeric requirements for retrofits, and a variety of other actions. The relevant sections of this Final Fact Sheet discuss those provisions more fully.

There will be two additional permit terms prior to 2025 during which the District will implement many additional and/or more robust measures to attain its Bay TMDL WLAs. Provisions, targets and numeric thresholds in this Final Permit are not necessarily the ones that will be included in subsequent permits. EPA believes, however, that the 2011 Final Permit sets the foundation for a number of actions and policies upon which those future actions will be based.

Section 4.10.2 of the Final Permit requires the District to implement and complete the proposed replacement/rehabilitation, inspection and enforcement, and public education aspects of the strategy for Hickey Run to satisfy the applicable oil and grease TMDL wasteload allocations. In addition, the District is required to install end-of-pipe management practices at four identified outfalls to address oil and grease and trash in Hickey Run no later than the end of this permit term. Implementation requirements to attain these WLAs were initiated during prior

100 District of Columbia Department of Environment, *Chesapeake Bay TMDL Watershed Implementation Plan* (2010) http://ddoe.dc.gov/ddoe/frames.asp?doc=/ddoe/lib/ddoe/tmdl/Final_District_of_Coluimbia_WIP_Bay_TMDL.pdf

permit terms. The requirements of today's Final Permit are intended to bring the District to the concluding stages of attaining the Hickey Run oil and grease and trash WLAs.

The 2003 District of Columbia TMDL for oil and grease in the Anacostia River noted that the waterbody was no longer impaired by oil and grease. In particular data from Hickey Run, which provided the basis for listing the Anacostia River as an impaired water body, had demonstrated consistent compliance with applicable water quality standards for oil and grease: for twenty-one samples taken in Hickey Run between January and December 2002, no values exceeded the 10mg/L standard, and only one sample exceeded a 5 mg/L detection limit value. The 2003 TMDL further concluded that on-going implementation activities, which included public education and automobile shop enforcement actions, caused a significant decrease in ambient pollutant concentrations.[101] The Final Permit includes a provision for additional controls on oil and grease in Hickey Run should monitoring during this permit term indicate it is necessary. However, per the demonstration noted above, EPA believes it likely this may not be necessary.

One commenter indicated that the shift from an aggregate numeric effluent limit for four outfalls into Hickey Run in the 2004 permit to a management practice-based approach in the Draft Permit violated the Clean Water Act's prohibition against backsliding, section 402(o)(1) of the CWA, 33 U.S.C. § 1342(o)(1) ("[A] Permit may not be renewed, reissued, or modified … subsequent to the original issuance of such Permit, to contain effluent limitations which are less stringent than the comparable effluent limitations in the previous Permit"). In response, EPA notes that a non-numeric effluent limitation is not automatically less stringent than a numeric effluent limitation. A different (numeric or non-numeric) effluent limitation only violates the anti-backsliding prohibition if it can be fairly compared to the prior numeric limit and found to be less stringent than that requirement. *See e.g., Communities for a Better Environment v. State Water Resources Control Bd.,* 132 Cal. App. 4th 1313 (August 29, 2005) (finding that no backsliding had occurred where the effluent limit in existing permit was not "comparable" to WQBEL in previous permit). In this case EPA 1) notes that additional controls on oil and grease may not be needed (as explained above), and 2) has determined regardless that compliance with the performance standards in the Final Permit will result in improved water quality protections for the District MS4 receiving streams more effectively than did the previous numeric effluent limitations (see discussions in relevant sections).

Section 4.10.3 of today's Final Permit requires the District to develop a Consolidated TMDL Implementation Plan (Consolidated Plan) for all TMDL wasteload allocations assigned to District MS4 discharges. All applicable WLAs must be considered in this plan, though the TMDLs listed at the beginning of this Section form the basis for District action to meet this requirement. EPA has evaluated these TMDLs along with existing water quality data and has concluded that *E. coli*, total nitrogen, total phosphorus, total suspended solids, copper, lead, zinc and trash are critical pollutants of concern for District waters, and should be the focus of implementation measures as well as of a revised monitoring program (*see* Section 5.1 for a

101 District of Columbia, *Final Total Maximum Daily Load for Oil and Grease in the Anacostia River* (2003) http://www.epa.gov/reg3wapd/tmdl/dc_tmdl/AnacostiaRiver/AnacoatiaOilReport.pdf

discussion of the latter).

The rationale for a Consolidated Plan is to allow for more efficient implementation of control measures. In many cases TMDLs have been developed on a stream segment basis, which is not always the most logical framework for implementation of controls. In addition, the solutions for reducing many pollutants and/or improving water bodies will be the same stormwater control measures and/or policies, and it would be wasteful of resources and duplicative to have separate implementation plans under those circumstances.

The Final Permit requires the Consolidated Plan to include:

1) Specified schedules for attaining applicable wasteload allocations for each TMDL; such schedules must includes numeric benchmarks that specify annual pollutant load reductions and the extent of control actions to achieve these numeric benchmarks.
2) Interim numeric milestones for TMDLs where final attainment of applicable wasteload allocations requires more than one permit cycle. These milestones shall originate with the third year of this permit term and every five years thereafter.
3) Demonstration using modeling of how each applicable WLA will be attained using the chosen controls, by the date for ultimate attainment.
4) The Consolidated TMDL Implementation Plan elements required in this section will become enforceable permit terms upon approval of such Plans, including the interim and final dates in this section for attainment of applicable WLAs.
5) Where data demonstrate that existing TMDLs are no longer appropriate or accurate, the Plan shall include recommended solutions, including, if appropriate, revising or withdrawing TMDLs.

Some of the applicable TMDLs developed within the District were based on limited or old data. In those cases the District may choose to reevaluate these waters and impairments to determine if revising or withdrawing the TMDL, or other action, would be appropriate.

The District has two years from the date of Final Permit issuance to develop, public notice and submit the Consolidated Plan to EPA for review and approval. EPA believes the required elements (1-5, above) will ensure clarity and enforceability, but also encourages interested parties to participate in the public process. EPA added this public notice requirement to the Final Permit because of the significant interest expressed by commenters on District TMDLs.

Section 4.10.4, Adjustments to TMDL Implementation Strategies, requires the District to make mid-course improvements to implementation measures and policies whenever data indicate insufficient progress towards attaining any relevant WLA. The District must adjust its management programs to compensate for the inadequate progress within 6 months, and document the modifications in the Consolidated TMDL Implementation Plan. The Plan modification shall include a reasonable assurance demonstration of the additional controls to achieve the necessary reductions, *i.e.*, quantitatively linking sources and causes to discharge

quality. In addition, annual reports must include a description of progress as evaluated against all implementation objectives, milestones and benchmarks, as relevant.

Finally, with respect to any new or revised TMDL that may be approved during the permit term, the Final Permit makes allowances for reopening the permit to address those WLAs (see Section 8.19 of the Final Permit: Reopener Clause for Permits), if necessary. EPA believes that reopening the permit will not typically be necessary since the Final Permit requires the District to update the Consolidated Plan within six months for any TMDL approved during the permit term with wasteload allocations assigned to District MS4 discharges, and also to include a description of revisions in the next regularly scheduled annual report.

(**4.11 Additional Pollutant Sources)**: Requirements in this Section of the Final Permit largely continue provisions in the 2004 Permit. EPA notes that the provisions of this section were mostly included in Section 3 of the Draft Permit.

5. MONITORING AND ASSESSMENT OF CONTROLS

(5.1 Revised Monitoring Program): As included in the Draft Permit, the monitoring requirements for the District's stormwater program have been significantly updated from the last permit cycle. This revision reflects the fact that the District has already performed broad monitoring of a variety of parameters over the last two permit cycles. The Phase I stormwater regulations require representative sampling for the purpose of discharge characterization in the first permit term, or initial years of the program (40 C.F.R. §122.26(d)(1)(iv)(E)). The District now has a decade worth of this type of data, and it is timely to update the monitoring program to more effectively evaluate the effectiveness of the program, and to more effectively and efficiently use the District's funds for this purpose. As noted in the National Research Council's report *Urban Stormwater Management in the United States* [102], the quality of stormwater from urbanized areas has been well-characterized. Continuing the standard end-of-pipe monitoring typical of most MS4 programs has produced data of limited usefulness because of a variety of shortcomings (as detailed in the report). The NRC Report strongly recommends that MS4 programs modify their evaluation metrics and methods to include biological and physical monitoring, better evaluations of the performance/effectiveness of controls and overall programs, and an increased emphasis on watershed scale analyses to ascertain what is actually going on in receiving waters. The report also emphasizes the link between study design and the ability to interpret data, *e.g.*, having enough samples to ensure that conclusions are statistically significant.

Consistent with these goals, the Final Permit requires the District to develop a Revised Monitoring Program to meet the following objectives:

1) Make wet weather loading estimates of the parameters in Table 4 from the MS4 to receiving waters. Number of samples, sampling frequencies and number and locations of

102 National Research Council, *Urban Stormwater Management in the United States* (2009) National Academy of Sciences http://www.nap.edu/catalog.php?record_id=12465

sampling stations must be adequate to ensure data are statistically significant and interpretable.

2) Evaluate the health of the receiving waters, to include biological and physical indicators such as macroinvertebrates and geomorphologic factors. Number of samples, frequencies and locations must be adequate to ensure data are statistically significant and interpretable for long-term trend purposes (not variation among individual years or seasons).

3) Any additional necessary monitoring for purposes of source identification and wasteload allocation tracking. This strategy must align with the Consolidated TMDL Implementation Plan required in Part 4.10.3 For all pollutants in Table 4 monitoring must be adequate to determine if relevant WLAs are being attained within specified timeframes in order to make modifications to relevant management programs, as necessary.

The Final Permit requires the District to public notice the Revised Monitoring Program, and to submit it to EPA for review and approval within two years of the effective date of the Final Permit.

EPA also significantly refined the list of required pollutant analytes/parameters for which monitoring is required from over 120 to 9:

(Table 4 from the Final Permit)
Monitoring Parameters

Parameter
E. coli
Total nitrogen
Total phosphorus
Total Suspended Solids
Cadmium
Copper
Lead
Zinc
Trash

These parameters are those for which relevant stormwater wasteload allocations exist, or (in the case of cadmium) where monitoring data indicate that the pollutant is occurring in discharges at concentrations and frequencies to consider it a pollutant of concern. End-of-pipe analytical monitoring is an expensive undertaking, and EPA feels strongly that the District's water quality-related evaluations will be much more robust and actionable with an enhanced focus on true pollutants of concern, along with the elimination of analytes for which monitoring routinely shows non-detect concentrations, and/or those to which notable water quality problems have not been linked.

One modification has been made to this list for the Final Permit from the Draft Permit.

The Draft Permit required evaluation of Trash reductions in the relevant sections for the Anacostia River Watershed Trash TMDL (4.10.1), but failed to include it in Table 4 (Table 3 of the Draft Permit). EPA has added trash as a monitoring parameter to this table to correct that oversight.

(5.2 Interim Monitoring): During the interim period from the effective date of the Final Permit until EPA approves the Revised Monitoring Program, the Final Permit requires the District to largely continue the monitoring program established and updated under the 2000 and 2004 permits, except the monitoring program is only required for the list of monitoring parameters in Table 4, which has been reduced to the nine parameters as discussed above.

EPA received several comments and questions on the interim monitoring requirements. Individual responses are included in the Responsiveness Summary published with the Final Permit and this Final Fact Sheet. EPA chose to not modify the interim monitoring provisions for the Final Permit because: 1) they are largely an extension of the same requirements and methods already approved and established under prior permits, which will ensure that data collected during the interim monitoring period are comparable to data collected during the past decade, thus providing "apples to apples" comparisons in data interpretation; and 2) EPA believes that the District's monitoring-related resources are more effectively spent developing a robust revised program, rather than revising the interim program.

(5.4 Area and/or Source Identification Program): The Final Permit provides that "[t]he permittee shall continue to implement a program to identify, investigate, and address areas and/or sources within its jurisdiction that may be contributing excessive levels of pollutants to the MS4 and receiving waters, including but not limited to those pollutants identified in Table 4 herein." This is identical in substance to section 5.5 in the Draft Permit and essentially continues the requirements from the 2004 MS4 Permit. EPA received a comment that this provision has been inadequate to identify sources contributing pollutants to MS4 discharges. EPA recognizes that this provision is general, but believes that the District's ongoing practices are sufficient during the interim monitoring period. EPA notes that the Final Permit requires the Revised Monitoring Program to include any additional necessary monitoring for purposes of source identification and wasteload allocation tracking. The public will have a chance to comment on the proposed objectives and methods in Plan, and EPA will review and approve this Plan. Therefore there will be several opportunities to ensure that the District has robust methods for identify additional pollutant inputs to District MS4 discharges.

(5.7 Reporting of Monitoring Results): In response to several comments, and because of the potential availability of electronic reporting in the future, EPA made several modifications to this Section of the Final Permit. When available the District may submit monitoring data through NetDMR, a national tool for regulated Clean Water Act permittees to submit discharge monitoring reports (DMRs) electronically via a secure Internet application to EPA. *See* http://www.epa.gov/netdmr/. However, if this system is not available to the National Marine Fisheries Service, then the District must continue to submit hard copies. The Final Permit eliminates the requirement for the District to submit monitoring reports to itself. This section

clarifies (consistent with Section 6.2) that all monitoring results from a given year be summarized in the following annual report.

6. REPORTING REQUIREMENTS

Permit reporting is required pursuant to 40 C.F.R. § 122.41(l). EPA has made a number of minor edits to this section primarily for the purposes of: maintaining consistency with other Sections of the Final Permit (as those provisions necessitated changes in reporting, the Final Fact Sheet discusses those changes in association with the relevant Section); eliminating redundancy; and to provide clarification.

(6.2 Annual Reporting): Consistent with comments from a number of commenters regarding public access to documents, today's Final Permit requires the District to post each Annual Report on its website at the same time the Report is submitted to EPA.

The separate 'Reporting on Funding' in the Draft Permit has been eliminated in the Final Permit because it was largely redundant with other reporting requirements, and because it was beyond the scope of what is needed from the District. The Final Permit requires annual reporting on projected costs and budget for the coming year as well as expenditures and budget for the prior year, including (i) an overview of the District's financial resources and budget, (ii) overall indebtedness and assets, (iii) sources for funds for stormwater programs, and (iv) a demonstration of adequate fiscal capacity to meet the permit requirements. However, EPA has concluded that additional detail would be superfluous. In addition, beyond a demonstration of basic budget considerations as outlined in the Final Permit, how the District chooses to allocate resources to comply with the permit is an internal decision.

EPA has also included a provision for an Annual Report Meeting in this permit in order to improve communication between the District and the Agency. This meeting will provide an opportunity for EPA to obtain more in-depth knowledge of the District's program, and should also enhance feed-back on the program. The permit requires the District to convene the first Annual Report Meeting within 12 months of issuance of the permit. If both parties agree that this first meeting was successful, the Annual Report meeting shall be extended for the duration of the permit term.

7. STORMWATER MODEL

The Stormwater Model and associated Geographical Information System are tools used by the District to help track and evaluate certain components of the water quality program. The Final Permit requires the use and maintenance of this system as a component of the District's Stormwater Management Program. There were no modifications to this Section between the Draft Permit and the Final Permit.

8. STANDARD PERMIT CONDITIONS FOR NPDES PERMITS

The provisions in Part 8 are requirements generally applicable to all NPDES permits, pursuant to 40 C.F.R. § 122.41, as well as other applicable conditions pursuant to § 122.49 and specific statutory or regulatory provisions as noted in the permit. No changes were made to this section of the permit.

9. PERMIT DEFINITIONS

Most changes to this section from the Draft Permit consist of minor clarifications. In addition, several terms were eliminated from this section because they do not appear elsewhere in the Final Permit: 'goal', 'internal sampling station', 'significant spills', and 'significant materials'. The definition of 'MS4 Permit Area' was removed because it is already defined in Part 1.1.

A definition of "development" was added to clarify that development is "the undertaking of any activity that disturbs a surface area greater than or equal to 5,000 square feet." The definition further clarifies that the relevant performance standard for development applies to projects that commence after 18 months from the effective date of the Final Permit or as soon as the District's stormwater regulations go into effect, whichever is sooner.

The definition of 'green roof' was modified to allow for the fact that some types of ecoroofs may be constructed without vegetation or soil media.

The definition of "retrofit" was modified to focus on environmental outcomes, *i.e.*, reductions in discharge volumes and pollutant loads and improvements in water quality, rather than implementation of conveyance measures.

The definition of "predevelopment hydrology" was enhanced to clarify that the phrase refers to a "stable, natural hydrologic site condition that protects or restores to the degree relevant for that site, stable hydrology in the receiving water, which will not necessarily be the hydrologic regime of that receiving water prior to any human disturbance in the watershed." This definition is consistent with several seminal publications on the topic including *Urban Stormwater Management in the United States*[103] and references therein, *Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act*[104], and *Guidance for Federal Land Management in the Chesapeake Bay Watershed*[105], issued in fulfillment of Part 502 of E.O. 13508.

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103 National Research Council, *Urban Stormwater Management in the United States* (2009) National Academy of Sciences http://www.nap.edu/catalog.php?record_id=12465

104 EPA, *Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act* (2009) http://www.epa.gov/owow_keep/nps/lid/section438/

105 EPA, *Guidance for Federal Land Management in the Chesapeake Bay Watershed*, Chapter 3. Urban

RELATIONSHIP TO NON-POINT SOURCE PROGRAM:

It should be noted that the measures required by the Permit are separate from those projects identified in the District's EPA-approved Non-Point Source Management Plan as being funded wholly or partially by funds pursuant to Section 319(h) of the Clean Water Act. See Section 3 of Permit ("These Permit requirements do not prohibit the use of 319(h) funds for other related activities that go beyond the requirements of this Permit, nor do they prohibit other sources of funding and/or other programs where legal or contractual requirements preclude direct use for stormwater permitting activities.").

ADMINISTRATIVE RECORD:

Copies of the documents that comprise the administrative record for the Permit are available to the public for review at the Martin Luther King, Jr. Public Library, which is located at 901 G Street, N.W. in Washington, D.C. An electronic copy of the proposed and final Permits and proposed and Final Fact Sheets are also available on the EPA Region III website, http://www.epa.gov/reg3wapd/npdes/draft_permits.html. For additional information, please contact Ms. Kaitlyn Bendik, Mail Code 3WP41, NPDES Permits Branch, Office of Permits and Enforcement, EPA Region III, United States Environmental Protection Agency, 1650 Arch Street, Philadelphia, Pennsylvania 19103-2029.

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and Suburban, EPA841-R-10-002, (2010) (http://www.epa.gov/owow_keep/NPS/chesbay502/pdf/chesbay_chap03.pdf)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OCT 27 2011

MEMORANDUM

SUBJECT: Achieving Water Quality Through Integrated Municipal Stormwater and Wastewater Plans

FROM: Nancy Stoner
Acting Assistant Administrator
Office of Water (OW)

Cynthia Giles
Assistant Administrator
Office of Enforcement and Compliance Assurance (OECA)

TO: EPA Regional Administrators, OW & OECA Office & Division Directors

One of the most basic objectives of the Clean Water Act (CWA) is to keep raw sewage and pollutants carried by stormwater out of our nation's waters. We have made tremendous strides towards achieving that objective, but much work remains to be done. As we move forward with our work, we must be mindful that many of our state and local government partners find themselves facing difficult financial conditions. Their ability to finance improvements by raising revenues or issuing bonds has been significantly impacted during the ongoing economic recovery. We write this memorandum to make sure that we proceed as one EPA to assure that we work with states and communities to get the most effective as well as cost-effective approaches for meeting our shared objective of clean water that protects public health and the environment.

Integrated Planning for Cost-Effective Solutions

Today, the EPA, states and municipalities often focus on each CWA requirement individually for protecting water quality. As a result, we sometimes assess and implement the best alternative to solve one problem at a time without full consideration of all CWA obligations. This approach may have the unintended consequence of constraining a municipality from implementing the most cost-effective solutions in a sequence that addresses the most serious water quality issues first. We encourage regions to work with the states to engage our local partners regarding all of their National Pollutant Discharge Elimination System (NPDES) related obligations in an orderly manner. A comprehensive and integrated planning approach to a municipal government's CWA waste- and storm-water obligations offers the greatest opportunity for identifying cost-effective and protective solutions and implementing the most important projects first. The CWA and its implementing regulations, policy and guidance provide us

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with the necessary flexibility to work with communities to utilize comprehensive integrated planning to prioritize its waste- and storm-water investments.

Integrated planning will put municipalities on a critical path to achieving the water quality objectives of the CWA by identifying efficiencies in implementing sometimes overlapping and competing requirements that arise from separate waste- and storm-water programs, including how best to make capital investments and meet operation and maintenance requirements. Integrated planning also can lead to the identification of sustainable and comprehensive solutions, such as green infrastructure, that improve water quality as well as support other quality of life attributes that enhance the vitality of communities.

In embracing an integrated approach to waste- and storm-water management we are not suggesting that existing regulatory or permitting standards that protect public health and water on which communities depend be lowered. Rather, we are simply suggesting that such an approach will help municipalities responsibly meet their CWA obligations by maximizing their infrastructure improvement dollars through the appropriate sequencing of work. This will require coordination between permit and enforcement actions and complementary state actions. In so doing, as we consider a particular municipality's financial ability to complete the required infrastructure improvement work we must be sure that we consider all of its CWA obligations. EPA's existing regulations and policies provide EPA and states flexibility to evaluate a municipality's financial capability in tough economic times and to set appropriate compliance schedules, allow for implementing innovative solutions and sequence critical waste- and storm-water capital projects and operation and maintenance related work in a way that ensures human health and environmental protection. We recognize that such an integrated approach will necessarily involve balancing all of a municipality's competing CWA priorities with the public health and welfare objectives of the CWA. In doing so, we must be diligent in ensuring that a municipality be positioned to address its most pressing public health and welfare issues first.

States and local governments share our commitment to protecting public health and welfare. As an initial step towards meeting this shared commitment, the Office of Water and Office of Enforcement and Compliance Assurance are developing an integrated planning approach framework to help EPA, including its regional offices, work with state and local governments toward cost effective decisions. The framework will identify: 1) the essential components of an integrated plan; 2) steps for identifying municipalities that might make best use of such an approach; and 3) how best to implement the plans with our state partners under the CWA permit and enforcement programs.

Once the framework is in draft form we want to begin discussions and hold meetings with states and local governments, utilities and environmental groups to obtain their feedback on the draft framework in the coming months. In addition, we hope to identify municipal leaders who are currently developing, or have developed, integrated plans that can serve as models for this work.

Green Infrastructure

As you know, given the multiple benefits associated with green infrastructure, EPA strongly encourages the use of green infrastructure and related innovative technologies, approaches, and practices to manage stormwater as a resource, reduce sewer overflows, enhance environmental quality, and achieve other economic and community benefits. Many cities and communities in the United States are now

employing green infrastructure practices and know the value of such projects to not only protect water resources, but also to bring opportunities for greenways and multiuse recreational areas, improving property values, saving energy and creating green jobs.

In April of this year, we released our new green infrastructure strategic agenda, which outlines the activities that we will undertake to help communities implement green infrastructure approaches. Our strategy aims to clarify and advance the wider utility of green infrastructure within the regulatory and enforcement contexts through improvements in outreach and information exchange, financing, and tool development and capacity building.

Over the past several years, we have been working closely with state and local governments to incorporate green infrastructure approaches to water quality within permits and enforcement actions. We have many successful examples of cities who will utilize green infrastructure to meet regulatory requirements while also benefiting from green jobs, neighborhood enhancements and more sustainable communities. We have also launched a community partnership program that has currently identified 10 communities with which the Agency will work on green infrastructure implementation issues. The Agency hopes to add up to an additional 20 communities in the future. We have also started to develop technical assistance resources for some of these communities on using green infrastructure on brownfield sites and slowly infiltrating soils and evaluating codes and ordinances for barriers. All of these green infrastructure and associate innovations are important tools that will be fundamental aspects of the integrated waste- and storm-water planning solutions we envision.

We have the tools in our existing regulations and guidance to find answers to these problems. The current economic times make the need for sensible and effective approaches even more pressing. We have already seen the benefits that leadership and creativity in the regions' work bring to resolving these issues, reflected in forward looking plans in Indianapolis, Cleveland, St. Louis and many others. We look forward to working with you, and with states and local communities, to continue to pursue innovative and cost effective solutions to our water quality challenges.

We encourage you and your staff to contact Deborah Nagle, Director, Water Permits Division (nagle.deborah@epa.gov) and Mark Pollins, Director, Water Enforcement Division (pollins.mark@epa.gov) with any questions you might have.

Cc: Regional Permit and Enforcement Liaisons

EPA
United States Environmental Protection Agency
EPA 841-N-12-004

051764

The Economic Benefits of Protecting Healthy Watersheds

April 2012

Did You Know?

Maintaining the integrity of natural biological and physical systems provides economic benefits through ecosystem service provision.

Degradation of riparian ecosystems can cause negative economic impacts far from the altered site.

Protecting healthy watersheds reduces capital costs to supply clean drinking water and to treat waste water.

Healthy Watersheds support healthy economies!

Protecting Healthy Watersheds…

--Lowers drinking water treatment costs

--Avoids expensive restoration activities

--Sustains revenue-generating recreational and tourism opportunities

--Minimizes vulnerability and damage from natural disasters

--Provides critical ecosystem services at a fraction of the cost for engineered services

--Increases property value premiums

--Supports millions of jobs nationwide

--Ensures we leave a foundation for a vibrant economy for generations to come

Protecting our nation's healthy watersheds makes economic sense

Healthy intact watersheds provide many ecosystem services that are necessary for our social and economic well-being. These services include water filtration and storage, air filtration, carbon storage, nutrient cycling, soil formation, recreation, food and timber. Many of these services have not been monetized and therefore the economic contributions of healthy intact ecosystems are often under-valued when making land use decisions. Ecosystem services provided by healthy watersheds are difficult to replace and most often very expensive to engineer (see chart). An engineered ecosystem service replacement may only provide a fraction of the services provided by highly functioning natural systems.

Preventing impairments in healthy watersheds protects valuable ecosystem services that provide economic benefits to society and prevent expensive replacement and restoration costs. Maintaining riparian connectivity and natural processes in the landscape provide a supporting network for ecological integrity, ensuring the sustainable and cost effective provision of clean water over time.

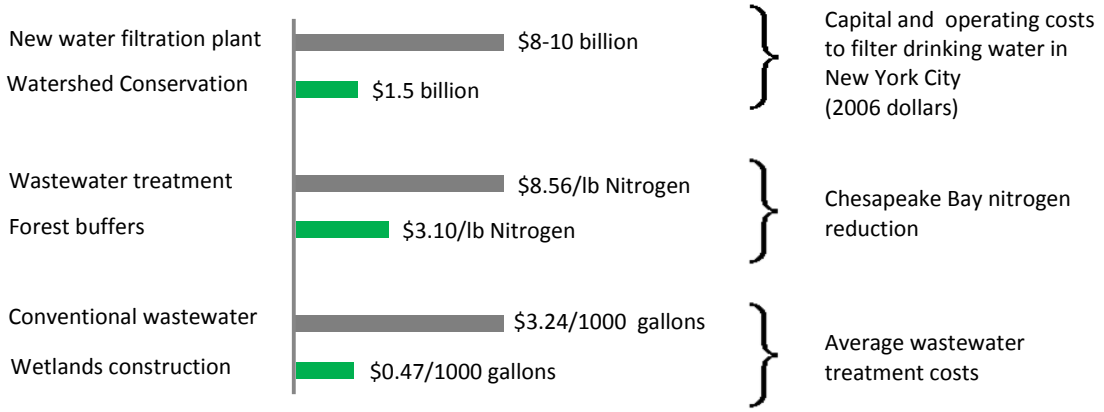

Watershed protection is less expensive than building new "grey" infrastructure
Hanson, Craig et al. 2011. Forests for water: exploring payments for watershed services in the US south." World Resources Institute Issue Brief, Issue 2, Pp15.

How is monetary value assigned to an ecosystem service?

Environmentalists and economists frequently suggest that there would be a greater incentive for environmental stewardship if ecosystem services were valued in a manner that reflects the large contribution they have to our economy and society. Assigning a monetary value to a particular service can be very complicated due to issues of scale and the complexity of ecological interactions that make isolating the economic effects of one service difficult. Although challenging, valuation is seen as essential for encouraging conservation. Economists have developed innovative methods that attempt to quantify ecosystem services and the economic benefits of conservation.

Instead of developing values for individual landscape features, such as a wetland, a healthy stream reach or headwaters, many economists have found that holistic valuation techniques that monetize a range of services provided by a landscape to be a more effective communication tool. At times, value is measured indirectly through payment for ecosystem services (PES) programs that compensate landowners for conserving land so that others may benefit from the multitude of ecosystem services the land supplies. Value can also be estimated by citizen's willingness to pay (WTP) to use or protect a land area or ecosystem service.

Another common indirect valuation method is the estimation of avoided costs to society due to protection activities. Cost avoidance scenarios are used to communicate the costs associated with losing ecosystem services and replacing them. These scenarios are commonly used to show costs saved from the prevention of flood damage or impairments that would occur if a floodplain was not intact.

Protecting healthy watersheds avoids future costs and benefits communities

Investing in the maintenance of healthy watersheds can significantly lower costs associated with water treatment and flooding. In a study of 27 US water suppliers, researchers found that protecting forested watersheds used for drinking water sources can reduce capital, operational and maintenance costs for drinking water treatment. They found that watersheds with greater percentages of protected forest correlate to fewer water treatment expenditures (see table).

Floods cause an average of $8 billion in damage every year in the United States

Retaining high quality natural green infrastructure minimizes property damage and clean-up costs from flood damage and storm surges. Forested cover prevents runoff from moving rapidly across the landscape and allows it to slowly infiltrate into the soil, reducing erosion and high flows. Intact wetlands store and capture excess water. For example, wetlands surrounding the Boston area have been estimated to prevent $42,111 of flood damage per acre of intact wetland. A healthy watershed will reduce the area and impact of a flood, minimize the economic burden on public infrastructure, reduce erosion and water treatment costs and can restore natural groundwater recharge.

Healthy watersheds that maintain protected riparian corridors are expected to be more resilient to the anticipated effects of climate change. Expenses associated with recovery from extreme weather impacts increased by a factor of six between 1997 and 2007. This rising trend is expected to continue. Floods now cause an average of $8 billion in damage every year in the U.S. The most efficient way to avoid excessive future costs is to increase the flexibility of ecosystems now so that they may function and retain resiliency under a wider range of climatic conditions. Riparian areas that are hydrologically connected to their landscape can maintain their functionality, are more adaptable to change, and better equipped to handle large storm events.

Share of forested watershed	Treatment costs per 3,000 m^3	Average annual treatment costs	Cost increase over 60% forest cover
60%	$29	$297,110	
50%	$36	$369,380	24%
40%	$46	$465,740	57%
30%	$58	$586,190	97%
20%	$74	$746,790	151%
10%	$91	$923,450	211%

Percent forest cover and predicted water treatment costs based on 27 US water supply system, based on treatment of 22 million gallons per day, the average daily production of water suppliers surveyed.
For more information, see *Postel, Sandra L. and Barton H. Thompson. 2005. Watershed protection: capturing the benefits of nature's water supply services. Natural Resources Forum*. Issue 29, Pp 98-108.

Future costs associated with the loss of natural intact systems and the services they provide may include constructing new infrastructure to manage and treat more stormwater and drinking water and greater clean-up costs from natural disasters. Comparing future adaptation costs to current short-term profits from land conversion can accurately reflect the ecological and economic consequences of land use decisions.

Economic and ecological benefits of conservation development

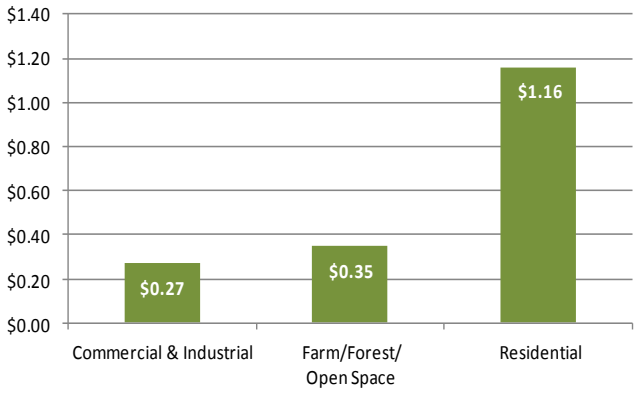

Conservation development preserves open space and maintains landscape connectivity, while clustering development to the least environmentally sensitive areas. Traditional development requires intensive and costly additions of grey infrastructure to connect new neighborhoods to road and utility networks. In a review of 98 communities across 21 states, researchers found that for every dollar received from residential development revenues, a median of $1.16 was spent on providing services to the new community by the local government (see figure). Conservation development provides economic benefits to communities because it consumes less land, needs fewer roads, resources and utility infrastructure. Additionally, many studies have shown that people are willing to pay a premium to live in conservation developments; these premiums provide greater revenues to local communities.

The median cost to provide public services to different land uses per dollar of revenue raised (n=98 communities)
Reprinted with permission from Crompton, John L. 2007."The impact of parks and open spaces on property taxes."The Economic Benefits of Land Conservation. Ed. Constance T.F.de Brun. The Trust for Public Land. Pp1-12.

Recreation and tourism

Recreation and tourism are billion-dollar industries in the United States. According to the American Sportfishing Association, there are over 30 million anglers in the U.S., generating over one million jobs and over $45 billion in retail sales annually. Healthy intact ecosystems are essential to the viability of both commercial and recreational fishing. More people in the U.S. fish (30 million) than play golf (24.2 million) or play tennis (10.2 million).

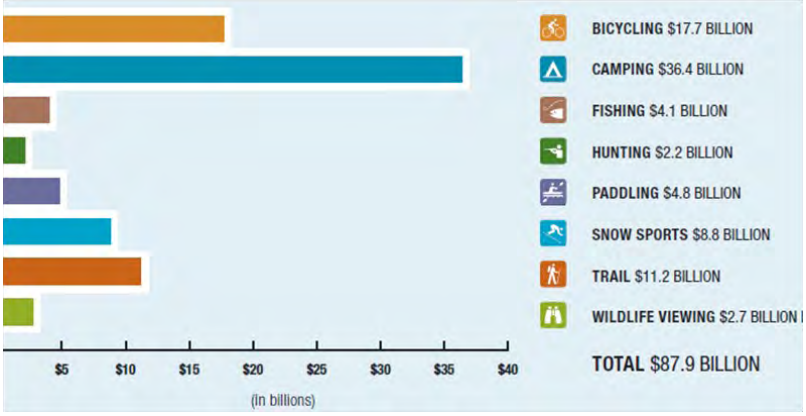

Federal and state tax revenues generated by recreational activity
Outdoor Industry Foundation 2003

In a 2003 study, the Outdoor Industry Foundation found that the outdoor recreation economy contributed $730 billion annually to the economy, supported 6.5 million jobs and generated $88 billion in state and federal tax revenues. Wildlife watchers in The Chesapeake Bay region spend about $3 billion annually on trip-related expenses and equipment; this estimate does not include job creation and multiplier effects from these activities. Rural areas near forest land and other types of open space often depend on tourist spending to help support their local economies. Outdoor recreation and eco-tourism are large economic forces whose foundation rely on the maintenance of healthy watersheds and the protection of open space.

More people in the United States fish (30 million) than play golf (24.2 million) or play tennis (10.2 million)

Property value premiums

People value living near healthy clean water. Studies from Maine and Minnesota show that home values declined by tens of thousands of dollars with declines in water quality. The aggregate effect of an increase in property values attributed to good water quality on a single lake equates to millions of dollars per lake in these areas. Further, recent studies around the country (e.g., in Colorado, Pennsylvania, Oregon, Maryland, Ohio and Virginia) have shown increased property values and tax revenues from properties near open space, green space, walking/biking trails, or riparian areas. Even in tight economic times, a relatively higher premium is placed on properties with access to nature. For example, a current study of five counties in southeastern Pennsylvania shows that open space is attributed with adding $16.3 billion to the regional housing stock value. Clean and healthy waterfronts boost property values and revenues for adjacent retail and commercial businesses, too. Waterfront business properties are attractive to customers and have greater property value premiums when they are near clean waters. Preserving healthy watersheds and protecting open space while providing access to people has the potential to boost local revenues while providing attractive amenities.

Quality of life and health benefits

The EPA and other public health organizations have long acknowledged the link between water and air quality to human health. When people think of human health and the environment, they often think of the negative health effects from an impacted environment, rather than the positive impacts that a healthy environment can have on human well-being.

There are social and health benefits related to the proximity of people to nature, parks, walking trails and biking trails—both in the form of physical exercise and mental stress relief. Forests outside of urban areas significantly contribute to human health in urban areas. These health benefits have the potential to provide significant cost savings in health expenditures. People who exercise regularly and seek stress relief are generally healthier, have fewer insurance claims and spend less time in hospitals, thus their societal health care costs are lower.

Forests outside of urban areas significantly contribute to human health in urban areas… reducing health expenditures

About Healthy Watersheds

EPA's Healthy Watersheds Initiative (HWI) was developed to protect the nation's remaining healthy watersheds, prevent them from becoming impaired, and accelerate our restoration successes.

The HWI complements existing EPA program efforts by focusing on protection of high quality watersheds. These healthy areas are identified through holistic aquatic ecosystem assessments. Protection and restoration priorities are developed through these assessments to strategically implement protective actions that are both economically and ecologically beneficial.

We can't afford not to protect our nation's remaining healthy watersheds!

If you would like to receive a copy of a white paper on the economic benefits of protecting healthy watersheds or learn more about Healthy Watersheds at EPA,
Contact Laura Gabanski: Gabanski.Laura@epa.gov
or
Visit our website www.epa.gov/healthywatersheds

People support protecting our nation's environment—it's good for the economy

Citizens across the United States have overwhelmingly voiced their support of environmental protection: between 1994 and 2004 over 75% of conservation referenda on ballots were passed and a 2011 Gallup poll shows that nearly 80% of people worry about pollution of lakes, rivers, streams and drinking water.

The United States has spent on average $1 billion per year on stream restoration since1990. These numbers are expected to rise as communities work to mitigate environmental problems. Restoration efforts are less successful without a supporting ecological network of healthy watersheds. Protecting highly functioning aquatic ecosystems is a cost-effective way to sustainably provide the multitude of services required to meet society's needs. Studies show that the total economic value of intact systems exceeds that of lands converted for intensive economic uses over time.

Understanding the contribution that healthy watersheds provide to local economies is an important tool for land stewardship. Strengthening protection of high quality waters or diverting new development from these sensitive areas can have a positive economic and social impact and maintain these benefits for generations to come.

Selected Publications and Resources

Ecosystem services provided by conserving forest land

Forests, water and people: Drinking water supply and forest lands in the Northeast and Midwest United States
http://na.fs.fed.us/watershed/fwp_preview.shtm
This analysis by the US Forest Service highlights the connection between forests and the protection of surface drinking water quality.

Investing in protecting healthy watersheds avoids future costs

Forests for water: Exploring payments for watershed services in the U.S. South
http://www.wri.org/publication/forests-for-water
This World Resources Institute study from 2011 explores the use of landowner compensation to protect natural resources and for avoided costs.

Green infrastructure: Smart conservation for the 21st century
Mark A. Benedict and Edward T. McMahon
http://www.greeninfrastructure.net/sites/greeninfrastructure.net/files/GI_RR.pdf
This 2002 publication lays out the natural green infrastructure concept of protecting ecological hubs and corridors and discusses how protecting these areas avoids future costs.

Revenues generated in recreation and tourism sectors from healthy watersheds

American Sportfishing Association
http://www.asafishing.org/
This organization provides links to several studies that explore the economic impact of the hunting and fishing industries, which rely on healthy fish and wildlife habitats.

Outdoor Industry Association
http://www.outdoorindustry.org/national-economic-impact-reports.php
This website provides links to comprehensive economic reports on the impact that outdoor recreational activity has on the economy.

Valuing ecosystem services

The World Conservation Union (IUCN) ***Value: Counting ecosystem services as infrastructure***
http://www.iucn.org/what/tpas/greeneconomy/resources/documents/?1136/Value-counting-ecosystems-as-water-infrastructure
This 2004 IUCN publication is a comprehensive look a how ecosystems provide valuable services and the critical need for investment in protecting natural systems.

The *Economic Benefits of Protecting Healthy Watersheds Fact Sheet* is produced by the U.S. Environmental Protection Agency. Mention of commercial products, publications, or web sites in this fact sheet does not constitute endorsement or recommendation for use by EPA or its contractors, and shall not be used for advertising or product endorsement purposes. The discussion in this document is intended solely as guidance. Thus, it does not impose legally binding requirements on EPA, States, or the regulated community. This guidance does not confer legal rights or impose legal obligations upon any member of the public. This is a living document and may be revised periodically without public notice. EPA welcomes public input on this document at any time.

AUTHENTICATED U.S. GOVERNMENT INFORMATION GPO

051768

FEDERAL REGISTER

Vol. 77 Friday,
No. 97 May 18, 2012

Part II

Environmental Protection Agency

40 CFR Parts 136, 260, et al.
Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act; Analysis and Sampling Procedures; Final Rule

051769

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 136, 260, 423, 430, and 435

[EPA–HQ–OW–2010–0192; FRL–9664–6]

RIN 2040–AF09

Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act; Analysis and Sampling Procedures

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: This rule modifies the testing procedures approved for analysis and sampling under the Clean Water Act. EPA proposed these changes for public comment on September 23, 2010. The changes adopted in this final rule fall into the following categories: New and revised EPA methods and new and revised methods published by voluntary consensus standard bodies (VCSB), such as ASTM International and the Standard Methods Committee; updated versions of currently approved methods; methods reviewed under the alternate test procedures (ATP) program; clarifications to the process for EPA approval for use of alternate procedures for nationwide and Regional use; minimum quality control requirements to improve consistency across method versions; corrections to previously approved methods; and revisions to sample collection, preservation, and holding time requirements. Finally, EPA makes changes to three effluent guideline regulations.

DATES: This regulation is effective on June 18, 2012. The incorporation by reference of these methods is approved by the Director of the Federal Register on June 18, 2012. For judicial review purposes, this final rule is promulgated as of 1:00 p.m. (Eastern time) on June 1, 2012 as provided at 40 CFR 23.2 and 23.7.

ADDRESSES: EPA has established a docket for this action under Docket ID No. EPA–HQ–OW–2010–0192. All documents in the docket are listed on the *http://www.regulations.gov* Web site. Although listed in the index, some information is not publically available, *e.g.,* CBI or other information whose disclosure is restricted by statute. Certain other materials, such as copyrighted material, are not placed on the Internet and will be publicly available only in hard copy form. Publicly available docket materials are available either electronically through *http://www.regulations.gov* or in hard copy at the HQ Water Docket Center, EPA/DC, EPA West, Room 3334, 1301 Constitution Ave. NW., Washington, DC. The Public Reading Room is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is 202–566–1744, and the telephone number is 202–566–2426 for the HQ Water Docket.

FOR FURTHER INFORMATION CONTACT: For information regarding the changes to inorganic chemical methods, contact Lemuel Walker, Engineering and Analysis Division (4303T), USEPA Office of Science and Technology, 1200 Pennsylvania Ave. NW., Washington, DC 20460, 202–566–1077 (email: *walker.lemuel@epa.gov*). For information regarding the changes to organic chemical methods, contact Maria Gomez-Taylor, Engineering and Analysis Division (4303T), USEPA Office of Science and Technology, 1200 Pennsylvania Ave. NW., Washington, DC 20460, 202–566–1005 (email: *gomez-taylor.maria@epa.gov*). For information regarding the changes to microbiological and whole effluent toxicity methods, contact Robin Oshiro, Engineering and Analysis Division (4303T), USEPA Office of Science and Technology, 1200 Pennsylvania Ave. NW., Washington, DC 20460, 202–566–1075 (email: *oshiro.robin@epa.gov*).

SUPPLEMENTARY INFORMATION:

A. General Information

1. Does this action apply to me?

EPA Regions, as well as States, Territories and Tribes authorized to implement the National Pollutant Discharge Elimination System (NPDES) program, issue permits with conditions designed to ensure compliance with the technology-based and water quality-based requirements of the Clean Water Act (CWA). These permits may include restrictions on the quantity of pollutants that may be discharged as well as pollutant measurement and reporting requirements. If EPA has approved a test procedure for analysis of a specific pollutant, the NPDES permittee must use an approved test procedure (or an approved alternate test procedure if specified by the permitting authority) for the specific pollutant when measuring the required waste constituent. Similarly, if EPA has established sampling requirements, measurements taken under an NPDES permit must comply with these requirements. Therefore, entities with NPDES permits will potentially be affected by the actions in this rulemaking. Categories and entities that may potentially be affected by the requirements of today's rule include:

Category	Examples of potentially affected entities
State, Territorial, and Indian Tribal Governments.	States, Territories, and Tribes authorized to administer the NPDES permitting program; States, Territories, and Tribes providing certification under Clean Water Act section 401; State, Territorial, and Indian Tribal owned facilities that must conduct monitoring to comply with NPDES permits.
Industry	Facilities that must conduct monitoring to comply with NPDES permits.
Municipalities	POTWs or other municipality owned facilities that must conduct monitoring to comply with NPDES permits.

This table is not intended to be exhaustive, but rather provides a guide for readers regarding entities likely to be affected by this action. This table lists types of entities that EPA is now aware of that could potentially be affected by this action. Other types of entities not listed in the table could also be affected. To determine whether your facility is affected by this action, you should carefully examine the applicability language at 40 CFR 122.1 (NPDES purpose and scope), 40 CFR 136.1 (NPDES permits and CWA) and 40 CFR 403.1 (Pretreatment standards purpose and applicability). If you have questions regarding the applicability of this action to a particular entity, consult the appropriate person listed in the preceding **FOR FURTHER INFORMATION CONTACT** section.

B. What process governs judicial review of this rule?

Under Section 509(b)(1) of the Clean Water Act (CWA), judicial review of today's CWA rule may be obtained by filing a petition for review in a United States Circuit Court of Appeals within 120 days from the date of promulgation of this rule. For judicial review purposes, this final rule is promulgated as of 1 p.m. (Eastern time) on June 1, 2012 as provided at 40 CFR 23.2. The

requirements of this regulation may also not be challenged later in civil or criminal proceedings brought by EPA.

C. Abbreviations and Acronyms Used in the Preamble and Final Rule

AOAC: AOAC International
ASTM: ASTM International
ATP: Alternate Test Procedure
CFR: Code of Federal Regulations
CWA: Clean Water Act
EPA: Environmental Protection Agency
FLAA: Flame Atomic Absorption Spectroscopy
HRGC: High Resolution Gas Chromatography
HRMS: High Resolution Mass Spectrometry
ICP/AES: Inductively Coupled Plasma-Atomic Emission Spectroscopy
ICP/MS: Inductively Coupled Plasma-Mass Spectrometry
ISO: International Organization for Standardization
MS: Mass Spectrometry
NIST: National Institute of Standards and Technology
NPDES: National Pollutant Discharge Elimination System
QA: Quality Assurance
QC: Quality Control
SDWA: Safe Drinking Water Act
SM: Standard Methods
SRM: Standard Reference Material
STGFAA: Stabilized Temperature Graphite Furnace Atomic Absorption Spectroscopy
USGS: United States Geological Survey
VCSB: Voluntary Consensus Standards Body
WET: Whole Effluent Toxicity

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H. Executive Order 13211: Actions That Significantly Affect Energy Supply, Distribution, or Use
I. National Technology Transfer and Advancement Act of 1995
J. Executive Order 12898: Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations
K. Congressional Review Act

I. Statutory Authority

EPA is promulgating today's rule pursuant to the authority of sections 301(a), 304(h), and 501(a) of the Clean Water Act (''CWA'' or the ''Act''), 33 U.S.C. 1311(a), 1314(h), 1361(a). Section 301(a) of the Act prohibits the discharge of any pollutant into navigable waters unless the discharge complies with a National Pollutant Discharge Elimination System (NPDES) permit issued under section 402 of the Act. Section 304(h) of the Act requires the Administrator of the EPA to ''* * * promulgate guidelines establishing test procedures for the analysis of pollutants that shall include the factors which must be provided in any certification pursuant to [section 401 of this Act] or permit application pursuant to [section 402 of this Act].'' Section 501(a) of the Act authorizes the Administrator to ''* * * prescribe such regulations as are necessary to carry out this function under [the Act].'' EPA generally has codified its test procedure regulations (including analysis and sampling requirements) for CWA programs at 40 CFR part 136, though some requirements are codified in other Parts (*e.g.,* 40 CFR Chapter I, Subchapters N and O).

II. Summary of Final Rule

The following sections describe the changes EPA is making in today's final rule.

A. New EPA Methods and New Versions of Previously Approved EPA Methods

This rule approves new EPA methods and new versions of already approved EPA methods. The following discussion briefly describes the EPA methods added today to Part 136.

1. Oil and grease. Today's rule adds a new version of EPA Method 1664, 1664 Revision B: n-Hexane Extractable Material (HEM; Oil and Grease) and Silica Gel Treated n-Hexane Extractable Material (SGT–HEM; Non-polar Material) by Extraction and Gravimetry for use in CWA programs. Today, EPA is also amending the RCRA regulations at 40 CFR 260.11, which currently specify the use of Method 1664 Rev. A, to provide additionally for use of the revised version, 1664 Rev. B. As stated in the preamble to the proposal (75 FR 58026, Sept. 23, 2010), EPA encourages that future delistings cite ''Method 1664 Rev. B'' while delistings already granted may continue to use Method 1664 Rev. A.

On December 14, 2011, EPA published a notice of data availability (NODA) on a new method for oil and grease for use in Clean Water Act programs (see 76 FR 77742). This method, ASTM D–7575–10, uses a different extractant (a membrane filter instead of n-hexane for the extraction of oil and grease material) and a different measurement technique (infrared absorption instead of gravimetry) from the extractant and measurement technique of currently approved methods for oil and grease. The new method was discussed in the September 23, 2010 notice but EPA did not propose it for use as an approved method to be codified at 40 CFR 136.3 because oil and grease is a method-defined parameter. By definition, the measurement results of method-defined parameters are specific to the described method and are not directly comparable to results obtained by another method. However, since publication of the Methods Update Rule proposal, the Agency received additional data and information about this method and is re-considering whether it should add this

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method to the list of approved methods for oil and grease at 40 CFR 136.3. In the NODA, EPA proposed to include ASTM D–7575 for the measurement of oil and grease based on comments received in response to its September 23, 2010 proposal and the additional data. EPA will make a decision on the inclusion of the new method once it reviews the public comments received in response to the NODA and will then publish that decision in a separate **Federal Register** notice.

2. Metals. Today's rule adds EPA Method 200.5 (Revision 4.2): ''Determination of Trace Elements in Drinking Water by Axially Viewed Inductively Coupled Plasma—Atomic Emission Spectrometry'' to Table IB. The rule also clarifies that the axial orientation of the torch is allowed for use with EPA Method 200.7. Thus, EPA will allow the use of axial instruments or radial instruments to measure metals in water samples.

3. Pesticides. Today's rule adds EPA Method 525.2 to Table IG (Test Methods for Pesticide Active Ingredients) as an additional approved method for all parameters for which EPA has previously approved EPA Method 525.1, and also adds Methods 525.1 and 525.2 to Table ID for the same parameters for which EPA had previously approved Method 525.1 in Table IG. The rule also adds some of the methods for Pesticide Active Ingredients (Table IG) to applicable parameters listed in Table ID for general use. These methods are:

a. EPA Method 608.1, ''The Determination of Organochlorine Pesticides in Municipal and Industrial Wastewater.'' This method measures chlorobenzilate, chloroneb, chloropropylate, dibromochloropropane, etridiazole, PCNB, and propachlor.

b. EPA Method 608.2, ''The Determination of Certain Organochlorine Pesticides in Municipal and Industrial Wastewater.'' This method measures chlorothalonil, DCPA, dichloran, methoxychlor, and permethrin.

c. EPA Method 614, ''The Determination of Organophosphorus Pesticides in Municipal and Industrial Wastewater.'' This method measures azinphos methyl, demeton, diazinon, disulfoton, ethion, malathion, parathion methyl, and parathion ethyl.

d. EPA Method 614.1, ''The Determination of Organophosphorus Pesticides in Municipal and Industrial Wastewater.'' This method measures dioxathion, EPN, ethion, and terbufos.

e. EPA Method 615, ''The Determination of Chlorinated Herbicides in Municipal and Industrial Wastewater.'' This method measures 2,4-D, dalapon, 2,4-DB, dicamba, dichlorprop, dinoseb, MCPA, MCPP, 2,4,5-T, and 2,4,5-TP.

f. EPA Method 617, ''The Determination of Organohalide Pesticides and PCBs in Municipal and Industrial Wastewater.'' This method measures aldrin, α-BHC, β-BHC, γ-BHC (lindane), captan, carbophenothion, chlordane, 4,4′-DDD, 4,4′-DDE, 4,4′-DDT, dichloran, dicofol, dieldrin, endosulfan I, endosulfan II, endosulfan sulfate, endrin, endrin aldehyde, heptachlor, heptachlor epoxide, isodrin, methoxychlor, mirex, PCNB, perthane, strobane, toxaphene, trifluralin, PCB-1016, PCB-1221, PCB-1232, PCB-1242, PCB-1248, PCB-1254, and PCB-1260.

g. EPA Method 619, ''The Determination of Triazine Pesticides in Municipal and Industrial Wastewater.'' This method measures ametryn, atraton, atrazine, prometon, prometryn, propazine, sec-bumeton, simetryn, simazine, terbuthylazine, and terbutryn.

h. EPA Method 622, ''The Determination of Organophosphorus Pesticides in Municipal and Industrial Wastewater.'' This method measures azinphos methyl, bolstar, chlorpyrifos, chlorpyrifos methyl, coumaphos, demeton, diazinon, dichlorvos, disulfoton, ethoprop, fensulfothion, fenthion, merphos, mevinphos, naled, parathion methyl, phorate, ronnel, stirofos, tokuthion, and trichloronate.

i. EPA Method 622.1, ''The Determination of Thiophosphate Pesticides in Municipal and Industrial Wastewater.'' This method measures aspon, dichlofenthion, famphur, fenitrothion, fonophos, phosmet, and thionazin.

j. EPA Method 632, ''The Determination of Carbamate and Urea Pesticides in Municipal and Industrial Wastewater.'' This method measures aminocarb, barban, carbaryl, carbofuran, chlorpropham, diuron, fenuron, fenuron-TCA, fluometuron, linuron, methiocarb, methomyl, mexacarbate, monuron, monuron-TCA, neburon, oxamyl, propham, propoxur, siduron, and swep.

4. Microbiologicals. Today's rule approves the 2005 versions of EPA Method 1622, ''Cryptosporidium in Water by Filtration/IMS/FA'' and EPA Method 1623, ''Cryptosporidium and Giardia in Water by Filtration/IMS/FA'' in Table IH for ambient water.

The rule approves revised versions of EPA Methods 1103.1, 1106.1, 1600, 1603, and 1680 in Table IH. The rule also approves the revised version of EPA Methods 1600, 1603 and 1680 in Table IA. We corrected technical errors in these revisions.

5. Non-Conventionals. Today's rule adds EPA Method 1627, ''Kinetic Test Method for the Prediction of Mine Drainage Quality'' to Table IB as a new parameter termed ''Acid Mine Drainage.''

6. Organics. Today's rule approves EPA Method 624, ''Purgeables,'' for the determination of acrolein and acrylonitrile in wastewater and revises footnote 4 to Table IC to specify that the laboratory must provide documentation about its ability to measure these analytes at the levels necessary to comply with associated regulations.

B. New Standard Methods and New Versions of Approved Standard Methods

This rule approves the following Standard Methods (SM) for certain pollutants currently listed in Table IB at Part 136. Laboratories performing measurements using any of the approved Standard Methods must follow the quality control (QC) procedures specified in the 20th or 21st edition of Standard Methods. Below is a list of the Standard Methods added to Table IB in Part 136:

1. SM 5520 B–2001 and SM 5520 F–2001, Oil and Grease, gravimetric
2. SM 4500–NH_3 G–1997, Ammonia (as N) and TKN, automated phenate method
3. SM 4500–B B–2000, Boron, curcumin method
4. SM 4140 B–1997, Inorganic Ions (Bromide, Chloride, Fluoride, Orthophosphate, and Sulfate), capillary ion electrophoresis with indirect UV detection
5. SM 3114 B–2009, Arsenic and Selenium, AA gaseous hydride
6. SM 3114 C–2009, Arsenic and Selenium, AA gaseous hydride
7. SM 3111 E–1999, Aluminum and Beryllium, direct aspiration atomic absorption spectrometry
8. SM 5220 B–1997, Chemical Oxygen Demand (COD), titrimetric
9. SM 3500–Cr B–2009, Chromium, colorimetric method
10. SM 4500–N_{org} D–1997, Kjeldahl Nitrogen, semi-automated block digestor colorimetric
11. SM 3112 B–2009, Mercury, cold vapor, manual
12. SM 4500–P G–1999 and SM 4500–P H–1999, Phosphorus, Total, automated ascorbic acid reduction
13. SM 4500–P E–1999 and SM 4500–P F–1999, Phosphorus, Total, manual, and automated ascorbic acid reduction
14. SM 4500–O B, D, E and F–2001, Oxygen, Dissolved, Winkler
15. SM 4500–O D–2001, Oxygen, Dissolved, Winkler

16. SM 4500–O E–2001, Oxygen, Dissolved, alum flocculation modification
17. SM 5530 B–2005, Phenols, manual distillation
18. SM 5530 D–2005, Phenols, colorimetric
19. SM 3500–K C–1997, Potassium, Total, selective electrode method
20. SM 2540 E–1997, Residues—Volatile, gravimetric
21. SM 4500–SiO_2 E–1997 and SM 4500–SiO_2 F–1997, Silica, Dissolved, automated molybdosilicate
22. SM 4500–SO_4^{2-} C–1997, D–1997, E–1997, F–1997 and G–1997, Sulfate, gravimetric, and automated colorimetric
23. SM 4500–S^{2-} B–2000 and C–2000, Sulfide, sample pretreatment

C. New ASTM Methods and New Versions of Previously Approved ASTM Methods

The rule approves the following ASTM methods for existing pollutants and ASTM methods for new pollutants to 40 CFR part 136, Table IB for inorganic compounds, and Table IC for organic compounds.

1. ASTM D2036–09 (B), Cyanide—Total, Cyanide amenable to cholorination
2. ASTM D6888–09, Cyanide—Available, flow injection and ligand exchange
3. ASTM D7284–08, Cyanide—Total, flow injection
4. ASTM D7511–09, Cyanide—Total, segmented flow injection
5. Free cyanide is added as a new parameter (24A in Table IB); two ASTM methods (D4282–02 and D7237–10) are approved, in addition to a new version of OIA 1677(2009) for this parameter. D4282–02 is a Standard Test Method for Determination of Free Cyanide in Water and Wastewater by Microdiffusion, and Method D7237–10 is a Standard Test Method for Free Cyanide with Flow Injection Analysis (FIA) Utilizing Gas Diffusion Separation and Amperometric Detection.
6. ASTM D888–09 (A), Oxygen Dissolved, Winkler
7. ASTM D7573–09, Organic Carbon—Total, combustion
8. ASTM D7065–06, Five new chemicals in water: Nonylphenol (NP), Bisphenol A (BPA), p-tert-Octylphenol (OP), Nonylphenol Monoethoxylate (NP1EO), and Nonylphenol Diethoxylate (NP2EO), Gas Chromatography/Mass Spectrometry

D. New Alternate Test Procedures at 40 CFR 136.3

The rule approves eight methods submitted to EPA for review through the alternate test procedures (ATP) program and deemed acceptable based on the evaluation of documented method performance. The eight methods approved are added to Table IB:

1. Hach Company's Method 10360 Luminescence Measurement of Dissolved Oxygen in Water and Wastewater and for Use in the Determination of BOD_5 and $cBOD_5$, Revision 1.2 dated October 2011
2. In-Situ Incorporated's Method 1002–8–2009 Dissolved Oxygen Measurement by Optical Probe
3. In-Situ Incorporated's Method 1003–8–2009 Biochemical Demand (BOD) Measurement by Optical Probe
4. In-Situ Incorporated's Method 1004–8–2009 Carbonaceous Biochemical Oxygen Demand (CBOD) Measurement by Optical Probe
5. Mitchell Method M5271 dated July 31, 2008 for turbidity
6. Mitchell Method M5331 dated July 31, 2008 for turbidity
7. Thermo Scientific's Orion Method AQ4500 dated March 12, 2009 for turbidity
8. Easy (1–Reagent) Nitrate Method dated November 12, 2011 for nitrate, nitrite and combined nitrate/nitrite

E. Clarifications and Corrections to Previously Approved Methods in 40 CFR 136.3

The rule also clarifies the procedures for measuring orthophosphate and corrects typographical or other citation errors in Part 136. Specifically, the rule clarifies the purpose of the immediate filtration requirement in orthophosphate measurements (Table IB, parameter 44), which is to assess the dissolved or bio-available form of orthophosphorus (*i.e.,* that portion which passes through a 0.45-micron filter)—hence the requirement to filter the sample immediately upon collection (*i.e.,* within 15 minutes of collection). EPA has added a footnote (24) to Table II providing this clarification. The rule also corrects missing citations to the table of microbiological methods for ambient water monitoring which are specified in Table IH at 40 CFR 136.3. When EPA approved the use of certain microbiological methods on March 26, 2007 (72 FR 14220), EPA inadvertently omitted fecal coliform, total coliform, and fecal streptococcus methods from the table. This omission is corrected in today's rule.

F. Revisions in Table II at 40 CFR 136.3(e) to Required Containers, Preservation Techniques, and Holding Times

The rule revises some of the current requirements in Table II at 136.3(e).

1. The rule revises footnote 4 of Table II to clarify the sample holding time for the Whole Effluent Toxicity (WET) samples for the three toxicity methods by adding the following sentence: ''For static-renewal toxicity tests, each grab or composite sample may also be used to prepare test solutions for renewal at 24 h, 48 h, and/or 72 h after first use, if stored at 0–6 °C, with minimum head space.'' In addition, EPA will post on the WET Web site corrections to errata in the ''Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms'' manual (EPA 2010e).

2. The rule revises the cyanide sample handling instructions in Footnote 5 of Table II to recommend the treatment options for samples containing oxidants described in ASTM's sample handling practice for cyanide samples, D7365–09a.

3. The rule revises the cyanide sample handling instructions in Footnote 6 of Table II to describe options available when the interference mitigation instructions in D7365–09a are not effective, and to allow the use of any technique for removal or suppression of interference, provided the laboratory demonstrates and documents that the alternate technique more accurately measures cyanide through quality control measures described in the analytical test method.

4. The rule revises footnote 16 of Table II instructions for handling Whole Effluent Toxicity (WET) samples by adding two sentences: ''Aqueous samples must not be frozen. Hand-delivered samples used on the day of collection do not need to be cooled to 0 to 6 °C prior to test initiation.''

5. The rule revises footnote 22 to Table II to read ''Sample analysis should begin as soon as possible after receipt; sample incubation must be started no later than 8 hours from time of collection.''

6. The rule adds three entries at the end of Table II with the containers, preservation, and holding times for the alkylated phenols, adsorbable organic halides, and chlorinated phenolics. When EPA proposed ASTM D7065–06 for the alkylated phenols, commenters noted that EPA did not include preservation and holding time information in Table II. When EPA moved EPA Methods 1650 and 1653

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from 40 CFR part 430 to Table IC, EPA inadvertently omitted the associated parameters to Table II, and is correcting this omission in today's rule. The Table II information for containers, preservation, and holding times for these three new entries are taken from the approved methods.

G. Revisions to 40 CFR 136.4 and 136.5

This rule changes §§ 136.4 and 136.5 to clarify the procedures for obtaining review and approval for the use of alternate test procedures (alternate methods or ATPs) for those methods for which EPA has published an ATP protocol (there are published protocols for chemistry, radiochemical, and microbiological culture methods). In particular, it establishes separate sections outlining the procedures for obtaining EPA review and approval for nationwide use of an ATP (§§ 136.4), and the procedures for obtaining approval for limited use of an ATP (§§ 136.5).

In addition, this rule adds language to Part 136.5 to clarify the purpose and intent of limited use applications. This provision only allows use of an alternate method for a specific application at a facility or type of discharge. The Regional Alternate Test Procedure (ATP) Coordinator or the permitting authority, at his/her discretion, may grant approval to all discharges or facilities specified in the approval letter. However, the appropriate permitting authority within a state may request supporting test data from each discharger or facility prior to allowing any such approvals.

Today's rule further clarifies that the limited use provision cannot be used to gain nationwide approval and is not a way to avoid the full examination of comparability that is required for alternate test procedures when EPA considers a method for nationwide use with the ultimate goal of listing it as an approved CWA method at 40 CFR part 136. As further clarification, in the event that EPA decides not to approve a method proposed for nationwide use, the Regional ATP Coordinator or the permitting authority may choose to reconsider any previous limited use approvals of the alternate method. Based on this reconsideration, the Regional ATP Coordinator or the permitting authority will notify the user(s) if the limited use approval is withdrawn. Otherwise, the limited use approvals remain in effect.

H. Revisions to Method Modification Provisions at 40 CFR 136.6

This section allows users to make certain modifications to an approved method to address matrix interferences without the extensive review and approval process specified for an alternate test procedure at 136.4 and 136.5. Today's rule revises 136.6 to provide more examples of allowed and prohibited method modifications. The intent of today's revisions is to clarify those situations in which an ATP is required and those where it is not. Analysts may use the examples to help assess the need for a formal ATP, and in the event an ATP is not needed to document that their modification is acceptable and does not depart substantially from the chemical principles in the method being modified.

In response to comments, EPA has included additional examples of allowed and prohibited method modifications and has made some revisions to the text language as discussed in Section III below.

I. New Quality Assurance and Quality Control Language at 40 CFR 136.7

EPA is specifying ''essential'' quality control elements at § 136.7 for use in conducting an analysis for CWA compliance monitoring. This new language is added because auditors, co-regulators, laboratory personnel, and the regulated community have noted the variations in quality assurance (QA) and quality control (QC) procedures practiced by laboratories that use 40 CFR part 136 methods for compliance monitoring. Some of these methods are published by voluntary consensus standards bodies, such as the Standard Methods Committee, and ASTM International. Standard Methods and ASTM are available in printed or electronic compendia, or as individual online files. As mentioned in the proposal, each organization has a unique compendium structure. QA and QC method guidance or requirements may be listed directly in the approved consensus method, or, as is more often the case, these requirements are listed in other parts of the compendium.

Regardless of the publisher, edition, or source of an analytical method approved for CWA compliance monitoring, analysts must use suitable QA/QC procedures whether EPA or other method publishers have specified these procedures in a particular Part 136 method, or referenced these procedures by other means. These records must be kept in-house as part of the method testing documentation. Consequently, today's rule clarifies that an analyst using these consensus standard body methods for reporting under the CWA must also comply with the quality assurance and quality control requirements listed in the appropriate sections in that consensus standard body compendium. EPA's approval of use of these voluntary consensus standard body methods contemplated that any analysis using such methods would also meet the quality assurance and quality control requirements prescribed for the particular method. Thus, not following the applicable and appropriate quality assurance and quality control requirements of the respective method means that the analysis does not comply with the requirements in EPA's NPDES regulations to monitor in accordance with the procedures of 40 CFR part 136 for analysis of pollutants.

For methods that lack QA/QC requirements (as specified in this new section at 40 CFR 136.7), whether developed by EPA, a vendor, or a consensus standard body, analysts can refer to and follow the QA/QC published in several public sources. Examples of these sources include the relevant QA/QC sections of an equivalent approved EPA method, or voluntary consensus standards published as Part 136 approved methods (*e.g.,* Standard Methods, ASTM International, and AOAC). In addition to and regardless of the source of the laboratory's or method's QA and QC instructions, for methods that lack QA/QC requirements, EPA is adding requirements at 136.7 to specify twelve essential quality control elements that must be in the laboratory's documented quality system unless a written rationale is provided to explain why these quality control elements are inappropriate for a specific analytical method or application. These twelve essential quality control checks must be clearly documented in the written SOP (or method) along with a performance specification or description for each of the twelve checks, as applicable to the specific method. EPA has clarified the language in this section in response to public comments. The revised language is discussed in section III below.

J. Revisions at 40 CFR Part 423 (Steam Electric Power Generating Point Source Category)

The rule revises the 40 CFR part 423 definitions for total residual chlorine and free available chlorine at §§ 423.11(a) and 423.11(l) to allow the use of ''chlorine—total residual'' and ''chlorine—free available'' methods in § 136.3(a), Table IB, or other methods approved by the permitting authority.

III. Changes Between the Proposed Rule and the Final Rule

Except as noted below, the content of the final rule is the same as that of the proposed rule.

A. EPA Is Not Adding EPA Method 1614A

The Agency proposed to add Method 1614A, ''Brominated Diphenyl Ethers in Water, Soil, Sediment, and Tissue by HRGC/HRMS.'' EPA developed this method to determine 49 polybrominated diphenyl ether (PBDE) congeners in aqueous, solid, tissue, and multi-phase matrices. This method uses isotope dilution and internal standard high resolution gas chromatography/high resolution mass spectrometry (HRGC/HRMS). The commenters were divided on whether EPA should approve this method. Two commenters stated that Method 1614A would be a valuable addition to the list of approved methods, while two other commenters stated that the method has not been sufficiently validated for use in Clean Water Act programs. Upon further evaluation of the data supporting the use of this test procedure and the peer review comments, EPA agrees with those commenters who stated that additional validation data are needed to fully characterize the performance of this method for various matrices and has decided not to include Method 1614A in today's final rule.

B. Deferral of Action on EPA Method 1668C

The Agency proposed to add EPA Method 1668C, ''Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS.'' This method measures individual chlorinated biphenyl congeners in environmental samples by isotope dilution and internal standard high resolution gas chromatography/high resolution mass spectrometry (HRGC/HRMS). As discussed in the proposal, Part 136 methods for chlorinated biphenyls (PCBs) only measure a mixture of congeners in seven Aroclors—PCB–1016, PCB–1221, PCB–1232, PCB–1242, PCB–1248, PCB–1254, and PCB–1260, while Method 1668C can measure the 209 PCB congeners in these mixtures.

EPA began development of this method in 1995, initially covering 13 congeners labeled ''toxic'' by the World Health Organization. In 1999, EPA expanded the scope of the method to include all 209 PCB congeners. The method has been used to support several studies, including the 2001 National Sewage Sludge Survey and the National Lake Fish Tissue Survey. Since 1999, EPA has revised the method to incorporate additional information and data collected such as the results of an inter-laboratory validation study, peer reviews of the method and the validation study data, additional QC performance criteria and MDL data, and user experiences. In the development and subsequent multi-laboratory validation of this method, EPA evaluated method performance characteristics, such as selectivity, calibration, bias, precision, quantitation and detection limits. The Agency is aware that this method is being used in some states in their regulatory programs and by other groups for some projects with good success. For example, in a study of data comparability between two laboratories on samples collected from the Passaic River in New Jersey, in which 151 PCB congeners were identified and measured, accuracy, as measured by analysis of an NIST SRM, was 15% or better. Recoveries of the PCB congeners ranged from 90% to 124% and averaged 105%; precision ranged from 4.2 to 23% (Passaic River 2010). This type of data shows that recoveries and precision for this method are within the performance achievable with other approved methods.

EPA received comments from thirty-five individuals or organizations on this method. Of these commenters, five (three states, one laboratory, and one laboratory organization) supported the approval of this method. Some states indicated that they are already requiring this method for use in permits and for other purposes. On the other hand, industry and industry groups/associations were critical of the method for various reasons. Commenters opposing the method provided a detailed critique of the method, the inter-laboratory study, the peer reviews and the other supporting documentation. Among the criticisms of the inter-laboratory study, commenters argued that: (1) EPA did not produce documentation supporting changes to the method approved by EPA for the interlaboratory study, (2) the raw data for wastewater and biosolids was poor and is not fit for use in a comprehensive interlaboratory study, (3) EPA cited certain guidelines such as ASTM but deviated from those guidelines (*e.g.,* used only one Youden pair per matrix), (4) the peer reviewers' qualifications were questioned, (5) the addendum and the pooled MDLs/MLs were not subjected to peer review, (6) MDL/ML are flawed, the process to calculate MDLs/MLs for congeners that co-elute was flawed, the MDL/ML ignored the ubiquitous problem of background contamination, and (7) the validation study did not include all matrices in the method (soil and sediment excluded). In addition, some commenters also suggested that EPA should first promulgate new detection and quantitation procedures. Further, commenters raised questions about possible adverse effects of this new method on compliance monitoring as well as concerns about data reporting and costs.

EPA is still evaluating the large number of public comments and intends to make a determination on the approval of this method at a later date. In the meantime, the Agency has decided to go forward with the promulgation of the other proposed analytical methods to expedite their implementation by the regulated community and laboratories. This decision does not negate the merits of this method for the determination of PCB congeners in regulatory programs or for other purposes when analyses are performed by an experienced laboratory.

C. EPA Is Not Adding ASTM Methods D7574–09 and D7485–09

In today's rule, EPA is not adding two proposed ASTM methods, ASTM D7574–09 ''Standard Test Method for Determination of Bisphenol A (BPA),'' and ASTM D7485–09 ''Standard Test Method for Determination of NP, OP, NP1EO, and NP2EO.'' These two methods involve liquid chromatography and tandem mass spectrometry (LC/MS/MS). The methods have been tested by a single laboratory in several environmental waters, and may be useful for many applications. However, EPA has decided to postpone approval of these two methods for general use until completion of a full inter-laboratory validation study designed to fully characterize the performance of these methods across multiple laboratories and matrices.

D. Revisions and Clarifications to EPA Method 200.7

EPA Method 200.5 ''Determination of Trace Elements in Drinking Water by Axially Viewed Inductively Coupled Plasma—Atomic Emission Spectrometry'' employs a plasma torch viewed in the axial orientation to measure chemical elements (metals). As stated earlier in today's rule, EPA is adding Method 200.5 for some metals in Table IB. Both Methods 200.5 and 200.7 are acceptable methods under Part 136 and both methods employ ICP/AES technology. However, Method 200.5 includes performance data for the axial configuration that is not in Method 200.7 because the axial technology torch

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results were not available when Method 200.7 was developed. For some parameters listed in Table IB, the axial orientation using ICP/AES technology results in greater sensitivity and lower detection limits than the radial orientation. Thus, today's approval of Method 200.5 and the additional flexibility to modify Method 200.7 to use the axial orientation discussed in the proposal will allow laboratories to use either axial instruments or radial instruments to measure metals in water samples with Method 200.7. In response to EPA's proposal to allow the use of the axial orientation of the torch with EPA Method 200.7, commenters expressed support for this added flexibility. Thus, today's rule clarifies that the use of the axial orientation of the torch to measure metals is an acceptable modification to Method 200.7. EPA has added new text at Part 136.6(b)(5) to allow the use of the axial orientation of the torch for Method 200.7 as an acceptable method modification that does not require an ATP application.

EPA further notes that there was a typographical error in Section II.J of the proposed rule which stated that the version of EPA Method 200.7 (which the Agency proposed to remove; with Appendix C, see section IIIM below) has been superseded by Revision 5.4 of Method 200.7. Today's final rule reflects that the correct reference is Revision 4.4 of EPA Method 200.7. In today's rule, EPA has added Method 200.7 Revision 4.4 as an additional approved method for the measurement of titanium. As some commenters pointed out, EPA Method 200.7 covers this parameter and exclusion of this method for the measurement of titanium in Table IB was an oversight.

In addition, EPA has removed EPA Method 200.7 from Table IB for the measurement of mercury. The addition of EPA Method 200.7 to the list of approved methods for mercury in Table IB was an error. Although this pollutant is on the list of analytes in EPA Method 200.7, mercury may be lost to the atmosphere through the use of the approved total recoverable metals digestion procedures (*e.g.,* EPA Method 200.2, or the digestion procedures listed in EPA Method 200.7) that must be applied to the wastewater samples of interest under the Clean Water Act program. Such losses can lead to poor recovery in the samples compared to the sample preparation procedures included in other mercury methods approved at 40 CFR part 136. Therefore, EPA Method 200.7 has not been included in Table IB for mercury.

E. Revisions and Corrections to Certain Citations in Tables IA, IB, IC, ID, and IG

EPA proposed some additions to Table IB which include some new Standard Methods or new versions of approved Standard Methods. Today's rule revises the applicability of some methods and makes some corrections to the method citations. Specifically, EPA removed SM 3120 and SM 3125 for the measurement of mercury because mercury is not on the list of analytes for these methods. In addition, EPA corrected the citation of SM 3113 to SM 3113B–2004 in the final rule and has added SM 3113B–2004 for the measurement of cadmium, chromium, iron, lead, and silver, because these analytes are covered by the method and they exhibit acceptable analytical performance. These omissions were an oversight.

EPA also deleted from Table ID an EPA GC/MS method, Method 525.1, for the measurement of ametryn, diazinon, disulfoton, prometon, and trifluoralin. These analytes are not listed within the scope of this method and their inclusion in the proposal was an error.

EPA has corrected a number of typographical errors in the tables and footnotes, correcting spelling and method availability information, method title names, and document identification numbers. A complete list of these changes has been included in a memo to the docket.

F. Continued Approval of Method 1664 Rev. A

EPA proposed to replace Method 1664 Rev. A for the measurement of oil and grease with a revised version (Method 1664 Rev. B). This new version of the method describes modifications that are allowed and modifications that are not allowed when using this method for compliance with Clean Water Act regulations. Comments were generally supportive of the revised method but some commenters recommended that Method 1664 Rev. A not be withdrawn immediately because many permits currently specify the use of this method. In response to these comments, EPA will continue to allow the use of Method 1664 Rev. A for current permits because this method is not significantly different from the revised version of the method. However, EPA strongly encourages the use of the revised method (Method 1664 Rev. B) in the future. EPA may revisit this decision in a future rulemaking.

G. Revision to Footnote 63 of Table IB at 40 CFR 136.3

EPA received comments that the Hach Method 10360, described in footnote 63 of Table IB, is a dissolved oxygen procedure, and as such, should only be listed as a procedure for dissolved oxygen, and not for BOD and CBOD. EPA disagrees with these commenters because the method on its face is clearly applicable to dissolved oxygen measurements in conjunction with BOD and CBOD analyses, as described in the method. As a result, in today's final rule, EPA added language to the end of this footnote to clarify that Part 136 allows the use of Hach Method 10360 for measurement of dissolved oxygen in conjunction with the methods approved for measurement of biochemical demand (BOD) and carbonaceous biochemical oxygen demand (CBOD).

H. Revision to Footnote 4 of Table IC at 40 CFR 136.3

EPA received comments on the proposed approval of Method 624 for the definitive determination of acrolein and acrylonitrile. Commenters agreed with the addition of these two analytes, but one of these commenters expressed concern about a blanket approval without requiring a demonstration of adequate performance and appropriate sample introduction techniques. This commenter recommended that performance criteria and information about appropriate sample introduction techniques be added to footnote 4 of Table IC. EPA agrees with this commenter's suggestions because this requirement would ensure that the laboratory has the ability to measure these analytes at the levels necessary to comply with any associated regulations. In response to these concerns, in today's rule, the Agency revised the footnote to add a statement requiring documentation of the ability to quantitatively measure these analytes and advising analysts that other sample introduction techniques may be required to achieve adequate performance.

I. Revisions to Table II Language

EPA proposed to revise the text at 136.3(e) to allow any party to modify sample preservation and holding times after submitting documentation to its permitting or other authority that supports use of an alternative approach. Commenters expressed concern that this change would present a burden both to permitting authorities to review and approve changes, and for laboratories that work in different states because each state could have different requirements. In response to public comments, EPA has removed the proposed language at 136.3(e) that would have allowed such modifications based on documentation and procedures

determined by individual permitting authorities. Instead, such modifications must continue to be requested via a limited use ATP application to the Regional Alternate Test Procedure Coordinator or permitting authority, as appropriate. Thus, approval of any changes in sample preservation procedures, container materials, and maximum allowable holding time will remain unchanged and continue to be the responsibility of EPA through its Alternate Test Procedure program. EPA clarified language regarding the limited use application process procedure. Additionally, in today's rule, EPA added a clarifying sentence at the end of the current language to emphasize that an analyst cannot modify any sample preservation or holding time requirements in an approved method unless the requirements in Section 136.3(e) are met.

EPA also revised footnote 4 to Table II to delete the parenthetical statement specifying that samples analyzed for fecal coliforms may be held up to six hours prior to commencing analysis. That statement in footnote 4 is inconsistent with the requirement for an eight-hour holding time, as pointed out by a commenter.

In response to comments, EPA included a new entry in Table II for the alkylated phenols (parameters 114 to 118 in Table IC) that was inadvertently omitted from the proposal. Similarly, when EPA moved EPA Methods 1650 and 1653 to Table IC, EPA inadvertently omitted to add the parameters adsorbable organic halides (AOX) and chlorinated phenolics to Table II. The Table II information for containers, preservation, and holding times for these three new entries are taken from the approved methods.

J. Approval of Alternate Test Procedures for Limited Use at 40 CFR 136.5

EPA proposed changes to 40 CFR 136.4 and 136.5 that establish the procedures for obtaining approval for use of a nationwide or limited use ATP. The proposed revisions established separate sections outlining the procedures for obtaining EPA review and approval for nationwide use of an ATP (§§ 136.4), and the procedures for obtaining approval for limited use of an ATP (§§ 136.5). The proposal also included language to clarify that limited use approvals do not require the same level of supporting data that would be required for nationwide approvals and that limited use approvals are not intended to be used as a means to avoid the full examination of comparability that is required for an application for approval of an alternative test procedure for nationwide use.

Today's rule finalizes these sections as proposed with one exception. EPA received comments that the proposed language under § 136.5 does not require that comparability data be submitted when seeking a Regional limited use ATP approval. EPA agrees that comparability data is an essential component of the ATP approval process and had inadvertently omitted this language. As a result, the Agency added language in today's final rule that requires an applicant to provide comparability data specific to the limited use for the performance of the proposed alternative test procedure relative to the performance of the reference method.

K. Revisions to Language at § 136.6

EPA proposed to revise the section on method modification provisions at 40 CFR 136.6 to provide more examples of allowed and prohibited method modifications. Acceptable reasons for an analyst to modify a method include analytical practices that lower detection limits, improve precision, reduce interferences, lower laboratory costs, and promote environmental stewardship by reducing generation of laboratory wastes. Acceptable modifications may use existing or emerging analytical technologies that achieve these ends provided that they do not depart substantially from the underlying chemical principles in methods currently approved in 40 CFR part 136. Analysts may use the examples in this section to help assess whether the modifications require an ATP and if not, to document that their modification is acceptable. The additional examples provide further guidance to laboratories and permittees on allowable method modifications that do not require an application through the ATP program. Proposal comments generally expressed support for allowing the flexibility to make certain changes to methods and for the specific examples of allowable changes included in the proposal. In addition, some commenters suggested revisions to clarify EPA's intent in Sections (b)(4) and (b)(5) of 40 CFR 136.6. EPA reviewed the suggestions and agrees with commenters that the revisions will provide additional clarity. In addition, as discussed in Section III.D of this preamble, EPA added the use of axially viewed torch as an allowable modification to Method 200.7. Today's rule includes the following revisions to the regulatory text:

(a) Adds language to Section (b)(3) to clarify that modifications to sample collection, preservation, and holding time do not fall within the scope of 136.6,

(b) Revises the language at (b)(4)(T) be more specific with respect to the use of gas diffusion across a hydrophobic semi-permeable membrane to separate the analyte of interest from the sample matrix in place of manual or automated distillation for the analysis of certain analytes,

(c) Revises the equation for Relative Standard Error (RSE) in (b)(4)(J) to make it consistent with the description in other EPA methods, and

(d) Adds the use of an axially viewed torch with Method 200.7 as an allowable modification.

L. Revisions to New Quality Assurance and Quality Control Language

For today's rule, EPA added some introductory language to this section to clarify the new requirements. EPA added this language to provide some additional clarity as to when the new requirements are applicable and, thus, must be incorporated into the laboratory's documented standard operating procedures. Additional discussion of the revisions is provided under section IV.C below.

M. Withdrawal of Appendices at 40 CFR Part 136

EPA proposed to incorporate by reference in Table IB all of the methods printed in 40 CFR part 136 Appendices A and C, and to remove most of the information in Appendix D. The methods in Appendix A are EPA Method Numbers 601 through 613, 624, 625, 1613B, 1624B, and 1625B. Appendix C contains EPA Method 200.7, ''Determination of Metals and Trace Elements in Water and Wastes by Inductively Coupled Plasma—Atomic Emission Spectrometry''. However, Federal regulations at 1 CFR part 51.7(c)(1) prohibit the incorporation by reference of material previously published in the **Federal Register**. Thus, EPA is not withdrawing Appendices A or C. Because EPA Method 200.7 has been revised, EPA is replacing the current version of this method in Appendix C with Rev. 4.4 of Method 200.7. All of these methods are readily accessible from a variety of sources, including EPA's CWA methods Web site *http://water.epa.gov/scitech/methods/cwa/index.cfm*.

The rule also removes most of the data from Appendix D for all EPA methods that are no longer approved, and retains only the Precision and Recovery Statements for EPA Method 279.2 for thallium and EPA Method 289.2 for zinc, and corrects

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typographical errors in the Appendix. The current version of Appendix D will be available online at the CWA methods Web site for historical purposes.

N. Revisions at 40 CFR Part 430 (Pulp, Paper, and Paperboard Point Source Category)

EPA also proposed to remove Appendix A at 40 CFR part 430 and to incorporate by reference the methods in this Appendix. Appendix A contains two methods, EPA Method 1650 for adsorbable organic halides or AOX, and EPA Method 1653 for chlorinated phenolics. As explained above, we cannot incorporate by reference this material, so Appendix A remains unchanged in the Code of Federal Regulations. These methods are also readily available from a variety of sources, including EPA's CWA methods Web site *http://water.epa.gov/scitech/methods/cwa/index.cfm*. EPA is also adding these two methods to Table IC for general use.

O. Revisions at 40 CFR Part 435 (Oil and Gas Extraction Point Source Category)

The rule makes several changes to Part 435, Oil and Gas Extraction Point Source Category. First, EPA is moving the methods and associated quality assurance requirements from 40 CFR part 435, Subpart A (Offshore Subcategory) to an EPA document (''Analytic Methods for the Oil and Gas Extraction Point Source Category,'' EPA–821–R–11–004), and incorporating by reference this document in the revised regulation at 40 CFR part 435. This approach organizes the analytical methods for the Offshore Subcategory into one document and allows for easier access to the methods for this category. The following table lists the methods EPA moved from part 435 to the cited document, EPA–821–R–11–004.

EPA METHOD NUMBERS FOR OIL AND GAS EXTRACTION POINT SOURCE CATEGORY ANALYTICAL METHODS AND PRIOR CFR REFERENCES

Analytical/Test method	EPA Method No.	Date first promulgated	Previous CFR references
Static Sheen Test	1617	1993	Subpart A, Appendix 1.
Drilling Fluids Toxicity Test	1619	1993	Subpart A, Appendix 2.
Procedure for Mixing Base Fluids With Sediments	1646	2001	Subpart A, Appendix 3.
Protocol for the Determination of Degradation of Non-Aqueous Base Fluids in a Marine Closed Bottle Biodegradation Test System: Modified ISO 11734:1995.	1647	2001	Subpart A, Appendix 4.
Determination of Crude Oil Contamination in Non-Aqueous Drilling Fluids by Gas Chromatography/Mass Spectrometry (GC/MS).	1655	2001	Subpart A, Appendix 5.
Reverse Phase Extraction (RPE) Method for Detection of Oil Contamination in Non-Aqueous Drilling Fluids (NAF).	1670	2001	Subpart A, Appendix 6.
Determination of the Amount of Non-Aqueous Drilling Fluid (NAF) Base Fluid from Drill Cuttings by a Retort Chamber (Derived from API Recommended Practice 13B–2).	1674	2001	Subpart A, Appendix 7.

As noticed in the proposed rule, EPA is also incorporating additional quality assurance procedures in the marine anaerobic biodegradation method (Appendix 4 of Subpart A of part 435) and is correcting some erroneous references and omissions in the method for identification of crude oil contamination (Appendix 5 of Subpart A of part 435) into the new document (EPA–821–R–11–004).

EPA promulgated the use of the marine anaerobic biodegradation method (closed bottle test, ISO 11734:1995 as clarified by Appendix 4 to Subpart A of part 435) as an Appendix to the rule in 2001 because it most closely modeled the ability of a drilling fluid to biodegrade anaerobically in marine environments (January 22, 2001; 66 FR 6864). Subsequent to this promulgation, EPA incorporated additional quality assurance procedures for the marine anaerobic biodegradation method in the NPDES permit for the Western Gulf of Mexico (''Final NPDES General Permit for New and Existing Sources and New Dischargers in the Offshore Subcategory of the Oil and Gas Extraction Category for the Western Portion of the Outer Continental Shelf of the Gulf of Mexico,'' GMG290000, Appendix B). The additional quality assurance instructions in the GMG290000 more clearly describe the sample preparation and compliance determination steps. Specifically, these additional quality assurance procedures clarify that users must only use headspace gas to determine compliance with the Part 435 effluent guidelines. EPA worked with the same industry consortium that assisted EPA in the development of the analytical methods used in the effluent guidelines for the Oil and Gas Extraction point source category (40 CFR part 435) to develop these additional quality assurance measures. Thus, the quality assurance procedures are generally applicable to this industry.

Additionally, as noticed in the proposed rule, EPA is correcting some erroneous references and omissions in the method for identification of crude oil contamination (Appendix 5 of Subpart A of Part 435), as follows:

a. Adding a schematic flow for qualitative identification of crude oil, which was erroneously omitted in Appendix 5 to Subpart A of part 435,

b. Correcting erroneous citations in sections 9.5, 9.6, 11.3, and 11.3.1 of Appendix 5, and

c. Adding a missing ''<'' (less than) sign for identification of crude oil contamination in the asphaltene crude discussion at Section 11.5.4.2. The asphaltene discussion now reads as follows: ''Asphaltene crude oils with API gravity < 20 may not produce chromatographic peaks strong enough to show contamination at levels of the calibration. Extracted ion peaks should be easier to see than increased intensities for the C8 to C13 peaks. If a sample of asphaltene crude from the formation is available, a calibration standard shall be prepared.''

EPA received three comments on the proposed changes. One commenter was concerned that the EPA document (EPA–821–R–11–004) would not have the same legal status as publishing the methods in the CFR. EPA disagrees with this comment. The incorporation by reference of this document has the same legal standing as publishing the text of the methods in the CFR. EPA has a long standing practice of publishing test methods using incorporation by reference and the cited test methods are

as legally enforceable as those published in full in the CFR. EPA is consolidating these methods into one document to allow for easier access to these methods. The incorporation by reference of this document also allows for better formatting of the methods and eliminates the redundant publication of these methods each year in the Code of Federal Regulations. Two other commenters had some recommendations for additional revisions to the EPA document (EPA–821–R–09–013). EPA has not adopted these suggestions, given the absence of an opportunity for the public generally to comment on them. EPA will, however, consider these comments and may propose additional revisions in a future rulemaking. As noticed in the proposed rulemaking, the final rule consolidates the oil and gas test methods into a single document and references this document in the effluent guidelines (40 CFR part 435). Like any other changes to an EPA-approved method, any changes to the methods in the EPA document (EPA–821–R–11–004) will require a rulemaking.

IV. Summary of EPA's Response to Comments

The Agency received comments from 117 different individuals or organizations on the September 23, 2010 proposal (75 FR 58024). Commenters represented a variety of different interests, including analytical laboratories, water utilities, instrument manufacturers, State and local governments, trade associations, and industry. A summary of major public comments on the proposed rule and the Agency's responses is presented in this section. The public docket for this rule includes all of the comments received and the Agency's responses.

A. Approval of Standard Methods

EPA proposed to revise how to identify EPA-approved Part 136 methods that are published by the Standard Methods Committee (*i.e.,* Standard Methods). EPA proposed two changes. First, EPA proposed to change the way it identifies an EPA-approved version of a Standard Method in Part 136. Second, EPA proposed to identify only the most recently EPA-approved version of a Standard Method in Part 136. In the past, EPA listed multiple versions of these methods from the 18th, 19th, 20th editions of the printed compendiums, or from the on-line editions published by the Standard Methods Committee, in one or more columns in the Part 136.3 tables. In some cases, EPA approved more than one version of a Standard Method for a particular analyte in Part 136. Approval of several versions of the same Standard Method for an analyte has led to inconsistencies in how laboratories conduct these analyses, especially in quality assurance/quality control (QA/QC) practices. For this reason, EPA proposed to list only the most recently EPA-approved version of a Standard Method (regardless of the printed or on-line edition) in Part 136, with few exceptions, to identify the method with the year of Standard Methods approval or adoption designated by the last four digits in the method number (*e.g.,* Standard Method 3113B–2004). This approach clearly identifies the version of the standard method approved under Part 136 and no longer ties it to a particular compendium printing or edition of Standard Methods. For example, the exact method, Standard Method 3113B–2004 appears in the 18th, 19th, and 20th edition of Standard Methods. Because this method is the same in all of these editions, a laboratory may refer to any of these editions when using Standard Method 3113B–2004 to measure the analytes listed in Table IB that are approved for this method. Thus, EPA's proposed approach to identify Part 136 approved standard methods does not rely on the particular edition of a compendium but rather on the latest Standard Methods approved version (by indicating the year of approval).

EPA received numerous comments concerning the proposed changes to specify the method with the year of publication, rather than specifying the editions of Standard Methods in which the method is printed, and to list in Part 136 only the most recent EPA-approved version of a Standard Method if Standard Methods has multiple versions of a method for a pollutant. Some commenters expressed concern about other economic impacts related to laboratory start-up tests, and the need for training and revised standard operating procedures (SOPs) associated with the use of the most recently approved method. In response, EPA maintains that the economic impacts of start-up tests or the need for revised SOPs are part of the necessary expenses to maintain a laboratory producing data of known and acceptable quality and these costs are not unusual. Training new staff or training current staff on new procedures is also a cost that any laboratory must consider as part of doing business.

EPA is aware that Standard Methods and other voluntary consensus organizations such as ASTM and AOAC periodically revise existing methods and publish them on-line and/or as a compendium. In addition to EPA-developed methods, the Agency approves certain methods developed by these and other organizations as required under the National Technology Transfer and Advancement Act (NTTAA) and lists them in Part 136 periodically. Often, after EPA approves a Standard Method for use in Part 136, Standard Methods releases or adopts a revised version of that method. Generally, these revised Standard Methods involve the use of new technologies or improvements to previously approved methods. By referencing the year of adoption by Standard Methods, EPA's proposed change in its method citations was intended to clarify which version of a Standard Method is approved by EPA in Part 136. The on-line site for Standard Methods allows electronic release of new methods and revisions to existing methods prior to the publication of the compendium edition. Currently, Standard Methods is on a 5–7 year cycle for publication of the compendium and is set to release its 22nd edition soon. In some cases, an older version of a method approved by the Standard Methods Committee may appear on the on-line or compendium version of Standard Methods. The date of adoption is on the first page of the compendium or on-line method.

Commenters are correct in pointing out that, in the event that they elect to use an EPA-approved Standard Method for compliance purposes, they would be required to use the most recently EPA-approved version of a Standard Method. EPA is not requiring any EPA-approved Standard Method in today's rule. Dischargers may use any approved Part 136 method for compliance monitoring unless the method is specified in its discharge permit by the permitting authority, or the method is not sufficiently sensitive to comply with the permit limit. Also, if the discharger elects to use an EPA-approved Standard Method and does not have the most recent EPA-approved version, EPA finds the costs would not be significant. The discharger/laboratory would need to purchase the on-line version for the individual method and would not need to absorb the cost of a full subscription to the on-line service. On-line versions of a single method generally cost $69. Relative to the costs that laboratories charge to run such an analysis (generally many times over), this cost is negligible. Therefore, EPA does not agree with commenters that they will have to purchase an on-line subscription to Standard Methods nor does it conclude that this change will

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present a significant financial burden to laboratories.

Another concern raised was that any changes in Standard Methods in the future would be automatically approved without EPA review. This assertion is incorrect. Any new or revised Standard Methods would be proposed in the **Federal Register** for public comment before inclusion in Part 136 as required under the Clean Water Act.

Some commenters also expressed concern that this change may affect the approval status of existing alternate test procedures that were evaluated by EPA relative to older Standard Methods. With respect to this concern, the Agency is not withdrawing any approved ATPs. EPA's withdrawal of its earlier approved versions of Standard Methods is not intended to affect the acceptance of any vendor-developed methods based on older Standard Methods that EPA previously determined to be acceptable versions, because the changes in Standard Methods are mostly editorial (*e.g.,* clarifications, increased flexibility) and not procedural changes.

In making this change in today's rule, EPA also considered that beginning with the publication of the 20th edition of Standard Methods, the Standard Methods Committee included the quality control (QC) procedures which are similar to the QC procedures that have been included by EPA in methods published in Part 136 over the last two decades for use in compliance monitoring programs under the Clean Water Act and the Safe Drinking Water Act. These procedures are specified in Part 1000 of the Standard Methods compendium and include the ''essential'' quality control checks that EPA has added at 40 CFR 136.7 as part of this final rule.

B. Preservation and Holding Time Requirements for EPA Method 624

In response to the proposed use of EPA Method 624 as a definitive measurement method for acrolein and acrylonitrile, EPA received comments on the preservation and holding time requirements for these two pollutants. Commenters noted that the preservation and holding time requirements in Part 136 Table II for these two analytes currently differ from the requirements for other Method 624 analytes. Historically, these two analytes have had different preservation and requirements than the analytes currently listed in EPA Method 624. The current requirements in Table II date to 1984 and specify that samples for acrolein and acrylonitrile must be preserved at a pH in the range of 4 to 5. This pH range is based on concerns about degradation of these two analytes in strongly acidic samples (*e.g.,* pH < 2). Footnote 10 to Table II currently states that pH adjustment is not required if acrolein will not be measured, but that samples for acrolein receiving no pH adjustment at all must be analyzed within 3 days of sampling. In contrast, samples to be analyzed by EPA Method 624 for purgeable halocarbons are not preserved by adjusting the pH, and samples to be analyzed for the purgeable aromatic hydrocarbons (benzene, ethylbenzene and toluene) are preserved at a pH of 2. Thus, in the case where a permittee wants to use EPA Method 624 to measure acrolein or acrylonitrile in addition to other analytes included in Method 624, the sampler has to take an additional sample, preserve the sample for acrolein and acrylonitrile to pH 4 to 5, and then perform separate analyses. Commenters stated that EPA does not have a basis for requiring a different preservation and holding times for these two analytes and submitted data that support their assertion that sample preservation be allowed at either a pH of 7 or a pH of 2. EPA has reviewed the data, but the Agency has concluded that these data are not sufficient or compelling to change the current preservation and holding time requirements for these analytes because the data are anecdotal rather than the result of a well-planned and properly documented stability study. As a result, EPA's final rule retains the current sample preservation and holding time requirements for acrolein and acrylonitrile.

C. Quality Assurance and Quality Control Requirements

EPA proposed to specify minimal essential quality control requirements at Part 136.7 for use in conducting analyses to comply with CWA monitoring requirements. The purpose of this requirement is to ensure that laboratories conducting CWA compliance monitoring use suitable QA/QC procedures. These QA/QC procedures were included in a memorandum to EPA's Regional Quality Assurance Managers (May 7, 2009 memorandum from Richard Reding) and have been posted on EPA's Web page since 2009. These requirements do not apply in the case of the use of Part 136 approved methods that contain (or reference) their own QA/QC procedures, or to any non-compliance analyses. Most analytical methods currently listed in Part 136 contain QA/QC procedures, and permittees/laboratories using those methods are not affected by the new requirement. However, there are a few older methods approved for use in Part 136 from the 1970s that contain no QA/QC requirements. Examples of Part 136 methods that lack QA/QC are Method 283.2 for titanium and Method 289.2 for zinc, both furnace atomic absorption methods issued in 1978. As explained previously, an additional issue identified in the May 7, 2009 memorandum is that approved methods from consensus organizations such as Standard Methods contain the QA/QC requirements in a different section of their methods compendium (*e.g.,* Standard Methods consolidates general QA/QC requirements for all methods in Part 1000 of their methods compendium). Thus, EPA wants to clarify that it expects permittees/laboratories using Part 136 approved methods developed by consensus organizations for reporting compliance under the CWA to also comply with the QA/QC requirements listed in the appropriate sections in that consensus organization's compendium.

In addition to following QA/QC requirements from consensus organizations for Part 136 methods without QA/QC procedures, the analyst has the option to follow the QA/QC published in another EPA-approved method for that parameter that contains such QA/QC.

As discussed in Section II.I of this preamble, EPA is reiterating the requirement to include QA/QC in any chemical method used for CWA compliance purposes. For those few Part 136 methods that lack QA/QC requirements, EPA is adding quality control requirements at § 136.7. EPA received numerous comments on this aspect of the proposed rule. Although some commenters expressed support for EPA's intent to ensure the quality of data by adding the new QC language, many commenters noted problems with the specific language, including that many of the QC elements do not apply to common parameters (*e.g.,* MDLs cannot be calculated for pH or BOD, and surrogates and internal standards have no counterparts in microbiological methods). Other commenters expressed concern that the new language was either duplicative or contradicted language in existing EPA-approved methods, or presented conflicts with various state or national accreditation programs. Other commenters objected to the perceived costs associated with this new requirement and suggested that the QC checks simply will not occur, regardless of the new Part 136.7 requirement. A few commenters suggested improvements to the proposed language, should EPA decide to proceed with this new section. One commenter stated that the section was

not needed, since EPA should not be approving methods at 40 CFR part 136 that do not already contain appropriate QA/QC. EPA addresses these issues below.

With respect to the issue of applicability of the QC elements, EPA agrees with commenters who stated that some QC elements listed in § 136.7 may not apply to common parameters (*e.g.,* matrix spike and matrix spike duplicates do not apply to pH measurements). For any of the Part 136 methods that include (or reference) appropriate QC elements for these parameters, these new QA/QC requirements are not applicable. As a result, in today's final rule, EPA has added introductory language in § 136.7 to clarify how laboratories should comply with this new requirement when one or more of the twelve essential quality control elements is not applicable to a method. This new introductory language states that in cases where one or more of the twelve QC elements do not apply to a given method, the laboratory may provide a written rationale for not including those elements in their standard operating procedures (SOP) for that analysis. This may be something as simple as stating that the given QC element does not apply to that analysis or is not possible to perform (as the example above for pH measurements). In addition, the final rule states that the twelve QC elements, as applicable, must be included in a laboratory's SOP for conducting an analysis with an approved method only when there are no QA/QC procedures in the Part 136 method. Again, as discussed above, this QA/QC requirement at Part 136 does not apply to approved methods containing (or referencing) QA/QC procedures.

In response to the comment that the language is either duplicative or contradicted in existing approved methods or accreditation programs, EPA has added this new section to the regulations at Part 136.7 to address concerns that certain approved methods do not contain QA/QC procedures. In those cases where an approved method incorporates these QC procedures (as applicable to that method), the laboratory can follow the method as written without creating any duplication or conflict. As mentioned in Section IV.A of this preamble, Standard Methods incorporated new QC requirements starting with the 20th edition of Standard Methods similar to the QC requirements included in EPA methods for the last two decades. Thus, most Standard Methods that are also approved methods in Part 136 already contain QA/QC requirements, as applicable. Similarly, EPA does not anticipate conflicts with laboratory accreditation programs because these programs generally follow the QC requirements in the method or as otherwise specified in regulatory programs. The purpose of this new section is to ensure that analyses conducted for compliance monitoring with CWA regulatory programs contain appropriate QA/QC and the Agency's view is that this is already occurring in most laboratories (with a few exceptions as discussed above). This new requirement is added to clarify that laboratories must implement proper QA/QC, as needed, for all CWA compliance related analyses to provide quality data that will withstand regulatory and legal challenges.

In response to the comment that this new requirement will be costly, proper QA/QC is essential for obtaining results of known and acceptable quality. In the long run, it could be much more costly to use data which lacks proper QC in demonstrating or enforcing discharge requirements. In the short run, laboratories would only incur costs associated with this new requirement when the method lacks QA/QC and when they have not included QA/QC as part of their SOPs. EPA estimates that this would not have a significant impact on laboratories because the vast majority of Part 136 methods already include or reference QA/QC requirements. Further, most laboratories already implement the QC checks prescribed by the newer methods and are already documenting these QC checks in the laboratory SOPs. Some of the QC checks are a one-time or infrequent expense (*e.g.,* demonstration of capability and determination of a method detection limit), while other checks are routine (*e.g.,* running a method blank). Typically, laboratories include QC as part of the overall analysis costs, and these costs generally add 10–20% to the analysis cost initially for an analyst demonstration of capability, and less (5–10%) after the initial cost for routine QC (*e.g.,* running a blank with every batch of samples). For a typical analysis of a metal using furnace atomic absorption, at a cost of $35–50 per sample, the QC costs would be typically 5–10% of the total costs, and are generally included in the laboratory pricing schedule. Thus, EPA expects that any costs associated with this aspect of today's rule will be minimal and limited to a few older methods that some laboratories may still elect to use rather than the many other methods that contain QA/QC requirements. EPA considers these QC checks to be an essential part of an overall approach to producing data of known quality and defensibility when a particular method is used to measure pollutants for compliance monitoring purposes. Ignoring these QC checks, as a commenter suggested, is inconsistent with EPA's NPDES permit requirements. Thus, 40 CFR 122.41(e) of EPA's NPDES permitting regulations provides that the permittee ''shall at all times properly operate and maintain all facilities and systems of treatment and control * * * Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures * * *.'' In most cases, these procedures are already a part of the quality control practices of most laboratories and will not create an additional burden. However, in codifying QC requirements, EPA provides clarification that these procedures are mandatory, as applicable, and not merely optional.

V. Statutory and Executive Order Reviews

A. Executive Order 12866: Regulatory Planning and Review and Executive Order 13563: Improving Regulation and Regulatory Review

This rule is not a ''significant regulatory action'' under the terms of Executive Order (EO) 12866 (58 FR 51735, October 4, 1993) and is therefore not subject to review under EO 12866 and EO 13563.

B. Paperwork Reduction Act

This action does not impose an information collection burden under the provisions of the Paperwork Reduction Act, 44 U.S.C. 3501 *et seq.* Burden is defined at 5 CFR 1320.3(b). This rule does not impose any information collection, reporting, or recordkeeping requirements. This rule merely adds new and revised versions of testing procedures, and sample preservation requirements.

C. Regulatory Flexibility Act

The Regulatory Flexibility Act (RFA) generally requires an agency to prepare a regulatory flexibility analysis of any rule subject to notice and comment rulemaking requirements under the Administrative Procedure Act or any other statute unless the agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. Small entities include small businesses, small organizations, and small governmental jurisdictions.

For purposes of assessing the impacts of this rule on small entities for methods under the Clean Water Act, small entity

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is defined as: (1) A small business that meets RFA default definitions (based on SBA size standards) found in 13 CFR 121.201; (2) a small governmental jurisdiction that is a government of a city, county, town, school district or special district with a population less than 50,000; and (3) a small organization that is any not-for-profit enterprise which is independently owned and operated and is not dominant in its field.

After considering the economic impacts of today's final rule on small entities, I certify that this action will not have a significant economic impact on a substantial number of small entities. This action approves new and revised versions of testing procedures. Generally, these changes will have a positive impact on small entities by increasing method flexibility, thereby allowing entities to reduce costs by choosing more cost-effective methods. Although EPA expects that in some cases the analytical costs could increase slightly due to additional QC requirements for a few old EPA-approved methods that lack QA/QC, EPA has determined that most laboratories that analyze samples for EPA compliance monitoring have already instituted QC requirements as part of their laboratory practices and this rule will not have a significant economic impact on a substantial number of small entities.

D. Unfunded Mandates Reform Act

This action contains no Federal mandates under the provisions of Title II of the Unfunded Mandates Reform Act of 1995 (UMRA), 2 U.S.C. 1531–1538 for State, local, or tribal governments, or the private sector.

EPA has determined that this final rule contains no regulatory requirements that might significantly or uniquely affect small governments. Generally, this action will have a positive impact by increasing method flexibility, thereby allowing method users to reduce costs by choosing more cost effective methods. In some cases, analytical costs may increase slightly due to changes in methods, but these increases are neither significant, nor unique to small governments. This rule merely approves new and revised versions of testing procedures, and new sample collection, preservation, and holding time requirements.

Thus, today's rule is not subject to the requirements of Section 203 of UMRA.

E. Executive Order 13132: Federalism

This final rule does not have federalism implications. It will not have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government, as specified in Executive Order 13132 (64 FR 43255, Aug. 10, 1999). This rule merely approves new and revised versions of testing procedures, and new sample collection, preservation, and holding time requirements. The costs to State and local governments will be minimal. In fact, governments may see a cost savings because the rule adds flexibility for laboratories and permittees to choose between additional approved test methods and it also provides additional flexibility to modify existing test methods. Thus, laboratories and permittees will not make as many requests for approval of alternative test methods or method modifications, and the rule does not preempt State law. Thus, Executive Order 13132 does not apply to this rule.

In the spirit of Executive Order 13132, and consistent with EPA policy to promote communications between EPA and State and local governments, EPA specifically solicited comment on the proposed rule from State and local officials.

F. Executive Order 13175: Consultation and Coordination With Indian Tribal Governments

This final rule does not have tribal implications, as specified in Executive Order 13175, (65 FR 67249, Nov. 9, 2000). It will not have substantial direct effects on Tribal governments, on the relationship between the federal government and Indian tribes, or on the distribution of power and responsibilities between the federal government and Indian tribes. This rule merely approves new and revised versions of testing procedures, and new sample collection, preservation, and holding time requirements. The costs to tribal governments will be minimal. In fact, tribal governments may see a cost savings because the rule adds flexibility for laboratories and permittees to choose between additional approved test methods and it also provides additional flexibility to modify existing test methods. Thus, laboratories and permittees will not make as many requests for approval of alternative test methods or method modifications. Thus, Executive Order 13175 does not apply to this rule.

In the spirit of Executive Order 13175, and consistent with EPA policy to promote communications between EPA and Indian tribes, EPA specifically solicited comment on the proposed rule from tribal officials. EPA did not receive any comments from Indian tribes.

G. Executive Order 13045: Protection of Children From Environmental Health Risks and Safety Risks

EPA interprets EO 13045 (62 FR 19885, April 23, 1997) as applying only to those regulatory actions that concern health or safety risks, such that the analysis required under section 5–501 of the EO has the potential to influence the regulation. This action is not subject to EO 13045 because it does not establish an environmental standard intended to mitigate health or safety risks. This rule approves new and revised versions of testing procedures, and new sample collection, preservation, and holding time requirements.

H. Executive Order 13211: Actions That Significantly Affect Energy Supply, Distribution, or Use

This action is not subject to Executive Order 13211, ''Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use'' (66 FR 28355 (May 22, 2001)) because it is not a significant regulatory action under Executive Order 12866.

I. National Technology Transfer and Advancement Act of 1995

Section 12(d) of the National Technology Transfer and Advancement Act of 1995, (NTTAA), Public Law 104–113, section 12(d) (15 U.S.C. 272 note), directs EPA to use voluntary consensus standards in its regulatory activities unless to do so would be inconsistent with applicable law or otherwise impractical. Voluntary consensus standards are technical standards (*e.g.,* material specifications, test methods, sampling procedures, and business practices) that are developed or adopted by voluntary consensus standard bodies. The NTTAA directs EPA to provide Congress, through the OMB, explanations when the Agency decides not to use available and applicable voluntary consensus standards.

This final rule approves the use of technical standards developed by the Standard Methods Committee, and ASTM International for use in compliance monitoring where the Agency has determined that those standards meet the needs of Clean Water Act programs. EPA is not adding two of the proposed ASTM methods to this final rule because these methods have not undergone full inter-laboratory validation as recommended in current Agency guidance (see Section III.C of this preamble). All other proposed voluntary consensus standards are approved in today's rule.

J. Executive Order 12898: Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations

Executive Order (EO) 12898 (59 FR 7629 (Feb. 16, 1994)) establishes federal executive policy on environmental justice. Its main provision directs federal agencies, to the greatest extent practicable and permitted by law, to make environmental justice part of their mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations in the United States.

This final rule provides additional compliance methods for use by any facility or laboratory with no disproportionate impact on minority or low-income populations because it merely approves new and revised versions of testing procedures to measure pollutants in water.

K. Congressional Review Act

The Congressional Review Act, 5 U.S.C. 801 et seq., as added by the Small Business Regulatory Enforcement Fairness Act of 1996, generally provides that before a rule may take effect, the agency promulgating the rule must submit a rule report, which includes a copy of the rule, to each House of the Congress and to the Comptroller General of the United States. EPA will submit a report containing this rule and other required information to the U.S. Senate, the U.S. House of Representatives, and the Comptroller General of the United States prior to publication of the rule in the **Federal Register**. This action is not a ''major rule'' as defined by 5 U.S.C. 804(2). This rule will be effective June 18, 2012.

List of Subjects

40 CFR Part 136

Environmental protection, Test procedures, Incorporation by reference, Reporting and recordkeeping requirements, Water pollution control.

40 CFR Part 260

Environmental protection, Administrative practice and procedure, Confidential business information, Hazardous waste, Incorporation by reference, Reporting and recordkeeping requirements.

40 CFR Part 423

Environmental protection, Steam Electric Power Generating Point Source Category, Incorporation by reference, Reporting and recordkeeping requirements, Water pollution control.

40 CFR Part 430

Environmental protection, Pulp, Paper, and Paperboard Point Source Category, Incorporation by reference, Reporting and recordkeeping requirements, Water pollution control.

40 CFR Part 435

Environmental protection, Oil and Gas Extraction Point Source Category, Incorporation by reference, Reporting and recordkeeping requirements, Water pollution control.

Dated: April 17, 2012.

Lisa P. Jackson,

Administrator.

For the reasons set out in the preamble, title 40, chapter I of the Code of Federal Regulations, is amended as follows:

PART 136—GUIDELINES ESTABLISHING TEST PROCEDURES FOR THE ANALYSIS OF POLLUTANTS

■ 1. The authority citation for Part 136 continues to read as follows:

Authority: Secs. 301, 304(h), 307, and 501(a) Pub. L. 95–217, 91 Stat. 1566, *et seq.* (33 U.S.C. 1251, *et seq.*) (The Federal Water Pollution Control Act Amendments of 1972 as amended by the Clean Water Act of 1977.)

■ 2. Section 136.1 is amended by revising paragraph (a) to read as follows:

§ 136.1 Applicability.

(a) The procedures prescribed herein shall, except as noted in §§ 136.4, 136.5, and 136.6, be used to perform the measurements indicated whenever the waste constituent specified is required to be measured for:

(1) An application submitted to the Administrator, or to a State having an approved NPDES program for a permit under section 402 of the Clean Water Act of 1977, as amended (CWA), and/or to reports required to be submitted under NPDES permits or other requests for quantitative or qualitative effluent data under parts 122 to 125 of title 40; and

(2) Reports required to be submitted by dischargers under the NPDES established by parts 124 and 125 of this chapter; and

(3) Certifications issued by States pursuant to section 401 of the CWA, as amended.

* * * * *

■ 3. Section 136.3 is amended:

■ a. By revising paragraph (a) introductory text and Tables IA, IB, IC, ID, IG, and IH;

■ b. By revising paragraph (b);

■ c. By revising paragraph (e) introductory text;

■ d. By revising Table II to paragraph (e).

These revisions and additions read as follows:

§ 136.3 Identification of test procedures.

(a) Parameters or pollutants, for which methods are approved, are listed together with test procedure descriptions and references in Tables IA, IB, IC, ID, IE, IF, IG, and IH. The methods listed in Tables IA, IB, IC, ID, IE, IF, IG, and IH are incorporated by reference, see paragraph (b) of this section, with the exception of EPA Methods 200.7, 601–613, 624, 625, 1613, 1624, and 1625. The full texts of Methods 601–613, 624, 625, 1613, 1624, and 1625 are printed in appendix A of this part 136, and the full text of Method 200.7 is printed in appendix C of this part 136. The full text for determining the method detection limit when using the test procedures is given in appendix B of this part 136. The full text of Method 200.7 is printed in appendix C of this part 136. In the event of a conflict between the reporting requirements of 40 CFR Parts 122 and 125 and any reporting requirements associated with the methods listed in these tables, the provisions of 40 CFR Parts 122 and 125 are controlling and will determine a permittee's reporting requirements. The full text of the referenced test procedures are incorporated by reference into Tables IA, IB, IC, ID, IE, IF, IG, and IH. The discharge parameter values for which reports are required must be determined by one of the standard analytical test procedures incorporated by reference and described in Tables IA, IB, IC, ID, IE, IF, IG, and IH or by any alternate test procedure which has been approved by the Administrator under the provisions of paragraph (d) of this section and §§ 136.4 and 136.5. Under certain circumstances paragraph (c) of this section, § 136.5(a) through (d) or 40 CFR 401.13, other additional or alternate test procedures may be used.

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TABLE IA—LIST OF APPROVED BIOLOGICAL METHODS FOR WASTEWATER AND SEWAGE SLUDGE

Parameter and units	Method [1]	EPA	Standard methods	AOAC, ASTM, USGS	Other
Bacteria:					
1. Coliform (fecal), number per 100 mL or number per gram dry weight.	Most Probable Number (MPN), 5 tube, 3 dilution, or	p. 132 [3] ..... 1680 [11,15]. 1681 [11,20].	9221 C E–2006.		
	Membrane filter (MF) [2], single step	p. 124 [3]	9222 D–1997	B–0050–85 [4].	
2. Coliform (fecal) in presence of chlorine, number per 100 mL.	MPN, 5 tube, 3 dilution, or	p. 132 [3]	9221 C E–2006.		
	MF [2], single step [5]	p. 124 [3]	9222 D–1997.		
3. Coliform (total), number per 100 mL.	MPN, 5 tube, 3 dilution, or.	p. 114 [3]	9221 B–2006.		
	MF [2], single step or two step.	p. 108 [3]	9222 B–1997	B–0025–85 [4]	
4. Coliform (total), in presence of chlorine, number per 100 mL.	MPN, 5 tube, 3 dilution, or	p. 114 [3]	9221 B–2006		
	MF [2] with enrichment [5]	p. 111 [3]	9222 (B + B.5c) – 1997		
5. *E. coli,* number per 100 mL [21].	MPN [6,8,16] multiple tube, or.	.....	9221B.1–2006/9221F–2006 [12,14].		
	multiple tube/multiple well, or	.....	9223 B–2004 [13]	991.15 [10]	Colilert® [13,18] Colilert-18® [13,17,18]
	MF [2,6,7,8] single step ...	1603 [22]	.....	.....	mColiBlue-24® [19]
6. Fecal streptococci, number per 100 mL.	MPN, 5 tube 3 dilution, or	p. 139 [3]	9230 B–2007.		
	MF [2], or	p. 136 [3]	9230 C–2007	B–0055–85 [4]	
	Plate count	p. 143 [3].			
7. Enterococci, number per 100 mL [22].	MPN [6,8], multiple tube/multiple well, or	.....	.....	D6503–99 [9]	Enterolert® [13,24]
	MF [2,6,7,8] single step or	1600 [25]	9230 C–2007		
	Plate count	p. 143 [3].			
8. *Salmonella,* number per gram dry weight [11].	MPN multiple tube	1682 [23].			
Aquatic Toxicity:					
9. Toxicity, acute, fresh water organisms, LC_{50}, percent effluent.	*Ceriodaphnia dubia* acute.	2002.0. [26]			
	Daphnia puplex and *Daphnia magna* acute.	2021.0. [26]			
	Fathead Minnow, *Pimephales promelas,* and Bannerfin shiner, *Cyprinella leedsi,* acute.	2000.0. [26]			
	Rainbow Trout, *Oncorhynchus mykiss,* and brook trout, *Salvelinus fontinalis,* acute.	2019.0. [26]			
10. Toxicity, acute, estuarine and marine organisms of the Atlantic Ocean and Gulf of Mexico, LC_{50}, percent effluent.	Mysid, *Mysidopsis bahia,* acute.	2007.0. [26]			

TABLE IA—LIST OF APPROVED BIOLOGICAL METHODS FOR WASTEWATER AND SEWAGE SLUDGE—Continued

Parameter and units	Method [1]	EPA	Standard methods	AOAC, ASTM, USGS	Other
	Sheepshead Minnow, *Cyprinodon variegatus,* acute.	2004.0 [26]			
	Silverside, *Menidia beryllina, Menidia menidia,* and *Menidia peninsulae,* acute.	2006.0 [26]			
11. Toxicity, chronic, fresh water organisms, NOEC or IC_{25}, percent effluent.	Fathead minnow, *Pimephales promelas,* larval survival and growth.	1000.0.[27]			
	Fathead minnow, *Pimephales promelas,* embryo-larval survival and teratogenicity.	1001.0.[27]			
	Daphnia, *Ceriodaphnia dubia,* survival and reproduction.	1002.0.[27]			
	Green alga, *Selenastrum capricornutum,* growth.	1003.0.[27]			
12. Toxicity, chronic, estuarine and marine organisms of the Atlantic Ocean and Gulf of Mexico, NOEC or IC_{25}, percent effluent.	Sheepshead minnow, *Cyprinodon variegatus,* larval survival and growth.	1004.0.[28]			
	Sheepshead minnow, *Cyprinodon variegatus,* embryo-larval survival and teratogenicity.	1005.0.[28]			
	Inland silverside, *Menidia beryllina,* larval survival and growth.	1006.0.[28]			
	Mysid, *Mysidopsis bahia,* survival, growth, and fecundity.	1007.0.[28]			
	Sea urchin, *Arbacia punctulata,* fertilization.	1008.0.[28]			

Table IA notes:

[1] The method must be specified when results are reported.

[2] A 0.45-µm membrane filter (MF) or other pore size certified by the manufacturer to fully retain organisms to be cultivated and to be free of extractables which could interfere with their growth.

[3] Microbiological Methods for Monitoring the Environment, Water, and Wastes, EPA/600/8–78/017. 1978. US EPA.

[4] U.S. Geological Survey Techniques of Water-Resource Investigations, Book 5, Laboratory Analysis, Chapter A4, Methods for Collection and Analysis of Aquatic Biological and Microbiological Samples. 1989. USGS.

[5] Because the MF technique usually yields low and variable recovery from chlorinated wastewaters, the Most Probable Number method will be required to resolve any controversies.

[6] Tests must be conducted to provide organism enumeration (density). Select the appropriate configuration of tubes/filtrations and dilutions/volumes to account for the quality, character, consistency, and anticipated organism density of the water sample.

[7] When the MF method has been used previously to test waters with high turbidity, large numbers of noncoliform bacteria, or samples that may contain organisms stressed by chlorine, a parallel test should be conducted with a multiple-tube technique to demonstrate applicability and comparability of results.

[8] To assess the comparability of results obtained with individual methods, it is suggested that side-by-side tests be conducted across seasons of the year with the water samples routinely tested in accordance with the most current Standard Methods for the Examination of Water and Wastewater or EPA alternate test procedure (ATP) guidelines.

[9] Annual Book of ASTM Standards–Water and Environmental Technology, Section 11.02. 2000, 1999, 1996. ASTM International.

[10] Official Methods of Analysis of AOAC International. 16th Edition, 4th Revision, 1998. AOAC International.

[11] Recommended for enumeration of target organism in sewage sludge.

[12] The multiple-tube fermentation test is used in 9221B.1–2006. Lactose broth may be used in lieu of lauryl tryptose broth (LTB), if at least 25 parallel tests are conducted between this broth and LTB using the water samples normally tested, and this comparison demonstrates that the false-positive rate and false-negative rate for total coliform using lactose broth is less than 10 percent. No requirement exists to run the completed phase on 10 percent of all total coliform-positive tubes on a seasonal basis.

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[13] These tests are collectively known as defined enzyme substrate tests, where, for example, a substrate is used to detect the enzyme β-glucuronidase produced by *E. coli.*

[14] After prior enrichment in a presumptive medium for total coliform using 9221B.1–2006, all presumptive tubes or bottles showing any amount of gas, growth or acidity within 48 h ± 3 h of incubation shall be submitted to 9221F–2006. Commercially available EC–MUG media or EC media supplemented in the laboratory with 50 µg/mL of MUG may be used.

[15] Method 1680: Fecal Coliforms in Sewage Sludge (Biosolids) by Multiple-Tube Fermentation Using Lauryl-Tryptose Broth (LTB) and EC Medium, EPA–821–R–10–003. April 2010. U.S. EPA.

[16] Samples shall be enumerated by the multiple-tube or multiple-well procedure. Using multiple-tube procedures, employ an appropriate tube and dilution configuration of the sample as needed and report the Most Probable Number (MPN). Samples tested with Colilert® may be enumerated with the multiple-well procedures, Quanti-Tray®, Quanti-Tray®/2000, and the MPN calculated from the table provided by the manufacturer.

[17] Colilert-18® is an optimized formulation of the Colilert® for the determination of total coliforms and *E. coli* that provides results within 18 h of incubation at 35 °C rather than the 24 h required for the Colilert® test and is recommended for marine water samples.

[18] Descriptions of the Colilert®, Colilert-18®, Quanti-Tray®, and Quanti-Tray®/2000 may be obtained from IDEXX Laboratories, Inc.

[19] A description of the mColiBlue24® test, is available from Hach Company.

[20] Method 1681: Fecal Coliforms in Sewage Sludge (Biosolids) by Multiple-Tube Fermentation using A–1 Medium, EPA–821–R–06–013. July 2006. U.S. EPA.

[21] Recommended for enumeration of target organism in wastewater effluent.

[22] Method 1603: *Escherichia coli* (*E. coli*) in Water by Membrane Filtration Using Modified membrane-Thermotolerant *Escherichia coli* Agar (modified mTEC), EPA–821–R–09–007. December 2009. U.S. EPA.

[23] Method 1682: *Salmonella* in Sewage Sludge (Biosolids) by Modified Semisolid Rappaport-Vassiliadis (MSRV) Medium, EPA–821–R–06–014. July 2006. U.S. EPA.

[24] A description of the Enterolert® test may be obtained from IDEXX Laboratories Inc.

[25] Method 1600: Enterococci in Water by Membrane Filtration Using membrane-Enterococcus Indoxyl-β-D–Glucoside Agar (mEI), EPA–821–R–09–016. December 2009. U.S. EPA.

[26] Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms. EPA–821–R–02–012. Fifth Edition, October 2002. U.S. EPA.

[27] Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms. EPA–821–R–02–013. Fourth Edition, October 2002. U.S. EPA.

[28] Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms. EPA–821–R–02–014. Third Edition, October 2002. U.S. EPA.

TABLE IB—LIST OF APPROVED INORGANIC TEST PROCEDURES

Parameter	Methodology [58]	EPA [52]	Standard methods	ASTM	USGS/AOAC/Other
1. Acidity, as $CaCO_3$, mg/L.	Electrometric endpoint or phenolphthalein endpoint.	.....	2310 B–1997	D1067–06	I–1020–85.[2]
2. Alkalinity, as $CaCO_3$, mg/L.	Electrometric or Colorimetric titration to pH 4.5, Manual.	.....	2320 B–1997	D1067–06	973.43[3], I–1030–85.[2]
	Automatic	310.2 (Rev. 1974)[1] ..	.....	.....	I–2030–85.[2]
3. Aluminum—Total,[4] mg/L.	Digestion,[4] followed by any of the following:				
	AA direct aspiration [36]	.....	3111 D–1999 or 3111 E–1999.	.....	I–3051–85.[2]
	AA furnace	.....	3113 B–2004.		
	STGFAA	200.9, Rev. 2.2 (1994).			
	ICP/AES [36]	200.5, Rev 4.2 (2003) [68]; 200.7, Rev. 4.4 (1994).	3120 B–1999	D1976–07	I–4471–97.[50]
	ICP/MS	200.8, Rev. 5.4 (1994).	3125 B–2009	D5673–05	993.14,[3] I–4471–97.[50]
	Direct Current Plasma (DCP) [36].	.....	.....	D4190–08	See footnote.[34]
	Colorimetric (Eriochrome cyanine R).	.....	3500–Al B–2001.		
4. Ammonia (as N), mg/L.	Manual distillation [6] or gas diffusion (pH > 11), followed by any of the following:	350.1, Rev. 2.0 (1993).	4500–NH_3 B–1997 ..	.....	973.49[3].
	Nesslerization	.....	.....	D1426–08 (A)	973.49[3], I–3520–85.[2]
	Titration	.....	4500–NH_3 C–1997.		
	Electrode	.....	4500–NH_3 D–1997 or E–1997.	D1426–08 (B).	
	Manual phenate, salicylate, or other substituted phenols in Berthelot reaction based methods.	.....	4500–NH_3 F–1997 ...	.....	See footnote.[60]
	Automated phenate, salicylate, or other substituted phenols in Berthelot reaction based methods.	350.1[30], Rev. 2.0 (1993).	4500–NH_3 G–1997 4500–NH_3 H–1997.	.....	I–4523–85.[2]

TABLE IB—LIST OF APPROVED INORGANIC TEST PROCEDURES—Continued

Parameter	Methodology [58]	EPA [52]	Standard methods	ASTM	USGS/AOAC/Other
	Automated electrode	Ion Chromatography	.....	D6919–09	See footnote.[7]
5. Antimony—Total,[4] mg/L.	Digestion,[4] followed by any of the following:				
	AA direct aspiration [36].	.....	3111 B–1999.		
	AA furnace	.....	3113 B–2004.		
	STGFAA	200.9, Rev. 2.2 (1994).			
	ICP/AES [36]	200.5, Rev 4.2 (2003) [68]; 200.7, Rev. 4.4 (1994).	3120 B–1999	D1976–07	I–4471–97.[50]
	ICP/MS	200.8, Rev. 5.4 (1994).	3125 B–2009	D5673–05	993.14,[3] I–4471–97.[50]
6. Arsenic–Total,[4] mg/L.	Digestion,[4] followed by any of the following:	206.5 (Issued 1978) [1].			
	AA gaseous hydride	.....	3114 B–2009 or 3114 C–2009	D2972–08 (B)	I–3062–85.[2]
	AA furnace	.....	3113 B–2004	D2972–08 (C)	I–4063–98.[49]
	STGFAA	200.9, Rev. 2.2 (1994).			
	ICP/AES [36]	200.5, Rev 4.2 (2003) [68]; 200.7, Rev. 4.4 (1994).	3120 B–1999	D1976–07.	
	ICP/MS	200.8, Rev. 5.4 (1994).	3125 B–2009	D5673–05	993.14,[3] I–4020–05.[70]
	Colorimetric (SDDC)	.....	3500–As B–1997	D2972–08 (A)	I–3060–85.[2]
7. Barium–Total,[4] mg/L.	Digestion[4], followed by any of the following:				
	AA direct aspiration [36].	.....	3111 D–1999	.....	I–3084–85.[2]
	AA furnace	.....	3113 B–2004	D4382–02(07).	
	ICP/AES [36]	200.5, Rev 4.2 (2003) [68]; 200.7, Rev. 4.4 (1994).	3120 B–1999	.....	I–4471–97.[50]
	ICP/MS	200.8, Rev. 5.4 (1994).	3125 B–2009	D5673–05	993.14,[3] I–4471–97.[50]
	DCP [36]	.....	.....	.....	See footnote.[34]
8. Beryllium—Total,[4] mg/L.	Digestion,[4] followed by any of the following:				
	AA direct aspiration	.....	3111 D–1999 or 3111 E–1999	D3645–08 (A)	I–3095–85.[2]
	AA furnace	.....	3113 B–2004	D3645–08 (B).	
	STGFAA	200.9, Rev. 2.2 (1994).			
	ICP/AES	200.5, Rev 4.2 (2003) [68]; 200.7, Rev. 4.4 (1994).	3120 B–1999	D1976–07	I–4471–97.[50]
	ICP/MS	200.8, Rev. 5.4 (1994).	3125 B–2009	D5673–05	993.14,[3] I–4471–97.[50]
	DCP	.....	.....	D4190–08	See footnote.[34]
	Colorimetric (aluminon).	.....	See footnote [61].		
9. Biochemical oxygen demand (BOD5), mg/L.	Dissolved Oxygen Depletion.	.....	5210 B–2001	.....	973.44[3], p. 17.[9], I–1578–78,[8] See footnote.[10,63]
10. Boron—Total,[37] mg/L.	Colorimetric (curcumin) ..	.....	4500–B B –2000	.....	I–3112–85.[2]
	ICP/AES	200.5, Rev 4.2 (2003) [68]; 200.7, Rev. 4.4 (1994).	3120 B–1999	D1976–07	I–4471–97.[50]
	ICP/MS	200.8, Rev. 5.4 (1994).	3125 B–2009	D5673–05	993.14,[3] I–4471–97.[50]
	DCP	.....	.....	D4190–08	See footnote.[34]
11. Bromide, mg/L	Electrode	.....	.....	D1246–05	I–1125–85.[2]
	Ion Chromatography	300.0, Rev 2.1 (1993) and 300.1–1, Rev 1.0 (1997).	4110 B–2000, C–2000, D–2000.	D4327–03	993.30.[3]
	CIE/UV	.....	4140 B–1997	D6508–00(05)	D6508, Rev. 2.[54]
12. Cadmium—Total,[4] mg/L.	Digestion,[4] followed by any of the following:				

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TABLE IB—LIST OF APPROVED INORGANIC TEST PROCEDURES—Continued

Parameter	Methodology [58]	EPA [52]	Standard methods	ASTM	USGS/AOAC/Other
	AA direct aspiration [36].	.....	3111 B–1999 ..... or 3111 C–1999	D3557–02(07) (A or B).	974.27,[3] p. 37.[9], I–3135–85 [2] or I–3136–85.[2]
	AA furnace	.....	3113 B–2004	D3557–02(07) (D)	I–4138–89.[51]
	STGFAA	200.9, Rev. 2.2 (1994).			
	ICP/AES [36]	200.5, Rev 4.2 (2003) [68]; 200.7, Rev. 4.4 (1994).	3120 B–1999	D1976–07	I–1472–85 [2] or I–4471–97.[50]
	ICP/MS	200.8, Rev. 5.4 (1994).	3125 B–2009	D5673–05	993.14,[3] I–4471–97.[50]
	DCP[36]	.....	.....	D4190–08	See footnote.[34]
	Voltametry[11]	.....	.....	D3557–02(07) (C).	
	Colorimetric (Dithizone).	.....	3500–Cd-D–1990.		
13. Calcium—Total,[4] mg/L.	Digestion,[4] followed by any of the following:				
	AA direct aspiration	.....	3111 B–1999	D511–08(B)	I–3152–85.[2]
	ICP/AES	200.5, Rev 4.2 (2003) [68]; 200.7, Rev. 4.4 (1994).	3120 B–1999	.....	I–4471–97.[50]
	ICP/MS	200.8, Rev. 5.4 (1994).	3125 B–2009	D5673–05	993.14.[3]
	DCP	.....	.....	.....	See footnote.[34]
	Titrimetric (EDTA) ...	.....	3500–Ca B–1997	D511–08 (A).	
	Ion Chromatography	.....	.....	D6919–09.	
14. Carbonaceous biochemical oxygen demand ($CBOD_5$), mg/L[12].	Dissolved Oxygen Depletion with nitrification inhibitor.	.....	5210 B–2001	.....	See footnote.[35,63]
15. Chemical oxygen demand (COD), mg/L.	Titrimetric	410.3 (Rev. 1978)[1] ..	5220 B–1997 ..... or C–1997	D1252–06 (A)	973.46,[3] p. 17,[9] I–3560–85.[2]
	Spectrophotometric, manual or automatic.	410.4, Rev. 2.0 (1993).	5220 D–1997	D1252–06 (B)	See footnotes.[13,14] I–3561–85.[2]
16. Chloride, mg/L	Titrimetric: (silver nitrate)	.....	4500–Cl^- B–1997 ...	D512–04 (B)	I–1183–85.[2]
	(Mercuric nitrate)	.....	4500–Cl^- C–1997 ...	D512–04 (A)	973.51,[3] I–1184–85.[2]
	Colorimetric: manual	.....	.....	.....	I–1187–85.[2]
	Automated (Ferricyanide)	.....	4500–Cl^- E–1997 ...	.....	I–2187–85.[2]
	Potentiometric Titration ..	.....	4500–Cl^- D–1997.		
	Ion Selective Electrode ..	.....	.....	D512–04 (C).	
	Ion Chromatography	300.0, Rev 2.1 (1993) and 300.1–1, Rev 1.0 (1997).	4110 B–2000 or 4110 C–2000	D4327–03	993.30[3] , I–2057–90.[51]
	CIE/UV	.....	4140 B–1997	D6508–00(05)	D6508, Rev. 2.[54]
17. Chlorine–Total residual, mg/L.	Amperometric direct	.....	4500–Cl D–2000	D1253–08.	
	Amperometric direct (low level).	.....	4500–Cl E–2000.		
	Iodometric direct	.....	4500–Cl B–2000.		
	Back titration ether end–point[15].	.....	4500–Cl C–2000.		
	DPD–FAS	.....	4500–Cl F–2000.		
	Spectrophotometric, DPD	.....	4500–Cl G–2000.		
	Electrode	.....	.....	.....	See footnote.[16]
17A. Chlorine–Free Available, mg/L.	Amperometric direct	.....	4500–Cl D–2000	D1253–08.	
	Amperometric direct (low level).	.....	4500–Cl E–2000.		
	DPD–FAS	.....	4500–Cl F–2000.		
	Spectrophotometric, DPD	.....	4500–Cl G–2000.		
18. Chromium VI dissolved, mg/L.	0.45-micron Filtration followed by any of the following:				
	AA chelation–extraction.	.....	3111 C–1999	.....	I–1232–85.[2]
	Ion Chromatography	218.6, Rev. 3.3 (1994).	3500–Cr C–2009	D5257–03	993.23.
	Colorimetric (Diphenyl–carbazide).	.....	3500–Cr B–2009	D1687–02(07) (A)	I–1230–85.[2]
19. Chromium—Total,[4] mg/L.	Digestion,[4] followed by any of the following:				

TABLE IB—LIST OF APPROVED INORGANIC TEST PROCEDURES—Continued

Parameter	Methodology [58]	EPA [52]	Standard methods	ASTM	USGS/AOAC/Other
	AA direct aspiration [36].	.....	3111 B–1999	D1687–02(07) (B)	974.27,[3] I–3236–85.[2]
	AA chelation–extraction.	.....	3111 C–1999.		
	AA furnace	.....	3113 B–2004	D1687–02(07) (C)	I–3233–93.[46]
	STGFAA	200.9, Rev. 2.2 (1994).			
	ICP/AES [36]	200.5, Rev 4.2 (2003),[68] 200.7, Rev. 4.4 (1994).	3120 B–1999	D1976–07	I–4471–97.[50]
	ICP/MS	200.8, Rev. 5.4 (1994).	3125 B–2009	D5673–05	993.14,[3] I–4020–05.[70]
	DCP [36]	.....	.....	D4190–08	See footnote.[34]
	Colorimetric (Diphenyl–carbazide).	.....	3500–Cr B–2009.		
20. Cobalt—Total,[4] mg/L.	Digestion,[4] followed by any of the following:				
	AA direct aspiration	.....	3111 B–1999 or 3111 C–1999.	D3558–08 (A or B) ..	p. 37,[9] I–3239–85.[2]
	AA furnace	.....	3113 B–2004	D3558–08 (C)	I–4243–89.[51]
	STGFAA	200.9, Rev. 2.2 (1994).			
	ICP/AES [36]	200.5, Rev 4.2 (2003) [68]; 200.7, Rev. 4.4 (1994).	3120 B–1999	D1976–07	I–4471–97.[50]
	ICP/MS	200.8, Rev. 5.4 (1994).	3125 B–2009	D5673–05	993.14,[3] I–4020–05.[70]
	DCP	.....	.....	D4190–08	See footnote.[34]
21. Color, platinum cobalt units or dominant wavelength, hue, luminance purity.	Colorimetric (ADMI)	.....	.....	.....	See footnote.[18]
	(Platinum cobalt) ..... Spectrophotometric.	.....	2120 B–2001	.....	I–1250–85.[2]
22. Copper—Total,[4] mg/L.	Digestion,[4] followed by any of the following:				
	AA direct aspiration [36].	.....	3111 B–1999 or 3111 C–1999	D1688–07 (A or B) ..	974.27,[3] p. 37,[9] I–3270–85 [2] or I–3271–85.[2]
	AA furnace	.....	3113 B–2004	D1688–07 (C)	I–4274–89.[51]
	STGFAA	200.9, Rev. 2.2 (1994).			
	ICP/AES [36]	200.5, Rev 4.2 (2003) [68]; 200.7, Rev. 4.4 (1994).	3120 B–1999	D1976–07	I–4471–97.[50]
	ICP/MS	200.8, Rev. 5.4 (1994).	3125 B–2009	D5673–05	993.14,[3] I–4020–05.[70]
	DCP [36]	.....	.....	D4190–08	See footnote.[34]
	Colorimetric (Neocuproine).	.....	3500–Cu B–1999.		
	(Bathocuproine)	.....	3500–Cu C–1999	.....	See footnote.[19]
23. Cyanide—Total, mg/L.	Automated UV digestion/distillation and Colorimetry.	.....	.....	.....	Kelada–01.[55]
	Segmented Flow Injection, In-Line Ultraviolet Digestion, followed by gas diffusion amperometry.	.....	.....	D7511–09.	
	Manual distillation with $MgCl_2$, followed by any of the following:	335.4, Rev. 1.0 (1993) [57].	4500–CN^- B–1999 or C–1999.	D2036–09(A), D7284–08.	10–204–00–1–X.[56]
	Flow Injection, gas diffusion amperometry.	.....	.....	D2036–09(A) D7284–08.	
	Titrimetric	.....	4500–CN^- D–1999	D2036–09(A)	p. 22.[9]
	Spectrophotometric, manual.	.....	4500–CN^- E–1999	D2036–09(A)	I–3300–85.[2]
	Semi-Automated [20] ..	335.4, Rev. 1.0 (1993) [57].	.....	.....	10–204–00–1–X,[56] I–4302–85.[2]
	Ion Chromatography	.....	.....	D2036–09(A).	

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TABLE IB—LIST OF APPROVED INORGANIC TEST PROCEDURES—Continued

Parameter	Methodology [58]	EPA [52]	Standard methods	ASTM	USGS/AOAC/Other
	Ion Selective Electrode.	.....	4500–CN⁻ F–1999	D2036–09(A).	
24. Cyanide–Available, mg/L.	Cyanide Amenable to Chlorination (CATC); Manual distillation with $MgCl_2$, followed by Titrimetric or Spectrophotometric.	.....	4500–CN⁻ G–1999	D2036–09(B).	
	Flow injection and ligand exchange, followed by gas diffusion amperometry [59].	.....	.....	D6888–09	OIA–1677–09.[44]
	Automated Distillation and Colorimetry (no UV digestion).	.....	.....	.....	Kelada–01.[55]
24.A Cyanide-Free, mg/L.	Flow Injection, followed by gas diffusion amperometry.	.....	.....	D7237–10	OIA–1677–09.[44]
	Manual micro-diffusion and colorimetry.	.....	.....	D4282–02.	
25. Fluoride—Total, mg/L.	Manual distillation,[6] followed by any of the following:	.....	4500–F⁻ B–1997.		
	Electrode, manual ...	.....	4500–F⁻ C–1997	D1179–04 (B).	
	Electrode, automated.	.....	.....	.....	I–4327–85.[2]
	Colorimetric, (SPADNS).	.....	4500–F⁻ D–1997	D1179–04 (A).	
	Automated complexone.	.....	4500–F⁻ E–1997.		
	Ion Chromatography	300.0, Rev 2.1 (1993) and 300.1–1, Rev 1.0 (1997).	4110 B–2000 or C–2000.	D4327–03	993.30.[3]
	CIE/UV	.....	4140 B–1997	D6508–00(05)	D6508, Rev. 2.[54]
26. Gold—Total,[4] mg/L.	Digestion,[4] followed by any of the following:				
	AA direct aspiration	.....	3111 B–1999.		
	AA furnace	231.2 (Issued 1978)[1]	3113 B–2004.		
	ICP/MS	200.8, Rev. 5.4 (1994).	3125 B–2009	D5673–05	993.14.[3]
	DCP	.....	.....	.....	See footnote.[34]
27. Hardness—Total, as $CaCO_3$, mg/L.	Automated colorimetric ...	130.1 (Issued 1971)[1].			
	Titrimetric (EDTA)	.....	2340 C–1997	D1126–02(07)	973.52B,[3] I–1338–85.[2]
	Ca plus Mg as their carbonates, by inductively coupled plasma or AA direct aspiration. (See Parameters 13 and 33)..	.....	2340 B–1997.		
28. Hydrogen ion (pH), pH units.	Electrometric measurement.	.....	4500–H⁺ B–2000	D1293–99 (A or B) ..	973.41,[3] I–1586–85.[2]
	Automated electrode	150.2 (Dec. 1982)[1] ..	.....	.....	See footnote,[21] I–2587–85.[2]
29. Iridium—Total,[4] mg/L.	Digestion,[4] followed by any of the following:				
	AA direct aspiration	.....	3111 B–1999.		
	AA furnace	235.2 (Issued 1978)[1].			
	ICP/MS	.....	3125 B–2009.		
30. Iron—Total,[4] mg/L	Digestion,[4] followed by any of the following:				
	AA direct aspiration [36].	.....	3111 B–1999 or 3111 C–1999	D1068–05 (A or B) ..	974.27,[3] I–3381–85.[2]
	AA furnace	.....	3113 B–2004	D1068–05 (C).	
	STGFAA	200.9, Rev. 2.2 (1994).			
	ICP/AES [36]	200.5, Rev 4.2 (2003) [68]; 200.7, Rev. 4.4 (1994).	3120 B–1999	D1976–07	I–4471–97.[50]
	ICP/MS	200.8, Rev. 5.4 (1994).	3125 B–2009	D5673–05	993.14.[3]

TABLE IB—LIST OF APPROVED INORGANIC TEST PROCEDURES—Continued

Parameter	Methodology [58]	EPA [52]	Standard methods	ASTM	USGS/AOAC/Other
	DCP [36]			D4190–08	See footnote.[34]
	Colorimetric (Phenanthroline).		3500–Fe-1997	D1068–05 (D)	See footnote.[22]
31. Kjeldahl Nitrogen [5]—Total, (as N), mg/L.	Manual digestion [20] and distillation or gas diffusion, followed by any of the following:		4500–N_{org} B–1997 or C–1997 and 4500–NH_3 B–1997.	D3590–02(06) (A)	I–4515–91.[45]
	Titration		4500–NH_3 C–1997		973.48.[3]
	Nesslerization			D1426–08 (A).	
	Electrode		4500–NH_3 D–1997 or E–1997.	D1426–08 (B).	
	Semi-automated phenate.	350.1 Rev 2.0 1993	4500–NH_3 G–1997. 4500–NH_3 H–1997.		
	Manual phenate, salicylate, or other substituted phenols in Berthelot reaction based methods.		4500–NH_3 F–1997		See footnote.[60]
	Automated Methods for TKN that do not require manual distillation				
	Automated phenate, salicylate, or other substituted phenols in Berthelot reaction based methods colorimetric (auto digestion and distillation).	351.1 (Rev. 1978)[1]			I–4551–78.[8]
	Semi-automated block digestor colorimetric (distillation not required).	351.2, Rev. 2.0 (1993).	4500–N_{org} D–1997	D3590–02(06) (B)	I–4515–91.[45]
	Block digester, followed by Auto distillation and Titration.				See footnote.[39]
	Block digester, followed by Auto distillation and Nesslerization.				See footnote.[40]
	Block Digester, followed by Flow injection gas diffusion (distillation not required).				See footnote.[41]
32. Lead—Total,[4] mg/L.	Digestion,[4] followed by any of the following:				
	AA direct aspiration [36].		3111 B–1999 or 3111 C–1999.	D3559–08 (A or B)	974.27,[3] I–3399–85.[2]
	AA furnace		3113 B–2004	D3559–08 (D)	I–4403–89.[51]
	STGFAA	200.9, Rev. 2.2 (1994).			
	ICP/AES [36]	200.5, Rev 4.2 (2003)[68]; 200.7, Rev. 4.4 (1994).	3120 B–1999	D1976–07	I–4471–97.[50]
	ICP/MS	200.8, Rev. 5.4 (1994).	3125 B–2009	D5673–05	993.14,[3] I–4471–97.[50]
	DCP [36]			D4190–08	See footnote.[34]
	Voltametry[11]			D3559–08 (C).	
	Colorimetric (Dithizone).		3500–Pb B–1997.		
33. Magnesium—Total,[4] mg/L.	Digestion,[4] followed by any of the following:				
	AA direct aspiration		3111 B–1999	D511–08 (B)	974.27,[3] I–3447–85.[2]
	ICP/AES	200.5, Rev 4.2 (2003) [68]; 200.7, Rev. 4.4 (1994).	3120 B–1999	D1976–07	I–4471–97.[50]
	ICP/MS	200.8, Rev. 5.4 (1994).	3125 B–2009	D5673–05	993.14.[3]
	DCP				See footnote.[34]
	Gravimetric.				
	Ion Chromatography			D6919–09.	
34. Manganese—Total,[4] mg/L.	Digestion [4] followed by any of the following:				

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TABLE IB—LIST OF APPROVED INORGANIC TEST PROCEDURES—Continued

Parameter	Methodology [58]	EPA [52]	Standard methods	ASTM	USGS/AOAC/Other
	AA direct aspiration [36].	.....	3111 B–1999	D858–07 (A or B)	974.27,[3] I–3454–85.[2]
	AA furnace	.....	3113 B–2004	D858–07 (C).	
	STGFAA	200.9, Rev. 2.2 (1994).			
	ICP/AES [36]	200.5, Rev 4.2 (2003) [68]; 200.7, Rev. 4.4 (1994).	3120 B–1999	D1976–07	I–4471–97.[50]
	ICP/MS	200.8, Rev. 5.4 (1994).	3125 B–2009	D5673–05	993.14,[3] I–4471–97.[50]
	DCP [36]	.....	.....	D4190–08	See footnote.[34]
	Colorimetric (Persulfate).	.....	3500–Mn B–1999	.....	920.203.[3]
	(Periodate)	.....	.....	.....	See footnote.[23]
35. Mercury—Total,[4] mg/L.	Cold vapor, Manual	245.1, Rev. 3.0 (1994).	3112 B–2009	D3223–02(07)	977.22,[3] I–3462–85.[2]
	Cold vapor, Automated ..	245.2 (Issued 1974)[1].			
	Cold vapor atomic fluorescence spectrometry (CVAFS).	245.7 Rev. 2.0 (2005)[17].	.....	.....	I–4464–01.[71]
	Purge and Trap CVAFS	1631E[43].			
36. Molybdenum—Total,[4] mg/L.	Digestion,[4] followed by any of the following:				
	AA direct aspiration	.....	3111 D–1999	.....	I–3490–85.[2]
	AA furnace	.....	3113 B–2004	.....	I–3492–96.[47]
	ICP/AES [36]	200.5, Rev 4.2 (2003) [68]; 200.7, Rev. 4.4 (1994).	3120 B–1999	D1976–07	I–4471–97.[50]
	ICP/MS	200.8, Rev. 5.4 (1994).	3125 B–2009	D5673–05	993.14,[3] I–4471–97.[50]
	DCP	.....	.....	.....	See footnote.[34]
37. Nickel—Total,[4] mg/L.	Digestion [4] followed by any of the following:				
	AA direct aspiration [36].	.....	3111 B–1999 or 3111 C–1999	D1886–08 (A or B) ..	I–3499–85.[2]
	AA furnace	.....	3113 B–2004	D1886–08 (C)	I–4503–89.[51]
	STGFAA	200.9, Rev. 2.2 (1994).			
	ICP/AES [36]	200.5, Rev 4.2 (2003) [68]; 200.7, Rev. 4.4 (1994).	3120 B–1999	D1976–07	I–4471–97.[50]
	ICP/MS	200.8, Rev. 5.4 (1994).	3125 B–2009	D5673–05	993.14,[3] I–4020–05.[70]
	DCP [36]	.....	.....	D4190–08	See footnote.[34]
38. Nitrate (as N), mg/L.	Ion Chromatography	300.0, Rev 2.1 (1993) and 300.1–1, Rev 1.0 (1997).	4110 B–2000 or C–2000.	D4327–03	993.30.[3]
	CIE/UV	.....	4140 B–1997	D6508–00(05)	D6508, Rev. 2.[54]
	Ion Selective Electrode.	.....	4500–NO_3^- D–2000.		
	Colorimetric (Brucine sulfate).	352.1 (Issued 1971)[1]	.....	.....	973.50,[3] 419D[1,7], p. 28.[9]
	Nitrate-nitrite N minus Nitrite N (See parameters 39 and 40).	.....	.....	.....	See footnote.[62]
39. Nitrate-nitrite (as N), mg/L.	Cadmium reduction, Manual.	.....	4500–NO_3^- E–2000	D3867–04 (B).	
	Cadmium reduction, Automated.	353.2, Rev. 2.0 (1993).	4500–NO_3^- F–2000	D3867–04 (A)	I–2545–90.[51]
	Automated hydrazine.	.....	4500–NO_3^- H–2000.		
	Reduction/Colorimetric.	.....	.....	.....	See footnote.[62]
	Ion Chromatography	300.0, Rev 2.1 (1993) and 300.1–1, Rev 1.0 (1997).	4110 B–2000 or C–2000.	D4327–03	993.30.[3]
	CIE/UV	.....	4140 B–1997	D6508–00(05)	D6508, Rev. 2.[54]
40. Nitrite (as N), mg/L	Spectrophotometric: Manual.	.....	4500–NO_2^- B–2000	.....	See footnote.[25]
	Automated (Diazotization).	.....	.....	.....	I–4540–85[2], See footnote.[62]

TABLE IB—LIST OF APPROVED INORGANIC TEST PROCEDURES—Continued

Parameter	Methodology [58]	EPA [52]	Standard methods	ASTM	USGS/AOAC/Other
	Automated (*bypass cadmium reduction).	353.2, Rev. 2.0 (1993).	4500–NO_3^- F–2000	D3867–04 (A)	I–4545–85.[2]
	Manual (*bypass cadmium reduction).		4500–NO_3^- E–2000	D3867–04 (B).	
	Ion Chromatography	300.0, Rev 2.1 (1993) and 300.1–1, Rev 1.0 (1997).	4110 B–2000 or C–2000.	D4327–03	993.30.[3]
	CIE/UV		4140 B–1997	D6508–00(05)	D6508, Rev. 2.[54]
41. Oil and grease—Total recoverable, mg/L.	Hexane extractable material (HEM): n–Hexane extraction and gravimetry.	1664 Rev. A; 1664 Rev. B[42].	5520 B–2001[38].		
	Silica gel treated HEM (SGT–HEM): Silica gel treatment and gravimetry.	1664 Rev. A; 1664 Rev. B[42].	5520 B–2001[38] and 5520 F–2001[38].		
42. Organic carbon—Total (TOC), mg/L.	Combustion		5310 B–2000	D7573–09	973.47[3], p. 14.[24]
	Heated persulfate or UV persulfate oxidation.		5310 C 2000 5310 D 2000.	D4839–03	973.47[3], p. 14.[24]
43. Organic nitrogen (as N), mg/L.	Total Kjeldahl N (Parameter 31) minus ammonia N (Parameter 4).				
44. Ortho-phosphate (as P), mg/L.		Ascorbic acid method:			
	Automated	365.1, Rev. 2.0 (1993).	4500–P F–1999 or G–1999.		973.56[3], I–4601–85.[2]
	Manual single reagent.		4500–P E–1999	D515–88(A)	973.55.[3]
	Manual two reagent	365.3 (Issued 1978)[1].			
	Ion Chromatography	300.0, Rev 2.1 (1993) and 300.1–1, Rev 1.0 (1997).	4110 B–2000 or C–2000.	D4327–03	993.30.[3]
	CIE/UV		4140 B–1997	D6508–00(05)	D6508, Rev. 2.[54]
45. Osmium—Total[4], mg/L.	Digestion[4], followed by any of the following:				
	AA direct aspiration,		3111 D–1999.		
	AA furnace	252.2 (Issued 1978)[1].			
46. Oxygen, dissolved, mg/L.	Winkler (Azide modification).		4500–O B–2001, C–2001, D–2001, E–2001, F–2001.	D888–09 (A)	973.45B[3], I–1575–78.[8]
	Electrode		4500–O G–2001	D888–09 (B)	I–1576–78.[8]
	Luminescence Based Sensor.			D888–09 (C)	See footnote[63] See footnote.[64]
47. Palladium—Total,[4] mg/L.	Digestion[4], followed by any of the following:				
	AA direct aspiration		3111 B–1999.		
	AA furnace	253.2[1](Issued 1978).			
	ICP/MS		3125 B–2009.		
	DCP				See footnote.[34]
48. Phenols, mg/L	Manual distillation[26], followed by any of the following:	420.1[1](Rev. 1978)	5530 B–2005	D1783–01.	
	Colorimetric (4AAP) manual.	420.1[1](Rev. 1978)	5530 D–2005[27]	D1783–01 (A or B).	
	Automated colorimetric (4AAP).	420.4 Rev. 1.0 (1993).			
49. Phosphorus (elemental), mg/L.	Gas–liquid chromatography.				See footnote.[28]
50. Phosphorus—Total, mg/L.	Digestion[20], followed by any of the following:		4500–P B(5)-1999		973.55.[3]
	Manual	365.3[1](Issued 1978)	4500–P E–1999	D515–88 (A).	
	Automated ascorbic acid reduction.	365.1 Rev. 2.0 (1993).	4500–P F–1999, G–1999, H–1999.		973.56[3], I–4600–85.[2]
	ICP/AES[4, 36]	200.7, Rev. 4.4 (1994).	3120 B–1999		I–4471–97.[50]

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TABLE IB—LIST OF APPROVED INORGANIC TEST PROCEDURES—Continued

Parameter	Methodology [58]	EPA [52]	Standard methods	ASTM	USGS/AOAC/Other
	Semi–automated block digestor (TKP digestion).	365.4[1] (Issued 1974)	.....	D515–88 (B)	I–4610–91.[48]
51. Platinum—Total,[4] mg/L.	Digestion[4] followed by any of the following:				
	AA direct aspiration	.....	3111 B–1999.		
	AA furnace	255.2 (Issued 1978)[1].			
	ICP/MS	.....	3125 B–2009.		
	DCP	.....	.....	.....	See footnote.[34]
52. Potassium—Total,[4] mg/L.	Digestion[4], followed by any of the following:				
	AA direct aspiration	.....	3111 B–1999	.....	973.53[3], I–3630–85.[2]
	ICP/AES	200.7, Rev. 4.4 (1994).	3120 B–1999.		
	ICP/MS	200.8, Rev. 5.4 (1994).	3125 B–2009	D5673–05	993.14.[3]
	Flame photometric ..	.....	3500–K B–1997.		
	Electrode	.....	3500–K C–1997.		
	Ion Chromatography	.....	.....	D6919–09.	
53. Residue—Total, mg/L.	Gravimetric, 103–105°	.....	2540 B–1997	.....	I–3750–85.[2]
54. Residue—filterable, mg/L.	Gravimetric, 180°	.....	2540 C–1997	D5907–03	I–1750–85.[2]
55. Residue—non–filterable (TSS), mg/L.	Gravimetric, 103–105° post washing of residue.	.....	2540 D–1997	D5907–03	I–3765–85.[2]
56. Residue—settleable, mg/L.	Volumetric, (Imhoff cone), or gravimetric.	.....	2540 F–1997.		
57. Residue—Volatile, mg/L.	Gravimetric, 550°	160.4 (Issued 1971)[1]	2540–E–1997	.....	I–3753–85.[2]
58. Rhodium—Total,[4] mg/L.	Digestion[4] followed by any of the following:				
	AA direct aspiration, or.	.....	3111 B–1999.		
	AA furnace	265.2 (Issued 1978)[1].			
	ICP/MS	.....	3125 B–2009.		
59. Ruthenium—Total,[4] mg/L.	Digestion[4] followed by any of the following:				
	AA direct aspiration, or.	.....	3111 B–1999.		
	AA furnace	267.2[1].			
	ICP/MS	.....	3125 B–2009.		
60. Selenium—Total,[4] mg/L.	Digestion[4], followed by any of the following:				
	AA furnace	.....	3113 B–2004	D3859–08 (B)	I–4668–98.[49]
	STGFAA	200.9, Rev. 2.2 (1994).			
	ICP/AES[36]	200.5, Rev 4.2 (2003)[68]; 200.7, Rev. 4.4 (1994).	3120 B–1999	D1976–07.	
	ICP/MS	200.8, Rev. 5.4 (1994).	3125 B–2009	D5673–05	993.14[3], I–4020–05.[70]
	AA gaseous hydride	.....	3114 B–2009, or 3111 C–2009.	D3859–08 (A)	I–3667–85.[2]
61. Silica—Dissolved,[37] mg/L.	0.45-micron filtration followed by any of the following:				
	Colorimetric, Manual	.....	4500–SiO_2 C–1997 ..	D859–05	I–1700–85.[2]
	Automated (Molybdosilicate).	.....	4500–SiO_2 E–1997 or F–1997.	.....	I–2700–85.[2]
	ICP/AES	200.5, Rev 4.2 (2003)[68]; 200.7, Rev. 4.4 (1994).	3120 B–1999	.....	I–4471–97.[50]
	ICP/MS	200.8, Rev. 5.4 (1994).	3125 B–2009	D5673–05	993.14.[3]
62. Silver—Total,[4, 31] mg/L.	Digestion[4, 29], followed by any of the following:				
	AA direct aspiration	.....	3111 B–1999 or 3111 C–1999	.....	974.27[3], p. 37[9], I–3720–85.[2]
	AA furnace	.....	3113 B–2004	.....	I–4724–89.[51]
	STGFAA	200.9, Rev. 2.2 (1994).			

TABLE IB—LIST OF APPROVED INORGANIC TEST PROCEDURES—Continued

Parameter	Methodology [58]	EPA [52]	Standard methods	ASTM	USGS/AOAC/Other
	ICP/AES	200.5, Rev 4.2 (2003)[68]; 200.7, Rev. 4.4 (1994).	3120 B–1999	D1976–07	I–4471–97.[50]
	ICP/MS	200.8, Rev. 5.4 (1994).	3125 B–2009	D5673–05	993.14[3], I–4471–97.[50]
	DCP				See footnote.[34]
63. Sodium—Total,[4] mg/L.	Digestion[4], followed by any of the following:				
	AA direct aspiration		3111 B–1999		973.54[3], I–3735–85.[2]
	ICP/AES	200.5, Rev 4.2 (2003)[68]; 200.7, Rev. 4.4 (1994).	3120 B–1999		I–4471–97.[50]
	ICP/MS	200.8, Rev. 5.4 (1994).	3125 B–2009	D5673–05	993.14.[3]
	DCP				See footnote.[34]
	Flame photometric		3500–Na B–1997.		
	Ion Chromatography			D6919–09.	
64. Specific conductance, micromhos/cm at 25°C.	Wheatstone bridge	120.1[1](Rev. 1982)	2510 B–1997	D1125–95(99) (A)	973.40[3], I–2781–85.[2]
65. Sulfate (as SO_4), mg/L.	Automated colorimetric	375.2, Rev. 2.0 (1993).	4500–SO_4[2] F–1997 or G–1997.		
	Gravimetric		4500–SO_4[2] C–1997 or D–1997.		925.54.[3]
	Turbidimetric		4500–SO_4[2] E–1997.	D516–07.	
	Ion Chromatography	300.0, Rev 2.1 (1993) and 300.1–1, Rev 1.0 (1997).	4110 B–2000 or C–2000.	D4327–03	993.30[3], I–4020–05.[70]
	CIE/UV		4140 B–1997	D6508–00(05)	D6508, Rev. 2.[54]
66. Sulfide (as S), mg/L.	Sample Pretreatment		4500–S^{2-} B, C–2000.		
	Titrimetric (iodine)		4500–S^{2-}F–2000		I–3840–85.[2]
	Colorimetric (methylene blue).		4500–S^{2-}D–2000.		
	Ion Selective Electrode.		4500–S^{2-}G–2000	D4658–08.	
67. Sulfite (as SO_3), mg/L.	Titrimetric (iodine-iodate)		4500–SO_3^{2-}B–2000.		
68. Surfactants, mg/L	Colorimetric (methylene blue).		5540 C–2000	D2330–02.	
69. Temperature, °C	Thermometric		2550 B–2000		See footnote.[32]
70. Thallium–Total,[4] mg/L.	Digestion[4], followed by any of the following:				
	AA direct aspiration		3111 B–1999.		
	AA furnace	279.2[1](Issued 1978)	3113 B–2004.		
	STGFAA	200.9, Rev. 2.2 (1994).			
	ICP/AES	200.7, Rev. 4.4 (1994); 200.5 Rev. 4.2 (2003)[68].	3120 B–1999	D1976–07.	
	ICP/MS	200.8, Rev. 5.4 (1994).	3125 B–2009	D5673–05	993.14[3], I–4471–97.[50]
71. Tin–Total,[4] mg/L	Digestion[4], followed by any of the following:.				
	AA direct aspiration		3111 B–1999		I–3850–78.[8]
	AA furnace		3113 B–2004.		
	STGFAA	200.9, Rev. 2.2 (1994).			
	ICP/AES	200.5, Rev 4.2 (2003)[68]; 200.7, Rev. 4.4 (1994).			
	ICP/MS	200.8, Rev. 5.4 (1994).	3125 B–2009	D5673–05	993.14.[3]
72. Titanium–Total,[4] mg/L.	Digestion[4] followed by any of the following:				
	AA direct aspiration		3111 D–1999.		
	AA furnace	283.2[1](Issued 1978).			
	ICP/AES	200.7, Rev. 4.4 (1994).			
	ICP/MS	200.8, Rev. 5.4 (1994).	3125 B–2009	D5673–05	993.14.[3]

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TABLE IB—LIST OF APPROVED INORGANIC TEST PROCEDURES—Continued

Parameter	Methodology [58]	EPA [52]	Standard methods	ASTM	USGS/AOAC/Other
	DCP				See footnote.[34]
73. Turbidity, NTU[53]	Nephelometric	180.1, Rev. 2.0 (1993).	2130 B–2001	D1889–00	I–3860–85.[2] See footnote.[65] See footnote.[66] See footnote.[67]
74. Vanadium–Total,[4] mg/L.	Digestion[4], followed by any of the following:				
	AA direct aspiration		3111 D–1999.		
	AA furnace		3113 B–2004	D3373–03(07).	
	ICP/AES	200.5, Rev 4.2 (2003)[68]; 200.7, Rev. 4.4 (1994).	3120 B–1999	D1976–07	I–4471–97.[50]
	ICP/MS	200.8, Rev. 5.4 (1994).	3125 B–2009	D5673–05	993.14[3], I–4020–05.[70]
	DCP			D4190–08	See footnote.[34]
	Colorimetric (Gallic Acid).		3500–V B–1997.		
75. Zinc–Total[4], mg/L	Digestion[4], followed by any of the following:				
	AA direct aspiration[36].		3111 B–1999 or 3111 C–1999.	D1691–02(07) (A or B).	974.27[3], p. 37[9], I–3900–85.[2]
	AA furnace	289.2[1](Issued 1978).			
	ICP/AES[36]	200.5, Rev 4.2 (2003)[68]; 200.7, Rev. 4.4 (1994).	3120 B–1999	D1976–07	I–4471–97.[50]
	ICP/MS	200.8, Rev. 5.4 (1994).	3125 B–2009	D5673–05	993.14[3], I–4020–05.[70]
	DCP[36]			D4190–08	See footnote.[34]
	Colorimetric (Zincon)		3500 Zn B–1997		See footnote.[33]
76. Acid Mine Drainage.		1627[69].			

Table IB Notes:

[1] Methods for Chemical Analysis of Water and Wastes, EPA–600/4–79–020. Revised March 1983 and 1979, where applicable. U.S. EPA.

[2] Methods for Analysis of Inorganic Substances in Water and Fluvial Sediments, Techniques of Water-Resource Investigations of the U.S. Geological Survey, Book 5, Chapter A1., unless otherwise stated. 1989. USGS.

[3] Official Methods of Analysis of the Association of Official Analytical Chemists, Methods Manual, Sixteenth Edition, 4th Revision, 1998. AOAC International.

[4] For the determination of total metals (which are equivalent to total recoverable metals) the sample is not filtered before processing. A digestion procedure is required to solubilize analytes in suspended material and to break down organic-metal complexes (to convert the analyte to a detectable form for colorimetric analysis). For non–platform graphite furnace atomic absorption determinations a digestion using nitric acid (as specified in Section 4.1.3 of Methods for the Chemical Analysis of Water and Wastes) is required prior to analysis. The procedure used should subject the sample to gentle, acid refluxing and at no time should the sample be taken to dryness. For direct aspiration flame atomic absorption determinations (FLAA) a combination acid (nitric and hydrochloric acids) digestion is preferred prior to analysis. The approved total recoverable digestion is described as Method 200.2 in Supplement I of ''Methods for the Determination of Metals in Environmental Samples'' EPA/600R–94/111, May, 1994, and is reproduced in EPA Methods 200.7, 200.8, and 200.9 from the same Supplement. However, when using the gaseous hydride technique or for the determination of certain elements such as antimony, arsenic, selenium, silver, and tin by non–EPA graphite furnace atomic absorption methods, mercury by cold vapor atomic absorption, the noble metals and titanium by FLAA, a specific or modified sample digestion procedure may be required and in all cases the referenced method write–up should be consulted for specific instruction and/or cautions. For analyses using inductively coupled plasma-atomic emission spectrometry (ICP–AES), the direct current plasma (DCP) technique or the EPA spectrochemical techniques (platform furnace AA, ICP–AES, and ICP–MS) use EPA Method 200.2 or an approved alternate procedure (*e.g.,* CEM microwave digestion, which may be used with certain analytes as indicated in Table IB); the total recoverable digestion procedures in EPA Methods 200.7, 200.8, and 200.9 may be used for those respective methods. Regardless of the digestion procedure, the results of the analysis after digestion procedure are reported as ''total'' metals.

[5] Copper sulfate or other catalysts that have been found suitable may be used in place of mercuric sulfate.

[6] Manual distillation is not required if comparability data on representative effluent samples are on file to show that this preliminary distillation step is not necessary: however, manual distillation will be required to resolve any controversies. In general, the analytical method should be consulted regarding the need for distillation. If the method is not clear, the laboratory may compare a minimum of 9 different sample matrices to evaluate the need for distillation. For each matrix, a matrix spike and matrix spike duplicate are analyzed both with and without the distillation step. (A total of 36 samples, assuming 9 matrices). If results are comparable, the laboratory may dispense with the distillation step for future analysis. Comparable is defined as < 20% RPD for all tested matrices). Alternatively the two populations of spike recovery percentages may be compared using a recognized statistical test.

[7] Industrial Method Number 379–75 WE Ammonia, Automated Electrode Method, Technicon Auto Analyzer II. February 19, 1976. Bran & Luebbe Analyzing Technologies Inc.

[8] The approved method is that cited in Methods for Determination of Inorganic Substances in Water and Fluvial Sediments, Techniques of Water-Resources Investigations of the U.S. Geological Survey, Book 5, Chapter A1. 1979. USGS.

[9] American National Standard on Photographic Processing Effluents. April 2, 1975. American National Standards Institute.

[10] In-Situ Method 1003–8–2009, Biochemical Oxygen Demand (BOD) Measurement by Optical Probe. 2009. In-Situ Incorporated.

[11] The use of normal and differential pulse voltage ramps to increase sensitivity and resolution is acceptable.

[12] Carbonaceous biochemical oxygen demand ($CBOD_5$) must not be confused with the traditional BOD_5 test method which measures ''total BOD.'' The addition of the nitrification inhibitor is not a procedural option, but must be included to report the $CBOD_5$ parameter. A discharger whose permit requires reporting the traditional BOD_5 may not use a nitrification inhibitor in the procedure for reporting the results. Only when a discharger's permit specifically states $CBOD_5$ is required can the permittee report data using a nitrification inhibitor.

[13] OIC Chemical Oxygen Demand Method. 1978. Oceanography International Corporation.

[14] Method 8000, Chemical Oxygen Demand, Hach Handbook of Water Analysis, 1979. Hach Company.

[15] The back titration method will be used to resolve controversy.

[16] Orion Research Instruction Manual, Residual Chlorine Electrode Model 97–70. 1977. Orion Research Incorporated. The calibration graph for the Orion residual chlorine method must be derived using a reagent blank and three standard solutions, containing 0.2, 1.0, and 5.0 mL 0.00281 N potassium iodate/100 mL solution, respectively.

[17] Method 245.7, Mercury in Water by Cold Vapor Atomic Fluorescence Spectrometry, EPA–821–R–05–001. Revision 2.0, February 2005. US EPA.

[18] National Council of the Paper Industry for Air and Stream Improvement (NCASI) Technical Bulletin 253, December 1971.

[19] Method 8506, Biocinchoninate Method for Copper, Hach Handbook of Water Analysis. 1979. Hach Company.

[20] When using a method with block digestion, this treatment is not required.

[21] Industrial Method Number 378–75WA, Hydrogen ion (pH) Automated Electrode Method, Bran & Luebbe (Technicon) Autoanalyzer II. October 1976. Bran & Luebbe Analyzing Technologies.

[22] Method 8008, 1,10–Phenanthroline Method using FerroVer Iron Reagent for Water. 1980. Hach Company.

[23] Method 8034, Periodate Oxidation Method for Manganese, Hach Handbook of Wastewater Analysis. 1979. Hach Company.

[24] Methods for Analysis of Organic Substances in Water and Fluvial Sediments, Techniques of Water-Resources Investigations of the U.S. Geological Survey, Book 5, Chapter A3, (1972 Revised 1987) p. 14. 1987. USGS.

[25] Method 8507, Nitrogen, Nitrite-Low Range, Diazotization Method for Water and Wastewater. 1979. Hach Company.

[26] Just prior to distillation, adjust the sulfuric-acid-preserved sample to pH 4 with 1 + 9 NaOH.

[27] The colorimetric reaction must be conducted at a pH of 10.0 ± 0.2.

[28] Addison, R.F., and R.G. Ackman. 1970. Direct Determination of Elemental Phosphorus by Gas–Liquid Chromatography, *Journal of Chromatography*, 47(3):421–426.

[29] Approved methods for the analysis of silver in industrial wastewaters at concentrations of 1 mg/L and above are inadequate where silver exists as an inorganic halide. Silver halides such as the bromide and chloride are relatively insoluble in reagents such as nitric acid but are readily soluble in an aqueous buffer of sodium thiosulfate and sodium hydroxide to pH of 12. Therefore, for levels of silver above 1 mg/L, 20 mL of sample should be diluted to 100 mL by adding 40 mL each of 2 M $Na_2S_2O_3$ and NaOH. Standards should be prepared in the same manner. For levels of silver below 1 mg/L the approved method is satisfactory.

[30] The use of EDTA decreases method sensitivity. Analysts may omit EDTA or replace with another suitable complexing reagent provided that all method specified quality control acceptance criteria are met.

[31] For samples known or suspected to contain high levels of silver (*e.g.,* in excess of 4 mg/L), cyanogen iodide should be used to keep the silver in solution for analysis. Prepare a cyanogen iodide solution by adding 4.0 mL of concentrated NH_4OH, 6.5 g of KCN, and 5.0 mL of a 1.0 N solution of I2 to 50 mL of reagent water in a volumetric flask and dilute to 100.0 mL. After digestion of the sample, adjust the pH of the digestate to >7 to prevent the formation of HCN under acidic conditions. Add 1 mL of the cyanogen iodide solution to the sample digestate and adjust the volume to 100 mL with reagent water (NOT acid). If cyanogen iodide is added to sample digestates, then silver standards must be prepared that contain cyanogen iodide as well. Prepare working standards by diluting a small volume of a silver stock solution with water and adjusting the pH≤7 with NH_4OH. Add 1 mL of the cyanogen iodide solution and let stand 1 hour. Transfer to a 100-mL volumetric flask and dilute to volume with water.

[32] ''Water Temperature–Influential Factors, Field Measurement and Data Presentation,'' Techniques of Water-Resources Investigations of the U.S. Geological Survey, Book 1, Chapter D1. 1975. USGS.

[33] Method 8009, Zincon Method for Zinc, Hach Handbook of Water Analysis, 1979. Hach Company.

[34] Method AES0029, Direct Current Plasma (DCP) Optical Emission Spectrometric Method for Trace Elemental Analysis of Water and Wastes. 1986–Revised 1991. Thermo Jarrell Ash Corporation.

[35] In-Situ Method 1004–8–2009, Carbonaceous Biochemical Oxygen Demand (CBOD) Measurement by Optical Probe. 2009. In-Situ Incorporated.

[36] Microwave-assisted digestion may be employed for this metal, when analyzed by this methodology. Closed Vessel Microwave Digestion of Wastewater Samples for Determination of Metals. April 16, 1992. CEM Corporation

[37] When determining boron and silica, only plastic, PTFE, or quartz laboratory ware may be used from start until completion of analysis.

[38] Only use n-hexane (n-Hexane—85% minimum purity, 99.0% min. saturated C6 isomers, residue less than 1 mg/L) extraction solvent when determining Oil and Grease parameters—Hexane Extractable Material (HEM), or Silica Gel Treated HEM (analogous to EPA Methods 1664 Rev. A and 1664 Rev. B). Use of other extraction solvents is prohibited.

[39] Method PAI–DK01, Nitrogen, Total Kjeldahl, Block Digestion, Steam Distillation, Titrimetric Detection. Revised December 22, 1994. OI Analytical.

[40] Method PAI–DK02, Nitrogen, Total Kjeldahl, Block Digestion, Steam Distillation, Colorimetric Detection. Revised December 22, 1994. OI Analytical.

[41] Method PAI–DK03, Nitrogen, Total Kjeldahl, Block Digestion, Automated FIA Gas Diffusion. Revised December 22, 1994. OI Analytical.

[42] Method 1664 Rev. B is the revised version of EPA Method 1664 Rev. A. U.S. EPA. February 1999, Revision A. Method 1664, n-Hexane Extractable Material (HEM; Oil and Grease) and Silica Gel Treated n-Hexane Extractable Material (SGT–HEM; Non-polar Material) by Extraction and Gravimetry. EPA–821–R–98–002. U.S. EPA. February 2010, Revision B. Method 1664, n-Hexane Extractable Material (HEM; Oil and Grease) and Silica Gel Treated n-Hexane Extractable Material (SGT–HEM; Non-polar Material) by Extraction and Gravimetry. EPA–821–R–10–001.

[43] Method 1631, Mercury in Water by Oxidation, Purge and Trap, and Cold Vapor Atomic Fluorescence Spectrometry, EPA–821–R–02–019. Revision E. August 2002, U.S. EPA. The application of clean techniques described in EPA's Method 1669: *Sampling Ambient Water for Trace Metals at EPA Water Quality Criteria Levels,* EPA–821–R–96–011, are recommended to preclude contamination at low-level, trace metal determinations.

[44] Method OIA–1677–09, Available Cyanide by Ligand Exchange and Flow Injection Analysis (FIA). 2010. OI Analytical.

[45] Open File Report 00–170, Methods of Analysis by the U.S. Geological Survey National Water Quality Laboratory—Determination of Ammonium Plus Organic Nitrogen by a Kjeldahl Digestion Method and an Automated Photometric Finish that Includes Digest Cleanup by Gas Diffusion. 2000. USGS.

[46] Open File Report 93–449, Methods of Analysis by the U.S. Geological Survey National Water Quality Laboratory—Determination of Chromium in Water by Graphite Furnace Atomic Absorption Spectrophotometry. 1993. USGS.

[47] Open File Report 97–198, Methods of Analysis by the U.S. Geological Survey National Water Quality Laboratory—Determination of Molybdenum by Graphite Furnace Atomic Absorption Spectrophotometry. 1997.. USGS.

[48] Open File Report 92–146, Methods of Analysis by the U.S. Geological Survey National Water Quality Laboratory—Determination of Total Phosphorus by Kjeldahl Digestion Method and an Automated Colorimetric Finish That Includes Dialysis. 1992. USGS.

[49] Open File Report 98–639, Methods of Analysis by the U.S. Geological Survey National Water Quality Laboratory—Determination of Arsenic and Selenium in Water and Sediment by Graphite Furnace-Atomic Absorption Spectrometry. 1999. USGS.

[50] Open File Report 98–165, Methods of Analysis by the U.S. Geological Survey National Water Quality Laboratory—Determination of Elements in Whole-water Digests Using Inductively Coupled Plasma-Optical Emission Spectrometry and Inductively Coupled Plasma-Mass Spectrometry. 1998. USGS.

[51] Open File Report 93–125, Methods of Analysis by the U.S. Geological Survey National Water Quality Laboratory—Determination of Inorganic and Organic Constituents in Water and Fluvial Sediments. 1993.. USGS.

[52] Unless otherwise indicated, all EPA methods, excluding EPA Method 300.1–1, are published in U.S. EPA. May 1994. Methods for the Determination of Metals in Environmental Samples, Supplement I, EPA/600/R–94/111; or U.S. EPA. August 1993. Methods for the Determination of Inorganic Substances in Environmental Samples, EPA/600/R–93/100. EPA Method 300.1 is US EPA. Revision 1.0, 1997, including errata cover sheet April 27, 1999. Determination of Inorganic Ions in Drinking Water by Ion Chromatography.

[53] Styrene divinyl benzene beads (*e.g.,* AMCO–AEPA–1 or equivalent) and stabilized formazin (*e.g.,* Hach StablCal™ or equivalent) are acceptable substitutes for formazin.

[54] Method D6508, Test Method for Determination of Dissolved Inorganic Anions in Aqueous Matrices Using Capillary Ion Electrophoresis and Chromate Electrolyte. December 2000. Waters Corp.

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[55] Kelada-01, Kelada Automated Test Methods for Total Cyanide, Acid Dissociable Cyanide, and Thiocyanate, EPA 821–B–01–009, Revision 1.2, August 2001. US EPA. Note: A 450–W UV lamp may be used in this method instead of the 550–W lamp specified if it provides performance within the quality control (QC) acceptance criteria of the method in a given instrument. Similarly, modified flow cell configurations and flow conditions may be used in the method, provided that the QC acceptance criteria are met.

[56] QuikChem Method 10–204–00–1–X, Digestion and Distillation of Total Cyanide in Drinking and Wastewaters using MICRO DIST and Determination of Cyanide by Flow Injection Analysis. Revision 2.2, March 2005. Lachat Instruments.

[57] When using sulfide removal test procedures described in EPA Method 335.4–1, reconstitute particulate that is filtered with the sample prior to distillation.

[58] Unless otherwise stated, if the language of this table specifies a sample digestion and/or distillation "followed by" analysis with a method, approved digestion and/or distillation are required prior to analysis.

[59] Samples analyzed for available cyanide using OI Analytical method OIA–1677–09 or ASTM method D6888–09 that contain particulate matter may be filtered only after the ligand exchange reagents have been added to the samples, because the ligand exchange process converts complexes containing available cyanide to free cyanide, which is not removed by filtration. Analysts are further cautioned to limit the time between the addition of the ligand exchange reagents and sample filtration to no more than 30 minutes to preclude settling of materials in samples.

[60] Analysts should be aware that pH optima and chromophore absorption maxima might differ when phenol is replaced by a substituted phenol as the color reagent in Berthelot Reaction ("phenol-hypochlorite reaction") colorimetric ammonium determination methods. For example when phenol is used as the color reagent, pH optimum and wavelength of maximum absorbance are about 11.5 and 635 nm, respectively—see, Patton, C.J. and S.R. Crouch. March 1977. Anal. Chem. 49:464–469. These reaction parameters increase to pH > 12.6 and 665 nm when salicylate is used as the color reagent—see, Krom, M.D. April 1980. The Analyst 105:305–316.

[61] If atomic absorption or ICP instrumentation is not available, the aluminon colorimetric method detailed in the 19th Edition of *Standard Methods* may be used. This method has poorer precision and bias than the methods of choice.

[62] Easy (1–Reagent) Nitrate Method, Revision November 12, 2011. Craig Chinchilla.

[63] Hach Method 10360, Luminescence Measurement of Dissolved Oxygen in Water and Wastewater and for Use in the Determination of BOD_5 and $cBOD_5$. Revision 1.2, October 2011. Hach Company. This method may be used to measure dissolved oxygen when performing the methods approved in Table IB for measurement of biochemical oxygen demand (BOD) and carbonaceous biochemical oxygen demand (CBOD).

[64] In-Situ Method 1002–8–2009, Dissolved Oxygen (DO) Measurement by Optical Probe. 2009. In-Situ Incorporated.

[65] Mitchell Method M5331, Determination of Turbidity by Nephelometry. Revision 1.0, July 31, 2008. Leck Mitchell.

[66] Mitchell Method M5271, Determination of Turbidity by Nephelometry. Revision 1.0, July 31, 2008. Leck Mitchell.

[67] Orion Method AQ4500, Determination of Turbidity by Nephelometry. Revision 5, March 12, 2009. Thermo Scientific.

[68] EPA Method 200.5, Determination of Trace Elements in Drinking Water by Axially Viewed Inductively Coupled Plasma-Atomic Emission Spectrometry, EPA/600/R–06/115. Revision 4.2, October 2003. US EPA.

[69] Method 1627, Kinetic Test Method for the Prediction of Mine Drainage Quality, EPA–821–R–09–002. December 2011. US EPA.

[70] Techniques and Methods Book 5–B1, Determination of Elements in Natural-Water, Biota, Sediment and Soil Samples Using Collision/Reaction Cell Inductively Coupled Plasma-Mass Spectrometry, Chapter 1, Section B, Methods of the National Water Quality Laboratory, Book 5, Laboratory Analysis, 2006. USGS.

[71] Water-Resources Investigations Report 01–4132, Methods of Analysis by the U.S. Geological Survey National Water Quality Laboratory—Determination of Organic Plus Inorganic Mercury in Filtered and Unfiltered Natural Water With Cold Vapor-Atomic Fluorescence Spectrometry, 2001. USGS.

TABLE IC—LIST OF APPROVED TEST PROCEDURES FOR NON-PESTICIDE ORGANIC COMPOUNDS

Parameter [1]	Method	EPA [2,7]	Standard methods	ASTM	Other
1. Acenaphthene	GC	610.			
	GC/MS	625, 1625B	6410 B–2000		See footnote [9], p. 27.
	HPLC	610	6440 B–2000	D4657–92 (98)	
2. Acenaphthylene	GC	610.			
	GC/MS	625, 1625B	6410 B–2000		See footnote [9], p. 27.
	HPLC	610	6440 B–2000	D4657–92 (98).	
3. Acrolein	GC	603.			
	GC/MS	624 [4], 1624B.			
4. Acrylonitrile	GC	603.			
	GC/MS	624 [4], 1624B.			
5. Anthracene	GC	610.			
	GC/MS	625, 1625B	6410 B–2000		See footnote [9], p. 27.
	HPLC	610	6440B–2000	D4657–92 (98).	
6. Benzene	GC	602	6200 C–1997.		
	GC/MS	624, 1624B	6200 B–1997.		
7. Benzidine	Spectro-photo-metric.				See footnote [3], p.1.
	GC/MS	625 [5], 1625B	6410 B–2000.		
	HPLC	605.			
8. Benzo(a)anthracene	GC	610.			
	GC/MS	625, 1625B	6410 B–2000		See footnote [9], p. 27.
	HPLC	610	6440 B–2000	D4657–92 (98).	
9. Benzo(a)pyrene	GC	610.			
	GC/MS	625, 1625B	6410 B–2000		See footnote [9], p. 27.
	HPLC	610	6440 B–2000	D4657–92 (98).	
10. Benzo(b)fluoranthene	GC	610.			
	GC/MS	625, 1625B	6410 B–2000		See footnote [9], p. 27.
	HPLC	610	6440 B–2000	D4657–92 (98).	
11. Benzo(g,h,i)perylene	GC	610.			

TABLE IC—LIST OF APPROVED TEST PROCEDURES FOR NON-PESTICIDE ORGANIC COMPOUNDS—Continued

Parameter [1]	Method	EPA [2,7]	Standard methods	ASTM	Other
	GC/MS	625, 1625B	6410 B–2000		See footnote [9], p. 27.
	HPLC	610	6440 B–2000	D4657–92 (98).	
12. Benzo(k)fluoranthene	GC	610.			
	GC/MS	625, 1625B	6410 B–2000		See footnote [9], p. 27.
	HPLC	610	6440 B–2000	D4657–92 (98).	
13. Benzyl chloride	GC				See footnote [3], p. 130.
	GC/MS				See footnote [6], p. S102.
14. Butyl benzyl phthalate	GC	606.			
	GC/MS	625, 1625B	6410 B–2000		See footnote [9], p. 27.
15. bis(2-Chloroethoxy) methane	GC	611.			
	GC/MS	625, 1625B	6410 B–2000		See footnote [9], p. 27.
16. bis(2-Chloroethyl) ether	GC	611.			
	GC/MS	625, 1625B	6410 B–2000		See footnote [9], p. 27.
17. bis(2-Ethylhexyl) phthalate	GC	606.			
	GC/MS	625, 1625B	6410 B–2000		See footnote [9], p. 27.
18. Bromodichloromethane	GC	601	6200 C–1997.		
	GC/MS	624, 1624B	6200 B–1997.		
19. Bromoform	GC	601	6200 C–1997.		
	GC/MS	624, 1624B	6200 B–1997.		
20. Bromomethane	GC	601	6200 C–1997.		
	GC/MS	624, 1624B	6200 B–1997.		
21. 4-Bromophenyl phenyl ether	GC	611.			
	GC/MS	625, 1625B	6410 B–2000		See footnote [9], p. 27.
22. Carbon tetrachloride	GC	601	6200 C–1997		See footnote [3], p. 130.
	GC/MS	624, 1624B	6200 B–1997.		
23. 4-Chloro-3-methyl phenol	GC	604	6420 B–2000.		
	GC/MS	625, 1625B	6410 B–2000.		See footnote [9], p. 27.
24. Chlorobenzene	GC	601, 602	6200 C–1997		See footnote [3], p. 130.
	GC/MS	624, 1624B	6200 B–1997.		
25. Chloroethane	GC	601	6200 C–1997.		
	GC/MS	624, 1624B	6200 B–1997.		
26. 2-Chloroethylvinyl ether	GC	601.			
	GC/MS	624, 1624B.			
27. Chloroform	GC	601	6200 C–1997		See footnote [3], p. 130.
	GC/MS	624, 1624B	6200 B–1997.		
28. Chloromethane	GC	601	6200 C–1997.		
	GC/MS	624, 1624B	6200 B–1997.		
29. 2-Chloronaphthalene	GC	612.			
	GC/MS	625, 1625B	6410 B–2000		See footnote [9], p. 27.
30. 2-Chlorophenol	GC	604	6420 B–2000.		
	GC/MS	625, 1625B	6410 B–2000		See footnote [9], p. 27.
31. 4-Chlorophenyl phenyl ether	GC	611.			
	GC/MS	625, 1625B	6410 B–2000		See footnote [9], p. 27.
32. Chrysene	GC	610.			
	GC/MS	625, 1625B	6410 B–2000		See footnote [9], p. 27.
	HPLC	610	6440 B–2000	D4657–92 (98).	
33. Dibenzo(a,h)anthracene	GC	610.			
	GC/MS	625, 1625B	6410 B–2000		See footnote [9], p. 27.
	HPLC	610	6440 B–2000	D4657–92 (98).	
34. Dibromochloromethane	GC	601	6200 C–1997.		
	GC/MS	624, 1624B	6200 B–1997.		
35. 1,2-Dichlorobenzene	GC	601, 602	6200 C–1997.		

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TABLE IC—LIST OF APPROVED TEST PROCEDURES FOR NON-PESTICIDE ORGANIC COMPOUNDS—Continued

Parameter [1]	Method	EPA [2,7]	Standard methods	ASTM	Other
	GC/MS	624, 1625B	6200 B–1997		See footnote [9], p. 27.
36. 1,3-Dichlorobenzene	GC	601, 602	6200 C–1997.		
	GC/MS	624, 1625B	6200 B–1997		See footnote [9], p. 27.
37. 1,4-Dichlorobenzene	GC	601, 602	6200 C–1997.		
	GC/MS	624, 1625B	6200 B–1997		See footnote [9], p. 27.
38. 3,3'-Dichlorobenzidine	GC/MS	625, 1625B	6410 B–2000.		
	HPLC	605.			
39. Dichlorodifluoromethane	GC	601.			
	GC/MS		6200 C–1997.		
40. 1,1-Dichloroethane	GC	601	6200 C–1997.		
	GC/MS	624, 1624B	6200 B–1997.		
41. 1,2-Dichloroethane	GC	601	6200 C–1997.		
	GC/MS	624, 1624B	6200 B–1997.		
42. 1,1-Dichloroethene	GC	601	6200 C–1997.		
	GC/MS	624, 1624B	6200 B–1997.		
43. trans-1,2-Dichloroethene	GC	601	6200 C–1997.		
	GC/MS	624, 1624B	6200 B–1997.		
44. 2,4-Dichlorophenol	GC	604	6420 B–2000.		
	GC/MS	625, 1625B	6410 B–2000		See footnote [9], p. 27.
45. 1,2-Dichloropropane	GC	601	6200 C–1997.		
	GC/MS	624, 1624B	6200 B–1997.		
46. cis-1,3-Dichloropropene	GC	601	6200 C–1997.		
	GC/MS	624, 1624B	6200 B–1997.		
47. trans-1,3-Dichloropropene	GC	601	6200 C–1997.		
	GC/MS	624, 1624B	6200 B–1997.		
48. Diethyl phthalate	GC	606.			
	GC/MS	625, 1625B	6410 B–2000		See footnote [9], p. 27.
49. 2,4-Dimethylphenol	GC	604	6420 B–2000.		
	GC/MS	625, 1625B	6410 B–2000		See footnote [9], p. 27.
50. Dimethyl phthalate	GC	606.			
	GC/MS	625, 1625B	6410 B–2000		See footnote [9], p. 27.
51. Di-n-butyl phthalate	GC	606.			
	GC/MS	625, 1625B	6410 B–2000		See footnote [9], p. 27.
52. Di-n-octyl phthalate	GC	606.			
	GC/MS	625, 1625B	6410 B–2000		See footnote [9], p. 27.
53. 2, 4-Dinitrophenol	GC	604	6420 B–2000		See footnote [9], p. 27.
	GC/MS	625, 1625B	6410 B–2000.		
54. 2,4-Dinitrotoluene	GC	609.			
	GC/MS	625, 1625B	6410 B–2000		See footnote [9], p. 27.
55. 2,6-Dinitrotoluene	GC	609.			
	GC/MS	625, 1625B	6410 B–2000		See footnote [9], p. 27.
56. Epichlorohydrin	GC				See footnote [3], p. 130.
	GC/MS				See footnote [6], p. S102.
57. Ethylbenzene	GC	602	6200 C–1997.		
	GC/MS	624, 1624B	6200 B–1997.		
58. Fluoranthene	GC	610.			
	GC/MS	625, 1625B	6410 B–2000		See footnote [9], p. 27.
	HPLC	610	6440 B–2000	D4657–92 (98).	
59. Fluorene	GC	610.			
	GC/MS	625, 1625B	6410 B–2000		See footnote [9], p. 27.
	HPLC	610	6440 B–2000	D4657–92 (98).	
60. 1,2,3,4,6,7,8-Heptachloro-dibenzofuran	GC/MS	1613B.			
61. 1,2,3,4,7,8,9-Heptachloro-dibenzofuran	GC/MS	1613B.			
62. 1,2,3,4,6,7,8- Heptachloro-dibenzo-p-dioxin	GC/MS	1613B.			
63. Hexachlorobenzene	GC	612.			

TABLE IC—LIST OF APPROVED TEST PROCEDURES FOR NON-PESTICIDE ORGANIC COMPOUNDS—Continued

Parameter [1]	Method	EPA [2,7]	Standard methods	ASTM	Other
	GC/MS	625, 1625B	6410 B–2000		See footnote [9], p. 27.
64. Hexachlorobutadiene	GC	612.			
	GC/MS	625, 1625B	6410 B–2000		See footnote [9], p. 27.
65. Hexachlorocyclopentadiene	GC	612.			
	GC/MS	625 [5], 1625B	6410 B–2000		See footnote [9], p. 27.
66. 1,2,3,4,7,8-Hexachloro-dibenzofuran	GC/MS	1613B.			
67. 1,2,3,6,7,8-Hexachloro-dibenzofuran	GC/MS	1613B.			
68. 1,2,3,7,8,9-Hexachloro-dibenzofuran	GC/MS	1613B.			
69. 2,3,4,6,7,8-Hexachloro-dibenzofuran	GC/MS	1613B.			
70. 1,2,3,4,7,8-Hexachloro-dibenzo-p-dioxin	GC/MS	1613B.			
71. 1,2,3,6,7,8-Hexachloro-dibenzo-p-dioxin	GC/MS	1613B.			
72. 1,2,3,7,8,9-Hexachloro-dibenzo-p-dioxin	GC/MS	1613B.			
73. Hexachloroethane	GC	612.			
	GC/MS	625, 1625B	6410 B–2000		See footnote [9], p. 27.
74. Indeno(1,2,3-c,d) pyrene	GC	610.			
	GC/MS	625, 1625B	6410 B–2000		See footnote [9], p. 27.
	HPLC	610	6440 B–2000	D4657–92 (98).	
75. Isophorone	GC	609.			
	GC/MS	625, 1625B	6410 B–2000		See footnote [9], p. 27.
76. Methylene chloride	GC	601	6200 C–1997.		See footnote [3], p. 130.
	GC/MS	624, 1624B	6200 B–1997.		
77. 2-Methyl-4,6-dinitrophenol	GC	604	6420 B–2000.		
	GC/MS	625, 1625B	6410 B–2000.		See footnote [9], p. 27.
78. Naphthalene	GC	610.			
	GC/MS	625, 1625B	6410 B–2000.		See footnote [9], p. 27
	HPLC	610	6440 B–2000.		
79. Nitrobenzene	GC	609.			
	GC/MS	625, 1625B	6410 B–2000		See footnote [9], p. 27.
	HPLC			D4657–92 (98).	
80. 2-Nitrophenol	GC	604	6420 B–2000.		
	GC/MS	625, 1625B	6410 B–2000		See footnote [9], p. 27.
81. 4-Nitrophenol	GC	604	6420 B–2000.		
	GC/MS	625, 1625B	6410 B–2000		See footnote [9], p. 27.
82. N-Nitrosodimethylamine	GC	607.			
	GC/MS	625 [5], 1625B	6410 B–2000		See footnote [9], p. 27.
83. N-Nitrosodi-n-propylamine	GC	607.			
	GC/MS	625 [5], 1625B	6410 B–2000		See footnote [9], p. 27.
84. N-Nitrosodiphenylamine	GC	607.			
	GC/MS	625 [5], 1625B	6410 B–2000		See footnote [9], p. 27.
85. Octachlorodibenzofuran	GC/MS	1613B. [10]			
86. Octachlorodibenzo-p-dioxin	GC/MS	1613B. [10]			
87. 2,2'-Oxybis(2-chloro-propane) [also known as bis(2-Chloroisopropyl) ether].	GC	611.			
	GC/MS	625, 1625B	6410 B–2000		See footnote [9], p. 27.
88. PCB–1016	GC	608			See footnote [3], p. 43; See footnote. [8]
	GC/MS	625	6410 B–2000.		
89. PCB–1221	GC	608			See footnote [3], p. 43; See footnote. [8]
	GC/MS	625	6410 B–2000.		
90. PCB–1232	GC	608			See footnote [3], p. 43; See footnote. [8]

TABLE IC—LIST OF APPROVED TEST PROCEDURES FOR NON-PESTICIDE ORGANIC COMPOUNDS—Continued

Parameter [1]	Method	EPA [2,7]	Standard methods	ASTM	Other
	GC/MS	625	6410 B–2000.		
91. PCB–1242	GC	608			See footnote [3], p. 43; See footnote. [8]
	GC/MS	625	6410 B–2000.		
92. PCB–1248	GC	608.			
	GC/MS	625	6410 B–2000.		
93. PCB–1254	GC	608			See footnote [3], p. 43; See footnote. [8]
	GC/MS	625	6410 B–2000.		
94. PCB–1260	GC	608			See footnote [3], p. 43; See footnote. [8]
	GC/MS	625	6410 B–2000.		
95. 1,2,3,7,8-Pentachloro-dibenzofuran	GC/MS	1613B.			
96. 2,3,4,7,8-Pentachloro-dibenzofuran	GC/MS	1613B.			
97. 1,2,3,7,8,-Pentachloro-dibenzo-p-dioxin	GC/MS	1613B.			
98. Pentachlorophenol	GC	604	6420 B–2000		See footnote [3], p. 140.
	GC/MS	625, 1625B	6410 B–2000		See footnote [9], p. 27.
99. Phenanthrene	GC	610.			
	GC/MS	625, 1625B	6410 B–2000		See footnote [9], p. 27.
	HPLC	610	6440 B–2000	D4657–92 (98).	
100. Phenol	GC	604	6420 B–2000.		
	GC/MS	625, 1625B	6410 B–2000		See footnote [9], p. 27.
101. Pyrene	GC	610.			
	GC/MS	625, 1625B	6410 B–2000		See footnote [9], p. 27.
	HPLC	610	6440 B–2000	D4657–92 (98).	
102. 2,3,7,8-Tetrachloro-dibenzofuran	GC/MS	1613B.[10]			
103. 2,3,7,8-Tetrachloro-dibenzo-p-dioxin	GC/MS	613, 625 [5a], 1613B.			
104. 1,1,2,2-Tetrachloroethane	GC	601	6200 C–1997		See footnote [3], p. 130.
	GC/MS	624, 1624B	6200 B–1997.		
105. Tetrachloroethene	GC	601	6200 C–1997		See footnote [3], p. 130.
	GC/MS	624, 1624B	6200 B–1997.		
106. Toluene	GC	602	6200 C–1997.		
	GC/MS	624, 1624B	6200 B–1997.		
107. 1,2,4-Trichlorobenzene	GC	612			See footnote [3], p. 130.
	GC/MS	625, 1625B	6410 B–2000		See footnote [9], p. 27.
108. 1,1,1-Trichloroethane	GC	601	6200 C–1997.		
	GC/MS	624, 1624B	6200 B–1997.		
109. 1,1,2-Trichloroethane	GC	601	6200 C–1997.		See footnote [3], p. 130.
	GC/MS	624, 1624B	6200 B–1997.		
110. Trichloroethene	GC	601	6200 C–1997.		
	GC/MS	624, 1624B	6200 B–1997.		
111. Trichlorofluoromethane	GC	601	6200 C–1997.		
	GC/MS	624	6200 B–1997.		
112. 2,4,6-Trichlorophenol	GC	604	6420 B–2000.		
	GC/MS	625, 1625B	6410 B–2000		See footnote [9], p. 27.
113. Vinyl chloride	GC	601	6200 C–1997.		
	GC/MS	624, 1624B	6200 B–1997.		
114. Nonylphenol	GC/MS			D7065–06.	
115. Bisphenol A (BPA)	GC/MS			D7065–06.	
116. p-tert-Octylphenol (OP)	GC/MS			D7065–06.	
117. Nonylphenol Monoethoxylate (NP1EO)	GC/MS			D7065–06.	
118. Nonylphenol Diethoxylate (NP2EO)	GC/MS			D7065–06.	
119. Adsorbable Organic Halides (AOX)	Adsorption and Coulometric Titration.	1650.[11]			

TABLE IC—LIST OF APPROVED TEST PROCEDURES FOR NON-PESTICIDE ORGANIC COMPOUNDS—Continued

Parameter [1]	Method	EPA [2,7]	Standard methods	ASTM	Other
120. Chlorinated Phenolics	In Situ Acetylation and GC/MS.	1653.[11]			

Table IC notes:

[1] All parameters are expressed in micrograms per liter (μg/L) except for Method 1613B, in which the parameters are expressed in picograms per liter (pg/L).

[2] The full text of Methods 601–613, 624, 625, 1613B, 1624B, and 1625B are provided at Appendix A, Test Procedures for Analysis of Organic Pollutants, of this Part 136. The standardized test procedure to be used to determine the method detection limit (MDL) for these test procedures is given at Appendix B, Definition and Procedure for the Determination of the Method Detection Limit, of this Part 136.

[3] Methods for Benzidine: Chlorinated Organic Compounds, Pentachlorophenol and Pesticides in Water and Wastewater. September 1978. U.S. EPA.

[4] Method 624 may be used for quantitative determination of acrolein and acrylonitrile, provided that the laboratory has documentation to substantiate the ability to detect and quantify these analytes at levels necessary to comply with any associated regulations. In addition, the use of sample introduction techniques other than simple purge-and-trap may be required. QC acceptance criteria from Method 603 should be used when analyzing samples for acrolein and acrylonitrile in the absence of such criteria in Method 624.

[5] Method 625 may be extended to include benzidine, hexachlorocyclopentadiene, N-nitrosodimethylamine, N-nitrosodi-n-propylamine, and N-nitrosodiphenylamine. However, when they are known to be present, Methods 605, 607, and 612, or Method 1625B, are preferred methods for these compounds.

[5a] Method 625, screening only.

[6] Selected Analytical Methods Approved and Cited by the United States Environmental Protection Agency, Supplement to the 15th Edition of *Standard Methods for the Examination of Water and Wastewater.* 1981. American Public Health Association (APHA).

[7] Each analyst must make an initial, one-time demonstration of their ability to generate acceptable precision and accuracy with Methods 601–603, 624, 625, 1624B, and 1625B in accordance with procedures each in Section 8.2 of each of these Methods. Additionally, each laboratory, on an on-going basis must spike and analyze 10% (5% for Methods 624 and 625 and 100% for methods 1624B and 1625B) of all samples to monitor and evaluate laboratory data quality in accordance with Sections 8.3 and 8.4 of these methods. When the recovery of any parameter falls outside the warning limits, the analytical results for that parameter in the unspiked sample are suspect. The results should be reported, but cannot be used to demonstrate regulatory compliance. These quality control requirements also apply to the Standard Methods, ASTM Methods, and other methods cited.

[8] Organochlorine Pesticides and PCBs in Wastewater Using Empore™ Disk. Revised October 28, 1994. 3M Corporation.

[9] Method O–3116–87 is in Open File Report 93–125, Methods of Analysis by U.S. Geological Survey National Water Quality Laboratory—Determination of Inorganic and Organic Constituents in Water and Fluvial Sediments. 1993. USGS.

[10] Analysts may use Fluid Management Systems, Inc. Power-Prep system in place of manual cleanup provided the analyst meets the requirements of Method 1613B (as specified in Section 9 of the method) and permitting authorities. Method 1613, Revision B, Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution HRGC/HRMS. Revision B, 1994. U.S. EPA. The full text of this method is provided in Appendix A to 40 CFR Part 136 and at *http://water.epa.gov/scitech/methods/cwa/index.cfm*

[11] Method 1650, Adsorbable Organic Halides by Adsorption and Coulometric Titration. Revision C, 1997. U.S. EPA. Method 1653, Chlorinated Phenolics in Wastewater by In Situ Acetylation and GCMS. Revision A, 1997. U.S. EPA. The full text for both of these methods is provided at Appendix A in Part 430, The Pulp, Paper, and Paperboard Point Source Category.

TABLE ID—LIST OF APPROVED TEST PROCEDURES FOR PESTICIDES [1]

Parameter	Method	EPA [2,7,10]	Standard methods	ASTM	Other
1. Aldrin	GC	608, 617	6630 B–2000 & C–2000.	D3086–90, D5812–96 (02).	See footnote [3], p. 7; See footnote [4], O–3104–83; See footnote [8], 3M0222.
	GC/MS	625	6410 B–2000.		
2. Ametryn	GC	507, 619			See footnote [3], p. 83; See footnote [9], O–3106–93; See footnote [6], p. S68.
	GC/MS	525.2			See footnote [14], O–1121–91.
3. Aminocarb	TLC				See footnote [3], p. 94; See footnote [6], p. S60.
	HPLC	632.			
4. Atraton	GC	619			See footnote [3], p. 83; See footnote [6], p. S68.
5. Atrazine	GC	507, 619			See footnote [3], p. 83; See footnote [6], p. S68; See footnote [9], O–3106–93.
	HPLC/MS				See footnote [12], O–2060–01.
	GC/MS	525.1, 525.2			See footnote [11], O–1126–95.
6. Azinphos methyl	GC	614, 622, 1657			See footnote [3], p. 25; See footnote [6], p. S51.
	GC-MS				See footnote [11], O–1126–95.
7. Barban	TLC				See footnote [3], p. 104; See footnote [6], p. S64.
	HPLC	632.			
8. α-BHC	GC	608, 617	6630 B–2000 & C–2000.	D3086–90, D5812–96(02).	See footnote [3], p. 7; See footnote [8], 3M0222.
	GC/MS	625 [5]	6410 B–2000		See footnote [11], O–1126–95.

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TABLE ID—LIST OF APPROVED TEST PROCEDURES FOR PESTICIDES [1]—Continued

Parameter	Method	EPA [2,7,10]	Standard methods	ASTM	Other
9. β–BHC	GC	608, 617	6630 B–2000 & C–2000.	D3086–90, D5812–96(02).	See footnote [8], 3M0222.
	GC/MS	625	6410 B–2000.		
10. δ-BHC	GC	608, 617	6630 B–2000 & C–2000.	D3086–90, D5812–96(02).	See footnote [8], 3M0222.
	GC/MS	625	6410 B–2000.		
11. γ-BHC (Lindane)	GC	608, 617	6630 B–2000 & C–2000.	D3086–90, D5812–96(02).	See footnote [3], p. 7; See footnote [4], O–3104–83; See footnote [8], 3M0222.
	GC/MS	625 [5]	6410 B–2000		See footnote [11], O–1126–95.
12. Captan	GC	617	6630 B–2000	D3086–90, D5812–96(02).	See footnote [3], p. 7.
13. Carbaryl	TLC				See footnote [3], p. 94, See footnote [6], p. S60.
	HPLC	531.1, 632.			
	HPLC/MS	553			See footnote [12], O–2060–01.
	GC/MS				See footnote [11], O–1126–95.
14. Carbophenothion	GC	617	6630 B–2000		See footnote [4], page 27; See footnote [6], p. S73.
15. Chlordane	GC	608, 617	6630 B–2000 & C–2000.	D3086–90, D5812–96(02).	See footnote [3], p. 7; See footnote [4], O–3104–83; See footnote [8], 3M0222.
	GC/MS	625	6410 B–2000.		
16. Chloropropham	TLC				See footnote [3], p. 104; See footnote [6], p. S64.
	HPLC	632.			
17. 2,4-D	GC	615	6640 B–2001		See footnote [3], p. 115; See footnote [4], O–3105 –83.
	HPLC/MS				See footnote [12], O–2060–01.
18. 4,4'-DDD	GC	608, 617	6630 B–2000 & C–2000.	D3086–90, D5812–96(02).	See footnote [3], p. 7; See footnote [4], O–3105–83; See footnote [8], 3M0222.
	GC/MS	625	6410 B–2000.		
19. 4,4'-DDE	GC	608, 617	6630 B–2000 & C–2000.	D3086–90, D5812–96(02).	See footnote [3], p. 7; See footnote [4], O–3104–83; See footnote [8], 3M0222.
	GC/MS	625	6410 B–2000		See footnote [11], O–1126–95.
20. 4,4'-DDT	GC	608, 617	6630 B–2000 & C–2000.	D3086–90, D5812–96(02).	See footnote [3], p. 7; See footnote [4], O–3104–83; See footnote [8], 3M0222.
	GC/MS	625	6410 B–2000.		
21. Demeton-O	GC	614, 622			See footnote [3], p. 25; See footnote [6], p. S51.
22. Demeton-S	GC	614, 622			See footnote [3], p. 25; See footnote [6], p. S51.
23. Diazinon	GC	507, 614, 622, 1657			See footnote [3], p. 25; See footnote [4], O–3104–83; See footnote [6], p. S51.
	GC/MS	525.2			See footnote [11], O–1126–95.
24. Dicamba	GC	615			See footnote [3], p. 115.
	HPLC/MS				See footnote [12], O–2060–01.
25. Dichlofenthion	GC	622.1			See footnote [4], page 27; See footnote [6], p. S73.
26. Dichloran	GC	608.2, 617	6630 B–2000		See footnote [3], p. 7;
27. Dicofol	GC	617			See footnote [4], O–3104–83.
28. Dieldrin	GC	608, 617	6630 B–2000 & C–2000.	D3086–90, D5812–96(02).	See footnote [3], p. 7; See footnote [4], O–3104–83; See footnote [8], 3M0222.
	GC/MS	625	6410 B–2000		See footnote [11], O–1126–95.
29. Dioxathion	GC	614.1, 1657			See footnote [4], page 27; See footnote [6], p. S73.
30. Disulfoton	GC	507, 614, 622, 1657			See footnote [3], p. 25; See footnote [6] p. S51.
	GC/MS	525.2			See footnote [11], O–1126–95.
31. Diuron	TLC				See footnote [3], p. 104; See footnote [6], p. S64.
	HPLC	632.			
	HPLC/MS	553			See footnote [12], O–2060–01.

TABLE ID—LIST OF APPROVED TEST PROCEDURES FOR PESTICIDES [1]—Continued

Parameter	Method	EPA [2,7,10]	Standard methods	ASTM	Other
32. Endosulfan I	GC	608, 617	6630 B–2000 & C–2000.	D3086–90, D5812–96(02).	See footnote [3], p. 7; See footnote [4], O–3104–83; See footnote [8], 3M022).
	GC/MS	625 [5]	6410 B–2000		See footnote [13], O–2002–01.
33. Endosulfan II	GC	608, 617	6630 B–2000 & C–2000.	D3086–90, D5812–96(02).	See footnote [3], p. 7; See footnote [8], 3M0222.
	GC/MS	625 [5]	6410 B–2000		See footnote [13], O–2002–01.
34. Endosulfan Sulfate	GC	608, 617	6630 C–2000		See footnote [8], 3M0222.
	GC/MS	625	6410 B–2000		
35. Endrin	GC	505, 508, 608, 617, 1656	6630 B–2000 & C–2000.	D3086–90, D5812–96(02).	See footnote [3], p. 7; See footnote [4], O–3104–83; See footnote [8], 3M0222.
	GC/MS	525.1, 525.2, 625 [5]	6410 B–2000.		
36. Endrin aldehyde	GC	608, 617	6630 C–2000		See footnote [8], 3M0222.
	GC/MS	625.			
37. Ethion	GC	614, 614.1,1657			See footnote [4], page 27; See footnote [6], p. S73.
	GC/MS				See footnote [13], O–2002–01.
38. Fenuron	TLC				See footnote [3], p. 104; See footnote [6], p. S64.
	HPLC	632.			
	HPLC/MS				See footnote [12], O–2060–01.
39. Fenuron-TCA	TLC				See footnote [3], p. 104; See footnote [6], p. S64.
	HPLC	632.			
40. Heptachlor	GC	505, 508, 608, 617, 1656	6630 B–2000 & C–2000.	D3086–90, D5812–96(02).	See footnote [3], p. 7; See footnote [4], O–3104–83; See footnote [8], 3M0222.
	GC/MS	525.1, 525.2, 625	6410 B–2000.		
41. Heptachlor epoxide	GC	608, 617	6630 B–2000 & C–2000.	D3086–90, D5812–96(02).	See footnote [3], p. 7; See footnote [4], O–3104–83; See footnote [6], p. S73; See footnote [8], 3M0222.
	GC/MS	625	6410 B–2000.		
42. Isodrin	GC	617	6630 B–2000 & C–2000.		See footnote [4], O–3104–83; See footnote [6], p. S73.
43. Linuron	GC				See footnote [3], p. 104; See footnote [6], p. S64.
	HPLC	632.			
	HPLC/MS	553			See footnote [12], O–2060–01.
	GC/MS				See footnote [11], O–1126–95.
44. Malathion	GC	614, 1657	6630 B–2000		See footnote [3], p. 25; See footnote [6], p. S51.
	GC/MS				See footnote [11], O–1126–95.
45. Methiocarb	TLC				See footnote [3], p. 94; See footnote [6], p. S60.
	HPLC	632.			
	HPLC/MS				See footnote [12], O–2060–01.
46. Methoxychlor	GC	505, 508, 608.2, 617, 1656.	6630 B–2000 & C–2000.	D3086–90, D5812–96(02).	See footnote [3], p. 7; See footnote [4], O–3104 –83; See footnote [8], 3M0222.
	GC/MS	525.1, 525.2			See footnote [11], O–1126–95.
47. Mexacarbate	TLC				See footnote [3], p. 94; See footnote [6], p.S60.
	HPLC	632.			
48. Mirex	GC	617	6630 B–2000 & C–2000.	D3086–90, D5812–96(02).	See footnote [3], p. 7; See footnote [4], O–3104–83.
49. Monuron	TLC				See footnote [3], p. 104; See footnote [6], p. S64.
	HPLC	632.			
50. Monuron-TCA	TLC				See footnote [3], p. 104; See footnote [6], p. S64.
	HPLC	632.			
51. Neburon	TLC				See footnote [3], p. 104; See footnote [6], p. S64.
	HPLC	632.			
	HPLC/MS				See footnote [12], O–2060–01.
52. Parathion methyl	GC	614, 622, 1657	6630 B–2000		See footnote [4], page 27; See footnote [3], p. 25.

TABLE ID—LIST OF APPROVED TEST PROCEDURES FOR PESTICIDES [1]—Continued

Parameter	Method	EPA [2,7,10]	Standard methods	ASTM	Other
	GC/MS				See footnote [11], O–1126–95.
53. Parathion ethyl	GC	614	6630 B–2000		See footnote [4], page 27; See footnote [3], p. 25.
	GC/MS				See footnote [11], O–1126–95.
54. PCNB	GC	608.1, 617	6630 B–2000 & C–2000.	D3086–90, D5812–96(02).	See footnote [3], p. 7.
55. Perthane	GC	617		D3086–90, D5812–96(02).	See footnote [4], O–3104–83.
56. Prometon	GC	507, 619			See footnote [3], p. 83; See footnote [6], p. S68; See footnote [9], O–3106–93.
	GC/MS	525.2			See footnote [11], O–1126–95.
57. Prometryn	GC	507, 619			See footnote [3], p. 83; See footnote [6], p. S68; See footnote [9],O–3106–93.
	GC/MS	525.1, 525.2			See footnote [13], O–2002–01.
58. Propazine	GC	507, 619, 1656			See footnote [3], p. 83; See footnote [6], p. S68; See footnote [9], O–3106–93.
	GC/MS	525.1, 525.2.			
59. Propham	TLC				See footnote [3], p. 104; See footnote [6], p. S64.
	HPLC	632.			
	HPLC/MS				See footnote [12], O–2060–01.
60. Propoxur	TLC				See footnote [3], p. 94; See footnote [6], p. S60.
	HPLC	632.			
61. Secbumeton	TLC				See footnote [3], p. 83; See footnote [6], p. S68.
	GC	619.			
62. Siduron	TLC				See footnote [3], p. 104; See footnote [6], p. S64.
	HPLC	632.			
	HPLC/MS				See footnote [12], O–2060–01.
63. Simazine	GC	505, 507, 619, 1656			See footnote [3], p. 83; See footnote [6], p. S68; See footnote [9], O–3106–93.
	GC/MS	525.1, 525.2			See footnote [11], O–1126–95.
64. Strobane	GC	617	6630 B–2000 & C–2000.		See footnote [3], p. 7.
65. Swep	TLC				See footnote [3], p. 104; See footnote [6], p. S64.
	HPLC	632.			
66. 2,4,5-T	GC	615	6640 B–2001		See footnote [3], p. 115; See footnote [4], O–3105–83.
67. 2,4,5-TP (Silvex)	GC	615	6640 B–2001		See footnote [3], p. 115; See footnote [4], O–3105–83.
68. Terbuthylazine	GC	619, 1656			See footnote [3], p. 83; See footnote [6], p. S68.
	GC/MS				See footnote [13], O–2002–01.
69. Toxaphene	GC	505, 508, 608, 617, 1656	6630 B–2000 & C–2000.	D3086–90, D5812–96(02).	See footnote [3], p. 7; See footnote [8]; See footnote [4], O–3105–83.
	GC/MS	525.1, 525.2, 625	6410 B–2000.		
70. Trifluralin	GC	508, 617, 627, 1656	6630 B–2000		See footnote [3], p. 7; See footnote [9], O–3106–93.
	GC/MS	525.2			See footnote [11], O–1126–95.

Table ID notes:

[1] Pesticides are listed in this table by common name for the convenience of the reader. Additional pesticides may be found under Table IC, where entries are listed by chemical name.

[2] The standardized test procedure to be used to determine the method detection limit (MDL) for these test procedures is given at Appendix B, Definition and Procedure for the Determination of the Method Detection Limit, of this Part 136.

[3] Methods for Benzidine, Chlorinated Organic Compounds, Pentachlorophenol and Pesticides in Water and Wastewater. September 1978. U.S. EPA. This EPA publication includes thin-layer chromatography (TLC) methods.

[4] Methods for the Determination of Organic Substances in Water and Fluvial Sediments, Techniques of Water-Resources Investigations of the U.S. Geological Survey, Book 5, Chapter A3. 1987. USGS.

[5] The method may be extended to include α-BHC, γ-BHC, endosulfan I, endosulfan II, and endrin. However, when they are known to exist, Method 608 is the preferred method.

[6] Selected Analytical Methods Approved and Cited by the United States Environmental Protection Agency, Supplement to the 15th Edition of *Standard Methods for the Examination of Water and Wastewater.* 1981. American Public Health Association (APHA).

[7] Each analyst must make an initial, one-time, demonstration of their ability to generate acceptable precision and accuracy with Methods 608 and 625 in accordance with procedures given in Section 8.2 of each of these methods. Additionally, each laboratory, on an on-going basis, must spike and analyze 10% of all samples analyzed with Method 608 or 5% of all samples analyzed with Method 625 to monitor and evaluate laboratory data quality in accordance with Sections 8.3 and 8.4 of these methods. When the recovery of any parameter falls outside the warning limits, the analytical results for that parameter in the unspiked sample are suspect. The results should be reported, but cannot be used to demonstrate regulatory compliance. These quality control requirements also apply to the Standard Methods, ASTM Methods, and other methods cited.

[8] Organochlorine Pesticides and PCBs in Wastewater Using Empore™ Disk. Revised October 28, 1994. 3M Corporation.

[9] Method O–3106–93 is in Open File Report 94–37, Methods of Analysis by the U.S. Geological Survey National Water Quality Laboratory—Determination of Triazine and Other Nitrogen-Containing Compounds by Gas Chromatography With Nitrogen Phosphorus Detectors. 1994. USGS.

[10] EPA Methods 608.1, 608.2, 614, 614.1, 615, 617, 619, 622, 622.1, 627, and 632 are found in Methods for the Determination of Nonconventional Pesticides in Municipal and Industrial Wastewater, EPA 821–R–92–002, April 1992, U.S. EPA. The full text of Methods 608 and 625 are provided at Appendix A, Test Procedures for Analysis of Organic Pollutants, of this Part 136. EPA Methods 505, 507, 508, 525.1, 531.1 and 553 are in Methods for the Determination of Nonconventional Pesticides in Municipal and Industrial Wastewater, Volume II, EPA 821–R–93–010B, 1993, U.S. EPA. EPA Method 525.2 is in Determination of Organic Compounds in Drinking Water by Liquid-Solid Extraction and Capillary Column Gas Chromatography/Mass Spectrometry, Revision 2.0, 1995, U.S. EPA. EPA methods 1656 and 1657 are in Methods For The Determination of Nonconventional Pesticides In Municipal and Industrial Wastewater, Volume I, EPA 821–R–93–010A, 1993, U.S. EPA.

[11] Method O–1126–95 is in Open-File Report 95–181, Methods of Analysis by the U.S. Geological Survey National Water Quality Laboratory—Determination of pesticides in water by C–18 solid-phase extraction and capillary-column gas chromatography/mass spectrometry with selected-ion monitoring. 1995. USGS.

[12] Method O–2060–01 is in Water-Resources Investigations Report 01–4134, Methods of Analysis by the U.S. Geological Survey National Water Quality Laboratory—Determination of Pesticides in Water by Graphitized Carbon-Based Solid-Phase Extraction and High-Performance Liquid Chromatography/Mass Spectrometry. 2001. USGS.

[13] Method O–2002–01 is in Water-Resources Investigations Report 01–4098, Methods of Analysis by the U.S. Geological Survey National Water Quality Laboratory—Determination of moderate-use pesticides in water by C–18 solid-phase extraction and capillary-column gas chromatography/mass spectrometry. 2001. USGS.

[14] Method O–1121–91 is in Open-File Report 91–519, Methods of Analysis by the U.S. Geological Survey National Water Quality Laboratory—Determination of organonitrogen herbicides in water by solid-phase extraction and capillary-column gas chromatography/mass spectrometry with selected-ion monitoring. 1992. USGS.

* * * * *

TABLE IG—TEST METHODS FOR PESTICIDE ACTIVE INGREDIENTS (40 CFR PART 455)

EPA survey code	Pesticide name	CAS No.	EPA analytical method No.(s) [3]
8	Triadimefon	43121–43–3	507/633/525.1/525.2/1656
12	Dichlorvos	62–73–7	1657/507/622/525.1/525.2
16	2,4-D; 2,4-D Salts and Esters [2,4-Dichloro-phenoxy-acetic acid].	94–75–7	1658/515.1/615/515.2/555
17	2,4-DB; 2,4-DB Salts and Esters [2,4-Dichlorophenoxybutyric acid].	94–82–6	1658/515.1/615/515.2/555
22	Mevinphos	7786–34–7	1657/507/622/525.1/525.2
25	Cyanazine	21725–46–2	629/507
26	Propachlor	1918–16–7	1656/508/608.1/525.1/525.2
27	MCPA; MCPA Salts and Esters [2-Methyl-4-chlorophenoxyacetic acid].	94–74–6	1658/615/555
30	Dichlorprop; Dichlorprop Salts and Esters [2-(2,4-Dichlorophenoxy) propionic acid].	120–36–5	1658/515.1/615/515.2/555
31	MCPP; MCPP Salts and Esters [2-(2-Methyl-4-chlorophenoxy) propionic acid].	93–65–2	1658/615/555
35	TCMTB [2-(Thiocyanomethylthio) benzo-thiazole]	21564–17–0	637
39	Pronamide	23950–58–5	525.1/525.2/507/633.1
41	Propanil	709–98–8	632.1/1656
45	Metribuzin	21087–64–9	507/633/525.1/525.2/1656
52	Acephate	30560–19–1	1656/1657
53	Acifluorfen	50594–66–6	515.1/515.2/555
54	Alachlor	15972–60–8	505/507/645/525.1/525.2/1656
55	Aldicarb	116–06–3	531.1
58	Ametryn	834–12–8	507/619/525.2
60	Atrazine	1912–24–9	505/507/619/525.1/525.2/1656
62	Benomyl	17804–35–2	631
68	Bromacil; Bromacil Salts and Esters	314–40–9	507/633/525.1/525.2/1656
69	Bromoxynil	1689–84–5	1625/1661
69	Bromoxynil octanoate	1689–99–2	1656
70	Butachlor	23184–66–9	507/645/525.1/525.2/1656
73	Captafol	2425–06–1	1656
75	Carbaryl [Sevin]	63–25–2	531.1/632/553
76	Carbofuran	1563–66–2	531.1/632
80	Chloroneb	2675–77–6	1656/508/608.1/525.1/525.2
82	Chlorothalonil	1897–45–6	508/608.2/525.1/525.2/1656
84	Stirofos	961–11–5	1657/507/622/525.1/525.2
86	Chlorpyrifos	2921–88–2	1657/508/622
90	Fenvalerate	51630–58–1	1660
103	Diazinon	333–41–5	1657/507/614/622/525.2
107	Parathion methyl	298–00–0	1657/614/622
110	DCPA [Dimethyl 2,3,5,6-tetrachloro-terephthalate]	1861–32–1	508/608.2/525.1/525.2/515.1 [2]/515.2 [2]/1656

TABLE IG—TEST METHODS FOR PESTICIDE ACTIVE INGREDIENTS (40 CFR PART 455)—Continued

EPA survey code	Pesticide name	CAS No.	EPA analytical method No.(s) [3]
112	Dinoseb	88–85–7	1658/515.1/615/515.2/555
113	Dioxathion	78–34–2	1657/614.1
118	Nabonate [Disodium cyanodithio-imidocarbonate]	138–93–2	630.1
119	Diuron	330–54–1	632/553
123	Endothall	145–73–3	548/548.1
124	Endrin	72–20–8	1656/505/508/608/617/525.1/525.2
125	Ethalfluralin	55283–68–6	1656/627 See footnote 1
126	Ethion	563–12–2	1657/614/614.1
127	Ethoprop	13194–48–4	1657/507/622/525.1/525.2
132	Fenarimol	60168–88–9	507/633.1/525.1/525.2/1656
133	Fenthion	55–38–9	1657/622
138	Glyphosate [N-(Phosphonomethyl) glycine]	1071–83–6	547
140	Heptachlor	76–44–8	1656/505/508/608/617/525.1/525.2
144	Isopropalin	33820–53–0	1656/627
148	Linuron	330–55–2	553/632
150	Malathion	121–75–5	1657/614
154	Methamidophos	10265–92–6	1657
156	Methomyl	16752–77–5	531.1/632
158	Methoxychlor	72–43–5	1656/505/508/608.2/617/525.1/525.2
172	Nabam	142–59–6	630/630.1
173	Naled	300–76–5	1657/622
175	Norflurazon	27314–13–2	507/645/525.1/525.2/1656
178	Benfluralin	1861–40–1	1656/627 See footnote 1
182	Fensulfothion	115–90–2	1657/622
183	Disulfoton	298–04–4	1657/507/614/622/525.2
185	Phosmet	732–11–6	1657/622.1
186	Azinphos Methyl	86–50–0	1657/614/622
192	Organo-tin pesticides	12379–54–3	Ind-01/200.7/200.9
197	Bolstar	35400–43–2	1657/622
203	Parathion	56–38–2	1657/614
204	Pendimethalin	40487–42–1	1656
205	Pentachloronitrobenzene	82–68–8	1656/608.1/617
206	Pentachlorophenol	87–86–5	625/1625/515.2/555/515.1/525.1/525.2
208	Permethrin	52645–53–1	608.2/508/525.1/525.2/1656/1660
212	Phorate	298–02–2	1657/622
218	Busan 85 [Potassium dimethyldithiocarbamate]	128–03–0	630/630.1
219	Busan 40 [Potassium N-hydroxymethyl-N-methyldithiocarbamate].	51026–28–9	630/630.1
220	KN Methyl [Potassium N-methyl-dithiocarbamate]	137–41–7	630/630.1
223	Prometon	1610–18–0	507/619/525.2
224	Prometryn	7287–19–6	507/619/525.1/525.2
226	Propazine	139–40–2	507/619/525.1/525.2/1656
230	Pyrethrin I	121–21–1	1660
232	Pyrethrin II	121–29–9	1660
236	DEF [S,S,S-Tributyl phosphorotrithioate]	78–48–8	1657
239	Simazine	122–34–9	505/507/619/525.1/525.2/1656
241	Carbam-S [Sodium dimethyldithio-carbamate]	128–04–1	630/630.1
243	Vapam [Sodium methyldithiocarbamate]	137–42–8	630/630.1
252	Tebuthiuron	34014–18–1	507/525.1/525.2
254	Terbacil	5902–51–2	507/633/525.1/525.2/1656
255	Terbufos	13071–79–9	1657/507/614.1/525.1/525.2
256	Terbuthylazine	5915–41–3	619/1656
257	Terbutryn	886–50–0	507/619/525.1/525.2
259	Dazomet	533–74–4	630/630.1/1659
262	Toxaphene	8001–35–2	1656/505/508/608/617/525.1/525.2
263	Merphos [Tributyl phosphorotrithioate]	150–50–5	1657/507/525.1/525.2/622
264	Trifluralin [1]	1582–09–8	1656/508/617/627/525.2
268	Ziram [Zinc dimethyldithiocarbamate]	137–30–4	630/630.1

Table 1G notes:

[1] Monitor and report as total Trifluralin.

[2] Applicable to the analysis of DCPA degradates.

[3] EPA Methods 608.1 through 645, 1645 through 1661, and Ind-01 are available in Methods For The Determination of Nonconventional Pesticides In Municipal and Industrial Wastewater, Volume I, EPA 821–R–93–010A, Revision I, August 1993, U.S. EPA. EPA Methods 200.9 and 505 through 555 are available in Methods For The Determination of Nonconventional Pesticides In Municipal and Industrial Wastewater, Volume II, EPA 821–R–93–010B, August 1993, U.S. EPA. The full text of Methods 608, 625 and 1625 are provided at Appendix A of this Part 136. The full text of Method 200.7 is provided at Appendix C of this Part 136.

TABLE IH—LIST OF APPROVED MICROBIOLOGICAL METHODS FOR AMBIENT WATER

Parameter and units	Method [1]	EPA	Standard methods	AOAC, ASTM, USGS	Other
Bacteria:					
1. Coliform (fecal), number per 100 mL or number per gram dry weight.	Most Probable Number (MPN), 5 tube, 3 dilution, or.	p. 132 [3]	9221 C E–2006.		
	Membrane filter (MF) [2], single step.	p. 124 [3]	9222 D–1997	B–0050–85 [4]	
2. Coliform (fecal) in presence of chlorine, number per 100 mL.	MPN, 5 tube, 3 dilution, or.	p. 132 [3]	9221 C E–2006.		
	MF [2], single step [5]	p. 124 [3]	9222 D–1997.		
3. Coliform (total), number per 100 mL.	MPN, 5 tube, 3 dilution, or.	p. 114 [3]	9221 B–2006.		
	MF [2], single step or two step.	p. 108 [3]	9222 B–1997	B–0025–85 [4]	
4. Coliform (total), in presence of chlorine, number per 100 mL.	MPN, 5 tube, 3 dilution, or.	p. 114 [3]	9221 B–2006.		
	MF [2] with enrichment	p. 111 [3]	9222 (B+B.5c)–1997.		
5. *E. coli,* number per 100 mL.	MPN [6,8,14], multiple tube, or.		9221 B.1–2006/9221 F–2006 [11,13].		
	Multiple tube/multiple well, or.		9223 B–2004 [12]	991.15 [10]	Colilert®[12,16], Colilert-18®[12,15,16].
	MF [2,5,6,7,8], two step, or	1103.1 [19]	9222 B–1997/9222 G–1997 [18], 9213 D–2007.	D5392–93 [9].	
	Single step	1603 [20], 1604 [21].			mColiBlue-24®[17].
6. Fecal streptococci, number per 100 mL.	MPN, 5 tube, 3 dilution, or.	p. 139 [3]	9230 B–2007.		
	MF [2], or	p. 136 [3]	9230 C–2007	B–0055–85 [4].	
	Plate count	p. 143 [3].			
7. Enterococci, number per 100 mL.	MPN [6,8], multiple tube/multiple well, or.			D6503–99 [9]	Enterolert®[12,22].
	MF [2,5,6,7,8] two step, or	1106.1 [23]	9230 C–2007	D5259–92 [9].	
	Single step, or	1600 [24]	9230 C–2007.		
	Plate count	p. 143 [3].			
Protozoa:					
8. *Cryptosporidium*	Filtration/IMS/FA	1622 [25], 1623 [26].			
9. *Giardia*	Filtration/IMS/FA	1623 [26]			

Table 1H notes:

[1] The method must be specified when results are reported.

[2] A 0.45-μm membrane filter (MF) or other pore size certified by the manufacturer to fully retain organisms to be cultivated and to be free of extractables which could interfere with their growth.

[3] Microbiological Methods for Monitoring the Environment, Water, and Wastes. EPA/600/8–78/017. 1978. US EPA.

[4] U.S. Geological Survey Techniques of Water-Resource Investigations, Book 5, Laboratory Analysis, Chapter A4, Methods for Collection and Analysis of Aquatic Biological and Microbiological Samples. 1989. USGS.

[5] Because the MF technique usually yields low and variable recovery from chlorinated wastewaters, the Most Probable Number method will be required to resolve any controversies.

[6] Tests must be conducted to provide organism enumeration (density). Select the appropriate configuration of tubes/filtrations and dilutions/volumes to account for the quality, character, consistency, and anticipated organism density of the water sample.

[7] When the MF method has not been used previously to test waters with high turbidity, large numbers of noncoliform bacteria, or samples that may contain organisms stressed by chlorine, a parallel test should be conducted with a multiple-tube technique to demonstrate applicability and comparability of results.

[8] To assess the comparability of results obtained with individual methods, it is suggested that side-by-side tests be conducted across seasons of the year with the water samples routinely tested in accordance with the most current Standard Methods for the Examination of Water and Wastewater or EPA alternate test procedure (ATP) guidelines.

[9] Annual Book of ASTM Standards—Water and Environmental Technology. Section 11.02. 2000, 1999, 1996. ASTM International.

[10] Official Methods of Analysis of AOAC International, 16th Edition, Volume I, Chapter 17. 1995. AOAC International.

[11] The multiple-tube fermentation test is used in 9221B.1–2006. Lactose broth may be used in lieu of lauryl tryptose broth (LTB), if at least 25 parallel tests are conducted between this broth and LTB using the water samples normally tested, and this comparison demonstrates that the false-positive rate and false-negative rate for total coliform using lactose broth is less than 10 percent. No requirement exists to run the completed phase on 10 percent of all total coliform-positive tubes on a seasonal basis.

[12] These tests are collectively known as defined enzyme substrate tests, where, for example, a substrate is used to detect the enzyme β-glucuronidase produced by *E. coli.*

[13] After prior enrichment in a presumptive medium for total coliform using 9221B.1–2006, all presumptive tubes or bottles showing any amount of gas, growth or acidity within 48 h ± 3 h of incubation shall be submitted to 9221F–2006. Commercially available EC–MUG media or EC media supplemented in the laboratory with 50 μg/mL of MUG may be used.

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[14] Samples shall be enumerated by the multiple-tube or multiple-well procedure. Using multiple-tube procedures, employ an appropriate tube and dilution configuration of the sample as needed and report the Most Probable Number (MPN). Samples tested with Colilert® may be enumerated with the multiple-well procedures, Quanti-Tray® or Quanti-Tray®/2000, and the MPN calculated from the table provided by the manufacturer.

[15] Colilert-18® is an optimized formulation of the Colilert® for the determination of total coliforms and *E. coli* that provides results within 18 h of incubation at 35 °C, rather than the 24 h required for the Colilert® test, and is recommended for marine water samples.

[16] Descriptions of the Colilert®, Colilert-18®, Quanti-Tray®, and Quanti-Tray®/2000 may be obtained from IDEXX Laboratories Inc.

[17] A description of the mColiBlue24® test may be obtained from Hach Company.

[18] Subject total coliform positive samples determined by 9222B–1997 or other membrane filter procedure to 9222G–1997 using NA–MUG media.

[19] Method 1103.1: *Escherichia coli* (*E. coli*) in Water by Membrane Filtration Using membrane-Thermotolerant *Escherichia coli* Agar (mTEC), EPA–821–R–10–002. March 2010. US EPA.

[20] Method 1603: *Escherichia coli* (*E. coli*) in Water by Membrane Filtration Using Modified membrane-Thermotolerant *Escherichia coli* Agar (Modified mTEC), EPA–821–R–09–007. December 2009. US EPA.

[21] Preparation and use of MI agar with a standard membrane filter procedure is set forth in the article, Brenner et al. 1993. New Medium for the Simultaneous Detection of Total Coliform and *Escherichia coli* in Water. Appl. Environ. Microbiol. 59:3534–3544 and in Method 1604: Total Coliforms and *Escherichia coli* (*E. coli*) in Water by Membrane Filtration by Using a Simultaneous Detection Technique (MI Medium), EPA 821–R–02–024, September 2002, US EPA.

[22] A description of the Enterolert® test may be obtained from IDEXX Laboratories Inc.

[23] Method 1106.1: Enterococci in Water by Membrane Filtration Using membrane-Enterococcus-Esculin Iron Agar (mE–EIA), EPA–821–R–09–015. December 2009. US EPA.

[24] Method 1600: Enterococci in Water by Membrane Filtration Using membrane-Enterococcus Indoxyl-β-D-Glucoside Agar (mEI), EPA–821–R–09–016. December 2009. US EPA.

[25] Method 1622 uses a filtration, concentration, immunomagnetic separation of oocysts from captured material, immunofluorescence assay to determine concentrations, and confirmation through vital dye staining and differential interference contrast microscopy for the detection of *Cryptosporidium*. Method 1622: *Cryptosporidium* in Water by Filtration/IMS/FA, EPA–821–R–05–001. December 2005. US EPA.

[26] Method 1623 uses a filtration, concentration, immunomagnetic separation of oocysts and cysts from captured material, immunofluorescence assay to determine concentrations, and confirmation through vital dye staining and differential interference contrast microscopy for the simultaneous detection of *Cryptosporidium* and *Giardia* oocysts and cysts. Method 1623. *Cryptosporidium* and *Giardia* in Water by Filtration/IMS/FA. EPA–821–R–05–002. December 2005. US EPA.

(b) The documents required in this section are incorporated by reference into this section with approval of the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies of the documents may be obtained from the sources listed in paragraph (b) of this section. Documents may be inspected at EPA's Water Docket, EPA West, 1301 Constitution Avenue NW., Room B102, Washington, DC (Telephone: 202–566–2426); or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202–741–6030, or go to: *http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html*. These test procedures are incorporated as they exist on the day of approval and a notice of any change in these test procedures will be published in the **Federal Register**. The full texts of the methods from the following references which are cited in Tables IA, IB, IC, ID, IE, IF, IG and IH are incorporated by reference into this regulation and may be obtained from the source identified. All costs cited are subject to change and must be verified from the indicated source.

(1) Environmental Monitoring and Support Laboratory, U.S. Environmental Protection Agency, Cincinnati OH (US EPA). Available at *http://water.epa.gov/scitech/methods/cwa/index.cfm* or from: National Technical Information Service, 5285 Port Royal Road, Springfield, Virginia 22161

(i) Microbiological Methods for Monitoring the Environment, Water, and Wastes. 1978. EPA/600/8–78/017, Pub. No. PB–290329/A.S.

(A) Part III Analytical Methodology, Section B Total Coliform Methods, page 108. Table IA, Note 3; Table IH, Note 3.

(B) Part III Analytical Methodology, Section B Total Coliform Methods, 2.6.2 Two-Step Enrichment Procedure, page 111. Table IA, Note 3; Table IH, Note 3.

(C) Part III Analytical Methodology, Section B Total Coliform Methods, 4 Most Probable Number (MPN) Method, page 114. Table IA, Note 3; Table IH, Note 3.

(D) Part III Analytical Methodology, Section C Fecal Coliform Methods, 2 Direct Membrane Filter (MF) Method, page 124. Table IA, Note 3; Table IH, Note 3.

(E) Part III, Analytical Methodology, Section C Fecal Coliform Methods, 5 Most Probable Number (MPN) Method, page 132. Table IA, Note 3; Table IH, Note 3.

(F) Part III Analytical Methodology, Section D Fecal Streptococci, 2 Membrane Filter (MF) Method, page 136. Table IA, Note 3; Table IH, Note 3.

(G) Part III Analytical Methodology, Section D Fecal Streptococci, 4 Most Probable Number Method, page 139. Table IA, Note 3; Table IH, Note 3.

(H) Part III Analytical Methodology, Section D Fecal Streptococci, 5 Pour Plate Method, page 143. Table IA, Note 3; Table IH, Note 3.

(ii) [Reserved]

(2) Environmental Monitoring and Support Laboratory, U.S. Environmental Protection Agency, Cincinnati OH (US EPA). Available at *http://water.epa.gov/scitech/methods/cwa/index.cfm*.

(i) Method 300.1 (including Errata Cover Sheet, April 27, 1999), Determination of Inorganic Ions in Drinking Water by Ion Chromatography, Revision 1.0, 1997. Table IB, Note 52.

(ii) Method 551, Determination of Chlorination Disinfection Byproducts and Chlorinated Solvents in Drinking Water by Liquid-Liquid Extraction and Gas Chromatography With Electron-Capture Detection. 1990. Table IF.

(3) National Exposure Risk Laboratory-Cincinnati, U.S. Environmental Protection Agency, Cincinnati OH (US EPA). Available from *http://water.epa.gov/scitech/methods/cwa/index.cfm* or from the National Technical Information Service (NTIS), 5285 Port Royal Road, Springfield, VA 22161. Telephone: 800–553–6847.

(i) Methods for the Determination of Inorganic Substances in Environmental Samples. August 1993. EPA/600/R–93/100, Pub. No. PB 94120821. Table IB, Note 52.

(A) Method 180.1, Determination of Turbidity by Nephelometry. Revision 2.0. Table IB, Note 52.

(B) Method 300.0, Determination of Inorganic Anions by Ion Chromatography. Revision 2.1. Table IB, Note 52.

(C) Method 335.4, Determination of Total Cyanide by Semi-Automated Colorimetry. Revision 1.0. Table IB, Notes 52 and 57.

(D) Method 350.1, Determination of Ammonium Nitrogen by Semi-Automated Colorimetry. Revision 2.0. Table IB, Notes 30 and 52.

(E) Method 351.2, Determination of Total Kjeldahl Nitrogen by Semi-Automated Colorimetry. Revision 2.0. Table IB, Note 52.

(F) Method 353.2, Determination of Nitrate-Nitrite Automated Colorimetry. Revision 2.0. Table IB, Note 52.

(G) Method 365.1, Determination of Phosphorus by Automated Colorimetry. Revision 2.0. Table IB, Note 52.

(H) Method 375.2, Determination of Sulfate by Automated Colorimetry. Revision 2.0. Table IB, Note 52.

(I) Method 410.4, Determination of Chemical Oxygen Demand by Semi-Automated Colorimetry. Revision 2.0. Table IB, Note 52.

(ii) Methods for the Determination of Metals in Environmental Samples, Supplement I. May 1994. EPA/600/R–94/111, Pub. No. PB 95125472. Table IB, Note 52.

(A) Method 200.7, Determination of Metals and Trace Elements in Water and Wastes by Inductively Coupled Plasma-Atomic Emission Spectrometry. Revision 4.4. Table IB, Note 52.

(B) Method 200.8, Determination of Trace Elements in Water and Wastes by Inductively Coupled Plasma Mass Spectrometry. Revision 5.3. Table IB, Note 52.

(C) Method 200.9, Determination of Trace Elements by Stabilized Temperature Graphite Furnace Atomic Absorption Spectrometry. Revision 2.2. Table IB, Note 52.

(D) Method 218.6, Determination of Dissolved Hexavalent Chromium in Drinking Water, Groundwater, and Industrial Wastewater Effluents by Ion Chromatography. Revision 3.3. Table IB, Note 52.

(E) Method 245.1, Determination of Mercury in Water by Cold Vapor Atomic Absorption Spectrometry. Revision 3.0. Table IB, Note 52.

(4) National Exposure Risk Laboratory-Cincinnati, U.S. Environmental Protection Agency, Cincinnati OH (US EPA). Available at *http://water.epa.gov/scitech/methods/cwa/index.cfm*.

(i) EPA Method 200.5, Determination of Trace Elements in Drinking Water by Axially Viewed Inductively Coupled Plasma-Atomic Emission Spectrometry. Revision 4.2, October 2003. EPA/600/R–06/115. Table IB, Note 68.

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(xx) ASTM D1293–99, Standard Test Methods for pH of Water. March 2000. Table IB.

(xxi) ASTM D1426–08, Standard Test Methods for Ammonia Nitrogen in Water. September 2008. Table IB.

(xxii) ASTM D1687–02 (Reapproved 2007)[E1], Standard Test Methods for Chromium in Water. August 2007. Table IB.

(xxiii) ASTM D1688–07, Standard Test Methods for Copper in Water. August 2007. Table IB.

(xxiv) ASTM D1691–02 (Reapproved 2007)[E1], Standard Test Methods for Zinc in Water. August 2007. Table IB.

(xxv) ASTM D1783–01 (Reapproved 2007), Standard Test Methods for Phenolic Compounds in Water. January 2008). Table IB.

(xxvi) ASTM D1886–08, Standard Test Methods for Nickel in Water. October 2008. Table IB.

(xxvii) ASTM D1889–00, Standard Test Method for Turbidity of Water. October 2000. Table IB.

(xxviii) ASTM D1890–96, Standard Test Method for Beta Particle Radioactivity of Water. April 1996. Table IE.

(xxix) ASTM D1943–96, Standard Test Method for Alpha Particle Radioactivity of Water. April 1996. Table IE.

(xxx) ASTM D1976–07, Standard Test Method for Elements in Water by Inductively-Coupled Argon Plasma Atomic Emission Spectroscopy. August 2007. Table IB.

(xxxi) ASTM D2036–09, Standard Test Methods for Cyanides in Water. October 2009. Table IB.

(xxxii) ASTM D2330–02, Standard Test Method for Methylene Blue Active Substances. August 2002. Table IB.

(xxxiii) ASTM D2460–97, Standard Test Method for Alpha-Particle-Emitting Isotopes of Radium in Water. October 1997. Table IE.

(xxxiv) ASTM D2972–08, Standard Tests Method for Arsenic in Water. October 2008. Table IB.

(xxxv) ASTM D3223–02 (Reapproved 2007)[E1], Standard Test Method for Total Mercury in Water. August 2007. Table IB.

(xxxvi) ASTM D3371–95, Standard Test Method for Nitriles in Aqueous Solution by Gas-Liquid Chromatography, February 1996. Table IF.

(xxxvii) ASTM D3373–03 (Reapproved 2007)[E1], Standard Test Method for Vanadium in Water. September 2007. Table IB.

(xxxviii) ASTM D3454–97, Standard Test Method for Radium-226 in Water. February 1998. Table IE.

(xxxix) ASTM D3557–02 (Reapproved 2007)[E1], Standard Test Method for Cadmium in Water. September 2007. Table IB.

(xl) ASTM D3558–08, Standard Test Method for Cobalt in Water. November 2008. Table IB.

(xli) ASTM D3559–08, Standard Test Methods for Lead in Water. October 2008. Table IB.

(xlii) ASTM D3590–02 (Reapproved 2006), Standard Test Methods for Total Kjeldahl Nitrogen in Water. February 2007. Table IB.

(xliii) ASTM D3645–08, Standard Test Methods for Beryllium in Water. October 2008. Table IB.

(xliv) ASTM D3695–95, Standard Test Method for Volatile Alcohols in Water by Direct Aqueous-Injection Gas Chromatography. April 1995. Table IF.

(xlv) ASTM D3859–08, Standard Test Methods for Selenium in Water. October 2008. Table IB.

(xlvi) ASTM D3867–04, Standard Test Method for Nitrite-Nitrate in Water. July 2004. Table IB.

(xlvii) ASTM D4190–08, Standard Test Method for Elements in Water by Direct-Current Plasma Atomic Emission Spectroscopy. October 2008. Table IB.

(xlviii) ASTM D4282–02, Standard Test Method for Determination of Free Cyanide in Water and Wastewater by Microdiffusion. August 2002. Table IB.

(xlix) ASTM D4327–03, Standard Test Method for Anions in Water by Chemically Suppressed Ion Chromatography. January 2003. Table IB.

(l) ASTM D4382–02 (Reapproved 2007)[E1], Standard Test Method for Barium in Water, Atomic Absorption Spectrophotometry, Graphite Furnace. September 2007. Table IB.

(li) ASTM D4657–92 (Reapproved 1998), Standard Test Method for Polynuclear Aromatic Hydrocarbons in Water. January 1993. Table IC.

(lii) ASTM D4658–08, Standard Test Method for Sulfide Ion in Water. August 2008. Table IB.

(liii) ASTM D4763–88 (Reapproved 2001), Standard Practice for Identification of Chemicals in Water by Fluorescence Spectroscopy. September 1988. Table IF.

(liv) ASTM D4839–03, Standard Test Method for Total Carbon and Organic Carbon in Water by Ultraviolet, or Persulfate Oxidation, or Both, and Infrared Detection. January 2003. Table IB.

(lv) ASTM D5257–03, Standard Test Method for Dissolved Hexavalent Chromium in Water by Ion Chromatography. January 2003. Table IB.

(lvi) ASTM D5259–92, Standard Test Method for Isolation and Enumeration of Enterococci from Water by the Membrane Filter Procedure. October 1992. Table IH, Note 9.

(lvii) ASTM D5392–93, Standard Test Method for Isolation and Enumeration of *Escherichia coli* in Water by the Two-Step Membrane Filter Procedure. September 1993. Table IH, Note 9.

(lviii) ASTM D5673–05, Standard Test Method for Elements in Water by Inductively Coupled Plasma—Mass Spectrometry. July 2005. Table IB.

(lix) ASTM D5907–03, Standard Test Method for Filterable and Nonfilterable Matter in Water. July 2003. Table IB.

(lx) ASTM D6503–99, Standard Test Method for Enterococci in Water Using Enterolert. April 2000. Table IA Note 9, Table IH, Note 9.

(lxi) ASTM. D6508–00 (Reapproved 2005)[E2], Standard Test Method for Determination of Dissolved Inorganic Anions in Aqueous Matrices Using Capillary Ion Electrophoresis and Chromate Electrolyte. April 2005. Table IB.

(lxii) ASTM. D6888–09, Standard Test Method for Available Cyanide with Ligand Displacement and Flow Injection Analysis (FIA) Utilizing Gas Diffusion Separation and Amperometric Detection. October 2009. Table IB, Note 59.

(lxiii) ASTM. D6919–09, Standard Test Method for Determination of Dissolved Alkali and Alkaline Earth Cations and Ammonium in Water and Wastewater by Ion Chromatography. May 2009. Table IB.

(lxiv) ASTM. D7065–06, Standard Test Method for Determination of Nonylphenol, Bisphenol A, p-tert-Octylphenol, Nonylphenol Monoethoxylate and Nonylphenol Diethoxylate in Environmental Waters

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by Gas Chromatography Mass Spectrometry. January 2007. Table IC.

(lxv) ASTM. D7237–10, Standard Test Method for Free Cyanide with Flow Injection Analysis (FIA) Utilizing Gas Diffusion Separation and Amperometric Detection. June 2010. Table IB.

(lxvi) ASTM. D7284–08, Standard Test Method for Total Cyanide in Water by Micro Distillation followed by Flow Injection Analysis with Gas Diffusion Separation and Amperometric Detection. April 2008). Table IB.

(lxvii) ASTM. D7365–09a, Standard Practice for Sampling, Preservation, and Mitigating Interferences in Water Samples for Analysis of Cyanide. October 2009. Table II, Notes 5 and 6.

(lxviii) ASTM. D7511–09^{E2}, Standard Test Method for Total Cyanide by Segmented Flow Injection Analysis, In-Line Ultraviolet Digestion and Amperometric Detection. March 2009. Table IB.

(lxix) ASTM. D7573–09, Standard Test Method for Total Carbon and Organic Carbon in Water by High Temperature Catalytic Combustion and Infrared Detection. November 2009. Table IB.

(16) Bran & Luebbe Analyzing Technologies, Inc., Elmsford NY 10523.

(i) Industrial Method Number 378–75WA, Hydrogen Ion (pH) Automated Electrode Method, Bran & Luebbe (Technicon) Auto Analyzer II. October 1976. Table IB, Note 21.

(ii) [Reserved]

(17) CEM Corporation, P.O. Box 200, Matthews NC 28106–0200.

(i) Closed Vessel Microwave Digestion of Wastewater Samples for Determination of Metals. April 16, 1992. Table IB, Note 36.

(ii) [Reserved]

(18) Craig R. Chinchilla, 900 Jorie Blvd., Suite 35, Oak Brook IL 60523. Telephone: 630–645–0600.

(i) Nitrate by Discrete Analysis Easy (1-Reagent) Nitrate Method, (Colorimetric, Automated, 1 Reagent). Revision 1, November 12, 2011. Table IB, Note 62.

(ii) [Reserved]

(19) Hach Company, P.O. Box 389, Loveland CO 80537.

(i) Method 8000, Chemical Oxygen Demand. Hach Handbook of Water Analysis. 1979. Table IB, Note 14.

(ii) Method 8008, 1,10-Phenanthroline Method using FerroVer Iron Reagent for Water. 1980. Table IB, Note 22.

(iii) Method 8009, Zincon Method for Zinc. Hach Handbook for Water Analysis. 1979. Table IB, Note 33.

(iv) Method 8034, Periodate Oxidation Method for Manganese. Hach Handbook for Water Analysis. 1979. Table IB, Note 23.

(v) Method 8506, Bicinchoninate Method for Copper. Hach Handbook of Water Analysis. 1979. Table IB, Note 19.

(vi) Method 8507, Nitrogen, Nitrite—Low Range, Diazotization Method for Water and Wastewater. 1979. Table IB, Note 25.

(vii) Hach Method 10360, Luminescence Measurement of Dissolved Oxygen in Water and Wastewater and for Use in the Determination of BOD_5 and $cBOD_5$. Revision 1.2, October 2011. Table IB, Note 63.

(viii) m-ColiBlue24® Method, for total Coliforms and *E. coli*. Revision 2, 1999. Table IA, Note 18; Table IH, Note 17.

(20) IDEXX Laboratories Inc., One Idexx Drive, Westbrook ME 04092.

(i) Colilert® Method. 2002. Table IA, Notes 17 and 18; Table IH, Notes 14, 15 and 16.

(ii) Colilert-18® Method. 2002. Table IA, Notes 17 and 18; Table IH, Notes 14, 15 and 16.

(iii) Enterolert® Method. 2002. Table IA, Note 24; Table IH, Note 12.

(iv) Quanti-Tray® Method. 2002. Table IA, Note 18; Table IH, Notes 14 and 16.

(v) Quanti-Tray®/2000 Method. 2002. Table IA, Note 18; Table IH, Notes 14 and 16.

(21) In-Situ Incorporated, 221 E. Lincoln Ave., Ft. Collins CO 80524. Telephone: 970–498–1500.

(i) In-Situ Inc. Method 1002–8–2009, Dissolved Oxygen Measurement by Optical Probe. 2009. Table IB, Note 64.

(ii) In-Situ Inc. Method 1003–8–2009, Biochemical Oxygen Demand (BOD) Measurement by Optical Probe. 2009. Table IB, Note 10.

(iii) In-Situ Inc. Method 1004–8–2009, Carbonaceous Biochemical Oxygen Demand (CBOD) Measurement by Optical Probe. 2009. Table IB, Note 35.

(22) Journal of Chromatography, Elsevier/North-Holland, Inc., Journal Information Centre, 52 Vanderbilt Avenue, New York NY 10164. (Also available from most public libraries.

(i) Direct Determination of Elemental Phosphorus by Gas-Liquid Chromatography. Addison, R.F. and R.G. Ackman. 47(3): 421–426, 1970. Table IB, Note 28.

(ii) [Reserved]

(23) Lachat Instruments, 6645 W. Mill Road, Milwaukee WI 53218, Telephone: 414–358–4200.

(i) QuikChem Method 10–204–00–1–X, Digestion and Distillation of Total Cyanide in Drinking and Wastewaters using MICRO DIST and Determination of Cyanide by Flow Injection Analysis. Revision 2.2, March 2005. Table IB, Note 56.

(ii) [Reserved]

(24) Leck Mitchell, Ph.D., P.E., 656 Independence Valley Dr., Grand Junction CO 81507. Telephone: 970–244–8661.

(i) Mitchell Method M5271, Determination of Turbidity by Nephelometry. Revision 1.0, July 31, 2008. Table IB, Note 66.

(ii) Mitchell Method M5331, Determination of Turbidity by Nephelometry. Revision 1.0, July 31, 2008. Table IB, Note 65.

(25) National Council of the Paper Industry for Air and Stream Improvements, Inc. (NCASI), 260 Madison Avenue, New York NY 10016.

(i) NCASI Technical Bulletin No. 253, An Investigation of Improved Procedures for Measurement of Mill Effluent and Receiving Water Color. December 1971. Table IB, Note 18.

(ii) [Reserved]

(26) Oceanography International Corporation, 512 West Loop, P.O. Box 2980, College Station TX 77840.

(i) OIC Chemical Oxygen Demand Method. 1978. Table IB, Note 13.

(ii) [Reserved]

(27) OI Analytical, Box 9010, College Station TX 77820–9010.

(i) Method OIA–1677–09, Available Cyanide by Ligand Exchange and Flow Injection Analysis (FIA). Copyright 2010. Table IB, Note 59.

(ii) Method PAI–DK01, Nitrogen, Total Kjeldahl, Block Digestion, Steam Distillation, Titrimetric Detection. Revised December 22, 1994. Table IB, Note 39.

(iii) Method PAI–DK02, Nitrogen, Total Kjeldahl, Block Digestion, Steam Distillation, Colorimetric Detection. Revised December 22, 1994. Table IB, Note 40.

(iv) Method PAI–DK03, Nitrogen, Total Kjeldahl, Block Digestion, Automated FIA Gas Diffusion. Revised December 22, 1994. Table IB, Note 41.

(28) ORION Research Corporation, 840 Memorial Drive, Cambridge, Massachusetts 02138.

(i) ORION Research Instruction Manual, Residual Chlorine Electrode Model 97–70. 1977. Table IB, Note 16.

(ii) [Reserved]

(29) Technicon Industrial Systems, Tarrytown NY 10591.

(i) Industrial Method Number 379–75WE Ammonia, Automated Electrode Method, Technicon Auto Analyzer II. February 19, 1976. Table IB, Note 7.

(ii) [Reserved]

(30) Thermo Jarrell Ash Corporation, 27 Forge Parkway, Franklin MA 02038.

(i) Method AES0029. Direct Current Plasma (DCP) Optical Emission Spectrometric Method for Trace Elemental Analysis of Water and Wastes. 1986, Revised 1991. Table IB, Note 34.

(ii) [Reserved]

(31) Thermo Scientific, 166 Cummings Center, Beverly MA 01915. Telephone: 1–800–225–1480. *www.thermoscientific.com*.

(i) Thermo Scientific Orion Method AQ4500, Determination of Turbidity by Nephelometry. Revision 5, March 12, 2009. Table IB, Note 67.

(ii) [Reserved]

(32) 3M Corporation, 3M Center Building 220–9E–10, St. Paul MN 55144–1000.

(i) Organochlorine Pesticides and PCBs in Wastewater Using Empore™ Disk'' Test Method 3M 0222. Revised October 28, 1994. Table IC, Note 8; Table ID, Note 8.

(ii) [Reserved]

(33) U.S. Geological Survey (USGS), U.S. Department of the Interior, Reston, Virginia. Available from USGS Books and Open-File Reports (OFR) Section, Federal Center, Box 25425, Denver, CO 80225.

(i) OFR 76–177, Selected Methods of the U.S. Geological Survey of Analysis of Wastewaters. 1976. Table IE, Note 2.

(ii) OFR 91–519, Methods of Analysis by the U.S. Geological Survey National Water Quality Laboratory—Determination of Organonitrogen Herbicides in Water by Solid-Phase Extraction and Capillary-Column Gas Chromatography/Mass Spectrometry With Selected-Ion Monitoring. 1992. Table ID, Note 14.

(iii) OFR 92–146, Methods of Analysis by the U.S. Geological Survey National Water Quality Laboratory—Determination of Total Phosphorus by a Kjeldahl Digestion Method and an Automated Colorimetric Finish That Includes Dialysis. 1992. Table IB, Note 48.

(iv) OFR 93–125, Methods of Analysis by the U.S. Geological Survey National Water Quality Laboratory—Determination of Inorganic and Organic Constituents in Water and Fluvial Sediments. 1993. Table IB, Note 51; Table IC, Note 9.

(v) OFR 93–449, Methods of Analysis by the U.S. Geological Survey National Water Quality Laboratory—Determination of Chromium in Water by Graphite Furnace Atomic Absorption Spectrophotometry. 1993. Table IB, Note 46.

(vi) OFR 94–37, Methods of Analysis by the U.S. Geological Survey National Water Quality Laboratory—Determination of Triazine and Other Nitrogen-containing Compounds by Gas Chromatography with Nitrogen Phosphorus Detectors. 1994. Table ID, Note 9.

(vii) OFR 95–181, Methods of Analysis by the U.S. Geological Survey National Water Quality Laboratory—Determination of Pesticides in Water by C-18 Solid-Phase Extraction and Capillary-Column Gas Chromatography/Mass Spectrometry With Selected-Ion Monitoring. 1995. Table ID, Note 11.

(viii) OFR 97–198, Methods of Analysis by the U.S. Geological Survey National Water Quality Laboratory—Determination of Molybdenum in Water by Graphite Furnace Atomic Absorption Spectrophotometry. 1997. Table IB, Note 47.

(ix) OFR 98–165, Methods of Analysis by the U.S. Geological Survey National Water Quality Laboratory—Determination of Elements in Whole-Water Digests Using Inductively Coupled Plasma-Optical Emission Spectrometry and Inductively Coupled Plasma-Mass Spectrometry. 1998. Table IB, Note 50.

(x) OFR 98–639, Methods of Analysis by the U.S. Geological Survey National Water Quality Laboratory—Determination of Arsenic and Selenium in Water and Sediment by Graphite Furnace—Atomic Absorption Spectrometry. 1999. Table IB, Note 49.

(xi) OFR 00–170, Methods of Analysis by the U.S. Geological Survey National Water Quality Laboratory—Determination of Ammonium Plus Organic Nitrogen by a Kjeldahl Digestion Method and an Automated Photometric Finish that Includes Digest Cleanup by Gas Diffusion. 2000. Table IB, Note 45.

(xii) Water-Resources Investigation Report 01–4098, Methods of Analysis by the U.S. Geological Survey National Water Quality Laboratory—Determination of Moderate-Use Pesticides and Selected Degradates in Water by C-18 Solid-Phase Extraction and Gas Chromatography/Mass Spectrometry. 2001. Table ID, Note 13.

(xiii) Water-Resources Investigations Report 01–4132, Methods of Analysis by the U.S. Geological Survey National Water Quality Laboratory—Determination of Organic Plus Inorganic Mercury in Filtered and Unfiltered Natural Water With Cold Vapor-Atomic Fluorescence Spectrometry. 2001. Table IB, Note 71.

(xiv) Water-Resources Investigation Report 01–4134, Methods of Analysis by the U.S. Geological Survey National Water Quality Laboratory—Determination of Pesticides in Water by Graphitized Carbon-Based Solid-Phase Extraction and High-Performance Liquid Chormatography/Mass Spectrometry. 2001. Table ID, Note 12.

(xv) Methods for Determination of Inorganic Substances in Water and Fluvial Sediments, editors, Techniques of Water-Resources Investigations of the U.S. Geological Survey, Book 5, Chapter A1. 1979. Table IB, Note 8.

(xvi) Methods for Determination of Inorganic Substances in Water and Fluvial Sediments, Techniques of Water-Resources Investigations of the U.S. Geological Survey, Book 5, Chapter A1. 1989. Table IB, Note 2.

(xvii) Methods for the Determination of Organic Substances in Water and Fluvial Sediments. Techniques of Water-Resources Investigations of the U.S. Geological Survey, Book 5, Chapter A3. 1987. Table IB, Note 24; Table ID, Note 4.

(xviii) Techniques and Methods Book 5–B1, Determination of Elements in Natural-Water, Biota, Sediment and Soil Samples Using Collision/Reaction Cell Inductively Coupled Plasma-Mass Spectrometry. Chapter 1, Section B, Methods of the National Water Quality Laboratory, Book 5, Laboratory Analysis. 2006. Table IB, Note 70.

(xix) U.S. Geological Survey Techniques of Water-Resources Investigations, Book 5, Laboratory Analysis, Chapter A4, Methods for Collection and Analysis of Aquatic Biological and Microbiological Samples. 1989. Table IA, Note 4; Table IH, Note 4.

(xx) Water Temperature—Influential Factors, Field Measurement and Data Presentation, Techniques of Water-Resources Investigations of the U.S. Geological Survey, Book 1, Chapter D1. 1975. Table IB, Note 32.

(34) Waters Corporation, 34 Maple Street, Milford MA 01757, Telephone: 508–482–2131, Fax: 508–482–3625.

(i) Method D6508, Test Method for Determination of Dissolved Inorganic Anions in Aqueous Matrices Using Capillary Ion Electrophoresis and Chromate Electrolyte. Revision 2, December 2000. Table IB, Note 54.

(ii) [Reserved]

* * * * *

(e) Sample preservation procedures, container materials, and maximum allowable holding times for parameters are cited in Tables IA, IB, IC, ID, IE, IF, IG, and IH are prescribed in Table II. Information in the table takes precedence over information in specific methods or elsewhere. Any person may apply for a change from the prescribed preservation techniques, container materials, and maximum holding times applicable to samples taken from a specific discharge. Applications for such limited use changes may be made by letters to the Regional Alternative Test Procedure (ATP) Program Coordinator or the permitting authority in the Region in which the discharge will occur. Sufficient data should be

provided to assure such changes in sample preservation, containers or holding times do not adversely affect the integrity of the sample. The Regional ATP Coordinator or permitting authority will review the application and then notify the applicant and the appropriate State agency of approval or rejection of the use of the alternate test procedure. A decision to approve or deny any request on deviations from the prescribed Table II requirements will be made within 90 days of receipt of the application by the Regional Administrator. An analyst may not modify any sample preservation and/or holding time requirements of an approved method unless the requirements of this section are met.

TABLE II—REQUIRED CONTAINERS, PRESERVATION TECHNIQUES, AND HOLDING TIMES

Parameter number/name	Container [1]	Preservation [2,3]	Maximum holding time [4]
Table IA—Bacterial Tests:			
1–5. Coliform, total, fecal, and *E. coli*	PA, G	Cool, <10 °C, 0.0008% $Na_2S_2O_3$ [5].	8 hours.[22,23]
6. Fecal streptococci	PA, G	Cool, <10 °C, 0.0008% $Na_2S_2O_3$ [5].	8 hours.[22]
7. Enterococci	PA, G	Cool, <10 °C, 0.0008% $Na_2S_2O_3$ [5].	8 hours.[22]
8. *Salmonella*	PA, G	Cool, <10 °C, 0.0008% $Na_2S_2O_3$ [5].	8 hours.[22]
Table IA—Aquatic Toxicity Tests:			
9–12. Toxicity, acute and chronic	P, FP, G	Cool, ≤6 °C [16]	36 hours.
Table IB—Inorganic Tests:			
1. Acidity	P, FP, G	Cool, ≤6 °C [18]	14 days.
2. Alkalinity	P, FP, G	Cool, ≤6 °C [18]	14 days.
4. Ammonia	P, FP, G	Cool, ≤6 °C [18], H_2SO_4 to pH <2.	28 days.
9. Biochemical oxygen demand	P, FP, G	Cool, ≤6 °C [18]	48 hours.
10. Boron	P, FP, or Quartz	HNO_3 to pH <2	6 months.
11. Bromide	P, FP, G	None required	28 days.
14. Biochemical oxygen demand, carbonaceous	P, FP G	Cool, ≤6 °C [18]	48 hours.
15. Chemical oxygen demand	P, FP, G	Cool, ≤6 °C [18], H_2SO_4 to pH <2.	28 days.
16. Chloride	P, FP, G	None required	28 days.
17. Chlorine, total residual	P, G	None required	Analyze within 15 minutes.
21. Color	P, FP, G	Cool, ≤6 °C [18]	48 hours.
23–24. Cyanide, total or available (or CATC) and free.	P, FP, G	Cool, ≤6 °C [18], NaOH to pH >10 [5,6], reducing agent if oxidizer present.	14 days.
25. Fluoride	P	None required	28 days.
27. Hardness	P, FP, G	HNO_3 or H_2SO_4 to pH <2	6 months.
28. Hydrogen ion (pH)	P, FP, G	None required	Analyze within 15 minutes.
31, 43. Kjeldahl and organic N	P, FP, G	Cool, ≤6 °C[18], H_2SO_4 to pH <2.	28 days.
Table IB—Metals: [7]			
18. Chromium VI	P, FP, G	Cool, ≤6 °C[18], pH = 9.3–9.7 [20].	28 days.
35. Mercury (CVAA)	P, FP, G	HNO_3 to pH <2	28 days.
35. Mercury (CVAFS)	FP, G; and FP-lined cap [17]	5 mL/L 12N HCl or 5 mL/L BrCl [17].	90 days.[17]
3, 5–8, 12, 13, 19, 20, 22, 26, 29, 30, 32–34, 36, 37, 45, 47, 51, 52, 58–60, 62, 63, 70–72, 74, 75. Metals, except boron, chromium VI, and mercury.	P, FP, G	HNO_3 to pH <2, or at least 24 hours prior to analysis [19].	6 months.
38. Nitrate	P, FP, G	Cool, ≤6 °C [18]	48 hours.
39. Nitrate-nitrite	P, FP, G	Cool, ≤6 °C[18], H_2SO_4 to pH <2.	28 days.
40. Nitrite	P, FP, G	Cool, ≤6 °C [18]	48 hours.
41. Oil and grease	G	Cool to ≤6 °C[18], HCl or H_2SO_4 to pH <2.	28 days.
42. Organic Carbon	P, FP, G	Cool to ≤6 °C [18], HCl, H_2SO_4, or H_3PO_4 to pH <2.	28 days.
44. Orthophosphate	P, FP, G	Cool, to ≤6 °C [18,24]	Filter within 15 minutes; Analyze within 48 hours.
46. Oxygen, Dissolved Probe	G, Bottle and top	None required	Analyze within 15 minutes.
47. Winkler	G, Bottle and top	Fix on site and store in dark.	8 hours.
48. Phenols	G	Cool, ≤6 °C[18], H_2SO_4 to pH <2.	28 days.
49. Phosphorous (elemental)	G	Cool, ≤6 °C [18]	48 hours.
50. Phosphorous, total	P, FP, G	Cool, ≤6 °C [18], H_2SO_4 to pH <2.	28 days.
53. Residue, total	P, FP, G	Cool, ≤6 °C [18]	7 days.
54. Residue, Filterable	P, FP, G	Cool, ≤6 °C [18]	7 days.

TABLE II—REQUIRED CONTAINERS, PRESERVATION TECHNIQUES, AND HOLDING TIMES—Continued

Parameter number/name	Container [1]	Preservation [2,3]	Maximum holding time [4]
55. Residue, Nonfilterable (TSS)	P, FP, G	Cool, ≤6 °C [18]	7 days.
56. Residue, Settleable	P, FP, G	Cool, ≤6 °C [18]	48 hours.
57. Residue, Volatile	P, FP, G	Cool, ≤6 °C [18]	7 days.
61. Silica	P or Quartz	Cool, ≤6 °C [18]	28 days.
64. Specific conductance	P, FP, G	Cool, ≤6 °C [18]	28 days.
65. Sulfate	P, FP, G	Cool, ≤6 °C [18]	28 days.
66. Sulfide	P, FP, G	Cool, ≤6 °C [18], add zinc acetate plus sodium hydroxide to pH >9.	7 days.
67. Sulfite	P, FP, G	None required	Analyze within 15 minutes.
68. Surfactants	P, FP, G	Cool, ≤6 °C [18]	48 hours.
69. Temperature	P, FP, G	None required	Analyze.
73. Turbidity	P, FP, G	Cool, ≤6 °C [18]	48 hours.
Table IC—Organic Tests: [8]	.		
13, 18–20, 22, 24–28, 34–37, 39–43, 45–47, 56, 76, 104, 105, 108–111, 113. Purgeable Halocarbons.	G, FP-lined septum	Cool, ≤6 °C [18], 0.008% $Na_2S_2O_3$[5].	14 days.
6, 57, 106. Purgeable aromatic hydrocarbons	G, FP-lined septum	Cool, ≤6 °C[18], 0.008% $Na_2S_2O_3$ [5], HCl to pH 2 [9].	14 days.[9]
3, 4. Acrolein and acrylonitrile	G, FP-lined septum	Cool, ≤6 °C [18], 0.008% $Na_2S_2O_3$, pH to 4–5[10].	14 days.[10]
23, 30, 44, 49, 53, 77, 80, 81, 98, 100, 112. Phenols [11].	G, FP-lined cap	Cool, ≤6 °C [18], 0.008% $Na_2S_2O_3$.	7 days until extraction, 40 days after extraction.
7, 38. Benzidines [11,12]	G, FP-lined cap	Cool, ≤6 °C [18], 0.008% $Na_2S_2O_3$[5].	7 days until extraction.[13]
14, 17, 48, 50–52. Phthalate esters [11]	G, FP-lined cap	Cool, ≤6 °C [18]	7 days until extraction, 40 days after extraction.
82–84. Nitrosamines [11,14]	G, FP-lined cap	Cool, ≤6 °C[18], store in dark, 0.008% $Na_2S_2O_3$[5].	7 days until extraction, 40 days after extraction.
88–94. PCBs [11]	G, FP-lined cap	Cool, ≤6 °C [18]	1 year until extraction, 1 year after extraction.
54, 55, 75, 79. Nitroaromatics and isophorone [11]	G, FP-lined cap	Cool, ≤6 °C [18], store in dark, 0.008% $Na_2S_2O_3$[5].	7 days until extraction, 40 days after extraction.
1, 2, 5, 8–12, 32, 33, 58, 59, 74, 78, 99, 101. Polynuclear aromatic hydrocarbons [11].	G, FP-lined cap	Cool, ≤6 °C [18], store in dark, 0.008% $Na_2S_2O_3$[5].	7 days until extraction, 40 days after extraction.
15, 16, 21, 31, 87. Haloethers [11]	G, FP-lined cap	Cool, ≤6 °C [18], 0.008% $Na_2S_2O_3$[5].	7 days until extraction, 40 days after extraction.
29, 35–37, 63–65, 107. Chlorinated hydrocarbons [11].	G, FP-lined cap	Cool, ≤6 °C [18]	7 days until extraction, 40 days after extraction.
60–62, 66–72, 85, 86, 95–97, 102, 103. CDDs/CDFs [11].	.		
Aqueous Samples: Field and Lab Preservation	G	Cool, ≤6 °C [18], 0.008% $Na_2S_2O_3$[5], pH <9.	1 year.
Solids and Mixed-Phase Samples: Field Preservation.	G	Cool, ≤6 °C [18]	7 days.
Tissue Samples: Field Preservation	G	Cool, ≤6 °C [18]	24 hours.
Solids, Mixed-Phase, and Tissue Samples: Lab Preservation.	G	Freeze, ≤ −10 °C	1 year.
114–118. Alkylated phenols	G	Cool, <6 °C, H_2SO_4 to pH <2.	28 days until extraction, 40 days after extraction.
119. Adsorbable Organic Halides (AOX)	G	Cool, <6 °C, 0.008% $Na_2S_2O_3$ HNO_3 to pH <2.	Hold *at least* 3 days, but not more than 6 months.
120. Chlorinated Phenolics		Cool, <6 °C, 0.008% $Na_2S_2O_3$ H_2SO_4 to pH <2.	30 days until acetylation, 30 days after acetylation.
Table ID—Pesticides Tests:			
1–70. Pesticides [11]	G, FP-lined cap	Cool, ≤6 °C[18], pH 5–9–[15]	7 days until extraction, 40 days after extraction.
Table IE—Radiological Tests:			
1–5. Alpha, beta, and radium	P, FP, G	HNO_3 to pH <2	6 months.
Table IH—Bacterial Tests:			
1. *E. coli*	PA, G	Cool, <10 °C, 0.0008% $Na_2S_2O_3$[5].	8 hours.[22]
2. Enterococci	PA, G	Cool, <10 °C, 0.0008% $Na_2S_2O_3$ [5].	8 hours.[22]
Table IH—Protozoan Tests:	.		
8. *Cryptosporidium*	LDPE; field filtration	1–10 °C	96 hours.[21]
9. *Giardia*	LDPE; field filtration	1–10 °C	96 hours.[21]

[1] "P" is for polyethylene; "FP" is fluoropolymer (polytetrafluoroethylene (PTFE); Teflon®), or other fluoropolymer, unless stated otherwise in this Table II; "G" is glass; "PA" is any plastic that is made of a sterilizable material (polypropylene or other autoclavable plastic); "LDPE" is low density polyethylene.

[2] Except where noted in this Table II and the method for the parameter, preserve each grab sample within 15 minutes of collection. For a composite sample collected with an automated sample (*e.g.,* using a 24-hour composite sample; see 40 CFR 122.21(g)(7)(i) or 40 CFR Part 403, Appendix E), refrigerate the sample at ≤ 6 °C during collection unless specified otherwise in this Table II or in the method(s). For a composite sample to be split into separate aliquots for preservation and/or analysis, maintain the sample at ≤ 6 °C, unless specified otherwise in this Table II or in the method(s), until collection, splitting, and preservation is completed. Add the preservative to the sample container prior to sample collection when the preservative will not compromise the integrity of a grab sample, a composite sample, or aliquot split from a composite sample within 15 minutes of collection. If a composite measurement is required but a composite sample would compromise sample integrity, individual grab samples must be collected at prescribed time intervals (*e.g.,* 4 samples over the course of a day, at 6-hour intervals). Grab samples must be analyzed separately and the concentrations averaged. Alternatively, grab samples may be collected in the field and composited in the laboratory if the compositing procedure produces results equivalent to results produced by arithmetic averaging of results of analysis of individual grab samples. For examples of laboratory compositing procedures, see EPA Method 1664 Rev. A (oil and grease) and the procedures at 40 CFR 141.34(f)(14)(iv) and (v) (volatile organics).

[3] When any sample is to be shipped by common carrier or sent via the U.S. Postal Service, it must comply with the Department of Transportation Hazardous Materials Regulations (49 CFR part 172). The person offering such material for transportation is responsible for ensuring such compliance. For the preservation requirement of Table II, the Office of Hazardous Materials, Materials Transportation Bureau, Department of Transportation has determined that the Hazardous Materials Regulations do not apply to the following materials: Hydrochloric acid (HCl) in water solutions at concentrations of 0.04% by weight or less (pH about 1.96 or greater; Nitric acid (HNO_3) in water solutions at concentrations of 0.15% by weight or less (pH about 1.62 or greater); Sulfuric acid (H_2SO_4) in water solutions at concentrations of 0.35% by weight or less (pH about 1.15 or greater); and Sodium hydroxide (NaOH) in water solutions at concentrations of 0.080% by weight or less (pH about 12.30 or less).

[4] Samples should be analyzed as soon as possible after collection. The times listed are the maximum times that samples may be held before the start of analysis and still be considered valid. Samples may be held for longer periods only if the permittee or monitoring laboratory has data on file to show that, for the specific types of samples under study, the analytes are stable for the longer time, and has received a variance from the Regional Administrator under Sec. 136.3(e). For a grab sample, the holding time begins at the time of collection. For a composite sample collected with an automated sampler (*e.g.,* using a 24-hour composite sampler; see 40 CFR 122.21(g)(7)(i) or 40 CFR part 403, Appendix E), the holding time begins at the time of the end of collection of the composite sample. For a set of grab samples composited in the field or laboratory, the holding time begins at the time of collection of the last grab sample in the set. Some samples may not be stable for the maximum time period given in the table. A permittee or monitoring laboratory is obligated to hold the sample for a shorter time if it knows that a shorter time is necessary to maintain sample stability. See 136.3(e) for details. The date and time of collection of an individual grab sample is the date and time at which the sample is collected. For a set of grab samples to be composited, and that are all collected on the same calendar date, the date of collection is the date on which the samples are collected. For a set of grab samples to be composited, and that are collected across two calendar dates, the date of collection is the dates of the two days; *e.g.,* November 14–15. For a composite sample collected automatically on a given date, the date of collection is the date on which the sample is collected. For a composite sample collected automatically, and that is collected across two calendar dates, the date of collection is the dates of the two days; *e.g.,* November 14–15. For static-renewal toxicity tests, each grab or composite sample may also be used to prepare test solutions for renewal at 24 h, 48 h, and/or 72 h after first use, if stored at 0–6 °C, with minimum head space.

[5] ASTM D7365–09a specifies treatment options for samples containing oxidants (e.g., chlorine). Also, Section 9060A of Standard Methods for the Examination of Water and Wastewater (20th and 21st editions) addresses dechlorination procedures.

[6] Sampling, preservation and mitigating interferences in water samples for analysis of cyanide are described in ASTM D7365–09a. There may be interferences that are not mitigated by the analytical test methods or D7365–09a. Any technique for removal or suppression of interference may be employed, provided the laboratory demonstrates that it more accurately measures cyanide through quality control measures described in the analytical test method. Any removal or suppression technique not described in D7365–09a or the analytical test method must be documented along with supporting data.

[7] For dissolved metals, filter grab samples within 15 minutes of collection and before adding preservatives. For a composite sample collected with an automated sampler (*e.g.,* using a 24-hour composite sampler; see 40 CFR 122.21(g)(7)(i) or 40 CFR Part 403, Appendix E), filter the sample within 15 minutes after completion of collection and before adding preservatives. If it is known or suspected that dissolved sample integrity will be compromised during collection of a composite sample collected automatically over time (*e.g.,* by interchange of a metal between dissolved and suspended forms), collect and filter grab samples to be composited (footnote 2) in place of a composite sample collected automatically.

[8] Guidance applies to samples to be analyzed by GC, LC, or GC/MS for specific compounds.

[9] If the sample is not adjusted to pH 2, then the sample must be analyzed within seven days of sampling.

[10] The pH adjustment is not required if acrolein will not be measured. Samples for acrolein receiving no pH adjustment must be analyzed within 3 days of sampling.

[11] When the extractable analytes of concern fall within a single chemical category, the specified preservative and maximum holding times should be observed for optimum safeguard of sample integrity (*i.e.,* use all necessary preservatives and hold for the shortest time listed). When the analytes of concern fall within two or more chemical categories, the sample may be preserved by cooling to ≤ 6 °C, reducing residual chlorine with 0.008% sodium thiosulfate, storing in the dark, and adjusting the pH to 6–9; samples preserved in this manner may be held for seven days before extraction and for forty days after extraction. Exceptions to this optional preservation and holding time procedure are noted in footnote 5 (regarding the requirement for thiosulfate reduction), and footnotes 12, 13 (regarding the analysis of benzidine).

[12] If 1,2-diphenylhydrazine is likely to be present, adjust the pH of the sample to 4.0 ± 0.2 to prevent rearrangement to benzidine.

[13] Extracts may be stored up to 30 days at < 0 °C.

[14] For the analysis of diphenylnitrosamine, add 0.008% $Na_2S_2O_3$ and adjust pH to 7–10 with NaOH within 24 hours of sampling.

[15] The pH adjustment may be performed upon receipt at the laboratory and may be omitted if the samples are extracted within 72 hours of collection. For the analysis of aldrin, add 0.008% $Na_2S_2O_3$.

[16] Place sufficient ice with the samples in the shipping container to ensure that ice is still present when the samples arrive at the laboratory. However, even if ice is present when the samples arrive, immediately measure the temperature of the samples and confirm that the preservation temperature maximum has not been exceeded. In the isolated cases where it can be documented that this holding temperature cannot be met, the permittee can be given the option of on-site testing or can request a variance. The request for a variance should include supportive data which show that the toxicity of the effluent samples is not reduced because of the increased holding temperature. Aqueous samples must not be frozen. Hand-delivered samples used on the day of collection do not need to be cooled to 0 to 6 °C prior to test initiation.

[17] Samples collected for the determination of trace level mercury (<100 ng/L) using EPA Method 1631 must be collected in tightly-capped fluoropolymer or glass bottles and preserved with BrCl or HCl solution within 48 hours of sample collection. The time to preservation may be extended to 28 days if a sample is oxidized in the sample bottle. A sample collected for dissolved trace level mercury should be filtered in the laboratory within 24 hours of the time of collection. However, if circumstances preclude overnight shipment, the sample should be filtered in a designated clean area in the field in accordance with procedures given in Method 1669. If sample integrity will not be maintained by shipment to and filtration in the laboratory, the sample must be filtered in a designated clean area in the field within the time period necessary to maintain sample integrity. A sample that has been collected for determination of total or dissolved trace level mercury must be analyzed within 90 days of sample collection.

[18] Aqueous samples must be preserved at ≤ 6 °C, and should not be frozen unless data demonstrating that sample freezing does not adversely impact sample integrity is maintained on file and accepted as valid by the regulatory authority. Also, for purposes of NPDES monitoring, the specification of "≤ °C" is used in place of the "4 °C" and "< 4 °C" sample temperature requirements listed in some methods. It is not necessary to measure the sample temperature to three significant figures (1/100th of 1 degree); rather, three significant figures are specified so that rounding down to 6 °C may not be used to meet the ≤6 °C requirement. The preservation temperature does not apply to samples that are analyzed immediately (less than 15 minutes).

[19] An aqueous sample may be collected and shipped without acid preservation. However, acid must be added at least 24 hours before analysis to dissolve any metals that adsorb to the container walls. If the sample must be analyzed within 24 hours of collection, add the acid immediately (see footnote 2). Soil and sediment samples do not need to be preserved with acid. The allowances in this footnote supersede the preservation and holding time requirements in the approved metals methods.

[20] To achieve the 28-day holding time, use the ammonium sulfate buffer solution specified in EPA Method 218.6. The allowance in this footnote supersedes preservation and holding time requirements in the approved hexavalent chromium methods, unless this supersession would compromise the measurement, in which case requirements in the method must be followed.

[21] Holding time is calculated from time of sample collection to elution for samples shipped to the laboratory in bulk and calculated from the time of sample filtration to elution for samples filtered in the field.

[22] Sample analysis should begin as soon as possible after receipt; sample incubation must be started no later than 8 hours from time of collection.

[23] For fecal coliform samples for sewage sludge (biosolids) only, the holding time is extended to 24 hours for the following sample types using either EPA Method 1680 (LTB–EC) or 1681 (A–1): Class A composted, Class B aerobically digested, and Class B anaerobically digested.

[24] The immediate filtration requirement in orthophosphate measurement is to assess the dissolved or bio-available form of orthophosphorus (*i.e.,* that which passes through a 0.45-micron filter), hence the requirement to filter the sample immediately upon collection (*i.e.,* within 15 minutes of collection).

■ 4. Section 136.4 is revised to read as follows:

§ 136.4 Application for and approval of alternate test procedures for nationwide use.

(a) A written application for review of an alternate test procedure (alternate method) for nationwide use may be made by letter via email or by hard copy in triplicate to the National Alternate Test Procedure (ATP) Program Coordinator (National Coordinator), Office of Science and Technology (4303T), Office of Water, U.S. Environmental Protection Agency, 1200 Pennsylvania Ave. NW., Washington, DC 20460. Any application for an alternate test procedure (ATP) under this paragraph (a) shall:

(1) Provide the name and address of the responsible person or firm making the application.

(2) Identify the pollutant(s) or parameter(s) for which nationwide approval of an alternate test procedure is being requested.

(3) Provide a detailed description of the proposed alternate test procedure, together with references to published or other studies confirming the general applicability of the alternate test procedure for the analysis of the pollutant(s) or parameter(s) in wastewater discharges from representative and specified industrial or other categories.

(4) Provide comparability data for the performance of the proposed alternative test procedure compared to the performance of the reference method.

(b) The National Coordinator may request additional information and analyses from the applicant in order to determine whether the alternate test procedure satisfies the applicable requirements of this Part.

(c) *Approval for nationwide use.* (1) After a review of the application and any additional analyses requested from the applicant, the National Coordinator will notify the applicant, in writing, of acceptance or rejection of the alternate test procedure for nationwide use in CWA programs. If the application is not approved, the National Coordinator will specify what additional information might lead to a reconsideration of the application, and notify the Regional Alternate Test Procedure Coordinators of such rejection. Based on the National Coordinator's rejection of a proposed alternate test procedure and an assessment of any approvals for limited uses for the unapproved method, the Regional ATP Coordinator or permitting authority may decide to withdraw approval of the method for limited use in the Region.

(2) Where the National Coordinator approved an applicant's request for nationwide use of an alternate test procedure, the National Coordinator will notify the applicant that the National Coordinator will recommend rulemaking to approve the alternate test procedure. The National Coordinator will notify the Regional ATP Coordinator or permitting authorities that they may consider approval of this alternate test procedure for limited use in their Regions based on the information and data provided in the applicant's application. The Regional ATP Coordinator or permitting authority will grant approval on a case-by-case basis prior to use of the alternate test procedure for compliance analyses until the alternate test procedure is approved by publication in a final rule in the **Federal Register**.

(3) EPA will propose to amend 40 CFR Part 136 to include the alternate test procedure in § 136.3. EPA shall make available for review all the factual bases for its proposal, including any performance data submitted by the applicant and any available EPA analysis of those data.

(4) Following public comment, EPA shall publish in the **Federal Register** a final decision on whether to amend 40 CFR Part 136 to include the alternate test procedure as an approved analytical method.

(5) Whenever the National Coordinator has approved an applicant's request for nationwide use of an alternate test procedure, any person may request an approval of the method for limited use under § 136.5 from the EPA Region.

■ 5. Section 136.5 is revised to read as follows:

§ 136.5 Approval of alternate test procedures for limited use.

(a) Any person may request the Regional Alternate Test Procedure (ATP) Coordinator or permitting authority to approve the use of an alternate test procedure in the Region.

(b) When the request for the use of an alternate test procedure concerns use in a State with an NPDES permit program approved pursuant to section 402 of the Act, the requestor shall first submit an application for limited use to the Director of the State agency having responsibility for issuance of NPDES permits within such State (*i.e.,* permitting authority). The Director will forward the application to the Regional ATP Coordinator or permitting authority with a recommendation for or against approval.

(c) Any application for approval of an alternate test procedure for limited use may be made by letter, email or by hard copy. The application shall include the following:

(1) Provide the name and address of the applicant and the applicable ID number of the existing or pending permit and issuing agency for which use of the alternate test procedure is requested, and the discharge serial number.

(2) Identify the pollutant or parameter for which approval of an alternate test procedure is being requested.

(3) Provide justification for using testing procedures other than those specified in Tables IA through IH of § 136.3, or in the NPDES permit.

(4) Provide a detailed description of the proposed alternate test procedure, together with references to published studies of the applicability of the alternate test procedure to the effluents in question.

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(5) Provide comparability data for the performance of the proposed alternate test procedure compared to the performance of the reference method.

(d) *Approval for limited use.* (1) After a review of the application by the Alternate Test Procedure Regional ATP Coordinator or permitting authority, the Regional ATP Coordinator or permitting authority notifies the applicant and the appropriate State agency of approval or rejection of the use of the alternate test procedure. The approval may be restricted to use only with respect to a specific discharge or facility (and its laboratory) or, at the discretion of the Regional ATP Coordinator or permitting authority, to all discharger or facilities (and their associated laboratories) specified in the approval for the Region. If the application is not approved, the Regional ATP Coordinator or permitting authority shall specify what additional information might lead to a reconsideration of the application.

(2) The Regional ATP Coordinator or permitting authority will forward a copy of every approval and rejection notification to the National Alternate Test Procedure Coordinator.

■ 6. Section 136.6 is revised to read as follows:

§ 136.6 Method modifications and analytical requirements.

(a) *Definitions of terms used in this section*—(1) *Analyst* means the person or laboratory using a test procedure (analytical method) in this Part.

(2) *Chemistry of the method* means the reagents and reactions used in a test procedure that allow determination of the analyte(s) of interest in an environmental sample.

(3) *Determinative technique* means the way in which an analyte is identified and quantified (*e.g.,* colorimetry, mass spectrometry).

(4) *Equivalent performance* means that the modified method produces results that meet or exceed the QC acceptance criteria of the approved method.

(5) *Method-defined analyte* means an analyte defined solely by the method used to determine the analyte. Such an analyte may be a physical parameter, a parameter that is not a specific chemical, or a parameter that may be comprised of a number of substances. Examples of such analytes include temperature, oil and grease, total suspended solids, total phenolics, turbidity, chemical oxygen demand, and biochemical oxygen demand.

(6) *QC* means ''quality control.''

(b) *Method modifications.* (1) If the underlying chemistry and determinative technique in a modified method are essentially the same as an approved Part 136 method, then the modified method is an equivalent and acceptable alternative to the approved method provided the requirements of this section are met. However, those who develop or use a modification to an approved (Part 136) method must document that the performance of the modified method, in the matrix to which the modified method will be applied, is equivalent to the performance of the approved method. If such a demonstration cannot be made and documented, then the modified method is not an acceptable alternative to the approved method. Supporting documentation must, if applicable, include the routine initial demonstration of capability and ongoing QC including determination of precision and accuracy, detection limits, and matrix spike recoveries. Initial demonstration of capability typically includes analysis of four replicates of a mid-level standard and a method detection limit study. Ongoing quality control typically includes method blanks, mid-level laboratory control samples, and matrix spikes (QC is as specified in the method). The method is considered equivalent if the quality control requirements in the reference method are achieved. The method user's Standard Operating Procedure (SOP) must clearly document the modifications made to the reference method. Examples of allowed method modifications are listed in this section. The user must notify their permitting authority of the intent to use a modified method. Such notification should be of the form ''Method xxx has been modified within the flexibility allowed in 40 CFR 136.6.'' The user may indicate the specific paragraph of § 136.6 allowing the method modification. However, specific details of the modification need not be provided, but must be documented in the Standard Operating Procedure (SOP). If the method user is uncertain whether a method modification is allowed, the Regional ATP Coordinator or permitting authority should be contacted for approval *prior* to implementing the modification. The method user should also complete necessary performance checks to verify that acceptable performance is achieved with the method modification *prior* to analyses of compliance samples.

(2) *Requirements.* The modified method must be sufficiently sensitive and meet or exceed performance of the approved method(s) for the analyte(s) of interest, as documented by meeting the initial and ongoing quality control requirements in the method.

(i) *Requirements for establishing equivalent performance.* If the approved method contains QC tests and QC acceptance criteria, the modified method must use these QC tests and the modified method must meet the QC acceptance criteria with the following conditions:

(A) The analyst may only rely on QC tests and QC acceptance criteria in a method if it includes wastewater matrix QC tests and QC acceptance criteria (*e.g.,* matrix spikes) and both initial (start-up) and ongoing QC tests and QC acceptance criteria.

(B) If the approved method does not contain QC tests and QC acceptance criteria or if the QC tests and QC acceptance criteria in the method do not meet the requirements of this section, then the analyst must employ QC tests published in the ''equivalent'' of a Part 136 method that has such QC, or the essential QC requirements specified at 136.7, as applicable. If the approved method is from a compendium or VCSB and the QA/QC requirements are published in other parts of that organization's compendium rather than within the Part 136 method then that part of the organization's compendium must be used for the QC tests.

(C) In addition, the analyst must perform ongoing QC tests, including assessment of performance of the modified method on the sample matrix (*e.g.,* analysis of a matrix spike/matrix spike duplicate pair for every twenty samples), and analysis of an ongoing precision and recovery sample (*e.g.,* laboratory fortified blank or blank spike) and a blank with each batch of 20 or fewer samples.

(D) If the performance of the modified method in the wastewater matrix or reagent water does not meet or exceed the QC acceptance criteria, the method modification may not be used.

(ii) *Requirements for documentation.* The modified method must be documented in a method write-up or an addendum that describes the modification(s) to the approved method prior to the use of the method for compliance purposes. The write-up or addendum must include a reference number (*e.g.,* method number), revision number, and revision date so that it may be referenced accurately. In addition, the organization that uses the modified method must document the results of QC tests and keep these records, along with a copy of the method write-up or addendum, for review by an auditor.

(3) *Restrictions.* An analyst may not modify an approved Clean Water Act analytical method for a method-defined

analyte. In addition, an analyst may not modify an approved method if the modification would result in measurement of a different form or species of an analyte. Changes in method procedures are not allowed if such changes would alter the defined chemistry (*i.e.,* method principle) of the unmodified method. For example, phenol method 420.1 or 420.4 defines phenolics as ferric iron oxidized compounds that react with 4-aminoantipyrine (4-AAP) at pH 10 after being distilled from acid solution. Because total phenolics represents a group of compounds that all react at different efficiencies with 4-AAP, changing test conditions likely would change the behavior of these different phenolic compounds. An analyst may not modify any sample collection, preservation, or holding time requirements of an approved method. Such modifications to sample collection, preservation, and holding time requirements do not fall within the scope of the flexibility allowed at § 136.6. Method flexibility refers to modifications of the analytical procedures used for identification and measurement of the analyte only and does not apply to sample collection, preservation, or holding time procedures, which may only be modified as specified in § 136.3(e).

(4) *Allowable changes.* Except as noted under paragraph (b)(3) of this section, an analyst may modify an approved test procedure (analytical method) provided that the underlying reactions and principles used in the approved method remain essentially the same, and provided that the requirements of this section are met. If equal or better performance can be obtained with an alternative reagent, then it is allowed. A laboratory wishing to use these modifications must demonstrate acceptable method performance by performing and documenting all applicable initial demonstration of capability and ongoing QC tests and meeting all applicable QC acceptance criteria as described in § 136.7. Some examples of the allowed types of changes, provided the requirements of this section are met include:

(i) Changes between manual method, flow analyzer, and discrete instrumentation.

(ii) Changes in chromatographic columns or temperature programs.

(iii) Changes between automated and manual sample preparation, such as digestions, distillations, and extractions; in-line sample preparation is an acceptable form of automated sample preparation for CWA methods.

(iv) In general, ICP–MS is a sensitive and selective detector for metal analysis; however isobaric interference can cause problems for quantitative determination, as well as identification based on the isotope pattern. Interference reduction technologies, such as collision cells or reaction cells, are designed to reduce the effect of spectroscopic interferences that may bias results for the element of interest. The use of interference reduction technologies is allowed, provided the method performance specifications relevant to ICP–MS measurements are met.

(v) The use of EPA Method 200.2 or the sample preparation steps from EPA Method 1638, including the use of closed-vessel digestion, is allowed for EPA Method 200.8, provided the method performance specifications relevant to the ICP–MS are met.

(vi) Changes in pH adjustment reagents. Changes in compounds used to adjust pH are acceptable as long as they do not produce interference. For example, using a different acid to adjust pH in colorimetric methods.

(vii) Changes in buffer reagents are acceptable provided that the changes do not produce interferences.

(viii) Changes in the order of reagent addition are acceptable provided that the change does not alter the chemistry and does not produce an interference. For example, using the same reagents, but adding them in different order, or preparing them in combined or separate solutions (so they can be added separately), is allowed, provided reagent stability or method performance is equivalent or improved.

(ix) Changes in calibration range (provided that the modified range covers any relevant regulatory limit and the method performance specifications for calibration are met).

(x) Changes in calibration model. (A) Linear calibration models do not adequately fit calibration data with one or two inflection points. For example, vendor-supplied data acquisition and processing software on some instruments may provide quadratic fitting functions to handle such situations. If the calibration data for a particular analytical method routinely display quadratic character, using quadratic fitting functions may be acceptable. In such cases, the minimum number of calibrators for second order fits should be six, and in no case should concentrations be extrapolated for instrument responses that exceed that of the most concentrated calibrator. Examples of methods with nonlinear calibration functions include chloride by SM4500–Cl–E–1997, hardness by EPA Method 130.1, cyanide by ASTM D6888 or OIA1677, Kjeldahl nitrogen by PAI–DK03, and anions by EPA Method 300.0.

(B) As an alternative to using the average response factor, the quality of the calibration may be evaluated using the Relative Standard Error (RSE). The acceptance criterion for the RSE is the same as the acceptance criterion for Relative Standard Deviation (RSD), in the method. RSE is calculated as:

$$\%\,RSE = 100 \times \sqrt{\frac{\sum_{i=1}^{n}\left[\frac{x_i' - x_i}{x_i}\right]^2}{(n-p)}}$$

Where:

x'_i = Calculated concentration at level i

x_i = Actual concentration of the calibration level i

n = Number of calibration points

p = Number of terms in the fitting equation (average = 1, linear = 2, quadratic = 3)

(C) Using the RSE as a metric has the added advantage of allowing the same numerical standard to be applied to the calibration model, regardless of the form of the model. Thus, if a method states that the RSD should be ≤20% for the traditional linear model through the origin, then the RSE acceptance limit can remain ≤20% as well. Similarly, if a method provides an RSD acceptance limit of ≤15%, then that same figure can be used as the acceptance limit for the RSE. The RSE may be used as an alternative to correlation coefficients and coefficients of determination for evaluating calibration curves for any of

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the methods at Part 136. If the method includes a numerical criterion for the RSD, then the same numerical value is used for the RSE. Some older methods do not include any criterion for the calibration curve—for these methods, if RSE is used the value should be ≤20%. Note that the use of the RSE is included as an alternative to the use of the correlation coefficient as a measure of the suitability of a calibration curve. It is not necessary to evaluate both the RSE and the correlation coefficient.

(xi) Changes in equipment such as equipment from a vendor different from the one specified in the method.

(xii) The use of micro or midi distillation apparatus in place of macro distillation apparatus.

(xiii) The use of prepackaged reagents.

(xiv) The use of digital titrators and methods where the underlying chemistry used for the determination is similar to that used in the approved method.

(xv) Use of selected ion monitoring (SIM) mode for analytes that cannot be effectively analyzed in full-scan mode and reach the required sensitivity. False positives are more of a concern when using SIM analysis, so at a minimum, one quantitation and two qualifying ions must be monitored for each analyte (unless fewer than three ions with intensity greater than 15% of the base peak are available). The ratio of each of the two qualifying ions to the quantitation ion must be evaluated and should agree with the ratio observed in an authentic standard within ±20 percent. Analyst judgment must be applied to the evaluation of ion ratios because the ratios can be affected by co-eluting compounds present in the sample matrix. The signal-to-noise ratio of the least sensitive ion should be at least 3:1. Retention time in the sample should match within 0.05 minute of an authentic standard analyzed under identical conditions. Matrix interferences can cause minor shifts in retention time and may be evident as shifts in the retention times of the internal standards. The total scan time should be such that a minimum of eight scans are obtained per chromatographic peak.

(xvi) Changes are allowed in purge-and-trap sample volumes or operating conditions. Some examples are:

(A) Changes in purge time and purge-gas flow rate. A change in purge time and purge-gas flow rate is allowed provided that sufficient total purge volume is used to achieve the required minimum detectible concentration and calibration range for all compounds. In general, a purge rate in the range 20–200 mL/min and a total purge volume in the range 240–880 mL are recommended.

(B) Use of nitrogen or helium as a purge gas, provided that the required sensitivities for all compounds are met.

(C) Sample temperature during the purge state. Gentle heating of the sample during purging (*e.g.,* 40 °C) increases purging efficiency of hydrophilic compounds and may improve sample-to-sample repeatability because all samples are purged under precisely the same conditions.

(D) Trap sorbent. Any trap design is acceptable, provided that the data acquired meet all QC criteria.

(E) Changes to the desorb time. Shortening the desorb time (*e.g.,* from 4 minutes to 1 minute) may not affect compound recoveries, and can shorten overall cycle time and significantly reduce the amount of water introduced to the analytical system, thus improving the precision of analysis, especially for water-soluble analytes. A desorb time of four minutes is recommended, however a shorter desorb time may be used, provided that all QC specifications in the method are met.

(F) Use of water management techniques is allowed. Water is always collected on the trap along with the analytes and is a significant interference for analytical systems (GC and GC/MS). Modern water management techniques (*e.g.,* dry purge or condensation points) can remove moisture from the sample stream and improve analytical performance.

(xvii) The following modifications are allowable when performing EPA Method 625: The base/neutral and acid fractions may be added together and analyzed as one extract, provided that the analytes can be reliably identified and quantified in the combined extracts; the pH extraction sequence may be reversed to better separate acid and neutral components; neutral components may be extracted with either acid or base components; a smaller sample volume may be used to minimize matrix interferences provided matrix interferences are demonstrated and documented; alternative surrogate and internal standard concentrations other than those specified in the method are acceptable, provided that method performance is not degraded; an alternative concentration range may be used for the calibration other than the range specified in the method; the solvent for the calibration standards may be changed to match the solvent of the final sample extract.

(xviii) If the characteristics of a wastewater matrix prevent efficient recovery of organic pollutants and prevent the method from meeting QC requirements, the analyst may attempt to resolve the issue by adding salts to the sample, provided that such salts do not react with or introduce the target pollutant into the sample (as evidenced by the analysis of method blanks, laboratory control samples, and spiked samples that also contain such salts), and that all requirements of paragraph (b)(2) of this section are met. Samples having residual chlorine or other halogen must be dechlorinated prior to the addition of such salts.

(xix) If the characteristics of a wastewater matrix result in poor sample dispersion or reagent deposition on equipment and prevent the analyst from meeting QC requirements, the analyst may attempt to resolve the issue by adding a inert surfactant that does not affect the chemistry of the method, such as Brij-35 or sodium dodecyl sulfate (SDS), provided that such surfactant does not react with or introduce the target pollutant into the sample (as evidenced by the analysis of method blanks, laboratory control samples, and spiked samples that also contain such surfactant) and that all requirements of paragraph (b)(1) and (b)(2) of this section are met. Samples having residual chlorine or other halogen must be dechlorinated prior to the addition of such surfactant.

(xx) The use of gas diffusion (using pH change to convert the analyte to gaseous form and/or heat to separate an analyte contained in steam from the sample matrix) across a hydrophobic semi-permeable membrane to separate the analyte of interest from the sample matrix may be used in place of manual or automated distillation in methods for analysis such as ammonia, total cyanide, total Kjeldahl nitrogen, and total phenols. These procedures do not replace the digestion procedures specified in the approved methods and must be used in conjunction with those procedures.

(xxi) Changes in equipment operating parameters such as the monitoring wavelength of a colorimeter or the reaction time and temperature as needed to achieve the chemical reactions defined in the unmodified CWA method. For example, molybdenum blue phosphate methods have two absorbance maxima, one at about 660 nm and another at about 880 nm. The former is about 2.5 times less sensitive than the latter. Wavelength choice provides a cost-effective, dilution-free means to increase sensitivity of molybdenum blue phosphate methods.

(xxii) Interchange of oxidants, such as the use of titanium oxide in UV-assisted automated digestion of TOC and total

phosphorus, as long as complete oxidation can be demonstrated.

(xxii) Use of an axially viewed torch with Method 200.7.

■ 7. Add new § 136.7 to read as follows:

§ 136.7 Quality assurance and quality control.

The permittee/laboratory shall use suitable QA/QC procedures when conducting compliance analyses with any Part 136 chemical method or an alternative method specified by the permitting authority. These QA/QC procedures are generally included in the analytical method or may be part of the methods compendium for approved Part 136 methods from a consensus organization. For example, Standard Methods contains QA/QC procedures in the Part 1000 section of the Standard Methods Compendium. The permittee/laboratory shall follow these QA/QC procedures, as described in the method or methods compendium. If the method lacks QA/QC procedures, the permittee/laboratory has the following options to comply with the QA/QC requirements:

(a) Refer to and follow the QA/QC published in the ''equivalent'' EPA method for that parameter that has such QA/QC procedures;

(b) Refer to the appropriate QA/QC section(s) of an approved Part 136 method from a consensus organization compendium;

(c)(1) Incorporate the following twelve quality control elements, where applicable, into the laboratory's documented standard operating procedure (SOP) for performing compliance analyses when using an approved Part 136 method when the method lacks such QA/QC procedures. One or more of the twelve QC elements may not apply to a given method and may be omitted if a written rationale is provided indicating why the element(s) is/are inappropriate for a specific method.

(i) Demonstration of Capability (DOC);

(ii) Method Detection Limit (MDL);

(iii) Laboratory reagent blank (LRB), also referred to as method blank (MB);

(iv) Laboratory fortified blank (LFB), also referred to as a spiked blank, or laboratory control sample (LCS);

(v) Matrix spike (MS) and matrix spike duplicate (MSD), or laboratory fortified matrix (LFM) and LFM duplicate, may be used for suspected matrix interference problems to assess precision;

(vi) Internal standards (for GC/MS analyses), surrogate standards (for organic analysis) or tracers (for radiochemistry);

(vii) Calibration (initial and continuing), also referred to as initial calibration verification (ICV) and continuing calibration verification (CCV);

(viii) Control charts (or other trend analyses of quality control results);

(ix) Corrective action (root cause analysis);

(x) QC acceptance criteria;

(xi) Definitions of preparation and analytical batches that may drive QC frequencies; and

(xii) Minimum frequency for conducting all QC elements.

(2) These twelve quality control elements must be clearly documented in the written standard operating procedure for each analytical method not containing QA/QC procedures, where applicable.

■ 8. Revise Appendix C to Part 136 to read as follows.

APPENDIX C TO PART 136—DETERMINATION OF METALS AND TRACE ELEMENTS IN WATER AND WASTES BY INDUCTIVELY COUPLED PLASMA–ATOMIC EMISSION SPECTROMETRY METHOD 200.7

1.0 Scope and Application

1.1 Inductively coupled plasma-atomic emission spectrometry (ICP–AES) is used to determine metals and some nonmetals in solution. This method is a consolidation of existing methods for water, wastewater, and solid wastes.[1–4] (For analysis of petroleum products see References 5 and 6, Section 16.0). This method is applicable to the following analytes:

Analyte	Chemical abstract services registry number (CASRN)
Aluminum (Al)	7429–90–5
Antimony (Sb)	7440–36–0
Arsenic (As)	7440–38–2
Barium (Ba)	7440–39–3
Beryllium (Be)	7440–41–7
Boron (B)	7440–42–8
Cadmium (Cd)	7440–43–9
Calcium (Ca)	7440–70–2
Cerium [a] (Cr)	7440–45–1
Chromium (Cr)	7440–47–3
Cobalt (Co)	7440–48–4
Copper (Cu)	7440–50–8
Iron (Fe)	7439–89–6
Lead (Pb)	7439–92–1
Lithium (Li)	7439–93–2
Magnesium (Mg)	7439–95–4
Manganese (Mn)	7439–96–5
Mercury (Hg)	7439–97–6
Molybdenum (Mo)	7439–98–7
Nickel (Ni)	7440–02–0
Phosphorus (P)	7723–14–0
Potassium (K)	7440–09–7
Selenium (Se)	7782–49–2
Silica [b] ($Si0_2$)	7631–86–9
Silver (Ag)	7440–22–4
Sodium (Na)	7440–23–5
Strontium (Sr)	7440–24–6
Thallium (Tl)	7440–28–0
Tin (Sn)	7440–31–5
Titanium (Ti)	7440–32–6
Vanadium (V)	7440–62–2
Zinc (Zn)	7440–66–6

[a] Cerium has been included as method analyte for correction of potential interelement spectral interference.

[b] This method is *not* suitable for the determination of silica in solids.

1.2 For reference where this method is approved for use in compliance monitoring programs [*e.g.,* Clean Water Act (NPDES) or Safe Drinking Water Act (SDWA)] consult both the appropriate sections of the Code of Federal Regulation (40 CFR Part 136 Table 1B for NPDES, and Part 141 § 141.23 for drinking water), and the latest **Federal Register** announcements.

1.3 ICP–AES can be used to determine dissolved analytes in aqueous samples after suitable filtration and acid preservation. To reduce potential interferences, dissolved solids should be <0.2% (w/v) (Section 4.2).

1.4 With the exception of silver, where this method is approved for the determination of certain metal and metalloid contaminants in drinking water, samples may be analyzed directly by pneumatic nebulization without acid digestion if the sample has been properly preserved with acid and has turbidity of <1 NTU at the time of analysis. This total recoverable determination procedure is referred to as ''direct analysis''. However, in the determination of some primary drinking water metal contaminants, preconcentration of the sample may be required prior to analysis in order to meet drinking water acceptance performance criteria (Sections 11.2.2 through 11.2.7).

1.5 For the determination of total recoverable analytes in aqueous and solid samples a digestion/extraction is required prior to analysis when the elements are not in solution (*e.g.,* soils, sludges, sediments and aqueous samples that may contain particulate and suspended solids). Aqueous samples containing suspended or particulate material 1% (w/v) should be extracted as a solid type sample.

1.6 When determining boron and silica in aqueous samples, only plastic, PTFE or quartz labware should be used from time of sample collection to completion of analysis. For accurate determination of boron in solid samples only quartz or PTFE beakers should be used during acid extraction with immediate transfer of an extract aliquot to a plastic centrifuge tube following dilution of the extract to volume. When possible, borosilicate glass should be avoided to prevent contamination of these analytes.

1.7 Silver is only slightly soluble in the presence of chloride unless there is a sufficient chloride concentration to form the soluble chloride complex. Therefore, low recoveries of silver may occur in samples, fortified sample matrices and even fortified blanks if determined as a dissolved analyte or by ''direct analysis'' where the sample has not been processed using the total recoverable mixed acid digestion. For this reason it is recommended that samples be digested prior to the determination of silver.

The total recoverable sample digestion procedure given in this method is suitable for the determination of silver in aqueous samples containing concentrations up to 0.1 mg/L. For the analysis of wastewater samples containing higher concentrations of silver, succeeding smaller volume, well mixed aliquots should be prepared until the analysis solution contains <0.1 mg/L silver. The extraction of solid samples containing concentrations of silver >50 mg/kg should be treated in a similar manner. Also, the extraction of tin from solid samples should be prepared again using aliquots <1 g when determined sample concentrations exceed 1%.

1.8 The total recoverable sample digestion procedure given in this method will solubilize and hold in solution only minimal concentrations of barium in the presence of free sulfate. For the analysis of barium in samples having varying and unknown concentrations of sulfate, analysis should be completed as soon as possible after sample preparation.

1.9 The total recoverable sample digestion procedure given in this method is not suitable for the determination of volatile organo-mercury compounds. However, if digestion is not required (turbidity <1 NTU), the combined concentrations of inorganic and organo-mercury in solution can be determined by ''direct analysis'' pneumatic nebulization provided the sample solution is adjusted to contain the same mixed acid (HNO_3 + HCl) matrix as the total recoverable calibration standards and blank solutions.

1.10 Detection limits and linear ranges for the elements will vary with the wavelength selected, the spectrometer, and the matrices. Table 1 provides estimated instrument detection limits for the listed wavelengths.[7] However, actual method detection limits and linear working ranges will be dependent on the sample matrix, instrumentation, and selected operating conditions.

1.11 Users of the method data should state the data-quality objectives prior to analysis. Users of the method must document and have on file the required initial demonstration performance data described in Section 9.2 prior to using the method for analysis.

2.0 Summary of Method

2.1 An aliquot of a well mixed, homogeneous aqueous or solid sample is accurately weighed or measured for sample processing. For total recoverable analysis of a solid or an aqueous sample containing undissolved material, analytes are first solubilized by gentle refluxing with nitric and hydrochloric acids. After cooling, the sample is made up to volume, is mixed and centrifuged or allowed to settle overnight prior to analysis. For the determination of dissolved analytes in a filtered aqueous sample aliquot, or for the ''direct analysis'' total recoverable determination of analytes in drinking water where sample turbidity is <1 NTU, the sample is made ready for analysis by the appropriate addition of nitric acid, and then diluted to a predetermined volume and mixed before analysis.

2.2 The analysis described in this method involves multielemental determinations by ICP–AES using sequential or simultaneous instruments. The instruments measure characteristic atomic-line emission spectra by optical spectrometry. Samples are nebulized and the resulting aerosol is transported to the plasma torch. Element specific emission spectra are produced by a radio-frequency inductively coupled plasma. The spectra are dispersed by a grating spectrometer, and the intensities of the line spectra are monitored at specific wavelengths by a photosensitive device. Photocurrents from the photosensitive device are processed and controlled by a computer system. A background correction technique is required to compensate for variable background contribution to the determination of the analytes. Background must be measured adjacent to the analyte wavelength during analysis. Various interferences must be considered and addressed appropriately as discussed in Sections 4.0, 7.0, 9.0, 10.0, and 11.0.

3.0 Definitions

3.1 Calibration Blank—A volume of reagent water acidified with the same acid matrix as in the calibration standards. The calibration blank is a zero standard and is used to calibrate the ICP instrument (Section 7.10.1).

3.2 Calibration Standard (CAL)—A solution prepared from the dilution of stock standard solutions. The CAL solutions are used to calibrate the instrument response with respect to analyte concentration (Section 7.9).

3.3 Dissolved Analyte—The concentration of analyte in an aqueous sample that will pass through a 0.45 µm membrane filter assembly prior to sample acidification (Section 11.1).

3.4 Field Reagent Blank (FRB)—An aliquot of reagent water or other blank matrix that is placed in a sample container in the laboratory and treated as a sample in all respects, including shipment to the sampling site, exposure to the sampling site conditions, storage, preservation, and all analytical procedures. The purpose of the FRB is to determine if method analytes or other interferences are present in the field environment (Section 8.5).

3.5 Instrument Detection Limit (IDL)—The concentration equivalent to the analyte signal which is equal to three times the standard deviation of a series of 10 replicate measurements of the calibration blank signal at the same wavelength (Table 1.).

3.6 Instrument Performance Check (IPC) Solution—A solution of method analytes, used to evaluate the performance of the instrument system with respect to a defined set of method criteria (Sections 7.11 and 9.3.4).

3.7 Internal Standard—Pure analyte(s) added to a sample, extract, or standard solution in known amount(s) and used to measure the relative responses of other method analytes that are components of the same sample or solution. The internal standard must be an analyte that is not a sample component (Section 11.5).

3.8 Laboratory Duplicates (LD1 and LD2)—Two aliquots of the same sample taken in the laboratory and analyzed separately with identical procedures. Analyses of LD1 and LD2 indicate precision associated with laboratory procedures, but not with sample collection, preservation, or storage procedures.

3.9 Laboratory Fortified Blank (LFB)—An aliquot of LRB to which known quantities of the method analytes are added in the laboratory. The LFB is analyzed exactly like a sample, and its purpose is to determine whether the methodology is in control and whether the laboratory is capable of making accurate and precise measurements (Sections 7.10.3 and 9.3.2).

3.10 Laboratory Fortified Sample Matrix (LFM)—An aliquot of an environmental sample to which known quantities of the method analytes are added in the laboratory. The LFM is analyzed exactly like a sample, and its purpose is to determine whether the sample matrix contributes bias to the analytical results. The background concentrations of the analytes in the sample matrix must be determined in a separate aliquot and the measured values in the LFM corrected for background concentrations (Section 9.4).

3.11 Laboratory Reagent Blank (LRB)—An aliquot of reagent water or other blank matrices that are treated exactly as a sample including exposure to all glassware, equipment, solvents, reagents, and internal standards that are used with other samples. The LRB is used to determine if method analytes or other interferences are present in the laboratory environment, reagents, or apparatus (Sections 7.10.2 and 9.3.1).

3.12 Linear Dynamic Range (LDR)—The concentration range over which the instrument response to an analyte is linear (Section 9.2.2).

3.13 Method Detection Limit (MDL)—The minimum concentration of an analyte that can be identified, measured, and reported with 99% confidence that the analyte concentration is greater than zero (Section 9.2.4 and Table 4.).

3.14 Plasma Solution—A solution that is used to determine the optimum height above the work coil for viewing the plasma (Sections 7.15 and 10.2.3).

3.15 Quality Control Sample (QCS)—A solution of method analytes of known concentrations which is used to fortify an aliquot of LRB or sample matrix. The QCS is obtained from a source external to the laboratory and different from the source of calibration standards. It is used to check either laboratory or instrument performance (Sections 7.12 and 9.2.3).

3.16 Solid Sample—For the purpose of this method, a sample taken from material classified as soil, sediment or sludge.

3.17 Spectral Interference Check (SIC) Solution—A solution of selected method analytes of higher concentrations which is used to evaluate the procedural routine for correcting known interelement spectral interferences with respect to a defined set of method criteria (Sections 7.13, 7.14 and 9.3.5).

3.18 Standard Addition—The addition of a known amount of analyte to the sample in order to determine the relative response of the detector to an analyte within the sample matrix. The relative response is then used to

assess either an operative matrix effect or the sample analyte concentration (Sections 9.5.1 and 11.5).

3.19 Stock Standard Solution—A concentrated solution containing one or more method analytes prepared in the laboratory using assayed reference materials or purchased from a reputable commercial source (Section 7.8).

3.20 Total Recoverable Analyte—The concentration of analyte determined either by ''direct analysis'' of an unfiltered acid preserved drinking water sample with turbidity of <1 NTU (Section 11.2.1), or by analysis of the solution extract of a solid sample or an unfiltered aqueous sample following digestion by refluxing with hot dilute mineral acid(s) as specified in the method (Sections 11.2 and 11.3).

3.21 Water Sample—For the purpose of this method, a sample taken from one of the following sources: drinking, surface, ground, storm runoff, industrial or domestic wastewater.

4.0 Interferences

4.1 Spectral interferences are caused by background emission from continuous or recombination phenomena, stray light from the line emission of high concentration elements, overlap of a spectral line from another element, or unresolved overlap of molecular band spectra.

4.1.1 Background emission and stray light can usually be compensated for by subtracting the background emission determined by measurement(s) adjacent to the analyte wavelength peak. Spectral scans of samples or single element solutions in the analyte regions may indicate not only when alternate wavelengths are desirable because of severe spectral interference, but also will show whether the most appropriate estimate of the background emission is provided by an interpolation from measurements on both sides of the wavelength peak or by the measured emission on one side or the other. The location(s) selected for the measurement of background intensity will be determined by the complexity of the spectrum adjacent to the wavelength peak. The location(s) used for routine measurement must be free of off-line spectral interference (interelement or molecular) or adequately corrected to reflect the same change in background intensity as occurs at the wavelength peak.

4.1.2 Spectral overlaps may be avoided by using an alternate wavelength or can be compensated for by equations that correct for interelement contributions, which involves measuring the interfering elements. Some potential on-line spectral interferences observed for the recommended wavelengths are given in Table 2. When operative and uncorrected, these interferences will produce false-positive determinations and be reported as analyte concentrations. The interferences listed are only those that occur between method analytes. Only interferences of a direct overlap nature that were observed with a single instrument having a working resolution of 0.035 nm are listed. More extensive information on interferant effects at various wavelengths and resolutions is available in Boumans' Tables.[8] Users may apply interelement correction factors determined on their instruments within tested concentration ranges to compensate (off-line or on-line) for the effects of interfering elements.

4.1.3 When interelement corrections are applied, there is a need to verify their accuracy by analyzing spectral interference check solutions as described in Section 7.13. Interelement corrections will vary for the same emission line among instruments because of differences in resolution, as determined by the grating plus the entrance and exit slit widths, and by the order of dispersion. Interelement corrections will also vary depending upon the choice of background correction points. Selecting a background correction point where an interfering emission line may appear should be avoided when practical. Interelement corrections that constitute a major portion of an emission signal may not yield accurate data. Users should not forget that some samples may contain uncommon elements that could contribute spectral interferences.[7,8]

4.1.4 The interference effects must be evaluated for each individual instrument whether configured as a sequential or simultaneous instrument. For each instrument, intensities will vary not only with optical resolution but also with operating conditions (such as power, viewing height and argon flow rate). When using the recommended wavelengths given in Table 1, the analyst is required to determine and document for each wavelength the effect from the known interferences given in Table 2, and to utilize a computer routine for their automatic correction on all analyses. To determine the appropriate location for off-line background correction, the user must scan the area on either side adjacent to the wavelength and record the apparent emission intensity from all other method analytes. This spectral information must be documented and kept on file. The location selected for background correction must be either free of off-line interelement spectral interference or a computer routine must be used for their automatic correction on all determinations. If a wavelength other than the recommended wavelength is used, the user must determine and document both the on-line and off-line spectral interference effect from all method analytes and provide for their automatic correction on all analyses. Tests to determine the spectral interference must be done using analyte concentrations that will adequately describe the interference. Normally, 100 mg/L single element solutions are sufficient, however, for analytes such as iron that may be found at high concentration a more appropriate test would be to use a concentration near the upper LDR limit. See Section 10.4 for required spectral interference test criteria.

4.1.5 When interelement corrections are not used, either on-going SIC solutions (Section 7.14) must be analyzed to verify the absence of interelement spectral interference or a computer software routine must be employed for comparing the determinative data to limits files for notifying the analyst when an interfering element is detected in the sample at a concentration that will produce either an apparent false positive concentration, greater than the analyte IDL, or false negative analyte concentration, less than the 99% lower control limit of the calibration blank. When the interference accounts for 10% or more of the analyte concentration, either an alternate wavelength free of interference or another approved test procedure must be used to complete the analysis. For example, the copper peak at 213.853 nm could be mistaken for the zinc peak at 213.856 nm in solutions with high copper and low zinc concentrations. For this example, a spectral scan in the 213.8 nm region would not reveal the misidentification because a single peak near the zinc location would be observed. The possibility of this misidentification of copper for the zinc peak at 213.856 nm can be identified by measuring the copper at another emission line, *e.g.,* 324.754 nm. Users should be aware that, depending upon the instrumental resolution, alternate wavelengths with adequate sensitivity and freedom from interference may not be available for all matrices. In these circumstances the analyte must be determined using another approved test procedure.

4.2 Physical interferences are effects associated with the sample nebulization and transport processes. Changes in viscosity and surface tension can cause significant inaccuracies, especially in samples containing high dissolved solids or high acid concentrations. If physical interferences are present, they must be reduced by such means as a high-solids nebulizer, diluting the sample, using a peristaltic pump, or using an appropriate internal standard element. Another problem that can occur with high dissolved solids is salt buildup at the tip of the nebulizer, which affects aerosol flow rate and causes instrumental drift. This problem can be controlled by a high-solids nebulizer, wetting the argon prior to nebulization, using a tip washer, or diluting the sample. Also, it has been reported that better control of the argon flow rates, especially for the nebulizer, improves instrument stability and precision; this is accomplished with the use of mass flow controllers.

4.3 Chemical interferences include molecular-compound formation, ionization effects, and solute-vaporization effects. Normally, these effects are not significant with the ICP–AES technique. If observed, they can be minimized by careful selection of operating conditions (such as incident power and observation height), by buffering of the sample, by matrix matching, and by standard-addition procedures. Chemical interferences are highly dependent on matrix type and the specific analyte element.

4.4 Memory interferences result when analytes in a previous sample contribute to the signals measured in a new sample. Memory effects can result from sample deposition on the uptake tubing to the nebulizer, and from the buildup of sample material in the plasma torch and spray chamber. The site where these effects occur is dependent on the element and can be minimized by flushing the system with a rinse blank between samples (Section 7.10.4). The possibility of memory interferences should be recognized within an analytical run and suitable rinse times should be used

to reduce them. The rinse times necessary for a particular element must be estimated prior to analysis. This may be achieved by aspirating a standard containing elements corresponding to either their LDR or a concentration ten times those usually encountered. The aspiration time should be the same as a normal sample analysis period, followed by analysis of the rinse blank at designated intervals. The length of time required to reduce analyte signals to within a factor of two of the method detection limit, should be noted. Until the required rinse time is established, this method requires a rinse period of at least 60 seconds between samples and standards. If a memory interference is suspected, the sample must be re-analyzed after a long rinse period.

5.0 Safety

5.1 The toxicity or carcinogenicity of each reagent used in this method have not been fully established. Each chemical should be regarded as a potential health hazard and exposure to these compounds should be as low as reasonably achievable. Each laboratory is responsible for maintaining a current awareness file of OSHA regulations regarding the safe handling of the chemicals specified in this method.[9–12] A reference file of material data handling sheets should also be made available to all personnel involved in the chemical analysis. Specifically, concentrated nitric and hydrochloric acids present various hazards and are moderately toxic and extremely irritating to skin and mucus membranes. Use these reagents in a fume hood whenever possible and if eye or skin contact occurs, flush with large volumes of water. Always wear safety glasses or a shield for eye protection, protective clothing and observe proper mixing when working with these reagents.

5.2 The acidification of samples containing reactive materials may result in the release of toxic gases, such as cyanides or sulfides. Acidification of samples should be done in a fume hood.

5.3 All personnel handling environmental samples known to contain or to have been in contact with human waste should be immunized against known disease causative agents.

5.4 The inductively coupled plasma should only be viewed with proper eye protection from the ultraviolet emissions.

5.5 It is the responsibility of the user of this method to comply with relevant disposal and waste regulations. For guidance see Sections 14.0 and 15.0.

6.0 Equipment and Supplies

6.1 Inductively coupled plasma emission spectrometer:

6.1.1 Computer-controlled emission spectrometer with background-correction capability.

The spectrometer must be capable of meeting and complying with the requirements described and referenced in Section 2.2.

6.1.2 Radio-frequency generator compliant with FCC regulations.

6.1.3 Argon gas supply—High purity grade (99.99%). When analyses are conducted frequently, liquid argon is more economical and requires less frequent replacement of tanks than compressed argon in conventional cylinders.

6.1.4 A variable speed peristaltic pump is required to deliver both standard and sample solutions to the nebulizer.

6.1.5 (Optional) Mass flow controllers to regulate the argon flow rates, especially the aerosol transport gas, are highly recommended. Their use will provide more exacting control of reproducible plasma conditions.

6.2 Analytical balance, with capability to measure to 0.1 mg, for use in weighing solids, for preparing standards, and for determining dissolved solids in digests or extracts.

6.3 A temperature adjustable hot plate capable of maintaining a temperature of 95 °C.

6.4 (Optional) A temperature adjustable block digester capable of maintaining a temperature of 95 °C and equipped with 250 mL constricted digestion tubes.

6.5 (Optional) A steel cabinet centrifuge with guard bowl, electric timer and brake.

6.6 A gravity convection drying oven with thermostatic control capable of maintaining 180 °C ± 5 °C.

6.7 (Optional) An air displacement pipetter capable of delivering volumes ranging from 0.1–2500 µL with an assortment of high quality disposable pipet tips.

6.8 Mortar and pestle, ceramic or nonmetallic material.

6.9 Polypropylene sieve, 5-mesh (4 mm opening).

6.10 Labware—For determination of trace levels of elements, contamination and loss are of prime consideration. Potential contamination sources include improperly cleaned laboratory apparatus and general contamination within the laboratory environment from dust, etc. A clean laboratory work area designated for trace element sample handling must be used. Sample containers can introduce positive and negative errors in the determination of trace elements by contributing contaminants through surface desorption or leaching, or depleting element concentrations through adsorption processes. All reusable labware (glass, quartz, polyethylene, PTFE, FEP, etc.) should be sufficiently clean for the task objectives. Several procedures found to provide clean labware include washing with a detergent solution, rinsing with tap water, soaking for four hours or more in 20% (v/v) nitric acid or a mixture of HNO_3 and HCl (1+2+9), rinsing with reagent water and storing clean.[2 3] Chromic acid cleaning solutions must be avoided because chromium is an analyte.

6.10.1 Glassware—Volumetric flasks, graduated cylinders, funnels and centrifuge tubes (glass and/or metal-free plastic).

6.10.2 Assorted calibrated pipettes.

6.10.3 Conical Phillips beakers (Corning 1080–250 or equivalent), 250 mL with 50 mm watch glasses.

6.10.4 Griffin beakers, 250 mL with 75 mm watch glasses and (optional) 75 mm ribbed watch glasses.

6.10.5 (Optional) PTFE and/or quartz Griffin beakers, 250 mL with PTFE covers.

6.10.6 Evaporating dishes or high-form crucibles, porcelain, 100 mL capacity.

6.10.7 Narrow-mouth storage bottles, FEP (fluorinated ethylene propylene) with screw closure, 125 mL to 1 L capacities.

6.10.8 One-piece stem FEP wash bottle with screw closure, 125 mL capacity.

7.0 Reagents and Standards

7.1 Reagents may contain elemental impurities which might affect analytical data. Only high-purity reagents that conform to the American Chemical Society specifications [13] should be used whenever possible. If the purity of a reagent is in question, analyze for contamination. All acids used for this method must be of ultra high-purity grade or equivalent. Suitable acids are available from a number of manufacturers. Redistilled acids prepared by sub-boiling distillation are acceptable.

7.2 Hydrochloric acid, concentrated (sp.gr. 1.19)—HCl.

7.2.1 Hydrochloric acid (1+1)—Add 500 mL concentrated HCl to 400 mL reagent water and dilute to 1 L.

7.2.2 Hydrochloric acid (1+4)—Add 200 mL concentrated HCl to 400 mL reagent water and dilute to 1 L.

7.2.3 Hydrochloric acid (1+20)—Add 10 mL concentrated HCl to 200 mL reagent water.

7.3 Nitric acid, concentrated (sp.gr. 1.41)—HNO_3.

7.3.1 Nitric acid (1+1)—Add 500 mL concentrated HNO_3 to 400 mL reagent water and dilute to 1 L.

7.3.2 Nitric acid (1+2)—Add 100 mL concentrated HNO_3 to 200 mL reagent water.

7.3.3 Nitric acid (1+5)—Add 50 mL concentrated HNO_3 to 250 mL reagent water.

7.3.4 Nitric acid (1+9)—Add 10 mL concentrated HNO_3 to 90 mL reagent water.

7.4 Reagent water. All references to water in this method refer to ASTM Type I grade water.[14]

7.5 Ammonium hydroxide, concentrated (sp.gr. 0.902).

7.6 Tartaric acid, ACS reagent grade.

7.7 Hydrogen peroxide, 50%, stabilized certified reagent grade.

7.8 Standard Stock Solutions—Stock standards may be purchased or prepared from ultra-high purity grade chemicals (99.99–99.999% pure). All compounds must be dried for one hour at 105 °C, unless otherwise specified. It is recommended that stock solutions be stored in FEP bottles. Replace stock standards when succeeding dilutions for preparation of calibration standards cannot be verified.

CAUTION: Many of these chemicals are extremely toxic if inhaled or swallowed (Section 5.1). Wash hands thoroughly after handling.

Typical stock solution preparation procedures follow for 1 L quantities, but for the purpose of pollution prevention, the analyst is encouraged to prepare smaller quantities when possible. Concentrations are calculated based upon the weight of the pure element or upon the weight of the compound multiplied by the fraction of the analyte in the compound

From pure element,

$$\text{Concentration} = \frac{\text{weight (mg)}}{\text{volume (L)}}$$

From pure compound,

$$\text{Concentration} = \frac{\text{weight (mg)} \times \text{gravimetric factor}}{\text{volume (L)}}$$

where: gravimetric factor = the weight fraction of the analyte in the compound

7.8.1 Aluminum solution, stock, 1 mL = 1000 µg Al: Dissolve 1.000 g of aluminum metal, weighed accurately to at least four significant figures, in an acid mixture of 4.0 mL of (1+1) HCl and 1 mL of concentrated HNO_3 in a beaker. Warm beaker slowly to effect solution. When dissolution is complete, transfer solution quantitatively to a 1 L flask, add an additional 10.0 mL of (1+1) HCl and dilute to volume with reagent water.

7.8.2 Antimony solution, stock, 1 mL = 1000 µg Sb: Dissolve 1.000 g of antimony powder, weighed accurately to at least four significant figures, in 20.0 mL (1+1) HNO_3 and 10.0 mL concentrated HCl. Add 100 mL reagent water and 1.50 g tartaric acid. Warm solution slightly to effect complete dissolution. Cool solution and add reagent water to volume in a 1 L volumetric flask.

7.8.3 Arsenic solution, stock, 1 mL = 1000 µg As: Dissolve 1.320 g of As_2O_3 (As fraction = 0.7574), weighed accurately to at least four significant figures, in 100 mL of reagent water containing 10.0 mL concentrated NH_4OH. Warm the solution gently to effect dissolution. Acidify the solution with 20.0 mL concentrated HNO_3 and dilute to volume in a 1 L volumetric flask with reagent water.

7.8.4 Barium solution, stock, 1 mL = 1000 µg Ba: Dissolve 1.437 g $BaCO_3$ (Ba fraction = 0.6960), weighed accurately to at least four significant figures, in 150 mL (1+2) HNO_3 with heating and stirring to degas and dissolve compound. Let solution cool and dilute with reagent water in 1 L volumetric flask.

7.8.5 Beryllium solution, stock, 1 mL = 1000 µg Be: *DO NOT DRY.* Dissolve 19.66 g $BeSO_4 \bullet 4H_2O$ (Be fraction = 0.0509), weighed accurately to at least four significant figures, in reagent water, add 10.0 mL concentrated HNO_3, and dilute to volume in a 1 L volumetric flask with reagent water.

7.8.6 Boron solution, stock, 1 mL = 1000 µg B: *DO NOT DRY.* Dissolve 5.716 g anhydrous H_3BO_3 (B fraction = 0.1749), weighed accurately to at least four significant figures, in reagent water and dilute in a 1 L volumetric flask with reagent water. Transfer immediately after mixing to a clean FEP bottle to minimize any leaching of boron from the glass volumetric container. Use of a nonglass volumetric flask is recommended to avoid boron contamination from glassware.

7.8.7 Cadmium solution, stock, 1 mL = 1000 µg Cd: Dissolve 1.000 g Cd metal, acid cleaned with (1+9) HNO_3, weighed accurately to at least four significant figures, in 50 mL (1+1) HNO_3 with heating to effect dissolution. Let solution cool and dilute with reagent water in a 1 L volumetric flask.

7.8.8 Calcium solution, stock, 1 mL = 1000 µg Ca: Suspend 2.498 g $CaCO_3$ (Ca fraction = 0.4005), dried at 180 °C for one hour before weighing, weighed accurately to at least four significant figures, in reagent water and dissolve cautiously with a minimum amount of (1+1) HNO_3. Add 10.0 mL concentrated HNO_3 and dilute to volume in a 1 L volumetric flask with reagent water.

7.8.9 Cerium solution, stock, 1 mL = 1000 µg Ce: Slurry 1.228 g CeO_2 (Ce fraction = 0.8141), weighed accurately to at least four significant figures, in 100 mL concentrated HNO_3 and evaporate to dryness. Slurry the residue in 20 mL H_2O, add 50 mL concentrated HNO_3, with heat and stirring add 60 mL 50% H_2O_2 dropwise in 1 mL increments allowing periods of stirring between the 1 mL additions. Boil off excess H_2O_2 before diluting to volume in a 1 L volumetric flask with reagent water.

7.8.10 Chromium solution, stock, 1 mL = 1000 µg Cr: Dissolve 1.923 g CrO_3 (Cr fraction = 0.5200), weighed accurately to at least four significant figures, in 120 mL (1+5) HNO_3. When solution is complete, dilute to volume in a 1 L volumetric flask with reagent water.

7.8.11 Cobalt solution, stock, 1 mL = 1000 µg Co: Dissolve 1.000 g Co metal, acid cleaned with (1+9) HNO_3, weighed accurately to at least four significant figures, in 50.0 mL (1+1) HNO_3. Let solution cool and dilute to volume in a 1 L volumetric flask with reagent water.

7.8.12 Copper solution, stock, 1 mL = 1000 µg Cu: Dissolve 1.000 g Cu metal, acid cleaned with (1+9) HNO_3, weighed accurately to at least four significant figures, in 50.0 mL (1+1) HNO_3 with heating to effect dissolution. Let solution cool and dilute in a 1 L volumetric flask with reagent water.

7.8.13 Iron solution, stock, 1 mL = 1000 µg Fe: Dissolve 1.000 g Fe metal, acid cleaned with (1+1) HCl, weighed accurately to four significant figures, in 100 mL (1+1) HCl with heating to effect dissolution. Let solution cool and dilute with reagent water in a 1 L volumetric flask.

7.8.14 Lead solution, stock, 1 mL = 1000 µg Pb: Dissolve 1.599 g $Pb(NO_3)_2$ (Pb fraction = 0.6256), weighed accurately to at least four significant figures, in a minimum amount of (1+1) HNO_3. Add 20.0 mL (1+1) HNO_3 and dilute to volume in a 1 L volumetric flask with reagent water.

7.8.15 Lithium solution, stock, 1 mL = 1000 µg Li: Dissolve 5.324 g Li_2CO_3 (Li fraction = 0.1878), weighed accurately to at least four significant figures, in a minimum amount of (1+1) HCl and dilute to volume in a 1 L volumetric flask with reagent water.

7.8.16 Magnesium solution, stock, 1 mL = 1000 µg Mg: Dissolve 1.000 g cleanly polished Mg ribbon, accurately weighed to at least four significant figures, in slowly added 5.0 mL (1+1) HCl (CAUTION: reaction is vigorous). Add 20.0 mL (1+1) HNO_3 and dilute to volume in a 1 L volumetric flask with reagent water.

7.8.17 Manganese solution, stock, 1 mL = 1000 µg Mn: Dissolve 1.000 g of manganese metal, weighed accurately to at least four significant figures, in 50 mL (1+1) HNO_3 and dilute to volume in a 1 L volumetric flask with reagent water.

7.8.18 Mercury solution, stock, 1 mL = 1000 µg Hg: *DO NOT DRY.* CAUTION: highly toxic element. Dissolve 1.354 g $HgCl_2$ (Hg fraction = 0.7388) in reagent water. Add 50.0 mL concentrated HNO_3 and dilute to volume in 1 L volumetric flask with reagent water.

7.8.19 Molybdenum solution, stock, 1 mL = 1000 µg Mo: Dissolve 1.500 g MoO_3 (Mo fraction = 0.6666), weighed accurately to at least four significant figures, in a mixture of 100 mL reagent water and 10.0 mL concentrated NH_4OH, heating to effect dissolution. Let solution cool and dilute with reagent water in a 1 L volumetric flask.

7.8.20 Nickel solution, stock, 1 mL = 1000 µg Ni: Dissolve 1.000 g of nickel metal, weighed accurately to at least four significant figures, in 20.0 mL hot concentrated HNO_3, cool, and dilute to volume in a 1 L volumetric flask with reagent water.

7.8.21 Phosphorus solution, stock, 1 mL = 1000 µg P: Dissolve 3.745 g $NH_4H_2PO_4$ (P fraction = 0.2696), weighed accurately to at least four significant figures, in 200 mL reagent water and dilute to volume in a 1 L volumetric flask with reagent water.

7.8.22 Potassium solution, stock, 1 mL = 1000 µg K: Dissolve 1.907 g KCl (K fraction = 0.5244) dried at 110 °C, weighed accurately to at least four significant figures, in reagent water, add 20 mL (1+1) HCl and dilute to volume in a 1 L volumetric flask with reagent water.

7.8.23 Selenium solution, stock, 1 mL = 1000 µg Se: Dissolve 1.405 g SeO_2 (Se fraction = 0.7116), weighed accurately to at least four significant figures, in 200 mL reagent water and dilute to volume in a 1 L volumetric flask with reagent water.

7.8.24 Silica solution, stock, 1 mL = 1000 µg SiO_2: *DO NOT DRY.* Dissolve 2.964 g $(NH_4)_2SiF_6$, weighed accurately to at least four significant figures, in 200 mL (1+20) HCl with heating at 85 °C to effect dissolution. Let solution cool and dilute to volume in a 1 L volumetric flask with reagent water.

7.8.25 Silver solution, stock, 1 mL = 1000 µg Ag: Dissolve 1.000 g Ag metal, weighed accurately to at least four significant figures, in 80 mL (1+1) HNO_3 with heating to effect dissolution. Let solution cool and dilute with reagent water in a 1 L volumetric flask. Store

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solution in amber bottle or wrap bottle completely with aluminum foil to protect solution from light.

7.8.26 Sodium solution, stock, 1 mL = 1000 µg Na: Dissolve 2.542 g NaCl (Na fraction = 0.3934), weighed accurately to at least four significant figures, in reagent water. Add 10.0 mL concentrated HNO_3 and dilute to volume in a 1 L volumetric flask with reagent water.

7.8.27 Strontium solution, stock, 1 mL = 1000 µg Sr: Dissolve 1.685 g $SrCO_3$ (Sr fraction = 0.5935), weighed accurately to at least four significant figures, in 200 mL reagent water with dropwise addition of 100 mL (1+1) HCl. Dilute to volume in a 1 L volumetric flask with reagent water.

7.8.28 Thallium solution, stock, 1 mL = 1000 µg Tl: Dissolve 1.303 g $TlNO_3$ (Tl fraction = 0.7672), weighed accurately to at least four significant figures, in reagent water. Add 10.0 mL concentrated HNO_3 and dilute to volume in a 1 L volumetric flask with reagent water.

7.8.29 Tin solution, stock, 1 mL = 1000 µg Sn: Dissolve 1.000 g Sn shot, weighed accurately to at least four significant figures, in an acid mixture of 10.0 mL concentrated HCl and 2.0 mL (1+1) HNO_3 with heating to effect dissolution. Let solution cool, add 200 mL concentrated HCl, and dilute to volume in a 1 L volumetric flask with reagent water.

7.8.30 Titanium solution, stock, 1 mL = 1000 µg Ti: *DO NOT DRY*. Dissolve 6.138 g $(NH_4)_2TiO(C_2O_4)_2 \bullet H_2O$ (Ti fraction = 0.1629), weighed accurately to at least four significant figures, in 100 mL reagent water. Dilute to volume in a 1 L volumetric flask with reagent water.

7.8.31 Vanadium solution, stock, 1 mL = 1000 µg V: Dissolve 1.000 g V metal, acid cleaned with (1+9) HNO_3, weighed accurately to at least four significant figures, in 50 mL (1+1) HNO_3 with heating to effect dissolution. Let solution cool and dilute with reagent water to volume in a 1 L volumetric flask.

7.8.32 Yttrium solution, stock 1 mL = 1000 µg Y: Dissolve 1.270 g Y_2O_3 (Y fraction = 0.7875), weighed accurately to at least four significant figures, in 50 mL (1+1) HNO_3, heating to effect dissolution. Cool and dilute to volume in a 1 L volumetric flask with reagent water.

7.8.33 Zinc solution, stock, 1 mL = 1000 µg Zn: Dissolve 1.000 g Zn metal, acid cleaned with (1+9) HNO_3, weighed accurately to at least four significant figures, in 50 mL (1+1) HNO_3 with heating to effect dissolution. Let solution cool and dilute with reagent water to volume in a 1 L volumetric flask.

7.9 Mixed Calibration Standard Solutions—For the analysis of total recoverable digested samples prepare mixed calibration standard solutions (see Table 3) by combining appropriate volumes of the stock solutions in 500 mL volumetric flasks containing 20 mL (1+1) HNO_3 and 20 mL (1+1) HCl and dilute to volume with reagent water. Prior to preparing the mixed standards, each stock solution should be analyzed separately to determine possible spectral interferences or the presence of impurities. Care should be taken when preparing the mixed standards to ensure that the elements are compatible and stable together. To minimize the opportunity for contamination by the containers, it is recommended to transfer the mixed-standard solutions to acid-cleaned, never-used FEP fluorocarbon (FEP) bottles for storage. Fresh mixed standards should be prepared, as needed, with the realization that concentrations can change on aging. Calibration standards not prepared from primary standards must be initially verified using a certified reference solution. For the recommended wavelengths listed in Table 1 some typical calibration standard combinations are given in Table 3.

NOTE: If the addition of silver to the recommended mixed-acid calibration standard results in an initial precipitation, add 15 mL of reagent water and warm the flask until the solution clears. For this acid combination, the silver concentration should be limited to 0.5 mg/L.

7.10 Blanks—Four types of blanks are required for the analysis. The calibration blank is used in establishing the analytical curve, the laboratory reagent blank is used to assess possible contamination from the sample preparation procedure, the laboratory fortified blank is used to assess routine laboratory performance and a rinse blank is used to flush the instrument uptake system and nebulizer between standards, check solutions, and samples to reduce memory interferences.

7.10.1 The calibration blank for aqueous samples and extracts is prepared by acidifying reagent water to the same concentrations of the acids as used for the standards. The calibration blank should be stored in a FEP bottle.

7.10.2 The laboratory reagent blank (LRB) must contain all the reagents in the same volumes as used in the processing of the samples. The LRB must be carried through the same entire preparation scheme as the samples including sample digestion, when applicable.

7.10.3 The laboratory fortified blank (LFB) is prepared by fortifying an aliquot of the laboratory reagent blank with all analytes to a suitable concentration using the following recommended criteria: Ag 0.1 mg/L, K 5.0 mg/L and all other analytes 0.2 mg/L or a concentration approximately 100 times their respective MDL, whichever is greater. The LFB must be carried through the same entire preparation scheme as the samples including sample digestion, when applicable.

7.10.4 The rinse blank is prepared by acidifying reagent water to the same concentrations of acids as used in the calibration blank and stored in a convenient manner.

7.11 Instrument Performance Check (IPC) Solution—The IPC solution is used to periodically verify instrument performance during analysis. It should be prepared in the same acid mixture as the calibration standards by combining method analytes at appropriate concentrations. Silver must be limited to <0.5 mg/L; while potassium and phosphorus because of higher MDLs and silica because of potential contamination should be at concentrations of 10 mg/L. For other analytes a concentration of 2 mg/L is recommended. The IPC solution should be prepared from the same standard stock solutions used to prepare the calibration standards and stored in an FEP bottle. Agency programs may specify or request that additional instrument performance check solutions be prepared at specified concentrations in order to meet particular program needs.

7.12 Quality Control Sample (QCS)—Analysis of a QCS is required for initial and periodic verification of calibration standards or stock standard solutions in order to verify instrument performance. The QCS must be obtained from an outside source different from the standard stock solutions and prepared in the same acid mixture as the calibration standards. The concentration of the analytes in the QCS solution should be 1 mg/L, except silver, which must be limited to a concentration of 0.5 mg/L for solution stability. The QCS solution should be stored in a FEP bottle and analyzed as needed to meet data-quality needs. A fresh solution should be prepared quarterly or more frequently as needed.

7.13 Spectral Interference Check (SIC) Solutions—When interelement corrections are applied, SIC solutions are needed containing concentrations of the interfering elements at levels that will provide an adequate test of the correction factors.

7.13.1 SIC solutions containing (a) 300 mg/L Fe; (b) 200 mg/L AL; (c) 50 mg/L Ba; (d) 50 mg/L Be; (e) 50 mg/L Cd; (f) 50 mg/L Ce; (g) 50 mg/L Co; (h) 50 mg/L Cr; (i) 50 mg/L Cu; (j) 50 mg/L Mn; (k) 50 mg/L Mo; (l) 50 mg/L Ni; (m) 50 mg/L Sn; (n) 50 mg/L SiO_2; (o) 50 mg/L Ti; (p) 50 mg/L Tl and (q) 50 mg/L V should be prepared in the same acid mixture as the calibration standards and stored in FEP bottles. These solutions can be used to periodically verify a partial list of the on-line (and possible off-line) interelement spectral correction factors for the recommended wavelengths given in Table 1. Other solutions could achieve the same objective as well. (Multielement SIC solutions[3] may be prepared and substituted for the single element solutions provided an analyte is not subject to interference from more than one interferant in the solution.)

Note: If wavelengths other than those recommended in Table 1 are used, other solutions different from those above (a through q) may be required.

7.13.2 For interferences from iron and aluminum, only those correction factors (positive or negative) when multiplied by 100 to calculate apparent analyte concentrations that exceed the determined analyte IDL or fall below the lower 3-sigma control limit of the calibration blank need be tested on a daily basis.

7.13.3 For the other interfering elements, only those correction factors (positive or negative) when multiplied by 10 to calculate apparent analyte concentrations that exceed the determined analyte IDL or fall below the lower 3-sigma control limit of the calibration blank need be tested on a daily basis.

7.13.4 If the correction routine is operating properly, the determined apparent analyte(s) concentration from analysis of each interference solution (a through q) should fall within a specific concentration range bracketing the calibration blank. This

concentration range is calculated by multiplying the concentration of the interfering element by the value of the correction factor being tested and dividing by 10. If after subtraction of the calibration blank the apparent analyte concentration is outside (above or below) this range, a change in the correction factor of more than 10% should be suspected. The cause of the change should be determined and corrected and the correction factor should be updated.

Note: The SIC solution should be analyzed more than once to confirm a change has occurred with adequate rinse time between solutions and before subsequent analysis of the calibration blank.

7.13.5 If the correction factors tested on a daily basis are found to be within the 10% criteria for five consecutive days, the required verification frequency of those factors in compliance may be extended to a weekly basis. Also, if the nature of the samples analyzed is such (*e.g.,* finished drinking water) that they do not contain concentrations of the interfering elements at the 10 mg/L level, daily verification is not required; however, all interelement spectral correction factors must be verified annually and updated, if necessary.

7.13.6 If the instrument does not display negative concentration values, fortify the SIC solutions with the elements of interest at 1 mg/L and test for analyte recoveries that are below 95%. In the absence of measurable analyte, over-correction could go undetected because a negative value could be reported as zero.

7.14 For instruments without interelement correction capability or when interelement corrections are not used, SIC solutions (containing similar concentrations of the major components in the samples, *e.g.,* 10 mg/L) can serve to verify the absence of effects at the wavelengths selected. These data must be kept on file with the sample analysis data. If the SIC solution confirms an operative interference that is 10% of the analyte concentration, the analyte must be determined using a wavelength and background correction location free of the interference or by another approved test procedure. Users are advised that high salt concentrations can cause analyte signal suppressions and confuse interference tests.

7.15 Plasma Solution—The plasma solution is used for determining the optimum viewing height of the plasma above the work coil prior to using the method (Section 10.2). The solution is prepared by adding a 5 mL aliquot from each of the stock standard solutions of arsenic, lead, selenium, and thallium to a mixture of 20 mL (1+1) nitric acid and 20 mL (1+1) hydrochloric acid and diluting to 500 mL with reagent water. Store in a FEP bottle.

8.0 Sample Collection, Preservation, and Storage

8.1 Prior to the collection of an aqueous sample, consideration should be given to the type of data required, (*i.e.,* dissolved or total recoverable), so that appropriate preservation and pretreatment steps can be taken. The pH of all aqueous samples must be tested immediately prior to aliquoting for processing or ''direct analysis'' to ensure the sample has been properly preserved. If properly acid preserved, the sample can be held up to six months before analysis.

8.2 For the determination of the dissolved elements, the sample must be filtered through a 0.45 µm pore diameter membrane filter at the time of collection or as soon thereafter as practically possible. (Glass or plastic filtering apparatus are recommended to avoid possible contamination. Only plastic apparatus should be used when the determinations of boron and silica are critical.) Use a portion of the filtered sample to rinse the filter flask, discard this portion and collect the required volume of filtrate. Acidify the filtrate with (1+1) nitric acid immediately following filtration to pH <2.

8.3 For the determination of total recoverable elements in aqueous samples, samples are not filtered, but acidified with (1+1) nitric acid to pH <2 (normally, 3 mL of (1+1) acid per liter of sample is sufficient for most ambient and drinking water samples). Preservation may be done at the time of collection, however, to avoid the hazards of strong acids in the field, transport restrictions, and possible contamination it is recommended that the samples be returned to the laboratory within two weeks of collection and acid preserved upon receipt in the laboratory. Following acidification, the sample should be mixed, held for 16 hours, and then verified to be pH <2 just prior withdrawing an aliquot for processing or ''direct analysis''. If for some reason such as high alkalinity the sample pH is verified to be >2, more acid must be added and the sample held for 16 hours until verified to be pH <2. See Section 8.1.

Note: When the nature of the sample is either unknown or is known to be hazardous, acidification should be done in a fume hood. See Section 5.2.

8.4 Solid samples require no preservation prior to analysis other than storage at 4 °C. There is no established holding time limitation for solid samples.

8.5 For aqueous samples, a field blank should be prepared and analyzed as required by the data user. Use the same container and acid as used in sample collection.

9.0 Quality Control

9.1 Each laboratory using this method is required to operate a formal quality control (QC) program. The minimum requirements of this program consist of an initial demonstration of laboratory capability, and the periodic analysis of laboratory reagent blanks, fortified blanks and other laboratory solutions as a continuing check on performance. The laboratory is required to maintain performance records that define the quality of the data thus generated.

9.2 Initial Demonstration of Performance (mandatory).

9.2.1 The initial demonstration of performance is used to characterize instrument performance (determination of linear dynamic ranges and analysis of quality control samples) and laboratory performance (determination of method detection limits) prior to analyses conducted by this method.

9.2.2 Linear dynamic range (LDR)—The upper limit of the LDR must be established for each wavelength utilized. It must be determined from a linear calibration prepared in the normal manner using the established analytical operating procedure for the instrument. The LDR should be determined by analyzing succeedingly higher standard concentrations of the analyte until the observed analyte concentration is no more than 10% below the stated concentration of the standard. Determined LDRs must be documented and kept on file. The LDR which may be used for the analysis of samples should be judged by the analyst from the resulting data. Determined sample analyte concentrations that are greater than 90% of the determined upper LDR limit must be diluted and reanalyzed. The LDRs should be verified annually or whenever, in the judgment of the analyst, a change in analytical performance caused by either a change in instrument hardware or operating conditions would dictate they be redetermined.

9.2.3 Quality control sample (QCS)—When beginning the use of this method, on a quarterly basis, after the preparation of stock or calibration standard solutions or as required to meet data-quality needs, verify the calibration standards and acceptable instrument performance with the preparation and analyses of a QCS (Section 7.12). To verify the calibration standards the determined mean concentrations from three analyses of the QCS must be within 5% of the stated values. If the calibration standard cannot be verified, performance of the determinative step of the method is unacceptable. The source of the problem must be identified and corrected before either proceeding on with the initial determination of method detection limits or continuing with on-going analyses.

9.2.4 Method detection limit (MDL)—MDLs must be established for all wavelengths utilized, using reagent water (blank) fortified at a concentration of two to three times the estimated instrument detection limit.[15] To determine MDL values, take seven replicate aliquots of the fortified reagent water and process through the entire analytical method. Perform all calculations defined in the method and report the concentration values in the appropriate units. Calculate the MDL as follows:

$$MDL = (t) \times (S)$$

Where:

t = students' t value for a 99% confidence level and a standard deviation estimate with n-1 degrees of freedom [t = 3.14 for seven replicates]

S = standard deviation of the replicate analyses

Note: If additional confirmation is desired, reanalyze the seven replicate aliquots on two more nonconsecutive days and again calculate the MDL values for each day. An average of the three MDL values for each analyte may provide for a more appropriate MDL estimate. If the relative standard deviation (RSD) from the analyses of the seven aliquots is <10%, the concentration used to determine the analyte MDL may have been inappropriately high for the determination. If so, this could result in the calculation of an unrealistically low MDL. Concurrently, determination of MDL in

reagent water represents a best case situation and does not reflect possible matrix effects of real world samples. However, successful analyses of LFMs (Section 9.4) and the analyte addition test described in Section 9.5.1 can give confidence to the MDL value determined in reagent water. Typical single laboratory MDL values using this method are given in Table 4.

The MDLs must be sufficient to detect analytes at the required levels according to compliance monitoring regulation (Section 1.2). MDLs should be determined annually, when a new operator begins work or whenever, in the judgment of the analyst, a change in analytical performance caused by either a change in instrument hardware or operating conditions would dictate they be redetermined.

9.3 Assessing Laboratory Performance (mandatory)

9.3.1 Laboratory reagent blank (LRB)—The laboratory must analyze at least one LRB (Section 7.10.2) with each batch of 20 or fewer samples of the same matrix. LRB data are used to assess contamination from the laboratory environment. LRB values that exceed the MDL indicate laboratory or reagent contamination should be suspected. When LRB values constitute 10% or more of the analyte level determined for a sample or is 2.2 times the analyte MDL whichever is greater, fresh aliquots of the samples must be prepared and analyzed again for the affected analytes after the source of contamination has been corrected and acceptable LRB values have been obtained.

9.3.2 Laboratory fortified blank (LFB)—The laboratory must analyze at least one LFB (Section 7.10.3) with each batch of samples. Calculate accuracy as percent recovery using the following equation:

$$R = \frac{LFB - LRB}{s} \times 100$$

Where:

R = percent recovery
LFB = laboratory fortified blank
LRB = laboratory reagent blank
s = concentration equivalent of analyte added to fortify the LBR solution

If the recovery of any analyte falls outside the required control limits of 85–115%, that analyte is judged out of control, and the source of the problem should be identified and resolved before continuing analyses.

9.3.3 The laboratory must use LFB analyses data to assess laboratory performance against the required control limits of 85–115% (Section 9.3.2). When sufficient internal performance data become available (usually a minimum of 20–30 analyses), optional control limits can be developed from the mean percent recovery (x) and the standard deviation (S) of the mean percent recovery. These data can be used to establish the upper and lower control limits as follows:

UPPER CONTROL LIMIT = x + 3S
LOWER CONTROL LIMIT = x − 3S

The optional control limits must be equal to or better than the required control limits of 85–115%. After each five to 10 new recovery measurements, new control limits can be calculated using only the most recent 20–30 data points. Also, the standard deviation (S) data should be used to establish an on-going precision statement for the level of concentrations included in the LFB. These data must be kept on file and be available for review.

9.3.4 Instrument performance check (IPC) solution—For all determinations the laboratory must analyze the IPC solution (Section 7.11) and a calibration blank immediately following daily calibration, after every 10th sample (or more frequently, if required) and at the end of the sample run. Analysis of the calibration blank should always be < the analyte IDL, but greater than the lower 3-sigma control limit of the calibration blank. Analysis of the IPC solution immediately following calibration must verify that the instrument is within 5% of calibration with a relative standard deviation <3% from replicate integrations 4. Subsequent analyses of the IPC solution must be within 10% of calibration. If the calibration cannot be verified within the specified limits, reanalyze either or both the IPC solution and the calibration blank. If the second analysis of the IPC solution or the calibration blank confirm calibration to be outside the limits, sample analysis must be discontinued, the cause determined, corrected and/or the instrument recalibrated. All samples following the last acceptable IPC solution must be reanalyzed. The analysis data of the calibration blank and IPC solution must be kept on file with the sample analyses data.

9.3.5 Spectral interference check (SIC) solution—For all determinations the laboratory must periodically verify the interelement spectral interference correction routine by analyzing SIC solutions. The preparation and required periodic analysis of SIC solutions and test criteria for verifying the interelement interference correction routine are given in Section 7.13. Special cases where on-going verification is required are described in Section 7.14.

9.4 Assessing Analyte Recovery and Data Quality.

9.4.1 Sample homogeneity and the chemical nature of the sample matrix can affect analyte recovery and the quality of the data. Taking separate aliquots from the sample for replicate and fortified analyses can in some cases assess the effect. Unless otherwise specified by the data user, laboratory or program, the following laboratory fortified matrix (LFM) procedure (Section 9.4.2) is required. Also, other tests such as the analyte addition test (Section 9.5.1) and sample dilution test (Section 9.5.2) can indicate if matrix effects are operative.

9.4.2 The laboratory must add a known amount of each analyte to a minimum of 10% of the routine samples. In each case the LFM aliquot must be a duplicate of the aliquot used for sample analysis and for total recoverable determinations added prior to sample preparation. For water samples, the added analyte concentration must be the same as that used in the laboratory fortified blank (Section 7.10.3). For solid samples, however, the concentration added should be expressed as mg/kg and is calculated for a one gram aliquot by multiplying the added analyte concentration (mg/L) in solution by the conversion factor 100 (mg/L × 0.1L/0.001kg = 100, Section 12.5). (For notes on Ag, Ba, and Sn see Sections 1.7 and 1.8.) Over time, samples from all routine sample sources should be fortified.

Note: The concentration of calcium, magnesium, sodium and strontium in environmental waters, along with iron and aluminum in solids can vary greatly and are not necessarily predictable. Fortifying these analytes in routine samples at the same concentration used for the LFB may prove to be of little use in assessing data quality for these analytes. For these analytes sample dilution and reanalysis using the criteria given in Section 9.5.2 is recommended. Also, if specified by the data user, laboratory or program, samples can be fortified at higher concentrations, but even major constituents should be limited to <25 mg/L so as not to alter the sample matrix and affect the analysis.

9.4.3 Calculate the percent recovery for each analyte, corrected for background concentrations measured in the unfortified sample, and compare these values to the designated LFM recovery range of 70–130% or a 3-sigma recovery range calculated from the regression equations given in Table 9.[16] Recovery calculations are not required if the concentration added is less than 30% of the sample background concentration. Percent recovery may be calculated in units appropriate to the matrix, using the following equation:

$$R = \frac{C_s - C}{s} \times 100$$

Where:

R = percent recovery
C_s = fortified sample concentration
C = sample background concentration
s = concentration equivalent of analyte added to fortify the sample

9.4.4 If the recovery of any analyte falls outside the designated LFM recovery range, and the laboratory performance for that analyte is shown to be in control (Section 9.3), the recovery problem encountered with the fortified sample is judged to be matrix related, not system related. The data user should be informed that the result for that analyte in the unfortified sample is suspect due to either the heterogeneous nature of the sample or matrix effects and analysis by method of standard addition or the use of an internal standard(s) (Section 11.5) should be considered.

9.4.5 Where reference materials are available, they should be analyzed to provide additional performance data. The analysis of reference samples is a valuable tool for demonstrating the ability to perform the method acceptably. Reference materials containing high concentrations of analytes can provide additional information on the performance of the spectral interference correction routine.

9.5 Assess the possible need for the method of standard additions (MSA) or internal standard elements by the following tests. Directions for using MSA or internal standard(s) are given in Section 11.5.

9.5.1 Analyte addition test: An analyte(s) standard added to a portion of a prepared

sample, or its dilution, should be recovered to within 85% to 115% of the known value. The analyte(s) addition should produce a minimum level of 20 times and a maximum of 100 times the method detection limit. If the analyte addition is <20% of the sample analyte concentration, the following dilution test should be used. If recovery of the analyte(s) is not within the specified limits, a matrix effect should be suspected, and the associated data flagged accordingly. The method of additions or the use of an appropriate internal standard element may provide more accurate data.

9.5.2 Dilution test: If the analyte concentration is sufficiently high (minimally, a factor of 50 above the instrument detection limit in the original solution but <90% of the linear limit), an analysis of a 1 + 4 dilution should agree (after correction for the fivefold dilution) within 10% of the original determination. If not, a chemical or physical interference effect should be suspected and the associated data flagged accordingly. The method of standard additions or the use of an internal-standard element may provide more accurate data for samples failing this test.

10.0 Calibration and Standardization

10.1 Specific wavelengths are listed in Table 1. Other wavelengths may be substituted if they can provide the needed sensitivity and are corrected for spectral interference. However, because of the difference among various makes and models of spectrometers, specific instrument operating conditions cannot be given. The instrument and operating conditions utilized for determination must be capable of providing data of acceptable quality to the program and data user. The analyst should follow the instructions provided by the instrument manufacturer unless other conditions provide similar or better performance for a task. Operating conditions for aqueous solutions usually vary from 1100–1200 watts forward power, 15–16 mm viewing height, 15–19 L/min. argon coolant flow, 0.6–1 L/min. argon aerosol flow, 1–1.8 mL/min. sample pumping rate with a one minute preflush time and measurement time near 1 s per wavelength peak (for sequential instruments) and near 10 s per sample (for simultaneous instruments). Use of the Cu/Mn intensity ratio at 324.754 nm and 257.610 nm (by adjusting the argon aerosol flow) has been recommended as a way to achieve repeatable interference correction factors.[17]

10.2 Prior to using this method optimize the plasma operating conditions. The following procedure is recommended for vertically configured plasmas. The purpose of plasma optimization is to provide a maximum signal-to-background ratio for the least sensitive element in the analytical array. The use of a mass flow controller to regulate the nebulizer gas flow rate greatly facilitates the procedure.

10.2.1 Ignite the plasma and select an appropriate incident rf power with minimum reflected power. Allow the instrument to become thermally stable before beginning. This usually requires at least 30 to 60 minutes of operation. While aspirating the 1000 µg/mL solution of yttrium (Section 7.8.32), follow the instrument manufacturer's instructions and adjust the aerosol carrier gas flow rate through the nebulizer so a definitive blue emission region of the plasma extends approximately from 5–20 mm above the top of the work coil.[18] Record the nebulizer gas flow rate or pressure setting for future reference.

10.2.2 After establishing the nebulizer gas flow rate, determine the solution uptake rate of the nebulizer in mL/min. by aspirating a known volume calibration blank for a period of at least three minutes. Divide the spent volume by the aspiration time (in minutes) and record the uptake rate. Set the peristaltic pump to deliver the uptake rate in a steady even flow.

10.2.3 After horizontally aligning the plasma and/or optically profiling the spectrometer, use the selected instrument conditions from Sections 10.2.1 and 10.2.2, and aspirate the plasma solution (Section 7.15), containing 10 µg/mL each of As, Pb, Se and Tl. Collect intensity data at the wavelength peak for each analyte at 1 mm intervals from 14–18 mm above the top of the work coil. (This region of the plasma is commonly referred to as the analytical zone.)[19] Repeat the process using the calibration blank. Determine the net signal to blank intensity ratio for each analyte for each viewing height setting. Choose the height for viewing the plasma that provides the largest intensity ratio for the least sensitive element of the four analytes. If more than one position provides the same ratio, select the position that provides the highest net intensity counts for the least sensitive element or accept a compromise position of the intensity ratios of all four analytes.

10.2.4 The instrument operating condition finally selected as being optimum should provide the lowest reliable instrument detection limits and method detection limits. Refer to Tables 1 and 4 for comparison of IDLs and MDLs, respectively.

10.2.5 If either the instrument operating conditions, such as incident power and/or nebulizer gas flow rate are changed, or a new torch injector tube having a different orifice i.d. is installed, the plasma and plasma viewing height should be reoptimized.

10.2.6 Before daily calibration and after the instrument warmup period, the nebulizer gas flow must be reset to the determined optimized flow. If a mass flow controller is being used, it should be reset to the recorded optimized flow rate. In order to maintain valid spectral interelement correction routines the nebulizer gas flow rate should be the same from day-to-day (<2% change). The change in signal intensity with a change in nebulizer gas flow rate for both ''hard'' (Pb 220.353 nm) and ''soft'' (Cu 324.754) lines is illustrated in Figure 1.

10.3 Before using the procedure (Section 11.0) to analyze samples, there must be data available documenting initial demonstration of performance. The required data and procedure is described in Section 9.2. This data must be generated using the same instrument operating conditions and calibration routine (Section 11.4) to be used for sample analysis. These documented data must be kept on file and be available for review by the data user.

10.4 After completing the initial demonstration of performance, but before analyzing samples, the laboratory must establish and initially verify an interelement spectral interference correction routine to be used during sample analysis. A general description concerning spectral interference and the analytical requirements for background correction and for correction of interelement spectral interference in particular are given in Section 4.1. To determine the appropriate location for background correction and to establish the interelement interference correction routine, repeated spectral scan about the analyte wavelength and repeated analyses of the single element solutions may be required. Criteria for determining an interelement spectral interference is an apparent positive or negative concentration on the analyte that is outside the 3-sigma control limits of the calibration blank for the analyte. (The upper-control limit is the analyte IDL.) Once established, the entire routine must be initially and periodically verified annually, or whenever there is a change in instrument operating conditions (Section 10.2.5). Only a portion of the correction routine must be verified more frequently or on a daily basis. Test criteria and required solutions are described in Section 7.13. Initial and periodic verification data of the routine should be kept on file. Special cases where on-going verification are required is described in Section 7.14.

11.0 Procedure

11.1 Aqueous Sample Preparation—Dissolved Analytes

11.1.1 For the determination of dissolved analytes in ground and surface waters, pipet an aliquot (20 mL) of the filtered, acid preserved sample into a 50 mL polypropylene centrifuge tube. Add an appropriate volume of (1 + 1) nitric acid to adjust the acid concentration of the aliquot to approximate a 1% (v/v) nitric acid solution (*e.g.,* add 0.4 mL (1 + 1) HNO_3 to a 20 mL aliquot of sample). Cap the tube and mix. The sample is now ready for analysis (Section 1.3). Allowance for sample dilution should be made in the calculations. (If mercury is to be determined, a separate aliquot must be additionally acidified to contain 1% (v/v) HCl to match the signal response of mercury in the calibration standard and reduce memory interference effects. Section 1.9).

Note: If a precipitate is formed during acidification, transport, or storage, the sample aliquot must be treated using the procedure described in Sections 11.2.2 through 11.2.7 prior to analysis.

11.2 Aqueous Sample Preparation—Total Recoverable Analytes

11.2.1 For the ''direct analysis'' of total recoverable analytes in drinking water samples containing turbidity <1 NTU, treat an unfiltered acid preserved sample aliquot using the sample preparation procedure described in Section 11.1.1 while making allowance for sample dilution in the data calculation (Section 1.2). For the determination of total recoverable analytes in all other aqueous samples or for

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preconcentrating drinking water samples prior to analysis follow the procedure given in Sections 11.2.2 through 11.2.7.

11.2.2 For the determination of total recoverable analytes in aqueous samples (other than drinking water with <1 NTU turbidity), transfer a 100 mL (1 mL) aliquot from a well mixed, acid preserved sample to a 250 mL Griffin beaker (Sections 1.2, 1.3, 1.6, 1.7, 1.8, and 1.9). (When necessary, smaller sample aliquot volumes may be used.)

Note: If the sample contains *undissolved* solids >1%, a well mixed, acid preserved aliquot containing no more than 1 g particulate material should be cautiously evaporated to near 10 mL and extracted using the acid-mixture procedure described in Sections 11.3.3 through 11.3.6.

11.2.3 Add 2 mL (1+1) nitric acid and 1.0 mL of (1+1) hydrochloric acid to the beaker containing the measured volume of sample. Place the beaker on the hot plate for solution evaporation. The hot plate should be located in a fume hood and previously adjusted to provide evaporation at a temperature of approximately but no higher than 85 °C. (See the following note.) The beaker should be covered with an elevated watch glass or other necessary steps should be taken to prevent sample contamination from the fume hood environment.

Note: For proper heating adjust the temperature control of the hot plate such that an uncovered Griffin beaker containing 50 mL of water placed in the center of the hot plate can be maintained at a temperature approximately but no higher than 85 °C. (Once the beaker is covered with a watch glass the temperature of the water will rise to approximately 95 °C.)

11.2.4 Reduce the volume of the sample aliquot to about 20 mL by gentle heating at 85 °C. *DO NOT BOIL.* This step takes about two hours for a 100 mL aliquot with the rate of evaporation rapidly increasing as the sample volume approaches 20 mL. (A spare beaker containing 20 mL of water can be used as a gauge.)

11.2.5 Cover the lip of the beaker with a watch glass to reduce additional evaporation and gently reflux the sample for 30 minutes. (Slight boiling may occur, but vigorous boiling must be avoided to prevent loss of the HCl-H_2O azeotrope.)

11.2.6 Allow the beaker to cool. Quantitatively transfer the sample solution to a 50 mL volumetric flask, make to volume with reagent water, stopper and mix.

11.2.7 Allow any undissolved material to settle overnight, or centrifuge a portion of the prepared sample until clear. (If after centrifuging or standing overnight the sample contains suspended solids that would clog the nebulizer, a portion of the sample may be filtered for their removal prior to analysis. However, care should be exercised to avoid potential contamination from filtration.) The sample is now ready for analysis. Because the effects of various matrices on the stability of diluted samples cannot be characterized, all analyses should be performed as soon as possible after the completed preparation.

11.3 Solid Sample Preparation—Total Recoverable Analytes

11.3.1 For the determination of total recoverable analytes in solid samples, mix the sample thoroughly and transfer a portion (>20 g) to tared weighing dish, weigh the sample and record the wet weight (WW). (For samples with <35% moisture a 20 g portion is sufficient. For samples with moisture >35% a larger aliquot 50–100 g is required.) Dry the sample to a constant weight at 60 °C and record the dry weight (DW) for calculation of percent solids (Section 12.6). (The sample is dried at 60 °C to prevent the loss of mercury and other possible volatile metallic compounds, to facilitate sieving, and to ready the sample for grinding.)

11.3.2 To achieve homogeneity, sieve the dried sample using a 5-mesh polypropylene sieve and grind in a mortar and pestle. (The sieve, mortar and pestle should be cleaned between samples.) From the dried, ground material weigh accurately a representative 1.0 ± 0.01 g aliquot (W) of the sample and transfer to a 250 mL Phillips beaker for acid extraction (Sections 1.6, 1.7, 1.8, and 1.9).

11.3.3 To the beaker add 4 mL of (1+1) HNO_3 and 10 mL of (1+4) HCl. Cover the lip of the beaker with a watch glass. Place the beaker on a hot plate for reflux extraction of the analytes. The hot plate should be located in a fume hood and previously adjusted to provide a reflux temperature of approximately 95 °C. (See the following note.)

Note: For proper heating adjust the temperature control of the hot plate such that an uncovered Griffin beaker containing 50 mL of water placed in the center of the hot plate can be maintained at a temperature approximately but no higher than 85 °C. (Once the beaker is covered with a watch glass the temperature of the water will rise to approximately 95 °C.) Also, a block digester capable of maintaining a temperature of 95 °C and equipped with 250 mL constricted volumetric digestion tubes may be substituted for the hot plate and conical beakers in the extraction step.

11.3.4 Heat the sample and gently reflux for 30 minutes. Very slight boiling may occur, however vigorous boiling must be avoided to prevent loss of the HCl-H_2O azeotrope. Some solution evaporation will occur (3–4 mL).

11.3.5 Allow the sample to cool and quantitatively transfer the extract to a 100 mL volumetric flask. Dilute to volume with reagent water, stopper and mix.

11.3.6 Allow the sample extract solution to stand overnight to separate insoluble material or centrifuge a portion of the sample solution until clear. (If after centrifuging or standing overnight the extract solution contains suspended solids that would clog the nebulizer, a portion of the extract solution may be filtered for their removal prior to analysis. However, care should be exercised to avoid potential contamination from filtration.) The sample extract is now ready for analysis. Because the effects of various matrices on the stability of diluted samples cannot be characterized, all analyses should be performed as soon as possible after the completed preparation.

11.4 Sample Analysis

11.4.1 Prior to daily calibration of the instrument inspect the sample introduction system including the nebulizer, torch, injector tube and uptake tubing for salt deposits, dirt and debris that would restrict solution flow and affect instrument performance. Clean the system when needed or on a daily basis.

11.4.2 Configure the instrument system to the selected power and operating conditions as determined in Sections 10.1 and 10.2.

11.4.3 The instrument must be allowed to become thermally stable before calibration and analyses. This usually requires at least 30 to 60 minutes of operation. After instrument warmup, complete any required optical profiling or alignment particular to the instrument.

11.4.4 For initial and daily operation calibrate the instrument according to the instrument manufacturer's recommended procedures, using mixed calibration standard solutions (Section 7.9) and the calibration blank (Section 7.10.1). A peristaltic pump must be used to introduce all solutions to the nebulizer. To allow equilibrium to be reached in the plasma, aspirate all solutions for 30 seconds after reaching the plasma before beginning integration of the background corrected signal to accumulate data. When possible, use the average value of replicate integration periods of the signal to be correlated to the analyte concentration. Flush the system with the rinse blank (Section 7.10.4) for a minimum of 60 seconds (Section 4.4) between each standard. The calibration line should consist of a minimum of a calibration blank and a high standard. Replicates of the blank and highest standard provide an optimal distribution of calibration standards to minimize the confidence band for a straight-line calibration in a response region with uniform variance.[20]

11.4.5 After completion of the initial requirements of this method (Sections 10.3 and 10.4), samples should be analyzed in the same operational manner used in the calibration routine with the rinse blank also being used between all sample solutions, LFBs, LFMs, and check solutions (Section 7.10.4).

11.4.6 During the analysis of samples, the laboratory must comply with the required quality control described in Sections 9.3 and 9.4. Only for the determination of dissolved analytes or the ''direct analysis'' of drinking water with turbidity of <1 NTU is the sample digestion step of the LRB, LFB, and LFM not required.

11.4.7 Determined sample analyte concentrations that are 90% or more of the upper limit of the analyte LDR must be diluted with reagent water that has been acidified in the same manner as calibration blank and reanalyzed (see Section 11.4.8). Also, for the interelement spectral interference correction routines to remain valid during sample analysis, the interferant concentration must not exceed its LDR. If the interferant LDR is exceeded, sample dilution with acidified reagent water and reanalysis is required. In these circumstances analyte detection limits are raised and determination by another approved test procedure that is either more sensitive and/or interference free is recommended.

11.4.8 When it is necessary to assess an operative matrix interference (*e.g.,* signal reduction due to high dissolved solids), the tests described in Section 9.5 are recommended.

11.4.9 Report data as directed in Section 12.0.

11.5 If the method of standard additions (MSA) is used, standards are added at one or more levels to portions of a prepared sample. This technique [21] compensates for enhancement or depression of an analyte signal by a matrix. It will not correct for additive interferences such as contamination, interelement interferences, or baseline shifts. This technique is valid in the linear range when the interference effect is constant over the range, the added analyte responds the same as the endogenous analyte, and the signal is corrected for additive interferences. The simplest version of this technique is the single-addition method. This procedure calls for two identical aliquots of the sample solution to be taken. To the first aliquot, a small volume of standard is added; while to the second aliquot, a volume of acid blank is added equal to the standard addition. The sample concentration is calculated by the following:

$$\text{Sample Conc. (mg/L or mg/kg)} = \frac{S_2 \times V_1 \times C}{(S_1 - S_2) \times V_2}$$

Where:

C = Concentration of the standard solution (mg/L)
S_1 = Signal for fortified aliquot
S_2 = Signal for unfortified aliquot
V_1 = Volume of the standard addition (L)
V_2 = Volume of the sample aliquot (L) used for MSA

For more than one fortified portion of the prepared sample, linear regression analysis can be applied using a computer or calculator program to obtain the concentration of the sample solution. An alternative to using the method of standard additions is use of the internal standard technique by adding one or more elements (not in the samples and verified not to cause an uncorrected interelement spectral interference) at the same concentration (which is sufficient for optimum precision) to the prepared samples (blanks and standards) that are affected the same as the analytes by the sample matrix. Use the ratio of analyte signal to the internal standard signal for calibration and quantitation.

12.0 Data Analysis and Calculations

12.1 Sample data should be reported in units of mg/L for aqueous samples and mg/kg dry weight for solid samples.

12.2 For dissolved aqueous analytes (Section 11.1) report the data generated directly from the instrument with allowance for sample dilution. Do not report analyte concentrations below the IDL.

12.3 For total recoverable aqueous analytes (Section 11.2), multiply solution analyte concentrations by the dilution factor 0.5, when 100 mL aliquot is used to produce the 50 mL final solution, and report data as instructed in Section 12.4. If a different aliquot volume other than 100 mL is used for sample preparation, adjust the dilution factor accordingly. Also, account for any additional dilution of the prepared sample solution needed to complete the determination of analytes exceeding 90% or more of the LDR upper limit. Do not report data below the determined analyte MDL concentration or below an adjusted detection limit reflecting smaller sample aliquots used in processing or additional dilutions required to complete the analysis.

12.4 For analytes with MDLs <0.01 mg/L, round the data values to the thousandth place and report analyte concentrations up to three significant figures. For analytes with MDLs <0.01 mg/L round the data values to the 100th place and report analyte concentrations up to three significant figures. Extract concentrations for solids data should be rounded in a similar manner before calculations in Section 12.5 are performed.

12.5 For total recoverable analytes in solid samples (Section 11.3), round the solution analyte concentrations (mg/L) as instructed in Section 12.4. Report the data up to three significant figures as mg/kg dry-weight basis unless specified otherwise by the program or data user. Calculate the concentration using the equation below:

$$\text{Sample Conc. (mg/kg) dry} - \text{weight basis} = \frac{C \times V \times D}{W}$$

Where:

C = Concentration in extract (mg/L)
V = Volume of extract (L, 100 mL = 0.1L)
D = Dilution factor (undiluted = 1)
W = Weight of sample aliquot extracted (g x 0.001 = kg)

Do not report analyte data below the estimated solids MDL or an adjusted MDL because of additional dilutions required to complete the analysis.

12.6 To report percent solids in solid samples (Section 11.3) calculate as follows:

$$\%\ \text{solids (S)} = \frac{DW}{WW} \times 100$$

Where:

DW = Sample weight (g) dried at 60 °C
WW = Sample weight (g) before drying

Note: If the data user, program or laboratory requires that the reported percent solids be determined by drying at 105 °C, repeat the procedure given in Section 11.3 using a separate portion (>20 g) of the sample and dry to constant weight at 103–105 °C.

12.7 The QC data obtained during the analyses provide an indication of the quality of the sample data and should be provided with the sample results.

13.0 Method Performance

13.1 Listed in Table 4 are typical single laboratory total recoverable MDLs determined for the recommended wavelengths using simultaneous ICP–AES and the operating conditions given in Table 5. The MDLs were determined in reagent blank matrix (best case situation). PTFE beakers were used to avoid boron and silica contamination from glassware with the final dilution to 50 mL completed in polypropylene centrifuged tubes. The listed MDLs for solids are estimates and were calculated from the aqueous MDL determinations.

13.2 Data obtained from single laboratory method testing are summarized in Table 6 for five types of water samples consisting of drinking water, surface water, ground water, and two wastewater effluents. The data presented cover all analytes except cerium and titanium. Samples were prepared using the procedure described in Section 11.2. For each matrix, five replicate aliquots were prepared, analyzed and the average of the five determinations used to define the sample background concentration of each analyte. In addition, two pairs of duplicates were fortified at different concentration levels. For each method analyte, the sample background concentration, mean percent recovery, standard deviation of the percent recovery, and relative percent difference between the duplicate fortified samples are listed in Table 6. The variance of the five replicate sample background determinations is included in the calculated standard deviation of the percent recovery when the analyte concentration in the sample was greater than the MDL. The tap and well waters were processed in Teflon and quartz beakers and diluted in polypropylene centrifuged tubes. The nonuse of borosilicate glassware is reflected in the precision and recovery data for boron and silica in those two sample types.

13.3 Data obtained from single laboratory method testing are summarized in Table 7 for three solid samples consisting of EPA 884 Hazardous Soil, SRM 1645 River Sediment, and EPA 286 Electroplating Sludge. Samples were prepared using the procedure described in Section 11.3. For each method analyte, the sample background concentration, mean percent recovery of the fortified additions, the standard deviation of the percent

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recovery, and relative percent difference between duplicate additions were determined as described in Section 13.2. Data presented are for all analytes except cerium, silica, and titanium. Limited comparative data to other methods and SRM materials are presented in Reference 23 of Section 16.0.

13.4 Performance data for aqueous solutions independent of sample preparation from a multilaboratory study are provided in Table 8.[22]

13.5 Listed in Table 9 are regression equations for precision and bias for 25 analytes abstracted from EPA Method Study 27, a multilaboratory validation study of Method 200.7.[1] These equations were developed from data received from 12 laboratories using the total recoverable sample preparation procedure on reagent water, drinking water, surface water and three industrial effluents. For a complete review and description of the study, see Reference 16 of Section 16.0.

14.0 Pollution Prevention

14.1 Pollution prevention encompasses any technique that reduces or eliminates the quantity or toxicity of waste at the point of generation. Numerous opportunities for pollution prevention exist in laboratory operation. The EPA has established a preferred hierarchy of environmental management techniques that places pollution prevention as the management option of first choice. Whenever feasible, laboratory personnel should use pollution prevention techniques to address their waste generation (*e.g.,* Section 7.8). When wastes cannot be feasibly reduced at the source, the Agency recommends recycling as the next best option.

14.2 For information about pollution prevention that may be applicable to laboratories and research institutions, consult ''Less is Better: Laboratory Chemical Management for Waste Reduction'', available from the American Chemical Society's Department of Government Relations and Science Policy, 1155 16th Street NW., Washington, DC 20036, (202) 872–4477.

15.0 Waste Management

15.1 The Environmental Protection Agency requires that laboratory waste management practices be conducted consistent with all applicable rules and regulations. The Agency urges laboratories to protect the air, water, and land by minimizing and controlling all releases from hoods and bench operations, complying with the letter and spirit of any sewer discharge permits and regulations, and by complying with all solid and hazardous waste regulations, particularly the hazardous waste identification rules and land disposal restrictions. For further information on waste management consult ''The Waste Management Manual for Laboratory Personnel'', available from the American Chemical Society at the address listed in the Section 14.2.

16.0 References

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17.0 Tables, Diagrams, Flowcharts, and Validation Data

TABLE 1—WAVELENGTHS, ESTIMATED INSTRUMENT DETECTION LIMITS, AND RECOMMENDED CALIBRATION

Analyte	Wavelength[a] (nm)	Estimated detection limit[b] (μg/L)	Calibrate[c] to (mg/L)
Aluminum	308.215	45	10
Antimony	206.833	32	5
Arsenic	193.759	53	10
Barium	493.409	2.3	1
Beryllium	313.042	0.27	1
Boron	249.678	5.7	1
Cadmium	226.502	3.4	2
Calcium	315.887	30	10
Cerium	413.765	48	2
Chromium	205.552	6.1	5
Cobalt	228.616	7.0	2
Copper	324.754	5.4	2
Iron	259.940	6.2	10
Lead	220.353	42	10
Lithium	670.784	[d]3.7	5
Magnesium	279.079	30	10
Manganese	257.610	1.4	2
Mercury	194.227	2.5	2
Molybdenum	203.844	12	10
Nickel	231.604	15	2
Phosphorus	214.914	76	10
Potassium	766.491	[e]700	20
Selenium	196.090	75	5
Silica (SiO_2)	251.611	[d]26 (SiO_2)	10
Silver	328.068	7.0	0.5
Sodium	588.995	29	10
Strontium	421.552	0.77	1
Thallium	190.864	40	5
Tin	189.980	25	4
Titanium	334.941	3.8	10
Vanadium	292.402	7.5	2
Zinc	213.856	1.8	5

[a] The wavelengths listed are recommended because of their sensitivity and overall acceptability. Other wavelengths may be substituted if they can provide the needed sensitivity and are treated with the same corrective techniques for spectral interference (see Section 4.1).

[b] These estimated 3-sigma instrumental detection limits[16] are provided only as a guide to instrumental limits. The method detection limits are sample dependent and may vary as the sample matrix varies. *Detection limits for solids* can be estimated by dividing these values by the grams extracted per liter, which depends upon the extraction procedure. Divide solution detection limits by 10 for 1 g extracted to 100 mL for solid detection limits.

[c] Suggested concentration for instrument calibration.[2] Other calibration limits in the linear ranges may be used.

[d] Calculated from 2-sigma data.[5]

[e] Highly dependent on operating conditions and plasma position.

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TABLE 2—ON-LINE METHOD INTERELEMENT SPECTRAL INTERFERANCES ARISING FROM INTERFERANTS AT THE 100 MG/L LEVEL

Analyte	Wavelength (nm)	Interferant*
Ag	328.068	Ce, Ti, Mn
Al	308.215	V, Mo, Ce, Mn
As	193.759	V, Al, Co, Fe, Ni
B	249.678	None
Ba	493.409	None
Be	313.042	V, Ce
Ca	315.887	Co, Mo, Ce
Cd	226.502	Ni, Ti, Fe, Ce
Ce	413.765	None
Co	228.616	Ti, Ba, Cd, Ni, Cr, Mo, Ce
Cr	205.552	Be, Mo, Ni
Cu	324.754	Mo, Ti
Fe	259.940	None
Hg	194.227	V, Mo
K	766.491	None
Li	670.784	None
Mg	279.079	Ce
Mn	257.610	Ce
Mo	203.844	Ce
Na	588.995	None
Ni	231.604	Co, Tl
P	214.914	Cu, Mo
Pb	220.353	Co, Al, Ce, Cu, Ni, Ti, Fe
Sb	206.833	Cr, Mo, Sn, Ti, Ce, Fe
Se	196.099	Fe
SiO_2	251.611	None
Sn	189.980	Mo, Ti, Fe, Mn, Si
Sr	421.552	None
Tl	190.864	Ti, Mo, Co, Ce, Al, V, Mn
Ti	334.941	None
V	292.402	Mo, Ti, Cr, Fe, Ce
Zn	213.856	Ni, Cu, Fe

*These on-line interferences from method analytes and titanium only were observed using an instrument with 0.035 nm resolution (see Section 4.1.2). Interferant ranked by magnitude of intensity with the most severe interferant listed first in the row.

TABLE 3—MIXED STANDARD SOLUTIONS

Solution	Analytes
I	Ag, As, B, Ba, Ca, Cd, Cu, Mn, Sb, and Se
II	K, Li, Mo, Na, Sr, and Ti
III	Co, P, V, and Ce
IV	Al, Cr, Hg, SiO_2, Sn, and Zn
V	Be, Fe, Mg, Ni, Pb, and Tl

TABLE 4—TOTAL RECOVERABLE METHOD DETECTION LIMITS (MDL)

Analyte	MDLs Aqueous, mg/L(1)	Solids, mg/kg(2)
Ag	0.002	0.3
Al	0.02	3
As	0.008	2
B	0.003	—
Ba	0.001	0.2
Be	0.0003	0.1
Ca	0.01	2
Cd	0.001	0.2
Ce	0.02	3
Co	0.002	0.4
Cr	0.004	0.8
Cu	0.003	0.5
Fe	*0.03	6
Hg	0.007	2
K	0.3	60
Li	0.001	0.2
Mg	0.02	3
Mn	0.001	0.2
Mo	0.004	1

TABLE 4—TOTAL RECOVERABLE METHOD DETECTION LIMITS (MDL)—Continued

Analyte	MDLs Aqueous, mg/L(1)	Solids, mg/kg(2)
Na	0.03	6
Ni	0.005	1
P	0.06	12
Pb	0.01	2
Sb	0.008	2
Se	0.02	5
SiO_2	0.02	—
Sn	0.007	2
Sr	0.0003	0.1
Tl	0.001	0.2
Ti	0.02	3
V	0.003	1
Zn	0.002	0.3

(1) MDL concentrations are computed for original matrix with allowance for 2x sample preconcentration during preparation. Samples were processed in PTFE and diluted in 50-mL plastic centrifuge tubes.
(2) Estimated, calculated from aqueous MDL determinations.
— Boron not reported because of glassware contamination. Silica not determined in solid samples.
* Elevated value due to fume-hood contamination.

TABLE 5—INDUCTIVELY COUPLED PLASMA INSTRUMENT OPERATING CONDITIONS

Incident rf power	1100 watts
Reflected rf power	<5 watts
Viewing height above work coil.	15 mm

TABLE 5—INDUCTIVELY COUPLED PLASMA INSTRUMENT OPERATING CONDITIONS—Continued

Injector tube orifice i.d.	1 mm
Argon supply	liquid argon
Argon pressure	40 psi
Coolant argon flow rate	19 L/min.
Aerosol carrier argon flow rate	620 mL/min.

TABLE 5—INDUCTIVELY COUPLED PLASMA INSTRUMENT OPERATING CONDITIONS—Continued

Auxiliary (plasma) argon flow rate.	300 mL/min.
Sample uptake rate controlled to.	1.2 mL/min.

TABLE 6—PRECISION AND RECOVERY DATA IN AQUEOUS MATRICES

Analyte	Sample conc. mg/L	Low spike mg/L	Average recovery R (%)	S (R)	RPD	High spike mg/L	Average recovery R (%)	S (R)	RPD
Tap Water									
Ag	<0.002	0.05	95	0.7	2.1	0.2	96	0.0	0.0
Al	0.185	0.05	98	8.8	1.7	0.2	105	3.0	3.1
As	<0.008	0.05	108	1.4	3.7	0.2	101	0.7	2.0
B	0.023	0.1	98	0.2	0.0	0.4	98	0.2	0.5
Ba	0.042	0.05	102	1.6	2.2	0.2	98	0.4	0.8
Be	<0.0003	0.01	100	0.0	0.0	0.1	99	0.0	0.0
Ca	35.2	5.0	101	8.8	1.7	20.0	103	2.0	0.9
Cd	<0.001	0.01	105	3.5	9.5	0.1	98	0.0	0.0
Co	<0.002	0.02	100	0.0	0.0	0.2	99	0.5	1.5
Cr	<0.004	0.01	110	0.0	0.0	0.1	102	0.0	0.0
Cu	<0.003	0.02	103	1.8	4.9	0.2	101	1.2	3.5
Fe	0.008	0.1	106	1.0	1.8	0.4	105	0.3	0.5
Hg	<0.007	0.05	103	0.7	1.9	0.2	100	0.4	1.0
K	1.98	5.0	109	1.4	2.3	20.	107	0.7	1.7
Li	0.006	0.02	103	6.9	3.8	0.2	110	1.9	4.4
Mg	8.08	5.0	104	2.2	1.5	20.0	100	0.7	1.1
Mn	<0.001	0.01	100	0.0	0.0	0.1	99	0.0	0.0
Mo	<0.004	0.02	95	3.5	10.5	0.2	108	0.5	1.4
Na	10.3	5.0	99	3.0	2.0	20.0	106	1.0	1.6
Ni	<0.005	0.02	108	1.8	4.7	0.2	104	1.1	2.9
P	0.045	0.1	102	13.1	9.4	0.4	104	3.2	1.3
Pb	<0.01	0.05	95	0.7	2.1	0.2	100	0.2	0.5
Sb	<0.008	0.05	99	0.7	2.0	0.2	102	0.7	2.0
Se	<0.02	0.1	87	1.1	3.5	0.4	99	0.8	2.3
SiO_2	6.5	5.0	104	3.3	3.4	20.0	96	1.1	2.3
Sn	<0.007	0.05	103	2.1	5.8	0.2	101	1.8	5.0
Sr	0.181	0.1	102	3.3	2.1	0.4	105	0.8	1.0
Tl	<0.02	0.1	101	3.9	10.9	0.4	101	0.1	0.3
V	<0.003	0.05	101	0.7	2.0	0.2	99	0.2	0.5
Zn	0.005	0.05	101	3.7	9.0	0.2	98	0.9	2.5
Pond Water									
Ag	<0.002	0.05	92	0.0	0.0	0.2	94	0.0	0.0

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TABLE 6—PRECISION AND RECOVERY DATA IN AQUEOUS MATRICES—Continued

Analyte	Sample conc. mg/L	Low spike mg/L	Average recovery R (%)	S (R)	RPD	High spike mg/L	Average recovery R (%)	S (R)	RPD
Al	0.819	0.2	88	10.0	5.0	0.8	100	2.9	3.7
As	<0.008	0.05	102	0.0	0.0	0.2	98	1.4	4.1
B	0.034	0.1	111	8.9	6.9	0.4	103	2.0	0.0
Ba	0.029	0.05	96	0.9	0.0	0.2	97	0.3	0.5
Be	<0.0003	0.01	95	0.4	1.1	0.2	95	0.0	0.0
Ca	53.9	5.0	*	*	0.7	20.0	100	2.0	1.5
Cd	<0.001	0.01	107	0.0	0.0	0.1	97	0.0	0.0
Co	<0.002	0.02	100	2.7	7.5	0.2	97	0.7	2.1
Cr	<0.004	0.01	105	3.5	9.5	0.1	103	1.1	2.9
Cu	<0.003	0.02	98	2.1	4.4	0.2	100	0.5	1.5
Fe	0.875	0.2	95	8.9	2.8	0.8	97	3.2	3.6
Hg	<0.007	0.05	97	3.5	10.3	0.2	98	0.0	0.0
K	2.48	5.0	106	0.3	0.1	20.0	103	0.2	0.4
Li	<0.001	0.02	110	0.0	0.0	0.2	106	0.2	0.5
Mg	10.8	5.0	102	0.5	0.0	20.0	96	0.7	1.3
Mn	0.632	0.01	*	*	0.2	0.1	97	2.3	0.3
Mo	<0.004	0.02	105	3.5	9.5	0.2	103	0.4	1.0
Na	17.8	5.0	103	1.3	0.4	20.0	94	0.3	0.0
Ni	<0.005	0.02	96	5.6	9.1	0.2	100	0.7	1.5
P	0.196	0.1	91	14.7	0.3	0.4	108	3.9	1.3
Pb	<0.01	0.05	96	2.6	7.8	0.2	100	0.7	2.0
Sb	<0.008	0.05	102	2.8	7.8	0.2	104	0.4	1.0
Se	<0.02	0.1	104	2.1	5.8	0.4	103	1.6	4.4
SiO_2	7.83	5.0	151	1.6	1.3	20.0	117	0.4	0.6
Sn	<0.007	0.05	98	0.0	0.0	0.2	99	1.1	3.0
Sr	0.129	0.1	105	0.4	0.0	0.4	99	0.1	0.2
Tl	<0.02	0.1	103	1.1	2.9	0.4	97	1.3	3.9
V	0.003	0.05	94	0.4	0.0	0.2	98	0.1	0.0
Zn	0.006	0.05	97	1.6	1.8	0.2	94	0.4	0.0
Well Water									
Ag	<0.002	0.05	97	0.7	2.1	0.2	96	0.2	0.5
Al	0.036	0.05	107	7.6	10.1	0.2	101	1.1	0.8
As	<0.008	0.05	107	0.7	1.9	0.2	104	0.4	1.0
B	0.063	0.1	97	0.6	0.7	0.4	98	0.8	2.1
Ba	0.102	0.05	102	3.0	0.0	0.2	99	0.9	1.0
Be	<0.0003	0.01	100	0.0	0.0	0.1	100	0.0	0.0
Ca	93.8	5.0	*	*	2.1	20.0	100	4.1	0.1
Cd	0.002	0.01	90	0.0	0.0	0.1	96	0.0	0.0
Co	<0.002	0.02	94	0.4	1.1	0.2	94	0.4	1.1
Cr	<0.004	0.01	100	7.1	20.0	0.1	100	0.4	1.0
Cu	<0.005	0.02	100	1.1	0.4	0.2	96	0.5	1.5
Fe	0.042	0.1	99	2.3	1.4	0.4	97	1.4	3.3
Hg	<0.007	0.05	94	2.8	8.5	0.2	93	1.2	3.8
K	6.21	5.0	96	3.4	3.6	20.0	101	1.2	2.3
Li	0.001	0.02	100	7.6	9.5	0.2	104	1.0	1.9
Mg	24.5	5.0	95	5.6	0.3	20.0	93	1.6	1.2
Mn	2.76	0.01	*	*	0.4	0.1	*	*	0.7
Mo	<0.004	0.02	108	1.8	4.7	0.2	101	0.2	0.5
Na	35.0	5.0	101	11.4	0.8	20.0	100	3.1	1.5
Ni	<0.005	0.02	112	1.8	4.4	0.2	96	0.2	0.5
P	0.197	0.1	95	12.7	1.9	0.4	98	3.4	0.9
Pb	<0.01	0.05	87	4.9	16.1	0.2	95	0.2	0.5
Sb	<0.008	0.05	98	2.8	8.2	0.2	99	1.4	4.0
Se	<0.02	0.1	102	0.4	1.0	0.4	94	1.1	3.4
SiO_2	13.1	5.0	93	4.8	2.8	20.0	99	0.8	0.0
Sn	<0.007	0.05	98	2.8	8.2	0.2	94	0.2	0.5
Sr	0.274	0.1	94	5.7	2.7	0.4	95	1.7	2.2
Tl	<0.02	0.1	92	0.4	1.1	0.4	95	1.1	3.2
V	<0.003	0.05	98	0.0	0.0	0.2	99	0.4	1.0
Zn	0.538	0.05	*	*	0.7	0.2	99	2.5	1.1
Sewage Treatment Effluent									
Ag	0.009	0.05	92	1.5	3.6	0.2	95	0.1	0.0
Al	1.19	0.05	*	*	0.9	0.2	113	12.4	2.1
As	<0.008	0.05	99	2.1	6.1	0.2	93	2.1	6.5
B	0.226	0.1	217	16.3	9.5	0.4	119	13.1	20.9
Ba	0.189	0.05	90	6.8	1.7	0.2	99	1.6	0.5

TABLE 6—PRECISION AND RECOVERY DATA IN AQUEOUS MATRICES—Continued

Analyte	Sample conc. mg/L	Low spike mg/L	Average recovery R (%)	S (R)	RPD	High spike mg/L	Average recovery R (%)	S (R)	RPD
Be	<0.0003	0.01	94	0.4	1.1	0.1	100	0.4	1.0
Ca	87.9	5.0	*	*	0.6	20.0	101	3.7	0.0
Cd	0.009	0.01	89	2.6	2.3	0.1	97	0.4	1.0
Co	0.016	0.02	95	3.1	0.0	0.2	93	0.4	0.5
Cr	0.128	0.01	*	*	1.5	0.1	97	2.4	2.7
Cu	0.174	0.02	98	33.1	4.7	0.2	98	3.0	1.4
Fe	1.28	0.1	*	*	2.8	0.4	111	7.0	0.6
Hg	<0.007	0.05	102	1.4	3.9	0.2	98	0.5	1.5
K	10.6	5.0	104	2.8	1.3	20.0	101	0.6	0.0
Li	0.011	0.02	103	8.5	3.2	0.2	105	0.8	0.5
Mg	22.7	5.0	100	4.4	0.0	20.0	92	1.1	0.2
Mn	0.199	0.01	*	*	2.0	0.1	104	1.9	0.3
Mo	0.125	0.02	110	21.2	6.8	0.2	102	1.3	0.9
Na	0.236	5.0	*	*	0.0	20.0	*	*	0.4
Ni	0.087	0.02	122	10.7	4.5	0.2	98	0.8	1.1
P	4.71	0.1	*	*	2.6	0.4	*	*	1.4
Pb	0.015	0.05	91	3.5	5.0	0.2	96	1.3	2.9
Sb	<0.008	0.05	97	0.7	2.1	0.2	103	1.1	2.9
Se	<0.02	0.1	108	3.9	10.0	0.4	101	2.6	7.2
SiO_2	16.7	5.0	124	4.0	0.9	20.0	108	1.1	0.8
Sn	0.016	0.05	90	3.8	0.0	0.2	95	1.0	0.0
Sr	0.515	0.1	103	6.4	0.5	0.4	96	1.6	0.2
Tl	<0.02	0.1	105	0.4	1.0	0.4	95	0.0	0.0
V	0.003	0.05	93	0.9	2.0	0.2	97	0.2	0.5
Zn	0.160	0.05	98	3.3	1.9	0.2	101	1.0	1.4
Industrial Effluent									
Ag	<0.0003	0.05	88	0.0	0.0	0.2	84	0.9	3.0
Al	0.054	0.05	88	11.7	12.2	0.2	90	3.9	8.1
As	<0.02	0.05	82	2.8	9.8	0.2	88	0.5	1.7
B	0.17	0.1	162	17.6	13.9	0.4	92	4.7	9.3
Ba	0.083	0.05	86	8.2	1.6	0.2	85	2.3	2.4
Be	<0.0006	0.01	94	0.4	1.1	0.1	82	1.4	4.9
Ca	500	5.0	*	*	2.8	20.0	*	*	2.3
Cd	0.008	0.01	85	4.7	6.1	0.1	82	1.4	4.4
Co	<0.004	0.02	93	1.8	5.4	0.2	83	0.4	1.2
Cr	0.165	0.01	*	*	4.5	0.1	106	6.6	5.6
Cu	0.095	0.02	93	23.3	0.9	0.2	95	2.7	2.8
Fe	0.315	0.1	88	16.4	1.0	0.4	99	6.5	8.0
Hg	<0.01	0.05	87	0.7	2.3	0.2	86	0.4	1.2
K	2.87	5.0	101	3.4	2.4	20.0	100	0.8	0.4
Li	0.069	0.02	103	24.7	5.6	0.2	104	2.5	2.2
Mg	6.84	5.0	87	3.1	0.0	20.0	87	0.9	1.2
Mn	0.141	0.01	*	*	1.2	0.1	89	6.6	4.8
Mo	1.27	0.02	*	*	0.0	0.2	100	15.0	2.7
Na	1500	5.0	*	*	2.7	20.0	*	*	2.0
Ni	0.014	0.02	98	4.4	3.0	0.2	87	0.5	1.1
P	0.326	0.1	105	16.0	4.7	0.4	97	3.9	1.4
Pb	0.251	0.05	80	19.9	1.4	0.2	88	5.0	0.9
Sb	2.81	0.05	*	*	0.4	0.2	*	*	2.0
Se	0.021	0.1	106	2.6	3.2	0.4	105	1.9	4.6
SiO_2	6.83	5.0	99	6.8	1.7	20.0	100	2.2	3.0
Sn	<0.01	0.05	87	0.7	2.3	0.2	86	0.4	1.2
Sr	6.54	0.1	*	*	2.0	0.4	*	*	2.7
Tl	<0.03	0.1	87	1.8	5.8	0.4	84	1.1	3.6
V	<0.005	0.05	90	1.4	4.4	0.2	84	1.1	3.6
Zn	0.024	0.05	89	6.0	4.4	0.2	91	3.5	8.9

S (R) Standard deviation of percent recovery.
RPD Relative percent difference between duplicate spike determinations.
< Sample concentration below established method detection limit.
* Spike concentration <10% of sample background concentration.

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TABLE 7—PRECISION AND RECOVERY DATA IN SOLID MATRICES

Analyte	Sample conc. mg/kg	Low + spike mg/kg	Average recovery R (%)	S (R)	RPD	High + spike mg/kg	Average recovery R (%)	S (R)	RPD
EPA Hazardous Soil #884									
Ag	1.1	20	98	0.7	1.0	100	96	0.2	0.6
Al	5080	20	*	*	7.2	100	*	*	5.4
As	5.7	20	95	5.4	10.6	100	96	1.4	3.6
B	20.4	100	93	2.7	5.3	400	100	2.1	5.5
Ba	111	20	98	71.4	22.2	100	97	10.0	1.0
Be	0.66	20	97	0.7	2.3	100	99	0.1	0.2
Ca	85200	–	–	–	–	–	–	–	–
Cd	2	20	93	0.7	1.0	100	94	0.2	0.4
Co	5.5	20	96	3.5	7.7	100	93	0.8	2.1
Cr	79.7	20	87	28.8	16.5	100	104	1.3	1.1
Cu	113	20	110	16.2	4.4	100	104	4.0	4.2
Fe	16500	–	–	–	–	–	–	–	–
Hg	<1.4	10	92	2.5	7.7	40	98	0.0	0.0
K	621	500	121	1.3	0.0	2000	107	0.9	1.8
Li	6.7	10	113	3.5	4.4	40	106	0.6	0.6
Mg	24400	500	*	*	8.4	2000	*	*	10.1
Mn	343	20	*	*	8.5	100	95	11.0	1.6
Mo	5.3	20	88	5.3	13.2	100	91	1.4	4.1
Na	195	500	102	2.2	2.4	2000	100	1.5	3.7
Ni	15.6	20	100	1.8	0.0	100	94	1.5	3.6
P	595	500	106	13.4	8.0	2000	103	3.2	2.7
Pb	145	20	88	51.8	17.9	100	108	15.6	17.4
Sb	6.1	20	83	3.9	7.5	100	81	1.9	5.9
Se	<5	20	79	14.7	52.4	100	99	0.7	2.1
Sn	16.6	20	91	34.6	5.8	80	112	8.7	2.8
Sr	102	100	84	9.6	10.8	400	94	2.5	4.6
Tl	<4	20	92	4.8	14.6	100	91	1.5	4.6
V	16.7	20	104	4.2	5.4	100	99	0.8	1.7
Zn	131	20	103	31.2	7.3	100	104	7.2	6.4
EPA Electroplating Sludge #286									
Ag	6	20	96	0.2	0.4	100	93	0.1	0.4
Al	4980	20	*	*	4.4	100	*	*	5.6
As	32	20	94	1.3	0.8	100	97	0.7	1.6
B	210	100	113	2.0	1.6	400	98	1.9	3.5
Ba	39.8	20	0	6.8	0.3	100	0	1.6	5.7
Be	0.32	20	96	0.2	0.5	100	101	0.7	2.0
Ca	48500	–	–	–	–	–	–	–	–
Cd	108	20	98	2.5	0.8	100	96	0.5	0.5
Co	5.9	20	93	2.9	5.7	100	93	0.6	1.5
Cr	7580	20	*	*	0.7	100	*	*	1.3
Cu	806	20	*	*	1.5	100	94	8.3	0.7
Fe	31100	–	–	–	–	–	–	–	–
Hg	6.1	10	90	2.5	4.0	40	97	1.7	4.3
K	2390	500	75	8.3	4.0	2000	94	2.9	3.8
Li	9.1	10	101	2.8	0.5	40	106	1.6	3.1
Mg	1950	500	110	2.0	0.8	2000	108	2.3	3.2
Mn	262	20	*	*	1.8	100	91	1.2	0.9
Mo	13.2	20	92	2.1	2.9	100	92	0.3	0.0
Na	73400	500	*	*	1.7	2000	*	*	1.4
Ni	456	20	*	*	0.4	100	88	2.7	0.9
P	9610	500	*	*	2.9	2000	114	7.4	3.4
Pb	1420	20	*	*	2.1	100	*	*	1.3
Sb	<2	20	76	0.9	3.3	100	75	2.8	10.7
Se	6.3	20	86	9.0	16.6	100	103	1.6	2.7
Sn	24.0	20	87	4.0	2.7	80	92	0.7	0.0
Sr	145	100	90	8.1	8.1	400	93	2.4	4.6
Tl	16	20	89	4.6	5.3	100	92	0.8	0.9
V	21.7	20	95	1.2	1.0	100	96	0.4	0.9
Zn	12500	20	*	*	0.8	100	*	*	0.8
NBS 1645 River Sediment									
Ag	1.6	20	92	0.4	1.0	100	96	0.3	0.9
Al	5160	20	*	*	8.4	100	*	*	2.4
As	62.8	20	89	14.4	9.7	100	97	2.9	5.0
B	31.9	100	116	7.1	13.5	400	95	0.6	1.5
Ba	54.8	20	95	6.1	2.8	100	98	1.2	1.3

TABLE 7—PRECISION AND RECOVERY DATA IN SOLID MATRICES—Continued

Analyte	Sample conc. mg/kg	Low + spike mg/kg	Average recovery R (%)	S (R)	RPD	High + spike mg/kg	Average recovery R (%)	S (R)	RPD
Be	0.72	20	101	0.4	1.0	100	103	1.4	3.9
Ca	28000	–	–	–	–	–	–	–	–
Cd	9.7	20	100	1.1	0.0	100	101	0.7	1.8
Co	9.4	20	98	3.8	4.8	100	98	0.9	1.8
Cr	28500	20	*	*	0.4	100	*	*	0.7
Cu	109	20	115	8.5	0.0	100	102	1.8	1.0
Fe	84800	–	–	–	–	–	–	–	–
Hg	3.1	10	99	4.3	7.7	40	96	0.7	1.0
K	452	500	98	4.1	2.0	2000	106	1.4	2.3
Li	3.7	10	101	2.0	0.7	40	108	1.3	3.0
Mg	6360	500	*	*	1.8	2000	93	2.7	1.0
Mn	728	20	*	*	3.5	100	97	12.4	2.2
Mo	17.9	20	97	12.5	18.5	100	98	0.6	0.0
Na	1020	500	92	2.6	0.0	2000	97	1.1	1.7
Ni	36.2	20	94	5.9	4.0	100	100	1.1	1.5
P	553	500	102	1.4	0.9	2000	100	0.8	1.6
Pb	707	20	*	*	0.8	100	103	5.9	0.4
Sb	22.8	20	86	2.3	0.0	100	88	0.6	0.9
Se	6.7	20	103	14.3	27.1	100	98	3.1	7.6
Sn	309	20	*	*	1.0	80	101	7.9	2.7
Sr	782	100	91	12.3	3.0	400	96	3.3	2.6
Tl	<4	20	90	0.0	0.0	100	95	1.3	4.0
V	20.1	20	89	5.4	5.8	100	98	0.7	0.0
Zn	1640	20	*	*	1.8	100	*	*	1.1

S (R) Standard deviation of percent recovery.
RPD Relative percent difference between duplicate spike determinations.
< Sample concentration below established method detection limit.
* Spike concentration <10% of sample background concentration.
– Not spiked.
+ Equivalent.

TABLE 8—ICP–AES INSTRUMENTAL PRECISION AND ACCURACY FOR AQUEOUS SOLUTIONS [a]

Element	Mean conc. (mg/L)	N [b]	RSD (%)	Accurace [c] (% of Nominal)
Al	14.8	8	6.3	100
Sb	15.1	8	7.7	102
As	14.7	7	6.4	99
Ba	3.66	7	3.1	99
Be	3.78	8	5.8	102
Cd	3.61	8	7.0	97
Ca	15.0	8	7.4	101
Cr	3.75	8	8.2	101
Co	3.52	8	5.9	95
Cu	3.58	8	5.6	97
Fe	14.8	8	5.9	100
Pb	14.4	7	5.9	97
Mg	14.1	8	6.5	96
Mn	3.70	8	4.3	100
Mo	3.70	8	6.9	100
Ni	3.70	7	5.7	100
K	14.1	8	6.6	95
Se	15.3	8	7.5	104
Na	14.0	8	4.2	95
Tl	15.1	7	8.5	102
V	3.51	8	6.6	95
Zn	3.57	8	8.3	96

[a] These performance values are independent of sample preparation because the labs analyzed portions of the same solutions using sequential or simultaneous instruments.
[b] N = Number of measurements for mean and relative standard deviation (RSD).
[c] Accuracy is expressed as a percentage of the nominal value for each analyte in the acidified, multi-element solutions.

TABLE 9—MULTILABORATORY ICP PRECISION AND ACCURACY DATA*

Analyte	Concentration µg/L	Total recoverable digestion µ/L
Aluminum	69–4792	X = 0.9380 (C) + 22.1

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TABLE 9—MULTILABORATORY ICP PRECISION AND ACCURACY DATA*—Continued

Analyte	Concentration µg/L	Total recoverable digestion µ/L
Antimony	77–1406	SR = 0.0481 (X) + 18.8 0.8908 (C) + 0.9
Arsenic	69–1887	SR = 0.0682 (X) + 2.5 X = 1.0175 (C) + 3.9
Barium	9–377	SR = 0.0643 (X) + 10.3 X = 0.8.80 (C) + 1.68
Beryllium	3–1906	SR = 0.0826 (X) + 3.54 X = 1.0177 (C) − 0.55
Boron	19–5189	SR = 0.0445 (X) − 0.10 X = 0.9676 (C) + 18.7
Cadmium	9–1943	SR = 0.0743 (X) + 21.1 X = 1.0137 (C) − 0.65
Calcium	17–47170	SR = 0.0332 (X) + 0.90 X = 0.9658 (C) + 0.8
Chromium	13–1406	SR = 0.0327 (X) + 10.1 X = 1.0049 (C) − 1.2
Cobalt	17–2340	SR = 0.0571 (X) + 1.0 X = 0.9278 (C) + 1.5
Copper	8–1887	SR = 0.0407 (X) + 0.4 X = 0.9647 (C) − 3.64
Iron	13–9359	SR = 0.0406 (X) + 0.96 X = 0.9830 (C) + 5.7
Lead	42–4717	SR = 0.0790 (X) + 11.5 X = 1.0056 (C) + 4.1
Magnesium	34–13868	SR = 0.0448 (X) + 3.5 X = 0.9879 (C) + 2.2
Manganese	4–1887	SR = 0.0268 (X) + 8.1 X = 0.9725 (C) + 0.07
Molybdenum	17–1830	SR = 0.0400 (X) + 0.82 X = 0.9707 (C) − 2.3
Nickel	17–47170	SR = 0.0529 (X) + 2.1 X = 0.9869 (C) + 1.5
Potassium	347–14151	SR = 0.0393 (X) + 2.2 X = 0.9355 (C) − 183.1
Selenium	69–1415	SR = 0.0329 (X) + 60.9 X = 0.9737 (C) − 1.0
Silicon	189–9434	SR = 0.0443 (X) + 6.6 X = 0.9737 (C) − 22.6
Silver	8–189	SR = 0.2133 (X) + 22.6 X = 0.3987 (C) + 8.25
Sodium	35–47170	SR = 0.1836 (X) − 0.27 X = 1.0526 (C) + 26.7
Thallium	79–1434	SR = 0.0884 (X) + 50.5 X = 0.9238 (C) + 5.5
Vanadium	13–4698	SR = 0.0106 (X) + 48.0 X = 0.9551 (C) + 0.4
Zinc	7–7076	SR = 0.0472 (X) + 0.5 X = 0.9500 (C) + 1.82 SR = 0.0153 (X) + 7.78

*—Regression equations abstracted from Reference 16.
X = Mean Recovery, µg/L.
C = True Value for the Concentration, µg/L.
SR = Single-analyst Standard Deviation, µg/L.

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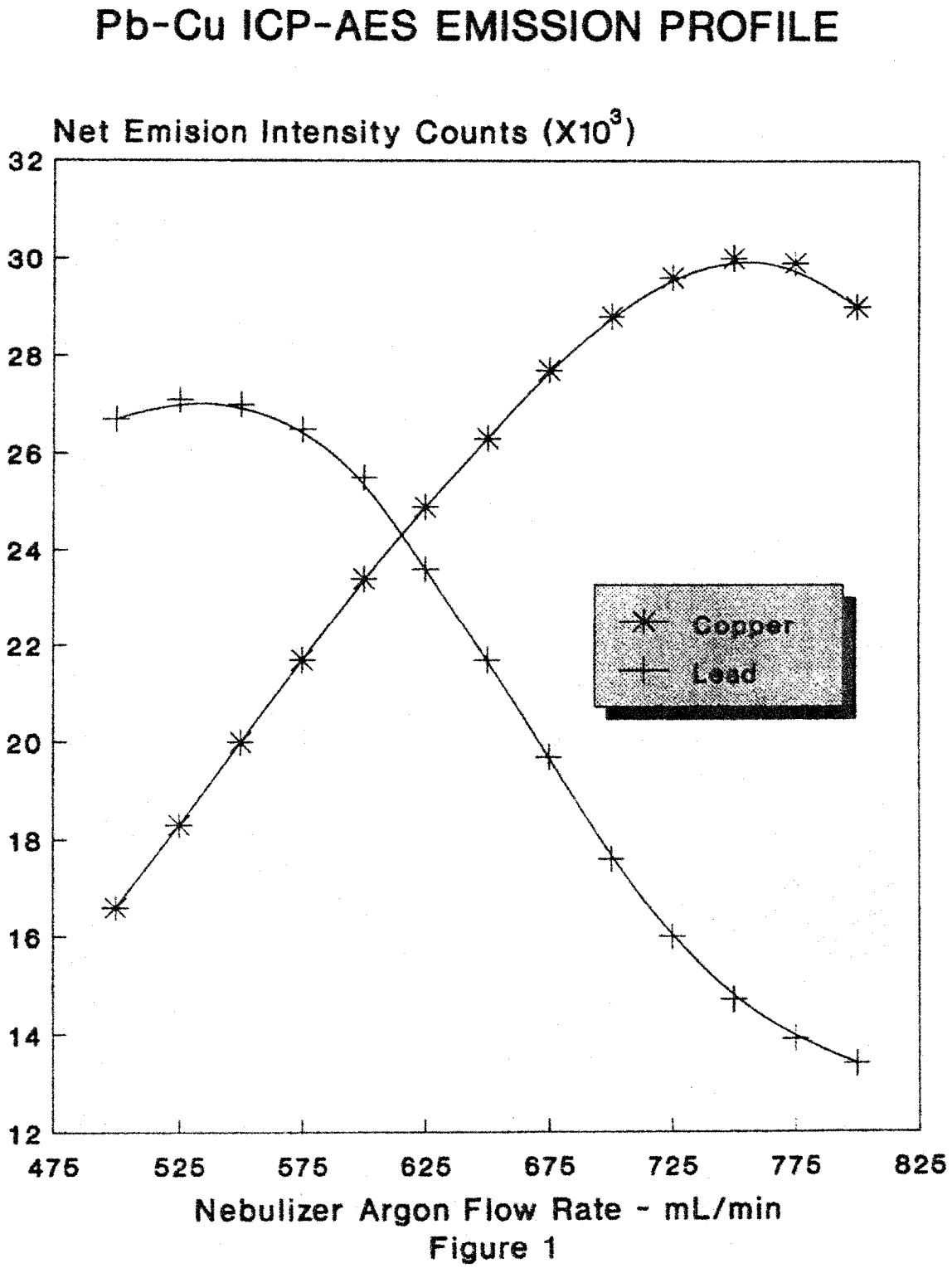

Figure 1

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■ 9. Revise Appendix D to Part 136 to read as follows:

Appendix D to Part 136—Precision and Recovery Statements for Methods for Measuring Metals

Two selected methods from ''Methods for Chemical Analysis of Water and Wastes,'' EPA–600/4–79–020 (1979) have been subjected to interlaboratory method validation studies. The two selected methods are for Thallium and Zinc. The following precision and recovery statements are presented in this appendix and incorporated into Part 136:

Method 279.2

For Thallium, Method 279.2 (Atomic Absorption, Furnace Technique) replace the Precision and Accuracy Section statement with the following:

Precision and Accuracy

An interlaboratory study on metal analyses by this method was conducted by the Quality Assurance Branch (QAB) of the

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Environmental Monitoring Systems Laboratory—Cincinnati (EMSL–CI). Synthetic concentrates containing various levels of this element were added to reagent water, surface water, drinking water and three effluents. These samples were digested by the total digestion procedure, 4.1.3 in this manual. Results for the reagent water are given below. Results for other water types and study details are found in ''EPA Method Study 31, Trace Metals by Atomic Absorption (Furnace Techniques),'' National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161 Order No. PB 86–121 704/AS, by Copeland, F.R. and Maney, J.P., January 1986.

For a concentration range of 10.00–252 µg/L

$X = 0.8781(C) - 0.715$
$S = 0.1112(X) + 0.669$
$SR = 0.1005(X) + 0.241$

Where:

C = True Value for the Concentration, µg/L
X = Mean Recovery, µg/L
S = Multi-laboratory Standard Deviation, µg/L
SR = Single-analyst Standard Deviation, µg/L

Method 289.2

For Zinc, Method 289.2 (Atomic Absorption, Furnace Technique) replace the Precision and Accuracy Section statement with the following:

Precision and Accuracy

An interlaboratory study on metal analyses by this method was conducted by the Quality Assurance Branch (QAB) of the Environmental Monitoring Systems Laboratory—Cincinnati (EMSL–CI). Synthetic concentrates containing various levels of this element were added to reagent water, surface water, drinking water and three effluents. These samples were digested by the total digestion procedure, 4.1.3 in this manual. Results for the reagent water are given below. Results for other water types and study details are found in ''EPA Method Study 31, Trace Metals by Atomic Absorption (Furnace Techniques),'' National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161 Order No. PB 86–121 704/AS, by Copeland, F.R. and Maney, J.P., January 1986.

For a concentration range of 0.51–189 µg/L

$X = 1.6710(C) + 1.485$
$S = 0.6740(X) - 0.342$
$SR = 0.3895(X) - 0.384$

Where:

C = True Value for the Concentration, µg/L
X = Mean Recovery, µg/L
S = Multi-laboratory Standard Deviation, µg/L
SR = Single-analyst Standard Deviation, µg/L

PART 260—HAZARDOUS WASTE MANAGEMENT SYSTEM: GENERAL

■ 10. The authority citation for Part 260 continues to read as follows:

Authority: 42 U.S.C. 6905, 6912(a), 6921–6927, 6930, 6934, 6935, 6937, 6938, 6939, and 6974.

Subpart B—Definitions

■ 11. Section 260.11 is amended by revising paragraph (c)(2) to read as follows:

§ 260.11 References.

* * * * *

(c) * * *

(2) Method 1664, n-Hexane Extractable Material (HEM; Oil and Grease) and Silica Gel Treated n-Hexane Extractable Material SGT–HEM; Non-polar Material) by Extraction and Gravimetry:

(i) Revision A, EPA–821–R–98–002, February 1999, IBR approved for Part 261, Appendix IX.

(ii) Revision B, EPA–821–R–10–001, February 2010, IBR approved for Part 261, Appendix IX.

* * * * *

PART 423—STEAM ELECTRIC POWER GENERATING POINT SOURCE CATEGORY

■ 12. The authority citation for Part 423 continues to read as follows:

Authority: Secs. 301; 304(b), (c), (e), and (g); 306(b) and (c); 307(b) and (c); and 501, Clean Water Act (Federal Water Pollution Control Act Amendments of 1972, as amended by Clean Water Act of 1977) (the ''Act''; 33 U.S.C. 1311; 1314(b), (c), (e), and (g); 1316(b) and (c); 1317(b) and (c); and 1361; 86 Stat. 816, Pub. L. 92–500; 91 Stat. 1567, Pub. L. 95–217), unless otherwise noted.

■ 13. Section 423.11 is amended by revising paragraphs (a) and (l) to read as follows:

§ 423.11 Specialized definitions.

* * * * *

(a) The term *total residual chlorine* (or total residual oxidants for intake water with bromides) means the value obtained using any of the ''chlorine—total residual'' methods in Table IB in 40 CFR 136.3(a), or other methods approved by the permitting authority.

* * * * *

(l) The term *free available chlorine* means the value obtained using any of the ''chlorine—free available'' methods in Table IB in 40 CFR 136.3(a) where the method has the capability of measuring free available chlorine, or other methods approved by the permitting authority.

* * * * *

PART 430—PULP, PAPER, AND PAPERBOARD POINT SOURCE CATEGORY

■ 14. The authority citation for Part 430 continues to read as follows:

Authority: Secs. 301, 304, 306, 307, 308, 402, and 501, Clean Water Act as amended, (33 U.S.C. 1311, 1314, 1316, 1317, 1318, 1342, and 1361) and Section 112 of the Clean Air Act, as amended (42 U.S.C. 7412).

■ 15. Section 430.01 is amended by revising paragraph (a) and by adding paragraphs (s) through (v) to read as follows:

§ 430.01 General definitions.

* * * * *

(a) *Adsorbable organic halides (AOX).* A bulk parameter that measures the total mass of chlorinated organic matter in water and wastewater. The approved method of analysis for AOX is Method 1650, which is available in Appendix A of this part, and online at *http://water.epa.gov/scitech/methods/cwa/index.cfm*.

* * * * *

(s) TCDD. 2,3,7,8-tetrachlorodibenzo-*p*-dioxin. The approved method of analysis for TCDD is Method 1613B, which is available in Appendix A of this part, and online at *http://water.epa.gov/scitech/methods/cwa/index.cfm*.

(t) TCDF. 2,3,7,8-tetrachlorodibenzofuran. The approved method of analysis for TCDF is Method 1613B, which is available in Appendix A of this part, and online at *http://water.epa.gov/scitech/methods/cwa/index.cfm*.

(u) Chloroform. The approved methods of analysis for chloroform are listed in Table IC at 40 CFR 136.3.

(v) The approved method of analysis for the following chlorinated phenolic compounds is Method 1653, which is available in Appendix A of this part, and online at *http://water.epa.gov/scitech/methods/cwa/index.cfm*:

(1) Trichlorosyringol.
(2) 3,4,5-Trichlorocatechol.
(3) 3,4,6-Trichlorocatechol.
(4) 3,4,5-Trichloroguaiacol.
(5) 3,4,6-Trichloroguaiacol.
(6) 4,5,6-Trichloroguaiacol.
(7) 2,4,5-Trichlorophenol.
(8) 2,4,6-Trichlorophenol.
(9) Tetrachlorocatechol.
(10) Tetrachloroguaiacol.
(11) 2,3,4,6–Tetrachlorophenol.
(12) Pentachlorophenol.

PART 435—OIL AND GAS EXTRACTION POINT SOURCE CATEGORY

■ 16. The authority citation for part 435 continues to read as follows:

Authority: 33 U.S.C. 1311, 1314, 1316, 1317, 1318, 1342, and 1361.

■ 17. Section 435.11 is amended as follows:

■ a. By revising paragraph (d).
■ b. By revising paragraph (e).
■ c. By revising paragraph (k)(2).

■ d. By revising paragraph (o).
■ e. By revising paragraph (t).
■ f. By revising paragraph (u).
■ g. By revising paragraph (v).
■ h. By revising paragraph (x).
■ i. By revising paragraph (ee).
■ j. By revising paragraph (gg).
■ k. By revising paragraph (hh).
■ l. By revising paragraph (ss).
■ m. By adding paragraph (uu).

§ 435.11 Special definitions.

* * * * *

(d) *Base fluid retained on cuttings* as applied to BAT effluent limitations and NSPS refers to the ''Determination of the Amount of Non-Aqueous Drilling Fluid (NAF) Base Fluid from Drill Cuttings by a Retort Chamber (Derived from API Recommended Practice 13B–2)'', EPA Method 1674, which is published as an appendix to Subpart A of this part and in ''Analytic Methods for the Oil and Gas Extraction Point Source Category,'' EPA–821–R–11–004. See paragraph (uu) of this section.

(e) *Biodegradation rate* as applied to BAT effluent limitations and NSPS for drilling fluids and drill cuttings refers to the ''Protocol for the Determination of Degradation of Non Aqueous Base Fluids in a Marine Closed Bottle Biodegradation Test System: Modified ISO 11734:1995,'' EPA Method 1647, supplemented with ''Procedure for Mixing Base Fluids With Sediments,'' EPA Method 1646. Both EPA Method 1646 and 1647 are published as appendices to Subpart A of this part and in ''Analytic Methods for the Oil and Gas Extraction Point Source Category,'' EPA–821–R–11–004. See paragraph (uu) of this section.

* * * * *

(k) * * *

(2) *Dry drill cuttings* means the residue remaining in the retort vessel after completing the retort procedure specified in EPA Method 1674, which is published as an appendix to Subpart A of this part and in ''Analytic Methods for the Oil and Gas Extraction Point Source Category,'' EPA–821–R–11–004. See paragraph (uu) of this section.

* * * * *

(o) *Formation oil* means the oil from a producing formation which is detected in the drilling fluid, as determined by the GC/MS compliance assurance method, EPA Method 1655, when the drilling fluid is analyzed before being shipped offshore, and as determined by the RPE method, EPA Method 1670, when the drilling fluid is analyzed at the offshore point of discharge. The GC/MS compliance assurance method and the RPE method approved for use with this part are published as appendices to Subpart A of this part and in ''Analytic Methods for the Oil and Gas Extraction Point Source Category,'' EPA–821–R–11–004. See paragraph (uu) of this section. Detection of formation oil by the RPE method may be confirmed by the GC/MS compliance assurance method, and the results of the GC/MS compliance assurance method shall apply instead of those of the RPE method.

* * * * *

(t) *Maximum weighted mass ratio averaged over all NAF well sections* for BAT effluent limitations and NSPS for base fluid retained on cuttings means the weighted average base fluid retention for all NAF well sections as determined by EPA Method 1674, which is published as an appendix to Subpart A of this part and in ''Analytic Methods for the Oil and Gas Extraction Point Source Category,'' EPA–821–R–11–004. See paragraph (uu) of this section.

(u) *Method 1654A* refers to EPA Method 1654, Revision A, entitled ''PAH Content of Oil by HPLC/UV,'' December 1992, which is published as an appendix to Subpart A of this part and in ''Analytic Methods for the Oil and Gas Extraction Point Source Category,'' EPA–821–R–11–004. See paragraph (uu) of this section.

(v) *Minimum* as applied to BAT effluent limitations and NSPS for drilling fluids and drill cuttings means the minimum 96-hour LC_{50} value allowed as measured in any single sample of the discharged waste stream. *Minimum* as applied to BPT and BCT effluent limitations and NSPS for sanitary wastes means the minimum concentration value allowed as measured in any single sample of the discharged waste stream.

* * * * *

(x) *No discharge of free oil* means that waste streams may not be discharged that contain free oil as evidenced by the monitoring method specified for that particular stream, *e.g.,* deck drainage or miscellaneous discharges cannot be discharged when they would cause a film or sheen upon or discoloration of the surface of the receiving water; drilling fluids or cuttings may not be discharged when they fail EPA Method 1617 (Static Sheen Test), which is published as an appendix to Subpart A of this part and in ''Analytic Methods for the Oil and Gas Extraction Point Source Category,'' EPA–821–R–11–004. See paragraph (uu) of this section.

* * * * *

(ee) *Sediment toxicity* as applied to BAT effluent limitations and NSPS for drilling fluids and drill cuttings refers to EPA Method 1644: ''Method for Conducting a Sediment Toxicity Test with *Leptocheirus plumulosus* and Non-Aqueous Drilling Fluids or Synthetic-Based Drilling Muds'' and sediment preparation procedures specified in EPA Method 1646. EPA Method 1644 is published in ''Analytic Methods for the Oil and Gas Extraction Point Source Category,'' (see paragraph (uu) of this section) and EPA Method 1646 is published as an appendix to Subpart A of this part.

* * * * *

(gg) *SPP toxicity* as applied to BAT effluent limitations and NSPS for drilling fluids and drill cuttings refers to the bioassay test procedure, ''Suspended Particulate Phase (SPP) Toxicity Test,'' presented in EPA Method 1619, which is published as an appendix to Subpart A of this part and in ''Analytic Methods for the Oil and Gas Extraction Point Source Category,'' EPA–821–R–11–004. See paragraph (uu) of this section.

(hh) *Static sheen test* means the standard test procedure that has been developed for this industrial subcategory for the purpose of demonstrating compliance with the requirement of no discharge of free oil. The methodology for performing the static sheen test is presented in EPA Method 1617, which is published as an appendix to Subpart A of this part and in ''Analytic Methods for the Oil and Gas Extraction Point Source Category,'' EPA–821–R–11–004. See paragraph (uu) of this section.

* * * * *

(ss) C_{16}-C_{18} *internal olefin drilling fluid* means a C_{16}-C_{18} internal olefin drilling fluid formulated as specified in appendix 1 of subpart A of this part.

* * * * *

(uu) *Analytic Methods for the Oil and Gas Extraction Point Source Category* is the EPA document, ''Analytic Methods for the Oil and Gas Point Source Category,'' December 2011, EPA–821–R–11–004, that compiles analytic methods for this category. This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies may be inspected at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202–741–6030, or go to: *http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.* A copy may also be inspected at EPA's Water Docket, 1200 Pennsylvania Ave. NW., Washington, DC 20460. This method may be obtained

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at *http://water.epa.gov/scitech/methods/cwa/index.cfm*.

■ 18. In § 435.12, Footnote 1 to the table is revised to read as follows:

§ 435.12 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT).

* * * * *

[1] No discharge of free oil. See § 435.11(x).

* * * * *

■ 19. In § 435.13:

■ a. Remove ''LC_5'' and add in its place ''LC_{50}'' wherever it appears.

■ b. Footnotes 2, 3, and 5 through 11 to the table are revised to read as follows:

§ 435.13 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT).

* * * * *

[2] As determined by the suspended particulate phase (SPP) toxicity test. See § 435.11(gg).

[3] As determined by the static sheen test. See § 435.11(hh).

* * * * *

[5] PAH mass ratio = Mass (g) of PAH (as phenanthrene)/Mass (g) of stock base fluid as determined by EPA Method 1654, Revision A, [specified at § 435.11(u)] entitled ''PAH Content of Oil by HPLC/UV,'' December 1992, which is published as an appendix to Subpart A of this part and in ''Analytic Methods for the Oil and Gas Extraction Point Source Category,'' EPA–821–R–11–004. See § 435.11(uu).

[6] Base fluid sediment toxicity ratio = 10-day LC_{50} of C_{16}-C_{18} internal olefin/10-day LC_{50} of stock base fluid as determined by EPA Method 1644: ''Method for Conducting a Sediment Toxicity Test with *Leptocheirus plumulosus* and Non-Aqueous Drilling Fluids or Synthetic-Based Drilling Muds'' after preparing the sediment according to the procedure specified in EPA Method 1646, which are published as appendices to Subpart A of this part and in ''Analytic Methods for the Oil and Gas Extraction Point Source Category,'' EPA–821–R–11–004. See § 435.11(ee) and (uu).

[7] Biodegradation rate ratio = Cumulative headspace gas production (ml) of C_{16}-C_{18} internal olefin/Cumulative headspace gas production (ml) of stock base fluid, both at 275 days as determined by EPA Method 1647, which is published as an appendix to Subpart A of this part and in ''Analytic Methods for the Oil and Gas Extraction Point Source Category,'' EPA–821–R–11–004. See § 435.11(e) and (uu).

[8] Drilling fluid sediment toxicity ratio = 4-day LC_{50} of C_{16}-C_{18} internal olefin drilling fluid/4-day LC_{50} of drilling fluid removed from drill cuttings at the solids control equipment as determined by EPA Method 1644: ''Method for Conducting a Sediment Toxicity Test with *Leptocheirus plumulosus* and Non-Aqueous Drilling Fluids or Synthetic-Based Drilling Muds'' after sediment preparation procedures specified in EPA Method 1646, which are published as appendices to Subpart A of this part and in ''Analytic Methods for the Oil and Gas Extraction Point Source Category,'' EPA–821–R–11–004. See § 435.11(ee) and (uu).

[9] As determined before drilling fluids are shipped offshore by the GC/MS compliance assurance method (EPA Method 1655), and as determined prior to discharge by the RPE method (EPA Method 1670) applied to drilling fluid removed from drill cuttings. If the operator wishes to confirm the results of the RPE method (EPA Method 1670), the operator may use the GC/MS compliance assurance method (EPA Method 1655). Results from the GC/MS compliance assurance method (EPA Method 1655) shall supersede the results of the RPE method (EPA Method 1670). EPA Method 1655 and 1670 are published as appendices to Subpart A of this part and in ''Analytic Methods for the Oil and Gas Extraction Point Source Category,'' EPA–821–R–11–004. See § 435.11(uu).

[10] Maximum permissible retention of non-aqueous drilling fluid (NAF) base fluid on wet drill cuttings averaged over drilling intervals using NAFs as determined by EPA Method 1674, which is published as an appendix to Subpart A of this part and in ''Analytic Methods for the Oil and Gas Extraction Point Source Category,'' EPA–821–R–11–004. See § 435.11(uu). This limitation is applicable for NAF base fluids that meet the base fluid sediment toxicity ratio (Footnote 6), biodegradation rate ratio (Footnote 7), PAH, mercury, and cadmium stock limitations (C_{16}-C_{18} internal olefin) defined above in this table.

[11] Maximum permissible retention of non-aqueous drilling fluid (NAF) base fluid on wet drill cuttings average over drilling intervals using NAFs as determined by EPA Method 1674, which is published as an appendix to Subpart A of this part and in ''Analytic Methods for the Oil and Gas Extraction Point Source Category,'' EPA–821–R–11–004. See § 435.11(uu). This limitation is applicable for NAF base fluids that meet the ester base fluid sediment toxicity ratio and ester biodegradation rate ratio stock limitations defined as:

(a) ester base fluid sediment toxicity ratio = 10-day LC_{50} of C_{12}-C_{14} ester or C_8 ester/10-day LC_{50} of stock base fluid as determined by EPA Method 1644: ''Method for Conducting a Sediment Toxicity Test with *Leptocheirus plumulosus* and Non-Aqueous Drilling Fluids or Synthetic-Based Drilling Muds'' after sediment preparation procedures specified in EPA Method 1646, which are published as appendices to Subpart A of this part and in ''Analytic Methods for the Oil and Gas Extraction Point Source Category,'' EPA–821–R–11–004. See § 435.11(ee) and (uu);

(b) ester biodegradation rate ratio = Cumulative headspace gas production (ml) of C_{12}-C_{14} ester or C_8 ester/Cumulative headspace gas production (ml) of stock base fluid, both at 275 days as determined by EPA Method 1647, which is published as an appendix to Subpart A of this part and in ''Analytic Methods for the Oil and Gas Extraction Point Source Category,'' EPA–821–R–11–004. See § 435.11(e) and (uu); and

(c) PAH mass ratio (Footnote 5), mercury, and cadmium stock limitations (C_{16}-C_{18} internal olefin) defined above in this table.

■ 20. In § 435.14 footnote 2 to the table is revised to read as follows:

§ 435.14 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT).

* * * * *

[2] As determined by the static sheen test. See § 435.11(hh).

* * * * *

■ 21. In § 435.15:

■ a. Remove ''LC_5'' and add in its place ''LC_{50}''wherever it appears.

■ b. Footnotes 2, 3, and 5 through 11 to the table are revised to read as follows:

§ 435.15 Standards of performance for new sources (NSPS).

* * * * *

[2] As determined by the suspended particulate phase (SPP) toxicity test. See § 435.11(gg).

[3] As determined by the static sheen test. See § 435.11(hh).

* * * * *

[5] PAH mass ratio = Mass (g) of PAH (as phenanthrene)/Mass (g) of stock base fluid as determined by EPA Method 1654, Revision A, [specified at § 435.11(u)] entitled ''PAH Content of Oil by HPLC/UV,'' December 1992, which is published as an appendix to Subpart A of this part and in ''Analytic Methods for the Oil and Gas Extraction Point Source Category,'' EPA–821–R–11–004. See § 435.11(uu).

[6] Base fluid sediment toxicity ratio = 10-day LC_{50} of C_{16}-C_{18} internal olefin/10-day LC_{50} of stock base fluid as determined by EPA Method 1644: ''Method for Conducting a Sediment Toxicity Test with *Leptocheirus plumulosus* and Non-Aqueous Drilling Fluids or Synthetic-Based Drilling Muds'' after preparing the sediment according to the procedure specified in EPA Method 1646, which are published as appendices to Subpart A of this part and in ''Analytic Methods for the Oil and Gas Extraction Point Source Category,'' EPA–821–R–11–004. See § 435.11(ee) and (uu).

[7] Biodegradation rate ratio = Cumulative headspace gas production (ml) of C_{16}-C_{18} internal olefin/Cumulative headspace gas production (ml) of stock base fluid, both at 275 days as determined by EPA Method 1647, which is published as an appendix to Subpart A of this part and in ''Analytic Methods for the Oil and Gas Extraction Point Source Category,'' EPA–821–R–11–004. See § 435.11(e) and (uu).

[8] Drilling fluid sediment toxicity ratio = 4-day LC_{50} of C_{16}-C_{18} internal olefin drilling fluid/4-day LC_{50} of drilling fluid removed from drill cuttings at the solids control equipment as determined by EPA Method 1644: ''Method for Conducting a Sediment Toxicity Test with *Leptocheirus plumulosus* and Non-Aqueous Drilling Fluids or Synthetic-Based Drilling Muds'' after sediment preparation procedures specified in

EPA Method 1646, which are published as appendices to Subpart A of this part and in ''Analytic Methods for the Oil and Gas Extraction Point Source Category,'' EPA–821–R–11–004. See § 435.11(ee) and (uu).

[9] As determined before drilling fluids are shipped offshore by the GC/MS compliance assurance method (EPA Method 1655), and as determined prior to discharge by the RPE method (EPA Method 1670) applied to drilling fluid removed from drill cuttings. If the operator wishes to confirm the results of the RPE method (EPA Method 1670), the operator may use the GC/MS compliance assurance method (EPA Method 1655). Results from the GC/MS compliance assurance method (EPA Method 1655) shall supersede the results of the RPE method (EPA Method 1670). EPA Method 1655 and 1670 are published as appendices to Subpart A of this part and in ''Analytic Methods for the Oil and Gas Extraction Point Source Category,'' EPA–821–R–11–004. See § 435.11(uu).

[10] Maximum permissible retention of non-aqueous drilling fluid (NAF) base fluid on wet drill cuttings averaged over drilling intervals using NAFs as determined by EPA Method 1674, which is published as an appendix to Subpart A of this part and in ''Analytic Methods for the Oil and Gas Extraction Point Source Category,'' EPA–821–R–11–004. See § 435.11(uu). This limitation is applicable for NAF base fluids that meet the base fluid sediment toxicity ratio (Footnote 6), biodegradation rate ratio (Footnote 7), PAH, mercury, and cadmium stock limitations (C_{16}-C_{18} internal olefin) defined above in this table.

[11] Maximum permissible retention of non-aqueous drilling fluid (NAF) base fluid on wet drill cuttings average over drilling intervals using NAFs as determined by EPA Method 1674, which is published as an appendix to Subpart A of this part and in ''Analytic Methods for the Oil and Gas Extraction Point Source Category,'' EPA–821–R–11–004. See § 435.11(uu). This limitation is applicable for NAF base fluids that meet the ester base fluid sediment toxicity ratio and ester biodegradation rate ratio stock limitations defined as:

(a) ester base fluid sediment toxicity ratio = 10-day LC_{50} of C_{12}-C_{14} ester or C_8 ester/10-day LC_{50} of stock base fluid as determined by EPA Method 1644: ''Method for Conducting a Sediment Toxicity Test with *Leptocheirus plumulosus* and Non-Aqueous Drilling Fluids or Synthetic-Based Drilling Muds'' after sediment preparation procedures specified in EPA Method 1646, which are published as appendices to Subpart A of this part and in ''Analytic Methods for the Oil and Gas Extraction Point Source Category,'' EPA–821–R–11–004. See § 435.11(ee) and (uu);

(b) ester biodegradation rate ratio = Cumulative headspace gas production (ml) of C_{12}-C_{14} ester or C_8 ester/Cumulative headspace gas production (ml) of stock base fluid, both at 275 days as determined by EPA Method 1647, which is published as an appendix to Subpart A of this part and in ''Analytic Methods for the Oil and Gas Extraction Point Source Category,'' EPA–821–R–11–004. See § 435.11(e) and (uu); and

(c) PAH mass ratio (Footnote 5), mercury, and cadmium stock limitations (C_{16}-C_{18} internal olefin) defined above in this table.

■ 22. The heading of Appendix 1 to Subpart A of Part 435 is revised to read as follows:

Appendix 1 to Subpart A of Part 435—Static Sheen Test (EPA Method 1617)

* * * * *

■ 23. Appendix 2 to Subpart A of Part 435 is amended as follows:

■ a. Revise the appendix heading.

■ b. Remove the fourth sentence from Section II.C.6.

■ c. Revise Section III.A.1.

■ d. Revise Section III.E.2.

The revisions read as follows:

Appendix 2 to Subpart A of Part 435—Drilling Fluids Toxicity Test (EPA Method 1619)

* * * * *

III–A. * * *

(1) Each definitive test consists of 18 test containers: 3 replicates of a control and 5 SPP dilutions. Test containers should be Pyrex or equivalent glass. For definitive tests, 5 SPP dilutions with 3 replicates of at least 500 ml each are required. Twenty mysids per replicate, 360 per definitive test are required.

* * * * *

III–E. * * *

(2) Establish the definitive test concentrations based on results of a range finding test or based on prior experience and knowledge of the mud system.

* * * * *

■ 24. The heading of Appendix 3 to Subpart A of Part 435 is amended to read as follows:

Appendix 3 to Subpart A of Part 435—Procedure for Mixing Base Fluids With Sediments (EPA Method 1646)

* * * * *

■ 25. Appendix 4 to Subpart A of Part 435 is revised to read as follows:

Appendix 4 to Subpart A of Part 435—Protocol for the Determination of Degradation of Non-Aqueous Base Fluids in a Marine Closed Bottle Biodegradation Test System: Modified ISO 11734:1995 (EPA Method 1647)

1.0. Summary of EPA Method 1647

a. This method determines the anaerobic degradation potential of mineral oils, paraffin oils and non-aqueous fluids (NAF) in sediments. These substrates are base fluids for formulating offshore drilling fluids. The test evaluates base fluid biodegradation rates by monitoring gas production due to microbial degradation of the test fluid in natural marine sediment.

b. The test procedure places a mixture of marine/estuarine sediment, test substrate (hydrocarbon or controls) and seawater into clean 120 mL (150 mL actual volume) Wheaton serum bottles. The test is run using four replicate serum bottles containing 2,000 mg carbon/kg dry weight concentration of test substrate in sediment. The use of resazurin dye solution (1 ppm) evaluates the anaerobic (redox) condition of the bottles (dye is blue when oxygen is present, reddish in low oxygen conditions and colorless if oxygen free). After capping the bottles, a nitrogen sparge removes air in the headspace before incubation begins. During the incubation period, the sample should be kept at a constant temperature of 29 ± 1°C. Gas production and composition is measured approximately every two weeks. The samples need to be brought to ambient temperature before making the measurements. Measure gas production using a pressure gauge. Barometric pressure is measured at the time of testing to make necessary volume adjustments.

c. ISO 11734:1995 specifies that total gas is the standard measure of biodegradation. While modifying this test for evaluating biodegradation of NAFs, methane was also monitored and found to be an acceptable method of evaluating biodegradation. Section 7 contains the procedures used to follow biodegradation by methane production. Measurement of either total gas or methane production is permitted. If methane is followed, determine the composition of the gas by using gas chromatography (GC) analysis at each sampling. At the end of the test when gas production stops, or at around 275 days, an analysis of sediment for substrate content is possible. Common methods which have been successfully used for analyzing NAFs from sediments are listed in Section 8.

2.0 System Requirements

This environmental test system has three phases, spiked sediment, overlying seawater, and a gas headspace. The sediment/test compound mixture is combined with synthetic sea water and transferred into 120-mL serum bottles. The total volume of sediment/sea water mixture in the bottles is 75 mL. The volume of the sediment layer will be approximately 50 mL, but the exact volume of the sediment will depend on sediment characteristics (wet:dry ratio and density). The amount of synthetic sea water will be calculated to bring the total volume in the bottles to 75 mL. The test systems are maintained at a temperature of 29 ± 1°C during incubation. The test systems are brought to ambient temperatures prior to measuring pressure or gas volume.

2.1 Sample Requirements

a. The concentration of base fluids are at least 2,000 mg carbon test material/kg dry sediment. Carbon concentration is determined by theoretical composition based on the chemical formula or by chemical analysis by ASTM D5291–96. Sediments with positive, intermediate and negative control substances as well as a C_{16}-C_{18} internal olefin type base fluid will be run in conjunction with test materials under the same conditions. The positive control is ethyl oleate (CAS 111–62–6), the intermediate control is 1-hexadecene (CAS 629–73–2), and the negative control is squalane (CAS 111–01–3). Controls must be of analytical grade or

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the highest grade available. Each test control concentration should be prepared according to the mixing procedure described in Section 3.1.

b. Product names will be used for examples or clarification in the following text. Any use of trade or product names in this publication is for descriptive use only, and does not constitute endorsement by EPA or the authors.

2.2. Seawater Requirements

Synthetic seawater at a salinity of 25 ± 1 ppt should be used for the test. The synthetic seawater should be prepared by mixing a commercially available artificial seawater mix, into high purity distilled or de-ionized water. The seawater should be aerated and allowed to age for approximately one month prior to use.

2.3. Sediment Requirements

a. The dilution sediment must be from a natural estuarine or marine environment and be free of the compounds of interest. The collection location, date and time will be documented and reported. The sediment is prepared by press-sieving through a 2,000-micron mesh sieve to remove large debris, then press-sieving through a 500-micron sieve to remove indigenous organisms that may confound test results. The water content of the sediment should be less than 60% (w/w) or a wet to dry ratio of 2.5. The sediment should have a minimum organic matter content of 3% (w/w) as determined by ASTM D2974–07a (Method A and D and calculate organic matter as in Section 8.3 of method ASTM D2974–07a).

b. To reduce the osmotic shock to the microorganisms in the sediment the salinity of the sediment's pore water should be between 20–30 ppt. Sediment should be used for testing as soon as possible after field collection. If required, sediment can be stored in the dark at 4 °C with 3–6 inches of overlying water in a sealed container for a maximum period of 2 months prior to use.

3.0 Test Set Up

The test is set up by first mixing the test or control substrates into the sediment inoculum, then mixing in seawater to make a pourable slurry. The slurry is then poured into serum bottles, which are then flushed with nitrogen and sealed.

3.1. Mixing Procedure

Because base fluids are strongly hydrophobic and do not readily mix with sediments, care must be taken to ensure base fluids are thoroughly homogenized within the sediment. All concentrations are weight-to-weight comparisons (mg of base fluid to kg of dry control sediment). Sediment and base fluid mixing will be accomplished by using the following method.

3.1.1. Determine the wet to dry weight ratio for the control sediment by weighing approximately 10 sub-samples of approximately 1 g each of the screened and homogenized wet sediment into tared aluminum weigh pans. Dry sediment at 105 °C for 18–24 h. Remove the dried sediments and cool in a desiccator. Repeat the drying, cooling, and weighing cycle until a constant weight is achieved (within 4% of previous weight). Re-weigh the samples to determine the dry weight. Calculate the mean wet and dry weights of the 10 sub samples and determine the wet/dry ratio by dividing the mean wet weight by the mean dry weight using Equation 5–1. This is required to determine the weight of wet sediment needed to prepare the test samples.

$$\frac{\text{Mean Wet Sediment Weight (g)}}{\text{Mean Dry Sediment Weight (g)}} = \text{Wet to Dry Ratio} \qquad \text{[Eq.1]}$$

3.1.2. Determine the density (g/ml) of the wet sediment. This will be used to determine total volume of wet sediment needed for the various test treatments. One method is to tare a 5 ml graduated cylinder and add about 5 ml of homogenized sediment. Carefully record the volume then weigh this volume of sediment. Repeat this a total of three times. To determine the wet sediment density, divide the weight by volume per the following formula:

$$\frac{\text{Mean Wet Sediment Weight (g)}}{\text{Mean Wet Sediment Volume (mL)}} = \text{Wet Sediment Density (g/mL)} \qquad \text{[Eq. 2]}$$

3.1.3. Determine the amount of base fluid to be spiked into wet sediment in order to obtain the desired initial base fluid concentration of 2,000 mg carbon/kg dry weight. An amount of wet sediment that is the equivalent of 30 g of dry sediment will be added to each bottle. A typical procedure is to prepare enough sediment for 8 serum bottles (3 bottles to be sacrificed at the start of the test, 4 bottles incubated for headspace analysis, and enough extra sediment for 2 extra bottles). Extra sediment is needed because some of the sediment will remain coated onto the mixing bowl and utensils. Experience with this test may indicate that preparing larger volumes of spiked sediment is a useful practice, then the following calculations should be adjusted accordingly.

a. Determine the total weight of dry sediment needed to add 30 g dry sediment to 8 bottles. If more bottles are used then the calculations should be modified accordingly. For example:

$$\text{30 g dry sediment per bottle} \times 8 = \text{240 g dry sediment} \qquad \text{[Eq.3]}$$

b. Determine the weight of base fluid, in terms of carbon, needed to obtain a final base fluid concentration of 2,000 mg carbon/kg dry weight. For example:

$$\frac{\text{2,000 mg carbon}}{\text{Per kg dry sediment}} \times \frac{\text{240 g}}{\text{1,000}} = \text{480 mg carbon} \qquad \text{[Eq. 4]}$$

c. i. Convert from mg of carbon to mg of base fluid. This calculation will depend on the % fraction of carbon present in the molecular structure of each base fluid. For the control fluids, ethyl oleate is composed of 77.3% carbon, hexadecene is composed of 85.7% carbon, and squalane is composed of 85.3% carbon. The carbon fraction of each base fluid should be supplied by the manufacturer or determined before use. ASTM D5291–96 or equivalent will be used to determine composition of fluid.

ii. To calculate the amount of base fluid to add to the sediment, divide the amount of carbon (480 mg) by the percent fraction of carbon in the fluid.

iii. For example, the amount of ethyl oleate added to 240 g dry weight sediment can be calculated from the following equation:

$$\frac{480 \text{ mg carbon}}{(77.3 \div 100)} = 621 \text{ mg ethyl oleate} \quad \text{[Eq. 5]}$$

iv. Therefore, add 621 mg of ethyl oleate to 240 g dry weight sediment for a final concentration of 2,000 mg carbon/kg sediment dry weight.

3.1.4. Mix the calculated amount of base fluid with the appropriate weight of wet sediment.

a. Use the wet:dry ratio to convert from g sediment dry weight to g sediment wet weight, as follows:

$$240 \text{ g dry sediment} \times \text{wet:dry ratio} = \text{g wet sediment needed} \quad \text{[Eq. 6]}$$

b. i. Weigh the appropriate amount of base fluid (calculated in Section 3.1.3.c) into stainless mixing bowls, tare the vessel weight, then add the wet sediment calculated in Equation 5, and mix with a high shear dispersing impeller for 9 minutes.

ii. The sediment is now mixed with synthetic sea water to form a slurry that will be transferred into the bottles.

3.2. Creating Seawater/Sediment Slurry

Given that the total volume of sediment/sea water slurry in each bottle is to be 75 mL, determine the volume of sea water to add to the wet sediment.

3.2.1. If each bottle is to contain 30 g dry sediment, calculate the weight, and then the volume, of wet sediment to be added to each bottle.

$$30 \text{ g dry sediment} \times \text{wet:dry ratio} = \text{g wet sediment added to each bottle} \quad \text{[Eq. 7]}$$

$$\frac{\text{g wet sediment}}{\text{Density (g/mL) of wet sediment}} = \text{mL wet sediment} \quad \text{[Eq. 8]}$$

3.2.2. Calculate volume of sea water to be added to each bottle.

$$75 \text{ mL total volume} - \text{mL wet sediment (from Eq. 8)} = \text{mL of sea water} \quad \text{[Eq. 9]}$$

3.2.3. Determine the ratio of sea water to wet sediment (volume:volume) in each bottle.

$$\frac{\text{Volume sea water per bottle (Eq. 9)}}{\text{Volume sediment water per bottle (Eq. 8)}} = \text{Ratio of sea water:wet sediment} \quad \text{[Eq. 10]}$$

3.2.4. Convert the wet sediment weight from Equation 6 into a volume using the sediment density.

$$\text{g wet sediment (Eq. 6) density} = \text{volume (mL) of sediment} \quad \text{[Eq. 11]}$$

3.2.5. Determine the amount of sea water to mix with the wet sediment.

$$\underset{\text{(Eq. 11)}}{\text{mL wet sediment}} \times \underset{\text{(Eq. 10)}}{\text{Sea water:sediment ratio}} = \text{mL sea water to add to wet sediment} \quad \text{[Eq. 12]}$$

Mix sea water thoroughly with wet sediment to form a sediment/sea water slurry.

3.3. Bottling the Sediment Seawater Slurry

The total volume of sediment/sea water slurry in each bottle is to be 75 mL. Convert the volume (mL) of sediment/sea water slurry into a weight (g) using the density of the sediment and the seawater.

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3.3.1. Determine the weight of sediment to be added to each bottle.

$$\text{mL sediment (Eq. 8)} \times \text{density of wet sediment (g/mL)} = \text{g wet sediment} \quad \text{[Eq. 13]}$$

3.3.2. Determine the weight of sea water to be added to each bottle.

$$\text{mL sea water (Eq. 9)} \times \text{density of sea water (1.01 g/mL)} = \text{g sea water} \quad \text{[Eq. 14]}$$

3.3.3. Determine weight of sediment/sea water slurry to be added to each bottle.

$$\text{g wet sediment (Eq. 13)} + \text{g sea water (Eq. 14)} = \text{g sediment/sea water slurry} \quad \text{[Eq. 15]}$$

This should provide each bottle with 30 g dry sediment in a total volume of 75 mL.

3.3.4. Putting the sediment:seawater slurry in the serum bottles.

a. **Note:** The slurry will need to be constantly stirred to keep the sediment suspended.

b. Place a tared serum bottle on a balance and add the appropriate amount of slurry to the bottle using a funnel. Once the required slurry is in the bottle remove the funnel, add 2–3 drops (25 µL) of a 1 gram/L resazurin dye stock solution. Cap the bottle with a butyl rubber stopper (Bellco Glass, Part #2048–11800) and crimp with an aluminum seal (Bellco Glass Part #2048–11020).

c. Using a plastic tube with a (23-gauge, 1-inch long) needle attached to one side and a nitrogen source to the other, puncture the serum cap with the needle. Puncture the serum cap again with a second needle to sparge the bottle's headspace of residual air for two minutes. The nitrogen should be flowing at no more than 100 mL/min to encourage gentle displacement of oxygenated air with nitrogen. Faster nitrogen flow rates would cause mixing and complete oxygen removal would take much longer. Remove the nitrogen needle first to avoid any initial pressure problems. The second (vent) needle should be removed within 30 seconds of removing the nitrogen needle.

d. Triplicate blank test systems are prepared, with similar quantities of sediment and seawater without any base fluid. Incubate in the dark at a constant temperature of 29 ± 1 °C.

e. Record the test temperature. The test duration is dependent on base fluid performance, but at a maximum should be no more than 275 days. Stop the test after all base fluids have achieved a plateau of gas production. At termination, base fluid concentrations can be verified in the terminated samples by extraction and GC analysis according to Section 8.

4.0. Concentration Verification Chemical Analyses

a. Because of the difficulty of homogeneously mixing base fluid with sediment, it is important to demonstrate that the base fluid is evenly mixed within the sediment sea water slurry that was added to each bottle. Of the seven serum bottles set up for each test or control condition, three are randomly selected for concentration verification analyses. These should be immediately placed at 4 °C and a sample of sediment from each bottle should be analyzed for base fluid content as soon as possible. The coefficient of variation (CV) for the replicate samples must be less than 20%. The results should show recovery of at least 70% of the spiked base fluid. Use an appropriate analytical procedure described in Section 8 to perform the extractions and analyses. If any set of sediments fail the criteria for concentration verification, then the corrective action for that set of sediments is also outlined in Section 8.

b. The nominal concentrations and the measured concentrations from the three bottles selected for concentration verification should be reported for the initial test concentrations. The coefficient of variation (CV) for the replicate samples must be less than 20%. If base fluid content results are not within the 20% CV limit, the test must be stopped and restarted with adequately mixed sediment.

5.0. Gas Monitoring Procedures

Biodegradation is measured by total gas as specified in ISO 11734:1995. Methane production can also be tracked and is described in Section 7.

5.1. Total Gas Monitoring Procedures

Bottles should be brought to room temperature before readings are taken. a. The bottles are observed to confirm that the resazurin has not oxidized to pink or blue. Total gas production in the culture bottles should be measured using a pressure transducer (one source is Biotech International). The pressure readings from test and control cultures are evaluated against a calibration curve created by analyzing the pressure created by known additions of gas to bottles established identically to the culture bottles. Bottles used for the standard curve contain 75 mL of water, and are sealed with the same rubber septa and crimp cap seals used for the bottles containing sediment. After the bottles used in the standard curve have been sealed, a syringe needle inserted through the septa is used to equilibrate the pressure inside the bottles to the outside atmosphere. The syringe needle is removed and known volumes of air are injected into the headspace of the bottles. Pressure readings provide a standard curve relating the volume of gas injected into the bottles and headspace pressure. No less than three points may be used to generate the standard curve. A typical standard curve may use 0, 1, 5, 10, 20 and 40 mL of gas added to the standard curve bottles.

b. The room temperature and barometric pressure (to two digits) should be recorded at the time of sampling. One option for the barometer is Fisher Part #02–400 or 02–401. Gas production by the sediment is expressed in terms of the volume (mL) of gas at standard temperature (0 °C = 273 °K) and pressure (1 atm = 30 inches of Hg) using Eq. 16.

$$V_2 = \frac{P_1 \times V_1 \times T_2}{T_1 \times P_2} \quad \text{[Eq.16]}$$

Where:

V_2 = Volume of gas production at standard temperature and pressure

P_1 = Barometric pressure on day of sampling (inches of Hg)

V_1 = Volume of gas measured on day of sampling (mL)

T_2 = Standard temperature = 273 °K

T_1 = Temperature on day of sampling (°C + 273 = °K)

P_2 = Standard pressure = 30 inches Hg

c. An estimate can be made of the total volume of anaerobic gas that will be produced in the bottles. The gas production measured for each base fluid can be expressed as a percent of predicted total anaerobic gas production.

5.1.1. Calculate the total amount of carbon in the form of the base fluid present in each bottle.

a. Each bottle is to contain 30 g dry weight sediment. The base fluid concentration is 2,000 mg carbon/kg dry weight sediment. Therefore:

$$2{,}000 \text{ mg carbon/kg sediment} \times (30 \text{ g} \div 1{,}000) = 60 \text{ mg carbon per bottle} \quad \text{[Eq. 17]}$$

5.1.2. Theory states that anaerobic microorganisms will convert 1 mole of carbon substrate into 1 mole of total anaerobic gas production.

a. Calculate the number of moles of carbon in each bottle.

b. The molecular weight of carbon is 12 (*i.e.,* 1 mole of carbon = 12 g). Therefore, the number of moles of carbon in each bottle can be calculated.

$$\frac{60 \text{ mg carbon per bottle}/1{,}000}{12 \text{ g/mole}} = 0.005 \text{ moles carbon} \quad \text{[Eq. 18]}$$

5.1.3. Calculate the predicted volume of anaerobic gas.

One mole of gas equals 22.4 L (at standard temperature and pressure), therefore,

$$0.005 \text{ moles} \times 22.4 \text{ L} = 0.112\text{L (or 112 mL total gas production)} \quad \text{[Eq. 19]}$$

5.2. Gas Venting

a. If the pressure in the serum bottle is too great for the pressure transducer or syringe, some of the excess gas must be wasted. The best method to do this is to vent the excess gas right after measurement. To do this, remove the barrel from a 10-mL syringe and fill it ⅓ full with water. This is then inserted into the bottle through the stopper using a small diameter (high gauge) needle. The excess pressure is allowed to vent through the water until the bubbles stop. This allows equalization of the pressure inside the bottle to atmospheric without introducing oxygen. The amount of gas vented (which is equal to the volume determined that day) must be kept track of each time the bottles are vented. A simple way to do this in a spreadsheet format is to have a separate column in which cumulative vented gas is tabulated. Each time the volume of gas in the cultures is analyzed, the total gas produced is equal to the gas in the culture at that time plus the total of the vented gas.

b. To keep track of the methane lost in the venting procedure, multiply the amount of gas vented each time by the corrected % methane determined on that day. The answer gives the volume of methane wasted. This must be added into the cumulative totals similarly to the total gas additions.

6.0. Test Acceptability and Interpretation

6.1. Test Acceptability

At day 275 or when gas production has plateaued, whichever is first, the controls are evaluated to confirm that the test has been performed appropriately. In order for this modification of the closed bottle biodegradation test to be considered acceptable, all the controls must meet the biodegradation levels indicated in Table 1. The intermediate control hexadecene must produce at least 30% of the theoretical gas production. This level may be reexamined after two years and more data has been generated.

TABLE 1—TEST ACCEPTABILITY CRITERIA

Concentration	Percent biodegradability as a function of gas measurement		
	Positive control	Squalane negative control	Hexadecene intermediate control
2,000 mg carbon/kg	≥60% theoretical	≤5% theoretical	≥30% theoretical.

6.2 Interpretation

a. In order for a fluid to pass the closed bottle test, the biodegradation of the base fluid as indicated by the total amount of total gas (or methane) generated once gas production has plateaued (or at the end of 275 days, which ever is first) must be greater than or equal to the volume of gas (or methane) produced by the reference standard (internal elefin or ester).

b. The method for evaluating the data to determine whether a fluid has passed the biodegradation test must use the equations:

$$\frac{\text{\% Theoretical gas production of reference fluid}}{\text{\% Theoretical gas production of NAF}} \leq 1.0 \quad \text{[Eq. 20]}$$

Where:

NAF = Stock base fluid being tested for compliance

Reference fluid = C_{16}-C_{18} internal olefin or C_{12} –C_{14} or C_8 ester reference fluid

7.0. Methane Measurement

7.1. Methane Monitoring Procedures

a. The use of total gas production alone may result in an underestimation of the actual metabolism occurring since CO_2 is slightly soluble in water. An acceptable alternative method is to monitor methane production and total gas production. This is easily done using GC analysis. A direct injection of headspace gases can be made into a GC using almost any packed or capillary column with an FID detector. Unless volatile fuels or solvents are present in the test material or the inocula, the only component of the headspace gas that can be detected using an FID detector is methane. The percent methane in the headspace gas is determined by comparing the response of the sample injections to the response from injections of known percent methane standards. The percent methane is corrected for water vapor saturation using Eq. 21 and then converted to a volume of dry methane using Eq. 22.

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$$\text{Corrected \% } CH_4 = \frac{\% \ CH_4}{1 - \frac{D \times 22.4 \text{ L/mol}}{18 \text{ g/mol} \times 1{,}000}} \qquad \text{[Eq. 21]}$$

Where:

D = The density of water vapor at saturation (g/m³, can be found in CRC Handbook of Chemistry and Physics) for the temperature of sampling.

$$V_{CH4} \text{ (ml)} = (S + V) \times \frac{P - P_W}{T + 273} \times \frac{CH_4}{100} \times \frac{273}{760} \qquad \text{[Eq. 22]}$$

Where:

V_{CH4} = Volume of methane in the bottle
S = Volume of excess gas production (measured with a pressure transducer)
V = Volume of the headspace in the culture bottle (total volume—liquid phase)
P = Barometric pressure (mm Hg, measured with barometer)
T = Temperature (°C)
P_w = Vapor pressure of water at T (mm Hg, can be found in CRC Handbook of Chemistry and Physics)
CH_4 = % methane in headspace gas (after correction for water vapor)

b. The total volume of serum bottles sold as 125 mL bottles (Wheaton) is 154.8 mL.

c. The volumes of methane produced are then compared to the volumes of methane in the controls to determine if a significant inhibition of methane production or a significant increase of methane production has been observed. Effective statistical analyses are important, as variability in the results is common due to the heterogeneity of the inoculum's source. It is also common to observe that the timing of the initiation of culture activity is not equal in all of the cultures. Expect a great variability over the period when the cultures are active, some replicates will start sooner than others, but all of the replicates should eventually reach similar levels of base fluid degradation and methane production.

7.2. Expected Methane Production Calculations

a. The amount of methane expected can be calculated using the equation of Symons and Buswell (Eq. 23). In the case of complete mineralization, all of the carbon will appear as wither CO_2 or CH_4, thus the total moles of gas produced will be equal to the total moles of carbon in the parent molecule. The use of the Buswell equation allows you to calculate the effects the redox potential will have on the distribution of the products in methanogenic cultures. More reduced electron donors will allow the production of more methane, while more oxidized electron donors will cause a production of more carbon dioxide.

$$\frac{12 \text{ mole } CH_4}{\text{mole hexadecene}} \times \frac{22.4 \text{ L}}{\text{mole } CH_4} \times \frac{1{,}000 \text{ ml}}{\text{L}} \times \frac{1 \text{ mole hexadecene}}{224.4 \text{ g hexadecene}} \times \frac{23 \text{ g hexadecene}}{\text{kg dry soil}} \times \frac{0.03 \text{ kg}}{\text{culture}} = 84 \text{ (ml)} \qquad \text{[Eq. 24]}$$

b. An example calculation of the expected methane volume in a culture fed 2,000 mg/kg hexadecene is as follows. The application of Symons and Buswell's equation reveals that hexadecene ($C_{16}H_{32}$) will yield 4 moles of CO_2 and 12 moles of CH_4. Assuming 30 g of dry sediment are added to the bottles with 2,334 mg hexadecene/kg dry sediment (*i.e.,* equivalent to 2,000 mg carbon/kg dry sediment) the calculation is as follows.

$$\frac{12 \text{ mole } CH_4}{\text{mole hexadecene}} \times \frac{22.4 \text{ L}}{\text{mole } CH_4} \times \frac{1{,}000 \text{ ml}}{\text{L}} \times \frac{1 \text{ mole hexadecene}}{224.4 \text{ g hexadecene}} \times \frac{23 \text{ g hexadecene}}{\text{kg dry soil}} \times \frac{0.03 \text{ kg}}{\text{culture}} = 84 \text{ (ml)} \qquad \text{[Eq. 24]}$$

c. By subtracting the average amount of methane in control bottles from the test bottles and then dividing by the expected volume an evaluation of the completion of the process may be conducted.

8.0. Concentration Verification Analysis

The Concentration Verification analysis is required at the beginning of the test to ensure homogeneity and confirm that the required amount of fluid was delivered to the sediments at the start of the test.

8.1. Three samples per fluid need to be analyzed and achieve ≤20% Coefficient of Variability and an average of ≥70% to ≤120% of fluid delivered to sediment.

8.2. If a third party performs the analysis, then the laboratory should be capable of delivering the homogeneity data within seven days, in order to identify any samples that do not meet the homogeneity requirement as quickly as possible.

8.3. If one sediment/fluid set, out a multiple set batch of samples, fails these criteria, then that one set of samples must be discarded and a fresh set of spiked sediment prepared, started, and analyzed to ensure homogeneity. The same stock sediment is used to prepare the replacement set(s). The remaining sets do not need to be re-mixed or restarted.

8.4. The re-mixed set(s) will need to be run the additional days as appropriate to ensure that the total number of days is the same for all sets of bottles, even though the specific days are not aligned.

8.5. Re-mixing of bottle sets can be performed multiple times as a result of a failure of the analytical criteria, until the holding time for the stock sediment has expired (60 days). If the problem set(s) has not fallen within the acceptable analytical criteria by then, it must not be part of the batch of bottles run. If the problem batch is one of the controls, and those controls were not successfully prepared when the sediment holding time expired, then the entire test must be restarted.

9.0 Program Quality Assurance and Quality Control

9.1 Calibration

9.1.1. All equipment/instrumentation will be calibrated in accordance with the test method or the manufacturer's instructions and may be scheduled or triggered.

9.1.2. Where possible, standards used in calibration will be traceable to a nationally recognized standard (*e.g.,* certified standard by NIST).

9.1.3. All calibration activities will be documented and the records retained.

9.1.4. The source, lot, batch number, and expiration date of all reagents used with be documented and retained.

9.2. Maintenance

9.2.1. All equipment/instrumentation will be maintained in accordance with the test method or the manufacturer's instructions and may be scheduled or triggered.

9.2.2. All maintenance activities will be documented and the records retained.

9.3. Data Management and Handling

9.3.1. All primary (raw) data will be correct, complete, without selective reporting, and will be maintained.

9.3.2. Hand-written data will be recorded in lab notebooks or electronically at the time of observation.

9.3.3. All hand-written records will be legible and amenable to reproduction by electrostatic copiers.

9.3.4. All changes to data or other records will be made by:

a. Using a single line to mark-through the erroneous entry (maintaining original data legibility).

b. Write the revision.

c. Initial, date, and provide revision code (*see* attached or laboratory's equivalent).

9.3.5. All data entry, transcriptions, and calculations will be verified by a qualified person.

a. Verification will be documented by initials of verifier and date.

9.3.6. Procedures will be in place to address data management procedures used (at minimum):

a. Significant figures.

b. Rounding practices.

c. Identification of outliers in data series.

d. Required statistics.

9.4. Document Control

9.4.1. All technical procedures, methods, work instructions, standard operating procedures must be documented and approved by laboratory management prior to the implementation.

9.4.2. All primary data will be maintained by the contractor for a minimum of five (5) years.

9.5. Personnel and Training

9.5.1. Only qualified personnel shall perform laboratory activities.

9.5.2. Records of staff training and experience will be available. This will include initial and refresher training (as appropriate).

9.6. Test Performance

9.6.1. All testing will done in accordance with the specified test methods.

9.6.2. Receipt, arrival condition, storage conditions, dispersal, and accountability of the test article will be documented and maintained.

9.6.3. Receipt or production, arrival or initial condition, storage conditions, dispersal, and accountability of the test matrix (*e.g.,* sediment or artificial seawater) will be documented and maintained.

9.6.4. Source, receipt, arrival condition, storage conditions, dispersal, and accountability of the test organisms (including inoculum) will be documented and maintained.

9.6.5. Actual concentrations administered at each treatment level will be verified by appropriate methodologies.

9.6.6. Any data originating at a different laboratory will be identified and the laboratory fully referenced in the final report.

9.7. The following references identify analytical methods that have historically been successful for achieving the analytical quality criteria.

9.7.1. Continental Shelf Associates Report 1998. Joint EPA/Industry Screening Survey to Assess the Deposition of Drill Cuttings and Associated Synthetic Based Mud on the Seabed of the Louisiana Continental Shelf, Gulf of Mexico. Analysis by Charlie Henry Report Number IES/RCAT97–36 GC–FID and GC/MS.

9.7.2. EPA Method 3550 for extraction with EPA Method 8015 for GC–FID. EPA Method 3550C, Revision 3. February 2007. Ultrasonic Extraction. EPA Method 8015C, Revision 3. February 2007. Nonhalogenated Organics by Gas Chromatography.

9.7.3. Chandler, J.E., S.P. Rabke, and A.J.J. Leuterman. 1999. Predicting the Potential Impact of Synthetic-Based Muds With the Use of Biodegradation Studies. Society of Petroleum Engineers SPE 52742.

9.7.4. Chandler, J.E., B. Lee, S.P. Rabke, J.M. Geliff, R. Stauffer, and J. Hein. 2000. Modification of a Standardized Anaerobic Biodegradation Test to Discriminate Performance of Various Non-Aqueous Base Fluids. Society of Petroleum Engineers SPE 61203.

9.7.5. Munro, P.D., B Croce, C.F. Moffet, N.A Brown, A.D. McIntosh, S.J. Hird, and R.M. Stagg. 1998. Solid-Phase Test for Comparison for Degradation Rates of Synthetic Mud Base Fluids Used in the Offshore Drilling Industry. *Environ. Toxicol. Chem.* 17:1951–1959.

9.7.6. Webster, L., P.R. Mackie, S.J. Hird, P.D. Munro, N.A. Brown, and C.F. Moffat. 1997. Development of Analytical Methods for the Determination of Synthetic Mud Base Fluids in Marine Sediments. *The Analyst* 122:1485–1490.

9.8 The following standards are approved for incorporation by reference by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies may also be inspected at EPA's Water Docket, 1200 Pennsylvania Ave. NW., Washington, DC 20460 and at at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202–741–6030, or go to: *http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.*

9.8.1 ASTM International. Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428–2959, or online at *http://www.astm.org.*

9.8.1.1 ASTM D5291–96, Standard Test Methods for Instrumental Determination of Carbon, Hydrogen, and Nitrogen in Petroleum Products and Lubricants, approved April 10, 1996.

9.8.1.2 ASTM D2974–07a, Standard Test Methods for Moisture, Ash, and Organic Matter of Peat and Other Organic Soils, approved March 15, 2007.

■ 26. Amend Appendix 5 to Subpart A of Part 435 by:

■ a. Revising the appendix heading.

■ b. Removing ''35 to 500 amu'' and adding in its place ''35 to 600 amu'' in Section 6.3.2.

■ c. Revising section 9.5. introductory text.

■ d. Revising the equation in section 9.5.2.

■ e. Revising sections 9.6, 11.3 introductory text, 11.3.1, and 11.5.4.2.

■ f. Adding section 6.17.

Appendix 5 to Subpart A of Part 435—Determination of Crude Oil Contamination in Non-Aqueous Drilling Fluids by Gas Chromatography/Mass Spectrometry (GC/MS) (EPA Method 1655)

* * * * *

9.5 Duplicates—A duplicate field sample shall be prepared and analyzed according to Section 11. The relative percent difference (RPD) of the calculated concentrations shall be less than 15%.

* * * * *

$$RPD = \frac{|D_1 - D_2|}{[(D_1 + D_2)/2]} \times 100$$

9.6 A clean NAF sample shall be prepared and analyzed according to Section 11. Ultimately the oil-equivalent concentration from the TIC or EIP signal measured in the clean NAF sample shall be subtracted from the corresponding authentic field samples in order to calculate the true contaminant concentration (% oil) in the field samples (*see* Section 12).

* * * * *

11.3 Qualitative Identification—See Section 17 of this method for schematic flowchart.

11.3.1 Qualitative identification shall be accomplished by comparison of the TIC and EIP area data from an authentic sample to the TIC and EIP area data from the calibration standards (*see* Section 10.4). Crude oil shall be identified by the presence of C_{10} to C_{13} n-alkanes and corresponding target aromatics.

* * * * *

11.5.4.2 Asphaltene crude oils with API gravity <20 may not produce chromatographic peaks strong enough to show contamination at levels of the calibration. Extracted ion peaks should be easier to see than increased intensities for the C8 to C13 peaks. If a sample of asphaltene crude from the formation is available, a calibration standard shall be prepared.

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6.17 Schematic Flowchart for Qualitative Identification

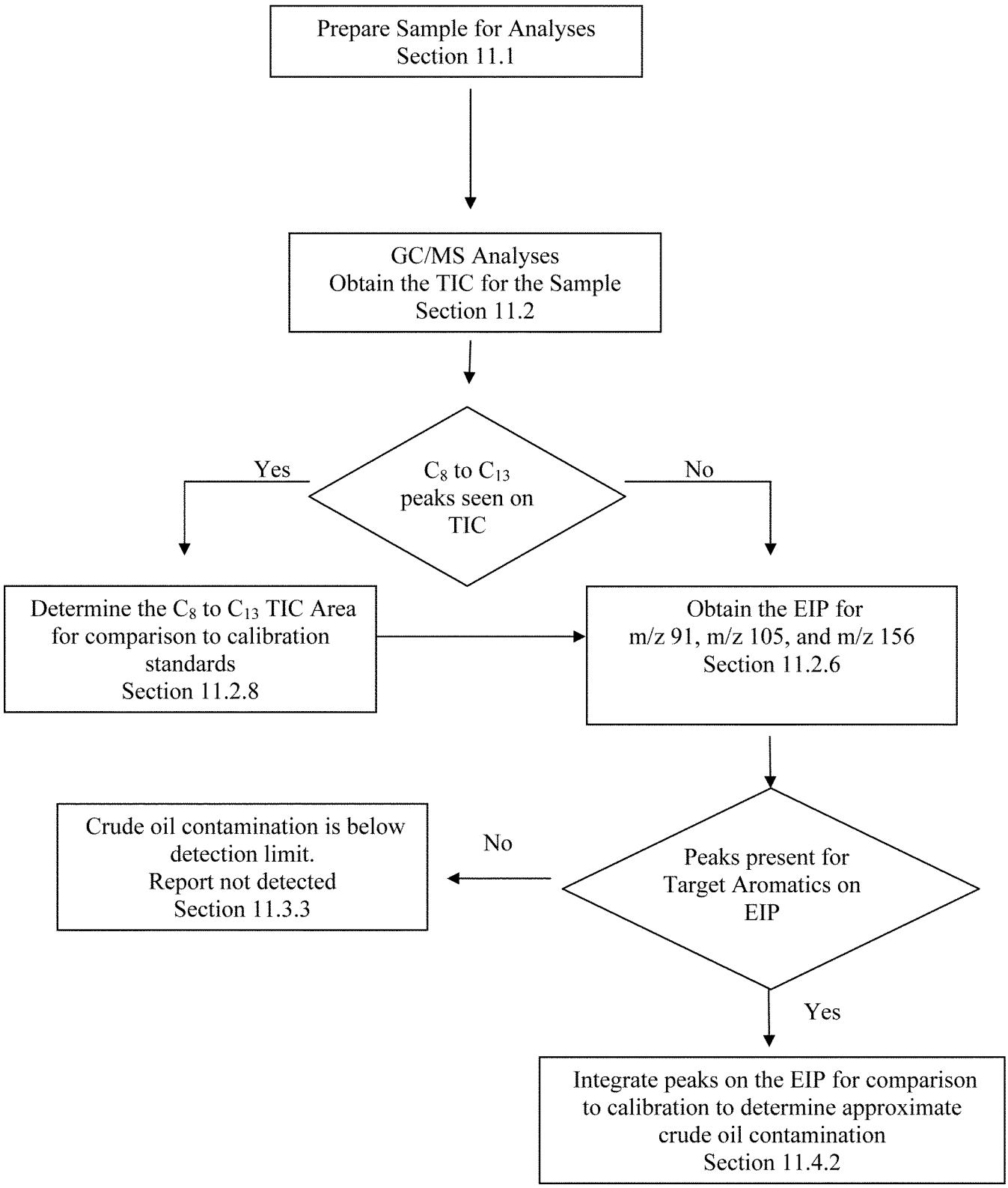

Figure 1. Schematic Flowchart for Qualitative Identification

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■ 27. The heading of Appendix 6 to Subpart A of Part 435 is revised to read as follows:

Appendix 6 to Subpart A of Part 435—Reverse Phase Extraction (RPE) Method for Detection of Oil Contamination in Non-Aqueous Drilling Fluids (NAF) (GC/MS) (EPA Method 1670)

* * * * *

■ 28. The heading of Appendix 7 to Subpart A of Part 435 is revised to read as follows:

Appendix 7 to Subpart A of Part 435—Determination of the Amount of Non-Aqueous Drilling Fluid (NAF) Base Fluid From Drill Cuttings by a Retort Chamber (Derived From API Recommended Practice 13B–2) (EPA Method 1674)

* * * * *

■ 29. Appendix 8 to Subpart A of Part 435 is amended by:

■ a. Revising the second paragraph.

■ b. Adding ''>'' before ''11–14'' in Table 1.

Appendix 8 to Subpart A of Part 435—Reference C_{16}-C_{18} Internal Olefin Drilling Fluid Formulation

* * * * *

Drilling fluid sediment toxicity ratio = 4-day LC_{50} of C_{16}-C_{18} internal olefin drilling fluid/4-day LC_{50} of drilling fluid removed from drill cuttings at the solids control equipment as determined by EPA Method 1644: ''Method for Conducting a Sediment Toxicity Test with *Leptocheirus plumulosus* and Non-Aqueous Drilling Fluids or Synthetic-Based Drilling Muds'' after sediment preparation procedures specified in EPA Method 1646, which are published as appendices to Subpart A of this part and in ''Analytic Methods for the Oil and Gas Extraction Point Source Category,'' EPA–821–R–11–004. See § 435.11(ee) and (uu).

* * * * *

Subpart D—Coastal Subcategory

■ 30. Section 435.41 is amended:

■ a. By revising paragraph (d).

■ b. By revising paragraph (e).

■ c. By revising paragraph (k).

■ d. By revising paragraph (m)(2).

■ e. By revising paragraph (q).

■ f. By revising paragraph (r).

■ g. By amending paragraph (w) to remove ''LC_5'' and add in its place ''LC_{50}''.

■ h. By revising paragraph (y).

■ i. By revising paragraph (ee).

■ j. By revising paragraph (ff).

■ k. By adding paragraph (mm).

§ 435.41 Special definitions.

* * * * *

(d) *Base fluid retained on cuttings* as applied to BAT effluent limitations and NSPS refers to the ''Determination of the Amount of Non-Aqueous Drilling Fluid (NAF) Base Fluid from Drill Cuttings by a Retort Chamber (Derived from API Recommended Practice 13B–2)'', EPA Method 1674, which is published as an appendix to Subpart A of this part and in ''Analytic Methods for the Oil and Gas Extraction Point Source Category,'' EPA–821–R–11–004. See paragraph (mm) of this section.

(e) *Biodegradation rate* as applied to BAT effluent limitations and NSPS for drilling fluids and drill cuttings refers to the ''Protocol for the Determination of Degradation of Non Aqueous Base Fluids in a Marine Closed Bottle Biodegradation Test System: Modified ISO 11734:1995,'' EPA Method 1647, supplemented with ''Procedure for Mixing Base Fluids With Sediments,'' EPA Method 1646. Both EPA Method 1646 and 1647 are published as appendices to Subpart A of this part and in ''Analytic Methods for the Oil and Gas Extraction Point Source Category,'' EPA–821–R–11–004. See paragraph (mm) of this section.

* * * * *

(k) *Diesel oil* refers to the grade of distillate fuel oil, as specified in the American Society for Testing and Materials Standard Specification for Diesel Fuel Oils D975–91, that is typically used as the continuous phase in conventional oil-based drilling fluids. This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies may be obtained from the American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428. Copies may be inspected at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202–741–6030, or go to: *http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html*. A copy may also be inspected at EPA's Water Docket, 1200 Pennsylvania Ave. NW., Washington, DC 20460.

* * * * *

(m) * * *

(2) *Dry drill cuttings* means the residue remaining in the retort vessel after completing the retort procedure specified in EPA Method 1674, which is published as an appendix to Subpart A of this part and in ''Analytic Methods for the Oil and Gas Extraction Point Source Category,'' EPA–821–R–11–004. See paragraph (mm) of this section.

* * * * *

(q) *Formation oil* means the oil from a producing formation which is detected in the drilling fluid, as determined by the GC/MS compliance assurance method, EPA Method 1655, when the drilling fluid is analyzed before being shipped offshore, and as determined by the RPE method, EPA Method 1670, when the drilling fluid is analyzed at the offshore point of discharge. The GC/MS compliance assurance method and the RPE method approved for use with this part are published as appendices to Subpart A of this part and in ''Analytic Methods for the Oil and Gas Extraction Point Source Category,'' EPA–821–R–11–004. See paragraph (mm) of this section. Detection of formation oil by the RPE method may be confirmed by the GC/MS compliance assurance method, and the results of the GC/MS compliance assurance method shall supersede those of the RPE method.

(r) *Garbage* means all kinds of victual, domestic, and operational waste, excluding fresh fish and parts thereof, generated during the normal operation of coastal oil and gas facility and liable to be disposed of continuously or periodically, except dishwater, graywater, and those substances that are defined or listed in other Annexes to MARPOL 73/78. A copy of MARPOL may be inspected at EPA's Water Docket, 1200 Pennsylvania Ave. NW., Washington, DC 20460.

* * * * *

(y) *No discharge of free oil* means that waste streams may not be discharged that contain free oil as evidenced by the monitoring method specified for that particular stream, *e.g.,* deck drainage or miscellaneous discharges cannot be discharged when they would cause a film or sheen upon or discoloration of the surface of the receiving water; drilling fluids or cuttings may not be discharged when they fail EPA Method 1617 (Static Sheen Test), which is published as an appendix to Subpart A of this part and in ''Analytic Methods for the Oil and Gas Extraction Point Source Category,'' EPA–821–R–11–004. See paragraph (mm) of this section.

* * * * *

(ee) *SPP toxicity* as applied to BAT effluent limitations and NSPS for drilling fluids and drill cuttings refers to the bioassay test procedure, ''Suspended Particulate Phase (SPP) Toxicity Test,'' presented in EPA Method 1619, which is published as an appendix to Subpart A of this part and in ''Analytic Methods for the Oil and Gas Extraction Point Source Category,'' EPA–821–R–11–004. See paragraph (mm) of this section.

(ff) *Static sheen test* means the standard test procedure that has been

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developed for this industrial subcategory for the purpose of demonstrating compliance with the requirement of no discharge of free oil. The methodology for performing the static sheen test is presented in EPA Method 1617, which is published as an appendix to Subpart A of this part and in ''Analytic Methods for the Oil and Gas Extraction Point Source Category,'' EPA–821–R–11–004. See paragraph (mm) of this section.

* * * * *

(mm) *Analytic Methods for the Oil and Gas Extraction Point Source Category* is the EPA document, EPA–821–R–11–004, that compiles analytic methods for this category. Copies may be inspected at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202–741–6030, or go to: *http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.* A copy may also be inspected at EPA's Water Docket, 1200 Pennsylvania Ave. NW., Washington, DC 20460. This method may be obtained at *http://water.epa.gov/scitech/methods/cwa/index.cfm.*

■ 31. In § 435.42 footnote 1 to the table is revised to read as follows:

§ 435.42 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT).

* * * * *

[1] No discharge of free oil. See § 435.41(y).

* * * * *

■ 32. In § 435.43:

■ a. Remove ''LC_5'' and add in its place ''LC_{50}'' in the table.

■ b. Footnotes 2 and 4 to the table are revised to read as follows:

§ 435.43 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT).

* * * * *

[2] As determined by the static sheen test. See § 435.41(ff).

* * * * *

[4] As determined by the suspended particulate phase (SPP) toxicity test. See § 435.41(ee).

* * * * *

■ 33. In § 435.44 footnote 2 to the table is revised to read as follows:

§ 435.44 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT).

* * * * *

[2] As determined by the static sheen test. See § 435.41(ff).

* * * * *

■ 34. In § 435.45:

■ a. Remove ''LC_5'' and add in its place ''LC_{50}''in the table.

■ b. Footnotes 2 and 4 to the table are revised to read as follows:

§ 435.45 Standards of performance for new sources (NSPS).

* * * * *

[2] As determined by the static sheen test. See § 435.41(ff).

* * * * *

[4] As determined by the suspended particulate phase (SPP) toxicity test. See § 435.41(ee).

* * * * *

[FR Doc. 2012–10210 Filed 5–17–12; 8:45 am]

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

NOV 26 2014

OFFICE OF WATER

MEMORANDUM

SUBJECT: Revisions to the November 22, 2002 Memorandum "Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs"

FROM: Andrew D. Sawyers, Director
Office of Wastewater Management

Benita Best-Wong, Director
Office of Wetlands, Oceans and Watersheds

TO: Water Division Directors
Regions 1 - 10

This memorandum updates aspects of EPA's November 22, 2002 memorandum from Robert H. Wayland, III, Director of the Office of Wetlands, Oceans and Watersheds, and James A. Hanlon, Director of the Office of Wastewater Management, on the subject of "Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs" (hereafter "2002 memorandum"). Today's memorandum replaces the November 12, 2010, memorandum on the same subject; the Water Division Directors should no longer refer to that memorandum for guidance.

This memorandum is guidance. It is not a regulation and does not impose legally binding requirements on EPA or States. EPA and state regulatory authorities should continue to make permitting and TMDL decisions on a case-by-case basis considering the particular facts and circumstances and consistent with applicable statutes, regulations, and case law. The recommendations in this guidance may not be applicable to a particular situation. EPA may change or revoke this guidance at any time.

Background

Stormwater discharges are a significant contributor to water quality impairment in this country, and the challenges from these discharges are growing as more land is developed and more impervious surface is created. Stormwater discharges cause beach closures and contaminate shellfish and surface drinking water supplies. The increased volume and velocity of stormwater discharges causes streambank erosion, flooding, sewer overflows, and basement backups. The decreased natural infiltration of rainwater reduces groundwater recharge, depleting

our underground sources of drinking water.[1] There are stormwater management solutions, such as green infrastructure, that can protect our waterbodies from stormwater discharges and, at the same time, offer many other benefits to communities.

Section III of the 2002 memorandum recommended that for NPDES-regulated municipal and small construction stormwater discharges, effluent limits be expressed as best management practices (BMPs) or other similar requirements, rather than as numeric effluent limits. The 2002 memorandum went on to provide guidance on using "an iterative, adaptive management BMP approach" for improving stormwater management over time as permitting agencies, the regulated community, and other involved stakeholders gain more experience and knowledge. EPA continues to support use of an iterative approach, but with greater emphasis on clear, specific, and measurable permit requirements and, where feasible, numeric NPDES permit provisions, as discussed below.

Since 2002, States and EPA have obtained considerable experience in developing TMDLs and WLAs that address stormwater sources (see Box 1 in the attachment for specific examples). Monitoring of the impacts of stormwater discharges on water quality has become more sophisticated and widespread.[2] The experience gained during this time has provided better information on the effectiveness of stormwater controls to reduce pollutant loadings and address water quality impairments. In many parts of the country, permitting agencies have issued several rounds of stormwater permits. Notwithstanding these developments, stormwater discharges remain a significant cause of water quality impairment in many places, highlighting a continuing need for more meaningful WLAs and more clear, specific, and measurable NPDES permit provisions to help restore impaired waters to their beneficial uses.

With this additional experience in mind, on November 12, 2010, EPA issued a memorandum updating and revising elements of the 2002 memorandum to better reflect current practices and trends in permits and WLAs for stormwater discharges. On March 17, 2011, EPA sought public comment on the November 2010 memorandum and, earlier this year, completed a nationwide review of current practices used in MS4 permits[3] and industrial and construction stormwater discharge permits. As a result of comments received and informed by the reviews of EPA and state-issued stormwater permits, EPA is in this memorandum replacing the

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[1] See generally Urban Stormwater Management in the United States (National Research Council, 2009), particularly the discussion in Chapter 3, *Hydrologic, Geomorphic, and Biological Effects of Urbanization on Watersheds*.

[2] Stormwater discharge monitoring programs have expanded the types pollutants and other indices (e.g., biologic integrity) being evaluated. This information is being used to help target priority areas for cleanup and to assess the effectiveness of stormwater BMPs. There are a number of noteworthy monitoring programs that are ongoing, including for example those being carried out by Duluth, MN, Capitol Region Watershed District, MN, Honolulu, HI, Baltimore or Montgomery County, MD, Puget Sound, WA, Los Angeles County, CA, and the Alabama Dept. of Transportation, among many others. See also Section 4.2 (Monitoring/Modeling Requirements) of EPA's *Municipal Separate Storm Sewer System Permits: Post-Construction Performance Standards & Water Quality-Based Requirements – A Compendium of Permitting Approaches* (EPA, June 2014), or "MS4 Compendium" available at http://water.epa.gov/polwaste/npdes/stormwater/upload/sw_ms4_compendium.pdf, for other examples of note.

[3] See EPA's MS4 Permit Compendium, referenced in the above footnote.

November 2010 memorandum, updating aspects of the 2002 memorandum and providing additional information in the following areas:

- Including clear, specific, and measurable permit requirements and, where feasible, numeric effluent limitations in NPDES permits for stormwater discharges;
- Disaggregating stormwater sources in a WLA; and
- Designating additional stormwater sources to regulate and developing permit limits for such sources.

Including Clear, Specific, and Measurable Permit Requirements and, Where Feasible, Numeric Effluent Limitations in NPDES Permits for Stormwater Discharges

At the outset of both the Phase I and Phase II stormwater permit programs, EPA provided guidance on the type of water quality-based effluent limits (WQBELs) that were considered most appropriate for stormwater permits. See Interim Permitting Policy for Water Quality-Based Limitations in Storm Water Permits [61 FR 43761 (August 26, 1996) and 61 FR 57425 (November 6, 1996)] and the Phase II rulemaking preamble 64 FR 68753 (December 8, 1999). Under the approach discussed in these documents, EPA envisioned that in the first two to three rounds of permit issuance, stormwater permits typically would require implementation of increasingly more effective best management practices (BMPs). In subsequent stormwater permit terms, if the BMPs used during prior years were shown to be inadequate to meet the requirements of the Clean Water Act (CWA), including attainment of applicable water quality standards, the permit would need to contain more specific conditions or limitations.

There are many ways to include more effective WQBELs in permits. In the spring of 2014, EPA published the results of a nationwide review of current practices used in MS4 permits in *Municipal Separate Storm Sewer Systems Permits: Post-Construction Performance Standards & Water Quality-Based Requirements – A Compendium of Permitting Approaches* (June 2014). This MS4 Compendium demonstrates how NPDES authorities have been able to effectively establish permit requirements that are more specifically tied to a measurable water quality target, and includes examples of permit requirements expressed in both numeric and non-numeric form. These approaches, while appropriately permit-specific, each share the attribute of being expressed in a clear, specific, and measurable way. For example, EPA found a number of permits that employ numeric, retention-based performance standards for post-construction discharges, as well as instances where permits have effectively incorporated numeric effluent limits or other quantifiable measures to address water quality impairment (see the attachment to this memorandum).

EPA has also found examples where the applicable WLAs have been translated into BMPs, which are required to be implemented during the permit term to reflect reasonable further progress towards meeting the applicable water quality standard (WQS). Incorporating greater specificity and clarity echoes the approach first advanced by EPA in the 1996 Interim Permitting Policy, which anticipated that where necessary to address water quality concerns, permits would be modified in subsequent terms to include "more specific conditions or limitations [which] may include an integrated suite of BMPs, performance objectives, narrative standards, monitoring triggers, numeric WQBELs, action levels, etc."

EPA also recently completed a review of state-issued NPDES industrial and construction permits, which also revealed a number of examples where WQBELs are expressed using clear, specific, and measurable terms. Permits are exhibiting a number of different approaches, not unlike the types of provisions shown in the MS4 Compendium. For example, some permits are requiring as an effluent limitation compliance with a numeric or narrative WQS, while others require the implementation of specific BMPs that reduce the discharge of the pollutant of concern as necessary to meet applicable WQS or to implement a WLA and/or are requiring their permittees to conduct stormwater monitoring to ensure the effectiveness of those BMPs. EPA intends to publish a compendium of permitting approaches in state-issued industrial and construction stormwater permits in early 2015.

Permits for MS4 Discharges

The CWA provides that stormwater permits for MS4 discharges "shall require controls to reduce the discharge of pollutants to the maximum extent practicable … and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants." CWA section 402(p)(3)(B)(iii). Under this provision, the NPDES permitting authority has the discretion to include requirements for reducing pollutants in stormwater discharges as necessary for compliance with water quality standards. *Defenders of Wildlife v. Browner*, 191 F.3d 1159, 1166 (9th Cir. 1999).

The 2002 memorandum stated "EPA expects that most WQBELs for NPDES-regulated municipal and small construction stormwater discharges will be in the form of BMPs, and that numeric limitations will be used only in rare instances." As demonstrated in the MS4 Compendium, NPDES permitting authorities are using various forms of clear, specific, and measurable requirements, and, where feasible, numeric effluent limitations in order to establish a more objective and accountable means for reducing pollutant discharges that contribute to water quality problems.[4] Where the NPDES authority determines that MS4 discharges have the reasonable potential to cause or contribute to a water quality standard excursion, EPA recommends that the NPDES permitting authority exercise its discretion to include clear, specific, and measurable permit requirements and, where feasible, numeric effluent limitations[5] as necessary to meet water quality standards.

NPDES authorities have significant flexibility in how they express WQBELs in MS4 permits (see examples in Box 1 of the attachment). WQBELs in MS4 permits can be expressed as system-wide requirements rather than as individual discharge location requirements such as

[4] The MS4 Compendium presents examples of different permitting approaches that EPA has found during a nationwide review of state MS4 permits. Examples of different WQBEL approaches in the MS4 Compendium include permits that have (1) a list of applicable TMDLs, WLAs, and the affected MS4s; (2) numeric limits and other quantifiable approaches for specific pollutants of concern; (3) requirements to implement specific stormwater controls or management measures to meet the applicable WLA; (4) permitting authority review and approval of TMDL plans; (5) specific impaired waters monitoring and modeling requirements; and (6) requirements for discharges to impaired waters prior to TMDL approval.

[5] For the purpose of this memorandum, and in the context of NPDES permits for stormwater discharges, "numeric" effluent limitations refer to limitations with a quantifiable or measurable parameter related to a pollutant (or pollutants). Numeric WQBELs may include other types of numeric limits in addition to end-of-pipe limits. Numeric WQBELs may include, among others, limits on pollutant discharges by specifying parameters such as on-site stormwater retention volume or percentage or amount of effective impervious cover, as well as the more traditional pollutant concentration limits and pollutant loads in the discharge.

effluent limitations on discharges from individual outfalls. Moreover, the inclusion of numeric limitations in an MS4 permit does not, by itself, mandate the type of controls that a permittee will use to meet the limitation.

EPA recommends that NPDES permitting authorities establish clear, specific, and measurable permit requirements to implement the minimum control measures in MS4 permits. With respect to requirements for post-construction stormwater management, consistent with guidance in the 1999 Phase II Rule, EPA recommends, where feasible and appropriate, numeric requirements that attempt to maintain pre-development runoff conditions (40 CFR § 122.34(b)(5)) be incorporated into MS4 permits. EPA's MS4 Compendium features examples from 17 states and the District of Columbia that have already implemented retention performance standards for newly developed and redeveloped sites. See Box 2 of the attachment for examples.

Permits for Industrial Stormwater Discharges

The CWA requires that permits for stormwater discharges associated with industrial activity comply with section 301 of the Act, including the requirement under section 301(b)(1)(C) to contain WQBELs to achieve water quality standards for any discharge that the permitting authority determines has the reasonable potential to cause or contribute to a water quality standard excursion. CWA section 402(p)(3)(A), 40 CFR § 122.44(d)(1)(iii). When the permitting authority determines, using the procedures specified at 40 CFR § 122.44(d)(1)(ii), that the discharge causes or has the reasonable potential to cause or contribute to an in-stream excursion of the water quality standards, the permit must contain WQBELs as stringent as necessary to meet any applicable water quality standard for that pollutant. EPA recommends that NPDES permitting authorities use the experience gained in developing WQBELs to design effective permit conditions to create objective and accountable means for controlling stormwater discharges. See box 3 in the attachment for examples.

Permits should contain clear, specific, and measurable elements associated with BMP implementation (*e.g.*, schedule for BMP installation, frequency of a practice, or level of BMP performance), as appropriate, and should be supported by documentation that implementation of selected BMPs will result in achievement of water quality standards. Permitting authorities should also consider including numeric benchmarks for BMPs and associated monitoring protocols for estimating BMP effectiveness in stormwater permits. Benchmarks can support an adaptive approach to meeting applicable water quality standards. While exceeding the benchmark is not generally a permit violation, exceeding the benchmark would typically require the permittee to take additional action, such as evaluating the effectiveness of the BMPs, implementing and/or modifying BMPs, or providing additional measures to protect water quality.[6] Permitting authorities should consider structuring the permit to clarify that failure to implement required corrective action, including a corrective action for exceeding a benchmark, is a permit violation. EPA notes that, as many stormwater discharges are authorized under a general

[6] For example, Part 6.2.1 of EPA's 2008 MSGP provides: "This permit stipulates pollutant benchmark concentrations that may be applicable to your discharge. The benchmark concentrations are not effluent limitations; a benchmark exceedance, therefore, is not a permit violation. Benchmark monitoring data are primarily for your use to determine the overall effectiveness of your control measures and to assist you in knowing when additional corrective action(s) may be necessary to comply with the effluent limitations …"

permit, NPDES authorities may find it more appropriate where resources allow to issue individual permits that are better tailored to meeting water quality standards for large industrial stormwater discharges with more complex stormwater management features, such as multiple outfalls and multiple entities responsible for permit compliance.

All Permitted Stormwater Discharges

As stated in the 2002 memorandum, where a State or EPA has established a TMDL, NPDES permits must contain effluent limits and conditions consistent with the assumptions and requirements of the WLAs in the TMDL. See 40 CFR § 122.44(d)(1)(vii)(B). Where the TMDL includes WLAs for stormwater sources that provide numeric pollutant loads, the WLA should, where feasible, be translated into effective, measurable WQBELs that will achieve this objective. This could take the form of a numeric limit, or of a measurable, objective BMP-based limit that is projected to achieve the WLA. For MS4 discharges, CWA section 402(p)(3)(B)(iii) provides flexibility for NPDES authorities to set appropriate deadlines for meeting WQBELs consistent with the requirements for compliance schedules in NPDES permits set forth in 40 CFR § 122.47.

The permitting authority's decision as to how to express the WQBEL(s), either as numeric effluent limitations or as BMPs, with clear, specific, and measurable elements, should be based on an analysis of the specific facts and circumstances surrounding the permit, and/or the underlying WLA, including the nature of the stormwater discharge, available data, modeling results, and other relevant information. As discussed in the 2002 memorandum, the permit's administrative record needs to provide an adequate demonstration that, where a BMP-based approach to permit limitations is selected, the BMPs required by the permit will be sufficient to implement applicable WLAs. Permits should also include milestones or other mechanisms where needed to ensure that the progress of implementing BMPs can be tracked. Improved knowledge of BMP effectiveness gained since 2002[7] should be reflected in the demonstration and supporting rationale that implementation of the BMPs will attain water quality standards and be consistent with WLAs.

EPA's regulations at 40 CFR § 122.47 govern the use of compliance schedules in NPDES permits. Central among the requirements is that the effluent limitation(s) must be met "as soon as possible." 40 CFR § 122.47(a)(1). As previously discussed, by providing discretion to include "such other provisions" as deemed appropriate, CWA section 402(p)(3)(B)(iii) provides flexibility for NPDES authorities to set appropriate deadlines towards meeting WQBELs in MS4 permits consistent with the requirements for compliance schedules in NPDES permits set forth in 40 CFR § 122.47. See *Defenders of Wildlife v Browner*, 191 F.3d at 1166. EPA expects the permitting authority to document in the permit record the basis for determining that the compliance schedule is "appropriate" and consistent with the CWA and 40 CFR § 122.47. Where a TMDL has been established and there is an accompanying implementation plan that provides a schedule for an MS4 to implement the TMDL, or where a comprehensive, integrated plan addressing a municipal government's wastewater and stormwater obligations under the NPDES program has been developed, the permitting authority should consider such

[7] See compilation of current BMP databases and summary reports available at http://water.epa.gov/infrastructure/greeninfrastructure/gi_performance.cfm, which has compiled current BMP databases and summary reports.

schedules as it decides whether and how to establish enforceable interim requirements and interim dates in the permit.

EPA notes that many permitted stormwater discharges are covered by general permits. Permitting authorities should consider and build into general permits requirements to ensure that permittees take actions necessary to meet the WLAs in approved TMDLs and address impaired waters. A general permit can, for example, identify permittees subject to applicable TMDLs in an appendix, and prescribe the activities that are required to meet an applicable WLA.

Lastly, NPDES permits must specify monitoring requirements necessary to determine compliance with effluent limitations. See CWA section 402(a)(2); 40 CFR 122.44(i). The permit could specify actions that the permittee must take if the BMPs are not performing properly or meeting expected load reductions. When developing monitoring requirements, the NPDES authority should consider the variable nature of stormwater as well as the availability of reliable and applicable field data describing the treatment efficiencies of the BMPs required and supporting modeling analysis.

Disaggregating Stormwater Sources in a WLA

In the 2002 memorandum, EPA said it "may be reasonable to express allocations for NPDES-regulated stormwater discharges from multiple point sources as a single categorical wasteload allocation when data and information are insufficient to assign each source or outfall individual WLAs." EPA also said that, "[i]n cases where wasteload allocations are developed for categories of discharges, these categories should be defined as narrowly as available information allows." Furthermore, EPA said it "recognizes that the available data and information usually are not detailed enough to determine waste load allocations for NPDES-regulated stormwater discharges on an outfall-specific basis."

EPA still recognizes that "[d]ecisions about allocations of pollutant loads within a TMDL are driven by the quantity and quality of existing and readily available water quality data," but has noted the difficulty of establishing clear, specific, and measurable NPDES permit limitations for sources covered by WLAs that are expressed as single categorical or aggregated wasteload allocations. Today, TMDL writers may have more information—such as more ambient monitoring data, better spatial and temporal representation of stormwater sources, and/or more permit-generated data—than they did in 2002 to develop more disaggregated TMDL WLAs.

Accordingly, for all these reasons, EPA is again recommending that, "when information allows," WLAs for NPDES-regulated stormwater discharges be expressed "as different WLAs for different identifiable categories" (*e.g.*, separate WLAs for MS4 and industrial stormwater discharges). In addition, as EPA said in 2002, "[t]hese categories should be defined as narrowly as available information allows (*e.g.*, for municipalities, separate WLAs for each municipality and for industrial sources, separate WLAs for different types of industrial stormwater sources or dischargers)." EPA does not expect states to assign WLAs to individual MS4 outfalls; however, some states may choose to do so to support their implementation efforts. These recommendations are consistent with the decision in *Anacostia Riverkeeper, Inc. v. Jackson*, 2011 U.S. Dist. Lexis 80316 (July 25, 2011).

In general, states are encouraged to disaggregate the WLA when circumstances allow to facilitate implementation. TMDL writers may want to consult with permit writers and local authorities to collect additional information such as sewer locations, MS4 jurisdictional boundaries, land use and growth projections, and locations of stormwater controls and infrastructure, to facilitate disaggregation. TMDLs have used different approaches to disaggregate stormwater to facilitate MS4 permit development that is consistent with the assumptions and requirements of the WLA. For example, some TMDLs have used a geographic approach and developed individual WLAs by subwatershed[8] or MS4 boundary (*i.e.*, the WLA is subdivided by the relative estimated load contribution to the subwatershed or the area served by the MS4). TMDLs have also assigned percent reductions[9] of the loading based on the estimated wasteload contribution from each MS4 permit holder. Where appropriate, EPA encourages permit writers to identify specific shares of an applicable wasteload allocation for specific permittees during the permitting process, as permit writers may have more detailed information than TMDL writers to effectively identify reductions for specific sources.

Designating Additional Stormwater Sources to Regulate and Developing Permit Limits for Such Sources

The 2002 memorandum states that "stormwater discharges from sources that are not currently subject to NPDES regulation may be addressed by the load allocation component of a TMDL." Section 402(p)(2) of the Clean Water Act (CWA) requires industrial stormwater sources, certain municipal separate storm sewer systems, and other designated sources to be subject to NPDES permits. Section 402(p)(6) provides EPA with authority to identify additional stormwater discharges as needing a permit.

In addition to the stormwater discharges specifically identified as needing an NPDES permit, the CWA and the NPDES regulations allow for EPA and NPDES authorized States to designate additional stormwater discharges for regulation. See:
40 CFR §§122.26 (a)(9)(i)(C), (a)(9)(i)(D), (b)(4)(iii), (b)(7)(iii), (b)(15)(ii) and 122.32(a)(2). Accordingly, EPA encourages permitting authorities to consider designation of stormwater sources in situations where coverage under NPDES permits would, in the reasonable judgment of the permitting authority and, considering the facts and circumstances in the waterbody, provide the most appropriate mechanism for implementing the pollution controls needed within a watershed to attain and maintain applicable water quality standards.

If a TMDL had previously included a newly permitted source as part of a single aggregated or gross load allocation for all unregulated stormwater sources, or all unregulated sources in a specific category, the NPDES permit authority could identify an appropriate allocation share and include a corresponding limitation specific to the newly permitted stormwater source. EPA recommends that any additional analysis used to identify that share and develop the corresponding limit be included in the administrative record for the permit. The

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[8] Wissahickon Creek Siltation TMDL (Pennsylvania) www.epa.gov/reg3wapd/tmdl/pa_tmdl/wissahickon/index.htm.
[9] Liberty Bay Watershed Fecal Coliform Bacteria TMDL (Washington). https://fortress.wa.gov/ecy/publications/SummaryPages/1310014.html and Upper Minnehaha Creek Watershed Nutrients and Bacteria TMDL (Minnesota) http://www.pca.state.mn.us/index.php/view-document.html?gid=20792

permit writer's additional analysis would not change the TMDL, including its overall loading cap.

In situations where a stormwater source addressed in a TMDL's load allocation is not currently regulated by an NPDES permit but may be required to obtain an NPDES permit in the future, the TMDL writer should consider including language in the TMDL explaining that the allocation for the stormwater source is expressed in the TMDL as a "load allocation" contingent on the source remaining unpermitted, but that the "load allocation" would later be deemed a "wasteload allocation" if the stormwater discharge from the source were required to obtain NPDES permit coverage. Such language would help ensure that the allocation is properly characterized by the permit writer should the source's regulatory status change. This will help the permit writer develop limitations for the NPDES permit applicable to the newly permitted source that are consistent with the assumptions and requirements of the TMDL's allocation to that source.

If you have any questions please feel free to contact us or Deborah Nagle, Director of the Water Permits Division, or Tom Wall, Director of the Assessment and Watershed Protection Division.

cc: Association of Clean Water Administrators
TMDL Program Branch Chiefs, Regions 1 – 10
NPDES Permits Branch Chiefs, Regions 1 – 10

Attachment: MS4 and Industrial Stormwater Permit Examples

ATTACHMENT: MS4 and Industrial Stormwater Permit Examples

BOX 1. Examples of WQBELs in MS4 Permits:

1. Numeric expression of the WQBEL: The MS4 Permit includes a specific, quantifiable performance requirement that must be achieved within a set timeframe. For example:
   - Reduce fine sediment particles, total phosphorus, and total nitrogen loads by 10 percent, 7 percent, and 8 percent, respectively, by September 30, 2016 (2011 Lake Tahoe, CA MS4 permit)
   - Restore within the 5-year permit term 20 percent of the previously developed impervious land (2014 Prince George's County, MD MS4 permit)
   - Achieve a minimum net annual planting rate of 4,150 planting annually within the MS4 area, with the objective of an MS4-wide urban tree canopy of 40 percent by 2035 (2011 Washington, DC MS4 permit)
   - Discharges from the MS4 must not cause or contribute to exceedances of receiving water limits for Diazinon of 0.08µg/L for acute exposure (1 hr averaging period) or 0.05µg/L for chronic exposure (4-day averaging period), OR must not exceed Diazinon discharge limits of 0.072 µg/L for acute exposure or 0.045µg/L for chronic exposure (2013 San Diego, CA Regional MS4 permit)

2. Non-numeric expressions of the WQBEL: The MS4 Permit establishes individualized, watershed-based requirements that require each affected MS4 to implement specific BMPs within the permit term, which will ensure reasonable further progress towards meeting applicable water quality standards.
   - To implement the corrective action recommendations of the Issaquah Creek Basin Water Cleanup Plan for Fecal Coliform Bacteria (part of the approved Fecal Coliform Bacteria TMDL for the Issaquah Creek Basin), King County is required during the permit term to install and maintain animal waste education and/or collection stations at municipal parks and other permittee owned and operated lands reasonably expected to have substantial domestic animal use and the potential for stormwater pollution. The County is also required to complete IDDE screening for bacteria sources in 50 percent of the MS4 subbasins, including rural MS4 subbasins, by February 2, 2017 and implement the activities identified in the Phase I permit for responding to any illicit discharges found (2013 Western Washington Small MS4 General Permit)
   - For discharges to Segment 14 of the Upper South Platte River Basin associated with WLAs from the approved *E. coli* TMDL, the MS4 must identify outfalls with dry weather flows; monitor priority outfalls for flow rates and *E. coli* densities; implement a system maintenance program for listed priority basins (which includes storm sewer cleaning and sanitary sewer investigations); install markers on at least 90% of storm drain inlets in areas with public access; and conduct a public outreach program focused on sources that contribute *E. coli* loads to the MS4. By November 30, 2018, dry weather discharges from MS4 outfalls of concern must not contribute to an exceedance of the *E. coli* standard (126 cfu per 100 ml for a geometric mean of all samples collected at a specific outfall in a 30-day period) (2009 Denver, CO MS4 Permit)

3. Hybrid approach with both numeric and non-numeric expressions of the WQBEL:
   - Discharges of trash from the MS4 to the LA River must be reduced to zero by Sept. 2016. Permittees also have the option of complying via the installation of defined "full capture systems" to prevent trash from entering the MS4 (2012 Los Angeles County, CA MS4 Permit).
   - To attain the shared, load allocation of 27,000 metric tons/year of sediment in the Napa River sediment TMDL, municipalities shall determine opportunities to retrofit and/or reconstruction of road crossings to minimize road-related sediment delivery (≤ 500 cubic yards/mile per 20-year period) to stream channels (2013 CA Small MS4 General Permit).

Box 2. Examples of Retention Post Construction Standards for New and Redevelopment in MS4 Permits

- 2009 WV small MS4 permit: Keep and manage on site the first one inch of rainfall from a 24-hour storm preceded by 48 hours of no measurable precipitation.
- 2011 DC Phase I MS4 permit: Achieve on-site retention of 1.2" of stormwater from a 24-hour storm with a 72-hour antecedent dry period through evapotranspiration, infiltration and/or stormwater harvesting.
- 2012 Albuquerque, NM Phase I MS4 permit: Capture the 90th percentile storm event runoff to mimic the predevelopment hydrology of the previously undeveloped site.
- 2010 Anchorage, AK Phase I MS4 permit: Keep and manage the runoff generated from the first 0.52 inches of rainfall from a 24 hour event preceded by 48 hours of no measureable precipitation.
- 2013 Western WA small MS4 permit: Implement low impact development performance standards to match developed discharge durations to pre-developed durations for the range of pre-developed discharge rates from 8% of the 2-year flow to 50% of the 2-year flow.

BOX 3. Examples of WQBELs in Industrial (including Construction) Stormwater Permits:

1. Numeric expression of the WQBEL: The permit includes a specific, quantifiable performance requirement that must be achieved:
   - Pollutant concentrations shall not exceed the stormwater discharge limits specified in the permit (based on state WQS), including (for example): Cadmium-0.003 mg/l; Mercury-0.0024 mg/l; Selenium-0.02 mg/l (2013 Hawaii MSGP)
   - Beginning July 1, 2010, permittees discharging to impaired waters without an EPA-approved TMDL shall comply with the following effluent limits (based on state WQS), including (for example): Turbidity-25 NTU; TSS-30 mg/l; Mercury-0.0021 mg/l; Phosphorus, Ammonia, Lead, Copper, Zinc-site-specific limits to be determined at time of permit coverage (2010 Washington MSGP)
   - If discharging to waters on the 303(d) list (Category 5) impaired for turbidity, fine sediment, or phosphorus, the discharge must comply with the following effluent limit for turbidity: 25 NTU (at the point of discharge from the site), or no more than 5 NTU above background turbidity when the background turbidity is 50 NTU or less, or no more than a 10% increase in turbidity when background turbidity is more than 50 NTU. Discharges to waterbodies on the 303(d) list (Category 5) for high pH must comply with the numeric effluent limit of pH 6.5 to 8.5 su (2010 Washington CGP) (2010 Washington CGP)

2. Narrative expression of the WQBEL: The permit includes narrative effluent limits based on applicable WQS:
   - New discharges or new dischargers to an impaired water are not eligible for permit coverage, unless documentation or data exists to show that (1) all exposure of the pollutant(s) of concern to stormwater is prevented; or (2) the pollutant(s) of concern are not present at the facility; or (3) the discharge of the pollutant(s) of concern will meet instream water quality criteria at the point of discharge (for waters without an EPA-approved TMDL), or there is sufficient remaining WLAs in an EPA-approved TMDL to allow the discharge and that existing dischargers are subject to compliance schedules to bring the waterbody into attainment with WQS (2011 Vermont MSGP; similar requirements in RI, NY, MD, VA, WV, SC, AR, TX, KS, NE, AZ, CA, AK, OR, and WA permits)
   - In addition to other applicable WQBELs, there shall be no discharge that causes visible oil sheen, and no discharge of floating solids or persistent foam in other than trace amounts. Persistent foam is foam that does not dissipate within one half hour of point of discharge (2014 Maryland MSGP)

3. Requirement to implement additional practices or procedures for discharges to impaired waters:
   - For sediment-impaired waters (without an approved TMDL), the permittee is required to maintain a minimum 50-foot buffer zone between any disturbance and all edges of the receiving water (2009 Kentucky CGP)
   - For discharges to impaired waters, implement the following: (1) stabilization of all exposed soil areas immediately, but in no case later than 7 days after the construction activity in that portion of the site has temporarily or permanently ceased (as compared to 14 days for no-impaired waters); (2) temporary sediment basins must meet specified design standards if they will serve an area of 5 or more acres (as compared to 10 or more acres for other sites); (3) retain a water quality volume of 1 inch of runoff from the new impervious surfaces created by the project (though this volume reduction requirement is for discharges to all waters, not just impaired waters) (2013 Minnesota CGP).
   - If the site discharges to a water impaired for sediment or turbidity, or to a water subject to an EPA-approved TMDL, the permittee must implement one or more of the following practices: (1) compost berms, compost blankets, or compost socks; (2) erosion control mats; (3) tackifiers used with a perimeter control BMP; (4) a natural buffer of 50 feet (horizontally) plus 25 feet (horizontally) for 5 degrees of slope; (5) water treatment by electro-coagulation, flocculation, or filtration; and/or (6) other substantially equivalent sediment or turbidity BMP approved by the state (2010 Oregon CGP)

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Forest Service Specifications for Construction of Roads & Bridges

Preface

The Forest Service, U.S. Department of Agriculture, developed this book for use in the preparation and administration of contracts for the construction of roads and bridges on the National Forest Development Road System under Public Works Contracts, or as a condition of Timber Sale Contracts.

This book contains the Standard Specifications that commonly apply in Public Works and Timber Sale Contracts. When designated in a Forest Service contract, the specifications in this book are binding on the parties signing the contract and become a part of the contract. Provisions and clauses pertinent to Public Works Contracts are located in the Federal Acquisition Regulation (FAR). Standard Provisions and Special Provisions for timber sale projects are located in the Timber Sale Contract, Divisions B (BT) and C (CT) respectively. Conditions and requirements peculiar to individual projects, including additions and revisions to Standard Specifications, are located in the SPECIAL PROJECT SPECIFICATIONS section of the Contract.

In the development of this book, some section numbers were not utilized. The section numbers that are not included in this book may be used when it is necessary to develop a specification that is not adequately covered in one of the sections contained in this book, as long as it utilizes the same format and is included within the appropriate division.

This book is available to the public from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. It is also available from other U.S. Government bookstores located in various cities around the country, including: Atlanta, GA; Birmingham, AL; Boston, MA; Chicago, IL; Cleveland, OH; Columbus, OH; Dallas, TX; Denver, CO; Detroit, MI; Houston, TX; Jacksonville, FL; Kansas City, MO; Los Angeles, CA; Milwaukee, WI; New York, NY; Philadelphia, PA; Pittsburgh, PA; Portland, OR; Pueblo, CO; and San Francisco, CA.

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Forest Service

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Forest Service Specifications for Construction of Roads & Bridges

DIVISION 100
General Specifications

Section 101—Abbreviations, Acronyms, & Terms

101.01 Terms, Organizations, & Standards

These specifications are generally written in the imperative mood. In sentences using the imperative mood, the subject, “the Contractor,” is implied. Also implied in this language is “shall,” “shall be,” or similar words and phrases. In material specifications, the subject may also be the supplier, fabricator, or manufacturer supplying material, products, or equipment for use on the project.

Wherever “directed,” “required,” “prescribed,” or similar words are used, the “direction,” “requirement,” or “order” of the Contracting Officer (CO) is intended. Similarly, wherever “approved,” “acceptable,” “suitable,” “satisfactory,” or similar words are used, they mean “approved by,” “acceptable to,” or “satisfactory to” the CO.

The word “will” generally pertains to decisions or actions of the CO.

Whenever in these specifications, or in other contract documents, the following terms (or pronouns in place of them) are used, the intent and meaning shall be interpreted as follows: reference to a specific standard, test, testing method, or specification shall mean the latest published edition or amendment that is in effect at the solicitation issue date for Public Works Contracts or the sale advertisement date for Timber Sale Contracts.

These specifications are divided into the following divisions:

- Division 100 consists of general specifications for which no direct payment is made. These requirements are applicable to all contracts.

- Division 150 consists of engineering requirements that are applicable to some contracts. Work under this division is paid for directly when there is a PAY ITEM IN THE SCHEDULE OF ITEMS. When there is no PAY ITEM IN THE SCHEDULE OF ITEMS, no direct payment is made.

- Divisions 200–600 consist of construction contract requirements for specific items of work. Work under these divisions is paid for directly or indirectly according to Section 106 and the section for ordering the work when there is a PAY ITEM IN THE SCHEDULE OF ITEMS.

- Division 700 contains the material requirements for Divisions 200–600. No direct payment is made under Division 700. Payment for material is included as part of the work required in Divisions 200–600.

(a) Acronyms. The following acronyms are used in these specifications:

AA	Aluminum Association
AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
ADA	Americans With Disabilities Act
AGC	Associated General Contractors of America
AI	Asphalt Institute
AISC	American Institute of Steel Construction
AITC	American Institute of Timber Construction
ALSC	American Lumber Standards Committee
ANSI	American National Standards Institute
APA	American Plywood Association
ARTBA	American Road and Transportation Builders Association
ASTM	American Society for Testing and Material
AWPA	American Wood Preservers Association
AWS	American Welding Society
AWWA	American Water Works Association
CFR	Code of Federal Regulations
CRSI	Concrete Reinforcing Steel Institute
DEMA	Diesel Engine Manufacturers Association
DOT	U.S. Department of Transportation
FAR	Federal Acquisition Regulation
FHWA	Federal Highway Administration
FLH	Federal Lands Highway (Federal Highway Administration)
FSS	Federal Specifications and Standards
ISSA	International Slurry Surfacing Association
MIL	Military Specification(s)
MSHA	Mine Safety and Health Administration
MUTCD	Manual on Uniform Traffic Control Devices
NBS	National Bureau of Standards
OSHA	Occupational Safety and Health Administration
PCI	Prestressed Concrete Institute
PTI	Post-Tensioning Institute
SI	International System of Units
SSPC	Steel Structures Painting Council
WWPI	Western Wood Preservation Institute

(b) System of International Units (SI) Symbols. The following SI symbols are used in these specifications:

A	-	ampere	electric current
cd	-	candela	luminous intensity
°C	-	degree Celsius (K – 273.15)	temperature
d	-	day	time
g	-	gram	mass
h	-	hour	time
ha	-	hectare	area
Hz	-	hertz (s^{-1})	frequency
J	-	joule (N•m)	energy
K	-	kelvin	temperature
L	-	liter	volume
lx	-	lux	illuminance
m	-	meter	length
m^2	-	square meter	area
m^3	-	cubic meter	volume
min	-	minute	time
N	-	newton (kg•m/s^2)	force
Pa	-	pascal (N/m^2)	pressure
s	-	second	time
t	-	ton	mass
V	-	volt (W/A)	electric potential
W	-	watt (J/s)	power
Ω	-	ohm (V/A)	electric resistance
°	-	degree	plane angle
′	-	minute	plane angle
″	-	second	plane angle

(c) SI Prefix Symbols. The following SI prefix symbols are used in these specifications:

E	-	exa	10^{18}
P	-	peta	10^{15}
T	-	tera	10^{12}
G	-	giga	10^{9}
M	-	mega	10^{6}
k	-	kilo	10^{3}
c	-	centi	10^{-2}
m	-	milli	10^{-3}
µ	-	micro	10^{-6}

n	-	nano	10^{-9}
p	-	pico	10^{-12}
f	-	femto	10^{-15}
a	-	atto	10^{-18}

(d) SI Slope Notation (vertical : horizontal). For slopes flatter than 1:1, express the slope as the ratio of one unit vertical to a number of units horizontal. For slopes steeper than 1:1, express the slope as the ratio of a number of units vertical to one unit horizontal.

101.02 Abbreviations

ABS	Acrylonitrile-butadiene-styrene
ACA	Ammoniacal copper arsenate
ACZA	Ammoniacal copper zinc arsenate
Agg	Aggregate
Al	Aluminum
AOS	Apparent opening size
AQ	Actual quantities
AQL	Acceptable Quality Level
BMP	Best Management Practice
CAPWAP	Case pile wave analysis program
CCA	Chromated copper arsenate
CMP	Corrugated metal pipe
CMPA	Corrugated metal pipe arch
CO	Contracting Officer
CPF	Composite pay factor
CSP	Corrugated steel pipe
CSPA	Corrugated steel pipe arch
CTB	Cement-treated base
DAR	Durability Absorption Ratio
Dia	Diameter
DQ	Designed quantities
DTI	Direct tension indicator
Dwgs	Drawings
FM	Fineness modulus
GFM	Government-furnished materials
Gr	Grade
h	Hour
H	Height
ha	Hectare

HDO	High-density overlay
HDPE	High-density polyethylene
Hor	Horizontal
HSLA	High-strength low-alloy
kg	Kilogram
kL	Kiloliter
kL km	Kiloliter kilometer
km	Kilometer
L	Length
l	Liter
LSL	Lower specification limit
m	Meter
m^2	Square meter
m^3	Cubic meter
m^3 km	Cubic meter kilometer
Matl	Material
max.	Maximum
Mbf	Thousand board feet
min.	Minimum
Misc	Miscellaneous
mm	Millimeter
N/C	Numerically controlled
PG	Performance-graded
PI	Plasticity index
ppm	Parts per million
PS	Product Standard (issued by the U.S. Department of Commerce)
PVC	Polyvinylchloride
SQ	Staked quantities
t	Ton (1,000 kg)
t km	Ton kilometer
T	Temperature
T&L	Tops and limbs
TFE	Tetraflouroethylene
Th	Thickness
TV	Target value
USL	Upper specification limit
Vert	Vertical
VMA	Voids in Mineral Aggregate
VOC	Volatile organic compound
W	Width
W/	With
W/O	Without
WW	Woven wire
WWF	Welded wire fabric

Section 102—Definitions

Wherever the following terms, or pronouns in place of them, are used in these specifications or in other contract documents, the intent and meaning are as follows:

Adjustment in Contract Price. "Equitable adjustment," as used in the Federal Acquisition Regulations, or "construction cost adjustment," as used in the Timber Sale Contract, as applicable.

Arch. A culvert section, usually formed of bolted structural plates, that is an arc of a circle (usually one-half or less); that is, a bottomless culvert.

Base Course. The layer or layers of specified or selected material of designed thickness placed on a subbase or subgrade to support a surface course. (See figure 102-1.)

Bearings. The portion of a beam, girder, or truss that transmits the bridge superstructure load to the substructure.

Berm. Curb or dike constructed to control roadway runoff water. (See figure 102-1.)

Best Management Practice. A series of water quality protection practices and procedures approved or certified by the State water quality agency under the provisions of sections 319 and 402 of the Clean Water Act, as amended.

Bridge. A structure, including supports, erected over a depression or an obstruction, such as water, a road, a trail, or a railway, and having a floor for carrying traffic or other moving loads.

Bridge Length. The overall length measured along the centerline of road to the back of abutment backwalls, if present; otherwise, end to end of the bridge floor, but in no case less than the total clear opening of the structure.

Bridge Traveled Way Width. The clear width measured at right angles to the longitudinal centerline of the bridge between the bottom of curbs or, if curbs are not used, between the inner faces of parapet or railing.

Certificate of Compliance. A signed statement by a person with legal authority to bind a company or supplier to its product. The certificate states that the material or assemblies furnished fully comply with the requirements of the contract.

Change. "Change" means "change order" as used in the Federal Acquisition Regulations, or "design change" as used in the Timber Sale Contract.

Clearing Limits. The limits of clearing as designated on the ground or on the drawings. (See figure 102-1.)

Cofferdam. A cofferdam is an enclosed single or double wall braced structure with walls sheeted with timber, concrete, or steel, and extending well below the bottom of excavation, when practical. Earthen or rockfill dikes, dams, or embankments are not considered cribs or cofferdams for this purpose.

Conduit. A natural or artificial channel for carrying fluids, such as water pipe, canal, or aqueduct.

Construction Slash. All vegetative material not meeting Utilization Standards, such as tops and limbs, timber, brush, and grubbed stumps associated with construction or reconstruction of a facility.

Contracting Officer (CO). The person with the authority to enter into, administer, and/or terminate contracts and make related determinations and findings. The term includes certain authorized representatives of the CO acting within the limits of their authority as delegated by the CO. Authorized representatives include the Forest Service Representative, Engineering Representative, Contracting Officer's Representative, and Inspector.

Contractor. The individual, partnership, joint venture, or corporation undertaking the execution of the work under the terms of the contract and acting directly or through agents, employees, or subcontractors. As used in specifications and drawings for specified roads (Timber Sale Contracts), "Contractor" is "purchaser."

Controlled Felling. Directing the placement of trees in felling by using wedges, jacks, cable tension, or distribution of holding wood, or any combinations of these, to ensure that trees are dropped into previously cleared areas, or clear of any objects that are to remain.

Culvert. A conduit or passageway under a road, trail, or other obstruction. A culvert differs from a bridge in that it is usually constructed entirely below the elevation of the traveled way.

Curve Widening. Additional width added to curves to allow for vehicle offtracking.

Cushion Material. Native or imported material generally placed over rocky sections of unsurfaced roads to provide a usable and maintainable traveled way.

Defect. A failure to meet a requirement with respect to a single quality characteristic.

Drawings. The documents, including plan and profile sheets, plans, cross sections, diagrams, layouts, schematics, descriptive literature, illustrations, schedules, performance and test data, and similar materials showing details for construction of a facility.

Embankment. A structure of soil, aggregate, or rock material placed on the prepared ground surface and constructed to subgrade.

Equipment. All machinery and equipment, together with the necessary supplies for upkeep and maintenance, as well as tools and apparatus necessary for the proper construction and acceptable completion of the work.

Excess Excavation. Material from the roadway in excess of that needed for construction of designed roadways.

Falsework. Any temporary construction work used to support the permanent structure until it becomes self-supporting. Falsework includes steel or timber beams, girders, columns, piles, foundations, and any proprietary equipment including modular shoring frames, post shores, and adjustable horizontal shoring.

Forest Service. The United States of America, acting through the Forest Service, U.S. Department of Agriculture.

Government Land. National Forest System lands, and other lands controlled or administered by the Forest Service or other Federal agencies.

Inspector. The Government-authorized representative designated in writing by the Contracting Officer, Contracting Officer's Representative, or Engineering Representative responsible for detailed inspection.

Invert. The lowest point of the internal cross section of culvert or pipe arch.

Job-Mix Formula. The percentage of each material in a mixture intended for a particular use.

Laboratory. A testing laboratory of the Government, or any other testing laboratory approved by the Contracting Officer.

Live Stream. A defined streambed with flowing water.

Lot. An isolated quantity of material from a single source; a measured amount of construction assumed to be produced by the same process.

Materials. Any substance specified for use in the construction of the project and its appurtenances.

Maximum Density. The highest density that can be obtained for a specific material using the stated test procedure.

Measurement. Determining and expressing the quantities of work or materials.

Multibeam Girder. A precast, prestressed concrete member where the concrete deck is precast as an integral part of the member.

Neat Line. A line defining the proposed or specified limits of an excavation or structure.

Nominal Dimensions or Weights. The numerical values shown on the drawings or in the specifications as measurements of material to be used in the construction.

Nominal Maximum Particle Size. The largest sieve size listed in the applicable specification upon which any material is permitted to be retained.

Overbreak. Material beyond the neat line of an excavation that is removed in the process of excavation, usually by blasting.

Pass. A pass shall consist of one complete coverage of the surface.

Pavement Structure. Subbase, base, or surface course, or combination thereof, placed on a subgrade to support the traffic load and distribute it to the roadbed.

Pioneer Road. Temporary construction access built along the route of the project.

Pipe. A culvert that is circular (round) in cross section.

Pipe Arch. A pipe that has been factory-deformed from a circular shape such that the width (or span) is larger than the vertical dimension (or rise).

Profile Grade. The trace of a vertical plane, as shown on the drawings, intersecting the top surface at the centerline of the proposed facility construction.

Purchaser. The individual, partnership, joint venture, or corporation contracting with the Government under the terms of a Timber Sale Contract and acting independently or through agents, employees, or subcontractors.

Random Sampling. A sample of material chosen such that each increment of a population of material has an equal probability of being selected.

Reasonably Close Conformity. Compliance with reasonable and customary manufacturing and construction tolerances, performing all work and furnishing all materials in "reasonably close conformity" with lines, grades, cross sections, dimensions, and material requirements shown on the drawings, indicated in the specifications, or designated on the ground.

Right-of-Way. A general term denoting (1) the privilege to pass over land in some particular line (including easement, lease, permit, or license to occupy, use, or traverse public or private lands), or (2) land, appurtenances thereto, or interest therein, usually in a strip, acquired for public or private passageway. (See figure 102-1.)

Road Order. An order affecting and controlling traffic on roads under Forest Service jurisdiction. Road Orders are issued by a designated Forest Officer under the authorities of 36 CFR, part 260.

Road Template. The shape and cross-sectional dimensions of the roadway to be constructed, as defined by the construction staking notes and the characteristics of the typical sections.

Roadbed. The graded portion of a road between the intersection of subgrade and side slopes, excluding that portion of the ditch below subgrade. (See figure 102-1.)

Roadside. A general term denoting the area adjoining the outer edge of the roadway. (See figure 102-1.)

Roadway. The portion of the road within the limits of excavation and embankment, including slope rounding. (See figure 102-1.)

Schedule of Items. A schedule in the contract that contains a listing and description of construction items, quantities, units of measure, methods of measurement, unit price, and amount.

Second Samples. A sample taken when the initial sample indicates that the material is defective.

Shoulder. The portion of the roadway contiguous to the traveled way for accommodation of stopped vehicles, emergency use, and lateral support of pavement structure. (See figure 102-1.)

Sidewalk. The portion of the roadway constructed primarily for pedestrian use.

Special Project Specifications. The specifications that detail the conditions and requirements specific to the individual project, including additions and revisions to Standard Specifications.

Specifications. A description of the technical requirements for a material, product, or service that includes criteria for determining whether these requirements are met.

Spring Line. The point of contact between arch and footing.

Standard Specifications. Specifications approved for general application and repetitive use.

Station. (1) A measure of distance used for highways and railroads equal to 1 kilometer. (2) A precise location along a survey line.

Subbase. The layers of specified or selected material of designed thickness placed on a subgrade to support a base course.

Subgrade Treatment. Modification of roadbed material by stabilization.

Subgrade. The prepared surface, including widening for curves, turnouts, and other areas upon which a subbase, base, or surface course is constructed. For roads without base course or surface course, that portion of roadbed prepared as the finished wearing surface. (See figure 102-1.)

Substructure (Bridge). All of that part of the structure below the bearings of simple and continuous spans, skewbacks of arches, and tops of footings of rigid frames, together with the backwalls, wingwalls, and wing protection railings.

Superstructure (Bridge). The entire structure, except the substructure.

Surface Course. The top layer of a pavement structure, sometimes called the wearing course, usually designed to resist skidding, traffic abrasion, and the disintegrating effects of climate. (See figure 102-1.)

Tackifier. Binder for vegetative mulch.

Target Value. Values that are established according to contract, and from which allowable variations are measured.

Timber Sale Contract. A written contract for the removal of national forest timber.

Tops and Limbs. All woody material including bushes, vines, and portions of trees smaller than the dimensions for timber shown in Subsection 201.03.

Traveled Way. The portion of the roadway for the movement of vehicles, exclusive of shoulders and auxiliary lanes. (See figure 102-1.)

Turnout. A short auxiliary lane on a one-lane road provided for the passage of meeting vehicles.

Unit of Measurement. The unit and fractions of units DESIGNATED IN THE SCHEDULE OF ITEMS.

Unsuitable Material. The material excavated during roadway construction that is not usable in embankment and must be disposed of, or that can be used only in certain locations or for limited purposes.

Utilization Standards. The minimum size and percent soundness of trees described in the specifications to determine merchantable timber.

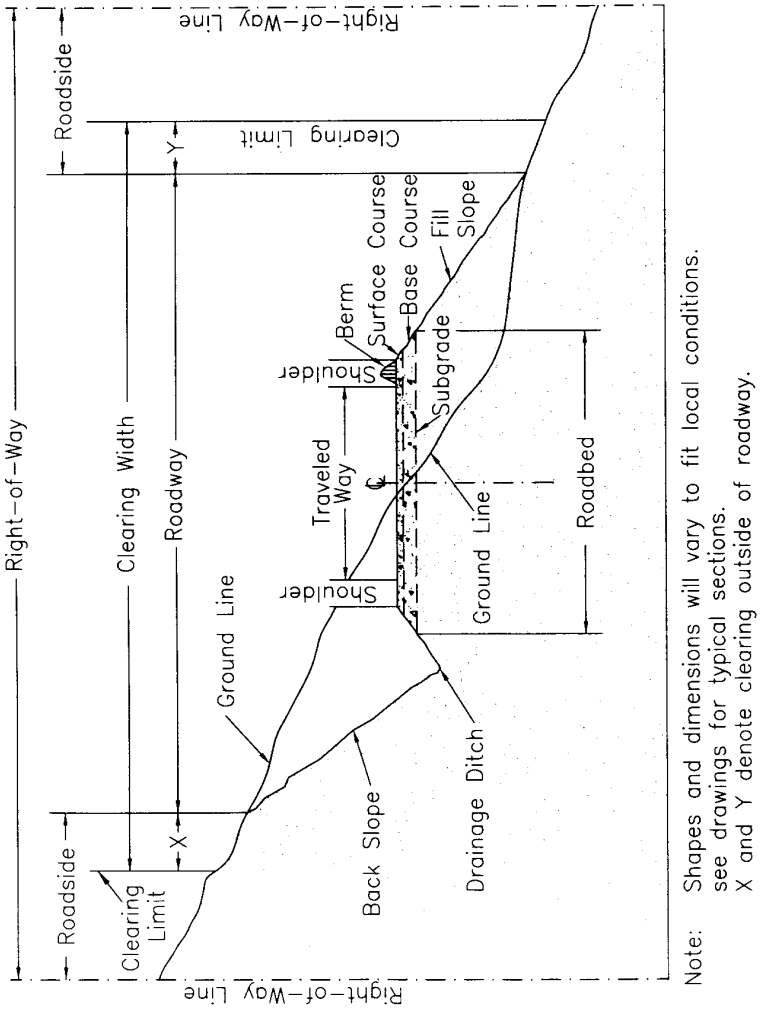

Figure 102-1.—Illustration of road structure terms.

Section 103—Intent of Contract

The intent of the contract is to provide for the complete construction of the project described in the contract. Unless otherwise provided, furnish all labor, materials, equipment, tools, transportation, and supplies, and perform all work required to complete the project in reasonably close conformity with drawings and specifications, and in accordance with provisions of the contract.

Section 104—Maintenance for Traffic

104.01 Roads To Be Constructed

Unless otherwise SHOWN ON THE DRAWINGS or described in the SPECIAL PROJECT SPECIFICATIONS, keep existing roads open to all traffic during road improvement work, and maintain them in a condition that will adequately accommodate traffic. Perform no work that interferes or conflicts with traffic or existing access to the roadway surface until a plan for the satisfactory handling of traffic has been approved. Specific requirements for temporary closures, detours, part-width construction, and access to adjacent or intersecting facilities will be SHOWN ON THE DRAWINGS or described in the SPECIAL PROJECT SPECIFICATIONS. Post construction signs and traffic control devices in conformance with the "Manual on Uniform Traffic Control Devices" (MUTCD). Do not proceed with work on the project until all required signs are in place and approved.

Before shutting down any operations, take all necessary precautions to prevent damage to the project, such as temporary detours, approaches, crossings, or intersections; and provide for normal drainage and minimization of erosion. Leave all travelways in a condition suitable for traffic.

The Government may permit use of portions of the project during periods when operations have shut down All maintenance attributable to permitted use during periods of work suspension will be provided by the Government, except for maintenance needed through the fault or negligence of the Contractor. The Contractor shall be responsible for any maintenance not attributable to use, or that is necessary during suspensions through the fault or negligence of the Contractor.

When SHOWN ON THE DRAWINGS or described in the SPECIAL PROJECT SPECIFICATIONS, road segments may be closed to all traffic during the period(s) when construction is in progress. If any of the listed roads are to be closed during construction operations, give at least 14 days advance notice.

Unless otherwise provided, when construction activity is in progress and total closure has not been provided for herein, delays may not exceed *30 minutes*, in order to reasonably accommodate traffic.

104.02 Use of Roads by Contractor

The Contractor is authorized to use roads under the jurisdiction of the Forest Service for all activities necessary to complete this contract, subject to the limita-

tions and authorizations SHOWN ON THE DRAWINGS, designated in the Road Order, or described in the SPECIAL PROJECT SPECIFICATIONS, when such use will not damage the roads or national forest resources, and when traffic can be accommodated safely.

Section 105—Control of Materials

105.01 Handling Materials

Transport and handle all materials to preserve their quality and fitness for the work. Stockpile, load, and transport aggregates in a manner that will preserve specified gradation and avoid contamination. Do not intermingle stockpiles of aggregate with different gradations. Stockpile crushed or screened aggregate in accordance with Section 305.

105.02 Weighing Devices

When the measurement is by weight, provide weigh scales and transport the materials so they can be weighed. Perform all weighing.

(a) Platform Scales. Provide platform scales of sufficient length and capacity to permit simultaneous weighing of all axle loads of each hauling unit.

Provide scales accurate to within 1 percent of the correct weight throughout the range of use. Before using the scales and as frequently thereafter as necessary to ensure accuracy, have the scales checked, adjusted, and certified by a representative of the State agency responsible for weights and measures or by a qualified manufacturer's representative.

Provide copies of weight tickets from a certified scale.

Material may be weighed on other certified scales without additional compensation. In this case, furnish certified weight tickets for all material delivered to the project, and guarantee permission to periodically check the weighing procedure and records.

(b) Belt Conveyor Scales. Belt conveyor weighing will be accepted in lieu of platform scales, provided this method or device meets the requirements specified below and is compatible with the provisions of measurement and payment in the applicable specifications.

Use a belt conveyor scale that meets the design, marking, installation, and tolerance requirements of the National Bureau of Standards (NBS) Handbook No. 44. Provide a copy of a NBS Prototype Examination Report of Test to certify the scale.

Use a weighing mechanism that contains a weight totalizer and a self-printing device that legibly imprints the load-out weight on appropriate serially numbered and time-dated tickets. Time date manually, or use an automatic printing device.

Deliver each ticket at the job site or point of use. Furnish the totalizer calibration adjustment and ticket imprinting device with a security lock and key.

Under observation of the CO, run a daily zero-load test in accordance with NBS Handbook No. 44.

105.03 Sampling & Testing of Aggregate

When Designated Sources or Contractor-Furnished Sources are specified (see Subsections 105.06(a) and (b)), submit test results and a Certificate of Compliance that states that the aggregate meets the contract requirements. Equip crushing, screening, and mixing plants with sampling devices. Submit test results within 16 working hours of obtaining sample(s). Take additional samples, if required by the CO, to validate the certification.

Before incorporating material into the work, ensure that sampling and testing of material conform to the American Association of State Highway and Transportation Officials (AASHTO) requirements, and occur as follows:

(a) For onsite-produced materials at crushing or screening plants: after additions of any necessary blending material.

(b) For commercially produced aggregates: at the producer's plant or stockpile.

(c) For gradation of combined aggregate in bituminous plant mixtures: either before or after introduction of bituminous material.

These test results shall not preclude later sampling and testing for final acceptance after final processing of the material.

105.04 Certification & Sampling of Asphalt Materials

(a) Certification With Shipments. When each load of asphalt material is delivered, furnish one copy of the Bill of Lading; a fully executed Certificate of Compliance in the format shown in figure 105-1; and a copy of the refinery test reports. The refinery test reports should include the following information:

(1) Consignee.
(2) Contract number.
(3) Date of shipment.
(4) Type and grade of material.
(5) Test results as follows:
    (a) For performance-based asphalt and performance-graded asphalt cements:
        (1) Flash point.
        (2) Absolute viscosity of the original asphalt at 60 °C.

Consignee _____ Designation _____
Contract Number _____ Date _____
Identification (truck no., car no., etc.)_____
Type and Grade _____ With Additive (percent and brand)_____
Loading Temp. _____ Net Weight _____
Net Liters _____ Specific Gravity_____

This shipment of bituminous material identified above and covered by this Bill of Lading complies with Forest Service STANDARD SPECIFICATIONS as modified by SPECIAL PROJECT SPECIFICATIONS applicable to this project.

Producer _____
Signed _____
Producer's Representative

Figure 105-1.—Sample Bill of Lading and Certificate of Compliance.

(3) Absolute viscosity of the residue from the Rolling Thin Film Oven test at 60 °C.
(4) Penetration of the residue from the Rolling Thin Film Oven test at 4 °C.

(b) For aged-residue graded asphalt cements:
(1) Flash point.
(2) Absolute viscosity of the original asphalt at 60 °C.
(3) Absolute viscosity of the residue from the Rolling Thin Film Oven test at 60 °C.
(4) Penetration of the residue from the Rolling Thin Film Oven test at 25 °C.

(c) For asphalt concrete graded asphalt cements:
(1) Flash point.
(2) Absolute viscosity of original and residue asphalt at 60 °C.
(3) Penetration of the original asphalt at 25 °C.

(d) For pen graded asphalt cements:
(1) Flash point.
(2) Penetration of the original and residue asphalt at 25 °C.

(e) For emulsified asphalt:
(1) Percent residue from distillation.
(2) Saybolt furol viscosity of the emulsion at the specified temperature.
(3) Penetration of the residue from distillation at 25 °C.
(4) Oil distillate, by volume of emulsion.
(5) If applicable, torsional recovery or toughness tenacity.

(f) For cutback asphalt:
(1) Flash point.
(2) Percent residue from distillation.

(3) Original kinematic viscosity at 60 °C.
(4) Absolute viscosity of the residue from distillation at 60 °C.

A separate Certificate of Compliance will not be required if the standard Bill of Lading contains the essential information required by the certificate.

(b) Sampling. Unless otherwise directed, take at least two samples of bituminous material from each hauling unit of the transporting vehicle, or samples representing each hauling unit taken from the distribution truck. Obtain samples in the presence of the CO; samples will become property of the Government. Obtain polymer-modified emulsified asphalt samples from the distribution truck just prior to application.

Construct all delivery and plant equipment to permit sampling in conformance with AASHTO T 40 test procedure.

105.05 Rights in & Use of Materials Found or Produced on the Work

(a) With the written approval of the CO, suitable stone, gravel, sand, or other material found in the excavation can be used on the project. Payment will be made both for the excavation of such materials at the corresponding contract unit price and for the pay items for which the excavated material is used. Replace, without additional compensation, sufficient suitable materials to complete the portion of the work that was originally contemplated to be constructed with such material.

(b) Materials produced or processed from Government lands in excess of the quantities required for performance of this contract are the property of the Government. The Government is not obligated to make reimbursement for the cost of producing these materials.

105.06 Material Sources

(a) Designated Sources. Sources of local materials designated in the SPECIAL PROJECT SPECIFICATIONS or SHOWN ON THE DRAWINGS are guaranteed by the Government for the quality and quantity of material in the source. Determine the equipment and work required to produce the specified product. Submit test results and a Certificate of Compliance that states that the gradation of the aggregate meets the contract requirements.

Utilize all suitable material in the source. The designation of a source includes the Contractor's right to use areas SHOWN ON THE DRAWINGS for the purposes designated (that is, plant sites, stockpiles, and haul roads). Unless otherwise indicated or approved, no additional operating area shall be allowed. In this case, operate only in the confines of the area(s) designated.

The weight/volume relationship used for determining designed quantities (DQ) of material in designated sources subject to weight measurement is SHOWN ON THE DRAWINGS.

Should the designated source contain insufficient suitable material due to causes beyond the Contractor's control, the Government will provide another source, with an adjustment in contract price, in accordance with applicable contract provisions.

Designated sources will be available for the Contractor's use during the periods SHOWN ON THE DRAWINGS. Use at any other time will require an agreement with the party scheduled for that period, with the CO's approval.

(b) Contractor-Furnished Sources. When the material sources are not designated as provided above, or when designated sources are not used, furnish material that produces an end product equivalent in performance to that originally designated. An adjustment in contract price shall be made where the weight/volume relationship differences between designated source material and Contractor-furnished source material result in a financial disadvantage to the Government. When SHOWN ON THE DRAWINGS, complete any pit development specified for a designated source, even when material is not obtained from the source.

Test for quality in conformance with applicable requirements, to establish the equivalency of the end product. Furnish test results and a Certificate of Compliance.

Section 106—Measurement & Payment

106.01 Measurement & Payment

Compensation provided for in the contract is full payment for performing all contract work in a complete and acceptable manner. All risk, loss, damage, or expense arising out of the nature or prosecution of the work is included in the compensation provided by the contract.

Work required by the contract will not be paid for directly unless a PAY ITEM for the work is DESIGNATED IN THE SCHEDULE OF ITEMS.

Work referenced for measurement under another section will not be paid for directly unless a PAY ITEM for the work is DESIGNATED IN THE SCHEDULE OF ITEMS for the referenced section.

Work not paid for directly is considered to be included under the other contract PAY ITEMS.

Unless otherwise shown, work measured and paid for under one PAY ITEM will not be paid for under any other PAY ITEM.

The quantity to be paid for is the quantity DESIGNATED IN THE SCHEDULE OF ITEMS. No payment will be made for work performed in excess of that staked, ordered, or otherwise authorized.

When more than one class, size, or thickness is specified in the SCHEDULE OF ITEMS for any PAY ITEM, suffixes will be added to the item number to differentiate between the items.

106.02 Determination of Quantities

The following measurements and calculations are used to determine contract quantities.

For individual construction items, longitudinal and lateral measurements for area computations shall be made horizontally or corrected to horizontal measurement unless otherwise specified. Measurements for seeding, mulching, geotextiles, netting, erosion control blankets, and sodding shall be along slope lines.

The average end area method shall be used to compute volumes of excavation or embankment. However, if in the judgment of the CO the average end area method

is impractical, measurement shall be made by volume in hauling vehicles, or by other three-dimensional methods.

Structures shall be measured according to neat lines SHOWN ON THE DRAWINGS, or as altered by the CO in writing to fit field conditions.

For items that have linear measurements, such as pipe culverts, fencing, guardrails, and underdrains, measurements shall be made parallel to the base or foundation upon which the structures are placed. Pipe and pipe arch culverts shall be measured along center of invert, and arches shall be measured at spring line.

For aggregates weighed for payment, the tonnage weight shall not be adjusted for moisture content, unless otherwise provided in SPECIAL PROJECT SPECIFICATIONS.

For asphalt material, volumes shall be measured at 15.6 °C, or shall be corrected to the volume at 15.6 °C by using ASTM D 1250 for asphalt. Emulsified asphalt shall be measured at 15.6 °C, or by converting the volume at another temperature to volume at 15.6 °C by means of the following formula:

$$\text{L at } 15.6\ ^\circ\text{C} = \frac{\text{L at } T\ ^\circ\text{C}}{1 + 0.00045\,(T\ ^\circ\text{C} - 15.6\ ^\circ\text{C})}$$

where

T °C = temperature of the emulsified asphalt at the time the volume is measured

For vehicular shipments, net certified scale weights or weights based on certified volumes shall be used as a basis of measurement. Measurements shall be adjusted when asphalt material has been lost from the vehicle or from the distributor, has been wasted, or has otherwise not been incorporated into the work. True weights of hauling vehicles shall be determined by weighing the empty vehicles at least once a day at the times the CO specifies. Each vehicle shall bear a plainly legible identification mark.

When asphalt materials are shipped, net certified weights, or volume corrected for loss of foaming, can be used for computing quantities.

For standard manufactured items—such as fence, wire, plates, rolled shapes, and pipe conduits—identified by gauge, weight, section dimensions, and so forth, such identifications shall be considered the nominal weights or dimensions. Unless controlled by tolerances in cited specifications, manufacturer's tolerances shall be accepted.

106.03 Units of Measurement

Payment will be by units defined and determined according to measure. Unless otherwise specified, the meanings of the following terms are as follows:

(a) Cubic Meter in Place (m^3). Measure solid volumes by the average end area method as follows:

(1) Measure cross sections of the original ground and use with design or staked templates, or take other comparable measurements to determine the end areas. Do not measure work outside of the established lines or slopes.

(2) If any portion of the work is acceptable, but is not completed to the established lines and slopes, remeasure cross sections or comparable measurements of that portion of the work. Deduct any quantity outside the designated or staked limits. Use these measurements to calculate new end areas.

(3) Compute the quantity using the average end areas multiplied by the horizontal distance along a centerline or reference line between the end areas. Deduct any quantity outside the designed or staked limits.

Where it is impractical to measure material by the average end area method, other methods involving three-dimensional measurements may be used.

Measure liquid volumes in accordance with Subsection 106.03(h).

(b) Cubic Meter in the Hauling Vehicle. Measure the cubic meter volume in the hauling vehicle using three-dimensional measurements at the point of delivery. Use vehicles bearing a legible identification mark with the body shaped so the actual contents may be readily and accurately determined. Before use, mutually agree in writing upon the volume of material to be hauled by each vehicle. Vehicles carrying less than the agreed volume may be rejected or accepted at the reduced volume.

Level selected loads. If leveling reveals that the vehicle was hauling less than the approved volume, reduce the quantity of all material received since the last leveled load by the same ratio as the ratio of the current leveled load volume to the agreed volume. Payment will not be made for material in excess of the agreed volume.

Material measured in the hauling vehicle may be weighed and converted to cubic meters for payment purposes if the conversion factors are mutually agreed to in writing.

Compute measurement using measurements of material in the hauling vehicles at the point of delivery. Load vehicles to at least their water-level capacity. Leveling of the loads may be required when vehicles arrive at the delivery point.

(c) Each. One entire unit, which may consist of one or more parts. The quantity is the actual number of units completed and accepted.

(d) Hectare (ha). 10,000 m^2. Make longitudinal and transverse measurements for area computations horizontally. Do not make deductions from the area computation for individual exclusions having an area of 50 m^2 or less.

(e) Hour (h). Measurement will be for the actual number of hours ordered and performed by the Contractor.

(f) Kilogram (kg). 1,000 g. If sacked or packaged material is furnished, the net weight as packed by the manufacturer may be used.

(g) Kilometer (km). 1,000 m. Measure horizontal along the centerline of each roadway, approach road, or ramp.

(h) Liter (*l*). The quantity may be measured by any of the following methods:

(1) Measured volume container.

(2) Metered volume. Use an approved metering system.

(3) Commercially packaged volumes.

(i) Lump Sum. Do not measure directly. The bid amount is complete payment for all work described in the contract and necessary to complete the work for that item.

(j) Meter (m). Measure from end to end, parallel to the base or foundation being measured, or horizontal.

(k) Station. 1,000 m measured horizontally.

(l) Square Meter (m^2). Measure on a plane parallel to the surface being measured or horizontal.

Where measurement is horizontal, make no deductions from the area computation for individual exclusions having an area of 1 m^2 or less.

For pavement structure courses, measure the width horizontally to include the top design width and allowable curve widening. Do not include side slopes. Measure

the length horizontally along the centerline of each roadway, approach road, or ramp.

(m) Thousand Board Feet (Mbf). 1,000 board feet based on nominal widths, thickness, and extreme usable length of each piece of lumber or timber actually incorporated in the job. For glued laminated timber, 1,000 board feet based on actual width, thickness, and length of each piece actually incorporated in the job.

(n) Ton (t). 1,000 kg.

No adjustment in contract unit price will be made for variations in quantity due to differences in the specific gravity or moisture content.

Use net certified scale weights, or weights based on certified volumes.

106.04 Methods of Measurement

One of the following methods of measurement for determining final payment is DESIGNATED IN THE SCHEDULE OF ITEMS for each PAY ITEM:

(a) Designed Quantities (DQ). These quantities denote the final number of units to be paid for under the terms of the contract. They are based upon the original design data available prior to advertising the project. Original design data include the preliminary survey information, design assumptions, calculations, drawings, and the presentation in the contract. Changes in the number of units DESIGNATED IN THE SCHEDULE OF ITEMS may be authorized under any of the following conditions:

(1) Changes in the work authorized by the CO.

(2) A determination by the CO that errors exist in the original design that cause a PAY ITEM quantity to change by 15 percent or more.

(3) A written request submitted to the CO showing evidence of errors in the original design that cause the quantity of a PAY ITEM to change by 15 percent or more. The evidence must be verifiable and consist of calculations, drawings, or other data that show how the designed quantity is in error.

(b) Staked Quantities (SQ). These quantities are determined from staked measurements prior to construction.

(c) Actual Quantities (AQ). These quantities are determined from measurements of completed work.

(d) Vehicle Quantities (VQ). These quantities are measured or weighed in hauling vehicles.

(e) Lump Sum Quantities (LSQ). These quantities denote one complete unit of work as required by or described in the contract, including necessary materials, equipment, and labor to complete the job.

106.05 Price Adjustment for Asphalt Materials

Asphalt materials are defined as all types and grades of asphalt cement, cutback, and emulsified asphalt.

The refinery test reports and the Certificate of Compliance required in Subsection 105.04 will be reviewed and used to support acceptance of the asphalt material incorporated into the project.

If materials are found not to be in conformance with the specified tolerances or within the specification limits, the CO will determine an equitable adjustment in payment.

If the CO elects to test field samples, the test results may be used for acceptance.

106.06 Earthwork Tolerances

Where tolerances are shown in the contract, they are intended to define "reasonably close conformity." Make adjustments of horizontal or vertical alignment within the tolerances specified in this contract, or shifts of balance points up to 30 m, as necessary to produce the designed roadway section and to balance earthwork. Such adjustments will not be considered "changes."

DIVISION 150
Engineering

Section 160—Quality Control & Quantity Measurement

Description

160.01 Work. Provide quality control in conformance with the Inspection of Construction provisions of this contract to ensure compliance with the drawings, specifications, and provisions of the contract. Measure the quantities of completed work in conformance with the provisions of the applicable specification. Provide all personnel, equipment, tests, and reports necessary to meet the requirements of this specification.

Construction

160.02 Quality Control & Quantity Measurement System. Provide and maintain a quality control system that will ensure that all services, supplies, and construction required under this contract conform to the contract requirements. Perform, or cause to be performed, the sampling, inspection, and testing required to substantiate that all supplies, services, and construction conform to the contract requirements.

In addition, perform, or cause to be performed, all measurement of quantities of materials incorporated into the work or work processes that are to be measured under the provisions of the contract.

(a) Quality Control Plan. Submit in writing the following:

(1) Authorities and responsibilities of inspection and testing personnel.

(2) Experience and qualifications of inspection and testing personnel to be assigned and name and location of any (for hire) testing facility to be used.

(b) Approval of Quality Control Plan. Before beginning work, submit proposed quality control plan for all items requiring quality control to the CO for review. Within 5 days of receipt of the plan, the CO will determine whether the plan adequately covers quality control requirements. Do not perform construction work before receiving written approval of the proposed plan. Submit to the CO in writing any proposed changes in the approved quality control plan. Do not put proposed changes into effect until approved in writing by the CO.

160.03 Sampling, Testing, Inspection, & Measurement of Quantities. Provide and maintain appropriate measuring and testing devices, equipment, and supplies to accomplish the required measurement, testing, and inspection in a timely manner. Make all tests, measurements, and certifications as required by the

drawings and specifications. Take samples and perform inspections and tests as necessary to achieve the quality of construction required by the contract, and make required measurements of work performed onsite or offsite under this contract. Sampling and testing frequency for specific items will be SHOWN ON THE DRAWINGS, in the Standard Specifications, or in a SPECIAL PROJECT SPECIFICATION.

Where random sample or random measurement is specified, provide a stratified statistically random sample. Determine random numbers in accordance with ASTM D 3665, sections 5.1 through 5.7, or use a computer-generated random number program approved by the CO. Ensure that the sampling is stratified to eliminate the possibility that sample points are "clustered." Perform stratification by dividing the total quantity for the applicable bid item by the sample frequency. This process divides the total project quantity of one lot into sublots. Use the random number to obtain a random sampling point within each sublot. A lot may be terminated and a new lot started when approved by the CO. After a lot is terminated, do not combine it with any other lot. If material within a sublot fails to meet specification requirement, the CO may allow the sublot materials to be reworked and resampling to be performed at new randomly selected locations.

The CO may reject any quantity of material that appears to be defective based on visual inspection or test results. Do not use such rejected material in the work. Results of tests run on this rejected material will not be included in results of lot acceptance tests.

160.04 Records of Inspection, Tests, & Measurement. Meet the following requirements for inspection and tests, and as-built drawings:

(a) Inspection and Tests. Maintain current records of all inspections and tests performed. The following format, or one with the following information, will be acceptable to the Government:

Road No. _____ Contract No. _____

Pay Item No.	Test	Date	Station	Standard	Results	Test By (Initials)

Certify in writing that all inspections and tests were performed in accordance with specifications.

(b) As-Built Drawings. Maintain a set of the contract drawings depicting as-built conditions. Maintain these drawings in current condition, and make them available for review. Indicate all variations from contract drawings in red on the drawings. Upon completion of the contract work, submit as-built drawings to the CO.

160.05 Certifications & Measurements. Meet the following requirements for offsite-produced materials and quantity measurements:

(a) Offsite-Produced Materials. Furnish certificates executed by the manufacturer, supplier, or vendor, stipulating that all materials produced offsite that are incorporated into the work meet the applicable requirements SHOWN ON THE DRAWINGS or stated in the specifications. Certify all incidental purchases needed to remedy minor shortages of material.

(b) Quantity Measurements. Make all measurements for computation of quantities for all work items, except those specified for payment by designed quantity or lump sum. Compute the quantities for periodic progress payments; the CO will compute the quantities for the final payment based on measurements taken. All Contractor measurements are subject to verification. Submit all field notes, calculation sheets, and other data used to determine quantities, and certify in writing as to the accuracy of the measurements and computations submitted.

The following format, or one containing the following information, will be acceptable to the Government:

Road No. _____ Contract No. _____

Pay Item No.	Date	Station	Quantity or Measurement	Measured By (Initials)

Measurement

160.06 Method. Do not make separate measurements for this section.

Payment

160.07 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS. Otherwise, quality control and quantity measurement will be incidental to other specified work.

Payment will be prorated based on the percentage of work accomplished on the related PAY ITEM that meets specifications.

Section 161—Certification for Quality & Quantity

Description

161.01 Work. Provide certification that the quality and quantity of construction conforms to the drawings, specifications, and requirements of the contract.

Construction

161.02 Certifications & Measurements. Meet the following requirements for offsite-produced materials and quantity measurements:

(a) Offsite-Produced Materials. Furnish certificates executed by the manufacturer, supplier, or vendor, stipulating that all materials produced offsite that are incorporated into the work meet the applicable requirements SHOWN ON THE DRAWINGS or stated in the specifications. Make each certificate apply to a single commodity or invoice. Certify all incidental purchases needed to remedy minor shortages of material.

(b) Quantity Measurements. Make all measurements for computation of quantities for all work items, except those specified for payment by designed quantity or lump sum. Compute the quantities for periodic progress payments; the CO will compute the quantities for the final payment based on measurements taken. All Contractor measurements are subject to verification. Submit all field notes, calculation sheets, and other data used to determine quantities, and certify in writing as to the accuracy of the measurements and computations submitted.

The following format, or one containing the following information, will be acceptable to the Government:

Road No. _____ Contract No. _____

Pay Item No.	Date	Station	Quantity or Measurement	Measured By (Initials)

161.03 Records. Meet the following requirements for as-built drawings:

As-Built Drawings. Maintain a set of the contract drawings depicting as-built conditions. Maintain these drawings in current condition, and make them available for review. Indicate all variations from contract drawings in red on the drawings. Upon completion of the contract work, submit as-built drawings to the CO.

Measurement

161.04 Method. Make no separate measurements for this item.

Payment

161.05 Basis. Payment will be considered incidental to other pay items in this contract.

Section 170—Construction Staking, L-Line

Description

170.01 Work. Complete the construction staking of a road by the L-line method in accordance with the drawings and specifications. Furnish all labor, equipment, instruments, materials, transportation, and other incidentals necessary to complete the construction staking in accordance with these specifications and acceptable engineering practice. In addition, set grade-finishing stakes, and stake major structures.

Conduct construction staking under the direction of a licensed professional engineer or land surveyor who is closely associated and familiar with the construction staking. Periodic visits to the project site are required.

Materials

170.02 Stakes. Provide stakes that all have the nominal dimensions SHOWN ON THE DRAWINGS or stated in the SPECIAL PROJECT SPECIFICATIONS. Ensure that identification stakes and hubs are of sufficient length to provide a solid set in the ground and space for marking above ground when applicable. Other dimensions and materials may be used, such as steel reinforcing bars, wire flagging and markers, and metal pins, if approved in writing by the CO. Paint the top 50 mm of all slope, guard, reference, clearing, and structure stakes, or mark them with plastic flagging. Use colors on stakes or for flagging as SHOWN ON THE DRAWINGS or stated in the SPECIAL PROJECT SPECIFICATIONS.

170.03 Survey Notes. Furnish field notebooks or note papers. Use moisture-resistant paper for survey notes. Keep notes in books with covers that will protect the contents and retain the pages in numerical sequence during field use. When using electronic data collectors, provide electronic and hardcopy notes as listed in the SPECIAL PROJECT SPECIFICATIONS.

170.04 Government-Furnished Documents. Drawings, P-line survey notes, P-line to L-line offset data, construction staking notes, and the projected locations of catch points will be furnished by the Government. Return one set of “as-staked” drawings and all documents to the CO.

Survey Requirements

170.05 Precision. Accuracy and precision requirements are contained in tables 170-1 and 170-2. Perform all work under this specification to meet the

Table 170-1.—Accuracy requirements for reestablishing P-line, traverse, and elevations.

Precision Class	Minimum Position Closure	Angular Accuracy (±)	L-Line Tangent Control Points[a] (±)	Vertical Closure[b] (±)
A (Bridges)	1/10,000	2 sets, direct/reverse 10” rejection limit	N/A	5 mm or 20 mm/km[c]
B	1/5,000	2 sets, direct/reverse 20” rejection limit	30 mm	50 mm or 200 mm/km[c]
C	1/1,000	1 set, direct/reverse 1’ rejection limit	60 mm	500 mm/km

a. Accuracy of offset measurement.
b. Determine vertical closures at intervals not to exceed 1 km, as measured along centerline.
c. Use greatest value.

precision requirements DESIGNATED IN THE SCHEDULE OF ITEMS or stated in the SPECIAL PROJECT SPECIFICATIONS.

170.06 Survey Notes Format. All notes will become the property of the Forest Service. Use the slope stake note format shown in figure 170-1. The sketch in the lower half of figure 170-1 is for information only, and is not required as part of actual slope stake note format. Other formats may be used if approved by the CO.

Print all manually recorded survey notes in characters at least 4 mm high, and make them legible at a distance of 750 mm. Delete errors by lining out. At the beginning of each day’s work, record date, crew names and positions, instrumentation, and weather in the notes. Ensure that the party chief signs or initials each page of the notes immediately after the last entry for each day’s work.

Consecutively number electronically recorded survey notes, and use headings to identify the contents. Support and accompany the notes with a bound Day Book that records the project name and, for each day, the date; crew names and positions; instrumentation; weather; type of survey; stationing of sections between which the survey was performed; and survey data or sketches that cannot be electronically recorded. Ensure that the party chief signs or initials the electronically recorded notes and Day Book immediately after the last entry for each day’s work.

Table 170-2.—Cross section and slope stake precision.

Item	Precision A (±)	Precision B (±)	Precision C (±)
Allowable deviation of cross-section line projection from a true perpendicular to tangents, a true bisector of angle points, or a true radius of curves	2°	3°	3°
Take cross-section topography measurements so that variations in ground from a straight line connecting the cross-section points will not exceed	150 mm	300 mm	600 mm
Horizontal and vertical accuracy for cross sections, in millimeters or percentage of horizontal distance measured from traverse line, whichever is greater	30 mm or 0.4%	45 mm or 0.6%	60 mm or 1.0%
Horizontal and vertical accuracy for slope stake, slope stake references, and clearing limits, in millimeters or percentage of horizontal distance measured from centerline or reference stake, whichever is greater:			
Slope reference stakes and slope stakes	30 mm or 0.4%	45 mm or 0.6%	60 mm or 1.0%
Clearing limits	300 mm	300 mm	300 mm

170.07 Reestablishing Preliminary Survey Line. A preliminary survey line has been established on the ground for this project, with initial and specific succeeding survey points referenced. Reestablish missing P-line points necessary to control subsequent construction staking operations to the precision DESIGNATED IN THE SCHEDULE OF ITEMS.

170.08 Establishing Centerline. Determine the direction of centerline (L-line) tangents using coordinates furnished by the CO. Locate at least two points on each tangent to establish its direction. Do not change the location of tangent lines established on the ground.

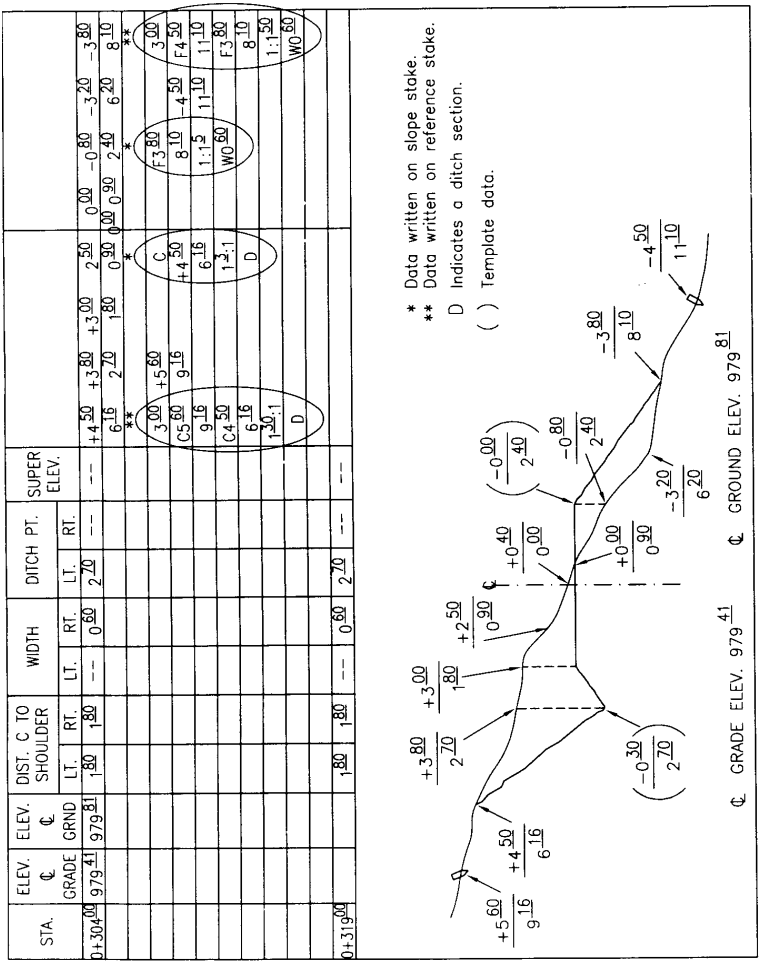

Figure 170-1.—Slope stake note entries related to actual ground elevations.

Measure the deflection angle from one tangent to another. When the measured deflection angle differs from the one SHOWN ON THE DRAWINGS, use the measured angle and the curve external (E) SHOWN ON THE DRAWINGS to compute new curve data. Compute the new curve data and note them in the field books, and on the "as-staked" drawings. Establish the new control points (P.I., or P.C.'s & P.T.'s) on the ground using hubs and tacks.

Throughout the project, continuously establish centerline points using horizontal distance measurements, and stake them to the nearest 3 mm for control points, and 30 mm for other points. Mark centerline stakes as shown in figure 170-2. Introduce equations at the P.T. of curves to adjust field stationing to that SHOWN ON THE DRAWINGS or in the staking notes when the difference between designed and located centerline stationing exceeds 1.5 m. Set centerline stakes at even 15-m intervals when practicable, at significant breaks in the ground, at culvert locations, at equation points, or at other locations indicated in the staking notes. Set stakes no more than 15 m apart. Stake all curves of 20 degrees or more every 10 m. Stake all other curves every 15 m.

Where centerline stations fall in an existing trail, obstruction, or roadway, offset the stakes left or right from centerline (perpendicular to tangents and on the radial lines of curves) clear of the trail, obstruction, or roadway, and mark the offset distance on the side facing the centerline. As centerline point, use a 20-penny or larger nail that is flagged and driven at least 25 mm below the road surface.

Clear the survey line to facilitate travel and surveying. Remove clearing slash from the travel or work area. Cut all brush and trees as near to the ground as possible.

170.09 Referencing Centerline. Reference centerline control points, and make them intervisible after clearing is completed to facilitate reestablishment of the centerline. Measure references to the precision of the centerline survey. Establish references consisting of two intersecting lines with an included angle of at least 30°. Place the forward reference a minimum of 8 m outside the clearing limits as computed from the preliminary slope stake printout notes, and place the rear hub or point on each line not less than 10 m beyond the forward hub or point. Mark reference points with hubs and tacks.

170.10 Vertical Control & "L" Profile Levels. Relocate bench marks that were established during the P-line survey that are within the clearing limits to points 6 m or more outside the clearing limits. Determine elevation of relocated bench marks by the precision class specified, as listed in table 170-1. Construct bench marks to be permanent and to allow a level rod to stand vertically and squarely on the mark. Bench marks may be established by driving a 40-penny or larger nail into a notch cut in the base of a tree, by marking a point on a stable rock, or by other approved means. Drive spikes into trees less than 300 mm above the ground. Record location and descriptions of relocated bench marks in

the level notes. Set at least two bench marks at each bridge and structural-plate culvert site.

Use appropriate survey equipment between bench marks to determine centerline ground elevations on L-line stations, to the nearest 30 mm, and to verify bench marks.

170.11 Discrepancies. Compare the staked centerline horizontal and vertical alignment with the design data. Refer to the CO any differences found between previously recorded and observed elevations of bench marks, and any differences exceeding 1 degree in angle found between the horizontal alignment data SHOWN ON THE DRAWINGS and the alignment observed on the ground. Report differences in centerline profile elevations exceeding 300 mm at any two or more consecutive points to the CO for evaluation and possible revision. Defer the staking of these areas until these differences are resolved by the CO.

170.12 "L" Topography Cross Sections. Take cross sections at right angles to tangents and normal to curves at every staked point on the "L" profile line. Determine the elevations of significant breaks in topography, breaks in the designed roadway template, and cross-section reference points. Record ground shots for these cross sections in terms of meters plus or minus from ground at centerline, and horizontal distances from centerline. Measure cross sections and record them to the nearest 10 mm in elevation and to the nearest 100 mm in horizontal distance. Ensure that cross sections extend approximately 6 m beyond the designed clearing-and-grubbing limit on cut sections, and approximately 6 m beyond the toe of fill on fill sections.

Identify cross sections at each end with lath marked to show centerline station and the horizontal and vertical distance to the centerline.

Return cross-section data to the CO for recomputation of earthwork quantities and slope stake catchpoint printouts. If the PAY ITEM for earthwork under Section 203 is Staked Quantities, submit the cross-section data to the CO for recomputation of earthwork quantities and slope stake "catchpoints."

Slope stakes established during the "L" topography cross section phase of the work may be subject to relocation to adjust earthwork quantities.

170.13 Slope Stakes, Clearing Limits, & Reference Stakes. Establish slope catchpoints, clearing limits, and slope reference stakes on both sides of the centerline at each "L" station established. Determine the position of these stakes by methods that will produce on the ground the designed template shown in the slope stake survey notes to the precision shown in table 170-2 and DESIGNATED IN THE SCHEDULE OF ITEMS.

Record the cut or fill and horizontal distance to centerline, to bottom of ditch, or to shoulder as designated by the CO on the slope stakes and in the slope stake notes, as shown in figure 170-1.

Set clearing limits on both sides of the centerline at each established “L” station within the tolerance shown in table 170-2. Locate the clearing limit on the ground to the dimensions SHOWN ON THE DRAWINGS and mark with lath, flagging, or other methods approved by the CO. Record the total horizontal distance from the centerline to the clearing limit at each section to the nearest 300 mm in the field book.

Establish slope reference stakes at a minimum horizontal distance of 3 m outside the clearing limits, and record on the stakes the horizontal distance to centerline and the vertical distance to the construction grade at centerline. In addition, record on the reference stake, and in the slope stake book, the offset from the slope stake catchpoint, and slope stake catchpoint information, as shown in figure 170-1.

Ensure that the elevation and location of slope reference stakes comply with the precision class specified in table 170-2.

Reset the slope stake where the difference in reference stake elevation between that established by slope staking and that observed by an elevation survey exceeds the allowed tolerance.

170.14 Monuments of Property Boundaries or Surveys. If property boundary or survey monuments, or survey markers, are found within or adjacent to the construction limits, immediately notify the CO.

170.15 Staking Culverts. Set slope stakes and slope reference stakes at all culvert locations. Set a culvert reference stake and hub on the centerline of the culvert 3 m from each end, or beyond the clearing limit, whichever is greater. Record the following on these stakes:

(a) Diameter, actual field measured length, and type of culvert.

(b) The vertical and horizontal distance from hubs to the invert at the ends of the culvert.

(c) Stationing of centerline point.

When SHOWN ON THE DRAWINGS, stake headwalls for culverts by setting a hub with a guard stake on each side of the culvert on line with the face of the headwall. (Perform this work after clearing is completed.)

170.16 Staking Drain Dips. Establish slope stakes and slope reference stakes on the projected centerline of the bottom of the dip at all drain dip locations, as SHOWN ON THE DRAWINGS.

170.17 Staking Major Structures. Meet the following requirements for staking bridges, cattleguards, and other structures:

(a) Bridges. Designate bridge locations on the ground by establishing reference points for the bridge centerline and the transverse centerline of each pier or abutment. Use hubs and tacks that are set on line beyond the construction limits as reference points, and mark them to identify the point and distance to the point referenced. Set at least one bench mark on each side of the stream beyond construction limits, but close enough to the bridge site to allow direct leveling between the bench marks and the bridge without an intermediate setup. Record all of the above information in a separate book that includes a sketch showing the stream, bridge, and location of all construction stakes set. Perform staking to the accuracy standards shown in table 170-1.

(b) Cattleguards. Stake cattleguards as SHOWN ON THE DRAWINGS.

(c) Other Structures. When required, stake other structures as described in SPECIAL PROJECT SPECIFICATIONS and/or as SHOWN ON THE DRAWINGS.

170.18 Grade Finishing Stakes. Set finishing stakes when DESIGNATED IN THE SCHEDULE OF ITEMS. Use blue tops for subgrade finishing stakes, and red tops for base course finishing stakes.

Ensure that stakes are nominal 25 x 25-mm hubs of sufficient length to provide a solid set.

Place finishing stakes on the staked cross section and road template line. Set a stake at each shoulder and at centerline. Set additional stakes when SHOWN ON THE DRAWINGS.

Set finishing stakes when subgrade is within 150 mm, or when base course is within 60 mm of final grade. Set stakes to the nearest 6 mm of the measured grade line.

170.19 Marking Stakes. Legibly mark all stakes in the format that is shown in figure 170-2, or as SHOWN ON THE DRAWINGS, with a stake pencil that leaves an imprint or with waterproof ink. Mark in conformance with the following nomenclature:

PI	Point of intersection of tangents
PC	Point of curvature
POC	Point on curve

PT	Point of tangency
POT	Point on tangent
RP	Reference point
P	P-line (preliminary location line)
L	L-line (final location line)
BM	Bench mark
TBM	Temporary bench mark
BT	Begin taper (any)
ET	End taper (any)
BFTO	Begin full turnout
EFTO	End full turnout
BFEW	Begin full extra widening
EFEW	End full extra widening
DD	Drain dip
C	Cut
F	Fill
℄	Centerline
D	Ditch
W	Width
CW	Curve widening
FW	Fill widening
H	Horizontal
M	Metric
SE	Superelevation
V	Vertical

170.20 Stake Approval & Maintenance. Do not begin construction work within a roadway segment until the stakes, marks, and controls established have been approved in writing by the CO. The minimum segment for approval shall be 1 km or the length of the project, whichever is less.

Approval of construction staking shall not relieve the Contractor of responsibility for maintaining the survey work and for correcting errors, whether the errors are discovered during the actual survey work or in subsequent phases of the project. Stakes within the roadway need not be maintained after clearing operations have started.

Measurement

170.21 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Reestablishing P-line includes all work needed to replace missing portions of the P-line that are necessary for the determination of L-line tangents. When DESIGNATED IN THE SCHEDULE OF ITEMS, the quantity shall be the number of kilometers of P-line reestablished, as measured along centerline to the nearest

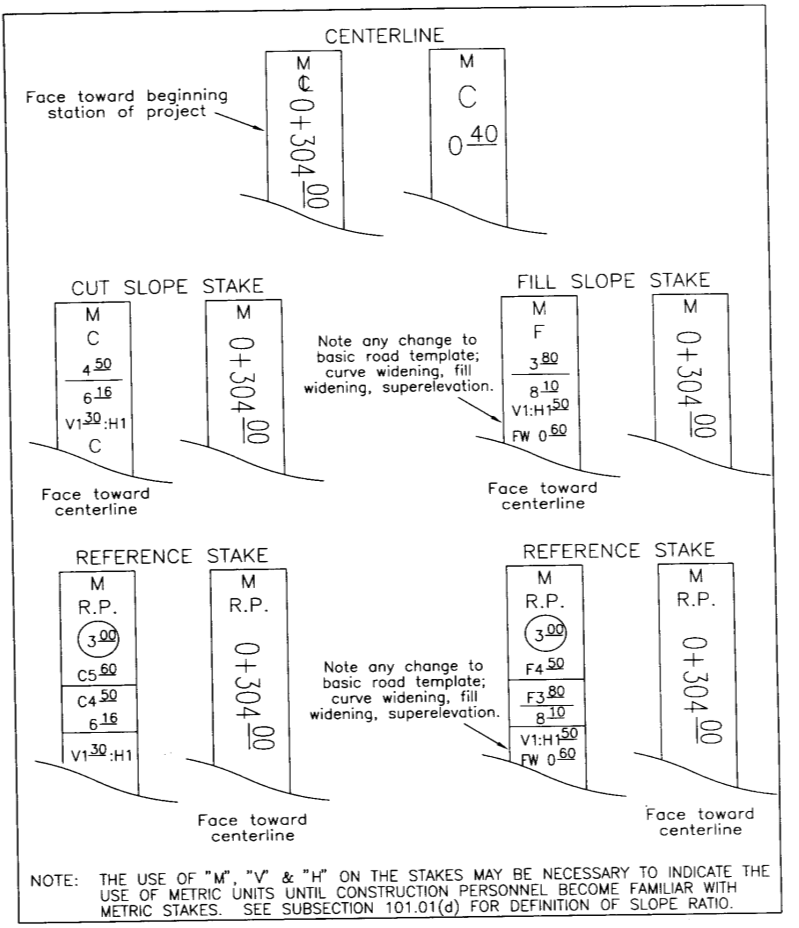

Figure 170-2.—Construction stakes.

5 m. When the length of P-line to be replaced does not exceed 10 percent of the measured length of the L-line, reestablishing P-line shall be considered incidental to establishing centerline, and no separate payment will be made.

Establishing centerline includes all work necessary to establish and reference the centerline, establish vertical controls, determine the centerline profile elevations, and cross-section the original ground from the centerline datum established by this survey. The quantity shall be the number of kilometers of centerline completed and accepted, as measured along centerline to the nearest 5 m.

Slope staking includes all work necessary to establish slope stakes, clearing limits, and reference stakes from a previously established centerline. The quantity shall be the number of kilometers of previously established centerline completed and accepted, as measured along centerline to the nearest 5 m.

Finish staking includes all work necessary to reestablish the centerline to control placement of finish stakes and set the finish stakes. The quantity shall be the number of kilometers of previously established centerline that were completed and accepted, as measured along centerline to the nearest 5 m.

Staking major structures includes all work necessary to establish lines and grades for the construction of the structure(s). The quantity shall be the actual number of structures completed and accepted of the type DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment

170.22 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item	Pay Unit
170 (01) Reestablish P-line, precision _____	Kilometer
170 (02) Establish centerline, precision _____	Kilometer
170 (03) Slope staking, precision _____	Kilometer
170 (04) Finish staking, subgrade, precision _____	Kilometer
170 (05) Finish staking, base course, precision _____	Kilometer
170 (06) Staking major structure(s), type _____ precision _____	Each

Section 171—Construction Staking, Offset L-Line

Description

171.01 Work. Complete the construction staking of a road project in accordance with the drawings and specifications. Furnish all labor, equipment, instruments, materials and transportation, and other incidentals necessary to complete the construction staking in accordance with these specifications and acceptable engineering practice.

Conduct construction staking under the direction of a licensed professional engineer or land surveyor who is closely associated and familiar with the construction staking. Periodic visits to the project site are required.

Materials

171.02 Stakes. Provide stakes and hubs that have the nominal dimensions SHOWN ON THE DRAWINGS or stated in the SPECIAL PROJECT SPECIFICATIONS. Ensure that identification stakes and hubs are of sufficient length to provide a solid set in the ground and space for marking above ground when applicable. Other dimensions and materials may be used if approved in writing by the CO. Paint the top 50 mm of all stakes and lath, or mark them with plastic flagging. Use colors for paint or flagging as SHOWN ON THE DRAWINGS or as stated in the SPECIAL PROJECT SPECIFICATIONS.

171.03 Survey Note Paper & Books. Furnish field notebooks or note papers. Use moisture-resistant paper for survey notes. Keep notes in books with covers that will protect the contents and retain the pages in numerical sequence during field use.

171.04 Government-Furnished Documents. Drawings, P-line survey notes, P-line to L-line offset data, construction staking notes, and the projected location of catch points will be furnished by the Government. Return one set of "as-staked" drawings and all documents to the CO.

Survey Requirements

171.05 Precision. Accuracy and precision requirements are contained in tables 171-1 and 171-2. Ensure that all work performed under this specification meets the requirements of the survey precision DESIGNATED IN THE SCHEDULE OF ITEMS or stated in the SPECIAL PROJECT SPECIFICATIONS.

171.06 Survey Notes. All notes will become the property of the Forest Service. Format slope stake notes in conformance with the format shown in figure 171-1.

Table 171-1.—Accuracy requirements for reestablishing P-line, traverse, and elevations.

Precision Class	Minimum Position Closure	Angular Accuracy (±)	L-Line Tangent Control Points[a] (±)	Vertical Closure[b] (±)
C	1/1,000	1 set, direct/reverse 1′rejection limit	60 mm	500 mm/km
D	1/300	Foresight and backsight; 15’ rejection limit[c]	120 mm	1,000 mm/km
E	1/100	Foresight and backsight; 30’ rejection limit[c]	240 mm	1,000 mm/km

a. Accuracy of offset measurement.
b. Determine vertical closures at intervals not to exceed 1 km, as measured along centerline.
c. Magnetic attraction will require a deflection angle traverse.

The sketch in the lower half of figure 171-1 is for information only and is not required as part of actual slope stake note format. Other formats may be used if approved by the CO.

Print manually recorded survey notes in characters at least 4 mm high, and make them legible at a distance of 750 mm. Delete errors by lining out. At the beginning of each day’s work, record date, crew names and positions, instrumentation, and weather in the notes.

Consecutively number electronically recorded survey notes, and use headings to identify the contents. Support and accompany the notes with a bound Day Book that records the project name and, for each day, the date; crew names and positions; instrumentation; weather; type of survey; stationing of sections between which the survey was performed; and survey data or sketches that cannot be electronically recorded. Ensure that the party chief signs or initials the Day Book immediately after the last entry for each day’s work. When using electronic data collectors, have them approved by the CO, or provide suitable hardcopy notes.

Ensure that the party chief signs or initials each page of electronically recorded notes and the final page of bound notes immediately after the last entry for each day’s work.

Table 171-2.—Cross section and slope stake precision.

Item	Precision C (±)	Precision D (±)	Precision E (±)
Allowable deviation of cross-section line projection from a true perpendicular to tangents, a true bisector of angle points, or a true radius of curves	3°	5°	5°
Take cross-section topography measurements so that variations in ground from a straight line connecting the cross section points will not exceed	300 mm	450 mm	750 mm
Staking by computed			
Horizontal and vertical accuracy for cross sections, in millimeters or percentage of horizontal distance measured from traverse line, whichever is greater	45 mm or 0.6%	60 mm or 0.8%	90 mm or 1.0%
Horizontal and vertical accuracy for slope stake, slope stake references, and clearing limits, in millimeters or percentage of horizontal distance measured from centerline or reference stake, whichever is greater—			
Slope reference stakes and slope stakes	45 mm or 0.6%	60 mm or 0.8%	75 mm or 1.5%
Clearing limits	300 mm	450 mm	600 mm
Staking by catchpoint measurement method:			
Accuracy for setting slope catchpoints, reference points, and clearing limits, in millimeters or percentage of slope distance, measured from centerline, whichever is greater—			
Slope catchpoint stakes and reference points	45 mm or 0.5%	60 mm or 0.7%	90 mm or 2.0%
Clearing limits	300 mm	450 mm	600 mm

171.07 Reestablishing Preliminary Survey Line. A preliminary survey line has been established on the ground for this project, with initial and specific succeeding survey points referenced. Reestablish missing P-line points as necessary to control subsequent construction staking operations to the precision DESIGNATED IN THE SCHEDULE OF ITEMS, SHOWN ON THE DRAWINGS, or stated in the SPECIAL PROJECT SPECIFICATIONS.

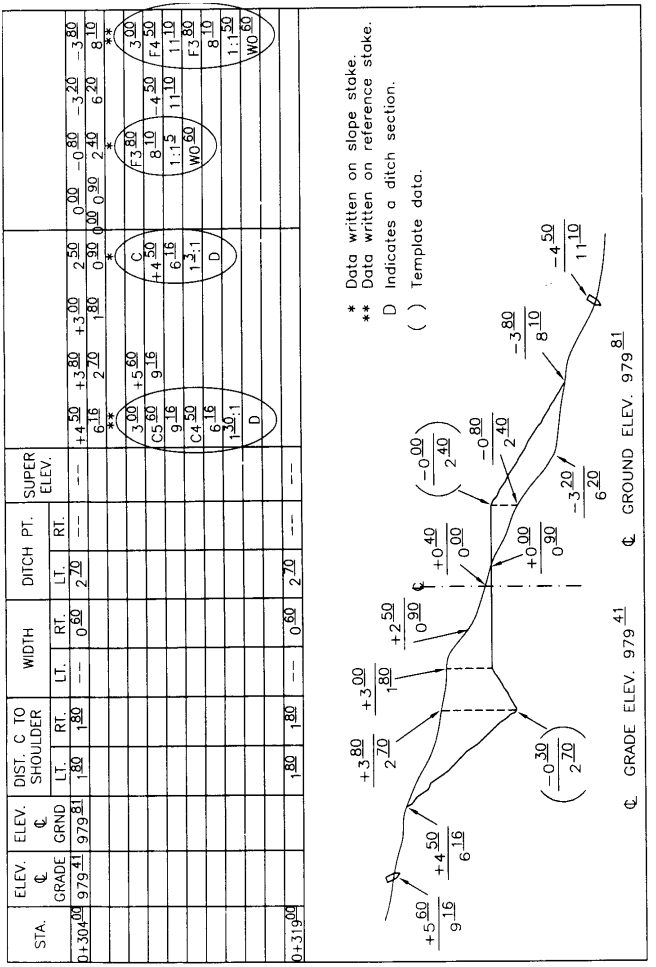

Figure 171-1.—Slope stake note entries related to actual ground elevations.

171.08 Establishing Centerline. Establish the position of the centerline (L-line) by measuring right or left from the preliminary survey line (P-line) the horizontal distance shown in the "offset listing" furnished by the Forest Service. Adjust the centerline established in alignment only to correct misalignment created by measured offsets along skewed sections. Ensure that the station of the centerline point is that listed in the P-line to L-line offset data.

Set additional intermediate centerline stakes at locations SHOWN ON THE DRAWINGS and listed in the construction staking notes, as needed to establish control for beginning and ending of extra widening and turnout tapers; for the beginning and end of full-width extra widening and turnouts; for crest and sag of drainage dips; for culvert catch basins; and for turnarounds. Establish the position and ground elevation of these additional stakes by measuring from the nearest established centerline stake.

Where centerline stations fall in an existing trail, roadway, or obstruction, offset the stakes right or left from centerline (perpendicular to tangents and on the bisector of angle points) and the distance marked on the side of the stake facing centerline. Drive suitable markers on the centerline to denote the actual centerline point.

Clear the survey line to facilitate surveying. Remove clearing slash from the travel or work area. Cut brush and trees as near to the ground as possible.

171.09 Vertical Control & "L" Profile Levels. Relocate bench marks that were established during the P-line survey within the clearing limits to points 6 m or more outside the clearing limits. Determine elevation of relocated bench marks by the precision class specified, as listed in table 171-1.

Construct bench marks to be permanent and to allow a level rod to stand vertically and squarely on the mark. Bench marks may be established by driving a 40-penny or larger nail into a notch cut in the base of a tree, by marking a point on a stable rock, or by other approved means. Drive spikes into trees less than 300 mm above the ground. Record location and descriptions of relocated bench marks in the level notes.

Use appropriate survey equipment between bench marks to determine centerline ground elevations on L-line stations, to the nearest 30 mm, and to verify bench marks.

For precision C and D, determine elevation of centerline stations by leveling from the listed elevation of the P-line station from which they were offset.

171.10 Discrepancies. Refer to the CO any differences that exceed 5° of angle in horizontal alignment of curves with less than 30 m radius found between the data SHOWN ON THE DRAWINGS and those observed on the ground.

Compare the found centerline cut and fill depth with design data. Report differences in centerline profile elevations exceeding 300 mm at any two or more consecutive points to the CO, who will determine whether revision is needed. Defer staking of these areas until these differences are resolved by the CO.

Check horizontal distances on the centerline by measuring between stakes on L-line. If discrepancies in actual distances measured are greater than 1.5 m, report them to the CO for possible corrective action.

171.11 Slope Stakes, Clearing Limits, & Reference Points. Establish slope stakes, clearing limits, and slope stake references at each side centerline station, as SHOWN ON THE DRAWINGS; at each centerline station; on a line at right angles to tangents; and on the radial lines of curves. Use a method to establish the slope stake catchpoint that conforms to the METHOD described below, as DESIGNATED IN THE SCHEDULE OF ITEMS.

(a) Method I—Computed Method. Locate slope stake catchpoints by using the template information shown in the slope stake notes to calculate the actual location of the catchpoint. The slope stake "catchpoint distance" shown in the stake notes may be used as a trial location to initiate slope staking.

Where SHOWN ON THE DRAWINGS, measure topography of the cross section at each centerline stake. Record the horizontal and vertical distance to the centerline ground for each break in ground slope between the centerline and the reference point(s).

(b) Method II—Slope Distance Measurement Method. Locate slope stake catchpoints by measuring the slope distance shown in the slope stake notes.

(c) Method III—Catchpoint Measurement Method. Locate slope stake catchpoints and clearing limits by measuring the "catchpoint distance" shown in the slope stake notes.

(d) Method IV—Reestablishing Slope Stakes, Clearing Limits, & References. Slope stakes and marks previously established for this project have either been destroyed or have become unreadable. Reestablish the missing stakes and marks from the original slope stake notes, as described in the SPECIAL PROJECT SPECIFICATIONS.

Mark clearing limits with colored plastic ribbon or tags on trees to be left standing, or on lath.

Place a reference stake or tag for each slope stake 3 m outside the clearing limit as SHOWN ON THE DRAWINGS. Remove slope stakes to the reference stake prior to clearing, and replace them after clearing is completed.

Set slope stakes temporarily at the slope stake catchpoint location established under method I, II, or III above for use in determining clearing limits and slope stake references.

Locate clearing limits at the distance SHOWN ON THE DRAWINGS from either the slope stake catchpoint or road shoulder, whichever is greater. Mark clearing limits with plastic flagging or tags on trees to be left standing, or on lath.

After clearing limits and references are established, move the slope stakes to the reference stake, and replace them at the catchpoint after clearing is completed.

171.12 Resetting Slope Stakes. Reestablish slope stakes after clearing and grubbing is completed and before excavation is started. Recheck the original catchpoint location from the reference stake to determine whether revisions are needed because of ground disturbance; recheck slope stakes and reset them to the original precision requirements.

171.13 Monuments of Property Boundaries or Surveys of Other Agencies. If property boundary or survey monuments or survey markers of other agencies are found within or adjacent to the construction limits, immediately notify the CO.

171.14 Staking Culverts. Set slope stakes and slope stake references at all culvert locations. Set a culvert reference stake on the centerline of the culvert 3 m from each end or beyond the clearing limit, whichever is greater. Record the following on these stakes:

(a) Diameter, actual field measured length, and type of culvert.

(b) The vertical and horizontal distance from the reference stake to the invert at the ends of the culvert.

(c) Stationing of centerline point.

171.15 Staking Drain Dips. Establish slope stakes and slope stake references on the projected centerline of the bottom of the dip at all drain dip locations, as SHOWN ON THE DRAWINGS.

171.16 Staking Structures. Stake cattleguards and other structures as described in the SPECIAL PROJECT SPECIFICATIONS or as SHOWN ON THE DRAWINGS.

171.17 Marking Stakes. Legibly mark all stakes in the format shown in figure 171-2, or as SHOWN ON THE DRAWINGS, with a stake pencil that

leaves an imprint or with waterproof ink. Mark in conformance with the following nomenclature:

RP	Reference point
P	P-line (preliminary location line)
L	L-line (final location line)
BM	Bench mark
TBM	Temporary bench mark
BT	Begin taper (any)
ET	End taper (any)
BFTO	Begin full turnout
EFTO	End full turnout
BFEW	Begin full extra widening
EFEW	End full extra widening
DD	Drain dip
C	Cut
F	Fill
℄	Centerline
D	Ditch
W	Width
CW	Curve widening
FW	Fill widening
H	Horizontal
M	Metric
SE	Superelevation
V	Vertical

171.18 Stake Approval & Maintenance. Do not begin construction work within a roadway segment until the stakes, marks, and controls established have been ap-proved in writing by the CO. The minimum segment for approval shall be 1 km or the length of the project, whichever is less.

Approval of construction staking shall not relieve the Contractor of responsibility for maintaining the survey work until construction has been completed, and for correct-ing errors, whether the errors are discovered during the performance of survey or in subsequent phases of the project. Centerline stakes need not be maintained after clearing operations have started.

Measurement

171.19 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

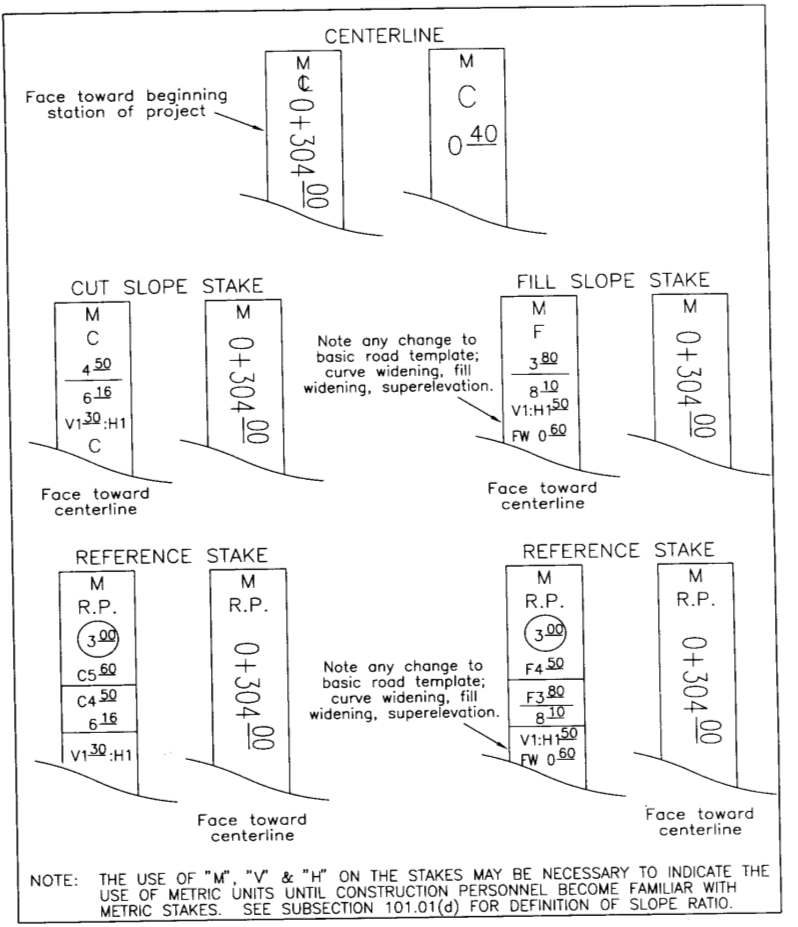

Figure 171-2.—Construction stakes.

Reestablishing P-line includes all work needed to replace missing portions of the P-line that are necessary for the determination of L-line tangents. When listed in the SCHEDULE OF ITEMS, the quantity shall be the number of kilometers of P-line reestablished, as measured along centerline to the nearest 5 m. When the length of
P-line to be replaced does not exceed 10 percent of the length of the P-line, reestablishing P-line shall be considered incidental to construction staking, and no separate payment will be made.

Construction staking includes all work necessary to establish the project centerline and to establish slope stakes, clearing limits, and reference stakes in accordance with the METHOD DESIGNATED IN THE SCHEDULE OF ITEMS. The quantity shall be the number of kilometers of construction staking completed and accepted, to be measured along the centerline to the nearest 10 m.

Payment

171.20 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item	Pay Unit
171 (01) Reestablish P-line, precision _____	Kilometer
171 (02) Construction staking, precision _____, method _____	Kilometer
171 (03) Staking structures, precision _____, method _____	Each

Section 173—Construction Staking, Location Line

Description

173.01 Work. Complete the construction staking of a road project that will be constructed predominantly by sidecast or end-dump construction methods. Establish clearing limits and staking of drainage structures. Establish slope stakes for cuts and fills when SHOWN ON THE DRAWINGS. The survey required by this specification may be used in conjunction with other specifications in specific areas SHOWN ON THE DRAWINGS in order to produce staking adequate for construction needs.

Furnish all labor, equipment, instruments, materials, transportation, and other incidentals necessary to complete the construction staking in accordance with these specifications and acceptable engineering practice.

Perform construction staking under the direction of a licensed professional engineer or land surveyor who is closely associated and familiar with the construction staking. Periodic visits to the project site are required.

Materials

173.02 Stakes. Provide stakes that have the nominal dimensions SHOWN ON THE DRAWINGS or stated in the SPECIAL PROJECT SPECIFICATIONS. Ensure that identification stakes are of sufficient length to provide a solid set in the ground and space for marking above ground when applicable. Other dimensions and materials may be used if approved in writing by the CO. Paint the top 50 mm of all stakes and lath, or mark them with plastic flagging. Use colors for paint or flagging as SHOWN ON THE DRAWINGS or as stated in the SPECIAL PROJECT SPECIFICATIONS.

173.03 Survey Note Paper & Books. Use moisture-resistant paper for survey notes. Keep notes in books with covers that will protect the contents and retain the pages in numerical sequence during field use.

173.04 Government-Furnished Documents. Drawings, P-line survey notes, and, where applicable, construction staking notes will be furnished by the Government. Return all documents to the CO.

Survey Requirements

173.05 Precision. Use a woven or fiberglass/plastic tape in good condition and a hand level or abney, or other instruments capable of attaining the same accuracy of measurement.

173.06 Survey Notes. Neatly record survey notes in a standard format approved by the CO. Make lettering at least 4 mm high and legible at a distance of 750 mm from the eye. Delete errors by lining out. Certify all field notes as to originality. All field notes will become the property of the Forest Service.

173.07 Location Survey Line. A location line for this project has been established on the ground.

173.08 Clearing Limits. Establish clearing limits on each side of the location line by measuring the horizontal or slope distances as shown in the stake notes. Mark the clearing limits with flagging or tags on trees to be left standing, or on lath. Make markings intervisible, and in no case more than 30 m apart. Use colors for flagging or tags as SHOWN ON THE DRAWINGS or as stated in the SPECIAL PROJECT SPECIFICATIONS.

After establishing clearing limits, move the location line stake outside the clearing limits for station identification purposes, and mark it with horizontal distance to location line.

173.09 Slope Stakes & References. When SHOWN ON THE DRAWINGS, locate slope stakes on designated portions of the road. Locate the slope stake catchpoints and use them to establish clearing limits and slope stake references. Use a method to establish the slope stake catchpoint that conforms to the METHOD described below, as DESIGNATED IN THE SCHEDULE OF ITEMS.

(a) Method I—Computed Method. Establish slope stake catchpoints by using the template information shown in the slope stake notes to calculate the actual location of the catchpoint. The slope stake "catchpoint distance" shown in the stake notes may be used as a trial location to initiate slope staking.

(b) Method II—Catchpoint Measurement Method. Determine the location of slope stake catchpoints by measuring the catchpoint distances shown in the stake notes.

Place slope stakes as SHOWN ON THE DRAWINGS. Ensure that slope stakes indicate the station, the amount of cut or fill in meters, the horizontal distance to centerline in meters, and the cutslope or fillslope ratios.

Place slope reference stakes a minimum of 3 m outside the clearing line, and marked with the offset distance to the slope stake.

Prior to clearing and grubbing operations, move the slope stake outside the clearing limit to the slope reference stake. After clearing and grubbing and before excavation, reset the slope stakes in their original position.

173.10 Monuments of Property Boundaries or Surveys. If property boundary or survey monuments, or survey markers, are found within or adjacent to the construction limits, immediately notify the CO.

173.11 Staking Culverts. Set culvert reference stakes at all culvert locations. Set a culvert reference stake on the centerline of the culvert 3 m from each end or beyond the clearing limit, whichever is greater. Record the following on these stakes:

(a) Diameter, design length, and type of culvert.

(b) The horizontal distance from the reference stake to the invert at the ends of the culvert.

(c) Stationing of centerline point.

173.12 Staking Drain Dips. Establish reference stakes outside the clearing limits on the projected centerline of the bottom of the drain dip at all drain dip locations, as SHOWN ON THE DRAWINGS.

173.13 Staking Cattleguards. Stake cattleguards as SHOWN ON THE DRAWINGS.

173.14 Marking Stakes. Mark all stakes with a stake pencil that leaves an imprint, or with waterproof ink, in a format approved by the CO.

173.15 Approval & Maintenance. Do not begin construction work within a roadway segment until the stakes and marks established are approved in writing by the CO. The minimum segment for approval shall be 1 km or the length of the project, whichever is less.

Approval of construction marking or staking shall not relieve the Contractor of responsibility for maintaining the survey work until construction has been completed and accepted, and for correcting errors, whether the errors are discovered during the performance of the survey or during subsequent phases of the project. Location line stakes need not be maintained after clearing operations have started.

Measurement

173.16 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Construction staking includes all work necessary to establish slope stakes, clearing limits, and slope stake references. The quantity shall be the number of

kilometers of construction staking completed and accepted, as measured along centerline to the nearest 10 m.

Payment

173.17 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item	Pay Unit
173 (01) Establish clearing limits _____	Kilometer
173 (02) Establish slope stakes, method _____	Kilometer

DIVISION 200
Earthwork

Section 201—Clearing & Grubbing

Description

201.01 Work. Clear and grub; treat timber, construction slash, and debris; and preserve vegetation and objects designated to remain free from injury or defacement.

Construction

201.02 Clearing & Grubbing. Clear and grub in accordance with the following:

(a) Exceptions. Within the clearing limits, clear and treat trees, debris, stumps, roots, and other protruding vegetative material not designated to remain, except the following:

(1) Undisturbed stumps outside the roadway or in embankment areas, provided they do not extend more than 300 mm above the original ground (measured from the uphill side); they are no closer than 600 mm to the finished subgrade or 300 mm to any slope surface, or as otherwise SHOWN ON THE DRAWINGS; and they do not interfere with the placement or compaction of embankments.

(2) Material in channel changes, rock sections, and ditches that is below the depth of the proposed excavation.

(3) Uncut vegetation less than 1 m in height and less than 75 mm in diameter, that is within the clearing limits but beyond the roadway and not in a decking area, and that does not interfere with sight distance along the road.

(b) Performance. Grub all roots over 75 mm in diameter within the roadbed area to a minimum depth of 150 mm below subgrade. Cut flush with the excavated road surface all roots over 75 mm in diameter that protrude from the excavated slope.

Clear slash treatment areas and treat debris in accordance with Subsections 201.02(a) and 201.05.

Clear decking areas and treat debris in accordance with Subsection 201.05.

Unless shown otherwise in the SPECIAL PROJECT SPECIFICATIONS, fell trees into the area being cleared when ground conditions, tree lean, and shape of clearing permit.

Use controlled felling to ensure the direction of fall to prevent damage to property, structures, trees designated to remain, and traffic.

Dead trees over 150 mm in diameter measured 300 mm above the ground that lean toward the road and are sufficiently tall to reach the roadbed are designated for cutting. Fell hazard trees or unstable live trees that are tall enough to reach the roadbed, when marked, before felling timber in the immediate clearing vicinity. Maximum stump height is 300 mm or one-third of the stump diameter, whichever is higher, measured on the side adjacent to the highest ground. Leave trees felled outside the clearing limits in place, and treat them no further unless otherwise SHOWN ON THE DRAWINGS.

Trim branches on remaining trees or shrubs to give a clear height of 5 m above the roadbed, unless otherwise SHOWN ON THE DRAWINGS. Trim tree limbs as near flush with the trunk as practicable.

201.03 Utilization of Timber. Merchantable timber is timber that meets Utilization Standards in the SPECIAL PROJECT SPECIFICATIONS. Conform logging methods and utilization to the following:

(a) Felling & Bucking. Fell trees to minimize damage to merchantable timber and to remaining trees located outside of clearing limits. Fell trees with saws or shears unless shown otherwise in the SPECIAL PROJECT SPECIFICATIONS.
Buck logs to permit removal of all minimum pieces set forth in the SPECIAL PROJECT SPECIFICATIONS.

(b) Utilization & Removal of Timber. Remove or treat trees that equal or exceed the diameters and minimum lengths listed in the SPECIAL PROJECT SPECIFICATIONS, and that contain one minimum piece, using one of the following methods, as DESIGNATED IN THE SCHEDULE OF ITEMS:

(1) Dispose of merchantable timber designated for removal in accordance with the B(BT) provisions of the Timber Sale Contract.

(2) Limb and deck logs that meet Utilization Standards at locations approved by the CO or SHOWN ON THE DRAWINGS. Deck logs such that logs are piled parallel one to the other; can reasonably be removed by standard log-loading equipment; will not damage standing trees; and will not roll. Log decks are to be free of brush and soil.

(3) Remove from Government land merchantable timber designated for removal, without charge to the Government. This timber becomes the property of the Contractor, but may not be exported from the United States or used as substitution (as defined in 23 CFR 223.10) for timber from private lands exported by the Contractor or an affiliate, directly or indirectly.

(4) Dispose of unmerchantable timber in accordance with Subsection 201.05 by the treatment methods SHOWN ON THE DRAWINGS and DESIGNATED IN THE SCHEDULE OF ITEMS.

201.04 Pioneer Roads. During pioneering operations, prevent undercutting of the final excavation slope. Avoid any restriction of drainages while pioneering the road. Keep all materials within the roadway limits unless otherwise SHOWN ON THE DRAWINGS.

201.05 Slash Treatment. Use or treat construction slash larger than 75 mm in diameter and 1 m in length by one or more of the following methods, as DESIGNATED IN THE SCHEDULE OF ITEMS:

(1) Windrowing construction slash.

(2) Windrowing large material.

(3) Windrowing and covering.

(4) Scattering.

(5) Burying.

(6) Chipping or grinding.

(7) Piling and burning.

(8) Decking unmerchantable material.

(9) Placement in cutting units.

(10) Removal.

(11) Piling.

(12) Placing slash on embankment slopes.

(13) Debris mat.

Pieces of wood less than 75 mm in diameter and 1 m in length may be scattered within the clearing limits.

(a) All Methods. Construction slash placement will not be allowed in lakes, meadows, streams, or streambeds. Immediately remove construction slash that interferes with drainage structures.

Fell and dispose of trees that are scorched or damaged beyond recovery, and adjacent to the clearing limits, in accordance with Subsection 201.03; or treat these trees as construction slash.

(b) Specific Methods. When using one or more of the following slash treatment methods, meet requirements specified below:

(1) Windrowing Construction Slash. Windrow according to the following requirements unless otherwise specified in the SPECIAL PROJECT SPECIFICATIONS. Clear areas to accommodate the windrow slash. Place construction slash outside the roadway in neat, compacted windrows laid approximately parallel to and along the toeline of embankment slopes. Do not permit the top of the windrows to extend above the top of subgrade. Use construction equipment to matt down all material in a windrow to form a compact and uniform pile. Construct breaks of at least 5 m at least every 60 m in a windrow. Do not place windrows against trees. A pioneer road may be constructed to provide an area for placement of windrows, provided the excavated material is kept within the clearing limits and does not adversely affect the road construction.

(2) Windrowing Large Material. Windrow construction slash that is 250 mm or more in diameter at the small end, and 2 m or more in length, as specified in Subsection 201.05(b)(1). Treat smaller material by one or more of the other included methods for slash treatment.

(3) Windrowing & Covering. Place and compact construction slash as specified in Subsection 201.05(b)(1), and cover with at least 150 mm of rock and soil to form a smooth and uniform windrow.

(4) Scattering. Scatter according to the following requirements unless otherwise specified in the SPECIAL PROJECT SPECIFICATIONS. Scatter construction slash outside the clearing limits without damaging trees. Limb all logs. Place logs and stumps away from trees, positioned so they will not roll, and are not on top of one another. Limb and scatter other construction slash to reduce slash concentrations.

(5) Burying. Bury construction slash at the locations SHOWN ON THE DRAWINGS and designated on the ground. Mat construction slash down in layers, and cover it with at least 600 mm of rock and soil. Smooth and slope the final surface to drain.

(6) Chipping or Grinding. Process construction slash that is up to at least 100 mm in diameter and longer than 1 m through a chipping machine or machine designed and operated to grind slash and stumps into pieces, such as a tub grinder. Deposit chips or ground woody material on embankment slopes or outside the roadway to a loose depth not exceeding 150 mm. Minor amounts of chips or ground woody material may be permitted within the roadway if they are thoroughly mixed with soil and do not form a layer.

(7) Piling & Burning. Deposit construction slash in areas SHOWN ON THE DRAWINGS and designated on the ground. Construct piles so that burning does not damage standing trees. If burning is incomplete, repile and burn the slash remaining until pieces are reduced to less than 75 mm in diameter and 1 m in length. Scatter the remaining pieces.

(8) Decking Unmerchantable Material. Deck logs that do not meet Utilization Standards specified in Subsection 201.03, and other material that exceeds the diameter and length shown in the SPECIAL PROJECT SPECIFICATIONS in areas SHOWN ON THE DRAWINGS. Other locations may be approved by the CO.

Cut material into lengths not exceeding 9.7 m, and remove all limbs. Decks are to be stable and free of brush and soil. Treat other material according to slash treatment methods SHOWN ON THE DRAWINGS and in the SCHEDULE OF ITEMS.

(9) Placement in Cutting Units. Place construction slash from within cutting units and the adjacent 60 m with cutting unit logging slash. Place construction slash at least 15 m inside the cutting unit boundary such that it will not inhibit logging of the unit and may be treated by the prescribed logging slash treatment method.

(10) Removal. Remove or haul construction slash to locations SHOWN ON THE DRAWINGS or designated on the ground.

(11) Piling. Pile construction slash in areas SHOWN ON THE DRAWINGS or designated on the ground. Place and construct piles so future burning will not damage remaining trees. Keep piles reasonably free of dirt from stumps. Cut unmerchantable logs into lengths of less than 6 m prior to placement in the pile.

(12) Placing Slash on Embankment Slopes. Place construction slash on completed embankment slopes to reduce soil erosion where SHOWN ON THE DRAWINGS. Place construction slash as flat as practicable on the completed slope. Place slash from the toe of the embankment to a point at least 600 mm below subgrade elevation. Priority for use of available slash is for: (1) through fills; (2) insides of curves; and (3) ditch relief outlets.

(13) Debris Mat. Use tree limbs, tops, cull logs, split stumps, wood chunks, and other debris to form a mat upon which construction equipment is operated. Place stumps upside down and blend stumps into the mat.

Measurement

201.06 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Linear measurements are to be horizontal along the road centerline.

Area quantities are the number of hectares within the clearing limits.

Individual removal of trees is the number of trees of the various size designations removed. Measure tree diameters at a height of 300 mm above ground. Do not count trees less than 150 mm in diameter. Size designations are shown in table 201-1.

Table 201-1.—Size designations for trees removed.

	Size of Least Diameter at Height of 300	
Pay Item Designation	Greater Than	Less Than
Small	150 mm	600 mm
Medium	600 mm	1 m
Large	1 m	–

Payment

201.07 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item		Pay Unit
201 (01)	Clearing and grubbing, slash treatment methods for tops and limbs _____ _____ _____ _____, logs _____ _____ _____, and stumps _____ _____ _____, utilization of timber _____	Hectare
201 (02)	Clearing and grubbing, slash treatment methods for tops and limbs _____ _____ _____ _____, logs _____ _____ _____, and stumps _____ _____ _____, utilization of timber _____	Kilometer
201 (03)	Clearing and grubbing, slash treatment methods for tops and limbs _____ _____ _____ _____, logs _____ _____ _____, and stumps _____ _____ _____, utilization of timber _____	Lump Sum
201 (04)	Individual removal of trees, small; slash treatment methods for tops and limbs _____ _____ _____ _____ and logs _____ _____ _____ _____, utilization of timber _____	Each

201 (05) Individual removal of trees, medium; slash treatment methods for tops and limbs _____ _____ _____ _____ and logs _____ _____ _____ _____, utilization of timber _____ ..... Each

201 (06) Individual removal of trees, large; slash treatment methods for tops and limbs _____ _____ _____ _____ and logs _____ _____ _____ _____, utilization of timber _____ ..... Each

201 (07) Individual removal of trees, miscellaneous; slash treatment methods for tops and limbs _____ _____ _____ _____ and logs _____ _____ _____ _____, utilization of timber _____ ..... Each

201 (08) Individual removal of trees; slash treatment methods for tops and limbs _____ _____ ____ ___ and logs ____ ____ ____ _____, utilization of timber _____ ..... Kilometer

201 (09) Individual removal of stumps, slash treatment methods _____ ..... Each

Section 202—Removal of Structures & Obstructions

Description

202.01 Work. Salvage, remove, and/or dispose of buildings, fences, structures, pavements, culverts, utilities, curbs, sidewalks, and other obstructions as SHOWN ON THE DRAWINGS. Salvage designated materials and backfill the resulting trenches, holes, pits, or as SHOWN ON THE DRAWINGS.

Construction

202.02 Salvaging Material. Use reasonable care to salvage all material designated to be salvaged. Salvage in readily transportable sections or pieces. Replace or repair all members, pins, nuts, plates, and related hardware damaged, lost, or destroyed during the salvage operations. Wire all loose parts to adjacent members or pack them in sturdy boxes with the contents clearly marked.

Carefully remove culvert, taking precautions to avoid damage. Store culverts to be relaid, when necessary, to prevent loss or damage before relaying. Replace without additional compensation all sections lost from storage or damaged by use of improper methods.

Matchmark members of salvaged structures. Furnish the CO with one set of drawings identifying the members and their respective matchmarks.

Stockpile salvaged material in a designated area.

202.03 Removing Material. Saw cut sidewalks, curbs, pavements, and structures when partial removal is required.

Raze and remove all buildings, foundations, pavements, sidewalks, curbs, fences, structures, and other obstructions that interfere with the work and are not designated to remain.

Existing culverts may be left in an embankment, provided that no portion of the culvert is within 600 mm of the subgrade, the embankment slope, or a new culvert or structure. Crush culvert ends.

Remove structures and obstructions in the roadbed to 300 mm below subgrade elevation. Remove structures and obstructions outside the roadbed to 300 mm below finished ground or to the natural stream bottom.

Prior to removal, place rock and soil material located on the bridge deck, or structure so that it does not enter a stream.

Remove the substructures of existing structures down to the natural stream bottom, and remove the parts outside of a stream down to at least 300 mm below natural ground surface or finished groundline, whichever is lower. Remove portions of existing structures that lie wholly or in part within the limits for a new structure to accommodate construction of the proposed structure.

Except in excavation areas, fill cavities left by structure removal with material to the level of the finished ground, and compact. Place and compact the type of backfill material that is SHOWN ON THE DRAWINGS, designated in the SPECIAL PROJECT SPECIFICATIONS, or approved by the CO.

202.04 Disposing of Material or Structures Not Designated for Salvage. Dispose of material and structures as SHOWN ON THE DRAWINGS or designated in the SPECIAL PROJECT SPECIFICATIONS, using one or more of the following methods:

(a) Removal From Project. Make necessary arrangements with property owners, and haul debris to suitable disposal locations as approved by the CO. Furnish a signed copy of the disposal agreement. Hazardous materials must be properly disposed of.

(b) Burning. Burn debris using high-intensity burning processes that produce few emissions. Examples include incinerating, high stacking, or pit and ditch burning. Provide a watchperson during burning operations.

When burning is complete, extinguish the fire so no smoldering debris remains. Dispose of unburned material in accordance with Subsection 202.04(c).

(c) Burying. Bury debris in trenches or pits in approved areas within the right-of-way. Do not bury debris inside the roadway prism limits, beneath drainage ditches, or in any riparian areas.

Place debris with earth material in alternating layers consisting of 1 m of debris covered by 600 mm of earth. Distribute stumps, logs, and other large pieces to form a compact mass and minimize air voids. Fill all voids. Cover the top layer of buried debris with at least 300 mm of compacted earth. Grade and shape the area.

Measurement

202.05 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment

202.06 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item		Pay Unit
202 (01)	Removal of structures and obstructions	Lump Sum
202 (02)	Removal of _____	Each
202 (03)	Removal of _____	Meter
202 (04)	Removal of _____	Square Meter
202 (05)	Removal of _____	Lump Sum

Section 203—Excavation, Embankment, & Haul

Description

203.01 Work. Excavate material and construct embankments. Furnish, haul, stockpile, place, dispose of, slope, shape, compact, and/or finish earthen and rocky material.

203.02 Excavation. Excavation consists of the excavation and placement of all excavated material that is not included under other PAY ITEMS listed in the SCHEDULE OF ITEMS.

203.03 Borrow Excavation. Excavate and utilize material from sources SHOWN ON THE DRAWINGS or described in the SPECIAL PROJECT SPECIFICATIONS. Additional sources of borrow excavation will be subject to advance approval by the CO. Develop sources in accordance with Section 611.

Construction

203.04 Clearing & Grubbing. Clear and grub in accordance with Section 201 before work under Section 203 begins. Road pioneering, slash disposal, and grubbing of stumps may proceed concurrently with excavation when approved by the CO. Conduct excavation and placement operations so material to be treated under Section 201 will not be incorporated in the roadway unless specifically included in the slash treatment method.

203.05 Pioneering. During pioneering operations, prevent undercutting of the final excavation slope. Avoid any restriction of drainages while pioneering the road. Keep all materials within the roadway limits unless otherwise SHOWN ON THE DRAWINGS.

203.06 Utilization of Excavated Materials. Use all suitable excavated material in the construction of embankments, subgrades, shoulders, slopes, bedding, and backfill for structures and other purposes, as SHOWN ON THE DRAWINGS.

(a) Excess Excavation. Place excess excavation as SHOWN ON THE DRAWINGS.

(b) Rock for Slope Protection. Conserve and use suitable excavated rock for protecting embankments.

(c) Conserving Material. Excavated material suitable for cushion, road finishing, or other purposes may be conserved and utilized instead of materials from designated

sources. Field drain and dry excessively wet material that is otherwise suitable for embankment before placement.

(d) Excavation of Unsuitable Material & Backfill. Place unsuitable excavated material as SHOWN ON THE DRAWINGS. Backfill excavated areas with suitable material when necessary to complete the work. Do not place frozen material in embankments.

Break up rocks that are too large to be incorporated into the embankment or move them to locations approved by the CO. Broken pieces of rock may be placed on the face of the embankment and embedded so they will not roll or obstruct the use and maintenance of the roadbed. Immediately remove any excavated material that inadvertently reaches a stream course.

(e) Conservation of Topsoil. When SHOWN ON THE DRAWINGS, remove, transport, and deposit suitable topsoil in the designated stockpile areas.

(f) Abandoned Structures & Obstructions. Treat abandoned structures and obstructions in accordance with Section 202.

203.07 Drainage Excavation. Construct side ditches, minor channel changes, inlet and outlet ditches, furrow ditches, ditches along the road but beyond roadway limits, and other minor earth drainage structures as SHOWN ON THE DRAWINGS. Utilize excavated material in accordance with Subsection 203.06.

203.08 Sloping, Shaping, & Finishing. Complete slopes and ditches before placing aggregate courses. Slope, shape, and finish as follows:

(a) Sloping. Leave all earth slopes with uniform roughened surfaces, except as described in Subsection 203.08(b), with no noticeable break as viewed from the road. Except in solid rock, round the tops and bottoms of all slopes, including the slopes of drainage ditches, where SHOWN ON THE DRAWINGS. Round the material overlaying solid rock to the extent practical.

If a slide or slipout occurs on a cut or embankment slope, remove or replace the material, and repair or restore all damage to the work. Bench or key slope to stabilize the slide. Reshape the cut or embankment slope to an acceptable condition.

(b) Stepped Slopes. Where SHOWN ON THE DRAWINGS, construct steps on slopes of 1.3:1 to 1:2. Construct the steps about 500 mm high. Blend the steps into natural ground at the end of the cut. If the slope contains nonrippable rock outcrops, blend steps into the rock. Remove loose material found in transitional area. Except for removing large rocks that may fall, scaling stepped slopes is not required.

(c) Shaping. Shape the subgrade to a smooth surface and to the cross section required. Shape slopes to gradually transition into slope adjustments without noticeable breaks. At the ends of cuts and at intersections of cuts and embankments, adjust slopes in the horizontal and vertical planes to blend into each other or into the natural ground. For roads receiving base or surface course, rocks may remain in place if they do not protrude above the subgrade more than one-third of the depth of the base or surface course, or 75 mm, whichever is less.

(d) Finishing. Finish the road surface to be reasonably smooth, uniform, and shaped to conform to the typical sections as SHOWN ON THE DRAWINGS. Remove unsuitable material from the roadbed and replace it with suitable material. Finish roadbeds to the tolerance class shown in table 203-1 or as SHOWN ON THE DRAWINGS.

Ensure that the subgrade for both surfaced and unsurfaced roads is visibly moist during shaping and dressing. Bring low sections, holes, cracks, or depressions to grade with suitable material. Compact the subgrade as required by the designated embankment placing method.

Finish the roadbed for unsurfaced roads using one of the following methods, as SHOWN ON THE DRAWINGS:

(1) Method A. Ensure that the top 100 mm below the finished roadbed contains rocks no larger than 100 mm. Remove oversize material, reduce to acceptable size, or cover by importing suitable material approved by the CO.

(2) Method B. Roll the roadbed to break down rocky material. Roll a minimum of five full-width passes, or until visual displacement ceases, with a vibratory grid roller or equivalent weighing a minimum of 9 t.

(3) Method C. Tractor finish work by spreading the excavation for roads SHOWN ON THE DRAWINGS as Construction Tolerance Class K, L, or M, as shown in table 203-1. Eliminate rock berms that may form during embankment construction with a tractor finish.

203.09 Snow Removal. Remove snow and ice in advance of the work and deposit beyond the roadway limits in a manner that will not waste material. Snow and ice will not be incorporated into the embankment or be placed to cause damage.

203.10 Finishing Slopes. Ensure that finished slopes conform reasonably to the lines STAKED ON THE GROUND or SHOWN ON THE DRAWINGS. Finish slopes in a roughened condition to facilitate the establishment of vegetative growth. The finish associated with template and stringline or hand-raking methods will not be required. Remove rock, debris, and other loose material that are more than 150 mm in diameter, unless otherwise SHOWN ON THE DRAWINGS.

Table 203-1—Construction tolerences.

	Tolerance Class[a]												
	A	B	C	D	E	F	G	H	I	J	K	L	M
Roadbed width (mm)	150	150	300	300	300	300	300	450	300	600	600	600	600
Subgrade elevation (mm)	±30	±60	±60	±150	±150	±300	±300	±450	±600	±900	±600	±900	-[c]
Centerline alignment (mm)	60	60	150	150	300	300	300	450	600	900	900	1500	-[c]
Slopes, excavation, and embankment (% slope[b])	±3	±5	±5	±5	±5	±5	±10	±10	±10	±10	±20	±20	±20

a. Maximum allowable deviation from construction stakes and drawings.
b. Maximum allowable deviation from staked slope measured from slope stakes or hinge points.
c. Unless otherwise SHOWN ON THE DRAWINGS, the centerline alignment and subgrade elevation, as built, have no horizontal curves with a radius of less than 26 m, and no vertical curves with a curve length of less than 25 m when the algebraic difference in the grade change is less than 10 percent, or a curve length of less than 30 m when the algebraic difference of the grade change is greater than or equal to 10 percent. The centerline grade is not to exceed 20 percent in 30 m of length.

In areas that require blasting, use blasting techniques in accordance with Section 220, as SHOWN ON THE DRAWINGS. Presplitting is not required, unless controlled backslope blasting is SHOWN ON THE DRAWINGS.

Perform test blasting in accordance with Subsection 220.06, unless directed otherwise by the CO.

203.11 Landscape & Stream Protection. Confine excavation, blasted material, and embankment material within the roadway limits, unless otherwise approved by the CO, to avoid overbuilding and to protect the landscape and streams. Retrieve and incorporate into designated areas all material deposited outside of the clearing limits.

203.12 Subgrade Treatments. Subgrade treatment consists of soil modification by admixing aggregates or placing geotextiles, fiber mat, wood corduroy, rock blanket, or other similar materials over areas of unsuitable embankment foundation materials that are SHOWN ON THE DRAWINGS. The construction and material requirements for the type of subgrade treatment will be specified in the SPECIAL PROJECT SPECIFICATIONS or SHOWN ON THE DRAWINGS.

203.13 Earth Berms. Construct permanent earth berms along the shoulder of traveled ways at locations SHOWN ON THE DRAWINGS. Use well-graded material that contains no rocks having a dimension greater than one-fourth the height of the berm in the construction. Acceptable material for the berm may be windrowed as the roadbed is constructed. When local material is not acceptable, import material from approved sources. Frozen material, roots, sod, or other deleterious material is unacceptable for berm construction. Do not waste materials over the embankment slope.

Accomplish compaction by operating the spreading equipment over the full section of the berm.

203.14 Water. Develop, haul, and apply water in accordance with Section 207.

203.15 Compaction Equipment. Use equipment capable of obtaining compaction requirements. The compacting units may be of any type, provided that they are capable of compacting each lift of material as specified, and that they meet the minimum requirements specified below. Heavier compacting units may be required to achieve the specified density of the embankment. Minimum requirements for rollers are as follows:

(a) Sheepsfoot, tamping, or grid rollers shall be capable of exerting a force of 4.5 kg/mm of width of roller drum.

(b) Steel-wheel rollers, other than the vibratory type, shall be capable of exerting a force of not less than 4.5 kg/mm of width of the compression roll or rolls.

(c) Vibratory steel-wheel rollers shall have a minimum weight of 5 t. The compactor shall be equipped with amplitude and frequency controls, and specifically designed to compact the material on which it is used.

(d) Pneumatic-tire rollers shall have smooth tread tires of equal size that will provide a uniform compacting pressure for the full width of the roller and capable of exerting a ground pressure of at least 550 kPa.

203.16 Embankment Placement. Place embankment in accordance with the following requirements:

(a) All Methods. Construct the lower part of the embankment in a single layer to the minimum depth necessary to support construction equipment when an embankment is to be placed across swampy ground and removal of unsuitable material or subgrade treatment is not required.

(b) Specific Methods. Place all embankments using one or more of the following methods, as SHOWN ON THE DRAWINGS and listed in the SCHEDULE OF ITEMS:

(1) Method 1—Side Casting & End Dumping. Embankment may be placed by side casting and end dumping. Build solid embankments by working smaller rocks and fines in with the larger rocks and fines to fill the voids.

(2) Method 2—Layer Placement. Roughen or step surfaces steeper than a ratio of 1 vertical to 3 horizontal (1:3) upon which embankment is to be placed, when SHOWN ON THE DRAWINGS, in order to provide permanent bonding of new and old materials.

Layer place embankment, except over rock surfaces. Over rock surfaces, material may be placed by end dumping to the minimum depth needed for operation of spreading equipment. Level and smooth each embankment layer before placement of subsequent layers. Operate hauling and spreading equipment uniformly over the full width of each layer.

Place suitable material in layers no more than 300 mm thick, except when the material contains rock more than 225 mm in diameter, in which case layers may be of sufficient thickness to accommodate the material involved. Ensure that no layer exceeds 600 mm before compaction.

Placing individual rocks or boulders greater than 600 mm in diameter will be permitted, provided that the embankment will accommodate them and that they are at least 150 mm below the subgrade. Carefully distribute rocks and fill the voids with finer material to form a dense and compacted mass.

Where material containing large amounts of rock is used to construct embankments, make layers of sufficient thickness to accommodate the material involved. Construct a solid embankment with adequate compaction by working smaller rock and fines in with the larger rocks to fill the voids, and by operating hauling and spreading equipment uniformly over the full width of each layer as the embankment is constructed.

Ensure that material is at a moisture content suitable to obtain a mass that will not visibly deflect under the load of the hauling and spreading equipment. Handle excessively wet material in accordance with Subsection 203.06(c).

(3) Method 3—Layer Placement (Roller Compaction). Place embankments as specified in method 2. Place in horizontal layers not exceeding 300 mm prior to compaction, except when the material contains rock more than 225 mm in diameter, in which case layers may be of sufficient thickness to accommodate the material involved. Obtain compaction using equipment listed in Subsection 203.15. Operate compaction equipment over the full width of each layer until visible deformation of the layer ceases or, in the case of the sheepsfoot roller, the roller "walks out" of the layer. Make at least three complete passes.

(4) Method 4—Controlled Compaction. Place embankments as specified in method 2; but place earth embankments in horizontal layers not exceeding 300 mm (loose measure), and compact them. Ensure that the moisture content of material is suitable for attaining the required compaction. Compact the embankments and the top 300 mm of excavation sections to at least 95 percent of the maximum density, as determined by AASHTO T 99, method C or D.

Determine the density of the embankment material during the progress of the work, in accordance with AASHTO T 191, T 205, or T 238; and T 217, T 239, or T 255. Correct for coarse particles in accordance with AASHTO T 224.

Density requirements will not apply to portions of rock embankments that cannot be tested in accordance with approved methods. When this condition exists, accomplish compaction by working smaller rocks and fines in with the larger rocks to fill the voids and by operating equipment over the embankment materials.

(5) Method 5—Special Project Controlled Compaction. Place and compact embankments to at least 90 percent of the maximum density determined by AASHTO T 180, method C or D, but obtain compaction of not less than 95 percent of AASHTO T 180, method C or D, for a minimum depth of 300 mm below subgrade for the width of the roadbed in both excavation and embankment sections.

Determine density during the work in accordance with AASHTO T 191, T 205, or T 238; T 217, T 239, or T 255; and T 224.

203.17 Construction Tolerances. Construct to the tolerance class as SHOWN ON THE DRAWINGS and in accordance with table 203-1. Construct roadway ditches to flow in the direction SHOWN ON THE DRAWINGS.

Ensure that deviations are uniform in the direction of change for a distance of 60 m or more along the project centerline.

203.18 Haul. Haul is incidental to excavation and borrow excavation, unless listed as a separate PAY ITEM in the SCHEDULE OF ITEMS.

Measurement

203.19 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Quantities of excavation will include:

(a) Roadway excavation.

(b) Rock and unsuitable material below the required grade, and unsuitable material beneath embankment areas.

(c) Furrow ditches outside the roadway, except when furrow ditches are included in the SCHEDULE OF ITEMS.

(d) Topsoil and other material removed and stockpiled as directed.

(e) Borrow material used in the work, except when borrow is included in the SCHEDULE OF ITEMS.

(f) The volume of conserved materials taken from stockpiles and used in the work, except topsoil included under other PAY ITEMS.

(g) Slide material not attributable to negligence of the Contractor.

Quantities of excavation will not include:

(a) Material used for other than approved purposes.

(b) Unauthorized excavation or borrow.

(c) Quantity of material excavated from slope rounding or slope tapering.

(d) Overbreakage from the backslope in rock excavation requiring blasting.

(e) Material scarified in place to receive the first layer of embankment.

(f) Benching or stepping existing ground for embankment foundation.

(g) Stepping or scaling cut slopes.

(h) Oversize material removed when finishing unsurfaced roads.

When designed quantities are DESIGNATED IN THE SCHEDULE OF ITEMS as the method of measurement, estimate the quantities from design data based on undisturbed ground surface elevations.

When staked quantities are DESIGNATED IN THE SCHEDULE OF ITEMS as the method of measurement, determine excavation quantities by the average end area method using slope stake information taken prior to construction.

When actual quantities are DESIGNATED IN THE SCHEDULE OF ITEMS as the method of measurement, take preliminary cross sections, or comparable measurements, of the undisturbed ground surface; and measure final quantities in accordance with the following:

(a) When excavation is designated as a PAY ITEM in the SCHEDULE OF ITEMS, take final cross sections, or comparable measurements, of the completed and accepted work.

(b) When embankment is designated as a PAY ITEM in the SCHEDULE OF ITEMS, determine measurement in the final position.

(c) When borrow excavation is designated as a PAY ITEM in the SCHEDULE OF ITEMS, determine measurement in the original position.

Payment

203.20 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item		Pay Unit
203 (01)	Excavation, placement method 1	Cubic Meter
203 (02)	Excavation, placement method 2	Cubic Meter
203 (03)	Excavation, placement method 3	Cubic Meter

203 (04) Excavation, placement method 4 ..... Cubic Meter

203 (05) Excavation, placement method 5 ..... Cubic Meter

203 (06) Excavation, placement method _____ ..... Kilometer

203 (07) Excavation, placement method _____ ..... Lump Sum

203 (08) Borrow excavation, placement method _____ ... Cubic Meter

203 (09) Borrow excavation, placement method _____ ..... Ton

203 (10) Unsuitable excavation ..... Cubic Meter

203 (11) Embankment, placement method _____ ..... Cubic Meter

203 (12) Embankment, placement method _____ ..... Kilometer

203 (13) Subgrade treatment, type _____ ..... Square Meter

203 (14) Rounding cut slopes ..... Meter

203 (15) Drainage excavation, type _____ ..... Cubic Meter

203 (16) Drainage excavation, type _____ ..... Meter

203 (17) Drainage excavation, type _____ ..... Each

203 (18) Furrow ditches ..... Meter

203 (19) Topsoil (stockpiled) ..... Cubic Meter

203 (20) Earth berms ..... Meter

203 (21) Haul ..... Cubic Meter Kilometer

Section 204—Soil Erosion & Water Pollution Control

Description

204.01 Work. Furnish, construct, and maintain permanent and temporary erosion and sediment control measures.

Materials

204.02 Requirements. Ensure that materials meet the requirements specified in the following subsections:

Agricultural Limestone	713.02
Bales	713.13
Erosion Control Mats, Roving, & Geocell	713.07
Fertilizer	713.03
Geotextiles	714.01
Mulch	713.05
Sandbags	713.14
Seed	713.04
Stabilizing Emulsion Tackifiers	713.12

Ensure that all other materials are as SHOWN ON THE DRAWINGS or specified in the SPECIAL PROJECT SPECIFICATIONS.

Construction

204.03 Performance. Prior to the start of construction, submit a written plan that provides permanent and temporary erosion control measures to minimize erosion and sedimentation during and after construction. Do not begin work until the necessary controls for that particular phase of work have been implemented. Do not modify the type, size, or location of any control. An alternate erosion control plan with all necessary permits may be submitted 30 days before intended use.

Incorporate all permanent erosion control features into the project at the earliest practicable time, as outlined in the approved plan, to minimize the need for temporary erosion control.

Before grubbing and grading, construct all erosion controls around the perimeter of the project, including filter barriers, diversion, and settling structures. When required by the SPECIAL PROJECT SPECIFICATIONS, schedule clearing and grubbing so that grading operations and permanent erosion control measures can follow without interference.

Install any temporary erosion or pollution control measures that are required due to negligence or carelessness, without compensation.

204.04 Construction. Construct erosion control and sediment control measures as follows:

(a) Construct temporary erosion controls in incremental stages as construction proceeds.

(b) Construct temporary slope drains, diversion channels, and earth berms to protect disturbed areas and slopes.

(c) Apply permanent turf establishment to the finished slopes and ditches within 30 days, or as required in the SPECIAL PROJECT SPECIFICATION or SHOWN ON THE DRAWINGS.

(d) Apply temporary turf establishment on disturbed areas that will remain exposed for more than 30 days.

(e) Construct outlet protection as soon as culverts or other structures are complete.

(f) Construct permanent erosion controls, including waterway linings and slope treatments, as soon as practical or upon completion of the roadbed.

(g) Construct and maintain erosion controls on and around soil stockpiles to prevent soil loss.

(h) Following each day's grading operations, shape earthwork to minimize and control erosion from storm runoff.

204.05 Filter Barriers. Construct silt fence, straw bales, and brush barriers for filtering sediment from runoff and reducing the velocity of sheet flow.

204.06 Sediment Retention Structures. Construct sediment retention structures of the following types:

(a) Temporary Sediment Traps. Construct temporary sediment traps to detain runoff from disturbed areas and settle out sediment. Provide outlet protection.

(b) Sediment Basins. Construct sediment basins to store runoff and settle out sediment for large drainage areas. Construct sediment basins according to Section 203. Construct riser pipes according to Section 603A or 603B. Provide outlet protection.

204.07 Outlet Protection. Construct riprap aprons or basins to reduce water velocity and prevent scour at the outlet of permanent and temporary erosion control measures. Construct riprap according to Section 251.

204.08 Water Crossings. Construct temporary culvert pipe at temporary crossing where construction vehicles cross a live waterway.

204.09 Diversions. Construct temporary channels, temporary culverts, earth berms, or sandbags to divert water around disturbed areas and slopes. Use temporary channels, temporary culverts, pumps, sandbags, or other methods to divert the flow of live streams for permanent culvert installations and other work. Stabilize channels and provide outlet protection.

204.10 Waterway & Slope Protection & Stabilization. Use plastic lining, riprap, check dams, erosion control blankets and mats, and temporary slope drains as follows:

(a) Plastic Lining. Use plastic lining to protect underlying soil from erosion. Place the plastic lining loosely on a smooth soil surface free of projections or depressions that may cause the liner to puncture or tear. Lap transverse joints a minimum of 600 mm in the direction of flow. Do not use longitudinal joints. Anchor the lining in place using riprap.

(b) Riprap. Construct riprap for channel lining according to Section 251.

(c) Check Dams. Construct riprap, sandbags, or earth berms for temporary dams to reduce the velocity in ditches and swales.

(d) Temporary Slope Drains. Use drainpipe, riprap, or plastic lined waterway for temporary slope drains to channel runoff down slopes. Channel water into the slope drain with an earth berm constructed at the top of a cut or fill. Anchor slope drains to the slope. Provide outlet protection.

204.11 Temporary Turf Establishment. Apply seed, fertilizer, and mulch for soil erosion protection at the rates SHOWN ON THE DRAWINGS or in the SPECIAL PROJECT SPECIFICATIONS.

204.12 Inspection & Reporting. Inspect all erosion control facilities at least every 7 days, within 24 hours after more than 20 mm of rain in 24 hours, and as required in the contract permits.

Furnish inspection reports that include the following:

(a) Summary of the inspection.

(b) Names of personnel making the inspection.

(c) Date and time of inspection.

(d) Observations made.

(e) Corrective action necessary.

204.13 Maintenance & Cleanup. Maintain temporary erosion control measures in working condition until the project is complete or the measures are no longer needed. Clean erosion control measures when half full of sediment. Use the sediment in the work, if acceptable, or place it in accordance with Subsection 203.06.

Replace erosion control measures that cannot be maintained and those that are damaged by construction operations.

Remove and dispose of temporary erosion control measures when the turf is satisfactorily established, and when drainage and channels are lined and stabilized. Remove and dispose of erosion control measures according to Subsection 202.04(a).

Restore the ground to its natural or intended condition and provide permanent erosion control measures.

Measurement

204.14 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment

204.15 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item		Pay Unit
204 (01)	Temporary seeding and fertilizing	Hectare
204 (02)	Mulching	Ton
204 (03)	Asphaltic material	Liter
204 (04)	Temporary netting	Square Meter

204 (05) Straw/hay bales ..... Each

204 (06) Gravel blanket ..... Cubic Meter

204 (07) Silt fence ..... Meter

204 (08) Brush barrier ..... Meter

204 (09) Sediment basin ..... Each

204 (10) Berm ..... Meter

204 (11) Dike ..... Meter

204 (12) Dam ..... Each

204 (13) Temporary water bars ..... Each

204 (14) _____ for soil erosion and pollution control ..... Each

204 (15) _____ for soil erosion and pollution control ..... Meter

204 (16) _____ for soil erosion and pollution control ..... Square Meter

204 (17) _____ for soil erosion and pollution control ..... Hectare

204 (18) _____ for soil erosion and pollution control ..... Cubic Meter

204 (19) Soil erosion and pollution control ..... Lump Sum

Section 206—Structural Excavation for Major Structures

Description

206.01 Work. Excavate, backfill, and dispose of material for the construction of structures. Preserve channels; shore and brace; construct cofferdams; seal foundations; dewater; excavate; prepare foundations; backfill; and subsequently remove safety features and cofferdams.

Materials

206.02 Requirements. Ensure that material conforms to specifications in the following sections and subsections:

Foundation Fill	704.01
Structural Backfill	704.04
Structural Concrete	552

Construction

206.03 Preparation for Structural Excavation. Clear the area of vegetation and obstructions according to Sections 201 and 202.

When structural excavation is to be measured and paid for by the cubic meter, notify the CO sufficiently before beginning any clearing, grubbing, or excavation so that cross-sectional measurements of the undisturbed ground may be taken. Do not disturb the natural ground adjacent to the structure until authorized by the CO.

206.04 General. Consider the elevations of the bottoms of footings or foundations when SHOWN ON THE DRAWINGS to be approximate elevations. The CO may order, in writing, changes in the elevations of footings and foundations when necessary to secure a satisfactory foundation.

Excavate trenches or foundation pits to a width and length that allows room for work. Provide a firm foundation of uniform density throughout its length and width. Do not place footings until the depth of excavation and the foundation material have been approved in writing.

Where necessary to blast rock, blast according to Section 220.

Follow Occupational Safety and Health Administration (OSHA) safety regulations (29 CFR, part 1926, subpart P, Excavation), or OSHA-approved State Plan requirements for sloping the sides of excavations and for using shoring, bracing, and

other safety features. When sides of excavations are sloped for safety considerations, provide one copy of the design that demonstrates conformity with OSHA regulations. Submit working drawings and construction details when required by the SPECIAL PROJECT SPECIFICATIONS where support systems, shield systems, or other protective systems are used. Ensure that drawings demonstrate conformity with regulations.

Remove safety features when no longer necessary. Remove shoring and bracing to at least 300 mm below the surface of the finished ground.

Saw cut existing pavements or concrete structures that are adjacent to the area to be excavated and are designated to remain.

Conserve suitable material for structural backfill from excavated material. Do not deposit excavated material in or near a waterway. Do not stockpile excavated material closer than 1 m from the edge of the excavation.

Place unsuitable or excess material according to Subsection 203.06. If approved, suitable material may be used in embankment construction.

Remove all water as necessary to perform work.

206.05 Channel Preservation. Perform work in or next to a running waterway as follows:

(a) Excavate inside cofferdams, sheeting, or other approved separations such as dikes or sandbags.

(b) Do not disturb the natural bed of the waterway adjacent to the work.

(c) Backfill the excavation with structural backfill to original groundline.

(d) Do not pump water from foundation excavations directly into live streams. Pump water into settling areas as SHOWN ON THE DRAWINGS or as approved.

206.06 Cofferdams. Use cofferdams when excavating under water or when the excavation is affected by groundwater.

Submit three working copies of drawings and calculations 21 days prior to installation, showing proposed methods and construction details of cofferdams. Place seal and signature of a licensed professional engineer on the drawings and calculations.

Shore and construct cofferdams according to OSHA standards. Ensure that cofferdams:

(a) Extend below the bottom of the footing.

(b) Are braced to withstand expected pressures and loads without buckling, and are secured in place to prevent tipping or movement.

(c) Are as watertight as practicable.

(d) Provide sufficient clearance for the placement of forms and the inspection of their exteriors.

(e) Provide for dewatering.

(f) Protect fresh concrete against damage from sudden rises in water elevation.

(g) Prevent damage to the foundation by erosion.

When no longer required, remove all cofferdam material down to the natural bed of the waterway. Remove cofferdam material outside the waterway to a minimum of 300 mm below the surface of the finished ground.

Do not disturb, damage, or mar finished structure. Remove all timber or bracing in the cofferdam that extends into substructure masonry.

206.07 Foundation Seal. Construct a foundation seal of seal-concrete where a foundation area cannot be pumped reasonably free of water, and/or where the substructure concrete cannot be placed in accordance with Section 552.

While placing a foundation seal, maintain the water level inside the cofferdam at the same level as the water outside the cofferdam. Where a foundation seal is placed in tidal water or in a stream subject to sudden water level increases, vent or port the cofferdam at low water level.

Do not dewater a concrete-sealed cofferdam until the concrete strength is sufficient to withstand the hydrostatic pressure.

206.08 Dewatering. While placing concrete, locate and operate the pumps outside the foundation form. If pumping is permitted from the interior of any foundation enclosure, pump in a manner to avoid removal or disturbance of concrete material.

206.09 Foundation Preparation. Prepare footing foundations as follows:

(a) Footings Placed on Bedrock. Cut the bottom of the excavation to the specified elevations. Clean the foundation surface of loose or disintegrated material. Clean and grout all open seams and crevices that will remain beneath the footing.

(b) Footings Placed on an Excavated Surface Other Than Bedrock. Do not disturb the bottom of the foundation excavation. Remove material to foundation grade and compact the foundation immediately before concrete is placed. Treat material below the foundation grade that is disturbed as unstable material (see Subsection 206.09(d)).

(***c) Footings Keyed Into Undisturbed Material.*** Excavate the foundation to the neat lines of the footing and compact the foundation. Where material does not stand vertically, fill all space between the neat lines of the footing and the remaining undisturbed material with concrete. If the top of the excavation is below the top of the footing, fill only to the top of the excavation; otherwise, fill to the top of the footing. Concrete placed against steel sheet piles in cofferdams is considered to be against undisturbed material.

(d) Unstable Material Below Footing Elevation. Excavate unstable material below foundation grade to the depth and lateral extent as approved, and replace it with foundation fill. Place foundation fill material in horizontal layers that, when compacted, do not exceed 150 mm in depth. Compact each layer according to Subsection 206.11.

(e) Foundations Using Piles. Excavate to the foundation elevation and drive the piles. Remove all loose and displaced material and reshape the bottom of the excavation to the foundation elevation. Smooth and compact the bed to receive the footing.

206.10 Backfill. Backfill structural excavation with structural backfill material.

Place structural backfill in horizontal layers that, when compacted, do not exceed 150 mm in depth. Compact each layer according to Subsection 206.11.

Do not place backfill or embankment behind the walls of concrete culverts or abutments of rigid frame structures until the top slab has been placed and cured. For all structures held at the top by the superstructure and behind the sidewalls of concrete culverts, bring backfill and embankment up evenly behind opposite abutments or sidewalls.

Do not place rock that is greater than 150 mm in its largest dimension within any backfill or embankment that is within 1 m of any structure.

Extend each layer to the limits of the excavation or to natural ground.

Do not place backfill against concrete that is less than 7 days old, or until 90 percent of the design strength is achieved.

206.11 Embankment. Construct all embankments, and backfill in horizontal layers adjacent to structures. Compact backfill in accordance with Subsection 203.16(b), method 4, except that mechanical tampers may be used for the required compaction. Use special care to prevent wedging action against the structure. Bench all slopes that bound or are within the areas to be backfilled to prevent wedging action. Extend compacted material horizontally for a distance at least equal to the height of the substructure or wall that is to be backfilled against, except where undisturbed material remains within the area.

Measurement

206.12 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Measure structural excavation by the cubic meter that is in place in its original position. Do not include the following volumes in structural excavation:

(a) Material excavated outside vertical planes located 450 mm outside and parallel to the neat lines of footings or foundations. Use these vertical planes to determine pay quantities, regardless of the amount of material excavated inside or outside these planes.

(b) Any material included within the staked limits of the roadway excavation, such as contiguous channel changes and ditches, for which payment is otherwise provided in the contract.

(c) Water or other liquid material.

(d) Material excavated before the survey of elevations and measurements of the original ground.

(e) Material rehandled, except when the contract specifically requires excavation after embankment placement.

(f) Material excavated for footings or foundations at a depth more than 1.5 m below the lowest elevation for such footings or foundations, as shown on the plans.

Measure foundation fill, when DESIGNATED IN THE SCHEDULE OF ITEMS, by the cubic meter in place.

Measure structural backfill, and structural backfill for walls, by the cubic meter in place. Limit the volume of structural backfill measured to that placed inside vertical planes located 450 mm outside and parallel to the neat lines of footings or foundations. Use these vertical planes to determine pay quantities, regardless of the amount of backfill material placed outside these planes.

Measure work for shoring and bracing and for cofferdams on a lump-sum basis for all work needed to complete excavation to a depth of 1.5 m below the lowest elevation, as SHOWN ON THE DRAWINGS, for each foundation structure.

Payment

206.13 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Excavation for footings or foundations, shoring and bracing, and cofferdams at depths more than 1.5 m below the lowest elevation for such footing or foundation as SHOWN ON THE DRAWINGS will be paid for by design change.

Payment will be made under:

Pay Item		Pay Unit
206 (01)	Structural excavation	Cubic Meter
206 (02)	Foundation fill	Cubic Meter
206 (03)	Structural backfill	Cubic Meter
206 (04)	Structural backfill for walls	Cubic Meter
206 (05)	Shoring and bracing	Lump Sum
206 (06)	Cofferdams	Lump Sum
206 (07)	Structural excavation	Lump Sum

Section 206A—Structural Excavation for Minor Structures

Description

206A.01 Work. Excavate, backfill, and dispose of material for the construction of culverts and minor structures. Preserve channels; shore and brace; seal foundations; dewater; excavate; prepare foundations; bed; and backfill.

Materials

206A.02 Requirements. Ensure that material conforms to specifications in the following sections and subsections:

Backfill Material	704.03
Bedding	704.02
Foundation Fill	704.01
Minor Concrete Structures	602
Structural Concrete	552
Unclassified Borrow	704.06

Construction

206A.03 Preparation for Structural Excavation. Clear the area of vegetation and obstructions according to Sections 201 and 202.

206A.04 General. Excavate trenches or foundation pits according to Subsection 206.04 and the following:

(a) Minor Structures. Clean all loose material from all rock or other foundation material and cut to a firm surface that is level, stepped, or serrated. Remove all loose and disintegrated rock and thin strata. When the footing is to rest on material other than rock, complete the excavation just before the footing is to be placed.

(b) Culverts. Construct the width of trenches in natural ground to permit satisfactory joining of the culvert sections and thorough tamping of the bedding material under and around the culvert. Excavate trenches to a minimum width equal to the culvert diameter plus 600 mm.

Construct trenches for culverts being placed in embankments to a width of one diameter, plus one diameter on each side.

Excavate unsuitable foundation material below the invert of the culvert to an approximate depth of 600 mm and a width of at least the culvert diameter plus

1.25 m. Remove rock, hardpan, or other unyielding material below the foundation grade for a depth of at least 300 mm and a width of at least 600 mm greater than the outside width of the culvert.

Excavate to foundation grade without unduly disturbing the trench or foundation surface. Foundation grade is the elevation at the bottom of any bedding for the installation of the structure.

206A.05 Channel Preservation. Preserve channels according to Subsection 206.05, but excavate inside separations such as dikes or sandbags.

206A.06 Foundation Seal. Where necessary, construct foundation seal according to Subsection 206.07.

206A.07 Dewatering. Where necessary, dewater according to Subsection 206.08.

206A.08 Foundation Preparation. Excavate any unsuitable material present at foundation grade, and replace it with foundation fill. Place and compact the foundation fill material according to Subsection 206.09(d).

Where footing must be keyed into undisturbed material, prepare foundation and construct footing according to Subsection 206.09(c). Notify the CO when each excavation is completed, and receive written approval of the excavation and the foundation material before placing footings.

206A.09 Utilization of Excavated Materials. Utilize all suitable excavated material as backfill or embankment. Do not place excavated material in live streams.

Dispose of all surplus material as SHOWN ON THE DRAWINGS. Do not deposit excavated material in a manner that will endanger the partly finished structure.

206A.10 Backfill & Embankments for Minor Structures. Backfill excavated areas around minor structures to the level of the original ground surface. Backfill with selected material placed in horizontal layers not over 150 mm (loose measure) in depth. Use compactible material free of frozen lumps, chunks of highly plastic clay, or other objectionable material. Do not use rocks larger than 75 mm in diameter within 300 mm of the structure. Compact each layer in accordance with Subsection 203.16(b), method 4.

206A.11 Bedding, Backfill, & Embankment for Pipe Culverts. Install bedding, backfill, and embankment for pipe culverts in accordance with Sections 603, 603A, and 603B, unless otherwise SHOWN ON THE DRAWINGS or described in the SPECIAL PROJECT SPECIFICATIONS.

Measurement

206A.12 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Measure bedding material by the cubic meter in place. Measure foundation fill under Section 206. Measure concrete under Section 552.

Payment

206A.13 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item		Pay Unit
206A (01)	Minor structure excavation	Cubic Meter
206A (02)	Pipe culvert excavation	Cubic Meter
206A (03)	Bedding material	Cubic Meter
206A (04)	Foundation fill	Cubic Meter
206A (05)	Structural concrete class for _____ *Description*	Cubic Meter
206A (06)	Minor structure excavation and backfill	Lump Sum
206A (07)	Pipe culvert excavation and backfill	Lump Sum

Section 207—Developing Water Supply & Watering

Description

207.01 Work. Furnish, haul, and apply water.

Materials

207.02 Requirements. In the planting or care of vegetation, use water that is free of substances injurious to plant life.

Ensure that water meets requirements of Subsection 725.01.

Water sources are SHOWN ON THE DRAWINGS. If other sources of water are used, obtain the right to use the water, and pay any royalty costs.

Construction

207.03 Development of Supply & Access. Develop water supplies and access as SHOWN ON THE DRAWINGS.

207.04 Equipment. Use watertight tanks of known capacity with mobile watering equipment. Provide uniform and controlled application of water without ponding or washing. Maintain positive control of water from the driver's position at all times.

Measurement

207.05 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Furnish calibrated tanks, distributors, or accurate water meters for measurement when directed by the CO.

When the SCHEDULE OF ITEMS calls for developing water supply and water, the cost of developing the supply is included in the unit price for the quantity of water delivered.

Measure hauling of water along the shortest feasible route to the nearest water supply. Do not include the cost of developing the supply.

Payment

207.06 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item		Pay Unit
207 (01)	Developing water supply	Lump Sum
207 (02)	Water	k Liters
207 (03)	Water	Lump Sum
207 (04)	Developing water supply and water	k Liters
207 (05)	Developing water supply and water	Lump Sum
207 (06)	Hauling water	k Liters-km

Section 210—Closing, Obliteration, or Treatment of Existing Roads

Description

210.01 Work. Treat roadways by removing rigid material, including culverts and bridges; constructing waterbars, overflow ditches, and earthen barriers; sloping and scarifying the roadbed; removing selected fill; hauling materials to designated disposal areas; and revegetating.

210.02 Performance. Break rigid material such as pavements, curbs, gutters, sidewalks, and other nonasphalt material into pieces with a maximum dimension of 300 mm.

Dispose of material by one of the methods listed in Subsection 202.04 or as SHOWN ON THE DRAWINGS.

Restore and maintain the natural drainage patterns.

210.03 Treatment of Roadway. Treat the roadway using one of the following methods, as specified in the SCHEDULE OF ITEMS:

(a) Method A. Fill ditches and restore the roadway to approximate original ground contour or shape to blend with the terrain. Loosen the roadbed by ripping, plowing, or scarifying to promote the establishment of vegetation. Scarify a representative area to determine the number of passes necessary to decompact the road surface. Apply this number to the entire project. Pull all major embankments, and use material to contour or fill ditches; or haul it to designated areas, as SHOWN ON THE DRAWINGS. Keep excavated material within the original roadway limits, unless otherwise directed by the CO or SHOWN ON THE DRAWINGS.

(b) Method B. Shape the roadway as SHOWN ON THE DRAWINGS to drain water. Fill ditches and outslope the roadbed when SHOWN ON THE DRAWINGS. Loosen the roadbed by ripping or scarifying to provide a seedbed, and promote establishment of vegetation.

(c) Method C. Treat the roadway as SHOWN ON THE DRAWINGS.

210.04 Waterbars & Barriers. Construct barriers to prevent vehicle access and waterbars as SHOWN ON THE DRAWINGS.

210.05 Establishing Vegetative Cover. Seed, fertilize, and mulch all disturbed areas as specified in Section 625 or SHOWN ON THE DRAWINGS.

Measurement

210.06 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment

210.07 Basis. The quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Seed, fertilizer, and mulch will be a separate PAY ITEM under Section 625.

Payment will be made under:

Pay Item		Pay Unit
210 (01)	Treatment of existing roadway, method _____	Square Meter
210 (02)	Treatment of existing roadway, method _____	Kilometer
210 (03)	Treatment of existing roadway, method _____	Lump Sum
210 (04)	Treatment of _____	Each

Section 220—Rock Blasting

Description

220.01 Work. Fracture rock and construct stable final rock cut faces using controlled backslope blasting and production-blasting techniques, as SHOWN ON THE DRAWINGS. For controlled backslope blasting, use explosives to form a shear plane in the rock along a specified backslope. Controlled backslope blasting includes presplitting and cushion blasting. For production blasting, use explosives to fracture rock to produce slopes in reasonable conformity to the drawings and to minimize rock throw.

Materials

220.02 Requirements. Ensure that material conforms to the specifications in the following subsection:

Explosives & Blasting Accessories 725.24

Construction

220.03 Regulations. Furnish copies or other proof of all applicable permits and licenses. There are Federal, State, and local regulations on the purchase, transportation, storage, and use of explosive material. Federal regulations include the following:

(a) Safety & Health. OSHA, 29 CFR, part 1926, subpart U.

(b) Storage, Security, & Accountability. Bureau of Alcohol, Tobacco, and Firearms, 27 CFR, part 181.

(c) Shipment. U. S. Department of Transportation (DOT), 49 CFR, parts 171–179, 390–397.

220.04 Blasting Plan. Submit a blasting plan at least 14 days before drilling operations begin or whenever a change in drilling and blasting procedures is proposed. Include full details of drilling and blasting patterns and the techniques proposed for controlled and production blasting, including provisions for loading wet holes.

Ensure that the blasting plan contains at least the following:

(a) Maximum dimensions for width, length, and depth of shot.

(b) Typical plan and section view of the drill pattern for controlled backslope blast holes and production blast holes. Show the free face, burden, hole diameters, depths, spacings, inclinations, and depth of subdrilling, if any.

(c) Loading pattern diagram showing:

(1) Location of each hole.

(2) Location and amount of each type of explosive in each hole, including primer and initiators.

(3) Location, type, and depth of stemming.

(d) Initiation and delay methods, delay times, and overall powder factor.

(e) Manufacturer's data sheets for all explosives, primers, initiators, and other blasting devices.

(f) Working procedures and safety precautions for storing, transporting, and handling explosives.

(g) Working procedures and safety precautions for blasting.

The blasting plan is for quality control and recordkeeping purposes. The review of the blasting plan does not relieve the Contractor of the responsibility for using existing drilling and blasting technology, and for obtaining the required results.

220.05 Blaster-In-Charge. At least 10 days before the delivery or use of explosive material, designate in writing a blaster-in-charge.

220.06 Test Blasting. Drill, blast, and excavate one or more short test sections, as proposed in the blasting plan, before full-scale drilling and blasting. Test blasts may be made away from or at the final slope line.

Space blast holes according to the blasting plan for the initial test blast. Adjust the spacing as needed. A blast is unacceptable when it results in fragmentation beyond the final rock face; excessive fly rock; vibration; air blast; overbreak; damage to the final rock face; or a violation of other requirements. When a blast is determined to be unacceptable, revise the blasting plan and make an additional test blast.

220.07 Controlled Backslope Blasting. Perform controlled backslope blasting according to the following specifications:

(a) General. Drill and blast according to the blasting plan. Use controlled backslope blasting methods to form the final rock cut faces when the rock height is more than 3 m above ditch grade and slopes are staked 2:1 or steeper.

Use downhole angle or fan drill blast holes for pioneering the tops of rock cuts or preparing a working platform for controlled blasting. Use the blast hole diameter established for controlled backslope blasting and a hole spacing not exceeding 750 mm.

(b) Drilling. Remove overburden soil and loose rock along the top of the excavation for at least 10 m beyond the production hole drilling limits, or to the end of the cut.

Drill 75 ± 25-mm-diameter controlled backslope blast holes along the final rock face line. Drill controlled blast holes at least 10 m beyond the production holes to be detonated, or to the end of the cut.

Use drilling equipment with mechanical or electrical-mechanical devices that accurately control the angle at which the drill enters the rock. Select a lift height and conduct drilling operations so that the blast hole spacing and down-hole alignment do not vary more than 200 mm from the proposed spacing and alignment. When more than 5 percent of the holes exceed the variance, reduce the lift height and modify the drilling operations until the blast holes are within the allowable variance. Maximum lift height is limited to 20 m.

A 300-mm offset is allowed for a working bench at the bottom of each lift for drilling the next lower controlled blasting hole pattern.

Adjust the drill inclination angle or the initial drill collar location so that the required ditch cross section is obtained when the bench is used.

Drilling 500 mm below the ditch bottom is allowed for removing the toe.

(c) Blasting. Free blast holes of obstructions for their entire depth. Place charges with reasonable care to not cave in the blast hole walls.

Use the types of explosives and blasting accessories necessary to obtain the required results. A bottom charge may be larger than the line charges if no overbreak results. Do not use bulk ammonium nitrate and fuel oil for controlled blasting.

Stem the upper portion of all blast holes, preferably with dry sand or other granular material that passes a 9.5-mm sieve.

Where presplitting, delay the nearest production blast row at least 25 milliseconds after blasting the presplit line. Presplit a minimum of 10 m ahead of production blasting zone.

Where cushion (trim) blasting, delay the cushion blast row from 25 to 75 milliseconds after blasting the nearest production row.

220.08 Production Blasting. Perform production blasting according to the following specifications:

(a) General. Drill production holes and blast according to the blasting plan. Take all necessary precautions to minimize blast damage to the final rock face.

Following a blast, stop work in the entire blast area and check for misfires before allowing workers to return to excavate the rock.

Remove or stabilize all cut face rock that is loose, hanging, or potentially dangerous. Scale by hand using a standard steel mine scaling rod. Machine scale using hydraulic splitters or light blasting when necessary. Leave minor irregularities or surface variations in place if they do not create a hazard. Drill the next lift only after cleanup and stabilization work are completed.

If blasting operations cause fracturing of the final rock face, repair or stabilize it in an approved manner. Repair or stabilization may include removal, rock bolting, rock dowels, or other stabilization techniques.

Halt blasting operations if any of the following occur:

(1) Slopes are unstable.

(2) Slopes exceed tolerances.

(3) Backslope damage occurs.

(4) Public safety is jeopardized.

(5) Property or natural features are endangered.

(6) Fly rock is generated.

(b) Drilling. Drill the row of production blast holes closest to the controlled blast line parallel to the controlled blast line and no closer than 2 m to it. Do not drill production blast holes lower than the bottom of the controlled blast holes.

(c) Blasting. Use the types of explosives and blasting accessories that will obtain the desired fragmentation. Clean the blast holes, place the charges, and stem the holes according to Subsection 220.07(c). Detonate production holes on a delay sequence toward a free face.

220.09 Blasting Log. Submit a blasting log for each blast, including the following in the log:

(a) All actual dimensions of the shot, including blast hole depths, burden, spacing, subdrilling, stemming, powder loads, and timing.

(b) A drawing or sketch showing the direction of the face or faces, and the physical shot layout.

Measurement

220.10 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Measure controlled backslope blast holes by the meter based on the actual length of drilling as recorded in the blasting log when it is included in the SCHEDULE OF ITEMS. All other rock blasting is subsidiary to other PAY ITEMS.

Payment

220.11 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item		Pay Unit
220 (01)	Controlled backslope blast hole	Meter

Section 221—Earthwork Geotextiles

Description

221.01 Work. Furnish and place a geotextile as a permeable separator or permanent erosion control measure.

Geotextile types are designated as follows:

Type II (A, B, or C)	Separation
Type III (A or B)	Stabilization
Type IV (A, B, C, D, E, or F)	Permanent erosion control

Materials

221.02 Requirement. Ensure that material conforms to specifications in the following subsection:

Geotextiles 714.01

Construction

221.03 General. Where placing geotextiles on native ground, cut the trees and shrubs flush with the ground surface. Do not remove the topsoil and vegetation mat. Remove all sharp objects and large rocks. Fill depressions or holes with suitable material to provide a firm foundation.

Replace or repair all geotextile that is torn or punctured. When repairing, place a patch of the same type of geotextile overlapping 1 m beyond the damaged area.

221.04 Separation & Stabilization Applications. Where placing geotextiles on a subgrade, prepare the subgrade according to Subsections 203.08(c) and 203.08(d).

Place the geotextile smooth and free of tension, stress, or wrinkles. Fold or cut the geotextile to conform to curves. Overlap in the direction of construction. Overlap the geotextile a minimum of 500 mm at the ends and sides of adjoining sheets, or sew the geotextile joints according to the manufacturer's recommendations. Do not place longitudinal overlaps below anticipated wheel loads. Hold the geotextile in place with pins, staples, or piles of cover material.

End dump the cover material onto the geotextile from the edge of the geotextile or from previously placed cover material. Do not operate equipment directly on the

geotextile. Spread the end-dumped pile of cover material, maintaining a minimum lift thickness as SHOWN ON THE DRAWINGS. Compact the cover material with rubber-tired or nonvibratory smooth drum rollers. Avoid sudden stops, starts, or turns of the construction equipment. Fill all ruts from construction equipment with additional cover material. Do not regrade ruts with placement equipment.

Place subsequent lifts of cover material in the same manner. Vibratory compactors may be used for compacting subsequent lifts. If foundation failures occur, repair the damaged areas and revert to the use of nonvibratory compaction equipment.

221.05 Erosion Control Applications. Place and anchor the geotextile on an approved smooth-graded surface. For slope or wave protection, place the long dimension of the geotextile down the slope. For stream bank protection, place the long dimension of the geotextile parallel to the centerline of the channel.

Overlap the geotextile a minimum of 300 mm at the ends and sides of adjoining sheets, or sew the geotextile joints according to the manufacturer's recommendations. Overlap the uphill or upstream sheet over the downhill or downstream sheet. Offset end joints of adjacent sheets a minimum of 1.5 m. Pins may be used to hold the geotextile sheets in place. Space pins along the overlaps at approximately 1 m between pins.

Place aggregate, slope protection, or riprap on the geotextile starting at the toe of the slope and proceed upward. Place riprap onto the geotextile from a height of less than 300 mm. Place slope protection rock or aggregate backfill onto the geotextile from a height less than 1 m. In underwater applications, place the geotextile and cover material on the same day.

Measurement

221.06 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Measure earthwork geotextile by the square meter on a plane parallel to the ground surface, excluding overlaps.

Payment

221.07 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item		Pay Unit
221 (01)	Earthwork geotextile, type ____	Square Meter

Section 249—Composite Road Construction

Description

249.01 Work. Perform clearing and grubbing, excavation and embankment, and erosion control. During clearing and grubbing, treat merchantable timber and construction slash, including all trees designated for removal. During excavation and embankment, excavate and use borrow material; excavate drainage; shape the roadway, including approaches, turnarounds, ditches, and drainage dips; and place all excavated material, regardless of nature. Perform erosion control by furnishing and placing seed, fertilizer, mulch, and tackifier as SHOWN ON THE DRAWINGS. Construct the roadway in conformance with the dimensions SHOWN ON THE DRAWINGS or designated on the ground.

Materials

249.02 Requirement. Ensure that materials are as SHOWN ON THE DRAWINGS, and that they meet requirements specified in the following section and subsection:

Seeding & Mulching 625
Stabilizing Emulsion Tackifiers 713.12

Construction

249.03 Clearing & Disposal. Protect construction stakes and construction control markers. Remove or treat all trees, snags, downed timber, brush, and stumps within the clearing limits according to the following specifications:

(a) Merchantable Timber. Deck or remove timber meeting Utilization Standards as SHOWN ON THE DRAWINGS.

(b) Unmerchantable Timber. Treat unmerchantable timber as SHOWN ON THE DRAWINGS.

(c) Large Construction Slash. Treat construction slash larger than 75 mm in diameter and longer than 1 m by one or more of the following methods, as SHOWN ON THE DRAWINGS:

(1) Method A. Incorporate construction slash in the embankment.

(2) Method B. Windrow construction slash inside the clearing limits. When slash is windrowed, place it approximately parallel to the roadway outside the toe of the fill slope.

(3) Method C. Scatter construction slash outside the roadway without damaging trees. Limb all logs. Place logs and stumps away from trees, positioned so they will remain in place and are not on top of one another.

(4) Method D. Construct piles that are free of soil, with smaller slash well mixed with larger slash. Buck unmerchantable logs into lengths less than 6 m prior to placement in piles.

(5) Method E. Sidecast construction slash into the area below the roadway. Slash may be sidecast beyond the lower clearing limit for a distance not to exceed 3 m.

(6) Method F. Bury construction slash within the roadway limits. Construct mats in layers and cover the mats with at least 500 mm of rock and soil.

(7) Method G. Construct piles of construction slash in the areas SHOWN ON THE DRAWINGS or designated on the ground. Construct the piles so that burning does not damage standing trees. Burn the piles until all the material remaining in the pile is charred or ash.

(8) Method H. Bury the construction slash outside the roadway at the locations SHOWN ON THE DRAWINGS or designated on the ground. Construct mats in layers, and cover the mats with at least 500 mm of rock and soil. Slope the final surface to drain.

(9) Method J. Construct a debris mat of construction slash under the road subgrade. Use tree limbs, tops, cull logs, split stumps, wood chunks, and other debris to form a mat. Place stumps upside down and blended into the mat as SHOWN ON THE DRAWINGS.

(d) Small Construction Slash. Construction slash less than 75 mm in diameter and less than 1 m may be incorporated into embankments so long as the material is distributed so that it does not result in concentrations or matting.

Immediately remove slash deposited in stream courses.

Fell all dead trees outside the clearing limits that lean toward the road and are sufficiently tall to reach the roadbed. Fell hazard or unstable live trees designated on the ground outside the clearing limits before felling timber in the immediate clearing vicinity.

Leave stump heights less than 300 mm or one-third of the stump diameter, whichever is greater, measured on the side adjacent to the highest ground. Leave felled trees outside the clearing limits in place, and treat them no further unless otherwise SHOWN ON THE DRAWINGS.

249.04 Pioneering. Do not undercut the final back slope during pioneering operations. Deposit material inside the roadway limits. Do not restrict drainage.

249.05 Grubbing. Grub within the limits as SHOWN ON THE DRAWINGS. Stumps outside the grubbing limits may remain if cut no higher than 300 mm or one-third of the stump diameter, whichever is greater, above the original ground, measured on the uphill side, unless otherwise SHOWN ON THE DRAWINGS. Grub stumps that will protrude through the subgrade or have less than 150 mm of cover.

249.06 Excavation & Embankment. Construct the roadway to conform to the typical sections SHOWN ON THE DRAWINGS. Protect backslopes from being undercut. Embankment may be placed by side casting and end dumping.

Locate and use borrow material, and remove and treat unsuitable or excess material, as SHOWN ON THE DRAWINGS.

Place rocks that are too large to be incorporated in the embankment outside the traveled way on the downhill side such that they will not roll, obstruct drainage, or hinder roadbed use and maintenance.

Leave slopes that are to be seeded in a roughened condition.

Shape and finish the roadbed to the condition ordinarily accomplished by a crawler tractor with dozer blade to provide drainage of surface water, unless otherwise SHOWN ON THE DRAWINGS. Do not permit individual rocks to protrude more than 100 mm above the subgrade of the roadbed. A motor grader finish is not required.

Unless otherwise SHOWN ON THE DRAWINGS, observe a width tolerance for the traveled way of (+) 750 mm.

249.07 Erosion Control. Perform erosion control measures, including seeding, as SHOWN ON THE DRAWINGS. Use methods and rates of application, and types of seed, fertilizer, mulch, and tackifier, as specified in Section 625 and SHOWN ON THE DRAWINGS. Apply materials uniformly to the areas to be treated.

Measurement

249.08 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment

249.09 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item		Pay Unit
249 (01)	Composite road construction	Kilometer
249 (02)	Composite road construction	Lump Sum

DIVISION 250
Structural Embankments

Section 251—Riprap

Description

251.01 Work. Furnish and place riprap for bank protection, slope protection, drainage structures, and erosion control.

Riprap classes are designated as shown in table 705-1.

Materials

251.02 Requirements. Provide materials that conform to requirements in the following subsections:

Geotextiles, Type IV (A, B, C, D, E, or F)	714.01
Mortar for Masonry Beds & Joints	712.05
Riprap Rock	705.02
Rock for Hand-Placed Embankments	705.05
Granular Backfill	703.03

Provide gravel cushion that meets the gradation requirements SHOWN ON THE DRAWINGS and the quality requirements specified in Subsection 703.06.

Construction

251.03 General. Minimize ground disturbance where practicable in preparing for placement of riprap. Prepare surfaces by removing logs, cutting brush and stumps flush with the ground, or as SHOWN ON THE DRAWINGS. Remove all soft or spongy material to the depths SHOWN ON THE DRAWINGS and replace it with approved material. Perform structural excavation and backfill as specified in Section 206A. Place geotextile as SHOWN ON THE DRAWINGS.

Control gradation by visual inspection. When SHOWN ON THE DRAWINGS, provide two samples of the specified class of rock. Each sample shall be at least 4.5 t or 10 percent of the total riprap weight, whichever is less. Provide one sample at the construction site, which may be a part of the finished riprap covering. Provide the other sample at the quarry. Use these samples as a frequent reference for judging the gradation of the riprap supplied. When specified in the SPECIAL PROJECT SPECIFICATIONS, provide mechanical equipment at the sorting site and the labor needed to assist in checking gradation.

251.04 Placed Riprap. Placed riprap is rock placed on a prepared surface to form a well-graded mass.

(a) Method A, Machine Placed. Place riprap to its full thickness in one operation to avoid displacing the underlying material. Do not place riprap material by methods that cause segregation or damage to the prepared surface. Place or rearrange individual rocks by mechanical or manual methods to obtain a compact uniform blanket with a reasonably smooth surface.

(b) Method B, End Dumped. Dump riprap to its full thickness in one operation. Avoid displacing the underlying material. Distribute larger rocks throughout the mass of stone. Obtain a uniformly thick blanket with a reasonably smooth surface.

251.05 Keyed Riprap. Keyed riprap is rock placed on a prepared surface and keyed into place by striking with a flat-faced weight.

Place rock for keyed riprap according to Subsection 251.04. Key the riprap into place by striking the surface with a 1.2 x 1.5-m flat-faced weight that weighs approximately 2,000 kg. Do not strike riprap below the water surface.

251.06 Mortared Riprap. Mortared riprap is rock placed on a prepared surface with the voids filled with Portland cement mortar.

Place rock for mortared riprap according to Subsection 251.04. Thoroughly moisten the rocks and wash any excess fines to the underside of the riprap. Place mortar only when the temperature is above 2 °C and rising. Place the mortar in a manner to prevent segregation. Fill all voids without unseating the rocks. Provide weep holes through the riprap as SHOWN ON THE DRAWINGS. Protect the mortared riprap from freezing and keep it moist for 3 days after the work is completed.

Where the depth SHOWN ON THE DRAWINGS for grouting is in excess of 300 mm, place the riprap in lifts of 300 mm or less. Grout each lift prior to placing the next lift. Construct and grout the succeeding lifts before the grout in the previous lift has hardened.

251.07 Sacked Concrete Riprap. Ensure that type A and type B sacked concrete riprap is prepared as described below.

(a) Type A. Prepare concrete containing at least 195 kg of cement per cubic meter; aggregate with a maximum size of 60 mm; and water limited to that necessary to ensure good workability without loss of cement by seepage through the sacks. Use reasonably clean and strong aggregate of appropriate size gradation. Use sacks that are at least 310 g/m^2 burlap, with a 1,016-mm width, or equivalent. Ensure that minimum weight of the filled sack is 25 kg. Place sacks while contents are moist. Premixed concrete that meets the requirements specified in this section is acceptable.

Loosely place the sacks, filled with concrete, to leave room for folding at the top. Make the fold just enough to retain the concrete at time of placing. Immediately after filling the sacks with concrete, place and lightly trample them to cause them to conform with the earth face and with adjacent sacks.

Remove all dirt and debris from the top of the sacks before the next course is laid thereon. Place stretchers so the folded ends will not be adjacent. Place headers with the folds toward the earth face. Do not place more than four vertical courses of sacks in any tier until initial set has taken place in the first course of any such tier.

(b) Type B. Provide type B (premixed) sacked concrete riprap containing commercially packaged dry combined materials for concrete. Ensure that each sack weighs at least 30 kg; is about 300 x 450 x 150 mm in size; and is strong enough for the mass of concrete it contains and free of tears and imperfections. Ensure that the concrete has not taken an initial set prior to placing.

Place and lightly compress sacks to cause them to conform with the earth surface and with adjacent sacks. When more than one layer of sacks is required, stagger joints one-half sack width. Do not place more than four vertical courses (one tier) of sacks until initial set has taken place in the first course of any such tier.

After placement, penetrate each sack at least six times from the top through the entire sack thickness, leaving at least a 13- to 25-mm-diameter void in the concrete mixture. Do not damage the sack through these penetrations to the extent that the concrete mixture is spilled or wasted.

When there will not be proper bearing or bond for the concrete because of delays in placing succeeding layers of sacks or because the work is hampered by storms, mud, or other causes, excavate a small trench behind the row of sacks already in place, and fill the trench with fresh concrete before laying the next layer of sacks.

Keep sacked concrete riprap moist and protected from freezing for a period of 4 days after placement.

251.08 Sacked Soil Cement Riprap. Sacked soil cement riprap may be composed of any combination of gravel, sand, silt, and clay with the following limitations: do not use topsoil; ensure that at least 55 percent of the mixed soil passes the 4.75-mm (no. 4) sieve, and that not more than 15 percent passes the 75-µm (no. 200) sieve; and ensure that the maximum size gravel passes the 37.5-mm sieve. Pulverize the soil so that no lumps exceed 13 mm in diameter. Thoroughly and uniformly mix the cement, soil, and water before placing in sacks. Limit moisture content to that necessary for good mixing without seepage. Provide sacks that are at least 310 g/m^2 burlap, with a 1,016-mm width, or

equivalent. Ensure that the minimum weight of the filled sack is 25 kg. Place sacks while contents are moist.

The cement requirements in percent by volume for each soil group are shown below:

AASHTO Classification (M 145) Soil Group	Percent Cement by Volume
A-1-a	7
A-1-b	9
A-2	10
A-3	12
A-4	12
A-5	13
A-6	14
A-7	15

251.09 Hand-Placed Riprap. Securely bed the rock. Use spalls and small rocks to fill voids. Fill any spaces in back of the hand-placed riprap with compacted material.

251.10 Granular Filter Blanket. Place a sheathing material as specified in Subsection 703.04 where SHOWN ON THE DRAWINGS to the full specified thickness of each layer in one operation, using methods that will not cause segregation of particle sizes within the layer. Ensure that the surface of the finished layer is reasonably even and free of mounds or windrows. Place additional layers of filter material in a manner that will not cause mixture of the material in the different layers.

251.11 Geotextile. Place the geotextile as SHOWN ON THE DRAWINGS. Provide surfaces upon which the geotextile is to be placed with a uniform slope, and make them reasonably smooth and free of obstructions, depressions, and debris that could damage the geotextile. Have the surfaces approved before placing geotextile.

Loosely lay the geotextile without wrinkles or creases. Sew or overlap adjacent strips at joints. Insert securing pins through both strips of overlapped geotextile at maximum intervals of 900 mm, but not closer than 50 mm to each edge. Prevent the geotextile from being displaced.

Have the installed geotextile approved before covering with granular backfill or other materials. Carefully place the granular backfill on the geotextile to the depth SHOWN ON THE DRAWINGS by methods that will not damage the geotextile. Do not drop riprap placed on the granular backfill a distance greater than 900 mm.

Measurement

251.12 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment

251.13 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item	Pay Unit
251 (01) Placed riprap, class _____, method _____	Cubic Meter
251 (02) Placed riprap, class _____, method _____	Ton
251 (03) Placed riprap, class _____, method _____	Square Meter
251 (04) Keyed riprap, class _____	Cubic Meter
251 (05) Keyed riprap, class _____	Ton
251 (06) Mortared riprap, class _____	Cubic Meter
251 (07) Sacked concrete riprap, type _____	Square Meter
251 (08) Sacked concrete riprap, type _____	Cubic Meter
251 (09) Sacked soil cement riprap	Square Meter
251 (10) Sacked soil cement riprap	Cubic Meter
251 (11) Granular filter blanket	Cubic Meter
251 (12) Hand-placed riprap	Square Meter
251 (13) Geotextile, type IV, _____	Square Meter

Section 252—Special Rock Embankment & Rock Buttress

Description

252.01 Work. For special rock embankment, furnish rock and place it mechanically or by hand in fill sections. For rock buttress, furnish rock and place it mechanically or by hand in cut sections.

Special rock embankments and rock buttresses are designated as hand placed or mechanically placed.

Materials

252.02 Requirements. Furnish material that conforms to specifications in the following subsections:

Geotextiles, Type II (A, B, or C) 714.01
Rock for Hand-Placed Embankments 705.05
Rock for Mechanically Placed Embankments 705.04

Control gradation by visual inspection. When SHOWN ON THE DRAWINGS, provide two samples of the specified class of rock. Each sample shall be at least 4.5 t or 10 percent of the total rock weight, whichever is less. Provide one sample at the construction site, which may be a part of the finished rock covering. Provide the other sample at the quarry. Use these samples as a frequent reference for judging the gradation of the rock supplied. When specified in the SPECIAL PROJECT SPECIFICATIONS, provide mechanical equipment at the sorting site and the labor needed to assist in checking gradation.

Construction

252.03 Geotextile Installation. Place the geotextile as SHOWN ON THE DRAWINGS. Ensure that the surfaces upon which geotextile is to be placed have a uniform slope and are reasonably smooth and free of obstructions, depressions, and debris that could damage the geotextile. Have the surface approved by the CO prior to placing geotextile.

Lay the geotextile without tension, stress, wrinkles, or creases. Sew or overlap adjacent strips a minimum of 300 mm at joints. Insert securing pins through both strips of overlapped geotextile at maximum intervals of 900 mm, but no closer than 50 mm to each edge, to prevent the geotextile from being displaced.

Have the installed geotextile approved by the CO prior to covering.

252.04 Placing Rock. Perform the work specified in Section 203 or 206A, as required.

Place the rock in a stable orientation with minimal voids. Offset the rock to produce a random pattern. Use spalls smaller than the minimum rock size to chock the larger rock solidly in position and to fill voids between the large rocks.

Construct the exposed face of the rock mass to be reasonably uniform, with no projections beyond the neat line of the slope that are more than 500 mm for mechanically placed rock and 300 mm for hand-placed rock, or as SHOWN ON THE DRAWINGS.

Measurement

252.05 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment

252.06 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item	Pay Unit
252 (01) Special rock embankment, _____	Cubic Meter
252 (02) Special rock embankment, _____	Square Meter
252 (03) Special rock embankment, _____	Ton
252 (04) Rock buttress, _____	Cubic Meter
252 (05) Rock buttress, _____	Square Meter
252 (06) Rock buttress, _____	Ton
252 (07) Geotextile, type II, _____	Square Meter

Section 253—Gabions

Description

253.01 Work. Construct gabion structures and mattresses.

Materials

253.02 Requirements. Ensure that material conforms to specifications in the following subsections:

Gabion Material	720.02
Gabion Rock	705.01
Geotextiles, Type IV (A, B, C, D, E, or F)	714.01
Structural Backfill	704.04

Construction

253.03 General. Perform the work specified in Section 206A.

253.04 Basket Assembly. Do not damage wire coatings during basket assembly, structure erection, cell filling, or backfilling. Rotate the basket panels into position and join the vertical edges with fasteners according to Subsection 253.05. Temporary fasteners may be used for basket assembly if they are supplemented during structure erection with permanent fasteners according to Subsection 253.05.

Rotate the diaphragms into position and join the vertical edges according to Subsection 253.05.

253.05 Structure Erection. Place the empty gabion baskets on the foundation and interconnect the adjacent baskets along the top and vertical edges using fasteners.

Where lacing wire is used, wrap the wire with alternating single and double loops every other mesh opening and not more than 150 mm apart. Where spiral binders are used, crimp the ends to secure the binders in place. Where alternate fasteners are used, space the fasteners in every mesh opening and not more than 150 mm apart.

In the same manner, interconnect each vertical layer of baskets to the underlying layer of baskets along the front, back, and sides. Stagger the vertical joints between the baskets of adjacent rows and layers by at least one cell length.

253.06 Cell Filling. Remove all kinks and folds in the wire mesh, and properly align all the baskets. Place rock carefully in the basket cells to prevent the baskets from bulging and to minimize voids in the rock fill. Maintain the basket alignment.

Place internal connecting wires in each unrestrained exterior basket cell greater than 300 mm in height. This includes interior basket cells left temporarily unrestrained. Place internal connecting wires concurrently with rock placement.

Fill the cells in any row or layer so that no cell is filled more than 300 mm above an adjacent cell. Repeat this process until the basket is full and the lid bears on the final rock layer.

Secure the lid to the sides, ends, and diaphragms according to Subsection 253.05. Make all exposed basket surfaces smooth and neat, with no sharp rock edges projecting through the wire mesh.

253.07 Geotextile Installation. Place the geotextile according to Section 221 or as SHOWN ON THE DRAWINGS. Ensure that the surfaces upon which geotextile is to be placed have a uniform slope and are reasonably smooth and free of obstructions, depressions, and debris that could damage the geotextile. Have the surface approved by the CO prior to placing geotextile.

Lay the geotextile without tension, stress, wrinkles, or creases. Sew or overlap adjacent strips a minimum of 300 mm at joints. Insert securing pins through both strips of overlapped geotextile at maximum intervals of 900 mm, but no closer than 50 mm to each edge, to prevent the geotextile from being displaced.

Have the installed geotextile approved by the CO prior to backfilling with structural backfill or other approved material.

253.08 Backfilling. Backfill behind the gabion structure concurrently with the cell- filling operation. Backfill the area behind the gabion structure with structural backfill or acceptable roadway excavation, as approved by the CO. Compact each layer in accordance with Subsection 203.16(b), method 4.

253.09 Gabion Mattresses. Place a geotextile according to Section 221. Construct revet mattresses according to Subsections 253.04 through 253.06. Anchor the mattresses in place. Place geotextile against the vertical edges of the mattress, and backfill against the geotextile using structural backfill or other material, as approved by the CO. Overfill gabion mattresses by 30 to 50 mm.

Measurement

253.10 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment

253.11 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item		Pay Unit
253 (01)	Gabions, galvanized- or aluminized-coated	Square Meter
253 (02)	Gabions, epoxy- or polyvinylchloride (PVC)-coated	Square Meter
253 (03)	Gabions, galvanized- or aluminized-coated	Cubic Meter
253 (04)	Gabions, epoxy- or PVC-coated	Cubic Meter
253 (05)	Geotextile, type IV, _____	Square Meter

Section 254—Crib Walls

Description

254.01 Work. Construct concrete, metal, or timber crib retaining walls.

Materials

254.02 Requirements. Ensure that material conforms to specifications in the following subsections:

Bed Course	704.09
Crib Wall Backfill	704.12
Hardware & Structural Steel	716.02
Geotextiles, Type IV (A, B, C, D, E, or F)	714.01
Metal Bin Type Crib Walls	720.03
Precast Concrete Units	725.11
Structural Backfill	704.04
Treated Structural Timber & Lumber	716.03

Construction

254.03 General. Perform the work specified in Section 206. When the wall is set on a rocky foundation, place 200 mm of bed course under the wall base elements.

254.04 Erection. Furnish all necessary bolts, nuts, and hardware for complete assembly of the units into a continuous wall of connected units. Erect the crib wall according to the fabricator's or manufacturer's instructions. On curves, obtain the proper curvature for the face by using shorter stringers in the front or rear panels. Construct the wall to within 25 mm per 3 m from the lines and elevations, as SHOWN ON THE DRAWINGS.

(a) Concrete Crib Wall. Remove and replace all concrete members that are cracked or damaged.

(b) Metal Crib Wall. Torque bolts for metal crib walls according to manufacturer's recommendations.

(c) Timber Crib Wall. Construct timber cribs according to Section 557.

254.05 Geotextile Installation. Place the geotextile as SHOWN ON THE DRAWINGS. Ensure that the surfaces upon which geotextile is to be placed have a uniform slope and are reasonably smooth and free of obstructions, depressions,

and debris that could damage the geotextile. Have the surface approved by the CO prior to placing geotextile.

Lay the geotextile without tension, stress, wrinkles, or creases. Sew or overlap adjacent strips a minimum of 300 mm at joints. Insert securing pins through both strips of overlapped geotextile at maximum intervals of 900 mm, but no closer than-50 mm to each edge, to prevent the geotextile from being displaced.

Have the installed geotextile approved by the CO prior to backfilling.

254.06 Backfilling. Backfill the inside of the cribs formed by the wall members with crib wall backfill in 150-mm layers. Place crib wall backfill, structural backfill, or acceptable roadway excavation behind cribs. Maintain an equal elevation of fill behind and inside cribs during backfilling operations. Compact each layer according to Subsection 203.16(b), method 4.

Measurement

254.07 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment

254.08 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item	Pay Unit
254 (01) Concrete crib retaining wall	Square Meter
254 (02) Metal crib retaining wall	Square Meter
254 (03) Treated timber crib retaining wall	Square Meter
254 (04) Crib wall backfill	Cubic Meter
254 (05) Geotextile, type IV, _____	Square Meter

Section 255—Mechanically Stabilized Earth Walls

Description

255.01 Work. Construct mechanically stabilized earth walls.

Materials

255.02 Requirements. Ensure that material conforms to specifications in the following section and subsections:

Geotextiles, Type IV (A, B, C, D, E, or F)	714.01
Mechanically Stabilized Earth Wall Material	720.01
Minor Concrete Structures	602
Select Granular Backfill	704.10
Structural Backfill	704.04

Construction

255.03 General. Perform the work specified in Section 206. Grade the foundation for a width equal to the length of reinforcing mesh or strips plus 500 mm. Where the wall is set on a rocky foundation, place 150 mm of select granular backfill under the reinforcing mesh or strips.

For concrete-faced walls, provide a precast reinforced or a nonreinforced cast-in-place concrete leveling pad. Cure cast-in-place leveling pads a minimum of 12 hours before placing wall panels.

255.04 Wall Erection. Erect the wall as SHOWN ON THE DRAWINGS and according to the manufacturer's recommendations.

(a) Concrete-Faced Walls. Erect panels by means of lifting devices connected to the upper edge of the panel. Align precast facing panels within 19 mm vertically and horizontally when measured with a 3-m straightedge.

Make the joint openings 19 mm ± 6 mm wide. Install joint material according to the drawings. Cover all joints on the backside of the panels with a 300-mm-wide strip of geotextile. Overlap geotextile splices a minimum of 100 mm.

Hold the panels in position with temporary wedges or bracing during backfilling operations. Erect the wall so the overall vertical tolerance (top to bottom) does not exceed 13 mm per 3 m of wall height.

(b) Wire-Faced Walls. Place backing mats and 6-mm hardware cloth in successive horizontal lifts as backfill placement proceeds. Connect, tighten, and anchor soil reinforcement elements to the wall facing units before placing backfill. Do not exceed an individual lift vertical tolerance and an overall-wall (top-to-bottom) vertical tolerance of 25 mm per 3 m of wall height. Place reinforcement elements within 25 mm vertically of the corresponding connection elevation at the wall face. Do not deviate from the designed batter of the wall by more than 25 mm per 3 m of wall height. Do not deviate more than 50 mm at any point in the wall from a
3-m straightedge placed horizontally on the theoretical plane of the design face.

(c) Gabion-Faced Walls. Furnish and assemble gabion baskets according to Subsection 253.04. Lay reinforcement mesh horizontally on compacted fill. Place the soil reinforcement mesh normal to the face of the wall. Connect the gabion facing unit to reinforcement mesh with spiral binders or tie wire at 100 mm nominal spacing with alternating single and double locked loops. Join adjacent baskets along vertical edges according to Subsection 253.05. Fill gabion basket cells according to Subsection 253.06. Pull and anchor the reinforcement mesh taut before placing backfill. Place gabion baskets in successive horizontal lifts in the sequence shown on the drawings as backfill placement proceeds.

255.05 Backfilling. Backfill and compact the stabilized volume with select granular backfill in accordance with Subsection 203.16(b), method 4. Ensure that no voids exist beneath the reinforcing mesh or strips. Where spread footings used to support bridge or other structural loads are supported by the stabilized volume, compact the top 1.5 m below the footing elevation to at least 100 percent of the maximum density, as determined by AASHTO T 99, method C or D.

Do not damage or disturb the facing, reinforcing mesh, or strips. Compact within 1 m of the wall face with an approved lightweight mechanical tamper, roller, or vibratory system. Correct all damaged, misaligned, or distorted wall elements.

Backfill and compact behind the stabilized volume with structural backfill or suitable roadway excavation.

At the end of each day's operation, slope the last lift of backfill away from the wall face to rapidly direct runoff away from the wall. Do not allow surface runoff from adjacent areas to enter the wall construction site.

Measurement

255.06 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment

255.07 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item	Pay Unit
255 (01) Mechanically stabilized earth wall	Square Meter

Section 257—Alternate Retaining Walls

Description

257.01 Work. Ensure that various types of retaining walls are constructed at the Contractor's option. The alternate wall types are gabions, crib walls, mechanically stabilized earth walls, permanent ground anchor walls, reinforced concrete retaining walls, and reinforced soil embankments.

Materials

257.02 Requirements. Ensure that material conforms to specifications in the following sections:

Crib Walls 254
Driven Piles 551
Gabions 253
Mechanically Stabilized Earth Walls 255
Reinforced Soil Embankments 259
Reinforcing Steel 554
Structural Concrete 552

Construction

257.03 General. The designer/supplier furnishing the proposed wall is responsible for the stability of the wall. Do not qualify the responsibility for the design or restrict the use of the drawings or calculations for the proposed alternate. Indemnify the Government from all claims for infringement of proprietary rights by others without the consent of the patent holders or licensees.

257.04 Submittal. Submit a proposal using any of the wall types listed. Submit wall type proposals on a site-by-site basis. Different types may be used at individual sites on the project.

Provide drawings of the proposed wall within 120 days of the notice to proceed and at least 90 days before starting wall construction. Verify the limits of the wall before preparing drawings.

All drawings shall be signed by a licensed professional engineer.

Include all details, dimensions, quantities, ground profiles, and cross sections necessary to construct the wall. Submit design calculations on sheets about 200 x 300 mm in size with the project number, wall location, designation, date of

preparation, initials of designer and checker, and page number at the top of the page.

Provide an index page with the design calculations. Ensure that the drawings include, but are not limited to, the following items:

(a) Plan and elevation drawings for each wall, containing the following:

(1) A plan view of the wall, identifying:

(a) The offset from the construction centerline to the face of the wall at its base at all changes in horizontal alignment.

(b) The limit of widest module, mesh, strip, or anchor.

(c) The centerline of any drainage structure or drainage pipe behind, passing through, or passing under the wall.

(2) An elevation view of the wall identifying:

(a) The elevation at the top of the wall, at all horizontal and vertical break points, and at least every 10 m along the wall.

(b) Elevations at the wall base, the top of leveling pads and footings, or the bottom of soldier piles.

(c) The wall batter.

(d) The distance along the face of the wall to all steps in the wall base, footings, leveling pads, or lagging.

(e) The type of panel or depth of module or lagging.

(f) The length and type of mesh, strips, or anchors.

(g) The distance along the face of the wall to where changes in length of the mesh, strips, or anchors occur.

(h) The original and final ground line.

(3) General notes for constructing the wall.

(4) Horizontal and vertical curve data affecting the wall. Match lines or other details to relate wall stationing to centerline stationing.

(5) A listing of the summary of quantities on the elevation drawing of each wall.

(b) Dimensions and schedules of all reinforcing steel, including reinforcing bar bending details, dowels, and/or studs for attaching the facing.

(c) Details and dimensions for foundations and leveling pads, including steps in the footings or leveling pads.

(d) Details and dimensions for:

(1) All panels, modules, soldier piles, and lagging necessary to construct the element.

(2) All reinforcing steel in the element.

(3) The location of mesh, strip attachment, or anchor devices embedded in the panels.

(4) All anchors and soldier piling, including the spacing and size of piles and the spacing and angle of anchors.

(e) Details for constructing walls around drainage facilities.

(f) Details for terminating walls and adjacent slope construction.

(g) Architectural treatment details.

(h) Design notes including an explanation of any symbols and computer programs used in the design of the walls. Specify the factors of safety for sliding, pullout, and overturning. Specify the bearing pressure beneath the wall footing, stabilized earth mass, or soldier piles.

(i) Verification of the design criteria for the site-specific wall locations with test procedures, results, and interpretations. Include results from creep, durability, construction-induced damage, and junction strength tests.

(j) Other design calculations.

Process all submissions unless written permission is given for the wall designer/supplier and the CO to communicate directly.

Submit three sets of the wall drawings with the initial submission. One set will be returned with any indicated corrections. If revisions are necessary, make the necessary corrections and resubmit three revised sets.

When the drawings are approved, furnish five sets and a mylar sepia set of the drawings.

257.05 Construction. Construct the wall according to the approved drawings and the following sections, as applicable:

(a) Gabions—Section 253.

(b) Crib walls—Section 254.

(c) Mechanically stabilized earth walls—Section 255.

(d) Permanent ground anchor walls—Sections 551 and 552.

(e) Reinforced soil embankments—Section 259.

Revise the drawings when plan dimensions are revised due to field conditions or for other reasons.

Measurement

257.06 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Measure alternate retaining walls by the lump sum.

Payment

257.07 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

When plan dimensions are changed by the CO during construction to account for field conditions, the lump sum price of the wall will be adjusted by applying a calculated per-square-meter cost adjustment factor to the added or decreased wall front face area resulting from the change. The adjustment factor will be determined by dividing the lump sum price bid for each wall by its estimated area shown in the PAY ITEM.

The alternate retaining wall lump sum will be paid based on the progress of the work under this section.

Payment will be made under:

Pay Item	Pay Unit
257 (01) Alternate retaining wall _____ *Location* (_____ square meters) *Estimated*	Lump Sum

Section 259—Reinforced Soil Embankments

Description

259.01 Work. Construct reinforced soil embankments. Geogrid soil reinforcement material categories are designated as shown in table 714-7.

Materials

259.02 Requirements. Ensure that material conforms to specifications in the following subsections:

Geogrids, Categories 1, 2, 3, 4, 5, or 6 ..... 714.03
Select Granular Backfill 704.10

Construction

259.03 General. Lay soil reinforcements at the proper elevation and alignment, as SHOWN ON THE DRAWINGS.

Orient soil reinforcements such that the maximum tensile strength available is in the direction of primary reinforcement, as SHOWN ON THE DRAWINGS.

Do not splice reinforcements in the primary direction. Geogrids may be overlapped three ribs (approximately 25 mm) in the direction transverse to the primary direction, and may be held together with hog rings or other approved devices.

Install soil reinforcements in accordance with manufacturer's recommendations for their intended purpose. Include a copy of those recommendations with project submittals.

Exercise care to prevent wrinkle development and/or slippage of reinforcement during fill placement and spreading. Prior to beginning work, submit a plan indicating how the stretching and staking will be accomplished.

Do not permit construction equipment to operate directly upon the reinforcement material. A minimum fill thickness of 150 mm is required prior to operation of tracked vehicles over the reinforced material. Keep turning of tracked vehicles to a minimum to prevent tracks from displacing the fill and damaging the material.

Ensure that the following tolerances apply to the elevations and dimension as SHOWN ON THE DRAWINGS: install the base of reinforcement material within ± 100 mm of that specified; and do not permit any layer to exceed 300 mm in thickness.

259.04 Field Adjustments. The final limits and configuration of the fills or reinforcement sections may vary, depending on the foundation materials encountered during excavation. Ensure that final foundation limits are approved by the CO in writing before placing any backfill material.

At least 48 hours before beginning work, notify the CO to inspect the foundation.

259.05 Excavation. Dispose of unsuitable material as SHOWN ON THE DRAWINGS.

259.06 Performance. Maintain all construction stakes to control the work.

259.07 Backfilling. Provide select granular backfill material that meets requirements specified in Subsection 704.10, unless otherwise SHOWN ON THE DRAWINGS. Place and compact backfill in accordance with Subsection 203.16(b), method 4. Do not use sheepsfoot rollers to obtain compaction. On geogrid fills, place backfill so as to keep tension in the geogrid.

259.08 Slope Face Treatment. Treat the face of the reinforced slope for erosion control in accordance with Section 204 and as SHOWN ON THE DRAWINGS.

Measurement

259.09 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be based on the contract unit price of reinforcing material placed and accepted. This will be exclusive of overlap and wastage.

Payment

259.10 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item	Pay Unit
259 (01) Geogrid category_____	Square Meter

DIVISION 300
Bases

Section 304—Aggregate Base or Surface Course

Description

304.01 Work. Furnish, haul, and place aggregate base or surface course on the subgrade or base or stockpile site approved by the CO. Work may include additive mineral filler, or binder as specified in the SPECIAL PROJECT SPECIFICATIONS. Produce aggregate by pit-run, grid-rolling, screening, or crushing methods, or procure Government-furnished aggregate, as DESIGNATED IN THE SCHEDULE OF ITEMS.

Materials

304.02 Source. Obtain materials from sources or stockpiles SHOWN ON THE DRAWINGS, or from other approved sources.

Develop and utilize Government-furnished sources in accordance with Section 611.

304.03 Gradation. Ensure that grading requirements for crushing or screening operations meet the requirements specified in Subsection 703.05.

After a representative quantity of aggregate has been produced, and before incorporating the aggregate into the work, set target values (TV's) for the required gradation within the gradation ranges shown in table 703-2 or table 703-3.

No gradation other than maximum size will be required for pit-run or grid-rolled material. For grid rolling, utilize all suitable material that can be reduced to maximum size as DESIGNATED IN THE SCHEDULE OF ITEMS. After processing on the road, remove all oversize material from the road and dispose of it as SHOWN ON THE DRAWINGS.

304.04 Quality. Ensure that all aggregate meets the quality requirements specified in Subsection 703.05, unless otherwise required in the SPECIAL PROJECT SPECIFICATIONS.

304.05 Additives. Provide additives, if required, that meet specifications in the following subsections:

Bentonite	725.20
Calcium Chloride Flake	723.02
Hydrated Lime	725.03
Lignin Sulfonate	723.03
Magnesium or Calcium Chloride Brine	723.01

304.06 Water. Develop, haul, and apply water in accordance with Section 207.

304.07 Mineral Filler. Add mineral filler to meet quality and/or gradation requirements as specified in the SPECIAL PROJECT SPECIFICATIONS.

Construction

304.08 Preparation of Roadbed. Complete the roadbed in accordance with Section 203, 306, or 309, and have it approved in writing by the CO before placing base or surface course.

304.09 Mixing & Placing. Ensure that aggregate and any required additives, water, mineral filler, and binder are mixed by method(s) as SHOWN ON THE DRAWINGS; except, if crushed aggregate products are being produced and mineral filler, binder, or additives are required, uniformly blend during crushing.

(a) Stationary Plant Method. Mix the aggregate with other required materials in an approved mixer. Add water during the mixing operation in the amount necessary to provide the moisture content for compacting to the specified density. After mixing, transport the aggregate to the jobsite while it contains the proper moisture content, and place it on the subgrade or base course using an aggregate spreader.

(b) Travel Plant Method. After the aggregate for each layer has been placed with an aggregate spreader or windrow-sizing device, uniformly mix it with other required materials using a traveling mixing plant. During mixing, add water to provide the necessary moisture content for compacting.

(c) Road Mix Method. After the aggregate for each layer has been placed, mix it with other required materials at the required moisture content until the mixture is uniform throughout. Mix aggregate and all other materials until a uniform distribution is obtained.

Spread the aggregate in a uniform layer, with no segregation of size, and to a loose depth that has the required thickness when compacted.

If the required compacted depth of any aggregate base or surface course exceeds 150 mm, place the aggregate base or surface course in two or more layers of approximately equal thickness. If the nominal maximum particle size exceeds 75 mm, place the aggregate in layers that do not exceed twice the maximum size of the specified aggregate size.

During placement of aggregate over geotextile, place aggregate in a single lift to the full depth specified, unless otherwise SHOWN ON THE DRAWINGS or in the SPECIAL PROJECT SPECIFICATIONS.

Operate hauling equipment over the surface of the previously constructed layer in a dispersed manner to minimize rutting or uneven compaction.

304.10 Compaction. Compact the aggregate using one of the following methods, as specified in the SCHEDULE OF ITEMS:

(a) Compaction A. Compact the aggregate by operating spreading and hauling equipment over the full width of each layer of the aggregate.

(b) Compaction B. Moisten or dry the aggregate to a uniform moisture content suitable for compaction. Operate rollers that meet the requirements specified in Subsection 203.15(b), (c), or (d) over the full width of each layer until visual displacement ceases, making no fewer than three complete passes.

(c) Compaction C. Compact each layer of aggregate to a density of at least 95 percent of the maximum density, as determined by AASHTO T 99, method C or D.

(1) Compaction C-1. Compact each layer of aggregate to a density of at least 96 percent of the maximum density, as determined by the Modified Marshall Hammer Compaction Method (available upon request from USDA Forest Service, Regional Materials Engineering Center, P.O. Box 7669, Missoula, MT 59807).

(d) Compaction D. Compact each layer of aggregate to a density of at least 95 percent of the maximum density, as determined by AASHTO T 180, method C or D.

(1) Compaction D-1. Compact each layer of aggregate to a density of at least 100 percent of the maximum density as determined by the Modified Marshall Hammer Compaction Method (available upon request from USDA Forest Service, Regional Materials Engineering Center, P.O. Box 7669, Missoula, MT 59807).

(e) Compaction E. Ensure that materials produced by pit-run and grid-rolling are visually moist and compacted using operating compaction equipment defined in Subsection 203.15(b), (c), and (d) over the full width of each layer until visual displacement ceases.

For all compaction methods, blade the surface of each layer during the compaction operations to remove irregularities and produce a smooth, even surface. When a density requirement is specified, determine the density of each layer in accordance with AASHTO T 191, T 205, T 238, T 217, T 239, T 255, or T 224.

304.11 Stockpiling. If DESIGNATED IN THE SCHEDULE OF ITEMS or if the Contractor elects to produce and stockpile aggregates prior to placement, the aggregates shall be handled and stockpiled in accordance with Section 305. Establish stockpile sites at locations SHOWN ON THE DRAWINGS or approved by the CO.

Clear and grub stockpile sites, if required, in accordance with Section 201.

304.12 Thickness & Width Requirements. Ensure that the thickness and width of the compacted aggregate conform to the dimensions SHOWN ON THE DRAWINGS, and that measurements on the compacted aggregate meet the following criteria:

(a) The maximum variation from the specified thickness is 25 mm.

(b) The compacted thickness is not consistently above or below the specified thickness, and the average thickness of 4 or more measurements for any 1 km of road segment is within ± 5 mm of the specified thickness.

(c) The compacted width has a (+) 300 mm tolerance.

Measurement

304.13 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Aggregate quantities include mineral filler, binder, and water.

Payment

304.14 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item		Pay Unit
304 (01)	Pit run aggregate, maximum size _____, compaction_____	Cubic Meter
304 (02)	Pit run aggregate, maximum size _____, compaction _____	Ton
304 (03)	Pit run aggregate, maximum size _____, compaction_____	Lump Sum
304 (04)	Grid-rolled aggregate, maximum size _____, compaction_____	Cubic Meter

304 (05) Grid-rolled aggregate, maximum size _____,
compaction _____ ..... Ton

304 (06) Grid-rolled aggregate, maximum size _____,
compaction _____ ..... Lump Sum

304 (07) Screened aggregate, grading _____,
compaction _____ ..... Cubic Meter

304 (08) Screened aggregate, grading _____,
compaction _____ ..... Ton

304 (09) Screened aggregate, grading _____,
compaction _____ ..... Lump Sum

304 (10) Crushed aggregate, type ____, grading ___,
compaction _____ ..... Cubic Meter

304 (11) Crushed aggregate, type ____, grading ___,
compaction _____ ..... Ton

304 (12) Crushed aggregate, type ____, grading ___,
compaction _____ ..... Lump Sum

304 (13) Placing aggregate, compaction _____ ..... Cubic Meter

304 (14) Placing aggregate, compaction _____ ..... Ton

304 (15) Placing aggregate, compaction _____ ..... Lump Sum

304 (16) Stockpiled aggregate, type _____,
grading _____ ..... Cubic Meter

304 (17) Stockpiled aggregate, type _____,
grading _____ ..... Ton

304 (18) Furnishing and applying magnesium/calcium
chloride brine ..... Ton

304 (19) Furnishing and applying calcium chloride flake ..... Ton

304 (20) Furnishing and applying lignin sulfonate ..... Ton

304 (21) Furnishing and applying hydrated lime ..... Ton

304 (22) Furnishing and applying bentonite ..... Ton

Section 305—Stockpiled Aggregates

Description

305.01 Work. Furnish and place aggregate in a stockpile location as SHOWN ON THE DRAWINGS.

Materials

305.02 Requirements. Furnish material that conforms to specifications in the following section:

Aggregate 703

Furnish stockpiled aggregates that conform to the gradation and quality requirements specified in the SCHEDULE OF ITEMS.

After a representative quantity of aggregate has been produced, and before incorporating the aggregate into the stockpile, set TV's for the required gradation within the gradation ranges.

Construction

305.03 Stockpile Site. Prepare existing sites as necessary to accommodate the quantity of aggregate to be stockpiled and as SHOWN ON THE DRAWINGS.

Prepare new sites as follows:

(a) Clear and grub in accordance with Section 201.

(b) Grade and shape the site to a uniform cross section that drains.

(c) Compact the floor of the site with at least three passes using compaction equipment conforming to Subsection 203.15.

(d) Place, compact, and maintain a minimum 150-mm layer of crushed aggregate over the stockpile site and access roads for stabilization and to prevent contamination of the stockpiles.

305.04 Stockpile. Obtain site approval before stockpiling aggregates. Make the stockpiles neat and regular in shape. Make the side slopes no flatter than 1:1.5.

Build the stockpiles in layers not to exceed 2 m in thickness. Complete each layer before depositing aggregates in the next layer.

Construct stockpile layers by spreading aggregates with trucks or other approved pneumatic-tired equipment. Do not push aggregates into piles.

Do not dump the aggregate such that any part of it runs down and over the lower layers in the stockpile. Do not drop aggregates from a bucket or spout in one location to form a cone-shaped pile.

When operating trucks on stockpiles, avoid tracking dirt or other foreign matter onto the stockpiled material.

Space stockpiles far enough apart to prevent different aggregate gradations from mixing, or use suitable walls or partitions to separate stockpiles.

Measurement

305.05 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment

305.06 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item		Pay Unit
305 (01)	Stockpiled aggregate, section ___, grading ___	Ton
305 (02)	Stockpiled aggregate, section ___, grading ___	Cubic Meter
305 (03)	Preparation of stockpile site	Hectare

Section 306—Reconditioning Existing Road

Description

306.01 Work. Recondition existing road; clean ditches, cattleguards, and culverts, including inlets and outlets; remove slide material; scarify where SHOWN ON THE DRAWINGS; and shape and compact the traveled way and shoulders, including parking areas, turnouts, and approach road intersections.

Construction

306.02 Blading & Shaping. Unless otherwise SHOWN ON THE DRAWINGS, blade and shape the existing traveled way and shoulders, including turnouts, to remove minor surface irregularities. Maintain the existing cross slope or crown, unless otherwise SHOWN ON THE DRAWINGS. Establish a blading pattern that will retain the surfacing on the roadbed and provide a thorough mixing of the materials within the completed surface width.

Scarify and shape the existing traveled way and shoulders at locations and to the depth and width SHOWN ON THE DRAWINGS. Remove any rock larger than 100 mm in its greatest dimension that is brought to the surface during scarification, except as provided below.

When a base or surface course is required, remove to at least 150 mm below existing surface any rocks that protrude above the existing surface more than one-third of the depth of the base or surface course, and any rocks with exposed surface area exceeding 0.2 m^2. Remove all unsuitable materials and place them in areas as SHOWN ON THE DRAWINGS.

Scarify and pulverize existing bituminous surfaces, as SHOWN ON THE DRAWINGS, until all lumps are reduced to the maximum size SHOWN ON THE DRAWINGS. Incorporate the bituminous pulverized aggregate into the traveled way and shoulders.

Similarly treat the traveled way and shoulders of intersecting roads to provide a smooth transition for the distance SHOWN ON THE DRAWINGS.

306.03 Rock Reduction. Where SHOWN ON THE DRAWINGS, roll the traveled way to break down rocky material. Continue rolling until visual breakdown or visual displacement of rocky material ceases, up to a maximum of five full-width passes. A pass is defined as one complete coverage of the surface.

Use rollers that are specifically designed to break down rocky material and that meet the requirements specified in Subsection 203.15(a) or (c), unless otherwise approved by the CO.

306.04 Drainage. Grade the ditches to the typical sections and at the locations SHOWN ON THE DRAWINGS. Clean culverts to drain.

Remove excess materials from the roadbed, culverts, and ditches, and place material as SHOWN ON THE DRAWINGS.

306.05 Cattleguards. Remove the cattleguard deck prior to cleaning, and reinstall it upon completion. Clean the area beneath the cattleguard of soil and other material to the bottom of the original foundation, or as SHOWN ON THE DRAWINGS, over the entire width of the installation.

Never leave the cattleguard opening unattended or open without an adequate barricade.

306.06 Compaction. Shape and compact the traveled way and shoulders using one of the methods described in Subsection 304.10, as DESIGNATED IN THE SCHEDULE OF ITEMS.

Measurement

306.07 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment

306.08 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item		Pay Unit
306 (01)	Reconditioning of roadbed, compaction _____	Kilometer
306 (02)	Reconditioning of roadbed, compaction _____	Lump Sum
306 (03)	Cleaning cattleguard	Each
306 (04)	Cleaning culvert	Each

Section 307—Portland Cement-Treated Base—Central Plant Mix

Description

307.01 Work. On a prepared roadbed, construct one or more courses of a mixture of aggregate, water, and cement, or a mixture of aggregate, water, fly ash, lime, and/or cement.

Treated aggregate courses are designated as cement or aggregate, water, fly ash, lime, and/or cement.

Materials

307.02 Requirements. Ensure that materials meet the requirements specified in the following subsections:

Blotter	703.12
Cement	701.01
Chemical Admixtures (Set-Retarding)	711.03
Emulsified Asphalt	702.03
Fly Ash	725.04
Fog Seal	410.10
Hydrated Lime	725.03
Subbase, Base, and Surface Course Aggregate	703.05
Water	725.01

Construction

307.03 General. Store all chemical additives in closed, weatherproof containers. Prepare the surface that the Portland cement-treated base is to be placed upon in accordance with Section 203 or 306, as applicable.

Thirty days before producing the treated aggregate mixture, submit the mix design for approval. Include the following, as applicable:

(1) Source of each component.

(2) Report showing the results of the following tests:

(a) Moisture density relationship at selected cement content or selected aggregate, water, fly ash, lime, and/or cement content.

(b) Compressive strength data for all specimens tested, at each cement content or each aggregate, water, fly ash, lime, and/or cement content.

(3) Target values for each aggregate sieve size specified.

(4) 90-kg sample of aggregate.

(5) 25-kg sample of fly ash.

(6) 10-kg sample of hydrated lime.

(7) 10-kg sample of Portland cement.

(8) 2-kg sample of the retarder or other additives.

Furnish a new mix design if there is a change in the source of material. Begin production only after the mix design is approved.

At least 10 days prior to construction, submit a quality control plan for review and approval. Include all tolerance items, field tests, and measurements shown in the specification. Ensure that the plan verifies compliance with these requirements for each 500-t or smaller sublot produced. Perform field testing and measurement at statistically random points within each sublot.

307.04 Mix Design Requirements. Provide test samples with a minimum average compressive strength of 3.4 MPa, with no single test lower than 2.8 MPa.

(a) Aggregate/Cement-Treated Course. Provide a mix design, based on dry weight, within the limits shown in table 307-1.

Table 307-1.—Range of aggregate/cement mix design parameters.

Material	Percent[a]
Aggregate	90–96
Portland cement	4–10

a. By weight of total dry mix.

(b) Aggregate/Water/Fly Ash/Lime/Cement-Treated Course. Provide an aggregate, water, fly ash, lime, and/or cement mix design, based on dry weight, within the limits shown in table 307-2.

Table 307-2.—Range of aggregate, water, fly ash, lime, and/or cement mix design parameters.

Material	Percent[a]
Aggregate	75–92
Fly ash	6–20
Hydrated lime and/or Portland cement	2–5

a. By weight of total dry mix.

Mold, cure, and test samples of the aggregate, water, fly ash, lime, and/or cement mixture in accordance with ASTM C 593, parts 10 and 11, but revise the curing period from 7 to 28 days at 38 ± 2 °C.

307.05 Mixing. Do not begin mixing operations when the atmospheric temperature is expected to fall below 4 °C within 48 hours. Do not place a treated aggregate course when the underlying surface is frozen or muddy, or when it is raining or snowing. Protect the finished course from freezing for at least 7 days after mixing.

Mix the components with a stationary pugmill-type central mixing plant until a uniform mixture is obtained. The CO may require additional mixing to insure uniformity. During mixing, add sufficient water to obtain the optimum moisture content for compaction, plus 2 percent.

Equip the mixer with batching or metering devices for proportioning the components either by weight or by volume. Maintain the accuracy of the amounts of aggregate, chemical additives, and water (based on total dry weight of mixture) within the following tolerances:

Aggregate ..... ± 2.0% by weight
Fly ash ..... ± 1.5% by weight
Hydrated lime or cement ..... ± 0.5% by weight
Water ..... ± 2.0% by weight

A retarder may be used to slow initial set for a maximum of 2 hours. Dissolve retarder in water and uniformly add the solution to the mixture.

Transport the mixture in vehicles that maintain moisture content, and that prevent segregation and loss of the fine material.

307.06 Placing, Compacting, & Finishing. Maintain the moisture content (± 2 percent of optimum) during placing, compacting, and finishing.

Spread the mixture on the prepared surface in a uniform layer. Do not place the mixture in a layer exceeding 150 mm in compacted thickness. When more than one layer is necessary, shape and compact each layer before the succeeding layer is placed. Route hauling equipment uniformly over the full width of the surface to minimize rutting or uneven compaction. Shape the final layer to line, grade, and cross section.

Compact each layer full width. Roll from the sides to the center, parallel to the centerline of the road. Compact each layer of aggregate to not less than 95 percent of maximum density.

Use AASHTO T 99 to determine the maximum density. Determine in-place density using any applicable AASHTO procedure.

Do not leave any treated aggregate that has not been compacted undisturbed for more than 30 minutes. Complete the compaction and finishing within 1 hour (up to 2 hours for mixtures with a retarder) from the time water is added to the mixture. Make the compacted surface smooth, dense, and free of compaction planes, ridges, or loose material.

The finished course thickness must be within a tolerance of 13 mm from that specified. Ensure that the finished thickness is not consistently above or below the specified thickness. Finish the surface to within ± 10 mm from the staked line and grade elevation. Correct all defective areas by loosening the material, adding or removing material, reshaping, and compacting.

If the time between placing adjacent partial widths exceeds 30 minutes, provide a construction joint.

307.07 Construction Joints. For lime and fly ash mixtures, tie each day's operation into the completed work of the previous day by remixing approximately 500 mm of the completed course before processing additional sections. Add 50 percent of the original amount of lime or fly ash to the remixed material.

For cement mixtures, or when a lime or fly ash mixture remains undisturbed for more than 24 hours, make a transverse construction joint by cutting back into the completed work to form an approximately vertical face.

307.08 Curing. Minimize hauling over the unprotected treated aggregate course. Limit traffic over the treated surface to prohibit any visible deflection, rutting, raveling, or wear of the surface. Keep the completed layer or course continuously moist until the subsequent layer or course is placed. Apply all curing water under pressure through a spray bar equipped with nozzles that produce a fine, uniform spray. Place and compact the subsequent layer or course within 2 days after the treated aggregate course has been compacted and finished. Placement of the

subsequent layer or course may be deferred up to 21 days by placing a fog seal over the treated course. Do not place fog seals on intermediate layers of a course.

When a fog seal is used, keep the surface continuously moist for a minimum of 7 days after compacting and finishing. After the 7-day period, apply a diluted slow-setting emulsified asphalt at a rate of 0.45 to 1.15 L/m^2 to provide a continuous film over the course. Apply the fog seal in accordance with Subsection 410.10. When necessary for the maintenance of vehicular traffic, furnish and apply blotter material.

Reapply the fog seal where it has been determined that the “continuous film” has been damaged.

If the material loses the required stability, density, or finish before placement of the next course or acceptance of the work, reprocess, recompact, and add additives as necessary to restore the strength of the damaged material to that specified in the design.

Measurement

307.09 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Measure fog seal and blotter under Section 410.

Payment

307.10 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item		Pay Unit
307 (01)	_____ Portland cement-treated base, grading ___	Ton
307 (02)	_____ Portland cement-treated base, grading ___, _____ -mm depth	Square Meter
307 (03)	Portland cement	Ton
307 (04)	Fly ash	Ton
307 (05)	Hydrated lime	Ton

Section 308—Portland Cement-Treated Base—In-Place Stabilization

Description

308.01 Work. Process and incorporate chemical additives (fly ash, hydrated lime, or Portland cement) and water to a depth as SHOWN ON THE DRAWINGS.

Materials

308.02 Requirements. Ensure that materials meet the requirements specified in the following subsections:

Blotter	703.12
Cement	701.01
Chemical Admixtures (Set-Retarding)	711.03
Crushed Aggregate	703.06
Emulsified Asphalt	702.03
Fly Ash	725.04
Fog Seal	410.10
Hydrated Lime	725.03
Water	725.01

Construction

308.03 General. Scarify the road surface to the depth SHOWN ON THE DRAWINGS. Windrow the scarified materials or spread them to a uniform thickness for mixing. Remove any material that would be retained on a 50-mm sieve, along with other unsuitable materials. If additional aggregate is required, blend it with the existing material. If necessary, clean and trim all butt joints at existing pavement or structures prior to mixing.

Ensure that the subgrade supports all equipment required in the construction of the base. Prior to mixing, subexcavate soft or yielding areas and replace them with suitable materials, in accordance with Subsection 203.06(d).

At least 10 days prior to construction, submit a quality control plan for review and approval. Include all tolerance items, field tests, and measurements shown in this specification. Ensure that the plan verifies compliance with these requirements for each sublot produced that is 500 m^3 or less. Perform field testing and measurement at statistically random points within each sublot.

308.04 Application. Apply additives to a dry, unfrozen surface with a surface temperature of at least 4 °C. Do not apply when there is excessive loss of additive due to washing or blowing, or when the air temperature is expected to fall below 4 °C within 48 hours.

Apply additives at the required rates using one of the following methods:

(a) Dry Method. Uniformly apply the additives using an approved spreader. A motor grader is not an approved spreader. Apply water using approved methods to obtain the proper moisture content for mixing and compaction.

(b) Slurry Method. Mix additives with water and apply as a thin water suspension or slurry using either trucks with approved distributors or rotary mixers. Equip the distributor truck or rotary mixer tank with an agitator to keep the additives and water in suspension. Make successive passes over the aggregate course until the moisture and additive content for mixing and compaction are obtained.

Maintain the application of components within the following tolerances based on total dry weight of mixture:

Fly ash ..... ± 2%
Hydrated lime or cement ..... ± 1%
Water ..... ± 2%

308.05 Mixing. Perform initial and final mixing as follows:

(a) Initial Mixing. Mix the material until a homogeneous friable mixture is obtained.

For lime or fly ash mixtures, add sufficient water and thoroughly mix to obtain the optimum moisture content for compaction, in accordance with AASHTO T 99, plus necessary hydration moisture. Hydration moisture is 1-1/2 percent for each percent of additive in the mixture. Complete the mixing within 6 hours of additive application.

For cement mixtures, add sufficient water and thoroughly mix to obtain the optimum moisture content for compaction, in accordance with AASHTO T 99, plus 2 percent. Complete the mixing within 2 hours of cement application.

Moist cure the mixture for 2 to 4 days.

(b) Final Mixing. For lime or fly ash mixtures, remix the material using an approved road mixer. Retarder may be added as desired. If the remixed material contains clods, rescarify in accordance with Subsection 306.02. Do not remix Portland cement mixtures.

308.06 Compaction & Finishing. Immediately after final mixing, shape and compact each layer full width. Roll from the sides to the center, parallel to the centerline of the road. Compact each layer of aggregate to not less than 95 percent of maximum density.

Use AASHTO T 99 to determine the maximum density. Use AASHTO T 224 to correct for coarse particles. Determine in-place density using any applicable AASHTO procedure.

Do not leave any treated aggregate that has not been compacted undisturbed for more than 30 minutes. Complete the compaction and finishing within 1 hour (up to 2 hours for mixtures with a retarder) from the time water is added to the mixture. Make the compacted surface smooth, dense, and free of compaction planes, ridges, or loose material.

The finished course thickness must be within a tolerance of 25 mm from that specified. Ensure that the finished thickness is not consistently above or below the specified thickness. Finish the surface to within ± 20 mm from the staked line and grade elevation. Correct all defective areas by loosening the material, adding or removing material, reshaping, and compacting.

If the time between placing adjacent partial widths exceeds 30 minutes, provide a construction joint.

308.07 Construction Joints. For lime and fly ash mixtures, tie each day's operation into the completed work of the previous day by remixing approximately 0.5 m of the completed course before processing additional sections. Add 50 percent of the original amount of lime or fly ash to the remixed material.

For cement mixtures or when a lime or fly ash mixture remains undisturbed for more than 24 hours, make a transverse construction joint by cutting back into the completed work to form an approximately vertical face. Use crushed aggregate meeting the requirements of Subsection 703.06 to repair transverse construction joints.

308.08 Curing. Minimize hauling over the unprotected treated aggregate course. Limit traffic over the treated surface to prohibit any visible deflection, rutting, raveling, or wear of the surface. Keep the completed layer or course continuously moist until the subsequent layer or course is placed. Apply all curing water under pressure through a spray bar equipped with nozzles that produce a fine, uniform spray. Place and compact the subsequent layer or course within 2 days after the treated aggregate course has been compacted and finished. Placement of the subsequent layer or course may be deferred up to 21 days by placing a fog seal over the treated course. Do not place fog seals on intermediate layers of a course.

When a fog seal is used, keep the surface continuously moist for a minimum of 7 days after compacting and finishing. After the 7-day period, apply a diluted slow-setting emulsified asphalt at a rate of 0.45 to 1.15 L/m^2 to provide a continuous film over the course. Apply the fog seal in accordance with Subsection 410.10. When necessary for the maintenance of vehicular traffic, furnish and apply blotter material.

Reapply the fog seal where it has been determined that the “continuous film” has been damaged.

If the material loses the required stability, density, or finish before placement of the next course or acceptance of the work, reprocess, recompact, and add additives as necessary to restore the strength of the damaged material to that specified in the design.

Measurement

308.09 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Measure fog seal and blotter under Section 410.

Payment

308.10 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item		Pay Unit
308 (01)	Portland cement-treated base	Kilometer
308 (02)	Portland cement-treated base	Square Meter
308 (03)	Hydrated lime	Ton
308 (04)	Portland cement	Ton
308 (05)	Fly ash	Ton

Section 309—Subgrade Stabilization

Description

309.01 Work. Process and incorporate additives into the upper layer of a subgrade.

Additives are designated as fly ash, hydrated lime, or Portland cement.

On existing subgrade, remove and dispose of slide material, vegetation, or other debris from roadbed shoulders, ditches, and culvert inlets and outlets, and reshape the roadbed shoulders, ditches, and culvert inlets and outlets.

Materials

309.02 Requirements. Ensure that materials meet the requirements specified in the following subsections:

Blotter	703.12
Cement	701.01
Chemical Admixtures (Retarder)	711.03
Emulsified Asphalt	702.03
Fly Ash	725.04
Fog Seal	410.10
Hydrated Lime	725.03
Water	725.01

Construction

309.03 General. Apply stabilization additives at the rates SHOWN ON THE DRAWINGS.

Store chemical additives and admixtures in closed, weatherproof containers. Prepare the subgrade in accordance with applicable requirements specified in Section 306. Scarify and pulverize the roadbed to a depth of 150 mm. Size and shape the material for the addition of additives. Limit the quantity of material being processed to a volume that is suitable for the mixing machine.

309.04 Mixing. Do not apply additives when the surface is wet, the surface temperature is below 5 °C, or the air temperature is expected to fall below 5 °C within 48 hours after mixing. Do not apply when additive is lost due to washing or blowing.

Mix the additives with the prepared material in either a dry or a slurry state, in accordance with Subsection 308.04. Continue mixing or remixing until a homogeneous mixture is obtained. Adjust the moisture content of the mixture in accordance with Subsection 308.05.

Except for the mixing equipment, keep all traffic off the spread material until mixing is completed.

For lime and hydrated lime/fly ash mixtures, complete the first mixing within 6 hours of application, and cure the mixture for 2 to 4 days by keeping the mixture moist. Perform final mixing by uniformly remixing the material. Mixing is complete when 95 percent of all material except rock passes a 45-mm sieve, and at least 50 percent of the material passes a 4.75-mm sieve when tested in accordance with AASHTO T 27, in a nondried condition. Retarders may be added.

For Portland cement mixtures, complete the mixing within 2 hours of application.

309.05 Compacting & Finishing. Immediately after final mixing, shape and finish the mixture in accordance with Subsection 203.08(c) and (d). Within 2 days after final mixing, finish the surface to make it smooth and suitable for placing a base or surface course.

Compact treated material in accordance with Subsection 203.16(b), method 4. During compaction and until final finishing, aerate or water as necessary to maintain the moisture content within ± 2 percent of the optimum moisture content necessary for compaction. If the time between placing adjacent partial widths exceeds 30 minutes, or when tying into the previous work, provide a construction joint in accordance with Subsection 307.07.

309.06 Curing. Cure in accordance with Subsection 307.08.

If the material loses the required stability, density, or finish before placement of the next course or acceptance of the work, reprocess or recompact as necessary to restore the strength of the damaged material to that specified in the mix design.

Measurement

309.07 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Measure fog seal and blotter material under Section 410.

Payment

309.08 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item		Pay Unit
309 (01)	Subgrade stabilization with _____, _____ mm depth	Square Meter
309 (02)	Hydrated lime	Ton
309 (03)	Portland cement	Ton
309 (04)	Fly ash	Ton

Section 310—Dust Abatement

Description

310.01 Work. Furnish and apply dust palliative and blotter material, if necessary, to a road surface.

Materials

310.02 Requirements. Furnish material of the type and grade DESIGNATED IN THE SCHEDULE OF ITEMS that meet the requirements specified in the following subsections:

Calcium Chloride Flake	723.02
Lignin Sulfonate	723.03
Magnesium or Calcium Chloride Brine	723.01

Apply product at temperatures as stated in Section 723. Use the preparation method DESIGNATED IN THE SCHEDULE OF ITEMS.

310.03 Blotter Material. Furnish blotter material that meets the requirements specified in Subsection 703.12.

Construction

310.04 Weather Limitations. Application during a light rain is acceptable, provided the dust palliative penetrates the road surface and does not flow to low areas or off of the road surface. Apply chloride brines and lignin sulfonate only when the ambient temperature is 5 °C or higher and the ground is not frozen.

310.05 Equipment. Ensure that distribution equipment applies dust palliative uniformly on variable widths of road surface. The maximum allowable variation from the specified application rate is ± 10 percent of the specified rate for individual distributor loads, and ± 2 percent of the specified rate over the total project.

For liquid products, meet the following requirements:

(a) Application at controlled rates from 0.5 to 2.6 L/m^2 with uniform pressure and application.

(b) Spray pattern from each nozzle on the spray bar is uniform across the spray bar.

(c) Provide distribution equipment that includes accurate volume-measuring devices or a calibrated tank; a thermometer for measuring temperatures of tank contents; and a hose-and-nozzle attachment for applying material to areas inaccessible to the spray bar.

When compaction is included in the SCHEDULE OF ITEMS, provide rollers that meet the requirements specified in Subsection 203.15(b), (c), or (d).

310.06 Preparation of Road Surface. Use one or more of the following preparation and application methods, as SHOWN ON THE DRAWINGS or in the SPECIAL PROJECT SPECIFICATIONS. For all methods, apply water to the road surface or to the windrow at the times and in the quantities directed by the CO to ensure a near-optimum moisture content that will allow adequate penetration or mixing of the dust palliatives and surface materials. To accelerate penetration and absorption of calcium chloride flake materials, the road surface may be dampened prior to or after flake application.

(a) Method 1. Apply the dust palliative directly to the prepared and compacted surface.

(b) Method 2. Develop a layer of loose cushion material approximately 25 mm in depth for the full width of traveled way, and keep it in a loose condition prior to applying dust palliative.

(c) Method 3. Blade approximately 25 mm of the surface material into a berm on the shoulder. Then make the initial application on the exposed surface. As soon as practicable, but no more than 4 hours after application, blade the material in the berm(s) to a uniform depth across the previously treated surface, and water it if necessary to meet required water content. Then apply the second application.

For methods 2 and 3, process the road surface by blading below the elevation of raveling, washboarding, and potholes. After processing, shape the surface by blading to the required cross section as SHOWN ON THE DRAWINGS. Have the prepared surface approved in writing by the CO prior to treatment.

310.07 Application of Dust Palliative Treatment. Ensure that the dust palliative application rate and width of road surface to be covered are as SHOWN ON THE DRAWINGS or in the SPECIAL PROJECT SPECIFICATIONS. Adjust the application rate and apply the product in as many stages as necessary to assure thorough penetration and to prevent product runoff. If more than one application is required, do not apply the second application until the previous application has sufficiently penetrated the road surface.

Obtain uniform distribution at all points. Correct any overlapping or skipping between spread sections. Use blotter material to cover areas with excess dust

palliative. Protect the surface of adjacent structures and trees from spattering or marring. Discharge dust palliative material only in approved areas, and do not allow it to flow into ditches or stream courses.

310.08 Compaction. Compaction is required if included in the SCHEDULE OF ITEMS. Begin compaction as soon as the dust palliative has penetrated enough to prevent pickup of material. Operate rollers over the full width of each layer until visual displacement ceases, but make no fewer than three complete passes.

310.09 Maintenance & Opening to Traffic. Do not permit traffic on dust palliative treatment until the treatment has penetrated and cured enough to prevent excessive pickup under traffic. If it becomes necessary to permit traffic prior to that time, apply blotter material where necessary.

Measurement

310.10 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment

310.11 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS, with the following exceptions:

(a) If laboratory quality assurance tests indicate that the minimum magnesium or calcium chloride concentrations applied to the road surface were not as specified in Subsection 723.01, the CO may reduce payment by multiplying the pay factor as calculated below, times the contract unit price for the appropriate PAY ITEMS, times the accepted quantity. No payment will be made for brine concentrations below 20 percent.

Magnesium Chloride Brine Pay Factor =
1.0 – ((28% – Concentration Applied)/8%)

Calcium Chloride Brine Pay Factor =
1.0 – ((36% – Concentration Applied)/16%)

(b) If laboratory quality assurance tests indicate that the minimum lignin sulfonate concentrations were not as specified in Subsection 723.03, the CO may reduce payment by multiplying the pay factor as calculated below times the contract unit price for the appropriate PAY ITEMS, times the accepted quantity. No payment will be made for concentrations below 24 percent.

Lignin Pay Factor =
1.0 – ((48% – Concentration Applied)/24%)

Payment will be made under:

Pay Item		Pay Unit
310 (01)	Magnesium chloride brine at 28 percent minimum concentration, preparation method _____	Ton
310 (02)	Lignin sulfonate solution at 48 percent minimum concentration, preparation method_____	Ton
310 (03)	Calcium chloride brine at 36 percent minimum concentration, preparation method_____	Ton
310 (04)	Magnesium chloride brine at 28 percent minimum concentration, or calcium chloride brine at 36 percent minimum concentration, or calcium chloride flake at 77 percent minimum concentration, preparation method_____	Lump Sum
310 (05)	Calcium chloride flake at 77 percent minimum concentration, preparation method_____	Ton
310 (06)	Compaction	Kilometer

DIVISION 400
Bituminous Pavements

Section 401—Major Hot Asphalt Concrete Pavement With Pay Factor

Description

401.01 Work. Construct one or more courses of hot asphalt concrete pavement as SHOWN ON THE DRAWINGS. Have the surface approved in writing by the CO before placing the hot asphalt concrete pavement.

Hot asphalt concrete pavement classes are designated as shown in table 401-1. Hot asphalt concrete pavement aggregate grading is designated as shown in table 703-4. State asphalt concrete pavement classes are designated by local State department of transportation designations. Superpave asphalt concrete pavement nominal size and grading are designated as shown in table 703-10, 703-11, or 703-12.

Table 401-1.—Asphalt concrete mixture requirements.

Design Parameters	Class of Mixture		
	A	B	C
(a) Hveem (AASHTO T 246 and T 247):			
(1) Stabilometer, min.	37	35	30
(2) Air voids, %[a]	3–5	3–5	3–5
(3) Voids in Mineral Aggregate (VMA), min. %	See table 401-2		
(b) Marshall (AASHTO T 245)[b]:			
(1) Stability, kN min.	8.0	5.3	4.4
(2) Flow, 0.25 mm	8–14	8–16	8–20
(3) Air voids, %[a]	3–5	3–5	3–5
(4) VMA, min. %	See table 401-2		
(5) Compaction, number of blows each end of test specimen	75	50	50
(c) Immersion-Compression (AASHTO T 165 and T 167)			
(1) Compressive strength, MPa min.	2.1	1.7	1.4
(2) Retained strength, min. %	70	70	70
(d) Root–Tunnicliff (ASTM D 4867):			
(1) Tensile strength ratio, min. %	70	70	70
(e) Dust/asphalt ratio[c]	0.6–1.3	0.6–1.3	0.6–1.3

a. The percent of air voids is based on AASHTO T 166, AASHTO T 209, and AASHTO T 269. Maximum specific gravity will be based on AASHTO T 209.
b. Following mixing, asphalt cement mixtures will be cured in an oven maintained at 12 °C to 18 °C above the compaction temperature for 90 ± 10 minutes.
c. Dust/asphalt ratio is defined as the percent of material, including nonliquid antistrip and mineral filler, that passes the 75-µm sieve, divided by the percent of asphalt (calculated by weight of mix).

Table 401-2.—VMA for Marshall, Hveem, and Superpave mix design.

	Minimum Voids [b,c] (%)		
Sieve Size [a]	Marshall	Hveem	Superpave
2.36 mm	21	19	–
4.75 mm	18	16	–
9.5 mm	16	14	15
12.5 mm	15	13	14
19 mm	14	12	13
25 mm	13	11	12
37.5 mm	12	10	11
50 mm	11.5	9.5	10.5

a. The largest sieve size listed in the applicable specification upon which any material is permitted to be retained.
b. VMA to be determined in accordance with Asphalt Institute (AI) Manual Series number 2 (MS–2).
c. When a mineral filler or nonliquid antistrip is used, include the percentage specified in the calculation for compliance with the VMA.

Asphalt cement grade is designated as shown in AASHTO M 20, M 226, or MP 1, or in applicable State department of transportation specifications for asphalt materials for the grade specified.

A prepaving conference will be held at least 10 working days prior to the beginning of paving operations. At that time, the Contractor and the CO will discuss methods of accomplishing all phases of the paving work, including laydown operations, work schedules, work force, quality control systems, spill prevention and contingency plans, and asphalt concrete mix delivery.

Materials

401.02 Requirements. Ensure that material conforms to specifications in the following subsections:

Antistrip Additive 702.07
Asphalt Cement 702.01
Hot Asphalt Concrete Pavement Aggregate 703.07
Mineral Filler 725.05
Recycling Agent 702.05
Superpave Asphalt Concrete Pavement Aggregate 703.14

Ensure that reclaimed asphalt pavement material conforms to the following:

(a) 100 percent passes the 50-mm screen.

(b) The material consists of asphalt cement and asphalt cement-coated aggregate.

Construction

401.03 Composition of Mixture (Job-Mix Formula). Up to 20 percent reclaimed asphalt pavement material may be used, subject to approval of a Contractor quality control plan and submission of test data demonstrating that the mixture will meet the requirements specified in this section.

Furnish the appropriate mixture as follows:

(a) Hot Asphalt Concrete Pavement Mixture. Furnish aggregate, asphalt, additives, and, when applicable, reclaimed asphalt pavement material that meet the applicable aggregate gradation requirement shown in table 703-4, and design parameters (a) or (b); (c) or (d); and (e) shown in table 401-1.

(b) Superpave Asphalt Concrete Pavement Mixture. Furnish aggregate, asphalt, and additives that meet applicable gradation and material requirements specified in Subsection 703.14, and the appropriate design parameters shown in tables 401-2 and 401-2A. Compact specimens with the gyratory compactive effort specified in table 401-2B for the specified air temperature as SHOWN ON THE DRAWINGS.

Table 401-2A.—Superpave asphalt concrete mixture requirements.

Design Parameters	Requirement
Percent air voids, design gyrations, N_{des}	4.0
Percent maximum density, initial gyrations, N_{init}	89 max.
Percent maximum density, maximum gyrations, N_{max}	98 max.
Tensile strength ratio (AASHTO T 283)	80 min.
Voids Filled With Asphalt	70-80%
Dust/asphalt [a] ratio	0.6 - 1.2

a. Dust/asphalt ratio is defined as the percent of material passing the 75-µm sieve, divided by the effective asphalt content as calculated by weight of mix.

Table 401-2B.—Gyratory compactive effort.

Average Design High Air Temperature	N_{init}	N_{des}	N_{max}
< 39 °C	7	68	104
39–40 °C	7	74	114
41–42 °C	7	78	121
43–44 °C	7	82	127

(c) State Asphalt Concrete Pavement Mixture. Furnish aggregate, asphalt, and additives that meet the applicable aggregate gradation and aggregate quality specified by the local State department of transportation, and design parameters (a) or (b); (c) or (d); and (e) shown in table 401-1. Local State department of transportation design parameters in lieu of those shown in table 401-1 may be used if approved by the CO.

Submit written job-mix formulas for approval at least 21 days before production. For each job-mix formula, submit the following:

(1) Aggregate and mineral filler, including:

(a) TV for percent passing each sieve size for the aggregate blend. Ensure that the gradation of the blended aggregate and reclaimed asphalt pavement material falls within the gradation band for each sieve size designated in the specified grading.

(b) Source and percentage of each aggregate stockpile to be used.

(c) Average gradation of each aggregate stockpile.

(d) Results of aggregate quality tests.

(e) Samples, when SHOWN ON THE DRAWINGS.

(2) Asphalt cement, including:

(a) TV for percent of asphalt cement based on total weight of mix.

(b) Recent quality test results from the manufacturer for the asphalt cement, including a temperature/viscosity curve.

(c) Material safety data sheets.

(d) Samples, when SHOWN ON THE DRAWINGS.

(3) Antistrip additives. When applicable, furnish:

(a) Type and TV for percent of antistrip additive.

(b) Material safety data sheet.

(c) Samples, when SHOWN ON THE DRAWINGS.

(4) Mix temperatures, including:

(a) Temperature leaving the mixer.

(b) Temperature immediately preceding initial compaction.

(5) Maximum specific gravity, determined according to AASHTO T 209 at the asphalt cement TV.

(6) Reclaimed asphalt pavement material; when applicable, the percent reclaimed asphalt pavement material and the type and percent of recycling agent.

(7) Asphalt mixtures; when applicable, the location of all commercial mixing plants to be used. A job-mix formula is needed for each plant.

The CO will evaluate the suitability of the material and the proposed job-mix formula. After reviewing the proposed job-mix formula, the CO will develop a TV for the asphalt cement content and determine the need for antistrip additive, the specific gravity in accordance with AASHTO T 209, and the discharge temperature range.

If a job-mix formula is rejected, submit a new job-mix formula as described above.

Changes to an approved job-mix formula require approval before production. Allow up to 14 days to evaluate a change. Approved changes in TV's will not be applied retroactively for payment.

401.04 Mixing Plant. Use mixing plants that conform to ASTM D 995, unless producing approved material for a local State department of transportation. Supplement mixing plant as follows:

(a) All Plants. For all plants, use:

(1) Automated Controls. Automatically control the proportioning, mixing, and discharging of the mixture.

(2) Emission Controls. If a wet scrubber is used, circulate the collected material though sludge pits or settling tanks. Remove the resultant sediment from the project or bury according to Subsection 202.04.

(b) Drum Dryer-Mixer Plants. For drum dryer-mixer plants, use:

(1) Bins. Provide a separate bin in the cold aggregate feeder for each individual aggregate stockpile in the mixture. Use bins of sufficient size to keep the plant in continuous operation, and of proper design to prevent overflow of material from one bin to another.

(2) Stockpiling Procedures. Separate aggregate into at least two stockpiles with different gradations. At a minimum, designate one stockpile to contain mostly coarse material, and one stockpile to contain mostly fine material. Stockpile material according to Subsections 305.03 and 305.04.

(3) Reclaimed Asphalt Pavement Material. Modify drum dryer-mixer plants to prevent direct contact of the reclaimed asphalt pavement material with the burner flame and to prevent overheating of the reclaimed asphalt pavement material. Stockpile the material according to Subsection 305.03 and 305.04.

(c) Batch & Continuous Mix Plants. For batch and continuous mix plants, use:

(1) A Hot Aggregate Bin. Provide a bin with three or more separate compartments for storage of the screened aggregate fractions to be combined for the mixture. Make the partitions between the compartments tight and of sufficient height to prevent spillage of aggregate from one compartment into another.

(2) Load Cells. Calibrated load cells instead of scales may be used in batch plants.

(3) Reclaimed Asphalt Pavement Material. Modify batch plants to allow the introduction of reclaimed asphalt pavement material into the mixture using methods that bypass the dryer. Design the cold feed bin, conveyor system, and special bin adjacent to the weigh hopper, if used, to avoid segregation and sticking of the reclaimed asphalt pavement material. Heat the new aggregate and/or reclaimed aggregate material to a temperature that will transfer sufficient heat to the reclaimed asphalt pavement material to produce a mix of uniform temperature within the range specified in the approved job-mix formula.

401.05 Pavers. Use pavers that are:

(a) Self-contained, power-propelled units with adjustable vibratory screeds with full-width screw augers.

(b) Heated for the full width of the screed.

(c) Capable of spreading and finishing courses of asphalt mixture in widths at least 300 mm more than the width of one lane.

(d) Equipped with a receiving hopper with sufficient capacity to ensure a uniform spreading operation.

(e) Equipped with automatic feed controls that are properly adjusted to maintain a uniform depth of material ahead of the screed.

(f) Capable of being operated at forward speeds consistent with satisfactory laying of the mixture.

(g) Capable of producing a finished surface with the required smoothness and texture without segregating, tearing, shoving, or gouging the mixture.

(h) Equipped with automatic screed controls with sensors capable of sensing grade from an outside reference line, sensing the transverse slope of the screed, and providing the automatic signals that operate the screed to maintain grade and transverse slope.

401.06 Surface Preparation. Prepare the surface in accordance with Section 304, 306, 307, or 308, as applicable. Apply an asphalt tack coat to contact surfaces of curbing, gutters, manholes, and other structures, in accordance with Section 407.

401.07 Weather Limitations. Place hot asphalt concrete pavement on a dry, unfrozen surface when the air temperature in the shade is above 2 °C and rising, and when the temperature of the road surface in the shade, the lift thickness, and the minimum laydown temperature are as shown in table 401-3.

Table 401-3.—Minimum laydown temperature[a] for hot asphalt concrete mixture placement (°C).

	Lift Thickness		
Road Surface Temperature (°C)	≤50 mm	50–75 mm	≥ 75 mm
< 2	–[b]	–[b]	–[b]
2–3.9	–[b]	–[b]	138
4–9.9	–[b]	141	135
10–14.9	146	138	132
15–19.9	141	135	129
20–24.9	138	132	129
25–29.9	132	129	127
≥30	129	127	124

a. Never heat the asphalt concrete mixture above the temperature specified in the approved mix design.
b. Paving not allowed.

401.08 Asphalt Preparation. Uniformly heat the asphalt cement to provide a continuous supply of the heated asphalt cement from storage to the mixer. Do not heat asphalt cement above 175 °C.

If the job-mix formula requires a liquid heat-stable antistrip additive, meter it into the asphalt cement transfer lines at a bulk terminal or mixing plant. Inject the additive for at least 80 percent of the transfer or mixing time to obtain uniformity.

401.09 Aggregate Preparation. If nonliquid antistrip is used, adjust the aggregate moisture to at least 4 percent by weight of aggregate. Mix the antistrip uniformly

with the aggregate before introducing the aggregate into the dryer or dryer drum. Use calibrated weighing or metering devices to measure the amount of antistrip and moisture added to the aggregate.

For batch plants, heat, dry, and deliver aggregate for pugmill mixing at a temperature sufficient to produce a mixture temperature within the approved range. Adjust flames used for drying and heating to prevent damage to and contamination of the aggregate.

Control plant operations so the moisture content of the mixture behind the paver is 0.5 percent or less, in accordance with AASHTO T 110.

401.10 Mixing. Measure the aggregate and asphalt into the mixer in accordance with the approved job-mix formula. Mix until all the particles are completely and uniformly coated with asphalt, in accordance with ASTM D 995. Maintain the discharge temperature within the approved range.

401.11 Hauling. Use vehicles with tight, clean, and smooth metal beds for hauling asphalt concrete mixtures.

Thinly coat the beds with an approved material to prevent the mixture from adhering to the beds. Do not use petroleum derivatives or other coating material that contaminates or alters the characteristics of the mixture. Drain the bed before loading.

Equip each truck with a canvas cover or other suitable material of sufficient size to protect the mixture from the weather. When necessary to maintain temperature, use insulated truck beds and securely fastened covers. Provide access ports or holes for checking the temperature of the asphalt mixture in the truck.

401.12 Placing & Finishing. Do not use mixtures produced from different plants unless the mixtures are produced in accordance with the same job-mix formula, contain material from the same sources, and are approved.

Place asphalt concrete mixture at a temperature conforming to table 401-3. Measure temperature of the mixture in the hauling vehicle just before dumping into spreader, or measure it in the windrow immediately before pickup.

Place the mixture with a paver that conforms to specifications in Subsection 401.05. Control horizontal alignment using a reference line. Automatically control the grade and slope from reference lines, a ski and slope control device, dual skis. Use skis with a minimum length of 6 m.

Limit the compacted thickness to 75 mm, unless otherwise SHOWN ON THE DRAWINGS.

On areas where mechanical spreading and finishing is impractical, place and finish the mixture with other equipment to produce a uniform surface closely matching the surface obtained when using a mechanical paver.

Offset the longitudinal joint of one layer at least 150 mm from the joint in the layer immediately below. Make the longitudinal joint in the top layer along the centerline of two-lane roadways, or at the lane lines of roadways with more than two lanes. Offset transverse joints in adjacent lanes and in multiple lifts by at least 3 m.

The CO will designate the job-mix formula to be used for wedge and leveling courses at each location unless DESIGNATED IN THE SCHEDULE OF ITEMS. Place wedge and leveling courses in maximum 75-mm lifts and compact with a pneumatic-tire roller meeting the requirements of Subsection 203.15(d). Complete the wedge and leveling before starting normal paving operations.

401.13 Compacting. Furnish at least three rollers, one each for breakdown, intermediate, and finish rolling. Furnish at least one roller with pneumatic tires. Size the rollers to achieve the required results. Operate rollers in accordance with manufacturer's recommendations.

Thoroughly and uniformly compact the asphalt surface by rolling. Do not cause undue displacement, cracking, or shoving. Continue rolling until all roller ridges, ruts, and humps are eliminated and the required compaction is obtained. Do not vibratory roll the mixture after its surface cools below 80 °C.

Along forms, curbs, headers, walls, and other places not accessible to the rollers, compact the mixture with other equipment to obtain the minimum compaction.

401.14 Joints, Trimming Edges, & Cleanup. At connections to existing pavements and previously placed lifts, make the transverse joints vertical to the depth of the new pavement. Form transverse joints by cutting back on the previous run to expose the full depth course. Dispose of trimmed asphalt material in accordance with Subsection 202.04 (a).

Apply an asphalt tack coat to the edge of the joint for both transverse and longitudinal joints, and where SHOWN ON THE DRAWINGS, in accordance with Section 407.

Place the asphalt concrete mixture as continuously as possible. Do not pass rollers over the unprotected end of a freshly laid mixture.

401.15 Acceptance. Provide a quality control plan and then sample, test, and maintain records according to Section 160. See table 401-4 for minimum sampling and testing requirements. Sample to ensure that:

Table 401-4.—Sampling and testing.

Type of Acceptance	Material or Product	Property or Characteristic	Test Method or Specification	Frequency	Sampling Point
Production certification (Subsection105.04)	Asphalt cement	Contract requirements	AASHTO M 20, M 226, or MP 1, as applicable	Daily	–
Tested conformance	Material source	Los Angeles abrasion	AASHTO T 96	Three times for each undeveloped source,[b] or once for all other sources	Material source
		Sodium sulfate soundness loss	AASHTO T 104		
		Durability index (coarse and fine)	AASHTO T 210		
	Aggregate	Fractured faces (coarse)[a]	FLH T 507	Three times for each undeveloped source,[b] or once for all other sources	Cold feed prior to entering dryer
		Sand equivalent value (fine)	AASHTO T 176, alternate method number 2 (referee method)		
	Asphalt cement	Sample	Subsection 105.04(b)	Once for each 500 t of mix, and not more than three times per day	At point of shipment delivery
	Job-mix formula	Contract requirements	Subsection 401.03	Once for each product or material change	–
Mix evaluation	Hot asphalt concrete pavement	Asphalt content	AASHTO T 164, method B or E	Once for each 500 t, and not more than three times per day	At plant, in hauling units, or behind laydown machine before rolling
		Gradation	AASHTO T 30		
		Compaction	ASTM D 2950, “Procedure”	Five times for each 500 t, and not less than five times per day	In-place after compaction
		Maximum specific gravity	AASHTO T 209	Once for each 1,000 t	At plant, in hauling units, or behind laydown machine before rolling

a. Use only for gravel sources.
b. An undeveloped source is a source that has not supplied aggregate for asphalt concrete within 365 days of the start of producing asphalt concrete for this particular project.

- The sample size is adequate to provide a duplicate to the CO and to meet potential need for retesting as specified in Subsection 401.18.

- Samples are prepared according to AASHTO T 248 or other procedures applicable to the item being sampled.

- The sample is adequately identified and placed in CO-approved containers provided by the Contractor.

The CO may perform quality assurance testing, and these tests will be made available to the Contractor upon request.

A lot is defined as the number of tons of material or work produced and/or placed under one set of TV's. The lot will be represented by randomly selected samples tested for acceptance. Plant and equipment operators will not be advised ahead of time when samples are taken.

Acceptance will be evaluated as follows:

(a) Asphalt Cement. Asphalt cement will be evaluated for acceptance under Subsection 106.05.

(b) Pavement Smoothness. Use a 3-m metal straightedge to measure at right angles and parallel to the centerline at designated sites. Defective areas are surface deviations in excess of 10 mm between any two contacts of the straightedge with the surface. Correct defective areas using approved methods.

(c) Thickness & Width. Ensure that the thickness and width of the compacted mixture conform to the dimensions SHOWN ON THE DRAWINGS and meet the following requirements:

(1) The maximum variation from the specified thickness is less than 6 mm for the wearing course or 12 mm for the base course.

(2) The compacted width has a +150-mm tolerance.

(3) The compacted thickness and width are not consistently above or below the specified dimensions.

(d) Asphalt Concrete Mixture Gradation and Asphalt Content. Gradation and asphalt content will be evaluated for acceptance under Subsection 401.16.

(e) Asphalt Concrete Pavement Compaction. Compaction will be evaluated for acceptance under Subsection 401.17.

401.16 Acceptance Sampling & Testing of Asphalt Concrete Mixture Gradation & Asphalt Content. Take statistically random samples in accordance with the tests specified in table 401-4. Take a minimum of three tests per lot. Acceptance or rejection of completed work will be on a lot basis. If the Contractor's quality control tests required in table 401-4 are validated by the CO in accordance with Subsection 401.18 (Test Result Validation Procedure), then the Contractor's tests will be used for acceptance tests.

Obtain samples of the mixture at the plant in approved State department of transportation sampling devices, or after the mixture has been discharged into hauling units or placed on the road in accordance with AASHTO T 168. Test samples for asphalt content by means of AASHTO T 164, method B (Reflux Method) or method E (Vacuum Extraction). Other methods, including nuclear, require approval in writing by the CO and may require an increased sampling and testing frequency. Report the asphalt content to the nearest 0.01 percent. Determine gradation of the entire quantity of extracted material in accordance with AASHTO T 30, except that results shall be reported to the nearest 0.1 percent for all sieves except the 75-µm sieve. Report this sieve to the nearest 0.01 percent. Determine the percent moisture in the asphalt mixture in accordance with AASHTO T 110.

If samples are tested for asphalt content by means of AASHTO T 164, determine an Extraction Retention Factor based on the average difference between at least three samples of known asphalt content, and corresponding asphalt content by the same procedure that will be used for acceptance. Prepare the samples in accordance with table 401-1, (b) Marshall, unless otherwise approved by the CO.

If areas of isolated defect are identified by the CO, treat these areas as a separate lot.

The mix tolerance, also referred to as the upper and lower specification limits (USL's and LSL's), is as shown in table 401-5. For Superpave asphalt concrete pavement, the sieve tolerances will follow the allowable deviations in Subsection 703.14 for the designated nominal size.

Table 401-5.—Mix tolerances.

Mixture Characteristic	Tolerances
Bitumen content	TV ± 0.5
Sieve size:	
4.75 mm and larger	TV ± 6.0
600 µm to 4.74 mm	TV ± 4.0
300 to 599 µm	TV ± 3.0
75 to 299 µm	TV ± 2.0

The Contractor may request a change in TV's subject to the provisions in Subsection 401.03. If the TV's are changed, evaluate all of the material produced up to the time of the change as a lot, and begin a new lot.

The lot will be accepted with respect to gradation and asphalt content using statistical evaluation procedures in accordance with Subsection 401.19.

401.17 Acceptance Sampling & Testing of Asphalt Concrete Pavement
Compaction. Take statistically random samples in accordance with the tests specified in table 401-4. Take a minimum of five tests per lot. Acceptance or rejection of completed work will be on a lot basis. If the Contractor's quality control tests required in table 401-4 are validated by the CO in accordance with Subsection 401.18 (Test Result Validation Procedure), then the Contractor's tests will be used for acceptance tests.

Use the nuclear gauge for acceptance. Calibrate the nuclear gauge in accordance with ASTM D 2950, Calibration section, within 6 months prior to use on this project, and check the standard and reference on each day of use in accordance with ASTM D 2950, Standardization and Reference Check sections. Do not take acceptance samples within 0.3 m from the edges of the panel. Determine the LSL for compaction using either the control strip method or the maximum density method as follows:

(a) Control Strip Method. Use a control strip to establish the LSL. To determine the LSL, construct a control strip at the beginning of work on each type of material to be compacted. Leave each control strip, constructed to acceptable density and surface tolerances, in place to become a section of the completed roadway. Correct or remove unacceptable control strips and replace them at the Contractor's expense. Construct a control strip at least 100 m long and one lane wide, and of the designated lift thickness SHOWN ON THE DRAWINGS.

Ensure that the materials used in the construction of the control strip meet the specification requirements. Furnish them from the same source and of the same type and asphalt content used in the remainder of the course represented by the control strip.

Use equipment in the construction of the control strip that meets the requirements of specified in Subsections 401.05 and 401.13, and that is of the same type and weight as that used on the remainder of the course represented by the control strip.

Begin compaction of the control strips immediately after the course has been placed to the specified thickness. Ensure that compaction is continuous and uniform over the entire surface. Continue compaction of the control strip until no discernible increase in density can be obtained by additional compactive effort.

Upon completion of the compaction, determine the mean density of the control strip by averaging the results of 10 consecutive nuclear density tests taken at randomly selected sites within the control strip. The mean density of the control strip must equal or exceed the density shown in table 401-6.

Table 401-6.—Compaction requirements.

Road Grade (%)	% of AASHTO T 209 converted to density
≤ 8	90
8–12	89
> 12	88

Cease paving if three consecutive control strips fail to achieve the specified minimum density. Take all necessary actions to resolve compaction problems. Do not resume paving without approval of the CO. The LSL shall then be 98 percent of the mean density of the control strip. Construct a new control strip if any of the following occur:

(1) A change in the properties of the material.

(2) A change in the rollers.

(3) A new layer.

(4) Changes in grade as indicated in table 401-6.

(b) Maximum Density Method. The LSL shall be as shown in table 401-6.

After the bituminous mixture has been placed and compacted, the lot will be accepted with respect to compaction using statistical evaluation procedures in accordance with Subsection 401.19. The maximum pay factor for compaction will be 1.00 for the control strip method and 1.05 for the maximum density method. If areas of isolated defect are identified by the CO, these areas will be treated as a separate lot.

401.18 Test Result Validation Procedure. Provide the CO with a duplicate of all required samples, specified in table 401-4. If the Government decides to run assurance tests on the duplicate samples, the CO will determine the number to be run. Normally, the first three samples submitted will be tested, and 10 percent thereafter.

As testing is completed, the CO will evaluate all the Contractor testing. If Contractor testing is verified by Government testing, the Contractor's test results may be used by the Government to evaluate work for acceptance. If Contractor testing is not verified by Government testing, the Contractor has the option of either retesting or having the Government test the duplicate sample. The Contractor or the CO may witness the testing of the remaining sample portions. If the Contractor retests the sample, the test results will again be evaluated based on Government verification testing. If the test results are not valid, the Government test results will then be used for acceptance.

If it becomes necessary for the Government to test all of the samples for a work item due to the Contractor's tests being declared invalid, a payment deduction equal to the total cost of performing all of the testing for the applicable item will be made.

If the Contractor's test results are shown to be valid, but significant differences or shifts make the test results questionable, the CO will review the Contractor's equipment and test procedures.

If any deficiencies are identified that would account for the significant differences or shifts, the CO will suspend acceptance of all material until the deficiencies have been corrected. If no deficiencies that would account for the significant differences or shifts in test results can be identified, continue testing. In order to identify the deficiencies, the CO will increase testing frequency of sample portions.

401.19 Statistical Evaluation of Materials for Acceptance. Analyze all test results for a lot collectively and statistically by the Quality Level Analysis—Standard Deviation Method, using the procedures listed to determine the total estimated percent of the lot that is within specification limits. Quality Level Analysis is a statistical procedure for estimating the percent compliance to a specification. This procedure is affected by shifts in the arithmetic mean (X) and by the sample standard deviation(s). The analysis of each test parameter is based on an Acceptable Quality Level (AQL) of 95.0 and a producer's risk of 5 percent. The AQL may be viewed as the lowest percent of material inside the specification limit that is acceptable at the contract price. The producer's risk is the probability that when the Contractor is producing material at exactly the AQL, the material will receive less than a 1.00 pay factor. As an incentive to produce uniform quality material, payment of up to 5 percent more than the contract unit price may be obtained.

Quality Level Analysis—Standard Deviation Method Procedures are as follows:

(a) Determine the arithmetic mean (X) of each component tested:

$$X = \Sigma x / n$$

where

Σx = summation of individual test values

n = total number test values

(b) Compute the sample standard deviation(s):

$$s = \sqrt{\left(\frac{\Sigma x^2 - nX^2}{n-1}\right)}$$

where

Σx^2 = summation of the squares of individual test values

X^2 = arithmetic mean squared

n = total number test values

(c) Compute the upper quality index (Q_U):

$$Q_U = \frac{USL - X}{s}$$

where

USL = TV plus allowable deviation

s = sample standard deviation

(d) Compute the lower quality index (Q_L):

$$Q_L = \frac{X - LSL}{s}$$

where

LSL = TV minus allowable deviation

s = sample standard deviation

(e) Determine P_U (the percent within the USL that corresponds to a given Q_U) from table 401-7. Note that if a USL is not specified, P_U will be 100.

Table 401-7.—Quality Level Analysis by the Standard Deviation Method.

Estimated % Inside Specification Limit (P_U and/or P_L)	Upper Quality Index (Q_U) or Lower Quality Index (Q_L)														
	n=3	n=4	n=5	n=6	n=7	n=8	n=9	n=10 to n=11	n=12 to n=14	n=15 to n=18	n=19 to n=25	n=26 to n=37	n=38 to n=69	n=70 to n=200	n=200 to 999
100	1.16	1.05	1.79	2.03	2.23	2.39	2.53	2.65	2.83	3.03	3.20	3.38	3.54	3.70	3.83
99	–	1.47	1.67	1.80	1.89	1.95	2.00	2.04	2.09	2.14	2.18	2.22	2.26	2.29	2.31
98	1.15	1.44	1.60	1.70	1.76	1.81	1.84	1.86	1.91	1.93	1.96	1.99	2.01	2.03	2.05
97	–	1.41	1.54	1.62	1.67	1.70	1.72	1.74	1.77	1.79	1.81	1.83	1.85	1.86	1.87
96	1.14	1.38	1.49	1.55	1.59	1.61	1.63	1.65	1.67	1.68	1.70	1.71	1.73	1.74	1.75
95	–	1.35	1.44	1.49	1.52	1.54	1.55	1.56	1.58	1.59	1.61	1.62	1.63	1.63	1.64
94	1.13	1.32	1.39	1.43	1.46	1.47	1.48	1.49	1.50	1.51	1.52	1.53	1.54	1.55	1.55
93	–	1.29	1.35	1.38	1.40	1.41	1.42	1.43	1.44	1.44	1.45	1.46	1.46	1.47	1.47
92	1.12	1.26	1.31	1.33	1.35	1.36	1.36	1.37	1.37	1.38	1.39	1.39	1.40	1.40	1.40
91	1.11	1.23	1.27	1.29	1.30	1.30	1.31	1.31	1.32	1.32	1.33	1.33	1.33	1.34	1.34
90	1.10	1.20	1.23	1.24	1.25	1.25	1.26	1.26	1.26	1.27	1.27	1.27	1.28	1.28	1.28
89	1.09	1.17	1.19	1.20	1.20	1.21	1.21	1.21	1.21	1.22	1.22	1.22	1.22	1.22	1.23
88	1.07	1.14	1.15	1.16	1.16	1.16	1.16	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.17
87	1.06	1.11	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.13	1.13
86	1.04	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08
85	1.03	1.05	1.05	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
84	1.01	1.02	1.01	1.01	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	0.99	0.99
83	1.00	0.99	0.98	0.97	0.97	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.95	0.95	0.95
82	0.97	0.96	0.95	0.94	0.93	0.93	0.93	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
81	0.96	0.93	0.91	0.90	0.90	0.89	0.89	0.89	0.89	0.88	0.88	0.88	0.88	0.88	0.88
80	0.93	0.90	0.88	0.87	0.86	0.86	0.86	0.85	0.85	0.85	0.85	0.84	0.84	0.84	0.84
79	0.91	0.87	0.85	0.84	0.83	0.82	0.82	0.82	0.82	0.81	0.81	0.81	0.81	0.81	0.81
78	0.89	0.84	0.82	0.80	0.80	0.79	0.79	0.79	0.78	0.78	0.78	0.78	0.78	0.78	0.78
77	0.87	0.81	0.78	0.77	0.76	0.76	0.76	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75

Table 401-7.—Quality Level Analysis by the Standard Deviation Method (cont.).

76	0.84	0.78	0.75	0.74	0.73	0.73	0.72	0.72	0.72	0.71	0.71	0.71	0.71	0.71	0.71
75	0.82	0.75	0.72	0.71	0.70	0.70	0.69	0.69	0.69	0.68	0.68	0.68	0.68	0.68	0.68
74	0.79	0.76	0.69	0.68	0.67	0.66	0.66	0.66	0.66	0.65	0.65	0.65	0.65	0.64	0.64
73	0.76	0.69	0.66	0.65	0.64	0.63	0.63	0.63	0.62	0.62	0.62	0.62	0.62	0.61	0.61
72	0.74	0.66	0.63	0.62	0.61	0.60	0.60	0.60	0.59	0.59	0.59	0.59	0.59	0.58	0.58
71	0.71	0.63	0.60	0.59	0.58	0.57	0.57	0.57	0.57	0.56	0.56	0.56	0.56	0.55	0.55
70	0.68	0.60	0.57	0.56	0.55	0.55	0.54	0.54	0.54	0.53	0.53	0.53	0.53	0.53	0.52
69	0.65	0.57	0.54	0.53	0.52	0.52	0.51	0.51	0.51	0.50	0.50	0.50	0.50	0.50	0.50
68	0.62	0.54	0.51	0.50	0.49	0.49	0.48	0.48	0.48	0.48	0.47	0.47	0.47	0.47	0.47
67	0.59	0.51	0.47	0.47	0.46	0.46	0.46	0.45	0.45	0.45	0.45	0.44	0.44	0.44	0.44
66	0.56	0.48	0.45	0.44	0.44	0.43	0.43	0.43	0.42	0.42	0.42	0.42	0.41	0.41	0.41
65	0.52	0.45	0.43	0.41	0.41	0.40	0.40	0.40	0.40	0.39	0.39	0.39	0.39	0.39	0.39
64	0.49	0.42	0.40	0.39	0.38	0.38	0.37	0.37	0.37	0.37	0.36	0.36	0.36	0.36	0.36
63	0.46	0.39	0.37	0.36	0.35	0.35	0.35	0.34	0.34	0.34	0.34	0.34	0.33	0.33	0.33
62	0.43	0.36	0.34	0.33	0.35	0.32	0.32	0.32	0.31	0.31	0.31	0.31	0.31	0.31	0.31
61	0.39	0.33	0.31	0.30	0.32	0.29	0.29	0.29	0.29	0.29	0.28	0.28	0.28	0.28	0.28
60	0.36	0.30	0.28	0.27	0.30	0.27	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.25	0.25
59	0.32	0.27	0.25	0.25	0.24	0.24	0.24	0.24	0.23	0.23	0.23	0.23	0.23	0.23	0.23
58	0.29	0.24	0.23	0.22	0.21	0.21	0.21	0.21	0.21	0.21	0.20	0.20	0.20	0.20	0.20
57	0.25	0.21	0.20	0.19	0.19	0.19	0.19	0.19	0.18	0.18	0.18	0.18	0.18	0.18	0.18
56	0.22	0.18	0.17	0.16	0.16	0.16	0.16	0.16	0.16	0.15	0.15	0.15	0.15	0.15	0.15
55	0.18	0.15	0.14	0.14	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
54	0.14	0.12	0.11	0.11	0.11	0.11	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
53	0.11	0.09	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
52	0.07	0.06	0.06	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
51	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note: If the value of Q_U or Q_L does not correspond to a value in the table, use the next lower value. If Q_U or Q_L are negative values, P_U or P_L is equal to 100 minus the table value for P_U or P_L. If the value of Q_U or Q_L does not correspond exactly to a figure in the table, use the next higher figure.

(f) Determine P_L (the percent within the *LSL* that corresponds to a given Q_L) from table 401-7. Note that if an *LSL* is not specified, P_L will be 100.

(g) Determine the Quality Level (the total percent within specification limits) as follows:

$$\text{Quality Level} = (P_U + P_L) - 100$$

(h) Using the Quality Level from step (g), determine the pay factor (*PFi*) from table 401-8 for each constituent tested.

The contract unit price will be paid for any lot for which at least three samples have been obtained and all of the test results meet the appropriate criteria listed below:

- All test results are within the allowable deviations specified for the item, or
- All test results are greater than or equal to a minimum specification limit, or
- All test results are less than or equal to a maximum specification limit.

Compute the Quality Level and composite pay factor (CPF) in these instances to determine the amount of any bonus that might be warranted.

If less than three samples have been obtained at the time a lot is terminated, include the material in this shortened lot as part of an adjacent lot at the pay factor computed for the revised lot.

If the lot does not meet the criteria for payment at the contract unit price, the lot will be accepted if the CPF is greater than 0.75, provided there are no isolated defects identified by the CO. If a lot contains a CPF less than 0.75, the lot will be rejected. The CO may permit one or more of the following:

- Require complete removal and replacement with specification material at no cost to the Government.
- At the Contractor’s written request, allow corrective work at no additional cost to the Government, and then apply an appropriate price reduction that may range from no reduction to no payment.
- At the Contractor’s written request, allow material to remain in place with an appropriate price reduction that may range from a designated percentage reduction to no payment.

Table 401-8.—Required quality level for a given sample size (*n*) and a given pay factor (*PFi*).

PFi	*n*=3	*n*=4	*n*=5	*n*=6	*n*=7	*n*=8	*n*=9	*n* =10 to *n* =11	*n* =12 to *n* =14	*n* =15 to *n* =18	*n* =19 to *n* =25	*n* =26 to *n* =37	*n* =38 to *n* =69	*n* =70 to *n* =200	*n* =201 to 999
1.05	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
1.04	90	91	92	93	93	93	94	94	95	95	96	96	97	97	99
1.03	80	85	87	88	89	90	91	91	92	93	93	94	95	96	97
1.02	75	80	83	85	86	87	88	88	89	90	91	92	93	94	95
1.01	71	77	80	82	84	85	85	86	87	88	89	90	91	93	94
1.00	68	74	78	80	81	82	83	84	85	86	87	89	90	91	93
0.99	66	72	75	77	79	80	81	82	83	85	86	87	88	90	92
0.98	64	70	73	75	77	78	79	80	81	83	84	85	87	88	90
0.97	62	68	71	74	75	77	78	78	80	81	83	84	85	87	89
0.96	60	66	69	72	73	75	76	77	78	80	81	83	84	86	88
0.95	59	64	68	70	72	73	74	75	77	78	80	81	83	85	87
0.94	57	63	66	68	70	72	73	74	75	77	78	80	81	83	86
0.93	56	61	65	67	69	70	71	72	74	75	77	78	80	82	84
0.92	55	60	63	65	67	69	70	71	72	74	75	77	79	81	83
0.91	53	58	62	64	66	67	68	69	71	73	74	76	78	80	82
0.90	52	57	60	63	64	66	67	68	70	71	73	75	76	79	81
0.89	51	55	59	61	63	64	66	67	68	70	72	73	75	77	80
0.88	50	54	57	60	62	63	64	65	67	69	70	72	74	76	79
0.87	48	53	56	58	60	62	63	64	66	67	69	71	73	75	78
0.86	47	51	55	57	59	60	62	63	64	66	68	70	72	74	77
0.85	46	50	53	56	58	59	60	61	63	65	67	69	71	73	76
0.84	45	49	52	55	56	58	59	60	62	64	65	67	69	72	75
0.83	44	48	51	53	55	57	58	59	61	63	64	66	68	71	74
0.82	42	46	50	52	54	55	57	58	60	61	63	65	67	70	72
0.81	41	45	48	51	53	54	56	57	58	60	62	64	66	69	71
0.80	40	44	47	50	52	53	54	55	57	59	61	63	65	67	70
0.79	38	43	46	48	50	52	53	54	56	58	60	62	64	66	69
0.78	37	41	45	47	49	51	52	53	55	57	59	61	63	65	68
0.77	36	40	43	46	48	50	51	52	54	56	57	60	62	64	67
0.76	34	39	42	45	47	48	50	51	53	55	56	58	61	63	66
0.75[a]	33	38	41	44	46	47	49	50	51	53	55	57	59	62	65

Note: If the computed Quality Level does not correspond exactly to a figure in the table, use the next lower value.

a. Reject quality levels less than those specified for a 0.75 pay factor.

Determine the CPF for each lot as follows:

$$CPF = \frac{[f1(PF1) + f2(PF2) + ... + fi(PFi)]}{\Sigma fi}$$

where

PFi = pay factor for each constituent tested
fi = weighting factor listed below for the applicable material:

Item	Weighting factor (*fi*)
9.5-mm and larger material	1
4.75-mm to 9.49-mm material	3
2.36-mm to 4.74-mm material	5
74-µm to 2.35-mm material	3
75-µm material	12
Asphalt content	29
Compaction	45

Measurement

401.20 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Calculate tonnage as the weight used in the accepted pavement. No deduction will be made for the weight of asphalt cement in the mixture.

Payment

401.21 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM listed below that is DESIGNATED IN THE SCHEDULE OF ITEMS, with the following exceptions:

(a) Payment for hot asphalt concrete pavement and asphalt cement will be made at a price determined by multiplying contract unit bid price by the CPF, as determined in Subsection 401.19.

(b) Payment for sampling and testing will be made as follows:

(1) Twenty-five percent of the lump sum, not to exceed 0.5 percent of the original contract amount, will be paid after all the testing facilities are in place, qualified sampling and testing personnel are identified, and the work being tested has started.

(2) Payment for the remaining portion of the lump sum will be prorated based on the total work completed.

(3) Payment for all or part of this PAY ITEM may be retained if the Government assurance tests invalidate the Contractor's testing.

Payment will be made under:

Pay Item		Pay Unit
401 (01)	Hot asphalt concrete pavement, class ___, grading ___	Ton
401 (02)	Superpave asphalt concrete pavement, nominal size ____	Ton
401 (03)	State asphalt concrete pavement, class ___	Ton
401 (04)	Hot asphalt concrete pavement, class ___, grading ___, wedge and leveling course	Ton
401 (05)	Asphalt cement, grade ___	Ton
401 (06)	Asphalt cement, State department of transportation grade ___	Ton
401 (07)	Sampling and testing	Lump Sum

Section 402—Major Hot Asphalt Concrete Pavement

Description

402.01 Work. Construct one or more courses of hot asphalt concrete pavement as SHOWN ON THE DRAWINGS. Have the surface approved by the CO in writing before placing the hot asphalt concrete pavement.

Hot asphalt concrete pavement classes are designated as shown in table 402-1. Hot asphalt concrete pavement aggregate grading is designated as shown in table 703-4. State asphalt concrete pavement classes are designated by local State department of transportation designations.

Asphalt cement grade is designated as shown in AASHTO M 20, M 226, or MP 1, or in applicable State department of transportation specifications for asphalt materials for the grade specified.

A prepaving conference will be held at least 10 working days prior to the beginning of paving operations. At that time, the Contractor and the CO will discuss methods of accomplishing all phases of the paving work, including laydown operations, work schedules, work force, quality control systems, spill prevention and contingency plans, and asphalt concrete mix delivery.

Materials

402.02 Requirements. Ensure that material conforms to the requirements specified in the following subsections:

Antistrip Additive	702.07
Asphalt Cement	702.01
Hot Asphalt Concrete Pavement Aggregate	703.07
Mineral Filler	725.05
Recycling Agent	702.05

Ensure that reclaimed asphalt pavement material conforms to the following:

(a) 100 percent passes the 50-mm screen.

(b) The material consists of asphalt cement and asphalt cement-coated aggregate.

Table 402-1—Asphalt concrete mixture requirements.

Design Parameters [a]	Class of Mixture A	Class of Mixture B	Class of Mixture C
(a) Hveem (AASHTO T 246 and T 247):			
(1) Stabilometer, min.	37	35	30
(2) Air voids, % [a]	3–5	3–5	3–5
(3) VMA, min. %	See table 402-2		
(b) Marshall (AASHTO T 245):[b]			
(1) Stability, kN min.	8.0	5.3	4.4
(2) Flow, 0.25 mm	8–14	8–16	8–20
(3) Air voids, % [a]	3–5	3–5	3–5
(4) VMA, min. %	See table 402-2		
(5) Compaction, number of blows each end of test specimen	75	50	50
(c) Immersion-Compression (AASHTO T 165 and T 167):			
(1) Compressive strength, MPa min.	2.1	1.7	1.4
(2) Retained strength, min. %	70	70	70
(d) Root–Tunnicliff (ASTM D 4867):			
(1) Tensile strength ratio, min. %	70	70	70
(e) Dust/asphalt ratio [c]	0.6–1.3	0.6–1.3	0.6–1.3

a. Percent of air voids is based on AASHTO T 166, AASHTO T 209, and AASHTO T 269. Maximum specific gravity will be based on AASHTO T 209.
b. Following mixing, asphalt cement mixtures will be cured in an oven maintained at 12 °C to 18 °C above the compaction temperature for 90 ± 10 minutes.
c. Dust/asphalt ratio is defined as the percent of material, including nonliquid antistrip and mineral filler, that passes the 75-µm sieve, divided by the percent of asphalt (calculated by weight of mix).

Construction

402.03 Composition of Mixture (Job-Mix Formula). Up to 20 percent reclaimed asphalt pavement material may be used, subject to approval of a Contractor quality control plan and submission of test data demonstrating that the mixture will meet the requirements specified in this section.

Furnish the appropriate mixture as follows:

(a) Hot Asphalt Concrete Pavement Mixture. Furnish aggregate, asphalt additives, and, when applicable, reclaimed asphalt pavement material that meet the applicable aggregate gradation requirement shown in table 703-4, and design parameters (a) or (b); (c) or (d); and (e) shown in table 402-1.

Table 402-2.—VMA for Marshall or Hveem mix design.

Size[a]	Minimum Voids[b,c] (%)	
	Marshall	Hveem
2.36 mm	21	19
4.75 mm	18	16
9.5 mm	16	14
12.5 mm	15	13
19 mm	14	12
25 mm	13	11
37.5 mm	12	10
50 mm	11.5	9.5

a. The largest sieve size listed in the applicable specification upon which any material is permitted to be retained.
b. VMA to be determined in accordance with AI Manual Series number 2 (MS–2).
c. When a mineral filler or nonliquid antistrip is used, include the percentage specified in the calculation for compliance with the VMA.

(b) State Asphalt Concrete Pavement Mixture. Furnish aggregate, asphalt, and additives that meet applicable aggregate gradation and aggregate quality requirements of the local State department of transportation, and design parameters (a) or (b); (c) or (d); and (e) shown in table 402-1. Local State department of transportation design parameters in lieu of those in table 402-1 may be used if approved by the CO.

Submit written job-mix formulas for approval at least 21 days before production. For each job-mix formula, submit the following:

(1) Aggregate and mineral filler, including:

(a) TV for percent passing each sieve size for the aggregate blend. Ensure that the gradation of the blended aggregate and reclaimed asphalt pavement falls within the gradation band for each sieve size designated in the specified grading.

(b) Source and percentage of each aggregate stockpile to be used.

(c) Average gradation of each aggregate stockpile.

(d) Results of aggregate quality tests.

(e) Samples, when SHOWN ON THE DRAWINGS.

(2) Asphalt cement, including:

(a) TV for percent of asphalt cement based on total weight of mix.

(b) Recent quality test results from the manufacturer for the asphalt cement, including a temperature-viscosity curve.

(c) Material safety data sheets.

(d) Samples, when SHOWN ON THE DRAWINGS.

(3) Antistrip additives. When applicable, furnish:

(a) Type and TV for percent of antistrip additive.

(b) Material safety data sheet.

(c) Samples, when SHOWN ON THE DRAWINGS.

(4) Mix temperatures, including:

(a) Temperatures leaving the mixer.

(b) Temperature immediately preceding initial compaction.

(5) Maximum specific gravity, determined according to AASHTO T 209 at the asphalt cement TV.

(6) Reclaimed asphalt pavement material; when applicable, the percent reclaimed asphalt pavement material and type and percent of recycling agent.

(7) Asphalt mixtures; when applicable, the location of all commercial mixing plants to be used. A job-mix formula is needed for each plant.

The CO will evaluate the suitability of the material and the proposed job-mix formula. After reviewing the proposed job-mix formula, the CO will develop a TV for the asphalt cement content and determine the need for antistrip additive, the specific gravity in accordance with AASHTO T 209, and the discharge temperature range.

If a job-mix formula is rejected, submit a new job-mix formula as described above.

Changes to an approved job-mix formula require approval before production. Allow up to 14 days to evaluate a change. Approved changes in TV's will not be applied retroactively for payment.

402.04 Mixing Plant. Use mixing plants that conform to ASTM D 995, unless producing approved materials for a local State department of transportation. Supplement mixing plant as follows:

(a) All Plants. For all plants, use:

(1) Automated Controls. Automatically control the proportioning, mixing, and discharging of the mixture.

(2) Emission Controls. If a wet scrubber is used, circulate the collected material through sludge pits or settling tanks. Remove the resultant sediment from the project or bury according to Subsection 202.04.

(b) Drum Dryer-Mixer Plants. For drum dryer-mixer plants, use:

(1) Bins. Provide a separate bin in the cold aggregate feeder for each individual aggregate stockpile in the mixture. Use bins of sufficient size to keep the plant in continuous operation, and of proper design to prevent overflow of material from one bin to another.

(2) Stockpiling Procedures. Separate aggregate into at least two stockpiles with different gradations. As a minimum, one stockpile shall contain mostly coarse material, and one stockpile shall contain mostly fine material.

(3) Reclaimed Asphalt Pavement Material. Modify drum dryer-mixer plants to prevent direct contact of the reclaimed asphalt pavement material with the burner flame and to prevent overheating of the reclaimed asphalt pavement material.

(c) Batch & Continuous Mix Plants. For batch and continuous mix plants, use:

(1) A Hot Aggregate Bin. Provide a bin with three or more separate compartments for storage of the screened aggregate fractions to be combined for the mixture. Make the partitions between the compartments tight and of sufficient height to prevent spillage of aggregate from one compartment into another.

(2) Load Cells. Calibrated load cells instead of scales may be used in batch plants.

(3) Reclaimed Asphalt Pavement Material. Modify batch plants to allow the introduction of reclaimed asphalt pavement material into the mixture using methods that bypass the dryer. Design the cold feed bin, conveyor system, and special bin adjacent to the weigh hopper, if used, to avoid segregation and sticking of the reclaimed asphalt pavement material. Heat the new aggregate and/or reclaimed

aggregate material to a temperature that will transfer sufficient heat to the reclaimed asphalt pavement material to produce a mix of uniform temperature within the range specified in the approved job-mix formula.

402.05 Pavers. Use pavers that are:

(a) Self-contained, power-propelled units with adjustable vibratory screeds with full-width screw augers.

(b) Heated for the full width of the screed.

(c) Capable of spreading and finishing courses of asphalt mixture in widths at least 300 mm more than the width of one lane.

(d) Equipped with a receiving hopper with sufficient capacity to ensure a uniform spreading operation.

(e) Equipped with automatic feed controls that are properly adjusted to maintain a uniform depth of material ahead of the screed.

(f) Capable of being operated at forward speeds consistent with satisfactory laying of the mixture.

(g) Capable of producing a finished surface of the required smoothness and texture without segregating, tearing, shoving, or gouging the mixture.

(h) Equipped with automatic screed controls with sensors capable of sensing grade from an outside reference line, sensing the transverse slope of the screed, and providing the automatic signals that operate the screed to maintain grade and transverse slope.

402.06 Surface Preparation. Prepare the surface in accordance with Section 304, 306, 307, or 308, as applicable. Apply an asphalt tack coat to contact surfaces of curbing, gutters, manholes, and other structures in accordance with Section 407.

402.07 Weather Limitations. Place hot asphalt concrete pavement on a dry, unfrozen surface when the air temperature in the shade is above 2 °C and rising, and the temperature of the road surface in the shade, the lift thickness, and the minimum laydown temperature are as shown in table 402-3.

402.08 Asphalt Preparation. Uniformly heat the asphalt cement to provide a continuous supply of the heated asphalt cement from storage to the mixer. Do not heat asphalt cement above 175 °C.

Table 402-3.—Minimum laydown temperature[a] for hot asphalt concrete mixture placement (°C).

Road Surface Temperature (°C)	Lift Thickness		
	≤ 50 mm	50–75 mm	≥ 75 mm
< 2	—[b]	—[b]	—[b]
2–3.9	—[b]	—[b]	138
4–9.9	—[b]	141	135
10–14.9	146	138	132
15–19.9	141	135	129
20–24.9	138	132	129
25–29.9	132	129	127
≥ 30	129	127	124

a. Never heat the asphalt concrete mixture above the temperature specified in the approved mix design.
b. Paving not allowed.

If the job-mix formula requires a liquid heat-stable antistrip additive, meter it into the asphalt cement transfer lines at a bulk terminal or mixing plant. Inject the additive for at least 80 percent of the transfer or mixing time to obtain uniformity.

402.09 Aggregate Preparation. If nonliquid antistrip is used, adjust the aggregate moisture to at least 4 percent by weight of aggregate. Mix the antistrip uniformly with the aggregate before introducing the aggregate into the dryer or dryer drum. Use calibrated weighing or metering devices to measure the amount of antistrip and moisture added to the aggregate.

For batch plants, heat, dry, and deliver aggregate for pugmill mixing at a temperature sufficient to produce a mixture temperature within the approved range. Adjust flames used for drying and heating to prevent damage to, and contamination of, the aggregate.

Control plant operations so the moisture content of the mixture behind the paver is 0.5 percent or less, in accordance with AASHTO T 110.

402.10 Mixing. Measure the aggregate and asphalt into the mixer in accordance with the approved job-mix formula. Mix until all the particles are completely and uniformly coated with asphalt in accordance with ASTM D 995. Maintain the discharge temperature within the approved range.

402.11 Hauling. Use vehicles with tight, clean, smooth metal beds for hauling asphalt concrete mixtures.

Thinly coat the beds with an approved material to prevent the mixture from adhering to the beds. Do not use petroleum derivatives or other coating material that contaminates or alters the characteristics of the mixture. Drain the bed before loading.

Equip each truck with a canvas cover or other suitable material of sufficient size to protect the mixture from the weather. When necessary to maintain temperature, use insulated truck beds and securely fastened covers. Provide access ports or holes for checking the temperature of the asphalt mixture in the truck.

402.12 Placing & Finishing. Do not use mixtures produced from different plants unless the mixtures are produced in accordance with the same job-mix formula, use material from the same sources, and are approved.

Place asphalt concrete mixture at a temperature that conforms to table 402-3. Measure temperature of the mixture in the hauling vehicle just before dumping into spreader, or measure it in the windrow immediately before pickup.

Place the mixture with a paver that conforms to specifications in Subsection 402.05. Control horizontal alignment using a reference line. Automatically control the grade and slope from reference lines, a ski and slope control device, dual skis. Use skis with a minimum length of 6 m.

Limit the compacted thickness to 75 mm, unless otherwise SHOWN ON THE DRAWINGS.

On areas where mechanical spreading and finishing is impractical, place and finish the mixture with alternate equipment to produce a uniform surface closely matching the surface obtained when using a mechanical paver.

Offset the longitudinal joint of one layer at least 150 mm from the joint in the layer immediately below. Make the longitudinal joint in the top layer along the centerline of two-lane roadways or at the lane lines of roadways with more than two lanes. Offset transverse joint in adjacent lanes and in multiple lifts at least 3 m.

The CO will designate the job-mix formula to be used for wedge and leveling courses at each location unless DESIGNATED IN THE SCHEDULE OF ITEMS. Place wedge and leveling courses in maximum 75-mm lifts and compact with a pneumatic-tire roller meeting the requirements of Subsection 203.15(d). Complete the wedge and leveling before starting normal paving operations.

402.13 Compacting. Furnish at least three rollers, one each for breakdown, intermediate, and finish rolling. Furnish at least one roller with pneumatic tires. Size the rollers to achieve the required results. Operate rollers in accordance with manufacturer’s recommendations.

Thoroughly and uniformly compact the asphalt surface by rolling. Do not cause undue displacement, cracking, or shoving. Continue rolling until all roller marks are eliminated and the required compaction is obtained. Do not vibratory roll the mixture after its surface cools below 80 °C.

Along forms, curbs, headers, walls, and other places not accessible to the rollers, use other equipment to obtain the minimum compaction of the mixture.

402.14 Joints, Trimming Edges, & Cleanup. At connections to existing pavements and previously placed lifts, make the transverse joints vertical to the depth of the new pavement. Form transverse joints by cutting back on the previous run to expose the full depth course. Dispose of trimmed asphalt material in accordance with Subsection 210.02(a).

Apply an asphalt tack coat to the edge of the joint for both transverse and longitudinal joints, and where SHOWN ON THE DRAWINGS, in accordance with Section 407.

Place the asphalt concrete mixture as continuously as possible. Do not pass rollers over the unprotected end of a freshly laid mixture.

402.15 Acceptance. Provide a quality control plan, and then sample, test, and maintain records according to Section 160. See table 402-4 for minimum sampling and testing requirements. Sample to ensure that:

(a) The sample size is adequate to provide a duplicate to the CO and to meet potential need for retesting as specified in Subsection 402.18.

(b) Samples are prepared according to AASHTO T 248 or other procedures applicable to the item being sampled.

(c) The sample is adequately identified and placed in CO-approved containers provided by the Contractor.

The CO may perform quality assurances testing, and these tests will be made available to the Contractor upon request.

A lot is defined as the number of tons of material or work produced, and/or placed under one set of TV's. The lot will be represented by randomly selected samples tested for acceptance. Plant and equipment operators will not be advised ahead of time when samples are taken.

Acceptance will be evaluated as follows:

(a) Asphalt Cement. Asphalt cement will be evaluated for acceptance under Subsection 106.05.

Table 402-4.—Sampling and testing.

Type of Acceptance	Material or Product	Property or Characteristic	Test Method or Specification	Frequency	Sampling Point
Production certification (Subsection 105.04)	Asphalt cement	Contract requirements	AASHTO M 20, M 226, or MP 1, as applicable	Daily	–
Tested conformance	Material source	Los Angeles abrasion	AASHTO T 96	Three times for each undeveloped source, [b] or once for all other sources	Material source
		Sodium sulfate soundness loss	AASHTO T 104		
		Durability index (coarse and fine)	AASHTO T 210		
	Aggregate	Fractured faces (coarse) [a]	FLH T 507	Three times for each undeveloped source, [b] or once for all other sources	Cold feed prior to entering dryer
		Sand equivalent value (fine)	AASHTO T 176, alternate method number 2 (referee method)		
	Asphalt cement	Sample	Subsection 105.04(b)	Once for each 500 t of mix, and not more than three times per day	At point of shipment delivery
	Job-mix formula	Contract requirements	Subsection 402.03	Once for each product or material change	–
Mix evaluation	Hot asphalt concrete pavement	Asphalt content	AASHTO T 164, method B or E	Once for each 500 t, and not more than three times per day	At plant, in hauling units, or behind laydown machine before rolling
		Gradation	AASHTO T 30		
		Compaction	ASTM D 2950, “Procedure”	Five times for each 500 t, and not less than five times per day	In-place after compaction
		Maximum specific gravity	AASHTO T 209	Once for each 1,000 t	At plant, in hauling units, or behind laydown machine before rolling

a. Use only for gravel sources.
b. An undeveloped source is a source that has not supplied aggregate for asphalt concrete within 365 days of the start of producing asphalt concrete for this particular project.

(b) Pavement Smoothness. Use a 3-m metal straightedge to measure at right angles and parallel to the centerline at designated sites. Surface deviations in excess of 10 mm between any two contacts of the straightedge with the surface are defective areas. Correct these areas using approved methods.

(c) Thickness & Width. Ensure that the thickness and width of the compacted mixture conform to the dimensions SHOWN ON THE DRAWINGS and meet the following requirements:

(1) The maximum variation from the specified thickness is less than 6 mm for the wearing course or 12 mm for the base course.

(2) The compacted width has a +150-mm tolerance.

(3) The compacted thickness and width are not consistently above or below the specified dimension.

(d) Asphalt Concrete Mixture Gradation and Asphalt Content. Gradation and asphalt content will be evaluated for acceptance under Subsection 402.16.

(e) Asphalt Concrete Pavement Compaction. Compaction will be evaluated for acceptance under Subsection 402.17.

402.16 Acceptance Sampling & Testing of Asphalt Concrete Mixture Gradation & Asphalt Content. Take statistically random samples in accordance with the tests specified in table 402-4. Take a minimum of three tests per lot. Acceptance or rejection of completed work will be on a lot basis. If the Contractor quality control tests required in table 402-4 are validated by the CO in accordance with Subsection 402.18 (Test Result Validation Procedure), then the Contractor tests shall be used for acceptance tests. Take samples of the mixture at the plant in approved State department of transportation sampling devices, or after the mixture has been discharged into hauling units or placed on the road in accordance with AASHTO T 168. Test the samples for asphalt content by means of AASHTO T 164, method B (Reflux Method) or method E (Vacuum Extraction). Other methods, including nuclear, require approval in writing by the CO, and may require an increased sampling and testing frequency. Report the asphalt content to the nearest 0.01 percent. Determine gradation of the entire quantity of extracted material in accordance with AASHTO T 30, but report results to the nearest 0.1 percent for all sieves except the 75-µm sieve; report this sieve to the nearest 0.01 percent. Determine the percent moisture in the asphalt concrete mixture in accordance with AASHTO T 110.

If samples are tested for asphalt content by means of AASHTO T 164, determine an Extraction Retention Factor based on the average difference between at least three

samples of known asphalt content and corresponding asphalt content by the same procedure that will be used for acceptance. Prepare the samples in accordance with table 402-1, (b) Marshall, unless otherwise approved by the CO.

If areas of isolated defect are identified by the CO, treat these areas as a separate lot.

The Contractor may request a change in TV's subject to the provisions in Subsection 402.03. If the TV's are changed, evaluate all of the material produced up to the time of the change as a lot, and begin a new lot.

The lot will be accepted with respect to gradation and asphalt if the average of all test results fall within the tolerances shown in table 402-5.

Table 402-5.—Mix tolerances.

Mixture Characteristic	Tolerances
Bitumen content	TV ± 0.5
Sieve size:	
4.75 mm and larger	TV ± 6.0
600 µm to 4.74 mm	TV ± 4.0
300 to 599 µm	TV ± 3.0
75 to 299 µm	TV ± 2.0
Temperature:	
Leaving the mixture	TV + 6 °C
Placed on the road	TV ± 8 °C

402.17 Acceptance Sampling & Testing of Asphalt Concrete Pavement Compaction. Take statistically random samples in accordance with the tests specified in table 402-4. Take a minimum of five tests per lot. Acceptance or rejection of completed work will be on a lot basis. If the Contractor's quality control tests required in table 402-4 are validated by the CO in accordance with Subsection 402.18 (Test Result Validation Procedure), then the Contractor's tests will be used for acceptance tests.

Use the nuclear gauge for acceptance. Calibrate the nuclear gauge in accordance with ASTM D 2950, Calibration section, within 6 months prior to use on this project, and check the standard and reference on each day of use in accordance with ASTM D 2950, Standardization and Reference Check sections. Do not take acceptance samples within 0.3 m from the edges of the panel. Determine the TV for

compaction using either the Control Strip Method or the Maximum Density Method as follows:

(a) Control Strip Method. Construct a control strip at the beginning of work on each type of material to be compacted. Construct each control strip to acceptable density and surface tolerances, and leave it in place to become a section of the completed roadway. Correct or remove unacceptable control strips, and replace them at the Contractor's expense. Construct a control strip at least 100 m long and one lane wide, and at the compacted lift thickness SHOWN ON THE DRAWINGS.

Ensure that the materials used in the construction of the control strip meet the specification requirements. Furnish them from the same source and of the same type and asphalt content used in the remainder of the course represented by the control strip.

Use equipment in the construction of the control strip that meets the requirements specified in Subsections 402.05 and 402.13, and is of the same type and weight as that to be used on the remainder of the course represented by the control strip.

Begin compacting the control strips immediately after the course has been placed to the specified thickness. Ensure that compaction is continuous and uniform over the entire surface. Continue compaction of the control strip until no discernible increase in density can be obtained by additional compactive effort.

Upon completion of the compaction, determine the mean density of the control strip by averaging the results of 10 consecutive nuclear density tests taken at randomly selected sites within the control strip. The mean density of the control strip must equal or exceed the density shown in table 402-6. The TV shall then be 98 percent of the mean density of the control strip.

Table 402-6.—Compaction requirements.

Road Grade (%)	% of AASHTO T 209 converted to density
≤ 8	90
8–12	89
> 12	88

Cease paving if three consecutive control strips fail to achieve the specified minimum density. Take all necessary actions to resolve compaction problems. Do not resume paving without approval by the CO. Construct a new control strip in case of any of the following:

(1) Any change in the properties of the material.

(2) Any change in the rollers.

(3) A new layer.

(4) Or changes in grade as indicated in table 402-6.

(b) Maximum Density Method. The TV shall be as shown in table 402-6.

After the bituminous mixture has been placed and compacted, compaction for the lot will be accepted if both of the following apply:

(1) All individual test results equal or exceed 98 percent of the TV.

(2) The average of all tests equals or exceeds the TV.

402.18 Test Result Validation Procedure. Provide the CO with a duplicate of all samples specified in table 402-4. If the Government decides to run assurance tests on the duplicate samples, the CO will determine the number to be run. Normally, the first three samples submitted will be tested, and 10 percent thereafter.

As testing is completed, the CO will evaluate all the Contractor testing. If Contractor testing is verified by Government testing, the Contractor's test results may be used by the Government to evaluate work for acceptance. If Contractor testing is not verified by Government testing, the Contractor has the option of either retesting or having the Government test the duplicate sample. The Contractor or the CO may witness the testing of the remaining sample portions. If the Contractor retests the sample, the test results will again be evaluated based on Government verification testing. If the test results are not valid, the Government test results will then be used for acceptance.

If it becomes necessary for the Government to test all of the samples for a work item due to the Contractor's tests being declared invalid, a payment deduction equal to the total cost of performing all of the testing for the applicable item will be made.

If the Contractor's test results are shown to be valid, but significant differences or shifts make the test results questionable, the CO will review the Contractor's equipment and test procedures.

If any deficiencies are identified that would account for the significant differences or shifts, the CO will suspend acceptance of all material until the deficiencies have been corrected. If no deficiencies that would account for the significant differences or shifts in test results can be identified, continue testing. In order to identify the deficiencies, the CO will increase testing frequency of sample portions.

Measurement

402.19 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Calculate the tonnage as the weight used in the accepted pavement, and make no deduction for the weight of asphalt cement in the mixture.

Payment

402.20 Basis. The accepted quantities will be paid at the contract unit price for each PAY ITEM listed below that is DESIGNATED IN THE SCHEDULE OF ITEMS, except that payment for sampling and testing will be made as follows:

(a) Twenty-five percent of the lump sum, not to exceed 0.5 percent of the original contract amount, will be paid after all the testing facilities are in place, qualified sampling and testing personnel are identified, and the work being tested has started.

(b) Payment for the remaining portion of the lump sum will be prorated based on the total work completed.

(c) Payment for all or part of this PAY ITEM may be retained if the Government assurance tests invalidate the Contractor's testing.

Payment will be made under:

Pay Item		Pay Unit
402 (01)	Hot asphalt concrete pavement, class _____, grading _____	Ton
402 (02)	State asphalt concrete pavement, class _____	Ton
402 (03)	Hot asphalt concrete pavement, class _____, grading _____, wedge, and level course	Ton
402 (04)	Asphalt cement, grade _____	Ton
402 (05)	Asphalt cement, State department of transportation grade _____	Ton
402 (06)	Sampling and testing	Lump Sum

Section 403—Minor Hot Asphalt Concrete Pavement

Description

403.01 Work. Construct one or more courses of hot asphalt concrete plant mix on a prepared surface as SHOWN ON THE DRAWINGS. Have the surface approved by the CO in writing prior to placing hot asphalt concrete plant mix.

Materials

403.02 Asphalt Cement. Ensure that asphalt cement meets the requirements specified in Subsection 702.01. The exact percent of asphalt cement and the grade to be used will be furnished by the CO after requirements in Subsection 403.05 have been reviewed and evaluated. Ensure that mixing temperatures meet the requirements specified in Subsection 702.04.

403.03 Aggregate. Ensure that aggregate meets the requirements specified in Subsection 703.07, except for aggregate gradation. Maximum gradation size or suggested gradation designations will be SHOWN ON THE DRAWINGS.

403.04 Additives. Additives, such as filler, hydrated lime, and antistrip agents, may be used as necessary to meet specifications. Ensure that filler meets the requirements of AASHTO M 17, hydrated lime meets the requirements of AASHTO M 216, type N, and antistrip materials meet the requirements specified in Subsection 702.07.

403.05 Job-Mix Formula. Submit a job-mix formula and supporting documentation, test results, and calculations for the material to be incorporated into the work. Include copies of laboratory test results and mix design data that demonstrate that the properties of the aggregate, additives, and mixture meet those requirements and criteria of local public agencies or the AI. After reviewing the Contractor's proposed job-mix formula, the CO will determine the final values for the job-mix formula to be used and notify the Contractor in writing.

Construction

403.06 Asphalt Mixing Plant. Ensure that plants used for preparing hot asphalt concrete mixtures are manufactured for that purpose, in good repair, and capable of mixing the material to a uniform consistency.

403.07 Hauling Equipment. Ensure that trucks used for hauling asphalt concrete mixtures have tight, clean, smooth metal beds that have been thinly coated with a material to prevent the mixture from adhering to the beds. Do not use petroleum

derivatives or other coating material that contaminates or alters the characteristics of the mixture. Drain truck beds prior to loading, and ensure that each truck has a cover to protect the mixture from weather. When necessary to ensure that the mixture will be delivered at the specified temperature, ensure that truck beds are insulated and covers securely fastened.

403.08 Pavers. Use pavers that are in good working order and have an adjustable vibrating screed or strike-off assembly, heated if necessary, and an auger ahead of the screed to distribute the mixture. Use pavers that are capable of spreading and finishing courses of asphalt concrete plant mix material in lane widths and thickness SHOWN ON THE DRAWINGS. Unless otherwise SHOWN ON THE DRAWINGS, towed-type pavers and Layton-type pavers or graders may be used to place and spread the asphalt concrete plant mix material.

403.09 Rollers. Ensure that all rollers meet the requirements specified in Subsections 203.15(b), (c), and (d). Where it is impractical to operate larger rollers, 3- to 5-t rollers may be used. On walkways, 1-t rollers may be used.

403.10 Weather Limitations. Do not place the asphalt concrete mixture when weather conditions prevent the proper compaction of the mixture, the base course is frozen, or the average temperature of the underlying surface upon which the asphalt concrete mixture is to be placed is less than 7 °C, or when it is raining or snowing.

403.11 Conditioning of Existing Surface. Immediately before placing the asphalt concrete mixture, clean the existing surface of loose or deleterious material.

Before placing the asphalt concrete mixture, paint the contact surfaces of curbing, gutters, manholes, and other structures with a thin, uniform coating of asphalt material.

403.12 Control of Asphalt Concrete Mixture. Supply a certification from the mixing plant stating that the mix conforms to the approved job-mix formula. The CO may reject any batch, load, or section of roadway that appears defective in gradation, asphalt cement content, or moisture content. Do not incorporate material rejected before placement into the pavement. Remove any rejected section of roadway. No payment will be made for the rejected materials or the removal of the materials, unless the Contractor requests that the rejected material be tested, at the Contractor's expense, under the following provisions:

(a) Obtain three representative samples and have them tested at a laboratory approved by the CO.

(b) If test results show that the material conforms to the tolerance shown in table 403-1, payment will be made for the material, and for its removal and testing.

Table 403-1.—Allowable tolerances.

Mixture Characteristic	Tolerances
Asphalt content	Job-mix formula ± 0.5
Sieve size:	
9.5 mm and larger	Job-mix formula ± 5.0
4.75 to 9.49 mm	Job-mix formula ± 7.0
76 µm to 4.74 mm	Job-mix formula ± 5.0
75 µm	Job-mix formula ± 2.0

403.13 Transporting, Spreading, & Finishing. Transport the mixture from the mixing plant to the point of use in vehicles that meet the requirements specified in Subsection 403.07.

Spread the mixture and strike it off to the grade and elevation established. Provide a maximum compacted lift thickness of 100 mm unless otherwise SHOWN ON THE DRAWINGS.

Ensure that the longitudinal joint in any layer offsets that in the layer immediately below by approximately 150 mm. Where laydown requires placement of two adjacent panels to cover the surface of a traveled way, ensure that the longitudinal joint of the top layer is at the centerline. This requirement does not apply to turnouts, extra widening, or parking areas. Offset transverse joints in succeeding layers and in adjacent lanes at least 3 m, where possible.

On areas where irregularities or unavoidable obstacles make the use of mechanical spreading and finishing equipment impracticable, the mixture may be placed and finished using hand tools.

403.14 Compaction. Thoroughly and uniformly compact the surface with rollers that meet the requirements specified in Subsection 403.09, and perform initial compaction while the mixture is above 120 °C. Perform finish rolling with steel-wheel rollers and continue until no roller tracks remain.

Measurement

403.15 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Calculate the quantity of hot asphalt concrete mix that is the tonnage of combined aggregate and asphalt cement used in the accepted work. No separate payment will be made for asphalt cement used in the mixture.

Payment

403.16 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item		Pay Unit
403 (01)	Hot asphalt concrete plant mix	Ton
403 (02)	Hot asphalt concrete plant mix	Square Meter

Section 404—Major Cold Asphalt Concrete Pavement

Description

404.01 Work. Construct one or more courses of cold asphalt concrete pavement on a prepared surface that has been approved in writing by the CO.

Cold asphalt concrete pavement grade is designated as shown in table 703-5 or table 703-6.

Cutback asphalt grade is designated as shown in AASHTO M 81, AASHTO M 82, or ASTM D 2026. Emulsified asphalt grade is designated as shown in AASHTO M 140 or M 208.

A prepaving conference will be held at least 10 working days prior to the beginning of paving operations. At that time, the Contractor and the CO will discuss methods of accomplishing all phases of the paving work, including laydown operations, work schedules, work force, quality control systems, spill prevention and contingency plans, and asphalt concrete mix delivery.

Materials

404.02 Requirements. Ensure that the material conforms to specifications in the following subsections:

Antistrip Additive	702.07
Cement	701.01
Choker Aggregate	703.11
Cold Asphalt Concrete Pavement Aggregate	703.08
Cutback Asphalt	702.02
Emulsified Asphalt	702.03
Hydrated Lime	725.03
Mineral Filler	725.05
Water	725.01

Ensure that mixing temperature meets the requirements specified in Subsection 702.04.

Construction

404.03 Composition of Mixture (Job-Mix Formula). Ensure that the composition of cold asphalt concrete mixtures conforms to the following:

(a) Furnish a job-mix formula at least 21 days prior to production. Base the formula on a mix design using the type and grade of asphalt material that will be furnished for the project and of aggregate that will be produced for the project. Acceptable job-mix procedures and criteria are found in AI Manual Series number 14 and number 19. After reviewing the Contractor's proposed job-mix formula, the CO will determine a job-mix formula with TV's and will notify the Contractor in writing.

(b) In the proposed job-mix formula, include definite single-value TV's for:

(1) The percentage of aggregate passing each specified sieve, based on the dry weight of aggregate. These percentages shall be within the range shown in Subsection 703.08, table 703-5 or table 703-6, as applicable.

(2) The percentage of bituminous material to be added, based on the total weight of mixture and corresponding residual asphalt content.

(3) The kind and percentages of additives to be used.

(4) The percentage of water, based on the total dry weight of the mixture.

(5) For emulsified asphalt only, the percentage to total fluids at compaction, based on the total dry weight of the mixture.

404.04 Performance. Perform construction in accordance with the following:

(a) Mixing Plant. Use asphalt mixing plants or pugmills that:

(1) Are manufactured for that purpose.

(2) Are in good working order.

(3) Are equipped with weighing or volumetric equipment capable of providing accurate control of the material entering the mixer.

(4) Interlock the aggregate feed controls with the asphalt material and other additives.

(b) Pavers. Use pavers that are:

(1) Self-contained, power-propelled units with adjustable vibratory screeds with full-width screw augers.

(2) Capable of spreading and finishing courses of asphalt mixture in widths at least 300 mm more than the width of one lane.

(3) Equipped with a receiving hopper with sufficient capacity to ensure a uniform spreading operation.

(4) Equipped with automatic feed controls that are properly adjusted to maintain a uniform depth of material ahead of the screed.

(5) Capable of being operated at forward speeds consistent with satisfactory laying of the mixture.

(6) Capable of producing a finished surface of the required smoothness and texture without segregating, tearing, shoving, or gouging the mixture.

(7) Equipped with automatic screed controls with sensors capable of sensing grade from an outside reference line, sensing the transverse slope of the screed, and providing the automatic signals that operate the screed to maintain grade and transverse slope.

(c) Surface Preparation. Prepare the surface in accordance with Sections 304, 306, 307, and 308, as applicable. Apply an asphalt tack coat to contact surfaces of curbing, gutters, manholes, and other structures in accordance with Section 407.

(d) Weather Limitations. Place cold asphalt concrete pavement on unfrozen, reasonably dry surface when the temperature of the road surface, in the shade, is above 15 °C, and it is not raining or snowing, or predicted to rain or snow within 24 hours after placement.

(e) Mixing. Introduce the material into the mixing plant according to the approved job-mix formula. Control the moisture content by adding water in the plant, covering the stockpile, drying the aggregate, or a combination of these methods as necessary to comply with the job-mix formula. When approved in writing by the CO, additives such as lime or cement may be incorporated into the mixture to correct moisture content.

When the aggregate is combined with asphalt materials other than emulsified asphalt, ensure that the aggregate does not contain more than 3 percent moisture and is at a temperature not less than 16 °C and not more than 107 °C. When the aggregate is combined with emulsified asphalt, ensure that the aggregate is at a temperature not less than 16 °C and not more than 79 °C. Determine the mixing time for each phase of the mixing operation from the nature of the aggregates, the job-mix formula, and the size of the batch. If the mixture is stockpiled, do not allow the pile to segregate such that the emulsified asphalt breaks.

(f) Hauling. Use vehicles conforming to Subsection 402.11.

(g) Placing & Finishing. Do not use mixtures produced from different plants unless the mixtures are produced in accordance with the same job-mix formula, use material from the same sources, and are approved.

Place the mixture with a paver that conforms to Subsection 404.04(b). Control horizontal alignment using a reference line. Automatically control the grade and slope from reference lines, a ski and slope control device, or dual skis. Use skis with a minimum length of 6 m.

Offset and locate longitudinal joint according to Subsection 402.12.

For dense-graded mixtures, allow the surface to cure for not less than 10 days, and for open-graded mixtures, not less than 4 days, before covering with the next course. During this period, maintain the surface and keep it free of corrugations. Use an approved material to patch all holes. Remove all excess blotter, dirt, or other objectionable substances before placing the following course or treatment.

(h) Compacting. Perform initial compaction through a minimum of three complete coverages with a steel-wheel roller that meets the requirements of Subsection 203.15(b). If necessary for dense-graded mixtures, aerate the material by periodically moving and exposing it in the stockpile or through manipulation in a windrow to remove excess moisture or cutter. When DESIGNATED IN THE SCHEDULE OF ITEMS, and prior to intermediate rolling, apply choker aggregate to the top layer only using aggregate spreading equipment designed for the controlled spreading of fine material. Uniformly spread the material to a depth that, when compacted, is sufficient to fill the voids of the asphalt concrete mat. Remove excess choker material by brooming.

Perform intermediate compaction through a minimum of two complete coverages of a self-propelled pneumatic-tire roller with a maximum tire pressure of 275 kPa.

Perform final compaction through two complete coverages with a static roller that meets the requirements of Subsection 203.15, and until all roller marks are eliminated. For open-graded mixtures, use a steel-wheel roller. When no choker aggregate is required, perform final compaction while the emulsion is still tacky.

Along forms, curbs, headers, walls, and other places not accessible to the rollers, use other equipment to obtain the minimum compaction of the mixture.

404.05 Acceptance Sampling & Testing. Perform acceptance sampling and testing in accordance with Subsections 402.15 through 402.18, with the following modifications:

(a) Use table 404-1.

(b) Use table 404-2.

Table 404-1.—Sampling and testing.

Type of Acceptance	Material or Product	Property or Characteristics	Test Method or Specification	Frequency	Sampling Point
Production certification (Subsection 105.04)	Asphalt	Contract requirements	AASHTO M 81, AASHTO M 82, AASHTO M 140 AASHTO M 208 ASTM D 2026, as applicable	Daily	–
Tested conformance	Material source	Los Angeles abrasion	AASHTO T 96	Three times for each undeveloped source,[b] or once for all other sources	Material source
		Sodium sulfate soundness	AASHTO T 104		
		Durability index (coarse and fine)	AASHTO T 210		
	Aggregate	Fracture faces (coarse) [a]	FLH T 507	Three times for each undeveloped source,[b] or once for all other sources	Cold feed prior to entering mixer
		Sand equivalent value (fine)	AASHTO T 176, alternate method number 2 (referee method)		
	Asphalt	Sample	Subsection 105.04(b)	Once for each 500 t of mix, and not more than three times per day	At point of shipment delivery
	Job-mix formula	Contract requirements	Subsection 404.03	Once for each product or material change	–
Mix evaluation	Cold asphalt concrete pavement	Asphalt content Gradation	AASHTO T 164, method B or E AASHTO T 30	Once for each 500 t, and not more than three times per day	At plant, in hauling units,, or behind machine before rolling

a. Use only for gravel sources.
b. An undeveloped source is a source that has not supplied aggregate for asphalt concrete within 365 days of the start of producing asphalt concrete for this particular project.

Table 404-2—Mix tolerances.

Mixture Characteristic[a]	Tolerances
Residual asphalt content	TV ± 0.5
Total fluids in aggregate at compaction	TV ± 1.5

a. For sieve size tolerance, refer to table 703-5 or 703-6, according to the grading DESIGNATED IN THE SCHEDULE OF ITEMS.

(c) Compaction for the lot will be accepted if the requirements specified in Subsection 404.04(g) have been met and all roller marks are eliminated.

Measurement

404.06 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Calculate tonnage as the weight used in the accepted pavement. Make no deduction for the weight of bituminous material or water. No separate payment will be made for water or additives used in the mixture.

Payment

404.07 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS, except that payment for sampling and testing will be made as follows:

(a) Twenty-five percent of the lump sum, not to exceed 0.5 percent of the original contract amount, will be paid after all the testing facilities are in place, qualified sampling and testing personnel are identified, and the work being tested has started.

(b) Payment for the remaining portion of the lump sum will be prorated based on the total work completed.

(c) Payment for all or part of this pay item may be withheld if the Government assurance tests invalidate the Contractor's testing.

Payment will be made under:

Pay Item		Pay Unit
404 (01)	Cold bituminous pavement, _____ grading	Ton
404 (02)	Cutback asphalt, grade _____	Ton
404 (03)	Emulsified asphalt, grade _____	Ton
404 (04)	Choker aggregate	Ton
404 (05)	Sampling and testing	Lump Sum

Section 405—Minor Cold Asphalt Concrete Pavement

Description

405.01 Work. Construct one or more courses of cold asphalt concrete plant mix on a prepared surface as SHOWN ON THE DRAWINGS. Have the surface approved by the CO in writing prior to placing cold asphalt concrete plant mix.

Cutback asphalt grade is designated as shown in AASHTO M 81 or M 82. Emulsified asphalt grade is designated as shown in AASHTO M 140 or M 208.

Materials

405.02 Asphalt Material. Ensure that asphalt material meets the requirements specified in Subsection 702.02 or 702.03, as applicable. The exact percent of asphalt material and the grade to be used will be furnished by the CO after requirements in Subsection 405.05 have been reviewed and evaluated. Ensure that mixing temperatures shall meet the requirements specified in Subsection 702.04.

405.03 Aggregate. Ensure that aggregate meets the requirements specified in Subsection 703.09, except for aggregate gradation. Maximum gradation size or suggested gradation designations will be SHOWN ON THE DRAWINGS.

405.04 Additives. Additives, such as filler, hydrated lime, and antistrip agents, may be used as necessary to meet specifications. Ensure that filler meets the requirements of AASHTO M 17; hydrated lime meets the requirements of AASHTO M 216, type N; antistrip materials meet the requirements specified in Subsection 702.07; and choker aggregate meets the requirements specified in Subsection 703.11.

405.05 Job-Mix Formula. Submit a job-mix formula and supporting documentation, test results, and calculations for the material to be incorporated into the work. Include copies of laboratory test results and mix design data that demonstrate that the properties of the aggregate, additives, and mixture meet those requirements and criteria of local public agencies or the AI. After reviewing the Contractor's proposed job-mix formula, the CO will determine the final values for the job-mix formula to be used and notify the Contractor in writing.

Construction

405.06 Asphalt Concrete Mixing Plant. Ensure that plants used for preparing cold asphalt concrete mixtures are manufactured for that purpose, in good repair, and capable of mixing the material to a uniform consistency.

405.07 Hauling Equipment. Ensure that trucks used for hauling asphalt concrete mixtures have tight, clean, smooth metal beds that have been thinly coated with a material to prevent the mixture from adhering to the beds. Do not use petroleum derivatives or other coating material that contaminates or alters the characteristics of the mixture. Drain truck beds prior to loading, and ensure that each truck has a cover to protect the mixture from weather. When necessary to ensure that the mixture will be delivered at the specified temperature, ensure that truck beds are insulated and covers securely fastened.

405.08 Pavers. Use pavers that are in good working order and have an adjustable vibrating screed or strike-off assembly, and an auger ahead of the screed to distribute the mixture. Use pavers that are capable of spreading and finishing courses of asphalt concrete plant mix material in the lane widths and thickness SHOWN ON THE DRAWINGS. Unless otherwise SHOWN ON THE DRAWINGS, towed-type pavers and Layton-type pavers or graders may be used to place and spread the asphalt concrete plant mix material.

405.09 Rollers. Ensure that all rollers meet the requirements specified in Subsections 203.15(b), (c), and (d). Where it is impractical to operate larger rollers, 3- to 5-t rollers may be used. On walkways, 1-t rollers may be used.

405.10 Weather Limitations. Do not place the asphalt concrete mixture when the base course is frozen, when the average temperature of the underlying surface upon which the asphalt concrete mixture is to be placed is less than 10 °C in the shade, or when it is raining or snowing, or predicted to rain or snow within 24 hours after placement.

405.11 Conditioning of Existing Surface. Immediately before placing the asphalt concrete mixture, clean the existing surface of loose or deleterious material.

Before placing the asphalt concrete mixture, paint the contact surfaces of curbing, gutters, manholes, and other structures with a thin, uniform coating of asphalt material.

405.12 Control of Asphalt Concrete Mixture. Supply a certification from the mixing plant stating that the mix conforms to the approved job-mix formula. The CO may reject any batch, load, or section of roadway that appears defective in gradation, asphalt content, or moisture content. Do not incorporate material rejected before placement into the pavement. Remove any rejected section of roadway. No payment will be made for the rejected materials or the removal of the materials, unless the Contractor requests that the rejected material be tested, at the Contractor's expense, under the following provisions:

(a) Obtain three representative samples and have them tested at a laboratory approved by the CO.

(b) If test results show that the material conforms to the tolerance shown in table 405-1, payment will be made for the material and for its removal and testing.

Table 405-1.—Allowable tolerances.

Mixture Characteristic	Tolerances
Residual asphalt content	Job-mix formula ± 0.5
Sieve size:	
9.5 mm and larger	Job-mix formula ± 5.0
4.75 to 9.49 mm	Job-mix formula ± 7.0
76 µm to 4.74 mm	Job-mix formula ± 5.0
75 µm	Job-mix formula ± 2.0

405.13 Transporting, Spreading, & Finishing. Transport the mixture from the mixing plant to the point of use in vehicles that meet the requirements specified in Subsection 405.07.

Spread the mixture and strike it off to the grade and elevation established. Provide a maximum compacted lift thickness of 100 mm unless otherwise SHOWN ON THE DRAWINGS.

Ensure that the longitudinal joint in any layer offsets that in the layer immediately below by approximately 150 mm. Where laydown requires placement of two adjacent panels to cover the surface of a traveled way, ensure that the longitudinal joint of the top layer is at the centerline. This requirement does not apply to turnouts, extra widening, or parking areas. Offset transverse joints in succeeding layers and in adjacent lanes at least 3 m.

On areas where irregularities or unavoidable obstacles make the use of mechanical spreading and finishing equipment impracticable, the mixture may be placed and finished by using hand tools.

405.14 Compaction. Perform compaction with rollers that meet the requirements specified in Subsection 405.09. Perform initial compaction with steel-wheel rollers for a minimum of three complete coverages. Between initial and final rolling on open-graded mixtures, apply a choker aggregate to the top layer only using aggregate spreading equipment designed for the controlled spreading of fine material. Uniformly spread the material to a depth that, when compacted, will be sufficient to fill the surface voids of the bituminous mat. Remove excessive choke material by brooming. Continue rolling, with a minimum of four complete coverages and until no roller tracks remain, and while the bituminous material is still tacky.

Measurement

405.15 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Calculate the quantity of cold asphalt concrete plant mix as the tonnage of combined aggregate and asphalt material used in the accepted work. No separate payment will be made for asphalt material, water, or additives used in the mixture.

Payment

405.16 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item		Pay Unit
405 (01)	Cold asphalt concrete plant mix, grade ____	Ton
405 (02)	Cold asphalt concrete plant mix, grade ____	Square Meter

Section 407—Asphalt Tack Coat

Description

407.01 Work. Apply an emulsified asphalt tack coat. Have the surface to be treated approved by the CO in writing prior to treatment.

Tack coat emulsified asphalt grade is designated as shown in AASHTO M 140 or M 208.

Materials

407.02 Requirements. Ensure that material conforms to the specifications in the following subsections:

Emulsified Asphalt	702.03
Water	725.01

Construction

407.03 Equipment. Use equipment that conforms to specifications in Subsection 410.04.

407.04 Surface Preparation. Immediately before the application of the tack coat, patch the surface to be treated and remove all foreign and loose material.

407.05 Weather Limitations. Apply asphalt tack coat on a dry, unfrozen surface when the surface temperature in the shade is above 5 °C and rising.

407.06 Asphalt Application. Where slow-setting emulsified asphalt is used, dilute it by adding an equal amount of water to the emulsified asphalt.

Apply the asphalt in accordance with Subsection 410.08 at a rate of 0.15 to 0.70 L/m^2. When a tack coat cannot be applied with an asphalt distributor spray bar, apply the tack coat uniformly and completely by fogging with a hand spray attachment or by another approved method. Ensure that the surfaces of adjacent structures and trees are protected from splattering and marring.

If excess asphalt material is applied, squeegee the excess from the surface. Allow the tacked surfaces to completely cure before placing the covering course. Place the covering course within 4 hours of placing the tack coat.

407.07 Acceptance. Emulsified asphalt will be evaluated for acceptance under Subsection 106.05.

Provide the minimum number of samples specified in table 410-4.

Measurement

407.08 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Water used for diluting emulsified asphalt will not be included in the quantities for PAY ITEMS 407(01) or 407(02), and will not be paid for separately.

Payment

407.09 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item		Pay Unit
407 (01)	Tack coat, grade ___	Ton
407 (02)	Tack coat, grade ___	Liter

Section 408—Asphalt Prime Coat

Description

408.01 Work. Apply a cutback or emulsified asphalt prime coat. Have the surface approved in writing by the CO prior to applying the prime coat.

Prime coat asphalt grade is designated as shown in AASHTO M 140 or M 208 for emulsified asphalt, and AASHTO M 81 or M 82 for cutback asphalt.

Materials

408.02 Requirements. Ensure that material conforms to the specifications in the following subsections:

Blotter	703.12
Choker Aggregate	703.11
Cutback Asphalt	702.02
Emulsified Asphalt	702.03
Water	725.01

Construction

408.03 Equipment. Use equipment that conforms to Subsection 410.04.

408.04 Surface Preparation. Immediately before applying the prime coat, lightly blade the surface and roll it with a smooth-wheel roller. Ensure that the moisture content of the top 25 mm of the surface to be treated is slightly damp.

408.05 Weather Limitations. Apply prime coat when the air temperature in the shade and the pavement surface temperature are at least 10 °C and rising, and when the weather is not foggy or rainy.

408.06 Asphalt Application. When required by the CO, lightly spray the surface with water before applying the prime coat. In order to obtain optimum penetration, apply cutback asphalt in accordance with Subsection 410.08 at a rate of 0.45 to 2.25 L/m^2.

Where using an emulsified asphalt that is not formulated as a penetrating prime coat material, dampen the roadway surface and scarify 25 to 50 mm deep. Dilute the emulsified asphalt by adding an equal amount of water. Apply the diluted emulsified asphalt in accordance with the Subsection 410.08 at a rate of 0.45 to 1.35 L/m^2. Immediately process, respread, and compact the material.

Cure surfaces primed with emulsified asphalt for not less than 24 hours, and surfaces primed with cutback asphalt for not less than 5 days before covering with the next course.

Until the next course is placed, maintain the primed surface and keep it free of corrugations.

Where traffic is routed over a primed surface before the asphalt material has been completely absorbed, or to minimize damage by rain, spread blotter to cover the unabsorbed asphalt. If an emulsified asphalt is used, use choker aggregate. When cutback asphalt is used, do not apply the blotter material for at least 4 hours following application of the asphalt. Remove all excess blotter, choke, dirt, or other deleterious material and repair all damaged areas before placing the next course. Dispose of asphalt material in accordance with Subsection 202.04(a).

408.07 Acceptance. Cutback asphalt and emulsified asphalt will be evaluated for acceptance under Subsection 106.05.

Blotter will be evaluated for acceptance under Subsection 105.03.

Provide the minimum number of samples and tests specified in table 410-4.

Measurement

408.08 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Water used for diluting emulsified asphalt will not be included in the quantity for PAY ITEMS 408(01) or 408(02) and will not be paid for separately.

Payment

408.09 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will made under:

Pay Item		Pay Unit
408 (01)	Prime coat, grade ___	Ton
408 (02)	Prime coat, grade ___	Liter
408 (03)	Blotter	Ton
408 (04)	Blotter	Cubic Meter

Section 409—Slurry Seal

Description

409.01 Work. Apply an asphalt slurry seal mixture. Have the surface approved by the CO in writing prior to placing the slurry seal.

Slurry seal type is designated as shown in table 703-8.

Materials

409.02 Requirements. Ensure that material conforms to the specifications in the following subsections:

Emulsified Asphalt	702.03(d)
Mineral Filler	725.05
Slurry Seal Aggregate	703.10
Water	725.01

Construction

409.03 Composition of Mixture (Job-Mix Formula). Furnish a slurry seal mixture of aggregate, water, emulsified asphalt, and additives in accordance with ASTM D 3910 and ISSA T 114. Ensure that the mixture meets the applicable aggregate gradation shown in table 703-8 and has the following residual asphalt contents, based upon weight of dry aggregate:

- Type I—Residual asphalt between 10.0 percent and 16.0 percent.
- Type II—Residual asphalt between 7.5 percent and 13.5 percent.
- Type III—Residual asphalt between 6.5 percent and 12.0 percent.

Submit a written job-mix formula for approval at least 21 days before production that includes the following:

(a) Aggregate Gradation Values. Provide the representative value for each sieve size for the aggregate blend.

(b) Emulsified Asphalt Content. Provide the residual asphalt content, as a percent by weight of dry aggregate.

(c) Samples. Provide samples of the aggregate, emulsified asphalt, and mineral filler when SHOWN ON THE DRAWINGS.

(d) Laboratory Test Reports & Mix Design Data. Provide copies of all laboratory test reports and mix design data verifying that the material meets the requirements of Subsection 409.02 and the job-mix formula.

The job-mix formula will be evaluated and approved in accordance with Subsection 401.03.

409.04 Equipment. Furnish equipment with the following capabilities:

(a) Slurry Seal Mixer. Furnish a slurry seal mixer with the following features and capabilities:

(1) Self-propelled.

(2) Continuous-flow mixing.

(3) Calibrated controls.

(4) Easily readable metering devices that accurately measure all raw material before entering the pugmill.

(5) Automated system for sequencing in all raw material to ensure constant slurry mixture.

(6) Mixing chamber to thoroughly blend all ingredients together.

(7) Fines feeder with an accurate metering device for introducing additive into the mixer, where the aggregate is introduced into the mixer.

(8) A pressurized water system with a fog-type spray bar capable of fogging the surface immediately ahead of the spreading equipment at a rate of 0.13 to 0.27 L/m^2.

(9) Proportioning system that is accurate for measuring all material independent of the engine speed.

(10) Minimum speed of 20 m/min and maximum speed of 55 m/min.

(11) Minimum storage capacity of 6 t.

(12) Capability in accordance with ISSA Performance Guidelines A 105.

(b) Mechanical-Type Single Squeegee Spreader Box. Furnish with the following capabilities:

(1) Attaches to the slurry seal mixer.

(2) Flexible squeegee in contact with the surface to prevent loss of slurry.

(3) Adjustable to assure a uniform spread over varying grades and crowns.

(4) Adjustable in width with a flexible strike-off.

(5) Augers for uniform flow to edges.

(c) Auxiliary Equipment. Furnish hand squeegees, shovels, and other equipment necessary to perform the work. Provide cleaning equipment that includes, but is not limited to, power brooms, air compressors, water-flushing equipment, and hand brooms for surface preparation.

(d) Pneumatic-Tire Roller. When SHOWN ON THE DRAWINGS, provide a pneumatic-tire roller with the following features:

(1) Smooth tread tires of equal size.

(2) Minimum ground pressure of tire greater than 345 kPa.

409.05 Surface Preparation. Immediately before placing the slurry seal, clean the existing surface of loose or deleterious material.

409.06 Weather Limitations. Apply slurry seal when the air temperature in the shade and the surface temperature are at least 15 °C and rising, and when the weather is not foggy, rainy, or overcast.

409.07 Slurry Seal Application. Mix the slurry seal using a slurry seal mixer. Fog the surface with water immediately preceding the spreader.

Blend the additive with the aggregate using the fines feeder. Prewet the aggregate in the pugmill immediately before mixing with the emulsified asphalt. Stockpile aggregate accordingly to Subsection 305.04.

Mix the slurry seal for a maximum of 4 minutes. Ensure that the slurry seal mixture is of the desired consistency as it leaves the mixer, and that it conforms to the approved job-mix formula. If approved by the CO, the mineral filler and the emulsified asphalt content may be adjusted during construction to conform to variations in field conditions.

Carry sufficient slurry seal mixture in the spreader to completely cover the surface. Spread the mixture with a mechanical-type single squeegee spreader box. In areas not accessible to the spreader box, use hand squeegees to work the slurry seal mixture.

Remove or repair ridges or bumps in the slurry surface.

When required, roll the slurry surface, providing a minimum of five coverages, to completely cure it prior to opening to traffic. Cure is complete when clear water can be pressed out of the slurry mixture with a piece of paper without discoloring the paper.

409.08 Acceptance. Emulsified asphalt will be evaluated for acceptance under Subsection 106.05.

Aggregate will be evaluated for acceptance under Subsection 105.03.

Provide the minimum number of samples and tests specified in table 409-1, in accordance with Section 160.

Measurement

409.09 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment

409.10 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item		Pay Unit
409 (01)	Slurry seal, type ___	Square Meter

Table 409-1.—Sampling and testing.

Type of Acceptance	Material or Product	Property or Characteristic	Test Method or Specification	Frequency	Sampling Point
Production certification	Emulsified asphalt[a]	Contract requirements	AASHTO M 140 or M 208, as applicable	Each shipment	–
Tested conformance	Material source[b] (Contractor-located source)	Los Angeles abrasion	AASHTO T 96	Three times for each undeveloped source,[c] or once for all other sources	Material source
	Slurry seal aggregate	Gradation, table 703-8	AASHTO T 27 and T 11	Once for each 1,700 m^2, but not more than three times per day	
		Sand equivalent value	AASHTO T 176, alternate method number 2 (referee method)		
	Emulsified asphalt	Sample	Subsection 106.04(b)	Each tanker, including all trailers	At point of shipment delivery

a. Use in work permitted before sampling and testing for conformance.
b. See Subsection 105.03. Testing not required when using Government-provided material source.
c. An undeveloped source is a source that has not supplied slurry seal aggregate within 365 days of the start of producing slurry seal aggregate for this project.

Section 410—Asphalt Surface Treatment

Description

410.01 Work. Construct a single or multiple asphalt surface treatment course. Have the surface approved by the CO in writing prior to placing the asphalt surface treatment.

Surface treatment aggregate is designated as shown in tables 410-1, 410-2, and 410-3.

Table 410-1.—Approximate quantities of material for single-course surface treatment.

Sequence of Operations	Treatment Designation and Aggregate Gradation				
	B	C	D	E	F
Apply asphalt material (L/m^2);					
Emulsified asphalt	2.5	2.0	1.6	1.1	1.1
Cutback asphalt	1.9	1.6	1.2	0.9	0.9
Asphalt cement	1.7	1.4	1.1	0.8	0.8
Spread aggregate[a,b] (kg/m^2)	24	16	12	8	11

a. See table 703-7 for aggregate gradations.
b. Aggregate weights are for aggregates that have a bulk specific gravity of 2.65, as determined by AASHTO T 84 and T 85. Make proportionate corrections when the aggregate furnished has a bulk specific gravity above 2.75 or below 2.55.

The grade of asphalt is designated as shown in AASHTO M 20 or M 226 for asphalt cement, Subsection 702.03 for emulsified asphalt, and AASHTO M 81 or M 82 for cutback asphalt, or in applicable State department of transportation specifications for the grade specified.

A presurface treatment conference will be held at least 10 working days prior to the beginning of surface treatment operations. At that time, the Contractor and the CO will discuss methods of accomplishing all phases of the work, including operations, work schedules, work force, quality control systems, spill prevention and contingency plans, and material application rates.

Materials

410.02 Requirements. Ensure that material conforms to the specifications in the following subsections:

Table 410-2—Approximate quantities of material for multiple-course surface treatment (using cutback asphalt).

Sequence of Operations	Treatment Designation Aggregate Gradation [a,b]				
	CT–20	CT–24	CT–36	CT–44	CT–48
First course:					
Apply asphalt material (L/m^2)	1.2	1.6	1.9	1.9	1.9
Spread aggregate (kg/m^2)					
Grading D	12	–	–	–	–
Grading C	–	16	–	–	–
Grading B	–	–	24	24	24
Second course:					
Apply asphalt material (L/m^2)	0.9	0.9	1.2	1.2	1.6
Spread aggregate (kg/m^2)					
Grading E	8	8	–	–	–
Grading D	–	–	12	12	–
Grading C	–	–	–	–	16
Third course:					
Apply asphalt material (L/m^2)	–	–	–	0.9	0.9
Spread aggregate (kg/m^2)					
Grading E	–	–	–	8	8
Totals:					
Asphalt material (L/m^2)	3.1	2.5	3.1	4.0	4.4
Aggregate (kg/m^2)	20	24	36	44	48

a. See table 703-7 for aggregate gradations.
b. Aggregate weights are for aggregates that have a bulk specific gravity of 2.65, as determined by AASHTO T 84 and T 85. Make proportionate corrections when the aggregate furnished has a bulk specific gravity above 2.75 or below 2.55.

Asphalt Cement 702.01
Asphalt Surface Treatment Aggregate 703.09
Blotter 703.12
Cutback Asphalt 702.02
Emulsified Asphalt 702.03

Construction

410.03 Material Submittals. For surface treatments, submit the information and samples shown below for approval at least 21 days before production.

(a) Aggregate Samples. Provide 35 kg from each stockpile produced and the gradation range represented by each.

(b) Aggregate Gradation TV's. Submit the proposed percentage of each stockpile to be used and the proposed TV for each sieve size.

Table 410-3—Approximate quantities of material for multiple-course surface treatment (using emulsified asphalt or asphalt cement[a]).

Sequence of Operations	Treatment Designation Aggregate Gradation [b,c]				
	ET–20	ET–24	ET–36	ET–44	ET–48
First course:					
Apply asphalt material (L/m^2)	1.6	1.9	2.5	2.1	2.3
Spread aggregate (kg/m^2)					
Grading D	12	–	–	–	–
Grading C	–	16	–	–	–
Grading B	–	–	24	24	24
Second course:					
Apply asphalt material (L/m^2)	1.1	1.3	1.6	2.1	2.3
Spread aggregate (kg/m^2)					
Grading E	8	8	–	–	–
Grading D	–	–	12	12	–
Grading C	–	–	–	–	16
Third course:					
Apply asphalt material (L/m^2)	–	–	–	1.0	1.1
Spread aggregate (kg/m^2)					
Grading E	–	–	–	8	8
Totals:					
Asphalt material (L/m^2)	2.7	3.2	4.1	5.2	5.7
Aggregate (kg/m^2)	20	24	36	44	48

a. For asphalt cement spread rates, multiply the asphalt material spread rates shown in the table by 0.68.
b. See table 703-7 for aggregate gradations.
c. Aggregate weights are for aggregates that have a bulk specific gravity of 2.65, as determined by AASHTO T 84 and T 85. Make proportionate corrections when the aggregate furnished has a bulk specific gravity above 2.75 or below 2.55.

(c) Asphalt Temperature. Ensure that asphalt application temperatures conform to table 702-1.

(d) Spread Rates. Furnish proposed spread rates for the asphalt material and aggregate.

410.04 Equipment. Ensure that all equipment is in good working order. Furnish the equipment shown below:

(a) Asphalt Distributor. Furnish an asphalt distributor with the following features and capabilities:

(1) Capable of heating asphalt evenly.

(2) Full-circulation spray bar adjustable to at least 4.6 m wide.

(3) Positive controls, including tachometer, pressure gage, volume-measuring device, or calibrated tank, to uniformly deposit asphalt over the full width within 0.08 L/m^2 of the required rate.

(4) Thermometer for measuring the asphalt temperature in the tank.

(b) Rotary Power Broom. Furnish a rotary power broom equipped to control the vertical broom pressure.

(c) Pneumatic-Tire Rollers. Furnish a minimum of two pneumatic-tire rollers with the following features and capabilities:

(1) Minimum compacting width of 1.5 m.

(2) Minimum ground contact pressure of 550 kPa, with all tires exerting equal contact pressure.

(3) Gross weight adjustable within the range of 35 to 65 kg/mm of compaction width.

(4) Self-propelled.

(d) Aggregate Spreader. Furnish an aggregate spreader with the following features:

(1) Self-propelled.

(2) Minimum of four pneumatic tires on two axles.

(3) Positive controls to uniformly deposit the aggregate over the full width of asphalt within 10 percent by weight of the required rates.

(e) Two-Way Communication. Provide two-way radio communication between the asphalt distributor and aggregate spreader.

(f) Other Equipment. When approved, other equipment of proven performance may be used in addition to, or in lieu of, the equipment specified.

410.05 Surface Preparation. Immediately before placing any layer of the surface treatment, remove loose dirt and other objectionable material from the existing surface.

Apply surface treatments to an existing asphalt surface only when the surface is dry. Prior to application, allow a newly constructed cold or road mix surface to cure for at

least 21 days for a cutback asphalt mix, and at least 14 days for an emulsified asphalt mix, unless otherwise approved by the CO.

When applying surface treatments to existing aggregate surfaces, ensure that the surface is dry if the aggregate was primed, and slightly damp if not primed. If the aggregate surface is primed, allow a prime coat curing period of at least 5 days for cutback asphalt and 24 hours for emulsions, unless otherwise approved by the CO.

Fog seal patches SHOWN ON THE DRAWINGS or listed in the SPECIAL PROJECT SPECIFICATIONS using CSS–1 emulsion, diluted with an equal part of water, at 0.65 L/m^2, unless another rate is SHOWN ON THE DRAWINGS.

410.06 Weather Limitations. Apply surface treatments with aggregate only when the ambient air and surface temperatures are above 18 °C and rising, when the weather is not foggy or rainy, and when rain is not forecast for at least 24 hours after application.

Apply fog seals only when the ambient air and surface temperatures are above 10 °C and rising, when the weather is not foggy or rainy, and when rain is not forecast for at least 24 hours after application.

For all work:

(a) Ensure that humidity is less than 75 percent as measured by the sling psychrometer method.

(b) Complete application of the surface treatment 2 hours before sunset.

(c) Unless otherwise approved by the CO, construct fog seals and single-course surface treatments between June 1 and September 1, and multiple-course surface treatments between June 1 and September 15.

410.07 Production Startup Procedures for Surface Treatment. Provide 7 days advance notice before constructing any asphalt surface treatments containing aggregate, and also use these startup procedures when resuming production after termination due to nonconforming work.

Calibrate each asphalt distributor’s bar height, nozzle angle, pump pressure, and longitude and transverse spread rates in accordance with ASTM D 2995. If different asphalt distributors are used throughout the project, calibrate each prior to use on the project.

On the first day of production of each surface treatment layer, whenever there is a change in the surface texture or the aggregate TV's, construct a 150-m control strip one lane wide. Locate the control strip on the project as designated.

Construct the control strip using material, laydown, and compaction procedures intended for the remainder of the surface treatment. Cease production after construction of the control strip until the material, the control strip, and the asphalt distributor calibration procedures are evaluated and accepted.

Acceptable control strips may remain in place, and will be accepted as a part of the completed surface treatment.

Repeat this control strip process until an acceptable control strip is produced.

410.08 Asphalt Application. Protect the surfaces of nearby objects to prevent spattering or marring. For transverse construction joints, spread building paper on the surface for a sufficient distance from the beginning and end of each application so that the flow through the distributor nozzles may be started and stopped on the paper.

The CO may make adjustments for variations in field conditions. Apply the asphalt uniformly with an asphalt distributor with the spray bar height set for triple overlap. Move the distributor forward at the proper application speed at the time the spray bar is opened. Use care not to apply excess asphalt at the junction of spreads.

Ensure that the length of spread is no more than what can be covered with aggregate within 1 minute of the asphalt application.

Correct skipped areas or deficiencies. Remove and dispose of paper or other material used, in accordance with Subsection 202.04(a).

410.09 Aggregate Application. When using emulsified asphalt, moisten the aggregate to remove its dust coating.

Stockpile aggregate according to Subsections 305.03 and 305.04.

Apply the aggregate uniformly with an aggregate spreader immediately after the asphalt is applied. Operate the aggregate spreader so the asphalt is covered with the aggregate before wheels pass over it. During part-width construction, leave a strip of the sprayed asphalt approximately 150 mm wide uncovered to permit an overlap of the asphalt material.

Immediately correct excesses and deficiencies by brooming, or by the addition or removal of aggregate, until a uniform texture is achieved. Use hand methods in areas not accessible to power equipment.

Make the first roller pass to seat the aggregate immediately after the aggregate is applied. Operate rollers at a maximum speed of 8 km/h. Do not permit the aggregate to be displaced by pickup or sticking of materials to the tire surface. Ensure that the amount of rolling is sufficient to uniformly and thoroughly bond the aggregate over the full width. Make a minimum of three complete coverages. Ensure that rolling is completed within 1 hour after the asphalt is applied to the surface.

410.10 Fog Seal. To construct a fog seal, apply a slow-setting emulsified asphalt diluted with an equal amount of water onto an existing asphalt surface. Apply the diluted emulsified asphalt in accordance with Subsection 410.08 at a rate of 0.45 to 0.70 L/m^2, depending on the condition of the existing surface. Allow the fog seal to penetrate undisturbed for at least 2 hours, or until the emulsified asphalt breaks and is substantially absorbed into the existing surface. Then lightly cover remaining spots of excess asphalt with blotter before opening the surface to traffic.

410.11 Single-Course Surface Treatment. To construct a single-course surface treatment, apply asphalt onto an existing asphalt surface, immediately followed by a single, uniform application of aggregate. Apply the asphalt and aggregate in accordance with Subsections 410.08 and 410.09 at the approximate rates shown in table 410-1. Determine the exact application rates based on approved control strips.

Unless the road is closed to all traffic for the duration of the placement of the surface treatment, use a pilot car to limit traffic speeds. During the initial 45 minutes after rolling, limit the traffic speeds to 15 km/h. Limit traffic speeds to 30 km/h for 24 hours. At all times, operate hauling equipment in a prudent manner and at speeds that will not damage the new surface treatment or create a hazard to the traveling public.

Lightly broom the aggregate surface on the morning after construction. Do not displace embedded material.

Maintain the surface for 4 days after the application of the last layer of aggregate by distributing blotter to absorb any free asphalt, by repairing areas deficient in aggregate, and by sweeping excess material from the surface using a rotary power broom. Broom when the air temperature is less than 24 °C. Do not displace embedded material when brooming.

410.12 Multiple-Course Surface Treatment. To construct a multiple-course surface treatment, apply multiple layers of asphalt and aggregate. Apply each asphalt and aggregate layer in accordance with Subsections 410.08 and 410.09, and at the approximate rates shown in table 410-2 or 410-3. Determine the exact application rates based on approved control strips. When approved by the CO, a steel-wheeled roller with a minimum weight of 8 t may be substituted for one of the pneumatic tire rollers.

Maintain the surface and limit traffic in accordance with Subsection 410.11.

Wait at least 72 hours between application of the layers when using a cutback asphalt, and 24 hours when using an emulsified asphalt. No wait is necessary when using asphalt cement.

410.13 Acceptance. Asphalt cement, emulsified asphalt, and cutback asphalt will be evaluated for acceptance under Subsection 106.05.

Asphalt treatment aggregate and blotter will be evaluated for acceptance under Subsection 105.03.

Provide the minimum number of samples and tests specified in table 410-4, in accordance with Section 160.

Measurement

410.14 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Water used for diluting emulsified asphalt will not be included in the quantity for PAY ITEM 410(04), and will not be paid for separately.

Payment

410.15 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item		Pay Unit
410 (01)	Surface treatment aggregates, designation ___	Ton
410 (02)	Surface treatment aggregates, designation ___	Cubic Meter
410 (03)	Asphalt cement, grade ___	Ton
410 (04)	Emulsified asphalt, grade ___	Ton
410 (05)	Cutback asphalt, grade ___	Ton
410 (06)	Blotter	Ton
410 (07)	Blotter	Cubic Meter

Table 410-4—Sampling and testing. 052113

Type of Acceptance	Material or Product	Property or Characteristic	Test Method or Specification	Frequency	Sampling Point
Production certification	Asphalt cement [a]	Contract requirements	AASHTO M 20 or M 226, as applicable	Each shipment	–
	Emulsified asphalt [a]		Subsection 702.03		
	Cutback asphalt [a]		AASHTO M 81 or M 82, as applicable		
Tested conformance	Material source [b] (Contractor-located source)	Los Angeles abrasion	AASHTO T 96	Three times for each undeveloped source, [c] or once for all other sources	Material source
		Sodium sulfate soundness loss	AASHTO T 104		
		Durability index (coarse and fine)	AASHTO T 210		
		Density	AASHTO T 19		
		Coating and stripping of bitumen - aggregate	AASHTO T 182		
	Asphalt surface treatment aggregate	Gradation , table 703-8 [d]	AASHTO T 27 and T 11	Once for each 500 t, but not less than once per day of production	At stockpile
		Fractured faces (coarse) [d,e]	FLH T 507		
		Flakiness index [d]	FLH T 508		
	Blotter or choker aggregate	Gradation	AASHTO T 27	Once for each 500 t, but not less than once per day of production	Material source
		Liquid limit	AASHTO T 89		
		Sand equivalent	AASHTO T 176		
		Plasticity index	AASHTO T 90		
	Asphalt cement	Sample	Subsection 105.04(b)	Each tanker, including all trailers	At point of shipment delivery
	Emulsified asphalt				
	Cutback asphalt				

a. Use in work is permitted prior to sampling and testing for conformance.
b. See Subsection 105.06. Testing not required when using Government-provided material source.
c. An undeveloped source is a source that has not supplied surface treatment aggregate within 365 days of the start of producing surface treatment aggregate for this project.
d. Applies to each aggregate grade furnished.
e. Use only for gravel sources.

Section 411—Miscellaneous Asphalt Pavement Seals

Description

411.01 Work. Apply pavement sealing material(s) or rejuvenator to pavement surfaces SHOWN ON THE DRAWINGS. The pavement seal may require blotter or color treatment as SHOWN ON THE DRAWINGS. Have the surface approved by the CO in writing prior to placing the miscellaneous asphalt pavement seal.

Materials

411.02 Requirements. Meet the following requirements for materials:

(a) Seal Material. As the primary component of the pavement seal material, use slow-setting asphalt emulsion that conforms to AASHTO M 140 or M 208. Submit a manufacturer's Certificate of Compliance with each shipment of asphalt emulsion. Mix asphalt emulsions with additives that prevent bleeding. Seal materials may be diluted with water to improve penetration into the pavement surface or to improve consistency.

(b) Rejuvenation Material. Dilute rejuvenation materials by two parts concentrate to one part water. Ensure that the concentrate meets the requirements specified in table 411-1.

(c) Additive Materials. Materials such as clays, slates, fibers, carbon black, and polymers may be added to emulsified asphalt, provided that the manufacturer's product literature is reviewed and approved by the CO prior to application. If the pavement seal material is blended with sand, use sand that has clean, hard, durable, uncoated particles, and is free of clay lumps and organic matter, with 100 percent passing the 600-µm sieve and a maximum of 5 percent passing the 75-µm sieve. The sand must have a gradation that helps control segregation and promotes suspension during product application. Do not add more than 360 g of sand to each liter of applied material.

(d) Color Treatment. When SHOWN ON THE DRAWINGS, use color treatments. Carefully mix and apply color additives according with the manufacturer's instructions, so that a consistent color and durable seal are obtained. Asphacolor is the only known material to meet these requirements. If other products are proposed, provide manufacturer's literature that shows similar color, consistency, and durability characteristics.

Table 411-1—Rejuvenator concentration requirements.

Test	Test Method ASTM	Test Method AASHTO	Requirements Min.	Requirements Max.
On emulsion:				
Viscosity at 25 °C, SFS	D 244	T 59	15	40
Residue, percent[a]	D 244 (mod.)	T 59 (mod.)	60	65
Miscibility test[b]	D 244 (mod.)	T 59 (mod.)	No coagulation	
Sieve test, percent[c]	D 244 (mod.)	T 59 (mod.)	–	0.1
Particle charge test	D 244	T 59	Positive	–
On residue from distillation:				
Flash point, COC, °C	D 92	T 48	196	–
Viscosity at 60 °C, cSt	D 445	–	100	200
Asphaltenes, %	D 2006–70	–	–	1.0
Maltene distribution ratio,[d] $\frac{PC + A1}{S + A2}$	D 2006–70	–	0.3	0.6
PC/S ratio[d]	D 2006–70	–	0.5	–
Saturated hydro-carbons, S	D 2006–70	–	21	28

a. For the ASTM D 244 modified evaporation test for percent of residue, heat a 50-g sample to 149 °C until foaming ceases, then cool immediately and calculate results.
b. Use test procedure identical to ASTM D 244–60, but use .02 percent normal calcium chloride solution in place of distilled water.
c. Use test procedure identical to ASTM D 244, but use distilled water in place of 2 percent sodium oleate solution.
d. Chemical composition by ASTM method D 2006–70, where PC = polar compounds, A2 = first acidaffins, A1 = second acidaffins, and S = saturated hydrocarbons.

(e) Blotter. Meet the requirements specified in Subsection 703.12.

(f) Water. Meet the requirements specified in Subsection 725.01.

411.03 Sampling. When directed by the CO, sample materials that are used in the work. Give the CO the opportunity to witness sampling. The CO will be responsible for testing.

Construction

411.04 Weather Limitations. Apply asphalt pavement seals only when the ambient air and surface temperatures are above 10 °C and rising, when the weather is not foggy or rainy, and when rain is not forecast for at least 24 hours after application.

411.05 Equipment. For all materials, use the distribution equipment that is capable of placing a uniform consistency of the material and enabling a uniform application over variable widths of surface. The required application rate may be obtained by making multiple applications. Use equipment for storing and applying of liquid and slurry products that include accurate volume measuring devices and a calibrated tank. The CO may require transport or application equipment to be weighed when full and when empty, if volume-measuring equipment is inadequate.

411.06 Preparation of Surface. Prior to placing the pavement seal, ensure that the surface of the pavement is clean and free from dust, dirt, or other loose foreign matter, grease, oil, or any type of objectionable surface film. Accumulations of oil or grease may be removed by pressure washing, grinding, or burning and scraping. Remove existing painted stripes if SHOWN ON THE DRAWINGS.

Clean all cracks wider than 3 mm by removing accumulated dirt and vegetation, and blow the cracks out with compressed air to a depth of at least three times the crack width. Fill transverse cracks that are more than 3 mm wide according to Subsections 414.04 and 414.05. Other cracks that are more than 3 mm wide may be filled with pavement seal materials prior to application of seal materials over the entire surface.

411.07 Pavement Seal Application With or Without Color Treatment. Application may be by hand-held spray equipment, asphalt distributor, squeegee, or slurry seal spreader box. Spread the seal material in two directions, 180° from each other. The CO may require an additional application on small areas of pavement that have more surface voids, where voids have prevented adequate coverage, or where uneven application exists.

Obtain the minimum residue application rate of 0.55 kg/m^2 over the entire surface to be treated. Ensure that residue consists of the asphalt cement portion of the emulsified asphalt and nonevaporative additive materials (such as clays, slates, fibers, polymers, and sand) that are suspended in the emulsion when applied. Application rates may be adjusted up or down by 0.08 kg residue per square meter by the CO to compensate for pavement surface absorption and roughness.

Readily determine the volume of emulsion used prior to, during, and after application. Final payment will be based on meeting the specified application rate of residue. The CO will determine the weight of residue per liter by drying field samples from the project to constant weight.

411.08 Blotter Application. When blotter is included as a PAY ITEM, apply it at 5 kg/m^2 to areas SHOWN ON THE DRAWINGS. Complete the application within 24 hours of the emulsified asphalt application. The CO may require redistribution of blotter during the first 3 days of the pavement seal curing period.

411.09 Rejuvenator Application. Apply diluted rejuvenator at a rate between 0.2 and 0.4 L/m^2. The exact rate will be determined by the CO. Two hours after application, blot the treated surface with 0.5 to 1.5 kg of blotter sand per square meter. Allow the required cure time of 24 to 48 hours before brooming the sand from the surface.

411.10 Surface Maintenance. Prevent asphalt pickup under traffic for 4 days after treatment. Open the treated pavement surface to traffic within 24 hours following treatment. When directed by the CO, apply blotter sand to the sealed pavement to prevent asphalt pickup by vehicles. The CO may require removal of loose blotter by brooming after the maintenance period. After the treatment has been open to traffic for 4 days, repair any areas that are damaged by traffic or that are peeling or cracking. All damage repair is the responsibility of the Contractor.

411.11 Acceptance. Acceptance for pavement seal with or without color will be as follows:

If laboratory-quality assurance tests on samples taken during application do not contain enough residue to meet the specified application rates established by the CO in Subsection 411.07, the CO may require the application of more material or may reduce payment. The following factors will be used to determine whether the specified application rate has been obtained:

(a) The average unit weight of the field samples, determined by weighing 1,000 mL to within ± 0.1 g.

(b) The percent residue per liter on a by-weight basis.

(c) The total volume of product applied.

The rejuvenator will be evaluated for acceptance under Subsection 106.05.

Blotter will be evaluated for acceptance under Subsection 105.03.

Measurement

411.12 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Water used for diluting the pavement seal or rejuvenator will not be included in the quantity for PAY ITEMS 411(01), 411(02), or 411(04), and will not be paid for separately.

Payment

411.13 Basis. The accepted quantities will be paid for at the contract unit price for the PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item		Pay Unit
411 (01)	Pavement seal	Square Meter
411 (02)	Pavement seal with color treatment	Square Meter
411 (03)	Blotter	Square Meter
411 (04)	Asphalt rejuvenator	Square Meter

Section 413—Asphalt Pavement Milling

Description

413.01 Work. Remove asphalt pavement using a cold milling process.

Construction Requirements

413.02 Equipment—Milling Machine. Furnish equipment in good working order and with the following capabilities and features:

(a) Self-propelled.

(b) Sufficient power, traction, and stability to accurately maintain depth of cut.

(c) Capable of removing the pavement thickness to provide profile and cross slope.

(d) Automatic system to control grade elevations by referencing from the existing pavement by means of a ski or matching shoe or from an independent grade control.

(e) Automatic system to maintain cross slope.

(f) System to effectively limit dust and other particulate matter from escaping removal operations.

(g) Loading system or adequate support equipment to completely recover milled material at removal rate.

(h) Cutting width equal to at least one-third of the lane width.

413.03 Milling. Use a longitudinal reference to accurately guide the machine. References may include a curb, the edge of pavement, or a string attached to the pavement surface. Mill in a longitudinal direction to the depth SHOWN ON THE DRAWINGS.

Mill the transverse slope to within 6 mm in 3 m of the required slope. Transition from one transverse slope to another at a uniform rate. Uniformly mill the entire roadway lane width so the cross section of the new surface forms a straight line.

Transition between different depths of cut at a uniform rate of 17 mm of depth per 10 m. At the beginning and end of the milling work, construct a smooth transition to the original surface at this rate. Do not leave an exposed vertical edge perpendicular to the direction of travel.

Mill the surface to a smoothness such that a 3-m metal straightedge, measured at right angle and parallel to the centerline, does not have more than a 7-mm surface deviation between any two contact points.

Use a rotary broom and vacuum immediately behind the milling operations to remove and completely recover all loose material. Minimize the escape of dust into the air. Dispose of recovered milled material in accordance with Subsection 202.04(a) or as SHOWN ON THE DRAWINGS.

413.04 Acceptance. Asphalt pavement milling will be evaluated for acceptance based on visual and measured conformance based upon contract requirements and customary construction tolerances.

Measurement

413.05 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment

413.06 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item		Pay Unit
413 (01)	Asphalt pavement milling	Square Meter
413 (02)	Asphalt pavement milling	Kilometer

Section 414—Asphalt Pavement Joint & Crack Treatments

Description

414.01 Work. Cut or rout open cracks. Clean and either seal or fill joints and cracks in asphalt pavement. Joint sealant classes are designated in Subsection 414.02.

Materials

414.02 Requirements. Ensure that material conforms to specifications in the following subsections:

Asphalt Cement	702.01
Backer Rod	712.01(g)
Blotter	703.12
Crack Fillers	712.01(a)(3) and (4)
Emulsified Asphalt	702.03
Fine Aggregate for Portland Cement Concrete	703.01
Joint Sealant, Class 1	712.01(a)(1)
Joint Sealant, Class 2	712.01(a)(2)
Joint Sealant, Class 3	712.01(f)
Slurry Seal	409.02 and 409.03

Construction

414.03 Equipment. Furnish equipment with the features and capabilities shown below:

(a) Power Saw & Blades. A saw and blades of such size and configuration that saw cuts can be made with one pass to the required depth and width. Spacers are not allowed.

(b) Router. A power rotary impact router or vertical spindle router capable of cleaning cracks or joints to the required depth and width.

(c) Hot-Compressed Air Lance. A lance capable of providing clean, oil-free compressed air at a volume of 2.8 m^3/min, at a pressure of 830 kPa, and at a temperature of 1,000 °C.

(d) Application Wand. A crack sealant applicator wand attached to a heated hose that is attached to a heated sealant chamber.

(e) Heating Kettle. An indirect-heating-type double boiler with the space between the inner and outer shells filled with oil or other heat transfer medium capable of constant agitation and able to maintain the temperature of the sealant within manufacturer's

tolerances. Provide an accurate and calibrated thermometer with a range from 100 °C to 300 °C in 2 °C graduations. Locate the thermometer such that the temperature of the joint sealant may be safely checked.

(f) Squeegee. Provide a hand-held squeegee for ensuring that the crack is filled to the existing surface.

414.04 Joint Cutting & Cleaning. Saw cut or rout, clean, and seal joints in a continuous operation. Either dry or wet cutting is allowed. The depth and width of joint cutting will be as SHOWN ON THE DRAWINGS.

Clean dry-sawed joints with a stream of air sufficient to remove all dirt, dust, or deleterious matter adhering to the joint walls or remaining in the joint cavity. Blow or brush dry material off the pavement surface.

Immediately after sawing, clean wet-sawed joints with a water blast, 350 kPa minimum, to remove any sawing slurry, dirt, or deleterious matter adhering to the joint walls or remaining in the joint cavity. Immediately flush all sawing slurry from the pavement surface. Blow wet-sawed joints with air to dry joint surfaces.

Do not allow traffic to knead together or damage the sawed joints. If cleaning operations cause interference with traffic, provide protective screening.

414.05 Joint Cleaning & Sealing. If necessary, clean the joint according to Subsection 414.06. Place the sealant when the pavement surface temperature is 4 °C and rising. Discontinue operations when weather conditions detrimentally affect the quality of forming joints and applying sealant.

Submit a copy of, and adhere to, the manufacturer's recommendations for heating and applying the sealant. Heat the sealant in a heating kettle. Do not heat the sealant above the safe heating temperature recommended by the manufacturer. Do not hold the material at the pouring temperature for more than 6 hours, and do not reheat the material.

Place a backer rod in the bottom of the cut or routed joint. Ensure that the size of the backer rod conforms to table 712-2.

Seal the joints with an applicator wand when the sealant material is at the pouring temperature. Heat or insulate the applicator wand to maintain the pouring temperature of the sealant during placing operation. Return the applicator wand to the machine and recirculate the joint sealant material immediately after sealing each joint.

Immediately screed the joint sealant to the elevation of the existing surface. Use a squeegee to ensure that a 75-mm-wide band is centered on the finished sealed crack.

Wait for the sealant to be tack free before opening the joint to traffic. Do not spread blotter on the sealed joints to allow early opening to traffic.

414.06 Crack Cleaning & Filling. Clean the existing surface of all loose material, dirt, or other deleterious substances by brooming, flushing with water, or other approved methods. Dry cracks before sealing.

When using the hot-compressed air lance, keep it moving so as not to burn the surrounding pavement and the crack. Place and finish sealant within 5 minutes after heating with the hot-compressed air lance.

For cracks 6 mm or less, fill with CSS–1, SS–1, or crack filler. Submit a copy of, and adhere to, the manufacturer's recommendations for heating and applying the crack filler. Use a squeegee to ensure that a 75-mm-wide band is centered on the finished sealed crack. Cover the sealed crack with a light application of blotter.

For cracks with a width greater than 6 mm and less than 25 mm, fill with either a slurry seal mixture, fine aggregate-asphalt cement mixture, or fine aggregate–emulsified asphalt mixture. Have the mixture approved by the CO. Use a squeegee or other suitable equipment to force the mixture into the cracks. Immediately screed the sealant or asphalt mixture to the elevation of the existing surface. Cover the sealed crack with a light application of blotter.

For cracks with a width greater than 25 mm, fill flush to the existing surface with either hot or cold asphalt concrete mix. Have the mixture approved by the CO.

414.07 Resealing Defective Joints or Cracks. Reseal areas that exhibit adhesion failure, damage, missed areas, foreign objects in the sealant, or other problems that will accelerate failure.

414.08 Acceptance. Material for joint sealant and crack filler will be evaluated under Subsection 106.05.

Measurement

414.09 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment

414.10 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item		Pay Unit
414 (01)	Joint cutting and cleaning	Meter
414 (02)	Joint cleaning and sealing	Meter
414 (03)	Joint sealant, class _____	Liter
414 (04)	Joint sealant, class _____	Kilogram
414 (05)	Joint sealant, class _____	Meter
414 (06)	Crack cleaning and filling	Meter
414 (07)	Crack filler	Liter
414 (08)	Crack filler	Kilogram
414 (09)	Crack filler	Meter

Section 415—Paving Geotextiles

Description

415. 01 Work. Furnish and place a paving geotextile and asphalt sealant between pavement layers to form a waterproofing and stress-relieving membrane within the pavement structure. Have the surface approved by the CO in writing prior to placing the asphalt sealant and paving geotextile.

Materials

415.02 Requirements. Provide material that conforms to specifications in the following subsections:

Asphalt Cement	702.01
Choker Aggregate	703.12
Emulsified Asphalt	702.03
Geotextiles, Type VI	714.01

Construction

415.03 Surface Preparation. Clean the surface on which the geotextile is to be placed using a power broom and/or power blower. Fill cracks that exceed 6 mm according to Subsection 414.06. Allow crack filler and patches to cure before placing the geotextile. Remove all foreign and loose material.

415.04 Weather Limitations. Apply asphalt sealant and paving geotextile on a dry surface when the pavement surface temperature is at least 13 °C and rising.

415.05 Asphalt Sealant Application. Use asphalt cements within a temperature range of 140 °C to 165 °C. Use emulsified asphalts within a temperature range of 55 °C to 70 °C.

Apply the asphalt sealant to the pavement surface in accordance with Subsection 410.08 at a rate of 0.90 to 1.35 L/m^2 for asphalt cement and 1.3 to 2.0 L/m^2 for emulsified asphalt.

Spray the asphalt sealant 150 mm wider than the paving geotextile. Do not apply the asphalt sealant any farther in advance of the paving geotextile placement than can be maintained free of traffic.

Where emulsified asphalt is used, allow the emulsion to completely break before placing the paving geotextile.

Where asphalt cement is used, place the paving geotextile immediately after the asphalt cement is applied.

415.06 Paving Geotextile Placement. Place the paving geotextile onto the asphalt sealant with minimal wrinkling. Slit, lay flat, and tack all wrinkles or folds higher than 25 mm. Broom and/or roll the paving geotextile to maximize fabric contact with the pavement surface.

At geotextile joints, overlap the geotextile 150 mm to ensure full closure. Overlap transverse joints in the direction of paving to prevent edge pickup by the paver. Apply additional asphalt sealant to paving geotextile overlaps to ensure proper bonding of the double fabric layer.

If asphalt sealant bleeds through the fabric, treat the affected areas with choker aggregate. Minimize traffic on the geotextile. If circumstances require traffic on the membrane, apply choker aggregate and place signs that read “Slippery When Wet.” Broom the excess choke from the geotextile surface before placing the overlay. Repair all damaged fabric before placing the overlay. Apply a light tack coat in accordance with Section 407 before placing the overlay. To avoid damaging the geotextile, do not turn equipment on the geotextile.

Place a hot asphalt concrete overlay within 48 hours after placing the paving geotextile. Limit the laydown temperature of the mix to a maximum of 165 °C, except when the paving geotextile is composed of polypropylene fibers. In this case, limit the laydown temperature of the mix to a maximum of 150 °C.

415.07 Acceptance. Asphalt cement and emulsified asphalt will be evaluated for acceptance under Subsection 106.05.

Blotter will be evaluated for acceptance under Subsection 105.03.

Paving geotextile material will be evaluated for acceptance under Subsection 714.01.

Provide the minimum number of samples specified in table 410-4.

Measurement

415.08 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment

415.09 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item		Pay Unit
415 (01)	Paving geotextile	Square Meter
415 (02)	Asphalt sealant	Ton
415 (03)	Choker aggregate	Ton

Section 416—Asphalt Pavement Patching

Description

416.01 Work. Perform deep patching, skin patching of asphalt surfaces, and patching of asphalt berms. Prepare the area to be patched, and furnish and place all necessary materials.

Materials

416.02 Requirements. Ensure that asphalt materials are of the type and grade SHOWN ON THE DRAWINGS, and that they meet the requirements specified in the following subsections:

Asphalt Cement.	702.01
Cutback Asphalt	702.02
Emulsified Asphalt	702.03

Ensure that mixing temperatures meet the requirements specified in Subsection 702.04; that aggregates meet the requirements specified in Subsection 703.07, except for gradation; and that fabric meets the requirements specified in Subsection 714.01.

416.03 Job-Mix Formula. Prior to producing asphalt concrete mixtures, submit in writing a proposed job-mix formula and supporting documentation for each mixture to the CO for use in setting the job-mix formula to be used with the proposed materials.

After reviewing the proposed job-mix formula, the CO will determine the final values for the job-mix formula to be used and notify the Contractor in writing.

Construction

416.04 Deep Patching. Remove surface course and base course materials above the subgrade to a minimum depth of 50 mm, or as necessary to reach firm support. If firm support for a patch is unavailable, notify the CO prior to placing any material.

Trim or mill the edges of the prepared hole to form a vertical face in unfractured asphalt surfacing. Make the prepared hole rectangular in shape, and clean it of all loose material. When the hole is dry, spray the bottom and faces with an emulsified asphalt.

Immediately patch or barricade prepared sites.

Place the asphalt concrete mixture in layers not exceeding 100 mm. Thoroughly compact each layer with hand or mechanical tampers or rollers.

Compact the finished surface with a steel-wheel roller or vibratory plate compactor. For hot asphalt concrete mixtures, compact the mix while it is above 110 °C. Ensure that the compacted patch, upon completion, is approximately 3 to 6 mm above the level of the adjacent pavement. Seal the edges of the completed patch with emulsified asphalt, and blot with fine sand.

When SHOWN ON THE DRAWINGS and DESIGNATED IN THE SCHEDULE OF ITEMS, use a geotextile saturated with rubberized asphalt to strengthen the pothole area. Ensure that the geotextile has a minimum grab strength of 90 N. Prepare the surface on which the fabric is placed by digging out and patching as described above, or by cleaning the surface, removing vegetation, and filling all cracks more than 6 mm wide with an approved crack-filling material. Remove excess crack-filling material.

Place the fabric membrane over the repaired area. Extend the fabric a minimum of 150 mm beyond the repaired or patched area onto sound adjoining pavement. Use a minimum of 50 mm overlap where adjacent fabric panels are needed to cover the repaired area.

416.05 Skin Patches. Prior to skin patching, patch all potholes.

Treat minor depressions, light raveling, or surface checking at scattered locations SHOWN ON THE DRAWINGS or marked on the ground by applying a skin patch.

Prior to skin patching, clean the surface of loose and deleterious material, and spray it with emulsified asphalt at the rate ordered by the CO. Do not place mixture until authorized by the CO.

Uniformly distribute asphalt concrete mixture in layers not to exceed 50 mm compacted depth. Feather the edges of skin patches. When multiple layers are necessary, offset all joints at least 150 mm between layers.

Compact each layer with a 7- to 9-t steel roller. For hot asphalt concrete mixtures, compact the mix while it is above 110 °C.

Ensure that the completed patch does not have abrupt transitions that could adversely affect the steering of a passenger car traveling across the area. Provide transition tapers for skin patches that are 100 mm per 1 mm thickness of patch in the direction on travel.

416.06 Asphalt Berm. Remove damaged segments of berm and bevel exposed ends at approximately 45° from vertical. Clean and patch the berm foundation as

necessary. Coat the foundation and joining surfaces with emulsified asphalt. Place and compact asphalt mix to conform with the shape of the undamaged segment.

416.07 Waste Material. Dispose of all materials removed from potholes, patches, and berms in accordance with Subsection 202.04(a).

Measurement

416.08 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment

416.09 Basis. The accepted quantities will be paid for at the contract unit price DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item		Pay Unit
416 (01)	Hot asphalt concrete mixture	Ton
416 (02)	Deep patch hot asphalt concrete mixture	Ton
416 (03)	Skin patch hot asphalt concrete mixture	Ton
416 (04)	Cold asphalt concrete mixture	Ton
416 (05)	Rubberized asphalt saturated geotextile	Square Meter

DIVISION 550
Bridge Construction

Section 551—Driven Piles

Description

551.01 Work. Furnish and drive piles. In addition, furnish and place reinforcing steel and concrete in concrete-filled steel shell and concrete-filled pipe piles.

Piles are designated as steel H-piles, steel pipe piles, concrete-filled steel shell piles, concrete-filled pipe piles, precast concrete piles, prestressed concrete piles, or timber piles. Pile load tests are designated as static or dynamic.

Materials

551.02 Requirements. Furnish material that conforms to the specifications in the following sections and subsections:

Concrete Piles	715.03
Paint	708
Pile Shoes	715.08
Reinforcing Steel	554
Sheet Piles	715.07
Splices	715.09
Steel H-Piles	715.06
Steel Pipes	715.05
Steel Shells	715.04
Structural Concrete	552
Treated Timber Piles	715.02
Untreated Timber Piles	715.01

Construction

551.03 Pile-Driving Equipment. Furnish equipment meeting the following requirements:

(a) Pile Hammers. Fumish pile hammers as shown below.

(1) Gravity Hammers. Use gravity hammers to drive timber piles only, and where the ultimate bearing capacity of the timber pile is less than 800 kN. Furnish a hammer with a ram weighing between 900 and 1,600 kg and limit the drop height to 4 m. Ensure that the ram mass is greater than the combined mass of the drive head and pile. Provide hammer guides to ensure concentric impact on the drive head.

(2) Open-End Diesel Hammers. Equip open-end (single-acting) diesel hammers with a device, such as rings on the ram or a scale (jump stick) extending above the ram cylinder, to permit visual determination of hammer stroke. Submit a chart from the hammer manufacturer equating stroke and blows per minute for the hammer to be used. A speed-versus-stroke calibration may be used if approved.

(3) Closed-End Diesel Hammers. Submit a chart, calibrated to actual hammer performance within 90 days of use, equating bounce chamber pressure to either equivalent energy or stroke for the hammer to be used. Equip hammers with a dial gage for measuring pressure in the bounce chamber. Make the gage readable at ground level. Calibrate the dial gage to allow for losses in the gage hose. Verify the accuracy of the calibrated dial gage during driving operations by ensuring that cylinder lift occurs when bounce chamber pressure is consistent with the maximum energy given in the hammer specifications. Do not use closed-end diesel hammers that do not attain cylinder lift at the maximum energy-bounce chamber pressure relationship given in the hammer specification.

(4) Air or Steam Hammers. Furnish plant and equipment for steam and air hammers with sufficient capacity to maintain the volume and pressure specified by the hammer manufacturer. Equip the hammer with accurate pressure gages that are easily accessible. Use a hammer with the mass of the striking parts equal to or greater than one-third the combined mass of the driving head and pile. Ensure that the combined mass is at least 1,250 kg.

When driving test piles, measure inlet pressures for double-acting and differential-acting air or stream hammers with a needle gage at the head of the hammer. If required, also measure inlet pressures during the driving of the production piles. A pressure-versus-speed calibration may be developed for the specific driving conditions at the project as an alternative to periodic measurements with a needle gage.

(5) Nonimpact Hammers. Do not use nonimpact hammers, such as vibratory hammers, unless permitted in writing, SHOWN ON THE DRAWINGS, or provided in the SPECIAL PROJECT SPECIFICATIONS. If permitted, use such equipment for installing production piles only after the pile tip elevation, or embedment length, for safe support of the pile load is established by static or dynamic load testing. Control the installation of production piles when using vibratory hammers by power consumption, rate of penetration, specified tip elevation, or other acceptable methods that will ensure the required pile load capacity is obtained. On 1 out of every 10 piles driven, strike with an impact hammer of suitable energy to verify that the required pile capacity is obtained.

(b) Approval of Pile-Driving Equipment. Furnish pile-driving equipment of such size that the production piles can be driven with reasonable effort to the required lengths without damage.

The Government will evaluate the suitability of the equipment and will accept or reject the driving system within 21 days of receipt of the pile and driving equipment information. Approval of pile-driving equipment will be based on a wave equation analysis under the following conditions:

- When dynamic load testing is required.
- When ultimate pile capacities exceed 2,400 kN.
- When precast or prestressed concrete piles are used.
- When double-acting or differential hammers, air, steam, or diesel are used.

When the wave equation analysis is not used, approval of the pile-driving equipment will be based on minimum hammer energy in table 551-1. Approval of a pile hammer relative to driving stress damage does not relieve the Contractor of responsibility for damaged piles.

Table 551-1.—Minimum pile hammer energy.

Ultimate Pile Capacity (kN)	Minimum Rated Hammer Energy (kJ)
≤ 800	14.0
1,330	21.2
1,600	28.1
1,870	36.0
2,140	44.9
2,400	54.4
> 2,400	Wave equation required

If the wave equation analysis shows an inability to drive the pile(s) to the required ultimate pile-bearing capacity with an acceptable blow count, or that pile damage will occur, change the proposed driving equipment until the wave equation analysis indicates that piles can be driven as specified. Submit proposed changes to the CO for review.

Approval of the pile-driving system is specific to the equipment submitted. If the proposed equipment is modified or replaced, resubmit the revised data for approval before using. The revised driving system will be accepted or rejected within 21 days of receipt of the revised pile, equipment, and wave equation analysis information (if required). Use only the approved equipment during pile-driving operations.

(1) Equipment Submittal. Submit two copies of the following pile-driving equipment information at least 30 days before driving piles. When dynamic load tests are required, submit a wave equation analysis performed by a pile specialty consultant who meets the requirements specified in Subsection 551.12(a). If dynamic load testing is not required, the Government will perform the wave equation analysis.

(a) General. Project and structure identification, pile driving contractor or subcontractor, and auxiliary methods of installation, such as jetting or preboring, and the type and use of the equipment.

(b) Hammer. Manufacturer, model, type, serial number, rated energy (_____ at _____ length of stroke), and modifications.

(c) Capblock (Hammer Cushion). Material, thickness, area, modulus of elasticity (E), and coefficient of restitution (e).

(d) Pile Cap. Helmet mass, bonnet mass, anvil block mass, and drivehead weight.

(e) Pile Cushion. Cushion material, thickness, area, modulus of elasticity (E), and coefficient of restitution (e).

(f) Pile. Pile type, length (in leads), mass per meter, wall thickness, taper, cross-sectional area, design pile capacity, description of splice, and tip treatment description.

(2) Wave Equation. The required number of hammer blows indicated by the wave equation at the ultimate pile capacity shall be between 3 and 15 per 25 mm. In addition, ensure that the pile stresses resulting from the wave equation analysis do not exceed the values at which pile damage is impending. The point of impending damage is defined for steel, concrete, and timber piles as follows:

(a) Steel Piles. Limit the compressive driving stress to 90 percent of the yield stress of the pile material.

(b) Concrete Piles. Limit the tensile (TS) and compressive (CS) driving stresses to:

$$TS - 3f_c' + EPV$$
$$CS - 0.85f_c' - EPV$$

where

f_c' = 28-day design compressive strength of concrete
EPV = effective prestress value (prestressed piles only)

(c) Timber Piles. Limit the compressive driving stress to 3 times the allowable static design stress.

(3) Minimum Hammer Energy. Ensure that the energy of the driving equipment submitted for approval, as rated by the manufacturer, is at least the energy specified in table 551-1 that corresponds to the required ultimate pile capacity.

(c) Driving Appurtenances. Furnish the driving appurtenances shown below.

(1) Hammer Cushion. Equip all impact pile-driving equipment, except gravity hammers, with a suitable thickness of hammer cushion material to prevent damage to the hammer or pile and to ensure uniform driving behavior. Fabricate hammer cushions from durable, manufactured material in accordance with the hammer manufacturer's recommendations. Do not use wood, wire rope, or asbestos hammer cushions. Place a striker plate, as recommended by the hammer manufacturer, on the hammer cushion to ensure uniform compression of the cushion material. Inspect the hammer cushion in the presence of the CO when beginning pile-driving at each bent or substructure unit or after each 100 hours of pile-driving, whichever is less. Replace the cushion when its thickness is reduced by more than 50 percent of its original thickness or when it begins to burn.

(2) Pile Drive Head. Provide adequate drive heads for impact hammers, and provide appropriate drive heads, mandrels, or other devices for special piles, in accordance with the manufacturer's recommendations. Align the drive head axially with the hammer and pile. Fit the drive head around the pile head so that it will prevent transfer of torsional forces during driving while maintaining proper alignment of hammer and pile.

(3) Leads. Support piles in line and position with leads while driving. Construct pile driver leads to allow freedom of movement of the hammer while maintaining axial alignment of the hammer and the pile. Do not use swinging leads unless permitted in writing, SHOWN ON THE DRAWINGS, or provided in the SPECIAL PROJECT SPECIFICATIONS. When swinging leads are permitted, fit swinging leads with a pile gate at the bottom of the leads and, in the case of battered piles, with a horizontal brace between the crane and the leads. Adequately embed the leads in the ground or constrain the pile in a structural frame (template) to maintain proper alignment. Provide leads of sufficient length that do not require a follower and will permit proper alignment of battered piles.

(4) Followers. Followers are not permitted unless approved in writing. When followers are permitted, drive the first pile in each bent or substructure unit and every tenth pile driven thereafter, full length without a follower, to verify that adequate pile embedment is being attained to develop the required ultimate pile capacity. Provide a follower of such material and dimensions that will permit the piles to be driven to the required penetration. Hold and maintain the follower and pile in proper alignment during driving.

(5) Jetting. Do not use jetting unless approved in writing. Provide jetting equipment with sufficient capacity to deliver a consistent pressure equivalent to at least 700 kPa at two 20-mm jet nozzles. Jet so as not to affect the lateral stability of the final in-place pile. Remove jet pipes when the pile tip is at least 1.5 m above the prescribed tip elevation, and drive the pile to the required ultimate pile capacity with an impact hammer. Control, treat, if necessary, and dispose of all jet water in an approved manner.

551.04 Pile Lengths. Unless otherwise specified, furnish piles with sufficient length to obtain the required penetration and bearing capacity and extend into the pile cap or footing as SHOWN ON THE DRAWINGS. In addition, increase the length to provide fresh heading and to provide for the Contractor's method of operation. When test piles are required, furnish piles in the lengths determined by the test piles, increased to provide for the Contractor's method of operation.

551.05 Test Piles. Construct test piles at locations SHOWN ON THE DRAWINGS. Excavate the ground at the site of each test pile or production pile to the elevation of the bottom of the footing or pile cap before the pile is driven. Furnish test piles that are longer than the estimated length of production piles. Drive test piles with the same equipment as the production piles.

Drive test piles to the required ultimate capacity at the estimated tip elevation. Allow test piles that do not attain the required ultimate capacity at the estimated tip elevation to "set up" for 24 hours before redriving. Warm the hammer before redriving begins by applying at least 20 blows to another pile. If the required ultimate capacity is not attained on redriving, drive a portion or all of the remaining test pile length and repeat the "set up" and redrive procedure as directed. Splice and continue driving until the required ultimate pile capacity is obtained.

Ensure that test piles that are used in the completed structure conform to the requirements for production piles. Remove test piles that are not incorporated into the completed structure to at least 0.5 m below finished grade.

Do not order piling to be used in the completed structure until test pile data have been reviewed and the production pile order lengths are determined. The CO will provide an estimated length list or pile order list within 10 days after completion of all test pile driving.

551.06 Driven-Pile Capacity. Drive piles with approved pile-driving equipment to the specified penetration and to the depth necessary to obtain the required ultimate pile capacity. Splice piles that do not obtain the required ultimate capacity at the ordered length and drive with an impact hammer until the required ultimate pile capacity is achieved.

Use the dynamic formula to determine ultimate pile capacity of the in-place pile, unless the wave equation is required in accordance with Subsection 551.03(b).

(a) Wave Equation. Adequate penetration will be considered to be obtained when the specified wave equation resistance criteria are achieved within 1.5 m of the designated tip elevation as SHOWN ON DRAWINGS. Drive any piles that do not achieve the specified resistance within these limits to a penetration determined by the CO.

(b) Dynamic Formula. Drive the piles to the penetration necessary to obtain the ultimate pile capacity in accordance with the following formula:

$$Ru = \left(7\sqrt{E\log(10N)}\right) - 550$$

where

Ru = ultimate pile capacity in kilonewtons
E = manufacturer's rated hammer energy in joules at the ram stroke observed or measured in the field
E = W xH x 9.81
W = mass kilograms of striking parts of hammer
H = meter height of fall of the ram measured during pile driving in the field
log (10N) = logarithm to the base 10 of the quantity 10 multiplied by N
N = number of hammer blows per 25 mm at final penetration

Solving for N:

$$N = 10^{x}$$

$$x = \left(\frac{Ru + 550}{7\sqrt{E}}\right) - 1$$

Factor of Safety (FS) = 3.0

(1) Jetted Piles. Determine the in-place ultimate capacity of jetted piles based on impact hammer blow counts (dynamic formula) after the jet pipes have been removed. After the pile penetration length necessary to produce the required ultimate pile capacity has been determined by impact hammer blow count, install the remaining piles in each group or in each substructure unit to similar depths with similar methods. Confirm that the required ultimate pile capacity has been achieved by using the dynamic formula.

(2) Vibratory Hammers. The ultimate bearing capacity of piles driven with vibratory hammers will be based on impact driving blow count after the vibratory equipment has been removed. When vibratory installation of the piles is approved

by the CO and the vibrated piles do not attain the required ultimate pile-bearing capacity at the specified length, splice them as required without compensation, and drive with a specified impact pile hammer until the required ultimate pile-bearing capacity is achieved.

(3) Conditions for Dynamic Formula. The dynamic formula is applicable only if all of the following criteria apply:

(a) The hammer is in good condition and operating in a satisfactory manner.

(b) The hammer ram falls freely.

(c) A follower is not used.

(d) The head of the pile is not broomed or crushed.

(c) "Set Period" & Redriving. If piles do not attain the required bearing capacity when driven to the specified length, allow the piles to stand for a "set period" without driving. The "set period" shall be a minimum of 24 hours unless otherwise approved by the CO. After the "set period," perform check driving on either 2 piles in each bent or on 1 pile in 10 piles, whichever is more. The CO will designate the piles on which check driving is to be performed. Do not use a cold hammer for redriving. Warm up the hammer before redriving begins by applying at least 20 blows to another pile. Perform redriving by driving the pile to the required bearing with a maximum of 15 blows. If the specified hammer blow count is not attained on redriving, the CO may require driving all of the remaining pile length and repeating the "set period" and redriving procedure. Splice any piles driven to plan grade that do not attain the hammer blow count required, and drive until the required bearing is obtained. If the required bearing capacity is attained for each pile that is redriven, then the remaining piles in that bent will be considered satisfactory when driven to at least the same penetration and resistance as the redriven piles.

551.07 Preboring. Unless otherwise provided in the SPECIAL PROJECT SPECIFICATIONS, prebore holes to natural ground when piles are driven through compacted embankments more than 1.5 m in depth. Use augering, wet rotary drilling, or other approved methods of preboring. Except for piles end bearing on rock or hardpan, stop preboring at least 1.5 m above the pile tip elevation and drive the pile with an impact hammer to a penetration that achieves the required ultimate pile capacity. Preboring may extend to the surface of the rock or hardpan where piles are to be end bearing on rock or hardpan. Seat installed piles into the end bearing strata.

Prebore holes smaller than the diameter or diagonal of the pile cross section while allowing penetration of the pile to the specified depth. If subsurface obstructions such as boulders or rock layers are encountered, the hole diameter may be increased to the least dimension adequate for pile installation. After driving is completed,

fill any void space remaining around the pile with sand or other approved material. Do not use a punch or a spud in lieu of preboring.

Do not impair the carrying capacity of existing piles or the safety of adjacent structures. If preboring disturbs the load carrying capacities of previously installed piles or structures, restore the required ultimate capacity of piles and structures by approved methods.

551.08 Jetting. Jetting will be permitted only when SHOWN ON THE DRAWINGS or approved in writing by the CO. When jetting is not required, but approved at the Contractor's request, determine the number of jets and the volume and pressure of water at the jet nozzles necessary to freely erode the material adjacent to the pile without affecting the lateral stability of the final in-place pile. Control, treat if necessary, and dispose of all jet water in a satisfactory manner. Drive all jetted piles with an approved impact hammer.

551.09 Preparation & Driving. Perform the work specified in Section 206 prior to driving piles. Make the heads of all piles plane and perpendicular to the longitudinal axis of the pile. Coordinate pile driving so as not to damage other parts of the completed work.

Drive piles to within 50 mm of plan location at cutoff elevation for bent caps, and within 150 mm of plan location for piles capped below finished ground. Ensure that the pile is no closer than 100 mm to any cap face and no closer than 225 mm to the face of any footing. Drive piles so that the axial alignment is within 20 mm/m of the required alignment. The CO may stop driving to check the pile alignment. Check the alignment of piles that cannot be internally inspected after installation before the last 1.5 m are driven. Do not pull laterally on piles or splice to correct misalignment. Do not splice a properly aligned section on a misaligned pile.

Unless otherwise SHOWN ON THE DRAWINGS, drive piles at least 5 m below the footing or cap. If the required minimum penetration cannot be obtained, provide a larger hammer, prebore or jet holes, or use other methods approved by the CO and in accordance with Subsection 551.03.

If the specified location and/or alignment tolerances are exceeded, the effect of the pile misalignment on the substructure design will be investigated. If the CO determines that corrective measures are necessary, implement suitable measures to correct the problem without compensation.

Place individual piles in pile groups, either starting from the center of the group and proceeding outward in both directions, or starting at the outside row and proceeding progressively across the group.

In an approved manner, correct all piles that are driven improperly, driven out of proper location, misaligned, or driven below the designated cutoff elevation. Replace piles damaged during handling or driving. Obtain approval for the proposed method(s) of correcting or repairing deficiencies.

Ensure that the method used in driving piles does not produce crushing and spalling of the concrete; injurious splitting, splintering, and brooming of the wood; or deformation of the steel.

(a) Timber Piles. Use piling that meets the minimum diameter requirements SHOWN ON THE DRAWINGS. Do not use piles with checks wider than 15 mm. Drive treated timber piles within 6 months after treatment. Handle and care for pressure-treated piles in accordance with American Wood Preservers Association (AWPA) standard M 4 and applicable portions of Subsection 557.04.

Install pile shoes as SHOWN ON THE DRAWINGS. Carefully shape the pile tip to secure an even, uniform bearing for the pile shoe. Fasten the shoe securely to the pile. Treat all holes, cuts, or daps in treated piles with two brush applications of creosote-coal tar solution or other preservative, as provided in the SPECIAL PROJECT SPECIFICATIONS.

Regulate the drop of the hammer to avoid damage to the pile if driving with a gravity hammer is permitted.

Select piles for any one bent to avoid undue bending or distortion of the sway bracing. Exercise care in the distribution of piles of various sizes to obtain uniform strength and rigidity in the bents of any given structure.

(b) Steel Piles. Furnish full length unspliced piles for lengths up to 18 m. If splices are required in the first pile driven and it is anticipated that subsequent piles will also require splices, place the splices in the lower one-third of the pile. Splice lengths less than 3 m are not permitted, and only two splices per pile are allowed, unless otherwise approved by the CO.

Load, transport, unload, store, and handle steel piles so that the metal is kept clean and free from damage. Do not use piles that exceed the camber and sweep permitted by allowable mill tolerance. Steel piles damaged during installation are considered unsatisfactory unless load tests prove that the bearing capacity is 100 percent of the required ultimate capacity. Load tests performed will be at no cost to the Government.

(c) Precast & Prestressed Concrete Piles. Support concrete piles during lifting or moving at the points SHOWN ON THE DRAWINGS or approved shop drawings. If points are not shown, provide support at the quarter points. Provide slings or other

equipment when raising or transporting concrete piles to avoid bending the pile or breaking edges.

Protect the heads of concrete piles with a pile cushion at least 100 mm thick. Cut the pile cushion to match the cross section of the pile top. Replace the pile cushion if it is either compressed more than one-half its original thickness or begins to burn. Provide a new pile cushion for each pile.

A concrete pile is defective if any defect is observed that will affect the strength or long-term performance of the pile.

(d) Concrete-Filled Pipe or Steel Shell Piles. Furnish and handle the steel shells or pipes in accordance with Subsection 551.09(b). Cutting shoes for shells or pipes may be inside or outside the shell. Use high-carbon structural steel with a machined ledge for shell bearing or cast steel with a ledge designed for attachment with a simple weld.

When practicable, drive all pile shells or pipes for a substructure unit prior to placing concrete in any of the shells or pipes. Do not drive pile shells or pipes within 5 m of any concrete-filled pile shell or pipe until the concrete has cured for at least 7 days, or 3 days if using high-early-strength concrete. Do not drive any pile shell or pipe after it is filled with concrete.

Remove and replace shells that are determined to be unacceptable for use due to breaks, bends, or kinks.

551.10 Splices. Submit details for pile field splices for approval. Align and connect pile sections so the axis of the spliced pile is straight.

(a) Steel Piles. Submit a welder certification for each welder. Use welders certified for structural welding.

Make surfaces to be welded smooth, uniform, and free from loose scale, slag, grease, or other material that prevents proper welding. Steel may be oxygen cut. Carbon-arc gouging, chipping, or grinding may be used for joint preparation.

Weld in accordance with AASHTO/American Welding Society (AWS) D 1.5, Bridge Welding Code. Weld the entire pile cross section using prequalified AWS groove weld butt joints. Weld so there is no visual evidence of cracks, lack of fusion, undercutting, excessive piping, porosity, or inadequate size. Manufactured splices may be used in place of full penetration groove butt welds.

(b) Concrete Pile Splices. Submit drawings of proposed splices for approval. Use dowels or other acceptable mechanical means to splice precast concrete or precast

prestressed concrete piles. Ensure that the splice develops strengths in compression, tension, and bending equal to or exceeding the strength of the pile being spliced.

(c) Concrete Pile Extensions. Construct precast concrete piles and prestressed piles as shown below.

(1) Precast Concrete Piles. Extend precast concrete piles by removing the concrete at the end of the pile and leaving 40 diameters of reinforcement steel exposed. Remove the concrete to produce a face perpendicular to the axis of the pile. Securely fasten reinforcement of the same size as that used in the pile to the projecting reinforcing steel. Form the extension to prevent leakage along the pile.

Immediately before placing concrete, wet the top of the pile thoroughly and cover with a thin coating of neat cement, retempered mortar, or other approved bonding material. Place concrete of the same mix design and quality as that used in the pile. Keep forms in place for not less than 7 days after the concrete has been placed. Cure and finish in accordance with Section 552.

(2) Prestressed Piles. Extend prestressed precast piles in accordance with Subsection 551.10(c)(1). Include reinforcement bars in the pile head for splicing to the extension bars. Do not drive extended prestressed precast piles.

(d) Timber Piles. Do not splice timber piles.

551.11 Heaved Piles. Check for pile heave during the driving operation. Take level readings immediately after each pile is driven and again after piles within a radius of 5 m are driven. Redrive all piles that heave more than 5 mm. Redrive to the specified resistance or penetration. Continue readings until the CO determines that such checking is no longer required.

551.12 Pile Load Tests. Pile load tests are not required unless SHOWN ON THE DRAWINGS.

(a) Dynamic Load Test. Use a qualified pile specialty consultant with at least 3 years experience in dynamic load testing and analysis, to perform the dynamic load test, the Case Pile Wave Analysis Program (CAPWAP), and the wave equation analysis including the initial wave analysis specified in Subsection 551.03(b)(1). Submit a resume of the specialty consultant for approval by the CO.

Furnish a shelter to protect the dynamic test equipment from the elements. Locate the shelter within 15 m of the test location. Provide a shelter with a minimum floor size of 6 m^2 and minimum ceiling height of 2 m. Maintain the inside temperature between 10 °C and 35 °C.

Furnish equipment and perform dynamic load tests in accordance with ASTM D 4945 under the supervision of the CO.

Place the piles designated as dynamic load test piles in a horizontal position and not in contact with other piles. Drill holes for mounting instruments near the head of the pile. Mount the instruments and take wave speed measurements. Place the designated pile in the leads. Provide at least a 1.2 x 1.2-m rigid platform, with a 1.1-m safety rail, that can be raised to the top of the pile.

Provide a suitable electrical power supply for the test equipment. If field generators are used as the power source, provide functioning meters for monitoring power voltage and frequency.

Drive the pile to the depth at which the dynamic test equipment indicates that the required ultimate pile capacity is achieved. If necessary to maintain stresses in the pile below the values shown in Subsection 551.03(b)(2), reduce the driving energy transmitted to the pile by using additional cushions or reducing the energy output of the hammer. If nonaxial driving is indicated, immediately realign the driving system.

At least 24 hours after the initial driving, redrive each dynamic load test pile with instrumentation attached. Warm the hammer before redriving by applying at least 20 blows to another pile. Redrive the dynamic load test pile for a maximum penetration of 150 mm or a maximum of 50 blows, whichever occurs first. Practical driving refusal is defined as 15 blows per 25 mm for steel piles, 8 blows per 25 mm for concrete piles, and 5 blows per 25 mm for timber piles.

Verify the assumptions used in the initial wave equation analysis submitted in accordance with Subsection 551.03(b) using CAPWAP. Analyze one blow from the original driving and one blow from the redriving for each pile tested.

Perform additional wave equation analyses with adjustments based on the CAPWAP results. Provide a graph showing blow count versus ultimate capacity. For open-end diesel hammers, provide a blow count versus stroke graph for the ultimate capacity. Provide the driving stresses, transferred energy, and pile capacity as a function of depth for each dynamic load test.

Based on the results of the dynamic load testing, CAPWAP analyses, and wave equation analyses, the production driving criteria may be approved by the CO, who will provide the order list and the required cutoff elevations, or additional pile penetration and testing may be specified. This information will be provided within 10 days after receipt of all required test data for the test piles driven.

(b) Static Load Tests. Perform static load tests in accordance with ASTM D 1143 using the quick load test method, except as modified herein. Submit drawings of

the proposed loading apparatus for approval by the CO, in accordance with the following:

(1) Have a licensed professional engineer prepare the drawings.

(2) Furnish a loading system capable of applying 150 percent of the ultimate pile capacity or 9,000 kN, whichever is less.

(3) Construct the apparatus to allow increments of load to be placed gradually without causing vibration to the test pile.

When tension (anchor) piles are required, drive tension piles at the location of permanent piles when feasible. Do not use timber or tapered piles installed in permanent locations as tension piles. Take the test to plunging failure or the capacity of the loading system.

The safe axial pile load is defined as 50 percent of the failure load. The failure pile load is defined as follows:

- For piles 600 mm or less in diameter or diagonal width:

$$S_f = S + (3.8 + 0.008\,D)$$

- For piles greater than 600 mm in diameter or diagonal width:

$$S_f = S + \frac{D}{30}$$

where

S_f = settlement at failure in millimeters
D = pile diameter or diagonal width in millimeters
S = elastic deformation of pile in millimeters

Determine top elevation of the test pile immediately after driving and again just before load testing to check for heave. Wait a minimum of 3 days between the driving of any anchor or the load test piles and the commencement of the load test. Prior to testing, redrive or jack to the original elevation any pile that heaves more than 6 mm.

After completion of static testing, remove or cut off any test or anchor piling not a part of the finished structure at least 500 mm below either the bottom of the footing or the finished ground elevation.

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Based on the results of the static load testing, the production driving equipment may be approved by the CO, who will provide the order list and the required cutoff elevations, or additional tests may be specified. This information will be provided within 10 days after receipt of all required test data for the test piles driven.

551.13 Pile Cutoffs. Cut off the tops of all production piles and pile casings at the required elevation. Cut off the piles clean and straight parallel to the bottom face of the structural member in which they are embedded.

Ensure full bearing between timber caps and piles by making accurate, square cuts.

Remove all unused pile cutoff lengths and dispose of them in accordance with applicable State and local laws and regulations. Dispose of treated timber pile cut-offs in accordance with the requirements of Subsection 202.04(a) for disposal of treated material.

(a) Steel Piles. Do not paint steel to be embedded in concrete. Before painting the exposed steel pile, thoroughly clean the metal surface of any substance that will inhibit paint adhesion. Paint in accordance with Section 563. Paint portions of completed trestle or other exposed piling to a point not less than 1 m below finished groundline or to the waterline, as SHOWN ON THE DRAWINGS or as provided in the SPECIAL PROJECT SPECIFICATIONS.

(b) Wood Piles. When possible, cut the top of the pile on a bevel. Treat the heads of all treated timber piles that are not embedded in concrete using one of the following methods:

(1) Where possible, reduce the moisture content of the wood to no more than 25 percent and allow no free moisture on the surface. Brush on one application of creosote-coal tar solution as required in AWPA standards, or preservatives as provided in the SPECIAL PROJECT SPECIFICATIONS.

(2) Build up a protective cap by applying alternate layers of loosely woven fabric and hot asphalt or tar similar to membrane waterproofing, using three layers of asphalt or tar and two layers of fabric. Use fabric at least 150 mm wider in each direction than the diameter of the pile. Turn the fabric down over the pile and secure the edges by binding with two turns of 3-mm-diameter galvanized wire. Apply a final layer of asphalt or tar to cover the wire. Neatly trim the fabric below the wires.

(3) Cover the sawed surface with three applications of a hot mixture of 60 percent creosote and 40 percent roofing pitch, or thoroughly brush coat with three applications of hot creosote and cover with hot roofing pitch.

551.14 Unsatisfactory Piles. Correct unsatisfactory piles using an approved method. Methods of correcting unsatisfactory piles may include one or more of the following:

(a) Using the pile at a reduced capacity.

(b) Installing additional piles.

(c) Repairing damaged piles.

(d) Replacing damaged piles.

(e) Splicing on additional length(s) and driving, when necessary.

(f) Building up pile(s).

551.15 Placing Concrete in Steel Shell or Pipe Piles. After driving, clean the inside of shells and pipes by removing all loose material. Keep the shell or pipe substantially watertight. Provide suitable equipment for inspecting the entire inside surface of the driven shell or pipe just before placing concrete.

(a) Reinforcing Steel. When reinforcing steel is required, make the spacing between adjacent cage elements at least 5 times the maximum size of aggregate in the concrete.

Securely tie concrete spacers or other approved spacers at fifth points around the perimeter of the reinforcing steel cage. Install spacers at intervals not to exceed 3 m measured along the length of the cage.

Place the reinforcement cage into the driven shell or pipe when the concrete reaches the lower limits of the reinforcement. Support the reinforcement so it remains within 50 mm of the required vertical location. Support the cage from the top until the concrete reaches the top of the pile.

(b) Concrete. Construct concrete in accordance with Section 552. Place concrete in one continuous operation from the bottom to the top of the pile. Before the initial concrete set, consolidate the top 3 m of the concrete pile using approved vibratory equipment.

Measurement

551.16 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Measure piles by the meter or by the each. When measurement is by the meter, measure the length of pile from the cutoff elevation rounded to the tip.

Measure pile load tests by the each or by the lump sum.

Measure preboring by the meter.

Measure splices by the each for those made as required to drive piling in excess of the estimated plan tip elevation.

Measure test piles and pile shoes by the each.

Payment

551.17 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item		Pay Unit
551(01)	_____ piles, furnished	Meter
551(02)	_____ piles, driven	Meter
551(03)	_____ piles, furnished	Each
551(04)	_____ piles, driven	Each
551(05)	_____ pile load test	Each
551(06)	_____ pile load test	Lump Sum
551(07)	Preboring	Meter
551(08)	Splices	Each
551(09)	Test piles	Each
551(10)	Pile shoes	Each

Section 552—Structural Concrete

Description

552.01 Work. Furnish, place, finish, and cure concrete in bridges, culverts, and other structures.

Structural concrete class is designated as shown in table 552-1.

Table 552-1.—Composition of concrete.

Class of Concrete	Minimum Cement Content (kg x m^3)	Maximum W/C Ratio	Slump[a] (mm)	Minimum Air Content[b] (%)	Coarse Aggregate AASHTO M 43
A	360	0.49	50–100	–	No. 57
A(AE)	360	0.44	25–100	5.0	No. 57
C	390	0.49	50–100	–	No. 7
C(AE)	390	0.44	25–75	6.0	No. 7
P	390	0.44	0–100	–	No. 67
Seal	390	0.54	100–200	–	No. 57

a. Maximum slump is 200 mm if approved mix design includes a high-range water reducer.
b. See Subsection 552.03 for maximum air content.

Materials

552.02 Requirements. Furnish material that conforms to specifications in the following subsections:

Air-Entraining Admixtures 711.02
Boiled Linseed Oil 725.14
Chemical Admixtures 711.03
Coarse Aggregate 703.02
Color Coating 725.23
Curing Material 711.01
Elastomeric Bearing Pads 717.10
Elastomeric Compression Joint Seals 717.16
Epoxy Resin Adhesives 725.21
Fine Aggregate 703.01
Fly Ash 725.04
High-Strength Nonshrink Grout 701.02
Latex Modifier 711.04
Low-Strength Grout 701.03
Mortar 701.04
Portland Cement 701.01

Sealants, Fillers, Seals, & Sleeves 712.01
Water 725.01

Construction

552.03 Composition (Concrete Mix Design). Design and produce concrete mixtures that conform to table 552-1 for the class of concrete specified and the minimum strength requirements as SHOWN ON THE DRAWINGS or in Subsection 552.04. Determine design strength values in accordance with ACI 214. Ensure that structural concrete also conforms to the following ACI specifications:

- ACI 211.1 for normal and heavyweight concrete.
- ACI 211.2 for lightweight concrete.
- ACI 211.3 for no-slump concrete.

Submit written concrete mix designs for approval at least 30 days before production. Include the following in each mix design submittal:

(a) Project identification.

(b) Name and address of Contractor and concrete producer.

(c) Mix design designation.

(d) Class of concrete and intended use.

(e) Material proportions.

(f) Name and location of material sources for aggregate, cement, admixtures, and water.

(g) Type of cement and type of cement replacement, if used. Fly ash, ground iron blast-furniture slag, or silica fume may partially replace cement as follows in any mix design except for prestressed concrete:

(1) Fly ash.

(a) Class F. Not more than 20 percent of the minimum weight of Portland cement in table 552-1 may be replaced with class F fly ash at the rate of 1.5 parts fly ash per 1 part cement.

(b) Class C. Not more than 25 percent of the minimum mass of Portland cement in table 552-1 may be replaced with class C fly ash at the rate of 1 part fly ash per 1 part cement.

(2) Ground iron blast-furnace slag. Not more than 50 percent of the minimum mass of Portland cement in table 552-1 may be replaced with ground iron blast-furnace slag at the rate of 1 part slag per 1 part cement.

(3) Silica fume (microsilica). Not more than 10 percent of the minimum mass of Portland cement in table 552-1 may be replaced with silica fume at the rate of 1 part silica fume per 1 part cement.

The water/cement ratio for modified concrete is the ratio of the mass of water to the combined masses of Portland cement and cement substitute.

(h) Cement content in kilograms per cubic meter of concrete.

(i) The saturated surface dry batch weight of the coarse and fine aggregate in kilograms per cubic meter of concrete.

(j) Water content (including free moisture in the aggregate plus water in the drum, exclusive of absorbed moisture in the aggregate) in kilograms per cubic meter of concrete.

(k) Target water/cement ratio.

(l) Dosage of admixtures. Entrained air may be obtained either by the use of an air-entraining Portland cement, or by the use of an air-entraining admixture. Do not use set-accelerating admixtures with class P (prestressed) concrete. Do not mix chemical admixtures from different manufacturers.

(m) Sieve analysis of fine and coarse aggregate.

(n) Absorption of fine and coarse aggregate.

(o) Bulk specific gravity (dry and saturated surface dry) of fine and coarse aggregate.

(p) Dry rodded unit mass of coarse aggregate in kilograms per cubic meter.

(q) Fineness modulus (FM) of fine aggregate.

(r) Deleterious substances (coarse and fine aggregate); clay lumps and friable particles; material finer than the 75-µm sieve; coal and lignite (AASHTO M 80 7.1.6); chert (coarse aggregate only); and organic impurities (fine aggregate only).

(s) Evaluation of potential aggregate reactivity.

(t) Percentage of wear (L.A.R.) for coarse aggregate only.

(u) Sand equivalent (fine aggregate only).

(v) Material certifications for cement, admixtures, and aggregate.

(w) TV's for concrete slump with and without high-range water reducers.

(x) TV's for concrete air content. Include the proposed range of air content for concrete to be incorporated into the work. Describe the methods by which air content will be monitored and controlled. Provide acceptable documentation that the slump and compressive strength of the concrete are within specified limits throughout the full range of proposed air content. In the absence of such acceptable documentation, ensure that the maximum air content is 10 percent.

(y) Concrete unit mass.

(z) Compressive strengths of 7- and 28-day concrete. Pending 28-day strength results, a mix design may be approved on the basis that the 7-day compressive strength results equal or exceed 85 percent of the minimum strength requirements, when no accelerators or early strength cements are used.

(aa) Material samples, if requested.

Use a testing laboratory that is fully equipped and capable of performing the required tests and services. Base the mix design on representative samples of aggregates, cement, water, and admixtures to be used on the project. Take aggregate samples in accordance with AASHTO T 2 and reduce to testing size in accordance with AASHTO T 248. Submit a separate proposed mix design for each class of concrete to the CO for review.

Current mix designs for other projects may be acceptable, provided that all items required herein are covered by certified submittals. Ensure that mix design and aggregate quality tests from other projects have been run within 12 months of the date of submittal, and that the aggregate source is the same.

Begin production only after the mix design is approved.

Furnish a new mix design for approval if there is a change in a source of material, or when the FM of the fine aggregate changes by more than 0.20.

Use type II cement for all classes of concrete, but use type III cement when concrete work is permitted by the CO in air temperatures below 2 °C. Type III cement may be used in class A and seal concrete with the approval of the CO. Type III cement may be used in class P concrete when documented in the approved mix design.

552.04 Concrete Compressive Strength. Use the minimum 28-day compressive strength for the given classes of concrete shown in table 552-2, unless otherwise SHOWN ON THE DRAWINGS.

Table 552-2.—Specified minimum concrete strength (MPa).

Concrete Class	At Time of Transfer of Prestress Force	7-Day	28-Day
A & A(AE)	–	15.9	24.2
C & C(AE)	–	18.2	27.7
P	31.5	–	40
P (AE)	31.5	–	34.5
Seal	–	13.8	20.7

Make two standard test specimens for a strength test. Take enough specimens to make at least one 7-day strength test and one 28-day strength test (a minimum total of four specimens) for each structural element. Use the average of the strengths of the two specimens for test result, but discard any specimen that shows definite evidence, other than low strength, of improper sampling, molding, handling, curing, or testing, and consider the strength of the remaining cylinder to be the test result.

Extend the standard 28-day curing period for compressive strength tests for fly-ash-modified concrete by 1 day (rounded to the nearest whole day) for each 1.5 percent of Portland cement replaced with fly ash at the selected rate. (Example: If the maximum of 20 percent cement is replaced, the curing period for cylinders is 41 days.)

552.05 Storage & Handling of Material. Store and handle all material in a manner that prevents segregation, contamination, or other harmful effects. Do not use cement and fly ash containing evidence of moisture contamination. Store and handle aggregate in a manner that ensures a uniform moisture content at the time of batching.

Obtain the CO's approval before using cement that has been stored on the site for more than 60 days. Provide separate storage of cement that is of different blends, types, or from different mills.

552.06 Measuring Material. Batch the concrete in accordance with the approved mix design and the following tolerances:

Cement ..... ± 1%
Water ..... ± 1%
Aggregate ..... ± 2%
Additive ..... ± 3%

Submit to the CO, for approval, a written procedure for adding the specified amount of admixture. Provide separate scales for the admixtures that are to be proportioned by mass and accurate measures for those to be proportioned by volume.

A calibrated volumetric system may be used if the specified tolerances are maintained.

552.07 Batching Plant, Mixers, & Agitators. Use a batching plant, mixer, and agitator conforming to AASHTO M 157. Use continuous volumetric mixing equipment that conforms to AASHTO M 241.

552.08 Mixing. Mix the concrete in a central-mix plant or in truck mixers. Operate all equipment within manufacturer's recommended capacity. Produce concrete of uniform consistency.

(a) Central-Mix Plant. Dispense liquid admixtures through a controlled flowmeter. Use dispensers with sufficient capacity to measure, at one time, the full quantity of admixture required for each batch. If more than one admixture is used, dispense each with separate equipment.

Charge the coarse aggregate, one-third of the water, and all air-entraining admixture into the mixer first, then add remainder of the material.

Mix for at least 50 seconds. Begin mixing time after all cement and aggregate are in the drum. Add the remaining water during the first quarter of the mixing time. Add 4 seconds to the mixing time if timing starts the instant the skip reaches its maximum raised position. Transfer time in multiple-drum mixers is included in mixing time. Mixing time ends when the discharge chute opens.

Remove the contents of an individual mixer before a succeeding batch is charged into the drum.

(b) Truck Mixer. Do not use mixers with any section of the blades worn 25 mm or more below the original manufactured height. Do not use mixers and agitators with accumulated hard concrete or mortar in the mixing drum.

Add admixtures to the mix water before or during mixing.

Charge the batch into the drum so a portion of the mixing water enters in advance of the cement.

Mix each batch of concrete not less than 70 or more than 100 revolutions of the drum or blades at mixing speed. Begin the count of mixing revolutions as soon as all material, including water, is in the mixer drum.

Do not allow the sum of all drum revolutions at both mixing and agitating speeds to exceed 300 before all concrete has been discharged from the drum; but ensure that the sum of all drum revolutions does not exceed 200 if the outside air temperature is over 30 °C. If mixing is done before arrival of the truck at the point of delivery, rotate the drum at mixing speed for 10 to 15 revolutions to reblend possible stagnant spots.

If set-retarding admixture is used, do not allow the sum of all drum revolutions at both mixing and agitating speeds to exceed 550 before all concrete has been discharged from the drum; but ensure that the sum of all drum revolutions does not exceed 450 if the outside air temperature is over 30 °C.

Do not handmix except in case of emergency and with the written approval of the CO. When permitted, perform only on watertight platforms. Do not exceed 0.1 m^3 volume for handmixed batches. Do not permit handmixing for concrete that is to be placed under water.

552.09 Delivery. Submit a written schedule of concreting operations, including scheduling, personnel, and equipment, when requested by the CO. Provide the CO 24-hour notice prior to placing any concrete.

Produce and deliver concrete to permit a continuous placement. Do not permit concrete to achieve initial set before the remaining concrete is placed adjacent to it. Never allow the time interval between placement to exceed 30 minutes. Use methods of delivering, handling, and placing that will minimize rehandling of the concrete and prevent any damage to the structure.

Do not place concrete that has developed an initial set. Never retemper concrete by adding water.

(a) Truck Mixer/Agitator. Use the agitating speed for all rotation after mixing. When a truck mixer or truck agitator is used to transport concrete that is completely mixed in a stationary central construction mixer, mix during transportation at manufacturer's recommended agitating speed.

Water and admixtures (if in the approved mix design) may be added at the project to obtain the required slump or air content, provided that the total of all water in the mix does not exceed the maximum water/cement ratio. If additional water is necessary, add only once and remix with 30 revolutions at mixing speed. Complete the remixing within 45 minutes (75 minutes for type I, IA, II, or IIA cements with water-reducing or -retarding admixture) after the initial introduction of the mixing water to the cement or the cement to the aggregates.

After the beginning of the addition of the cement, complete the discharge of the concrete within the time specified in table 552-3, unless otherwise approved by the CO or as allowed by the SPECIAL PROJECT SPECIFICATIONS.

Table 552-3.—Concrete discharge time limits.

Cement Type	Time Limit (h)	
With and Without Admixtures	≤ 30 °C	> 30 °C
Type I, IA, II, or IIA	1.50	1.00
Type I, IA, II, or IIA with water-reducing or -retarding admixture	2.00	1.50
Type III	1.25	0.75
Type III with water-reducing or -retarding admixture	1.75	1.25

Note: Temperatures are ambient air measured on formwork.

(b) Nonagitating Equipment. Nonagitating equipment may be used to deliver concrete if the concrete discharge is completed within 20 minutes from the beginning of the addition of the cement to the mixing drum. Use equipment with smooth, mortar-tight, metal containers capable of discharging the concrete at a controlled rate without segregation. Provide covers when needed for protection.

552.10 Quality Control of Mix. Submit and follow a quality control plan for the following:

(a) Mixing. Designate a competent and experienced concrete technician to be at the mixing plant in charge of the mixing operations and to be responsible for the overall quality control, including:

(1) The proper storage and handling of all components of the mix.

(2) The proper maintenance and cleanliness of plant, trucks, and other equipment.

(3) The gradation testing of fine and coarse aggregates.

(4) The determination of the FM of fine aggregate.

(5) The measurement of moisture content of the aggregates and adjustment of the mix proportions, as required before each day's production, or more often if necessary, to maintain the required water/cement ratio.

(6) The computation of the batch weights for each day's production and the checking of the plant's calibration as necessary.

(7) The completion of batch tickets. Include the following information:

(a) Concrete supplier.

(b) Ticket serial number.

(c) Date and truck number.

(d) Contractor.

(e) Structure or location of placement.

(f) Mix design and concrete class.

(g) Component quantities and concrete total volume.

(h) Moisture corrections for aggregate moisture.

(i) Total water in mix at plant.

(j) Time of batching and time at which discharge must be completed.

(k) Maximum water that may be added to the mix at the jobsite.

Provide equipment necessary for the above tests and controls. Furnish copies of work sheets for items (3), (4), (5), and (6) as they are completed.

(b) Delivery & Sampling. Designate at least one competent and experienced concrete technician to be at the project and be responsible for concrete delivery, discharge operations, and sampling, including:

(1) The verification that adjustments to the mix before discharge comply with the specifications.

(2) The completion of the batch ticket, the recording of the apparent water/cement ratio, and the time discharge is completed. Furnish a copy of each batch ticket at the time of placement.

(3) The furnishing of all equipment and the performance of temperature, unit weight, air content, slump, and other tests to verify specification compliance before and during each placement operation.

Sample every batch after at least 0.2 m^3 are discharged and before placing any of the batch in the forms. When continuous mixing is used, sample approximately every 10 m^3. Test the air content in accordance with AASHTO T 152 or T 196, and evaluate the result based on a single test or the average of two tests.

Test slump and temperature of each batch in accordance with AASHTO T 119 and AASHTO T 152 or T 196.

If three successive samples are tested and compliance with the specifications is indicated, screening tests may be reduced to a frequency approved by the CO. Resume initial testing frequency if a test shows a failing temperature, air content, or slump, or when directed.

If there is no prior experience with the approved mix design or if special handling procedures, such as pumping, change one or more of the characteristics between discharge of the load and placement in the forms, correlate the discharge tests with the placement tests to define these changes. Provide documentation. Repeat the correlations as often as necessary or as directed.

(4) The taking of samples for strength tests in accordance with AASHTO T 141 and T 23 from batches specified by the CO. Composite samples are not required. The point of sampling is from the discharge stream at the point of placement. Provide cylinder molds. Make compressive strength test

cylinders as directed by the CO, provide the appropriate initial curing, and carefully transport the cylinders to the jobsite curing facility. Cylinders will be used for 28-day breaks, verification, projected strengths, or other purposes specified. Assist in the performing of other tests as requested.

(c) Testing. Determine compressive strength of concrete test cylinders in accordance with AASHTO T 22, and of drilled concrete cores in accordance with AASHTO T 24.

Ensure that the average of all the strength tests representing the concrete in each structural element meets the following requirements:

(1) For concrete in structures designed by the service load method, when seven or more strength tests are available, not more than 20 percent of the strength tests shall have values less than the specified strength, and the average of any six consecutive strength tests shall be equal to or greater than the specified strength. This paragraph does not apply to designs by the strength method where the service load method was used to check fatigue and crack control.

(2) For concrete in structures designed by the strength method and in all prestressed members, when seven or more strength tests are available, not more than 10 percent of the strength tests shall have values less than the specified strength, and the average of any three consecutive strength tests shall be equal to or greater than the specified strength. In applying this requirement to prestressed members, the strength tests performed on all similar members, such as all beams, shall be grouped together for purposes of counting the number of tests available. This paragraph also applies to designs by the strength method where the service load method was used to check fatigue and crack control.

If six or fewer strength tests are available, the average of all the tests shall be equal to or greater than the strengths shown in the following:

	Required Average Strength (% of specified strength)	
Number of Strength Tests	Class A, C, and Seal	Class P
1	79	86
2	90	97
3	94	102
4	97	105
5	99	107
6	100	108

If the concrete strength tests fail to meet the requirements of this specification, the CO may order the Contractor to have a testing laboratory that is acceptable to the Forest Service take and test core samples of questionable concrete. The CO may

order all low-strength concrete removed and replaced if core strengths are below specified strengths. All costs connected with concrete coring and removal and replacement of concrete that fails to meet these requirements shall be borne by the Contractor.

552.11 Field Adjustment of Concrete Mix. Field adjustment of the concrete mix designs will be necessary to compensate for the free-water content in the aggregates.

After initial mixing, if the consistency (slump) is outside the specification limits (table 552-l) by less than 25 mm, the CO may approve the addition of water or cement, provided all that the following conditions are met:

(a) Addition of Water. Water may be added, provided that:

(1) The maximum allowable water content in kilograms per cubic meter of concrete (table 552-1) is not exceeded.

(2) The maximum allowable mixing time (or number of drum revolutions) is not exceeded.

(3) Concrete is remixed for at least half of the minimum mixing time (or number of drum revolutions).

(b) Addition of Cement. Cement may be added, except to class P concrete, provided that:

(1) The amount of cement added does not exceed 55.7 kg/m^3 more than the mix design or a total of 418 kg/m^3, unless otherwise DESIGNATED IN THE SPECIAL PROJECT SPECIFICATIONS.

(2) The maximum allowable mixing time (or number of drum revolutions) is not exceeded.

(3) Concrete is remixed for at least half of the minimum mixing time (or number of drum revolutions).

(c) Adjustment for Percent Entrained Air. Vary the amount of air-entraining admixture used in each batch as necessary from that given in the approved mix design to produce concrete with the percent entrained air specified in table 552-1.

552.12 Temperature and Weather Conditions. Maintain the temperature of the concrete mixture just before placement between 10 °C and 32 °C; except maintain the concrete for bridge decks between 10 °C and 25 °C.

(a) Cold Weather. Cold weather is defined as any time during the concrete placement or curing period that the ambient temperature at the worksite drops

below 2 °C or the ambient temperature at the site drops below 10 °C for a period of 12 hours or more.

When cold weather is reasonably expected or has occurred within 7 days of anticipated concrete placement, submit a detailed plan for producing, transporting, placing, protecting, curing, and temperature monitoring of concrete during cold weather. Include procedures for accommodating abrupt changes in weather conditions. Do not commence placement until plan is approved. Approval of an acceptable plan will take at least 1 day.

Before commencing cold weather concreting, have all material and equipment required for protection available at or near the project and subject to the approval of the CO.

Remove all snow, ice, and frost from the surfaces, including reinforcement and subgrade, against which the concrete is to be placed. Ensure that the temperature of any surface that will come into contact with fresh concrete is at least 2 °C and is maintained at a temperature of 2 °C or above during the placement of the concrete.

Place heaters and direct ducts so as not to cause concrete drying or fire hazards. Vent exhaust flue gases from combustion heating units to the outside of any enclosures. Heat the concrete components in a manner that is not detrimental to the mix. Do not heat cement or permit the cement to come into contact with aggregates that are hotter than 40 °C. Ensure that concrete at the time of placement is of uniform temperature and free of frost lumps. Do not heat aggregates with a direct flame or on sheet metal over fire. Do not heat fine aggregate by direct steam. Do not add salts to prevent freezing.

Provide heat within the housing by steam or hot air. Maintain a humid condition within the housing during the heating period. Do not use stoves or open-burning salamanders within the housing.

Do not use any heating method that will endanger forms, falsework, or any part of the structure, or that will subject the concrete to drying out or other injury due to excessive temperatures. Do not allow the concrete deck surface temperature to exceed 32 °C throughout the curing period.

Maintain a reasonably uniform temperature within the enclosure throughout the curing period.

Provide adequate fire protection when heating is in progress, and maintain watchmen or other attendants to keep heating units in continuous operation.

Furnish and place continuously recording surface temperature measuring devices that are accurate within ± 1 °C.

Make outside air temperature recordings at the same time that recordings are made within the enclosure. Provide a copy of temperature records to the CO.

During cold weather, protect the concrete for at least 7 days at or above the minimum temperatures shown in table 552-4.

Table 552-4.—Cold weather concrete surface temperatures.

Concrete Surface Temperatures	Minimum Section Size Dimension (mm)			
	< 300	300–900	900–1,800	> 1,800
Minimum temperature during protection period	13 °C	10 °C	7 °C	4 °C
Maximum allowable temperature drop in any 24-hour period after end of protection	28 °C	22 °C	17 °C	11 °C

When pozzolan or fly ash cement is used, adjust the required period of controlled temperature and moisture as follows:

Percentage of Cement Replaced by Weight	Required Period of Controlled Temperature and Moisture
10%	9 days
10–15%	10 days
16–20%	11 days

The above requirement for an extended period of controlled temperature and/or moisture may be waived if a compressive strength of 65 percent of the specified 28-day strength is achieved in 7 days.

At the end of the protection period, allow the concrete to cool gradually over 24 hours at a rate not to exceed the maximum values shown in table 552-4. All protection may be removed when the concrete surface temperature is within 15 °C of the ambient air temperature.

If the concrete temperatures cannot be maintained within the limits specified in table 552-4 through insulated forms or blankets, enclose each section of the structure with adequate housing before placing the concrete in the section.

Make the protective housing of sufficient size to allow all concrete placing and finishing operations for any one placement to proceed under cover without hindrance. However, to facilitate the placement of concrete, install the covering material immediately after depositing the concrete. Construct the housing to be weathertight and in a manner that will ensure that specified temperatures will be maintained uniformly throughout the enclosure during the protection period.

When housing of the structure is not initially installed, but may be subsequently required in accordance with the specifications, protect structural concrete in bridge decks or similar thin sections with insulating blankets or other methods approved by the CO. Ensure that the curing method prevents moisture loss on all exposed surfaces, including those protected by insulating blankets.

Provide insulation that consists of bats or blankets of fiberglass, rock wool, balsam wool, insulation boards, or other approved material.

Completely encase the bats or blankets in suitable wind- and water-resistant covers that are be fastened securely to wood forms between the studs and walls, with edges and ends sealed to the framing to minimize heat loss. Attach insulation to steel forms by adhesive or other approved methods. Cover ribs and flanges of steel forms with insulating blankets or separate strips of insulation. Ensure that the edges and corners of concrete are well insulated. Protect horizontal surfaces of concrete with a layer of the insulating material securely fastened in place. Protect the tops of placements, such as bridge decks and similar flat slab sections, with tarpaulins over the insulation. Cover large insulating blankets around and securely fasten in place for curing concrete columns cast in prefabricated forms and similar concrete items. Seal all joints in the blankets with tape.

Use electric heating blankets and other suitable materials instead of insulated blankets or bats only when specifically approved by the CO for each application.

Assume entire responsibility for the proper protection and final satisfactory condition of all concrete placed during cold weather or exposed to cold weather within the required protection period. Remove and replace any concrete that has been frozen or damaged due to other causes.

(b) Hot Weather. Hot weather is defined as any time during the concrete placement that the ambient temperature at the work site is above 35 °C.

In hot weather, cool all surfaces that will come in contact with the mix to below 35 °C. Cool by covering with wet burlap or cotton mats, fog spraying with water, covering with protective housing, or using other approved methods.

Immediately prior to and during placement, maintain concrete at a temperature not to exceed 35 °C; but ensure that bridge superstructure (deck) concrete does not exceed a temperature of 25 °C.

When placing concrete deck slabs, if the air temperature near the slab's surface is expected to rise above 25 °C, schedule operations so that finishing of the top of the slab is completed before this occurs, or use hot-weather concreting practices to maintain the deck surface temperature at 25 °C or less until finishing is completed.

Maintain concrete temperature by using any combination of the following methods:

(1) Shade the material storage areas or production equipment.

(2) Cool aggregate by sprinkling.

(3) Cool aggregate and/or water by refrigeration or replace a portion or all of the mix water with flaked or crushed ice to the extent that the ice will completely melt during mixing of the concrete.

(c) Evaporation. When placing concrete in bridge decks or other exposed slabs, limit the expected evaporation rate to less than 0.5 kg/m^2/h, as determined by figure 552-1 or the following:

$$EVAP = \frac{1 + 0.2374WV}{2{,}906} \times \left[CT^2 - 4.762CT + 220.8 - RH \times \left[\frac{AT^3 + 127.8AT^2 + 665.6AT + 34{,}283}{20{,}415} \right] \right]$$

where

EVAP = evaporation rate (kg/m^2/h)
WV = wind velocity (km/h)
RH = relative humidity (%)
AT = air temperature (°C)
CT = concrete temperature (°C)

When necessary, take one or more of the following actions:

(1) Construct windbreaks or enclosures to effectively reduce the wind velocity throughout the area of placement and for a period of 12 hours following completion of deck placement or until the evaporation rate is less than 0.5 kg/m^2/h.

(2) Use fog sprayers upwind of the placement operation to effectively increase the relative humidity.

(3) Reduce the temperature of the concrete in accordance with Subsection 552.12(b).

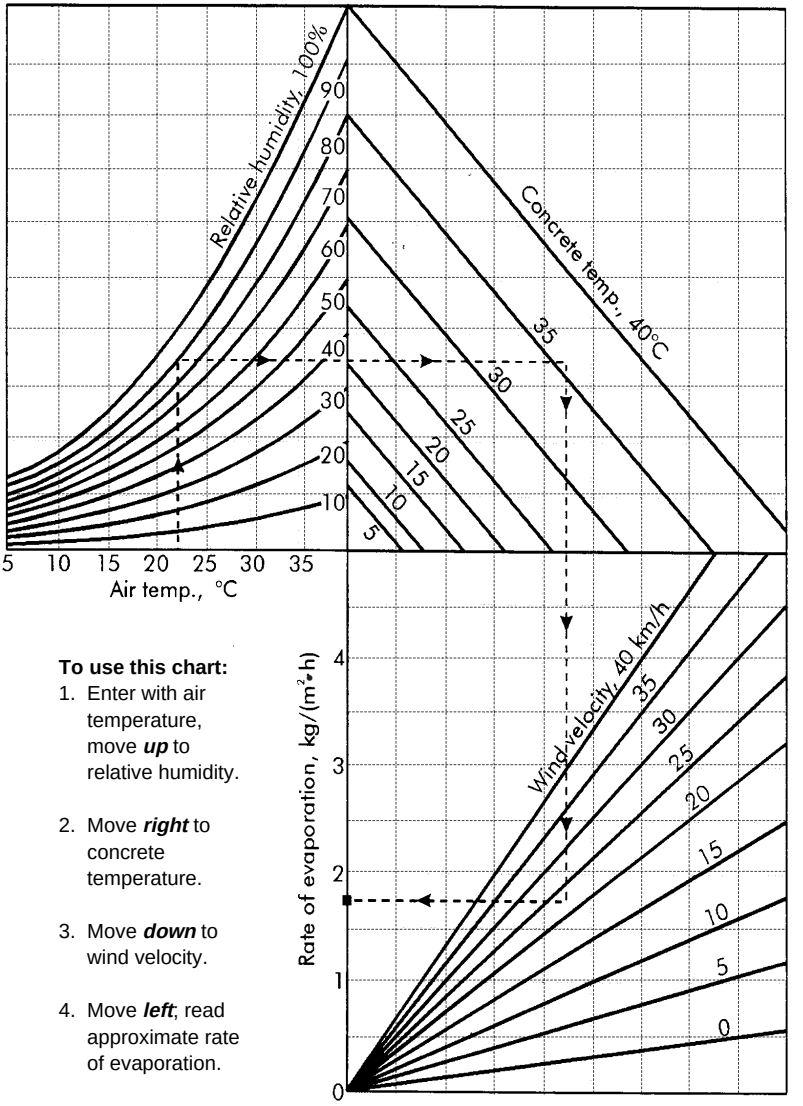

To use this chart:

1. Enter with air temperature, move ***up*** to relative humidity.
2. Move ***right*** to concrete temperature.
3. Move ***down*** to wind velocity.
4. Move ***left***; read approximate rate of evaporation.

Note: Example shown by dashed lines is for an air temperature of 22.5 °C, relative humidity of 90 percent, concrete temperature of 36 °C, and wind velocity of 22.5 km/h. This results in a rate of evaporation of 1.75 kg/m²/h.

Figure 552-1.—Evaporation rate of surface moisture.

(d) Rain. At all times during and immediately after placement, protect the concrete from rain.

552.13 Handling & Placing Concrete. Perform the work specified in Section 206. Construct reinforcing steel, structural steel, bearing devices, joint material, and miscellaneous items in accordance with the appropriate sections.

(a) General. Use falsework and forms in accordance with Section 562. Handle, place, and consolidate concrete using methods that will not cause segregation and will result in dense, homogeneous concrete that is free of voids and rock pockets. Use placement methods that do not cause displacement of reinforcing steel or other material that is embedded in the concrete. Place and consolidate concrete before initial set. Do not retemper concrete by adding water to the mix except as provided for in Subsection 552.11.

Do not place concrete until the forms, all embedded material, and the adequacy of the foundation material have been inspected and approved by the CO.

Remove all mortar, debris, and foreign material from the forms and reinforcing steel before commencing placement. Thoroughly moisten the forms and subgrade immediately before concrete is placed against them. Temporary form spreader devices may be left in place until concrete placement precludes their need. Remove them when no longer needed.

Place concrete continuously without interruption between planned construction or expansion joints. Ensure that the delivery rate and placing sequence and methods are such that fresh concrete is always placed and consolidated against previously placed concrete before initial set has occurred in the previously placed concrete. Do not allow the time between the placement of successive batches to exceed 30 minutes (20 minutes under hot weather conditions).

During and after placement of concrete, do not damage previously placed concrete or break the bond between the concrete and reinforcing steel. Keep workers off fresh concrete. Do not support platforms for workers and equipment directly on reinforcing steel. After the concrete is set, do not disturb the forms or reinforcing bars that project from the concrete until it is of sufficient strength to resist damage.

Five to 10 working days before placing concrete in a cast-in-place bridge deck, hold a preplacement conference to discuss the construction procedures, personnel, and equipment to be used. At this time, provide full details on plans for the placement operation, including finishing machine data, workforce, contingency plans, concrete delivery, and other information requested by the CO.

(b) Sequence of Placement. Observe the following sequence of placement:

(1) Substructures. Do not place loads on finished bents, piers, or abutments until concrete strength cylinder tests from the same concrete cured under the same conditions as the substructure element indicate that all concrete has at least 80 percent of its required 28-day compressive strength.

(2) Vertical Members. For vertical members more than 5 m in height, allow the concrete to set for at least 4 hours before placing concrete for integral horizontal members. For vertical members less than 5 m in height, allow the concrete to set for at least 30 minutes. Do not apply loads from horizontal members until the vertical member has attained its required strength.

(3) Superstructures. Do not place concrete in the superstructure until substructure forms have been stripped sufficiently to determine the acceptability of the supporting substructure concrete. Do not place concrete in the superstructure until the substructure has attained the required strength.

Place concrete for T-beams in two separate operations. Wait at least 5 days after stem placement before placing the top deck slab concrete.

Concrete for box girders may be placed in two or three separate operations consisting of bottom slab, girder webs, and top slab, or as SHOWN ON THE DRAWINGS. However, place the bottom slab first, and do not place the top slab until the girder webs have been in place for at least 5 days.

(4) Arches. Place concrete in arch rings so that the centering is loaded uniformly and symmetrically.

Place centering upon approved jacks to provide means of correcting any slight settlement that may occur after concrete placement has begun. Make any adjustments made necessary by settlement before the concrete has taken its initial set.

(5) Box Culverts. Place the base slab of box culverts and allow to set 24 hours before the remainder of the culvert is constructed. For sidewall heights of 1.5 m or less, the sidewalls and top slab may be placed in one continuous operation. For sidewalls greater than 1.5 m but less than 5 m in height, allow sidewall concrete to set at least 30 minutes before placing concrete in the top slab. For sidewalls 5 m or higher, allow sidewall concrete to set at least 12 hours before placing concrete in the top slab.

(6) Precast Elements. Place and consolidate concrete so that shrinkage cracks are not produced in the member.

(c) Placing Methods. Use equipment of sufficient capacity, and ensure that it is designed and operated to prevent mix segregation and mortar loss. Do not use equipment that causes vibrations that could damage the freshly placed concrete. Do not use equipment with aluminum parts that come in contact with the concrete. Remove set or dried mortar from inside surfaces of placing equipment.

Place concrete as near as possible to its final position. Do not place concrete in horizontal layers greater than 0.5 m thick. Do not exceed the vibrator capacity to consolidate and merge the new layer with the previous layer. Do not place concrete at a rate that, when corrected for temperature, exceeds the design loading of the forms.

Do not drop unconfined concrete more than 2 m. Concrete may be confined by using a tube fitted with a hopper head or other approved device that prevents mix segregation and mortar spattering. This does not apply to cast-in-place piling when concrete placement is completed before initial set occurs in the concrete placed first.

In thin sections where there is not sufficient space inside the form to place by chute, place concrete through form windows.

Operate concrete pumps so that a continuous stream of concrete without air pockets is delivered at the tube discharge. Do not use conveyor belt systems longer than 170 m when measured from end to end of the total belt assembly. Arrange the belt assembly so that each section discharges into a vertical hopper to the next section without mortar adhering to the belt. Use a hopper, chute, and deflectors at the discharge end of the conveyor belt system to cause the concrete to drop vertically.

Arrange the equipment so that no vibrations result that might damage freshly placed concrete.

(d) Consolidation. Provide sufficient hand-held internal concrete vibrators suitable for the conditions of concrete placement. Ensure that the vibrators meet requirements shown in table 552-5. Provide rubber-coated vibrators when epoxy-coated reinforcement is used.

Table 552-5.—Hand-held vibratory requirements.

Head Diameter (mm)	Frequency (vibrations/min)	Radius of Action (mm)
19–38	10,000–15,000	75–125
32–64	9,000–13,500	125–255
50–89	8,000–12,000	180–485

Provide a sufficient number of vibrators to consolidate each batch as it is placed. Provide a spare vibrator at the site in case of breakdown. Use external form vibrators only when the forms have been designed for external vibration and when internal vibration is not possible.

Consolidate all concrete by mechanical vibration immediately after placement. Manipulate vibrators to thoroughly work the concrete around reinforcement, embedded fixtures, corners, and angles in the forms. Do not cause segregation. Do not consolidate concrete placed underwater. Supplement vibration with spading, as necessary, to provide smooth surfaces and dense concrete along form surfaces, in corners, and at locations impossible to reach with the vibrators.

Vibrate the concrete at the point of deposit and at uniformly spaced points not farther apart than one and one-half times the radius over which the vibration is visibly effective. Insert vibrators so that the affected vibrated areas overlap. Do not use vibrators to move concrete. Insert vibrators vertically, and slowly withdraw them from the concrete. Vibrate long and intensely enough to thoroughly consolidate the concrete, but not to cause segregation. Do not vibrate at any one point long enough to cause localized areas of grout to form. Do not vibrate reinforcement.

(e) Underwater Placement. Underwater placement of concrete is permitted only for seal concrete and drilled shafts. Perform underwater placement only in the presence of the CO. If other than seal concrete is used, increase the minimum cement content by 10 percent. Use tremies, concrete pumps, or other approved methods for placement. Do not place concrete in running water.

(1) Tremies. Use watertight tremies with a diameter of 250 mm or more. Fit the top with a hopper. Use multiple tremies as required. Make tremies capable of being rapidly lowered to retard or stop the flow of concrete and to permit free movement of the discharge end over the entire surface of the cement.

At the start of concrete placement, seal the discharge end and fill the tremie tube with concrete. Keep the tremie tube full of concrete to the bottom during placement, and keep the discharge end completely submerged in the concrete at all times. If water enters the tube, withdraw the tremie and reseal the discharge end. Maintain continuous concrete flow until the placement is completed.

(2) Concrete Pumps. Use pumps with a device at the end of the discharge tube to seal out water while the tube is first being filled with concrete. When concrete flow is started, keep the end of the discharge tube full of concrete and below the surface of the deposited concrete until placement has been completed.

Place underwater concrete continuously from start to finish in a compact mass. Place each succeeding layer of concrete before the preceding layer has taken

initial set. Use more than one tremie or pump as necessary to ensure compliance with this requirement. Keep the concrete surface as horizontal as practicable. Do not disturb after placement. Maintain still water at the point of deposit.

Dewater after test specimens cured under similar conditions indicate that the concrete has sufficient strength to resist the expected loads. Remove all laitance or other unsatisfactory material from the exposed concrete.

(f) Concrete Railings & Parapets. Use smooth, tight-fitting, rigid forms. Neatly miter corners. Place concrete railings and parapets after the centering or falsework for the supporting span is released. Remove forms without damaging the concrete. Finish all corners to be true, clean-cut, and free from cracks, spalls, or other defects.

Cast precast railing members in mortar-tight forms. Remove precast members from molds as soon as the concrete has sufficient strength to be self-supporting. Protect edges and corners from chipping, cracking, and other damage. Cure in accordance with Subsection 552.17(b). The curing period may be shortened, as approved, by using moist heat and/or type III cement or water-reducing agents.

552.14 Construction Joints. Provide construction joints at locations as SHOWN ON THE DRAWINGS. Written approval is required for any additional construction joints.

At horizontal construction joints, place gage strips inside the forms along all exposed faces to produce straight joint lines. Clean and saturate construction joints before placing fresh concrete. Keep joints saturated until adjacent fresh concrete is placed. Immediately before placing new concrete, draw forms tight against previously placed concrete. Where accessible, thoroughly coat the existing surface with a very thin coating of cement mortar. Extend reinforcing bars across construction joints.

552.15 Expansion & Contraction Joints. Form expansion and contraction joints as follows:

(a) Open Joints. Form open joints with a wooden strip, metal plate, or other approved material. Remove the joint-forming material without chipping or breaking the corners of the concrete. Do not extend reinforcement across an open joint.

(b) Filled Joints. Cut premolded expansion joint filler to the shape and size of the surface being jointed. Secure the joint filler on one surface of the joint using galvanized nails or other acceptable means so that it will not be displaced by the concrete. Splice in accordance with the manufacturer's recommendations. After form removal, neatly cut and remove all concrete or mortar that has sealed across the joint. Fill all joint gaps 3 mm or wider with hot asphalt or other approved filler. Place all necessary dowels, load transfer devices, and other devices as SHOWN ON THE DRAWINGS or as directed.

(c) Steel Joints. Fabricate plates, angles, or other structural shapes accurately to conform to the concrete surface. Set joint opening to conform to the ambient temperature at the time of concrete placement and as SHOWN ON THE DRAWINGS. Securely fasten the joints to keep them in correct position. Maintain an unobstructed joint opening during concrete placement.

(d) Water Stops. Construct water stops in accordance with Section 712 and as SHOWN ON THE DRAWINGS.

(e) Compression Joint Seals. Use one-piece compression joint seals for transverse joints and the longest practicable length for longitudinal joints. Clean and dry joints and remove spalls and irregularities. Apply a lubricant-adhesive as a covering film to both sides of the seal immediately before installation. Compress the seal and place it in the joint as recommended by the manufacturer. Make sure the seal is in full contact with the joint walls throughout its length.

Remove and discard all seals that are twisted, curled, nicked, or improperly formed. Remove and reinstall joint seals that elongate more than 5 percent of their original length when compressed. Remove all excess lubricant-adhesive before it dries.

(f) Elastomeric Expansion Joint Seal. Install the joint in accordance with the manufacturer's recommendations and the SPECIAL PROJECT SPECIFICATIONS, or as SHOWN ON THE DRAWINGS.

552.16 Finishing Plastic Concrete. Strike off concrete surfaces that are not placed against forms. Float finish the concrete surface. Remove any laitance or thin grout. Carefully tool all nonchamfered edges with an edger. Leave edges of joint filler exposed.

Protect the surface from rain damage.

Finish all concrete surfaces used by traffic to a skid-resistant surface.

(a) Striking Off & Floating. For bridge decks or top slabs of structures serving as finished pavements, use an approved power-driven finishing machine equipped with oscillating screed. If approved, use hand-finishing methods for irregular areas where the use of a machine is impractical.

Limit placement of concrete to that which can be properly finished before the beginning of initial set. Never allow concrete to be placed more than 2.5 m ahead of the finishing machine.

Strike off all surfaces using equipment supported by and traveling on screed rails or headers. Do not support rails within the limits of the concrete placement without approval.

Set rails or headers that can be readily adjusted for elevation on nonyielding supports so the finishing equipment operates without interruption over the entire surface being finished. Extend rails beyond both ends of the scheduled concrete placement a sufficient distance to enable the finishing machine to finish the concrete being placed.

Set rails the entire length of steel girder superstructures.

Use rails or headers that are of a type that can be installed so that no springing or deflection will occur under the weight of the finishing equipment.

Adjust rails, headers, and strike-off equipment to the required profile and cross section, allowing for anticipated settlement, camber, and deflection of falsework.

Before beginning delivery and placement of concrete, operate the finishing machine over the entire area to be finished to check for excessive rail deflections, proper deck thickness, and reinforcing steel cover, and to verify proper operation of equipment. Make necessary corrections before concrete placement begins. Obtain approval to begin deck concrete placement.

Schedule delivery and placement of concrete so as to permit all placement and finishing operations to be completed during daylight hours, unless otherwise approved in advance by the CO.

Place concrete bridge decks continuously along the full length of the structure or superstructure unit, unless otherwise SHOWN ON THE DRAWINGS or approved in writing by the CO. Provide sufficient material, equipment, and manpower to complete bridge deck placement at a minimum rate of 6 m per hour, unless otherwise SHOWN ON THE DRAWINGS.

Should settlement or other unanticipated events occur that would prevent obtaining a bridge deck meeting the requirements of this specification, discontinue placing deck concrete until corrective measures are taken. If satisfactory measures are not taken prior to initial set of the concrete in the affected area, discontinue all placing of concrete and install a bulkhead at a location approved by the CO. Remove all concrete in place beyond the bulkhead.

After placing the concrete, operate the finishing machine over the concrete as needed to obtain the required profile and cross section. Keep a slight roll of excess concrete in front of the cutting edge of the screed at all times. Maintain this excess of concrete to the end of the pour or form and then remove and waste it. Adjust rails or headers as necessary to correct for unanticipated settlement or deflection.

Remove rail supports embedded in the concrete to at least 50 mm below the finished surface, and fill and finish any voids with fresh concrete. Finish the surface with a float, roller, or other approved device as necessary to remove all local irregularities.

Remove all excess water, laitance, or foreign material brought to the surface using a squeegee or straightedge drawn from the center of the slab towards either edge. Do not apply water to the surface of the concrete during finishing operations.

Following the completion of the strike-off, float the roadway slab surface to a smooth, uniform surface by means of floats 3 m or more in length. Use floats to remove roughness and minor irregularities left by the strike board or finishing machine and to seal the concrete surface. Do not permit excessive working of the concrete surface. Ensure that each transverse pass of the float overlaps the previous pass by a distance equal to at least one-half the length of the float.

Operate hand-operated float boards from transverse finishing bridges. Provide finishing bridges that completely span the roadway area being floated. Provide a sufficient number of finishing bridges to permit operation of the floats without undue delay and to permit inspection of the work. Use at least two transverse finishing brid-ges when hand-operated float boards are used, unless otherwise approved bythe CO.

Provide finishing bridges that are of rigid construction, free of wobble and spring when used by the operators of longitudinal floats, and easily moved.

(b) Straightedging. Check all slab and sidewalk surfaces in the presence of the CO. Check the entire surface parallel to the centerline of the bridge with a 3-m metal straightedge. Overlap the straightedge at least one-half the length of the previous straightedge placement.

Correct deviations in excess of 3 mm from the testing edge of the straightedge. For deck surfaces that are to receive an overlay, correct deviations in excess of 6 mm.

(c) Texturing. Produce a skid-resistant surface texture on all driving surfaces by grooving. Use grooved, sidewalk, and troweled and brushed finishes, or a combination thereof, for other surfaces as required.

(1) Grooved Finish. Use a float with a single row of fins or an approved machine designed specifically for sawing grooves in concrete pavements. Space fins 13 to 20 mm on centers. Make the grooves 2 to 5 mm wide and 3 to 5 mm deep. Groove perpendicular to the centerline without tearing the concrete surface or loosening surface aggregate.

If grooves are sawn, cut the grooves 5 mm wide at a spacing of 15 to 25 mm.

On bridge decks, discontinue grooving 300 mm from the curb face and provide a longitudinal troweled finish on the surface of gutters.

(2) Sidewalk Finish. Strike off the surface using a strike board, and then float the surface. Use an edging tool on edges and expansion joints. Broom the surface using a broom with stiff bristles. Broom perpendicular to the centerline from edge to edge, with adjacent strokes slightly overlapped. Produce regular corrugations not more

than 3 mm in depth without tearing the concrete. While the concrete is plastic, correct porous spots, irregularities, depressions, small pockets, and rough spots. Groove con-traction joints at the required interval using an approved grooving tool.

(3) Troweled & Brushed Finish. Use a steel trowel to produce a slick, smooth surface free of bleedwater. Brush the surface with a fine brush using parallel strokes.

(4) Exposed Aggregate Finish. Strike off the surface using a strike board and then float the surface. Use an edging tool on all transverse and longitudinal joints that are against forms or existing pavement. Do not edge transverse joints in a continuous pour or longitudinal joints in a continuous dual-lane pour.

As soon as the concrete hardens sufficiently to prevent particles of gravel from being dislodged, broom the surface. Use stiff brushes approved by the CO. Exercise care to prevent marring of the surface and cracking or chipping of slab edges or joints. If approved by the CO, apply a light spray of retardant to the unfinished surface to facilitate this work.

First, broom transversely across the pavement. Pull the loosened semistiff mortar entirely off the pavment. Remove the mortar from all adjacent pavements. Then broom parallel to the pavement centerline. Continue this operation until a sufficient amount of coarse aggregate is exposed. Other methods of aggregate exposure, such as using a water spray attachment on a special exposed aggregate broom, will be permitted if satisfactory results are demonstrated.

After curing according to Subsection 501.10, wash the surface with brush and water to remove all laitance and cement from the exposed coarse aggregate.

(d) Surface Underneath Bearings. Finish all bearing surfaces to within 5 mm of plan elevation. When a masonry plate is to be placed directly on the concrete or on filler material less than 5 mm thick, finish the surface with a float to an elevation slightly above plan elevation. After the concrete is set, grind the surface as necessary to provide a full and even bearing.

When a masonry plate is to be set on filler material between 5 and 15 mm thick, finish the surface with a steel trowel. Finish or grind the surface so that it does not vary from a straightedge in any direction by more than 2 mm.

When a masonry plate is to be set on filler material greater than 15 mm thick or when an elastomeric bearing pad is to be used, finish the surface to a plane surface free of ridges.

When required under a masonry plate or elastomeric bearing pad, use mortar in the proportions of 1 part Portland cement and 1-1/2 parts clean sand. Thoroughly mix sand and cement before adding water. Mix only enough mortar for immediate use.

Discard mortar that is more than 45 minutes old. Do not retemper mortar. Cure mortar at least 3 days, and do not apply loads to mortar for at least 48 hours. Do not mix and use mortar during freezing conditions. Ensure that mortar sand conforms to AASHTO M 45. Proprietary products may be used with approval.

(e) Surface Underneath Waterproofing Membrane Deck Seal. Ensure that surfaces that are to be covered with a waterproofing membrane deck seal are not coarse textured, but rather finished to a smooth surface that is free of ridges and other projections.

552.17 Curing Concrete. Begin curing immediately after the free surface water has evaporated and the finishing is complete. If the surface of the concrete begins to dry before the selected cure method can be implemented, keep concrete surface moist using a fog spray without damaging the surface. Unless otherwise approved by the CO, provide fogging equipment for all deck placement operations.

Use fogging equipment capable of applying water to the concrete in the form of a fine mist in sufficient quantity to curb the effects of rapid evaporation of mixing water from the concrete on the deck. Obtain approval by the CO in advance for fogging noz-zles and water supply methods. Produce a true mist that will not harm the surface finish of fresh concrete. Apply the mist at the times and in the manner approved by the CO.

Keep surfaces to be rubbed moist after forms are removed. Cure immediately following the first rub.

Cure the top surfaces of bridge decks using the liquid membrane curing compound method, combined with either the water method or the waterproof cover method. Apply liquid membrane curing compound immediately after finishing. Apply a water method or the waterproof cover method within 4 hours after finishing.

Cure all concrete for at least 7 consecutive days. When pozzolan or fly-ash-modified cement is used, extend the required period of controlled moisture, as called for in Subsection 552.12.

(a) Forms-in-Place Method. For formed surfaces, leave the forms in place without loosening. If forms are removed during the curing period to facilitate rubbing, strip forms only from areas able to be rubbed during the same shift. During rubbing, keep the surface of the exposed concrete moist. After the rubbing is complete, continue curing process using the water method or by applying a clear curing compound (type 1 or type 1–D) for the remainder of the curing period.

(b) Water Method. Keep the concrete surface continuously wet by ponding, spraying, or covering with material that is kept continuously and thoroughly wet. Covering material may consist of cotton mats, multiple layers of burlap, or other approved material that does not discolor or otherwise damage the concrete. Do not cure concrete underwater if the temperature of the water is less than 2 °C.

Cover the wet concrete surface with a waterproof sheet material that prevents moisture loss from the concrete.

Use widest sheets practical. Lap adjacent sheets at least 150 mm and tightly seal all seams with pressure-sensitive tape, mastic, glue, or other approved methods. Secure all material so that wind will not displace it. Immediately repair sheets that are broken or damaged.

(c) Liquid Membrane Curing Compound Method. Do not use the liquid membrane method on surfaces to receive a rubbed finish. Use on construction joint surfaces is permitted only if the compound is removed from the concrete and the reinforcing steel by sandblasting before placement of concrete against the joint.

Use type 2 white-pigmented liquid membrane only on the top surfaces of bridge decks or on surfaces not exposed to view in the completed work. Use type 1 or 1–D clear curing compounds on other surfaces.

Mix membrane curing solutions containing pigments before use. Continue to agitate during application. Use equipment capable of producing a fine spray. Apply the curing compound at a minimum rate of 0.25 L/m^2 in one or two uniform applications. If the solution is applied in two applications, follow the first application with the second application within 30 minutes and apply at right angles to the first application.

If the membrane is damaged by rain or other means during the curing period, immediately apply a new coat over the damaged areas.

552.18 Finishing Formed Concrete Surfaces. Remove and replace or repair, as approved, all rock pockets or honeycombed concrete.

Provide a class 1 finish to all formed concrete surfaces, unless another finish is SHOWN ON THE DRAWINGS or called for in the SPECIAL PROJECT SPECIFICATIONS.

Finish sound formed concrete surfaces as shown below.

(a) Class 1—Ordinary Surface Finish. Finish the following surfaces with a class 1, ordinary surface finish:

(1) Undersurfaces of slab spans, box girders, filled spandrel arch spans, and the roadway deck slab between superstructure girders.

(2) Inside vertical surfaces of exterior superstructure girders and all vertical surfaces of interior girders.

(3) Surfaces to be buried and culvert surfaces above finished ground that are not visible from the traveled way or a walkway.

Begin finishing as soon as the forms are removed. Remove fins and irregular projections from all surfaces that are exposed or will be waterproofed. Remove bulges and offsets with carborundum stones or discs. Remove localized poorly bonded rock pockets or honeycombed concrete and replace with sound concrete or packed mortar in an approved manner. Cut back at least 25 mm beneath the concrete surface all projecting wire or other devices used to hold forms in place.

Clean and point all form tie cavities, holes, depressions, voids, broken corners and edges, and other defects. Saturate the area with water. Finish the area with mortar that is less than 1 hour old. After the mortar is set, rub it (if required) and continue curing. Match exposed surfaces to surrounding concrete.

Carefully tool and remove free mortar and concrete from construction and expansion joints. Leave joint filler exposed for its full length with clean, true edges.

Rub or grind bearing surfaces on piers and abutments to the specified elevation and slope.

For patching large or deep areas, add coarse aggregate to the patching material and take special precautions to ensure a dense, well-bonded, and properly cured patch. Areas of honeycomb that exceed 2 percent of the surface area of a structural element may be considered sufficient cause for rejection of the structural element.

Cure mortar patches in accordance with Subsection 552.17.

If the final finished surface is not true and uniform, rub it in accordance with Subsection 552.18(b).

(b) Class 2—Rubbed Finish. Finish the following surfaces with a class 2 rubbed finish:

(1) All surfaces of bridge superstructures, except those surfaces designated to receive a class 1 or other finish.

(2) All surfaces of bridge piers, piles, columns and abutments, and retaining walls above finished ground and to at least 300 mm below finished ground.

(3) All surfaces of open spandrel arch rings, spandrel columns, and abutment towers.

(4) All surfaces of pedestrian undercrossings, except floors and surfaces to be covered with earth.

(5) Surfaces above finished ground of culvert headwalls and endwalls when visible from the traveled way or walkway.

(6) Inside surfaces of culvert barrels higher than 1 m that are visible from the traveled way. Finish for a distance inside the barrel at least equal to the height of the culvert.

(7) All surfaces of railings.

Complete a class 1 finish in accordance with Subsection 552.18(a). Saturate the concrete surface with water. Rub the surface with a medium-coarse carborundum stone using a small amount of mortar on its face. Use mortar composed of cement and fine sand mixed in the same proportions as the concrete being finished. Continue rubbing until form marks, projections, and irregularities are removed and a uniform surface is obtained. Leave the paste produced by this rubbing in place.

After other work that could affect the surface is completed, rub with a fine carborundum stone and water until the entire surface has a smooth texture and uniform color. After the surface has dried, rub it with burlap to remove loose powder. Leave it free from all unsound patches, paste, powder, and objectionable marks.

(c) Class 3—Tooled Finish. Let the concrete set for at least 14 days or longer if necessary to prevent the aggregate particles from being "picked" out of the surface. Use air tools such as a bush hammer, pick, or crandall. Chip away the surface mortar and break the aggregate particles to expose a grouping of broken aggregate particles in a matrix of mortar.

(d) Class 4—Sandblasted Finish. Let the concrete set for at least 14 days. Protect adjacent surfaces that are not to be sandblasted. Sandblast the surface with hard, sharp sand to produce an even fine-grained surface in which the mortar is cut away, leaving the aggregate exposed.

(e) Class 5—Wire Brushed or Scrubbed Finish. Begin as soon as the forms are removed. Scrub the surface with stiff wire or fiber brushes using a solution of muriatic acid. Mix the solution in the proportion of 1 part acid to 4 parts water. Scrub until the cement film or surface is completely removed and the aggregate particles are exposed. Leave an even pebbled texture with the appearance of fine granite to coarse conglomerate, depending upon the size and grading of aggregate. Wash the entire surface with water containing a small amount of ammonia.

(f) Class 6—Color Finish. Build a sufficient number of 0.5 x 1-m concrete color sample panels to obtain a color acceptable to the CO. Protect the approved color sample panel at all times during the work. Color all designated surfaces to match the color of the approved sample.

Complete a class 1 finish in accordance with Subsection 552.18(a). Do not apply the color finish until all concrete placement for the structure is complete. Remove all dust, foreign matter, form oil, grease, and curing compound with a 5-percent solution of trisodium phosphate, and then rinse the concrete surface with clean water.

Use paper, cloth, or other means to protect surfaces not to be color finished. Apply the finish to a dry concrete surface when the surface temperature is 4 °C or higher and the air temperature in the shade is anticipated to be 4 °C or higher during the 24 hours following application.

Apply the color finish in accordance with the manufacturer's recommendations. Spray, brush, or roll on the first coat of penetrating sealer and color base. Spray, brush, or roll on the finish coat after the first coat has thoroughly dried. Apply finish to provide a uniform, permanent color, free from runs and sags to the surfaces.

Clean concrete areas not intended to be covered by the finish using an approved method.

552.19 Concrete Anchorage Devices. Use chemical, grouted, or cast-in-place concrete anchorage devices for attaching equipment or fixtures to concrete.

Furnish the following for approval:

(a) Concrete anchorage device sample.

(b) Manufacturer's installation instructions.

(c) Material data and certifications.

Fabricate all metal parts of the anchorage devices from stainless steel or from steel protected with a corrosion-resistant metallic coating that does not react chemically with concrete. Supply anchorage devices complete with all hardware.

For chemical or grouted anchors, conduct a system approval test on one anchor at the jobsite, not to be incorporated in the work. Conduct a static load test in accordance with ASTM E 488. Demonstrate that the anchorage device will withstand a sustained direct tension test load not less than the values shown in table 552-5 for a period of at least 48 hours with movement not to exceed 1 mm. Also demonstrate that, when loaded to failure, the anchorage device demonstrates a ductile failure of the anchor steel, not a failure of the chemical, grout, or concrete.

Install concrete anchorage devices as recommended by the device manufacturer and so that the attached equipment or fixtures will bear firmly against the concrete. Torque installed nuts to the values specified in table 552-6, unless

Table 552-5.—Sustained load test values.

Anchorage Device Stud Size	Tension Test Load (kN)
M20	24.0
M16	18.3
M12	12.7
M8	7.1

Table 552-6.—Torque for anchorage devices.

Anchorage Device Stud Size	Torque (N•m)
M20	180
M16	130
M12	80
M8	30

otherwise specified in the manufacturer's instructions. Set bearing anchor bolts in accordance with the requirements specified in Section 564.

In the presence of the CO, proof load a random sample of at least 10 percent of the anchors to 90 percent of the yield stress of the steel. If any anchor fails, reset the failed anchor and proof torque the reset anchor and 100 percent of all remaining anchors. The proof load may be applied by torquing against load indicator washers, applying direct tension load to the anchor, or some other method approved by the CO. After proof loading, release the load on the anchor and retighten to the load specified in table 552-6, or in accordance with the manufacturer's instructions.

552.20 Loads on New Concrete Structures. Do not allow vehicles or construction equipment on any span until concrete in the entire superstructure has attained its design compressive strength and has been in place 21 days.

Do not place any loads on finished piers, bents, or abutments until tests on concrete cylinders cast from the same concrete and cured under the same conditions indicate that the concrete has obtained at least 80 percent of the specified minimum 28-day concrete comprehensive strength. This restriction does not apply to placement of upper lifts for substructure elements cast in stages.

For posttensioned concrete structures, do not allow vehicles weighing more than 2,000 kg on any span until the prestressing steel for that span is tensioned, grouted, and cured. Vehicles weighing less than 2,000 kg may be permitted on a span, provided the weight of the vehicle was included in the falsework design.

Permit no public traffic on the bridge until approaches, curbs, bridge rail, and object markers are completed and in place.

Erect barricades at each end of the bridge span upon completion of the deck concreting if road approaches allow vehicles to drive directly onto the structure. Locate barricades so as to physically prevent vehicular access to the bridge. Do not remove barricades until the structure is open to public traffic as approved by the CO.

Measurement

552.21 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Measure structural concrete by the cubic meter or lump sum. Measure in accordance with the neat lines of the structure as SHOWN ON THE DRAWINGS, except as altered by the CO to fit field conditions. Make no deduction for the volume occupied by reinforcing steel, anchors, weep holes, piling, or pipes less than 200 mm in diameter. Do not include the volume of fillet less than 150 mm on a side or the varying thickness haunches between prefabricated girder and bridge decks.

Payment

552.22 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item		Pay Unit
552 (01)	Structural concrete, class ___	Cubic Meter
552 (02)	Structural concrete, class ___	Lump Sum
552 (03)	Structural concrete, class ___, for _____ ..... *Description*	Cubic Meter
552 (04)	Structural concrete, class ____, for _____ ..... *Description*	Lump Sum

Section 553—Prestressed Concrete

Description

553.01 Work. Prestress precast or cast-in-place concrete by furnishing, placing, and tensioning prestressing steel. Manufacture, transport, store, and install all precast prestressed members except piling.

Furnish prestressed members complete, including all concrete, prestressing steel, bar reinforcing steel, and incidentals in connection therewith.

Materials

553.02 Requirements. Furnish material that conforms to specifications in the following sections and subsections:

Elastomeric Bearing Pads	717.10
High-Strength Nonshrink Grout	701.02
Low-Strength Grout	701.03
Mortar	701.04
Prestressing Steel	709.03
Reinforcing Steel	554
Sealants, Fillers, Seals, & Sleeves	712.01
Structural Concrete	552
Structural Steel	717.01

Use class P concrete in prestressed members unless otherwise SHOWN ON THE DRAWINGS. Design the concrete mix in accordance with Subsection 552.03 with a 28-day design compressive strength as SHOWN ON THE DRAWINGS. Do not permit lightweight concrete unless otherwise SHOWN ON THE DRAWINGS.

Construction

553.03 Method Approval. Notify the CO a minimum of 10 days prior to fabrication of any prestressed members.

Inspect all prestressed concrete members by one of the following methods, unless otherwise SHOWN ON THE DRAWINGS or in the SPECIAL PROJECT SPECIFICATIONS:

- Use the quality control engineer of a plant certified by the Prestressed Concrete Institute (PCI). Submit a copy of the transmittal letter of the latest PCI inspection with the shop drawings. Furnish a copy of all testing and inspection reports to the CO upon delivery of the members to the jobsite.

- Use an independent licensed professional engineer experienced in prestressed concrete girder inspection to certify that the prestressed members were built in accordance with the drawings and specifications. Furnish, along with the certification, a copy of all testing and inspection reports to the CO upon delivery of the members to the jobsite.

Ensure that dimensional tolerances for prestressed girders are as given in division 5, section 5 of PCI manual 116–77 ("Manual for Quality Control: Precast Prestressed Concrete Products," Prestressed Concrete Institute, Chicago, Illinois).

Perform prestressing by pretensioning methods. Submit four copies of shop drawings for prestressed members and one copy of reproducible detailed drawings of the method, material, and equipment proposed for approval at least 21 days before starting prestressing.

Show the following:

(a) Method and sequence of stressing.

(b) Complete specifications, details, and test results for the prestressing steel and anchoring devices.

(c) Anchoring stresses.

(d) Arrangement of the prestressing steel in the members to include the strand pattern at midspan and at centerspan of bearing; and the location of total strand center of gravity at midspan, at hold-down points, at quarter points, and at centerline of bearing.

(e) Tendon elongation calculations for jacking procedures to be used, to include the calibration curve for the gauge and jacking system, the stress-strain curve for the prestressed strands, and the pressure gauge readings.

(f) Number, spacing, and method of draping pretensioned strands.

(g) The prestressing bed layout and overall length between grips at fixed and jacking ends, and the type of equipment to be used.

(h) Other substantiating calculations for the prestressing method.

(i) Certification of wire or strand taken in accordance with Subsection 709.03.

(j) Concrete mix design.

Provide the signature and seal of a licensed professional engineer on all shop drawings and calculations prepared for fabrication of prestressed members.

The CO will review mix designs and approve shop drawings prior to fabrication of prestressed members.

553.04 Prestressing Steel. Use prestressing steel that is bright and free of corrosion, dirt, grease, wax, scale, rust, oil, or other foreign material that may prevent bond between the steel and the concrete. Do not use prestressing steel that has sustained physical damage or is pitted.

One approved splice per pretensioning strand is permitted if the splice is between members in the casting bed. Splice so the strands have the same "twist" or "lay."

Do not weld or ground welding equipment on forms or other steel in the member after the prestressing steel is installed.

Allow a seven-wire strand with one broken wire to remain in the member, provided it is within the following limits:

For members with:

(a) Less than 20 strands, no wire breaks permitted.

(b) 20 to 39 strands, one wire break permitted.

(c) 40 to 59 strands, two wire breaks permitted.

(d) 60 or more strands, three wire breaks permitted.

Remove and replace all strands that exceed the permissible number of wire breaks. Remove any strand that has one or more than one broken wire. Securely wrap the broken ends of any wire breaks that are permitted to remain in the member with tie wire to prevent raveling.

553.05 Concrete. Construct prestressed concrete in accordance with Section 552. Construct reinforcing steel in accordance with Section 554.

Ensure that threaded inserts develop the full tensile strength of bars or bolts they secure. Unless otherwise SHOWN ON THE DRAWINGS, provide lifting devices of adequate strength to safely lift the girders within 600 mm of the girder ends.

Straighten wires, wire groups, parallel-lay cables, and any other prestressing elements to ensure proper position in the enclosures. Provide suitable horizontal and vertical spacers, if required, to hold the wires in position.

Do not place concrete in the forms until the placement of reinforcing steel, prestressing steel, ducts, bearing plates, and other embedded material is approved. Place and vibrate concrete with care to avoid displacing the embedded material.

Rough cast the top surface of members against which concrete will be cast.

Determine the strength of precast concrete required prior to release of pretensioned strands by tests on cylinders cast and cured under conditions in which the time-temperature relationship of the cylinder will simulate as nearly as possible that obtained during the curing of the structural member. When the forms are heated by steam or hot air, place the cylinder in the lowest heat zone during the curing period. When forms are heated by some other means, provide a recording of the time-temperature relationship of the test cylinder for comparison with that of the prestressed unit.

Mold, cure, and test the cylinders in accordance with AASHTO T 126 and T 22 for 28-day test cylinders, and AASHTO T 23 for test cylinders cured with the members. When accelerated curing methods are used, allow the cylinders to cool for at least one-half hour prior to capping, and allow caps of sulfur compound to cure one-half hour before testing.

Table 553-1.—Prestressed members (from the same placements).

Number of Members/Day	Release Test Cylinders Taken [a]	Minimum Cylinders Broken (Release Test)	28-Day Strength Test Cylinders Taken and Broken [a]
1	3	2	3
2	3	1 per beam	4 [b]
3	3 [c]	1 per beam	6 [b]
4	4 [c]	1 per beam	8 [b]
5	5 [c]	1 per beam	10 [b]
6	6 [c]	1 per beam	12 [b]
7	7 [c]	1 per beam	14 [b]
8	8 [c]	1 per beam	16 [b]

a. Assumes all concrete is air-entrained or nonair-entrained. If both types of concrete are used in the same member, the number of test cylinders listed shall be taken from the air-entrained concrete, and the same number of test cylinders shall be taken from the nonair-entrained concrete.
b. Two test cylinders taken from each member.
c. One test cylinder taken from each member.

As a minimum, take the numbers of test cylinders shown in table 553-1. Take more cylinders if the CO judges it necessary.

Cure the girder in a saturated atmosphere of at least 90 percent relative humidity. Cure time may be shortened by heating the outside of impervious forms with radiant heat, convection heat, conducted steam, or hot air.

Apply radiant heat by means of pipes circulating steam, hot oil, hot water, or electric heating elements. Inspect casting beds to ensure uniform heat application. Use a suitable enclosure to contain the heat. Minimize moisture loss by covering all exposed concrete surfaces with plastic sheeting or liquid membrane curing compound in accordance with Subsection 552.17. Sandblast curing compound from all surfaces to which concrete will be bonded.

When using steam, envelop the entire surface with saturated steam. Completely enclose the casting bed with a suitable type of housing, tightly constructed to prevent the escape of steam and exclude outside air. Use steam at 100 percent relative humidity. Do not apply the steam directly to the concrete.

When using hot air, the CO will approve the method to envelop and maintain the girder in a saturated atmosphere. Never allow dry heat to touch the girder surface.

For all heat curing methods:

(a) Keep all unformed girder surfaces in a saturated atmosphere throughout the curing time.

(b) Embed a thermocouple linked with a thermometer accurate to ± 3 °C 150 to 200 mm from the top or bottom of the girder on its centerline and near its midpoint.

(c) Monitor with a recording sensor (accurate to ± 3 °C) arranged and calibrated to continuously record, date, and identify concrete temperature throughout the heating cycle.

(d) Make this temperature record available to the CO.

(e) Heat concrete to no more the 38 °C during the first 2 hours after placing concrete, and then increase no more than 14 °C per hour to a maximum of 80 °C.

(f) After curing is complete, cool concrete no more than 14 °C per hour to 38 °C.

(g) Keep the temperature of the concrete above 15 °C until the girder reaches release strength.

(h) Do not expose the girders to temperatures below freezing until the specified 28-day strength has been achieved.

(i) To prevent cracking of members, detension strands and transfer their stress to the concrete immediately upon attainment of required release strengths and before the members have been allowed to dry and cool. Should this be impractical, keep the members covered and moist, and hold at a minimum temperature of 15 °C until strands are detensioned.

Cure precast pretensioned members until the concrete has attained the required release compressive strength. The average strength of two test cylinders shall be greater than the minimum required strength. Ensure that the individual strength of any one cylinder is not more than 5 percent below the required strength.

Steam-cure curbs and diaphragms cast after the prestress member has been cured for a minimum of 12 hours at 38 °C to 71 °C or moist-cured for a minimum of 3 days in accordance with Subsection 552.17.

Provide a class 2 rubbed finish to the exterior surface of the exterior girders and the bottom flanges of all girders, as specified in Subsection 552.18(b), unless otherwise SHOWN ON THE DRAWINGS. Provide a class 1 ordinary surface finish to the rest of the girders, as specified in Subsection 552.18(a).

Finish portions of prestressed members that will serve as bridge decks, as provided in Subsection 552.16(c)(1) or (2), as appropriate, or as SHOWN ON THE DRAWINGS.

With the approval of the CO, repair rock pockets and other minor deficiencies of a nonstructural nature in the girders. Reject any girders that are repaired without the approval of the CO, regardless of the extent of the repair work.

553.06 Tensioning. Stress strands only when an inspector (see Subsection 553.03) is present. Record the pretensioning gauge pressures and measured strand elongations, and provide a copy to the CO.

Use hydraulic jacks to tension prestressing steel. Use a pressure gage or load cell for measuring jacking force.

Calibrate measuring devices at least once every 6 months, or if they appear to be giving erratic results. Calibrate the jack and gage as a unit, with the cylinder extension in the approximate position to be at final jacking force. Keep a certified calibration chart with each gage.

If a pressure gage is used, do not gage loads less than one-quarter or more than three-quarters of the total graduated capacity of the gage, unless calibration data clearly establishes consistent accuracy over a wider range. Use a pressure gage with an accurate reading dial at least 150 mm in diameter.

Measure the force induced in the prestressing steel using jacking gages, and take elongation measurements of the prestressing steel. If there is a discrepancy of more than 7 percent between the jacking force and the expected elongation, check the entire operation, determine the reasons for the discrepancy, and correct before proceeding. Recalibrate jacking gages if their readings do not agree within 5 percent of each other. If the jacking system is equipped with an automatic release valve that closes when the required prestressing force is reached, strand elongation measurements are only required for the first and last tendon tensioned and for at least 10 percent of the remaining tendons.

If a load cell is used, do not use the lower 10 percent of the manufacturer's rated capacity of the load cell to determine the jacking force.

Do not exceed a temporary tensile stress in prestressing steel of 80 percent of the specified minimum ultimate tensile strength of the prestressing steel. Anchor prestressing steel at an initial stress that will result in the retention of a working stress after all losses of not less than those required.

For pretensioned members, do not allow the initial release stress after seating and before other losses to exceed 70 percent of the specified minimum ultimate tensile strength of the prestressing steel for stress-relieved strands, and 75 percent for low-relaxation strands. For posttensioned members, do not allow the initial release stress after seating to exceed 70 percent of the specified minimum ultimate tensile strength of the prestressing steel.

553.07 Pretensioned Members. Cast pretensioned members to the tolerances shown in table 553-2.

Cast pretensioned members in commercial prestressing plants that are PCI-Certified Plants in Product Group B—Bridges, category B3 (Prestressed Straight Strand Bridge Members) or category B4 (Prestressed Draped Strand Bridge Members), as applicable to the members to be manufactured.

(a) Prestressing Steel. Protect prestressing steel placed in the stressing bed from contamination and corrosion if the stressing bed will be exposed to weather for more than 36 hours before encasement in concrete.

Table 553-2.—Prestressed concrete member tolerances.

Description	Tolerance
Precast girders with cast-in-place decks:[a]	
Length	± 10 mm/10 m, ± 25 mm max.
Width (overall)	+ 10 mm, – 5 mm
Depth (overall)	+ 15 mm, – 5 mm
Depth (flanges)	– 5 mm
Width (web)	+ 10 mm, – 5 mm
Sweep [b]	3 mm/3 m
Variation from end squareness or skew	± 15 mm/m, ± 25 mm max.
Camber variation from design camber	± 3 mm/3 m ± 15 mm, max. > 25 m length ± 25 mm, max. > 25 m length
Position of strands:	
Individual	± 5 mm—bundled
Bundled	± 15 mm
Position from design location of deflection points for deflected strands	± 500 mm
Position of plates other than bearing plates	± 25 mm
Position of bearing plates	± 15 mm
Tipping and flushness of plates	± 5 mm
Tipping and flushness of bearing plates	± 5 mm
Position of inserts for structural connections	± 15 mm
Position of handling devices:	
Parallel to length	± 150 mm
Transverse to length	± 25 mm
Position of stirrups:	
Longitudinal spacing	± 50 mm
Projection above top	± 20 mm
Local smoothness [c]	± 6 mm in 3 m, any surface

a. AASHTO I Beams and Bulb Tee Girders.
b. Variation from straight line parallel to centerline of member.
c. Does not apply to top surface left rough to receive a topping or to visually concealed surfaces.

Free all strands of kinks or twists. Accurately hold prestressing steel in position, and tension in accordance with Subsection 553.06. Do not allow strands to unwind more than one turn. Keep a record of the jacking force and elongation measurements after the strands are tensioned to 20 percent of final jacking force.

Tension prestressing steel to the required stress. Include in elongation computations strand anchorage slippage, splice slippage, horizontal movement of abutments, and prestressing steel temperature changes between the time of tensioning and the time when the concrete takes its initial set.

Table 553-2.—Prestressed concrete member tolerances (cont.).

Description	Tolerance
Precast girders used in multibeam decks:[d]	
Length	± 20 mm
Width (overall)	± 5 mm
Depth (overall)	± 5 mm
Depth (top flange)	± 15 mm
Depth (bottom flange)	+ 15 mm, – 5 mm
Width (web)	± 10 mm
Sweep[e] –	
Up to 12-m member length	± 5 mm
12- to 18-m member length	± 10 mm
Greater than 18-m member length	± 15 mm
Variation from end squareness or skew:	± 10 mm/m
Horizontal	± 15 mm max.
Vertical	± 15 mm
Camber variation from design camber	± 3 mm/3 m, ± 15 mm max.
Differential camber between adjacent members of the same design	6 mm/3 m, 20 mm max.
Position of strands:	
Individual	± 5 mm
Bundled	± 5 mm
Position from design location of deflection points for deflected strands	500 mm
Position of plates other than bearing plates	± 25 mm
Tipping and flushness of plates	± 5 mm
Position of inserts for structural connections	± 15 mm
Position of handling devices:	
Parallel to length	± 150 mm
Transverse to length	± 25 mm

d. Box beams, slabs, decked bulb tee, and multistem girders.
e. Variation from straight line parallel to centerline of member.

Maintain the prestress bed forms, strands, and reinforcement bar temperature within 14 °C of the temperature of the concrete to be placed in the forms. Support strands with rollers at points of direction change when strands are tensioned in a draped position. Use free-running rollers with minimal friction. Initially, when strands are tensioned and then pulled into the draped position, tension to no more than the required tension minus the increased tension due to forcing the strand to a draped profile. If the load in a draped strand at the dead end, as determined by elongation measurements, is less than 95 percent of the jack load, tension the strand from both ends of the bed. Make the load, as computed from the sum of elongations produced by jacking at both ends, agree within 5 percent of the jack load.

Table 553-2.—Prestressed concrete member tolerances (cont.).

Description	Tolerance
Precast girders used in multibeam decks, position of stirrups:	
Longitudinal spacing	± 25 mm
Projection above top	+ 5 mm, – 20 mm
Tipping of beam seat bearing area	± 5 mm
Position of dowel tubes	± 15 mm
Position of tie rod tubes:	
Parallel to length	± 15 mm
Vertical	± 10 mm
Position of slab void:	
End of void to center of tie hole	± 15 mm
Adjacent to end block	± 25 mm
Local smoothness [f]	± 5 mm in 3 m, any surface
Posttension members:	
Position of posttensioning ducts	± 5 mm
Position of tendon anchorage bearing plates	± 5 mm

f. Does not apply to top surface left rough to receive a topping or to visually concealed surfaces.

Within 3 hours before placing concrete, check the tension on all prestressing steel strands. The method and equipment for checking the loss of prestress shall be subject to approval by the CO. If strands are tensioned individually, check each strand for loss of prestress. Retension to the original computed jacking stress all strands that show a loss of prestress in excess of 3 percent. If strands are tensioned in a group, check the entire group for loss of prestress. Release and retension the entire group if the total prestress shows a loss in excess of 3 percent, or if any individual strand appears significantly different from the rest of the strands in the group.

(b) Releasing Steel. Release the prestress load to the concrete after the concrete has attained its required release compressive strength. Do not expose the concrete to temperatures below freezing for at least 7 days after casting. Cut or release strands such that lateral eccentricity of the prestress force will be minimized. Cut prestress steel off flush with the end of the member unless otherwise SHOWN ON THE DRAWINGS.

553.08 Storing, Transporting, & Erecting. Do not ship prestressed concrete members until concrete cylinder tests manufactured of the same concrete and cured under the same conditions as the members indicate that the concrete in each member has attained the minimum required design strength and is at least 14 days old.

Store, transport, and erect precast and prestressed girders, slab units, and box units in the upright position with the points of support and directions of the reactions, with respect to the member, approximately the same as when the member is in its final position, unless otherwise shown on approved shop drawings. Prevent cracking or damage during storage, hoisting, and handling of the precast units. Replace units damaged by improper storage or handling.

Store, transfer, and erect precast prestressed concrete piling in accordance with the requirements for precast concrete piling specified in Section 551. Place other precast prestressed structural members in the structure as SHOWN ON THE DRAWINGS and in accordance with the SPECIAL PROJECT SPECIFICATIONS.

553.09 Erecting & Placement of Multibeam Members. Advise the CO a minimum of 48 hours before prestressed girders for multibeam bridges are to be field welded, and before any field grout or mortar is to be placed.

Adjust, if necessary, multibeam girders by using galvanized steel shims the same length and width as the bearing pad or plate. Allow no more than 5 mm vertical difference between top of adjacent beam edges at each end of the span. When an asphalt wearing surface or cast-in-place deck is to be placed on top of the prestressed beams, allow a vertical tolerance of only 15 mm. Do not load beams to make them assume the same camber as an adjacent beam.

Perform abrasive blasting on the keyway surfaces of all multibeam prestressed concrete members to provide a new and clean concrete surface that is free of carbonated concrete and other contaminants, and to expose parts of the large aggregate beneath the concrete paste.

Use high-pressure water blasting (20.7 kPa or more) to remove all debris and loosened paste in the keyways immediately prior to placing mortar. Remove all free-standing water and allow keyways to completely surface dry. Test for the presence of carbonated concrete when directed by the CO or called for by the SPECIAL PROJECT SPECIFICATIONS. Repeat abrasive blasting and water washing as needed if tests indicate the presence of carbonated concrete.

Use mortar in keyways between multibeam members and to patch defects, blockouts, or other areas on the concrete roadway portion of the structure 25 mm or more in depth and over 25 mm in width. Patch smaller areas on the concrete roadway with grout.

Maintain air and concrete keyway temperatures between 7 °C and 30 °C before placing mortar. Maintain the temperature within these limits until mortar placement and application of curing method is completed.

Use grout on all anchor bolts and dowels to make all repairs.

Require air and concrete temperatures for grout placement to be the same as required for mortar. Thoroughly saturate the areas to be grouted with water and remove all free-standing water just prior to grout placement.

Strike off exposed grout surfaces flush with the same surface texture finish as the surrounding concrete as soon as the grout has set sufficiently. Cure the exposed surface as specified in Subsection 552.17. When artificial means are used to control the curing temperature of the mortar or grout, as during hot or cold weather, the CO will approve the method in advance. Use combustion heaters only if fully vented outside their enclosure. Store all dry mortar materials and mixing and placing equipment such that their temperature is above freezing. Warm mixing water to provide mortar or grout at desired temperature, but ensure that it is at 30 °C or less when mixed with the dry materials. Use ice as part of the mixing water provided it is completely melted prior to the introduction of the water to the dry materials.

Ensure that patching mortar and grout are the same color as the parent concrete.

Ensure that all field welding meets the requirements specified in Section 555. When welding or burning on precast members, attach the ground lead directly to the base metal; reject any precast prestressed member used as a conductor for the ground, and replace the member without compensation.

553.10 Painting Steel. Use a wire brush or abrasive blast to remove all dirt and residue not firmly bonded to the metal or concrete surfaces. Clean and paint the exposed ends of the prestress steel, posttension anchor head assemblies, and a 25-mm strip of adjoining concrete.

Mix zinc-rich paint conforming to Federal Specifications and Standards (FSS) TT–P–641. Work the paint into all voids in the prestressing tendons. Apply one thick coat to surfaces that will be covered with concrete. Apply two coats to surfaces not covered with concrete.

Measurement

553.11 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Measure precast prestressed structural concrete members by the each or by the meter.

Measure prestressed piling under Section 551.

Payment

553.12 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item		Pay Unit
553 (01)	Precast prestressed concrete structural members, _____ *Description*	Each
553 (02)	Precast prestressed concrete structural members, _____ *Description*	Meter

Section 553A—Precast Concrete Structures

Description

553A.01 Work. Construct precast concrete members. In addition, manufacture, test materials for, transport, store, and install all precast concrete portions except piling, and perform all necessary grouting, welding, or other connections. Furnish precast concrete members complete and in place, including all concrete reinforcing steel and incidentals connected therewith.

Materials

553A.02 Requirements. Provide materials that meet the requirements specified in the following subsections:

Elastomeric Bearing Pads	717.10
High-Strength Nonshrink Grout	701.02
Low-Strength Grout	701.03
Mortar	701.04
Reinforcing Steel	709.01
Sealants, Fillers, Seals, & Sleeves	712.01
Structural Concrete	552.02
Structural Steel	717.01

Provide precast concrete members of the size, shape, strength, air content, and finish that are SHOWN ON THE DRAWINGS.

Perform all sampling, testing, and inspection necessary to ensure quality control of the component materials and the concrete. Sample and test for quality control and acceptance testing in accordance with the AASHTO or ASTM test methods prescribed in Section 552.

Maintain adequate records of all inspections and tests. Keep records that indicate the nature and number of observations made, the number and type of deficiencies found, the quantities approved and rejected, and the nature of any corrective action taken.

Sample and test every batch (100 percent sampling and testing) for air content and slump at the start of concrete production. Random sampling and testing for air con-tent and slump at the rate of one for every five successive batches may be substituted for 100 percent sampling and testing if the test results for three

successive batches are within the specification limitations for air content or slump; but reinstate 100 percent sampling and testing if a test result for any random sample is outside the specification limitations for either air content or slump.

Make compression tests to determine the minimum strength requirements on cylinders. Make a minimum of four cylinders from each day's production, and cure them in the same manner as the precast units. Use testing methods in accordance with AASHTO T 22.

Furnish, or have the supplier furnish, a Certificate of Compliance to the CO certifying that the above materials comply with the applicable specifications. In addition, furnish to the CO a copy of all test results performed by the Contractor or supplier that are necessary to ensure compliance.

Construction

553A.03 Performance. Construct precast concrete structural members in accordance with the following sections and subsections, as applicable:

Erecting and Placement of Multibeam Members..... 553.09
Reinforcing Steel 554
Storing, Transporting, & Erecting 553.08
Structural Concrete 552

Submit four sets of shop drawings to the CO for approval, including the concrete mix design for each class of concrete proposed for use, a minimum of 21 days before fabrication of the precast member(s).

553A.04 Casting Yard. The precasting of concrete structural members may be done at a casting yard location selected by the Contractor.

553A.05 Handling, Transporting, & Erecting. Provide additional reinforcement, as needed, to meet the requirements of handling, transporting, and erecting precast members.

Measurement

553A.06 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Each member will include the concrete, reinforcement steel, anchorages, plates, nuts, and other material contained within or attached to the unit.

Payment

553A.07 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Pay Item		Pay Unit
553A (01)	Precast concrete member, _____ *Description*	..... Each
553A (02)	Precast concrete structure, _____ *Description*	..... Lump Sum

Section 554—Reinforcing Steel

Description

554.01 Work. Furnish and place reinforcing steel.

Materials

554.02 Requirements. Furnish material that conforms to specifications in the following subsections:

Reinforcing Steel 709.01

Construction

554.03 Order Lists. When SHOWN ON THE DRAWINGS or in the SPECIAL PROJECT SPECIFICATIONS, submit all order lists and bending diagrams to the CO for approval. Approval does not relieve the Contractor of responsibility for the accuracy of the lists and diagrams. Do not order material until the lists and diagrams are approved.

Do not fabricate vertical reinforcement in columns, walls, piers, and shafts until footing elevations are established in the field, unless otherwise SHOWN ON THE DRAWINGS or in the SPECIAL PROJECT SPECIFICATIONS.

554.04 Identification. Ship bar reinforcement in standard bundles tagged and marked in accordance with the "Manual of Standard Practice" by the Concrete Reinforcing Steel Institute (CRSI).

554.05 Bending. Fabricate reinforcing bars in accordance with ACI SP 66. Cold bend all reinforcing bars that require bending. Limit the overall height or drop bending tolerance of deck truss bars to + 0 mm or – 6 mm. Do not bend bars partially embedded in concrete except as SHOWN ON THE DRAWINGS or otherwise permitted.

When the dimensions of hooks or the diameter of bends is not SHOWN ON THE DRAWINGS, provide standard hooks conforming to ACI SP 66.

554.06 Protection of Material. Store reinforcing steel above the ground on platforms, skids, or other supports. Protect from physical damage, rust, and other surface deterioration.

Use reinforcing steel only when the surface is clean and the minimum dimensions, cross-sectional area, and tensile properties conform to the physical requirements for the size and grade of steel specified.

Do not use reinforcing steel that is cracked, laminated, or covered with dirt, rust, loose scale, paint, grease, oil, or other deleterious material.

554.07 Epoxy-Coated Reinforcing Steel. Support coated bars on padded contact areas. Pad all bundled bands. Lift with a strong back, multiple supports, or a platform bridge. Prevent bar-to-bar abrasion. Do not drop or drag bundles.

Before placement, inspect coated bars for damage to the coating. Patch all defects in the coating that are discernible to the unaided eye with a prequalified patching/repair material, in accordance with AASHTO M 284M. Clean areas to be patched by removing all surface contaminants and damaged coating. Roughen the area to be patched before applying the patching material. Where rust is present, remove the rust by blast cleaning or power-tool cleaning immediately before applying the patching material.

Promptly treat the bar in accordance with the resin manufacturer's recommendations and before detrimental oxidation occurs. Overlap the patching material onto the original coating for 50 mm or as recommended by the manufacturer. Provide a minimum 200-µm dry film thickness on the patched areas.

Take necessary steps to minimize damage to the epoxy coating of installed bars. Clean and patch any damage to the coating noted after installation, as described above.

Field repairs will not be allowed on bars that have severely damaged coatings. Replace bars with severely damaged coatings. A severely damaged coating is defined as a coating with a total damaged area in any 0.5-m length of bar that exceeds
5 percent of the surface area of that portion of the bar. Coat mechanical splices after splice installation in accordance with AASHTO M 284M for patching damaged epoxy coatings.

554.08 Placing & Fastening. Support the bars on precast concrete blocks or metal supports in accordance with the CRSI "Manual of Standard Practice of the Concrete Reinforcing Steel Institute." Attach concrete block supports to the supported bar with 2-mm wire cast in the center of each block. Use class 1 (plastic-protected) or class 2, type B (stainless-steel-protected) metal supports in contact with exposed concrete surfaces. Use stainless steel conforming to ASTM A 493, type 430. Coat chairs, tie wires, and other devices used to support, position, or fasten epoxy-coated reinforcement with a dielectric material. Do not use plastic, wood, aluminum, brick, or rock supports.

Space slab bar supports no more than 1.2 m apart transversely or longitudinally. Do not use bar supports either directly or indirectly to support runways for concrete buggies or other similar construction loads.

Space parallel bars within 38 mm of the required location. Do not accumulate spacing variations. Ensure that the average of any two adjacent spaces does not exceed the required spacing.

Provide 50 mm clear cover for all reinforcement except as otherwise SHOWN ON THE DRAWINGS.

Place reinforcing steel in deck slabs within 6 mm of the vertical plan location. Tie bridge deck reinforcing bars together at all intersections, except where spacing is less than 300 mm in both directions, in which case alternate intersections may be tied. Check the clear cover over deck-reinforcing steel using a template before placing deck concrete. Replace damaged supports.

Tie every reinforcing-steel intersection at the outside edges of decks, in top mats of footings, and in all precast and/or prestressed concrete units.

Tie bundle bars together at intervals not exceeding 2 m. Do not bundle bars unless the location and splice details are specified.

Do not place concrete in any member until the placement of the reinforcement is approved by the CO. Concrete placed without approval may be rejected, and the Contractor may be required to remove it without compensation.

554.09 Splices. Splicing, except as SHOWN ON THE DRAWINGS, is not permitted without approval. Provide lap lengths as SHOWN ON THE DRAWINGS or in accordance with the latest edition of “Standard Specifications for Highway Bridges,” published by AASHTO.

Splice reinforcing bars only where SHOWN ON THE DRAWINGS. Do not place slab bar mechanical splices adjacent to each other.

Make lapped splices by placing the reinforcing bars in contact and wiring them together with at least three ties to maintain the alignment and position of the bars.

If welding of reinforcing steel is permitted, ensure that the welds conform to AWS D 1.4. Do not weld reinforcing steel if the chemical composition of the steel exceeds the percentages shown in table 554-1.

Use welders that are currently certified. When required, test each weld using magnetic particle, radiography, or other nondestructive inspection techniques.

Table 554-1.—Reinforcing steel components.

Chemical Composition	Percent
Carbon	0.30
Manganese	1.50
Carbon equivalent	0.55

Do not tack-weld reinforcing steel.

Mechanical couplers may be used in lieu of welding, if approved. Use couplers with a strength that is at least 125 percent of the required yield strength of the reinforcing steel.

If welded wire fabric is shipped in rolls, straighten into flat sheets before placing. Splice sheets of mesh or bar mat reinforcement by overlapping not less than 1 mesh width plus 50 mm. Securely fasten at the ends and edges.

Measurement

554.10 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Measure reinforcing steel by the kilogram or by the lump sum, excluding laps added for the Contractor's convenience.

Payment

554.11 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item		Pay Unit
554 (01)	Reinforcing steel	Kilogram
554 (02)	Epoxy-coated reinforcing steel	Kilogram
554 (03)	Reinforcing steel	Lump Sum

Section 555—Steel Structures

Description

555.01 Work. Construct steel structures and the steel structure portions of composite structures. Furnish, fabricate, and erect structural steels, and perform incidental metal construction.

Materials

555.02 Requirements. Furnish material that conforms to specifications in the following sections and subsections:

Bearing Devices	564
Bolts & Nuts	717.01(d)
Castings	717.04
Elastomeric Compression Joint Seals	717.16
Falsework	562
Galvanized Coatings	717.07
High-Strength Bolts, Nuts, & Washers	717.01(e)
Painting	563
Pins & Rollers	717.03
Sheet Lead	717.08
Steel Forgings	717.02
Steel Grid Floors	717.09
Steel Pipe	717.06
Structural Steel	717.01
Welded Stud Shear Connectors	717.05

Construction

555.03 General. Fabricate the structural steel in a fabricating plant that is certified under the American Institute of Steel Construction (AISC) Quality Certification Program. Fabricate "fracture-critical" elements in accordance with the AASHTO "Guide Specifications for Fracture Critical Non-Redundant Steel Bridge Members."

Perform welding and weld qualification tests in accordance with the provisions of American National Standards Institute (ANSI)/AASHTO/AWS Bridge Welding Code D 1.5.

555.04 Notice of Beginning of Work. Give written notice 30 days before beginning work at the shop. Do not manufacture any material or perform any work in the shop before notification.

555.05 Inspection. Structural steel may be inspected at the fabrication site.

Ultrasonically inspect all girder flanges before fabrication, in accordance with ASTM A 578, except as follows:

(a) Inspect after the flanges are stripped from the master plate.

(b) Section 6 and 7 acceptance standards do not apply. Use supplementary requirement S2.1 for acceptance standards.

(c) Flanges may be inspected in the plant or warehouse where the flanges are stripped.

Furnish a copy of all mill orders and certified mill test reports. Show on the mill test reports the chemical analyses and physical test results for each heat of steel used in the work.

If approved, furnish production certificates in lieu of mill test reports for material that normally is not supplied with mill test reports and for items such as fills, minor gusset plates, and similar material when quantities are small and the material is taken from stock.

Include in the certified mill test reports for steels with specified impact values, in addition to other test results, the results of Charpy V-notch impact tests. When fine-grain practice is specified, confirm on the test report that the material was so produced. Furnish copies of mill orders at the time orders are placed with the manufacturer. Furnish certified mill test reports and production certificates before the start of fabrication using material covered by these reports. Furnish, from the manufacturer, a Certificate of Compliance in accordance with Subsection 106.03.

555.06 Drawings (Shop Drawings, Erection Drawings, & Transportation Drawings). Prepare and submit drawings at the times indicated herein. Approval of the drawings covers the requirements for strength and detail only. No responsibility is assumed for errors in dimensions.

(a) Shop Drawings. Submit four copies of shop drawings at least 21 days in advance of the start of fabrication to allow time for review without delaying the work. Show full detailed dimensions and sizes of component parts of the structure and details of all miscellaneous parts (such as pins, nuts, bolts, drains, weld symbols, and so forth) on shop drawings for steel structures.

Where specific orientation of plates is required, show the direction of rolling of plates. Cut flanges and webs of plate girders from plates so the long dimension of the girder parallels the rolling direction.

Show the sequence of shop and field assembly and erection, and all welding sequences and procedures.

Identify on the shop drawings the type and grade of each piece.

Show on the shop drawings assembly marks that are cross-referenced to the original pieces of mill steel and their certified mill test reports.

The location of all shop-welded splices shown on the shop drawings is subject to approval. Locate all shop-welded splices to avoid points of maximum tensile or fatigue stress. Locate splices in webs at least 300 mm from shop splices, butt joints in flanges, or stiffeners. Additional nondestructive tests may be required on shop-welded splices.

(b) Erection Drawings. Submit drawings fully illustrating the proposed method of erection a minimum of 21 days before field assembly and erection. Show details of all falsework bents, bracing, guys, dead-men, lifting devices, and attachments to the bridge members. Show the sequence of erection, location of cranes and barges, crane capacities, location of lifting points, and weights of bridge members. Show complete details for all anticipated phases and conditions of erection. Calculations may be required to demonstrate that allowable stresses are not exceeded and that member capacities and final geometry will be correct. See Subsection 562.03 for additional requirements.

(c) Camber Diagram. Along with the shop drawings, furnish a camber diagram complete with substantiating calculations that show the camber at each panel point of trusses or arch ribs and at the location of field splices and fractions of span length (one-quarter points minimum) of continuous beams and girders or rigid frames. On the camber diagram, show calculated cambers to be used in preassembly of the structure, as required in Subsection 555.15.

(d) Transportation Drawings. If required, furnish transportation drawings for approval a minimum of 10 days prior to shipment.

Show all support points, tie-downs, temporary stiffening trusses or beams, and any other details needed to support and brace the member. Provide calculation sheets showing the dead load plus impact stresses induced by the loading and transportation procedure. Use impact stresses of at least 200 percent of the dead load stress. Use a total load, including impact, of not less than 300 percent of the dead load.

Ship and store all members, both straight and curved, with their webs vertical.

555.07 Storage of Material. Store structural material above the ground on platforms, skids, or other supports. Keep material free from dirt, grease, and other foreign matter, and provide appropriate protection from corrosion.

555.08 Fabrication. Provide a workmanship and finish in accordance with the best general practice in modern bridge shops. Finish neatly all portions of the work exposed to view. Perform shearing, flame cutting, and chipping carefully and accurately.

Rolled material must be straight before being laid off or worked. If straightening is necessary, use methods that will not injure the metal. Sharp kinks and bends will be cause for rejection of the material.

Heat curving of steel girders is not allowed.

(a) Identification of Steels. Use a system of assembly-marking of individual pieces and cutting instructions to the shop (generally by cross-referencing of the assembly marks shown on the shop drawings with the corresponding item covered on the mill purchase order) that maintains the identity of the original piece.

Material may be furnished from stock that can be identified by heat number and mill test report.

During fabrication, up to the point of assembling members, show clearly and legibly the specification of each piece of steel by writing the material specification on the piece or using the identification color code shown in table 555-1.

Table 555-1.—Identification color codes.

Grade	Color
345	Green and yellow
345W	Blue and yellow
485W	Blue and orange
690	Red
690W	Red and orange

For other steels not shown in table 555-1 or included in AASHTO M 160M, provide information on the color code used.

Mark for grade by steel-die stamping, or by firmly attaching a substantial tag, pieces of steel that, before assembling into members, will be subject to fabrication operations (such as blast cleaning, galvanizing, heating for forming, or painting) that

might obliterate paint color code marking. Where the steel-stamping method is used, place the impressions on the thicker tension-joint member in transition joints.

The maximum allowed depth of the impression is 0.25 mm. Use a tool that will make character sizes with corresponding face radii as shown in table 555-2. Avoid impressions near edges of tensile-stressed plate members.

Table 555-2.—Size of steel die stamp markings.

Character Size	Minimum Face Radii
3 mm	0.2 mm
5 mm	0.1 mm
6 mm	0.3 mm

Use low-stress-type steel die stamps. Do not use die stamps on fracture-critical members.

If requested, furnish an affidavit certifying that the identification of steel has been maintained throughout the fabrication operation.

(b) Plates. Conform to the following:

(1) Direction of Rolling. Unless otherwise SHOWN ON THE DRAWINGS, cut and fabricate steel plates for main members and splice plates for flanges and main tension members, not secondary members, so that the primary direction of rolling is parallel to the direction of the principal tensile and/or compressive stresses.

(2) Plate Cut Edges. Conform to the following:

(a) Edge Planing. Remove sheared edges on plates thicker than 15 mm to a depth of 5 mm beyond the original sheared edge, or beyond any re-entrant cut produced by shearing. Fillet re-entrant cuts before cutting.

(1) Oxygen Cutting. Oxygen cut structural steel in accordance with ANSI/AASHTO/AWS Bridge Welding Code D 1.5.

(2) Visual Inspection & Repair of Plate Cut Edges. Visually inspect and repair plate cut edges. Ensure that cut edges conform to ANSI/AASHTO/AWS Bridge Welding Code D 1.5.

(b) Flange Plates. Furnish flange plates with oxygen-cut edges that have the corners chamfered at least 2 mm by grinding, or furnish universal mill plates unless oxygen-cut edges are required.

(c) Web Plates. Oxygen cut to the prescribed camber web plates of built-up beams and girders, box girders, and box arches. Cut sufficient extra camber into the webs to provide for all camber losses due to welding, cutting, and so forth.

(d) Truss Members. Use oxygen cutting to prepare all longitudinal edges of all plates in welded sections of truss web and chord members. Chamfer at least 2 mm by grinding the edges of the corners of plates not joined by welding.

(e) Stiffeners & Connection Plates. Stiffeners and connection plates welded transverse to girder webs and flanges may be furnished with sheared edges, provided that the plate thickness does not exceed 20 mm. Universal mill plate may be used, provided that its thickness does not exceed 25 mm. Furnish other stiffeners and connection plates with oxygen-cut edges.

(f) Lateral Gusset Plates. Oxygen cut, parallel to lines of stress, gusset plates and other connections that are welded parallel to lines of stress in tension members where the plate thickness exceeds 10 mm. Bolted lateral gusset plates may be furnished with sheared edges, provided the thickness is less than or equal to 20 mm.

(g) Splice Plates & Gusset Plates. Furnish girder and stringer splice plates and truss gusset plates with oxygen-cut edges.

(h) Bent Plates. Furnish unwelded, load-carrying, rolled-steel plates to be bent as shown in table 555-3.

Table 555-3.—Minimum bending radii.[a]

Plate Thickness (mm)	Bending Radius[b]
$t \leq 13$	$2(t)$
$13 < t \leq 25$	$2.5(t)$
$25 < t \leq 38$	$3(t)$
$38 < t \leq 64$	$3.5(t)$
$64 < t \leq 102$	$4(t)$

a. t = plate thickness.
b. For all grades of structural steel.

Take material from the stock plates such that the bend line will be at right angles to the direction of rolling, except that cold-bent ribs for orthotropic deck bridges may be bent with bend lines in the direction of rolling.

Before bending, round the corners of the plates to a radius of 2 mm throughout the portion of the plate where the bending occurs.

(1) Cold Bending. Cold bend so that no cracking of the plate occurs. Use the minimum bend radii shown in table 555-3 measured to the concave face of the metal.

Allow for springback of grade 690 and grade 690W steels equal to about 3 times that for grade 250 steel. Use a lower die span of at least 16 times the plate thickness for break press forming.

(2) Hot Bending. If a radius shorter than the minimum specified for cold bending is essential, hot bend the plates at a temperature not greater than 650 °C, except for grades 690 and 690W. When grade 690 and grade 690W steel plates are heated to temperatures greater than 610 °C, requench and temper in accordance with the producing mill's standard practice.

(c) Fit of Stiffeners. Fabricate (mill, grind, or weld as SHOWN ON THE DRAWINGS or as specified) end-bearing stiffeners for girders and stiffeners intended as supports for concentrated loads to provide full bearing on the flanges to which they transmit load or from which they receive load. Fabricate intermediate stiffeners not intended to support concentrated loads to provide a tight fit against the compression flange.

(d) Abutting Joints. Mill or saw-cut abutting joints in compression members of trusses and columns to give a square joint and uniform bearing. The maximum allowed opening at other joints, not required to be faced, is 10 mm.

(e) Facing of Bearing Surfaces. Finish bearing and base plates and other bearing surfaces that will come in contact with each other or with concrete to the ANSI surface roughness defined in ANSI B46.1, "Surface Roughness, Waviness and Lay, Part I," as shown in table 555-4.

Table 555-4.—ANSI surface roughness values.

Bearing Surface	Surface Roughness Value (µm)
Steel slabs	50
Heavy plates in contact in shoes to be welded	25
Milled ends of compression members, milled or ground ends of stiffeners and fillers	13
Bridge rollers and rockers	6
Pins and pin holes	3
Sliding bearings	3

Machine sliding bearings that have a surface roughness greater than 2 µm according to ANSI, so the lay of the cut is parallel to the direction of movement.

Fabricate parts in bearing to provide a uniform, even contact with the adjacent bearing surface when assembled. Limit the maximum gap between bearing surfaces to 1 mm. Base and sole plates that are plane and true and have a surface roughness

not exceeding the above-tabulated values need not be machined, except machine sliding surfaces of base plates.

Do not machine surfaces of fabricated members until all fabrication on that particular assembly or subassembly is complete. Machine metal components that are to be heat-treated after heat treatment.

(f) Straightening Material. If approved, straighten plates, angles, other shapes, and built-up members by methods that will not produce fracture or other damage to the metal. Straighten distorted members by mechanical means or, if approved, by carefully planned procedures and supervised application of a limited amount of localized heat. Use rigidly controlled procedures and do not exceed the temperatures specified in table 555-5 when heat straightening grades 485W, 690, and 690W steel members.

Table 555-5.—Heat-straightening temperatures.

Material To Be Straightened	Maximum Temperature
Grade 485W > 150 mm from weld	580 °C
Grade 485W < 150 mm from weld	480 °C
Grade 690 or 690W > 150 mm from weld	605 °C
Grade 690 or 690W < 150 mm from weld	510 °C

In all other steels, do not exceed 650 °C in the heated area. Control the application by temperature-indicating crayons, liquids, or bimetal thermometers.

Keep parts to be heat-straightened substantially free of external forces and stress, except stresses resulting from mechanical means used in conjunction with the application of heat.

Evidence of fracture following straightening of a bend or buckle will be cause for rejection of the damaged piece.

555.09 Annealing & Stress Relieving. Machine, finish bore, and straighten annealed or normalized structural members subsequent to heat treatment. Normalize and anneal (full annealing) in accordance with ASTM A 919. Maintain uniform temperatures throughout the furnace during the heating and cooling so that the temperature at any two points on the member does not differ by more than 60 °C at any one time.

Do not anneal or normalize members of grades 690/690W or 485W steels. Stress relieve these grades only with approval.

Record each furnace charge, identify the pieces in the charge, and show the temperatures and schedule actually used. Provide proper instruments, including recording pyrometers, for determining at any time the temperatures of members in the furnace. Make records of the treatment operation available for approval. The maximum allowed holding temperature for stress relieving grades 690/690W and 485W steels is 605 °C and 580 °C, respectively.

Stress relieve members (such as bridge shoes, pedestals, or other parts that are built up by welding sections of plate together) in accordance with subsection 4.4 of ANSI/AASHTO/AWS Bridge Welding Code D 1.5.

555.10 Bolt Holes. Punch or drill all bolt holes. Material forming the parts of a member that is composed of not more than five thicknesses of metal may be punched 2 mm larger than the nominal diameter of the bolts where the thickness of the material is not greater than 20 mm for structural steel, 15 mm for high-strength steel, or 15 mm for quenched and tempered alloy steel, unless subpunching and reaming is required under Subsection 555.10(h), Preparation of Field Connections.

Where there are more than five thicknesses or where any of the main material is thicker than 20 mm for structural steel, 15 mm for high-strength steel, or 15 mm for quenched and tempered alloy steel, either subdrill and ream or drill all holes full size.

If required, either subpunch or subdrill (subdrill if thickness limitation governs) 5 mm smaller and, after assembling, ream 2 mm larger or drill full size to 2 mm larger than the nominal diameter of the bolts.

(a) Punched Holes. Use a die diameter that is not more than 2 mm larger than the punch diameter. Ream holes that require enlarging to admit bolts. Cut the holes clean without leaving torn or ragged edges.

(b) Reamed or Drilled Holes. Ream or drill holes so they are cylindrical and perpendicular to the member. Where practical, direct reamers by mechanical means. Remove burrs on the outside surfaces. Ream and drill with twist drills, twist reamers, or roto-broach cutters. Assemble and securely hold together connecting parts that are being reamed or drilled and match-mark before disassembling.

(c) Accuracy of Holes. Holes not more than 1 mm larger in diameter than the true decimal equivalent of the nominal diameter of the drill or reamer are acceptable. The slightly conical hole resulting from punching operations is acceptable. Ensure that the width of slotted holes produced by flame cutting or a combination of drilling or

punching and flame cutting is no more than 1 mm greater than the nominal width. Grind flame-cut surfaces smooth.

(d) Accuracy of Hole Group Before Reaming. Accurately punch full-size, subpunched, or subdrilled holes so that after assembling (before any reaming is done) a cylindrical pin 3 mm smaller in diameter than the nominal size of the punched hole may be entered perpendicular to the face of the member, without drifting, in at least 75 percent of the contiguous holes in the same plane. Punched pieces not meeting this requirement will be rejected. Holes through which a pin 5 mm smaller in diameter than the nominal size of the punched hole cannot be inserted will be rejected.

(e) Accuracy of Hole Group After Reaming. After reaming, the maximum allowed offset of 85 percent of any contiguous group of holes through adjacent thicknesses of metal is 1 mm.

Use steel templates with hardened-steel bushings in holes accurately dimensioned from the centerlines of the connection, as inscribed on the template. Use connection centerlines when locating templates from the milled or scribed ends of members.

(f) Numerically Controlled (N/C) Drilled Field Connections. In lieu of drilling undersized holes and reaming while assembled, or drilling holes full-size while assembled, drilling or punching bolt holes full-size is allowed in unassembled pieces and/or connections, including templates for use with matching undersized and reamed holes by means of suitable N/C drilling or punching equipment.

(g) Holes for Ribbed Bolts, Turned Bolts, or Other Approved Bearing-Type Bolts. Provide finished holes with a driving fit.

(h) Preparation of Field Connections. Subpunch or subdrill and ream while assembled, or drill full-size to a steel template, holes in all field connections and field splices of main members of trusses, arches, continuous beam spans, bents, towers (each face), plate girders, and rigid frames.

Holes for field splices of rolled beam stringers continuous over floor beams or cross frames may be drilled full-size unassembled to a steel template. Holes for floor beams or cross frames may be drilled full-size unassembled to a steel template. Subpunch and ream while assembled, or drill full-size to a steel template, all holes for floor beam and stringer field end connections.

When reaming or drilling full-size field connection holes through a steel template, carefully locate and position the template and firmly bolt in place before drilling. Use exact duplicates of templates used for reaming matching members, or the opposite faces of a single member. Accurately locate templates used for connections

on like parts or members so that the parts or members are duplicates and require no match-marking.

For any connection, in lieu of subpunching and reaming or subdrilling and reaming, holes drilled full-size through all thicknesses or material assembled in proper position may be used.

555.11 Pins & Rollers. Accurately fabricate pins and rollers that are straight, smooth, and free from flaws. Forge and anneal pins and rollers more than 225 mm in diameter. Pins and rollers 225 mm or less in diameter may be either forged and annealed or cold-finished carbon-steel shafting.

In pins larger than 225 mm in diameter, bore a hole not less than 50 mm in diameter full length along the pin axis after the forging has been allowed to cool to a temperature below the critical range (under suitable conditions to prevent damage by too-rapid cooling and before being annealed).

(a) Boring Pin Holes. Bore pin holes true to the specified diameter, smooth and straight, at right angles with the axis of the member and parallel with each other. Produce the final surface using a finishing cut.

Produce a pin hole diameter that does not exceed that of the pin by more than 0.5 mm for pins 125 mm or less in diameter, or by 1 mm for larger pins.

The maximum allowed variation of the outside-to-outside distance of end holes in tension members and the inside-to-inside distance of end holes in compression members is 1 mm from that specified. Bore pin holes in built-up members after the member has been assembled.

(b) Threads for Bolts and Pins. Provide threads on all bolts and pins for structural steel construction that conform to the Unified Standard Series UNC ANSI B1.1, class 2A for external threads and class 2B for internal threads; but when pin ends have a diameter of 35 mm or more, provide six threads per 25 mm.

555.12 Eyebars. Pin holes may be flame cut at least 50 mm smaller in diameter than the finished pin diameter. Securely fasten together (in the order to be placed on the pin) all eyebars that are to be placed side by side in the structure and bore at both ends while clamped. Pack and match-mark eyebars for shipment and erection. Stamp with steel stencils, so as to be visible when the bars are nested in place on the structure, all identifying marks on the edge of one head of each member after fabrication is completed. Use low-stress-type steel die stamps.

Provide eyebars, straight and free from twists, with pin holes accurately located on the centerline of the bar. Do not allow the inclination of any bar to the plane of the truss to exceed 5.25 mm/m.

Simultaneously cut the edges of eyebars that lie between the transverse centerline of their pin holes with two mechanically operated torches abreast of each other, guided by a substantial template to prevent distortion of the plates.

555.13 Assembly—Bolting. Clean surfaces of metal in contact before assembling. Assemble parts of a member. Securely pin and firmly draw together before beginning drilling, reaming, or bolting. Take assembled pieces apart, if necessary, for the removal of burrs and shavings produced by the operation. Assemble members so that they are free from twists, bends, and other deformation.

Drift during assembling only enough to bring the parts into position without enlarging holes or distorting the metal.

555.14 Welded Connections. Fabricate surfaces and edges to be welded smooth, uniform, clean, and free of defects that would adversely affect the quality of the weld. Prepare edge in accordance with ANSI/AASHTO/AWS Bridge Welding Code D 1.5.

555.15 Preassembly of Field Connections. Preassemble field connections of main members of trusses, arches, continuous beams, plate girders, bents, towers, and rigid frames before erection to verify the geometry of the completed structure or unit and to verify or prepare field splices. Present the method and details of preassembly for approval.

Use methods and details of preassembly that are consistent with the procedure shown on the approved erection camber diagrams. Assemble all girders and beams in their cambered (no-load) condition.

When members are assembled with their webs vertical, support them at intervals of 6 m, or two-tenths of the span length, whichever is less. When the webs are horizontal, the above intervals of support may be increased, provided there is no noticeable deflection between points of support.

Assemble trusses in full dead-load position, unless the design of the structure provides for the secondary stresses created by assembling the truss in the fully cambered (no-load) position. Support trusses during assembly at each panel point. Preassemble at least three contiguous panels that are accurately adjusted for line and camber. For successive assemblies, include at least one section or panel of the previous assembly (repositioned if necessary and adequately pinned to assure accurate alignment) plus two or more sections or panels added at the advancing end. For structures longer than 50 m, make each assembly not less than 50 m long, regardless of the length of individual continuous panels or sections. Assembly may start from any location in the structure and proceed in one or both directions, as long as the preceding requirements are satisfied.

(a) Bolted Connections. Where applicable, assemble major components with milled ends of compression members in full bearing and then ream subsized holes to the specified size while the connections are assembled.

(b) Check Assembly—N/C Drilling. When using N/C drilling or punching, make a check assembly for each major structural type of each project. Fabricate the check assembly of at least three contiguous shop sections or, for a truss, all members in at least three contiguous panels, but not less than the number of panels associated with three contiguous chord lengths (such as the length between field splices). Base check assemblies on the proposed order of erection, joints in bearings, special complex points, and similar considerations. Shop assemblies other than the check assemblies are not required.

If the check assembly fails in some specific manner to demonstrate that the required accuracy is being obtained, further check assemblies may be required.

Receive approval of each assembly (including camber, alignment, accuracy of holes, and fit of milled joints) before reaming is commenced or before any N/C-drilled check assembly is dismantled.

(c) Field-Welded Connections. Field-welded connections are prohibited unless specifically SHOWN ON THE DRAWINGS. Verify the fit of members (including the proper space between abutting flanges) with the preassembled segment.

(d) Match-Marking. Match-mark connecting parts preassembled in the shop to assure proper fit in the field. Provide a diagram showing such match-marks.

555.16 Connections Using Unfinished, Turned, or Ribbed Bolts. Use unfinished, turned, or ribbed bolts, where specified, that conform to ASTM A 307 for grade-A bolts. Use bolts with approved single self-locking nuts or double nuts. Use beveled washers where bearing faces have a slope of more than 1:20 with respect to a plane normal to the bolt axis.

(a) Turned Bolts. Furnish turned bolts with a body-surface ANSI roughness not exceeding 3 µm. Furnish hex-headed bolts and nuts of the nominal size specified. Carefully ream holes for turned bolts, and furnish bolts to provide for a light driving fit. Keep bolt threads entirely outside of the holes. Provide a washer under the nut.

(b) Ribbed Bolts. Use approved form of ribbed body with continuous longitudinal ribs. Provide a body diameter measured on a circle through the points of the ribs 2 mm greater than the nominal diameter specified for the bolts.

Furnish ribbed bolts with round heads conforming to ANSI B18.5. Furnish hexagonal nuts that are either recessed or have a washer of suitable thickness. Furnish

ribbed bolts that have a driving fit when installed in holes. Provide sufficiently hard ribs such that the ribs do not compress, deform, or allow the bolts to turn in the holes during tightening. If the bolt twists before drawing tight, ream the hole and provide an oversized replacement bolt.

555.17 Connections Using High-Strength Bolts. Assemble structural joints using AASHTO M 164M or M 253M high-strength bolts, or equivalent fasteners, as SHOWN ON THE DRAWINGS, tightened to a high tension.

(a) Bolted Parts. Use steel material within the grip of the bolt with no compressible material such as gaskets or insulation. Fabricate bolted steel parts to fit solidly together after the bolts are tightened. Limit the maximum slope of the surfaces of parts in contact with the bolt head or nut to 1:20 with respect to a plane normal to the bolt axis.

(b) Surface Conditions. At the time of assembly clean all joint surfaces (including surfaces adjacent to the bolt head and nut) of dirt or foreign material and scale, except tight mill scale. Remove burrs that would prevent solid seating of the connected parts in the snug-tight condition.

Paint or other coatings are not permitted on the faying surfaces of slip-critical connections. All connections are considered to be slip-critical, unless otherwise SHOWN ON THE DRAWINGS. Exclude paint (including any inadvertent overspray) from areas closer than one bolt diameter, but not less than 25 mm, from the edge of any bolt hole and all areas within the bolt pattern.

(c) Installation. Install fasteners of the same lot number together. Protect fasteners from dirt and moisture. Take from protected storage only as many fasteners as are anticipated to be installed and tightened during a work shift. Return to protected storage fasteners not used at the end of the shift. Do not clean lubricant from fasteners where the lubricant is required to be present in the as-delivered condition. Clean and relubricate, before installation, fasteners for slip-critical connections that accumulate rust or dirt.

Provide a tension-measuring device (a Skidmore-Wilhelm calibrator or other acceptable bolt-tension-indicating device) at all job-sites where high-strength fasteners are being installed and tightened. Use the tension-measuring device to perform the rotational-capacity test and to confirm all of the following:

- The requirements of table 555-6 of the complete fastener assembly.
- The calibration of the wrenches, if applicable.
- The understanding and proper use of the tightening method.

For short grip bolts, direct tension indicators (DTI's) with solid plates may be used to perform this test. First check the DTI with a longer grip bolt in the Skidmore-Wilhelm calibrator. The frequency of confirmation testing, number of tests to be performed, and test procedure shall conform to Subsection 555.17(c)(3) through (5), as applicable. Confirm the accuracy of the tension-measuring device through an approved testing agency at least once per year.

Install fasteners together with washers of the size and quality specified, located as required below, in properly aligned holes and tightened using any of the methods described in Subsection 555.17(c)(3) through (6) to at least the minimum tension specified in table 555-6 after all the fasteners are tight.

Table 555-6.—Minimum fastener tension.[a]

Nominal Bolt Diameter and Tread Pitch	AASHTO M 164M (kN)	AASHTO M 253M (kN)
M16 x 2	91	114
M20 x 2.5	142	179
M22 x 2.5	176	221
M24 x 3	205	258
M27 x 3	267	334
M30 x 3.5	326	408
M36 x 4	475	595

a. Equal to 70 percent of the specified minimum tensile strength of bolts (as specified for tests of full-size ASTM A 325M and ASTM A 490M bolts), rounded to the nearest kilonewton.

If approved, tightening may be performed by turning the bolt while the nut is prevented from rotating when it is impractical to turn the nut. If impact wrenches are used, provide adequate capacity and sufficient air to tighten each bolt in approximately 10 seconds.

Do not reuse AASHTO M 253M fasteners and galvanized AASHTO M 164M fasteners. If approved, other AASHTO M 164M bolts may be reused once. Touching up or retightening previously tightened bolts that may have been loosened by the tightening of adjacent bolts will not be considered to be reuse, provided the snugging up continues from the initial position and does not require greater rotation, including the tolerance, than that specified in table 555-7.

(1) Rotational-Capacity Tests. Subject high-strength fasteners, black and galvanized, to jobsite rotational-capacity tests performed in accordance with AASHTO M 164M, subsection 8.5, and the following:

(a) After tightening to a snug-tight condition, as defined in Subsection 555.17(c)(3), tighten the fastener twice the required number of turns indicated in table 555-7, in a Skidmore-Wilhelm calibrator or equivalent tension-measuring device, without stripping or failure.

Table 555-7.[a]—Nut rotation from the snug-tight condition.[b]

Bolt Length Measured From Underside of Head to End of Bolt	Geometry of Outer Faces of Bolted: Both Faces Normal to Bolt Axis	One Face Normal to Bolt Axis and Other Face Sloped Not More Than 1:20 (Bevel Washers Not Used)	Both Faces Sloped Not More Than 1:20 From Normal to Bolt Axis (Bevel Washers Not Used)
Up to and including 4 diameters	1/3 turn	1/2 turn	2/3 turn
Over 4 diameters, but not exceeding 8 diameters	1/2 turn	2/3 turn	5/6 turn
Over 8 diameters, but not exceeding 12 diameters[c]	2/3 turn	5/6 turn	1 turn

a. Applicable only to connections where all material within the grip of the bolt is steel.
b. Nut rotation is relative to bolt, regardless of the element (nut or bolt) being turned. The tolerance is ± 30° for bolts installed by 1/2 turn or less. The tolerance is ± 45° for bolts installed by 2/3 turn or more.
c. Determine the required rotation by actual tests in a suitable tension device simulating the actual conditions.

(b) During this test, the maximum recorded tension must be equal to or greater than the turn test tension, which is 1.15 times the required minimum fastener tension indicated in table 555-6.

(c) Ensure that the measured torque at a tension *P*, after exceeding the turn test tension required above, does not exceed the value obtained by the following equation:

$$Torque = PD/4{,}000$$

where

Torque = measured torque in newton meters (N•m)
P = measured bolt tension in newtons (N)
D = nominal bolt diameter in millimeters (mm)

For rotational-capacity tests, use washers even though their use may not be required in the actual installation.

(2) Washers. Where the outer face of the bolted parts has a slope greater than 1:20 with respect to a plane normal to the bolt axis, use a hardened beveled washer to compensate for the lack of parallelism.

Use hardened square or rectangular beveled washers for American Standard Beams and Channels conforming to AASHTO M 293.

Where necessary, washers may be clipped on one side not closer than seven-eighths of the bolt diameter from the center of the washer.

Hardened washers are not required for connections using AASHTO M 164M and M 253M bolts except under the following conditions:

(a) Use hardened washers under the element turned in tightening when the tightening is done by the calibrated wrench method.

(b) Use hardened washers under both the head and the nut when AASHTO M 253M bolts are installed in material with a specified yield point less than 275 MPa, regardless of the tightening method.

(c) Use a hardened washer conforming to ASTM F 436M where AASHTO M 164M bolts of any diameter or AASHTO M 253M bolts equal to or less than M 24 are to be installed in oversize or short-slotted holes in an outer ply.

(d) Use hardened washers conforming to ASTM F 436M, except with 8 mm minimum thickness, under both the head and the nut in lieu of standard-thickness hardened washers where AASHTO M 253 bolts over M 24 are to be installed in an oversize or short-slotted hole in an outer ply. Multiple hardened washers with combined thickness equal to or greater than 8 mm do not satisfy this requirement.

(e) Where AASHTO M 164M bolts of any diameter or AASHTO M 253M bolts equal to or less than M24 are installed in a long-slotted hole in an outer ply, provide a plate washer or continuous bar that has a thickness of at least 8 mm, with standard holes of sufficient size to cover the slot after installation, and is of structural-grade material that need not be hardened.

When AASHTO M 253M bolts over M24 are used in long-slotted holes in external plies, use a single hardened washer conforming to ASTM F 436M with an 8-mm minimum thickness in lieu of washers or bars of structural steel. Multiple hardened washers with combined thickness equal to or greater than 8 mm do not satisfy this requirement.

Alternate design fasteners conforming to Subsection 717.01, with a geometry that provides a bearing circle on the head or nut with a diameter equal to or greater than the diameter of hardened washers conforming to ASTM F 436M, satisfy the requirements for washers specified herein and may be used without washers.

(3) Turn-of-Nut Tightening. At the start of work, test nut tightening using a device capable of indicating bolt tension. Test not less than three bolt-and-nut assemblies of each diameter, length, and grade to be used in the work. Demonstrate with the test that the method to be used for estimating the snug-tight condition and controlling the turns from snug tight develops a tension not less than 5 percent greater than the tension specified in table 555-6. Perform periodic retesting when required.

Install bolts in all holes of the connection and initially tighten to a snug-tight condition. Snug tight is defined as the tightness that exists when the plies of the joint are in firm contact. This may be attained by a few impacts of an impact wrench or the full effort of a worker using an ordinary spud wrench.

Systematically snug-tighten bolt groups from the most rigid part of the connection to the free edges. Then retighten the bolts of the connection in a similar systematic manner as necessary until all bolts are snug tight and the connection is fully compacted. Following the snug-tightening operation, tighten all bolts in the connection by the applicable amount of rotation specified in table 555-7.

During all tightening operations, do not allow rotation of the fastener part not turned by the wrench. Tighten systematically from the most rigid part of the joint to its free edges.

(4) Calibrated Wrench Tightening. Calibrated wrench tightening may be used only when installation procedures are calibrated on a daily basis and when a hardened washer is used under the element turned in tightening. Standard torques taken from tables or from formulas that assume to relate torque to tension are not acceptable.

If calibrated wrenches are used for installation, set them to provide a tension not less than 5 percent in excess of the minimum tension specified in table 555-6. Calibrate the installation procedure at least once each working day for each bolt diameter, length, and grade using fastener assemblies that are being installed in the work.

Perform the calibration with a device capable of indicating actual bolt tension by tightening three typical bolts of each diameter, length, and grade from the bolts and washers being installed using a job-supplied washer under the element turned in tightening. Recalibrate wrenches when significant difference is noted in the surface condition of the bolts, threads, nuts, or washers. Verify during use that the wrench adjustment selected by the calibration does not produce a nut or bolt head rotation from snug tight greater than permitted in table 555-7. Turn nuts in the tightening direction when measuring the torque of manual torque wrenches.

If calibrated wrenches are used to install bolts in a connection, install bolts with hardened washers under the turned element. When tightening bolts in all holes of the connection, tighten to a snug-tight condition. Following this initial tightening

operation, tighten all bolts in the connection using a calibrated wrench. Tighten systematically from the most rigid part of the joint to its free edges. “Touch up” previously tightened bolts that may have been relaxed during the subsequent tightening of adjacent bolts until all bolts are properly tightened.

(5) DTI Tightening. When tightening bolts using DTI devices, assemble a representative sample of not less than three devices for each diameter and grade of fastener to be used in the work in a calibration device capable of indicating bolt tension. Include in the test assembly flat-hardened washers, if required in the actual connection, arranged like those in the actual connections to be tensioned. The calibration test must demonstrate that the device indicates a tension not less than 5 percent greater than that specified in table 555-6.

Follow the manufacturer’s installation procedures for installation of bolts in the calibration device and in all connections. Give special attention to proper installation of flat-hardened washers when DTI devices are used with bolts installed in oversize or slotted holes, and where the load-indicating devices are used under the turned element.

When bolts are installed using DTI’s conforming to ASTM F 959, install bolts in all holes of the connection and bring to a snug-tight condition. Snug tight is indicated by partial compression of the DTI protrusions. Then tighten all fasteners systematically from the most rigid part of the connection to the free edges in a manner that will minimize relaxation of previously tightened fasteners. Comply with the installation instructions portion of section 11.5.6.4.7, division II, of AASHTO’s “Standard Specifications for Highway Bridges.” Proper tensioning of the bolts may require more than a single cycle of systematic partial tightening before final tightening to deform the protrusion to the specified gap.

(6) Installation of Alternate Design Bolts. When fasteners that incorporate a design feature intended to indirectly indicate the bolt tension or to automatically provide the tension specified in table 555-6 and that conform to Subsection 717.01 are to be installed, test a representative sample of not less than three bolts of each diameter, length, and grade at the jobsite with a device capable of indicating bolt tension.

Include in the test assembly flat-hardened washers, if required in the actual connection, arranged as in the actual connections to be tensioned. The calibration test must demonstrate that each bolt develops a tension not less than 5 percent greater than the tension specified in table 555-6. Follow manufacturer’s installation procedure. Perform periodic retesting when required.

When alternate design fasteners that are intended to control or indicate bolt tension of the fasteners are used, install bolts in all holes of the connection and initially tighten sufficiently to bring all plies of the joint into firm contact, but without

yielding or fracturing the control or indicator element of the fasteners. Continue to tighten systematically from the most rigid part of the connection to the free edges in a manner that will minimize relaxation of previously tightened fasteners.

Proper tensioning of the bolts may require more than a single cycle of systematic partial tightening before final twist-off or pull-off of the control or indicator element of individual fasteners.

(7) Inspection. Inspect the tightened bolts in the presence of the CO. Use an inspection torque wrench to verify tightening of threaded fasteners. For nonthreaded fasteners, ping each fastener with a hammer to test for soundness. Replace or retighten any loose or relaxed fastener. Cutting with a torch will not be permitted for removal of bolts.

Individually place three bolts of the same grade, size, and condition as those under inspection in a device calibrated to measure bolt tension. Perform this calibration operation at least once each inspection day. Permit the CO full opportunity to witness calibration tests.

Use a washer under the part turned in tightening each bolt if washers are used on the structure. If washers are not used on the structure, use the same specification material that abuts the part turned in the tension-measuring device as used on the structure. In the calibrated device, tighten each bolt by any convenient means to the specified tension. Apply the inspecting wrench to the tightened bolt to determine the torque required to turn the nut or head 5°, approximately 30 mm at a 300-mm radius, in the tightening direction. Use the average of the torque required for all three bolts as the job-inspection torque.

Select at random in each connection 10 percent (at least two) of the tightened bolts on the structure represented by the test bolts, and apply the job-inspection torque to each selected bolt with the inspecting wrench turned in the tightening direction. If this torque turns no bolt head or nut, the bolts in the connection will be considered to be properly tightened. If the torque turns one or more bolt heads or nuts, apply the job-inspection torque to all bolts in the connection. Tighten and reinspect any bolt whose head or nut turns at this stage. As an option, retighten all bolts in the connection and resubmit for inspection.

555.18 Welding. Ensure that welding, welder qualifications, prequalification of weld details, and inspection of welds conform to ANSI/AASHTO/AWS Bridge Welding Code D 1.5. Delete the provisions of section 9.25.1.7. Do not underrun the nominal fillet weld size.

Do not weld or tack brackets, clips, shipping devices, or other material not required to any member unless SHOWN ON THE DRAWINGS.

555.19 Erection. Ensure that falsework and forms conform to Section 562.

(a) Handling & Storing Material. Place material stored at the jobsite on skids above ground. Keep material clean and properly drained. Place and shore girders and beams upright. Support long members, such as columns and chords, on skids placed near enough together to prevent damage due to deflection.

(b) Bearings & Anchorages. Furnish and install bridge bearings in accordance with Section 564. If the steel superstructure is to be placed on a substructure that was built under a separate contract, verify that the masonry has been correctly constructed before ordering material.

(c) Erection Procedures. Follow the procedures shown below.

(1) Conformance to Drawings. Erect as SHOWN ON THE DRAWINGS. Modifications to or deviations from the approved erection procedure will require revised drawings and verification of stresses and geometry.

(2) Erection Stresses. Allow for erection stresses induced in the structure as a result of the use of a method of erection or equipment that differs from that previously approved, and that will remain in the finished structure as locked-in stresses. Provide additional material, as needed, to keep both temporary and final stresses within the allowable limits used in the design.

Provide temporary bracing or stiffening devices to accommodate handling stresses in individual members or segments of the structure during erection.

(3) Maintaining Alignment & Camber. During erection, support segments of the structure in a manner that will produce the proper alignment and camber in the completed structure. Install cross frames and diagonal bracing as necessary during erection to provide stability and assure correct geometry. As necessary, provide temporary bracing at any stage of erection.

(d) Field Assembly. Accurately assemble as SHOWN ON THE DRAWINGS and required by match-marks. Carefully handle the material. Do not hammer, damage, or distort the members. Clean bearing surfaces and permanent contact surfaces before assembly.

Assemble splices and field connections with at least two cylindrical erection pins per part (a minimum of four per splice or connection). Use cylindrical erection pins 1 mm larger than the bolts to be used. A plate girder splice requires, for example, at least four cylindrical erection pins for the top flange splice, four pins for the web splice, and four pins for the bottom flange splice. (These provide two pins for each part.) Place the pins in the corner holes of the splice plates.

Install more cylindrical erection pins, if necessary, to accurately align the parts. Fill the remaining holes in the connection with bolts, and tighten systematically in accordance with Subsection 555.17 from the most rigid part of the connection to the free edges. Remove cylindrical erection pins and replace with tightened bolts.

Release temporary erection supports at a splice or connection only after all bolts are installed and tightened. Special assembly and support situations are SHOWN ON THE DRAWINGS or approved submittals.

Fitting-up bolts may be the same high-strength bolts used in the installation. If other fitting-up bolts are required, use the same nominal diameter as the high-strength bolts.

(e) Pin Connections. Use pilot and driving nuts in driving pins. Drive the pins so that the members will fully bear on the pins. Screw pin nuts tight, install nut retaining devices as SHOWN ON THE DRAWINGS, and burr the threads at the face of the nut with a pointed tool.

(f) Misfits. Correction of minor misfits involving minor amounts of reaming, cutting, and chipping may be done, if approved. Any error in the shop fabrication or deformation resulting from handling and transporting will be cause for rejection.

Measurement

555.20 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Measure structural steel by the kilogram or lump sum computed in accordance with the AASHTO "Standard Specifications for Highway Bridges." The quantity will include metal items incidental to the structure, such as castings, steel plates, anchor bolts and nuts, bearings, rockers, rollers, pins and nuts, expansion dams, roadway drains and scuppers, weld metal, bolts embedded in concrete, cradles and brackets, posts, conduits and ducts, and structural shapes.

Changes in quantities resulting from alternative details proposed by the Contractor and approved by the CO are not subject to price adjustment.

Payment

555.21 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item		Pay Unit
555 (01)	Structural steel, _____, furnished, *Description* fabricated, and erected	Kilogram
555 (02)	Structural steel, _____, furnished, *Description* fabricated, and erected	Lump Sum

Section 556—Bridge Railing

Description

556.01 Work. Furnish and erect and/or remove and reset bridge railing and bridge approach railing.

Bridge railing is designated as concrete, steel, aluminum, or timber in accordance with the predominant material contained in the railing.

Materials

556.02 Requirements. Furnish material that conforms to specifications in the following sections and subsections:

Aluminum Bolt Heads and Nuts	717.14
Aluminum Alloy for Bridge Rail	717.13
Aluminum-Impregnated Caulking Compound	725.27
Aluminum Welding Wire	717.15
Box Beam Rail	710.07
Guardrail	606
Painting	563
Reinforcing Steel	554
Steel Structures	555
Structural Concrete	552
Timber Structures	557

Construction

556.03 General. Accurately place anchor bolts to provide correct and true alignment of the railing. Set anchor bolts so that they project not more than 10 mm beyond the nut when tightened. Chamfer or round by grinding or filing all sharp exposed metal edges.

Provide bridge rail shop drawings when SHOWN ON THE DRAWINGS or called for in the SPECIAL PROJECT SPECIFICATIONS.

Do not erect railing until centering or falsework for the supporting span is removed. Construct bridge railing so that it does not follow any unevenness in the curb, sidewalk, or wall that supports the railing. The railing shall present a smooth, uniform appearance in its final position. Set all posts vertical.

556.04 Concrete Railing. Construct in accordance with Section 552 and the following:

- Construct expansion joints that permit freedom of movement. After all other work is completed, use a sharp chisel to remove all loose or thin shells of concrete likely to spall under movement at expansion joints.

(a) Fixed Forms. Construct forms that are smooth and tight fitting, rigidly held in line and grade, and removed without damage to the concrete. Make form joints in vertical planes. Construct all moldings, panel work, and bevel strips as SHOWN ON THE DRAWINGS. Make corners in the finished work true and free from cracks, spalls, or other defects.

(b) Slipformed. Concrete rails may be slipformed if the DRAWINGS contain details for slipforming. Before slipforming any permanent rail, one or both of the following requirements shall be met, as directed by the CO:

(1) Cast a test section at least 6 m long that shall:

(a) Be placed off the structure.

(b) Have the same section and reinforcement as detailed for use on the structure.

(c) Include one typical contraction or open joint.

(d) Be removed and disposed of without compensation.

(2) Identify, for the purposes of evaluating work quality, at least two recent slipformed rail projects completed by the Contractor.

The CO will make the final decision about the use of slipforming on the project based on work quality. If slipforming is approved by the CO:

- Provide concrete with a slump of 25 mm ± 12 mm.

- Keep the top and faces of the finished rail free from sags, humps, and other irregularities.

- Maintain contraction joints, open joints, and expansion joints to the dimensions SHOWN ON THE DRAWINGS until the concrete sets.

- Use slipforming only for section of rail with constant dimensions. Use fixed forms where dimensions vary, as at luminaire or signal supports and at rail end transitions.

- Brush finish exposed rail surfaces with vertical strokes. Do not grind brush finished surfaces that are to receive a class 1 finish as specified in Subsection 552.18(a).

- Remove and replace any unsatisfactory work without compensation.

(***c) Surface Finish.*** Apply a general surface finish using a class 2 finish to all exposed concrete surfaces as specified in Subsection 552.18(b).

556.05 Steel Railing. Construct in accordance with Section 555. Ensure that structural tubing conforms to AASHTO M 183 (ASTM A 500, grade B).

If required, galvanize in accordance with AASHTO M 111, and furnish nuts, bolts, and washers galvanized in accordance with AASHTO M 232. Repair minor abrasions with zinc-rich paint.

For exposed weathering steel, use railing fasteners, railing hardware, rail post anchor bolts, nuts, washers, and shims with the same atmospheric corrosion resistance and weathering characteristics as the railing and posts. Use hand methods to clean erected steel railing of all oil, dirt, grease, mortar, and other foreign substances. Use weld metal with similar atmospheric corrosion resistance and coloring characteristics as the base metal. Clean welds by power brushing or blast cleaning to remove welding flux, slag, and spatter.

Unless a coating is required, clean all weathering steel in accordance with Steel Structures Painting Council (SSPC) standard SSPC–SP 6 and remove all mill scale and other foreign substances so that the steel surface is uniformly exposed to the atmosphere.

556.06 Aluminum Railing. Construct in accordance with Section 555, except as amended by the following:

(a) Cutting. Material that is 13 mm thick or less may be cut by shearing, sawing, or milling. Saw or mill material that is more than 13 mm thick. Do not flame cut. Make cut edges true, smooth, and free from excessive burrs or ragged breaks. Fillet re-entrant cuts by drilling before cutting.

(b) Bending. Material may be heated to a maximum 200 °C for a period not to exceed 30 minutes to facilitate bending.

(c) Rivet & Bolt Holes. Drill rivet and bolt holes to finished size or subpunch smaller than the nominal diameter of the fastener and ream to size. Subpunch to a diameter that is smaller than that of the finished hole by at least one-quarter the thickness of the piece. Make the finished diameter of holes not more than 7 percent greater than the nominal diameter of the fastener, except:

(1) Fabricate slotted bolt holes as required.

(2) Fabricate anchor bolt holes up to 25 percent larger, not to exceed 15 mm larger than the nominal bolt diameter.

(d) Welding. Weld in accordance with AWS Structural Aluminum Welding Code D 1.2.

(e) Contact With Other Material. Do not place aluminum alloys in contact with copper, copper base alloys, lead, or nickel. Where aluminum alloys come in contact with other metals, coat the contacting surfaces thoroughly with an approved aluminum-impregnated caulking compound or place a neoprene gasket between the surfaces.

Where aluminum alloys come in contact with concrete or stone, coat the contacting surfaces with an aluminum-impregnated caulking compound. When bond between aluminum and concrete is required, coat the aluminum with zinc-chromate paint and allow to dry before installation.

Where aluminum alloys come in contact with wood, coat the contacting wood surface with three coats of paint in accordance with Section 563 and coat the contacting aluminum surface with an aluminum caulking compound.

556.07 Timber Railing. Construct in accordance with Section 557.

When SHOWN ON THE DRAWINGS or directed in the SPECIAL PROJECT SPECIFICATIONS, clean all exposed surfaces of timber railing treated with pentachlorophenol or creosote that are located where contact by people may occur. Seal these surfaces with two coats of urethane, shellac, latex epoxy, enamel, or varnish.

556.08 Approach Railing. Construct in accordance with Subsection 556.05 and Section 606.

556.09 Remove & Reset Bridge Railing. Remove and store the existing bridge railings and appurtenances. Replace all railings, supports, and hardware damaged during removal, storage, or resetting.

556.10 Painting. Paint in accordance with Section 563.

Measurement

556.11 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Measure bridge railing by the meter or by the lump sum. Measure removed and reset bridge railing by the meter. When bridge railing is measured by the meter, measure along the top of the railing center to center of end posts.

When bridge approach railing is measured by the meter, measure the total approach railing length along the face of the railing from the ends of the bridge railing, as SHOWN ON THE DRAWINGS, to the center of the end approach railing posts, unless otherwise SHOWN ON THE DRAWINGS.

Payment

556.12 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item		Pay Unit
556 (01)	_____ bridge railing	Meter
556 (02)	_____ bridge railing	Lump Sum
556 (03)	Remove and reset bridge railing	Meter
556 (04)	Bridge approach railing, type_____ , class_____	Meter
556 (05)	Terminal section, _____ *Description*	Each
556 (06)	Anchorage	Each

Section 557—Timber Structures

Description

557.01 Work. Furnish, fabricate, erect, and paint structural timber, including all required yard lumber and hardware.

Materials

557.02 Requirements. Furnish material that conforms to specifications in the following section and subsections:

Hardware & Structural Steel	716.02
Painting	563
Structural Glued Laminated Timber	716.04
Treated Structural Timber & Lumber	716.03
Treated Timber Piles	715.02
Untreated Structural Timber & Lumber	716.01

Furnish the following compliance certificates to the CO upon delivery of the materials to the jobsite:

(a) Verification of compliance with grading rules and species of timber and lumber. Provide certification by an agency accepted as competent by the American Lumber Standards Committee (ALSC).

(b) Lot certification of each charge for preservative, penetration in millimeters, and retention in kilograms per cubic meter (assay method) by a qualified independent inspection and testing agency. In addition, have the producer of the treated products provide written certification that Best Management Practices (BMP's) in accordance with "Best Management Practices for Treated Wood in Western Aquatic Environments," published by the Western Wood Preservation Institute (WWPI) and Canadian Institute of Treated Wood, were followed, including a description and appropriate documentation of the applicable BMP's used.

(c) Certification from a qualified inspection and testing agency indicating that all glued laminated members are in accordance with the requirements of American National Standard for Wood Products, "Structural Glued Laminated Timber" (ANSI/AITC A190.1), modified as SHOWN ON THE DRAWINGS.

(d) Such other certifications as SHOWN ON THE DRAWINGS or called for in the SPECIAL PROJECT SPECIFICATIONS.

Incise all glued laminated and solid sawn members thicker than 50 mm in accordance with AWPA standard C1, unless otherwise SHOWN ON THE DRAWINGS.

Provide shop drawings for all timber 21 days in advance of fabrication when SHOWN ON THE DRAWINGS or in the SPECIAL PROJECT SPECIFICATIONS. Show all dimensions and fabrication details for all cut, framed, or bored timbers.

Construction

557.03 General. Perform the work under Section 206. Furnish structural lumber and timber of the required stress grade.

Clear stacks of weeds, rubbish, or other objectionable material from the ground under and in the vicinity of all stored material. Place the bottom layer of material at least 200 mm above the ground level. Provide sufficient support to prevent sagging.

Open-stack untreated material to shed water. Stack material in layers on spacers (stickers) that extend across the full width of the stack to allow for free air circulation. Align all stickers vertically and space them at regular intervals.

Close-stack treated material to shed water.

Protect material from the weather. If covered, use sheet material such as water-resistant paper or opaque polyethylene film. Do not cover with impervious membranes, such as polyethylene film, during dry weather. Slit individual wrappings full length or puncture on the lower side to permit drainage of water.

Store and protect glued laminated timber in accordance with the recommendations for Loading and Handling, Job Site Storage, and Erection in “Recommended Practice for Protection of Structural Glued Laminated Timber During Transit, Storage, and Erection,” published by the American Institute of Timber Construction, AITC 111.

Use slings or other devices to protect corners of heavy construction timbers and banded packages of lighter construction timber.

557.04 Treated Timber. Fabricate timbers before treatment. Handle treated timber according to the Consumer Information Sheet published by AWPA. Do not cut, frame, or bore treated timber after treatment unless approved by the CO. Handle

treated timbers carefully and do not drop, damage outer fibers, or penetrate the surface with tools. Do not use cant dogs, hooks, or pike poles. In coastal waters, do not cut or bore timber below the highwater mark.

For timbers originally treated with pentachlorophenol, creosote, creosote solutions, or waterborne preservatives, field treat all cuts, abrasions, bolt holes, and recesses that occur after treatment with two liberal applications of a compatible preservative in accordance with the requirements specified in AWPA standard M4, Standard for the Care of Pressure-Treated Wood Products.

Unless otherwise specified, copper naphthenate solutions may be used for field treatments of material originally treated with copper naphthenate, pentachlorophenol, creosote, creosote solution, or waterborne preservatives. Prepare the preservative solution by blending copper naphthenate preservative that meets P8 requirements with a solvent conforming to AWPA standard P9. Ensure that the resulting preservative solution concentration contains a minimum of 2 percent copper metal.

Plug all unused holes with preservative-treated plugs. Perform all field-applied preservative treatment with necessary precautions so as to prevent any soil and/or water contamination.

557.05 Untreated Timber. Coat the following untreated timber surfaces in accordance with AWPA standard M4:

(a) All ends and tops, and all contact surfaces of posts, sills, and caps.

(b) All ends, joints, and contact surfaces of bracing and truss members.

(c) All surfaces of timber bumpers and the back faces of bulkheads.

(d) All other timber that will be in contact with earth.

557.06 Workmanship. Cut and form all lumber and construction timber so all joints will have even bearing over the entire contact surface. Do not use shims in making joints. Construct all joints to be closed. Drive nails and spikes to set the heads flush with the wood surface. Use the same end, face, and edge of the timber member for all layout dimensions. Bore all holes from mating faces.

557.07 Holes for Bolts, Dowels, Rods, & Lag Screws. Bore all holes before preservative treating the wood. Bore holes for round driftbolts and dowels 2 mm smaller in diameter than that of the bolt or dowel to be used. Ensure that the diameter of holes for square driftbolts or dowels is equal to the side dimension of the bolt or dowel.

Bore holes for machine bolts with a bit 1.5 mm larger than the diameter, except when galvanized bolts are specified. In this case, drill all holes 3 mm greater than the bolt size. Bore holes for lag screws with a bit not larger than the body of the screw at the base of the thread. Drill the depth of lag screw bolt holes 25 mm less than the length under the screw head and with a diameter approximately 75 percent of the shank diameter.

557.08 Hardware. Furnish the hardware as SHOWN ON THE DRAWINGS, as specified below.

(a) Bolts & Washers. Finally tighten all nuts to provide proper bearing, and cut off excess bolt lengths of more than 25 mm. After final tightening, check or burr all bolts effectively with a pointing tool to prevent loosening of the nuts.

Use malleable iron washers with a diameter approximately three times the bolt diameter under all bolt heads or nuts in contact with wood. Use cast-iron washers when the timber is in contact with the ground. Use square washers only when SHOWN ON THE DRAWINGS or with the approval of the CO.

(b) Galvanizing. Unless otherwise SHOWN ON THE DRAWINGS, ensure that all hardware for timber structures is galvanized, except for the glued laminated deck panel dowels. Ensure that all fasteners, including nails, spikes, bolts, washers, and timber connectors, other than malleable iron, are galvanized.

557.09 Countersinking. Countersink nuts and bolt heads where SHOWN ON THE DRAWINGS. Paint recesses formed for countersinking with an approved preservative, except in railing. After bolts or screws are in place, fill the holes with hot pitch or other approved filler.

557.10 Framing. Do not slab or trim treated piles for fitting sway or sash braces. Fill all gaps that occur between braces and piles with treated blocks so that the bracing is securely fastened to the piles.

557.11 Framing Bents. Bed mud sills firmly, evenly, and level to solid bearing, and tamp in place.

When concrete is cast and dowels are used for anchoring sills and posts, install dowels (18 mm minimum diameter) that project at least 150 mm above the tops of the pedestals. Carefully finish concrete pedestals supporting framed bents so that sills or posts bear evenly on the pedestals.

Provide firm, uniform bedding for mud sills. Make sills bear true and even on mud sills, piles, or pedestals. Drift bolt sills with bolts that extend into the mud sills or piles for at least 150 mm. Where possible, remove all earth in contact with sills for circulation of air around the sills.

557.12 Posts. Fasten posts to pedestals with dowels not less than 18 mm in diameter that extend at least 150 mm into the posts, or with other types of connectors as SHOWN ON THE DRAWINGS. Fasten posts to sills using one of the following methods, as SHOWN ON THE DRAWINGS:

(a) With dowels not less than 18 mm in diameter that extend at least 150 mm into posts and sills.

(b) With drift bolts not less than 18 mm diameter driven diagonally through the base of the post and extending at least 175 mm into the sill. Drive drift bolts into holes at a 45° angle to enter the post at least 150 mm above the post base.

(c) With other types of connectors as SHOWN ON THE DRAWINGS.

557.13 Pile Bents. Treat, furnish, and drive piles in accordance with Section 551.

557.14 Caps for All Bents. Make timber caps bear even and uniform over the tops of the supporting posts or piles, with their ends in alignment. Secure all caps with drift bolts and set approximately at the center of and extending into the posts or piles at least 230 mm.

557.15 Bracing. Bolt the ends of bracing through the pile, post, cap, or sill. Brace intermediate intersections with posts or piles with bolts or spikes, as required. In all cases, use galvanized spikes in addition to bolts.

Make all bracing bear firmly against the pile or cap to which it is bolted. Provide and place shims as necessary to prevent bending the bracing more than 25 mm out of line when bracing bolts are tightened.

Where the space between the bracing and cap or pile is less than 25 mm, shims need not be used.

Where the space between the bracing and the cap or pile is 40 mm ± 15 mm, place two ogee washers, with their narrow faces together, or other approved washers on each bolt that passes through the space.

Where the space between the bracing and the cap or pile is over 55 mm, use wooden shims of the proper thickness. Fabricate the wooden shims from White Oak or from other approved hardwood. Do not use built-up wooden shims. Make wooden shims from a single piece of lumber with the width not less than 100 mm and the length not less than the width of the bracing measured along the cap or pile. Do not adze, trim, or cut any treated member to avoid the use of shims.

557.16 Stringers. Place solid sawn stringers in position so that knots near edges are in the top portions of the stringers.

Outside stringers may have butt joints with the ends cut on a taper. Lap interior stringers to take bearing over the full width of the floor beam or cap at each end. Separate the lapped ends of untreated stringers by at least 15 mm for air circulation. Securely fasten the lapped ends with drift bolts, as required. Stagger the joints where stringers are two panels in length.

Install cross-bridging between stringers as SHOWN ON THE DRAWINGS. If timber cross-bridging members are used, cut for a full bearing at each end against the sides of the stringers. Place cross-bridging at the center of each span or as SHOWN ON THE DRAWINGS.

557.17 Plank Floors. Use plank that is surfaced on four sides (S4S).

Single-ply timber floors consist of a single thickness of planks supported on stringers. Lay the planks heart side down with 5 mm space between them for seasoned material, and with tight joints for unseasoned material. Spike each plank securely to each stringer. Carefully grade the planks as to thickness and lay so that no two adjacent planks vary in thickness by more than 2 mm.

Two-ply timber floors consist of two layers of flooring supported on stringers. Pressure treat the lower layer with creosote oil or with another preservative as SHOWN ON THE DRAWINGS. Lay the top layer either diagonal or parallel to the centerline of roadway as required. Securely fasten each floor piece to the lower layer. Stagger joints at least 1 m. Where the top layer is placed parallel to the centerline of the roadway, use special care to securely fasten the ends of the flooring. Bevel the ends of top layer members at each end of the structure.

557.18 Transversely Nail-Laminated Decks. Use 50-mm nominal thickness laminations; surface one edge hit or miss 3 mm scant (SIE–H or M 3 mm scant), and one side hit or miss 3 mm scant (SIS–H or M 3 mm scant).

Place the laminations on edge and at right angles to the centerline of the roadway. Spike each piece to the preceding piece at each end and at approximately 450-mm intervals, with the galvanized spikes driven alternately near the top and bottom edges. Use spikes of sufficient length to pass through two pieces and at least halfway through the third piece.

Where timber stringers are used, toenail every other piece to every other stringer. Use the size spikes specified. When steel stringers are used, securely attach the pieces using approved galvanized metal clips.

Use pieces of sufficient length to bear on at least four stringers. Do not splice pieces between stringers. Space end joints on any one stringer no closer than every third piece. Space end joints in adjoining pieces no closer than every second stringer.

557.19 Glued Laminated Panel Decks. Do not drag or skid panels. When lifted, support panels in the weak-moment plane at a sufficient number of points to avoid overstressing, and protect the edges from damage.

When dowels are SHOWN ON THE DRAWINGS between deck panels, use a template or drilling jig to ensure that dowel holes are accurately spaced and drilled parallel to one another and to the horizontal surfaces of the panel. Drill holes to a depth 6 mm greater than one-half the dowel length, and of a diameter that is 2 mm greater than the dowel, unless otherwise SHOWN ON THE DRAWINGS. Use a temporary dowel as a check for snug fit prior to production drilling. Use dowels of the size SHOWN ON THE DRAWINGS, with the tips slightly tapered or rounded. Use an approved lubricant to facilitate the connection process.

Start the tips of all dowels partially and equally into the holes of the two panels being joined. Draw the panels together keeping the edges parallel, until the panels abut tightly. Securely fasten each panel to each stringer as SHOWN ON THE DRAWINGS.

Assemble and match-mark panels prior to delivery to the construction site when SHOWN ON THE DRAWINGS or called for in the SPECIAL PROJECT SPECIFICATIONS. Follow erection procedures given in FPL–263, Forest Service, Forest Products Laboratory (FPL), Madison, Wisconsin.

557.20 Wheel Guards & Railings. Surface (S4S) wheel guards, rails, and posts. Place wheel guards in sections not less than 4 m in length. Squarely butt-joint all rails at posts.

557.21 Trusses. Fabricate trusses to show no irregularities of line when completed. Fabricate chords straight and true from end to end in horizontal projection. In vertical projection, fabricate chords to a smooth chorded curve through panel points conforming to the correct camber. Do not make uneven or rough cuts at the points of bearing.

557.22 Drains. Hot-dip galvanize drains, including anchorages, after fabrication.

557.23 Painting. Paint in accordance with Section 563.

Measurement

557.24 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Measure untreated and treated structural timber and lumber by the cubic meter of lumber and timber in place in the completed structure. Compute the quantities from nominal dimensions and actual lengths, except for transversely nail-laminated decks. Measure transversely nail-laminated decks in place after dressing.

Measure timber piles under Subsection 551.16.

Measure timber bridge rail under Subsection 556.11.

Measure structural excavation under Subsection 206.12.

Payment

557.25 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item		Pay Unit
557 (01)	Untreated structural timber and lumber	Cubic Meter
557 (02)	Treated structural timber and lumber	Cubic Meter
557 (03)	Untreated structural timber and lumber	Lump Sum
557 (04)	Treated structural timber and lumber	Lump Sum
557 (05)	Treated structural timber, glued laminated	Cubic Meter
557 (06)	Treated structural timber, glued laminated	Lump Sum

Section 558—Prefabricated, Modular Bridge Superstructure

Description

558.01 Work. Design, fabricate, deliver, and install a prefabricated, modular bridge superstructure, or transport and install Government-furnished prefabricated, modular superstructure and components as DESIGNATED IN THE SCHEDULE OF ITEMS. Construct the length, width, and capacity of the structure, including curbs and railings and the horizontal and vertical alignment, as SHOWN ON THE DRAWINGS.

Also furnish material for, and construct, bridge railing as SHOWN ON THE DRAWINGS or on approved manufacturer's drawings. Unless components are furnished by the Government, furnish prefabricated, modular bridge superstructure components complete and in place, including deck and railing, when required, to form a bridge superstructure capable of supporting traffic as soon as construction of approaches is complete. Include all incidental materials required to provide a completed structure ready for use.

When there are specific requirements for design, materials, appearance, and/or construction, they shall be SHOWN ON THE DRAWINGS or in the SPECIAL PROJECT SPECIFICATIONS.

Materials

558.02 Requirements. Furnish materials that meet the requirements specified in the following sections and subsections:

Bridge Railing	556
Hardware & Structural Steel	716.02
Precast Concrete Structures	553A
Prestressed Concrete	553
Reinforcing Steel	554
Steel Structures	555
Structural Concrete	552
Timber Structures	557

Concrete compressive strength, structural steel tensile strength, finish, designation, timber species, grade, treatment, and other material specifications shall be as SHOWN ON THE DRAWINGS or in the SPECIAL PROJECT SPECIFICATIONS. If material specifications are not in the contract documents, take them from the manufacturer's drawings, and have them approved by the CO prior to fabrication.

558.03 Design Requirements. Design in accordance with the AASHTO "Standard Specifications for Highway Bridges," latest edition and interims, for the HS20–44 loading, including impact, unless otherwise SHOWN ON THE DRAWINGS or in the SPECIAL PROJECT SPECIFICATIONS.

When design of the structure is required, provide on all the drawings and calculations that are submitted for review the signature and seal of a professional engineer who is currently licensed in the State where the bridge will initially be located.

Use materials that are durable enough to allow removal, transportation, and re-installation using typical forest logging or construction equipment. Use design techniques and fabrication methods to minimize field erection difficulties. Fabricate primary components from steel unless otherwise SHOWN ON THE DRAWINGS or in the SPECIAL PROJECT SPECIFICATIONS.

Rig main superstructure components with permanent lifting devices to facilitate efficient installation and removal of these items with equipment common to logging or construction operations. Place lifting devices so as not to interfere with traffic utilizing the structure.

558.04 Design Drawings. When furnishing a prefabricated bridge superstructure, submit design drawings, calculations, and/or shop drawings sufficiently in advance of the start of fabrication to allow time for review by the CO and correction of any changes. Such time shall be proportional to the work, but not less than 21 days. Include plan, elevation, and section views of the modular bridge superstructure, dimensions of all components, welding and connection details, and general and specific notes regarding design and construction.

When Government-furnished prefabricated bridge superstructure components are specified, material lists, erection information, and manufacturer's instructions will be furnished by the Government.

Construction

558.05 General. Perform excavation, backfill, and embankment work under Sections 203 and 206.

Dispose of all debris resulting from operations in accordance with Section 202.

Perform all construction of substructures, riprap, and signs under Sections 206, 206A, 251, 551, 552, 553A, 554, 555, 557, 564, 602, and 633, as applicable.

558.06 Performance. Provide 2 weeks' notice prior to delivery and/or installation.

If the prefabricated superstructure is not installed immediately upon delivery to the project site, provide appropriate equipment and labor to unload and stack, support, and store all material at the delivery point. Support and stack all components to prevent damage. Furnish and install blocking such that all components are supported at least 300 mm above the ground.

Furnish all tools, devices, special equipment, and material needed for installation in well-marked watertight containers suitable for long-term, outdoor storage.

558.07 Contractor-Furnished Prefabricated Bridge Superstructure. As applicable, furnish the CO with the following items for approval prior to delivery of the bridge component:

(a) Supplier or inspection agency certification of wood species and grade of all timber and a conformance certificate for all sawn and glued laminated members.

(b) Certification by an approved inspection and testing agency of wood treatment, listing method of treatment, type of preservative, retention, and penetration. Supplier certification is permitted if each piece is stamped or branded with a legible American Wood Preservers Bureau quality mark.

(c) Certification of structural steel, fasteners, and hardware.

(d) Certification of galvanizing process used.

(e) Steel fabricator certification that steel fabrication and quality control meet the requirements of the AISC Code of Standard Practice; and that all welding meets the requirements of ANSI/AASHTO/AWS D 1.5 Bridge Welding Code.

(f) A complete list of all bridge components, hardware, and fasteners.

(g) Complete erection instructions and drawings. Provide drawings that are black line, on a reproducible mylar media, on ANSI sheet size B or D.

As appropriate to the type of modular bridge, mark each major component of the bridge superstructure with the same serial number. Ensure that the marking is permanent and clearly visible on each component, both when stacked in storage and when erected on a bridge site.

When called for in the SPECIAL PROJECT SPECIFICATIONS, assemble each bridge superstructure prior to delivery to ensure proper fit-up of all components. Notify the CO of the assembly 2 weeks in advance so that inspection of the assembly can be arranged.

558.08 Government-Furnished Prefabricated Bridge Superstructure. When Government-furnished prefabricated bridge units are specified, transport all designated material from the storage site(s) designated in the SPECIAL PROJECT SPECIFICATIONS or SHOWN ON THE DRAWINGS to the bridge site, and install the superstructure complete and in place, including connection of all girders, diaphragms, railings, panels, transoms, and other elements.

Upon taking possession of the Government-furnished units at the storage site, assume all liability for damage resulting from handling, transporting, and/or erecting the units in place, until final acceptance of the project.

Measurement

558.09 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Measure prefabricated bridge superstructures on a lump sum basis. Include all materials and work necessary to furnish, transport, and install the superstructure, including the deck and railing, as SHOWN ON THE DRAWINGS.

Payment

558.10 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item		Pay Unit
558 (01)	Prefabricated bridge superstructure—design, fabricate, deliver, and install	Each
558 (02)	Government-furnished prefabricated bridge superstructure—transport and install	Each

Section 559—Log Bridges

Description

559.01 Work. Furnish, fabricate, and install the logs and timber for constructing log bridges, including abutments, piers, and superstructure. In addition, furnish and install all hardware and other required material.

Materials

559.02 Requirements. Furnish materials that conform to specifications in the following section and subsections:

Geotextiles	714.01
Reinforcing Steel	554
Structural Concrete	552
Timber Structures	557

559.03 Logs. Furnish logs used for stringers within the dimensional tolerance and of the species SHOWN ON THE DRAWINGS. They must be of high quality, straight, sound, and free of wind shake, decay, or excessive twist (spiral grain with a slope of grain relative to the longitudinal axis of the log exceeding 1 in 8). Ensure that knots in the middle half of the stringer length do not significantly affect structural capacity.

If SHOWN ON THE DRAWINGS, peel logs and provide preservative treatment as SHOWN ON THE DRAWINGS. Obtain written approval from the CO for all logs to be used in the structure.

559.04 Timber & Lumber. Furnish structural lumber and timber in accordance with the species, grades, and dimensions SHOWN ON THE DRAWINGS and in accordance with Section 557.

559.05 Aggregate. When required, furnish aggregate for decking or surfacing to meet the requirements SHOWN ON THE DRAWINGS.

Construction

559.06 General. Perform excavation, foundation, backfill, and embankment work specified in Sections 203 and 206, as applicable.

Handle all logs and timber carefully to prevent damage to the wood and/or preservative treatment.

Dispose of all debris resulting from operations in accordance with Section 202.

Construct abutments and pier as SHOWN ON THE DRAWINGS.

559.07 Performance. Construct bridge superstructure and substructures as SHOWN ON THE DRAWINGS, with attention paid to the details of erection, fit-up, and connection. Obtain written approval for all deviations from the CO.

Place timber caps to obtain even and uniform bearing over the tops of supporting posts or piles and with post and pile ends in true alignment. Secure all caps as SHOWN ON THE DRAWINGS.

Match stringers for size at the bearings and place them in position so that the crown is up. Alternate stringers butt to tip. Locate any knots that may affect the strength of the member in the top portion of the stringer.

Cut stringers to length with a square cut. Remove sufficient material from the top surface of the log stringer to provide an adequate bearing area for the decking as SHOWN ON THE DRAWINGS. Do not allow hewing to exceed 19 mm in depth at the small end of the log. Do not allow hewing of the top of the butt end to exceed 75 mm in depth for a distance not to exceed one-fourth span length.

Cut or hew the bottom surface of the small end of the stringer logs only to the depth necessary to achieve the required bearing area. Block or shim tip ends that are smaller than the largest tip. Cut or dap butt ends to the depth of the largest top end. Allow the maximum slope of any dap to be 1 to 10. Make top and bottom cuts parallel. Require shims or blocks used under small ends to cover the entire bearing area.

Notch all logs together, including face logs, tie logs, mud sills, and anchor logs as SHOWN ON THE DRAWINGS, and drift pin all connections.

Use an approved type of suitable granular, free-draining material and/or rock for backfill when crib abutments are to be constructed.

Use tiebacks or other abutment anchoring devices as SHOWN ON THE DRAWINGS or as approved in writing by the CO.

Measurement

559.08 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

When untreated and treated timber and lumber is measured, measure by the cubic meter of timber and lumber in place in the completed structure. Compute the quantities from nominal cross section dimensions and actual lengths.

When bridge railing is measured, measure under Subsection 556.11. When concrete is measured, measure under Subsection 552.21.

Measure log bridges on a lump sum basis, including all work necessary to furnish, prepare, and install the log portions of the bridge superstructure and substructure units.

Payment

559.09 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item		Pay Unit
559 (01)	Log bridge	Lump Sum

Section 561—Structural Concrete Bonding

Description

561.01 Work. Repair cracks in concrete structures by pressure injecting epoxy.

Materials

561.02 Requirements. Furnish material that conforms to specifications in the following subsections:

Epoxy Resin Adhesives	725.21
Low-Strength Grout	701.03(b)
Polymer Grout	701.05

Construction

561.03 Crack Preparation. Provide notice of crack sealing at least 14 days before beginning work. The work areas will be identified and the locations of the cracks to be repaired will be marked.

Remove all dirt, laitance, and other debris from the exterior and interior of cracks. Apply a temporary surface seal material to the face of cracks. Use surface seal material with sufficient strength and adhesion to confine the injected epoxy material until cured.

Provide openings (entry ports) in the surface seal along the crack. Make the distance between entry ports at least the thickness of the concrete member being repaired.

After the injection adhesive has cured, remove the surface seal. Finish the face of the crack and entry ports flush with the adjacent surface.

561.04 Injection Procedures. Begin injecting epoxy at the lowest entry port. Continue injection at the first port until epoxy begins to flow out of the next highest port. Plug the first port and inject epoxy in the second port until the epoxy flows from the next highest port. Continue this sequence until the entire crack is filled. Use a two-component epoxy system. Maintain the mix ratio for the epoxy as prescribed by the manufacturer within 5 percent by volume at any discharge pressure not to exceed 1.4 MPa. Do not use solvents to thin the epoxy.

Use positive inline displacement-type equipment to meter, mix, and inject the epoxy at pressures not to exceed 1.4 MPa.

(a) Test for Proper Ratio. Perform this test for each injection unit at the beginning and end of every day that the unit is used. Disconnect the mixing head of the injection equipment and pump the two adhesive components through a ratio check device with two independent valved nozzles capable of controlling flow rate and back pressure by opening or closing valves on the check device. Use a pressure gage capable of sensing the back pressure behind each valve to adjust the discharge pressure to 1.4 MPa for both epoxy components. Simultaneously discharge both epoxy components into separate calibrated containers. Compare the discharged amounts to determine the mix ratio.

After the test is completed at 1.4 MPa discharge pressure, repeat the procedures for zero MPa discharge pressure.

(b) Test for Pressure Check. Perform this test for each injection unit at the beginning and end of every day that the unit is used.

Disconnect the mixing head of the injection equipment and attach the two adhesive component delivery lines to a pressure check device with two independent valved nozzles capable of controlling flow rate and pressure by opening or closing the valves. Use a pressure gage capable of sensing the pressure buildup behind each valve. Close the valves on the pressure check device and operate the equipment until the gage pressure on each line reads 1.4 MPa. When the pumps are stopped, the gage pressure must not drop below 1.3 MPa within 3 minutes.

(c) Records. Maintain and make available complete and accurate records of the ratio check tests and the pressure check tests. Additional ratio and pressure check tests may be required.

561.05 Coring. Take one 50-mm diameter test core, in accordance with AASHTO T 24, for every 15 m of repaired crack at designated locations. The crack repair is acceptable if the core sample indicates that 90 percent or more of the crack has been successfully bonded.

When a test core shows that the epoxy bonding has penetrated less than 90 percent of the crack volume within the core sample, redo that 15-m crack segment, or the segment that the core represents, and resample. Repeat this procedure until acceptable crack repair is achieved.

Fill all sample core holes with polymer grout and finish the surface to match the adjacent concrete.

Measurement

561.06 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Measure crack preparation by the meter or lump sum. Measure structural concrete bonding by the meter, liter, or lump sum. When measurement is by the meter, measure the actual meters of surface crack acceptably repaired.

When measurement is by the liter, measure the actual number of liters of bonding material injected in the marked cracks that are acceptably repaired.

Payment

561.07 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item		Pay Unit
561 (01)	Structural concrete bonding	Meter
561 (02)	Structural concrete bonding	Liter
561 (03)	Structural concrete bonding	Lump Sum
561 (04)	Crack preparation	Meter
561 (05)	Crack preparation	Lump Sum

Section 562—Forms & Falsework

Description

562.01 Work. Design, construct, and remove forms and falsework to temporarily support concrete, girders, and other structural elements until the structure is completed to the point where it can support itself.

Design & Construction

562.02 Drawings. When complete details for forms and falsework are not shown, prepare and submit drawings as SHOWN ON THE DRAWINGS or as directed in the SPECIAL PROJECT SPECIFICATIONS. Perform the following, as applicable:

(a) Design and show the details for constructing safe and adequate forms and falsework that provide the necessary rigidity, support the loads imposed, and produce the required lines and grades in the finished structure. See Subsection 562.03 for design loads; Subsection 562.04 for design stresses, loadings, and deflections; and Subsection 562.05 for manufactured assemblies.

(b) Show the maximum applied structural load on the foundation material. Include a drainage plan or description of how foundations will be protected from saturation, erosion, and/or scour. See Subsection 562.06.

(c) Precisely describe all proposed material. Describe the material that is not describable by standard nomenclature (such as AASHTO or ASTM specifications) based on manufacturer's tests, and recommended working loads. Evaluate falsework material and ascertain whether the physical properties and conditions of the material are such that the material can support the loads assumed in the design.

(d) Furnish design calculations and material specifications showing that the proposed system will support the imposed concrete pressures and other loads. Provide an outline of the proposed concrete placement operation listing the equipment, labor, and procedures to be used for the duration of each operation. Include proposed placement rates and design pressures for each pour. Include a superstructure placing diagram showing the concrete placing sequence and construction joint locations.

(e) Provide design calculations for proposed bridge falsework. Appoint a licensed professional engineer proficient in structural design to design, sign, and seal the drawings. Ensure that the falsework design calculations show the stresses and deflections in load supporting members.

(f) Show anticipated total settlements of falsework and forms. Include falsework footing settlement and joint takeup. Design for anticipated settlements not to exceed 25 mm. Design and detail falsework supporting deck slabs and overhangs on girder bridges so there is no differential settlement between the girders and the deck forms during placement of deck concrete. Design and construct the falsework to elevations that include anticipated settlement during concrete placement and required camber to compensate for member deflections during construction.

(g) Show the support systems for form panels supporting concrete deck slabs and overhangs on girder bridges.

(h) Show details for strengthening and protecting falsework over or adjacent to roadways and railroads during each phase of erection and removal. See Subsection 562.07.

(i) Include intended steel erection procedures with calculations in sufficient detail to substantiate the girder geometry. See Subsection 562.08.

(j) Submit details of proposed anchorage and ties for void forms. See Subsection 562.10 for void form requirements.

Submit separate falsework drawings for each structure, except for identical structures with identical falsework design and details. Do not start construction of any unit of falsework until the drawings for that unit are reviewed and accepted.

562.03 Design Loads. Conform to the following:

(a) Vertical Design Loads. Dead loads include the weight of concrete, reinforcing steel, forms, and falsework. Consider the entire superstructure, or any concrete mass being supported by falsework, to be a fluid dead load with no ability to support itself. If the concrete is to be prestressed, design the falsework to support any increased or readjusted loads caused by the prestressing forces.

Assume that the density of concrete, reinforcing steel, and forms is not less than 2,600 kg/m^3 for normal concrete, and not less than 2,100 kg/m^3 for lightweight concrete.

Consider live loads to be the actual mass of equipment to be supported by falsework applied as concentrated loads at the point of contact plus a uniform load of not less than 1,000 Pa applied over the area supported, plus 1,100 N/m applied at the outside edge of deck falsework overhangs.

The total vertical design load for falsework is the sum of vertical dead and live loads. Use a total vertical design load of not less than 4,800 Pa.

(b) Horizontal Design Loads. Use an assumed horizontal design load on falsework towers, bents, frames, and other falsework structures to verify lateral stability. The assumed horizontal load is the sum of the actual horizontal loads due to equipment, construction sequence, or other causes and an allowance for wind. However, in no case is the assumed horizontal load to be less than 2 percent of the total supported dead load at the location under consideration.

The minimum wind allowance for each heavy-duty steel shoring with a vertical load carrying capacity exceeding 130 kN per leg is the sum of the products of the wind impact area, shape factor, and applicable wind pressure value for each height zone. The wind impact area is the total projected area of all the elements in the tower face normal to the applied wind. Assume that the shape factor for heavy-duty shoring is 2.2. Determine design wind pressure values from table 562-1.

Table 562-1.—Design wind pressure—heavy duty steel shoring.

Height Zone Above Ground (m)	Wind Pressure Value (Pa)	
	Adjacent to Traffic	At Other Locations
0	960	720
9–15	1,200	960
15–30	1,450	1,200
Over 30	1.675	1.450

The minimum wind allowance on all other types of falsework, including falsework supported on heavy-duty shoring, is the sum of the products of the wind impact area and the applicable wind pressure value for each height zone. The wind impact area is the gross projected area of the falsework and unrestrained portion of the permanent structure, excluding the areas between falsework posts or towers where diagonal bracing is not used. Determine design wind pressure values from table 562-2.

Table 562-2.—Design wind pressure—other types of falsework.

Height Zone Above Ground (m)	Wind Pressure Value (Pa)	
	For Members Over and Bents Adjacent to Traffic Openings	At Other Locations
0	320 Q	240 Q
9–15	400 Q	320 Q
15–30	480 Q	400 Q
Over 30	560 Q	480 Q

Note: Q = 0.3 + 0.2W, but not more than 3. W is the width of the falsework system in meters measured in the direction of the wind force being considered.

Design the falsework to have sufficient rigidity to resist the assumed horizontal load without vertical dead load. Neglect the effects of frictional resistance.

(c) Lateral Fluid Pressure. For concrete with retarding admixture, fly ash, or other pozzolan replacement for cement, design forms, form ties, and bracing for a lateral fluid pressure based on concrete with a density of 2,400 kg/m^3. For concrete containing no pozzolans or admixtures, which affect the time to initial set, determine the lateral fluid pressure based on concrete temperature and rate of placement in accordance with ACI standard 347R, "Guide for Formwork for Concrete."

562.04 Design Stresses, Loads, & Deflections. The allowable maximum design stresses and loads listed in this section are based on the use of undamaged, high-quality material. If lesser quality material is used, reduce the allowable stresses and loads. Do not exceed the following maximum stresses, loads, and deflections in the falsework design:

(a) Timber. For timber, use the following values:

Compression perpendicular to the grain = 3,100 kPa
Compression parallel to the grain[1] = 3,309 MPa/$(L/d)^2$

[1]Compression parallel to the grain is not to exceed 11 MPa.

where

L = unsupported length.
d = least dimension of a square or rectangular column or the width of a square of equivalent cross-sectional area for round columns

Flexural stress[1] = 12.4 MPa

[1]Reduce flexural stress to 10 MPa for members with a nominal depth of 200 mm or less.

Horizontal shear = 1,300 kPa
Axial tension = 8.3 MPa

Deflection due to the weight of concrete may not exceed 1/500 of the span, even if the deflection is compensated for by camber strips.

The modulus of elasticity (E) for timber = 11.7 GPa
Maximum axial loading on timber piles = 400 kN

Design timber connections in accordance with the stresses and loads allowed in the "National Design Specification for Wood Construction," published by the National Forest Products Association, except:

(1) Reductions in allowable loads required for high moisture condition of the lumber and service conditions do not apply.

(2) Use 75 percent of the tabulated design value as the design value of bolts in two member connections (single shear).

(b) Steel. For identified grades of steel, do not exceed the design stresses (other than stresses due to flexural compression) specified in the "Manual of Steel Construction," Allowable Stress Design, as published by the AISC.

When the grade of steel cannot be positively identified, do not exceed the design stresses, other than stresses due to flexural compression, specified in the AISC Manual for ASTM A 36 steel or the following:

Tension, axial and flexural = 150 MPa
Compression, axial[1] = $110{,}000 - 2.6(L/r)^2$ kPa

[1]L/r is not to exceed 120.

Shear on the web gross section of rolled shapes = 100 MPa
Web crippling for rolled shapes = 185 MPa

For all grades of steel, do not exceed the following design stresses and deflection:

Compression, flexural[1] = $82{,}750 \text{ MPa}/(Ld/bt)$

[1]Not to exceed 150 MPa for unidentified steel or steel conforming to ASTM A 36. Not to exceed $0.6F_y$ for other identified steel.

where

L = unsupported length
d = least dimension of a square or rectangular column or the width of a square of equivalent cross sectional area for round columns or depth of beams
b = width of the compression flange
t = thickness of the compression flange
F_y = specified minimum yield stress for the grade of steel used

Deflection due to the mass of concrete may not exceed 1/500 of the span, even if the deflection is compensated for by camber strips.

The modulus of elasticity (E) for steel = 210 GPa

(c) Other Requirements. Limit falsework spans supporting T-beam girder bridges to 4.3 m plus 8.5 times the overall depth of the T-beam girder.

562.05 Manufactured Assemblies. For jacks, brackets, columns, joists, and other manufactured devices, do not exceed the manufacturer's recommendations or 40 percent of the ultimate load-carrying capacity of the assembly based on the manufacturer's tests or additional tests ordered. Limit the maximum allowable dead load deflection of joists to 1/500 of their spans.

Furnish catalog or equivalent data showing the manufacturer's recommendations, or perform tests, as necessary, to demonstrate the adequacy of any manufactured device proposed for use. Do not substitute other manufacturers' components unless the manufacturer's data encompass such substitutions, or field tests reaffirm the integrity of the system.

If a component of the falsework system consists of a steel frame tower more than two or more tiers high, the differential leg loading within the steel tower unit shall not exceed 4 to 1. An exception may be approved if the manufacturer of the steel frame certifies, based on manufacturer's tests, that the proposed differential loadings are not detrimental to the safe load-carrying capacity of the steel frame.

562.06 Falsework Foundations. Field-verify all ground elevations at proposed foundation locations before design.

Where spread footing type foundations are used, determine the bearing capacity of the soil. The maximum allowable bearing capacity for foundation material, other than rock, is 190 kPa.

Do not locate the edge of footings closer than 300 mm from the intersection of the bench and the top of the slope. Unless the excavation for footings is adequately supported by shoring, do not locate the edge of the footings closer than 1.2 m or the depth of excavation, whichever is greater, from the edge of the excavation.

When a pile type foundation is used, use in accordance with Section 551. When falsework is supported by footings placed on paved, well-compacted slopes of berm fills, do not strut the falsework to columns unless the column is founded on rock or supported by piling.

Size spread footings to support the footing design load at the assumed bearing capacity of the soil without exceeding anticipated settlements. Provide steel reinforcement in concrete footings.

When individual steel towers have maximum leg loads exceeding 130 kN, provide for uniform settlement under all legs or each tower under all loading conditions.

Protect the foundation from adverse effects for the duration of its use. Advise the CO of actions that will be taken to protect the foundation.

562.07 Falsework Over or Adjacent to Roadways & Railroads. Design and construct the falsework to be protected from vehicle impact. This includes falsework posts that support members crossing over a roadway or railroad and other falsework posts if they are located in the row of falsework posts nearest to the roadway or railroad and if the horizontal distance from the traffic side of the falsework to the edge of pavement or to a point 3 m from the centerline of track is less than the total height of the falsework.

Provide additional features to ensure that this falsework will remain stable if subjected to impact by vehicles. Use vertical design loads for these falsework posts, columns, and towers (but not footings) that are not less than either of the following:

(a) 150 percent of the design load calculated in accordance with Subsection 562.03, but not including any increased or readjusted loads caused by prestressing forces.

(b) The increased or readjusted loads caused by prestressing forces.

Install temporary traffic barriers before erecting falsework towers or columns adjacent to an open public roadway. Locate barriers so that falsework footings or pile caps are at least 75 mm clear of concrete traffic barriers, and all other falsework members are at least 300 mm clear. Do not remove barriers until approved.

Use falsework columns that are steel with a minimum section modulus about each axis of 156,000 mm^3 or sound timbers with a minimum section modulus about each axis of 4,100,000 mm^3.

Mechanically connect the base of each column or tower frame supporting falsework over or immediately adjacent to an open public road to its supporting footing or provide other lateral restraint to withstand a force of not less than 9 kN applied to the base of the column in any direction. Mechanically connect such columns or frames to the falsework cap or stringer to resist a horizontal force of not less than 4.5 kN in any direction. Neglect the effects of frictional resistance.

For exterior girders upon which overhanging bridge deck falsework brackets are hung, brace or tie them to the adjacent interior girders as necessary to prevent rotation of the exterior girders or overstressing of the exterior girder web.

Mechanically connect all exterior falsework stringers and stringers adjacent to the end of discontinuous caps, the stringer or stringers over points of minimum vertical clearance, and every fifth remaining stringer to the falsework cap or framing. Provide mechanical connections capable of resisting a load in any direction, including uplift

on the stringer, of not less than 2.2 kN. Install connections before traffic is allowed to pass beneath the span.

Use 16-mm-diameter or larger bolts to connect timber members used to brace falsework bents located adjacent to roadways or railroads.

Sheath falsework bents within 6 m of the centerline of a railroad track solid in the area between 1 and 5 m above the track on the side facing the track. Construct sheathing of plywood not less than 16 mm thick or lumber not less than 25 mm nominal thickness. Provide adequate bracing on such bents so that the bent resists the required assumed horizontal load or 22 kN, whichever is greater, without the aid of sheathing.

Provide at least the minimum required vertical and horizontal clearances through falsework for roadways, railroads, pedestrians, and boats.

562.08 Falsework for Steel Structures. Conform to the following:

(a) Use falsework design loads consisting of the mass of structural steel, the load of supported erection equipment, and all other loads supported by the falsework.

(b) Design falsework and forms for concrete supported on steel structures so that loads are applied to girder webs within 150 mm of a flange or stiffener. Distribute the loads in a manner that does not produce local distortion of the web. Do not use deck overhang forms that require holes to be drilled in the girder webs.

(c) Strut and tie exterior girders supporting overhanging deck falsework brackets to adjacent interior girders to prevent distortion and overstressing of the exterior girder web.

(d) Do not apply loads to existing, new, or partially completed structures that exceed the load-carrying capacity of any part of the structure in accordance with the Load Factor Design methods of the AASHTO “Standard Specifications for Highway Bridges” using Load Group IB.

(e) Build supporting falsework that will accommodate the proposed method of erection without overstressing the structural steel, and will produce the required final structural geometry, intended continuity, and structural action.

562.09 Falsework Construction. Construct falsework as SHOWN ON THE DRAWINGS.

When welding is required, submit a welder certification for each welder, in accordance with Subsection 555.18.

Build camber into the falsework to compensate for falsework deflection and anticipated structure deflection. Camber as SHOWN ON THE DRAWINGS or specified by the CO is for anticipated structure deflection only.

Attach tell-tales to soffit of concrete forms in enough systematically placed locations to be able to determine from the ground the total settlement of the structure while concrete is placed.

Do not apply dead loads, other than forms and reinforcing steel, to any falsework until authorized.

When the falsework installation is complete and when SHOWN ON THE DRAWINGS or specified in the SPECIAL PROJECT SPECIFICATIONS, have the falsework inspected by a licensed professional engineer proficient in structural engineering. Certify in writing that the falsework installation conforms to accepted falsework drawings, specifications, and acceptable engineering practices. Provide a copy of the certification to the CO prior to concrete placement.

Discontinue concrete placement and take corrective action if unanticipated events occur, including settlements that cause a deviation of more then 10 mm from those SHOWN ON THE DRAWINGS. If satisfactory corrective action is not taken before initial set, remove all unacceptable concrete.

562.10 Forms. For exposed concrete surfaces, use U.S. Product Standard 1 for Exterior B–B (Concrete Form) class I plywood or other approved material that will produce a smooth and uniform concrete surface. Use only form panels in good condition and free of defects on exposed surfaces. If form panel material other than plywood is used, ensure that it has flexural strength, modulus of elasticity, and other physical properties equal to or greater than the physical properties for the type of plywood specified.

Furnish and place form panels for exposed surfaces in uniform widths of not less than 1 m and in uniform lengths of not less than 2 m, except where the width of the member formed is less than 1 m.

Arrange panels in symmetrical patterns conforming to the general lines of the structure. Place panels for vertical surfaces with the long dimension horizontal and with horizontal joints level and continuous. For walls with sloping footings that do not abut other walls, panels may be placed with the long dimension parallel to the footing.

Precisely align form panels on each side of the panel joint by means of supports or

fasteners common to both panels. Provide 19-mm triangular fillets at all sharp edges of the concrete, unless otherwise SHOWN ON THE DRAWINGS.

Devices may be cast into the concrete for later use in supporting forms or for lifting precast members. Do not use driven devices for fastening forms or form supports to concrete. Use form ties consisting of form bolts, clamps, or other devices necessary to prevent spreading of the forms during concrete placement.

Do not use form ties consisting of twisted wire loops. Use form ties and anchors that can be removed without damaging the concrete surface. Construct metal ties or anchorages within the forms to permit their removal to a depth of at least 25 mm from the face without damage to the concrete. Fill cavities with cement mortar in accordance with Subsection 701.04, and finish to a sound, smooth, uniform colored surface.

Construct all exposed concrete surfaces that will not be completely enclosed or hidden below the permanent ground surface so the formed surface of the concrete does not undulate more than 2.5 mm or 1/360 of the center-to-center distance between studs, joists, form stiffeners, form fasteners, or wales. Interior surfaces of underground drainage structures are considered to be completely enclosed surfaces. Form all exposed surfaces for each element of a concrete structure with the same forming material or with material that produces similar surface textures, color, and appearance.

Support forms for cast-in-place concrete bridge decks on the girders upon which the deck is to be cast. Do not shore deck forms to the ground or to the substructure.

Support roadway slab forms of box girder type structures on wales or similar supports fastened, as nearly as possible, to the top of the web walls.

Construct concrete forms mortar-tight, true to the dimensions, lines, and grades of the structure, and of sufficient strength to prevent appreciable deflection during placement of concrete. Place all material required to be embedded in the concrete before concrete placement. Clean inside surfaces of forms of all dirt, mortar, and foreign material. Remove all loose material before the completion of forming for the roadway deck slab of cast-in-place box girders or cells or voids of other members in which the forms are to either remain in place or be removed.

Form exposed curved surfaces to follow the shape of the curve. However, on any retaining walls that follow a horizontal curve, the wall stems may be a series of short chords if all of the following conditions apply:

- The chords within the panel are the same length.
- The chords do not vary from a true curve by more than 15 mm at any point.

- All panel points are on the true curve.

When architectural treatment is required, make the angle points for chords in wall stems fall at vertical rustication joints.

Coat with form oil all forms to be removed. Use commercial-quality form oil or an equivalent coating that permits release of the forms and does not discolor the concrete. Do not place concrete in forms until the forms have been inspected and approved.

(a) Stay-in-Place Deck Forms. Use permanent or stay-in-place forms only when SHOWN ON THE DRAWINGS.

Fabricate permanent steel bridge deck forms and supports from steel conforming to ASTM A 653M, coating designation 2600, any grade except 340, class 3.

Install forms in accordance with approved fabrication and erection drawings. Do not rest form sheets directly on the top of stringer or floor beam flanges. Securely fasten sheets to form supports. Place form supports in direct contact with the stringer flange or floor beam. Make all attachments with permissible welds, bolts, or clips. Do not weld form supports to flanges of steels not considered weldable or to portions of flanges subject to tensile stresses.

Clean, wire brush, and paint with two coats of zinc dust zinc-oxide primer (FSS TT–P–641 type II, no color added) any permanently exposed form metal where the galvanized coating has been damaged. Minor heat discoloration in areas of welds need not be touched up.

Locate transverse construction joints in slabs at the bottom of a flute. Field-drill 6-mm-diameter weep holes at not less than 300 mm on center along the line of the joint.

(b) Void Forms. Store void forms in a dry location to prevent distortion. Secure the forms using anchors and ties that leave a minimum of metal or other supporting material exposed at the bottom of finished slab.

Make the outside surface of the forms waterproof. Cover the ends with waterproof mortar-tight caps. Use a premolded 6-mm-thick rubber joint filler around the perimeter of the caps to permit expansion.

Provide a PVC vent near each end of each void form. Construct vents so the vent tube does not extend more than 13 mm below the bottom surface of the finished concrete after form removal. Protect void forms from the weather until concrete is placed.

(c) Metal Forms. The specifications for forms relative to design, mortar tightness, filleted corners, beveled projections, bracing, alignment, removal, reuse, and oiling also apply to metal forms.

562.11 Removal of Forms & Falsework. Remove all forms except:

(a) Interior soffit forms for roadway deck slabs of cast-in-place box girders.

(b) Forms for the interior voids of precast members.

(c) Forms for abutments or piers when no permanent access is available into the cells or voids.

To facilitate finishing, when approved by the CO, the removal of forms that do not support the dead load of concrete members and of forms for railings and barriers may begin 24 hours after the concrete for the member has been placed. Protect exposed concrete surfaces from damage. Cure all exposed concrete surfaces in accordance with Subsection 552.17, if forms are removed less than 7 days after concrete placement.

Do not remove forms and falsework until the concrete strength and time requirements in table 562-3 have been met.

Do not remove falsework under concrete that has been cured at a temperature continuously under 10 °C without first determining if the concrete has gained the specified strength, no matter how much time has passed.

Ensure that substructure concrete has reached the required 28-day compressive strength prior to erecting any superstructure or additional substructure elements, unless approved otherwise by the CO.

Do not release falsework in any span in continuous structures until the first and second adjoining spans on each side have reached the strength specified herein or in the SPECIAL PROJECT SPECIFICATIONS.

Uniformly and gradually remove falsework for arch bridges, beginning at the crown and working toward the springing. Remove falsework for adjacent arch spans simultaneously.

Completely release the falsework under all spans of continuous structures before concrete is placed in curbs, railings, and parapets.

Remove forms from columns before releasing supports from beneath beams and girders in order to determine the condition of column concrete.

Table 562-3.—Minimum form/support release criteria.

Structural Element	% of Specified 28-Day Strength (f_c')	Minimum Number of Days Since Last Pour	
		Standard Concrete	Type III Concrete
Columns and wall faces (not yet supporting loads)	50	3	2
Mass piers and mass abutments (not yet supporting loads) except pier caps	50	3	N/A
Box girders	80	14	7
Simple span girders, T-beam girders, slab bridges, cross beams, caps, pier caps not continuously supported, struts, and top slabs of concrete box culverts	80	14	7
Trestle slabs where supported on wood stringers	70	10	4
Slabs and overhangs where supported on steel stringers or prestressed concrete girders	70	10	4
Pier caps continuously supported	60	7	3
Arches, continuous span bridges, and rigid frames	90	21	10

Remove all forms from the cells of concrete box girders unless otherwise SHOWN ON THE DRAWINGS or permitted by the CO. Leave no forms that might jeopardize drainage or enclosed utilities.

Do not release falsework for cast-in-place prestressed portions of structures until after the prestressing steel has been tensioned.

Do not remove falsework supporting the deck of rigid frame structures, excluding box culverts, until compacted backfill material has been placed against vertical legs of the frame.

Install a reshoring system if the falsework supporting the sides of girder stems with slopes steeper than 1:1 are removed before placing deck slab concrete. Design a reshoring system with lateral supports that resist all rotational forces acting on the

stem, including those caused by the placement of deck slab concrete. Install the lateral supports immediately after each form panel is removed and before release of supports for the adjacent form panel.

Completely remove falsework material. Remove falsework piling at least 0.5 m below the surface of the original ground or stream bed. Where falsework piling is driven within the limits of ditch or channel excavation, remove the piling to at least 0.5 m below the bottom and side slopes of the excavated areas.

Leave the forms for footings constructed within a cofferdam or crib in place when their removal would endanger the safety of the cofferdam or crib, and where the forms will not be exposed to view in the finished structure.

Remove all other forms, whether above or below groundline or water level.

Measurement & Payment

562.12 Method & Basis. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Do not measure forms and falsework for payment.

Section 563—Painting

Description

563.01 Work. Apply protective coatings to metal, timber, or concrete surfaces to control corrosion and deterioration.

Materials

563.02 Requirements. Furnish material that conforms to specifications in the following section and subsections:

Boiled Linseed Oil	725.14(a)
Paint	708
Petroleum Spirits (Mineral Spirits)	725.14(b)
Water	725.01

Construction

563.03 Protection of Public, Property, & Workers. Comply with the SSPC's "SSPC–PA Guide 3—A Guide to Safety in Paint Application" and with OSHA requirements. If the paint being removed is a hazardous material containing lead chromium, comply with all of the following:

- SSPC Guide 6I(CON)—"Guide for Containing Debris Generated During Paint Removal Operations."
- SSPC Guide 7I(DIS)—"Guide for the Disposal of Lead-Contaminated Surface Preparation Debris."
- 29 CFR 1926.62—"OSHA Construction Industry Standards for Lead."
- 40 CFR 50.6—"EPA National Primary and Secondary Ambient Air Quality Standards for Particulate Matter."
- 40 CFR, 50.12—"EPA National Primary and Secondary Ambient Air Quality Standards for Lead."
- 40 CFR, parts 260–268—"Resource Conservation and Recovery Act (RCRA)."

At least 28 days before beginning surface preparation, submit a written plan for approval that details the measures to be used for the protection of the environment, public, adjacent property, and the workers while performing the work. Include in the plan the following:

(a) Manufacturer's material safety data sheets and product sheets for all cleaning and painting products.

(b) A detailed containment plan for removed material, cleaning products, and paint debris. Include details of attachment to the structure.

(c) A detailed disposal plan for removal, cleaning products, and paint debris.

(d) Specific safety measures to protect workers from site hazards, including falls, fumes, fires, or explosions.

(e) If paint being removed is hazardous material, include specific safety measures to comply with 29 CFR 1962.26, 40 CFR 50.6, 40 CFR 50.12, and 40 CFR, parts 260–268. Document compliance upon request.

(f) A written plan for emergency spill procedures.

(g) A competent person responsible for ensuring that all necessary health, safety, and containment measures are enacted and maintained.

After acceptance, perform work according to the plan. If the measures fail to perform as intended, immediately stop work and take corrective action. Collect and properly dispose of all material, including wastewater that is used in preparing, cleaning, or painting.

563.04 Protection of the Work. Use tarps, screens, paper, cloth, or other suitable means to protect adjacent surfaces that are not to be painted. Prevent contamination of freshly painted surfaces by dust, oil, grease, or other harmful and deleterious material.

563.05 Surface Preparation, General. Notify the CO in writing at least 7 days before beginning operations. Immediately before painting, prepare the surface according to the following:

(a) Clean the surface to the specified cleanliness level.

(b) Remove dirt, dust, and other contaminants from the surface using methods recommended by the paint manufacturer.

(c) Thoroughly dry the surface.

(d) Determine that the surface temperature is between 10 °C and 40 °C.

(e) Determine that the surface temperature is 3 °C or more above the dew point according to ASTM 337.

(f) Determine that the humidity is 85 percent or less, unless specified otherwise on the manufacturer's product data sheet.

Suitable engineering control, such as enclosures and dehumidification, may be used to provide the conditions required above.

563.06 Paint Application, General. Use safe handling practices that conform to the manufacturer's safety data sheet and instructions. Mix and apply paint according to the product instructions. Mix paint with mechanical mixers for a sufficient length of time to thoroughly blend the pigment and vehicle together. Continue the mixing during application. Do not thin paint that is formulated ready for application.

Paint in a neat and workmanlike manner that does not produce excessive paint buildup, runs, sags, skips, holidays, or thin areas in the paint film. Measure the wet film thickness during application, and adjust the application rate such that, after curing, the desired dry film thickness is obtained. Apply paint by brush, spray, roller, or any combination thereof if permitted by the manufacturer's product data sheet.

Use brushes that have sufficient bristle body and length to spread the paint in a uniform film. Use round, oval-shaped, or flat brushes no wider than 120 mm. Evenly spread and thoroughly brush out the paint as it is applied.

Use airless or conventional spray equipment with suitable traps, filters, or separators to exclude oil and water from the compressed air. Use the spray gun tip sizes and pressures recommended by the manufacturer. Use compressed air that is free from oil or moisture and does not show black or wet spots when tested in accordance with ASTM D 4285.

Use rollers only on flat, even surfaces. Do not use rollers that leave a stippled texture in the paint film.

Use sheepskin daubers, bottle brushes, or other acceptable methods to paint surfaces that are inaccessible for painting by regular means.

Cure each coat of paint according to the manufacturer's recommendations. Correct all thin areas, skips, holidays, and other deficiencies before the next application of paint. Tint succeeding applications of paint to contrast with the paint being covered. The CO will approve the color for the finish coat before application.

Coat structures with the total thickness of undercoats before erection. Coat any surfaces that will be inaccessible after erection with the full number of required applications before erection. After erection and before applying the final coat, thoroughly clean all areas where coating has been damaged or has deteriorated, or where there are exposed unpainted surfaces, and spot coat with the specified undercoats to the specified thickness.

563.07 Structural Iron & Steel. Conform to the following:

(***a) Paint Systems.*** Conform to the following:

(1) New Surfaces or Surfaces With All Existing Paint Removed. Furnish a paint system shown in table 563-1.

(2) Surfaces With Existing Sound Paint. Furnish a paint system that is compatible with the existing paint. Any of the systems listed in table 563-2 or any system that is approved for use on steel structures by the State department of transportation in the State in which the structure is located is acceptable if the proposed system is compatible with the existing system.

At least 14 days before ordering paint, verify compatibility of the proposed system with the existing system as follows:

(a) Select a test area of at least 3 m^2 in a condition representative of the condition of the structure. Perform the specified level of surface preparation and apply the proposed system to the existing topcoat and primer. Watch for lifting, bleeding, blistering, wrinkling, cracking, flaking, or other evidence of incompatibility.

(b) Verify that no indication of incompatibility exists at least 14 days after the application of each product. Perform adhesion tests according to ASTM D 3359, method A. Notify the CO immediately if adhesive testing fails at the interface of the existing finish coat and primer. An adhesion failure indicates incompatibility. Choose a more compatible paint system.

(b) Surface Preparation. Do not remove sound paint unless SHOWN ON THE DRAWINGS.

(1) New Surfaces or Surfaces With All Existing Paint Removed. Remove all dirt, mill scale, rust, paint, and other foreign material from exposed surfaces by blast cleaning to near white metal in accordance with SSPC–SP 10.

Use compressed air that is free from oil or moisture and does not show black or wet spots when tested in accordance with ASTM D 4285. Do not use unwashed sand or abrasives that contain salts, dirt, oil, or other foreign matter. Before blast cleaning

Table 563-1.—Structural iron and steel coating systems for new surfaces and surfaces with all existing paint removed.

	Paint System [a]				
	1	2	3	4	5
Coat	Aggressive Environments (Salt)	Aggressive Environments (Salt)	Aggressive Environments (Salt)	Less Aggressive Environments (No Salt)	Less Aggressive Environments (No Salt)
Primer	Inorganic zinc, type II, 75–100 µm dry	Zinc-rich epoxy, 75–100 µm dry	Moisture-cured urethane, 50–75 µm dry	Acrylic latex, 50–75 µm dry	Low-VOC alkyd, 50–75 µm dry
Intermediate	Epoxy, 75–100 µm dry	Epoxy, 75–100 µm dry	Moisture-cured urethane, 50–75 µm dry	Acrylic latex, 50–75 µm dry	Low-VOC alkyd, 50–75 µm dry
Top	Aliphatic urethane, 50–75 µm dry	Aliphatic urethane, 50–75 µm dry	Moisture-cured or aliphatic urethane, 50–75 µm dry	Acrylic latex, 50–75 µm dry	Low-VOC alkyd, 50–75 µm dry
Total thickness	200–275 µm dry	200–275 µm dry	150–225 µm dry	150–225 µm dry	150–225 µm dry

a. System 1, 2, or 3 is for the corrosion protection of iron and steel in aggressively corrosive atmospheric environments, such as marine, industrial, or high-humidity environments, and in structures exposed to deicing salts. System 4 or 5 is for use in environments that are free from high concentrations of salts or pollutants that cause aggressive corrosion.

Table 563-2—Structural iron and steel coating systems for surfaces with existing sound paint.

	Paint System [a]		
	6	7	8
Coat	Aggressive Environments (Salt)	Less Aggressive Environments (No Salt)	Less Aggressive Environments (No Salt)
Primer	Moisture-cured urethane, 50–75 µm dry	Low-VOC alkyd, 50–75 µm dry	Low-viscosity epoxy sealer, 25–50 µm dry
Intermediate	Moisture-cured urethane, 50–75 µm dry	Low-VOC alkyd, 50–75 µm dry	Epoxy, 75–100 µm dry
Top	Moisture-cured or aliphatic urethane, 50–75 µm dry	Low-VOC silicone alkyd, 50–75 µm dry	Aliphatic urethane, 50–75 µm dry
Total thickness	150–225 µm dry	150–225 µm dry	150–225 µm dry

a. System 6 is for the corrosion protection of iron and steel in aggressively corrosive atmospheric environments, such as marine, industrial, or high-humidity environments, and in structures exposed to deicing salts. System 7 or 8 is for use in environments that are free from high concentrations of salts or pollutants that cause aggressive corrosion.

near machinery, seal all bearings, journals, motors, and moving parts against entry of abrasive dust.

Blast clean with clean, dry sand, mineral grit, steel shot, or steel grit. Use a suitable gradation to produce a dense, uniform anchor pattern. Produce an anchor profile height of 25 to 50 µm, but not less than that recommended by the manufacturer's product data sheet for the paint system specified. Measure anchor profile height using the tape method in accordance with ASTM D 4417.

The same day cleaning is performed, remove dirt, dust, and other debris from the surface by brushing, blowing with clean, dry air, or vacuuming and apply the first coat of paint to the blast-cleaned surfaces. If the cleaned surfaces rust or become contaminated before painting, repeat blast cleaning.

(*2*) *Surfaces With Existing Sound Paint.* Wash all areas to be painted with pressurized water to remove dirt, surface chalking, loose rust, and contaminants such as chlorides. Maintain a washwater pressure of at least 3.5 MPa. Capture all washwater and removed waste according to appropriate regulations.

Clean according to SSPC–SP 2, Hand Tool Cleaning; SSPC–SP 3, Power Tool Cleaning; or SSPC–SP 6, Commercial Blast Cleaning, to remove dirt, loose mill scale, loose rust, or paint that is not firmly bonded to the underlying surface. Clean

small areas that show pinhole corrosion, stone damage from traffic, or minor scratches. Clean at least 50 mm beyond the damaged areas. Feather edges of remaining old paint to achieve a reasonably smooth surface.

The same day hand- or power-tool cleaning is performed, remove dirt, dust, and other contaminants from the surface with solvent cleaning methods according to SSPC–SP 1, and spot paint all bare steel areas cleaned with the first coat of paint. If the cleaned surfaces rust or become contaminated before painting, repeat solvent cleaning. Repair all damage to sound paint by applying the entire system.

(c) Application of Paints. Apply each coat to the wet film thickness as recommended by the paint manufacturer to obtain the specified dry film thickness. Verify the application rate of each coat with a wet film paint thickness gauge immediately after applying paint to the surface. Confirm the application rate by measuring the dry film thickness after the solvent has evaporated from the surface.

For example, if 75 µm of dry thickness is desired and the volatile content of the paint is 50 percent, the wet film paint thickness gauge must read at least 150 µm immediately after application of the paint to achieve the desired dry coat thickness of 75 µm.

563.08 Painting Galvanized Surfaces. Clean and prepare the surface to be painted by washing with a mineral spirit solvent to remove all oil, grease, or other contaminants on the surface, in accordance with SSPC–SP 1.

Apply the coating system shown in table 563-3 for other metals.

563.09 Painting Timber Structures. Dry timber to a moisture content of 20 percent or less. On previously painted timber, remove all cracked or peeled paint, loose chalky paint, dirt, and other foreign material by wire brushing, scraping, or other approved methods. On timber treated with creosote or oilborne pentachlorophenol preservative, wash and brush away visible salt crystals on the wood surface and allow to dry. Remove all dust or other foreign material from the surface to be painted.

Apply the coating system shown in table 563-3. The primer may be applied before erection. After the primer dries and the timber is in place, fill all cracks, checks, nail holes, or other depressions flush with the surface using approved putty. Evenly spread and thoroughly work the paint into all corners and recesses. Allow the full thickness of the applied coat of paint to dry before applying the next coat.

Table 563-3—Coating systems for other structures.

Substrate	Paint Coatings			
	Primer	Intermediate	Finish	Total Thickness
Smooth wood	Exterior wood primer,[a] 60–70 µm dry	Exterior latex or alkyd, 35–50 µm dry	Exterior latex or alkyd, 35–50 µm dry	130–170 µm dry
Rough lumber	Exterior latex or alkyd,[a] 35-50 µm dry	Exterior latex or alkyd, 35–50 µm dry	Exterior latex or alkyd, 35–50 µm dry	105–150 µm dry
Concrete	Epoxy single coat, 80–100 µm dry. For gloss finish, finish with aliphatic polyurethane (50 µm dry).			80–150 µm dry
Masonry block	Masonry block filler, 50–60 µm dry	Exterior latex or alkyd, 35–50 µm dry	Exterior latex or alkyd, 35–50 µm dry	120–160 µm dry
Aluminum	Metal primer, 30–40 µm dry	Exterior latex or alkyd, 35–50 µm dry	Exterior latex or alkyd, 35–50 µm dry	100–140 µm dry
Other metals	Metal primer,[b] 35–45 µm dry	Exterior latex or alkyd, 35–50 µm dry	Exterior latex or alkyd, 35–50 µm dry	105–145 µm dry

a. For untreated wood, thin the primer with up to 0.1 L of turpentine and 0.1 L of linseed oil per liter of paint.

b. For galvanized surfaces, use an epoxy primer (35–45 µm dry thickness) or a vinyl wash primer (7–13 µm dry thickness).

563.10 Painting Concrete Structures. Clean and prepare the concrete surface to be painted by removing all laitance, dust, foreign material, curing compound, form oil, grease, or other deleterious material. If form oil, grease, or curing compound is present, wash the surface clean with a 5 percent solution of trisodium phosphate. After washing, thoroughly rinse the surface with clean water and allow to dry completely.

Give the cleaned surface a light abrasive sweep to remove mortar wash or other contaminants. Remove all residue and dust by hand, broom, compressed air, or other approved methods.

Apply the coating system shown in table 563-3. Evenly spread and thoroughly work the paint into all corners and recesses. Allow the full thickness of the applied coat of paint to dry before applying the succeeding coat.

Measurement

563.11 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Measure painting by the square meter or lump sum.

When measurement is by the square meter, measure the visible surface area painted.

Payment

563.12 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item		Pay Unit
563 (01)	Painting, _____ structure ..... *Description*	Lump Sum
563 (02)	Painting, _____ structure ..... *Description*	Square Meter

Section 564—Bearing Devices

Description

564.01 Work. Furnish and install bridge bearings. Bearing devices are designated as elastomeric, rocker, roller, and sliding plate.

Materials

564.02 Requirements. Furnish material that conforms to specifications in the following subsections:

Elastomeric Bearing Pads 717.10
TFE Surfaces for Bearings 717.11

Construction

564.03 General. Conform to the fallowing:

(a) Drawings. Prepare and submit drawings for the bearings in accordance with section 18, AASHTO "Standard Specifications for Highway Bridges," division II, volume II, when SHOWN ON THE DRAWINGS or in the SPECIAL PROJECT SPECIFICATIONS. Show all details of the bearings, including the material proposed for use. Obtain approval before beginning fabrication.

(b) Fabrication. Fabricate bearings in accordance with section 18 of the AASHTO "Standard Specifications for Highway Bridges," division II, volume II. Ensure that the surface finish of bearing components in contact with each other or with concrete, but not embedded in concrete, conforms to Subsection 555.08(e).

Preassemble bearing assemblies in the shop and check for proper completeness and geometry. Galvanize steel bearing components and anchor bolts in accordance with Subsection 717.07. Do not galvanize stainless steel bearing components or anchor bolts.

(c) Packaging, Handling, & Storage. Before shipping from the manufacturer, clearly identify each bearing component, and mark on its top the location and orientation in the structure. Securely bolt, strap, or otherwise fasten the bearings to prevent any relative movement.

Package bearings so they are protected from damage due to shipping, handling, weather, or other hazards. Do not dismantle bearing assemblies at the site except for inspection or installation.

Store all bearing devices and components at the worksite in a location that provides protection from environmental and physical damage.

(d) Construction & Installation. Clean the bearings of all deleterious substances. Install the bearings at the positions SHOWN ON THE DRAWINGS. Set bearings and bearing components to the dimensions SHOWN ON THE DRAWINGS or as prescribed by the manufacturer. Adjust in accordance with the manufacturer's instructions to compensate for installation temperature and future movements of the bridge.

Set bridge bearings level at the exact elevation and position. Provide full and even bearing on all external bearing contact surfaces. If bearing surfaces are at improper elevations or not level, or if bearings cannot otherwise be set properly, notify the CO and submit a written proposal to modify the installation for approval.

Bed metallic bearing assemblies that are not embedded in concrete on concrete with an approved filler or fabric material.

Set elastomeric bearing pads directly on properly prepared concrete surfaces without bedding material.

Machine all bearing surfaces that are seated directly on steel to provide a level and planar surface upon which to place the bearing.

564.04 Elastomeric Bearings. The bearings include nonreinforced pads (consisting of elastomer only) and reinforced bearings with steel or fabric laminates.

Reinforce elastomeric bearings that are more than 15 mm thick with laminates every 15 mm through the entire thickness.

If not specified, use 50 durometer elastomer that is capable of sustaining an average compressive stress of 7 MPa.

Fabricate elastomeric bearings in accordance with AASHTO M 251. Use material that meets the flash tolerance, finish, and appearance requirements of the "Rubber Handbook" published by the Rubber Manufacturer's Association Incorporated, RMA F3 and T.063 for molded bearings and RMA F2 for extruded bearings. Determine compliance with AASHTO M 251, level I acceptance criteria.

Mark each reinforced bearing with indelible ink or flexible paint. Mark the order number, lot number, bearing identification number, and elastomer type and grade number. Unless otherwise specified, mark on a face that is visible after erection of the bridge. Furnish a list of all individual bearing numbers.

Place bearings on a level surface. Correct any misalignment in the support to form a level surface. Do not weld steel girders or base plates to the exterior plates of the bearing unless there is more than 40 mm of steel between the weld and elastomer. Do not expose the elastomer or elastomer bond to instantaneous temperatures greater than 200 °C.

564.05 Rocker, Roller, & Sliding Bearings. When TFE coatings are required, use coatings that conform to Subsection 564.07.

Fabricate rocker, roller, and sliding bearings in accordance with the details SHOWN ON THE DRAWINGS and with Section 555. Perform fabrication in accordance with standard practice in modern commercial shops. Remove burrs, rough and sharp edges, and other flaws. Stress-relieve rocker, roller, and other bearings that are built up by welding sections of plate together before boring, straightening, or finished machining.

Thoroughly coat all contact surfaces with oil and graphite just before placing roller bearings. Install rocker, roller, and sliding bearings so they are vertical at the specified mean temperature after release of falsework and after any shortening due to prestressing forces. Take into account any variation from mean temperature of the supported span at time of installation and any other anticipated changes in length of the supported span.

Make sure the superstructure has full and free movement at movable bearings. Carefully position cylindrical bearings so that their axes of rotation align and coincide with the axis of rotation of the superstructure.

564.06 Masonry, Sole, & Shim Plates for Bearings. Provide metal plates used in masonry, sole, and shim plates that conform to AASHTO M 270M, grade 250.

Fabricate and finish steel in accordance with Section 555. Form holes in bearing plates by drilling, punching, or accurately controlled oxygen cutting. Remove all burrs by grinding.

Accurately set bearing plates in level position as SHOWN ON THE DRAWINGS and provide a uniform bearing over the bearing contact area. When plates are embedded in concrete, make provision to keep them in correct position as the concrete is placed.

564.07 TFE Surfaces for Bearings. Furnish TFE material that is factory bonded, mechanically connected, or recessed into the backup material, as SHOWN ON THE DRAWINGS.

Bond or mechanically attach the fabric containing TFE fibers to a rigid substrate. Use a fabric capable of carrying unit loads of 70 MPa without cold flow. Use a fabric-substrate bond capable of withstanding, without delamination, a shear force equal to 10 percent of the perpendicular or normal application loading, plus any other bearing shear forces.

Determine compliance using approved test methods and procedures in accordance with section 18, subsection 18.8.3, AASHTO "Standard Specifications for Highway Bridges," division II, volume II. If the test facility does not permit testing completed bearings, manufacture extra bearings and prepare samples of at least 450 kN capacity at normal working stresses.

Determine static and dynamic coefficient of friction at first movement of the test bearing at a sliding speed of less than 25 mm per minute. Ensure that the coefficient of friction does not exceed the coefficient of friction specified in table 564-1 or by the manufacturer.

Table 564-1.—Coefficient of friction.

Material	Bearing Pressure (MPa)	Friction Coefficient
Unfilled TFE, fabric containing	3.5	0.08
TFE fibers, or TFE-perforated	14	0.06
metal composite	24	0.04
Filled TFE	3.5	0.12
	14	0.10
	24	0.08
Interlocked bronze and filled	3.5	0.10
TFE structures	14	0.07
	24	0.05

Furnish a listing of all individual bearing numbers.

564.08 Anchor Bolts. Furnish wedge or thread anchor bolts that conform to ASTM A 307 or as SHOWN ON THE DRAWINGS.

Drill holes for anchor bolts and set them in Portland cement nonshrink grout or preset them before placing the concrete.

Adjust bolt locations for superstructure temperature as required. Do not restrict free movement of the superstructure at movable bearings through anchor bolts or nuts.

564.09 Bedding of Masonry Plates. Place filler or fabric as bedding material under masonry plates, as SHOWN ON THE DRAWINGS. Use the type of filler or fabric specified and install to provide full bearing on contact areas. Thoroughly clean the contact surfaces of the concrete and steel immediately before placing the bedding material and installing bearings or masonry plates.

Measurement

564.10 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Measure bearing devices by the each.

Payment

564.11 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item		Pay Unit
564 (01)	_____ bearing device	Each
	Description	

DIVISION 600
Incidental Construction

Section 601—Mobilization

Description

601.01 Work. Move personnel, equipment, material, and incidentals to the project, and perform all activities necessary to accomplish work at the project site. Obtain permits, insurance, and bonds.

Measurement

601.02 Method. Measure mobilization by the lump sum.

Payment

601.03 Basis. The accepted quantity, measured as provided above, will be paid at the contract price per unit of measurement for the PAY ITEM listed below that is DESIGNATED IN THE SCHEDULE OF ITEMS.

The mobilization lump sum will be paid as follows:

(a) If applicable, bond premiums will be reimbursed according to FAR clause 52.232–5, Payment Under Fixed-Price Construction Contracts, after receipt of evidence of payment.

(b) Fifty percent of the lump sum, not to exceed 5 percent of the original contract amount, will be paid following completion of 5 percent of the original contract amount, not including mobilization.

(c) Payment of the remaining portion of the lump sum, up to 10 percent of the original contract amount, will be paid following completion of 10 percent of the original contract amount, not including mobilization.

(d) Any portion of the lump sum in excess of 10 percent of the original contract amount will be paid after final acceptance.

Payment will be made under:

Pay Item		Pay Unit
601 (01)	Mobilization	Lump Sum

Section 602—Minor Concrete Structures

Description

602.01 Work. Construct reinforced or unreinforced minor concrete structures.

Materials

602.02 Requirements. Furnish materials that meet the requirements specified in the following subsections:

Air-Entraining Admixtures	711.02
Cement	701.01
Chemical Admixtures	711.03
Coarse Aggregate for Portland Cement Concrete	703.02
Curing Material	711.01
Fine Aggregate for Portland Cement Concrete	703.01
Fly Ash	725.04
High-Strength Nonshrink Grout	701.02
Latex Modifier	711.04
Reinforcing Steel	709.01
Water	725.01

602.03 Concrete Composition. Use the concrete composition method DESIGNATED IN THE SCHEDULE OF ITEMS.

(a) Method A. Furnish to the CO a mix design showing the proposed weights of aggregate, water, and cement per cubic meter of concrete a minimum of 7 days prior to beginning placement. Proportion the cement, aggregate, and water to obtain concrete with good workability. Ensure that slump is 100 mm or less, as determined by AASHTO T 119. Ensure that air-entrainment is 6 ± 1 percent, as determined by AASHTO T 152 or T 196.

Ensure that the concrete develops a 28-day minimum compressive strength of 20 MPa, unless otherwise SHOWN ON THE DRAWINGS. Furnish concrete for specimens. Strength will be determined by test cylinders made and cured in accordance with AASHTO T 23 and tested in accordance with AASHTO T 22.

Failure of any test cylinder to meet the required strength, for any structural element tested, will be considered evidence of noncompliance with the strength requirement of this specification.

(b) Method B. Submit for approval the following information a minimum of 7 days prior to beginning placement:

(1) Type, grading, and sources of aggregate.

(2) Type and source of cement, blended cement, or fly ash.

(3) Saturated surface dry weights of the fine and coarse aggregate in kilograms per cubic meter of concrete.

(4) Weight of mixing water in kilograms per cubic meter of concrete.

(5) Weight of cement in kilograms per cubic meter of concrete.

(6) Admixture type, quantity, and certification by manufacturer.

(7) Air content.

(8) Slump.

(9) 28-day compressive strength.

Ensure that the concrete contains not less than 310 kg of cement per cubic meter. Ensure that slump is 100 mm or less, as determined by AASHTO T 119.

When a commercial supplier is used, furnish a certification with each truckload of concrete certifying that the material and mix proportions used are in conformance with the approved mixture.

(c) Method C. Make the concrete using a dry, preproportioned, blended, and bagged mix meeting the requirements of ASTM C 387 and mixed at the jobsite in accordance with the manufacturer's recommendations.

(d) Fly Ash- or Pozzolan-Modified Concrete. Fly ash may be substituted for cement at the rate of 550 g of fly ash per 450 g of Portland cement. After substitution, reduce the design aggregate volumes by an amount equal to the net increase in volume of the combined cement and fly ash. Replace no less than 10 percent and no more than 20 percent of the weight of Portland cement required with fly ash at the above rate. For purposes of controlling the maximum water/cement ratio of 0.49, make the water/cement ratio for fly-ash-modified concrete the ratio of the weight of water to the combined weights of Portland cement and 60 percent of the weight of the fly ash.

Extend the standard 28-day curing period for compressive-strength tests for fly-ash-modified concrete by 1 day (rounded to the nearest whole day) for each 1.5 percent of

Portland cement replaced with fly ash at the selected rate. (Example: If the maximum of 20 percent cement is replaced, the curing period for cylinders is 41 days.)

Construction

602.04 Forms. Design and construct forms so they can be removed without damaging the concrete. Make them free of bulge and warp, and constructed so that the finished concrete has the form and dimensions SHOWN ON THE DRAWINGS and is true to line and grade. Concrete may be placed without forms where SHOWN ON THE DRAWINGS.

Design forms for concrete that contains a retarding admixture, fly ash, or other pozzolan replacement for cement so that the lateral pressures exerted by the full anticipated height of fluidized concrete are contained, unless documented information in regard to initial set is provided by the manufacturer.

602.05 Placing Concrete. Place all reinforcing steel in position as SHOWN ON THE DRAWINGS, and ensure that it is securely held in place by approved supports during placing of concrete. Do not place concrete until the grading, forms, and steel reinforcements have been inspected and approved by the CO. Give the CO 24 hours written notice prior to placement of any concrete.

Ensure that reinforcing steel material and construction requirements are in accordance with Section 554.

Discharge all concrete prepared using methods A and B into the forms within the time limits shown in table 602-1. These time limits are based on jobsite ambient air temperature, cement type, and admixture used. Begin counting time from when the cement is introduced into the aggregate. Discharge concrete prepared using method C into the forms within 1-1/2 hours after introducing water to the mixture. Do not retemper concrete. Cement must be added to the mixer at the jobsite when required in the SPECIAL PROJECT SPECIFICATIONS. Do not mix or place concrete when the daily minimum atmospheric temperature is, or is expected to be, less than 5 °C unless adequate provisions are made to protect the concrete.

Place concrete to avoid segregation. Use high-frequency internal vibrators for consolidating concrete in the forms. Operate vibrators to produce concrete free of voids, but do not hold them in one place long enough to result in segregation or formation of laitance on the surface.

Method C concrete may be rodded instead of internally vibrated as necessary to remove voids.

Table 602-1.—Concrete discharge time limits.

Cement Type With and Without Admixtures	Time Limit (hour)	
	< 30 °C [a]	≥ 30 °C [a]
Type I, IA, II, or IIA	2.0	1.5
Type I, IA, II, or IIA with water-reducing or -retarding admixture	3.0	2.0
Type III	1.5	1.0
Type III with water-reducing or -retarding admixture	2.0	1.5

a. Ambient air temperature.

Do not use aluminum pipe, conduit, or troughs for transporting concrete. When concrete is pumped, take samples from the discharge stream at the point of placement.

602.06 Finishing. Perform finishing of concrete surfaces as follows:

(a) Formed Surfaces. Unless otherwise SHOWN ON THE DRAWINGS, remove all fins and irregular projections exceeding 6 mm from the exposed surfaces. Fill holes produced by removing form ties with dry-pack mortar or other approved patching compounds.

(b) Unformed Surfaces. Strike off unformed surfaces with a straightedge, and finish them to a smooth uniform texture by floating and troweling. Prepare final finish of the surface as SHOWN ON THE DRAWINGS.

602.07 Curing Concrete. Beginning immediately after finishing, cure all concrete a minimum of 7 days or, if high-early-strength cement is used, a minimum of 3 days. For fly-ash-modified concrete placed in structures, the required moisture-controlled curing period shall be:

Percentage of Cement Replaced by Weight	Required Curing Period
10%	9 days
11–15%	10 days
16–20%	11 days

For cold weather concreting, maintain a controlled temperature for the required curing period. The above requirement for an extended curing period may be waived if a compressive strength of 65 percent of the specified 28-day design strength is achieved in 6 days.

Cure by maintaining a minimum concrete temperature of 5 °C and keeping the concrete continuously moist. Keep moist by supplying additional moisture or preventing moisture loss.

Acceptable methods of supplying additional moisture are ponding or sprinkling, and covering with burlap cloth that is kept saturated. Surfaces SHOWN ON THE DRAWINGS may be covered with saturated sand or 150 mm of saturated hay or straw to retain moisture.

Acceptable methods of preventing moisture loss are applying liquid membrane-forming compounds, or waterproof paper or polyethylene sheet materials. Apply liquid membrane-forming compounds by spraying at the coverage rates and patterns recommended by the manufacturer. Ensure that sheet material has overlapped sealed joints and forms a complete waterproof cover over the entire concrete surface.

602.08 Backfilling. Backfill in accordance with Subsection 206A.10. Do not backfill concrete until it has completed the required curing period.

Measurement

602.09 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment

602.10 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item		Pay Unit
602 (01)	Concrete, method____	Cubic Meter
602 (02)	Concrete, method____	Lump Sum

Section 603—Metal Pipe

Description

603.01 Work. Furnish and install, or install only, metal pipe and pipe appurtenances, including all bedding and backfilling required to complete the work. The term "metal" refers to aluminum and steel.

Materials

603.02 Requirements. Furnish materials that meet the requirements specified in the following subsections:

Aluminum-Alloy Corrugated Pipe	707.03
Aluminum-Alloy Spiral Rib Pipe	707.12
Asphalt-Coated Pipe	707.04
Concrete-Lined Corrugated Steel Pipe	707.13
Ductile Iron Culvert Pipe	707.01
Fiber-Bonded Bituminous-Coated Steel Pipe	707.09
Invert-Paved Corrugated Steel Pipe	707.14
Metallic-Coated Corrugated Steel Pipe	707.02
Metallic-Coated Spiral Rib Pipe	707.11
Polymer-Coated Steel Pipe	707.08
Repair of Damaged Coatings	707.15
Slotted Drain Pipe	707.10
Watertight Gaskets	712.03

Furnish bedding material that meets the requirements specified in Subsection 603.04.

Furnish backfill materials that meet the requirements specified in Subsection 603.08.

Clean and paint damaged spelter coating caused by welding, field cutting, or mishandling, as specified in Subsection 707.15.

To prevent electrolysis or physical failure, use materials in each pipe installation that are compatible with each other.

Either annular or helical pipe corrugations will be acceptable. Helical corrugated pipe containing annular rerolled ends may be used in conjunction with annular pipe of like or compatible materials.

Provide fabricator's certification that the sheet and pipe fabrication are in accordance with AASHTO M 36, M 196, and M 245, as applicable. Submit the certification before installing the pipe.

The lengths and locations of individual pipe SHOWN ON THE DRAWINGS are approximate. Do not order pipe until culvert locations are DESIGNATED ON THE GROUND and a written list of the correct lengths is approved by the CO.

Construction

603.03 Excavation. Excavate in accordance with the requirements specified in Section 206A.

Specific pipe installation time restrictions and installation plan requirements are SHOWN ON THE DRAWINGS.

603.04 Bedding. Bed the pipe to a depth of not less than 10 percent of its total height. After excavating in accordance with Subsection 206A.04(b), compact the foundation surface in accordance with Subsection 603.08 and shape it to fit the pipe.

As bedding material, provide selected mineral soil that meets the requirements for backfill specified in Subsection 603.08. When SHOWN ON THE DRAWINGS, ensure that completed bedding has a longitudinal camber.

603.05 Laying Pipe. Lay the lower segment of the pipe so that it is in contact with the bedding for the required depth throughout its length. Place outside circumferential laps facing upstream.

Lay paved or partially lined pipe so the longitudinal centerline of the paved segment coincides with the flowline. Place elliptical pipe with the major axis within 5° of a vertical plane through the longitudinal axis of the pipe.

Ensure that the final installed alignment allows no reverse grades, and does not permit any point to vary from a straight line drawn from inlet to outlet by more than 2 percent horizontally and vertically of the culvert length, or 300 mm, whichever is less.

Do not place any pipe in service until a suitable outlet is provided.

Install helically corrugated lock-seam pipe with the seam at the inlet end placed below the horizontal centerline. This requirement applies to the outlet end when the outlet is less than 1.5 m below subgrade.

Position longitudinal laps on riveted or spot-welded pipe at any location between 45° above or below horizontal.

603.06 Joining Pipes. Firmly join pipe using form-fitting coupling bands. Attach end sections to the pipe using connecting bands or other means, as recommended by the manufacturer. Install gaskets at each joint to form a watertight connection when SHOWN ON THE DRAWINGS. Do not use dimpled bands when the slope of the pipe is greater than 15 percent.

Ensure that coupling bands meet the strength requirements of field joints for Nonerodible Soil Condition—Special Joint Type, according to division II, section 26, of the "Standard Specifications for Highway Bridges" by AASHTO.

When aluminum alloys come in contact with other metals, coat the contacting surfaces with an asphalt mastic or other impregnated caulking compound approved by the CO.

603.07 Shop Elongation. When SHOWN ON THE DRAWINGS, increase the vertical diameter of round pipe 5 percent by shop elongation.

603.08 Backfilling. Do not place or backfill pipe that meets any of the following conditions until the excavation and foundation have been approved by the CO:

- Embankment height greater than 3 m at subgrade centerline.
- Installation in a live stream.
- Round pipe with a diameter of 1,200 mm or greater.
- Pipe arches with a span of 1,270 mm or greater.

After the bedding is prepared and the pipe is placed, place selected material in layers not exceeding 150 mm loose thickness, and compact the material under the haunches and alongside the pipe. Use material that is readily compactible and free of frozen lumps, chunks of highly plastic clay (with a plasticity index greater than 10), or other objectionable material. Do not use rocks larger than 75 mm in greatest dimension within 300 mm of the pipe. On each side of the pipe, place an area of compacted material at least as wide as the diameter of the pipe. Compact the backfill without damaging or displacing the pipe.

Continue backfilling and compacting until the backfill is a minimum of 300 mm above the top of the culvert.

After bedding and backfilling the pipe, protect it with an adequate cover of embankment before heavy equipment is permitted to cross during roadway construction.

Replace any pipe that is distorted by more than 5 percent of nominal dimensions, or that is ruptured or broken.

Compact backfill using method A, B, or C, as DESIGNATED IN THE SCHEDULE OF ITEMS.

(a) Method A. Ensure that backfill density exceeds the density of the surrounding embankment.

(b) Method B. Ensure that backfill density exceeds 95 percent of the maximum density as determined by AASHTO T 99, method C or D.

Determine density of the compacted material during the process of the work in accordance with AASHTO T 191, T 205, or T 238; and AASHTO T 217, T 239, or T 255. Corrections for coarse particles may be made in accordance with AASHTO T 224.

(c) Method C. Ensure a moisture content suitable for obtaining compaction. Compact each layer using compaction equipment designed for this purpose until visual displacement ceases.

Measurement

603.09 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

When DESIGNATED IN THE SCHEDULE OF ITEMS, measure backfill material adjacent to the pipe 300 mm horizontally and vertically from the outside dimensions of the pipe, with a deduction for the volume of the pipe along the full length of the backfill.

Payment

603.10 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will made under:

Pay Item		Pay Unit
603 (01)	_____-mm corrugated metal pipe, _____-mm thickness for steel or _____-mm thickness for aluminum, method _____	..... Meter

603 (02) _____-mm span, _____-mm rise corrugated metal pipe arch, _____-mm thickness for steel or _____ -mm thickness for aluminum, method _____ ..... Meter

603 (03) _____-mm metal end section ..... Each

603 (04) _____-mm span, _____-mm rise metal end section ..... Each

603 (05) _____-mm corrugated steel pipe, _____-mm thickness, method _____ ..... Meter

603 (06) _____-mm span, _____-mm rise corrugated steel pipe arch, _____-mm thickness, method _____ ..... Meter

603 (07) _____-mm steel end section ..... Each

603 (08) _____-mm span, _____-mm rise steel end section ..... Each

603 (09) _____-mm _____ -type _____ -coated corrugated steel pipe, _____-mm thickness, method _____ ..... Meter

603 (10) _____-mm _____ -type _____ -coated paved invert corrugated steel pipe, _____-mm thickness, method _____ ..... Meter

603 (11) _____-mm span, _____-mm rise _____-type _____ -coated corrugated steel pipe arch, _____-mm thickness, method _____ ..... Meter

603 (12) _____-mm _____ -type _____ -coated steel section end ..... Each

603 (13) _____-mm span, _____-mm rise _____-coated steel end section ..... Each

603 (14) _____-mm corrugated aluminum pipe, _____-mm thickness, method _____ ..... Meter

603 (15) _____-mm paved invert corrugated aluminum pipe, _____-mm thickness, method _____ ..... Meter

603 (16) _____-mm span, _____-mm rise corrugated aluminum pipe arch, _____-mm thickness, method _____ ..... Meter

603 (17) _____-mm aluminum end section ..... Each

603 (18) _____-mm span, _____-mm rise aluminum end section ..... Each

603 (19) Pipe elbow, _____-mm diameter, _____-mm thickness ..... Each

603 (20) Branch connection, _____-mm diameter, _____-mm thickness ..... Each

603 (21) Furnishing and placing backfill material for pipe ..... Cubic Meter

Section 603A—Concrete Pipe

Description

603A.01 Work. Furnish and install, or install only, concrete pipe and pipe appurtenances, including all bedding and backfilling required to complete the work.

Materials

603A.02 Requirements. Furnish materials that meet the requirements specified in the following subsections:

Nonreinforced Concrete Pipe	706.01
Precast Reinforced Concrete Box Sections	706.07
Reinforced Arch-Shaped Concrete Pipe	706.04
Reinforced Concrete Pipe	706.02
Reinforced D-Load Concrete Pipe	706.06
Reinforced Elliptical-Shaped Concrete Pipe	706.05
Watertight Gaskets	712.03

Furnish end sections constructed of the same material as the main section of the pipe.

Furnish bedding material that conforms to the requirements of Subsection 603A.04. Furnish backfill material that conforms to the requirements of Subsection 603A.06, or as SHOWN ON THE DRAWINGS.

The lengths and locations of individual pipe SHOWN ON THE DRAWINGS are approximate. Do not order pipe until culvert locations are designated on the ground and a written list of the correct lengths is approved by the CO.

Construction

603A.03 Excavation. Conduct excavation in accordance with the requirements are specified in Section 206A. Excavate the trench a minimum of 100 mm below grade.

Specific pipe installation time restrictions and installation plan requirements are SHOWN ON THE DRAWINGS.

603A.04 Bedding. Unless otherwise SHOWN ON THE DRAWINGS, backfill the trench with bedding material to grade. Extend bedding material to a minimum height

of one-sixth the pipe diameter above the bottom of the pipe, and compact it in accordance with Subsection 603A.06.

Bed pipe with select excavated material from the roadway in the vicinity of the pipe, or with material from the source SHOWN ON THE DRAWINGS. Use material that contains no rocks greater than 25 mm in size. Ensure that the bedding surface provides a foundation of uniform density and support throughout the entire length of the pipe; provides for camber as SHOWN ON THE DRAWINGS; and has recesses shaped to receive the bell, of the bell and spigot pipe.

603A.05 Placing & Joining. Do not place or backfill any pipe until the excavation and foundation have been approved by the CO and a suitable outlet has been constructed. Ensure that the bell or groove ends face upstream. Join the pipe section so that the inner surfaces are reasonably flush and even, and the ends are entered as required. Make joints with a cold applied bituminous mastic, with rubber, or with plastic ring gaskets, as SHOWN ON THE DRAWINGS. When using mastic material, fill the joints with the material prior to joining the pipe.

603A.06 Backfilling. Furnish readily compactible backfill material that is free from frozen lumps and chunks of highly plastic clay or other objectionable material. Use no rock larger than 75 mm in greatest dimension within 300 mm of the pipe.

Place backfill material at or near optimum moisture content, and compact it in layers not exceeding 150 mm loose thickness on both sides, and to an elevation of 300 mm above the top of the pipe. Thoroughly compact the backfill under the haunches of the pipe. Bring the backfill up evenly on both sides of the pipe for the full length. Make the width of backfill on each side of the pipe equal to the diameter of the pipe.

Compact the backfill to at least 95 percent of the maximum density, as determined by AASHTO T 99, method C or D, unless otherwise SHOWN ON THE DRAWINGS.

Determine density of the compacted material during the process of the work in accordance with AASHTO T 191, T 205, or T 238; and AASHTO T 217, T 239, or T 255. Corrections for coarse particles may be made in accordance with AASHTO T 224.

Ensure that the final installed alignment of all pipe allows no reverse grades, and does not permit horizontal and vertical alignments to vary from a straight line drawn from center of inlet to center of outlet by more than 2 percent of pipe center length or 300 mm, whichever is less.

Measurement

603A.07 Method
Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

When DESIGNATED IN THE SCHEDULE OF ITEMS, measure backfill material adjacent to the pipe 300 mm horizontally and vertically from the outside dimensions of the pipe, with a deduction for the volume of the pipe along the full length of the backfill.

Payment

603A.08 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item		Pay Unit
603A (01)	_____-mm reinforced concrete pipe, class _____	Meter
603A (02)	_____-mm span, _____-mm rise reinforced concrete pipe, class _____	Meter
603A (03)	_____-mm reinforced concrete end section	Each
603A (04)	_____-mm span, _____-mm rise reinforced concrete end section	Each
603A (05)	Furnishing and placing backfill material for pipe	Cubic Meter

Section 603B—Plastic Pipe

Description

603B.01 Work. Furnish and install, or install only, plastic pipe and pipe appurtenances, including all bedding and backfilling required to complete the work.

Materials

603B.02 Requirements. Furnish materials that meet the requirements specified in the following subsections:

Plastic Pipe 706.08
Watertight Gaskets 712.03

Furnish bedding material that meets the requirements specified in Subsection 603B.04, or as SHOWN ON THE DRAWINGS.

Furnish backfill materials that meet the requirements specified in Subsection 603B.06, or as SHOWN ON THE DRAWINGS.

The lengths and locations of individual pipe SHOWN ON THE DRAWINGS are approximate. Do not order pipe until culvert locations are designated on the ground and a written list of the correct lengths is approved by the CO.

Construction

603B.03 Excavation. Conduct excavation in accordance with the requirements specified in Section 206A. Excavate a minimum of 200 mm below the designed invert elevation.

Specific pipe installation time restrictions and installation plan requirements are SHOWN ON THE DRAWINGS.

603B.04 Bedding. Place bedding material in the excavated section, and compact the material to ensure a uniform foundation bed for the pipe.

As bedding material, use selected mineral soil that meets the requirements for backfill specified in Subsection 603B.06.

When SHOWN ON THE DRAWINGS, ensure that the completed bedding has a longitudinal camber.

603B.05 Placing & Joining. Join to form a watertight connection, when SHOWN ON THE DRAWINGS.

Protect portions of the pipe that will be exposed, when SHOWN ON THE DRAWINGS.

Ensure that the final installed alignment allows no reverse grades, and does not permit any point to vary from a straight line drawn from center of inlet to center of outlet by more than 2 percent horizontally and vertically of the culvert length, or 300 mm, whichever is less, unless otherwise SHOWN ON THE DRAWINGS.

603B.06 Backfilling. Furnish readily compactible backfill material that is free of frozen lumps and chunks of highly plastic clay (with a plasticity index greater than 10) or other objectionable material. Do not use rocks larger than 25 mm in greatest dimension within 300 mm of the pipe.

Place backfill material that is at or near optimum moisture content, and compact it in layers not exceeding 150 mm loose thickness on both sides, and to an elevation of 300 mm minimum above the top of the pipe. Thoroughly compact the backfill under the haunches of the pipe. Bring the backfill up evenly on both sides of the pipe for the full length. Extend the width of the compacted backfill a minimum of 300 mm on each side of the pipe.

Continue backfilling and compacting until the backfill is a minimum of 300 mm above the top of the culvert.

After bedding and backfilling the pipe, protect it with an adequate cover of embankment before heavy equipment is permitted to cross during roadway construction.

Replace any pipe that is distorted by more than 5 percent of nominal dimensions, or that is ruptured or broken.

Compact backfill using method A, B, or C, as DESIGNATED IN THE SCHEDULE OF ITEMS.

(a) Method A. Ensure that backfill density exceeds the density of the surrounding embankment.

(b) Method B. Ensure that backfill density exceeds 95 percent of the maximum density, as determined by AASHTO T 99, method C or D.

Determine density of the compacted material during the process of the work in accordance with AASHTO T 191, T 205, or T 238; and AASHTO T 217, T 239, or T 255. Corrections for coarse particles may be made in accordance with AASHTO T 224.

(c) Method C. Ensure a moisture content suitable for obtaining compaction. Compact each layer using compaction equipment designed for this purpose until visual displacement ceases.

Measurement

603B.07 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

When DESIGNATED IN THE SCHEDULE OF ITEMS, measure backfill material adjacent to the pipe 300 mm horizontally and vertically from the outside dimensions of the pipe, with a deduction for the volume of the pipe along the full length of the backfill.

Payment

603B.08 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item		Pay Unit
603B (01)	_____ -mm plastic pipe, method ____	Meter
603B (02)	Furnishing and placing backfill material for pipe	Cubic Meter

Section 605—Underdrains

Description

605.01 Work. Furnish and install underdrains, sheet drains, and pavement edge drains.

The term “metal” refers collectively to aluminum and steel.

Materials

605.02 Requirements. Furnish materials that meet the requirements specified in the following subsections:

Aluminum-Alloy Corrugated Pipe	707.03
Asphalt-Coated Pipe	707.04
Geocomposite Drains	714.02
Geotextile, Type I (A, B, C, D, E, or F)	714.01
Granular Backfill	703.03
Metallic-Coated Corrugated Steel Pipe	707.02
Perforated Concrete Pipe	706.03
Plastic Pipe	706.08
Repair of Damaged Coatings	707.15
Structural Backfill	704.04

Construction

605.03 General. Use the same material and coating on all contiguous drain sections, extensions, elbows, branch connections, and other special sections.

Type of backfill material and underdrain pipe material, orientation of geosynthetic material, and approximate location are SHOWN ON THE DRAWINGS. Determine the final location and length in the field.

Conduct excavation in accordance with the requirements specified in Section 206A.

If geotextile or geocomposite is used, smooth the trench surfaces by removing all projections that may damage the geotextile or geocomposite. Replace geotextile or geocomposite damaged during installation. Make repairs to geocomposites in accordance with the manufacturer’s recommendations.

Do not permit soil materials or other foreign matter to enter the drain systems. Plug the upgrade end of installations.

Backfill in 150-mm layers by first dampening the granular backfill and then compacting each layer with two or more passes of a mechanical tamper.

Furnish nonperforated pipe for outlet pipe. Install outlet pipe as specified in Sections 603, 603A, and 603B. Immediately place and secure a screen made of 1.4-mm-diameter galvanized wire with approximately 13 ∞ 13-mm mesh openings over the outlet ends of all exposed pipes and weep holes.

605.04 Underdrain & Trench. Place a layer of granular backfill at least 100 mm in thickness in the bottom of the trench.

Furnish a collector pipe at least 125 mm in diameter with all underdrains.

Join pipe sections securely with coupling fittings or bands. Join PVC and acrylonitrile-butadiene-styrene (ABS) pipe using either a flexible elastomeric seal or solvent cement. Join polyethylene pipe with snap-on, screw-on, or wrap-around coupling bands, as recommended by the manufacturer.

When underdrain is placed in drainages, prevent infiltration of surface water by placing material conforming to AASHTO M 145 classifications A-4, A-5, A-6, or A-7 in the top 300 mm of the trench.

(a) Standard Underdrain. When geotextile is required, place the long dimension of the geotextile parallel to the centerline of the trench. Position the geotextile, without stretching, such that it lies smoothly in contact with the trench surface. Overlap the joints a minimum of 600 mm with the upstream geotextile placed over the downstream geotextile.

Place collector pipe with the perforations down. Firmly embed the underdrain pipe in granular backfill material.

Place granular backfill to a height of 300 mm above the top of the collector pipe and compact. Do not displace the collector pipe. Place and compact the remainder of the granular backfill material as specified in Subsection 603.08, method A or B.

Fold the geotextile over the top of the granular backfill with a minimum overlap of 300 mm.

(b) Geocomposite Underdrain or Sheet Drain. Extend the geotextile from the bottom of the drainage core around the collector pipe.

Construct splices, joints, and outlet fittings as recommended by the manufacturer and in a manner that prevents infiltration of soil into the geocomposite core and does not impede flow through the geocomposite core or damage the core.

Place the assembled geocomposite in the trench with the geocomposite placed against the inflow side of the trench. If the trench wall is irregular such that flow along or through the geocomposite may be impeded, smooth the trench or place a layer of granular backfill between the geocomposite and the trench wall.

Temporarily support the drain against the trench side while backfilling.

When the trench is less than 0.5 m in width, backfill the trench using fine granular backfill. Except as otherwise indicated, backfilling in layers and compacting are not required. After the backfill is in place, densify by wheel rolling, vibrating, tamping with a mechanical tamper, or flooding with water.

When the trench is 0.5 m or more in width, place granular coarse or fine backfill to a height of 300 mm above the top of the collector pipe and compact the material. Finish backfilling the trench as indicated in Subsection 605.03.

605.05 Geocomposite Sheet Drain. Do not place sheet drain against a mortar course less than 4 days old.

When a geocomposite is used in conjunction with a waterproof membrane, install drainage panels compatible with the membrane using methods recommended by the membrane manufacturer. Assemble and place the geocomposite drain against the surface to be backfilled according to the manufacturer's recommendations.

Splice geocomposite drains so the flow across the edges is continuous. Overlap the geotextile a minimum of 75 mm in the direction of waterflow. For vertical splices, overlap the geotextile in the direction that backfill proceeds.

Connect the drainage core to the collector pipe or weep holes so the flow is continuous through the system. Extend the geotextile from the bottom of the drainage core around the collector pipe.

Backfill with structural backfill material, and compact it as specified in Subsection 605.03.

605.06 Geocomposite Pavement Edge Drain. Assemble the geocomposite pavement edge drain and outlet material according to the manufacturer's recommendations and place them in the trench. If the trench is irregular such that flow along or through the geocomposite may be impeded, smooth the trench or place a layer of fine granular backfill between the geocomposite and the trench wall.

Temporarily support the drain against the trench while backfilling.

When the trench is less than 0.5 m in width, backfill the trench using fine granular backfill. Backfilling in layers and compacting are not required. After the backfill is in place, densify by wheel rolling, vibrating, tamping with a mechanical tamper, or flooding with water.

When the trench is 0.5 m or more in width, place coarse or fine backfill to a height of 300 mm above the top of the collector pipe and compact. Finish backfilling the trench as indicated in Subsection 605.03.

When underdrain is placed in drainages, prevent infiltration of surface water by placing material conforming to AASHTO M 145 classifications A-4, A-5, A-6, or A-7 in the top 300 mm of the trench.

Measurement

605.07 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Measure geotextile material on surface area covered according to the dimensions, as SHOWN ON THE DRAWINGS.

Payment

605.08 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item		Pay Unit
605 (01)	Standard underdrain system	Meter
605 (02)	Geocomposite underdrain system	Meter
605 (03)	Geocomposite sheet drain system	Square Meter
605 (04)	Geocomposite pavement edge drain system	Meter
605 (05)	_____-mm collector pipe	Meter
605 (06)	_____-mm outlet pipe	Meter

605 (07) Coarse granular backfill ..... Cubic Meter

605 (08) Fine granular backfill ..... Cubic Meter

605 (09) Geotextile material ..... Square Meter

605 (10) Structural backfill ..... Cubic Meter

Section 606—Guardrail

Description

606.01 Work. Construct guardrail systems, and/or modify, remove, reset, and/or raise existing guardrail systems.

(a) Guardrail systems are designated as follows:

G1	Cable guardrail
G2	W-beam (weak post)
G3	Box beam
G4	Blocked-out W-beam standard barrier
G9	Blocked-out thrie-beam standard barrier
MB4	Blocked-out W-beam median barrier
SBTA	Steel-backed timber guardrail/timber posts and blockout
SBTB	Steel-backed timber guardrail/timber posts and no blockout
CRT	W-beam guardrail and no blockout
STLG	Steel-backed log rail

(b) Steel guardrail types are designated as follows:

I Zinc-coated, 550 g/m^2
II Zinc-coated, 1,100 g/m^2
III Painted rails
IV Corrosion-resistant steel

(c) Steel guardrail classes are designated as follows:

A Metal thickness—2.67 mm
B Metal thickness—3.43 mm

(d) Terminal section types are designated as follows:

BCT	Breakaway cable terminal
CRT	Cable releasing terminal
MELT	Modified eccentric loader terminal
G4–BAT	Back slope anchor terminal

Materials

606.02 Requirements. Furnish materials that meet the requirements specified in the following section and subsections:

Box Beam Rail	710.07
Corrosion-Resistant Steel Rail	710.06(b)
Galvanized Steel Rail	710.06(a)
Guardrail Hardware	710.10
Guardrail Hardware (Reflector Tabs)	710.10
Guardrail Posts	710.09
Minor Concrete Structures	602
Precast Concrete Units (Precast Anchors)	725.11
Retroreflective Sheeting, Type I or Type II	718.01
Steel-Backed Timber Rail	710.08
Treated Structural Timber & Lumber	716.03
Welding	555.18
Wire Rope or Wire Cable	709.02

Construction

606.03 Posts. When pavement is within 1 m of the guardrail, set posts before placing the pavement.

Do not shorten guardrail posts unless the cut end is set in concrete. Do not shorten posts in terminal sections.

Drive posts into pilot holes that are punched or drilled. The dimensions of the pilot hole shall not exceed the dimensions of the post by more than 15 mm. Set posts plumb, backfill, and compact in accordance with Subsection 206A.10.

When longer posts are specified, do not use them in the terminal sections.

Alternate hole arrangements, when specified, do not apply to posts in the anchorage assembly.

Protect posts from traffic at all times by attaching rail elements and all associated hardware, or by other approved methods.

606.04 Rail Elements. Install the rail elements after the pavement adjacent to the guardrail is complete. Do not modify specified hole diameters or slot dimensions. Install guardrail systems of the type and class SHOWN ON THE DRAWINGS.

(a) Steel Rail. Shop bend all curved guardrail with a radius of 45 m or less.

Erect rail elements in a smooth continuous line with the laps in the direction of traffic flow. Use bolts that extend at least 6 mm, but not more than 25 mm beyond the nuts. Tighten all bolts.

Paint all scrapes on galvanized surfaces that are through to the base metal with two coats of zinc-oxide paint.

Where installation of the rail elements interferes with paving operation, rail elements may be temporarily attached directly to the posts without blockouts. Install blockouts within 15 days following the paving operation. Securely bolt a type 1 end section assembly to the last post at the end of each day on guardrail sections that have an exposed end toward oncoming traffic. Diaphragms are optional in the end section assembly.

(b) Timber Rail. Align timber guardrail along the top of the rail.

Field cut timber rails to produce a close fit at joints. Treat field cuts with two coats of the preservative originally used for treatment.

(c) Log Rail. Construct log rail as SHOWN ON THE DRAWINGS.

606.05 Terminal Sections. Construct terminal sections at the locations shown. Terminal sections consist of posts, railing, hardware, and anchorage assembly necessary to construct the type of terminal section specified.

Where concrete anchors are installed, construct either cast-in-place or precast units. Do not connect the guardrail to cast-in-place anchors until the concrete has cured 7 days. Install end anchor cables tightly, without slack.

Use either the steel tube anchor or the concrete anchor in the construction of the anchorage assembly for the type BCT terminal section.

When required, construct earth berms as specified in Section 203.13.

606.06 Connection to Structure. Construct connection to structure and, where required, reinforced concrete transition as SHOWN ON THE DRAWINGS.

606.07 Removing & Resetting Guardrail. Remove and store the existing guardrail, posts, and appurtenances. Remove and dispose of posts that are set in concrete. Replace all guardrail, posts, and hardware damaged during removal, storage, or resetting. Backfill all holes resulting from the removal of guardrail posts and anchors with granular material as specified in Subsection 206A.10.

606.08 Raising Guardrail. Remove the existing guardrail and appurtenances. Replace and reset posts as needed. Replace all guardrail, posts, and hardware damaged during the removal and raising.

Measurement

606.09 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Measure guardrail, except steel-backed timber guardrail and steel-backed log rail, by the meter along the face of the rail, excluding terminal sections. Measure steel-backed timber guardrail and steel-backed log rail by the meter along the face of the rail, including terminal sections. Measure transition sections from G9 rail to G4 rail as G9 rail.

Measure terminal sections, except steel-backed timber guardrail terminal sections and steel-backed log rail terminal sections, by the each.

Measure removing and resetting guardrail and raising guardrail by the meter along the face of the rail, including reset terminal sections.

Measure replacement posts (except replacement posts for posts damaged by construction operations) used in removing, resetting, or raising guardrail by the each.

Measure reinforced concrete flared back parapet wall and safety shape transition by the each.

Payment

606.10 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item		Pay Unit
606 (01)	Guardrail system ____, type ___, class ___	Meter
606 (02)	Terminal section, _____ ..... *Description*	Each
606 (03)	Removing and resetting guardrail	Meter
606 (04)	Raising guardrail	Meter
606 (05)	Replacement posts	Each
606 (06)	Connection to structure	Each
606 (07)	Reinforced concrete transition	Each

Section 607—Fences, Gates, & Cattleguards

Description

607.01 Work. Furnish and install, or install only, fences, gates, and cattleguards.

Materials

607.02 Requirements. Furnish materials that meet the requirements specified in the following sections and subsections:

Barbed Wire	710.01
Chain Link Fence	710.03
Fence Posts	710.04
Material for Timber Structures	716
Precast Concrete Units	725.11
Reinforcing Steel	709.01
Structural Metal	717
Timber Rails	710.13
Woven Wire	710.02

Furnish materials for gates and cattleguards that meet the requirements as SHOWN ON THE DRAWINGS. Concrete for cattleguard units may be cast-in-place or precast. Furnish concrete that meets the requirements specified in Subsection 602.03, method A or B, as SHOWN ON THE DRAWINGS.

Construction

607.03 Fences & Gates. Remove trees, brush, and other obstacles along the fence line that interfere with the fence. Do not perform continuous grubbing or grading along the fence line. Where possible, erect the fence on natural ground. Establish clearing width and dispose of materials as SHOWN ON THE DRAWINGS.

When drilling into solid rock is required to set a post, the post may be shortened, provided a minimum of 300 mm of post is grouted into the rock.

Where breaks in a run of fencing are required, or at intersections with existing fences, adjust post spacing to meet the requirements for the type of closure.

When posts, braces, or anchors are to be embedded in concrete, install temporary guys or braces as required to hold the posts in proper position until the concrete has set. Install no materials on posts, and place no strain on guys and bracing set in concrete, until 7 days have elapsed from the time the concrete was placed.

Set all posts vertically and to the grade and alignment SHOWN ON THE DRAWINGS. Do not cut tops of posts unless approved by the CO.

Stretch wire or fencing taut, and firmly attach it to the posts and braces, as SHOWN ON THE DRAWINGS.

At each location where a high-voltage overhead electric transmission line crosses a fence containing metal, ground the fencing by installing a galvanized or copper-coated steel grounding rod 2.5 m long, with a minimum diameter of 13 mm, directly below the point of crossing. Drive the rod vertically until the top is 150 mm below the ground surface. Use a number 6 solid copper conductor or equivalent to connect each metal fence element to the grounding rod. Braze the connections or fasten them with noncorrosive clamps approved by the CO.

When a powerline is within 150 m and runs parallel or nearly parallel to the fence, ground the fence at each end, at gate posts, and at intervals not to exceed 450 m.

When acceptable vertical penetration of the grounding rod cannot be obtained, submit an equivalent horizontal grounding system for approval by the CO.

Ensure that the bottom of the fence fabric generally follows the contour of the ground. Grade where necessary to provide a neat appearance. Where abrupt changes in the ground profile make it impractical to maintain the specified ground clearance, longer posts may be used and multiple strands of barbed wire stretched between them. Make the vertical spacing between strands of barbed wire 150 mm, unless otherwise SHOWN ON THE DRAWINGS. At grade depressions, where stresses tend to pull posts from the ground, install sag bracing, as SHOWN ON THE DRAWINGS.

Splice wire as SHOWN ON THE DRAWINGS.

Repair all posts in accordance with approved procedures after cutting or drilling.

607.04 Cattleguards. Complete work required under Section 203 or 306 at the location of the cattleguard before beginning excavation for the cattleguard. Install the cattleguard at the grade elevation that is SHOWN ON THE DRAWINGS or as staked on the ground. Provide drainage at time of installation so the cattleguard will drain. Construct the bypass and gate as SHOWN ON THE DRAWINGS.

Conduct excavation and backfill in accordance with Section 206A.

After cattleguard is bedded, place selected material in layers not exceeding 150 mm loose thickness, uniformly compacted on all sides, along the cattleguard. Use readily compactible backfill material that is free of frozen lumps, chunks of highly plastic clay, or other objectionable material. Compact the backfill without damaging or

displacing the cattleguard. Continue backfilling and compacting to the top of the cattleguard foundation.

Raise cattleguards by modifying the cattleguard base as SHOWN ON THE DRAWINGS. Replace or recondition cattleground wings, posts, or decks as SHOWN ON THE DRAWINGS.

After bedding and backfilling, protect the cattleguard with adequate ramps on each side before heavy equipment is permitted to cross during roadway construction.

Measurement

607.05 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Measure the length of the fence along the top of the fence between the outsides of the end posts for each continuous run of fence.

When brace panels and bypass gates are SHOWN ON THE DRAWINGS, payment for cattleguards will include these items.

Payment

607.06 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item		Pay Unit
607 (01)	Cattleguard, _____ foundation, loading _____, width _____	Each
607 (02)	Fence _____, type _____, height _____	Meter
607 (03)	Gate _____, type _____, size _____	Each
607 (04)	Cattleguard modification	Each
607 (05)	Recondition	Each
607 (06)	Replace	Each

Section 609—Curb or Curb & Gutter

Description

609.01 Work. Construct or reset curb, gutter, or combination curb and gutter.

Materials

609.02 Requirements. Furnish materials that meet the requirements specified in the following sections and subsections:

Aggregate for Lean Concrete Backfill	703.13
Curing Material	711.01
Emulsified Asphalt (for Tack Coat)	702.03
Joint Mortar	712.02
Precast Concrete Curbing	725.06
Reinforcing Steel	709.01
Sealants, Fillers, Seals, & Sleeves	712.01
Stone Curbing	705.06

Furnish concrete that meets the requirements of Subsection 602.03, method A or B, as SHOWN ON THE DRAWINGS.

Furnish bituminous mixtures that meet the requirements as SHOWN ON THE DRAWINGS or in the SPECIAL PROJECT SPECIFICATIONS.

Concrete, bituminous mixes, and manufactured curbing materials will be subject to inspection and tests at the plants for compliance with quality requirements.

Construction

609.03 Cast-in-Place Portland Cement Concrete Curbing or Curb & Gutter. For cast-in-place Portland cement concrete curbing or curb and gutter, meet the requirements in the following subsections:

(a) Excavation. Excavate to the depth SHOWN ON THE DRAWINGS. Compact the foundation to a firm, even surface. Remove all soft, yielding material and replace it with acceptable material.

(b) Forms. Use forms of wood, metal, or other suitable material and extend them to the full depth of the concrete. Ensure that all forms are straight, free of warp, and of sufficient strength to resist the pressure of the concrete without displacement. Brace and stake the forms to keep them in both horizontal and vertical alignment until their

removal. Clean all forms and coat them with an approved form-release agent before concrete is placed. Use divider plates made of metal. After the forms have been set to line and grade, bring the foundation to the grade required, and wet it well approximately 12 hours before placing the concrete. Machine slip forming may be used.

(c) Mixing & Placing. Proportion, mix, and place the concrete in accordance with the requirements specified in Subsection 602.03, method A or B, and as SHOWN ON THE DRAWINGS. Deposit the concrete without segregation in a single course. Use vibration or other acceptable methods to consolidate concrete placed in the forms. Leave forms in place for 24 hours or until the concrete has set sufficiently so that forms can be removed without damage to the curbing. Strike off the concrete to the cross section SHOWN ON THE DRAWINGS, then finish the concrete smooth and even by means of a wooden float.

For the purpose of matching adjacent concrete finishes or for other reasons, the CO may permit other methods of finishing. No plastering shall be permitted.

(d) Contraction Joints. Construct curbing in sections of a uniform length of 3 m, unless otherwise approved by the CO. Separate sections by open joints approximately 3 mm wide and at least 25 mm deep, except at expansion joints. Where the curb is constructed adjacent to concrete pavement, match the contraction or open joints in the curb to the contraction joints in the pavement.

(e) Expansion Joints. Form expansion joints at the intervals SHOWN ON THE DRAWINGS using a preformed expansion joint filler with a thickness of 13 mm. When the curb is constructed adjacent to or on concrete pavement, locate expansion joints at expansion joints in the pavement.

(f) Curing. Immediately upon completion of the finishing, moisten the curb and keep it moist for 3 days, or use membrane-forming material to cure the curbing. Ensure that all materials meet the requirements specified in Subsection 711.01.

(g) Backfilling. After the concrete has set sufficiently, backfill the curb to the required elevation with suitable material, and compact the material in accordance with Subsection 203.16(b), method 4, in layers of not more than 150 mm loose thickness.

(h) Curb Machine. The curb or curb and gutter may be constructed using a curb-forming machine that meets the requirements of Subsection 609.06(c).

(i) Curb Template. Exposed curb face may be constructed and finished using trowel-type templates shaped to produce the desired contours when operated along approved forms set to the established lines and grades.

While the concrete is green, float the top, front, or other exposed surfaces of the curb or combined curb and gutter with a moist wooden float. Remove form marks and any other irregularities.

609.04 Precast Concrete Curbing. Set the curb so that the top surfaces of adjoining sections are true and even. Fill all spaces under the curbing with material that meets the requirements of the material for bed course, and compact this material.

609.05 Reflecting Concrete Curbing. Use construction methods for this item that meet the requirements specified in Subsection 609.03, with the following exceptions:

(a) Use a mortar mix consisting of one part white Portland cement to 1.75 parts light-colored washed mortar sand to create the reflecting surface of the curbing. Make this mortar mix approximately 25 mm thick.

(b) Alternatively, construct the entire curbing of concrete with white Portland cement.

Use washed mortar sand that meets all the requirements for mortar sand and is light in color. Place the reflecting surface mortar immediately after the base concrete. Never let more than 20 minutes elapse between placing the base concrete and the reflecting surface.

Perform scoring or surface deformation and finishing of the reflecting surface in accordance with the details SHOWN ON THE DRAWINGS.

609.06 Bituminous Concrete Curbing. For bituminous concrete curbing, meet the requirements in the following specifications:

(a) Excavation. Excavate as specified in Subsection 609.03(a).

(b) Preparation of Bed. When curbing is to be constructed on a cured or aged Portland cement concrete base, on bituminous pavement, or on a bituminous-treated base, thoroughly sweep the bed and clean it using compressed air. Thoroughly dry the surface, and immediately before placing the bituminous mixture, apply a tack coat of bituminous materials of the type and grade SHOWN ON THE DRAWINGS. Apply the tack coat material at a rate between 0.23 and 0.68 L/m^2 of surface area. Prevent the tack coat from spreading to areas outside of the area to be occupied by the curb.

(c) Placing. Construct bituminous curbing using a self-propelled automatic curber or curb machine, or a paver with curbing attachments. Use an automatic curber or machine that meets the following requirements:

(1) The weight of the machine must provide compaction without the machine riding above the bed on which curbing is constructed.

(2) The machine must form curbing of uniform texture, shape, and density.

(3) The construction of curbing by means other than the automatic curber or machine is acceptable when short sections or sections with short radii are required. Ensure that the resulting curbing conforms in all respects to the curbing produced by using the machine.

Place the mixture only when the bed is dry and weather conditions are suitable for properly handling and finishing the mixture.

Place the bituminous mixture at a workable temperature of not less than 105 °C. Place the curbs to an accurate alignment and with a high density such that material is free of honeycombs. When joining to a section of curb that has become cold, give the contact surface of the cold curb a thin uniform tack coat of bituminous material prior to placing the fresh bituminous mixture against the cold joint. Protect the curb from traffic using barricades or other suitable methods until the curb has hardened.

(d) Painting & Sealing. Seal or paint only on a curbing that is clean and dry and has reached an ambient temperature.

(e) Backfilling. Backfill as specified in Subsection 609.03(g).

609.07 Resetting Curb. In resetting curb, meet the requirements in the following specifications.

(a) Salvage of Curbing. Carefully remove, store, and clean curbing that is specified for resetting. Replace any curbing to be reset that is lost from storage or damaged through improper handling.

(b) Excavation. Excavate and provide bedding as specified in Subsection 609.03(a).

(c) Resetting Curb. Set the curb on a firm bed with the top surface of adjoining sections true and even. Set all sections of curbing so that the maximum opening between adjacent sections is not more than 19 mm wide for the entire exposed top and face. Dress the ends of the curbing as necessary to meet this requirement.

After the curb has been set, completely fill the joints with mortar as SHOWN ON THE DRAWINGS.

(d) Backfilling. Backfill the curb with suitable material to the required elevation. Thoroughly tamp backfill material in layers of not more than 150 mm loose thickness.

(e) Cutting & Fitting. Cut or fit as necessary to install the curbing.

Measurement

609.08 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Measure curbing along the front face of the section at the finished grade elevation. Measure the length of combination curb and gutter along the face of the curb. Make no deduction in length for drainage structures installed in the curbing section, or for driveway openings where the gutter is carried across the drive.

Payment

609.09 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item		Pay Unit
609 (01)	Portland cement concrete curb, _____ -mm depth, type _____	Meter
609 (02)	Portland cement concrete gutter, type _____	Meter
609 (03)	Portland cement concrete curb and gutter, _____ -mm depth, type _____	Meter
609 (04)	Bituminous concrete curb, _____ -mm depth	Meter
609 (05)	Reset curb	Meter
609 (06)	Bed course material	Ton
609 (07)	Bed course material	Cubic Meter

Section 610—Stone Masonry Structures

Description

610.01 Work. Construct stone masonry structures and stone masonry portions of composite structures.

610.02 Classes of Masonry. The class of masonry required for each part of a structure will be SHOWN ON THE DRAWINGS.

(a) *Cement rubble masonry* shall consist of roughly dressed stones of various sizes and shapes laid in random courses in cement mortar.

(b) *Class A and class B masonry* shall consist of stones shaped, dressed, and laid broken-coursed in cement mortar.

(c) *Dimensioned masonry* shall consist of broken-coursed ashlar masonry composed of stones with two or more dimensions SHOWN ON THE DRAWINGS.

Materials

610.03 Stone. Furnish stone that is sound and durable. Use stone for dimensioned masonry that is free of reeds, rifts, seams, laminations, and minerals that, by weathering, would cause discoloration or deterioration.

(a) Sizes & Shapes. Furnish stones in the sizes and face areas necessary to produce the general characteristics and appearance SHOWN ON THE DRAWINGS.

In general, furnish stones with a thickness of not less than 125 mm, a width not less than 300 mm and one and one-half times the thickness of the stones, and a length not less than one and one-half times their width. Where headers are required, use stones with lengths not less than the width of the bed of the widest adjacent stretcher, plus 300 mm.

Ensure that at least 50 percent of the total volume of the masonry is made up of stones with a volume of at least 0.03 m^3 each.

(b) Dressing. Dress the stone to remove any thin or weak portions. Dress face stones to provide bed and joint lines with a maximum variation from true line as follows:

Type of Masonry	Maximum Variation
Cement rubble masonry	37 mm
Class A masonry	19 mm
Class B masonry	6 mm
Dimensioned masonry	Reasonably true

(c) Bed Surfaces. Ensure that bed surfaces of face stones are normal to the faces of the stones for about 75 mm. From this point, they may depart from normal, not to exceed 25 mm in 300 mm for dimensioned masonry, and 50 mm in 300 mm for all other classes.

(d) Joint Surfaces. In all classes of masonry except dimensioned masonry, construct joint surfaces of face stones to form an angle with the bed surfaces of not less than 45°.

In dimensioned masonry, ensure that joint surfaces are normal to the bed surfaces, and normal to the exposed faces of the stone for at least 50 mm. From this point, they may depart from normal by not more than 25 mm in 300 mm.

Do not round the corners at the meeting of the bed and joint lines in excess of the following radii:

Type of Masonry	Dimensions
Cement rubble masonry	37 mm
Class A masonry	25 mm
Class B masonry	No rounding
Dimensioned masonry	No rounding

(e) Arch Ring Stone Joint Surfaces. Ensure that arch ring stone joint surfaces are radial and at right angles to the front faces of the stones. Dress them for a distance of at least 75 mm from the front faces and soffits. From these points, they may depart from a plane normal to the face, not to exceed 19 mm in 300 mm. Ensure that the back surface is in contact with the concrete of the arch barrel parallel to the front face, and dress it for a distance of 150 mm from the intrados. Cut the top perpendicular to the front face, and dress it for a distance of at least 75 mm from the front.

When concrete is to be placed after the masonry has been constructed, place adjacent ring stones to vary at least 150 mm in depth.

(f) Stratification. Ensure that stratification in arch ring stones is parallel to the radial joints, and in other stones parallel to the beds.

(g) Finish for Exposed Faces. Pitch face stones to the line along all beds and joints. The kind of finish for exposed faces will be SHOWN ON THE DRAWINGS. The following symbols will be used, representing the type of surface or dressing specified below:

(1) Fine Pointed (F.P.). Make the point depressions approximately 10 mm apart with surface variation not to exceed 3 mm from the pitch line.

(2) Medium Pointed (M.P.). Make the point depressions approximately 15 mm apart with surface variations not to exceed 6 mm from the pitch line.

(3) Coarse Pointed (C.P.). Make the point depressions approximately 25 to 31 mm apart, with surface variations not to exceed 10 mm from the pitch line.

(4) Split or Seam Faced (S.). Make the surface present a smooth appearance without tool marks, without depressions below the pitch line, and with no projection exceeding 19 mm beyond the pitch line.

(5) Rock Faced (R.F.). Make the face an irregular, projecting surface without indications of tool marks, without concave surfaces below the pitch line, and with projections beyond the pitch line, when measured in millimeters, not exceeding the figure preceding the symbol as SHOWN ON THE DRAWINGS (for example, "37 R.F." means projections beyond the pitch line not exceeding 37 mm). Where a variable rock face is specified, distribute stones of the same height of projection.

Removal of drill and quarry marks from the faces of stones in cement rubble masonry shall not be required.

610.04 Quarry Operations. Organize quarry operations and delivery of stone to the point of use to ensure that deliveries are well ahead of masonry operations. Keep a sufficiently large stock of stone on the site at all times to permit adequate selection of stone by the masons.

610.05 Mortar. Use mortar that meets the requirements specified in Subsection 712.05.

Construction

610.06 Excavation & Backfill. Excavate and backfill as specified in Section 206A, modified as follows:

For filled spandrel arches, carefully place the backfill to load the ring uniformly and symmetrically. Use backfill material approved by the CO. Place it in horizontal layers, carefully tamp it, and bring it up simultaneously from both haunches. Do not place wedge-shaped sections of backfill material against spandrels, wings, or abutments.

610.07 Falsework. Construct arch centering in accordance with construction drawings submitted. Provide wedges for raising or lowering the forms to the exact elevation for taking up any settlement that occurs during loading. Lower the centering gradually and symmetrically to avoid overstresses in the arch.

Rest centering upon jacks in order to take up and correct any slight settlement that may occur after the placing of masonry has begun. In general, strike the centering and make the arch self-supporting before the railing or coping is placed. For filled spandrel arches, leave these portions of the spandrel walls for construction subsequent to the striking of centers as necessary to avoid jamming of the expansion joints.

610.08 Sample Section. When SHOWN ON THE DRAWINGS, build an L-shaped sample section of wall not less than 1.5 m high and 2.5 m long, showing examples of face wall, top wall, method of turning corners, and method of forming joints. The sample section will be subject to the CO's approval. Do not lay any masonry other than the foundation masonry before such samples are approved.

610.09 Arch Ring Template. Lay out a full-size template of the arch ring near the quarry site, showing face dimensions of each ring stone and thickness of joints. Do not begin shaping any ring stone before the template is approved by the CO, and do not place any ring stone in the structure that does not correspond to approved configuration.

610.10 Selection & Placing. When the masonry is to be placed on a prepared foundation bed, make the bed firm and normal to, or in steps normal to, the face of the wall. Do not place any stone before the bed is approved by the CO. When stone is to be placed on foundation masonry, thoroughly clean the bearing surface of this masonry thoroughly and wet it immediately before the mortar bed is spread.

Set face stones in random bond to produce the effect SHOWN ON THE DRAWINGS and to correspond with the sample section approved by the CO.

Prevent small stones or stones of the same size from bunching. When weathered or colored stones or stones of varying texture are used, uniformly distribute the various kinds of stones throughout the exposed faces of the work. Use large stones for the bottom courses and large selected stones in the corners. In general, ensure that the stones decrease in size from the bottom to the top of work.

Thoroughly clean all stones and wet them immediately before they are set. Clean and moisten the bed before the mortar is spread. Lay the stones with their longest faces horizontal in full beds of mortar, and flush the joints with mortar.

610.11 Beds & Joints. Ensure that the exposed faces of individual stones are parallel to the faces of the walls in which the stones are set.

Do not jar or displace stones already set. Provide equipment for setting stones larger than those that can be handled by two people. Do not roll or turn stones on the walls. If a stone is loosened after the mortar has taken initial set, remove it, clean off the mortar, and relay the stone with fresh mortar.

Carefully set arch ring stone to exact positions, and hold the stone in place with hardwood wedges until the joints are packed with mortar.

Ensure that the thickness of beds and joints of face stones are as follows:

Type of Masonry	Beds	Joints
Cement rubble masonry	12–62 mm	12–62 mm
Class A masonry	12–50 mm	12–50 mm
Class B masonry	12–50 mm	12–37 mm
Dimensioned masonry	(See note)	19–25 mm

Note: The thickness of beds in dimensioned masonry may vary from 19 to 25 mm from the bottom to the top of the work. However, make the beds of uniform thickness throughout in each course.

Do not allow beds to extend in an unbroken line across more than 5 stones, and joints across more than 2 stones.

Make joints in dimensioned masonry vertical. In all other masonry, joints may be at angles with the vertical from 0° to 45°.

Bond each face stone with all contiguous face stones at least 150 mm longitudinally and 50 mm vertically.

Do not make the corners of four stones adjacent to each other.

Make cross beds for vertical walls level. For battered walls, cross beds may vary from level to normal to the batter line of the face of the wall. Completely fill all arch ring joints with mortar.

610.12 Headers. Uniformly distribute headers throughout the walls of structures to form at least one-fifth of the faces.

610.13 Backing. Build the backing chiefly of large stones and in a workmanlike manner. Ensure that the individual stones composing the backing and hearting are well bonded with the stones in the face wall and with each other. Completely fill all openings and interstices in the backing with mortar, or with spalls completely surrounded by mortar.

610.14 Coping. Prepare copings as SHOWN ON THE DRAWINGS. If copings are not SHOWN ON THE DRAWINGS, finish the top of the wall with stones wide enough to cover the top of the wall, from 0.5 to 1.5 m in length, and of random heights, with a minimum height of 150 mm. Lay stones so the top course is an integral part of the wall. Align the tops of the top courses of stone in both vertical and horizontal planes.

610.15 Parapet Walls. Use selected stones, squared and pitched to line and with heads dressed, in the ends of parapet walls and in all exposed angles and corners. Interlock headers well, and extend as many as possible entirely through the wall. Ensure that both the headers and stretchers in the two faces of the wall are well interlocked in heart and comprise practically the whole volume of the wall. Completely fill all interstices in the wall with cement grout, or with spalls completely surrounded with mortar or grout.

610.16 Facing for Concrete. Construct the stone masonry before placing concrete. Concrete may be placed before constructing the stone masonry if approved by the CO.

(a) Stone Masonry Constructed Prior to Placing Concrete. Ensure that hooked steel anchors, consisting of number 4 bars each bent into an elongated “S” shape, are spaced 600 mm apart both horizontally and vertically, unless closer spacing is SHOWN ON THE DRAWINGS. To improve the bond between the stone masonry and the concrete backing, make the back of the former as uneven as the stones will permit. Rigidly embed each anchor in a horizontal joint of the masonry, with one end 50 mm from the faces of the stones. Project the other end approximately 250 mm into the concrete hacking.

When the stone facing has been laid and the mortar has attained sufficient strength, carefully clean all surfaces against which concrete is to be placed and remove all

dirt, loose material, and accumulations of mortar droppings. If necessary, use picks, scrapers, and wire brooms for this purpose. If compressed air is available, use it to blow out the dust and dirt. Just before the concrete is placed, wash the surfaces thoroughly. Forcibly dash water against the stones and into the joints, preferably using a hose. In depositing concrete, hold the top surface immediately adjacent to the stones, slightly low, and carry a neat cement grout of the consistency of cream on top of the concrete and against the masonry at all times, coating the entire exposed areas of all the stones with grout. Fill all interstices of the masonry, and thoroughly spade the concrete, working it until it is brought into intimate contact with every part of the back of the masonry.

(b) Concrete Placed Before Constructing Masonry. Except where otherwise SHOWN ON THE DRAWINGS, allow a thickness of 225 mm for facing. Set galvanized metal slots with anchors for the stone work, or other approved type of metal anchor, vertically in the concrete face at a horizontal spacing of no more than 600 mm. Temporarily fill the slots with felt or other material to prevent them from being filled with concrete. During the setting of the stone facing, fit the metal anchors tightly in the slots at an average vertical spacing of 600 mm. The CO will mark on the concrete backing the approximate location of the anchors. Place the anchor in the stone joint nearest to the mark. Ensure that at least 25 percent of the metal anchors have a short right-angle bend to engage a recess to be cut into the stone. Extend the anchors to within 75 mm of the exposed face of the stone work.

Where the shape of the concrete face is unsuitable for the use of metal slots, place ties consisting of U.S. Standard Gauge number 9 galvanized iron wire, as approved by the CO, with not less than one wire tie for each 0.14 m^2 of exposed stone surface. In laying the stone, continuously keep the concrete face wet for 2 hours before placing the stone, and thoroughly fill all spaces between the stone and concrete with mortar. Immediately after laying, clean all exposed stone surfaces, and keep them clean of loose mortar and cement stains.

610.17 Pointing. Point or finish all joints as SHOWN ON THE DRAWINGS.

When raked joints are called for, rake out all mortar in exposed faced joints and beds to the depth SHOWN ON THE DRAWINGS. Clean stone faces in the joints free of mortar.

When weather joints are called for, weather strike the bed. Slightly rake the joints to conform to the bed weather joint. Never make the mortar flush with the faces of the stones.

To provide drainage, slightly crown the mortar in joints on top surfaces at the center of the masonry.

610.18 Weep Holes. Provide all walls and abutments with weep holes, as SHOWN ON THE DRAWINGS.

610.19 Cleaning Exposed Faces. Immediately after being laid and while the mortar is fresh, thoroughly clean all face stone of mortar stains, and keep it clean until the work is completed. Before the final acceptance, clean the surface of the masonry using wire brushes and acid, if necessary.

610.20 Weather Limitations. Do not lay stone in freezing weather unless the CO approves in writing, and then only using precautionary methods prescribed for doing the work and protecting it at all times. This permission and the use of the prescribed methods shall not release the Contractor from the obligation to build a satisfactory structure. Remove and replace all work damaged by cold weather. In hot or dry weather, use satisfactory means to protect the masonry from the sun, and keep it wet for at least 3 days after completion.

Measurement

610.21 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Do not include sample sections of wall, unless they are permitted to be incorporated in the work.

When computing quantities, use the dimensions determined by the lines SHOWN ON THE DRAWINGS. Make no deductions for weep holes, drain pipes, or other openings of less than 0.2 m^2 in area, or for chamfers or other ornamental cuts that amount to 5 percent or less of the volume of the stone in which they occur.

Payment

610.22 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item		Pay Unit
610 (01)	Cement rubble masonry	Cubic Meter
610 (02)	Class A masonry	Cubic Meter
610 (03)	Class B masonry	Cubic Meter
610 (04)	Dimensioned masonry	Cubic Meter

Section 610A—Simulated Stone Masonry Surface

Description

610A.01 Work. Design, furnish, and install textured form liners. Apply a surface finish (color/stain application) that will duplicate the unique coloring and mottled appearance of stone masonry. Prepare a simulated stone masonry test wall and demonstrate the surface finish before beginning production work.

In accordance with the intent of the contract, simulate the texture and color of native stone masonry. Construct the simulated stone masonry stone pattern as SHOWN ON THE DRAWINGS.

Materials

610A.02 Requirements. Furnish material as specified in the following subsections:

Form Liner	725.26
Low-Strength Grout (Plaster Mix)	701.03(b)
Penetrating Stain	708.05
Preformed Expansion Joint Fillers	712.01(b)

Construction

610A.03 Form Liner Fabrication. Take an impression of the stone shape, texture, and mortar joints from a designated location. Design form liners from the impressions according to the stone pattern, as SHOWN ON THE DRAWINGS.

610A.04 Form Liner Installation. Attach the form liners to the form. Attach adjacent form liners to each other, with less than a 3-mm seam. Do not repeat the form liner pattern between expansion joints or within 6-m intervals, whichever is greater.

Form expansion joints at the intervals as SHOWN ON THE DRAWINGS. Blend the butt joints into the pattern and the final concrete surface.

Coordinate the forms with wall ties. Place form tie holes in the high point of rustication or in the mortar joint.

Clean off buildup before reusing form liners. Visually inspect each liner for blemishes and tears. Repair the liner before installation.

610A.05 Top Surface. Emboss the plastic concrete in the exposed top surface by stamping, tooling, troweling, or hand shaping, or a combination thereof, to simulate the stone masonry texture and mortared joints. Match the side pattern of the formed mortared joints. Immediately after the free surface water evaporates and the finish embossing is complete, cure the concrete for 7 days, as specified in Subsection 552.17(b). Do not use liquid membrane curing compounds.

610A.06 Form Liner Removal. Within 24 hours after placing concrete, remove or break free the form liners without causing concrete surface deterioration or weakness in the substratum. Remove all form tie material to a depth of at least 25 mm below the concrete face without spalling and damaging the concrete.

Cure the concrete for 7 days, as specified in Subsection 552.17(b). Do not use liquid membrane curing compounds.

610A.07 Preparation of Concrete Surface. Finish all exposed formed concrete surfaces as specified in Subsection 552.18(a). Finish so that vertical seams, horizontal seams, and butt joint marks are not visible. Keep grinding and chipping to a minimum to avoid exposing aggregate.

Provide a completed surface free of blemishes, discolorations, surface voids, and conspicuous form marks. Make the finished texture and patterns continuous without visual interruption.

610A.08 Color/Stain Application. Age concrete, including patches, a minimum of 30 days. Use approved methods to clean the surface of all latency, dirt, dust, grease, and any foreign material.

Remove efflorescence with a pressure water wash. Use a fan nozzle held perpendicular to the surface at a distance from 0.6 to 1 m. Use a minimum 20 MPa water pressure at a rate of 12 to 16 L/min. Do not sandblast any surface that will receive color or stain.

Correct any surface irregularities created by the surface cleaning.

Maintain the concrete temperature between 4 °C and 30 °C when applying color or stain, and for 48 hours after applying color or stain.

Color or stain all exposed concrete surfaces. Use a color or stain application suitable to obtain the appearance of the native stone masonry. Use a minimum of three colors or stains.

When required at boundaries between two color tones or between surfaces that receive color at different times, take care to provide protection to avoid overspray and color overlap.

Apply grout of a natural cement color to each form joint. Use sufficient grout so the overspray of the color or stain is not visible. Give the form pattern grout joint the appearance of mortared joints in completed masonry.

Recoat any areas that lack a uniform appearance or are inconsistent in appearance with the approved test wall.

Treat expansion joints with caulk or grout to blend with the appearance of the adjacent stone or motor joint.

610A.09 Test Wall. Before beginning production work on the simulated stone masonry, construct a test wall with a minimum size of 1.0 m height by 0.5 m width by 3.0 m length, in accordance with Section 552 and these specifications.

Cast the test wall on site, using the same forming methods, procedures, form liner, texture configuration, expansion joint, concrete mixture, and color or stain application proposed for the production work. Demonstrate the quality and consistency of joint treatment, end treatment, top embossing methods, back treatment, and the color or stain application on the test wall. Construct a new test wall if results are not acceptable.

Begin production structural concrete work only after the test wall is approved. Begin production color or stain application only after the color or stain application on the test wall is approved. Dispose of the test wall after use as SHOWN ON THE DRAWINGS.

Measurement

610A.10 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Measure simulated stone masonry surface treatment by the square meter.

Measure the simulated stone masonry test wall, including concrete and surface finish, by the each.

Do not measure form liners.

Payment

610A.11 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item		Pay Unit
610A (01)	Simulated stone masonry surface treatment	Square Meter
610A (02)	Simulated stone masonry test wall	Each

Section 611—Development of Pits & Quarries

Description

611.01 Work. Clear, grub, strip topsoil, remove overburden, construct access roads, conduct restoration activities, and perform other incidental work required for pit or quarry development.

Construction

611.02 General. Perform all work in accordance with Sections 201, 203, and 625; landscape preservation requirements; and the pit and quarry development and/or restoration plan, as SHOWN ON THE DRAWINGS.

611.03 Source. Develop designated sources in accordance with requirements SHOWN ON THE DRAWINGS or in the SPECIAL PROJECT SPECIFICATIONS.

611.04 Clearing, Grubbing, & Slash Cleanup. Meet clearing, grubbing, and slash cleanup requirements as specified in Section 201 and as SHOWN ON THE DRAWINGS.

611.05 Access Roads. Construct or recondition access roads to the pit or quarry as specified in Section 203 or 306, and as SHOWN ON THE DRAWINGS.

611.06 Topsoil. Strip, stockpile, and place topsoil obtained from the site as specified in Section 203 and as SHOWN ON THE DRAWINGS.

611.07 Overburden. Remove overburden to expose rock material for aggregate production, and stockpile or place the overburden in the embankment within the limits of the pit or quarry, as specified in Section 203 and as SHOWN ON THE DRAWINGS.

611.08 Ground Control & Haulways. Perform the work in accordance with MSHA 30 CFR, part 56, as related to ground control and haulways. Immediately correct any deterioration of overburden slopes, safety benches, or protective berms, or any encroachment on clearing limits.

611.09 Oversize Material. Use all suitable material for aggregate, regardless of size, that is developed in stripping, overburden removal, and excavation of rock material, unless other disposition is SHOWN ON THE DRAWINGS.

611.10 Restoration. After excavation has been completed in part or all of the area, slope and grade the sides, and smooth the general pit area as SHOWN ON THE DRAWINGS.

Rip and drain access roads that are marked on the drawings for obliteration; block them to traffic; and seed them in accordance with Section 625.

Measurement

611.11 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment

611.12 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item		Pay Unit
611 (01)	Pit development	Each
611 (02)	Quarry development	Each

Section 617—Structural-Plate Structures

Description

617.01 Work. Furnish and install, or install only, structural-plate pipes, pipe arches, arches, boxes, and underpasses. Include joints and connections to pipes, catch basins, headwalls, stiffening ribs, thrust beams, and other appurtenances required to complete the structure.

Materials

617.02 Requirements. Ensure that materials meet the requirements specified in the following subsections:

Aluminum-Alloy Structural-Plate Structures	707.06
Asphalt-Coated Structural-Plate Structures	707.07
Backfill Material	704.03
High-Strength Nonshrink Grout	701.02
Reinforcing Steel	709.01
Repair of Damaged Coatings	707.15
Steel Structural-Plate Structures	707.05

Furnish concrete that meets the requirements specified in Subsection 602.03, method A or B, or as SHOWN ON THE DRAWINGS.

Construction

617.03 Excavation & Bedding. Excavate to the limits SHOWN ON THE DRAWINGS and in accordance with the requirements of Sections 206 and 206A.

Specific structure installation time restrictions and installation plan requirements are SHOWN ON THE DRAWINGS.

Provide bedding material that meets the same requirements as backfill material.

Bed the culvert in a compacted layer of bedding material with a thickness equal to at least 10 percent of the culvert height. Place the bedding material in layers that do not exceed 150 mm in depth when compacted. Shape and compact the bed to fit the culvert. Where applicable, recess the shaped foundation to receive the joints.

Do not place or backfill structure until the CO has approved the excavation and foundation.

617.04 Design & Fabrication. Submit four sets of shop drawings of the plate structure to the CO at least 21 days before planned construction. Accompany shop drawings with all calculations used to determine the size, shape, location, and spacing of stiffening ribs, thrust beams, or other special structural features.

Fabricate plates in accordance with AASHTO M 167 or M 219.

Form plates to provide lap joints. Stagger joints so that not more than three plates come together at any one point. Punch the bolt holes so that all plates with like dimensions, curvature, and the same number of bolts per meter of seam are interchangeable. Curve each plate to the proper radius so that the cross-sectional dimensions of the finished structure are as SHOWN ON THE DRAWINGS.

Cut plates for forming skewed or sloped ends to give the angle of skew or slope as SHOWN ON THE DRAWINGS. Place legible identification numerals on each plate to designate its proper position in the finished structure.

617.05 Erection. Provide a copy of manufacturer's assembly instructions before assembly. The instructions shall show the position of each plate and the assembly order.

Assemble the structural plates according to the manufacturer's instructions. Exercise care in the use of drift pins and pry bars to prevent damage to the structural plate and its coating. Torque all bolts before beginning the backfill. Repair damaged coatings according to Subsection 707.15. Ensure that the plates have a proper fit-up.

When aluminum alloys come in contact with other metals, coat the contacting surfaces with asphalt mastic according to Subsection 707.07 or a preapproved asphalt-impregnated caulking compound.

Torque steel bolts on steel plates to a minimum of 135 N•m and a maximum of 400 N•m.

Torque steel and aluminum bolts on 2.5-mm-thick aluminum plates to a minimum of 120 N•m and a maximum of 155 N•m.

Torque steel bolts and aluminum bolts on 3-mm-thick and heavier aluminum plates to a minimum of 155 N•m and a maximum of 180 N•m.

For long-span structures:

(a) Tighten the longitudinal seams when the plates are assembled unless the plates are held in shape by cables, struts, or backfill. Properly align plates circumferentially to avoid permanent distortion from the design shape. Before backfilling, do not exceed 2 percent variation from the design shape.

(b) Do not distort the shape of the structure by operating equipment over or near it.

(c) Provide survey control on the structure to check structure movement when SHOWN ON THE DRAWINGS.

(d) Check and control the deflection movements of the structure during the entire backfilling operation. Do not exceed the manufacturer's recommended limits.

(e) Provide a manufacturer's representative onsite to assist in the erection and backfilling of the structure when SHOWN ON THE DRAWINGS.

617.06 Backfilling. Provide backfill meeting the material and placement requirements of Section 206 or 206A.

After preparing bedding and placing the structure, place backfill in layers not exceeding 150 mm loose thickness, and compact it under the haunches and alongside the structure. The material shall be readily compactible and free of frozen lumps, chunks of highly plastic clay, or other objectionable material. Do not use rocks larger than 75 mm in greatest dimension within 300 mm of the structure. Ensure that there is an area of compacted material at least as wide as one diameter of the structure or 3.5 m, whichever is less, on each side of the structure. Compact the backfill without damaging or displacing the structure.

When filling around and over arches before headwalls are in place, place the first embankment material midway between the ends of the arch, forming as narrow a ramp as possible, until reaching the top of the arch. Build the ramp evenly from both sides, and compact the embankment material as it is placed. After building the two ramps to the top of the arch, deposit the remainder of the embankment material from the top of the arch in both directions from the center to the ends, and as evenly as possible on both sides of the arch.

If headwalls are built before any embankment material is placed around and over the arch, first place the embankment material adjacent to one headwall until reaching the top of the arch. Then dump the embankment material from the top of the arch toward the other headwall, depositing the material evenly on both sides of the arch.

Follow the procedures specified above in multiple installations. Bring up the embankment material evenly on each side of each arch to avoid unequal pressure.

Ensure that backfill density exceeds 95 percent of the maximum density as determined by AASHTO T 99, method C or D.

Continue backfilling and compacting until the backfill is 300 mm above the top of the structure.

After bedding and backfilling, protect the structure with an adequate cover of compacted embankment, as indicated by manufacturer's recommendation. Do this before permitting heavy equipment to cross during roadway construction.

Replace structure that is distorted by more than 5 percent of nominal dimensions, or that is ruptured or broken.

Ensure that backfilling materials, methods, and procedures meet the manufacturer's requirements.

Measurement

617.07 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

The quantity of concrete or reinforcing steel used in thrust beams or additional structural metal or plates used in stiffening ribs or other special structural features will not be included in the quantities for payment.

Payment

617.08 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item		Pay Unit
617 (01)	_____ structural-plate pipe, size _____, *Material* _____ -coated, _____ thickness	Meter
617 (02)	_____ structural-plate pipe arch, _____ span, *Material* _____ rise, _____ -coated, _____ thickness	Meter
617 (03)	_____ structural-plate arch, _____ span, *Material* _____ rise, _____ -coated, _____ thickness	Meter
617 (04)	_____ structural-plate underpass, size _____, *Material* _____ -coated, _____ thickness	Meter

617 (05) _____ structural-plate box culvert, _____ span,
Material
_____ rise, _____ -coated, _____ thickness ..... Meter

617 (06) _____ long-span structure, plate _____ -coated,
Material *Type*
_____ span, _____ rise, _____ thickness ..... Meter

617 (07) Installation only ..... Each

Section 618—Cleaning & Reconditioning Existing Drainage Structures

Description

618.01 Work. Clean and recondition existing pipe and appurtenant structures.

Materials

618.02 Requirements. Ensure that the materials used for repair or replacement meet the applicable requirements of sections SHOWN ON THE DRAWINGS or specified in the SPECIAL PROJECT SPECIFICATIONS.

Construction

618.03 Pipe Removed & Cleaned. Carefully remove the pipe and appurtenant structures and clean foreign material out of the barrel and at the jointed ends.

618.04 Pipe Cleaned in Place. Remove all foreign material inside the barrel by methods that do not damage the pipe. Take adequate measures to protect the drainage and prevent stream siltation or increased turbidity when hydraulically cleaning pipe in place.

If approved by the CO, all or part of the pipe designated to be cleaned in place may be removed, cleaned, and relaid in accordance with Sections 603, 603A, and 603B. In these cases, furnish all material required to replace damaged pipe and joints, perform all excavation and backfill, and relay the pipe.

618.05 Relaying or Stockpiling Salvaged Pipe. The locations of pipe and appurtenant structures to be removed, cleaned, and relaid will be SHOWN ON THE DRAWINGS. Relay the pipe in accordance with Sections 603, 603A, and 603B. Furnish all jointing material, and replace pipe that has been damaged during removing or handling, in sufficient lengths to complete the designated length to be relaid, without added compensation. Place salvaged pipe designated to be stockpiled where SHOWN ON THE DRAWINGS. Carefully remove and handle all pipe to avoid breaking or damaging it. Do not place pipe that has been structurally damaged in stockpiles. Dispose of damaged pipe at an approved location in accordance with Subsection 202.04.

618.06 Reconditioning Drainage Structure. Remove all debris, repair leaks, and replace broken or missing metalwork on all structures, such as manholes and inlets, that are SHOWN ON THE DRAWINGS as needing reconditioning. Leave these structures in operating condition.

Measurement

618.07 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

The quantity of pipe and appurtenant structures removed, cleaned, and relaid is the length in final position.

The quantity of pipe and appurtenant structures removed, cleaned, and stockpiled is the total length of all pipe acceptably removed, cleaned, and placed in the stockpile.

The quantity of pipe and appurtenant structures cleaned in place is the length along the flow line.

No additional payment will be made for material to replace damaged pipe and joints, excavation, relaying pipes, or backfill if pipe is removed for cleaning, when damage is the result of operation.

Payment

618.08 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item		Pay Unit
618 (01)	Removing, cleaning, and stockpiling salvaged _____	Meter
618 (02)	Removing, cleaning, and relaying salvaged _____	Meter
618 (03)	Cleaning _____ in place	Meter
618 (04)	Cleaning _____ in place	Each
618 (05)	Reconditioning drainage structures	Each

Section 621—Corrugated Metal Spillways

Description

621.01 Work. Furnish and install, or install only, corrugated metal spillway inlet assemblies, outlet pipes, half-round outlet pipe, rectangular flumes, and other appurtenances for downdrains.

Materials

621.02 Requirements. Ensure that spillway inlet assemblies, outlets, and connectors are of the type and thickness SHOWN ON THE DRAWINGS and are constructed of corrugated sheet metal that meets the requirements specified in Subsection 603.02. Fillet weld or rivet bulkheads and connections for outlet pipes to the inlet chamber to form watertight joints. Rivet or weld anchors, lips, and skirts so they are secure. Ensure that connections for outlet pipes meet the requirements specified in Subsection 603.06.

Ensure that outlets are the type, size, and arrangement SHOWN ON THE DRAWINGS, and that they meet the requirements for corrugated metal pipe specified in Subsection 603.02. Furnish half-round pipe with end sections punched so that joints can be riveted in the field. Furnish elbows of the full-circle type.

Ensure that anchor assemblies for the downdrains and other components are as SHOWN ON THE DRAWINGS.

Ensure that coating for spillway inlet assemblies and outlet pipes meets the requirements for coated corrugated pipe specified in Subsection 603.02.

Install a gasket or equivalent material on circular pipe at the joints on each side of elbows and at each joint on the downdrain to make the connections watertight. Install gaskets on the entire circumference. Use gasket material of sponge rubber or synthetic rubber compound specifically designed for such installations and recommended by the coupling band fabricator. Approved joint compounds, such as Thiocaulk or Plastiflex, may be used instead of gaskets.

Construction

621.03 Performance. Place spillway inlets where SHOWN ON THE DRAWINGS. Compact the earth backfill in accordance with Subsection 603.08, method B.

Install outlet pipes in accordance with Section 603. Place outside laps so they face upstream.

Repair damaged coating on the inlet assemblies or pipe and all field rivet heads as required in Subsection 707.15.

Ensure that there are no reverse grades, and that no point varies from a straight line drawn from inlet to outlet by more than 2 percent horizontally and vertically of the spillway length, or 300 mm on the final installed alignment, whichever is less, unless otherwise SHOWN ON THE DRAWINGS.

Measurement

621.04 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

The quantity of outlet pipes shall be the length from end to end of each outlet pipe, excluding elbows and spillway assemblies.

Payment

621.05 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item		Pay Unit
621 (01)	Spillway inlet assemblies	Each
621 (02)	Spillway inlet assemblies with _____ coating	Each
621 (03)	_____-mm half-round outlet pipe	Meter
621 (04)	_____-mm half-round outlet pipe with _____ coating	Meter
621 (05)	_____-mm flexible downpipe	Meter
621 (06)	Anchors for downdrains for _____-mm pipe	Each
621 (07)	_____-mm full-circle outlet pipe	Meter
621 (08)	_____-mm full-circle outlet pipe with _____ coating	Meter
621 (09)	Pipe elbow _____	Each

621 (10) Pipe elbow, _____ -coated _____ ..... Each

621 (11) _____ -mm pipe end section ..... Each

621 (12) Starter section, type _____ ..... Each

621 (13) Flume, type _____ ..... Meter

621 (14) Anchor stakes _____ ..... Each

621 (15) Energy dissipator, type _____ ..... Each

Section 622—Paved Waterways

Description

622.01 Work. Pave ditches, gutters, spillways, and other similar waterways with concrete, grouted rubble, ungrouted rubble, mortared rubble, concrete and rubble, or a mixture of aggregate and bituminous material. Also construct a bed course.

Materials

622.02 Requirements. Furnish concrete that meets the requirements specified in Subsection 602.03, method A or B, as SHOWN ON THE DRAWINGS.

Ensure that materials meet the requirements specified in the following sections or subsections:

Bed Course	704.09
Bituminous Material	702
Cold Asphalt Concrete Pavement Aggregate	703.08
Low-Strength Grout	701.03
Reinforcing Steel	709.01

Ensure that materials and proportions for bituminous mixtures are as SHOWN ON THE DRAWINGS.

Provide rubble for pavement that is approved, sound, durable rock of the sizes SHOWN ON THE DRAWINGS. Inspect all rock before and after laying it, and remove all rejected material immediately.

Construction

622.03 Bed Course. Form the bed course to the required depth below and parallel with the finished surface of the waterway. Replace all soft, yielding, or otherwise unsuitable material with suitable material. Compact and finish the bed course to a smooth, firm surface.

Do not construct the paved waterway until the CO gives written approval of the bed.

622.04 Grouted Rubble. Place and compact bed course material to the required thickness when SHOWN ON THE DRAWINGS.

Place the pavement stones on the bed course with flat faces up and their longest dimensions at right angles to the centerline of the waterway.

Break joints so they are not wider than 25 mm. Ram the rocks until the surface is firm and reasonably true to the finished surface in grade, alignment, and cross section. Relay or replace any rock that causes an irregular or uneven surface. After the rocks are rammed into place and the surface is satisfactory, fill the spaces or voids between and around the stones with filler aggregate to within 100 mm of the surface. Then pour and broom cement grout into the spaces between the stones. Continue this operation until the grout is about 25 mm below the tops of the stones. Ensure that the grout flows readily into the spaces between the rocks, but is not so wet that solid matter separates from the water.

622.05 Ungrouted Rubble. Place the pavement rocks on the bed course with flat faces up and their longest dimensions at right angles to the centerline of the waterway. Break joints so they are not wider than 12 mm. Ram the rocks until the surface is firm and reasonably true to the finished surface in grade, alignment, and cross section. Relay or replace any rock that causes an irregular or uneven surface, or any rock that is not in reasonably close contact with adjacent rocks.

622.06 Mortared Rubble. Lay the pavement rocks with flat faces up and their longest dimensions parallel to the gutter line.

Break joints so they are not wider than 25 mm. After each rock is rammed into place and the surface is satisfactory, apply enough mortar on the exposed side so that when the adjacent rock is rammed into position, the mortar fills the interstices between the rocks to within 25 mm of the surface and does not protrude above their tops. Ensure the finished rock surface is free from mortar stain.

622.07 Reinforced Concrete & Rubble. Construct a reinforced concrete foundation upon a repaired foundation as SHOWN ON THE DRAWINGS. Construct it progressively by laying surface rocks and bedding them securely in the concrete before it hardens. Ensure that the faces of the rocks in contact with the concrete are clean and free of any defects that will impair their bond with the concrete.

Thoroughly wet rocks before laying them, allowing ample time for them to become nearly saturated. Fill joints between rocks with mortar. Keep the bedded reinforcement steel within the middle third of the depth of the concrete during construction.

622.08 Bituminous Mixture. Prepare the bituminous mixture, stake forms, and place the mixture as specified below.

(a) Preparing Mixture. Prepare the bituminous mixture by using either a rotary mixer or a pugmill, or by spreading the aggregate on a flat, firm surface off the area to be surfaced, and mix it using road-mix methods. Either batch- or continuous-type pugmills may be used.

Except when emulsified asphalt is used, ensure that the aggregate does not have a moisture content of more than 2 percent at the time it is mixed with the bituminous materials. However, if an approved additive is used, the aggregate may have a moisture content of up to 5 percent.

Apply bituminous material to the aggregate or introduce it into the mixture at the temperature at which the aggregate will be coated uniformly and completely.

When mixing is done in a mixer, mix for no less than 40 seconds from the time all materials are in the mixer until they are discharged. When road-mix methods are used, continue the mixing until all aggregate particles are uniformly coated with bituminous material.

(b) Forms. Securely stake all forms approved by the CO into position at the correct line and elevation.

(c) Placing Mixture. Place the mixture on the prepared bed only when the bed is sufficiently dry and weather conditions are suitable. Place and compact the mixture in one or more courses to the thickness SHOWN ON THE DRAWINGS. Smooth each course by raking or screeding and compact it thoroughly by rolling with a hand-operated roller weighing no less than 135 kg, or with an approved small power roller. Compact areas that cannot be reached with rollers by using hand tampers. Ensure that the surface is smooth and even, and that it has a dense texture after it is compacted.

622.09 Concrete Paving. Ensure that concrete paving is plain or reinforced, as SHOWN ON THE DRAWINGS, and that it meets the requirements specified in Section 602.

622.10 Finishing Work. Remove forms from paved waterways, and make necessary repairs to edges. Shape and compact the adjacent slopes and shoulders to the cross section SHOWN ON THE DRAWINGS.

Measurement

622.11 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Base area computations upon surface measurements.

Payment

622.12 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item		Pay Unit
622 (01)	Grouted rubble paved waterway	Square Meter
622 (02)	Ungrouted rubble paved waterway	Square Meter
622 (03)	Mortared rubble paved waterway	Square Meter
622 (04)	Concrete and rubble paved waterway	Square Meter
622 (05)	Bituminous paved waterway	Square Meter
622 (06)	Concrete paved waterway	Square Meter
622 (07)	Bed course material	Ton

Section 623—Monuments & Markers

Description

623.01 Basis. Furnish and install right-of-way monuments, milepost markers, underdrain markers, and culvert markers.

Materials

623.02 Requirements. Furnish materials for the various types of monuments and markers as SHOWN ON THE DRAWINGS.

Construction

623.03 Performance. Fabricate and install the various types of monuments and markers as SHOWN ON THE DRAWINGS, and also paint the posts, if required. Set each monument and post accurately at the required location and elevation.

Measurement

623.04 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment

623.05 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item		Pay Unit
623 (01)	Right-of-way monument	Each
623 (02)	Milepost marker	Each
623 (03)	Underdrain marker	Each
623 (04)	Culvert marker	Each

Section 624—Topsoiling

Description

624.01 Work. Furnish, excavate, or remove topsoil from stockpiles; then haul, deposit, and spread it.

Materials

624.02 Source. Obtain topsoil from sources SHOWN ON THE DRAWINGS or specified in the SPECIAL PROJECT SPECIFICATIONS.

624.03 Quality. Ensure that topsoil meets the requirements specified in Subsection 713.01.

Construction

624.04 Spreading. Spread the topsoil to the depth and at the locations SHOWN ON THE DRAWINGS.

Do not spread topsoil when the ground or topsoil is frozen, excessively wet, or in a condition detrimental to the work.

Remove and dispose of large clods, rocks larger than 50 mm in any dimension, roots, stumps, and other litter as SHOWN ON THE DRAWINGS.

624.05 Hauling. Keep the roadbed surfacing clean during hauling operations. Remove topsoil or other soil from the surfacing before traffic compacts it.

624.06 Source Area Other Than Roadway. After stripping operations have been completed, rough grade the source area and remove refuse. Leave the area in a neat condition. Leave a minimum 75 mm of topsoil on the source, and seed the area as SHOWN ON THE DRAWINGS.

Measurement

624.07 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Measure the topsoil provided by the Contractor and paid for by cubic meter in the vehicles at the point of delivery. Measure the volume of topsoil from designated stockpiles in the original stockpile.

When topsoil is paid for by the square meter, compute its quantity along slope dimensions.

Payment

624.08 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item		Pay Unit
624 (01)	Furnishing and placing topsoil	Square Meter
624 (02)	Furnishing and placing topsoil	Cubic Meter
624 (03)	Placing topsoil	Square Meter
624 (04)	Placing topsoil	Cubic Meter

Section 625—Seeding & Mulching

Description

625.01 Work. Prepare seedbeds, and furnish and place required seed, fertilizer, limestone, mulch, net, and blanket material.

Materials

625.02 Requirements. Ensure that materials meet the requirements specified in the following subsections:

Agricultural Limestone	713.02
Erosion Control Mats, Roving, & Geocell	713.07
Fertilizer	713.03
Mulch	713.05
Seed	713.04
Stabilizing Emulsion Tackifiers	713.12
Water	725.01(b)

Construction

625.03 Seeding Seasons. Observe the normal seasonal dates for seeding, as shown in the SPECIAL PROJECT SPECIFICATIONS. Do not apply seeding materials during windy weather or when the ground is excessively wet or frozen.

625.04 Soil Preparation. Finish the areas to be seeded, as required by other applicable sections, to the lines and grades SHOWN ON THE DRAWINGS. Restore areas that are damaged by erosion or other causes. Ensure that the surface soil is in a roughened condition favorable for germination and growth. When required, apply limestone uniformly at the rate given in the SPECIAL PROJECT SPECIFICATIONS, either before or after soil preparation.

625.05 Application Methods for Seed, Fertilizer, & Limestone. To control erosion, apply seed to disturbed soil and slopes within 30 days of disturbance. If the slopes have not been finished, apply the seed by the dry method as an interim erosion control measure. Apply fertilizer with the seed when specified in the SPECIAL PROJECT SPECIFICATIONS.

The following methods may be used to place material:

(a) Hydraulic Method. Mix the seed or seed and fertilizer with water in the amounts and mixtures shown in the SPECIAL PROJECT SPECIFICATIONS to produce a slurry, then apply it under pressure at the rates specified in the SPECIAL PROJECT SPECIFICATIONS. When wood cellulose or grass straw mulch materials are to be incorporated as an integral part of the slurry mix, add them after all other materials have been thoroughly mixed in the tank.

Use an inoculum for hydraulic seeding that is four times what is recommended for dry seeding.

(b) Dry Method. Use mechanical, landscape, or cultipacker seeders, seed drills, fertilizer spreaders, or other approved mechanical seeding equipment to apply the seed or seed and fertilizer in the amounts and mixtures shown in the SPECIAL PROJECT SPECIFICATIONS.

Spread dry fertilizer and ground limestone separately at the rates given in the SPECIAL PROJECT SPECIFICATIONS. Incorporate them in a single operation to the required depth in the areas SHOWN ON THE DRAWINGS.

Hand-operated seeding devices may be used to apply dry seed, fertilizer, and ground limestone.

625.06 Application of Mulch. The following methods may be used to apply mulch:

(a) Hydraulic Method. Hydraulic equipment that uses water as the carrying agent may be used to apply wood cellulose or grass straw fiber mulch, tackifier, and fertilizer in a single operation. Continuously agitate the materials to keep them in uniform suspension throughout the distribution cycle. Ensure that the discharge line evenly distributes the solution to the seedbed. Do not mulch where there is free surface water. Start application to areas SHOWN ON THE DRAWINGS at the top of the slope and work downward. If necessary, use extension hoses to reach the extremities of slopes. Apply at the rate specified in the SPECIAL PROJECT SPECIFICATIONS.

(b) Dry Method. After completion of seeding and fertilizing, unless otherwise indicated in the SPECIAL PROJECT SPECIFICATIONS, apply mulch uniformly at the rate specified in the SPECIAL PROJECT SPECIFICATIONS.

When a tackifier is used for mulch, apply the material at the rate specified in the SPECIAL PROJECT SPECIFICATIONS. Immediately distribute it evenly over the mulch. Prevent asphalt adhesive materials from marking or defacing structures, appurtenances, pavements, utilities, or plant growth.

625.07 Installation of Netting & Erosion Control Blankets. Install nettings and erosion control blankets as SHOWN ON THE DRAWINGS and in accordance with the manufacturer's recommendations.

625.08 Care During Construction. Protect and care for seeded areas until the work is finally accepted. Repair all damage to seeded areas caused by construction, without additional compensation.

Measurement

625.09 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Base area computations on surface measurements.

Seed used for interim erosion control will be paid for as Seed Mix and will be measured by the kilogram. When fertilizer is used for interim erosion control, it will be measured by the ton.

Payment

625.10 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item		Pay Unit
625 (01)	Seeding, _____ method (without mulch)	Hectare
625 (02)	Seeding, _____ method (with mulch)	Hectare
625 (03)	Mulch (supplemental application)	Ton
625 (04)	Fertilizer (supplemental application)	Ton
625 (05)	Seed mix (supplemental application)	Kilogram
625 (06)	Netting, type _____	Square Meter
625 (07)	Erosion control blanket, type _____	Square Meter

Section 626—Trees, Shrubs, Vines, & Ground Cover

Description

626.01 Work. Furnish and plant trees, shrubs, vines, and ground cover plants.

Materials

626.02 Requirements. Ensure that materials meet the requirements specified in the following subsections:

Topsoil	713.01
Fertilizer	713.03
Mulch	713.05
Plant Materials	713.06
Miscellaneous Planting Material	713.08
Water	725.01(b)

Construction

626.03 Performance. Follow the specifications below.

(a) Planting Seasons. Plant during the seasons indicated in the SPECIAL PROJECT SPECIFICATIONS. Do not plant in frozen ground, when snow covers the ground, or when the soil is in an unsatisfactory condition for planting.

(b) Delivery & Inspection. Notify the CO not less than 15 days before plants are delivered. Inform the CO about the source of supply and the shipping dates for all plant material. Ensure that all plant materials comply with State and Federal laws applicable to inspection for plant diseases and insect infestations. Deliver all required certificates of inspection to the CO.

(c) Protection & Temporary Storage. Keep all plant material moist. Protect plants when they are in transit, in temporary storage, or on the project site awaiting planting.

(d) Layout. Designate the locations of plant material and bed outlines on the project site so they conform to the lines, grades, and elevations SHOWN ON THE DRAWINGS. The CO may adjust plant material locations to meet field conditions.

(e) Excavation for Plant Pits & Beds. Do not excavate plant pits and beds until the layout is approved. Remove and dispose of all sod, weeds, roots, and other objectionable material that is unsuitable for backfill.

For root spreads from 600 to 1,200 mm, make pit diameters 600 mm greater than the root spread. For root spreads over 1,200 mm, make pit diameters one and one-half times the root spread.

Ensure that all pits are deep enough to permit a minimum of 150 mm of loam–humus backfill under all roots or balls. Excavate to sufficient depth to plant at the root collar.

Loosen the soil at the bottom of the plant pit to a depth of at least 150 mm before backfilling or planting begins.

(f) Prepared Backfill Soil. Prepare the backfill soil to consist of a mixture of four parts topsoil, loam, or selected soil, and one part peat moss or peat humus.

(g) Setting Plants. Set all plants approximately plumb and at the same level, or not more than 25 mm lower than the depth at which they were grown in the nursery or collecting field.

(1) Bare Root Stock. Place prepared backfill soil in the plant pit to the required depth. Then place bare-rooted plants in the center of the plant pit and spread out the roots in a natural position. Cleanly cut back all broken or damaged roots to sound root growth.

Carefully work backfill soil around and over the roots, then settle it by firming or tamping. Thoroughly water or puddle around bare-rooted plants. Form earth saucers or water basins with a diameter equal to the plant, at least 100 mm deep for trees, and 75 mm deep for shrubs, around individual plants.

(2) Balled & Burlapped Stock. Carefully place balled and burlapped plants in the prepared pits on the required depth of tamped backfill soil so they are in a firm, upright position. Put backfill soil around the plant ball to half the depth of the ball, then tamp and thoroughly water. Cut away the burlap and remove it from the upper half of the ball, or loosen and fold it back. Place the remainder of the backfill. Provide earth saucers or water basins, and thoroughly water the plant.

(h) Fertilizing. Use the types and rates of fertilizer application for the different plants that are shown in the SPECIAL PROJECT SPECIFICATIONS. Uniformly apply fertilizer within 5 days after planting, and cultivate it into the top 50 mm of the plant pit area or shrub bed. Work the proper amount of fertilizer for each type of plant into the prepared backfill material. Apply fertilizer before mulching plant pits or shrub beds.

(i) Watering. Water all plants during and immediately after planting, and at intervals specified in the SPECIAL PROJECT SPECIFICATIONS. Ensure that

water does not contain elements toxic to plant life. Thoroughly saturate the soil around each plant at each watering.

(j) Guying & Staking. Immediately after planting, guy and stake all trees as SHOWN ON THE DRAWINGS. Do not contact the roots when staking.

(k) Wrapping. Wrap deciduous trees only. Completely wrap tree trunks that are 50 mm in diameter or larger with burlap or other approved material. Begin wrapping at the base of the tree, extend it to the first branches, and tie it adequately. Do not wrap tree trunks until they have been inspected and approved. Finish wrapping tree trunks within 24 hours after approval.

(l) Antidesiccant Spray. An approved antidesiccant spray may be used in place of wrapping.

(m) Pruning. Prune plants before or immediately after planting in a manner that will preserve their natural character. Employ experienced personnel who use proper equipment and accepted horticultural practices when pruning. Paint cuts that are over 20 mm in diameter with an approved tree wound dressing.

(n) Mulching. Furnish and place mulch over all pit or saucer areas of individual trees and shrubs, and completely over shrub beds to the depth SHOWN ON THE DRAWINGS. Ensure that mulch is as SHOWN ON THE DRAWINGS or in the SPECIAL PROJECT SPECIFICATIONS. Put 3.5 kg of nitrogen per cubic meter of mulch material around plants to be mulched with wood chips, in addition to the normal dressing of commercial fertilizer. Mulch the plantings within 24 hours after fertilizing is completed.

626.04 Restoration & Cleanup. Restore grass areas that have been damaged or scarred during planting to their original condition. Clean up debris, spoil piles, containers, and so forth.

626.05 Plant Establishment Period & Replacement. During the plant establishment period, which is one full growing season, use all possible means to keep the plants in a healthy growing condition. There will be a semifinal inspection 15 days before the end of the full growing system. At the end of the establishment period, the CO will determine if the plantings are acceptable. Water, cultivate, prune, repair and adjust guys and stakes, and perform other maintenance during the establishment period. Promptly remove dead or unsatisfactory plants. During the next planting season, replace all dead and unsatisfactory plants in kind with robust, healthy plants. Use alternative or substitute varieties only if approved. There will be a final inspection of these plants within 15 days after planting is completed.

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Measurement

626.06 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Include in the quantities only living plants that are in healthy condition at the time of final inspection, as specified in Subsection 626.05.

Payment

626.07 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item		Pay Unit
626 (01)	_____, _____	Each
	Name of plant *Size*	
626 (02)	Plant materials	Lump Sum

Section 628—Sprigging

Description

628.01 Work. This work consists of furnishing and planting living grass plants. Sprigging is designated as broadcast, row, or spot, according to Subsection 628.06.

Materials

628.02 Requirements. Provide material that meets requirements specified in the following subsections:

Agricultural Limestone	713.02
Fertilizer	713.03
Mulch	713.05
Sprigs	713.09
Water	725.01(b)

Construction

628.03 General. Do not sprig during windy weather or when the ground is dry, excessively wet, frozen, or otherwise untillable.

628.04 Harvesting Sprigs. Provide at least 5 days notice before harvesting sprigs. Before harvesting, mow grass and weeds to a height of 65 ± 15 mm and remove all clippings.

Loosen sprigs by cross-disking, shallow plowing, or other acceptable methods. Gather the sprigs in small piles or windrows, water, and keep moist until planting. Dispose of sprigs that freeze or dry out.

628.05 Preparing the Soil. Clear and grade the area to be sprigged. Cultivate, disk, harrow, or otherwise loosen the grade to a depth of not less than 100 mm. Remove stones larger than 50 mm in any diameter, sticks, stumps, and other debris that might interfere with proper placement or subsequent growth.

Place topsoil according to Section 624.

Apply fertilizer and agricultural limestone uniformly over the sprigging area at the application rates SHOWN ON THE DRAWINGS. Mechanical spreaders or blower equipment may be used. Disk or till the fertilizer and limestone into the soil to a depth of 100 mm.

Moisten the prepared soil.

628.06 Planting Sprigs. Plant the sprigs within 24 hours after harvesting.

(a) Broadcast Sprigging. Broadcast sprigs by hand or using suitable equipment in a uniform layer over the prepared surface, with spacing between sprigs not to exceed 150 mm. Force the sprigs into the soil to a depth of 75 ± 25 mm with a straight spade, disk harrow, or other equipment.

(b) Row Sprigging. Open furrows along the approximate contour of slopes. Place sprigs in a continuous row in the open furrow, with successive sprigs touching. Cover the sprigs immediately.

(c) Spot Sprigging. Spot sprig according to Subsection 628.06(b), except that instead of planting in a continuous row, group four or more sprigs 500 mm apart in the rows.

After planting, clear the surface of stones larger than 25 mm, large clods, roots, and other litter brought to the surface during sprigging. Lightly compact the sprigged area within 24 hours. Do not compact when the soil is so wet that it is picked up by the equipment. Do not compact clayey soils.

When mulch is required, cover the sprigged area with mulch within 24 hours, in accordance with Subsection 625.06.

628.07 Maintaining Sprigged Areas. Keep the sprigged areas moist. Water carefully to avoid erosion. Erect warning signs and barriers to protect newly sprigged areas. Regrade and resprig all areas damaged.

Measurement

628.08 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Measure sprigging by the hectare or square meter on the ground surface. Measure topsoil under Subsection 624.07.

Payment

628.09 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item		Pay Unit
628 (01)	_____ sprigging	Hectare
628 (02)	_____ sprigging	Square Meter

Section 629—Sodding

Description

629.01 Work. Prepare the sod bed, and furnish, cut, haul, and lay live sod of perennial turf-forming grasses.

Materials

629.02 Requirements. Ensure that materials meet the requirements specified in the following subsections:

Agricultural Limestone	713.02
Fertilizer	713.03
Pegs for Sod	713.11
Sod	713.10
Water	725.01(b)

Construction

629.03 Season. Sod during the season SHOWN ON THE DRAWINGS or in the SPECIAL PROJECT SPECIFICATIONS.

629.04 Sources of Sod. The CO will approve sod obtained from other than commercial sources, in the original position, before cutting and delivery to the project. Notify the CO at least 5 days before cutting begins.

629.05 Soil Preparation & Cleanup. Bring areas to be sodded to the lines and grades SHOWN ON THE DRAWINGS, then plow, disk, harrow, or otherwise loosen them before sod is delivered. Remove stones larger than 50 mm in diameter, sticks, stumps, and other debris that might interfere with the proper laying or subsequent growth of sod.

629.06 Topsoiling. Place topsoil where SHOWN ON THE DRAWINGS. Remove and dispose of large clods, stones larger than 50 mm in any dimension, roots, stumps, and other litter at locations SHOWN ON THE DRAWINGS.

629.07 Applying Fertilizer & Ground Limestone. After soil preparation, cleanup, and topsoiling, uniformly spread fertilizer and ground limestone, when specified, at the rate SHOWN ON THE DRAWINGS or in the SPECIAL PROJECT SPECIFICATIONS. Use mechanical spreaders, blower equipment, or other approved methods to spread fertilizer and ground limestone. Incorporate these materials into the soil by disking or other tillage.

629.08 Laying Sod. Lay sod on the prepared bed within 24 hours after cutting, except when stored in stacks or piles, grass to grass and roots to roots, for not more than 5 days. Protect sod from drying by sun or wind and from freezing. Move and lay sod when weather conditions and soil moisture are favorable.

Lay sod according to one or more of the following methods, as DESIGNATED IN THE SCHEDULE OF ITEMS:

(a) Lay solid sodding when soils are moist. Thoroughly moisten dry sod bed areas before laying sod. Lay sections of solid sod edge to edge with staggered joints. Plug openings with sod or fill them with acceptable loamy topsoil. After laying and filling joints, roll or tamp the sod to eliminate air pockets and make an even surface. On slopes of 1:0.5 or steeper and in channels, peg sod on approximate 600-mm centers after tamping. Drive pegs flush with the sod bed surface.

(b) Lay strip sod in parallel rows of the width SHOWN ON THE DRAWINGS. Lay sod in a shallow trench and firmly roll or tamp it until the surface is level with or below the adjacent soils. If SHOWN ON THE DRAWINGS or in the SPECIAL PROJECT SPECIFICATIONS, seed the ground between strips of sod with grass seeds of the kind and at the rates specified. Then rake or drag the seeded areas to cover the seed.

(c) Perform spot sodding by laying sod blocks as SHOWN ON THE DRAWINGS. Firmly roll or tamp the pieces into the soil until the surfaces of sod blocks are slightly below the surrounding ground surface.

629.09 Care During Construction, Watering, & Temporary Maintenance of Sodded Areas. Water the sod when it is laid and keep it moist until final acceptance of the contract. Distribute water evenly at a measured rate per unit of area. Water to avoid erosion and prevent damage to sodded areas.

Erect necessary warning signs and barriers; mow sodded areas; repair or replace sodded areas that fail to show a uniform growth of grass or are damaged by construction operations; and otherwise maintain the sod until final acceptance of the contract.

Replace dried-out or damaged sod at no charge to the Government.

Measurement

629.10 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Base area computations upon surface measurement.

Payment

629.11 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item		Pay Unit
629 (01)	Solid sodding	Square Meter
629 (02)	Strip sodding	Square Meter
629 (03)	Spot sodding	Square Meter

Section 633—Signs

Description

633.01 Work. Install only, or furnish and install, delineators, markers, signs, sign supports, panels, and posts; or remove and dispose of existing signs, posts, and hardware.

633.02 Traffic Control Sign Details. Ensure that traffic control signs meet the requirements of the MUTCD and details as SHOWN ON THE DRAWINGS.

Materials

633.03 Requirements. Furnish materials that meet the requirements specified in the following subsections:

Aluminum Panels 718.05
Conventional Traffic Paint 718.16
Delineator & Object Marker Retroreflectors 718.15
Edge Film 718.10
Epoxy Markings 718.18
Epoxy Resin Adhesives 718.26
Extruded Aluminum Panels 718.07
Glass Beads 718.22
Hardware 718.13
Letters, Numerals, Arrows, Symbols, & Borders 718.14
Object Marker & Delineator Posts 718.12
Paint 718.08
Plastic Panels 718.06
Plywood Panels 718.03
Polyester Markings 718.19
Preformed Plastic Markings 718.21
Raised Pavement Markers 718.23
Retroreflective Sheeting 718.01
Signposts 718.11
Silk Screen Inks 718.09
Steel Panels 718.04
Temporary Pavement Markings 718.24
Temporary Traffic Control Devices 718.25
Test Procedures 718.02
Thermoplastic Markings 718.20
Waterborne Traffic Paint 718.17

Furnish certification to the CO that all materials comply with the specified requirements.

Ensure that all concrete meets the requirements specified in Section 602, or as SHOWN ON THE DRAWINGS.

Furnish reinforcing steel as SHOWN ON THE DRAWINGS that meets the requirements specified in Subsection 709.01.

Construction

633.04 Fabrication of Sign Panels. Fabricate all parts in a uniform manner. Complete all panel fabrication, including cutting, punching, and drilling of holes, prior to final surface preparation and application of reflective sheeting, except where required for the fabrication of diecut or sawed letters on processed and mounted signs. Ensure that workmanship is of high quality, and that there are no visible defects in the finished product.

(a) Sign Panel Preparation. Cut sign panel from the specified substrate material. Ensure that it is flat and free of warp and any defects that interrupt smooth continuity of the panel surface. Prepare all panels precisely as described in writing by the substrate and sheeting manufacturers.

For sign panels smaller than 1.2 x 2.4 m, cut them from a single sheet of substrate material without joints.

For high-density overlay (HDO) substrate sign panels larger than 1.2 x 2.4 m, fabricate in sections using 19-mm-thick material. Prepare individual panel sections to be joined using doweled butt joints. Use dowels that are 9-mm threaded bolt stock and 112 mm in length. Place them 50 mm from each side, and every 300 to 375 mm along the joint. Do not actually join the individual panels until sign installation.

Make panels of the dimensions that are SHOWN ON THE DRAWINGS, with a tolerance of ± 6 mm.

(b) Beveling. Slightly round or bevel all edges of sign panels to eliminate edge sharpness.

(c) Drilling. Drill holes at the locations and to the sizes that are SHOWN ON THE DRAWINGS. Debur all holes. Do not field drill holes in any part of the structural assembly without the approval of the CO.

(d) Surface & Edge Finishing. Fill all core-cap holes on HDO plywood signs with an exterior wood dough, sanded with medium grit (50–60) sandpaper to

produce a smooth surface. Apply one coat of paint to the edges prior to application of background sheeting.

(e) Sheeting, Legend, Border, & Symbol Application. Apply all sheeting, legend, border, and symbols precisely as prescribed in writing by the sheeting manufacturer. Either pressure-sensitive or heat-activated material may be used, as SHOWN ON THE DRAWINGS. Cover the entire face of the sign panel with one unspliced sheet if the panel is less than 1.2 m in either dimension. On each section, use horizontal splicing only. Color match materials, and ensure that splices do not coincide with any legend. Ensure that the top piece overlaps the bottom piece by at least 12 mm.

Ensure that all letters, layout, and spacing are as specified in the Federal Highway Administration's (FHWA's) "Standard Alphabets for Highway Signs," current edition, and as SHOWN ON THE DRAWINGS. Apply the following tolerances:

(1) Horizontally align letters, numerals, and symbols to a tolerance of ± 3 mm.

(2) Vertically align letters, numerals, and symbols to a tolerance of ± 2 mm.

(3) Ensure that spacing between lines does not exceed a tolerance of ± 3 mm.

(f) Silk-Screening. Perform all silk-screening operations precisely as prescribed in writing by the manufacturers of the ink and the sheeting. Use direct screen process to apply messages and borders that are darker in color than the sign background. Use the reverse screen process to produce messages and borders that are lighter in color than the sign background. Screen to produce uniform colors and tone, with sharply defined edges of legend and border, and without blemishes on the sign background.

Color-match silk-screened inks to eliminate any visual difference between silk-screened material and applied material of the same color on the same sign.

(g) Trimming & Edge Finishing. After all sheeting, legends, borders, and symbols have been applied to the substrate, trim all excess material flush with the edge of the sign panel. Sheeting may overlap HDO plywood substrate sign edges by 3 mm. Finish the edges of HDO substrate panels with a second coat of paint applied in accordance with the recommendation of the paint manufacturer.

(h) Edge Film. When SHOWN ON THE DRAWINGS, apply edge tape over the entire top edge of the panel precisely as prescribed in writing by the manufacturer of the material being used.

(i) Maker's Mark. Install a decal showing the Contractor's identification or trademark and the date of manufacture on the back upper left-hand corner of each sign.

633.05 Delineator Posts & Housing. Drive delineator posts at locations and to the depth SHOWN ON THE DRAWINGS. Attach the delineator housing to the post, in accordance with the manufacturer's direction.

633.06 Sign Erection. Erect sign supports plumb and in accordance with the details SHOWN ON THE DRAWINGS. Make length of supports as SHOWN ON THE DRAWINGS, and in accordance with MUTCD, or as described in the SCHEDULE OF ITEMS.

Securely fasten the sign panels to the posts, as SHOWN ON THE DRAWINGS.

To reduce specular glare, erect the sign panel face in accordance with MUTCD, section 2A-26.

633.07 Sign Removal. Remove sign assemblies that are to be replaced, as SHOWN ON THE DRAWINGS. Ensure that sign replacement assemblies are replaced within 24 hours. Dispose of all removed sign material as SHOWN ON THE DRAWINGS. Remove signposts to a minimum of 75 mm below natural ground line. Backfill and compact remaining post holes with suitable material. When regulatory and warning signs are removed, immediately place replacement signs.

Measurement

633.08 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Compute quantities of sign face area using the dimensions SHOWN ON THE DRAWINGS.

Make no deduction for rounded corners.

Compute the area for irregularly shaped signs, such as "Stop" signs, by multiplying the extreme width by the extreme height of the sign face.

For sign removal, treat an assembly of posts and signs as only one sign when these materials are integrally connected and standing at one location.

Payment

633.09 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item		Pay Unit
633 (01)	Wood posts	Meter
633 (02)	Steel posts	Meter
633 (03)	Aluminum posts	Meter
633 (04)	Plastic posts	Each
633 (05)	Fiberglass-reinforced plastic posts	Each
633 (06)	Aluminum sign panels	Square Meter
633 (07)	Plywood sign panels	Square Meter
633 (08)	Steel sign panels	Square Meter
633 (09)	Plastic sign panels	Square Meter
633 (10)	Fiberglass-reinforced plastic sign panels	Square Meter
633 (11)	Delineators	Each
633 (12)	Sign	Each
633 (13)	Sign removal	Each
633 (14)	Sign and post(s), installation only	Each
633 (15)	Regulatory signs	Each
633 (16)	Warning signs and markers	Each
633 (17)	Object markers	Each

Section 634—Painted Traffic Markings

Description

634.01 Work. Apply permanent pavement markings and raised pavement markers on the completed pavement.

Pavement markings are designated as follows:

Type A	Conventional traffic paint with type 1 glass beads
Type B	Waterborne traffic paint with type 1 glass beads
Type C	Waterborne traffic paint with type 3 glass beads
Type D	Epoxy markings with type 1 glass beads
Type E	Epoxy markings with type 1 and type 4 glass beads
Type F	Polyester markings with type 1 glass beads
Type G	Polyester markings with type 1 and type 4 glass beads
Type H	Thermoplastic markings with type 1 glass beads
Type I	Thermoplastic markings with type 1 and type 5 glass beads
Type J	Preformed plastic markings
Type K	Nonreflectorized markings

Materials

634.02 Requirements. Furnish material that conforms to the MUTCD and the following subsections:

Conventional Traffic Paint	718.16
Epoxy Markings	718.18
Epoxy Resin Adhesives	718.26
Glass Beads	718.22
Polyester Markings	718.19
Preformed Plastic Markings	718.21
Raised Pavement Markers	718.23
Thermoplastic Markings	718.20
Waterborne Traffic Paint	718.17

Construction

634.03 Performance. Where existing and final pavement marking locations are identical, stake the limits of all existing pavement markings (no-passing zones, edge stripes, etc.) before any pavement work. Upon completion of the final

surface course, establish line limits for the new pavement for approval before marking. Establish markings according to the MUTCD.

Remove loose particles, dirt, tar, grease, and other deleterious material from the surface to be marked. Where markings are placed on Portland cement concrete pavement less than 1 year old, clean the pavement of all residue and curing compounds. Remove temporary pavement markings the same day permanent pavement markings are applied. Apply markings to a clean, dry surface according to the MUTCD.

Furnish a written copy of the manufacturer's marking recommendations to the CO at least 7 days before starting pavement marking application. A field demonstration may be required to verify the adequacy of recommendations.

Ship marking material in appropriate containers plainly marked with the following information, as appropriate for the material being furnished:

(a) Manufacturer's name and address.

(b) Name of product.

(c) Lot/batch numbers.

(d) Color.

(e) Net weight and volume of contents.

(f) Date of manufacture.

(g) Date of expiration.

(h) Statement of contents, if mixing of components is required.

(i) Mixing proportions and instructions.

(j) Safety information.

Apply pavement markings in the direction of traffic according to the manufacturer's recommendations. Apply all markings to provide a clean-cut, uniform, and workmanlike appearance by day and night.

Make lines 100 mm wide. Make broken lines 3 m long, with 9-m gaps. Make dotted lines 0.5 m long, with 1.0-m gaps. Separate double lines with a 100-mm space.

Protect marked areas from traffic until the markings are dried to no-tracking condition. Remove all tracking marks, spilled marking material, markings in unauthorized areas, and defective markings.

634.04 Conventional Traffic Paint (Type A). Apply paint when the pavement and air temperatures are above 4 °C. Spray paint at a 0.38-mm minimum wet film thickness before glass beads, or at a rate of 2.6 m^2/L. Immediately apply glass beads on the paint at a minimum rate of 0.7 kg/L of paint.

Apply two coats with glass beads to all centerline stripes. Coats are applied in opposite directions on bituminous surface treatment or chip seal surfaces. Second coats are applied from 4 to 48 hours after the first coat.

634.05 Waterborne Traffic Paint (Types B & C). Apply paint when the pavement and air temperatures are above 10 °C. Spray paint at 0.38-mm minimum wet film thickness before glass beads, or at a rate of 2.6 m^2/L.

(a) Type B. Immediately apply type 1 glass beads on the paint at a minimum rate of 0.7 kg/L of paint.

(b) Type C. Immediately apply type 3 glass beads on the paint at a minimum rate of 1.4 kg/L of paint.

Apply two coats with glass beads to all centerline stripes. Coats are applied in opposite directions on bituminous surface treatment or chip seal surfaces. Second coats are applied from 4 to 48 hours after the first coat.

634.06 Epoxy Markings (Types D & E). Heat components A and B separately at 43 ± 17 °C and mix. Discard all material heated over 60 °C. Apply epoxy when the pavement and air temperatures are above 10 °C. Apply as a spray at 43 ± 17 °C (gun tip temperature) at a 0.38-mm minimum dry film thickness, or a rate of 2.6 m^2/L.

(a) Type D. Immediately apply type 1 glass beads on the epoxy at a minimum rate of 1.8 kg/L of epoxy.

(b) Type E. Use two bead dispensers. Immediately apply type 4 glass beads on the epoxy at a minimum rate of 1.4 kg/L of epoxy, immediately followed by an application of type 1 glass beads at a minimum rate of 1.4 kg/L.

634.07 Polyester Markings (Types F & G). Apply polyester when the pavement and air temperatures are above 10 °C. Spray at 53 ± 4 °C (gun tip temperature) at a 0.38-mm minimum dry film thickness, or at a rate of 2.6 m^2/L. Discard all material heated over 66 °C. Do not use fast-dry polyester markings on hot asphalt concrete pavements that are less than 1 year old.

(a) Type F. Immediately apply type 1 glass beads on the polyester at a minimum rate of 1.8 kg/L of polyester.

(b) Type G. Use two bead dispensers. Immediately apply type 4 glass beads on the polyester at a minimum rate of 1.4 kg/L of polyester, immediately followed by an application of type 1 glass beads at a minimum rate of 1.4 kg/L.

634.08 Thermoplastic Markings (Types H & I). On areas to be marked on Portland cement concrete pavements and old asphalt pavements, apply an epoxy resin primer/sealer according to the thermoplastic manufacturer's recommendations. Allow the primer/sealer to dry.

Apply thermoplastic when the pavement and air temperatures are above 10 °C. Spray or extrude the thermoplastic at 220 ± 3 °C. For centerlines and lane lines, spray or extrude a 2.3-mm minimum dry film thickness, or at a rate of 0.44 m^2/L. For edge lines, spray or extrude a 1.5-mm minimum dry film thickness, or at a rate of 0.66 m^2/L.

(a) Type H. Immediately apply type 1 glass beads on the thermoplastic at a minimum rate of 0.59 kg/m^2.

(b) Type I. Use two bead dispensers. Immediately apply type 5 glass beads on the thermoplastic at a minimum rate of 0.59 kg/m^2, immediately followed by an application of type 1 glass beads at a minimum rate of 0.59 kg/m^2.

Ensure that the minimum bond strength of the thermoplastic is 1.2 MPa on Portland cement concrete pavements.

634.09 Preformed Plastic Markings (Type J). Install to form a durable, weather-resistant bond to the pavement. Apply preformed plastic markings according to the manufacturer's recommendation.

Where applied during final compaction of asphalt pavement, apply preformed plastic when the pavement temperature is about 60 °C. Roll the marking onto the surface with a steel-wheeled roller. The finished pavement marking may extend approximately 0.25 mm above the final surface.

634.10 Nonreflectorized Markings (Type K). Apply conventional traffic paint, waterborne traffic paint, epoxy markings, polyester markings, or thermoplastic markings as described above, but with no glass beads added.

634.11 Raised Pavement Markers. Install raised pavement markers when the pavement and air temperatures are above 10 °C. Apply raised pavement markers with epoxy resin or asphalt adhesive.

Heat epoxy components A and B separately with indirect heat; mix, and apply at 21 ± 6 °C. Discard all material heated over 49 °C or stiffened by polymerization.

Heat and apply asphalt adhesives at 211 ± 7 °C. Discard all material heated over 232 °C.

Space and align the markers to within 13 mm of the required location. Do not place raised pavement markers over pavement joints.

Make the minimum bond strength 12 kPa, or a total tensile strength of 110 N.

Measurement

634.12 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Measure pavement markings by the meter, kilometer, liter, or square meter.

When pavement markings are measured by the meter or kilometer, measure the length of line applied along the centerline of each 100-mm-wide line applied, regardless of color. Measure broken or dotted pavement lines from end to end of the line, including gaps. Measure solid pavement lines from end to end of each continuous line. For line widths other than 100 mm, the measured length of line is adjusted in the ratio of the required width to 100 mm.

When pavement markings are measured by the square meter, measure the number of square meters of symbol or letter marking based on the marking area shown in the contract or, if not shown, the area of each marking measured in place to the nearest square meter.

Measure raised pavement markers by the each.

Payment

634.13 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item		Pay Unit
634 (01)	Pavement markings, type _____, color _____	Meter
634 (02)	Pavement markings, type _____, color _____	Kilometer
634 (03)	Pavement markings, type _____, color _____	Square Meter
634 (04)	Pavement markings, type _____, color _____	Liter
634 (05)	Raised pavement markers, type _____, color _____	Each

Section 637—Equipment Rental

Description

637.01 Work. Furnish and operate equipment for construction work ordered by the CO and not otherwise provided for under the contract.

Equipment

637.02 Requirements. The CO will order in writing rental equipment for use on the project. Submit the model number and serial number for each piece of equipment before use. Make equipment available for inspection and approval before use.

Furnish and operate equipment with such auxiliary attachments, oilers, and so forth, as are usually needed for efficient operation of the equipment. Keep the equipment in good repair and capable of operating 90 percent of the working time.

Obtain approval for the length of workday and workweek before beginning work. Keep daily records of the number of unit-hours of operation. Submit the records along with certified copies of the payroll.

Measurement

637.03 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Measure rental equipment by the hour. When the equipment is operated part-time in any half shift and is operative and not used on other work during the half shift, measure the full half shift. Measure time in excess of 40 hours per week at the same rate as the first 40 hours.

Do not make deductions for nonoperating time for reasonable interruptions for minor repairs if the nonoperating time does not exceed one-half hour per workday. Do not measure nonoperating time in excess of the one-half hour per workday. Do not measure equipment dependent upon another piece of nonoperable equipment.

Do not measure standby time, or time for moving equipment to or from the project or between project worksites.

Measure quantities to include the actual hours, to the nearest half hour, that the equipment is in operation performing the required work. Each day, record the actual hours that the equipment is in operation on the required work.

Payment

637.04 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item		Pay Unit
637 (01)	_____	Hour
	Type and size of equipment	

Section 640—Road Closure Devices

Description

640.01 Work. Furnish and install, or install only, road closure devices using fabricated gates and accessories, combination post and rail barriers, concrete barriers, earth mound barriers, and other devices as SHOWN ON THE DRAWINGS.

Materials

640.02 Requirements. Furnish materials to be used in fabricating gates and barriers as SHOWN ON THE DRAWINGS.

Furnish metal beam elements, steel posts, structural steel, and steel pipe that meet the requirements SHOWN ON THE DRAWINGS.

Ensure that all hardware is galvanized in accordance with AASHTO M 232 and meets the requirements of ASTM A 307. Furnish plain or cut washers that are American Standard Washers.

Furnish timber posts, rails, and lumber that meet the requirements of AASHTO M 168. Provide timber of the species and type, and rate of preservative treatment, that are SHOWN ON THE DRAWINGS.

Furnish concrete that meets the requirements of Subsection 602.03, method B or C, as SHOWN ON THE DRAWINGS.

Construct earth mound barriers as SHOWN ON THE DRAWINGS from excavated material adjacent to the barrier location, or from other locations as SHOWN ON THE DRAWINGS.

Construction

640.03 Performance. Place road closure devices at the location SHOWN ON THE DRAWINGS. Construct all devices to the dimensions SHOWN ON THE DRAWINGS.

In assembling gates, perform required welding in accordance with the best modern practice and the applicable requirements of AWS D1.1.

After assembly, clean nongalvanized steel pipe gates and paint them with one coat of zinc-rich primer and two coats of exterior enamel of the type and color SHOWN ON THE DRAWINGS or in the SPECIAL PROJECT SPECIFICATIONS.

Set all posts vertically and embed them to the depth SHOWN ON THE DRAWINGS. Place concrete for embedment against undisturbed earth within an excavation sized to achieve the embedment dimensions. Compact the backfill in 150-mm layers to finished grade.

Furnish and install all signs and/or reflective warning markers accessory to the road closure device, as SHOWN ON THE DRAWINGS.

Measurement

640.04 Method. Use the method of measurement that is DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment

640.05 Basis. The accepted quantities will be paid for at the contract unit price for each PAY ITEM DESIGNATED IN THE SCHEDULE OF ITEMS.

Payment will be made under:

Pay Item		Pay Unit
640 (01)	Furnish and install road closure device, type _____, size _____	Each
640 (02)	Install road closure device, type _____, size _____	Each
640 (03)	Furnish and install road closure barrier, type _____, size _____	Each
640 (04)	Install road closure barrier, type _____, size _____	Each

DIVISION 700
Materials

Section 701—Cement, Grout, & Mortar

701.01 Cement

Ensure that cement meets requirements in the following specifications:

(a) Portland Cement. Ensure that Portland cement meets requirements specified in AASHTO M 85.

(b) Blended Hydraulic Cements, Excluding Types S & SA. Ensure that they meet requirements specified in AASHTO M 240.

(c) Masonry Cement. Ensure that masonry cement meets requirements specified in ASTM C 91.

Fly ash or pozzolan may be substituted for Portland cement, provided the proportions of cement and fly ash or pozzolan conform to the requirements specified in Section 552 or 602.

When blended cement (AASHTO M 240) is proposed for use, meet all requirements for fly-ash-modified concrete in the applicable sections.

Ensure that fly ash or pozzolan materials conform to the requirements specified in Subsection 725.04.

Use the product of only one manufacturing plant and only one brand of any one type of Portland cement on the project.

Store the cement and protect it against dampness. Reject cement that for any reason has become partially set or that contains lumps of caked cement. Do not use cement salvaged from discarded or used bags.

701.02 High-Strength Nonshrink Grout

Furnish grout that is packaged and ready for use with the addition of water at the construction site. Ensure that each bag is stamped to show the last date on which it may be used. Use grout that consists of a hydraulic cementitious system, graded and processed natural fine aggregate, and additional technical components such that the product meets the following conditions:

(a) It is free of inorganic accelerators, including chlorides.

(b) It is free of oxydizing catalysts.

(c) It is free of gas-producing agents.

(d) When mixed to 130 percent flow on flow table (ASTM C 230 at 10 drops), it does not reduce in linear dimension when tested in accordance with ASTM C 157. Take measurements at 72 hours and 7 days.

(e) It produces no bleeding for the first 2 hours after mixing when mixed to 130 percent flow on flow table (ASTM C 230 at 10 drops), as tested in accordance with ASTM C 232.

(f) It has a minimum strength as follows when tested in accordance with ASTM C 109:

(1) After 72 hours, 25 MPa.

(2) At 7 days, 40 MPa.

(3) After 28 days, 50 MPa.

Provide performance characteristics at 115 to 120 percent flow on flow table (ASTM C 230 at 10 drops).

(g) It must be designed, as stated by the manufacturer, to be mixed, placed, and cured at atmospheric temperatures of 5 °C to 30 °C. Submit products proposed for use for approval by the CO, and accompany them with manufacturer's submittals substantiating all requirements in this subsection, including graphs or charts showing the time, temperature, and humidity requirements for curing to achieve the specified grout strengths; and recommendations for storage, mixing, application, and curing procedures.

701.03 Low-Strength Grout

Furnish grout mixtures that conform to the following for the type or types SHOWN ON THE DRAWINGS:

(a) Hydraulic Cement Grout. Furnish a mixture of Portland cement, fine aggregate, water, expansive admixture, and/or fly ash such that the product meets the following requirements:

(1) 7-day compressive strength, AASHTO T 106 ..... 4 MPa min.

(2) Flow, FLH T 502 or ASTM C 939, conforming to the following:

(a) Time of efflux[1] ..... 16 to 26 seconds

[1]A more fluid mix having a flow cone time of efflux from 9 to 15 seconds may be used during initial injection.

Submit the following with the Certificate of Compliance:

- Mill certifications for the cement.
- Physical and chemical analysis for the pozzolans.
- Independent laboratory test results (1-day, 3-day, and 7-day strengths, flow cone times, shrinkage and expansion observed, and time of initial set).

(b) Plaster Mix (Grout). Ensure that plaster mix (grout) conforms to the following:

(1) Adhesive strength, 28-day, sheer bond adhesion testing method ..... 2 MPa min.

(2) Freeze-thaw resistance, ASTM C 666, method B ..... No cracks or delamination after 300 cycles

(3) Accelerated weathering, 5,000-hour ..... No visible defects

(4) Slat spray resistance, 300-hour ..... No deterioration or loss of adhesion

(5) Absorption, ASTM C 67 ..... 3.5% max.

(6) Flexural strength, ASTM C 348, 28-day ..... 6.8 MPa min.

(7) Compressive strength, AASHTO T 106, 28-day ..... 27.5 MPa min.

(c) Portland Cement Grout. Furnish one part Portland cement and three parts sand. Thoroughly mix with water to produce a thick, creamy consistency.

701.04 Mortar

Furnish mortar that is packaged and ready for use with the addition of water at the construction site. Ensure that each bag is stamped to show the latest date on which it may be used. Use mortar that consists of a cementitious system made up of:

(a) Natural aggregate, 10 mm in maximum size, that meets the requirements specified in ASTM C 33 except for grading. Accomplish grading by blending sieve sizes to obtain the optimum density.

(b) Metallic aggregate free from nonferrous material, soluble alkaline compounds, and visible rust.

(c) Water reducers, workability agents, air-entraining agents, and catalysts.

Blend the materials to minimize bleeding, increase workability, resist exposure to freeze-thaw cycles and deicing salts, and prevent shrinkage within and at the perimeter of the patch, keyway, or other area to be filled.

Ensure that the minimum compressive strength of the mortar, as tested by ASTM C 109 for a 75-mm slump, is:

- 24-hour ..... 35 MPa
- 7-day ..... 60 MPa
- 28-day ..... 70 MPa

Ensure that the durability of the products when tested at 300 cycles, ASTM C 666, procedure A, is:

Submerged in:	DF (%)
Water	98
5% $CaCl_2$ solution	95
5% NaCl solution	85

Ensure that the scaling resistance has a rating of 3, Moderate Scaling, after 50 cycles when tested in accordance with ASTM C 672.

Provide certification from the manufacturer that the product is compatible for work that is 25 mm or more in depth and more than 25 mm in width; and where the mixing, placing, and curing temperatures may range from 5 °C to 30 °C.

Submit products proposed for use to the CO for approval, and accompany them with the manufacturer's submittals substantiating all requirements in this section, including (1) graphs or charts showing the time, temperature, humidity, and curing requirements to achieve mortar strengths equal to the adjacent concrete; and (2) complete recommendations for storage, mixing, application, and curing procedures.

701.05 Polymer Grout

Furnish a polymer binder and fine aggregate in the proportions recommended by the polymer manufacturer with a minimum compressive strength of 25 MPa in 4 hours.

Section 702—Bituminous Material

702.01 Asphalt Cement

Ensure that asphalt cement conforms to AASHTO M 20 or M 226, AASHTO MP 1, or applicable State department of transportation specifications for asphalt materials for the grade specified. When modified asphalt cement is used, test it in accordance with AASHTO PP 5.

702.02 Cutback Asphalt

Ensure that cutback asphalt conforms to the following specifications:

(a) Rapid-curing, AASHTO M 81.

(b) Medium-curing, AASHTO M 82.

(c) Slow-curing, ASTM D 2026.

702.03 Emulsified Asphalt

Ensure that anionic emulsified asphalt conforms to AASHTO M 140, and cationic emulsified asphalt to AASHTO M 208, except as specified below. When specified for tack coat, an equivalent anionic grade emulsion may be substituted for a cationic grade, and vice versa. Unless otherwise noted, test the emulsion in accordance with the procedures in AASHTO T 59.

(a) CRS–2 Emulsions. Ensure that CRS–2 emulsions conform to AASHTO M 208.

(b) CRS–1h & CRS–2h Emulsions. Ensure that CRS–1h and CRS–2h emulsions conform to the requirements of CRS–1 and CRS–2, respectively, except as follows:

(1) Penetration, 25 °C, 100 g, 5-second ..... 40 to 90 mm

(c) CMS–2 & CMS–2h Emulsions. Ensure that CMS–2 and CMS–2h emulsions conform to AASHTO M 208; but in table 1, revise the percent of oil distillate as follows:

(1) Oil distillate, by volume of emulsion ..... 5 to 12%

(d) Quick-Set Emulsions. Ensure that quick-set emulsions conform to the following:

(1) Viscosity, Saybolt Furol at 25 °C ..... 20 to 100 seconds

(2) Residue by distillation ..... 57% min.

(3) Sieve test ..... 0.10% max.

(4) Tests on residue from distillation:

(a) Penetration, 25 °C, 100 g, 5-second, AASHTO T 49 ..... 40 to 100 mm

(b) Solubility in trichloroethylene, AASHTO T 44 ..... 97.5% min.

(c) Ductility, 25 °C, 50 mm per minute, AASHTO T 51 ... 40 mm min.

(e) CRS–2 Polymer-Modified Emulsions. Ensure that polymer-modified emulsions conform to the following:

(1) Viscosity, 50 °C, Saybolt Furol ..... 100 to 400 seconds

(2) Storage stability test after 24 hours ..... 1.0% max.

(3) Demulsibility ..... 40% min.

(4) Particle charge ..... Positive

(5) Sieve test ..... 0.3% max.

(6) Residual by distillation ..... 65% max.

(7) Oil distillate by volume of emulsion ..... 3% max.

(8) Test on residue from distillation:

(a) Penetration, 25 °C, 100 g, 5-second ..... 90 to 200 mm

(b) Solubility in trichloroethylene ..... 97.5% min.

(c) Torsional recovery, CAL TRANS test no. 332 ..... 18% min.
or toughness/tenacity N•m[1] ..... 5.6/2.8 min.

[1] Benson Method of Toughness and Tenacity, Scott tester, mm-kg at 25 °C, 500 mm per minute pull. Tensionhead 22 mm diameter (ASTM D 4, proposed P 243).

Ensure that polymer is milled into the emulsion during the manufacturing process.

702.04 Application Temperatures

Apply asphalts within the temperature ranges shown in table 702-1.

Table 702-1.—Application temperatures, range (°C).

Type and Grade of Asphalt	Temperature Ranges (minimum–maximum)	
	Spraying Temperatures	Mixing Temperatures[b]
Cutback asphalt:		
MC–30	30–[a]	–
RC, MC, or SC–70	50–[a]	–
RC, MC, or SC–250	75–[a]	60–80[c]
RC, MC, or SC–800	95–[a]	75–100[c]
RC, MC, or SC–3000	110–[a]	80–115[c]
Emulsified asphalt:		
RS–1	20–60	–
RS–2	50–85	–
MS–1	20–70	20–70
MS–2, –2h	–	20–70
HFMS–1, –2, –2h, –2s	20–70	10–70
SS–1, –1h; CSS–1, –1h	20–70[d]	20–70
CRS–1, –1h	50–85	–
CRS–2, –2h, –2 modified	60–85	–
CMS–2, –2h	40–70	50–60
Asphalt cement, all grades	180 max.	180 max.

a. The maximum temperature at which fogging or foaming does not occur.
b. Temperature of mix immediately after discharge.
c. Temperature may be above flash point. Take precautions to prevent fire or explosion.
d. For fog seals and tack coats.

702.05 Recycling Agent

Use recycling agents that conform to ASTM D 4552, or use a preapproved petroleum product additive that restores aged asphalt to the required specifications.

702.06 Asphalt Mastic

Use asphalt mastic that conforms to AASHTO M 243.

702.07 Antistrip Additive

(a) Furnish commercially produced heat-stable liquid products that have the chemical and physical properties when added to an asphalt to prevent separation of the asphalt from aggregates.

(b) Furnish cement that conforms to Subsection 701.01 or fly ash that conforms to Subsection 725.04.

(c) Furnish hydrated lime conforming to Subsection 725.03.

702.08 Cold Asphalt Concrete

Provide an asphalt concrete mixture composed of crushed stone or gravel and asphalt cement mixed in an approved plant. Ensure that the gradation and quality of the aggregate and the grade and quality of asphalt binder conform to those normally used in the construction of highways by Federal or State agencies.

Do not use an aggregate asphalt mixture that strips. Use an asphalt grade that leaves the mix pliable and workable at a temperature of –10 °C.

Section 703—Aggregate

703.01 Fine Aggregate for Portland Cement Concrete

As fine aggregate, use sand that conforms to the requirements shown below.

(a) For structural concrete, fine aggregate is sand that conforms to AASHTO M 6, class B, but limit the material that passes the 75-µm sieve to 3.0 percent. Also meet the supplementary requirements of AASHTO M 6 for reactive aggregates. Use material that conforms to sand equivalent value, AASHTO T 176, alternate method number 2, 75 minimum.

(b) For structural concrete, lightweight fine aggregate is sand that conforms to AASHTO M 195, where applicable.

(c) For minor concrete structures, meet requirements specified in AASHTO M 6.

703.02 Coarse Aggregate for Portland Cement Concrete

Furnish coarse aggregate that conforms to the requirements listed below.

(a) For structural concrete, furnish coarse aggregate that conforms to AASHTO M 80, class A, but use aggregates with a percentage of wear that is not more than 40 percent, in accordance with AASHTO T 96. In concrete used in bridge decks or for paving, do not use aggregates known to polish, or carbonate aggregates containing by weight less than 25 percent insoluble residue, as determined by ASTM D 3042.

Ensure that the adherent coating on the aggregate does not exceed 1.0 percent when tested in accordance with FLH T 512.

(b) For structural concrete, furnish lightweight coarse aggregate that conforms to AASHTO M 195, when applicable.

(c) For minor concrete structures, aggregate must meet AASHTO M 80 and the class designations that are appropriate for end use and weathering exposure.

703.03 Granular Backfill

(a) Coarse Granular Backfill. Furnish backfill material that conforms to AASHTO M 80, class E, and AASHTO M 43, grading number 3, 4, 5, 7, 57, or 67.

Minor variations in the gradation and the deleterious substance content are subject to approval by the CO.

(b) Fine Granular Backfill. Furnish backfill material that conforms to AASHTO M 6. The soundness test is not required. Minor variations in the gradation and the deleterious substance content are subject to approval by the CO.

703.04 Sheathing Material

Furnish either fine aggregate meeting gradation requirements of AASHTO M 6, or coarse aggregate consisting of sound, durable particles of gravel, slag, or crushed stone, as specified in table 703-1.

Table 703-1.—Sheathing material gradation.

Sieve Designation	% by Weight Passing Standard Sieves (AASHTO T 11 and T 27)
75 mm	100
19 mm	50–90
4.75 mm	20–50
75 µm	0.0–2.0

703.05 Subbase, Base, & Surface Course Aggregate

(a) General. Furnish aggregates that consist of hard, durable particles or fragments of crushed stone, crushed slag, or crushed gravel meeting the appropriate gradation, as shown in table 703-2 or 703-3, and conforming to the following:

(1) Los Angeles abrasion, AASHTO T 96 ..... 40% max.

(2) Sodium sulfate soundness loss (five cycles), AASHTO T 104 ..... 12% max.

(3) Durability index (coarse), AASHTO T 210 ..... 35 min.

(4) Durability index (fine), AASHTO T 210 ..... 35 min.

(5) Fractured faces, FLH T 507 ..... 50% min.

Furnish a material that is free from organic matter and lumps or balls of clay. Do not use material that breaks up when alternately frozen and thawed or wetted and dried.

Obtain the aggregate gradation by crushing, screening, and blending processes as necessary. Ensure that fine aggregate (material passing the 4.75-mm sieve) consists of natural or crushed sand and fine mineral particles.

Table 703-2.—Gradation TV ranges for subbase and base.

Sieve Size	% by Mass Passing Designated Sieve (AASHTO T 27 and T 11)				
	Grading Designation				
	A (Subbase)	B (Subbase)	C (Base)	D (Base)	E (Base)
63 mm	100	–	–	–	–
50 mm	97–100	100	100	–	–
37.5 mm	–	97–100	97–100	100	–
25 mm	65–79 (6)	–	–	97–100	100
19 mm	–	–	67–81 (6)	–	97–100
12.5 mm	45–59 (7)	–	–	–	–
9.5 mm	–	–	–	56–70 (7)	67–79 (6)
4.75 mm	28–42 (6)	40–60 (8)	33–47 (6)	39–53 (6)	47–59 (7)
425 µm	9–17 (4)	–	10–19 (4)	12–21 (4)	12–21 (4)
75 µm	4.0–8.0 (3)	0.0–12.0 (4)	4.0–8.0 (3)	4.0–8.0 (3)	4.0–8.0 (3)

Note: Allowable deviations (±) from TV are shown in parentheses.

Table 703-3.—Gradation TV ranges for surface courses.

Sieve Size	% by Mass Passing Designated Sieve (AASHTO T 27 and T 11)	
	Grading Designation	
	F	G
37.5 mm	100	–
25 mm	97–100	100
19 mm	76–89 (6)	97–100
9.5 mm	56–68 (6)	70–80 (6)
4.75 mm	43–53 (7)	51–63 (7)
1.18 mm	23–32 (6)	28–39 (6)
425 µm	15–23 (5)	19–27 (5)
75 µm	10–16 (4)	10–16 (4)

Note: Allowable deviations (±) from TV are shown in parentheses. If the plasticity index (PI) is greater than 0, the TV range for the 75-µm sieve size is 6–12 (± 4).

(b) Subbase & Base Aggregates. Furnish subbase or base aggregate that conforms to specifications in Subsection 703.05(a), and to the following:

(1) Liquid limit, AASHTO T 89 ..... 25 max.

(2) Plastic limit, AASHTO T 90 ..... Nonplastic

(c) Surface Course Aggregate. Furnish surface course aggregate that conforms to specifications in Subsection 703.05(a), and to the following:

(1) Liquid limit, AASHTO T 89 ..... 35 max.

(2) Plasticity index, AASHTO T 90:

(a) If the percent passing the 75-µm sieve is less than 12% ..... 2 to 9

(b) If the percent passing the 75-µm sieve is greater than 12% 0

Do not furnish material that contains asbestos fibers.

703.06 Crushed Aggregate

Furnish crushed hard, durable particles or fragments of stone or gravel meeting the size and quality requirements for crushed aggregate material normally used locally in the construction and maintenance of highways by Federal or State agencies.

Furnish crushed aggregate with a maximum size of 25 mm as determined by AASHTO T 27 and AASHTO T 11. Furnish crushed aggregate that is uniformly graded from coarse to fine and is free of organic matter and lumps or balls of clay.

703.07 Hot Asphalt Concrete Pavement Aggregate

Aggregate for hot asphalt concrete pavement consists of hard, durable particles or fragments of crushed stone, crushed slag, or crushed gravel.

Size, grade, and combine the aggregate fractions for the mixture in proportions such that the resulting composite blend conforms to the gradation shown in table 703-4 for the grading designated.

Furnish a blend that is reasonably free from organic or other deleterious material and does not contain more than 1.0 percent clay lumps and friable particles when tested in accordance with AASHTO T 112.

Local State department of transportation requirements for gradation and quality of hot asphalt concrete pavement may be substituted for the above requirements when DESIGNATED IN THE SCHEDULE OF ITEMS.

Table 703-4.—Aggregate gradation requirements for hot asphalt concrete pavement.

Sieve Size	% by Weight Passing Designated Sieve (AASHTO T 27 and T 11)			
	Grading Designation			
	A	B	D	F
50 mm	–	–	–	–
37.5 mm	100	–	–	–
25 mm	97–100	100	–	–
19 mm	–	97–100	100	–
12.5 mm	–	76–88	97–100	–
9.5 mm	53–70	–	–	100
4.75 mm	40–52	49–59	57–69	33–47
2.36 mm	25–39	36–45	41–49	7–13
600 µm	12–22	20–28	22–30	–
300 µm	8–16	13–21	13–21	–
75 µm	3–8	3–7	3–8	2–4

(a) Coarse Aggregate. Coarse aggregate (aggregate retained on the 4.75-mm sieve) consists of crushed stone, crushed slag, or crushed gravel that conforms to the following:

(1) Los Angeles abrasion, AASHTO T 96 ..... 40% max.

(2) Sodium sulfate soundness loss (five cycles), AASHTO T 104 ..... 12% max.

(3) Fractured faces, FLH T 507 ..... 75% min.

(4) Durability index (coarse), AASHTO T 210 ..... 35 min.

Do not use aggregates known to polish, or carbonate aggregates containing by weight less than 25 percent insoluble residue when tested in accordance with ASTM D 3042.

(b) Fine Aggregate. Fine aggregate (aggregate that passes a 4.75-mm sieve) consists of natural sand, stone screenings, slag screenings, or a combination thereof conforming to AASHTO M 29. Exclude the grading requirements and include the sodium sulfate soundness test and the following:

(1) Durability index (fine), AASHTO T 210 ..... 35 min.

(2) Sand equivalent value, AASHTO T 176, alternate method number 2 ..... 45 min.

(c) Lightweight Aggregate (Slag). Only use crushed slag that conforms to the quality requirements specified in AASHTO M 195. Other kinds or types of lightweight aggregates covered in AASHTO M 195 are not permitted.

703.08 Cold Asphalt Concrete Pavement Aggregate

Furnish aggregate for cold asphalt concrete pavement consisting of hard, durable particles or fragments of crushed stone, crushed slag, or crushed gravel.

Size, grade, and combine the aggregate fractions for the mixture in proportions such that the resulting composite blend conforms to the applicable gradation requirements shown in table 703-5 for dense-graded mixtures and table 703-6 for open-graded mixtures.

Ensure that the composite blend is reasonably free from organic or other deleterious material and contains less than 1.0 percent clay lumps and friable particles when tested in accordance with AASHTO T 112.

(a) Coarse Aggregate. Furnish coarse aggregate consisting of crushed stone, crushed slag, or crushed gravel that conforms to the following:

(1) Los Angeles abrasion, AASHTO T 96 ..... 40% max.

(2) Sodium sulfate soundness loss (five cycles), AASHTO T 104 ..... 12% max.

(3) Fractured faces, FLH T 507 ..... 75% min.

(4) Durability index (coarse), AASHTO T 210 ..... 35 min.

Do not use aggregates known to polish, or carbonate aggregates containing by weight less than 25 percent insoluble residue, in accordance with ASTM D 3042.

Table 703-5.—Aggregate gradation requirements and TV ranges for dense-graded cold bituminous pavement.

Sieve Size	% by Weight Passing Designated Sieve (AASHTO T 27 and T 11)				
	Grading Designation				
	DA	DB	DC	DD	DE
50 mm	100	–	–	–	–
37.5 mm	95–100	100	–	–	–
25 mm	–	95–100	100	–	–
19 mm	60–80 (7)	–	95–100	100	–
12.5 mm	–	60–80 (7)	–	95–100	100
9.5 mm	–	–	60–80 (7)	–	95–100
4.75 mm	20–55 (7)	25–60 (7)	35–65 (7)	45–70 (7)	60–80 (7)
2.36 mm	10–40 (6)	15–45 (6)	20–50 (6)	25–55 (6)	35–65 (6)
300 µm	2–16 (4)	3–18 (4)	3–20 (4)	5–20 (4)	6–25 (4)
75 µm	0–5 (3)	1–7 (3)	2–8 (3)	2–9 (3)	2–10 (3)

Note: Allowable deviations (±) from TV are shown in parentheses.

Table 703-6.—Aggregate gradation requirements and TV ranges for open-graded cold bituminous pavement.

Sieve Size	% by Weight Passing Designated Sieve (AASHTO T 27 and T 11)			
	Grading Designation			
	OA	OB	OC	OD
37.5 mm	100	–	–	–
25 mm	95–100	100	–	–
19 mm	–	95–100	100	–
12.5 mm	25–65 (7)	–	95–100	100
9.5 mm	–	20–55 (7)	35–40 (7)	85–100 (7)
4.75 mm	0–10 (5)	0–10 (5)	–	–
2.36 mm	0–5 (3)	0–5 (3)	3–7 (3)	–
1.18 mm	–	–	–	0–5 (3)
75 µm	0–2 (1)	0–2 (1)	0–1 (1)	0–2 (1)

Note: Allowable deviations (±) from TV are shown in parentheses.

(b) Fine Aggregate. Furnish fine aggregate consisting of natural sand, stone screenings, slag screenings, or a combination thereof conforming to AASHTO M 29. Exclude the grading requirements and include the sodium sulfate soundness test and the following:

(1) Durability index (fine), AASHTO T 210 ..... 35 min.

(2) Sand equivalent value, AASHTO T 176, alternate method number 2 ..... 35 min.

703.09 Asphalt Surface Treatment Aggregate

Furnish aggregate for single and multiple surface treatment courses consisting of hard, durable particles or fragments of crushed stone, crushed slag, or crushed gravel.

Size, grade, and combine the aggregate fractions to conform to specifications in table 703-7 for the gradation designated. Ensure that the composite blend is reasonably free from organic or other deleterious material and contains less than 1.0 percent clay lumps and friable particles when tested in accordance with AASHTO T 112.

Table 703-7.—Aggregate gradation requirements for single- and multiple-course surface treatments.

	% by Weight Passing Designated Sieve (AASHTO T 27 and T 11)					
	Grading Designation					
Sieve Size	A	B	C	D	E	F
37.5 mm	100	–	–	–	–	–
25 mm	90–100	100	–	–	–	–
19 mm	0–35	90–100	100	–	–	–
12.5 mm	0–8	0–35	90–100	100	–	–
9.5 mm	–	0–12	0–35	85–100	100	100
4.75 mm	–	–	0–12	0–35	85–100	85–100
2.36 mm	–	–	–	0–8	0–23	–
75 µm	0–2	0–2	0–2	0–2	0–2	0–10

Use only one type of aggregate on a project, and ensure that aggregates meet the following quality requirements:

(a) Los Angeles abrasion, AASHTO T 96 ..... 40% max.

(b) Sodium sulfate soundness loss, AASHTO T 104 ..... 12% max.

(c) Loose unit weight shoveling procedure, AASHTO T 19M ..... 1,100 kg/m^3 min.

(d) Coating and stripping of bitumen-aggregate mixtures, AASHTO T 182[1] ..... 95% min.

(e) Fractured faces, FLH T 507 ..... 75% min.

(f) Flakiness index, FLH 508 ..... 30 max.

(g) Durability index (coarse), AASHTO T 210 ..... 35 min.

(h) Durability index (fine), AASHTO T 210 ..... 35 min.

(i) Adherent coating on the aggregate, FLH T 512 ..... 0.5% max.

[1]An approved chemical additive may be used to meet this requirement.

Do not use lightweight aggregate as defined in AASHTO M 195.

703.10 Slurry Seal Aggregate

For slurry seals, furnish aggregate that is a natural or manufactured sand, slag, crushed fines, or other mineral aggregate conforming to table 703-8 and the following:

(a) Los Angeles abrasion, AASHTO T 96 ..... 35% max.

(b) Sand equivalent value, AASHTO T 176, alternate method number 2 ..... 45 min.

(c) Sand content by weight of total combined aggregate with < 1.25% water absorption ..... 50% max.

(d) Sodium sulfate soundness loss, AASHTO T 104 ..... 12% max.

(e) Fine durability index, AASHTO T 210 ..... 60% max.

Ensure that aggregate gradation is as shown in table 703-8 for the type specified.

Table 703-8.—Slurry seal aggregate gradation requirements and application rates.[a]

	% by Weight Passing Designated Sieve (AASHTO T 27 and T 11)		
	Type of Slurry Seal		
Sieve Size	I	II	III
9.5 mm	–	100	100
4.75 mm	100	90–100	70–90
2.36 mm	90–100	65–90	45–70
1.18 mm	65–90	45–70	28–50
600 µm	40–65	30–50	19–34
300 µm	25–42	18–30	12–25
150 µm	15–30	10–21	7–18
75 µm	10–20	5–15	5–15
Application rate (kg/m^2)	3.3–5.5	5.5–8.2	≥ 8.2

a. Based on the dry weight of the aggregate.

703.11 Choker Aggregate

Furnish aggregate for choker consisting of hard durable particles or fragments of crushed gravel or crushed stone meeting the gradation shown in table 703-9. Furnish a material that is free from organic matter and clay balls and has a minimum sand equivalent value of 75, as determined by AASHTO T 176, referee method.

Table 703-9.—Choker aggregate gradation.

Sieve Size	% by Weight Passing Designated Sieve (AASHTO T 27 and T 11)
9.5 mm	100
4.75 mm	70–100
75 µm	0.0–5.0

703.12 Blotter

Furnish aggregate for blotter material consisting of sound, durable particles of gravel or crushed stone with a gradation such that all particles will pass a sieve with 9.5-mm square openings. Furnish material that is free from organic matter and has a liquid limit, established by AASHTO T 89, of less than 25.

703.13 Aggregate for Lean Concrete Backfill

Furnish hard, clean, durable, nonplastic, nonorganic, nonreactive aggregate.

703.14 Superpave Asphalt Concrete Pavement Aggregate

Furnish hard, durable particles, or fragments of crushed stone, crushed slag, or crushed gravel conforming to the following:

(a) Los Angeles abrasion, AASHTO T 96 ..... 35% max.

(b) Sodium sulfate soundness loss, AASHOT T 104 (five cycles) ..... 12% max.

(c) Durability index, AASHTO T 210 (coarse and fine) ..... 35 min.

(d) Fractured faces, FLH T 507 ..... 55 min.

(e) Sand equivalent value, AASHTO T 176, alternate method number 2 ..... 40 min.

(f) Size, grade, and combine the aggregate fractions for the mixture in proportions such that the resulting composite blend is located between the control points for the appropriate nominal maximum size of aggregate shown in table 703-10, 703-11, or 703-12, and figure 703-1, 703-2, or 703-3. The nominal maximum size is one sieve size greater than the first sieve to retain more than 10 percent of the combined aggregate. Use the appropriate table and figure in accordance with the nominal maximum size of aggregate. The gradation should not pass through the restricted zone when plotted. Test in accordance with AASHTO T 11 and T 27.

Table 703-10.—Superpave requirements for 12.5-mm nominal size aggregate.

Sieve Size (mm)	Control Points		0.45 Chart Max. Density	Restricted Zone		TV's	Allowable Deviation[b]
				Min. Boundary	Max. Boundary		
19.00	–	100.0	100.0	–	–	–	–
12.50	100.0	90.0	82.8	–	–	–	–
9.50	–	–	73.2	–	–	–	–
4.75	–	–	53.6	–	–	–[a]	6
2.36	58.0	28.0	39.1	39.1	39.1	–[a]	6
1.18	–	–	28.6	25.6	31.6	–	–
0.60	–	–	21.1	19.1	23.1	–[a]	4
0.30	–	–	15.5	15.1	15.1	–[a]	3
0.15	–	–	11.3	–	–	–	–
0.075	10.0	2.0	8.3	–	–	–[a]	2

a. Establish TV's as part of the job-mix formula. Establish aggregate gradation TV's to the nearest 0.1 percent.
b. Plus or minus from established TV's.

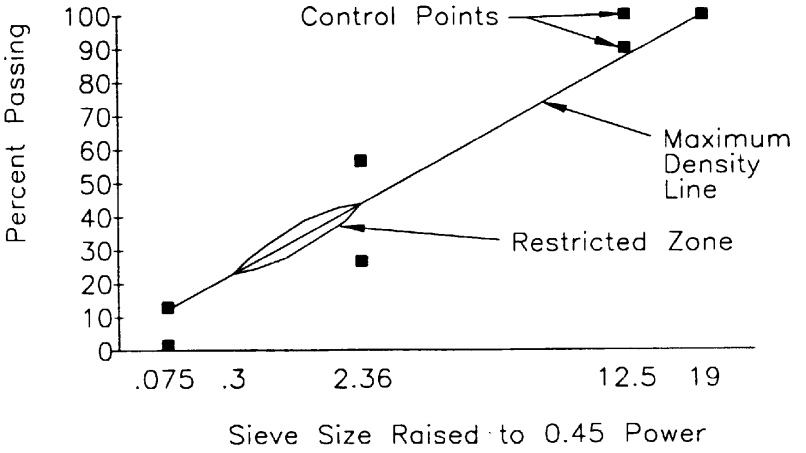

Figure 703-1.—Gradation chart for 12.5-mm nominal size aggregate.

Table 703-11.—Superpave requirements for 19-mm nominal size aggregate.

Sieve Size (mm)	Control Points		0.45 Chart Max. Density	Restricted Zone Min. Boundary	Restricted Zone Max. Boundary	TV's	Allowable Deviation[b]
25.00	–	100.0	100.0	–	–	–	–
19.00	100.0	90.0	88.4	–	–	–	–
12.50	–	–	73.2	–	–	–	–
9.50	–	–	64.7	–	–	–	–
4.75	–	–	47.4	–	–	–[a]	6
2.36	49.0	23.0	34.6	34.6	34.6	–[a]	6
1.18	–	–	25.3	22.3	28.3	–	–
0.60	–	–	18.7	16.7	20.7	–[a]	4
0.30	–	–	13.7	13.7	13.7	–[a]	3
0.15	–	–	10.0	–	–	–	–
0.075	8.0	2.0	7.3	–	–	–[a]	2

a. Establish TV's as part of the job-mix formula. Establish aggregate gradation TV's to the nearest 0.1 percent.
b. Plus or minus from established TV's.

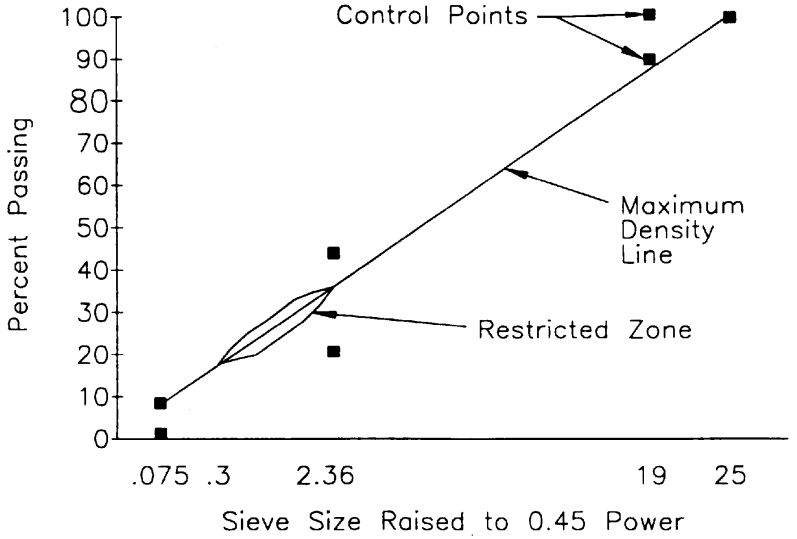

Figure 703-2.—Gradation chart for 19-mm nominal size aggregate.

Table 703-12.—Superpave requirements for 25-mm nominal size aggregate.

Sieve Size (mm)	Control Points		0.45 Chart Max. Density	Restricted Zone Min. Boundary	Restricted Zone Max. Boundary	TV's	Allowable Deviation [b]
37.5	–	100.0	100.0	–	–	–	–
25.0	100.0	90.0	83.3	–	–	–	–
19.00	–	–	73.6	–	–	–	–
12.50	–	–	61.0	–	–	–	–
9.50	–	–	53.9	–	–	–	–
4.75	–	–	39.5	39.5	39.5	–[a]	6
2.36	45.0	19.0	28.8	26.8	30.8	–[a]	6
1.18	–	–	21.1	18.1	24.1	–	–
0.60	–	–	15.6	13.6	17.6	–[a]	4
0.30	–	–	11.4	11.4	11.4	–[a]	3
0.15	–	–	8.3	–	–	–	–
0.075	7.0	1.0	6.1	–	–	–[a]	2

a. Establish TV's as part of the job-mix formula. Establish aggregate gradation TV's to the nearest 0.1 percent.
b. Plus or minus from established TV's.

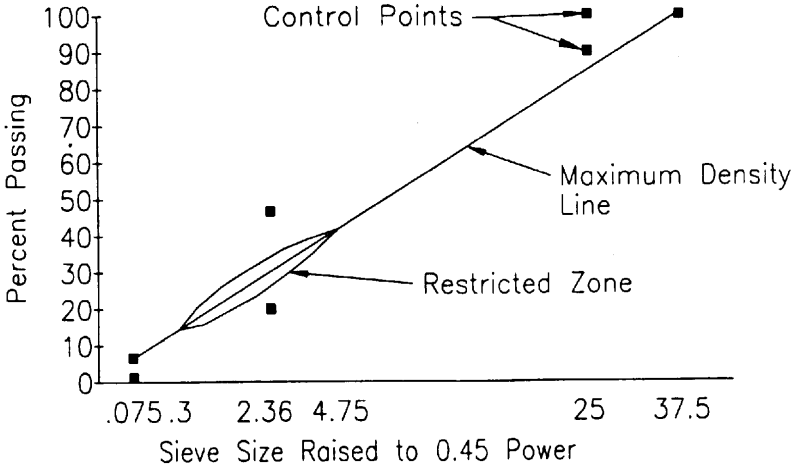

Figure 703-3.—Gradation chart for 25-mm nominal size aggregate.

Section 704—Soil

704.01 Foundation Fill

Furnish granular material free of excess moisture, frozen lumps, roots, sod, and other deleterious material and conforming to the following:

(a) Material passing 50-mm sieve 100%

(b) Soil classification, AASHTO M 145 ..... A-1-a

(c) In wet environments, material passing 75-µm sieve ... 6% max.

704.02 Bedding

Furnish material that conforms to the following for the class specified:

(a) Class A Bedding. Furnish concrete in accordance with specifications in Section 602.

(b) Class B Bedding. Furnish approved sand or selected sandy soil free of excess moisture, muck, frozen lumps, roots, sod, and other deleterious material, and conforming to the following:

(1) Material passing 9.5-mm sieve 100%

(2) Material passing 75-µm sieve, AASHTO T 27 and T 11 ..... 10% max.

(c) Class C Bedding. Furnish approved sand or fine granular material free of excess moisture, muck, frozen lumps, roots, sod, and other deleterious material. Remove all rock particles and hard earth clods larger than 38 mm.

704.03 Backfill Material

Furnish granular material or fine compatible soil free of excess moisture, muck, frozen lumps, roots, sod, and other deleterious material. Remove all rock particles and hard earth clods larger than 75 mm in the longest dimension.

704.04 Structural Backfill

Furnish free-draining granular material free of excess moisture, muck, frozen lumps, roots, sod, and other deleterious material. Remove all rock particles and hard earth clods larger than 75 mm in the longest dimension. Ensure that material conforms to the following:

(a) Material passing 75-µm sieve, AASHTO T 27 and T 11 ..... 15% max.

(b) Liquid limit, AASHTO T 89 ..... 30 max.

704.05 Topping

Furnish a granular material free of excess moisture, muck, frozen lumps, roots, sod, and other deleterious material. Remove all rock particles larger than 100 mm in the longest dimension. Ensure that material conforms to AASHTO M 145, table 2, soil classification A-1 or A-3.

704.06 Unclassified Borrow

Furnish granular material free of excess moisture, muck, frozen lumps, roots, sod, and other deleterious material. Remove all rock fragments and boulders greater than 600 mm in the longest dimension. Ensure that material conforms to AASHTO M 145, table 2, soil classification A-1, A-3, or A-2-4.

704.07 Select Borrow

Furnish crushed, partially crushed, or natural material free of excess moisture, muck, frozen lumps, roots, sod, and other deleterious material. Ensure that material conforms to the following:

(a) Gradation ..... Table 704-1

(b) Liquid limit, AASHTO T 89 ..... 30 max.

Table 704-1.—Select borrow gradation.

Sieve Size	% by Weight Passing Designated Sieve (AASHTO T 27 and T 11)
75 mm	100
25 mm	70–100
4.75 mm	30–70
150 µm	0–15

704.08 Select Topping

Furnish crushed, partially crushed, or natural material free of excess moisture, muck, frozen lumps, roots, sod, and other deleterious material. Ensure that material conforms to the following:

(a) Gradation, uniform coarse to fine ..... Table 704-2

(b) Liquid limit, AASHTO T 89 ..... 30 max.

Table 704-2.—Select topping gradation.

Sieve Size	% by Weight Passing Designated Sieve (AASHTO T 27 and T 11)
75 mm	100
75 µm	0–15

704.09 Bed Course

Furnish porous, free-draining granular material free of excess moisture, muck, frozen lumps, roots, sod, and other deleterious material. Ensure that material conforms to the following:

(a) Gradation, uniform coarse to fine ..... Table 704-3

(b) Liquid limit, AASHTO T 89 ..... 30 max.

Table 704-3.—Bed course gradation.

Sieve Size	% by Weight Passing Designated Sieve (AASHTO T 27 and T 11)
12.5 mm	100
75.0 µm	0–10

704.10 Select Granular Backfill

Furnish sound, durable granular material free from organic matter or other deleterious material (such as shale or other soft particles with poor durability). Ensure that material conforms to the specifications below.

(a) Quality Requirements. Furnish material that meets the following quality requirements:

(1) Gradation ..... Table 704-4

(2) Shear angle of internal friction, AASHTO T 236[1] ..... 34° min.

(3) Sodium sulfate soundness loss (five cycles), AASHTO T 104 ..... 15% max.

(4) Los Angeles abrasion, AASHTO T 96 ..... 50% max.

(5) Liquid limit, AASHTO T 89 ..... 30 max.

[1] Compact samples for AASHTO T 236 to 95 percent of the maximum density determined in accordance with AASHTO T 99, method C or D, and corrected for oversized material as set forth in AASHTO T 99.

Table 704-4.—Select granular backfill gradation.

Sieve Size	% by Weight Passing Designated Sieve (AASHTO T 27 and T 11)
100 mm	100
75 mm	75–100
75 µm	0–15

(b) Electrochemical Requirements. Furnish material that meets the following electrochemical requirements:

(1) Resistivity, AASHTO T 288, any method ..... 3,000 Ω x centimeter min.

(2) pH, AASHTO T 289, any method ..... 5.0 to 10.0

(3) Sulfate content, AASHTO T 290, any method[1] ..... 1,000 ppm max.

(4) Chloride content, AASHTO T 291, any method[1] ..... 200 ppm max.

[1] Tests for sulfate and chloride content are not required when pH is between 6.0 and 8.0 and the resistivity is greater than 5,000 Ω x centimeter

704.11 Special Grout Backfill

Furnish lean grout slurry composed of three parts Portland cement and eight parts fine aggregate by volume. Fly ash may be substituted for two of the three parts Portland cement. Ensure that material conforms to the following:

(a) Water/cement ratio 1.5

(b) Portland cement 701.01

(c) Fly ash ..... 725.04, type C

(d) Fine aggregate 703.01

(e) Water 725.01

704.12 Crib Wall Backfill

Furnish material in accordance with Subsection 704.10, but conform to the following:

(a) Gradation ..... Table 704-5

(b) Unit weight ..... 1,900 kg/m^3 min.

Table 704-5.—Crib wall backfill gradation.

Sieve Size	% by Weight Passing Designated Sieve (AASHTO T 27 and T 11)
75 mm	100
4.75 mm	25–70
300 µm	5–20
75 µm	0–5

Section 705—Rock

705.01 Gabion Rock

Furnish hard, durable rock that is resistant to weathering and reasonably free of organic and spoil material. Ensure that rock conforms to the following specifications:

(a) Coarse durability index, AASHTO T 210 ..... 52 min.

(b) Unit weight of a filled basket ..... 1,600 kg/m^3 min.

(c) Gradation:

(1) Baskets 0.3 m or greater in the vertical dimension:

(a) Max. dimension ..... 200 mm

(b) Min. dimension ..... 100 mm

(2) Baskets less than 0.3 m in the vertical dimension:

(a) Max. dimension ..... 150 mm

(b) Min. dimension ..... 75 mm

705.02 Riprap Rock

Furnish hard, durable, angular rock free of organic and spoil material and resistant to weathering and water action. Do not use rounded rock, boulders, shale, or rock with shale seams. Furnish rock that conforms to the following:

(a) Apparent specific gravity, AASHTO T 85 ..... 2.50 min.

(b) Absorption, AASHTO T 85 ..... 4.2% max.

(c) Coarse durability index, AASHTO T 210 ..... 52 min.

(d) Gradation for the class specified ..... Table 705-1

Table 705-1.—Gradation requirements for riprap.

Class	% of Rock by Mass	Mass (kg)	Approximate Cubic Dimension[b,c] (mm)
1	20	10–15	150–200
	30	5–10	125–150
	40	0.5–5	50–125
	10[a]	0–0.5	0–50
2	20	25–50	200–250
	30	10–25	150–200
	40	1–10	75–150
	10[a]	0–1	0–75
3	20	100–150	350–400
	30	50–100	250–350
	40	5–50	125–250
	10[a]	0–5	0–125
4	20	250–350	450–500
	30	100–250	350–450
	40	10–100	150–350
	10[a]	0–10	0–150
5	20	700–1,000	650–700
	30	350–700	500–650
	40	25–350	200–500
	10[a]	0–25	0–200
6	20	850–1,600	700–850
	30	500–850	550–700
	40	50–500	250–550
	10[a]	0–50	0–250

a. Furnish spalls and rock fragments graded to provide a stable compact mass.
b. The volume of a rock with these cubic dimensions will have a mass approximately equal to the specified rock mass.
c. Furnish stone with breadth and thickness at least one-third its length.

705.03 Rock for Masonry Structures

Furnish sound, durable rock that is native to the vicinity of the work or is similar in texture and color to the native rock and has been proven satisfactory for the intended use.

Furnish dimensioned masonry rock free of reeds, rifts, seams, laminations, and minerals that may cause discoloration or deterioration from weathering.

(a) Sizes & Shapes. Do not use rock with depressions or projections that might weaken it or prevent it from being properly bedded.

When no dimensions are shown on the plans, furnish the rocks in the sizes and with the face areas necessary to produce the general characteristics and appearance indicated on the plans.

Unless otherwise specified, furnish rock fragments with the following minimum dimensions:

(1) Min. thickness ..... 125 mm

(2) Min. width ..... 300 mm or 1-1/2 times the thickness, whichever is greater

(3) Min. length ..... 1-1/2 times the width

When headers are required, furnish headers with lengths no less than the width of bed of the widest adjacent stretcher plus 300 mm.

Ensure that at least 50 percent of the total volume of masonry consists of rock with a volume of at least 0.03 m^3.

(b) Dressing. Dress the rocks to remove any thin or weak portions. Dress face rocks to provide bed and joint lines with a maximum variation from true line as follows:

(1) Cement rubble masonry ..... 40 mm

(2) Class B masonry ..... 20 mm

(3) Class A masonry ..... 5 mm

(4) Dimensioned masonry ..... Reasonably true

(c) Bed Surfaces. Bed surfaces of face rock normal to the faces of the rocks for 75 mm. Beyond that point, do not permit the departure from normal to exceed 25 mm in 300 mm for dimensioned masonry, and 50 mm in 300 mm for all other classes.

(d) Joint Surfaces. For dimensioned masonry, dress face rock joint surfaces normal to the bed surface. In all classes of masonry except dimensioned masonry, ensure that the joint surfaces of face rocks form an angle with the bed surfaces of not less than 45°.

Dress face rock joint surfaces normal to the bed surfaces and to the exposed faces of the rock for at least 50 mm. Beyond that point, do not permit the departure from normal to exceed 25 mm in 300 mm.

Do not round corners at the meeting of the bed and joint lines in excess of the following radii:

(1) Cement rubble masonry ..... 40 mm

(2) Class B masonry ..... 25 mm

(3) Class A masonry ..... No rounding

(4) Dimensioned masonry ..... No rounding

(e) Arch Ring Rock Joint Surfaces. Dress ring rock joint surfaces radial to the arch or normal to the front face to a depth of 75 mm. Beyond that point, the departure from the radial or normal may not exceed 20 mm in 300 mm.

Dress the back surface adjacent to the arch barrel concrete parallel to the front face and normal to the intrados to a depth of 150 mm. When concrete is placed after the masonry is constructed, vary adjacent ring stones at least 150 mm in depth.

(f) Finish for Exposed Faces. Remove all drill or quarry marks from exposed faces. Pitch face stones to the line along all beds and joints. Finish the exposed faces as SHOWN ON THE DRAWINGS. The following symbols are used to represent the type of surface or dressing specified:

(1) Fine Pointed (F.P.). The point depressions are approximately 10 mm apart with surface variations not to exceed 3 mm from the pitch line.

(2) Medium Pointed (M.P.). The point depressions are approximately 15 mm apart with surface variations not to exceed 5 mm from the pitch line.

(3) Coarse Pointed (C.P.). The point depressions are approximately 30 mm apart with surface variations not to exceed 10 mm from the pitch line.

(4) Split or Seam Faced (S.). The surface presents a smooth appearance that is free from tool marks, with no depressions below the pitch line, and no projection exceeding 20 mm beyond the pitch line.

(5) Rock Faced (R.F.). The face is an irregular projecting surface without indications of tool marks, with no concave surfaces below the pitch line, and with projections beyond the pitch line. Do not permit the projections to exceed the maximum specified.

For example, where "40 R.F." is specified, do not permit projections beyond the pitch line to exceed 40 mm. Where a "variable rock face" is specified, uniformly distribute stones of the same height of projection.

705.04 Rock for Mechanically Placed Embankments

Furnish hard, durable rock that is angular in shape, resistant to weathering, and graded in a well-balanced range of sizes. Furnish material that conforms to table 705-2.

Table 705-2.—Gradation for mechanically placed rock.

% of Rock Fragments by Mass	Mass (kg)	Equivalent Cubic Dimension (mm)
50	> 900	> 700
50	40–900	250–700

Rock placed below the high water mark of live streams shall have breadth and thickness at least one-third its length and conform to the following:

(a) Apparent specific gravity, AASHTO T 85 ..... 2.50 min.

(b) Absorption, AASHTO T 85 ..... 4.2% max.

(c) Coarse durability index, AASHTO T 210 ..... 52 min.

705.05 Rock for Hand-Placed Embankments

Furnish hard, durable rock that is angular in shape, resistant to weathering, and graded in a well-balanced range of sizes. Furnish material that conforms to table 705-3.

Table 705-3.—Gradation for hand-placed rock.

% of Rock Fragments by Mass	Mass (kg)	Equivalent Cubic Dimension (mm)
75	> 75	> 300
25	40–75	250–300

Rock placed below the high water mark of live streams shall have breadth and thickness at least one-third its length and conform to the following:

(a) Apparent specific gravity, AASHTO T 85 ..... 2.50 min.

(b) Absorption, AASHTO T 85 ..... 4.2% max.

(c) Coarse durability index, AASHTO T 210 ..... 52 min.

705.06 Stone Curbing

(a) Stone Curb, Type I. Ensure that stone conforms to the size and shape specified, and to the following:

(1) Furnish quarried limestone, sandstone, or granite from an approved source. Use one type of stone throughout the project. Do not use stone with visible drill marks on the exposed faces.

(2) Saw or point the top surface of all vertical stone curb to an approximate true plane with no depression or projection on the top surface of more than 6 mm. Pitch the front and back arris lines straight and true. Do not permit any projection or depression on the back surface to exceed a batter of 25 mm horizontal to 75 mm vertical.

(3) Saw, point, or smooth quarry split the front exposed face of the vertical stone curb and form to an approximately true plane. Do not permit the remaining face distance to have any projections or depressions greater than 25 mm from the plane of the exposed face.

(4) Square the ends of vertical stone curb with the top back and face and finish so that when the sections are placed end to end, no space more than 13 mm shows in the joint for the full width of the top surface and for the entire exposed front face. Do not permit the remainder of the end to break back more than 100 mm from the plane of the joint. Cut the joints of circular or curved stone curb on radial lines.

(5) Ensure that the minimum length of any segment of vertical stone curb is 1.2 m, except where a depressed or modified section of curb is required for driveways, crossings, closures, and so forth, where the length may vary.

(b) Stone Curb, Type II. Ensure that slope stone curb conforms to the requirements for type I stone curb, except as follows:

(1) On a horizontal top surface, limit the maximum allowable projection or depression to 13 mm. On other exposed faces, limit the maximum allowable projection or depression to 25 mm.

(2) For unexposed surfaces, limit the maximum allowable projection or depression from a true plane on a 0.5-m length to 75 mm.

(3) On exposed faces between adjacent segments of slope stone curb, limit the maximum allowable space that shows to 19 mm. Ensure that the minimum length of any segment of slope stone curb is 0.5 m.

Section 706—Concrete & Plastic Pipe

706.01 Nonreinforced Concrete Pipe

Furnish pipe that conforms to AASHTO M 86M for the diameters and strength classes specified.

706.02 Reinforced Concrete Pipe

Furnish pipe that conforms to AASHTO M 170M for the diameters and strength classes specified. Ensure that precast reinforced concrete end sections conform to the cited specifications, to the extent to which they apply.

706.03 Perforated Concrete Pipe

Furnish pipe that conforms to AASHTO M 175M, type 1 or type 2, and to AASHTO M 86M for the diameters and strength classes specified.

706.04 Reinforced Arch-Shaped Concrete Pipe

Furnish pipe that conforms to AASHTO M 206M for the diameters and strength classes specified.

706.05 Reinforced Elliptical-Shaped Concrete Pipe

Furnish pipe that conforms to AASHTO M 207M for the diameters, placement design (horizontal or vertical), and strength classes specified.

706.06 Reinforced D-Load Concrete Pipe

Furnish pipe that conforms to AASHTO M 242M for the diameters specified.

706.07 Precast Reinforced Concrete Box Sections

Furnish sections that conform to AASHTO M 259M or M 273M, as applicable, for the dimensions and loading conditions specified.

706.08 Plastic Pipe

Furnish perforated and nonperforated plastic pipe that conforms as shown below for the sizes and types SHOWN ON THE DRAWINGS. Ensure that joints specified as watertight conform to ASTM D 3212.

(a) Smooth Wall Polyethylene Pipe. Furnish 300- to 1,050-mm-diameter pipe conforming to ASTM F 714 and minimum cell class, ASTM D 3350, 335434C.

(b) Corrugated Polyethylene Pipe. Furnish 300- to 900-mm-diameter pipe conforming to AASHTO M 294 and minimum cell class, ASTM D 3350, 315412C or 324420C.

(c) Profile Wall (Ribbed) Polyethylene Pipe. Furnish 450- to 1,200-mm-diameter pipe conforming to ASTM F 894 and minimum cell class, ASTM D 3350, 334433C or 335434C.

(d) Corrugated Polyethylene Drainage Tubing. Furnish 75- to 250-mm-diameter tubing conforming to AASHTO M 252.

(e) Smooth Wall PVC Pipe. Furnish 100 to 375-mm-diameter pipe conforming to AASHTO M 278 and minimum cell class, ASTM D 1784, 12454C or 12364C. For sanitary sewer conditions, conform to ASTM D 3034.

(f) Profile Wall (Ribbed) PVC Pipe. Furnish 100- to 1,200-mm-diameter pipe conforming to AASHTO M 304M and minimum cell class, ASTM D 1784, 12454C or 12364C. For sanitary sewer conditions, conform to ASTM F 794 or F 949.

(g) ABS Pipe. Furnish pipe conforming to AASHTO M 264. When perforated pipe is specified, ensure that perforations conform to AASHTO M 278.

Section 707—Metal Pipe

707.01 Ductile Iron Culvert Pipe

Furnish pipe that conforms to ASTM A 716 for the sizes specified.

707.02 Metallic-Coated Corrugated Steel Pipe

Furnish pipe, special sections (such as elbows, branch connections, and prefabricated flared end sections), and coupling bands that conform to AASHTO M 36M and AASHTO M 218, M 274, or M 289 for the dimensions and thicknesses specified.

Fabricate underdrain pipe from a minimum of 1.32-mm steel sheets. Use any class of perforation specified in AASHTO M 36M.

707.03 Aluminum-Alloy Corrugated Pipe

Furnish pipe, special sections (such as elbows, branch connections, and prefabricated flared end sections), and coupling bands that conform to AASHTO M 196M for the sectional dimensions and thicknesses specified.

Fabricate underdrain pipe from a minimum of 1.22-mm aluminum sheets. Use any class of perforation.

707.04 Asphalt-Coated Pipe

Furnish pipe, special sections (such as elbows, branch connections, and prefabricated flared end sections), and coupling bands that conform to Subsections 707.02, 707.03, 707.08, 707.09, and 707.13, as applicable for the kinds of pipes to be coated. Coat the pipe with bituminous material conforming to AASHTO M 190 for the type of coating specified.

Coat special sections (such as elbows, branch connections, and end sections) and coupling bands in accordance with AASHTO M 190. Coat flared end sections with a type A bituminous coating conforming to AASHTO M 190, or with a field-applied asphalt mastic coating conforming to AASHTO M 243.

707.05 Steel Structural-Plate Structures

Furnish structures and assembly fasteners for connecting plates that conform to AASHTO M 167M for the sizes and types specified.

707.06 Aluminum-Alloy Structural-Plate Structures

Furnish structures and assembly fasteners for connecting plates that conform to AASHTO M 219M for the sizes and types specified.

707.07 Asphalt-Coated Structural-Plate Structures

Furnish structures that conform to either Subsection 707.05 or Subsection 707.06, as applicable. Apply a bituminous coating at the place of fabrication conforming to AASHTO M 190 for a type A coating, or apply an onsite asphalt mastic coating conforming to AASHTO M 243, as specified.

If asphalt coating is applied to the plates before field erection, identify each plate's nominal metal thickness by appropriately painting the data on the inside surface of the plate after coating. Other methods of plate identification may be used if approved.

707.08 Polymer-Coated Steel Pipe

Furnish pipe, special sections (such as elbows and branch connections), and coupling bands that conform to AASHTO M 245M and M 246M. Furnish the pipe with a 250/250 polymer coating.

707.09 Fiber-Bonded Bituminous-Coated Steel Pipe

Furnish pipe, special sections (such as elbows, branch connections and prefabricated flared end sections), and coupling bands that conform to Subsection 707.02, but use a zinc metallic coating impregnated with an aramid fiber composite conforming to ASTM A 885.

After fabrication, coat the pipe sections with an asphalt material in accordance with AASHTO M 190 for the type of coating specified.

Coat coupling bands with a bituminous material in accordance with AASHTO M 190, type A. Coupling bands do not require fiber bonding.

707.10 Slotted Drain Pipe

Furnish pipe that conforms to AASHTO M 36M and AASHTO M 218, M 274, or M 289 for the dimensions and thicknesses specified. Fabricate the pipe with either angle or grate slots and as detailed on the plans.

Ensure that slot angles for the angle slot drain conform to ASTM A 570 M, grade 36, and that grate assemblies for the grate slot drain conform to ASTM A 570. Galvanize slot angles and grate slot assemblies in accordance with Subsection 725.12.

707.11 Metallic-Coated Spiral Rib Pipe

Furnish pipe, special sections (such as elbows and branch connections), and coupling bands that conform to AASHTO M 36M, type IR and IIR, and AASHTO M 218, M 274, or M 289 for the dimensions and thicknesses specified.

707.12 Aluminum-Alloy Spiral Rib Pipe

Furnish pipe, special sections (such as elbows and branch connections), and coupling bands that conform to AASHTO M 196M, type IR and IIR, for the dimensions and thicknesses specified.

707.13 Concrete-Lined Corrugated Steel Pipe

Furnish pipe, special sections (such as elbows and branch connections), and coupling bands that conform to Subsection 707.02 for the dimensions and thicknesses specified.

Fully line the pipe and special sections with concrete, in accordance with ASTM A 849, class C.

707.14 Invert-Paved Corrugated Steel Pipe

Furnish pipe, special sections (such as elbows and branch connections), and coupling bands that conform to Subsection 707.02 for the dimensions and thicknesses specified.

Pave the invert of the pipe and special sections with concrete or asphalt material, in accordance with ASTM A 849, class C or B, as specified.

707.15 Repair of Damaged Coatings

Repair damaged coatings in accordance with AASHTO M 36M and ASTM A 849.

Section 708—Paint

708.01 Paint, General

Furnish a contrasting color for each coat of paint. For the finish coat color, conform to FSS 595 B. If requested by the CO, provide color chips from the paint supplier.

(a) Packaging. Furnish paint in strong, substantial containers plainly marked with the following:

(1) Trade name or trademark.

(2) Paint type, color, formulation, lot number, and date of manufacture.

(3) Net weight.

(4) Volume, including the percent of solids and the percent of volatile organic compound (VOC).

(5) Storage requirements.

(6) Mixing and equipment cleanup instructions.

(7) Name and address of the manufacturer.

(b) VOC Content. Conform to the following VOC limits for both shop and field paintings:

(1) Clear (unpigmented) coatings ..... 520 g/L

(2) Other coatings ..... 350 g/L

(c) Lead Content. Furnish paint with a maximum lead content of 0.06 percent by weight in the dried film.

(d) Other Properties. Furnish paint that:

(1) Does not show excessive settling in a freshly opened full can.

(2) Easily redisperses with a paddle to a smooth, homogeneous state free of curdling, livering, caking, color separation, lumps, and skins.

(3) Does not skin within 48 hours in a closed container that is three-fourths full.

(4) Brushes on easily.

(5) Possesses good leveling properties.

(6) Shows no running or sagging tendencies when applied to smooth steel vertical surfaces.

(7) Dries to a smooth uniform finish, free from roughness, grit, unevenness, and other surface imperfections.

(8) Shows no streaking or separation when flowed on clean glass.

(9) Shows no thickening, curdling, gelling, or hard caking after 6 months storage in a full, tightly covered container at a temperature of 20 °C.

708.02 Paint for Timber Structures

(a) Primer. Conform to FSS TT–P–25, TT–P–96D, or TT–P–001984.

(b) Paint. Conform to FSS TT–P–102, class A; TT–P–96D; TT–P–102F; or TT–P–19D.

708.03 Paint for Concrete & Masonry Block Structures

Conform to FS TT–P–19. Color tint with universal or all-purpose concentrates.

708.04 Paint for Steel Structures

(a) Inorganic Zinc Primer. Conform to AASHTO M 300, type II.

(b) Vinyl Wash Primer. Conform to MIL–P–15328 or SSPC number 27.

(c) Aliphatic Urethane Coating. Conform to U.S. Product Standard C–644, type I.

(d) Acrylic Latex Coating. Conform to SSPC number 24.

708.05 Penetrating Stain

Conform to the following:

(a) Weatherometer on base material, ASTM G 23 ..... 1,000 hours

(b) Acrylic dispersion ..... 73.4% of nonvolatile vehicle

(c) Viscosity ..... 58 ± 2 Kerb units

(d) Solids volatile content 40.3%

Store stain in accordance with the manufacturer's recommendations.

Section 709—Reinforcing Steel & Wire Rope

709.01 Reinforcing Steel

(a) General. Furnish the following information with each shipment of steel to the project:

(1) Name and location of the steel rolling mill.

(2) Manufacturing process.

(3) Heat number(s).

(4) Size(s).

(5) Specifications.

(6) Copies of mill test analyses for chemical and physical tests.

(7) Consignee and destination of shipment.

(b) Reinforcing Bars. Furnish deformed, grade 400 bars conforming to AASHTO M 31M, M 42M, or M 53M.

(c) Epoxy-Coated Reinforcing Bars. Conform to AASHTO M 284M.

Inspect the reinforcing bars after the near white blast cleaning. Reject all bars with steel slivers or scabs. Selective sorting and rejection at the fabricator's shop may avoid unnecessary delays and subsequent rejection of bars during the precoating inspection at the coating applicator's shop.

Coat epoxy-coated reinforcing steel in a plant certified by CRSI as a fusion-bonded epoxy applicator.

(d) Tie Bar. Furnish deformed, grade 400 bars conforming to AASHTO M 31M or M 42M, except do not use AASHTO M 42M steel for tie bars bent and restraightened during construction.

(e) Hook Bolts. Furnish plain, grade 400 bars conforming to AASHTO M 31M or M 42M with M14 rolled threads or M16 cut threads. Furnish a threaded sleeve nut capable of sustaining a minimum axial load of 67 kN.

(f) Dowel Bars. Conform to AASHTO M 254, type A or B. Use plain round bars, free from burring or other deformation restricting free movement in the concrete. Paint half the length of each dowel bar with one coat of tar paint. When the paint dries and immediately before placing the dowels, lubricate the painted end to prevent concrete from bonding to the painted end.

For expansion joints, furnish a dowel cap that snugly covers 50 mm ± 5 mm of the dowel, has a closed end, and has a suitable stop to hold the closed end 25 mm from the end of the dowel bar.

Lubricants for type B dowels may be rapid-curing cutback asphalt, medium-setting emulsified asphalt, or a flaked graphite and vehicle. Lubricants are not required for type A coated dowel bars.

Furnish dowel assemblies that hold dowel bars within 6 mm tolerance vertically and horizontally during concrete placement and permit unrestricted movement of the pavement slab.

Use wire conforming to AASHTO M 32M for dowel assemblies. Coat dowel assemblies with the same material as the dowel bar. Recoat or repair damaged coatings equivalent to the manufacturer's original coating.

(g) Deformed Steel Wire. Conform to AASHTO M 225M.

(h) Welded Steel Wire Fabric. Conform to AASHTO M 55M.

(i) Cold-Drawn Steel Wire. Conform to AASHTO M 32M.

(j) Welded Deformed Steel Wire Fabric. Conform to AASHTO M 221M.

(k) Fabricated Deformed Steel Bar or Rod Mats. Conform to AASHTO M 54M.

(l) Low-Alloy Steel Deformed Bars. Conform to ASTM A 706M.

709.02 Wire Rope or Wire Cable

Conform to AASHTO M 30 for size and strength class specified.

709.03 Prestressing Steel

Fabricate from one of the following:

(a) Stress-relieved wire strand, AASHTO M 204M, type BA or WA.

(b) Stress-relieved seven-wire strand, AASHTO M 203M, grade 270.

(c) High-strength steel bars, AASHTO M 275M, type II.

Protect all prestressing steel against physical damage, rust, or corrosion at all times. Do not use damaged prestressing steel.

Package prestressing steel to protect it from physical damage and corrosion during shipping and storage. Place a corrosion inhibitor in the package. Use a corrosion inhibitor that will have no deleterious effect on the steel, concrete, or bond strength of steel to concrete. Immediately replace or restore damaged packaging.

Mark the shipping package with a statement that the package contains high-strength prestressing steel and a warning to use care in handling. Identify the type, kind, and amount of corrosion inhibitor used, including the date when placed, safety regulations, and instructions for use. For identification purposes, assign a lot number and tag to all wire, strand, anchorage assemblies, or bars shipped to the site.

Submit representative samples from members fabricated offsite. In the case of wire or strand, take the sample from the same master roll.

Section 710—Fence & Guardrail

710.01 Barbed Wire

Furnish galvanized barbed wire of the coating class specified in conformance with AASHTO M 280, and aluminum-coated steel barbed wire that conforms to AASHTO M 305, type I.

710.02 Woven Wire

Furnish galvanized woven wire fence fabric that conforms to AASHTO M 279 for the design number, grade, and coating specified, and aluminum-coated woven wire fence fabric that conforms to ASTM A 584.

710.03 Chain Link Fence

Furnish chain link fabric, posts, rails, ties, bands, bars, rods, and other fittings and hardware that conform to AASHTO M 181 for the kind of metal, coating, size of wire, and mesh specified.

Furnish coiled spring steel tension wire that is 4.5 mm, conforms to ASTM A 641M, and has hard temper with a class 3 galvanized coating or an aluminized coating with a minimum coating weight of 120 g/m^2 of aluminum. Use the same coating on the coiled spring steel tension wire as used on the rest of the chain link fence.

710.04 Fence Posts

(a) Wood. Furnish wood posts with the details and dimensions SHOWN ON THE DRAWINGS. Furnish wood posts of sound, seasoned wood, peeled and with ends cut as SHOWN ON THE DRAWINGS. Furnish posts that are straight and have all knots trimmed flush with the surface. Where treated posts are called for, provide the kind and type of treatment that meets the requirements SHOWN ON THE DRAWINGS. The requirements for peeling may be omitted for Redcedar posts or bracing.

(b) Concrete. Ensure that all dimension timber and lumber required for fences or gates is sound, straight, and reasonably free from knots, splits, shakes, and other defects. Furnish the species and grades SHOWN ON THE DRAWINGS, and dress and finish on four sides.

Furnish concrete posts made of concrete that meets the requirements specified in Subsection 602.03, method A or B. Furnish steel reinforcement, as SHOWN ON THE DRAWINGS, that meets the requirements specified in Section 709.

(c) Steel. Furnish steel posts for line-type fencing that are manufactured in accordance with AASTM A 702 and galvanized in accordance with AASHTO M 111 (ASTM A 123), but ensure that tubular steel posts are galvanized in accordance with ASTM A 120. Furnish fittings, hardware, and other appurtenances that are galvanized in accordance with ASTM A 120 by current standard practice, and are of standard commercial grade. Furnish weathering steel posts that meet the requirements of AASHTO M 222.

(d) Aluminum. Furnish aluminum alloy posts that meet the requirements of AASHTO M 181.

710.05 Fence Gates

Furnish frame gates used with chain link fences that conform to the applicable requirements of AASHTO M 181 for the types and sizes specified. Ensure that the fabric in the gate conforms to fabric in the chain link fence.

Furnish frame and wire gates used with woven wire and barbed wire fences that conform to the dimensions and material SHOWN ON THE DRAWINGS.

710.06 Metal Beam Rail

(a) Galvanized Steel Rail. Furnish W-beam or thrie-beam rail elements fabricated from corrugated sheet steel that conform to AASHTO M 180 for the designated shape, class, type, and weight of coating specified.

(b) Corrosion-Resistant Steel Rail. Furnish W-beam and thrie-beam rail elements and associated weathering steel hardware that conform to the following:

(1) Shapes and plates ..... AASHTO M 222M

(2) Rail elements ..... ASTM A 606, type 4

(3) Fasteners ..... AASHTO M 164M, type 3

710.07 Box Beam Rail

Furnish steel box beam rail elements that conform to the applicable standards contained in the AASHTO–Associated General Contractors of America (AGC)–ARTBA “Guide to Standardized Highway Barrier Hardware,” 1995 edition.

710.08 Steel-Backed Timber Rail

Furnish timber that conforms to AASHTO M 168. Fabricate the 150 x 250-mm timber rail and the 100 x 225-mm blockouts from dry, well-seasoned, and dressed

rough-sawn Douglas Fir, Southern Pine, or other species with a stress grade of at least 10 MPa.

Treat the timber rail and blockout elements with CCA, ACZA, or ACA preservative treatment conforming to AWPA C14, but ensure that the minimum retention is 9.6 kg/m^3.

Fabricate the steel backing elements from 9.5-mm structural steel conforming to AASHTO M 222M. Furnish fastener hardware that conforms to ASTM A 325M, type 3.

710.09 Guardrail Posts

(a) Box Beam Post. Furnish guardrail posts for metal beam guardrail that conform to the applicable standards contained in the AASHTO–AGC–ARTBA "Guide to Standardized Highway Barrier Hardware," 1995 edition.

(b) Steel-Backed Timber Post. Furnish 250 x 300-mm guardrail posts for steel-backed timber rail that conform to specifications in Subsection 710.08. Use the post lengths SHOWN ON THE DRAWINGS.

(c) Wood Post. Do not use a wooden guardrail post that has a through check, shake, or end split in the same plane as the bolt hole, or in a plane parallel to the bolt hole, and that extends from the top of the post to within 75 mm of the bolt hole.

710.10 Guardrail Hardware

Furnish guardrail hardware for use with galvanized steel beam rail that conforms to the standards contained in the AASHTO–AGC–ARTBA "Guide to Standardized Highway Barrier Hardware," 1995 edition. Ensure that guardrail hardware for corrosion-resistant steel conforms to the requirements specified in Subsection 710.06.

Except for material covered in Subsection 710.06, make all angles, channels, wide flanges, and plates not contained in the above standard conform to ASTM A 36, but make the structural tubing for the short steel post conform to ASTM A 500 or A 513, grade 1008. Galvanize soil plates and structural tubing in accordance with ASTM A 123. Do not punch, drill, cut, or weld the metal after galvanizing.

Manufacture reflector tabs from 4-mm aluminum or galvanized steel sheets. Use adhesive that resists peeling with a force of 0.89 kg/cm of width. Use mildew-resistant adhesive that has no staining effect on the reflective sheeting.

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710.11 Temporary Plastic Fence

Furnish plastic noncorrosive fence fabricated from high-density polyethylene (HDPE) and ultraviolet-stabilized for outdoor weathering. Furnish material that conforms to the following:

(a) Height ..... 1,200 mm min.

(b) Mesh openings ..... 80 to 85 mm

(c) Color ..... International orange

(d) Mass ..... 0.25 kg/m min.

710.12 Crash Cushion Barrels

Furnish 900-mm-diameter barrels made of HDPE structural foam or equal material. Furnish lids of the same material as the barrels, but of a thinner gauge. Furnish appropriate height cores made of polystyrene or equivalent material.

710.13 Timber Rails

Furnish timber rail that is cut from dry, well-seasoned, and dressed timber stock that meets the requirements of AASHTO M 168 for the grade and species SHOWN ON THE DRAWINGS.

Provide preservative treatment that meets the requirements specified in Subsection 716.03, or as SHOWN ON THE DRAWINGS.

Furnish rustic rails that are straight, sound, and free of injurious defects, and are cut from live trees not less than 30 days, and not more than 1 year, before use. Ensure that they are stripped of bark before seasoning or stored under water. Immediately before the logs are used in the work, trim all knots and projections smooth and, if logs are water cured, peel all bark.

Section 711—Concrete Curing Material & Admixtures

711.01 Curing Material

Conform to the following:

(a) Burlap cloth ..... AASHTO M 182

(b) Waterproof paper ..... AASHTO M 171

(c) Polyethylene film ..... AASHTO M 171

(d) Liquid membrane-forming compounds ..... AASHTO M 148

711.02 Air-Entraining Admixtures

Conform to AASHTO M 154.

For structural concrete, furnish air-entraining admixtures classified as vinsol resin or neutralized vinsol resin.

711.03 Chemical Admixtures

Furnish water-reducing, set-retarding, and set-accelerating additives, or combinations thereof, that conform to AASHTO M 194. Do not combine chemical admixtures together in a mixture unless they are compatible. Furnish supporting documentation of compatibility from the manufacturers. Do not use chloride accelerators.

711.04 Latex Modifier

Furnish a homogeneous, nontoxic, film-forming polymeric emulsion with stabilizers added at the point of manufacture. Conform to the following:

(a) Color ..... White

(b) Styrene butadiene polymer type ..... 68 ± 4% styrene
32 ± 4% butadiene

(c) Chlorides 0%

(d) Polymer particle size ..... 0.15 to 0.25 µm avg.

(e) Emulsion stabilizers ..... Anionic and nonionic surfactant

(f) Solids ..... 46.5 to 49.0%

(g) Mass ..... 1.00 to 1.02 kg/L

(h) pH ..... 9 to 13

(i) Shelf life ..... 2 years min.

Section 712—Joint Material

712.01 Sealants, Fillers, Seals, & Sleeves

Conform to the following:

(a) Joint Sealants & Crack Fillers. Furnish a commercial certification identifying the batch and/or lot number, material, quantity of batch, date and time of manufacture, and name and address of the manufacturer. Conform to the following:

(1) Concrete joint sealer, hot-poured elastic type ..... ASTM D 1190

(2) Joint sealants, hot-poured, for concrete and asphalt pavement ..... ASTM D 3405

(3) Crack filler, hot-applied, for asphalt concrete and Portland cement concrete pavements ..... ASTM D 5078

(4) For proprietary asphalt-rubber products, furnish the following:

(a) Source and grade of asphalt cement.

(b) Total granulated rubber content and mass, as a percent of the asphalt-rubber mixture.

(c) Granulated rubber type(s) and content of each type (if blend).

(1) Mass as a percent of combined rubber.

(2) Gradation of granulated rubber.

(d) Type of asphalt modifier, if any.

(e) Quantity of asphalt modifier and mass as a percent of asphalt cement.

(f) Other additives.

(g) Heating and application temperatures.

(h) Manufacturer's recommended application procedures.

(b) Preformed Expansion Joint Fillers. Furnish in a single piece for the depth and width required for the joint:

(1) Preformed expansion joint filler for concrete (bituminous type) ..... AASHTO M 33

(2) Preformed sponge rubber expansion joint fillers for concrete paving and structural construction..... AASHTO M 153

(3) Preformed cork expansion joint fillers for concrete paving and structural construction[1] ..... AASHTO M 153

(4) Preformed expansion joint fillers for concrete paving and structural construction (nonextruding and resilient bituminous types) ..... AASHTO M 213

[1] Do not use in concrete structures.

(c) Preformed Joint Seals & Sleeves. Furnish material in accordance with the following:

(1) Paving Applications. Furnish a polychloroprene elastomeric seal conforming to AASHTO M 220. Use a lubricant adhesive with a minimum solids content of 22 percent by weight, in accordance with ASTM D 2369, and a maximum peel strength of 10 MPa, in accordance with ASTM D 903. Use within 9 months of manufacture.

(2) Manhole, Inlet, & Drainage Applications. Furnish a multisectional neoprene rubber and ethylene propylene dimonomer rubber seal with a minimum thickness of 1.5 mm. Before shipping, coat the rubber with a nonhardening butyl rubber sealant to produce a watertight seal when installed. Properties and values are shown in table 712-1.

Table 712-1.—Preformed joint seals.

Physical Properties	ASTM Test Method	EPDM	Neoprene	Butyl Mastic
Tensile (MPa)	D 412	10	12	–
Elongation (%)	D 412	440	230	280
Tear resistance	D 624 (Die B)	40	20	–
Rebound (%, 5 min)	C 972 (mod.)	–	–	11
Rebound (%, 2 h)	C 972 (mod.)	–	–	12

(d) Foam Filler. Furnish an expanded polystyrene filler having a compressive strength of not less than 70 kPa.

(e) Cold-Poured Sealer. Furnish a one-part, low-modulus silicone rubber-base joint-sealing compound conforming to FSS TT–S–1543, class A, with an ultimate elongation of 1,200 percent.

(f) Low-Modulus Silicone Joint Sealant. Furnish a one-part silicone formulation conforming to the following:

(1) Flow, MIL–S–8802 ..... 8 mm max.

(2) Extrusion rate, MIL–S–8802 ..... 75 to 250 g/min

(3) Tack-free time, MIL–S–8802 ..... 20 to 75 minutes

(4) Specific gravity, ASTM D 792, method A ..... 1.010 to 1.515

(5) Durometer hardness, shore A, ASTM D 2240 ..... 10 to 25

(6) Tensile stress at 150% elongation, ASTM D 412..... 520 kPa max.

(7) Elongation, ASTM D 412..... 500% min.

(8) Peel (adhesion), MIL–S–8802 ..... ≥9 kg with ≥75% cohesive failure

(9) Age from manufacturing ..... 6 months max.

(g) Backer Rod. Furnish a closed-cell polyethylene conforming to ASTM D 3204, type 1. Use a compatible sealant as recommended by the manufacturer of the rod. Select size as shown in table 712-2.

Table 712-2.—Backer rod sizes.

Joint Width	Rod Diameter
8 mm	9 mm
9 mm	13 mm
13 mm	16 mm
16 mm	19 mm
19 mm	25 mm
25 mm	32 mm
32 mm	38 mm
38 mm	50 mm

712.02 Joint Mortar

Furnish Portland cement and fine aggregate conforming to Subsections 701.01 and 703.01, respectively. Mix one part Portland cement and two parts approved sand, with water as necessary to obtain a usable consistency. Use the mortar within 30 minutes after mixing.

712.03 Watertight Gaskets

For ring gaskets for rigid pipe, conform to AASHTO M 198, type A or B. For ring gaskets for flexible metal pipe, conform to ASTM C 361M. For continuous flat gaskets for flexible metal pipe with bands or bands with projections, conform to ASTM D 1056, grade SCE 41, and use a gasket with a thickness 13 mm greater than the nominal depth of the pipe corrugations. For continuous flat gaskets for flexible metal pipe with corrugated bands, conform to ASTM D 1056, grade SCE 43, and use a 9-mm-thick gasket.

712.04 Oakum

Fabricate oakum from a thoroughly corded and finished hemp (*Cannabis sativa*) line, Benares Sunn fiber, or a combination thereof that is reasonably free from lumps, dirt, and extraneous matter.

712.05 Mortar for Masonry Beds & Joints

(a) Composition. Mix one part masonry cement, Portland cement, or air-entraining Portland cement with two parts fine aggregate by volume. Lime or fly ash may be added in an amount not to exceed 10 percent of the Portland cement by weight. In lieu of air-entraining cement, Portland cement may be used with an air-entraining admixture, in accordance with the applicable provisions of Subsections 552.06 and 552.08.

(b) Material. Conform to the following:

(1) Masonry cement/Portland cement 701.01

(2) Fine aggregate ..... 703.01 or AASHTO M 45

(3) Hydrated lime 725.03

(4) Fly ash 725.04

(5) Water 725.01

(6) Air-entraining admixtures 711.02

(c) Comprehensive Strength. Use mortar with a minimum 28-day comprehensive strength of 14 MPa when tested according to AASHTO T 22 and T 23, except that samples shall consist of cylinders with a length-to-diameter ratio of 2 to 1.

712.06 Copper Water Stops or Flashings

Furnish sheet copper for water stops or flashings that conform to AASHTO M 138M, copper USN number C11000. The resistivity test is not required.

712.07 Rubber Water Stops

Furnish molded or extruded rubber with a uniform cross section that is free from porosity or other defects. If approved, an equivalent standard shape may be furnished.

Fabricate rubber water stops from a compound of natural rubber, synthetic rubber, or a blend of the two, together with other compatible material. Do not use any reclaimed material. Furnish a certification from the producer showing the composition of the material. Conform to the following:

(a) Hardness (shore), 3021[1] ..... 60 to 70

(b) Compression set, 3311[1] ..... 30% max.

(c) Tensile strength, 4111[1] ..... 17 MPa min.

(d) Elongation at breaking, ASTM D 412 ..... 450% min.

(e) Tensile stress, 300% elongation, 4131[1] ..... 6 MPa min.

(f) Water absorption by weight, 6631[1] ..... 5% max.

(g) Tensile strength after aging, 7111[1] ..... 80% of original, min.

[1] Federal Test Method Standard number 601.

712.08 Plastic Water Stops

Fabricate from a homogeneous, elastomeric, plastic compound of basic PVC and other material. Form to a uniform cross section that is free from porosity and other defects. If approved, an equivalent standard shape may be furnished. Conform to the following:

(a) Tensile strength, ASTM D 638M ..... 9.6 MPa min.

(b) Elongation at breaking, ASTM D 638M ..... 250% min.

(c) Hardness, ASTM D 2240 ..... 60 to 75 shore

(d) Specific gravity, 5011[1] ..... Manufacturer's value ± 0.02

(e) Resistance to alkali,[2] ASTM D 543:

(1) Mass change ..... – 0.10 to + 0.25%

(2) Hardness change ..... ± 5 shore max.

(3) Tensile strength change ..... 15% max.

(f) Water absorption (48 hours), ASTM D 570 ..... 0.50% max.

(g) Cold bending[3] ..... No cracking

(h) Volatile loss, ASTM D 1203 ..... Not more than manufacturer's value

[1] Federal Test Method Standard number 406.
[2] Use a 10 percent solution of NaOH for a 7-day test period.
[3] Subject a 25 x 150-mm strip that is 3 mm thick to a temperature of 29 °C for a period of 2 hours. After the 2 hours, immediately bend the sample 180° around a 3-mm-diameter rod. Apply sufficient force to maintain contact with the rod during bending. Examine the sample for evidence of cracking. Test and report results for at least three individual samples from each lot.

Furnish the manufacturer's test results for the above properties with the product certification. If directed, furnish samples in lengths adequate for performing the specified tests.

Section 713—Roadside Improvement Material

713.01 Topsoil

(a) Furnished Topsoil. Furnish fertile, friable, free-draining, sandy loam soil free of subsoil, refuse, stumps, roots, brush, weeds, rocks or stones larger than 25 mm, and other substances detrimental to the development of vegetative growth. Demonstrate that the soil will sustain healthy crops of grass, shrubs, or other plant growth. Furnish material that conforms to the following:

(1) Texture:

(a) Organic matter, AASHTO T 267 ..... 3 to 10%

(b) Sand, AASHTO T 88 ..... 20 to 70%

(c) Silt, AASHTO T 88 ..... 10 to 60%

(d) Clay, AASHTO T 88 ..... 5 to 30%

(2) pH, AASHTO T 289 ..... 6 to 8

(b) Conserved Topsoil. Conserve natural humus-bearing soils from the overlying portions of the roadway excavation and embankment areas, in accordance with Subsection 203.06(e).

713.02 Agricultural Limestone

Furnish calcic or dolomitic ground limestone conforming to the standards of the Association of Official Analytical Chemists International, applicable State and Federal regulations, and the following:

(a) Purity (calcium and magnesium) carbonates ..... 75% min.

(b) Gradation ..... Table 713-1

Granulated slag or other approved natural sources of lime may be used, provided that the application rate is adjusted to equal the total neutralizing power of the specified ground limestone.

Table 713-1.—Agricultural limestone gradation.

Sieve Size	Minimum % by Weight Passing Designated Sieve (AASHTO T 27)
2 mm	90
425 µm	50

713.03 Fertilizer

Furnish standard commercial-grade dry formulated fertilizer conforming to the standards of the Association of Official Analytical Chemists International, applicable State and Federal regulations, and required minimum percentages of available nutrients.

Supply the fertilizer in new, clean, sealed, and properly labeled containers with name, weight, and guaranteed analysis of contents clearly marked.

A liquid form of fertilizer containing the minimum percentage of available nutrients may be used.

713.04 Seed

Furnish seed that conforms to FSS JJJ–S–181 for seed testing and quality, and is in conformance with the State Seed Acts. If seed species in the specified seed mix are not listed in FSS JJJ–S–181, furnish certified weed-free seed. Do not use wet, moldy, or otherwise contaminated or damaged seed.

Provide seeds as follows:

(a) Furnish each seed type in a separate standard sealed container. Clearly label each container with the following:

(1) Name and type of seed.

(2) Lot number.

(3) Net weight.

(4) Percent of purity, germination, and hard seed.

(5) Percent of maximum weed seed content.

Inoculate legume seed with approved cultures, in accordance with the manufacturer’s instructions.

(b) Furnish a product certification for each kind or type of seed, certifying that the seed was tested by a recognized laboratory within 6 months of the date of delivery. Include the following:

(1) Name and address of testing laboratory.

(2) Date of test.

(3) Seed identification.

(4) Test results showing the percentages of purity, germination, and weed content.

(5) Certified weed-free seed.

713.05 Mulch

(a) Straw. Obtain straw for mulching from oats, wheat, rye, or other grain crops that are free from weeds, mold, and other objectionable material. Furnish straw mulch in an air-dry condition suitable for placing with mulch blower equipment.

(b) Hay. Obtain hay from herbaceous mowing. Ensure that it is free from weeds, mold, and other objectionable material. Furnish hay in an air-dry condition suitable for placing with mulch-blower equipment.

(c) Wood Fiber. Furnish processed wood fiber from wood chips that is:

(1) Colored with a green dye noninjurious to plant growth.

(2) Readily dispersible in water.

(3) Nontoxic to seed or other plant material.

(4) Free of growth or germination inhibiting substances.

(5) Certified weed-free seed.

(6) Air dried to an equilibrium moisture content of 12 ± 3 percent.

(7) Packaged in new, labeled containers.

(8) Packaged in a condition appropriate for mixing in a homogeneous slurry suitable for application with power-spray equipment.

(d) Grass Straw Cellulose Fiber. Furnish processed grass straw fiber that is:

(1) Colored with a green dye noninjurious to plant growth.

(2) Readily dispersible in water.

(3) Nontoxic to seed or other plant material.

(4) Free of growth- or germination-inhibiting substances.

(5) Certified weed-free seed.

(6) Air dried to a moisture content of 10 ± 0.2 percent.

(7) Air dried to a uniform weight of ± 5 percent.

(8) Packaged in new containers labeled with the manufacturer's name and air-dry weight.

(9) Packaged in a condition appropriate for mixing in a homogeneous slurry suitable for application with power-spray equipment

(e) Sawdust. Obtain sawdust from wood that has not been subjected to conditions that would cause the sawdust to lose its value or usefulness as mulch. Ensure that sawdust contains no toxic substances and has been naturally aged for at least 5 years.

(f) Peat Moss. Furnish a granulated sphagnum peat moss that is air dried, in conformance with State and Federal regulations, and meets the following requirements:

(1) Sticks, stones, and mineral matter 0%

(2) Partially decomposed stems and leaves of sphagnum ..... 75% min.

(3) Color ..... Brown

(4) Texture ..... Porous fibrous to spongy fibrous

(5) pH ..... 3.5 to 7.5

(g) Mature Compost. Furnish partially decomposed organic materials, such as leaves, grass, shrubs, and yard trimmings, cured for 4 to 8 weeks. Maturity is indicated by temperature stability and soil-like odor. Furnish friable, dark brown, weed- and pathogen-free mature compost with the following properties:

(1) Carbon/nitrogen ratio ..... 25:1 to 35:1

(2) Carbon/phosphorus ratio ..... 120:1 to 240:1

(3) pH ..... 6.0 to 7.8

(4) Water content ..... 40% max.

(5) Particle size:

(a) Seeding and sodding ..... 12 mm max.

(b) Erosion control ..... 25 mm max.

(6) Organic material ..... 50% min.

(7) Manmade inserts (plastic, glass, and metal) ..... 2% max.

(h) Straw for Hydroseeding. Use clean agricultural straw. Mill fibers to 25 mm or less in length. Dry the fibers to 10 percent moisture for compaction. Bale in heat-sealed plastic bags.

(i) Bonded Fiber Matrix Hydramulch. Furnish a mixture of long wood fibers and bonding agent that, when hydraulically applied and dried, produces a matrix that:

(1) Does not dissolve or disperse when wetted.

(2) Holds at least 1,000 g of water per 100 g of dry matrix.

(3) Has no germination- or growth-inhibiting factors.

(4) Forms no water-insensitive crust.

(5) Contains material that is 100 percent biodegradable.

713.06 Plant Material

Conform to “American Standard for Nursery Stock.”

(a) Quality of Plant Material. Furnish plants that are excellent representatives of their normal species or varieties. Ensure that all plants are nursery grown stock that has been transplanted or root-trimmed two or more times, in accordance with the kind and size of plants. Furnish plants with a normal developed branch system that is free from disfiguring knots, sun-scald, injuries, abrasions of the bark, dead or dry wood, broken terminal growth, and other objectionable disfigurements.

Furnish trees that have reasonably straight stems and are well branched and symmetrical, in accordance with their natural habits of growth.

(b) Plant Names. For scientific and common plant names, conform to "Standardized Plant Names," as adopted by the American Joint Committee on Horticultural Nomenclature. Legibly tag and identify all plants by name and size.

(c) Grading Standards. For grading of plants, conform to "American Standard for Nursery Stock," as approved by ANSI.

(d) Nursery Inspection and Plant Quarantine. Furnish plants that are essentially free from plant diseases and insect pests.

Comply with all nursery inspection and plant quarantine regulations of the States of origin and destination, and with Federal regulations governing interstate movement of nursery stock. Provide a valid copy of the certificate of inspection with each package, box, bale, and carload shipped or otherwise delivered.

(e) Balled & Burlapped Plants. Obtain the plants from the original and undisturbed soil in which the plants were grown. Dig balled and burlapped plants to retain as many fibrous roots as possible. Wrap, transport, and handle the plants so the soil ball and small and fibrous roots remain intact.

713.07 Erosion Control Mats, Roving, & Geocell

(a) Erosion Control Mats. Erosion control mats are designated as types 1, 2, 3, 4, and 5, described below.

(1) Type 1—Erosion Control Mats. Type 1 mats are designated as follows:

(a) Straw Erosion Control Mat. Furnish a mat consisting of clean agricultural straw, in accordance with Subsection 713.05(a), that is attached to a photodegradable polypropylene netting by sewing with cotton thread. Ensure that material conforms to the specifications shown in table 713-2.

Table 713-2.—Straw erosion control mat.

Material	Specification Minimums
Straw [a]	240 g/m^2
Netting	Photodegradable netting on one side. 5- to 20-mm square mesh [b] with a 1.5 kg/100 m^2 weight.

a. Moisture content shall not exceed 20 percent.
b. Dimensions are approximate and may vary to meet manufacturer's standards.

(b) Burlap. Furnish burlap fabric in a standard weave with a weight of 145 ± 20 g/m^2.

(c) Jute Mesh. Furnish jute mesh with a uniform open plain weave fabricated from jute yarn that does not vary in thickness by more than one-half its normal diameter, and that conforms to the following:

(1) Mesh size ..... 25 x 25 mm max.

(2) Mesh weight, ASTM D 1776 ..... 0.5 kg/m^2 ± 5%

(d) Woven Paper or Sisal Mesh Netting. Furnish mesh netting of woven paper or woven sisal twisted yard conforming to the following:

(1) Mesh openings ..... 3 to 6 mm

(2) Shrinkage after wetting ..... 20% max.

(2) Type 2—Erosion Control Mats. Type 2 mats are designated as follows:

(a) Straw and Coconut Mat. Furnish mat consisting of undyed, untreated, biodegradable, jute, coconut coir, synthetic polypropylene fibers, or other approved yarn woven into a plain weave mesh with 16- to 25-mm square openings. Ensure that material conforms to the specifications shown in table 713-3.

Table 713-3.—Straw and coconut mat.

Material	Specification Minimums
Straw [a] 70%	240 g/m^2
Coconut 30%	240 g/m^2
Netting	Photodegradable netting on one side. 16- to 25-mm square mesh [b] with a 1.5 kg/100 m^2 weight.

a. Moisture content shall not exceed 20 percent.
b. Dimensions are approximate and may vary to meet manufacturer's standards.

(b) Excelsior Blanket. Furnish a blanket of uniform thickness consisting of curled wood excelsior secured on the top side to biodegradable, photodegradable extruded plastic mesh. Make the blanket smolder resistant without the use of chemical additives. Conform to the following:

(1) Excelsior fibers ≥ 200 mm length ..... 80% min.

(2) Mesh size ..... 25 x 50 mm

(3) Blanket mass/area ..... 0.53 ± 0.05 kg/m^2

(c) Mulch Blanket. Furnish a 3- to 13-mm-thick blanket consisting of organic, biodegradable mulch such as straw, curled wood cellulose, coconut coir, or other material evenly distributed on one side of a photodegradable polypropylene mesh with a minimum weight of 0.27 kg/m^2.

(3) Type 3—Coconut Mats. Furnish coconut mat consisting of undyed, untreated, biodegradable jute, coconut coir, synthetic polypropylene fibers, or other approved yarn woven into a plain weave mesh with approximately 16- to 25-mm square openings. Ensure that material conforms to the specifications shown in table 713-4.

Table 713-4.—Coconut erosion control mat.

Material	Specification Minimums
Coconut[a]	240 g/m^2
Netting	Photodegradable netting on one side. 16- to 25-mm square mesh[b] with a 1.5 kg/100 m^2 weight.

a. Do not permit moisture content to exceed 20 percent.
b. Dimensions are approximate and may vary to meet manufacturer's standards.

(4) Type 4—Synthetic Erosion Control Mats and Meshes. Type 4 erosion control mats are designated as follows:

(a) Synthetic Erosion Control Mat. Furnish a machine-produced flexible mat consisting of polyolefin monofilament fibers positioned between two biaxially oriented nets, and mechanically bound together by parallel stitching with polyolefin thread to form a three-dimensional weblike weave that is highly resistant to environmental and chemical deterioration. Ensure that material conforms to the specifications shown in table 713-5.

(b) Synthetic Polypropylene Mesh. Furnish a flexible woven geotextile mesh fabricated from polypropylene fibers that have been spun in one direction. Ensure that material conforms to the specifications shown in table 713-6.

(c) Synthetic Mulch Control Netting. Furnish a uniformly extruded, rectangular, plastic mesh netting with 50 x 50-mm nominal mesh openings and weighing at least 8 g/m^2.

Table 713-5.—Synthetic erosion control mat.

Property	Specification	Test Method
Color	Green	Visual
Thickness	6 mm (min.)	ASTM D 1777
Strength [a]	1,590 x 525 N/m (min.)	ASTM D 5035
Elongation [a]	50% (max.)	ASTM D 5035
Porosity [b]	85% (min.)	Calculated
Resiliency [c]	80%	ASTM D 1777
Ultraviolet stability [d]	80%	ASTM D 4355

a. Values for both machine and cross-machine directions under dry or saturated conditions. Machine direction specimen for 50-mm strip test includes one machine-direction polyolefin stitch line centered within its width and extending the full length of the specimen.
b. Calculation based upon weight, thickness, and specific gravity.
c. The percent of original thickness retained after three cycles of a 690-kPa load for 60 seconds, followed by 60 seconds without load. Thickness measured 30 minutes after load removed.
d. Tensile strength retained after 1,000 hours in a Xenon ARC weatherometer.

Table 713-6.—Synthetic polypropylene erosion control mesh.

Property	Specification	Test Method
Color	Beige	Visual
Weight	59 g/m ^{2}(min.)	ASTM D 5261
Tensile strength	6,700 x 3,700 N/m	ASTM D 5035
Elongation at break	40% (max.)	ASTM D 5035
Mullen burst strength	515 kPa (min.)	ASTM D 3786

(d) Organic Mulch Control Netting. Furnish a leno weave mesh netting fabricated from 12.7-kg biodegradable cellulose fiber yarn with five twists per 25 mm. Make the size of the mesh grid 13 to 25 mm square. Finish the selvedge to prevent raveling or fraying.

(5) Type 5—Turf Reinforcement Mats. Furnish a web of mechanically or melt bonded polymer netting, monofilaments, or fibers that are entangled to form a strong and dimensionally stable mat. Bonding methods include polymer welding, thermal or polymer fusion, and the placement of fibers between two high-strength, biaxially oriented nets mechanically bound together by parallel stitching with polyolefin thread. Ensure that the mat is resistant to biological, chemical, and ultraviolet degradation. Ensure that material conforms to the specifications shown in table 713-7.

(b) Roving. Roving types are described below.

(1) Fiberglass Roving. Form fiberglass roving from continuous fibers drawn from molten glass, coated with a chrome-complex sizing compound, collected into strands and lightly bound together into roving without the use of clay, starch, or other similar deleterious substances. Wind the roving into a cylindrical package approximately 300 mm high so the roving can be continuously fed from the center of the package through an ejector driven by compressed air and expanded into a mat of glass fibers on the soil surface. Ensure that the material contains no petroleum solvents or other agents known to be toxic to plant or animal life, and that it conforms to the specifications shown in table 713-8.

Table 713-7.—Synthetic polypropylene erosion control mat.

Property	Specification	Test Method
Color	Black	Visual
Thickness	13 mm (min.)	ASTM D 1777
Tensile strength [a]	1,370 x 790 N/m	ASTM D 5035
Elongation [a]	50% (max.)	ASTM D 5035
Porosity [b]	90% (min.)	Calculated
Resiliency [c]	80%	ASTM D 1777
Ultraviolet stability [d]	80%	ASTM D 4355

a. Values for both machine and cross-machine directions under dry or saturated conditions using 50-mm strip method.
b. Calculation based upon weight, thickness, and specific gravity.
c. The percent of original thickness retained after three cycles of a 690-kPa load for 60 seconds, followed by 60 seconds without load. Thickness measured 30 minutes after load removed.
d. Tensile strength retained after 1,000 hours in a Xenon ARC weatherometer.

Table 713-8.—Fiberglass roving.

Property	Specification	Test Method
Strands per rove	56–64	End count
Fibers per strands	184–234	End count
Fiber diameter (trade designation G)	0.009–0.013 mm	ASTM D 578
m/kg of rove	340–600 m/kg	ASTM D 578
km/kg of strand	2.62–2.82	ASTM D 578
Organic content, % max.	1.65	ASTM D 578

(2) Polypropylene Roving. Form polypropylene roving from continuous strands of fibrillated polypropylene yarn. Wind the roving into a cylindrical package so the roving can be continuously fed from the outside of the package through an ejector driven by compressed air, and can be expanded into a mat of polypropylene strands. Ensure that the material contains no agents that are toxic to plant or animal life, and that it conforms to the specifications shown in table 713-9.

Table 713-9.—Polypropylene roving.

Property	Specification	Test Method
Tensile strength	15.6 N	ASTM D 2256
Elongation at break	15.5%	ASTM D 2256
Mass of strand	360 denier	ASTM D 1907
Strands per rove	24	Measured
Ultraviolet stability	50% retained after 200 h	ASTM D 4355

(c) Geocell (Cellular Confinement System). Furnish a flexible honeycomb three-dimensional structure fabricated from HDPE that has been ultraviolet-stabilized with carbon black and/or hindered anime light stabilizers.

713.08 Miscellaneous Planting Material

(a) Stakes for Bracing and Anchoring. Fabricate stakes for bracing and anchoring trees from rough cypress, cedar, locust, or other approved wood that is essentially free from knots, rot, cross grain, and other defects that would impair the strength of the stake.

Ensure that stakes are a minimum 50 x 50 mm square in cross section, and of adequate length. Furnish stakes that conform to basic requirements of the American Lumber Standards Committee (ALSC).

Furnish anchor stakes that conform to the same size and quality as bracing stakes. The diameter and length of deadman will be SHOWN ON THE DRAWINGS.

(b) Hose. Furnish 25-mm-diameter garden or steam hose (rubber and fabric) to be used with wire for bracing and anchoring trees.

(c) Wire. Use 3.8-mm-diameter soft annealed galvanized steel wire for bracing and anchoring trees.

(d) Wrapping Material. Use 100-mm-wide rolls of waterproof paper (triple lamination 30–30–30) or 150-mm-wide rolls of burlap for wrapping trees.

(e) Twine. Use two-ply twine for trees 75 mm and less in diameter and three-ply twine for trees more than 75 mm in diameter for tying wrapping material to the trees.

(f) Antidesiccant. If approved, use a commercially available antidesiccant emulsion that will provide a film over plant surfaces permeable enough to permit transpiration.

(g) Tree Wound Dressing. Use commercially available products that have an asphalt base and contain a fungicide. Furnish a material that is antiseptic, waterproof, adhesive, and elastic. Do not use material that would be harmful to living tree tissue, such as kerosene, coal tar, creosote, and so forth.

713.09 Sprigs

Furnish healthy living stems (stolons or rhizomes) and attached roots of the perennial turf-forming grasses as SHOWN ON THE DRAWINGS. Obtain sprigs from approved heavy and thickly matted sources in the locality of the work. Remove all Johnson grass and other objectionable grasses, weeds, and other detrimental material.

713.10 Sod

Furnish living vigorous sod of the type of grass and thickness as SHOWN ON THE DRAWINGS. Furnish grass with a dense root system contained in suitable sod and reasonably free from noxious weeds and grasses. When the sod is cut, its top growth shall not be more than 75 mm in height.

713.11 Pegs for Sod

Fabricate square or round pegs from sound wood. Ensure that pegs conform to the following:

(a) Length ..... 200 mm min.

(b) Approximate cross-sectional area ..... 600 mm^2

713.12 Stabilizing Emulsion Tackifiers

Furnish a commercially available product containing no solvents or other diluting agents toxic to plant life. Furnish material that conforms to one of the following:

(a) Emulsified asphalt, grades SS–1, SS–1h, CSS–1, or CSS–1h.

(b) Nonasphalt emulsions with a water-soluble natural vegetable gum, blended with gelling and hardening agents or a water-soluble blend of hydrophilic polymers, viscosifiers, sticking agents, and gums.

(c) Polyvinyl acetate using emulsion resins and containing 60 ± 1 percent total solids by weight.

713.13 Bales

(a) Straw Bales. Tie the bales with either a commercial-quality baling wire or string. Ensure that straw and bales conform to the following:

(1) Straw ..... 713.05(a)

(2) Approximate length ..... 1 m

(3) Shape ..... Rectangular

(4) Approximate mass ..... 30 kg

(b) Wood Excelsior Bales. Furnish bales of curled wood excelsior. Tie the bales with either commercial bailing wire, plastic, or string. Ensure that bales conform to the following:

(1) Approximate dimensions ..... 400 ∞ 450 ∞ 900 mm

(2) Approximate mass ..... 33 kg

713.14 Sandbags

Use clean, silt-free material for sand filler. Furnish material that conforms to the following:

(a) Bag material ..... Canvas or burlap

(b) Volume per bag ..... 0.01 m^3 min.

713.15 Erosion Control Culvert Pipe

Furnish culvert pipe fabricated from corrugated metal, plastic, or concrete for use in diverting live streams through work areas. Provide for AASHTO M 18 loading on temporary culvert pipe placed beneath the traveled way.

713.16 Silt Fence

Furnish silt fence consisting of a combination of the following materials, constructed as specified:

(a) Posts. Furnish 75-mm-diameter wood or 1.86-kg/m steel fence posts.

(b) Supports. Furnish 2.03-mm steel wire with a mesh spacing of 150 ∞ 150 mm or a prefabricated polymeric mesh of equivalent strength.

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(c) Geotextile. Furnish geotextile conforming to Subsection 714.01 and table 714-5, as applicable.

(d) Height. Ensure that minimum height above the ground is 760 mm, and that minimum embedment depth is 150 mm.

If approved, variations from the above may be permitted to accommodate premanufactured fences.

Section 714—Geotextile, Geocomposite Drain Material, & Geogrids

714.01 Geotextiles

Use long-chain synthetic polymers composed by weight of at least 95 percent polyolefins or polyesters to manufacture geotextile or the threads used to sew geotextiles. Form the geotextiles, including selvedges, into a stable network such that the filaments or yarns retain their dimensional stability relative to each other.

(a) Physical Requirements. For the specified type, see the following tables:

(1) Subsurface drainage, type I (A–F) ..... Table 714-1

(2) Separation, type II (A–C) ..... Table 714-2

(3) Stabilization, type III (A–B) ..... Table 714-3

(4) Permanent erosion control, type IV (A–F) ..... Table 714-4

(5) Temporary silt fence, type V (A–C) ..... Table 714-5

(6) Paving fabric, type VI ..... Table 714-6

All property values in these specifications, with the exception of apparent opening size (AOS), represent minimum average roll values in the weakest principal direction (i.e., ensure that average test results of any roll in a lot sampled for conformance or quality assurance testing shall meet or exceed the specified values). Values for AOS represent maximum average roll values.

Elevate and protect rolls with a waterproof cover if stored outdoors. When using a geotextile for a permanent installation, limit the geotextile exposure to ultraviolet radiation to less than 10 days.

(b) Evaluation Procedures. Furnish a product certification, including the name of the manufacturer, product name, style number, chemical composition of the filaments or yarn, and other pertinent information to fully describe the geotextile.

When samples are required, remove a 1-m-long full-width sample from beyond the first outer wrap of the roll. Label the sample with the lot and batch number, date of sampling, project number, item number, manufacturer name, and product name.

Table 714-1.—Physical requirements for subsurface drainage geotextile.

Property	Test Method	Units	Specifications[a]					
			Type I-A	Type I-B	Type I-C	Type I-D	Type I-E	Type I-F
Grab strength	ASTM D 4632	N	1,100/700	1,100/700	1,100/700	800/500	800/500	800/500
Sewn seam strength	ASTM D 4632	N	990/630	990/630	990/630	720/450	720/450	720/450
Tear strength	ASTM D 4533	N	400[c]/250	400[c]/250	400[c]/250	300/175	300/175	300/175
Puncture strength	ASTM D 4833	N	400/250	400/250	400/250	300/175	300/175	300/175
Burst strength	ASTM D 3786	kPa	2,700/1,300	2,700/1,300	2,700/1,300	2,100/950	2,100/950	2,100/950
Permittivity	ASTM D 4491	s^{-1}	0.5	0.2	0.1	0.5	0.2	0.1
Apparent opening size	ASTM D 4751	mm	0.45[b]	0.25[b]	0.22[b]	0.45[b]	0.25[b]	0.22[b]
Ultraviolet stability	ASTM D 4355	%	50[d]	50[d]	50[d]	50[d]	50[d]	50[d]

a. The first values in a column apply to geotextiles that break at < 50 percent elongation (ASTM D 4632). The second values in a column apply to geotextiles that break at • 50 percent elongation (ASTM D 4632).
b. Maximum average roll value.
c. The minimum average roll tear strength for woven monofilament geotextile is 245 N.
d. After 500 hours of exposure.

Table 714-2.—Physical requirements for separation geotextile.

Property	Test Method	Units	Specifications[a] Type II-A	Type II-B	Type II-C
Grab strength	ASTM D 4632	N	1,400/900	1,100/700	800/500
Sewn seam strength	ASTM D 4632	N	1,260/810	990/630	720/450
Tear strength	ASTM D 4533	N	500/350	400[c]/250	300/180
Puncture strength	ASTM D 4833	N	500/350	400/250	300/180
Burst strength	ASTM D 3786	kPa	3,500/ 1,700	2,750/ 1,300	2,100/950
Permittivity	ASTM D 4491	s^{-1}	0.02	0.02	0.02
Apparent opening size	ASTM D 4751	mm	0.60[b]	0.60[b]	0.60[b]
Ultraviolet stability	ASTM D 4355	%	50[d]	50[d]	50[d]

a. The first values in a column apply to geotextiles that break at < 50 percent elongation (ASTM D 4632). The second values in a column apply to geotextiles that break at • 50 percent elongation (ASTM D 4632).
b. Maximum average roll value.
c. The minimum average tear strength for woven monofilament geotextile is 245 N.
d. After 500 hours of exposure.

Table 714-3.—Physical requirements for stabilization geotextile.

Property	Test Method	Units	Specifications[a] Type III-A	Type III-B
Grab strength	ASTM D 4632	N	1,400/900	1,100/700
Sewn seam strength	ASTM D 4632	N	1,260/810	990/630
Tear strength	ASTM D 4533	N	500/350	400[c]/250
Puncture strength	ASTM D 4833	N	500/350	400/250
Burst strength	ASTM D 3786	kPa	3,500/1,700	2,750/1,300
Permittivity	ASTM D 4491	s^{-1}	0.05	0.05
Apparent opening size	ASTM D 4751	mm	0.43[b]	0.43[b]
Ultraviolet stability	ASTM D 4355	%	50[d]	50[d]

a. The first values in a column apply to geotextiles that break at < 50 percent elongation (ASTM D 4632). The second values in a column apply to geotextiles that break at • 50 percent elongation (ASTM D 4632).
b. Maximum average roll value.
c. The minimum average tear strength for woven monofilament geotextile is 245 N.
d. After 500 hours of exposure.

Table 714-4.—Physical requirements for permanent erosion control geotextile.

Property	Test Method	Units	Specifications[a]					
			Type IV-A	Type IV-B	Type IV-C	Type IV-D	Type IV-E	Type IV-F
Grab strength	ASTM D 4632	N	1,400/900	1,400/900	1,400/900	1,100/700	1,100/700	1,100/700
Sewn seam strength	ASTM D 4632	N	1,260/810	1,260/810	1,260/810	990/630	990/630	990/630
Tear strength	ASTM D 4533	N	500/350	500/350	500/350	400[c]/250	400[c]/250	400[c]/250
Puncture strength	ASTM D 4833	N	500/350	500/350	500/350	400/250	400/250	400/250
Burst strength	ASTM D 3786	kPa	3,500/1,700	3,500/1,700	3,500/1,700	2,750/1,300	2,750/1,300	2,750/1,300
Permittivity	ASTM D 4491	s^{-1}	0.7	0.2	0.1	0.7	0.2	0.1
Apparent opening size	ASTM D 4751	mm	0.43[b]	0.25[b]	0.22[b]	0.43[b]	0.25[b]	0.22[b]
Ultraviolet stability	ASTM D 4355	%	50[d]	50[d]	50[d]	50[d]	50[d]	50[d]

a. The first values in a column apply to geotextiles that break at < 50 percent elongation (ASTM D 4632). The second values in a column apply to geotextiles that break at • 50 percent elongation (ASTM D 4632).
b. Maximum average roll value.
c. The minimum average roll tear strength for woven monofilament geotextile is 245 N.
d. After 500 hours of exposure.

Table 714-5.—Physical requirements for temporary silt fence.

Property	Test Method	Units	Specifications Type V-A	Type V-B [b]	Type V-C [c]
Maximum post spacing	–	m	1.2	1.2	2
Grab strength:					
Machine direction	ASTM D 4632	N	400	550	550
Cross direction		N	400	450	450
Permittivity	ASTM D 4491	s^{-1}	0.05	0.05	0.05
Apparent opening size	ASTM D 4751	mm	0.60 [a]	0.60 [a]	0.60 [a]
Ultraviolet stability	ASTM D 4355	%	70 [d]	70 [d]	70 [d]

a. Maximum average roll value.
b. Elongation at break • 50 percent elongation (ASTM D 4632).
c. Elongation at break < 50 percent elongation (ASTM D 4632).
d. After 500 hours of exposure.

Table 714-6.—Physical requirements for paving fabric.

Property	Test Method	Units	Specifications Type VI
Grab strength	ASTM D 4632	N	500
Ultimate elongation	ASTM D 4632	N	50% at break
Asphalt retention	Texas DOT item 3099	L/m^2	0.90
Melting point	ASTM D 276	°C	150

In addition, when geotextile joints are sewn, submit the seam assembly description and a sample of the sewn material. In the description, include the seam type, seam allowance, stitch type, sewing thread tex ticket number(s) and type(s), stitch density, and stitch gage. If the production seams are sewn in both the machine and cross-machine directions, provide sample sewn seams that are oriented in both the machine and cross-machine directions. Furnish a sewn sample that has a minimum 2 m of sewn seam and is at least 1.5 m in width. Sew the sample seams with the same equipment and procedures that are used to sew the production seams. Ensure that seams sewn onsite conform to the manufacturer's recommendations and are approved before installation.

714.02 Geocomposite Drains

Geocomposite drains consist of a polymeric drainage core with a geotextile conforming to Subsection 714.01(a)(1) attached to or encapsulating the core. Ensure that the geocomposite drain includes all necessary fittings and material to splice one

sheet, panel, or roll to the next and to connect the geocomposite drain to the collector and outlet piping.

Fabricate the drainage core in sheet, panel, or roll form of adequate strength to resist installation stresses and long-term loading conditions. Furnish core material that consists of long chain synthetic polymers composed by weight of at least 85 percent polypropylene, polyester, polyamide, PVC, polyolifin, or polystyrene. Build the core up in thickness by means of columns, cones, nubs, cusps, meshes, stiff filaments or other configurations.

Ensure that geocomposite drains have a minimum compressive strength of 275 kPa when tested in accordance with ASTM D 1621, procedure A. Ensure that all splices, fittings, and connections have sufficient strength to maintain the integrity of the system during construction handling and permanent loading, and do not impede flow or damage the core.

Identify, ship, and store the geocomposite drains in accordance with AASHTO M 288. Elevate and protect sheets, panels, and rolls with a waterproof and ultra-violet-resistant cover if stored outdoors.

When using a geocomposite drain for a permanent installation, limit the geocomposite exposure to ultraviolet radiation to less than 10 days.

When samples are required, provide a 1-m-square sample from products supplied as sheets or panels, or a 1-m-length full-roll-width sample from products supplied in rolls. Label the sample with the lot and batch number, date of sampling, project number, item number, manufacturer's name, and product name.

(a) Geocomposite Underdrains. Ensure that the horizontal and vertical flow of water within the core interconnects at all times for the full height of the core, and water can pass from one side of the core to the other. Ensure that the drainage core with the geotextile in place provides a minimum flow rate of 0.1 L/s/m of width when tested in accordance with ASTM D 4716 under the following test conditions:

(1) A specimen 300 mm long.

(2) An applied load of 69 kPa.

(3) A gradient of 0.1.

(4) A 100-hour seating period.

(5) A closed-cell foam rubber between platens and geocomposite.

Firmly attach the geotextile to the core so folding, wrinkling, and other movement cannot occur either during handling or after placement. Achieve bonding using nonwater-soluble adhesive, heat sealing, or another method recommended by the manufacturer. Do not use adhesive on areas of the geotextile fabric where flow is intended to occur.

If heat sealing is used, do not weaken the geotextile below the required strength values. Extend the geotextile below the bottom of the core far enough to completely encapsulate the collector pipe.

(b) Geocomposite Sheet Drains. Ensure that the horizontal and vertical flow of water within the sheet drain interconnects at all times for the full height of the core. Ensure that the drainage core with the geotextile in place provides a minimum flow rate of 0.1 liters per second per meter of width when tested in accordance with ASTM D 4716 under the following test conditions:

(1) A specimen 300 mm long.

(2) An applied load of 69 kPa.

(3) A gradient of 0.1.

(4) A 100-hour seating period.

(5) A closed-cell foam rubber between platens and geocomposite.

If core construction separates the flow channel into two or more sections, only the flow rate on the inflow face is considered in determining the core's acceptability.

Firmly attach the geotextile to the core so folding, wrinkling, and other movement cannot occur either during handling or after placement. Achieve bonding using nonwater-soluble adhesive, heat sealing, or another method recommended by the manufacturer. Do not use adhesive on areas of the geotextile fabric where flow is intended to occur.

If heat sealing is used, do not weaken the geotextile below the required strength values. Extend the geotextile below the bottom of the core far enough to completely encapsulate a the collector pipe.

(c) Geocomposite Pavement Edge Drains. Ensure that the geotextile tightly encapsulates the geocomposite edge drain, and that the edge drains permit inflow from both sides. Ensure that the drain core with the geotextile in place provides a minimum flow rate of 3 liters per second per meter of width when tested in accordance with ASTM D 4716 under the following test conditions:

(1) A specimen 300 mm long.

(2) An applied load of 69 kPa.

(3) A gradient of 0.1.

(4) A 100-hour seating period.

(5) A closed-cell foam rubber between platens and geocomposite.

If the geocomposite polymer core separates the flow channel into two or more parts, consider only the tested flow rate of the channel facing the pavement.

Firmly attach the geotextile to the core so folding, wrinkling, and other movement cannot occur during handling or after placement. Achieve bonding using nonwater-soluble adhesive, heat sealing, or another method recommended by the manufacturer. Do not use adhesive on areas of the geotextile fabric where flow is intended to occur.

If heat sealing is used, do not weaken the geotextile below the required strength values. Extend the geotextile below the bottom of the core far enough to completely encapsulate the collector pipe.

Furnish nonperforated plastic pipe conforming to Subsection 706.08 for all pipe and pipe fittings used for an outlet to the edge drain.

Furnish solvent cement for the outlet pipe and fittings in accordance with ASTM D 2564. Ensure that the material composition of the outlet fittings is compatible for direct solvent welding to PVC.

714.03 Geogrids

Furnish geogrids consisting of polymeric materials such as polypropylene, polyethylene, or polyester formed into a stable network of bars or straps fixed at their junctions such that the bars retain their relative position to each other. Ensure that the geogrid is treated to resist ultraviolet degradation, and that it conforms to the physical strength requirements shown in table 714-7 in accordance with ASTM D 4595.

Table 714-7.—Physical strength requirements for geogrids.

Category	Minimum Strength at 5% Strain (kN/m)	Minimum Ultimate Strength at Breakage (kN/m)
1	9	13
2	13	21
3	17	29
4	28	61
5	53	98
6	70	125

Furnish the CO with a certificate signed by a legally authorized official from the company that manufactured the geogrid. Ensure that the certificate attests that the geogrid meets the chemical, physical, material, and manufacturing requirements stated in the specification. When requested by the CO, furnish a sample of the geogrid from each lot for verification testing.

During shipment and storage, wrap the geogrid in a heavy-duty protective covering. Protect the geogrid from mud, soil, dust, debris, and sunlight prior to installation.

Ensure that the geogrid meets the minimum average roll values for the wide-width strip tensile strength tests performed in accordance with ASTM D 4595 for the category SHOWN ON THE DRAWINGS. Provide test results to the CO prior to incorporating the geogrid into the work.

Ensure that the aperture size for all geogrids is from 22 to 75 mm. Square and rectangular openings are permitted. Strengths shown in table 714-7 are for both the machine and cross directions.

Section 715—Piling

715.01 Untreated Timber Piles

Conform to ASTM D 25. Fabricate the piles from the following species for the sizes and dimensions as SHOWN ON THE DRAWINGS:

(a) Douglas Fir

(b) Larch

(c) Norway Pine

(d) Red Oak

(e) Southern Yellow Pine

Install steel straps along the length of the pile at not more than 3-m centers. In addition, place a strap at 75, 150, and 300 mm from the tip and two additional straps within 600 mm of the butt. Use 32-mm-wide x 0.8-mm-thick steel strapping material fabricated from cold-rolled, heat-treated, high-tensile steel with a minimum tensile strength of 22 kN.

Hold straps in place with clips that are secured by crimping twice in the clip length with a notch-type sealer. Fabricate the clips from 57 x 0.9-mm-thick steel. The clip joint shall develop at least 75 percent of the strap tensile strength. Straps shall encircle the pile once and shall be tightened by hand-operated or power-assisted tensioning tools.

Furnish one copy each of the supplier's certification of species and the certification that the piling meets the requirements specified in ASTM D 25.

715.02 Treated Timber Piles

Conform to Subsection 715.01, except furnish only Douglas Fir or Southern Yellow Pine piles for use in saltwater. Treat the piles with preservative in accordance with AASHTO M 133 for the types and quantities of preservatives as SHOWN ON THE DRAWINGS.

Use the pressure method procedure prescribed in AWPA standard C1. Apply the treatment to the piles after all millwork is completed.

Ensure that the treating plant imprints legible symbols or legends on the end of all piles, identifying the name of the treating company and type and year of treatment in accordance with AWPA standards M1 and M6.

Furnish one copy of the following Certificates of Compliance to the CO upon delivery of the piling to the jobsite:

(a) Supplier certification of species, and certification that the piling meets the requirements specified in ASTM D 25.

(b) Certificate of Conformance to AASHTO M 133, including type of treatment, retention (Assay method), and penetration from an ALSC-accredited agency.

Have the compliance certification made by a qualified testing and inspection agency.

715.03 Concrete Piles

Fabricate piles from class A (AE) concrete conforming to Section 552. Furnish billet steel and rail steel reinforcement bars conforming to Subsection 709.01. For prestressing reinforcement steel, conform to Subsection 709.03.

Construct precast concrete piles in accordance with Section 552. Construct prestressed concrete piles according to Section 553. When lifting anchors are used, maintain at least a 25-mm clearance from the pile reinforcing steel or prestressing steel.

Use metal, plywood, or dressed lumber forms that are watertight, rigid, and true-to-line. Use a 25-mm chamfer strip in all corners of the forms.

Cast piles separately or, if alternate piles are cast in a tier, cast the intermediate piles at least 4 days after the adjacent piles have been poured. Separate piles cast in tiers with tar paper or other suitable separating material. Place concrete in each tier in a continuous operation that prevents the formation of stone pockets, honeycombs, and other defects. Leave forms in place for at least 24 hours.

When the forms are removed, make the pile surface true, smooth, even, and free from honeycombs and voids. Make piles straight so that a line stretched from butt to tip on any face will not be more than 25 mm from the face of the pile at any point.

Remove lifting anchors to a depth of at least 25 mm below the concrete surface, and fill the resulting hole with concrete. Finish the surface of each pile with a class 1 ordinary surface finish, according to Subsection 552.18. Cure the piles in accordance with Sections 552 and 553, as applicable.

If concrete test cylinders are made and tested in accordance with Section 552, do not move piles until the tests indicate a compressive strength of at least 80 percent of the design 28-day compressive strength. Do not transport or drive piles until the tests indicate that the minimum design 28-day compressive strength has been attained.

If concrete test cylinders are not made, do not move piles until they have cured for at least 14 days at a minimum temperature of 15 °C, or 21 days at a minimum temperature of 4 °C. Do not transport or drive piles until cured for at least 21 days at a minimum of 15 °C, or 28 days at a minimum of 4 °C. When high-early-strength cement is used, do not move, transport, or drive piles until cured for at least 7 days.

715.04 Steel Shells

Furnish either cylindrical or tapered pile shells of spiral welded, straight-seam welded, or seamless tube steel material. Use only one type of pile shell throughout a structure. Conform to the following minimum shell wall thickness:

- Outside cylinder diameter < 350 mm ..... 6 mm
- Outside cylinder diameter≥350 mm ..... 10 mm
- Tapered or fluted ..... 4.5 mm

(a) Shells Driven Without a Mandrel. For tapered or step-tapered cast-in-place concrete piles, furnish shells having a minimum 300-mm diameter at cutoff and a minimum 200-mm diameter at tip. For constant-diameter cast-in-place concrete piles, furnish shells having a minimum nominal diameter of 270 mm.

Fabricate the shells from not less than 4.5-mm plate stock conforming to AASHTO M 183M. Shells may be either spirally welded or longitudinally welded and either tapered or constant in section. Seal the tips as SHOWN ON THE DRAWINGS.

(b) Shells Driven With a Mandrel. Furnish shells of sufficient strength and thickness to withstand driving without injury and to resist harmful distortion and/or buckling due to soil pressure after being driven and the mandrel is removed. Butt and tip dimensions will be SHOWN ON THE DRAWINGS.

715.05 Steel Pipes

Conform to the following:

(a) Steel pipe to be filled with concrete ..... ASTM A 252, grade 2

(b) Closure plates for closed end piles ..... AASHTO M 183M

(c) Reinforced conical points for pipe closure at the tip ... AASHTO M 103M

(d) Unfilled tubular steel piles for welded and seamless steel pipe piles with chemical properties conforming to ASTM A 53, grade B ..... ASTM A 252, grade 2

715.06 Steel H-Piles

Furnish steel H-piles from rolled steel sections of the weight and shape SHOWN ON THE DRAWINGS. Fabricate the H-piles from structural steel conforming to AASHTO M 183M, except do not use steel manufactured by the acid Bessemer treatment process.

For copper-bearing structural steel, furnish steel that contains not less than 0.20 percent or more than 0.35 percent copper.

715.07 Sheet Piles

Furnish steel sheet piles conforming to AASHTO M 202M or AASHTO M 223M. Make the joints practically watertight when the piles are in place.

715.08 Pile Shoes

Furnish shoes for timber piles that are prefabricated from cast steel conforming to ASTM A 27M.

715.09 Splices

Manufacture splices for H-piles or pipe piles from structural steel conforming to AASHTO M 183M.

Section 716—Material for Timber Structures

716.01 Untreated Structural Timber & Lumber

Furnish structural timber and lumber that conform to AASHTO M 168 and the applicable standards of the West Coast Lumber Inspection Bureau, Southern Pine Inspection Bureau, or another nationally recognized timber association. Ensure that all structural timber and lumber are seasoned and dried at the time of fabrication. Material that has become twisted, curved, or otherwise distorted prior to assembly into the final structure may be cause for rejection.

Do not use boxed-heart pieces of Douglas Fir or Redwood in stringer, floor beams, caps, posts, sills, curbs, rails, rail posts, and rail post blocks. Boxed-heart pieces are defined as timber so sawed that at any point in the length of a sawed pieced the pith lies entirely inside the four faces.

Legibly mark, stamp, or brand all pieces, identifying the inspection service, grade designation, species, and identity of the inspector. Furnish timber and lumber that conform to the species, design values, and nominal dimensions SHOWN ON THE DRAWINGS. Furnish an inspection certification as to the species and grade from an agency accredited by ALSC.

716.02 Hardware & Structural Steel

Furnish machine and carriage bolts that meet the requirements of ASTM A 307, drift pins and dowels that meet the requirements of ASTM A 575, and galvanized hardware that meets the requirements of AASHTO M 232.

Ensure that all structural steel shapes, rods, glued laminated deck panel dowels, and plates are structural steel that meets the requirements of AASHTO M 183. Ensure that galvanizing meets the requirements of AASHTO M 111.

Furnish bolts with square or hexagonal heads, nuts or dome-heated bolts as SHOWN ON THE DRAWINGS, and nails that are cut or round nails of standard form. Use cut, round, or boat spikes, as specified. Use washers that are malleable iron castings, and plain or cut washers that are American Standard Plain Washers.

Use ring or shear plate timber connectors conforming to AASHTO's "Standard Specifications for Highway Bridges," division II, article 16.2.6, Timber Connectors.

716.03 Treated Structural Timber & Lumber

Furnish wood in accordance with Subsection 716.01. Treat the wood and mark each piece of treated timber in accordance with AASHTO M 133. Use the type of treatment and minimum net retention of preservative that are SHOWN ON THE DRAWINGS. Completely and accurately fabricate all treated timber before it is treated. Except for Southern Pine, incise all surfaces greater than 50 mm in width, including glued laminated members, before treatment. Treat glued laminated timbers in accordance with AWPA C28. Furnish inspection certification of treatment from an agency accredited by ALSC.

Use the assay method to determine retention of preservatives in all lumber and timbers.

Ensure that treatment meets the requirements in the current edition of the WWPI's "Best Management Practices for the Use of Treated Wood in Aquatic Environments."

716.04 Structural Glued Laminated Timber

Furnish structural glued laminated timber that meets the requirements specified in the current edition of AITC 117. Use the combination symbol, protection, quality marks, certificates, and preservation treatment that are SHOWN ON THE DRAWINGS. Ensure that manufacture, marking, and quality control of structural glued laminated timber are in conformance with ANSI/AITC A190.1, Structural Glued Laminated Timber.

Ensure that members are manufactured as industrial-appearance grade for wet use conditions, using a phenol-resorcinol resin type of adhesive throughout. Use only single- or multiple-piece laminations with boded edge joints.

Ensure that caulking compound used to seal deck panel joints meets the requirements of FSS TT–S–001543 (com.) and is brown or bronze in color.

716.05 Substitution for Solid Sawn Structural Timber & Lumber

Comparable glued laminated material may be substituted for solid sawn material. Ensure that all substitutions have approximately equal dimension and will provide equal or greater bonding and shear strength per member. Before fabrication, submit drawings that show revised details, including any changes in dimensions, elevation, and bolt length.

Section 717—Structural Metal

717.01 Structural Steel

Furnish structural carbon steel in accordance with AASHTO M 270M and as shown below.

(a) Structural Carbon Steel. For primary bridge members, furnish structural carbon steel that conforms to AASHTO M 270M, grade 250T. For fracture-critical bridge members, furnish structural carbon steel that conforms to AASHTO M 270M, grade 250F. For other shapes, plates, and bars, furnish structural carbon steel that conforms to AASHTO M 270M, grade 250.

(b) High-Strength Low-Alloy (HSLA) Structural Steel. For other shapes, plates, and bars, furnish HSLA steel that conforms to AASHTO M 270M, grade 345 or 345W.

For primary bridge members, furnish HSLA steel that conforms to AASHTO M 270M, grade 345T or 345WT. Ensure that fracture-critical bridge members conform to AASHTO M 270M, grade 345F or 345WF.

For welded members, furnish HSLA steel that conforms to AASHTO M 270M, grade 345T or 345WT. Ensure that fracture-critical welded members conform to AASHTO M 270M, grade 345F or 345WF.

(c) High-Strength Quenched & Tempered Steel. For other shapes, plates, and bars, ensure that all quenched and tempered steel provided conforms to AASHTO M 270M, grade 485W, 690, or 690W. For primary bridge members, furnish quenched and tempered steel that conforms to AASHTO M 270M, grade 485WT, 690T, or 690WT. Furnish fracture-critical bridge members that conform to AASHTO M 270M, grade 485WF, 690F, or 690 WF.

(d) Bolts & Nuts. Conform to ASTM A 307.

(e) High-Strength Bolts, Nuts, & Washers. Conform to either AASHTO M 164M or AASHTO M 253M, as specified. Furnish circular, clipped, and beveled hardened steel washers that conform to AASHTO M 293 (ASTM F 436).

(f) Load-Indicating Washers. Furnish load-indicating washers that conform to ASTM F 959, type 325 or 490. Use type 325 with AASHTO M 164 bolts, and type 490 with AASHTO M 253 bolts.

(g) Steel Anchor Bolts. Furnish steel anchor bolts that conform to AASHTO M 314 and are of the grade and dimensions SHOWN ON THE DRAWINGS. Ensure that the exposed portion of the bolt is zinc coated by hot dip of mechanical deposition.

717.02 Steel Forgings

Conform to AASHTO M 102, classes C, D, F, and G.

717.03 Pins & Rollers

Furnish pins and rollers that are more than 225 mm in diameter from annealed carbon-steel forgings that conform to AASHTO M 102, class C.

Furnish pins and rollers that are 225 mm or less in diameter either from annealed carbon-steel forgings that conform to AASHTO M 102, class C, or from cold-finished carbon-steel shafting that conforms to AASHTO M 169, grade 1016 to 1030, inclusive, with a minimum Rockwell Scale B hardness of 85. The hardness requirement may be waived if the steel develops a tensile strength of 480 MPa and a yield point of 250 MPa.

Furnish pin threads that conform to the ANSI B1.1 Coarse Thread Series, class 2A. Thread pin ends with a diameter of 35 mm or more with six threads in 25 mm.

717.04 Castings

Furnish castings that conform to the following:

(a) Steel Castings. Furnish steel castings that conform to AASHTO M 192M, class 485.

(b) Chromium Alloy Steel Castings. Furnish chromium alloy steel castings that conform to AASHTO M 163M, grade CA–15.

(c) Gray Iron Castings. Furnish gray iron castings that conform to AASHTO M 105, class number 30B, unless otherwise specified. Furnish iron castings that are free from pouring faults, sponginess, cracks, blow holes, and other defects in position affecting their strength and value for the service intended. Boldly fillet the castings at angles and make the arrises sharp and perfect. Sand blast all castings, or otherwise effectively remove the scale, and sand to present a smooth, clean, and uniform surface.

(d) Malleable Iron Castings. Furnish malleable iron castings that conform to ASTM A 47, grade number 35018, unless otherwise specified. Ensure that workmanship, finishing, and cleaning conform to Subsection 717.04(c).

717.05 Welded Stud Shear Connectors

Furnish shear connector studs that conform to AASHTO M 169 for standard-quality, cold-finished, carbon steel bars. Provide the connectors conforming to AASHTO's "Standard Specifications for Highway Bridges," division II, article 11.3.3, Welded Stud Shear Connectors.

717.06 Steel Pipe

Furnish galvanized steel pipe conforming to ASTM A 3, type F, standard weight class, and plain ends for the designation SHOWN ON THE DRAWINGS.

717.07 Galvanized Coatings

When galvanizing is specified, galvanize structural steel shapes, plates, bars, and their products in accordance with AASHTO M 111. Galvanize hardware in accordance with AASHTO M 232.

717.08 Sheet Lead

Furnish sheet lead that conforms to ASTM B 29 for common desilverized lead. Furnish the sheets in a uniform thickness of 6 mm ± 1 mm, and make them free from cracks, seams, slivers, scale, and other defects.

717.09 Steel Grid Floors

Furnish steel grid floors that conform to AASHTO M 270M, grade 250 or 345W. Ensure that steel furnished in accordance with AASHTO M 270M, grade 250, has a minimum copper content of 0.2 percent unless galvanized. Galvanize steel grid floors unless painting is specified.

717.10 Elastomeric Bearing Pads

Furnish elastomeric bearing pads that conform to AASHTO M 251.

717.11 TFE Surfaces for Bearings

(a) TFE Resin. Furnish virgin TFE resin material conforming to ASTM D 1457. Ensure that specific gravity is 2.13 to 2.19 and the melting point is 328 °C ± 1 °C.

(b) Filler Material. Furnish filler material consisting of milled glass fibers, carbon, or other approved inert material.

(c) Adhesive Material. Furnish epoxy resin adhesive conforming to FSS MMM–A–134, FEP film, or an approved equivalent.

(d) Unfilled TFE Sheet. Furnish unfilled TFE sheet from TFE resin conforming to the following:

(1) Min. tensile strength, ASTM D 1457 ..... 19 MPa

(2) Min. elongation, ASTM D 1457 ..... 200%

(e) Filled TFE Sheet. Furnish filled TFE sheet from TFE resin uniformly blended with inert filler material. For filled TFE sheets containing glass fiber or carbon, conform to specifications in table 717-1.

Table 717-1.—TFE sheeting.

Property	ASTM Method	15% Glass Fibers	25% Carbon
Mechanical:			
Minimum tensile strength	D 1457	14 MPa	9 MPa
Minimum elongation	D 1457	150%	75%
Physical:			
Minimum specific gravity	D 792	2.20	2.10
Melting point	D 1457	327 °C ± 10 °C	327 °C ± 10 °C

(f) Fabric Containing TFE Fibers. Furnish fabric from oriental multifilament TFE fluorocarbon and other fibers. Use TFE fibers that conform to the following:

(1) Min. tensile strength, ASTM D 2256 ..... 165 MPa

(2) Min. elongation, ASTM D 2256 ..... 75%

(g) Interlocked Bronze & Filled TFE Components. Furnish interlocked bronze and filled TFE components that consist of a phosphor bronze plate conforming to ASTM B 100 with an 0.25-mm-thick porous bronze surface layer conforming to ASTM B 103M, into which a TFE compound is impregnated. Overlay the surface with compounded TFE not less than 25 µm thick.

(h) TFE Metal Composite. Furnish virgin TFE molded on each side and completely through a 33-mm perforated stainless steel sheet conforming to ASTM A 240, type 304.

(i) Surface Treatment. For epoxy bonding, factory treat one side of the TFE sheet with a sodium naphthalene or sodium ammonia process.

(j) Stainless Steel Mating Surface. Furnish stainless steel mating surfaces that are at least 0.91 mm thick, conform to ASTM A 240, type 304, and have a surface finish

less than 0.5 µm root mean square. Polish or roll stainless steel mating surfaces as necessary to provide the specified friction properties.

717.12 Structural Aluminum Alloy

Furnish structural aluminum material that conforms to the requirements SHOWN ON THE DRAWINGS and to "Specifications for Aluminum Structures," published by the Aluminum Association, Inc. (AA). For aluminum expansion joint material, furnish aluminum extrusion alloy 6061–T6.

717.13 Aluminum Alloy for Bridge Rail

Furnish aluminum alloys that conform to the applicable specifications of table 717-3, as specified.

717.14 Aluminum Bolt Heads & Nuts

Furnish aluminum bolt heads and nuts that conform to American Standard heavy hexagon ANSI B18.2. Ensure that threads conform to American Standard coarse series, class 2 fit, ANSI specification B1.1.

717.15 Aluminum Welding Wire

Furnish aluminum welding wire that conforms to the specifications in table 717-2.

Table 717-2.—Aluminum welding wire.

Alloys Series	Specification	Wire
3xxx and 6xxx	AWS 5.10	ER 4043
3xxx, 5xxx, and 6xxx	AWS 5.10	ER 5356
5xxx and 6xxx	AWS 5.10	ER 5556 or 5183

717.16 Elastomeric Compression Joint Seals

Furnish elastomeric compression joint seals that conform to AASHTO M 220.

717.17 Dowels

Furnish dowels that conform to the requirements of AASHTO M 31 (ASTM A 615) for grades 40 and 60, or AASHTO M 227 (ASTM A 663) for grades 70, 75, and 80.

Table 717-3.—Aluminum alloys for bridge railing systems (ASTM and AA alloy designation).

Railing Component	Sheet and Plate ASTM B 209	Drawn Formless Tubes ASTM B 210	Bars, Rods, and Wire ASTM B 211	Extruded Bars, Rods, Shapes, and Tubes ASTM B 221	Pipe ASTM B 241	Standard Structural Shapes ASTM B 308	Rivet Cold and Heading Wires and Rods ASTM B 316	Sand Castings ASTM B 26	Permanent Mold Castings ASTM B 108
Posts and post bases, structural:									
Wrought				6061–T6	6061–T6	6061–T6			
Cast					6063–T6				A444.0–T4
Posts, ornamental:									
Wrought				6063–T6	6063–T6			356.0–T6	A356.0–T6
Cast								356.0–T6	A356.0–T6
Rails and sleeves, structural:									
Wrought		6061–T6 6063–T6		6061–T6 6063–T6 6351–T5	6061–T6 6063–T6	6061–T6			
Bolts and screws, misc.[a,b]									
Aluminum, wrought			2024–T4[c]						
Stainless steel			6061–T6[d]						
Galvanized steel									
Aluminized steel									
Nuts,[e] wrought:			2024–T4	6061–T6[f]					
6 mm and over[b]			6061–T6						
5 mm and under			6262–T9						

Note: "F" temper applies to products that acquire some temper from fabricating processes.

a. Use compatible stainless or coated steel nuts and washers. Do not use aluminum for anchor bolts.

b. Coat alloy 2024–T4 with a 5-µm minimum thickness anodic coating with a dichromate or boiling water seal.

c. Use alloy 2024–T4 for stress-carrying bolts and minor bolts.

d. Use alloy 6061–T6 as an alternate material for minor bolts.

e. Use with aluminum bolts and screws. Do not use aluminum for anchor bolt nuts and washers.

f. ASTM B 211 is an acceptable alternate.

Table 717-3.—Aluminum alloys for bridge railing systems (ASTM and AA alloy designation) (cont.).

Railing Component	Sheet and Plate ASTM B 209	Drawn Formless Tubes ASTM B 210	Bars, Rods, and Wire ASTM B 211	Extruded Bars, Rods, Shapes, and Tubes ASTM B 221	Pipe ASTM B 241	Standard Structural Shapes ASTM B 308	Rivet Cold and Heading Wires and Rods ASTM B 316	Sand Castings ASTM B 26	Permanent Mold Castings ASTM B 108
Washers, flat:[b]									
Wrought	Alclad 2024–T4 Alclad 2024–T3[c]								
Washers, springlock:[b]									
Wrought			7075–T6						
Rivets:									
Wrought				6061–T6			6061–T6[a,d] 6061–T4[a,e]		
Shims:									
Wrought	1100–0			6063–F[a]				443.0–F	
Cast									
Weld filler:									
Wrought						5356			
End caps:									
Wrought	6061–T6			6061–T6				356.0–T6[a]	
Cast								356.0–F 443.0–F	

Note: "F" temper applies to products that acquire some temper from fabricating processes.
a. Chemical, composition only.
b. Use with aluminum bolts and screws. Do not use aluminum for anchor bolt nuts and washers.
c. Use T3 temper for thicknesses less than 6 mm, and use T4 temper for thicknesses 6 mm and greater.
d. Use for cold-driven rivets.
e. Use for rivets driven at 530 °C to 565 °C.

Section 718—Traffic Signing & Marking Material

718.01 Retroreflective Sheeting

Furnish retroreflective sheeting material that conforms to AASHTO M 268, except that the minimum coefficients of retroreflection for brown type I sheeting shown in AASHTO M 268, table 1, are amended as follows:

(a) 2.0 cd/lx/m^2 at 0.2° observation angle and – 4° entrance angle.

(b) 1.0 cd/lx/m^2 at 0.2° observation angle and + 30° entrance angle, and at 0.5° observation angle and – 4° entrance angle.

(c) 0.5 cd/lx/m^2 at 0.5° observation angle and + 30° entrance angle.

Furnish retroreflective sheeting material that conforms to AASHTO M 268 supplemental requirement S1, if specified. Furnish reboundable retroreflective sheeting that conforms to AASHTO M 268, including supplemental requirement S2.

Furnish sheeting that is either heat activated or pressure sensitive (class 1), engineer grade, unless otherwise specified. Ensure that colors are as specified in the MUTCD and as SHOWN ON THE DRAWINGS.

Ensure that no more than 12 months elapse from the date of manufacture to the date of application.

When an adhesive is used, use backing class 1, 2, or 3, in accordance with AASHTO M 268.

718.02 Test Procedures

Use test procedures in accordance with AASHTO M 268, except that subsection S1.3.3 is amended as follows:

The stock cultures of *Aspergillus niger*, American Type Culture Collection number 6275, may be kept for not more than 4 months in a refrigerator at a temperature from 3 °C to 10 °C. Use subcultures incubated at 28 °C to 30 °C for 10 to 14 days in preparing the inoculum.

718.03 Plywood Panels

Fabricate the panels from HDO plywood, two sides Douglas Fir, exterior type, conforming to U.S. Product Standard 1 (current edition), with a B-grade veneer or better on both faces. Ensure that surfacing overlay material is high-density 90–90 resin-impregnated fiber, permanently fused to the base panel under heat and pressure. Furnish material that is suitable for sign manufacturing and compatible with reflective-sheeting adhesive. Do not permit any marks, blemishes, or damage of any kind. Overlay color may be either black or buff, unless specified otherwise. Ensure that each panel edge-brand includes the following: HDO B–B G1 EXT APA PS 1.

Use a minimum 13-mm-thick plywood for signs less than 600 mm in the longest dimension. Use a minimum 15-mm-thick plywood for all other signs cut from a single sheet. Use a minimum 19-mm-thick plywood for all signs requiring joining.

Abrade, clean, and degrease the face of the plywood panel in accordance with methods recommended by the manufacturer of the retroreflective sheeting. Treat the edges of the plywood panel with an approved edge sealant.

718.04 Steel Panels

Fabricate the panels from 2-mm continuous-coat galvanized sheet steel blanks conforming to ASTM A 525. Mill phosphatize the zinc coating (designation G 90) to a thickness of 1.1 ± 0.5 g/m^2 of surface area.

The finished plate shall be free of twist or buckles and the background substantially a plane surface. Clean, degrease, or otherwise prepare the panels in accordance with methods recommended by the sheeting manufacturer.

718.05 Aluminum Panels

Furnish sheets and plates that conform to ASTM B 209, alloy 6061–T6 or 5052–H38.

Fabricate temporary panels and permanent panels that are 750 x 750 mm or smaller from 2-mm-thick aluminum sheets. Fabricate larger permanent panels from 3-mm-thick aluminum sheets.

Furnish blanks that are free from laminations, blisters, open seams, pits, holes, and other defects that may affect their appearance or use. Ensure that thickness is uniform and the blank commercially flat. Perform shearing, cutting, and punching before preparing the blanks for application of reflective material.

Clean, degrease, and chromate the blanks, or otherwise properly prepare the panels in accordance with methods recommended by the sheeting manufacturer.

718.06 Plastic Panels

(a) Plastic. Fabricate the panels from sheets of lightweight, flexible, high-impact, and ultraviolet-chemical-resistant polycarbonate material or approved equivalent that will accept adhesives, coatings, and retroreflective sheeting material, as recommended for such material.

Fabricate panels that are 600 x 600 mm or smaller from 2-mm-thick plastic blanks. Fabricate larger panels from 3-mm-thick plastic blanks.

Furnish panels that are flat and free of buckles, warps, and other defects. Where multiple panels adjoin, ensure that the gap between adjacent panels is no greater than 16 mm. Ensure that signs larger than 600 x 600 mm have reinforcement stiffeners attached on the back for rigidity and for mounting on the supports.

(b) Fiberglass-Reinforced Plastic. Fabricate fiberglass-reinforced plastic signs from fiberglass-reinforced thermoset polyester acrylic modified laminate sheets. Furnish sign panel that is ultraviolet stabilized for outdoor weathering ability. Ensure that sign panel accepts adhesives, coatings, and retroreflective sheeting material, as recommended.

Furnish sign panel free of visible cracks, pinholes, foreign inclusions, and surface wrinkles that would affect implied performance, alter the specific dimensions of the panel, or otherwise affect the sign panel's serviceability.

Wipe sign panel surface clean with a slightly dampened cloth before applying reflective sheeting.

Furnish fiberglass-reinforced plastic that complies with the recommendations of the Fiberglass Reinforced Panel Council publication "Recommended Traffic Control Sign Panel Specification." Unless otherwise SHOWN ON THE DRAWINGS, furnish material that is brown, matching FSS 595a, color number 20059.

718.07 Extruded Aluminum Panels

Fabricate the panels from aluminum alloy 6063–T6 conforming to the requirements of ASTM B 221. Ensure that panel thickness and fabrication conform to Subsection 718.05. The maximum allowable deviation from flat on the face is 4 mm/m.

718.08 Paint

Furnish premium-grade exterior silicone alkyd enamel paint with a color to match the color of the HDO plywood substrate.

718.09 Silk Screen Inks

Furnish inks that are compatible with the sheeting, as determined by the manufacturer of the ink and the manufacturer of the sheeting. Furnish color as specified in the MUTCD and as SHOWN ON THE DRAWINGS.

718.10 Edge Film

Furnish edge film that is a pressure-sensitive, premium-quality, clear, ultraviolet-resistant, 75-mm-wide vinyl film.

718.11 Signposts

Fabricate traffic signposts from wood, steel, plastic, aluminum, or fiberglass-reinforced plastic, as specified.

(a) Wood Posts. Fabricate wood posts from dry number 1 structural-grade Douglas Fir, Southern or Ponderosa Pine, Hemlock, Spruce, or Western Larch conforming to AASHTO M 168. Treat the posts with waterborne preservative ACA, ACZA, or CCA, in accordance with AWPA standard C14, but ensure that the minimum preservative retention is 6 kg/m^3.

(b) Steel Posts. Fabricate steel posts from billet or rail steel conforming to ASTM A 499. Drill or punch 10-mm holes in the posts along the centerline of the web before galvanizing. Begin punching or drilling 25 mm from the top of the post and proceed on 25-mm centers for the entire length of the post. Galvanize the posts in accordance with ASTM A 123.

(c) Aluminum Posts. Fabricate aluminum posts in approved standard shapes and thicknesses using aluminum alloy 6061–T6, 6351–T5, 6063–T6, or 6005–T5 conforming to ASTM B 221.

(d) Plastic Posts. Fabricate flexible posts made with high-impact-resistant, ultraviolet, chemical-resistant polycarbonate material or approved equivalent.

(e) Fiberglass-Reinforced Plastic Posts. Fabricate fiberglass-reinforced plastic posts from fiberglass-reinforced thermoset polymers. Post to be ultraviolet stabilized for outdoor weathering ability.

718.12 Object Marker & Delineator Posts

Fabricate object marker and delineator posts from wood, steel, aluminum, plastic, or fiberglass-reinforced plastic.

(a) Wood Posts. Furnish 100 x 100-mm wood posts that conform to Subsection 718.11.

(b) Steel Posts. Furnish flanged U-channel steel posts that weigh not less than 3 kg/m and conform to ASTM A 36. Galvanize the posts in accordance with ASTM A 123.

(c) Aluminum Posts. Furnish standard-shaped 3-mm-thick aluminum posts conforming to ASTM B 221, alloy 6061–T6.

(d) Plastic Posts. Furnish flexible delineator posts made with high-impact-resistant, ultraviolet-chemical-resistant polycarbonate or approved equivalent.

(e) Fiberglass-Reinforced Plastic Posts. Fabricate fiberglass-reinforced plastic posts from fiberglass-reinforced thermoset polymers. Post to be ultraviolet stabilized for outdoor weathering ability.

718.13 Hardware

Use galvanized steel or aluminum alloy for fittings such as lag screws, washers, clip angles, wood screws, shear plates, U-bolts, clamps, bolts, nuts, and other fasteners.

Furnish high-strength steel bolts, nuts, and washers conforming to specifications in Subsection 717.01. Galvanize steel hardware in accordance with ASTM A 153.

Furnish aluminum alloy bolts, nuts, and washers conforming to specifications in Subsections 717.13 and 717.14, as applicable.

Furnish oversize bolt heads and oversize neoprene or nylon washers for plastic sign panels.

718.14 Letters, Numerals, Arrows, Symbols, & Borders

Furnish colors as SHOWN ON THE DRAWING and in accordance with Subsection 718.01 and the FHWA's "Standard Alphabets for Highway Signs," current edition.

Perform all silk-screening operations precisely as prescribed in writing by the manufacturers of the ink and the sheeting to which they are applied.

Furnish silk screen inks that are color matched to eliminate any visual difference between silk-screened material and applied material of the same color on the same sign.

Form letters, numerals, and other units to provide a continuous stroke width with smooth edges. Make the surface flat and free of warp, blisters, wrinkles, burrs, and splinters. Ensure that units of the sign message conform to the following:

(a) Type L–1 (Screen Process). Apply letters, numerals, arrows, symbols, and borders on the retroreflective sheeting or opaque background of the sign by direct or reverse screen process. Apply messages and borders that are of a darker color than the background to the paint or the retroreflective sheeting by direct process. Produce messages and borders that are of a lighter color than sign background by the reverse screen process.

Use opaque or transparent colors, inks, and paints in the screen process of the type and quality recommended by the retroreflective sheeting manufacturer.

Perform the screening in a manner that results in a uniform color and tone, with sharply defined edges of legends and borders and without blemishes on the sign background that will affect intended use.

Air dry or bake the signs after screening in accordance with manufacturer's recommendations to provide a smooth, hard finish. Any signs with blisters or other blemishes will be rejected.

(b) Type L–3 (Direct-Applied Characters). Cut letters, numerals, symbols, borders, and other features of the sign message from the type and color of the retroreflective sheeting specified and apply them to the sign background's retroreflective sheeting in accordance with the retroreflective sheeting manufacturer's instructions. Ensure that the retroreflective sheeting has a minimum coefficient of retroreflection (R_A) in accordance with ASTM D 4956.

718.15 Delineator & Object Marker Retroreflectors

Retroreflector units for delineators and object markers are either type 1 (acrylic plastic lens) or type 2 (retroreflective sheeting). Furnish the units ready for mounting.

(a) Type 1 (Acrylic Plastic Lens). The retroreflector unit has an acrylic plastic lens with a minimum area of 4,500 mm^2, prismatic optical elements, and a smooth, clear, transparent face. Fabricate the back from similar material and fuse it to the lens around the entire perimeter to form a homogenous unit. Retroreflection is provided by the lens prismatic optical elements. Permanently seal the units against the intrusion of dust, water, and air.

Ensure that the coefficient of (retroreflective) luminous intensity of each retroreflector unit equals or exceeds the minimum values shown in table 718-1, regardless of the orientation angle.

Mount the retroreflector unit in a housing fabricated from 1.6-mm aluminum alloy 3003–H–14 or similar material, or from cold-rolled, hot dip galvanized steel with a thickness of 1.6 mm. Provide antitheft attachment hardware.

Table 718-1.—Minimum coefficient of (retroreflective) luminous intensity (R_i) (cd/lx).

Observation Angle (°)	Entrance Angle (°)	White [a]	Yellow	Red
0.1	0	10.7	6.5	2.8
0.1	20	4.2	2.3	1.1

a. Crystal, clear, or colorless are acceptable color designations.

(b) Type 2 (Retroreflective Sheeting). The retroreflector unit is composed of a fungus-resistant type III, type IV, or type V retroreflective sheeting material with a class 1 or class 2 adhesive backing conforming to AASHTO M 268.

Attach type 2 retroreflective units to an aluminum or plastic support panel (target plate) of the size and dimension specified. Type 1 units require a sealed optical system complete with housing and assembly hardware and do not require attachment to a support panel unless otherwise specified.

Furnish post-mounting antitheft hardware consisting of bolts, nuts, washers, fastening plates, brackets, and so forth, as required.

718.16 Conventional Traffic Paint

Furnish an alkyd resin ready-mixed paint for use on asphalt and Portland cement concrete pavements conforming to FSS TT–P–115F.

718.17 Waterborne Traffic Paint

Furnish an acrylic water-based ready-mixed paint for use on asphalt and Portland cement concrete pavements conforming to the following:

(a) Composition. Furnish a paint composed of resin solids of 100 percent acrylic polymer with the exact formulation determined by the manufacturer. Conform to the following:

(1) Pigment, by mass, ASTM D 3723 ..... 45 to 55%

(2) Nonvolatile vehicle, by mass, FTMS 141, method 6121 .... 40% min.

(3) Lead, chromium, cadmium, or barium 0%

(4) Volatile organic matter ..... 250 g/L max.

(5) Mass of paint, ASTM D 1475..... 1.44 kg/L min.

(b) Viscosity. Conform to ASTM D 562, 75 to 95 Krebs units.

(c) Drying Time. Conform to the following:

(1) Paint shall dry to a no-pickup condition, according to ASTM D 711, in a maximum of 10 minutes.

(2) Paint having 0.7 kg/L type 1 waterproofed glass beads shall dry to a no-tracking condition under traffic in a maximum of 90 seconds when applied at 0.38 mm ± 0.03 mm wet film thickness at 54 °C, or in a maximum of 10 minutes when applied at ambient temperatures.

(d) Flexibility. Conform to FSS TT–P–1952B. No cracking or flaking.

(e) Dry Opacity. Conform to FTMS 141, contrast ratio at 0.25 mm, 0.96 minimum.

(f) Color. Conform to the following:

(1) White ..... FHWA standard highway white

(2) Yellow ..... FHWA standard highway yellow

(g) Daylight Reflectance. Conform to the following, without glass beads:

(1) White, FTMS 141, method 6121 ..... 84% relative to magnesium oxide standard

(2) Yellow, FTMS 141, method 6121 ..... 55% relative to magnesium oxide standard

(h) Bleeding Ratio. Conform to FSS TT–P–1952B, 0.96 minimum.

(i) Scrub Resistance. Conform to ASTM D 2486, 300 cycles minimum.

(j) Freeze-Thaw Stability. Conform to FSS TT–P–1952B:

(1) Change in consistency ..... ± 5 Krebs units max.

(2) Decrease in scrub resistance ..... –10% max.

(k) Storage Stability. During a 12-month storage period, conform to the following:

(1) No excessive setting, caking, or increase in viscosity.

(2) Readily stirred to a consistency for use in the striping equipment.

718.18 Epoxy Markings

Formulate a two-component, 100-percent-solids type system for hot-spray application conforming to the following:

(a) Pigments. Furnish component A (percent by weight) as follows:

(1) White:

(a) Titanium dioxide (TiO_2), ASTM D 476, type II 16.5% min. at 100% purity) ..... 18% min.

(b) Epoxy resin ..... 75 to 82%

(2) Yellow:

(a) Chrome yellow ($PbCrO_4$), ASTM D 211, type III (20% min. at 100% purity) ..... 23% min.

(b) Epoxy resin ..... 70 to 77%

(b) Epoxy Content. For component A (weight per epoxy equivalent), ASTM D 1652, meet manufacturer's TV ± 50.

(c) Amine Value. For component B, ASTM D 2074, meet manufacturer's TV ± 50.

(d) Toxicity. Do not permit toxic or injurious fumes at application temperature.

(e) Color. Furnish 0.38-mm thickness (cured), as follows:

(1) White ..... FHWA standard highway white

(2) Yellow ..... FHWA standard highway yellow

(f) Directional Reflectance. Furnish directional reflectance without glass beads as follows:

(1) White, FSS 141, method 6121 ..... 84% relative to magnesium oxide standard

(2) Yellow, FSS 141, method 6121 ..... 55% relative to magnesium oxide standard

(g) Drying Time. Furnish 0.38-mm film thickness with beads as follows:

(1) Laboratory at 22 °C, ASTM D 711 ..... 30 min max. to no-pickup condition

(2) Field at 25 °C, viewed from 15 m ..... 10 min max. to no-tracking condition

(h) Abrasion Resistance. Ensure that wear index with a CS–17 wheel under a 1,000-g load for 1,000 cycles, ASTM C 501, is a maximum of 82.

(i) Hardness. Ensure that shore D hardness with 72- to 96-hour cure at 22 °C, ASTM D 2240, is 75 to 100.

(j) Storage. When stored for up to 12 months, individual epoxy components do not require mixing before use.

718.19 Polyester Markings

Formulate a two-component system conforming to the following:

(a) Directional reflectance (without glass beads):

(1) White, FSS 141, method 6121 ..... 80% relative to magnesium oxide standard

(2) Yellow, FSS 141, method 6121 ..... 55% relative to magnesium oxide standard

(b) Color:

(1) White ..... FHWA standard highway white

(2) Yellow ..... FHWA standard highway yellow

(c) Viscosity, uncatalyzed polyester at – 4 °C, ASTM D 562 ..... 70 to 90 Krebs

(d) Bleeding, ASTM D 969 ..... 6 min.

(e) Drying time in field, viewed from 15 m ..... 45 min max. to no-tracking condition

718.20 Thermoplastic Markings

Conform to AASHTO M 249.

718.21 Preformed Plastic Markings

Furnish thermoplastic material consisting of a mixture of polymeric material, pigments, and glass beads homogeneously distributed throughout. Embed additional glass beads into the retroreflective surface. Provide a precoated adhesive system or liquid contact cement to make the marking material capable of being attached to asphalt and Portland cement pavements.

Ensure that the marking material molds itself to pavement contours by the action of traffic at normal pavement temperatures. Furnish marking material that can be used for patching worn areas of previously applied markings of similar composition under normal conditions of use.

Furnish material that conforms to ASTM D 4505, type I, V, VI, or VII, grade A, B, C, D, or E.

Ensure that the minimum thickness without adhesive is 1.5 mm. Ensure that a matrix with a raised pattern cross-sectional area has a minimum thickness of 0.5 mm between pattern configurations.

718.22 Glass Beads

Furnish glass beads for dropping or spraying on pavement markings that conform to AASHTO M 247 for the type specified. Treat glass beads with an adherence coating, as recommended by manufacturer.

AASHTO M 247, table 1, Gradation of Glass Beads, is supplemented by the gradations of glass beads shown in table 718-2.

Ensure that type 3, 4, and 5 glass beads also conform to the following:

(a) Treat beads with a reactive adherence coating, as recommended by the manufacturer.

(b) Ensure that roundness, FLH T 520, conforms to 70 percent minimum for each sieve size.

(c) Ensure that the refractive index, AASHTO M 247, is from 1.50 to 1.55.

Table 718-2.—Gradation of glass beads.

Sieve Size	Percent by Weight Passing Designated Sieve (ASTM D 1214) Grading Designation Type 3	Type 4	Type 5
2.36 mm	–	–	100
2.0 mm	–	100	95–100
1.7 mm	100	95–100	80–95
1.4 mm	95–100	80–95	10–40
1.18 mm	80–95	10–40	0–5
1.0 mm	10–40	0–5	0–2
850 µm	0–5	0–2	–
710 µm	0–2	–	–

718.23 Raised Pavement Markers

Furnish prismatic retroreflector-type markers consisting of a methyl methacrylate, polycarbonate, or suitably compounded ABS shell fitted with retroreflective lenses. Make the exterior surface of the shell smooth.

Use a retroreflector with a minimum coefficient of (retroreflected) luminous intensity conforming to table 718-3.

Table 718-3.—Minimum coefficient of (retroreflected) luminous intensity (R_I) (mcd/lx).

Observation Angle (°)	Entrance Angle (°)	White [a]	Yellow	Red
0.2	0	279	167	70
0.2	20	112	67	28

a. Crystal, clear, or colorless are acceptable color designations.

Make the base of the marker flat, patterned, or textured and free from gloss or substances that may reduce its bond to the adhesive. Do not permit deviation from a flat surface to exceed 1 mm.

718.24 Temporary Pavement Markings

(a) Preformed Retroreflective Tape. Furnish 100-mm-wide tape conforming to ASTM D 4592, type I (removable).

(b) Raised Pavement Markers. Furnish an L-shaped polyurethane marker body with retroreflective tape on both faces of the vertical section, capable of retroreflecting light from opposite directions, and with an adhesive on the base.

Provide a minimum coefficient of retroreflection of 1,200 cd/lx/m^2 at 0.1° observation angle and – 4° entrance angle.

Fabricate the marker body from polyurethane with a 1.5-mm minimum thickness. Fabricate the vertical leg about 50 mm high by about 100 mm wide. Fabricate the base for the marker body about 30 mm wide.

Factory apply a 3-mm minimum thickness and 19-mm-wide pressure-sensitive adhesive to the marker base and protect it with release paper.

If approved, variations in design and dimensions will be permitted in order to meet manufacturer's standards.

718.25 Temporary Traffic Control Devices

Furnish traffic control devices (barricades, cones, tubular markers, vertical panels, drums, portable barriers, warning lights, advance warning arrow panels, traffic control signals, and so forth) whose designs and configurations conform to the MUTCD.

Use suitable commercial-grade material for the fabrication of the temporary traffic control devices. Construct the devices from material that is capable of withstanding anticipated weather and traffic conditions and is suitable for the intended use. Do not use units that have been used on other projects without approval.

When interpreting the requirements in the applicable MUTCD sections, replace the word "should" with the word "shall."

718.26 Epoxy Resin Adhesives

Furnish epoxy resin adhesives for bonding traffic markers to hardened Portland cement and asphalt concrete that conform to AASHTO M 237.

Section 720—Structural Wall & Stabilized Embankment Material

720.01 Mechanically Stabilized Earth Wall Material

(a) Concrete Face Panels. Fabricate the panels in accordance with Section 552, except for the following:

(1) Furnish Portland cement concrete that conforms to class A(AE) and has a minimum 30 MPa 28-day compressive strength.

(2) In addition to meeting the requirements specified in Subsection 562.11 for removal of forms and falsework, fully support the units until the concrete reaches a minimum compressive strength of 7 MPa. The units may be shipped and/or installed after the concrete reaches a minimum compressive strength of 24 MPa.

(3) Finish the front face of the concrete panel surface with a class 1 finish, in accordance with Subsection 552.18. Give the rear face a uniform surface finish. Screed the rear face of the panel to eliminate open pockets of aggregate and surface distortions in excess of 6 mm. Cast the panels on a flat area. Do not attach galvanized connecting devices or fasteners to the face panel reinforcement steel.

(4) Clearly scribe on an unexposed face of each panel the date of manufacture, production lot number, and piece mark.

(5) Handle, store, and ship all units in a way that eliminates any danger of chipping, discoloration, cracks, fractures, and excessive bending stresses. Support panels in storage on firm blocking to protect the panel connection devices and the exposed exterior finish.

(6) Manufacture all units within the following tolerances:

(a) For panel dimensions, ensure that the position of panel connection devices is within 25 mm, and that all other dimensions are within 5 mm.

(b) For panel squareness, as determined by the difference between the two diagonals, do not exceed 13 mm.

(c) For panel surface finish, do not permit surface defects on smooth formed surfaces 1.5 m or more in length to exceed 3 mm. Do not permit surface

defects on textured-finished surfaces 1.5 m or more in length to exceed 8 mm.

Concrete face panels with any or all of the following defects will be rejected:

- Defects that indicate imperfect molding.
- Defects that indicate honeycombed or open texture concrete.
- Cracked or severely chipped panels.
- Color variation on front face of panel due to excess form oil or for other reasons.

(b) Wire Facing. Fabricate wire facing from MW40 ∞ MW15 welded wire fabric conforming to AASHTO M 55M, but ensure that the average shear value is not be less than 450 kPa. After fabrication, galvanize the wire mesh in accordance with AASHTO M 111.

(c) Backing Mat. Fabricate backing mat from MW10 ∞ MW10 (minimum) welded wire fabric conforming to AASHTO M 55M. After fabrication, galvanize the backing mat in accordance with AASHTO M 111.

(d) Clevis Connector. Fabricate clevis connectors from cold-drawn steel wire conforming to AASHTO M 32 and welded in accordance with AASHTO M 55M. After fabrication, galvanize clevis connectors in accordance with AASHTO M 111.

(e) Connector Bars. Fabricate the connector bars from cold-drawn steel wire conforming to AASHTO M 32. Galvanize the bars in accordance with AASHTO M 111.

(f) Fasteners. Furnish 13-mm-diameter heavy hexhead bolts, nuts, and washers conforming to AASHTO M 164M. Galvanize the fasteners in accordance with AASHTO M 232.

(g) Hardware Cloth. Fabricate hardware cloth with maximum 7-mm square mesh openings from woven steel wire fabric conforming to ASTM A 740. After fabrication, galvanize the cloth in accordance with AASHTO M 111.

(h) Reinforcing Mesh. Fabricate the reinforcing mesh from cold-drawn steel wire conforming to AASHTO M 32. Weld the mesh into the finished mesh fabric in accordance with AASHTO M 55M. After fabrication, galvanize the reinforcing mesh in accordance with AASHTO M 111. Repair any damage to the galvanized coating before installation.

(i) Reinforcing Strips. Fabricate reinforcing strips from HSLA structural steel conforming to AASHTO M 223M, grade 65 (450), type 3. After fabrication, galvanize in accordance with AASHTO M 111.

(j) Tie Strip. Fabricate tie strips from hot rolled steel conforming to ASTM A 570, grade 50. Galvanize in accordance with AASHTO M 111.

720.02 Gabion Material

(a) Basket Mesh. Twist or weld the mesh from galvanized steel wire, class 3, soft temper, conforming to ASTM A 641M class 3, or from aluminized steel wire, soft temper, conforming to ASTM A 809. Use wire with a minimum tensile strength of 415 MPa when tested in accordance with ASTM A 370. The zinc or aluminum coating shall be applied after the mesh fabrication has been welded.

Fabricate baskets from either twisted wire mesh or welded wire mesh. Make the mesh openings with a maximum dimension of less than 120 mm and an area of less than 7,000 mm^2. Furnish baskets in the dimensions required with a dimension tolerance of ± 5 percent.

Where the length of the basket exceeds one and one-half times its width, equally divide the basket into cells less than or equal to the basket width using diaphragms of the same type and size mesh as the basket panels. Prefabricate each basket with the necessary panels and diaphragms secured so they rotate into place.

(1) Gabion Baskets 0.3 m or Greater in the Vertical Dimension. Fabricate the mesh for galvanized or aluminized coated gabions from wire with a diameter of 3.0 mm or greater in nominal size, and fabricate the mesh for epoxy or PVC-coated gabions from wire with a diameter of 2.7 mm or greater in nominal size.

(a) Twisted Wire Mesh. Form the mesh in a uniform hexagonal pattern with nonraveling double twists. Tie the perimeter edges of the mesh for each panel to a selvedge wire with a diameter of 3.9 mm or greater, or a selvedge wire with a diameter of 3.4 mm or greater for epoxy- or PVC-coated gabions, so that the selvedge is at least the same strength as the body of the mesh. Furnish selvedge wire from the same kind and type of material used for the wire mesh.

(b) Welded Wire Mesh. For mesh from wire with a diameter of 3.0 mm or greater in nominal size, weld each connection to obtain a minimum average weld shear strength of 2,600 N, with no value less than 2,000 N. For mesh for epoxy or PVC-coated gabions from wire with a diameter of 2.7 mm in nominal size, weld each connection to obtain a minimum average weld shear strength of 2,100 N, with no value less than 1,600 N.

(2) Gabion Mattresses. Fabricate the mesh from wire with a diameter of 2.2 mm or greater in nominal size.

(a) Twisted Wire Mesh. Form the mesh in a uniform hexagonal pattern with nonraveling double twists. Tie the perimeter edges of the mesh for each panel to a selvedge wire with a diameter of 2.7 mm or greater so that the selvedge is at least the same strength as the body of the mesh. Furnish selvedge wire from the same kind and type of material used for the wire mesh.

(b) Welded Wire Mesh. Weld each connection to obtain a minimum average weld shear strength of 1,300 N, with no value less than 1,000 N.

(3) PVC-Coated Gabions. Use either the fusion bonding or extrusion coating process to coat the galvanized or aluminized mesh.

Make the coating at least 0.38 mm in thickness. For PVC coating, make the color black or gray and conform to the following:

(a)	Specific gravity, ASTM D 792	1.20 to 1.40
(b)	Tensile strength, ASTM D 638	15.7 MPa min.
(c)	Modulus of elasticity, ASTM D 638	13.7 MPa min. at 100% strain
(d)	Hardness—shore “A,” ASTM D 2240	75 min.
(e)	Brittleness temperature, ASTM D 746	– 9 °C max.
(f)	Abrasion resistance, ASTM D 1242, method B, at 200 cycles, CSI–A abrader tape, 80 grit	12% max. weight loss
(g)	Salt spray (ASTM B 117) and ultraviolet light exposure (ASTM D 1499 and G 23 using apparatus type E and 63 °C for 3,000 h)	No visual effect *(1)* $\Delta < 6\%$ *(2)* $\Delta < 25\%$ *(3)* $\Delta < 25\%$ *(6)* $\Delta < 10\%$
(h)	Mandrel bend, 360° bend at –18 °C around a mandrel 10 times the wire diameter	No breaks or cracks in coating

(b) Fasteners. For lacing wire, use wire with a diameter of 2.2 mm in nominal size and that is of the same type, strength, and coating as the basket mesh.

For welded wire mesh panels, form the spiral binders with wire that has at least the same thickness, strength, and coating as the basket mesh.

Furnish alternate fasteners that are acceptable to the gabion manufacturer and that remain closed when subjected to a 2,600-N tensile force when confining the maximum number of wires to be confined. Submit installation procedures and fastener test results.

(c) Internal Connecting Wire. Use lacing wire as described in Subsection 720.02(b) to reinforce side panels. Alternate stiffeners that are acceptable to the gabion manufacturer may also be used.

720.03 Metal Bin Type Crib Walls

Fabricate members of the type and kind of material SHOWN ON THE DRAWINGS. Conform to the following:

(a) Galvanized steel sheets ..... AASHTO M 218

(b) Aluminum sheets ..... AASHTO M 197M

(c) Fiber-bonded steel sheets 707.09

(d) Aluminum-coated steel sheets ..... AASHTO M 274

(e) Bolts and nuts ..... ASTM A 307, grade A

Furnish heavy hexagon heads and nuts without washers, or hexagon heads and nuts with two plate washers. Fabricate washers from 3.3-mm-thick round steel plate, including coating with holes not more than 1.6 mm larger than the bolt diameter. Galvanize the bolts, nuts, and washers in accordance with AASHTO M 232.

Section 722—Anchor Material

722.01 Ground Anchors

Furnish material for ground anchors in accordance with the specifications shown below.

(a) Tendons. Furnish ground anchor tendons for either single or multiple elements that conform to one of the following:

(1) Steel strand uncoated seven-wire stress relieved for prestressed concrete ..... AASHTO M 203M

(2) Uncoated high-strength steel bar for prestressed concrete ..... AASHTO M 275M

(3) Steel strand uncoated seven-wire compacted stress relieved[1] for prestressing concrete ..... ASTM A 779M

[1] Ensure that elements also conform to the minimum requirements of AASHTO M 203M.

(b) Couplers. Furnish couplers for tendon sections that are capable of developing 95 percent of the minimum specified ultimate tensile strength of the tendon.

(c) Sheathing. Furnish sheathing of the tendon in accordance with one of the following:

(1) Unbonded Length. For unbonded length, meet the following requirements:

(a) Polyethylene Tube. Furnish polyethylene of type II, III, or IV, as defined by ASTM D 1248. Furnish tubing with a minimum wall thickness of 1.5 mm.

(b) Hot-Melt Extruded Polypropylene Tube. Furnish polypropylene with cell classification PP 210 B5554211, as defined by ASTM D 4101. Furnish tubing with a minimum wall thickness of 1.5 mm.

(c) Hot-Melt Extruded Polyethylene Tube. Furnish polyethylene of high-density type III, as defined by ASTM D 3350 and D 1248. Furnish tubing with a minimum wall thickness of 1.5 mm.

(d) Steel Tubing. Furnish tubing that conforms to ASTM A 500 and has a minimum wall thickness of 5 mm.

(e) Steel Pipe. Furnish pipe that conforms to ASTM A 53, schedule 40, minimum.

(f) Plastic Pipe. Furnish pipe that conforms to ASTM D 1785, schedule 40, minimum.

(2) Bonded Length. For bonded length, meet the following requirements:

(a) High-Density Corrugated Polyethylene Tubing. Furnish tubing that conforms to AASHTO M 252 and has a minimum wall thickness of 0.75 mm.

(b) Corrugated PVC Tubes. Furnish PVC compounds that conform to ASTM D 1784, class 13464–B.

(c) Fusion-Bonded Epoxy. Furnish epoxy that conforms to AASHTO M 284M and has a minimum film thickness of 0.4 mm.

(d) Grease. Furnish grease that is compounded to provide corrosion-inhibiting and lubricating properties, and that conforms to the PTI "Post Tensioning Manual," table 3.2.1.

(e) Grout. Furnish grout that consists of a pumpable mixture of Portland cement, sand, water, and admixtures mixed in accordance with Subsection 701.03. Use type I, II, or III Portland cement in accordance with Subsection 701.01.

Chemical additives that can control bleed or retard set may be used, provided that the additives conform to Subsection 711.03 and are mixed in accordance with the manufacturer's recommendations.

Furnish grout that is capable of reaching a cube strength (AASHTO T 106) of 25 MPa in 7 days. Make grout cubes for testing from random batches of grout, as directed. Normally, strength testing will not be required, because system performance will be measured by proof-testing each anchor. Grout cube testing will be required if admixtures are used or irregularities occur in anchor testing.

(f) Centralizers. Centralizers and spacers may be fabricated from any type of material except wood that is not deleterious to the prestressing steel.

(g) Anchorage Devices. Furnish anchorage devices that conform to the PTI's "Post Tensioning Manual," section 3.2.3. Furnish anchorage devices for strand tendons that are designed to permit lift-off testing without the jack engaging the strand. Furnish bearing plate for anchorage devices that is steel plate conforming to AASHTO M 183M or M 222M.

Ensure that a pipe or trumpet extends from the anchor plate far enough to encapsulate the protective sheath. Furnish anchorage devices that are capable of developing 95 percent of the minimum specified ultimate tensile strength of the anchor tendon.

Section 723—Dust Palliative Materials

723.01 Magnesium or Calcium Chloride Brine

Furnish chloride brines consisting of water and magnesium and/or calcium chloride with the following chemical composition (percent by weight brine):

(a) Chloride concentration (sum of magnesium and calcium chloride):[1]

(1) Magnesium chloride products ..... 28% min.
Calcium chloride products ..... 36% min.

(2) Sulfate ..... 4.3% max.

(3) Nitrate ..... 5.0% max.

[1] Use test method R1–412/C1 (available on request from USDA Forest Service, Regional Materials Engineering Center, P.O. Box 7669, Missoula, Montana 59807).

Ensure that the pH is between 4.5 and 10.0, and that the temperature of the material is 5 °C or above when applied. Provide certification and sampling in accordance with Subsection 723.04.

723.02 Calcium Chloride Flake

Furnish calcium chloride flake in accordance with the following:

(a) Chemical composition (percent by weight):

(1) Calcium chloride ($CaCl_2$)[1] ..... 77% min.

(2) Total alkali chlorides (as NaCl) ASTM E 449 ..... 3% max.

(3) Calcium hydroxide ($Ca(OH)_2$) ASTM E 449 ..... 0.3% max.

[1] Use test method R1–412/C1 (available on request from USDA Forest Service, Regional Materials Engineering Center, P.O. Box 7669, Missoula, Montana 59807).

(b) Particle size (percent passing screen) by AASHTO T 27:

(1) 9.5-mm screen 100%

(2) 4.75-mm screen ..... 80 to 100%

(3) 600-µm screen..... 0 to 5%

(c) Certification and sampling 723.04

723.03 Lignin Sulfonate

Furnish lignin sulfonate from the residue produced by the acid-sulfite pulping of wood. Ensure that its base cation is ammonium, calcium, or sodium, and supply it as a uniform mixture that is miscible with an equal weight of water and meets the following requirements:

(a) Undiluted lignin sulfonate:

(1) pH, AASHTO T 200 ..... 4.5 min.

(2) Viscosity at 25 °C, AASHTO T 202 ..... 20.5 poise max.

(3) Total lignin solids concentration[1] ..... 48% min.

(b) Solids:

(1) Lignin sulfonate ..... 50% min.

(2) Reducing sugars ..... 25% max.

(c) Temperature during application ..... 5 °C to 60 °C

(d) Certification and sampling 723.04

[1] Use test method R1–412/LS for total lignin solids concentration (available on request from USDA Forest Service, Regional Materials Engineering Center, P.O. Box 7669, Missoula, Montana 59807).

723.04 Certification & Sampling

(a) Certification With Shipments. When each load of dust palliative is delivered, furnish the CO with one copy of the Bill of Lading and a fully executed Certificate of Compliance containing the applicable information shown in figure 723-1. A separate Certificate of Compliance will not be required if the standard Bill of Lading contains the applicable information required on the certificate.

(b) Sampling. Sampling of dust palliative prior to any mixing with water may be required to validate certifications furnished by the Contractor. When sampling is directed by the Government, obtain the actual samples, and give the CO the opportunity to witness sampling. Construct all liquid delivery equipment to permit sampling in conformance with AASHTO T 40 sampling procedure.

CERTIFICATE OF COMPLIANCE

Consignee _____

Transportation ID (Truck No., etc.) _____

Product Concentration by Weight _____

Destination _____

Date _____

Magnesium Chloride: _____ %

Calcium Chloride: _____ %

Lignin Sulfonate: _____ %

Net Weight Total Shipment _____

Net Liters at 15 °C _____

Product Specific Gravity at 15 °C _____

This shipment of _____ identified above and covered by this Certificate of Compliance complies with Forest Service Specifications applicable to Contract # _____ .

MSDS Identification Code: _____

Producer: _____

Signed By: _____

(Producer's Representative)

Figure 723-1.—Sample Certificate of Compliance.

Section 725—Miscellaneous Material

725.01 Water

Do not use water from streams, lakes, ponds, or similar sources without prior approval. Use water that conforms to the specifications shown below.

(a) Water for Mixing or Curing Cement Concrete, Mortar, or Grout. Furnish water that conforms to AASHTO M 157. Potable water of known quality may be used without testing in accordance with AASHTO T 26. Potable water is defined as water that is safe for human consumption, as described by the public health authority with jurisdiction.

(b) Water for Planting or Care of Vegetation. Furnish water that is free of substances injurious to plant life, such as oils, acids, alkalies, and salts.

(c) Water for Earthwork, Pavement Courses, Dust Control, & Incidental Construction. Furnish water that is free of substances detrimental to the work.

725.02 Calcium Chloride & Sodium Chloride

(a) Calcium Chloride for Concrete. Furnish material that conforms to ASTM D 98, type L, for the concentration specified.

(b) Sodium Chloride. Furnish material that conforms to ASTM D 632, type II, grade 1.

725.03 Hydrated Lime

(a) Lime for Masonry. Furnish hydrated lime that conforms to ASTM C 207, type N.

(b) Lime for Soil Stabilization & Paving. Furnish hydrated lime or quicklime that conforms to AASHTO M 216.

725.04 Fly Ash

Furnish fly ash and raw or calcined pozzolans that conform to AASHTO M 295.

725.05 Mineral Filler

Furnish mineral filler that conforms to AASHTO M 17.

725.06 Precast Concrete Curbing

Furnish units conforming to the lengths, shapes, and details SHOWN ON THE DRAWINGS, and to the following:

(a) Concrete 602

(b) Reinforcing steel 709.01

725.07 Clay or Shale Brick

Furnish clay or shale brick that conforms to one of the following:

(a) Sewer brick ..... ASTM C 32, grade SM

(b) Building brick ..... ASTM C 62, grade SW

725.08 Concrete Brick

Furnish concrete brick that conforms to ASTM C 55, grade N–I.

725.09 Concrete Masonry Blocks

Furnish rectangular or segmented concrete masonry blocks. When required, form the block ends to provide an interlock at vertical joints. Furnish blocks that conform to the following:

(a) Solid load-bearing blocks ..... ASTM C 90

(b) Hollow load-bearing blocks ..... ASTM C 90

(c) Nonload-bearing blocks ..... ASTM C 129

725.10 Cellular Concrete Blocks

Furnish cellular concrete blocks that conform to ASTM C 90, normal weight; but use concrete that conforms to Section 602.

725.11 Precast Concrete Units

Cast the units in substantial permanent steel forms. Provide additional reinforcement as necessary to provide for handling the units. Use concrete that conforms to the following:

(a) 28-day strength, AASHTO T 22 ..... 25 MPa min.

(b) Air content by volume, AASHTO T 152 ..... 5% min.

Cure the units in accordance with AASHTO M 170M.

Cast a sufficient number of concrete cylinders from each unit to permit compression tests at 7, 14, and 28 days. Make at least three cylinders for each test. If the strength requirement is met at 7 or 14 days, the units will be certified for use 14 days from date of casting.

Do not use precast concrete units when:

- Representative cylinders do not meet the strength requirement by 28 days.
- Air content tests do not meet 5 percent minimum.
- Cracks or honeycombed or patched areas are larger than 0.02 m^2.

Furnish precast reinforced concrete manhole risers and tops conforming to AASHTO M 199M.

725.12 Frames, Grates, Covers, & Ladder Rungs

Fabricate metal grates and covers to evenly bear on the frames. Correct bearing inaccuracies by machining. Assemble all units before shipment. Mark all pieces to facilitate reassembly at the installation site. Uniformly coat all castings with asphalt varnish or a commercial preservative in accordance with the manufacture's standard practice. Conform to the following:

(a) Gray iron castings ..... AASHTO M 105

(b) Carbon steel castings ..... AASHTO M 103M

(c) Structural steel ..... AASHTO M 183M

(d) Galvanizing ..... AASHTO M 111

(e) Malleable iron castings ..... ASTM A 47M

(f) Aluminum alloy ladder rung material ..... ASTM B 221M, alloy 6061–T6

(g) Aluminum castings ..... ASTM B 26M, alloy 356.0–T6

(h) Asphalt varnish ..... FSS TT–V–51

725.13 Corrugated Metal Units

Furnish material that conforms to one of the following:

(a) Steel corrugated units ..... AASHTO M 36M

(b) Aluminum corrugated units ..... AASHTO M 196M

(c) Bituminous-coated corrugated units ..... AASHTO M 190, type A

(d) Polymer-precoated corrugated units ..... AASHTO M 245M, grade 250/250

(e) Fiber-bonded units 707.09

725.14 Protective Coatings for Concrete

Furnish protective coatings for bridge decks, curbs, sidewalks, and concrete portions of bridge railings. Provide one of the following coatings:

(a) Boiled Linseed Oil. Furnish boiled linseed oil in accordance with ASTM D 260, type I or II.

(b) Petroleum Spirits (Mineral Spirits). Furnish petroleum spirits (mineral spirits) in accordance with ASTM D 235.

725.15 PVC Pipe for Water Distribution Systems

Furnish material that conforms to the following for the designated sizes and strength schedules:

(a) PVC pipe ..... ASTM D 1785

(b) Solvent cement for pipe and fittings ..... ASTM D 2564

725.16 Polyethylene Pipe for Water Distribution Systems

Furnish material that conforms to ASTM D 2447 for the designated sizes and strength schedules.

725.17 Cast Iron Soil Pipe & Fittings

Furnish material that conforms to ASTM A 74, class SV, for the designated sizes.

725.18 Seamless Copper Water Tube & Fittings

Furnish material that conforms to ASTM B 88M, type L, for the designated sizes.

725.19 Plastic Lining

Furnish a film with a thickness of 175 ± 25 µm that conforms to one of the following:

(a) PVC plastic film ..... ASTM D 1593, type II

(b) Polyethylene plastic film ..... ASTM D 2103, type 02000

725.20 Bentonite

Furnish bentonite as sodium montmorillonite (sodium bentonite) in the form of a powder that meets the following requirements:

(a) Ensure that colloid content by AASHTO T88 or ASTM D422 is 60 percent minimum.

(b) Ensure that a sieve analysis in accordance with AASHTO T27 on a dry, unwashed, unpulverized sample yields the following:

(1) A minimum of 95 percent passing the 4.75-mm sieve.

(2) A minimum of 15 percent passing the 75-µm sieve.

725.21 Epoxy Resin Adhesives

Ensure that epoxy resin adhesives conform to AASHTO M 235.

725.22 Spray Finish

Furnish a commercial product that is specifically designed for color spraying concrete, and that consists of a pliolite resin base, fiberglass, perlite, mica additives, and durable tinting pigments capable of making a light gray color similar to the color of concrete containing 230 g of carbon black per bag of cement.

725.23 Color Coating

Furnish a semiopaque colored toner containing methyl methacrylateethyl acrylate copolymer resins or equivalent resins, solvents, and color toning pigments suspended in solution by a chemical suspension agent. Ensure that the color toning pigments consist of laminar silicates, titanium dioxide, and inorganic oxides. Furnish material that conforms to the following:

(a)	Mass per liter, ASTM D 1475	1 kg min.
(b)	Solids by weight, ASTM D 2369	30% min.
(c)	Solids by volume	21% min.
(d)	Drying time, ASTM D 1640	30 min at 21 °C and 50% max. humidity
(e)	Color change, ASTM D 822, 1,000 h	No appreciable change
(f)	Resistance to acids, alkalies, gasoline, and mineral spirits, ASTM D 543	Excellent
(g)	Water vapor transmission from interior concrete, ASTM D 1653	Transmittable
(h)	Exterior moisture absorption into the concrete surface pores, FSS TT–C–555	Reduces rate
(i)	Oxidation over time	None

725.24 Explosives & Blasting Accessories

For the transportation, handling, and storage of explosives, conform to 29 CFR, part 1926, subpart U.

Explosives and initiating devices include, but are not necessarily limited to, dynamite and other high explosives, slurries, water gels, emulsions, blasting agents, initiating explosives, detonators, and detonating cord.

725.25 Mineral Slurry (Driller's Mud)

Furnish commercially available sodium bentonite or attapulgite in a potable water. Use a mineral grain size that will remain in suspension with sufficient viscosity and gel characteristics so the mixture is capable of transporting excavated material to a suitable screening system.

725.26 Form Liner

Furnish a high-quality product that attaches easily to the forming system. Install the form liner so it does not compress more than 6 mm at a concrete pour rate of 3,650 kg/m^2.

725.27 Aluminum-Impregnated Caulking Compound

Conform to FSS TT–C–598, grade 1.

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Appendix A

ENGINEERING CONVERSION FACTORS*

Quantity	From Imperial Units	Multiply By	To Metric Units**
Mass	lb kip (1000 lb) ton (short)	0.453 592 0.453 592 0.907 184	kg metric ton (1000 kg) metric ton
Mass/unit length	plf	1.488 16	kg/m
Mass/unit area	psf lb/sy	4.882 43 0.542 492	kg/m^2 kg/m^2
Mass density	pcf	16.018 5	kg/m^3
Force	lb kip	4.448 22 4.448 22	N k N
Force/unit length	plf klf	14.593 9 14.593 9	N/m kN/m
Pressure, stress, modulus of elasticity	psf ksf psi ksi	47.880 3 47.880 3 6.894 76 6.894 76	Pa kPa kPa MPa
Bending moment, torque	ft-lb ft-kip	1.355 82 1.355 82	N • m kN • m
Volume/unit area	gal/sy	4.527 19	L/m^2

*Approximate conversions to SI units.

**To convert from metric units to imperial units, multiply by the reciprocal of the conversion factor.

Appendix B

SI* (MODERN METRIC) CONVERSION FACTORS

APPROXIMATE CONVERSIONS TO SI UNITS

Symbol	When You Know	Multiply By	To Find	Symbol
		LENGTH		
in	inches	25.4	millimeters	mm
ft	feet	0.305	meters	m
yd	yards	0.914	meters	m
mi	miles	1.61	kilometers	km
		AREA		
in^2	square inches	645.2	square millimeters	mm^2
ft^2	square feet	0.093	square meters	m^2
yd^2	square yards	0.836	square meters	m^2
ac	acres	0.405	hectares	ha
mi^2	square miles	2.59	square kilometers	km^2
		VOLUME		
fl oz	fluid ounces	29.57	milliliters	mL
gal	gallon	3.785	liters	L
ft^3	cubic feet	0.028	cubic meters	m^3
yd^3	cubic yards	0.765	cubic meters	m^3
NOTE: Volumes greater than 1000 L shall be shown in m^3.				
		MASS		
oz	ounces	28.35	grams	g
lb	pounds	0.454	kilograms	kg
T	short tons (2000 lb)	0.907	megagrams (or "metric ton")	Mg (or "t")
		TEMPERATURE (exact)		
°F	Fahrenheit temperature	5 (F – 32)/9 or (F – 32)/1.8	Celcius temperature	°C
		ILLUMINATON		
fc	foot-candles	10.76	lux	lx
fl	foot-Lamberts	3.426	candela/m^2	cd/m^2
		FORCE and PRESSURE or STRESS		
lbf	poundforce	4.45	newtons	N
lbf/in^2	poundforce per square inch	6.89	kilopascals	kPa

*SI is the symbol for the International System of Units. Appropriate rounding should be made to comply with section 4 of ASTM E 380.

Appendix B (cont.)

SI* (MODERN METRIC) CONVERSION FACTORS

APPROXIMATE CONVERSIONS FROM SI UNITS

Symbol	When You Know	Multiply By	To Find	Symbol
		LENGTH		
mm	millimeters	0.039	inches	in
m	meters	3.28	feet	ft
m	meters	1.09	yards	yd
km	kilometers	0.621	miles	mi
		AREA		
mm^2	square millimeters	0.0016	square inches	in^2
m^2	square meters	10.764	square feet	ft^2
m^2	square meters	1.195	square yards	yd^2
ha	hectares	2.47	acres	ac
km^2	square kilometers	0.386	square miles	mi^2
		VOLUME		
mL	milliliters	0.034	fluid ounces	fl oz
L	liters	0.264	gallon	gal
m^3	cubic meters	35.71	cubic feet	ft^3
m^3	cubic meters	1.307	cubic yards	yd^3
		MASS		
g	grams	0.035	ounces	oz
kg	kilograms	2.202	pounds	lb
Mg (or "t")	megagrams (or "metric ton")	1.103	short tons (2000 lb)	T
		TEMPERATURE (exact)		
°C	Celcius	1.8C + 32	Fahrenheit temperature	°F
		ILLUMINATON		
lx	lux	0.0929	foot-candles	fc
cd/m^2	$candela/m^2$	0.2919	foot-Lamberts	fl
		FORCE and PRESSURE or STRESS		
N	newtons	0.225	poundforce	lbf
kPa	kilopascals	0.145	poundforce per square inch	lbf/in^2

*SI is the symbol for the International System of Units. Appropriate rounding should be made to comply with section 4 of ASTM E 380.

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Engineering Management Series

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DIVISION 550 — Bridge Construction

DIVISION 600 — Incidental Construction

DIVISION 700 — Materials

052525

California Stormwater Quality Association

Stormwater Best Management Practice Handbook

Municipal

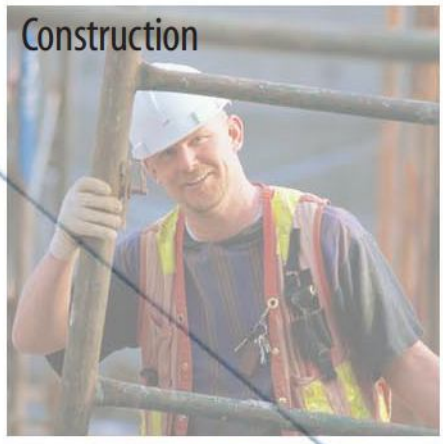

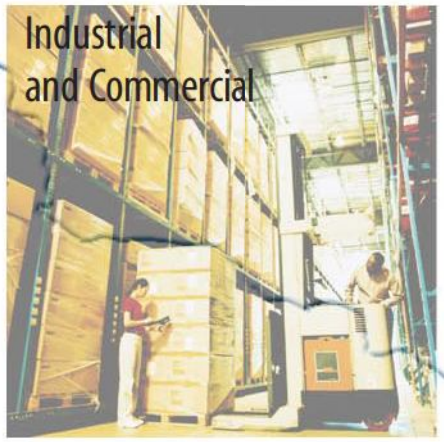

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CASQA is a nonprofit public benefit corporation and is not organized for private gain of any person. It is organized under the Nonprofit Public Benefit Corporation Law of California for charitable and educational purposes. The specific purpose of CASQA is to assist those entities charged with stormwater quality management responsibilities with the development and implementation of stormwater quality goals and programs. CASQA serves its members through various educational, technical, and scientific initiatives. The publication of the Stormwater Best Management Practice Handbooks is one of CASQA's educational and technical initiatives.

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Port of San Diego

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San Bernardino County Flood Control District

Vallejo Sanitation and Flood Control District

Ventura County Flood Control District

The development of the Stormwater Best Management Practice Handbooks was guided by a Steering Committee, a Technical Advisory Committee, and the CASQA BMP Workgroup. The Steering Committee provided CASQA's direction to the Consultant. The Steering Committee included representatives from Phase I communities, special districts, regulatory agencies, and consulting. The Technical Advisory Committee and BMP Workgroup reviewed draft work products and provided comments to the Steering Committee. The Technical Advisory Committee included representatives from Phase I communities, Phase II communities, regulatory agencies (water quality and health), academia, industry, transportation, and consulting. The quality of the handbooks is a result of the diverse expertise and experience of the committees and the workgroup.

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The California Stormwater Quality Handbooks are intended to provide a range of general information about stormwater quality best management practices (BMPs) and related issues. Due to the multitude of applications of BMPs, the Handbooks do not address site-specific applications. Therefore, users of the Handbooks must seek advice of a stormwater quality professional to determine the applicability of the information provided for any general use or site-specific application. Users of the Handbooks assume all liability directly or indirectly arising from use of the Handbooks.

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Section 1
Introduction

Stormwater runoff is part of a natural hydrologic process. Human activities particularly urbanization and agriculture, can alter natural drainage patterns and add pollutants to rivers, lakes, and streams as well as coastal bays, estuaries, and ultimately, the ocean. Numerous studies have shown urban runoff to be a significant source of water pollution, causing declines in fisheries, restricting swimming, and limiting our ability to enjoy many of the other benefits that water resources provide (USEPA, 1992). Urban runoff in this context includes all flows discharged from urban land uses into stormwater conveyance systems and receiving waters and includes both dry weather non-stormwater sources (e.g., runoff from landscape irrigation, water line and hydrant flushing) and wet weather stormwater runoff. In this handbook, urban runoff and stormwater runoff are used interchangeably.

For many years, the effort to control the discharge of stormwater focused mainly on the quantity (e.g. drainage, flood control) and, only to a limited extent, on the quality of the stormwater (e.g. sediment and erosion control). In recent years, however, awareness of the need to improve water quality has increased. With this awareness, federal, state, and local programs have been established to reduce pollutants contained in stormwater discharges to our waterways. The emphasis of these programs is to promote the concept and the practice of preventing pollution at the source, before it can cause environmental problems (USEPA, 1992). Where further controls are needed, treatment of polluted runoff may be required.

1.1 Handbook Purpose and Scope

The purpose of this handbook is to provide general guidance for selecting and implementing Best Management Practices (BMPs) to reduce pollutants in runoff from municipal operations. Federal and state programs require selected municipalities to reduce the discharge of pollutants in their stormwater discharges to the maximum extent practicable (MEP) using an array of control measures including BMPs. It is not the intent of this handbook to dictate the actual selection of BMPs (this will be done by the municipality), but rather to provide the framework for an informed selection of BMPs for the program.

Although MEP has not been defined by the federal regulations, the use of this handbook and the selection process presented herein should assist municipalities in achieving MEP. In selecting BMPs that will achieve MEP, it is important to remember that municipalities will be responsible to reduce the discharge of pollutants in stormwater to the maximum extent practicable. The following factors should be considered in deciding if a BMP is practicable:

- Pollutant Removal - Will the BMP remove (or control) the pollutant(s) of concern?
- Regulatory Compliance - Is the BMP compatible with stormwater regulations as well as other regulations for air, hazardous wastes, solid waste disposal, groundwater protection, etc.?
- Public Acceptance - Does the BMP have public support?

- Implementation - Is the BMP compatible with land uses, facilities, or activities in question?
- Cost - Will the cost for implementing the BMP significantly exceed the pollution control benefits? Does a revenue stream exist for ongoing maintenance?
- Technical Feasibility - Is the BMP technically feasible considering soils, geography, water resources, etc.?

Ultimately, the municipality must implement and maintain the selected BMPs and prepare and adhere to a schedule for implementation and maintenance.

1.1.1 Users of the Handbook

This handbook is primarily designed to assist municipal staff with incorporating pollution prevention controls into their overall stormwater management program and specifically publicly owned/operated facilities (fixed facilities) and field activities (field programs). Users include public and private sector engineers, planners, environmental specialists, and stormwater program managers. Managers and employees of the various municipal facilities and municipal field programs may find this handbook especially helpful when implementing and evaluating the effectiveness of these stormwater management efforts.

1.1.2 Organization of the Handbook

The handbook is organized to assist the user in selecting and implementing best management practices to reduce impacts of stormwater discharges on receiving waters. The handbook consists of the following sections:

Section 1
Introduction
This section provides a general review of the sources and impacts of municipal stormwater discharges and provides an overview of the federal and state programs regulating stormwater discharges.

Section 2
Stormwater Pollution Prevention Planning for Municipal Operations
This section describes a process to follow in identifying and selecting BMPs for pollutant generating activities.

Section 3
Source Control BMPs
BMP fact sheets presented in this section address BMPs (or procedures) to control or eliminate sources of stormwater pollutants. These BMPs should be considered in all efforts to reduce pollutants from municipal operations

Section 4
Treatment Control BMPs
BMP fact sheets presented in this section address BMPs that remove pollutants from runoff (treatment controls). These fact sheets focus on the maintenance requirements of these controls.

Section 5
BMP Implementation and Evaluation
This section outlines development of a program to monitor BMP effectiveness and evaluate additional BMP requirements. Topics include site inspections, BMP monitoring, recordkeeping, and BMP review/modifications.

Section 6
Glossary and List of Acronyms
This section identifies terms and abbreviations used in the handbooks.

Appendix A
Inventory of Municipal Operations
This appendix provides an example of an inventory of municipal operations that may be sources of pollutants in stormwater runoff.

Appendix B
Assessment of Municipal Operations
This appendix provides an example worksheet for assessing fixed facilities to determine the level of BMP implementation.

Appendix C
BMP Selection Process
This appendix provides an example of BMP selection for a fixed facility.

Appendix D
Contract/Lease Agreement
This appendix provides example lease language for fixed facilities.

1.1.3 Relationship to Other Handbooks

This handbook is one of four handbooks developed by the California Stormwater Quality Associations (CASQA) to address BMP selection. Collectively, the four handbooks address BMP selection throughout the life of a project,from planning and design through construction and into operation and maintenance. Individually, each handbook is geared to a specific target audience during each stage of a project.

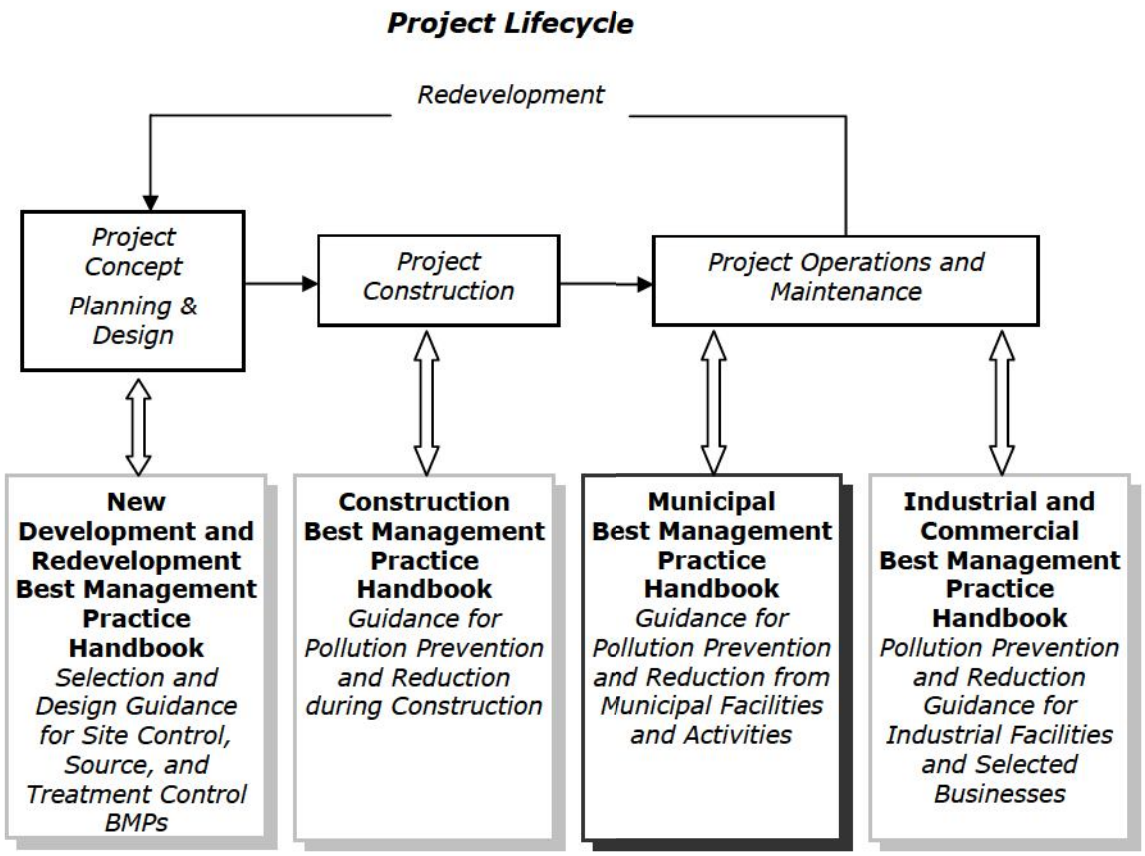

This handbook, the Municipal Handbook, provides information primarily for municipalities to use in selecting and implementing control measures for municipal operations including fixed facilities and field programs. In this context, information provided in Section 4, Treatment Control BMPs, is focused on maintenance requirements for existing treatment control BMPs. If a new treatment control BMP is being considered at an existing or new municipal facility, the reader is referred to the New Development and Redevelopment Handbook.

For a comprehensive understanding of stormwater pollution controls throughout the life cycle of development, it is recommended that the readers obtain and become familiar with all four handbooks. Typically, municipal stormwater program managers, regulators, environmental organizations, and stormwater quality professionals will have an interest in all four handbooks. For a focused understanding of stormwater pollution control during a single phase of the project life cycle, a reader may obtain and become familiar with the handbook associated with the appropriate phase. Typically, contractors, construction inspectors, industrial site operators, commercial site operators, some regulators, and some municipal staff may have an interest in a single handbook.

1.2 Stormwater Pollutants and Impacts on Water Quality

Stormwater runoff naturally contains numerous constituents; however, urbanization and urban activities (including municipal activities) typically increase constituent concentrations to levels that may impact water quality. Pollutants associated with stormwater include sediment, nutrients, bacteria and viruses, oil and grease, metals, organics, pesticides, and gross pollutants (floatables). In addition, nutrient-rich stormwater runoff is an attractive medium for vector production when it accumulates and stands for more than 72 hours. Stormwater pollutants are described in Table 1-1.

Municipal Activities Generating Pollutants

Municipalities conduct various activities that are sources of pollutants in stormwater runoff. For the purpose of this handbook, these activities are categorized according to whether they occur at a specific location (fixed facility) or across a broader and non-specific area (field programs). Some of these activities are summarized in the list below. All activities are discussed in more detail in Section 2. These activities must be addressed through the implementation of BMPs to minimize or eliminate the pollutants from entering the local water bodies or drainage system.

Typical Municipal Operations that Generate Pollutants

Fixed Facilities Activities	***Field Program Activities***
Building Maintenance & Repair	Street Sweeping and Cleaning
Parking Lot Maintenance	Street Repair and Maintenance
Landscape Maintenance	Bridge and Structure Maintenance
Waste Handling and Disposal	Sidewalk Surface Cleaning
Vehicle Fueling and Storage Tank Filling	Graffiti Cleaning
Equipment Maintenance & Repair	Sidewalk Repair
Vehicle and Equipment Storage	Controlling Litter
Vehicle and Equipment Cleaning	Fountain Maintenance
Material Handling & Storage	Landscape Mowing/Trimming/Planting
Material Loading & Unloading	Fertilizer & Pesticide Management
Minor Construction	Controlling Illicit Connections
Over Water Activities	Controlling Illegal Dumping
	Solid Waste Collection and Recycling

Table 1-1 Pollutant Impacts on Water Quality

Sediment	Sediment is a common component of stormwater, and can be a pollutant. Sediment can be detrimental to aquatic life (primary producers, benthic invertebrates, and fish) by interfering with photosynthesis, respiration, growth, reproduction, and oxygen exchange in water bodies. Sediment can transport other pollutants that are attached to it including nutrients, trace metals, and hydrocarbons. Sediment is the primary component of total suspended solids (TSS), a common water quality analytical parameter.
Nutrients	Nutrients including nitrogen and phosphorous are the major plant nutrients used for fertilizing landscapes, and are often found in stormwater. These nutrients can result in excessive or accelerated growth of vegetation, such as algae, resulting in impaired use of water in lakes and other sources of water supply. For example, nutrients have led to a loss of water clarity in Lake Tahoe. In addition, un-ionized ammonia (one of the nitrogen forms) can be toxic to fish.
Bacteria and viruses	Bacteria and viruses are common contaminants of stormwater. For separate storm drain systems, sources of these contaminants include animal excrement and sanitary sewer overflow. High levels of indicator bacteria in stormwater have led to the closure of beaches, lakes, and rivers to contact recreation such as swimming.
Oil and Grease	Oil and grease includes a wide array of hydrocarbon compounds, some of which are toxic to aquatic organisms at low concentrations. Sources of oil and grease include leakage, spills, cleaning and sloughing associated with vehicle and equipment engines and suspensions, leaking and breaks in hydraulic systems, restaurants, and waste oil disposal.
Metals	Metals including lead, zinc, cadmium, copper, chromium, and nickel are commonly found in stormwater. Many of the artificial surfaces of the urban environment (e.g., galvanized metal, paint, automobiles, or preserved wood) contain metals, which enter stormwater as the surfaces corrode, flake, dissolve, decay, or leach. Over half the trace metal load carried in stormwater is associated with sediments. Metals are of concern because they are toxic to aquatic organisms, can bioaccumulate (accumulate to toxic levels in aquatic animals such as fish), and have the potential to contaminate drinking water supplies.
Organics	Organics may be found in stormwater in low concentrations. Often synthetic organic compounds (adhesives, cleaners, sealants, solvents, etc.) are widely applied and may be improperly stored and disposed. In addition, deliberate dumping of these chemicals into storm drains and inlets causes environmental harm to waterways.
Pesticides	Pesticides (including herbicides, fungicides, rodenticides, and insecticides) have been repeatedly detected in stormwater at toxic levels, even when pesticides have been applied in accordance with label instructions. As pesticide use has increased, so too have concerns about adverse effects of pesticides on the environment and human health. Accumulation of these compounds in simple aquatic organisms, such as plankton, provides an avenue for biomagnification through the food web, potentially resulting in elevated levels of toxins in organisms that feed on them, such as fish and birds.
Gross Pollutants	Gross Pollutants (trash, debris, and floatables) may include heavy metals, pesticides, and bacteria in stormwater. Typically resulting from an urban environment, industrial sites and construction sites, trash and floatables may create an aesthetic "eye sore" in waterways. Gross pollutants also include plant debris (such as leaves and lawn-clippings from landscape maintenance), animal excrement, street litter, and other organic matter. Such substances may harbor bacteria, viruses, vectors, and depress the dissolved oxygen levels in streams, lakes, and estuaries sometimes causing fish kills.
Vector Production	Vector production (e.g., mosquitoes, flies, and rodents) is frequently associated with sheltered habitats and standing water. Unless designed and maintained properly, standing water may occur in treatment control BMPs for 72 hours or more, thus providing a source for vector habitat and reproduction (Metzger, 2002).

1.3 Regulatory Requirements

The federal Clean Water Act (CWA), as amended in 1987, is the principal legislation for establishing requirements for the control of stormwater pollutants. Enforcement of the CWA and other laws such as the Endangered Species Act and California's Porter-Cologne Act has generated a number of federal, state and local requirements and programs that deal directly or indirectly with controlling stormwater discharges. In the following sections, various programs are discussed in relationship to control of pollutants in stormwater from municipal storm drain systems. These programs are expected to evolve over the next several years and the user is advised to contact local regulatory and/or municipal officials for further information.

1.3.1 Federal NPDES Programs

In 1972, provisions of the federal Water Pollution Control Act, also referred to as the Clean Water Act (CWA), were amended so that discharge of pollutants to waters of the United States from any point source is effectively prohibited, unless the discharge is in compliance with a National Pollutant Discharge Elimination (NPDES) permit. The 1987 amendments to the CWA added Section 402(p), which established a framework for regulating municipal, industrial, and construction stormwater discharges under the NPDES program. On November 16, 1990, USEPA published final Phase I regulations that established application requirements for stormwater permits for municipal separate storm sewer systems (MS4s) serving a population of over 100,000 and certain industrial facilities, including construction sites greater than 5 acres. These regulations were revised in July 1998 (USEPA, 1998). On December 8, 1999, USEPA published the final Phase II regulations for communities under 100,000 and operators of construction sites between 1 and 5 acres (USEPA, 1999).

1.3.2 State NPDES Programs

The state Porter-Cologne Act (Water Code 13000, et seq.) is the principal legislation for controlling stormwater pollutants in California. The Act requires development of Basin Plans for drainage basins within California. Each plan serves as a blueprint for protecting water quality within the various watersheds. These basin plans are used in turn to identify more specific controls for discharges (e.g., wastewater treatment plant effluent, urban runoff, and agriculture drainage). Specific controls are implemented through permits called Waste Discharge Requirements.

In California, the federal NPDES stormwater permitting program is administered by the State Water Resources Control Board (SWRCB) through the nine Regional Water Quality Control Boards (RWQCBs) by issuing joint Waste Discharge Requirements and NPDES permits. SWRCB and RWQCBs use three types of NPDES permits to regulate stormwater discharges. These include:

- Individual Permits
- Area Wide Permits
- General Permits

The current set of stormwater NPDES permits in California includes a combination of stormwater discharge type and permit type (Table 1-2). The following sections describe minimum requirements in each of the municipal discharge-permit combinations.

Table 1-2 Stormwater Discharge-Permit Type Combinations

	Discharge Type		
Permit type	**Municipal**	**Construction**	**Industrial**
Individual	Phase I MS4 Caltrans		Facility-specific
Area Wide	Phase I MS4s		
General	Phase II MS4	Phase I and II	Phase I

1.3.3 Municipal NPDES Stormwater Programs

Municipalities with a population of over 100,000 or that have been determined to be a significant contributor of pollutants are required to obtain an individual NPDES stormwater permit. These municipalities are classified as Phase I communities and are typically referred to as MS4s (municipal separate storm sewer systems). To meet CWA Section 402(p) requirements, Phase I MS4s are required to implement a stormwater management program that contains the following elements:

- **Program Management**: including program structure, institutional arrangements, legal authority, and fiscal resources
- **Illicit Discharges**: including prohibition of illicit connections and dumping, and enforcement procedures.
- **Industrial / Commercial Discharges**: including identification of sources, BMPs, outreach, inspections, staff training, and coordination with state General Permit.
- **New Development and Re-development**: including planning processes, local permits, staff training, post-construction structural BMPs, and outreach.
- **Construction**: including erosion and grading permits, construction BMPs, site inspections, enforcement, and coordination with state General Permit.
- **Public Agency (Municipal) Operations**: including inventory and BMPs for corporation yards, parks and recreation, storm drain system operation and maintenance, streets and roads, flood control, public facilities, and ponds, fountains and other public water bodies. (This is a primary focus of this handbook.)
- **Public Information and Participation**: including general and focused outreach, school education programs, citizen participation, and effectiveness evaluation of the public information program.

- **Program Evaluation**: including performance standards, annual and sub-annual reports, internal reporting and record keeping, and Stormwater Management Plan revisions.

- **Monitoring**: including system characterization, source identification, control measure effectiveness, pollutant loading, and data management

Smaller, Phase II communities (under 100,000 population) are covered by a General Permit. Phase II communities are required to develop and implement a stormwater management plan with the following six minimum control measures:

- **Public Education and Outreach** - Distributing educational materials and performing outreach to inform citizens about the impacts polluted stormwater runoff discharges can have on water quality.

- **Public Involvement and Participation** - Providing opportunities for citizens to participate in program development, implementation, and review, including effectively publicizing public hearings or participation.

- **Illicit Discharge Detection and Elimination** - Developing and implementing a plan to detect and eliminate illicit discharges to the storm drain system including illicit connections and illegal dumping.

- **Construction Site Runoff Control** - Developing, implementing, and enforcing an erosion and sediment control program for construction activities that disturb one or more acres of land.

- **Pollution Prevention / Good Housekeeping for Municipal Operations** - Developing and implementing a program to prevent or reduce pollutant runoff from municipal operations. (This is a primary focus of this handbook.)

- **Post-Construction Stormwater Management in New Development and Redevelopment** - Developing, implementing, and enforcing a program to address discharges of stormwater runoff from new and redevelopment areas.

In addition to the six measures listed above, the stormwater management plan must identify measurable goals (or performance standards) for each minimum control measure. Measurable goals will be used by the MS4 and the RWQCB to gauge compliance and evaluate the effectiveness of individual BMPs or control measures and the stormwater management program as a whole. Phase II communities must also monitor their efforts and prepare annual reports demonstrating that the community has implemented the minimum control measures and complied with the measurable goals.

1.4 Definitions

Many of the common definitions for stormwater control are found in the Glossary (see Section 6). Throughout the handbook, the user will find references to the following terms:

NPDES Permit for Stormwater Discharges NPDES is an acronym for National Pollutant Discharge Elimination System. NPDES is the national program for administering and regulating Sections 307, 318, 402 and 405 of the Clean Water Act (CWA). In California, the State Water Resources Control Board (SWRCB) has issued a General Permit for stormwater discharges associated with Phase II communities. For Phase I communities the Regional Water Quality Control Boards issue individual NPDES permits to either an individual permittee or a group of permittees.

Notice of Intent (NOI) is a formal notice to the SWRCB submitted by a Phase II municipality. The NOI provides information on the permittee, location of discharge, type of discharge and certifies that the permittee will comply with conditions of the Phase II General Permit. The NOI is not a permit application and does not require approval.

A ***Best Management Practice (BMP)*** is defined as any program, technology, process, siting criteria, operating method, measure, or device which controls, prevents, removes, or reduces pollution.

Source Control BMPs are operational practices that prevent pollution by reducing potential pollutants at the source. They typically do not require maintenance or construction.

Treatment Control BMPs are methods of treatment to remove pollutants from stormwater.

Non-Stormwater Discharge is any discharge to municipal separate storm sewer that is not composed entirely of stormwater.

Vector as defined in the California Health & Safety Code, Section 2200, is any animal capable of transmitting the causative agent of human disease or capable of producing human discomfort or injury, including, but not limited to, mosquitoes, flies, other insects, ticks, mites, and rodents.

1.5 References and Resources

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United States Environmental Protection Agency (U.S.E.P.A.). *NPDES Stormwater Sampling Guidance Document*. 1992, EPA 833-B-92-001, U.S. Environmental Protection Office, Office of Wastewater Enforcement and Compliance, Washington, DC.

http://www.swrcb.ca.gov/stormwtr/municipal.html#phaseii. This link on the State Water Resources Control Board website provides Phase I MS4 area wide permits in each region, a link to Phase I and II resources.

http://cfpub.epa.gov/npdes/stormwater/swphase1.cfm. This link on the USEPA website provides an overview of the Phase I NPDES stormwater program and specific information on requirements pertaining to Phase I stormwater discharges.

Municipal Programs

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Orange County Stormwater Program. http://www.ocwatersheds.com/StormWater/swp_documents_intro.asp

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Santa Clara Valley Urban Runoff Pollution Prevention Program. 1997 Urban Runoff Management Plan. September 1997, updated October 2000.

Section 2
Stormwater Pollution Prevention Planning for Municipal Operations

2.1 Introduction

As noted in Section 1 municipalities are required to develop and implement a comprehensive stormwater management program including the reduction of pollutants from municipal operations. In this section, a planning process is suggested for municipal operations, which allows the municipality to identify the activities that generate pollutants and the best management practices (BMPs) applicable to the activities. The recommended process includes the following key components:

- **Inventory:** First, an inventory is developed of all municipal facilities and activities that may be a source of pollutants in stormwater (Section 2.2).
- **Assessment:** Next, the activities are evaluated for their potential to discharge pollutants to storm drains and/or to receiving waters (Section 2.3).
- **BMP Selection:** BMPs are then selected to deal with the identified sources of stormwater pollution. Emphasis is placed on source control (procedures) BMPs and proper maintenance of treatment control BMPs (Section 2.4 and Sections 3 and 4).
- **Implementation:** BMPs are implemented and their effectiveness evaluated. The monitoring, reporting, and inspection requirements of the BMPs is oriented toward gaining insight into the performance of the BMPs (Section 5).

It is worth noting that some municipal facilities may be classified as an industrial–type facility subject to the State NPDES General Permit for Industrial Activities. The reader is referred to the Industrial and Commercial BMP Handbook to determine the classification of the municipal facility. If classified as an industrial facility then the reader should use the Industrial and Commercial BMP Handbook. For all other municipal facilities, the planning procedure described here is applicable.

2.2 Develop Inventory of Public Agency Activities

This section describes steps that may be used to generate and maintain comprehensive inventories of the pollutant generating activities associated with municipal operations. These activities can be categorized into two groups as described below:

- Fixed Facilities – specific locations municipalities own and operate and at which municipal activities occur. These types of facilities may also be municipally owned but privately leased. Examples of fixed facility types include municipal waste facilities and corporation yards.
- Field Programs - a set of related municipal activities that take place throughout the municipality. These types of activities may also be privately contracted. Examples of

municipal field programs include roads, streets, and highways maintenance, and drainage system operation and maintenance.

The flow chart presented in Figure 2-1 illustrates the two steps involved in compiling the inventories for both fixed facilities and field programs. A summary of the information that is collected as part of inventory is provided in Table 2-1. Sections 2.2.1 and 2.2.2 provide the guidelines for fully completing the inventories.

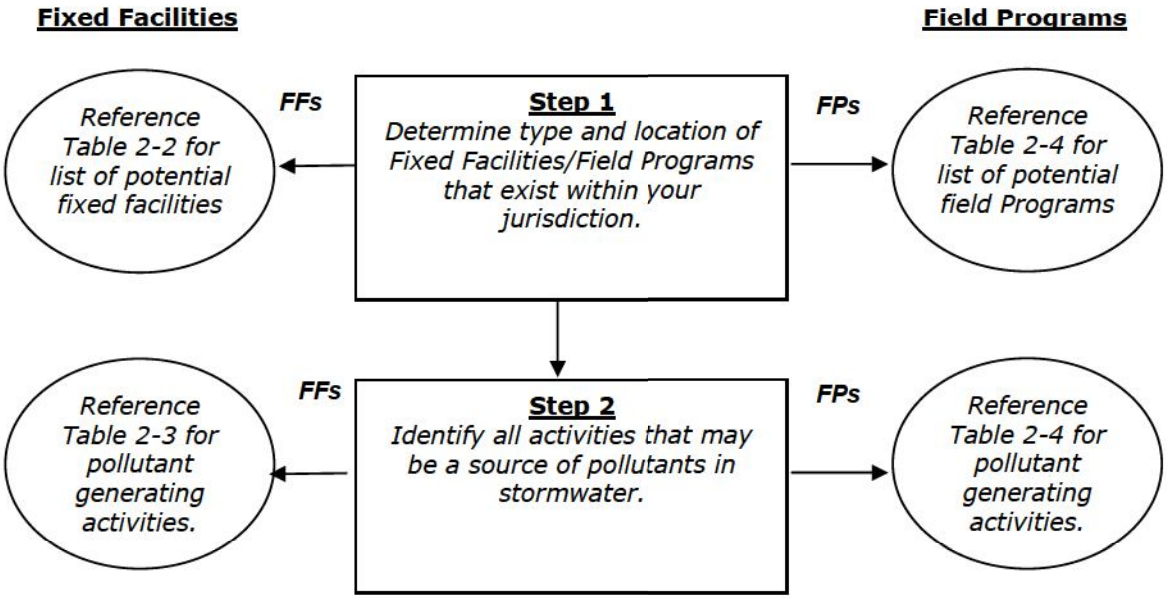

Figure 2-1
Inventory Process for Fixed Facilities and Field Programs

Table 2-1 Inventory Information

Fixed Facility

Facility Type and Location (Step 1)

- *Facility name/type of facility*
- *Sub-category facility type (see Table 2-2)*
- *Physical Address Information*
- *Watershed and nearby water bodies*
- *GIS Information (longitude and latitude, etc.)*
- *Site Map*

Facilities Activities and Pollutants (Step 2)

- *Facility Activities*
- *Potential Pollutants (See Table 2-3)*
- *Pollutants of concern into a 303(d) listed water body or other ESA*
- *List of past significant spills and leaks*
- *List of significant materials and chemicals*
- *Potential non-stormwater discharges*

Field Program

Program Type and Location (Step 1)

- *Program type*
- *Name and contact information of contractor (if work is contracted out)*
- *Area of coverage*
- *Watershed(s) within coverage area (hydrologic units)*
- *Description of drainage facilities (number, size, length of open channels and closed conduits)*
- *Adjacent to and/or discharge to 303(d) listed water body or other ESA*

Program Activities and Pollutants (Step 2)

- *Activities performed (see Table 2-4)*
- *Potential Pollutants (See Table 2-4)*
- *Pollutants of concern into a 303(d) listed water body or other ESA*
- *Potential non-stormwater discharges*

2.2.1 Fixed Facility Inventory Procedures

Step 1 – Determine Fixed Facilities Type and Location

The first step in the inventory process is to identify fixed facilities that are owned and operated or owned and leased by the city (county). Baseline information about the fixed facility needs to be developed including the name, address, type of facility, longitude and latitude, and watershed.

Each fixed facility should be identified with a main and sub-category type within the inventory. The main and sub-category types that typically have the greatest potential for discharging pollutants are listed in Table 2-2.

Table 2-2 Types of Municipal Fixed Facilities

Main Fixed Facility Types	Subcategory of Fixed Facilities
Municipal Waste Facilities	Active or Closed Municipal Landfills
	Publicly Owned Treatment Facilities
	Incinerators
	Solid Waste Transfer Facilities
	Land Application Sites
	Sites for Disposing and Treating Sewage Sludge
	Hazardous Waste Treatment, Disposal, and Recovery Facilities
	Uncontrolled Sanitary Landfills
Corporation Yards	Corporation Yards
	Maintenance Yards
	Storage Yards for Materials
Other Municipal Owned and/or Operated Facilities	Airfields
	Parks, Cemeteries & Golf Courses
	Public Buildings (Police, Fire, Libraries, etc.)
	Stadiums
	Stables
	Boat/Shipping Yards
	Animal Shelters/Services
	Public Parking Facilities
	Fairgrounds
	Other Facilities Identified by the Municipality

A site map should be prepared for each fixed facility that includes:

- The facility boundaries
- The outline of all stormwater drainage areas
- Portions of the drainage area impacted by run-on from surrounding areas
- Direction of flow of each drainage area
- On-site surface water bodies
- Areas of soil erosion
- Nearby water bodies (such as rivers, lakes, ponds)
- Municipal storm drain inlets where the facility's stormwater discharges
- Stormwater collection and conveyance system, associated points of discharge, and the flow direction

- Control measures that affect stormwater discharges
- Locations of all catch basins
- Location of authorized non-stormwater discharges to the storm drain
- Outline of all impervious areas of the facility
- Locations where materials are directly exposed to precipitation
- Locations where significant spills or leaks have occurred
- Areas of municipal activities

The inventory should also determine whether the facility is within or adjacent to or discharging directly to an Environmentally Sensitive Area (ESA). For the purposes of this Handbook, "adjacent" is defined as being located within 200 feet of the listed water body. "Discharging directly to" is defined as a discharge from a drainage system servicing the subject facility or activity that flows to the ESA without mixing with other flows (i.e., discharge from an urban area that co-mingles with downstream flows prior to an ESA is not subject to this definition).

An ESA exists if any of the following designations have been applied to the water body of concern:

- Clean Water Act 303(d) listed impaired water body. It should be noted that the 303(d) list is updated on a regular basis by the state and USEPA. Each time that happens, maps showing 303(d) listed water bodies and the inventories will need to be updated.
- Areas designated as Areas of Special Biological Significance (also known as State Water Quality Protection Area) by the SWRCB
- Water bodies designated with the RARE beneficial use by the SWRCB
- Water bodies located within areas designated as preserves or equivalent under the Natural Community Conservation Planning Program
- Areas designated as Critical Aquatic Resources
- Any other equivalent ESAs that contain water bodies which have been identified to be of local concern

An example of an inventory of municipal operations is provided in Appendix A.

Step 2 – Identify Potential Pollutant Generating Activities

In addition to the identification of the main and subcategories of fixed facility types in Step 1, the potential pollutant generating activities and potential pollutants for each fixed facility should be identified and included in the inventory.

A list of fixed facility activities that have the potential to generate pollutant discharges and the potential pollutants that are associated with those activities is presented in Table 2-3. This list is not inclusive but does provide a good starting point to identify potential pollutants. In addition to these activities, efforts should be made to compile a list of past significant spills and leaks and a list of materials and chemicals stored on-site.

Finally, determine if pollutants associated with identified activities have the potential to discharge into 303 (d) listed water bodies for which the pollutant is listed.

Table 2-3 Potential Pollutants Likely Associated with Fixed Facility Activities

Fixed Facility Activity	Potential Pollutants								
	Sediment	Nutrients	Trash	Metals	Bacteria	Oil & Grease	Organics	Pesticides	Oxygen Demanding Substances
Building and Grounds Maintenance and Repair	X	X	X	X	X	X	X	X	X
Parking/Storage Area Maintenance	X	X	X	X	X	X	X		X
Waste Handling and Disposal	X	X	X	X	X	X	X	X	X
Vehicle and Equipment Fueling			X	X		X	X		
Vehicle and Equipment Maintenance and Repair				X		X	X		
Vehicle and Equipment Washing and Steam Cleaning	X	X	X	X		X	X		
Outdoor Loading and Unloading of Materials	X	X	X	X		X	X	X	X
Outdoor Container Storage of Liquids		X		X		X	X	X	X
Outdoor Storage of Raw Materials	X	X	X			X	X	X	X
Outdoor Process Equipment	X		X	X		X	X		
Over water Activities			X	X	X	X	X	X	X
Landscape Maintenance	X	X	X		X			X	X

2.2.2 Field Program Inventory Procedures

Step 1 – Determine Field Program Type and Location

The first step in the inventory process is to identify all field programs conducted by a municipality. The field program and associated activities that have the potential for pollutant discharges are listed in Table 2-4. This list is not inclusive but serves as a starting point for identifying applicable field programs. Baseline information about field programs should be included in the inventory, such as the approximate area of coverage for the field program and an identifier if the performance of the field program is contracted out.

In addition, the watershed where the program occurs should be identified. Most field programs are conducted throughout a political jurisdiction and therefore may affect multiple watersheds. The inventory should reflect all those watersheds in which field programs occur. Mapping the field program infrastructure according to watershed may be useful in this step. As with the fixed facilities inventory information regarding environmentally sensitive areas including location and stressor pollutant should be compiled as part of the inventory effort. See Table 2-1 for a more complete list of information that may be collected during the inventory procedure.

Step 2 – Identify Potential Pollutant Generating Activities

The potential pollutant generating activities and potential pollutants for each field program must be identified and included in the inventory. A list of field program activities that have the potential to generate pollutant discharges and the potential pollutants that are associated with those activities is presented in Table 2-4.

Although Table 2-4 identifies the primary pollutants typically associated with stormwater runoff there are other environmental conditions that may be applicable to a field program. These include pH, temperature, and toxicity.

Table 2-4 Field Program Activities and Associated Potential Pollutants

Field Programs	Activities	Potential Pollutants								
		Sediment	Nutrients	Trash	Metals	Bacteria	Oil & Grease	Organics	Pesticides	Oxygen Demanding Substances
Roads, Streets, and Highways Operation and Maintenance	Sweeping and Cleaning	X		X	X		X			X
	Street Repair, Maintenance, and Striping /Painting	X		X	X		X	X		
	Bridge and Structure Maintenance	X		X	X		X	X		
Plaza, Sidewalk, and Parking Lot Maintenance and Cleaning	Surface Cleaning	X	X			X	X			X
	Graffiti Cleaning	X	X		X			X		
	Sidewalk Repair	X		X						
	Controlling Litter	X		X		X	X			X
Fountains, Pools, Lakes, and Lagoons Maintenance	Fountain and Pool Draining		X					X		
	Lake and Lagoon Maintenance	X	X	X		X			X	X
Landscape Maintenance	Mowing/Trimming/Planting	X	X	X		X			X	X
	Fertilizer & Pesticide Management	X	X						X	
	Managing Landscape Wastes			X					X	X
	Erosion Control	X	X							
Drainage System Operation and Maintenance	Inspection and Cleaning of Stormwater Conveyance Structures	X	X	X		X		X		X
	Controlling Illicit Connections and Discharges	X	X	X	X	X	X	X	X	X
	Controlling Illegal Dumping	X	X	X	X	X	X	X	X	X
	Maintenance of Inlet and Outlet Structures	X		X	X		X			X
Waste Handling and Disposal	Solid Waste Collection		X	X	X	X	X	X		X
	Waste Reduction and Recycling			X	X					X
	Household Hazardous Waste Collection			X	X		X	X	X	
	Controlling Litter			X	X	X		X		X
	Controlling Illegal Dumping	X		X		X	X		X	X
Water and Sewer Utility Operation and Maintenance	Water line Maintenance	X				X	X			
	Sanitary Sewer Maintenance	X				X	X			X
	Spill/Leak/Overflow Control, Response, and Containment	X	X			X		X		X

2.3 Assessment

This section outlines the procedures for assessing fixed facilities and field programs for BMP selection and implementation. Data gathered during the inventory process should be used to support the assessment process described below.

2.3.1 Assessment of Fixed Facilities

The first step in the assessment is to identify BMPs already in place at a facility. These may include pavement sweeping, drain inlet cleaning, covered waste storage bins, and spill prevention and cleanup procedures. This information should be considered when determining which BMPs should be selected and implemented at a site. Worksheet 1 provides a checklist that may be helpful in determining existing BMPs at a site. Other BMPs that were installed for reasons unrelated to stormwater control, such as berming, covered materials storage, and designated wash areas, should also be identified.

Once the existing BMPs have been identified and the inventory completed per Section 2.2, an assessment of all municipal activities and potential pollutant sources should be conducted to determine which areas of the facility are likely sources of pollutants in stormwater and non-stormwater discharges, and which pollutants are likely to be present in stormwater and non-stormwater discharges. Worksheet 1 may help with this task.

Facility operators must then decide whether additional or new BMPs should be implemented to reduce stormwater pollutants to the maximum extent practicable from a site. The municipality should consider and evaluate various factors when performing this assessment, such as:

- effectiveness of current BMPs
- type of activities
- type and quantities of significant materials handled, produced, stored, or disposed of
- history of spill or leaks
- non-stormwater discharges
- size of facility (including percent impervious)
- proximity to receiving water and/or type of receiving water

The municipality should also consider whether its facility is discharging pollutants identified to be causing impairment in the local water bodies. Appendix B provides an example of a method for assessing a facility for BMP implementation.

2.3.2 Assessment of Field Programs

Similar to the effort at a fixed facility a municipality should identify BMPs that are already in place and the extent of their effectiveness. Using this information and the inventory data the municipality can identify the activities with the potential for discharging pollutants, the type of

pollutants being discharged, and the extent that the pollutants are being addressed with current procedures or BMPs. The municipality can then assess whether additional or new BMPs are necessary. In considering the need for new or additional BMPs, a municipality should consider:

- effectiveness of current BMPs
- type of field program and pollutants being discharged
- exposure of activities to stormwater
- land use category
- proximity to receiving water and/or type of receiving water

2.4 Identify and Select BMPs

Selection of BMPs should focus first on source control BMPs and second on treatment control BMPs. Typically, source control BMPs will serve to reduce pollutants from activities to the maximum extent practicable. Treatment controls BMPs should be considered when source control BMPs have been shown to be ineffective or when special environmental or site conditions warrant a more comprehensive approach. The reader is referred to the New Development and Redevelopment BMP Handbook if treatment control BMPs are determined to be necessary. An example of selecting source control BMPs is provided in Appendix C.

Municipalities can identify and select BMPs from those presented in Section 3 – Source Control BMPs. The BMPs are described in activity-based and field program-based fact sheets that also provide information on the pollutants that can be addressed by the BMP. The BMPs shown in Section 3 are a comprehensive collection and not all may be applicable to the activities or field programs of a particular municipality. In order to be effective, BMPs must be appropriate to the application and properly implemented.

Municipalities must also consider the maintenance requirements of existing treatment control BMPs. In this regard, the municipality should refer to Section 4 –Treatment Control BMPs. The fact sheets in Section 4 are focused on the maintenance requirements of these treatment control BMPs. Proper maintenance is necessary for these controls to operate effectively.

WORKSHEET 1

Facility Name: Site Address:

Contact Name: Phone:

1. **ACTIVITIES** – In the table below check each activity present at the site and evaluate its **potential for pollutant discharge (PPD):** 1 = high potential, 2= medium potential, 3= low potential

2. **BMP EFFECTIVENESS** – In the table below, provide an effectiveness rating using the provided scale.

ACTIVITY AND BMP CHECKLIST					
	APPLICABLE ACTIVITY Yes	No	PPD	EFFECTIVENESS RATING *	
A. VEHICLE AND EQUIPMENT FUELING BMPs employed:	[ ]	[ ]	[ ]	① ② ③ ④ ⑤	
B. VEHICLE AND EQUIPMENT WASHING/STEAM CLEANING BMPs employed:	[ ]	[ ]	[ ]	① ② ③ ④ ⑤	
C. VEHICLE AND EQUIPMENT MAINTENANCE AND REPAIR BMPs employed:	[ ]	[ ]	[ ]	① ② ③ ④ ⑤	
D. OUTDOOR LOADING/UNLOADING OF MATERIALS BMPs employed:	[ ]	[ ]	[ ]	① ② ③ ④ ⑤	
E. OUTDOOR CONTAINER STORAGE OF LIQUIDS BMPs employed:	[ ]	[ ]	[ ]	① ② ③ ④ ⑤	
F. OUTDOOR PROCESS EQUIPMENT OPERATIONS AND MAINTENANCE BMPs employed:	[ ]	[ ]	[ ]	① ② ③ ④ ⑤	
G. OUTDOOR STORAGE OF RAW MATERIALS BMPs employed:	[ ]	[ ]	[ ]	① ② ③ ④ ⑤	
H. WASTE HANDLING AND DISPOSAL BMPs employed:	[ ]	[ ]	[ ]	① ② ③ ④ ⑤	
I. BUILDING AND GROUNDS MAINTENANCE BMPs employed:	[ ]	[ ]	[ ]	① ② ③ ④ ⑤	
J. PARKING/STORAGE AREA MAINTENANCE BMPs employed:	[ ]	[ ]	[ ]	① ② ③ ④ ⑤	
K. OVER WATER ACTIVITIES BMPs employed:	[ ]	[ ]	[ ]	① ② ③ ④ ⑤	
L. OTHER (describe):	[ ]	[ ]	[ ]	① ② ③ ④ ⑤	

***① No BMPs used and stormwater pollution likely** **② Some BMPs used but not effective** **③ Some BMPs used and moderately effective**

④ Source control BMPs used and very effective/structural BMPs needed **⑤ All necessary BMPs used and very effective**

3. **TYPE AND QUANTITY OF MATERIALS USED**

Material	Typical Quantity/Frequency	Is Stored Material Likely to Generate Pollutants

4. **HISTORY OF SPILLS AND LEAKS**

   a) Is there a chronic history of spills and leaks?_____

b) Is there no evidence of leaks and drips from equipment and machinery?_____
c) Is there a spill prevention and response team?_____
d) Are appropriate spill containment and cleanup materials kept on-site and in convenient locations?_____
e) Are cleanup procedures for spills followed regularly and correctly?_____
f) Are used absorbent materials removed and disposed of in a timely manner? _____
g) Are personnel regularly trained in the use of spill control materials?_____

5. NON-STORMWATER DISCHARGES

a) Outfall directly observed during assessment_____
b) Are BMPs implemented to prevent, treat, or control non-stormwater discharges?_____
c) Is there a potential for non-stormwater discharges (i.e. non-stormwater sources observed without BMPs implemented)_____

6. SIZE OF FACILTIY (incorporating the size of a facility serves as a surrogate measure for flow)

a) Total area_____
b) The impervious area (including parking lot) is _____

7. PROXIMITY TO RECEIVING WATER

Does the facility discharge directly or adjacent to a 303(d) water body or other environmentally sensitive area?_____

Section 3
Source Control BMPs

3.1 Introduction

This section provides a description of specific source control Best Management Practices (BMPs) for activities related to municipal operations. As noted in Sections 1 and 2, municipal fixed facilities conduct activities that have the potential to generate pollutants. The source control BMPs in this section address these activities (see Table 3-1).

In addition, municipalities conduct various field programs where activities may occur and create pollutants. BMPs for these field programs and associated activities are listed in Table 3-2.

Table 3-1	Municipal Fixed Facility BMPs
Non-Stormwater Management	
SC-10	Non-Stormwater Discharges
SC-11	Spill Prevention, Control and Cleanup
Vehicle and Equipment Management	
SC-20	Vehicle and Equipment Fueling
SC-21	Vehicle and Equipment Cleaning
SC-22	Vehicle and Equipment Repair
Material and Waste Management	
SC-30	Outdoor Loading/Unloading
SC-31	Outdoor Container Storage
SC-32	Outdoor Equipment Maintenance
SC-33	Outdoor Storage of Raw Materials
SC-34	Waste Handling and Disposal
Building and Grounds Management	
SC-41	Building and Grounds Maintenance
SC-43	Parking/Storage Area Maintenance
Over Water Activities	
SC-50	Over Water Activities
General Stormwater Management	
SC-60	Housekeeping Practices
SC-61	Safer Alternative Products

Table 3-2	Municipal Field Program BMPs
SC-70	Road and Street Maintenance
SC-71	Plaza and Sidewalk Cleaning
SC-72	Fountains & Pools Maintenance
SC-73	Landscape Maintenance
SC-74	Drainage System Maintenance
SC-75	Waste Handling and Disposal
SC-76	Water and Sewer Utility Maintenance

3.2 Fact Sheet Format

Each BMP fact sheet is a short document that gives all the information about a particular BMP. Typically, each fact sheet contains the information outlined in Figure 3-1. Completed fact sheets for each of the activities listed in Tables 3-1 and 3-2 are provided in Section 3.3.

The fact sheets also contain side bar presentations with information on BMP objectives and targeted constituents.

The information provided in each fact sheet is extensive and may not be applicable to all municipal operations. The readers may find it helpful to modify and simplify the BMP fact sheets to better reflect their existing operations.

3.3 BMP Fact Sheets

BMP fact sheets for fixed facilities activities and field programs follow. The BMP fact sheets are individually page numbered and are suitable for photocopying and inclusions in stormwater quality management plans. Fresh copies of the fact sheets can be individually downloaded from the California Stormwater BMP Handbook website at http://www.cabmphandbooks.com

SC-xx Example Fact Sheet

Description of the BMP

Approach

- Pollution Prevention
- Suggested Protocols
- Training
- Spill Response and Prevention
- Other Considerations

Requirements

- Costs
- Maintenance

Supplemental Information

- Further Details on the BMP
- Examples

References and Resources

Figure 3-1
Example Fact Sheet

Non-Stormwater Discharges SC-10

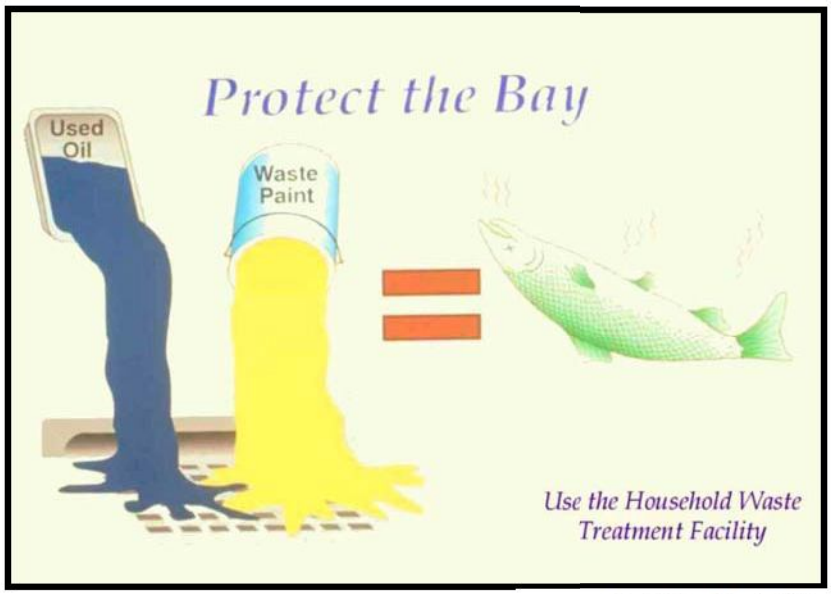

Graphic by: Margie Winter

Objectives

- Contain
- Educate
- Reduce/Minimize

Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	☑
Oil and Grease	☑
Organics	☑
Oxygen Demanding	☑

Description

Non-stormwater discharges are those flows that do not consist entirely of stormwater. For municipalities non-stormwater discharges present themselves in two situations. One is from fixed facilities owned and/or operated by the municipality. The other situation is non-stormwater discharges that are discovered during the normal operation of a field program. Some non-stormwater discharges do not include pollutants and may be discharged to the storm drain. These include uncontaminated groundwater and natural springs. There are also some non-stormwater discharges that typically do not contain pollutants and may be discharged to the storm drain with conditions. These include car washing, and surface cleaning. However, there are certain non-stormwater discharges that pose environmental concern. These discharges may originate from illegal dumping or from internal floor drains, appliances, industrial processes, sinks, and toilets that are connected to the nearby storm drainage system. These discharges (which may include: process waste waters, cooling waters, wash waters, and sanitary wastewater) can carry substances (such as paint, oil, fuel and other automotive fluids, chemicals and other pollutants) into storm drains. The ultimate goal is to effectively eliminate non-stormwater discharges to the stormwater drainage system through implementation of measures to detect, correct, and enforce against illicit connections and illegal discharges.

Approach

The municipality must address non-stormwater discharges from its fixed facilities by assessing the types of non-stormwater discharges and implementing BMPs for the discharges determined to pose environmental concern. For field programs

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the field staff must be trained to now what to look for regarding non-stormwater discharges and the procedures to follow in investigating the detected discharges.

Suggested Protocols

Fixed Facility

General

- Post "No Dumping" signs with a phone number for reporting dumping and disposal. Signs should also indicate fines and penalties for illegal dumping.
- Stencil storm drains, where applicable, to prevent illegal disposal of pollutants. Storm drain inlets should have messages such as "Dump No Waste Drains to Stream" stenciled next to them to warn against ignorant or intentional dumping of pollutants into the storm drainage system.
- Landscaping and beautification efforts of hot spots might also discourage future dumping, as well as provide open space and increase property values.
- Lighting or barriers may also be needed to discourage future dumping.

Illicit Connections

- Locate discharges from the fixed facility drainage system to the municipal storm drain system through review of "as-built" piping schematics.
- Use techniques such as smoke testing, dye testing and television camera inspection (as noted below) to verify physical connections.
- Isolate problem areas and plug illicit discharge points.

Visual Inspection and Inventory

- Inventory and inspect each discharge point during dry weather.
- Keep in mind that drainage from a storm event can continue for several days following the end of a storm and groundwater may infiltrate the underground stormwater collection system. Also, non-stormwater discharges are often intermittent and may require periodic inspections.

Review Infield Piping

- Review the "as-built" piping schematic as a way to determine if there are any connections to the stormwater collection system.
- Inspect the path of floor drains in older buildings.

Smoke Testing

- Smoke testing of wastewater and stormwater collection systems is used to detect connections between the two systems.

- During dry weather the stormwater collection system is filled with smoke and then traced to sources. The appearance of smoke at the base of a toilet indicates that there may be a connection between the sanitary and the stormwater system.

Dye Testing

- A dye test can be performed by simply releasing a dye into either your sanitary or process wastewater system and examining the discharge points from the stormwater collection system for discoloration.

TV Inspection of Storm Sewer

- TV Cameras can be employed to visually identify illicit connections to the fixed facility storm drain system.

Illegal Dumping

- Regularly inspect and clean up hot spots and other storm drainage areas where illegal dumping and disposal occurs.
- Clean up spills on paved surfaces with as little water as possible. Use a rag for small spills, a damp mop for general cleanup, and absorbent material for larger spills. If the spilled material is hazardous, then the used cleanup materials are also hazardous and must be sent to a certified laundry (rags) or disposed of as hazardous waste.
- Never hose down or bury dry material spills. Sweep up the material and dispose of properly.
- Use adsorbent materials on small spills rather than hosing down the spill. Remove the adsorbent materials promptly and dispose of properly.
- For larger spills, a private spill cleanup company or Hazmat team may be necessary.
- See fact sheet SC-11 Spill Prevention, Control, and Clean Up.

Field Program

General

- Develop clear protocols and lines of communication for effectively prohibiting non-stormwater discharges, especially ones that involve more than one jurisdiction and those that are not classified as hazardous, which are often not responded to as effectively as they need to be.
- Stencil storm drains, where applicable, to prevent illegal disposal of pollutants. Storm drain inlets should have messages such as "Dump No Waste Drains to Stream" stenciled next to them to warn against ignorant or intentional dumping of pollutants into the storm drainage system.
- See SC-74 Stormwater Drainage System Maintenance for additional information.

Field Inspection

- Regularly inspect and clean up hot spots and other storm drainage areas where illegal dumping and disposal occurs.
- During routine field program maintenance field staff should look for evidence of illegal discharges or illicit connection:
  - Is there evidence of spills such as paints, discoloring, etc.
  - Are there any odors associated with the drainage system
  - Record locations of apparent illegal discharges/illicit connections and notify appropriate investigating agency.
- If trained, conduct field investigation of non-stormwater discharges to determine whether they pose a threat to water quality.

Recommended Complaint Investigation Equipment

- Field Screening Analysis
  - pH paper or meter
  - Commercial stormwater pollutant screening kit that can detect for reactive phosphorus, nitrate nitrogen, ammonium nitrogen, specific conductance, and turbidity
  - Sample jars
  - Sample collection pole
  - A tool to remove access hole covers
- Laboratory Analysis
  - Sample cooler
  - Ice
  - Sample jars and labels
  - Chain of custody forms.
- Documentation
  - Camera
  - Notebook
  - Pens
  - Notice of Violation forms

- Educational materials

Reporting

- A database is useful for defining and tracking the magnitude and location of the problem.
- Report prohibited non-stormwater discharges observed during the course of normal daily activities so they can be investigated, contained and cleaned up or eliminated.
- Document that non-stormwater discharges have been eliminated by recording tests performed, methods used, dates of testing, and any onsite drainage points observed.
- Maintain documentation of illicit connection and illegal dumping incidents, including significant conditionally exempt discharges that are not properly managed.

Enforcement

- Educate the responsible party if identified on the impacts of their actions, explain the stormwater requirements, and provide information regarding Best Management Practices (BMP), as appropriate. Initiate follow-up and/or enforcement procedures.
- If an illegal discharge is traced to a commercial, residential or industrial source, conduct the following activities or coordinate the following activities with the appropriate agency:
  - Contact the responsible party to discuss methods of eliminating the non-stormwater discharge, including disposal options, recycling, and possible discharge to the sanitary sewer (if within POTW limits).
  - Provide information regarding BMPs to the responsible party, where appropriate.
  - Begin enforcement procedures, if appropriate.
  - Continue inspection and follow-up activities until the illicit discharge activity has ceased.
- If an illegal discharge is traced to a commercial or industrial activity, coordinate information on the discharge with the jurisdiction's commercial and industrial facility inspection program.

Training

- Train technical staff to identify and document illegal dumping incidents.
- Well-trained employees can reduce human errors that lead to accidental releases or spills. The employee should have the tools and knowledge to immediately begin cleaning up a spill if one should occur. Employees should be familiar with the Spill Prevention Control and Countermeasure Plan.
- Train employees to identify non-stormwater discharges and report them to the appropriate departments.
- Train staff who have the authority to conduct surveillance and inspections, and write citations for those caught illegally dumping.

- Train municipal staff responsible for surveillance and inspection in the following:
  - OSHA-required Health and Safety Training (29 CFR 1910.120) plus annual refresher training (as needed).
  - OSHA Confined Space Entry training (Cal-OSHA Confined Space, Title 8 and federal OSHA 29 CFR 1910.146).
  - Procedural training (field screening, sampling, smoke/dye testing, TV inspection).
- Educate the identified responsible party on the impacts of his or her actions.

Spill Response and Prevention

- See SC-11 Spill Prevention Control and Clean Up

Other Considerations

- The elimination of illegal dumping is dependent on the availability, convenience, and cost of alternative means of disposal. The cost of fees for dumping at a proper waste disposal facility are often more than the fine for an illegal dumping offense, thereby discouraging people from complying with the law. The absence of routine or affordable pickup service for trash and recyclables in some communities also encourages illegal dumping. A lack of understanding regarding applicable laws or the inadequacy of existing laws may also contribute to the problem.
- Municipal codes should include sections prohibiting the discharge of soil, debris, refuse, hazardous wastes, and other pollutants into the storm drain system.
- Many facilities do not have accurate, up-to-date schematic drawings.
- Can be difficult to locate illicit connections especially if there is groundwater infiltration.

Requirements

Costs

- Eliminating illicit connections can be expensive especially if structural modifications are required such re-plumbing cross connections under an existing slab.
- Minor cost to train field crews regarding the identification of non-stormwater discharges. The primary cost is for a fully integrated program to identify and eliminate illicit connections and illegal dumping. However, by combining with other municipal programs (i.e. pretreatment program) cost may be lowered.
- Municipal cost for containment and disposal may be borne by the discharger.

Maintenance

Not applicable

Supplemental Information

Further Detail of the BMP

What constitutes a "non-stormwater" discharge?

- Non-stormwater discharges are discharges not made up entirely of stormwater and include water used directly in the manufacturing process (process wastewater), air conditioning condensate and coolant, non-contact cooling water, cooling equipment condensate, outdoor secondary containment water, vehicle and equipment wash water, landscape irrigation, sink and drinking fountain wastewater, sanitary wastes, or other wastewaters.

Permit Requirements

- Current municipal NPDES permits require municipalities to effectively prohibit non-stormwater discharges unless authorized by a separate NPDES permit or allowed in accordance with the current NPDES permit conditions. Typically the current permits allow certain non-stormwater discharges in the storm drain system as long as the discharges are not significant sources of pollutants. In this context the following non-stormwater discharges are typically allowed:
  - Diverted stream flows;
  - Rising found waters;
  - Uncontaminated ground water infiltration (as defined at 40 CFR 35.2005(20));
  - Uncontaminated pumped ground water;
  - Foundation drains;
  - Springs;
  - Water from crawl space pumps;
  - Footing drains;
  - Air conditioning condensation;
  - Flows from riparian habitats and wetlands;
  - Water line and hydrant flushing ;
  - Landscape irrigation;
  - Planned and unplanned discharges from potable water sources;
  - Irrigation water;
  - Individual residential car washing; and
  - Lawn watering.

SC-10 Non-Stormwater Discharges

Municipal facilities subject to industrial general permit requirements must include a certification that the stormwater collection system has been tested or evaluated for the presence of non-stormwater discharges. The state's General Industrial Stormwater Permit requires that non-stormwater discharges be eliminated prior to implementation of the facility's SWPPP.

Illegal Dumping

- Establish a system for tracking incidents. The system should be designed to identify the following:
  - Illegal dumping hot spots
  - Types and quantities (in some cases) of wastes
  - Patterns in time of occurrence (time of day/night, month, or year)
  - Mode of dumping (abandoned containers, "midnight dumping" from moving vehicles, direct dumping of materials, accidents/spills)
  - Responsible parties

Outreach

One of the keys to success of reducing or eliminating illegal dumping is increasing the number of people on the street who are aware of the problem and who have the tools to at least identify the incident, if not correct it. There we a number of ways of accomplishing this:

- Train municipal staff from all departments (public works, utilities, street cleaning, parks and recreation, industrial waste inspection, hazardous waste inspection, sewer maintenance) to recognize and report the incidents.
- Deputize municipal staff who may come into contact with illegal dumping with the authority to write illegal dumping tickets for offenders caught in the act (see below).
- Educate the public. As many as 3 out of 4 people do not understand that in most communities the storm drain does not go to the wastewater treatment plant. Unfortunately, with the heavy emphasis in recent years on public education about solid waste management, including recycling and household hazardous waste, the sewer system (both storm and sanitary) has been the likely recipient of cross-media transfers of waste.
- Provide the public with a mechanism for reporting incidents such as a hot line and/or door hanger (see below).
- Help areas where incidents occur more frequently set up environmental watch programs (like crime watch programs).
- Train volunteers to notice and report the presence and suspected source of an observed pollutant to the appropriate public agency.

What constitutes a "non-stormwater" discharge?

- Non-stormwater discharges are discharges not made up entirely of stormwater and include water used directly in the manufacturing process (process wastewater), air conditioning condensate and coolant, non-contact cooling water, cooling equipment condensate, outdoor secondary containment water, vehicle and equipment wash water, landscape irrigation, sink and drinking fountain wastewater, sanitary wastes, or other wastewaters.

Permit Requirements

- Current municipal NPDES permits require municipalities to effectively prohibit non-stormwater discharges unless authorized by a separate NPDES permit or allowed in accordance with the current NPDES permit conditions. Typically the current permits allow certain non-stormwater discharges in the storm drain system as long as the discharges are not significant sources of pollutants. In this context the following non-stormwater discharges are typically allowed:
  - Diverted stream flows;
  - Rising found waters;
  - Uncontaminated ground water infiltration (as defined at 40 CFR 35.2005(20));
  - Uncontaminated pumped ground water;
  - Foundation drains;
  - Springs;
  - Water from crawl space pumps;
  - Footing drains;
  - Air conditioning condensation;
  - Flows from riparian habitats and wetlands;
  - Water line and hydrant flushing ;
  - Landscape irrigation;
  - Planned and unplanned discharges from potable water sources;
  - Irrigation water;
  - Individual residential car washing; and
  - Lawn watering.

Municipal facilities subject to industrial general permit requirements must include a certification that the stormwater collection system has been tested or evaluated for the presence

of non-stormwater discharges. The state's General Industrial Stormwater Permit requires that non-stormwater discharges be eliminated prior to implementation of the facility's SWPPP.

Storm Drain Stenciling

- Stencil storm drain inlets with a message to prohibit illegal dumpings, especially in areas with waste handling facilities.
- Encourage public reporting of improper waste disposal by a HOTLINE number stenciled onto the storm drain inlet.
- See Supplemental Information section of this fact sheet for further detail on stenciling program approach.

Oil Recycling

- Contract collection and hauling of used oil to a private licensed used oil hauler/recycler.
- Comply with all applicable state and federal regulations regarding storage, handling, and transport of petroleum products.
- Create procedures for collection such as; collection locations and schedule, acceptable containers, and maximum amounts accepted.
- The California Integrated Waste Management Board has a Recycling Hotline, (800) 553-2962, that provides information and recycling locations for used oil.

Household Hazardous Waste

- Provide household hazardous waste (HHW) collection facilities. Several types of collection approaches are available including permanent, periodic, or mobile centers, curbside collection, or a combination of these systems.

Training

- Train municipal employees and contractors in proper and consistent methods for waste disposal.
- Train municipal employees to recognize and report illegal dumping.
- Train employees and subcontractors in proper hazardous waste management.

Spill Response and Prevention

- Refer to SC-11, Spill Prevention, Control & Cleanup
- Have spill cleanup materials readily available and in a known location.
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.

Other Considerations

- Federal Regulations (RCRA, SARA, CERCLA) and state regulations exist regarding the disposal of hazardous waste.
- Municipalities are required to have a used oil recycling element and a HHW element within their integrated waste management plan.
- Significant liability issues are involved with the collection, handling, and disposal of HHW.

Examples

The City of Palo Alto has developed a public participation program for reporting dumping violations. When a concerned citizen or public employee encounters evidence of illegal dumping, a door hanger (similar in format to hotel "Do Not Disturb" signs) is placed on the front doors in the neighborhood. The door hanger notes that a violation has occurred in the neighborhood, informs the reader why illegal dumping is a problem, and notes that illegal dumping carries a significant financial penalty. Information is also provided on what citizens can do as well as contact numbers for more information or to report a violation.

The Port of Long Beach has a state of the art database incorporating storm drain infrastructure, potential pollutant sources, facility management practices, and a pollutant tracking system.

The State Department of Fish and Game has a hotline for reporting violations called CalTIP (1-800-952-5400). The phone number may be used to report any violation of a Fish and Game code (illegal dumping, poaching, etc.).

The California Department of Toxic Substances Control's Waste Alert Hotline, 1-800-69TOXIC, can be used to report hazardous waste violations.

References and Resources

http://www.stormwatercenter.net/

California's Nonpoint Source Program Plan http://www.co.clark.wa.us/pubworks/bmpman.pdf

King County Stormwater Pollution Control Manual - http://dnr.metrokc.gov/wlr/dss/spcm.htm

Orange County Stormwater Program,
http://www.ocwatersheds.com/stormwater/swp_introduction.asp

San Diego Stormwater Co-permittees Jurisdictional Urban Runoff Management Program (http://www.projectcleanwater.org)

Santa Clara Valley Urban Runoff Pollution Prevention Program
http://www.scvurppp-w2k.com/pdf%20documents/PS_ICID.PDF

Spill Prevention, Control & Cleanup SC-11

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Description

Spills and leaks, if not properly controlled, can adversely impact the storm drain system and receiving waters. Due to the type of work or the materials involved, many activities that occur either at a municipal facility or as a part of municipal field programs have the potential for accidental spills and leaks. Proper spill response planning and preparation can enable municipal employees to effectively respond to problems when they occur and minimize the discharge of pollutants to the environment.

Targeted Constituents

Sediment	
Nutrients	☑
Trash	
Metals	☑
Bacteria	
Oil and Grease	☑
Organics	☑
Oxygen Demanding	☑

Approach

- An effective spill response and control plan should include:
  - Spill/leak prevention measures;
  - Spill response procedures;
  - Spill cleanup procedures;
  - Reporting; and
  - Training
- A well thought out and implemented plan can prevent pollutants from entering the storm drainage system and can be used as a tool for training personnel to prevent and control future spills as well.

Pollution Prevention

- Develop and implement a Spill Prevention Control and Response Plan. The plan should include:

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- A description of the facility, the address, activities and materials involved
- Identification of key spill response personnel
- Identification of the potential spill areas or operations prone to spills/leaks
- Identification of which areas should be or are bermed to contain spills/leaks
- Facility map identifying the key locations of areas, activities, materials, structural BMPs, etc.
- Material handling procedures
- Spill response procedures including:
    - Assessment of the site and potential impacts
    - Containment of the material
    - Notification of the proper personnel and evacuation procedures
    - Clean up of the site
    - Disposal of the waste material and
    - Proper record keeping

- Product substitution – use less toxic materials (i.e. use water based paints instead of oil based paints)
- Recycle, reclaim, or reuse materials whenever possible. This will reduce the amount of materials that are brought into the facility or into the field.

Suggested Protocols

Spill/Leak Prevention Measures

- If possible, move material handling indoors, under cover, or away from storm drains or sensitive water bodies.
- Properly label all containers so that the contents are easily identifiable.
- Berm storage areas so that if a spill or leak occurs, the material is contained.
- Cover outside storage areas either with a permanent structure or with a seasonal one such as a tarp so that rain can not come into contact with the materials.
- Check containers (and any containment sumps) often for leaks and spills. Replace containers that are leaking, corroded, or otherwise deteriorating with containers in good condition. Collect all spilled liquids and properly dispose of them.

- Store, contain and transfer liquid materials in such a manner that if the container is ruptured or the contents spilled, they will not discharge, flow or be washed into the storm drainage system, surface waters, or groundwater.
- Place drip pans or absorbent materials beneath all mounted taps and at all potential drip and spill locations during the filling and unloading of containers. Any collected liquids or soiled absorbent materials should be reused/recycled or properly disposed of.
- For field programs, only transport the minimum amount of material needed for the daily activities and transfer materials between containers at a municipal yard where leaks and spill are easier to control.
- If paved, sweep and clean storage areas monthly, do not use water to hose down the area unless all of the water will be collected and disposed of properly.
- Install a spill control device (such as a tee section) in any catch basins that collect runoff from any storage areas if the materials stored are oil, gas, or other materials that separate from and float on water. This will allow for easier cleanup if a spill occurs.
- If necessary, protect catch basins while conducting field activities so that if a spill occurs, the material will be contained.

Training

- Educate employees about spill prevention, spill response and cleanup on a routine basis.
- Well-trained employees can reduce human errors that lead to accidental releases or spills:
  - The employees should have the tools and knowledge to immediately begin cleaning up a spill if one should occur.
  - Employees should be familiar with the Spill Prevention Control and Countermeasure Plan if one is available.
- Training of staff from all municipal departments should focus on recognizing and reporting potential or current spills/leaks and who they should contact.
- Employees responsible for aboveground storage tanks and liquid transfers for large bulk containers should be thoroughly familiar with the Spill Prevention Control and Countermeasure Plan and the plan should be readily available.

Spill Response and Prevention

- Identify key spill response personnel and train employees on who they are.
- Store and maintain appropriate spill cleanup materials in a clearly marked location near storage areas; and train employees to ensure familiarity with the site's spill control plan and/or proper spill cleanup procedures.
- Locate spill cleanup materials, such as absorbents, where they will be readily accessible (e.g. near storage and maintenance areas, on field trucks).

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- Follow the Spill Prevention Control and Countermeasure Plan if one is available.
- If a spill occurs, notify the key spill response personnel immediately. If the material is unknown or hazardous, the local fire department may also need to be contacted.
- If safe to do so, attempt to contain the material and block the nearby storm drains so that the area impacted is minimized. If the material is unknown or hazardous wait for properly trained personnel to contain the materials.
- Perform an assessment of the area where the spill occurred and the downstream area that it could impact. Relay this information to the key spill response and clean up personnel.

Spill Cleanup Procedures

- Small non-hazardous spills
  - Use a rag, damp cloth or absorbent materials for general clean up of liquids
  - Use brooms or shovels for the general clean up of dry materials
  - If water is used, it must be collected and properly disposed of. The wash water can not be allowed to enter the storm drain.
  - Dispose of any waste materials properly
  - Clean or dispose of any equipment used to clean up the spill properly
- Large non-hazardous spills
  - Use absorbent materials for general clean up of liquids
  - Use brooms, shovels or street sweepers for the general clean up of dry materials
  - If water is used, it must be collected and properly disposed of. The wash water can not be allowed to enter the storm drain.
  - Dispose of any waste materials properly
  - Clean or dispose of any equipment used to clean up the spill properly
- For hazardous or very large spills, a private cleanup company or Hazmat team may need to be contacted to assess the situation and conduct the cleanup and disposal of the materials.
- Chemical cleanups of material can be achieved with the use of absorbents, gels, and foams. Remove the adsorbent materials promptly and dispose of according to regulations.
- If the spilled material is hazardous, then the used cleanup materials are also hazardous and must be sent to a certified laundry (rags) or disposed of as hazardous waste.

Reporting

- Report any spills immediately to the identified key municipal spill response personnel.

- Report spills in accordance with applicable reporting laws. Spills that pose an immediate threat to human health or the environment must be reported immediately to the Office of Emergency Service (OES)
- Spills that pose an immediate threat to human health or the environment may also need to be reported within 24 hours to the Regional Water Quality Control Board.
- Federal regulations require that any oil spill into a water body or onto an adjoining shoreline be reported to the National Response Center (NRC) at 800-424-8802 (24 hour)
- After the spill has been contained and cleaned up, a detailed report about the incident should be generated and kept on file (see the section on Reporting below). The incident may also be used in briefing staff about proper procedures

Other Considerations

- State regulations exist for facilities with a storage capacity of 10,000 gallons or more of petroleum to prepare a Spill Prevention Control and Countermeasure Plan (SPCC) Plan (Health & Safety Code Chapter 6.67).
- State regulations also exist for storage of hazardous materials (Health & Safety Code Chapter 6.95), including the preparation of area and business plans for emergency response to the releases or threatened releases.
- Consider requiring smaller secondary containment areas (less than 200 sq. ft.) to be connected to the sanitary sewer, if permitted to do so, prohibiting any hard connections to the storm drain.

Requirements

Costs

- Will vary depending on the size of the facility and the necessary controls.
- Prevention of leaks and spills is inexpensive. Treatment and/or disposal of wastes, contaminated soil and water is very expensive

Maintenance

- This BMP has no major administrative or staffing requirements. However, extra time is needed to properly handle and dispose of spills, which results in increased labor costs

Supplemental Information

Further Detail of the BMP

Reporting

Record keeping and internal reporting represent good operating practices because they can increase the efficiency of the response and containment of a spill. A good record keeping system helps the municipality minimize incident recurrence, correctly respond with appropriate containment and cleanup activities, and comply with legal requirements.

A record keeping and reporting system should be set up for documenting spills, leaks, and other discharges, including discharges of hazardous substances in reportable quantities. Incident records describe the quality and quantity of non-stormwater discharges to the storm drain.

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These records should contain the following information:

- Date and time of the incident
- Weather conditions
- Duration of the spill/leak/discharge
- Cause of the spill/leak/discharge
- Response procedures implemented
- Persons notified
- Environmental problems associated with the spill/leak/discharge

Separate record keeping systems should be established to document housekeeping and preventive maintenance inspections, and training activities. All housekeeping and preventive maintenance inspections should be documented. Inspection documentation should contain the following information:

- The date and time the inspection was performed
- Name of the inspector
- Items inspected
- Problems noted
- Corrective action required
- Date corrective action was taken

Other means to document and record inspection results are field notes, timed and dated photographs, videotapes, and drawings and maps.

Examples

The City of Palo Alto includes spill prevention and control as a major element of its highly effective program for municipal vehicle maintenance shops.

References and Resources

King County Stormwater Pollution Control Manual - http://dnr.metrokc.gov/wlr/dss/spcm.htm

Orange County Stormwater Program
http://www.ocwatersheds.com/stormwater/swp_introduction.asp

San Diego Stormwater Co-permittees Jurisdictional Urban Runoff Management Program (URMP)
http://www.projectcleanwater.org/pdf/Model%20Program%20Municipal%20Facilities.pdf

Vehicle and Equipment Fueling SC-20

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize

Targeted Constituents

Sediment	
Nutrients	
Trash	☑
Metals	☑
Bacteria	
Oil and Grease	☑
Organics	☑
Oxygen Demanding	

Description

Spills and leaks that occur during vehicle and equipment fueling can contribute hydrocarbons, oil and grease, as well as heavy metals to stormwater runoff. Implementing the following management practices can help prevent fuel spills and leaks.

Approach

Reduce potential for pollutant discharge through source control pollution prevention and BMP implementation. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives.

Pollution Prevention

- Use properly maintained offsite fueling stations whenever possible. These businesses are better equipped to handle fuel and spills properly.
- Educate employees about pollution prevention measures and goals
- Focus pollution prevention activities on containment of spills and leaks, most of which may occur during liquid transfers.

Suggested Protocols

General

- "Spot clean" leaks and drips routinely. Leaks are not cleaned up until the absorbent is picked up and disposed of properly.

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- Label drains within the facility boundary, by paint/stencil (or equivalent), to indicate whether they flow to an oil/water separator, directly to the sewer, or to a storm drain. Labels are not necessary for plumbing fixtures directly connected to the sanitary sewer but may be useful to help eliminate confusion about where the drain leads.
- Post signs to remind employees not to top off the fuel tank when filling and signs that ban employees from changing engine oil or other fluids at that location.
- Report leaking vehicles to fleet maintenance.
- Install inlet catch basin equipped with a small sedimentation basin or grit chamber to remove large particles from stormwater in highly impervious areas. Proper maintenance of these devices is necessary.
- Accumulated non-contaminated stormwater (e.g., in a secondary containment) should be released prior to next storm.
- Ensure the following safeguards are in place:
  - Overflow protection devices on tank systems to warn the operator to automatically shutdown transfer pumps when the tank reaches full capacity.
  - Protective guards around tanks and piping to prevent vehicle or forklift damage.
  - Clearly tagging or labeling all valves to reduce human error.
  - Automatic shut off for severed fuel hoses.

Fuel Dispensing Areas

- Maintain clean fuel-dispensing areas using dry cleanup methods such as sweeping for removal of litter and debris, or use of rags and absorbents for leaks and spills. Do not wash down areas with water.
- Fit underground storage tanks with spill containment and overfill prevention systems meeting the requirements of Section 2635(b) of Title 23 of the California Code of Regulations.
- Fit fuel dispensing nozzles with "hold-open latches" (automatic shutoffs) except where prohibited by local fire departments.
- Post signs at the fuel dispenser or fuel island warning vehicle owners/operators against "topping off" of vehicle fuel tanks.
- Design fueling area to prevent stormwater runoff and spills.
- Cover fueling area with an overhanging roof structure or canopy so that precipitation cannot come in contact with the fueling area and if possible use a perimeter drain or slope pavement inward with drainage to a blind sump (must be properly maintained and water properly disposed of); pave area with concrete rather than asphalt.

- Apply a suitable sealant that protects the asphalt from spilled fuels in areas where covering is infeasible and the fuel island is surrounded by pavement.
- Install vapor recovery nozzles to help control drips as well as air pollution.
- Use secondary containment when transferring fuel from the tank truck to the fuel tank.
- Cover storm drains in the vicinity during transfer.

Outdoor Waste Receptacle Area

- Spot clean leaks and drips routinely to prevent runoff of spillage.
- Minimize the possibility of stormwater pollution from outside waste receptacles by using an effective combination of the following:
  - use only watertight waste receptacle(s) and keep the lid(s) closed, or
  - grade and pave the waste receptacle area to prevent runon of stormwater, or
  - install a roof over the waste receptacle area, or
  - install a low containment berm around the waste receptacle area, or
  - use and maintain drip pans under waste receptacles. Containment areas and drip pans must be properly maintained and collected water disposed of properly (e.g., to sanitary sewer). Several drip pans should be stored in a covered location near outdoor waste receptacle area so that they are always available, yet protected from precipitation when not in use.
- Post "no littering" signs.

Air/Water Supply Area

- Minimize the possibility of stormwater pollution from air/water supply areas by implementing an effective combination of the following:
  - spot clean leaks and drips routinely to prevent runoff of spillage, or
  - grade and pave the air/water supply area to prevent runon of stormwater, or
  - install a roof over the air/water supply area, or
  - install a low containment berm around the air/water supply area. Maintain containment areas and dispose of contaminated water properly (e.g., to sanitary sewer).

Inspection

- Aboveground Tank Leak and Spill Control:
  - Check for external corrosion and structural failure.

- Check for spills and overfills due to operator error.
- Check for failure of piping system.
- Check for leaks or spills during pumping of liquids or gases from truck or rail car to a storage facility or vice versa.
- Visually inspect new tank or container installation for loose fittings, poor welding, and improper or poorly fitted gaskets.
- Inspect tank foundations, connections, coatings, and tank walls and piping system. Look for corrosion, leaks, cracks, scratches, and other physical damage that may weaken the tank or container system.
- Periodically, integrity testing should be conducted by a qualified professional.

- Inspect and clean, if necessary, storm drain inlets and catch basins within the facility boundary before October 1 each year.

Training

- Train all employees upon hiring and annually thereafter on proper methods for handling and disposing of waste. Make sure that all employees understand stormwater discharge prohibitions, wastewater discharge requirements, and these best management practices.
- Train employees on proper fueling and cleanup procedures.
- Use a training log or similar method to document training.
- Ensure that employees are familiar with the site's spill control plan and/or proper spill cleanup procedures.

Spill Response and Prevention

- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- Place stockpiles of spill cleanup materials where they are readily accessible.
- Use adsorbent materials on small spills and general cleaning rather than hosing down the area. Remove the adsorbent materials promptly and dispose properly.
- Store portable absorbent booms (long flexible shafts or barriers made of absorbent material) in unbermed fueling areas.
- Report spills promptly.
- Install an oil/water separator and connect to the sanitary sewer (if allowed), if a dead-end sump is not used to collect spills.

Other Considerations

- Carry out all federal and state requirements regarding underground storage tanks, or install above ground tanks.

Requirements

Costs

- The retrofitting of existing fueling areas to minimize stormwater exposure or spill runoff can be expensive. Good design must occur during the initial installation.
- Extruded curb along the "upstream" side of the fueling area to prevent stormwater runon is of modest cost.

Maintenance

- Clean oil/water separators at appropriate intervals.
- Keep ample supplies of spill cleanup materials onsite.
- Inspect fueling areas, storage tanks, catch basin inserts, containment areas, and drip pans on a regular schedule.

Supplemental Information

Design Considerations

Designing New Installations

The elements listed below should be included in the design and construction of new or substantially remodeled facilities.

Fuel Dispensing Areas

- Fuel dispensing areas must be paved with Portland cement concrete (or, equivalent smooth impervious surface), with a 2% to 4% slope to prevent ponding, and must be separated from the rest of the site by a grade break that prevents runon of stormwater to the extent practicable. The fuel dispensing area is defined as extending 6.5 feet from the corner of each fuel dispenser or the length at which the hose and nozzle assembly may be operated plus 1 foot, whichever is less. The paving around the fuel dispensing area may exceed the minimum dimensions of the "fuel dispensing area" stated above.
- The fuel dispensing area must be covered, and the cover's minimum dimensions must be equal to or greater than the area within the grade break or the fuel dispensing area, as defined above. The cover must not drain onto the fuel dispensing area.
- If necessary install and maintain an oil control device in the appropriate catch basin(s) to treat runoff from the fueling area.

Outdoor Waste Receptacle Area

- Grade and pave the outdoor waste receptacle area to prevent runon of stormwater to the extent practicable.

Air/Water Supply Area

- Grade and pave the air/water supply area to prevent runon of stormwater to the extent practicable.

SC-20 Vehicle and Equipment Fueling

Designated Fueling Area

- If your facility has large numbers of mobile equipment working throughout the site and you currently fuel them with a mobile fuel truck, consider establishing a designated fueling area. With the exception of tracked equipment such as bulldozers and perhaps small forklifts, most vehicles should be able to travel to a designated area with little lost time. Place temporary "caps" over nearby catch basins or manhole covers so that if a spill occurs it is prevented from entering the storm drain.

Examples

The Spill Prevention Control and Countermeasure (SPCC) Plan, which is required by law for some facilities, is an effective program to reduce the number of accidental spills and minimize contamination of stormwater runoff.

The City of Palo Alto has an effective program for commercial vehicle service facilities. Many of the program's elements, including specific BMP guidance and lists of equipment suppliers, are also applicable to industrial facilities.

References and Resources

Best Management Practice Guide for Retail Gasoline Outlets, California Stormwater Quality Task Force. 1997.

King County Stormwater Pollution Control Manual – http//www.dnr.metrokc.gov/wlr/dss/spcm.htm

Orange County Stormwater Program http://www.ocwatersheds.com/StormWater/swp_introduction.asp

San Diego Stormwater Co-permittees Jurisdictional Urban Runoff Management Program (URMP)

Vehicle and Equipment Cleaning SC-21

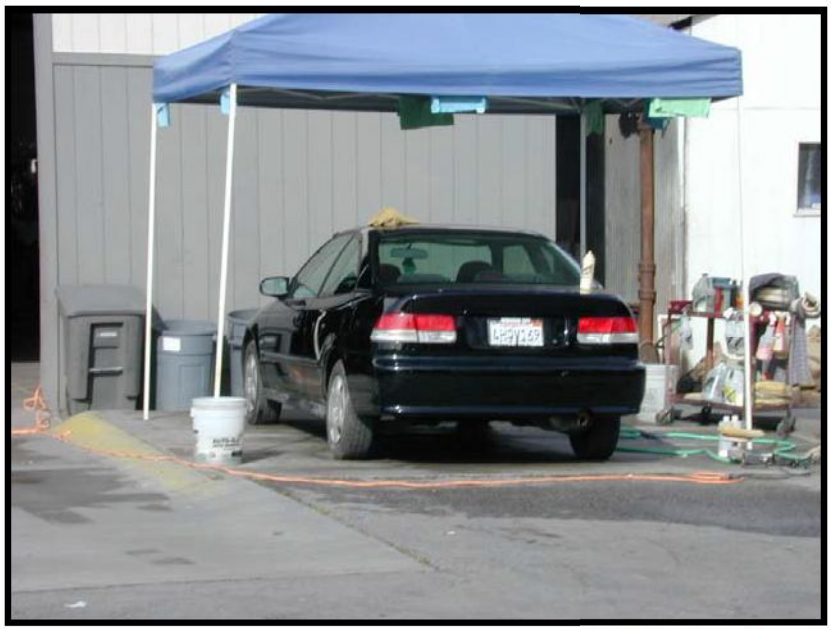

Photo Credit: Geoff Brosseau

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	
Oil and Grease	☑
Organics	☑
Oxygen Demanding	

Description

Wash water from vehicle and equipment cleaning activities performed outdoors or in areas where wash water flows onto the ground can contribute toxic hydrocarbons and other organic compounds, oils and greases, nutrients, phosphates, heavy metals, and suspended solids to stormwater runoff. Use of the procedures outlined below can prevent or reduce the discharge of pollutants to stormwater during vehicle and equipment cleaning.

Approach

Reduce potential for pollutant discharge through source control pollution prevention and BMP implementation. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives

Pollution Prevention

- If possible, use properly maintained off-site commercial washing and steam cleaning businesses whenever possible. These businesses are better equipped to handle and properly dispose of the wash waters.

- Good housekeeping practices can minimize the risk of contamination from wash water discharges.

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SC-21 Vehicle and Equipment Cleaning

Suggested Protocols

General

- Use biodegradable, phosphate-free detergents for washing vehicles as appropriate.
- Mark the area clearly as a wash area.
- Post signs stating that only washing is allowed in wash area and that discharges to the storm drain are prohibited.
- Provide a trash container in wash area.
- Map on-site storm drain locations to avoid discharges to the storm drain system.
- Emphasize the connection between the storm drain system and runoff and help reinforce that car washing activities can have an affect on local water quality. This can be accomplished through storm drain stenciling programs.

Vehicle and Equipment Cleaning

- Design wash areas to properly collect and dispose of wash water when engine cleaning is conducted and when chemical additives, solvents, or degreasers are used. This may include installation of sumps or drain lines to collect wash water or construction of a berm around the designated area and grading of the area to collect wash water as well as prevent stormwater run-on.
- Consider washing vehicles and equipment inside the building if washing/cleaning must occur on-site. This will help to control the targeted constituents by directing them to the sanitary sewer.
- If washing must occur on-site and outdoor:
  - Use designated paved wash areas. Designated wash areas must be well marked with signs indicating where and how washing must be done. This area must be covered or bermed to collect the wash water and graded to direct the wash water to a treatment or disposal facility.
  - Oil changes and other engine maintenance cannot be conducted in the designated washing area. Perform these activities in a place designated for such activities.
  - Cover the wash area when not in use to prevent contact with rain water.
- Use hoses with nozzles that automatically turn off when left unattended.
- Perform pressure cleaning and steam cleaning off-site to avoid generating runoff with high pollutant concentrations. If done on-site, no pressure cleaning and steam cleaning should be done in areas designated as wellhead protection areas for public water supply.

Disposal

- Consider filtering and recycling wash water.

- Discharge equipment wash water to the sanitary sewer, a holding tank, or a process treatment system, regardless of the washing method used.
- Discharge vehicle wash water to (1) the sanitary sewer, a holding tank, or process treatment system or (2) an enclosed recycling system.
- Discharge wash water to sanitary sewer only after contacting the local sewer authority to find out if pretreatment is required.

Training

- Train employees on proper cleaning and wash water disposal procedures and conduct "refresher" courses on a regular basis.
- Train staff on proper maintenance measures for the wash area.
- Train employees and contractors on proper spill containment and cleanup. The employee should have the tools and knowledge to immediately begin cleaning up a spill if one should occur.

Spill Response and Prevention

- Refer to SC-11, Spill Prevention, Control and Cleanup.
- Keep your Spill Prevention Control and Counter Measure (SPCC) Plan up-to-date, and implement accordingly.
- Have spill cleanup materials readily available and in a known location.
- Clean up spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.

Other Considerations (Limitations and Regulations)

- Some municipalities may require pretreatment and monitoring of wash water discharges to the sanitary sewer.
- Steam cleaning can generate significant pollutant concentrations requiring that careful consideration be given to the environmental impacts and compliance issues related to steam cleaning.
- Most car washing best management practices are inexpensive, and rely more on good housekeeping practices (where vehicles are washed, planning for the collection of wash water) than on expensive technology. However, the construction of a specialized area for vehicle washing can be expensive for municipal facilities. Also, for facilities that cannot recycle their wash water the cost of pre-treating wash water through either structural practices or planning for collection and hauling of contaminated water to sewage treatment plants can represent a cost limitation.

Requirements

Costs

- Capital costs vary depending on measures implemented

- Low cost ($500-1,000) for berm construction,
- Medium cost ($5,000-20,000) for plumbing modifications (including re-routing discharge to sanitary sewer and installing simple sump).
- High cost ($30,000-150,000) for on-site treatment and recycling.

- O&M costs increase with increasing capital investment.

Maintenance

- Berm repair and patching.
- Sweep washing areas frequently to remove solid debris.
- Inspect and maintain sumps, oil/water separators, and on-site treatment/recycling units.

Supplemental Information

Design Considerations

Designated Cleaning Areas

- Washing operations outside should be conducted in a designated wash area having the following characteristics:
  - Paved with Portland cement concrete,
  - Covered and bermed to prevent contact with stormwater and contain wash water,
  - Sloped for wash water collection,
  - Equipped with an oil/water separator, if necessary.

Examples

The City of Palo Alto has an effective program for commercial vehicle service facilities. Many of the program's elements, including specific BMP guidance and lists of equipment suppliers, are applicable to industrial vehicle service facilities.

The U.S. Postal Service in West Sacramento has a new vehicle wash system that collects, filters, and recycles the wash water.

References and Resources

http://www.stormwatercenter.net/

King County - ftp://dnr.metrokc.gov/wlr/dss/spcm/Chapter%203.PDF

Orange County Stormwater Program
http://www.ocwatersheds.com/StormWater/swp_introduction.asp

San Diego Stormwater Co-permittees Jurisdictional Urban Runoff Management Program (URMP)
http://www.projectcleanwater.org/pdf/Model%20Program%20Municipal%20Facilities.pdf

Vehicle and Equipment Repair SC-22

Photo Credit: Geoff Brosseau

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Description

Vehicle or equipment maintenance and repair is potentially a significant source of stormwater pollution, due to the use of materials and wastes created that are harmful to humans and the environment. Engine repair and service (e.g. parts cleaning), replacement of fluids (e.g. oil change), and outdoor equipment storage and parking (dripping engines) can impact water quality if stormwater runoff from areas with these activities occurring on them becomes polluted by a variety of contaminants. Implementation of the following activities will prevent or reduce the discharge of pollutants to stormwater from vehicle and equipment maintenance and repair activities.

Targeted Constituents

Sediment	
Nutrients	
Trash	
Metals	☑
Bacteria	
Oil and Grease	☑
Organics	☑
Oxygen Demanding	

Approach

Pollution Prevention

- Keep accurate maintenance logs to evaluate materials use.
- Switch to non-toxic chemicals for maintenance when possible.
- Choose cleaning agents that can be recycled.
- Minimize use of solvents. Clean parts without using solvents whenever possible.
- Keep an accurate, up-to-date inventory of materials.
- Recycle used motor oil, diesel oil, and other vehicle fluids and parts whenever possible.

Suggested Protocols

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SC-22 Vehicle and Equipment Repair

General

- Move maintenance and repair activities indoors whenever feasible.
- Store idle equipment containing fluids under cover.
- Use a vehicle maintenance area designed to prevent stormwater pollution - minimize contact of stormwater with outside operations through berming and appropriate drainage routing.
- Avoid hosing down your work areas. If work areas are washed, collect and direct wash water to sanitary sewer.
- Paint signs on storm drain inlets to indicate that they are not to receive liquid or solid wastes.
- Post signs at sinks to remind employees, not to pour hazardous wastes down drains.
- Clean yard storm drain inlets(s) regularly.
- Do not pour materials down drains or hose down work areas; use dry sweeping.
- Cover the work area so as to limit exposure to the rain
- Place curbs around the immediate boundaries of the process equipment.
- Build a shed or temporary roof over areas where you park cars awaiting repair or salvage, especially if you handle wrecked vehicles. Build a roof over vehicles you keep for parts.

Material and Waste Handling

- Store materials and wastes under cover whenever possible.
- Designate a special area to drain and replace motor oil, coolant, and other fluids. This area should not have any connections to the storm drain or the sanitary sewer and should allow for easy clean up of drips and spills.
- Drain all fluids from wrecked vehicles immediately. Ensure that the drain pan or drip pan is large enough to contain drained fluids (e.g. larger pans are needed to contain antifreeze, which may gush from some vehicles).
- Do not pour liquid waste to floor drains, sinks, outdoor storm drain inlets, or other storm drains or sewer connections.
- Do not dispose of used or leftover cleaning solutions, solvents, and automotive fluids and oil in the sanitary sewer.
- Dispose of all waste materials according to applicable laws and regulations.
- Collect leaking or dripping fluids in drip pans or containers. Fluids are easier to recycle if kept separate.

- Promptly transfer used fluids to the proper waste or recycling drums and store in an appropriately designed area that can contain spills. Don't leave drip pans or other open containers lying around.
- Do not dispose of oil filters in trash cans or dumpsters, which may leak oil and contaminate stormwater. Place the oil filter in a funnel over a waste oil recycling drum to drain excess oil before disposal. Most municipalities prohibit or discourage disposal of these items in solid waste facilities. Oil filters can also be recycled. Ask your oil supplier or recycler about recycling oil filters.
- Store cracked and/or dead batteries in a non-leaking covered secondary container and dispose of properly at recycling or household hazardous waste facilities..

Maintenance and Repair Activities

- Provide a designated area for vehicle maintenance.
- Keep equipment clean, don't allow excessive build-up of oil and grease.
- If temporary work is being conducted outside: Use a tarp, ground cloth, or drip pans beneath the vehicle or equipment to capture all spills and drips., The collected drips and spills must be disposed, reused, or recycled properly.
- If possible, perform all vehicle fluid removal or changing inside or under cover to prevent the runon of stormwater and the runoff of spills:
  - Keep a drip pan under the vehicle while you unclip hoses, unscrew filters, or remove other parts. Use a drip pan under any vehicle that might leak while you work on it to keep splatters or drips off the shop floor.
  - Promptly transfer used fluids to the proper waste or recycling drums. Don't leave drip pans or other open containers lying around.
  - Keep drip pans or containers under vehicles or equipment that might drip during repairs.
  - Do not change motor oil or perform equipment maintenance in non-appropriate areas.
- If equipment (e.g., radiators, axles) is to be stored outdoors, oil and other fluids should be drained first. This is also applicable to vehicles being stored and not used on a regular basis.
- Monitor parked vehicles closely for leaks and place pans under any leaks to collect the fluids for proper disposal or recycling.

Parts Cleaning

- Clean vehicle parts without using liquid cleaners wherever possible to reduce waste.
- Do all liquid cleaning at a centralized station so the solvents and residues stay in one area.

- Discharge wastewater generated from steam cleaning and pressure washing to an appropriate treatment control that is connected to a blind sump. Non-caustic detergents should be used instead of caustic cleaning agents, detergent-based or water-based cleaning systems in place of organic solvent degreasers, and non-chlorinated solvent in place of chlorinated organic solvents for parts cleaning. Refer to SC-21 for more information on steam cleaning.

- Locate drip pans, drain boards, and drying racks to direct drips back into a solvent sink or fluid holding tank for reuse.

Inspection

- Regularly inspect vehicles and equipment for leaks, and repair immediately.

- Make sure incoming vehicles are checked for leaking oil and fluids. Apply controls accordingly.

Training

- Train employees and contractors in the proper handling and disposal of engine fluids and waste materials.

- Ensure that employees are familiar with the site's spill control plan and/or proper spill cleanup procedures (You can use reusable cloth rags to clean up small drips and spills instead of disposables; these can be washed by a permitted industrial laundry. Do not clean them at home or at a coin-operated laundry business). The employee should have the tools and knowledge to immediately begin cleaning up a spill if one should occur.

- Use a training log or similar method to document training.

Spill Response and Prevention

- Refer to SC-11 Spill Prevention, Control & Cleanup for more information.

- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date, and implement accordingly.

- Place adequate stockpiles of spill cleanup materials where they are readily accessible.

- Clean leaks, drips, and other spills with as little water as possible. Use rags for small spills, a damp mop for general cleanup, and dry absorbent material for larger spills. Use the following three-step method for cleaning floors:

  - Clean spills with rags or other absorbent materials

  - Sweep floor using dry absorbent material

  - Mop the floor. Mop water may be discharged to the sanitary sewer via a toilet or sink.

- Remove absorbent materials used for cleaning small spills promptly and properly.

- Do not saturate rags or absorbent material to eliminate need for disposal of spilled material as hazardous waste.

Other Considerations

- Space and time limitations may preclude all work being conducted indoors.
- It may not be possible to contain and clean up spills from vehicles/equipment brought onsite after working hours.
- Drain pans (usually 1 ft. x 1 ft.) are generally too small to contain antifreeze, so drip pans (3 ft. x 3 ft.) may have to be purchased or fabricated.
- Identification of engine leaks may require some use of solvents, which may require disposal as hazardous waste.
- Installation of structural treatment practices for pretreatment controls of wastewater discharges can be expensive.
- Prices for recycled materials and fluids may be higher than those of non-recycled materials.
- Some facilities can be limited by a lack of providers of recycled materials, and by the absence of businesses to provide services such as hazardous waste removal, structural treatment practice maintenance or solvent equipment and solvent recycling.

Requirements

Costs

- Should be low, but will vary depending on the size of the facility.

Maintenance

- Sweep the maintenance area weekly, if it is paved, to collect loose particles, and wipe up spills with rags and other absorbent material immediately, do not hose down the area to a storm drain.

Supplemental Information

Further Detail of the BMP

Recycling

Separating wastes allows for easier recycling and may reduce treatment costs. Keep hazardous and non-hazardous wastes separate, do not mix used oil and solvents, and keep chlorinated solvents (e.g., 1,1,1-trichloroethane) separate from non-chlorinated solvents (e.g., kerosene and mineral spirits).

Many products made of recycled (i.e., refined or purified) materials are available. Engine oil, transmission fluid, antifreeze, and hydraulic fluid are available in recycled form. Buying recycled products supports the market for recycled materials.

- Recycling is always preferable to disposal of unwanted materials.
- Separate wastes for easier recycling. Keep hazardous and non-hazardous wastes separate, do not mix used oil and solvents, and keep chlorinated solvents separate from non-chlorinated solvents.
- Label and track the recycling of waste material (e.g. used oil, spent solvents, batteries).

- Purchase recycled products to support the market for recycled materials.

Safer Alternatives

If possible, eliminate or reduce the amount of hazardous materials and waste by substituting non-hazardous or less hazardous material:

- Use non-caustic detergents instead of caustic cleaning for parts cleaning.
- Use detergent-based or water-based cleaning systems in place of organic solvent degreasers. Wash water may require treatment before it can be discharged to the sewer.
- Replace chlorinated organic solvents with non-chlorinated solvents. Non-chlorinated solvents like kerosene or mineral spirits are less toxic and less expensive to dispose of properly. Check list of active ingredients to see whether it contains chlorinated solvents.
- Choose cleaning agents that can be recycled.
- Refer to SC-61 Safer Alternative Products fact sheet for more information.

References and Resources

DTSC Doc. No. 619a Switching to Water Based Cleaners

DTSC Doc. No. 621 http://www.stormwatercenter.net/

King County - ftp://dnr.metrokc.gov/wlr/dss/spcm/Chapter%203.PDF

Model Urban Runoff Program: A How-To-Guide for Developing Urban Runoff Programs for Small Municipalities. Prepared by City of Monterey, City of Santa Cruz, California Coastal Commission, Monterey Bay National Marine Sanctuary, Association of Monterey Bay Area Governments, Woodward-Clyde, Central Coast Regional Water Quality Control Board. July 1998 (Revised February 2002 by the California Coastal Commission).

Orange County Stormwater Program
http://www.ocwatersheds.com/StormWater/swp_introduction.asp

San Diego Stormwater Co-permittees Jurisdictional Urban Runoff Management Program (URMP) -
http://www.projectcleanwater.org/pdf/Model%20Program%20Municipal%20Facilities.pdf

Outdoor Loading/Unloading SC-30

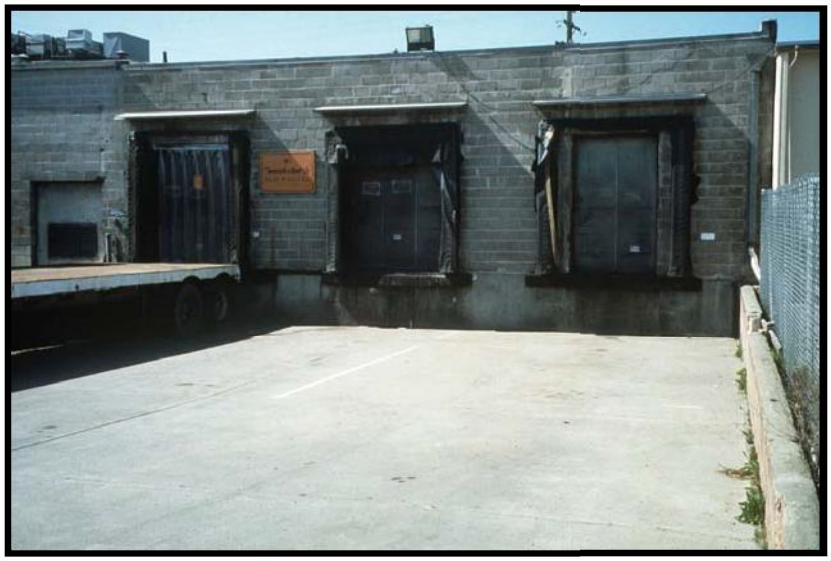

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Description

The loading/unloading of materials usually takes place outside on docks or terminals; therefore, materials spilled, leaked, or lost during loading/unloading may collect in the soil or on other surfaces and have the potential to be carried away by stormwater runoff or when the area is cleaned. Additionally, rainfall may wash pollutants from machinery used to unload or move materials. Loading and unloading of material may include package products, barrels, and bulk products. Implementation of the following protocols will prevent or reduce the discharge of pollutants to stormwater from outdoor loading/unloading of materials.

Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	
Metals	☑
Bacteria	
Oil and Grease	☑
Organics	☑
Oxygen Demanding	☑

Approach

Pollution Prevention

- Keep accurate maintenance logs to evaluate materials removed and improvements made.
- Park tank trucks or delivery vehicles in designated areas so that spills or leaks can be contained.
- Limit exposure of materials with the potential to contaminate stormwater.
- Prevent stormwater runon.
- Regularly check equipment for leaks.

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Suggested Protocols

Loading and Unloading – General Guidelines

- Develop an operations plan that describes procedures for loading and/or unloading.
- Do not conduct loading and unloading during wet weather, whenever possible.
- Cover designated loading/unloading areas to reduce exposure of materials to rain.
- A seal or door skirt between delivery vehicles and building can reduce or prevent exposure to rain.
- Design loading/unloading area to prevent stormwater runon which would include grading or berming the area, and positioning roof downspouts so they direct stormwater away from the loading/unloading areas.
- If feasible, load and unload all materials and equipment in covered areas such as building overhangs at loading docks.
- Load/unload only at designated loading areas.
- Use drip pans underneath hose and pipe connections and other leak-prone spots during liquid transfer operations, and when making and breaking connections. Several drip pans should be stored in a covered location near the liquid transfer area so that they are always available, yet protected from precipitation when not in use. Drip pans can be made specifically for railroad tracks. Drip pans must be cleaned periodically, and drip collected materials must be disposed of properly.
- Pave loading areas with concrete instead of asphalt.
- Avoid placing storm drains in the area.
- Grade and/or berm he loading/ unloading area to a drain that is connected to a dead-end sump.

Inspection

- Check loading and unloading equipment regularly for leaks, including valves, pumps, flanges and connections.
- Look for dust or fumes during loading or unloading operations.

Training

- Train employees (e.g. fork lift operators) and contractors on proper spill containment and cleanup.
- Employees trained in spill containment and cleanup should be present during the loading/unloading.
- Train employees in proper handling techniques during liquid transfers to avoid spills.

- Make sure forklift operators are properly trained on loading and unloading procedures.

Spill Response and Prevention

- Refer to SC-11, Spill Prevention, Control & Cleanup
- Keep your spill prevention Control and countermeasure (SPCC) Plan up-to-date, and implement accordingly.
- Have spill cleanup materials readily available and in a known location.
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.

Other Considerations

- Space, material characteristics and/or time limitations may preclude all transfers from being performed indoors or under cover.

Requirements

Costs

- Should be low except when covering a large loading/unloading area.

Maintenance

- Conduct regular inspections and make repairs as necessary. The frequency of repairs will depend on the age of the facility.
- Check loading and unloading equipment regularly for leaks.
- Regular broom dry-sweeping of area.
- Conduct major clean-out of loading and unloading area and sump prior to October 1 of each year.

Supplemental Information

Further Detail of the BMP

Special Circumstances for Indoor Loading/Unloading of Materials

As appropriate loading or unloading of liquids should occur indoors so that any spills that are not completely retained can be discharged to the sanitary sewer, treatment plant, or treated in a manner consistent with local sewer authorities and permit requirements.

- For loading and unloading tank trucks to above and below ground storage tanks, the following procedures should be used:
  - The area where the transfer takes place should be paved. If the liquid is reactive with the asphalt, Portland cement should be used to pave the area.
  - Transfer area should be designed to prevent runon of stormwater from adjacent areas. Sloping the pad and using a curb, like a speed bump, around the uphill side of the transfer area should reduce run-on.

- Transfer area should be designed to prevent runoff of spilled liquids from the area. Sloping the area to a drain should prevent runoff. The drain should be connected to a dead-end sump or to the sanitary sewer (if allowed). A positive control valve should be installed on the drain.

- For transfer from rail cars to storage tanks that must occur outside, use the following procedures:
  - Drip pans should be placed at locations where spillage may occur, such as hose connections, hose reels, and filler nozzles, Use drip pans when making and breaking connections.
  - Drip pan systems should be installed between the rails to collect spillage from tank cars.

References and Resources

http://www.stormwatercenter.net/

King County - ftp://dnr.metrokc.gov/wlr/dss/spcm/Chapter%203.PDF

Orange County Stormwater Program
http://www.ocwatersheds.com/StormWater/swp_introduction.asp

San Diego Stormwater Co-permittees Jurisdictional Urban Runoff Management Program (URMP) -
http://www.projectcleanwater.org/pdf/Model%20Program%20Municipal%20Facilities.pdf

Outdoor Container Storage SC-31

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Description

Accidental releases of materials from above ground liquid storage tanks, drums, and dumpsters present the potential for contaminating stormwaters with many different pollutants. Tanks may store many potential stormwater runoff pollutants, such as gasoline, aviation gas, diesel fuel, ammonia, solvents, syrups, etc. Materials spilled, leaked, or lost from storage tanks may accumulate in soils or on other surfaces and be carried away by rainfall runoff. These source controls apply to containers located outside of a building used to temporarily store liquid materials and include installing safeguards against accidental releases, installing secondary containment, conducting regular inspections, and training employees in standard operating procedures and spill cleanup techniques.

Targeted Constituents

Sediment	
Nutrients	☑
Trash	
Metals	☑
Bacteria	
Oil and Grease	☑
Organics	☑
Oxygen Demanding	☑

Approach

Pollution Prevention

- Educate employees about pollution prevention measures and goals
- Keep an accurate, up-to-date inventory of the materials delivered and stored on-site. Re-evaluate inventory needs and consider purchasing alternative products. Properly dispose of outdated products.
- Try to keep chemicals in their original containers, and keep them well labeled.

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Suggested Protocols

General

- Develop an operations plan that describes procedures for loading and/or unloading. Refer to SC-30 Outdoor Loading/Unloading for more detailed BMP information pertaining to loading and unloading of liquids.
- Protect materials from rainfall, runon, runoff, and wind dispersal:
  - Cover the storage area with a roof.
  - Minimize stormwater runon by enclosing the area or building a berm around it.
  - Use a "doghouse" structure for storage of liquid containers.
  - Use covered dumpsters for waste product containers.
- Employ safeguards against accidental releases:
  - Provide overflow protection devices to warn operator or automatic shut down transfer pumps.
  - Provide protection guards (bollards) around tanks and piping to prevent vehicle or forklift damage, and
  - Provide clear tagging or labeling, and restricting access to valves to reduce human error.
- Berm or surround tank or container with secondary containment system using dikes, liners, vaults, or double walled tanks.
- Contact the appropriate regulatory agency regarding environmental compliance for facilities with "spill ponds" designed to intercept, treat, and/or divert spills.
- Have registered and specifically trained professional engineers can identify and correct potential problems such as loose fittings, poor welding, and improper or poorly fitted gaskets for newly installed tank systems.

Storage Areas

- Provide storage tank piping located below product level with a shut-off valve at the tank; ideally this valve should be an automatic shear valve with the shut-off located inside the tank.
- Provide barriers such as posts or guard rails, where tanks are exposed, to prevent collision damage with vehicles.
- Provide secure storage to prevent vandalism.
- Place tight-fitting lids on all containers.
- Enclose or cover the containers where they are stored.

- Raise the containers off the ground by use of pallet or similar method, with provisions for spill control and secondary containment.
- Contain the material in such a manner that if the container leaks or spills, the contents will not discharge, flow, or be washed into the storm drainage system, surface waters or groundwater.
- Place drip pans or absorbent materials beneath all mounted container taps, and at all potential drip and spill locations during filling and unloading of containers. Drip pans must be cleaned periodically, and all collected liquids and soiled absorbent materials must be reused/recycled or properly disposed.
- Ensure that any underground or aboveground storage tanks shall be designed and managed in accordance with applicable regulations, be identified as a potential pollution source, have secondary containment, such as a berm or dike with an impervious surface.
- Rainfall collected in secondary containment system must not contain pollutants for discharge to storm drain system.

Container Management

- Keep containers in good condition without corrosion or leaky seams.
- Place containers in a lean-to structure or otherwise covered to keep rainfall from reaching the drums.
- Replace containers if they are deteriorating to the point where leakage is occurring. Keep all containers undercover to prevent the entry of stormwater. Employees should be made aware of the importance of keeping the containers free from leaks.
- Keep waste container drums in an area such as a service bay. Drums stored outside must be stored in a lean-to type structure, shed or walk-in container.

Storage of Hazardous Materials

- Storage of reactive, ignitable, or flammable liquids must comply with the fire and hazardous waste codes.
- Place containers in a designated area that is paved, free of cracks and gaps, and impervious in order to contain leaks and spills. The area should also be covered.
- Surround stored hazardous materials and waste with a curb or dike to provide the volume to contain 10 percent of the volume of all of the containers or 110 percent of the volume of the largest container, whichever is greater. The area inside the curb should slope to a drain and a dead-end sump should be installed in the drain.

Inspection

- Provide regular inspections:
  - Inspect storage areas regularly for leaks or spills.

- Conduct routine inspections and check for external corrosion of material containers. Also check for structural failure, spills and overfills due to operator error, failure of piping system.
- Check for leaks or spills during pumping of liquids or gases from truck or rail car to a storage facility or vice versa.
- Visually inspect new tank or container installations for loose fittings, poor welding, and improper or poorly fitted gaskets.
- Inspect tank foundations, connections, coatings, and tank walls and piping system. Look for corrosion, leaks, cracks, scratches, and other physical damage that may weaken the tank or container system.
- Replace containers that are leaking, corroded, or otherwise deteriorating with ones in good condition. If the liquid chemicals are corrosive, containers made of compatible materials must be used instead of metal drums.
- Label new or secondary containers with the product name and hazards.

Training

- Train employees (e.g. fork lift operators) and contractors in proper spill containment and cleanup. The employee should have the tools and knowledge to immediately begin cleaning up a spill if one should occur.
- Train employees in proper storage measures.
- Use a training log or similar method to document training.

Spill Response and Prevention

- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date, and implement accordingly.
- Have an emergency plan, equipment and trained personnel ready at all times to deal immediately with major spills.
- Collect all spilled liquids and properly dispose of them.
- Employees trained in emergency spill cleanup procedures should be present when dangerous waste, liquid chemicals, or other wastes are delivered.
- Operator errors can be prevented by using engineering safe guards and thus reducing accidental releases of pollutant.
- Store and maintain appropriate spill cleanup materials in a location known to all near the tank storage area.
- See Aboveground Tank Leak and Spill Control section of the Spill Prevention, Control & Cleanup fact sheet (SC-11) for additional information.

Other Considerations

- Storage sheds often must meet building and fire code requirements.
- The local fire district must be consulted for limitations on clearance of roof covers over containers used to store flammable materials.
- All specific standards set by federal and state laws concerning the storage of oil and hazardous materials must be met.
- Storage of reactive, ignitable, or flammable liquids should comply with the Uniform Fire Code and the National Electric Code.
- Storage of oil and hazardous materials must meet specific federal and state standards including:
  - Spill Prevention Control and Countermeasure Plan (SPCC) Plan
  - Secondary containment
  - Integrity and leak detection monitoring
  - Emergency preparedness plans

Requirements

Costs

- Will vary depending on the size of the facility and the necessary controls, such as berms or safeguards against accidental controls.

Maintenance

- Conduct weekly inspection.
- Sweep and clean the storage area regularly if it is paved, do not hose down the area to a storm drain.

Supplemental Information

- The most common causes of unintentional releases are:
  - Installation problems,
  - Failure of piping systems (pipes, pumps, flanges, couplings, hoses, and valves),
  - External corrosion and structural failure,
  - Spills and overfills due to operator error, and
  - Leaks during pumping of liquids or gases from truck or rail car to a storage tank or vice versa

Further Detail of the BMP

Dikes

One of the best protective measures against contamination of stormwater is diking. Containment dikes are berms or retaining walls that are designed to hold spills. Diking is an effective pollution prevention measure for above ground storage tanks and railcar or tank truck loading and unloading areas. The dike surrounds the area of concern and holds the spill, keeping spill materials separated from the stormwater side of the dike area. Diking can be used in any industrial or municipal facility, but it is most commonly used for controlling large spills or releases from liquid storage areas and liquid transfer areas.

- For single-wall tanks, containment dikes should be large enough to hold the contents of the storage tank for the facility plus rain water.
- For trucks, diked areas should be capable of holding an amount equal to the volume of the tank truck compartment. Diked construction material should be strong enough to safely hold spilled materials.
- Dike materials can consist of earth, concrete, synthetic materials, metal, or other impervious materials.
- Strong acids or bases may react with metal containers, concrete, and some plastics.
- Where strong acids or bases or stored, alternative dike materials should be considered. More active organic chemicals may need certain special liners for dikes.
- Dikes may also be designed with impermeable materials to increase containment capabilities.
- Dikes should be inspected during or after significant storms or spills to check for washouts or overflows.
- Regular checks of containment dikes to insure the dikes are capable of holding spills should be conducted.
- Inability of a structure to retain stormwater, dike erosion, soggy areas, or changes in vegetation indicate problems with dike structures. Damaged areas should be patched and stabilized immediately.
- Accumulated stormwater in the containment are should be analyzed for pollutants before it is released to surface waters. If pollutants are found or if stormwater quality is not determined, then methods other than discharging to surface waters should be employed (e.g., discharge to sanitary sewer if allowed).
- Earthen dikes may require special maintenance of vegetation such as mulching and irrigation.

Curbing

Curbing is a barrier that surrounds an area of concern. Curbing is similar to containment diking in the way that it prevents spills and leaks from being released into the environment. The curbing is usually small scaled and does not contain large spills like diking. Curbing is common at many facilities in small areas where handling and transfer liquid materials occur. Curbing can redirect stormwater away from the storage area. It is useful in areas where liquid materials are transferred from one container to another. Asphalt is a common material used for curbing; however, curbing materials include earth, concrete, synthetic materials, metal, or other impenetrable materials.

- Spilled materials should be removed immediately from curbed areas to allow space for future spills.
- Curbs should have manually-controlled pump systems rather than common drainage systems for collection of spilled materials.
- The curbed area should be inspected regularly to clear clogging debris.
- Maintenance should also be conducted frequently to prevent overflow of any spilled materials as curbed areas are designed only for smaller spills.
- Curbing has the following advantages:
  - Excellent runon control,
  - Inexpensive,
  - Ease of installment,
  - Provides option to recycle materials spilled in curb areas, and
  - Common industry practice.

Examples

The "doghouse" design has been used to store small liquid containers. The roof and flooring design prevent contact with direct rain or runoff. The doghouse has two solid structural walls and two canvas covered walls. The flooring is wire mesh about secondary containment. The unit has been used successfully at Lockheed Missile and Space Company in Sunnyvale.

References and Resources

British Columbia Lake Stewardship Society. Best Management Practices to Protect Water Quality from Non-Point Source Pollution. March 2000
http://www.nalms.org/bclss/storage.html

King County Stormwater Pollution Control Manual –
http://dnr.metrokc.gov/wlr/dss/spcm.htm

San Diego Stormwater Co-permittees Jurisdictional Urban Runoff Management Program (URMP) -
http://www.projectcleanwater.org/pdf/Model%20Program%20Municipal%20Facilities.pdf

Outdoor Equipment Maintenance SC-32

Description

Outside process equipment operations and maintenance can contaminate stormwater runoff. Activities, such as grinding, painting, coating, sanding, degreasing or parts cleaning, landfills and waste piles, solid waste treatment and disposal, are examples of process operations that can lead to contamination of stormwater runoff. Source controls for outdoor process equipment operations and maintenance include reducing the amount of waste created, enclosing or covering all or some of the equipment, installing secondary containment, and training employees.

Approach

Pollution Prevention

- Perform the activity during dry periods.
- Use non-toxic chemicals for maintenance and minimize or eliminate the use of solvents.

Suggested Protocols

- Consider enclosing the activity in a building and connecting the floor drains to the sanitary sewer.
- Cover the work area with a permanent roof.
- Minimize contact of stormwater with outside process equipment operations through berming and drainage routing (runon prevention). If allowed, connect process equipment area to public sewer.
- Dry clean the work area regularly.

Training

- Train employees to perform the activity during dry periods only and to use less or non-toxic materials.
- Train employee and contractors in proper techniques for spill containment and cleanup. The employee should have the tools and knowledge to immediately begin cleaning up a spill if one should occur.

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	☑
Nutrients	
Trash	☑
Metals	☑
Bacteria	
Oil and Grease	☑
Organics	☑
Oxygen Demanding	

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SC-32 Outdoor Equipment Maintenance

Spill Response and Prevention

- Refer to SC-11, Spill Prevention, Control & Cleanup
- Keep your spill prevention control and countermeasure (SPCC) plan up-date, and implement accordingly.
- Have spill cleanup materials readily available and in a known location.
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.

Other Considerations

- Space limitations may preclude enclosing some equipment.
- Storage sheds often must meet building and fire code requirements.

Requirements

Costs

- Costs vary depending on the complexity of the operation and the amount of control necessary for stormwater pollution control.
- Providing cover may be expensive.

Maintenance

- Conduct routine preventive maintenance, including checking process equipment for leaks.
- Clean the storm drain system regularly.

Supplemental Information

Further Detail of the BMP

Hydraulic/Treatment Modifications

In some cases it may be necessary to capture and treat polluted stormwater. If the municipality does not have its own process wastewater treatment system, consider discharging to the public sewer system. Use of the public sewer might be allowed under the following conditions:

- If the activity area is very small (less than a few hundred square feet), the local sewer authority may be willing to allow the area to remain uncovered with the drain connected to the public sewer.
- It may be possible under unusual circumstances to connect a much larger area to the public sewer, as long as the rate of stormwater discharges does not exceed the capacity of the wastewater treatment plant. The stormwater could be stored during the storm and then transferred to the public sewer when the normal flow is low, such as at night.

References and Resources

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

Clark County Stormwater Pollution Control Manual
http://www.co.clark.wa.us/pubworks/bmpman.pdf

King County Stormwater Pollution Control Manual http://dnr.metrokc.gov/wlr/dss/spcm.htm

Santa Clara Valley Urban Runoff Pollution Prevention Program http://www.scvurppp.org

The Stormwater Managers Resource Center http://www.stormwatercenter.net/

Outdoor Storage of Raw Materials SC-33

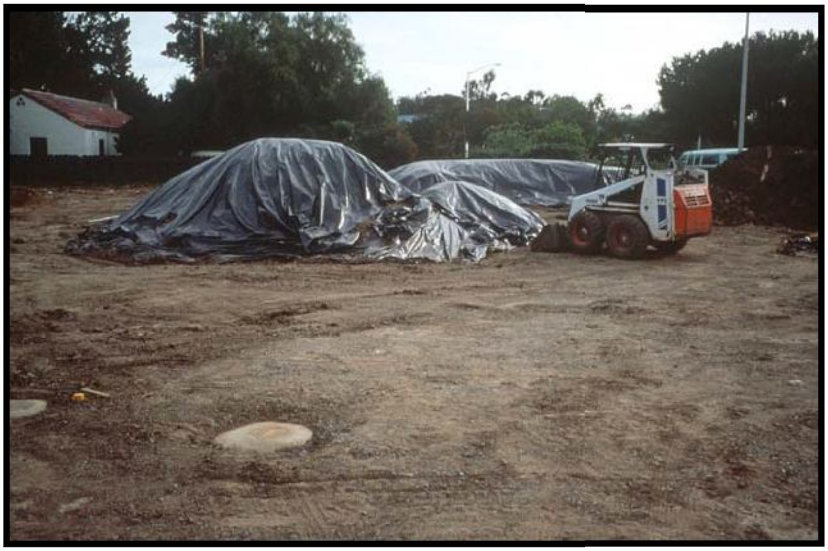

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize

Description

Raw materials, by-products, finished products, containers, and material storage areas exposed to rain and/or runoff can pollute stormwater. Stormwater can become contaminated when materials wash off or dissolve into water or are added to runoff by spills and leaks. Improper storage of these materials can result in accidental spills and the release of materials. To prevent or reduce the discharge of pollutants to stormwater from material delivery and storage, pollution prevention and source control measures, such as minimizing the storage of hazardous materials on-site, enclosing or covering materials, storing materials in a designated area, installing secondary containment, conducting regular inspections, preventing stormwater runon and runoff, and training employees and subcontractors must be implemented.

Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	☑
Metals	
Bacteria	
Oil and Grease	☑
Organics	☑
Oxygen Demanding	☑

Approach

Pollution Prevention

- Employee education is paramount for successful BMP implementation.
- Minimize inventory of raw materials.
- Keep an accurate, up-to-date inventory of the materials delivered and stored on-site.
- Try to keep chemicals in their original containers, and keep them well labeled.

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SC-33 Outdoor Storage of Raw Materials

Suggested Protocols

General

- Store all materials inside. If this is not feasible, then all outside storage areas should be covered with a roof, and bermed, or enclosed to prevent stormwater contact. At the very minimum, a temporary waterproof covering made of polyethylene, polypropylene or hypalon should be used over all materials stored outside.
- Cover and contain the stockpiles of raw materials to prevent stormwater from running into the covered piles. The covers must be in place at all times when work with the stockpiles is not occurring. (applicable to small stockpiles only).
- If the stockpiles are so large that they cannot feasibly be covered and contained, implement erosion control practices at the perimeter of your site and at any catch basins to prevent erosion of the stockpiled material off site,
- Keep liquids in a designated area on a paved impervious surface within a secondary containment.
- Keep outdoor storage containers in good condition.
- Keep storage areas clean and dry.
- Design paved areas to be sloped in a manner that minimizes the pooling of water on the site, particularly with materials that may leach pollutants into stormwater and/or groundwater, such as compost, logs, and wood chips. A minimum slope of 1.5 percent is recommended.
- Secure drums stored in an area where unauthorized persons may gain access to prevent accidental spillage, pilferage, or any unauthorized use.
- Cover wood products treated with chromated copper arsenate, ammonical copper zinc arsenate, creosote, or pentachlorophenol with tarps or store indoors.

Raw Material Containment

- Do not store chemicals, drums, or bagged materials directly on the ground. Place these items in secondary containers if applicable.
- Prevent the run-on of uncontaminated stormwater from adjacent areas as well as runoff of stormwater from the stockpile areas, by placing a curb along the perimeter of the area. The area inside the curb should slope to a drain. Liquids should be drained to the sanitary sewer if allowed. The drain must have a positive control such as a lock, valve, or plug to prevent release of contaminated liquids.
- Tanks should be bermed or surrounded by a secondary containment system.
- Release accumulated stormwater in petroleum storage areas prior to the next storm. At a minimum, water should pass through an oil/water separator and, if allowed, discharged to a sanitary sewer.

Inspection

- Conduct regular inspections of storage areas so that leaks and spills are detected as soon as possible.
- Conduct routine inspections and check for external corrosion of material containers. Also check for structural failure, spills and overfills due to operator error, failure of piping system.
- Check for leaks or spills during pumping of liquids or gases from truck or rail car to a storage facility or vice versa.
- Visually inspect new tank or container installations for loose fittings, poor welding, and improper or poorly fitted gaskets.
- Inspect tank foundations, connections, coatings, and tank walls and piping system. Look for corrosion, leaks, cracks, scratches, and other physical damage that may weaken the tank or container system.

Training

- Employees should be well trained in proper material storage.
- Train employees and contractors in proper techniques for spill containment and cleanup.

Spill Response and Prevention

- Refer to SC-11, Spill Prevention, Control & Cleanup.
- Keep your Spill Prevention Control and countermeasure (SPCC) plan up-to-date, and implement accordingly.
- Have spill cleanup materials readily available and in a known location.
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.
- Have employees trained in spill containment and cleanup present during loading/unloading of dangerous waste, liquid chemicals and other potentially hazardous materials.

Other Considerations

- Storage sheds often must meet building and fire code requirements. Storage of reactive, ignitable, or flammable liquids must comply with the Uniform Fire Code and the National Electric Code.
- Space limitations may preclude storing some materials indoors.
- Some municipalities require that secondary containment areas (regardless of size) be connected to the sanitary sewer, prohibiting any hard connections to the storm drain. Storage sheds often must meet building and fire code requirements.
- The local fire district must be consulted for limitations on clearance of roof covers over containers used to store flammable materials.

SC-33 Outdoor Storage of Raw Materials

Requirements

Costs

- Costs will vary depending on the size of the facility and the necessary controls. They should be low except where large areas may have to be covered.

Maintenance

- Accurate and up-to-date inventories should be kept of all stored materials.
- Berms and curbs may require periodic repair and patching.
- Parking lots or other surfaces near bulk materials storage areas should be swept periodically to remove debris blown or washed from storage area.
- Sweep paved storage areas regularly for collection and disposal of loose solid materials, do not hose down the area to a storm drain or conveyance ditch.
- Keep outdoor storage areas in good condition (e.g. repair roofs, floors, etc. to limit releases to runoff).

Supplemental Information

Further Detail of the BMP

Raw Material Containment

Paved areas should be sloped in a manner that minimize the pooling of water on the site, particularly with materials that may leach pollutants into stormwater and/or groundwater, such as compost, logs, and wood chips. A minimum slope of 1.5 percent is recommended.

- Curbing should be placed along the perimeter of the area to prevent the runon of uncontaminated stormwater from adjacent areas as well as runoff of stormwater from the stockpile areas.
- The storm drainage system should be designed to minimize the use of catch basins in the interior of the area as they tend to rapidly fill with manufacturing material.
- The area should be sloped to drain stormwater to the perimeter where it can be collected or to internal drainage alleyways where material is not stockpiled.
- If the raw material, by-product, or product is a liquid, more information for outside storage of liquids can be found under SC-31, Outdoor Container Storage.

Examples

The "doghouse" design has been used to store small liquid containers. The roof and flooring design prevent contact with direct rain or runoff. The doghouse has two solid structural walls and two canvas covered walls. The flooring is wire mesh about secondary containment. The unit has been used successively at Lockheed Missile and Space Company in Sunnyvale.

References and Resources

King County Stormwater Pollution Control Manual - http://dnr.metrokc.gov/wlr/dss/spcm.htm

Model Urban Runoff Program: A How-To-Guide for Developing Urban Runoff Programs for Small Municipalities. Prepared by City of Monterey, City of Santa Cruz, California Coastal Commission, Monterey Bay National Marine Sanctuary, Association of Monterey Bay Area Governments, Woodward-Clyde, Central Coast Regional Water Quality Control Board. July 1998 (Revised February 2002 by the California Coastal Commission).

Orange County Stormwater Program
http://www.ocwatersheds.com/StormWater/swp_introduction.asp

San Diego Stormwater Co-permittees Jurisdictional Urban Runoff Management Program (URMP)
http://www.projectcleanwater.org/pdf/Model%20Program%20Municipal%20Facilities.pdf

Waste Handling & Disposal

SC-34

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Description

Improper storage and handling of solid wastes can allow toxic compounds, oils and greases, heavy metals, nutrients, suspended solids, and other pollutants to enter stormwater runoff. The discharge of pollutants to stormwater from waste handling and disposal can be prevented and reduced by tracking waste generation, storage, and disposal; reducing waste generation and disposal through source reduction, re-use, and recycling; and preventing runon and runoff.

Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	☑
Oil and Grease	☑
Organics	☑
Oxygen Demanding	☑

Approach

Pollution Prevention

- Reduction in the amount of waste generated can be accomplished using the following source controls such as:
  - Production planning and sequencing
  - Process or equipment modification
  - Raw material substitution or elimination
  - Loss prevention and housekeeping
  - Waste segregation and separation
  - Close loop recycling
- Establish a material tracking system to increase awareness about material usage. This may reduce spills and minimize contamination, thus reducing the amount of waste produced.
- Recycle materials whenever possible.

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Suggested Protocols

General

- Cover storage containers with leak proof lids or some other means. If waste is not in containers, cover all waste piles (plastic tarps are acceptable coverage) and prevent stormwater runon and runoff with a berm. The waste containers or piles must be covered except when in use.
- Use drip pans or absorbent materials whenever grease containers are emptied by vacuum trucks or other means. Grease cannot be left on the ground. Collected grease must be properly disposed of as garbage.
- Check storage containers weekly for leaks and to ensure that lids are on tightly. Replace any that are leaking, corroded, or otherwise deteriorating.
- Sweep and clean the storage area regularly. If it is paved, do not hose down the area to a storm drain.
- Dispose of rinse and wash water from cleaning waste containers into a sanitary sewer if allowed by the local sewer authority. Do not discharge wash water to the street or storm drain.
- Transfer waste from damaged containers into safe containers.
- Take special care when loading or unloading wastes to minimize losses. Loading systems can be used to minimize spills and fugitive emission losses such as dust or mist. Vacuum transfer systems can minimize waste loss.

Controlling Litter

- Post "No Littering" signs and enforce anti-litter laws.
- Provide a sufficient number of litter receptacles for the facility.
- Clean out and cover litter receptacles frequently to prevent spillage.

Waste Collection

- Keep waste collection areas clean.
- Inspect solid waste containers for structural damage or leaks regularly. Repair or replace damaged containers as necessary.
- Secure solid waste containers; containers must be closed tightly when not in use.
- Place waste containers under cover if possible.
- Do not fill waste containers with washout water or any other liquid.
- Ensure that only appropriate solid wastes are added to the solid waste container. Certain wastes such as hazardous wastes, appliances, fluorescent lamps, pesticides, etc. may not be

disposed of in solid waste containers (see chemical/ hazardous waste collection section below).

- Do not mix wastes; this can cause chemical reactions, make recycling impossible, and complicate disposal.

Good Housekeeping

- Use all of the product before disposing of the container.
- Keep the waste management area clean at all times by sweeping and cleaning up spills immediately.
- Use dry methods when possible (e.g. sweeping, use of absorbents) when cleaning around restaurant/food handling dumpster areas. If water must be used after sweeping/using absorbents, collect water and discharge through grease interceptor to the sewer.
- Stencil storm drains on the facility's property with prohibitive message regarding waste disposal.

Chemical/Hazardous Wastes

- Select designated hazardous waste collection areas on-site.
- Store hazardous materials and wastes in covered containers protected from vandalism, and in compliance with fire and hazardous waste codes.
- Place hazardous waste containers in secondary containment.
- Make sure that hazardous waste is collected, removed, and disposed of only at authorized disposal areas.

Runon/Runoff Prevention

- Prevent stormwater runon from entering the waste management area by enclosing the area or building a berm around the area.
- Prevent the waste materials from directly contacting rain.
- Cover waste piles with temporary covering material such as reinforced tarpaulin, polyethylene, polyurethane, polypropyleneor hypalon.
- Cover the area with a permanent roof if feasible.
- Cover dumpsters to prevent rain from washing waste out of holes or cracks in the bottom of the dumpster.
- Move the activity indoor after ensuring all safety concerns such as fire hazard and ventilation are addressed.

Inspection

- Inspect and replace faulty pumps or hoses regularly to minimize the potential of releases and spills.
- Check waste management areas for leaking containers or spills.
- Repair leaking equipment including valves, lines, seals, or pumps promptly.

Training

- Train staff pollution prevention measures and proper disposal methods.
- Train employees and contractors proper spill containment and cleanup. The employee should have the tools and knowledge to immediately begin cleaning up a spill if one should occur.
- Train employees and subcontractors in proper hazardous waste management.

Spill Response and Prevention

- Refer to SC-11, Spill Prevention, Control & Cleanup.
- Keep your Spill Prevention Control and countermeasure (SPCC) plan up-to-date, and implement accordingly.
- Have spill cleanup materials readily available and in a known location.
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.
- Vehicles transporting waste should have spill prevention equipment that can prevent spills during transport. The spill prevention equipment includes:
  - Vehicles equipped with baffles for liquid waste
  - Trucks with sealed gates and spill guards for solid waste

Other Considerations

- Hazardous waste cannot be re-used or recycled; it must be disposed of by a licensed hazardous waste hauler.

Requirements

Costs

- Capital and operation and maintenance costs will vary substantially depending on the size of the facility and the types of waste handled. Costs should be low if there is an inventory program in place.

Maintenance

- None except for maintaining equipment for material tracking program.

Supplemental Information

Further Detail of the BMP

Land Treatment System

- Minimize the runoff of polluted stormwater from land application of municipal waste on-site by:
  - Choosing a site where slopes are under 6%, the soil is permeable, there is a low water table, it is located away from wetlands or marshes, there is a closed drainage system.
  - Avoiding application of waste to the site when it is raining or when the ground is saturated with water.
  - Growing vegetation on land disposal areas to stabilize soils and reduce the volume of surface water runoff from the site.
  - Maintaining adequate barriers between the land application site and the receiving waters. Planted strips are particularly good.
  - Using erosion control techniques such as mulching and matting, filter fences, straw bales, diversion terracing, and sediment basins.
  - Performing routine maintenance to ensure the erosion control or site stabilization measures are working.

References and Resources

King County Stormwater Pollution Control Manual - http://dnr.metrokc.gov/wlr/dss/spcm.htm

Orange County Stormwater Program
http://www.ocwatersheds.com/StormWater/swp_introduction.asp

Pollution from Surface Cleaning Folder. 1996. Bay Area Stormwater Management Agencies Associations (BASMAA). On-line: http://www.basmaa.org

Building & Grounds Maintenance SC-41

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	☑
Oil and Grease	☑
Organics	☑
Oxygen Demanding	☑

Description

Stormwater runoff from building and grounds maintenance activities can be contaminated with toxic hydrocarbons in solvents, fertilizers and pesticides, suspended solids, heavy metals, and abnormal pH. Utilizing the following protocols will prevent or reduce the discharge of pollutants to stormwater from building and grounds maintenance activities by washing and cleaning up with as little water as possible, following good landscape management practices, preventing and cleaning up spills immediately, keeping debris from entering the storm drains, and maintaining the stormwater collection system.

Approach

Pollution Prevention

- Switch to non-toxic chemicals for maintenance when possible.
- Choose cleaning agents that can be recycled.
- Encourage proper lawn management and landscaping, including use of native vegetation.
- Encourage use of Integrated Pest Management techniques for pest control.
- Encourage proper onsite recycling of yard trimmings.
- Recycle residual paints, solvents, lumber, and other material as much as possible.

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SC-41 Building & Grounds Maintenance

Suggested Protocols

Pressure Washing of Buildings, Rooftops, and Other Large Objects

- In situations where soaps or detergents are used and the surrounding area is paved, pressure washers must use a waste water collection device that enables collection of wash water and associated solids. A sump pump, wet vacuum or similarly effective device must be used to collect the runoff and loose materials. The collected runoff and solids must be disposed of properly.
- If soaps or detergents are not used, and the surrounding area is paved, wash water runoff does not have to be collected but must be screened. Pressure washers must use filter fabric or some other type of screen on the ground and/or in he catch basin to trap the particles in wash water runoff.
- If you are pressure washing on a grassed area (with or without soap), runoff must be dispersed as sheet flow as much as possible, rather than as a concentrated stream. The wash runoff must remain on the grass and not drain to pavement. Ensure that this practice does not kill grass.

Landscaping Activities

- Do not apply any chemicals (insecticide, herbicide, or fertilizer) directly to surface waters, unless the application is approved and permitted by the state.
- Dispose of grass clippings, leaves, sticks, or other collected vegetation as garbage, or by composting. Do not dispose of collected vegetation into waterways or storm drainage systems.
- Use mulch or other erosion control measures on exposed soils.
- Check irrigation schedules so pesticides will not be washed away and to minimize non-stormwater discharge.

Building Repair, Remodeling, and Construction

- Do not dump any toxic substance or liquid waste on the pavement, the ground, or toward a storm drain.
- Use ground or drop cloths underneath outdoor painting, scraping, and sandblasting work, and properly dispose of collected material daily.
- Use a ground cloth or oversized tub for activities such as paint mixing and tool cleaning.
- Clean paint brushes and tools covered with water-based paints in sinks connected to sanitary sewers or in portable containers that can be dumped into a sanitary sewer drain. Brushes and tools covered with non-water-based paints, finishes, or other materials must be cleaned in a manner that enables collection of used solvents (e.g., paint thinner, turpentine, etc.) for recycling or proper disposal.

- Use a storm drain cover, filter fabric, or similarly effective runoff control mechanism if dust, grit, wash water, or other pollutants may escape the work area and enter a catch basin. The containment device(s) must be in place at the beginning of the work day, and accumulated dirty runoff and solids must be collected and disposed of before removing the containment device(s) at the end of the work day.

- If you need to de-water an excavation site, you may need to filter the water before discharging to a catch basin or off-site. In which case you should direct the water through hay bales and filter fabric or use other sediment filters or traps.

- Store toxic material under cover with secondary containment during precipitation events and when not in use. A cover would include tarps or other temporary cover material.

Mowing, Trimming, and Planting

- Dispose of leaves, sticks, or other collected vegetation as garbage, by composting or at a permitted landfill. Do not dispose of collected vegetation into waterways or storm drainage systems.

- Use mulch or other erosion control measures when soils are exposed.

- Place temporarily stockpiled material away from watercourses and drain inlets, and berm or cover stockpiles to prevent material releases to the storm drain system.

- Consider an alternative approach when bailing out muddy water; do not put it in the storm drain, pour over landscaped areas.

- Use hand or mechanical weeding where practical.

Fertilizer and Pesticide Management

- Follow all federal, state, and local laws and regulations governing the use, storage, and disposal of fertilizers and pesticides and training of applicators and pest control advisors.

- Follow manufacturers' recommendations and label directions. Pesticides must never be applied if precipitation is occuring or predicted. Do not apply insecticides within 100 feet of surface waters such as lakes, ponds, wetlands, and streams.

- Use less toxic pesticides that will do the job, whenever possible. Avoid use of copper-based pesticides if possible.

- Do not use pesticides if rain is expected.

- Do not mix or prepare pesticides for application near storm drains.

- Use the minimum amount needed for the job.

- Calibrate fertilizer distributors to avoid excessive application.

- Employ techniques to minimize off-target application (e.g. spray drift) of pesticides, including consideration of alternative application techniques.

- Apply pesticides only when wind speeds are low.
- Work fertilizers into the soil rather than dumping or broadcasting them onto the surface.
- Irrigate slowly to prevent runoff and then only as much as is needed.
- Clean pavement and sidewalk if fertilizer is spilled on these surfaces before applying irrigation water.
- Dispose of empty pesticide containers according to the instructions on the container label.
- Use up the pesticides. Rinse containers, and use rinse water as product. Dispose of unused pesticide as hazardous waste.
- Implement storage requirements for pesticide products with guidance from the local fire department and County Agricultural Commissioner. Provide secondary containment for pesticides.

Inspection

- Inspect irrigation system periodically to ensure that the right amount of water is being applied and that excessive runoff is not occurring. Minimize excess watering, and repair leaks in the irrigation system as soon as they are observed.

Training

- Educate and train employees on use of pesticides and in pesticide application techniques to prevent pollution.
- Train employees and contractors in proper techniques for spill containment and cleanup.
- Be sure the frequency of training takes into account the complexity of the operations and the nature of the staff.

Spill Response and Prevention

- Refer to SC-11, Spill Prevention, Control & Cleanup
- Keep your Spill Prevention Control and countermeasure (SPCC) plan up-to-date, and implement accordingly.
- Have spill cleanup materials readily available and in a known location.
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.

Other Considerations

- Alternative pest/weed controls may not be available, suitable, or effective in many cases.

Requirements

Costs

- Overall costs should be low in comparison to other BMPs.

Maintenance

- Sweep paved areas regularly to collect loose particles, and wipe up spills with rags and other absorbent material immediately, do not hose down the area to a storm drain.

Supplemental Information

Further Detail of the BMP

Fire Sprinkler Line Flushing

Building fire sprinkler line flushing may be a source of non-stormwater runoff pollution. The water entering the system is usually potable water though in some areas it may be non-potable reclaimed wastewater. There are subsequent factors that may drastically reduce the quality of the water in such systems. Black iron pipe is usually used since it is cheaper than potable piping but it is subject to rusting and results in lower quality water. Initially the black iron pipe has an oil coating to protect it from rusting between manufacture and installation; this will contaminate the water from the first flush but not from subsequent flushes. Nitrates, poly-phosphates and other corrosion inhibitors, as well as fire suppressants and antifreeze may be added to the sprinkler water system. Water generally remains in the sprinkler system a long time, typically a year, between flushes and may accumulate iron, manganese, lead, copper, nickel and zinc. The water generally becomes anoxic and contains living and dead bacteria and breakdown products from chlorination. This may result in a significant BOD problem and the water often smells. Consequently dispose fire sprinkler line flush water into the sanitary sewer. Do not allow discharge to storm drain or infiltration due to potential high levels of pollutants in fire sprinkler line water.

References and Resources

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

King County - ftp://dnr.metrokc.gov/wlr/dss/spcm/Chapter%203.PDF

Orange County Stormwater Program
http://www.ocwatersheds.com/StormWater/swp_introduction.asp

Mobile Cleaners Pilot Program: Final Report. 1997. Bay Area Stormwater Management Agencies Association (BASSMA) http://www.basmaa.org/

Pollution from Surface Cleaning Folder. 1996. Bay Area Stormwater Management Agencies Association (BASMAA) http://www.basmaa.org/

San Diego Stormwater Co-permittees Jurisdictional Urban Runoff Management Program (URMP) -
http://www.projectcleanwater.org/pdf/Model%20Program%20Municipal%20Facilities.pdf

Parking/Storage Area Maintenance SC-43

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	☑
Oil and Grease	☑
Organics	☑
Oxygen Demanding	☑

Description

Parking lots and storage areas can contribute a number of substances, such as trash, suspended solids, hydrocarbons, oil and grease, and heavy metals that can enter receiving waters through stormwater runoff or non-stormwater discharges. The following protocols are intended to prevent or reduce the discharge of pollutants from parking/storage areas and include using good housekeeping practices, following appropriate cleaning BMPs, and training employees.

Approach

Pollution Prevention

- Encourage alternative designs and maintenance strategies for impervious parking lots. (See New Development and Redevelopment BMP Handbook).
- Keep accurate maintenance logs to evaluate BMP implementation.

Suggested Protocols

General

- Keep the parking and storage areas clean and orderly. Remove debris in a timely fashion.
- Allow sheet runoff to flow into biofilters (vegetated strip and swale) and/or infiltration devices.
- Utilize sand filters or oleophilic collectors for oily waste in low concentrations.

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SC-43 Parking/Storage Area Maintenance

- Arrange rooftop drains to prevent drainage directly onto paved surfaces.
- Design lot to include semi-permeable hardscape.

Controlling Litter

- Post "No Littering" signs and enforce anti-litter laws.
- Provide an adequate number of litter receptacles.
- Clean out and cover litter receptacles frequently to prevent spillage.
- Provide trash receptacles in parking lots to discourage litter.
- Routinely sweep, shovel and dispose of litter in the trash.

Surface cleaning

- Use dry cleaning methods (e.g. sweeping or vacuuming) to prevent the discharge of pollutants into the stormwater conveyance system.
- Establish frequency of public parking lot sweeping based on usage and field observations of waste accumulation.
- Sweep all parking lots at least once before the onset of the wet season.
- If water is used follow the procedures below:
  - Block the storm drain or contain runoff.
  - Wash water should be collected and pumped to the sanitary sewer or discharged to a pervious surface, do not allow wash water to enter storm drains.
  - Dispose of parking lot sweeping debris and dirt at a landfill.
- When cleaning heavy oily deposits:
  - Use absorbent materials on oily spots prior to sweeping or washing.
  - Dispose of used absorbents appropriately.

Surface Repair

- Pre-heat, transfer or load hot bituminous material away from storm drain inlets.
- Apply concrete, asphalt, and seal coat during dry weather to prevent contamination form contacting stormwater runoff.
- Cover and seal nearby storm drain inlets (with waterproof material or mesh) and manholes before applying seal coat, slurry seal, etc., where applicable. Leave covers in place until job is complete and until all water from emulsified oil sealants has drained or evaporated. Clean any debris from these covered manholes and drains for proper disposal.

- Use only as much water as necessary for dust control, to avoid runoff.
- Catch drips from paving equipment that is not in use with pans or absorbent material placed under the machines. Dispose of collected material and absorbents properly.

Inspection

- Have designated personnel conduct inspections of the parking facilities and stormwater conveyance systems associated with them on a regular basis.
- Inspect cleaning equipment/sweepers for leaks on a regular basis.

Training

- Provide regular training to field employees and/or contractors regarding cleaning of paved areas and proper operation of equipment.
- Train employees and contractors in proper techniques for spill containment and cleanup.

Spill Response and Prevention

- Refer to SC-11, Spill Prevention, Control & Cleanup.
- Keep your Spill Prevention Control and countermeasure (SPCC) plan up-to-date, nad implement accordingly.
- Have spill cleanup materials readily available and in a known location.
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.

Other Considerations

- Limitations related to sweeping activities at large parking facilities may include high equipment costs, the need for sweeper operator training, and the inability of current sweeper technology to remove oil and grease.

Requirements

Costs

Cleaning/sweeping costs can be quite large, construction and maintenance of stormwater structural controls can be quite expensive as well.

Maintenance

- Sweep parking lot to minimize cleaning with water.
- Clean out oil/water/sand separators regularly, especially after heavy storms.
- Clean parking facilities on a regular basis to prevent accumulated wastes and pollutants from being discharged into conveyance systems during rainy conditions.

SC-43 Parking/Storage Area Maintenance

Supplemental Information

Further Detail of the BMP

Surface Repair

Apply concrete, asphalt, and seal coat during dry weather to prevent contamination form contacting stormwater runoff. Where applicable, cover and seal nearby storm drain inlets (with waterproof material or mesh) and manholes before applying seal coat, slurry seal, etc. Leave covers in place until job is complete and until all water from emulsified oil sealants has drained or evaporated. Clean any debris from these covered manholes and drains for proper disposal. Use only as much water as necessary for dust control, to avoid runoff.

References and Resources

http://www.stormwatercenter.net/

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

Model Urban Runoff Program: A How-To Guide for Developing Urban Runoff Programs for Small Municipalities. Prepared by City of Monterey, City of Santa Cruz, California Coastal Commission, Monterey Bay National Marine Sanctuary, Association of Monterey Bay Area Governments, Woodward-Clyde, Central Coast Regional Water Quality control Board. July 1998 (Revised February 2002 by the California Coastal Commission).

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Pollution from Surface Cleaning Folder. 1996. Bay Area Stormwater Management Agencies Association (BASMAA) http://www.basma.org

San Diego Stormwater Co-permittees Jurisdictional Urban Runoff Management Program (URMP)
http://www.projectcleanwater.org/pdf/Model%20Program%20Municipal%20Facilities.pdf

Over Water Activities

SC-50

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	
Nutrients	
Trash	☑
Metals	☑
Bacteria	☑
Oil and Grease	☑
Organics	☑
Oxygen Demanding	☑

Description

Over-water activities occur at boat and ship repair yards, marinas, and yacht clubs. The discharge of pollutants to receiving waters during these activities can be prevented or reduced by minimizing over-water maintenance, keeping wastes out of the water, cleaning up spills and wastes immediately, and educating tenants and employees.

Approach

Pollution Prevention

- Switch to non-toxic chemicals for maintenance when possible.
- Choose cleaning agents that can be recycled.
- Minimize use of solvents. Clean parts without using solvents whenever possible.
- Recycle used motor oil, diesel oil, and other vehicle fluids and parts whenever possible

Suggested Protocols

General

- Perform paint and solvent mixing, fuel mixing, and similar handling of liquids on-shore, to avoid spillage directly in surface water bodies.
- Post signs to indicate proper use and disposal of residual paints, rags, used oil, and other engine fluids.

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- Sweep dry docks before flooding.

On Board Maintenance

- Move maintenance and repair activities on-shore if possible. This action reduces some of the potential for direct pollution on water bodies.
- Used antifreeze should be stored in a separate, labeled drum and recycled.
- Fuel tank vents should have valves to prevent fuel overflows or spills.
- Boats with inboard engines should have oil absorption pads in bilge areas that should be changed when no longer useful or at least once a year.
- Careful consideration must be given to fueling boat engines, recycling used oil, and discarding worn motor parts into proper receptacles to prevent spills.
- Keeping boat motors well-tuned prevents fuel and lubricant leaks and improves fuel efficiency.

Cleaning, Chipping, and Painting

- Shelter any blasting and spray painting activities by hanging wind blocking tarps to prevent sand blasting dust and overspray from escaping.
- Use secondary containment on paint cans.
- Limit over-water hull surface maintenance to sanding and minor painting.
- Major hull resurfacing should occur on land.
- Use ground cloths when painting boats on land.
- Paint mixing should not occur on the dock
- Vacuuming up loose paint chips and paint dust can help to prevent paint and other chemical substances from entering waters.
- Properly dispose of surface chips, used blasting sand, residual paints, and other materials. Use temporary storage containment that is not exposed to rain.
- Use phosphate-free and biodegradable detergents for hull washing.
- Select nontoxic cleaning products that do not harm humans or aquatic life

Disposal of Bilge Water, Ballast Water, and Wastewater

- Collect bilge and ballast water that has an oily sheen on the surface for proper disposal rather than dumping in water or on land.
- Collect and properly dispose of wash water from washing painted boat hulls. Consider taking the boat to a local boat yard that is equipped to collect and treat wash water.

- Pump bilge water discharged at sea through an oil/water separator first and store the oil for discharge into storage tanks on shore for treatment.
- Pump bilge water into storage tanks on shore for analysis, treatment and proper disposal.
- Properly dispose of domestic wastewater and ballast water. DO NOT ALLOW discharge of treated or untreated sewage from vessels to harbors.
- Fecal matter and other solid waste should be contained in a U.S. Coast Guard-approved marine sanitation device (MSD).
- Portable toilets should be emptied into approved shore side waste handling facilities, and MSDs should be discharged into approved pump out stations.
- Avoid the intake of ballast water in shallow water or areas where bottom sediments are suspended.
- Avoid the intake of ballast water where there is an algal bloom in progress.
- Use as fine a filter as is practical on the ballast water intake ports to eliminate as many organisms and as much particulate matter as possible. Tests have been conducted using 300 micron followed by a 25 micron filter on intakes to see how well they work and hold up in practice.
- Dump estuarine or harbour ballast water at sea and take in fresh high salinity water to eliminate both pollutants and estuarine organisms.
- Ballast water may be discharged into large tanks on shore where it is treated, although the large volumes involved make this a very expensive and logistically difficult option.
- Ballast water may also be discharged into specially oufitted tanker ships which meet incoming ships and take in their ballast water for treatment and discharge of the clean water. The sludge produced would still have to be taken ashore for treatment or disposal. This is also an expensive and logistically difficult process.
- Carry out physical or chemical sterilization or neutralization of ballast water in situ, and subsequent neutralization of the sterilant, if required, before discharge.

Training

- Provide regular training to employees and/or contractors regarding stormwater BMPs for over water activities.
- Train employees and contractors in proper techniques for spill containment and cleanup.

Spill Response and Prevention

- Refer to Spill Prevention, Control & Cleanup.
- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date, and implement accordingly.
- Place an adequate stockpile of spill cleanup materials where it will be readily accessible. Clean leaks, drips, and other spills with as little water as possible. Use rags for small spills, a damp mop for general cleanup, and dry absorbent material for larger spills.
- Store and maintain appropriate spill cleanup materials in a location known to all; and ensure that employees are familiar with the site's spill control plan and/or proper spill cleanup procedures.
- Clean up spills on docks or boats immediately.

Other Considerations

- Private tenants at marinas may resist restrictions on shipboard painting and maintenance. Existing contracts with tenants may not allow the owner to require that tenants abide by new rules that benefit water quality. Even biodegradable cleaning agents have been found to be toxic to fish.

Requirements

Costs

- Most of the BMPs are of low and modest cost. Exceptions are stations for temporary storage of residual paints and engine fluids, and wastewater pumpout facilities.

Maintenance

- Sweep maintenance yard areas, docks and boat ramps weekly to collect sandblasting material, paint chips, oils, and other loose debris, do not hose down the area to the water or a storm drain.

Supplemental Information

Further Detail of the BMP

- Best management practices for ballast water generally fall into three main categories:
  - Preventing Uptake at the Source - Generally harbors are a poor place to take in ballast water since they are often polluted and when shallow are high in suspended sediments. Open ocean water in a better source of ballast water.
  - Killing or Neutralization During the Voyage - The current fleet of cargo vessels are not built to carry out these processes. New ships should be designed for these kinds of activities but retrofitting may be impossible, difficult or expensive. Any residues or sludges arising from these procedures would have to be separated from the water and discharged on shore for treatment. Many of these processes would render the ballast tanks lethal to the crew and require them to be absolutely airtight and provisions would be necessary for purging and re-introducing a safe breathable atmosphere into the tanks.

- Treatment at the Destination - A further way to reduce the movement of alien organisms in ballast water is to avoid discharge of the ballast water into the destination environment.

References and Resources

British Columbia Lake Stewardship Society. Best Management Practices to Protect Water Quality from Non-Point Source Pollution. March 2000.
http://www.nalms.org/bclss/bmphome.html#bmp

King County Stormwater Pollution Control Manual
http://www.dnr.metrokc.gov/wlr/dss/spcm.htm

Orange County Stormwater Program
http://www.ocwatersheds.com/stormwater/swp_introduction.asp

San Diego Stormwater Co-permittees Jurisdictional Urban Runoff Management Program (URMP) -
http://www.projectcleanwater.org/pdf/Model%20Program%20Municipal%20Facilities.pdf

Housekeeping Practices SC-60

Description

Promote efficient and safe housekeeping practices (storage, use, and cleanup) when handling potentially harmful materials such as fertilizers, pesticides, cleaning solutions, paint products, automotive products, and swimming pool chemicals. Related information is provided in BMP fact sheets SC-11 Spill Prevention, Control & Cleanup and SC-34 Waste Handling & Disposal.

Approach

Pollution Prevention

- Purchase only the amount of material that will be needed for foreseeable use. In most cases this will result in cost savings in both purchasing and disposal. See SC-61 Safer Alternative Products for additional information.

- Be aware of new products that may do the same job with less environmental risk and for less or the equivalent cost. Total cost must be used here; this includes purchase price, transportation costs, storage costs, use related costs, clean up costs and disposal costs.

Suggested Protocols

General

- Keep work sites clean and orderly. Remove debris in a timely fashion. Sweep the area.

- Dispose of wash water, sweepings, and sediments, properly.

- Recycle or dispose of fluids properly.

- Establish a daily checklist of office, yard and plant areas to confirm cleanliness and adherence to proper storage and security. Specific employees should be assigned specific inspection responsibilities and given the authority to remedy any problems found.

- Post waste disposal charts in appropriate locations detailing for each waste its hazardous nature (poison, corrosive, flammable), prohibitions on its disposal (dumpster, drain, sewer) and the recommended disposal method (recycle, sewer, burn, storage, landfill).

- Summarize the chosen BMPs applicable to your operation and post them in appropriate conspicuous places.

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	☑
Oil and Grease	☑
Organics	☑
Oxygen Demanding	☑

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- Require a signed checklist from every user of any hazardous material detailing amount taken, amount used, amount returned and disposal of spent material.
- Do a before audit of your site to establish baseline conditions and regular subsequent audits to note any changes and whether conditions are improving or deteriorating.
- Keep records of water, air and solid waste quantities and quality tests and their disposition.
- Maintain a mass balance of incoming, outgoing and on hand materials so you know when there are unknown losses that need to be tracked down and accounted for.
- Use and reward employee suggestions related to BMPs, hazards, pollution reduction, work place safety, cost reduction, alternative materials and procedures, recycling and disposal.
- Have, and review regularly, a contingency plan for spills, leaks, weather extremes etc. Make sure all employees know about it and what their role is so that it comes into force automatically.

Training

- Train all employees, management, office, yard, manufacturing, field and clerical in BMPs and pollution prevention and make them accountable.
- Train municipal employees who handle potentially harmful materials in good housekeeping practices.
- Train personnel who use pesticides in the proper use of the pesticides. The California Department of Pesticide Regulation license pesticide dealers, certify pesticide applicators and conduct onsite inspections.
- Train employees and contractors in proper techniques for spill containment and cleanup. The employee should have the tools and knowledge to immediately begin cleaning up a spill if one should occur.

Spill Response and Prevention

- Refer to SC-11, Spill Prevention, Control & Cleanup.
- Keep your Spill Prevention Control and Countermeasure (SPCC) plant up-to-date, and implement accordingly.
- Have spill cleanup materials readily available and in a known location.
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.

Other Considerations

- There are no major limitations to this best management practice.
- There are no regulatory requirements to this BMP. Existing regulations already require municipalities to properly store, use, and dispose of hazardous materials

Requirements

Costs

- Minimal cost associated with this BMP. Implementation of good housekeeping practices may result in cost savings as these procedures may reduce the need for more costly BMPs.

Maintenance

- Ongoing maintenance required to keep a clean site. Level of effort is a function of site size and type of activities.

Supplemental Information

Further Detail of the BMP

- The California Integrated Waste Management Board's Recycling Hotline, 1-800-553-2962, provides information on household hazardous waste collection programs and facilities.

Examples

There are a number of communities with effective programs. The most pro-active include Santa Clara County and the City of Palo Alto, the City and County of San Francisco, and the Municipality of Metropolitan Seattle (Metro).

References and Resources

British Columbia Lake Stewardship Society. Best Management Practices to Protect Water Quality from Non-Point Source Pollution. March 2000.
http://www.nalms.org/bclss/bmphome.html#bmp

King County Stormwater Pollution Control Manual - http://dnr.metrokc.gov/wlr/dss/spcm.htm

Model Urban Runoff Program: A How-To Guide for Developing Urban Runoff Programs for Small Municipalities, Prepared by City of Monterey, City of Santa Cruz, California Coastal Commission, Monterey Bay National Marine Sanctuary, Association of Monterey Bay Area Governments, Woodward-Clyde, Central Coast Regional Water Quality Control Board. July, 1998, Revised by California Coastal Commission, February 2002.

Orange County Stormwater Program
http://www.ocwatersheds.com/stormwater/swp_introduction.asp

San Mateo STOPPP - (http://stoppp.tripod.com/bmp.html)

Safer Alternative Products SC-61

Descriptions

Promote the use of less harmful products. Alternatives exist for most product classes including chemical fertilizers, pesticides, cleaning solutions, janitorial chemicals, automotive and paint products, and consumables (batteries, fluorescent lamps).

Approach

Develop a comprehensive program based on:

- The "Precautionary Principle," which is an alternative to the "Risk Assessment" model that says it's acceptable to use a potentially harmful product until physical evidence of its harmful effects are established and deemed too costly from an environmental or public health perspective. For instance, a risk assessment approach might say it's acceptable to use a pesticide until there is direct proof of an environmental impact. The Precautionary Principle approach is used to evaluate whether a given product is safe, whether it is really necessary, and whether alternative products would perform just as well.
- Environmentally Preferable Purchasing Program to minimize the purchase of products containing hazardous ingredients used in the facility's custodial services, fleet maintenance, and facility maintenance in favor of using alternate products that pose less risk to employees and to the environment.
- Integrated Pest Management (IPM) or Less-Toxic Pesticide Program, which uses a pest management approach that minimizes the use of toxic chemicals and gets rid of pests by methods that pose a lower risk to employees, the public, and the environment.
- Energy Efficiency Program including no-cost and low-cost energy conservation and efficiency actions that can reduce both energy consumption and electricity bills, along with long-term energy efficiency investments.

Consider the following mechanisms for developing and implementing a comprehensive program:

- Policies
- Procedures
  - Standard operating procedures (SOPs)
  - Purchasing guidelines and procedures

Objectives

- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	
Nutrients	☑
Trash	
Metals	☑
Bacteria	
Oil and Grease	☑
Organics	☑
Oxygen Demanding	

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- Bid packages (services and supplies)

- Materials
  - Preferred or approved product and supplier lists
  - Product and supplier evaluation criteria
  - Training sessions and manuals
  - Fact sheets for employees

Training

- Employees who handle potentially harmful materials in the use of safer alternatives.
- Purchasing departments should be encouraged to procure less hazardous materials and products that contain little or no harmful substances or TMDL pollutants.

Regulations

This BMP has no regulatory requirements. Existing regulations already encourage facilities to reduce the use of hazardous materials through incentives such as reduced:

- Specialized equipment storage and handling requirements,
- Stormwater runoff sampling requirements,
- Training and licensing requirements, and
- Record keeping and reporting requirements.

Equipment

- There are no major equipment requirements to this BMP.

Limitations

- Alternative products may not be available, suitable, or effective in every case.

Requirements

Costs

- The primary cost is for staff time to: 1) develop new policies and procedures and 2) educate purchasing departments and employees who handle potentially harmful materials about the availability, procurement, and use of safer alternatives.
- Some alternative products may be slightly more expensive than conventional products.

Supplemental Information

Employees and contractors / service providers can both be educated about safer alternatives by using information developed by a number of organizations including the references and resources listed below.

Safer Alternative Products SC-61

The following discussion provides some general information on safer alternatives. More specific information on particular hazardous materials and the available alternatives may be found in the references and resources listed below.

- Automotive products – Less toxic alternatives are not available for many automotive products, especially engine fluids. But there are alternatives to grease lubricants, car polishes, degreasers, and windshield washer solution. Rerefined motor oil is also available.
- Vehicle/Trailer lubrication – Fifth wheel bearings on trucks require routine lubrication. Adhesive lubricants are available to replace typical chassis grease.
- Cleaners – Vegetables-based or citrus-based soaps are available to replace petroleum-based soaps/detergents.
- Paint products – Water-based paints, wood preservatives, stains, and finishes are available.
- Pesticides – Specific alternative products or methods exist to control most insects, fungi, and weeds.
- Chemical Fertilizers – Compost and soil amendments are natural alternatives.
- Consumables – Manufacturers have either reduced or are in the process of reducing the amount of heavy metals in consumables such as batteries and fluorescent lamps. All fluorescent lamps contain mercury, however low-mercury containing lamps are now available from most hardware and lighting stores. Fluorescent lamps are also more energy efficient than the average incandescent lamp.
- Janitorial chemicals – Even biodegradable soap can harm fish and wildlife before it biodegrades. Biodegradable does not mean non-toxic. Safer products and procedures are available for floor stripping and cleaning, as well as carpet, glass, metal, and restroom cleaning and disinfecting.

Examples

There are a number of business and trade associations, and communities with effective programs. Some of the more prominent are listed below in the references and resources section.

References and Resources

Note: Many of these references provide alternative products for materials that typically are used inside and disposed to the sanitary sewer as well as alternatives to products that usually end up in the storm drain.

General Sustainable Practices and Pollution Prevention Including Pollutant-Specific Information

California Department of Toxic Substances Control (www.dtsc.ca.gov)

California Integrated Waste Management Board (www.ciwmb.ca.gov)

City of Santa Monica (www.santa-monica.org/environment)

City of Palo Alto (www.city.palo-alto.ca.us/cleanbay)

City and County of San Francisco, Department of the Environment (www.ci.sf.ca.us/sfenvironment)

Earth 911 (www.earth911.org/master.asp)

Environmental Finance Center Region IX (www.greenstart.org/efc9)

Flex Your Power (www.flexyourpower.ca.gov)

GreenBiz.com (www.greenbiz.com)

Green Business Program (www.abag.org/bayarea/enviro/gbus/gb.html)

Pacific Industrial and Business Association (www.piba.org)

Sacramento Clean Water Business Partners (www.sacstormwater.org)

USEPA BMP fact sheet – Alternative products (http://cfpub.epa.gov/npdes/stormwater/menuofbmps/poll_2.cfm)

USEPA Region IX Pollution Prevention Program (www.epa.gov/region09/p2)

Western Regional Pollution Prevention Network (www.westp2net.org)

Metals (mercury, copper)

National Electrical Manufacturers Association - Environment, Health and Safety (www.nema.org)

Sustainable Conservation (www.suscon.org)

- Auto Recycling Project
- Brake Pad Partnership

Pesticides and Chemical Fertilizers

Bio-Integral Resource Center (www.birc.org)

California Department of Pesticide Regulation (www.cdpr.ca.gov)

University of California Statewide IPM Program (www.ipm.ucdavis.edu/default.html)

Dioxins

Bay Area Dioxins Project (http://dioxin.abag.ca.gov/)

Road and Street Maintenance SC-70

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	☑
Nutrients	
Trash	☑
Metals	☑
Bacteria	
Oil and Grease	☑
Organics	☑
Oxygen Demanding	☑

Description

Streets, roads, and highways are significant sources of pollutants in stormwater discharges, and operation and maintenance (O&M) practices, if not conducted properly, can contribute to the problem. Stormwater pollution from roadway and bridge maintenance should be addressed on a site-specific basis. Use of the procedures outlined below, that address street sweeping and repair, bridge and structure maintenance, and unpaved roads will reduce pollutants in stormwater.

Approach

Pollution Prevention

- Use the least toxic materials available (e.g. water based paints, gels or sprays for graffiti removal)
- Recycle paint and other materials whenever possible.
- Enlist the help of citizens to keep yard waste, used oil, and other wastes out of the gutter.

Suggested Protocols

Street Sweeping and Cleaning

- Maintain a consistent sweeping schedule. Provide minimum monthly sweeping of curbed streets.
- Perform street cleaning during dry weather if possible.

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- Avoid wet cleaning or flushing of street, and utilize dry methods where possible.
- Consider increasing sweeping frequency based on factors such as traffic volume, land use, field observations of sediment and trash accumulation, proximity to water courses, etc. For example:
  - Increase the sweeping frequency for streets with high pollutant loadings, especially in high traffic and industrial areas.
  - Increase the sweeping frequency just before the wet season to remove sediments accumulated during the summer.
  - Increase the sweeping frequency for streets in special problem areas such as special events, high litter or erosion zones.
- Maintain cleaning equipment in good working condition and purchase replacement equipment as needed. Old sweepers should be replaced with new technologically advanced sweepers (preferably regenerative air sweepers) that maximize pollutant removal.
- Operate sweepers at manufacturer requested optimal speed levels to increase effectiveness.
- To increase sweeping effectiveness consider the following:
  - Institute a parking policy to restrict parking in problematic areas during periods of street sweeping.
  - Post permanent street sweeping signs in problematic areas; use temporary signs if installation of permanent signs is not possible.
  - Develop and distribute flyers notifying residents of street sweeping schedules.
- Regularly inspect vehicles and equipment for leaks, and repair immediately.
- If available use vacuum or regenerative air sweepers in the high sediment and trash areas (typically industrial/commercial).
- Keep accurate logs of the number of curb-miles swept and the amount of waste collected.
- Dispose of street sweeping debris and dirt at a landfill.
- Do not store swept material along the side of the street or near a storm drain inlet.
- Keep debris storage to a minimum during the wet season or make sure debris piles are contained (e.g. by berming the area) or covered (e.g. with tarps or permanent covers).

Street Repair and Maintenance

Pavement marking

- Schedule pavement marking activities for dry weather.

- Develop paint handling procedures for proper use, storage, and disposal of paints.
- Transfer and load paint and hot thermoplastic away from storm drain inlets.
- Provide drop cloths and drip pans in paint mixing areas.
- Properly maintain application equipment.
- Street sweep thermoplastic grindings. Yellow thermoplastic grindings may require special handling as they may contain lead.
- Paints containing lead or tributyltin are considered a hazardous waste and must be disposed of properly.
- Use water based paints whenever possible. If using water based paints, clean the application equipment in a sink that is connected to the sanitary sewer.
- Properly store leftover paints if they are to be kept for the next job, or dispose of properly.

Concrete installation and repair

- Schedule asphalt and concrete activities for dry weather.
- Take measures to protect any nearby storm drain inlets and adjacent watercourses, prior to breaking up asphalt or concrete (e.g. place san bags around inlets or work areas).
- Limit the amount of fresh concrete or cement mortar mixed, mix only what is needed for the job.
- Store concrete materials under cover, away from drainage areas. Secure bags of cement after they are open. Be sure to keep wind-blown cement powder away from streets, gutters, storm drains, rainfall, and runoff.
- Return leftover materials to the transit mixer. Dispose of small amounts of hardened excess concrete, grout, and mortar in the trash.
- Do not wash sweepings from exposed aggregate concrete into the street or storm drain. Collect and return sweepings to aggregate base stockpile, or dispose in the trash.
- When making saw cuts in pavement, use as little water as possible and perform during dry weather. Cover each storm drain inlet completely with filter fabric or plastic during the sawing operation and contain the slurry by placing straw bales, sandbags, or gravel dams around the inlets. After the liquid drains or evaporates, shovel or vacuum the slurry residue from the pavement or gutter and remove from site. Alternatively, a small onsite vacuum may be used to pick up the slurry as this will prohibit slurry from reaching storm drain inlets.
- Wash concrete trucks off site or in designated areas on site designed to preclude discharge of wash water to drainage system.

Patching, resurfacing, and surface sealing

- Schedule patching, resurfacing and surface sealing for dry weather.
- Stockpile materials away from streets, gutter areas, storm drain inlets or watercourses. During wet weather, cover stockpiles with plastic tarps or berm around them if necessary to prevent transport of materials in runoff.
- Pre-heat, transfer or load hot bituminous material away from drainage systems or watercourses.
- Where applicable, cover and seal nearby storm drain inlets (with waterproof material or mesh) and maintenance holes before applying seal coat, slurry seal, etc. Leave covers in place until job is complete and until all water from emulsified oil sealants has drained or evaporated. Clean any debris from covered maintenance holes and storm drain inlets when the job is complete.
- Prevent excess material from exposed aggregate concrete or similar treatments from entering streets or storm drain inlets. Designate an area for clean up and proper disposal of excess materials.
- Use only as much water as necessary for dust control, to avoid runoff.
- Sweep, never hose down streets to clean up tracked dirt. Use a street sweeper or vacuum truck. Do not dump vacuumed liquid in storm drains.
- Catch drips from paving equipment that is not in use with pans or absorbent material placed under the machines. Dispose of collected material and absorbents properly.

Equipment cleaning maintenance and storage

- Inspect equipment daily and repair any leaks. Place drip pans or absorbent materials under heavy equipment when not in use.
- Perform major equipment repairs at the corporation yard, when practical.
- If refueling or repairing vehicles and equipment must be done onsite, use a location away from storm drain inlets and watercourses.
- Clean equipment including sprayers, sprayer paint supply lines, patch and paving equipment, and mud jacking equipment at the end of each day. Clean in a sink or other area (e.g. vehicle wash area) that is connected to the sanitary sewer.

Bridge and Structure Maintenance

Paint and Paint Removal

- Transport paint and materials to and from job sites in containers with secure lids and tied down to the transport vehicle.
- Do not transfer or load paint near storm drain inlets or watercourses.

- Test and inspect spray equipment prior to starting to paint. Tighten all hoses and connections and do not overfill paint container.
- Plug nearby storm drain inlets prior to starting painting where there is significant risk of a spill reaching storm drains. Remove plugs when job is completed.
- If sand blasting is used to remove paint, cover nearby storm drain inlets prior to starting work.
- Perform work on a maintenance traveler or platform, or use suspended netting or tarps to capture paint, rust, paint removing agents, or other materials, to prevent discharge of materials to surface waters if the bridge crosses a watercourse. If sanding, use a sander with a vacuum filter bag.
- Capture all clean-up water, and dispose of properly.
- Recycle paint when possible (e.g. paint may be used for graffiti removal activities). Dispose of unused paint at an appropriate household hazardous waste facility.

Graffiti Removal

- Schedule graffiti removal activities for dry weather.
- Protect nearby storm drain inlets prior to removing graffiti from walls, signs, sidewalks, or other structures needing graffiti abatement. Clean up afterwards by sweeping or vacuuming thoroughly, and/or by using absorbent and properly disposing of the absorbent.
- When graffiti is removed by painting over, implement the procedures under Painting and Paint Removal above.
- Direct runoff from sand blasting and high pressure washing (with no cleaning agents) into a landscaped or dirt area. If such an area is not available, filter runoff through an appropriate filtering device (e.g. filter fabric) to keep sand, particles, and debris out of storm drains.
- If a graffiti abatement method generates wash water containing a cleaning compound (such as high pressure washing with a cleaning compound), plug nearby storm drains and vacuum/pump wash water to the sanitary sewer.
- Consider using a waterless and non-toxic chemical cleaning method for graffiti removal (e.g. gels or spray compounds).

Repair Work

- Prevent concrete, steel, wood, metal parts, tools, or other work materials from entering storm drains or watercourses.
- Thoroughly clean up the job site when the repair work is completed.
- When cleaning guardrails or fences follow the appropriate surface cleaning methods (depending on the type of surface) outlined in SC-71 Plaza & Sidewalk Cleaning fact sheet.

- If painting is conducted, follow the painting and paint removal procedures above.
- If graffiti removal is conducted, follow the graffiti removal procedures above.
- If construction takes place, see the Construction Activity BMP Handbook.
- Recycle materials whenever possible.

Unpaved Roads and Trails

- Stabilize exposed soil areas to prevent soil from eroding during rain events. This is particularly important on steep slopes.
- For roadside areas with exposed soils, the most cost-effective choice is to vegetate the area, preferably with a mulch or binder that will hold the soils in place while the vegetation is establishing. Native vegetation should be used if possible.
- If vegetation cannot be established immediately, apply temporary erosion control mats/blankets; a comma straw, or gravel as appropriate.
- If sediment is already eroded and mobilized in roadside areas, temporary controls should be installed. These may include: sediment control fences, fabric-covered triangular dikes, gravel-filled burlap bags, biobags, or hay bales staked in place.

Non-Stormwater Discharges

Field crews should be aware of non-stormwater discharges as part of their ongoing street maintenance efforts.

- Refer to SC-10 Non-Stormwater Discharges
- Identify location, time and estimated quantity of discharges.
- Notify appropriate personnel.

Training

- Train employees regarding proper street sweeping operation and street repair and maintenance.
- Instruct employees and subcontractors to ensure that measures to reduce the stormwater impacts of roadway/bridge maintenance are being followed.
- Require engineering staff and/or consulting A/E firms to address stormwater quality in new bridge designs or existing bridge retrofits.
- Use a training log or similar method to document training.
- Train employees on proper spill containment and clean up, and in identifying non-stormwater discharges.

Spill Response and Prevention

- Refer to SC-11, Spill Prevention, Control & Cleanup.
- Keep your Spill Prevention Control and countermeasure (SPCC) plan up-to-date, and implement accordingly.
- Have spill cleanup materials readily available and in a known location.
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.

Other Considerations

- Densely populated areas or heavily used streets may require parking regulations to clear streets for cleaning.
- No currently available conventional sweeper is effective at removing oil and grease. Mechanical sweepers are not effective at removing finer sediments.
- Limitations may arise in the location of new bridges. The availability and cost of land and other economic and political factors may dictate where the placement of a new bridge will occur. Better design of the bridge to control runoff is required if it is being placed near sensitive waters.

Requirements

Costs

- The maintenance of local roads and bridges is already a consideration of most community public works or transportation departments. Therefore, the cost of pollutant reducing management practices will involve the training and equipment required to implement these new practices.
- The largest expenditures for street sweeping programs are in staffing and equipment. The capital cost for a conventional street sweeper is between $60,000 and $120,000. Newer technologies might have prices approaching $180,000. The average useful life of a conventional sweeper is about four years, and programs must budget for equipment replacement. Sweeping frequencies will determine equipment life, so programs that sweep more often should expect to have a higher cost of replacement.
- A street sweeping program may require the following.
  - Sweeper operators, maintenance, supervisory, and administrative personnel are required.
  - Traffic control officers may be required to enforce parking restrictions.
  - Skillful design of cleaning routes is required for program to be productive.
  - Arrangements must be made for disposal of collected wastes.

- If investing in newer technologies, training for operators must be included in operation and maintenance budgets. Costs for public education are small, and mostly deal with the need to obey parking restrictions and litter control. Parking tickets are an effective reminder to obey parking rules, as well as being a source of revenue.

Maintenance

- Not applicable

Supplemental Information

Further Detail of the BMP

Street sweeping

There are advantages and disadvantages to the two common types of sweepers. The best choice depends on your specific conditions. Many communities find it useful to have a compliment of both types in their fleet.

Mechanical Broom Sweepers - More effective at picking up large debris and cleaning wet streets. Less costly to purchase and operate. Create more airborne dust.

Vacuum Sweepers - More effective at removing fine particles and associated heavy metals. Ineffective at cleaning wet streets. Noisier than mechanical broom sweepers which may restrict areas or times of operation. May require an advance vehicle to remove large debris.

Street Flushers - Not affected by biggest interference to cleaning, parked cars. May remove finer sediments, moving them toward the gutter and stormwater inlets. For this reason, flushing fell out of favor and is now used primarily after sweeping. Flushing may be effective for combined sewer systems. Presently street flushing is not allowed under most NPDES permits.

Cross-Media Transfer of Pollutants

The California Air Resources Board (ARB) has established state ambient air quality standards including a standard for respirable particulate matter (less than or equal to 10 microns in diameter, symbolized as PM10). In the effort to sweep up finer sediments to remove attached heavy metals, municipalities should be aware that fine dust, that cannot be captured by the sweeping equipment and becomes airborne, could lead to issues of worker and public safety.

Bridges

Bridges that carry vehicular traffic generate some of the more direct discharges of runoff to surface waters. Bridge scupper drains cause a direct discharge of stormwater into receiving waters and have been shown to carry relatively high concentrations of pollutants. Bridge maintenance also generates wastes that may be either directly deposited to the water below or carried to the receiving water by stormwater. The following steps will help reduce the stormwater impacts of bridge maintenance:

- Site new bridges so that significant adverse impacts to wetlands, sensitive areas, critical habitat, and riparian vegetation are minimized.

- Design new bridges to avoid the use of scupper drains and route runoff to land for treatment control. Existing scupper drains should be cleaned on a regular basis to avoid sediment/debris accumulation.
- Reduce the discharge of pollutants to surface waters during maintenance by using suspended traps, vacuums, or booms in the water to capture paint, rust, and paint removing agents. Many of these wastes may be hazardous. Properly dispose of this waste by referring to CA21 (Hazardous Waste Management) in the Construction Handbook.
- Train employees and subcontractors to reduce the discharge of wastes during bridge maintenance.

De-icing

- Do not over-apply deicing salt and sand, and routinely calibrate spreaders.
- Near reservoirs, restrict the application of deicing salt and redirect any runoff away from reservoirs.
- Consider using alternative deicing agents (less toxic, biodegradable, etc.).

References and Resources

Model Urban Runoff Program: A How-To Guide for Developing Urban Runoff Programs for Small Municipalities. Prepared by City of Monterey, City of Santa Cruz, California Coastal Commission, Monterey Bay National Marine Sanctuary, Association of Monterey Bay Area Governments, Woodward-Clyde, Central Coast Regional Water Quality Control Board. July. 1998.

Orange County Stormwater Program
http://www.ocwatersheds.com/stormwater/swp_introduction.asp

Oregon Association of Clean Water Agencies. Oregon Municipal Stormwater Toolbox for Maintenance Practices. June 1998.

Santa Clara Valley Urban Runoff Pollution Prevention Program. 1997 Urban Runoff Management Plan. September 1997, updated October 2000.

Santa Clara Valley Urban Runoff Pollution Prevention Program. 2001. Fresh Concrete and Mortar Application Best Management Practices for the Construction Industry. June.

Santa Clara Valley Urban Runoff Pollution Prevention Program. 2001. Roadwork and Paving Best Management Practices for the Construction Industry. June.

United States Environmental Protection Agency (USEPA). 2002. Pollution Prevention/Good Housekeeping for Municipal Operations Roadway and Bridge Maintenance. On-line
http://www.epa.gov/npdes/menuofbmps/poll_13.htm

Plaza and Sidewalk Cleaning SC-71

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	☑
Oil and Grease	☑
Organics	☑
Oxygen Demanding	☑

Description

Pollutants on sidewalks and other pedestrian traffic areas and plazas are typically due to littering and vehicle use. This fact sheet describes good housekeeping practices that can be incorporated into the municipality's existing cleaning and maintenance program.

Approach

Pollution Prevention

- Use dry cleaning methods whenever practical for surface cleaning activities.
- Use the least toxic materials available (e.g. water based paints, gels or sprays for graffiti removal).

Suggested Protocols

Surface Cleaning

- Regularly broom (dry) sweep sidewalk, plaza and parking lot areas to minimize cleaning with water.
- Dry cleanup first (sweep, collect, and dispose of debris and trash) when cleaning sidewalks or plazas, then wash with or without soap.
- Block the storm drain or contain runoff when cleaning with water. Discharge wash water to landscaping or collect water and pump to a tank or discharge to sanitary sewer if allowed. (Permission may be required from local sanitation district.)

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- Block the storm drain or contain runoff when washing parking areas, driveways or drive-throughs. Use absorbents to pick up oil; then dry sweep. Clean with or without soap. Collect water and pump to a tank or discharge to sanitary sewer if allowed. Street Repair and Maintenance.

Graffiti Removal

- Avoid graffiti abatement activities during rain events.
- Implement the procedures under Painting and Paint Removal in SC-70 Roads, Streets, and Highway Operation and Maintenance fact sheet when graffiti is removed by painting over.
- Direct runoff from sand blasting and high pressure washing (with no cleaning agents) into a dirt or landscaped area after treating with an appropriate filtering device.
- Plug nearby storm drain inlets and vacuum/pump wash water to the sanitary sewer if authorized to do so if a graffiti abatement method generates wash water containing a cleaning compound (such as high pressure washing with a cleaning compound). Ensure that a non-hazardous cleaning compound is used or dispose as hazardous waste, as appropriate.

Surface Removal and Repair

- Schedule surface removal activities for dry weather if possible.
- Avoid creating excess dust when breaking asphalt or concrete.
- Take measures to protect nearby storm drain inlets prior to breaking up asphalt or concrete (e.g. place hay bales or sand bags around inlets). Clean afterwards by sweeping up as much material as possible.
- Designate an area for clean up and proper disposal of excess materials.
- Remove and recycle as much of the broken pavement as possible to avoid contact with rainfall and stormwater runoff.
- When making saw cuts in pavement, use as little water as possible. Cover each storm drain inlet completely with filter fabric during the sawing operation and contain the slurry by placing straw bales, sandbags, or gravel dams around the inlets. After the liquid drains or evaporates, shovel or vacuum the slurry residue from the pavement or gutter and remove from site.
- Always dry sweep first to clean up tracked dirt. Use a street sweeper or vacuum truck. Do not dump vacuumed liquid in storm drains. Once dry sweeping is complete, the area may be hosed down if needed. Wash water should be directed to landscaping or collected and pumped to the sanitary sewer if allowed.

Concrete Installation and Repair

- Schedule asphalt and concrete activities for dry weather.

- Take measures to protect any nearby storm drain inlets and adjacent watercourses, prior to breaking up asphalt or concrete (e.g. place san bags around inlets or work areas).
- Limit the amount of fresh concrete or cement mortar mixed, mix only what is needed for the job.
- Store concrete materials under cover, away from drainage areas. Secure bags of cement after they are open. Be sure to keep wind-blown cement powder away from streets, gutters, storm drains, rainfall, and runoff.
- Return leftover materials to the transit mixer. Dispose of small amounts of hardened excess concrete, grout, and mortar in the trash.
- Do not wash sweepings from exposed aggregate concrete into the street or storm drain. Collect and return sweepings to aggregate base stockpile, or dispose in the trash.
- Protect applications of fresh concrete from rainfall and runoff until the material has dried.
- Do not allow excess concrete to be dumped onsite, except in designated areas.
- Wash concrete trucks off site or in designated areas on site designed to preclude discharge of wash water to drainage system.

Controlling Litter

- Post "No Littering" signs and enforce anti-litter laws.
- Provide litter receptacles in busy, high pedestrian traffic areas of the community, at recreational facilities, and at community events.
- Cover litter receptacles and clean out frequently to prevent leaking/spillage or overflow.
- Clean parking lots on a regular basis with a street sweeper.

Training

- Provide regular training to field employees and/or contractors regarding surface cleaning and proper operation of equipment.
- Train employee and contractors in proper techniques for spill containment and cleanup.
- Use a training log or similar method to document training.

Spill Response and Prevention

- Refer to SC-11, Spill Prevention, Control & Cleanup.
- Have spill cleanup materials readily available and in a known location.
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.

Other Considerations

- Limitations related to sweeping activities at large parking facilities may include current sweeper technology to remove oil and grease.
- Surface cleaning activities that require discharges to the local sewering agency will require coordination with the agency.
- Arrangements for disposal of the swept material collected must be made, as well as accurate tracking of the areas swept and the frequency of sweeping.

Requirements

Costs

- The largest expenditures for sweeping and cleaning of sidewalks, plazas, and parking lots are in staffing and equipment. Sweeping of these areas should be incorporated into street sweeping programs to reduce costs.

Maintenance

Not applicable

Supplemental Information

Further Detail of the BMP

Community education, such as informing residents about their options for recycling and waste disposal, as well as the consequences of littering, can instill a sense of citizen responsibility and potentially reduce the amount of maintenance required by the municipality.

Additional BMPs that should be considered for parking lot areas include:

- Allow sheet runoff to flow into biofilters (vegetated strip and swale) and infiltration devices.
- Utilize sand filters or oleophilic collectors for oily waste in low concentrations.
- Arrange rooftop drains to prevent drainage directly onto paved surfaces.
- Design lot to include semi-permeable hardscape.
- Structural BMPs such as storm drain inlet filters can be very effective in reducing the amount of pollutants discharged from parking facilities during periods of rain.

References and Resources

Bay Area Stormwater Management Agencies Association (BASMAA). 1996. Pollution From Surface Cleaning Folder http://www.basmaa.org

Model Urban Runoff Program: A How-To Guide for Developing Urban Runoff Programs for Small Municipalities. Prepared by City of Monterey, City of Santa Cruz, California Coastal Commission, Monterey Bay National Marine Sanctuary, Association of Monterey Bay Area Governments, Woodward-Clyde, Central Coast Regional Water Quality Control Board. July. 1998.

Oregon Association of Clean Water Agencies. Oregon Municipal Stormwater Toolbox for Maintenance Practices. June 1998.

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Santa Clara Valley Urban Runoff Pollution Prevention Program. 1997 Urban Runoff Management Plan. September 1997, updated October 2000.

Santa Clara Valley Urban Runoff Pollution Prevention Program. Maintenance Best Management Practices for the Construction Industry. Brochures: Landscaping, Gardening, and Pool; Roadwork and Paving; and Fresh Concrete and Mortar Application. June 2001.

San Diego Stormwater Co-permittees Jurisdictional Urban Runoff Management Plan. 2001. Municipal Activities Model Program Guidance. November.

Fountain & Pool Maintenance SC-72

Description

The primary pollutant of concern in municipal swimming pool water is chlorine or chloramine used as a disinfectant. This water, if discharged to the storm drain system, can be toxic to aquatic life. In lakes, lagoons, and fountains, the pollutants of concern are chemical algaecides that are added to control algae mainly for aesthetic reasons (visual and odor). Following the procedures noted in this fact sheet will reduce the pollutants in this discharge.

Approach

Pollution Prevention

- Prevent algae problems with regular cleaning, consistent adequate chlorine levels, and well-maintained water filtration and circulation systems.
- Manage pH and water hardness to minimize corrosion of copper pipes.

Suggested Protocols

Pools and Fountains

- Do not use copper-based algaecides. Control algae with chlorine or other alternatives, such as sodium bromide.
- Do not discharge water to a street or storm drain when draining pools or fountains; discharge to the sanitary sewer if permitted to do so. If water is dechlorinated with a neutralizing chemical or by allowing chlorine to dissipate for a few days (do not use the facility during this time), the water may be recycled/reused by draining it gradually onto a landscaped area. Water must be tested prior to discharge to ensure that chlorine is not present.
- Prevent backflow if draining a pool to the sanitary sewer by maintaining an "air gap" between the discharge line and the sewer line (do not seal the connection between the hose and sewer line). Be sure to call the local wastewater treatment plant for further guidance on flow rate restrictions, backflow prevention, and handling special cleaning waste (such as acid wash). Discharge flows should be kept to the low levels typically possible through a garden hose. Higher flow rates may be prohibited by local ordinance.
- Provide drip pans or buckets beneath drain pipe connections to catch leaks. This will be especially pertinent if pool or spa water that has not been dechlorinated is pumped through piping to a discharge location.

Objectives

- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	☑
Metals	
Bacteria	☑
Oil and Grease	
Organics	☑
Oxygen Demanding	☑

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- Never clean a filter in the street or near a storm drain.
- Rinse cartridge filters onto a dirt area, and spade filter residue into soil.
- Backwash diatomaceous earth filters onto dirt. Dispose of spent diatomaceous earth in the garbage. Spent diatomaceous earth cannot be discharged to surface waters, storm drainage systems, septic systems, or on the ground.
- If there is not a suitable dirt area discharge filter backwash or rinsewater to the sanitary sewer if permitted to do so by the local sewering agency.

Lakes and Lagoons

- Reduce fertilizer use in areas around the water body. High nitrogen fertilizers can produce excess growth requiring more frequent mowing or trimming, and may contribute to excessive algae growth.
- To control bacteria, discourage the public from feeding birds and fish (i.e. place signs that prohibit feeding of waterfowl).
- Consider introducing fish species that consume algae. Contact the California Department of Fish and Game for more information on this issue.
- Mechanically remove pond scum (blue-green algae) using a 60 micron net.
- Educate the public on algae and that no controls are necessary for certain types of algae that are beneficial to the water body.
- Control erosion by doing the following:
  - Maintain vegetative cover on banks to prevent soil erosion. Apply mulch or leave clippings to serve as additional cover for soil stabilization and to reduce the velocity of stormwater runoff.
  - Areas should be designed (sloped) to prevent runoff and erosion and to promote better irrigation practices.
  - Provide energy dissipaters (e.g. riprap) along banks to minimize potential for erosion.
  - Confine excavated materials to surfaces away from lakes. Material must be covered if rain is expected.
- Conduct inspections to detect illegal dumping of clippings/cuttings in or near a lake. Materials found should be picked up and properly disposed of.
- Avoid landscape wastes in and around lakes should be avoided by either using bagging equipment or by manually picking up the material. Collect trash and debris from within water bodies where feasible
- Provide and maintain trash receptacles near recreational water bodies to hold refuse generated by the public.

- Increase trash collection during peak visitation months (generally June, July and August).

Training

- Train maintenance personnel to test chlorine levels and to apply neutralizing chemicals.
- Train personnel regarding proper maintenance of pools, ponds and lakes.

Spill Response and Prevention

- Refer to SC-11, Spill Prevention, Control & Cleanup
- Have spill cleanup materials readily available and in a known location.
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.

Other Considerations

- Managers of pools located in sensitive areas or adjacent to shorelines should check with the appropriate authorities to determine if code requirements apply.
- Cleanup activities at lakes and lagoons may create a slight disturbance for local aquatic species. If the lake is recognized as a wetland, many activities, including maintenance, may be subject to regulation and permitting.

Requirements

Costs

- The maintenance of pools and lakes is already a consideration of most municipal public works departments. Therefore the cost associated with this BMP is minimal and only reflects an increase in employee training and public outreach.

Maintenance

Not applicable

Supplemental Information

Further Detail of the BMP

When dredging is conducted, adhere to the following:

- Dredge with shovels when laying/maintaining pipes.
- To determine amount to dredge, determine rate of volume loss due to sediments.
- For large lakes, dredge every 10 years.
- When dredging small lakes, drain lake.
- When dredging large lakes, use vacuum equipment.
- After dredging test sediment piles for proper disposal. Dredged sediment can be used as fill, or may have to be land filled.

SC-72 Fountains & Pools Maintenance

References and Resources

King County Stormwater Pollution Control Manual. Best Management Practices for Businesses. 1995. King County Surface Water Management. July. On-line: http://dnr.metrokc.gov/wlr/dss/spcm.htm

Los Angeles County Stormwater Quality. Public Agency Activities Model Program. On-line: http://ladpw.org/wmd/npdes/public_TC.cfm

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Orange County Stormwater Program http://www.ocwatersheds.com/StormWater/swp_introduction.asp

Santa Clara Valley Urban Runoff Pollution Prevention Program. Maintenance Best Management Practices for the Construction Industry. Brochures: Landscaping, Gardening, and Pool; Roadwork and Paving; and Fresh Concrete and Mortar Application. June 2001.

Landscape Maintenance

SC-73

Objectives

- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	☑
Metals	
Bacteria	
Oil and Grease	
Organics	
Oxygen Demanding	☑

Description

Landscape maintenance activities include vegetation removal; herbicide and insecticide application; fertilizer application; watering; and other gardening and lawn care practices. Vegetation control typically involves a combination of chemical (herbicide) application and mechanical methods. All of these maintenance practices have the potential to contribute pollutants to the storm drain system. The major objectives of this BMP are to minimize the discharge of pesticides, herbicides and fertilizers to the storm drain system and receiving waters; prevent the disposal of landscape waste into the storm drain system by collecting and properly disposing of clippings and cuttings, and educating employees and the public.

Approach

Pollution Prevention

- Implement an integrated pest management (IPM) program. IPM is a sustainable approach to managing pests by combining biological, cultural, physical, and chemical tools.
- Choose low water using flowers, trees, shrubs, and groundcover.
- Consider alternative landscaping techniques such as naturescaping and xeriscaping.
- Conduct appropriate maintenance (i.e. properly timed fertilizing, weeding, pest control, and pruning) to help preserve the landscapes water efficiency.

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- Consider grass cycling (grass cycling is the natural recycling of grass by leaving the clippings on the lawn when mowing. Grass clippings decompose quickly and release valuable nutrients back into the lawn).

Suggested Protocols

Mowing, Trimming, and Weeding

- Whenever possible use mechanical methods of vegetation removal (e.g mowing with tractor-type or push mowers, hand cutting with gas or electric powered weed trimmers) rather than applying herbicides. Use hand weeding where practical.
- Avoid loosening the soil when conducting mechanical or manual weed control, this could lead to erosion. Use mulch or other erosion control measures when soils are exposed.
- Performing mowing at optimal times. Mowing should not be performed if significant rain events are predicted.
- Mulching mowers may be recommended for certain flat areas. Other techniques may be employed to minimize mowing such as selective vegetative planting using low maintenance grasses and shrubs.
- Collect lawn and garden clippings, pruning waste, tree trimmings, and weeds. Chip if necessary, and compost or dispose of at a landfill (see waste management section of this fact sheet).
- Place temporarily stockpiled material away from watercourses, and berm or cover stockpiles to prevent material releases to storm drains.

Planting

- Determine existing native vegetation features (location, species, size, function, importance) and consider the feasibility of protecting them. Consider elements such as their effect on drainage and erosion, hardiness, maintenance requirements, and possible conflicts between preserving vegetation and the resulting maintenance needs.
- Retain and/or plant selected native vegetation whose features are determined to be beneficial, where feasible. Native vegetation usually requires less maintenance (e.g., irrigation, fertilizer) than planting new vegetation.
- Consider using low water use groundcovers when planting or replanting.

Waste Management

- Compost leaves, sticks, or other collected vegetation or dispose of at a permitted landfill. Do not dispose of collected vegetation into waterways or storm drainage systems.
- Place temporarily stockpiled material away from watercourses and storm drain inlets, and berm or cover stockpiles to prevent material releases to the storm drain system.
- Reduce the use of high nitrogen fertilizers that produce excess growth requiring more frequent mowing or trimming.

- Avoid landscape wastes in and around storm drain inlets by either using bagging equipment or by manually picking up the material.

Irrigation

- Where practical, use automatic timers to minimize runoff.
- Use popup sprinkler heads in areas with a lot of activity or where there is a chance the pipes may be broken. Consider the use of mechanisms that reduce water flow to sprinkler heads if broken.
- Ensure that there is no runoff from the landscaped area(s) if re-claimed water is used for irrigation.
- If bailing of muddy water is required (e.g. when repairing a water line leak), do not put it in the storm drain; pour over landscaped areas.
- Irrigate slowly or pulse irrigate to prevent runoff and then only irrigate as much as is needed.
- Apply water at rates that do not exceed the infiltration rate of the soil.

Fertilizer and Pesticide Management

- Utilize a comprehensive management system that incorporates integrated pest management (IPM) techniques. There are many methods and types of IPM, including the following:
  - Mulching can be used to prevent weeds where turf is absent, fencing installed to keep rodents out, and netting used to keep birds and insects away from leaves and fruit.
  - Visible insects can be removed by hand (with gloves or tweezers) and placed in soapy water or vegetable oil. Alternatively, insects can be sprayed off the plant with water or in some cases vacuumed off of larger plants.
  - Store-bought traps, such as species-specific, pheromone-based traps or colored sticky cards, can be used.
  - Slugs can be trapped in small cups filled with beer that are set in the ground so the slugs can get in easily.
  - In cases where microscopic parasites, such as bacteria and fungi, are causing damage to plants, the affected plant material can be removed and disposed of (pruning equipment should be disinfected with bleach to prevent spreading the disease organism).
  - Small mammals and birds can be excluded using fences, netting, tree trunk guards.
  - Beneficial organisms, such as bats, birds, green lacewings, ladybugs, praying mantis, ground beetles, parasitic nematodes, trichogramma wasps, seed head weevils, and spiders that prey on detrimental pest species can be promoted.
- Follow all federal, state, and local laws and regulations governing the use, storage, and disposal of fertilizers and pesticides and training of applicators and pest control advisors.

- Use pesticides only if there is an actual pest problem (not on a regular preventative schedule).
- Do not use pesticides if rain is expected. Apply pesticides only when wind speeds are low (less than 5 mph).
- Do not mix or prepare pesticides for application near storm drains.
- Prepare the minimum amount of pesticide needed for the job and use the lowest rate that will effectively control the pest.
- Employ techniques to minimize off-target application (e.g. spray drift) of pesticides, including consideration of alternative application techniques.
- Fertilizers should be worked into the soil rather than dumped or broadcast onto the surface.
- Calibrate fertilizer and pesticide application equipment to avoid excessive application.
- Periodically test soils for determining proper fertilizer use.
- Sweep pavement and sidewalk if fertilizer is spilled on these surfaces before applying irrigation water.
- Purchase only the amount of pesticide that you can reasonably use in a given time period (month or year depending on the product).
- Triple rinse containers, and use rinse water as product. Dispose of unused pesticide as hazardous waste.
- Dispose of empty pesticide containers according to the instructions on the container label.

Inspection

- Inspect irrigation system periodically to ensure that the right amount of water is being applied and that excessive runoff is not occurring. Minimize excess watering, and repair leaks in the irrigation system as soon as they are observed.
- Inspect pesticide/fertilizer equipment and transportation vehicles daily.

Training

- Educate and train employees on use of pesticides and in pesticide application techniques to prevent pollution. Pesticide application must be under the supervision of a California qualified pesticide applicator.
- Train/encourage municipal maintenance crews to use IPM techniques for managing public green areas.
- Annually train employees within departments responsible for pesticide application on the appropriate portions of the agency's IPM Policy, SOPs, and BMPs, and the latest IPM techniques.

- Employees who are not authorized and trained to apply pesticides should be periodically (at least annually) informed that they cannot use over-the-counter pesticides in or around the workplace.
- Use a training log or similar method to document training.

Spill Response and Prevention

- Refer to SC-11, Spill Prevention, Control & Cleanup
- Have spill cleanup materials readily available and in a know in location
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.

Other Considerations

- The Federal Pesticide, Fungicide, and Rodenticide Act and California Title 3, Division 6, Pesticides and Pest Control Operations place strict controls over pesticide application and handling and specify training, annual refresher, and testing requirements. The regulations generally cover: a list of approved pesticides and selected uses, updated regularly; general application information; equipment use and maintenance procedures; and record keeping. The California Department of Pesticide Regulations and the County Agricultural Commission coordinate and maintain the licensing and certification programs. All public agency employees who apply pesticides and herbicides in "agricultural use" areas such as parks, golf courses, rights-of-way and recreation areas should be properly certified in accordance with state regulations. Contracts for landscape maintenance should include similar requirements.
- All employees who handle pesticides should be familiar with the most recent material safety data sheet (MSDS) files.
- Municipalities do not have the authority to regulate the use of pesticides by school districts, however the California Healthy Schools Act of 2000 (AB 2260) has imposed requirements on California school districts regarding pesticide use in schools. Posting of notification prior to the application of pesticides is now required, and IPM is stated as the preferred approach to pest management in schools.

Requirements

Costs

Additional training of municipal employees will be required to address IPM techniques and BMPs. IPM methods will likely increase labor cost for pest control which may be offset by lower chemical costs.

Maintenance

Not applicable

Supplemental Information

Further Detail of the BMP

Waste Management

Composting is one of the better disposal alternatives if locally available. Most municipalities either have or are planning yard waste composting facilities as a means of reducing the amount of waste going to the landfill. Lawn clippings from municipal maintenance programs as well as private sources would probably be compatible with most composting facilities

Contractors and Other Pesticide Users

Municipal agencies should develop and implement a process to ensure that any contractor employed to conduct pest control and pesticide application on municipal property engages in pest control methods consistent with the IPM Policy adopted by the agency. Specifically, municipalities should require contractors to follow the agency's IPM policy, SOPs, and BMPs; provide evidence to the agency of having received training on current IPM techniques when feasible; provide documentation of pesticide use on agency property to the agency in a timely manner.

References and Resources

King County Stormwater Pollution Control Manual. Best Management Practices for Businesses. 1995. King County Surface Water Management. July. On-line: http://dnr.metrokc.gov/wlr/dss/spcm.htm

Los Angeles County Stormwater Quality Model Programs. Public Agency Activities http://ladpw.org/wmd/npdes/model_links.cfm

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United States Environmental Protection Agency (USEPA). 2002. Pollution Prevention/Good Housekeeping for Municipal Operations Landscaping and Lawn Care. Office of Water. Office of Wastewater Management. On-line: http://www.epa.gov/npdes/menuofbmps/poll_8.htm

Drainage System Maintenance SC-74

Photo Credit: Geoff Brosseau

Objectives

- Contain
- Educate
- Reduce/Minimize

Description

As a consequence of its function, the stormwater conveyance system collects and transports urban runoff that may contain certain pollutants. Maintaining catch basins, stormwater inlets, and other stormwater conveyance structures on a regular basis will remove pollutants, prevent clogging of the downstream conveyance system, restore catch basins' sediment trapping capacity, and ensure the system functions properly hydraulically to avoid flooding.

Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	☑
Oil and Grease	☑
Organics	☑
Oxygen Demanding	☑

Approach

Suggested Protocols

Catch Basins/Inlet Structures

- Municipal staff should regularly inspect facilities to ensure the following:
  - Immediate repair of any deterioration threatening structural integrity.
  - Cleaning before the sump is 40% full. Catch basins should be cleaned as frequently as needed to meet this standard.
  - Stenciling of catch basins and inlets (see SC-75 Waste Handling and Disposal).
- Clean catch basins, storm drain inlets, and other conveyance structures in high pollutant load areas just before the wet season to remove sediments and debris accumulated during the summer.

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- Conduct inspections more frequently during the wet season for problem areas where sediment or trash accumulates more often. Clean and repair as needed.
- Keep accurate logs of the number of catch basins cleaned.
- Record the amount of waste collected.
- Store wastes collected from cleaning activities of the drainage system in appropriate containers or temporary storage sites in a manner that prevents discharge to the storm drain.
- Dewater the wastes with outflow into the sanitary sewer if permitted. Water should be treated with an appropriate filtering device prior to discharge to the sanitary sewer. If discharge to the sanitary sewer is not allowed, water should be pumped or vacuumed to a tank and properly disposed of. Do not dewater near a storm drain or stream.
- Except for small communities with relatively few catch basins that may be cleaned manually, most municipalities will require mechanical cleaners such as eductors, vacuums, or bucket loaders.

Storm Drain Conveyance System

- Locate reaches of storm drain with deposit problems and develop a flushing schedule that keeps the pipe clear of excessive buildup.
- Collect flushed effluent and pump to the sanitary sewer for treatment.

Pump Stations

- Clean all storm drain pump stations prior to the wet season to remove silt and trash.
- Do not allow discharge from cleaning a storm drain pump station or other facility to reach the storm drain system.
- Conduct quarterly routine maintenance at each pump station.
- Inspect, clean, and repair as necessary all outlet structures prior to the wet season.
- Sample collected sediments to determine if landfill disposal is possible, or illegal discharges in the watershed are occurring.

Open Channel

- Consider modification of storm channel characteristics to improve channel hydraulics, to increase pollutant removals, and to enhance channel/creek aesthetic and habitat value.
- Conduct channel modification/improvement in accordance with existing laws. Any person, government agency, or public utility proposing an activity that will change the natural (emphasis added) state of any river, stream, or lake in California, must enter into a steam or Lake Alteration Agreement with the Department of Fish and Game. The developer-applicant should also contact local governments (city, county, special districts), other state agencies

(SWRCB, RWQCB, Department of Forestry, Department of Water Resources), and Federal Corps of Engineers and USFWS

Illicit Connections and Discharges

- During routine maintenance of conveyance system and drainage structures field staff should look for evidence of illegal discharges or illicit connections:
  - Is there evidence of spills such as paints, discoloring, etc.
  - Are there any odors associated with the drainage system
  - Record locations of apparent illegal discharges/illicit connections
  - Track flows back to potential dischargers and conduct aboveground inspections. This can be done through visual inspection of up gradient manholes or alternate techniques including zinc chloride smoke testing, fluorometric dye testing, physical inspection testing, or television camera inspection.
  - Once the origin of flow is established, require illicit discharger to eliminate the discharge.
- Stencil storm drains, where applicable, to prevent illegal disposal of pollutants. Storm drain inlets should have messages such as "Dump No Waste Drains to Stream" stenciled next to them to warn against ignorant or intentional dumping of pollutants into the storm drainage system.
- Refer to fact sheet SC-10 Non-Stormwater Discharges.

Illegal Dumping

- Regularly inspect and clean up hot spots and other storm drainage areas where illegal dumping and disposal occurs.
- Establish a system for tracking incidents. The system should be designed to identify the following:
  - Illegal dumping hot spots
  - Types and quantities (in some cases) of wastes
  - Patterns in time of occurrence (time of day/night, month, or year)
  - Mode of dumping (abandoned containers, "midnight dumping" from moving vehicles, direct dumping of materials, accidents/spills)
  - Responsible parties
- Post "No Dumping" signs in problem areas with a phone number for reporting dumping and disposal. Signs should also indicate fines and penalties for illegal dumping.
- Refer to fact sheet SC-10 Non-Stormwater Discharges.

- The State Department of Fish and Game has a hotline for reporting violations called Cal TIP (1-800-952-5400). The phone number may be used to report any violation of a Fish and Game code (illegal dumping, poaching, etc.).
- The California Department of Toxic Substances Control's Waste Alert Hotline, 1-800-69TOXIC, can be used to report hazardous waste violations.

Training

- Train crews in proper maintenance activities, including record keeping and disposal.
- Only properly trained individuals are allowed to handle hazardous materials/wastes.
- Train municipal employees from all departments (public works, utilities, street cleaning, parks and recreation, industrial waste inspection, hazardous waste inspection, sewer maintenance) to recognize and report illegal dumping.
- Train municipal employees and educate businesses, contractors, and the general public in proper and consistent methods for disposal.
- Train municipal staff regarding non-stormwater discharges (See SC-10 Non-Stormwater Discharges).

Spill Response and Prevention

- Refer to SC-11, Prevention, Control & Cleanup
- Have spill cleanup materials readily available and in a known location.
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.

Other Considerations

- Cleanup activities may create a slight disturbance for local aquatic species. Access to items and material on private property may be limited. Trade-offs may exist between channel hydraulics and water quality/riparian habitat. If storm channels or basins are recognized as wetlands, many activities, including maintenance, may be subject to regulation and permitting.
- Storm drain flushing is most effective in small diameter pipes (36-inch diameter pipe or less, depending on water supply and sediment collection capacity). Other considerations associated with storm drain flushing may include the availability of a water source, finding a downstream area to collect sediments, liquid/sediment disposal, and disposal of flushed effluent to sanitary sewer may be prohibited in some areas.
- Regulations may include adoption of substantial penalties for illegal dumping and disposal.
- Municipal codes should include sections prohibiting the discharge of soil, debris, refuse, hazardous wastes, and other pollutants into the storm drain system.
- Private property access rights may be needed to track illegal discharges up gradient.

- Requirements of municipal ordinance authority for suspected source verification testing for illicit connections necessary for guaranteed rights of entry.

Requirements

Costs

- An aggressive catch basin cleaning program could require a significant capital and O&M budget. A careful study of cleaning effectiveness should be undertaken before increased cleaning is implemented. Catch basin cleaning costs are less expensive if vacuum street sweepers are available; cleaning catch basins manually can cost approximately twice as much as cleaning the basins with a vacuum attached to a sweeper.

- Methods used for illicit connection detection (smoke testing, dye testing, visual inspection, and flow monitoring) can be costly and time-consuming. Site-specific factors, such as the level of impervious area, the density and ages of buildings, and type of land use will determine the level of investigation necessary. Encouraging reporting of illicit discharges by employees can offset costs by saving expense on inspectors and directing resources more efficiently. Some programs have used funds available from "environmental fees" or special assessment districts to fund their illicit connection elimination programs.

Maintenance

- Two-person teams may be required to clean catch basins with vactor trucks.

- Identifying illicit discharges requires teams of at least two people (volunteers can be used), plus administrative personnel, depending on the complexity of the storm sewer system.

- Arrangements must be made for proper disposal of collected wastes.

- Requires technical staff to detect and investigate illegal dumping violations, and to coordinate public education.

Supplemental Information

Further Detail of the BMP

Storm Drain flushing

Sanitary sewer flushing is a common maintenance activity used to improve pipe hydraulics and to remove pollutants in sanitary sewer systems. The same principles that make sanitary sewer flushing effective can be used to flush storm drains. Flushing may be designed to hydraulically convey accumulated material to strategic locations, such as to an open channel, to another point where flushing will be initiated, or over to the sanitary sewer and on to the treatment facilities, thus preventing re-suspension and overflow of a portion of the solids during storm events. Flushing prevents "plug flow" discharges of concentrated pollutant loadings and sediments. The deposits can hinder the designed conveyance capacity of the storm drain system and potentially cause backwater conditions in severe cases of clogging.

Storm drain flushing usually takes place along segments of pipe with grades that are too flat to maintain adequate velocity to keep particles in suspension. An upstream manhole is selected to place an inflatable device that temporarily plugs the pipe. Further upstream, water is pumped into the line to create a flushing wave. When the upstream reach of pipe is sufficiently full to

cause a flushing wave, the inflated device is rapidly deflated with the assistance of a vacuum pump, releasing the backed up water and resulting in the cleaning of the storm drain segment.

To further reduce the impacts of stormwater pollution, a second inflatable device, placed well downstream, may be used to re-collect the water after the force of the flushing wave has dissipated. A pump may then be used to transfer the water and accumulated material to the sanitary sewer for treatment. In some cases, an interceptor structure may be more practical or required to re-collect the flushed waters.

It has been found that cleansing efficiency of periodic flush waves is dependent upon flush volume, flush discharge rate, sewer slope, sewer length, sewer flow rate, sewer diameter, and population density. As a rule of thumb, the length of line to be flushed should not exceed 700 feet. At this maximum recommended length, the percent removal efficiency ranges between 65-75 percent for organics and 55-65 percent for dry weather grit/inorganic material. The percent removal efficiency drops rapidly beyond that. Water is commonly supplied by a water truck, but fire hydrants can also supply water. To make the best use of water, it is recommended that reclaimed water be used or that fire hydrant line flushing coincide with storm drain flushing.

Flow Management

Flow management has been one of the principal motivations for designing urban stream corridors in the past. Such needs may or may not be compatible with the stormwater quality goals in the stream corridor.

Downstream flood peaks can be suppressed by reducing through flow velocity. This can be accomplished by reducing gradient with grade control structures or increasing roughness with boulders, dense vegetation, or complex banks forms. Reducing velocity correspondingly increases flood height, so all such measures have a natural association with floodplain open space. Flood elevations laterally adjacent to the stream can be lowered by increasing through flow velocity.

However, increasing velocity increases flooding downstream and inherently conflicts with channel stability and human safety. Where topography permits, another way to lower flood elevation is to lower the level of the floodway with drop structures into a large but subtly excavated bowl where flood flows we allowed to spread out.

Stream Corridor Planning

Urban streams receive and convey stormwater flows from developed or developing watersheds. Planning of stream corridors thus interacts with urban stormwater management programs. If local programs are intended to control or protect downstream environments by managing flows delivered to the channels, then it is logical that such programs should be supplemented by management of the materials, forms, and uses of the downstream riparian corridor. Any proposal for steam alteration or management should be investigated for its potential flow and stability effects on upstream, downstream, and laterally adjacent areas. The timing and rate of flow from various tributaries can combine in complex ways to alter flood hazards. Each section of channel is unique, influenced by its own distribution of roughness elements, management activities, and stream responses.

Flexibility to adapt to stream features and behaviors as they evolve must be included in stream reclamation planning. The amenity and ecology of streams may be enhanced through the landscape design options of 1) corridor reservation, 2) bank treatment, 3) geomorphic restoration, and 4) grade control.

Corridor reservation - Reserving stream corridors and valleys to accommodate natural stream meandering, aggradation, degradation, and over bank flows allows streams to find their own form and generate less ongoing erosion. In California, open stream corridors in recent urban developments have produced recreational open space, irrigation of streamside plantings, and the aesthetic amenity of flowing water.

Bank treatment - The use of armoring, vegetative cover, and flow deflection may be used to influence a channel's form, stability, and biotic habitat. To prevent bank erosion, armoring can be done with rigid construction materials, such as concrete, masonry, wood planks and logs, riprap, and gabions. Concrete linings have been criticized because of their lack of provision of biotic habitat. In contrast, riprap and gabions make relatively porous and flexible linings. Boulders, placed in the bed reduce velocity and erosive power.

Riparian vegetation can stabilize the banks of streams that are at or near a condition of equilibrium. Binding networks of roots increase bank shear strength. During flood flows, resilient vegetation is forced into erosion-inhibiting mats. The roughness of vegetation leads to lower velocity, further reducing erosive effects. Structural flow deflection can protect banks from erosion or alter fish habitat. By concentrating flow, a deflector causes a pool to be scoured in the bed.

Geomorphic restoration – Restoration refers to alteration of disturbed streams so their form and behavior emulate those of undisturbed streams. Natural meanders are retained, with grading to gentle slopes on the inside of curves to allow point bars and riffle-pool sequences to develop. Trees are retained to provide scenic quality, biotic productivity, and roots for bank stabilization, supplemented by plantings where necessary.

A restorative approach can be successful where the stream is already approaching equilibrium. However, if upstream urbanization continues new flow regimes will be generated that could disrupt the equilibrium of the treated system.

Grade Control - A grade control structure is a level shelf of a permanent material, such as stone, masonry, or concrete, over which stream water flows. A grade control structure is called a sill, weir, or drop structure, depending on the relation of its invert elevation to upstream and downstream channels.

A sill is installed at the preexisting channel bed elevation to prevent upstream migration of nick points. It establishes a firm base level below which the upstream channel can not erode.

A weir or check dam is installed with invert above the preexisting bed elevation. A weir raises the local base level of the stream and causes aggradation upstream. The gradient, velocity, and erosive potential of the stream channel are reduced. A drop structure lowers the downstream invert below its preexisting elevation, reducing downstream gradient and velocity. Weirs and drop structure control erosion by dissipating energy and reducing slope velocity.

When carefully applied, grade control structures can be highly versatile in establishing human and environmental benefits in stabilized channels. To be successful, application of grade control structures should be guided by analysis of the stream system both upstream and downstream from the area to he reclaimed.

Examples

The California Department of Water Resources began the Urban Stream Restoration Program in 1985. The program provides grant funds to municipalities and community groups to implement stream restoration projects. The projects reduce damages from streambank aid watershed instability arid floods while restoring streams' aesthetic, recreational, and fish and wildlife values.

In Buena Vista Park, upper floodway slopes are gentle and grassed to achieve continuity of usable park land across the channel of small boulders at the base of the slopes.

The San Diego River is a large, vegetative lined channel, which was planted in a variety of species to support riparian wildlife while stabilizing the steep banks of the floodway.

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Waste Handling and Disposal SC-75

Objectives

- Cover
- Contain
- Educate
- Reduce/Reuse

Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	☑
Oil and Grease	☑
Organics	☑
Oxygen Demanding	☑

Description

It is important to control litter to eliminate trash and other materials in stormwater runoff. Waste reduction is a major component of waste management and should be encouraged through training and public outreach. Management of waste once it is collected may involve reuse, recycling, or proper disposal.

Approach

Pollution Prevention

- Reuse products when possible.
- Encourage recycling programs with recycling bins, used oil collection, etc.

Suggested Protocols

Solid Waste Collection

- Implement procedures, where applicable, to collect, transport, and dispose of solid waste at appropriate disposal facilities in accordance with applicable federal, state, and local laws and regulations.
- Include properly designed trash storage areas. If feasible provide cover over trash storage areas.
- Regularly inspect solid waste containers for structural damage. Repair or replace damaged containers as necessary.

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- Secure solid waste containers; containers must be closed tightly when not in use.
- Do not fill waste containers with washout water or any other liquid.
- Ensure that only appropriate solid wastes are added to the solid waste container. Certain wastes such as hazardous wastes, appliances, fluorescent lamps, pesticides, etc. may not be disposed of in solid waste containers (see chemical/ hazardous waste collection section below).
- Do not mix wastes; this can cause chemical reactions, make recycling impossible, and complicate disposal.
- Refer to SC-34 Waste Handling and Disposal for more information regarding solid waste facilities.

Waste Reduction and Recycling

- Recycle wastes whenever possible. Many types of waste can be recycled, recycling options for each waste type are limited. All gasoline, antifreeze, waste oil, and lead-acid batteries can be recycled. Latex and oil-based paint can be reused, as well as recycled. Materials that cannot be reused or recycled should either be incinerated or disposed of at a properly permitted landfill.
- Recycling is always preferable to disposal of unwanted materials.
- Recycling bins for glass, metal, newspaper, plastic bottles and other recyclable household solid wastes should be provided at public facilities and/or for residential curbside collection.

Controlling Litter

- Post "No Littering" signs and enforce anti-litter laws.
- Provide litter receptacles in busy, high pedestrian traffic areas of the community, at recreational facilities, and at community events.
- Clean out and cover litter receptacles frequently to prevent spillage.

Illegal Dumping

Substances illegally dumped on streets and into the storm drain system and creeks include paints, used oil and other automotive fluids, construction debris, chemicals, fresh concrete, leaves, grass clipping, and pet wastes.

- Post "No Dumping" signs with a phone number for reporting dumping and disposal. Signs should also indicate fines and penalties for illegal dumping.
- Landscaping and beautification efforts of hot spots might also discourage future dumping.
- See SC-74 Drainage System Maintenance, and SC-10 Non-Stormwater Discharges.

Requirements

Costs

- The costs for a solid waste source control program vary depending on the type of method. The cost of a community education program or a plan to increase the number of trash receptacles can be very minimal. Costs for structural controls such as trash racks, bar screens, and silt traps can be quite costly ranging from $250,000 to $900,000.

- A collection facility or curbside collection for used oil may result in significant costs. Commercial locations (automobile service stations, quick oil change centers, etc.) as collection points eliminate hauling and recycling costs.

- Collection and disposal of hazardous waste can be very expensive and requires trained operators; laboratory and detection equipment; and extensive record keeping including dates, types, and quantities.

- Use of volunteer work forces can lower storm drain stenciling program costs. Stenciling kits require procurement of durable/disposable items. The stenciling program can aid in the cataloging of the storm drain system. One municipality from the state of Washington has estimated that stenciling kits cost approximately $50 each. Stencils may cost about $8 each including the die cost on an order of 1,000. Re-orders cost about $1/stencil. Stencil designs may be available from other communities. Stencil kits should be provided on a loan basis to volunteer groups free of charge with the understanding that kit remnants are to be returned.

Maintenance

- The primary staff demand for stenciling programs is for program setup to provide marketing and training. Ongoing/follow-up staff time is minimal because of volunteer services.

- Staffing requirements are minimal for oil recycling programs if collection/recycling is contracted out to a used oil hauler/recycler or required at commercial locations.

- Staff requirements for maintaining good housekeeping BMPs at waste handling sites is minimal.

Supplemental Information

Further Detail of the BMP

Waste Reduction

An approach to reduce stormwater pollution from waste handling and disposal is to assess activities and reduce waste generation. The assessment is designed to find situations where waste can be eliminated or reduced and emissions and environmental damage can be minimized. The assessment involves collecting process specific information, setting pollution prevention targets, and developing, screening and selecting waste reduction options for further study. Starting a waste reduction program is economically beneficial because of reduced raw material purchases and lower waste disposal fees.

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Water & Sewer Utility Maintenance SC-76

Objectives

- Contain
- Educate
- Reduce/Minimize

Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	
Metals	
Bacteria	☑
Oil and Grease	☑
Organics	☑
Oxygen Demanding	☑

Description

Although the operation and maintenance of public utilities are not considered chronic sources of stormwater pollution, some activities and accidents can result in the discharge of pollutants that can pose a threat to both human health and the quality of receiving waters if they enter the storm drain system. Sewage incident response and investigation may involve a coordinated effort between staff from a number of different departments/agencies. Cities that do not provide maintenance of water and sewer utilities must coordinate with the contracting agency responsible for these activities and ensure that these model procedures are followed.

Approach

Pollution Prevention

Inspect potential non-stormwater discharge flow paths and clear/cleanup any debris or pollutants found (i.e. remove trash, leaves, sediment, and wipe up liquids, including oil spills).

Suggested Protocols

Water Line Maintenance and Cleaning

Procedures can be employed to reduce pollutants from discharges associated with water utility operation and maintenance activities. Planned discharges may include fire hydrant testing, flushing water supply mains after new construction, flushing lines due to complaints of taste and odor, dewatering mains for maintenance work. Unplanned discharges from treated, recycled water, raw water, and groundwater systems operation and maintenance activities can occur from water main

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breaks, sheared fire hydrants, equipment malfunction, and operator error.

Planned discharges

- Identify a suitable discharge option in the following order of preference:
  - Apply to the land.
  - Reuse water for dust suppression, irrigation, or construction compaction.
  - Discharge to a sanitary sewer system with approval.
  - Discharge to the storm drain system using applicable pollution control measures. (Only available to clean water discharges such as water main/ water storage tank/water hydrant flushing).
- If water is discharged to a storm drain, control measures must be put in place to control potential pollutants (i.e. sediment, chlorine, etc.). Examples of some storm drain protection options include:
  - Silt fence – appropriate where the inlet drains a relatively flat area.
  - Gravel and wire mesh sediment filter – Appropriate where concentrated flows are expected.
  - Wooden weir and fabric – use at curb inlets where a compact installation is desired.
- Prior to discharge, inspect discharge flow path and clear/cleanup any debris or pollutants found (i.e. remove trash, leaves, sediment, and wipe up liquids, including oil spills).
- General Design considerations for inlet protection devices include the following:
  - The device should be constructed such that cleaning and disposal of trapped sediment is made easy, while minimizing interference with discharge activities.
  - Devices should be constructed so that any standing water resulting from the discharge will not cause excessive inconvenience or flooding/damage to adjacent land or structures.
- The effectiveness of control devices must be monitored during the discharge period and any necessary repairs or modifications made.

Unplanned Discharges

- Stop the discharge as quickly as possible.
- Inspect flow path of the discharged water:
  - Identify erodible areas which may need to be repaired or protected during subsequent repairs or corrective actions

- Identify the potential for pollutants to be washed into the waterway

- If repairs or corrective action will cause additional discharges of water, select the appropriate procedures for erosion control, chlorine residual, turbidity, and chemical additives. Prevent potential pollutants from entering the flow path.

Sanitary Sewer Maintenance

Applicable to municipalities who own and operated a sewage collection system. Facilities that are covered under this program include sanitary sewer pipes and pump stations owned and operated by a municipality. The owner of the sanitary sewer facilities is the entity responsible for carrying out this prevention and response program.

- Clean sewer lines on a regular basis to remove grease, grit, and other debris that may lead to sewer backups.

- Establish routine maintenance program. Cleaning should be conducted at an established minimum frequency and more frequently for problem areas such as restaurants that are identified

- Cleaning activities may require removal of tree roots and other identified obstructions.

- During routine maintenance and inspection note the condition of sanitary sewer structures and identify areas that need repair or maintenance. Items to note may include the following:

  - Cracked/deteriorating pipes

  - Leaking joints/seals at manhole

  - Frequent line plugs

  - Line generally flows at or near capacity

  - Suspected infiltration or exfiltration.

- Prioritize repairs based on the nature and severity of the problem. Immediate clearing of blockage or repair is required where an overflow is currently occurring or for urgent problems that may cause an imminent overflow (e.g. pump station failures, sewer line ruptures, sewer line blockages). These repairs may be temporary until scheduled or capital improvements can be completed.

- Review previous sewer maintenance records to help identify "hot spots" or areas with frequent maintenance problems and locations of potential system failure.

Spills and Overflows

- Identify and track sanitary sewer discharges. Identify dry weather infiltration and inflow first. Wet weather overflow connections are very difficult to locate.

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- Locate wet weather overflows and leaking sanitary sewers using conventional source identification techniques such as monitoring and field screening. Techniques used to identify other illicit connection sources can also be used for sewer system evaluation surveys (see SC74 Drainage System Operation and Maintenance).

- Implement community awareness programs for monitoring sanitary sewer wet weather overflows. A citizen's hotline for reporting observed overflow conditions should be established to supplement field screening efforts.

- Establish lead department/agency responsible for spill response and containment. Provide coordination within departments.

- When a spill, leak, and/or overflow occurs and when disinfecting a sewage contaminated area, take every effort to ensure that the sewage, disinfectant and/or sewage treated with the disinfectant is not discharged to the storm drain system or receiving waters. Methods may include:

  - Blocking storm drain inlets and catch basins

  - Containing and diverting sewage and disinfectant away from open channels and other storm drain fixtures (using sandbags, inflatable dams, etc.)

  - Removing the material with vacuum equipment

- Record required information at the spill site.

- Perform field tests as necessary to determine the source of the spill.

- Develop notification procedures regarding spill reporting.

Septic Systems

- Ensure that homeowners, installers, and inspectors are educated in proper maintenance of septic systems. This may require coordination with staff from other departments. Outreach to homeowners should include inspection reminders informing then that inspection and perhaps maintenance is due for their systems. Recommend that the system be inspected annually and pumped-out regularly.

- Programs which seek to address failing septic systems should consider using field screening to pinpoint areas where more detailed onsite inspection surveys are warranted.

Training

- Conduct annual training of water utility personnel and service contractors. (field screening, sampling, smoke/dye testing, TV inspection).

- OSHA-required Health and Safety Training 29 CFR 1910.120 plus annual Refresher Training (as needed).

- OSHA Confined Space Entry training (Cal-OSHA Confined Space, Title 8 and federal OSHA 29 CFR 1910.146).

Spill Response and Prevention

- See previous section regarding spills and overflows.
- Refer to SC-11, Spill Prevention, Control & Cleanup.
- Have spill cleanup materials readily available and in a known location.
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.

Other Considerations

- Enact ordinance granting "right-of-entry" to locate potentially responsible parties for sewer overflows.
- Reliance on individual onsite inspection to detect failed septic systems can be a major limitation. The individual onsite inspection is very labor-intensive and requires access to private property to pinpoint the exact location of the failing system.
- A significant limitation to correcting failing septic systems is the lack of techniques available for detecting individual failed septic systems.

Requirements

Costs

- Departmental cooperation recommended for sharing or borrowing staff resources and equipment from municipal wastewater department.
- Infiltration, inflow, and wet weather overflows from sanitary sewers are very labor and equipment intensive to locate.
- The costs associated with detecting and correcting septic system failures are subject to a number of factors, including availability of trained personnel, cost of materials, and the level of follow-up required to fix the system problems.

Maintenance

- Minimum 2-person teams to perform field screening and associated sampling.
- Larger teams required for implementing other techniques (i.e. zinc chloride smoke testing, fluorometric dye testing, television camera inspection and physical inspection with confined space entry) to identify sewer system leaks.
- Program coordination required for handling emergencies, record keeping, etc.
- Many of the problems associated with improper use of septic systems may be attributed to lack of user knowledge on operation and maintenance. Educational materials for homeowners and training courses for installers and inspectors can reduce the incidence of pollution from these widespread and commonly used pollution control devices.

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Supplemental Information

Further Detail of the BMP

Onsite Sewage Disposal Systems

New onsite sewage disposal systems should be designed, located, and installed away from open waterbodies and sensitive resources such as wetlands and floodplains. A protective separation between the OSDS and groundwater should also be established. OSDSs should be operated and maintained to prevent surface water discharges and reduce pollutant loadings to groundwater. Inspection of OSDSs should occur regularly and repairs made immediately. New or replacement plumbing fixtures should be of the high efficiency type.

Typical Sanitary Sewer Problems

- Old and deteriorated main and lateral pipes - Sewers range in age from 30 to 100 years with an average age of 50 years.
- Cracked sewer pipes - Existing sewers are mostly clay pipes which can crack as they deteriorate with age and also by earth movement.
- Misaligned and open pipe joints - Most of the mortar used to seal the joints between sections of clay pipe has deteriorated.
- Undersized sewer pipe - The existing sewer system is overloaded due to new sewer hook-ups, underground water infiltration, and illegal roof and/or yard drain connections.
- Defective manholes - Old manholes are made of bricks. Typical problems associated with brick manholes are loose bricks, missing bricks, and misaligned manholes.
- Missing and/or unrecorded sewer pipes and manholes - This problem is typical in the easement/backline sewer. Sewer pipe locations shown on the sewer record map are different from the actual sewer location.
- Sewer main under houses and other improvements - Complaints of sewer main alignment crossing the house and other improvements. A solution to this problem requires an agreement with the property owner for a new sewer easement at a relocated line.

Causes of Sanitary Sewer Backups

- Root infiltration - Tree roots are a major cause of backups.
- Water inflow/infiltration - Rain water entering the sewer pipe causes overflows.
- Solids - Typical solids that buildup in the pipe and cause backups are grease, dirt, bones, tampons, paper towels, diapers, broken dishware, garbage, concrete, and debris.
- Structural defects in pipes and manholes - Sags in the line, cracks, holes, protruding laterals, misaligned pipe, offset joints are all possible causes of backups.

Design Considerations

Sanitary sewer overflows can often be reduced or eliminated by a number of practices, in addition to sewer system cleaning and maintenance, including the following:

- Reducing infiltration and inflow through rehabilitation and repair of broken or leaking sewer lines.
- Enlarging or upgrading the capacity of sewer lines, pump stations, or sewage treatment plants.
- Constructing wet weather storage and treatment facilities to treat excess flows.
- Addressing SSOs during sewer system master planning and facilities planning.

Septic Systems

Two field screening techniques that have been used with success at identifying possible locations of failing septic systems are the brightener test and color infrared (CIR) aerial photography. The first involves the use of specific phosphorus-based elements found in many laundry products, often called brighteners, as an indicator of the presence of failing onsite wastewater systems. The second technique uses color infrared (CIR) aerial photography to characterize the performance of septic systems. This method has been found to be a quick and cost-effective method for assessing the potential impacts of failing systems and uses variations in vegetative growth or stress patterns over septic system field lines to identify those systems that may potentially be malfunctioning. Then a more detailed onsite visual and physical inspection will confirm whether the system has truly failed and the extent of the repairs needed. These inspections may be carried out by county health departments or other authorized personnel.

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Section 4
Treatment Control BMPs

4.1 Introduction

This section discusses the inspection and maintenance requirements for treatment control BMPs shown in Table 4-1. The specific design requirements, performance specifications, and limitations of each of these BMPs are discussed in detail in the New Development and Redevelopment BMP Handbook. Inspection and maintenance requirements are necessary to verify that each treatment control BMP performs efficiently throughout its design life. Although specific inspection and maintenance frequencies are presented in the following fact sheets, these are only suggested and should be adapted to each site situation to best accommodate environmental, economic, and local regulatory concerns.

For the purpose of this Handbook, treatment control BMPs have been classified according to whether they are public domain or proprietary controls. Public domain controls, as the name implies, are controls that are available to the general public, while proprietary controls are typically patented devices and are purchased from a vendor.

Table 4-1 Treatment Control BMPs

Public Domain	
TC-10	Infiltration Trench
TC-11	Infiltration Basin
TC-12	Retention/Irrigation
TC-20	Wet Pond
TC-21	Constructed Wetland
TC-22	Extended Detention Basin
TC-30	Vegetated Swale
TC-31	Vegetated Buffer Strip
TC-32	Bioretention
TC-40	Media Filter
TC-50	Water Quality Inlet
TC-60	Multiple Systems
Manufactured (Proprietary)	
MP-20	Wetland
MP-40	Media Filter
MP-50	Wet Vault
MP-51	Vortex Separator
MP-52	Drain Inlet

4.2 Fact Sheet Format

A BMP fact sheet is a short document that gives pertinent maintenance and inspection information about a particular treatment control BMP. Typically, each fact sheet contains the information outlined in Figure 4-1. Completed fact sheets for each of the treatment control BMPs shown in Table 4-1 are provided in Section 4.3.

The fact sheets also contain side bar presentations with information on BMP maintenance concerns, objectives, and goals; targeted constituents; and removal effectiveness if known.

TC-xx Example Maintenance Fact Sheet

General Description

Inspection/Maintenance Considerations

Inspection Activities

Maintenance Activities

Additional Information

References

Figure 4-1
Example Fact Sheet

4.3 BMP Fact Sheets

Maintenance BMP fact sheets for public domain and manufactured BMPs follow. The BMP fact sheets are individually page numbered and are suitable for photocopying and inclusion in stormwater quality management plans. Fresh copies of the fact sheets can be individually downloaded from the California Stormwater BMP Handbook website at www.cabmphandbooks.com . As noted previously, the reader should refer to the New Development and Redevelopment BMP Handbook for details regarding BMP design, performance, and installation. In addition to the references at the end of each fact sheet, the 1993 version of the California Stormwater BMP Handbook was used as a general reference and starting point for the preparation of the maintenance fact sheets that follow.

In addition, it is worth noting that there are numerous proprietary treatment control devices available. Manufacturers typically have recommended inspection schedules and maintenance requirements for each device. If your facility utilizes proprietary treatment control devices for stormwater runoff, a maintenance agreement and detailed maintenance plan should be developed to ensure that they are well maintained, and operate according to design specifications. For many manufactured devices, municipalities can contract with the manufacturer or representative to provide maintenance services.

Infiltration Trench

TC-10

Maintenance Concerns, Objectives, and Goals

- Accumulation of Metals
- Clogged Soil Outlet Structures
- Vegetation/Landscape Maintenance

General Description

An infiltration trench is a long, narrow, rock-filled trench with no outlet that receives stormwater runoff. Runoff is stored in the void space between the stones and infiltrates through the bottom and into the soil matrix. Infiltration trenches perform well for removal of fine sediment and associated pollutants. Pretreatment using buffer strips, swales, or detention basins is important for limiting amounts of coarse sediment entering the trench which can clog and render the trench ineffective.

Inspection/Maintenance Considerations

Frequency of clogging is dependant on effectiveness of pretreatment, such as vegetated buffer strips, at removing sediments. See appropriate maintenance factsheets for associated pretreatment. If the trench clogs, it may be necessary to remove and replace all or part of the filter fabric and possibly the coarse aggregate. Clogged infiltration trenches with surface standing water can become a nuisance due to mosquito breeding. Maintenance efforts associated with infiltration trenches should include frequent inspections to ensure that water infiltrates into the subsurface completely at a recommended infiltration rate of 72 hours or less to prevent creating mosquito and other vector habitats. Most of the maintenance should be concentrated on the pretreatment practices, such as buffer strips and swales upstream of the trench to ensure that sediment does not reach the infiltration trench. Regular inspection should determine if the sediment removal structures require routine maintenance. Infiltration trenches should not be put into operation until the upstream tributary area is stabilized.

Targeted Constituents

☑	Sediment	■
☑	Nutrients	■
☑	Trash	■
☑	Metals	■
☑	Bacteria	■
☑	Oil and Grease	■
☑	Organics	■
☑	Oxygen Demanding	■

Legend ***(Removal Effectiveness)***

● Low ■ High

▲ Medium

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Inspection Activities	Suggested Frequency
■ Inspect after every major storm for the first few months to ensure proper functioning. Drain times should be observed to confirm that designed drain times has been achieved.	After construction
■ Inspect facility for signs of wetness or damage to structures, signs of petroleum hydrocarbon contamination, standing water, trash and debris, sediment accumulation, slope stability, standing water, and material buildup. ■ Check for standing water or, if available, check observation wells following 3 days of dry weather to ensure proper drain time. ■ Inspect pretreatment devices and diversion structures for damage, sediment buildup, and structural damage.	Semi-annual and after extreme events
■ Trenches with filter fabric should be inspected for sediment deposits by removing a small section of the top layer. If inspection indicates that the trench is partially or completely clogged, it should be restored to its design condition.	Annual
Maintenance Activities	**Suggested Frequency**
■ Repair undercut and eroded areas at inflow and outflow structures. ■ Remove sediment, debris, and oil/grease from pretreatment devices and overflow structures.	Standard maintenance (as needed)
■ Remove trash, debris, grass clippings, trees, and other large vegetation from the trench perimeter and dispose of properly. ■ Mow and trim vegetation to prevent establishment of woody vegetation, and for aesthetic and vector reasons.	Semi-annual, more often as needed
■ Clean out sediment traps, forebays, inlet/outlet structures, overflow spillway, and trenches if necessary. ■ Remove grass clippings, leaves, and accumulated sediment from the surface of the trench. Replace first layer of aggregate and filter fabric if clogging appears only to be at the surface. ■ Clean trench when loss of infiltrative capacity is observed. If drawdown time is observed to have increased significantly over the design drawdown time, removal of sediment may be necessary. This is an expensive maintenance activity and the need for it can be minimized through prevention of upstream erosion.	Annual
■ If bypass capability is available, it may be possible to regain the infiltration rate in the short term by providing an extended dry period. ■ Seed or sod to restore ground cover.	5-year maintenance
■ Total rehabilitation of the trench should be conducted to maintain storage capacity within 2/3 of the design treatment volume and 72-hour exfiltration rate limit. ■ Trench walls should be excavated to expose clean soil. ■ All of the stone aggregate and filter fabric or media must be removed. Accumulated sediment should be stripped from the trench bottom. At this point the bottom may be scarified or tilled to help induce infiltration. New fabric and clean stone aggregate should be refilled.	Upon failure

Additional Information

Infiltration practices have historically had a high rate of failure compared to other stormwater management practices. One study conducted in Prince George's County, Maryland (Galli, 1992), revealed that less than half of the infiltration trenches investigated (of about 50) were still functioning properly, and less than one-third still functioned properly after 5 years. Many of these practices, however, did not incorporate advanced pretreatment. By carefully selecting the location and improving the design features of infiltration practices, their performance should improve.

It is absolutely critical that settleable particles and floatable organic materials be removed from runoff water before it enters the infiltration trench. The trench will clog and become nonfunctional if excessive particulate matter is allowed to enter the trench.

Cold climate considerations – see http://www.cwp.org/cold-climates.htm

References

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Infiltration Basin

TC-11

Maintenance Concerns, Objectives, and Goals

- Vector Control
- Clogged soil or outlet structures
- Vegetation/Landscape Maintenance
- Groundwater contamination
- Accumulation of metals
- Aesthetics

Targeted Constituents

☑	Sediment	■
☑	Nutrients	■
☑	Trash	■
☑	Metals	■
☑	Bacteria	■
☑	Oil and Grease	■
☑	Organics	■
☑	Oxygen Demanding	■

Legend ***(Removal Effectiveness)***

● Low ■ High

▲ Medium

General Description

An infiltration basin is a shallow impoundment that is designed to infiltrate stormwater. Infiltration basins use the natural filtering ability of the soil to remove pollutants in stormwater runoff. Infiltration facilities store runoff until it gradually infiltrates into the soil and eventually into the water table. This practice has high pollutant removal efficiency and can also help recharge groundwater, thus helping to maintain low flows in stream systems. Infiltration basins can be challenging to apply on many sites, however, because of soils requirements. In addition, some studies have shown relatively high failure rates compared with other management practices.

Inspection/Maintenance Considerations

Infiltration basins perform better in well-drained permeable soils. Infiltration basins in areas of low permeability can clog within a couple years, and require more frequent inspections and maintenance. The use and regular maintenance of pretreatment BMPs will significantly minimize maintenance requirements for the basin. Spill response procedures and controls should be implemented to prevent spills from reaching the infiltration system.

Scarification or other disturbance should only be performed when there are actual signs of clogging or significant loss of infiltrative capacity, rather than on a routine basis. Always remove deposited sediments before scarification, and use a hand-guided rotary tiller, if possible, or a disc harrow pulled by a light tractor. This BMP may require groundwater monitoring. Basins cannot be put into operation until the upstream tributary area is stabilized.

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Clogged infiltration basins with surface standing water can become a breeding area for mosquitoes and midges. Maintenance efforts associated with infiltration basins should include frequent inspections to ensure that water infiltrates into the subsurface completely (recommended infiltration rate of 72 hours or less) and that vegetation is carefully managed to prevent creating mosquito and other vector habitats.

Inspection Activities	Suggested Frequency
■ Observe drain time for a storm after completion or modification of the facility to confirm that the desired drain time has been obtained. ■ Newly established vegetation should be inspected several times to determine if any landscape maintenance (reseeding, irrigation, etc.) is necessary.	Post construction
■ Inspect for the following issues: differential accumulation of sediment, signs of wetness or damage to structures, erosion of the basin floor, dead or dying grass on the bottom, condition of riprap, drain time, signs of petroleum hydrocarbon contamination, standing water, trash and debris, sediment accumulation, slope stability, pretreatment device condition	Semi-annual and after extreme events
Maintenance Activities	**Suggested Frequency**
■ Factors responsible for clogging should be repaired immediately. ■ Weed once monthly during the first two growing seasons.	Post construction
■ Stabilize eroded banks. ■ Repair undercut and eroded areas at inflow and outflow structures. ■ Maintain access to the basin for regular maintenance activities. ■ Mow as appropriate for vegetative cover species. ■ Monitor health of vegetation and replace as necessary. ■ Control mosquitoes as necessary. ■ Remove litter and debris from infiltration basin area as required.	Standard maintenance (as needed)
■ Mow and remove grass clippings, litter, and debris. ■ Trim vegetation at the beginning and end of the wet season to prevent establishment of woody vegetation and for aesthetic and vector reasons. ■ Replant eroded or barren spots to prevent erosion and accumulation of sediment.	Semi-annual
■ Scrape bottom and remove sediment when accumulated sediment reduces original infiltration rate by 25-50%. Restore original cross-section and infiltration rate. Properly dispose of sediment. ■ Seed or sod to restore ground cover. ■ Disc or otherwise aerate bottom. ■ Dethatch basin bottom.	3-5 year maintenance

Additional Information

In most cases, sediment from an infiltration basin does not contain toxins at levels posing a hazardous concern. Studies to date indicate that pond sediments are generally below toxicity limits and can be safely landfilled or disposed onsite. Onsite sediment disposal is always preferable (if local authorities permit) as long as the sediments are deposited away from the shoreline to prevent their reentry into the pond and away from recreation areas, where they could possibly be ingested by young children. Sediments should be tested for toxicants in compliance with current disposal requirements if land uses in the catchment include commercial or industrial zones, or if visual or olfactory indications of pollution are noticed. Sediments containing high levels of pollutants should be disposed of properly.

Light equipment, which will not compact the underlying soil, should be used to remove the top layer of sediment. The remaining soil should be tilled and revegetated as soon as possible.

Sediment removal within the basin should be performed when the sediment is dry enough so that it is cracked and readily separates from the basin floor. This also prevents smearing of the basin floor.

References

King County, Stormwater Pollution Control Manual – Best Management Practices for Businesses. July, 1995 Available at: ftp://dnr metrokc.gov/wlr/dss/spcm/SPCM.HTM

Metropolitan Council, Urban Small Sites Best Management Practices Manual. Available at: http://www.metrocouncil.org/environment/Watershed/BMP/manual.htm

U.S. Environmental Protection Agency, Post-Construction Stormwater Management in New Development & Redevelopment BMP Factsheets. Available at: http://www.cfpub.epa.gov/npdes/stormwater/menuofbmps/bmp_files.cfm

Ventura Countywide Stormwater Quality Management Program, Technical Guidance Manual for Stormwater Quality Control Measures. July, 2002.

Retention/Irrigation TC-12

General Description

Retention/irrigation refers to the capture of stormwater runoff in a holding pond and subsequent use of the captured volume for irrigation of landscape or natural pervious areas. This technology is very effective as a stormwater quality practice in that, for the captured water quality volume, it provides virtually no discharge to receiving waters and high stormwater constituent removal efficiencies. This technology mimics natural undeveloped watershed conditions wherein the vast majority of the rainfall volume during smaller rainfall events is infiltrated through the soil profile. Their main advantage over other infiltration technologies is the use of an irrigation system to spread the runoff over a larger area for infiltration. This allows them to be used in areas with low permeability soils.

Capture of stormwater can be accomplished in almost any kind of runoff storage facility, ranging from dry, concrete-lined ponds to those with vegetated basins and permanent pools. The pump and wet well should be automated with a rainfall sensor to provide irrigation only during periods when required infiltration rates can be realized. Generally, a spray irrigation system is required to provide an adequate flow rate for distributing the water quality volume (LCRA, 1998). Collection of roof runoff for subsequent use (rainwater harvesting) also qualifies as a retention/irrigation practice.

Inspection/Maintenance Considerations

Pollutant removal rates are estimated to be nearly 100% for all pollutants in the captured and irrigated stormwater volume. However, relatively frequent inspection and maintenance is necessary to verify proper operation of these facilities.

Maintenance Concerns, Objectives, and Goals

- Sediment Accumulation
- Mechanical malfunction
- Vector Control

Targeted Constituents

☑	Sediment	■
☑	Nutrients	■
☑	Trash	■
☑	Metals	■
☑	Bacteria	■
☑	Oil and Grease	■
☑	Organics	■
☑	Oxygen Demanding	■

Legend ***(Removal Effectiveness)***

● Low ■ High

▲ Medium

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TC-12 Retention/Irrigation

Inspection Activities	Suggested Frequency
■ The irrigation system should be inspected and tested (or observed while in operation) to verify proper operation multiple times annually. Two of these inspections should occur during or immediately following wet weather. Any leaks, broken spray heads, or other malfunctions with the irrigation system should be repaired immediately.	Frequently (3-6 times per year)
Maintenance Activities	**Suggested Frequency**
■ The upper stage, side slopes, and embankment of a retention basin must be mowed regularly to discourage woody growth and control weeds.	Frequently
■ Remove sediment from inlet structure/sediment forebay, and from around the sump area at least 2 times annually or when depth reaches 3 inches. When sediment in other areas of the basin fills the volume allocated for sediment accumulation, all sediment should be removed and disposed of properly. ■ Grass areas in and around basins must be mowed at least twice annually to limit vegetation height to 18 inches. More frequent mowing to maintain aesthetic appeal may be necessary in landscaped areas. When mowing is performed, a mulching mower should be used, or grass clippings should be caught and removed. ■ Debris and litter will accumulate near the basin pump and should be removed during regular mowing operations and inspections. Particular attention should be paid to floating debris that can eventually clog the irrigation system.	Semi-annual
■ The pond side slopes and embankment may periodically suffer from slumping and erosion, although this should not occur often if the soils are properly compacted during construction. Regrading and revegetation may be required to correct the problems.	Infrequently

Wet Pond

TC-20

Maintenance Concerns, Objectives, and Goals

- Vegetation/Landscape Maintenance
- Endangered Species Habitat Creation
- Pollutant Removal Efficiency
- Clogging of the Outlet
- Invasive/exotic Plant Species
- Vector Control

General Description

Wet ponds (a.k.a. stormwater ponds, retention ponds, wet extended detention ponds) are constructed basins that have a permanent pool of water throughout the year (or at least throughout the wet season) and differ from constructed wetlands primarily in having a greater average depth. Ponds treat incoming stormwater runoff by settling and biological uptake. The primary removal mechanism is settling as stormwater runoff resides in this pool, but pollutant uptake, particularly of nutrients, also occurs to some degree through biological activity in the pond. Wet ponds are among the most widely used stormwater practices. While there are several different versions of the wet pond design, the most common modification is the extended detention wet pond, where storage is provided above the permanent pool in order to detain stormwater runoff and promote settling. The schematic diagram is of an on-line pond that includes detention for larger events, but this is not required in all areas of the state.

Targeted Constituents

☑	Sediment	■
☑	Nutrients	▲
☑	Trash	■
☑	Metals	■
☑	Bacteria	■
☑	Oil and Grease	■
☑	Organics	■
☑	Oxygen Demanding	■

Legend ***(Removal Effectiveness)***

● Low ■ High

▲ Medium

Inspection/Maintenance Considerations

In order to maintain the pond's design capacity, sediment must be removed occasionally and adequate resources must be committed to properly maintain peripheral aquatic vegetation, control vector production, and to maintain effective pool volume. Wet ponds can become a nuisance due to mosquito and midge breeding unless carefully designed and maintained. A proactive and routine preventative maintenance plan (which can vary according to location) is crucial to minimizing vector habitat. A vegetated buffer should be preserved around the pond to protect the banks from erosion and provide some pollutant removal before runoff enters the pond by overland flow.

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Inspection Activities	Suggested Frequency
■ Inspect after several storm events to confirm that the drainage system functions, and bank stability and vegetation growth are sufficient.	Post construction
■ Inspect for invasive vegetation, trash and debris, clogging of inlet/outlet structures, excessive erosion, sediment buildup in basin or outlet, cracking or settling of the dam, bank stability, tree growth on dam or embankment, vigor and density of the grass turf on the basin side slopes and floor, differential settlement, leakage, subsidence, damage to the emergency spillway, mechanical component condition, and graffiti.	Semi-annual, after significant storms, or more frequent as needed
■ Inspect condition of inlet and outlet structures, pipes, sediment forebays, basin, and upstream and downstream channel conditions. Monitor drain times, and check for algal growth, signs of pollution such as oil sheens, discolored water, or unpleasant odors, and signs of flooding.	Annual inspection
■ During inspections, note changes to the wet pond or the contributing watershed as these may affect basin performance.	
Maintenance Activities	**Suggested Frequency**
■ Introduce mosquito fish, *Gambusia* spp., (where permitted by the Department of Fish and Game or other agency regulations) to enhance natural mosquito and midge control and regularly maintain emergent and shoreline vegetation to provide access for vector inspectors and facilitate vector control if needed.	Post construction
■ Perform vector control, if necessary. ■ Remove sediment from outlet structure. Dispose of properly. ■ Remove accumulated trash and debris in the basin, inlet/outlet structures, side slopes, and collection system as required. ■ Repair undercut areas and erosion to banks and basin.	Semi annual, after significant storm events
■ Maintain protected vegetated buffer around pond. Mow side slopes and maintain vegetation in and around basin to prevent any erosion or aesthetic problems. Minimize use of fertilizers and pesticides. Reseed if necessary. ■ Manage and harvest wetland plants. ■ Structural repair or replacement, as needed.	Annual maintenance (if needed)
■ Remove sediment from the forebay and regrade when the accumulated sediment volume exceeds 10-20% of the forebay volume. Clean in early spring so vegetation damaged during cleaning has time to re-establish.	5- to 7-year maintenance
■ Remove sediment when the permanent pool volume has become reduced significantly (sediment accumulation exceeds 25% of design depth), resuspension is observed, or the pond becomes eutrophic.	>5 year maintenance

Additional Information

In most cases, sediment from wet ponds do not contain toxins at levels posing a hazardous concern. Studies to date indicate that pond sediments are generally below toxicity limits and can be safely landfilled or disposed onsite. Onsite sediment disposal is always preferable (if local authorities permit) as long as the sediments are deposited away from the shoreline to prevent their reentry into the pond and away from recreation areas, where they could possibly be ingested by young children.

Sediments should be tested for toxicants in compliance with current disposal requirements if land uses in the catchment include commercial or industrial zones, or if visual or olfactory indications of pollution are noticed. Sediments containing high levels of pollutants should be disposed of properly.

For the best water quality benefit, the pond should hold water for at least 24 hours. It should drain down to the permanent water level within 72 hours of a storm event to avoid conditions which might increase water temperatures, deplete oxygen, promote vector growth, and/or cause odors.

References

King County, Stormwater Pollution Control Manual – Best Management Practices for Businesses. July, 1995 Available at: ftp://dnr.metrokc.gov/wlr/dss/spcm/SPCM.HTM

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Ventura Countywide Stormwater Quality Management Program, Technical Guidance Manual for Stormwater Quality Control Measures. July, 2002.

Constructed Wetland

TC-21

Maintenance Concerns, Objectives, and Goals

- Vector/Pest Control
- Sediment and Trash Removal
- Vegetation/Landscape Maintenance
- Invasive Species Management
- Bank Erosion
- Nutrient Release During Winter
- Clogging of the Outlet

General Description

Constructed wetlands are constructed basins that have a permanent pool of water throughout the year (or at least throughout the wet season) and differ from wet ponds primarily in being shallower and having greater vegetation coverage.

A distinction should be made between using a constructed wetland for storm water management and diverting storm water into a natural wetland. The latter practice is not recommended and in all circumstances, natural wetlands should be protected from the adverse effects of development, including impacts from increased storm water runoff. This is especially important because natural wetlands provide storm water and flood control benefits on a regional scale.

Wetlands are among the most effective stormwater practices in terms of pollutant removal and they also offer aesthetic value. As stormwater runoff flows through the wetland, pollutant removal is achieved through settling and biological uptake within the wetland. Flow through the root systems forces the vegetation to remove nutrients and dissolved pollutants from the stormwater.

Targeted Constituents

☑	Sediment	■
☑	Nutrients	▲
☑	Trash	■
☑	Metals	■
☑	Bacteria	■
☑	Oil and Grease	■
☑	Organics	■
☑	Oxygen Demanding	■

Legend ***(Removal Effectiveness)***

● Low ■ High

▲ Medium

Inspection/Maintenance Considerations

Wetlands need a continuous base flow to maintain aquatic plants. Salts and scum can accumulate in wetlands and, unless properly designed and managed, can be flushed out during larger storms. Wetlands can also release nutrients during the non-growing season. Wetlands can become a breeding area for mosquitoes and midges unless carefully designed and maintained. A proactive and routine preventative maintenance plan (which can vary according to location) is crucial to minimizing vector habitat.

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To maximize wetland removal of pollutants, the vegetation must be harvested frequently. Harvesting is particularly important with respect to the removal of phosphorus and metals, less so for nitrogen. Harvesting should occur by mid-summer before the plants begin to transfer phosphorus from the aboveground foliage to subsurface roots, or begin to lose metals that desorb during plant die off. While not stated by the manufacturer, it is also desirable that every few years the entire plant mass including roots be harvested. This is because the below-ground biomass constitutes a significant reservoir (possibly half) of the nutrients and metals that are removed from the stormwater by plants (Minton, 2002).

If pretreatment is provided then maintenance consideration must be given to the build up of debris and floatables.

Constructed Wetland TC-21

Inspection Activities	Suggested Frequency
■ Inspect after several storm events for bank stability, vegetation growth, drainage system functioning, and structural damage.	After construction
■ Inspect for invasive vegetation, differential settlement, cracking; erosion, leakage, or tree growth on the embankment; the condition of the riprap in the inlet, outlet, and pilot channels; sediment accumulation in the basin; clogging of outlet; and the vigor and density of the vegetation on the basin side slopes and floor. Correct observed problems as necessary.	Semi-annual inspection
■ Inspect for damage to the embankment and inlet/outlet structures. Repair as necessary. ■ Note signs of hydrocarbon buildup such as floating oil on water surface. ■ Monitor for sediment accumulation in the facility and forebay. ■ Examine inlet and outlet devices to ensure they are free of debris and are operational.	Annual inspection
Maintenance Activities	**Suggested Frequency**
■ Replace wetland vegetation to maintain at least 50% surface area coverage in wetland plants after the second growing season.	One-time
■ Repair undercut areas, erosion to banks, and bottom as required. ■ Where permitted by the Department of Fish and Game or other agency regulations, stock constructed wetlands regularly with mosquito fish (*Gambusia* spp.) to enhance natural mosquito and midge control	As needed maintenance
■ Clean and remove debris from inlet and outlet structures. ■ Mow side slopes and remove grass clippings. ■ Remove litter and debris from banks, basin bottom, trash racks, outlet structures, and valves as required.	Frequent (3-4 times/year) maintenance
■ Supplement wetland plants if a significant portion have not established (at least 50% of the surface area). ■ Remove nuisance plant species.	Annual maintenance (if needed)
■ Clean forebay to avoid accumulation in main wetland area to minimize when the main wetland area needs to be cleaned.	5- to 7-year maintenance
■ Harvest plant species if vegetation becomes too thick causing flow backup and flooding. More frequent plant harvesting may be required by local vector control agencies.	5- to 7-year maintenance (or more frequently as required)
■ Monitor sediment accumulations, and remove sediment when the accumulated sediment volume exceeds 10-20% of the basin volume, plants are "choked" with sediment, or the wetland becomes eutrophic. It is suggested that the main area be cleaned one half at a time with at least one growing season in between cleanings. This will help to preserve the vegetation and enable the wetland to recover more quickly from the cleaning.	As needed maintenance (20- to 50-years)

Additional Information

The following observations should be made during the inspections:

- Type and distribution of dominant wetland plants in the marsh
- The presence and distribution of planted wetland species
- The presence and distribution of invasive wetland species
- Signs that invasive species are replacing the planted wetland species
- Percentage of unvegetated standing water (excluding the deep water cells which are not suitable for emergent plant growth)
- The maximum elevation and the vegetative condition in this zone, if the design elevation of the normal pool is being maintained for wetlands with extended zones
- Stability of the original depth zones and the microtopographic features, accumulation of sediment in the forebay and micropool, and survival rate of plants in the wetland buffer.

References

Metropolitan Council, Urban Small Sites Best Management Practices Manual. Available at: http://www.metrocouncil.org/environment/Watershed/BMP/manual.htm

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Ventura Countywide Stormwater Quality Management Program, Technical Guidance Manual for Stormwater Quality Control Measures. July, 2002.

Extended Detention Basin TC-22

Maintenance Concerns, Objectives, and Goals

- Vector/Pest Control
- Sediment and Trash Removal
- Vegetation/Landscape Maintenance
- Re-suspension of settled material
- Clogging of the Outlet

General Description

Dry extended detention ponds (a.k.a. dry ponds, extended detention basins, detention ponds, extended detention ponds) are basins whose outlets have been designed to detain the stormwater runoff from a water quality design storm for some minimum time (e.g., 72 hours) to allow particles and associated pollutants to settle. Unlike wet ponds, these facilities do not have a large permanent pool. They can also be used to provide flood control by including additional flood detention storage.

Inspection/Maintenance Considerations

Inspections should be conducted semi-annually and after significant storm events to identify potential problems early. Most maintenance efforts will need to be directed toward vegetation management and vector control, which may focus on basic housekeeping practices such as removal of debris accumulations and vegetation management to ensure that the basin dewaters completely (recommended 72 hour residence time or less) to prevent creating mosquito and other vector habitats.

Targeted Constituents

☑	Sediment	▲
☑	Nutrients	●
☑	Trash	■
☑	Metals	▲
☑	Bacteria	▲
☑	Oil and Grease	▲
☑	Organics	▲
☑	Oxygen Demanding	▲

Legend ***(Removal Effectiveness)***

● Low ■ High

▲ Medium

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TC-22 Extended Detention Basin

Inspection Activities	Suggested Frequency
■ Inspect after several storm events for bank stability, vegetation growth, and to determine if the desired residence time has been achieved. ■ Inspect outlet structure for evidence of clogging or outflow release velocities that are greater than design flow.	Post construction
■ Inspect for the following issues: differential settlement, cracking; erosion of pond banks or bottom, leakage, or tree growth on the embankment; the condition of the riprap in the inlet, clogging of outlet and pilot channels; standing water, slope stability, presence of burrows; sediment accumulation in the basin, forebay, and outlet structures; trash and debris, and the vigor and density of the grass turf on the basin side slopes and floor.	Semi-annual, after significant storms, or more frequent
■ Inspect for the following issues: subsidence, damage to the emergency spillway; inadequacy of the inlet/outlet channel erosion control measures; changes in the condition of the pilot channel, accumulated sediment volume, and semi-annual inspection items.	Annual
■ During inspections, changes to the extended storage pond or the contributing watershed should be noted, as these may affect basin performance.	Annual inspection
Maintenance Activities	**Suggested Frequency**
■ If necessary, modify the outlet orifice to achieve design values if inspection indicates modifications are necessary. ■ Repair undercut or eroded areas. ■ Mow side slopes. ■ Manage pesticide and nutrients. ■ Remove litter and debris. ■ Control vectors as necessary.	As needed
■ Remove accumulated trash and debris from the basin, around the riser pipe, side slopes, embankment, emergency spillway, and outflow trash racks. The frequency of this activity may be altered to meet specific site conditions. ■ Trim vegetation at the beginning and end of the wet season to prevent establishment of woody vegetation and for aesthetic and vector reasons.	Semi-annual, or more frequent, as needed
■ Seed or sod to restore dead or damaged ground cover. ■ Repair erosion to banks and bottom as required.	Annual maintenance (as needed)
■ Supplement wetland plants if a significant portion have not been established (at least 50% of the surface area). ■ Remove nuisance plant species.	Annual maintenance (if needed)
■ Remove sediment from the forebay to reduce frequency of main basin cleaning.	3- to 5-year maintenance
■ Monitor sediment accumulation and remove accumulated sediment and regrade about every 10 years or when the accumulated sediment volume exceeds 10-20% of the basin volume, or when accumulation reaches 6 inches or if resuspension is observed. Clean in early spring so vegetation damaged during cleaning has time to re-establish.	Every 10-25 years

Additional Information

In most cases, sediment from extended detention basin does not contain toxins at levels posing a hazardous concern. Studies to date indicate that pond sediments are likely to meet toxicity limits and can be safely landfilled or disposed of onsite. Onsite sediment disposal is always preferable (if local authorities permit it) as long as the sediments are deposited away from the shoreline to prevent their re-entry into the pond.

Sediments should be tested for toxin in compliance with current disposal requirements if land uses in the catchment include commercial or industrial zones, or if visual or olfactory indications of pollution are noticed.

References

Metropolitan Council, Urban Small Sites Best Management Practices Manual. Available at: http://www.metrocouncil.org/environment/Watershed/BMP/manual.htm

U.S. Environmental Protection Agency, Post-Construction Stormwater Management in New Development & Redevelopment BMP Factsheets. Available at: cfpub.epa.gov/npdes/stormwater/menuofbmps/bmp_files.cfm

Ventura Countywide Stormwater Quality Management Program, Technical Guidance Manual for Stormwater Quality Control Measures. July, 2002.

Vegetated Swale

TC-30

Maintenance Concerns, Objectives, and Goals

- Channelization
- Vegetation/Landscape Maintenance
- Vector Control
- Aesthetics
- Hydraulic and Removal Efficacy

General Description

Vegetated swales are open, shallow channels with vegetation covering the side slopes and bottom that collect and slowly convey runoff flow to downstream discharge points. They are designed to treat runoff through filtering by the vegetation in the channel, filtering through a subsoil matrix, and/or infiltration into the underlying soils. Swales can be natural or manmade. They trap particulate pollutants (suspended solids and trace metals), promote infiltration, and reduce the flow velocity of stormwater runoff. Vegetated swales can serve as part of a stormwater drainage system and can replace curbs, gutters and storm sewer systems. Therefore, swales are best suited for residential, industrial, and commercial areas with low flow and smaller populations.

Targeted Constituents

☑	Sediment	▲
☑	Nutrients	●
☑	Trash	●
☑	Metals	▲
☑	Bacteria	●
☑	Oil and Grease	▲
☑	Organics	▲
☑	Oxygen Demanding	▲

Legend ***(Removal Effectiveness)***

● Low ■ High

▲ Medium

Inspection/Maintenance Considerations

It is important to consider that a thick vegetative cover is needed for vegetated swales to function properly. Usually, swales require little more than normal landscape maintenance activities such as irrigation and mowing to maintain pollutant removal efficiency. Swales can become a nuisance due to mosquito breeding in standing water if obstructions develop (e.g., debris accumulation, invasive vegetation) and/or if proper drainage slopes are not implemented and maintained. The application of fertilizers and pesticides should be minimized.

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TC-30 Vegetated Swale

Inspection Activities	Suggested Frequency
■ Inspect after seeding and after first major storms for any damages.	Post construction
■ Inspect for signs of erosion, damage to vegetation, channelization of flow, debris and litter, and areas of sediment accumulation. Perform inspections at the beginning and end of the wet season. Additional inspections after periods of heavy runoff are desirable.	Semi-annual
■ Inspect level spreader for clogging, grass along side slopes for erosion and formation of rills or gullies, and sand/soil bed for erosion problems.	Annual
Maintenance Activities	**Suggested Frequency**
■ Mow grass to maintain a height of 3–4 inches, for safety, aesthetic, or other purposes. Litter should always be removed prior to mowing. Clippings should be composted. ■ Irrigate swale during dry season (April through October) or when necessary to maintain the vegetation. ■ Provide weed control, if necessary to control invasive species.	As needed (frequent, seasonally)
■ Remove litter, branches, rocks blockages, and other debris and dispose of properly. ■ Maintain inlet flow spreader (if applicable). ■ Repair any damaged areas within a channel identified during inspections. Erosion rills or gullies should be corrected as needed. Bare areas should be replanted as necessary.	Semi-annual
■ Declog the pea gravel diaphragm, if necessary. ■ Correct erosion problems in the sand/soil bed of dry swales. ■ Plant an alternative grass species if the original grass cover has not been successfully established. Reseed and apply mulch to damaged areas.	Annual (as needed)
■ Remove all accumulated sediment that may obstruct flow through the swale. Sediment accumulating near culverts and in channels should be removed when it builds up to 3 in. at any spot, or covers vegetation, or once it has accumulated to 10% of the original design volume. Replace the grass areas damaged in the process. ■ Rototill or cultivate the surface of the sand/soil bed of dry swales if the swale does not draw down within 48 hours.	As needed (infrequent)

Additional Information

Recent research (Colwell et al., 2000) indicates that grass height and mowing frequency have little impact on pollutant removal. Consequently, mowing may only be necessary once or twice a year for safety or aesthetics or to suppress weeds and woody vegetation.

References

Metropolitan Council, Urban Small Sites Best Management Practices Manual. Available at: http://www.metrocouncil.org/environment/Watershed/BMP/manual.htm

U.S. Environmental Protection Agency, Post-Construction Stormwater Management in New Development & Redevelopment BMP Factsheets. Available at: cfpub.epa.gov/npdes/stormwater/menuofbmps/bmp_files.cfm

Ventura Countywide Stormwater Quality Management Program, Technical Guidance Manual for Stormwater Quality Control Measures. July, 2002.

Vegetated Buffer Strip

TC-31

Maintenance Concerns, Objectives, and Goals

- Clogged Soil or Outlet Structures
- Invasive Species Management
- Vegetation/Landscape Maintenance
- Erosion
- Channelization of Flow
- Aesthetics

General Description

Grassed buffer strips (vegetated filter strips, filter strips, and grassed filters) are vegetated surfaces that are designed to treat sheet flow from adjacent surfaces. Filter strips function by slowing runoff velocities and allowing sediment and other pollutants to settle and by providing some infiltration into underlying soils. Filter strips were originally used as an agricultural treatment practice and have more recently evolved into an urban practice. With proper design and maintenance, filter strips can provide relatively high pollutant removal. In addition, the public views them as landscaped amenities and not as stormwater infrastructure. Consequently, there is little resistance to their use.

Targeted Constituents

☑	Sediment	■
☑	Nutrients	●
☑	Trash	▲
☑	Metals	■
☑	Bacteria	●
☑	Oil and Grease	■
☑	Organics	▲
☑	Oxygen Demanding	▲

Legend ***(Removal Effectiveness)***

● Low ■ High

▲ Medium

Inspection/Maintenance Considerations

Vegetated buffer strips require frequent landscape maintenance. In many cases, vegetated buffer strips initially require intense maintenance, but less maintenance is needed over time. In many cases, maintenance tasks can be completed by a landscaping contractor. Maintenance requirements typically include grass or shrub-growing activities such as irrigation, mowing, trimming, removal of invasive species, and replanting when necessary. Buffer strips require more tending as the volume of sediment increases. Vegetated buffer strips can become a nuisance due to mosquito breeding in level spreaders (unless designed to dewater completely in 72 hours or less) and/or if proper drainage slopes are not maintained.

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TC-31 Vegetated Buffer Strip

Inspection Activities	Suggested Frequency
■ Once the vegetated buffer strip is established, inspect at least three times per year. Repair all damage immediately. ■ Inspect buffer strips after seeding and repair as needed.	Post construction
■ Inspect buffer strip and repair all damage immediately. ■ Inspect soil and repair eroded areas.	After major storms
■ Inspect for erosion or damage to vegetation, preferably at the end of the wet season to schedule summer maintenance and before major fall runoff to be sure the strips are ready for winter. However, additional inspection after periods of heavy runoff is desirable. ■ Inspect pea-gravel diaphragm/level spreader for clogging and effectiveness and remove built-up sediment. ■ Inspect for rolls and gullies. Immediately fill with topsoil, install erosion control blanket and seed or sod. ■ Inspect to ensure grass is well established. If not, either prepare soil and reseed or replace with alternative species. Install erosion control blanket. ■ Check for debris and litter, and areas of sediment accumulation.	Semi-annual

Maintenance Activities	Suggested Frequency
■ Water plants daily for 2 weeks after construction.	Post construction
■ Mow regularly to maintain vegetation height between 2 - 4 inches, and to promote thick, dense vegetative growth. Cut only when soil is dry to prevent tracking damage to vegetation, soil compaction and flow concentrations. Clippings are to be removed immediately after mowing. ■ Remove all litter, branches, rocks, or other debris. Damaged areas of the filter strip should be repaired immediately by reseeding and applying mulch. ■ Regularly maintain inlet flow spreader. ■ Irrigate during dry season (April through October) when necessary to maintain the vegetation.	Frequently, as needed
■ Remulch void areas. ■ Treat diseased trees and shrubs, remove dead vegetation.	Semi-annual
■ Remove sediment and replant in areas of buildup. Sediment accumulating near culverts and in channels should be removed when it builds up to 3 in. at any spot, or covers vegetation. ■ Limit fertilizer applications based on plant vigor and soil test results. ■ Rework or replant buffer strip if concentrated flow erodes a channel through the strip.	Annual

Additional Information

Recent research (Colwell et al., 2000) indicates that grass height and mowing frequency have little impact on pollutant removal. Consequently, mowing may only be necessary once or twice a year for safety or aesthetics or to suppress weeds and woody vegetation.

Trash tends to accumulate in swale areas, particularly along highways. The need for litter removal is determined through periodic inspection, but litter should always be removed prior to mowing.

References

Metropolitan Council, Urban Small Sites Best Management Practices Manual. Available at: http://www.metrocouncil.org/environment/Watershed/BMP/manual.htm

U.S. Environmental Protection Agency, Post-Construction Stormwater Management in New Development & Redevelopment BMP Factsheets. Available at: cfpub.epa.gov/npdes/stormwater/menuofbmps/bmp_files.cfm

Ventura Countywide Stormwater Quality Management Program, Technical Guidance Manual for Stormwater Quality Control Measures. July, 2002.

Bioretention

TC-32

Maintenance Concerns, Objectives, and Goals

- Clogged Soil or Outlet Structures
- Invasive Species
- Vegetation/Landscape Maintenance
- Erosion
- Channelization of Flow
- Aesthetics

General Description

The bioretention best management practice (BMP) functions as a soil and plant-based filtration device that removes pollutants through a variety of physical, biological, and chemical treatment processes. These facilities normally consist of a grass buffer strip, sand bed, ponding area, organic layer or mulch layer, planting soil, and plants. The runoff's velocity is reduced by passing over or through a sand bed and is subsequently distributed evenly along a ponding area. Exfiltration of the stored water in the bioretention area planting soil into the underlying soils occurs over a period of days.

Inspection/Maintenance Considerations

Bioretention requires frequent landscaping maintenance, including measures to ensure that the area is functioning properly, as well as maintenance of the landscaping on the practice. In many cases, bioretention areas initially require intense maintenance, but less maintenance is needed over time. In many cases, maintenance tasks can be completed by a landscaping contractor, who may already be hired at the site. In cold climates the soil may freeze, preventing runoff from infiltrating into the planting soil.

Targeted Constituents

☑	Sediment	■
☑	Nutrients	▲
☑	Trash	■
☑	Metals	■
☑	Bacteria	■
☑	Oil and Grease	■
☑	Organics	■
☑	Oxygen Demanding	■

Legend ***(Removal Effectiveness)***

● Low ■ High

▲ Medium

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Inspection Activities	Suggested Frequency
■ Inspect soil and repair eroded areas.	Monthly
■ Inspect for erosion or damage to vegetation, preferably at the end of the wet season to schedule summer maintenance and before major fall runoff to be sure the strips are ready for winter. However, additional inspection after periods of heavy runoff is desirable.	Semi-annual inspection
■ Inspect to ensure grass is well established. If not, either prepare soil and reseed or replace with alternative species. Install erosion control blanket. ■ Check for debris and litter, and areas of sediment accumulation. ■ Inspect health of trees and shrubs.	

Maintenance Activities	Suggested Frequency
■ Water plants daily for 2 weeks.	At project completion
■ Remove litter and debris.	Monthly
■ Remove sediment. ■ Remulch void areas. ■ Treat diseased trees and shrubs. ■ Mow turf areas. ■ Repair erosion at inflow points. ■ Repair outflow structures. ■ Unclog underdrain. ■ Regulate soil pH regulation.	As needed
■ Remove and replace dead and diseased vegetation.	Semi-annual
■ Add mulch. ■ Replace tree stakes and wires.	Annual
■ Mulch should be replaced every 2 to 3 years or when bare spots appear. Remulch prior to the wet season.	Every 2-3 years, or as needed

Additional Information

Landscaping is critical to the function and aesthetic value of bioretention areas. It is preferable to plant the area with native vegetation, or plants that provide habitat value, where possible. Another important design feature is to select species that can withstand the hydrologic regime they will experience. At the bottom of the bioretention facility, plants that tolerate both wet and dry conditions are preferable. At the edges, which will remain primarily dry, upland species will be the most resilient. It is best to select a combination of trees, shrubs, and herbaceous materials.

References

Metropolitan Council, Urban Small Sites Best Management Practices Manual. Available at: http://www.metrocouncil.org/environment/Watershed/BMP/manual.htm

Model Urban Runoff Program: A How-To Guide for Developing Urban Runoff Programs for Small Municipalities. Prepared by City of Monterey, City of Santa Cruz, California Coastal Commission, Monterey Bay National Marine Sanctuary, Association of Monterey Bay Area Governments, Woodward-Clyde, Central Coast Regional Water Quality Control Board. July, 1998, revised February, 2002.

U.S. Environmental Protection Agency, Post-Construction Stormwater Management in New Development & Redevelopment BMP Factsheets. Available at: cfpub.epa.gov/npdes/stormwater/menuofbmps/bmp_files.cfm

Ventura Countywide Stormwater Quality Management Program, Technical Guidance Manual for Stormwater Quality Control Measures. July, 2002.

Media Filter

TC-40

Maintenance Concerns, Objectives, and Goals

- Pollutant Breakthrough
- Clogged of Sand Media
- Trash and Debris Accumulation

General Description

Stormwater media filters are usually two-chambered including a pretreatment settling basin and a filter bed filled with sand or other absorptive filtering media. As stormwater flows into the first chamber, large particles settle out, and then finer particles and other pollutants are removed as stormwater flows through the filtering media in the second chamber. There are a number of design variations including the Austin sand filter, Delaware sand filter, and multi-chambered treatment train (MCTT).

Inspection/Maintenance Considerations

Media filters may exhibit decreased effectiveness after a few years of operation, depending on the activities occurring in the drainage area. Media filters clog easily when subjected to high sediment loads. Sediment reducing pretreatment practices, such as vegetated buffer strips or vegetated swales, placed upstream of the filter should be maintained properly to reduce sediment loads into filter. Media filters can become a nuisance due to mosquito or midge breeding if not properly designed and maintained. Installations should dewater completely (recommended 72 hour or less residence time) to prevent creating mosquito and other vector habitats. Maintenance efforts will need to focus on basic housekeeping practices such as removal of debris accumulations and vegetation management (in filter media) to prevent clogs and/or pods of standing water. To minimize the potential for clogging, frequent maintenance and inspection practices are required. Waste sand, gravel, filter cloth, or filter media must be disposed of properly and in accordance with all applicable laws.

Targeted Constituents

☑	Sediment	■
☑	Nutrients	●
☑	Trash	■
☑	Metals	■
☑	Bacteria	▲
☑	Oil and Grease	■
☑	Organics	■
☑	Oxygen Demanding	■

Legend ***(Removal Effectiveness)***

● Low ■ High

▲ Medium

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Inspection Activities	Suggested Frequency
■ During the first year of operation, inspect chambers quarterly to ensure that the system is functioning properly. ■ Inspect sand filters after every major storm in the first few months after construction to ensure that the system is functioning properly.	Post construction
■ Ensure that filter surface, inlets, and outlets are clear of debris. ■ Ensure that the contributing area is stabilized and mowed, with clippings removed. ■ Check to ensure that the filter surface is not clogging. ■ Ensure that activities in the drainage area minimize oil/grease and sediment entry to the system. ■ Inspect the facility once during the wet season after a large rain event to determine whether the facility is draining completely within 72 hr.	Quarterly, and after major storms
■ Inspect for standing water, sediment, trash and debris, structural damage, and to identify potential problems.	Semi-annual
■ Check to see that the filter bed is clean of sediments and the sediment chamber contains no more than six inches of sediment. ■ Make sure that there is no evidence of deterioration of concrete structures. ■ Inspect grates (if used). ■ Inspect inlets, outlets, and overflow spillway to ensure good condition and no evidence of erosion. ■ Ensure that flow is not bypassing the facility. ■ Ensure that no noticeable odors are detected outside the facility.	Annual
Maintenance Activities	**Suggested Frequency**
■ Remove trash and debris from the sedimentation basin (Austin design), the riser pipe, and the filter bed as needed. ■ Prevent grass clippings from washing into the filter. ■ Remove trash from inlet grates to maintain the inflow capacity of the media filter. ■ Upstream vegetation should be maintained as needed.	Frequently (as needed)
■ Clean filter surface semiannually; or more often if watershed is excessively erosive. ■ Replace sorbent pillows (Multi-Chamber Treatment Train only).	Semi-annual
■ Repair or replace any damaged structural parts. ■ Stabilize any eroded areas.	Annual
■ Remove accumulated sediment in the sedimentation chamber every 10 years or when the sediment occupies 10-20% of the basin volume or accumulates to a depth of six inches, whichever is less. ■ Remove top 2 in. of media filter and landfill if facility drain time exceeds 72 hr. Restore media depth to 18 in. when overall media depth drops to 12 in.).	As needed

References

Metropolitan Council, Urban Small Sites Best Management Practices Manual. Available at: http://www.metrocouncil.org/environment/Watershed/BMP/manual.htm

U.S. Environmental Protection Agency, Post-Construction Stormwater Management in New Development & Redevelopment BMP Factsheets. Available at: http://www.cfpub.epa.gov/npdes/stormwater/menuofbmps/bmp_files.cfm

Ventura Countywide Stormwater Quality Management Program, Technical Guidance Manual for Stormwater Quality Control Measures. July, 2002.

Water Quality Inlet

TC-50

General Description

Water quality inlets (WQIs), also commonly called trapping catch basins, oil/grit separators or oil/water separators, consist of one or more chambers that promote sedimentation of coarse materials and separation of free oil (as opposed to emulsified or dissolved oil) from stormwater. Some WQIs also contain screens to help retain larger or floating debris, and many of the newer designs also include a coalescing unit that helps promote oil/water separation.

These devices are appropriate for capturing hydrocarbon spills, but provide very marginal sediment removal and are not very effective for treatment of stormwater runoff. WQIs typically capture only the first portion of runoff for treatment and are generally used for pretreatment before discharging to other best management practices (BMPs).

Inspection/Maintenance Considerations

High sediment loads can interfere with the ability of the WQI to effectively separate oil and grease from the runoff. During periods of high flow, sediment can be resuspended and released from the WQI into surface waters. Maintenance of WQIs can be easily neglected because they are underground. Establishment of a maintenance schedule is helpful for ensuring proper maintenance occurs. The required maintenance effort will be site-specific due to variations in sediment and hydrocarbon loading. Since WQI residuals contain hydrocarbon by-products, they may require disposal as hazardous waste. Many WQI owners coordinate with waste haulers to collect and dispose of these residuals.

Maintenance Concerns, Objectives, and Goals

- High Sediment Loads
- Hazardous Waste
- Vector Control

Targeted Constituents

☑	Sediment	●
☑	Nutrients	●
☑	Trash	▲
☑	Metals	●
☑	Bacteria	●
☑	Oil and Grease	▲
☑	Organics	●
☑	Oxygen Demanding	●

Legend ***(Removal Effectiveness)***

● Low ■ High

▲ Medium

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CALIFORNIA STORMWATER QUALITY ASSOCIATION

TC-50 Water Quality Inlet

Inspection Activities	Suggested Frequency
■ Inspect after every storm event to determine if maintenance is required.	Monthly during the wet season, or after significant rain events

Maintenance Activities	Suggested Frequency
■ Clean out and dispose of accumulated oil, grease, and sediments. Remove accumulated trash and debris. The clean out and disposal techniques should be environmentally acceptable and in accordance with local regulations.	Annual, before the wet season, or more frequent as needed

Additional Information

Since WQIs can be relatively deep, they may be designated as confined spaces. Caution should be exercised to comply with confined space entry safety regulations if it is required.

References

http://www.co.pierce.wa.us/pc/services/home/environ/water/swm/sppman/bmpt1.htm

Multiple Systems

TC-60

General Description

A multiple treatment system uses two or more BMPs in series. Some examples of multiple systems include: settling basin combined with a sand filter; settling basin or biofilter combined with an infiltration basin or trench; extended detention zone on a wet pond.

Inspection/Maintenance Considerations

Each of the separate treatment processes will require maintenance as described in the previous fact sheets. For example, multiple system comprises of a biofilter combined with an infiltration basin would require the inspection and maintenance considerations outlined on the fact sheet for each process.

Inspection Activities	Suggested Frequency
■ Refer to individual treatment control factsheets	As needed

Maintenance Activities	Suggested Frequency
■ Refer to individual treatment control factsheets	As needed

Maintenance Concerns, Objectives, and Goals

May include the following:

- Accumulation of Metals
- Aesthetics
- Channelization of Flow
- Clogging of the Outlet
- Endangered Species Habitat Creation
- Erosion
- Groundwater Contamination
- Hazardous Waste
- Hydraulic and Removal Efficiency
- Invasive Species Management
- Mechanical Malfunction
- Pollutant Breakthrough
- Re-suspension of settled material
- Sediment and Trash Removal
- Sedimentation
- Vector/Pest Control
- Vegetation harvesting
- Vegetation/Landscape Maintenance

Targeted Constituents

☑ Sediment	■
☑ Nutrients	●
☑ Trash	■
☑ Metals	■
☑ Bacteria	▲
☑ Oil and Grease	■
☑ Organics	■
☑ Oxygen Demanding	■

Legend ***(Removal Effectiveness)***

● Low ■ High

▲ Medium

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Wetland

MP-20

General Description

A manufactured wetland is similar to public domain stormwater wetlands. In a manufactured wetland, gravel substrate and subsurface flow of the stormwater through the root systems force the vegetation to remove nutrients and dissolved pollutants from the stormwater.

Only one company currently manufactures a pre-engineered wetland: It consists of a standard module, about 9.5 feet in diameter and 4 feet in height. The module is constructed of recycled polyethylene. The number of units is varied to meet the design volume of the site.

Inspection/Maintenance Considerations

To maximize wetland removal of pollutants, the vegetation must be harvested frequently. Harvesting is particularly important with respect to the removal of phosphorus and metals, less so nitrogen. Harvesting should occur by mid-summer before the plants begin to transfer phosphorus from the aboveground foliage to subsurface roots, or begin to lose metals that desorb during plant die off. While not stated by the manufacturer, it is also desirable that every few years the entire plant mass including roots be harvested. This is because the belowground biomass constitutes a significant reservoir (possibly half) of the nutrients and metals that are removed from the stormwater by plants (Minton, 2002).

If pretreatment is provided then maintenance consideration must be given to the build up of debris and floatables.

Inspection Activities	Suggested Frequency
■ Inspect during the dry season to determine if irrigation of plants is necessary.	As needed
■ Inspect to verify that invasive species of wetland plants is not occurring.	Annual
Maintenance Activities	**Suggested Frequency**
■ Clean the center well.	As needed
■ Remove vegetation near end of each growth season to capture the nutrients and pollutants removed by the wetland vegetation.	Annual

Maintenance Concerns, Objectives, and Goals

- Vegetation/Landscape Maintenance
- Endangered Species Habitat Creation
- Pollutant Removal Efficiency
- Clogging of the Outlet
- Invasive/exotic Plant Species
- Vector Control

Targeted Constituents

- ☑ Sediment
- ☑ Nutrients
- ☑ Trash
- ☑ Metals
- ☑ Bacteria
- ☑ Oil and Grease
- ☑ Organics
- ☑ Oxygen Demanding

Removal Effectiveness

See New Development and Redevelopment BMP Handbook-Section 5.

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Media Filter

MP-40

General Description

Stormwater media filters are usually two-chambered including a pretreatment settling basin and a filter bed filled with sand or other absorptive filtering media. As stormwater flows into the first chamber, large particles settle out, and then finer particles and other pollutants are removed as stormwater flows through the filtering media in the second chamber.

There are currently three manufacturers of stormwater filter systems. Two are similar in that they use cartridges of a standard size. The cartridges are placed in vaults; the number of cartridges a function of the design flow rate. The water flows laterally (horizontally) into the cartridge to a centerwell, then downward to an underdrain system. The third product is a flatbed filter, similar in appearance to sand filters.

Inspection/Maintenance Considerations

Media filters may exhibit decreased effectiveness after a few years of operation, depending on the activities occurring in the drainage area. Media filters clog easily when subjected to high sediment loads. Sediment reducing pretreatment practices, such as vegetated buffer strips or vegetated swales, placed upstream of the filter should be maintained properly to reduce sediment loads into filter. Media filters can become a nuisance due to mosquito or midge breeding if not properly designed and maintained. Installations should dewater completely (recommended 72 hour or less residence time) to prevent creating mosquito and other vector habitats. Maintenance efforts will need to focus on basic housekeeping practices such as removal of debris accumulations and vegetation management (in filter media) to prevent clogs and/or pods of standing water. To minimize the potential for clogging, frequent maintenance and inspection practices are required. Waste sand, gravel, filter cloth, or filter media must be disposed of properly and in accordance with all applicable laws.

Maintenance Concerns, Objectives, and Goals

- Pollutant Breakthrough
- Clogged of Sand Media
- Trash and Debris Accumulation

Targeted Constituents

- ☑ Sediment
- ☑ Nutrients
- ☑ Trash
- ☑ Metals
- ☑ Bacteria
- ☑ Oil and Grease
- ☑ Organics
- ☑ Oxygen Demanding

Removal Effectiveness

See New Development and Redevelopment BMP Handbook-Section 5.

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Inspection Activities	Suggested Frequency
■ During the first year of operation, inspect chambers quarterly to ensure that the system is functioning properly. ■ Inspect sand filters after every major storm in the first few months after construction to ensure that the system is functioning properly.	Post construction
■ Ensure that filter surface, inlets, and outlets are clear of debris. ■ Ensure that the contributing area is stabilized and mowed, with clippings removed. ■ Check to ensure that the filter surface is not clogging. ■ Ensure that activities in the drainage area minimize oil/grease and sediment entry to the system. ■ Inspect the facility once during the wet season after a large rain event to determine whether the facility is draining completely within 72 hr.	Quarterly, and after major storms
■ Inspect for standing water, sediment, trash and debris, structural damage, and to identify potential problems.	Semi-annual
■ Check to see that the filter bed is clean of sediments and the sediment chamber contains no more than six inches of sediment. ■ Make sure that there is no evidence of deterioration of concrete structures. ■ Inspect grates (if used). ■ Inspect inlets, outlets, and overflow spillway to ensure good condition and no evidence of erosion. ■ Ensure that flow is not bypassing the facility. ■ Ensure that no noticeable odors are detected outside the facility.	Annual
Maintenance Activities	**Suggested Frequency**
■ Remove trash and debris from the sedimentation basin (Austin design), the riser pipe, and the filter bed as needed. ■ Prevent grass clippings from washing into the filter. ■ Remove trash from inlet grates to maintain the inflow capacity of the media filter. ■ Upstream vegetation should be maintained as needed.	Frequently (as needed)
■ Clean filter surface semiannually; or more often if watershed is excessively erosive. ■ Replace sorbent pillows (Multi-Chamber Treatment Train only).	Semi-annual
■ Repair or replace any damaged structural parts. ■ Stabilize any eroded areas.	Annual
■ Remove accumulated sediment in the sedimentation chamber every 10 years or when the sediment occupies 10-20% of the basin volume or accumulates to a depth of six inches, whichever is less. ■ Remove top 2 in. of media filter and landfill if facility drain time exceeds 72 hr. Restore media depth to 18 in. when overall media depth drops to 12 in.).	As needed

References

Metropolitan Council, Urban Small Sites Best Management Practices Manual. Available at: http://www.metrocouncil.org/environment/Watershed/BMP/manual.htm

U.S. Environmental Protection Agency, Post-Construction Stormwater Management in New Development & Redevelopment BMP Factsheets. Available at: http://www.cfpub.epa.gov/npdes/stormwater/menuofbmps/bmp_files.cfm

Ventura Countywide Stormwater Quality Management Program, Technical Guidance Manual for Stormwater Quality Control Measures. July, 2002.

Wet Vault

MP-50

General Description

A wet vault is a vault with a permanent water pool, generally 3 to 5 feet deep. The vault may also have a constricted outlet that causes a temporary rise of the water level (i.e., extended detention) during each storm. This live volume generally drains within 12 to 48 hours after the end of each storm.

Inspection/Maintenance Considerations

Maintenance of wet vaults requires special equipment. Each manufacturer provides storage capacities with respect to sediments and floatables, with recommendations on the frequency of cleaning as a function of the percentage of the volume in the unit that has been filled by these materials. There is concern about mosquito breeding in standing water. A loss of dissolved pollutants may occur as accumulated organic matter (e.g., leaves) decomposes in the units. If regular maintenance is not performed, accumulated sediment may cause noxious gases to form.

It is important to recognize that as storage of accumulated sediment occurs directly in the operating area of the wet vault, treatment efficiency will decline over time given the reduction in treatment volume. Whether this is significant depends on the design capacity. Some manufactured wet vaults have relatively little sediment storage and therefore must be cleaned frequently (e.g., annually) while others have sufficient capacity to reduce cleaning frequency. Vault maintenance procedures must meet OSHA confined space entry requirements.

Sediment should be tested for toxicants in compliance with current disposal requirements if land uses in the catchment include commercial or industrial zones, or if visual or olfactory indications of pollution are noticed.

Maintenance Concerns, Objectives, and Goals

- Sediment Removal
- Vector Control

Targeted Constituents

- ☑ Sediment
- ☑ Nutrients
- ☑ Trash
- ☑ Metals
- Bacteria
- ☑ Oil and Grease
- ☑ Organics
- ☑ Oxygen Demanding

Removal Effectiveness

See New Development and Redevelopment BMP Handbook-Section 5.

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Inspection Activities	Suggested Frequency
■ Inspect the unit twice during the first wet season of operation, setting the cleaning frequency accordingly.	Post construction
■ Inspect for floating debris, sediment buildup, and accumulated petroleum products.	Annual
Maintenance Activities	**Suggested Frequency**
■ Remove sediment that has accumulated in the vault after construction in the drainage area is complete.	Post construction
■ The recommended frequency of cleaning differs with the manufacturer, ranging from one to two years. ■ Maintenance consists of the removal of accumulated material with an eductor truck. It may be necessary to remove and dispose the floatables separately due to the presence of petroleum product. Annual maintenance is typical.	Annual, or per manufacturers recommendations
■ Remove floating debris and accumulated petroleum products as needed. Floating oil should be removed from wet vaults that are used as oil/water separators when oil accumulation exceeds one inch.	Annual, or more frequent as needed

References

Metropolitan Council, Urban Small Sites Best Management Practices Manual. Available at: http://www.metrocouncil.org/environment/Watershed/BMP/manual.htm

Vortex Separator MP-51

General Description

Vortex separators: (alternatively, swirl concentrators) are gravity separators, and in principle are essentially wet vaults. The difference from wet vaults, however, is that the vortex separator is round, rather than rectangular, and the water moves in a centrifugal fashion before exiting. By having the water move in a circular fashion, rather than a straight line as is the case with a standard wet vault, it is possible to obtain significant removal of suspended sediments and attached pollutants with less space. Vortex separators were originally developed for combined sewer overflows (CSOs), where it is used primarily to remove coarse inorganic solids. Vortex separation has been adapted to stormwater treatment by several manufacturers.

Inspection/Maintenance Considerations

As some of the systems have standing water that remains between storms, there is concern about mosquito breeding. Also, a loss of dissolved pollutants may occur as accumulated organic matter (e.g., leaves) decomposes in the units.

Inspection Activities	Suggested Frequency
■ Inspect for accumulated sediment/debris.	As needed
Maintenance Activities	**Suggested Frequency**
■ Remove of accumulated material with an eductor truck. It may be necessary to remove and dispose the floatables separately due to the presence of petroleum product.	Annual, or more frequent as needed

Maintenance Concerns, Objectives, and Goals

- Sediment/Debris Removal
- Vector Control

Targeted Constituents

- ☑ Sediment
- ☑ Nutrients
- ☑ Trash
- ☑ Metals
- Bacteria
- ☑ Oil and Grease
- ☑ Organics
- ☑ Oxygen Demanding

Removal Effectiveness

See New Development and Redevelopment BMP Handbook-Section 5.

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Drain Insert

MP-52

General Description

Drain inserts are manufactured filters or fabric placed in a drop inlet to remove sediment and debris. There are a multitude of inserts of various shapes and configurations, typically falling into one of three different groups: socks, boxes, and trays. The sock consists of a fabric, usually constructed of polypropylene. The fabric may be attached to a frame or the grate of the inlet holds the sock. Socks are meant for vertical (drop) inlets. Boxes are constructed of plastic or wire mesh. Typically a polypropylene "bag" is placed in the wire mesh box. The bag takes the form of the box. Most box products are one box; that is, the setting area and filtration through media occur in the same box. Some products consist of one or more trays or mesh grates. The trays may hold different types of media. Filtration media vary by manufacturer. Types include polypropylene, porous polymer, treated cellulose, and activated carbon.

Inspection/Maintenance Considerations

Washout problems increase with rain intensity. At low flow rates, energy dissipater between gate and treatment areas can minimize re-suspension of accumulated sediment.

Inspection Activities	Suggested Frequency
■ Inspect for sediment buildup and proper functioning.	At the beginning of the wet season and after significant storms
■ Verify that stormwater enters the unit and does not leak around the perimeter.	After construction.
Maintenance Activities	**Suggested Frequency**
■ Remove sediment as needed.	At the beginning of the wet season and as necessary

Maintenance Concerns, Objectives, and Goals

■ Sediment/Debris Removal

Targeted Constituents

- ☑ Sediment
- ☑ Nutrients
- ☑ Trash
- ☑ Metals
- Bacteria
- ☑ Oil and Grease
- ☑ Organics
- ☑ Oxygen Demanding

Removal Effectiveness

See New Development and Redevelopment BMP Handbook-Section 5.

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Section 4
Treatment Control BMPs

4.1 Introduction

This section discusses the inspection and maintenance requirements for treatment control BMPs shown in Table 4-1. The specific design requirements, performance specifications, and limitations of each of these BMPs are discussed in detail in the New Development and Redevelopment BMP Handbook. Inspection and maintenance requirements are necessary to verify that each treatment control BMP performs efficiently throughout its design life. Although specific inspection and maintenance frequencies are presented in the following fact sheets, these are only suggested and should be adapted to each site situation to best accommodate environmental, economic, and local regulatory concerns.

For the purpose of this Handbook, treatment control BMPs have been classified according to whether they are public domain or proprietary controls. Public domain controls, as the name implies, are controls that are available to the general public, while proprietary controls are typically patented devices and are purchased from a vendor.

Table 4-1 Treatment Control BMPs

Public Domain	
TC-10	Infiltration Trench
TC-11	Infiltration Basin
TC-12	Retention/Irrigation
TC-20	Wet Pond
TC-21	Constructed Wetland
TC-22	Extended Detention Basin
TC-30	Vegetated Swale
TC-31	Vegetated Buffer Strip
TC-32	Bioretention
TC-40	Media Filter
TC-50	Water Quality Inlet
TC-60	Multiple Systems
Manufactured (Proprietary)	
MP-20	Wetland
MP-40	Media Filter
MP-50	Wet Vault
MP-51	Vortex Separator
MP-52	Drain Inlet

4.2 Fact Sheet Format

A BMP fact sheet is a short document that gives pertinent maintenance and inspection information about a particular treatment control BMP. Typically, each fact sheet contains the information outlined in Figure 4-1. Completed fact sheets for each of the treatment control BMPs shown in Table 4-1 are provided in Section 4.3.

The fact sheets also contain side bar presentations with information on BMP maintenance concerns, objectives, and goals; targeted constituents; and removal effectiveness if known.

TC-xx Example Maintenance Fact Sheet

General Description

Inspection/Maintenance Considerations

Inspection Activities

Maintenance Activities

Additional Information

References

Figure 4-1
Example Fact Sheet

4.3 BMP Fact Sheets

Maintenance BMP fact sheets for public domain and manufactured BMPs follow. The BMP fact sheets are individually page numbered and are suitable for photocopying and inclusion in stormwater quality management plans. Fresh copies of the fact sheets can be individually downloaded from the California Stormwater BMP Handbook website at www.cabmphandbooks.com . As noted previously, the reader should refer to the New Development and Redevelopment BMP Handbook for details regarding BMP design, performance, and installation. In addition to the references at the end of each fact sheet, the 1993 version of the California Stormwater BMP Handbook was used as a general reference and starting point for the preparation of the maintenance fact sheets that follow.

In addition, it is worth noting that there are numerous proprietary treatment control devices available. Manufacturers typically have recommended inspection schedules and maintenance requirements for each device. If your facility utilizes proprietary treatment control devices for stormwater runoff, a maintenance agreement and detailed maintenance plan should be developed to ensure that they are well maintained, and operate according to design specifications. For many manufactured devices, municipalities can contract with the manufacturer or representative to provide maintenance services.

Infiltration Trench

TC-10

Maintenance Concerns, Objectives, and Goals

- Accumulation of Metals
- Clogged Soil Outlet Structures
- Vegetation/Landscape Maintenance

General Description

An infiltration trench is a long, narrow, rock-filled trench with no outlet that receives stormwater runoff. Runoff is stored in the void space between the stones and infiltrates through the bottom and into the soil matrix. Infiltration trenches perform well for removal of fine sediment and associated pollutants. Pretreatment using buffer strips, swales, or detention basins is important for limiting amounts of coarse sediment entering the trench which can clog and render the trench ineffective.

Inspection/Maintenance Considerations

Frequency of clogging is dependant on effectiveness of pretreatment, such as vegetated buffer strips, at removing sediments. See appropriate maintenance factsheets for associated pretreatment. If the trench clogs, it may be necessary to remove and replace all or part of the filter fabric and possibly the coarse aggregate. Clogged infiltration trenches with surface standing water can become a nuisance due to mosquito breeding. Maintenance efforts associated with infiltration trenches should include frequent inspections to ensure that water infiltrates into the subsurface completely at a recommended infiltration rate of 72 hours or less to prevent creating mosquito and other vector habitats. Most of the maintenance should be concentrated on the pretreatment practices, such as buffer strips and swales upstream of the trench to ensure that sediment does not reach the infiltration trench. Regular inspection should determine if the sediment removal structures require routine maintenance. Infiltration trenches should not be put into operation until the upstream tributary area is stabilized.

Targeted Constituents

☑	Sediment	■
☑	Nutrients	■
☑	Trash	■
☑	Metals	■
☑	Bacteria	■
☑	Oil and Grease	■
☑	Organics	■
☑	Oxygen Demanding	■

Legend ***(Removal Effectiveness)***

● Low ■ High

▲ Medium

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Inspection Activities	Suggested Frequency
■ Inspect after every major storm for the first few months to ensure proper functioning. Drain times should be observed to confirm that designed drain times has been achieved.	After construction
■ Inspect facility for signs of wetness or damage to structures, signs of petroleum hydrocarbon contamination, standing water, trash and debris, sediment accumulation, slope stability, standing water, and material buildup. ■ Check for standing water or, if available, check observation wells following 3 days of dry weather to ensure proper drain time. ■ Inspect pretreatment devices and diversion structures for damage, sediment buildup, and structural damage.	Semi-annual and after extreme events
■ Trenches with filter fabric should be inspected for sediment deposits by removing a small section of the top layer. If inspection indicates that the trench is partially or completely clogged, it should be restored to its design condition.	Annual
Maintenance Activities	**Suggested Frequency**
■ Repair undercut and eroded areas at inflow and outflow structures. ■ Remove sediment, debris, and oil/grease from pretreatment devices and overflow structures.	Standard maintenance (as needed)
■ Remove trash, debris, grass clippings, trees, and other large vegetation from the trench perimeter and dispose of properly. ■ Mow and trim vegetation to prevent establishment of woody vegetation, and for aesthetic and vector reasons.	Semi-annual, more often as needed
■ Clean out sediment traps, forebays, inlet/outlet structures, overflow spillway, and trenches if necessary. ■ Remove grass clippings, leaves, and accumulated sediment from the surface of the trench. Replace first layer of aggregate and filter fabric if clogging appears only to be at the surface. ■ Clean trench when loss of infiltrative capacity is observed. If drawdown time is observed to have increased significantly over the design drawdown time, removal of sediment may be necessary. This is an expensive maintenance activity and the need for it can be minimized through prevention of upstream erosion.	Annual
■ If bypass capability is available, it may be possible to regain the infiltration rate in the short term by providing an extended dry period. ■ Seed or sod to restore ground cover.	5-year maintenance
■ Total rehabilitation of the trench should be conducted to maintain storage capacity within 2/3 of the design treatment volume and 72-hour exfiltration rate limit. ■ Trench walls should be excavated to expose clean soil. ■ All of the stone aggregate and filter fabric or media must be removed. Accumulated sediment should be stripped from the trench bottom. At this point the bottom may be scarified or tilled to help induce infiltration. New fabric and clean stone aggregate should be refilled.	Upon failure

Additional Information

Infiltration practices have historically had a high rate of failure compared to other stormwater management practices. One study conducted in Prince George's County, Maryland (Galli, 1992), revealed that less than half of the infiltration trenches investigated (of about 50) were still functioning properly, and less than one-third still functioned properly after 5 years. Many of these practices, however, did not incorporate advanced pretreatment. By carefully selecting the location and improving the design features of infiltration practices, their performance should improve.

It is absolutely critical that settleable particles and floatable organic materials be removed from runoff water before it enters the infiltration trench. The trench will clog and become nonfunctional if excessive particulate matter is allowed to enter the trench.

Cold climate considerations – see http://www.cwp.org/cold-climates.htm

References

EPA, Stormwater Technology Fact Sheet - Infiltration Trench. EPA 832-F-99-019. September, 1999.

Metropolitan Council, Urban Small Sites Best Management Practices Manual. Available at: http://www.metrocouncil.org/environment/Watershed/BMP/manual.htm

Michigan Department of Environmental Quality. Infiltration Trench Factsheet. Available at: http://www.deq.state.mi.us/documents/deq-swq-nps-it.pdf

Montgomery County Department of Environmental Protection. Maintaining Urban Stormwater Facilities - A Guidebook for Common Ownership Communities. Available at: http://www.montgomerycountymd.gov/mc/services/dep/Stormwater/maintain.htm

Stormwater Managers Resource Center, Manual Builder. Available at: http://www.stormwatercenter.net/intro_manual.htm

Stormwater Managers Resource Center. On-line: http://www.stormwatercenter.net

U.S. Department of Agriculture, Natural Resources Conservation Service. Illinois Urban Manual: A Technical Manual Designed for Urban Ecosystem Protection and Enhancement, 1995.

U.S. Environmental Protection Agency, Post-Construction Stormwater Management in New Development & Redevelopment BMP Factsheets. Available at: http://www.cfpub.epa.gov/npdes/stormwater/menuofbmps/bmp_files.cfm

Ventura Countywide Stormwater Quality Management Program, Technical Guidance Manual for Stormwater Quality Control Measures. July, 2002.

Infiltration Basin

TC-11

Maintenance Concerns, Objectives, and Goals

- Vector Control
- Clogged soil or outlet structures
- Vegetation/Landscape Maintenance
- Groundwater contamination
- Accumulation of metals
- Aesthetics

Targeted Constituents

☑	Sediment	■
☑	Nutrients	■
☑	Trash	■
☑	Metals	■
☑	Bacteria	■
☑	Oil and Grease	■
☑	Organics	■
☑	Oxygen Demanding	■

Legend ***(Removal Effectiveness)***

● Low ■ High

▲ Medium

General Description

An infiltration basin is a shallow impoundment that is designed to infiltrate stormwater. Infiltration basins use the natural filtering ability of the soil to remove pollutants in stormwater runoff. Infiltration facilities store runoff until it gradually infiltrates into the soil and eventually into the water table. This practice has high pollutant removal efficiency and can also help recharge groundwater, thus helping to maintain low flows in stream systems. Infiltration basins can be challenging to apply on many sites, however, because of soils requirements. In addition, some studies have shown relatively high failure rates compared with other management practices.

Inspection/Maintenance Considerations

Infiltration basins perform better in well-drained permeable soils. Infiltration basins in areas of low permeability can clog within a couple years, and require more frequent inspections and maintenance. The use and regular maintenance of pretreatment BMPs will significantly minimize maintenance requirements for the basin. Spill response procedures and controls should be implemented to prevent spills from reaching the infiltration system.

Scarification or other disturbance should only be performed when there are actual signs of clogging or significant loss of infiltrative capacity, rather than on a routine basis. Always remove deposited sediments before scarification, and use a hand-guided rotary tiller, if possible, or a disc harrow pulled by a light tractor. This BMP may require groundwater monitoring. Basins cannot be put into operation until the upstream tributary area is stabilized.

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Clogged infiltration basins with surface standing water can become a breeding area for mosquitoes and midges. Maintenance efforts associated with infiltration basins should include frequent inspections to ensure that water infiltrates into the subsurface completely (recommended infiltration rate of 72 hours or less) and that vegetation is carefully managed to prevent creating mosquito and other vector habitats.

Inspection Activities	Suggested Frequency
■ Observe drain time for a storm after completion or modification of the facility to confirm that the desired drain time has been obtained. ■ Newly established vegetation should be inspected several times to determine if any landscape maintenance (reseeding, irrigation, etc.) is necessary.	Post construction
■ Inspect for the following issues: differential accumulation of sediment, signs of wetness or damage to structures, erosion of the basin floor, dead or dying grass on the bottom, condition of riprap, drain time, signs of petroleum hydrocarbon contamination, standing water, trash and debris, sediment accumulation, slope stability, pretreatment device condition	Semi-annual and after extreme events
Maintenance Activities	**Suggested Frequency**
■ Factors responsible for clogging should be repaired immediately. ■ Weed once monthly during the first two growing seasons.	Post construction
■ Stabilize eroded banks. ■ Repair undercut and eroded areas at inflow and outflow structures. ■ Maintain access to the basin for regular maintenance activities. ■ Mow as appropriate for vegetative cover species. ■ Monitor health of vegetation and replace as necessary. ■ Control mosquitoes as necessary. ■ Remove litter and debris from infiltration basin area as required.	Standard maintenance (as needed)
■ Mow and remove grass clippings, litter, and debris. ■ Trim vegetation at the beginning and end of the wet season to prevent establishment of woody vegetation and for aesthetic and vector reasons. ■ Replant eroded or barren spots to prevent erosion and accumulation of sediment.	Semi-annual
■ Scrape bottom and remove sediment when accumulated sediment reduces original infiltration rate by 25-50%. Restore original cross-section and infiltration rate. Properly dispose of sediment. ■ Seed or sod to restore ground cover. ■ Disc or otherwise aerate bottom. ■ Dethatch basin bottom.	3-5 year maintenance

Additional Information

In most cases, sediment from an infiltration basin does not contain toxins at levels posing a hazardous concern. Studies to date indicate that pond sediments are generally below toxicity limits and can be safely landfilled or disposed onsite. Onsite sediment disposal is always preferable (if local authorities permit) as long as the sediments are deposited away from the shoreline to prevent their reentry into the pond and away from recreation areas, where they could possibly be ingested by young children. Sediments should be tested for toxicants in compliance with current disposal requirements if land uses in the catchment include commercial or industrial zones, or if visual or olfactory indications of pollution are noticed. Sediments containing high levels of pollutants should be disposed of properly.

Light equipment, which will not compact the underlying soil, should be used to remove the top layer of sediment. The remaining soil should be tilled and revegetated as soon as possible.

Sediment removal within the basin should be performed when the sediment is dry enough so that it is cracked and readily separates from the basin floor. This also prevents smearing of the basin floor.

References

King County, Stormwater Pollution Control Manual – Best Management Practices for Businesses. July, 1995 Available at: ftp://dnr metrokc.gov/wlr/dss/spcm/SPCM.HTM

Metropolitan Council, Urban Small Sites Best Management Practices Manual. Available at: http://www.metrocouncil.org/environment/Watershed/BMP/manual.htm

U.S. Environmental Protection Agency, Post-Construction Stormwater Management in New Development & Redevelopment BMP Factsheets. Available at: http://www.cfpub.epa.gov/npdes/stormwater/menuofbmps/bmp_files.cfm

Ventura Countywide Stormwater Quality Management Program, Technical Guidance Manual for Stormwater Quality Control Measures. July, 2002.

Retention/Irrigation TC-12

General Description

Retention/irrigation refers to the capture of stormwater runoff in a holding pond and subsequent use of the captured volume for irrigation of landscape or natural pervious areas. This technology is very effective as a stormwater quality practice in that, for the captured water quality volume, it provides virtually no discharge to receiving waters and high stormwater constituent removal efficiencies. This technology mimics natural undeveloped watershed conditions wherein the vast majority of the rainfall volume during smaller rainfall events is infiltrated through the soil profile. Their main advantage over other infiltration technologies is the use of an irrigation system to spread the runoff over a larger area for infiltration. This allows them to be used in areas with low permeability soils.

Capture of stormwater can be accomplished in almost any kind of runoff storage facility, ranging from dry, concrete-lined ponds to those with vegetated basins and permanent pools. The pump and wet well should be automated with a rainfall sensor to provide irrigation only during periods when required infiltration rates can be realized. Generally, a spray irrigation system is required to provide an adequate flow rate for distributing the water quality volume (LCRA, 1998). Collection of roof runoff for subsequent use (rainwater harvesting) also qualifies as a retention/irrigation practice.

Inspection/Maintenance Considerations

Pollutant removal rates are estimated to be nearly 100% for all pollutants in the captured and irrigated stormwater volume. However, relatively frequent inspection and maintenance is necessary to verify proper operation of these facilities.

Maintenance Concerns, Objectives, and Goals

- Sediment Accumulation
- Mechanical malfunction
- Vector Control

Targeted Constituents

☑	Sediment	■
☑	Nutrients	■
☑	Trash	■
☑	Metals	■
☑	Bacteria	■
☑	Oil and Grease	■
☑	Organics	■
☑	Oxygen Demanding	■

Legend ***(Removal Effectiveness)***

● Low ■ High

▲ Medium

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TC-12 Retention/Irrigation

Inspection Activities	Suggested Frequency
■ The irrigation system should be inspected and tested (or observed while in operation) to verify proper operation multiple times annually. Two of these inspections should occur during or immediately following wet weather. Any leaks, broken spray heads, or other malfunctions with the irrigation system should be repaired immediately.	Frequently (3-6 times per year)

Maintenance Activities	Suggested Frequency
■ The upper stage, side slopes, and embankment of a retention basin must be mowed regularly to discourage woody growth and control weeds.	Frequently
■ Remove sediment from inlet structure/sediment forebay, and from around the sump area at least 2 times annually or when depth reaches 3 inches. When sediment in other areas of the basin fills the volume allocated for sediment accumulation, all sediment should be removed and disposed of properly. ■ Grass areas in and around basins must be mowed at least twice annually to limit vegetation height to 18 inches. More frequent mowing to maintain aesthetic appeal may be necessary in landscaped areas. When mowing is performed, a mulching mower should be used, or grass clippings should be caught and removed. ■ Debris and litter will accumulate near the basin pump and should be removed during regular mowing operations and inspections. Particular attention should be paid to floating debris that can eventually clog the irrigation system.	Semi-annual
■ The pond side slopes and embankment may periodically suffer from slumping and erosion, although this should not occur often if the soils are properly compacted during construction. Regrading and revegetation may be required to correct the problems.	Infrequently

Wet Pond

TC-20

Maintenance Concerns, Objectives, and Goals

- Vegetation/Landscape Maintenance
- Endangered Species Habitat Creation
- Pollutant Removal Efficiency
- Clogging of the Outlet
- Invasive/exotic Plant Species
- Vector Control

General Description

Wet ponds (a.k.a. stormwater ponds, retention ponds, wet extended detention ponds) are constructed basins that have a permanent pool of water throughout the year (or at least throughout the wet season) and differ from constructed wetlands primarily in having a greater average depth. Ponds treat incoming stormwater runoff by settling and biological uptake. The primary removal mechanism is settling as stormwater runoff resides in this pool, but pollutant uptake, particularly of nutrients, also occurs to some degree through biological activity in the pond. Wet ponds are among the most widely used stormwater practices. While there are several different versions of the wet pond design, the most common modification is the extended detention wet pond, where storage is provided above the permanent pool in order to detain stormwater runoff and promote settling. The schematic diagram is of an on-line pond that includes detention for larger events, but this is not required in all areas of the state.

Targeted Constituents

☑	Sediment	■
☑	Nutrients	▲
☑	Trash	■
☑	Metals	■
☑	Bacteria	■
☑	Oil and Grease	■
☑	Organics	■
☑	Oxygen Demanding	■

Legend ***(Removal Effectiveness)***

● Low ■ High

▲ Medium

Inspection/Maintenance Considerations

In order to maintain the pond's design capacity, sediment must be removed occasionally and adequate resources must be committed to properly maintain peripheral aquatic vegetation, control vector production, and to maintain effective pool volume. Wet ponds can become a nuisance due to mosquito and midge breeding unless carefully designed and maintained. A proactive and routine preventative maintenance plan (which can vary according to location) is crucial to minimizing vector habitat. A vegetated buffer should be preserved around the pond to protect the banks from erosion and provide some pollutant removal before runoff enters the pond by overland flow.

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Inspection Activities	Suggested Frequency
■ Inspect after several storm events to confirm that the drainage system functions, and bank stability and vegetation growth are sufficient.	Post construction
■ Inspect for invasive vegetation, trash and debris, clogging of inlet/outlet structures, excessive erosion, sediment buildup in basin or outlet, cracking or settling of the dam, bank stability, tree growth on dam or embankment, vigor and density of the grass turf on the basin side slopes and floor, differential settlement, leakage, subsidence, damage to the emergency spillway, mechanical component condition, and graffiti.	Semi-annual, after significant storms, or more frequent as needed
■ Inspect condition of inlet and outlet structures, pipes, sediment forebays, basin, and upstream and downstream channel conditions. Monitor drain times, and check for algal growth, signs of pollution such as oil sheens, discolored water, or unpleasant odors, and signs of flooding.	Annual inspection
■ During inspections, note changes to the wet pond or the contributing watershed as these may affect basin performance.	
Maintenance Activities	**Suggested Frequency**
■ Introduce mosquito fish, *Gambusia* spp., (where permitted by the Department of Fish and Game or other agency regulations) to enhance natural mosquito and midge control and regularly maintain emergent and shoreline vegetation to provide access for vector inspectors and facilitate vector control if needed.	Post construction
■ Perform vector control, if necessary. ■ Remove sediment from outlet structure. Dispose of properly. ■ Remove accumulated trash and debris in the basin, inlet/outlet structures, side slopes, and collection system as required. ■ Repair undercut areas and erosion to banks and basin.	Semi annual, after significant storm events
■ Maintain protected vegetated buffer around pond. Mow side slopes and maintain vegetation in and around basin to prevent any erosion or aesthetic problems. Minimize use of fertilizers and pesticides. Reseed if necessary. ■ Manage and harvest wetland plants. ■ Structural repair or replacement, as needed.	Annual maintenance (if needed)
■ Remove sediment from the forebay and regrade when the accumulated sediment volume exceeds 10-20% of the forebay volume. Clean in early spring so vegetation damaged during cleaning has time to re-establish.	5- to 7-year maintenance
■ Remove sediment when the permanent pool volume has become reduced significantly (sediment accumulation exceeds 25% of design depth), resuspension is observed, or the pond becomes eutrophic.	>5 year maintenance

Additional Information

In most cases, sediment from wet ponds do not contain toxins at levels posing a hazardous concern. Studies to date indicate that pond sediments are generally below toxicity limits and can be safely landfilled or disposed onsite. Onsite sediment disposal is always preferable (if local authorities permit) as long as the sediments are deposited away from the shoreline to prevent their reentry into the pond and away from recreation areas, where they could possibly be ingested by young children.

Sediments should be tested for toxicants in compliance with current disposal requirements if land uses in the catchment include commercial or industrial zones, or if visual or olfactory indications of pollution are noticed. Sediments containing high levels of pollutants should be disposed of properly.

For the best water quality benefit, the pond should hold water for at least 24 hours. It should drain down to the permanent water level within 72 hours of a storm event to avoid conditions which might increase water temperatures, deplete oxygen, promote vector growth, and/or cause odors.

References

King County, Stormwater Pollution Control Manual – Best Management Practices for Businesses. July, 1995 Available at: ftp://dnr.metrokc.gov/wlr/dss/spcm/SPCM.HTM

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U.S. Environmental Protection Agency, Post-Construction Stormwater Management in New Development & Redevelopment BMP Factsheets. Available at: cfpub.epa.gov/npdes/stormwater/menuofbmps/bmp_files.cfm

Ventura Countywide Stormwater Quality Management Program, Technical Guidance Manual for Stormwater Quality Control Measures. July, 2002.

Constructed Wetland

TC-21

Maintenance Concerns, Objectives, and Goals

- Vector/Pest Control
- Sediment and Trash Removal
- Vegetation/Landscape Maintenance
- Invasive Species Management
- Bank Erosion
- Nutrient Release During Winter
- Clogging of the Outlet

General Description

Constructed wetlands are constructed basins that have a permanent pool of water throughout the year (or at least throughout the wet season) and differ from wet ponds primarily in being shallower and having greater vegetation coverage.

A distinction should be made between using a constructed wetland for storm water management and diverting storm water into a natural wetland. The latter practice is not recommended and in all circumstances, natural wetlands should be protected from the adverse effects of development, including impacts from increased storm water runoff. This is especially important because natural wetlands provide storm water and flood control benefits on a regional scale.

Wetlands are among the most effective stormwater practices in terms of pollutant removal and they also offer aesthetic value. As stormwater runoff flows through the wetland, pollutant removal is achieved through settling and biological uptake within the wetland. Flow through the root systems forces the vegetation to remove nutrients and dissolved pollutants from the stormwater.

Targeted Constituents

☑	Sediment	■
☑	Nutrients	▲
☑	Trash	■
☑	Metals	■
☑	Bacteria	■
☑	Oil and Grease	■
☑	Organics	■
☑	Oxygen Demanding	■

Legend ***(Removal Effectiveness)***

● Low ■ High

▲ Medium

Inspection/Maintenance Considerations

Wetlands need a continuous base flow to maintain aquatic plants. Salts and scum can accumulate in wetlands and, unless properly designed and managed, can be flushed out during larger storms. Wetlands can also release nutrients during the non-growing season. Wetlands can become a breeding area for mosquitoes and midges unless carefully designed and maintained. A proactive and routine preventative maintenance plan (which can vary according to location) is crucial to minimizing vector habitat.

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To maximize wetland removal of pollutants, the vegetation must be harvested frequently. Harvesting is particularly important with respect to the removal of phosphorus and metals, less so for nitrogen. Harvesting should occur by mid-summer before the plants begin to transfer phosphorus from the aboveground foliage to subsurface roots, or begin to lose metals that desorb during plant die off. While not stated by the manufacturer, it is also desirable that every few years the entire plant mass including roots be harvested. This is because the below-ground biomass constitutes a significant reservoir (possibly half) of the nutrients and metals that are removed from the stormwater by plants (Minton, 2002).

If pretreatment is provided then maintenance consideration must be given to the build up of debris and floatables.

Inspection Activities	Suggested Frequency
■ Inspect after several storm events for bank stability, vegetation growth, drainage system functioning, and structural damage.	After construction
■ Inspect for invasive vegetation, differential settlement, cracking; erosion, leakage, or tree growth on the embankment; the condition of the riprap in the inlet, outlet, and pilot channels; sediment accumulation in the basin; clogging of outlet; and the vigor and density of the vegetation on the basin side slopes and floor. Correct observed problems as necessary.	Semi-annual inspection
■ Inspect for damage to the embankment and inlet/outlet structures. Repair as necessary. ■ Note signs of hydrocarbon buildup such as floating oil on water surface. ■ Monitor for sediment accumulation in the facility and forebay. ■ Examine inlet and outlet devices to ensure they are free of debris and are operational.	Annual inspection
Maintenance Activities	**Suggested Frequency**
■ Replace wetland vegetation to maintain at least 50% surface area coverage in wetland plants after the second growing season.	One-time
■ Repair undercut areas, erosion to banks, and bottom as required. ■ Where permitted by the Department of Fish and Game or other agency regulations, stock constructed wetlands regularly with mosquito fish (*Gambusia* spp.) to enhance natural mosquito and midge control	As needed maintenance
■ Clean and remove debris from inlet and outlet structures. ■ Mow side slopes and remove grass clippings. ■ Remove litter and debris from banks, basin bottom, trash racks, outlet structures, and valves as required.	Frequent (3-4 times/year) maintenance
■ Supplement wetland plants if a significant portion have not established (at least 50% of the surface area). ■ Remove nuisance plant species.	Annual maintenance (if needed)
■ Clean forebay to avoid accumulation in main wetland area to minimize when the main wetland area needs to be cleaned.	5- to 7-year maintenance
■ Harvest plant species if vegetation becomes too thick causing flow backup and flooding. More frequent plant harvesting may be required by local vector control agencies.	5- to 7-year maintenance (or more frequently as required)
■ Monitor sediment accumulations, and remove sediment when the accumulated sediment volume exceeds 10-20% of the basin volume, plants are "choked" with sediment, or the wetland becomes eutrophic. It is suggested that the main area be cleaned one half at a time with at least one growing season in between cleanings. This will help to preserve the vegetation and enable the wetland to recover more quickly from the cleaning.	As needed maintenance (20- to 50-years)

Additional Information

The following observations should be made during the inspections:

- Type and distribution of dominant wetland plants in the marsh
- The presence and distribution of planted wetland species
- The presence and distribution of invasive wetland species
- Signs that invasive species are replacing the planted wetland species
- Percentage of unvegetated standing water (excluding the deep water cells which are not suitable for emergent plant growth)
- The maximum elevation and the vegetative condition in this zone, if the design elevation of the normal pool is being maintained for wetlands with extended zones
- Stability of the original depth zones and the microtopographic features, accumulation of sediment in the forebay and micropool, and survival rate of plants in the wetland buffer.

References

Metropolitan Council, Urban Small Sites Best Management Practices Manual. Available at: http://www.metrocouncil.org/environment/Watershed/BMP/manual.htm

Model Urban Runoff Program: A How-To Guide for Developing Urban Runoff Programs for Small Municipalities. Prepared by City of Monterey, City of Santa Cruz, California Coastal Commission, Monterey Bay National Marine Sanctuary, Association of Monterey Bay Area Governments, Woodward-Clyde, Central Coast Regional Water Quality Control Board. July, 1998, revised February, 2002.

U.S. Environmental Protection Agency, Post-Construction Stormwater Management in New Development & Redevelopment BMP Factsheets. Available at: cfpub.epa.gov/npdes/stormwater/menuofbmps/bmp_files.cfm

Ventura Countywide Stormwater Quality Management Program, Technical Guidance Manual for Stormwater Quality Control Measures. July, 2002.

Extended Detention Basin TC-22

Maintenance Concerns, Objectives, and Goals

- Vector/Pest Control
- Sediment and Trash Removal
- Vegetation/Landscape Maintenance
- Re-suspension of settled material
- Clogging of the Outlet

General Description

Dry extended detention ponds (a.k.a. dry ponds, extended detention basins, detention ponds, extended detention ponds) are basins whose outlets have been designed to detain the stormwater runoff from a water quality design storm for some minimum time (e.g., 72 hours) to allow particles and associated pollutants to settle. Unlike wet ponds, these facilities do not have a large permanent pool. They can also be used to provide flood control by including additional flood detention storage.

Inspection/Maintenance Considerations

Inspections should be conducted semi-annually and after significant storm events to identify potential problems early. Most maintenance efforts will need to be directed toward vegetation management and vector control, which may focus on basic housekeeping practices such as removal of debris accumulations and vegetation management to ensure that the basin dewaters completely (recommended 72 hour residence time or less) to prevent creating mosquito and other vector habitats.

Targeted Constituents

☑	Sediment	▲
☑	Nutrients	●
☑	Trash	■
☑	Metals	▲
☑	Bacteria	▲
☑	Oil and Grease	▲
☑	Organics	▲
☑	Oxygen Demanding	▲

Legend ***(Removal Effectiveness)***

● Low ■ High

▲ Medium

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TC-22 Extended Detention Basin

Inspection Activities	Suggested Frequency
■ Inspect after several storm events for bank stability, vegetation growth, and to determine if the desired residence time has been achieved. ■ Inspect outlet structure for evidence of clogging or outflow release velocities that are greater than design flow.	Post construction
■ Inspect for the following issues: differential settlement, cracking; erosion of pond banks or bottom, leakage, or tree growth on the embankment; the condition of the riprap in the inlet, clogging of outlet and pilot channels; standing water, slope stability, presence of burrows; sediment accumulation in the basin, forebay, and outlet structures; trash and debris, and the vigor and density of the grass turf on the basin side slopes and floor.	Semi-annual, after significant storms, or more frequent
■ Inspect for the following issues: subsidence, damage to the emergency spillway; inadequacy of the inlet/outlet channel erosion control measures; changes in the condition of the pilot channel, accumulated sediment volume, and semi-annual inspection items.	Annual
■ During inspections, changes to the extended storage pond or the contributing watershed should be noted, as these may affect basin performance.	Annual inspection
Maintenance Activities	**Suggested Frequency**
■ If necessary, modify the outlet orifice to achieve design values if inspection indicates modifications are necessary. ■ Repair undercut or eroded areas. ■ Mow side slopes. ■ Manage pesticide and nutrients. ■ Remove litter and debris. ■ Control vectors as necessary.	As needed
■ Remove accumulated trash and debris from the basin, around the riser pipe, side slopes, embankment, emergency spillway, and outflow trash racks. The frequency of this activity may be altered to meet specific site conditions. ■ Trim vegetation at the beginning and end of the wet season to prevent establishment of woody vegetation and for aesthetic and vector reasons.	Semi-annual, or more frequent, as needed
■ Seed or sod to restore dead or damaged ground cover. ■ Repair erosion to banks and bottom as required.	Annual maintenance (as needed)
■ Supplement wetland plants if a significant portion have not been established (at least 50% of the surface area). ■ Remove nuisance plant species.	Annual maintenance (if needed)
■ Remove sediment from the forebay to reduce frequency of main basin cleaning.	3- to 5-year maintenance
■ Monitor sediment accumulation and remove accumulated sediment and regrade about every 10 years or when the accumulated sediment volume exceeds 10-20% of the basin volume, or when accumulation reaches 6 inches or if resuspension is observed. Clean in early spring so vegetation damaged during cleaning has time to re-establish.	Every 10-25 years

Additional Information

In most cases, sediment from extended detention basin does not contain toxins at levels posing a hazardous concern. Studies to date indicate that pond sediments are likely to meet toxicity limits and can be safely landfilled or disposed of onsite. Onsite sediment disposal is always preferable (if local authorities permit it) as long as the sediments are deposited away from the shoreline to prevent their re-entry into the pond.

Sediments should be tested for toxin in compliance with current disposal requirements if land uses in the catchment include commercial or industrial zones, or if visual or olfactory indications of pollution are noticed.

References

Metropolitan Council, Urban Small Sites Best Management Practices Manual. Available at: http://www.metrocouncil.org/environment/Watershed/BMP/manual.htm

U.S. Environmental Protection Agency, Post-Construction Stormwater Management in New Development & Redevelopment BMP Factsheets. Available at: cfpub.epa.gov/npdes/stormwater/menuofbmps/bmp_files.cfm

Ventura Countywide Stormwater Quality Management Program, Technical Guidance Manual for Stormwater Quality Control Measures. July, 2002.

Vegetated Swale

TC-30

Maintenance Concerns, Objectives, and Goals

- Channelization
- Vegetation/Landscape Maintenance
- Vector Control
- Aesthetics
- Hydraulic and Removal Efficacy

General Description

Vegetated swales are open, shallow channels with vegetation covering the side slopes and bottom that collect and slowly convey runoff flow to downstream discharge points. They are designed to treat runoff through filtering by the vegetation in the channel, filtering through a subsoil matrix, and/or infiltration into the underlying soils. Swales can be natural or manmade. They trap particulate pollutants (suspended solids and trace metals), promote infiltration, and reduce the flow velocity of stormwater runoff. Vegetated swales can serve as part of a stormwater drainage system and can replace curbs, gutters and storm sewer systems. Therefore, swales are best suited for residential, industrial, and commercial areas with low flow and smaller populations.

Targeted Constituents

☑	Sediment	▲
☑	Nutrients	●
☑	Trash	●
☑	Metals	▲
☑	Bacteria	●
☑	Oil and Grease	▲
☑	Organics	▲
☑	Oxygen Demanding	▲

Legend ***(Removal Effectiveness)***

● Low ■ High

▲ Medium

Inspection/Maintenance Considerations

It is important to consider that a thick vegetative cover is needed for vegetated swales to function properly. Usually, swales require little more than normal landscape maintenance activities such as irrigation and mowing to maintain pollutant removal efficiency. Swales can become a nuisance due to mosquito breeding in standing water if obstructions develop (e.g., debris accumulation, invasive vegetation) and/or if proper drainage slopes are not implemented and maintained. The application of fertilizers and pesticides should be minimized.

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Inspection Activities	Suggested Frequency
■ Inspect after seeding and after first major storms for any damages.	Post construction
■ Inspect for signs of erosion, damage to vegetation, channelization of flow, debris and litter, and areas of sediment accumulation. Perform inspections at the beginning and end of the wet season. Additional inspections after periods of heavy runoff are desirable.	Semi-annual
■ Inspect level spreader for clogging, grass along side slopes for erosion and formation of rills or gullies, and sand/soil bed for erosion problems.	Annual
Maintenance Activities	**Suggested Frequency**
■ Mow grass to maintain a height of 3–4 inches, for safety, aesthetic, or other purposes. Litter should always be removed prior to mowing. Clippings should be composted. ■ Irrigate swale during dry season (April through October) or when necessary to maintain the vegetation. ■ Provide weed control, if necessary to control invasive species.	As needed (frequent, seasonally)
■ Remove litter, branches, rocks blockages, and other debris and dispose of properly. ■ Maintain inlet flow spreader (if applicable). ■ Repair any damaged areas within a channel identified during inspections. Erosion rills or gullies should be corrected as needed. Bare areas should be replanted as necessary.	Semi-annual
■ Declog the pea gravel diaphragm, if necessary. ■ Correct erosion problems in the sand/soil bed of dry swales. ■ Plant an alternative grass species if the original grass cover has not been successfully established. Reseed and apply mulch to damaged areas.	Annual (as needed)
■ Remove all accumulated sediment that may obstruct flow through the swale. Sediment accumulating near culverts and in channels should be removed when it builds up to 3 in. at any spot, or covers vegetation, or once it has accumulated to 10% of the original design volume. Replace the grass areas damaged in the process. ■ Rototill or cultivate the surface of the sand/soil bed of dry swales if the swale does not draw down within 48 hours.	As needed (infrequent)

Additional Information

Recent research (Colwell et al., 2000) indicates that grass height and mowing frequency have little impact on pollutant removal. Consequently, mowing may only be necessary once or twice a year for safety or aesthetics or to suppress weeds and woody vegetation.

References

Metropolitan Council, Urban Small Sites Best Management Practices Manual. Available at: http://www.metrocouncil.org/environment/Watershed/BMP/manual.htm

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Ventura Countywide Stormwater Quality Management Program, Technical Guidance Manual for Stormwater Quality Control Measures. July, 2002.

Vegetated Buffer Strip

TC-31

Maintenance Concerns, Objectives, and Goals

- Clogged Soil or Outlet Structures
- Invasive Species Management
- Vegetation/Landscape Maintenance
- Erosion
- Channelization of Flow
- Aesthetics

General Description

Grassed buffer strips (vegetated filter strips, filter strips, and grassed filters) are vegetated surfaces that are designed to treat sheet flow from adjacent surfaces. Filter strips function by slowing runoff velocities and allowing sediment and other pollutants to settle and by providing some infiltration into underlying soils. Filter strips were originally used as an agricultural treatment practice and have more recently evolved into an urban practice. With proper design and maintenance, filter strips can provide relatively high pollutant removal. In addition, the public views them as landscaped amenities and not as stormwater infrastructure. Consequently, there is little resistance to their use.

Inspection/Maintenance Considerations

Vegetated buffer strips require frequent landscape maintenance. In many cases, vegetated buffer strips initially require intense maintenance, but less maintenance is needed over time. In many cases, maintenance tasks can be completed by a landscaping contractor. Maintenance requirements typically include grass or shrub-growing activities such as irrigation, mowing, trimming, removal of invasive species, and replanting when necessary. Buffer strips require more tending as the volume of sediment increases. Vegetated buffer strips can become a nuisance due to mosquito breeding in level spreaders (unless designed to dewater completely in 72 hours or less) and/or if proper drainage slopes are not maintained.

Targeted Constituents

☑	Sediment	■
☑	Nutrients	●
☑	Trash	▲
☑	Metals	■
☑	Bacteria	●
☑	Oil and Grease	■
☑	Organics	▲
☑	Oxygen Demanding	▲

Legend ***(Removal Effectiveness)***

● Low ■ High

▲ Medium

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TC-31 Vegetated Buffer Strip

Inspection Activities	Suggested Frequency
■ Once the vegetated buffer strip is established, inspect at least three times per year. Repair all damage immediately. ■ Inspect buffer strips after seeding and repair as needed.	Post construction
■ Inspect buffer strip and repair all damage immediately. ■ Inspect soil and repair eroded areas.	After major storms
■ Inspect for erosion or damage to vegetation, preferably at the end of the wet season to schedule summer maintenance and before major fall runoff to be sure the strips are ready for winter. However, additional inspection after periods of heavy runoff is desirable. ■ Inspect pea-gravel diaphragm/level spreader for clogging and effectiveness and remove built-up sediment. ■ Inspect for rolls and gullies. Immediately fill with topsoil, install erosion control blanket and seed or sod. ■ Inspect to ensure grass is well established. If not, either prepare soil and reseed or replace with alternative species. Install erosion control blanket. ■ Check for debris and litter, and areas of sediment accumulation.	Semi-annual

Maintenance Activities	Suggested Frequency
■ Water plants daily for 2 weeks after construction.	Post construction
■ Mow regularly to maintain vegetation height between 2 - 4 inches, and to promote thick, dense vegetative growth. Cut only when soil is dry to prevent tracking damage to vegetation, soil compaction and flow concentrations. Clippings are to be removed immediately after mowing. ■ Remove all litter, branches, rocks, or other debris. Damaged areas of the filter strip should be repaired immediately by reseeding and applying mulch. ■ Regularly maintain inlet flow spreader. ■ Irrigate during dry season (April through October) when necessary to maintain the vegetation.	Frequently, as needed
■ Remulch void areas. ■ Treat diseased trees and shrubs, remove dead vegetation.	Semi-annual
■ Remove sediment and replant in areas of buildup. Sediment accumulating near culverts and in channels should be removed when it builds up to 3 in. at any spot, or covers vegetation. ■ Limit fertilizer applications based on plant vigor and soil test results. ■ Rework or replant buffer strip if concentrated flow erodes a channel through the strip.	Annual

Additional Information

Recent research (Colwell et al., 2000) indicates that grass height and mowing frequency have little impact on pollutant removal. Consequently, mowing may only be necessary once or twice a year for safety or aesthetics or to suppress weeds and woody vegetation.

Trash tends to accumulate in swale areas, particularly along highways. The need for litter removal is determined through periodic inspection, but litter should always be removed prior to mowing.

References

Metropolitan Council, Urban Small Sites Best Management Practices Manual. Available at: http://www.metrocouncil.org/environment/Watershed/BMP/manual.htm

U.S. Environmental Protection Agency, Post-Construction Stormwater Management in New Development & Redevelopment BMP Factsheets. Available at: cfpub.epa.gov/npdes/stormwater/menuofbmps/bmp_files.cfm

Ventura Countywide Stormwater Quality Management Program, Technical Guidance Manual for Stormwater Quality Control Measures. July, 2002.

Bioretention

TC-32

Maintenance Concerns, Objectives, and Goals

- Clogged Soil or Outlet Structures
- Invasive Species
- Vegetation/Landscape Maintenance
- Erosion
- Channelization of Flow
- Aesthetics

General Description

The bioretention best management practice (BMP) functions as a soil and plant-based filtration device that removes pollutants through a variety of physical, biological, and chemical treatment processes. These facilities normally consist of a grass buffer strip, sand bed, ponding area, organic layer or mulch layer, planting soil, and plants. The runoff's velocity is reduced by passing over or through a sand bed and is subsequently distributed evenly along a ponding area. Exfiltration of the stored water in the bioretention area planting soil into the underlying soils occurs over a period of days.

Inspection/Maintenance Considerations

Bioretention requires frequent landscaping maintenance, including measures to ensure that the area is functioning properly, as well as maintenance of the landscaping on the practice. In many cases, bioretention areas initially require intense maintenance, but less maintenance is needed over time. In many cases, maintenance tasks can be completed by a landscaping contractor, who may already be hired at the site. In cold climates the soil may freeze, preventing runoff from infiltrating into the planting soil.

Targeted Constituents

☑	Sediment	■
☑	Nutrients	▲
☑	Trash	■
☑	Metals	■
☑	Bacteria	■
☑	Oil and Grease	■
☑	Organics	■
☑	Oxygen Demanding	■

Legend ***(Removal Effectiveness)***

● Low ■ High

▲ Medium

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Inspection Activities	Suggested Frequency
■ Inspect soil and repair eroded areas.	Monthly
■ Inspect for erosion or damage to vegetation, preferably at the end of the wet season to schedule summer maintenance and before major fall runoff to be sure the strips are ready for winter. However, additional inspection after periods of heavy runoff is desirable.	Semi-annual inspection
■ Inspect to ensure grass is well established. If not, either prepare soil and reseed or replace with alternative species. Install erosion control blanket. ■ Check for debris and litter, and areas of sediment accumulation. ■ Inspect health of trees and shrubs.	

Maintenance Activities	Suggested Frequency
■ Water plants daily for 2 weeks.	At project completion
■ Remove litter and debris.	Monthly
■ Remove sediment. ■ Remulch void areas. ■ Treat diseased trees and shrubs. ■ Mow turf areas. ■ Repair erosion at inflow points. ■ Repair outflow structures. ■ Unclog underdrain. ■ Regulate soil pH regulation.	As needed
■ Remove and replace dead and diseased vegetation.	Semi-annual
■ Add mulch. ■ Replace tree stakes and wires.	Annual
■ Mulch should be replaced every 2 to 3 years or when bare spots appear. Remulch prior to the wet season.	Every 2-3 years, or as needed

Additional Information

Landscaping is critical to the function and aesthetic value of bioretention areas. It is preferable to plant the area with native vegetation, or plants that provide habitat value, where possible. Another important design feature is to select species that can withstand the hydrologic regime they will experience. At the bottom of the bioretention facility, plants that tolerate both wet and dry conditions are preferable. At the edges, which will remain primarily dry, upland species will be the most resilient. It is best to select a combination of trees, shrubs, and herbaceous materials.

References

Metropolitan Council, Urban Small Sites Best Management Practices Manual. Available at: http://www.metrocouncil.org/environment/Watershed/BMP/manual.htm

Model Urban Runoff Program: A How-To Guide for Developing Urban Runoff Programs for Small Municipalities. Prepared by City of Monterey, City of Santa Cruz, California Coastal Commission, Monterey Bay National Marine Sanctuary, Association of Monterey Bay Area Governments, Woodward-Clyde, Central Coast Regional Water Quality Control Board. July, 1998, revised February, 2002.

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Ventura Countywide Stormwater Quality Management Program, Technical Guidance Manual for Stormwater Quality Control Measures. July, 2002.

Media Filter

TC-40

Maintenance Concerns, Objectives, and Goals

- Pollutant Breakthrough
- Clogged of Sand Media
- Trash and Debris Accumulation

General Description

Stormwater media filters are usually two-chambered including a pretreatment settling basin and a filter bed filled with sand or other absorptive filtering media. As stormwater flows into the first chamber, large particles settle out, and then finer particles and other pollutants are removed as stormwater flows through the filtering media in the second chamber. There are a number of design variations including the Austin sand filter, Delaware sand filter, and multi-chambered treatment train (MCTT).

Inspection/Maintenance Considerations

Media filters may exhibit decreased effectiveness after a few years of operation, depending on the activities occurring in the drainage area. Media filters clog easily when subjected to high sediment loads. Sediment reducing pretreatment practices, such as vegetated buffer strips or vegetated swales, placed upstream of the filter should be maintained properly to reduce sediment loads into filter. Media filters can become a nuisance due to mosquito or midge breeding if not properly designed and maintained. Installations should dewater completely (recommended 72 hour or less residence time) to prevent creating mosquito and other vector habitats. Maintenance efforts will need to focus on basic housekeeping practices such as removal of debris accumulations and vegetation management (in filter media) to prevent clogs and/or pods of standing water. To minimize the potential for clogging, frequent maintenance and inspection practices are required. Waste sand, gravel, filter cloth, or filter media must be disposed of properly and in accordance with all applicable laws.

Targeted Constituents

☑	Sediment	■
☑	Nutrients	●
☑	Trash	■
☑	Metals	■
☑	Bacteria	▲
☑	Oil and Grease	■
☑	Organics	■
☑	Oxygen Demanding	■

Legend ***(Removal Effectiveness)***

● Low ■ High

▲ Medium

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Inspection Activities	Suggested Frequency
■ During the first year of operation, inspect chambers quarterly to ensure that the system is functioning properly. ■ Inspect sand filters after every major storm in the first few months after construction to ensure that the system is functioning properly.	Post construction
■ Ensure that filter surface, inlets, and outlets are clear of debris. ■ Ensure that the contributing area is stabilized and mowed, with clippings removed. ■ Check to ensure that the filter surface is not clogging. ■ Ensure that activities in the drainage area minimize oil/grease and sediment entry to the system. ■ Inspect the facility once during the wet season after a large rain event to determine whether the facility is draining completely within 72 hr.	Quarterly, and after major storms
■ Inspect for standing water, sediment, trash and debris, structural damage, and to identify potential problems.	Semi-annual
■ Check to see that the filter bed is clean of sediments and the sediment chamber contains no more than six inches of sediment. ■ Make sure that there is no evidence of deterioration of concrete structures. ■ Inspect grates (if used). ■ Inspect inlets, outlets, and overflow spillway to ensure good condition and no evidence of erosion. ■ Ensure that flow is not bypassing the facility. ■ Ensure that no noticeable odors are detected outside the facility.	Annual
Maintenance Activities	**Suggested Frequency**
■ Remove trash and debris from the sedimentation basin (Austin design), the riser pipe, and the filter bed as needed. ■ Prevent grass clippings from washing into the filter. ■ Remove trash from inlet grates to maintain the inflow capacity of the media filter. ■ Upstream vegetation should be maintained as needed.	Frequently (as needed)
■ Clean filter surface semiannually; or more often if watershed is excessively erosive. ■ Replace sorbent pillows (Multi-Chamber Treatment Train only).	Semi-annual
■ Repair or replace any damaged structural parts. ■ Stabilize any eroded areas.	Annual
■ Remove accumulated sediment in the sedimentation chamber every 10 years or when the sediment occupies 10-20% of the basin volume or accumulates to a depth of six inches, whichever is less. ■ Remove top 2 in. of media filter and landfill if facility drain time exceeds 72 hr. Restore media depth to 18 in. when overall media depth drops to 12 in.).	As needed

References

Metropolitan Council, Urban Small Sites Best Management Practices Manual. Available at: http://www.metrocouncil.org/environment/Watershed/BMP/manual.htm

U.S. Environmental Protection Agency, Post-Construction Stormwater Management in New Development & Redevelopment BMP Factsheets. Available at: http://www.cfpub.epa.gov/npdes/stormwater/menuofbmps/bmp_files.cfm

Ventura Countywide Stormwater Quality Management Program, Technical Guidance Manual for Stormwater Quality Control Measures. July, 2002.

Water Quality Inlet

TC-50

General Description

Water quality inlets (WQIs), also commonly called trapping catch basins, oil/grit separators or oil/water separators, consist of one or more chambers that promote sedimentation of coarse materials and separation of free oil (as opposed to emulsified or dissolved oil) from stormwater. Some WQIs also contain screens to help retain larger or floating debris, and many of the newer designs also include a coalescing unit that helps promote oil/water separation.

These devices are appropriate for capturing hydrocarbon spills, but provide very marginal sediment removal and are not very effective for treatment of stormwater runoff. WQIs typically capture only the first portion of runoff for treatment and are generally used for pretreatment before discharging to other best management practices (BMPs).

Inspection/Maintenance Considerations

High sediment loads can interfere with the ability of the WQI to effectively separate oil and grease from the runoff. During periods of high flow, sediment can be resuspended and released from the WQI into surface waters. Maintenance of WQIs can be easily neglected because they are underground. Establishment of a maintenance schedule is helpful for ensuring proper maintenance occurs. The required maintenance effort will be site-specific due to variations in sediment and hydrocarbon loading. Since WQI residuals contain hydrocarbon by-products, they may require disposal as hazardous waste. Many WQI owners coordinate with waste haulers to collect and dispose of these residuals.

Maintenance Concerns, Objectives, and Goals

- High Sediment Loads
- Hazardous Waste
- Vector Control

Targeted Constituents

☑	Sediment	●
☑	Nutrients	●
☑	Trash	▲
☑	Metals	●
☑	Bacteria	●
☑	Oil and Grease	▲
☑	Organics	●
☑	Oxygen Demanding	●

Legend ***(Removal Effectiveness)***

● Low ■ High

▲ Medium

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Inspection Activities	Suggested Frequency
■ Inspect after every storm event to determine if maintenance is required.	Monthly during the wet season, or after significant rain events

Maintenance Activities	Suggested Frequency
■ Clean out and dispose of accumulated oil, grease, and sediments. Remove accumulated trash and debris. The clean out and disposal techniques should be environmentally acceptable and in accordance with local regulations.	Annual, before the wet season, or more frequent as needed

Additional Information

Since WQIs can be relatively deep, they may be designated as confined spaces. Caution should be exercised to comply with confined space entry safety regulations if it is required.

References

http://www.co.pierce.wa.us/pc/services/home/environ/water/swm/sppman/bmpt1.htm

Multiple Systems

TC-60

General Description

A multiple treatment system uses two or more BMPs in series. Some examples of multiple systems include: settling basin combined with a sand filter; settling basin or biofilter combined with an infiltration basin or trench; extended detention zone on a wet pond.

Inspection/Maintenance Considerations

Each of the separate treatment processes will require maintenance as described in the previous fact sheets. For example, multiple system comprises of a biofilter combined with an infiltration basin would require the inspection and maintenance considerations outlined on the fact sheet for each process.

Inspection Activities	Suggested Frequency
■ Refer to individual treatment control factsheets	As needed

Maintenance Activities	Suggested Frequency
■ Refer to individual treatment control factsheets	As needed

Maintenance Concerns, Objectives, and Goals

May include the following:

- Accumulation of Metals
- Aesthetics
- Channelization of Flow
- Clogging of the Outlet
- Endangered Species Habitat Creation
- Erosion
- Groundwater Contamination
- Hazardous Waste
- Hydraulic and Removal Efficiency
- Invasive Species Management
- Mechanical Malfunction
- Pollutant Breakthrough
- Re-suspension of settled material
- Sediment and Trash Removal
- Sedimentation
- Vector/Pest Control
- Vegetation harvesting
- Vegetation/Landscape Maintenance

Targeted Constituents

☑ Sediment	■
☑ Nutrients	●
☑ Trash	■
☑ Metals	■
☑ Bacteria	▲
☑ Oil and Grease	■
☑ Organics	■
☑ Oxygen Demanding	■

Legend ***(Removal Effectiveness)***

● Low ■ High

▲ Medium

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Section 5
BMP Implementation and Evaluation

5.1 Introduction

As noted in Section 1 each municipality regulated under stormwater NPDES permits, whether categorized as a Phase I or Phase II municipality, is required to implement a stormwater management program and to assess the effectiveness of the program. Although specific program requirements and the level of implementation required differ between Phase I and Phase II municipalities, both prohibit non-stormwater discharges into storm drains, and require controls to reduce the discharge of pollutants to the maximum extent practicable (MEP). As part of the program, the municipalities are required to address public agency (municipal) operations to reduce the discharge of pollutants and to assess these efforts. Section 2 provides information on some of the necessary elements and steps involved in identifying BMPs for municipal activities occurring at fixed facilities and in field programs, whereas this Section discusses the components necessary to successfully implement a BMP and evaluate its effectiveness.

5.2 BMP Implementation

Municipal employees perform numerous municipal activities that have the potential to discharge pollutants. Staff should consistently implement the procedures or BMPs applicable to these activities. Some municipal activities are contracted to other parties. For example, many municipalities contract out street sweeping or waste collection. Similarly, many municipalities lease city-owned facilities to other parties, at which activities take place that have the potential to discharge pollutants. To ensure measures are taken to reduce pollutants while contractors or lessees perform such activities, contract and lease language should explicitly specify requirements to comply with all BMP specifications. Sample contract/lease language is presented in Appendix D.

Successful implementation of a BMP is dependent on the following components:

- Effective training of municipal and contract employees working in both fixed facilities and field programs.
- Regular inspections of fixed facilities, field programs, and treatment controls.
- Maintenance of treatment controls as needed to ensure proper functioning.
- Periodic evaluation/monitoring of BMP performance consistent with NPDES permit requirements.
- Follow-up action to correct deficiencies in BMP implementation noted during inspections.
- Accurate record keeping to track training, inspections, monitoring, and BMP maintenance.
- Submittal of an annual report to the applicable RWQCB regarding the effectiveness of the municipal efforts to reduce pollutants from fixed facilities and field programs.

- For Phase II Programs, documentation showing how the municipality has met its measurable goals, or revisions to those goals with supporting documentation.

5.3 Staff Training

Education and training is the key to the success of BMP implementation. Typically, municipalities provide annual training sessions. In addition to municipally sponsored training, staff may also attend local, regional, statewide, or national training seminars or workshops related to stormwater management and water quality conducted by other organizations.

In general, a municipality should consider a training program for employees working in fixed facilities and/or field programs. The training program should address the following subjects:

- Maintenance Procedure Implementation and Inspection – In this training effort, proper procedures for performing municipal activities that may adversely affect stormwater quality are addressed. Maintenance procedures cover a wide range of municipal activities and the training may address either all maintenance procedures applicable to the municipality or a specific procedure (e.g. fertilizer and pesticide use). This training can be conducted in either a formal or a tailgate-style format.

- Pollution Prevention/Spill Awareness – This training addresses the general techniques municipal staff may implement to prevent pollution, as well as to respond to spills once they have occurred. Training can be tailored to management and other municipal staff who oversee pollution prevention measures, to field staff conducting activities that may result in spills, or to field staff who may encounter spills or illicit discharges.

5.4 Site Inspections

Inspections of municipal fixed facilities and field programs should be performed to verify that BMPs are being implemented, that they are appropriate for that facility or program, and that they continue to reduce the discharge of pollutants. Inspections generally consist of the following:

- Fixed Facilities – Inspections are typically performed by a combination of stormwater program staff and on-site fixed facility managers. The inspection of a fixed facility may include spot checks of the facility and activities being performed at the facility, and interviews with key line staff.

- Field Programs– Inspections are typically performed by a combination of stormwater program staff and field program supervisors. The inspection of a field program may include spot checks of activities being performed, and interviews with key staff.

- Contracted Activities – Inspections are typically performed by municipal staff to supplement and check on self-inspections and reporting by the management staff of the contract firm performing the activity. Performance should be checked against contract/lease language (see Appendix D).

- Leased Facilities – Inspections are typically performed by municipal staff to supplement and check on self-inspections and reporting by the management staff of the lessor (see Appendix D).

5.4.1 Inspection Frequencies

Fixed facility or field program inspection frequency depends on the nature of the facility or program. Annual inspection is typical, with a more frequent schedule for facilities/activities that pose a greater threat to discharge pollutants (e.g. corporation yards). In the event of an observed problem, such as ineffective maintenance procedures or detected non-stormwater discharges, the inspection frequency should be increased as appropriate to facilitate correction of the problem (see section 5.7 for discussion regarding follow-up enforcement).

5.4.2 Inspection Documentation Procedures

Inspection forms may be developed and used to properly document all inspections and gather the necessary information for record keeping and annual reporting. Examples include:

- General Inspection Forms – These primary forms provide for a general characterization of the fixed facility or field program being inspected, including the type of facility or program, the reason for inspection, activities that may take place, and BMPs applicable for the facility. A general form for all inspections and a single fixed facility specific form should be completed.

- Activity Specific Inspection Forms – These secondary forms include a series of questions or checklist items about specific activities taking place at a fixed facility or as part of a field program, as well as a list of suggested corrective action plans that can be implemented should a problem be found. All forms applicable to the activities being performed at a fixed facility or field program should be completed.

5.5 Treatment Control BMP Maintenance

Maintenance of treatment controls and drainage conveyance systems (e.g. detention and retention basins, infiltration devices, catch basins) including regular inspections as presented in Section 4, is needed to maintain efficient pollutant reduction. If treatment control BMPs are not properly maintained, BMP effectiveness is reduced and water quality deteriorates. Training should be provided where needed. Maintenance schedules should be periodically reviewed and updated as needed to maintain BMP effectiveness. Where regular scheduled maintenance is not appropriate, regular inspections should be scheduled to determine when repairs, cleaning, or replacement are necessary. See Section 4 for a comprehensive discussion regarding maintenance of treatment control BMPs.

Where municipal contractors are responsible for maintenance of treatment controls, special attention should be directed toward ensuring proper maintenance procedures are implemented. Contract and lease language should include recommended maintenance procedures and schedules. Regularly scheduled inspections of facilities or programs operated by the contractor should include compliance with BMP maintenance requirements.

5.6 Analytical Monitoring

Although expensive, stormwater monitoring is a valuable way to assess long-term BMP effectiveness and cost-effectiveness of selected BMPs at reducing pollutants to the "maximum extent practicable". For Phase I municipalities, specific monitoring requirements depend on the individual NPDES permits issued. Phase II municipalities are covered by the Phase II General NPDES Permit and are not explicitly required to conduct chemical monitoring. Monitoring activities can include source identification, and chemical characterization of effluent/runoff, and non-stormwater discharges.

It is beyond the scope of this handbook to describe specific sampling and analytical techniques. For guidance on conventional stormwater sampling techniques and protocol, the reader should refer to NPDES Stormwater Sampling Guidance Document, 1992, published by the USEPA, or Caltrans' Guidance Manual: Stormwater Monitoring Protocols, 2000.

5.7 Enforcement

To ensure proper BMP performance, enforcement procedures and mechanisms should be established for the municipal fixed facilities and field programs. Enforcement actions may occur as a result of a problem found during an inspection or in response to a complaint that is received. Several different types of enforcement mechanisms and penalties can be utilized to ensure compliance. The internal enforcement procedures, directed toward municipal staff, include initial verbal warnings, written warnings, and more serious disciplinary actions if verbal and written warnings do not result in appropriate action. External enforcement procedures which pertain to municipal contractors may be undertaken primarily by the municipality's inspectors, managers, and supervisors who possess enforcement authority through established policies and procedures or ordinances. Depending on the severity of the violation, enforcement could range from the issuance of a notice of noncompliance to the loss of a contract or lease, or a fine.

5.8 Recordkeeping

As applicable, the municipality should maintain records demonstrating successful implementation of BMPs. Recordkeeping may include training, site inspection and maintenance, and if applicable, monitoring.

Training and Workshops

Records of all training sessions provided to staff should be maintained to allow for:

- determining which staff requires which training;
- determining when training sessions must be conducted; and
- documenting training activities for enforcement and compliance purposes.

Municipal staff may attend training sessions or workshops sponsored by non-Permittees such as local or national organizations. For these sessions, the following information should be recorded:

- Name of Workshop/Training
- Sponsoring Organization
- General Description of the Subject Matter
- Location
- Date
- Attendee information (name, title, department, phone and/or email)

Site Inspection and BMP Maintenance

Inspection reports should be kept to track frequency and results of inspections, BMPs implemented, condition of BMPs inspected, and follow-up actions taken. It is also important to keep a record of maintenance activities or any other BMPs that are of an "action" nature. It is easy to demonstrate that a BMP that involves a physical change, such as berming or covering, has been accomplished. However, actions that relate to good housekeeping can only be demonstrated by recordkeeping. Besides demonstrating compliance, records can assist in BMP management. Keeping a record of catch basin cleaning, for example, also provides insight into how long it takes for the catch basin sump to refill.

Monitoring

Records of all stormwater monitoring information, inspections and visual observations, certifications, corrective actions and follow-up activities, and copies of all reports must be retained for a period of at least five years. These records shall include at a minimum, when applicable:

- Date, place, and time of sampling, visual observations, and/or measurements.
- Individual(s) who performed the sampling, visual observations, and or measurements.
- Visual observation records for storm events.
- Visual observations and inspections of non-stormwater discharges.
- Calibration and maintenance records of on-site instruments used.
- Visual observations and sample collection exception records,
- Date and approximate time of analyses.
- Individual who performed the analyses.
- Analytical results, method detection limits, and the analytical techniques or methods used.
- Quality assurance/quality control records and results.

- Sampling and analysis exemption and reduction certifications and supporting documentation.
- Records of any corrective actions and follow-up activities that resulted from the visual observations.

5.9 Reporting

Phase I municipalities are required to submit annual reports documenting BMP implementation, with due dates varying depending on individual NPDES permit requirements. Specific reporting requirements differ between individual permits. Typically, they include, but are not limited to, the following:

- Program implementation status.
- Summary of stormwater activities performed.
- Stormwater monitoring results summary and analysis.
- Assessment of the effectiveness of selected control measures or BMPs.
- Changes or suggested changes to the BMP that will improve overall effectiveness of the program.

Phase II municipalities will be required under the Phase II General NDPES Permit, beginning in 2004, to submit annual reports to the appropriate RWQCB by August 15th of each year, or as otherwise required by the RWQCB executive officer. Specific reporting requirements will include:

- Program implementation status.
- Summary of stormwater activities performed.
- Results of information collected, such as monitoring data.
- Summary of proposed stormwater activities for the next reporting cycle.
- Changes made in BMP selection.
- Changes in stormwater management personnel.
- Changes made in program or measurable goals.

Section 6
Glossary and List of Acronyms
6.1 Glossary

303(d) Listed: Water bodies listed as impaired as per Section 303(d) of the 1972 Clean Water Act.

Best Management Practices (BMPs): Includes schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent, eliminate, or reduce the pollution of waters of the receiving waters. BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Catch Basin (Also known as Inlet): Box-like underground concrete structure with openings in curbs and gutters designed to collect runoff from streets and pavement.

Clean Water Act (CWA): (33 U.S.C. 1251 et seq.) requirements of the NPDES program are defined under Sections 307, 402, 318 and 405 of the CWA.

Construction Activity: Includes clearing, grading, excavation, and contractor activities that result in soil disturbance.

Construction General Permit: A National Pollutant Discharge Elimination System (NPDES) permit issued by the State Water Resources Control Board for the discharge of stormwater associated with construction activity from soil disturbance of five acres or more. Threshold lowered to one acre beginning October 10, 2003. Construction General Permit No. CAS000002.

Denuded: Land stripped of vegetation or land that has had its vegetation worn down due to the impacts from the elements or humans.

Detention: The capture and subsequent release of stormwater runoff from the site at a slower rate than it is collected, the difference being held in temporary storage.

Discharge: A release or flow of stormwater or other substance from a conveyance system or storage container. Broader – includes release to storm drains, etc.

Effluent Limits: Limitations on amounts of pollutants that may be contained in a discharge. Can be expressed in a number of ways including as a concentration, as a concentration over a time period (e.g., 30-day average must be less than 20 mg/l), or as a total mass per time unit, or as a narrative limit.

Erosion: The wearing away of land surface by wind or water. Erosion occurs naturally from weather or runoff but can be intensified by land-clearing practices related to farming, new development, redevelopment, road building, or timber cutting.

Facility: Is a collection of industrial processes discharging stormwater associated with industrial activity within the property boundary or operational unit.

Grading: The cutting or filling of the land surface to a desired slope or elevation.

Hazardous Waste: A waste or combination of wastes that, because of its quantity, concentration, or physical, chemical or infectious characteristics, may either cause or significantly contribute to an increase in mortality or an increase in serious irreversible illness; or pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of or otherwise managed. Possesses at least one of four characteristics (ignitability, corrosivity, reactivity, or toxicity) or appears on special EPA or state lists. Regulated under the federal Resource Conservation and Recovery Act and the California Health and Safety Code.

Illicit Discharges: Any discharge to a municipal separate storm sewer that is not in compliance with applicable laws and regulations as discussed in this document.

Industrial General Permit: A National Pollutant Discharge Elimination System (NPDES) Permit (No. CAS000001) issued by the State Water Resources Control Board for discharge of stormwater associated with industrial activity. Board Order 97-03-DWQ.

Inlet: An entrance into a ditch, storm drain, or other waterway.

Integrated Pest Management (IPM): An ecosystem-based strategy that focuses on long-term prevention of pests or their damage through a combination of techniques such as biological control, habitat manipulation, modification of cultural practices, and use of resistant varieties. Pesticides are used only after monitoring indicates they are needed according to established guidelines, and treatments are made with the goal of removing only the target organism.

Municipal Separate Storm Sewer System (MS4): A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) designed or used for collecting or conveying storm water; (ii) which is not a combined sewer; and (iii) which is not part of a Publicly Owned Treatment Works (POTW) as defined at Title 40 of the Code of Federal Regulations (CFR) 122.2. A "Small MS4" is defined as an MS4 that is not a permitted MS4 under the Phase I regulations. This definition of a Small MS4 applies to MS4 operated within cities and counties as well as governmental facilities that have a system of storm sewers.

Non-Stormwater Discharge: Any discharge to municipal separate storm sewer that is not composed entirely of stormwater.

Nonpoint Source Pollution: Pollution that does not come from a point source. Nonpoint source pollution originates from aerial diffuse sources that are mostly related to land use.

Notice of Intent (NOI): A formal notice to SWRCB submitted by the owner of an industrial site or construction site that said owner seeks coverage under a General Permit for discharges associated with industrial and construction activities. The NOI provides information on the

owner, location, type of project, and certifies that the owner will comply with the conditions of the construction General Permit.

Notice of Termination (NOT): Formal notice to SWRCB submitted by owner/ developer that a construction project is complete.

NPDES Permit: NPDES is an acronym for National Pollutant Discharge Elimination System. NPDES is the national program for administering and regulating Sections 307, 318, 402, and 405 of the Clean Water Act (CWA). In California, the State Water Resources Control Board (SWRCB) has issued a General Permit for stormwater discharges associated with industrial activities (see Appendix A).

Outfall: The end point where storm drains discharge water into a waterway.

Point Source: Any discernible, confined, and discrete conveyance from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural stormwater runoff.

Pollutant: Generally, any substance introduced into the environment that adversely affects the usefulness of a resource.

Pollution Prevention (P2): Practices and actions that reduce or eliminate the generation of pollutants.

Precipitation: Any form of rain or snow.

Pretreatment: Treatment of waste stream before it is discharged to a collection system.

Reclaim (water reclamation): Planned use of treated effluent that would otherwise be discharged without being put to direct use.

Retention: The storage of stormwater to prevent it from leaving the development site.

Reuse (water reuse): (see Reclaim)

Runoff: Water originating from rainfall, melted snow, and other sources (e.g., sprinkler irrigation) that flows over the land surface to drainage facilities, rivers, streams, springs, seeps, ponds, lakes, and wetlands.

Run-on: Off site stormwater surface flow or other surface flow which enters your site.

Scour: The erosive and digging action in a watercourse caused by flowing water.

Secondary Containment: Structures, usually dikes or berms, surrounding tanks or other storage containers, designed to catch spilled materials from the storage containers.

Sedimentation: The process of depositing soil particles, clays, sands, or other sediments that were picked up by runoff.

Sediments: Soil, sand, and minerals washed from land into water, usually after rain, that collect in reservoirs, rivers, and harbors, destroying fish nesting areas and clouding the water, thus preventing sunlight from reaching aquatic plants. Farming, mining, and building activities without proper implementation of BMPs will expose sediment materials, allowing them to be washed off the land after rainfalls.

Significant Materials: Includes, but not limited to, raw materials; fuels; materials such as solvents, detergents, and plastic pellets; finished materials such as metallic products; raw materials used in food processing or production; hazardous substances designed under Section 101(14) of CERLCA; any chemical the facility is required to report pursuant to Section 313 of Title III of SARA; fertilizers; pesticides; and waste products such as ashes, slag, and sludge that have the potential to be released with stormwater discharges.

Significant Quantities: The volume, concentrations, or mass of a pollutant in stormwater discharge that can cause or threaten to cause pollution, contamination, or nuisance that adversely impact human health or the environment and cause or contribute to a violation of any applicable water quality standards for receiving water.

Source Control BMPs: Operational practices that reduce potential pollutants at the source.

Source Reduction (also source control): The technique of stopping and/ or reducing pollutants at their point of generation so that they do not come into contact with stormwater.

Storm Drains: Above- and below-ground structures for transporting stormwater to streams or outfalls for flood control purposes.

Stormwater: Defined as urban runoff and snowmelt runoff consisting only of those discharges, which originate from precipitation events. Stormwater is that portion of precipitation that flows across a surface to the storm drain system or receiving waters.

Stormwater Discharge Associated with Industrial Activity: Discharge from any conveyance which is used for collecting and conveying stormwater from an area that is directly related to manufacturing, processing, or raw materials storage activities at an industrial plant.

Stormwater Pollution Control Plan (SWPCP): A less formal plan than the SWPPP that addresses the implementation of BMPs at facilities/businesses not covered by a general permit but that have the potential to discharge pollutants.

Stormwater Pollution Prevention Plan (SWPPP): A written plan that documents the series of phases and activities that, first, characterizes your site, and then prompts you to select and carry out actions which prevent the pollution of stormwater discharges.

Treatment Control BMPs: Treatment methods to remove pollutants from stormwater.

Toxicity: Adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies.

Turbidity: Describes the ability of light to pass through water. The cloudy appearance of water caused by suspended and colloidal matter (particles).

6.2 Acronyms

AASHTO	American Association of State Highway and Transportation Officials
AC	Asphalt Concrete
ADL	Aerially Deposited Lead
AIMP	Impervious Area
AINF	Infiltration Area
ANSI	American National Standards Institute
APHA	American Public Health Association
APWA	American Public Works Association
ARS	Agricultural Research Service
AQMD	Air Quality Management District
ASTM	American Society for Testing Materials
AWWA	American Water Works Association
BAT	Best Available Technology (economically available)
BCT	Best Conventional Technology (pollution control)
BFP	Bonded Fiber Matrix
BMPs	Best Management Practices
BOD	Biological Oxygen Demand
CA	Contractor Activities
CAL-EPA	California Environmental Protection Agency
CAL-OSHA	California Division of Occupational Safety and Health Administration
CASQA	California Stormwater Quality Association
CCR	California Code of Regulations

CCS	Cellular Confinement System
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
CFR	Code of Federal Register
CMA	Congestion Management Program
COE	U.S. Army Corps of Engineers
CPI	Coalescing Plate Interceptor
CWA	Clean Water Act (Federal Water Pollution Control Act of 1972 as amended in 1987)
DCIA	Directly Connected Impervious Area
DTSC	California Department of Toxic Substances Control
EEC	Effect Effluent Concentration
EIR	Environmental Impact Report
EMC	Event Mean Concentration
EOS	Equivalent Opening Size
ESA	Environmentally Sensitive Area
ESC	Erosion and Sedimentation Control
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
GIS	Geographical Information System
Hazmat	Hazardous Material
HSG	Hydrologic Soil Groups
IPM	Integrated Pest Management
JURMP	Jurisdictional Urban Runoff Management Program
MEP	Maximum Extent Practicable

MS4	Municipal Separate Storm Sewer System
MSDS	Material Safety Data Sheet
MSHA	Mine Safety and Health Administration
NMFS	National Marine Fisheries Service
NOAA	National Oceanographic and Atmospheric Administration
NOI	Notice of Intent
NPDES	National Pollution Discharge Elimination System
NPS	Nonpoint Source
NRC	National Response Center
NRCS	Natural Resources Conservation Service
NSF	National Science Foundation
NURP	National Urban Runoff Program
O&G	Oil and Grease
O&M	Operations and Maintenance
OSDS	On-site Disposal System
OSHA	Occupational Safety and Health Administration
P2	Pollution Prevention
PAHs	Polyaromatic Hydrocarbons
PAM	Polyacrylamide
PCBs	Polychlorinated Biphenyls
PCC	Portland Concrete Cement
PPT	Pollution Prevention Team
POTW	Publicly Owned Treatment Works
PSD	Particle Size Distribution
RCRA	Resource Conservation and Recovery Act

RWQCB	Regional Water Quality Control Board
SAP	Sampling and Analysis Plan
SARA	Superfund Amendments and Reauthorization Act
SIC	Standard Industrial Classification
SPCC	Spill Prevention Control and Countermeasure
SUSMP	Standard Urban Stormwater Mitigation Plan
SWMP	Stormwater Management Program
SWPCP	Stormwater Pollution Control Plan
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resource Control Board
TMDL	Total Maximum Daily Load
TOC	Total Organic Carbon
TSS	Total Suspended Solids
UFC	Uniform Fire Code
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USDOT	United States Department of Transportation
USEPA	United States Environmental Protection Agency
WEF	Water Environment Federation

Appendix A
Inventory of Municipal Operations

This appendix provides an example of an inventory database. The purpose of this example is to illustrate the types of data that should be collected for municipal operations and how these data can be organized into a database that can be used for other steps of a municipality's stormwater management program. Specifically, the information gathered in the inventory process should be used to assess municipal operations for BMP implementation (Appendix B) and for BMP selection (Appendix C).

The example provided here was adapted from the inventory database developed by the County of Orange Stormwater Program for fixed facilities. The field program inventory database should include similar information (see Section 2).

Step 1 Facility and Location

Facility Physical Address Information*										Watershed Identification		
Facility Name	Street Number	Street Name	Street Suffix	City	Zip	Business Phone Number	Business Fax Number	Facility Contact Name	Facility Size (Total Square Feet of Facility)	Watershed (Identify if possible)	Longitude (X)	Latitude (Y)
County Yard	1200	Pine	Road	Anaheim	92933	(714) 555-6363	(111) 222-3333	Ron Jones	400,000	E - Lower Santa Ana River	133.49.55	34.34.45
City Service Center	645	Main	Street	Brea	92821	(714) 555-1234	(123) 456-7890	Joe Smith	200,000	A - San Gabriel River/Coyote Creek	102.48.50	33.34.44

* Add facility mailing address information if different from physical address

Step 2 Potential Pollutant Generating Activities

Identify all activities that apply for each facility and associated pollutants											
Facility Name	Vehicle and Equipment Fueling	Vehicle and Equipment Washing & Steam Cleaning	Vehicle & Equipment Maintenance and Repair	Outdoor Loading/ Unloading of Materials	Outdoor Container Storage of Liquids	Outdoor Process Equipment Operations & Maintenance	Outdoor Storage of Raw Materials	Waste Handling and Disposal	Building and Grounds Maintenance	Parking/ Storage Area Maintenance	Over Water Activities
County yard	Metals, O&G, Org., Trash	Sed., Nut., Trash, Metals, O&G, Org.	Metals, O&G, Org.	Sed., Nut., Metals, O&G			Sed., Nut., Metals, O&G			Sed., Nut., Trash, Metals, Bact., O&G, Org., Oxy	
City Service Center	Metals, O&G, Org., Trash	Sed., Nut., Trash, Metals, O&G, Org.	Metals, O&G, Org.	Sed., Nut., Metals, O&G			Sed., Nut., Metals, O&G		Sed., Nut., Trash, Metals, Bact., O&G, Org., Pest., Oxy	Sed., Nut., Trash, Metals, Bact., O&G, Org., Oxy	

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Appendix B
Assessment of Municipal Operations

This appendix provides an example assessment worksheet that can be used for evaluating fixed facilities to determine the level of BMP implementation. The results of this assessment process can then be used as the basis for BMP selection (see Appendix C).

WORKSHEET 1

Facility Name: County yard
Contact Name: Ron Jones

Site Address: 1200 Pine Rd., Anaheim, CA 92933
Phone: (111) 222-3333

1. ACTIVITIES – In the table below check each activity present at the site and evaluate its **potential for pollutant discharge (PPD):** 1 = high potential, 2= medium potential, 3= low potential

2. BMP EFFECTIVENESS – In the table below provide an effectiveness rating using the provided scale.

ACTIVITY AND BMP CHECKLIST	APPLICABLE ACTIVITY Yes	No	PPD	EFFECTIVENESS RATING *
A. VEHICLE AND EQUIPMENT FUELING BMPs employed: ▪ Employees trained in proper fueling and cleanup procedures. ▪ "Shut-off" valves installed on nozzles. ▪ "Topping off" of fuel tanks is discouraged. ▪ Adsorbent materials used on spills as opposed to hosing down. ▪ Drains labeled within the facility boundary, by stencil to indicate whether they flow to an oil/water separator, directly to the sewer, or to a storm drain. ▪ Fueling area designed to prevent storm water runoff and spills. ▪ Fueling area covered with an overhanging roof structure.	[x]	[ ]	[1]	① ② ❸ ④ ⑤
B. VEHICLE AND EQUIPMENT WASHING/STEAM CLEANING BMPs employed: ▪ Vehicles and equipment are washed at an off-site commercial washing location whenever possible. ▪ On-site washing area is clearly marked as a wash area. ▪ Signs are posted stating that only washing is allowed in wash area and that discharges to the storm drain are prohibited. ▪ Trash containers are provided in wash area. ▪ A map of on-site storm drain locations exists to avoid discharges to the storm drain system.	[x]	[ ]	[2]	① ② ③ ❹ ⑤
C. VEHICLE AND EQUIPMENT MAINTENANCE AND REPAIR BMPs employed: ▪ Idle equipment is stored under cover. ▪ Drip pans are used for leaking vehicle/equipment. ▪ Vehicle maintenance area is designed to prevent storm water pollution (area contains berming and appropriate drainage routing). ▪ Signs are painted on storm drain inlets to indicate that they are not to receive liquid or solid wastes. ▪ The work area is covered to limit exposure to the rain.	[x]	[ ]	[1]	① ② ❸ ④ ⑤
D. OUTDOOR LOADING/UNLOADING OF MATERIALS BMPs employed:	[ ]	[x]	[ ]	① ② ③ ④ ⑤
E. OUTDOOR CONTAINER STORAGE OF LIQUIDS BMPs employed:	[ ]	[x]	[ ]	① ② ③ ④ ⑤
F. OUTDOOR PROCESS EQUIPMENT OPERATIONS AND MAINTENANCE BMPs employed:	[ ]	[x]	[ ]	① ② ③ ④ ⑤
G. OUTDOOR STORAGE OF RAW MATERIALS BMPs employed: ▪ Materials are stored inside when feasible. ▪ All outside storage areas are covered with a roof or enclosed to prevent stormwater contact. ▪ Outdoor storage containers are kept in good condition. ▪ Lids are secured on waste barrels and containers. ▪ Drums are stored in a secure area where unauthorized persons cannot gain access.	[x]	[ ]	[2]	① ② ③ ❹ ⑤
H. WASTE HANDLING AND DISPOSAL BMPs employed:	[ ]	[x]	[-]	① ② ③ ④ ⑤
I BUILDING AND GROUNDS MAINTENANCE BMPs employed:	[ ]	[x]	[-]	① ② ③ ④ ⑤
J PARKING/STORAGE AREA MAINTENANCE BMPs employed: ▪ Parking and storage areas are kept clean and orderly. ▪ Site is designed to allow sheet runoff to flow into biofilters (vegetated strip and swale) and/or infiltration devices. ▪ Rooftop drains are arranged to prevent drainage directly onto paved surfaces. ▪ Lot is designed to include semi-permeable hardscape.	[ ]	[x]	[-]	① ② ❸ ④ ⑤
K. OVER WATER ACTIVITIES BMPs employed:	[ ]	[x]	[-]	① ② ③ ④ ⑤
L. OTHER (describe):	[ ]	[x]	[-]	① ② ③ ④ ⑤

***① No BMPs used and stormwater pollution likely ② Some BMPs used but not effective ③ Some BMPs used and moderately effective**
④ Source control BMPs used and very effective/structural BMPs needed ⑤ All necessary BMPs used and very effective

3. TYPE AND QUANTITY OF MATERIALS USED

Material	Typical Quantity/Frequency	Is Stored Material Likely to Generate Pollutants
Gasoline	250 gal/day	yes
Motor oil	90 gal/wk	yes
Detergents	40 lb/wk	no

4. HISTORY OF SPILLS AND LEAKS

a) Is there a chronic history of spills and leaks? *no*

b) Is there no evidence of leaks and drips from equipment and machinery? *drip pans in place*

c) Is there a spill prevention and response team? *yes*

d) Are appropriate spill containment and cleanup materials kept on-site and in convenient locations? *materials present, but need to be placed near fueling areas.*

e) Are cleanup procedures for spills followed regularly and correctly? *yes*

f) Are used absorbent materials removed and disposed of in a timely manner? *stored spill clean up materials observed on-site, proper disposal required.*

g) Are personnel regularly trained in the use of spill control materials? *yes*

5. NON-STORMWATER DISCHARGES

a) Outfall directly observed during assessment *no*

b) Are BMPs implemented to prevent, treat, or control non-stormwater discharges? *yes, but could use improvement (see BMP selection recommendations).*

c) Is there a potential for non-stormwater discharges (i.e. non-stormwater sources observed without BMPs implemented) *yes, (see BMP selection recommendations)*

6. SIZE OF FACILTIY (incorporating the size of a facility serves as a surrogate measure for flow)

a) Total area *400,000 square feet.*

b) The impervious area (including parking lot) is *320,000 square feet (80% impervious)*

7. PROXIMITY TO RECEIVING WATER

Does the facility discharge directly or adjacent to a 303(d) water body or other environmentally sensitive area? *no*

Appendix C
BMP Selection Process

The purpose of this appendix is to illustrate the process of selecting BMPs for an example fixed facility. Information necessary for this process includes use of the results from the inventory (Appendix A) and assessment (Appendix B) processes.

The BMPs listed in the example checklist below are the required measures to control the discharge of pollutants to the stormwater drainage system for the activities identified during the assessment process (Appendix B). The BMPs listed include both those that were currently being implemented at the site as well as recommended BMPs based on the facility assessment. The BMP fact sheets presented in Section 3 should be used to identify recommended BMPs for municipal operations, however, note that not all BMPs listed in the fact sheets may be applicable to a given facility. You are encouraged to employ additional BMPs if they will control pollutants in an effective manner.

Facility Name: County Yard Site Address: 1200 Pine Rd., Anaheim, CA

Contact Name: Ron Jones Phone: (111) 222-3333

APPLICABLE BMPs

A. VEHICLE AND EQUIPMENT FUELING (Fact Sheet SC-20)

Current

- Employees trained in proper fueling and cleanup procedures.
- "Shut-off" valves installed on nozzles.
- "Topping off" of fuel tanks is discouraged.
- Adsorbent materials used on spills as opposed to hosing down.
- Drains labeled within the facility boundary, by stencil to indicate whether they flow to an oil/water separator, directly to the sewer, or to a storm drain.
- Fueling area designed to prevent storm water runoff and spills.
- Fueling area covered with an overhanging roof structure.

Recommended

- Spot clean" leaks and drips routinely. Leaks are not cleaned up until the absorbent is picked up and disposed of properly.
- Install covered spill kits next to fueling area.

B. VEHICLE AND EQUIPMENT WASHING/STEAM CLEANING (Fact Sheet SC-21)

Current

- Vehicles and equipment are washed at an off-site commercial washing location whenever possible.
- On-site washing area is clearly marked as a wash area.
- Signs are posted stating that only washing is allowed in wash area and that discharges to the storm drain are prohibited.
- Trash containers are provided in wash area.
- A map of on-site storm drain locations exists to avoid discharges to the storm drain system.

Recommended

- Use biodegradable, phosphate-free detergents for washing vehicles as appropriate.
- Consider washing vehicle equipment inside the building to control the targeted constituents by directing them to the sanitary sewer.

C. VEHICLE AND EQUIPMENT MAINTENANCE AND REPAIR (Fact Sheet SC22)

Current

- Idle equipment is stored under cover.
- Drip pans are used for leaking vehicle/equipment.

- Vehicle maintenance area is designed to prevent storm water pollution (area contains berming and appropriate drainage routing).
- Signs are painted on storm drain inlets to indicate that they are not to receive liquid or solid wastes.
- The work area is covered to limit exposure to the rain.

Recommended

- Avoid hosing down your work areas; use dry sweeping.
- Post signs at sinks to remind employees not to pour hazardous wastes down drains.
- Clean yard storm drain inlets(s) regularly and especially after large storms.

D. OUTDOOR LOADING/UNLOADING OF MATERIALS (Fact Sheet SC-30) N/A

E. OUTDOOR CONTAINER STORAGE OF LIQUIDS (Fact Sheet SC-31) N/A

F. OUTDOOR PROCESS EQUIPMENT OPERATIONS AND MAINTENANCE (Fact Sheet SC-32) N/A

G. OUTDOOR STORAGE OF RAW MATERIALS (Fact Sheet SC-33)

Current

- Materials are stored inside when feasible.
- All outside storage areas are covered with a roof or enclosed to prevent stormwater contact.
- Outdoor storage containers are kept in good condition.
- Lids are secured on waste barrels and containers.
- Drums are stored in a secure area where unauthorized persons cannot gain access.

Recommended

- All materials stored outside should have some type of secondary containment system in case of spills or leaks.

H. WASTE HANDLING AND DISPOSAL (Fact Sheet SC-34) N/A

I. BUILDING AND GROUNDS MAINTENANCE (Fact Sheet SC-41) N/A

J. PARKING/STORAGE AREA MAINTENANCE (Fact Sheet SC-43)

Current

- Parking and storage areas are kept clean and orderly.
- Site is designed to allow sheet runoff to flow into biofilters (vegetated strip and swale) and/or infiltration devices.
- Rooftop drains are arranged to prevent drainage directly onto paved surfaces.
- Lot is designed to include semi-permeable hardscape.

Recommended

- Remove debris in a timely fashion.
- Utilize sand filters or oleophilic collectors for oily waste in low concentrations.

K. OVER WATER ACTIVITIES (Fact Sheet SC-50) N/A

L. OTHER (describe):

Appendix D
Example Contract/Lease Language for BMP Implementation

Appendix D Example Contract/Lease Language for BMP Implementation

Example Lease Language for Fixed Facilities

Following is example language that can be inserted into municipal leases:

> The _____ Regional Water Quality Control Board (RWQCB) has issued a permit that governs stormwater and non-stormwater discharges resulting from municipal activities performed by or for the City of _____. The RWQCB Permit is National Pollutant Discharge Elimination System (NPDES) Permit No. _____. Copy of the RWQCB Permit is available for review.
>
> In order to comply with the Permit requirements, the City has developed Best Management Practices (BMPs) that parties leasing municipal owned properties must adhere to. These BMPs contain pollution prevention and source control techniques to minimize the impact of those activities upon dry-weather urban runoff, stormwater runoff, and receiving water quality.
>
> Activities performed at the facility leased under this agreement shall conform to the Permit and BMPs, and must be performed as described within all applicable BMPs. The holder of this agreement shall fully understand the BMPs applicable to activities conducted at the facility leased under this agreement prior to conducting them and maintain copies of the BMPs at the leased facility throughout the agreement duration. The applicable BMPs are included as Exhibit ___ of this agreement.
>
> Evaluation of activities subject to Permit performed at the facility leased under this agreement will be conducted by the city to verify compliance with BMP requirements and may be required through lessor self-evaluation as determined by the city.

Example Contract Language for Field Programs

Following is example language that can be inserted into municipal field program contracts:

> The _____ Regional Water Quality Control Boards (RWQCB) has issued a permit that governs stormwater and non-stormwater discharges resulting from areas owned and operated by the City of _____. The RWQCB Permit is National Pollutant Discharge Elimination System (NPDES) Permit No. _____. Copy of the RWQCB Permit is available for review.
>
> In order to comply with the Permit requirements, the City has developed Best Management Practices (BMPs) that parties conducting the municipal activities must adhere to. These BMPs apply to any party conducting municipal activities and contain pollution prevention and source control techniques to minimize the impact of those activities upon dry-weather urban runoff, stormwater runoff, and receiving water quality.

Work performed under this CONTRACT shall conform to the Permit requirements, and BMPs, and must be performed as described within all applicable BMPs. The CONTRACTOR shall fully understand the BMPs applicable to activities that are being conducted under this CONTRACT prior to conducting them and maintain copies of the BMPs throughout the CONTRACT duration. The applicable BMPs are included as Exhibit ___ of this CONTRACT.

Evaluation of activities subject to BMPs performed under this CONTRACT will be conducted to verify compliance with BMP requirements and may be required through CONTRACTOR self-evaluation as determined by the city.

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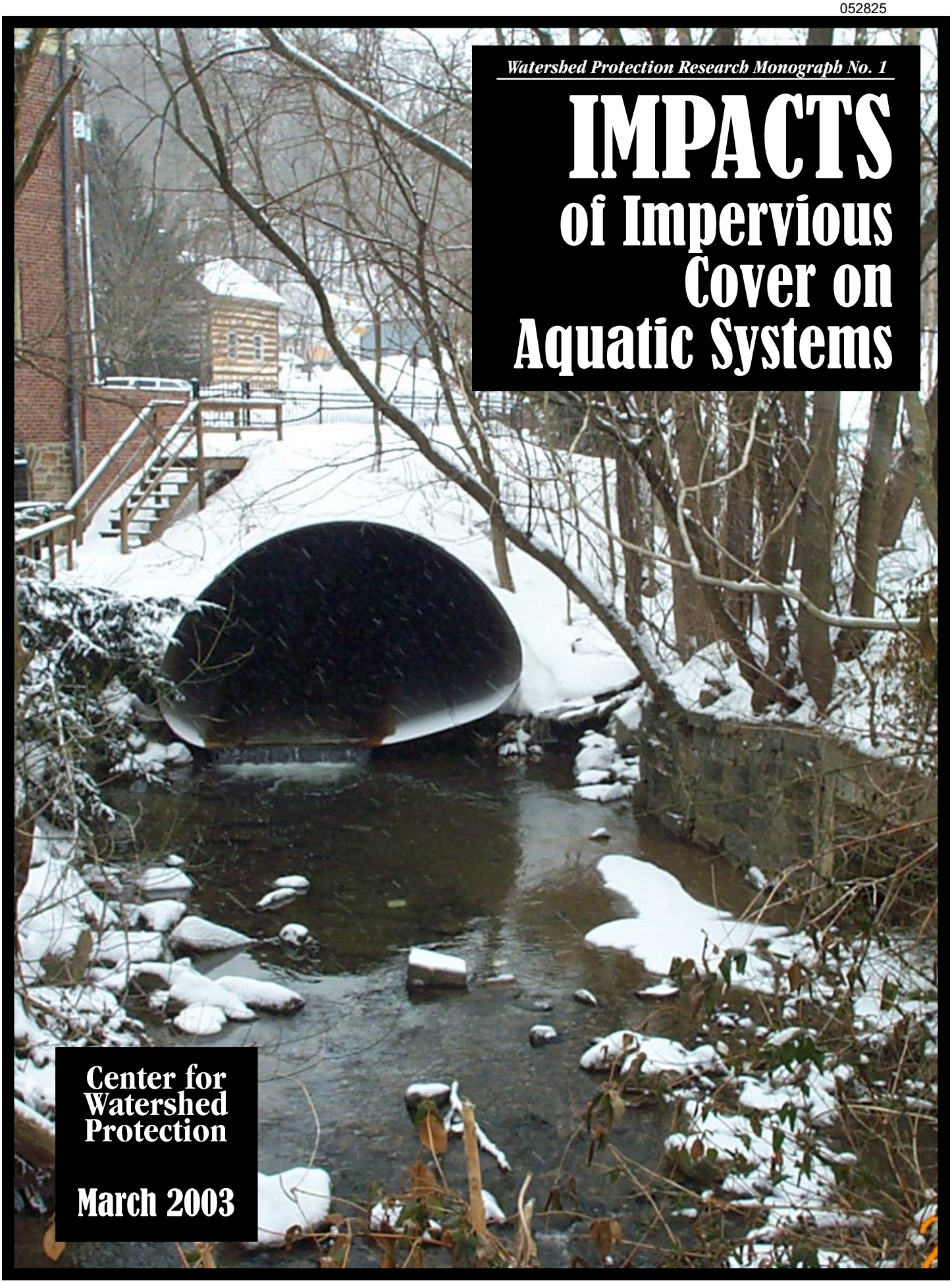

Watershed Protection Research Monograph No. 1

IMPACTS of Impervious Cover on Aquatic Systems

Center for Watershed Protection

March 2003

Cover photograph Ellicott City, Maryland 2003.
Courtesy Anne Kitchell, Center for Watershed Protection.

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Watershed Protection Research Monograph No. 1

Impacts of Impervious Cover on Aquatic Systems

March 2003

Prepared by:
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Foreword

We are extremely pleased to launch the first edition of a new series called *Watershed Protection Research Monographs*. Each monograph will synthesize emerging research within a major topical area in the practice of watershed protection. The series of periodic monographs will replace our journal *Watershed Protection Techniques,* which lapsed in 2002. We hope this new format will provide watershed managers with the science and perspectives they need to better protect and restore their local watersheds.

This monograph was written to respond to many inquiries from watershed managers and policy makers seeking to understand the scientific basis behind the relationship between impervious cover and the health of aquatic ecosystems. It reviews more than 225 research studies that have explored the impact of impervious cover and other indicators of urbanization on aquatic systems. This report comprehensively reviews the available scientific data on how urbanization influences hydrologic, physical, water quality, and biological indicators of aquatic health, as of late 2002.

Our intention was to organize the available scientific data in a manner that was accessible to watershed leaders, policy-makers and agency staff. In addition, the research itself, which spans dozens of different academic departments and disciplines, was conducted in many different eco-regions, climatic zones, and stream types. In order to communicate across such a wide audience, we have resorted to some simplifications, avoided some important particulars, refrained from some jargon, and tried, wherever possible, to use consistent terminology. Thus, the interpretations and conclusions contained in this document are ours alone, and our readers are encouraged to consult the original sources when in doubt.

We would also like to note that the Center for Watershed Protection and the University of Alabama are currently developing a major national database on stormwater quality. The database will contain nearly 4,000 station-storm events collected by municipalities as part of the U.S. EPA's National Pollutant Discharge Elimination System (NPDES) Phase I Stormwater Permit Program. We anticipate releasing a data report in late 2003 that will provide a much needed update of stormwater event mean concentrations (EMCs).

As of this writing, many research efforts are underway that will further test and refine these relationships (most notably, the U.S. Geological Survey gradients initiative, but also many other local, state and academic efforts). We hope that this report provides a useful summary of the existing science, suggests some directions for new research, and stimulates greater discussion of this important topic in watershed management. We also feel it is time for a major conference or symposium, where this diverse community can join together to discuss methods, findings and the important policy implications of their research.

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Acknowledgments

Putting this first research monograph together took a lot of energy, editing and analysis, and many Center staff devoted their time and energy over the last two years to get it done. The project team consisted of Karen Cappiella, Deb Caraco, Samantha Corbin, Heather Holland, Anne Kitchell, Stephanie Linebaugh, Paul Sturm, and Chris Swann. Special thanks are extended to Tiffany Wright, who worked tirelessly to assemble, edit and otherwise polish the final draft.

I am also grateful to Michael Paul of Tetratech, Inc., who graciously provided us with an extensive literature review from his PhD days at the University of Georgia that contained many obscure and hard to find citations. Portions of this monograph were developed as part of a literature review conducted as part of a work assignment for the U.S. EPA Office of Wastewater Management in 2001, which proved indispensable in our efforts. Lastly, I would like to thank the hundreds of scientists who have contributed their time and data to explore and test the relationships between urbanization and aquatic health.

Tom Schueler
Center for Watershed Protection

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Acronyms and Abbreviations

B-IBI	Benthic Index of Biotic Integrity
BOD	Biological Oxygen Demand
BSD	Better Site Design
C-IBI	Combined Index of Biotic Integrity
cfs	cubic feet per second
COD	Chemical Oxygen Demand
CSO	Combined Sewer Overflow
Cu	Copper
DOC	Dissolved Organic Carbon
du/ac	dwelling units per acre
EMC	Event Mean Concentration
EPT	Ephemeroptera, Plecoptera and Trichoptera
FC	Forest Cover
GIS	Geographic Information Systems
IBI	Index of Biotic Integrity
IC	Impervious Cover
ICM	Impervious Cover Model
lbs/ac	pounds per acre
LWD	Large Woody Debris
mg/kg	milligrams per kilogram
mg/l	milligrams per liter (equal to ppm)
MPN	Most Probable Number
MTBE	Methyl Tertiary-Butyl Ether
N	Number of Studies
N/R	data not reported
NO_2	Nitrite
NO_3	Nitrate
NO_x	Nitrogen Oxides
NPDES	National Pollutant Discharge Elimination System
NTU	Nephelometric Turbidity Unit
NURP	National Urban Runoff Program
PAH	Polycylic Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyl
ppb	Parts per billion (equal to ug/l)
ppm	Parts per million (equal to mg/l)
RBP	Rapid Bioassessment Protocol
SLAMM	Source Loading Assessment/ Management Model
SPMD	Semi-Permeable Membrane Device
SSO	Sanitary Sewer Overflow
STP	Stormwater Treatment Practice
TC	Turf Cover
TDS	Total Dissolved Solids
TKN	Total Kjeldhal Nitrogen
TMDL	Total Maximum Daily Load
Total N	Total Nitrogen
Total P	Total Phosphorous
TOC	Total Organic Carbon
TSS	Total Suspended Solids
ug/l	micrograms per liter (equal to ppb)
VMT	Vehicle Miles Traveled
VOC	Volatile Organic Compound
WLF	Water Level Fluctuation
WTP	Wastewater Treatment Plant

Chapter 1: Introduction

This research monograph comprehensively reviews the available scientific data on the impacts of urbanization on small streams and receiving waters. These impacts are generally classified according to one of four broad categories: changes in hydrologic, physical, water quality or biological indicators. More than 225 research studies have documented the adverse impact of urbanization on one or more of these key indicators. In general, most research has focused on smaller watersheds, with drainage areas ranging from a few hundred acres up to ten square miles.

Streams vs. Downstream Receiving Waters

Urban watershed research has traditionally pursued two core themes. One theme has evaluated the direct impact of urbanization on small streams, whereas the second theme has explored the more indirect impact of urbanization on downstream receiving waters, such as rivers, lakes, reservoirs, estuaries and coastal areas. This report is organized to profile recent research progress in both thematic areas and to discuss the implications each poses for urban watershed managers.

When evaluating the direct impact of urbanization on streams, researchers have emphasized hydrologic, physical and biological indicators to define urban stream quality. In recent years, impervious cover (IC) has emerged as a key paradigm to explain and sometimes predict how severely these stream quality indicators change in response to different levels of watershed development. The Center for Watershed Protection has integrated these research findings into a general watershed planning model, known as the impervious cover model (ICM). The ICM predicts that most stream quality indicators decline when watershed IC exceeds 10%, with severe degradation expected beyond 25% IC. In the first part of this review, we critically analyze the scientific basis for the ICM and explore some of its more interesting technical implications.

While many researchers have monitored the quality of stormwater runoff from small watersheds, few have directly linked these pollutants to specific water quality problems within streams (e.g., toxicity, biofouling, eutrophication). Instead, the prevailing view is that stormwater pollutants are a downstream export. That is, they primarily influence downstream receiving water quality. Therefore, researchers have focused on how to estimate stormwater pollutant loads and then determine the water quality response of the rivers, lakes and estuaries that receive them. To be sure, there is an increasing recognition that runoff volume can influence physical and biological indicators within some receiving waters, but only a handful of studies have explored this area. In the second part of this review, we review the impacts of urbanization on downstream receiving waters, primarily from the standpoint of stormwater quality. We also evaluate whether the ICM can be extended to predict water quality in rivers, lakes and estuaries.

This chapter is organized as follows:

1.1 A Review of Recent Urban Stream Research and the ICM
1.2 Impacts of Urbanization on Downstream Receiving Waters
1.3 Implications of the ICM for Watershed Managers

1.1 A Review of Recent Urban Stream Research and the ICM

In 1994, the Center published "The Importance of Imperviousness," which outlined the scientific evidence for the relationship between IC and stream quality. At that time, about two dozen research studies documented a reasonably strong relationship between watershed IC and various indicators of stream quality. The research findings were subsequently integrated into the ICM (Schueler, 1994a and CWP, 1998). A brief summary of the basic assumptions of the ICM can be found in Figure 1. The ICM has had a major influence in watershed planning, stream classification and land use regulation in many communities. The ICM is a deceptively simple model that raises extremely complex and profound policy implications for watershed managers.

The ICM has been widely applied in many urban watershed settings for the purposes of small watershed planning, stream classification, and supporting restrictive development regulations and watershed zoning. As such, the ICM has stimulated intense debate among the planning, engineering and scientific communities. This debate is likely to soon spill over into the realm of politics and the courtroom, given its potential implications for local land use and environmental regulation. It is no wonder that the specter of scientific uncertainty is frequently invoked in the ICM debate, given the land use policy issues at stake. In this light, it is helpful to review the current strength of the evidence for and against the ICM.

The ICM is based on the following assumptions and caveats:

- Applies only to 1st, 2nd and 3rd order streams.
- Requires accurate estimates of percent IC, which is defined as the total amount of impervious cover over a subwatershed area.
- Predicts potential rather than actual stream quality. It can and should be expected that some streams will depart from the predictions of the model. For example, monitoring indicators may reveal poor water quality in a stream classified as "sensitive" or a surprisingly high biological diversity

Figure 1: Impervious Cover Model

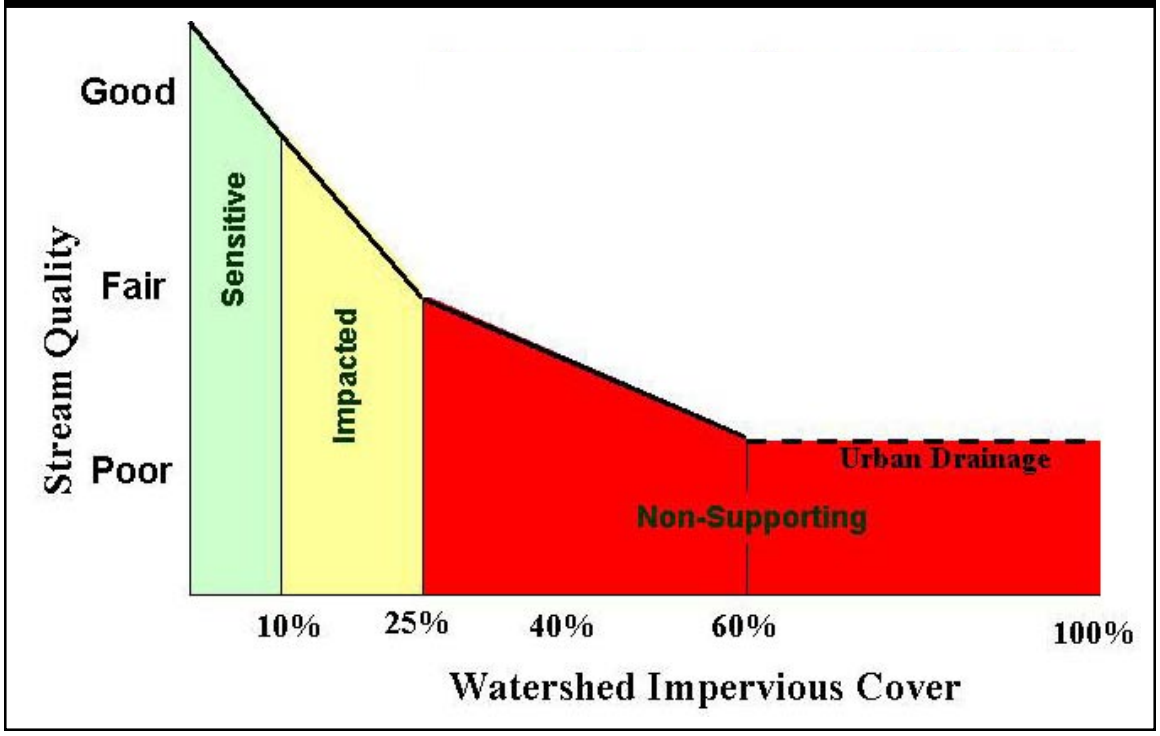

score in a "non-supporting" one. Consequently, while IC can be used to initially diagnose stream quality, supplemental field monitoring is recommended to actually confirm it.

- Does not predict the precise score of an individual stream quality indicator but rather predicts the average behavior of a group of indicators over a range of IC. Extreme care should be exercised if the ICM is used to predict the fate of individual species (e.g., trout, salmon, mussels).

- "Thresholds" defined as 10 and 25% IC are not sharp "breakpoints," but instead reflect the expected transition of a composite of individual indicators in that range of IC. Thus, it is virtually impossible to distinguish real differences in stream quality indicators within a few percentage points of watershed IC (e.g., 9.9 vs. 10.1%).

- Should only be applied within the ecoregions where it has been tested, including the mid-Atlantic, Northeast, Southeast, Upper Midwest, and Pacific Northwest.

- Has not yet been validated for non-stream conditions (e.g., lakes, reservoirs, aquifers and estuaries).

- Does not currently predict the impact of watershed treatment.

In this section, we review available stream research to answer four questions about the ICM:

1. Does recent stream research still support the basic ICM?
2. What, if any, modifications need to be made to the ICM?
3. To what extent can watershed practices shift the predictions of the ICM?
4. What additional research is needed to test the ICM?

1.1.1 Strength of the Evidence for the ICM

Many researchers have investigated the IC/stream quality relationship in recent years. The Center recently undertook a comprehensive analysis of the literature to assess the scientific basis for the ICM. As of the end of 2002, we discovered more than 225 research studies that measured 26 different urban stream indicators within many regions of North America. We classified the research studies into three basic groups.

The first and most important group consists of studies that directly test the IC/stream quality indicator relationship by monitoring a large population of small watersheds. The second and largest group encompasses secondary studies that indirectly support the ICM by showing significant differences in stream quality indicators between urban and non-urban watersheds. The third and last group of studies includes widely accepted engineering models that explicitly use IC to directly predict stream quality indicators. Examples include engineering models that predict peak discharge or stormwater pollutant loads as a direct function of IC. In most cases, these relationships were derived from prior empirical research.

Table 1 provides a condensed summary of recent urban stream research, which shows the impressive growth in our understanding of urban streams and the watershed factors that influence them. A negative relationship between watershed development and nearly all of the 26 stream quality indicators has been established over many regions and scientific disciplines. About 50 primary studies have tested the IC/stream quality indicator relationship, with the largest number looking at biological indicators of stream health, such as the diversity of aquatic insects or fish. Another 150 or so secondary studies provide evidence that stream quality indicators are significantly different between urban and non-urban watersheds, which lends at least indirect support for the ICM and suggests that additional research to directly test the IC/stream quality indicator

Table 1: The Strength of Evidence: A Review of the Current Research on Urban Stream Indicators

Stream Quality Indicator	#	IC	UN	EM	RV	Notes
Increased Runoff Volume	2	Y	Y	Y	N	extensive national data
Increased Peak Discharge	7	Y	Y	Y	Y	type of drainage system key
Increased Frequency of Bankfull Flow	2	?	Y	N	N	hard to measure
Diminished Baseflow	8	?	Y	N	Y	inconclusive data
Stream Channel Enlargement	8	Y	Y	N	Y	stream type important
Increased Channel Modification	4	Y	Y	N	?	stream enclosure
Loss of Riparian Continuity	4	Y	Y	N	?	can be affected by buffer
Reduced Large Woody Debris	4	Y	Y	N	?	Pacific NW studies
Decline in Stream Habitat Quality	11	Y	Y	N	?	
Changes in Pool Riffle/Structure	4	Y	Y	N	?	
Reduced Channel Sinuosity	1	?	Y	N	?	straighter channels
Decline in Streambed Quality	2	Y	Y	N	?	embeddedness
Increased Stream Temperature	5	Y	Y	N	?	buffers and ponds also a factor
Increased Road Crossings	3	?	Y	N	?	create fish barriers
Increased Nutrient Load	30+	?	Y	Y	N	higher stormwater EMCs
Increased Sediment Load	30+	?	Y	N	Y	higher EMCs in arid regions
Increased Metals & Hydrocarbons	20+	?	Y	Y	N	related to traffic/VMT
Increased Pesticide Levels	7	?	Y	N	Y	may be related to turf cover
Increased Chloride Levels	5	?	Y	N	Y	related to road density
Violations of Bacteria Standards	9	Y	Y	N	Y	indirect association
Decline in Aquatic Insect Diversity	33	Y	Y	N	N	IBI and EPT
Decline in Fish Diversity	19	Y	Y	N	N	regional IBI differences
Loss of Coldwater Fish Species	6	Y	Y	N	N	trout and salmon
Reduced Fish Spawning	3	Y	Y	N	?	
Decline in Wetland Plant Diversity	2	N	Y	N	?	water level fluctuation
Decline in Amphibian Community	5	Y	Y	N	?	few studies

#: *total number of all studies that evaluated the indicator for urban watersheds*
IC: *does balance of studies indicate a progressive change in the indicator as IC increases? Answers: Yes, No or No data (?)*
UN: *If the answer to IC is no, does the balance of the studies show a change in the indicator from non-urban to urban watersheds? Yes or No*
EM *Is the IC/stream quality indicator relationship implicitly assumed within the framework of widely accepted engineering models? Yes, No or No models yet exist (?)*
RV: *If the relationship has been tested in more than one eco-region, does it generally show major differences between ecoregions? Answers: Yes, No, or insufficient data (?)*

relationship is warranted. In some cases, the IC/stream quality indicator relationship is considered so strongly established by historical research that it has been directly incorporated into accepted engineering models. This has been particularly true for hydrological and water quality indicators.

1.1.2 Reinterpretation of the ICM

Although the balance of recent stream research generally supports the ICM, it also offers several important insights for interpreting and applying the ICM, which are discussed next.

Statistical Variability

Scatter is a common characteristic of most IC/stream quality indicator relationships. In most cases, the overall trend for the indicator is down, but considerable variation exists along the trend line. Often, linear regression equations between IC and individual stream quality indicators produce relatively modest correlation coefficients (reported r^2 of 0.3 to 0.7 are often considered quite strong).

Figure 2 shows typical examples of the IC/stream quality indicator relationship that illustrate the pattern of statistical variability. Variation is always encountered when dealing with urban stream data (particularly so for biological indicators), but several patterns exist that have important implications for watershed managers.

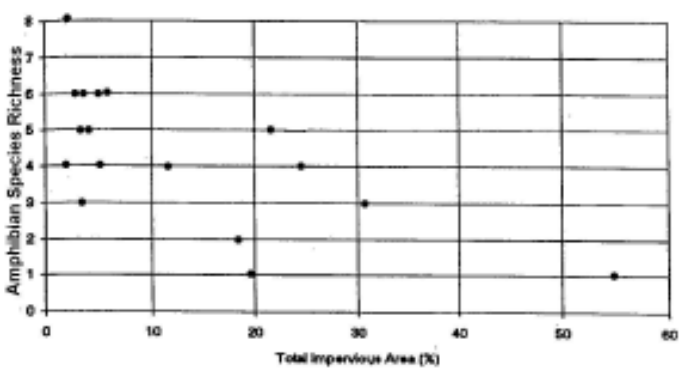

a. Fish IBI vs. IC in Fairfax, VA (Fairfax County, 2001)

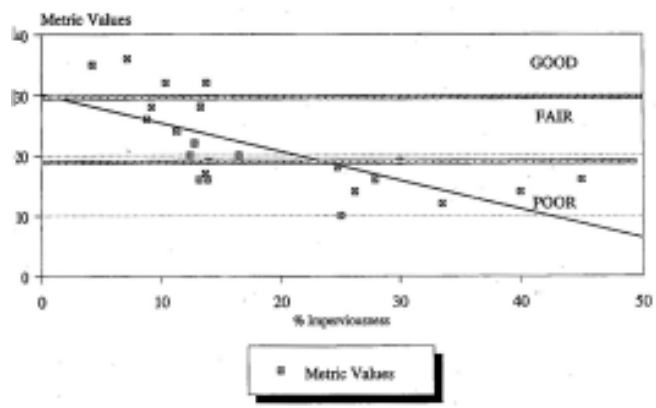

b. CPSS vs. IC in Montgomery County, MD (MNCPPC, 2000)

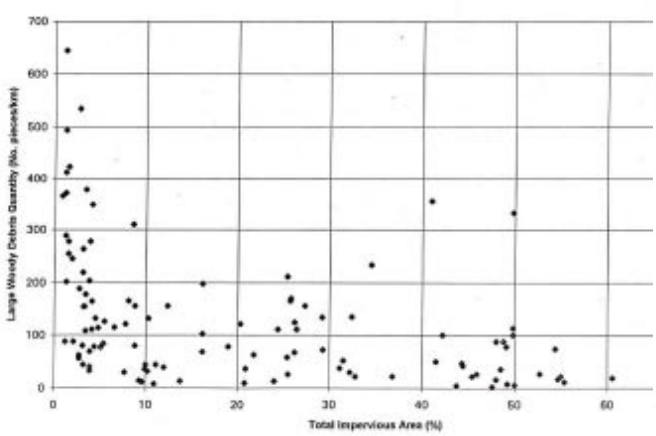

c. Large Woody Debris vs. IC (Booth *et al.*, 1997)

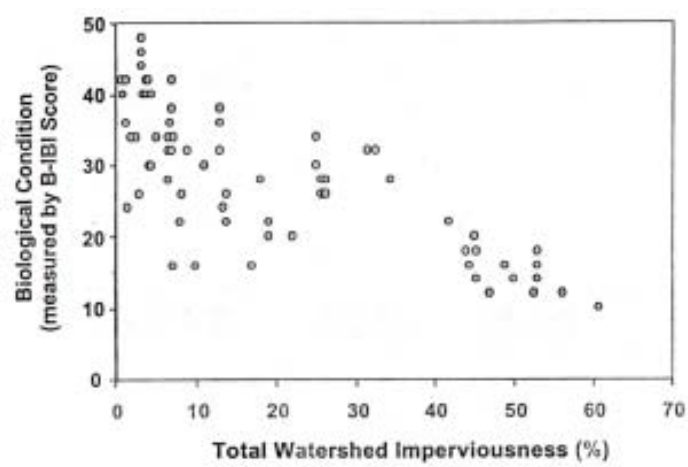

d. Biological Condition vs. Total Watershed IC (Booth, 2000)

Figure 2: Typical Scatter Found in IC/Stream Quality Indicator Research

The first pattern to note is that the greatest scatter in stream quality indicator scores is frequently seen in the range of one to 10% IC. These streams, which are classified as "sensitive" according to the ICM, often exhibit low, moderate or high stream quality indicator scores, as shown in Figure 2. The key interpretation is that sensitive streams have the potential to attain high stream quality indicator scores, but may not always realize this potential.

Quite simply, the influence of IC in the one to 10% range is relatively weak compared to other potential watershed factors, such as percent forest cover, riparian continuity, historical land use, soils, agriculture, acid mine drainage or a host of other stressors. Consequently, watershed managers should never rely on IC alone to classify and manage streams in watersheds with less than 10% IC. Rather, they should evaluate a range of supplemental watershed variables to measure or predict actual stream quality within these lightly developed watersheds.

The second important pattern is that variability in stream quality indicator data is usually dampened when IC exceeds 10%, which presumably reflects the stronger influence of stormwater runoff on stream quality indicators. In particular, the chance that a stream quality indicator will attain a high quality score is sharply diminished at higher IC levels. This trend becomes pronounced within the 10 to 25% IC range and almost inevitable when watershed IC exceeds 25%. Once again, this pattern suggests that IC is a more robust and reliable indicator of overall stream quality beyond the 10% IC threshold.

Other Watershed Variables and the ICM

Several other watershed variables can potentially be included in the ICM. They include forest cover, riparian forest continuity and turf cover.

Forest cover (FC) is clearly the main rival to IC as a useful predictor of stream quality in urban watersheds, at least for humid regions of North America. In some regions, FC is simply the reciprocal of IC. For example, Horner and May (1999) have demonstrated a strong interrelationship between IC and FC for subwatersheds in the Puget Sound region (Figure 3). In other regions, however, "pre-

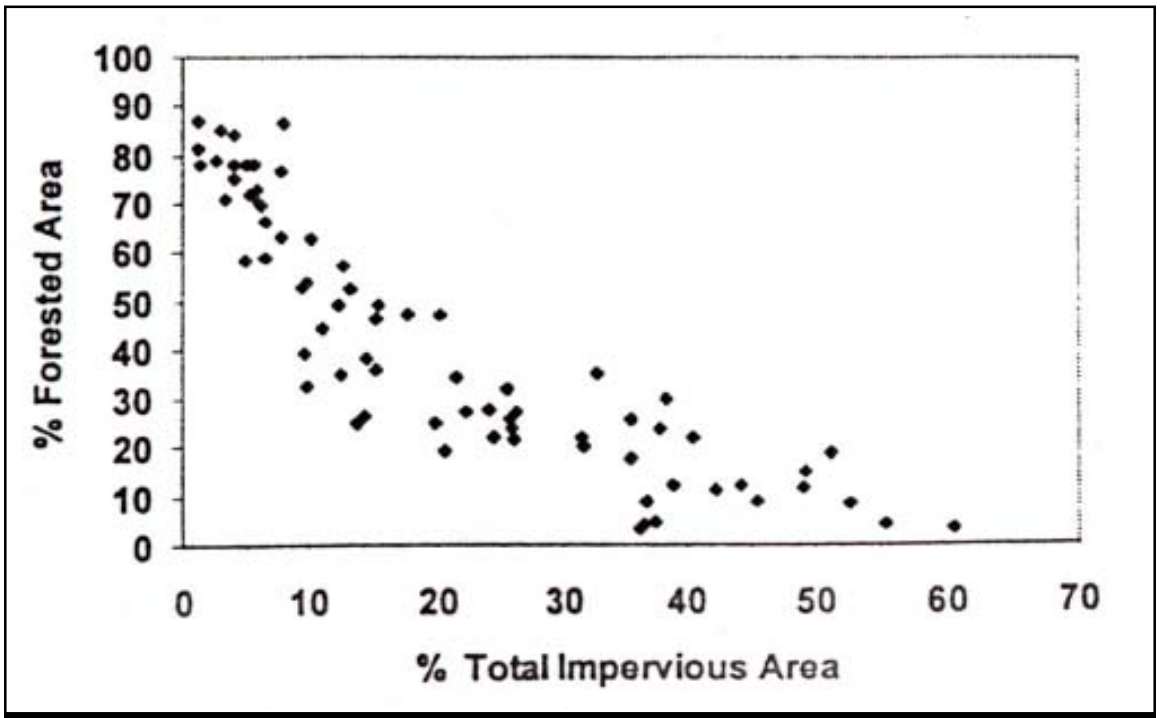

Figure 3: Relationship of IC and FC in Puget Sound Subwatersheds (Horner and May, 1999)

development" land use represents a complex mosaic of crop land, pasture and forest. Therefore, an inverse relationship between FC and IC may not be universal for subwatersheds that have witnessed many cycles of deforestation and cultivation.

It should come as little surprise that the progressive loss of FC has been linked to declining stream quality indicators, given that forested watersheds are often routinely used to define natural reference conditions for streams (Booth, 2000 and Horner *et al.*, 2001). Mature forest is considered to be the main benchmark for defining pre-development hydrology within a subwatershed, as well. Consequently, FC is perhaps the most powerful indicator to predict the quality of streams within the "sensitive" category (zero to 10% IC).

To use an extreme example, one would expect that stream quality indicators would respond quite differently in a subwatershed that had 90% FC compared to one that had 90% crop cover. Indeed, Booth (1991) suggests that stream quality can only be maintained when IC is limited to less than 10% <u>and</u> at least 65% FC is retained within a subwatershed. The key management implication then is that stream health is best managed by simultaneously minimizing the creation of IC and maximizing the preservation of native FC.

FC has also been shown to be useful in predicting the quality of terrestrial variables in a subwatershed. For example, the Mid-Atlantic Integrated Assessment (USEPA, 2000) has documented that watershed FC can reliably predict the diversity of bird, reptile and amphibian communities in the mid-Atlantic region. Moreover, the emerging discipline of landscape ecology provides watershed managers with a strong scientific foundation for deciding where FC should be conserved in a watershed. Conservation plans that protect and connect large forest fragments have been shown to be effective in conserving terrestrial species.

Riparian forest continuity has also shown considerable promise in predicting at least some indicators of stream quality for urban watersheds. Researchers have yet to come up with a standard definition of riparian continuity, but it is usually defined as the proportion of the perennial stream network in a subwatershed that has a fixed width of mature streamside forest. A series of studies indicates that aquatic insect and fish diversity are associated with high levels of riparian continuity (Horner *et al.,* 2001; May *et al.*, 1997; MNCPPC, 2000; Roth *et al.,* 1998). On the other hand, not much evidence has been presented to support the notion that riparian continuity has a strong influence on hydrology or water quality indicators.

One watershed variable that received little attention is the fraction of watershed area maintained in turf cover (TC). Grass often comprises the largest fraction of land area within low-density residential development and could play a significant role in streams that fall within the "impacted" category (10 to 25% IC). Although lawns are pervious, they have sharply different properties than the forests and farmlands they replace (i.e., irrigation, compacted soils, greater runoff, and much higher input of fertilizers and pesticides, etc.). It is interesting to speculate whether the combined area of IC and TC might provide better predictions about stream health than IC area alone, particularly within impacted subwatersheds.

Several other watershed variables might have at least supplemental value in predicting stream quality. They include the presence of extensive wetlands and/or beaverdam complexes in a subwatershed; the dominant form of drainage present in the watershed (tile drains, ditches, swales, curb and gutters, storm drain pipes); the average age of development; and the proximity of sewer lines to the stream. As far as we could discover, none of these variables has been systematically tested in a controlled population of small watersheds. We have observed that these factors could be important in our field investigations and often measure them to provide greater insight into subwatershed behavior.

Lastly, several watershed variables that are closely related to IC have been proposed to predict stream quality. These include popula-

tion, percent urban land, housing density, road density and other indices of watershed development. As might be expected, they generally track the same trend as IC, but each has some significant technical limitations and/or difficulties in actual planning applications (Brown, 2000).

Individual vs. Multiple Indicators

The ICM does not predict the precise score of individual stream quality indicators, but rather predicts the average behavior of a group of indicators over a range of IC. Extreme care should be exercised if the ICM is used to predict the fate of individual indicators and/or species. This is particularly true for sensitive aquatic species, such as trout, salmon, and freshwater mussels. When researchers have examined the relationship between IC and individual species, they have often discovered lower thresholds for harm. For example, Boward *et al.* (1999) found that brook trout were not found in subwatersheds that had more than 4% IC in Maryland, whereas Horner and May (1999) asserted an 8% threshold for sustaining salmon in Puget Sound streams.

The key point is that if watershed managers want to maintain an individual species, they should be very cautious about adopting the 10% IC threshold. The essential habitat requirements for many sensitive or endangered species are probably determined by the *most sensitive* stream quality indicators, rather than the *average behavior* of all stream quality indicators.

Direct Causality vs. Association

A strong relationship between IC and declining stream quality indicators does not always mean that the IC is directly responsible for the decline. In some cases, however, causality can be demonstrated. For example, increased stormwater runoff volumes are directly caused by the percentage of IC in a subwatershed, although other factors such as conveyance, slope and soils may play a role.

In other cases, the link is much more indirect. For these indicators, IC is merely an index of the cumulative amount of watershed development, and more IC simply means that a greater number of known or unknown pollutant sources or stressors are present. In yet other cases, a causal link appears likely but has not yet been scientifically demonstrated. A good example is the more than 50 studies that have explored how fish or aquatic insect diversity changes in response to IC. While the majority of these studies consistently shows a very strong negative association between IC and biodiversity, they do not really establish which stressor or combination of stressors contributes most to the decline. The widely accepted theory is that IC changes stream hydrology, which degrades stream habitat, and in turn leads to reduced stream biodiversity.

Regional Differences

Currently, the ICM has been largely confirmed within the following regions of North America: the mid-Atlantic, the Northeast, the Southeast, the upper Midwest and the Pacific Northwest. Limited testing in Northern California, the lower Midwest and Central Texas generally agrees with the ICM. The ICM has not been tested in Florida, the Rocky Mountain West, and the Southwest. For a number of reasons, it is not certain if the ICM accurately predicts biological indicators in arid and semiarid climates (Maxted, 1999).

Measuring Impervious Cover

Most researchers have relied on total impervious cover as the basic unit to measure IC at the subwatershed level. The case has repeatedly been made that effective impervious cover is probably a superior metric (e.g., only counting IC that is hydraulically connected to the drainage system). Notwithstanding, most researchers have continued to measure total IC because it is generally quicker and does not require extensive (and often subjective) engineering judgement as to whether it is connected or not. Researchers have used a wide variety of techniques to estimate subwatershed IC, including satellite imagery, analysis of aerial photographs, and derivation from GIS land use layers. Table 2 presents some standard land use/IC relationships that were developed for suburban regions of the Chesapeake Bay.

Table 2: Land Use/IC Relationships for Suburban Areas of the Chesapeake Bay
(Cappiella and Brown, 2001)

Land Use Category	Sample Number (N)	Mean IC (SE)	Land Use Category	Sample Number (N)	Mean IC (SE)
Agriculture	8	**1.9** – 0.3	Institutional	30	**34.4** – 3.45
Open Urban Land	11	**8.6** – 1.64	Light	20	**53.4** – 2.8
2 Acre Lot Residential	12	**10.6** – 0.65	Commercia	23	**72.2** – 2.0
1 Acre Lot Residential	23	**14.3** – 0.53	Churches	8	**39.9** – 7.8 1
1/2 Acre Lot Residential	20	**21.2** – 0.78	Schools	13	**30.3** – 4.8
1/4 Acre Lot Residential	23	**27.8** – 0.60	Municipals	9	**35.4** – 6.3
1/8 Acre Lot Residential	10	**32.6** – 1.6	Golf	4	**5.0** – 1.7
Townhome Residential	20	**40.9** – 1.39	Cemeteries	3	**8.3** – 3.5
Multifamily Residential	18	**44.4** – 2.0	Parks	4	**12.5** – 0.7

Three points are worth noting. First, it is fair to say that most researchers have spent more quality control effort on their stream quality indicator measurements than on their subwatershed IC estimates. At the current time, no standard protocol exists to estimate subwatershed IC, although Cappiella and Brown (2001) presented a useful method. At best, the different methods used to measure IC make it difficult to compare results from different studies, and at worst, it can introduce an error term of perhaps +/- 10% from the true value within an individual subwatershed. Second, it is important to keep in mind that IC is not constant over time; indeed, major changes in subwatershed IC have been observed within as few as two years. Consequently, it is sound practice to obtain subwatershed IC estimates from the most recent possible mapping data, to ensure that it coincides with stream quality indicator measurements. Lastly, it is important to keep in mind that most suburban and even rural zoning categories exceed 10% IC (see Table 2). Therefore, from a management standpoint, planners should try to project future IC, in order to determine the future stream classification for individual subwatersheds.

1.1.3 Influence of Watershed Treatment Practices on the ICM

The most hotly debated question about the ICM is whether widespread application of watershed practices such as stream buffers or stormwater management can mitigate the impact of IC, thereby allowing greater development density for a given watershed. At this point in time, there are fewer than 10 studies that directly bear on this critical question. Before these are reviewed, it is instructive to look at the difficult technical and scientific issues involved in detecting the effect of watershed treatment, given its enormous implications for land use control and watershed management.

The first tough issue is how to detect the effect of watershed treatment, given the inherent scatter seen in the IC/stream quality indicator relationship. Figure 4 illustrates the "double scatter" problem, based on three different urban stream research studies in Delaware, Maryland and Washington. A quick inspection of the three plots shows how intrinsically hard it is to distinguish the watershed treatment effect. As can be seen, stream quality indicators in subwatersheds with treatment tend to

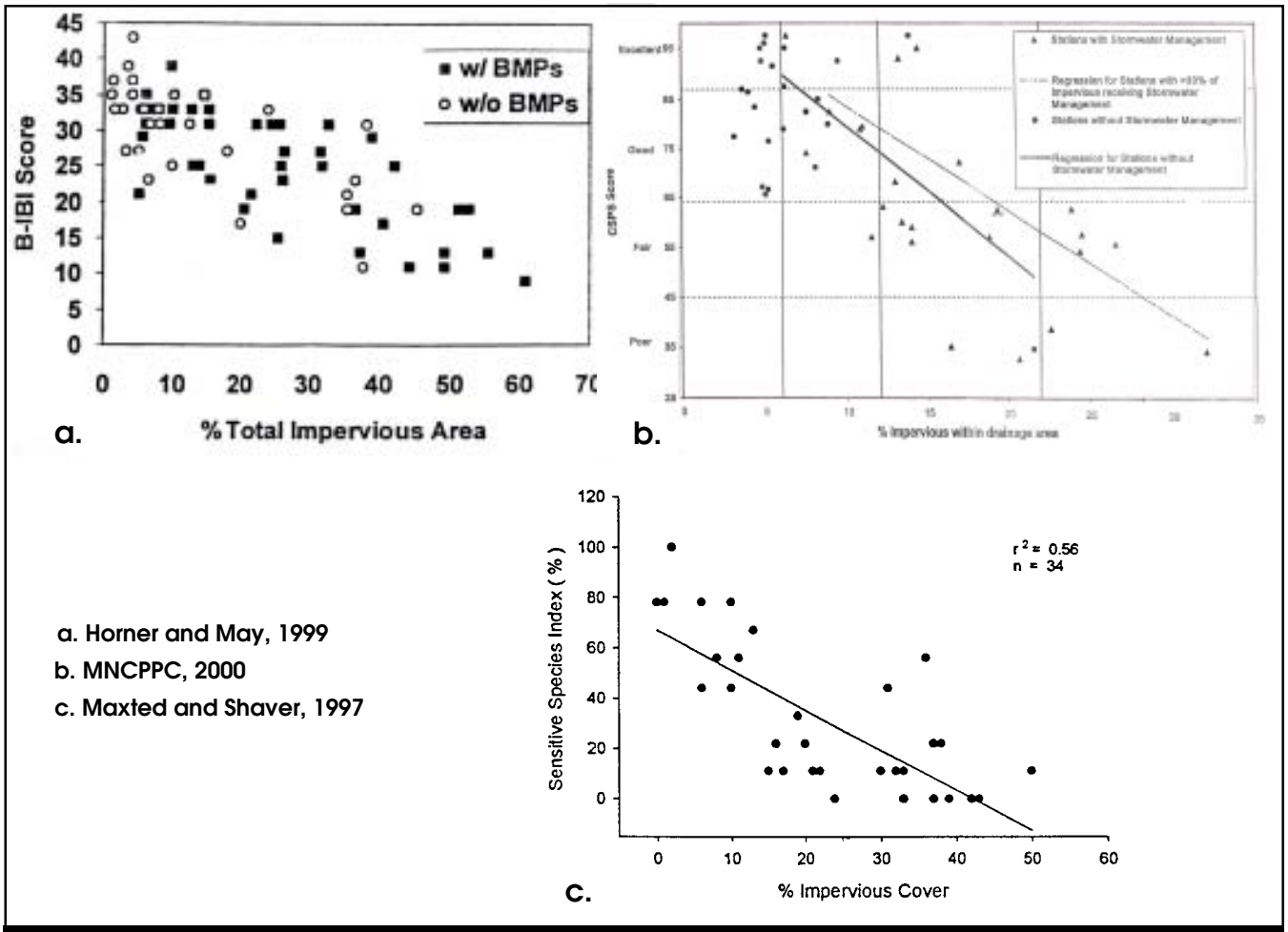

Figure 4: The Double Scatter Problem: Difficulties in Detecting the Effect of Watershed Treatment

overplot those in subwatersheds that lack treatment. While subtle statistical differences may be detected, they are not visibly evident. This suggests that the impact of watershed treatment would need to be extremely dramatic to be detected, given the inherent statistical variability seen in small watersheds (particularly so within the five to 25% IC range where scatter is considerable).

In an ideal world, a watershed study design would look at a controlled population of small urban watersheds that were developed with and without watershed practices to detect the impact of "treatment." In the real world, however, it is impossible to strictly control subwatershed variables. Quite simply, no two subwatersheds are ever alike. Each differs slightly with respect to drainage area, IC, forest cover, riparian continuity, historical land use, and percent watershed treatment. Researchers must also confront other real world issues when designing their watershed treatment experiments.

For example, researchers must carefully choose which indicator or group of indicators will be used to define stream health. IC has a negative influence on 26 stream quality indicators, yet nearly all of the watershed treatment research so far has focused on just a few biological indicators (e.g., aquatic insect or fish diversity) to define stream health. It is conceivable that watershed treatment might have no effect on biological indicators, yet have a positive influence on hydrology, habitat or water quality indicators. At this point, few of these indicators have been systematically

tested in the field. It is extremely doubtful that any watershed practice can simultaneously improve or mitigate all 26 stream quality indicators, so researchers must carefully interpret the outcomes of their watershed treatment experiments.

The second issue involves how to quantify watershed treatment. In reality, watershed treatment collectively refers to dozens of practices that are installed at individual development sites in the many years or even decades it takes to fully "build out" a subwatershed. Several researchers have discovered that watershed practices are seldom installed consistently across an entire subwatershed. In some cases, less than a third of the IC in a subwatershed was actually treated by any practice, because development occurred prior to regulations; recent projects were exempted, waived or grandfathered; or practices were inadequately constructed or maintained (Horner and May, 1999 and MNCPPC, 2000).

Even when good coverage is achieved in a watershed, such as the 65 to 90% reported in studies of stormwater ponds (Jones *et al*., 1996; Maxted, 1999; Maxted and Shaver, 1997), it is still quite difficult to quantify the actual quality of treatment. Often, each subwatershed contains its own unique mix of stormwater practices installed over several decades, designed under diverse design criteria, and utilizing widely different stormwater technologies. Given these inconsistencies, researchers will need to develop standard protocols to define the extent and quality of watershed treatment.

Effect of Stormwater Ponds

With this in mind, the effect of stormwater ponds and stream buffers can be discussed. The effect of larger stormwater ponds in mitigating the impacts of IC in small watersheds has received the most scrutiny to date. This is not surprising, since larger ponds often control a large fraction of their contributing subwatershed area (e.g. 100 to 1,000 acres) and are located on the stream itself, therefore lending themselves to easier monitoring. Three studies have evaluated the impact of large stormwater ponds on downstream aquatic insect communities (Jones *et al.*, 1996; Maxted and Shaver, 1997; Stribling *et al.*, 2001). Each of these studies was conducted in small headwater subwatersheds in the mid-Atlantic Region, and none was able to detect major differences in aquatic insect diversity in streams with or without stormwater ponds.

Four additional studies statistically evaluated the stormwater treatment effect in larger populations of small watersheds with varying degrees of IC (Horner and May, 1999; Horner *et al.,* 2001; Maxted, 1999; MNCPPC, 2000). These studies generally sampled larger watersheds that had many stormwater practices but not necessarily complete watershed coverage. In general, these studies detected a small but positive effect of stormwater treatment relative to aquatic insect diversity. This positive effect was typically seen only in the range of five to 20% IC and was generally undetected beyond about 30% IC. Although each author was hesitant about interpreting his results, all generally agreed that perhaps as much as 5% IC could be added to a subwatershed while maintaining aquatic insect diversity, given effective stormwater treatment. Forest retention and stream buffers were found to be very important, as well. Horner *et al.* (2001) reported a somewhat stronger IC threshold for various species of salmon in Puget Sound streams.

Some might conclude from these initial findings that stormwater ponds have little or no value in maintaining biological diversity in small streams. However, such a conclusion may be premature for several reasons. First, the generation of stormwater ponds that was tested was not explicitly designed to protect stream habitat or to prevent downstream channel erosion, which would presumably promote aquatic diversity. Several states have recently changed their stormwater criteria to require extended detention for the express purpose of preventing downstream channel erosion, and these new criteria may exert a stronger influence on aquatic diversity. Instead, their basic design objective was to maximize pollutant removal, which they did reasonably well.

The second point to stress is that streams with larger stormwater ponds should be considered "regulated streams" (Ward and Stanford, 1979), which have a significantly altered aquatic insect community downstream of the ponds. For example, Galli (1988) has reported that on-stream wet stormwater ponds shift the trophic structure of the aquatic insect community. The insect community above the pond was dominated by shredders, while the insect community below the pond was dominated by scrapers, filterers and collectors. Of particular note, several pollution-sensitive species were eliminated below the pond. Galli reported that changes in stream temperatures, carbon supply and substrate fouling were responsible for the downstream shift in the aquatic insect community. Thus, while it is clear that large stormwater ponds can be expected to have a negative effect on aquatic insect diversity, they could still exert positive influence on other stream quality indicators.

Effect of Stream Buffers

A handful of studies have evaluated biological indicator scores for urban streams that have extensive forest buffers, compared to streams where they were mostly or completely absent (Horner and May, 1999; Horner *et al.,* 2001; May *et al.*, 1997; MNCPPC, 2000; Roth *et al.,* 1998; Steedman, 1988). Biological indicators included various indices of aquatic insect, fish and salmon diversity. Each study sampled a large population of small subwatersheds over a range of IC and derived a quantitative measure to express the continuity, width and forest cover of the riparian buffer network within each subwatershed. Riparian forests were hypothesized to have a positive influence on stream biodiversity, given the direct ways they contribute to stream habitat (e.g., shading, woody debris, leaf litter, bank stability, and organic carbon supply).

All five studies detected a small to moderate positive effect when forested stream buffers were present (frequently defined as at least two-thirds of the stream network with at least 100 feet of stream side forest). The greatest effect was reported by Horner and May (1999) and Horner *et al.* (2001) for salmon streams in the Puget Sound ecoregion. If excellent riparian habitats were preserved, they generally reported that fish diversity could be maintained up to 15% IC, and good aquatic insect diversity could be maintained with as much as 30% IC. Steedman (1988) reported a somewhat smaller effect for Ontario streams. MNCPPC (2000), May *et al.* (1997), and Roth *et al.* (1998) could not find a statistically significant relationship between riparian quality and urban stream quality indicators but did report that most outliers (defined as higher IC subwatersheds with unusually high biological indicator scores) were generally associated with extensive stream side forest.

1.1.4 Recommendations for Further ICM Research

At this point, we recommend three research directions to improve the utility of the ICM for watershed managers. The **first direction** is to expand basic research on the relationship between IC and stream quality indicators that have received little scrutiny. In particular, more work is needed to define the relationship between IC and hydrological and physical indicators such as the following:

- Physical loss or alteration of the stream network
- Stream habitat measures
- Riparian continuity
- Baseflow conditions during dry weather

In addition, more watershed research is needed in ecoregions and physiographic areas where the ICM has not yet been widely tested. Key areas include Florida, arid and semiarid climates, karst areas and mountainous regions. The basic multiple subwatershed monitoring protocol set forth by Schueler (1994a) can be used to investigate IC/stream quality relationships, although it would be wise to measure a wider suite of subwatershed variables beyond IC (e.g., forest cover, turf cover, and riparian continuity).

The **second** research direction is to more clearly define the impact of watershed treatment on stream quality indicators. Based on

the insurmountable problems encountered in controlling variation at the subwatershed level, it may be necessary to abandon the multiple watershed or paired watershed sampling approaches that have been used to date. Instead, longitudinal monitoring studies within individual subwatersheds may be a more powerful tool to detect the effect of watershed treatment. These studies could track changes in stream quality indicators in individual subwatersheds over the entire development cycle: pre-development land use, clearing, construction, build out, and post construction. In most cases, longitudinal studies would take five to 10 years to complete, but they would allow watershed managers to measure and control the inherent variability at the subwatershed level and provide a "before and after" test of watershed treatment. Of course, a large population of test subwatersheds would be needed to satisfactorily answer the watershed treatment question.

The **third** research direction is to monitor more non-supporting streams, in order to provide a stronger technical foundation for crafting more realistic urban stream standards and to see how they respond to various watershed restoration treatments. As a general rule, most researchers have been more interested in the behavior of sensitive and impacted streams. The non-supporting stream category spans a wide range of IC, yet we do not really understand how stream quality indicators behave over the entire 25 to 100% IC range.

For example, it would be helpful to establish the IC level at the upper end of the range where streams are essentially transformed into an artificial conveyance system (i.e., become pipes or artificial channels). It would also be interesting to sample more streams near the lower end of the non-supporting category (25 to 35% IC) to detect whether stream quality indicators respond to past watershed treatment or current watershed restoration efforts. For practical reasons, the multiple subwatershed sampling approach is still recommended to characterize indicators in non-supporting streams. However, researchers will need to screen a large number of non-supporting subwatersheds in order to identify a few subwatersheds that are adequate for subsequent sampling (i.e., to control for area, IC, development age, percent watershed treatment, type of conveyance systems, etc.).

1.2 Impacts of Urbanization on Downstream Receiving Waters

In this section, we review the impacts of urbanization on downstream receiving waters, primarily from the standpoint of impacts caused by poor stormwater quality. We begin by looking at the relationship between IC and stormwater pollutant loadings. Next, we discuss the sensitivity of selected downstream receiving waters to stormwater pollutant loads. Lastly, we examine the effect of watershed treatment in reducing stormwater pollutant loads.

1.2.1 Relationship Between Impervious Cover and Stormwater Quality

Urban stormwater runoff contains a wide range of pollutants that can degrade downstream water quality (Table 3). Several generalizations can be supported by the majority of research conducted to date. First, the unit area pollutant load delivered by stormwater runoff to receiving waters increases in direct proportion to watershed IC. This is not altogether surprising, since pollutant load is the product of the average pollutant concentration and stormwater runoff volume. Given that runoff volume increases in direct proportion to IC, pollutant loads must automatically increase when IC increases, as long the average pollutant concentration stays the same (or increases). This relationship is a central assumption in most simple and complex pollutant loading models (Bicknell *et al.*, 1993; Donigian and Huber, 1991; Haith *et al.*, 1992; Novotny and Chester, 1981; NVPDC, 1987; Pitt and Voorhees, 1989).

The second generalization is that stormwater pollutant concentrations are generally similar

Table 3: Summary of Urban Stormwater Pollutant Loads on Quality of Receiving Waters

Pollutants in Urban Stormwater	WQ Impacts To:					Higher Unit Load?	Load a function of IC?	Other Factors Important in Loading
	R	L	E	A	W			
Suspended Sediment	Y	Y	Y	N	Y	Y (ag)	Y	channel erosion
Total Nitrogen	N	N	Y	Y	N	Y (ag)	Y	septic systems
Total Phosphorus	Y	Y	N	N	Y	Y (ag)	Y	tree canopy
Metals	Y	Y	Y	?	N	Y	Y	vehicles
Hydrocarbons	Y	Y	Y	Y	Y	Y	?	related to VMTs and hotspots
Bacteria/Pathogens	Y	Y	Y	N	Y	Y	Y	many sources
Organic Carbon	N	?	?	?	Y	Y	Y	
MTBE	N	N	N	Y	Y	Y	?	roadway, VMTs
Pesticides	?	?	?	?	Y	Y	?	turf/landscaping
Chloride	?	Y	N	Y	Y	Y	?	road density
Trash/Debris	Y	Y	Y	N	?	Y	Y	curb and gutters

Major Water Quality Impacts Reported for:
R = River, L = Lake, E = Estuary, A = Aquifer, W = Surface Water Supply
Higher Unit Area Load? Yes (compared to all land uses) (ag): with exception of cropland
Load a function of IC? Yes, increases proportionally with IC

at the catchment level, regardless of the mix of IC types monitored (e.g., residential, commercial, industrial or highway runoff). Several hundred studies have examined stormwater pollutant concentrations from small urban catchments and have generally found that the variation within a catchment is as great as the variation between catchments. Runoff concentrations tend to be log-normally distributed, and therefore the long term "average" concentration is best expressed by a median value. It should be kept in mind that researchers have discovered sharp differences in pollutant concentrations for smaller, individual components of IC (e.g., rooftops, parking lots, streets, driveways and the like). Since most urban catchments are composed of many kinds of IC, this mosaic quality tempers the variability in long term pollutant concentrations at the catchment or subwatershed scale.

The third generalization is that median concentrations of pollutants in urban runoff are usually higher than in stormwater runoff from most other non-urban land uses. Consequently, the unit area nonpoint pollutant load generated by urban land normally exceeds that of nearly all watershed land uses that it replaces (forest, pasture, cropland, open space — see Table 3). One important exception is cropland, which often produces high unit area sediment and nutrient loads in many regions of the country. In these watersheds, conversion of intensively managed crops to low density residential development may actually result in a slightly decreased sediment or nutrient load. On the other hand, more intensive land development (30% IC or more) will tend to equal or exceed cropland loadings.

The last generalization is that the effect of IC on stormwater pollutant loadings tends to be weakest for subwatersheds in the one to 10% IC range. Numerous studies have suggested that other watershed and regional factors may have a stronger influence, such as the underlying geology, the amount of carbonate rock in the watershed, physiographic region, local soil types, and most important, the relative fraction of forest and crop cover in the subwatershed (Herlihy *et al*., 1998 and Liu *et al.,* 2000). The limited influence of IC on pollutant loads is generally consistent with the finding for hydrologic, habitat and biological indicators over this narrow range of IC. Once again, watershed managers are advised to track other watershed indicators in the sensitive stream category, such as forest or crop cover.

1.2.2 Water Quality Response to Stormwater Pollution

As noted in the previous section, most ICM research has been done on streams, which are directly influenced by increased stormwater. Many managers have wondered whether the ICM also applies to downstream receiving waters, such as lakes, water supply reservoirs and small estuaries. In general, the exact water quality response of downstream receiving waters to increased nonpoint source pollutant loads depends on many factors, including the specific pollutant, the existing loading generated by the converted land use, and the geometry and hydraulics of the receiving water. Table 3 indicates the sensitivity of rivers, lakes, estuaries, aquifers and water supply reservoirs to various stormwater pollutants.

Lakes and the ICM

The water column and sediments of urban lakes are impacted by many stormwater pollutants, including sediment, nutrients, bacteria, metals, hydrocarbons, chlorides, and trash/debris. Of these pollutants, limnologists have always regarded phosphorus as the primary lake management concern, given that more than 80% of urban lakes experience symptoms of eutrophication (CWP, 2001a).

In general, phosphorus export steadily increases as IC is added to a lake watershed, although the precise amount of IC that triggers eutrophication problems is unique to each urban lake. With a little effort, it is possible to calculate the specific IC threshold for an individual lake, given its internal geometry, the size of its contributing watershed, current in-lake phosphorus concentration, degree of watershed treatment, and the desired water quality goals for the lake (CWP, 2001a). As a general rule, most lakes are extremely sensitive

to increases in phosphorus loads caused by watershed IC. Exceptions include lakes that are unusually deep and/or have very small drainage area/lake area ratios. In most lakes, however, even a small amount of watershed development will result in an upward shift in trophic status (CWP, 2001a).

Reservoirs and the ICM

While surface water supply reservoirs respond to stormwater pollutant loads in the same general manner as lakes, they are subject to stricter standards because of their uses for drinking water. In particular, water supply reservoirs are particularly sensitive to increased turbidity, pathogens, total organic carbon, chlorides, metals, pesticides and hydrocarbon loads, in addition to phosphorus (Kitchell, 2001). While some pollutants can be removed or reduced through expanded filtering and treatment at drinking water intakes, the most reliable approach is to protect the source waters through watershed protection and treatment.

Consequently, we often recommend that the ICM be used as a "threat index" for most drinking water supplies. Quite simply, if current or future development is expected to exceed 10% IC in the contributing watershed, we recommend that a very aggressive watershed protection strategy be implemented (Kitchell, 2001). In addition, we contend that drinking water quality cannot be sustained once watershed IC exceeds 25% and have yet to find an actual watershed where a drinking water utility has been maintained under these conditions.

Small Tidal Estuaries and Coves and the ICM

The aquatic resources of small tidal estuaries, creeks, and coves are often highly impacted by watershed development and associated activities, such as boating/marinas, wastewater discharge, septic systems, alterations in freshwater flow and wetland degradation and loss. Given the unique impacts of eutrophication on the marine system and stringent water quality standards for shellfish harvesting, the stormwater pollutants of greatest concern in the estuarine water column are nitrogen and fecal coliform bacteria. Metals and hydrocarbons in stormwater runoff can also contaminate bottom sediments, which can prove toxic to local biota (Fortner *et al*., 1996; Fulton *et al.*, 1996; Kucklick *et al.*, 1997; Lerberg *et al.*, 2000; Sanger *et al.,* 1999; Vernberg *et al.*, 1992).

While numerous studies have demonstrated that physical, hydrologic, water quality and biological indicators differ in urban and non-urban coastal watersheds, only a handful of studies have used watershed IC as an indicator of estuarine health. These studies show significant correlations with IC, although degradation thresholds may not necessarily adhere to the ICM due to tidal dilution and dispersion. Given the limited research, it is not fully clear if the ICM can be applied to coastal systems without modification.

Atmospheric deposition is considered a primary source of nitrogen loading to estuarine watersheds. Consequently, nitrogen loads in urban stormwater are often directly linked to IC. Total nitrogen loads have also been linked to groundwater input, especially from subsurface discharges from septic systems, which are common in low density coastal development (Swann, 2001; Valiela *et al.*, 1997; Vernberg *et al.*, 1996a). Nitrogen is generally considered to be the limiting nutrient in estuarine systems, and increased loading has been shown to increase algal and phytoplankton biomass and cause shifts in the phytoplankton community and food web structure that may increase the potential for phytoplankton blooms and fish kills (Bowen and Valiela, 2001; Evgenidou *et al.*, 1997; Livingston, 1996).

Increased nitrogen loads have been linked to declining seagrass communities, finfish populations, zooplankton reproduction, invertebrate species richness, and shellfish populations (Bowen and Valiela, 2001; Rutkowski *et al*., 1999; Short and Wyllie-Echeverria, 1996; Valiela and Costa, 1988). Multiple studies have shown significant increases in nitrogen loading as watershed land use becomes more urban (Valiela *et al.,* 1997; Vernberg *et al.* 1996a; Wahl *et al.,* 1997). While a few studies

link nitrogen loads with building and population density, no study was found that used IC as an indicator of estuarine nitrogen loading.

The second key water quality concern in small estuaries is high fecal coliform levels in stormwater runoff, which can lead to the closure of shellfish beds and swimming beaches. Waterfowl and other wildlife have also been shown to contribute to fecal coliform loading (Wieskel *et al.*, 1996). Recent research has shown that fecal coliform standards are routinely violated during storm events at very low levels of IC in coastal watersheds (Mallin *et al.,* 2001; Vernberg *et al.*, 1996b; Schueler, 1999). Maiolo and Tschetter (1981) found a significant correlation between human population and closed shellfish acreage in North Carolina, and Duda and Cromartie (1982) found greater fecal coliform densities when septic tank density and IC increased, with an approximate threshold at 10% watershed IC.

Recently, Mallin *et al.* (2000) studied five small North Carolina estuaries of different land uses and showed that fecal coliform levels were significantly correlated with watershed population, developed land and IC. Percent IC was the most statistically significant indicator and could explain 95% of the variability in fecal coliform concentrations. They also found that shellfish bed closures were possible in watersheds with less than 10% IC, common in watersheds above 10% IC, and almost certain in watersheds above 20% IC. While higher fecal coliform levels were observed in developed watersheds, salinity, flushing and proximity to pollution sources often resulted in higher concentrations at upstream locations and at high tides (Mallin *et al.*, 1999). While these studies support the ICM, more research is needed to prove the reliability of the ICM in predicting shellfish bed closures based on IC.

Several studies have also investigated the impacts of urbanization on estuarine fish, macrobenthos and shellfish communities. Increased PAH accumulation in oysters, negative effects of growth in juvenile sheepshead minnows, reduced molting efficiency in copepods, and reduced numbers of grass shrimp have all been reported for urban estuaries as compared to forested estuaries (Fulton *et al.,* 1996). Holland *et al. (*1997) reported that the greatest abundance of penaid shrimp and mummichogs was observed in tidal creeks with forested watersheds compared to those with urban cover. Porter *et al.* (1997) found lower grass shrimp abundance in small tidal creeks adjacent to commercial and urban development, as compared to non-urban watersheds.

Lerberg *et al.* (2000) studied small tidal creeks and found that highly urban watersheds (50% IC) had the lowest benthic diversity and abundance as compared to suburban and forested creeks, and benthic communities were numerically dominated by tolerant oligochaetes and polychaetes. Suburban watersheds (15 to 35% IC) also showed signs of degradation and had some pollution tolerant macrobenthos, though not as markedly as urban creeks. Percent abundance of pollution-indicative species showed a marked decline at 30% IC, and the abundance of pollution-sensitive species also significantly correlated with IC (Lerberg *et al*., 2000). Holland *et al*. (1997) reported that the variety and food availability for juvenile fish species was impacted at 15 to 20% IC.

Lastly, a limited amount of research has focused on the direct impact of stormwater runoff on salinity and hypoxia in small tidal creeks. Blood and Smith (1996) compared urban and forested watersheds and found higher salinities in urban watersheds due to the increased number of impoundments. Fluctuations in salinity have been shown to affect shellfish and other aquatic populations (see Vernberg, 1996b). When urban and forested watersheds were compared, Lerberg *et al.* (2000) reported that higher salinity fluctuations occurred most often in developed watersheds; significant correlations with salinity range and IC were also determined. Lerberg *et al.* (2000) also found that the most severe and frequent hypoxia occurred in impacted salt marsh creeks and that dissolved oxygen dynamics in tidal creeks were comparable to dead-end canals common in residential marina-style

coastal developments. Suburban watersheds (15 to 35% IC) exhibited signs of degradation and had some pollution-tolerant macrobenthic species, though not to the extent of urban watersheds (50% IC).

In summary, recent research suggests that indicators of coastal watershed health are linked to IC. However, more research is needed to clarify the relationship between IC and estuarine indicators in small tidal estuaries and high salinity creeks.

1.2.3 Effect of Watershed Treatment on Stormwater Quality

Over the past two decades, many communities have invested in watershed protection practices, such as stormwater treatment practices (STPs), stream buffers, and better site design, in order to reduce pollutant loads to receiving waters. In this section, we review the effect of watershed treatment on the quality of stormwater runoff.

Effect of Stormwater Treatment Practices
We cannot directly answer the question as to whether or not stormwater treatment practices can significantly reduce water quality impacts at the watershed level, simply because no controlled monitoring studies have yet been conducted at this scale. Instead, we must rely on more indirect research that has tracked the change in mass or concentration of pollutants as they travel through individual stormwater treatment practices. Thankfully, we have an abundance of these performance studies, with nearly 140 monitoring studies evaluating a diverse range of STPs, including ponds, wetlands, filters, and swales (Winer, 2000).

These studies have generally shown that stormwater practices have at least a moderate ability to remove many pollutants in urban stormwater. Table 4 provides average removal efficiency rates for a range of practices and stormwater pollutants, and Table 5 profiles the mean storm outflow concentrations for various practices. As can be seen, some groups of practices perform better than others in removing certain stormwater pollutants. Consequently, managers need to carefully choose which practices to apply to solve the primary water quality problems within their watersheds.

It is also important to keep in mind that site-based removal rates cannot be extrapolated to the watershed level without significant adjustment. Individual site practices are never implemented perfectly or consistently across a watershed. At least three discount factors need to be considered: bypassed load, treatability and loss of performance over time. For a review on how these discounts are derived, consult Schueler and Caraco (2001). Even under the most optimistic watershed implementation scenarios, overall pollutant reduc-

Table 4: The Effectiveness of Stormwater Treatment Practices in Removing Pollutants - Percent Removal Rate (Winer, 2000)

Practice	N	TSS	TP	OP	TN	NOx	Cu	Zn	Oil/ Grease[1]	Bacteria
Dry Ponds	9	47	19	N/R	25	3.5	26	26	3	44
Wet Ponds	43	80	51	65	33	43	57	66	78	70
Wetlands	36	76	49	48	30	67	40	44	85	78
Filtering Practices[2]	18	86	59	57	38	-14	49	88	84	37
Water Quality Swales	9	81	34	1.0	84	31	51	71	62	-25
Ditches[3]	9	31	-16	N/R	-9.0	24	14	0	N/R	0
Infiltration	6	95	80	85	51	82	N/R	N/R	N/R	N/R

1: Represents data for Oil and Grease and PAH
2: Excludes vertical sand filters
3: Refers to open channel practices not designed for water quality
N/R = Not Reported

Table 5: Median Effluent Concentrations from Stormwater Treatment Practices (mg/l) (Winer, 2000)

Practice	N	TSS	TP	OP	TN	NOx	Cu[1]	Zn[1]
Dry Ponds[2]	3	28	0.18	N/R	0.86	N/R	9.0	98
Wet Ponds	25	17	0.11	0.03	1.3	0.26	5.0	30
Wetlands	19	22	0.20	0.07	1.7	0.36	7.0	31
Filtering Practices[3]	8	11	0.10	0.07	1.1	0.55	9.7	21
Water Quality Swales	7	14	0.19	0.09	1.1	0.35	10	53
Ditches[4]	3	29	0.31	N/R	2.4	0.72	18	32

1. Units for Zn and Cu are micrograms per liter (Fg/l)
2. Data available for Dry Extended Detention Ponds only
3. Excludes vertical sand filters
4. Refers to open channel practices not designed for water quality
N/R = Not Reported

tions by STPs may need to be discounted by at least 30% to account for partial watershed treatment.

Even with discounting, however, it is evident that STPs can achieve enough pollutant reduction to mimic rural background loads for many pollutants, as long as the watershed IC does not exceed 30 to 35%. This capability is illustrated in Figure 5, which shows phosphorus load as a function of IC, with and without stormwater treatment.

Effect of Stream Buffers/Riparian Areas
Forested stream buffers are thought to have very limited capability to remove stormwater pollutants, although virtually no systematic monitoring data exists to test this hypothesis. The major reason cited for their limited removal capacity is that stormwater generated from upland IC has usually concentrated before it reaches the forest buffer and therefore crosses the buffer in a channel, ditch or storm drain pipe. Consequently, the opportunity to filter runoff is lost in many forest buffers in urban watersheds.

Effect of Better Site Design
Better site design (BSD) is a term for nonstructural practices that minimize IC, conserve natural areas and distribute stormwater treatment across individual development sites. BSD is also known by many other names, including conservation development, low-impact development, green infrastructure, and sustainable urban drainage systems. While

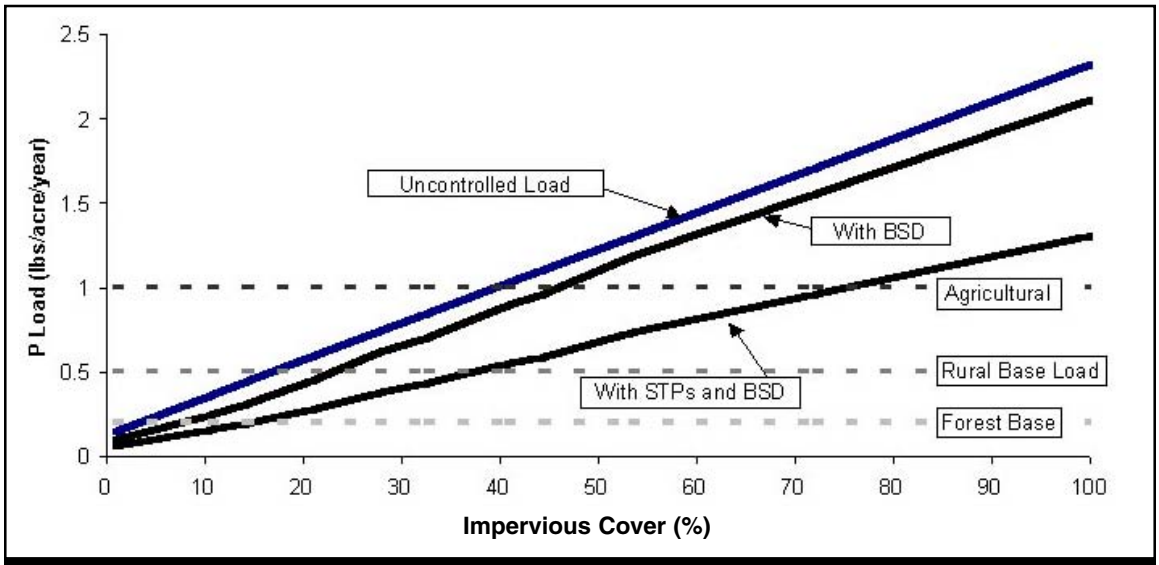

Figure 5: Estimated Phosphorus Load as a Function of Impervious Cover, Discounted Stormwater Treatment and Better Site Design (Schueler and Caraco, 2001)

some maintain that BSD is an alternative to traditional STPs, most consider it to be an important complement to reduce pollutant loads.

While BSD has become popular in recent years, only one controlled research study has evaluated its potential performance, and this is not yet complete (i.e. Jordan Cove, CT).

Indirect estimates of the potential value of BSD to reduce pollutant discharges have been inferred from modeling and redesign analyses (Zielinski, 2000). A typical example is provided in Figure 5, which shows the presumed impact of BSD in reducing phosphorus loadings. As is apparent, BSD appears to be a very effective strategy in the one to 25% IC range, but its benefits diminish beyond that point.

1.3 Implications of the ICM for Watershed Managers

One of the major policy implications of the ICM is that in the absence of watershed treatment, it predicts negative stream impacts at an extremely low intensity of watershed development. To put this in perspective, consider that a watershed zoned for two-acre lot residential development will generally exceed 10% IC, and therefore shift from a sensitive to an impacted stream classification (Cappiella and Brown, 2001). Thus, if a community wants to protect an important water resource or a highly regarded species (such as trout, salmon or an endangered freshwater mussel), the ICM suggests that there is a maximum limit to growth that is not only quite low, but is usually well below the current zoning for many suburban or even rural watersheds. Consequently, the ICM suggests the unpleasant prospect that massive down-zoning, with all of the associated political and legal carnage involving property rights and economic development, may be required to maintain stream quality.

It is not surprising, then, that the ICM debate has quickly shifted to the issue of whether or not watershed treatment practices can provide adequate mitigation for IC. How much relief can be expected from stream buffers, stormwater ponds, and other watershed practices, which might allow greater development density within a given watershed? Only a limited amount of research has addressed this question, and the early results are not reassuring (reviewed in section 1.1.3). At this early stage, researchers are still having trouble detecting the impact of watershed treatment, much less defining it. As noted earlier, both watershed research techniques and practice implementation need to be greatly improved if we ever expect to get a scientifically defensible answer to this crucial question. Until then, managers should be extremely cautious in setting high expectations for how much watershed treatment can mitigate IC.

1.3.1 Management of Non-Supporting Streams

Most researchers acknowledge that streams with more than 25% IC in their watersheds cannot support their designated uses or attain water quality standards and are severely degraded from a physical and biological standpoint. As a consequence, many of these streams are listed for non-attainment under the Clean Water Act and are subject to Total Maximum Daily Load (TMDL) regulations. Communities that have streams within this regulatory class must prepare implementation plans that demonstrate that water quality standards can ultimately be met.

While some communities have started to restore or rehabilitate these streams in recent years, their efforts have yielded only modest improvements in water quality and biological indicators. In particular, no community has yet demonstrated that they can achieve water quality standards in an urban watershed that exceeds 25% IC. Many communities are deeply concerned that non-supporting streams may never achieve water quality standards, despite massive investments in watershed restoration. The ICM suggests that water quality standards may need to be sharply revised for streams with more than 25% IC, if they are ever to come into attainment. While states have authority to create more achievable standards for non-supporting streams within the regulatory framework of the Clean Water Act (Swietlik, 2001), no state has yet exercised this authority. At this time, we are not aware of any water quality standards that are based on the ICM or similar urban stream classification techniques.

Two political perceptions largely explain why states are so reticent about revising water quality standards. The first is a concern that they will run afoul of anti-degradation provisions within the Clean Water Act or be accused of “backsliding” by the environmental community. The second concern relates to the demographics of watershed organizations across the country. According to recent surveys, slightly more than half of all watershed organizations

represent moderately to highly developed watersheds (CWP, 2001a). These urban watershed organizations often have a keen interest in keeping the existing regulatory structure intact, since it is perceived to be the only lever to motivate municipalities to implement restoration efforts in non-supporting streams.

However, revised water quality standards are urgently needed to support smart growth efforts. A key premise of smart growth is that it is more desirable to locate new development within a non-supporting subwatershed rather than a sensitive or impacted one (i.e., concentrating density and IC within an existing subwatershed helps prevent sprawl from encroaching on a less developed one). Yet while smart growth is desirable on a regional basis, it will usually contribute to already serious problems in non-supporting watersheds, which makes it even more difficult to meet water quality standards.

This creates a tough choice for regulators: if they adopt stringent development criteria for non-supporting watersheds, their added costs can quickly become a powerful barrier to desired redevelopment. If, on the other hand, they relax or waive environmental criteria, they contribute to the further degradation of the watershed. To address this problem, the Center has developed a "smart watersheds" program to ensure that any localized degradation caused by development within a non-supporting subwatershed is more than compensated for by improvements in stream quality achieved through municipal restoration efforts (CWP, in press). Specifically, the smart watersheds program includes 17 public sector programs to treat stormwater runoff, restore urban stream corridors and reduce pollution discharges in highly urban watersheds. It is hoped that communities that adopt and implement smart watershed programs will be given greater flexibility to meet state and federal water quality regulations and standards within non-supporting watersheds.

1.3.2 Use of the ICM for Urban Stream Classification

The ICM has proven to be a useful tool for classifying and managing the large inventory of streams that most communities possess. It is not unusual for a typical county to have several thousand miles of headwater streams within its political boundaries, and the ICM provides a unified framework to identify and manage these subwatersheds. In our watershed practice, we use the ICM to make an initial diagnosis rather than a final determination for stream classification. Where possible, we conduct rapid stream and subwatershed assessments as a final check for an individual stream classification, particularly if it borders between the sensitive and impacted category. As noted earlier, the statistical variation in the IC/stream quality indicator makes it difficult to distinguish between a stream with 9% versus 11% IC. Some of the key criteria we use to make a final stream classification are provided in Table 6.

1.3.3 Role of the ICM in Small Watershed Planning

The ICM has also proven to be an extremely important tool for watershed planning, since it can rapidly project how streams will change in response to future land use. We routinely estimate existing and future IC in our watershed planning practice and find that it is an excellent indicator of change for subwatersheds in the zero to 30% IC range. In particular, the ICM often forces watershed planners to directly confront land use planning and land conservation issues early in the planning process.

On the other hand, we often find that the ICM has limited planning value when subwatersheds exceed 30% IC for two practical reasons. First, the ICM does not differentiate stream conditions within this very large span of IC (i.e., there is no difference in the stream quality prediction for a subwatershed that has 39.6% IC versus one that has 58.4% IC). Second, the key management question for non-supporting watersheds is whether or not

they are potentially restorable. More detailed analysis and field investigations are needed to determine, in each subwatershed, the answer to this question. While a knowledge of IC is often used in these feasibility assessments, it is but one of many factors that needs to be considered.

Lastly, we have come to recognize several practical factors when applying the ICM for small watershed planning. These include thoughtful delineation of subwatershed boundaries, the proper accounting of a direct drainage area in larger watersheds, and the critical need for the most recent IC data. More guidance on these factors can be found in Zielinski (2001).

Impervious cover is not a perfect indicator of existing stream quality. A number of stream and subwatershed criteria should be evaluated in the field before a final classification decision is made, particularly when the stream is on the borderline between two classifications. We routinely look at the stream and subwatershed criteria to decide whether a borderline stream should be classified as sensitive or impacted. Table 6 reviews these additional criteria.

Table 6: Additional Considerations for Urban Stream Classification
Stream Criteria
Reported presence of rare, threatened or endangered species in the aquatic community (e.g., freshwater mussels, fish, crayfish or amphibians) Confirmed spawning of cold-water fish species (e.g., trout) Fair/good, good, or good to excellent macro invertebrate scores More than 65% of EPT species present in macro-invertebrate surveys No barriers impede movement of fish between the subwatershed and downstream receiving waters Stream channels show little evidence of ditching, enclosure, tile drainage or channelization Water quality monitoring indicates no standards violations during dry weather Stream and flood plain remain connected and regularly interact Stream drains to a downstream surface water supply Stream channels are generally stable, as determined by the Rosgen level analysis Stream habitat scores are rated at least fair to good
Subwatershed Criteria
Contains terrestrial species that are documented as rare, threatened and endangered Wetlands, flood plains and/or beaver complexes make up more than 10% of subwatershed area Inventoried conservation areas comprise more than 10% of subwatershed area More than 50% of the riparian forest corridor has forest cover and is either publicly owned or regulated Large contiguous forest tracts remain in the subwatershed (more than 40% in forest cover) Significant fraction of subwatershed is in public ownership and management Subwatershed connected to the watershed through a wide corridor Farming, ranching and livestock operations in the subwatershed utilize best management practices Prior development in the subwatershed has utilized stormwater treatment practices

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1.4 Summary

The remainder of this report presents greater detail on the individual research studies that bear on the ICM. Chapter 2 profiles research on hydrologic indicators in urban streams, while Chapter 3 summarizes the status of current research on the impact of urbanization on physical habitat indicators. Chapter 4 presents a comprehensive review of the impact of urbanization on ten major stormwater pollutants. Finally, Chapter 5 reviews the growing body of research on the link between IC and biological indicators within urban streams and wetlands.

Chapter 2: Hydrologic Impacts of Impervious Cover

The natural hydrology of streams is fundamentally changed by increased watershed development. This chapter reviews the impacts of watershed development on selected indicators of stream hydrology.

This chapter is organized as follows:

2.1 Introduction
2.2 Increased Runoff Volume
2.3 Increased Peak Discharge Rates
2.4 Increased Bankfull Flow
2.5 Decreased Baseflow
2.6 Conclusions

2.1 Introduction

Fundamental changes in urban stream hydrology occur as a result of three changes in the urban landscape that accompany land development. First, large areas of the watershed are paved, rendering them impervious. Second, soils are compacted during construction, which significantly reduces their infiltration capabilities. Lastly, urban stormwater drainage systems are installed that increase the efficiency with which runoff is delivered to the stream (i.e., curbs and gutters, and storm drain pipes). Consequently, a greater fraction of annual rainfall is converted to surface runoff, runoff occurs more quickly, and peak flows become larger. Additionally, dry weather flow in streams may actually decrease because less groundwater recharge is available. Figure 6 illustrates the change in hydrology due to increased urban runoff as compared to pre-development conditions.

Research has demonstrated that the effect of watershed urbanization on peak discharge is more marked for smaller storm events. In particular, the bankfull, or channel forming flow, is increased in magnitude, frequency and duration. Increased bankfull flows have strong ramifications for sediment transport and channel enlargement. All of these changes in the natural water balance have impacts on the physical structure of streams, and ultimately affect water quality and biological diversity.

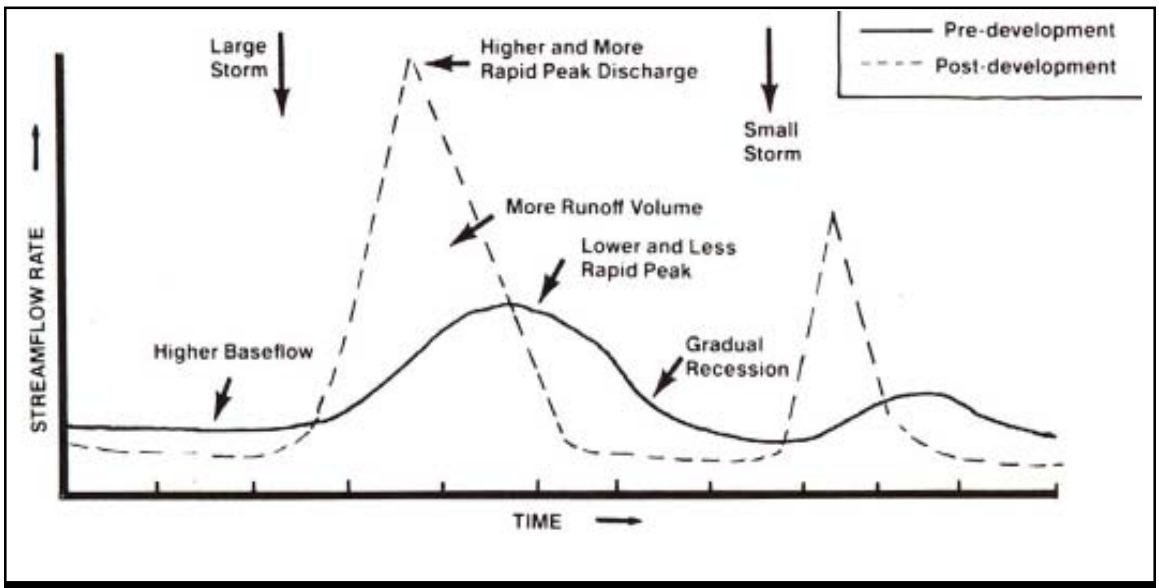

Figure 6: Altered Hydrograph in Response to Urbanization (Schueler, 1987)

The relationship between watershed IC and stream hydrology is widely accepted, and has been incorporated into many hydrologic engineering models over the past three decades. Several articles provide a good summary of these (Bicknell *et al.*, 1993; Hirsch *et al.*, 1990; HEC, 1977; Huber and Dickinson, 1988; McCuen and Moglen, 1988; Overton and Meadows, 1976; Pitt and Voorhees, 1989; Schueler, 1987; USDA, 1992; 1986).

The primary impacts of watershed development on stream hydrology are as follows:

- Increased runoff volume
- Increased peak discharge rates
- Increased magnitude, frequency, and duration of bankfull flows
- Diminished baseflow

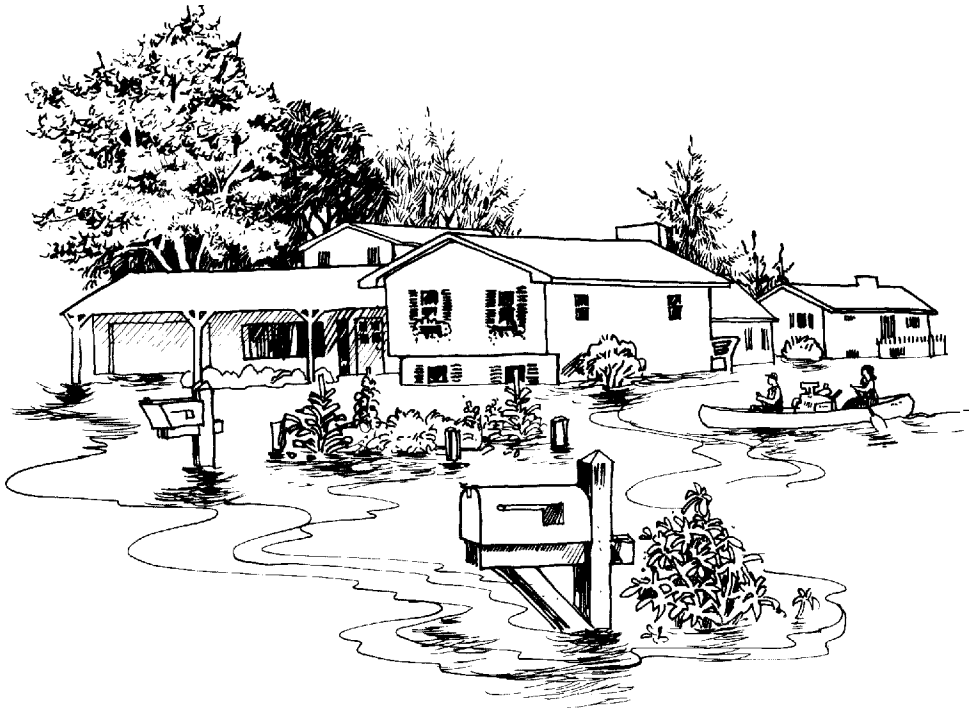

2.2 Increased Runoff Volume

Impervious cover and other urban land use alterations, such as soil compaction and storm drain construction, alter infiltration rates and increase runoff velocities and the efficiency with which water is delivered to streams. This decrease in infiltration and basin lag time can significantly increase runoff volumes. Table 7 reviews research on the impact of IC on runoff volume in urban streams. Schueler (1987) demonstrated that runoff values are directly related to subwatershed IC (Figure 7). Runoff data was derived from 44 small catchment areas across the country for EPA's Nationwide Urban Runoff Program.

Table 8 illustrates the difference in runoff volume between a meadow and a parking lot, as compiled from engineering models. The parking lot produces more than 15 times more runoff than a meadow for the same storm event.

Urban soils are also profoundly modified during the construction process. The compaction of urban soils and the removal of topsoil can decrease the infiltration capacity, causing increases in runoff volumes (Schueler, 2000). Bulk density is often used to measure soil compaction, and Table 9 illustrates how bulk density increases in many urban land uses.

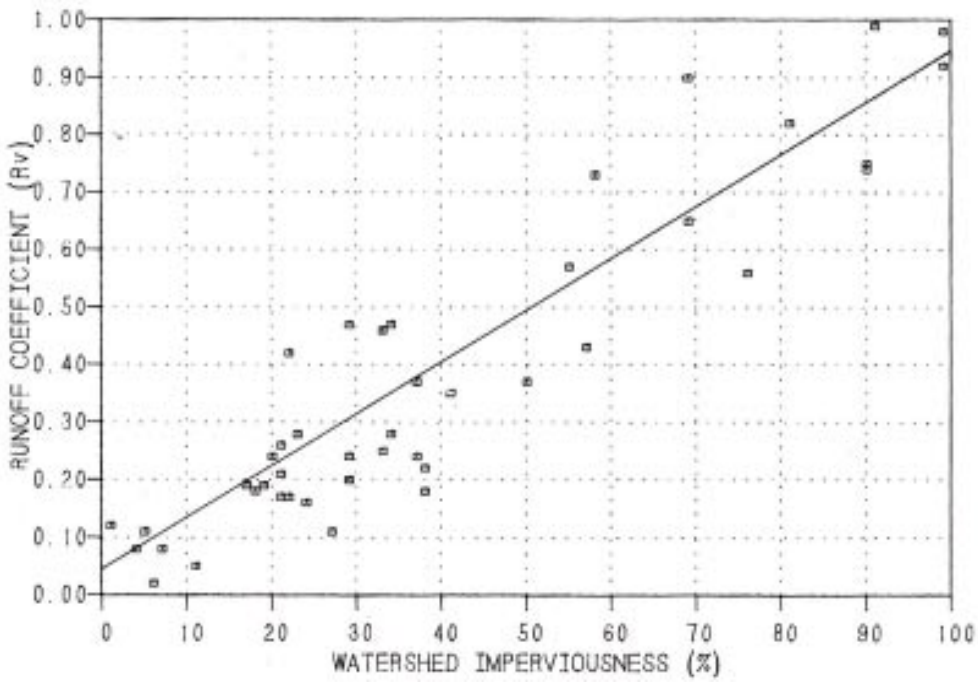

Note: 44 small urban catchments monitored during the national NURP study

Figure 7: Runoff Coefficient vs. IC (Schueler, 1987)

Table 7: Research Review of Increased Runoff Volume and Peak Discharge in Urban Streams		
Reference	**Key Finding**	**Location**
Increased Runoff Volume		
Schueler, 1987	Runoff coefficients were found to be strongly correlated with IC at 44 sites nationwide.	U.S.
Neller, 1988	Urban watershed produced more than seven times as much runoff as a similar rural watershed. Average time to produce runoff was reduced by 63% in urban watersheds compared to rural watersheds.	Australia
Increased Peak Discharge		
Hollis, 1975	Review of data from several studies showed that floods with a return period of a year or longer are not affected by a 5% watershed IC; small floods may be increased 10 times by urbanization; flood with a return period of 100 years may be doubled in size by a 30% watershed IC.	N/A
Leopold, 1968	Data from seven nationwide studies showed that 20% IC can cause the mean annual flood to double.	U.S.
Neller, 1988	Average peak discharge from urban watersheds was 3.5 times higher than peak runoff from rural watersheds.	Australia
Doll *et al.*, 2000	Peak discharge was greater for 18 urban streams versus 11 rural Piedmont streams.	NC
Sauer *et al.*, 1983	Estimates of flood discharge for various recurrence intervals showed that less than 50% watershed IC can result in a doubling of the 2-year, 10-year, and 100-year floods.	U.S.
Leopold, 1994	Watershed development over a 29-year period caused the peak discharge of the 10-year storm to more than double.	MD
Kibler *et al.*, 1981	Rainfall/runoff model for two watersheds showed that an increase in IC caused a significant increase in mean annual flood.	PA
Konrad and Booth, 2002	Evaluated streamflow data at 11 streams and found that the fraction of annual mean discharges was exceeded and maximum annual instantaneous discharges were related to watershed development and road density for moderately and highly developed watersheds.	WA

Table 8: Hydrologic Differences Between a Parking Lot and a Meadow (Schueler, 1994a)		
Hydrologic or Water Quality Parameter	**Parking Lot**	**Meadow**
Runoff Coefficient	0.95	0.06
Time of Concentration (minutes)	4.8	14.4
Peak Discharge, two-year, 24-hour storm (cfs)	4.3	0.4
Peak Discharge Rate, 100-year storm (cfs)	12.6	3.1
Runoff Volume from one-inch storm (cu. ft)	3,450	218
Runoff Velocity @ two-year storm (ft/sec)	8	1.8

Key Assumptions:

2-yr, 24-hr storm = 3.1 in; 100-yr storm = 8.9 in.

Parking Lot: 100% imperviousness; 3% slope; 200ft flow length; hydraulic radius =.03; concrete channel; suburban Washington C values

Meadow: 1% impervious; 3% slope; 200 ft flow length; good vegetative condition; B soils; earthen channel

Source: Schueler, 1994a

Table 9: Comparison of Bulk Density for Undisturbed Soils and Common Urban Conditions (Schueler, 2000)			
Undisturbed Soil Type or Urban Condition	**Surface Bulk Density (grams/cubic centimeter)**	**Urban Condition**	**Surface Bulk Density (grams/cubic centimeter)**
Peat	0.2 to 0.3	Urban Lawns	1.5 to 1.9
Compost	1.0	Crushed Rock Parking Lot	1.5 to 1.9
Sandy Soils	1.1 to 1.3	Urban Fill Soils	1.8 to 2.0
Silty Sands	1.4	Athletic Fields	1.8 to 2.0
Silt	1.3 to 1.4	Rights-of-Way and Building Pads (85%)	1.5 to 1.8
Silt Loams	1.2 to 1.5	Rights-of-Way and Building Pads (95%)	1.6 to 2.1
Organic Silts/Clays	1.0 to 1.2	Concrete Pavement	2.2
Glacial Till	1.6 to 2.0	Rock	2.65

2.3 Increased Peak Discharge Rate

Watershed development has a strong influence on the magnitude and frequency of flooding in urban streams. Peak discharge rates are often used to define flooding risk. Doll *et al.* (2000) compared 18 urban streams with 11 rural streams in the North Carolina Piedmont and found that unit area peak discharge was always greater in urban streams (Figure 8). Data from Seneca Creek, Maryland also suggest a similar increase in peak discharge. The watershed experienced significant growth during the 1950s and 1960s. Comparison of pre- and post-development gage records suggests that the peak 10-year flow event more than doubled over that time (Leopold, 1994).

Hollis (1975) reviewed numerous studies on the effects of urbanization on floods of different recurrence intervals and found that the effect of urbanization diminishes when flood recurrence gets longer (i.e., 50 and 100 years). Figure 9 shows the effect on flood magnitude in urban watersheds with 30% IC, and shows the one-year peak discharge rate increasing by a factor of 10, compared to an undeveloped watershed. In contrast, floods with a 100-year recurrence interval only double in size under the same watershed conditions.

Sauer *et al.* (1983) evaluated the magnitude of flooding in urban watersheds throughout the United States. An equation was developed for estimating discharge for floods of two-year, 10-year, and 100-year recurrence intervals. The equations used IC to account for increased runoff volume and a basin development factor to account for sewers, curbs and gutters, channel improvements and drainage development. Sauer noted that IC is not the dominant factor in determining peak discharge rates for extreme floods because these storm events saturate the soils of undeveloped watersheds and produce high peak discharge rates. Sauer found that watersheds with 50% IC can increase peak discharge for the two-year flood by a factor of four, the 10-year flood by a factor of three, and the 100-year flood by a factor of 2.5, depending on the basin development factor (Figure 10).

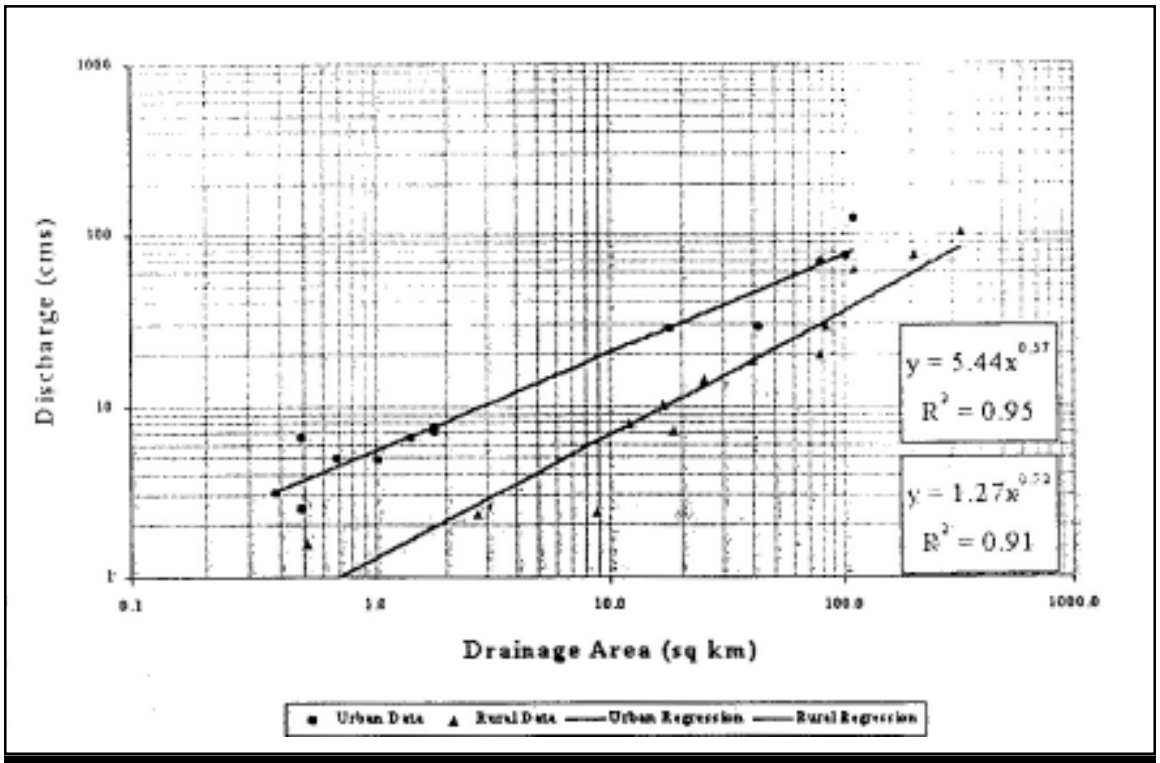

Figure 8: Peak Discharge for Urban and Rural Streams in North Carolina (Doll *et al.*, 2000)

2.4 Increased Bankfull Flow

Urbanization also increases the frequency and duration of peak discharge associated with smaller flood events (i.e., one- to two-year return storms). In terms of stream channel morphology, these more frequent bankfull flows are actually much more important than large flood events in forming the channel. In fact, Hollis (1975) demonstrated that urbanization increased the frequency and magnitude of bankfull flow events to a greater degree than the larger flood events.

An example of the increase in bankfull flow in arid regions is presented by the U.S. Geological Survey (1996), which compared the peak discharge rate from two-year storm events before and after watersheds urbanized in Parris Valley, California. Over an approximately 20-year period, watershed IC increased by 13.5%, which caused the two-year peak flow to more than double. Table 10 reviews other research studies on the relationship between watershed IC and bankfull flows in urban streams.

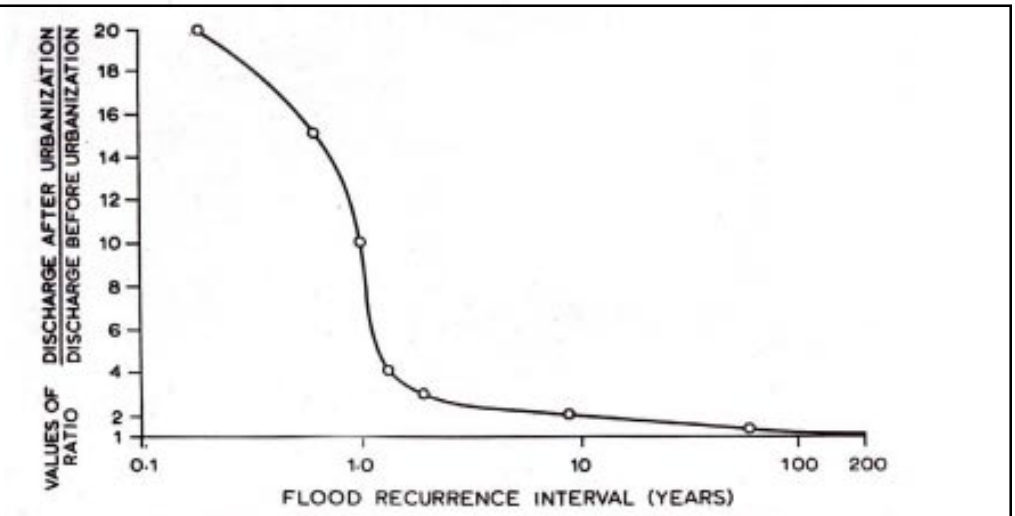

Fig. 3. Effect on flood magnitudes of paving 20% of a basin (based on Figure 2).

Figure 9: Effect on Flood Magnitudes of 30% Basin IC (Hollis, 1975)

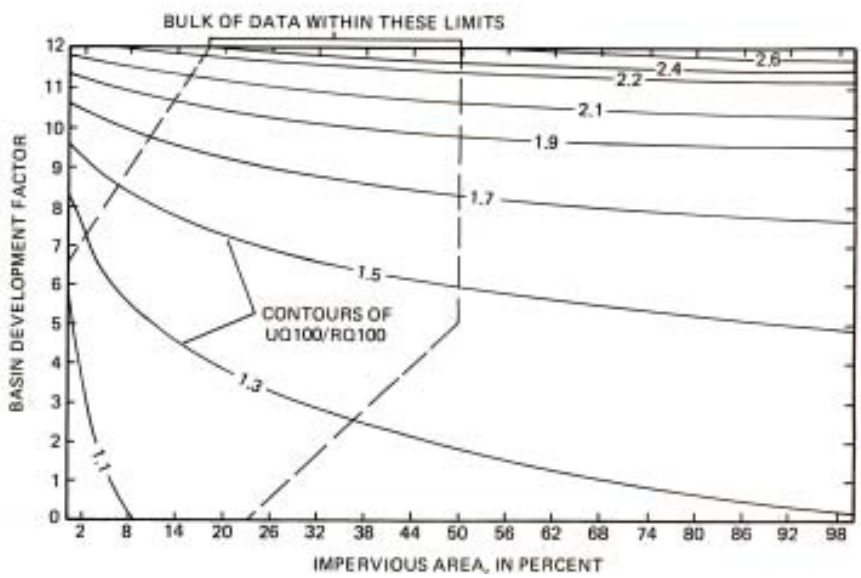

Figure 10: Relationship of Urban/Rural 100-Year Peak Flow Ratio to Basin Development Factor and IC (Sauer *et al.*, 1983)

Table 10: Research Review of Increased Bankfull Discharge in Urban Streams		
Reference	**Key Finding**	**Location**
Booth and Reinelt, 1993	Using a simulation model and hydrologic data from four watersheds, it was estimated that more than 10% watershed IC may cause discharge from the two-year storm under current conditions to equal or exceed discharge from the 10-year storm under forested conditions.	WA
Fongers and Fulcher, 2001	Bankfull flow of 1200 cfs was exceeded more frequently over time with urbanization, and exceedence was three times as frequent from 1930s to 1990s.	MI
USGS, 1996	Over a 20-year period, IC increased 13.5%, and the two-year peak flow more than doubled in a semi-arid watershed.	CA
Henshaw and Booth, 2000	Two of three watersheds in the Puget Sound lowlands showed increasing flashiness over 50 years with urbanization.	WA
Leopold, 1968	Using hydrologic data from a nine-year period for North Branch Brandywine Creek, it was estimated that for a 50% IC watershed, bankfull frequency would be increased fourfold.	PA
Leopold, 1994	Bankfull frequency increased two to seven times after urbanization in Watts Branch.	MD
MacRae, 1996	For a site downstream of a stormwater pond in Markham, Ontario hours of exceedence of bankfull flows increased by 4.2 times after the watershed urbanized (34% IC)	Ontario

Leopold (1968) evaluated data from seven nationwide studies and extrapolated this data to illustrate the increase in bankfull flows due to urbanization. Figure 11 summarizes the relationship between bankfull flows over a range of watershed IC. For example, watersheds that have 20% IC increase the number of flows equal to or greater than bankfull flow by a factor of two. Leopold (1994) also observed a dramatic increase in the frequency of the bankfull event in Watts Branch, an urban subwatershed in Rockville, Maryland. This watershed experienced significant urban development during the 1950s and 1960s. Leopold compared gage records and found that the bankfull storm event frequency increased from two to seven times per year from 1958 to 1987.

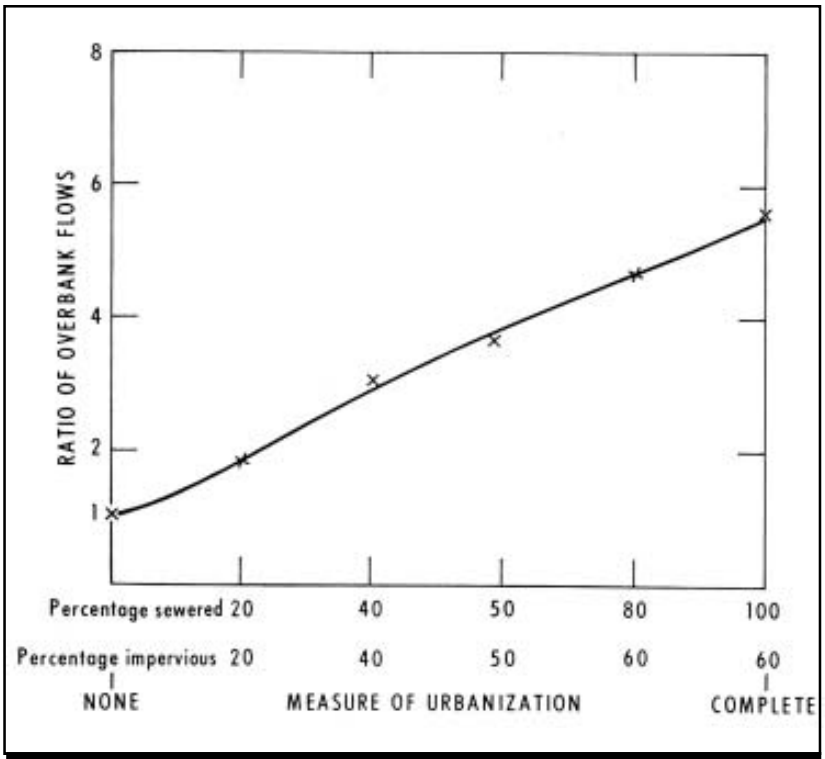

Figure 11: Increase in Bankfull Flows Due to Urbanization (Leopold, 1968)

More recent data on bankfull flow frequency was reported for the Rouge River near Detroit, Michigan by Fongers and Fulcher (2001). They noted that channel-forming flow (1200 cfs) was exceeded more frequently as urbanization increased in the watershed and had become three times more frequent between 1930 and 1990 (Figure 12).

McCuen and Moglen (1988) have documented the increase in duration of bankfull flows in response to urbanization using hydrology models. MacRae (1996), monitored a stream in Markham, Ontario downstream of a stormwater pond and found that the hours of

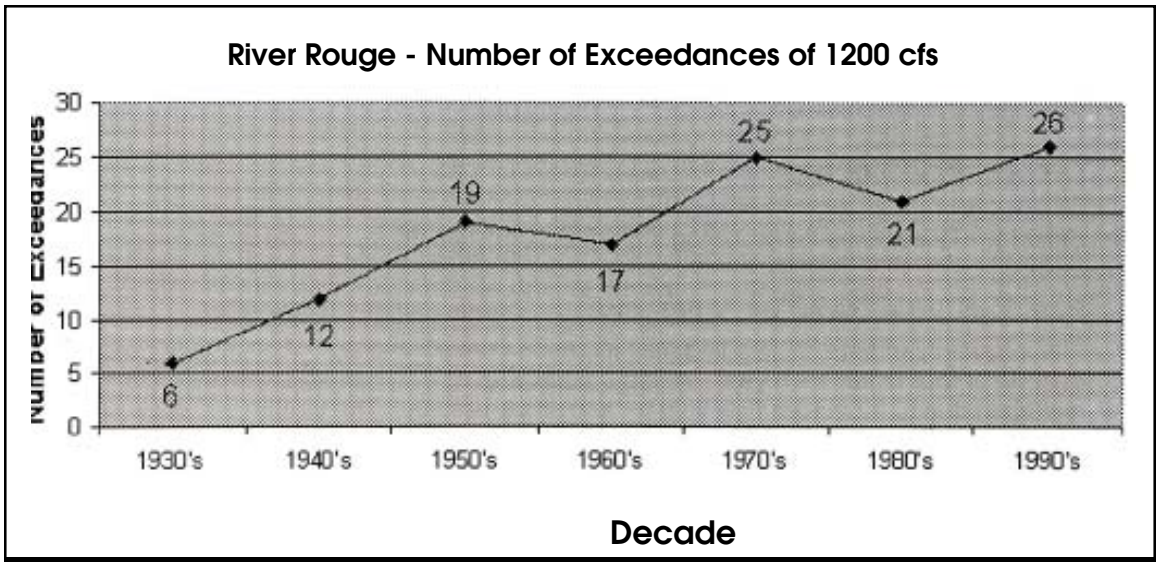

Figure 12: Increase in Number of Exceedences of Bankfull Flow Over Time With Urbanization in the Rouge River, MT (Fongers and Fulcher, 2001)

exceedence of bankfull flows increased by a factor of 4.2 once watershed IC exceeded 30%. Modeling for seven streams also downstream of stormwater ponds in Surrey, British Columbia also indicated an increase in bankfull flooding in response to watershed development (MacRae, 1996).

Watershed IC also increases the "flashiness" of stream hydrographs. Flashiness is defined here as the percent of daily flows each year that exceeds the mean annual flow. Henshaw and Booth (2000) evaluated seven urbanized watersheds in the Puget Sound lowland streams and tracked changes in flashiness over 50 years (Figure 13). The most urbanized watersheds experienced flashy discharges. Henshaw and Booth concluded that increased runoff in urban watersheds leads to higher but shorter-duration peak discharges.

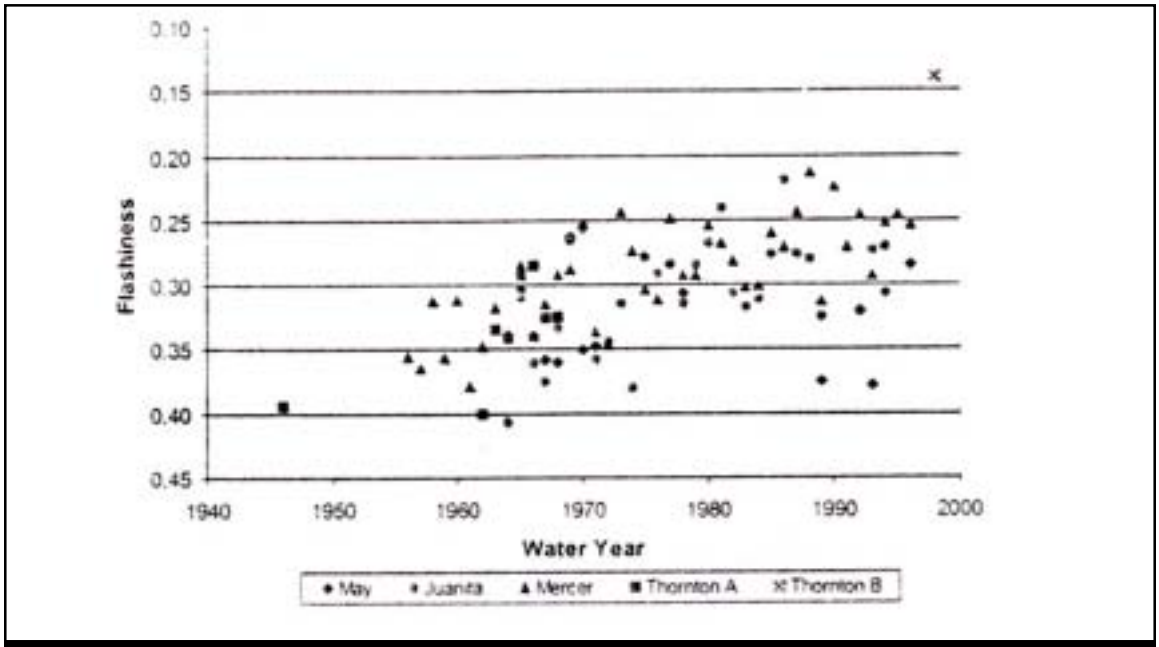

Figure 13: Percent of Gage Reading Above Mean Annual Flow for Puget Sound Lowland Streams (Henshaw and Booth, 2000)

2.5 Decreased Baseflow

As IC increases in a watershed, less groundwater infiltration is expected, which can potentially decrease stream flow during dry periods, (i.e. baseflow). Several East Coast studies provide support for a decrease in baseflow as a result of watershed development. Table 11 reviews eight research studies on baseflow in urban streams.

Klein (1979) measured baseflow in 27 small watersheds in the Maryland Piedmont and reported an inverse relationship between IC and baseflow (Figure 14). Spinello and Simmons (1992) demonstrated that baseflow in two urban Long Island streams declined seasonally as a result of urbanization (Figure 15). Saravanapavan (2002) also found that percentage of baseflow decreased in direct proportion to percent IC for 13 subwatersheds of the Shawsheen River watershed in Massachusetts (Figure 16).

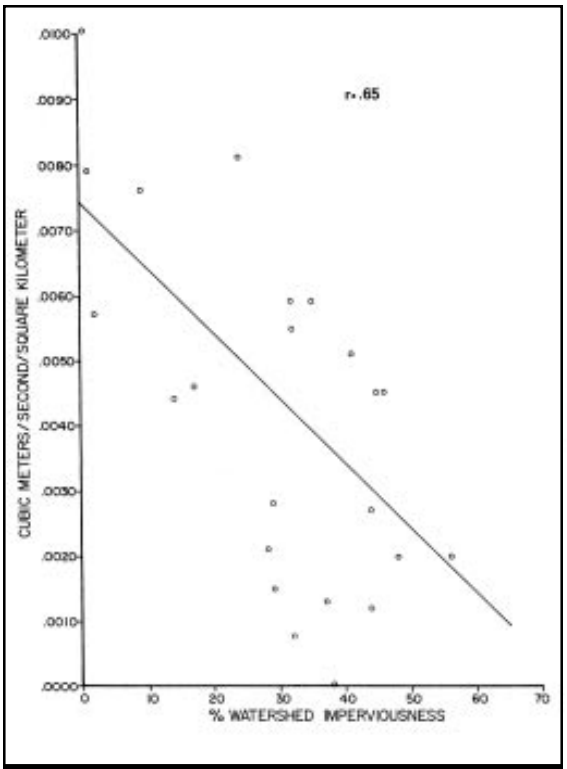

Figure 14: Relationship Between Baseflow and Watershed IC in the Streams on Maryland Piedmont (Klein, 1979)

Table 11: Research Review of Decreased Baseflow in Urban Streams

Reference	Key Finding	Location
Finkenbine *et al.*, 2000	Summer base flow was uniformly low in 11 streams when IC reached 40% or greater.	Vancouver
Klein, 1979	Baseflow decreased as IC increased in Piedmont streams.	MD
Saravanapavan, 2002	Percentage of baseflow decreased linearly as IC increased for 13 subwatersheds of Shawsheen River watershed.	MA
Simmons and Reynolds, 1982	Dry weather flow dropped 20 to 85% after development in several urban watersheds on Long Island.	NY
Spinello and Simmons, 1992	Baseflow in two Long Island streams went dry as a result of urbanization.	NY
Konrad and Booth, 2002	No discernable trend over many decades in the annual seven day low flow discharge for 11 Washington streams.	WA
Wang *et al.*, 2001	Stream baseflow was negatively correlated with watershed IC in 47 small streams, with an apparent breakpoint at 8 to 12% IC.	WI
Evett *et al.*, 1994	No clear relationship between dry weather flow and urban and rural streams in 21 larger watersheds.	NC

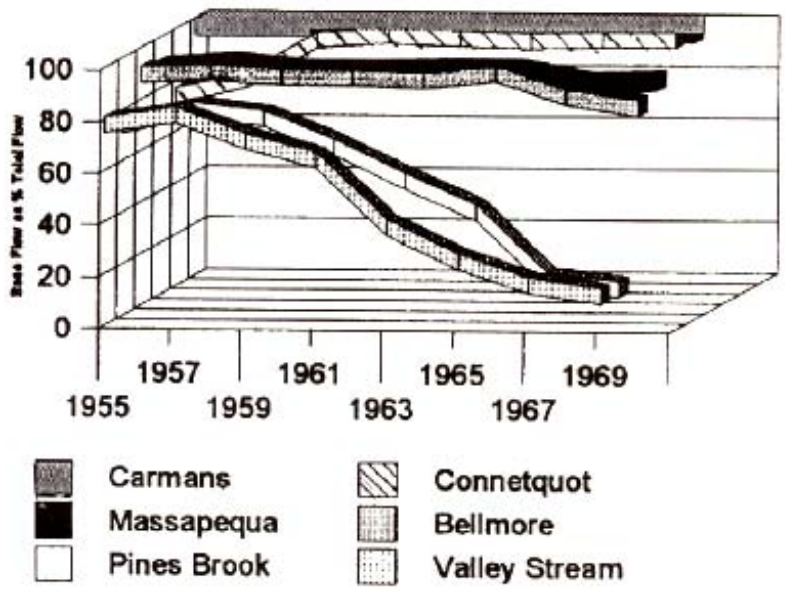

Notes:

Carmans and Connetquot: Rural/suburban, watersheds are unsewered

Bellmore and Massapequa: Moderately urbanized, not sewered until 1989

Valley Stream and Pine Brook: Urbanized and densely populated watersheds, sewer systems completed in 1960s

1953-1964: Period of sanitary sewer construction in eastern Nassau County

1962-1966: Drought years

Figure 15: Baseflow Response to Urbanization in Long Island Streams (Spinello and Simmons, 1992)

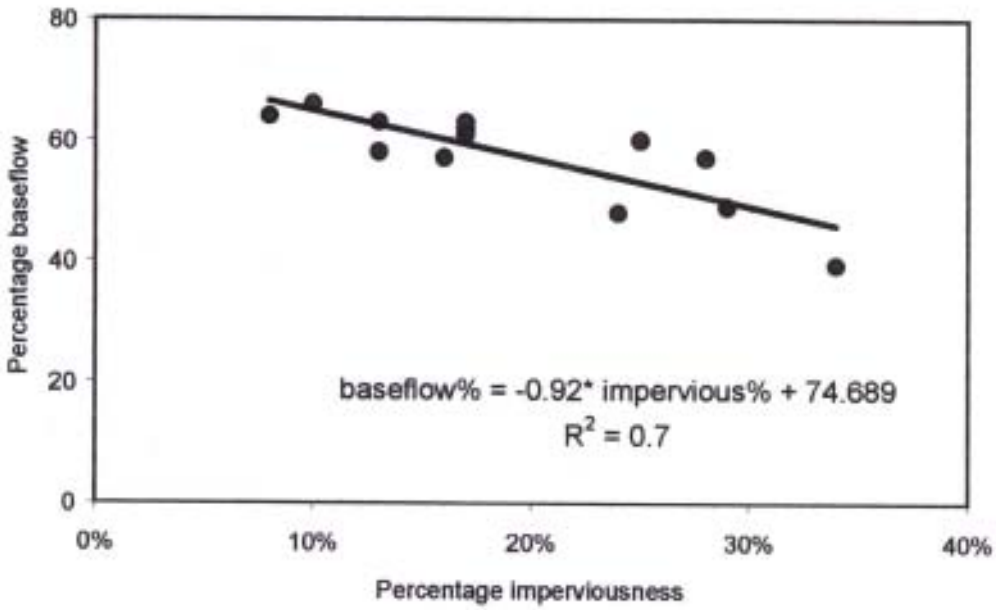

Figure 16: Relationship Between Percentage Baseflow and Percent IC in Massachusetts Streams (Saravanapan, 2002)

Finkebine *et al.* (2000) monitored summer baseflow in 11 streams near Vancouver, British Columbia and found that stream base flow was uniformly low due to decreased groundwater recharge in watersheds with more than 40% IC (Figure 17). Baseflow velocity also consistently decreased when IC increased (Figure 18). The study cautioned that other factors can affect stream baseflow, such as watershed geology and age of development.

Other studies, however, have not been able to establish a relationship between IC and declining baseflow. For example, a study in North Carolina could not conclusively determine that urbanization reduced baseflow in larger urban and suburban watersheds in that area (Evett *et al.*, 1994). In some cases, stream baseflow is supported by deeper aquifers or originate in areas outside the surface watershed boundary. In others, baseflow is augmented by leaking sewers, water pipes and irrigation return flows.

This appears to be particularly true in arid and semi-arid areas, where baseflow can actually increase in response to greater IC (Hollis, 1975). For instance, Crippen and Waananen (1969) found that Sharon Creek near San Francisco changed from an ephemeral stream into a perennial stream after urban development. Increased infiltration from lawn watering and return flow from sewage treatment plants are two common sources of augmented baseflows in these regions (Caraco, 2000a).

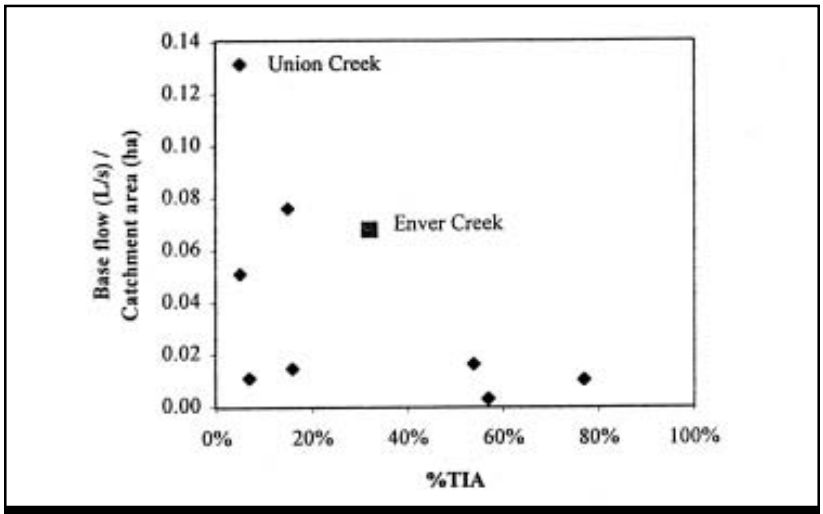

Figure 17: Effect of IC on Summer Baseflow in Vancouver Streams (Finkerbine *et al.*, 2000)

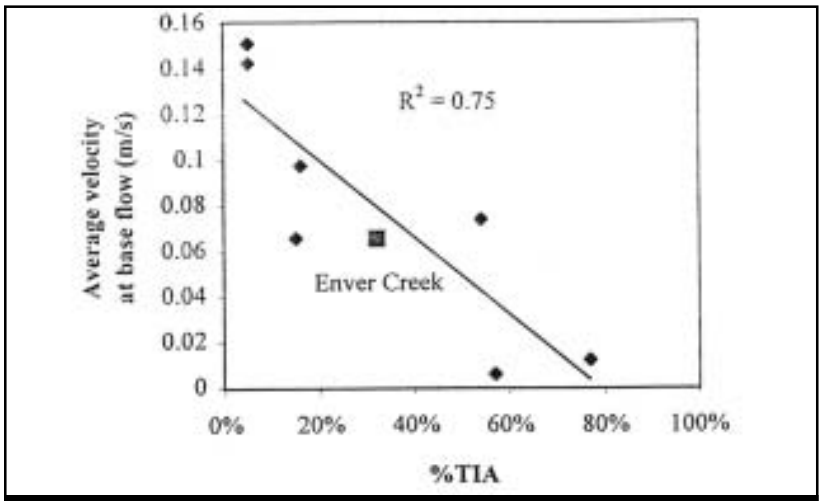

Figure 18: Effect of Watershed IC on Summer Stream Velocity in Vancouver Streams (Finkerbine *et al.*, 2000)

2.6 Conclusions

The changes in hydrology indicators caused by watershed urbanization include increased runoff volume; increased peak discharge; increased magnitude, frequency and duration of bankfull flows; flashier/less predictable flows; and decreased baseflow. Many studies support the direct relationship between IC and these indicators. However, at low levels of watershed IC, site-specific factors such as slope, soils, types of conveyance systems, age of development, and watershed dimensions often play a stronger role in determining a watershed's hydrologic response.

Overall, the following conclusions can be drawn from the relationship between watershed IC and hydrology indicators:

- Strong evidence exists for the direct relationship between watershed IC and increased stormwater runoff volume and peak discharge. These relationships are considered so strong that they have been incorporated into widely accepted engineering models.
- The relationship between IC and bankfull flow frequency has not been extensively documented, although abundant data exists for differences between urban and non-urban watersheds.
- The relationship between IC and declining stream flow is more ambiguous and appears to vary regionally in response to climate and geologic factors, as well as water and sewer infrastructure.

The changes in hydrology indicators caused by watershed urbanization directly influence physical and habitat characteristics of streams. The next chapter reviews how urban streams physically respond to the major changes to their hydrology.

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Chapter 3: Physical Impacts of Impervious Cover

A growing body of scientific literature documents the physical changes that occur in streams undergoing watershed urbanization. This chapter discusses the impact of watershed development on various measures of physical habitat in urban stream channels and is organized as follows:

3.1 Difficulty in Measuring Habitat
3.2 Changes in Channel Geometry
3.3 Effect on Composite Indexes of Stream Habitat
3.4 Effect on Individual Elements of Stream Habitat
3.5 Increased Stream Warming
3.6 Alteration of Stream Channel Network
3.7 Conclusion

This chapter reviews the available evidence on stream habitat. We begin by looking at geomorphological research that has examined how the geometry of streams changes in response to altered urban hydrology. The typical response is an enlargement of the cross-sectional area of the stream channel through a process of channel incision, widening, or a combination of both. This process triggers an increase in bank and/or bed erosion that increases sediment transport from the stream, possibly for several decades or more.

Next, we examine the handful of studies that have evaluated the relationship between watershed development and composite indicators of stream habitat (such as the habitat Rapid Bioassessment Protocol, or RBP). In the fourth section, we examine the dozen studies that have evaluated how individual habitat elements respond to watershed development. These studies show a consistent picture. Generally, streams with low levels of IC have stable banks, contain considerable large woody debris (LWD) and possess complex habitat structure. As watershed IC increases, however, urban streambanks become increasingly unstable, streams lose LWD, and they develop a more simple and uniform habitat structure. This is typified by reduced pool depths, loss of pool and riffle sequences, reduced channel roughness and less channel sinuosity.

Water temperature is often regarded as a key habitat element, and the fifth section describes the stream warming effect observed in urban streams in six studies. The last section looks at the effect of watershed development on the stream channel network as a whole, in regard to headwater stream loss and the creation of fish barriers.

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3.1 Difficulty in Measuring Habitat

The physical transformation of urban streams is perhaps the most conspicuous impact of watershed development. These dramatic physical changes are easily documented in sequences of stream photos with progressively greater watershed IC (see Figure 19). Indeed, the network of headwater stream channels generally disappears when watershed IC exceeds 60% (CWP).

3.1.1 The Habitat Problem

It is interesting to note that while the physical impacts of urbanization on streams are widely accepted, they have rarely been documented by the research community. As a consequence, no predictive models exist to quantify how physical indicators of stream habitat will decline in response to watershed IC, despite the fact that most would agree that some kind of decline is expected (see Table 12).

Figure 19: Urban Stream Channels with Progressively Greater IC

The main reason for this gap is that "habitat" is extremely hard to define, and even more difficult to measure in the field. Most indices of physical habitat involve a visual and qualitative assessment of 10 or more individual habitat elements that are perceived by fishery and stream biologists to contribute to quality stream habitat. Since these indices include many different habitat elements, each of which is given equal weight, they have not been very useful in discriminating watershed effects (Wang *et al.*, 2001).

Researchers have had greater success in relating individual habitat elements to watershed conditions, such as large woody debris (LWD), embeddedness, or bank stability. Even so, direct testing has been limited, partly because individual habitat elements are hard to measure and are notoriously variable in both space and time. Consider bank stability for a moment. It would be quite surprising to see a highly urban stream that did not have unstable banks. Yet, the hard question is exactly how would bank instability be quantitatively measured? Where would it be measured — at a point, a cross-section, along a reach, on the left bank or the right?

Geomorphologists stress that no two stream reaches are exactly alike, due to differences in gradient, bed material, sediment transport, hydrology, watershed history and many other factors. Consequently, it is difficult to make controlled comparisons among different streams. Indeed, geomorphic theory stresses that individual stream reaches respond in a highly dynamic way to changes in watershed hydrology and sediment transport, and can take several decades to fully adjust to a new equilibrium.

Table 12: Physical Impacts of Urbanization on Streams

Specific Impacts
Sediment transport modified
Channel enlargement
Channel incision
Stream embeddedness
Loss of large woody debris
Changes in pool/riffle structure
Loss of riparian cover
Reduced channel sinuosity
Warmer in-stream temperatures
Loss of cold water species and diversity
Channel hardening
Fish blockages
Loss of 1st and 2nd order streams through storm drain enclosure

Returning to our example of defining bank stability, how might our measure of bank instability change over time as its watershed gradually urbanizes, is built out, and possibly reaches a new equilibrium over several decades? It is not very surprising that the effect of watershed development on stream habitat is widely observed, yet rarely measured.

3.2 Changes in Stream Geometry

As noted in the last chapter, urbanization causes an increase in the frequency and duration of bankfull and sub-bankfull flow events in streams. These flow events perform more "effective work" on the stream channel, as defined by Leopold (1994). The net effect is that an urban stream channel is exposed to more shear stress above the critical threshold needed to move bank and bed sediments (Figure 20). This usually triggers a cycle of active bank erosion and greater sediment transport in urban streams. As a consequence, the stream channel adjusts by expanding its cross-sectional area, in order to effectively accommodate greater flows and sediment supply. The stream channel can expand by incision, widening, or both. Incision refers to stream down-cutting through the streambed, whereas widening refers to lateral erosion of the stream bank and its flood plain (Allen and Narramore, 1985; Booth, 1990; Morisawa and LaFlure, 1979).

3.2.1 Channel Enlargement

A handful of research studies have specifically examined the relationship between watershed development and stream channel enlargement (Table 13). These studies indicate that stream cross-sectional areas can enlarge by as much as two to eight times in response to urbanization, although the process is complex and may take several decades to complete (Pizzuto *et al*., 2000; Caraco, 2000b; Hammer, 1972). An example of channel enlargement is provided in Figure 21, which shows how a stream cross-section in Watts Branch near Rockville, Maryland has expanded in response to nearly five decades of urbanization (i.e., watershed IC increased from two to 27%).

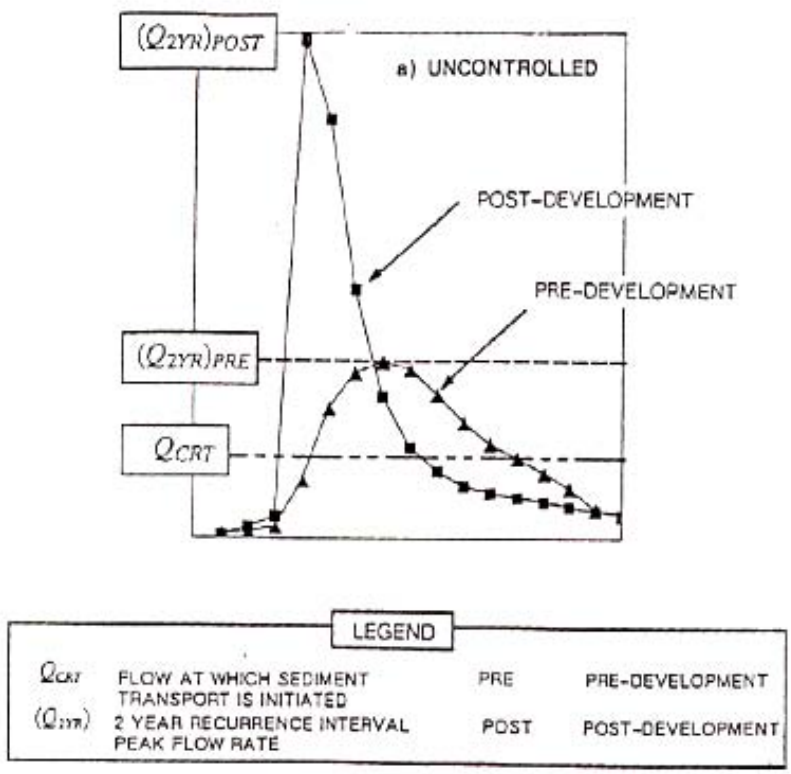

Figure 20: Increased Shear Stress from a Hydrograph (MacRae and Rowney, 1992)

Table 13: Research Review of Channel Enlargement and Sediment Transport in Urban Streams		
Reference	**Key Finding**	**Location**
% IC used as Indicator		
Caraco, 2000b	Reported enlargement in ratios of 1.5 to 2.2 for 10 stream reaches in Watts Branch and computed ultimate enlargement ratios of 2.0	MD
MacCrae and De Andrea, 1999	Introduced the concept of ultimate channel enlargement based on watershed IC and channel characteristics.	Ontario, TX
Morse, 2001	Demonstrated increased erosion rates with increases in IC (channels were generally of the same geomorphic type).	ME
Urbanization Used as Indicator		
Allen and Narramore, 1985	Enlargement ratios in two urban streams ranged from 1.7 to 2.4.	TX
Bledsoe, 2001	Reported that channel response to urbanization depends on other factors in addition to watershed IC including geology, vegetation, sediment and flow regimes.	N/A
Booth and Henshaw, 2001	Evaluated channel cross section erosion rates and determined that these rates vary based on additional factors including the underlying geology, age of development and gradient.	WA
Hammer, 1972	Enlargement ratios ranged from 0.7 to 3.8 in urban watersheds.	PA
Neller, 1989	Enlargement ratios in small urban catchments ranged from two to 7.19, the higher enlargement ratios were primarily from incision occurring in small channels.	Australia
Pizzuto *et al.*, 2000	Evaluated channel characteristics of paired urban and rural streams and demonstrated median bankfull cross sectional increase of 180%. Median values for channel sinuosity were 8% lower in urban streams; Mannings N values were found to be 10% lower in urban streams.	PA
Hession *et al.*, *in press*	Bankfull widths for urban streams were significantly wider than non-urban streams in 26 paired streams. Forested reaches were consistently wider than non-forested reaches in urban streams.	MD, DE, PA
Dartiguenave *et al.*, 1997	Bank erosion accounted for up to 75% of the sediment transport in urban watersheds.	TX
Trimble, 1997	Demonstrated channel enlargement over time in an urbanizing San Diego Creek; Bank erosion accounted for over 66% of the sediment transport.	CA

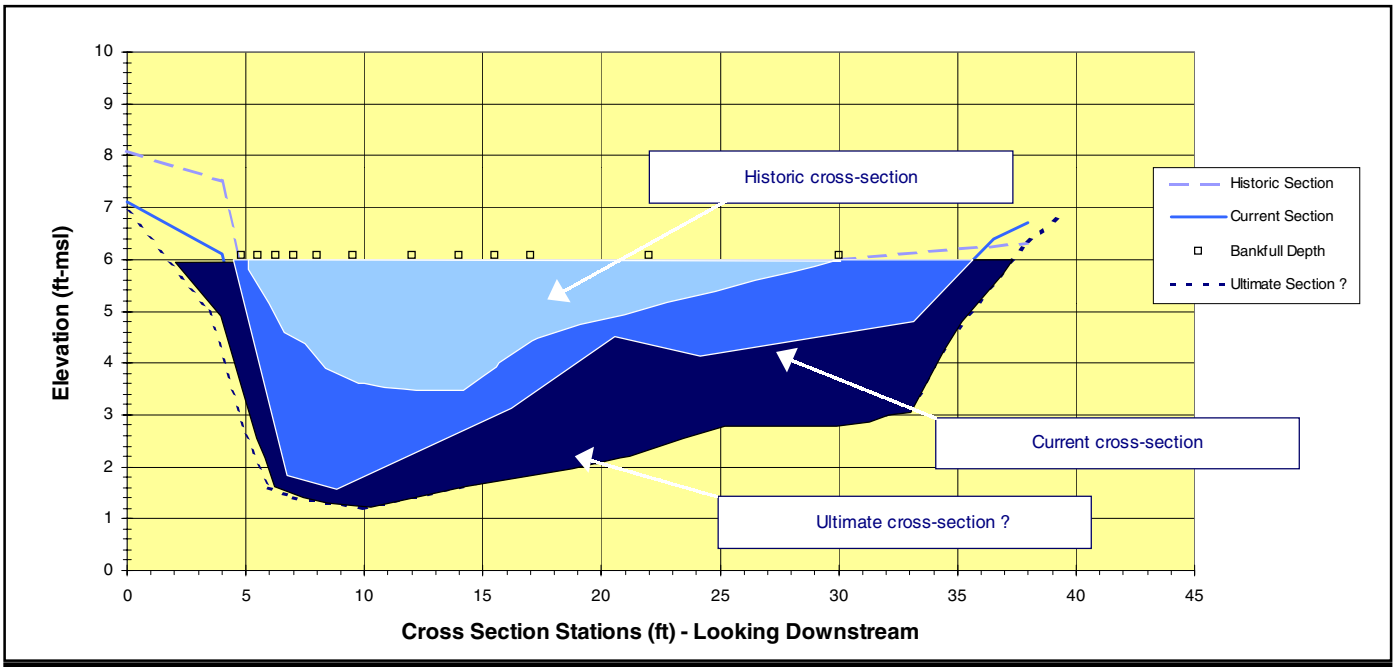

Figure 21: Stream Channel Enlargement in Watts Branch, MD 1950-2000 (Caraco, 2000b)

Some geomorphologists suggest that urban stream channels will reach an "ultimate enlargement" relative to pre-developed channels (MacRae and DeAndrea, 1999) and that this can be predicted based on watershed IC, age of development, and the resistance of the channel bed and banks. A relationship between ultimate stream channel enlargement and watershed IC has been developed for alluvial streams in Texas, Vermont and Maryland (Figure 22). Other geomorphologists such as Bledsoe (2001) and Booth and Henshaw (2001) contend that channel response to urbanization is more complex, and also depends on geology, grade control, stream gradient and other factors.

Channel incision is often limited by grade control caused by bedrock, cobbles, armored substrates, bridges, culverts and pipelines. These features can impede the downward erosion of the stream channel and thereby limit the incision process. Stream incision can become severe in streams that have softer substrates such as sand, gravel and clay (Booth, 1990). For example, Allen and Narramore (1985) showed that channel enlargement in chalk channels was 12 to 67% greater than in shale channels near Dallas, Texas. They attributed the differences to the softer substrate, greater velocities and higher shear stress in the chalk channels.

Neller (1989) and Booth and Henshaw (2001) also report that incised urban stream channels possess cross-sectional areas that are larger than would be predicted based on watershed area or discharge alone. This is due to the fact that larger floods are often contained within the stream channel rather than the floodplain. Thus, incised channels often result in greater erosion and geomorphic change. In general, stream conditions that can foster incision include erodible substrates, moderate to high stream gradients, and an absence of grade control features.

Channel widening occurs more frequently when streams have grade control and the stream has cut into its bank, thereby expanding its cross-sectional area. Urban stream channels often have artificial grade controls caused by frequent culverts and road crossings. These grade controls often cause localized sediment deposition that can reduce the capacity of culverts and bridge crossings to pass flood waters.

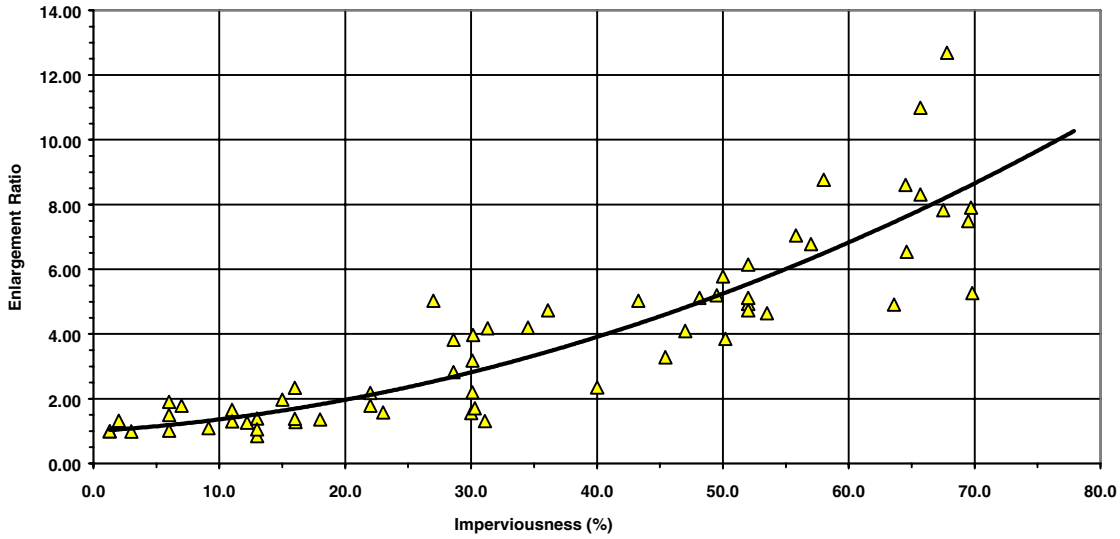

Figure 22: Ultimate Channel Enlargement in MD, UT and TX Alluvial Streams (MacRae and DeAndrea, 1999 and CWP, 2001b)

The loss of flood plain and riparian vegetation has been strongly associated with watershed urbanization (May *et al.*, 1997). A few studies have shown that the loss of riparian trees can result in increased erosion and channel migration rates (Beeson and Doyle, 1995 and Allmendinger *et al.*, 1999). For example, Beeson and Doyle (1995) found that meander bends with vegetation were five times less likely to experience significant erosion from a major flood than non-vegetated meander bends.Hession *et al.* (in press) observed that forested reaches consistently had greater bankfull widths than non-forested reaches in a series of urban streams in Pennsylvania, Maryland and Delaware.

3.2.2 Effect of Channel Enlargement on Sediment Yield

Regardless of whether a stream incises, widens, or does both, it will greatly increase sediment transport from the watershed due to erosion. Urban stream research conducted in California and Texas suggests that 60 to 75% of the sediment yield of urban watersheds can be derived from channel erosion (Trimble, 1997 and Dartingunave *et al.*, 1997) This can be compared to estimates for rural streams where channel erosion accounts for only five to 20% of the annual sediment yield (Collins *et al.*, 1997 and Walling and Woodward, 1995).

Some geomorphologists speculate that urban stream channels will ultimately adjust to their post-development flow regime and sediment supply. Finkenbine *et al.* (2000) observed these conditions in Vancouver streams, where study streams eventually stabilized two decades after the watersheds were fully developed. In older urban streams, reduced sediment transport can be expected when urbanization has been completed. At this point, headwater stream channels are replaced by storm drains and pipes, which can transport less sediment. The lack of available sediment may cause downstream channel erosion, due to the diminished sediment supply found in the stream.

3.3 Effect on Composite Measures of Stream Habitat

Composite measures of stream habitat refer to assessments such as EPA's Habitat Rapid Bioassessment Protocol (RBP) that combine multiple habitat elements into a single score or index (Barbour *et al*., 1999). For example, the RBP requires visual assessment of 10 stream habitat elements, including embeddedness, epifaunal substrate quality, velocity/depth regime, sediment deposition, channel flow status, riffle frequency, bank stabilization, streambank vegetation and riparian vegetation width. Each habitat element is qualitatively scored on a 20 point scale, and each element is weighted equally to derive a composite score for the stream reach.

To date, several studies have found a relationship between declining composite habitat indicator scores and increasing watershed IC in different eco-regions of the United States. A typical pattern in the composite habitat scores is provided for headwater streams in Maine (Morse, 2001; Figure 23). This general finding has been reported in the mid-Atlantic, Northeast and the Northwest (Black and Veatch, 1994; Booth and Jackson, 1997; Hicks and Larson, 1997; Maxted and Shaver, 1997; Morse, 2001; Stranko and Rodney, 2001).

However, other researchers have found a much weaker relationship between composite habitat scores and watershed IC. Wang and his colleagues (2001) found that composite habitat scores were not correlated with watershed IC in Wisconsin streams, although it was correlated with individual habitat elements, such as streambank erosion. They noted that many agricultural and rural streams had fair to poor composite habitat scores, due to poor riparian management and sediment deposition. The same basic conclusion was also reported for streams of the Maryland Piedmont (MNCPPC, 2000).

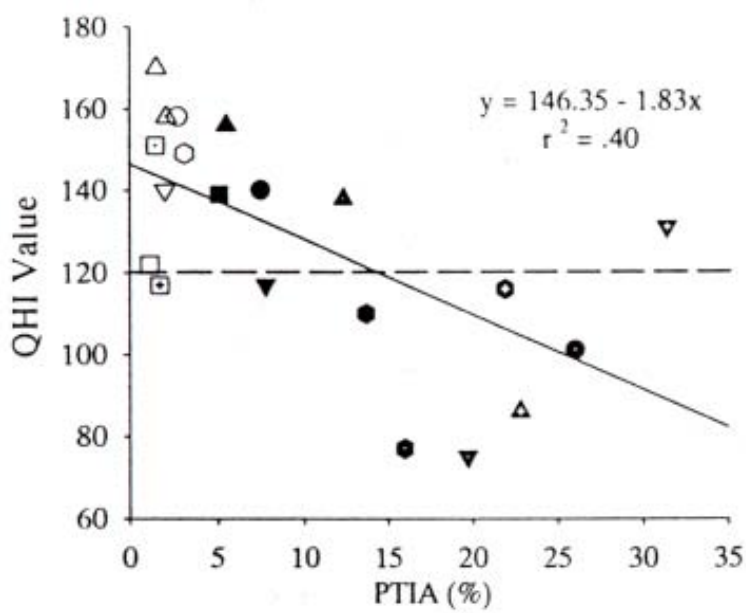

Figure 23: Relationship Between Habitat Quality and IC in Maine Streams (Morse, 2001)

3.4 Effect on Individual Elements of Stream Habitat

Roughly a dozen studies have examined the effect of watershed development on the degradation of individual stream habitat features such as bank stability, embeddedness, riffle/pool quality, and loss of LWD (Table 14). Much of this data has been acquired from the Pacific Northwest, where the importance of such habitat for migrating salmon has been a persistent management concern.

3.4.1 Bank Erosion and Bank Stability

It is somewhat surprising that we could only find one study that related bank stability or bank erosion to watershed IC. Conducted by Booth (1991) in the streams of the Puget Sound lowlands, the study reported that stream banks were consistently rated as stable in watersheds with less than 10% IC, but became progressively more unstable above this threshold. Dozens of stream assessments have found high rates of bank erosion in urban streams, but none, to our knowledge, has systematically related the prevalence or severity of bank erosion to watershed IC. As noted earlier, this may reflect the lack of a universally recognized method to measure comparative bank erosion in the field.

3.4.2 Embeddedness

Embeddedness is a term that describes the extent to which the rock surfaces found on the stream bottom are filled in with sand, silts and clay. In a healthy stream, the interstitial pores between cobbles, rock and gravel generally lack fine sediments, and are an active habitat zone and detrital processing area. The increased sediment transport in urban streams can rapidly fill up these pores in a process known as embedding. Normally, embeddedness is visually measured in riffle zones of streams. Riffles tend to be an important habitat for aquatic insects and fish (such as darters and sculpins). Clean stream substrates are also critical to trout and salmon egg incubation and embryo development. May *et al.* (1997) demonstrated that the percent of fine sediment particles in riffles generally increased with watershed IC (Figure 24). However, Finkenbine *et al.* (2000) reported that embeddedness eventually decreased slightly after watershed land use and sediment transport had stabilized for 20 years.

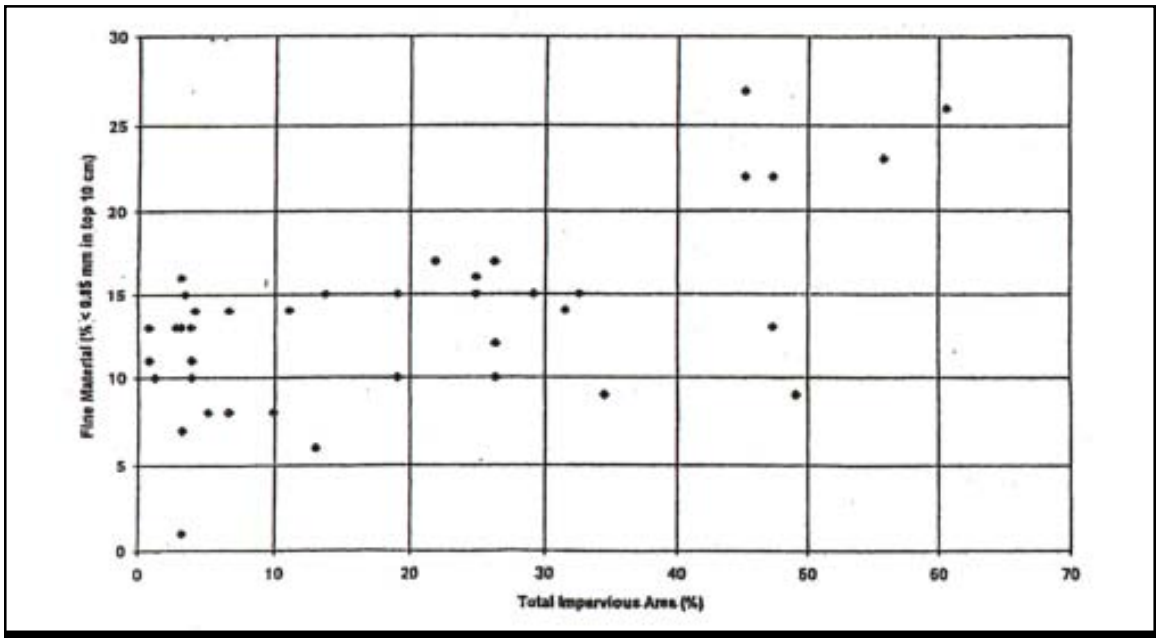

Figure 24: Fine Material Sediment Deposition as a Function of IC in Pacific Northwest Streams (Horner *et al.*, 1997)

Table 14: Research Review of Changes in Urban Stream Habitat		
Reference	**Key Finding**	**Location**
% IC Used as Indicator		
Black & Veatch, 1994	Habitat scores were ranked as poor in five subwatersheds that had greater than 30% IC.	MD
Booth and Jackson, 1997	Increase in degraded habitat conditions with increases in watershed IC.	WA
Hicks and Larson, 1997	Reported a reduction in composite stream habitat indices with increasing watershed IC.	MA
May *et al.*, 1997	Composite stream habitat declined most rapidly during the initial phase of the watershed urbanization, when percent IC exceeded the 5-10% range.	WA
Stranko and Rodney, 2001	Composite index of stream habitat declined with increasing watershed IC in coastal plain streams.	MD
Wang *et al.*, 2001	Composite stream habitat scores were not correlated with watershed IC in 47 small watersheds, although channel erosion was. Non-urban watersheds were highly agricultural and often lacked riparian forest buffers.	WI
MNCPPC, 2000	Reported that stream habitat scores were not correlated with IC in suburban watersheds.	MD
Morse, 2001	Composite habitat values tended to decline with increases in watershed IC.	ME
Booth, 1991	Channel stability and fish habitat quality declined rapidly after 10% watershed IC.	WA
Booth *et al.*, 1997	Decreased LWD with increased IC.	PNW
Finkenbine *et al.*, 2000	LWD was scarce in streams with greater than 20% IC in Vancouver.	B.C.
Horner & May, 1999	When IC levels were >5%, average LWD densities fell below 300 pieces/kilometer.	PNW
Horner *et al.*, 1997	Interstitial spaces in streambed sediments begin to fill with increasing watershed IC.	PNW
Urbanization Used as Indicator		
Dunne and Leopold, 1978	Natural channels replaced by storm drains and pipes; increased erosion rates observed downstream.	MD
May *et al.*, 1997	Forested riparian corridor width declines with increased watershed IC.	PNW
MWCOG, 1992	Fish blockages caused by bridges and culverts noted in urban watersheds.	D.C.
Pizzuto *et al.*, 2000	Urban streams had reduced pool depth, roughness, and sinuosity, compared to rural streams; Pools were 31% shallower in urban streams compared to non-urban ones.	PA
Richey, 1982	Altered pool/riffle sequence observed in urban streams.	WA
Scott *et al.*, 1986	Loss of habitat diversity noted in urban watersheds.	PNW
Spence *et al.*, 1996	Large woody debris is important for habitat diversity and anadromous fish.	PNW

3.4.3 Large Woody Debris (LWD)

LWD is a habitat element that describes the approximate volume of large woody material (< four inches in diameter) found in contact with the stream. The presence and stability of LWD is an important habitat parameter in streams. LWD can form dams and pools, trap sediment and detritus, stabilize stream channels, dissipate flow energy, and promote habitat complexity (Booth *et al.,* 1997). LWD creates a variety of pool features (plunge, lateral, scour and backwater); short riffles; undercut banks; side channels; and a range of water depths (Spence *et al.*, 1996). Urban streams tend to have a low supply of LWD, as increased stormwater flows transport LWD and clears riparian areas. Horner *et al.* (1997) presents evidence from Pacific Northwest streams that LWD decreases in response to increasing watershed IC (Figure 25).

3.4.4 Changes in Other Individual Stream Parameters

One of the notable changes in urban stream habitat is a decrease in pool depth and a general simplification of habitat features such as pools, riffles and runs. For example, Richey (1982) and Scott *et al.* (1986) reported an increase in the prevalence of glides and a corresponding altered riffle/pool sequence due to urbanization. Pizzuto *et al.* (2000) reported a median 31% decrease in pool depth in urban streams when compared to forested streams. Pizzuto *et al.* also reported a modest decrease in channel sinuosity and channel roughness in the same urban streams in Pennsylvania.

Several individual stream habitat parameters appear to have received no attention in urban stream research to date. These parameters include riparian shading, wetted perimeter, various measures of velocity/depth regimes, riffle frequency, and sediment deposition in pools. More systematic monitoring of these individual stream habitat parameters may be warranted.

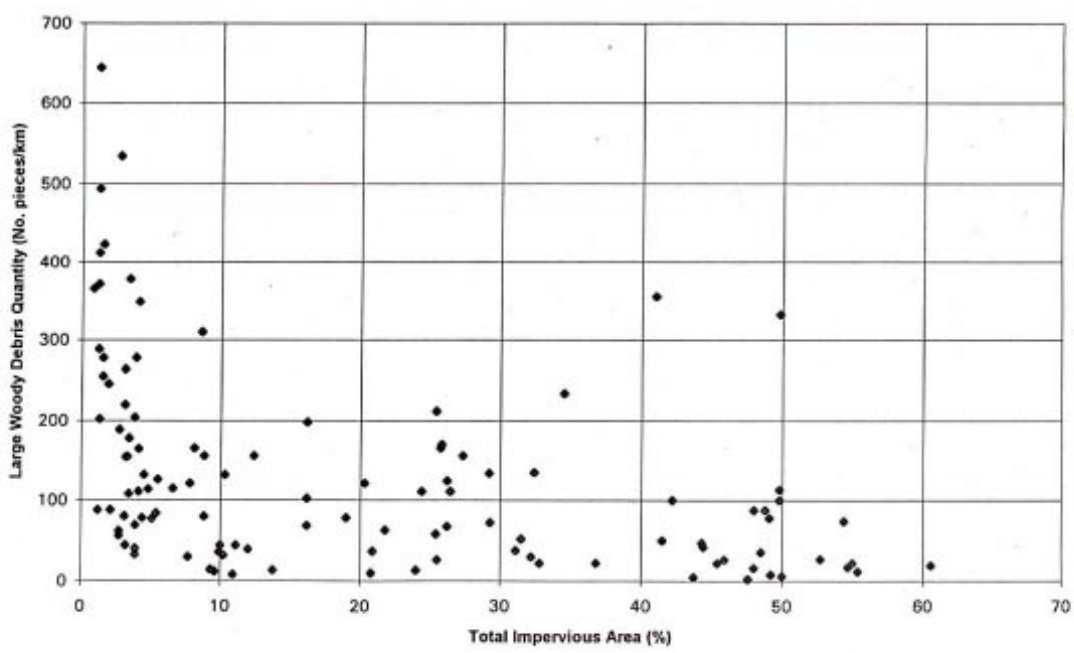

Figure 25: LWD as a Function of IC in Puget Sound Streams (Horner *et al.*, 1997)

3.5 Increased Stream Warming

IC directly influences our local weather in urban areas. This effect is obvious to anyone walking across a parking lot on a hot summer day, when temperatures often reach a scorching 110 to 120 degrees F. Parking lots and other hard surfaces tend to absorb solar energy and release it slowly. Furthermore, they lack the normal cooling properties of trees and vegetation, which act as natural air conditioners. Finally, urban areas release excess heat as a result of the combustion of fossil fuels for heating, cooling and transportation. As a result, highly urban areas tend to be much warmer than their rural counterparts and are known as urban heat islands. Researchers have found that summer temperatures tend to be six to eight degrees F warmer in the summer and two to four degrees F warmer during the winter months.

Water temperature in headwater streams is strongly influenced by local air temperatures. Summer temperatures in urban streams have been shown to increase by as much as five to 12 degrees F in response to watershed development (Table 15). Increased water temperatures can preclude temperature-sensitive species from being able to survive in urban streams.

Figure 26 shows the stream warming phenomenon in small headwater streams in the Maryland Piedmont.

Galli (1990) reported that stream temperatures throughout the summer increased in urban watersheds. He monitored five headwater streams in the Maryland Piedmont with different levels of IC. Each urban stream had mean temperatures that were consistently warmer than a forested reference stream, and stream warming appeared to be a direct function of watershed IC. Other factors, such as lack of riparian cover and the presence of ponds, were also demonstrated to amplify stream warming, but the primary contributing factor appeared to be watershed IC.

Johnson (1995) studied how stormwater influenced an urban trout stream in Minnesota and reported up to a 10 degree F increase in stream water temperatures after summer storm events. Paul *et al.* (2001) evaluated stream temperatures for 30 subwatersheds to the Etowah River in Georgia, which ranged from five to 61% urban land. They found a correlation between summer daily mean water temperatures and the percentage of urban land in a subwatershed.

Table 15: Research Review of Thermal Impacts in Urban Streams

Reference	Key Finding	Location
%IC Used as Indicator		
Galli, 1990	Increase in stream temperatures of five to 12 degrees Fahrenheit in urban watersheds; stream warming linked to IC.	MD
Urbanization Used as Indicator		
Johnson, 1995	Up to 10 degrees Fahrenheit increases in stream temperatures after summer storm events in an urban area	MN
LeBlanc *et al.*, 1997	Calibrated a model predicting stream temperature increase as a result of urbanization	Ontario
MCDEP, 2000	Monitoring effect of urbanization and stormwater ponds on stream temperatures revealed stream warming associated with urbanization and stormwater ponds	MD
Paul *et al.*, 2001	Daily mean stream temperatures in summer increased with urban land use	GA

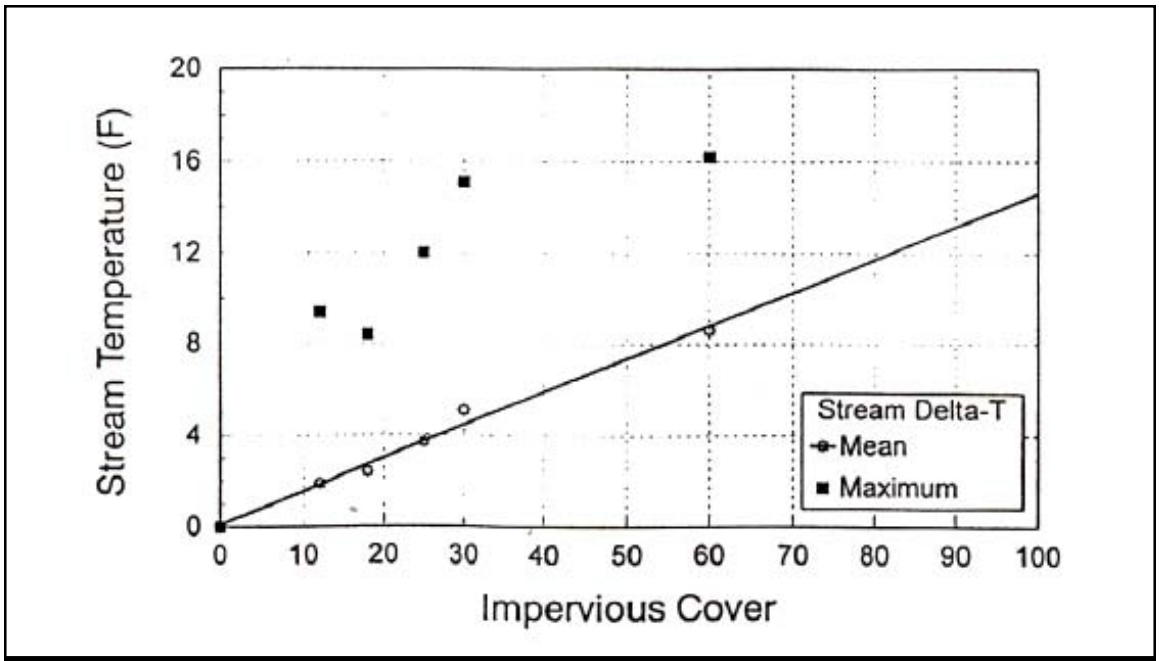

Figure 26: Stream Temperature Increase in Response to IC in Maryland Piedmont Streams (Galli, 1990)

Discharges from stormwater ponds can also contribute to stream warming in urban watersheds. Three studies highlight the temperature increase that can result from stormwater ponds. A study in Ontario found that baseflow temperatures below wet stormwater ponds increased by nine to 18 degrees F in the summer (SWAMP, 2000a, b). Oberts (1997) also measured change in the baseflow temperature as it flowed through a wetland/wet pond system in Minnesota. He concluded that the temperature had increased by an average of nine degrees F during the summer months. Galli (1988) also observed a mean increase of two to 10 degrees F in four stormwater ponds located in Maryland.

3.6 Alteration of Stream Channel Networks

Urban stream channels are often severely altered by man. Channels are lined with rip rap or concrete, natural channels are straightened, and first order and ephemeral streams are enclosed in storm drain pipes. From an engineering standpoint, these modifications rapidly convey flood waters downstream and locally stabilize stream banks. Cumulatively, however, these modifications can have a dramatic effect on the length and habitat quality of headwater stream networks.

3.6.1 Channel Modification

Over time, watershed development can alter or eliminate a significant percentage of the perennial stream network. In general, the loss of stream network becomes quite extensive when watershed IC exceeds 50%. This loss is striking when pre- and post-development stream networks are compared (Figure 27). The first panel illustrates the loss of stream network over time in a highly urban Northern Virginia watershed; the second panel shows how the drainage network of Rock Creek has changed in response to watershed development.

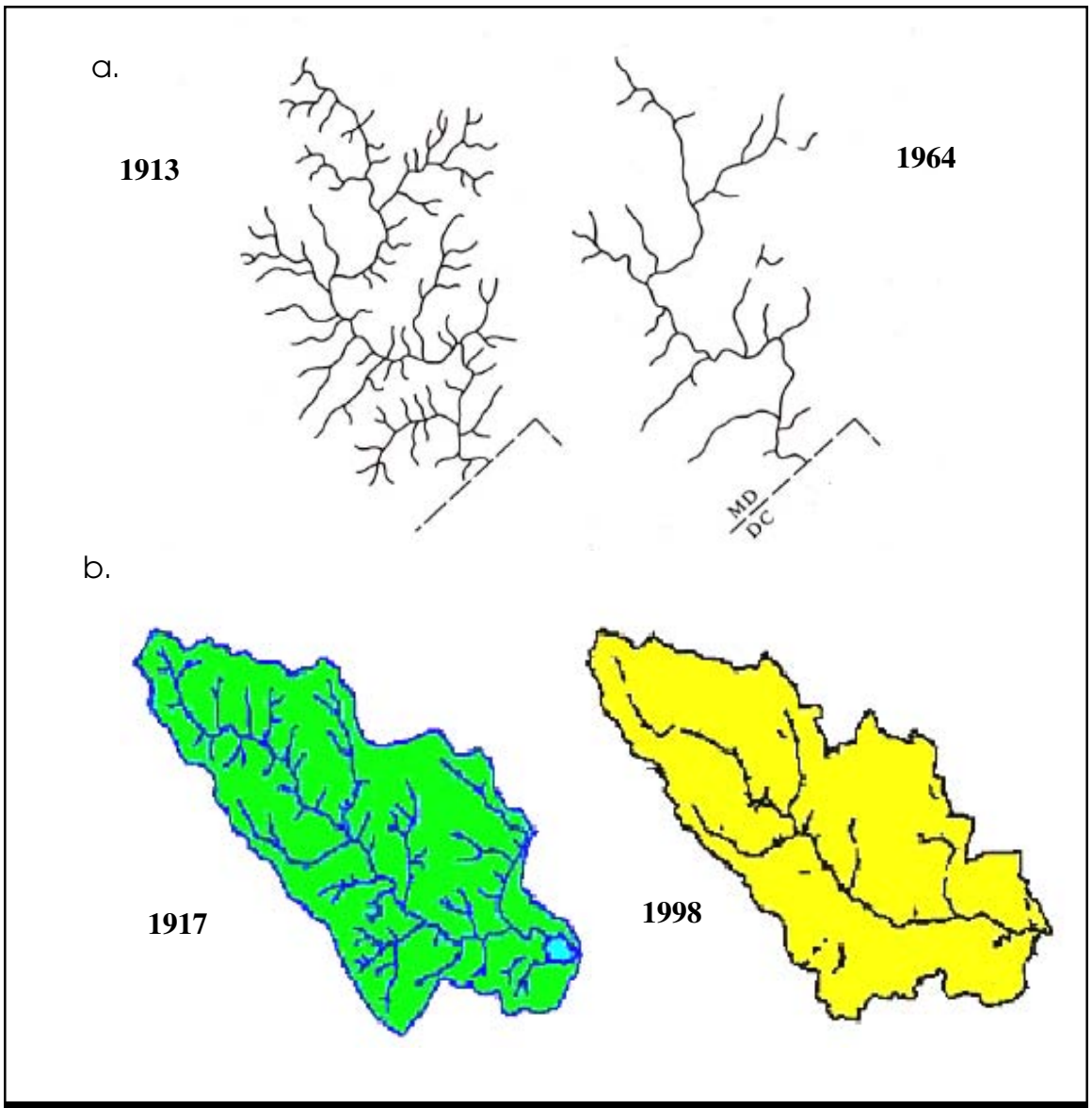

Figure 27: a. Drainage Network of Rock Creek, D.C. (Dunne and Leopold, 1978) and b. Drainage Network of Four Mile Run, VA Before and After Urbanization (NVRC, 2001)

In a national study of 269 gaged urban watersheds, Sauer *et al.* (1983) observed that channelization and channel hardening were important watershed variables that control peak discharge rates. The channel modifications increase the efficiency with which runoff is transported through the stream channel, increasing critical shear stress velocities and causing downstream channel erosion.

3.6.2 Barriers to Fish Migration

Infrastructure such as bridges, dams, pipelines and culverts can create partial or total barriers to fish migration and impair the ability of fish to move freely in a watershed. Blockages can have localized effects on small streams where non-migratory fish species can be prevented from re-colonizing upstream areas after acutely toxic events. The upstream movement of anadromous fish species such as shad, herring, salmon and steelhead can also be blocked by these barriers. Figure 28 depicts the prevalence of fish barriers in the Anacostia Watershed (MWCOG, 1992).

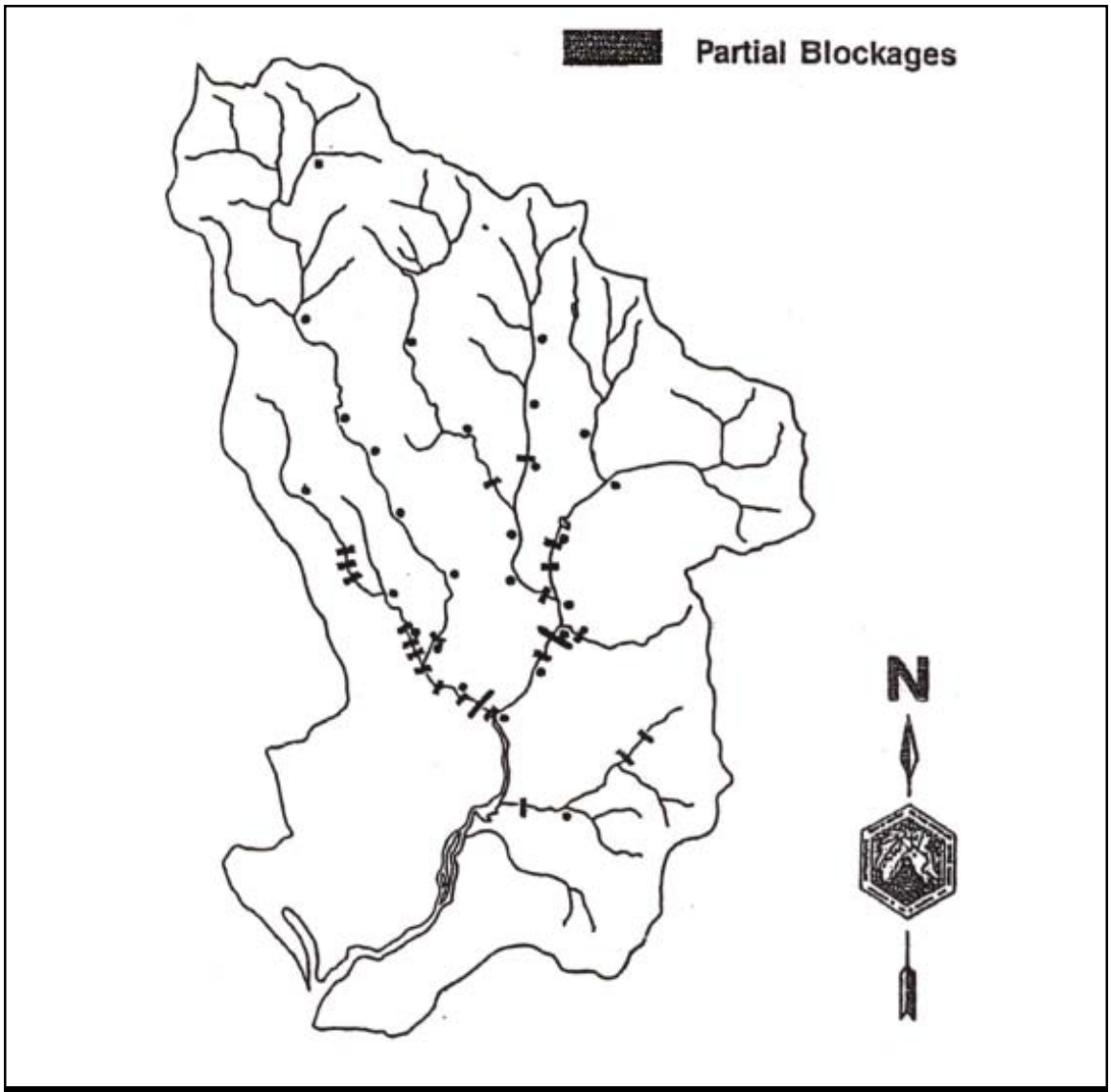

Figure 28: Fish Migration Barriers in the Anacostia Watershed of D.C. and MD (MWCOG, 1992)

3.7 Conclusion

Watershed development and the associated increase in IC have been found to significantly degrade the physical habitat of urban streams. In alluvial streams, the effects of channel enlargement and sediment transport can be severe at relatively low levels of IC (10 to 20%). However, the exact response of any stream is also contingent upon a combination of other physical factors such as geology, vegetation, gradient, the age of development, sediment supply, the use and design of stormwater treatment practices, and the extent of riparian buffers (Bledsoe, 2001).

Despite the uncertainty introduced by these factors, the limited geomorphic research to date suggests that physical habitat quality is almost always degraded by higher levels of watershed IC. Even in bedrock-controlled channels, where sediment transport and channel enlargement may not be as dramatic, researchers have noted changes in stream habitat features, such as embeddedness, loss of LWD, and stream warming.

Overall, the following conclusions can be made about the influence of watershed development on the physical habitat of urban streams:

- The major changes in physical habitat in urban streams are caused by the increased frequency and duration of bankfull and sub-bankfull discharges, and the attendant changes in sediment supply and transport. As a consequence, many urban streams experience significant channel enlargement. Generally, channel enlargement is most evident in alluvial streams.

- Typical habitat changes observed in urban streams include increased embeddedness, reduced supply of LWD, and simplification of stream habitat features such as pools, riffles and runs, as well as reduced channel sinuosity.

- Stream warming is often directly linked to watershed development, although more systematic subwatershed sampling is needed to precisely predict the extent of warming.

- Channel straightening, hardening and enclosure and the creation of fish barriers are all associated with watershed development. More systematic research is needed to establish whether these variables can be predicted based on watershed IC.

- In general, stream habitat diminishes at about 10% watershed IC, and becomes severely degraded beyond 25% watershed IC.

While our understanding of the relationship between stream habitat features and watershed development has improved in recent years, the topic deserves greater research in three areas. First, more systematic monitoring of composite habitat variables needs to be conducted across the full range of watershed IC. In particular, research is needed to define the approximate degree of watershed IC where urban streams are transformed into urban drainage systems.

Second, additional research is needed to explore the relationship between watershed IC and individual and measurable stream habitat parameters, such as bank erosion, channel sinuosity, pool depth and wetted perimeter. Lastly, more research is needed to determine if watershed treatment such as stormwater practices and stream buffers can mitigate the impacts of watershed IC on stream habitat. Together, these three research efforts could provide a technical foundation to develop a more predictive model of how watershed development influences stream habitat.

Chapter 4: Water Quality Impacts of Impervious Cover

This chapter presents information on pollutant concentrations found in urban stormwater runoff based on a national and regional data assessment for nine categories of pollutants. Included is a description of the Simple Method, which can be used to estimate pollutant loads based on the amount of IC found in a catchment or subwatershed. This chapter also addresses specific water quality impacts of stormwater pollutants and explores research on the sources and source areas of stormwater pollutants.

This chapter is organized as follows:

4.1 Introduction
4.2 Summary of National and Regional Stormwater Pollutant Concentration Data
4.3 Relationship Between Pollutant Loads and IC: The Simple Method
4.4 Sediment
4.5 Nutrients
4.6 Trace Metals
4.7 Hydrocarbons (PAH and Oil and Grease)
4.8 Bacteria and Pathogens
4.9 Organic Carbon
4.10 MTBE
4.11 Pesticides
4.12 Deicers
4.13 Conclusion

4.1 Introduction

Streams are usually the first aquatic system to receive stormwater runoff, and their water quality can be compromised by the pollutants it contains. Stormwater runoff typically contains dozens of pollutants that are detectable at some concentration, however small. Simply put, any pollutant deposited or derived from an activity on land will likely end up in stormwater runoff, although certain pollutants are consistently more likely to cause water quality problems in receiving waters. Pollutants that are frequently found in stormwater runoff can be grouped into nine broad categories: sediment, nutrients, metals, hydrocarbons, bacteria and pathogens, organic carbon, MTBE, pesticides, and deicers.

The impact that stormwater pollutants exert on water quality depends on many factors, including concentration, annual pollutant load, and category of pollutant. Based on nationally reported concentration data, there is considerable variation in stormwater pollutant concentrations. This variation has been at least partially attributed to regional differences, including rainfall and snowmelt. The volume and regularity of rainfall, the length of snow accumulation, and the rate of snowmelt can all influence stormwater pollutant concentrations.

The annual pollutant load can have long-term effects on stream water quality, and is particularly important information for stormwater managers to have when dealing with non-point source pollution control. The Simple Method is a model developed to estimate the pollutant load for chemical pollutants, assuming that the annual pollutant load is a function of IC. It is an effective method for determining annual sediment, nutrient, and trace metal loads. It cannot always be applied to other stormwater pollutants, since they are not always correlated with IC.

The direct water quality impact of stormwater pollutants also depends on the type of pollutant, as different pollutants impact streams differently. For example, sediments affect stream habitat and aquatic biodiversity; nutrients cause eutrophication; metals, hydrocarbons, deicers, and MTBE can be toxic to aquatic life; and organic carbon can lower dissolved oxygen levels.

The impact stormwater pollutants have on

water quality can also directly influence human uses and activities. Perhaps the pollutants of greatest concern are those with associated public health impacts, such as bacteria and pathogens. These pollutants can affect the availability of clean drinking water and limit consumptive recreational activities, such as swimming or fishing. In extreme situations, these pollutants can even limit contact recreational activities such as boating and wading.

It should be noted that although there is much research available on the effects of urbanization on water quality, the majority has not been focused on the impact on streams, but on the response of lakes, reservoirs, rivers and estuaries. It is also important to note that not all pollutants are equally represented in monitoring conducted to date. While we possess excellent monitoring data for sediment, nutrients and trace metals, we have relatively little monitoring data for pesticides, hydrocarbons, organic carbon, deicers, and MTBE.

4.2 Summary of National and Regional Stormwater Pollutant Concentration Data

4.2.1 National Data

National mean concentrations of typical stormwater pollutants are presented in Table 16. National stormwater data are compiled from the Nationwide Urban Runoff Program (NURP), with additional data obtained from the U.S.Geological Survey (USGS), as well as initial stormwater monitoring conducted for EPA's National Pollutant Discharge Elimination System (NPDES) Phase I stormwater program.

In most cases, stormwater pollutant data is reported as an event mean concentration (EMC), which represents the average concentration of the pollutant during an entire stormwater runoff event.

When evaluating stormwater EMC data, it is important to keep in mind that regional EMCs can differ sharply from the reported national pollutant EMCs. Differences in EMCs between regions are often attributed to the variation in the amount and frequency of rainfall and snowmelt.

4.2.2 Regional Differences Due to Rainfall

The frequency of rainfall is important, since it influences the accumulation of pollutants on IC that are subsequently available for wash-off during storm events. The USGS developed a national stormwater database encompassing 1,123 storms in 20 metropolitan areas and used it as the primary data source to define regional differences in stormwater EMCs. Driver (1988) performed regression analysis to determine which factors had the greatest influence on stormwater EMCs and determined that annual rainfall depth was the best overall predictor. Driver grouped together stormwater EMCs based on the depth of average annual rainfall, and Table 17 depicts the regional rainfall groupings and general trends for each

region. Table 18 illustrates the distribution of stormwater EMCs for a range of rainfall regions from 13 local studies, based on other monitoring studies. In general, stormwater EMCs for nutrients, suspended sediment and metals tend to be higher in arid and semi-arid

Table 16: National EMCs for Stormwater Pollutants

Pollutant	Source	EMCs		Number of Events
		Mean	Median	
Sediments (mg/l)				
TSS	(1)	78.4	54.5	3047
Nutrients (mg/l)				
Total P	(1)	0.32	0.26	3094
Soluble P	(1)	0.13	0.10	1091
Total N	(1)	2.39	2.00	2016
TKN	(1)	1.73	1.47	2693
Nitrite & Nitrate	(1)	0.66	0.53	2016
Metals (Fg/l)				
Copper	(1)	13.4	11.1	1657
Lead	(1)	67.5	50.7	2713
Zinc	(1)	162	129	2234
Cadmium	(1)	0.7	N/R	150
Chromium	(4)	4	7	164
Hydrocarbons (mg/l)				
PAH	(5)	3.5	N/R	N/R
Oil and Grease	(6)	3	N/R	N/R
Bacteria and Pathogens (colonies/ 100ml)				
Fecal Coliform	(7)	15,038	N/R	34
Fecal Streptococci	(7)	35,351	N/R	17
Organic Carbon (mg/l)				
TOC	(11)	17	15.2	19 studies
BOD	(1)	14.1	11.5	1035
COD	(1)	52.8	44.7	2639
MTBE	(8)	N/R	1.6	592
Pesticides (Fg/l)				
Diazinon	(10)	N/R	0.025	326
	(2)	N/R	0.55	76
Chlorpyrifos	(10)	N/R	N/R	327
Atrazine	(10)	N/R	0.023	327
Prometon	(10)	N/R	0.031	327
Simazine	(10)	N/R	0.039	327
Chloride (mg/l)				
Chloride	(9)	N/R	397	282

Sources: (1) Smullen and Cave, 1998; (2) Brush et al., 1995; (3) Baird et al., 1996; (4) Bannerman et al., 1996; (5) Rabanal and Grizzard, 1995; (6) Crunkilton et al., 1996; (7) Schueler, 1999; (8) Delzer, 1996; (9) Environment Canada, 2001; (10) USEPA, 1998; (11) CWP, 2001a N/R - Not Reported

Table 17: Regional Groupings by Annual Rainfall Amount (Driver, 1988)

Region	Annual Rainfall	States Monitored	Concentration Data
Region I: Low Rainfall	<20 inches	AK, CA, CO, NM, UT	Highest mean and median values for Total N, Total P, TSS and COD
Region II: Moderate Rainfall	20 40 inches	HA, IL, MI, MN, MI, NY, TX, OR, OH, WA, WI	Higher mean and median values than Region III for TSS, dissolved phosphorus and cadmium
Region III: High Rainfall	>40 inches	FL, MD, MA, NC, NH, NY, TX, TN, AR	Lower values for many parameters likely due to the frequency of storms and the lack of build up in pollutants

regions and tend to decrease slightly when annual rainfall increases (Table 19).

It is also hypothesized that a greater amount of sediment is eroded from pervious surfaces in arid or semi-arid regions than in humid regions due to the sparsity of protective vegetative cover. Table 19 shows that the highest concentrations of total suspended solids were recorded in regions with least rainfall. In addition, the chronic toxicity standards for several metals are most frequently exceeded during low rainfall regions (Table 20).

4.2.3 Cold Region Snowmelt Data

In colder regions, snowmelt can have a significant impact on pollutant concentrations. Snow accumulation in winter coincides with pollutant build-up; therefore, greater concentrations of pollutants are measured during snowmelt events. Sources of snowpack pollution in urban areas include wet and dry atmospheric deposition, traffic emissions, urban litter, deteriorated infrastructure, and deicing chemicals and abrasives (WERF, 1999).

Oberts *et al.* (1989) measured snowmelt pollutants in Minnesota streams and found that as much as 50% of annual sediment, nutrient, hydrocarbon and metal loads could be attributed to snowmelt runoff during late winter and early spring. This trend probably applies to any region where snow cover persists through much of the winter. Pollutants accumulate in the snowpack and then contribute high concentrations during snowmelt runoff. Oberts (1994) described four types of snowmelt runoff events and the resulting pollutant characteristics (Table 21).

A typical hydrograph for winter and early spring snow melts in a northern cold climate is portrayed in Figure 29. The importance of snowpack melt on peak runoff during March 1989 can clearly be seen for an urban watershed located in St. Paul, Minnesota.

Major source areas for snowmelt pollutants include snow dumps and roadside snowpacks. Pollutant concentrations in snow dumps can be as much as five times greater than typical stormwater pollutant concentrations (Environment Canada, 2001). Snow dumps and packs accumulate pollutants over the winter months and can release them during a few rain or snow melt events in the early spring. High levels of chloride, lead, phosphorus, biochemical oxygen demand, and total suspended solids have been reported in snow pack runoff (La Barre *et al*, 1973; Oliver *et al.*, 1974; Pierstorff and Bishop, 1980; Scott and Wylie, 1980; Van Loon, 1972).

Atmospheric deposition can add pollutants to snow piles and snowpacks. Deposited pollutants include trace metals, nutrients and particles that are primarily generated by fossil fuel combustion and industrial emissions (Boom and Marsalek, 1988; Horkeby and Malmqvist, 1977; Malmqvist, 1978; Novotny and Chester, 1981; Schrimpff and Herrman, 1979).

Table 18: Stormwater Pollutant Event Mean Concentration for Different U.S. Regions (Units: mg/l, except for metals which are in *F*g/l)

		Region I - Low Rainfall				Region II - Moderate Rainfall			Region III - High Rainfall				Snow
	National	Phoenix, AZ	San Diego, CA	Boise, ID	Denver, CO	Dallas, TX	Marquette, MI	Austin, TX	MD	Louisville, KY	GA	FL	MN
Reference	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(11)	(12)
Annual Rainfall (in.)	N/A	7.1"	10"	11"	15"	28"	32"	32"	41"	43"	51"	52"	N/R
Number of Events	3000	40	36	15	35	32	12	N/R	107	21	81	N/R	49
Pollutant													
TSS	78.4	227	330	116	242	663	159	190	67	98	258	43	112
Total N	2.39	3.26	4.55	4.13	4.06	2.70	1.87	2.35	N/R	2.37	2.52	1.74	4.30
Total P	0.32	0.41	0.7	0.75	0.65	0.78	0.29	0.32	0.33	0.32	0.33	0.38	0.70
Soluble P	0.13	0.17	0.4	0.47	N/R	N/R	0.04	0.24	N/R	0.21	0.14	0.23	0.18
Copper	14	47	25	34	60	40	22	16	18	15	32	1.4	N/R
Lead	68	72	44	46	250	330	49	38	12.5	60	28	8.5	100
Zinc	162	204	180	342	350	540	111	190	143	190	148	55	N/R
BOD	14.1	109	21	89	N/R	112	15.4	14	14.4	88	14	11	N/R
COD	52.8	239	105	261	227	106	66	98	N/R	38	73	64	112

Sources: Adapted from Caraco, 2000a: (1) Smullen and Cave, 1998; (2) Lopes et al.; 1995; (3) Schiff, 1996; (4) Kjelstrom, 1995 (computed); (5) DRCOG, 1983, (6) Brush et al., *1995; (7) Steuer* et al., *1997; (8) Barrett* et al., *1995; (9) Barr, 1997; (10) Evaldi* et al., *1992; (11) Thomas and McClelland, 1995; (12) Oberts, 1994 N/R = Not Reported; N/A = Not Applicable*

Table 19: Mean and Median Nutrient and Sediment Stormwater Concentrations for Residential Land Use Based on Rainfall Regions (Driver, 1988)

Region	Total N (median)	Total P (median)	TSS (mean)
Region I: Low Rainfall	4	0.45	320
Region II: Moderate Rainfall	2.3	0.31	250
Region III: High Rainfall	2.15	0.31	120

Table 20: EPA 1986 Water Quality Standards and Percentage of Metal Concentrations Exceeding Water Quality Standards by Rainfall Region (Driver, 1988)

	Cadmium	Copper	Lead	Zinc
EPA Standards	10 *F*g/l	12 *F*g/l	32 *F*g/l	47 *F*g/l
Percent Exceedance of EPA Standards				
Region I: Low Rainfall	1.5%	89%	97%	97%
Region II: Moderate Rainfall	0	78%	89%	85%
Region III: High Rainfall	0	75%	91%	84%

Table 21: Runoff and Pollutant Characteristics of Snowmelt Stages (Oberts, 1994)

Snowmelt Stage	Duration /Frequency	Runoff Volume	Pollutant Characteristics
Pavement	Short, but many times in winter	Low	Acidic, high concentrations of soluble pollutants; Chloride, nitrate, lead; total load is minimal
Roadside	Moderate	Moderate	Moderate concentrations of both soluble and particulate pollutants
Pervious Area	Gradual, often most at end of season	High	Dilute concentrations of soluble pollutants; moderate to high concentrations of particulate pollutants depending on flow
Rain-on-Snow	Short	Extreme	High concentrations of particulate pollutants; moderate to high concentrations of soluble pollutants; high total load

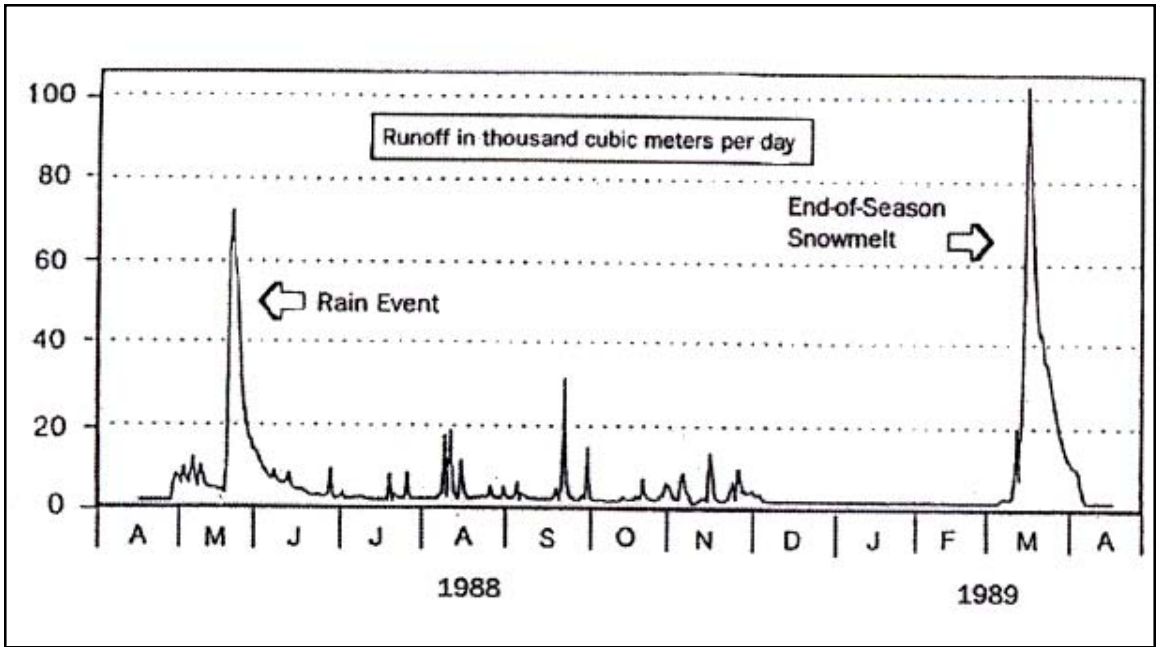

Figure 29: Snowmelt Runoff Hydrograph for Minneapolis Stream (Oberts, 1994)

4.3 Relationship Between Pollutant Loads and IC: The Simple Method

Urban stormwater runoff contains a wide range of pollutants that can degrade downstream water quality. The majority of stormwater monitoring research conducted to date supports several generalizations. First, the unit area pollutant load delivered to receiving waters by stormwater runoff increases in direct proportion to watershed IC. This is not altogether surprising, since pollutant load is the product of the average pollutant concentration and stormwater runoff volume. Given that runoff volume increases in direct proportion to IC, pollutant loads must automatically increase when IC increases, as long the average pollutant concentration stays the same (or increases). This relationship is a central assumption in most simple and complex pollutant loading models (Bicknell *et al.*, 1993; Donigian and Huber, 1991; Haith *et al.*, 1992; Novotny and Chester, 1981; NVPDC, 1987; Pitt and Voorhees, 1989).

Recognizing the relationship between IC and pollutant loads, Schueler (1987) developed the "Simple Method" to quickly and easily estimate stormwater pollutant loads for small urban watersheds (see Figure 30). Estimates of pollutant loads are important to watershed managers as they grapple with costly decisions on non-point source control. The Simple Method is empirical in nature and utilizes the extensive regional and national database (Driscoll, 1983; MWCOG, 1983; USEPA, 1983). Figure 30 provides the basic equations to estimate pollutant loads using the Simple

Figure 30: The Simple Method - Basic Equations

The Simple Method estimates pollutant loads as the product of annual runoff volume and pollutant EMC, as:

$$(1)\ L = 0.226 * R * C * A$$

Where: L = Annual load (lbs), and:
R = Annual runoff (inches)
C = Pollutant concentration in stormwater, EMC (mg/l)
A = Area (acres)
0.226 = Unit conversion factor

For bacteria, the equation is slightly different, to account for the differences in units. The modified equation for bacteria is:

$$(2)\ L = 1.03 * 10^{-3} * R * C * A$$

Where: L = Annual load (Billion Colonies), and:
R = Annual runoff (inches)
C = Bacteria concentration (#/100 ml)
A = Area (acres)
$1.03 * 10^{-3}$ = Unit conversion factor

Annual Runoff

The Simple Method calculates the depth of annual runoff as a product of annual runoff volume and a runoff coefficient (Rv). Runoff volume is calculated as:

$$(3)\ R = P * P_j * Rv$$

Where: R = Annual runoff (inches), and:
P = Annual rainfall (inches)
P_j = Fraction of annual rainfall events that produce runoff (usually 0.9)
Rv = Runoff coefficient

In the Simple Method, the runoff coefficient is calculated based on IC in the subwatershed. The following equation represents the best fit line for the data set (N=47, R^2=0.71).

$$(4)\ Rv=0.05+0.9Ia$$

Where: Rv = runoff coefficient, and:
Ia = Impervious fraction

Method. It assumes that loads of stormwater pollutants are a direct function of watershed IC, as IC is the key independent variable in the equation.

The technique requires a modest amount of information, including the subwatershed drainage area, IC, stormwater runoff pollutant EMCs, and annual precipitation. With the Simple Method, the investigator can either divide up land use into specific areas (i.e. residential, commercial, industrial, and roadway) and calculate annual pollutant loads for each land use, or utilize a generic urban land use. Stormwater pollutant EMC data can be derived from the many summary tables of local, regional, or national monitoring efforts provided in this chapter (e.g., Tables 16, 18, 22, 28, 30, 35, 36, 40, and 44). The model also requires different IC values for separate land uses within a subwatershed. Representative IC data from Cappiella and Brown (2001) were provided in Table 2 (Chapter 1).

Additionally, the Simple Method should not be used to estimate annual pollutant loads of deicers, hydrocarbons and MTBE, because they have not been found to be correlated with IC. These pollutants have been linked to other indicators. Chlorides, hydrocarbons and MTBE are often associated with road density and vehicle miles traveled (VMT). Pesticides are associated with turf area, and traffic patterns and "hotspots" have been noted as potential indicators for hydrocarbons and MTBE.

Limitations of the Simple Method

The Simple Method should provide reasonable estimates of changes in pollutant export resulting from urban development. However, several caveats should be kept in mind when applying this method.

The Simple Method is most appropriate for assessing and comparing the relative stormflow pollutant load changes from different land uses and stormwater treatment scenarios. The Simple Method provides estimates of storm pollutant export that are probably close to the "true" but unknown value for a development site, catchment, or subwatershed. However, it is very important not to overemphasize the precision of the load estimate obtained. For example, it would be inappropriate to use the Simple Method to evaluate relatively similar development scenarios (e.g., 34.3% versus 36.9% IC). The Simple Method provides a general planning estimate of likely storm pollutant export from areas at the scale of a development site, catchment or subwatershed. More sophisticated modeling is needed to analyze larger and more complex watersheds.

In addition, the Simple Method only estimates pollutant loads generated during storm events. It does not consider pollutants associated with baseflow during dry weather. Typically, baseflow is negligible or non-existent at the scale of a single development site and can be safely neglected. However, catchments and subwatersheds do generate significant baseflow volume. Pollutant loads in baseflow are generally low and can seldom be distinguished from natural background levels (NVPDC, 1979).

Consequently, baseflow pollutant loads normally constitute only a small fraction of the total pollutant load delivered from an urban area. Nevertheless, it is important to remember that the load estimates refer only to storm event derived loads and should not be confused with the total pollutant load from an area. This is particularly important when the development density of an area is low. For example, in a low density residential subwatershed (IC < 5%), as much as 75% of the annual runoff volume could occur as baseflow. In such a case, annual baseflow load may be equivalent to the annual stormflow load.

4.4 Sediment

Sediment is an important and ubiquitous pollutant in urban stormwater runoff. Sediment can be measured in three distinct ways: Total Suspended Solids (TSS), Total Dissolved Solids (TDS) and turbidity. TSS is a measure of the total mass suspended sediment particles in water. The measurement of TSS in urban stormwater helps to estimate sediment load transported to local and downstream receiving waters. Table 22 summarizes stormwater EMCs for total suspended solids, as reported by Barrett *et al.* (1995), Smullen and Cave (1998), and USEPA (1983). TDS is a measure of the dissolved solids and minerals present in stormwater runoff and is used as a primary indication of the purity of drinking water. Since few stormwater monitoring efforts have focused on TDS, they are not reported in this document. Turbidity is a measure of how suspended solids present in water reduce the ability of light to penetrate the water column. Turbidity can exert impacts on aquatic biota, such as the ability of submerged aquatic vegetation to receive light and the ability of fish and aquatic insects to use their gills (Table 23).

4.4.1 Concentrations

TSS concentrations in stormwater across the country are well documented. Table 18 reviews mean TSS EMCs from 13 communities across the country and reveals a wide range of recorded concentrations. The lowest concentration of 43 mg/l was reported in Florida, while TSS reached 663 mg/l in Dallas, Texas. Variation in sediment concentrations has been attributed to regional rainfall differences (Driver, 1988); construction site runoff (Leopold, 1968); and bank erosion (Dartiguenave *et al.*, 1997). National values are provided in Table 22.

Turbidity levels are not as frequently reported in national and regional monitoring summaries. Barrett and Malina (1998) monitored turbidity at two sites in Austin, Texas and reported a mean turbidity of 53 NTU over 34 storm events (Table 22).

4.4.2 Impacts of Sediment on Streams

The impacts of sediment on aquatic biota are well documented and can be divided into impacts caused by suspended sediment and those caused by deposited sediments (Tables 23 and 24).

In general, high levels of TSS and/or turbidity can affect stream habitat and cause sedimentation in downstream receiving waters. Deposited sediment can cover benthic organisms such as aquatic insects and freshwater mussels. Other problems associated with high sediments loads include stream warming by reflecting radiant energy due to increased turbidity (Kundell and Rasmussen, 1995), decreased flow capacity (Leopold, 1973), and increasing overbank flows (Barrett and Malina, 1998). Sediments also transport other pollutants which bind to sediment particles. Significant levels of pollutants can be transported by sediment during stormwater runoff events,

Table 22: EMCs for Total Suspended Solids and Turbidity

Pollutant	EMCs		Number of Events	Source
	Mean	Median		
TSS (mg/l)	78.4	54.5	3047	Smullen and Cave, 1998
	174	113	2000	USEPA, 1983
Turbidity (NTU)	53	N/R	423	Barrett and Malina, 1998

N/R = Not Reported

Table 23: Summary of Impacts of Suspended Sediment on the Aquatic Environment (Schueler and Holland, 2000)
Abrades and damages fish gills, increasing risk of infection and disease
Scouring of periphyton from stream (plants attached to rocks)
Loss of sensitive or threatened fish species when turbidity exceeds 25 NTU
Shifts in fish community toward more sediment-tolerant species
Decline in sunfish, bass, chub and catfish when month turbidity exceeds 100 NTU
Reduces sight distance for trout, with reduction in feeding efficiency
Reduces light penetration causing reduction in plankton and aquatic plant growth
Adversely impacts aquatic insects, which are the base of the food chain
Slightly increases the stream temperature in the summer
Suspended sediments can be a major carrier of nutrients and metals
Reduces anglers chances of catching fish

Table 24: Summary of Impacts of Deposited Sediments on the Aquatic Environment (Schueler and Holland, 2000)
1. Physical smothering of benthic aquatic insect community
2. Reduced survival rates for fish eggs
3. Destruction of fish spawning areas and eggs
4. Embeddedness of stream bottom reduced fish and macroinvertebrate habitat value
5. Loss of trout habitat when fine sediments are deposited in spawning or riffle-runs
6. Sensitive or threatened darters and dace may be eliminated from fish community
7. Increase in sediment oxygen demand can deplete dissolved oxygen in streams
8. Significant contributing factor in the alarming decline of freshwater mussels
9. Reduced channel capacity, exacerbating downstream bank erosion and flooding
10. Reduced flood transport capacity under bridges and through culverts
11. Deposits diminish scenic and recreational values of waterways

including trace metals, hydrocarbons and nutrients (Crunkilton *et al.,* 1996; Dartiguenave *et al*., 1997; Gavin and Moore, 1982; Novotny and Chester, 1989; Schueler 1994b).

4.4.3 Sources and Source Areas of Sediment

Sediment sources in urban watersheds include stream bank erosion; erosion from exposed soils, such as from construction sites; and washoff from impervious areas (Table 25).

As noted in this chapter, streambank erosion is generally considered to be the primary source of sediment to urban streams. Recent studies by Dartiguenave *et al.* (1997) and Trimble (1997) determined that streambank erosion contributes the majority of the annual sediment budget of urban streams. Trimble (1997) directly measured stream cross sections, sediment aggradation and suspended sediment loads and determined that two-thirds of the annual sediment budget of a San Diego, California watershed was supplied by streambank erosion. Dartiguenave *et al.* (1997) developed a GIS based model in Austin, Texas to determine the effects of stream bank erosion on the annual sediment budget. They compared modeled sediment loads from the watershed with the actual sediment loads measured at USGS gaging stations and concluded that more than 75% of the sediment load came from streambank erosion. Dartiguenave *et al.* (1997) reported that sediment load per unit area increases with increasing IC (Figure 31).

Sediment loads are also produced by washoff of sediment particles from impervious areas and their subsequent transport in stormwater runoff sediment. Source areas include parking lots, streets, rooftops, driveways and lawns. Streets and parking lots build up dirt and grime from the wearing of the street surface, exhaust particulates, "blown on" soil and organic matter, and atmospheric deposition. Lawn runoff primarily contains soil and organic matter. Urban source areas that produce the highest TSS concentrations include streets, parking lots and lawns (Table 26).

Parking lots and streets are not only responsible for high concentrations of sediment but also high runoff volumes. The SLAMM source loading model (Pitt and Voorhees, 1989) looks at runoff volume and concentrations of pollutants from different urban land uses and predicts stream loading. When used in the Wisconsin and Michigan subwatersheds, it demonstrated that parking lots and streets were responsible for over 70% of the TSS delivered to the stream. (Steuer *et al*., 1997; Waschbusch *et al.*, 2000).

Table 25: Sources and Loading of Suspended Solids Sediment in Urban Areas

Sources	Loading	Source
Bank Erosion	75% of stream sediment budget	Dartinguenave *et al.*, 1997
	66% of stream sediment budget	Trimble, 1997
Overland Flow- Lawns	397 mg/l (geometric mean)	Bannerman *et al.*, 1993
	262 mg/l	Steuer *et al.*, 1997
	11.5% (estimated; 2 sites)	Waschbusch *et al.*, 2000
Construction Sites	200 to 1200 mg/l	Table 27
Washoff from Impervious Surfaces	78 mg/l (mean)	Table 16

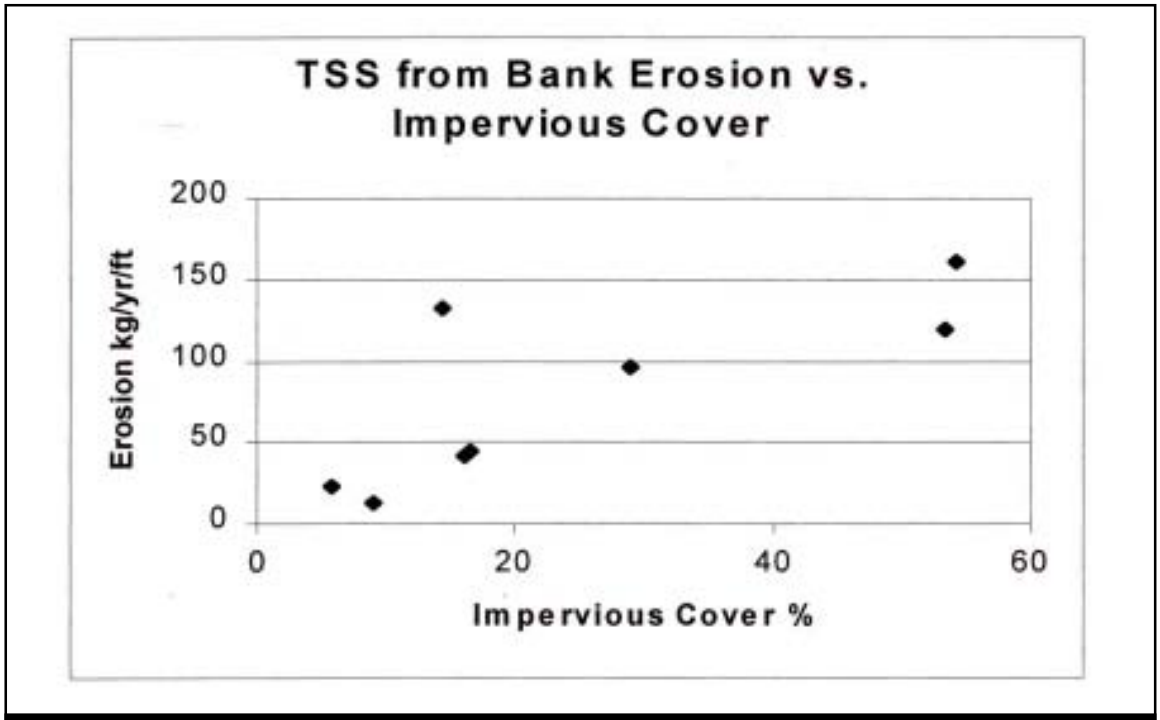

Figure 31: TSS from Bank Erosion vs. IC in Texas Streams (Daringuenave *et al.*, 1997)

The third major source of sediment loads is erosion from construction sites. Several studies have reported extremely high TSS concentrations in construction site runoff, and these findings are summarized in Table 27. TSS concentrations from uncontrolled construction sites can be more than 150 times greater than those from undeveloped land (Leopold, 1968) and can be reduced if erosion and sediment control practices are applied to construction sites.

Table 26: Source Area Geometric Mean Concentrations for Suspended Solids in Urban Areas

Source Area	Suspended Solids (mg/l)		
Source	(1)	(2)	(3)
Commercial Parking Lot	110	58	51
High Traffic Street	226	232	65
Medium Traffic Street	305	326	51
Low Traffic Street	175	662	68
Commercial Rooftop	24	15	18
Residential Rooftop	36	27	15
Residential Driveway	157	173	N/R
Residential Lawn	262	397	59

Sources: (1) Steuer et al., 1997; (2) Bannerman et al., 1993; (3) Waschbusch et al., 2000; N/R = Not Reported

Table 27: Mean TSS Inflow and Outflow at Uncontrolled, Controlled and Simulated Construction Sites

Source	Mean Inflow TSS Concentration (mg/l)	Mean Outflow TSS Concentration (mg/l)	Location
Uncontrolled Sites			
Horner *et al.*, 1990	7,363	281	PNW
Schueler and Lugbill,1990	3,646	501	MD
York and Herb, 1978	4,200	N/R	MD
Islam *et al.*, 1988	2,950	N/R	OH
Controlled Sites			
Schueler and Lugbill, 1990	466	212	MD
Simulated Sediment Concentrations			
Jarrett, 1996	9,700	800	PA
Sturm and Kirby, 1991	1,500-4,500	200-1,000	GA
Barfield and Clar, 1985	1,000-5,000	200-1,200	MD
Dartiguenave *et al.*, 1997	N/R	600	TX

N/R = Not Reported

4.5 Nutrients

Nitrogen and phosphorus are essential nutrients for aquatic systems. However, when they appear in excess concentrations, they can exert a negative impact on receiving waters. Nutrient concentrations are reported in several ways. Nitrogen is often reported as nitrate (NO_3) and nitrite (NO_2), which are inorganic forms of nitrogen; total nitrogen (Total N), which is the sum of nitrate, nitrite, organic nitrogen and ammonia; and total Kjeldhal nitrogen (TKN), which is organic nitrogen plus ammonia.

Phosphates are frequently reported as soluble phosphorus, which is the dissolved and reactive form of phosphorus that is available for uptake by plants and animals. Total phosphorus (Total P) is also measured, which includes both organic and inorganic forms of phosphorus. Organic phosphorus is derived from living plants and animals, while inorganic phosphate is comprised of phosphate ions that are often bound to sediments.

4.5.1 Concentrations

Many studies have indicated that nutrient concentrations are linked to land use type, with urban and agricultural watersheds producing the highest nutrient loads (Chessman *et al.* 1992; Paul *et al.*, 2001; USGS, 2001b and Wernick *et al.*,1998). Typical nitrogen and phosphorus EMC data in urban stormwater runoff are summarized in Table 28.

Some indication of the typical concentrations of nitrate and phosphorus in stormwater runoff are evident in Figures 32 and 33. These graphs profile average EMCs in stormwater runoff recorded at 37 residential catchments across the U.S. The average nitrate EMC is remarkably consistent among residential neighborhoods, with most clustered around the mean of 0.6 mg/l and a range of 0.25 to 1.4 mg/l. The concentration of phosphorus during storms is also very consistent with a mean of 0.30 mg/l and a rather tight range of 0.1 to 0.66 mg/l (Schueler, 1995).

The amount of annual rainfall can also influence the magnitude of nutrient concentrations in stormwater runoff. For example, both Caraco (2000a) and Driver (1988) reported that the highest nutrient EMCs were found in stormwater from arid or semi-arid regions.

Table 28: EMCs of Phosphorus and Nitrogen Urban Stormwater Pollutants

Pollutant	EMCs (mg/l)		Number of Events	Source
	Mean	Median		
Total P	0.315	0.259	3094	Smullen and Cave, 1998
	0.337	0.266	1902	USEPA, 1983
Soluble P	0.129	0.103	1091	Smullen and Cave, 1998
	0.1	0.078	767	USEPA, 1983
Total N	2.39	2.00	2016	Smullen and Cave, 1998
	2.51	2.08	1234	USEPA, 1983
TKN	1.73	1.47	2693	Smullen and Cave, 1998
	1.67	1.41	1601	USEPA, 1983
Nitrite & Nitrate	0.658	0.533	2016	Smullen and Cave, 1998
	0.837	0.666	1234	USEPA, 1983

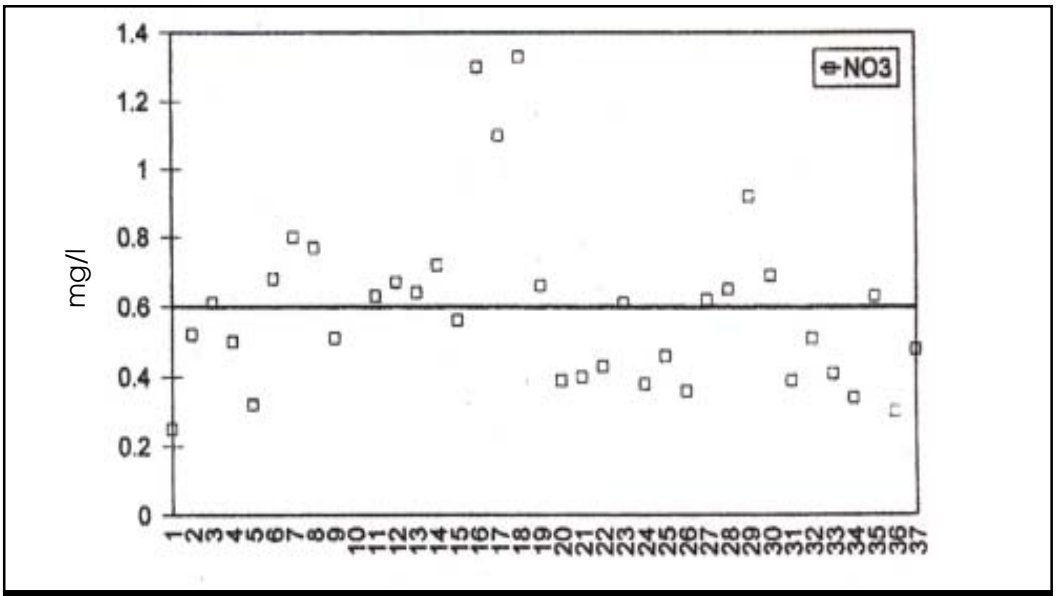

Figure 32: Nitrate-Nitrogen Concentration in Stormwater Runoff at 37 Sites Nationally (Schueler, 1999)

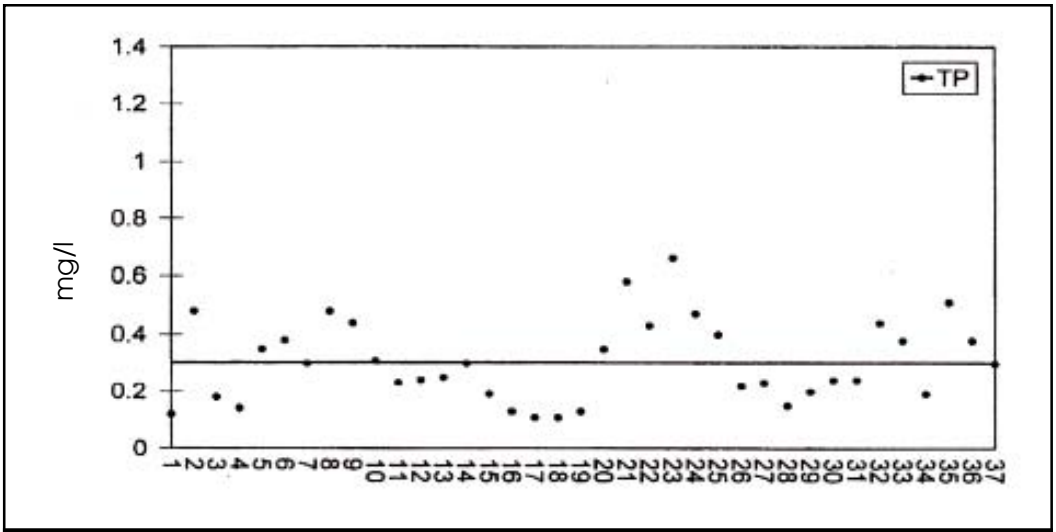

Figure 33: Total Phosphorus Concentration in Stormwater at 37 Sites Nationally (Schueler, 1999)

4.5.2 Impacts of Nutrients on Streams

Much research on the impact of nutrient loads has been focused on lakes, reservoirs and estuaries, which can experience eutrophication. Nitrogen and phosphorus can contribute to algae growth and eutrophic conditions, depending on which nutrient limits growth (USEPA, 1998). Dissolved oxygen is also affected by eutrophication. When algae or aquatic plants that are stimulated by excess nutrients die off, they are broken down by bacteria, which depletes the oxygen in the water. Relatively few studies have specifically explored the impact of nutrient enrichment on urban streams. Chessman *et al*. (1992) studied the limiting nutrients for periphyton growth in a variety of streams and noted that the severity of eutrophication was related to low flow conditions. Higher flow rates in streams may cycle nutrients faster than in slow flow rates, thus diminishing the extent of stream eutrophication.

4.5.3 Sources and Source Areas of Nutrients

Phosphorus is normally transported in surface water attached to sediment particles or in soluble forms. Nitrogen is normally transported by surface water runoff in urban watersheds. Sources for nitrogen and phosphorus in urban stormwater include fertilizer, pet waste, organic matter (such as leaves and detritus), and stream bank erosion. Another significant source of nutrients is atmospheric deposition. Fossil fuel combustion by automobiles, power plants and industry can supply nutrients in both wet fall and dry fall. The Metropolitan Washington Council of Governments (MWCOG, 1983) estimated total annual atmospheric deposition rates of 17 lbs/ac for nitrogen and 0.7 lbs/ac for phosphorus in the Washington, D.C. metro area.

Research from the upper Midwest suggests "hot spot" sources can exist for both nitrogen and phosphorus in urban watersheds. Lawns, in particular, contribute greater concentrations of Total N, Total P and dissolved phosphorus than other urban source areas. Indeed, source research suggests that nutrient concentrations in lawn runoff can be as much as four times greater than other urban sources such as streets, rooftops or driveways (Bannerman *et al.*, 1993; Steuer *et al.*, 1997 and Waschbusch *et al.*, 2000) (Table 29). This finding is significant, since lawns can comprise more than 50% of the total area in suburban watersheds. Lawn care, however, has seldom been directly linked to elevated nutrient concentrations during storms. A very recent lakeshore study noted that phosphorus concentrations were higher in fertilized lawns compared to unfertilized lawns, but no significant difference was noted for nitrogen (Garn, 2002).

Wash-off of deposited nutrients from IC is thought to be a major source of nitrogen and phosphorus during storms (MWCOG, 1983). While the concentration of nitrogen and phosphorus from parking lots and streets is lower than lawns, the volume of runoff is significantly higher. In two studies using the SLAMM source loading model (Pitt and Voorhees, 1989), parking lots and streets were responsible for over 30% of the nitrogen and were second behind lawns in their contributions to the phosphorus load (Steuer *et al.*, 1997; Waschbusch *et al.*, 2000).

Table 29: Source Area Monitoring Data for Total Nitrogen and Total Phosphorous in Urban Areas

Source Area	Total N (mg/l)	Total P (mg/l)		
Source	(1)	(1)	(2)	(3)
Commercial Parking Lot	1.94	0.20	N/R	0.10
High Traffic Street	2.95	0.31	0.47	0.18
Med. Traffic Street	1.62	0.23	1.07	0.22
Low Traffic Street	1.17	0.14	1.31	0.40
Commercial Rooftop	2.09	0.09	0.20	0.13
Residential Rooftop	1.46	0.06	0.15	0.07
Residential Driveway	2.10	0.35	1.16	N/R
Residential Lawn	9.70	2.33	2.67	0.79
Basin Outlet	1.87	0.29	0.66	N/R

(1) Steuer et al., 1997; (2) Bannerman et al., 1993; (3) Waschbusch et al., 2000; N/R= Not Reported

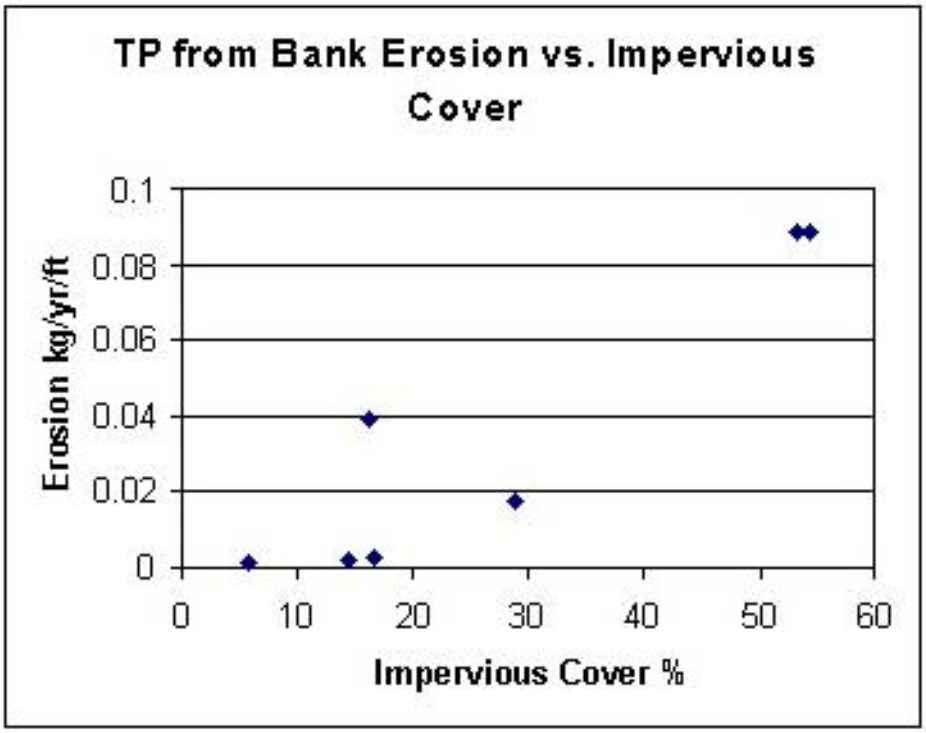

Figure 34: Total Phosphorus from Bank Erosion as a Function of IC in Texas Streams (Dartiguenave *et al.*, 1997)

Streambank erosion also appears to be a major source of nitrogen and phosphorus in urban streams. Both nitrogen and phosphorus are often attached to eroded bank sediment, as indicated in a recent study by Dartiguenave *et al.* (1997) in Austin, Texas. They showed that channel erosion contributed nearly 50% of the Total P load shown for subwatersheds with IC levels between 10 and 60 % (Figure 34). These findings suggest that prevention or reduction of downstream channel erosion may be an important nutrient reduction strategy for urban watersheds.

Snowmelt runoff generally has higher nutrient EMCs, compared to stormwater runoff. Oberts (1994) found that TKN and nitrate EMCs were much higher in snowmelt at all sites. The same pattern has also been observed for phosphorus EMCs during snowmelt and stormwater runoff. Zapf-Gilje *et al*. (1986) found that the first 20% of snowmelt events contained 65% of the phosphorus and 90% of the nitrogen load. Ayers *et al.* (1985) reported that a higher percentage of the annual nitrate, TKN and phosphorus load was derived from snowmelt runoff compared to stormwater runoff in an urban Minnesota watershed, which presumably reflects the accumulation of nutrients in the snowpack during the winter.

4.6 Trace Metals

Many trace metals can be found at potentially harmful concentrations in urban stormwater. Certain metals, such as zinc, copper, lead, cadmium and chromium, are consistently present at concentrations that may be of concern. These metals primarily result from the use of motor vehicles, weathering of metals and paints, burning of fossil fuels and atmospheric deposition.

Metals are routinely reported as the total recoverable form or the dissolved form. The dissolved form refers to the amount of metal dissolved in the water, which excludes metals attached to suspended particles that cannot pass through a 0.45 micron filter. Total recoverable refers to the concentration of an unfiltered sample that is treated with hot dilute mineral acid. In general, the toxicity of metals is related more to the dissolved form than the recoverable form.

4.6.1 Concentrations

Stormwater EMCs for zinc, copper, lead, cadmium and chromium vary regionally and are reviewed in Table 30. Regional differences in trace metal concentrations and water quality standard exceedence appears to be related to climate. In general, drier regions often have a

Table 30: EMCs and Detection Frequency for Metals in Urban Stormwater

Metal	Detection Frequency(1)	EMCs (Fg/l)		Number of Events	Source
		Mean	Median		
Zinc	94%	162	129	2234	Smullen and Cave, 1998
		176	140	1281	USEPA, 1983
Copper	91%	13.5	11.1	1657	Smullen and Cave, 1998
		66.6	54.8	849	USEPA, 1983
Lead	94%	67.5	50.7	2713	Smullen and Cave, 1998
		175(2)	131 (2)	1579	USEPA, 1983
Cadmium	48%	0.7	N/R	150	USEPA, 1983
		0.5	N/R	100	USEPA, 1993
		N/R	0.75 **R** 0.96 **C** 2.1 **I**	30	Baird *et al.*, 1996
		3 **I** 1**U**	N/R	9	Doerfer and Urbonas, 1993
Chromium	58%	4	N/R	32	Baird *et al.*, 1996
		N/R	2.1 **R** 10 **C** 7 **I**	30	Baird *et al.*, 1996
		N/R	7	164	Bannerman *et al.*, 1993

N/R = Not Reported; R- Residential, C- Commercial, I- Industrial; (1) as reprinted in USEPA, 1983; (2) Lead levels have declined over time with the introduction of unleaded gasoline

Table 31: Average Total Recoverable and Dissolved Metals for 13 Stormwater Flows and Nine Baseflow Samples from Lincoln Creek in 1994 (Crunkilton *et al.*, 1996)

	Total Recoverable		Dissolved	
Metal (Fg/l)	Storm Flow	Baseflow	Storm Flow	Baseflow
Lead	35	3	1.7	1.2
Zinc	133	22	13	8
Copper	23	7	5	4
Cadmium	0.6	0.1	0.1	0.1

higher risk of exceeding trace metal concentration standards.

Crunkilton *et al.* (1996) measured recoverable and dissolved metals concentrations in Lincoln Creek, Wisconsin and found higher EMCs during storm events compared to baseflow periods (Table 31). They also found that total recoverable metal concentrations were almost always higher than the dissolved concentration (which is the more available form).

4.6.2 Impacts of Trace Metals on Streams

Although a great deal is known about the concentration of metals in urban stormwater, much less is known about their possible toxicity on aquatic biota. The primary concern related to the presence of trace metals in streams is their potential toxicity to aquatic organisms. High concentrations can lead to bioaccumulation of metals in plants and animals, possible chronic or acute toxicity, and contamination of sediments, which can affect bottom dwelling organisms (Masterson and Bannerman, 1994). Generally, trace metal concentrations found in urban stormwater are not high enough to cause acute toxicity (Field and Pitt, 1990). The cumulative accumulation of trace metal concentrations in bottom sediments and animal tissues are of greater concern. Some evidence exists for trace metal accumulation in bottom sediments of receiving waters and for bioaccumulation in aquatic species (Bay and Brown, 2000 and Livingston, 1996).

Relatively few studies have examined the chronic toxicity issue. Crunkilton *et al.* (1996) found that concentrations of lead, zinc and copper exceeded EPA's Chronic Toxicity Criteria more than 75% of the time in stormflow in stormwater samples for Lincoln Creek in Wisconsin. When exposed to storm and base flows in Lincoln Creek, *Ceriodaphnia dubia*, a common invertebrate test species, demonstrated significant mortality in extended flow-through tests. Around 30% mortality was recorded after seven days of exposure and 70% mortality was recorded after 14 days.

Crunkilton *et al.* (1996) also found that significant mortality in bullhead minnows occurred in only 14% of the tests by the end of 14 days, but mortality increased to 100% during exposures of 17 to 61 days (see Table 32). In a related study in the same watershed, Masterson and Bannerman (1994) determined that crayfish in Lincoln Creek had elevated levels of lead, cadmium, chromium and copper when compared to crayfish from a reference stream. The Lincoln Creek research provides limited evidence that prolonged exposure to trace metals in urban streams may result in significant toxicity.

Most toxicity research conducted on urban stormwater has tested for acute toxicity over a short period of time (two to seven days). Shorter term whole effluent toxicity protocols are generally limited to seven days (Crunkilton *et al.*, 1996). Research by Ellis (1986) reported delayed toxicity in urban streams. Field and Pitt (1990) demonstrated that pollutants deposited to the stream during storm events

may take upwards of 10 to 14 days to exert influence. The research suggests that longer term in-situ and flow-through monitoring are needed to definitively answer the question whether metal levels in stormwater can be chronically toxic.

An additional concern is that trace metals co-occur with other pollutants found in urban stormwater, and it is not clear whether they interact to increase or decrease potential toxicity. Hall and Anderson (1988) investigated the toxicity and chemical composition of urban stormwater runoff in British Columbia and found that the interaction of pollutants changed the toxicity of some metals. In laboratory analysis with *Daphnia pulex*, an aquatic invertebrate, they found that the toxicity of iron was low and that its presence reduced the toxicity of other metals. On the other hand, the presence of lead increased the toxicity of copper and zinc.

Interaction with sediment also influences the impact of metals. Often, over half of the trace metals are attached to sediment (MWCOG, 1983). This effectively removes the metals from the water column and reduces the availability for biological uptake and subsequent bioaccumulation (Gavin and Moore, 1982 and OWML, 1983). However, metals accumulated in bottom sediment can then be resuspended during storms (Heaney and Huber, 1978). It is important to note that the toxic effect of metals can be altered when found in conjunction with other substances. For instance, the presence of chlorides can increase the toxicity of some metals. Both metals and chlorides are common pollutants in snowpacks (see section 4.2 for more snow melt information).

4.6.3 Sources and Source Areas of Trace Metals

Research conducted in the Santa Clara Valley of California suggests that cars can be the dominant loading source for many metals of concern, such as cadmium, chromium, copper, lead, mercury and zinc (EOA, Inc., 2001). Other sources are also important and include atmospheric deposition, rooftops and runoff from industrial and residential sites.

The sources and source areas for zinc, copper, lead, chromium and cadmium are listed in Table 33. Source areas for trace metals in the urban environment include streets, parking lots, snowpacks and rooftops. Copper is often found in higher concentrations on urban streets, because some vehicles have brake pads that contain copper. For example, the Santa Clara study estimated that 50% of the total copper load was due to brake pad wear (Woodward-Clyde, 1992). Sources of lead include atmospheric deposition and diesel fuel emissions, which frequently occur along rooftops

Table 32: Percentage of In-situ Flow-through Toxicity Tests Using Daphnia *magna* and Pimephales *promelas* with Significant Toxic Effects from Lincoln Creek (Crunkilton *et al.*, 1996)

Species	Effect	Percent of Tests with Significant ($p<0.05$) Toxic Effects as Compared to Controls According to Exposure				
		48 hours	96 hours	7 days	14 days	17-61 days
D. *magna*	Mortality	0	N/R	36%	93%	N/R
	Reduced Reproduction	0	N/R	36%	93%	N/R
P. *promelas*	Mortality	N/R	0	0	14%	100%
	Reduced Biomass	N/R	N/R	60%	75%	N/R

N/R = Not Reported

and streets. Zinc in urban environments is a result of the wear of automobile tires (estimated 60% in the Santa Clara study), paints, and weathering of galvanized gutters and downspouts. Source area concentrations of trace metals are presented in Table 34. In general, trace metal concentrations vary considerably, but the relative rank among source areas remains relatively constant. For example, a source loading model developed for an urban watershed in Michigan estimated that parking lots, driveways and residential streets were the primary source areas for zinc, copper and cadmium loads (Steuer *et al.*, 1997).

Table 33: Metal Sources and Source Area "Hotspots" in Urban Areas

Metal	Sources	Source Area Hotspots
Zinc	tires, fuel combustion, galvanized pipes, roofs and gutters, road salts **estimate of 60% from tires*	parking lots, commercial and industrial rooftops, and streets
Copper	auto brake linings, pipes and fittings, algacides, and electroplating **estimate of 50% from brake pad wear*	parking lots, commercial roofs and streets
Lead	diesel fuel, paints and stains	parking lots, rooftops, and streets
Cadmium	component of motor oil and corrodes from alloys and plated surfaces	parking lots, rooftops, and streets
Chromium	found in exterior paints and corrodes from alloys and plated surfaces	most frequently found in industrial and commercial runoff

Sources: Bannerman et al., 1993; Barr, 1997; Steuer et al., 1997; Good, 1993; Woodward - Clyde, 1992

Table 34: Metal Source Area Concentrations in the Urban Landscape (Fg/l)

Source Area	Dissolved Zinc	Total Zinc	Dissolved Copper		Total Copper	Dissolved Lead		Total Lead		
Source	(1)	(2)	(1)	(2)	(2)	(1)	(3)	(1)	(3)	(2)
Commercial Parking Lot	64	178	10.7	9	15	N/R	N/R	40	N/R	22
High Traffic Street	73	508	11.2	18	46	2.1	1.7	37	25	50
Medium Traffic Street	44	339	7.3	24	56	1.5	1.9	29	46	55
Low Traffic Street	24	220	7.5	9	24	1.5	.5	21	10	33
Commercial Rooftop	263	330	17.8	6	9	20	N/R	48	N/R	9
Residential Rooftop	188	149	6.6	10	15	4.4	N/R	25	N/R	21
Residential Driveway	27	107	11.8	9	17	2.3	N/R	52	N/R	17
Residential Lawn	N/R	59	N/R	13	13	N/R	N/R	N/R	N/R	N/R
Basin Outlet	23	203	7.0	5	16	2.4	N/R	49	N/R	32

Sources: (1) Steuer et al., 1997; (2) Bannerman et al., 1993; (3) Waschbusch, 2000; N/R = Not Reported

4.7 Hydrocarbons: PAH, Oil and Grease

Hydrocarbons are petroleum-based substances and are found frequently in urban stormwater. The term "hydrocarbons" is used to refer to measurements of oil and grease and polycyclic-aromatic hydrocarbons (PAH). Certain components of hydrocarbons, such as pyrene and benzo[b]fluoranthene, are carcinogens and may be toxic to biota (Menzie-Cura , 1995). Hydrocarbons normally travel attached to sediment or organic carbon. Like many pollutants, hydrocarbons accumulate in bottom sediments of receiving waters, such as urban lakes and estuaries. Relatively few studies have directly researched the impact of hydrocarbons on streams.

4.7.1 Concentrations

Table 35 summarizes reported EMCs of PAH and oil and grease derived from storm event monitoring at three different areas of the U.S. The limited research on oil and grease concentrations in urban runoff indicated that the highest concentrations were consistently found in commercial areas, while the lowest were found in residential areas.

4.7.2 Impacts of Hydrocarbons on Streams

The primary concern of PAH and oil and grease on streams is their potential bioaccumulation and toxicity in aquatic organisms. Bioaccumulation in crayfish, clams and fish has been reported by Masterson and Bannerman (1994); Moring and Rose (1997); and Velinsky and Cummins (1994).

Table 35: Hydrocarbon EMCs in Urban Areas

Hydrocarbon Indicator	EMC Mean	Number of Events	Source	Location
PAH (Fg/l)	3.2*	12	Menzie-Cura, 1995	MA
	7.1	19	Menzie-Cura, 1995	MA
	13.4	N/R	Crunkilton *et al.*, 1996	WI
Oil and Grease (mg/l)	1.7 **R** 9 **C** 3 **I**	30	Baird *et al.*, 1996	TX
	3	N/R	USEPA, 1983	U.S.
	5.4*	8	Menzie-Cura, 1995	MA
	3.5	10	Menzie-Cura, 1995	MA
	3.89 **R** 13.13 **C** 7.10 **I**	N/R	Silverman *et al.*, 1988	CA
	2.35 **R** 5.63 **C** 4.86 **I**	107	Barr, 1997	MD

*N/R = Not Reported; R = Residential, C = Commercial, I = Industrial; * = geometric mean, ** = median*

Moring and Rose (1997) also showed that not all PAH compounds accumulate equally in urban streams. They detected 24 different PAH compounds in semi-permeable membrane devices (SPMDs), but only three PAH compounds were detected in freshwater clam tissue. In addition, PAH levels in the SPMDs were significantly higher than those reported in the clams.

While acute PAH toxicity has been reported at extremely high concentrations (Ireland *et al.*, 1996), delayed toxicity has also been found (Ellis, 1986). Crayfish from Lincoln Creek had a PAH concentration of 360 Fg/kg, much higher than the concentration thought to be carcinogenic (Masterson and Bannerman, 1994). By comparison, crayfish in a non-urban stream had undetectable PAH levels. Toxic effects from PAH compounds may be limited since many are attached to sediment and may be less available, with further reduction occurring through photodegradation (Ireland *et al.,* 1996).

The metabolic effect of PAH compounds on aquatic life is unclear. Crunkilton *et al.* (1996) found potential metabolic costs to organisms, but Masterson and Bannerman (1994) and MacCoy and Black (1998) did not. The long-term effect of PAH compounds in sediments of receiving waters remains a question for further study.

4.7.3 Sources and Source Areas of Hydrocarbons

In most residential stormwater runoff, hydrocarbon concentrations are generally less than 5mg/l, but the concentrations can increase to five to 10 mg/l within some commercial, industrial and highway areas (See Table 35). Specific "hotspots" for hydrocarbons include gas stations, commuter parking lots, convenience stores, residential parking areas and streets (Schueler and Shepp, 1993). These authors evaluated hydrocarbon concentrations within oil and grease separators in the Washington Metropolitan area and determined that gas stations had significantly higher concentrations of hydrocarbons and trace metals, as compared to other urban source areas. Source area research in an urban catchment in Michigan showed that commercial parking lots contributed 64% of the total hydrocarbon load (Steuer *et al.*, 1997). In addition, highways were found to be a significant contributor of hydrocarbons by Lopes and Dionne (1998).

4.8 Bacteria and Pathogens

Bacteria are single celled organisms that are too small to see with the naked eye. Of particular interest are coliform bacteria, typically found within the digestive system of warm-blooded animals. The coliform family of bacteria includes fecal coliform, fecal streptococci and Escherichia coli, which are consistently found in urban stormwater runoff. Their presence confirms the existence of sewage or animal wastes in the water and indicates that other harmful bacteria, viruses or protozoans may be present, as well. Coliform bacteria are indicators of potential public health risks and not actual causes of disease.

A pathogen is a microbe that is actually known to cause disease under the right conditions. Two of the most common waterborne pathogens in the U.S. are the protozoans *Cryptosporidium parvum* and *Giardia lambia*. *Cryptosporidium* is a waterborne intestinal parasite that infects cattle and domestic animals and can be transmitted to humans, causing life-threatening problems in people with impaired immune systems (Xiao *et al.*, 2001). *Giardia* can cause intestinal problems in humans and animals when ingested (Bagley *et al.,* 1998). To infect new hosts, protozoans create hard casings known as oocysts (*Cryptosporidium*) or cysts (*Giardia*) that are shed in feces and travel through surface waters in search of a new host.

4.8.1 Concentrations

Concentrations of fecal coliform bacteria in urban stormwater typically exceed the 200 MPN/100 ml threshold set for human contact recreation (USGS, 2001b). Bacteria concentrations also tend to be highly variable from storm to storm. For example, a national summary of fecal coliform bacteria in stormwater runoff is shown in Figure 35 and Table 36. The variability in fecal coliform ranges from 10 to 500,000 MPN/100ml with a mean of 15,038 MPN/100ml (Schueler, 1999). Another national database of more than 1,600 stormwater events computed a mean concentration of 20,000

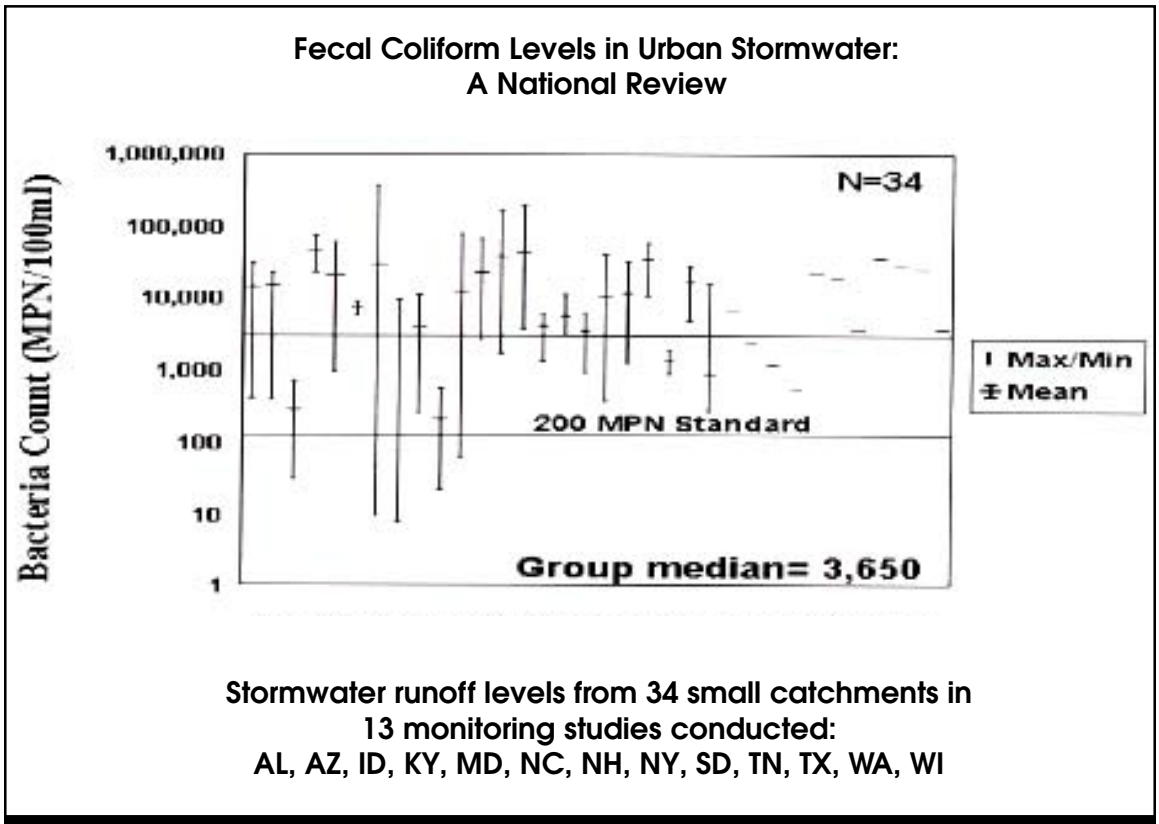

Figure 35: Fecal Coliform Levels in Urban Stormwater (Schueler, 1999)

Table 36: Bacteria EMCs in Urban Areas

Bacteria Type	EMCs (MPN/100ml) Mean	Number of Events	Source	Location
Fecal Coliform	15,038	34	Schueler, 1999	U.S.
	20,000	1600	Pitt, 1998	U.S.
	7,653	27	Thomas and McClelland, 1995	GA
	20,000 **R*** 6900 **C** 9700 **I**	30*	Baird *et al.*, 1996	TX
	77,970	21 watersheds	Chang *et al.*, 1990	TX
	4,500	189	Varner, 1995	WA
	23,500	3	Young and Thackston, 1999	TN
Fecal Strep	35,351	17	Schueler, 1999	U.S.
	28,864 **R**	27	Thomas and McClelland, 1995	GA
	56,000 **R** * 18,000 **C** 6,100 **I**	30*	Baird *et al.*, 1996	TX

*N/R = Not Reported, R = Residential Area, C = Commercial Area, I = Industrial Area, * = Median*

MPN/100ml for fecal coliform (Pitt, 1998). Fecal streptococci concentrations for 17 urban sites across the country had a mean of 35,351 MPN/100ml (Schueler, 1999).

Young and Thackston (1999) showed that bacteria concentrations at four sites in metro Nashville were directly related to watershed IC. Increasing IC reflects the cumulative increase in potential bacteria sources in the urban landscape, such as failing septic systems, sewage overflows, dogs, and inappropriate discharges. Other studies show that concentrations of bacteria are typically higher in urban areas than rural areas (USGS, 1999a), but they are not always directly related to IC. For example, Hydroqual (1996) found that concentrations of fecal coliform in seven subwatersheds of the Kensico watershed in New York were generally higher for more developed basins, but fecal coliform concentrations did not directly increase with IC in the developed basins (Figure 36).

There is some evidence that higher concentrations of coliform are found in arid or semi-arid watersheds. Monitoring data from semi-arid regions in Austin, San Antonio, and Corpus Christi, Texas averaged 61,000, 37,500 and 40,500 MPN/100ml, respectively (Baird *et al.*,1996 and Chang *et al.* 1990). Schiff (1996), in a report of Southern California NPDES monitoring, found that median concentrations of fecal coliform in San Diego were 50,000 MPN/100ml and averaged 130,000 MPN/100ml in Los Angeles. In all of these arid and semi-arid regions, concentrations were significantly higher than the national average of 15,000 to 20,000 MPN/100ml.

Concentrations of *Cryptosporidium* and *Giardia* in urban stormwater are shown in Table 37. States *et al.* (1997) found high concentrations of *Cryptosporidium* and *Giardia* in storm samples from a combined sewer in Pittsburgh (geometric mean 2,013 oocysts/100ml and 28,881 cysts/100ml). There is evidence that urban stormwater runoff may have higher concentrations of *Cryptosporidium* and *Giardia* than other surface waters, as reported in Table 38 (Stern, 1996). Both pathogens were detected in about 50% of urban stormwater samples, suggesting some concern for drinking water supplies.

4.8.2 Impacts of Bacteria and Pathogens on Streams

Fecal coliform bacteria indicate the potential for harmful bacteria, viruses, or protozoans and are used by health authorities to determine public health risks. These standards were established to protect human health based on exposures to water during recreation and drinking. Bacteria standards for various water uses are presented in Table 39 and are all easily exceeded by typical urban stormwater concentrations. In fact, over 80,000 miles of streams and rivers are currently in non-attain-

Table 37: *Cryptosporidium* and *Giardia* EMCs

Pathogens	Units	EMCs		Number of Events	Source
		Mean	Median		
Cryptosporidium	oocysts	37.2	3.9	78	Stern, 1996
	oocysts/100ml	2013	N/R	N/R	States *et al.*, 1997
Giardia	cysts	41.0	6.4	78	Stern, 1996
	cysts/100ml	28,881	N/R	N/R	States *et al.*, 1997

N/R= Not reported

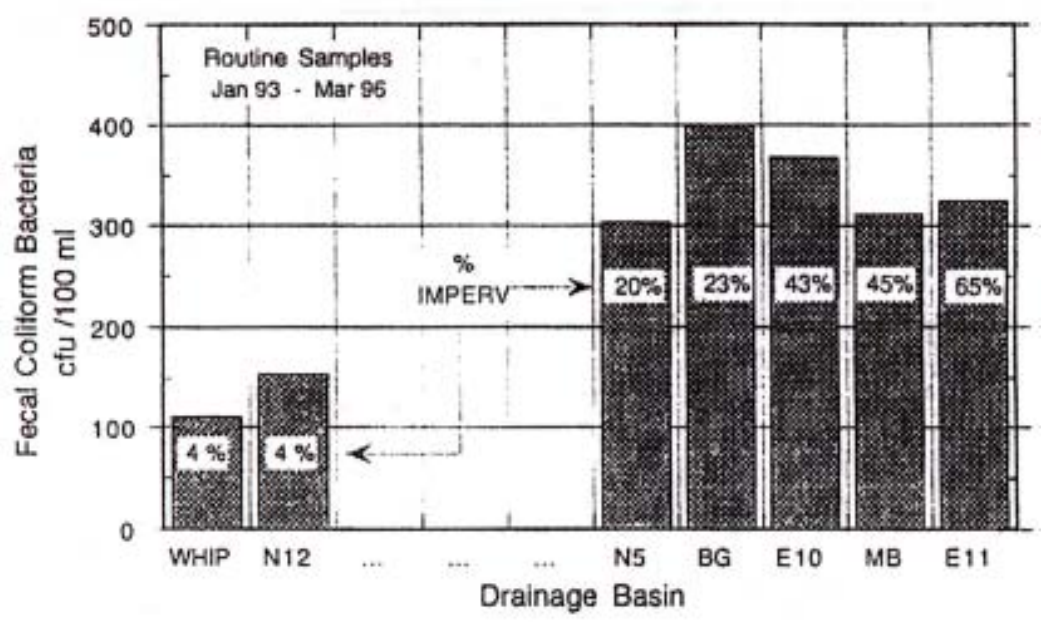

Figure 36: Relationship Between IC and Fecal Coliform Concentrations in New York Streams (Hydroqual, 1996)

Table 38: Percent Detection of *Giardia* cysts and *Cryptosporidium* oocysts in Subwatersheds and Wastewater Treatment Plant Effluent in the New York City Water Supply Watersheds (Stern, 1996)

Source Water Sampled	Number of Sources/ Number of Samples	Percent Detection			
		Total *Giardia*	Confirmed *Giardia*	Total *Cryptosporidium*	Confirmed *Cryptosporidium*
Wastewater Effluent	8/147	41.5%	12.9%	15.7%	5.4%
Urban Subwatershed	5/78	41.0%	6.4%	37.2%	3.9%
Agricultural Subwatershed	5/56	30.4%	3.6%	32.1%	3.6%
Undisturbed Subwatershed	5/73	26.0%	0.0%	9.6%	1.4%

Table 39: Typical Coliform Standards for Different Water Uses (USEPA, 1998)

Water Use	Microbial Indicator	Typical Water Standard
Water Contact Recreation	Fecal Coliform	<200 MPN per 100ml
Drinking Water Supply	Fecal Coliform	<20 MPN per 100ml
Shellfish Harvesting	Fecal Coliform	<14 MPN/ 100ml
Treated Drinking Water	Total Coliform	No more than 1% coliform positive samples per month
Freshwater Swimming	E.Coli	<126 MPN per 100ml

Important Note: Individual state standards may employ different sampling methods, indicators, averaging periods, averaging methods, instantaneous maximums and seasonal limits. MPN = most probable number. Higher or lower limits may be prescribed for different water use classes.

ment status because of high fecal coliform levels (USEPA, 1998).

4.8.3 Sources and Source Areas of Bacteria and Pathogens

Sources of coliform bacteria include waste from humans and wildlife, including livestock and pets. Essentially, any warm-blooded species that is present in significant numbers in a watershed is a potential culprit. Source identification studies, using methods such as DNA fingerprinting, have put the blame on species such as rats in urban areas, ducks and geese in stormwater ponds, livestock from hobby farms, dogs and even raccoons (Blankenship, 1996; Lim and Olivieri, 1982; Pitt, 1998; Samadpour and Checkowitz, 1998).

Transport of bacteria takes place through direct surface runoff, direct inputs to receiving waters, or indirect secondary sources. Source areas in the urban environment for direct runoff include lawns and turf, driveways, parking lots and streets. For example, dogs have high concentrations of fecal coliform in their feces and have a tendency to defecate in close proximity to IC (Schueler, 1999). Weiskel *et al.* (1996) found that direct inputs of fecal coliform from waterfowl can be very

important; these inputs accounted for as much as 67% of the annual coliform load to Buttermilk Bay, Massachusetts.

Indirect sources of bacteria include leaking septic systems, illicit discharges, sanitary sewer overflows (SSOs), and combined sewer overflows (CSOs). These sources have the potential to deliver high coliform concentrations to urban streams. In fact, extremely high bacteria concentrations are usually associated with wastewater discharges. CSOs and SSOs occur when the flow into the sewer exceeds the capacity of the sewer lines to drain them. CSOs result from stormwater flow in the lines, and SSOs are a result of infiltration problems or blockages in the lines.

Illicit connections from businesses and homes to the storm drainage system can discharge sewage or washwater into receiving waters. Illicit discharges can often be identified by baseflow sampling of storm sewer systems. Leaking septic systems are estimated to comprise between 10 and 40% of the systems, and individual inspections are the best way to determine failing systems (Schueler, 1999).

There is also evidence that coliform bacteria can survive and reproduce in stream sediments and storm sewers (Schueler, 1999). During a storm event, they often become resuspended and add to the in-stream bacteria load. Source area studies reported that end of pipe concentrations were an order of magnitude higher than any source area on the land surface; therefore, it is likely that the storm sewer system itself acts as a source of fecal coliform (Bannerman *et al.*, 1993 and Steuer *et al.*, 1997). Resuspension of fecal coliform from fine stream sediments during storm events has been reported in New Mexico (NMSWQB, 1999). The sediments in-stream and in the storm sewer system may be significant contributors to the fecal coliform load.

Sources of *Cryptosporidium* and *Giardia* include human sewage and animal feces. *Cryptosporidium* is commonly found in cattle, dogs and geese. Graczyk *et al.* (1998) found that migrating Canada geese were a vector for *Cryptosporidium* and *Giardia*, which has implications for water quality in urban ponds that support large populations of geese.

4.9 Organic Carbon

Total organic carbon (TOC) is often used as an indicator of the amount of organic matter in a water sample. Typically, the more organic matter present in water, the more oxygen consumed, since oxygen is used by bacteria in the decomposition process. Adequate levels of dissolved oxygen in streams and receiving waters are important because they are critical to maintain aquatic life. Organic carbon is routinely found in urban stormwater, and high concentrations can result in an increase in Biochemical Oxygen Demand (BOD) and Chemical Oxygen Demand (COD). BOD and COD are measures of the oxygen demand caused by the decay of organic matter.

4.9.1 Concentrations

Urban stormwater has a significant ability to exert a high oxygen demand on a stream or receiving water, even two to three weeks after an individual storm event (Field and Pitt, 1990). Average concentrations of TOC, BOD and COD in urban stormwater are presented in Table 40. Mean concentrations of TOC, BOD and COD during storm events in nationwide studies were 17 mg/l, 14.1 mg/l and 52.8 mg/l, respectively (Kitchell, 2001 and Smullen and Cave,1998).

4.9.2 Impacts of Organic Carbon on Streams

TOC is primarily a concern for aquatic life because of its link to oxygen demand in streams, rivers, lakes and estuaries. The initial effect of increased concentrations of TOC, BOD or COD in stormwater runoff may be a depression in oxygen levels, which may persist for many days after a storm, as deposited organic matter gradually decomposes (Field and Pitt, 1990).

TOC is also a concern for drinking water quality. Organic carbon reacts with chlorine during the drinking water disinfection process and forms trihalomethanes and other disinfection by-products, which can be a serious drinking water quality problem (Water, 1999). TOC concentrations greater than 2 mg/l in treated water and 4 mg/l in source water can result in unacceptably high levels of disinfection byproducts and must be treated to reduce TOC or remove the disinfection byproducts (USEPA, 1998). TOC can also be a carrier for other pollutants, such as trace metals, hydrocarbons and nutrients.

4.9.3 Sources and Source Areas of Total Organic Carbon

The primary sources of TOC in urban areas appear to be decaying leaves and other organic matter, sediment and combustion by-products. Source areas include curbs, storm drains, streets and stream channels. Dartiguenave *et al.* (1997) determined that about half of the annual TOC load in urban watersheds of Austin, TX was derived from the eroding streambanks.

Table 40: EMCs for Organic Carbon in Urban Areas

Organic Carbon Source	EMCs (mg/l)		Number of Events	Source
	Mean	Median		
Total Organic Carbon (TOC)	32.0	N/R	423	Barrett and Malina, 1998
	17	15.2	19 studies	Kitchell, 2001
Biological Oxygen Demand (BOD)	14.1	11.5	1035	Smullen and Cave, 1998
	10.4	8.4	474	USEPA, 1983
Chemical Oxygen Demand (COD)	52.8	44.7	2639	Smullen and Cave, 1998
	66.1	55	1538	USEPA, 1983

N/R = Not Reported

4.10 MTBE

Methyl tertiary butyl-ether (MTBE) is a volatile organic compound (VOC) that is added to gasoline to increase oxygen levels, which helps gas burn cleaner (called an oxygenate). MTBE has been used as a performance fuel additive since the 1970s. In 1990, the use of oxygenates was mandated by federal law and concentrations of MTBE in gasoline increased. Today, MTBE is primarily used in large metropolitan areas that experience air pollution problems. Since 1990, MTBE has been detected at increasing levels in both surface water and groundwater and is one of the most frequently detected VOCs in urban watersheds (USGS, 2001a). EPA has declared MTBE to be a potential human carcinogen at high doses. In March 2000, a decision was made by EPA to follow California's lead to significantly reduce or eliminate the use of MTBE in gasoline.

4.10.1 Concentrations

MTBE is highly soluble in water and therefore not easily removed once it enters surface or ground water. Delzer (1999) detected the presence of MTBE in 27% of the shallow wells monitored in eight urban areas across the country (Figure 37). Detection frequency was significantly higher in New England and Denver, as shown in Table 41. In a second study conducted in 16 metropolitan areas, Delzer (1999) found that 83% of MTBE detections occurred between October and March, the time when MTBE is primarily used as a fuel additive. The median MTBE concentration was 1.5 ppb, well below EPA's draft advisory level of 20 ppb (Delzer, 1996).

4.10.2 Impacts of MTBE on Streams

The primary concerns regarding MTBE are that it is a known carcinogen to small mammals, a suspected human carcinogen at higher

Table 41: MTBE Detection Frequency

Location	Detection Frequency	Source	Year
211 shallow wells in eight urban areas	27%	Delzer	1999
Surface water samples in 16 metro areas	7%	Delzer	1996

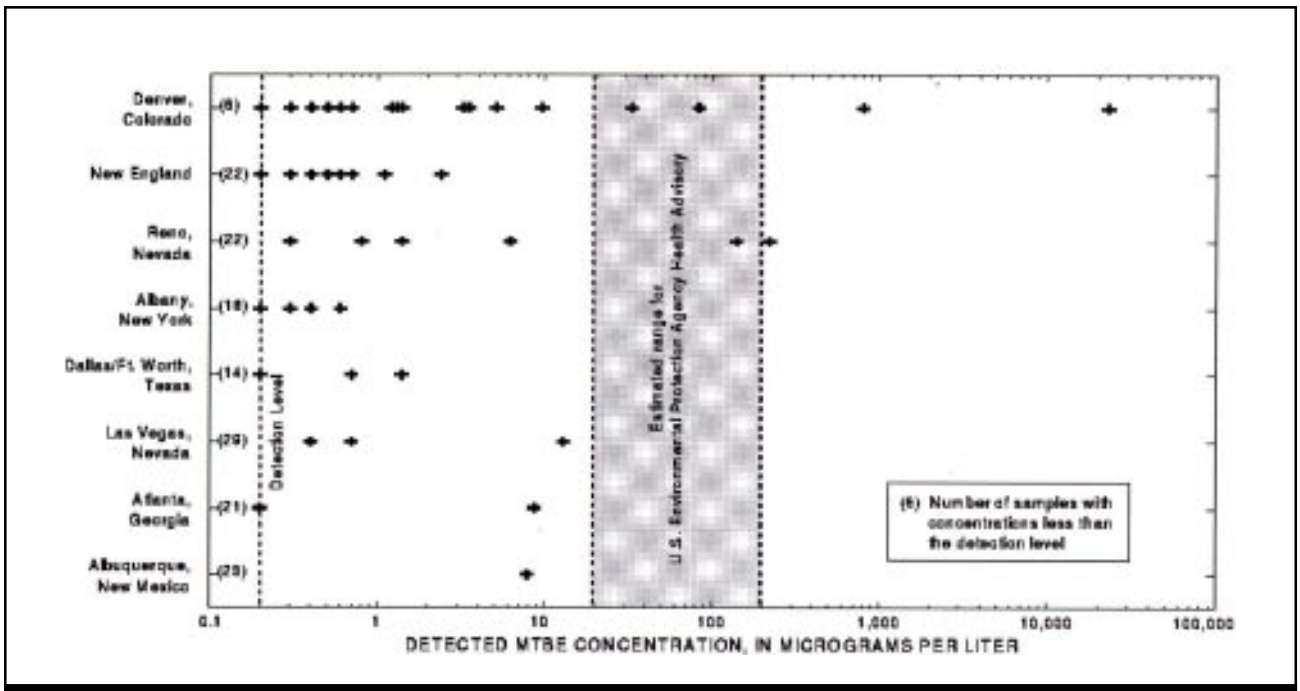

Figure 37: MTBE Concentrations in Surface Water from Eight Cities (Delzer, 1996)

doses and may possibly be toxic to aquatic life in small streams (Delzer, 1996). MTBE can also cause taste and odor problems in drinking water at fairly low concentrations. EPA issued a Drinking Water Advisory in 1997 that indicated that MTBE concentrations less than 20 ppb should not cause taste and odor problems for drinking water. However, the Association of California Water Agencies reports that some consumers can detect MTBE at levels as low as 2.5 ppb (ACWA, 2000). Because MTBE is frequently found in groundwater wells, it is thought to be a potential threat to drinking water (Delzer, 1999). For example, Santa Monica, California reportedly lost half of its groundwater drinking water supply due to MTBE contamination (Bay and Brown, 2000). MTBE has also been detected in human blood, especially in people frequently exposed to gasoline, such as gas station attendants (Squillace *et al.*, 1995).

4.10.3 Sources and Source Areas of MTBE

Since MTBE is a gasoline additive, its potential sources include any area that produces, transports, stores, or dispenses gasoline, particularly areas that are vulnerable to leaks and spills. Leaking underground storage tanks are usually associated with the highest MTBE concentrations in groundwater wells (Delzer, 1999). Vehicle emissions are also an important source of MTBE. Elevated levels are frequently observed along road corridors and drainage ditches. Once emitted, MTBE can travel in stormwater runoff or groundwater. Main source areas include heavily used multilane highways. Gas stations may also be a hotspot source area for MTBE contamination.

Another potential source of MTBE is watercraft, since two cycle engines can discharge as much as 20 to 30% of their fuel through the exhaust (Boughton and Lico, 1998). MTBE concentrations are clearly associated with increased use of gas engines, and there is concern that MTBE is an increasing component of atmospheric deposition (Boughton and Lico, 1998 and UC Davis, 1998).

4.11 Pesticides

Pesticides are used in the urban environment to control weeds, insects and other organisms that are considered pests. EPA estimates that nearly 70 million pounds of active pesticide ingredients are applied to urban lawns each year as herbicides or insecticides. Herbicides are used on urban lawns to target annual and perennial broadleaf weeds, while insecticides are used to control insects. Many types of pesticides are available for use in urban areas. Immerman and Drummond (1985) report that 338 different active ingredients are applied to lawns and gardens nationally. Each pesticide varies in mobility, persistence and potential aquatic impact. At high levels, many pesticides have been found to have adverse effects on ecological and human health. Several recent research studies by the USGS have shown that insecticides are detected with the greatest frequency in urban streams, and that pesticide detection frequency increases in proportion to the percentage of urban land in a watershed (Ferrari *et al.*, 1997; USGS, 1998, 1999a-b, 2001b). A national assessment by the USGS

Table 42: Median Concentrations and Detection Frequency of Herbicides and Insecticides in Urban Streams

Pollutant	Detection Frequency	Median Concentration (Fg/l)	Number of Samples	Source
Insecticides				
Diazinon	75%	0.025	326	USGS, 1998b
	92%	0.55	76	Brush *et al.*, 1995
	17%	0.002	1795	Ferrari *et al.*, 1997
Chlorpyrifos	41%	Non Detect	327	USGS, 1998b
	14%	0.004	1218	Brush *et al.*, 1995
Carbaryl	46%	Non Detect	327	USGS, 1998b
	22%	0.003	1128	Ferrari *et al.*, 1997
Herbicides				
Atrazine	86%	0.023	327	USGS, 1998b
	72%	0.099	2076	Ferrari *et al.*, 1997
Prometon	84%	0.031	327	USGS, 1998b
	56%	0.029	1531	Ferrari *et al.*, 1997
Simazine	88%	0.039	327	USGS, 1998b
	17%	0.046	1995	Ferrari *et al.*, 1997
2,4 -D	67%	1.1	11	Dindorf, 1992
	17%	0.035	786	Ferrari *et al.*, 1997
Dicamba	22%	1.8	4	Dindorf, 1992
MCPP	56%	1.8	10	Dindorf, 1992
MCPA	28%	1.0	5	Dindorf, 1992

(2001a) also indicates that insecticides are usually detected at higher concentrations in urban streams than in agricultural streams.

4.11.1 Concentrations

Median concentrations and detection frequency for common pesticides are shown in Table 42. Herbicides that are frequently detected in urban streams include atrazine; simazine; prometon; 2,4-D; dicamba; MCPP; and MCPA. Insecticides are also frequently encountered in urban streams, including diazinon, chlorpyrifos, malathion, and carbaryl. A USGS (1996) study monitored 16 sites in Gills Creek in Columbia, South Carolina over four days. This study reported that pesticide detection frequency increased as percent urban land increased.

Wotzka *et al.* (1994) monitored herbicide levels in an urban stream in Minneapolis, Minnesota during more than 40 storms. They found herbicides, such as 2,4-D; dicamba; MCPP; and MCPA in 85% of storm runoff events sampled. Total herbicide EMCs ranged from less than one to 70 µg/l. Ferrari *et al.* (1997) analyzed 463 streams in the mid-Atlantic region for the presence of 127 pesticide compounds. At least one pesticide was detected at more than 90% of the streams sampled.

Diazinon is one of the most commonly detected insecticides in urban stormwater runoff and dry weather flow. Diazinon was detected in 75% of National Water Quality Assessment (NAWQA) samples, 92% of stormflow samples from Texas, and 100% of urban stormflow samples in King County, Washington (Brush *et al.*, 1995 and USGS, 1999b). Diazinon is most frequently measured at concentrations greater than freshwater aquatic life criteria in urban stormwater (USGS, 1999a). USGS reports that diazinon concentrations were generally higher during urban stormflow (Ferrari *et al.,* 1997).

4.11.2 Impacts of Pesticides on Streams

Many pesticides are known or suspected carcinogens and can be toxic to humans and aquatic species. However, many of the known health effects require exposure to higher concentrations than typically found in the environment, while the health effects of chronic exposure to low levels are generally unknown (Ferrari *et al.*, 1997).

Studies that document the toxicity of insecticides and herbicides in urban stormwater have been focused largely on diazinon. Diazinon is responsible for the majority of acute toxicity in stormwater in Alameda County, California and King County, Washington (S.R. Hansen & Associates, 1995). Concentrations of diazinon in King County stormwater frequently exceed the freshwater aquatic life criteria (Figure 38). Similarly, research on Sacramento, California streams revealed acute toxicity for diazinon in 100% of stormwater samples using *Ceriodaphnia* as the test organism (Connor, 1995). Diazinon has a half-life of 42 days and is very soluble in water, which may explain its detection frequency and persistence in urban stormwater. Diazinon is also reported to attach fairly readily to organic carbon; consequently, it is likely re-suspended during storm events.

Insecticide concentrations exceeding acute and chronic toxicity thresholds for test organisms such as *Ceriodaphnia* have frequently been found in urban stormwater in New York, Texas, California, and Washington (Scanlin and Feng, 1997; Brush *et al.*, 1995; USGS, 1999b). The possibility exists that pesticides could have impacts on larger bodies of water, but there is a paucity of data on the subject at this time.

4.11.3 Sources and Source Areas of Pesticides

Sources for pesticides in urban areas include applications by homeowners, landscaping contractors and road maintenance crews. Source areas for pesticides in urban areas include lawns in residential areas; managed turf, such as golf courses, parks, and ball fields; and rights-of-way in nonresidential areas. Storage areas, which are subject to spills and leaks, can also be a source area. A study in San Francisco was able to trace high diazinon concentrations in some streams back to just a few households which had applied the pesticide at high levels (Scanlin and Feng, 1997). Two herbicides, simazine and atrazine, were detected in over 60% of samples in King County, WA stormwater but were not identified as being sold in retail stores. It is likely these herbicides are applied to nonresidential areas such as rights-of-way, parks and recreational areas (USGS, 1999b). Because pesticides are typically applied to turf, IC is not a direct indicator for pesticide concentrations, although they can drift onto paved surfaces and end up in stormwater runoff.

Active ingredient and trade name[1] example in parentheses	Freshwater aquatic-life criteria, in parts per billion (-- no aquatic-life criteria exist)			Concentration, in parts per billion (ppb) (RMC, recommended maximum concentration; Chronic aquatic-life criteria)
Herbicide	Acute	Chronic	RMC	
2,4-D (Weedone)	[4]10	[4]1	[5,2]4	
Acetochlor (Guardian)	--	--	--	
Atrazine (AAtrex)	[4]70	[4]7	[5]2	
Dicamba (Banvel)	[4]390	[4]39	[5]10	
Dichlobenil (Casoron)	--	--	[2]37	
Dichlorprop (2,4-DP)	--	--	--	
EPTC (Eptam)	--	--	--	
MCPA (Kilsem)	--	--	[5]2.6	
MCPP (Mecoprop)	--	--	--	
Metolachlor (Dual)	--	--	[5]8	
Napropamide (Devrinol)	--	--	--	
Oxadiazon (Ronstar)	--	--	--	
Prometon (Pramitol)	--	--	--	
Simazine (Princep)	[4]100	[4]10	[2,5]10	
Tebuthiuron (Spike)	--	--	--	
Triclopyr (Garlon)	[4]5,600	[4]560	--	
Trifluralin (Treflan)	--	--	[5]0.1	
Insecticide				
Carbaryl (Sevin)	[4]0.17	[4]0.017	[2]0.02	
Chlorpyrifos (Dursban)	[3,7]0.083	[3,7]0.041	[2]0.001	
Diazinon (Diazinon)	[6]0.16	[6]0.04	[2]0.009	
gamma-HCH (Lindane)	[3]0.95	[7]0.08	[2]0.02	
Malathion (Malathion)	--	[3]0.1	[2]0.008	
Fungicide				
Pentachlorophenol (Penta)	[3,8]19	[3,8]15	[5]0.5	

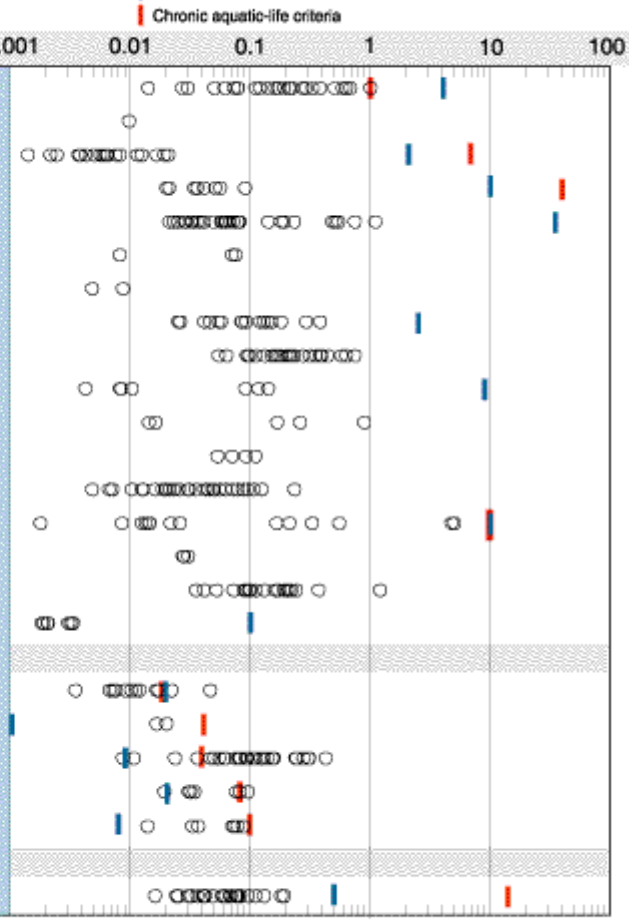

1 Use of trade names is for descriptive purposes and does not imply endorsement by the U.S. Geological Survey, the Department of Ecology, or King County
2 National Academy of Sciences and National Academy of Engineering, 1973
3 U.S. Environmental Protection Agency, 1998
4 Norris and Dost, 1991, Table 3
5 Ministers of Health Canada and Environment Canada, 1995
6 Menconi and Cox, 1994
7 State of Washington, 1992
8 Criteria are pH dependent; values shown calculated at pH of 7.8

Figure 38: Concentrations of Pesticides in Stormwater in King County, WA (S.R. Hansen & Associates, 1995 and USGS, 1999b)

4.12 Deicers

Deicers are substances used to melt snow and ice to keep roads and walking areas safe. The most commonly used deicer is sodium chloride, although it may also be blended with calcium chloride or magnesium chloride. Other less frequently used deicers include urea and glycol, which are primarily used at airports to deice planes. Table 43 summarizes the composition, use and water quality effects of common deicers.

Chlorides are frequently found in snowmelt and stormwater runoff in most regions that experience snow and ice in the winter months (Oberts, 1994 and Sherman, 1998). Figure 39 shows that the application of deicer salts has increased since 1940 from 200,000 tons to 10 to 20 million tons per year in recent years (Salt Institute, 2001). Several U.S. and Canadian studies indicate severe inputs of road salts on water quality and aquatic life (Environment Canada, 2001 and Novotny *et al.*, 1999).

Table 43: Use and Water Quality Effect of Snowmelt Deicers (Ohrel, 1995; Sills and Blakeslee, 1992)

Deicer	Description	Use	Water Quality Effect
Chlorides	Chloride based deicer usually combined with Na, Ca or Mg	Road Deicer and Residential Use	Cl complexes can release heavy metals, affect soil permeability, impacts to drinking water, potential toxic effects to small streams
Urea	Nitrogen-based fertilizer product	Used as alternative to glycol	Increased nitrogen in water and potential toxicity to organisms
Ethylene Glycol	Petroleum based organic compounds, similar to antifreeze	Used at airports for deicing planes	Toxicity effects, high BOD and COD, hazardous air pollutant

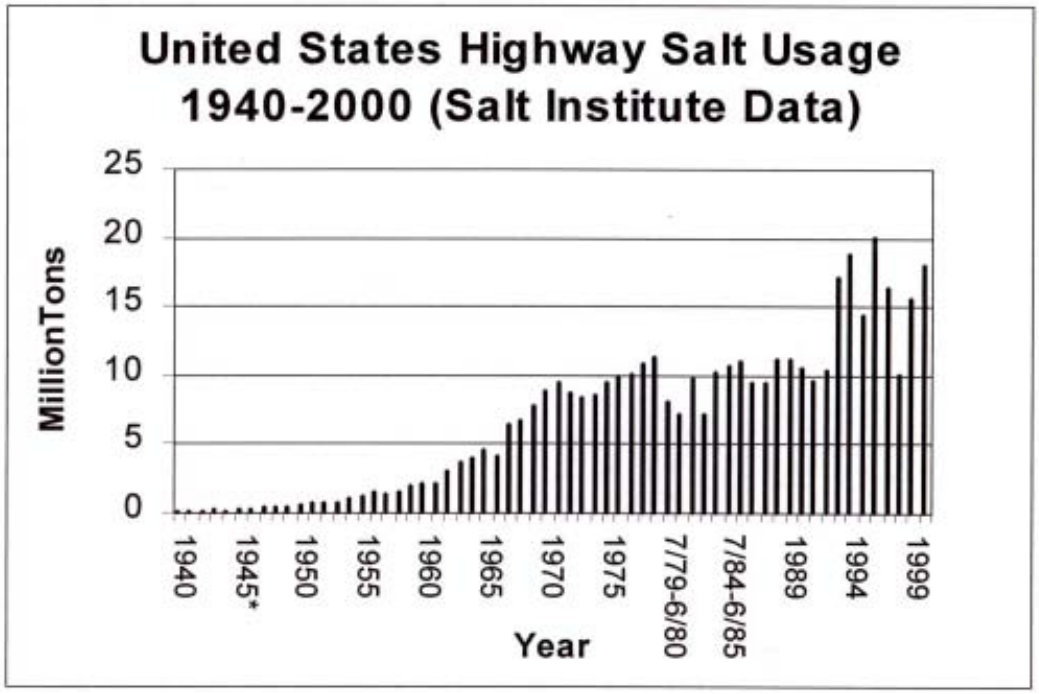

Figure 39: U.S. Highway Salt Usage Data (Salt Institute, 2001)

4.12.1 Concentrations

Chloride concentrations in snowmelt runoff depend on the amount applied and the dilution in the receiving waters. Data for snowmelt and stormwater runoff from several studies are presented in Table 44. For example, chloride concentrations in Lincoln Creek in Wisconsin were 1,612 mg/l in winter snowmelt runoff, as compared to 40 mg/l in non-winter runoff (Novotny *et al.*, 1999 and Masterson and Bannerman, 1994). Chloride concentrations in the range of 2,000 to 5,000 mg/l have been reported for Canadian streams (Environment Canada, 2001). Novotny *et al.* (1999) monitored chloride concentrations in snowmelt near Syracuse, New York and found that residential watersheds had higher chloride concentrations than rural watersheds.

Concentrations of glycol in stormwater runoff are also highly variable and depend on the amount of deicer used, the presence of a recovery system, and the nature of the precipitation event. Corsi *et al*. (2001) monitored streams receiving stormwater runoff from a Wisconsin airport. They found concentrations of propylene glycol as high as 39,000 mg/l at airport outfall sites during deicing operations and concentrations of up to 960 mg/l during low-flow sampling at an airport outfall site.

4.12.2 Impacts of Deicers on Streams

Chloride levels can harm aquatic and terrestrial life and contaminate groundwater and drinking water supplies (Ohrel, 1995). Generally, chloride becomes toxic to many organisms when it reaches concentrations of 500 to1,000 mg/l (Environment Canada, 2001). These concentrations are common in small streams in snow regions, at least for short periods of time. Many plant species are relatively intolerant to high salt levels in wetland swales and roadside corridors. Fish are also negatively affected by high chloride concentrations, with sensitivity as low as 600 mg/l for some species (Scott and Wylie, 1980).

Table 45 compares the maximum chloride concentrations for various water uses in eight states (USEPA, 1988). Snowmelt chloride concentrations typically exceed these levels.

Table 44: EMCs for Chloride in Snowmelt and Stormwater Runoff in Urban Areas

Form of Runoff	EMCs (mg/l) Mean	Number of Events	Sources	Location
Snowmelt	116*	49	Oberts, 1994	MN
	2119	N/R	Sherman, 1998	Ontario
	1267 **R** 474 **U**	N/R	Novotny *et al.*, 1999	NY
	1612	N/R	Masterson and Bannerman, 1994	WI
	397	282	Environment Canada, 2001	Ontario, Canada
Non-winter Storm Event	42	61	Brush *et al.*, 1995	TX
	45	N/R	Sherman, 1998	Ontario
	40.5	N/R	Masterson and Bannerman, 1994	WI

*N/R = Not Reported, R = residential, U = urban, * = Median*

Chloride is a concern in surface drinking water systems because it can interfere with some of the treatment processes and can cause taste problems at concentrations as low as 250 mg/l. Chloride is also extremely difficult to remove once it enters the water.

Glycol-based deicers have been shown to be highly toxic at relatively low concentrations in streams receiving airport runoff. These deicers contain many proprietary agents, which may increase their toxicity and also make it very difficult to set standards for their use (Hartwell *et al.*, 1995). Corsi *et al.* (2001) observed acute toxicity of *Ceriodaphnia dubia*, *Pimephelas promelax*, *Hyalela azteca*, and *Chironimus tentans* in Wisconsin streams that experienced propylene glycol concentrations of 5,000 mg/l or more. Chronic toxicity was observed for *Ceriodaphnia dubia* and *Pimephelas promelax* at propylene glycol concentrations of 1,500 mg/l in the same study. In addition, glycol exerts an extremely high BOD on receiving waters, which can quickly reduce or eliminate dissolved oxygen. Glycol can also be toxic to small animals that are attracted by its sweet taste (Novotny *et al.*, 1999).

As with many urban pollutants, the effects of chloride can be diluted in larger waterbodies. In general, small streams are more likely to experience chloride effects, compared to rivers, which have a greater dilution ability.

4.12.3 Sources and Source Areas of Deicers

The main sources for deicers in urban watersheds include highway maintenance crews, airport deicing operations, and homeowner applications. Direct road application is the largest source of chloride, by far. Source areas include roads, parking lots, sidewalks, storm drains, airport runways, and snow collection areas. Because deicers are applied to paved surfaces, the primary means of transport to streams is through stormwater and meltwater runoff. Therefore, concentrations of deicer compounds are typically associated with factors such as road density or traffic patterns.

Table 45: Summary of State Standards for Salinity of Receiving Waters (USEPA, 1988)

State	Limiting Concentration (mg/l)	Beneficial Use
CO	250*	Drinking water
IL	500	General water supply
	250	Drinking water
IN	500	Drinking water
MA	250	Class A waters
MN	250	Drinking water
	500	Class A fishing and recreation
OH	250	Drinking water
SD	250	Drinking water
	100	Fish propagation
VA	250	Drinking water

** Monthly average*

4.13 Conclusion

IC collects and accumulates pollutants deposited from the atmosphere, leaked from vehicles, or derived from other sources. The pollutants build up over time but are washed off quickly during storms and are often efficiently delivered to downstream waters. This can create water quality problems for downstream rivers, lakes and estuaries.

As a result of local and national monitoring efforts, we now have a much better understanding of the nature and impacts of stormwater pollution. The typical sample of urban stormwater is characterized by high levels of many common pollutants such as sediment, nutrients, metals, organic carbon, hydrocarbons, pesticides, and fecal coliform bacteria. Other pollutants that have more recently become a concern in urban areas include MTBE, deicers, and the pathogens *Cryptosporidium* and *Giardia*. Concentrations of most stormwater pollutants can be characterized, over the long run, by event mean storm concentrations. Monitoring techniques have also allowed researchers to identify source areas for pollutants in the urban environment, including stormwater hotspots, which generate higher pollutant loads than normal development.

In general, most monitoring data shows that mean pollutant storm concentrations are higher in urban watersheds than in non-urban ones. For many urban pollutants, EMCs can be used to predict stormwater pollutant loads for urban watersheds, using IC as the key predictive variable. While a direct relationship between IC and pollutant concentrations does not usually exist, IC directly influences the volume of stormwater and hence, the total load. A few exceptions are worth noting. MTBE, deicers, and PAH appear to be related more to traffic or road density than IC. Additionally, MTBE and PAH concentrations may be greater at hotspot source areas, which are not always widely or uniformly distributed across a watershed. Pesticides, bacteria and pathogens are often associated with turf areas rather than IC. Bacteria and pathogen sources also include direct inputs from wildlife and inappropriate sewage discharges that are not uniformly distributed across a watershed and are not directly related to IC.

Further research into the relationship between stormwater pollutant loads and other watershed indicators may be helpful. For example, it would be interesting to see if turf cover is a good indicator of stream quality for impacted streams. Other important watershed indicators worth studying are the influence of watershed treatment practices, such as stormwater practices and stream buffers.

The direct effects of stormwater pollutants on aquatic systems appears to be a function of the size of the receiving water and the initial health of the aquatic community. For example, a small urban stream receiving high stormwater pollutant concentrations would be more likely to experience impacts than a large river, which is diluted by other land uses. Likewise, organisms in sensitive streams should be more susceptible to stormwater pollutants than pollution-tolerant organisms found in non-supporting streams.

Overall, the following conclusions can be made:

- Sediment, nutrient and trace metal loads in stormwater runoff can be predicted as a function of IC, although concentrations are not tightly correlated with watershed IC.
- Violations of bacteria standards are indirectly associated with watershed IC.
- It is not clear whether loads of hydrocarbons, pesticides or chlorides can be predicted on the basis of IC at the small watershed level.
- More research needs to be conducted to evaluate the usefulness of other watershed indicators to predict stormwater pollutant loads. For example, traffic, road density or hotspots may be useful in predicting MTBE, deicer and hydrocarbon loads. Also, watershed turf cover may be useful in predicting pesticide and bacterial loads.

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- Most research on pollutants in stormwater runoff has been conducted at the small watershed level. Additional research is needed to evaluate the impact of watershed treatment, such as stormwater and buffer practices to determine the degree to which these may change stormwater concentrations or loads.
- Regional differences are evident for many stormwater pollutants, and these appear to be caused by either differences in rainfall frequency or snowmelt.

Chapter 5: Biological Impacts of Impervious Cover

This chapter reviews research on the impact of urbanization on the aquatic community, focusing on aquatic insects, fish, amphibians, freshwater mussels, and freshwater wetlands. Specifically, the relationship between the health of the aquatic community and the amount of watershed IC is analyzed within the context of the Impervious Cover Model (ICM).

The chapter is organized as follows:

5.1 Introduction
5.2 Indicators and General Trends
5.3 Effects on Aquatic Insect[1] Diversity
5.4 Effects on Fish Diversity
5.5 Effects on Amphibian Diversity
5.6 Effects on Wetland Diversity
5.7 Effects on Freshwater Mussel Diversity
5.8 Conclusion

5.1 Introduction

A number of studies, crossing different ecoregions and utilizing various techniques, have examined the link between watershed urbanization and its impact on stream and wetland biodiversity. These studies reveal that a relatively small amount of urbanization has a negative effect on aquatic diversity, and that as watersheds become highly urban, aquatic diversity becomes extremely degraded. As documented in prior chapters, hydrologic, physical, and water quality changes caused by watershed urbanization all stress the aquatic community and collectively diminish the quality and quantity of available habitat. As a result, these stressors generally cause a decline in biological diversity, a change in trophic structure, and a shift towards more pollution-tolerant organisms.

Many different habitat conditions are critical for supporting diverse aquatic ecosystems. For example, streambed substrates are vulnerable to deposition of fine sediments, which affects spawning, egg incubation and fry-rearing. Many aquatic insect species shelter in the large pore spaces among cobbles and boulders, particularly within riffles. When fine sediment fills these pore spaces, it reduces the quality and quantity of available habitat. The aquatic insect community is typically the base of the food chain in streams, helps break down organic matter and serves as a food source for juvenile fish.

Large woody debris (LWD) plays a critical role in the habitat of many aquatic insects and fish. For example, Bisson *et al.* (1988) contend that no other structural component is more important to salmon habitat than LWD, especially in the case of juvenile coho salmon. Loss of LWD due to the removal of stream side vegetation can significantly hinder the survival of more sensitive aquatic species. Since LWD creates different habitat types, its quality and quantity have been linked to salmonid rearing habitat and the ability of multiple fish species to coexist in streams.

The number of stream crossings (e.g., roads, sewers and pipelines) has been reported to increase directly in proportion to IC (May *et al*., 1997). Such crossings can become partial or total barriers to upstream fish migration, particularly if the stream bed downcuts below the fixed elevation of a culvert or pipeline. Fish barriers can prevent migration and recolonization of aquatic life in many urban streams.

Urbanization can also increase pollutant levels and stream temperatures. In particular, trace metals and pesticides often bind to sediment particles and may enter the food chain, particularly by aquatic insects that collect and filter particles. While in-stream data is rare, some data are available for ponds. A study of trace

[1] *Throughout this chapter, the term "aquatic insects" is used rather than the more cumbersome but technically correct "benthic macroinvertebrates."*

metal bioaccumulation of three fish species found in central Florida stormwater ponds discovered that trace metal levels were significantly higher in urban ponds than in non-urban control ponds, often by a factor of five to 10 (Campbell, 1995; see also Karouna-Renier, 1995). Although typical stormwater pollutants are rarely acutely toxic to fish, the cumulative effects of sublethal pollutant exposure may influence the stream community (Chapter 4).

Table 46 summarizes some of the numerous changes to streams caused by urbanization that have the potential to alter aquatic biodiversity. For a comprehensive review of the impacts of urbanization on stream habitat and biodiversity, the reader should consult Wood and Armitage (1997) and Hart and Finelli (1999).

Table 46: Review of Stressors to Urban Streams and Effects on Aquatic Life

Stream Change	Effects on Organisms
Increased flow volumes/ Channel forming storms	Alterations in habitat complexity Changes in availability of food organisms, related to timing of emergence and recovery after disturbance Reduced prey diversity Scour-related mortality Long-term depletion of LWD Accelerated streambank erosion
Decreased base flows	Crowding and increased competition for foraging sites Increased vulnerability to predation Increased fine sediment deposition
Increase in sediment transport	Reduced survival of eggs and alevins, loss of habitat due to deposition Siltation of pool areas, reduced macroinvertebrate reproduction
Loss of pools and riffles	Shift in the balance of species due to habitat change Loss of deep water cover and feeding areas
Changes in substrate composition	Reduced survival of eggs Loss of inter-gravel fry refugial spaces Reduced aquatic insect production
Loss of LWD	Loss of cover from predators and high flows Reduced sediment and organic matter storage Reduced pool formation and organic substrate for aquatic insects
Increase in temperature	Changes in migration patterns Increased metabolic activity, increased disease and parasite susceptibility Increased mortality of sensitive fish
Creation of fish blockages	Loss of spawning habitat for adults Inability to reach overwintering sites Loss of summer rearing habitat, Increased vulnerability to predation
Loss of vegetative rooting systems	Decreased channel stability Loss of undercut banks Reduced streambank integrity
Channel straightening or hardening	Increased stream scour Loss of habitat complexity
Reduction in water quality	Reduced survival of eggs and alevins Acute and chronic toxicity to juveniles and adult fish Increased physiological stress
Increase in turbidity	Reduced survival of eggs Reduced plant productivity Physiological stress on aquatic organisms
Algae blooms	Oxygen depletion due to algal blooms, increased eutrophication rate of standing waters

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5.2 Indicators and General Trends

Stream indicators are used to gauge aquatic health in particular watersheds. The two main categories of stream indicators are **biotic** and **development** indices. **Biotic** indices use stream diversity as the benchmark for aquatic health and use measures, such as species abundance, taxa richness, EPT Index, native species, presence of pollution-tolerant species, dominance, functional feeding group comparisons, or proportion with disease or anomalies. **Development** indices evaluate the relationship between the degree of watershed urbanization and scores for the biotic indices. Common development indices include watershed IC, housing density, population density, and percent urban land use.

5.2.1 Biological Indicators

Biotic indices are frequently used to measure the health of the aquatic insect or fish community in urban streams. Because many aquatic insects have limited migration patterns or a sessile mode of life, they are particularly well-suited to assess stream impacts over time. Aquatic insects integrate the effects of short-term environmental variations, as most species have a complex but short life cycle of a year or less. Sensitive life stages respond quickly to environmental stressors, but the overall community responds more slowly. Aquatic insect communities are comprised of a broad range of species, trophic levels and pollution tolerances, thus providing strong information for interpreting cumulative effects. Unlike fish, aquatic insects are abundant in most small, first and second order streams. Individuals are relatively easy to identify to family level, and many "intolerant" taxa can be identified to lower taxonomic levels with ease.

Fish are good stream indicators over longer time periods and broad habitat conditions because they are relatively long-lived and mobile. Fish communities generally include a range of species that represents a variety of trophic levels (omnivores, herbivores, insectivores, planktivores, and piscivores). Fish tend to integrate the effects of lower trophic levels; thus, their community structure reflects the prevailing food sources and habitat conditions. Fish are relatively easy to collect and identify to the species level. Most specimens can be sorted and identified in the field by experienced fisheries scientists and subsequently released unharmed.

A review of the literature indicates that a wide variety of metrics are used to measure the aquatic insect and fish community. Community indices, such as the Index of Biotic Integrity (IBI) for fish and the Benthic Index of Biotic Integrity (B-IBI) for the aquatic insect community are a weighted combination of various metrics that typically characterize the community from "excellent" to "poor." Common metrics of aquatic community are often based on a composite of measures, such as species richness, abundance, tolerance, trophic status, and native status. Combined indices (C-IBI) measure both fish and aquatic insect metrics and a variety of physical habitat conditions to classify streams. Table 47 lists several common metrics used in stream assessments. It should be clearly noted that community and combined indices rely on different measurements and cannot be directly compared. For a comprehensive review of aquatic community indicators, see Barbour *et al.*(1999).

5.2.2 Watershed Development Indices

Watershed IC, housing density, population density, and percent urban land have all been used as indices of the degree of watershed development. In addition, reverse indicators such as percent forest cover and riparian continuity have also been used. The majority of studies so far have used IC to explore the relationship between urbanization and aquatic diversity. Percent urban land has been the second most frequently used indicator to describe the impact of watershed development. Table 48 compares the four watershed development indices and the thresholds where significant impacts to aquatic life are typically observed.

Table 47: Examples of Biodiversity Metrics Used to Assess Aquatic Communities

Measurement	Applied to:	Definition of Measurement
Abundance	Fish, Aquatic Insects	Total number of individuals in a sample; sometimes modified to exclude tolerant species.
Taxa Richness	Fish, Aquatic Insects	Total number of unique taxa identified in a sample. Typically, an increase in taxa diversity indicates better water and habitat quality.
EPT Index	Aquatic Insects	Taxa belonging to the following three groups: *Ephemeroptera* (mayflies), *Plecoptera* (stoneflies), *Trichoptera* (caddisflies). Typically, species in these orders are considered to be pollution-intolerant taxa and are generally the first to disappear with stream quality degradation.
Native Status	Fish	Native vs. non-native taxa in the community.
Specific Habitat	Fish	Riffle benthic insectivorous individuals. Total number of benthic insectivores. Often these types of individuals, such as darters, sculpins, and dace are found in high velocity riffles and runs and are sensitive to physical habitat degradation.
		Minnow species Total number of minnow species present. Often used as an indicator of pool habitat quality. Includes all species present in the family Cyprinidae, such as daces, minnows, shiners, stonerollers, and chubs.
Tolerant Species	Fish, Aquatic Insects	The total number of species sensitive to and the number tolerant of degraded conditions. Typically, intolerant species decline with decreasing water quality and stream habitat. A common high pollution-tolerant species that is frequently used is Chironomids.
Dominance	Fish, Aquatic Insects	The proportion of individuals at each station from the single most abundant taxa at that particular station. Typically, a community dominated by a single taxa may be indicative of stream degradation.
Functional Feeding Group Comparisons	Fish	Omnivores/ Generalists: The proportion of individuals characterized as omnivores or generalists to the total number of individuals. Typically, there is a shift away from specialized feeding towards more opportunistic feeders under degraded conditions as food sources become unreliable.
		Insectivores: The proportion of individuals characterized as insectivores to the total number of individuals. Typically, the abundance of insectivores decreases relative to increasing stream degradation.
	Aquatic Insects	Others: The proportion of individuals characterized as shredders, scrapers, or filter feeders to the total number of individuals. Typically, changes in the proportion of functional feeders characterized as shredders can be reflective of contaminated leaf matter. In addition, an overabundance of scrapers over filterers can be indicative of increased benthic algae.
Disease/ Anomalies	Fish	Proportion of individuals with signs of disease or abnormalities. This is ascertained through gross external examination for abnormalities during the field identification process. Typically, this metric assumes that incidence of disease and deformities increases with increasing stream degradation.

** This table is not meant to provide a comprehensive listing of metrics used for diversity indices; it is intended to provide examples of types of measures used in biological stream assessments (see Barbour* et al.*, 1999).*

5.2.3 General Trends

Most research suggests that a decline in both species abundance and diversity begins at or around 10% watershed IC (Schueler, 1994a). However, considerable variations in aquatic diversity are frequently observed from five to 20% IC, due to historical alterations, the effectiveness of watershed management, prevailing riparian conditions, co-occurrence of stressors, and natural biological variation (see Chapter 1).

Figures 40 through 42 display the negative relationship commonly seen between biotic indices and various measures of watershed development. For example, stream research in the Maryland Piedmont indicated that IC was the best predictor of stream condition, based on a combined fish and aquatic insect IBI (MNCPPC, 2000). In general, streams with less than 6% watershed IC were in "excellent" condition, whereas streams in "good" condition had less than 12% IC, and streams in "fair" condition had less than 20%. Figure 40 shows the general boundaries and typical variation seen in MNCPPC stream research.

Figure 41 illustrates that B-IBI scores and Coho Salmon/Cutthroat Trout Ratio are a function of IC for 31 streams in Puget Sound, Washington. The interesting finding was that "good" to "excellent" B-IBI scores (greater than 25) were reported in watersheds that had less than 10% IC, with eight notable outliers. These outliers had greater IC (25 to 35%) but similar B-IBI scores. These outliers are unique in that they had a large upstream wetland and/or a large, intact riparian corridor upstream (i.e. >70% of stream corridor had buffer width >100 feet).

Figure 42 depicts the same negative relationship between watershed urbanization and fish-IBI scores but uses population density as the primary metric of development (Dreher, 1997). The six-county study area included the Chicago metro area and outlying rural watersheds. Significant declines in fish-IBI scores were noted when population density exceeded 1.5 persons per acre.

The actual level of watershed development at which an individual aquatic species begins to decline depends on several variables, but may be lower than that indicated by the ICM. Some researchers have detected impacts for individual aquatic species at watershed IC levels as low as 5%. Other research has suggested that the presence of certain stressors, such as sewage treatment plant discharges (Yoder and Miltner, 2000) or construction sites (Reice, 2000) may alter the ICM and lower the level of IC at which biodiversity impacts become evident.

Table 48: Alternate Land Use Indicators and Significant Impact Levels (Brown, 2000; Konrad and Booth, 2002)

Land Use Indicator	Level at which Significant Impact Observed	Typical Value for Low Density Residential Use	Comments
% IC	10-20%	10%	Most accurate; highest level of effort and cost
Housing Density	>1 unit/acre	1 unit/acre	Low accuracy in areas of substantial commercial or industrial development; less accurate at small scales
Population Density	1.5 to 8+ people/acre	2.5 people/acre	Low accuracy in areas of substantial commercial or industrial development; less accurate at small scales
% Urban Land Use	33% (variable)	10-100%	Does not measure intensity of development; moderately accurate at larger watershed scales
Road Density	5 miles/square mile	2 miles/square mile	Appears to be a potentially useful indicator

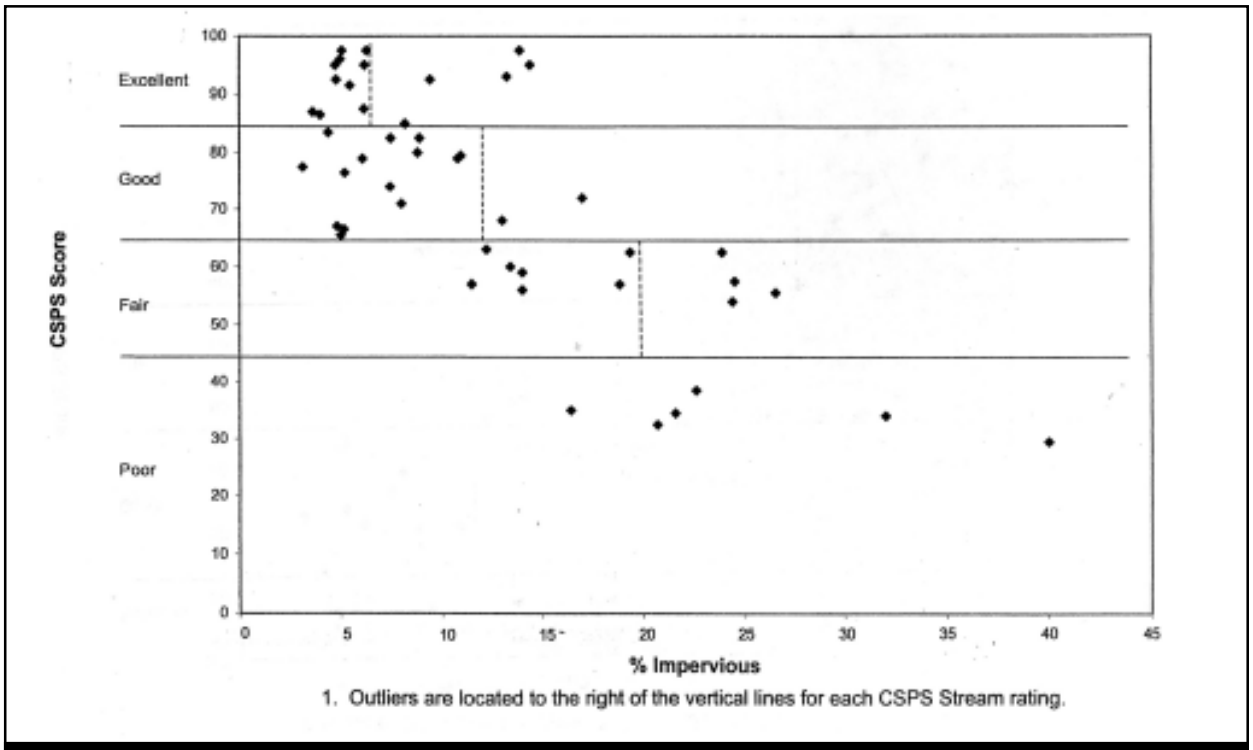

Figure 40: Combined Fish and Benthic IBI vs. IC in Maryland Piedmont Streams (MNCPPC, 2000)

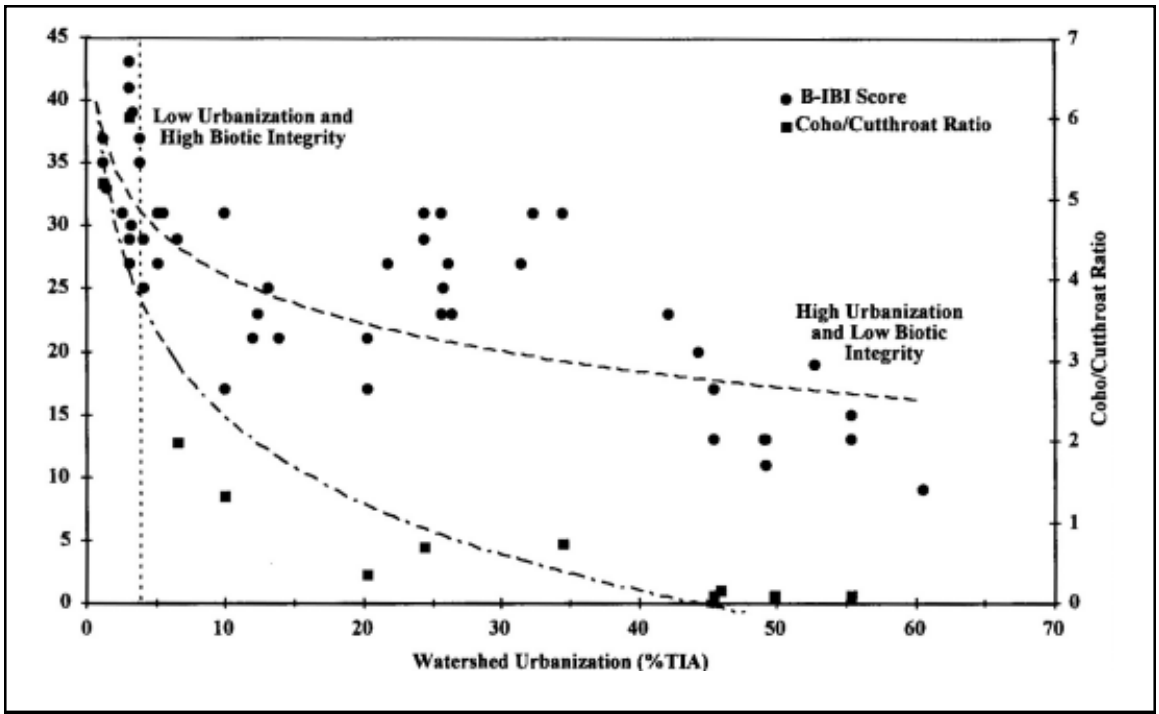

Figure 41: Relationship Between B-IBI, Coho/Cutthroat Ratios, and Watershed IC in Puget Sound Streams (Horner *et al.*, 1997)

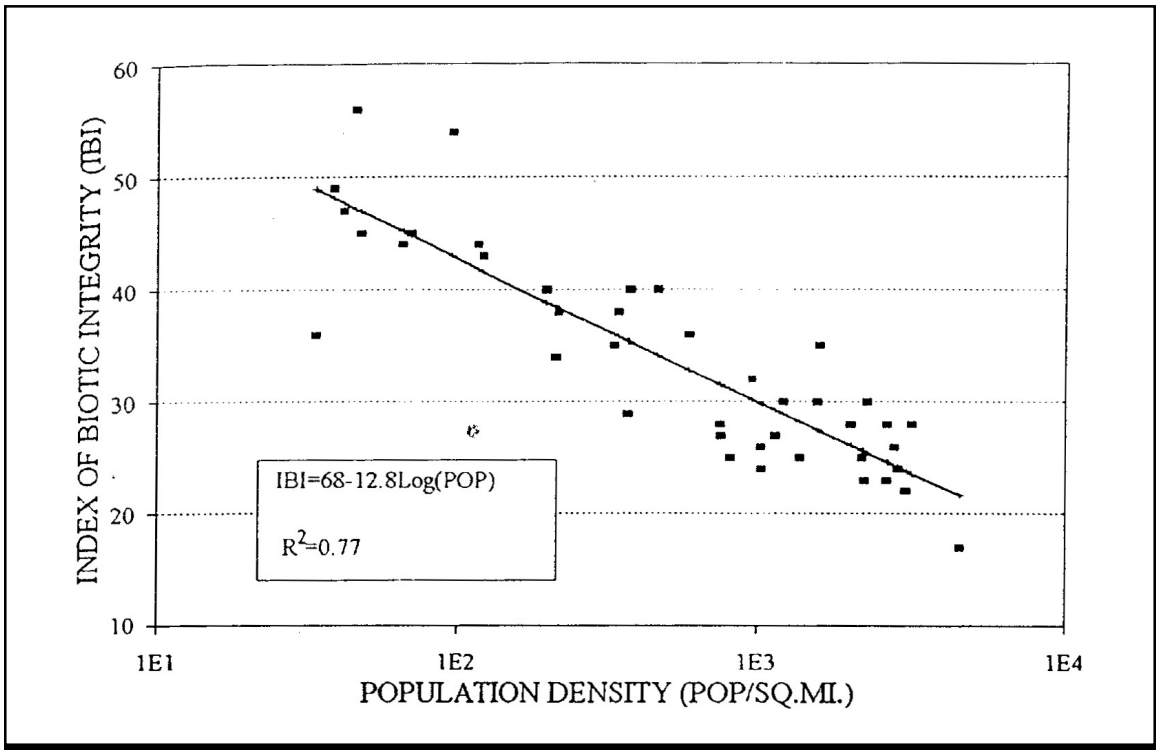

Figure 42: Index for Biological Integrity as a Function of Population Density in Illinois (Dreher, 1997)

5.3 Effects on Aquatic Insect Diversity

The diversity, richness and abundance of the aquatic insect community is frequently used to indicate urban stream quality. Aquatic insects are a useful indicator because they form the base of the stream food chain in most regions of the country. For this reason, declines or changes in aquatic insect diversity are often an early signal of biological impact due to watershed development. The aquatic insect community typically responds to increasing development by losing species diversity and richness and shifting to more pollution-tolerant species. More than 30 studies illustrate how IC and urbanization affect the aquatic insect community. These are summarized in Tables 49 and 50.

5.3.1 Findings Based on IC Indicators

Klein (1979) was one of the first researchers to note that aquatic insect diversity drops sharply in streams where watershed IC exceeded 10 to 15%. While "good" to "fair" diversity was noted in all headwater streams with less than 10% IC, nearly all streams with 12% or more watershed IC recorded "poor" diversity. Other studies have confirmed this general relationship between IC and the decline of aquatic insect species diversity. Their relationships have been an integral part in the development of the ICM. The sharp drop in aquatic insect diversity at or around 12 to 15% IC was also observed in streams in the coastal plain and Piedmont of Delaware (Maxted and Shaver, 1997).

Impacts at development thresholds lower than 10% IC have also been observed by Booth (2000), Davis (2001), Horner *et al.* (1997) and Morse (2001). There seems to be a general recognition that the high levels of variability observed below 10% IC indicate that other factors, such as riparian condition, effluent discharges, and pollution legacy may be better indicators of aquatic insect diversity (Horner and May, 1999; Kennen, 1999; Steedman, 1988; Yoder *et al.*, 1999).

The exact point at which aquatic insect diversity shifts from fair to poor is not known with absolute precision, but it is clear that few, if any, urban streams can support diverse aquatic insect communities with more than 25% IC. Indeed, several researchers failed to find aquatic insect communities with good or excellent diversity in any highly urban stream (Table 52). Indeed, MNCPPC (2000) reported that all streams with more than 20% watershed IC were rated as "poor."

Several good examples of the relationship between IC and B-IBI scores are shown in Figures 43 through 45. Figure 43 depicts the general trend line in aquatic insect diversity as IC increased at 138 stream sites in Northern Virginia (Fairfax County, 2001). The survey study concluded that stream degradation occurred at low levels of IC, and that older developments lacking more efficient site design and stormwater controls tended to have particularly degraded streams. Figures 44 and 45 show similar trends in the relationship between IC and aquatic insect B-IBI scores in Maryland and Washington streams. In particular, note the variability in B-IBI scores observed below 10% IC in both research studies.

Often, shift in the aquatic insect community from pollution-sensitive species to pollution-tolerant species occurs at relatively low IC levels (<10%). This shift is often tracked using the EPT metric, which evaluates sensitive species found in the urban stream community in the orders of *Ephemeroptera* (mayflies), *Plecoptera* (stoneflies), and *Trichoptera* (caddisflies). EPT species frequently disappear in urban streams and are replaced by more pollution-tolerant organisms, such as chironomids, tubificid worms, amphipods and snails.

In undisturbed streams, aquatic insects employ specialized feeding strategies, such as shredding leaf litter, filtering or collecting organic matter that flows by, or preying on other insects. These feeding guilds are greatly reduced in urban streams and are replaced by grazers, collectors and deposit feeders. Maxted and Shaver (1997) found that 90% of sensitive

Table 49: Recent Research Examining the Relationship Between IC and Aquatic Insect Diversity in Streams

Index	Key Finding (s)	Source	Location
Community Index	Three years stream sampling across the state at 1000 sites found that when IC was >15%, stream health was never rated good based on a C-IBI.	Boward *et al.*, 1999	MD
Community Index	Insect community and habitat scores were all ranked as poor in five subwatersheds that were greater than 30% IC.	Black and Veatch, 1994	MD
Community Index	Puget sound study finds that some degradation of aquatic invertebrate diversity can occur at any level of human disturbance (at least as measured by IC). 65% of watershed forest cover usually indicates a healthy aquatic insect community.	Booth, 2000	WA
Community Index	In a Puget Sound study, the steepest decline of B-IBI was observed after 6% IC. There was a steady decline, with approximately 50% reduction in B-IBI at 45% IC.	Horner *et al.*, 1997	WA
Community Index	B-IBI decreases with increasing urbanization in study involving 209 sites, with a sharp decline at 10% IC. Riparian condition helps mitigate effects.	Steedman, 1988	Ontario
Community Index	Wetlands, forest cover and riparian integrity act to mitigate the impact of IC on aquatic insect communities.	Horner *et al.*, 2001	WA, MD, TX
Community Index	B-IBI declines for aquatic insect with increasing IC at more than 200 streams.	Fairfax Co., 2001	VA
Community Index	Two-year stream study of eight Piedmont watersheds reported B-IBI scores declined sharply at an IC threshold of 15-30%.	Meyer and Couch,2000	GA
Community Index	Montgomery County study; subwatersheds with <12% IC generally had streams in good to excellent condition based on a combined fish and aquatic insect IBI. Watersheds with >20% IC had streams in poor condition.	MNCPPC, 2000	MD
Community Index	Study of 1st, 2nd, and 3rd order streams in the Patapsco River Basin showed negative relationship between B-IBI and IC.	Dail *et al.*, 1998	MD
Community Index	While no specific threshold was observed, impacts were seen at even low levels of IC. B-IBI values declined with increasing IC, with high scores observed only in reaches with <5% IC or intact riparian zones or upstream wetlands.	Horner and May, 1999	WA
Community Index	The C-IBI also decreased by 50% at 10-15% IC. These trends were particularly strong at low-density urban sites (0-30% IC).	Maxted and Shaver, 1997	DE
Diversity	In both coastal plain and Piedmont streams, a sharp decline in aquatic insect diversity was found around 10-15% IC.	Shaver *et al.*, 1995	DE
Diversity	In a comparison of Anacostia subwatersheds, there was significant decline in the diversity of aquatic insects at 10% IC.	MWCOG, 1992	DC
Diversity	In several dozen Piedmont headwater streams, aquatic diversity declined significantly beyond 10-12% IC.	Klein, 1979	MD
EPT Value	In a 10 stream study with watershed IC ranging from three to 30%, a significant decline in EPT values was reported as IC increased (r2 = 0.76).	Davis, 2001	MO
Sensitive Species	In a study of 38 wadeable, non-tidal streams in the urban Piedmont, 90% of sensitive organisms were eliminated from the benthic community after watershed IC reaches 10-15%.	Maxted and Shaver, 1997	DE
Species Abundance EPT values	For streams draining 20 catchments across the state, an abrupt decline in species abundance and EPT taxa was observed at approximately 6% IC.	Morse, 2001	ME

Table 50: Recent Research Examining the Relationship of Other Indices of Watershed Development on Aquatic Insect Diversity in Streams

Biotic	Key Finding (s)	Source	Location
Percent Urban Land use			
Community Index	Study of 700 streams in 5 major drainage basins found that the amount of urban land and total flow of municipal effluent were the most significant factors in predicting severe impairment of the aquatic insect community. Amount of forested land in drainage area was inversely related to impairment severity.	Kennen, 1999	NJ
Community Index	All 40 urban sites sampled had fair to very poor B-IBI scores, compared to undeveloped reference sites.	Yoder, 1991	OH
Community Index	A negative correlation between B-IBI and urban land use was noted. Community characteristics show similar patterns between agricultural and forested areas the most severe degradation being in urban and suburban areas.	Meyer and Couch, 2000	GA
EPT Value, Diversity, Community Index	A comparison of three stream types found urban streams had lowest diversity and richness. Urban streams had substantially lower EPT scores (22% vs 5% as number of all taxa, 65% vs 10% as percent abundance) and IBI scores in the poor range.	Crawford and Lenat, 1989	NC
Sensitive Species	Urbanization associated with decline in sensitive taxa, such as mayflies, caddisflies and amphipods while showing increases in oligochaetes.	Pitt and Bozeman, 1982	CA
Sensitive Species	Dramatic changes in aquatic insect community were observed in most urbanizing stream sections. Changes include an abundance of pollution-tolerant aquatic insect species in urban streams.	Kemp and Spotila, 1997	PA
Diversity	As watershed development levels increased, the aquatic insect diversity declined.	Richards *et al.*, 1993	MN
Diversity	Significant negative relationship between number of aquatic insect species and degree of urbanization in 21 Atlanta streams.	Benke *et al.*, 1981	GA
Diversity	Drop in insect taxa from 13 to 4 was noted in urban streams.	Garie and McIntosh, 1986	NJ
Diversity	Aquatic insect taxa were found to be more abundant in non-urban reaches than in urban reaches of the watershed.	Pitt and Bozeman, 1982	CA
Diversity	A study of five urban streams found that as watershed land use shifted from rural to urban, aquatic insect diversity decreased.	Masterson and Bannerman, 1994	WI
Other Land Use Indicators			
Community Index	Most degraded streams were found in developed areas, particularly older developments lacking newer and more efficient stormwater controls.	Fairfax Co., 2001	VA
Diversity	Urban streams had sharply lower aquatic insect diversity with human population above four persons/acre in northern VA.	Jones and Clark, 1987	VA
EPT Value	Monitoring of four construction sites in three varying regulatory settings found that EPT richness was related to enforcement of erosion and sediment controls. The pattern demonstrated that EPT richness was negatively affected as one moved from upstream to at the site, except for one site.	Reice, 2000	NC
Sensitive Species	In a Seattle study, aquatic insect community shifted to chironomid, oligochaetes and amphipod species that are pollution-tolerant and have simple feeding guild.	Pedersen and Perkins,1986	WA

species (based on EPT richness, % EPT abundance, and Hilsenhoff Biotic Index) were eliminated from the aquatic insect community when IC exceeded 10 to 15% in contributing watersheds of Delaware streams (Figure 46). In a recent study of 30 Maine watersheds, Morse (2001) found that reference streams with less than 5% watershed IC had significantly more EPT taxa than more urban streams. He also observed no significant differences in EPT Index values among streams with six to 27% watershed IC (Figure 47).

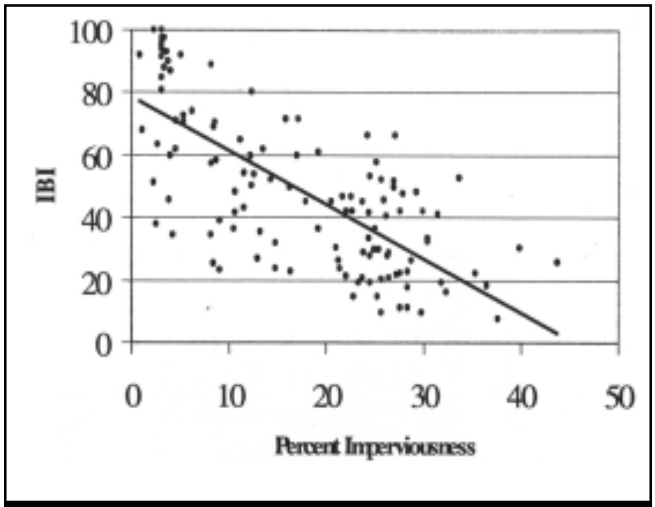

Figure 43: Trend Line Indicating Decline in Benthic IBI as IC Increases in Northern VA Streams (Fairfax County, 2001)

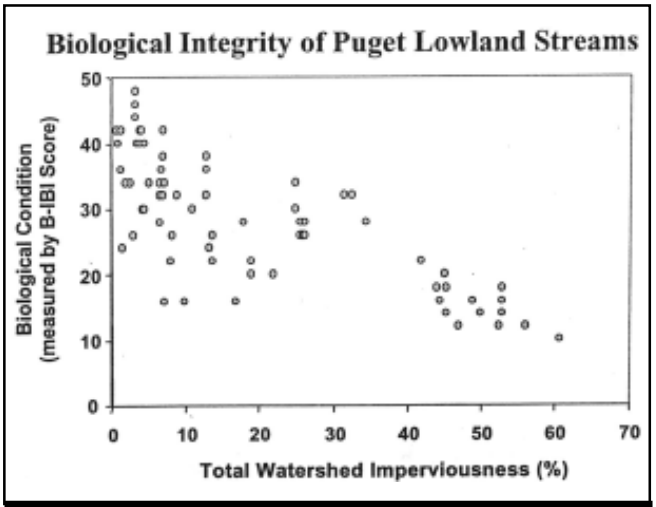

Figure 44: Relationship Between IC and B-IBI Scores in Aquatic Insects in Streams of the Puget Sound Lowlands (Booth, 2000)

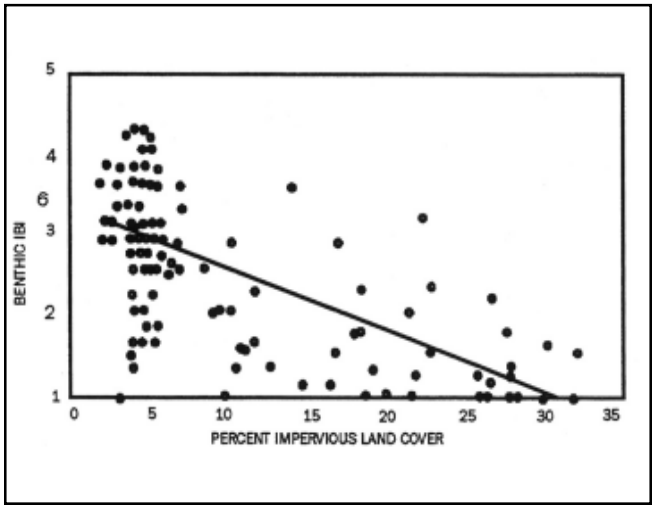

Figure 45: IC and B-IBI at Stream Sites in the Patapsco River Basin, MD (Dail *et al.*, 1998)

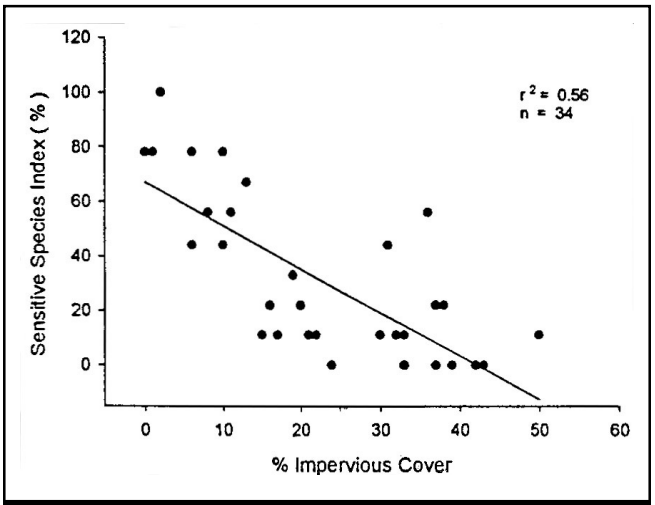

Figure 46: IC vs. Aquatic Insect Sensitivity - EPT Scores in Delaware Streams (Maxted and Shaver, 1997)

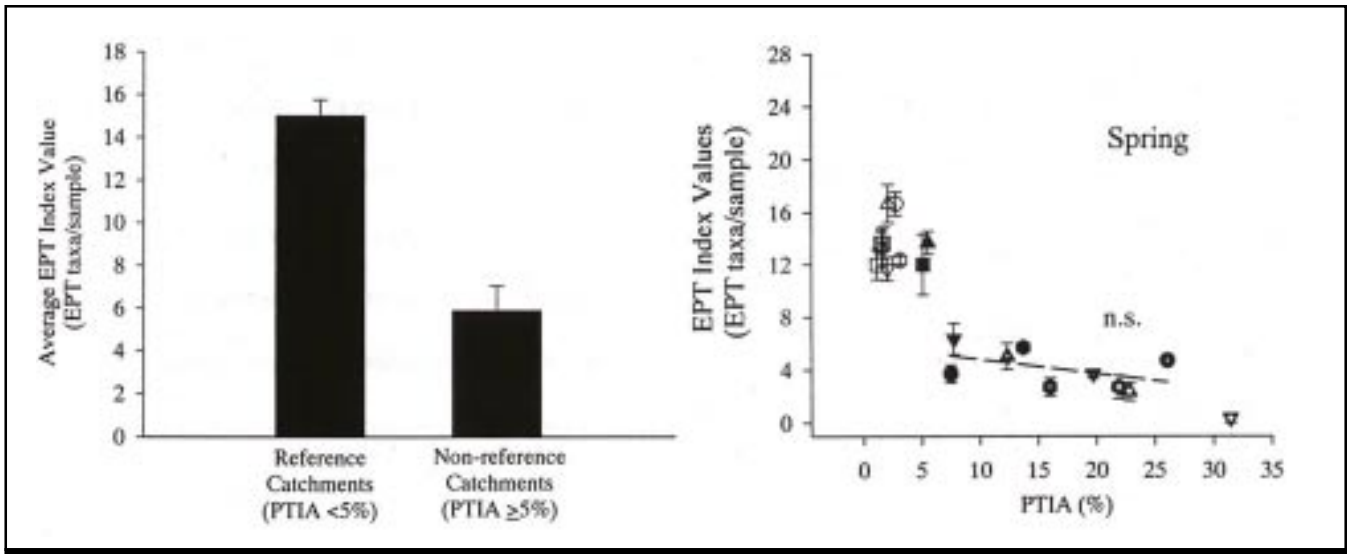

Figure 47: Average and Spring EPT Index Values vs.% IC in 20 Small Watersheds in Maine (Morse, 2001)

5.3.2 Findings Based on Other Development Indicators

Development indices, such as percent urban land use, population density, and forest and riparian cover have also been correlated with changes in aquatic insect communities in urban streams. Declines in benthic IBI scores have frequently been observed in proportion to the percent urban land use in small watersheds (Garie and McIntosh, 1986; Kemp and Spotila, 1997; Kennen, 1999; Masterson and Bannerman, 1994; Richards *et al.*, 1993; USEPA, 1982).

A study in Washington state compared a heavily urbanized stream to a stream with limited watershed development and found that the diversity of the aquatic insect community declined from 13 taxa in reference streams to five taxa in more urbanized streams (Pedersen and Perkins, 1986). The aquatic insect taxa that were lost were poorly suited to handle the variable erosional and depositional conditions found in urban streams. Similarly, a comparison of three North Carolina streams with different watershed land uses concluded the urban watershed had the least taxa and lowest EPT scores and greatest proportion of pollution-tolerant species (Crawford and Lenat, 1989).

Jones and Clark (1987) monitored 22 streams in Northern Virginia and concluded that aquatic insect diversity diminished markedly once watershed population density exceeded four or more people per acre. The population density roughly translates to ½ - 1 acre lot residential use, or about 10 to 20 % IC. Kennen (1999) evaluated 700 New Jersey streams and concluded that the percentage of watershed forest was positively correlated with aquatic insect density. Meyer and Couch (2000) reported a similar cover relationship between aquatic insect diversity and watershed and riparian forest cover for streams in the Atlanta, GA region. A study in the Puget Sound region found that aquatic insect diversity declined in streams once forest cover fell below 65% (Booth, 2000).

5.4 Effects on Fish Diversity

Fish communities are also excellent environmental indicators of stream health. In general, an increase in watershed IC produces the same kind of impact on fish diversity as it does for aquatic insects. The reduction in fish diversity is typified by a reduction in total species, loss of sensitive species, a shift toward more pollution-tolerant species, and decreased survival of eggs and larvae. More than 30 studies have examined the relationship between watershed development and fish diversity; they are summarized in Tables 51 and 52. About half of the research studies used IC as the major index of watershed development, while the remainder used other indices, such as percent urban land use, population density, housing density, and forest cover.

5.4.1 Findings Based on IC Indicators

Recent stream research shows a consistent, negative relationship between watershed development and various measures of fish diversity, such as diversity metrics, species loss and structural changes.

Typically, a notable decline in fish diversity occurs around 10 to 15% watershed IC (Boward *et al.*, 1999; Galli, 1994; Klein, 1979; Limburg and Schmidt, 1990; MNCPPC, 2000; MWCOG, 1992; Steward, 1983). A somewhat higher threshold was observed by Meyer and Couch (2000) for Atlanta streams with 15 to 30% IC; lower thresholds have also been observed (Horner *et al.*, 1997 and May *et al.*, 1997). A typical relationship between watershed IC and fish diversity is portrayed in Figure 48, which shows data from streams in the Patapsco River Basin in Maryland (Dail *et al.*, 1998). Once again, note the variability in fish-IBI scores observed below 10% IC.

Wang *et al.* (1997) evaluated 47 Wisconsin streams and found an apparent threshold around 10% IC. Fish-IBI scores were "good" to "excellent" below this threshold, but were consistently rated as "fair" to "poor." Additionally, Wang documented that the total number of fish species drops sharply when IC increases (Figure 49). Often, researchers also reported that increases in IC were strongly correlated with several fish metrics, such as increases in non-native and pollution-tolerant species in streams in Santa Clara, California (EOA, Inc., 2001).

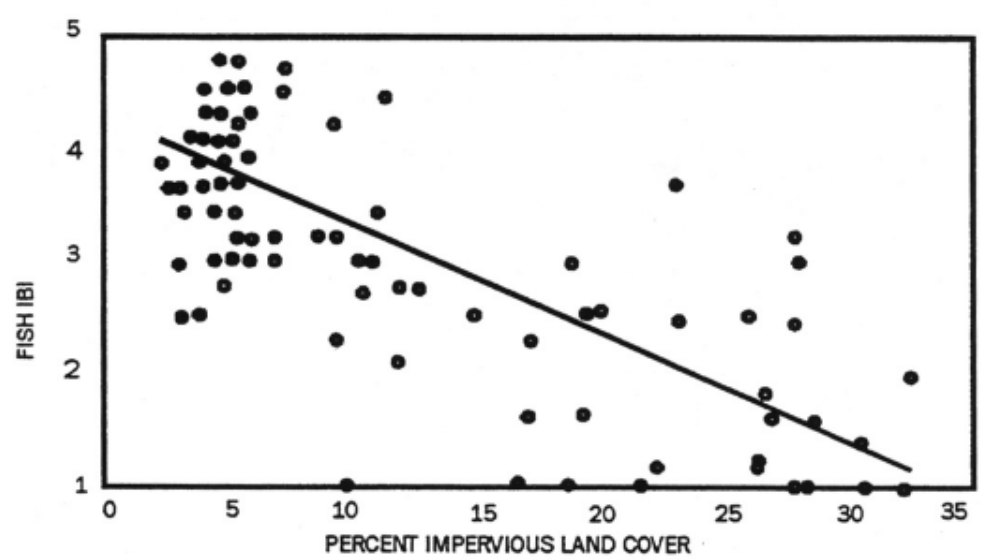

Figure 48: Fish-IBI vs. Watershed IC for Streams in the Patapsco River Basin, MD (Dail *et al.*, 1998)

Table 51: Recent Research Examining the Relationship Between Watershed IC and the Fish Community

Biotic	Key Finding (s)	Source	Location
Abundance	Brown trout abundance and recruitment declined sharply at 10-15% IC.	Galli, 1994	MD
Salmonids	Seattle study showed marked reduction in coho salmon populations noted at 10-15% IC at nine streams.	Steward, 1983	WA
Anadromous Fish Eggs	Resident and anadromous fish eggs and larvae declined in 16 subwatersheds draining to the Hudson River with >10% IC area.	Limburg and Schmidt, 1990	NY
Community Index	1st, 2nd, and 3rd order streams in the Patapsco River Basin showed negative relationship between IBI and IC.	Dail *et al.*, 1998	MD
Community Index	Fish IBI and habitat scores were all ranked as poor in five subwatersheds that were greater than 30% IC.	Black and Veatch, 1994	MD
Community Index	In the Potomac subregion, subwatersheds with < 12% IC generally had streams in good to excellent condition based on a combined fish and aquatic insect IBI. Watersheds with >20% IC had streams in poor condition.	MNCPPC, 2000	MD
Community Index	In a two-year study of Piedmont streams draining eight watersheds representing various land uses in Chattahochee River Basin, fish community quality dropped sharply at an IC threshold of 15-30%.	Meyer and Couch, 2000	GA
Diversity	Of 23 headwater stream stations, all draining <10% IC areas, rated as good to fair; all with >12% were rated as poor. Fish diversity declined sharply with increasing IC between 10-12%.	Schueler and Galli, 1992	MD
Diversity, Sensitive Species	Comparison of 4 similar subwatersheds in Piedmont streams, there was significant decline in the diversity of fish at 10% IC. Sensitive species (trout and sculpin) were lost at 10-12%.	MWCOG, 1992	MD
Diversity, Community Index	In a comparison of watershed land use and fish community data for 47 streams between the 1970s and 1990s, a strong negative correlation was found between number species and IBI scores with effective connected IC. A threshold of 10% IC was observed with community quality highly variable below 10% but consistently low above 10% IC.	Wang *et al.*, 1997	WI
Diversity	In several dozen Piedmont headwater streams fish diversity declined significantly in areas beyond 10-12% IC.	Klein, 1979	MD
Diversity , Abundance, Non-native Species	IC strongly associated with several fisheries species and individual-level metrics, including number of pollution-tolerant species, diseased individuals, native and non-native species and total species present	EOA, Inc., 2001	CA
Juvenile Salmon Ratios	In Puget Sound study, the steepest decline of biological functioning was observed after six percent IC. There was a steady decline, with approximately 50% reduction in initial biotic integrity at 45% IC area.	Horner *et al.*, 1997	WA
Juvenile Salmon Ratio	Physical and biological stream indicators declined most rapidly during the initial phase of the urbanization process as total IC area exceeded the five to 10% range.	May *et al.*, 1997	WA
Salmonoid	Negative effects of urbanization (IC) with the defacto loss of non-structural BMPs (wetland forest cover and riparian integrity) on salmon ratios	Horner *et al.*, 2001	WA, MD, TX
Salmonoid, Sensitive Species	While no specific threshold was observed (impacts seen at even low levels of IC), Coho/cutthroat salmon ratios >2:1 were found when IC was < 5%. Ratios fell below one at IC levels below 20 %.	Horner and May, 1999	WA
Sensitive species, Salmonid	Three years stream sampling across the state (approximately 1000 sites), MBSS found that when IC was >15%, stream health was never rated good based on CBI, and pollution sensitive brook trout were never found in streams with >2% IC.	Boward *et al.*, 1999	MD
Sensitive Species, Salmonids	Seattle study observed shift from less tolerant coho salmon to more tolerant cutthroat trout population between 10 and 15% IC at nine sites.	Luchetti and Feurstenburg 1993	WA

Sensitive fish are defined as species that strongly depend on clean and stable bottom substrates for feeding and/or spawning. Sensitive fish often show a precipitous decline in urban streams. The loss of sensitive fish species and a shift in community structure towards more pollution-tolerant species is confirmed by multiple studies. Figure 50 shows the results of a comparison of four similar subwatersheds in the Maryland Piedmont that were sampled for the number of fish species present (MWCOG, 1992). As the level of watershed IC increased, the number of fish species collected dropped. Two sensitive species, including sculpin, were lost when IC increased from 10 to 12%, and four more species were lost when IC reached 25%. Significantly, only two species remained in the fish community at 55% watershed IC.

Salmonid fish species (trout and salmon) and anadromous fish species appear to be particularly impacted by watershed IC. In a study in the Pacific Northwest, sensitive coho salmon were seldom found in watersheds above 10 or 15% IC (Luchetti and Feurstenburg, 1993 and Steward, 1983). Key stressors in urban streams, such as higher peak flows, lower dry weather flows, and reduction in habitat complexity (e.g. fewer pools, LWD, and hiding places) are believed to change salmon species composition, favoring cutthroat trout populations over the natural coho populations (WDFW, 1997).

A series of studies from the Puget Sound reported changes in the coho/cutthroat ratios of juvenile salmon as watershed IC increased (Figure 51). Horner *et al.* (1999) found Coho/Cutthroat ratios greater than 2:1 in watersheds with less than 5 % IC. Ratios fell below 1:1 when IC exceeded 20%. Similar results were reported by May *et al.* (1997). In the mid-Atlantic region, native trout have stringent temperature and habitat requirements and are seldom present in watersheds where IC exceeds 15% (Schueler, 1994a). Declines in trout spawning success are evident above 10% IC. In a study of over 1,000 Maryland streams, Boward *et al.* (1999) found that sensitive brook trout were never found in streams that had more than 4% IC in their contributing watersheds.

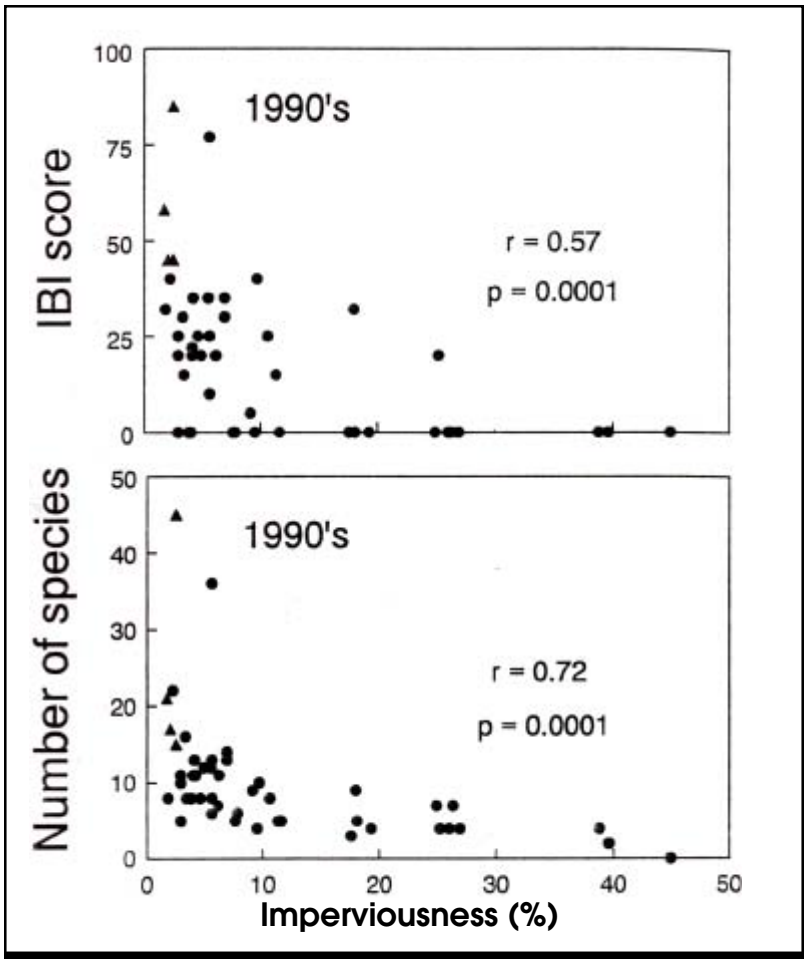

Figure 49: Fish-IBI and Number of Species vs. % IC in Wisconsin Streams (Wang *et al.*, 1997)

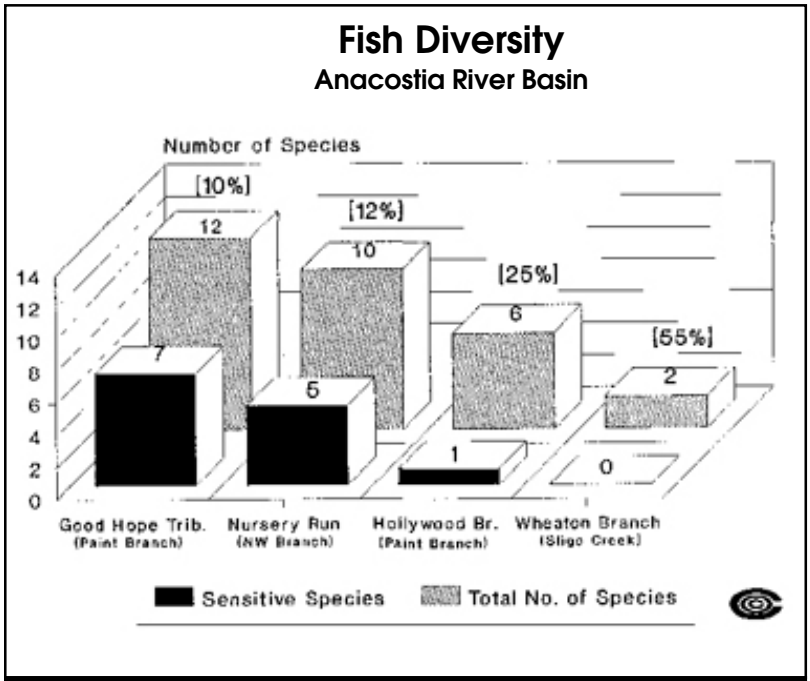

Figure 50: IC and Effects on Fish Species Diversity in Four Maryland Subwatersheds (MWCOG, 1992)

Table 52: Recent Research Examining Urbanization and Freshwater Fish Community Indicators

Biotic	Key Finding (s)	Source	Location
	Urbanization		
Community Index	All 40 urban sites sampled had fair to very poor IBI scores, compared to undeveloped reference sites.	Yoder, 1991	OH
Community Index	Negative correlations between biotic community and riparian conditions and forested areas were found. Similar levels of fish degradation were found between suburban and agricultural; urban areas were the most severe.	Meyer and Couch, 2000	GA
Community Index	Residential urban land use caused significant decrease in fish-IBI scores at 33%. In more urbanized Cuyahoga, a significant drop in IBI scores occurred around 8% urban land use in the watershed. When watersheds smaller than 100mi^2 were analyzed separately, the level of urban land associated with a significant drop in IBI scores occurred at around 15%. Above one du/ac, most sites failed to attain biocriteria regardless of degree of urbanization.	Yoder *et al.*, 1999	OH
Community Index, Abundance	As watershed development increased to about 10%, fish communities simplified to more habitat and trophic generalists and fish abundance and species richness declined. IBI scores for the urbanized stream fell from the good to fair category.	Weaver, 1991	VA
Diversity	A study of five urban streams found that as land use shifted from rural to urban, fish diversity decreased.	Masterson and Bannerman, 1994	WI
Diversity, Community Index	A comparison of three stream types found urban streams had lowest diversity and richness. Urban streams had IBI scores in the poor range.	Crawford and Lenat, 1989	NC
Salmon Spawning, Flooding Frequency	In comparing three streams over a 25-year period (two urbanizing and one remaining forested), increases in flooding frequencies and decreased trends in salmon spawning were observed in the two urbanizing streams, while no changes in flooding or spawning were seen in the forested system.	Moscript and Montgomery, 1997	WA
Sensitive Species	Observed dramatic changes in fish communities in most urbanizing stream sections, such as absence of brown trout and abundance of pollution-tolerant species in urban reaches.	Kemp and Spotila, 1997	PA
Sensitive Species, Diversity	Decline in sensitive species diversity and composition and changes in trophic structure from specialized feeders to generalists was seen in an urbanizing watershed from 1958 to 1990. Low intensity development was found to affect warm water stream fish communities similarly as more intense development.	Weaver and Garman, 1994	VA
Warm Water Habitat Biocriteria	25-30% urban land use defined as the upper threshold where attainment of warm water habitat biocriterion is effectively lost. Non-attainment also may occur at lower thresholds given the co-occurrence of stressors, such as pollution legacy, WTPs and CSOs.	Yoder and Miltner, 2000	OH
Community Index, Habitat	The amount of urban land use upstream of sample sites had a strong negative relationship with biotic integrity, and there appeared to be a threshold between 10 and 20% urban land use where IBI scores declined dramatically. Watersheds above 20% urban land invariably had scores less than 30 (poor to very poor). Habitat scores were not tightly correlated with degraded fish community attributes.	Wang *et al.*, 1997	WI
Community Index	A study in the Patapsco Basin found significant correlation of fish IBI scores with percent urbanized land over all scales (catchment, riparian area, and local area).	Roth *et al.*, 1998	MD

Table 52 (continued): Recent Research Examining Urbanization and Freshwater Fish Community Indicators			
Biotic	**Key Finding (s)**	**Source**	**Location**
Urbanization			
Sensitive Species	Evaluated effects of runoff in both urban and non-urban streams; found that native species dominated the non-urban portion of the watershed but accounted for only seven percent of species found in the urban portions of the watershed.	Pitt, 1982	CA
Other Land Use Indicators			
Community Index, Habitat	Atlanta study found that as watershed population density increased, there was a negative impact on urban fish and habitat. Urban stream IBI scores were inversely related to watershed population density, and once density exceeded four persons/acre, urban streams were consistently rated as very poor.	Couch *et al.*, 1997	GA
Community Index	In an Atlanta stream study, modified IBI scores declined once watershed population density exceeds four persons/acre in 21 urban watersheds	DeVivo *et al.*, 1997	GA
Community Index	In a six-county study (including Chicago, its suburbs and outlying rural/agricultural areas), streams showed a strong correlation between population density and fish community assessments such that as population density increased, community assessment scores went from the better - good range to fair - poor. Significant impacts seen at 1.5 people/acre.	Dreher, 1997	IL
Community Index	Similarly, negative correlations between biotic community and riparian conditions and forested areas were also found. Similar levels of fish degradation were found between suburban and agricultural; urban areas were the most severe.	Meyer and Couch, 2000	GA
Community Index	Amount of forested land in basin directly related to IBI scores for fish community condition.	Roth *et al.*, 1996	MD
Salmonid, Sensitive Species	Species community changes from natural coho salmon to cutthroat trout population with increases in peak flow, lower low flow, and reductions in stream complexity.	WDFW, 1997	WA

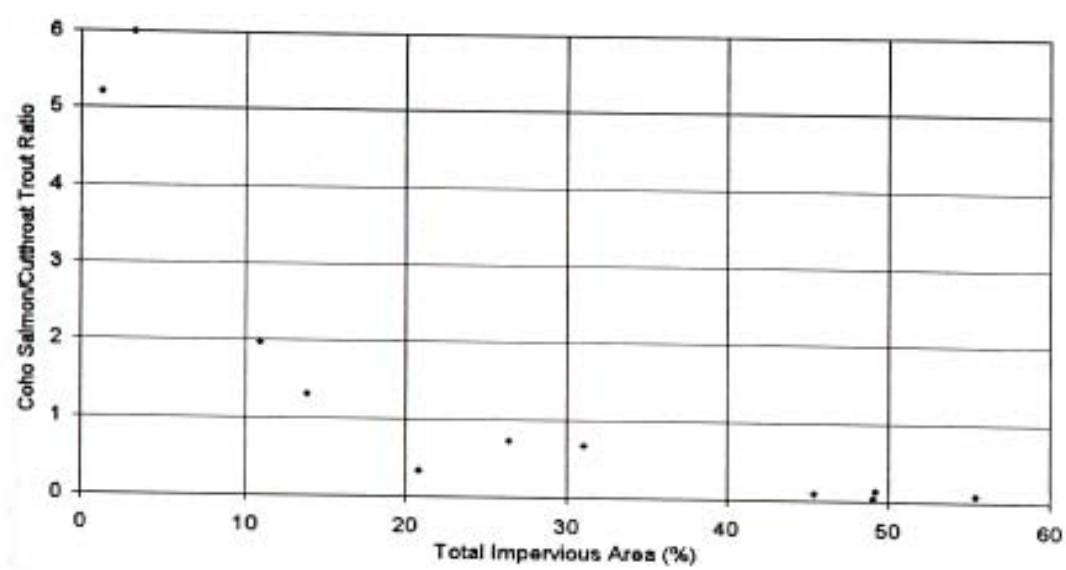

Figure 51: Coho Salmon/Cutthroat Trout Ratio for Puget Sound Streams (Horner *et al.*, 1997)

Many fish species have poor spawning success in urban streams and poor survival of fish eggs and fry. Fish barriers, low intragravel dissolved oxygen, sediment deposition and scour are all factors that can diminish the ability of fish species to successfully reproduce. For example, Limburg and Schmidt (1990) discovered that the density of anadromous fish eggs and larvae declined sharply in subwatersheds with more than 10% IC.

5.4.2 Findings Based on Other Development Indicators

Urban land use has frequently been used as a development indicator to evaluate the impact on fish diversity. Streams in urban watersheds typically had lower fish species diversity and richness than streams located in less developed watersheds. Declines in fish diversity as a function of urban land cover have been documented in numerous studies (Crawford and Lenat, 1989; Masterson and Bannerman, 1994; Roth *et al., 1998;* Yoder, 1991, and Yoder *et al.*, 1999). USEPA (1982) found that native fish species dominated the fish community of non-urban streams, but accounted for only 7% of the fish community found in urban streams. Kemp and Spotila (1997) evaluated streams in Pennsylvania and noted the loss of sensitive species (e.g. brown trout) and the increase of pollution-tolerant species, such as sunfish and creek chub (Figure 52).

Wang *et al.* (1997) cited percentage of urban land in Wisconsin watersheds as a strong negative factor influencing fish-IBI scores in streams and observed strong declines in IBI scores with 10 to 20% urban land use. Weaver and Garman (1994) compared the historical changes in the warm-water fish community of a Virginia stream that had undergone significant urbanization and found that many of the sensitive species present in 1958 were either absent or had dropped sharply in abundance when the watershed was sampled in 1990. Overall abundance had dropped from 2,056 fish collected in 1958 to 417 in 1990. In addition, the 1990 study showed that 67% of the catch was bluegill and common shiner, two species that are habitat and trophic "generalists." This shift in community to more habitat and trophic generalists was observed at 10% urban land use (Weaver, 1991).

Yoder *et al.* (1999) evaluated a series of streams in Ohio and reported a strong decrease in warm-water fish community scores around 33% residential urban land use. In the more urbanized Cuyahoga streams, sharp drops in

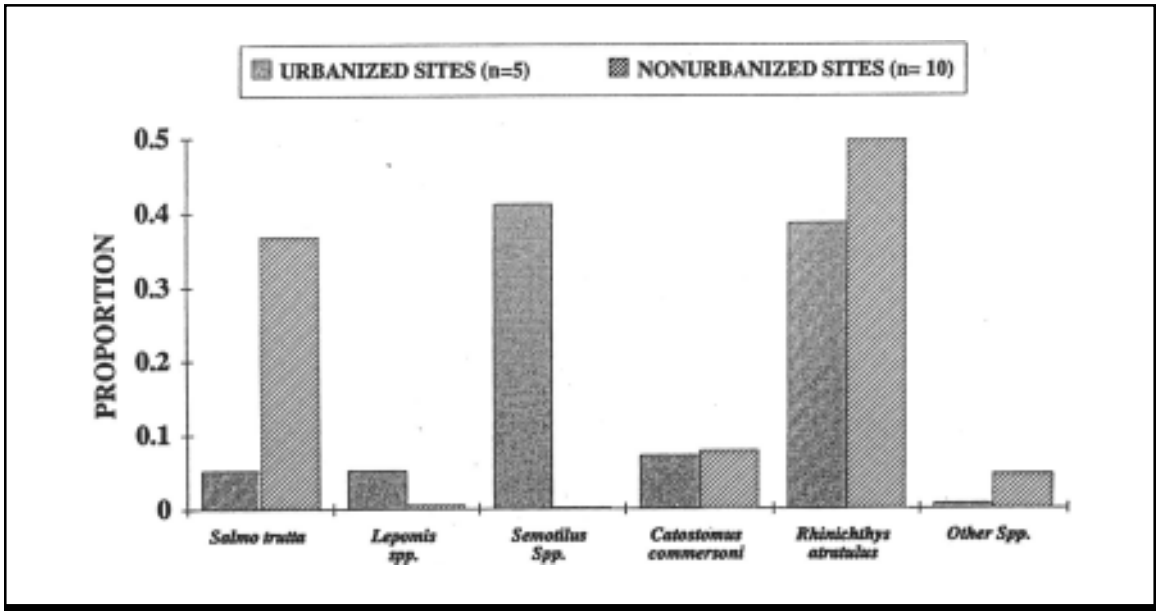

Figure 52: Mean Proportion of Fish Taxa in Urban and Non-Urban Streams, Valley Forge Watershed, PA (Kemp and Spotila, 1997)

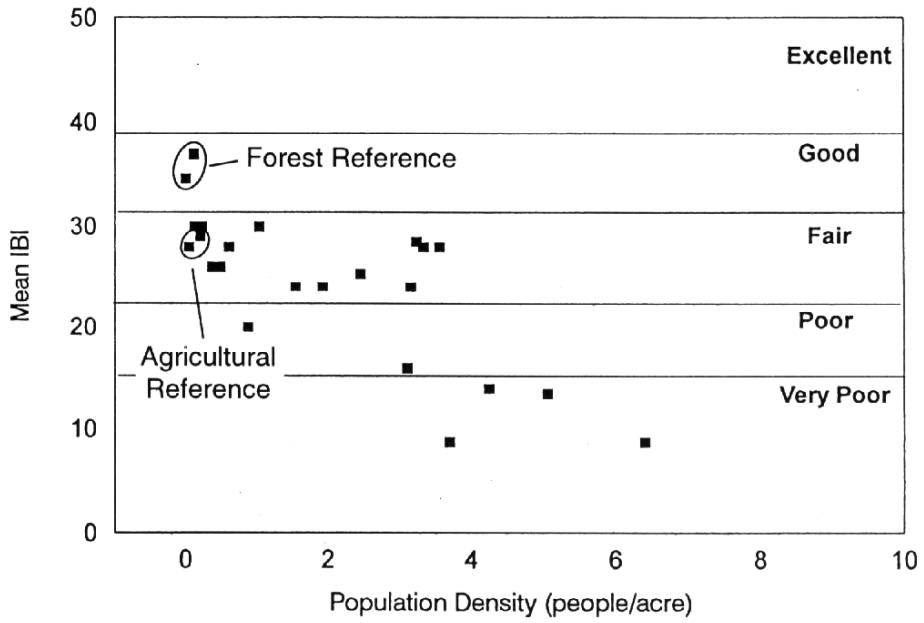

Figure 53: Relationship Between Watershed Population Density and Stream IBI Scores in Georgia Streams (DeVivo *et al.*, 1997)

fish-IBI scores occurred around 8% urban land use, primarily due to certain stressors which functioned to lower the non-attainment threshold. When watersheds smaller than 100mi^2 were analyzed separately, the percentage of urban land use associated with a sharp drop in fish-IBI scores was around 15%. In a later study, Yoder and Miltner (2000) described an upper threshold for quality warm-water fish habitat at 25 to 30% urban land use.

Watershed population and housing density have also been used as indicators of the health of the fish community. In a study of 21 urban watersheds in Atlanta, DeVivo *et al.* (1997) observed a shift in mean fish-IBI scores from "good to fair" to "very poor" when watershed population density exceeded four people/acre (Figure 53). A study of Midwest streams in metropolitan Illinois also found a negative relationship between increase in population density and fish communities, with significant impacts detected at population densities of 1.5 people or greater per acre (Dreher, 1997). In the Columbus and Cuyahoga watersheds in Ohio, Yoder *et al*. (1999) concluded that most streams failed to attain fish biocriteria above one dwelling unit/acre.

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5.5 Effects on Amphibian Diversity

Amphibians spend portions of their life cycle in aquatic systems and are frequently found within riparian, wetland or littoral areas. Relatively little research has been conducted to directly quantify the effects of watershed development on amphibian diversity. Intuitively, it would appear that the same stressors that affect fish and aquatic insects would also affect amphibian species, along with riparian wetland alteration. We located four research studies on the impacts of watershed urbanization on amphibian populations; only one was related to streams (Boward *et al.,* 1999), while others were related to wetlands (Table 53).

A primary factor influencing amphibian diversity appears to be water level fluctuations (WLF) in urban wetlands that occur as a result of increased stormwater discharges. Chin (1996) hypothesized that increased WLF and other hydrologic factors affected the abundance of egg clutches and available amphibian breeding habitat, thereby ultimately influencing amphibian richness. Increased WLF can limit reproductive success by eliminating mating habitat and the emergent vegetation to which amphibians attach their eggs.

Taylor (1993) examined the effect of watershed development on 19 freshwater wetlands in King County, WA and concluded that the additional stormwater contributed to greater annual WLF. When annual WLF exceeded about eight inches, the richness of both the wetland plant and amphibian communities dropped sharply. Large increases in WLF were consistently observed in freshwater wetlands when IC in upstream watersheds exceeded 10 to 15%. Further research on streams and wetlands in the Pacific northwest by Horner *et al.* (1997) demonstrated the correlation between watershed IC and diversity of amphibian species. Figure 54 illustrates the relationship between amphibian species abundance and watershed IC, as documented in the study.

Table 53: Recent Research on the Relationship Between Percent Watershed Urbanization and the Amphibian Community			
Indicator	**Key Finding(s)**	**Reference Year**	**Location**
% IC			
Reptile and Amphibian Abundance	In a three-year stream sampling across the state (approximately 1000 sites), MBSS found only hardy pollution-tolerant reptiles and amphibians in stream corridors with >25% IC drainage area.	Boward *et al.*, 1999	MD
Amphibian Density	Mean annual water fluctuation inversely correlated to amphibian density in urban wetlands. Declines noted beyond 10% IC.	Taylor, 1993	WA
Other Studies			
Species Richness	In 30 wetlands, species richness of reptiles and amphibians was significantly related to density of paved roads on lands within a two kilometer radius.	Findlay and Houlahan, 1997	Ontario
Species Richness	Decline in amphibian species richness as wetland WLF increased. While more of a continuous decline rather than a threshold, WLF = 22 centimeters may represent a tolerance boundary for amphibian community.	Horner *et al.*, 1997	WA
Amphibian Density	Mean annual water fluctuation inversely correlated to amphibian density in urban wetlands.	Taylor, 1993	WA

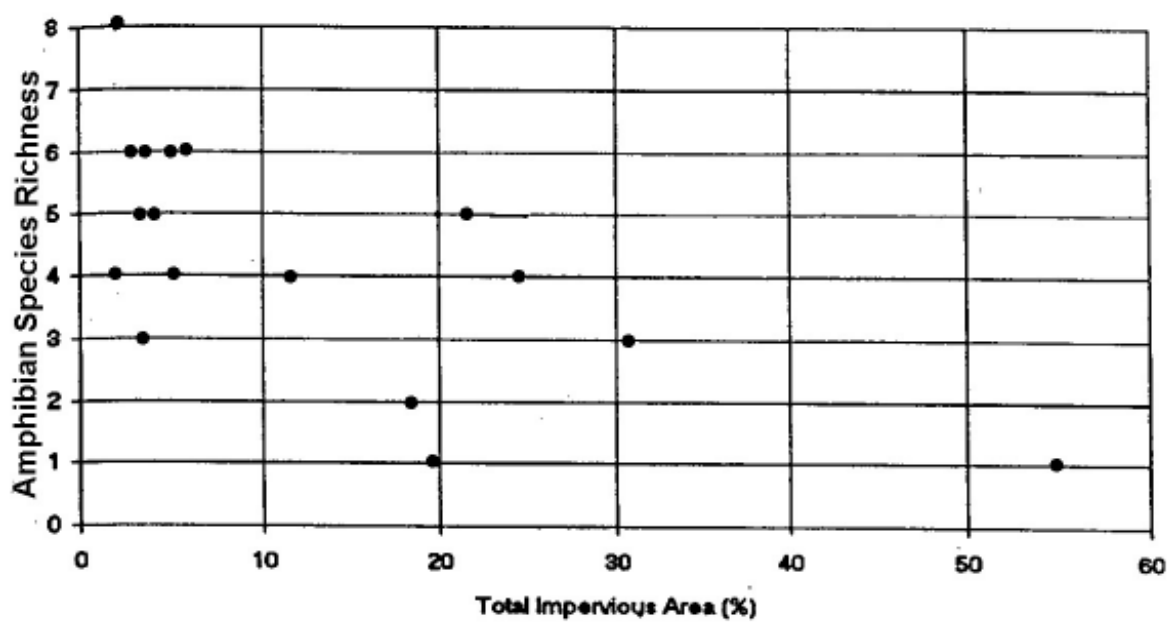

Figure 54: Amphibian Species Richness as a Function of Watershed IC in Puget Sound Lowland Wetlands (Horner *et al.*, 1997)

5.6 Effects on Wetland Diversity

We found a limited number of studies that evaluated the impact of watershed urbanization on wetland plant diversity (Table 54). Two studies used IC as an index of watershed development and observed reduced wetland plant diversity around or below 10% IC (Hicks and Larson, 1997 and Taylor, 1993). WLF and road density were also used as indicators (Findlay and Houlahan, 1997; Horner *et al.*, 1997; Taylor, 1993).

Horner *et al.* (1997) reported a decline in plant species richness in emergent and scrub-shrub wetland zones of the Puget Sound region as WLF increased. They cautioned that species numbers showed a continuous decline rather than a threshold value; however, it was indicated that WLF as small as 10 inches can represent a tolerance boundary for wetland plant communities. Horner further stated that in 90% of the cases where WLF exceeded 10 inches, watershed IC exceeded 21%.

Table 54: Recent Research Examining the Relationship Between Watershed Development and Urban Wetlands

Watershed Indicator Biotic	Key Finding(s)	Reference	Location
% IC			
Insect Community	Significant declines in various indicators of wetland aquatic macro-invertebrate community health were observed as IC increased to 8-9%.	Hicks and Larson, 1997	CT
WLF, Water Quality	There is a significant increase in WLF, conductivity, fecal coliform bacteria, and total phosphorus in urban wetland as IC exceeds 3.5%.	Taylor *et al.*, 1995	WA
Plant Density	Declines in urban wetland plant density noted in areas beyond 10% IC.	Taylor, 1993	WA
Other Watershed Indicators			
Plant Density	Mean annual water fluctuation inversely correlated to plant density in urban wetlands.	Taylor, 1993	WA
Plant Species Richness	Decline in plant species richness in emergent and scrub-shrub wetland zones as WLF increased. While more of a continuous decline, rather than a threshold, WLF=22 centimeters may represent a tolerance boundary for the community	Horner *et al.*, 1997	WA
Plant Species Richness	In 30 wetlands, species richness was significantly related to density of paved roads within a two kilometer radius of the wetland. Model predicted that a road density of 2kilometers per hectare in paved road within 1000 meters of wetland will lead to a 13% decrease in wetland plant species richness.	Findlay and Houlahan,1997	Ontario

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5.7 Effects on Freshwater Mussel Diversity

Freshwater mussels are excellent indicators of stream quality since they are filter-feeders and essentially immobile. The percentage of imperiled mussel species in freshwater ecoregions is high (Williams *et al.*, 1993). Of the 297 native mussel species in the United States, 72% are considered endangered, threatened, or of special concern, including 21 mussel species that are presumed to be extinct. Seventy mussel species (24%) are considered to have stable populations, although many of these have declined in abundance and distribution. Modification of aquatic habitats and sedimentation are the primary reasons cited for the decline of freshwater mussels (Williams *et al.,* 1993).

Freshwater mussels are very susceptible to smothering by sediment deposition. Consequently, increases in watershed development and sediment loading are suspected to be a factor leading to reduced mussel diversity. At sublethal levels, silt interferes with feeding and metabolism of mussels in general (Aldridge *et al.*, 1987). Major sources of mortality and loss of diversity in mussels include impoundment of rivers and streams, and eutrophication (Bauer, 1988). Changes in fish diversity and abundance due to dams and impoundments can also influence the availability of mussel hosts (Williams *et al.*, 1992).

Freshwater mussels are particularly sensitive to heavy metals and pesticides (Keller and Zam, 1991). Although the effects of metals and pesticides vary from one species to another, sub-lethal levels of PCBs, DDT, Malathion, Rotenone and other compounds are generally known to inhibit respiratory efficiency and accumulate in tissues (Watters, 1996). Mussels are more sensitive to pesticides than many other animals tested and often act as “first-alerts” to toxicity long before they are seen in other organisms.

We were unable to find any empirical studies relating impacts of IC on the freshwater mussel communities of streams.

5.8 Conclusion

The scientific record is quite strong with respect to the impact of watershed urbanization on the integrity and diversity of aquatic communities. We reviewed 35 studies that indicated that increased watershed development led to declines in aquatic insect diversity and about 30 studies showing a similar impact on fish diversity. The scientific literature generally shows that aquatic insect and freshwater fish diversity declines at fairly low levels of IC (10 to 15%), urban land use (33%), population density (1.5 to eight people/acre) and housing density (>1 du/ac). Many studies also suggest that sensitive elements of the aquatic community are affected at even lower levels of IC. Other impacts include loss of sensitive species and reduced abundance and spawning success. Research supports the ICM, although additional research is needed to establish the upper threshold at which watershed development aquatic biodiversity can be restored.

One area where more research is needed involves determining how regional and climatic variations affect aquatic diversity in the ICM. Generally, it appears that the 10% IC threshold applies to streams in the East Coast and Midwest, with Pacific Northwest streams showing impacts at a slightly higher level. For streams in the arid and semi-arid Southwest, it is unclear what, if any, IC threshold exists given the naturally stressful conditions for these intermittent and ephemeral streams (Maxted, 1999). Southwestern streams are characterized by seasonal bursts of short but intense rainfall and tend to have aquatic communities that are trophically simple and relatively low in species richness (Poff and Ward, 1989).

Overall, the following conclusions can be drawn:

- IC is the most commonly used index to assess the impacts of watershed urbanization on aquatic insect and fish diversity. Percent urban land use is also a common index.

- The ICM may not be sensitive enough to predict biological diversity in watersheds with low IC. For example, below 10% watershed IC, other watershed variables such as riparian continuity, natural forest cover, cropland, ditching and acid rain may be better for predicting stream health.

- More research needs to be done to determine the maximum level of watershed development at which stream diversity can be restored or maintained. Additionally, the capacity of stormwater treatment practices and stream buffers to mitigate high levels of watershed IC warrants more systematic research.

- More research is needed to test the ICM on amphibian and freshwater mussel diversity.

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Glossary

1st order stream: The smallest perennial stream. A stream that carries water throughout the year and does not have permanently flowing tributaries.

2nd order stream: Stream formed by the confluence of two 1st order streams.

3rd order stream: Stream formed by the confluence of two 2nd order streams.

Acute toxicity: Designates exposure to a dangerous substance or chemical with sufficient dosage to precipitate a severe reaction, such as death.

Alluvial: Pertaining to processes or materials associated with transportation or deposition by running water.

Anadromous: Organisms that spawn in freshwater streams but live most of their lives in the ocean.

Annual Pollutant Load: The total mass of a pollutant delivered to a receiving water body in a year.

Bankfull: The condition where streamflow just fills a stream channel up to the top of the bank and at a point where the water begins to overflow onto a floodplain.

Baseflow: Stream discharge derived from ground water that supports flow in dry weather.

Bedload: Material that moves along the stream bottom surface, as opposed to suspended particles.

Benthic Community: Community of organisms living in or on bottom substrates in aquatic habitats, such as streams.

Biological Indicators: A living organism that denotes the presence of a specific environmental condition.

Biological Oxygen Demand (BOD): An indirect measure of the concentration of biologically degradable material present in organic wastes. It usually reflects the amount of oxygen consumed in five days by bacterial processes breaking down organic waste.

Carcinogen: A cancer-causing substance or agent.

Catchment: The smallest watershed management unit. Defined as the area of a development site to its first intersection with a stream, usually as a pipe or open channel outfall.

Chemical Oxygen Demand (COD): A chemical measure of the amount of organic substances in water or wastewater. Non-biodegradable and slowly degrading compounds that are not detected by BOD are included.

Chronic Toxicity: Showing effects only over a long period of time.

Combined Sewer Overflow (CSO): Excess flow (combined wastewater and stormwater runoff) discharged to a receiving water body from a combined sewer network when the capacity of the sewer network and/or treatment plant is exceeded, typically during storm events.

Combined Indices (C-IBI or CSPS): Combined indices that use both fish and aquatic insect metrics and a variety of specific habitat scores to classify streams.

Cryptosporidium parvum: A parasite often found in the intestines of livestock which contaminates water when animal feces interacts with a water source.

Deicer: A compound, such as ethylene glycol, used to melt or prevent the formation of ice.

Dissolved Metals: The amount of trace metals dissolved in water.

Dissolved Phosphorus: The amount of phosphorus dissolved in water.

Diversity: A numerical expression of the evenness and distribution of organisms.

Ecoregion: A continuous geographic area over which the climate is uniform to permit the development of similar ecosystems on sites with similar geophysical properties.

Embeddedness: Packing of pebbles or cobbles with fine-grained silts and clays.

EPT Index: A count of the number of families of each of the three generally pollution-sensitive orders: Ephemeroptera (mayflies), Plecoptera (stoneflies), and Trichoptera (caddisflies).

Escherichia coli (E. coli): A bacteria that inhabits the intestinal tract of humans and other warm-blooded animals. Although it poses no threat to human health, its presence in drinking water does indicate the presence of other, more dangerous bacteria.

Eutrophication: The process of over-enrichment of water bodies by nutrients, often typified by the presence of algal blooms.

Fecal coliform: Applied to E. coli and similar bacteria that are found in the intestinal tract of humans and animals. Coliform bacteria are commonly used as indicators of the presence of pathogenic organisms. Their presence in water indicates fecal pollution and potential contamination by pathogens.

Fecal streptococci: Bacteria found in the intestine of warm-blooded animals. Their presence in water is considered to verify fecal pollution.

Fish Blockages: Infrastructures associated with urbanization, such as bridges, dams, and culverts, that affect the ability of fish to move freely upstream and downstream in watersheds. Can prevent re-colonization of resident fish and block the migration of anadromous fish.

Flashiness: Percent of flows exceeding the mean flow for the year. A flashy hydrograph would have larger, shorter-duration hydrograph peaks.

Geomorphic: The general characteristic of a land surface and the changes that take place in the evolution of land forms.

Giardia lamblia: A flagellate protozoan that causes severe gastrointestinal illness when it contaminates drinking water.

Herbicide: Chemicals developed to control or eradicate plants.

Hotspot: Area where land use or activities generate highly contaminated runoff, with concentrations of pollutants in excess of those typically found in stormwater.

Hydrograph: A graph showing variation in stage (depth) or discharge of a stream of water over a period of time.

Illicit discharge: Any discharge to a municipal separate storm sewer system that is not composed entirely of storm water, except for discharges allowed under an NPDES permit.

Impervious Cover: Any surface in the urban landscape that cannot effectively absorb or infiltrate rainfall.

Impervious Cover Model (ICM): A general watershed planning model that uses percent watershed impervious cover to predict various stream quality indicators. It predicts expected stream quality declines when watershed IC exceeds 10% and severe degradation beyond 25% IC.

Incision: Stream down-cuts and the channel expands in the vertical direction.

Index of Biological Integrity (IBI): Tool for assessing the effects of runoff on the quality of the aquatic ecosystem by comparing the condition of multiple groups of organisms or taxa against the levels expected in a healthy stream.

Infiltration: The downward movement of water from the surface to the subsoil. The infiltration capacity is expressed in terms of inches per hour.

Insecticide: Chemicals developed to control or eradicate insects.

Large Woody Debris (LWD): Fundamental to stream habitat structure. Can form dams and pools; trap sediment and detritus; provide stabilization to stream channels; dissipate flow energy and promote habitat complexity.

Mannings N: A commonly used roughness coefficient; actor in velocity and discharge formulas representing the effect of channel roughness on energy losses in flowing water.

Methyl Tertiary-Butyl Ether: An oxygenate and gasoline additive used to improve the efficiency of combustion engines in order to enhance air quality and meet air pollution standards. MTBE has been found to mix and move more easily in water than many other fuel components, thereby making it harder to control, particularly once it has entered surface or ground waters.

Microbe: Short for microorganism. Small organisms that can be seen only with the aid of a microscope. Most frequently used to refer to bacteria. Microbes are important in the degradation and decomposition of organic materials.

Nitrate: A chemical compound having the formula NO_3. Excess nitrate in surface waters can lead to excessive growth of aquatic plants.

Organic Matter: Plant and animal residues, or substances made by living organisms. All are based upon carbon compounds.

Organic Nitrogen: Nitrogen that is bound to carbon-containing compounds. This form of nitrogen must be subjected to mineralization or decomposition before it can be used by the plant community.

Overbank Flow: Water flow over the top of the bankfull channel and onto the floodplain.

Oxygenate: To treat, combine, or infuse with oxygen.

Peak Discharge: The maximum instantaneous rate of flow during a storm, usually in reference to a specific design storm event.

Pesticides: Any chemical agent used to control specific organisms, for example, insecticides, herbicides, fungicides and rodenticides.

Piedmont: Any plain, zone or feature located at the foot of a mountain. In the United States, the Piedmont (region) is a plateau extending from New Jersey to Alabama and lying east of the Appalachian Mountains.

Pool: A stream feature where there is a region of deeper, slow-moving water with fine bottom materials. Pools are the slowest and least turbulent of the riffle/run/pool category.

Protozoan: Any of a group of single-celled organisms.

Rapid Bioassessment Protocols (RBP): An integrated assessment, comparing habitat, water quality and biological measures with empirically defined reference conditions.

Receiving Waters: Rivers, lakes, oceans, or other bodies of water that receive water from another source.

Riffle: Shallow rocky banks in streams where water flows over and around rocks disturbing the water surface; often associated with whitewater. Riffles often support diverse biological communities due to their habitat niches and increased oxygen levels created by the water disturbance. Riffles are the most swift and turbulent in the riffle/run/pool category.

Roughness: A measurement of the resistance that streambed materials, vegetation, and other physical components contribute to the flow of water in the stream channel and flood-plain. It is commonly measured as the Manning's roughness coefficient (Manning's N).

Run: Stream feature characterized by water flow that is moderately swift flow, yet not particularly turbulent. Runs are considered intermediate in the riffle/run/pool category.

Runoff Coefficient: A value derived from a site impervious cover value that is applied to a given rainfall volume to yield a corresponding runoff volume.

Salmonid: Belonging to the family Salmonidae, which includes trout and salmon.

Sanitary Sewer Overflow (SSO): Excess flow of wastewater (sewage) discharged to a receiving water body when the capacity of the sewer network and/or treatment plant is exceeded, typically during storm events.

Semi-arid: Characterized by a small amount of annual precipitation, generally between 10 and 20 inches.

Simple Method: Technique used to estimate pollutant loads based on the amount of IC found in a catchment or subwatershed.

Sinuosity: A measure of channel curvature, usually quantified as the ratio of the length of the channel to the length of a straight line along the valley axis. It is, in essence, a ratio of the stream's actual running length to its down-gradient length.

Soluble Phosphorus: The amount of phosphorus available for uptake by plants and animals.

Stormwater: The water produced as a result of a storm.

Subwatershed: A smaller geographic section of a larger watershed unit with a drainage area of between two to 15 square miles and whose boundaries include all the land area draining to a point where two 2nd order streams combine to form a 3rd order stream.

Total Dissolved Solids (TDS): A measure of the amount of material dissolved in water (mostly inorganic salts).

Total Kjeldhal Nitrogen (TKN): The total concentration of nitrogen in a sample present as ammonia or bound in organic compounds.

Total Recoverable Metals: The amount of a metal that is in solution after a representative suspended sediment sample has been digested by a method (usually using a dilute acid solution) that results in dissolution of only readily soluble substances).

Total Maximum Daily Load (TMDL): The maximum quantity of a particular water pollutant that can be discharged into a body of water without violating a water quality standard.

Total Nitrogen (Total N): A measure of the total amount of nitrate, nitrite and ammonia concentrations in a body of water.

Total Organic Carbon (TOC): A measure of the amount of organic material suspended or dissolved in water.

Total Phosphorous (Total P): A measure of the concentration of phosphorus contained in a body of water.

Total Suspended Solids (TSS): The total amount of particulate matter suspended in the water column.

Trophic Level: The position of an organism in a food chain or food pyramid.

Turbidity: A measure of the reduced transparency of water due to suspended material which carries water quality and aesthetic implications. Applied to waters containing suspended matter that interferes with the passage of light through the water or in which visual depth is restricted.

Volatile Organic Compounds (VOC): Chemical compounds which are easily transported into air and water. Most are industrial chemicals and solvents. Due to their low water solubility they are commonly found in soil and water.

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Office of Policy Development and Research

The Practice of Low Impact Development

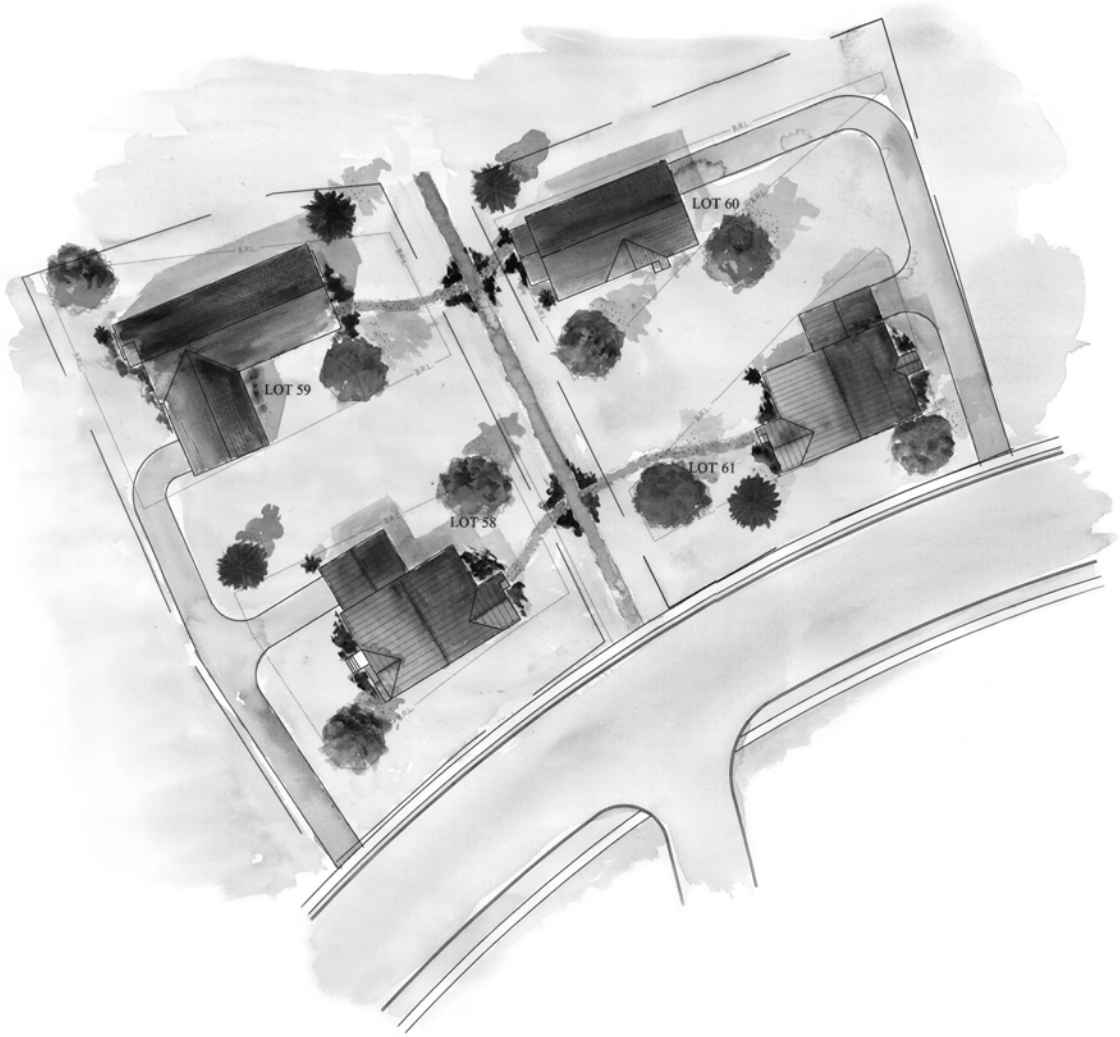

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PREFACE

This U.S. Department of Housing and Urban Development (HUD) document, *The Practice of Low Impact Development (LID)*, is intended to assist the housing industry during the land development process. It complements the 1993 HUD publication *Model Land Development Standards and Accompanying Model State Enabling Legislation*, which simultaneously promoted safe, high-quality housing and eliminated needless requirements that add to a home's final cost.

The HUD Office of Policy Development and Research (PD&R) supports the Department's overall mission of helping to create affordable housing and assisting communities with meeting their development needs. In particular, PD&R is responsible for monitoring the nation's housing needs, conducting research on significant community development issues, and providing reliable and objective analysis to our nation's policymakers. This publication underscores PD&R's commitment to delivering timely and accurate research to our nation's housing professionals.

The document focuses specifically on technologies that affect both the cost impacts and environmental issues associated with land development. It provides a brief introduction to low impact development and discusses conventional and alternative techniques and technologies that developers can integrate into their existing land development practices. By continually examining the land development process, the home building industry can continue to provide America with built environments that enhance the natural environment.

EXECUTIVE SUMMARY

Building professionals and municipal planning officials each have numerous goals and try to satisfy many needs during land development. Private developers are interested in profitable business ventures that also effectively address environmental concerns and meet regulatory requirements. Public sector officials ensure that development projects mesh with applicable zoning ordinances and help improve the surrounding community. This publication is intended to assist these groups by 1) providing basic conventional and innovative land development technology information, and 2) encouraging the amendment of existing development codes to facilitate the use of those technologies.

In an effort to help meet both groups' needs, the publication provides ways to simultaneously incorporate economic and environmental considerations into the land development process. This approach to land development, called Low Impact Development (LID), uses various land planning and design practices and technologies to simultaneously conserve and protect natural resource systems and reduce infrastructure costs. LID still allows land to be developed, but in a cost-effective manner that helps mitigate potential environmental impacts. LID is best suited for new, suburban development.

Some developers are already using some LID technologies in their projects, however this publication can help building professionals and municipal officials who are interested in learning more about LID. Lastly, developers do not have to incorporate all of the LID technologies noted herein into every development, rather, it is suggested developers carefully select the technologies appropriate to a site's unique regulatory, climatic, and topographic conditions. Some of the key LID recommendations are presented below.

Project Planning & Design

While the LID approach can result in a myriad of benefits for the developer, the municipality, and the environment, the proposed use of LID is likely to spawn questions during the development process. However, careful project planning, close collaboration with the local municipality, and education programs can minimize the challenges and effectively answer the questions.

Developers who have used LID practices and technologies have indicated that one of the keys to a successful project is to invest additional time and money in the initial planning stages of development. While this idea may be unpopular because of increased up-front costs, the expenditures are often recouped in the form of rapid home sales, enhanced community marketability, and higher lot yields.

Storm Water Management

Conventional storm water management systems rely on collection and conveyance systems to remove water safely from developed areas and to protect life, property, and health. The systems are engineered and designed according to estimates of post-development storm water flows and volumes from pervious and impervious areas.

Low impact development storm water management systems can reduce development costs through the reduction or elimination of conventional storm water conveyance and collection systems. LID systems can reduce the need for paving, curb and gutter, piping, inlet structures, and storm water ponds by treating water at its source instead of at the end of the pipe. However, developers are not the only parties to benefit from the use of LID storm water management techniques. Municipalities also benefit in the long term through reduced maintenance costs.

Wastewater Management

Wastewater can affect natural resources; all wastewater coming from a home must be sent to an effective treatment site or public treatment system in order to limit adverse environmental and health impacts. Nitrogen and phosphorus are two nutrients in wastewater that, either in excess or through cumulative effect, can adversely affect receiving waterbodies. When septic systems fail to operate as designed, excess nutrients in untreated wastewater can enter the environment.

In most cases, either municipal sewer or private on-site wastewater treatment systems (i.e., septic systems) can handle wastewater treatment needs. However, there are exceptions. For instance, in some circumstances, sewer systems cannot be used because of cost considerations; it might be too costly to run pipes long distances to link a proposed development's wastewater system to existing municipal sewer connections. In other cases, a municipality might have specific health or environmental concerns that make the use of septic systems unacceptable. Via the LID approach, developers can consider a variety of on-site wastewater treatment system options either as alternatives or enhancements to conventional septic systems. Some on-site treatment alternatives to conventional systems, such as recirculating sand filters and evapotranspiration systems, are "add-ons" to a traditional septic tank system. The additional treatment unit is connected in-line with the septic tank and provides an extra level of treatment.

Circulation & Design

As the struggle to decrease nonpoint source pollution in our nation's waters continues, municipalities have begun to reexamine the connection between circulation design and storm water management practices. New designs for streets, sidewalks, and driveways can maintain the functions of circulation while helping to reduce expanses of impervious surfaces that can alter local hydrology and degrade water quality. In turn, new street designs can influence the layout of lots and help to increase the volume of open space in new residential developments.

When coupled with narrower, open-section streets, a well-designed street layout can eliminate hundreds of square feet of impervious surface. Depending on the density, location, and type of subdivision, different types of street layouts may easily lend themselves to a cluster arrangement, conserving natural features, maintaining open space, and protecting water quality.

INTRODUCTION

What if you could simultaneously reduce your residential development and infrastructure costs, conserve and protect the environment, increase the marketability of your projects, and improve housing affordability? It may sound too good to be true, but many developers throughout the nation have been able to meet these ambitious goals. How? By incorporating a growing collection of innovative practices and technologies into their existing land development processes and practices.

Low Impact Development (LID) is an approach to land development that uses various land planning and design practices and technologies to simultaneously conserve and protect natural resource systems and reduce infrastructure costs. LID still allows land to be developed, but in a cost-effective manner that helps mitigate potential environmental impacts.

There are numerous design practices and technologies developers can use through the LID approach. For instance, developers can work together with municipal officials and the general public during the initial planning stages of development to identify environmental protection opportunities. Examples of opportunities include saving trees on the site, not building on designated sensitive areas, orienting roads and lots to allow for passive solar orientation of homes, and enhancing the effectiveness of on-site wastewater treatment systems. Such efforts have resulted in rapid home sales, enhanced community marketability, and higher-than-average lot yields.

This publication often refers to "technologies." For the purposes of the discussion, an LID technology can be structural or nonstructural. Equipment such as a sand filter is an example of a structural technology used to treat wastewater. Nonstructural LID technologies often use natural features or are land use strategies. An example of a nonstructural technology is the disconnection of rain gutters from storm water drains and redirection of rainwater toward rain gardens or grass swales.

To developers, LID can offer both infrastructure savings and a way to respond to increasingly stringent environmental regulations. For municipalities, LID can help contain burgeoning street and storm water management costs. For community residents, LID can encourage local environmental stewardship. And, for the environment, the benefits speak for themselves.

Definition of LID

Low Impact Development (LID) is an approach to land development that uses various land planning and design practices and technologies to simultaneously conserve and protect natural resource systems and reduce infrastructure costs. LID still allows land to be developed, but in a cost-effective manner that helps mitigate potential environmental impacts.

SCOPE

In 1993, the U.S. Department of Housing and Urban Development published *Proposed Model Land Development Standards and Accompanying Model State Enabling Legislation* to support its mission of providing decent, safe, and suitable living environments for all Americans. This important publication focused on the identification and elimination of unnecessary land development practices that add to a home's final cost. Many of the standards also offered ancillary environmental benefits. As an indication of the publication's impact on land development, the volume led many states and municipalities to consider, and in the case of New Jersey directly adopt, some of the standards. Indeed, the publication's recommendations are as applicable today as they were in 1993. Appendix D contains the 1993 publication's Table of Contents. HUD USER (Telephone: 800-245-2691) can provide the entire 1993 publication to anyone interested in obtaining it.

> **1993 HUD Publication**
>
> In 1993, the U.S. Department of Housing and Urban Development published *Proposed Model Land Development Standards and Accompanying Model State Enabling Legislation* to support its mission of providing decent, safe, and suitable living environments for all Americans. This important publication focused on the identification and elimination of unnecessary land development practices that add to a home's final cost.

This current effort by HUD's Office of Policy Development and Research is intended to complement and build on the information presented in the 1993 HUD document. It provides users with state-of-the-art information on relevant technologies that can help address both economic and environmental issues related to land development. Specifically, this document is designed to:

- Increase developer and public official awareness of LID opportunities;
- Discuss the alternative technologies available to developers;
- Encourage flexibility in local development codes;
- Continue to promote housing affordability; and
- Reduce land development's environmental impacts.

While LID may benefit all types of development, it is best suited for new, suburban residential development. Moreover, the LID practices and technologies are best integrated into a developer's existing land development process and practices. With some planning, the technologies described in this document can be integrated into today's land development projects. Based on a comprehensive site analysis (see Section 1.5.3), developers can decide which technology or combination of technologies will offer the best cost and environmental benefits taking into account the local ordinances. Developers do not have to incorporate all of the LID technologies noted herein into every development, rather, it is suggested developers carefully select the technologies appropriate to a site's unique regulatory, climatic, and topographic conditions.

HOW TO USE THIS DOCUMENT

This publication consists of two parts (see Table 1). Part I outlines the objectives of LID and explains how the approach can be easily integrated into a developer's project planning and design process. Part II presents the alternative practices and technologies that can be integrated into the land development process. In accordance with project objectives, site designers should explore the application of either an individual technology or a combination of technologies. For instance, planning for the conservation and protection of water resources on a project site may involve the integration of both storm water and wastewater management technologies. In sum, developers can first learn the objectives of LID (Part I) and then identify the practices and technologies (Part II) that can maximize the project's economic and environmental goals.

Part II of the document contains the following sections: Storm Water Management, Wastewater Treatment, and Circulation and Design, each of which was selected for its potential to offer the greatest LID benefits. Lastly, Appendix A contains a glossary, while Appendix B contains case studies that provide builders with real-world success stories of projects that used LID, Appendix C provides a list of references, and Appendix D provides the 1993 US HUD publication *Proposed Model Land Development Standards and Accompanying Model State Enabling Legislation's* table of contents.

The Practice of Low Impact Development		
Introduction	Part I	Part II
Definition of LID Relationship to 1993 Publication	LID Objectives Project Planning and Site Design	Alternative Technologies • Storm Water Management • Wastewater Treatment • Circulation and Design

TABLE 1. OVERVIEW OF DOCUMENT

AUDIENCE

This document is intended primarily for residential building professionals as they work through the initial stages of project planning and design. In addition, municipal planning officials benefit as the document can help them during various stages of the project development process.

Building professionals such as builders/developers, engineers, planners, and landscape architects using the LID approach indicate that successful projects require meticulous planning and design. Consulting this document before initiating the planning process can help building professionals identify and implement a range of LID practices and technologies and thus maximize a project's potential.

Municipal planning officials can also benefit from the use of this document. Reference to the document during the review and permitting stages of development can help officials understand the use of LID practices and technologies. Municipal planning officials are often responsible for drafting and enforcing local development codes and reviewing and approving preliminary site plans. Therefore, in addition to helping to educate municipal officials on the LID approach, the document can help encourage the amendment of existing development codes to facilitate the use of LID practices and technologies.

Section 1.4 discusses the challenges involved in implementing LID. The success of developments such as the Somerset community in Prince George's County, Maryland, and the Kensington Estates community in Pierce County, Washington, proves that developers and public officials can work together to integrate LID practices and technologies into today's projects. These communities have received praise for reducing strains on land, water, air, and soil resources.

PART I:
PROJECT PLANNING AND DESIGN

SECTION 1. LOW IMPACT DEVELOPMENT (LID) PRIMER

The LID approach to land development uses various land planning and design practices and technologies to simultaneously conserve and protect natural resource systems and reduce infrastructure costs.

1.1 OVERVIEW

In the mid 1990s, the Prince George's County, Maryland, Department of Environmental Resources outlined an approach for addressing suburban storm water management. That approach, termed Low Impact Development (LID), uses certain technology-based practices to ensure that a site's post-development hydrologic functions mimic those in its pre-development state. These functions include groundwater recharge, infiltration, and frequency and volume of discharges.

For the purposes of this document, we have expanded the concept of LID to include site planning and design considerations as well as wastewater management considerations.

1.2 BENEFITS OF LOW IMPACT DEVELOPMENT

LID reexamines traditional development practices and technologies and focuses on identifying project-specific site solutions that benefit the municipality, the developer, the home buyer, and the environment. Elements of the approach are also known by other names, such as conservation design, environmentally friendly design, resource-efficient design, and better site design. In addition to the fact that LID makes good sense, low impact development techniques can offer many benefits to a variety of stakeholders (see Table 2).

1.3 GOALS OF LOW IMPACT DEVELOPMENT

Many developers are aware that incorporating low impact development into their existing practices helps them systematically balance environmental and cost issues. In particular, residential building professionals using the LID approach seek to do the following:

Preserve Open Space and Minimize Land Disturbances

Successful LID communities recognize the value of open space, mature landscapes, and native vegetation. Open-space tracts incorporated into community designs and planned as components of larger, contiguous areas are highly desirable; in fact, homeowners frequently seek assurances that their community enjoys easy access to undeveloped areas located nearby. Minimizing land disturbance helps dampen the impacts to ecological and biological processes both on and off the site.

Protect Sensitive Natural Features and Natural Processes

Protection of a site’s sensitive natural features and natural processes is paramount to planning for LID. Judicious application of information gained in a site analysis can help identify developable and nondevelopable areas of a site and minimize impacts to air, water, soil, and vegetation (see Section 1.5.3).

Identify and Link On- and Off-Site “Green Infrastructure”

Green infrastructure represents the planned and managed network of wilderness, parks, greenways, conservation easements, and working lands with conservation value that support native species, maintain natural ecological processes, and sustain air and water

resources. Site planners should strive to identify on-site opportunities to support and expand regional green infrastructure.

Developers
• Reduces land clearing and grading costs • Reduces infrastructure costs (streets, curbs, gutters, sidewalk) • Reduces storm water management costs • Increases lot yields and reduces impact fees • Increases lot and community marketability
Municipalities
• Protects regional flora and fauna • Balances growth needs with environmental protection • Reduces municipal infrastructure and utility maintenance costs (streets, curbs, gutters, sidewalks, storm sewers) • Fosters public/private partnerships
Home Buyer
• Protects site and regional water quality by reducing sediment, nutrient, and toxic loads to waterbodies • Preserves and protects amenities that can translate into more salable homes and communities • Provides shading for homes and properly orients homes to help decrease monthly utility bills
Environment
• Preserves integrity of ecological and biological systems • Protects site and regional water quality by reducing sediment, nutrient, and toxic loads to waterbodies • Reduces impacts to local terrestrial and aquatic plants and animals • Preserves trees and natural vegetation

TABLE 2. BENEFITS TO STAKEHOLDERS

Incorporate Natural Features (Wetlands, Riparian Corridors, Mature Forests) into Site Designs

LID takes advantage of natural resources for both their functional and aesthetic qualities. For instance, when designed correctly, wetlands and pond systems can provide storm water management solutions as well as aesthetic and recreational benefits for the entire community, thus increasing lot and community marketability.

Customize Site Design According to the Site Analysis

Planning for LID communities relies on the performance of a thorough site analysis. Site planners can use the information gathered during the site analysis to create the best balance between development and the conservation of natural resources. By identifying buildable and nonbuildable areas of a site, planners can direct development into areas that will experience the least impacts on air, soil, and water.

Decentralize and Micromanage Storm Water at Its Source

Understanding the difference between pre- and post-development hydrologic patterns is critical to LID. The use of best management practices to reduce the amount of impervious surfaces, disconnect flow paths (i.e., downspouts connected to storm sewers), and treat storm water at its source all help minimize the impacts to local hydrology. Attainment of these goals can lead to the protection of water quality, reduction of impervious surfaces, increased open space, protection of trees, reduced land disturbance, decrease in infrastructure costs, and reduced homeowner energy bills.

Associated Benefits of LID

Protection of Water Quality
Reduction of Impervious Surfaces
Increased Open Space
Protection of Trees
Reduced Land Disturbance
Decrease in Infrastructure Costs
Reduced Homeowner Energy Bills

1.4 CHALLENGES TO USING LOW IMPACT DEVELOPMENT

While the LID approach can result in a myriad of benefits for the developer, the municipality, and the environment, the proposed use of LID is likely to spawn questions during the development process. Two of the most frequent challenges facing developers who contemplate the use of LID center around restrictive local ordinances and local officials' and citizens' opposition to the approach. However, careful project planning, close collaboration with the local municipality, and education programs can reduce the challenges. Appendix B includes several case studies that developers can use to support their decisions to use LID.

Local ordinances guide the design and construction of new development. Often, a community drafted and adopted its ordinances years ago such that the regulations no longer reflect today's development practices, especially those of LID. In many cases, developers wishing to use LID may have to obtain some type of variance or waiver from their local planning agency until local codes are updated to reflect current practice. Unfortunately, variances can create delays in the approval and permitting process, and those delays often translate into more debt service on the loans secured for the original land purchase.

As a pure business decision, it usually does not make sense for a developer to go through the potentially time consuming steps of the variance process. One way to address this issue is to have municipalities reword their zoning ordinances in order to allow LID in residential land development projects. One thing that would help facilitate the ordinance revision process is the development of a nationwide database containing information on ordinances supporting the use of LID. This database would provide the entire development industry, including local planning officials, with a centralized resource that would provide examples of ordinances

Helping Communities Permit the Use of LID

Developers work within the local land development regulations. If a municipality would like developers use the LID approach in future projects, then the zoning ordinances should encourage such a change. However, municipal officials are looking for information on how to best provide flexibility in the local development regulations. Municipal officials have asked for a nationwide database containing information on sample zoning ordinances that support the use of LID. Since such a database does not currently exist, creating and updating an information clearinghouse would address one of the significant challenges in front of people interested in using the LID approach.

that encourage the LID approach.

Ideally, the time to obtain permit approval for an innovative land design should be at least equal to the time needed to develop that same parcel of land under the provisions of existing regulations. Developers incorporating LID practices and technologies into their projects should ask for expedited permitting or pre-development assurances that review and permitting times will not be extended. In fact, public officials that want developers to use LID technologies can tie incentives, such as expedited permitting process times, to developments incorporating those technologies. Until development ordinances are amended to allow innovative practices and technologies by-right, other incentives, such as density bonuses and reduced impact, application, or development fees can also be negotiated between developers and municipal officials to help offset additional costs. .

Local citizens may also show resistance to accepting the proposed use of LID within their communities. Misconceptions and minimal data regarding the safety and long-term viability of LID systems have led to questions concerning the practices' and technologies' efficacy, particularly in terms of flood control and public health and safety. To help homeowners, and sometimes even municipal officials, understand the benefits of LID techniques, developers may find it helpful to prepare brief educational presentations or publications on LID for both the general public and municipal officials. Studies have shown that once residents understand the benefits to local water quality, they are more likely to support and accept alternative technologies. Often, homeowners view practices such as bioretention cells as extra builder landscaping.

1.5 PLANNING FOR LOW IMPACT DEVELOPMENT

Proper team development and collaboration, (see Section 1.5.1), careful coordination with the public reviewing agency (see Section 1.5.2), and the performance of a thorough site analysis (see Section 1.5.3) are essential ingredients for successfully incorporating LID concepts into development plans.

Table 3 highlights some of the ways in which LID differs from conventional development. Developers who have used LID practices and technologies have indicated that one of the keys to a successful project is to invest additional time and money in the initial planning stages of development. While this idea may be unpopular, the expenditures are often recouped in the form of rapid home sales, enhanced community marketability, and higher lot yields.

Due to the iterative and phased nature of construction, both the collaboration and ordinance review/outreach phases should be conducted continuously from project commencement through completion. For example, changes to one aspect of the project (e.g., lot layout) can affect other aspects of the project (e.g., storm water management). During site construction, the site should be continuously monitored for potential impacts to vegetation, soils, or sensitive water features such that appropriate protective measures can be implemented.

	Collaboration	→	Ordinance Review/Outreach	→	Site Review and Analysis
Traditional Practice	• Often uses an engineering team and one or two other experts. • Uses experts sequentially, i.e., conducts one phase of development process and then passes project details to the next expert.		• Limits interaction with public officials to permitting meetings. • Does not actively seek out public's input on design options. • Meets existing ordinances. • Uses pre-development meetings to review preliminary site plans.		• Analyzes the land use ordinances to identify regulatory barriers. • Conducts review with the goal of developing one design plan. • Meets the regulatory requirements.
Low Impact Development Practice	• Uses experts such as landscape architects, engineers, hydrologists, geologists, and biologists to collaborate, perform site analysis, and identify innovative solutions. • Encourages collaborative effort among all site design professionals to maximize natural resource benefits.		• Proactively seeks public officials' input in pre-development meetings to identify project opportunities. • Works with the community to include its interests in project design. • Conducts resource analysis first to determine what the site offers. Reviews the ordinances to determine potential barriers to proposed designs. Design must meet ordinances or developer obtains a variance.		• Analyzes the land and ordinances to identify resource opportunities and constraints. • Reviews all inputs to create multiple land design options for consideration. • Works together with public officials to gain flexibility in the design phase.

TABLE 3. COMPARISON BETWEEN LOW IMPACT DEVELOPMENT AND TRADITIONAL LAND DEVELOPMENT PROCESSES

1.5.1 COLLABORATION

Historically, engineers have assumed primary responsibility for identifying a site's natural resources and integrating them into project designs. These professionals, however, may or may not have undergone the specialized training necessary to carry out their assigned tasks in the context of the LID approach. Engineers working on LID projects have benefited from the input of a variety of natural resource and land development professionals, including planners, architects, landscape architects, biologists, ecologists, and hydrologists.

Conducting the site planning process with the assistance of the above professionals increases the likelihood that the design process will disclose all opportunities for low

impact development. For instance, a site located in a headwaters area for sensitive wetlands may need the assistance of a hydrologist to identify strategies to protect local water resources. A landscape architect could help orient houses and lots to take advantage of passive solar heating. Section 1.6 discusses the process of incorporating these opportunities into project goals during the project design phase.

Developers' use of these professionals should obviously reflect a project's size and budget. In fact, the expertise offered by the above professionals may be available from several sources other than the professionals themselves. For instance, project engineers can consult the Internet, periodicals, and local governments to gain insights into efficient natural resource use and land planning practices.[1]

1.5.2 ORDINANCE REVIEW/OUTREACH

Before commencing work on any site design, developers committed to integrating LID practices and technologies into their designs should meet with local officials to review current development ordinances. Ordinance review meetings between developers and planning staff can help identify ways in which the public and private sectors can work together to build communities that minimize development impacts. Similar to the pre-development meetings that are now required in many municipalities throughout the country, ordinance review meetings should focus on the ways in which LID practices and technologies can further the intent of current ordinances. Developers should not view the meetings as opportunities for local municipalities to exert added regulatory control, but rather as forums in which the two parties can work together to identify mutually beneficial solutions.

Items to Consider During an Ordinance Review/Outreach Meeting
• Street Design and Parking Requirements
• Lot Layout and Setback Requirements
• Storm Water Management and Wastewater Treatment Practices and Technologies
• Bonus Densities or Other Development Incentives
• Options for Waivers or Variances

TABLE 4. ITEMS TO CONSIDER

Before the ordinance review meetings, developers should familiarize themselves with the relevant local regulations and the specific LID practices and technologies that they wish to implement. For instance, even though current zoning and storm water management regulations may prohibit the LID approach, a developer might be interested in integrating open-section roadways and grassed swales into a development. At the ordinance review meeting, the developer and the municipality might negotiate a compromise that will allow the developer to implement the practice on certain local streets in exchange for setting aside additional stream buffers elsewhere on the site. Developers can then apply for a variance that will likely be looked upon favorably by municipal officials since it was negotiated earlier between the developer and public official. This win-win situation

[1] Additional resources are listed at the end of each section in Part II.

reduces the developer's street construction costs and storm water management burden and increases municipal protections for riparian systems.

1.5.3 SITE ANALYSIS

Highly attractive and marketable developments begin with a thorough site analysis that takes into consideration a site's natural features. A site analysis is a process by which a developer or one or more members of the development team inventories a site's natural features and attributes to identify development opportunities and constraints. Soils, water resources, vegetative patterns, topography, microclimate, solar orientation, viewsheds, and access are just a few of the site attributes that go into a thorough analysis. Many may view the site analysis as a way to identify and plan for potential constraints that can sideline a project or increase development time or costs. However, as environmental awareness continues to increase, developers have realized that identifying and strengthening potential opportunities can be just as important. Table 5 provides some site analysis considerations that relate to Part II.

Storm Water Management
• Topography (low points, high points, ridgelines, swales) • Hydrology (natural drainage patterns, surface and groundwater, wetlands, sensitive water resources) • Vegetation (existing vegetation, tree-save areas, aquatic buffers)
Wastewater Management
• Soils (porosity, depth to bedrock, groundwater table) • Topography (slopes conducive to drain fields) • Natural Water Features/Sensitive Waterbodies • Aesthetics (siting) • Vegetation (sensitive areas)
Circulation and Design
• Hydrology (natural drainage) • Topography (ridgelines/steep slopes) • Natural Features (viewsheds, waterbodies, forested areas) • Soils (hydric)

TABLE 5. SITE ANALYSIS CONSIDERATIONS FOR TECHNOLOGIES DISCUSSED IN PART II

Before even purchasing a piece of property, a developer usually conducts or commissions some type of feasibility study to identify possible physical, legal, or political barriers to developing the site. A feasibility study differs from a site analysis in that it is not usually conducted to assist in site design. In many instances, lending institutions may require an environmental assessment to identify any potential for site contamination that could increase liability for remediation and raise development costs. The data collected for a feasibility study should by no means be considered complete. Many other sources of public and private information are available (see Table 6). Information gathered from different sources should be synthesized into a single, usable map and taken to the site for

verification, especially given that many public maps do not accurately reflect current local site conditions.

However, a site analysis is about more than just preparing a base map and verifying site conditions. A good site analysis can help site designers integrate the built and natural environments into a functioning whole while ensuring identification of the processes, both natural and man-made, that occur on and off site. Armed with an understanding of a site's various attributes and functions, site designers can create developments that enhance the site's ecological integrity.

One of the first concepts to understand about the site analysis is that it can rarely be completed during one site visit. If time permits, the process should involve several site visits at different times to observe the effects of seasonal and climatologic changes on the property. For instance, site hydrology may change drastically from the spring to the summer or views may differ radically during the winter months when trees shed their leaves. Designers should also examine on- and off-site connections such as wildlife corridors, riparian areas, or valley systems. The value of these systems should be considered in terms of both their intrinsic value and their connection to their counterparts in the regional environment. Site analysis usually brings together three primary areas of interest: water, vegetation, and soils/topography as discussed below.

Possible Sources of Information for a LID Site Analysis
• City/County/State/Federal Maps • National Flood Insurance Program (NFIP) Floodplain Maps • Aerial Photographs • National Wetlands Inventory (NWI) Maps • Topography/Soils (U.S. Geological Survey/Soil Conservation Service / Natural Resources Conservation Service - USGS/SCS/NRCS) • Local Tax/Plat Maps • Seismic Maps • Hazard Maps • Coastal Zone Management Maps

TABLE 6. SOURCES OF INFORMATION

Water

Increasingly, public officials are evidencing concern over water quality and quantity. When properly protected and enhanced, water features can make a project highly marketable. Studies indicate that homebuyers will pay premiums not only for waterfront lots but also for lots with water views or lots in communities with desirable water features such as lakes or streams.

Many different water resources can exist on a given site, and all should be inventoried and their hydrologic relationships understood. It is important to keep in mind that the connectivity of hydrologic systems means that impacts to one resource may affect

another. For instance, sheetflow regime changes may affect a wetlands system, which may in turn affect both groundwater recharge rates and baseflows to streams.

In addition to surface water sources such as streams, rivers, and lakes, other less evident sources of water are equally important and must be identified and protected. Wetlands, seeps, and springs are groundwater-based sources that in most instances fall under the jurisdiction of the federal Clean Water Act. Since they are fed by groundwater, these features may ultimately determine the location of roads, lots, structures, and on-site storm water management or wastewater treatment systems.

Site designers should consider sheetflow characteristics and seasonally inundated areas. Sheetflow is the movement of rainwater across the surface of landscape or, in other words, how the site drains. Flow paths should be identified and natural channels inventoried and protected. Seasonally inundated areas, which are temporarily ponded shallow depressions that exist during rainy seasons, provide habitat for aquatic and migratory species and should be protected.

Vegetation

Tree-save areas are areas preserved on a development tract to meet tree ordinance requirements and/or to protect healthy vegetation from site development activities.

Trees can be valuable resources on project sites. They can significantly increase the value of individual lots by moderating temperatures within and outside structures, acting as wind buffers, and benefiting water quality. Vegetated riparian buffers and forested areas have the capacity to reduce storm water volumes, remove pollutants, and slow erosive flows. Current national trends indicate that buyers seek lots with mature vegetation. Builders now realize that the preservation of mature trees and stands of trees can mean more attractive communities. Viable tree areas should be inventoried and protected by a comprehensive tree preservation plan implemented before site clearing and grading. Most municipalities now mandate some form of tree protection and may offer credits for preservation of existing stands. Tree-save areas should be incorporated into both buildable and nonbuildable areas of a site.

Soils/Topography

Soils and topographic studies can help determine the placement of streets, lots, buildings, wells, drainfields, and other site amenities. A thorough analysis of all related soils information, including percolation and other geotechnical studies, is an essential component of the site analysis. Given that federal government soil surveys are highly generalized, planners should not rely on them for site-specific soils information. Hydric, or wetland soils, should be delineated by a certified wetlands professional and verified by the local U.S. Army Corps of Engineers field office.

1.6 SITE DESIGN FOR LOW IMPACT DEVELOPMENT

Once the planning phase is complete, the resultant information can be used in the formulation of the final site design. Often, standardized residential templates are overlaid on a site without regard to a site's natural features and environmental sensitivities. These "forced" patterns cause unnecessary impacts to local water, vegetation, and soils and can artificially inflate the infrastructure costs associated with clearing and grading.

Given that land development projects vary as widely as the parcels of land to be developed, it is difficult to prescribe an exact design process for every situation. The three topics discussed below, site area classification, circulation design, and infrastructure and natural resources design, are part of an LID approach that should embrace the various design determinants and variables identified in Figure 1. The list of design determinants and variables identified in the figure is by no means exhaustive. Site designers should identify a complete list of these items based on each site's characteristics.

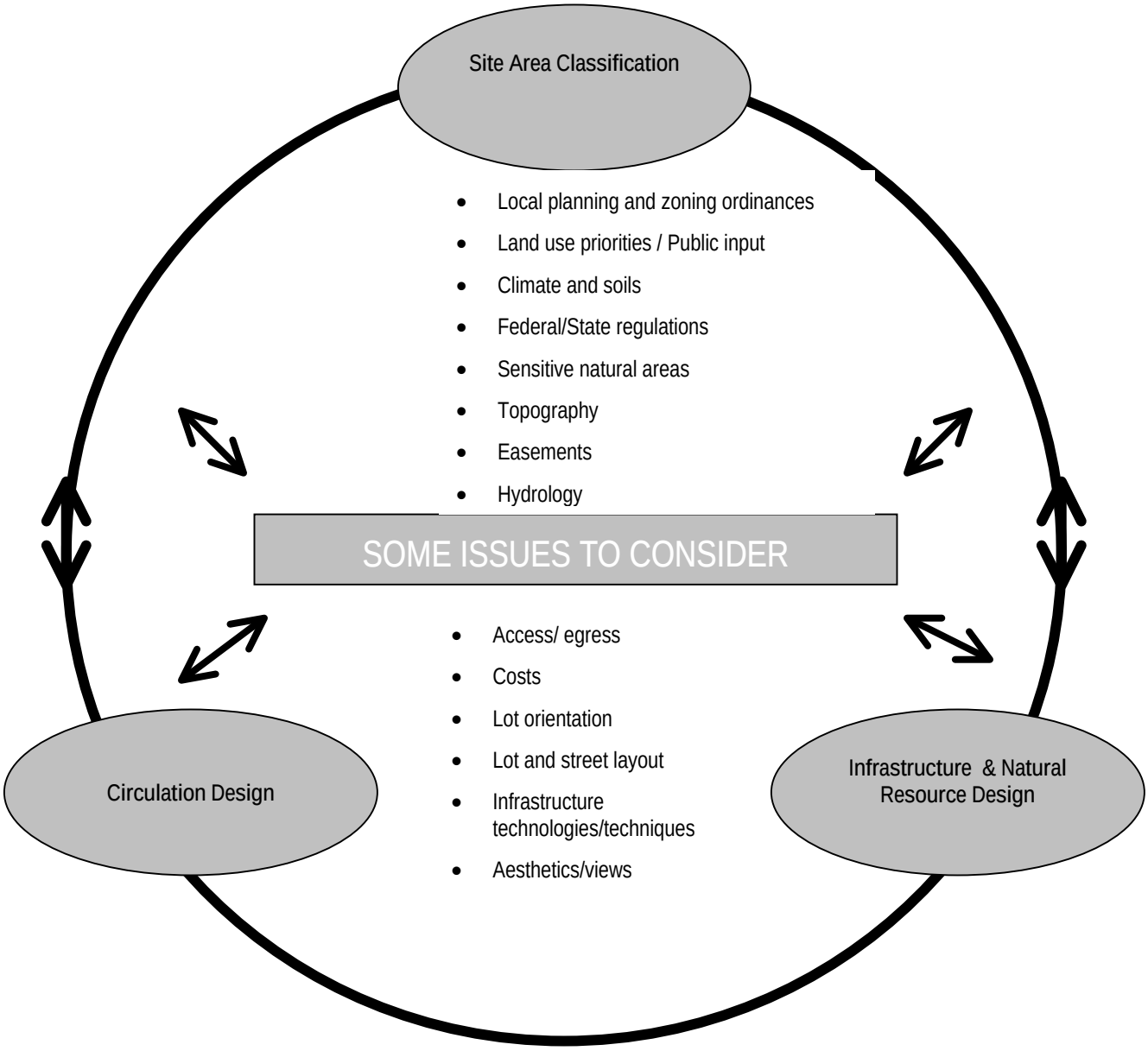

FIGURE 1. LOW IMPACT DEVELOPMENT SITE DESIGN

1.6.1 SITE AREA CLASSIFICATION

Once the site analysis is complete, site designers should analyze and classify areas of the site by suitability of use. During the process of site area classification, it is important to keep in mind that maximizing a site's development potential does not necessarily mean that the entire site needs to be developed. Compact forms of development make it possible to conserve open space and protect habitat and water quality while promoting housing affordability and a sense of community.

Even though open, nonvegetated areas are usually seen as prime development areas, site designers should remain flexible and take into account all natural resource information collected during the site analysis. For instance, a field might serve as a headwaters area for sensitive wetlands or be better developed into recreational fields for a park system.

Buildable Areas

Buildable areas of a site are the areas that are optimal for conversion into finished lots. Buildable areas usually have the fewest limitations in terms of access, regulatory restrictions, sensitive natural features, and zoning concerns. The process of identifying a site's buildable areas may point to the advisability of clustering development into several small areas rather than spreading it throughout one large area. While clustering can protect sensitive site features, it can contribute to infrastructure costs by increasing the excavation and construction costs for streets and utility lines. Yet, narrower streets and rights-of-way and smaller lot sizes mean that less land needs to be developed, permitting the achievement of lower development costs.

Nonbuildable Areas

Nonbuildable areas of a site should remain undeveloped in response to regulatory, natural resource, planning, or other development concerns. These areas can easily be incorporated into either community open space or larger regional systems. During site construction, nonbuildable areas should be protected with silt or tree protection fences, and equipment and materials should not be stored in them. Even though the areas are intended to remain undeveloped, site designers should examine opportunities to use the areas to accommodate the innovative technologies discussed in Part II (see Section 1.5.3 for additional information on the integration of infrastructure and natural resources).

1.6.2 CIRCULATION DESIGN

As discussed in Section 4 - Circulation and Design, a well-designed pedestrian and vehicular circulation system is critical to the success of a development project. The construction of roads is typically one of the largest infrastructure expenses for land development projects. It is estimated that the cost of paving a road averages $15 per square yard (The Center for Watershed Protection, 1999). The use of efficient road layouts, street types, and pavement treatments can significantly reduce the cost of roadway construction, decrease the quantity of runoff from a site, potentially increase lot yield and open space amounts, and protect natural resources.

After identifying buildable and nonbuildable areas, site designers should lay out an efficient circulation system that provides for access, parking, and circulation. To

minimize the amount of impervious surfaces, plans should maximize lot frontages and minimize pavement widths.

To minimize grading and to protect riparian channels, roadways should be located on topographic high points and should follow the natural contours of the land, within safe grade tolerances. Grade changes and curves in roadways can add visual interest to streets and communities and to help slow traffic. For additional road design standards, refer to AASHTO's *Green Book* (AASHTO, 1994).

1.6.3 INFRASTRUCTURE AND NATURAL RESOURCES DESIGN

The efficient blending of infrastructure and natural resources on a development site requires a thorough understanding of the natural processes that characterize the site and the infrastructure practices and technologies proposed as part of the land development process. Use of many of the practices and technologies discussed in Part II may allow for an entirely different set of site planning and design considerations. For instance, alternative wastewater treatment systems that use smaller drainfields may permit smaller lot sizes, which in turn can affect lot, road, and open-space layouts. All of the alternative practices and technologies discussed in this publication, whether related to storm water, wastewater, or circulation, affect water, soils, and vegetation. Site designers should use the best combination of systems based on individualized natural resource objectives for a given site.

PART II:
PROJECT TOOLS/REFERENCES

SECTION 2: STORM WATER MANAGEMENT

Implementing nontraditional, decentralized methods for handling storm water can significantly reduce site development costs, regional expenditures for storm water and planning, construction, and maintenance outlays while protecting the environment.

2.1 INTRODUCTION

Planning for storm water management in the initial stages of land development can yield significant cost and environmental benefits for developers, municipalities, and residents. Traditionally approached during site development as an obligation to satisfy state and federal regulatory requirements, storm water management has increasingly come under reexamination in light of its potential to function as a project opportunity and site design element. When correctly planned for and accommodated, storm water management systems can simultaneously satisfy regulatory requirements, act as site design elements, protect the environment, and reduce infrastructure costs—all the attributes of low-impact development.

The development of land, whenever and wherever it occurs, affects soils, vegetation, and water. After land is developed, rainwater that would have infiltrated into the ground, been absorbed by plant roots and transpired, or evaporated into the air instead becomes surface runoff. Runoff often picks up urban pollutants such as grease, oil, nutrients, metals, and debris and deposits them into local waterbodies. In addition to water quality impacts, post-development storm water runoff has other impacts, including changes to the peak flow characteristics of streams, degradation of habitat and aquatic species, and fluctuations in local groundwater tables.

> **Definition of LID**
>
> Low Impact Development (LID) is an approach to land development that uses various land planning and design practices and technologies to simultaneously conserve and protect natural resource systems and reduce infrastructure costs. LID still allows land to be developed, but in a cost-effective manner that helps mitigate potential environmental impacts.

Stricter federal water quality requirements under the Clean Water Act have caused both municipalities and developers to seek out more environmentally efficient, cost-effective storm water management alternatives that are compatible with hydrologic and watershed objectives. At the same time, traditional methods for addressing storm water management have brought to the fore other considerations such as cost and maintenance issues, liability issues, and the need for education and outreach programs for local officials and residents.

History of Low Impact Development

Initially developed and implemented by Prince George's County, Maryland, in the early 1990s as an innovative way to handle storm water runoff, LID techniques have rapidly spread across the country. The overall goal of LID storm water treatment is to mimic pre-development hydrologic conditions through the use of a variety of structural and nonstructural practices that detain, retain, percolate, and evaporate storm water. This publication is not intended as a comprehensive guide to LID storm water treatment strategies but merely aims at providing an overview of alternative storm water

> Prince George's County, Maryland has pioneered several new tools and practices in LID. The Prince George's County Maryland Department of Environmental Resources Programs and Planning Division (PGDER) created two publications: 1) *Low-Impact Development Design Strategies An Integrated Design Approach* (EPA 841-B-00-003), and 2) *Low-Impact Development Hydrologic Analysis* (EPA 841-B-00-002). These publications describe how LID can achieve storm water control through the creation of a hydrologically functional landscape that mimics the natural hydrologic regime.

management practices and technologies. For a comprehensive look at the LID process, readers should consult the Prince George's County, Maryland, Department of Environmental Resources for copies of its LID publications (Telephone: 301-883-5810).

Cost Benefits

Low impact development storm water management systems can reduce development costs through the reduction or elimination of conventional storm water conveyance and collection systems. LID systems can reduce the need for paving, curb and gutter, piping, inlet structures, and storm water ponds by treating water at its source instead of at the end of the pipe. However, developers are not the only parties to benefit from the use of LID storm water management techniques. Although more data is needed on the maintenance of LID technologies, recent history has indicated that municipalities may also benefit in the long term through reduced maintenance costs.

Environmental Benefits

As storm water drains from urban areas, it picks up nutrients and pollutants such as nitrogen, phosphorus, oil, grease, heavy metals, and trash. These pollutants impair water quality and degrade the riparian systems that many plant and animal species depend on for survival. LID practices remove pollutants from storm water naturally and restore a site's pre-development hydrology. The alternative practices discussed later can recharge local groundwater tables, reduce domestic water use for lawns and vegetation, and provide habitat for a variety of species.

Storm Water Management Techniques

This section briefly discusses the different conventional and alternative storm water management techniques available to site designers, briefly highlighting the environmental and economic benefits that each can offer. It is important to keep in mind that regional differences in land characteristics, climatologic conditions, soils, and local ordinances will dictate the availability, type, and effectiveness of options for a given site. Regardless of the practices and technologies ultimately chosen, developers should ensure that they are consistent with the goals of regional storm water management plans. Table 7 lists objectives for alternative storm water management techniques.

> LID Practices can Reduce Development Costs by:
>
> Reducing the use of roadways, curbs and gutters, and sidewalks
> Decreasing the use of traditional storm sewer appurtenances
> Eliminating the use of or downsizing storm water ponds

Finally, designers should remember that an integrated site storm water management system can use several combinations of conventional and alternative techniques to meet site environmental and watershed objectives. Given that each development site has its own characteristics and constraints, the value of a thorough site analysis and conceptual design phase should not be underestimated. While the complete decentralization of storm water operations is the

> Decentralizing Storm Water Management Involves:
>
> Reducing storm water quantities
> Disconnecting hydrologic elements, such as downspouts and storm drains
> Treating storm water at its source by using alternative techniques

most desirable option for cost savings and environmental benefits, designers may still wish to rely on conventional systems such as wetlands or ponds to promote aesthetic or recreational opportunities.

Objective 1 Reduce the amount of impervious surfaces on the development site. Objective 2 Manage storm water at the source instead of at centralized collection points. Objective 3: Use “chains” of natural treatment systems to reduce storm water quantities and pollutant loadings.

TABLE 7. STORM WATER MANAGEMENT OBJECTIVES

2.2 CONVENTIONAL APPROACHES TO STORM WATER MANAGEMENT

Conventional storm water management systems rely on collection and conveyance systems to remove water safely from developed areas and to protect life, property, and health. The systems are engineered and designed according to estimates of post-development storm water flows and volumes from pervious and impervious areas.

Conveyance Systems

Conveyance systems comprise curbs and gutters, inlet and outlet structures, and buried concrete (or other) piping systems that move water from source areas to centralized control areas. Costs for installing a conventional drainage system extend to material, labor, planning, and design costs. Research has indicated that the cost of a conventional conveyance system typically ranges between $40 and $50 per linear foot (MNCBIA, 2001). Assuming $45 per linear foot as an average, the elimination of one mile of curb and gutter can decrease infrastructure and storm conveyance costs by approximately $230,000.

Collection Systems

Collection systems consist of wet and dry ponds that retain and detain storm flows until they can be safely discharged into local receiving waters. While these systems have functioned well, other strategies for managing storm water that use ecological approaches are gaining popularity. Moreover, traditional ponds are increasingly seen as expensive to design, construct, and maintain. In one residential community in Prince George’s County, Maryland, one developer (and, ultimately, residents) saved nearly $300,000 when the use of individual-lot bioretention practices alleviated the need for a pond. Table 8 provides a summary of some of the current pond types used in residential developments.

It is estimated that storm water ponds in new, suburban developments consume approximately 10 percent of a project’s developed land area (England et al, 2000). The elimination of ponds, however, can permit the preservation of additional land as permanent open space or allow for the platting of additional lots. In the example from Prince George’s County, the developer was able to recover six lots that would have been lost to the area required for the storm water pond. Beyond the environmental benefits,

studies have indicated that residents are willing to pay premiums for the enjoyment of living next to permanent water bodies, even storm water ponds. At one condominium community in Virginia, the developer was able to receive premiums of up to $10,000 for waterfront lots (Friends of the Rappahannock, 2000).

Type of Pond	Cost	Advantages	Disadvantages
Dry Retention	Approximately $25,000 per acre of pond. Maintenance costs $100 to $500 per mowed acre.	High pollutant removal efficiencies. Groundwater recharge.	Proper design and construction critical to success. Periodic maintenance costs can be high.
Wet Detention	Approximately $90,000 per acre of pond. Maintenance costs variable.	Proper design can increase community and property values.	Large land areas needed to accommodate pond. Nitrogen and phosphorus removal capacities limited.
Wet Detention with Filtration	$100,000 per acre of pond. Maintenance costs variable.	Underdrain pipes with sand filters offer good removal of suspended solids and attached pollutants.	Significant maintenance required. Poor nitrogen and phosphorus removal.

Source: England et al, 2000.

TABLE 8. TYPES OF PONDS CURRENTLY USED IN RESIDENTIAL DEVELOPMENTS

2.3 ALTERNATIVES TO CONVENTIONAL SYSTEMS

Hydrologic alternatives to conventional storm water management systems can result in economic and environmental savings. Instead of piping the water to a central location, these alternatives try to treat the water at its source by infiltrating it into the ground. Some of the alternatives discussed include infiltration systems, filtering systems, alternate conveyance systems, and a few non-structural practices. Often used in support of site design principles that advocate the reduction of impervious surfaces, alternatives aim to mimic natural hydrologic cycles characteristic of forests and woodlands. In fact, hydrologic alternatives help decentralize storm water treatment thereby eliminating the need for expensive conveyance and collection systems such as pipes and ponds (see Table 9).

Hydrologic alternatives to conventional storm water management treat storm water at its source with small, cost-effective cells that use a combination of engineered soils and vegetation to evaporate, transpire, and percolate the storm water. Though significantly less costly to design, install, and maintain than conventional systems, the alternatives are also effective in filtering urban pollutants, recharging groundwater, and maintaining pre-development flows.

Description	Storm water Management Pond/Curb and Gutter Design	Bioretention System
Engineering Redesign	$0	$110,000
Land Reclamation (6 lots x $40,000 net)	$0	($240,000)
Total Costs	$2,457,843	$1,541,461
Total Costs--Land Reclamation *plus* Redesign Costs	$2,457,843	$1,671,461
Total Cost Savings = $916,382		
Cost Savings per Lot = $4,604		

Source: Derek Winogradoff, 2003.

TABLE 9. COST COMPARISON: CLOSED (CONVENTIONAL) SYSTEM VERSUS BIORETENTION

2.3.1 INFILTRATION SYSTEMS

Infiltration systems encourage the downward movement of water into the underlying soil to reduce the total quantity of overland runoff and pollutants from impervious surfaces. The systems discussed include trenches, drainfields, drywells, bioretention systems, and level spreaders. In comparison with conventional conveyance systems, infiltration systems are inexpensive to design and construct. Their use can reduce the amount and size of storm piping, inlet and outlet structures, and pond systems. However, as is the case with any LID technology, infiltration systems must be carefully engineered to the site's conditions. Table 10 provides a partial list of pollutant removal effectiveness. It is important to keep in mind that these systems are designed primarily for water infiltration and not necessarily for pollutant removal. For vegetated swales and filter/buffer strips there are situations where those systems are not always effective in removing pollutants, and can in fact increase the levels of phosphorus. In fact, a study conducted for the National Association of Home Builders (NAHB) indicates that those system's pollutant removal efficiencies are highly variable (NAHB, 2002b). Thus, building professionals should look at the site's climatic, soil, and other conditions to determine if a certain technology is right for the application.

> "First flush" pollutants are higher-concentration pollutant loadings that initially run off impervious areas. As the duration of the rainfall event increases, pollutant loadings usually decrease as compared to the "first flush" levels.

Infiltration Trenches

Infiltration trenches are excavated trenches that are backfilled with an aggregate material to permit the filtration and percolation of water into subsoils. Storm water from impervious areas, including rooftops, parking areas, and driveways, is routed into the trenches for treatment (see Figure 2). Infiltration trenches are usually most effective at treating "first-flush" pollutant loadings in storm water and are extremely effective in recharging groundwater tables that contribute to stream baseflows. It is estimated that the trenches can remove between 80 and 100 percent of total suspended solids, zinc, and lead

from storm water as well as between 40 and 60 percent of total phosphorus and nitrogen. (Prince George's County, 2001). In areas with high concentrations of pollutants such as sediment, oil, grease, or grit, pretreatment mechanisms such as grassed filter strips should be installed upstream of the system to filter such pollutants before they enter the trench. This linked system concept is considered a "treatment train" approach to storm water management.

System	Total Suspended Solids (TSS)	Total Phosphorus (P)	Total Nitrogen (N)	Zinc	Lead
Bioretention	-	81	43	99	99
Dry Well	80–100	40–60	40–60	80–100	80–100
Infiltration Trench	80—100	40–60	40–60	80–100	80–100
Filter/Buffer Strip	20–100	0–60	0–60	20–200	20–200
Vegetated Swale	30-65	10–25	0–15	20–50	20–50
Infiltration Swale	90	65	50	80–90	80–90
Wet Swale	80	20	40	40–70	40-70
Rain Barrel	NA	NA	NA	NA	NA
Cistern	NA	NA	NA	NA	NA

Source: Prince George's County Bioretention Manual, 2001.

TABLE 10. REPORTED POLLUTANT REMOVAL EFFICIENCY OF BEST MANAGEMENT PRACTICE (BMP)

Infiltration Drainfields

An infiltration drainfield is generally the same as an infiltration trench except that it functions in a manner similar to a drainfield for a septic system. It consists of a pretreatment structure , a perforated manifold-type arrangement of drain lines, and a permeable drainfield. The drainfield itself consists of layers of topsoil, aggregate stone, sand, and filter fabric. An observation well is usually located in one corner of the system to permit the monitoring of flows. Infiltration drainfields are extremely effective in maintaining hydrologic functions such as infiltration and groundwater recharge and in improving water and stream quality by filtering pollutants and attenuating runoff volumes.

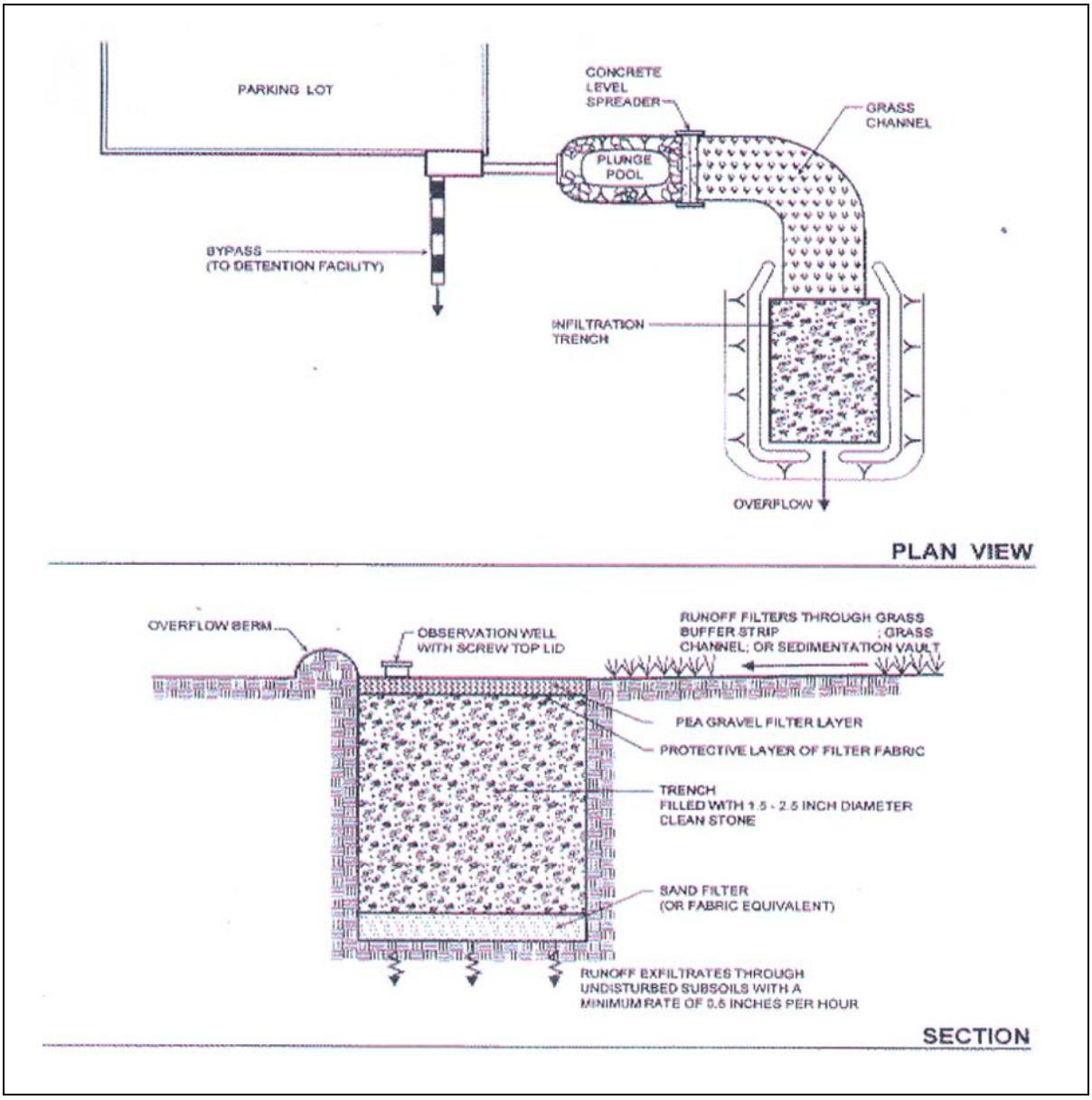

FIGURE 2. INFILTRATION TRENCH

Dry Wells

In residential communities, rooftops account for a significant source of runoff from impervious surfaces. Dry wells, sometimes referred to as "French drains," are usually sited near downspouts to manage rooftop runoff by infiltrating it into the ground (see Figure 3). Dry wells are excavated pits filled with aggregate stone to hold water until it can infiltrate into the ground. Similar to infiltration trenches, dry wells should be designed with emergency overflow structures that drain to public storm water conveyances to accommodate runoff from major storms. The drainage pathways should be well maintained and stabilized to prevent erosion.

Dry wells are extremely effective in removing sediment, zinc, and lead from storm water and mildly effective in reducing quantities of nitrogen and phosphorus. During construction, developers should take care to avoid excessive compaction of soils around the trenches and the accumulation of silt around the drainfield. Depending on the type of pollutants filtered, drainfields need to be maintained regularly for optimum performance.

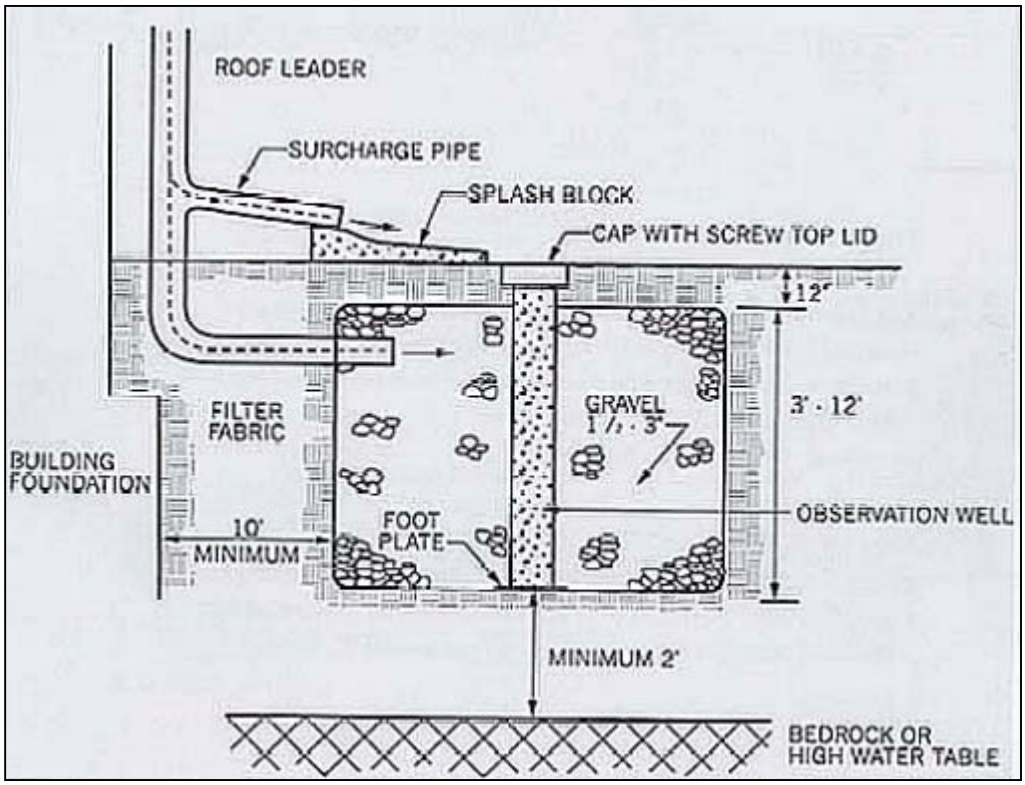

FIGURE 3. DRY WELL

Bioretention

Bioretention is possibly one of the most recognized alternative storm water management practices. Used in residential, commercial, and certain industrial settings, bioretention has the potential to offer developers significant cost savings and environmental benefits over conventional storm water management systems. Bioretention areas are shallow, topographic depressions filled with engineered soils and vegetation that retain, treat, and infiltrate water. Figure 4 depicts a typical bioretention area.

Bioretention systems are designed for the temporary storage of rainwater. They successfully remove pollutants through increased contact time with soils and plant materials. As compared with conventional storm water management systems, bioretention areas more closely mimic the natural hydrologic cycle, allowing soils and plants to filter pollutants from storm water and permitting the processes of infiltration, evaporation, and transpiration to occur. The systems can also create wildlife habitat, minimize erosion, and recharge local groundwater supplies.

In parking lots, storm water should be conveyed directly to the bioretention area through a system of grassed swales. For residential applications, treatment areas are generally located some distance away from houses to increase flow paths and treat runoff from rooftops and driveways. In either case, bioretention systems route storm water to bioretention areas that are designed to accumulate water to depths not exceeding six to12 inches. In the event that storm water volumes exceed treatment capacities, bioretention areas are usually equipped with overflow drop inlets routed to municipal storm water systems. In certain industrial and commercial areas, pollutant loadings may be too concentrated for the successful use of bioretention areas. In such areas, termed "hotspots," the use of structural practices to infiltrate storm water may be deleterious to groundwater supplies. In these instances, designers are advised to use alternative practices, such as exfiltration trenches, to convey filtered water into a conventional storm water management system for proper treatment.

On average, bioretention costs approximately $3 to $4 per square foot of size, depending on the quantity of water to be treated and excavation costs. Plant materials are approximately $6.40 per cubic foot of storm water treated.

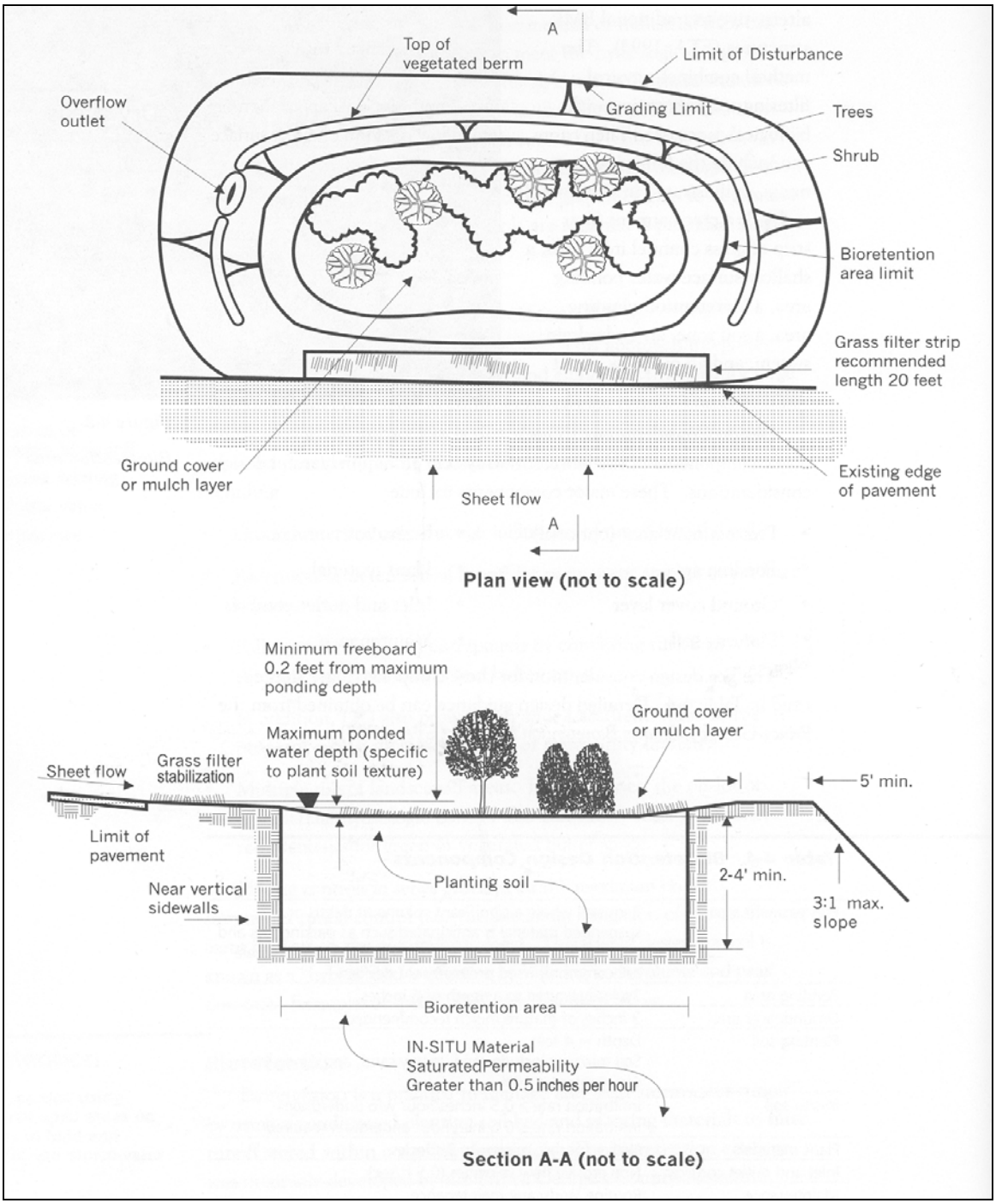

Source: Prince George's County Bioretention Manual, 2001.

FIGURE 4. TYPICAL BIORETENTION AREA

Level Spreaders

Level spreaders are mechanisms that convert concentrated runoff into sheetflow and slow the erosive velocities of storm water. Constructed by excavating a wide, shallow trench and filling it with crushed stone, a level spreader must be built with its lower edge

completely flat to ensure the even disbursement of water. Level spreaders are most effective in helping to convey sheetflow to bioretention areas. While not typically viewed as treatment mechanisms, level spreaders can help increase detention storage and time of concentrations and thus assist with pollutant and sediment removal functions. They should be used as part of an integrated, decentralized storm water management system.

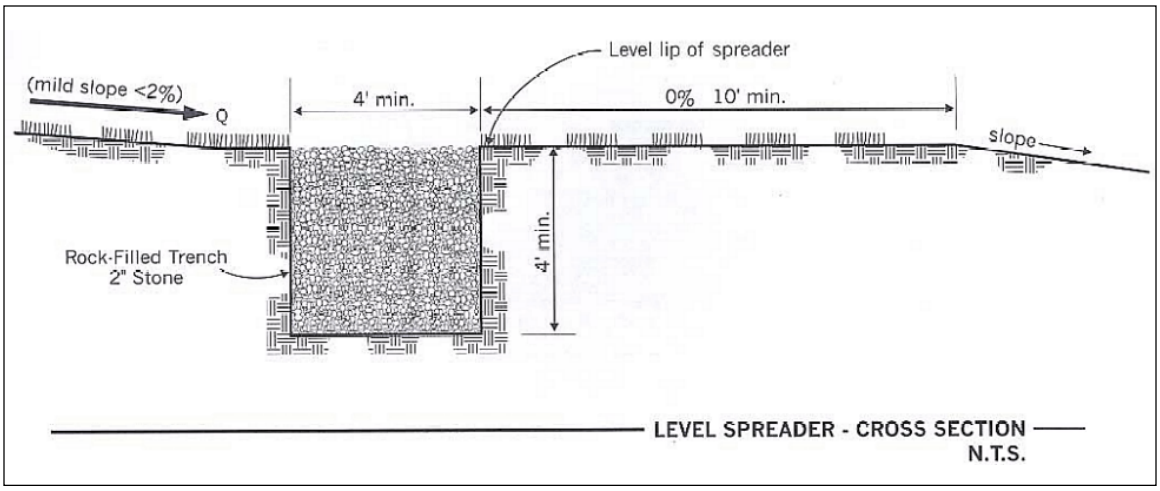

FIGURE 5. LEVEL SPREADER

2.3.2 FILTERING SYSTEMS

Filtering systems use soils and vegetation to remove pollutants from storm water. They function mainly as pre-treatment devices to remove sediment before water enters infiltration devices such as bioretention areas.

Filter Strips

Filter strips are low-grade vegetated areas that permit sediment deposition during sheetflow (see Figure 6). Usually used as one component of a storm water management system, filter strips are considered pre-treatment devices, meaning that water is routed through them before entering systems such as bioretention areas. For the systems to be fully effective, slopes should be minimal (0 to 2 percent), with channelized flows eliminated. Pollutant removal efficiency depends largely on the quantity of water treated, flow path and length, type of vegetation, and the soil infiltration rate. Depending on the amount and type of vegetation planted and the need for replacement or amendment of soils, filter strips can be inexpensive to construct and maintain.

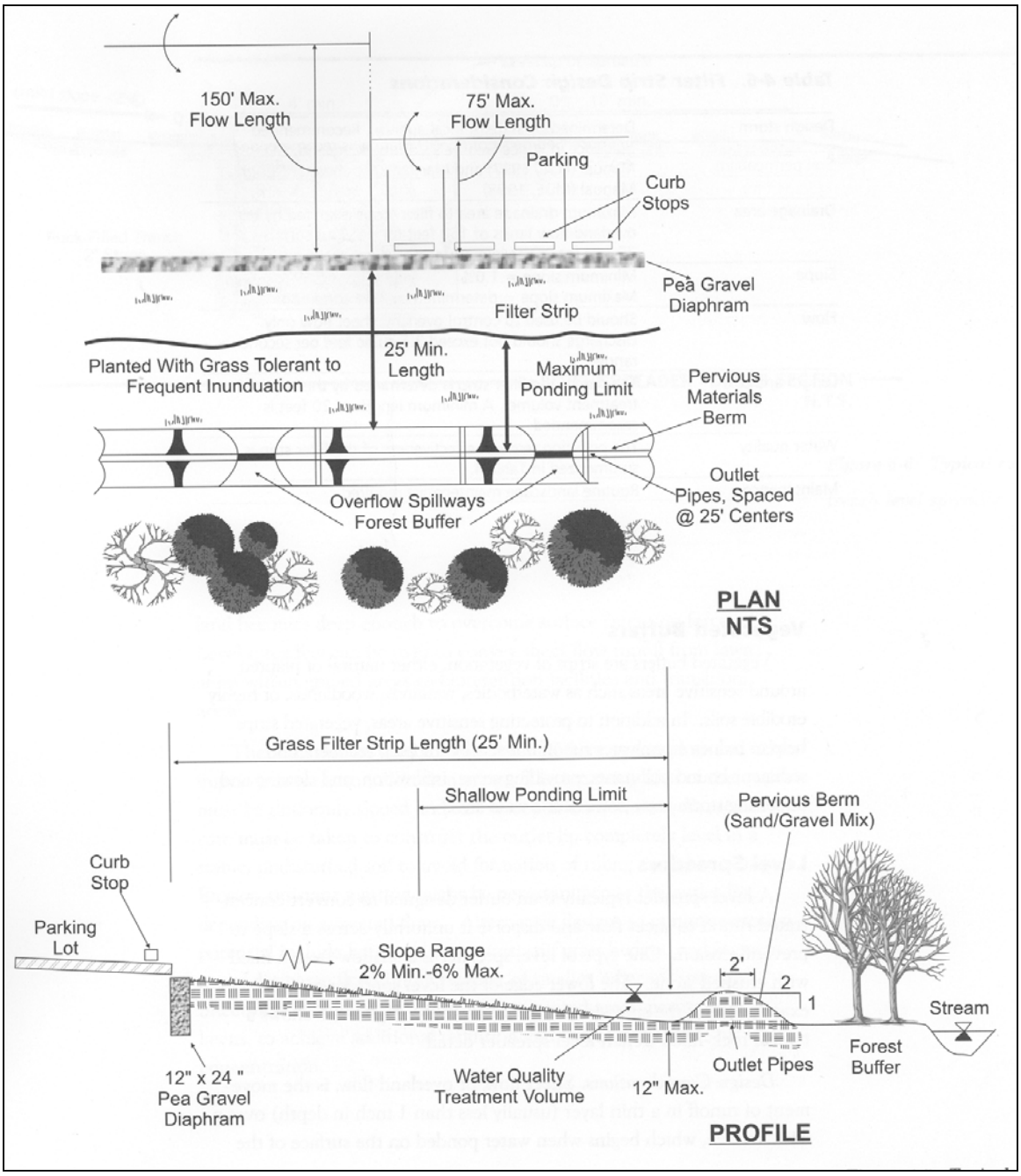

Source: Prince George's County Bioretention Manual, 2001.

FIGURE 6. TYPICAL GRASS FILTER STRIP

Exfiltration Trench/Dry Swale

Exfiltration trenches function in a manner similar to infiltration trenches except for an underdrain system built into the bottom of the trench (see Figure 7). After water has percolated through the soil media and pollutants have been removed, the water enters perforated drain tile and is conveyed to a local storm water drain system.

Exfiltration trenches are low-cost, low-maintenance systems that are highly effective in removing pollutants, especially sediment, from storm water. The perforated underdrain in the system protects groundwater supplies from contamination in areas with high pollutant loadings. These areas, usually termed “storm water hotspots,” are usually located in industrial or commercial areas dominated by vehicular traffic.

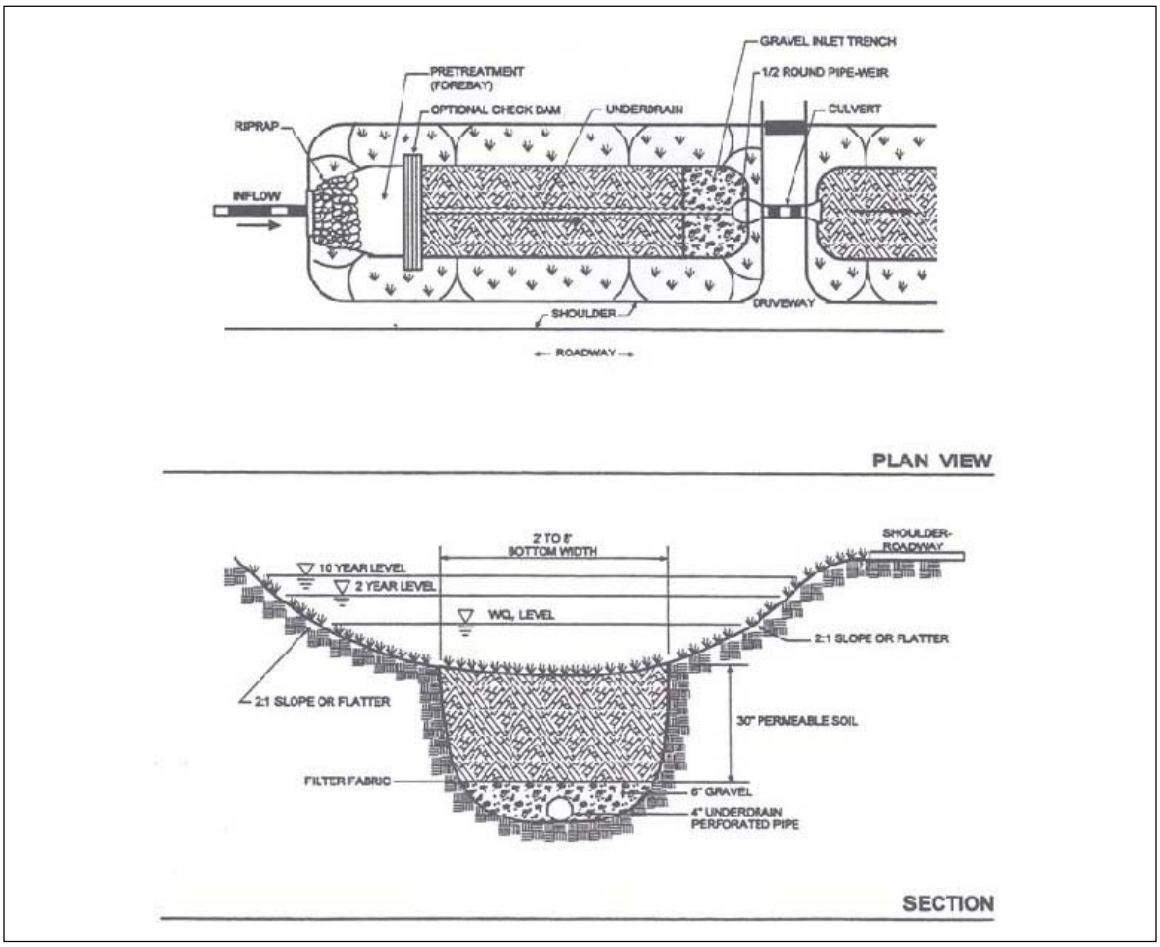

FIGURE 7. EXFILTRATION TRENCH/DRY SWALES

Wetlands

Constructed wetlands systems use soils, vegetation, and hydrology to remove pollutants from storm water. The systems are effective in attenuating flood flows, reducing pollutant loadings, and providing wildlife habitat (see Figure 8). From a community design standpoint, wetlands systems can create open space, offer improved aesthetics over traditional treatment systems, and provide recreational and educational opportunities.

Most natural and artificial wetlands systems are regulated by the Clean Water Act and fall under the jurisdictional authority of the U.S. Army Corps of Engineers (Corps). A recent U.S. Supreme Court decision concerning isolated wetlands has limited the jurisdiction of the Corps to navigable waters, their tributaries, and wetlands adjacent to these navigable waters and their tributaries.

Similar to their natural counterparts, constructed wetlands types can vary from seasonally inundated to year-round, open-water systems. To optimize pollutant removal capacities, design engineers usually aim to maximize flow paths through wetlands systems to prolong exposure to soils and vegetation, thereby facilitating nutrient and pollutant uptake, retention, and settling. Given the delicate hydrologic balance of wetlands systems, unmanaged storm water should never be discharged into jurisdictional wetlands, or wetlands under the direct control of the Corps. Therefore, constructed wetlands should be designed with water quality and quantity pre-treatment mechanisms, such as sediment forebays or gabion walls, which attenuate storm flows and protect sensitive wetlands vegetation.

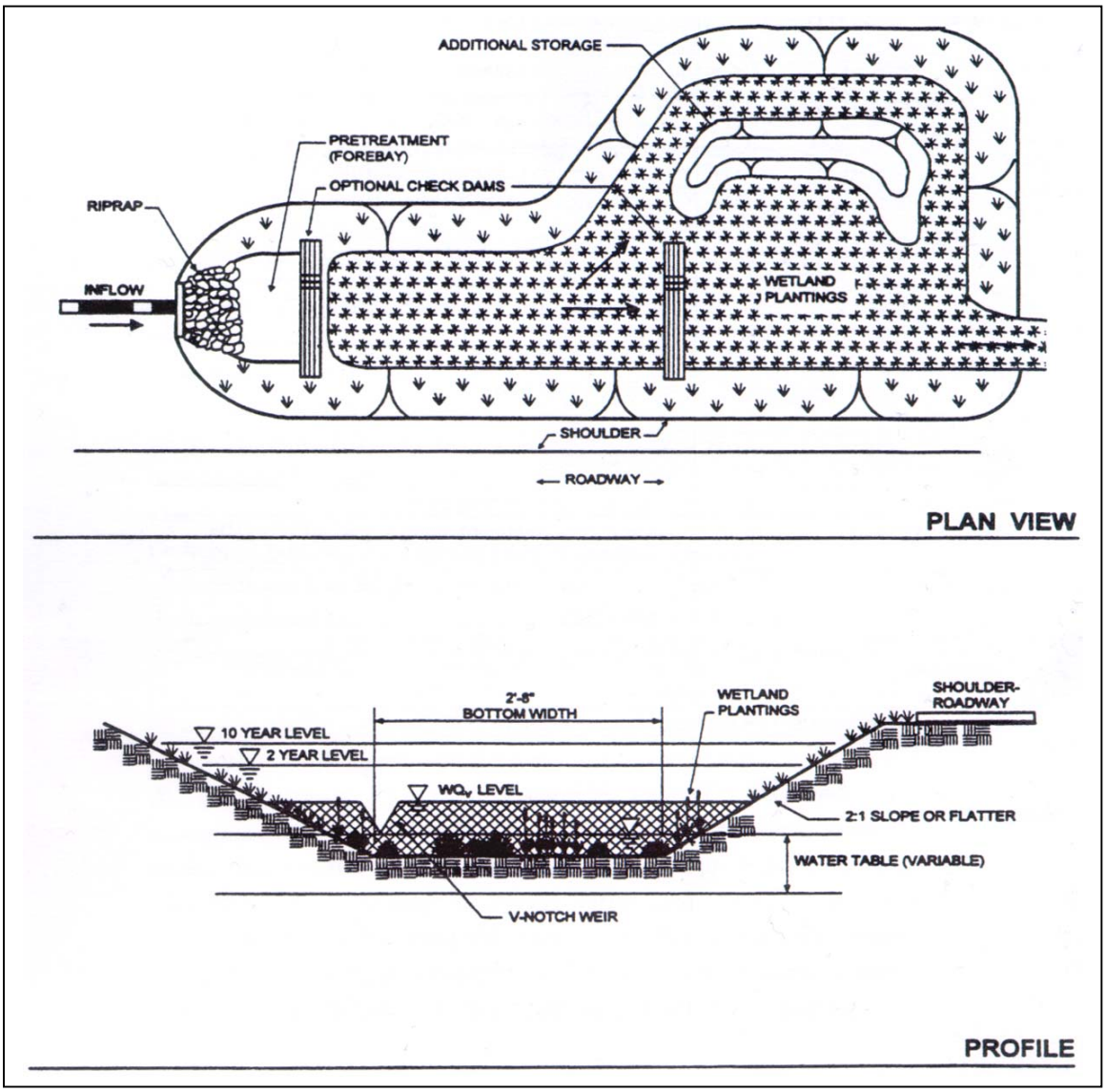

FIGURE 8. STORM WATER WETLANDS

As compared with other alternative systems, construction costs for wetlands systems may be high. The cost of a constructed storm water wetlands can exceed $300,000 per acre (JSPPOH, 2001), although shallow groundwater levels, shallow depth to bedrock, and

sloping topography can drive up construction costs further. In instances where the depth to groundwater is shallow, a clay liner should be used to prevent contamination of local aquifers. The quality and quantity of imported soils and plant material are also a factor when considering the total cost of built systems. However, while construction costs may be higher for constructed wetlands than for other BMP systems, operation and maintenance costs may be relatively low.

2.3.3 CONVEYANCE SYSTEMS

Alternate conveyance systems, such as vegetated channels and grassed swales, carry water to areas for treatment. Unlike conventional conveyance systems, such as curbs and gutters, these systems slow the erosive velocity of storm water, increase time of concentrating, and filter pollutants such as sediment.

Vegetated Channels/Grassed Swales

> Curb and gutter can cost upwards of $12.50 per linear foot.
>
> *Source: Friends of the Rappahannock Study, 2000.*

Vegetated channel systems and grassed swales are low-cost alternatives for conveying water away from streets, downspouts, and structures. They are low-cost alternatives to conventional conveyance systems, such as curbs or concrete channels. These alternatives reduce storm water velocities and allow sediment and pollutants contained within storm water to be filtered.

In residential settings, swales are an effective way to convey water to bioretention areas sited a short distance away from structures and foundations. When used in conjunction with bioretention areas, swales function as pre-treatment mechanisms that filter sediments from storm water. For health, safety, and maintenance reasons, minimum longitudinal slopes on swales should be 1 percent to avoid stagnation of water and to ensure proper drainage.

Wet swale systems are variants of dry swales and function similarly to a wetlands system. Slightly more expensive to construct than a vegetated channel or dry swale, wet swales are designed with a permanent pool structure and planted with wetlands vegetation for pollutant treatment. Due to health and safety concerns over potential mosquito breeding, wet swales have limited applicability in residential or commercial settings.

2.3.4 OTHER SYSTEMS

Rain Barrels

Rain barrels are low-cost retention devices placed below roof downspouts to collect water during storms (see Figure 9). Although rain barrels offer no primary pollutant removal benefits during collection times, they act as quantity controls and can help reduce the cumulative effects of storm water on downstream systems. As an example, one 42-gallon rain barrel can provide storage for 0.5 inch of runoff from a rooftop measuring 133 square feet (Prince George's County, 2001).

> One inch of rain on a 1,000-square-foot roof yields approximately 623 gallons of water.

During dry periods, water from the barrels can be used to irrigate lawns and vegetation. Rain barrels should be equipped with some type of overflow device that routes overflow to a bioretention area for treatment during major storms. Rain barrels can be purchased online from a variety of municipal natural resources departments and environmental organizations. They are available in a variety of colors and sizes to match architectural styles.

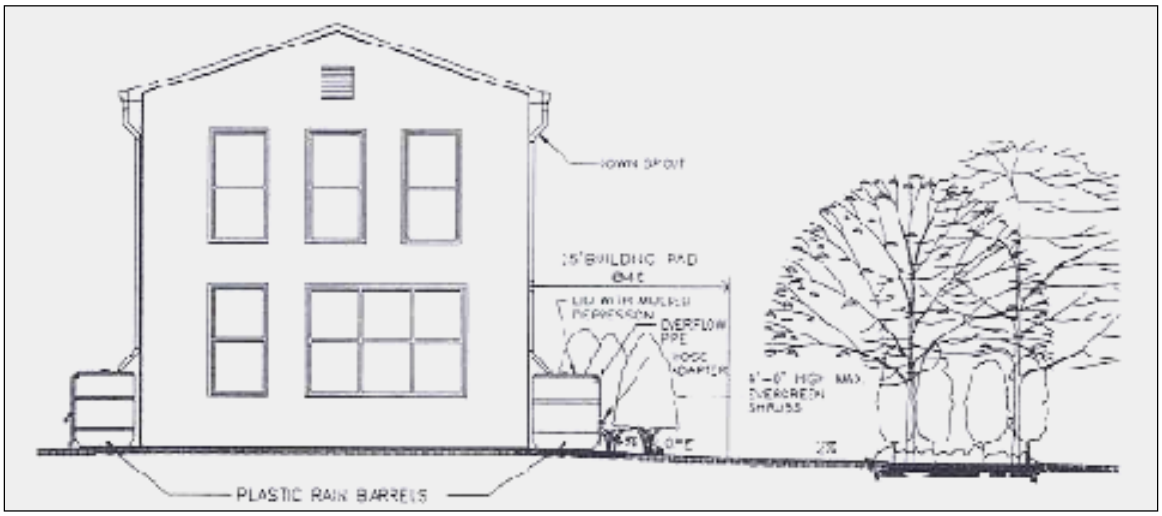

FIGURE 9. RAIN BARRELS

Cisterns

Cisterns are premolded plastic storage devices that are usually sited underground in proximity to rooftop downspouts. They function in a manner similar to rain barrels but offer storage capacities from 100 to 1,400 gallons. Water from cisterns is stored and released during dry periods, promoting water conservation for lawn and garden irrigation.

2.4 ADDITIONAL RESOURCES

Additional resources that provide detail on individual storm water management topics are listed below. The resources are not provided as endorsements, merely as educational and reference tools. Given regional variations in climate and land development needs, we have tried to include region- specific resources. It is important to note, however, that addresses, especially Internet links, are subject to change. This list contains the latest links and addresses as of the date of this publication.

Storm Water Management Manuals and Best Management Practices

City of Alexandria, Virginia
http://ci.alexandria.va.us/solidwaste/stormwater.html
Information on Virginia storm water ordinances and directions on acquiring publications such as *The Alexandria Supplement to the Northern Virginia BMP Handbook* and *The Virginia Storm Water Management Manual*.

City of Austin, Texas
http://www.ci.austin.tx.us/watercon/default.htm
Details of the city of Austin's Water Conservation Program as well as information about the city's rain barrel program (follow links to Single-family, Multi-family, and Commercial).

Friends of Bassett Creek, Minnesota
http://www.mninter.net/~stack/bassett/gardens.html
A comprehensive guide to the creation of rain gardens for runoff management, habitat creation, and aesthetic value is provided with design and construction information and recommendations on plant material.

F.X. Browne, Inc.
http://www.fxbrowne.com/html/gs-facts/gs_primers.htm
A fact sheet entitled *Bioretention Systems for Storm Water Management* is available for downloading at the homepage of the F.X. Browne environmental consulting firm.

National Association of Home Builders
http://www.toolbase.org/tertiaryT.asp?TrackID=&CategoryID=1438&DocumentID=2007
An online report from the association's Technology Inventory entitled *Bioretention Sites for Storm Water Management* includes installation details, a short benefit/cost analysis, and a short list of bioretention links.

Pennsylvania Association of Conservation Districts
http://www.pacd.org/products/bmp/bioretention.htm
A Web site devoted to providing information on the bioretention BMPs for storm water pollution prevention.

Prince George's County, Maryland
http://www.epa.gov/nps/lid/index.html
The Prince George's County Maryland Department of Environmental Resources Programs and Planning Division (PGDER) created two publications with assistance from the U.S. Environmental Protection Agency (EPA): 1) *Low-Impact Development Design Strategies An Integrated Design Approach* (EPA 841-B-00-003), and 2) *Low-Impact Development Hydrologic Analysis* (EPA 841-B-00-002).

State of Maryland Department of Environment
http://www.mde.state.md.us/environment/wma/stormwatermanual/
This link provides updates on Maryland's Storm Water Management Program, including information on obtaining copies of *The 2000 Maryland Storm Water Design Manual (Vols. I & II).*

State of Massachusetts Bureau of Resource Protection
http://www.state.ma.us/dep/brp/ww/wwpubs.htm#storm
Downloadable versions of *Massachusetts Storm Water Policy Handbook, Storm Water Technical Handbook,* and *Storm water Management Policy*.

Storm Water Center
http://www.stormwatercenter.net/Assorted%20Fact%20Sheets/Tool6_Storm

water_Practices/Filtering%20Practice/Bioretention.htm
A comprehensive document entitled *Storm Water Management Fact Sheet: Bioretention* provides detailed information on bioretention practices, including applicability, design considerations, and benefit/cost analysis.

Texas Natural Resources Conservation Service
http://www.txnpsbook.org
Texas Nonpoint Sourcebook, a site designed to provide storm water management information to public works professionals and other interested parties both in Texas and elsewhere, provides information ranging from basic to technical.

University of Washington Center for Urban Water Resources Management
http://depts.washington.edu/cuwrm/
A downloadable version of a publication from a research project investigating the use of permeable pavement entitled *The University of Washington Permeable Pavement Demonstration Project--Background and First-Year Results* is available under the Land Cover and Imperviousness section of the research link at the center's homepage.

U.S. Environmental Protection Agency
http://www.epa.gov/owm/mtbfact.htm
The Office of Wastewater Management in the Office of Water provides downloadable fact sheets on BMPs for urban storm water management, including bioretention, porous pavement, wet detention ponds, and more.

Washington State Department of Ecology
http://www.ecy.wa.gov/biblio/9911.html
The *Storm Water Management Manual for Western Washington* describes the storm water management standard for all new development and redevelopment projects in the Puget Sound area.

Organizations and Internet Resources

American Forests
http://www.americanforests.org/
The American Forests home page includes news, links, publications, and information on the use of trees to protect the environment. Included in the site is a link to the Trees, Cities and Sprawl section, which contains information and resources on urban forestry and resource protection.

American Society of Civil Engineers
http://www.bmpdatabase.org
The society and the U.S. Environmental Protection Agency provide an online, searchable database of over 90 studies evaluating the effectiveness of various storm water BMPs for surface water quality protection.

Center for Watershed Protection's Storm Water Center
http://www.stormwatercenter.net/
The Storm Water Center offers resources to assist decision makers and the public on storm water management issues. Resources include publications and manuals, slide shows, ordinance information, monitoring and assessment methods, and BMP fact sheets.

One publication, *Better Site Design: A Handbook for Changing Development Rules in Your Community*, could prove useful to municipal officials interested in revising their zoning ordinances.

Friends of the Rappahannock
http://for.communitypoint.org/pages/LID.htm
Friends of the Rappahannock, a nonprofit organization, highlights five existing commercial projects in the Fredericksburg, Virginia, area that were redesigned on paper to incorporate LID practices.

Low Impact Development Center, Inc.
http://www.lowimpactdevelopment.org
The Low Impact Development Center is a nonprofit water resources research group with a mission of conducting research and training on low impact development and sustainable storm water management. Publications, pictures, and other resources are available on the site.

Pennsylvania Housing Research/Resource Center
http://www.engr.psu.edu/phrc
Part of the Resource Center's work is in conducting research related to "smart growth" and sustainable site design. A workshop conducted March 2003 by Scott Brown entitled, "Understanding Management Practices for Post Construction Storm Water Control" provided information on the impact of development on runoff response.

Urban Land Institute
http://www.uli.org
The home page of the Urban Land Institute, an organization committed to providing responsible leadership in the use of land toward enhancing the environment, offers design resources for housing, retail, office, and transportation development.

U.S. Department of the Navy, Environmental Department
http://www.nfesc.navy.mil
A list of links to the Navy's pollution prevention program includes information about equipment, implementation, and planning. Also included is the Joint Service Pollution Prevention Library, a searchable database of prevention documents.

U.S. Environmental Protection Agency
http://www.epa.gov/OW/index.html
The Office of Water provides an immense amount of information on the protection and conservation of our nation's water resources.

Regional-Specific Resources

Northeastern United States

Cornell Cooperative Extension of Onondaga County
http://www.cce.cornell.edu/onondaga/fingerlakeslan/default.htm
The Web site presents information and design suggestions for landscaping property in a manner that reduces the risk of pollution to surface waters. The information is oriented to the Finger Lakes, New York region but is applicable to many other areas.

Minnesota Pollution Control Agency
http://www.mnerosion.org/tools.html
A comprehensive manual available online entitled *Protecting Water Quality in Urban Areas* highlights technical information about BMPs for protecting lakes, streams, and groundwater from storm water-related pollution.

New York State Department of Environmental Conservation
http://www.dec.state.ny.us/website/dow/swmanual/swmanual.html
The *New York State Storm Water Management Design Manual* provides designers with a general overview on how to size, design, select, and locate storm water management practices at a development site in compliance with state storm water performance standards.

Southeastern United States

Mississippi State University Agricultural and Biological Engineering Department
http://abe.msstate.edu/csd/NRCS-BMPs/pdf/water/quality/bioretentsys.pdf
A downloadable, two-page fact sheet providing descriptions and diagrams of a shallow-depression bioretention system.

Northern Virginia Regional Commission
http://www.novaregion.org/es_pubs.htm
A list of publications for purchase and downloading, including documents on BMPs such as *The Northern Virginia BMP Handbook* and *Nonstructural Urban BMP Handboo*k and publications on Virginia's watersheds.

NRDC's Storm Water Strategies: Strategies in the Southeast
http://www.main.nc.us/riverlink/content/07chap/chap07.htm
Case studies for addressing storm water management techniques in new development and redevelopment.

Western United States

Built Green Colorado
http://www.builtgreen.org/sites/green.htm
The Built Green Colorado Web page with links to many green building resources. Built Green Colorado is a public/private partnership created to encourage home builders to use technologies, products, and practices that enhance energy efficiency, reduce pollution, provide healthier indoor air, reduce water usage, preserve natural resources, improve durability, and reduce maintenance.

Caltrans Storm Water Management Program
http://www.dot.ca.gov/hq/env/stormwater/index.htm
Information on current monitoring studies, publications, conferences, and links are presented in the context of California's Storm Water Management Program. The site is oriented to reducing the impact of California roadways on aquatic resources.

City of Seattle
http://www.ci.seattle.wa.us/util/surfacewater/bmp/default.htm
Information on simple and effective BMPs for homeowners and businesses provided by

Seattle Public Utilities. The information includes everyday tips for protecting surface water.

U.S. Environmental Protection Agency Region 10
http://www.epa.gov/region10
The Region 10 home page provides general information on the region's resources as well as links to its programs. This site also includes regularly updated information on environmental issues in the local news.

Utah Association of Conservation Districts
http://www.ci.north-logan.ut.us/Information/Low%20Impact%20Report/Low%20Impact%20Report.html
The community of North Logan developed LID roadway design standards. The site includes documentation of the process, exhibits, standards, and specifications.

Southwestern United States

Arizona Department of Water Resources
http://www.adwr.state.az.us/
A variety of information on all aspects of water resources for the state of Arizona.

Pima County Department of Environmental Quality
http://www.deq.co.pima.az.us/water/storm.htm

Provides information on Tucson and the surrounding area's storm water management program and components.

Pima County Flood Control District
http://www.dot.co.pima.az.us/flood/wh/index.html
Methods for collecting, storing, and distributing rainwater to reduce residential runoff loads as well as information on harvesting system maintenance.

SECTION 3: WASTEWATER TREATMENT

Properly designed, installed, and maintained on-site wastewater treatment systems can cost effectively treat wastewater and protect the watershed from pollutant overloads.

3.1 INTRODUCTION

Section 2 addressed storm water management issues and explained how rainwater could be used as an asset instead of viewed as a liability in new developments. As we mentioned in Part I, we have expanded LID to include wastewater management. We now turn to the methods and systems that developers can use for effectively treating wastewater generated at residential sites.

It is becoming increasingly popular to protect the nation's surface water and groundwater and prevent further stress from a variety of pollution sources. Approximately 300,000 miles of rivers and shorelines and approximately 5 million acres of lakes are polluted by harmful microorganisms, sediment, and excess nutrients. (http://www.epa.gov/owow/tmdl/overviewfs.html). Wastewater can contain nutrients (e.g., nitrogen, phosphorus), pathogens (e.g., disease organisms), and chemicals (e.g., ammonia, medical byproducts). Thus, developers must ensure that equipment and management methods effectively treat wastewater before it is released into the environment.

Table 11 lists current conventional wastewater management practices and technologies and the alternative systems discussed in this chapter. The 1993 *HUD Proposed Model Land Development Standards and Accompanying Model State Enabling Legislation* publication addressed some of the conventional technologies, which are briefly noted below. To put current technology use into perspective, Figure 10 shows that a vast majority of homes in the United States rely on municipal sewer systems.

Wastewater Management Options Discussed in Chapter	
Conventional	Alternative
Municipal Sewer Single Septic Community Septic Combined On-Site Systems and Sewer Storage and Removal	Aerobic Sand Filters Mound Trickling Filter Evapotranspiration Low-Pressure Pipe

TABLE 11. WASTEWATER MANAGEMENT OPTIONS

Although only 23 percent of homes in the United States are on individual septic systems, such systems can be a significant source of water pollution. Moreover, the average age of a home with a septic system exceeds 30 years. Further, of those homes on septic systems, an estimated 403,000 experienced system breakdowns in a three-month period in 1997 (Bureau of the Census, 1999).

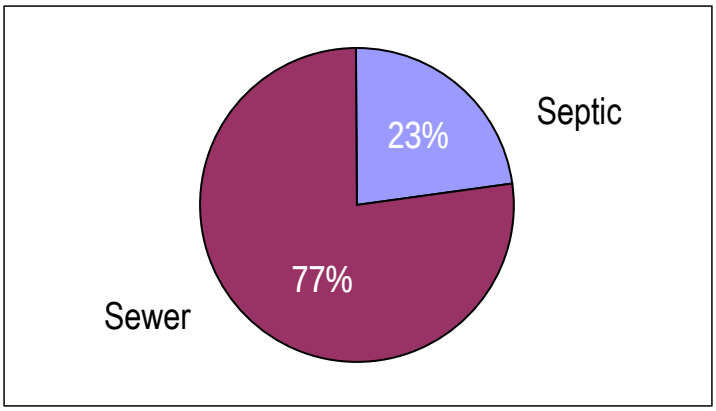

FIGURE 10. HOW HOMES HANDLE WASTEWATER

The management of residential wastewater is a process fraught with technological and regulatory issues. For instance, some communities limit the use of traditional septic systems because improperly maintained systems can release untreated effluent into the soils; in other instances, communities have experienced a number of system malfunctions. Effluent contains excess nutrients and harmful organisms that can adversely affect water quality. Regulatory officials respond to the need to protect our water by adopting progressively stringent wastewater treatment regulations. More specifically, in some cases, communities turn to rigorous regulation of conventional systems as a means of curtailing development, yet they fail to recognize that water quality issues can be addressed by using alternative wastewater management systems.

It is important to keep in mind that septic systems are still used effectively and approved throughout the country. However, in response to the problems noted above, private industry continues to develop alternative systems designed to overcome some of the issues that can plague the performance of conventional septic systems.

This chapter briefly describes the environmental, cost, and regulatory issues associated with wastewater treatment. It then explains how conventional residential developments deal with wastewater management. The last part of the chapter discusses some of the more common alternative means of wastewater management. Table 12 presents the chapter's overall objectives.

Objective 1:
Explain how the use of alternative systems and combinations of systems can reduce on-site infrastructure costs and loadings to municipal sewer systems.
Objective 2:
Demonstrate alternative lot and site layouts to accommodate a variety of system types.
Objective 3:
Show how the use of alternative systems and combinations of systems can reduce pollutant loadings to waterways.

TABLE 12. WASTEWATER MANAGEMENT OBJECTIVES

3.1.1 ENVIRONMENTAL ISSUES

LID is an approach that uses technologies to simultaneously conserve and protect natural resource systems and reduce infrastructure costs. Wastewater can affect natural resources; all wastewater coming from a home must be sent to an effective treatment site or public treatment system in order to limit adverse environmental and health impacts. One of the reasons that public officials prefer to rely on municipal sewer systems for wastewater treatment is that many of the systems are operated by trained technicians who continuously monitor the treatment process to ensure that discharge waters meet local permit or other regulatory requirements.

- Heavy Equipment--Heavy-duty trucks and other equipment passing over a septic system or drainfield may damage the pipes or system parts.
- Clogging--Systems are designed to keep solids, e.g., sludge and scum, out of the final effluent. However, if those elements make it to the drainage field, they can cause premature soil clogging such that the effluent from the septic tank has trouble percolating into the soil and can pond.
- Roots--Tree and bush roots can enter the system. It is essential to keep large plants away from the septic system.
- Improper Sizing/Design--The system must be large enough for the load and installed in suitable soils as well as in as shallow a trench as possible so that it does not interfere with groundwater.
- Improper/Lack of Maintenance--Septic systems need routine maintenance, including tank pumping and cleaning and inspection by a licensed professional. Properly maintaining a tank keeps solids from accumulating and clogging the leach field.

TABLE 13. COMMON REASONS FOR SEPTIC SYSTEM FAILURE

In most cases, wastewater treatment can be handled by one of the four conventional methods noted in Table 11. However, there are exceptions. For instance, in some circumstances, sewer systems cannot be used because of cost considerations; it might be too costly to run pipes long distances to link a proposed development's wastewater system to existing municipal sewer connections. In other cases, a municipality might have specific health or environmental concerns that make the use of septic systems unacceptable.

Nitrogen and phosphorus are two nutrients in wastewater that, either in excess or through cumulative effect, can adversely affect receiving waterbodies. When septic systems fail to operate as designed, excess nutrients in untreated wastewater can enter the environment. Excess nitrogen in streams, lakes, and estuaries stimulates the growth of plants (algae and phytoplankton). Algae in turn consume oxygen, and the decomposition of dense algal blooms leads to anoxia (no oxygen) and hypoxia (low oxygen). Eventually, the aging process of the waterbody is accelerated through a complex chain of events known as eutrophication. Indicators of eutrophic conditions include odors, poor water clarity, stressed marine organisms, and, in severe cases, dead fish.

From a public health point of view, conventional septic system failure is one of the main reasons for increased interest in alternative on-site wastewater treatment systems. Table 13 lists some common causes of septic system failure. Conventional septic system failures potentially can contaminate groundwater and surface water with bacteria harmful

to humans. Further, septic systems with poor nitrogen removal can overload nearby waterways, resulting in algal blooms and adverse impacts on aquatic life.

Numerous communities nationwide are attempting to address general water contamination and, in particular, nitrogen loading. For instance, when studies showed that septic systems were threatening groundwater supplies in the Los Angeles area, the Los Angeles Regional Water Quality Control Board voted in 1999 to prohibit the installation of any new septic systems in Ventura County and required the use of septic systems to cease by January 1, 2008 (California EPA Press Release, August 17, 1999). Studies showed that the prohibition was necessary to safeguard the public health and protect the local water supply; community drinking water is pumped from groundwater beneath the discharge area of the septic systems. As part of its overall water conservation plan, Milford, New Hampshire, prohibits septic system use near waterbodies (http://www.ci.milford.nh.us/conservation/streams.html). The Chesapeake Bay watershed is an area greatly affected by water pollutants. The Chesapeake Bay Program, which is designed to protect the bay, determined that between 55 and 85 percent of the nitrogen entering an on-site wastewater treatment system could be discharged into groundwater (U.S. Environmental Protection Agency, 1993). As noted in a U.S. Environmental Protection Agency (EPA) report, “Hydraulically functioning systems can create health and ecological risks when multiple treatment units are installed at densities that exceed the capacity of local soils to assimilate pollutant loads” (U.S. Environmental Protection Agency, 2002). Thus, the concern over septic systems extends to both the inability of septic systems to remove nitrogen and the increased number of septic tanks installed in any one area.

Phosphorus is another nutrient that, if discharged from septic systems, can lead to eutrophication of nearby waterbodies, although it is considered less of a threat than nitrogen to groundwater and surface contamination via conventional septic systems. Septic systems are generally effective in adequately removing phosphorus; furthermore, soil particles adequately adsorb soluble phosphorus and extract soluble phosphorus compounds from septic tank effluent as it leaches through the soil profile, thus limiting the movement of phosphorus through the soil.

3.1.2 COST ISSUES

Municipal Sewer Connection Fees

In addition to environmental issues, economic factors play a role in the selection of an appropriate wastewater treatment system. To connect a home or community to a municipal sewer system, developers must pay certain fees. A community that operates a municipal sewer system often combines the potable water tap fee with the sewer connection fee. In addition, communities sometimes charge developers impact fees to help offset new homeowner impacts on community resources.

Impact fees are not new; they have existed since enactment of the Standard Planning Enabling Act of 1922. However, both the number and dollar amount of impact and connection fees have risen dramatically since the early 1900s. In some communities, sewer connection fees have risen to help municipalities pay for system operation and maintenance costs and system expansions. Fees can range from $1,500 per house to over $14,000 per house. Fee increases have exacerbated the affordable housing problem

currently plaguing portions of the United States. In a related matter, some communities report that their wastewater treatment facility is at or near capacity, hindering further residential development until facility expansion can accommodate additional growth. In response, HUD's Office of Policy Development and Research created the Regulatory Barriers Clearinghouse to examine how impact fees and other issues affect the creation and maintenance of affordable housing (http://www.huduser.org/rbc/).

Conventional Septic Installation and Maintenance Costs

The cost of installing septic systems depends on system size, treatment capacity, occupancy, and land issues such as the type of on-site soil. For example, in Minnesota, the costs of installing a septic system can range from $2,000 to $7,000. The average cost to pump the tank's sludge ranges from $75 to $150. Pumping the tank at the appropriate frequency is less costly than replacing the system's leach field, which would be needed if solids enter the field from an overloaded septic tank. If a septic system and corresponding leach field need to be replaced in Minnesota, the costs are equal to that of installing a new system - http://www.extension.unm.edu/distribution/naturalresources/components/DD6946c.html.

3.1.3 REGULATORY ISSUES

Currently, most local regulations are prescriptive and limit the introduction and use of alternative on-site wastewater treatment systems (OWTS). Public health officials, however, can facilitate the use of alternative OWTSs by revising the applicable codes.

The use of alternative systems can reduce the capacity strain on an existing wastewater treatment facility. In fact, some local officials may be willing to allow alternative OWTSs on some but not all lots within a parcel. For instance, some lots may have the appropriate soil composition for the use of conventional septic systems while the soils on other lots in the development may not lend themselves to such systems. Thus, a community that needs to increase the capacity of the local wastewater treatment system could allow a mix of alternative and traditional OWTSs on a single site instead of relying exclusively on alternative systems. This is an example of how LID is flexible in its application.

3.1.4 GENERAL PERFORMANCE STANDARDS

In general, wastewater treatment systems take in wastewater, treat it, and release it to the environment. It is difficult, however, for prescriptive codes to specify the full range of technological options appropriate for a given site and anticipate the different sensitivities of the site's water and land resources. Although the topic is beyond the scope of this publication, public officials could use performance codes to address site-specific natural resource needs while meeting health requirements.

In 2002, the National On-Site Wastewater Recycling Association (NOWRA) received a grant to develop draft national on-site performance standards (http://www.nowra.org/model_code.html). The underlying issue and impetus for the project is that local wastewater regulations are usually prescriptive. Although alternative OWTSs have worked elsewhere in the country, local code officials are often reluctant to approve the use of these systems in their jurisdiction when a site does not meet the

prescriptive requirements. The goal of the NOWRA project is to create a set of national OWTS standards that local officials could use for approving the use of innovative systems (Small Flows Quarterly, Winter 2002).

The U.S. EPA states in a March 28, 2003 Federal Register notice regarding Voluntary National Guidelines for Management of On-site and Cluster (Decentralized) Wastewater Treatment Systems, "State agencies report that some of these systems have failed because of inappropriate siting or design or inadequate long-term maintenance. Historically high failure rates in some areas indicate a need for better management of these systems to protect public health and water quality." U.S. EPA has thus developed the Management Guidelines that are designed to enhance system performance through improving the quality of management programs (Federal Register, 2003). You may access this Federal Register notice electronically through the EPA Internet under the Federal Register listings at http://www.epa.gov/fedrgstr/T.

3.2 CONVENTIONAL APPROACHES TO WASTEWATER TREATMENT

Developers typically have four options regarding residential wastewater treatment systems: tying into a municipal or public sewer system, providing homeowners with an on-site septic system, using a community septic system, or using a combination of on-site systems and tying into the municipal system. Centralized municipal systems, often available in urban and many suburban areas, are often the most cost-effective option when municipal system connections are proximate to the land to be developed. Municipal systems consist of a series of pipes and pump stations leading to a wastewater treatment facility. The facility treats the water before releasing it to a body of water. In many instances, however, homes in a development cannot connect to a municipal treatment system. It may be cost-prohibitive to connect to a municipal system because of distance to conveyance pipes, or a municipal system already at capacity cannot treat additional effluent. In these cases, developers have traditionally turned to septic systems.

A conventional septic system normally treats a home's wastewater in an underground septic tank located on the property. The life of septic systems depends on the quality of the installation, correct usage, and the frequency of maintenance. With appropriate maintenance, many systems can last for 20 years or more.

Two primary factors in a septic system's successful operation include proper installation and appropriate operation and maintenance. Assuming proper installation, homeowners must ensure that the tank is pumped out as frequently as needed. In addition, given that the bacteria within the tank are sensitive to the wastewater inputs, homeowners should not use the system for the disposal of chemicals such as turpentine, alcohol, and bleach as well as for large volumes of grease and animal fats; such items can clog the system. Developers should provide homeowners with a list of "things to do and not to do". The National Small Flows Clearinghouse sells *The Homeowner On-Site System Recordkeeping Folder* (Item #WWBLPE37) and the *Homeowner Septic Tank Information Package* (Item #WWPKPE28) to help homeowners record and store information about their septic system and to educate homeowners on system care and system (http://www.nesc.wvu.edu/nsfc/nsfc_septicnews.htm#septic). In addition, the U.S. EPA has created a free, one-page Homeowner Septic System Checklist to highlight the homeowner's septic system maintenance needs (U.S. EPA, 2003).

Another wastewater management option sometimes used by developers is a communitywide wastewater treatment system. Although the vast majority of today's homes either use single septic systems or are connected to public sewer, some developers have installed communitywide septic systems. The systems treat wastewater for a group of homes in a manner similar to a septic system for a single home. Small community cluster systems often try to take the best attributes of municipal sewers and septic systems and use them to reduce wastewater treatment system installation costs while meeting environmental goals. The systems transport wastewater from homes via sewer pipes to either a conventional treatment plant or a pre-treatment facility. The effluent is then discharged to soils similar to those required in the last stage of a single septic system's treatment process.

Some communities install a centrally located package wastewater treatment plant that connects each home in that community to the plant. The package system is similar to public wastewater treatment facility except that the effluent from the homes travels to a privately owned and operated treatment plant located in the community (sometimes referred to as "small community sewer" or "distributed sewer").

A small number of jurisdictions are using natural open spaces, golf courses, and soccer fields as areas for drip irrigation of semitreated effluent. Such uses of open space allow effluent to be effectively disposed of across large areas. Another benefit of is that the systems can be created as needed. The developer can calculate how much effluent the entire development will likely generate and then phase in the system as homes are built. The system's potential drawbacks include a perception that odor will be a problem or that public health will be compromised.

In several communities, community systems have proven themselves a feasible alternative. For example, in Warren Village, Vermont, nearby streams had become polluted in part because of a combination of dense development, small lot sizes, and failed single septic systems. When residents determined that a municipal sewer system was too expensive, the town used two parcels--a soccer field and a vacant lot-- as common leaching fields with a total capacity of 30,000 gallons per day. Homeowners whose lots lacked adequate wastewater disposal capacity could pay the newly formed wastewater management district $250 per user per year to discharge to the community system (http://www.daylor.com/projects/Gloucester/CommunityWastwater.htm).

Community systems can also facilitate the use of smaller house lots. Single septic systems need an adequate land area for the leach field. With community systems, the final treatment location is consolidated into one large leach field instead of relegated to several individual fields. Allowing for smaller lots can help the developer preserve open space, furthering the goals of low-impact development.

Some instances warrant a combination of sewer hook-up and septic system installation. . For example, a municipal sewer system may be able to serve only an additional 50 homes, yet a proposed development calls for 200 homes. Public officials and the developer might agree to hook up 50 of the new homes to the public system and serve the rest of the homes with an on-site septic tank system.

A combination system might also be warranted when soils on part of the development are not suitable for septic tank installation. In this instance, the lots that cannot accommodate

septic systems could be connected to the municipal system while the rest of the lots could be served by septic systems or municipal connections.

Clearly, each parcel of land is often suited to a variety of options available to the developer. Developers can help create cost-effective developments by weighing all the wastewater management options and determining which will yield the best performance at the least cost. The LID approach helps increase the number of wastewater management system options available to the developer.

3.3 ALTERNATIVES TO CONVENTIONAL SYSTEMS

Table 14 contains a brief description of the OWTSs highlighted in this chapter. Listed below are expanded explanations of the alternative systems that provide secondary treatment and that might allow for on-site wastewater treatment (U.S. Environmental Protection Agency, 2002).

OWTS Type	Key Components	Situations Where Its Use Might Be Appropriate
Sand Filters	• Septic tank, sand filter, and sometimes a recirculation tank	• Where soil conditions do not allow for percolative beds/trenches • High groundwater
Mound	• Pre-treatment unit(s), dosing (pumping) chamber, and elevated mound	• Slow- or fast-permeability soils • Shallow rock cover over creviced or porous bedrock • High groundwater
Trickling Filter	• Circular bed of coarse or plastic material and rotating distributor	• High concentrations of organic material in wastewater
Evapotranspiration	• Pre-treatment unit, evapotranspiration sand bed, bed liner, fill material, monitoring, overflow protection, and surface cover	• Annual evaporation rate exceeds annual rate of precipitation and wastewater applied
Low-Pressure Pipe	• Septic tank, pumping (dosing) chamber, and small-diameter pipes	• Where soils would become clogged as a result of localized overloading • High groundwater • Anaerobic conditions due to continuous saturation
Aerobic	• Aeration compartment, settling chamber, pre-treatment compartment (optional)	• Where septic systems have failed • Where lot size is not sufficiently large to accommodate a standard septic system drainfield
Proprietary Systems	• Varied	• Where conventional septic systems or sewer hook-ups are not feasible

TABLE 14. ON-SITE WASTEWATER TREATMENT SYSTEM ALTERNATIVES

Alternative systems can use anaerobic bacterial action, i.e., the bacteria decomposes waste in the absence of oxygen, while other systems need oxygen (i.e., aerobic) to operate properly. In addition, hybrid systems use a combination of aerobic and anaerobic processes.

Developers can consider a variety of on-site wastewater treatment system options either as alternatives or enhancements to conventional septic systems. By using the LID approach, developers often uncover information and options that can help facilitate the development approval process.

While municipal sewer or on-site septic systems may be the most recognized wastewater treatment options, some sites might lack both sewer access *and* the ability to accommodate a septic system. Some of the limiting factors for septic systems include lot size (an ample soil absorption field is necessary), groundwater level, depth of bedrock, and on-site soil types. For example, dense clay or rocky soils can inhibit the use of septic systems. Recognition of various limitations has led to increased interest in and the development of alternative on-site wastewater treatment systems.

Alternative on-site wastewater treatment systems range from adding treatment steps (e.g., intermittent sand filter) to a conventional septic system to the reliance on proprietary systems that omit the use of traditional septic tanks. In fact, as technology grows more sophisticated, , it is often more important to establish an operation and maintenance plan for an alternative OWTSs than for an ordinary septic system.

Examples Where a Septic System May Not Be Allowed on a Lot

Lot size too small
Wrong types of soils
High groundwater level
Shallow soils/Depth of bedrock
Steep slopes
Soil does not percolate

When lots cannot be developed to take advantage of conventional wastewater management techniques (e.g., municipal sewer or on-site septic systems), the use of alternative OWTSs (discussed below) can make those lots suitable for development. Before using an alternative OWTS, however, developers are advised to familiarize themselves with the local public health criteria related to wastewater effluent and to recognize that, as opposed to municipal sewer systems, which are usually regulated by codes at the state level, local public health officials regulate on-site systems. The lack of information on the systems and absence of third-party verification of alternative system performance make public health officials reluctant to alternative OWTS. In general, public officials are most concerned with ensuring a certain level of public health, not with facilitating land development; therefore, officials often need to be educated about the efficacy of alternative systems.

On a related note, some public officials and environmental groups have expressed concern that the use of septic and/or alternative OWTSs will foster sprawl. The use of OWTSs by themselves does not lead to unchecked growth; indeed, the best way to manage growth effectively is through prudent zoning, not by eliminating potential wastewater treatment solutions or creating barriers for the adoption of alternative technologies related to development.

3.3.1 PROCESS FOR IDENTIFYING POTENTIAL ON-SITE WASTEWATER TREATMENT SYSTEM ALTERNATIVES

Each parcel of land is unique in terms of its size, shape, and soil types. If public health officials indicate that an alternative OWTS is a feasible option, then developers should consider several factors to identify the types of systems that might be used. For instance, OWTSs are more complex than septic systems and thus require a higher level of maintenance and supervision and may need additional excavation during installation to accommodate the various systems' several components. Table 15 briefly describes the various factors to be considered.

Costs can vary for different OWTS options. For instance, community wastewater treatment systems that rely on gravity to transport wastewater can require deep and thus costly excavations, but the use of pressurized systems with small-diameter plastic pipes can minimize excavation costs.

Some OWTS alternatives to conventional systems, such as recirculating sand filters and evapotranspiration systems, are "add-ons" to a traditional septic tank system. The additional treatment unit is connected in-line with the septic tank and provides an extra level of treatment. Although it may seem more costly to add another layer of treatment, alternative treatment systems may be less costly if conventional wastewater management methods require the hauling of extra fill material or the construction of a retaining wall.

As for other cost issues, alternative OWTSs may need electricity to operate the pumps that are sometimes required as part of the treatment system itself and that are sometimes needed to move wastewater from the house to the treatment area. In addition, the inclusion of other features such as recirculation piping, aeration, and an increased need for cleaning/pumping may increase an alternative system's operation and maintenance costs.

Another economic issue associated with the use of an alternative OWTS is the long-term operation and maintenance (O&M) costs and related organizational framework required

- Aesthetics--Both the general public and public officials will be most aware of aesthetic concerns. In short, potential insect problems and odor issues must be addressed and mitigated.
- Capacity--The system must be able to handle the home's capacity; the approval process will consider both rate and volume of sewage flow. In addition, public officials may want the system to be able to handle more than the current load to accommodate changing uses of the home.
- Cost--The upfront costs of alternative OWTSs can often be higher than the costs of traditional septic systems. In addition, the complexity of alternative systems yield somewhat higher operation and maintenance costs (e.g., the alternative systems usually need electricity to treat waste).
- Efficiency and Reliability--The community at large will be interested in any third-party reports and data indicating how well the proposed systems treat or remove potentially harmful wastewater components. In addition, the system must have adequate safeguards to warn the occupant of system failure.
- Environmental and Public Health--A system must maintain or improve environmental quality and adequately address public health issues.
- Operation and Maintenance (O&M)--As an emerging issue in the on-site wastewater treatment field, OWTSs require more monitoring than standard septic systems; thus, the local jurisdiction or a third party must ensure the proper maintenance of equipment.
- Siting--Soil type and lot size are often determining factors when siting OWTSs. For instance, only about one-third of the land area in the United States has soils suitable for conventional subsurface soil absorption fields.

Source: U.S. EPA, 2002.

TABLE 15. FACTORS TO CONSIDER WHEN EVALUATING ON-SITE WASTEWATER TREATMENT SYSTEMS

with the systems. Given that innovative systems usually require more frequent and ongoing O&M than conventional systems, developers, public officials, and communities must work together to develop an O&M plan and establish an entity that will ensure

effective system performance. Such an entity can oversee O&M activities, reduce liabilities, and establish service boundaries (Jones et al., 2001).

The following list offers criteria for determining situations in which an alternative OWTS could be most helpful:

- **When sewer is not located nearby.** If a given plot of land is not located close to existing infrastructure, thus making it costly to establish public sewer connections, then OWTS might be an effective option.
- **When the wastewater treatment facility is at capacity.** In some locales, the wastewater treatment facility is at capacity and cannot accept any more connections. In these instances, either a new facility will have to be built or the existing facility will have to be expanded. Either option will require the public's investment and time and will potentially delay land development.
- **When a lot is too small.** If local ordinances dictate that a lot is too small to accommodate a septic field, an alternative OWTS might help reduce the size of the required absorption field.
- **When a watershed requires higher-quality effluent.** In some instances, a watershed has effluent requirements that exceed the effluent characteristics normally produced by septic systems. Once again, the enhanced wastewater treatment available with some alternative OWTSs may help provide a solution.
- **When groundwater supply is limited.** Instead of pumping water off site through a sewer, an OWTS keeps water on the site; properly treated effluent from an alternative OWTS can help recharge the local groundwater aquifer.
- **When deep excavation is needed for a septic system.** Some alternative systems do not require as much excavation as septic systems, thus reducing initial costs.

Another way to look at the system selection process is through a variety of stakeholders' lenses. Figure 11 provides an overview of some of the groups interested in the process of selecting an appropriate OWTS and their relevant concerns (U.S. Environmental Protection Agency, 1997).

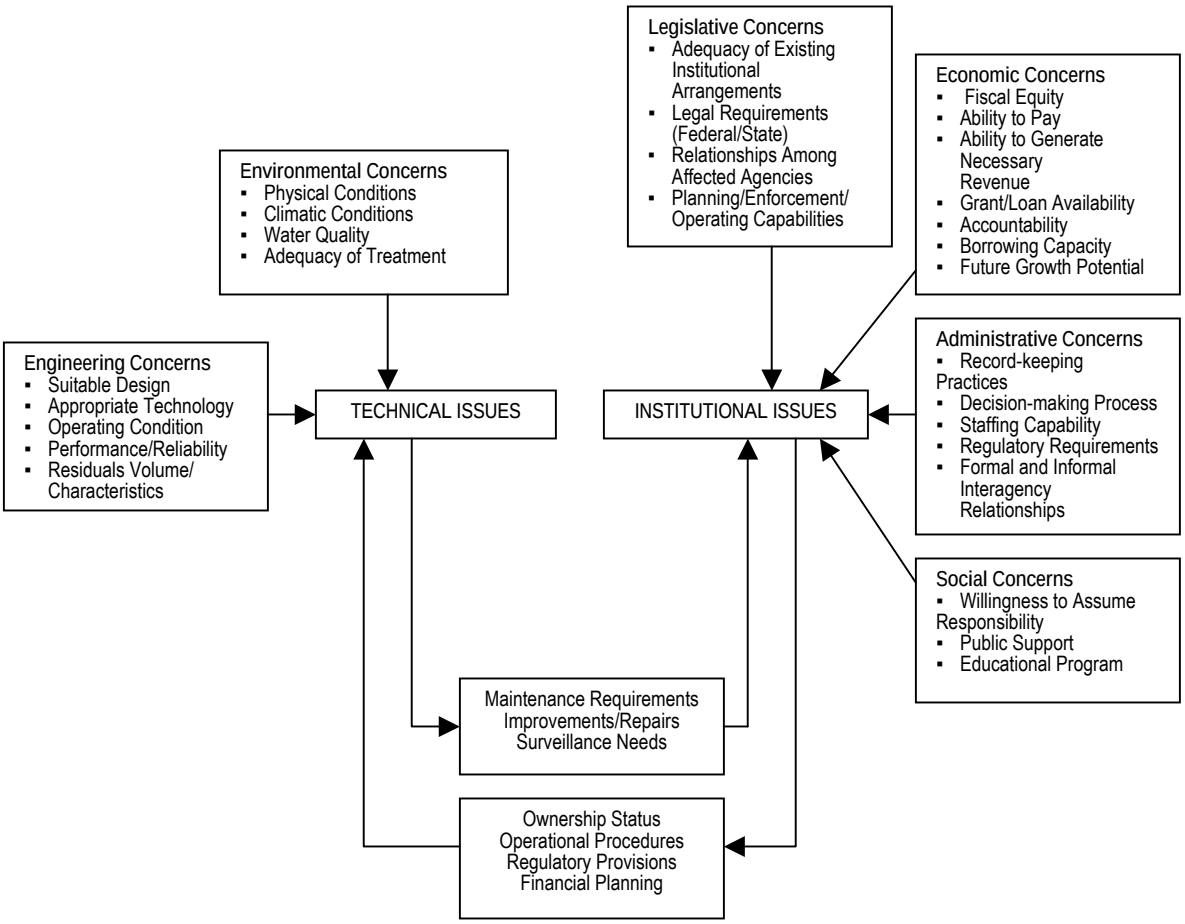

Source: Response to Congress On Use of Decentralized Wastewater Treatment Systems, http://www.epa.gov/owm/decent/response.

FIGURE 11. OVERVIEW OF PARTIES INTERESTED IN WASTEWATER TREATMENT DECISION MAKING

In some situations, conditions do not permit the installation of septic systems, particularly if soils are not appropriate or lot sizes are not sufficiently large to support a leach field. For example, the Floyd County, Kentucky, Plan Commission recently proposed a zoning ordinance amendment that would use soil conditions to dictate how many homes could be built per acre with septic systems (*The Courier-Journal*, Louisville, KY, May, 2002). In the worst soil and topographic conditions, the proposed amendment would limit development to one house with a septic system per 20 acres.

As previously noted, there are a variety of alternative systems available to developers. Below are descriptions of the different systems. Also included are considerations developers can take into account when deciding which systems to include in a new development.

3.3.2 SAND FILTERS

Intermittent Sand Filters

Sand filter systems treat the effluent downstream from a conventional septic tank. Two of the more common sand filter systems are the single-pass system (i.e., intermittent) and the recirculating system. In the single-pass system, the wastewater first undergoes primary treatment in a septic tank. The effluent is then applied intermittently to the top of a bed of sand (or other suitable media) that sits on an impermeable liner and percolates through the sand into drains located at the bottom of the bed (see Figure 12). As the wastewater passes through the sand filter, both physical and chemical processes treat the effluent, although microorganisms attached to the fixed media primarily treat the effluent. The effluent is then piped to the leach field for further treatment and disposal. Bottomless systems have no impermeable liner and do not discharge to a drainfield but rather to the soil below the filter.

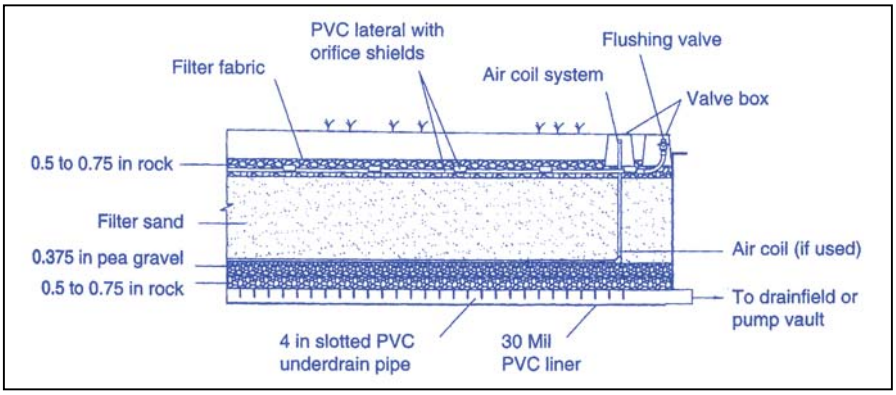

Source: National Small Flows Clearinghouse Fact Sheet, 1998.

FIGURE 12. TYPICAL CROSS-SECTION OF AN INTERMITTENT SAND FILTER

Intermittent sand filters produce a high-quality effluent by removing a high percentage of contaminants. The filter's ability to perform adequately depends on the filter's design and composition and, hence, the biodegradability of the wastewater and the environmental factors within the filter. The most important environmental factors include media re-aeration and temperature. Re-aeration makes oxygen available for the wastewater's aerobic decomposition. Temperature directly affects the rate of microbial growth, chemical reactions, and other factors that contribute to the stabilization of wastewater within the system.

System pumps and controls should be checked every three months while the sludge build-up in the septic tank should be checked as needed. Installation costs of intermittent sand filters, including labor and materials, generally range from $7,000 to $10,000. Daily energy costs for pumping the wastewater onto the filter bed run between $0.03 and $0.06.

Recirculating Sand Filters

In situations without sufficient land area for a single-pass filter system, recirculating sand filter systems are an option. In a recirculating system, wastewater first undergoes treatment in a septic tank. The pre-treated effluent then flows into a recirculation tank

along with some of the water that has already passed through the sand filter. A pump transports the wastewater mixture from the tank to the sand filter, where microorganisms attached to the filter media carry out treatment. The treated effluent collects at the bottom of the filter; some of the effluent is sent back to the recirculation tank for further treatment and some is sent out for disposal or another type of treatment disinfection. In this type of system, the sand is periodically changed (see Figure 13).

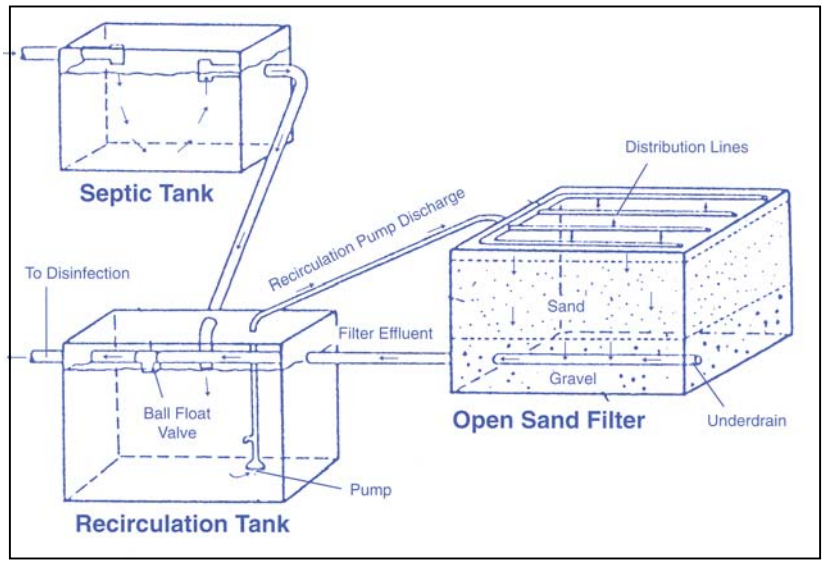

Source: National Small Flows Clearinghouse Fact Sheet, 1998.

FIGURE 13. TYPICAL RECIRCULATING SAND FILTER SYSTEM

Recirculating sand filters are relatively low-maintenance systems whose operating costs are generally modest. Operation and maintenance costs were under $5,000 for a 135-home septic tank system in Elkton, Oregon, including $780 for electricity and 25 to 30 labor hours per month. The replacement of the media represents one of the system's most expensive maintenance items. Thus, it is prudent to use locally available materials. For example, the capital cost (land not included) for a 5,000 gallon per day system with black beauty™ sand media that was not locally available totaled about $68,600. That same system cost $36,000 with standard sand media.

- Peat Filters--Organic particles and suspended solids are removed by passing wastewater through a peat bed.
- Batch Reactors--To increase nitrogen-removal efficacy, batch reactors alternate between oxygen-rich and oxygen-poor cycles and treat one batch of wastewater at a time.
- Activated Sludge Systems and Aerobic Treatment--Biooxidation (aerating wastewater) and oxygen-poor settling areas improve treatment.

TABLE 16. SECONDARY TREATMENT

Other types of filters provide secondary wastewater treatment (see Table 16).

3.3.3 MOUND

On lots with high water tables or soils unsuited to septic systems, a mound of suitable soils is placed on top of the soils that do not permit the use of a septic system. The primary treatment takes place in the septic tank. The wastewater from the tank passes

through a filter (to eliminate additional solids) and discharges to a dosing chamber. The effluent is then spread uniformly on the mound, which acts as an elevated or above-ground drain field. Typically, a mound system requires a pump that sends the effluent from the septic tank upward into perforated pipes that are located in the mound within a layer of fabric-covered coarse-gravel aggregate. The mound is often a soil cover that can support vegetation (see Figure 14).

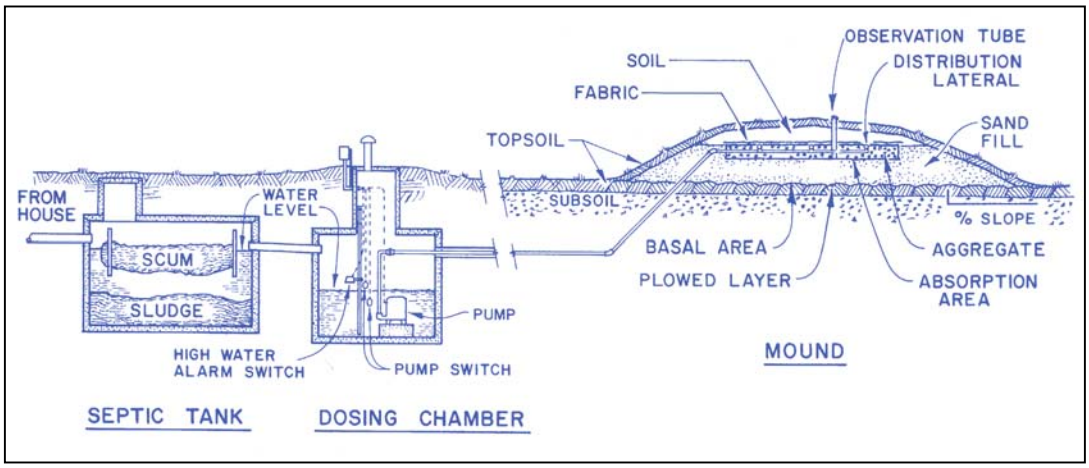

Source: National Small Flows Clearinghouse Fact Sheet, 1998.

FIGURE 14. SCHEMATIC OF A WISCONSIN MOUND SYSTEM

The mound's height should be sufficient to treat the effluent effectively before it reaches the limiting soils, bedrock, or high water table. In general, codes require a mound height between one and four feet. Mound slopes can be up to 25 percent. Mounds should be sited well away from flood plains, drainage ways, or depressions unless flood protection is provided.

Sand suitable for a mound system should contain 20 percent or less material greater than 2.0 mm and 5 percent or less finer than 0.053 mm. Mound design depends on several additional factors, including the number of rooms in a home; up to 150 gallons per day per bedroom are allowed. In addition, to minimize the number of solids entering the mound filter, the septic tank and dosing chamber must be watertight. In Wisconsin, the mound system success rate is more than 95 percent.

A typical mound system in Wisconsin costs approximately $9,000 to construct, with another $750 in site evaluation, design, and permitting costs. The operation and maintenance costs range from $125 to $200 per year.

3.3.4 TRICKLING FILTER

Trickling filters are effective in removing nitrogen from wastewater. They trickle wastewater over a fixed medium (coarse stones or plastic material) covered with a bacterial mat that removes nitrogen from the effluent. A rotating distributor, which is a rotating pipe containing several holes, evenly distributes the wastewater from above the filter medium. Microorganisms on the medium break down the organic materials in the wastewater as it passes through the medium (see Figure 15).

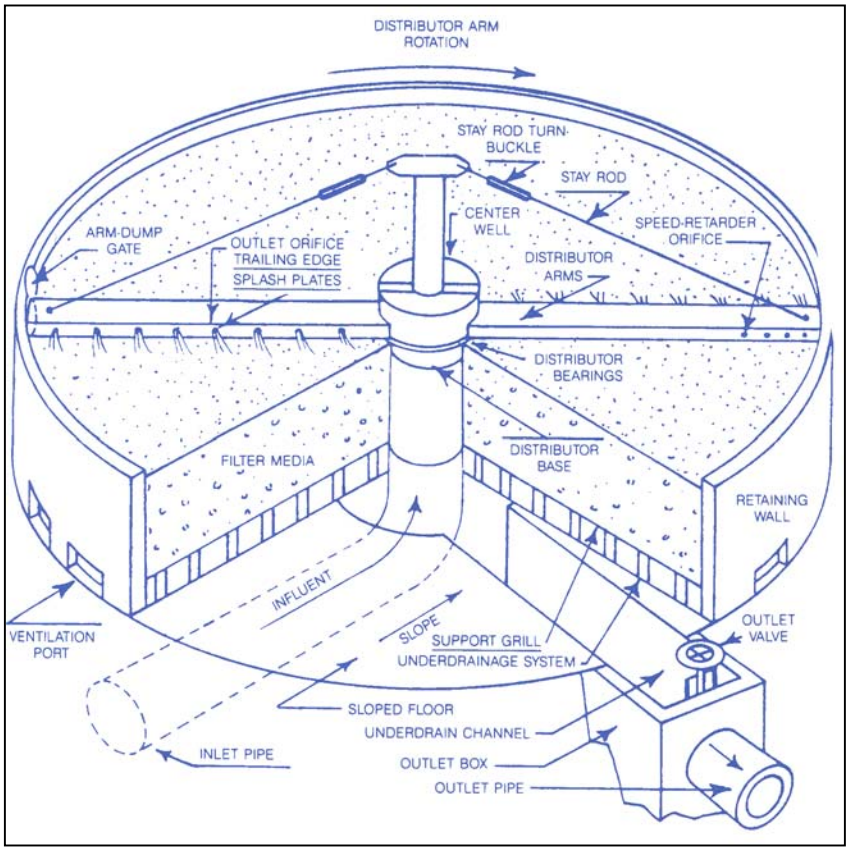

Source: National Small Flows Clearinghouse Fact Sheet, 1998.

FIGURE 15. SCHEMATIC OF A TRICKLING FILTER

Trickling filter systems are especially effective when the receiving waterbodies are highly sensitive to nitrogen loading. The filters successfully remove ammonia nitrogen by oxidizing it to nitrate nitrogen. The nitrate nitrogen is then converted into nitrogen gas that is vented to the atmosphere. The filters can accomplish ammonia nitrogen removal in one- or two-stage systems. In a single-stage unit, carbon oxidation (removal of organic material) and nitrification occur in the same unit. In two-stage systems, separate stages operate independently to complete the organic removal and nitrification steps. Trickling filters are highly sensitive to how much oxygen is available and to nitrogen loading rates.

3.3.5 EVAPOTRANSPIRATION

The two primary types of evapotranspiration (ET) systems are the standard ET system and an ET/absorption system (ETA). The more common is the ET system, which comprises a septic tank, an ET sand bed with wastewater distribution piping, a bed liner, fill material, monitoring wells, overflow protection, and a surface cover. Vegetation grows on the cover to facilitate the transpiration process.

Evapotranspiration systems are especially important on sites in need of surface and groundwater protection. An ET system can operate solely as a system that disposes of wastewater into the atmosphere through evaporation from the soil surface and/or transpiration by plants, or it can combine such treatment with seepage.

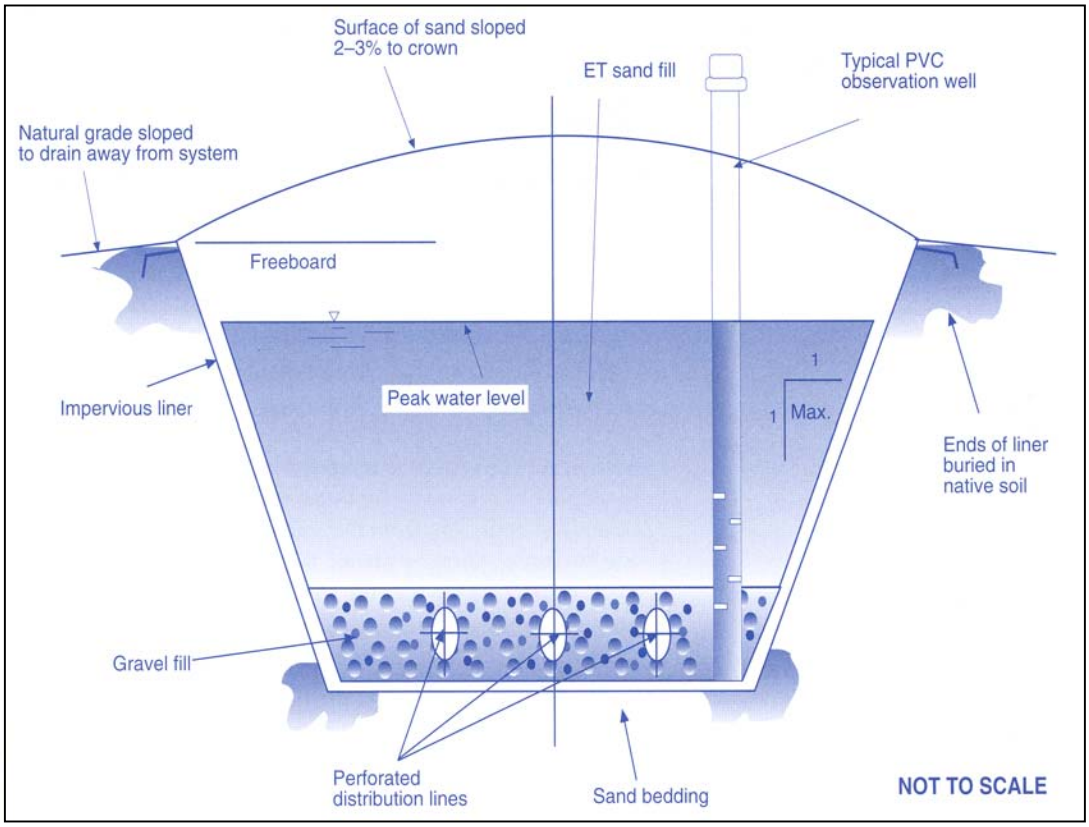

Source: National Small Flows Clearinghouse Fact Sheet, 1998.

FIGURE 16. CROSS-SECTION OF A TYPICAL EVAPOTRANSPIRATION BED

In a system that does not seep, the effluent flows from the septic tank into the lower portion of the sealed ET bed, which contains continuous impermeable liners and sand. Capillary action in the fine sand causes the wastewater to rise to the surface and escape into the atmosphere via evaporation. At the same time, vegetation brings wastewater from plant roots to the leaves, where it is transpired. An ET incorporates an unsealed bed, which allows for evaporation, transpiration, and percolation (see Figure 16).

To prevent overloading (with undersized systems) or excessive capital costs (with oversized systems), the design of ET systems requires accurate estimates of wastewater flow rates. The availability of land can limit the size of ET systems: up to 4,000 to 6,000 square feet of area is typically needed for a single-family home. However, the most important factor for ET systems is climate. Precipitation, humidity, wind speed, temperature, and the amount of solar radiation must are important considerations. For instance, system overloading can occur if large amounts of rainfall enter the system over a short period of time. Thus, ET systems are most suitable for use in arid to semi-arid locations such as the western and southwestern parts of the United States. The typical minimum cost for an ET system for a three-bedroom residence is $10,000.

3.3.6 LOW-PRESSURE PIPE

A low-pressure pipe (LPP) system is a shallow, pressure-dosed soil absorption system with a network of small-diameter perforated pipes placed in narrow trenches (see Figure

17). LPP systems can be used to address septic system issues such as soil clogging from localized overloading, mechanical sealing of the soil trench during construction, anaerobic conditions resulting from continuous saturation, and a high water table.

A typical LPP system consists of a septic tank for primary treatment. Partially treated effluent then flows by gravity to a pumping chamber, where it is stored until it reaches the level of the upper float control. Once the water reaches that level, the pump turns on and usually sends one to two batches of wastewater per day to the trenches via the distribution pipes. During each dosing cycle, the depth of wastewater in the trenches does not exceed two to three inches of the total trench depth.

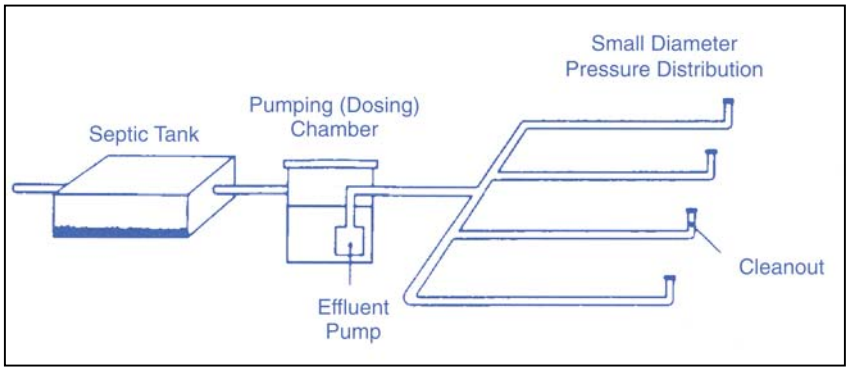

Source: National Small Flows Clearinghouse Fact Sheet, 1998.

FIGURE 17. LOW-PRESSURE PIPE SYSTEM

Two critical factors affecting LLP system performance are the dosing and distribution of the effluent. The dosing must be correct to maintain aerobic conditions in the trench, and effluent must be evenly distributed to avoid localized overloading.

A properly designed and installed LPP system needs little maintenance. For instance, North Carolina requires LPP systems to be inspected at least once every six months. The septic tank and pumping chamber should be checked periodically for sludge and scum build-up as needed. Watertight pumping tanks are necessary to ensure that drainfields do not inadvertently become hydraulically overloaded.

In a 1989 study of LPP use in North Carolina, the average cost to install an LPP system for a three-bedroom home was $2,600. The more LPP systems used in a county, the less is the average cost per system. In counties with several systems, the cost was approximately $1,500 per system as compared with $5,000 per system in counties with few LPP systems.

3.3.7 AEROBIC SYSTEMS

Similar to conventional septic systems, aerobic systems also use natural processes to treat wastewater. However, septic treatment does not require oxygen (anaerobic), whereas aerobic treatment does need oxygen. Thus, aerobic units include a device that injects air into and circulates it inside the treatment tank.

According to U.S Environmental Protection Agency, aerobic treatment units can range in size from 400 to 1,500 gallons and usually include an aeration compartment and a settling

chamber. Some units also include a pre-treatment compartment to remove garbage and grease (U.S. Environmental Protection Agency, 2000b). In addition, electrical service is required for the aeration equipment and pumps.

The two types of aerobic systems most often used for single-family homes are fixed-film and suspended-growth systems. Fixed-film systems are not available commercially and, as proprietary devices, are not described in detail here. Suspended-growth systems use microorganisms suspended in the waste stream to break down the wastes.

An aerobic system's application is limited primarily by soil conditions and topography. A site should have a percolation rate of less than 60 minutes per inch, its depth to the water table or bedrock should be two to four feet, and it should have level or slightly sloping topography.

Aerobic systems vary in cost, from $2,500 to $9,000 installed. In addition, the units must be maintained more frequently than a septic system. The recommended quarterly servicing costs about $350 per year.

3.3.8 PROPRIETARY SYSTEMS

Proprietary technologies are designed to provide turnkey solutions to developers' wastewater treatment needs.

Below are brief descriptions of the proprietary systems available today as well as the latest Web sites containing more information on the systems.

- Alascan--http://www.alascanofmn.com/

Alascan offers a variety of wastewater treatment options and systems to meet different needs, including source separation systems that separate blackwater from greywater and low-flush toilets that, according to the manufacturer, can reduce a home's water usage by 40 to 80 percent.

- Bio-Microbics, Inc.--http://www.biomicrobics.com/

Bio-Microbics, Inc., has created a Fixed Activated Sludge Treatment (FAST®) process. suited for use in single-family dwellings, clustered residential developments, and subdivisions. It can also be used to retrofit a failed conventional septic system.

- Cromaglass-- http://www.americanpump.com/croma3.htm

One of the more notable Cromaglass systems is the Cromaglass Batch Treat Process. The manufacturer claims that biological oxygen demand (BOD) and total suspended solid (TSS) removal rates exceed 90 percent and that independent laboratory research verifies system efficacy.

- E/One Sewer Systems--http://www.eone.com/sewer/intro/index.html

E/One offers several wastewater treatment systems sized to meet a customer's unique conditions. For instance, the GP 2010 is designed for single-family homes, whereas the GP 2016 is suited for multiple dwellings. The Web site provides brief case studies.

- Global Water Systems-- http://www.globalwater.com/encampment.htm

Global's source separation systems treat greywater for reuse in toilet flushing or irrigation.

- Blackwater-- Toilet wastes in wastewater
- Greywater--Washwater excluding toilet wastes

- MicroSepTec, Inc.-- http://www.microseptec.com/

The MicroSepTec (MST) system is an on-site wastewater treatment system that can be used for residential applications. In addition, MicroSepTec, Inc., is a full-service septic solution provider and will assist with permits, engineering, project management, maintenance, and monitoring.

- Orenco Systems, Inc.--http://www.orenco.com/

Orenco Systems® offers on-site (decentralized) treatment solutions for many types of residential properties for small flows and large flows, household-strength waste and high-strength waste, poor soils, and high groundwater. The company provides a variety of package solutions.

- Waterloo Biofilter Systems, Inc.--http://www.waterloo-biofilter.com/

The Waterloo Biofilter ® is a patented trickle-filter–type treatment system that uses a filter medium to treat residential and industrial wastewater. Wastewater is sprayed intermittently onto the medium and allowed to drain through by gravity.

3.4 ADDITIONAL RESOURCES

Additional resources with more detail on wastewater treatment are included below. They are not provided as endorsements, merely as educational and reference tools. Given regional variations in climate and land development needs, we have tried to include region-specific resources. It is important to note, however, that addresses, especially Internet links, are subject to change. This list contains the latest links and addresses as of the printing of this publication.

Wastewater Manuals and Best Management Practices

National On-Site Demonstration Program
http://www.nesc.wvu.edu/nodp/nodp_index.htm
The National On-Site Demonstration Program (NODP), established in 1993, was developed to encourage the use of alternative on-site wastewater treatment technologies to protect the public health, ensure water quality, and sustain the environment in small and rural communities. Funded through the U.S. Environmental Protection Agency (EPA) and directed by the National Environmental Services Center of the National Research Center for Coal and Energy at West Virginia University, the NODP provides communities throughout the country with information on cost-effective alternatives to centralized wastewater treatment systems.

U.S. Environmental Protection Agency
http://www.epa.gov/ORD/NRMRL/Pubs/625R00008/625R00008.htm

The 2002 *On-site Wastewater Treatment Systems Manual* is the U.S. Environmental Protection Agency's latest publication covering on-site wastewater technologies. As an update of the 1980 *On-Site Wastewater Treatment and Disposal Systems*, it provides supplemental and new information for wastewater treatment professionals in the public and private sectors. This manual is not intended to replace the previous manual but rather to explore further and discuss recent developments in treatment technologies, system design, and long-term system management.

Washington State Department of Ecology
http://www.ecy.wa.gov/biblio/9911.html
Washington's *Storm Water Management Manual for Western Washington* describes the storm water management standard for all new development and redevelopment projects in the Puget Sound region.

Organizations and Internet Resources

Canadian Housing Information Center (CHIC)
http://www.cmhc-schl.gc.ca/publications/en/rh-pr/tech/01-138-E.htm
Innovative On-Site Wastewater Treatment
The Canadian Housing Information Center has researched problems with residential septic systems across Canada and found surface breakouts, back-ups into houses, and contamination of groundwater supplies as evidence of system failures. Such problems arise from excessive water usage and lack of maintenance; inadequate site assessment, especially in marginal soils; outdated design practices; or poor construction.
http://www.cmhc-schl.gc.ca/en/imquaf/himu/wacon/wacon_001.cfm
Water conservation has been at the forefront of resource efficiency issues in Canada. In an effort to reduce water consumption, CMHC has conducted research into residential water reuse and innovative wastewater treatment technologies. Case Study of the Month presents water projects either supported by CMHC or undertaken by the private sector.

Hazen and Sawyer
http://www.co.sarasota.fl.us/environmental_services/pcssrp/pdfs/40075r048.pdf
Evaluation of On-site Wastewater Treatment and Wastewater Collection System Alternatives (TM No.7)
An assessment of available and applicable OWTS and collection system technologies determines the technologies' ability to improve current wastewater treatment and disposal practices in the Sarasota, Florida area.

NAHB Research Center
http://www.toolbase.org/tertiaryT.asp?TrackID=&DocumentID=3789&CategoryID=1843
On-site wastewater treatment systems can allow the construction of new homes on otherwise vacant infill lots in neighborhoods whose centralized wastewater treatment systems are beyond capacity. To find the best and most cost-effective aerobic treatment system, the Research Center is working with Anne Arundel County, Maryland, and will monitor the installation of several innovative on-site aerobic wastewater treatment systems on residential field sites. Approximately 25 percent of all homes in the county use on-site wastewater treatment systems, most of which are septic tanks.

Rocky Mountain Institute
http://www.rmi.org/images/other/W-ComDecMakWstwtrSys.pdf
Case Studies of Economic Analysis and Community Decision Making for Decentralized Wastewater Systems
The Rocky Mountain Institute is conducting an 18-month project to increase understanding of how communities consider and value the benefits and costs of different-scale wastewater facility options (on-site, cluster, and centralized options) in dollar or other terms. The project also is examining the driving issues, motivations, thought processes, and decision-making methods of stakeholders relative to choices of wastewater system scale.

Small Flows Quarterly
http://www.nesc.wvu.edu/nsfc/nsfc_index.htm
The National Small Flows Clearinghouse (NSFC), funded by the U.S. Environmental Protection Agency, helps America's small communities and homeowners solve their wastewater problems and thereby protect the public health and the environment. The successful long-term operation of wastewater systems protects drinking water sources from contaminants and natural systems from pollutants. The NSFC assists in planning, operating, financing, and managing new or existing sewage systems, both for individual households and communities of less than 10,000 people. One of the *Small Flows Quarterly*'s most recent peer-reviewed articles, "Proposed National On-Site Standards: A Broad Assessment of Their Relative Benefits to Industry," proposes ideas about on-site wastewater treatment management in small communities. In most states, regulatory systems dominated by prescriptive codes restrict the activities of on-site wastewater treatment system manufacturers and suppliers.

The Home Inspection and Construction Information Website
http://www.inspect-ny.com/septic/lockwood.htm
Septic Systems--An Engineer's View
The Home Inspection and Construction Information Web site describes septic systems, their operation, and the reasons for system failure. Contributed by Lockwood, Dietershagen Associates Licensed Professional Engineers, Clifton Park, New York.

U.S. Environmental Protection Agency
http://www.epa.gov/OW/index.html
The Office of Water provides an immense amount of information on the protection and conservation of our nation's water resources.

Regional-Specific Resources

Northeastern United States

Cornell Local Government Program
http://www.cardi.cornell.edu/clgp/septics/Exec_Summ.PDF
Increasingly, rural communities, unsewered subdivisions, and responsible agencies are aware of issues and concerns associated with treating and managing human waste products with on-site wastewater treatment systems (OWTSs or septic systems). This guide provides an information framework for those seeking change.

The New England Interstate Water Pollution Control Commission Regulatory Cooperation Project
http://www.neiwpcc.org/iatech.html
An interstate effort to evaluate innovative/alternative (I/A) on-site technologies capable of protecting the public health and the environment. The project provides states with an efficient review process for I/A technologies. By bringing together the interests of regulators and end users, the effort facilitates independent evaluation of environmental technology performance.

Southeastern United States

Commonwealth of Virginia State Board of Health
http://www.vdh.state.va.us/formfeed/VDH88.PDF
Regulations Governing Application Fees for Construction Permits for On-Site Sewage Disposal Systems and Private Wells

W*estern United States*

City of Oregon City--Development Services Department Engineering Division
http://www.orcity.org/public-works/design-standards/sewer/index.html
Sanitary Sewer Design Standards
Oregon City Development Services (Oregon) created sewer design standards to provide a consistent policy under which certain physical aspects of sanitary sewer design will be implemented.

Orenco Systems Incorporated
http://www.orenco.com/ccs/ccs_caseStudy.asp
Orenco Case Study--Diamond Lake, Washington: 12-Year-Old Effluent Sewer Requires Little Maintenance
The community of Diamond Lake, in northeast Washington, protected an 800-acre lake by replacing all the community's old, leaking septic tanks and inadequate disposal systems with watertight tanks and an Orenco effluent sewer system.

SECTION 4: CIRCULATION AND DESIGN

Reconsidering traditional methods for planning and accommodating pedestrian and vehicular circulation is part of a cadre of better site design techniques that can simultaneously reduce development costs, protect the environment, and create win-win situations for builders, municipalities, and residents.

4.1 INTRODUCTION

As the struggle to decrease nonpoint source pollution in our nation's waters continues, municipalities have begun to reexamine the connection between circulation design and storm water management practices. New designs for streets, sidewalks, and driveways can maintain the functions of circulation while helping to reduce expanses of impervious surfaces that can alter local hydrology and degrade water quality. In turn, new street designs can influence the layout of lots and help to increase the volume of open space in new residential developments. These considerations all contribute to creating low impact developments. This section examines alternative street and lot layouts and their associated environmental and cost benefits.

Vehicular and pedestrian circulation systems have always played an important role in organizing and defining residential communities. Traditionally, residential or local streets have been designed with a focus on accommodating community access, circulation, and parking. In the years before World War II, older, close-in suburban neighborhoods were designed with narrow streets that were wide enough for one travel lane and parking on one side of the street.

- Mobility--A measure of long-distance travel at relatively higher speeds. Mobility usually characterizes highways.
- Access--A measure of service to origins and destinations. Access usually relates to local streets.

In the years after World War II, suburbanization and highway construction grew at a rapid pace. As reliance on the automobile increased, transportation planners identified the need for a hierarchy of safe and efficient transportation routes linking suburban residences with urban employment centers, retail concentrations, and recreation opportunities. They developed a hierarchy of highways, arterials, collectors, and local streets. The classification system sought to strike a balance between providing mobility and access.

Unfortunately, at some point during post-war suburban expansion, the classes within the hierarchy blurred. Communities started to design local streets according to standards more appropriate to arterial road and highway construction. Many areas of the country saw pavement widths widened to accommodate increased vehicle trips, ensure access for larger emergency vehicles, and provide parking spaces on both sides of the street (even though most neighborhoods accommodate off-street parking in driveways). The larger impervious areas created by wide streets have led to increased storm water runoff, reduced water quality, and riparian habitat and species degradation. They have also translated into increased design, construction, and maintenance costs for both developers and municipalities. Low impact development practices can help to alleviate these concerns.

What is the cost of an excessively wide street?		
Not only do excessive street widths affect the livability of a community, but they also give rise to additional costs that must be paid by homeowners. The figures cited here are for 2001 based on unit costs of contractor services for a project in northern California. For this project, a section of street 100 feet long would cost about $9,500 to build to a width of 24 feet compared with $13,500 for a 36-foot-wide street. Paving widths are 20 feet and 32 feet, respectively, with an additional two-foot gutter on each side. Moreover, in this area where lots sell for $300,00 per acre, land costs exceed street construction costs, even for narrower streets. Total land and construction costs for a 100-foot section of a 36-foot-wide street amount to almost $40,000 compared with $26,000 for a narrower 24-foot-wide street.		
Cost per 100 Feet of Street		
	24 Feet	36 Feet
5-Inch Asphalt Paving/6-Inch Base	$6,800	$10,880
6-Inch Curb and Gutter	$1,265	$1,265
4-Inch Sidewalk	$1,400	$1,400
Total Construction Costs	$9,465	$13,545
Land (at $300,000 per acre)	$16,800	$25,200
Total Cost	$26,265	$38,745

TABLE 17. TYPICAL STREET CONSTRUCTION COSTS

This chapter begins by providing a brief overview of the environmental and economic benefits of LID circulation and design. It briefly discusses conventional approaches to circulation and design and then concludes by considering some alternatives to conventional approaches. Table 18 provides some overall objectives of community circulation and design systems.

Objective 1:
Maximize open space by using alternative street and lot layouts.
Objective 2:
Reduce impervious surfaces by considering alternative street widths, types, and amenities.
Objective 3:
Site lots and houses to maximize solar orientation, reduce vehicular trips, and create a sense of community.

TABLE 18. CIRCULATION AND DESIGN OBJECTIVES

4.1.1 ENVIRONMENTAL BENEFITS

Properly designed and sited streets and street systems can conserve and protect site and regional environmental systems and resources. Most street standards are the result of compromises among engineers, planning staffs, and local emergency management professionals (police and fire and rescue services). To provide two travel lanes, access for emergency vehicles, and parking on both sides of the street, communities have long required streets that are much wider than necessary. However, research and experience show that compact street layouts, narrower street widths, and alternative pavement edge treatments can minimize clearing and grading, reduce storm water runoff, and protect

water quality while providing ample access for emergency vehicles, residential vehicles, and parking.

Paved streets create impervious surfaces that prevent storm water from infiltrating into the ground. As storm water travels across streets and other impervious areas, it picks up motor oils, grease, fuel residues, nutrients, and sediment, all of which are then carried to local receiving waterbodies where they adversely affect aquatic species and their habitats. Impervious areas are major contributors to the urban nonpoint source pollution problems that impair the nation's water quality.

4.1.2 ECONOMIC BENEFITS

Where density and zoning allow, redesigned vehicular and pedestrian circulation routes can reduce final infrastructure and development costs by limiting street lengths and the expanse of pavement. At the same time, reworked street types and layouts can mean reduced costs associated with planning and design, clearing and grading, and storm water management. Table 4-3 provides information on various subdivision development costs.

Subdivision Improvement	Unit Cost
Roads, Grading	$22.00 per linear foot
Roads, Paving (26-foot width)	$71.50 per linear foot
Roads, Curb and Gutter	$12.50 per linear foot
Total Cost of Road	$106.00 per linear foot
Sidewalks	$10.00 per linear foot
Storm Sewer (24 inches)	$23.50 per linear foot
Driveway Aprons	$500 per apron
Parking Spaces	$1,100 per parking space ($2.75 per square foot)
Clearing (forest)	$4,000 per acre
Sediment Control	$800 per acre
Storm water Management	$5,000 to $60,000 per impervious acre
Water/Sewer	$5,000 per lot (variable)
Well/Septic	$5,000 per lot (variable)

Source: Center for Watershed Protection, 1998.

TABLE 19. UNIT COST ESTIMATES OF TYPICAL SUBDIVISION DEVELOPMENT

4.2 CONVENTIONAL APPROACHES TO CIRCULATION AND DESIGN

4.2.1 RIGHTS-OF-WAY

A street right-of-way is a measure of the total width needed to accommodate the street pavement, sidewalk(s), drainage, street trees, and utility easements. Current street rights-of-way range from 30 feet to over of 60 feet to accommodate parking and sidewalks on both sides of the street. Excessive rights-of-way create wide and often visually uninteresting streets that promote speeding and undermine safety. Wider street rights-of-

way require land to be set aside to accommodate street systems, leaving less land available for lots and community open space. At the same time, given that safety and maintenance concerns require the removal of vegetation and trees within the right-of-way, road construction results in the removal of many mature trees and vegetation, potentially leading to soil erosion and siltation problems in local waterways.

Street rights-of-way should be the minimum width necessary to accommodate the pavement, sidewalk(s), street trees, and utilities. Where zoning and density allow, communities should permit open-section roadways with sidewalks on one side of the roadway only. Open-section roadways consist of a variable-width gravel shoulder, usually wide enough to accommodate a parked car, and an adjoining grassed swale that conveys storm water. Street pavements should be adjusted accordingly depending on off-street parking availability and shoulder requirements. To encourage the preservation of existing vegetation, only those trees within approximately five feet of the pavement edge should be cleared. Utilities should be located under street pavements to eliminate conflicts with tree roots, grassed swales, and bioretention areas. In northern climates, the right-of-way should be wide enough to accommodate snow storage.

4.2.2 STREETS

Besides rooftops and driveways, residential streets account for an enormous share of a community's impervious surfaces. A reevaluation of residential street standards to address the expanse of impervious surfaces and enhance the environment can also reduce infrastructure costs, improve pedestrian and vehicular safety, and increase community aesthetics. Many municipalities have already begun the difficult process of reevaluating their residential street standards. The process requires the involvement of many different stakeholders, including emergency personnel (police and fire and rescue services)(See Table 20), public works departments, school boards, homeowner associations, and safety advocates. Indeed, disagreements can be easily resolved by examining the current research on the use of narrower streets.

Width (feet)	Source
18 to 20	U.S. Fire Administration
24 (on-street parking) 16 (no on-street parking)	Baltimore County, Maryland
18 (minimum)	Virginia State Fire Marshal
20	Prince George's County, Maryland
18 (on-street parking on one side) 26 (parking both sides)	Portland, Oregon

Source: Center for Watershed Protection, 1998.

TABLE 20. MINIMUM STREET WIDTHS FOR FIRE VEHICLES

Most municipalities' standards for street pavement widths usually specify streets at least 36 feet wide—a width that usually accommodates two travel lanes and parking on both sides of the street (see Table 21). Given that most homes are built with either garages and/or driveways that accommodate up to three cars, municipalities should consider eliminating one or both of a street's seven-foot-wide parking lanes. Even a new street width of 22 feet can still accommodate parking on one side of the roadway and leave

ample room for a safe travel lane that is generous enough to accommodate most fire trucks, school buses, and garbage trucks. Consistent with low impact development practices, the new standards reduce infrastructure construction and maintenance costs while reducing impervious surfaces within the community (See Section 4.3.2 on queuing streets for additional information).

Local Streets	
No On-Street Parking	18 feet
Parking on One Side	22 to 24 feet
Parking on Both Sides	24 to 26 feet
Collector Streets	
	32 to 36 feet

Source: Residential Streets, NAHB, 2001.

TABLE 21. SUGGESTED PAVEMENT WIDTHS

Where density and zoning allow, open-section roadways can reduce the need for costly curb and gutter sections and encourage the filtering and infiltration of storm water. Open-section roadways consist of a variable-width gravel shoulder, usually wide enough to accommodate a parked car, and an adjoining grassed swale that conveys storm water. The grassed swales are usually pitched at a minimum of 1 percent to prevent standing water and end at a drop-inlet storm structure or waterbody. Historically, improperly designed swales posed health concerns because they served as breeding areas for insects and caused flooding. However, if communities follow current engineering standards for the design of swales, they no longer have to concern themselves with the associated health and flooding issues (see Section 2.3.3.1 for additional information on grassed swales).

4.2.3 INTERSECTIONS

A curb radius is the radius of the circle formed by the curve of the curb at the intersection corners.

Intersections create large areas of impervious surface within residential subdivisions. Reducing the overall size and width of intersections can decrease the volume of storm water runoff. Depending on the class of street entering the intersection, the number of travel lanes, and the dimensions of the curb radii, intersection diameters can become overly wide. The larger the curb radii, the larger the intersection. Recommended ranges for curb radii are contained in Table 22. Smaller, tighter radii can slow turning traffic and make the intersection safer for pedestrians while limiting the expanse of impervious surface.

Type of Intersections	Curb Radius (in feet)
Local/Local	10 to15
Local/Collector	15 to 20
Collector/Collector	15 to 25

Source: AASHTO.

TABLE 22: RECOMMENDED RANGES FOR CURB RADII

One of the best ways to reduce the impacts of impervious areas within intersections is to incorporate a traffic circle into the middle of the intersection. A traffic circle in the center of an intersection serves a variety of functions. First, it can slow traffic through the intersection and community, making the area safer for pedestrians and vehicles. Second, storm water generated by the impervious areas of the intersection can be routed to a bioretention area sited in the center of the traffic circle where it is detained and treated. Finally, traffic circles can add character to a neighborhood and create visual interest along the streetscape.

Traffic circles are usually smaller than their counterparts, the traffic roundabout. While traffic circles are more appropriate for lower-speed, smaller-volume residential intersections, roundabouts are better suited for collector streets that serve higher traffic volumes. Generally, traffic circles are 15 to 20 feet in diameter and require no additional street space than standard intersections. The center can be planted with a variety of native plants that are well suited for harsher street conditions and whose root structures will tolerate periodic inundation with water and provide superior nutrient uptake.

4.2.4 CUL-DE-SACS

Cul-de-sacs are dead-end streets that terminate in bulb-shaped paved areas, with lots cited around the perimeter of the street (see Figure 18). Given homebuyer preferences for residential cul-de-sac properties, many developers try to incorporate as many cul-de-sacs as possible into new developments. Depending on a subdivision's lot size and street frontage requirements, five to ten houses can usually be located around a standard cul-de-sac perimeter. The bulb shape allows vehicles up to a certain turning radius to navigate the circle. To allow emergency vehicles to turn around, cul-de-sac radii can vary from as narrow as 30 feet to upwards of 60 feet, with right-of-way widths usually extending ten feet beyond these lengths.

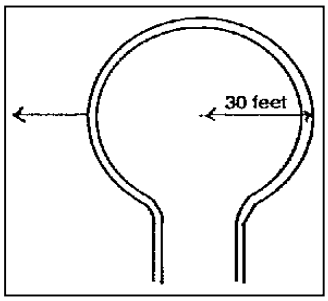

FIGURE 18. STANDARD CUL-DE-SAC

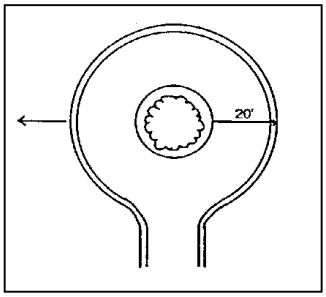

FIGURE 19. STANDARD BIORETENTION CUL-DE-SAC

Unfortunately, cul-de-sacs create excessive amounts of pavement that generate large volumes of storm water runoff. However, to reduce the expanse of paved surface and treat the runoff from the remaining pavement, cul-de-sacs can be designed with center vegetated islands (see Figure 19). As with intersections, the islands can be constructed as bioretention areas that detain storm water and filter urban pollutants such as grease, oils, hydrocarbons, and nutrients. For safety reasons, bioretention areas should be designed with underdrain and emergency overflow systems that safely convey peak flows into conventional storm drains.

Cul-de-sac designs with center bioretention islands should, at a minimum, retain 18-foot pavement widths around the island. To accommodate emergency vehicles, school buses, and sport utility vehicles, the portion of the travel way at the top of the island, which is directly opposite the entry, may be widened by several feet. Curb aprons can replace curb and gutter systems for the islands and allow water from the street to enter the system easily.

For dead-end streets serving fewer than ten houses, another option for reducing the expanse of impervious surface is "T-" or "Y-"turnarounds or auto courts (see Figure 20). These designs function much as cul-de-sacs but, due to a reduction in the area of paved surface, cannot accommodate bioretention areas in their centers. However, given that a standard 60-foot by 20-foot T- or Y-turnaround yields a paved area only 43 percent as large as the smallest (30-foot radius) circular turnaround, the turnaround generates much less storm water runoff (National Association of Home Builders, 2001) than that associated with traditional cul-de-sacs. Runoff could even undergo treatment in curbside swales located within the right-of-way.

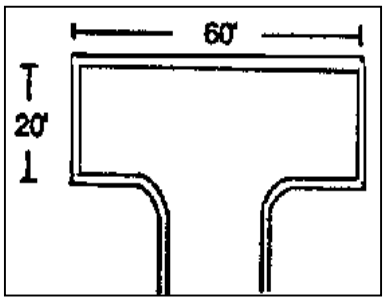

FIGURE 20. STANDARD “T-”TURNAROUND

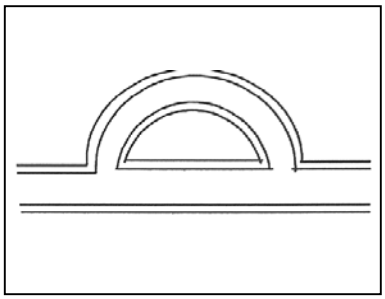

FIGURE 21. STANDARD LOOP TURNAROUND

An auto court is a functional automobile and pedestrian area that is surrounded by a cluster of homes and usually paved with decorative brick or stone pavers. Individual shortened driveways or garages are located immediately off the court. Auto courts use permeable paving systems, allowing runoff to percolate into and undergo filtration by the subsoil underlying the pavers. The systems help recharge local groundwater tables and reduce the need for conventional storm water management improvements. It should be noted, however, that the labor and material costs associated with the individually placed pavers exceed the cost of conventional asphalt paving. Costs may also be incurred for regular maintenance to remove any sediment and silt that accumulate in spaces between the pavers.

Looped turnarounds (see Figure 21) are another option for providing access to a small number of lots while limiting the expanse of impervious surface. Looped roads offer the same private and emergency vehicle access as standard cul-de-sacs, but without the added asphalt and construction costs. Similar to cul-de-sacs with center bioretention areas, the pavement width on a loop road should be no less than 18 feet to accommodate buses, emergency vehicles, and sport utility vehicles.

4.2.5 PARKING

No other decision can affect the final width of streets and ultimately the generation of storm water runoff as much as parking requirements. Most local ordinances require at

least 2 to 2.5 parking spaces per residence, either accommodated in a garage, in a driveway, or on the street. Current residential street standards tend to accommodate street parking on both sides of the street when in fact, the houses served by the street usually provide ample parking either in a driveway or garage. Most on-street parking spaces are 8 feet by 20 feet, resulting in long, underused street sections outside the general path of travel and excessively wide streets that are both expensive to construct and generate considerable quantities of storm water runoff. It is estimated that each seven- to eight-foot on-street parking lane can increase a street's impervious cover by 25 percent (Sykes, 1989). Given that most municipalities require post-development stormflows not to exceed pre-development flows, compliance with parking standards can translate into added costs for storm inlets, piping, and detention basin sizing.

From a water quality standpoint, water temperature can increase as storm water runoff moves across heated asphalt. As elevated-temperature water flows to a waterbody, it can damage sensitive aquatic environments, especially cold-water fisheries. The reduction of on-street parking, however, allows for narrower streets that can take advantage of the cooling effects of shade trees.

4.3 ALTERNATIVE APPROACHES TO CIRCULATION AND DESIGN

4.3.1 ALTERNATIVE DESIGN CONSIDERATIONS

Just as alternative street types and pavements can reduce infrastructure costs and environmental impacts, so, too, can alternative residential street layouts. When coupled with narrower, open-section streets, a well-designed street layout can eliminate hundreds of square feet of impervious surface. Depending on the density, location, and type of subdivision, different types of street layouts may easily lend themselves to a cluster arrangement, conserving natural features, maintaining open space, and protecting water quality.

Rethinking traditional circulation designs within residential subdivisions can result in:

- Decreased storm water quantities and nonpoint source pollution;
- Increased groundwater recharge; and
- Increases in community open space.

Traditional grid, curvilinear, and hybrid street patterns each have different characteristics that affect traffic movement, environmental values, and community aesthetics (see Figure 22). Grid patterns are typical of older, densely settled urban areas and are particularly effective in expediting traffic flow. Yet, research has indicated that they require 20 to 25 percent greater total street length than traditional, suburban curvilinear patterns and are most appropriate for flat sites with several access points. Given that densities in grid areas are often high, parking is generally needed on at least one side of the street.

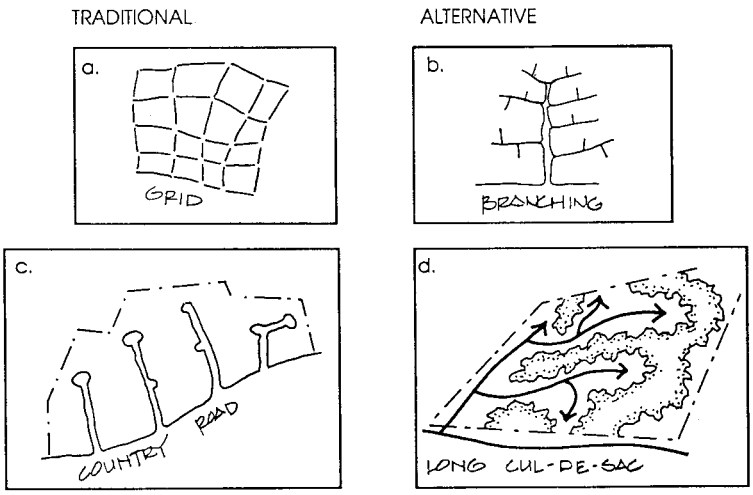

FIGURE 22. STREET LAYOUT EXAMPLES

Curvilinear patterns are best suited for larger-lot communities or communities with undulating topography. They are most popular in suburban settings and usually maximize the use of long cul-de-sacs that concentrate clusters of houses around natural resource areas, such as waterbodies. While the use of longer, winding streets and cul-de-sacs translates into greater expanses of impervious surface, communities can narrow their streets by limiting parking to only on one side of the street.

Possibly the best choice for suburban systems are hybrid layouts. Hybrid systems provide a balance between conventional grid and curvilinear patterns and are well suited to developments characterized by a mix of housing types and styles. They also permit the creation of open space. Hybrid systems can minimize the need for clearing and grading and help protect forests, wetlands, and trees.

Traffic Calming

Traffic calming refers to a set of measures designed to mitigate the effects of unmanaged traffic on urban and suburban roadways. While the use of traffic calming as a traffic mitigation strategy is beyond the scope of this publication, the practice is discussed here in terms of its relationship to low impact development and storm water management.

Certain traffic-calming measures, such as roundabouts or traffic islands, can be designed as vegetated bioretention islands that retain and treat street runoff. A traffic roundabout is a circle centered in an intersection; it slows traffic entering the intersection and directs it to exit points around the circle. Usually, a roundabout is raised and includes curbs and areas planted with grass or vegetation. Where street grades allow, roundabouts can be converted into bioretention areas.

Bioretention areas can be bordered by either curb cuts or flush-mount curbs that allow water to exit an intersection efficiently and enter the treatment system. Either treatment method allows for a transition between the street pavement and vegetated and mulched areas. As storm water enters the system, specially selected vegetation and engineered

soils retain and treat it. For reasons of safety, roundabouts designed for bioretention should incorporate underdrains and/or emergency overflow areas to prevent excessive ponding or flooding.

Clustering

With respect to lot layout, developers can turn to methods such as clustering to preserve open space, reduce infrastructure costs, and accommodate growth. This strategy concentrates small pockets of homes around the site in the least environmentally sensitive areas. In a clustered community, homes may be built on lots as small as 8,000 square feet, allowing developers to preserve unique land forms, trees, and vistas. Developers may need to work with local zoning officials to allow the use of clustering, if current zoning ordinances do not allow it. In addition, potential homeowners may need to be persuaded that cluster development creates a community that offers ample amounts of open space within walking distance of their homes.

> More than half of the 1,350 real estate agents surveyed by Bank of America thought that trees have a positive impact on potential buyers' impressions of homes and neighborhoods. In addition, 84 percent of agents indicated that a home with trees would be as much as 20 percent more salable than a home without trees.
> *Source: Building Greener Neighborhoods.*

Tree-Save Areas

Many parcels of land offer an array of natural resources that ingenious developers can capitalize on and transform into desirable design features. While most of this section of the publication has focused on ways to protect the water supply and thus enhance the environment, trees are a feature that homeowners value for their aesthetic and environmental benefits. Trees can shade homes, streets, parking areas, sidewalks, and paths, adding to the visual appeal of communities and helping to reduce heat island effects. Developers are beginning to recognize that lots with mature trees often sell for more than comparable lots without such trees.

> Native trees should be identified during a project's planning stage. The Building *With* Trees (BWT) program offers more details on how best to preserve appropriate trees. The National Arbor Day Foundation, with support from the National Association of Home Builders, created the BWT program to help developers streamline the process of saving natural resources during land development. Program details can be found at http://www.arborday.org/programs/buildingwithtrees/

Solar Orientation

In an effort to maximize energy efficiency for homeowners, some developers are building resource-efficient communities by orienting streets and lots to take advantage of passive solar design. Passive solar design optimally uses the sun's energy for heating and cooling. During the design process, builders aim to orient as many lots as possible to take advantage of solar benefits. The optimum position for maximum passive solar orientation is to orient the façade of the house directly south, however, the axis can vary within 20 degrees of true south with minimal detrimental effect on solor gain. Streets should be oriented on an east-west axis.

4.3.2 ALTERNATIVE STREET TYPES

To meet the multiple and sometimes competing goals of creating affordable, environmentally friendly, and aesthetically pleasing communities, developers are incorporating alternative street designs into their plans. Each alternative street and path type has unique characteristics that help it fit into one part of the community, but not the other. One street type does not fit all situations.

Queuing Streets

Prairie Crossing, a development near Chicago, focused on creating a community that embraces environmental protection, a sense of place, and resource conservation. Sales for Prairie Crossing homes are at a 40 percent premium over comparable homes nearby.

Queuing streets are narrower street types that contain one parallel parking lane and a travel lane sufficiently wide to accommodate the passage of larger emergency and service vehicles. In instances where cars park along the roadway, queuing streets require one car to wait temporarily in "queue" until the oncoming car passes (see Figure 23). Traditionally used in older, closer-in suburban neighborhoods, queuing streets are enjoying a renaissance

Typically, queuing streets range between 20 and 26 feet wide, with a 12- to 13-foot travel lane and a seven-foot parallel parking lane. Compared to a typical 36-foot-wide street, queuing streets can reduce planning and design costs as well as other infrastructure costs, such as those associated with storm water management. It has been estimated that the elimination of parking on one side of the street can reduce storm water runoff by 25 percent (Center for Watershed Protection, 1998).

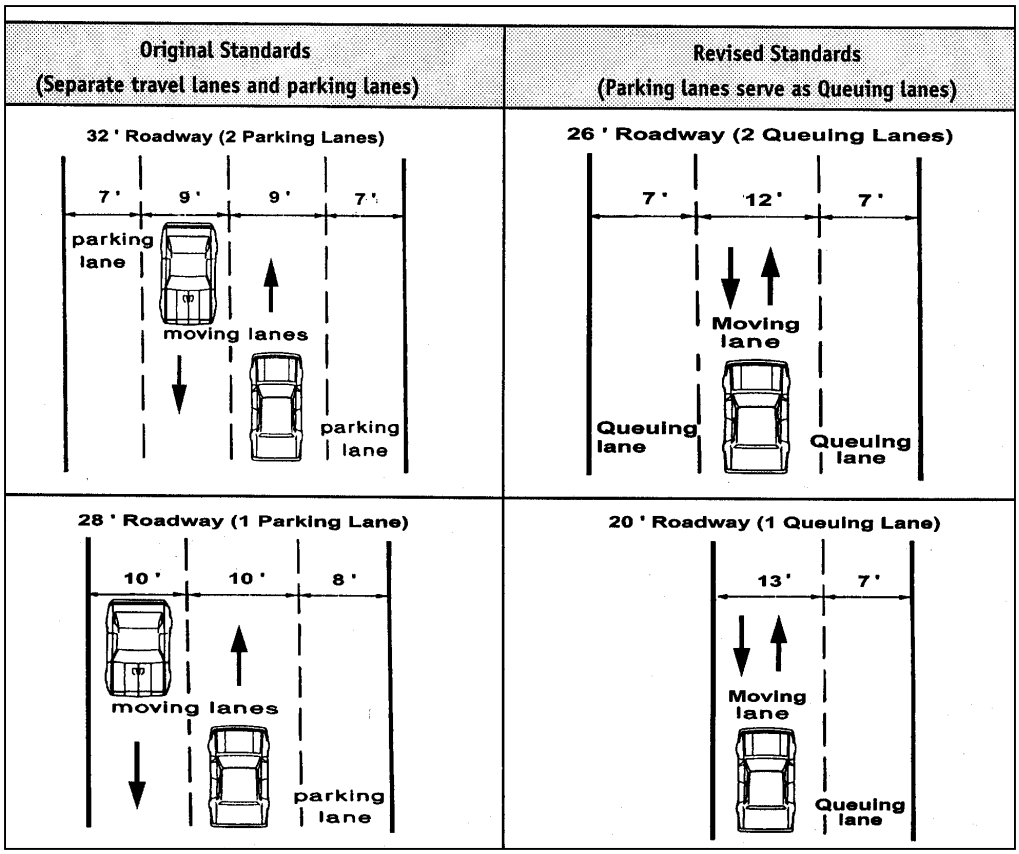

Source: Portland (OR) Office of Transportation, 1994.

FIGURE 23. A COMPARISON OF QUEUING STREETS VERSUS TRADITIONAL STREETS

From an environmental standpoint, narrower street rights-of-way can limit the amount of land areas subject to clearing and grading, make more land available for open space, and protect natural resource areas. Smaller streets also provide safer environments for pedestrians, which encourages walking and reduces dependence on the automobile.

Alleys

Alleys are considered a neotraditional design element that can be incorporated into residential designs to provide garage access and parking while accommodating functions such as utility maintenance and refuse collection. Alleys can also alleviate the need for on-street parking, which can increase street widths and the expanse of impervious surface. To limit the expanse of impervious surface, alleys should be no wider than 12 feet and constructed without curbs. An inverted crown that channels water to the center of the alley and then to either a storm drain or bioretention area can accommodate drainage.

Open-Section Streets

Instead of sending storm water to curbs and gutters, open-section roads drain storm water into grassed swales, where vegetation and soils treat pollutants. It has been estimated that, compared with any other residential design feature, streets contribute the highest volume of pollutants to urban storm water (Bannerman et al., 1993). Accordingly, where

density and traffic flow allow, streets with curb and gutter sections should be designed as open-section roadways.

For public works departments in most communities, maintenance concerns dictate a preference for curb and gutter roads in place of grassed swales. Grassed swales are more likely to be damaged by cars, erosion, and so forth while curb and gutter streets are easier to clean and provide a clear transition between pavement and lawn. However, in many localities, curbs and gutters drain directly to streams, lakes, and rivers, where they deposit harmful urban pollutants.

Open-section streets are less expensive to construct than curb and gutter systems. One study for a project in northern California in 2001 suggested that each linear foot of six-inch curb and gutter added approximately $12.65 to street construction costs (NAHB Residential Streets, 2001).

4.3.3 SHARED DRIVEWAYS

Shared driveways, sometimes referred to as pipestems, are another design tool that can help reduce the expanse of impervious surfaces. Driveways account for as much as 20 percent of the impervious cover in a residential subdivision (Center for Watershed Protection, 1995). Similar to a cul-de-sac, a shared driveway provides access to several houses from a single egress point off the local street. However, unlike cul-de-sacs, shared driveways terminate at the last house served instead of at a large impervious turnaround area. Table 23 provides several objectives for reducing impervious areas in driveways.

- Shorten driveway length through reduced front yard setback requirements.
- Reduce driveway widths or encourage driveway sharing between two or more homes.
- Use permeable pavements or a two-track surface with grass in between to facilitate water infiltration.

TABLE 23. DRIVEWAY CONSIDERATIONS FOR REDUCING IMPERVIOUS AREA

Where used in the appropriate situation and correctly designed, shared driveways can be functional, attractive, and environmentally friendly. In fact, alternative pavement materials such as bricks or pavers can further reduce a shared driveway's storm water runoff.

4.3.4 SIDEWALKS AND PATHS

While sidewalks and paths are an integral part of a community's transportation and circulation design, their impervious surface nonetheless contributes to the community's overall volume of storm water runoff (see Table 24). Depending on the density of the community and the type of street classification, sidewalks on only one side of the street might be appropriate; in the case of rural residential streets (250 average daily trips, sidewalks might not be needed at all. In rural residential instances, rights-of-way with a sufficiently wide gravel path can accommodate pedestrian and bicycle travel. Where used in combination with open-section roadways, sidewalks should be located several feet back from the outside crest of the grassed swale to allow for maintenance of the

swale and snow storage. Sidewalks should be horizontally sloped to drain toward roadside grassed swales and away from front yards.

- Shorten sidewalk length from the house to the street by reducing front yard setback requirements.
- Maximize sidewalk widths at four feet, depending on density.
- Increase the distance between the street and sidewalk to increase the likelihood that the grassy strip will be able to capture and absorb sheetflow from the sidewalk. Similarly, grade the sidewalk such that runoff drains toward the front yard and not the street.
- Place sidewalks in areas with pedestrian traffic.

TABLE 24. SIDEWALK CONSIDERATIONS FOR IMPERVIOUS AREAS

To reduce further the total expanse of a site's impervious surface, the use of pervious materials for sidewalks and paths might be considered in place of traditional concrete or asphalt. When properly maintained, alternative materials such as brick, compacted stone dust, and wood chips all accommodate safe passage of pedestrians and bicycles and, in most cases, still meet Americans with Disabilities Act (ADA) requirements. Permeable materials reduce the volume of slow runoff, allowing it to recharge groundwater.

4.3.5 ALTERNATIVE PAVEMENTS

Alternative pavements for streets, alleys, sidewalks, paths, and driveways should be considered along with traditional asphalt and concrete. Brick, block, concrete, and stone pavers reduce the percentage of site's impervious surface as well as the demand for conventional storm water management facilities. Unlike conventional pavements, pavers encourage groundwater recharge and reduce the runoff of pollutants such as oil, grease, hydrocarbons, and nutrients. A variety of alternative pavements can also meet different traffic, regulatory, climatologic, and aesthetic concerns. In addition to their environmental benefits, alternative pavements such as brick can add visual appeal and character to residential properties.

Material	Initial Cost	Maintenance Cost	Water Quality Benefits
Asphalt/Concrete	Medium	Low	Low
Pervious Concrete	High	High	High
Porous Asphalt	High	High	High
Turf Block	Medium	High	High
Brick	High	Medium	Medium
Natural Stone	High	Medium	Medium
Concrete Unit Paver	Medium	Medium	Medium
Gravel	Low	Medium	High
Wood Mulch	Low	Medium	High
Cobbles	Low	Medium	Medium

Source: Bay Area Storm Water Management Agencies Association (BASMAA), Start at the Source: Residential Site Planning & Design Guidance Manual for Storm Water Quality Protection*, 1997.*

TABLE 25. FUNCTIONAL COMPARISON OF VARIOUS TYPES OF ALTERNATIVE PAVEMENTS

Compared with conventional paving systems, material and installation costs can be higher for alternative paving systems (see Table 25). It is estimated that, while asphalt paving costs between $0.50 and $1.00 per square foot installed, interlocking concrete paving blocks can range anywhere from $5.00 to $10.00 per square foot. However, given that porous asphalts can help reduce overall storm water infrastructure costs, the total costs of site development can be significantly reduced, especially when considering the savings associated with potentially eliminating storm water management ponds. Clearly, any comparison of the costs of alternative versus traditional pavements should factor in total land development costs.

Some manufacturers are now producing pervious concrete products that decrease runoff and encourage infiltration. Pervious pavement such as porous asphalt or concrete can also decrease storm water conveyance costs and increase environmental quality. It is estimated that pervious pavements such as porous asphalt cost approximately 10 percent more that conventional nonporous asphalts. To maintain their efficiency and porosity, pervious pavements and pavers require regular maintenance to remove accumulated sediment and dirt.

4.3.6 ALTERNATIVE LOT SHAPES

Individual house lots are usually regularly shaped, that is, rectangular or square, and each lot has direct access to the street. In their attempt to conserve open space and reduce developed areas, low impact developments sometimes call for alternative lot shapes, including flag, zero-lot-line, Z- and angled Z-, or zipper lots. Figure 24 provides basic diagrams of alternative lot designs.

Flag lots, sometimes referred to as pipestem lots, mesh well with the concept of shared driveways. They accommodate a house or houses built behind another house, with one common driveway leading to the street. Flag lots are sometimes used to give developers

access to unused, landlocked spaces that are not preferred agricultural or conservation areas. The Center for Urban Policy Research defines a flag lot as a large lot not meeting minimum road frontage requirements and where access to the public road is by a narrow, private right-of-way or driveway. Zero-lot-line lots provide for greater usable yard space on each lot. The lots locate one side of the house on the lot line while the other side of the house faces the usable space. Interspersing various innovative lot types in a community can help developers incorporate passive solar design into house designs.

Z- or angled Z-lots are similar to zero-lot-line lots except that they are angled by about 30 to 40 degrees, allowing developers to alternate side- and front-loaded garages. In a zipper lot, the minimum rear setback is zero, and the rear yard depth varies to concentrate usable space on the side of the lot.

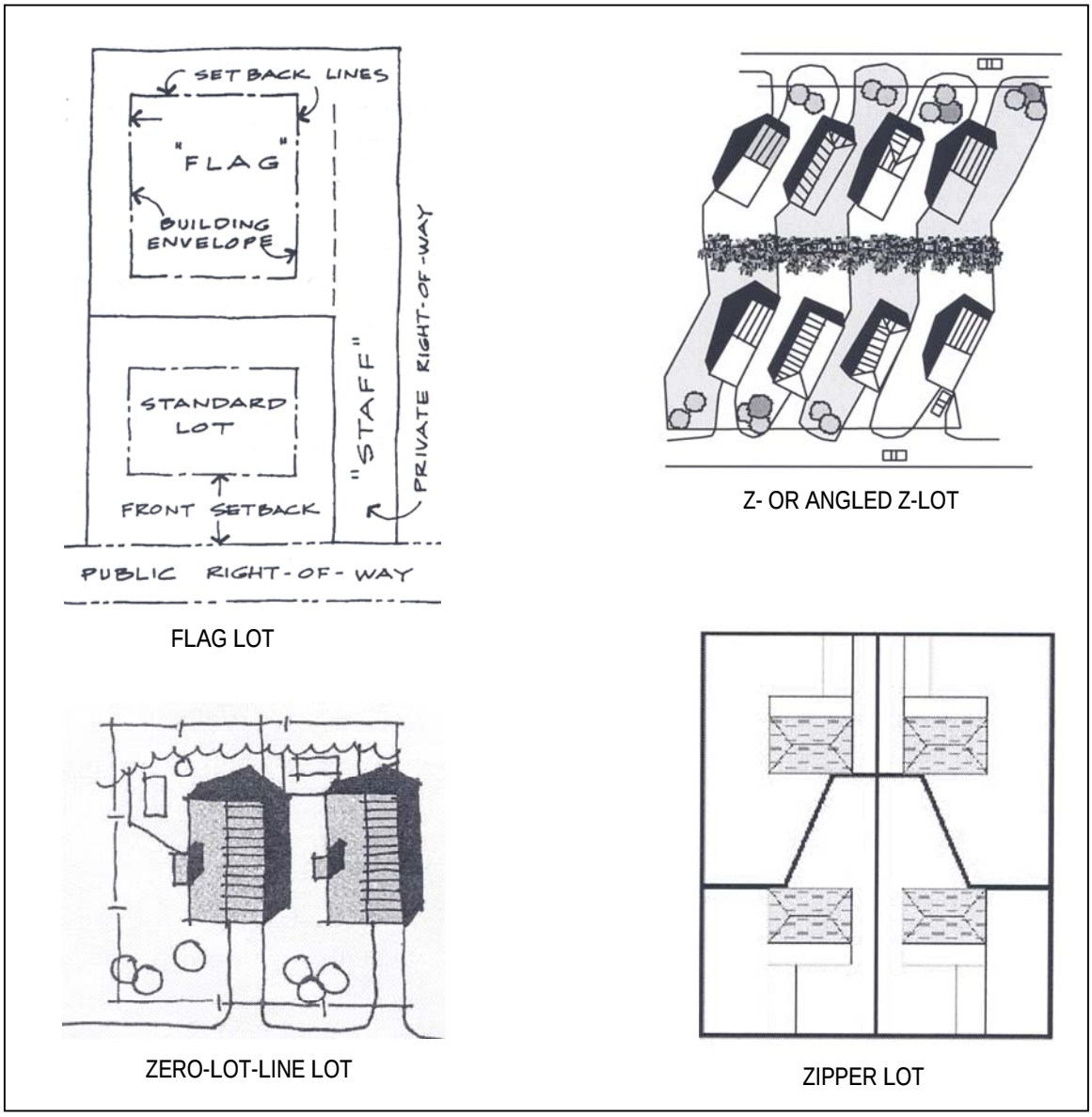

FIGURE 24. ALTERNATIVE LOT DESIGNS

4.4 ADDITIONAL RESOURCES

Additional resources that provide more detail on circulation and design are listed below. The resources are not provided as endorsements, merely as educational and reference tools. Given regional variations in climate and land development needs, we have included regional-specific resources. It is important to note, however, that addresses, especially Internet links, are subject to change. This list contains the latest links and addresses as of the printing of this publication.

Circulation Design and Resources

City of Portland Department of Transportation
http://www.trans.ci.portland.or.us/trafficcalming/devices/skinnystreets.
Information on Portland's Skinny Streets Program, including local traffic streets, queuing streets, and traffic-calming measures.

Geometric Design Practices for European Roads
http://international.fhwa.dot.gov/Pdfs/Geometric_Design.pdf
Practices and procedures in roadway geometric design and contextual design that seek a balance among safety, mobility, and community interests.

Sierra Club
http://www.sierraclub.org/sprawl/articles/narrow.asp
Web site discusses the value of narrow streets for slowing traffic, reducing vehicular crashes, and increasing neighborhood safety.

Organizations and Internet Resources

Center for Livable Communities
http://lgc.org/clc
Guidebook on how to implement designs for safe, efficient, and aesthetically pleasing streets.

Institute of Transportation Engineers
http://www.ite.org
Publications focusing on traditional neighborhood design and circulation patterns, including street space, connectivity, emergency access, parking, safety, and geometric design.

Local Government Commission
http://lgc.org/clc/
Publication on local communities' insight into how to implement local street.initiatives.

The Conservation Fund
http://www.conservationfund.org/
In partnership with the Urban Land Institute (http://www.uli.org), a workshop entitled "The Practice of Environmentally Sensitive Development" covers the full range of project planning, design, and construction.

Walkable Communities, Inc.
http://walkable.org
A nonprofit group that helps Florida communities become more walkable and pedestrian-friendly.

Publications

Longmont, Colorado, Street Study
A study by Swift and Associates correlating 20,000 accident reports over an eight-year period with 13 variables associated with the street. http://members.aol.com/phswi/swift-street.html

Residential Streets
A comprehensive design publication for residential streets published jointly by the National Association of Home Builders (NAHB), American Society of Civil Engineers (ASCE), and the Urban Land Institute (ULI). (800) 321-8050.
http://www.builderbooks.com

Roundabouts: An Informational Guide
A comprehensive source of information on modern roundabouts and their uses. (301) 577-0818.

Street Design Guidelines for Healthy Neighborhoods
http://lgc.org/clc
A publication of the Center for Liveable Communities to help communities implement guidelines for safe, efficient, and aesthetically pleasing streets for vehicular and pedestrian traffic.

Traditional Neighborhood Development Design Guidelines: Recommended Practice
A publication of the Institute of Transportation Engineers on neighborhood and street design, including sections on street space, connectivity, emergency access, parking, safety, and geometric design.

Regional-Specific Resources

Northeastern United States

Conservation Law Foundation
"Take Back Your Streets" focuses on the history of road design and its legal aspects in New England. (617) 350-0990.

Southeastern United States

Montgomery County, Maryland
Residential traffic-calming program to help reduce speeding and improve the residential environment.
http://www.dpwt.com/TraffPkgDiv/triage.htm

Walkable Communities
A 12-step program by the Florida Department of Transportation to encourage safe travel

for pedestrians and vehicles.
http://www.sustainable.doe.gov/pdf/walkable.pdf

Western United States

Citizens for Sensible Transportation
http://cfst.org/
A nonprofit group in Oregon that offers several publications on traffic calming and neighborhood livability.

Reclaiming Our Streets Task Force
http://www.trans.ci.portland.or.us/trafficcalming/reports/ArterialProgram/cover.htm
Community action plan to implement neighborhood transportation- calming techniques in the Portland, Oregon, area.

APPENDIX A - GLOSSARY

Aerobic--Having molecular oxygen as a part of the environment or growing or occurring only in the presence of molecular oxygen, as in aerobic microorganisms.

Anaerobic--Characterized by the absence of molecular oxygen or growing in the absence of molecular oxygen (as in anaerobic bacteria).

Best Management Practice (BMP)--A structural device or practice designed to mitigate the effects of storm water runoff to attenuate flooding, reduce erosion, and reduce pollution. BMPs include a variety of **Low impact development** practices such as bioretention, sand filters, and infiltration trenches.

Bioretention--A structural storm water practice that uses soils and vegetation to treat pollutants in urban runoff and to encourage infiltration of storm water into the ground.

Buffer--Area in its natural state left between development and a shoreline, wetlands, or stream to protect water quality. Development is restricted in a buffer zone.

Community Wastewater Treatment System--Term commonly used to describe an aerobic treatment unit serving multiple dwellings or an education, health care, or other large facility.

Cul-de-Sac--A residential street terminating in a closed, circular dead end that allows vehicles to turn around.

Curvilinear Street Pattern--A street layout that follows the natural contours of the site and relies on curving roadways and cul-de-sacs to reduce vehicle speeds and cut-through traffic.

Environmentally Sensitive Development--Development intended to conserve, protect, and enhance a site's natural resource systems through careful planning and design of site elements.

Eutrophication--A phenomenon caused by excessive plant nutrients in which waterbodies are deprived of oxygen and become uninhabitable for aquatic life. Streams and lakes receive excessive amounts of plant nutrients (primarily phosphorus, nitrogen, and carbon) in various ways. Runoff from agricultural fields, field lots, urban lawns, and golf courses are common sources of the nutrients. Untreated or partially treated domestic sewage is another major source.

Green Infrastructure--A strategically planned and managed network of wilderness, parks, greenways, conservation easements, and working lands with conservation value that supports native species, maintains natural ecological processes, sustains air and water resources, and contributes to the health and quality of life for America's communities and people (see http://www.greeninfrastructure.net/Intro/Definition.htm).

Groundwater--Water that is underground in cracks and spaces in soil, sand, and rocks. The layers of soil, sand, and rocks are also known as aquifers. Groundwater is used for drinking water by more than 50 percent of the U.S. population, including almost all residents of rural areas.

Hybrid Street Network--A street layout that is a mix between a traditional grid pattern and a curvilinear pattern. It can reduce a community's overall street length while still providing the functions of access, circulation, and parking.

Impervious Area--Any area in the landscape that cannot effectively allow the absorption and infiltration of rainwater into the ground.

Impervious Cover--Any surface in the built environment that prohibits the percolation and infiltration of rainwater into the ground.

Jurisdictional Wetlands--A wetlands or other water of the United States regulated under the Clean Water Act.

Low Impact Development (LID)--An approach to land development that uses various land planning and design practices and technologies for simultaneously conserving and protecting natural resource systems and reducing infrastructure costs.

Nonpoint Source Pollution--Water pollution caused by rainfall washing over and through land surfaces and carrying with it pollutants from the human environment. The Clean Water Act regulates nonpoint source pollution, which differs from point-source pollution.

Open-Section Roadway--A roadway that is constructed with gravel shoulders and grassed swale systems, instead of with curb and gutter systems, to convey storm water.

Open Space--Land set aside to remain undeveloped for a community's public use and enjoyment.

On-Site Wastewater Treatment System (OWTS)--A system that relies on natural processes and/or mechanical components to collect, treat, and disperse/discharge wastewater from individual dwellings or buildings.

Queuing Street--A street sufficiently wide for one travel lane and one parking lane that forces one of two passing automobiles to yield temporarily. These streets accommodate all the functions of normal streets, including emergency access, and reduce impervious areas and therefore storm water runoff.

Resource-Efficient Development (RED)--An innovative land development approach that incorporates environmental considerations into the land planning and design process to minimize impacts on local resources.

Right-of-Way--The width of the total land area required for street paving, curb and gutter, utilities, sidewalks, and street trees. Right-of-way widths should be the smallest measurement possible that accommodates these uses.

Riparian--Of or pertaining to stream systems or stream corridors. Riparian areas usually include a stream channel, its banks, the floodplain, and associated vegetated buffers.

Sand Filter--A packed-bed filter of sand or other granular material used to provide advanced secondary treatment of settled wastewater or septic tank effluent. Sand/media filters consist of a lined (e.g., impervious PVC liner on sand bedding) excavation or structure filled with uniform washed sand that is placed over an underdrain system. The wastewater is dosed onto the surface of the sand through a distribution network and allowed to percolate through the sand to the underdrain system, which collects the filter effluent for further processing or discharge.

Sedimentation--The transport, deposit, and accumulation of soil material by wind and water. Sedimentation is usually associated with the accumulation of soil material in waterbodies.

Septic Tank--A buried tank, designed to be watertight, that is constructed to receive and partially treat raw wastewater. The tank separates and retains settleable and floatable solids suspended in the raw wastewater. Settleable solids form a sludge layer at the tank bottom. Grease and other light materials float to the top to form a scum layer. The removed solids are stored in the tank, where they undergo liquefaction, which partially breaks down organic solids into dissolved fatty acids and gases. Gases generated during liquefaction are normally vented through a building's plumbing stack vent.

Setback--The minimum distance that design elements must be placed from other elements. For example, houses usually have front, side, and rear yard setbacks from streets and other buildings.

Sheetflow--The movement of rainwater across the surface of the landscape in response to topographic conditions.

Storm water Management--An integrated system of practices and techniques for managing the safe and efficient handling of post-development rainwater.

Subdivision--The process of dividing land into smaller parcels to accommodate housing, roads, open spaces, and utilities.

Swale--A small, linear topographic depression used to move water from one location to another.

Variance--A request to a zoning authority to deviate from the approved development ordinances of a particular area. For instance, a variance might be requested to waive a 40-foot front yard setback so that houses might be sited closer to the street.

Wastewater Treatment Facility--A wastewater treatment facility collects waste streams from residential, commercial, and industrial sources through sewer systems and treats the water to prescribed levels before release into a waterbody.

Zoning--Regulations governing the use, placement, spacing, and size of land and structures within a specific area.

APPENDIX B—CASE STUDIES

Appendix B contains the following case studies:

- Chancery on the Lake
- Duke Street Square
- Kensington Estates
- Phillippi Creek Septic System Replacement Program
- Ron Tyne and Associates
- Somerset Community

CHANCERY ON THE LAKE

Chancery on the Lake is a condominium development centered around a 14-acre wet pond. The lake is marketed as a feature of the development, resulting in an increased sales pace relative to that of competitors. In fact, the developer realizes a premium of $7,000 to $10,000per lakefront unit.

VIEW OF THE WALKWAY, PICNIC AREA, AND LAKE

Specifics

- Seven-acre, 170-unit condominium development in Alexandria, Virginia, centered around a large urban runoff pond.
- Prices for the condominiums range from $129,990 to $139,990 (Frederick et al., 1995).
- 14-acre pond surrounded by picnic tables, a gazebo, and a walking trail, with a fishing pier planned for construction (Frederick et al., 1995).
- $7,000 to $10,000 premium for condominiums fronting on the lake (Flora, 1997).
- Above-average sales pace for the area and the condominium market; a significant number of sales from buyers who shopped around and then were attracted to Chancery because of the lake (Flora, 1997).
- Pond marketed as a selling point (Flora, 1997).
- Lake constructed by damming an existing creek, with some excavation of the surrounding area to achieve the desired shape and volume.
- No maintenance required other than mowing grassed areas, visual inspections of the dam and lake, and sediment removal from the rip-rap outfall structure (Scalia, 1997).

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- Vic Scalia, Halle Enterprises. Silver Spring, MD. (301) 495-1520, personal communication.

DUKE STREET SQUARE

Duke Street Square uses a sand filter, which is a best management practice, to filter pollutants out of storm water runoff. At this urban site, buildable land was at a premium. An underground sand filter satisfied storm water management requirements without consuming buildable land area. The developer was able to add five to seven townhomes that would have been lost to land for a pond.

VIEW OF THE INSIDE OF A SAND FILTER SIMILAR TO THE ONE INSTALLED AT DUKE STREET SQUARE

Specifics

- 40-unit townhouse development in Alexandria, Virginia.
- Off-line sand filter system serves 1.38 impervious acres.
- Parking lot designed with grate inlets connected to underground pipes that carry storm water to the sand filter. Flows in excess of 0.5 inches of rainfall in a single event are diverted to the city sewer system.
- The filter's concrete chamber was cast in place (Keller, 1997).
- Underdrains transport filtered water to the city storm sewer system (Keller, 1997).
- Northern Virginia land prices of approximately $40 per square foot make it costly to install dry ponds, wet ponds, or storm water wetlands (Bell, 1997); the sand filter system uses no buildable area.
- Townhouse total includes between five and seven townhouses that normally would have been lost to land needed for a dry pond (Teets, 1997).

Cost Data

- Construction of the sand filter totaled $41,030, including the dry vault sand filter, two monitoring manholes, pipes with connections, and the sand filter itself ($35,197). The entire system cost $29,732 per impervious acre while the sand filter alone cost $25,505 per impervious acre.

- Filter's sand bed will need replacement approximately every five years.
- System will need periodic inspection and removal of accumulated trash from grate inlets, pre-treatment structure, and filter bed.

Community Acceptance

- The homeowner association has set aside money for routine and nonroutine maintenance.

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- Warren Bell, City Engineer, City of Alexandria. Alexandria, VA. (703) 838-4327.

KENSINGTON ESTATES

At Kensington Estates the use of LID technologies in a conventional, 103-lot single-family development planned on 24 acres in unincorporated Pierce County were evaluated. The site was characterized by poor soils. The development took advantage of the new Western Washington Storm Hydrology Model (WWHM) to illustrate the full range of LID technologies in the site's redesign.

Specifics

- Maintained lot yield of 103 lots.
- Designed a roadway system adequate for emergency vehicles.
- Achieved "zero" effective impervious surfaces.
- Incorporated full range of LID techniques, including soil rehabilitation, rain gardens, bioretention, and pervious pavement;
- Provided adequate off-street parking.
- Reduced total project impervious pavement.
- Minimized piped conveyance.

Cost Data

A cost evaluation of the redesign further illustrated the potential benefits of LID. Overall, the LID project permitted construction cost savings of over 20 percent over the conventional project. It achieved the largest share of savings by reducing the size of the storm pond structures and eliminating catchments and piped storm conveyance. Excavation and erosion control costs were also significantly reduced.

Even though the LID design called for a roadway width of 20 feet, the proposed use of porous paving material and of "looped" cul-de-sac clusters designed for emergency vehicle access made the costs associated with roadways and utilities roughly equal to or slightly higher than the costs for conventional materials and design.

PHILLIPPI CREEK SEPTIC SYSTEM REPLACEMENT PROGRAM

In Sarasota, Florida, available and applicable on-site wastewater treatment and collection technologies were evaluated (see Figure 25) to determine their potential for improving current wastewater treatment and disposal practices in Phillippi Creek.

Specifics

- Available technologies were grouped into three major categories for evaluation: natural systems (e.g., conventional septic tank and subsurface wastewater infiltration systems [SWIS] and septic tank and subsurface drip irrigation [SDI] systems); engineered biological systems (e.g., suspended growth systems, submerged biofilters, and unsaturated biofilters); and waste segregation systems (e.g., nonwater carriage toilets and on-site greywater treatment systems).
- Based on the number of connections, total flow, and available treatment plant and transmission capacities, the project area was previously divided into sixteen (16) manageable areas referred to as Wastewater Project Improvement Areas (WPIA).
- The cost analysis addressed natural systems and engineered biological systems but, because of a variety of implementation problems, including community acceptance, did not address waste segregation systems.

FIGURE 25. EVALUATION PROCESS FOR COMPARING COLLECTION AND ON-SITE WASTEWATER TREATMENT SYSTEM ALTERNATIVES

Cost Data

- The capital cost of a septic tank with a mound with 12-inch fill was $6,000.
- The capital cost of a septic tank with subsurface drip irrigation with 12-inch fill was $7,900.
- In terms of uniform annual cost, the septic tank with SWIS mound was the most cost-effective alternative in a low-density area. In medium- and high- density areas, the vacuum sewer system was the most cost-effective alternative.

RON TYNE AND ASSOCIATES

Terry Paff, president of Metropolitan Realty and Development in Sherwood, Arkansas, wanted to create a development that appealed to both the general public and permitting and review officials. He approached Ron Tyne of Tyne & Associates with his idea and hired the consultant to redesign a conventional site plan developed for a 130-acre parcel. The case study underscores two important points. First, at project inception, developers must formulate a vision of what they want to achieve. They then need to communicate that vision to everyone involved in and affected by the project. Second, by reducing infrastructure costs and collaborating with public officials, a developer can realize a net increase in a project's lot yield.

Specifics

- The new design worked with the land's features. For instance, streets flowed with the terrain, minimizing excavation needs; drainage areas were preserved and buffered by greenbelts.
- Existing drainage courses form a network of green spaces called greenbelts that are connected by neighborhood hiking trails.
- Maximizing the number of lots that backed up to the greenbelts addressed concerns about privacy.
- The original plan's collector street was changed to include green space buffers and traffic-calming circles, thus allowing the developer to reduce street widths from 36 to 27 feet. In addition, trees were allowed to stay close to the curb line.
- The site uses native vegetation such as buffalo grass. Cleared trees were transformed into mulch.
- The original plan preserved 1.5 acres of green space while the revised plan saved 23.5 acres.
- Some of the development cost savings went to fund a neighborhood park with picnic facilities, a pavilion, and ball fields.

Cost Data

- Overall, the developer made an additional profit of $2.2 million on the project by using the practices above.

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SOMERSET COMMUNITY

In a typical suburban development in Prince George's County, MD, the developer incorporated shallow landscaped depressions called bioretention areas, also known as rain gardens (see Figure 26), into each lot to control storm water quantity and quality. The bioretention areas eliminated the need for a storm water pond, allowed the development of six extra lots, and resulted in a cost savings of more than $4,000 per lot.

A TYPICAL BIORETENTION AREAIN SOMERSET

Specifics

- 80-acre site in Prince George's County, Maryland, undergoing development into 199 homes on 10,000-square-foot lots.
- Prices begin at $160,000.
- Bioretention areas range between 300 and 400 square feet, with one to two bioretention areas per lot (Daniels, 1995).
- Bioretention areas located at low points on lots (see Figure 27).
- Water allowed to pool to a depth of six inches in the bioretention areas after each rain event; complete infiltration of ponded water achieved within 48 hours (Daniels, 1995).
- Bioretention areas combined with grassed swales to replace curbs and-gutters.
- Total cost approximately $100,000 compared with nearly $400,000 for the storm water ponds originally planned (Daniels, 1995).
- Six more lots added to the development, thus increasing revenue (Daniels, 1995).
- Eliminated traditional curbs and gutters and storm water pond by using the less expensive alternative of bioretention areas and grassed swales.
- Development marketed as environmentally friendly. When told that they were helping preserve the Chesapeake Bay, homeowners and potential buyers became excited and interested in helping (Coffman, 1997).
- Bioretention areas perceived by homeowners as free landscaping (Coffman, 1997).
- Total cost for each bioretention area is $500 ($150 for excavation and $350 for plants) (Daniels, 1995).

INDIVIDUAL BIORETENTION AREA

Cost Data

Description	Storm water Management Pond/Curb and Gutter Design	Bioretention System
Engineering Redesign	$0	$110,000
Land Reclamation (6 lots x $40,000 net)	$0	<$240,000>
Total Costs	$2,457,843	$1,541,461
Total Costs--Land Reclamation *plus* Redesign Costs	$2,457,843	$1,671,461
Total Cost Savings = $916,382		
Cost Savings per Lot = $4,604		

Source: Winogradoff, 1997.

Table 26. Cost Comparison of Conventional Storm Water System versus Bioretention

Community Acceptance

Somerset residents have enthusiastically accepted their bioretention areas. Homeowners are actively maintaining them and have lodged few complaints. Only one bioretention area has experienced functional problems, which probably resulted from the diversion of too much water. Safety issues or mosquitoes have not been a problem.

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A Quantitative Tool for Assessing the Integrity of Southern Coastal California Streams

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ABSTRACT / We developed a benthic macroinvertebrate index of biological integrity (B-IBI) for the semiarid and populous southern California coastal region. Potential reference sites were screened from a pool of 275 sites, first with quantitative GIS landscape analysis at several spatial scales and then with local condition assessments (in-stream and riparian) that quantified stressors acting on study reaches. We screened 61 candidate metrics for inclusion in the B-IBI based on three criteria: sufficient range for scoring, responsiveness to watershed and reach-scale disturbance gradients, and minimal correlation with other responsive metrics. Final metrics included: percent collector-gatherer + collector-filterer individuals, percent noninsect taxa, percent tolerant taxa, Coleoptera richness, predator richness, percent intolerant individuals, and EPT richness. Three metrics had lower scores in chaparral reference sites than in mountain reference sites and were scored on separate scales in the B-IBI. Metrics were scored and assembled into a composite B-IBI, which was then divided into five roughly equal condition categories. PCA analysis was used to demonstrate that the B-IBI was sensitive to composite stressor gradients; we also confirmed that the B-IBI scores were not correlated with elevation, season, or watershed area. Application of the B-IBI to an independent validation dataset (69 sites) produced results congruent with the development dataset and a separate repeatability study at four sites in the region confirmed that the B-IBI scoring is precise. The SoCal B-IBI is an effective tool with strong performance characteristics and provides a practical means of evaluating biotic condition of streams in southern coastal California.

Assemblages of freshwater organisms (e.g., fish, macroinvertebrates, and periphyton) are commonly used to assess the biotic condition of streams, lakes, and wetlands because the integrity of these assemblages provides a direct measure of ecological condition of these water bodies (Karr and Chu 1999). Both multimetric (Karr and others 1986; Kerans and Karr 1994; McCormick and others 2001; Klemm and others 2003) and multivariate (Wright and others 1983; Hawkins and others 2000; Reynoldson and others 2001) methods have been developed to characterize biotic condition and to establish thresholds of ecological impairment. In both approaches, the ability to recognize degradation at study sites relies on an understanding of the organismal assemblages expected in the absence of disturbance. Thus, the adoption of a consistent and quantifiable method for defining reference condition is fundamental to any biomonitoring program (Hughes 1995).

Southern California faces daunting challenges in the conservation of its freshwater resources due to its aridity, its rapidly increasing human population, and its role as one of the world's top agricultural producers. In recent years, several state and federal agencies have become increasingly involved in developing analytical tools that can be used to assess the biological and physical condition of California's streams and rivers. For example, the US Environmental Protection Agency (EPA), the US Forest Service (USFS), and California's state and regional Water Quality Control Boards (WQCBs) have collected fish, periphyton and benthic macroinvertebrates (BMIs) from California streams and rivers as a critical component of regional water

KEY WORDS: Benthic macroinvertebrates; B-IBI; Biomonitoring; Mediterranean climate

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quality assessment and management programs. Together, these agencies have sampled BMIs from thousands of sites in California, but no analysis of BMI assemblage datasets based on comprehensively defined regional reference conditions has yet been undertaken. In the only other large-scale study within the state, Hawkins and others (2000) developed a predictive model of biotic integrity for third- to fourth-order streams on USFS lands in three montane regions in northern California. This ongoing effort (Hawkins unpublished) is an important contribution to bioassessment in the state, but the emphasis of this work has been concentrated on logging impacts within USFS lands. The lack of a broadly defined context for interpretation of BMI-based bioassessment remains the single largest impediment to the development of biocriteria for the majority of California streams and rivers. This article presents a benthic index of biotic integrity (B-IBI) for wadeable streams in southern coastal California assembled from BMI data collected in the region by the USFS, EPA, and state and regional WQCBs between 2000 and 2003.

Methods

Study Area

The Southern Coastal California B-IBI (SoCal B-IBI) was developed for the region bounded by Monterey County in the north, the Mexican border in the south, and inland by the eastern extent of the southern Coast Ranges (Figure 1). This Mediterranean climate region comprises two Level III ecoregions (Figure 1; Omernik 1987) and shares a common geology (dominated by recently uplifted and poorly consolidated marine sediments) and hydrology (precipitation averages 10–20 in./year in the lower elevations and 20–30 in./year in upper elevations, reaching 30–40 in./year in the highest elevations and in some isolated coastal watersheds (Spatial Climate Analysis Service, Oregon State University, www.climatesource.com). The human population in the region was approximately 20 million in 2000 and is projected to exceed 28 million by 2025 (California Department of Finance, Demographic Research Unit, www.dof.ca.gov).

Field Protocols and Combining Datasets

The SoCal B-IBI is based on BMI and physical habitat data collected from 275 sites (Figure 1) using the 3 protocols described in the following subsections. Sites were sampled during base flow periods between April and October of 2000–2003.

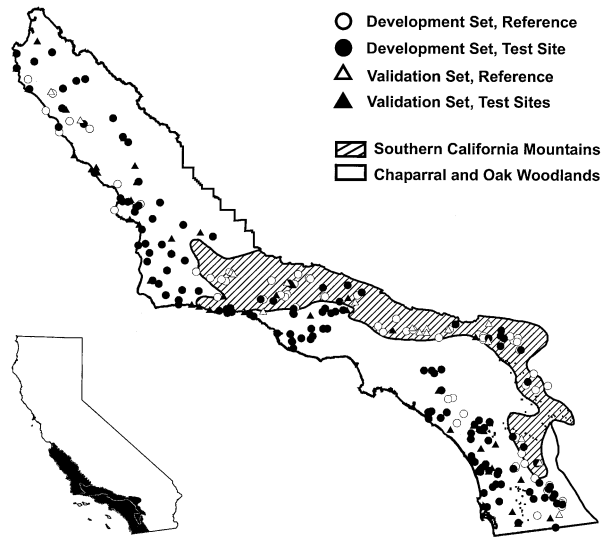

Figure 1. Map of study area showing the location of the study area within California, the distribution of test and reference sites and development and validation sites, and the boundaries of the two main ecoregions in the study area.

California Stream Bioassessment Protocol (CSBP, 144 sites). Several of the regional WQCBs in southern coastal California have implemented biomonitoring programs in their respective jurisdictions and have collected BMIs according to the CSBP (Harrington 1999). At CSBP sites, three riffles within a 100-m reach were randomly selected for sampling. At each riffle, a transect was established perpendicular to the flow, from which three separate areas of 0.18 m^2 each were sampled upstream of a 0.3-m-wide D-frame net and composited by transect. A total of 1.82 m^2 of substrate was sampled per reach and 900 organisms were subsampled from this material (300 organisms were processed separately from each of 3 transects). Water chemistry data were collected in accordance with the protocols of the different regional WQCBs (Puckett 2002) and qualitative physical habitat characteristics were measured according to Barbour and others (1999) and Harrington (1999).

USFS (56 sites). The USFS sampled streams on national forest lands in southern California in 2000 and 2001 using the targeted riffle protocol of Hawkins and others (2001). All study reaches were selected nonrandomly as part of a program to develop an interpretive (reference) framework for the results of stream biomonitoring studies on national forests in California. BMIs were sampled at study reaches (containing at least four fast-water habitat units) by disturbing two separate 0.09-m^2 areas of substrate upstream of a 0.3-m-wide D-frame net in each of four separate fast-water units; a total of 0.72 m^2 was disturbed and all sample

material from a reach was composited. Field crews used a combination of qualitative and quantitative measures to collect physical habitat and water chemistry data (Hawkins and others 2001). A 500-organism subsample was processed from the composite sample and identified following methods described by Vinson and Hawkins (1996).

Environmental Monitoring and Assessment Program (EMAP, 75 sites). The EPA sampled study reaches in southern coastal California from 2000 through 2003 as part of its Western EMAP pilot project. A sampling reach was defined as 40 times the average stream width at the center of the reach, with a minimum reach length of 150-m and maximum length of 500-m. A BMI sample was collected at each site using the USFS methodology described earlier (Hawkins and others 2001) in addition to a standard EMAP BMI sample (not used in this analysis). A 500-organism subsample was processed in the laboratory according to EMAP standard taxonomic effort levels (Klemm and others 1990). Water chemistry samples were collected from the midpoint of each reach and analyzed using EMAP protocols (Klemm and Lazorchak 1994). Field crews recorded physical habitat data using EPA qualitative methods (Barbour and others 1999) and quantitative methods (Kaufmann and others 1999).

As part of a methods comparison study, 77 sites were sampled between 2000 and 2001 with both the CSBP and USFS protocols. The two main differences between the methods are the area sampled and the number of organisms subsampled (discussed earlier). To determine the effect of sampling methodology on assessment of biotic condition, we compared the average difference in a biotic index score between the two methods at each site. Biotic index scores were computed with seven commonly used biotic metrics (taxonomic richness, Ephemoptera, Plecoptera, and Trichoptera (EPT) richness, percent dominant taxon, sensitive EPT individuals, Shannon diversity, percent intolerant taxa, and percent scraper individuals) according to the following equation:

$$Score = \sum (x_i - \bar{x})/sem_i$$

where x_i is the site value for the ith metric, x is the overall mean for the ith metric, and SEM_i is the standard error of the mean for the ith metric. A score of zero is the mean value.

Because USFS-style riffle samples were collected at all EMAP sites, only two field methods were combined in this study. All EMAP and CSBP samples were collected and processed by the California Department of Fish and Game's Aquatic Bioassessment Laboratory (ABL) and all USFS samples were processed by the US Bureau of Land Management's Bug Lab in Logan, Utah. Taxonomic data from both labs were combined in an MS Access© database application that standardized BMI taxonomic effort levels and metric calculations, allowing us to minimize any differences between the two labs that processed samples. Taxonomic effort followed standards defined by the California Aquatic Macroinvertebrate Laboratory Network (CAMLnet 2002; www.dfg.ca.gov/cabw/camlnetste.pdf). Sites with fewer than 450 organisms sampled were omitted from the analyses.

Screening Reference Sites

We followed an objective and quantitative reference site selection procedure in which potential reference sites were first screened with quantitative Geographical Information System (GIS) land-use analysis at several spatial scales and then local condition assessments (instream and riparian) were used to quantify stressors acting within study reaches. We calculated the proportions of different land-cover classes and other measures of human activity upstream of each site at four spatial scales that give unique information about potential stressors acting on each site: (1) within polygons delimiting the entire watershed upstream of each sampling site, (2) within polygons representing local regions (defined as the intersection of a 5-km-radius circle around each site and the primary watershed polygon), (3) within a 120-m riparian zone on each side of all streams within each watershed, and (4) within a 120-m riparian zone in the local region. We used the ArcView® (ESRI 1999) extension ATtILA (Ebert and Wade 2002) to calculate the percentage of various land-cover classes (urban, agriculture, natural, etc.) and other measures of human activity (population density, road density, etc.) in each of the four spatial areas defined for each site. Two satellite imagery datasets from the mid-1990s were combined for the land-cover analyses: California Land Cover Mapping & Monitoring Program (LCMMP) vegetation data (CalVEG) and a recent dataset produced by the Central Coast Watershed Group (Newman and Watson 2003). Population data were derived from the 2000 migrated TIGER dataset (California Department of Forestry and Fire Protection, www.cdf.ca.gov). Stream layers were obtained from the US Geological Survey (USGS) National Hydrography Dataset (NHD). The road network was obtained from the California Spatial Information Library (CaSIL, gis.ca.gov) and elevation was based on the USGS National Elevation Dataset (NED). Frequency histograms of land-use percentages for all sites were used to establish subjective thresholds for elim-

Table 1. List of minimum or maximum landuse thresholds used for rejecting potential reference sites

Stressor metric	Definition	Threshold
N_index_L	Percentage of natural land use at the local scale	≤ 95%
Purb_L	Percental of urban land use at the local scale	> 3%
Pagt_L	Percentage of total agriculture at the local scale	> 5%
Rddens_L	Road density at the local scale	> 2.0 km/km^2
PopDens_L	Population density (2000 census) at the local scale	> 150 indiv./km^2
N_index_W	Percentage of natural landuse at the watershed scale	≤ 95%
Purb_W	Percentage of urban landuse at the watershed scale	> 5%
Pagt_W	Percentage of total agriculture at the watershed scale	> 3%
Rddens_W	Road density at the watershed scale	> 2.0 km/km^2
PopDens_W	Population density (2000 census) at the watershed scale	> 150 indiv./km^2

inating sites from the potential reference pool (Table 1). Sites were further screened from the reference pool on the basis of reach-scale conditions (obvious bank instability or erosion/ sedimentation problems, evidence of mining, dams, grazing, recent fire, recent logging).

Eighty-eight sites passed all the land-use and local condition screens and were selected as reference sites, leaving 187 sites in the test group. We randomly divided the full set of sites into a development set (206 sites total: 66 reference/140 test) and a validation set (69 sites total: 22 reference/47 test). The development set was used to screen metrics and develop scoring ranges for component B-IBI metrics; the validation set was used for an independent evaluation of B-IBI performance.

Screening Metrics and Assembling the B-IBI

Sixty-one metrics were evaluated for possible use in the SoCal B-IBI (Table 2). A multistep screening process was used to evaluate each metric for (1) sufficient range to be used in scoring, (2) responsiveness to watershed-scale and reach-scale disturbance variables, and (3) lack of correlation with other responsive metrics.

Pearson correlations between all watershed-scale and reach-scale disturbance gradients were used to define the smallest suite of independent (nonredundant) disturbance variables against which to test biological metric response. Disturbance variables with correlation coefficients $|r| \geq 0.7$ were considered redundant. Responsiveness was assessed using visual inspection of biotic metric versus disturbance gradient scatterplots and linear regression coefficients. Metrics were selected as responsive if they showed either a linear or a "wedge-shaped" relationship with disturbance gradients. Biological metrics often show a "wedge-shaped" response rather than a linear response to single disturbance gradients because the single gradient only defines the upper boundary of the biological response; other independent disturbance gradients and natural limitations on species distributions might result in lower metric values than expected from response to the single gradient. Biotic metrics and disturbance gradients were log-transformed when necessary to improve normality and equalize variances. Metrics that passed the range and responsiveness tests were tested for redundancy. Pairs of metrics with product–moment correlation coefficients $|r| \geq 0.7$ were considered redundant and the least responsive metric of the pair was eliminated.

Scoring ranges were defined for each metric using techniques described in Hughes and others (1998), McCormick and others (2001), and Klemm and others (2003). Metrics were scored on a 0–10 scale using statistical properties of the raw metric values from both reference and nonreference sites to define upper and lower thresholds. For positive metrics (those that increase as disturbance decreases), any site with a metric value equal to or greater than the 80th percentile of reference sites received a score of 10; any site with a metric value equal to or less than the 10th percentile of the nonreference sites received a score of 0; these thresholds were reversed for negative metrics (20th percentile of reference and 90th percentile of nonreference). In both cases, the remaining range of intermediate metric values was divided equally and assigned scores of 1 through 9. Before assembling the B-IBI, we tested whether any of the final metrics were significantly different between chaparral and mountain reference sites in the southern California coastal region, in which case they would require separate scoring ranges in the B-IBI. Finally, an overall B-IBI score was calculated for each site by summing the constituent metric scores and adjusting the B-IBI to a 100-point scale.

Table 2. The 61 BMI metrics screened for use in the SoCal IBI

	Disturbance variables										
Candidate metrics	U_index_W	Pagt_W	Purb_L	RdDens_L	Channel Alteration	Bank Stability	Percent Fines	Total Dissolved Solids	Total Phosphorus	Total Nitrogen	Range Test
Taxonomic group metrics											
Coleoptera richness*	M	w	M	S	S	—	—	—	—	—	P
Crustacea + Mollusca richness	—	—	—	—	—	—	—	—	—	—	F
Diptera richness	—	—	—	—	—	—	—	—	—	—	P
Elmidae richness	w	—	w	M	S	M	S	M	—	—	F
Ephemerellidae richness					S	M	M	S	—	M	F
Ephemeroptera richness	S	S	M	S	w	M	S	S	—	S	P
EPT richness*	S	S	S	S	S	S	S	S	—	S	P
Hydropsychidae richness	—	—	w	—	S	—	—	—	—	—	F
Percent Amphipoda individuals	—	—	—	—	—	—	—	—	—	—	P
Percent Baetidae individuals	—	—	—	—	w	—	—	—	—	—	P
Percent Chironomidae individuals	—	—	—	—	—	—	—	—	M	—	P
Percent Corbicula individuals	—	—	—	—	—	—	—	—	—	—	P
Percent Crustacea individuals	—	—	—	—	—	—	—	—	—	—	P
Percent Diptera individuals	—	w	—	—	—	—	—	—	—	—	P
Percent Elmidae individuals	—	—	—	w	M	S	S	w	—	M	P
Percent Ephemeroptera individuals	—	w	w	—	M	w	—	—	—	—	P
Percent EPT individuals	—	—	M	M	M	M	—	—	—	—	P
Percent Gatropoda individuals	—	—	—	w	—	—	—	—	—	—	P
Percent Glossosomatidae individuals	—	—	—	—	w	—	—	—	—	M	F
Percent Hydropsychidae individuals	—	—	—	M	w	M	—	—	—	—	P
Percent Hydroptilidae individuals	—	—	—	M	—	w	—	—	—	—	F
Percent Mollusca individuals	—	—	—	w	w	—	—	—	—	—	P
Percent non-*Baetis/Fallceon* Ephemeroptera individuals	w	w	—	M	w	M	—	—	w	—	P
Percent non-*Hydropsyche* Hydropsychidae individuals	—	—	—	M	w	w	—	—	—	—	F
Percent non-*Hydropsyche/Cheumatopsyche* Trichoptera individuals	w	w	—	M	w	M	M	w	—	—	P
Percent non-insect Taxa*	M	w	M	M	w	—	—	—	w	M	F
Percent Oligochaeta individuals	—	—	—	—	w	—	—	—	—	—	P
Percent Perlodidae individuals	—	—	—	w	w	—	—	—	—	—	F
Percent Plecoptera individuals	—	—	—	M	M	M	M	M	w	S	P
Percent Rhyacophilidae individuals	—	—	—	w	S	S	w	—	—	M	F
Percent Simuliidae individuals	—	w	—	w	S	w	—	—		—	P
Percent Trichoptera	w	—	—	M	M	M	M	w	w	—	P
Plecoptera richness	M	S	w	M	w	w	M	S	—	S	F
Total taxa richness	M	M	w	S	w	w	w	w	w	M	P
Trichoptera richness	S	S	S	S	S	M	S	w	—	w	P

Table 2. Continued.

Candidate metrics	Disturbance variables										
	U_index_W	Pagt_W	Purb_L	RdDens_L	Channel Alteration	Bank Stability	Percent Fines	Total Dissolved Solids	Total Phosphorus	Total Nitrogen	Range Test
Functional feeding metrics											
Collector (filterers) richness	w	—	M	S	S	M	w	—	—	—	F
Collector (gatherers) richness	—	—	—	—	—	—	—	—	—	w	P
Percent collector (filterer) + collector (gatherer) individuals*	M	—	—	S	—	w	—	M	w	M	P
Percent collector (filterer) individuals	—	—	—	w	M	M	w	—	—	—	P
Percent collector (gatherer) individuals	—	—	—	w	M	—	—	w	M	w	P
Percent predator individuals	—	—	—	w	M	—	—	—	—	—	P
Percent scraper individuals	w	w	—	M	M	w	w	—	—	—	P
Percent scraper minus snails individuals	—	—	—	w	—	w	—	—	—	—	P
Percent shredder individuals	—	—	—	w	w	—	—	—	—	—	P
Predator richness*	S	S	w	M	w	—	—	S	—	M	P
Scraper richness	S	M	M	S	S	S	S	S	—	S	P
Shredder richness	M	M	—	M	S	—	—	—	—	M	F
Tolerance metrics											
Average tolerance value	M	w	w	S	w	—	M	—	—	w	P
Intolerant EPT richness	M	w	w	M	S	—	S	S	—	S	P
Intolerant taxa richness	M	w	w	M	S	M	S	S	—	S	P
Percent intolerant Diptera individuals	—	—	—	—	—	—	—	—	—	—	F
Percent intolerant individuals*	M	w	—	M	S	M	M	S	—	M	P
Percent intolerant scraper individuals	—	—	—	w	M	w	w	w	—	—	P
Percent of intolerant Ephemeroptera individuals	—	—	—	w	w	—	w	w	—	—	P
Percent of intolerant Trichoptera individuals	—	w	—	—	w	w	w	w	—	—	P
Percent sensitive EPT individuals	w	w	—	M	M	M	M	M	w	M	P
Percent tolerant individuals	—	—	—	—	—	—	w	w	—	—	P
Percent tolerant taxa*	w	—	w	M	—	—	—	w	—	M	P
Tolerant taxa richness	—	—	—	—	—	M	—	—	—	—	P
Others											
Percent dominant taxon	—	—	—	—	—	—	—	—	—	—	P
Shannon Diversity Index	w	w	w	M	M	w	—	w	w	w	P

Note: Each metric is indicated as having either no response (—), weak response (w), moderate response (M), or strong response (S) to each of eleven minimally correlated disturbance variables and whether each metric passed (P) or failed (F) the range test. The final seven minimally correlated metrics are indicated with an asterisk (*).

Table 3. Scoring ranges for seven component metrics in the SoCal B-IBI

Metric score	Coleoptera taxa (all sites)	EPT taxa		Predator taxa (all sites)	% Collector individuals		% Intolerant individuals		% Noninsect taxa (all sites)	% Tolerant taxa (all sites)
		6	8		6	8	6	8		
10	>5	>17	>18	>12	0–59	0–39	25–100	42–100	0–8	0–4
9		16–17	17–18	12	60–63	40–46	23–24	37–41	9–12	5–8
8	5	15	16	11	64–67	47–52	21–22	32–36	13–17	9–12
7	4	13–14	14–15	10	68–71	53–58	19–20	27–31	18–21	13–16
6		11–12	13	9	72–75	59–64	16–18	23–26	22–25	17–19
5	3	9–10	11–12	8	76–80	65–70	13–15	19–22	26–29	20–22
4	2	7–8	10	7	81–84	71–76	10–12	14–18	30–34	23–25
3		5–6	8–9	6	85–88	77–82	7–9	10–13	35–38	26–29
2	1	4	7	5	89–92	83–88	4–6	6–9	39–42	30–33
1		2–3	5–6	4	93–96	89–94	1–3	2–5	43–46	34–37
0	0	0–1	0–4	0–3	97–100	95–100	0	0–1	47–100	38–100

Note: Three metrics have separate scoring ranges for the two Omernik Level III ecoregions in southern coastal California region (6 = chaparral and oak woodlands, 8 = Southern California mountains).

Validation of B-IBI and Measurement of Performance Characteristics

To test whether the distribution of B-IBI scores in reference and test sites might have resulted from chance, we compared score distributions in the development set to those in the validation set. We also investigated a separate performance issue that ambient bioassessment studies often neglect: spatial variation at the reach scale. Although our use of a validation dataset tests whether the B-IBI scoring range is repeatable (Fore and others 1996; McCormick and others 2001), we designed a separate experiment to explicitly measure index precision. Four sites were resampled in May 2003. At each site, nine riffles were sampled following the CSBP, and material from randomly selected riffles was combined into three replicates of three riffles each. B-IBI scores were then calculated for each replicate. Variance among these replicates was used to calculate the minimum detectable difference (MDD) between two B-IBI scores based on a two-sample *t*-test model (Zar 1999). The index range can be divided by the MDD to estimate the number of stream condition categories detectable by the B-IBI (Doberstein and others 2000; Fore and others 2001).

Results

Combining Datasets

Unmodified CSBP samples (900 count) had significantly higher biotic condition scores ($t = -6.974$, $P < 0.0001$) than did USFS samples (500 count). However, there was no difference in biotic condition scores between USFS samples and CSBP samples that were randomly subsampled to reduce the 900 count to 500 ($t = -0.817$, $P = 0.416$). Thus, data from both targeted-riffle protocols were combined in B-IBI development.

Selected Metrics

Ten nonredundant stressor gradients were selected for metric screening: percent watershed unnatural, percent watershed in agriculture, percent local watershed in urban, road density in local watershed, qualitative channel alteration score, qualitative bank stability score, percent fine substrates, total dissolved solids, total nitrogen, and total phosphorous. Twenty-three biotic metrics that passed the first two screens (range and dose response) were analyzed for redundancy with Pearson product–moment correlation, and a set of seven minimally correlated metrics was selected for the B-IBI: percent collector-gatherer + collector-filterer individuals (% collectors), percent noninsect taxa, percent tolerant taxa, Coleoptera richness, predator richness, percent intolerant individuals, and EPT richness (Table 3). All metrics rejected as redundant were derived from taxa similar to those of selected metrics, but they had weaker relationships with stressor gradients. Dose–response relationships of the selected metrics to the 10 minimally correlated stressor variables are shown in Figure 2 and reasons for rejection or acceptance of all metrics are listed in Table 2. Regression coefficients were significant at the $P \leq 0.0001$ level among all seven selected metrics and at least two stressor gradients: percent watershed unnatural and road density in local watershed (Table 4). The final seven metrics included several metric types: richness, composition, tolerance measures, and func-

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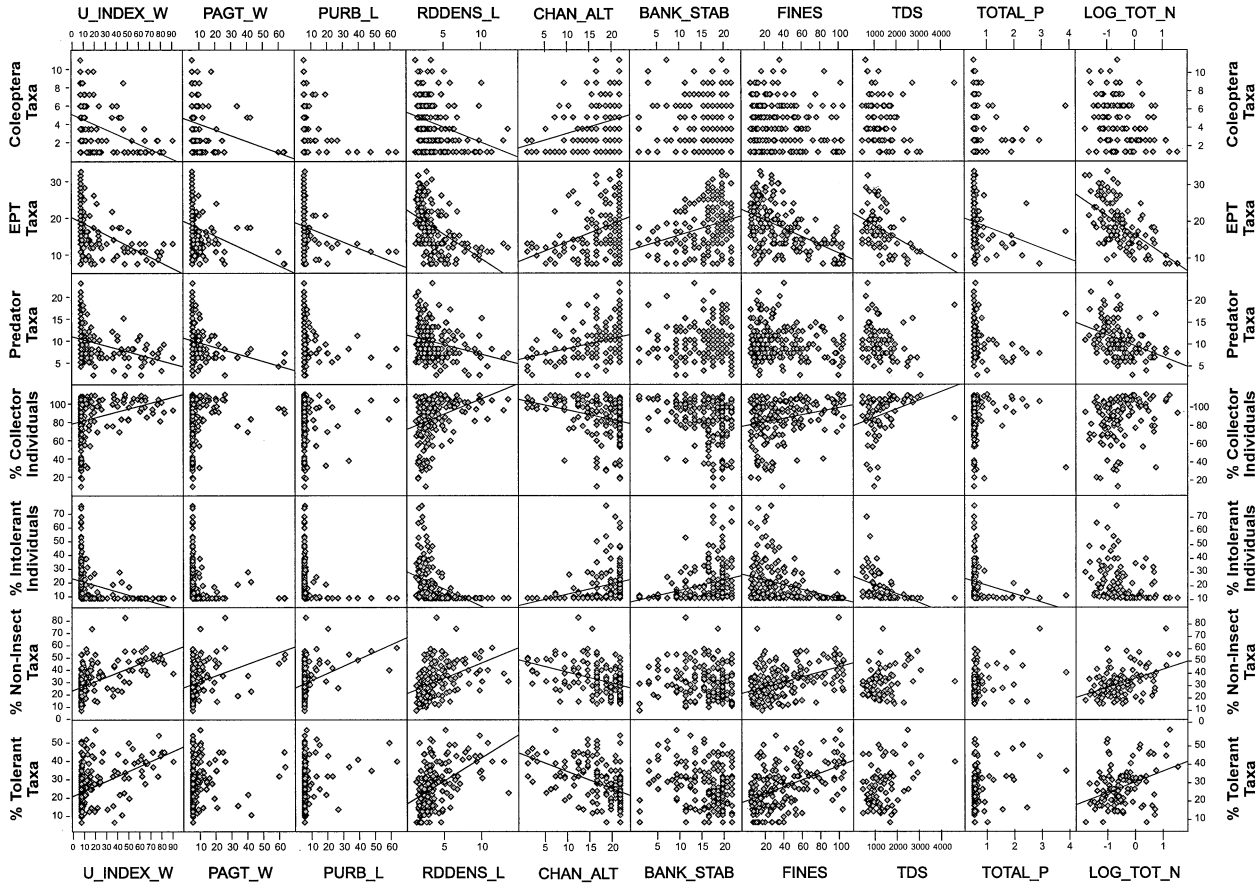

Figure 2. Scatterplots of dose–response relationships among 10 stressor gradients and 7 macroinvertebrate metrics (lines represent linear "best-fit" relationships; see text for abbreviations).

Table 4. Significance levels of linear regression relationships among 10 stressor metrics and 7 biological metrics

Metric	Coleoptera taxa	EPT taxa	Predator taxa	% Collector individuals	% Intolerant individuals	% Noninsect taxa	% Tolerant taxa
Bank Stability	0.813	**<0.0001**	0.3132	0.0009	0.0001	0.1473	0.0013
Fines	0.0017	**<0.0001**	0.0171	**0.0003**	**<0.0001**	**<0.0001**	**<0.0001**
Chan_Alt	**<0.0001**	**<0.0001**	**<0.0001**	**0.0003**	**<0.0001**	**<0.0001**	**<0.0001**
Log_U_Index_W	**<0.0001**	**<0.0001**	**<0.0001**	**<0.0001**	**<0.0001**	**<0.0001**	**<0.0001**
Log_PAgT_W	**0.0007**	**<0.0001**	**0.0004**	0.0054	0.0014	**<0.0001**	0.0012
Log_PUrb_L	0.0367	**0.0007**	0.0344	0.6899	0.0045	**0.0002**	0.0215
Log RdDens_L	**<0.0001**	**<0.0001**	**<0.0001**	**<0.0001**	**<0.0001**	**<0.0001**	**<0.0001**
Log_TDS	0.0094	**<0.0001**	0.0035	**0.0005**	**<0.0001**	0.0271	0.004
Log_Tot_N	0.0019	**<0.0001**	**<0.0001**	0.0078	0.0019	**<0.0001**	**<0.0001**
Log_Tot_P	0.062	**<0.0001**	0.0085	0.0162	**0.0001**	0.0018	0.0059

Note: Significant *P*-values corrected for 70 simultaneous comparisons ($P < 0.0007$) are highlighted in bold. Abbreviations are defined in Table 1 and in the text.

tional feeding groups. Because there are only seven metrics in the B-IBI, final scores calculated using this IBI are multiplied by 1.43 to adjust the scoring range to a 100-point scale.

The B-IBI scores were lower in chaparral reference sites than in mountain reference sites when calculated using unadjusted metric scores (Mann–Whitney *U*-test; $P = 0.02$). Although none of the final seven metrics

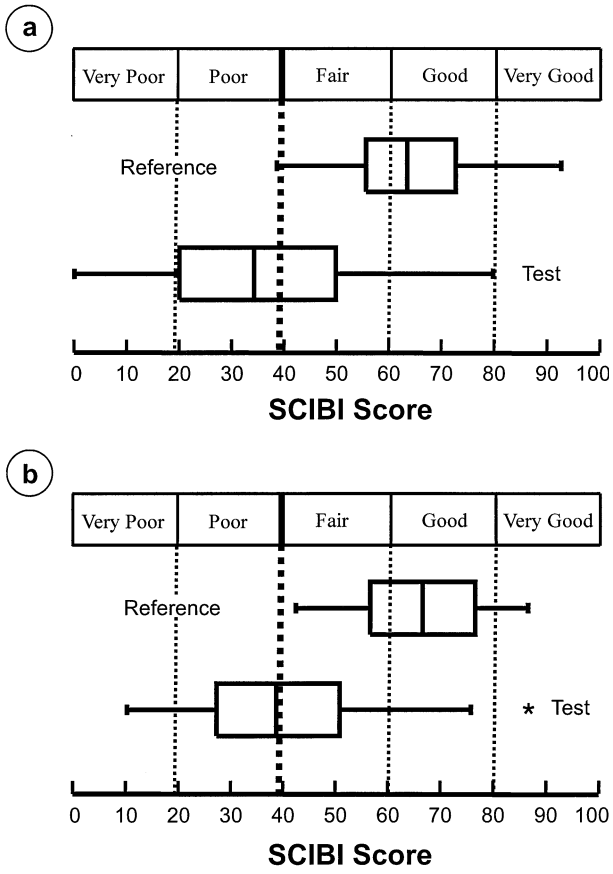

Figure 3. Box plots of B-IBI site scores for reference and test groups showing B-IBI scoring categories: (a) development sites and (b) validation sites. Dotted lines indicate condition category boundaries and heavy dotted lines indicate impairment thresholds.

were significantly different between chaparral reference sites and mountain reference sites at the $P = 0.05$ level ($P < 0.007$ after Bonferroni correction), scores for three metrics (EPT richness, percent collector-gatherer + collector-filterer individuals, and percent intolerant individuals) were substantially lower in chaparral reference sites than in mountain reference sites. We adjusted for this difference by creating separate scoring scales for the three metrics in the two ecoregions (Table 3). There was no difference in B-IBI scores between reference sites in the two ecoregions after the adjustment (Mann–Whitney *U*-test, $P = 0.364$).

Validation of B-IBI and Measurement of Performance Characteristics

The distribution of B-IBI scores at reference and nonreference sites was nearly identical between the development and validation data sets (Figure 3), indicating that our characterization of reference conditions and subsequent B-IBI scoring was repeatable and not likely due to chance. Based on a two-sample *t*-test model (setting $\alpha = 0.05$ and $\beta = 0.20$), the MDD for the SoCal IBI is 13.1. Thus, we have an 80% chance of detecting a 13.1-point difference between sites at the $P = 0.05$ level. Dividing the 100-point B-IBI scoring range by the MDD indicates that the SoCal B-IBI can detect a maximum of seven biological condition categories, a result similar to or more precise than other recent estimates of B-IBI precision (Barbour and others 1999; Fore and others 2001). We used a statistical criterion (two standard deviations below the mean reference site score) to define the boundary between "fair" and "poor" conditions, thereby setting B-IBI = 39 as an impairment threshold. The scoring range below 39 was divided into two equal condition categories, and the range above 39 was divided into three equal condition categories: 0–19 = "very poor", 20–39 = "poor", 40–59 = "fair", 60-79 = "good", and 80–100 = "very good" (Figure 3).

We ran two principle components analyses (PCAs) on the environmental stressor values used for testing metric responsiveness: 1 that included all 275 sites for which we calculated 4 watershed scale stressor values and another based on 124 sites for which we had measurements of 9 of the 10 minimally correlated stressor variables. We plotted B-IBI scores as a function of the first multivariate stressor axis from each PCA. We log-transformed percent watershed unnatural, percent watershed in agriculture, percent local watershed in urban, road density in local watershed, total nitrogen, and total phosphorous. Only PCA Axis 1 was significant in either analysis, having eigenvalues larger than those predicted from the broken-stick model (McCune and Grace 2002). In both PCAs, the B-IBI score decreased with increasing human disturbance (Figure 4) and was correlated (Spearman ρ) with PCA Axis 1 ($r = -0.652$, $P < 0.0001$ for all 275 sites; $r = -0.558$, $P \leq 0.0001$ for 124 sites). In the analysis of all 275 sites, all 4 watershed-scale stressors had high negative loadings, with percent watershed unnatural and local road density being the highest (Figure 5a). In the analysis of 124 sites, percent watershed unnatural, percent watershed in agriculture, and local road density had the highest negative loadings on the first axis, and channel alteration had the highest positive loading (Figure 4b).

Finally, we found no relationship between B-IBI scores and ecoregion (Mann–Whitney U, $P = 0.364$), Julian date ($R^2 = 0.01$, $P = 0.349$), watershed area ($R^2 = 0.002$, $P = 0.711$), or elevation ($R^2 = 0.01$, $P = 0.349$), indicating that the B-IBI scoring is robust with respect to these variables (Figure 5). Our ecoregion scoring adjustment probably corrects for the

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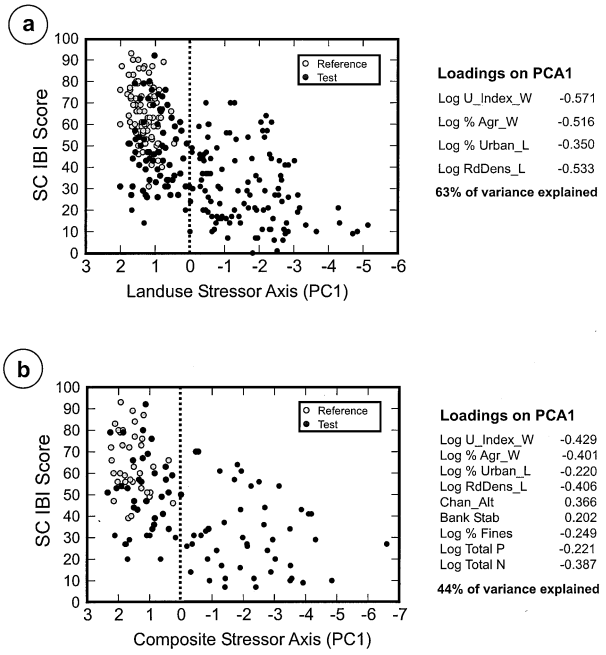

Figure 4. Scatterplots of SoCal B-IBI scores against two composite stressor axes from PCA: (a) values for all 275 sites; composite axis includes 4 land-use gradients; (b) values for 124 sites; composite axis includes 9 local and watershed scale stressor gradients.

strongest elevation effects, but there is no evidence that B-IBI scores are related to elevation differences within each ecoregion.

Discussion

The SoCal B-IBI is the most comprehensive assessment to date of freshwater biological integrity in California. As in other Mediterranean climate regions, the combination of aridity, geology, and high-amplitude cycles of seasonal flooding and drying in southern coastal California makes its streams and rivers particularly sensitive to disturbance (Gasith and Resh 1999). This sensitivity, coupled with the burgeoning human population and vast conversion of natural landscapes to agriculture and urban areas, has made it the focus of both state and federal attempts to maintain the ecological integrity of these strained aquatic resources.

Unfortunately, growing interest in biomonitoring is unmatched by financial resources available for this monitoring. Thus, combination of data among programs is very desirable, although this goal is rarely achieved in practice. We demonstrated that macroinvertebrate bioassessment data from multiple agencies could be successfully combined to produce a regional index that is useful to all agencies involved. This index is easy to apply, its fundamental assumptions are transparent, it provides precise condition assessments, and it is demonstrated to be responsive to a wide range of anthropogenic stressors. The index can also be applied throughout a long index period (mid-spring to mid-fall): Just as biotic factors tend to have more influence on assemblage structure during the summer dry period of Mediterranean climates than during the wet season when abiotic factors dominate (Cooper and others 1986; Gasith and Resh 1999), it is likely that our biotic index is more sensitive to anthropogenic stressors during the summer dry period. Because of these qualities, we expect the SoCal B-IBI to be a practical management tool for a wide range of water quality applications in the region.

This B-IBI is a regional adaptation of an approach to biotic assessment developed by Karr (1981) and subsequently extended and refined by many others (Kerans and Karr 1994; Barbour and others 1996; Fore and others 1996; Hughes and others 1998). We drew heavily upon recent refinements in multimetric index methodology that improve the objectivity and defensibility of these indices (McCormick and others 2001; Klemm and others 2003). A central goal of bioassessment is to select metrics that maximize the detection of anthropogenic stress while minimizing the noise of natural variation. One of the most important recent advances in B-IBI methods is the emphasis on quantitative screening tools for selecting appropriate metrics. We also minimized sources of redundancy in the analysis: (1) between watershed and local-scale stressor gradients for dose–response screening of biotic metrics and (2) in the final selection of metrics. The former guards against a B-IBI that is biased toward a set of highly correlated stressors and is, therefore, of limited sensitivity; the latter assures a compact B-IBI with component metrics that contribute independent information about stream condition. Combined with an assessment of responsiveness to specific regional disturbance gradients, these screening tools minimize the variability of B-IBI scores and improve its sensitivity.

The seven component metrics used in this B-IBI are similar to those selected for other B-IBIs (DeShon 1995; Barbour and others 1995, 1996; Fore and others 1996; Klemm and others 2003), but some of the metrics are either unique or are variations on other commonly used metrics. Like Klemm and others (2003), we found noninsect taxa to be responsive to human stressors, but richness was more responsive than percent of individuals. Some authors have separated the EPT metric into two or three metrics based on its component orders because the orders provided unique signals (Clements 1994; Fore and others 1996; Klemm

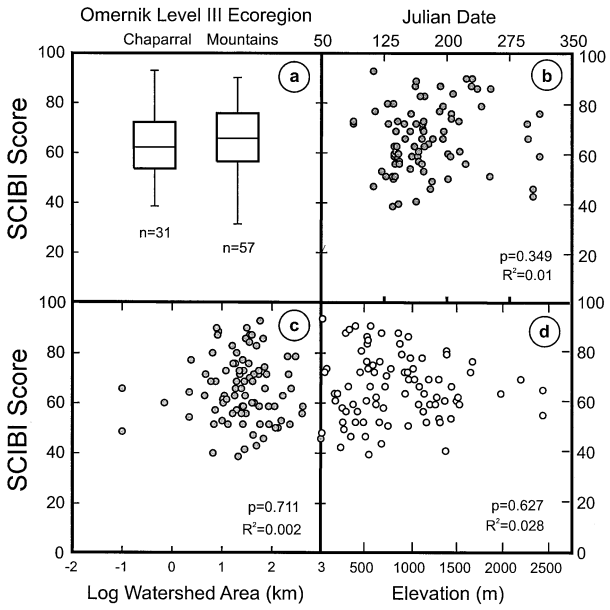

Figure 5. Relationship between B-IBI scores at 88 reference sites and (a) Omernik Level III ecoregion, (b) Julian date, (c) log watershed area, and (d) elevation.

and others 2003), but we found very similar patterns in these orders' response to various stressors we measured. To our knowledge, Coleoptera richness has not previously been included in a B-IBI, but beetle taxa might be a good indicator of the effects of fine sediments at impaired sites in this region (Brown 1973). A recent study of benthic assemblages in North Africa noted a high correspondence between EPT and EPTC (EPT + Coleoptera) (Beauchard and others 2003), but these orders were not highly correlated in our dataset. Feeding groups appear less often in B-IBIs than other metric types (Klemm and others 2003), but they were represented by two metrics in this B-IBI: predator richness and percent collectors (gatherers and filterers combined). Scraper richness was also responsive, but was rejected here because it was highly correlated with EPT richness.

The SoCal IBI should prove useful as a foundation for state and regional ambient water quality monitoring programs. Because the 75 EMAP sites were selected using a probabilistic statistical design, it will also be possible to use those samples to estimate the percentage of stream miles that are in "good", "fair", and "poor" condition in the southern California coastal region. These condition estimates, combined with stressor association techniques, have great potential to serve as a scientifically defensible basis for allocating precious monitoring resources in this region.

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Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California

A report from the Stormwater Monitoring Coalition's
Model Monitoring Technical Committee

August 2004

Technical Report #419

EXECUTIVE SUMMARY

This report describes a model monitoring program for receiving waters affected by urban runoff in both wet and dry weather. It provides a common design framework for municipal urban runoff programs and Regional Board staff to use in developing and/or revising program requirements for monitoring receiving waters for impacts, status and trends, toxicity, mass emissions, and source identification. This effort was funded in part by the State Water Resources Control Board (SWRCB), prompted by Senate Bill 72 (Kuehl), which addressed the standardization of sampling and analysis protocols in municipal stormwater monitoring programs. The development of the model monitoring program itself was organized through the Southern California Stormwater Monitoring Coalition (SMC), which impaneled a technical committee including representatives from:

- Regional Water Quality Control Boards (Los Angeles, Santa Ana, San Diego)
- Municipal permittees (Counties of Ventura, Los Angeles, San Bernardino, Riverside, Orange, and San Diego)
- Heal the Bay
- Southern California Coastal Water Research Project (SCCWRP).

As a result of the SMC's role and the makeup of the technical committee, the model stormwater monitoring program reflects issues and contexts of paramount importance in southern California and addresses some, but not all, of the requirements of SB72. Additional technical guidance related to performance standards for laboratory analysis and data reporting formats is detailed in companion documents.

The model program is structured around five fundamental management questions, with the goal of achieving a basic degree of comparability across southern California monitoring programs, while maintaining individual programs' ability to adapt to site-specific and local concerns.

The five core management questions are:

- Question 1: Are conditions in receiving waters protective, or likely to be protective, of beneficial uses?
- Question 2: What is the extent and magnitude of the current or potential receiving water problems?
- Question 3: What is the relative urban runoff contribution to the receiving water problem(s)?
- Question 4: What are the sources to urban runoff that contribute to receiving water problem(s)?
- Question 5: Are conditions in receiving waters getting better or worse?

As illustrated in Figure Ex-1, the questions are linked in a logical progression that defines an efficient sequence of study design steps.

While there is a wide range of beneficial uses defined in the Basin Plans for southern California, the model monitoring program focuses on a subset of these beneficial uses that are common to most urban runoff management programs in the region and relate to human health and habitat protection:

- Contact Water Recreation (REC1)
- Non-contact Water Recreation (REC2)
- Warm Freshwater Habitat (WARM)
- Estuarine Habitat (EST)
- Marine Habitat (MAR)
- Wildlife Habitat (WILD).

For each category of beneficial use (i.e., human health, habitat protection) the model program defines monitoring objectives and study designs. Where adequate historical data were available, statistical analyses were used to develop detailed guidance on appropriate levels of sampling effort. Rather than define a static program, the technical committee develop several tools to serve as adaptive triggers for initiating more monitoring effort if an impact was observed, or a reduction in monitoring effort if no impact (or potential for impact) was found. These tools include triggers for toxicity identification evaluations, upstream source tracking, a prioritization scheme for special studies, and a computer program for estimating sample size based on statistical power to detect trends.

The following types of stations could be integral parts of a stormwater monitoring program that address each of the five key management questions:

- Long-term, fixed, bottom-of-watershed (but above tidal influence) stations to assess cumulative water quality and aggregate loads, with monitoring based primarily on a mass emissions model including wet weather chemistry and toxicity
- Spatially extensive, perhaps randomly sited or rotating, stations to support statistically valid comparisons across multiple watersheds, and with monitoring based primarily on the Triad approach for dry weather sampling and on chemistry and toxicity for wet weather
- Site-specific stations focused on the status of high-priority inland habitats of concern, with monitoring based primarily on the Triad approach for dry weather sampling and on chemistry and toxicity for wet weather
- High-priority inland body contact recreation areas
- Site-specific stations designed to generate information to support key program goals, such as source prioritization or BMP implementation and evaluation
- Coastal estuarine stations to assess status in these key habitats, with monitoring based primarily on the Triad approach
- Coastal ocean stations to assess stormwater plume impacts, conducted primarily as part of the periodic Bight surveys.

While the idealized monitoring design in Figure 5-2 shows each type of monitoring station separately, in practice there may be overlap among two or more types of stations.

The technical committee gave significant consideration to how the model program would be used in practice. It was well aware that stormwater monitoring has been ongoing for some time in southern California and that important basic steps, such as characterization studies, have been completed by many programs. In addition, the degree to which programs have addressed the five management questions in Figure 2-1 varies substantially, in part due to each program's history and in part due to the nature of the surface waters in different parts of the region.

Thus, the model stormwater monitoring program does not assume that each program is starting with a blank sheet of paper. Nor does the model program assume that each permittee will proceed through Figure 2-1 in a linear, stepwise fashion. Instead, the model program is intended to

improve each program's ability to build appropriate linkages among the five core management questions. This is best accomplished through the following steps:

1. Evaluate a program's ability to answer each of the five management questions
2. Identify critical gaps in knowledge (e.g., inability to document impacts, lack of knowledge about potential sources, absence of trend monitoring component) relevant to each program's circumstances
3. Use the monitoring designs in the model monitoring program as a framework for developing monitoring components suited to each program's circumstances.

The SMC's technical committee intended that the model program be used to direct an incremental process of adaptation using the three steps above, rather than one of wholesale change. This incremental change should be based on a prioritization of needs (i.e. using the triad approach in perennial streams before ephemeral streams). Through this process, the ultimate goal of developing regionally consistent programs that directly address key management questions in a scientifically rigorous and cost effective manner can be accomplished.

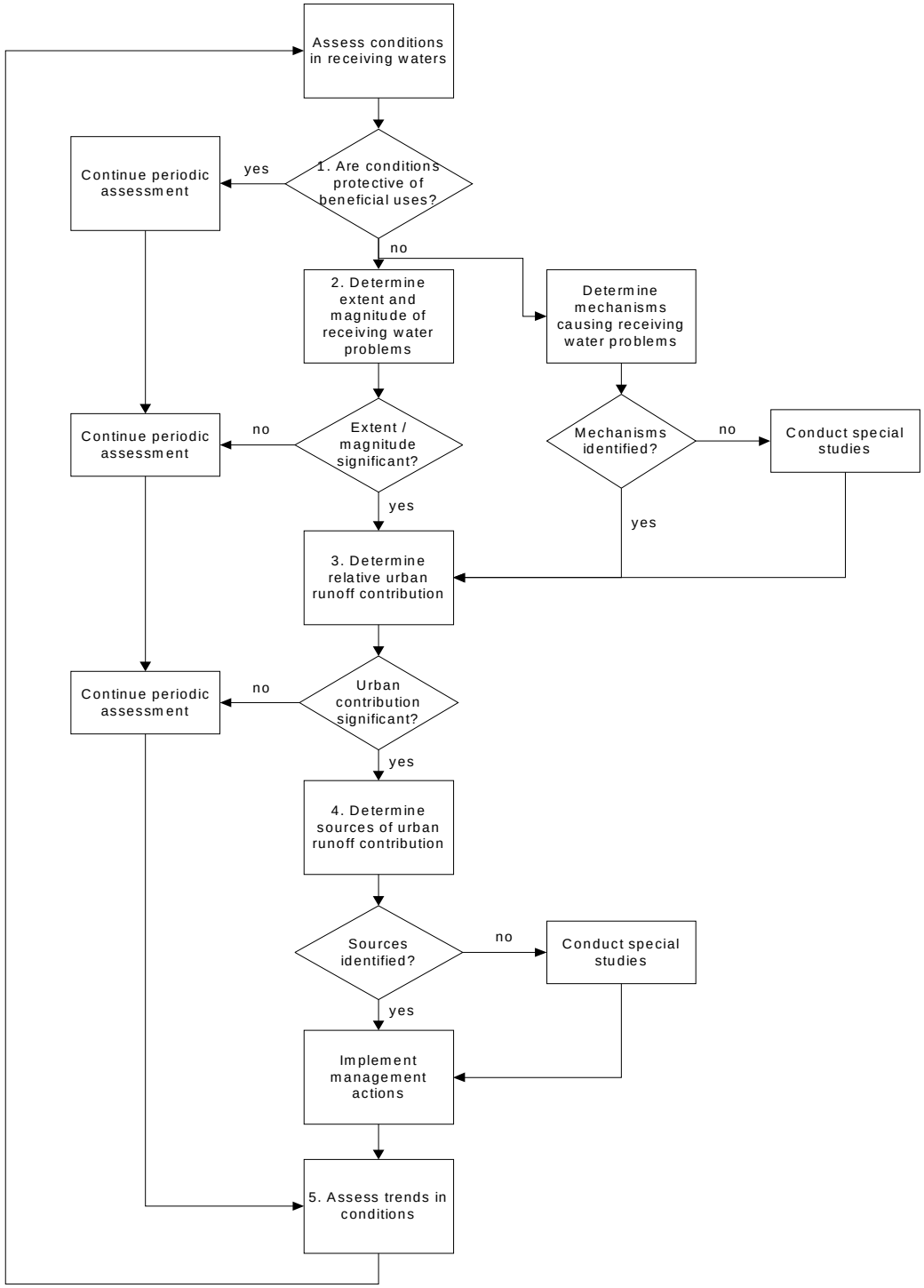

Figure Ex-1. Graphical illustration of the idealized logical flow through the five core management questions (reworded as statements to fit flowchart conventions). The answer to each question provides the basis for developing the monitoring design to answer the next. In actuality, monitoring programs may have addressed questions in parallel or out of sequence, depending on available knowledge and specific information needs.

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1.0 INTRODUCTION

1.1 Rationale and approach

Large municipalities in southern California are required, under the Clean Water Act (CWA) and National Pollutant Discharge Elimination System (NPDES) permits from their respective Regional Water Quality Control Boards (RWQCBs), to monitor discharges of urban runoff[1] from municipal separate storm sewer systems (MS4s) and their impacts on receiving waters. However, urban runoff monitoring programs throughout southern California often focus on different monitoring questions, approach the same question in different ways, sample different sets of parameters, and use a range of field and laboratory methods to collect and analyze samples. This inconsistency makes it difficult, if not impossible, to address questions on a broader spatial scale, to compare urban runoff monitoring results across programs, and to improve efficiency by taking advantage of opportunities for exchanging data and coordinating monitoring responsibilities at regional scales.

In response to this set of circumstances, the Southern California Stormwater Monitoring Coalition (SMC) has undertaken a project to develop regionally consistent monitoring approaches and designs. The goal of the study is to produce a "model" monitoring program that will provide a foundation for each of the urban runoff monitoring programs in southern California to build on for their respective agency's needs. The development of the model monitoring program will therefore focus on developing regionally consistent management questions, efficient monitoring designs to answer those questions, creating standardized laboratory analysis protocols, and coordinating necessary quality assurance activities to ensure comparability among programs. This document focuses specifically on management questions and monitoring designs. Standardization of laboratory analysis protocols and data transfer and reporting methods are dealt with in companion documents.

This report reflects the collaborative work of a technical committee impaneled by the SMC. The technical committee included representatives from three southern California RWQCBs (the Colorado Region was not represented), the lead municipal MS4 management programs (commonly referred to as stormwater programs), SCCWRP, Heal the Bay and the State Water Resources Control Board (SWRCB). This report makes recommendations about a model urban runoff monitoring program, assesses current monitoring practice, and recommends adjustments to bring current programs more in line with the model program.

1.2 Relationship to SB72 and State Board efforts

Senate Bill 72 (Kuehl), adopted in October 2001, required the State Water Resources Control Board (SWRCB) to develop "minimum monitoring requirements for regulated municipalities that were subject to a stormwater permit on or before December 31, 2001." The SWRCB therefore has initiated efforts to develop standardized protocols for collection and analysis of stormwater samples, as well as a standardized reporting format. Working in coordination with local stormwater agencies and RWQCBs through the SMC presents an opportunity to gain consensus towards a common shared goal.

[1] Urban runoff includes those discharges from residential, commercial, industrial and construction areas within the Permit Area and excludes discharges from feedlots, dairies, farms and open space.

There are, however, some important differences among the SMC and SWRCB goals. On one hand, the SWRCB goals are much larger than the SMC's goals. The SWRCB is mandated to develop statewide consistency while the goal of this project is development of consistency only for the southern California region. On the other hand, the SWRCB goals are more limited than the SMC's goals. The SWRCB is mandated to develop the "how to's" of stormwater monitoring (i.e. sampling, analysis, reporting), whereas this project starts with understanding the "why, where, and what" (i.e. monitoring questions and study designs) of developing an integrated stormwater monitoring program. Finally, the SWRCB and the SMC have different focal points of their monitoring programs. The SWRCB is mandated to develop standardized monitoring protocols for stormwater from all of their regulated discharges (i.e. municipal agencies and industrial facilities). This project, however, only addresses monitoring programs developed for municipal agencies, but examines monitoring designs for both wet and dry weather runoff.

1.3 A note on terminology

It is important to emphasize that the monitoring designs described in subsequent sections of this report focus explicitly on supporting the management of urban runoff to protect receiving water quality, with "receiving water" defined as surface Waters of the State, with the exception of ground water and lakes/reservoirs. While the SMC's technical committee recognized that there are other point and nonpoint sources of receiving water impact, the core focus of municipal stormwater programs is urban runoff, in both wet and dry weather. Thus, references to "stormwater" throughout the body of the report should be understood to refer to urban runoff.

It is also important to recognize that this document focuses on potential water quality problems and impacts, as opposed to water quality impairments. The technical committee opted to avoid the terminology of impairments because it has a distinct regulatory connotation that eventually leads to a Total Maximum Daily Load (see box on TMDLs). Water quality problems and impacts are more broad than impairments, which seemed more appropriate since some monitoring elements are meant to be early warning indicators and hopefully will avoid TMDLs in the future.

Total Maximum Daily Loads (TMDLs)

TMDLs are a regulatory framework for trying to restore beneficial uses in impaired waterbodies. Waterbodies sometimes have impaired water quality, even when all discharges to that waterbody are regulated under national pollutant discharge elimination system (NPDES) permits. The State will often use NPDES monitoring data to create the list of impaired waterbodies, also called the §303(d) list, which refers to the specific section in the Clean Water Act for TMDLs. Once promulgated, TMDLs typically call for additional monitoring either to refine source assessment or to determine if management actions implemented as a result of the TMDL are improving water quality. The model program described in this document is for urban runoff monitoring and, while there is some potential overlap with TMDL monitoring, the intent is to deliberately keep them separate. The reason is twofold. First, TMDLs are inherently site-specific and the goal of this document is to ensure regional applicability. Secondly, urban runoff may, or may not, be the cause of the water quality impairment that leads to a TMDL. If TMDL monitoring is called for, it is prudent to link monitoring from all NPDES dischargers to the impaired waterbody. Regardless of a §303(d) listing, urban runoff monitoring will be a necessity in order to characterize impacts, or lack of impacts, in receiving waters. Additional information on TMDLs in southern California can be found at www.swrcb.ca.gov

2.0 GOALS, OBJECTIVES AND IMPLEMENTATION

This model urban runoff monitoring program is intended as a framework to assist permittees and Regional Board staff in modifying existing monitoring programs, both wet and dry weather, with the goal of improving their ability to answer key management questions common to all programs in a cost effective and scientifically rigorous way. This is described in the following sections:

- The principals and philosophy for developing the model program are given in Section 3.0.
- A description of the key management questions, including rationale and expected data products, are given in section 4.0.
- The specific design elements, such as identifying the number of sampling sites and frequency of sampling, are given in Section 5.0.

This section, however, first addresses the basic program goals, how these goals address universal NPDES permit objectives as defined by the State and the Federal government, and describes an approach for applying the model monitoring program to an existing stormwater permit. Such modifications can occur when permits are periodically renewed and/or when permittees propose monitoring program revisions to their respective Regional Boards.

2.1 Monitoring program goals

Figure 2-1 summarizes the model monitoring program's ultimate goal, which is to ensure that each stormwater program has the ability to assess and manage its overall performance by answering five basic questions:

- Question 1: Are conditions in receiving waters protective, or likely to be protective, of beneficial uses?
- Question 2: What is the extent and magnitude of the current or potential receiving water problems?
- Question 3: What is the relative urban runoff contribution to the receiving water problem(s)?
- Question 4: What are the sources to urban runoff that contribute to receiving water problem(s)?
- Question 5: Are conditions in receiving waters getting better or worse?

These basic questions are universal to all MS4 programs in southern California and were prioritized by their program managers during the technical committees' early meetings.

2.2 Meeting permit objectives

Stormwater monitoring programs in southern California focus on meeting a set of NPDES permit objectives that, with some minor differences, are common to all programs in the region. These include the following (edited slightly for conciseness):

- Define water quality status, trends, and pollutants of concern associated with urban stormwater and non-stormwater discharges
- Evaluate impact of stormwater/urban runoff on biological species in receiving waters

- Identify those waters which cannot reasonably be expected to attain or maintain applicable water quality standards required to sustain beneficial uses
- Identify significant water quality problems related to urban stormwater and non-stormwater discharges
- Estimate annual mass emissions of pollutants discharged to surface waters through the MS4
- Evaluate water column and sediment toxicity in receiving waters
- Determine and prioritize pollutants of concern in stormwater
- Identify sources of urban runoff pollutants
- Identify other sources of pollutants in stormwater and non-stormwater runoff
- Evaluate the effectiveness of existing municipal stormwater quality management programs, including that of BMPs
- Identify and prohibit illicit connections
- Identify and prohibit illicit discharges.

The basic questions outlined in section 2.1 above, and described in detail in sections 4.0 and 5.0, will produce improved information that will help address many of these objectives (Table 2-1). The model program's structure, which moves from assessment monitoring, through source identification, and to tracking of longer-term trends, reflects the range of concerns represented in the set of common permit objectives.

2.3 Applying the model program

The technical committee's intent was to create the model program as guidance, providing sufficient detail to assure consistency in approach, but allowing for site-specific modifications and adaptations as necessary. This document serves as the starting point for negotiating a monitoring and reporting program. It is not a "copy and paste" list of static monitoring requirements, but an attempt to provide useful guidance. Therefore, this section outlines a procedure for implementing this guidance. We strongly recommend the user reread this section after reading sections 3.0, 4.0 and 5.0 in order to more fully understand this important implementation guidebook and place it in context.

The technical committee that developed the model program was well aware that stormwater monitoring has been ongoing for some time in many parts of southern California. Thus, important basic steps, such as stormwater characterization studies, have been completed by many programs (See Box on Discharge Characterization). In addition, the degree to which programs have addressed the five management questions in Figure 2-1 varies substantially, in part due to each program's history and in part due to the nature of the surface waters in different parts of the region. For example, inland programs in general have focused relatively more on identifying sources while coastal programs have allocated much more effort to assessing receiving

Stormwater Discharge Monitoring

The US EPA has published a manual (US EPA 1992) that provides detailed guidance for the basic elements of stormwater monitoring program design and implementation. This guidance is an extremely useful starting point for management programs faced with the necessity of performing initial characterization studies.

The manual describes when and where to sample, including defining storm event criteria, obtaining rainfall data, and dealing with the logistics of locating sampling sites. Alternative sampling methods (e.g., grab vs. composite, manual vs. automatic) are described and evaluated and special attention is given to the issue of measuring or estimating flow rates. In addition, the manual follows the analysis and reporting pathway once sampling is complete, providing detailed instructions on sample documentation, labeling, shipping, and chain of custody procedures.

water impacts, especially in high-use areas such as Newport or Santa Monica Bays.

The model stormwater monitoring program does not assume that each program is starting with a blank sheet of paper, nor that each program will implement the monitoring guidance in a linear, stepwise fashion. Instead, the model program is intended to improve each program's ability to build appropriate linkages among a key set of management questions (see Figure 2-1; Section 4.0). This is best accomplished through the following steps (see also Figure 2-3):

1. Evaluate a program's ability to answer each of the five management questions
2. Identify critical gaps in knowledge (e.g., inability to document impacts, lack of knowledge about potential sources, absence of trend monitoring component) relevant to each program's circumstances
3. Use the model program's monitoring guidance as a framework for developing monitoring components suited to each program's circumstances.

For Step 1, Appendix 1 summarizes current (as of June 2003) stormwater monitoring efforts in southern California, providing a first cut at assessing each program's ability to answer the five management questions. A full assessment under Step 1 would also involve a cumulative analysis of available historical monitoring data for each program. However, the variation among programs demonstrated in Appendix 1 suggests that implementing the model monitoring program would most likely involve focusing on different questions, and thus emphasizing different designs, for different programs. For example, source identification designs (Questions 3 and 4) might be needed for one program, but trend monitoring designs (Question 5) for another.

For Step 2, determining where to focus additional monitoring effort will depend on specific information on source characterization, patterns of development, hydrography and watershed structure, resources at risk, and levels and patterns of contamination. In addition, management initiatives in each program's area can influence decisions about what represents a critical knowledge gap. For example, TMDL development may require additional effort toward source identification. As another example, planned or ongoing BMP implementation may involve allocating additional effort to problem definition and/or to long-term trend monitoring to track BMP effectiveness.

For Step 3, the monitoring designs in the model monitoring program provide a starting point for developing detailed monitoring designs appropriate to the specifics of each program. The model framework is merely the foundation on which to build a permit-specific monitoring and reporting program. For example, the application of habitat monitoring designs based on bioassessment must take into account patterns of stream flow, the nature of biological communities, and the relative importance of urban runoff. The committee also considered the advisability of preparing explicit recommendations on the numbers and locations of sampling sites, and the degree of replication, but concluded that this was inappropriate given the amount of variation from program to program, as well as from place to place within each program. For example, numbers of stations will depend, among other things, on watershed size and complexity, amount and intensity of human use, severity and significance of potential impacts, known patterns of contamination, and hydrography of the study area. The degree of replication will depend on the kinds and amounts of variability in each area, as well as on the relative degree of certainty required by management agencies and the timeframe for decision making. Thus, the committee determined that each program should address the same five management questions and apply the same general monitoring design approaches, but then adapt the specifics of sampling to each individual situation. In this way, the model program will optimize comparability yet provide sufficient flexibility to address permit or site-specific needs

Table 2-1. Relationship between typical stormwater program monitoring objectives, as stated in NPDES permits, and the monitoring elements for which the model stormwater monitoring program prov**ides design guidance. "Q" refers to the management questions** described in Section 4.0 (e.g., Q1 refers to Question 1).

	Management question and type of monitoring				
Permit objective	**Q1: Assessment**	**Q2: Extent and magnitude**	**Q3: Urban runoff contribution**	**Q4: Source identification**	**Q5: Trends**
Define status, trends, pollutants	X				X
Evaluate impacts	X				X
Identify waters that do not attain uses	X	X			
Estimate mass emissions	X				X
Evaluate toxicity	X	X		X	
Identify polllutants of concern	X	X		X	
Identify sources of urban runoff pollutants			X	X	
Identify other sources			X	X	
Evaluate program effectiveness	X				X
Identify illicit connections				X	
Identify illicit discharges				X	

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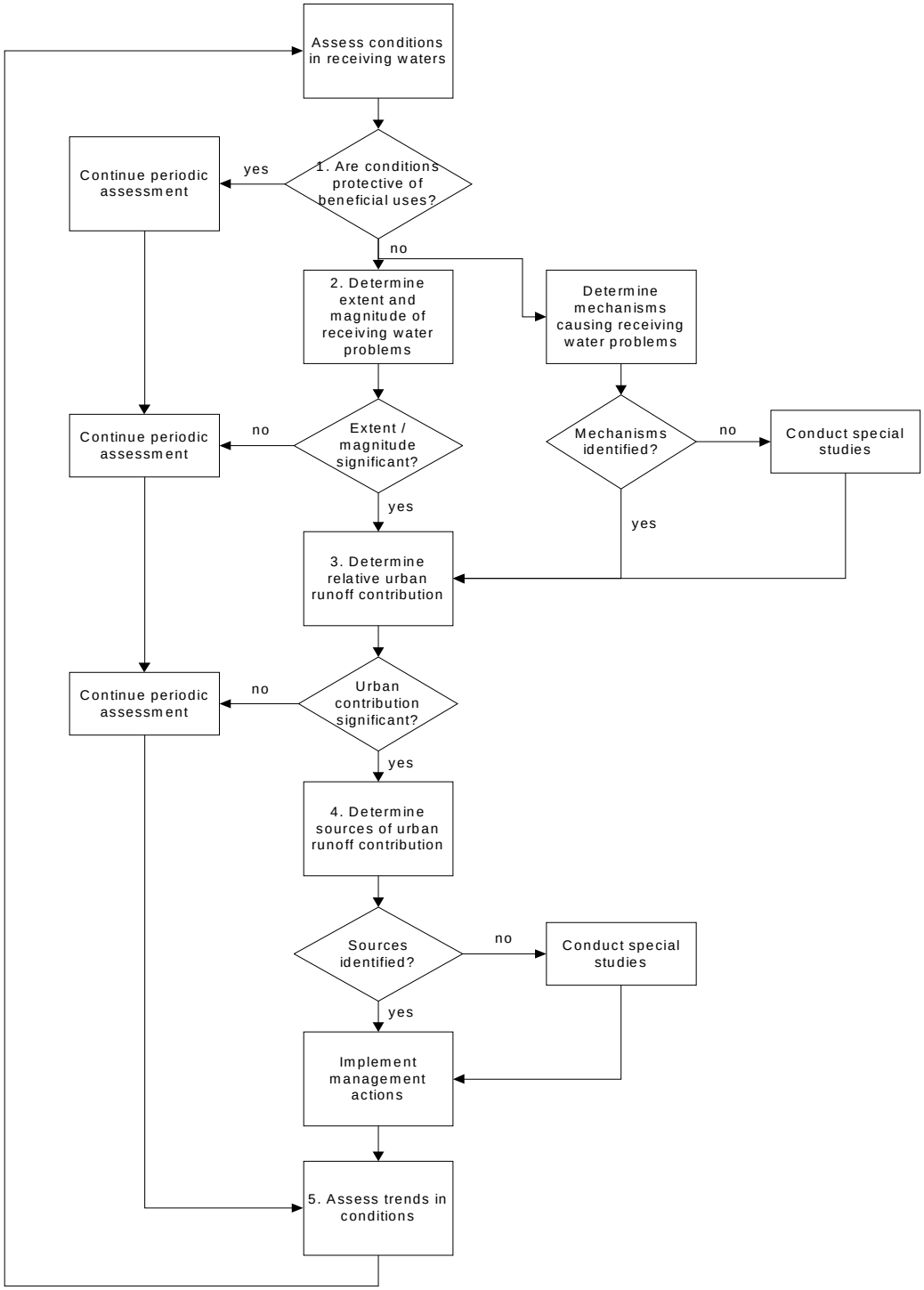

Figure 2-1. Graphical illustration of the idealized logical flow through the five core management questions (reworded as statements to fit flowchart conventions). The answer to each question provides the basis for developing the monitoring design to answer the next. In actuality, monitoring programs may have addressed questions in parallel or out of sequence, depending on available knowledge and specific information needs.

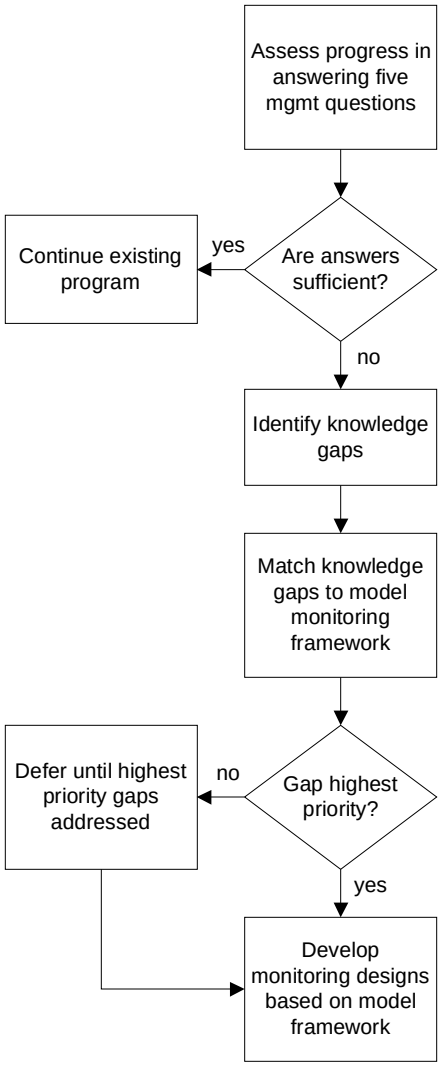

Figure 2-2. Sequence of steps involved in applying the model monitoring program framework to an existing stormwater monitoring program.

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3.0 PRINCIPLES AND FRAMEWORK FOR A MODEL MONITORING PROGRAM

3.1 Principles for allocating monitoring effort

In developing the details of monitoring guidance to address the management questions and their related objectives, the committee was guided by three basic principles that provided an overall set of boundary conditions for monitoring design:

- Monitoring should be focused on decision making; data not helpful in making a decision about clearly defined regulatory, management, or technical issues should not be collected.
- The level of monitoring effort should reflect the potential for impact, with more monitoring allocated to situations where the potential impact (in terms both of the probability of an impact's occurrence and its extent and magnitude) is higher and less monitoring to situations where such potential is lower or where monitoring is not likely to provide useful information.
- Monitoring should be adaptive, in terms of its ability to both trigger follow-on studies as needed and make necessary mid-course corrections based on monitoring findings.

In addition, the committee identified three categories of monitoring activities that fulfill different types of information needs and defined them in the monitoring guidance in Section 5.0.

Core monitoring includes long-term monitoring, intended to track compliance with specific regulatory requirements or limits, to conduct ongoing assessments, or to track trends in certain important conditions over time. Thus, core monitoring generally occurs at fixed stations that are sampled routinely over time.

Regional monitoring includes cooperative studies that provide a larger-scale view of conditions in the southern California region. Regional monitoring can be used to assess the cumulative results of anthropogenic and natural effects on the environment. Regional monitoring also helps to place individual stormwater agencies' monitoring in perspective by comparing local results (i.e. core monitoring) to the breadth and depth of human impacts and natural variability found throughout southern California's watersheds. Regional monitoring requires the participation of all dischargers to the environment, not just MS4 permittees, thus potentially making this type of monitoring more cost-effective (see Box on Regional Watershed Monitoring). Finally, regional monitoring is best conducted periodically (i.e.

Regional Watershed Monitoring

There are many agencies in and around southern California in addition to municipal stormwater agencies that are interested in watershed to regional scale monitoring. For instance, the Statewide Ambient Monitoring Program (SWAMP) coordinated by the State Water Resources Control Board conducts monitoring throughout the southern California region in order to assess, among other things, the health of California's watersheds and estuaries. Another is the State's Wetlands Recovery Project, which has a similar goal as SWAMP, but is focused on wetland habitats. In a similar vein, the US Environmental Protection Agency coordinates the Environmental Monitoring and Assessment Program (EMAP), which monitors watersheds in the southern California region, but attempts to integrate these assessments nationally. Several other agencies are also monitoring in southern California's watersheds including the US Geological Survey's National Water Quality Assessment Program (NAWQA), the US Fish and Wildlife Service, numerous water reclamation plants, water districts, citizen monitoring organizations, and universities. Although each agency has a slightly different motive for monitoring, they all have at least one goal in common; to assess the health of the environment. Therefore, each one of these agencies represent an opportunity for a productive partnership in regional monitoring since they bring a different set of skills and perceptions to a meaningful collaboration.

every five years) because of its large spatial scale and integration among program types.

Special projects include specific targeted studies included as adaptive elements within core or regional monitoring designs. These are shorter-term efforts intended to extend or provide more insight into core monitoring results, for example, by investigating the specific sources of a receiving water problem. Special projects also include developmental research, designed to move monitoring science and policy forward. These can be used to demonstrate the value of particular analyses, to illustrate ways in which data can be used, or to develop new skills. These projects have a specified beginning, middle, and end. Stormwater programs may wish to conduct special studies individually or in coordination with the SMC.

3.2 Framework for developing monitoring questions and designs

The first major philosophical approach of the model urban runoff monitoring program is to help ensure that monitoring activities are:

- Linked directly to key management questions
- Integrated into a logically consistent whole
- Designed and structured for both cost effectiveness and scientific rigor.

To accomplish this set of ideals, the committee followed the philosophical framework of Bernstein et al. (1993), which outlines a series of successively more detailed levels of monitoring objectives. This philosophy includes series of logical steps that led from defining the key monitoring questions to specifying the technical detail of monitoring designs. This framework was defined as:

- Level I: broadly stated public and management core concerns (management questions)
- Level II: management and scientific objectives that include specific statements about time and space scales, reference conditions, and the monitoring approach to be used
- Level III: measurement goals that identify the types and amounts of change to be monitored for
- Level IV: specific technical plans and methods for implementing monitoring.

The second philosophical approach of the model program was to develop a framework that would provide broad consistency of approach, but can also be adapted or customized to meet local needs and conditions. One major concern of the technical committee was that, in its attempt to standardize monitoring programs regionwide, the model urban runoff monitoring program would become too inflexible to adapt to local site specific needs. Therefore, this document fully specifies Level I and Level II objectives (See Section 5.0), partially spells out Level III objectives, and provides examples, through technical guidance and brief case studies, of possible Level IV objectives (See Section 5.0). In addition, the companion documents that describe the laboratory intercalibration study and the data transfer and reporting formats do provide detailed Level IV objectives for two aspects of monitoring design that are important for ensuring comparability of data among programs. In this way, the model urban runoff monitoring program is not too restrictive, but provides sufficient guidance to make certain that managers throughout southern California have similar aims and approaches among programs.

4.0 MANAGEMENT QUESTIONS

There are five questions (or Level I objectives) that create a common foundation for monitoring design and urban runoff management in the region. These questions are not strictly independent, but are logically linked (Figure 2-1) where the answer to one question establishes the context for addressing the next. Thus, the management questions provide a means of organizing information about impacts, sources, and long-term trends in receiving water conditions into a logically consistent whole. The five management questions are:

- Question 1: Are conditions in receiving waters protective, or likely to be protective, of beneficial uses?
- Question 2: What is the extent and magnitude of the current or potential receiving water problems?
- Question 3: What is the relative urban runoff contribution to the receiving water problem(s)?
- Question 4: What are the sources to urban runoff that contribute to receiving water problem(s)?
- Question 5: Are conditions in receiving waters getting better or worse?

Each question can be addressed by one or more categories of monitoring effort, as summarized in Table 3-2. That is, some questions are best addressed using core monitoring, others questions are best addressed in a cooperative regional monitoring program, and others by directed special studies. The category(ies) of monitoring effort is identified within each question description.

The committee recognized that there are many beneficial uses enumerated in the region's Basin Plans and agreed that the five core management questions are equally applicable to the entire range of beneficial uses. However, for purposes of developing specific monitoring guidance, it chose to focus on a subset that is common to most municipal stormwater programs in the region and for which monitoring and regulatory approaches are relatively well established. These include:

- Contact Water Recreation (REC1)
- Non-contact Water Recreation (REC2)
- Warm Freshwater Habitat (WARM)
- Estuarine Habitat (EST)
- Marine Habitat (MAR)
- Wildlife Habitat (WILD).

The following subsections describe each question in more detail including background and rationale, explain how they are functionally interrelated (see also Figure 2-1), and describe the specific management and scientific objectives appropriate to each question including expected data products. For each question, the technical committee defined:

- What is the management goal?
- What monitoring strategy is suitable?
- What degree of certainty and precision is possible or required?
- What reference conditions are appropriate?
- What spatial scale is appropriate?

- What temporal scale is appropriate?

These questions and objectives then form the basis for the more detailed monitoring designs described in Section 5.0.

4.1 Question 1: Are conditions in receiving water protective, or likely to be protective, of beneficial uses?

4.1.1 Background to Question 1

Question 1 is a fundamental linch-pin for many, if not most, aspects of stormwater management. The presence of receiving water problems, or at least the potential for such problems, is the justification for a broad range of activities to better identify and reduce sources of contamination from urban runoff that may cause or contribute to such problems. In addition, detailed information about the nature of receiving water problems can greatly improve the effectiveness of a wide range of management actions. In principle, the design of any receiving water monitoring program should be based on reconnaissance and/or characterizations studies that target the likely sources and locations of receiving water problems. However, the southern California stormwater programs have already generated substantial information about where receiving water problems should be monitored for. Thus, the model monitoring program does not include a reconnaissance or characterization step for Question 1. However, where information on conditions in receiving waters is sparse or nonexistent, it may be necessary to initially conduct broad reconnaissance studies and/or evaluations of available historical data to determine the likely sources and locations of current or potential problems in receiving waters. In those cases, USEPA guidance (US EPA 1992) is available to direct the design of such studies.

In general, there are two often competing approaches to assessing whether conditions in receiving waters constitute a "problem", the compliance approach and the assessment approach. The committee described a compliance approach as one in which monitoring is used to determine if the value of an indicator is above or below a quantitative regulatory threshold. In this approach, the indicator measure would be considered as evidence of recreational water quality or habitat problem, acting as a surrogate for more detailed studies involving a larger range of measures. Exceedance of compliance standards would then provide the basis for management actions such as source identification studies, source control efforts, and further iterative monitoring and management actions. In contrast, an assessment approach would not be based primarily on comparison to specific quantitative thresholds or limitations. Rather, it would focus on better understanding actual conditions in the receiving water (i.e., the actual nature of problems) and is based on a weight of evidence approach in which chemical, biological, and ecological data are used to assess impacts. This approach emphasizes developing evidence of actual impacts in receiving waters in addition to, or instead of, evidence derived only from indicator measures.

The model monitoring committee believes that these two approaches should be complementary, rather than competitive or mutually exclusive. Thus, evidence provided by indicators could help initiate further studies to determine actual problem(s) and identify sources. Quantitative thresholds or limitations could be used to trigger or justify needed management actions, and the overall timeframe would be long enough to encompass iterations of monitoring and management efforts. The program design guidance in Section 5.0 illustrate how both approaches can be used in tandem, as in, for example, the use of mortality levels of indicator organisms in toxicity tests as a trigger for follow-up TIEs to identify the source(s) of toxicity.

4.1.2 Recreational water quality objectives

The Level II objective suggested for recreational water quality for Question 1 is described in Table 4-3 that focuses primarily on identifying conditions that may present elevated risk to humans from body contact recreation. The Level II management/monitoring objective can be stated as:

> Monitor a suite of bacterial indicators at high-priority sites selected by qualitative risk characterization and affected by urban runoff, including along beaches; in enclosed bays and estuaries; and along creeks, streams, and rivers at frequencies needed to ensure that relevant freshwater and marine standards are being met, to a moderate degree of certainty and precision.

The types of data products appropriate for answering Question 1 for recreational water quality may include:

- Frequent (daily, weekly, monthly depending on the circumstance) measures of fecal coliform or E. coli, total coliform, and Enterococcus at high-priority (defined in Section 5.1.1 as having both high use and elevated levels of indicator bacteria) beaches, coastal storm drains, lagoons, bays, estuaries, and inland creeks, streams, and rivers (Tables of individual measurements and relevant averages)
- Comparisons of bacterial indicator values with relevant standards (i.e., REC1, REC2, AB411) on spatial and temporal scales that match sampling scales as closely as possible (tables that highlight exceedances, figures that show exceedances over time)
- Summaries that identify the relative degree of contamination at monitored locations (i.e., maps, Heal the Bay's Report Card for beaches in Santa Monica Bay).

4.1.3 Habitat objectives

The Level II objective suggested for habitat health for Question 1 is described in Table 4-4. The Level II management/monitoring objective can be stated as:

> Use the Triad approach as a basis for monitoring both specific sites of high concern, as well as a set of random watershed sites, at least yearly and assess overall habitat health by comparing a suite of measurements to relevant reference conditions, to a moderate degree of certainty and precision. Use the Triad results to trigger an appropriate set of adaptive follow-up studies intended to better characterize conditions.

As might be expected, given both the inherent complexity of ecosystem monitoring and the variety of measurements included in the Triad approach, there is a range of reference conditions potentially applicable to monitoring of this question. The committee therefore recommended a structured framework for using reference conditions in the interpretation of Triad monitoring results (see Section 5.0).

The types of data products appropriate for answering Question 1 for habitat include:

- Site-by-site summaries of each sampled leg of the Triad (tables of individual measurements and relevant averages)
- Site-by-site interpretations and conclusions based on synthesized Triad results (narrative conclusions, decision trees)

- Comparisons across sites for each leg of the Triad (tables highlighting differences, maps)
- Comparisons across sites for synthesized Triad results (narrative conclusions, decision trees, maps)

4.2 Question 2: What is the extent and magnitude of the current or potential receiving water problems?

4.2.1 Background to Question 2

Question 2 is framed as the logical next step once receiving water problems related to urban runoff are found or predicted. Question 2 thus expands on the information provided by Question 1as a basis for describing the spatial and temporal extent of existing or likely impacts, as well as their relative intensity. This information is necessary for assessing the relative severity or importance of different problems, targeting source identification efforts, and planning management actions such as source reduction efforts.

In most cases, monitoring designs to answer Question 1 will include only representative sites within key recreational areas or habitats. Thus, once a receiving water problem is found, data from these sites will most often be insufficient to characterize the full extent and magnitude of the problem and additional studies will normally be called for. This is because most managers need to know the severity of a problem before proceeding with some remedial action. Impacts that cover large areas or extend over long periods of time typically require more immediate attention. The information collected to answer Question 2 is important for scoping the source identification studies that are the focus of Questions 3 and 4 (see Figure 2-1).

In some cases, the extent, magnitude, and/or severity of a receiving water problem will be immediately apparent from the core monitoring data obtained under Question 1. In such cases, for example, very high bacteria counts along a popular beach or severe toxicity in an enclosed lagoon, source identification work as described in Questions 3 and 4 should begin promptly. In addition, un-permitted dry weather discharges are specifically forbidden and such discharges should therefore also be a high priority for prompt source identification studies. In other cases, broader sampling to assess spatial and temporal extent will be required, usually as shorter-term studies that are conducted once or perhaps periodically when there is reason to believe the scale of the problem has changed. In some situations, where the problem is complex and/or covers a large area, addressing Question 2 will involve regional studies that require the cooperative efforts of several agencies. Monitoring under Question 2 would be conducted in either wet or dry weather, depending on the specific issue and in accord with the findings of Question 1.

4.2.2 Recreational water quality objectives

The Level II objective suggested for recreational water quality for Question 2 is described in Table 4-6. The Level II management/monitoring objective can be stated as:

> Monitor a suite of bacterial indicators at a spatially and temporally more intensive set of stations around sites, prioritized by risk, in order to define the extent of problems to a moderate degree of certainty and precision, and compare indicator levels to relevant marine and freshwater standards in order to define the relative severity of the problem, also to a moderate degree of certainty and precision.

The types of data products appropriate for answering Question 2 for recreational water quality include:

- Measures of the spatial extent of bacterial contamination (maps)
- Measures of the temporal patterns of bacterial contamination (figures that show temporal patterns, measures of variance)
- Measures of the relative magnitude of indicator values over space and time (graphs of concentration over time or by site).

4.2.3 Habitat objectives

The Level II objective suggested for habitat for Question 2 is described in Table 4-7. The Level II management objective can be stated as:

> Monitor specific aspects of the Triad, including adaptive elements such as additional chemistry measurements or TIEs, at a spatially and temporally more intensive set of stations where impacts have been observed in order to define the extent of problems to a moderate degree of certainty and precision, and compare measurements to relevant marine and freshwater standards in order to define the relative severity of the problem, also to a moderate degree of certainty and precision.

The types of data products appropriate for answering Question 2 for habitat include:

- Measures of the spatial extent of modified communities, chemical contamination, and/or elevated toxicity (maps)
- Measures of the temporal patterns of modified communities, chemical contamination, and/or elevated toxicity (figures that show temporal patterns, measures of variance)
- Measures of the relative magnitude of indicator values over space and time (graphs of concentration or toxicity over time or by site).

4.3 Question 3: What is the relative urban runoff contribution to the receiving water problem(s)?

4.3.1 Background to Question 3

Once monitoring or other studies demonstrate that there is a current or potential impact to receiving waters (Question 1) and describe the problem's extent and magnitude (Question 2), decisions about any management responses depend on information about the source(s) of the problem. The model monitoring framework breaks this source identification into two parts (Figure 2-1), represented by Questions 3 and 4. The purpose of this two-step process is to prioritize more detailed source identification efforts in Question 4 at only those problems for which urban runoff is a significant contributor. Question 3 begins this process by taking the information from Questions 1 and 2 and beginning to work upstream, both literally and figuratively, to better define the overall contribution of urban runoff to receiving water problems. It is important to clarify that this two-step process involving Questions 3 and 4 is not intended in any way to diminish or replace municipalities' permit requirements to reduce contaminant inputs to the maximum extent practicable. It is rather intended to help determine when additional, more detailed and extensive, upstream source identification efforts should be conducted by a municipality, with the goal of ensuring that the full burden of source identification work not be shifted to the MS4 permittees where action by them would not solve the larger problem.

The model monitoring framework assumes that, if urban runoff contributes only a very small percentage to the receiving water problem, then there would be no need for a municipal permittee to independently carry out substantial source identification efforts in addition to those activities usually carried out under the municipal stormwater permit. For a first-cut estimation, therefore, Question 3 requires only minimal resolution, including at least a rough estimate of the identity and magnitude of the non-urban runoff contributions. In many situations, aggregate estimates of the non-urban runoff contribution, rather than source-by-source estimates, may be adequate and may already be available from previous characterization and/or monitoring studies. Only if urban runoff is found to contribute significantly to receiving water problems would a municipality be required to take the lead on conducting further source identification studies at greater resolution (as described in Question 4).

The committee engaged in substantial discussion of criteria for prioritizing source identification work and agreed that several factors should be taken into account in each instance, including:

- The severity of the problem
- The type of pollutant(s) involved
- The potential for human health risk
- The relative certainty of the estimates of relative contribution from different sources. If the estimate of urban contribution is very low, then even high uncertainty might not be important. However, if the estimate is higher, e.g., 10%, and the uncertainty is high (e.g., could be as high as 30%) then that would be a different situation
- Whether the problem occurs during dry and/or wet weather, since dry weather problems may be more easily dealt with
- The biological resources at issue
- Regulations and other legal mechanisms that require source identification and/or control
- Stakeholder involvement such as watershed group planning priorities.

The committee agreed that source identification work should be prioritized based on the factors above, and that the threshold level for further independent source identification efforts by the permittees should be somewhere between 5 – 10%. It is important to emphasize that this threshold is intended as a guideline only in situations where the source of a receiving water problem is not known. Where the source(s) of such problems are known, then relevant permit conditions related to source reduction and cleanup would come into play. As emphasized above, this threshold is not intended to diminish or replace permit requirements to reduce contaminant inputs to the maximum extent practicable (MEP) or other regulations or legal requirements.

4.3.2 Recreational water quality and habitat objectives

The Level II objective suggested for both recreational water quality and habitat for Question 3 is described in Table 4-8. The Level II management objective can be stated as:

> Using parameters relevant to the nature of the receiving water problem, estimate the proportional contribution of urban runoff at the most downstream point of input to the receiving water, based on a loads study performed at minimal to moderate resolution, and repeated every several years as needed.

The types of data products appropriate for answering Question 3 for both recreational water quality and habitat include:

- Description of all potential sources of inputs to the receiving water (maps of potential sources)
- Rough estimates of the relative magnitude of loads from all sources (table of concentrations or loads by source)
- Rough estimate of the proportional contribution of urban runoff to total loads (pie charts or stacked bar charts).

4.4 Question 4: What are the sources of the urban runoff contribution to receiving water problems?

4.4.1 Background to Question 4

Once it has been determined, either through specific studies carried out under Question 3 or through other available data, that urban runoff is, or is likely to be, a significant source of one or more receiving water problems, then more intensive source identification efforts are called for. Question 4 thus involves more thorough source identification studies intended to provide more detailed information about the nature, location, and quantity of inputs to the receiving waters identified in Question 1. This information can help refine receiving water monitoring, improve fundamental understanding of stormwater contamination processes, and help guide management actions intended to reduce sources and their attendant impacts. It can also help focus trend monitoring on those parameters that are potentially most responsive to urban runoff source reduction efforts.

In the context of Question 4, "sources" can refer to multiple layers of sources, such as a golf course that is the source of pesticides, which are in turn the source of toxicity in the receiving water. Thus, questions about sources should be framed carefully in order to clarify both the spatial definition of "upstream source" as well as the level of causality that is the central focus of the investigation.

4.4.2 Recreational water quality and habitat objectives

The Level II objective suggested for both recreational water quality and habitat for Question 4 is described in Table 4-9. The Level II management objective can be stated as:

> Using parameters relevant to the nature of the receiving water problem, prioritize receiving water sites for upstream source identification studies and perform source identification studies at the watershed scale and to a moderate degree of resolution until the appropriate stopping rules are reached.

The types of data products appropriate for answering Question 4 for both recreational water quality and habitat include:

- Prioritization of receiving water sites in terms of severity of impact (ranked list of sites)
- Description of all potential urban runoff sources of inputs to the higher priority receiving waters (map of potential sources)
- Determination of actual sources of urban runoff and their relative magnitude (table of concentrations and flows by source with estimated levels of confidence)
- Quantitative estimates of the loads from urban runoff sources(table of loads by source with estimated levels of confidence).

4.5 Question 5: Are conditions in receiving waters getting better or worse?

4.5.1 Background to Question 5

Assuming that monitoring related to Questions 1 – 4 has resulted in improved information about the nature and source(s) of current and/or potential receiving water problems, and that this in turn has led to management actions to address such sources, Question 5 provides the logical feedback to determine if such actions are improving conditions in receiving waters. Given that changes in receiving water conditions are likely to occur over several years (at the least), Question 5 is a trends monitoring question. The trends of interest are in both discharges and receiving waters and the time frame for this question is the longer-term period needed to determine if management actions are having their intended effects.

In its simplest form, a trend monitoring design involves repeated sampling over time at the same monitoring site(s). The ability of a trend design to detect change depends on:

- The amount of change it is important or necessary to detect
- The timeframe within which decision makers need information about trends
- The variability of the indicator on different time scales, typically shorter term (weekly, monthly) and longer term (yearly)
- The resources available for sampling and analysis.

Developing the specifics of the monitoring design thus involves making a series of tradeoffs among these factors.

The statistical power of a monitoring design is its ability to detect a change of a certain size, if it in fact has occurred. Power analysis, used to estimate the power of a given design, can provide insight into the sampling effort (both in terms of the number of samples per year and the number of years) required to observe trends of different size. In addition, power analyses can reveal important inherent constraints on the ability to detect trends imposed by underlying variability in the system being monitored. This can provide a realistic basis for establishing both management and monitoring goals, as well as a basis for making tradeoffs in the monitoring design (e.g., between the number of samples collected per year and the number of years over which the trend monitoring will extend).

Figure 4-1 provides an example of how site-specific power analysis results might be used. In one instance (Figure 4-1a), trend monitoring would be futile and monitoring resources should be shifted to another site and/or issue. In a second instance (Figure 4-1b), the only way to improve the design's ability to detect a trend is to increase the number of years to be monitored. In such an instance, the length of time needed to detect a trend must be compared against both the management time horizon (i.e., how quickly is information needed?) and the timeframe over which changes are expected to occur (e.g., how rapidly are BMPs expected to reduce loads?). In a third instance (Figure 4-1c), the main way to improve the design's power is to increase the number of samples per year. However, for some questions, there is a natural constraint imposed by the relatively small number of storms per year in southern California. In such cases, the monitoring design will have an inherent limit on its ability to detect trends within a given time period. In a final example (Figure 4-1d), sampling additional times per year and monitoring for more years must be traded off against each other, since increasing both kinds of sampling intensity improves power. Such tradeoffs should be based on both the management time horizon and the timeframe over which changes are expected to occur. Thus, if an answer to Question 5 is

not immediately urgent, then the number of samples per year can be reduced and the timeframe extended into the future.

Appendix 2 uses historical data from the southern California region to provide example power analysis results for trend monitoring of bacteria and mass emissions. Sufficient data for power analyses of other data types (e.g., bioassessment, toxicity) are not yet available. Because power analysis results can vary widely from site to site and across constituents, these results should be considered only as a "starter kit" for trend monitoring designs. The committee strongly recommends that each trend monitoring program conduct its own site-specific power analyses after obtaining three years of trend data, and revise its monitoring design accordingly based on these results. To support such program-specific design efforts, the committee has developed a simple software package that automates the needed power analysis (Go to http://www.sccwrp.org to download a copy of this program). Because trend monitoring programs will typically continue for many years, this approach will enable trend monitoring to begin and then to adjust its design appropriately with little or no loss of information.

The central importance of estimates of variability in trend monitoring highlights the importance of improving our basic understanding of sources of variability in MS4s. Thus, in addition to tracking trends over time, the analysis of monitoring data under Question 5 should include efforts to examine and quantify sources and patterns of variability in monitoring data, with the overall goal of reducing any controllable variability (i.e., variability introduced through sampling techniques and laboratory analysis, or due to spatial and temporal sources that can be accounted for in the structure of the monitoring design itself).

Finally, a full answer to Question 5 should also include an assessment of changes in the extent and magnitude of impacts over time. Such an assessment can be accomplished by repeating the studies described in Question 2.

4.5.2 Recreational water quality objectives

The Level II objective suggested for recreational water quality for Question 5 is described in Table 4-10. The Level II management objective can be stated as:

> Monitor bacterial indicators at fixed stations over a number of years to determine, to a moderate degree of resolution, whether levels have increased or decreased compared to historical data and to relevant standards.

The types of data products appropriate for answering Question 5 for recreational water quality include:

- Graphs of the levels of bacterial indicators over time at each station of concern
- Periodic statistical power analysis results to confirm the power of the trend monitoring design.

4.5.3 Habitat objectives

The Level II objective suggested for habitat for Question 5 is described in Table 4-11. The Level II management objective can be stated as:

Monitor relevant habitat indicators at fixed stations over a number of years to determine, to a moderate degree of resolution, whether levels have increased or decreased compared to historical data and to relevant standards.

The types of data products appropriate for answering Question 2 for habitat include:

- Graphs of the levels of habitat indicators over time at each station of concern
- Periodic statistical power analysis results to confirm the power of the trend monitoring design.

Table 4-1. Relationship between the five key management questions and the three basic categories of monitoring activity. Core monitoring for Questions 1 and 5 typically occurs at fixed stations over a period of time. The design of regional monitoring and special projects under Questions 2, 3, and 4 is contingent on monitoring results from other core management questions. Numbers in italics (e.g., *5.1.1*) refer to report sections that detail specific design guidance for each element of the model monitoring program.

Management Questions	Core Monitoring	Regional Monitoring	Special Projects
1. Are conditions protective?	Recreational water quality assessment (wet & dry) *5.1.1* Ecosystem assessment (dry) *5.1.2*		
2. What is extent / magnitude?		One-time or periodic larger-scale assessment (depends on Question 1) *5.2*	One-time or periodic larger-scale assessment (depends on Question 1) *5.2*
3. What is urban runoff contribution?		One-time characterization, assessment (depends on Questions 1 & 2) *5.3*	One-time characterization, assessment (depends on Questions 1 & 2) *5.3*
4. What are sources of urban contribution?			Site-specific, one-time or periodic source ID studies (wet & dry) (depends on Question 3) *5.4*
5. Are conditions getting better or worse?	Long-term trends monitoring (wet & dry) of: • Bacterial indicators *5.5.1* • Habitat indicators (incl. loads) *5.5.2*		

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Table 4-2. Level II objectives for recreational water quality monitoring for Question 1: Are conditions in receiving waters protective of beneficial uses? Aspects of the objective are organized around the six categories of information that make up each Level II objective.

Level II category – Q1 recreational water quality	**Level II objective – Q1 recreational water quality**
Management goal	Protect human health by meeting existing standards
Monitoring strategy	Allocate sampling effort with respect to overall risk (combination of use and contamination) Monitor bacteria indicators (fecal coliform (or E. coli), total coliform, Enterococcus) Use improved indicators when available and approved by health department Adaptive link to magnitude, extent, and upstream urban runoff source identification studies
Degree of certainty and precision	Moderate
Reference conditions	Freshwater standards (REC1, REC2) Marine standards (AB411)
Spatial scale	Open-coast beaches Specific coastal storm drains Bay, lagoons, estuaries Rivers and creeks
Temporal scale	Daily (for health risk) Weekly (for health risk) Seasonal (for health risk, trends)

Table 4-3. Level II objectives for habitat monitoring for Question 1: Are conditions in receiving waters protective of beneficial uses? Aspects of the objective are organized around the six categories of information that make up each Level II objective.

Level II category – Q1 habitat	**Level II objective – Q1 habitat**
Management goal	Protect ecosystem health by tracking the relationship of indicators to relevant reference conditions
Monitoring strategy	Triad approach Coordinated watershed and subwatershed scales Adaptive monitoring triggers depending on triad results Sites targeted at specific management issues
Degree of certainty and precision	Moderate
Reference conditions	Basin Plan Ocean Plan Regional IBI (for stream bioassessment) CTR (for chemistry) Toxicity test reference Historical reference conditions (site-specific) Local reference conditions (site-specific) Other watersheds (regional)
Spatial scale	Site-specific (e.g., Talbert Marsh) Watershed / subwatershed Jurisdictional
Temporal scale	Yearly Several years

Table 4-4. Level II objectives for recreational water quality monitoring for Question 2: What is the extent and magnitude of receiving water problems? Aspects of the objective are organized around the six categories of information that make up each Level II objective.

Level II category – Q1 recreational water quality	**Level II objectives – Q1 recreational water quality**
Management goal	Define the scale of impact
Monitoring strategy	Short-term sampling at broader spatial extent Sampling appropriate to define temporal patterns at weekly to seasonal scales Measure bacteria loads at MS4 discharge locations
Degree of certainty and precision	Moderate
Reference conditions	Freshwater standards (REC1, REC2) Marine standards (AB411) Comparisons across parts of the region
Spatial scale	Watershed / subwatershed Jurisdictional Regional
Temporal scale	For REC1 objective, geomean over a season Process-based (e.g., seasonal) 3 years for impairment (303d)

Table 4-5. Level II objectives for habitat monitoring for Question 2: What is the extent and magnitude of receiving water problems? Aspects of the objective are organized around the six categories of information that make up each Level II objective.

Level II category – Q2 ecosystem	**Level II objectives – Q2 ecosystem**
Management goal	Receiving water conditions improve (if impaired) Receiving water conditions remain the same (if not impaired)
Monitoring strategy	Triad monitoring in key receiving waters Long-term trend monitoring Adaptive toxicity testing Adaptive upstream toxicity testing
Degree of certainty and precision	Moderate
Reference conditions	Basin Plan Ocean Plan Regional IBI (for stream bioassessment) CTR (for toxicity) Toxicity test reference Comparisons across parts of the region
Spatial scale	Watershed / subwatershed Jurisdictional Regional
Temporal scale	Periodic snapshots (yearly)

Table 4-6. Level II objectives for both recreational water quality and habitat monitoring for Question 3: What is the relative urban runoff contribution to the receiving water problem(s)? Aspects of the objective are organized around the six categories of information that make up each Level II objective.

Level II category – Q3 recreational water quality & habitat	**Level II objective – Q3 recreational water quality & habitat**
Management goal	Estimate the proportional contribution of urban runoff to problem(s) in specific receiving water
Monitoring strategy	Loads estimation
Degree of certainty and precision	Minimal to moderate
Reference conditions	Relative severity of local receiving water problem(s) Relative contribution of urban runoff to other receiving waters in the region
Spatial scale	Point of input to receiving water (scales depending on definition of receiving water)
Temporal scale	Periodic assessment (every 5 years)

Table 4-7. Level II objectives for both recreational water quality and habitat monitoring for Question 4: What are the sources to urban runoff that contribute to receiving water problems? Aspects of the objective are organized around the six categories of information that make up each Level II objective.

Level II category – Q4 recreational water quality & ecosystem	**Level II objectives – Q 4 recreational water quality & ecosystem**
Management goal	Urban sources identified and resolved
Monitoring strategy	Prioritize downstream sites Upstream source ID studies
Degree of certainty and precision	Moderate to great
Reference conditions	Internal tests of “signal” strength
Spatial scale	Watershed / subwatershed Jurisdictional Regional
Temporal scale	Until stopping rules reached

Table 4-8. Level II objectives for recreational water quality monitoring for Question 5: Are conditions in receiving waters getting better or worse? Aspects of the objective are organized around the six categories of information that make up each Level II objective.

Level II category – Q5 recreational water quality	**Level II objectives – Q5 recreational water quality**
Management goal	Reduction in indicator levels Identification and removal of key sources
Monitoring strategy	Repeated monitoring at specific sites over a season Long-term trend monitoring
Degree of certainty and precision	Moderate
Reference conditions	Standards Historical data as a basis of trends
Spatial scale	Specific receiving waters Where use is concentrated Watershed / subwatershed Jurisdictional
Temporal scale	For REC1 objective, geomean over a season Process-based (e.g., seasonal) 3 years for impairment (303d) Permit term (~ 5 years) for trends TMDL implementation phase (~ 10 years)

Table 4-9. Level II objectives for habitat monitoring for Question 5: Are conditions in receiving waters getting better or worse? Aspects of the objective are organized around the six categories of information that make up each Level II objective.

Level II category – Q5 habitat	**Level II objective – Q5 habitat**
Management goal	Conditions improve (if degraded) Conditions remain the same (if not degraded)
Monitoring strategy	Triad approach
Degree of certainty and precision	Moderate
Reference conditions	Basin Plan Ocean Plan Regional IBI (for stream bioassessment) CTR (for chemistry) Toxicity test reference
Spatial scale	Watershed / subwatershed Jurisdictional
Temporal scale	Permit cycle for overall assessment Process-based for specific components Bioassessment (greater than 5 years) Bioaccumulation (e.g., short-term for Se, long-term for DDT) BMP (based on site-specific geomorphology, BMP mechanism) Hydrology (annual) Toxicity (sporadic, seasonal)

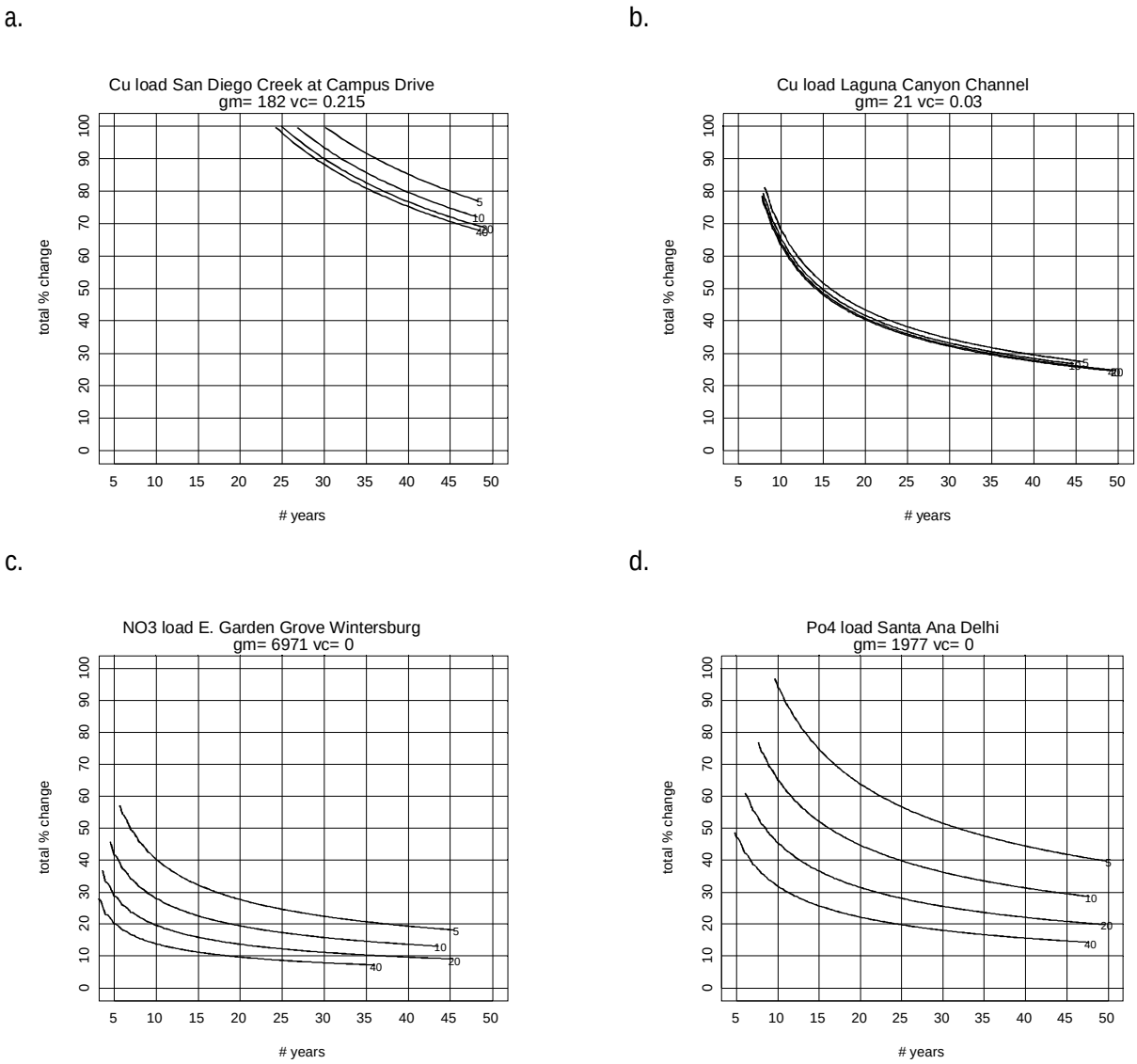

Figure 4-1. An example of the range of site-specific statistical power analysis results that can provide useful guidance for both trend monitoring design and setting management and monitoring goals. In the example figures below, the x-axis shows the number of years over which trend monitoring could continue and the y-axis the amount of change monitoring could detect. The four curves represent different amounts of sampling intensity per year. a. Even large amounts of sampling will not detect trends. b. Increasing the number of sampling events per year will not increase power because virtually all the variability is year-to-year variability. c. Increasing the number of years sampled beyond a certain point will not increase power because virtually all the variability is within-year variability. d. Both within- and between-year variability are important and increasing both kinds of sampling intensity will increase power.

5.0 MONITORING GUIDANCE

The following sections provide specific guidance for the design of core monitoring, regional monitoring, and special projects needed to address each of the core management questions (Table 4-1). The description of each monitoring design follows the same format:

- An overview that quickly summarizes the major features of the design, including a table of key design elements
- A lengthier description of specific design elements, such as station selection, monitoring frequency, indicators, triggers or thresholds for regional monitoring and/or special projects
- A discussion of design issues that describes the underlying rationale for the design and any important constraints that may affect monitoring success.

As the description of the key management questions and objectives (Section 4.0) makes clear, monitoring guidance focuses on recreational water quality and habitat issues. In some cases, distinct monitoring designs are required for each set of issues, while in other cases the same design approach is suitable for both. Where distinct monitoring designs are required, recreational water quality and habitat beneficial uses are presented separately.

5.1 Assessment monitoring

Assessment of recreational water quality and habitat conditions addresses Question 1: Are conditions in receiving waters protective, or likely to be protective, of beneficial uses? Data from such monitoring provides the basis for other aspects of the model program (Figure 3-1) intended to better characterize the extent and magnitude of any problems (Question 2), identify sources (Questions 3 and 4), and track trends in condition over time (Question 5).

Assessment monitoring effort falls exclusively into the core and regional monitoring categories (Table 4-1). Core monitoring is that conducted by individual agencies to evaluate issues related to specific sites or watershed. Regional monitoring is that conducted cooperatively by multiple agencies (see box on regional monitoring) to address issues across broader scales and time periods. In many cases, the same monitoring sites and/or approaches can meet both core and regional monitoring needs.

5.1.1 Recreational water quality assessment

5.1.1.1 Overview and philosophy

Design overview. Table 5-1 presents an overview of the technical design elements for assessment of recreational water quality conditions at beaches; bays and estuaries; and creeks, streams, and rivers. The following discussion does not include inland lakes and reservoirs, which, because they represent a special case, the committee agreed to defer until a later time.

The model monitoring framework allocates core monitoring of bacterial indicators to high-priority locations based on risk of adverse health effects. This risk is defined in terms of a combination of level of contamination and degree of human body contact use. In general, local public health departments have completed risk characterization for many waterbodies with recreational beneficial uses, particularly for marine beaches. Additionally, local health agencies have already established routine monitoring locations at many marine beaches that are sampled at

least weekly. To address the assessment of recreational water quality conditions, the model program recommends that stormwater agencies build upon the monitoring data, local knowledge, and experience of the local public health departments. Thus, the model monitoring committee explicitly assumed that local public health agencies would take the lead in specifying high priority areas based on their knowledge and experience.

Somewhat different monitoring designs are recommended for linear open-coast beaches, enclosed bays and estuaries, and creeks/streams/rivers, based on differences in their basic hydrology. The number of sampling locations is dependent on the size of an area and its level of relative risk, as is the sampling frequency. However, at all monitoring sites, monitoring should measure indicator levels in the discharge itself, as well as upcoast and downcoast (or upstream and downstream) of the discharge. In addition, where the monitoring objective is to determine whether overall conditions constitute a problem as opposed to monitoring for body contact, monitoring may be focused on that portion of the year that represents the worst-case scenario.

At the moment, there are no ongoing regional monitoring efforts focused on recreational water quality, with the exception of the Bight Program's periodic snapshots of shoreline water quality and the new regional harbors monitoring program being developed by the San Diego Regional Water Quality Control Board. Both programs rely on a probability-based design intended to support general conclusions about the relative degree of contamination in different parts of the region.

Design philosophy. The model design framework specifies somewhat different approaches for core monitoring at linear open-coast beaches; enclosed bays and estuaries; and creeks, streams, and rivers. However, all three approaches reflect the basic assumption that monitoring resources should be allocated based on risk. Where the county health departments and the State Board's Beach Water Quality Work Group (BWQWG) have established monitoring approaches and/or designs, the model stormwater program will remain consistent with these. The committee felt that, ultimately, the county health departments are one end-user for much of this data since they have the responsibility for assessing if a beach should be closed or posted for swimming.

Widely accepted risk management principles recommend allocating monitoring and management effort in proportion to the relative degree of risk. The basic design feature of the model urban runoff monitoring program for Question 1 for recreational water quality therefore is to focus effort at those places and times (whether wet or dry weather) where human health risk associated with urban runoff is the highest. The model design assumes that risk, at the population level, is directly related to exposure, and estimates exposure, in turn, as the qualitative combination of estimates of bacterial contamination and the intensity of human use. While these qualitative risk estimates may be improved by future risk assessments, this improved information should not alter the basic principle of allocating monitoring in terms of relative risk.

There are three types of situations that are relevant to stormwater monitoring programs and that require somewhat different monitoring approaches:

- Linear, open-coast beaches
- Enclosed bays and estuaries
- Inland creeks, streams, and rivers.

Both linear, open-coast beaches and enclosed bays and estuaries can have many kinds of bacteria inputs, although they differ somewhat. Open-coast beaches can receive bacteria from storm drains, river discharge, wildlife, intense beach usage, pet waste, terrestrial vegetation

decomposition, improperly maintained toilet facilities, and perhaps kelp decomposition. In addition to these potential sources, enclosed bays and estuaries can also be affected by bacteria from maintenance activities, homeless populations, groundwater, moored boats, failing septic systems, and concentrated populations of birds. The primary urban inputs of bacteria to inland creeks, streams, and rivers are through storm drain discharges, homeless encampments, unauthorized public use, and passage of domestic and wild animals. These and other differences stemming from their basic hydrology lead to a different approach for each situation. For each type of area, risk characterization should be completed in conjunction with the local health department.

The model design framework for regional monitoring adopts the probability-based design approach used by the Bight Program and assumes that, for purposes of assessment, the Bight Program does an adequate job of shoreline assessment. The Bight Program design is being used as a basis for developing a somewhat more spatially intensive regional monitoring program for enclosed bays and estuaries in the San Diego Region. Once this is completed, it can act as a design template for regional monitoring in other enclosed bays and estuaries throughout southern California. The model monitoring committee determined that, at present, concerns about recreational water quality in inland creeks, streams, and rivers were site specific enough to be dealt with by the core monitoring design. If there is a need for a regional assessment in the future, the basic stratified random sampling design used in the Bight Program would also apply here (see Section 5.1.2 Habitat assessment for more detail on regional watershed designs).

5.1.1.2 Design elements

Somewhat different monitoring designs are recommended for core monitoring at the three types of monitoring locations.

Linear open-coast beaches. Monitoring of storm drains (i.e., MS4s) discharging to beaches should conform to the prioritization framework (Table 5-2) established by the State Board's Beach Water Quality Work Group (BWQWG).

In this framework, the highest monitoring frequency of daily to five times per week is targeted at beaches with lifeguards and many potential sources of bacteria and a lower monitoring frequency (e.g., weekly to monthly) is applied to less heavily used beaches and/or beaches with only a few probable sources. Monitoring should measure indicator levels in the discharge itself, as well as upcoast and downcoast of the discharge. The basic monitoring approach includes stations situated both upcoast and downcoast of monitored storm drains because the ocean current direction in a portion of beach can frequently change, and because the dispersion of storm drain discharges in the surfzone can vary widely from place to place (due to discharge volume, bacteria concentration, beach configuration, current patterns, tidal height, and water temperature). The specific location of these stations should be determined after a characterization study of plume behavior to estimate the average seasonal range of influence of the storm drain discharge. This zone of influence will often extend further along the beach in one direction than the other, and will typically be much larger during wet weather. The upcoast and downcoast stations should then be located within the outer bounds of this influence, with a wet weather zone of influence applied to those stations that are routinely sampled during wet weather.

The model monitoring program does not include monitoring of beach coastal stations directly in front of storm drains, or "Point 0", the point in the surfzone where the storm drain discharge meets ocean water. Instead, most of the coastal beach monitoring completed by the local health departments and others is conducted at varying distances from the drain, depending on the sampling agency. Currently, county health departments do not monitor directly in front of storm

drains and freshwater outlets because all flowing outlets are posted with permanent warning signs of poor water quality. The model program follows this approach in accord with its primary intent to maximize coastal monitoring efforts by remaining consistent with the health departments' sampling protocols. However, since the ultimate management goal is to ensure that all locations at the beach are safe for swimming, stormwater monitoring agencies should be aware that the impacts to beaches directly in front of most storm drains and freshwater outlets is unknown, but are conservatively considered impacted by the health departments and the SWRCB. As stormwater monitoring and management programs progress, monitoring near drains and freshwater outlets at the beach may need to be adapted to include Point 0 monitoring. The issue of Point 0 sampling is being reevaluated by the State's Beach Water Quality Workgroup and, if the BWQWG revises the recommended health department sampling protocols, the model stormwater program should adjust to reflect this structure.

Enclosed bays and estuaries. In general, beaches in enclosed bays and estuaries (e.g., Newport Bay, Mission Bay) should be an important concern for allocating monitoring resources. This is because there is more potential for retention of bacteria, such waterbodies often have more numerous inputs, populations of birds are often denser, and children are more likely to engage in body contact recreation at these beaches. As at the open-coast beaches, monitoring effort should be allocated in proportion to relative risk, with high-use areas that have numerous inputs receiving the highest priority (Table 5-2). If all portions of an enclosed beach have equal risk, and it is not possible to monitor all urban runoff inputs, then a random subset of such inputs should be monitored, with the number of samples set based on analyses of the statistical power of alternative subsampling schemes. Monitoring should measure indicator levels in the targeted discharges themselves, as well as upcoast and downcoast of the discharge.

Creeks, streams, and rivers. As for the other two types of areas, monitoring of creeks, streams, and rivers should measure indicator levels in targeted discharges themselves, as well as upstream and downstream of the discharge. Because many inland waters in southern California are seasonal or intermittent, rather than perennial, monitoring should be prioritized with the risk-based approach described in Section 5.1.1. This approach prioritizes potential monitoring locations based on both their amount of body contact recreation and levels of bacteria contamination.

The Aliso Creek watershed in southern Orange County (which has been monitored intensively for the past two years) provides one example of how this approach can be applied. In this watershed, a recreational use survey indicated that human use "where the ingestion of water is reasonably possible" (Basin Plan definition of REC1 beneficial use) is concentrated in the lower portion of the Creek in the summer and early fall, when temperatures are warmest. An examination of two years' of monitoring data showed (Figure 5-2) that the late summer and early fall are also the period when bacterial levels are the highest. (The selection of monitoring sites was based on a field reconnaissance to identify those drains above a threshold size that typically had dry weather flow.) Given that bacterial levels are consistently elevated during this time period, if compliance with the Basin Plan REC1 objective could be demonstrated with one or two 30-day, 5-sample monitoring efforts in the late summer and early fall, which would represent the worst-case scenario, compliance is more likely during the rest of the year. This design is the most efficient approach to assessing the condition of the beneficial use; however, because large portions of the year are not monitored, it does not fulfill public health monitoring requirements.

This example from Aliso Creek illustrates the application of the criterion of allocating monitoring effort based on a qualitative risk assessment. It also demonstrates the difference between monitoring to address Question 1 and monitoring to fulfill public health requirements. Thus, even though exceedances occur during other periods of the year, the purpose of the monitoring design

in the example was to assess receiving water quality during the high-priority period. When bacteria levels in the high-priority period consistently drop to near the Basin Plan objectives in the future, it might be worthwhile at that point to expand monitoring to other parts of the year, on the assumption that indicator levels will have dropped below the objectives by that point (assuming the historical pattern stays the same, with the highest levels typically found in the late summer and early fall).

Indicators. Monitoring should use existing indicators (Table 5-1) and use comparable methods across the region. Laboratory intercalibration exercises for bacterial indicators were conducted as part of the Bight '98 and Bight '03 regional studies. Another intercalibration study, sponsored by the City of Los Angeles, will begin in early 2004 and includes most of the laboratories analyzing monitoring samples for SMC member agencies. With all indicators, the emphasis for assessment of recreational water quality conditions should be on comparison to existing standards, the Basin Plan REC1and REC2 for inland areas and AB411 for beaches.

5.1.1.3 Design issues

In general, there is currently a spatial distribution of responsibility for assessing recreational water quality conditions in the region, with county health departments having primary responsibility for beaches and for major inland water bodies (e.g., rivers, bays, lakes and reservoirs) where substantial body contact recreation occurs. In contrast, stormwater programs (i.e., MS4 permittees) tend to monitor inland storm drains and channels and, in some cases, storm drains that discharge directly to the beach. Thus, while there is some overlap between the two sets of agencies, health departments have a responsibility to protect public health while stormwater agencies focus on receiving water conditions and identifying urban runoff contributions to impaired receiving waters. As a result of their respective responsibilities, health departments typically monitor more frequently than do stormwater agencies.

To address Question 1, stormwater agencies should build upon the existing recreational water monitoring programs already implemented by local county health agencies. As a starting point, the stormwater agency should become thoroughly familiar with the existing health agencies' monitoring programs including risk characterization of beaches, monitoring locations, and sampling frequencies for both wet and dry weather. Next, with consultation from the health agency, the following types of questions should be answered to determine if additional monitoring should be conducted by the stormwater agency to answer Question 1:

- Are there urban runoff discharge points at marine beaches that are currently not monitored by the health agency?
- Are there marine beaches impacted by wet or dry urban runoff that are not monitored by the health agency?
- At marine beaches, what is the distance from the point the discharge enters the surfzone and the local health agency's monitoring location?
- What freshwater locations are frequently used for recreation? Are any of these currently monitored by the health agency or another entity? Which of these are potentially impacted by dry and wet weather urban runoff?
- Does the health agency monitor their routine sites during wet weather?

In general, data gaps in the existing health agency monitoring programs that may require new monitoring locations sampled by the stormwater agencies will likely include marine beaches where the health agencies' monitoring location is located away from the storm drain discharge point (thus, existing data may not indicate if the stormwater discharge is causing a problem on the

beach) and at freshwater locations that are currently not monitored by the health agencies. The stormwater agency should work with the health agencies to identify any new monitoring locations and to develop risk characterizations of these locations.

Stormwater agencies may be already working with local health agencies in southern California in many instances. For example:

- For the Pathogen TMDL in Newport Bay, the Orange County Health Care Agency conducts sampling while the Orange County Stormwater Program reports on the results
- In southern Orange County, the Stormwater Program samples and prioritizes coastal storm drains and reports the data to the Health Care Agency
- The Orange County Stormwater Program contracts with the Health Care Agency to conduct sampling and laboratory analyses
- The Riverside County Flood Control and Water Conservation District and San Bernardino County Flood Control District are conducting a bacterial source identification study on the Santa Ana River
- Orange County and San Diego Counties carry out routine IC/ID programs on their respective MS4s during dry weather, with a major focus on bacteria
- The City of Los Angeles conducts daily monitoring of more than two dozen beaches in Santa Monica Bay.

Such collaborative efforts formed the basis for the model monitoring committee's recommendation that such functional coordination be encouraged and expanded throughout the region, in two primary ways:

- Stormwater monitoring programs should strive to fill gaps in spatial coverage of high-priority areas not monitored by County Health Departments and characterized by the combination of elevated indicator levels and human use
- The application of adaptive triggers that would initiate upstream source identification studies by stormwater management agencies when receiving water monitoring has identified a receiving water problem.

Such a division of labor improves overall efficiency by emphasizing the respective strengths of each type of agency.

5.1.2 Habitat assessment

5.1.2.1 Overview and philosophy

Design overview. Table 5-3 presents an overview of the technical design elements for assessment of habitat status, using six distinct station types that fall into both core and regional monitoring categories (see detailed design elements in Section 5.1.2.2).

The model monitoring framework for habitat assessment is based primarily on the Triad approach, in which bioassessment, chemical, and toxicity data provide a variety of perspectives on conditions at a site. It is especially suited to situations where the primary concern is habitat or ecosystem condition and no single or simple suite of indicators afford an unambiguous measure of status (see Box on Bioassessment and Index of Biological Integrity). The framework identifies six different types of stations designed to capture the range of issues related to habitat condition, and capturing both core and regional monitoring issues. In addition to describing a decision framework for interpreting Triad results, the framework includes adaptive features intended to furnish the flexibility needed to adjust to specific local conditions and to accommodate the needs of both wet weather and dry weather sampling. However, the bioassessment leg of the Triad is best suited to perennial streams. Ephemeral stream systems may not be appropriate for routine bioassessment monitoring because they lack established biological communities except perhaps during periods in the spring.

Bioassessment and the Index of Biological Integrity

Rapid bioassessments of macrobenthic invertebrates are quickly becoming a valuable monitoring tool because biological communities are integrators of anthropogenic impacts. These organisms respond to both physical and chemical disturbances and can integrate these impacts over several storms or an entire wet season. The California department of Fish and Game (CDFG) has developed protocols for rapid bioassessments in wadeable rivers and streams and has conducted numerous surveys throughout the State. The CDFG has also developed an Index of Biological Integrity (IBI) for quantitatively assessing the status of biological communities in the San Diego Region. The Stormwater Monitoring Coalition has formed a partnership with the CDFG and the State Water Resources Control Board to build a monitoring infrastructure and standardize bioassessments throughout southern California, then refine an assessment tool, such as the IBI, for the entire region. The CDFG rapid bioassessment manual can be found at www.dfg.ca.gov/cabw/cabw/professionals.PDF

Design philosophy. The inherent complexity of watershed structure, and the variability in structure across watersheds, leads to a range of concerns about the effects of urban runoff on habitat conditions. Each concern is somewhat distinct, requiring a somewhat different monitoring approach, sampling frequency, and set of indicators. For example, some sites may be intended to measure conditions in specific, high-priority habitats (core monitoring), others to provide information about the watershed as a whole (core and/or regional monitoring), and yet others to improve knowledge about certain management issues related to urban runoff (special projects). This complexity is reflected in the several different types of habitat monitoring stations that can be established. In addition, the model monitoring design framework uses the Triad approach to organize this range of possible monitoring needs. The strength of the Triad approach (which is essentially a weight of evidence approach) is that it relies on multiple types of measures to reduce the chance of mistakenly concluding there is no impact when one in fact does exist.

5.1.2.2 Design elements

Types of monitoring sites. The committee identified several kinds of core and regional monitoring stations that could be required in assessing habitat conditions at the watershed scale:

- Long-term, fixed, bottom-of-watershed (but above tidal influence) mass emissions stations to assess cumulative water quality and aggregate loads, with monitoring based primarily on a mass emissions model and including wet weather chemistry and toxicity (core station)
- Spatially extensive, perhaps randomly sited or rotating, stations to support statistically valid comparisons across multiple watersheds, and with monitoring based primarily on the Triad

approach for dry weather sampling and on chemistry and toxicity for wet weather (regional station)

- Site-specific stations focused on the status of high-priority inland habitats of concern, with monitoring based primarily on the Triad approach for dry weather sampling and on chemistry and toxicity for wet weather (core station)
- Site-specific stations designed to generate information to support key program goals, such as source prioritization or BMP implementation and evaluation (core station, special project)
- Coastal estuarine stations to assess status in these key habitats, with monitoring based primarily on the Triad approach (core and/or regional station)
- Coastal ocean stations to assess stormwater plume impacts, conducted primarily as part of the periodic Bight surveys (regional station).

Given this potential variety of station types, monitoring within any particular watershed must be carefully integrated to achieve design efficiencies as well as an overall picture of the watershed. For example, Figure 5-1 presents an example watershed monitoring design, with a range of types of watershed monitoring stations, that illustrates how individual stations can serve more than one function within the watershed design (also see the US EPA strategy for randomized watershed sampling in US EPA 2002).

While there is an extensive body of experience in the region to support the development of core monitoring designs, this is less so for regional monitoring, or watershed-based, designs. The committee therefore outlined the following types of regional assessment designs that could be developed and implemented:

- Probability based designs, similar to the Bight Program design, in which stations are located randomly in order to provide the ability to draw statistically valid inferences about an area as a whole, rather than just the site itself. For example, the probability design used in the Bight Program permits statements about the percentage of the area that is above/below particular levels of different indicators. Such designs can allocate monitoring sites randomly throughout the entire region, or can subdivide the region into a number of strata that are relatively homogeneous. Strata can be defined on any number of grounds, depending on the questions or concerns that have motivated the program. For example, watershed strata could be based on relative amount of urbanization, general habitat type, or channel morphology, among others. Whatever the stratification scheme, the basic design principle is that samples are allocated randomly among strata, with the number of samples per stratum based on a consistent weighting factor (e.g., area of the respective strata). The level of sampling effort required in probability based designs depends, as in all designs, on the specific questions being asked, the underlying levels of variability in the data, and on the level of precision needed for decision making. The intent of the Bight Program's design, for example, is to be purely descriptive, rather than to test for conformity to a predetermined threshold or to detect a particular amount of change over time. Thus, the Program's requirement of 30 samples per stratum is based on a subjective decision by the Program's designers about the size of the confidence limit they are willing to accept in the descriptive statistics.
- Systematic designs, in which stations are located at set intervals along one or more underlying spatial or conceptual frameworks. For example, regional stations could be located on a 1-mile grid, every 1-mile along each river, creek, or stream, at every major discharge into rivers, and so on. One value of systematic designs is that they allow for more detailed mapping of indicator levels across a region. In addition, if resources permit, systematic designs can provide more thorough coverage than do probability based designs. The sampling

requirements in systematic designs are typically based on the degree of spatial resolution desired.

- Early warning designs, in which stations that are considered to be particularly vulnerable a particular impact are monitored as "canaries in the coal mine." Such monitoring can take place on a regular schedule or after the occurrence of an event thought to increase the probability of an impact past an acceptable level. The number of stations in an early warning design will depend on the number of suitable locations available and whether the potential for impact is homogeneous across the region. If the impact potential is homogeneous, then a subset of locations could adequately represent the entire region. If the impact potential is heterogeneous, then the region should be stratified in terms of impact potential and sampling within each stratum scheduled accordingly.
- Rotating designs, in which a different subset of stations in sampled during each sampling event, with the goal of sampling the entire set of stations over a certain period of time. Such designs have the virtue of maximizing the impact of limited monitoring resources because the entire suite of monitoring stations need not be sampled each time. However, because conditions change over time, rotating designs have a diminished ability to support valid comparisons between sets of stations sampled at different times in the rotation schedule. This can be compensated for to some extent by defining comparisons of interest during the design process and then ensuring that such stations are sampled during similar index periods or seasons. The location of stations in rotating designs can be random, systematic, or early warning depending on the kinds of questions being asked.

Evaluating Triad results. Once monitoring data are available, determining whether conditions are protective of beneficial uses depends on a combination of explicit definitions of reference conditions (see Table 4-4) and the ability to interpret results in the context of individual watershed conditions. Given the potential complexity of ecosystem impacts, the committee agreed that no single benchmark should be automatically used as evidence of impact. Thus, there are no hard and fast rules for determining that a receiving water impact has occurred. However, Table 5-4 provides an organized set of rules of thumb for interpreting Triad results and determining if further studies are warranted. Where the full Triad has not been sampled, Basin Plan, Ocean Plan, and other reference benchmarks listed in Table 4-4 could be applicable.

Adaptations of the basic design. Because of the range of specific situations that may occur in different watersheds, the basic design shown in Figure 5-1 may be adapted with a variety of alternative approaches. For example:

- Chemistry and toxicity could be used in wet weather when the bioassessment leg of the Triad is not feasible (e.g., in high flow conditions when biological communities. Any finding of impact could be investigated further with the complete Triad during dry weather (except in ephemeral streams, which rarely have dry-weather flow)
- Toxicity tests could be used in lieu of broader chemistry scans where historical data demonstrates no evidence of impacts at the site and there is no *a priori* reason to believe there are significant sources of chemical contamination
- Bioassessment could be used in lieu of toxicity tests and chemistry scans where the primary concern is the status of a particular habitat and historical data demonstrates no evidence of impacts from urban runoff at the site
- The spatial and temporal intensity of sampling could be adapted to match the spatial scale of the site and the temporal scale of the processes that influence habitat condition
- The suite of chemical analyses can be adjusted (see Tables 5 and 6, and following subsection) based on prior knowledge about sources of contamination.

Thus, the model framework provides an overall context for assessing and tracking habitat status, while allowing for the flexibility needed to make the best use of available information to adapt to specific management information needs.

Constituent list. While the committee emphasizes that the Triad approach (bioassessment, toxicity testing, chemistry monitoring) works best when all three legs are consistently sampled, it also recognized that certain situations may call for sampling only one or two, rather than all three, legs. Thus, the particular combination of Triad measurements to be collected at any individual site or time could be based on the season of the year (wet vs. dry), the location and purpose(s) of the station, the specific problem or question being addressed, the past history of monitoring results at that location. In general, however, sampling effort might be distributed as in Table 5-3 and Table 5-5 (core monitoring column).

The model monitoring committee gave particular attention to the suite of chemical constituents that should be measured at the watershed stations, attempting to balance a desire for regional comparability with the ability to adapt to the specifics of each situation. The committee developed a short list of common constituents (Table 5-6) to be sampled routinely by all programs and an expanded list, some of which would be sampled if needed. In addition, the full EPA priority pollutant list would be sampled once every several years in concert with the regional Bight Program.

A decision about when to add constituents from the expanded list would be dependent on both available information and the management question(s) being asked. For example, past monitoring data or data on historical land uses indicating the presence of legacy pesticide contamination could cause these constituents to be added to the program. As another example, where the focus is on total loads or trends, as at the mass emissions stations, then total metals would be the appropriate monitoring target. In contrast, where receiving water impacts are the primary concern, as at specific habitat stations, then dissolved metals should be measured. It will thus be important to consider the potential use(s) of the monitoring data when deciding which constituents to monitor. Dissolved metals might also be measured when toxicity has been found, the site is on the 303(d) list, or total metals exceeds the relevant CTR value, which is often used as a benchmark in receiving waters for stormwater effects.

Flow measurement and compositing approaches. Many field sampling methods relevant to stormwater monitoring programs are described and reviewed in BASMAA (1995), as well as in various USEPA guidance documents (e.g., USEPA 1992). Of particular interest are methods for estimating flow and compositing approaches for deriving mass emissions estimates.

In general, there are two basic methods for estimating flow. The first is based on engineering equations that use gravity, the height of water in an idealized pipe, the slope of the pipe, and a friction coefficient to derive the flow. The second is based more on direct measurement of the speed of the flow, combined with an estimate of the cross sectional area of the water (computed from the shape of the channel and the height of the water) to derive the flow. There are variations within each of these basic methods. For example, the engineering equations can use unimpeded flow in a pipe or channel or, alternatively, the height of flow over a weir. Similarly, direct flow measurements can be based on the rate of spin of a paddlewheel or on ultrasonic signals from sensors in the water. In addition, there is a range of methods for measuring the height of the water in a channel, the other key input to flow estimates. These methods range from simple staff gauges to various types of pressure transducers or ultrasonic sensors suspended over the water. As a rule of thumb, the more engineered a hydrologic system is, the easier it is to rate for flow. For

example, a concrete channel will typically have a constant cross section and the slope will be constant.

Different approaches have different strengths and weaknesses depending on the particular situation. For example, flow sensors that are mounted in the water are vulnerable to damage from debris carried in storm flows. Downward looking flow sensors can be more suited to smaller channels with space constraints, however, foam on the surface of the water can degrade the accuracy of the reading. Various pressure transducer models differ in their sensitivity and the maximum height of water they can accurately measure. Where the channel configuration permits, flow can be routed through a flume for more accurate measurements; however, flumes cannot handle large volumes of flow.

The United States Geological Survey (USGS), which is generally recognized as producing the most accurate and precise flow estimates, measures flow velocity at several points along a channel cross section at several times with different water heights. These data are then used to develop a flow rating curve specific to that channel. The rating curve can then be used to estimate flow based simply on the height of water at any given time, on the premise that water at a particular height will be moving at a specific speed. This is an empirically derived relationship as opposed to one based on modeled engineering principles. While this method can be the most accurate, it is also the most difficult to implement in terms of up-front effort and costs. In addition, changes to the channel morphology due, for example, to siltation or erosion can undermine the accuracy of a flow rating curve.

The various approaches to flow measurement also differ in terms of their relative accuracy and precision. The USGS attempts to achieve accuracy to within 5%, but that level can be difficult to achieve in channels with scouring, filling, and other sources of bias. Despite the potential drawbacks of empirical methods, they are considered to have better accuracy than the model-based engineering methods, although it can be very expensive to improve the precision of the empirical estimates. In contrast, the engineering methods can produce relatively precise estimates, but the accuracy may be less than that achievable with empirical methods, depending on the degree to which model assumptions are violated. The model monitoring committee was reluctant to propose specific performance standards for flow monitoring. The preferred approach in any particular situation will depend on site characteristics and the use(s) intended for the data.

In contrast, the committee considered that performance standards for the measurement of mass emissions, especially as part of a long-term trends monitoring program, were more relevant. There are two primary methods for estimating the concentrations of constituents of interest in urban runoff. The first, flow compositing, collects water samples for analysis at specific increments of flow. The second, time compositing, collects water samples at specific increments of time. These two approaches were described in more detail and compared in an intensive year-long sampling program (Leecaster et al., 2002) that found that flow compositing was the most efficient sampling approach to achieve a given degree of accuracy and precision. A minimum of 10 to 12 samples per composite using a flow-weighted scheme efficiently reduced bias and improved precision. Time-weighted composites can achieve similar levels of precision and bias, but required a far greater number of samples; more than 42 samples per composite were necessary.

5.1.2.3 Design issues

Ecosystem perspective. There are four major habitat types in the region:

- Ocean
- Estuaries / wetlands
- Streams, creeks, and channels
- Lakes and reservoirs.

Because they are somewhat of a special case, the committee agreed to set lakes and reservoirs aside for possible consideration at a later time. Based on the Bight '98 study in the coastal ocean, which showed that riverine effects on the benthic ecosystem are small, the committee agreed that further study of stormwater impacts in the coastal zone should be the focus of regional efforts (as in Bight '03). Such regional studies could then provide more concrete guidance to individual programs where urban runoff plume effects (perhaps on the water column) are found to be substantial. Thus, the model monitoring program framework focuses explicitly on streams, creeks, channels, and rivers, and on estuaries and wetlands.

Habitat monitoring for these habitat types can involve a wide range of methods, including:

- Water chemistry
- Sediment chemistry
- Aqueous toxicity
- Sediment toxicity
- Bioaccumulation
- Bioassessment
- Hydrology

Given this variety of potential measurements, the committee determined that monitoring should be based on an ecosystem perspective, rather than consisting of collections of functionally disconnected measurements on the one hand, or focusing on individual species or chemical parameters on the other. The Triad approach, which combines chemistry, toxicity, and bioassessment (including physical habitat measures) provides a practical means of integrating a wide range of measurements, as well as a structure on which to base adaptive follow-up monitoring. It should be noted that the bioassessment leg of the Triad may not be applicable in some situations, such as ephemeral streams, where minimum requirements are not consistently met. However, the overall watershed monitoring framework (see Figure 5-1) also provides a structure for including sites targeted at specific management issues such as problem characterization or BMP evaluation.

5.2 Extent and magnitude monitoring

Evaluation of the extent and magnitude of receiving water problems addresses Question 2: What is the extent and magnitude of the current or potential receiving water problems? Monitoring related to Question 2 provides useful information for prioritization of both source identification studies (Questions 3 and 4) and specific management actions intended to remediate the problem. Monitoring of the extent and magnitude of problems falls primarily into the special projects category (Table 4-1) because these are typically efforts targeted at specific problems and with clear beginning and ending points. However, to the extent that such studies require collaboration among multiple responsible parties and/or extend over large areas, they would also have some of the characteristics of regional monitoring.

5.2.1Extent and magnitude assessment – recreational water quality

5.2.1.1 Overview and philosophy

Table 5-7 presents an overview of the technical design elements for regional monitoring of recreational water quality monitoring focused on estimating the extent and magnitude of receiving water problems.

The model monitoring framework for assessing the extent and magnitude of recreational water quality problems assumes that the stormwater agency will work with local health departments to determine those high-priority (i.e., combination of human use and contamination) locations where extent and magnitude of a bacteria problem should be defined. Currently, coastal beach monitoring by local health agencies near urban runoff discharge points is comprised of one or two fixed stations located at various distances from the point of discharge. Thus, often the length of beach impacted by urban runoff has not been fully characterized. In most cases, even less data is likely available for inland freshwater sites. The monitoring design to determine the extent and magnitude of bacterial contamination should include estimates of bacterial loads, in addition to upcoast/downcoast (at beaches) or upstream/downstream (along creeks, streams, and rivers) arrays of samples. An estimate of temporal persistence would depend on monitoring through at least one complete year.

The extent and magnitude monitoring design is essentially the same for both regional monitoring and special projects aspects of the program, with regional monitoring encompassing a larger area and/or greater numbers and kinds of potential sources (see 5.2.1.2 Design elements).

5.2.1.2 Design elements

Regional monitoring to establish extent and magnitude is distinguished from special projects in its larger geographic scale and/or greater number and kinds of potential sources. The committee did not establish an explicit dividing line between these two categories of monitoring (i.e., regional and special projects), since real-world situations will exist on a continuum of scale and complexity. Regional monitoring will therefore most likely involve a wider range of parties and require more collaborative implementation. However, this is not a substantive design issue because the basic design approach is the same for both regional monitoring and special projects.

A monitoring design to establish the extent and magnitude of bacterial contamination must have the ability to determine:

- The degree of temporal persistence of a particular receiving water problem
- The spatial extent of a particular receiving water problem
- The relative severity of a particular receiving water problem, compared to other parts of the region.

Therefore, the monitoring design for this question should include:

- The core or regional monitoring assessment site(s) in the location of interest
- Measures of bacteria loads, which requires flow estimates
- Measures of the spatial extent of actual impact in receiving waters, which requires an array of upstream/downstream samples in creeks, and upcoast/downcoast samples, regularly spaced grids, or random arrays on the beach and in bays/estuaries
- Measures of temporal persistence or pattern, such as between wet and dry weather, which requires at a minimum samples through one calendar year.

Depending on the extent of existing knowledge, these design elements may be scaled as needed to fill data gaps. For example, where the spatial extent of contamination is well understood, additional sampling at only a few representative stations might be required to define the temporal extent of contamination. Conversely, where the spatial extent is not well understood, a survey of shorter-term but more intensive monitoring at an array of stations (either regularly spaced or random, depending on the site) might be necessary to define the boundary of contamination during periods when human use and contamination combine to create a high-priority period. Finally, if the spatial and temporal extent are well defined, a focused sampling effort during one or more representative subsets of the high-priority period might be used to determine peak loads and/or receiving water levels. A rule of thumb in such studies is to use the highest sampling frequency possible in order to better characterize the nature of variability in extent and magnitude. The key adaptive element of the bacteria monitoring design for assessing extent and magnitude thus includes the ability to modify the spatial and temporal intensity of sampling as needed, both in the discharge and the receiving waters.

Indicators in studies of the magnitude and extent of recreational water quality problems should include the levels and loads of the three main bacterial indicators (Table 5-7), along with other measures that may add useful information (e.g., stream or channel flow, patterns of human use).

5.2.13 Design issues

Existing sampling effort may be adequate in many cases to characterize the spatial and temporal extent of bacterial contamination, along with its severity. For example there already exist substantial monitoring data on levels of bacterial indicators at many coastal monitoring sites. Additional monitoring effort is being initiated along the San Diego and southern Orange County coasts, targeted at coastal storm drains, and at specific inland sites as part of these counties' dry weather reconnaissance and IC/ID programs.

In many cases, however, existing monitoring designs may not be optimal for measuring the extent, magnitude, and severity of bacterial contamination associated with urban runoff. At coastal locations near urban runoff discharges, sampling data that provides length of beach impacted by bacteria densities above the health standards may not available. Many factors can affect the length of beach impacted including the bacteria densities and flow rate of the urban runoff discharge, surfzone conditions including swell, wind and tide, and the configuration of the storm drain and beach relative to the incoming swell. Routine coastal monitoring completed by local health agencies may not capture extent. At freshwater inland sites, less routine monitoring data are collected by local health agencies and data on the extent of the problem will typically be limited to special studies. The extent and magnitude of bacteria problems along inland creeks, streams, and rivers resulting from urban runoff discharges may be particularly difficult to assess because there are often many, diffuse sources of bacteria, including natural sources. For both coastal and freshwater sites, defining extent of impact from individual discharges during wet weather may be difficult because plumes from separate discharges will often overlap and because of increased loading of bacteria from natural sources (particularly at freshwater locations). A further complication stems from the fact that extent and magnitude are likely to be very different in wet and dry weather.

In addition to these issues, data from the various bacterial monitoring programs are not aggregated, making it difficult to identify broad spatial patterns and temporal trends, and only recently has a laboratory intercalibration study for bacteria been undertaken. Further, there are growing concerns that the bacterial indicators, alone, may not provide an accurate picture of the extent and magnitude of actual human pathogen contamination. Not only do the indicators not measure pathogens directly, there is some evidence that the indicators themselves may propagate

in the MS4 system and may derive partly or entirely from animals and birds. Thus, even a data aggregation and mapping exercise that described indicator patterns in detail might not necessarily describe the extent and magnitude of actual pathogen problems associated with urban runoff.

While the model monitoring committee developed quantitative metrics to assist in prioritizing studies under other aspects of the overall program (e.g., TIEs, upstream bacterial source identification, it determined that the expert judgment of health department staff is the best source of information for triggering efforts to determine the extent and magnitude of bacterial contamination in each of the three kinds of areas (linear open-coast beaches; enclosed bays and estuaries; creeks, streams, and rivers). Thus, stormwater program staff would review monitoring data with health department staff and representatives of other potential sources to determine if they have completed additional sampling or have knowledge of data that establish the extent and magnitude of contamination, and to receive recommendations from health agency staff about which monitoring locations should be the first priority for additional efforts.

5.2.2 Extent and magnitude assessment – habitat

5.2.2.1 Overview and philosophy

The model monitoring framework for assessing the extent and magnitude of habitat problems builds on the core monitoring Triad approach, by adding repeated measurements to characterize temporal persistence, upstream sampling of the Triad components to describe spatial extent, and/or adaptive features such as TIEs or targeted upstream source identification studies to better define the magnitude of the problem (see Table 5-4). These latter two types of studies begin to merge into the kinds of special project source identification efforts described in Sections 5.3 and 5.4, illustrating the fact that real-world distinctions between monitoring categories are not always clear cut.

The extent and magnitude monitoring design is essentially the same for both regional monitoring and special projects aspects of the program, with regional monitoring encompassing a larger area and/or greater numbers and kinds of potential sources.

5.2.2.2 Design elements

Regional monitoring to establish extent and magnitude is distinguished from special projects in its larger geographic scale and/or greater number and kinds of potential sources. The committee did not establish an explicit dividing line between these two categories of monitoring (i.e., regional and special projects), since real-world situations will exist on a continuum of scale and complexity. Regional monitoring will therefore most likely involve a wider range of parties and require more collaborative implementation. However, this is not a substantive design issue because the design approach is the same for both regional monitoring and special projects.

Table 5-4 provides an overall framework for a set of adaptive monitoring and special study responses to a finding that there is or could be a receiving water problem, many of which focus on determining the magnitude, extent, and/or severity of any such problem. The type and design of any such adaptive monitoring in a particular instance will depend on the results of the Triad measurements, site-specific factors, and other types of relevant knowledge such as land use data or information on upstream sources. For example, additional toxicity tests at higher dilutions, accompanied in some instances by TIEs, can provide more information about the nature of toxicity (as described above, this is one example where assessment of the extent and magnitude of a problem would overlap somewhat with source identification special projects). Or, repeating toxicity tests with different toxicity test organisms could also improve the understanding of toxicity. In addition, repeating routine measurements over time at a specific station or group of related stations will determine the temporal extent of the problem. Similarly, extending an array

of stations upstream and downstream of the original monitoring station will help assess the spatial extent of the problem.

While Table 5-4 presents a conceptual overview of possible studies, the specific efforts required in any particular situation will depend on which leg(s) of the Triad have been sampled, on the nature of the monitoring findings, and on the characteristics of the environment. Issues that should be considered in designing adaptive studies of extent and magnitude include:

- The nature of the "signal," e.g., which leg(s) of the Triad are involved
- The strength of the "signal"
- Available information about possible causes of actual or potential problems
- The spatial and temporal extent of the habitat of concern
- Local geography and hydrology.

The preferred monitoring design, whether it be regional or a special study, is described in detail within the section on habitat assessment (Section 5.1.2). There are a variety of approaches for allocating sites including stratified random, systematic, or rotating designs depending on the specific area to be evaluated and indicators to be measured. For sure, managers will want to integrate the extent and magnitude designs into design(s) for assessment, which will maximize continuity and cost-efficiency.

5.2.2.2 Design issues

Assessing the extent and magnitude of impacts on ecosystem health will begin with an assessment of results from the suite of core watershed stations. As described in more detail in Section 5.1.2, stations should be located in receiving waters with key beneficial uses, where significant contamination problems related to urban runoff are known to exist, where the likelihood of such problems is high, in high-value habitats whose continued protection is a high priority, at core mass emissions stations, and at distributed locations that will provide a basis for comparisons among watersheds.

5.3 Urban runoff contribution assessment

Assessment of the relative contribution of urban runoff to a receiving water problem addresses Question 3: What is the relative urban runoff contribution to the receiving water problem(s)? Data from this monitoring element are useful primarily in prioritizing more extensive source identification efforts under Question 4. Assessments of the urban runoff contribution fall into the special projects category (Table 4-1) because such studies are targeted, one-time efforts. However, they may also take on the collaborative aspects of regional monitoring if they involve multiple parties and/or cover large areas (Table 4-1).

5.3.1 Overview and philosophy

The model monitoring framework for assessing the relative urban runoff contribution to both recreational water quality and habitat problems is primarily a matter of loads estimation at a fixed downstream reference point. Similar loads estimation approaches apply to both recreational water quality and habitat indicators, as described in the following sections, including expert judgment, visual reconnaissance, land use modeling, empirical tributary monitoring, the use of conservative tracers, and the evaluation of existing data (see Box on Modeling). The actual combination of methods in any particular instance will depend on the quantity and quality of historical data, the

nature of the receiving water problem, the number and types of potential sources, and the physical structure and hydrography of the watershed. In addition, many of the methods applicable to this issue are also directly applicable to the more detailed source identification special projects described in Section 5.3 and 5.4.

The extent and magnitude monitoring design is essentially the same for both regional monitoring and special projects aspects of the program, with regional monitoring encompassing a larger area and/or greater numbers and kinds of potential sources. The source identification case studies in Appendix 3 include examples of both. For example, the Contaminated Sediment Task Force study in Los Angeles Harbor was a regional study involving many participants, while the investigation of elevated total dissolved solids in Orange County was a special project conducted by the County Stormwater Program alone.

Modeling

Watershed modeling is a useful tool for estimating flow, concentrations or loads from unmonitored watersheds or unmonitored storm events. There are a variety of models available to watershed managers, from very simplistic spreadsheet-based techniques to very complex time-variable algorithms. The decision on which model to use is a function of the management questions and types of assumptions watershed managers are willing to make, as well as the availability of data for running the model. Simplistic models (i.e. rational method) answer questions at large temporal and spatial scales, make the most assumptions, and require the least data. Complex models (i.e. HSPF, SWMM, etc.) answer questions at finer temporal and spatial scales, make fewer assumptions, but require the most data. See Singh and Woolheiser (2002) for a recent review of watershed hydrology models.

5.3.2 Design elements

This section describes a general set of approaches to source identification, accompanied by a set of illustrative case studies presented in Appendix 3. The committee chose this approach because the wide variety of specific situations in which source identification studies might be required makes it impossible to define a standard approach.

Assessing the relative urban runoff contribution to a particular receiving water problem involves loads estimation at a fixed downstream point, which is in or near the affected receiving water. Depending on how the receiving water is defined in a particular instance, "downstream" may be at the point where a tributary enters a larger creek, where a creek enters a wetland or estuary, or where a river empties into the ocean. Similar loads estimation approaches apply to both recreational water quality and habitat indicators, including:

- Expert judgment
- Visual reconnaissance and observation
- Land use modeling
- Empirical tributary monitoring
- The use of unique and/or conservative tracers
- Evaluation of existing data.

These approaches can be extended with more detailed information provided in US EPA (1993), Pitt (2001), and SWRCB (2001), which describe a range of methods for identifying sources of stormwater pollution. A decision about which approach(es) to use in any particular instance will depend on the quantity and quality of historical data, the nature of the receiving water problem, the number and types of potential sources, and the physical structure and hydrography of the watershed. Thus, even a preliminary loads estimation for a high-priority bathing beach, such as in Mission Bay in San Diego, might proceed through several steps from expert judgment which provides the basis for targeting visual observation which in turn forms the basis for modeling

and/or empirical measurement. Where information from the Triad approach is available, Table 5-4 provides an example of a decision framework for interpreting monitoring results to better focus preliminary source identification efforts.

One key element of the committee's thinking is that such preliminary loads assessments should ideally be a collaborative effort, undertaken by all the parties responsible for potential inputs to the receiving water. Such regional, collaborative efforts will be more efficient and more productive because they will streamline data acquisition, integration, and evaluation. They can also provide a basis for future, more intensive, collaborative source identification efforts, should they be required.

While in general the needed accuracy and precision is only low to moderate, the degree of accuracy and precision needed will depend in part on the relative size of the urban contribution to the overall loads. For example, if the urban contribution is small (i.e., less than 5% of the cumulative load), there would probably be no need to refine the estimate any further because large variability does not change the answer to the question; urban runoff is still a small contribution. In contrast, if the urban contribution is 15% +/- 15%, there would be a need to refine the estimate to determine whether and to what extent to proceed to the more detailed source identification work described in Section 5.4. Thus, monitoring designs for this issue might proceed through multiple iterations.

When identifying and characterizing potential sources, it is important to use terminology that is consistent with standard USEPA usage. Thus:

- Urban runoff: both wet (stormwater) and dry weather (non-stormwater) runoff from urban land uses
- Dry weather runoff: runoff from urban land uses in dry weather
- Stormwater runoff: runoff from urban land uses during storms

In addition, there are other land uses and sources that discharge to MS4s but that are typically not under the jurisdiction of municipalities, including:

- Industry and POTW discharges (which are regulated by state permit)
- Other discharges permitted by the RWQCB
- State and federal facilities
- Agriculture
- Augmented water
- Open lands
- Native American lands
- Special districts, school districts, parks
- Utilities
- Aerial deposition.

5.3.3 Design issues

There are two primary design issues associated with determining the relative urban runoff contribution to a receiving water problem. The first is the fact that the wide variety of specific situations likely to be encountered makes it infeasible to recommend a standard design. The committee resolved this issue by providing general guidance on study design, referencing two reports that describe detailed monitoring methods, and including a set of representative case

studies in Appendix 3. The second is that there may be cases in which the relative urban runoff contribution is small. In such cases, the committee agreed that a municipal permittee should not be obligated to independently conduct detailed source identification studies beyond the activities already required in their respective NPDES permits. The committee therefore recommended a threshold level of urban runoff contribution above which permittees would be required to independently perform detailed source identification studies, and set this level at 5 – 10%. A lengthier discussion of the threshold issue is provided in Section 4.3.

5.4 Source identification studies

More detailed source identification studies address Question 4: What are the sources to urban runoff that contribute to receiving water problems? These are almost always special studies and are conducted when preliminary source identification work under Question 3 (Table 4-1) shows that urban runoff constitutes a significant portion of the source(s) of a receiving water problem. Information from these more detailed special projects can help refine receiving water monitoring, improve fundamental understanding of stormwater contamination processes, and help guide management actions intended to reduce sources and their attendant impacts.

5.4.1 Overview and philosophy

Table 5-8 presents an overview of the technical design elements for special projects monitoring of recreational water quality and habitat focused on source identification. Since the primary philosophy of the model program is not to design site-specific studies, this section provides guidance on adaptive triggers for special studies. Therefore, this section creates a series of starting and stopping rules for when to initiate detailed source identification studies and tools for prioritizing locations on where to conduct them.

The model monitoring framework for detailed source identification for both recreational water quality and habitat involves two kinds of studies. The first are studies at downstream stations to gain additional insight into the sources of the problem. For bacteria, this may include more traditional sanitary survey methods and/or more sophisticated biological testing. For habitat, this may include toxicity tests with a broader suite of test organisms, TIEs, or more detailed analyses of the pattern of impact in communities or on key organisms. The second kind of study will be upstream source tracking and source identification studies that may use a variety of methods. In general, however, they will share the same design, which will involve using a basic indicator of impact (e.g., bacterial indicator, toxicity) to trace the strength of the impact signal upstream, in either wet or dry weather, combined with more powerful and/or targeted methods (e.g., genetic source identification, TIEs, chemical reconnaissance, physical reconnaissance) to locate the specific source(s) of pollution.

5.4.2 Design elements – recreational water quality

There are two primary design elements for source identification related to recreational water quality. The first is to identify and then prioritize the upstream sites at which source identification efforts will be conducted. The second is to identify a core set of methods for bacterial source tracking at these sites. The approaches for these issues are somewhat different for beaches and for inland waters because inland waters (i.e., creeks, streams, and rivers) have a clear upstream – downstream morphology while beaches may not. Instead, contamination from a discharge can often spread out in both directions along a beach.

Open-coast and enclosed beaches. In contrast to creeks, there is no consistent and obvious upstream – downstream relationship between urban runoff inputs (typically storm drains) and the receiving water. Thus, it is not possible to estimate impact in terms of the difference between an upstream and a downstream station. The committee therefore proposed a prioritization approach based on the relationship between bacterial levels in individual storm drains and levels in the nearby receiving water.

Figure 5-3 demonstrates this approach with bacterial monitoring data from San Diego County. The figure is divided into five sections that reflect different relationships between indicator levels in the receiving water and those in the outflow of the coastal storm drain itself. In general, higher priority is given to storm drain discharges that are consistently high and receiving water densities that exceed health standards. While Figure 5-3 illustrates a prioritization approach specifically for fecal coliform, parallel methods could readily be developed for total coliforms and Enterococcus, since standards for these indicators in marine waters have been developed.

Once a subset of inputs has been identified for further source identification efforts, the well-accepted approaches described in US EPA (1993), Pitt (2001), and SWRCB (2001) are excellent sources of guidance. When implementing such approaches, it will be important to be systematic and thorough yet also have clear stopping points (Figure 5-4). In particular, the stopping rules are prioritized to focus on determining, first, whether there identifiable sources of human sewage and, second, whether there are other controllable anthropogenic sources. First and foremost, stormwater agencies need to identify and remove all sources of human inputs (See Box on Microbial Source Tracking). The committee agreed that further source identification efforts for nonhuman inputs should await the development of more powerful microbial source identification tools with the ability to more accurately distinguish among a range of specific sources (e.g., livestock, pets, birds, other wildlife). This testing is currently being conducted by the SMC and others (Griffith *et al* 2003).

Microbial Source Tracking

Microbial Source Tracking (MST) is a class of potentially powerful tools for identifying sources of bacteria in receiving waters. The traditional fecal indicator bacteria typically measured by county health departments are not human specific and can arise from any warm-blooded organism including birds, dogs, cats, livestock, horses or other mammals. Thus, the goal of most MST techniques is to determine if the measured indicator bacteria are of human origin and, if not, what was their host of origin. There are numerous MST techniques available, but all are still experimental. The Stormwater Monitoring Coalition co-sponsored a study in 2002 to test 11 MST techniques by 22 of the nations' leading researchers for their accuracy and precision in southern California. The results, which are summarized in the *Journal of Water and Health* (Volume 1, No. 4, November 2003), show that none of techniques worked perfectly and many were susceptible to false positives. As a result of the intercalibration study, research continues on refining and improving the more promising methods, but a single definitive technique(s) is still unavailable.

Creeks, streams, and rivers. Source identification studies in creeks, streams, and rivers are particularly problematic because bacteria are not conservative in the MS4, may originate from a wide range of small, diffuse sources, and can be highly variable in both space and time. However, because bacteria die off due to ultraviolet (UV) exposure as they flow downstream, there may be an upper limit on the distance bacteria can travel in longer natural creeks and streams and still impact high-priority areas of concern. (Bacteria can also be removed through sedimentation; however, during the low flow conditions characteristic of dry weather in southern California, UV exposure is the dominant factor.) Therefore, the committee developed a conceptual model (Figure 5-5; Appendix 4) to identify and prioritize inputs for upstream source identification work. This conceptual model also assumes that core monitoring has shown there is an exceedance of a bacteria water quality objective in a high-priority recreational use area, and

that either regional monitoring or special projects that it is persistent and large enough to warrant further action, and that urban runoff constitutes a substantial proportion of the source(s).

The following steps describe how to apply this conceptual model in a particular situation:

1. Locate high-priority use area
2. Define upstream boundary of high-priority use area
3. Calculate the number of days required for 95% of bacteria to die off, using the equation in Appendix 4 and an inactivation rate selected from the range presented in Appendix 4
4. Calculate average net downstream flow rate of the creek or stream in meters/day
5. Calculate the linear distance required for 95% of bacteria to die off, using the following equation:

   Days required for 95% die off x flow rate in meters/day = X meters
6. Define an upstream segment with its bottom edge at the upstream boundary of the high-priority use area and its upstream edge X meters upstream above that.

There are two constraints that would affect the application of this conceptual model. First, it may be most appropriate in dry weather in longer natural creeks and streams with relatively slow flow rates, because bacteria die off rates in creeks that are partially or fully concrete-lined may be less than transport times. For example, it would be less applicable to systems with discontinuous flow. Second, spatial and temporal variability in bacteria densities mean that deriving more than rough estimates of the upstream segment may require substantial sampling effort. However, even a somewhat rough estimate could prove valuable in focusing upstream source identification studies. Thus, this conceptual model is not directly applicable to all situations and should be applied carefully. For example, in the Santa Ana River above Prado Dam, flow during dry weather is discontinuous and consists of disinfected POTW effluent and rising groundwater. Though bacteria levels in this case exceed REC1 standards, there are no dry weather urban runoff discharges and the conceptual model would not be directly applicable.

Within this upstream portion of the drainage system, termed a "potential source segment," there may be a number of discharges or other inputs that must be prioritized for source identification study. The committee developed a unique tool for prioritizing such inputs, based on a combination of their loads and local impact on the receiving water, as explained in the following paragraph.

The influence of inputs within the potential source segment on the downstream high-priority recreational use area will result from a combination of the size of the input (bacterial load) and the effect of each input on the receiving water (impact). This is because loads alone do not reflect a discharge's potential impact on the receiving water. A large load discharged into a creek section with high flow may have little downstream effect, while a small load discharged into a creek section with low flow may have a disproportionately large downstream effect. Thus, prioritization of inputs for upstream source identification efforts, as well as monitoring of the inputs in the potential source area, should be based on both loads and impact, with impact measured as the difference between bacterial indicator levels at upstream and downstream stations. Table 5-9 demonstrates the committee's approach for combining measurements of both load and impact into a single metric for prioritizing a series of inputs. Generating this metric involves the following steps:

1. Calculate the bacterial load of each direct input to the creek within the potential source segment

2. Calculate the receiving water impact of each direct input, measured as the simple difference in bacterial concentration between stations 25 feet upstream and downstream of the input
3. Scale loads values from 0 – 1, with the lowest load assigned the value of 0 and the highest the value of 1
4. Scale impact values from 0 – 1
5. For each input, calculate the average of the scaled loads and impact values as:

$$\frac{\text{Scaled load + scaled impact}}{2}$$

6. Rank inputs within the potential source segment in terms of their average scaled value
7. Select highest ranked inputs for further source identification efforts upstream of each input.

If desired, loads and/or impact estimates could be weighted to emphasize one or the other to a greater degree. The highest ranked inputs would be selected for further source identification efforts, with the threshold established based on the pattern of average scaled values and cost and logistical constraints. It will be important to ensure that the data used for calculating this metric be gathered during that portion of the year when human health risk is the highest. It is also important to recognize that the relationship of each individual input in potential source segment to health-based water quality objectives in their immediate vicinity is not directly relevant to the prioritization exercise. There are two reasons for this. First, the prerequisite for the upstream prioritization exercise is that the downstream high-priority recreational use area has been determined to exceed water quality objectives on a regular basis. Second, a series of inputs could all contribute to a cumulative problem at the downstream use area, even if none of them individually exceeds water quality objectives.

Similar to the approach for beaches, once a set of inputs have been identified as potential sources of receiving water problems, upstream source identification studies on creeks, streams, and rivers should be conducted. The stopping rules described above for beaches and in Figure 5-4, are also directly applicable to creeks, streams, and rivers.

5.4.3 Design elements – habitat

The design elements for source identification for habitat are somewhat more complex than for recreational water quality. There are two main reasons for this. First, it is more difficult to quantitatively prioritize sites because the Triad approach involves three distinct types of data and there are no established standards or benchmarks for two of these, toxicity and bioassessment. Second, because these three data types sometimes produce inconsistent results (see Table 5-4 for examples), it can be difficult to establish clear benchmarks for when the weight of evidence calls for upstream source identification efforts. In addition, the availability of complete Triad data, as well as the interpretation of monitoring results, may be more complex in certain situations, such as ephemeral streams.

Rather than a quantitative metric, such as that shown for bacterial indicators in Table 5-9, the committee developed an overall framework for implementing a weight of evidence approach to triggering additional, targeted source identification studies (Tables 5-10 and 11). Table 5-10 provides expanded definitions of the thresholds in Table 5-4 that would trigger additional adaptive studies in response to combinations of Triad results. Table 5-11 then assigns a priority for source identification studies to each possible combination of Triad results from Table 5-4. Thus, in Table 5-11, the combination of results represented by Row 3 of Table 5-4 (persistent chemical exceedances, no toxicity, no benthic impact) would have a low priority for source identification studies. In contrast, the combination of results represented in Table 5-11 by Row 7 (no chemical exceedances, high toxicity, benthic impact) would have a high priority.

Monitoring results should be evaluated, using Table 5-4 as guidance, to determine whether the probable source(s) of impact is physical, chemical, or unknown. Upstream source identification efforts should then be initiated according to the set of priorities suggested in Table 5-21. Upstream source identification efforts should build on those performed to preliminarily assess the urban runoff contribution to receiving water problems, and should include detailed visual inspection of MS4s, water courses, and drainage areas as a first step. Visual inspections can then be followed with the water quality based source identification methods described in U.S. EPA (1993) and Pitt (2001).

As part of this overall framework, the committee did develop a quantitative method for combining toxicity testing results into a single metric (see Appendix 5) that would assist in ranking stations in terms of their aggregate toxicity. This ranking can then be used to assign priorities to stations for follow-up TIEs, as part of a source identification effort. The metric combines information about the degree of toxicity, the persistence of toxicity at a station throughout the year, and the percentage of test species found to exhibit toxicity.

Table 5-11 sets forth a set of starting rules for source identification efforts targeted at habitat impacts. Stopping rules are similar to those described for recreational water quality (Figure 5-6), with the same emphasis on identifying controllable sources.

5.4.4 Design issues

The same basic methods for detailed source identification apply to both recreational water quality and habitat. While the specific methods used in any instance will, of course, differ somewhat depending on the watershed structure and the constituents involved, they will include one or more of the following set of approaches, which are listed in order of increasing effort involved:

1. Evaluation of existing data
2. Visual reconnaissance and observation
3. Empirical tributary monitoring, which involves sampling tributary mouths upstream of the receiving water impact in order to identify the most likely point(s) of input
4. Sampling, or chemical "fingerprinting" of individual sources, including further upstream along tributaries, which can include the use of unique and/or conservative tracers.

These are similar to the methods described for the preliminary source identification in Question 3. However, Question 4 involves a more detailed focus on identifying specific sources of urban runoff and a greater degree of quantification than needed for Question 3. These methods are described more fully in US EPA (1993), Pitt (2001), and SWRCB (2001), which provide detailed descriptions of study designs, field sampling, and data analysis and interpretation appropriate for tracking sources of both bacteria and chemical pollutants.

The committee also recognized the need to supplement these methods descriptions with more explicit starting and stopping rules for detailed source identification studies. Starting rules are necessary for ensuring that source identification studies, which can be costly and time consuming, are triggered where and when monitoring data strongly suggest the presence of a persistent problem. Such rules are also needed to focus available resources on the highest priority problems. Stopping rules are essential for ensuring that source identification studies do not continue indefinitely, but end when reasonable and realistic expectations have been met. Such rules are proposed for receiving water problems associates with both recreational water quality and habitat.

5.5 Trend monitoring

Assessment of trends, for both recreational water quality and habitat, addresses Question 5: Are conditions in receiving waters getting better or worse? Question 5 provides the logical feedback to determine if management actions are having their intended effects. While this is a core monitoring element, the locations of stations and the relative emphasis on specific indicators may depend on information developed in answer to other questions (Table 4-1) related to the where problems exist (Question 1), the extent and magnitude of such problems (Question 2), and the nature and number of sources (Questions 3 and 4). Trends monitoring is a core monitoring program element (Table 4-1).

5.5.1 Recreational water quality trends

5.5.1.1 Overview

Table 5-12 presents an overview of the technical design elements for trend monitoring of recreational water quality at beaches; bays and estuaries; and creeks, streams, and rivers.

The model monitoring framework for trend monitoring of recreational water quality is based on statistical power analysis of a monitoring design that involves repeated sampling over time at fixed stations. For recreational water quality, sampling data from one inland watershed (Aliso Creek) suggests that trend monitoring might productively focus on one period of the year when both bacteria levels and human use are highest. Power analysis results from this watershed also suggest that the statistical power of the trend monitoring design can vary widely from station to station, as well as across indicators. However, comparable data were not available to support analogous conclusions for beaches and bays and estuaries. Thus, the committee recommends that programs begin trend monitoring with ten to fifteen weekly samples per year for three years, and then conduct site-specific power analyses with the software package developed by the committee and made available on the SCCWRP website. Power analyses on available data from southern California show clearly that differences across sites mean that a "one size fits all" approach to trend monitoring design will not work. The recommended approach will therefore ensure appropriate levels of both within-year replication and number of years of trend monitoring. Given that trend monitoring will most likely need to continue for a minimum or ten or fifteen years, devoting the first three years to obtaining site-specific data will not result in any substantial reduction in the longer-term power of the trend monitoring design. Any such reduction will be outweighed by gains in site-specific efficiency and statistical power.

See Section 4.5, for an expanded discussion of the use of statistical power analysis in the core trend monitoring aspects of the model monitoring design.

5.5.1.2 Design elements

The following subsections address, in turn, trend monitoring design in high-priority recreational areas where use is concentrated and then in the upstream areas that are the sources of contamination. Where such upstream source areas have been identified and are the targets of active source reduction efforts, it may be useful to monitor trends in the levels of these sources.

Conditions in high-priority recreational areas. Figure 5-2 shows that fecal coliform levels (the basis of the REC1 Basin Plan standard in this case) vary considerably among months in the high-priority area in lower Aliso Creek. While there are not equally intensive data records from other creeks throughout the region, it is reasonable to assume that similar variability would be present elsewhere. Thus, it would statistically be most efficient to stratify trend analyses by month, with separate trend analyses for each month. Lumping months that normally have highly divergent

fecal coliform counts would increase the within-year variability and make it more difficult to detect trends over time.

Power tests (see Section 4.5.1 and Figure 4-1 for a discussion of the importance of statistical power analyses as part of a trend monitoring design) on the monthly Aliso Creek data were thus conducted to estimate the number of years and number of samples within a 30-day period that might be required to detect different percentages of decrease in fecal coliform counts. Power tests were performed only at stations and for months for which more than one year was sampled because the power tests require an estimate of between-year variability. Figure A2.1 (Appendix 2), with plots for each station organized in order of increasing geomean, shows that the ideal months to sample differ from station to station. For example, the highest power for a given sampling effort occurs in August for the SOCWA treatment plant site (Figure A2.1d) but in June for the Aliso Wood Canyon Park Site (Figure A2.1c).

These results provide guidance that illustrates how the details of a trend monitoring design could be developed. Figure 5-5 shows that in the study of Aliso Creek the peak bacteria levels coincide with the period of highest recreational use in the late summer and early fall. Thus, it would be most efficient to target a trend monitoring program at one or more of the months in that portion of the year. Once a monitoring period is chosen, power analyses such as those in Figure A2.1 can be used to determine a preferred combination of reduction in indicator values, short-term sampling intensity, and length in years of the monitoring program. As mentioned above, the software package available on the SCCWRP website provides a straightforward means for each program to conduct power analysis with site-specific data.

High-priority inputs. Trend monitoring may also be useful where specific upstream inputs have been identified that contribute to contamination at a high-priority recreational use area. The key trend monitoring question for such inputs is whether the loads of bacteria, and their local impacts on the receiving water, are decreasing over time. Loads are a clear measure of the size of the input itself, and directly reflect the relative success of BMPs in the local drainage area. However, loads alone are insufficient to measure a discharge's potential impact on the receiving water. Thus, trend monitoring of high-priority inputs should include both loads and impact (measured as the difference between stations upstream and downstream of the discharge). A quantitative method for prioritizing upstream inputs for management actions and for trend monitoring is described above in Section 5.4.2, which discusses source identification approaches.

The monitoring data from Aliso Creek provide a useful illustration of how power analysis can be used to design a site-specific trend monitoring program. Figure A2.2 (Appendix 2) shows that bacterial levels in the high-priority drains in Aliso Creek, as well as at the upstream and downstream stations associated with each, are typically highest in the June – September period and lower throughout the rest of the year. The illustrative power analyses therefore focused on this period in order to reduce the within-year variability. Power analyses were performed for two measures, the load from each drain (Figure A2.3) and the impact of each drain (Figure A2.4) measured as the difference between the downstream and upstream stations. These results suggest that it will not be feasible to track loads at station J06 (Figure A2.3) nor to track impacts at station J01P08 (Figure A2.4). With the exception of these parameters at these stations, however, the power analysis also suggests that a sampling frequency of 20 samples, collected in the June – September period, would be adequate to detect an average 50% reduction in loads and an average 30% reduction in impact over a ten year period.

5.5.1.3 Design issues

Trends monitoring of existing bacterial indicators is complicated by their extreme variability in space and time. Thus, there may be limitations on our ability to detect change with current monitoring technology.

There are two aspects of trend monitoring with regards to recreational water quality. The first is related to conditions in the high-priority recreational use area(s) that are the major focus of concern. The question here is therefore whether indicator levels are trending downward toward applicable water quality objectives. The second aspect of such trend monitoring is related to whether the high-priority inputs upstream of the high-priority recreational area are improving. The question here is somewhat different, instead being whether loads and localized impacts (a measure of the direct effect on the receiving water) are declining. This is why the recommended indicators include both a measure of concentration and a measure of loads.

5.5.2 Habitat trends

5.5.2.1 Overview

Assessment of habitat trends addresses Question 5: Are conditions in receiving waters getting better or worse? Question 5 provides the logical feedback to determine if management actions are having their intended effects. While this is a core monitoring element, the locations of stations and the relative emphasis on specific indicators may depend on information developed in answer to other questions (Table 4-1) related to the where problems exist (Question 1), the extent and magnitude of such problems (Question 2), and the nature and number of sources (Questions 3 and 4).

Table 5-13 presents an overview of the technical design elements for trend monitoring of habitat conditions.

The model monitoring framework for trend monitoring of habitat conditions is based on statistical power analysis of a trend monitoring design that involves repeated sampling over time at fixed stations. For habitat, the timing of trend monitoring will differ depending on the parameters being tracked, with mass emissions monitored during wet weather and bioassessment during dry weather. Available data indicate that power analysis results can vary widely from station to station, as well as across parameters. Thus, the committee recommends that programs begin trend monitoring with two or three samples per year for three years, and then conduct site-specific power analyses with the software package developed by the committee and made available on the SCCWRP website.

5.5.2.2 Design elements

Trend monitoring is relevant to all aspects of habitat monitoring in the watershed design. Trend monitoring can occur at one or more of the core monitoring assessment stations depending on criteria such as the level of management concern or whether a receiving water problem has previously been documented.

Appendix 2 provides example statistical power analysis results for two aspects of a trend monitoring design (event mean concentration (EMC) and mass emissions) for which sufficient data currently exist for such an analysis. These results Figures A2.5 - and A2.14, which use data from several representative long-term stations in Orange County, reflect, as do the bacteria results described above, large differences in power from station to station and across parameters. (Data from other monitoring programs were not suitable for power analysis.) As a result, it is not possible to recommend levels of sampling effort that would be generally applicable across the

region. Therefore, the committee recommends that trend monitoring programs for habitat begin by collecting two or three samples per year for three years and then use these data to conduct site-specific power analyses to refine the following aspects of the design:

- The amount of change expected or desired
- The number of samples to be collected per year
- The number of years before the expected change is detected.

These analyses can be carried out with the software package available on the SCCWRP website. While results will undoubtedly vary from site to site, the committee's analyses of available historical monitoring data (Appendix 2) suggests that it is unlikely that substantial amounts of change (e.g., reductions of 50% or more) will be observable in less than ten years and that management targets and monitoring designs should be developed accordingly.

5.5.2.3 Design issues

Trends monitoring of habitat indicators is complicated by the variety of station types, the long list of monitored constituents, and the complexity of ecosystem processes that influence observed trends. Therefore, general guidance is presented for two main categories of monitoring data – mass emissions and toxicity. As for the recreational water quality aspect of Question 5, the power analysis software available on the SCCWRP website will enable each program to perform relevant site-specific power analyses as required

Table 5-1. Design overview for assessment monitoring of recreational water quality.

Type of area	Site location	Frequency	Indicator(s)
Open-coast beach	Gaps in Health Department coverage ● High-priority areas ● Flowing stormdrains Drain itself Upcoast and downcoast of drain Characterize dispersion of drain plume prior to siting upcoast and downcoast stations	Based on BWQWG prioritization Daily – monthly (see Table 5-2)	Total coliform Fecal coliform Enterococcus
Enclosed bays and estuaries	Gaps in Health Department coverage High priority areas Subsample of flowing stormdrains Drain itself Upcoast and downcoast of drain	Based on BWQWG prioritization Daily – monthly (see Table 5-2)	Total coliform Fecal coliform Enterococcus
Creeks, streams, and rivers	High-priority areas Drain or other input Upstream and downstream of input	Weekly in high-use season	Total coliform or E. coli Fecal coliform Enterococcus

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Table 5-**2. The Beach Water Quality Workgroup's risk-based approach fo**r determining sampling frequency. The presence of lifeguards is an indicator of high-use beaches that are most likely above the 50,000 users threshold in Assembly Bill 411.

	Likelihood of Contamination			
Usage	**High**: e.g., stormdrains that flow continuously, frequently exceeding bacterial standards; pier areas	**Medium**: e.g., stormdrains that flow intermittently or continuously with infrequent exceedances of standards	**Low**: source nearby, do not expect a problem, stormdrain not flowing but if had a sewage spill it would flow to beach, if a problem it would be long term	**No known source**
High use beach: lifeguarded, high use surf/dive area	Daily or 5X per week	5X per week	Weekly or 5X per month	Weekly or 5X per month
Accessible sandy beach: low use surf/dive area or other water contact recreation area (wind surfing, kayaking)	2 – 3X per week	Weekly or 5X per month	Weekly or 5X per month	None
Other accessible shoreline: rocky coastline, small coves accessible by trails, private homes limit access	Weekly or 5X per month	Weekly or 5X per month	Monthly or other identification system	None
Inaccessible: beach area > 1 mile from access area	None	None	None	None

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Table 5-3. Design overview for assessment monitoring of habitat.

Type of area	Site location	Frequency	Indicator(s)
Mass emissions	Bottoms of watersheds	3 storms / yr for 3 yrs, then modify per results of power analyses	Chemistry (see Table 5-16) Toxicity
Watershed	Random or rotating, perhaps per Bight design	Every few years, perhaps per Bight Program schedule	Triad in dry weather Chemistry, toxicity in wet weather
High-priority inland habitat	High-value habitat either impacted or threatened	1 or 2 / yr in dry weather	Triad
Program goals	As needed based on nature of specific goal(s)	Dependent upon problem, question	Dependent upon problem, question
Estuaries	Random per Bight design Key habitats and/or downstream of major inputs	Every few years per Bight design 1 or 2 / yr, in wet and/or dry, depending on problem, question	Chemistry (see Table 5-16) Toxicity
Nearshore ocean	Random and/or clustered in plumes, per Bight design	Every few years per Bight design	Chemistry (see Table 5-16) Toxicity

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Table 5-4. Decision framework for interpreting triad results. Possible conclusions and actions/decisions are intended as general guidance, dependent on the specific monitoring results found and the actual relationships among chemistry, toxicity, and benthic data.

	Chemistry	Toxicity	Benthic Alteration	Example Conclusions	Example Actions or Decisions
1.	Persistent exceedance of water quality objectives	Evidence of toxicity	Indications of alteration	Strong evidence of pollution-induced degradation	Toxicity tests at higher dilutions to better quantify toxicity Use TIE to identify contaminants of concern, based on TIE metric Initiate upstream source identification as a high priority
2.	No persistent exceedances of water quality objectives	No evidence of toxicity	No indications of alteration	No evidence of current pollution-induced degradation Potentially harmful pollutants not yet concentrated enough to cause visible impact	No immediate action necessary Conduct periodic broad scans for new and/or potentially harmful pollutants
3.	Persistent exceedance of water quality objectives	No evidence of toxicity	No indications of alteration	Contaminants are not bioavailable Test organisms not sensitive to problem pollutants	TIE would not provide useful information with no evidence of toxicity Continue monitoring for toxic and benthic impacts Consider whether different or additional test organisms should be evaluated Initiate upstream source identification as a low priority
4.	No persistent exceedances of water quality objectives	Evidence of toxicity	No indications of alteration	Unmeasured contaminant(s) or conditions have the potential to cause degradation Pollutant causing toxicity at very low levels Synergistic effects of multiple chemicals at low levels causing toxicity	Recheck chemical analyses and evaluate detection limits relative to reported toxic levels Verify toxicity test results Consider additional advanced chemical analyses Toxicity tests at higher dilutions to better quantify toxicity Use TIE to identify contaminants of concern, based on TIE metric Initiate upstream source identification as a medium priority

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	Chemistry	Toxicity	Benthic Alteration	Example Conclusions	Example Actions or Decisions
5.	No persistent exceedances of water quality objectives	No evidence of toxicity	Indications of alteration	Alteration may be due to physical impacts, not toxic contamination Test organisms not sensitive to problem pollutants Synergistic effects of multiple chemicals at low levels causing toxicity	No action necessary due to toxic chemicals Initiate upstream source identification (for physical sources) as a high priority Consider whether different or additional test organisms should be evaluated
6.	Persistent exceedance of water quality objectives	Evidence of toxicity	No indications of alteration	Toxic contaminants are bioavailable, but in situ effects are not demonstrable Benthic analysis not sensitive enough to detect impact Potentially harmful pollutants not yet concentrated enough to change community	Determine if chemical and toxicity tests indicate persistent degradation Recheck benthic analyses; consider additional data analyses Toxicity tests at higher dilutions to better quantify toxicity If recheck indicates benthic alteration, perform TIE to identify contaminants of concern, based on TIE metric Initiate upstream source identification as a high priority If recheck shows no effect, use TIE to identify contaminants of concern, based on TIE metric Initiate upstream source identification as a medium priority
7.	No persistent exceedances of water quality objectives	Evidence of toxicity	Indications of alteration	Unmeasured toxic contaminants are causing degradation Pollutant causing toxicity at very low levels Synergistic effects of multiple chemicals at low levels causing toxicity Benthic impact due to habitat disturbance, not toxicity	Recheck chemical analyses and consider additional advanced analyses Toxicity tests at higher dilutions to better quantify toxicity Use TIE to identify contaminants of concern, based on TIE metric Initiate upstream source identification as a high priority Consider potential role of physical habitat disturbance
8.	Exceedance of water quality objectives	No evidence of toxicity	Indications of alteration	Test organisms not sensitive to problem pollutants Benthic impact due to habitat disturbance, not toxicity	TIE would not provide useful information with no evidence of toxicity Initiate upstream source identification as a high priority Consider whether different or additional test organisms should be evaluated Consider potential role of physical habitat disturbance

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Table 5-5. Example distribution of monitoring effort among the various kinds of stations in the watershed design. Special studies would be implemented when results of core or regional monitoring indicated a need for them. Specific triggers initiate adaptive monitoring and special studies designed to answer questions about the magnitude, extent, and source(s) of problems.

Station type	**Core monitoring**	**Regional monitoring**	**Further monitoring / special studies**
Mass emissions	Triad, including broader suite of chemistry		TIEs (Q4) Upstream source ID (Q4)
Watershed		Bioassessment Basic chemistry Some toxicity	Expanded toxicity, chemistry (Q2) TIEs (Q4) Upstream source ID (Q4)
High-priority habitat	Bioassessment Chemistry (if prior reason) *		Toxicity, chemistry (Q1, 2) TIEs (Q4) Upstream source ID (Q4)
Program goals	Dependent on question(s)		
Estuaries	Toxicity Chemistry (if prior reason) *		TIEs (Q4) Upstream source ID (Q4) Process studies (Q1 – 4) Biology (e.g., benthos, bioaccumulation) (Q1, 2)
Nearshore ocean +		Plume tracking Plume toxicity Plume chemistry	

* Chemical monitoring could be deferred until bioassessment or toxicity results suggest a potential problem.
+ Conducted as part of the periodic regional Bight program.

Table 5-6. The short list of chemical constituents that should be sampled routinely by all programs and an expanded list to be sampled where routine monitoring data or other information suggest the need for additional information and/or where appropriate to the management question being asked.

Category	Short list	Expanded list
Trace metals	total Cd, Cr, Cu, Ni, Pb, Zn	dissolved (with hardness)
Nutrients	NH_3, total Kjeldahl Nitrogen (TKN), NO_3, total P	
Bacteria	total coliform, fecal coliform or E. coli, Enterococcus	
Pesticides	diazinon, chlorpyrifos, other OP pesticides	others as necessary, e.g., legacy pesticides (DDT, chlordane, lindane), emergent pesticides (e.g., pyrethroids)
Conventionals	temperature, pH, hardness, specific conductance, dissolved oxygen	chemical oxygen demand (COD), sulfides
PAHs	if methods are available that are suitable for measuring on particles, at low detection limits	
Volatiles		dry weather only
Suspended solids	total suspended solids (TSS)	
Priority pollutants	every 5 years, with Bight Program	

Table 5-7. Design overview for extent and magnitude monitoring of recreational water quality problems. Regional monitoring is distinguished from special projects in its larger geographic scale and/or greater number and kinds of potential sources

Type of area	**Site location**	**Frequency**	**Indicator(s)**
Open-coast beach	Input(s) of concern Spaced array upcoast and downcoast of input of concern	One calendar year to establish basic pattern, then: Daily within representative periods (e.g., storms, dry weather, dominant current regimes)	Concentration and loads: • Total coliform • Fecal coliform • Enterococcus Dye
Enclosed bays and estuaries	Input(s) of concern Based on nature of problem, either: • Spaced array around input of concern • Regular grid throughout area of concern • Random array throughout area of concern • Gradient array downcurrent of input of concern	One calendar year to establish basic pattern, then: Daily within representative periods (e.g., storms, dry weather, dominant current regimes)	Concentration and loads: • Total coliform • Fecal coliform • Enterococcus Dye
Creeks and streams	Regular grid throughout high-priority use area	One calendar year to establish basic pattern, then: Daily within subsample of high-use period	Total coliform or E. coli Fecal coliform Enterococcus Dye

Table 5-8. Design overview for both recreational water quality and habitat source identification under Question 4: What are the sources to urban runoff that contribute to receiving water problems?

Type of area	Site location	Frequency	Indicator(s)
Recreational water quality			
Open-coast beach	Inputs that fall in upper right section of Figure 5-3	Ongoing until reach stopping rules in Figure 5-7	Total coliform Fecal coliform Enterococcus
Enclosed bays and estuaries	Inputs that fall in upper right section of Figure 5-3	Ongoing until reach stopping rules in Figure 5-7	Total coliform Fecal coliform Enterococcus
Creeks and streams	High-priority inputs as identified with conceptual model in Figure 5-3	Ongoing until reach stopping rules in Figure 5-7	Total coliform or E. coli Fecal coliform Enterococcus
Habitat			
All areas except coastal ocean	At core monitoring site Upstream of core monitoring site	Ongoing until reach stopping rules in Figure 5-8	Constituents identified in Questions 1 - 3

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Table 5-9. Aliso Creek stations in order of scaled load and impact. Impact = downstream **concentration – upstream concentration on each date. Load = factor x flow (csf) x concentration in pipe on each date. Scaled values are rescaled to 0 – 1. Average scaled** values = average of scaled impact and load values. Stations are ranked in order of average scaled values.

Station	Avg scaled	Impact scaled	Load scaled	Impact	Load
J01P08	0.45442	0.30327	0.60558	1.09240	5.12476
J01P28	0.42830	0.16437	0.69223	0.59208	5.80725
J02P05	0.41653	0.21205	0.62102	0.76381	5.24640
J04	0.41279	0.12574	0.69984	0.45291	5.86718
J01P01	0.40517	0.22449	0.58585	0.80864	4.96939
J02TBN1	0.40237	0.23424	0.57049	0.84376	4.84841
J03P01	0.39515	0.17026	0.62004	0.61328	5.23868
J01TBN8	0.39016	0.27729	0.50303	0.99881	4.31707
J01P03	0.35542	0.10754	0.60331	0.38738	5.10688
J03P02	0.34631	0.04993	0.64270	0.17984	5.41714
J01P27	0.34413	0.05564	0.63262	0.20040	5.33780
J01P30	0.34067	0.10229	0.57906	0.36847	4.91588
J03P05	0.33684	0.04794	0.62573	0.17270	5.28352
J03TBN2	0.33178	0.19535	0.46821	0.70366	4.04286
J01P23	0.32485	0.09907	0.55062	0.35686	4.69191
J03P13	0.32480	0.09263	0.55698	0.33365	4.74199
J06	0.32433	0.09277	0.55589	0.33415	4.73343
J01P06	0.30957	0.12342	0.49573	0.44455	4.25962
J01P26	0.30500	0.05205	0.55794	0.18750	4.74956
J05	0.28978	0.05328	0.52628	0.19192	4.50018
J01P05	0.28974	0.08773	0.49175	0.31600	4.22829
J01TBN2	0.28929	0.12163	0.45695	0.43812	3.95419
J03TBN1	0.28574	0.09032	0.48116	0.32534	4.14483
J01P22	0.28419	0.06092	0.50745	0.21944	4.35194
J07P01	0.26681	0.09332	0.44031	0.33613	3.82309
J01TBN4	0.26512	0.05184	0.47840	0.18674	4.12309
J01P04	0.25812	0.06553	0.45072	0.23603	3.90509
J01P25	0.25406	0.05010	0.45801	0.18047	3.96254
J01TBN3	0.24684	0.04788	0.44580	0.17248	3.86634
J01P33	0.24246	0.05250	0.43242	0.18909	3.76094
J01P24	0.20587	0.03620	0.37553	0.13040	3.31286
J01P21	0.14696	0.04556	0.24836	0.16411	2.31128

Table 5-10. Definitions of the triggers in Table 5-4, the Triad interpretation framework, designed to initiate further adaptive studies to **identify potential sources of impact. "BRI"** refers to the regional Benthic Response Index for estuaries developed by the Bight **Program. "IBI" refers to the Index of Biotic** Integrity, a regional bioassessment index under development by the Stormwater Monitoring Coalition.

Possible trigger in Table 5-4	Definition of trigger
Persistent exceedance of water quality objectives	Exceedance of relevant Basin Plan or CTR objectives by 20% for 3 sampling periods
Evidence of toxicity	High score, in relation to other stations, on metric that combines magnitude and persistence of toxicity observed over an entire year (see Appendix 5: TIE Metric)
Evidence of benthic alteration	BRI score that indicates substantially degraded community (in estuaries) IBI score that indicates substantially degraded community (in freshwater creeks, streams, and rivers)

Table 5-11. Summary of the upstream source identification priorities from Table 4-7, based on combinations of the chemical, toxicity, and benthic components of the triad approach. **"Yes" and "No" refer to whether or not data from each component exceeded the triggers** described in Table 5-20.

Table 4-7 Row	Triad Component	Yes	No	Source ID Priority
1	chemistry	X		
	toxicity	X		
	benthos	X		High
2	chemistry		X	
	toxicity		X	
	benthos		X	None
3	chemistry	X		
	toxicity		X	
	benthos		X	Low[1]
4	chemistry		X	
	toxicity	X		
	benthos		X	Medium
5	chemistry		X	
	toxicity		X	
	benthos	X		High (for physical components)
6	chemistry	X		
	toxicity	X		
	benthos		X	Medium
7	chemistry		X	
	toxicity	X		
	benthos	X		High
8	chemistry	X		
	toxicity		X	
	benthos	X		High

[1] If further testing indicates appropriate and sensitive enough toxicity tests were used and analytical results suggest pollutant is not bioavailable.

Table 5-12. Design overview for trends monitoring of recreational water quality.

Type of area	Site location	Frequency	Duration	Indicator(s)
Open-coast beach	Input(s) of concern at high-priority beaches Upcoast and downcoast stations	Weekly within representative periods (e.g., storms, dry weather, dominant current regimes) Repeated yearly	10 – 15 per year for 3 years, then based on power analysis	Concentration and loads: • Total coliform • Fecal coliform • Enterococcus Dye
Enclosed bays and estuaries	Input(s) of concern at high-priority sites Stations bracketing input(s)	Weekly within representative periods (e.g., storms, dry weather, dominant current regimes) Repeated yearly	10 – 15 per year for 3 years, then based on power analysis	Concentration and loads: • Total coliform • Fecal coliform • Enterococcus Dye
Creeks and streams	High-priority use area High-priority upstream inputs	Weekly with representative periods (e.g., storms, dry weather, dominant current regimes) Repeated yearly	10 – 15 per year for 3 years, then based on power analysis	Concentration and loads: • Total coliform or E. coli • Fecal coliform • Enterococcus Dye

Table 5-13. Design overview for trends monitoring of habitat.

Type of area	Site location	Frequency	Duration	Indicator(s)
Mass emissions	Bottoms of watersheds	3 storms / yr for 3 yrs, then modify per results of power analyses	Based on power analysis	Chemistry (see Table 4-8) Toxicity
Watershed	Random or rotating, perhaps per Bight design	Every few years, perhaps per Bight Program schedule	Ongoing	Triad in dry weather Chemistry, toxicity in wet weather
High-priority habitat	High-value habitat either impacted or threatened	1 or 2 / yr in dry weather	Based on power analysis Revisit when habitat status changes	Triad
Program goals	As needed	Dependent upon problem, question	Based on power analysis Until goals met / change	Dependent upon problem, question
Estuaries	Random per Bight design Key habitats and/or downstream of major inputs	Every few years per Bight design 1 or 2 / yr, in wet and/or dry, depending on problem, question	Ongoing for Bight Based on power analysis for key habitats and downstream stations	Chemistry (see Table 4-8) Toxicity
Nearshore ocean	Random and/or clustered in plumes, per Bight design	Every few years per Bight design	Ongoing	Chemistry (see Table 4-8) Toxicity

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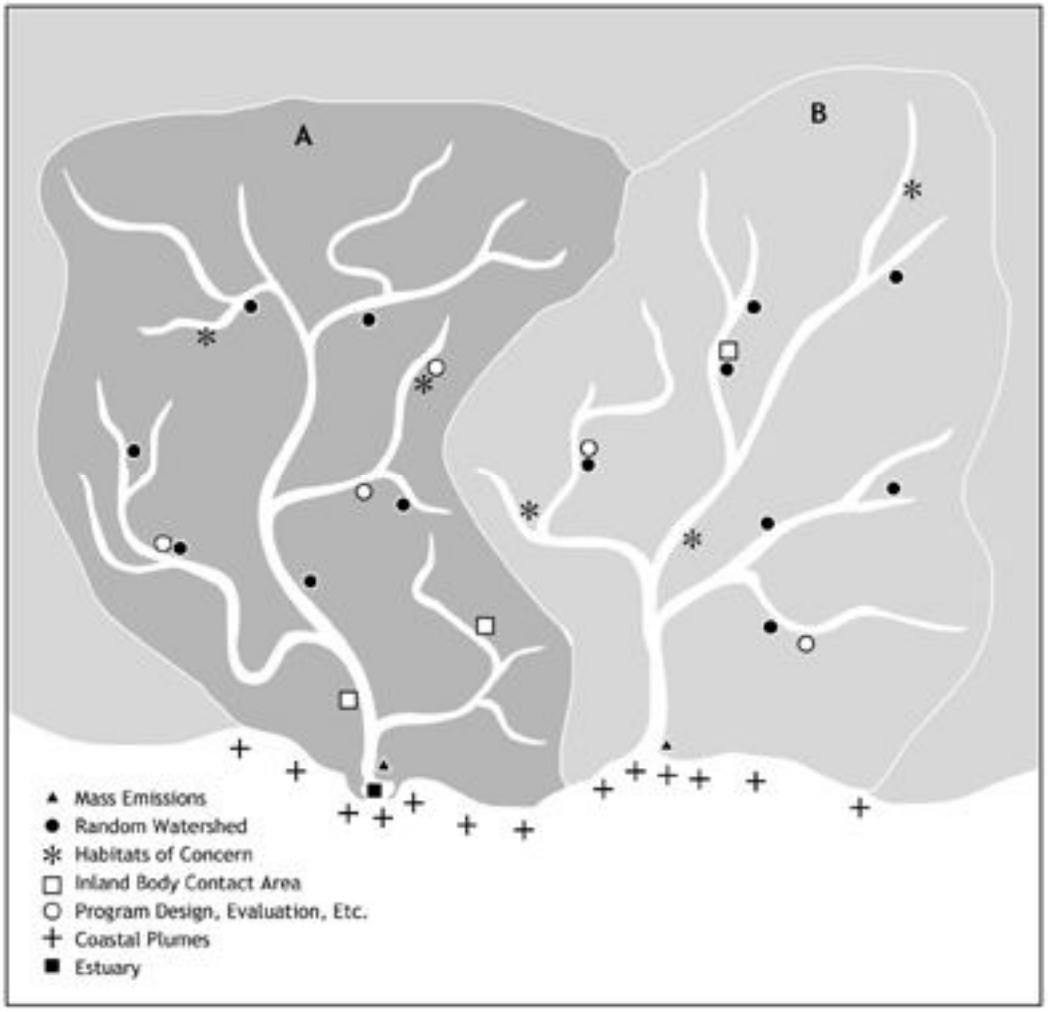

Figure 5-1. Example model monitoring program design in an idealized watershed.

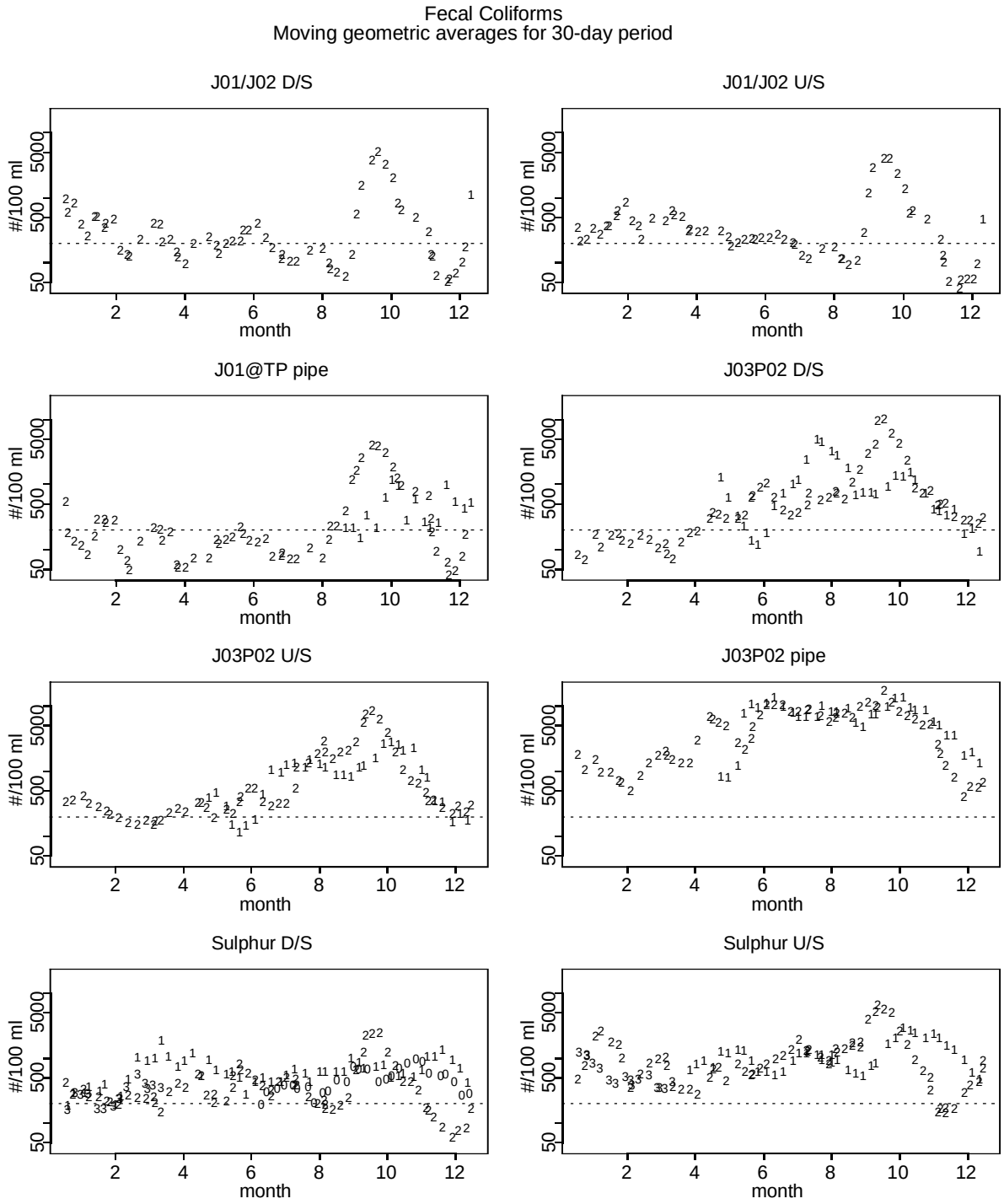

Figure 5-2a. Fecal coliform measurements at and upstream/downstream of discharge points in lower Aliso Creek. Data points are 5-sample moving geometric averages. The horizontal dashed line represents the Basin Plan REC1 objective for fecal coliforms (geomean not higher than 200/100 ml). The point symbols indicate the year of sampling (i.e., 1 for 2001, 2 for 2002).

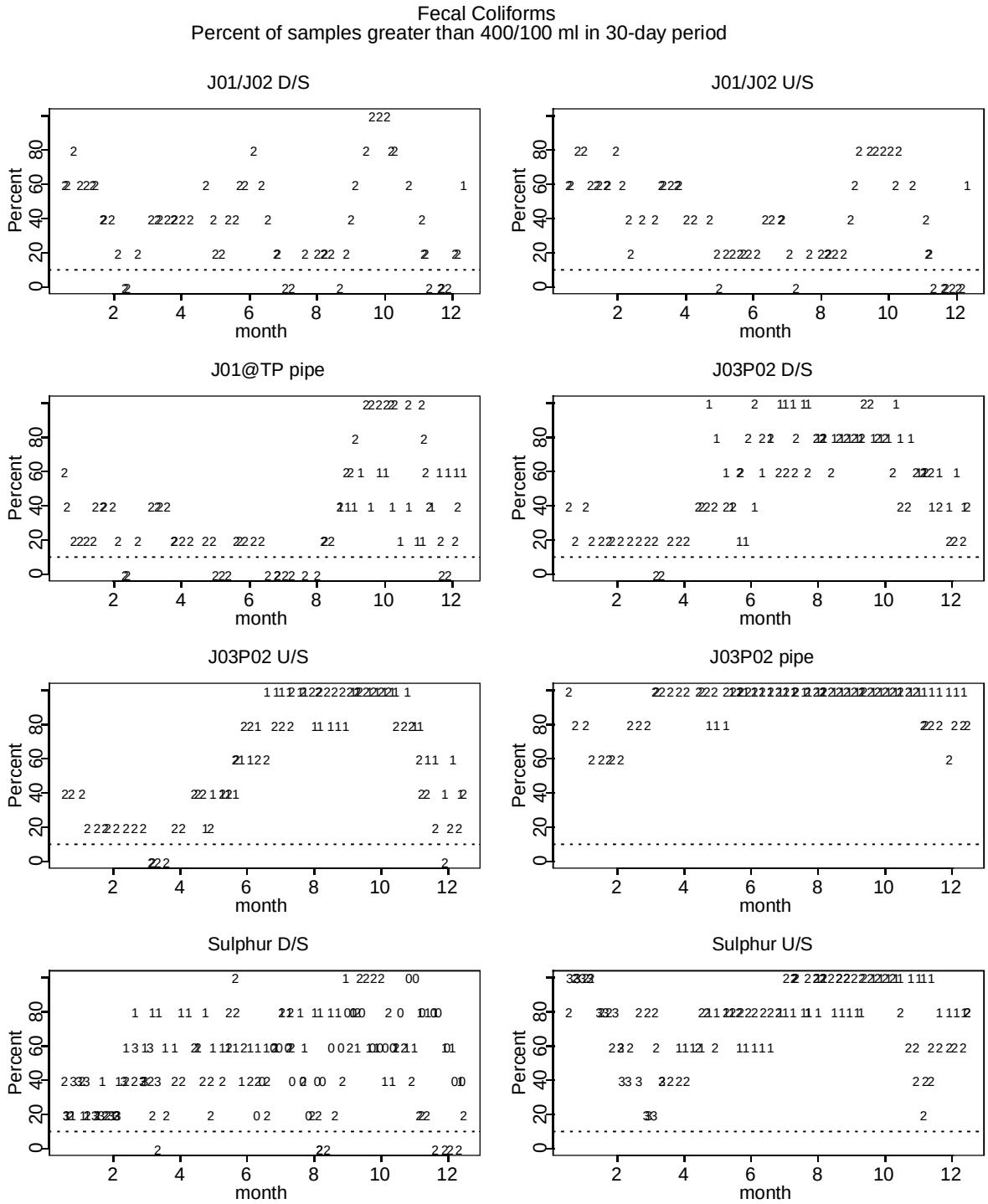

Figure 5-2b. Fecal coliform measurements at and upstream/downstream of discharge points in lower Aliso Creek. The data points are the percent of fecal coliform samples above 400/100 ml in the five most recent samples. The horizontal dashed line represents the Basin Plan REC1 objective for fecal coliforms (no more than 10% above 400/100 ml). The point symbols indicate the year of sampling (i.e., 1 for 2001, 2 for 2002).

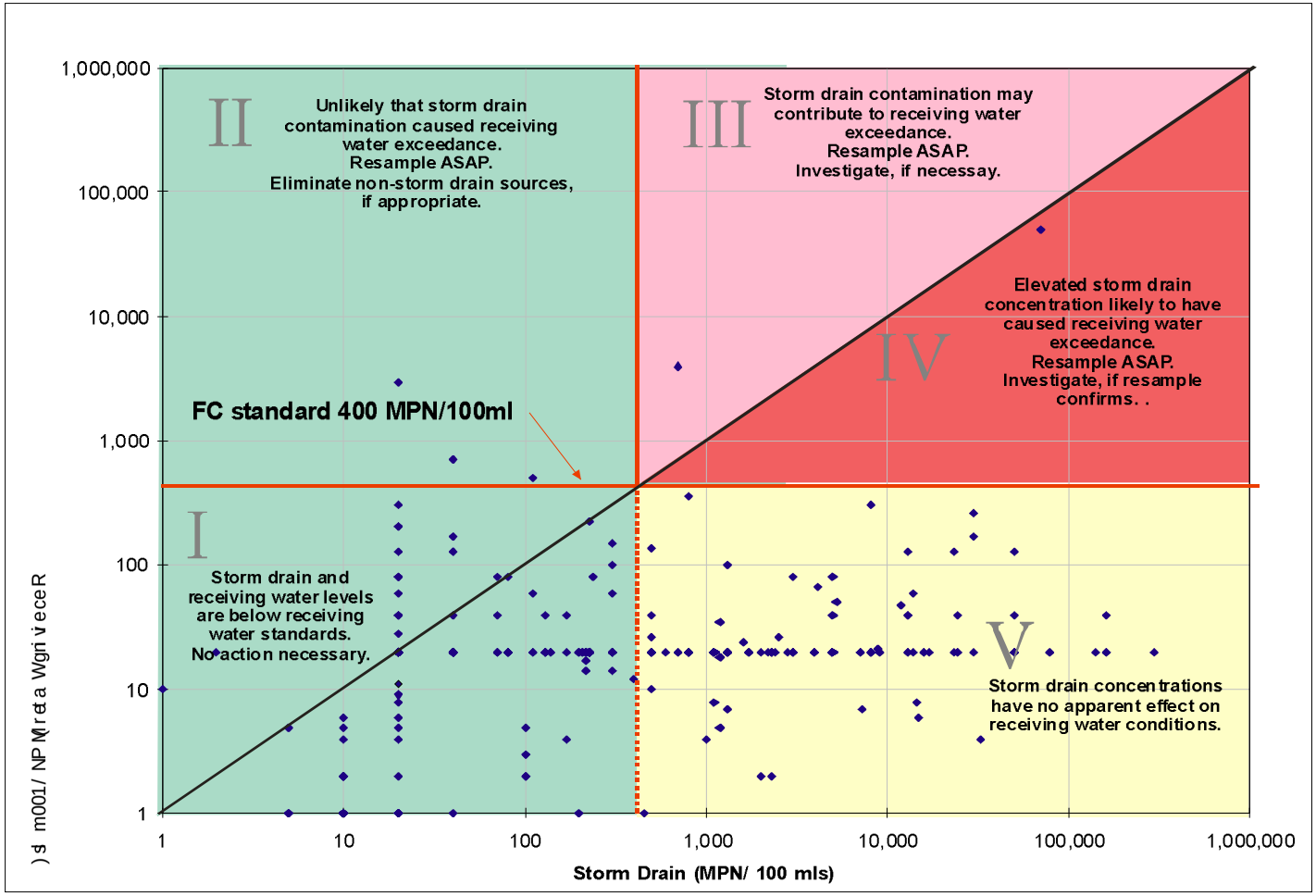

Figure 5-3. Approach for prioritizing coastal and estuarine bacterial inputs for further upstream source identification efforts. The highest priority is given to situations in which elevated bacterial indicator levels in the discharge are matched with elevated levels in the receiving water. This figure shows an example using fecal coliform, and analagous figures could be prepared with other indicator data.

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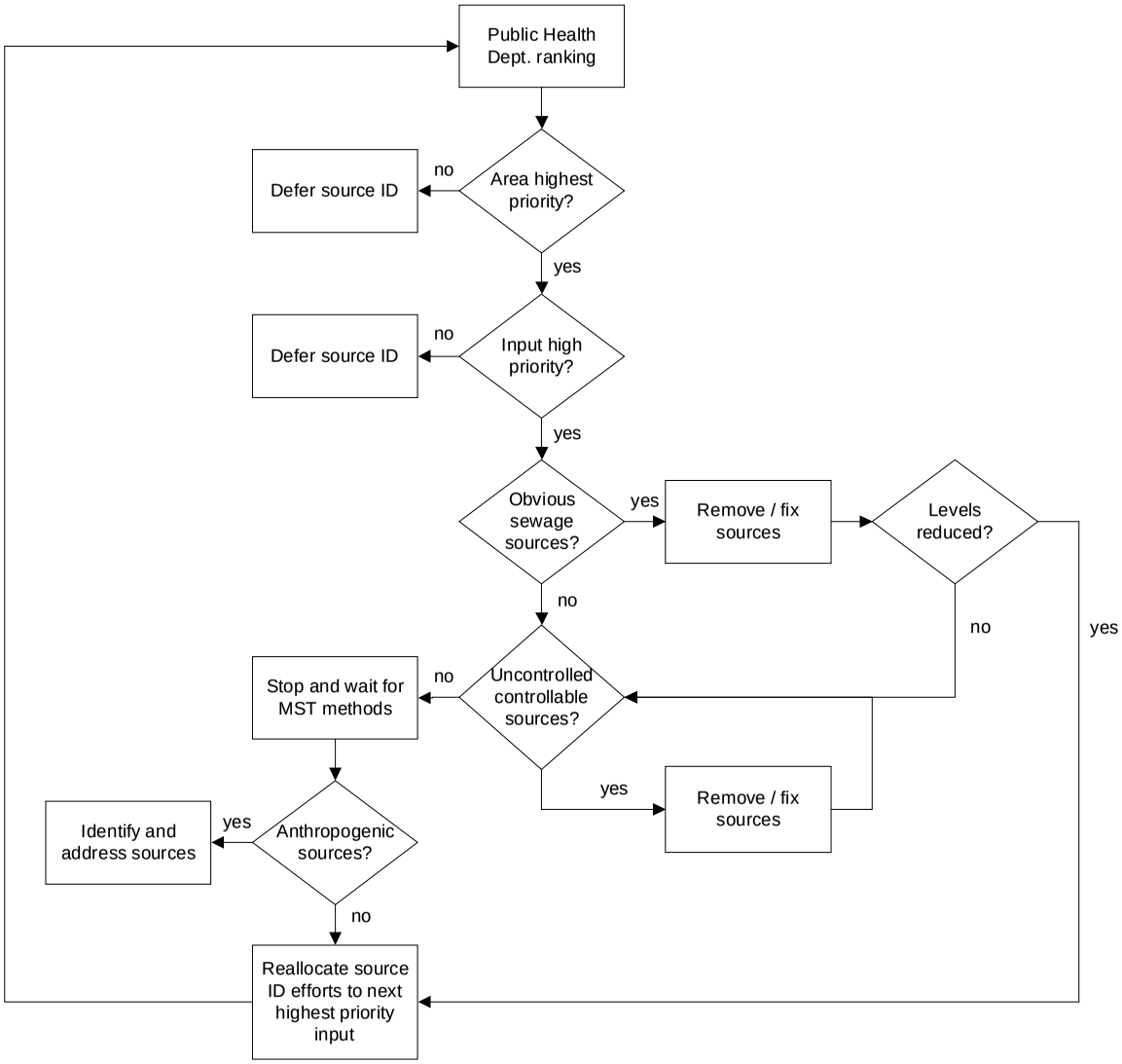

Figure 5-4. Decision tree that organizes starting and stopping rules for upstream bacterial source identification efforts. MST refers to microbial source tracking methods.

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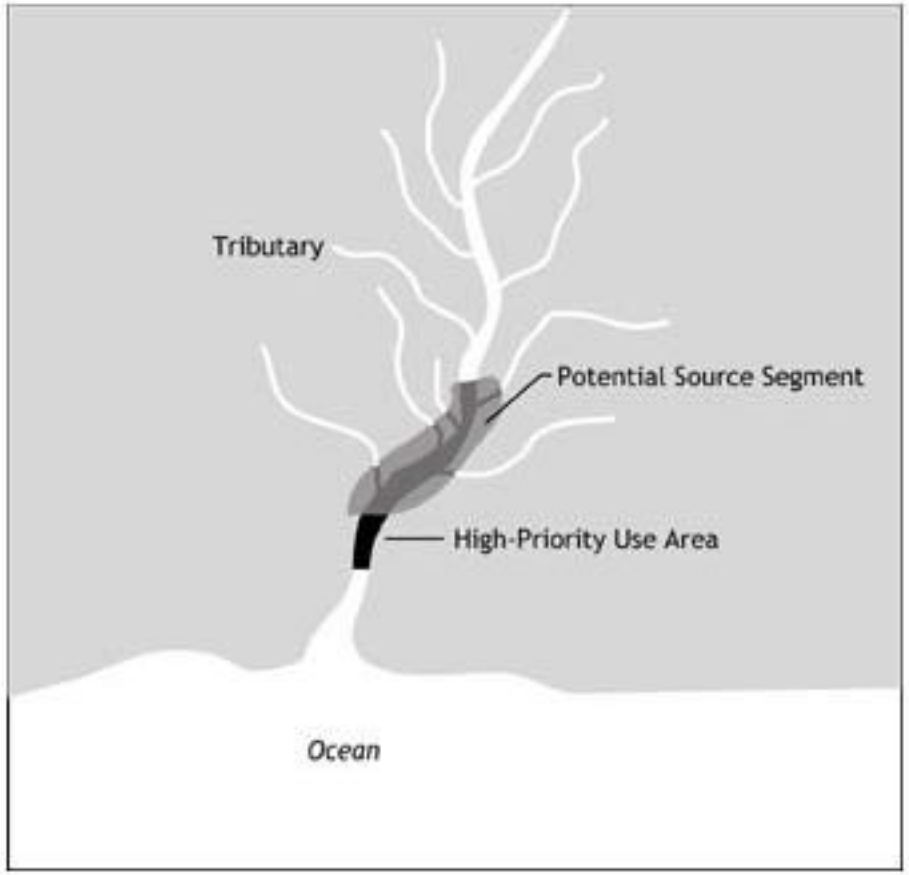

Figure 5-5. Conceptual model for determining the upstream segment of a creek or stream that should be the focus of source identification efforts for bacterial contamination. The model assumes that bacterial dieoff as water flows downstream places an upper limit on the distance bacteria can travel and still impact the high-priority use area.

053214

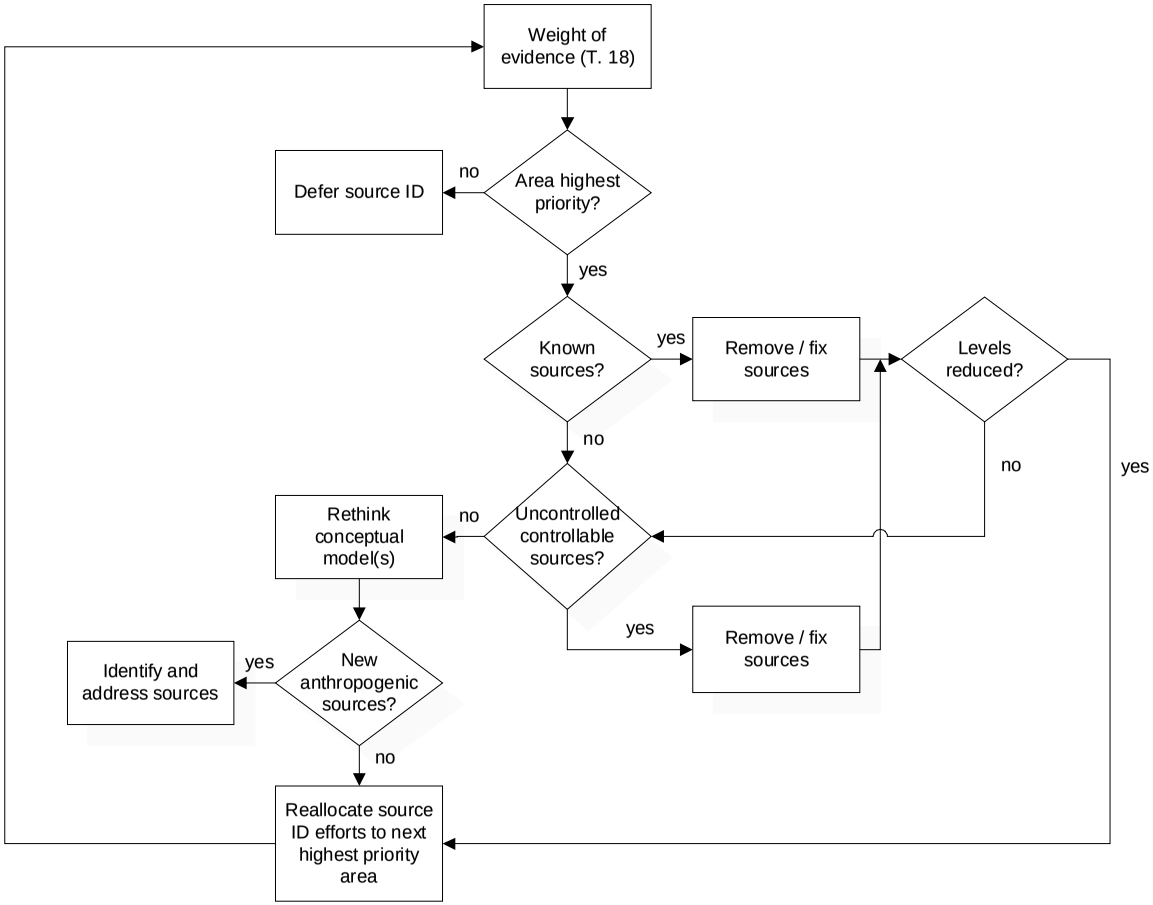

Figure 5-6. Decision tree that organizes starting and stopping rules for upstream source identification efforts targeted at habitat.

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6.0 REFERENCES

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7.0 APPENDICES

Appendix 1: Summary of Existing Municipal Stormwater Monitoring Programs in Southern California

June 2003

As part of the effort to develop a model stormwater monitoring program, we have reviewed and summarized the existing monitoring designs being implemented by each of the major stormwater programs in southern California. This information will be used, in a later step of the project, as a starting point for assessing what sorts of changes might be advisable to bring existing monitoring efforts more into line with the recommendations of the model program.

Program-specific details

There are six basic types of monitoring approaches currently used in NPDES stormwater monitoring programs throughout southern California, including:

- End of watershed designs that typically measure the cumulative mass emissions from all discharges
- Dispersed watershed designs that assess overall conditions and impacts in freshwater habitats
- Site-specific watershed designs that assess conditions and trends in freshwater or estuarine habitats of particular concern
- Beach stormdrain designs that assess stormwater impacts on the surfzone
- Near-coastal designs that assess the impact of stormwater plumes on near-coastal habitats
- Dry-weather reconnaissance designs focused on identifying sources of pollution to the MS4 system.

While all of these approaches can be found in the region, not every stormwater program includes all six, as illustrated in Table A1-1.

Table A1-1. Distribution of monitoring approaches across the separate stormwater programs in southern California.

Program	End of watershed	Dispersed watershed	Site-specific watershed	Beach	Near-coastal	Recon-naissance
Ventura		X				
Los Angeles	X		X			
Long Beach	X		X			
Orange	X	X	X	X	X	X
San Bernardino	X					
Riverside	X	X				
San Diego	X	X	X	X		X

In addition, the relative attention paid to each type of monitoring varies across programs. This reflects differences in habitat types, regulatory emphasis, stage of program development, and patterns of urbanization across the region. For example, monitoring in the northern part of Orange County focuses more heavily on problems intrinsic to more urbanized areas than does monitoring in Ventura County, which has a larger proportion of agricultural and open space land uses.

The following set of tables summarizes the existing distribution of effort in each of the programs. Information was drawn from the most recent set of program documents available for each program.

Table A1-2 shows the distribution of end of watershed monitoring efforts across the region's programs. All the programs except for San Bernardino County and Riverside County have ongoing end of watershed designs focused primarily on estimating mass loads from larger watersheds. The lack of such stations from San Bernardino and Riverside Counties partly reflects the fact that these inland areas are at the upper ends of large watersheds (such as for the Santa Ana River), which is a quite different situation than in the coastal counties. However, the lack of mass emissions stations in the inland counties also hampers their ability to estimate the proportional contribution of these inland areas to cumulative loads downstream.

Table A1-2. End of watershed monitoring efforts in each stormwater program.

Program	No. Sites	No. Events/Yr	Indicators	Notes
Ventura	3	2 wet, 5 dry		
Los Angeles	7 6/trib	3 storms, 2 dry 4 storms, 1 dry	Water qual, tox, trash Water qual	Adaptive TIE Rotate among tributaries each year
Long Beach	4	4 storms, 2 dry	Water qual, tox	Adaptive TIE Additional sites in LA and San Gabriel river watersheds as decided by Reg. Board
Orange	12 * 6	3 storms, 3 dry 3 storms	Water qual, tox Water qual, tox	Adaptive tox, TIE, source ID Adaptive TIE
San Bernardino	-			
Riverside	-			
San Diego	11	3 storms	Water qual, tox	Link to bioassessment at other sites

* For Orange County, the upper set of information refers to the Santa Ana Region of the County and the lower to the San Diego Region of the County, which have somewhat different monitoring programs.

Table A1-3 shows the distribution of dispersed watershed monitoring efforts across the monitoring programs in the region. Dispersed watershed monitoring efforts are typically used to assess the extent and magnitude of impact on watersheds and their beneficial uses. All the programs except for Long Beach (which is a relatively small, heavily urbanized area) include this approach, and four of these six programs contain bioassessment sampling. This reflects a growing awareness that chemical measurements alone, or even chemical measurements combined with toxicity testing, will not necessarily capture impacts to aquatic habitats. The inclusion of bioassessment monitoring is an effort to directly measure habitat quality in areas where this is of concern. The model program will identify the types of locations where dispersed watershed monitoring should occur and define the measurement indicators, including bioassessment, that should be monitored at these sites.

Table A1-3. Dispersed watershed monitoring efforts in each stormwater program.

Program	No. Sites	No. Events/Yr	Indicators	*Notes*
Ventura	3 landuse 2 rec. water	1 dry 1 dry	Water qual Water qual	Characterize landuse discharges
	14 bioass	1 dry	Bioassessment	Characterize receiving water quality in smaller tributaries
Los Angeles	20	1 dry	Bioassessment	CDFG methods
Long Beach	-			
Orange	11	2 dry	Water qual, tox, bioassessment	Includes reference sites Adaptive chem, tox, TIEs, source ID
	15	2 dry	Water qual, tox, bioassessment	
San Bernardino	5	4 storms	Water quality	
Riverside	25 25	1 – 5 wet 3 dry	Water qual Water qual	
San Diego	23	2 dry	Bioassessment	Link to mass emissions, tox at other sites

Table A1-4 shows the distribution of site-specific watershed monitoring across the region. These efforts are targeted at locations that are considered of concern because of their high ecological and societal value. The uneven distribution of such effort across the region reflects the uneven distribution of high-value habitats such as lagoons and estuaries (e.g., Newport Bay), as well as the varying degree to which management agencies have addressed this issue. The effect of sample size has not been fully evaluated in southern California. Too few samples will lead to conclusions with low confidence or even erroneous conclusions while oversampling leads to wasted resources. The model program will address this issue through power analysis of historical data to assess the optimal number of samples.

Table A1-4. Site-specific watershed monitoring efforts in each stormwater program.

Program	No. Sites	No. Events/Yr	Indicators	Notes
Ventura	-			
Los Angeles	-			
Long Beach	1	4 storms, 2 dry	Water qual, tox, bacteria	Alamitos Bay receiving water
Orange	12 estuary 6 channel	2 storms, 2 dry 2 storms, 2 dry	Water qual, tox, seds, benthos	Adaptive tox, TIE, source ID, link to Bight '03
San Bernardino	-			
Riverside	11	4	Water qual	
San Diego	13 lagoon	1 dry	Sed chem, tox, benthos	Adaptive prioritization using triad

Table A1-5 shows the distribution across the region of monitoring efforts targeted at storm drains discharging directly to the beach or coastal zone. The absence of such sites in San Bernardino and Riverside Counties is due to their inland location. In other coastal counties, beach monitoring may be conducted by county health departments rather than by stormwater programs. The stormwater model monitoring technical workgroup has teamed up with the SWRCB's Beach Water Quality Workgroup to evaluate potential collaborative monitoring designs that would coordinate with the county health department and other shoreline monitoring efforts.

Table A1-5. Beach drain monitoring efforts in each stormwater program.

Program	No. Sites	No. Events	Indicators	Notes
Ventura	-			Co DHS
Los Angeles	26	Daily	Bacteria	City of LA conducts
Long Beach	-			City DHS
Orange	TBD	Weekly	Bacteria	In addition to HCA; monitor surfzone up- and downcoast, adaptive source ID, risk assessment
	36	Weekly	Bacteria	
San Bernardino	-			
Riverside	-			
San Diego	60	Weekly	Bacteria	Cities conduct program, monitor drain and receiving water, adaptive source ID

Table A1-6 shows the distribution of near-coastal monitoring effort across the programs in the region. This is a relatively new priority for stormwater programs, as reflected in the fact that only the Los Angeles County and Orange County programs include this component. The model monitoring program is looking to integrate this monitoring with existing near coastal monitoring through southern California Regional Monitoring.

Table A1-7 shows the distribution of dry-weather reconnaissance monitoring efforts across the region's stormwater monitoring programs. This type of monitoring is targeted specifically at source identification, and is contained only in the Orange and San Diego County programs. Source characterization monitoring is important and the model monitoring program is looking to integrate this design as an adaptive element, triggered by the extent and magnitude of impacts described in Table A1-3.

Table A1-6. Near-coastal monitoring efforts in each program.

Program	No. Sites	No. Events/Yr	Indicators	Notes
Ventura	-			
Los Angeles	50	1 / permit period	Sed chem, tox, benthic infauna	Paired sites at and beyond mouths of rivers Adaptive TIE
Long Beach	-			
Orange	0 8	 2 storm, 2 dry	 Water qual, tox	 Adaptive drain characterization and nearshore plume tracking
San Bernardino	-			
Riverside	-			
San Diego	-			

Table A1-7. Dry-weather reconnaissance monitoring efforts in each program.

Program	No. Sites	No. Events/Yr	Indicators	Notes
Ventura	-			
Los Angeles	-			
Long Beach	-			
Orange	40 58	5 / dry 5 / dry	Water qual	Adaptive source ID
San Bernardino	-			
Riverside	-			
San Diego	90 County > 500 cities	3 / per permit period 1 / per permit period	Water qual	Adaptive source ID

Summary and Discussion

The monitoring programs described above were designed and implemented to address issues specific to each county or city. Thus, many of the differences between the programs reflect a logical amount of variety, given the variability across the entire region in factors such as degree

of urbanization, type and amount of critical habitat, design of the MS4 system, and kinds of beneficial uses. However, there are other differences that are more arbitrary in nature, for example the frequency of sampling events, the analyte list, and whether to include a dry weather reconnaissance program. In addition, some programs have moved aggressively to include adaptive elements, while others have chosen designs that remain relatively constant across sampling events throughout the permit term.

In addition, the monitoring programs currently in place in the region have to some extent accreted over time, with new elements being added as permits are renewed. Thus, programs have not all been designed with the goal of addressing, in a logical and integrated way, the core management questions the technical committee has identified:

1. Are conditions in receiving water protective of beneficial uses?

1a. What are the mechanism(s) causing receiving water problems?

2. What is the extent and magnitude of the receiving water problems?
3. What is the relative urban runoff (both storm and non-storm, wet and dry) contribution to the receiving water problem(s)?
4. What are the sources of the urban runoff contribution to receiving water problems?
5. Are conditions in receiving waters getting better or worse?

As a result, information about the extent and magnitude of impacts on receiving waters is not always available, nor are loadings estimates (Question 3) that separate out the urban runoff component always an integral part of monitoring designs. In addition, upstream source identification efforts occur in some programs but not others, and are designed to different standards of rigor.

This overview of current monitoring practice provides a concrete starting point for two distinct but complementary considerations. First, the variety across programs provides insight into the breadth and flexibility the model program needs to encompass to be applicable to programs throughout the region. Second, the overview presents information needed for assessing what adjustments could be made to individual programs to bring them more into accord with the model monitoring program, once it is fully fleshed out. The model monitoring program must balance the desire for consistency, standardization, and regional efficiency with reasonable requirements for program-specific differences in design needed to address site-specific issues.

Appendix 2: Power Analysis Results

This appendix contains results of statistical power analyses for long-term trend with several types of historical monitoring data from southern California, including:

- Bacteria indicators at a high-priority recreational use area on Aliso Creek
- Bacteria indicators at stations upstream of the high-priority use area
- Bacteria loads from discharges upstream of the high-priority use area
- Bacteria impacts from discharges upstream of the high-priority use area
- Event mean concentrations (EMC) at a series of mass emissions stations
- Loads at a series of mass emissions stations.

Bacteria loads were calculated as the difference between indicator levels 25 feet upstream and 25 feet downstream of the discharge. The specific figures included in this appendix are listed in the following table:

Figure	Content
Fig A3.1	Aliso Creek, downstream use area power analysis results
Fig A3.2	Levels of bacterial indicators at upstream Aliso Creek stations
Fig A3.3	Power analysis results for bacteria loads at upstream Aliso Creek stations
Fig A3.4	Power analysis results for bacteria impact at upstream Aliso Creek stations
Fig A3.5	Power analysis results for EMC, Anaheim Barber Channel
Fig A3.6	Power analysis results for EMC, Westminster Channel
Fig A3.7	Power analysis results for EMC, Santa Ana Delhi Channel
Fig A3.8	Power analysis results for EMC, San Diego Creek at Campus
Fig A3.9	Power analysis results for EMC, Oso Creek
Fig A3.10	Power analysis results for loads, Anaheim Barber Channel
Fig A3.11	Power analysis results for loads, Westminster Channel
Fig A3.12	Power analysis results for loads, Santa Ana Delhi Channel
Fig A3.13	Power analysis results for loads, San Diego Creek at Campus
Fig A3.14	Power analysis results for loads, Oso Creek

In each figure, the X-axis shows the number of years over which monitoring may continue, the Y-axis the cumulative percent change to be detected, and the four curves options for the number of samples per year that could be taken. Thus, each figure shows the amount of change that could be detected (at a statistical power of 80%) at each combination of within- and between-year sampling intensity.

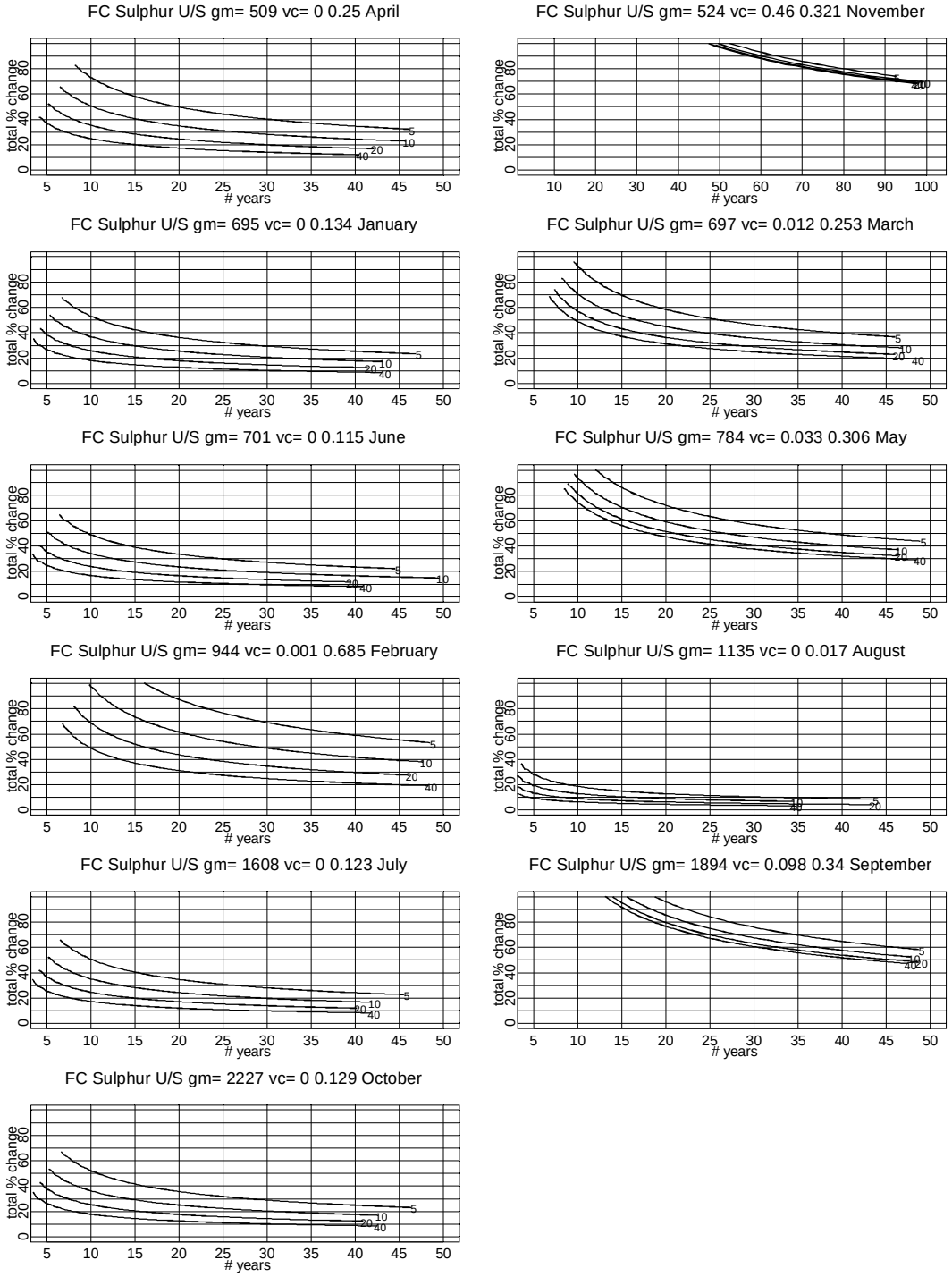

Figure A2.1a. Power analysis of a trend monitoring design at the AWMA ROAD Bridge, station Sulphur Creek upstream. The y-axis shows the amount of change detectable, the x-axis the years of sampling, and the different curves the number of samples in a given 30-day period (5, 10, 20, 40) needed for 80% power.

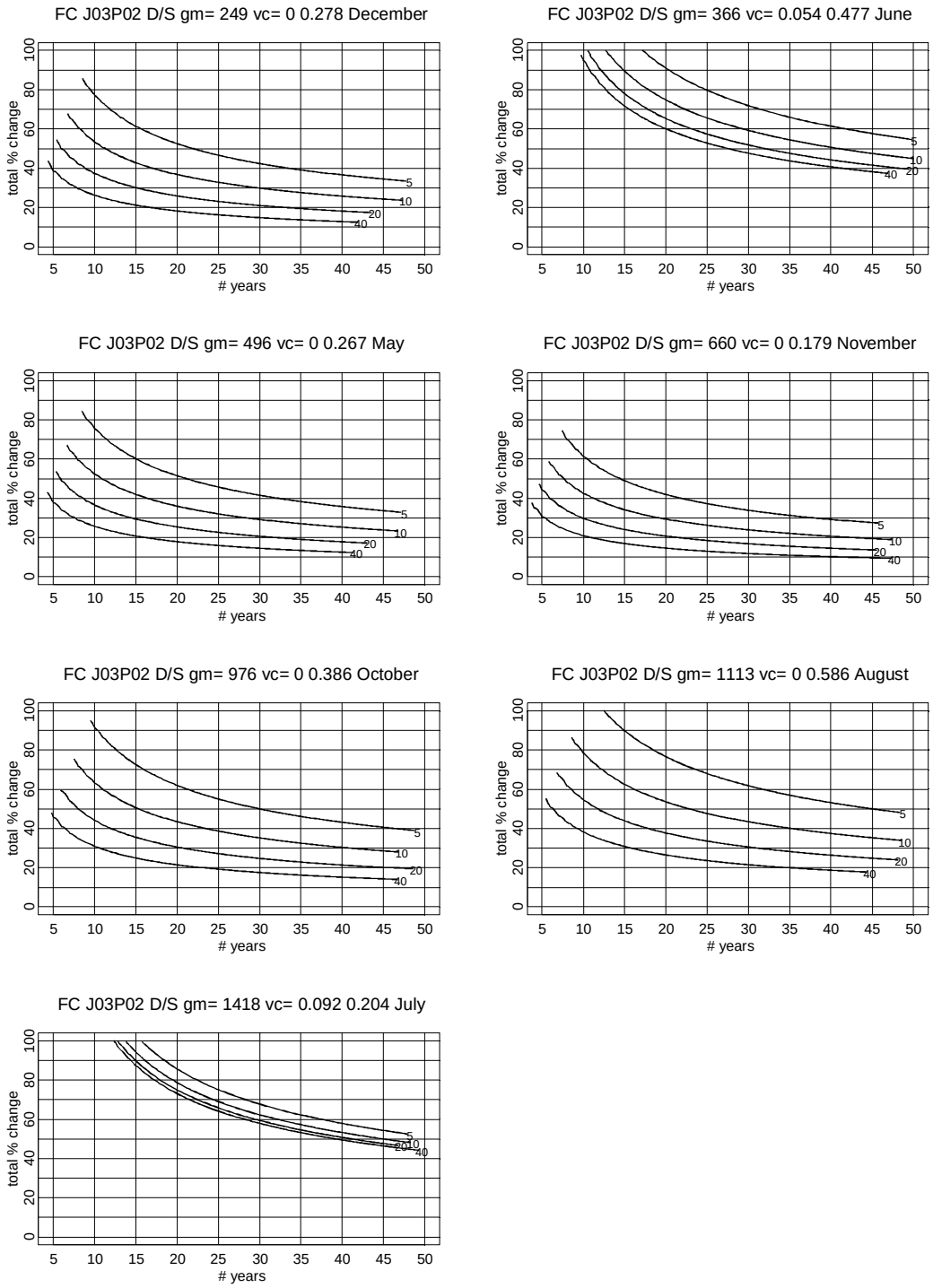

Figure A2.1b. Power analysis of a trend monitoring design at the confluence of Aliso and Sulphur Creeks, station J03P02 downstream. The y-axis shows the amount of change detectable, the x-axis the years of sampling, and the different curves the number of samples in a given 30-day period (5, 10, 20, 40) needed for 80% power.

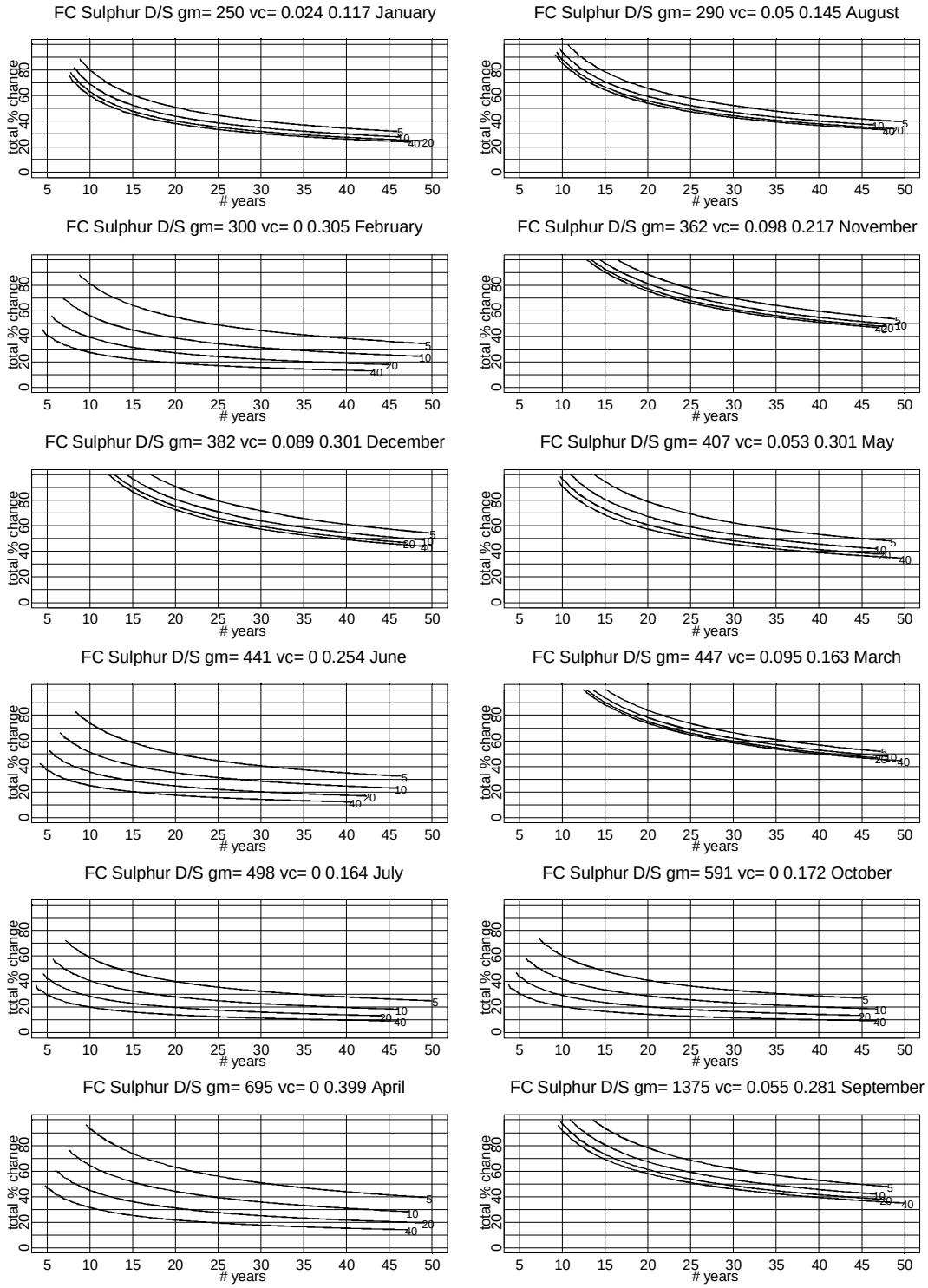

Figure A2.1c. Power analysis of a trend monitoring design at Aliso Wood Canyon Park, station Sulphur Creek downstream. The y-axis shows the amount of change detectable, the x-axis the years of sampling, and the different curves the number of samples in a given 30-day period (5, 10, 20, 40) needed for 80% power.

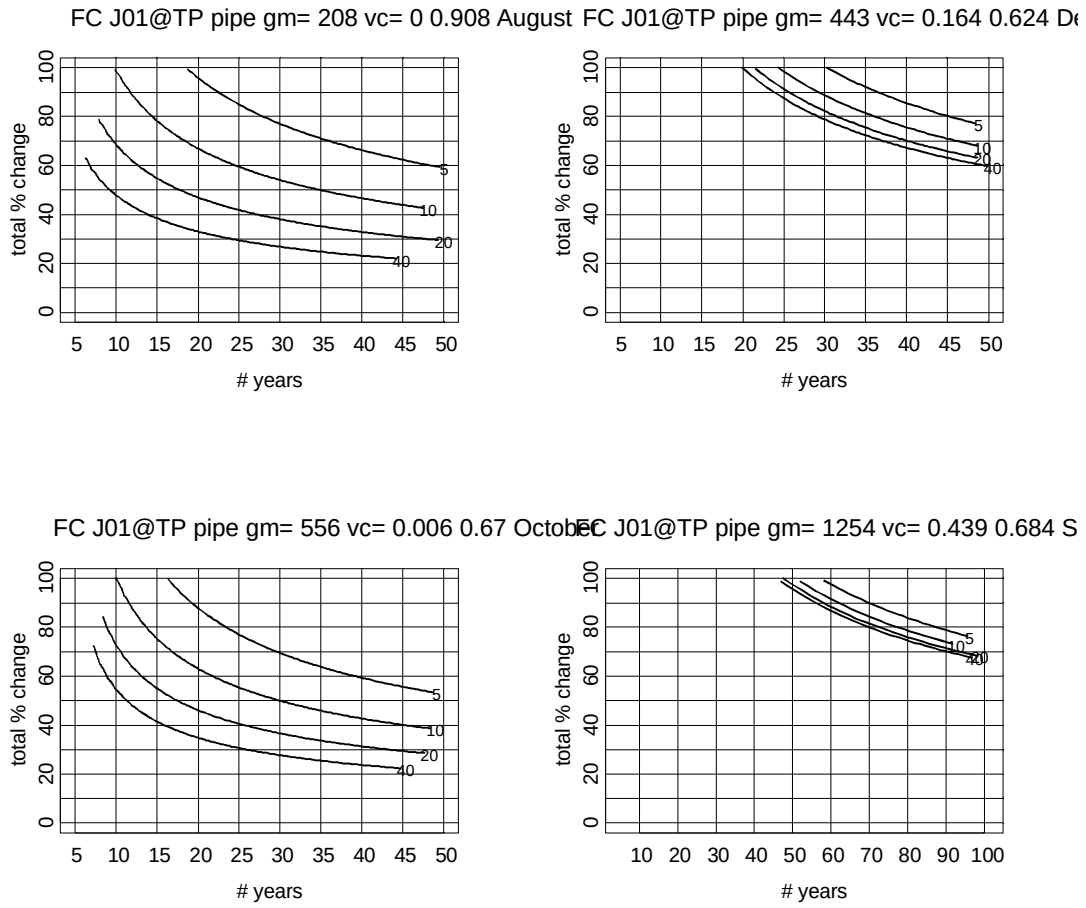

Figure A2.1d Power analysis of a trend monitoring design at the SOCWA treatment plant, station J01@TP. The y-axis shows the amount of change detectable, the x-axis the years of sampling, and the different curves the number of samples in a given 30-day period (5, 10, 20, 40) needed for 80% power.

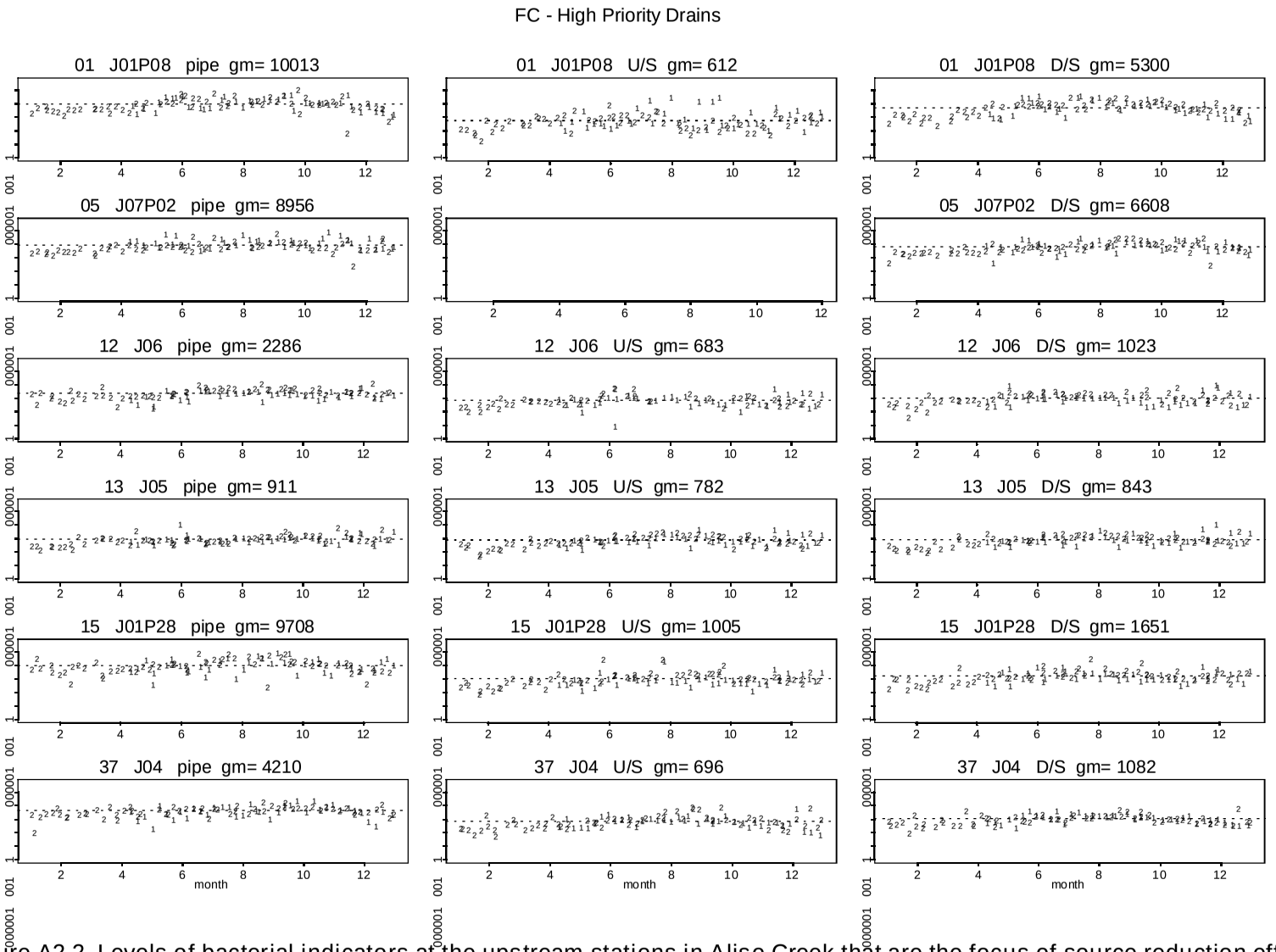

Figure A2.2. Levels of bacterial indicators at the upstream stations in Aliso Creek that are the focus of source reduction efforts.

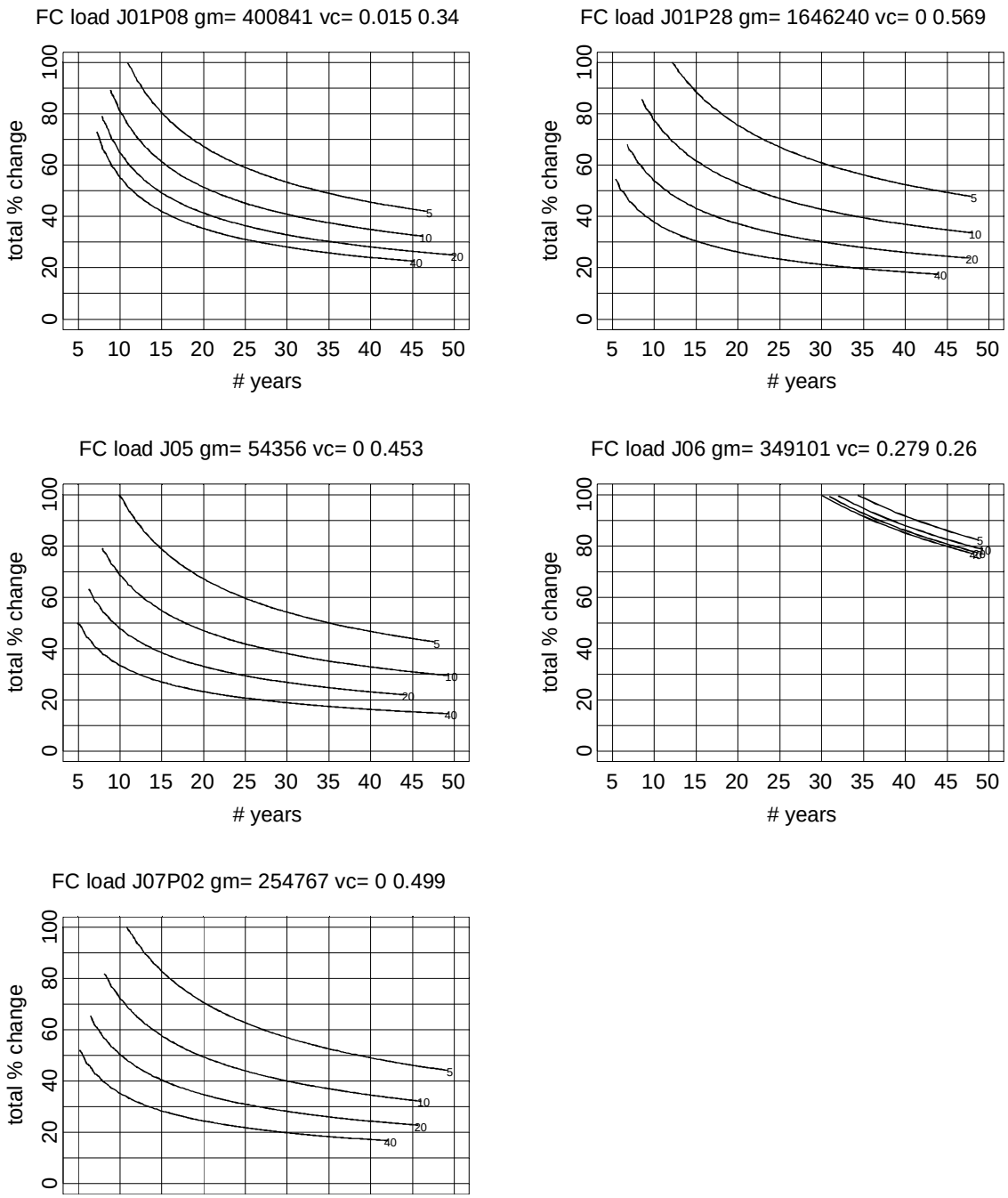

Figure A2.3. Statistical power analysis results of a trend monitoring design for bacterial loads at the upstream stations in Aliso Creek.

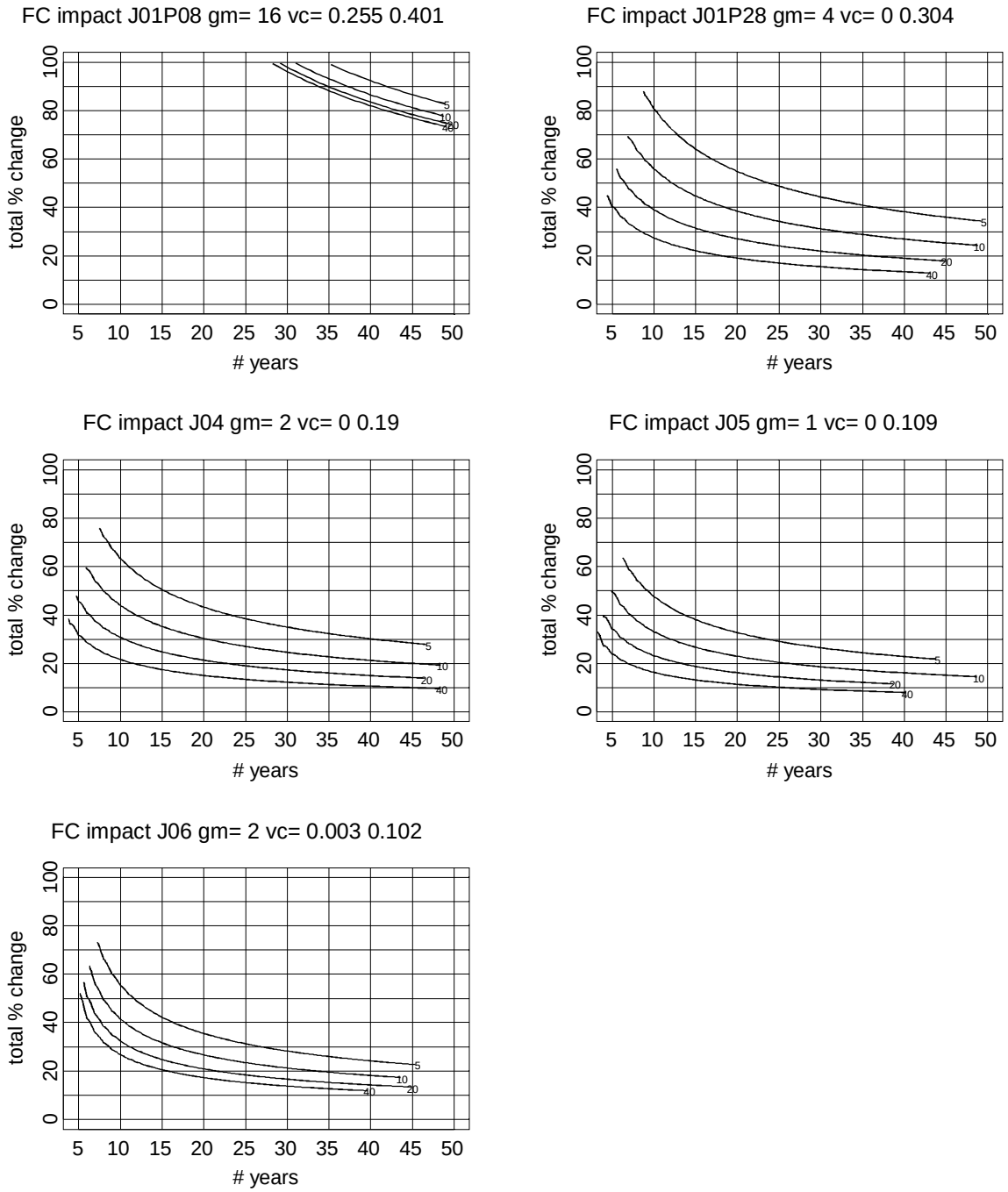

Figure A2.4. Statistical power analysis results of a trend monitoring design for receiving water impact (measured as the difference in bacterial levels between stations 25 feet upstream and downstream of the discharge point) at upstream stations in Aliso Creek.

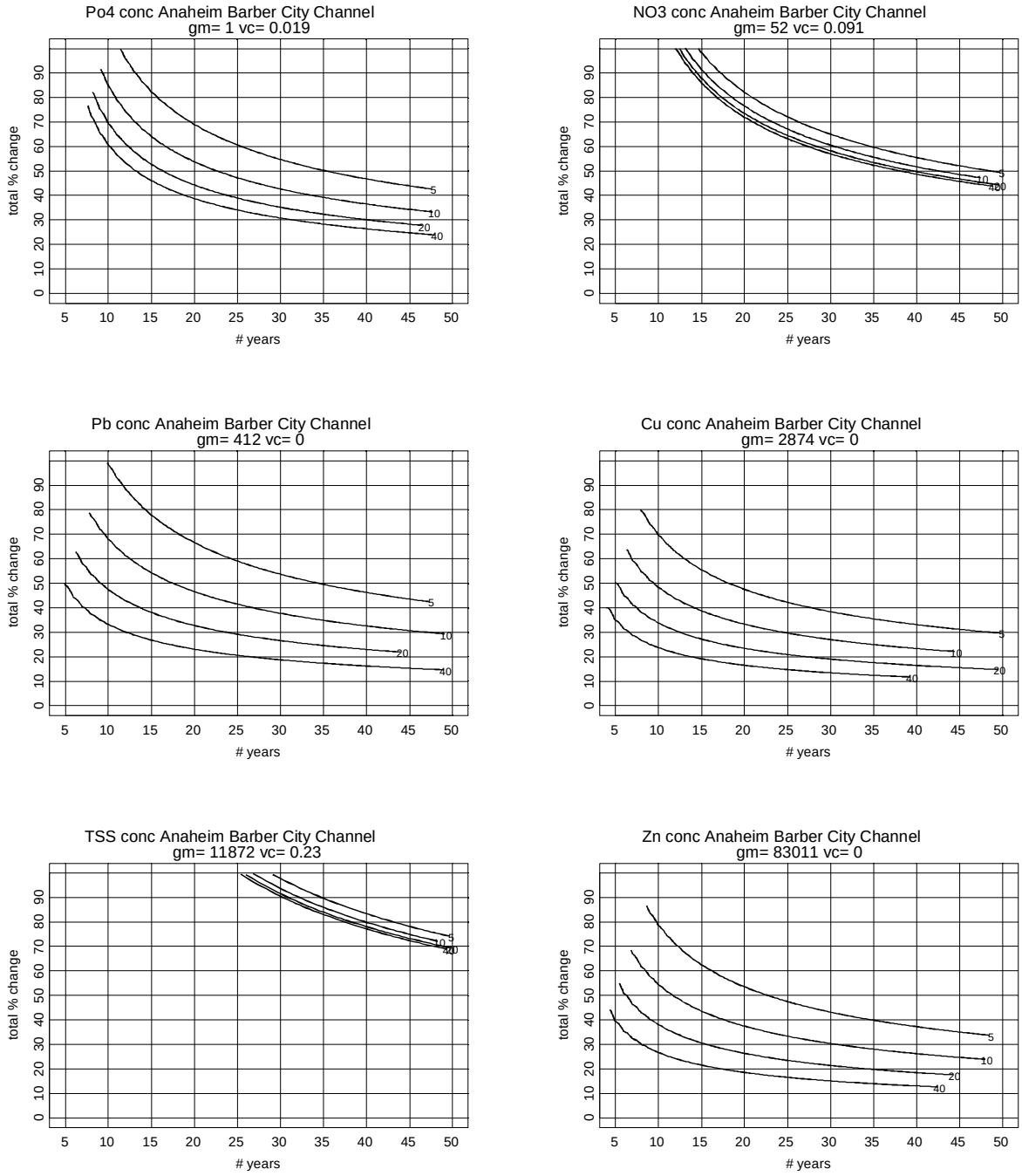

Figure A2.5. Statistical power analysis results for a trend monitoring design for event mean concentrations (EMC) of several parameters at Anaheim Barber City Channel, a long-term mass emissions station in Orange County.

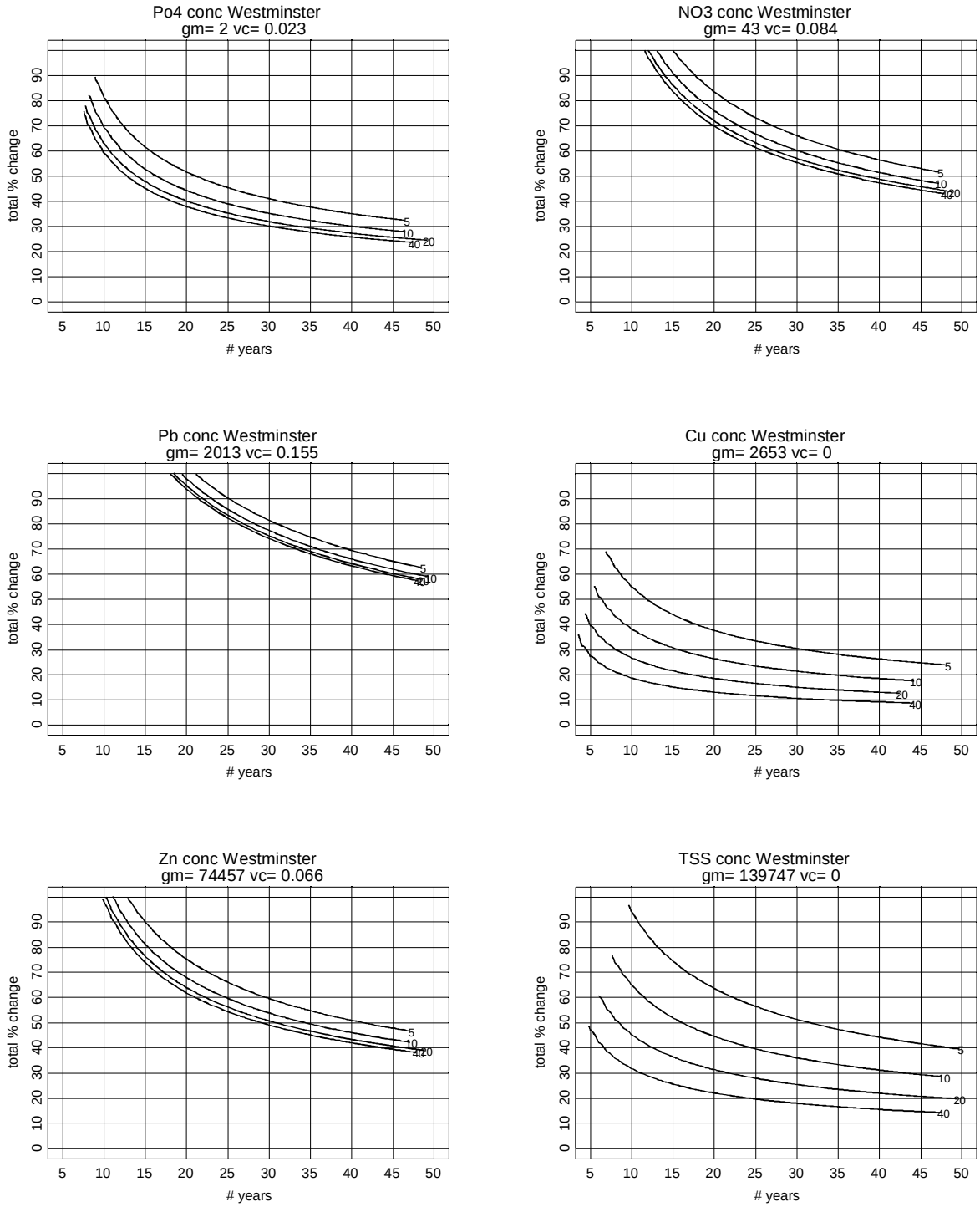

Figure A2.6. Statistical power analysis results for a trend monitoring design for event mean concentrations (EMC) of several parameters at Westminster Channel, a long-term mass emissions station in Orange County.

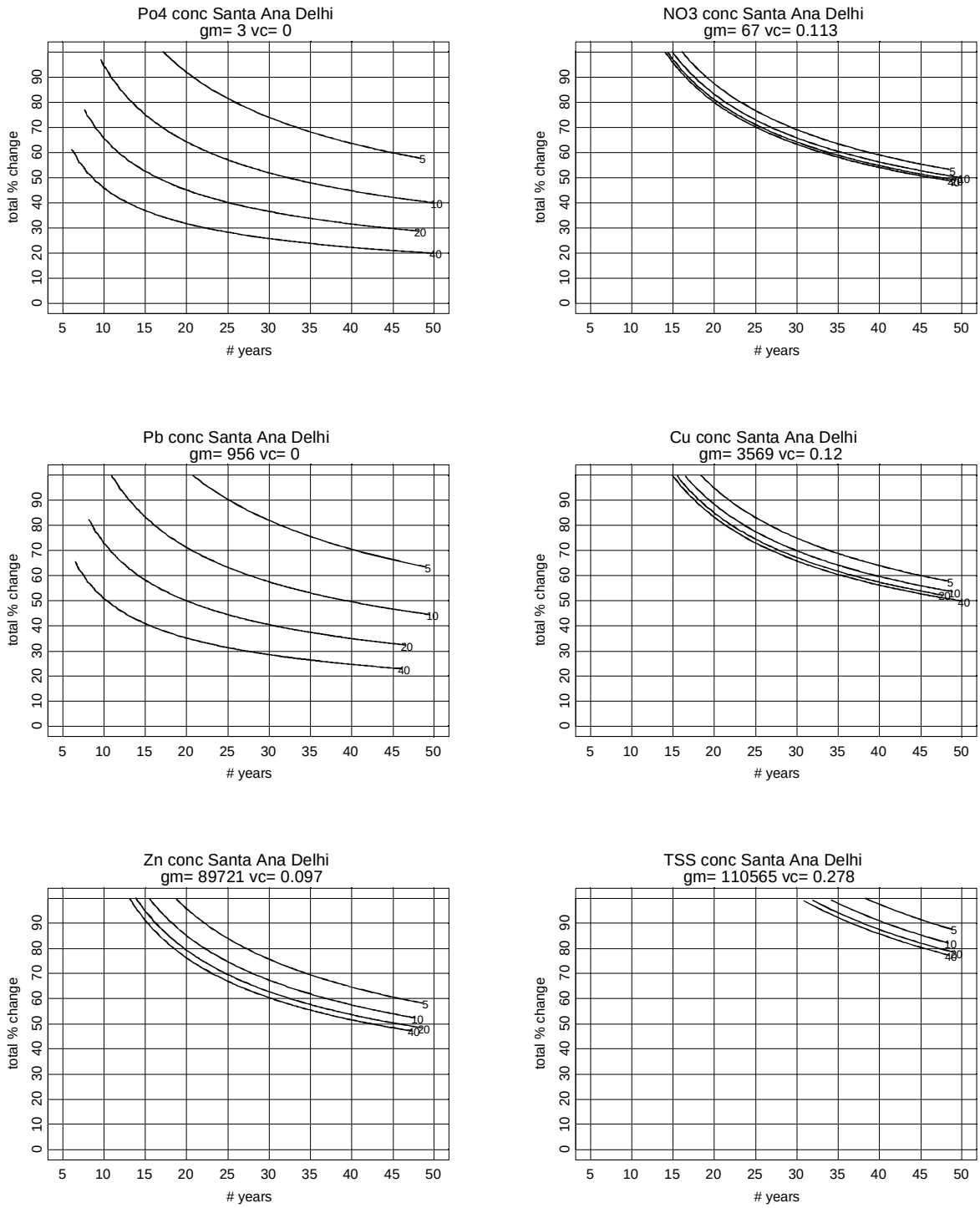

Figure A2.7. Statistical power analysis results for a trend monitoring design for event mean concentrations (EMC) of several parameters at Santa Ana Delhi Channel, a long-term mass emissions station in Orange Couinty.

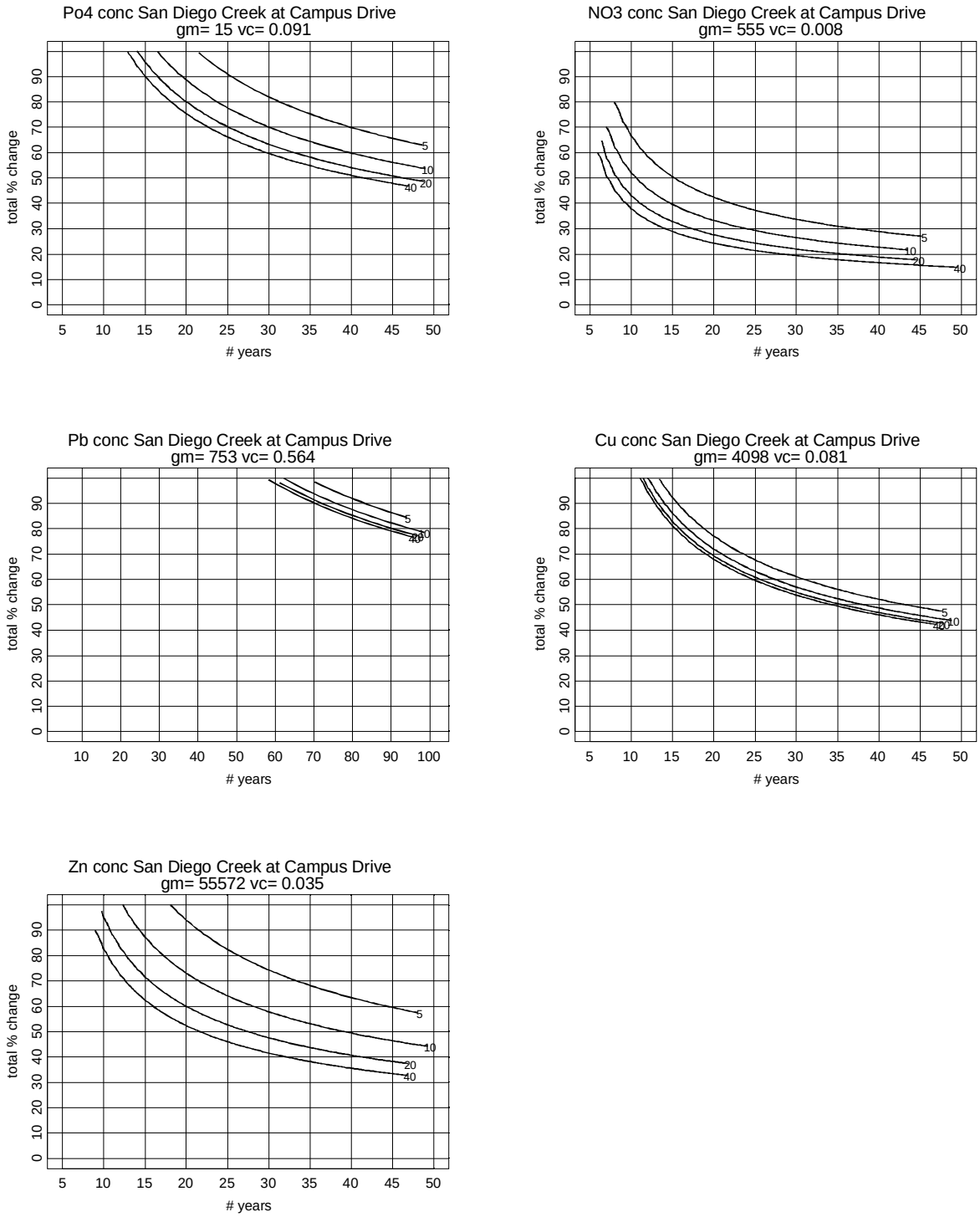

Figure A2.8. Statistical power analysis results for a trend monitoring design for event mean concentrations (EMC) of several parameters at San Diego Creek at Campus Drive, a long-term mass emissions station in Orange County.

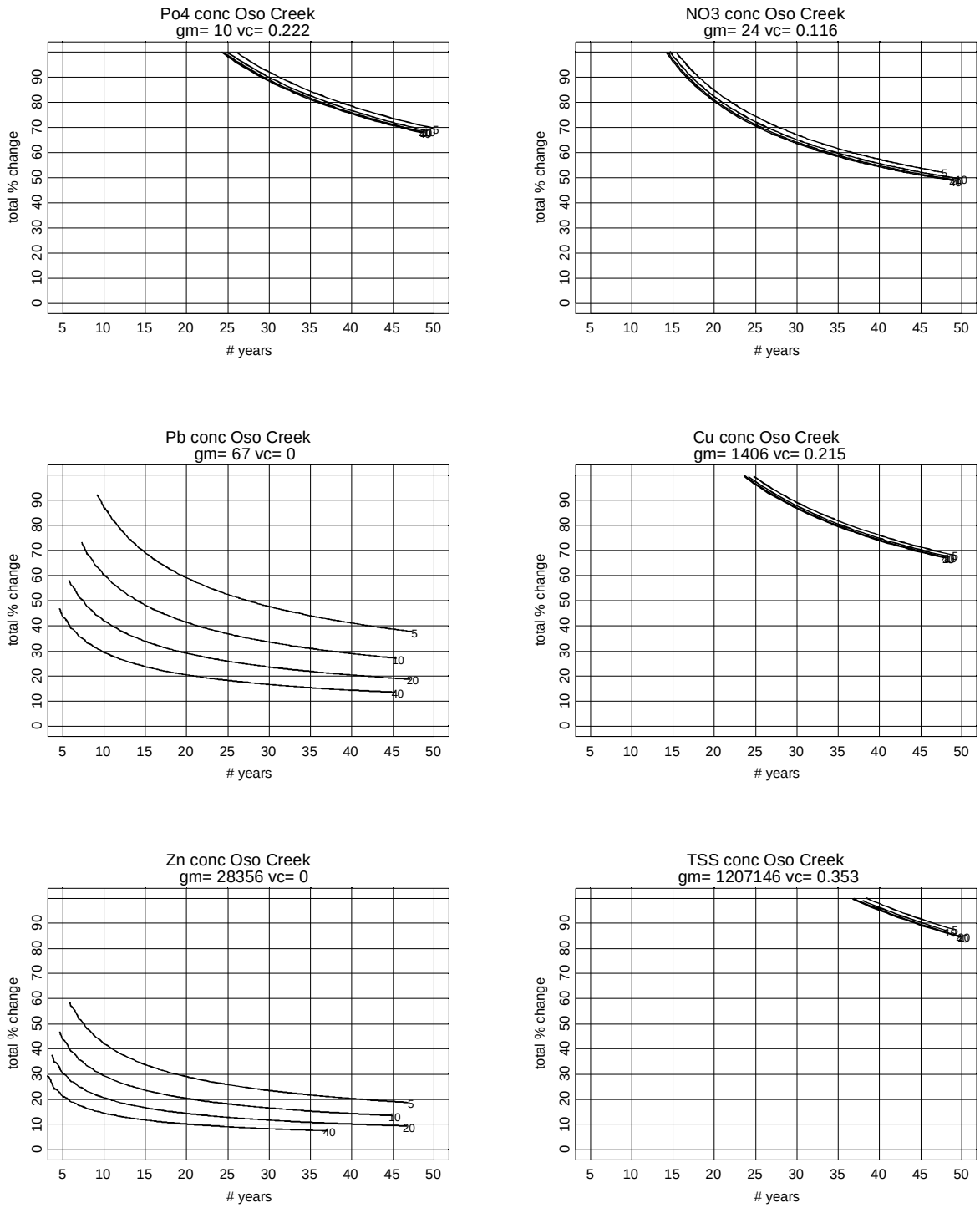

Figure A2.9. Statistical power analysis results for a trend monitoring design for event mean concentrations (EMC) of several parameters at Oso Creek, a long-term mass emissions station in Orange County.

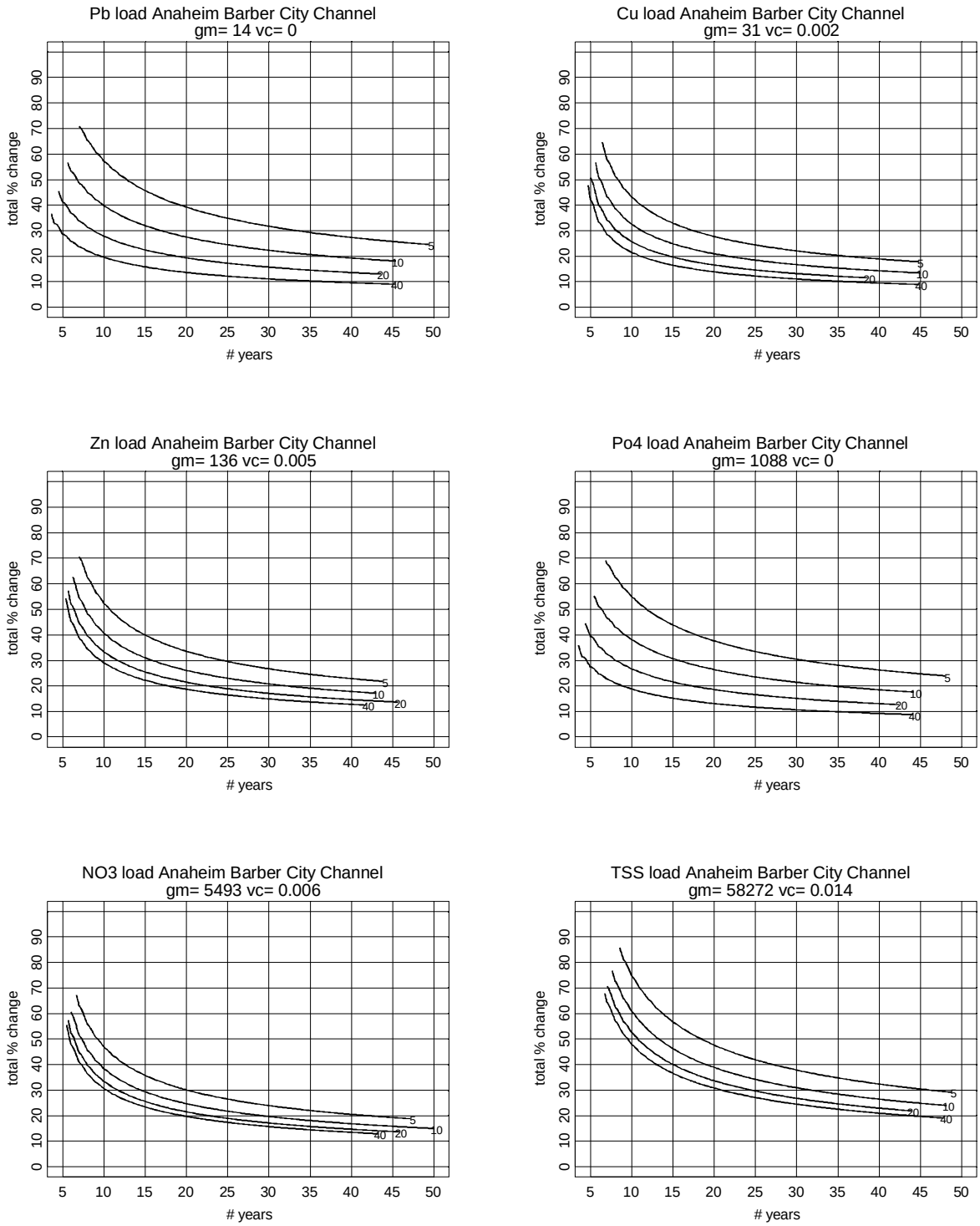

Figure A2.10. Statistical power analysis results for a trend monitoring design for loads of several parameters at Anaheim Barber Channel, a long-term mass emissions station in Orange County.

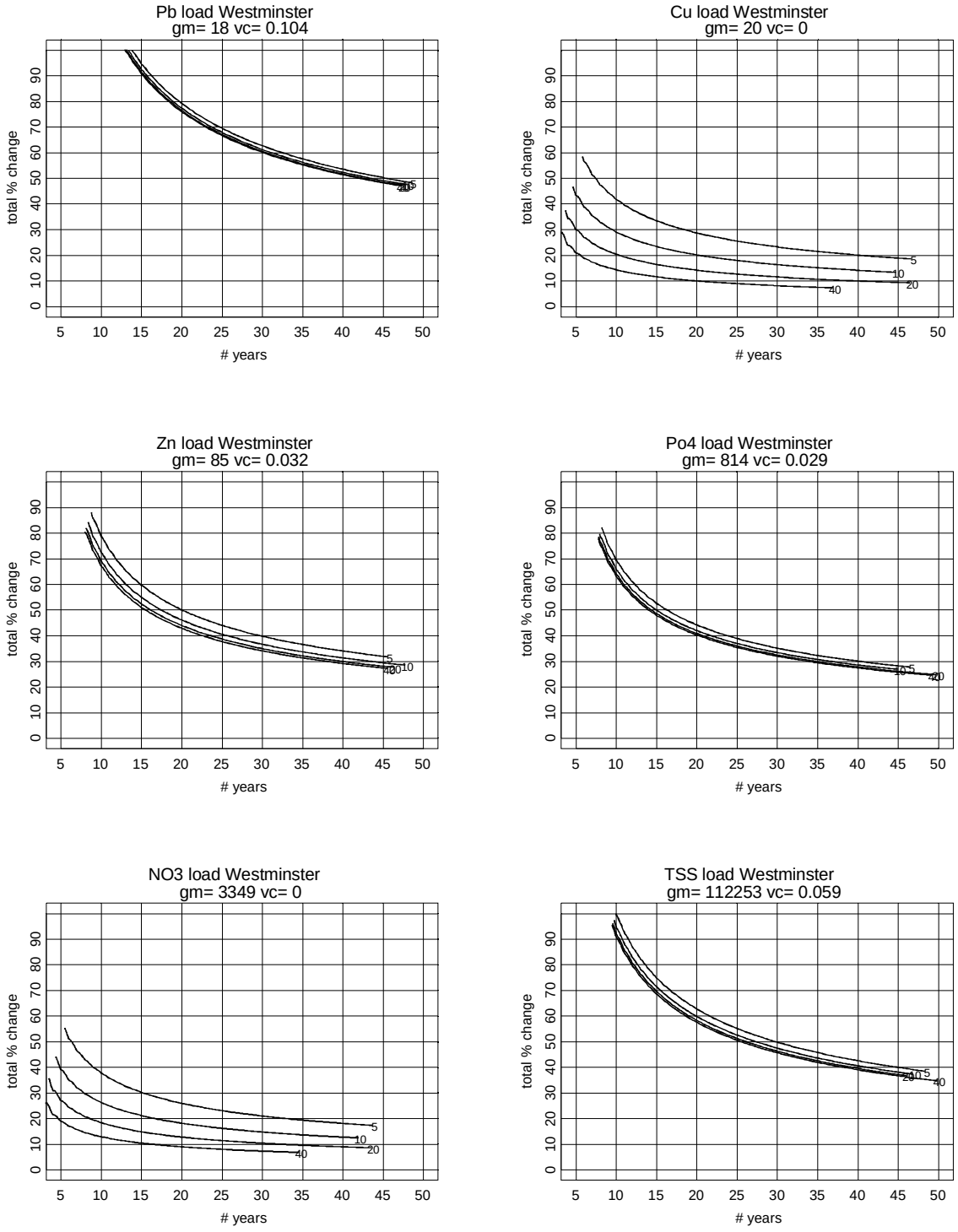

Figure A2.11. Statistical power analysis results for a trend monitoring design for loads of several parameters at Westminster Channel, a long-term mass emissions station in Orange County.

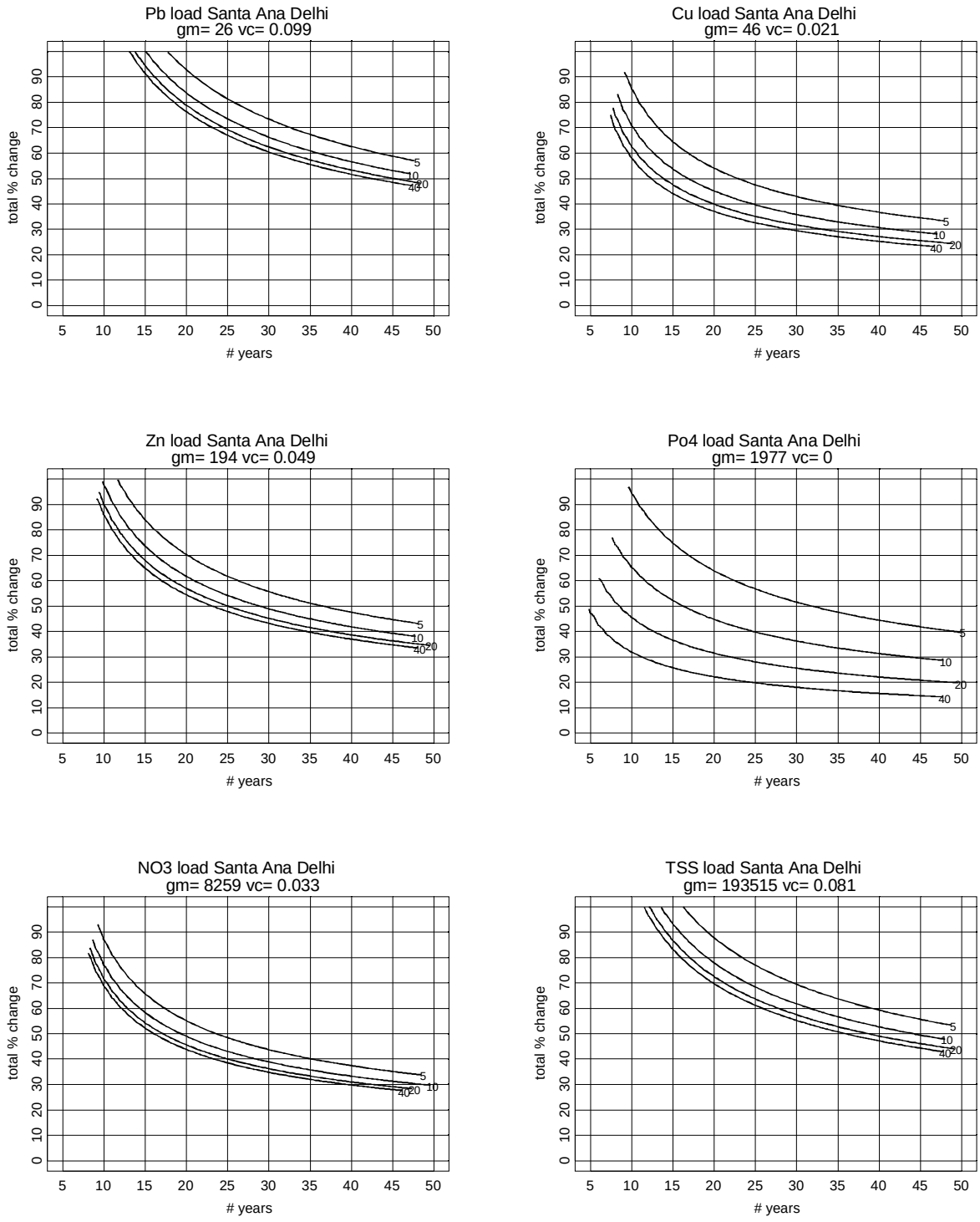

Figure A2.12. Statistical power analysis results for a trend monitoring design for loads of several parameters at Santa Ana Delhi Channel, a long-term mass emissions station in Orange County.

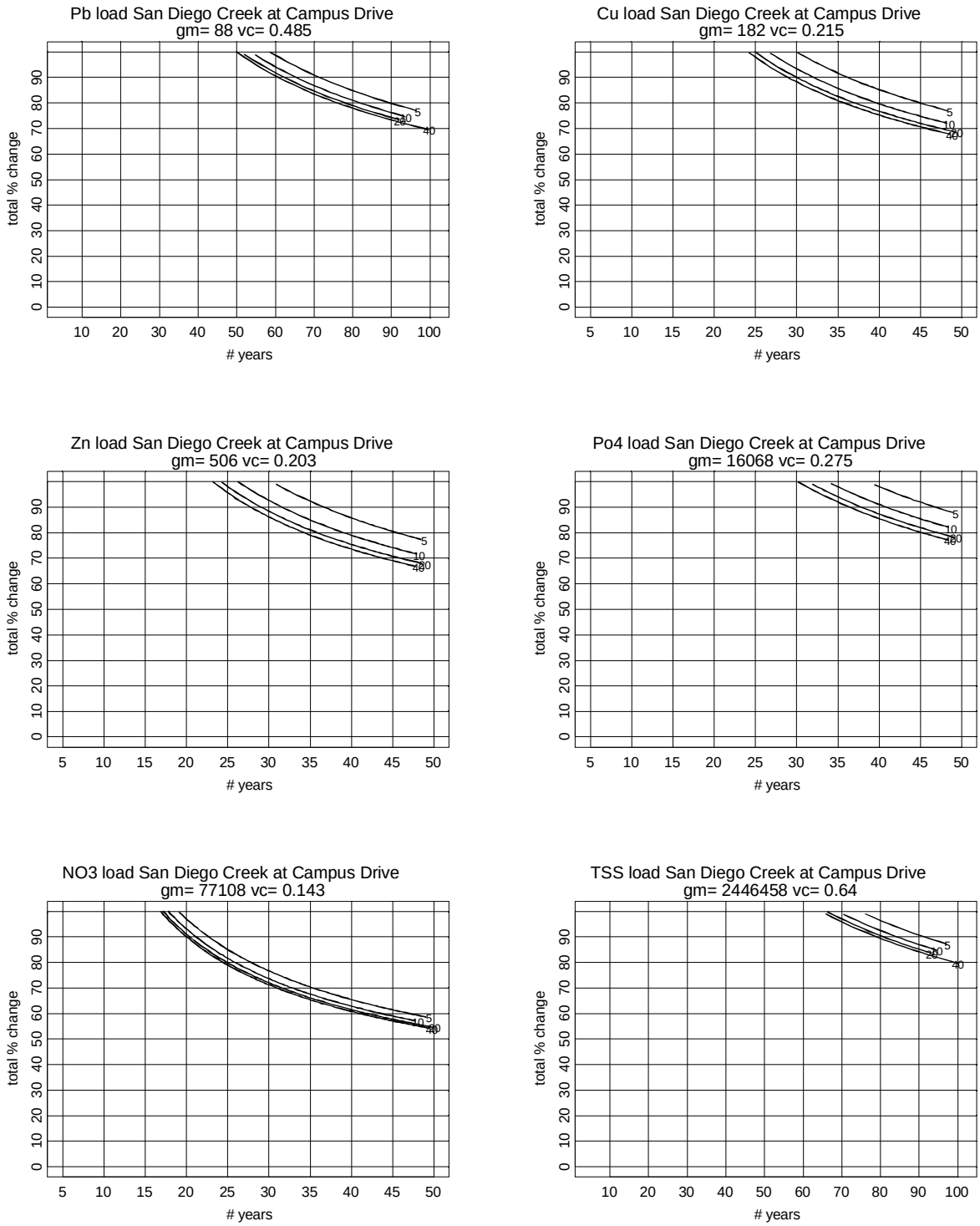

Figure A2.13. Statistical power analysis results for a trend monitoring design for loads of several parameters at San Diego Creek at Campus Drive, a long-term mass emissions station in Orange County.

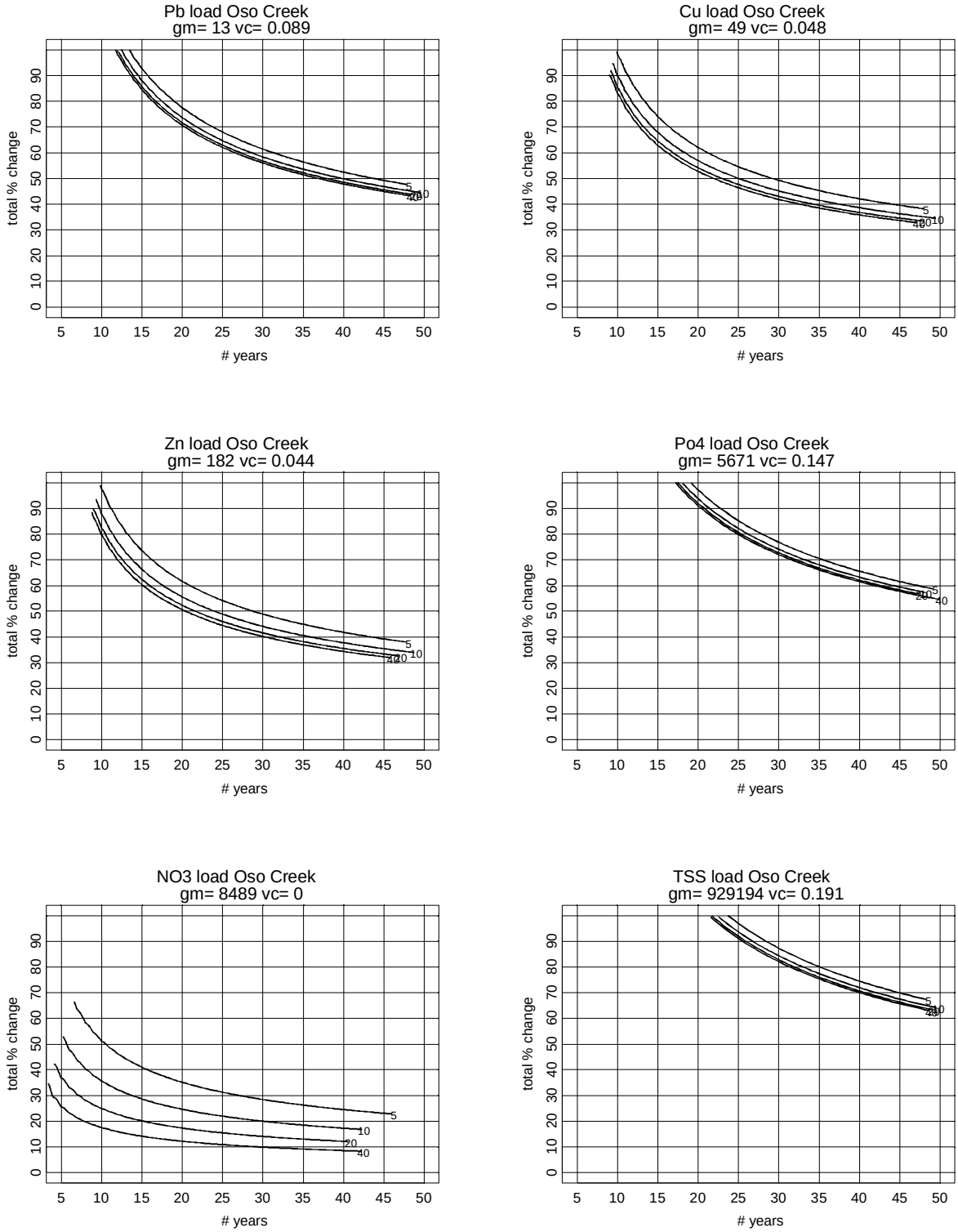

Figure A2.14. Statistical power analysis results for a trend monitoring design for loads of several parameters at Oso Creek, a long-term mass emissions station in Orange County.

Appendix 3: Source Identification Case Studies

The following case studies present examples of source identification efforts conducted to determine the rough proportion of input from urban runoff sources. They include several different kinds of problems and study approaches and exemplify the variety of methods that might be employed to address Question 3. The majority of the case studies were conducted in dry weather. This reflects difficulties of performing source identification studies in wet weather, given the large flow volumes and the typically increased number of possible sources. The cases also exhibit a range of level of effort, from evaluation of routine monitoring data and interviews to a series of iterative special field studies.

A3.1 Contaminated sediment taskforce (LA Harbor)

Sediments in ports, harbors, and marinas are subject to numerous pollutant inputs including sediments, trace metals, and organic contaminants. These sediments eventually need to be dredged to maintain navigable waterways, but the level of sediment contamination has a tremendous effect on the eventual disposal of these dredged materials. Clean sediments can be used for beach replenishment or even disposed at sea, but contaminated sediments need to be sent to a landfill or some other confined disposal area so they will not harm the environment. As the Port Districts, RWQCB and Coastal Commission (collectively known as the Contaminated Sediment Task Force) design a long-term dredged material management program, they are carefully considering ways to reduce the inputs of pollutants to the areas that need periodic maintenance dredging. One way to accomplish this is to identify and reduce or eliminate the sources of pollutants to these locations.

In order to begin reducing pollutant loads, the Contaminated Sediments Task Force asked SCCWRP to estimate the relative magnitude of pollutant loading from several potential sources to Los Angeles and Long Beach Harbors and Marina del Rey. A particular emphasis of the study was estimating loads from the Los Angeles River and Dominguez Channel to San Pedro Bay and from Ballona Creek to Marina del Rey. Primary questions addressed included:

- What are the predominant sources of contaminants?
- What are the long-term (i.e. decadal) trends in annual loading?
- What is the typical range of annual loading that should be expected?
- Which watersheds typically contribute the greatest annual loading?
- What land use types are the largest contributors to annual loading?

These questions were evaluated with an assessment study that involved existing data and limited modeling to estimate watershed loading patterns. Because historic data were somewhat limited, SCCWRP estimated loads with a ratio estimation technique. This involves establishing a relationship between flow and loads using available data and then applying this relationship to an entire storm season. Flow was estimated by applying rainfall data and standard runoff coefficients to different land use types. This combination of methods allowed loads to be approximated for a variety of land uses for entire years in the periods 1971-72, 1979-80, 1986-87, and 1987-88.

The analysis confirmed that the largest source of contamination to San Pedro Bay is watershed-derived loading from the Los Angeles River and Dominguez Channel watersheds. The Los Angeles River watershed contributed the greatest overall mass loading, but the Dominguez Channel watershed contributed the largest proportional loading (i.e. loading normalized for

watershed size). In general, industrial and residential land uses are the largest contributors of contaminants. Data from the 1990s also revealed that dry season (i.e. non-storm) loading may make up a significant portion of total annual loading, and in dry years, can be the predominant source of contaminants to the harbor. Analysis of temporal trends in the data showed that metals loading has not substantially changed since the 1970s, but loading of DDT and PCBs has declined.

Annual loadings of metals varied between 10^3 and 10^5 kg/year, with zinc and copper loading typically exceeding loads of other metals. Variations in annual loading appear to correspond with changes in rainfall and runoff; however, direct analysis of the relationship between rainfall intensity and duration and loading produced only weak correlation coefficients. This correlation would likely be improved by analyzing a larger data set on more homogenous land use types.

Because the study depended on available data, not all possible sources of loading could be evaluated and key data gaps remained. These included the lack of data on loading of PAH and pesticides, lack of long-term data on dry season loading, lack of information on inputs from the Dominguez Channel Watershed, and the need for more temporally resolved loading data from specific land use types. Information on the transport and fate of runoff-derived contaminants within the study area would also be needed to improve estimates of the impact of loadings on sediment contamination.

Summary based on SCCWRP Technical Report #143. Watershed-based sources of contaminants to San Pedro Bay and Marina del Rey: Patterns and trends. October 13, 2003. ftp://ftp.sccwrp.org/pub/download/PDFs/413_cstf_watershed.pdf

A3.2 Elevated total dissolved solids in Prima and Segunda Deshecha channels (Orange County)

Routine monitoring during the 2001-2002 monitoring year documented elevated levels of total dissolved solids (TDS) at monitoring stations in Prima and Segunda Deshecha channels in Orange County. Special studies involving hourly measurements of conductivity and flow rate, conducted in both channels, showed that the peak TDS concentration was not a function of tide (i.e., did not reflect a higher concentration of saltwater) and that the TDS concentration was inversely proportional to flow rate in the channel (see the figure below).

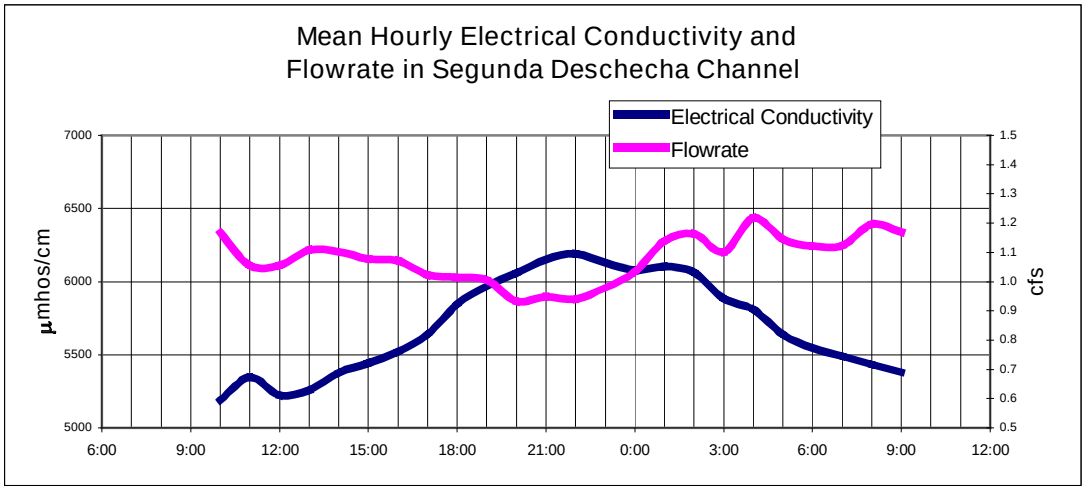

This strongly suggested that urban runoff diluted a naturally high level of dissolved solids in the channels. Subsequent to this finding, an upstream reconnaissance survey identified the presence of hundreds of weepholes in the concrete sidewalls of the channel. These weepholes appeared to be allowing subsurface drainage to leach salts from soils and carry them into the channel. Preliminary sampling of three weepholes during the reconnaissance survey showed them to have extremely high levels of electrical conductivity, an indicator of TDS. In addition, the crystalline residue on the channel walls near the routine monitoring location was found to have high concentrations of sodium and soluble sulfate.

These findings provided the basis for a more substantial upstream source identification study in the Prima Deshecha channel in March 2002 that included monitoring at several weepholes, as well as upstream and downstream of the weepholes. The resulting data (see following table) indicate that the seepage from the channel seams and weepholes increases the concentrations of dissolved solids in the channel downstream of the seepage.

Reach of Channel	Time	Monitoring Point	EC (µmhos)	TDS (mg/L)
At Diamante	13:00	Prima Deshecha Channel (M01)	Dry	
At Calle Nuevo	13:40	M01	5,150	
u/s Avenida Vacquero	14:48	M01 50' u/s weeping seam	5,510	4,880
	14:45	weeping seam	19,870	18,900
	14:42	M01 50' d/s weeping seam	7,510	7,330
	14:50	36" pipe discharging to M01	3,800	
d/s I-5	15:20	M01 in Shorecliff Golf Course	7,550	
u/s Calle Grande Vista	15:37	M01 50' u/s bubbling weepholes	7,750	7,490
	15:34	Bubbling weepholes	14,480	12,800
	15:40	48"pipe discharging to M01, 20' d/s weepholes	5,850	
At Calle Grande Vista	15:30	M01	8,480	

The conclusion was corroborated by soil samples collected from the levee of the Prima Deshecha channel above a weeping seam and from the levee of San Juan Creek, a channel with no history of elevated TDS levels (see following table).

Location	Chloride	Soluble Sulfate	Calcium	Magnesium	Potassium	Sodium
	mg/kg	%	mg/kg	mg/kg	mg/kg	mg/kg
Prima Deshecha Ch. Levee	61.3	0.447	861	275	37.2	582
San Juan Creek levee	13/7	0.048	34.1	11.1	15.4	202

Information obtained from the 2001-2002 annual report of the Orange County Stormwater Program

A3.3 SCCWRP's study of sources of loads to the LA River

The Los Angeles River drains most of Los Angeles County and extends 56 miles, starting from its headwaters in the San Fernando Valley, flowing past downtown Los Angeles, and eventually draining to San Pedro Bay near Long Beach. The highly developed watershed is 834 mi^2 and is comprised of residential (35%), commercial (5%), industrial (8%), and open land (51%) uses. The river's mainstem and tributaries are listed as impaired waterbodies for many constituents including nutrients (N), bacteria (fecal coliform), and trace metals (copper, lead, and zinc). The three primary sources of these pollutants included water reclamation plants (WRPs), major

tributaries, and storm drain outfalls. As part of efforts to establish TMDLs for the river, SCCWRP conducted a short-term study to characterize the water quality in the Los Angeles River and the various loads to the system.

This study was comprised of two parts. The first identified and sampled the inputs to the Los Angeles River and major tributaries. The second sampled the mainstem of the river to assess spatial distributions of water quality. The input monitoring was conducted using citizen volunteers while the spatial distribution monitoring was conducting using professionals. Visual observations were made of the outfall size and location, flow, and general characteristics (such as water discoloration; the presence of foam or oily sheens, trash or algae; and water quality). Flow was measured using either timed-volumetric or depth-velocity methods.

Water quality parameters included flow, total suspended solids (TSS), total organic carbon (TOC), biological oxygen demand (BOD5), nutrients (nitrate, nitrite, ammonia, TKN, and total phosphorous), and trace metals (cadmium, chromium, copper, iron, lead, nickel, mercury, and zinc). Sampling was accomplished on September 11, 2000 and included eight locations along the mainstem of the Los Angeles River and at the head of all seven tributaries Existing flow gages maintained by the Los Angeles County Department of Public Works provided flow information.

Table A3-3 shows the relative magnitude of the various inputs to the LA River. The majority of the dry weather flow in the river arose from the three inland POTW discharges in this watershed. In accordance, POTWs were the largest source of nutrients and some trace metals. In contrast, storm drains were the major source of bacteria and the remaining trace metals during dry weather. This preliminary sampling effort provided data sufficient to characterize the relative contributions of the major sources of pollutant loads to the system and a basis for more detailed source identification and loadings studies in the future.

Table A3-3. Total pollutant loads and the relative contributions among major sources to theLos Angeles River on September 10-11, 2000.

Constituent		Total Mass Emissions	Units	% Contribution POTWs	Tributaries	Storm Drains
Bacteria						
	E. coli	12,022	(10^9)/day	0	11	89
	Enterococcus	2,948	(10^9)/day	0	33	67
	Total Coliforms	113,854	(10^9)/day	1	65	35
Metals						
	Copper	3.7	kg/day	73	22	6
	Iron	39	kg/day	4	23	73
	Lead	0.53	kg/day	0	54	46
	Nickel	0.19	kg/day	0	0	100
	Zinc	11	kg/day	79	17	4
Nutrients						
	Ammonia-N3, 357		85	14	0	34
	Nitrate-N		kg/day	32	35	2
	TKN		kg/day	82	17	2
	Total Phosphate-P		kg/day	82	15	3

Ackerman, D., K. Schiff, H. Trim, and M. Mullin. 2003. Characterization of water quality in the Los Angeles River. *Bulletin of the Southern California Academy of Sciences* 102:17-25 or at ftp://ftp.sccwrp.org/pub/download/PDFs/2001_02ANNUALREPORT/08_ar08-drew.pdf.

A3.4 Elevated levels of diazinon in Bouquet Canyon Creek (Los Angeles County)

Toxicity tests conducted in late 2001 on water from Bouquet Canyon Creek documented elevated toxicity (4 – 5 toxic units). Subsequent TIEs showed the toxicity to be due primarily to diazinon, and water samples collected through late 2002 from inputs to the Creek (tributaries and storm drains) showed extremely high levels of diazinon (as high as 4000 ng/l). Following these findings, the Regional Board instructed Los Angeles County and the City of Santa Clarita to investigate the potential sources of diazinon and to eliminate any illicit discharges found.

By late November 2002, preliminary reconnaissance efforts, which included qualitative land use characterization) had identified several potential sources, including homeowner associations, exterminator companies, landscaping companies, and discharge outfalls. These efforts, including review of sales reports from hardware stores, suggested that there was no dominant single source of diazinon but, rather, that the diazinon contamination stemmed from widespread use by residents in the area. This conclusion led to the implementation of an aggressive pollution prevention approach in the area.

Monitoring continued at several key sites in parallel with the ongoing pollution prevention efforts. Monitoring data showed that, through March 2003, diazinon levels had dropped substantially (see following table), although some levels remained above the California Department of Fish and Game acute (0.08 ug/l) and chronic (0.05 ug/l) water quality criteria for diazinon.

Sample date	NR1	NR5	S2	S3	S7
08/28/02	5.698[1]	No data	4.214	No data	No data
10/16/02	0.95	3.76	1.19	0.46	0.53
11/20/02	0.20	0.02	0.17	No sample	No sample
01/14/03	0.34	No sample	0.16	0.41	0.31
02/03/03	0.05	No sample	0.04	0.08	0.08
03/05/03	0.15	No sample	0.10	0.22	0.08

[1] All data values reported as ug/l

The City of Santa Clarita is continuing with their educational outreach program, as part of ongoing pollution prevention efforts, to reduce diazinon levels to below State standards.

Information obtained from correspondence between the Los Angeles Regional Water Quality Control Board and the City of Santa Clarita.

A3.5 Elevated ammonia in Calleguas Creek stormwater flow (Ventura County)

Routine monitoring during the November 2001 detected an extremely high value of ammonia (52 mg/l) in Calleguas Creek. After the value was confirmed by reanalysis at the chemistry laboratory, Program staff conducted reconnaissance in the Calleguas watershed to attempt to identify the source of the ammonia. The reconnaissance was carried through in-person and telephone interviews to assess uses of ammonia in the watershed, which has a large percentage of agricultural land use. These interviews revealed that celery farmers typically inject ammonia into celery during wet weather to prevent the celery from becoming pithy.

Based on this information, the Program established five additional sites at the confluence of tributaries and at the inputs of major drains entering the creek from agricultural lands. This

sampling, conducted in dry weather, found no additional "hits" of ammonia. Nor did routine wet weather monitoring detect any further instances of elevated ammonia. Based on the information obtained about the use of ammonia by celery farmers, the presence of several celery farms upstream of the monitoring point, and the absence of any additional findings of elevated levels in either wet or dry weather samples, Program staff concluded that the elevated ammonia was most likely due to an unreported spill that occurred during the injection process. Because agriculture is exempt from the municipal NPDES permit, this was not pursued further.

Information obtained from personal communication with Ventura County Public Works Agency staff.

Appendix 4: Bacterial Die-off Rates in Freshwater Streams

This appendix reviews data on the inactivation of indicator microorganisms in freshwater as a basis for prioritizing sources of fecal contamination in southern California for further source identification work.

Fecal indicator bacteria, and the pathogenic organisms that they are meant to be the proxies for, have a limited ability to survive in most aquatic environments. Factors such as pH, temperature, solar (both UV and visible) irradiation, predation, osmotic stress, nutrient deficiencies, particulate levels, turbidity, oxygen concentrations, and microbial community composition affect bacteria inactivation once they reach receiving waters (Berry and Noton 1976, Mancini 1978, Kapuscinski and Mitchell 1980, Fujioka *et al.* 1981, Gerba and Bitton 1984, Auer and Niehaus 1992, Davies-Colley *et al.* 1994 , and Johnson *et al.* 1997). Indicator bacteria inactivation, that is, the rate at which the indicator bacteria die, is considered to be adequately represented by a first-order equation (see Thomann and Mueller, 1987). The first order decay rate (or inactivation) is usually referred to as k_D, and is usually reported as a per hour, or per day rate (e.g. 0.1 h^{-1}). In practice, people often use the term T_{90}, which describes the decline of bacteria in the time that it takes to obtain 90% mortality of the original number of bacteria, assuming a first-order loss. Throughout the rest of this document, the process will be referred to as inactivation, rather than decay, due to the fact that inactivation refers more specifically to the loss of the metabolic capabilities of the cell.

It is possible, with an adequate knowledge of environmental conditions, to create simple models of indicator bacteria inactivation using first order decay constants. In addition, several die-off equations can potentially be used in sequence with each other in order to estimate inputs from several stream inputs. There are existing models, like QUAL2E, that will permit the input of a particular coliform bacteria concentration, with temperature information, to estimate indicator bacteria levels downstream.

This document will outline a range of inactivation rates that could potentially be utilized to model bacterial inactivation in freshwater streams of southern California. However, it is particularly important to remember key points regarding bacterial inactivation rates, and the attempt to model such. First, even though most studies of rates of inactivation of indicator bacteria have been focused on single factors, we know that the process of inactivation is complex, and dependent upon multiple factors. For this reason, most of the studies that have been conducted in the laboratory to date should be reviewed suspiciously. Most of the studies have focused on analyzing the effects of one, two, or three factors independently (like temperature, pH, and TSS), and in doing so have ignored the biological complexities of the inactivation process. Second, solar irradiation/UV light is known to be one of the most important factors governing bacterial inactivation, and many studies have simply been conducted in the laboratory using UV lamps, ignoring the range of damage caused by visible, UV A, UV B, and UV C. Third, most studies have been conducted using laboratory strains of either *E. coli* or *enterococcus spp*. bacteria. These bacteria may not reflect the naturally found phylogenetic diversity of indicator bacteria inoculated into aquatic environments. Therefore the laboratory strains may be more susceptible to degradation than their outdoor counterparts. Finally, many different methods have been used to assess inactivation/decay/degradation. This is an issue that deserves much attention but in the interest of brevity, an example might be more useful. If two methods, membrane filtration, and chromogenic substrate kits (like Colilert-18®), were used to study rates of inactivation of *E. coli* in freshwater, the rate of inactivation determined with the use of the membrane filtration method would be much more rapid than that observed using the chromogenic substrate kits. The reason

for this discrepancy is that bacterial cells find it much more difficult, energetically speaking, to form a colony on a plate (the criteria for growth by membrane filtration), than to breakdown a growth substrate enzymatically (the criteria for growth by chromogenic substrate kits).

Given the cautions outlined above in interpreting data on bacterial inactivation, there are many useful studies that have been conducted that can be used to provide some general estimates of bacterial inactivation rates. Most studies have been conducted at a variety of temperatures, but presented here are the studies that have been conducted at temperate water temperatures that are applicable to southern California waters (ranging from 8-22° C).

One of the first things to do to understand the inactivation process is to determine whether or not sunlight will be considered in your estimates of bacterial inactivation rates. The detrimental effect of sunlight on survival of enteric bacteria in aquatic systems has been recognized for decades (Fujioka *et al.* 1981). Sunlight is capable of increasing inactivation rates by at least a factor of five compared to dark inactivation rates. Barcina *et al.* (1990) reported that EC was more resistant to damage by sunlight than *E. coli,* but Noble et al. (2003) demonstrated greater inactivation rates for EC than for *E. coli* even under low solar irradiation levels. The effect of sunlight is important to note, especially in sub-temperate latitudes such as southern California, where fluctuations in solar irradiation need to be considered. Published kD values for *E. coli* in freshwater can range from 0.03 to 0.06 h^{-1} (e.g., Barcina *et al.* 1986, Auer and Niehaus 1992, Menon 1993, and Mezrioui *et al.* 1995). However, other reports with kD as low as 0.001 h^{-1} and as high as 0.29 h^{-1} have been reported by Davies and Evison (1991), and Sinton *et al*. (2002), respectively. Obviously, different studies have revealed different rates of inactivation.

Given the concentration of the indicator bacteria of interest (C, in cfu or MPN/100 ml), an average decay coefficient (k_D, h^{-1}), a distance (D, meters or kilometers), and a stream or river velocity (U, translate into meters or kilometers per hour). An expected concentration of indicator bacteria can be calculated by:

$$C= C_0 * \exp(-k_D*D/U)$$

A general recommendation might be to assess the given conditions (high sunlight, low sunlight, etc.) and use a low rate of inactivation (conservative estimate), and a high rate of inactivation (liberal estimate) to provide a range of values of indicator bacteria that you will achieve downstream. The following table provides estimates of rates of inactivation, from several well-conducted and rigorously designed studies. Most rates of inactivation fall within the ranges observed here. In addition, the studies conducted by Noble et al. (2003) were specifically conducted in southern California waters, and so are a system specific representation of inactivation.

Table A4-1: Rates of inactivation for a range of studies.

Indicator	k_D (hr^{-1})	Notes	Reference
Total coliform	0.041-0.23	Ranges, freshwater, measured for 20° C	Thomann and Mueller, 1987
Total coliform	0.02	Riverine freshwater	Baudisova, 1997
Fecal coliforms	0.0162 0.007	Waste stabilization pond Raw sewage (conducted in the dark)	Sinton et al. 2002

Fecal coliforms	0.086 0.275	Waste stabilization pond Raw sewage (conducted in sunlight)	Sinton et al. 2002
E. coli	0.008	Natural surface water	Medema et al. 1997
E. coli	0.134	High solar radiation	Noble et al. 2003
E. coli	0.054	Low solar radiation	Noble et al. 2003
E. coli	0.001	Freshwater, dark	Davies and Evison 1991
E. coli	0.0171 0.023	Waste stabilization pond Raw sewage (conducted in the dark)	Sinton et al. 2002
E. coli	0.078 0.287	Waste stabilization pond Raw sewage in freshwater (conducted in sunlight)	Sinton et al. 2002
E. coli	0.03-0.06	Freshwater	Barcina et al. 1986,
Enterococci	0.27	High solar radiation	Noble et al. 2003
Enterococci	0.24	Low solar radiation	Noble et al. 2003
Enterococci	0.0168 0.012	Waste stabilization pond Raw sewage (conducted in the dark)	Sinton et al. 2002
Enterococci	0.276 0.137	Waste stabilization pond Raw sewage (conducted in sunlight)	Sinton et al. 2002
Enterococcus faecalis	0.016-0.038	Freshwater at 20° C	Thomann and Mueller, 1987

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Appendix 5: TIE Prioritization Metric

This appendix describes the calculation of a metric for prioritizing TIEs (Toxicity Identification Evaluations) to better identify the potential source(s) of toxicity in receiving waters. As discussed in the main body of the report, the model monitoring design recommends that a full year of toxicity testing be conducted and then TIEs be performed in the subsequent year, based on the relative magnitude and persistence of toxicity at the monitoring stations. The metric described below results in a single number for each site for each year and is an approach for combining the magnitude of toxicity (measured as mortality relative to a control), the breadth of toxicity across multiple test species, and the persistence of toxicity over multiple monitoring events in a given year. The metric provides users the ability to weight each of these three components differently, depending on the nature of toxicity and the specific management concern(s). However, all sites being considered for TIEs must be evaluated with the same metric weighting in order to ensure a consistent comparison among sites.

The experimental design is illustrated below:

	Time 1	Time 2	Time 3
Species 1			
Species 2			
Species 3			

At a specific site, three different species toxicity tests are performed at three different times over the course of the monitoring year. Each cell of the design contains a measure of the strength of water toxicity. A test with no measured toxic effects is represented by a value of zero.

The index is computed as the cell average toxicity value adjusted for consistency of toxic hits within species (rows) and/or time (columns). A toxic hit is defined as a toxicity value greater than zero. The consistency of toxicity within columns (across species) is measured by a cumulative score that depends on the numbers of toxic hits in the columns. For each column with three toxic hits, 1 is added to the total score (see the tables below), and for each column with two toxic hits, ½ is added to the total score. Nothing is added to the total score for 0 or 1 toxic hits in a column. A similar total score based in toxic hits in the rows is computed for consistency within rows.

Variables used to compute the index value are:

C_{col} = the column consistency score,

C_{row} = the row consistency score,

A_{col}=percent adjustment for column consistency,

A_{row}=percent adjustment for row consistency, and

M=the mean of all cells.

The index is computed as

$$I = M\left(1 + \frac{A_{col}}{100}\frac{C_{col}}{3} + \frac{A_{row}}{100}\frac{C_{row}}{3}\right). \qquad (1)$$

The value 3 in equation (1) is the maximum consistency score for rows (C_{row}) or columns (C_{col}). Thus, when the consistency score is maximal, the full percent adjustment (A) is added to the value in the parentheses, and lesser amounts are added for less than maximal scores. The values of 100 in equation (1) convert the adjustment percents to proportions.

It can be seen that equation (1) is the cell mean with upward adjustments for consistency within rows or columns. The user must decide what percent adjustment of the cell mean will be associated with the maximum score for both rows and columns. For example, if the user wants to emphasize consistency of toxicity across species at the same time, the user could set A_{col}=30 and A_{row}=0, which will adjust the cell mean upward by 30% for maximal within-column consistency, and ignore within-row consistency. Some example calculations with these A values are provided for below.

Example data with minimum within-column consistency might be as follows:

	Time 1	Time 2	Time 3	# hits
Species 1	30	40	20	3
Species 2	0	0	0	0
Species 3	0	0	0	0
# hits	1	1	1	

The calculations for these data with A_{col}=30 and A_{row}=0 are shown in equation (2).

$$I = M\left(1 + \frac{A_{col}}{100}\frac{C_{col}}{3} + \frac{A_{row}}{100}\frac{C_{row}}{3}\right) = 10\left(1 + \frac{30}{100}\frac{0}{3} + \frac{0}{100}\frac{1}{3}\right) = 10 \qquad (2)$$

Example data with some within-column consistency might be as follows:

	Time 1	Time 2	Time 3	# hits
Species 1	30	0	0	1
Species 2	40	0	0	1
Species 3	20	0	0	1
# hits	3+1	0	0	

The calculations for these data with A_{col}=30 and A_{row}=0 are shown in equation (3).

$$I = M\left(1 + \frac{A_{col}}{100}\frac{C_{col}}{3} + \frac{A_{row}}{100}\frac{C_{row}}{3}\right) = 10\left(1 + \frac{30}{100}\frac{1}{3} + \frac{0}{100}\frac{0}{3}\right) = 11 \qquad (3)$$

Note that the index value for the data used in equation (3) is higher than the index value for the data used in equation (2). This is because the equation (3) data have more within-column consistency and the A values were set to emphasize the within-column consistency. A more dramatic difference between the two index values would have resulted if a higher value for A_{col} was used.

It is important to stress that the intended use of the index (I) values is to help prioritize stations for follow-up TIEs. Thus, stations with higher index values would be a higher priority when allocating a fixed amount of resources for TIEs.

053257

The National Stormwater Quality Database, Version 1.1

A Compilation and Analysis of NPDES Stormwater Monitoring Information

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Abstract

The National Stormwater Quality Database v. 1.1 (NSQD) contains selected water quality information from the monitoring carried out as part of the U.S. EPA's National Pollutant Discharge Elimination System (NPDES) Phase 1 stormwater permit applications and subsequent permits, during the period of 1992 to 2002. This database contains about 3,765 events from 360 sites in 65 communities from throughout the U.S. For each site, more additional data, including the percentage of each land use in the catchment, the total area, the percentage of impervious cover, the geographical location, and the season, has been included in the database. Information about the characteristics of each event is also included. Total precipitation, precipitation intensity, total runoff and antecedent dry period are also included, if collected. The database only contains information for samples collected at drainage system outfalls; in-stream samples (which were a component of some state programs) were not included in the database, although some outfalls were located in open channel conveyances.

The first phase requirements of the federal stormwater permit program were first published in the Federal Register by the EPA in 1987 and was initially applied to large cities (>100,000 in population), while Phase II of the stormwater permit program was applied to all urban areas as of early 2003. This program requires significant changes in how stormwater is to be managed. Historical approaches only examined drainage issues, while the new regulations also require consideration of water quality issues.

There are a number of commonly accepted notions that are used by stormwater managers and regulators that can have major impacts on local costs and program effectiveness. This research report examines a number of these potential misconceptions to see how well they hold up under a comprehensive set of actual monitoring data collected throughout the U.S. as part of the Phase I stormwater permit program. This research report is mostly comprised of the major sections of the Ph.D. dissertation prepared by Alex Maestre in partial fulfillment of his degree requirements in the Department of Civil and Environmental Engineering at the University of Alabama.

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Chapter 1: Introduction

The first phase of the federal stormwater permit program was first published in the Federal Register by the EPA in 1987 and was initially applied to large cities (>100,000 in population), while Phase II of the stormwater permit program was applied to all urban areas as of early 2003. This program requires significant changes in how stormwater is to be managed. Historical approaches only examined drainage issues, while the new regulations also required consideration of water quality issues. Unfortunately, some professionals involved with stormwater management may not have an adequate understanding of stormwater characteristics, including its effects, and treatability. As an example, there are a number of commonly accepted notions that are used by stormwater managers and regulators that can have major impacts on local costs and program effectiveness. This research report examines a number of these notions to see how well they hold up under a comprehensive set of actual monitoring data collected throughout the U.S. as part of the Phase I stormwater permit program. This research report also includes a predictive tool that can assist stormwater managers in predicting expected stormwater conditions for local areas.

Researchers from the University of Alabama and the Center for Watershed Protection assembled a large database of stormwater characteristics, the National Stormwater Quality Database (NSQD), as part of an EPA-funded section 104(b)3 project from the Office of Water. This is the largest collection of information on stormwater characteristics ever assembled for US conditions. The research described in this report used this information to test the validity of several commonly accepted notions concerning stormwater, and produced a statistical tool that hopefully can assist stormwater managers and regulators. In addition, many suggestions concerning monitoring strategies for stormwater are summarized, based on the experiences of many of the Phase I permitted communities. The cumulative value of the monitoring data collected over nearly a ten-year period from more than 200 municipalities throughout the country has a great potential in characterizing the quality of stormwater runoff and comparing it against historical benchmarks.

The data set received a comprehensive quality assurance/quality control review, based on reasonableness of data, extreme values, relationships among parameters, sampling methods, and a review of the analytical methods. The statistical analyses were conducted at several levels. Probability plots were used to identify range, randomness and normality. Multivariate analyses were also utilized to characterize significant factors affecting the data patterns. The master data set was also evaluated to develop descriptive statistics, such as measures of central tendency and standard errors. Testing was done for regional and climatic differences, the influences of land use, and the effects of storm size, drainage area and season, among other factors.

This National Stormwater Quality Database (NSQD), in its first version presented here, is not intended for comprehensive characterization purposes for all conceivable situations and to replace the need for all characterization monitoring. Some communities may have obvious unusual conditions, or adequate data may not be available in the database for their region. In these conditions, site specific local outfall monitoring may be needed. In addition, stormwater monitoring will continue to be needed for other purposes in many areas having, or anticipating, active stormwater management programs (especially when supplemented with other biological, physical, and hydrologic monitoring components). These new monitoring programs should be designed specifically for additional objectives, beyond simple characterization. These may include receiving water assessments to understand local problems, source area monitoring to identify critical sources, treatability tests to verify performance of stormwater controls for local conditions, and assessment monitoring to verify the success of local stormwater management approaches (including model calibration and verification). In many cases, however, the resources being spent for conventional outfall monitoring could be more effectively spent to better understand many of these other aspects of an effective stormwater management program.

Report Organization

This report is divided into nine chapters and five appendices. Chapter 2 describes the National Stormwater Quality Database (NSQD). Chapter 3 describes the QA/QC procedures used during the collection of data and creation of the database, including an evaluation of alternative methods to address the presence of non-detected values. Chapter 4 addresses the hypothesis concerning the probability distributions most appropriate for the stormwater constituents. Chapter 5 describes the results of the investigations relating constituent concentrations to main factors and interactions of parameters described in the site description and hydrologic information sections of the database. Chapter 6 presents the results from the "first flush" analysis. Chapter 7 presents detailed results of the statistical tests used to develop predictive models of stormwater characteristics affected by geographical location and land use. Chapter 8 presents an example of how the data in the NSQD can be used to estimate the concentration of stormwater constituents for Maryland and Virginia (the region best represented in the database). Chapter 9 presents the conclusions and recommendations of this research.

Chapter 2: The National Stormwater Quality Database (NSQD) Description

Introduction

The National Stormwater Quality Database (NSQD) was prepared by the University of Alabama and the Center for Watershed Protection under 104(b)3 funding from the U.S. Environmental Protection Agency (EPA). The NSQD is a spreadsheet database and supporting documents describing the monitoring efforts of 65 communities from throughout the U.S. that are larger than 100,000. The monitoring period covered by the NSQD is from 1992 to 2002.

Several efforts have been performed in the past to describe the water quality characteristics of stormwater constituents at different locations. The importance of this EPA-sponsored project is based on the scarcity of nationally summarized and accessible data from the existing U.S. EPA's NPDES (National Pollutant Discharge Elimination System) stormwater permit program. There have been some local and regional data summaries, but little has been done with nationwide data. A notable exception is the Camp, Dresser, and McGee (CDM) national stormwater database (Smullen and Cave 2002) that combined historical Nationwide Urban Runoff Program (NURP) (EPA 1983) data, available urban U.S. Geological survey (USGS), and selected NPDES data. Their main effort had been to describe the probability distributions of these data (and corresponding EMCs, the event mean concentrations). They concluded that concentrations for different land uses were not significantly different, so all their data were pooled into a single urban land use category.

The Clean Water Act (CWA) of 1972 was the first major national regulation in the U.S. requiring control of conventional point source discharges of water pollutants (affecting municipal and industrial discharges). Section 208 also provided the capability to implement stormwater management plans at the regional level. In 1976, the EPA enlarged the planning initiative through the "Section 208: Areawide Assessment Procedures Manual". However, in the late 1970s, some problems arose with the 208 planning projects due to inadequate data and lack of technological development (Whipple, as quoted by Pitt, *et al*. 1999).

Between 1978 and 1983, the EPA conducted the Nationwide Urban Runoff Program (NURP) that examined stormwater quality from separate storm sewers in different land uses (EPA 1983). This program studied 81 outfalls in 28 communities throughout the U.S. and included the monitoring of approximately 2,300 storm events. NURP is still an important reference for water quality characteristics of urban stormwater; however, the collected data poorly represented the southern area of the country and was focused mainly in residential and mixed land use areas. Since NURP, other important studies have been conducted that characterize stormwater. The USGS created a database with more than 1,100 storms from 98 monitoring sites in 20 metropolitan areas. The Federal Highway Administration (FHWA) analyzed stormwater runoff from 31 highways in 11 states during the 1970s and 1980s. Strecker (personal communication) is also collecting information from highway monitoring as part of a current NCHRP (National Cooperative Highway Research Program) funded project. The city of Austin also developed a database having more than 1,200 events.

Other regional databases also exist for U.S. data, mostly using local NPDES data. These include the Los Angeles area database, the Santa Clara and Alameda County (California) databases, the Oregon Association of Clean Water Agencies Database, and the Dallas, Texas, area stormwater database. These regional data are included in the NSQD. However, the USGS and historical NURP data are not included in the NSQD due to lack of consistent descriptive information for the older drainage areas and because of the age of the data from those prior studies. Much of the NURP data is available in electronic form at the University of Alabama's student American Water Resources Association web page at: http://www.eng.ua.edu/~awra/download.htm.

Outside the U.S., there have been important efforts to characterize stormwater. In Toronto, Canada, the Toronto Area Watershed Management Strategy Study (TAWMS) was conducted during 1983 and 1984 and extensively

monitored industrial stormwater, along with snowmelt in the Toronto urban area, for example. Numerous other investigations in South Africa, the South Pacific, Europe and Latin America have also been conducted over the past 30 years, but no large-scale summaries of that data have been prepared. About 4,000 international references on stormwater have been reviewed and compiled since 1996 by the Urban Wet Weather Flows literature review team for publication in *Water Environment Research* (most recently by Clark, *et al*. 2001, 2002, 2003, 2004). An overall compilation of these literature reviews is available at: http://www.eng.ua.edu/~rpitt/Publications/Publications.shtml. These reviews include short summaries of the papers and are organized by major topics. Besides journal articles, many published conference proceedings are also represented (including the extensive conference proceedings from the 7th International Conference on Urban Storm Drainage held in Germany in 1996, the 8th International Conference on Urban Storm Drainage held in Sydney, Australia, in 1999, the 9th International Conference on Urban Storm Drainage held in Portland, OR, in 2002, and the Urban Water Systems Modeling conference series for the Toronto meetings organized by Computational Hydraulics, Inc., amongst many other specialty conferences).

In 1987, the amendments to the CWA established a two-phase program to regulate 13 classes of stormwater discharges. Two of these classifications were discharges from large and medium-sized Municipal Separate Storm Sewer Systems. A large MS4 serves an urban population of 250,000 or more, while a medium MS4 serves communities between 100,000 and 250,000. EPA set up a permit strategy for communities complying with NPDES requirements. Monitoring data from this program have been included in some databases. The CDM National Stormwater Runoff Pollution database included 816 NPDES storm events in a database that totals approximately 3,100 events. The Rouge River National Wet Weather Demonstration Program office in Detroit included their NPDES data in their database (Smullen and Cave 2003).

Another important effort has been the development of the National Stormwater Best Management Practices Database (http://www.bmpdatabase.com). This database was created with the purpose to evaluate the performance and effectiveness of stormwater control practices, frequently labeled "best management practices," or BMP's. Detention ponds, street cleaning, and hydrodynamic devices are examples of BMPs (ASCE/EPA 2000).

Data Collection

Data from 3,765 storm events at 360 monitoring sites were collected and are stored in version 1.1 of the NSQD. This version contains the results of approximately one fourth of the total number of communities that participated in the Phase I NPDES stormwater permit monitoring activities.

According to the published sampling guidance (40 CFR 122.21) for the permit application, each community was required to sample at least a residential, a commercial and an industrial watershed. At least three samples should be collected every year at each location. Each storm should be at least one month apart and have at least a 3 days antecedent dry period. Only samples from rain events greater than 0.1 inches, and close to the annual mean conditions, were considered valid for the analysis. It was required to collect a composite sample with subsamples collected during the first three hours of the event. An additional grab sample was required during the first 30 minutes of the event to evaluate the "first flush" effect. "First flush" refers to the hypothesis that the concentrations of stormwater constituents are higher at the beginning of the discharge event than during the complete event. Designated states were able to modify some of these sampling requirements to better address local concerns.

Most communities were required to submit annual reports describing the sampling locations and procedures, the equipment, and the quality control and quality assurance (QA/QC) procedures used during the sampling and analysis of the samples, the analytical methods used in the laboratory, and problems encountered during the sample collection. The reports also included the results of the chemical analyses performed by the laboratories.

Figure 1 is a map showing the 65 communities and 17 states included in the first version of the NSQD. The EPA-funded project was intended to focus on the Chesapeake Bay area and parts of the southern U.S. (specifically Birmingham, AL, and Atlanta, GA) as a demonstration of the usefulness of the data. However, it was possible to obtain some data from other parts of the country during the project period and these data were incorporated in the database, allowing some regional analyses. States representing most of the samples included Virginia (24%) and Maryland (13%). The states with low numbers of observations included Pennsylvania, Massachusetts, and Indiana.

Figure 1 also shows the EPA Rain Zones. Each zone corresponds to a geographical region with similar climatic conditions (EPA 1986). There is at least one community per rain zone indicating some geographical representation for the entire country. However, Table 1 indicates that most of the samples were collected west, south and east of the continental part of the country, with few of the large amounts of data from EPA Rain Zone 1 included in the database. EPA Rain Zones 8 and 9 have sparse available data from the Phase I monitoring program, due to few large cities in these areas.

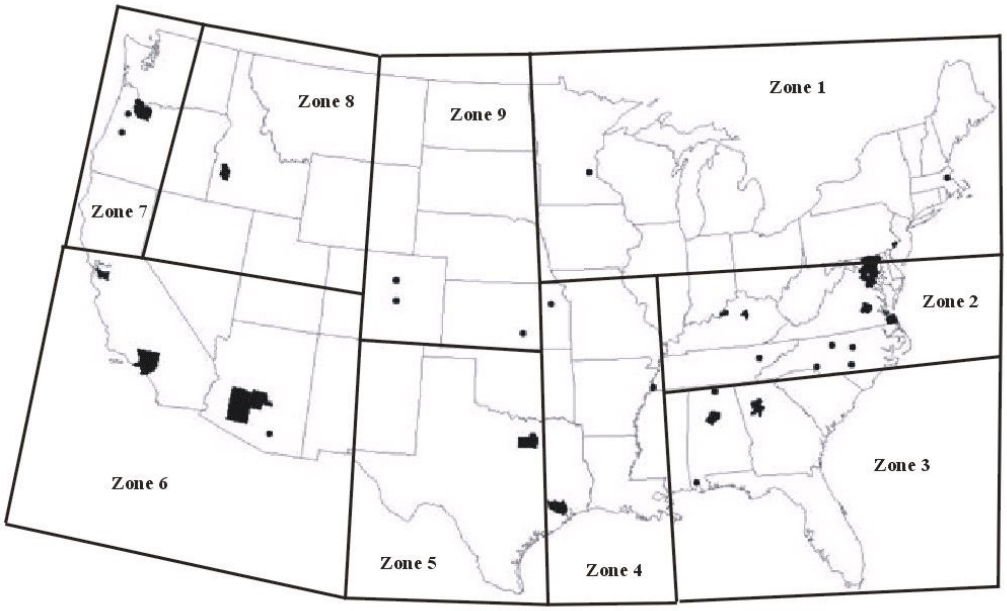

Figure 1. Communities included in the NSQD version 1.1 by rainfall zones

Table 1. Total Samples and Sites by EPA Rain Zone

EPA Rain Zone	Total Samples	Percentage of Samples	Number of Communities	Number of Sites
1	69	1.8	2	12
2	2000	53	28	185
3	266	7.1	8	30
4	212	5.6	4	21
5	485	13	9	33
6	356	9.5	4	30
7	229	6.1	6	28
8	24	0.63	1	4
9	124	3.3	3	17

Each site in the database corresponds to an outfall where the runoff produced in the watershed is discharged. During the monitored events, samples were collected to identify the characteristics of the stormwater being discharged. According to the land use of the watershed, each site was classified as residential, commercial, industrial, open space, freeway, or mixed. When a single land use was not identified for the watershed, then the site was considered mixed, with a predominant land use. Table 2 indicates the total number of sites included in the database, separated by land use.

Table 2. Total Samples and Sites by Land Use

Land use	Number of Sites	Percentage	Number of Events	Percentage
Residential	111	31	1042	28
Mixed Residential	44	12	611	16
Commercial	51	14	526	14
Mixed Commercial	29	8.1	325	8.6
Industrial	54	15	566	15
Mixed Industrial	22	6.1	249	6.6
Institutional	1	0.3	18	0.5
Open Space	10	2.8	49	1.3
Mixed Open Space	13	3.6	168	4.5
Freeways	22	6.1	185	4.9
Mixed Freeways	3	0.8	26	0.7

About one third of the sites included in the database correspond to residential areas, another third is shared by commercial and industrial land uses. The remaining third correspond to freeways, open space, institutional and all the mixed land uses. Several schools were identified in the sites, however only one site was considered 100% institutional.

Summary of U.S. NPDES Phase I Stormwater Data in the NSQD

Table 3 is a summary of selected data collected and entered into the database. The data are separated into 11 land use categories: residential, commercial, industrial, institutional, freeways, and open space, plus mixtures of these land uses. Summaries are shown for the major land use areas and for the total data set combined. The full database includes all of the data. The total number of observations and the percentage of observations above the detection limits are also shown on this summary table. In general, the coefficient of variation (COV) values range from 1.0 to 2.0 for the majority of pollutants across all major land uses.

The following sections describe the structure of the full database and present some findings. The findings presented are focused on specific issues and are illustrated using small portions of the complete database to minimize the effects of other interacting factors (such as using data from a single region and land use to show the effects of sampling methods, for example). Later sections of this report present more comprehensive discussions of the data that do consider interactions of the many factors available in the database.

Database Structure

The database has five major sections: General Information, Items Description, Constituents and Parameters, and the Database itself. In addition, detailed site information along with aerial photographs and topographic maps is provided for each municipality and monitoring location. Each of the sections is a tab in the bottom part of the spreadsheet.

Table 3. Summary of Available Stormwater Data Included in NSQD, version 1.1

	Area (acres)	% Impervious	Precipitation Depth (in)	Runoff Depth (in)	Conductivity (µS/cm @25ºC)	Hardness (mg/L CaCO3)	Oil and Grease (mg/L)	pH	Tempe-rature (C)	TDS (mg/L)	TSS (mg/L)	BOD_5 (mg/L)	COD (mg/L)
Overall Summary (3765)													
Number of observations	3765	2209	3316	1495	685	1082	1834	1665	861	2956	3493	3105	2750
% of samples above detection	100	100	100	100	100	98.7	66.1	100	100	99.0	97.9	96.2	98.4
Median	57.3	50.0	0.48	0.15	121	38.0	4.3	7.5	16.5	80	59	8.6	53
Coefficient of variation	3.7	0.4	1.0	1.9	1.6	1.4	9.7	0.1	0.4	3.4	1.8	7.4	1.1
Residential (1042)													
Number of observations	1042	614	919	372	104	215	483	286	181	814	978	908	748
% of samples above detection	100	100	100	100	100	100	54.9	100	100	99.1	98.3	97.1	98.7
Median	57.3	37.0	0.48	0.10	102	32.0	4.0	7.2	17.0	72.0	49	9.0	54.5
Coefficient of variation	4.8	0.4	1.0	1.5	1.6	1.1	7.8	0.1	0.4	1.1	1.8	1.5	0.93
Mixed Residential (611)													
Number of observations	611	278	491	262	105	168	283	333	137	491	582	549	465
% of samples above detection	100	100	100	100	100	98.2	70.3	100	100	99.2	98.3	94.2	99.6
Median	150.8	44.9	0.53	0.12	112	40.0	4.0	7.50	15.5	86	66	7.8	43
Coefficient of variation	2.1	0.3	0.8	1.3	1.2	1.1	2.6	0.1	0.3	5.2	1.6	1.3	1.2
Commercial (527)													
Number of observations	527	284	462	146	78	156	331	191	98	418	503	452	393
% of samples above detection	100	100	100	100	100	100	71.9	100	100	99.5	95.2	97.6	98.5
Median	38.8	84.5	0.42	0.29	107	36.5	4.6	7.4	16.0	72	43	11.0	58
Coefficient of variation	1.2	0.1	1.0	1.0	1.0	1.1	3.0	0.1	0.4	1.9	2.0	1.1	1.0
Mixed Commercial (324)													
Number of observations	324	237	305	118	59	98	134	156	98	265	297	277	267
% of samples above detection	100	100	100	100	100	99.0	79.9	100	100	99.6	99.7	98.9	99.6
Median	75.0	60.0	0.47	0.28	100	36.0	5.0	7.60	14.5	69.5	54.5	9.0	60
Coefficient of variation	1.4	0.3	1.0	0.9	0.8	1.8	2.9	0.1	0.4	1.9	1.3	1.7	1.0
Industrial (566)													
Number of observations	566	292	482	215	102	132	315	248	140	431	521	455	386
% of samples above detection	100	100	100	100	100	96.2	64.8	100	100	99.5	97.7	95.4	99.0
Median	39.5	75.0	0.50	0.16	139	39.0	4.8	7.50	17.9	86	81	9.0	58.6
Coefficient of variation	1.1	0.3	0.9	1.2	1.3	1.5	11.8	0.1	0.3	3.6	1.6	10.0	1.2

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Table 3. Summary of Available Stormwater Data Included in NSQD, version 1.1 – *Continued*

	Area (acres)	% Impervious	Precipitation Depth (in)	Runoff Depth (in)	Conductivity (µS/cm @25ºC)	Hardness (mg/L CaCO3)	Oil and Grease (mg/L)	pH	Tempe-rature (C)	TDS (mg/L)	TSS (mg/L)	BOD_5 (mg/L)	COD (mg/L)
Mixed Industrial (218)													
Number of observations	218	118	193	117	56	75	72	152	57	186	207	178	175
% of samples above detection	100	100	100	100	100	93.3	80.6	100	100	99.5	100	95.5	98.9
Median	168.0	44.0	0.45	0.29	126	29.3	9.0	7.70	18.0	90	82	7.5	39.9
Coefficient of variation	1.8	0.3	0.9	1.2	0.8	0.6	1.8	0.1	0.3	0.8	1.4	1.8	1.2
Institutional (18)													
Number of observations	18	18	17	14						18	18	18	18
% of samples above detection	100	100	100	100						100	94.4	88.9	88.9
Median	36.0	45.0	0.18	0.00						52.5	17	8.5	50
Coefficient of variation	0	0	0.9	2.1						0.7	0.83	0.7	0.9
Freeways (185)													
Number of observations	185	154	182	144	86	127	60	111	31	97	134	26	67
% of samples above detection	100	100	100	100	100	100	71.7	100	100	99.0	99.3	84.6	98.5
Median	1.6	80.0	0.54	0.41	99	34.0	8.0	7.10	14.0	77.5	99	8	100
Coefficient of variation	1.4	0.13	1.1	1.7	1.0	1.9	0.6	0.1	0.4	0.8	2.6	1.3	1.1
Mixed Freeways (26)													
Number of observations	26		26		21	12	20	17	17	15	23	23	15
% of samples above detection	100		100		100	100	100	100	100	100	100	100.0	100.0
Median	63.1		0.47		353	83	4.5	7.7	16.0	177	88	8.2	47
Coefficient of variation	0.7		0.8		0.6	0.3	1.8	0.1	0.3	0.4	1.1	1.2	0.5
Open Space (49)													
Number of observations	49	37	41	11	2	8	19	19	2	45	44	44	43
% of samples above detection	100	100	100	100	100	100	36.8	100	100	97.8	95.5	86.4	76.74
Median	85	2.0	0.52	0.05	113	150	1.3	7.70	14.6	125	48.5	5.4	42.1
Coefficient of variation	1.5	1.0	1.2	1.4	0.5	0.6	0.7	0.08	0.7	0.7	1.5	0.7	1.5
Mixed Open Space (168)													
Number of observations	168	131	167	93	65	70	90	128	76	148	153	145	145
% of samples above detection	100	100	100	100	100	100	60.0	100	100	99.3	97.4	96.6	96.6
Median	115.4	33.0	0.51	0.10	215	64.2	8.5	7.9	16.0	109	78.0	6.0	34
Coefficient of variation	0.8	0.4	0.8	1.2	1.7	1.3	1.5	0.1	0.3	2.2	1.6	2.7	1.6

Table 3. Summary of Available Stormwater Data Included in NSQD, version 1.1 – *Continued*

	Fecal Coliform (mpn/100 mL)	Fecal Strepto-coccus (mpn/100 mL)	Total Coliform (mpn/10 0 mL)	Total E. Coli (mpn/100 mL)	NH3 (mg/L)	N02+NO3 (mg/L)	Nitrogen, Total Kjeldahl (mg/L)	Phospho-rus, filtered (mg/L)	Phospho-rus, total (mg/L)	Sb, total (µg/L)	As, total (µg/L)	As, filtered (µg/L)	Be, total (µg/L)
Overall Summary (3765)													
Number of observations	1704	1141	83	67	1908	3075	3191	2477	3285	874	1507	210	947
% of samples above detection	91.2	94.0	90.4	95.5	71.3	97.3	95.6	85.1	96.5	7.2	49.9	27.1	7.7
Median	5091	17000	12000	1750	0.44	0.60	1.4	0.13	0.27	3.0	3.0	1.5	0.4
Coefficient of variation	4.6	3.8	2.4	2.3	1.4	0.97	1.2	1.6	1.5	1.7	2.6	1.0	2.5
Residential (1042)													
Number of observations	402	257		14	572	889	922	690	926		395		282
% of samples above detection	87.8	87.9		100	82.2	97.6	96.5	83.5	96.8		40.8		7.8
Median	7000	24300		700	0.31	0.60	1.5	0.18	0.31		3.0		0.5
Coefficient of variation	5.2	1.7		1.6	1.1	1.1	1.1	0.9	1.1		2.2		2.5
Mixed Residential (611)													
Number of observations	336	178	26	11	282	531	517	430	552		158		97
% of samples above detection	94.3	97.8	84.6	90.9	58.5	97.9	95.0	83.3	96.2		65.9		11.3
Median	11210	27500	5667	1050	0.39	0.57	1.4	0.13	0.28		3.0		0.3
Coefficient of variation	3.2	2.1	1.3	2.1	1.6	0.78	1.7	1.1	1.7		3.9		2.7
Commercial (527)													
Number of observations	253	201			300	445	469	343	466		235		
% of samples above detection	88.9	92.5			83.3	98.0	97.4	81.0	95.9		33.6		
Median	4600	12000			0.50	0.6	1.5	0.11	0.22		2.3		
Coefficient of variation	3.0	2.7			1.2	1.1	0.9	1.3	1.2		2.9		
Mixed Commercial (324)													
Number of observations	116	95			173	284	276	221	290	89	139		
% of samples above detection	94.8	98.9			67.1	96.8	96.0	93.7	98.6	11.9	45.5		
Median	5400	11900			0.60	0.58	1.4	0.12	0.26	15.0	2.0		
Coefficient of variation	3.0	2.6			1.0	0.7	0.9	2.1	1.5	1.0	1.0		
Industrial (566)													
Number of observations	315	189			272	461	483	344	478	152	255		197
% of samples above detection	87.3	93.7			78.3	96.3	96.3	88.1	96.2	14.5	52.9		10.7
Median	2400	12000			0.42	0.69	1.4	0.10	0.25	3.7	4.0		0.38
Coefficient of variation	5.7	7.0			1.3	0.92	1.1	1.2	1.4	1.4	1.4		2.5

Table 3. Summary of Available Stormwater Data Included in NSQD, version 1.1 – *Continued*

	Fecal Coliform (mpn/100 mL)	Fecal Strepto-coccus (mpn/100 mL)	Total Coliform (mpn/10 0 mL)	Total E. Coli (mpn/100 mL)	NH3 (mg/L)	N02+NO3 (mg/L)	Nitrogen, Total Kjeldahl (mg/L)	Phospho-rus, filtered (mg/L)	Phospho -rus, total (mg/L)	Sb, total (µg/L)	As, total (µg/L)	As, filtered (µg/L)	Be, total (µg/L)
Mixed Industrial (218)													
Number of observations	79	59	14		99	173	160	179	177		93		
% of samples above detection	98.7	96.9	71.4		30.3	98.8	92.5	84.4	95.5		88.2		
Median	3033	11000	2467		0.58	0.59	1.1	0.08	0.20		3.5		
Coefficient of variation	2.5	2.5	1.5		0.8	0.7	1.5	2.3	1.6		0.9		
Institutional (18)													
Number of observations					18	18	18	17	17				
% of samples above detection					88.9	100	100	82.4	94.1				
Median					0.31	0.6	1.35	0.13	0.18				
Coefficient of variation					0.5	0.6	0.5	0.5	1.0				
Freeways (185)													
Number of observations	49	25	16	13	79	25	125	22	128		61	72	
% of samples above detection	100	100	100	100	87.3	96.0	96.8	95.5	99.2		55.7	50.0	
Median	1700	17000	50000	1900	1.07	0.28	2.0	0.20	0.25		2.4	1.4	
Coefficient of variation	2.0	1.2	1.5	2.2	1.3	1.2	1.4	2.1	1.8		0.7	2.0	
Mixed Freeways (26)													
Number of observations	20	16				22	22	11	22		15		
% of samples above detection	85.0	93.8				100	100	100	100		80		
Median	2600	19000				0.9	2.3	0.03	0.34		3.0		
Coefficient of variation	2.3	1.1				0.7	1.3	0.9	0.7		0.7		
Open Space (68)													
Number of observations	23	22			32	44	45	44	46		19		
% of samples above detection	91.3	90.9			18.8	84.1	71.1	79.6	84.8		31.6		
Median	7200	24900			0.18	0.59	0.74	0.13	0.31		4.0		
Coefficient of variation	1.1	1.0			1.24	0.9	0.9	0.9	3.5		0.4		
Mixed Open Space (168)													
Number of observations	86	75			71	152	123	148	152		88		
% of samples above detection	97.7	100			22.5	97.4	90.2	85.8	96.1		44.3		
Median	3000	21000			0.51	0.7	1.1	0.09	0.25		3.0		
Coefficient of variation	2.3	2.4			1.2	0.8	0.9	1.1	1.1		0.9		

Table 3. Summary of Available Stormwater Data Included in NSQD, version 1.1 – *Continued*

	Cd, total (µg/L)	Cd, filtered (µg/L)	Cr, total (µg/L)	Cr, filtered (µg/L)	Cu, total (µg/L)	Cu, filtered (µg/L)	Pb, total (µg/L)	Pb, filtered (µg/L)	Hg, total (µg/L)	Ni, total (µg/l)	Ni, filtered (µg/L)	Zn, total (µg/L)	Zn, filtered (µg/L)
Overall Summary (3765)													
Number of observations	2574	389	1598	261	2722	411	2949	446	1014	1430	246	3007	381
% of samples above detection	40.6	30.3	70.2	60.5	87.4	83	77.7	49.8	10.2	59.8	64.2	96.6	96.3
Median	1.0	0.50	7.0	2.1	16	8.0	17.0	3.0	0.20	8.0	4.0	116	52
Coefficient of variation	3.7	1.1	1.5	0.7	2.2	1.6	1.8	2.0	2.5	1.2	1.5	3.3	3.9
Residential (1042)													
Number of observations	695		404		771	90	762	108	275	392	25	784	87
% of samples above detection	31.1		53.2		83.1	63.3	69.4	33.3	6.9	44.1	44.0	96.2	89.7
Median	0.5		4.5		12	7.0	12.0	3.0	0.20	5.6	2.0	73	31.5
Coefficient of variation	3.4		1.2		1.8	2.0	1.9	1.9	0.9	1.2	0.5	1.3	0.8
Mixed Residential (611)													
Number of observations	420	30	193	21	432	29	500	30	115	150	25	515	28
% of samples above detection	34.5	40.0	81.3	52.4	83.8	72.4	78.4	46.7	15.7	60	72.0	92.6	100
Median	0.9	0.30	7.0	2.0	16	5.5	16	3.0	0.20	7.8	5.5	95	48
Coefficient of variation	3.6	0.6	1.5	0.8	1.2	0.9	1.4	0.7	0.8	0.8	0.9	0.9	0.9
Commercial (527)													
Number of observations	379	47	257	27	408	48	399	59	170	242	23	414	49
% of samples above detection	41.7	23.4	60.7	40.7	92.9	79.2	85.5	52.5	6.5	60.3	47.8	99.0	100
Median	0.96	0.30	6.0	2.0	17	7.57	18.0	5.0	0.20	7.0	3.0	150	59
Coefficient of variation	2.7	1.3	1.3	0.6	1.5	0.8	1.6	1.6	0.8	1.2	0.8	1.2	1.4
Mixed Commercial (324)													
Number of observations	188	41	128	27	191	41	244	41		102	26	243	39
% of samples above detection	49.5	34.1	88.3	66.7	93.2	80.5	88.1	63.4		78.4	69.2	98.8	100
Median	0.9	0.35	5.0	2.5	17.5	10	17.0	3.5		5.1	3.5	131.4	73
Coefficient of variation	1.1	0.8	1.1	0.7	3.0	0.6	1.4	0.8		1.3	0.6	1.7	0.8
Industrial (566)													
Number of observations	435	42	250	36	455	42	452	51	199	237	36	473	42
% of samples above detection	49.0	54.8	72.0	55.6	88.6	90.5	75.0	52.9	13.9	61.6	58.3	98.9	95.2
Median	2.0	0.60	12.0	3.0	20.8	8.0	24.9	5.0	0.20	14.0	5.0	199	112
Coefficient of variation	2.2	1.1	1.2	0.7	2.0	0.7	1.9	1.6	2.7	1.0	1.4	1.5	3.6

Table 3. Summary of Available Stormwater Data Included in NSQD, version 1.1 – *Continued*

	Cd, total (µg/L)	Cd, filtered (µg/L)	Cr, total (µg/L)	Cr, filtered (µg/L)	Cu, total (µg/L)	Cu, filtered (µg/L)	Pb, total (µg/L)	Pb, filtered (µg/L)	Hg, total (µg/L)	Ni, total (µg/l)	Ni, filtered (µg/L)	Zn, total (µg/L)	Zn, filtered (µg/L)
Mixed Industrial (218)													
Number of observations	145	25	109	15	150	24	213	25	58	74	15	212	24
% of samples above detection	60.7	92.0	92.7	66.7	90.0	100.0	82.6	92.0	22.4	83.8	100.0	98.6	95.8
Median	1.6	0.60	8.0	2.0	23	6.0	20.0	5.0	0.3	12	5.0	172	2100
Coefficient of variation	1.9	0.6	1.7	0.7	0.8	0.6	1.4	1.0	0.6	0.8	0.6	3.1	1.2
Institutional (18)													
Number of observations							18					18	
% of samples above detection							77.8					100	
Median							5.75					305	
Coefficient of variation							0.8					0.8	
Freeways (185)													
Number of observations	95	114	76	101	97	130	107	126		99	95	93	105
% of samples above detection	71.6	26.3	98.7	78.2	99.0	99.2	100	50.0		89.9	67.4	96.8	99.1
Median	1.0	0.68	8.3	2.3	34.7	10.9	25	1.8		9.0	4.0	200	51
Coefficient of variation	0.9	1.0	0.7	0.7	1.0	1.5	1.5	1.7		0.9	1.4	1.0	1.9
Mixed Freeways (26)													
Number of observations	23		15		23		23					23	
% of samples above detection	56.5		100		100		56.5					100	
Median	0.5		6.0		14		10.0					130	
Coefficient of variation	2.2		1.0		1.0		1.3					0.9	
Open Space (68)													
Number of observations	38		36		39		45					45	
% of samples above detection	55.3		36.1		74.4		42.2					71.1	
Median	0.38		5.4		10		10.0					40	
Coefficient of variation	1.9		1.7		2.0		1.7					1.3	
Mixed Open Space (168)													
Number of observations	107		88		108		155		27	51		156	
% of samples above detection	18.7		81.8		89.8		74.2		14.8	72.5		98.1	
Median	2.0		6.0		9.0		10		0.15	8.0		80	
Coefficient of variation	1.4		1.3		1.0		2.3		0.4	1.1		1.1	

In the General Information tab, the spreadsheet lists the states and municipalities included in the current version of the database. The second tab describes the two main sections of the database: site descriptions and event descriptions. In the items description section, each column in the database is described. The last column in this table shows an example of the value expected in each column. The third tab describes the constituents and parameters included in the database, the number of observations, and the percentage of samples having detected observations. This table is useful to identify those constituents with high percentages of detected values.

The last tab in the database contains the data itself; a matrix of 232 columns by 3,765 rows containing all the data collected and reviewed. Each row represents a storm event for each monitoring location. This part of the table is divided in seven subsections describing the site location, the hydrology of the event and equipment used, and the constituent classifications. Each section of the database is described in the following discussion, with detailed analyses presented in Chapters 4 through 8 of this report.

The following discussion will require a copy of the database for reference. This is available at: http://unix.eng.ua.edu/~rpitt/Research/ms4/mainms4.shtml. Each of the sections and columns included in the spreadsheet will be explained in detail. Summary statistics, probability plots and box and whiskers plots will be used to describe the most important parameters.

Site Description [Columns A through Y]

Column A is an identifier of each storm event stored in the database. It is the table key. Column B describes the site main land use or activity: residential (RE), commercial (CO), industrial (ID), institutional (IS), open space (OS), and freeways (FW). In the case when more than one land use is present, a combination code is used beginning with the land use with the most area in the watershed. For example, if a site was 70% residential and 30% commercial, the site was coded as RE_CO. The percentage of each land use is indicated in the columns J through O.

Column C describes the month of the year when the sample was collected as follows: winter (WI) if the sample was collected in November, December or January; spring (SP) if the sample was collected in February, March, or April; summer (SU) if the sample was collected in May, June or July; and fall (FA) if the sample was collected in August, September, or October. A reasonably uniform number of samples were collected during each of the four periods: about 29% of the samples were collected in the winter, 30% in the spring, 19% in the summer, and 23% in the fall.

Columns D through F indicate the location of the site. LOCATION_ID is the key for sorting the sites, and is a code of eight characters: the first two letters indicate the name of the state, the next four letters is a code for the community, and the last two letters represent the site name. Columns E and F are the name of the community and the name of the site. Column G is the contact information of the person in that community that supplied the database information. Columns H through M are the percentages of the separate land uses in the drainage area, as described in column B.

Column N indicates the total watershed drainage area in acres. Figure 2 shows the distribution of the area by land use. The distribution of the watersheds areas can be considered approximately lognormal. Commercial, industrial, open space, and residential land uses have approximately the same distribution of drainage areas for the monitored outfalls, with a range between ten and one thousand acres. The median monitored watershed area for commercial and industrial sites was about 43 acres, while the median watershed area in residential and open space areas was about 65 acres. Freeways had smaller areas than the other land uses, with median areas being about 2 acres, with a range varying between one and one hundred acres.

Columns O and P list the approximate latitude and longitude of the outfall location in degrees, minutes, and seconds. Most of these coordinates were obtained using the Teraserver website. Column S indicates the EPA Rain Zone location of each site (Figure 1 and Table 1). About 52% of the sites are located in the EPA Rain Zone 2, which contains the Chesapeake Bay region, the main targeted area for this database. Each of the Rain Zones 3 through 7 has about 8% of the total sites. Rain Zones 1 and 9 have each about 3% of the sites. Rain Zone 8 has only one community with four locations, or about 1% of the total number of sites.

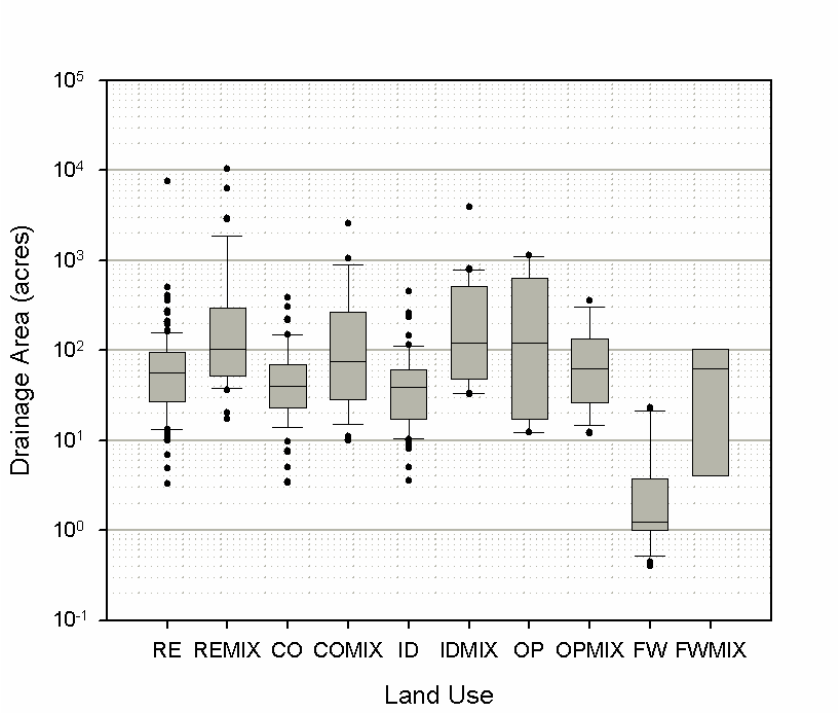

Figure 2. Drainage areas by land use

Column R indicates the total percentage of impervious surfaces reported for each site. Only Newport News, Virginia, contained information describing how the impervious areas were hydraulically connected to the drainage systems. It is expected that a watershed with high levels of impervious (a parking lot for example), is mostly directly connected due to little opportunity for draining to pervious areas. Less water is therefore infiltrated and the stormwater rapidly moves to the connected outfall. About 169 sites (about 47% of the total number of sites) included percentage of impervious surfaces in their annual reports or permit applications. Of this response, about 69 sites were for single or mixed residential areas, 34 sites were single or mixed industrial areas, 34 sites were single or mixed commercial area, 17 sites were single or mixed freeway areas, and 15 sites were single or mixed open space areas.

Figure 3 shows a box and whiskers plot of the reported impervious surface values for the predominant land uses. As expected, the open space sites have the lowest percentage of impervious surfaces (mean about 3.3%), while the mean impervious surface value for the freeway sites is 92%. Industrial and commercial area impervious surface values are higher, with means of 67% and 81% respectively. Residential areas cover almost the complete range, from about 7 to 89%. The impervious surfaces for residential areas are intermediate between the values for open space and the industrial/commercial values, as expected. The mean percentage of impervious areas in residential areas is approximately 41%.

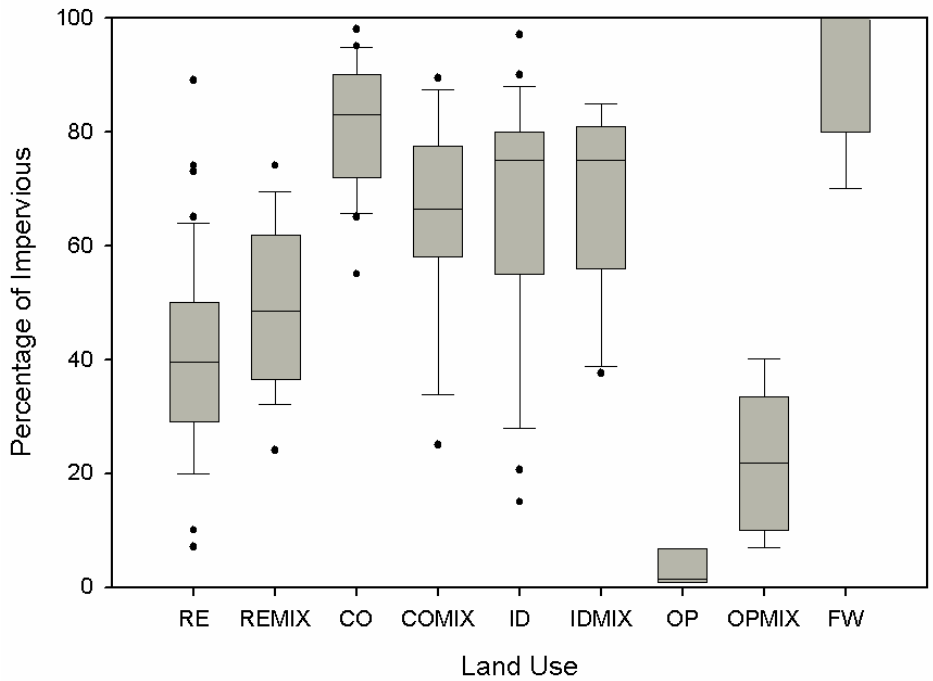

Figure 3. Percentage of impervious surfaces by land use

Column S is a qualifier for the total percentage of impervious surface area in the test watershed, indicating if there was an apparent increase in the percentage of imperviousness during the monitoring period, based on examinations of aerial photographs. Only one site (Pylon Street in Forth Worth, TX) had an apparent increase in the percentage of impervious area during the monitoring period. Column T indicates the volumetric runoff coefficient (Rv), or the ratio between the total runoff depth divided by the precipitation depth for each event. Figure 4 is a scatter plot of the reported percentage of impervious areas and reported Rv. As expected, higher volumetric runoff coefficients are reported for heavily paved areas, such as parking lots or freeways, compared to areas having much more landscaped areas, such as residential areas or parks. However, it is possible that some of the reported Rv values are simply calculated from the percent impervious cover values, and not from monitored rainfall and monitored runoff values.

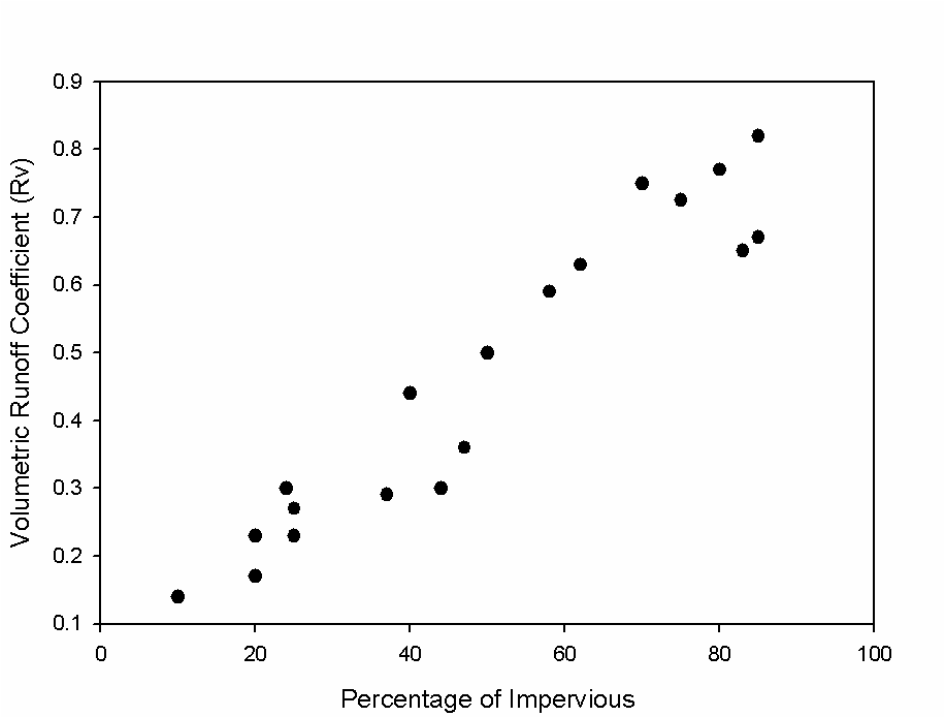

Figure 4. Scatter plot of percentage of impervious and Rv

None of the monitoring agencies reported the TR-55 curve number for the sites. This value is used to estimate the runoff volume using the Soil Conservation Service, SCS (now Natural Resources Conservation Service, NRCS) TR-55 method. Curve numbers (column U) were therefore not examined during this analysis. Only eight sites indicated the year when the land was developed, and these are shown in column V. Because of the low number of observations, this factor also could not be used in the data analyses.

Column W indicates the type of stormwater conveyance reported for the monitored area. This parameter indicates if the site is drained with "curb and gutter" systems typical of areas with high percentages of imperviousness, or if the water is transported beside the road through a grass-lined drainage channel (swales), more common in lower density areas. About 26% of the sites did not report the type of conveyance or it was not possible to identify them using the aerial photographs. Curb and gutter systems were reported for 65% of the sites, while grass swales were reported for 9% of the sites. Grass swales are usually considered a stormwater control, or "BMP," due to their ability to infiltrate large fractions of the runoff before discharge. They may provide some limited concentration reductions of particulate pollutants, but only for the shallowest flows. Detailed analyses are presented in Chapter 5 of this report.

The next column indicates if the site has wet detention ponds. About seven sites (out of the 360 total sites) have a wet pond at the outfall, nine sites have ponds in the watershed, and three sites have ponds in series, all upstream of the monitoring location. Other reported stormwater controls included: dry detention ponds (4 sites), small underground detention storage tanks (2 sites), besides the 32 sites having grass swales as noted above.

The final column in this section (Y) includes important comments that were not assigned to any of the other columns. Typical information in this column is the size of the pipe; if the outlet is a circular (pipe), or a square (box culvert); the number of pipes discharging from the watershed; or if there is a USGS monitoring station at the outfall that reported the data in the NSQD.

Hydrologic Information [Columns Z through AN]

Column Z is the identifier of each storm event stored in the database. It is used as a table sorting "key." Generally, it contains information about the location and the sampling date. Column AA indicates the precipitation depth recorded during the event, in inches. About 3,300 events included this parameter. Precipitation depth, flow volume

and similar hydrologic parameters were included in the annual reports or permit applications usually as appendices. During the data collection process, some of these appendices were not copied or located. The highest percentage of events with precipitation by land use was observed in single and mixed freeways (about 99%). The lowest percentage of events with precipitation data was observed in single and mixed residential areas, with 85% of the sites reporting this information. The percentage for the other land uses were: 87% for single and mixed industrial, 90% in single and mixed commercial, 96% in single and mixed open space.

Figure 5 shows the distribution of the available precipitation depth data by land use. The range of precipitation depth varies between 0.01 and 6 inches, indicating that some of the reported events were outside of the range specified by the general monitoring guidance (minimum of 0.1 inches and close to annual average characteristics). The distribution of the rainfall depth data is approximately lognormal, with a median between 0.4 to 0.6 inches. All the land uses have a similar pattern, with approximately the same variance. The mixed freeway category seems to have a narrower range, but they only represent 0.5% of the total events that have precipitation data. Column AB is a qualifier for the precipitation depth data. Some communities collected the data on site, while others used rain gauge data collected from a local airport. Rain gauges located on site are preferred as they are expected to better represent the rainfall conditions that occurred on the monitored site for the monitored event. Twelve percent of the total database events did not include precipitation depth data, 42% of the events were associated with rain data collected on site, 23% of the events did not indicate how the reported rain data was obtained, 7% of the events are associated with rain data from the local airport rain gauge, and the remaining 16% used other methods to determine the event rainfall data, such as regional rain gauges associated with flood monitoring systems.

Columns AC through AF indicate the starting and ending date and time of the event. Column AG indicates the maximum reported 15-minute rain intensity for each event. Events having high rain intensities have high kinetic energies, and it is hypothesized that these events will have increased washoff or erosion of particulate pollutants from watershed surfaces. However, only 1% of the database events reported this parameter. Column AG information was therefore not included in any of the data analyses.

Runoff depth (column AH) is the total volume of stormwater that leaves the monitored watershed during the rain event. For a directly connected paved parking lot, the runoff depth (expressed in inches of runoff for the complete drainage area) is only slightly smaller than the precipitation depth. In contrast, a park having mostly pervious surfaces would record total runoff volumes much smaller than the rain depth because most of the rainwater is infiltrated before it drains from the site. About 36% of the events included runoff data.

Figure 5 also shows the probability plots of runoff depth for each land use. As expected, smaller runoff values were observed in open space and residential areas, while freeways, mixed commercial, and mixed industrial land uses have runoff distributions similar to the rain distributions observed in the precipitation panel. A different pattern was observed for runoff at freeways, which are characterized by their small area and high percentage of impervious cover.

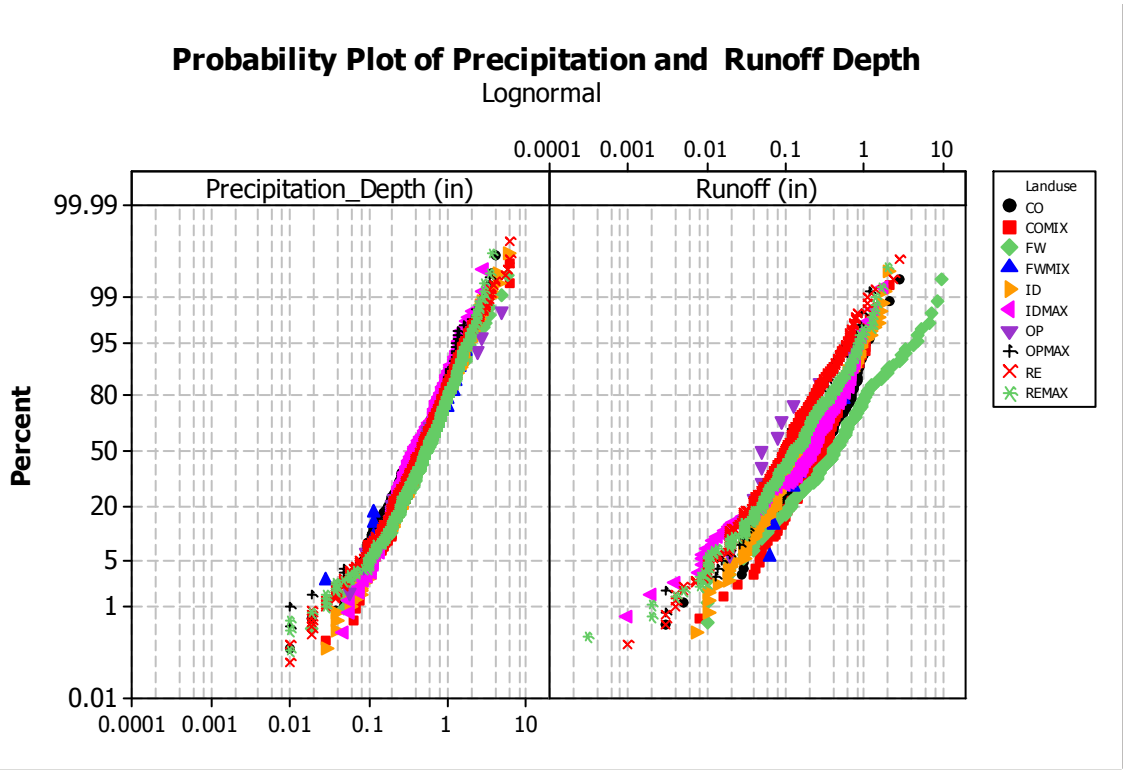

Figure 5. Precipitation and runoff depth by land use

Column AJ indicates if the runoff and precipitation were measured during the complete event or only the first three hours of the storm. The basic NPDES stormwater monitoring guidelines indicates that samples must be collected at least during the first three hours of the event. If the runoff and precipitation were not monitored for the complete event, then site hydrology confusion would occur. Most of the communities recorded the runoff for the complete event, even if monitoring only occurred for three hours. Only Greensboro, Topeka, Chesterfield County, and Fayetteville recorded runoff only for the first three hours of the events.

Column AK indicates if the events were from composite sampling, as required by the Federal Regulations guidance. First flush events were included in the first version of the database, version 1.0. After the paired first flush statistical analyses (see Chapter 6), these first-flush data were removed from the main database to eliminate confusion, leaving only the composite samples in the main database.

Column AL indicates if the composite sample was collected using automatic equipment, or if manual sampling was used. This column can be used to evaluate possible differences in the recorded concentrations due to the sampling method. About 81% of the events were collected using automatic samplers, 10.5% used manual sampling, and about 8.5% of the events did not have any reported sampling method. Detailed analyses concerning the effects of manual versus automatic sampling is discussed in Chapter 5 of this report.

Column AM describes if the collected sample was a flow-weighted or time-weighted composite sample. A flow-weighted composite sample is comprised of several equal volume subsamples that were collected according to the flow rate of the runoff water. The sampler is programmed to collect a subsample for a specified constant flow increment. The total volume in the single composite bottle is therefore proportionate to the total runoff volume associated with the monitored event. A time-weighted composite sample is made up of several equal volume subsamples that were collected at constant periods of time and collected into a single large composite sample bottle. At the end of the event, the total volume of sample in the composite sample bottle is proportionate to the duration of the event. About 73% of the events in the database were collected using flow-weighted composite sampling methods, while only 8% of the events were collected using time-weighted composite sampling methods. No composite sampling method information was available for the remaining 19% of the events.

The last column in this database section describes the number of days without rain prior to the event sampling. It is usually hypothesized that an increase in the number of dry days prior to an event would cause an increase in the constituent concentration. About 38% of the events had this information available. Detailed analyses are presented in Chapter 5 of this report.

Conventional Constituents [Columns AO through BS]

This section of the database contains measurement values for conventional stormwater constituents (conductivity, DO, hardness, oil and grease, pH, temperature, TDS, TSS, BOD_5, COD, fecal coliforms, and fecal streptococcus).

Table 3, presented earlier, contains a summary showing the total number of samples included in the database classified by land use, the percentages of samples detected, the medians, and the coefficients of variation. In general, the lowest concentrations were usually found at open space land uses, followed by residential areas. The highest concentrations were observed at freeway land use sites. Table 4 is a summary contrasting the land uses having the lowest and the highest concentrations of these constituents.

The Mann-Whitney test was used to determine if there is a significant difference between the land uses having the lowest and highest concentrations. As a complement, one-way ANOVA analyses were used to identify if a significant difference existed among any of the land uses. As the number of samples increase, the power of the test also increases. P-values close to zero will indicate that the concentration of at least one land use is statistically different than the other land uses (true for all constituents in Table 4, except for Dissolved Oxygen).

Table 4. Conventional Constituents Summary

Constituent	Land use having the lowest median concentration			Land use having the highest median concentration			Mann-Whitney Test	1-Way ANOVA by Land Use
	n	Land Use	Median	n	Land Use	Median	p-value	p-value
Conductivity (μS/cm)	106	RE	96.5	108	ID	135.5	0	0
Dissolved Oxygen (mg/L)	39	ID	7.3	30	RE	7.8	0.064	0.325
Hardness (mg/L CaCO3)	350	RE	32	139	CO	38.9	0.009	0
Oil and Grease Total (mg/L)	308	RE	3.85	43	FW	8.0	0	0.001
pH (s.u.)	111	FW	7.1	234	ID	7.5	0	0
Temperature (^oC)	31	FW	14	140	ID	17.8	0	0
Total Dissolved Solids (mg/L)	854	RE	72	411	ID	92	0	0
Total Suspended Solids (mg/L)	977	RE	49	133	FW	99	0	0
Biological Oxygen Demand (mg/L)	38	OP	5.4	421	CO	11	0	0
Chemical Oxygen Demand (mg/L)	33	OP	42.1	66	FW	100	0	0
Fecal Coliform (colonies/100 mL)	261	ID	2500	21	OP	7200	0.014	0
Fecal Streptococcus (colonies/100 mL)	166	CO	10285	273	RE	24600	0	0.003

Figure 6 contains examples of grouped box and whiskers plots for several constituents for different major land use categories. The freeways sites had the highest reported TSS, COD and oil and grease concentrations. Statistical ANOVA analyses for all land use categories found significant differences for land use categories for all constituents except for dissolved oxygen. Turbidity, total solids, total coliform and total E-coli have not enough samples in each group to evaluate if there is a difference among all land uses. Chapter 5 presents more comprehensive analyses for specific site conditions (considering interactions of land use, geographical location, etc.).

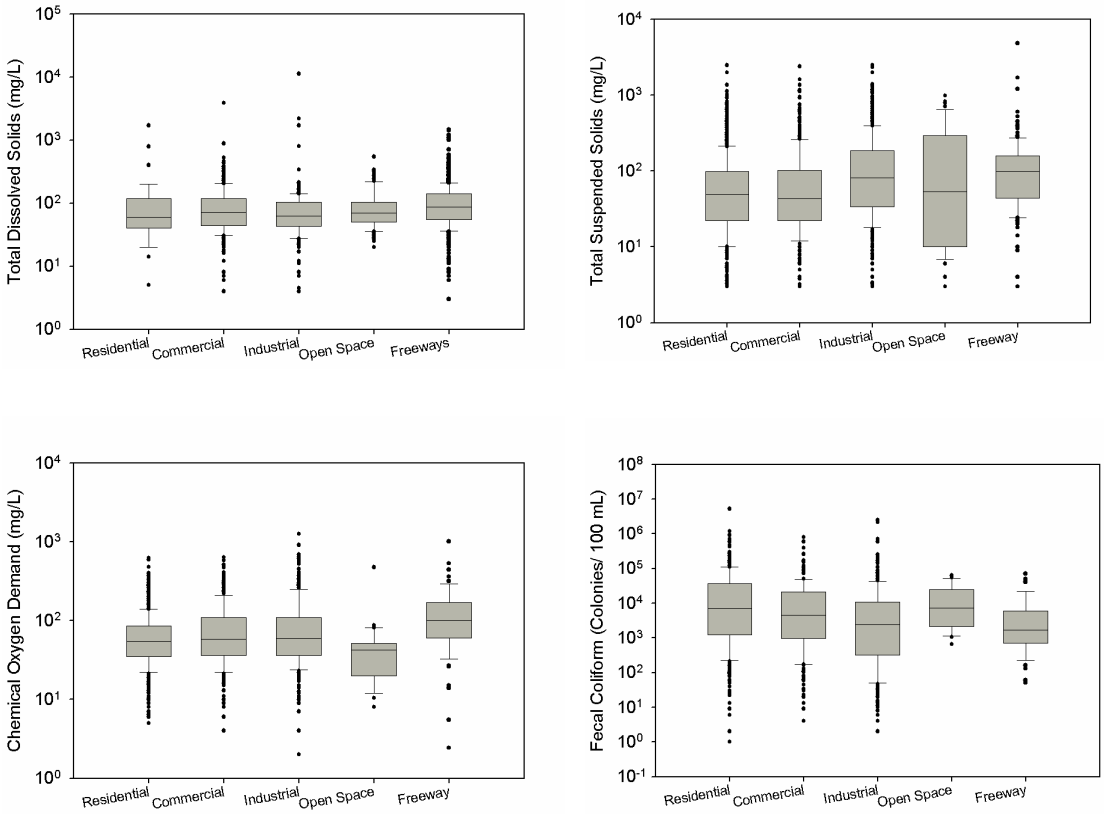

Figure 6. Box and whiskers plots for conventional constituents by single land use

Stormwater temperature depends of many factors, including season, the time of the day, and the types of surfaces in a land use. Column C shows the season of the year when each sample was obtained, the most obvious factor affecting runoff temperature.

Figure 7 shows the water temperatures for each month for the samples collected in the EPA Rain Zones 5 and 6 combined. Similar patterns were observed in the other EPA Rain Zones. Two main periods can be identified in this plot: from February to July the water temperature rises and from August to January the water temperature decreases. Table 4 shows that for almost all conventional constituents, residential and open space land uses have the lowest concentrations, except for pathogen indicators. Industrial and freeway land uses generally have the highest concentrations.

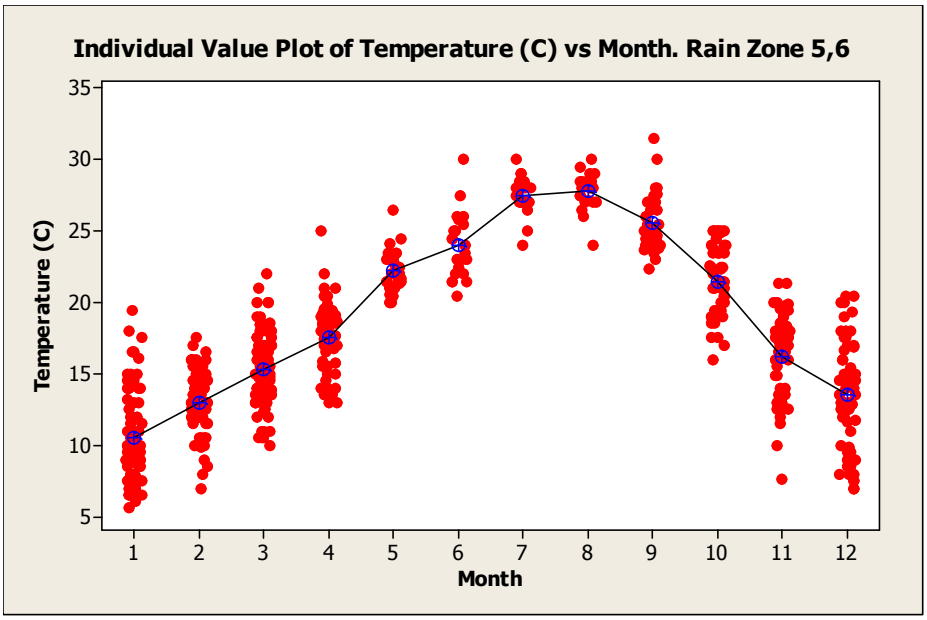

Figure 7. Water temperature in EPA Rain Zones 5 and 6 (line links median values for each month)

Nutrients [Columns BU through CG]

This section in the database contains the compounds associated with nitrogen and phosphorus compounds. Table 5 shows a summary of the land uses having the lowest and highest concentrations for each constituent. Again, the Mann Whitney and ANOVA tests were used to evaluate if there was a significant difference between land uses for these constituents.

In contrast to the conventional constituents, dissolved and total phosphorus have the highest concentrations in residential land uses. There was no significant difference noted for total nitrogen for the different land uses. The median ammonia concentration in freeway stormwater is almost three times the median concentration observed in residential and open space land uses, while freeways have the lowest orthophosphate and nitrite-nitrate concentrations; almost half of the concentration levels that were observed in industrial land uses. Figure 8 shows box plots for TKN, total phosphorus, and nitrite-nitrate for several land uses. It shows that even if there are differences in the median concentrations by a factor of two or three between the land uses, the extreme range of the concentrations within a single land uses can still vary by two or three orders of magnitude. Again, Chapter 5 examines many factors affecting these concentrations, in addition to land use.

Table 5. Nutrients Summary

Constituent	Land use having the smallest median concentration			Land use having the largest median concentration			Mann-Whitney Test	1-Way ANOVA by Land Use
	n	Land Use	Median	n	Land Use	Median	p-value	p-value
Ammonia (mg/L)	485	RE	0.31	69	FW	1.07	0	0
Nitrogen Nitrite-Nitrate (NO_2+NO_3) (mg/L)	24	FW	0.28	429	ID	0.71	0	0.001
Nitrogen Total (mg/L)	63	ID	2.03	81	RE	2.30	0.25	0.698
Nitrogen Kjeldahl Total (TKN) (mg/L)	32	OP	0.74	121	FW	2.00	0	0
Phosphate Ortho (mg/L)	103	FW	0.09	66	ID	0.23	0	0
Phosphorous Dissolved (mg/L)	283	ID	0.11	621	RE	0.17	0	0
Phosphorous Total (mg/L)	427	CO	0.22	933	RE	0.30	0	0

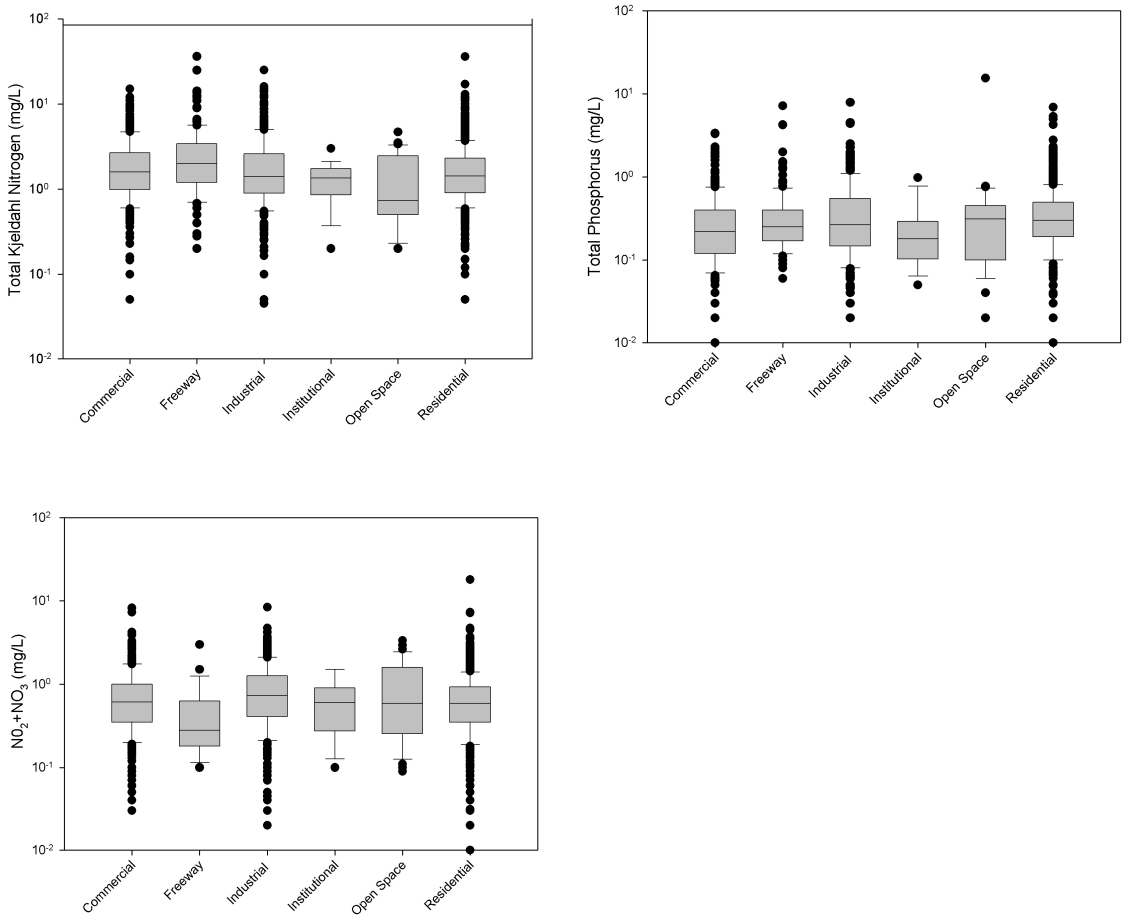

Figure 8. Box and whiskers plots for nutrients by single land use

Metals [Columns CK through EK]

This section in the database contains the metal concentrations. Industrial land uses have higher median concentrations of heavy metals than any of the other land uses, followed by freeways. Table 6 shows the ANOVA results for metals. As expected, open space and residential land uses have the lowest median concentrations. In almost all cases, the median metal concentrations at the industrial areas were about three times the median concentrations observed in open space and residential areas. Arsenic, cadmium, chromium, copper, lead, nickel, and zinc showed significant differences between the extreme land uses at the 1% level of confidence, or less. Other constituents are also included in the database (antimony, beryllium, cyanide, mercury, selenium, silver, and thallium), along with dissolved forms of the metals. Too few observations and large fractions of undetected observations hindered statistical analyses of these other metals.

Table 6. Summary of Metals Concentration

Constituent	Land use having the smallest concentration			Land use having the largest concentration			Mann-Whitney Test	1-Way ANOVA by Land Use
	n	Land Use	Median	p-value	Land Use	Median	p-value	p-value
Arsenic Total (μg/L)	70	CO	2.4	145	ID	4.0	0	0
Cadmium Total (μg/L)	219	RE	0.5	223	ID	1.9	0	0
Chromium Total (μg/L)	241	RE	4.6	186	ID	14.0	0	0
Copper Total (μg/L)	29	OP	10	96	FW	34.7	0	0
Lead Total (μg/L)	19	OP	10	343	ID	26	0	0
Nickel Total (μg/L)	190	RE	5.4	156	ID	16	0	0
Zinc Total (μg/L)	32	OP	40	455	ID	200	0	0

Figure 9 contains examples of grouped box and whiskers plots for lead, copper, and zinc constituents for different major land use categories. The highest lead and zinc concentrations were found in industrial land uses, while the highest copper concentrations were observed at freeways sites.

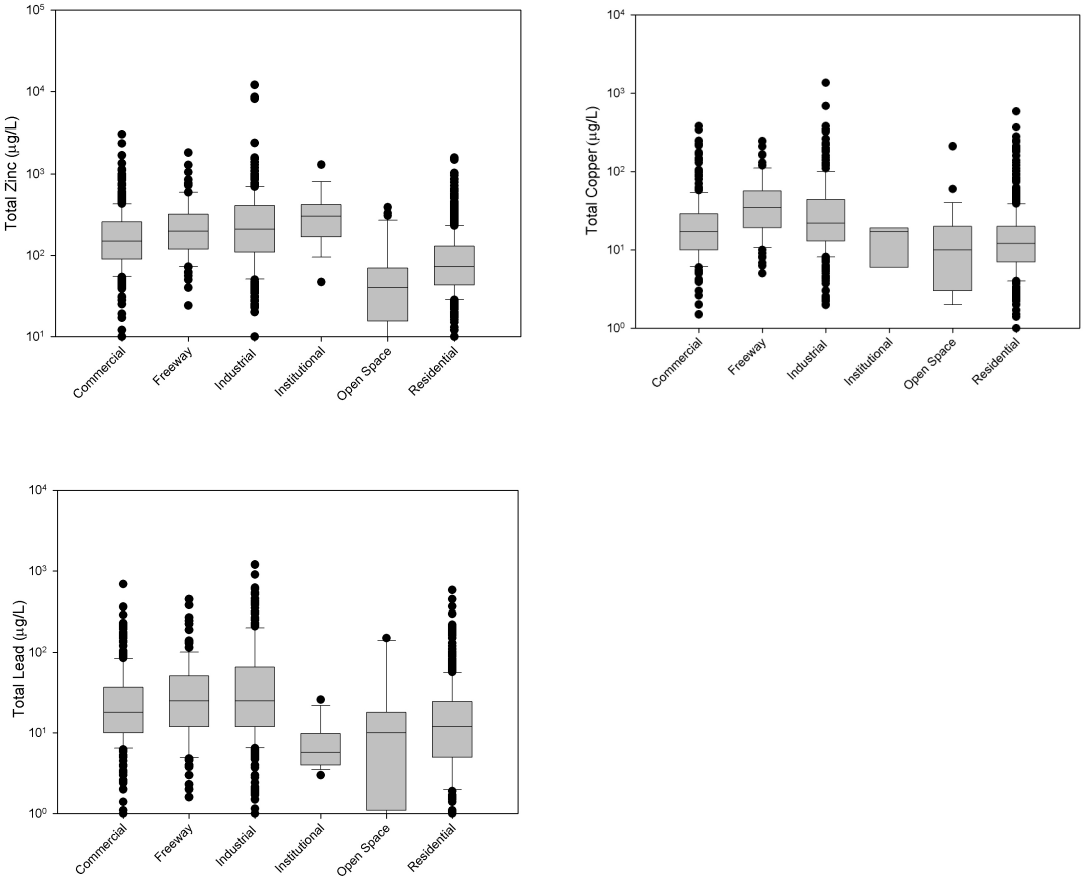

Figure 9. Box and whiskers plots for metals by single land use

Additional Constituents [Columns EM through HW]

These columns contain information for additional constituents that were sampled only during the permit application period (first year of sampling). Some constituents having more than a 30% detection level included: methylenechloride, total petroleum hydrocarbon (TPH), total organic carbon, chloride, nitrate nitrogen, nitrite nitrogen, total organic nitrogen, and iron.

Table 7 shows summaries for these additional constituents that have enough samples to identify significant differences between land uses. Only total petroleum hydrocarbon (TPH) and nitrite nitrogen showed significant differences (at the 5% significance level) between the land uses having lowest and highest median concentrations. The median stormwater TPH concentration in residential areas is almost half the median TPH stormwater concentration at freeway sites.

Table 7. Summary of Additional Constituents

Constituent	Land use having the smallest concentration			Land use having the largest concentration			Mann-Whitney Test	
	n	Land Use	Median	n	Land Use	Median	p-value	Significant α =5%
Total Petroleum Hydrocarbon (mg/L)	36	RE	0.38	20	FW	0.78	0	Yes
Chloride (mg/L) (FW and OP not included)	42	ID	7.1	38	CO	9.5	0.25	No
Nitrogen Nitrate (mg/L) (CO and OP not included)	13	RE	0.69	98	FW	0.84	0.58	No
Nitrogen Nitrite (mg/L) (CO and OP not included)	7	ID	0.07	42	FW	0.17	0.01	Yes
Nitrogen Total Organic (mg/L) (FW not included)	12	RE	0.96	5	CO	1.97	0.19	No
Iron (mg/L)	6	RE	2.99	27	FW	3.60	0.27	No

Site Descriptions and Additional Supporting Information

Supplemental reports were created containing additional information for each community. These site descriptions include (depending on available information) the land use and impervious surfaces for the monitored site, aerial photographs and a topographic map of the area, and descriptions of the sampling procedures and quality control (QA/QC) used during sample collection and analysis. The QA/QC description indicates if blank samples were used during the analysis to check the equipment, the protocols used during the sample collection, and in some cases, the chain of custody of the samples. These supplemental reports also contain descriptions of the sampled parameters, analytical methods, and field instrumentation used by the community.

About 38% of the aerial photographs have better than 1-meter resolution and the remaining photos have 1-meter resolution. The locations of most of the outfalls were included in the database in the Q and R columns (Latitude and Longitude). Table 8 shows the total number of sites with high-resolution aerial photos and with watershed delineations.

Table 8. Additional Site Information

EPA Rain-Zone	Number of Communities	Number of Sites	Sites with high-resolution aerial photos (resolution 0.25 m)	Sites with watershed delineations
1	2	12	0	2
2	28	185	38	18
3	8	30	15	20
4	4	21	15	17
5	9	33	18	0
6	4	30	20	9
7	6	28	19	0
8	1	4	0	0
9	3	17	13	8

Watershed delineations are an important component of the site descriptions by identifying the extent of the contributing area, the different land uses located in the watershed and the sampling location. Only 20% of the sites included their watershed delineations.

Most communities followed the sampling recommendations presented in the Code of Federal Register (40 CFR 122.21), although delegated NPDES state agencies were able to modify the specific requirements to better address local concerns. Almost all communities collected samples at least during the first 3 hours of the event (or the complete event if the duration was shorter). For about 66% of the events, the communities calculated the total runoff for the duration of the total event discharge, but used the concentrations from the shorter monitoring period. Chapter 6 includes a detailed analysis of first-flush concentrations that may indicate the maximum errors that may occur with truncated sampling periods. Seven percent of the events included runoff for only the first three hours of the event. The remaining 25% of the events did not include runoff volume data, or it was not clear if the runoff volume data was obtained during the first three hours, or for the whole event.

Another important monitoring aspect described in the site descriptions is how the composite sample was created. There are two compositing options: flow-weighted and time-weighted. During the time-weighted compositing scheme, subsamples of equal volume were obtained at specific time intervals during the three hour sampling period. All the subsamples were collected in a single bottle, creating the composite sample. In the flow-weighted compositing case, the subsamples were collected for a set flow increment. About 71% of the events were collected using flow-weighted sampling, 5% of the events were collected using time-weighted sampling, and it was not clear how the remaining 24% of the samples were collected. Roa-Espinosa and Bannerman (1995) found that time-weighted composite sampling could be representative of the sampling period, if many subsamples are collected throughout the storm period. Time-weighted compositing is much simpler and less expensive than flow-weighted composite sampling, but may have a slight error in the measured concentrations, compared with the flow-weighted method.

About 62% of the 65 communities represented in the NSQD indicated that they used automatic samplers during their monitoring activities, about 34% did not indicate how they collected their samples, and 4% collected their samples manually. ISCO samplers were the most commonly used automatic sampler, with about 24% of the sites using ISCO 2700, 3700 or 6700 samplers. American Sigma samplers were used at about 12% of the 65 communities. The most common American Sigma sampler models included 800SL, 900AV and 900 MAX. About 69% of the communities did not indicate how, or if, they measured flow, and did not report any flow data. About 20% of the sites used ISCO 3230 or 4230 flow meters. The remaining 11% used other methods to estimate the stormwater discharge volumes.

Problems Encountered during NPDES Stormwater Monitoring

About 58% of the communities also described problems found during the monitoring process and these are summarized in the site summary reports. Some communities reported more than one problem. One of the basic sampling requirements was to collect three samples every year for each of the land use stations. These samples were to be collected at least one month apart during rains having at least 0.1 inch rains, and with at least 72 hours from the previous 0.1-inch storm event. It was also required (when feasible), that the variance in the duration of the event and the total rainfall not exceeded the median rainfall for the area. About 47% of the communities reported problems meeting these requirements. In many areas of the country, it was difficult to have three storm events per year having these characteristics. The second most frequent problem, reported by 26% of the communities, concerned backwater tidal influences during sampling, or the outfall became submerged during the event. In other cases, it was observed that there was flow under the pipe (flowing outside of the pipe, in the backfill material, likely groundwater), or sometimes there was not flow at all. About 12% of the communities described errors related to malfunctions of the sampling equipment. Most of the communities with equipment failures did not report the reasons of the failure. When reported, the equipment failures were due to incompatibility between the software and the equipment, clogging of the rain gauges, and obstruction in the sampling or bubbler lines. Memory losses in the equipment recording data were also periodically reported. Other reported problems were associated with lighting, false starts of the automatic sampler before the runoff started, and operator error due to misinterpretation of the equipment configuration manual.

Sites located on the East coast (Hampton, VA for example) where the hurricane season produces frequent large storms, especially having a high water table, were especially susceptible. Base flows can commonly occur in separate storm drainage systems for a variety of reasons and they may be more important during some seasons than during others. In many cases, they cannot be avoided and should be included in the monitoring program, and their effects need to be recognized as an important flow phase. As an example, Pitt and McLean (1986) found dry weather base flows to be significant sources of many pollutants, even during a comprehensive research project that spent much time surveying the test watersheds to ensure they did not have any inappropriate discharges entering the storm drainage system.

Capturing runoff events within the acceptable range of rain depth was difficult for some monitoring agencies. Rain depth cannot be precisely predicted in many areas of the country. Also, if using rain gauge data from a location distant from the monitoring location, the reported rain depth may not have been representative of the depth that occurred at the site. The rain gauges need to be placed close to the monitored watersheds. This was likely one of the reasons why the runoff depths periodically exceeded the reported rain depths. Rain in urban areas can vary greatly over small distances. The ASCE/EPA (2002) recommended that rainfall gauges be located as close as possible to the monitoring station. In the NSQD, about 7% of the events had site precipitation estimated using rain gauge located at the city airport. About 16% of the events had precipitation depth estimated using their own monitoring network (Hampton Road Sanitation District, for example). Some communities had precipitation networks that were used for flood control purposes for the surrounding area. These networks can be considered better than the single airport rain gauge, but should at least be supplemented with a rain gauge located in the monitored watershed. Another factor that needs to be considered is the size of the watershed. Large watersheds cannot be represented with a single rain gauge at the monitoring station; in those cases the monitoring networks will be a better approach. Large watersheds are more difficult to represent with a single rain depth value.

Many of the monitoring stations lacked flow monitoring instrumentation, or did not properly evaluate the flow data. Accurate flow monitoring can be difficult, but it greatly adds to the value of the expensive water quality data. As noted previously, base flows also need to be properly removed from the event measurements so only direct runoff quantities are reported. It is probably unreasonable to expect to have a permanent flow monitoring station installed at a location where only manual grab samples are being obtained. However, manual flow monitoring can be conducted during manual sampling by carefully noting the flow stage in previously surveyed locations. These observations will need to be obtained during the complete duration of the event.

The three hour monitoring period that most used may have resulted in some bias in the reported water quality data. This limit was likely used to minimize the length of time personnel needed to be at a monitoring location during manual sampling activities. Also, it is unlikely that manual samplers were able to initiate sampling near the beginning of the events, unless they were deployed in anticipation of an event later in the day. A more cost-effective and reliable option would be to have semi-permanent monitoring stations located at the monitoring locations and sampling equipment installed in anticipation of a monitored event. Most monitoring agencies operated three to five land use stations at one time. This number of samplers, and flow equipment, could have been deployed in anticipation of an acceptable event and would not need to be installed in the field continuously.

Some of the site descriptions lacked important information and local personnel sometimes did not have the needed information. This was especially critical for watershed delineations on maps of the area. Also, few of the watershed descriptions adequately described how the impervious areas were connected to the drainage system, one of the most important factors affecting urban hydrologic analyses. In most cases, information concerning local stormwater controls was able to be determined from a variety of sources, but it was not clearly described in the annual reports.

Comparison of NSQD with Existing Stormwater Databases

The NSQD, with 3,765 events (from the 1992-2002 period) represented sites throughout much of the US for most land uses, and for many constituents. It is therefore the most comprehensive stormwater quality database currently available for US stormwater conditions. The historical NURP database (sampling period in the late 1970s and early 1980s) contains the results from 2,300 national stormwater events, while the CDM National Urban Stormwater Quality Database includes the results of approximately 3,100 events (including the NURP data, plus additional data collected by the USGS and about 30 NPDES permits; Smullen and Cave, 2002). Table 9 compares the results of the pooled EMC's from the NURP (calculated by Smullen and Cave 2002), CDM, and NSQD databases.

The NURP means and medians were computed by Smullen and Cave (2002) using the EPA (1983) data. The CDM and the NSQD results are similar for all constituents, except for lead and zinc. All three databases have similar reported median and mean concentrations for COD and BOD and the nutrients, but are apparently different for TSS and the heavy metals. The pooled mean event mean concentration (EMC) for TSS was 2.3 times larger in the NURP database compared to the NSQD. The largest reduction in mean EMCs was found for lead (7.9 times larger for NURP) followed by copper (7.9 times larger for NURP) and zinc (1.6 times large for NURP).

Table 9. Comparison of Stormwater Databases

Constituent	Units	Source	Event Mean Concentrations		Number of events
			Mean	Median	
Total Suspended Solids	mg/L	NURP	174	113	2000
		CDM	78.4	54.5	3047
		NSQD	79.1	49.8	3404
Biochemical Oxygen Demand	mg/L	NURP	10.4	8.4	474
		CDM[a]	14.1	11.5	1035
		NSQD	10.9	8.6	2973
Chemical Oxygen Demand	mg/L	NURP	66.1	55.0	1538
		CDM	52.8	44.7	2639
		NSQD	71.2	55.6	2699
Total Phosphorus	mg/L	NURP	0.337	0.266	1902
		CDM	0.315	0.259	3094
		NSQD	0.373	0.289	3162
Dissolved Phosphorus	mg/L	NURP	0.100	0.078	767
		CDM[b]	0.129	0.103	1091
		NSQD	0.107	0.078	2093
Total Kjeldahl Nitrogen	mg/L	NURP	1.67	1.41	1601
		CDM	1.73	1.47	2693
		NSQD	1.74	1.37	3034
Nitrite and Nitrate	mg/L	NURP	0.837	0.666	1234
		CDM	0.658	0.533	2016
		NSQD	0.767	0.606	2983
Copper	µg/L	NURP	66.6	54.8	849
		CDM	13.5	11.1	1657
		NSQD	17.8	14.2	2356
Lead	µg/L	NURP	175	131	1579
		CDM	67.5	50.7	2713
		NSQD	24.4	16.5	2250
Zinc	µg/L	NURP	176	140	1281
		CDM	162	129	2234
		NSQD	110	88	2888

Note: a. No BOD_5 for USGS dataset. b. No DP for CDM portion of NPDES dataset

In an effort to recognize why differences were observed between the NURP and NSQD databases, further examinations of two communities that monitored stormwater during both NURP and the Phase I NPDES program were made. As part of their MS4 Phase I application, Denver and Milwaukee both returned to some of their earlier sampled monitoring stations used during the local NURP projects (EPA 1983). In the time between the early 1980s (NURP) and the early 1990s (MS4 permit applications), they did not detect any significant differences, except for large decreases in lead concentrations. Figure 51 compares suspended solids, copper, lead, and zinc concentrations at the Wood Center NURP monitoring site in Milwaukee. The average site concentrations remained the same, except for lead, which decreased from about 450 to about 110µg/L, as expected due to the decrease in leaded gasoline during this period.

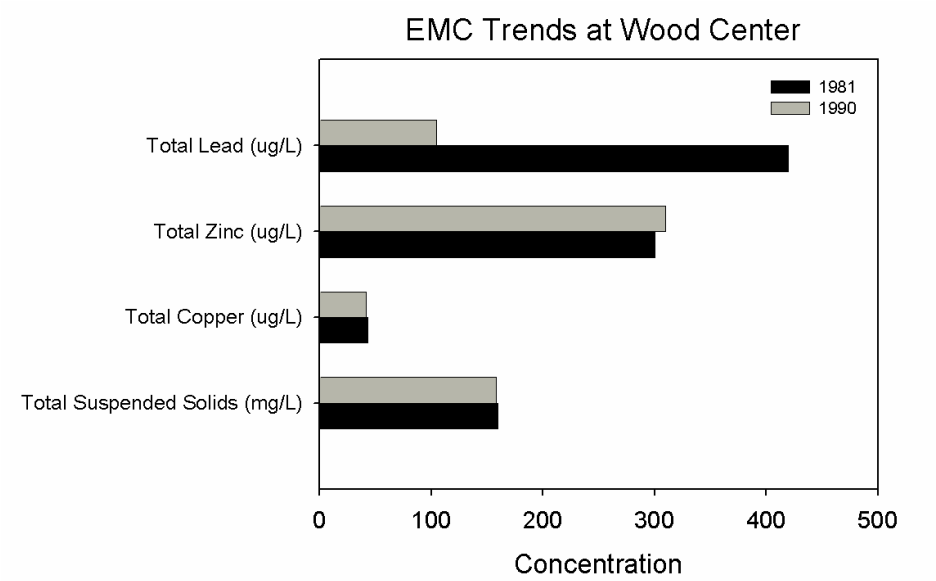

Figure 51. Comparison of pollutant concentrations collected during NURP (1981) to MS4 application data (1990) at the same location (personal communication, Roger Bannerman, WI DNR)

Urban Drainage and Flood Control District performed similar comparisons in the Denver Metropolitan area. Table 43 compares stormwater quality for commercial and residential areas for 1980/81 (NURP) and 1992/93 (MS4 application). Although there was an apparent difference in the averages of the event concentrations between the sampling dates, they concluded that the differences were all within the normal range of stormwater quality variations, except for lead, which decreased by about a factor of four.

Trends of stormwater concentrations with time can also be examined using the NSQD data. A classical example would be for lead, which is expected to decrease over time with the increased use of unleaded gasoline. Older stormwater samples from the 1970s typically have had lead concentrations of about 100 to 500µg/L, or higher (as indicated above for Milwaukee and Denver), while most current data indicate concentrations as low as 1 to 10µg/L.

Table 43. Comparison of Commercial and Residential Stormwater Runoff Quality from 1980/81 to 1992/93 (Doerfer, 1993)

Constituent	Commercial		Residential	
	1980 - 1981	1992 - 1993	1980 - 1981	1992 - 1993
Total suspended solids (mg/L)	251	165	226	325
Total nitrogen (mg/L)	3.0	3.9	3.2	4.7
Nitrate plus nitrite (mg/L)	0.80	1.4	0.61	0.92
Total phosphorus (mg/L)	0.46	0.34	0.61	0.87
Dissolved phosphorus (mg/L)	0.15	0.15	0.22	0.24
Copper, total recoverable (µg/L)	27	81	28	31
Lead, total recoverable (µg/L)	200	59	190	53
Zinc, total recoverable (µg/L)	220	290	180	180

The differences found in both the NURP and the NSQD databases are therefore most likely due to differences in geographical areas emphasized by each database. Figure 10 is a national map showing the percentage of events collected in each state as contained in the NSQD database, while Figure 11 shows the percentage of events contained in the NURP database. Half of the events included in the NSQD database were collected in EPA Rain Zone 2 (Maryland, Virginia, North Carolina, Kentucky and Tennessee), while half of the events contained in the

NURP database were collected in EPA Rain Zone 1 (Minnesota, Wisconsin, Michigan, Illinois, New York, Massachusetts and New Hampshire). Only 3% of the events in the NSQD are located in EPA Rain Zone 1, while 50% of the NURP data is from this area. Twenty four percent of the NURP data is located in the Mid-Atlantic and southeast states, while 60% of the NSQD data is from this area (the area that was emphasized for this EPA-funded project). The NSQD is slightly better representative of other parts of the country compared to NURP. As an example, the percentage of the total event data from the west coast is similar for both databases, but the NSQD represents 10 communities with almost 60 different sites, while NURP has only 3 communities and only 7 sites. The total number of sites, communities and events collected in the NURP study are shown in Table 10.

Table 10. Total Events Monitored During NURP by EPA Rain Zones

Rain Zone	Total Events	Percentage of Events	Number of Communities	Number of Sites
1	804	51	12	42
2	324	20	3	10
3	65	4.1	1	5
4	0	0	0	0
5	24	1.5	1	2
6	45	2.8	2	5
7	136	8.6	1	2
8	0	0	0	0
9	188	12	3	12

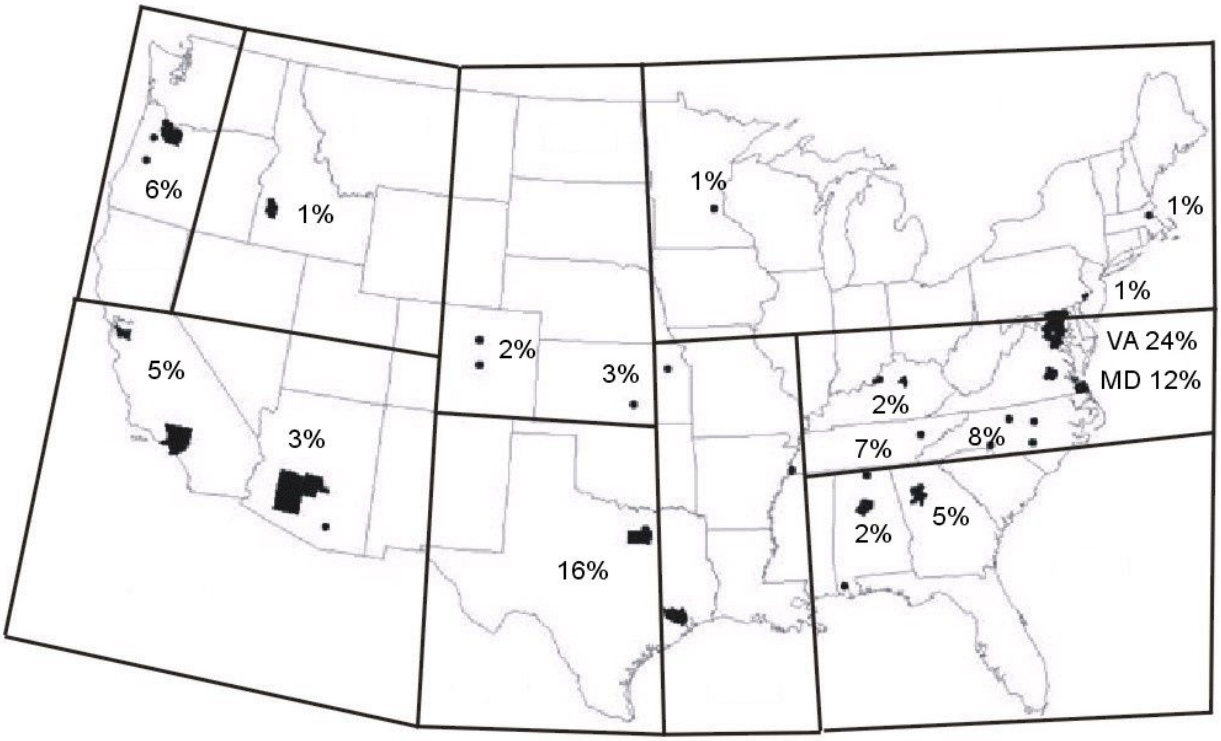

Figure 10. Distribution of collected events using the NSQD database.

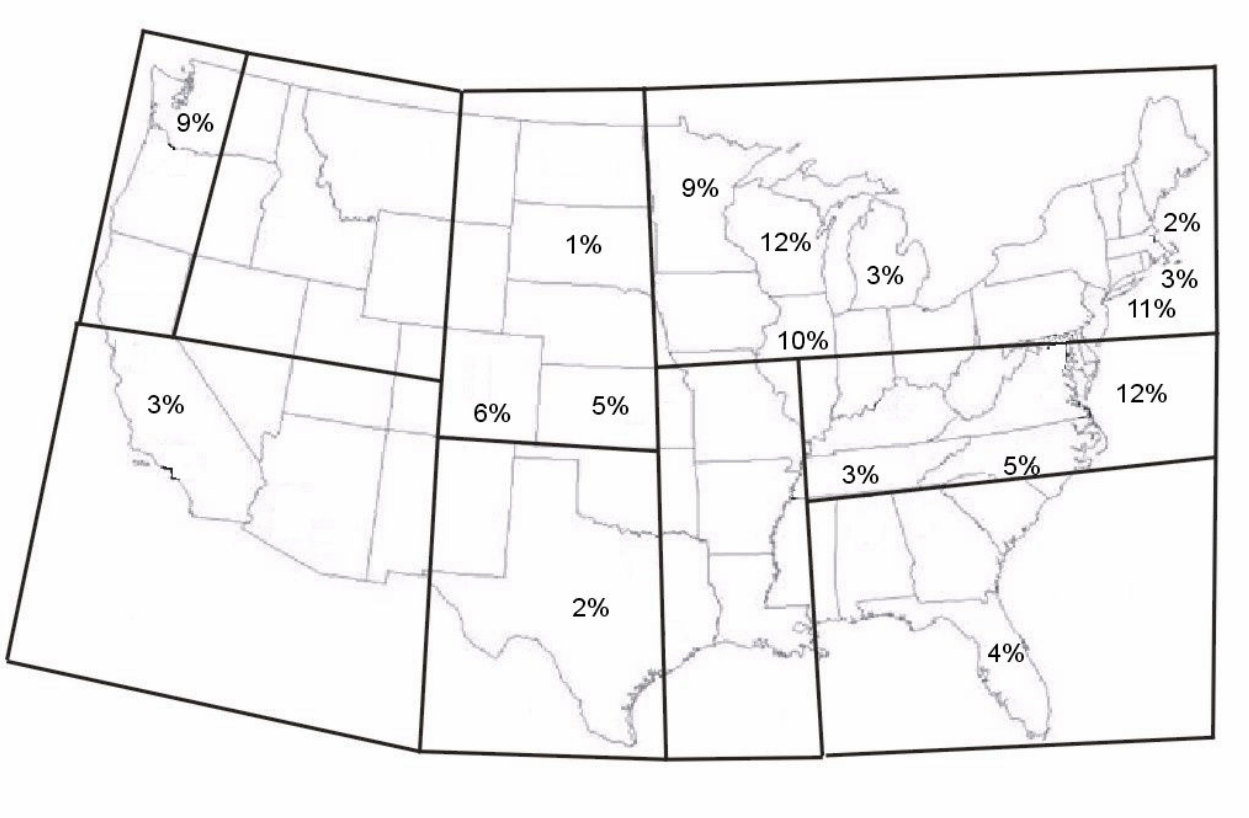

Figure 11. Distribution of collected events using the NURP database.

Figure 12 presents example plots for selected residential area data for different EPA Rain Zones for the country as contained in the NSQD. Rain Zones 3 and 7 (the wettest areas of the country) had the lowest concentrations for most of the constituents, while Rain Zone 1 has some of the highest concentrations.

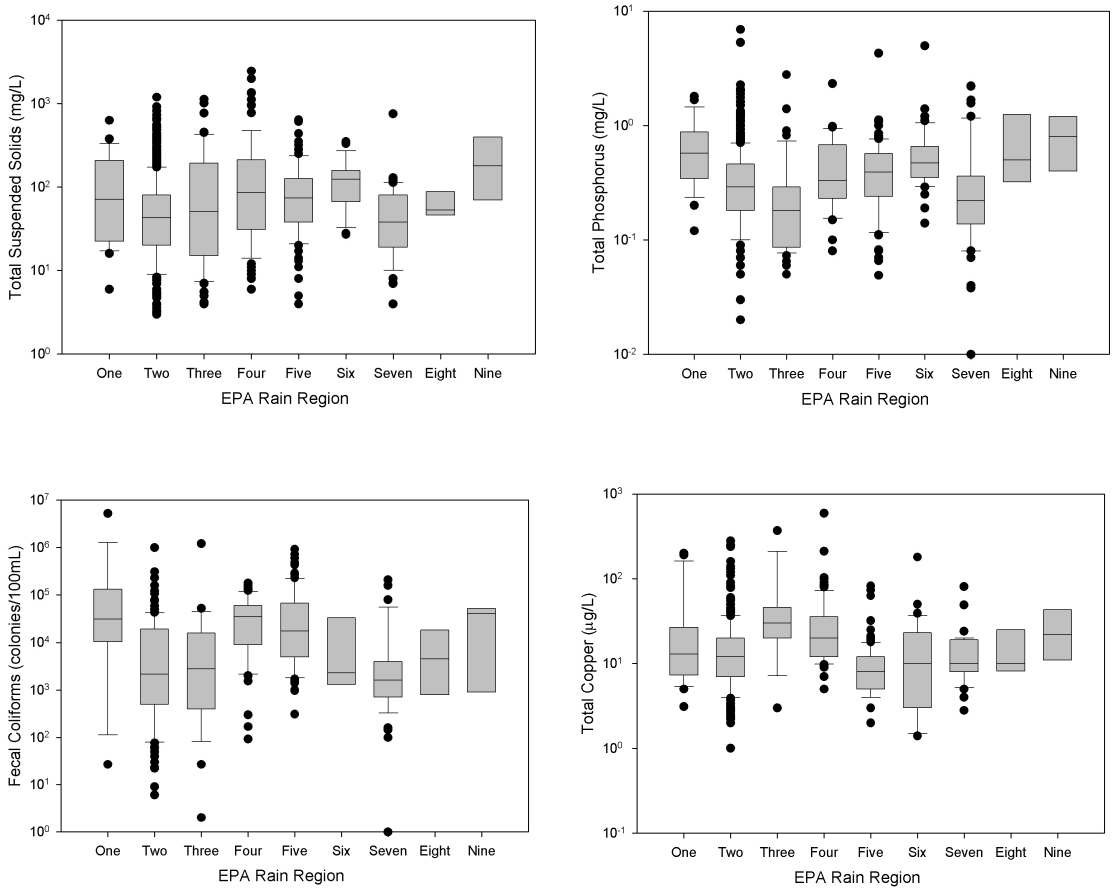

Figure 12. Example of constituents collected in residential land use by EPA Rain Zone

It is likely that the few data from EPA Rain Zone 1 (having relatively high concentrations) in the NSQD and the few data in EPA Rain Zones 2 and 3 (having relatively low concentrations) in NURP are the main reason for the differences in the database summary values.

Land use effects

Another factor that may affect the difference in reported concentrations between the NURP and NSQD databases is the percentage of samples collected for each different land use category. Although each database summarized observed concentrations by land use, having few data from few sites in a land use category reduces the reliability of the estimate. Almost 45% of the NURP database represents residential sites, while residential sites comprise about 30% of the NSQD. The percentage of industrial sites in the NSQD is 15%, while industrial sites in the NURP database represent only 6% of the total. The NSQD contains samples for freeways sites, which are not included in the NURP database. The percentages of mixed land uses and commercial areas are similar for both databases. However, a better representation of open space land uses was observed in the NURP database (10% of the total) compared with the NSQD (3% of the total).

Other Factors

Other factors may influence the differences in reported EMCs in the different databases. Figure 13 shows the probability plot for drainage areas for sites included in the NSQD and NURP databases.

This plot shows that the NURP watersheds are larger than those observed in the NSQD. The median NSQD drainage area was about 50 acres, while it was about twice as large during NURP. The NSQD also has about 10% of the

watersheds smaller than 10 acres, representing freeways sites. No literature was found that indicates that there is a relationship between the drainage area and the concentration of stormwater constituents.

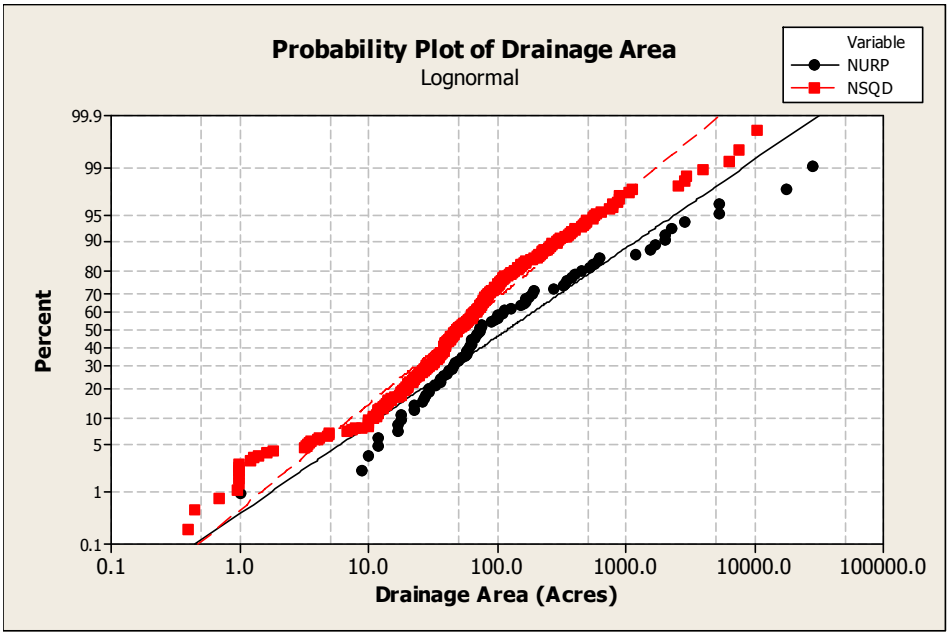

Figure 13. Distribution of collected events using the NURP database

Chapter Summary

This chapter describes the National Stormwater Quality Database. The information collected from the NPDES Phase I stormwater monitoring program was stored in a spreadsheet containing more than 3,700 rows and 250 columns. Each row represents a single monitored event. The main structure of the database is divided into six sections: site descriptions, hydrologic information, conventional constituents, nutrients, metals, and additional constituents. The collected data is grouped into 11 land use categories: residential, commercial, industrial, open space, freeways, mixtures of these land uses, and institutional. Support documents were also created for each community. These documents include aerial photos of the watershed and outfall area (when available), narrative descriptions about the main activities and land uses in the watersheds, sampling and quality control procedures, analytical methods, and equipment used during the collection and analysis of the samples. The last part of the support documents describe the problems that occurred during the collection and analyses of the samples, and meeting discharge permit requirements that specified sampling requirements. This information is useful for interpreting the reported monitoring data and as guidance for future stormwater programs in other communities around the country.

The data from the NSQD was compared with information from the most commonly used stormwater database, the EPA's Nationwide Urban Runoff Program (NURP) conducted more than 20 years ago. It was observed the concentrations in the NSQD were in general lower than those found during the NURP program. The analysis indicates that the main reason of these differences is the geographical differences represented by the monitoring locations represented in the databases. Most of the samples during the NURP program were collected in the upper Midwest and northeast coast areas of the country, while most of the samples represented in the NSQD were collected in the mid-east coast and southeast areas of the country. The preliminary regional analyses shown in this chapter indicate that southeast areas have lower stormwater concentrations than northeast areas.

Chapter 3: QA/QC Procedures

Introduction

This chapter presents the quality assurance and quality control procedures followed during the creation of the database. These tasks relied on two basic activities: identification of unusual observations and monitoring locations, and the examination of alternative methods to address non-detected pollutant concentration observations (left-censored data).

Quality Control/ Quality Assurance

More than 70 communities were contacted to request information concerning their NPDES Phase I monitoring activities. Communities submitted their reports in either electronic media or on paper. In cases where the data were in electronic form, the data were manipulated with macros and stored in the main Excel spreadsheet. For those communities with data only on paper, the information was typed directly into the spreadsheet.

Once the database was completed, the main table was first reviewed by rows (corresponding to individual runoff events) and then by columns (corresponding to measured constituents). Each row and column in the database was reviewed at least once and compared to information contained in the original reports (when available). For each constituent, probability plots, box and whisker plots, and time series plots were used to identify possible errors (likely associated with the transcription of the information, or as typographical errors in the original reports). Most of the identified errors were associated with the transcription process and, in some cases, errors associated with incorrect units (such as some metal results reported as mg/L when they were really as µg/L).

Additional "logical" plots were used to identify possible errors in the database. A plot of the dissolved (filtered) concentrations against the total concentrations for metals should indicate that the dissolved concentrations are lower than the total forms, for example (Figure 14). Other plots included TKN versus NH_3, COD versus BOD_5, SS versus turbidity and TDS versus conductivity.

In all cases, suspect values were carefully reviewed and many were found to be associated with simple transcription errors, or obviously improper units, which could be corrected. However, about 300 suspect values were removed from the database as they could not be verified. None of the data were deleted without sufficient evidence of a highly probable error. For example, if a set of samples from the same community had extremely high concentrations (in one case, 20 times larger than the typical concentrations reported for other events for the same community) at different sites, but for the same event, this will indicate a very likely error during the collection or analysis of the sample. If just a single site had high concentrations (especially if other related constituents were also high), it would not normally be targeted for deletion, but certainly subject to further scrutiny. If a value was deleted from the database, or otherwise modified, a question mark notation was assigned to the respective constituent in the qualifier column. Appendix B includes all the modifications performed in the database.

In order to calculate the standard deviations for the site quality control tests, each location must have at least two observations. Nine sites were not included in that analysis because they had only one observation. These sites were: ALHUDRAV, KYLXEHL4, KYLXEHL5, KYLXNEL1, MABOA007, ORCCA001, ORODA001, ORODA002, and ORODA004

Many specific statistical methods were used as part of the QA/QC review, in addition to simple data comparisons on multiple generations of data sheets, and logical patterns. The following is one example that was used to identify unusual monitoring locations and to verify the associated data observations with site characteristics.

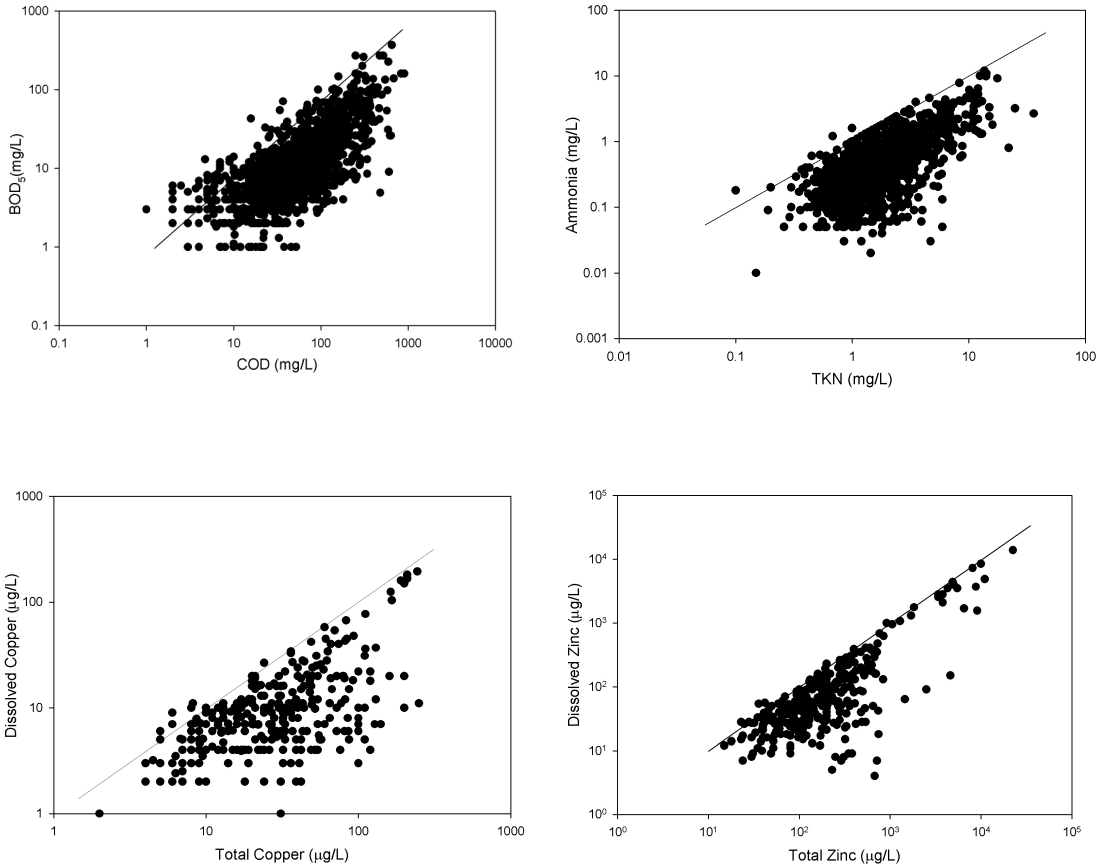

Figure 14. Example scatter plots of stormwater data (line of equivalent concentration shown)

Unusual Monitoring Locations

Box and whisker plots can be used as a preliminary examination of the principal factors and interactions between EPA Rain Zones and land use for any constituent. These plots can also be used to identify sites that do not fit within an established pattern shown by other land use locations from other regions of the country. Figure 23 shows box and whisker plots for residential, commercial, and industrial land uses for EPA Rain Zones 1 through 9. These plots indicate that there are significant differences between EPA Rain Zones and between land uses. Statistical tests also found that the interaction of these two factors was also significant. The median observations by land use have patterns similar to those found during NURP (EPA 1983), and other studies. Residential and open space areas have lower concentrations than commercial and industrial land use areas.

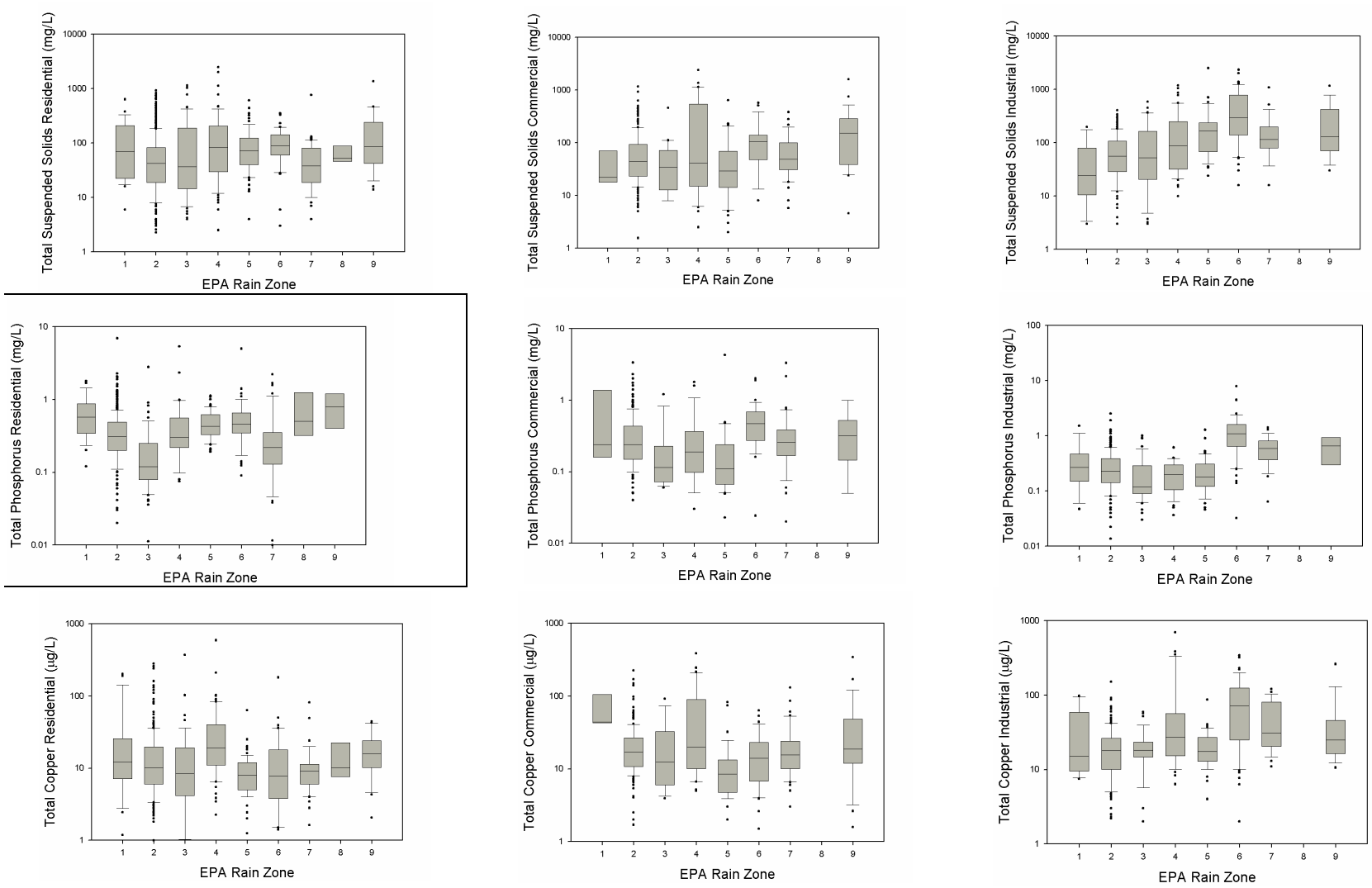

Figure 23. Box and whisker plots for TSS, total phosphorus and total copper by EPA Rain Zone and land use (Two-way ANOVA analyses indicate that both land use and geographical main factors and the interaction are significant at the 0.1% level)

Residential, commercial and industrial areas are the single land uses having the most observations in the database. These three land uses were analyzed separately to identify those sites with different characteristics than the remaining sites in the same land use and EPA Rain Zone. The following is an example using TSS at residential land use sites to demonstrate the method used to detect unusual monitoring sites in the database. Summaries of additional constituents in residential, commercial and industrial land uses are given in Appendix D.

Example Using Single Residential Land Use

The following example explains the steps used to identify unusual locations in the database. This analysis was performed in three steps. First, box and whisker plots we used to identify any site with concentrations unusually high or low compared with the other residential locations. The plot was used to identify preliminary differences between and within EPA Rain Zones. Figure 24 shows that there are some sites in EPA Rain Zone 2 having lower TSS concentrations than the remaining residential sites included in the database. On the other hand, it seems that sites located in EPA Rain Zone 4 have higher concentrations than other groups. The second step was to identify those single residential sites that failed the Xbar and S chart tests for all the observations and by EPA Rain Zone.

A total of 10 Xbar and S charts were created for each EPA Rain Zone and for all the zones combined. An indication of geographical differences is if the Xbar chart using all observations shows clusters close or outside the control limits. The effect will be confirmed if none of the sites failed the Xbar test within EPA Rain Zones. The S chart identifies those sites that have a larger or smaller variation than the overall sites in the set.

Figure 25 shows the Xbar and S chart for the residential land use sites. Six sites have mean TSS values different from the remaining sites in the same group. One important characteristic of this plot is that the control limits change with the number of samples collected at each site. The S chart identifies those sites with standard deviations different than the pooled deviation of the data set. In this case, two sites are outside the control limits. Table 15 shows the sites that failed the Xbar and S chart for all residential sites and for each EPA Rain Zone. Table 15 shows that most of the sites located below the lower control limit were located in North Carolina, Virginia (EPA Rain Zone 2) or Oregon (EPA Rain Zone 7). Sites above the upper control limit were located in Arizona (EPA Rain Zone 6), Kansas (EPA Rain Zone 4), and Colorado (EPA Rain Zone 9).

Xbar plots by EPA Rain Zones also indicate differences within groups. EPA Rain Zones 2, 3, and 4 showed nine sites failing the Xbar test. Six sites out of 54 failed the Xbar chart test in residential land use EPA Rain Zone 2. Each of these sites will be described individually.

The first site was located in Kentland Village (Flagstaff Street), in Prince George County, Maryland (Location_ID = MDPGCOS2, median TSS = 132 mg/L). This site with 63 events has the largest number of observations in the database. An industrial park and a commercial area surrounded this high-density residential site. A special characteristic of this site is the construction of a stadium close of the watershed during the monitoring period.

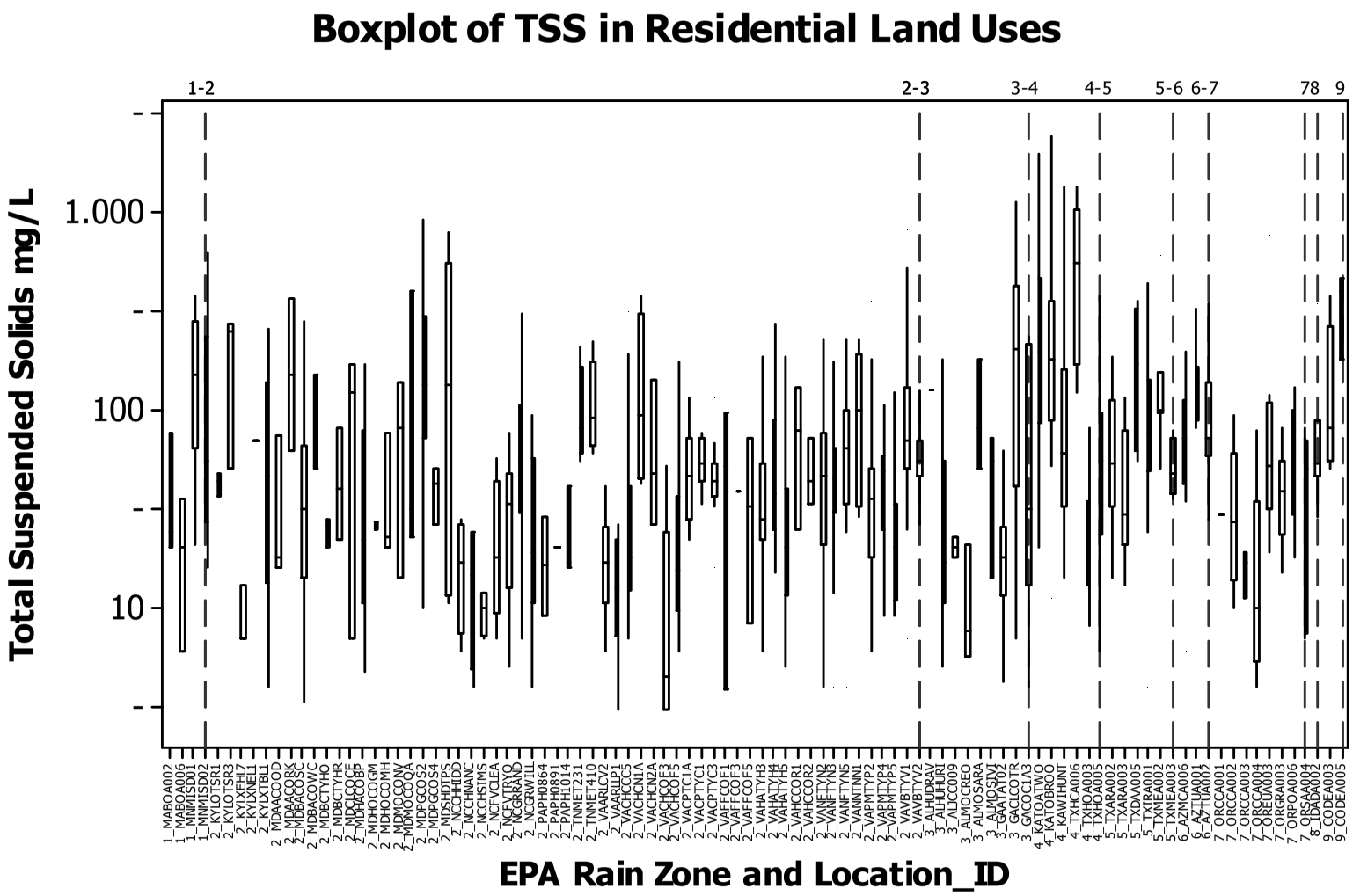

Figure 24. TSS box and whisker plots in residential land use by EPA Rain Zone and location

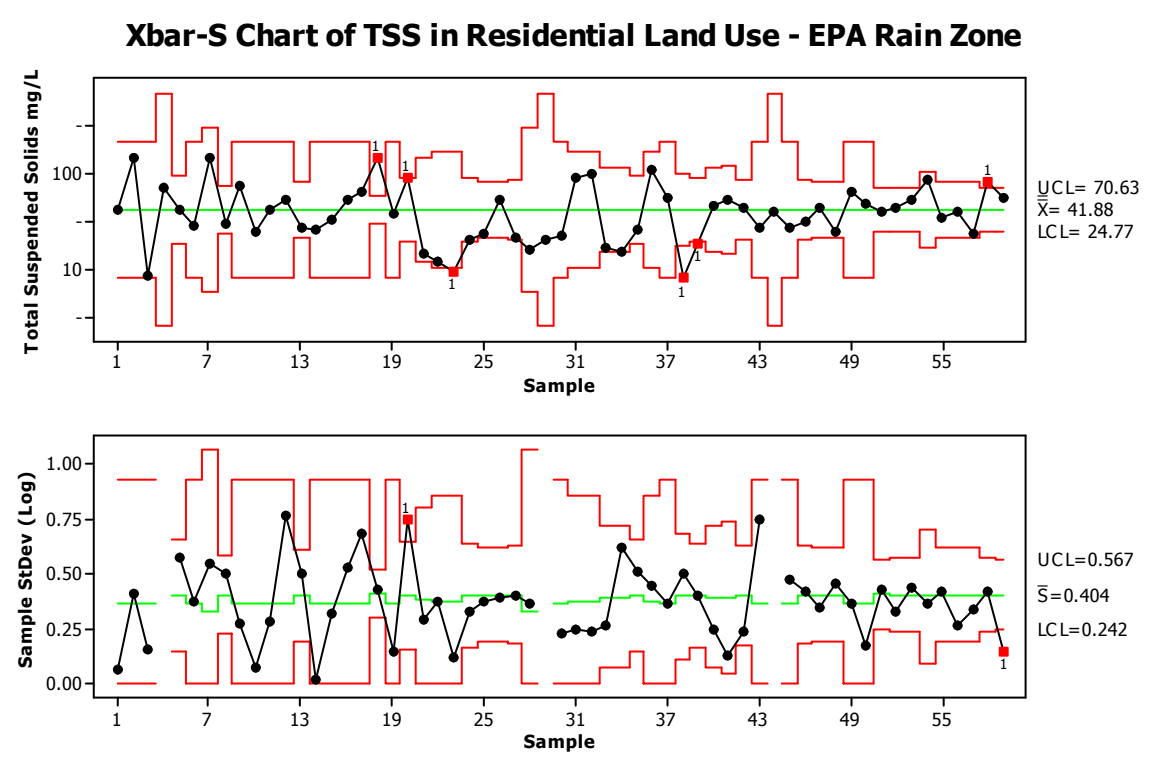

Figure 25. Xbar and S chart for residential land use in EPA Rain Zone 2

Table 15. Sites Failing Xbar and R Chart in Residential Land Uses

Rain Zone	Sites Failing Xbar chart	Sites Failing S Chart
ALL	AZTUA001(H) CODEA005(H) GAATAT02(L) GACLCOTR(H) KATOATWO(H) KATOBROO(H) KYLXEHL7(L) MDPGCOS2(H) MNMISD01(H) NCCHSIMS(L) NCFVCLEA(L) NCFVTRYO(L) NCGRWILL(L) ORCCA004(L) TXHCA006(H) TXHOA003(L) VAARLCV2(L) VAARLLP1(L) VACHCOF3(L) VACHCOF5(L) VAHATYH5(L) VAPMTYP5(L)	VAVBTYV2(L)
1	None	None
2	MDPGCOS2(H) MDSHDTPS(H) NCCHSIMS(L) VACHCOF3(L) VACHCOF5(L) VAVBTYV1(H)	MDSHDTPS(H) VAVBTYV2(L)
3	GACLCOTR(H)	None
4	TXHCA006(H) TXHOA003(L)	None
5	None	None
6	None	None
7	None	None
8	None	None
9	None	None

The second site has 13 observations and was operated by the Maryland State Highway Department (MDSHDTPS, median TSS = 135 mg/L). This 51-acre site is considered 96% single family residential, with 4% agricultural land use. The site is located close to the intersection of two highways. Observed concentrations ranged from 10 mg/L up to 750 mg/L. The highest concentrations were observed in summer and the lowest in spring. Another site in EPA Rain Zone 2 with elevated values has 26 observations and is located close to Bow Creek in Virginia Beach, VA (VAVBTYV1, median TSS = 69). This site is located close to a golf course and is drained by a natural channel.

The site with a standard deviation below the lower control limit (VAVBTYV2) is located next to VAVBTYV1. It has also a high TSS concentration but inside the control limits. A total of 30 samples were collected at VAVBTYV2. The aerial photograph did not indicate any unusual conditions at this site.

In EPA Rain Zone 4, only one site had high concentrations compared with the remaining residential sites. This site (TXHCA006) is located in Harris County, TX. Six samples were collected, having a median TSS of 550 mg/L. This site is also analyzed in Chapter 5 and seems to be affected by flooding or erosion activity. In EPA Rain Zone 3, site GACLCOTR is a new development in Tara Road, Clayton County, and Georgia. Twenty-two samples were collected at this location. The median TSS was 200 mg/L. No unusual conditions were identified when examining the aerial photographs.

Site mean concentrations below the lower control limit in the Xbar chart were located in Virginia, North Carolina and Texas. The two sites located in Virginia are located in Chesterfield County. The first site is located in King Mills Road (VACHCOF3, 10 observations, median TSS = 4 mg/L) and is located in a forested area with less than 20% impervious. The second site (VACHCOF5, 14 observations, median TSS = 15 mg/L) is 50% impervious, but surrounded by a forested area. Only four events were collected at the site between March and August 1993, in Silo Lane, Charlotte, North Carolina (NCCHSIMS, median TSS = 10 mg/L), no unusual characteristics were observed from the aerial photographs. The unusual low concentration site in Houston, Texas is located on Lazybrook Street (TXHOA003, median TSS = 21 mg/L). Freeways (I-610) are located in the north and west part of the watershed. Tall trees surrounding the houses were also observed inside the watershed.

The final step was using ANOVA to evaluate if any EPA Rain Zone was different than the others. The ANOVA table indicated a p-value close to zero, indicating that there are significant differences in the TSS concentration among at least two of the different EPA Rain Zones. The Dunnett's comparison test with a family error of 5% indicate that concentrations in EPA Rain Zones 4 (median TSS= 91 mg/L), 5 (median TSS = 83 mg/L), 6 (median TSS=118 mg/L), 7 (median TSS = 69 mg/L), and 9 (median TSS = 166 mg/L) are significantly higher than the concentrations observed in EPA Rain Zone 2 (median TSS = 49 mg/L).

This same procedure was performed for the following 13 additional constituents in residential, commercial and industrial land use areas: hardness, TSS, TDS, oil and grease, BOD, COD, NO2 + NO3, ammonia, TKN, dissolved phosphorus, total phosphorus, copper, lead and zinc.

Identification of Unusual Sites

The Xbar charts were created for residential, commercial and industrial land uses. In residential areas, 54 sites were identified with at least one constituent out of control. These sites failed when compared with sites in the same EPA Rain Zone. Table 16 shows the sites with more than 4 constituents outside the control limits.

These eight sites were located in EPA Rain Zone 2. Three sites show elevated concentrations, one in all constituents, and another in metals and the third in nutrients. The site located near a golf course in Virginia Beach (VAVBTYV1) shows elevated concentrations in TSS, phosphorus and COD. The site located in Prince George County close to an industrial park (MDPGCOS2), indicated elevated concentrations of total phosphorus, lead and zinc.

The site with the highest number of constituents outside the control limits (10 out of 14 constituents evaluated) was located in Mt. Vernon, Lexington, Kentucky (KYLXTBL1). This site was monitored between 1992 an 1997; it is located close to two high schools and the University of Kentucky. It is interesting that one of the sites having elevated concentrations is located next to one of the sites with a large number of constituents below the lower control limit (VAVBTYV2 is located close to VAVBTYV1). VAVBTYV1 has low concentrations for 6 out of 14 constituents. This indicates that not only can geographical differences be expected; there are also differences between locations in the same EPA Rain Zone. Lead was most frequently found with high concentrations within the same EPA Rain Zone. Eight sites had elevated lead concentrations, while 11 sites had lower concentrations in the same group. The least frequent out-of-bound constituent was oil and grease: none of the sites indicated elevated concentrations of oil and grease when compared with other locations in the same EPA Rain Zone.

Table 16. Sites Failing Xbar Chart in Residential Land Uses

SITE	HA	TSS	TDS	OG	BOD	COD	NO2	NH3	TKN	DP	TP	Cu	Pb	Zn
1MABOA006											L	H		
2KYLOTSR3			H											
2KYLXTBL1	H		H		H	H	H		L	H	H	H	H	H
2MDAACORK													L	
2MDBACOSC							H						L	
2MDBCTYHR									H			H		
2MDCLCOCE														H
2MDHACOBP					L				L		L	L	L	L
2MDHOCOGM					H									
2MDPGCOS2		H									H	L	H	H
2MDSHDTPS		H										L		
2NCCHHIDD							H	H						
2NCCHNANC					L									
2NCCHSIMS		L						H						
2NCFVCLEA			L								L	L		
2NCFVTRYO												L	L	
2NCGRWILL								L		H				
2VAARLCV2					L	L					L		L	
2VAARLLP1			H										L	L
2VACHCN2A												L		L
2VACHCOF3	L	L	L	L		L				L	L	L		
2VACHCOF5		L	L			L					L			
2VACPTSF2												L		L
2VAFFCOF1			L											
2VAHATYH3									L	L				
2VAHATYH5										H				L
2VANFTYN2										H	H			
2VANFTYN3						H							H	
2VANFTYN5													H	
2VAPMTYP2										L			H	
2VAPMTYP4								L		L				
2VAPMTYP5														L
2VAVBTYV1		H				H				H	H			
2VAVBTYV2			H		L		L	L		L		L		L
3GAATAT02												H		
3GACOC1A3					L									
3GACLCOTR		H												
4KATOATWO				L										
4KATOBROO				L										
4TXHOA003		L	H									L		
5TXARA002						L							L	
5TXARA003											H			
5TXDAA005													H	
5TXIRA001													H	
5TXMEA002	H													
5TXMEA003													L	
6AZMCA006												H		
6AZTUA001			H			H								
6AZTUA002													L	
7ORCCA004													L	
7OREUA003	H												H	
7ORGRA003				L										
7ORPOA006	L													
7ORSAA004									L				L	L

Note: H: Site with mean concentrations larger than UCL. L: Site with mean concentrations lower than LCL

In commercial land use areas, six out of 25 locations indicated more than three constituents outside of the control limits (Table 20). Five sites have more than one constituent above the upper detection limit. The site with the largest number was located in Wilhite Drive behind a K-Mart large shopping center in Lexington, Kentucky (KYLXWHL1). This site was monitored between 1992 and 1996. The site indicates elevated nutrients, BOD, hardness and TDS concentrations. The second site was also located in Kentucky. East Land is located in an old commercial area in Lexington (KYLXNEL3). This site has elevated total and dissolved phosphorus concentrations.

Table 17. Sites Failing Xbar Chart in Commercial Land Uses

SITE	HA	TSS	TDS	OG	BOD	COD	NO2	NH3	TKN	DP	TP	Cu	Pb	Zn
2KYLXNEL3								L		H	H			
2KYLXWHL1	H		H		H				H	H	H			
2MDAACOPP							L						L	
2MDHOCODC					L						L			
2MDHOCODC														
2MDPGCOS1		H										H	H	H
2NCGRATHE											H			
2NCGRMERR														L
2VAARLRS3					L	L							L	L
2VACHCCC4	H	L		L	L	L								
2VAHATYH1										L				
2VAHCCOC2														H
2VAPMTYP1										L				
3ALHUMASM													H	
3ALHUWERP													H	
3ALMODAPH					H									
4KATOJACK		H		H								H		H
4TXHOA004				L										
6AZTUA003													H	
7OREUA001	H													
7ORPOA001	L													
9CODEA001												H		H
9CODEA002				H										
9KAWITOWN				L										

Note: H: Site with mean concentrations larger than UCL. L: Site with mean concentrations lower than LCL

A third site having elevated stormwater concentrations was found in Brightseat Road adjacent to Landover Mall in Prince George County, Maryland (MDPGCOS1). This site was monitored between 1992 and 1996. It has elevated TSS, copper, lead and zinc concentrations. A fourth site with elevated stormwater concentrations is located in Topeka, Kansas (KATOJACK). This site is located close to a sand quarry. Median TSS concentrations at this location were close to 600 mg/L. Elevated oil and grease, total lead and total zinc were also found at this location. The last elevated concentration site is located in Denver, Colorado. Cherry Creek at Colfax Avenue (CODEA001) has elevated copper and zinc concentrations. The site is 87% commercial and contains a convention center, hotels and restaurants on 16th Street Mall, the State Capital and other government buildings.

Four out of 25 industrial land use locations indicated more than three constituents with median concentrations outside the upper control limit (Table 18). One site is located in Boston, Massachusetts. The Brighton (MABOA004) watershed drains runoff from warehouses and manufacturing operations associated with mechanical, roofing and electrical activities. According to the site description, there is a large potential for storage of rainfall on rooftops and poorly maintained parking lots and roadways. Extremely high ammonia and TKN concentrations were observed at this location. Another industrial site having high concentrations is located in Greensboro, North Carolina. The site is located at Husband Street (NCGRHUST). Zinc and especially copper concentrations were elevated (median copper = 29 μg/L).

A site located at Santa Fe Shops in Topeka, Kansas (KATOSTFE) had elevated metal concentrations. Railroad activity was present in the watershed. Another industrial site of interest is located on 27th Avenue at the Salt River in Maricopa, Arizona (AZMCA003). It had a median TSS of 668 mg/L. Copper, lead and zinc had extremely high concentrations at this location compared with many other single land uses sites in the database.

Table 18. Sites Failing Xbar Chart in Industrial Land Uses

SITE	HA	TSS	TDS	OG	BOD	COD	NO2	NH3	TKN	DP	TP	Cu	Pb	Zn
1MABOA004								H	H			H		
1MNMISD03												L		
2KYLOTSR2					H									
2KYLXTBL2								L		H	H			L
2MDBACOTC													H	
2MDCHCOIP												L		
2MDPGCOS6		H											H	
2NCCHBREV							H	H						
2NCCHHOSK								H						H
2NCFVWINS														H
2NCGRHUST					H							H		H
2VAARLTC4			H									L	L	L
2VACHCOF1												L		
2VACPTYC5		L	L		L	L	L	L	L	L	L	L		
2VAFFOF10									H				L	
2VAFFOF11					H				H					
2VAHATYH2												H		
2VAVBTYV4		L	L									L		
3ALHUCHIP													H	
3GAATAT01		L										L		
3GACLCOSI										H				
4KATOSTFE												H	H	H
4TNMET211								H						
4TXHCA004								L						
5TXDAA001										H		L		
5TXDAA002		L				L								L
5TXFWA004														H
6AZMCA001							L						L	
6AZMCA003		H					H					H	H	
6AZTUA004												L		
6CAALAL09			L						L					
7ORSAA003					L						L			L
9CODEA007												H		

Note: H: Site with mean concentrations larger than UCL. L: Site with mean concentrations lower than LCL

Non-Detected Analyses

Left-censored data refers to observations that are reported as below the limits of detection, while right-censored data refers to over-range observations. Unfortunately, many important stormwater measurements (such as for filtered heavy metals) have large fractions of undetected values. These missing data greatly hinder many statistical tests. A number of methods have been used over the years to substitute appropriate values for these missing data in order to perform statistical tests:

- ignore the non-detects and report only using the detected values (also report the detection limit and the frequency of missing data). This may be suitable for the most basic summaries of the data.
- replace the non-detects with zero. This is the method suggested by the EPA for reporting discharge quantities associated with discharge permits. This method results in a decreased discharge estimate by assuming that the non-detects are actually associated with no pollutants in the waste stream.
- replace the non-detects with the detection limit. This would result in an increased discharge amount when conducting mass balances.
- replace with half the detection limit. This is usually the most common method used, but still may result in biased results. The biggest problem with any of these set value replacement methods is that a single value is used for each missing data value. This can therefore have dramatic effects on the calculated variance of the data set and makes statistical comparison tests error prone.
- replace with a randomly generated value based on the measured variation of the available observations. This is usually the preferred method as the variation of the data set is preserved, allowing suitable non-paired comparison tests. Paired tests cannot be conducted as there is no knowledge of which values belong with which observation.
- report the actual instrument reading, even if below the "minimum quantification limit" or "method detection limit." This is the best method, from a statistical standpoint, but is rarely available. Most of the detection limits are extremely conservative, especially in comparison with the other errors associated with a monitoring program. The use of "substandard" detection limits enables the use of all statistical tests, however, care must be taken to describe the detection limit methodology and the actual instrumentation errors.

Berthouex and Brown (2002) has an extended discussion of some of these methods applied to environmental analyses. To estimate the problems associated with censored values, it is important to identify the probability distributions of the data in the dataset and the level of censoring. Most of the constituents in the NSQD followed a lognormal distribution (See Chapter 4). Appendix C shows several approaches to analyze censoring observations with single and multiple detection limits. Different comparisons substantiated the conclusion that the non-detected values in the NSQD can be best estimated using the Cohen's maximum likelihood method (a method that randomly generates the missing data based on the known probability distributions of the data), compared to other traditional methods.

The values of the detection limits and their frequencies varied among the different constituents and monitoring locations. This made handling the non-detectable values even more confusing, as each constituent had several detection limits. Therefore, the first step in evaluating the different methods to address censored data was to identify the probability distribution of the dataset. The second step was applying and evaluating the different estimation methods.

Censored Data Distribution

The level of censoring for each constituent was calculated for each land use and site, for 18 selected constituents. These constituents contained low levels of censored values. The National Council of the Paper Industry for Air and Stream Improvement found that for levels of censoring (non-detectable observations) above 60%, the use of any estimation method is not appropriate (NCASI 1995). Table 11 shows the maximum, minimum, and percentage of detected values by constituent for each main land use for the complete dataset. In general, freeway sites have the largest percentage of detected observations, while open space sites have the highest percentage of non-detected observations. This is expected as freeway areas have the highest concentrations and open space areas have the lowest concentrations of most reported constituents.

The constituents having greater than 95% detected observations (of these 18) are conductivity, pH, hardness, TSS, TDS, and COD (except for open space areas). Most of the non-detected observations of these 18 constituents were for oil and grease, dissolved phosphorus, lead, and nickel analyses. The percentage of detected observations for these constituents in open space areas varied between 18% and 75%, while freeways recorded valid values for 89% to 100% of the analyses for the metals.

Residential, commercial and industrial land uses have similar percentages of detected observations for each constituent shown in Table 11. The most frequent detection limit for each constituent was also identified. Because of

the duration of the monitoring activities reported in the NSQD, the large number of municipalities involved, and the large number of analytical methods used, each constituent usually had several reported detection limits. The number and percentage of non-detected observations at each detection limit was calculated with respect to the total number of non-detected observations. For example, there are a total of 60 oil and grease observations at freeway sites: 43 detected and 17 non-detected. There were three separate detection limits reported for the non-detected oil and grease observations: < 0.5, < 1 and < 3 mg/L with 1, 2 and 14 observations reported for each, respectively. The frequency distribution of non-detected oil and grease observations at freeways sites was therefore 5.8%, 11.8% and 82.3%, respectively. The results for the remaining land uses and constituents are shown in Table 12. A discussion about the percentage of the detected values and their distributions for each constituent is presented in Appendix D.

Table 11. Percentages of Detected Values by Land Use Category and for the Complete Database

Constituent	Land use*	Total Events	Minimum Detected Concentration	Maximum Detected Concentration	Percentage with detected values
Conductivity (μS/cm)	RE	106	27.3	2020	100
	CO	66	17	894	100
	ID	108	42	1958	100
	OP	2	75	150	100
	FW	86	20	870	100
	TOTAL	685	16.8	5955	100
Hardness (mg/L)	RE	250	3	401	100
	CO	139	1.9	356	100
	ID	138	5.5	888	96.4
	OP	8	11	270	100
	FW	127	5	1000	100
	TOTAL	1082	1.9	1100	98.7
Oil and Grease (mg/L)	RE	533	0.2	2980	57.8
	CO	308	0.8	359	70.8
	ID	327	0.5	11000	65.1
	OP	19	0.5	4	36.8
	FW	60	3	30	71.7
	TOTAL	1834	0.2	11000	66.1
Total Dissolved Solids (mg/L)	RE	861	3	1700	99.2
	CO	399	4	3860	99.5
	ID	412	4.5	11200	99.5
	OP	45	32	542	97.8
	FW	97	12	470	90.0
	TOTAL	2956	3	17900	99.3
Total Suspended Solids (mg/L)	RE	991	3	2426	98.6
	CO	458	3	2385	98.3
	ID	427	3	2490	99.1
	OP	44	3	980	95.5
	FW	134	3	4800	99.3
	TOTAL	3389	3	4800	98.8
BOD (mg/L)	RE	941	1	350	97.6
	CO	432	2	150	97.4
	ID	406	1	6920	95.3
	OP	44	1	20	86.4
	FW	26	2	89	84.6
	TOTAL	3105	1	6920	96.2
COD (mg/L)	RE	796	5	620	98.9
	CO	373	4	635	98.4
	ID	361	2	1,260	98.9
	OP	43	8	476	76.7
	FW	67	2.44	1,013	98.5
	TOTAL	2,750	1	1,260	98.4

RE = residential; CO=commercial; ID=industrial; OP=open space; FW=freeways
Total=total database, all land uses combined, including mixed land uses

Table 11. Percentages of Detected Values by Land Use Category and for the Complete Database - *Continuation*

Constituent	Land use	Total Events	Minimum Detected Concentration	Maximum Detected Concentration	Percentage of detected values
Fecal Coliform (Colonies/100mL)	RE	446	1	5,230,000	88.3
	CO	233	4	610,000	88.0
	ID	297	2	2,500,000	87.9
	OP	23	650	63,000	91.3
	FW	49	50	70,000	100
	TOTAL	1704	1	5,230,000	91.2
Fecal Streptococcus (Colonies/100mL)	RE	305	20	840,000	89.59
	CO	181	20	1,100,000	91.79
	ID	195	22	6,000,000	93.9
	OP	22	160	101,000	90.9
	FW	25	560	130,000	100
	TOTAL	1141	20	6,000,000	94.0
Ammonia (mg/L)	RE	595	0.01	6	81.5
	CO	299	0.02	8	83.3
	ID	253	0.03	10	83.4
	OP	32	0.07	2	18.8
	FW	79	0.08	12	87.3
	TOTAL	1908	0.01	12	71.3
NO2 + NO3 (mg/L)	RE	927	0.01	18	97.4
	CO	425	0.03	8.21	98.1
	ID	417	0.02	8.4	96.2
	OP	44	0.09	3.33	84.1
	FW	25	0.1	3	96.0
	TOTAL	3075	0.01	18	97.3
TKN (mg/L)	RE	957	0.05	36	95.6
	CO	449	0.05	15	96.8
	ID	439	0.05	25	97.3
	OP	45	0.2	5	95.9
	FW	125	0.2	36	71.1
	TOTAL	3191	0.05	66	96.8
Dissolved Phosphorus (mg/L)	RE	738	0.01	2	84.2
	CO	323	0.01	2	81.1
	ID	325	0.02	2	87.4
	OP	44	0.01	1	79.6
	FW	22	0.06	7	95.5
	TOTAL	2477	0.01	7	85.1
Total Phosphorus (mg/L)	RE	963	0.01	7	96.9
	CO	446	0.02	3	95.7
	ID	434	0.02	8	95.9
	OP	46	0.02	15	84.8
	FW	128	0.06	7	99.2
	TOTAL	3285	0.01	15	96.5

Table 11. Percentages of Detected Values by Land Use Category and for the Complete Database - *Continuation*

Constituent	Land use	Total Events	Minimum Detected Concentration	Maximum Detected Concentration	Percentage of detected values
Total Copper (μg/L)	RE	799	1	590	83.6
	CO	387	1.5	384	92.8
	ID	415	1.97	1360	89.6
	OP	39	2	210	74.4
	FW	97	5	244	99.0
	TOTAL	2723	0.6	1360	87.4
Total Lead (μg/L)	RE	788	0.5	585	71.3
	CO	377	1	689	85.4
	ID	411	1	1200	76.4
	OP	45	0.2	150	42.2
	FW	107	1.6	450	100
	TOTAL	2949	0.2	1200	77.7
Total Nickel (μg/L)	RE	419	1	100	45.4
	CO	232	2	110	59.5
	ID	249	1	110	62.7
	OP	38	12	120	18.4
	FW	99	2.8	100	89.9
	TOTAL	1430	1	120	59.8
Total Zinc (μg/L)	RE	810	3	1580	96.4
	CO	392	5	3050	99.0
	ID	432	5.77	8100	98.6
	OP	45	5	390	71.1
	FW	93	6	1829	96.8
	TOTAL	3007	2	22500	96.6

Table 12. Percentages of Non-detected Values for Different Reported Detection Limits by Land Use and for the Total Database

Constituent	Land use*	<**	<0.5	<0.6	<1	<1.2	<1.4	<1.9	<2	<2.24	<2.47	<2.5	<2.9	<3	<3.97	<5	<5.2	<6	<6.5	<7	<8.3	<10	<14	<17
Oil and Grease (mg/L)	RE	0.44	1.78		36.89		2.22		5.78	0.44	0.44	3.56		1.78		39.56		2.67	0.89		0.44	3.11		
	CO		2.22	1.11	34.44		2.22		5.56			3.33	1.11	4.44		40.00		4.44		1.11				
	ID		2.63		51.75		1.75		6.14			3.51				28.95	1.75	2.63				0.88		
	OP				100.00																			
	FW		5.88		11.76									82.35										
	TOTAL	0.16	1.93	0.16	44.69	0.16	2.09	0.16	5.14	0.16	0.16	2.57	0.16	4.02	0.16	32.64	0.32	2.09	0.32	0.16	0.16	2.25	0.16	0.16

*see footnote for Table 11 for definitions of land use categories

** the < sign without a value implies a non-detected value that was not identified

Constituent	Land use	<1	<5	<6	<10
Total Dissolved Solids (mg/L)	RE	14.29	71.43		14.29
	CO				100.00
	ID		50.00	50.00	
	OP		100.00		
	FW	100.00			
	TOTAL	15.00	55.00	5.00	25.00

Constituent	Land use	<0.5	<1	<2	<5	<10
Total Suspended Solids (mg/L)	RE	7.14	7.14		85.71	
	CO	12.50		12.50	62.50	12.50
	ID		25.00		75.00	
	OP		50.00		50.00	
	FW					
	TOTAL	4.76	9.52	4.76	78.57	2.38

Constituent	Land use	<1	<2	<3	<4	<5	<6	<10	<15	<20	<100
BOD (mg/L)	RE	8.70	13.04	8.70	4.35	34.78	8.70	4.35		8.70	
	CO	9.09	18.18	9.09		18.18	9.09	9.09			
	ID	5.26	31.58	5.26		47.37			5.26		
	OP	16.67	50.00	16.67						16.67	
	FW			50.00		50.00					
	TOTAL	33.05	20.34	6.78	3.39	18.64	2.54	1.69	0.85	3.39	1.69

Table 12. Percentages of Non-detected Values for Different Reported Detection Limits by Land Use and for the Total Database - *Continued*

Constituent	Land use	<1	<2	<5	<10	<20	<25
COD (mg/L)	RE	33.33		55.56	11.11		
	CO	50.00		33.33	16.67		
	ID				50.00	25.00	25.00
	OP				20.00	80.00	
	FW				100.00		
	TOTAL	15.91	2.27	15.91	40.91	22.73	2.27

Constituent	Land use	<	<1	<2	<3	<10	<20	<30	<100	<200	<2000	>	>1.6K	>2.4K	>3K	>6K	>12K	>16K	>24K	>30K	>35K	>40K	>60K	>80K	>160K
Fecal Coliform (Colonies/100mL)	RE		7.84	3.92		1.96				3.92			25.49	3.92		1.96		13.73	1.96			1.96	21.57	3.92	7.84
	CO		17.86		3.57	3.57			3.57	3.57			10.71	3.57	3.57			10.71			3.57	3.57	28.57		3.57
	ID		44.44	11.11			2.78	2.78	2.78	5.56			2.78			2.78		8.33					11.11	2.78	2.78
	OP																								100.00
	FW																								
	TOTAL	0.67	22.00	4.00	0.67	2.67	0.67	0.67	1.33	3.33	2.67	0.67	11.33	2.00	2.00	2.67	2.67	13.33	0.67	0.67	0.67	1.33	15.33	2.67	5.33

Constituent	Land use	<1	<2	<4	<200	>16K	>35K	>60K	>80K	>100K	>160K	>240K
Fecal Streptococcus (Colonies/100mL)	RE	21.88	6.25		9.38	15.63	3.13	21.88	6.25	6.25	6.25	3.13
	CO	20.00	20.00	6.67		6.67		46.67				
	ID	50.00	8.33		8.33	25.00		8.33				
	OP					50.00			50.00			
	FW											
	TOTAL	27.94	13.24	1.47	5.88	14.71	1.47	22.06	5.88	2.94	2.94	1.47

Constituent	Land use	<	<0.01	<0.02	<0.04	<0.05	<0.1	<0.2	<0.27	<0.3	<0.5	<1
Ammonia (mg/L)	RE	30.00		0.91	0.91	13.64	18.18	14.55		1.82	20.00	
	CO	18.00				2.00	22.00	30.00	2.00		26.00	
	ID	23.81				2.38	7.14	28.57			35.71	2.38
	OP	19.23			3.85	7.69					69.23	
	FW							100.00				
	TOTAL	14.63	0.37	0.18	0.55	4.94	9.87	53.75	0.18	0.37	14.81	0.37

Table 12. Percentages of Non-detected Values for Different Reported Detection Limits by Land Use and for the Total Database - *Continued*

Constituent	Land use	<	<0.01	<0.02	<0.03	<0.05	<0.06	<0.1	<0.2	<0.3	<0.5	<1
NO2 + NO3 (mg/L)	RE	16.67		8.33	8.33			37.50	4.17			25.00
	CO	25.00		12.50				50.00		12.50		
	ID	6.25		6.25		6.25		43.75	6.25	6.25		25.00
	OP							100.00				
	FW									100.00		
	TOTAL	15.85	1.22	8.54	4.88	4.88	1.22	35.37	4.88	6.10	3.66	13.41

Constituent	Land use	<	<0.01	<0.05	<0.1	<0.2	<0.28	<0.3	<0.5	<1	<1.5
TKN (mg/L)	RE	25.81	3.23		3.23	19.35			25.81	19.35	3.23
	CO	25.00	8.33			16.67			25.00	8.33	16.67
	ID	16.67	5.56			11.11			22.22	38.89	5.56
	OP								100.00		
	FW				50.00					50.00	
	TOTAL	15.71	2.86	0.71	2.86	30.71	0.71	7.86	22.14	13.57	2.86

Constituent	Land use	<	<0.001	<0.01	<0.016	<0.02	<0.03	<0.04	<0.05	<0.06	<0.1	<0.12	<0.15	<0.2	<0.5
Dissolved Phosphorus (mg/L)	RE	41.03		0.85	1.71	11.97		1.71	19.66	0.85	12.82	0.85			8.55
	CO	37.70		6.56	1.64	18.03	1.64		11.48	1.64		3.28			18.03
	ID	36.59				4.88			29.27		12.20			2.44	14.63
	OP			11.11					22.22		11.11				55.56
	FW			100.00											
	TOTAL	34.24	0.27	3.80	2.17	13.04	1.90	0.82	14.40	0.82	14.95	0.82	1.09	1.09	10.60

Constituent	Land use	<	<0.01	<0.02	<0.03	<0.04	<0.05	<0.06	<0.1	<0.12	<0.15	<0.5
Total Phosphorus (mg/L)	RE	10.00	6.67	3.33		3.33	10.00		30.00	3.33		33.33
	CO	15.79	5.26	10.53						10.53		57.89
	ID	38.89		5.56			11.11	16.67	5.56			22.22
	OP		14.29				28.57		14.29			42.86
	FW				100.00							
	TOTAL	13.91	4.35	9.57	3.48	0.87	7.83	2.61	20.87	2.61	6.09	27.83

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Table 12. Percentages of Non-detected Values for Different Reported Detection Limits by Land Use and for the Total Database – *Continued*

Constituent	Land use	<	<0.45	<1	<1.5	<2	<4	<5	<7	<8	<10	<15	<20	<25	<40	<41	<60
Total Copper (μg/L)	RE		0.76	1.53	1.53	3.82	0.76	19.85	0.76	0.76	41.98	2.29	25.95				
	CO	3.57				7.14		14.29			57.14		17.86				
	ID					9.30		9.30		4.65	18.60		48.84	2.33	2.33	2.33	2.33
	OP	20.00									70.00		10.00				
	FW										100.00						
	TOTAL	2.62	0.29	0.87	0.58	4.94	0.87	14.24	0.29	1.16	39.53	0.87	32.56	0.29	0.29	0.29	0.29

Constituent	Land use	<	<0.2	<0.65	<0.7	<1	<1.5	<1.6	<2	<2.5	<3	<4	<5	<6	<7	<9	<10	<15	<20	<25	<30	<40	<42	<50	<53	<55	<60	<100	<200	<250	<500
Total Lead (μg/L)	RE	10.6	0.4	0.4		0.4			2.2	4.0	9.3	1.3	21.7	0.4		7.5	5.8	1.3	4.4	5.8	0.9	3.5	0.4	8.9		0.9	1.3	5.3	3.1		
	CO	38.2			1.8	1.8			3.6	1.8		1.8	9.1			1.8	1.8				3.6	14.6	3.6	1.8				14.6			
	ID	17.5				3.1	1.0	1.0	3.1		3.1		13.4			8.3	2.1	2.1	8.3	5.2		3.1	1.0	9.3	1.0	3.1	2.1	10.3		1.0	1.0
	OP	11.5	3.9						3.9		7.7		11.5									19.2		19.2				23.1			
	FW																														
	TOTAL	14.7	0.3	0.2	0.2	6.2	0.2	0.2	2.6	1.7	4.9	3.3	12.4	0.2	2.0	6.4	14.3	1.1	2.9	4.3	0.9	3.6	0.6	6.1	0.3	1.1	0.9	6.4	2.0	0.2	0.2

Constituent	Land use	<	<0.5	<1	<2	<2.5	<3	<4	<5	<7	<10	<14	<15	<20	<25	<30	<40	<50	<60	<100
Total Nickel (μg/L)	RE	12.66		1.75	7.86	0.87	1.31	1.31	10.92	1.31	6.99		15.72	29.26	2.18	0.44	2.62	3.93	0.87	
	CO	22.34		1.06	6.38		1.06		14.89		6.38		7.45	36.17			2.13	1.06	1.06	
	ID	20.43			3.23		3.23	2.15	9.68	3.23	10.75	1.08	16.13	17.20	4.30	4.30	2.15	1.08		1.08
	OP	16.13			32.26		3.23		6.45					29.03		3.23	3.23	3.23	3.23	
	FW				10.00				60.00					30.00						
	TOTAL	15.30	0.17	1.22	8.17	0.52	1.74	0.87	12.00	1.57	7.65	0.35	14.26	27.30	1.57	1.04	2.26	2.96	0.87	0.17

Constituent	Land use	<	<0.0057	<0.6	<1	<2	<4	<5	<8	<10	<20	<25	<30	<80	<100	<110	<200
Total Zinc (μg/L)	RE	13.79		3.45		10.34		3.45		31.03	13.79			3.45	13.79		6.90
	CO	25.00													50.00		25.00
	ID	16.67					16.67			16.67					16.67	16.67	16.67
	OP	38.46						15.38		15.38	15.38				15.38		
	FW							33.33							66.67		
	TOTAL	15.53	0.97	0.97	5.83	3.88	0.97	3.88	0.97	13.59	17.48	10.68	2.91	0.97	15.53	0.97	4.85

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Total lead had the largest number of different detection limits (31 in total) with <10 µg/L as the most frequent censored observation at 14.3%. The constituent with the lowest number of detection limits was TDS, with four levels: < 1, < 5, < 6 and <10 mg/L. Less than 5 mg/L was the most common reported censored TDS observation occurring 55% of the time.

Expected Percentages of Observations at Different Levels of Detection

There are different approved methods to calculate the concentration of a specific constituent in a water sample. *Standard Methods for the Examination of Water and Waste Water* (APHA 1995 and more recent) lists several approved methods for the detection of many of these constituents. The choice of methods presents a problem as these methods have varying features and costs. The objective is usually to select a method with a detection limit that results in useable data for most samples.

The distribution of the data, including the non-detected values, can be used to estimate the percentage of observations that will be detected using different analytical methods. Table 13 shows the expected percentage of observations below a specific detection limit for each of these constituents using the cumulative density function for each constituent and land use. For example, if a stormwater sample is collected at a freeway site and the detection limit of the conductivity method is 100 µS/cm, about 51% of the observations will be not-detects.

Table 13. Percentages of Observations below Specific Concentrations

Constituent	Land use	Percentage of observations smaller than			
		20 µS/cm	100 µS/cm	200 µS/cm	2000 µS/cm
Conductivity (µS/cm)	RE	0	54	84	99
	CO	0	39	82	100
	ID	0	26	72	100
	OP	-	-	-	-
	FW	0	51	85	100
	TOTAL	0	39	73	99

Constituent	Land use	Percentage of observations smaller than				
		1 mg/L	4 mg/L	10 mg/L	160 mg/L	2500 mg/L
Hardness (mg/L)	RE	0	0	5	98	100
	CO	0	4	7	91	100
	ID	0	0	3	95	100
	OP	-	-	-	-	-
	FW	0	0	2	96	100
	TOTAL	0	0.1	3	94	100

Constituent	Land use	Percentage of observations smaller than				
		0.5 mg/L	1 mg/L	2 mg/L	5 mg/L	10 mg/L
Oil and Grease (mg/L)	RE	2	19	31	75	91
	CO	1	11	23	64	87
	ID	1	20	31	66	86
	OP	-	74	-	-	-
	FW	2	5	5	55	75
	TOTAL	0.3	17	29	67	84

Table 13. Percentages of Observations below Specific Concentrations (continued)

Constituent	Land use	Percentage of observations smaller than		
		1 mg/L	5 mg/L	10 mg/L
Total Dissolved Solids (mg/L)	RE	0	0.8	1.5
	CO	0	0	0.5
	ID	0	0	2
	OP	0	0	0
	FW	0	0	0
	TOTAL	0.1	0.7	1.5

Constituent	Land use	Percentage of observations smaller than		
		1 mg/L	5 mg/L	10 mg/L
Total Suspended Solids (mg/L)	RE	0.2	4	11
	CO	0.2	3	9
	ID	0.2	3	5
	OP	0	11	23
	FW	0	2	2
	TOTAL	0.2	3	7

Constituent	Land use	Percentage of observations smaller than		
		1 mg/L	2 mg/L	5 mg/L
BOD_5 (mg/L)	RE	0.2	2	18
	CO	0.2	1	16
	ID	0.2	3	18
	OP	2	11	55
	FW	0	0	31
	TOTAL	1	3	22

Constituent	Land use	Percentage of observations smaller than				
		0.7 mg/L	1 mg/L	5 mg/L	10 mg/L	20 mg/L
COD (mg/L)	RE	0	0.4	1	3	9
	CO	0	1	2	3	7
	ID	0	0	0.5	2	7
	OP	0	0	0	7	37
	FW	0	0	1	4	7
	TOTAL	0	0.2	2	5	13

Constituent	Land use	Percentage of observations smaller than				
		0.01 mg/L	0.05 mg/L	0.1 mg/L	0.2 mg/L	0.5 mg/L
Ammonia (mg/L)	RE	0	3	12	36	71
	CO	0	2	9	28	53
	ID	0	1	7	21	57
	OP	0	11	15	22	93
	FW	0	0	5	20	27
	TOTAL	0.1	2	10	37	65

Table 13. Percentages of Observations below Specific Concentrations (continued)

Constituent	Land use	Percentage of observations smaller than				
		0.01 mg/L	0.05 mg/L	0.1 mg/L	0.2 mg/L	0.5 mg/L
NO2 + NO3 (mg/L)	RE	0	2	5	11	40
	CO	0	1	4	11	40
	ID	0	2	6	11	31
	OP	0	0	18	21	50
	FW	0	0	0	28	72
	TOTAL	0	2	4	10	40

Constituent	Land use	Percentage of observations smaller than				
		0.01 mg/L	0.05 mg/L	0.1 mg/L	0.2 mg/L	0.5 mg/L
TKN (mg/L)	RE	0.1	0.1	0.5	2	6
	CO	0.2	0.2	0.7	2	6
	ID	0.2	0.5	0.7	2	8
	OP	0	0	0	0	44
	FW	0	0	2	2	6
	TOTAL	0.1	0.2	0.6	2	10

Constituent	Land use	Percentage of observations smaller than				
		0.01 mg/L	0.02 mg/L	0.05 mg/L	0.1 mg/L	0.5 mg/L
Dissolved Phosphorus (mg/L)	RE	0.3	3.5	11	32	93
	CO	1	6	21	48	91
	ID	0.3	2.2	16	46	95
	OP	2	7	23	45	93
	FW	5	5	5	14	82
	TOTAL	0.7	4.5	17.5	44.5	94

Constituent	Land use	Percentage of observations smaller than				
		0.01 mg/L	0.02 mg/L	0.05 mg/L	0.1 mg/L	0.5 mg/L
Total Phosphorus (mg/L)	RE	0.2	0.4	1.5	10	28
	CO	0.2	0.6	3	16	82
	ID	0	0.2	3	14	74
	OP	2	2	11	24	80
	FW	0	0	0	3	83
	TOTAL	0.1	0.5	3	12	78

Constituent	Land use	Percentage of observations smaller than				
		2 μg/L	5 μg/L	10 μg/L	20 μg/L	40 μg/L
Total Copper (μg/L)	RE	2.3	14	44	76	92
	CO	0.7	6	26	58	84
	ID	1.2	6	16	46	75
	OP	0	32	54	73	92
	FW	0	0	8	26	58
	TOTAL	1.4	9	31	63	85

Table 13. Percentages of Observations below Specific Concentrations (continued)

Constituent	Land use	Percentage of observations smaller than				
		1 µg/L	3 µg/L	5 µg/L	10 µg/L	50 µg/L
Total Lead (µg/L)	RE	2	14	28	47	88
	CO	0.6	3	8	23	80
	ID	0.7	7	12	24	72
	OP	12	21	33	38	76
	FW	0	3	9	22	72
	TOTAL	2	9	17	36	82

Constituent	Land use	Percentage of observations smaller than				
		1 µg/L	2 µg/L	5 µg/L	10 µg/L	20 µg/L
Total Nickel (µg/L)	RE	1	6	33	55	91
	CO	0.5	3	29	56	92
	ID	0	2	12	33	64
	OP	0	30	39	39	73
	FW	0	1	19	55	84
	TOTAL	0.6	5	26	52	84

Constituent	Land use	Percentage of observations smaller than				
		5 µg/L	10 µg/L	20 µg/L	100 µg/L	200 µg/L
Total Zinc (µg/L)	RE	1	3	7	65	87
	CO	0	0.2	1	28	51
	ID	0.2	0.7	1	24	48
	OP	5	25	35	85	92
	FW	1	2	3	20	51
	TOTAL	0.6	2	4	44	73

Appendix D describes the methods used to analyze censored observations for each constituent. Based on the results presented in Table 13 and these methods, it is possible to estimate the percentage of non-detected observations that can be obtained by constituent and land use. For example, the most frequently reported non-detected ammonia detection limit was 0.2 mg/L. About 37% of the detected and non-detected observations were located below this detection limit. One of the EPA approved methods to measure ammonia has a detection limit close to 0.02 mg/L. If this method was commonly used, the number of non-detected ammonia observations would have been significantly reduced. This is especially evident for metals analyses. Many commercial laboratories use ICP (inductively coupled plasma) procedures for heavy metals, as it is an approved method and generally more efficient than older atomic absorption methods using a graphite furnace. Unfortunately, standard ICP units have greatly reduced sensitivities compared to graphite furnace methods. When filtered heavy metals are to be analyzed, graphite furnace (or ICP-mass spec) methods should be used. It is important that the person conducting a stormwater monitoring program take care in specifying the analytical methods to be used to ensure that most of the data will be usable. Of course, other factors, besides detection limits, must also be considered when selecting analytical methods, including sample preparation, sample storage limits, sample volume needed, safety, cost, disposal problems associated with wastes, interferences, and comparisons with other methods, etc. Burton and Pitt (2002) present a review of many alternative analytical methods that are suitable for stormwater sample analyses.

Effects of Non-detected Observations on Calculating Mean and Standard Deviation Values

The selection of the proper procedure to deal with non-detected values is not an easy task. One option is to ignore the non-detected values and make a statement indicating the percentage of non-detected values found in the dataset. The problem arrives when it is desired to calculate the mean and standard deviation values of a dataset. The presence of non-detected values can strongly bias these parameters, depending on their prevalence. Three methods for dealing with non-detected values were explored during this research: 1) Ignore them; 2) Estimate them with the

Cohen's multi level MLE method for left censored data (NCASI 1995); and 3) replace them with half of the detection limit. In cases were Cohen's method could not be used (i.e. when only two values were detected), half of the detection limit was used as the estimated value to replace the non-detected observations.

Appendix D shows the results for each constituent and land use using the three substitution methods. In general, it was observed that if the censored data were deleted, the mean of the constituent was increased compared to the case where the non-detected values were replaced by half of the detection limit. The same pattern was observed for the standard deviation calculations. The behavior for the coefficient of variation was opposite: the coefficient of variation was reduced when the censored observations were deleted.

When the frequencies of the censored observations were lower than 5%, the means, standard deviations and coefficients of variation were almost identical when the censored observations were replaced by half of the detection limit, or estimated using Cohen's Method. As the percentage of non-detected values increases, replacing the censored observation by half of the detection limit instead of estimating them using the Cohen's maximum likelihood method produces lower means and larger standard deviations.

Effects on Mean, Median and Coefficient of Variation Values at Different Percentages of Censored Observations

As noted above, when the percentage of detected values is high, there are minimal changes in the calculated means, standard deviations, and coefficients of variation for any of the replacement methods. In this discussion, the ratios of the calculated values using the different methods for different frequencies of detection are examined. This analysis identifies the sensitivity of the detection frequencies for each substitution method.

The first task was to evaluate the effect of the substitutions and detection frequencies on the calculated means. When the percentage of detected values is close to 100%, all of the substitution methods produce the same mean, as expected. As the percentage of non-detected values increases, the Cohen's estimated values and half of detection limit methods produces smaller means than if ignored.

Figure 15 is a scatter plot of both ratios (Cohen estimated/ignore and half of the detection limit/ignore) of the calculated mean values. If the scatter plot values formed a line near the 1.0 ratio value, then the "ignore" and the other option would be accurate. If the scatter plot values formed the same line for both of the sets of ratios, then either substitution method would be accurate. The regression equation 3.1 for the Cohen estimated/ignore ratio of calculated mean values has a coefficient of determination of almost 93%. The coefficients in the equation are significant, with a probability that the coefficients are equal to zero smaller than 0.0001.

(3.1) $$\text{Ratio Mean (Estimated/Ignore)} = 0.316 + 0.0068 * D$$

Where D is the percentage of detected values (0 to 100).

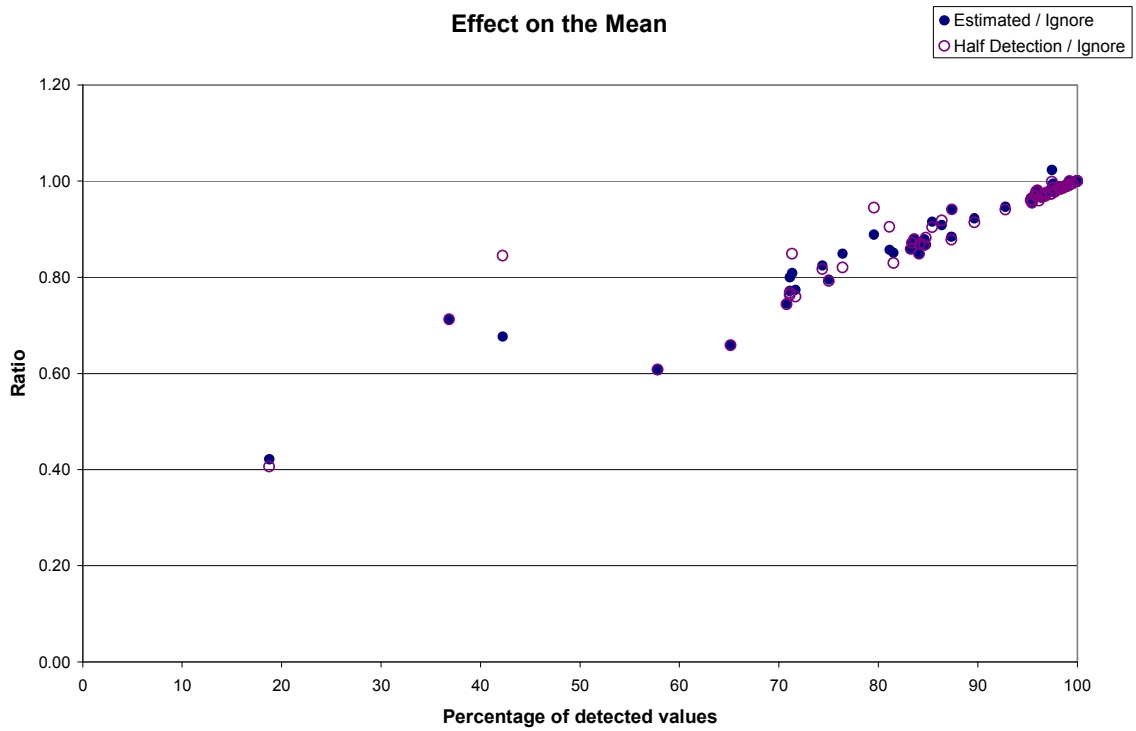

Figure 15. Effects on the mean when using random estimated values versus ignoring the non-detected observations, at different percentage of detected values

For percentages of detected values smaller than 60%, the ratios are located away from the line formed by the other observations. The residual plot of the regression indicates those observations that are most affecting the departure from the regression line. Six observations are considered influential in this plot: oil and grease in open space (most influential), residential and industrial land uses, plus ammonia and lead in open space land uses. The Cook's distance procedure was used to remove the overly influential points in the regression. After removing the influential observations the final regression is therefore:

(3.2) $$\textit{Ratio Mean (Estimated/Ignore)} = 0.248 + 0.0075*D$$

Equation 3.2 indicates that a stormwater dataset having 30% non-detectable observations would have an expected reduction in the calculated mean of 23% when the censored data is appropriately estimated instead of being ignored. The standard deviation of the residuals is 0.014. The coefficient of determination in this case was higher than 96% with no potential or influential points. This equation can be used to estimate the mean of the distribution for data sets with percentages of detected values higher than 60%. When the non-detected observations are replaced by half of the detection limit, the coefficient of determination was reduced to 92% of the actual value. Equation 3.3 describes the relationship between the ratio of the means and the percentage of detected observations.

(3.3) $$\textit{Ratio Mean (Half Detection/Ignore)} = 0.250 + 0.0075*D$$

From the regression of the ratios "estimated/ignore" and "half detection/ignore," replacing by half of the detection limit, or estimating the censored observations using Cohen's method, will produce the same results when the percentage of detected observations is larger than 80%.

The effects on the median are similar to those observed in the mean. When the non-detected values are estimated with Cohen's method instead of ignoring the non-detected values, the regression of the coefficient of determination reduces to 86%.

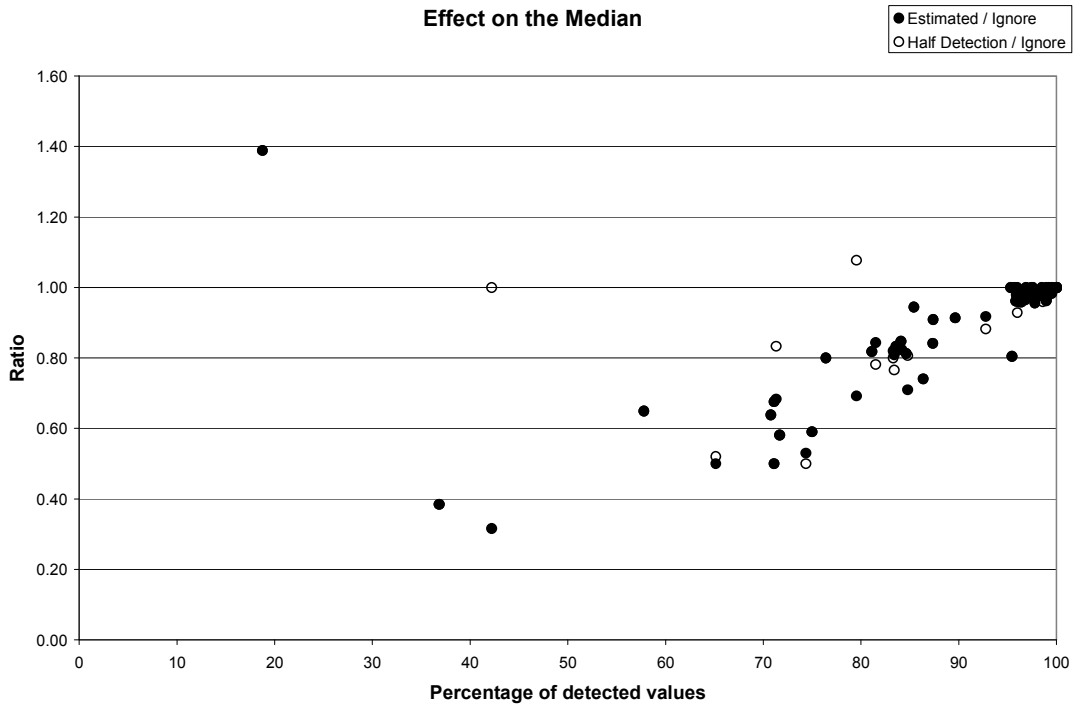

Figure 16. Effect of ignoring the non-detected observations on the median

Equation 3.4 shows the estimated regression line for the median case.

(3.4) *Ratio Median (Estimate /Ignore) = -0.326 + 0.0134*D*

This equation is valid for percentage of detected observations higher than 70%. A reduction of 40% in the median value is expected in a 30% censored dataset when the non-detected observations are estimated using Cohen's method instead of being ignored. The standard deviation of the residuals for this equation is 0.05.

When the censored observations are replaced by half of the detection limit, the coefficient of determination is about 73%. The regression equation for the ratio of the median is therefore not as good in explaining the variability as it was for the mean.

Equation 3.5 shows the calculated regression line for the median when the non-detected values are replace by half of the detection limit.

(3.5) *Ratio Median (Half Detection/Ignore) = -0.195 + 0.012*D*

This equation is valid when the percentage of detected observations is higher than 70%. Replacing the censored observations by half of the detection limit has the same effect on the median as estimating them using Cohen's method, except for dissolved and total phosphorus in open space and lead in residential land uses.

The effects on the calculated standard deviation values also indicate a good correlation between the level of detected observations and the ratio between the "estimate the non-detected or ignore them" values. Figure 17 shows the scatter plot of the median values as a function of the percentage of detected observations. Equation 3.6 presents the estimated regression line of these data.

(3.6) *Ratio Standard Deviation (Estimate/Ignore) = 0.68 + 0.003226*D*

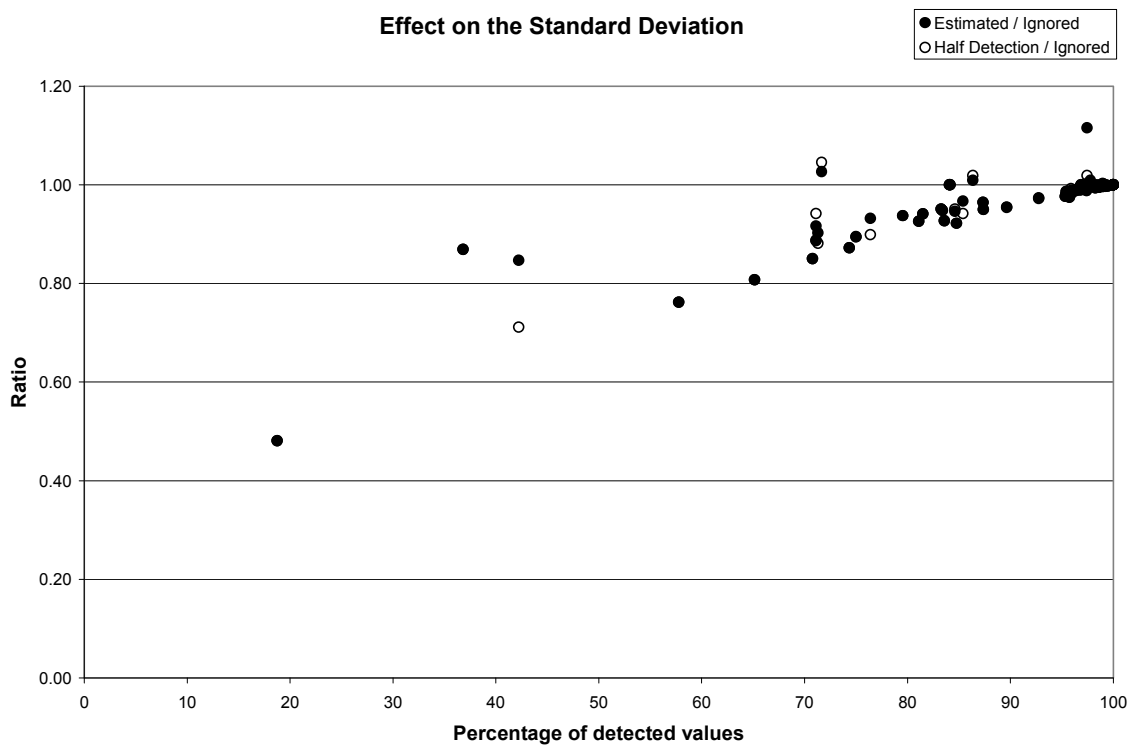

Figure 17. Effect of ignoring the non-detected observations in the median

The regression has a low coefficient of determination (56%) compared to the prior regressions. Oil and grease at freeway sites was considered unusual according to its Cook's distance. The data for this case was examined and no reason was found to eliminate it from the analysis. It was also observed that BOD_5 in commercial land use areas had 3 right-censored observations. Because the Cohen method must be used with left censored observations, these data were eliminated from this analysis. Observations where the percentage of detection was smaller than 70% were not included. Equation 3.7 shows the estimated regression line for those constituents with more than 60% detected observations.

(3.7) *Ratio Standard Deviation (Estimate/Ignore) = 0.68 + 0.003226*D*

This equation indicates that for a dataset with 30% censored observations, the standard deviation will be reduced by 9.5% when the non-detected observations are estimated instead of ignored. The standard deviation of the residuals is 0.023. When the censored observations are replaced by half of the detection limits, the coefficient of determination and the equation coefficients were almost the same. Equation 3.8 presents the estimated regression equation for the standard deviation when the censored observations are replaced by half of the detection limits.

(3.8) *Ratio Standard Deviation (Half Detection/Ignore) = 0.6778 + 0.00325*D*

The last parameter examined was the coefficient of variation. The coefficient of determination (69%) for the fitted regression equation was better than for the standard deviation regression, but not as high as for the median and mean regressions. The calculated regression equation is presented as equation 3.9

(3.9) *Ratio Coefficient of Variation (Estimate/Ignore) = 1.53 -0.0053*D*

The standard deviation of the residuals is 0.033. As the number of non-detected observations increases, the coefficient of variation also increases. The regression equation is valid for percentages of detected values higher than 70%. For a data set with 30% censored observations, the expected coefficients of variation using Cohen's method will be 16% higher than if the non-detected values are ignored.

In the case that the censored observations are replaced by half of the detection limits, the coefficient of determination of the resulting equation (equation 3.10) is reduced to 58%. Figure 18 shows the scatter plot for the ratios "estimated/ignore" and "half detection/ignore" for the coefficient of variation.

(3.10) *Ratio Coefficient of Variation (Half Detection/Ignore) = 1.543 -0.0054*D*

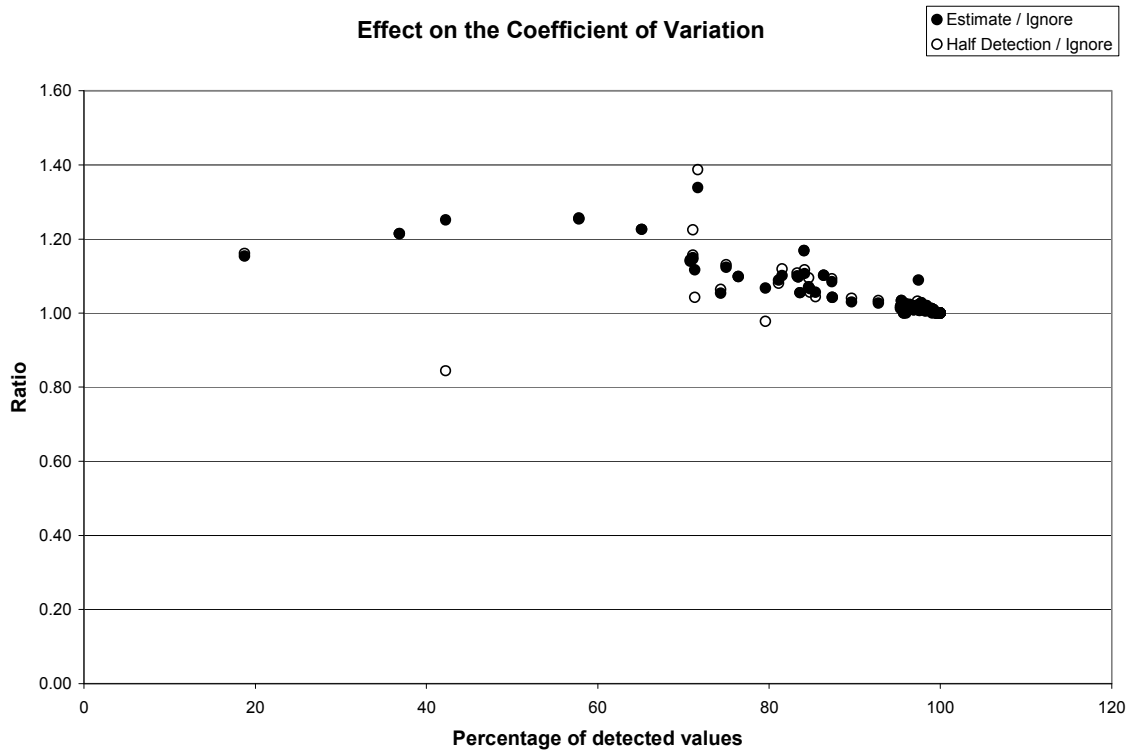

Figure 18. Effect of ignoring the non-detected observations on the coefficient of variation

Total Suspended Solids Analyses at Different Levels of Censoring

To evaluate the effect of the non-detected values in the mean and standard deviation observations at different levels of censoring, one of the constituents with low percentages of non-detected observation (TSS) was trimmed in the lower tail until reduced to 50% of the original distribution. All TSS observations were used during this analysis.

The results are similar to those observed during the analysis of the censoring observations within multiple constituents and land uses. Real mean, median and standard deviation are smaller than the calculated values when censored observations are ignored (Figure 19). The true coefficients of variation are larger than those calculated when the level of trimming is increased.

Table 14. Descriptive Statistics for TSS Truncated at Different Levels

			RATIO			
Total number of samples	% of original samples	Minimum concentration in set (mg/L)	Average	Median	Standard Deviation	Coefficient of Variation
2025	100.00	3	1.00	1.00	1.00	1.00
2015	99.51	3	1.00	1.00	1.00	1.00
1995	98.52	4	0.99	0.98	0.99	1.01
1974	97.48	5	0.98	0.96	0.99	1.02
1954	96.49	6	0.97	0.95	0.99	1.02
1934	95.51	7	0.96	0.95	0.98	1.03
1914	94.52	8	0.95	0.93	0.98	1.03
1873	92.49	10	0.93	0.90	0.97	1.05
1833	90.52	11	0.91	0.87	0.96	1.06
1792	88.49	13	0.89	0.84	0.96	1.07
1752	86.52	15	0.87	0.81	0.95	1.08
1711	84.49	17	0.86	0.78	0.94	1.10
1671	82.52	18	0.84	0.74	0.93	1.11
1630	80.49	20	0.82	0.73	0.92	1.12
1589	78.47	22	0.80	0.71	0.91	1.14
1545	76.30	24	0.78	0.68	0.90	1.15
1496	73.88	26	0.76	0.65	0.89	1.17
1468	72.49	27	0.75	0.64	0.89	1.18
1428	70.52	29	0.73	0.63	0.88	1.20
1387	68.49	31	0.72	0.60	0.87	1.21
1347	66.52	33	0.70	0.58	0.86	1.23
1306	64.49	35	0.68	0.57	0.85	1.24
1266	62.52	37	0.67	0.55	0.84	1.26
1225	60.49	40	0.65	0.53	0.83	1.28
1185	58.52	42	0.63	0.52	0.82	1.29
1144	56.49	44	0.62	0.50	0.81	1.31
1104	54.52	47	0.60	0.47	0.80	1.33
1063	52.49	50	0.58	0.46	0.79	1.35
1023	50.52	52	0.57	0.44	0.78	1.37

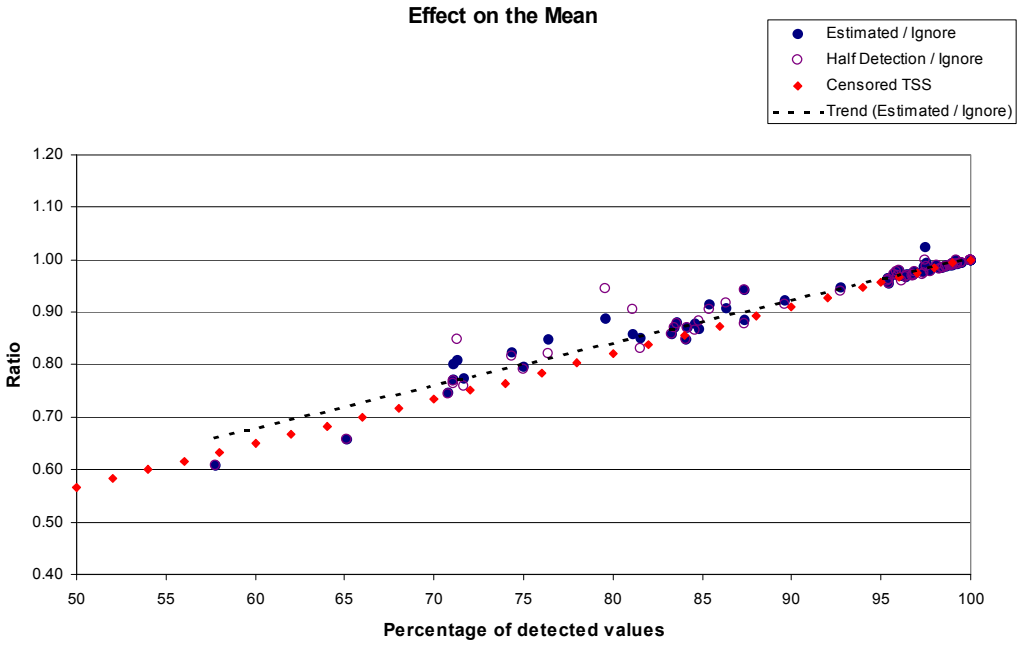

Figure 19. Effect on the mean when TSS observations are truncated

The effect on the mean indicates that when only about 5% of the data is censored or is trimmed, the ratios "replace/ignore," "estimated/ignore," or "trimmed/total" observations produced the same results in the mean of the distribution. When the percentage of non-detected observations is increased, the ratios "estimate/ignore" and "half detection/ignore" are higher than the ratio "trimmed/complete" in the TSS distribution. This means that trimming the data set has a larger effect than when the observations are censored. This is explained because for the trimmed/complete ratios, all the censored observations were at one value. In the other case, several detection limits were used during the analysis.

In the previous discussion, it was observed that censored levels less than 30% can be used for predicting simple statistics describing the distribution. The previous figure indicates that levels of censoring close to 45% followed the trend indicated by the ratio "trimmed/complete." This indicates that even if the regression analysis was recommended for levels of non-detected values smaller than 30%, they can be used for levels of censoring up to 45%.

The effects on the medians are stronger than on the means. When the level of censored observations is close to 30%, the ratio "trimmed/complete" is close to 0.6, compared with 0.75 in the case of the mean (Figure 20). Levels of censoring around 5% do not show the straight-line pattern that was observed with the mean. The trend for censoring levels between 5 and 45% is similar for the "estimated/ignore" ratio; however the dispersion around the trend line is higher.

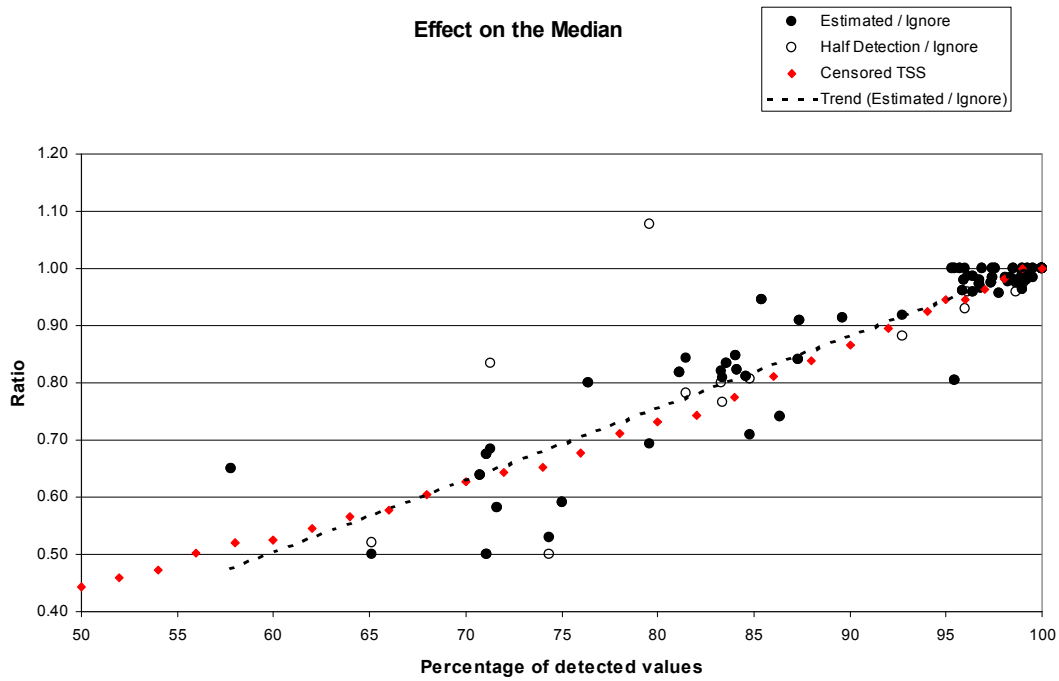

Figure 20. Effect on the median when the TSS dataset is truncated

The effect on the standard deviation of the trimming the TSS is similar to the effect in the mean (Figure 21). When the level of censoring is close to 30%, the ratio "trimmed/complete" is close to 0.85. The dispersion around the trend line is lower than in the median case. When the percentage of non-detected values is lower than 5%, the ratios "estimated/ignore," "half detection/ignore," and "trimmed/complete" are almost the same. For levels of censored observations larger than 15%, the differences among the ratios increase.

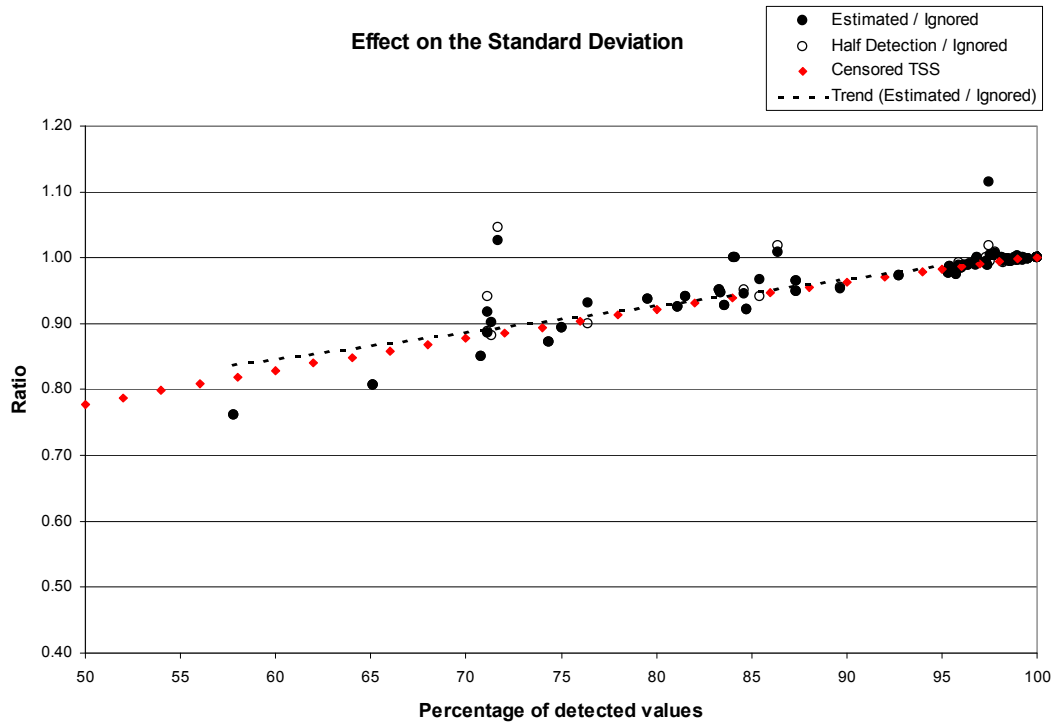

Figure 21. Effect on the standard deviation when the TSS dataset is truncated

The ratio of the effects on the calculated coefficients of variation has a different slope than the previous statistics. As in the mean case when the level of censoring is smaller than 5%, a linear trend between the percentage of detected and the ratio was observed (Figure 22). When the percentage of censored observations is larger than 15%, the differences among the three ratios increase.

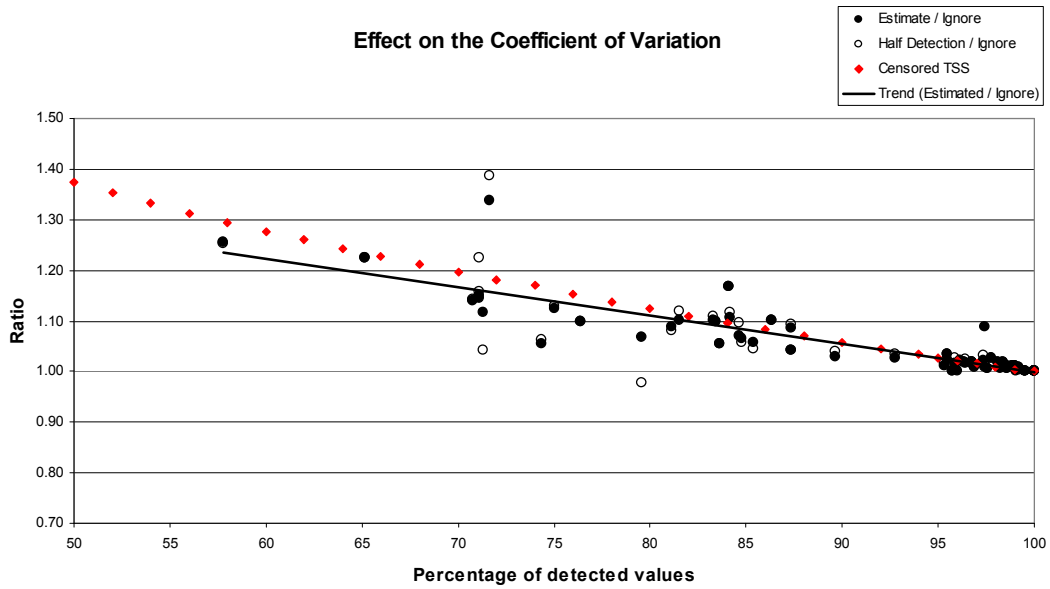

Figure 22. Effect on the coefficient of variation when the TSS dataset is truncated

Summary

The level of censoring observations in a dataset affects the calculated mean, median, standard deviation and coefficient of variation values. As the level of non-detected observations increase, the mean, median and standard deviation are larger than if the censored observations are detected. The opposite behavior is expected for the coefficient of variation. Different laboratories report different detection limits for the same constituents. In many cases, the detection limits are calculated by each laboratory based on their measured repeatability (precision) for a specific laboratory test. Using methods with low precision increases the percentage of non-detected values and the uncertainty of the real mean and standard deviation values.

Open space has the largest number of non-detected observations among land uses. The largest percentages of detected observations were observed in freeways and industrial land uses.

Estimating or replacing by half of the detection limit for levels of censoring smaller than 5% does not have a significant effect on the mean, standard deviation and coefficient of variation values.

Substituting the censored observations by half of the detection limit produces smaller values than when using Cohen's maximum likelihood method. Replacing the censored observations by half of the detection limit is not recommended for levels of censoring larger than 15%.

The censored observations in the database were replaced using estimated values using Cohen's maximum likelihood method for each site before the statistical tests. Because this method uses the detected observations to estimate the non-detected values, it is not very accurate, and therefore not recommended, when the percentage of censored observations is larger than 40%. Table 14 shows those constituents having percentages of non-detected observations smaller than 40% for the three main land uses.

All the methods used in this chapter are approximations to calculate the EMC when censored observations are present. These problems would not exist if appropriate analytical methods were used to analyze the samples. It is very important to select analytical methods capable of detecting the desired range of concentrations in the samples in order to reduce the numbers of censored observations to acceptable levels. Table 3XX summarizes the recommended minimum detection limits for various stormwater constituents to obtain manageable non-detection frequencies (<5%). Some of the open space stormwater measurements (oil and grease and lead, for example), would likely have greater than 5% non-detects, even with the detection limits shown. The detection limits for filtered heavy metals would be substantially less than shown on this table.

Table 3XX. Suggested Analytical Detection Limits for Stormwater Monitoring Programs to Obtain <5% Non-detects

	Residential, commercial, industrial, freeway	Open Space
Conductivity	20 μS/cm	20 μS/cm
Hardness	10 mg/L	10 mg/L
Oil and grease	0.5 mg/L	0.5 mg/L
TDS	10 mg/L	10 mg/L
TSS	5 mg/L	1 mg/L
BOD_5	2 mg/L	1 mg/L
COD	10 mg/L	5 mg/L
Ammonia	0.05 mg/L	0.01 mg/L
NO_2+NO_3	0.1 mg/L	0.05 mg/L
TKN	0.2 mg/L	0.2 mg/L
Dissolved P	0.02 mg/L	0.01 mg/L
Total P	0.05 mg/L	0.02 mg/L
Total Cu	2 μg/L	2 μg/L
Total Pb	3 μg/L (residential 1 μg/L)	1 μg/L
Total Ni	2 μg/L	1 μg/L
Total Zn	20 μg/L (residential 10 μg/L)	5 μg/L

Chapter 4: Stormwater Quality Descriptions Using the Three Parameter Lognormal Distribution

Introduction

Knowing the statistical distribution of observed stormwater data is a critical step in data analysis. The selection of the correct statistical analyses tools is dependent on the data distribution, and many QA/QC operations depend on examining the distribution behavior. However, much data is needed for accurate determinations of the statistical distributions of the data, especially when examining unusual behavior. The comparison of probability distributions between different data subsets is also a fundamental method to identify important factors affecting data observations. Statistical analyses basically are intended to explain data variability by identifying significantly different subsets of the data. The remaining variability that can not be explained must be described. In all cases, accurate descriptions of the data probability distributions are needed. This chapter explores these distributions for the NSQD data.

The Nationwide Urban Runoff Program (NURP) evaluated the characteristics of stormwater discharges at 81 outfalls in 28 communities throughout the U.S. (EPA 1983). One of the conclusions was that most of the stormwater constituent concentration probability plots could be described using lognormal distributions. More recently, Van Buren (1997) also found that stormwater concentrations were best described using a lognormal distribution for almost all constituents, with the exception of some dissolved constituents that were better described with a normal distribution. Beherra (2000) also found that some stormwater constituent concentrations were better described using a lognormal distribution, while others were better described with gamma or exponential distributions. The constituents that were best described with a gamma distribution included total solids, total Kjeldahl nitrogen (TKN), total phosphorous, chemical oxygen demand (COD), barium and copper. The constituents that were best described with an exponential distribution included suspended solids, nitrates and aluminum. In both of these recent studies, fewer than 50 samples (collected at the same site) were available for evaluation.

During the research reported in this chapter, statistical tests were used to evaluate the log-normality of a selection of the constituents in the NSQD database. Statistical descriptions were obtained of each set of data including box and whisker and probability plots for each land use category and for the pooled dataset. It was found in almost all cases that the log-transformed data followed a straight line between the 5th and 95th percentile, as illustrated in Figure 26 for total dissolved solids (TDS) in residential areas.

For many statistical tests focusing on the central tendency (such as for determining the average concentration that is used for mass balance calculations), this may be a suitable fit. As an example, WinSLAMM, the Source Loading and Management Model (Pitt and Voorhees 1995), uses a Monte Carlo component to describe the likely variability of stormwater source flow pollutant concentrations using either lognormal or normal probability distributions for each constituent. However, if the extreme values are of importance (such as when dealing with the influence of many non-detectable values on the predicted concentrations, or determining the frequency of observations exceeding a numerical standard), a better description of the extreme values may be important.

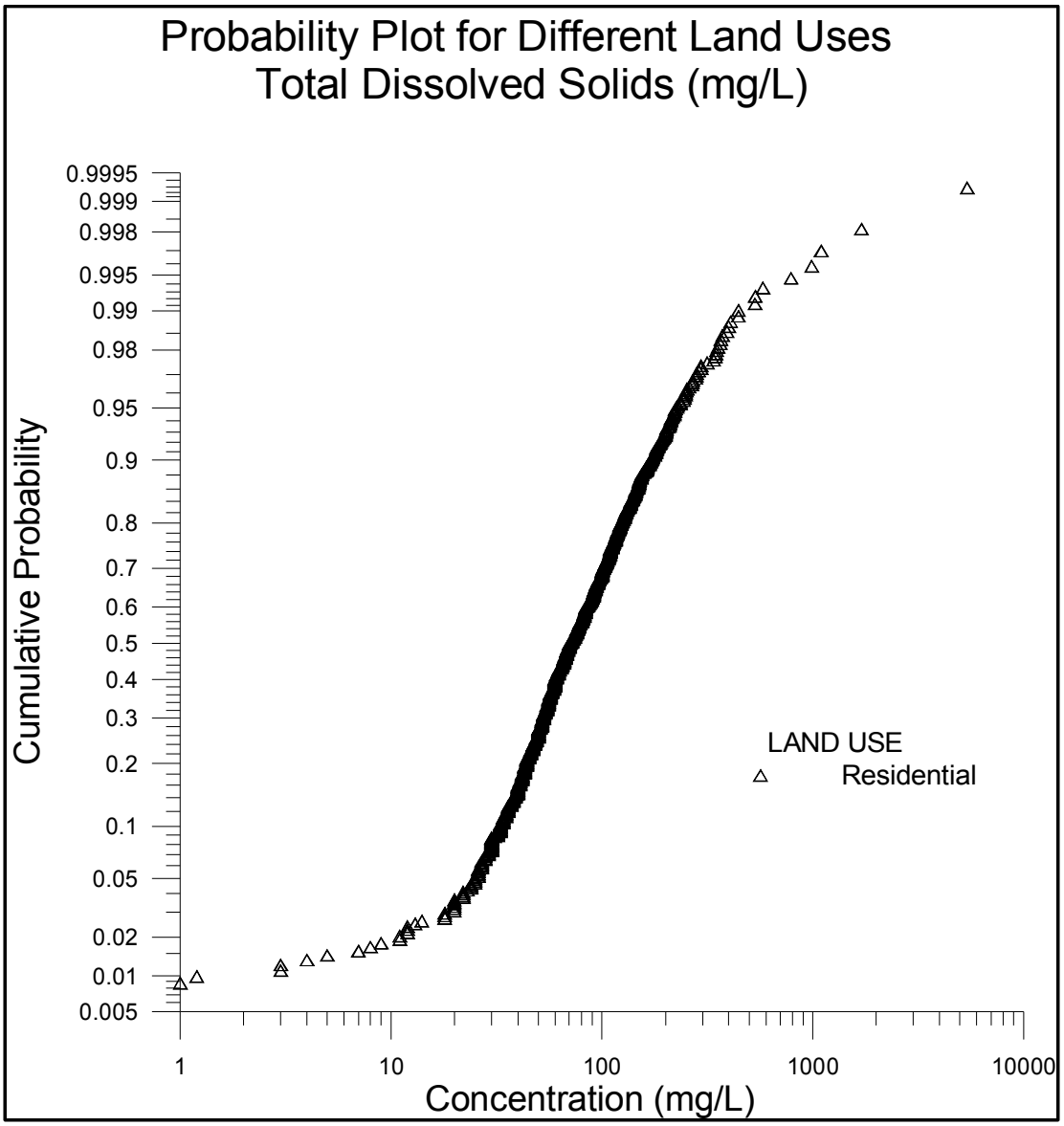

Figure 26. Log-probability plot of total dissolved solids in residential land use

The NSQD underwent an extensive data evaluation process, including multiple comparisons of the all data values in the database to original documents. In some cases, data was available from the local agency in electronic form. These spreadsheets were reformatted to be consistent to the NSQD format. However, it was found that all of the submitted electronic data needed to be verified against original data sheets and reports. When reviewing the NSQD, it was assumed that some of the events in the upper and lower tails of the distributions were caused by errors, most likely due to faulty transcription of the data (such as mislabeling the units for heavy metals or nutrients as mg/L instead of µg/L, for example). Unusual values were verified with the original reports and datasets. While some values (less than 5% of the complete dataset) were found to be in error and were corrected, most of the suspected values were found to be correct stormwater observations. Besides the targeted extreme values, many constituents were also examined in relationship to other related constituents (COD vs. BOD; total metal concentrations vs. dissolved metal concentrations; TKN vs. NH3; TDS vs. specific conductivity; SS vs. turbidity; etc) and unusual behavior was further checked and corrected, as necessary. In some cases, unusual values could not be verified and were therefore eliminated from the dataset, although this was very unusual. After the extensive QA/QC activities

and corrections were made to the NSQD, the next step was to conduct a sensitivity analysis to determine the effects of the remaining unusual high and low values on the probability distribution parameters.

The Effects of Unusual High and Low Values on Probability Distribution Parameters

For this evaluation, 10,000 sets of 200 samples each were randomly generated following a lognormal distribution (1, 1), but having differing amounts of extreme values in each data set. For each set, the mean, variance and coefficient of variation were calculated. Two main factors were analyzed using these data: the extreme value factor and percentage of extreme values in each sample. The following percentages of extreme values were selected for evaluation: 0.5, 1, 5, 10, 25 and 50%. For each percentage of extreme values, the following factors were analyzed: 0.001, 0.01, 0.1, 10, 100, 1.000, 10,000, 100,000 and 1,000,000. For example (5%, 100) indicates that in each set, 5% of the data were increased by a factor of 100. The coefficient of variation was then calculated for each set of data. The medians of the coefficients of variation for the 10,000 runs are shown in Figure 27 for each level of extreme values.

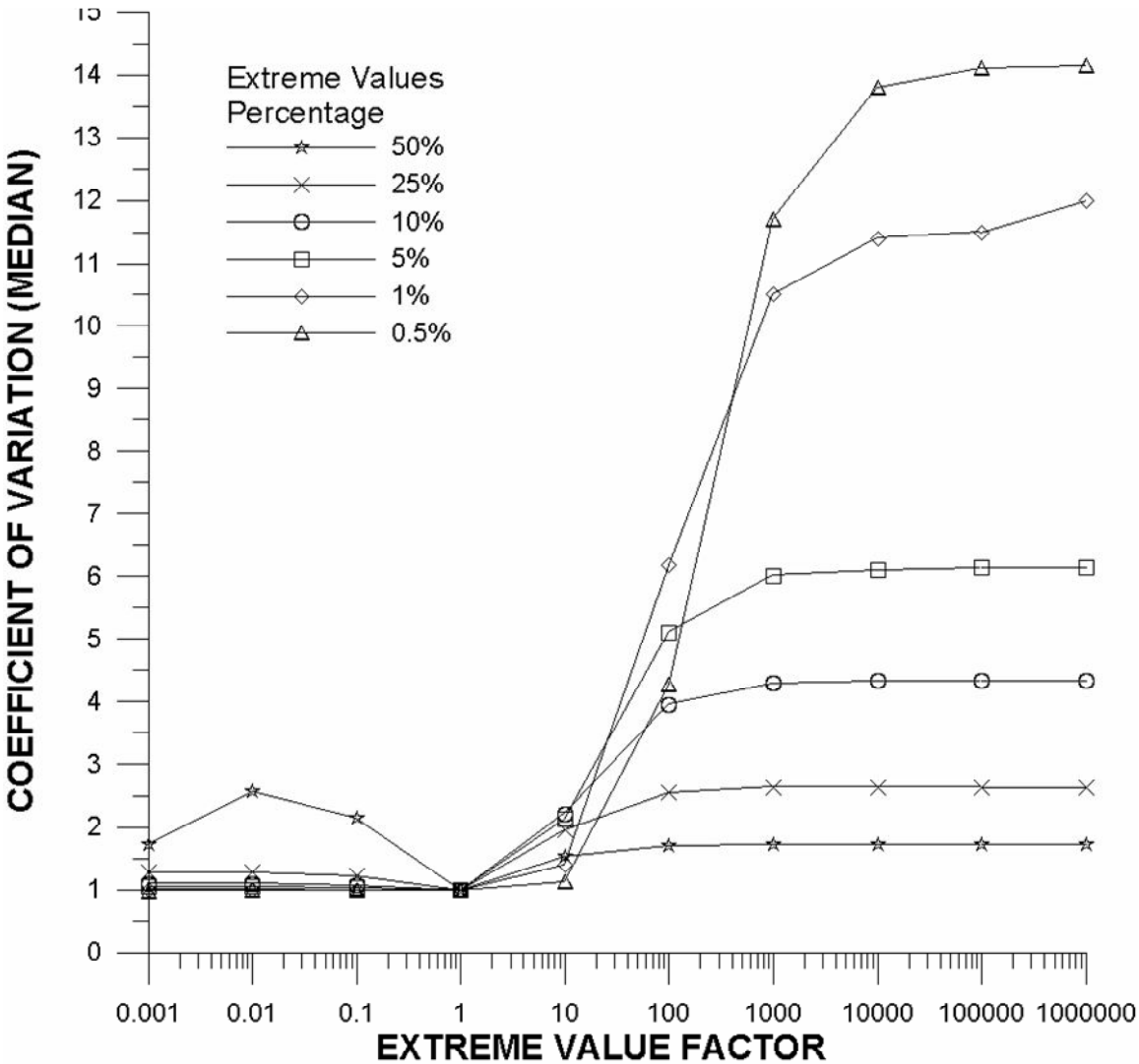

Figure 27. Effect of unusual values on the coefficient of variation (based on LN(1,1))

For a lognormal distribution (1, 1) the coefficient of variation is equal to one. Figure 27 shows how this original value is changed for different amounts of extreme values in the data sets, and for different factors in these extreme values. The horizontal axis represents the factor used in the extreme values. As an example, many of the incorrect extreme values observed in the NSQD for heavy metals were because the units were originally incorrectly reported as mg/L in the submitted information, while the correct units were actually µg/L. This would be an extreme value factor of 1,000. Extreme value factors of 10 were also fairly common and were associated with simple misplacements of decimal points in the data.

Figure 27 also shows that for small error factors (0.1, 0.01 and 0.001) there is not a large effect in the coefficient of variation for percentages smaller than 10%. For larger percentages, the effect in the coefficient of variation is important. When 50% of the data are affected by an error factor of 0.01, the coefficient of variation was increased by almost three times.

High extreme value factors can have a much more important effect on the coefficient of variation. When 10% of the data were increased by a factor of 10, the coefficient of variation was increased almost three times. Notice that affecting 10% of the data by a factor of ten have almost the same effect as affecting 50% of the data by a factor of a hundredth. This effect is reduced when the percentage of elevated values in the dataset is smaller than 10%.

For factors larger than a hundred, the effect on the coefficient of variation is much greater. Very low percentages of elevated values can increase the coefficient of variation by up to 15 times. For example, when only 0.5% of the sample is affected by a factor of a thousand, the coefficient of variation increases almost 12 times more than the correct value. As noted earlier this is important because it is not unusual to find reported values affected by a factor larger than a hundred (See Figure 26). Some of these values can be due to incorrect reporting units, but in many cases they were considered as valid observations because they were supported by similarly high values of other closely related constituents. For factors greater than 10,000 the multiplying value of the coefficient of variation remains stable at the maximum value obtained.

The above analyses indicate that in lognormal distributions, the presence of just a few unusual elevated values is important and can dramatically affect the reported coefficient of variation for the distribution of concentration. This observation is critical in the relatively common case where one or a very few observations are affected by a factor larger than a hundred. In the other extreme, factors smaller than one do not have a large impact on the reported coefficient of variation, except when the percentage of errors is greater than 50%.

The effect of extreme values on the mean and standard deviation was also analyzed. Figure 28 shows the effect of the extreme values on calculated standard deviation. For large extreme value factors (larger than one) the standard deviation increases as the percentage of extreme values increases.

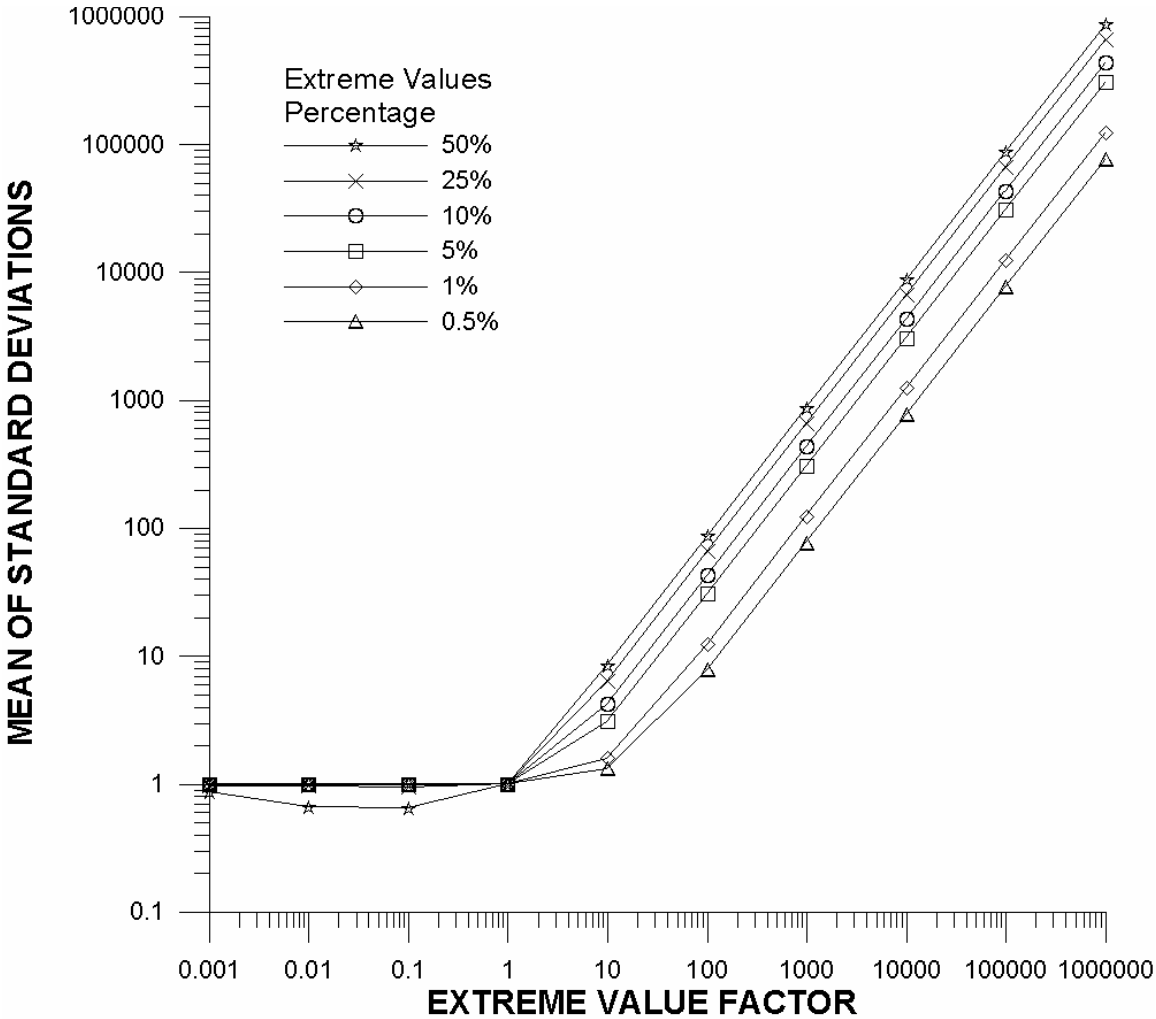

Figure 28. Effect of unusual values on the standard deviation (based on LN(1,1))

Percentages smaller than 25% do not have an important effect on the standard deviation for small extreme value factors. For a specific extreme value factor, changing the extreme value percentages from 0.5% to 50% increases the standard deviation close to 10 times.

The effect of the presence of extreme values on the distribution mean is shown in Figure 29. For small extreme value factors, the mean is reduced almost 80% when the extreme value percentage is close to 50%. This is expected because in a lognormal distribution (1, 1) most of the values are located in the lower tail of the distribution. For extreme value occurrences less than 25%, the mean value is reduced by less than 20%.

Large extreme value factors have much larger effects on the distribution means. As the extreme value percentage increases, the calculated means also increase. If 0.5% of the values are affected by a factor of a hundred, the mean value is doubled. If 50% of the values are affected by the same factor, the mean values are increased by almost 50 times. For factors larger than a thousand, increasing the percentages of extreme values from 0.5% to 50% increases the mean values by up to two orders of magnitude.

These evaluations are important because it points out that for a lognormal distribution, the effects of few elevated values in the upper tail have a much greater effect on common statistics than unusual values in the lower tail. Many

stormwater researchers have focused on the lower tail, especially when determining how to handle the detection limits and unreported data. Stormwater constituents usually have unusual values in both tails of the probability distribution. It is common to delete elevated values from the observations assuming they are expendable "outliers". This practice is not recommended unless there is sufficient evidence that the observed values are a mistake. Actual elevated values can have a large effect on the calculated distribution parameters. If these are arbitrarily removed, the data analyses will likely be flawed.

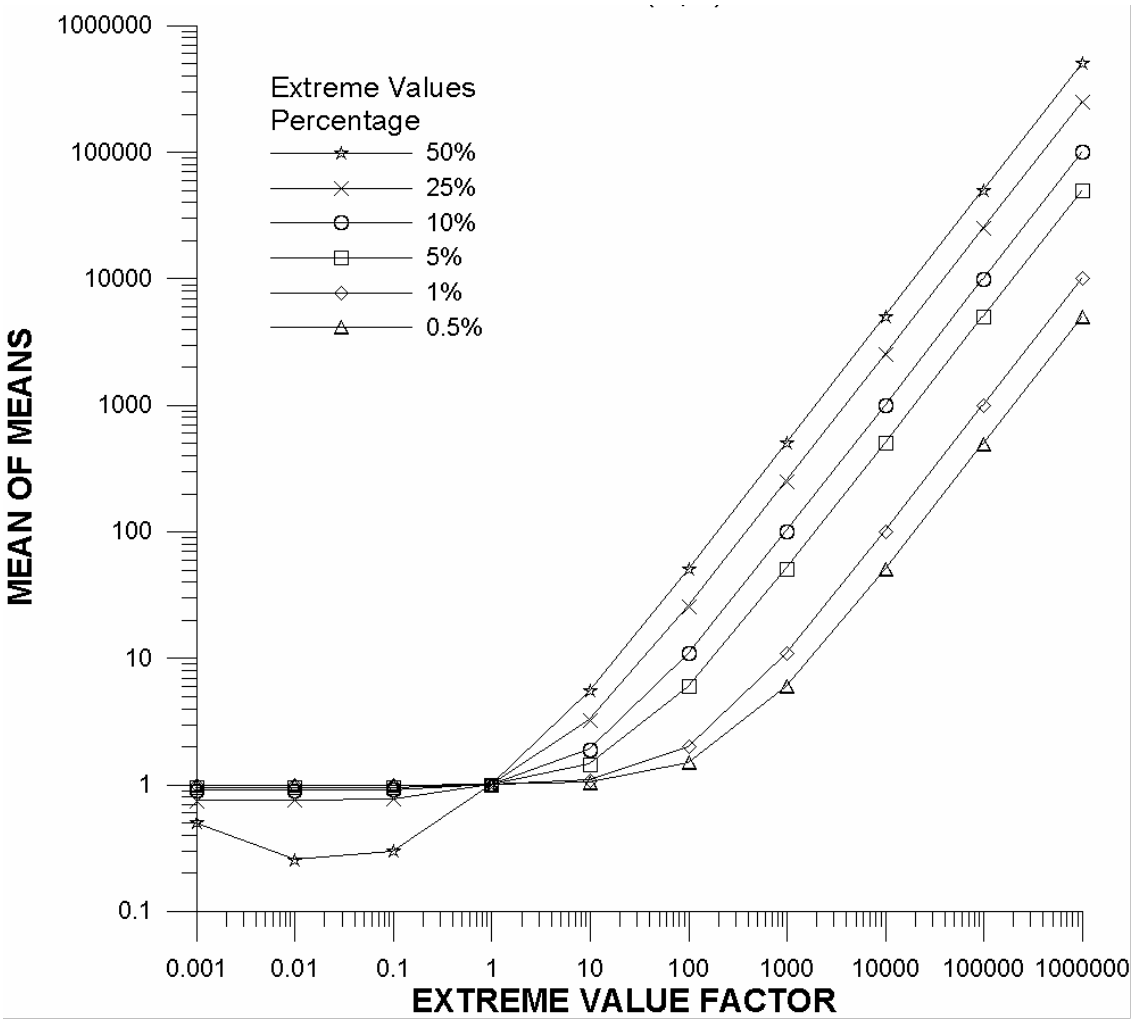

Figure 29. Effect of unusual values on the mean (based on LN(1,1))

Analysis of Lognormality of Stormwater Constituents Parameters

The goodness of fit of twenty nine stormwater constituent probability distributions was evaluated using the Kolmogorov-Smirnov test. Figure 30 shows how the test accepts or rejects the null hypothesis that the empirical and the estimated distributions are the same. If the null hypothesis is valid, then the constituent can be adequately represented by the lognormal distribution. The observations are sorted and a probability is assigned by its rank. The distribution generated by this ranking is known as the empirical distribution. The estimated distribution function is also compared on the same plot. The estimated distribution function is calculated with the mean and standard deviation of the original data. If the distance between the empirical and the estimated distributions is higher than a

critical value d_α or D_{max}, the hypothesis of lognormality is rejected. Notice in Figure 30 that the horizontal axis has a logarithmic scale.

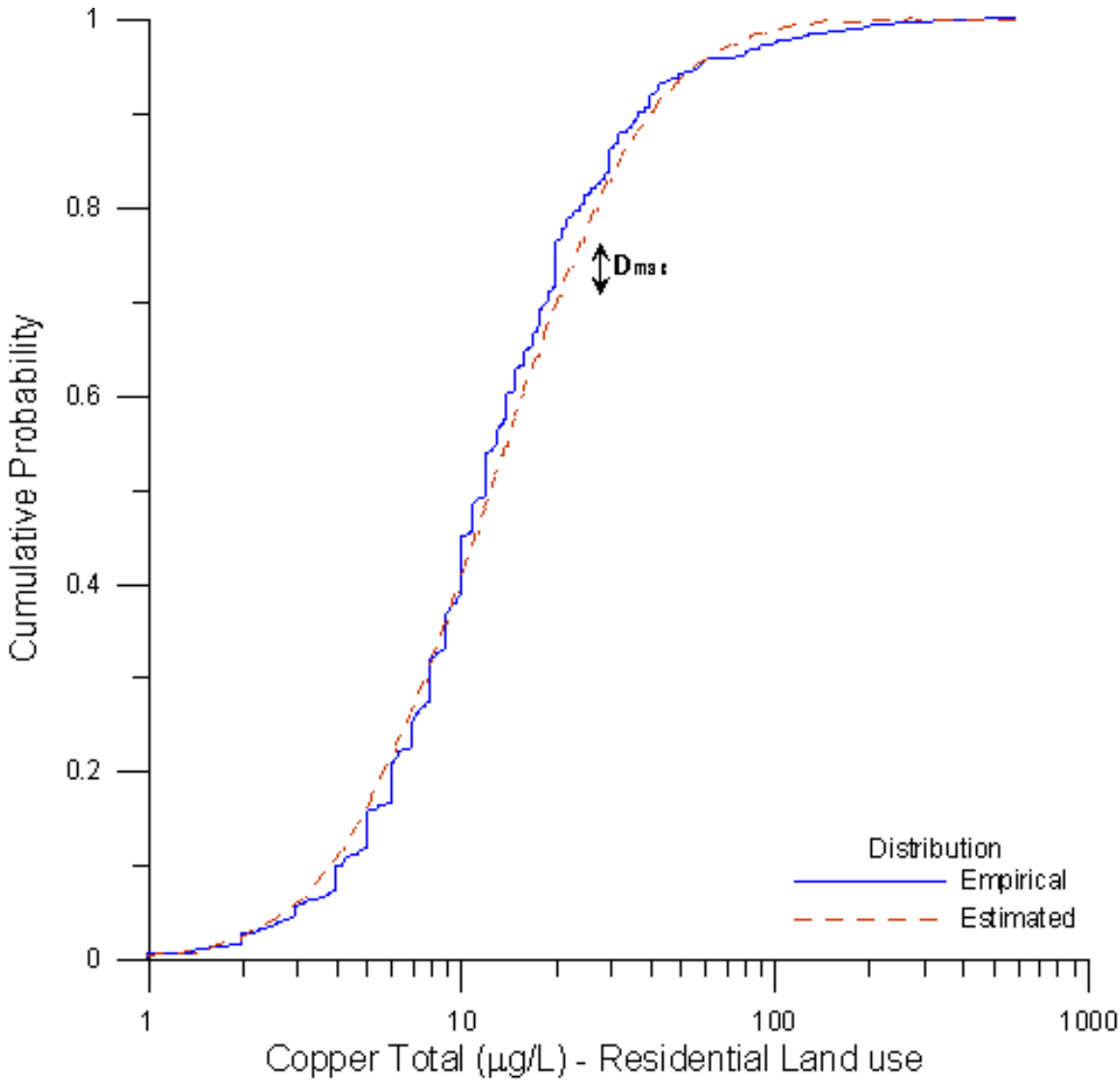

Figure 30. Cumulative and empirical probability distributions of total copper for residential land use data (Goodness of fit test, Kolmogorov-Smirnov)

There are many options to assign probability to a data observation based on ranks. Most methods assign the probability as a percentage of the total range. The probability of the observation is calculated as its rank divided by the number of observations. Kottegoda (1998) suggested that for extreme event analysis, the plotting position can be calculated as:

(4.1) $$p = \frac{i - 0.5}{n}$$

Where p is the cumulative probability of the observation, i is the rank of the observation and n is the total number of observations. This plotting position was used for the analyses during this research because it does not set the probability of the largest observation as one.

In the Kolmogorov-Smirnov test, the null hypothesis is that the observed data follow a lognormal distribution. If the sample size is small, and the distance between the empirical and the observed distributions is smaller than the critical value D_{max}, the test is interpreted as "there is not enough evidence to reject the hypothesis that the distribution is lognormal." In most cases, the NSQD contains enough samples to be able to accept or reject the null hypothesis with acceptable levels of confidence and power.

The NSQD contains many factors for each sampled event that likely affect the observed concentrations. These include such factors as seasons, geographical zones, rain intensities, etc. These factors may affect the shape of the probability distribution. As more data become available, the critical value D_{max} is reduced in the test. There will always be a specific number of samples that will lead to rejection of the null hypothesis because the maximum distance between the empirical and estimated probability distributions became larger than the critical value D_{max}. The only way to evaluate the required number of samples in each category is using the power of the test. Power is the probability that the test statistic will lead to a rejection of the null hypothesis when it is false (Gibbons and Chakraborti 2003). Masey (1950) states that the power of the Kolmogorov-Smirnov test can be written as:

(4.2)
$$power = 1 - \Pr\left(\frac{-d_\alpha \pm \Delta\sqrt{n}}{\sqrt{F_1(x_0)(1-F_1(x_0))}} < \frac{\{S_n(x_0) - F_1(x_0)\}\sqrt{n}}{\sqrt{F_1(x_0)(1-F_1(x_0))}} < \frac{d_\alpha \pm \Delta\sqrt{n}}{\sqrt{F_1(x_0)(1-F_1(x_0))}} \right)$$

where:

d_α	=	Dmax: critical distance at the level of significance α (confidence of the test),
S_n	=	Cumulative empirical probability distribution,
F_1	=	Cumulative alternative probability distribution,
Δ	=	Maximum absolute difference between the cumulative estimated probability distribution and the alternative cumulative probability distribution.

Massey (1951) also found that for large sample sizes, the power can be never be smaller than

(4.3)
$$power > 1 - \int_{2(\Delta\sqrt{n} - d_\alpha\sqrt{n})}^{2(\Delta\sqrt{n} + d_\alpha\sqrt{n})} \frac{1}{\sqrt{2\pi}} e^{-\frac{t^2}{2}} dt$$

This reduced expression can be used to calculate the number of samples required to reject the null hypothesis with a desired power. Figure 31 shows the power of the D test for 1%, 5%, and 10% levels of confidence of the test for samples size larger than 35 (Massey 1951). For example, assume that the maximum distance between the alternative cumulative and the estimated cumulative probability distributions is 0.2, and we want an 80% power (0.8) against the alternative at a 5% level of confidence. To calculate the number of required samples, we read that $\Delta(N)^{0.5}$ is 1.8 for a power of 0.8 and 5% level of confidence. Solving for $N = (1.8/0.2)^2 = 81$ samples. If we want to calculate the number of samples when the difference between the alternative cumulative and the estimated cumulative probability function is 0.05, with the same power and level of confidence, then 1,296 samples would be required. When the lines are very close together, it is obviously very difficult to statistically show that they are different, and many samples are needed.

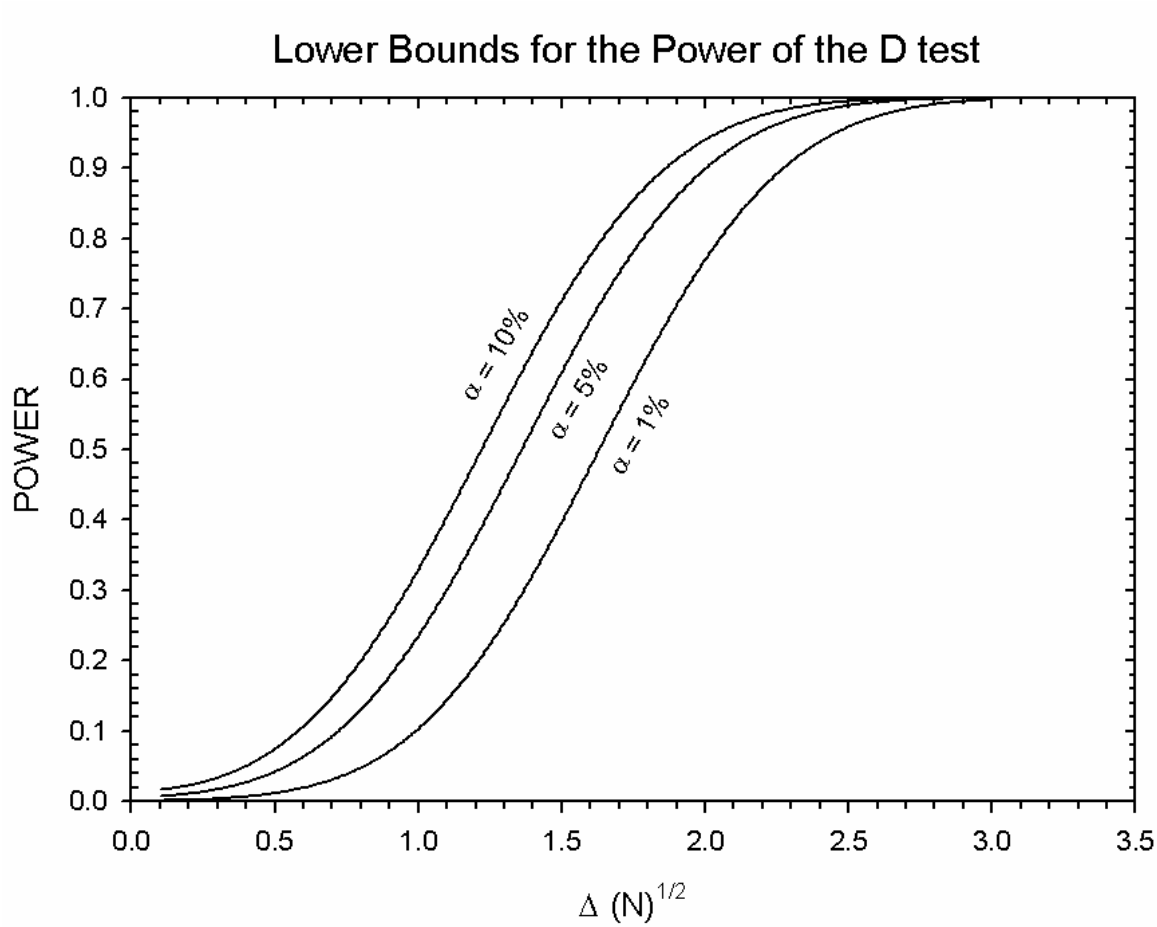

Figure 31. Lower bounds for the power of the D test for α = 1%, 5% and 10% (N>35)

The Kolmogorov-Smirnov test was used to indicate if the cumulative empirical probability distribution of the NSQD residential stormwater constituents can be adequately represented with a lognormal distribution. Table 19 shows the resulting power of the test for D=0.05 and D=0.1, when applied to selected constituents that had high levels of detection in residential land uses.

Table 19. Power of the Test When Applied to Selected Constituents in Residential Land Uses

Constituent	N	Percentage Detected	$\Delta N^{0.5}$ (α=0.05)	Power (D=0.05, β=5%)	$\Delta N^{0.5}$ (α=0.1)	Power (D=0.1, β =10%)
TDS (mg/L)	861	99.2	1.46	0.60	2.92	1
TSS (mg/L)	991	98.6	1.56	0.65	3.12	1
BOD (mg/L)	941	97.6	1.52	0.65	3.04	1
COD (mg/L)	796	98.9	1.40	0.55	2.80	1
NO2+NO3 (mg/L)	927	97.4	1.50	0.60	3.00	1
TKN (mg/L)	957	96.8	1.52	0.65	3.04	1
TP (mg/L)	963	96.9	1.53	0.65	3.06	1
Total Copper (μg/L)	799	83.6	1.29	0.50	2.58	1
Total Lead (μg/L)	788	71.3	1.19	0.40	2.38	1
Total Zinc (μg/L)	810	96.4	1.40	0.55	2.80	1

Table 19 shows that the number of collected samples is sufficient to detect if the empirical distribution is located inside an interval of width 0.1 above and below the estimated cumulative probability distribution. If the interval is reduced to 0.05, the power varies between 40 and 65%. To estimate the interval width, 10 cumulative distributions of 1,000 random data points, having a lognormal (1, 1) distribution, were compared with the estimated cumulative distribution for normal, gamma and exponential distributions. The maximum distance between the cumulative lognormal and the cumulative normal distributions was 0.25. The maximum distance with cumulative gamma (the same for exponential in this case) was 0.28. An interval width of 0.1 was considered appropriate for the analysis.

Another factor that must be considered is the importance of relatively small errors in the selected distribution and the problems of a false negative determination. It may not be practical to collect as many data observations as needed when the distributions are close (such as when the width interval is 0.05). Therefore, it is important to understand what types of further statistical and analysis problems may be caused by having fewer samples than optimal. For example, Figure 32 (total phosphorus in residential area) shows that most of the data fall along the straight line (indicating a lognormal fit), with fewer than 10 observations (out of 933) in the tails being outside of the obvious path of the line.

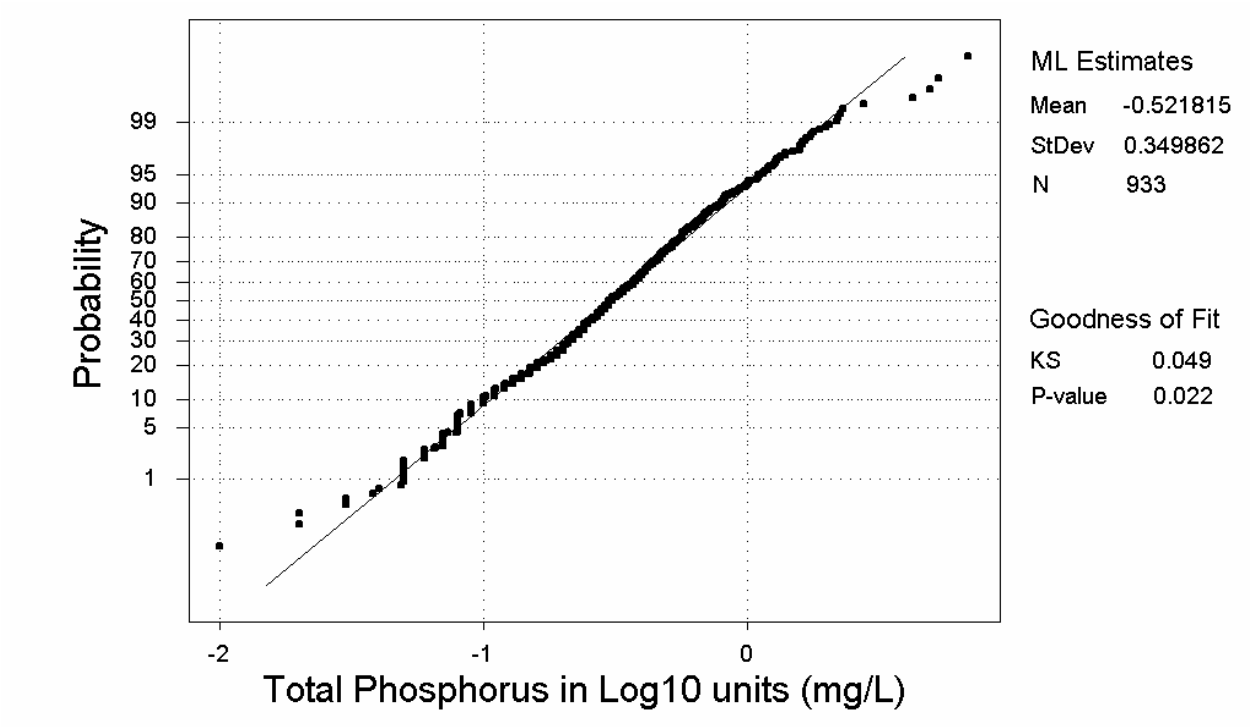

Figure 32. Normality test for total phosphorus in residential land uses using the NSQD

The calculated p-value for the Kolmogorov-Smirnov test is 0.022, indicating that the null hypothesis could be rejected and that there is not enough evidence that the empirical distribution is adequately represented by a lognormal distribution. Notice that errors in the tails are smaller than 0.049. However, the tails are not responsible for the rejection of the null hypothesis (see Figure 33).

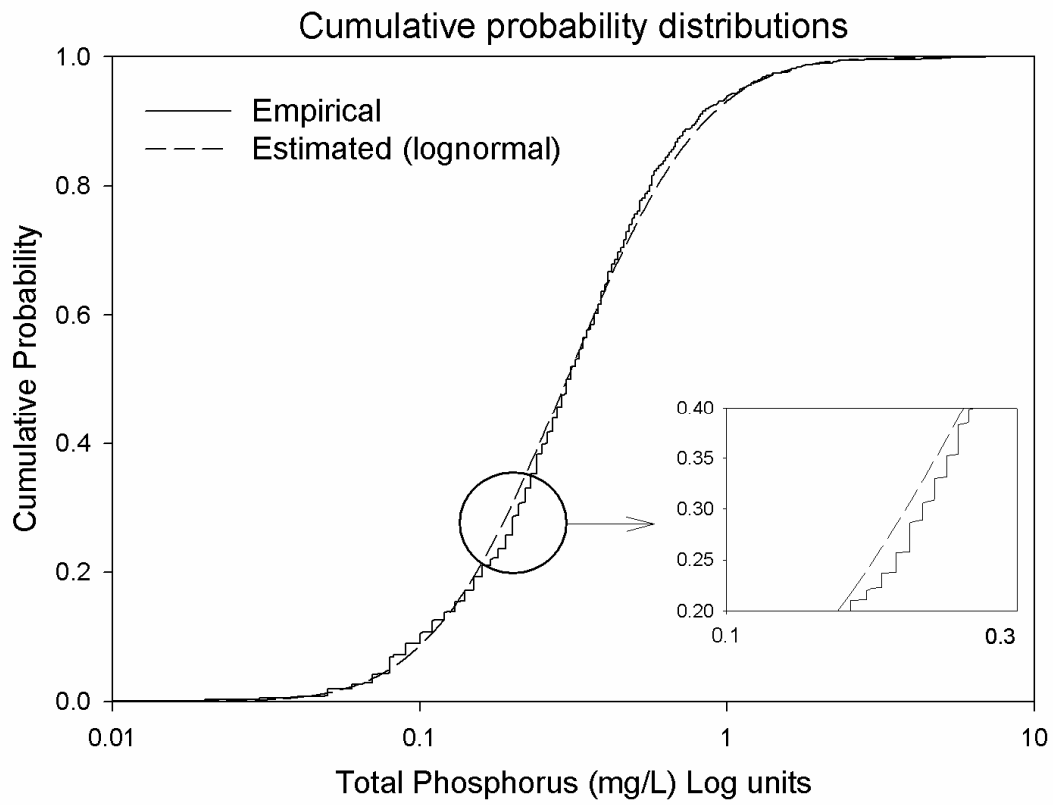

Figure 33. D_{max} was located in the middle of the distribution

In this case, D_{max} is located close to a total phosphorus concentration of 0.2 mg/L (-0.7 in log scale). As in this case, the hypothesized distributions are usually rejected because of the departures in the middle of the distribution, not in the tails. However, as previously pointed out, a small number of observations in the upper tail can change the shape of the estimated cumulative probability distribution by affecting the mean and standard deviation of the data. The methods used previously by Van Buren and Beherra evaluated the probability distributions only using two parameters, the median and the standard deviation. They suggested the gamma and exponential distributions as alternatives to the lognormal for some stormwater constituents. Table 20 shows the comparison for the goodness of fit using the 2-parameter gamma, exponential and lognormal distributions using the method of moments.

Table 20. Comparison of Goodness of Fit for Gamma, Exponential and Lognormal Distributions Using the NSQD v.1.1

CONSTITUENT	PDF	RESIDENTIAL			COMMERCIAL			INDUSTRIAL			OPEN SPACE			FREEWAYS		
		N_{Det}	Dmax	P-value	N_{Det}	Dmax	P-value	N_{Det}	Dmax	P-value	N_{Det}	Dmax	P-value	N_{Det}	Dmax	P-value
Conductivity (mS/cm)	Gamma	106 100%	0.381	0	66 100	0.230	0.002	108 100	0.348	0	2 100	-	-	86 100	0.238	0
	Exponential		0.195	0.001		0.237	0.001		0.228	0		-	-		0.232	0
	Lognormal		0.081	0.493		0.100	0.530		0.074	0.619		-	-		0.129	0.113
Hardness (mg/L)	Gamma	250 100%	0.217	0	139 100	0.141	0.008	138 96.4	0.323	0	8 100	0.304	0.458	127 100	0.451	0
	Exponential		0.203	0		0.115	0.067		0.133	0.018		0.369	0.228		0.161	0.003
	Lognormal		0.071	0.166		0.090	0.206		0.080	0.369		0.354	0.268		0.077	0.447
Oil and Grease (mg/L)	Gamma	533 57.8%	0.876	0	308 70.8	0.629	0	327 65.1	0.939	0	19 36.84	0.210	1.080	60 71.7	0.103	0.810
	Exponential		0.514	0		0.304	0		0.697	0		0.265	0.750		0.286	0.002
	Lognormal		0.112	0.001		0.103	0.019		0.098	0.032		0.202	1.127		0.101	0.827
Total Dissolved Solids (mg/L)	Gamma	861 99.3%	0.234	0	399 99.5	0.457	0	413 99.5	0.645	0	45 97.8	0.109	0.698	97 99	0.082	0.553
	Exponential		0.207	0		0.150	0		0.172	0		0.195	0.070		0.171	0.007
	Lognormal		0.050	0.029		0.049	0.303		0.066	0.053		0.120	0.561		0.054	1.136
Total Suspended Solids (mg/L)	Gamma	991 98.6%	0.288	0	458 98.3	0.363	0	428 99.1	0.206	0	44 95.5	0.132	0.464	134 99.3	0.534	0
	Exponential		0.141	0		0.214	0		0.108	0		0.289	0.002		0.168	0.011
	Lognormal		0.032	0.280		0.064	0.053		0.029	0.995		0.113	0.683		0.066	0.627
BOD5 (mg/L)	Gamma	941 97.6%	0.321	0	432 97.5	0.191	0	406 95.3	0.921	0	44 86.4	0.112	0.770	26 84.6	0.272	0.076
	Exponential		0.140	0		0.142	0		0.355	0		0.261	0.011		0.168	0.580
	Lognormal		0.058	0.004		0.054	0.166		0.105	0		0.114	0.746		0.103	1.252
COD (mg/L)	Gamma	796 98.9%	0.129	0	373 98.4	0.137	0	362 98.9	0.216	0	43 76.7	0.373	0	67 98.5	0.163	0.061
	Exponential		0.161	0		0.136	0		0.119	0		0.168	0.312		0.139	0.157
	Lognormal		0.036	0.250		0.038	0.695		0.074	0.040		0.128	0.684		0.107	0.445
Fecal Coliform (Colonies/100 mL)	Gamma	446 88.3%	0.655	0	233 88	0.333	0	297 87.9	-	-	23 91.3	0.179	0.520	49 100	0.239	0.007
	Exponential		0.374	0		0.396	0		0.504	0		0.208	0.324		0.355	0
	Lognormal		0.080	0.013		0.076	0.192		0.051	0.510		0.181	0.503		0.105	0.677
Fecal Streptococcus (Colonies/100 mL)	Gamma	305 89.5%	0.158	0	181 91.7	0.354	0	195 93.8	-	-	22 90.9	0.144	0.869	25 100	0.096	1.262
	Exponential		0.202	0		0.278	0		0.399	0		0.142	0.892		0.164	0.518
	Lognormal		0.077	0.081		0.097	0.091		0.083	0.161		0.181	0.538		0.119	0.990
Ammonia (mg/L)	Gamma	595 81.5%	0.132	0	299 83.3	0.131	0	254 85.8	0.154	0	32 18.7	-	-	79 87.3	0.216	0.003
	Exponential		0.101	0		0.066	0.228		0.071	0.221		-	-		0.105	0.440
	Lognormal		0.044	0.305		0.050	0.589		0.047	0.758		-	-		0.133	0.173
NO2+NO3 (mg/L)	Gamma	927 97.4%	0.197	0	425 98.1	0.147	0	418 96.2	0.080	0.011	44 84.1	0.123	0.654	25 96	0.274	0.055
	Exponential		0.141	0		0.120	0		0.132	0		0.120	0.686		0.177	0.443
	Lognormal		0.070	0		0.040	0.531		0.080	0.011		0.141	0.463		0.139	0.789
TKN (mg/L)	Gamma	957 96.8%	0.203	0	449 97.3	0.127	0	440 95.9	0.195	0	45 71.1	0.169	0.323	125 96.8	0.280	0
	Exponential		0.182	0		0.156	0		0.134	0		0.141	0.556		0.138	0.020
	Lognormal		0.035	0.218		0.042	0.423		0.048	0.292		0.147	0.500		0.074	0.539

* P-values greater than one are used only for comparison. NDet: Number of collected samples and percentage detected

Table 20. Comparison of Goodness of Fit for Gamma, Exponential and Lognormal Distributions Using the NSQD – *Continued*

CONSTITUENT	PDF	RESIDENTIAL			COMMERCIAL			INDUSTRIAL			OPEN SPACE			FREEWAYS		
		N_{Det}	Dmax	P-value	N_{Det}	Dmax	P-value	N_{Det}	Dmax	P-value	N_{Det}	Dmax	P-value	N_{Det}	Dmax	P-value
Dissolved Phosphorus (mg/L)	Gamma	738 84.1	0.117	0	323 81.1	0.177	0	325 87.1	0.200	0	44 79.5	0.154	0.127	22 95.5	0.449	0
	Exponential		0.144	0		0.129	0		0.135	0		0.384	0.657		0.350	0.012
	Lognormal		0.043	0.199		0.075	0.104		0.124	0.682		0.124	0.682		0.170	0.593
Total Phosphorus (mg/L)	Gamma	963 96.9	0.184	0	446 95.7	0.179	0	434 96.3	0.227	0	46 84.8	0.666	0	128 99.2	0.456	0
	Exponential		0.129	0		0.114	0		0.107	0		0.320	0.001		0.187	0
	Lognormal		0.049	0.022		0.038	0.582		0.049	0.273		0.116	0.696		0.085	0.325
Total Antimony (µg/L)	Gamma	288 2.8	0.268	0.636	142 2.1	-	-	164 14.6	0.282	0.045	17 0	-	-	14 50	0.423	0.164
	Exponential		0.417	0.213		-	-		0.173	0.473		-	-		0.465	0.096
	Lognormal		0.233	0.841		-	-		0.096	1.279		-	-		0.419	0.171
Total Arsenic (µg/L)	Gamma	426 42	0.531	0	213 32.9	0.643	0	267 54.3	0.291	0	19 31.6	0.271	0.828	61 55.7	0.125	0.694
	Exponential		0.224	0		0.249	0		0.141	0.006		0.462	0.154		0.266	0.016
	Lognormal		0.154	0		0.164	0.046		0.129	0.016		0.273	0.819		0.149	0.441
Total Beryllium (µg/L)	Gamma	301 7.3	0.464	0	163 4.29	0.305	0.542	209 10.5	0.390	0.002	19 0	-	-	12 16.7	-	-
	Exponential		0.471	0		0.530	0.039		0.539	0		-	-		-	-
	Lognormal		0.200	0.342		0.205	1.108		0.163	0.620		-	-		-	-
Total Cadmium (µg/L)	Gamma	723 30.3	0.643	0	358 43	0.511	0	395 49.4	0.445	0	38 55.3	0.295	0.051	95 71.6	0.110	0.388
	Exponential		0.358	0		0.311	0		0.237	0		0.560	0		0.153	0.083
	Lognormal		0.120	0.004		0.113	0.039		0.083	0.136		0.206	0.338		0.052	1.380
Total Chromium (µg/L)	Gamma	435 55.4	0.292	0	235 58.7	0.151	0.004	256 72.7	0.122	0.008	36 36.1	0.252	0.386	76 98.7	0.058	1.208
	Exponential		0.132	0		0.201	0		0.067	0.381		0.272	0.290		0.176	0.019
	Lognormal		0.069	0.206		0.086	0.262		0.062	0.480		0.180	0.861		0.084	0.685
Total Copper (µg/L)	Gamma	799 83.6	0.394	0	387 92.8	0.296	0	416 89.9	0.408	0	39 74.4	0.107	0.226	97 99	0.451	0
	Exponential		0.149	0		0.137	0		0.177	0		0.127	0.092		0.231	0.090
	Lognormal		0.067	0.005		0.070	0.060		0.080	0.017		0.131	0.742		0.038	1.507
Total Lead (µg/L)	Gamma	788 71.3	0.300	0	377 85.4	0.297	0	412 76.5	0.276	0	45 42.2	0.177	0.608	107 100	0.203	0
	Exponential		0.173	0		0.136	0		0.225	0		0.389	0.006		0.125	0.072
	Lognormal		0.044	0.218		0.057	0.250		0.059	0.223		0.132	1.034		0.039	1.451
Total Nickel (µg/L)	Gamma	419 45.3	0.292	0	232 59.5	0.260	0	250 62.4	0.090	0.159	38 18.4	0.164	1.373	99 89.9	0.188	0.004
	Exponential		0.203	0		0.176	0		0.111	0.044		0.261	0.772		0.227	0
	Lognormal		0.081	0.160		0.056	0.831		0.065	0.525		0.166	1.360		0.091	0.460
Total Selenium (µg/L)	Gamma	318 6.9	0.263	0.095	169 7.7	0.169	0.952	203 5.9	0.434	0.022	19 21.1	-	-	16 6.3	-	-
	Exponential		0.254	0.117		0.174	0.907		0.256	0.416		-	-		-	-
	Lognormal		0.253	0.119		0.196	0.735		0.190	0.841		-	-		-	-
Total Silver (µg/L)	Gamma	406 12.6	0.421	0	222 11.3	0.143	0.718	287 17.4	0.263	0.002	19 5.3	-	-	21 19	-	-
	Exponential		0.333	0		0.159	0.563		0.340	0		-	-		-	-
	Lognormal		0.271	0.001		0.184	0.370		0.146	0.236		-	-		-	-
Total Zinc (µg/L)	Gamma	810 96.4	0.244	0	392 99	0.234	0	433 98.6	0.273	0	45 71.1	0.180	0.253	93 96.8	0.158	0.023
	Exponential		0.122	0		0.141	0		0.083	0.005		0.167	0.336		0.155	0.027
	Lognormal		0.054	0.020		0.040	0.585		0.044	0.389		0.105	0.981		0.063	0.985

* P-values greater than one are used only for comparison. NDet: Number of collected samples and percentage detected

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Table 20 shows that for residential, commercial and industrial land uses, the lognormal distribution better fits the empirical data, except for selenium and silver in commercial land uses. In open space land uses, about 50% of the constituents were adequately fitted by the lognormal distribution, 30% by the gamma distribution and the remaining by the exponential distribution. In freeway areas, lognormal distributions better fit most of the constituents, except that fecal streptococcus, total arsenic and total chromium were better fitted by the gamma distribution and ammonia was better fitted by the exponential distribution. Also note in Table 20 that residential, commercial and industrial land uses had larger sample sizes than the other two land uses. It seems that for small sample sizes, gamma and exponential distributions better represent actual stormwater constituent distributions, but once the number of samples increases, the lognormal distribution is best. The few cases were the gamma distribution was a better fit was for NO_2+NO_3 in industrial land uses, and chromium in freeway areas. The exponential distribution better represents total ammonia in freeway areas (with around 70 detected samples) than the other two distribution types.

Other transformations were also tested, such as the square root, and other power functions, but the results were not improved. It was therefore decided to investigate if a three-parameter lognormal distribution function can be used to improve the overall goodness of fit for stormwater constituent probability distributions. As shown in the following section, this third parameter, in some cases, allows a much better fit of the cumulative empirical and estimated probability distributions.

Three Parameter Lognormal Calculations

Goodness of fit was evaluated using 3-parameter lognormal probability distribution. The probability distributions were created for residential, commercial, industrial, open space and freeways land uses. The distribution parameters were calculated using the maximum likelihood and the L-moments methods. The maximum likelihood method requires that it be solved iteratively using three equations (see Appendix C). The results were compared with the 2-parameter standard model and the actual data. The model with the smaller maximum distance between the empirical and the estimated function was selected as the best model. All the calculations were made using only the detected values. In general, the L-moments method provided a better fit for the upper tail of the distribution whereas the maximum likelihood method provided a better fit for the lower tail. Figure 34 shows the three estimated models for TSS in commercial land use areas.

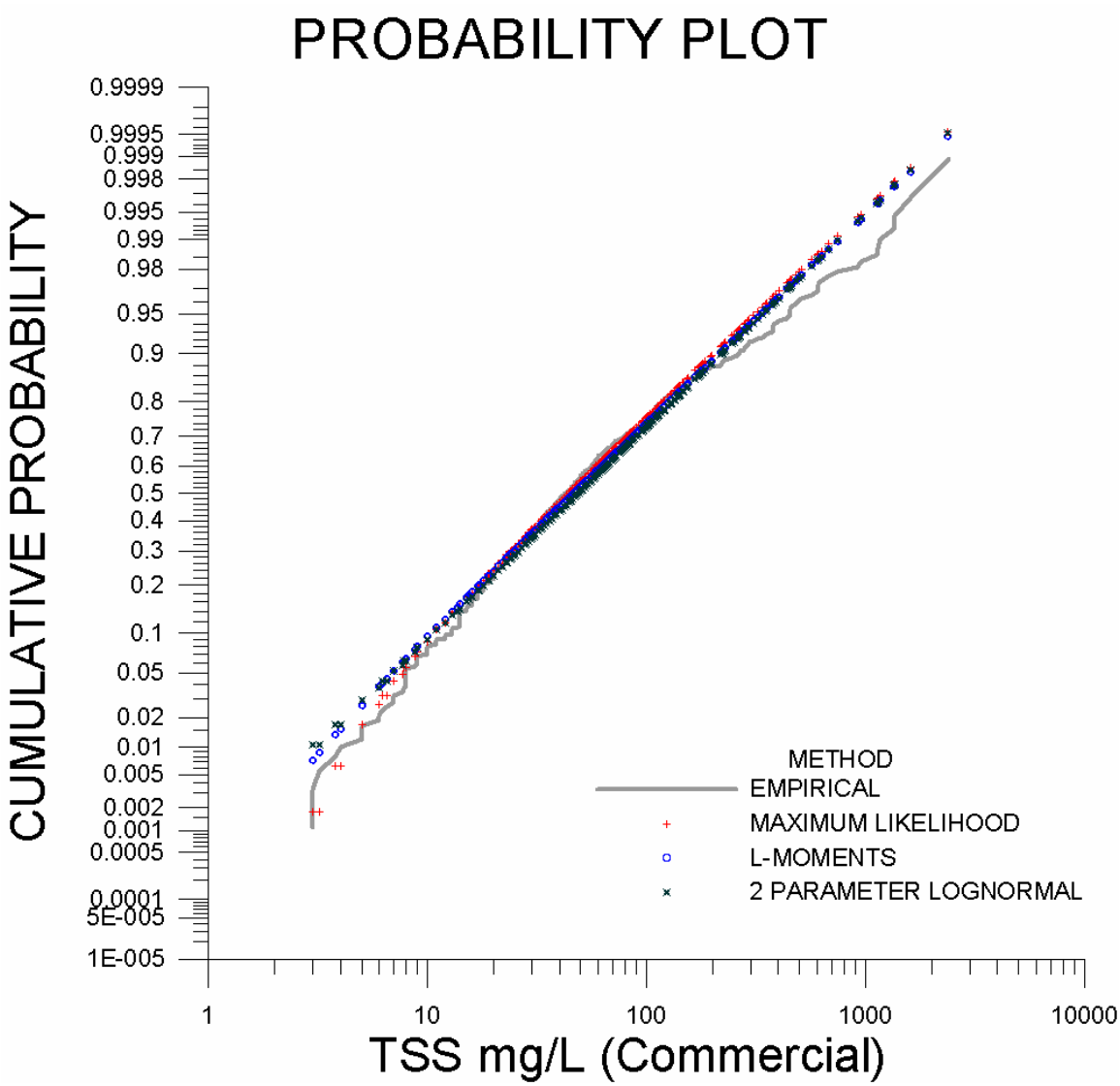

Figure 34. Estimated models for TSS in commercial land uses

In this graph, it is observed that the empirical distribution has higher values in the upper tail compared with any of the three models. In the lower tail, the maximum likelihood method using the 3-parameters better fit the observed values. In this case, the maximum likelihood method was better than the other two models, although none of the methods adequately represented the extreme high values. The L-moments method generally betters fits the upper tail distribution, but typically trims or overestimates the lower tail. Figure 35 shows the results for TDS in industrial land uses. The L-moments better fits the empirical distribution in the upper tail, but it trims any observation smaller than 35 mg/L (almost 20% of the total dataset) in the lower tail. The 2-parameter lognormal and the maximum likelihood method provide better results although both were worse than the L-moments in the upper tail region.

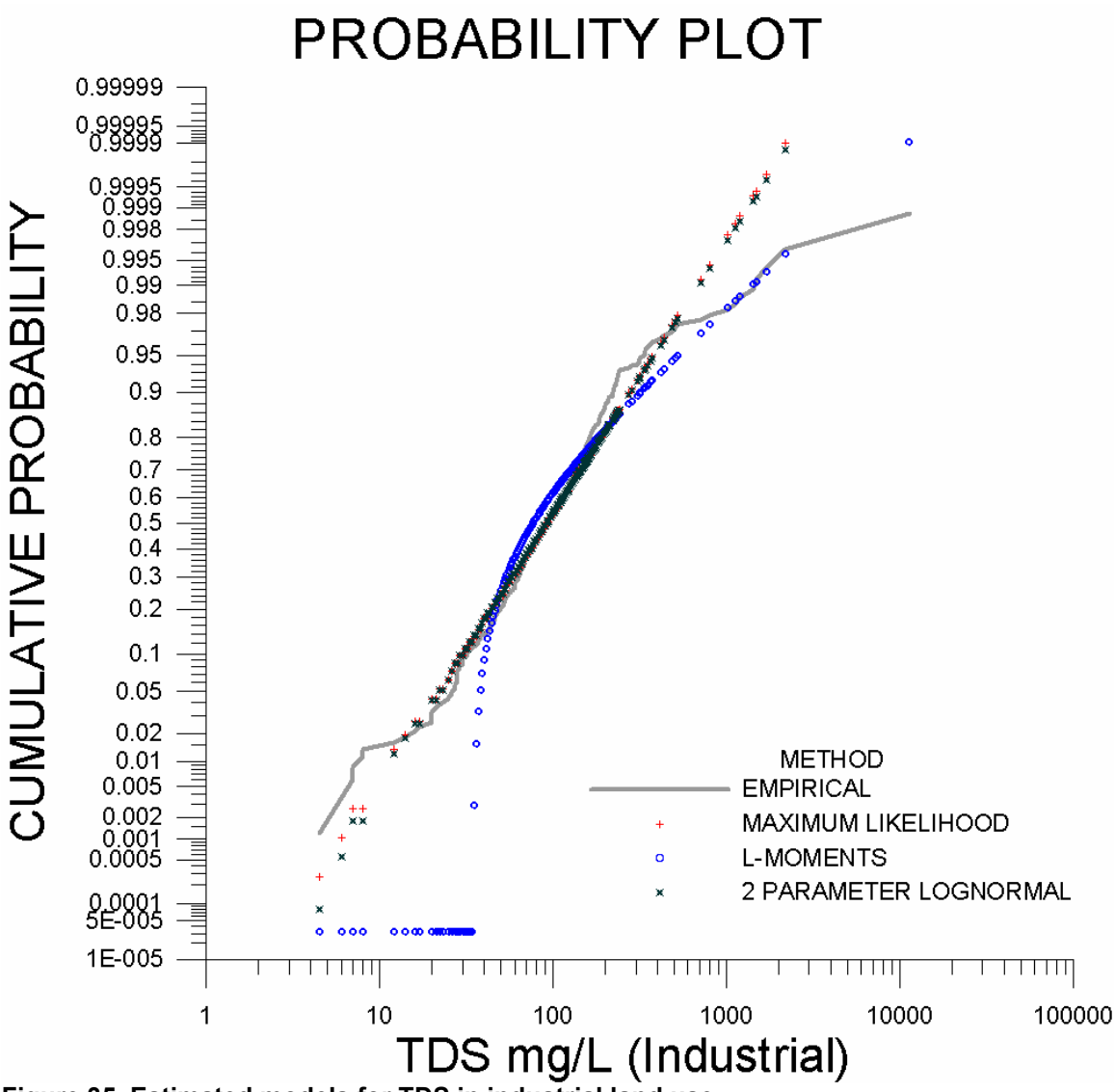

Figure 35. Estimated models for TDS in industrial land use

Table 21 presents the results for 15 constituents in five land uses. For each of the three methods, the p-value was calculated. The higher the p-value, the better is the fit between the empirical and the estimated function. Some of the p-values in the table are larger than one. When the number of samples is large, the p-value is calculated as a chi square distribution with two degrees of freedom. This probability is calculated only with one tail of the chi square distribution. The p-value is two times this probability. The maximum p-value is one, but for effects of comparison this presents two times the probability calculated from a one tail chi square distribution.

The maximum likelihood method with 3-parameters, or the lognormal 2-parameter distribution produced the best descriptions for most of the constituents. For almost all constituents the function estimated by the L-moments method failed the lognormal assumption. Low p-values were obtained because the function was truncated and does not estimate the lower tail of the distribution.

It seems that when the numbers of samples increase, the L-moments method tends to truncate the function. The maximum likelihood method seems to improve the fit of the distribution, but when the number of samples is large, the cumulative estimated probability distribution is far from the cumulative empirical probability distribution, or no convergence is possible during the iteration process.

In commercial, industrial and freeways land uses, the numbers of samples available were between 100 and 500 samples. According to the prior discussion, this number of samples will result in an analysis having a power close or above 0.5. In these cases, most of the better fits were obtained using the L-moments method. In commercial and industrial land uses, more than half of the constituents also had the highest p-values when the L-moments method was used.

In open space areas, there were not many samples available. The small number of samples results in a low power. In this case, the higher p-values results were observed when the 2-parameter lognormal distribution was used. The use of the third parameter in constituents having small numbers of sample observations did not improve the fit of the estimated cumulative probability distribution.

Summary

Most of the stormwater constituents can be assumed to follow a lognormal distribution with little error. The use of the third parameter does not show a significant improvement in estimating the empirical distribution compared with the 2-parameter lognormal distribution. When the number of samples is very large per category (approximately more than 400 samples) the maximum likelihood and the 2-parameter lognormal distribution better fit the empirical distribution. For large sample sizes, the L-moments method usually unacceptably truncates the distribution in the lower tail. When the sample size is small (<100 samples), the use of the third parameter does not improve the fit with the empirical distribution and the 2-parameter lognormal distribution produces a better fit than the other two methods.

The lognormal distribution is a skewed distribution when plotted in real space coordinates. When the sample size is small, the calculated skewness is smaller than the skewness of the real distribution. Insufficient sample sizes are not likely to accurately represent the extreme observations in the actual distribution of the data.

Table 21. Goodness of Fit for Different Land Uses (p-values Larger than One are Used Only for Comparison)

RESIDENTIAL			Critical	Observed		2 Parameter Log		3 parameter maximum likelihood					3 parameter L-moments				
CONSTITUENT	N	% Detected	$D_{0.05}$	μ	σ	D2	p-value	μ	σ	c	D3m	p-value	κ	α	ξ	D3l	p-value
Conductivity (μS/cm)	106	100	0.132	4.638	0.710	0.081	0.493	4.327	0.919	20.767	0.052	1.133	-1.240	61.461	88.366	0.087	0.398
Hardness (mg/L)	250	100	0.086	3.497	0.706	0.071	0.166	3.539	0.675	-1.114	0.066	0.231	-	-	-	0.635	0
Oil & Grease (mg/L)	533	57.8	0.077	1.428	1.204	0.112	0.001	1.356	1.267	0.164	0.102	0.003	-2.559	2.065	2.482	0.208	0
Fecal Coliform (Col/100 ml)	446	88.3	0.069	8.7205	2.40448	0.080	0.013	8.734	2.367	-2.992	0.078	0.017	-1.929	17283.541	8236.423	0.096	0.001
Fecal Streptococcus (C/100 ml)	305	89.5	0.082	9.8344	1.88029	0.077	0.081	9.907	1.725	-210.924	0.066	0.190	-1.309	38433.290	24834.760	0.077	0.078
Ammonia (mg/L)	595	81.5	0.062	-1.1672	0.9166	0.044	0.305	0.015	0.220	-0.684	0.139	0.000	-	-	-	-	-
DP (mg/L)	738	84.1	0.055	-1.8303	0.85689	0.043	0.199	0.003	0.056	-0.877	0.327	0.000	-	-	-	-	-
Antimony (μg/L)	288	2.8	0.454	1.3554	1.71904	0.233	0.841	6.569	0.023	-700.000	0.368	0.228	-1.117	9.631	5.281	0.270	0.626
Arsenic (μg/L)	426	42	0.102	1.2098	0.85043	0.154	0.000	1.047	0.971	0.356	0.166	0.000	-1.588	1.981	2.632	0.208	0
Beryllium (μg/L)	301	7.3	0.281	0.0283	1.5958	0.200	0.342	-0.423	2.040	0.136	0.186	0.436	-2.063	1.154	0.675	0.227	0.207
Total Cadmium (μg/L)	723	30.3	0.092	-0.3532	1.21891	0.120	0.004	-0.444	1.301	0.033	0.110	0.010	-1.880	0.626	0.511	0.093	0.045
Total Chromium (μg/L)	435	55.4	0.088	1.5794	0.89199	0.069	0.206	1.473	0.980	0.328	0.067	0.236	-1.157	4.003	4.382	0.066	0.242
Total Nickel (μg/L)	419	45.3	0.099	1.7909	0.75669	0.081	0.160	1.601	0.890	0.768	0.083	0.147	-1.078	4.163	5.384	0.084	0.137
Total Selenium (μg/L)	318	6.9	0.281	1.0969	0.83323	0.253	0.119	0.479	1.348	0.876	0.259	0.061	-1.178	2.103	2.577	0.257	0.11
Total Silver (μg/L)	406	12.6	0.19	1.0686	1.3707	0.271	0.001	0.984	1.469	0.089	0.278	0.001	-1.522	3.390	2.767	0.294	0

COMMERCIAL			Observed			2 Parameter Log		3 parameter maximum likelihood					3 parameter L-moments				
CONSTITUENT	N	% Detected	μ	σ	$D_{0.05}$	D2	p-value	μ	σ	c	D3m	p-value	κ	α	ξ	D3l	p-value
Conductivity (μS/cm)	66	100	4.779	0.721	0.167	0.100	0.530	4.736	0.746	3.865	0.097	0.581	-1.011	76.386	108.055	0.093	0.633
Hardness (mg/L)	139	100	3.689	0.988	0.115	0.090	0.206	3.828	0.844	-3.808	0.063	0.653	-0.935	36.911	40.394	0.072	0.474
Oil & Grease (mg/L)	308	70.8	1.609	1.070	0.092	0.103	0.019	1.300	1.358	0.737	0.092	0.062	-1.853	3.648	3.638	0.126	0.002
TDS (mg/L)	399	99.5	4.332	0.791	0.068	0.049	0.303	4.393	0.741	-3.495	0.049	0.289	-1.066	55.106	70.423	0.071	0.035
TSS (mg/L)	458	98.3	3.883	1.180	0.064	0.064	0.053	3.735	1.218	1.988	0.042	0.416	-1.207	55.082	46.245	0.048	0.250
BOD (mg/L)	432	97.5	2.493	0.868	0.066	0.054	0.166	2.302	1.026	1.396	0.040	0.527	-1.002	10.321	11.447	0.044	0.380
COD (mg/L)	373	98.4	4.167	0.865	0.071	0.038	0.695	4.163	0.868	0.194	0.037	0.719	-0.911	54.903	63.127	0.034	0.860
Fecal Coliform (Col/100 ml)	233	88	8.202	2.380	0.095	0.076	0.192	8.191	2.398	1.870	0.077	0.175	-1.768	11370.330	5408.770	0.150	0.000
Fecal Streptococcus (C/100 ml)	181	91.7	8.940	2.061	0.106	0.097	0.091	8.936	2.061	2.494	0.096	0.093	-1.640	16795.600	9532.540	0.056	0.702
Ammonia (mg/L)	299	83.3	-0.706	1.083	0.086	0.050	0.589	-0.697	1.072	-0.002	0.048	0.632	-0.947	0.549	0.522	0.040	0.888
NO2+NO3 (mg/L)	425	98.1	-0.523	0.882	0.067	0.040	0.531	-0.432	0.800	-0.039	0.034	0.837	-0.849	0.510	0.600	0.030	0.954
TKN (mg/L)	449	97.3	0.471	0.828	0.065	0.042	0.423	0.575	0.734	-0.126	0.050	0.228	-0.866	1.246	1.571	0.032	0.816
DP (mg/L)	323	81.1	-2.077	1.016	0.084	0.075	0.104	-2.157	1.092	0.006	0.062	0.273	-1.077	0.127	0.121	0.059	0.315
TP (mg/L)	446	95.7	-1.473	0.881	0.066	0.038	0.582	-1.537	0.935	0.010	0.041	0.466	-0.991	0.196	0.220	0.049	0.264
Arsenic (μg/L)	213	32.9	0.9336	0.92361	0.163	0.164	0.046	0.729	1.098	0.301	0.195	0.010	-1.736	1.565	1.935	0.280	0
Total Cadmium (μg/L)	358	43	0.047	1.309	0.11	0.113	0.039	0.023	1.335	0.011	0.109	0.052	-1.640	1.180	0.879	0.063	0.591
Total Chromium (μg/L)	235	58.7	1.8134	0.71608	0.116	0.086	0.262	1.711	0.787	0.453	0.089	0.225	-0.734	4.462	6.100	0.083	0.295
Total Copper (μg/L)	387	92.8	2.8829	0.90117	0.072	0.070	0.060	2.807	0.965	0.874	0.063	0.117	-1.251	14.103	15.641	0.069	0.067
Total Lead (μg/L)	377	85.4	3.0328	1.03226	0.076	0.057	0.250	3.015	1.049	0.220	0.058	0.225	-1.251	19.633	18.805	0.053	0.329
Total Nickel (μg/L)	232	59.5	1.9782	0.8075	0.116	0.056	0.831	1.668	1.070	1.282	0.089	0.220	-0.969	5.691	6.842	0.076	0.406
Total Selenium (μg/L)	169	7.7	1.366	0.953	0.361	0.196	0.735	0.829	1.492	0.863	0.167	0.670	-0.803	3.940	3.621	0.210	0.638
Total Silver (μg/L)	222	11.3	0.9637	1.35108	0.272	0.184	0.370	1.080	1.174	-0.141	0.182	0.379	-0.911	3.587	3.133	0.165	0.513
Total Zinc (μg/L)	392	99	5.0388	0.84183	0.069	0.040	0.585	5.082	0.803	-4.834	0.039	0.619	-1.021	120.091	144.868	0.052	0.243

Table 21. Goodness of Fit for Different Land Uses (p-values Larger than One are Used Only for Comparison) – *Continued*

INDUSTRIAL			Observed			2 Parameter Log		3 parameter maximum likelihood					3 parameter L-moments				
CONSTITUENT	**N**	**% Detected**	**μ**	**σ**	**$D_{0.05}$**	**D2**	**p-value**	**μ**	**σ**	**c**	**D3m**	**p-value**	**κ**	**α**	**ξ**	**D3l**	**p-value**
Conductivity (μS/cm)	108	100	5.011	0.673	0.131	0.074	0.619	4.743	0.848	27.365	0.067	0.767	-1.197	83.673	129.715	0.106	0.174
Hardness (mg/L)	138	96.4	3.794	0.842	0.118	0.080	0.369	3.701	0.914	2.758	0.081	0.346	-1.272	31.221	38.285	0.119	0.047
Oil & Grease (mg/L)	327	65.1	1.623	1.153	0.093	0.098	0.032	1.456	1.298	0.447	0.093	0.048	-3.227	1.068	2.750	0.313	0.000
TDS (mg/L)	413	99.5	4.516	0.870	0.067	0.066	0.053	4.539	0.849	-1.484	0.065	0.064	-1.496	62.528	76.123	0.111	0.000
TSS (mg/L)	428	99.1	4.287	1.200	0.066	0.029	0.995	4.292	1.193	-0.169	0.028	1.023	-1.133	88.174	74.697	0.026	1.119
BOD (mg/L)	406	95.3	2.4121	0.992	0.069	0.105	0.000	2.303	1.085	0.729	0.095	0.002	-2.246	5.718	7.369	0.184	0.000
COD (mg/L)	362	98.9	4.2217	0.91441	0.072	0.074	0.040	4.237	0.899	-0.714	0.076	0.032	-1.096	57.774	63.159	0.046	0.437
Fecal Coliform (Col/100 ml)	297	87.9	7.6064	2.65965	0.084	0.051	0.510	7.574	2.732	1.560	0.055	0.417	-2.356	5638.993	2369.488	0.045	0.688
Fecal Streptococcus (C/100 ml)	195	93.8	9.1491	1.82906	0.101	0.083	0.161	9.190	1.741	-64.211	0.073	0.280	-2.253	11045.202	7378.455	0.199	0.000
Ammonia (mg/L)	254	85.8	-0.7071	1.00903	0.092	0.047	0.758	-0.685	0.985	-0.007	0.049	0.715	-0.864	0.518	0.524	0.046	0.789
NO2+NO3 (mg/L)	418	96.2	-0.3857	0.93116	0.068	0.080	0.011	-0.142	0.703	-0.132	0.043	0.454	-0.689	0.608	0.739	0.045	0.406
TKN (mg/L)	440	95.9	0.4238	0.88424	0.066	0.048	0.292	0.471	0.840	-0.050	0.050	0.239	-1.023	1.256	1.444	0.040	0.502
DP (mg/L)	325	87.1	-2.1766	0.87102	0.081	0.124	0.682	-2.141	0.837	-0.003	0.051	0.450	-1.002	0.093	0.108	0.063	0.211
TP (mg/L)	434	96.3	-1.2683	0.98202	0.067	0.049	0.273	-1.299	1.010	0.005	0.044	0.387	-1.068	0.271	0.271	0.035	0.724
Antimony (μg/L)	164	14.6	1.4793	1.01264	0.269	0.096	1.279	1.275	1.183	0.479	0.113	1.088	-1.334	3.747	3.661	0.150	0.684
Arsenic (μg/L)	267	54.3	1.5218	0.95205	0.113	0.129	0.016	1.19121.2628		0.752	0.128	0.018	-1.069	4.359	4.359	0.116	0.039
Beryllium (μg/L)	209	10.5	-0.3588	1.94765	0.281	0.163	0.620	-0.892	2.658	0.060	0.197	0.362	-2.074	1.346	0.568	0.231	0.191
Total Cadmium (μg/L)	395	49.4	0.7417	1.12552	0.097	0.083	0.136	0.588	1.276	0.161	0.095	0.060	-1.611	1.898	1.686	0.115	0.012
Total Chromium (μg/L)	256	72.7	2.5512	1.06906	0.1	0.062	0.480	2.599	1.015	-0.359	0.059	0.543	-0.911	13.859	13.657	0.050	0.803
Total Copper (μg/L)	416	89.9	3.2275	1.02866	0.07	0.080	0.017	3.179	1.076	0.716	0.073	0.030	-1.343	22.969	22.081	0.057	0.172
Total Lead (μg/L)	412	76.5	3.3651	1.32824	0.077	0.059	0.223	3.333	1.367	0.379	0.057	0.263	-1.374	38.025	27.991	0.054	0.316
Total Nickel (μg/L)	250	62.4	2.8058	0.97034	0.109	0.065	0.525	2.802	0.971	0.042	0.066	0.512	-0.772	17.094	17.834	0.088	0.182
Total Selenium (μg/L)	203	5.9	1.1472	1.27671	0.375	0.190	0.841	6.916	0.014	-1000.000	0.364	0.083	-1.851	2.381	2.025	0.202	0.753
Total Silver (μg/L)	287	17.4	0.113	1.80819	0.192	0.146	0.236	0.158	1.708	-0.010	0.153	0.194	-1.358	2.181	1.394	0.157	0.170
Total Zinc (μg/L)	433	98.6	5.305	0.970	0.066	0.044	0.389	5.359	0.915	-7.026	0.034	0.743	-0.899	198.198	208.408	0.030	0.951

Table 21. Goodness of Fit for Different Land Uses (p-values Larger than One are Used Only for Comparison) – *Continued*

OPEN SPACE			Observed			2 Parameter Log		3 parameter maximum likelihood					3 parameter L-moments				
CONSTITUENT	**N**	**% Detected**	**μ**	**σ**	**$D_{0.05}$**	**D2**	**p-value**	**μ**	**σ**	**c**	**D3m**	**p-value**	**κ**	**α**	**ξ**	**D3l**	**p-value**
TDS (mg/L)	45	97.8	4.762	0.744	0.205	0.120	0.561	4.480	0.962	20.400	0.115	0.621	-	-	-	0.759	0
TSS (mg/L)	44	95.5	3.945	1.717	0.21	0.113	0.683	3.672	2.096	2.777	0.095	0.942	-1.184	121.932	72.238	0.173	0.162
BOD (mg/L)	44	86.4	1.6211	0.66954	0.215	0.114	0.746	1.624	0.659	-0.013	0.115	0.733	-0.614	3.421	5.098	0.110	0.801
COD (mg/L)	43	76.7	3.548	0.785	0.231	0.128	0.684	3.323	0.946	5.000	0.151	0.441	-1.221	23.447	-16.159	0.184	0.215
Fecal Coliform (Col/100 ml)	23	91.3	8.9527	1.43209	0.287	0.181	0.503	8.725	1.692	534.506	0.217	0.278	-0.791	13914.660	10684.240	0.187	0.458
Fecal Streptococcus (C/100 ml)	22	90.9	9.6472	1.62819	0.294	0.181	0.538	9.847	1.248	-1070.380	0.165	0.676	-0.599	27514.897	24175.705	0.139	0.921
NO2+NO3 (mg/L)	44	84.1	-0.478	1.07398	0.234	0.141	0.463	-0.378	1.173	0.135	0.141	0.464	-0.579	0.746	0.759	0.122	0.664
TKN (mg/L)	45	71.1	-0.097	0.92495	0.234	0.147	0.500	-0.378	1.173	0.135	0.140	0.569	-0.716	0.918	0.976	0.160	0.389
DP (mg/L)	44	79.5	-2.1844	1.08407	0.224	0.124	0.682	-2.137	1.017	-0.003	0.131	0.606	-0.595	0.135	0.137	0.142	0.484
TP (mg/L)	46	84.8	-1.4264	1.12592	0.215	0.116	0.696	-1.499	1.188	0.009	0.126	0.584	-1.999	0.161	0.171	0.211	0.062
Total Cadmium (μg/L)	38	55.3	0.0291	2.62317	0.287	0.206	0.338	6.921	0.244	-1000.000	0.327	0.022	-1.561	7.207	2.856	0.319	0.028
Total Chromium (μg/L)	36	36.1	-1.79	1.66154	0.325	0.799	0.000	6.926	0.030	-1000.000	0.275	0.279	-1.446	10.225	5.944	0.193	0.756
Total Copper (μg/L)	39	74.4	2.1184	1.20044	0.246	0.131	0.742	6.926	0.035	-1000.000	0.334	0.003	-1.539	8.380	6.792	0.187	0.262
Total Lead (μg/L)	45	42.2	1.8882	1.95431	0.301	0.132	1.034	1.634	2.355	0.188	0.203	0.417	-1.406	16.381	8.735	0.174	0.632
Total Zinc (μg/L)	45	71.1	3.6048	1.19833	0.234	0.105	0.981	3.315	1.527	3.980	0.132	0.658	-1.142	44.515	36.591	0.113	0.885

FREEWAYS			Observed			2 Parameter Log		3 parameter maximum likelihood					3 parameter L-moments				
CONSTITUENT	**N**	**% Detected**	**μ**	**σ**	**$D_{0.05}$**	**D2**	**p-value**	**μ**	**σ**	**c**	**D3m**	**p-value**	**κ**	**α**	**ξ**	**D3l**	**p-value**
Conductivity (μS/cm)	86	100	4.586	0.681	0.147	0.129	0.113	4.404	0.795	12.765	0.113	0.226	-1.060	58.592	87.231	0.096	0.411
Hardness (mg/L)	127	100	3.604	0.791	0.121	0.077	0.447	3.485	0.875	3.045	0.077	0.440	-1.395	22.761	30.345	0.114	0.074
Oil & Grease (mg/L)	60	71.7	1.974	0.575	0.207	0.101	0.827	1.395	0.976	2.433	0.161	0.214	-0.543	4.299	7.228	0.098	0.881
TDS (mg/L)	97	99	4.279	0.771	0.139	0.054	1.136	4.342	0.720	-3.500	0.051	1.210	-0.660	56.217	74.574	0.044	1.368
TSS (mg/L)	134	99.3	4.464	1.068	0.118	0.066	0.627	4.513	1.010	-2.484	0.059	0.797	-1.447	76.753	75.337	0.120	0.043
BOD (mg/L)	26	84.6	2.262	0.894	0.281	0.103	1.252	2.013	1.084	1.385	0.099	1.304	-1.212	7.478	8.170	0.117	1.097
COD (mg/L)	67	98.5	4.552	0.980	0.167	0.107	0.445	4.798	0.715	-17.925	0.073	0.999	-0.881	81.577	97.057	0.082	0.817
Fecal Coliform (Col/100 ml)	49	100	7.585	1.716	0.194	0.105	0.677	7.514	1.811	30.900	0.128	0.398	-1.569	3543.87	2053.58	0.108	0.635
Fecal Streptococcus (C/100 ml)	25	100	9.263	1.662	0.264	0.119	0.990	8.854	2.363	540.500	0.211	0.215	-0.896	21116.59	15451.91	0.132	0.833
Ammonia (mg/L)	79	87.3	0.009	1.094	0.164	0.133	0.173	0.141	0.942	-0.083	0.106	0.423	-1.065	1.00	1.01	0.123	0.252
NO2+NO3 (mg/L)	25	96	-1.097	0.868	0.269	0.139	0.789	-1.628	1.301	0.087	0.114	1.073	-1.275	0.241	0.275	0.117	1.038
TKN (mg/L)	125	96.8	0.750	0.887	0.124	0.074	0.539	0.723	0.907	0.038	0.075	0.512	-1.159	1.669	1.907	0.071	0.598
DP (mg/L)	22	95.5	-1.226	1.188	0.287	0.170	0.593	-1.670	1.595	0.053	0.207	0.333	-1.992	0.181	0.190	0.255	0.131
TP (mg/L)	128	99.2	-1.266	0.772	0.121	0.085	0.325	-1.545	0.961	0.051	0.065	0.686	-1.394	0.171	0.231	0.089	0.27
Antimony (μg/L)	14	50	0.967	0.284	0.483	0.419	0.171	4.415	0.008	-80.000	0.397	0.220	0.660	0.563	2.922	0.270	0.719
Arsenic (μg/L)	61	55.7	0.952	0.666	0.227	0.149	0.441	0.290	1.180	0.886	0.106	0.937	-0.679	1.787	2.547	0.096	1.07
Total Cadmium (μg/L)	95	71.6	0.016	0.838	0.165	0.052	1.380	-0.108	0.937	0.081	0.067	1.087	-0.781	0.028	1.574	0.051	1.409
Total Chromium (μg/L)	76	98.7	2.096	0.734	0.157	0.084	0.685	2.165	0.680	-0.450	0.075	0.854	-0.555	6.127	8.575	0.055	1.272
Total Copper (μg/L)	97	99.0	3.525	0.842	0.139	0.038	1.507	3.433	0.915	2.047	0.048	1.295	-0.857	28.576	33.493	0.041	1.443
Total Lead (μg/L)	107	100	3.226	1.164	0.131	0.039	1.451	3.178	1.212	0.587	0.045	1.285	-1.155	28.993	24.965	0.040	1.424
Total Nickel (μg/L)	99	89.9	2.325	0.673	0.144	0.091	0.460	1.989	0.896	2.228	0.062	1.013	-0.960	6.390	9.308	0.073	0.769
Total Zinc (μg/L)	93	96.8	5.273	0.877	0.143	0.063	0.985	5.392	0.757	-17.226	0.054	1.000	-0.920	156.885	189.601	0.064	0.959

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Experimental design procedures enable the required sample size to be estimated, according to desired confidence and power of the experimental results. It may be possible, without being able to identify the real skewness, that the best distribution fit could be the gamma or exponential distribution.

The utility of the third parameter has been questioned, especially because one of the objectives in modeling is to be parsimonious. Only in cases where it is important to include the effect of unusual elevated values in the model, is the third parameter recommended. In all the other cases, the use of the 2-parameter distribution is adequate to explain the distribution of most of the contaminants.

When the mean and the standard deviation values are not known, Lilieford's test is recommended to evaluate the goodness of fit to a specific distribution. During this research, the Kolmogorov-Smirnov test was used based on the assumption that the large sample sizes minimized errors associated with small sample sizes and uncertainty in the mean and standard deviation values.

Some constituents (such as TKN, TP, COD and Cu) show an increase in the p-value when the number of samples is acceptable and the 3-parameter lognormal probability distribution is used. The use of the lognormal distribution also has an advantage over the other distributions because it can be easily transformed to a normal distribution.

The few cases where the gamma distribution seems to be a better model was for cases with low counts (constituents in open space or arsenic, chromium and fecal streptococcus in freeways areas; for example). The exponential distribution better fit total ammonia in freeway areas. The remaining constituents were well represented by the lognormal distribution.

The 2-parameter lognormal distribution is considered the most appropriate distribution to represent stormwater constituents. Its use facilitates statistical analyses of the data, because procedures such as ANOVA or regression require the errors to be normally distributed. If the number of observations is small, the use of nonparametric methods will be required, as the distributions cannot be accurately determined. Some nonparametric methods require symmetry in the data distribution. The log transformed constituent concentrations usually satisfy these assumptions.

Chapter 5: Identification of Significant Factors Affecting Stormwater Quality Using the NSQD

Introduction

The normal approach to classify urban sites for estimating stormwater characteristics is based on land use. This approach is generally accepted because it is related to the activity in the watershed, plus many site features are generally consistent within each land use. Two drainage areas with the same size, percentage of imperviousness, ground slope, sampling methods, and stormwater controls will produce different stormwater concentrations if the main activity in one watershed is an automobile manufacturing facility (industrial land use) while the other is a shopping center (commercial land use) for example. There will likely be higher concentrations of metals at the industrial site due to the manufacturing processes, while the commercial site may have higher concentrations of PAHs (polycyclic aromatic hydrocarbons) due to the frequency and numbers of customer automobiles entering and leaving the parking lots.

The results from the previous chapter indicated that there are significant differences in stormwater constituents for different land use categories. This is supported for other databases like NURP (EPA 1983) and USGS (Driver, *et al*. 1985). The main question to be addressed in this chapter is if there is a different classification method that better describes stormwater quality, possibly by also considering such factors as geographical area (EPA Rain Zone), season, percentage of imperviousness cover, type of conveyance, controls in the watershed, sampling method, and type of sample compositing, and possible interactions between these factors.

This chapter presents several approaches to explain the variability of stormwater quality by considering these additional factors. As shown in Chapter 3, ignoring the non-detected observations can adversely affect the mean, median and standard deviations of the dataset, and the resulting statistical test results. Therefore, the calculations presented in this chapter were preceded by substituting the censored observations using the Cohen's maximum likelihood method.

Main Factors Affecting Stormwater Quality

The EPA Rain Zone, percentage of imperviousness, watershed size, land use, type of conveyance, controls in the watershed, sample analysis method, and type of sampling procedures were selected as potential influencing factors affecting stormwater quality for the preliminary analyses in this chapter. Data from sites having a single land use will be used in the basic analyses, while data from the mixed land use sites could be used for verification. The first step was to inventory the total number of events in each of the possible combinations of these factors. The EPA Rain Zone, land use, type of conveyance, type of controls present in the watershed, sampling methods and type of compositing procedures are discrete variables, while percentage of imperviousness and watershed area are continuous variables. The total counts and percentage for each discrete variable option is shown in Table 22.

Table 22. Numbers and percentage of samples by discrete site variable category

Land use	Events	%
Residential	1042	28
Mixed Residential	611	16
Commercial	527	14
Mixed Commercial	324	8.6
Industrial	566	15
Mixed Industrial	249	6.6
Institutional	18	0.48
Open Space	49	1.3
Mixed Open Space	168	4.5
Freeways	185	4.9
Mixed Freeways	26	0.69

EPA Rain Zone	Events	%
1	69	1.8
2	2000	53
3	266	7.1
4	212	5.6
5	485	13
6	356	9.5
7	229	6.1
8	24	0.64
9	124	3.3

Controls	Events	%
Channel Weirs (CW)	30	0.80
Dry Pond (DP)	50	1.3
Detention Storage (enlarged pipe) (DS)	17	0.45
Wet Pond at Outfall (WP)	113	3.0
Wet Pond in Watershed (WP_W)	182	4.8
Wet Pond in Series at Outfall (WP_S)	42	1.1
None	3331	88

Sample Analysis	Events	%
Composite, type not specified	718	19
Flow Composite	2752	73
Time Composite	295	7.8

Type of Conveyance	Events	%
Curb and gutter	2454	65
Grass swale	344	9.1
Not specified	967	26

Sampler	Events	%
Automatic	3055	81
Manual	393	10
Not specified	317	8.4

About 80% of the samples were collected using automatic samplers. It was observed that manual sampling can result in lower TSS concentrations compared to automatic sampling procedures. This may occur, for example, if the manual sampling team arrives after the start of runoff and therefore misses the first flush (if it exists for the site), resulting in reduced event mean concentrations. For those sites using automatic samplers, about 73% of the events

were collected using flow-composite samplers, 8% were collected using time-composite samplers, and about 19% did not have any designation available. Flow-composite samples are considered more accurate than time-composite samples when obtaining data for event mean concentrations, unless very large numbers of subsamples are obtained (Roa-Espinosa and Bannerman 1995).

Almost 66% of the events were collected at sites drained with conventional curbs and gutters, 9% were collected at sites having roadside grass swales, and it was not possible to determine the drainage system for about 25% of the samples. Grass swales can reduce the concentrations of suspended solids and metals, especially during low flows. They can also infiltrate large quantities of the stormwater, reducing pollutant mass discharges, runoff volume, and peak flows.

Effects of Stormwater Controls on Stormwater Quality

It is hoped that stormwater controls located in a watershed, or at an outfall, would result in significant reductions in stormwater pollutant concentrations. Figure 36 shows the effects on effluent TSS concentrations when using various controls in residential area watersheds in EPA Rain Zone 2 (Maryland, Virginia, North Carolina, Tennessee and Kentucky), an area having enough samples for an effective statistical analysis. The controls noted for these locations included:

- Channel weir: a flow measurement weir in an open channel that forms a small pool (a very small wet pond).
- Dry pond (DP): a dry detention pond that drains completely between each storm event.
- Wet pond (WP): a wet detention pond that retains water between events, forming a small lake or pond. If the pond is in the watershed but not at the outfall, this will be considered a wet pond inside of the watershed (WPW), which would only treat a fraction of the total stormwater from the site
- Detention storage (DS): Oversize pipes with small outlet orifices, usually under parking lots.

The stormwater monitoring was conducted at the outfalls of the drainage areas, after the stormwater controls. Wet ponds are seen to reduce the TSS concentration in the stormwater more than the other controls (about 78%) compared to the “no control” median value. Detention storage units and dry ponds also reduced the TSS concentrations, but to a smaller extent (about 60% and 37% respectively). Only one site (located in Virginia Beach) had a channel weir control, but that site did not reduce the observed TSS concentrations compared to the “no control” category. The effectiveness of the stormwater controls were evaluated for each constituent separately. The effects of sample analysis method, sampler instrument, and type of conveyance were also examined.

The first step was to identify the suitable subsets that could be examined, based on suitable numbers of samples in each category. The following four land uses and EPA Rain Zones had suitable numbers of sites having controls that could be examined: residential, commercial and industrial areas in EPA Rain Zone 2 and industrial areas in EPA Rain Zone 3. For each group, one-way ANOVA analyses were used to identify if there were any differences in the concentrations of 13 constituents (after log-transformations and substitutions for non-detectable values) for those sites that included different controls. Dunnet’s method was also used to compare sites with each specific stormwater control type with sites without stormwater controls, using a family error rate of 5%. Table 23 shows the results for these analyses for each of these groups.

Tables 23 through 26 show that there are no significant differences between sites with or without wet ponds for all constituents having observations in industrial land uses in EPA Rain Zone 3. Nitrite-nitrate, total phosphorus, total copper and total zinc were significantly lower in concentrations at sites located in EPA Rain Zone 2, having wet ponds before the outfall, compared to sites without stormwater controls. Wet ponds did not reduce the TKN concentrations in any of the four groups. Significant reductions in TSS concentrations were also observed for sites having wet ponds in residential and commercial land uses, but not in industrial land uses.

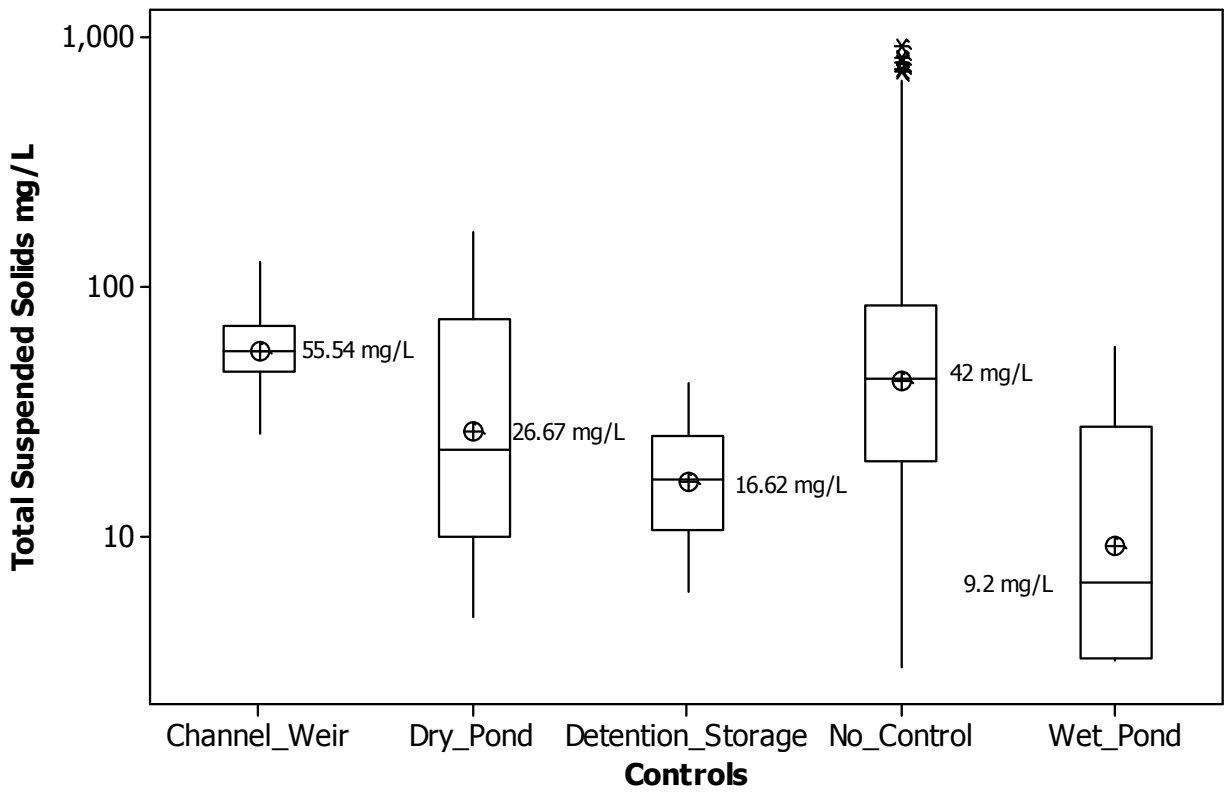

Figure 36. TSS distribution by controls in residential areas and EPA Rain Zone 2 (the cross circles indicate the average concentrations, while the median concentrations are written next to the median bar in the box diagrams)

Table 23. One-Way ANOVA Results by Control Type in Residential Land Use, Rain Zone 2

	Hardness mg/L			Oil and Grease mg/L			TDS mg/L			TSS mg/L		
p-value		***0.024****			0.999			***0***			***0***	
	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet
Weir				3	2.50	=	29	112.80	>	29	55.54	=
DP				3	2.68	=	3	58.88	=	21	26.67	=
DS	7	44.38	=	9	2.19	=	8	98.45	=	9	14.46	<
No Control	61	30.77		202	2.38		424	62.42		559	40.10	
WP	10	66.45	>	13	2.50	=	12	120.39	>	12	9.25	<

	BOD_5 mg/L			COD mg/L			Ammonia mg/L			$NO_2 + NO_3$ mg/L		
p-value		***0***			***0***			***0***			***0***	
	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet
Weir	29	6.16	<	29	49.02	=	29	0.05	<	29	0.05	<
DP	21	3.44	<	3	33.45	=	3	0.41	=	21	0.59	=
DS	9	3.66	<	9	22.17	<	9	0.40	=	9	0.98	=
No Control	533	11.07		418	56.91		409	0.24		546	0.54	
WP	12	3.10	<	12	24.58	<	12	0.07	<	12	0.28	<

	TKN mg/L			Dissolved Phosphorus mg/L			Total Phosphorus mg/L			Total Copper µg/L		
p-value		***0.012***			***0***			***0***			***0***	
	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet
Weir	29	1.49	=	29	0.04	<	29	0.23	=	3	2.69	<
DP	21	0.79	<	3	0.15	=	21	0.12	<	21	6.16	<
DS	9	1.38	=	8	0.11	=	9	0.15	<	9	20.75	>
No Control	549	1.34		404	0.14		550	0.30		403	11.01	
WP	12	1.04	=	12	0.03	<	12	0.07	<	4	3.13	<

	Total Lead µg/L			Total Zinc µg/L		
p-value		***0***			***0***	
	n	median	Dunnet	n	median	Dunnet
Weir	3	6.41	<	3	4.11	<
DP	21	1.50	<	21	29.63	<
DS	9	1.16	<	9	103.25	>
No Control	364	7.73		405	67.56	
WP	4	1.00	<	4	10.44	<

Table 24. One-Way ANOVA Results by Control Type in Commercial Land Use, Rain Zone 2

	Hardness mg/L			Oil and Grease mg/L			TDS mg/L			TSS mg/L		
p-value		0.717			0.082			0.477			***0***	
	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet
DS	8	58.17	=	8	1.84	=	8	100.69	=	8	19.54	<
No Control	35	58.97		100	4.20		174	74.89		244	48.13	
WP	11	71.80	=	17	2.84	=	26	89.99	=	26	19.47	<
WPW	9	47.11	=	13	3.36	=	13	71.12	=	13	16.85	<

	BOD_5 mg/L			COD mg/L			Ammonia mg/L			$NO_2 + NO_3$ mg/L		
p-value		***0***			***0***			***0***			***0***	
	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet
DS	8	4.44	<	8	27.18	<	8	0.30	=	8	1.18	=
No Control	241	14.66		174	73.62		174	0.39		242	0.60	
WP	26	7.06	<	26	35.99	<	26	0.13	<	26	0.48	=
WPW	12	5.41	<	13	23.88	<	13	0.16	<	13	0.22	<

	TKN mg/L			Dissolved Phosphorus mg/L			Total Phosphorus mg/L			Total Copper µg/L		
p-value		0.057			***0***			***0***			***0***	
	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet
DS	8	1.04	=	7	0.09	=	8	0.16	=	8	14.14	=
No Control	241	1.59		161	0.11		238	0.25		194	17.53	
WP	26	1.19	=	25	0.05	=	26	0.13	<	6	5.57	<
WPW	13	1.03	=	13	0.03	=	13	0.08	<	4	6.00	<

	Total Lead µg/L			Total Zinc µg/L		
p-value		***0***			***0***	
	n	median	Dunnet	n	median	Dunnet
DS	8	1.61	<	8	82.57	<
No Control	194	16.41		197	188.02	
WP	7	4.90	<	7	44.26	<
WPW	4	2.49	<	4	39.68	<

Table 25. One-Way ANOVA Results by Control Type in Industrial Land Use, Rain Zone 2

	Hardness mg/L			Oil and Grease mg/L			TDS mg/L			TSS mg/L		
p-value		none			***0***			none			0.693	
	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet
No Control				81	3.85					205	51.96	
WP				37	1.43	<				29	48.05	=

	BOD_5 mg/L			COD mg/L			Ammonia mg/L			$NO_2 + NO_3$ mg/L		
p-value		0.466			none			none			***0***	
	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet
No Control	200	10.63								197	0.61	
WP	29	9.30	=							29	0.30	<

	TKN mg/L			Dissolved Phosphorus mg/L			Total Phosphorus mg/L			Total Copper µg/L		
p-value		0.166			none			***0***			***0***	
	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet
No Control	198	1.22					200	0.23		150	16.00	
WP	29	0.98	=				29	0.09	<	29	7.38	<

	Total Lead µg/L			Total Zinc µg/L		
p-value		0.353			***0***	
	n	median	Dunnet	n	median	Dunnet
No Control	142	11.16		157	180.01	
WP	29	8.66	=	29	60.44	<

Table 26. One-Way ANOVA Results by Control Type in Industrial Land Use, Rain Zone 3

	Hardness mg/L			Oil and Grease mg/L			TDS mg/L			TSS mg/L		
p-value		None			None			0.112			0.281	
	n	median	Dunnet	n	median	Dunnet	N	median	Dunnet	n	median	Dunnet
No Control							44	69.53		44	48.35	
WP							25	49.84	=	25	70.40	=

	BOD_5 mg/L			COD mg/L			Ammonia mg/L			$NO_2 + NO_3$ mg/L		
p-value		0.221			0.395			0.165			0.193	
	n	median	Dunnet	n	median	Dunnet	N	median	Dunnet	n	median	Dunnet
No Control	44	6.41		44	37.00		3	0.12		30	0.57	
WP	23	5.14	=	25	43.06	=	25	0.03	=	25	0.40	=

	TKN mg/L			Dissolved Phosphorus mg/L			Total Phosphorus mg/L			Total Copper µg/L		
p-value		0.807			0.191			0.438			0.106	
	n	median	Dunnet	n	median	Dunnet	N	median	Dunnet	n	median	Dunnet
No Control	43	1.18		39	0.07		43	0.16		38	16.66	
WP	25	1.12	=	25	0.06	=	25	0.19	=	25	12.58	=

	Total Lead µg/L			Total Zinc µg/L		
p-value		0.454			0.608	
	n	median	Dunnet	n	median	Dunnet
No Control	31	8.49		38	143.28	
WP	25	6.73	=	25	156.93	=

Note. The bold, italicized probability values indicate "statistically significant" findings at the 0.05 level, or better.
Dunnet test compared if sites with control produces larger concentrations ">", smaller concentrations "<" or not statistically difference "=" than sites without control at a family error of 5%.
"None" indicates no samples were collected for this constituent in the group.

053367

Dry ponds were only available for evaluation in the residential land use category in EPA Rain Zone 2. No significant differences were found for TSS or nitrite-nitrate for sites having dry ponds. However, significant reductions of BOD_5, TKN, total phosphorus, total copper, total lead and total zinc were noted.

Some communities have installed detention-storage facilities (enlarged pipes) under parking lots to reduce runoff flow rates. More than 400 of these underground pipes are located in Arlington, Virginia, for example. A significant reduction in the TSS, BOD_5, COD, total lead, and total zinc concentrations were observed at sites with these underground devices. On the other hand, these controls did not indicate a significant difference in the concentrations of nutrients (ammonia, nitrite-nitrate, TKN, dissolved phosphorus and total phosphorus), compared to comparable sites not having stormwater controls. A conflicting situation was observed in EPA Rain Zone 2 for total zinc for sites having underground enlarged pipes. Zinc concentrations at residential land uses were significantly higher, while zinc concentrations at commercial areas were significantly lower, compared to sites with no stormwater controls. It is possible that the sites having elevated zinc concentrations used galvanized metal enlarged pipe systems.

Sampling Method Effects on Stormwater Concentrations

The use of manual or automatic sampling is a factor that is sometimes mentioned as having a possible effect on the quality of the collected samples. Manual sampling is usually preferred when the number of samples is small and when there are not available resources for the purchase, installation, operation, and maintenance of automatic samplers. Manual sampling may also be required when the constituents being sampled require specific handling (such as for bacteria, oil and grease, and volatile organic compounds) (ASCE/EPA 2002). Automatic samplers are recommended for larger sampling programs, when better representations of the flows are needed, and especially when site access is difficult or unsafe. In most cases, where a substantial number of samples are to be collected and when composite sampling is desired, automatic sampling can be much less expensive. Automatic samples also improve repeatability by reducing additional variability induced by the personnel from sample to sample (Bailey 1993). Most importantly, automatic samplers can be much more reliable compared to manual sampling, especially when the goal of a monitoring project is to obtain data for as many of the events that occur as possible, and sampling must start near the beginning of the rainfall (Burton and Pitt 2002).

Residential, commercial and industrial sites located in EPA Rain Zone 2 were used to evaluate any significant differences between the two sampling methods. One-way ANOVA analyses were used to identify any statistical differences between the two groups. Dunnet's test was used to compare manual sampling against automatic sampling. Tables 27 through 29 show the results from these ANOVA analyses.

Table 27. One-Way ANOVA Results by Type of Sampler in Residential Land Use, Rain Zone 2

	Hardness mg/L			Oil and Grease mg/L			TDS mg/L			TSS mg/L		
p-value		***0***						***0.004***			***0***	
	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet
Automatic	23	51.9		All manual			318	65.4		420	45.5	
Manual	28	22.4	<				66	50.0	<	78	19.2	<

	BOD_5 mg/L			COD mg/L			Ammonia mg/L			$NO_2 + NO_3$ mg/L		
p-value		0.162			***0***			0.909			***0.005***	
	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet
Automatic	396	11.3		312	62.2		310	0.229		410	0.51	
Manual	78	9,8	=	66	36.4	<	66	0.233	=	75	0.66	>

	TKN mg/L			Dissolved Phosphorus mg/L			Total Phosphorus mg/L			Total Copper µg/L		
p-value		***0.048***			0.308			***0***			***0.025***	
	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet
Automatic	410	1.40		302	0.136		416	0.325		256	11.57	
Manual	78	1.16	<	63	0.120	=	73	0.230	<	77	8.80	<

	Total Lead µg/L			Total Zinc µg/L		
p-value		***0***			***0.02***	
	n	median	Dunnet	n	median	Dunnet
Automatic	247	9.74		256	73.71	
Manual	71	4.14	<	76	53.22	<

Table 28. One-Way ANOVA Results by Type of Sampler in Commercial Land Use, Rain Zone 2

	Hardness mg/L			Oil and Grease mg/L			TDS mg/L			TSS mg/L		
p-value		***0***			***0.009***			0.25			***0***	
	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet
Automatic	23	97.86		70	4.75		123	76.36		179	52.29	
Manual	12	22.34	<	19	2.30	<	18	60.80	=	24	20.55	<

	BOD_5 mg/L			COD mg/L			Ammonia mg/L			$NO_2 + NO_3$ mg/L		
p-value		0.189			***0.003***			0.569			0.137	
	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet
Automatic	178	14.86		123	79.74		123	0.359		178	0.55	
Manual	23	11.70	=	18	44.02	<	18	0.433	=	23	0.75	=

	TKN mg/L			Dissolved Phosphorus mg/L			Total Phosphorus mg/L			Total Copper µg/L		
p-value		0.117			0.554			***0.003***			***0.001***	
	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet
Automatic	177	1.63		113	0.097		176	0.261		127	20.27	
Manual	24	1.21	=	17	0.115	=	23	0.157	<	23	11.80	<

	Total Lead µg/L			Total Zinc µg/L		
p-value		0.422			0.404	
	n	median	Dunnet	n	median	Dunnet
Automatic	130	17.62		130	208	
Manual	20	13.66	=	23	168	=

Table 29. One-Way ANOVA Results by Type of Sampler in Industrial Land Use, Rain Zone 2

	Hardness mg/L			Oil and Grease mg/L			TDS mg/L			TSS mg/L		
p-value		none			0.723			0.362			0.402	
	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet
Automatic				62	3.68		128	73.2		171	51.45	
Manual				14	4.10	=	10	100.0	=	19	62.82	=

	BOD_5 mg/L			COD mg/L			Ammonia mg/L			$NO_2 + NO_3$ mg/L		
p-value		0.112			0.371			***0***			***0.021***	
	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet
Automatic	166	9.65		127	55.02		122	0.243		163	0.558	
Manual	19	13.47	=	10	67.68	=	10	1.54	>	19	0.904	>

	TKN mg/L			Dissolved Phosphorus mg/L			Total Phosphorus mg/L			Total Copper µg/L		
p-value		***0.008***			0.870			***0.056***			0.797	
	n	median	Dunnet	n	median	Dunnet	N	median	Dunnet	N	median	Dunnet
Automatic	164	1.135		109	0.091		166	0.214		108	15.66	
Manual	19	1.944	>	10	0.086	=	19	0.315	=	22	14.97	=

	Total Lead µg/L			Total Zinc µg/L		
p-value		0.908			***0.028***	
	n	median	Dunnet	n	median	Dunnet
Automatic	109	11.27		115	156	
Manual	16	10.83	=	22	233	>

Note. The bold, italicized probability values indicate "statistically significant" findings at about the 0.05 level, or better.
Dunnet's test compared if sites with controls produce larger concentrations ">", smaller concentrations "<" or not statistically difference "=" than sites without controls at a family error of 5%.
"None" indicates no samples were collected for this constituent in the group.

053371

Tables 27 through 29 indicated that BOD_5 and dissolved phosphorus measurements are not affected by differences in sampling methods used in residential, commercial or industrial areas in EPA Rain Zone 2. In residential and commercial land uses, TSS and COD concentrations obtained using automatic samplers were almost twice the concentrations obtained when using manual sampling methods. Median total phosphorus concentrations were about 50% higher using automatic samplers, while no effects were noted for other nutrients. Figure 37 contains box and whisker plots comparing automatic versus manual sampling methods in residential land uses in EPA Rain Zone 2. TSS, total copper and total zinc have lower concentrations using manual sampling compared with automatic sampling (p-values of 0, 0.025 and 0.02 respectively). The opposite pattern was observed for nitrate-nitrate; manual sampling shows higher concentrations than samples collected with automatic samples (p-value of 0.005).

In industrial land uses, the pattern was found to be opposite. Ammonia, nitrate-nitrite, TKN and total zinc indicated higher concentrations when using manual sampling methods compared to using automatic samplers. Concentrations for these constituents were almost twice as high when using manual sampling, except for ammonia that was almost six times higher when manual sampling was used compared to automatic sampling methods. These elevated concentrations were observed in industrial sites located in Fairfax County Virginia, Howard County Maryland and the city of Charlotte in North Carolina. Sites with controls were not included in this analysis of the effects of sampling method.

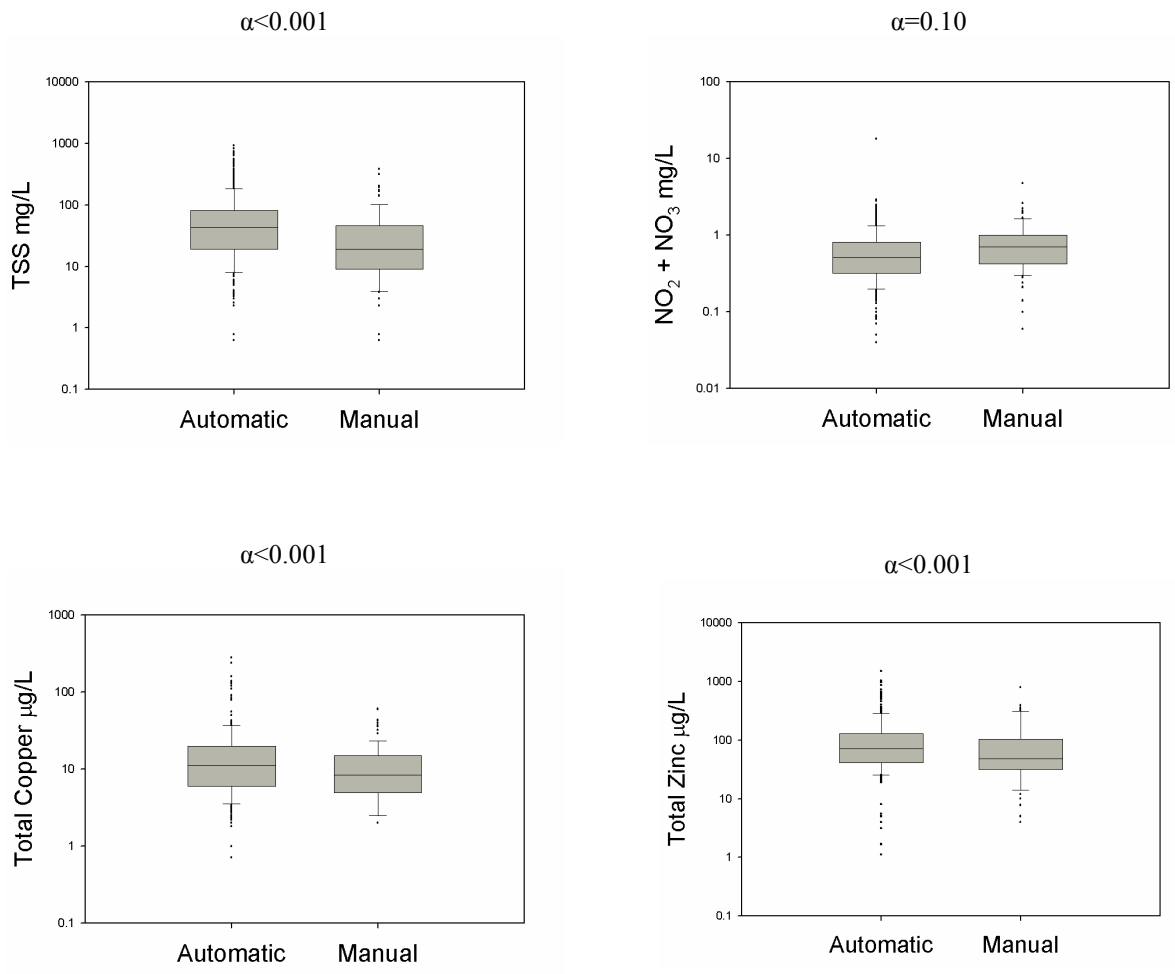

Figure 37. Comparison of reported concentrations in residential land use and EPA Rain Zone 2 for automatic vs. manual sampling methods

Sample Compositing Procedures

Time and flow-weighted composite options were also evaluated in residential, commercial, and industrial land uses in EPA Rain Zone 2 and in industrial land uses in EPA Rain Zone 3. With time-compositing, individual subsamples are combined for even time increments. As an example, automatic samplers can be programmed to collect a subsample every 15 minutes for deposit into a large composite bottle. An automatic sampler can also collect discrete subsamples at even time increments, keeping each sample in a separate smaller sample bottle. After the sampled event, these samples can be manually combined as a composite. With flow-weighted sampling, an automatic sampler can be programmed to deposit a subsample into a large composite bottle for each set increment of flow.

The Wisconsin Department of Natural Resources conducted a through evaluation of alternative sampling modes for stormwater sampling to determine the average pollutant concentrations for individual events (Roa-Espinosa and Bannerman 1995). Four sampling modes were compared at outfalls at five industrial sites, including: flow-weighted composite sampling, time-discrete sampling, time-composite sampling, and first flush sampling during the first 30 minutes of runoff. Based on many attributes, they concluded that time-composite sampling at outfalls is the best method due to simplicity, low cost, and good comparisons to flow-weighted composite sampling (assumed to be the most accurate). The time-composite sampling cost was about 25% of the cost of the time- discrete and flow-weighted sampling schemes, but was about three times the cost of the first flush sampling only. The accuracy and reproducibility of the composite samples were all good, while these attributes for the first flush samples were poor. Burton and Pitt (2001) stress that it is important to ensure that acceptable time-weighted composite sampling include many subsamples. Any sampling scheme is very inaccurate if too few samples are collected. Samples need to be collected to represent the extreme conditions during the event, and the total storm duration. Experimental design methods can be used to determine the minimum number of subsamples needed considering likely variations. It is more common to now include the use of “continuous” water quality probes at sampling locations, with in-situ observations obtained every few minutes. Unfortunately, these details were not available for the NSQD sampling sites; some sites may have had too few subsamples to represent the storm conditions, while others may have had sufficient numbers of subsamples. Also, most of the NSQD samples only represented the first 3 hours of runoff events. If events were longer, the later storm periods were likely not represented. These issues are discussed more in the next subsection.

One-way ANOVA tests were used to evaluate the presence of significant differences between these two composite sampling schemes. Dunnet’s comparison test was used to evaluate if concentrations associated with time-compositing were larger or lower than concentrations associated with flow- compositing. Tables 30 through 33 show the results of these tests.

Table 30. One-Way ANOVA Results by Sample Compositing Scheme in Residential Land Use, Rain Zone 2

	Hardness mg/L			Oil and Grease mg/L			TDS mg/L			TSS mg/L		
p-value		none						0.229			***0***	
	n	median	Dunnet	n	median	Dunnet	n	Median	Dunnet	n	median	Dunnet
Flow composite				No composite			351	64.02		398	36.08	
Time composite							14	76.90	=	80	90.30	>

	BOD_5 mg/L			COD mg/L			Ammonia mg/L			$NO_2 + NO_3$ mg/L		
p-value		0.785			0.416			***0***			0.097	
	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet
Flow composite	379	11.04		348	56.28		345	0.24		388	0.52	
Time composite	78	10.75	=	14	47.93	=	14	0.62	>	80	0.60	=

	TKN mg/L			Dissolved Phosphorus mg/L			Total Phosphorus mg/L			Total Copper µg/L		
p-value		0.215			0.832			***0***			***0***	
	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet
Flow composite	391	1.30		334	0.139		392	0.292		228	9.99	
Time composite	80	1.46	=	14	0.132	=	80	0.426	>	85	16.89	>

	Total Lead µg/L			Total Zinc µg/L		
p-value		***0***			***0***	
	n	median	Dunnet	n	median	Dunnet
Flow composite	222	5.94		227	50.77	
Time composite	85	19.62	>	85	142	>

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Table 31. One-Way ANOVA Results by Sample Compositing Scheme in Commercial Land Use, Rain Zone 2

	Hardness mg/L			Oil and Grease mg/L			TDS mg/L			TSS mg/L		
p-value		none			Few samples			Few samples			***0***	
	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet
Flow composite										163	38.18	
Time composite										30	135.6	>

	BOD_5 mg/L			COD mg/L			Ammonia mg/L			$NO_2 + NO_3$ mg/L		
p-value		0.563			Few samples			Few samples			0.875	
	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet
Flow composite	162	13.43								163	0.583	
Time composite	30	14.56	=							30	0.567	=

	TKN mg/L			Dissolved Phosphorus mg/L			Total Phosphorus mg/L			Total Copper µg/L		
p-value		0.637			Few samples			0.118			***0***	
	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet
Flow composite	163	1.47					161	0.242		115	14.91	
Time composite	30	1.36	=				30	0.194	=	30	36.34	>

	Total Lead µg/L			Total Zinc µg/L		
p-value		***0***			***0***	
	n	median	Dunnet	n	median	Dunnet
Flow composite	115	11.96		115	156	
Time composite	30	52.23	>	30	408	>

Table 32. One-Way ANOVA Results by Sample Compositing Scheme in Industrial Land Use, Rain Zone 2

	Hardness mg/L			Oil and Grease mg/L			TDS mg/L			TSS mg/L		
p-value		none			Few samples			0.076			***0***	
	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet
Flow composite							101	68.5		116	44.2	
Time composite							9	132.9	=	40	84.6	>

	BOD_5 mg/L			COD mg/L			Ammonia mg/L			$NO_2 + NO_3$ mg/L		
p-value		0.861			0.519			***0***			0.488	
	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet
Flow composite	112	9.67		100	53.93		96	0.25		109	0.547	
Time composite	39	9.94	=	9	63.04	=	9	1.11	>	39	0.614	=

	TKN mg/L			Dissolved Phosphorus mg/L			Total Phosphorus mg/L			Total Copper μg/L		
p-value		0.672			0.601			0.338			0.070	
	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet
Flow composite	109	1.06		82	0.087		111	0.208		72	15.75	
Time composite	40	1.13	=	9	0.074	=	40	0.242	=	40	21.27	=

	Total Lead μg/L			Total Zinc μg/L		
p-value		***0.001***			0.930	
	n	median	Dunnet	n	median	Dunnet
Flow composite	66	9.34		72	189.7	
Time composite	40	22.23	>	40	186.8	=

Table 33. One-Way ANOVA Results by Sample Compositing Scheme in Industrial Land Use, Rain Zone 3

	Hardness mg/L			Oil and Grease mg/L			TDS mg/L			TSS mg/L		
p-value		none			none			***0.012***			0.103	
	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet
Flow composite							16	93.93		16	22.44	
Time composite							20	43.11	<	20	52.38	=

	BOD_5 mg/L			COD mg/L			Ammonia mg/L			$NO_2 + NO_3$ mg/L		
p-value		0.265			0.088			none			***0.006***	
	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet
Flow composite	16	5.32		16	33.38					9	0.248	
Time composite	20	7.25	=	20	50.36	=				19	0.844	>

	TKN mg/L			Dissolved Phosphorus mg/L			Total Phosphorus mg/L			Total Copper μg/L		
p-value		***0.002***			***0***			0.556			0.143	
	n	median	Dunnet	n	median	Dunnet	N	median	Dunnet	N	median	Dunnet
Flow composite	15	0.64		11	0.035		15	0.161		15	12.56	
Time composite	20	1.63	>	20	0.116	>	20	0.189	=	20	18.19	=

	Total Lead μg/L			Total Zinc μg/L		
p-value		0.279			0.163	
	n	median	Dunnet	n	median	Dunnet
Flow composite	10	9.75		15	108.9	
Time composite	19	6.08	=	20	161.4	=

Note. Dunnet's test compared if sites with control produces larger concentrations ">", smaller concentrations "<" or not statistically difference "=" than sites without control at a family error of 5%.
"None" indicates no samples were collected for this constituent in the group.

053377

Tables 30 through 33 show that no significant differences were observed for BOD_5 concentrations using either of the compositing schemes for any of the four categories. A similar result was observed for COD except for commercial land uses in EPA Rain Zone 2, where not enough samples were collected to detect a significant difference. TSS and total lead median concentrations in EPA Rain Zone 2 were two to five times higher in concentration when time-compositing was used instead of flow-compositing.

Nutrients in EPA Rain Zone 2 collected in residential, commercial and industrial areas showed no significant differences using either compositing method. The only exceptions were for ammonia in residential and commercial land use areas and total phosphorus in residential areas where time-composite samples had higher concentrations. Metals were higher when time-compositing was used in residential and commercial land use areas. No differences were observed in industrial land use areas, except for lead. Figure 38 shows box and whiskers plots for TSS using both methods.

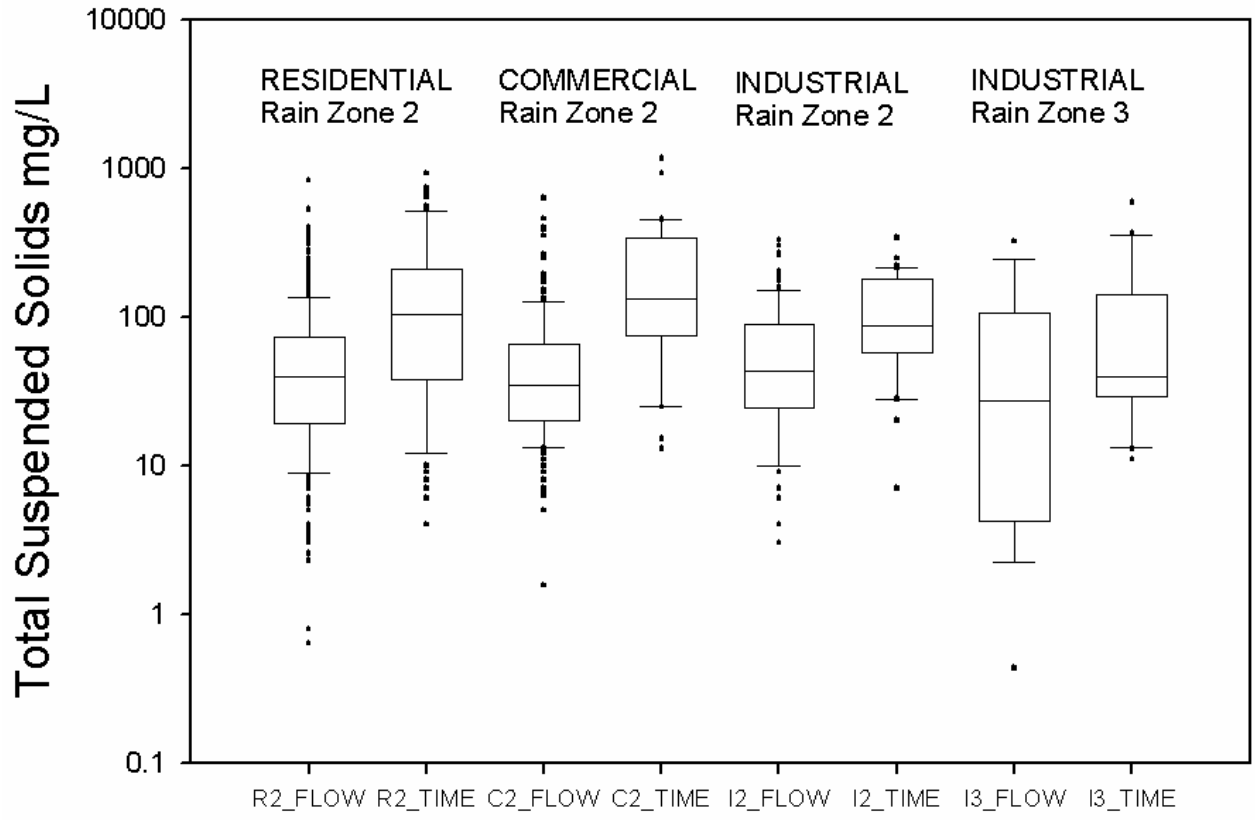

Figure 38. Comparisons between time- and flow-composite options for TSS

Sampling Period during Runoff Event and Selection of Events to Sample

Another potential factor that may affect stormwater quality is the sampling period during the runoff event. Automatic samplers can initiate sampling very close to the beginning of flow, while manual sampling usually requires travel time and other delays before sampling can be started. It is also possible for automatic samplers to represent the complete storm, especially if the storm is of long duration, as long as proper sampler setup programming is performed (Burton and Pitt 2001). However, automatic samplers are not capable of sampling bed load material, and are less effective in sampling larger particles (>500 µm). Manual sampling, if able to collect a sample from a cascading flow, can collect from the complete particle size distribution. Bed load samples and special floatable capture nets may be needed to supplement automatic samplers to obtain information for the complete range of solids.

The NPDES stormwater sampling protocols only required collecting composite samples over the first three hours of the event instead of during the whole event. Truncating the sampling before the runoff event ended may have adversely affected the measured stormwater quality.

Selecting a small subset of the annual events can also bias the monitoring results. In most stormwater research projects, the goal is to sample and analyze as many events as possible during the monitoring period. As a minimum, about 30 samples are usually desired in order to adequately determine the stormwater characteristics with an error level of about 25% (assuming 95% confidence and 80% power) (Burton and Pitt 2001). With only three events per year required per land use for the NPDES stormwater permits, the accuracy of the calculated EMC is questionable until many years have passed. Also, the three storms need to be randomly selected from the complete set of rains in order to be most statistically representative, not just for a narrow range of rain depths as specified in the NPDES sampling protocol.

Flagstaff Street, in Prince George MD, had the most events collected for any site in the NSQD. They collected 28 events during two years of sampling (1998 and 1999). A statistical test was made choosing 6 events (three for each year) from this set, creating 5,600 different possibilities. Figure 39 shows the histogram of these possibilities. The median TSS of the 28 events was 170 mg/L, with a 95% confidence interval between 119 and 232 mg/L. Only 60% of the 5,600 possibilities were inside this confidence interval. Almost half (40%) of the possibilities for the observed EMC would therefore be outside the 95% confidence interval for the true median concentration if only three events were available for two years. As the number of samples increase, there will be a reduction in the bias of the EMC estimates. In Southern California, Leecaster (2002) determined that ten years of collecting three samples per year was required in order to reduce the error to 10%.

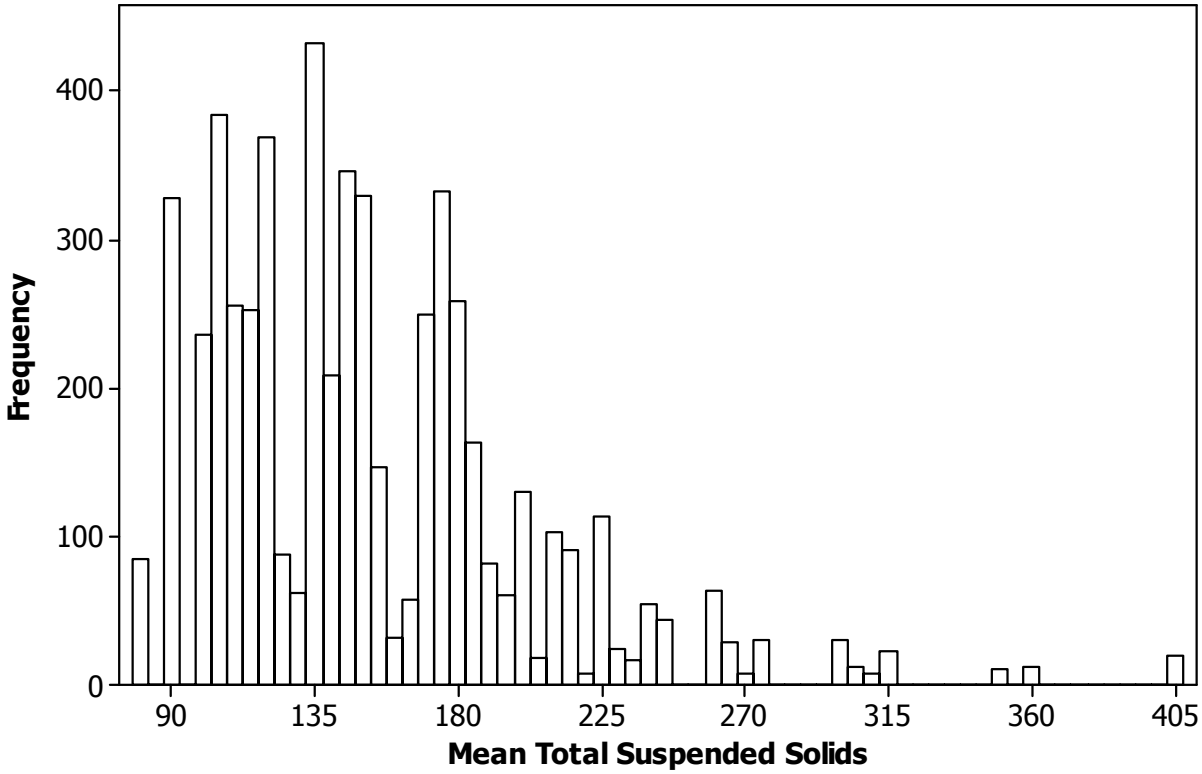

Figure 39. Histogram of possible TSS concentrations in Flagstaff Street based on collecting three samples per year for two years (the measured median TSS concentration was 170 mg/L)

Type of Conveyance

Almost all of the samples in the NSQD were collected using automatic samplers and flow compositing. Statistical tests investigating the effects of the type of conveyance only used information from flow-weighted composite samples to reduce potential errors associated with other sampling schemes, as discussed above. Grass swales are considered to be effective stormwater controls compared to conventional curb and gutter stormwater collection systems. Grass swales are commonly found in residential areas with low levels of imperviousness, especially in low density residential areas. NSQD data from residential and mixed residential sites in Virginia, Georgia, and Texas were used to compare stormwater concentrations in areas drained by grass swales and by concrete curbs and gutters.

Historical swale performance tests usually focused on pollutant mass discharges and not concentrations. Swales normally infiltrate significant amounts of the flowing water, resulting in large mass discharge decreases. Most swales operate with relatively deep water, and any "filtering" benefits of the grass (and hence concentration reductions) are usually minimal. Very shallow flows in swales do have particulate pollutant concentration reductions, but these are rarely observed during moderate to large flows (Nara and Pitt 2005).

One-way ANOVA analyses were used to identify any significant differences in stormwater pollutant concentrations between watersheds drained with grass swales or with curbs and gutters. Dunnett's test was used to determine if grass swales produced different concentrations than curbs and gutters. The results are shown in Tables 34 through 37.

Table 34. One-Way ANOVA Results by Type of Conveyance in Residential Land Use, Rain Zone 2

	Hardness mg/L			Oil and Grease mg/L			TDS mg/L			TSS mg/L		
p-value		none			0.824			none			none	
	n	median	Dunnet	n	median	Dunnet	n	Median	Dunnet	n	median	Dunnet
Curb and Gutter				59	3.11							
Grass Swale				7	2.95	=						

	BOD_5 mg/L			COD mg/L			Ammonia mg/L			$NO_2 + NO_3$ mg/L		
p-value		none			none			none			none	
	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet
Curb and Gutter												
Grass Swale												

	TKN mg/L			Dissolved Phosphorus mg/L			Total Phosphorus mg/L			Total Copper μg/L		
p-value		none			none			none			***0***	
	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet
Curb and Gutter										82	10.67	
Grass Swale										7	3.11	<

	Total Lead μg/L			Total Zinc μg/L		
p-value		0.112			***0.002***	
	n	median	Dunnet	n	median	Dunnet
Curb and Gutter	77	11.7		82	59.46	
Grass Swale	7	5.67	=	7	17.85	<

Table 35. One-Way ANOVA Results by Type of Conveyance in Industrial Land Use, Rain Zone 2

	Hardness mg/L			Oil and Grease mg/L			TDS mg/L			TSS mg/L		
p-value		none			none			***0***			***0.023***	
	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet
Curb and Gutter							67	45.5		69	37.52	
Grass Swale							77	184	>	7	97.70	>

	BOD_5 mg/L			COD mg/L			Ammonia mg/L			$NO_2 + NO_3$ mg/L		
p-value		***0***			***0.035***			0.492			none	
	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet
Curb and Gutter	67	6.84		66	50.16		61	0.223				
Grass Swale	5	39.98	>	7	85.64	>	7	0.285	=			

	TKN mg/L			Dissolved Phosphorus mg/L			Total Phosphorus mg/L			Total Copper μg/L		
p-value		none			***0.012***			0.468			0.905	
	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet
Curb and Gutter				50	0.07		64	0.174		20	13.0	
Grass Swale				4	0.23	>	7	0.232	=	7	12.36	=

	Total Lead μg/L			Total Zinc μg/L		
p-value		none			0.447	
	n	median	Dunnet	n	median	Dunnet
Curb and Gutter				20	225.7	
Grass Swale				7	188.4	=

Table 36. One-Way ANOVA Results by Type of Conveyance in Residential Land Uses, Rain Zone 3

	Hardness mg/L			Oil and Grease mg/L			TDS mg/L			TSS mg/L		
p-value		none			none			***0.049***			0.425	
	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet
Curb and Gutter							11	94.06		12	19.2	
Grass Swale							6	47.84	<	6	29.6	=

	BOD_5 mg/L			COD mg/L			Ammonia mg/L			$NO_2 + NO_3$ mg/L		
p-value		0.749			***0.027***			none			none	
	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet
Curb and Gutter	11	7.56		11	29.36							
Grass Swale	5	6.63	=	5	67.27	>						

	TKN mg/L			Dissolved Phosphorus mg/L			Total Phosphorus mg/L			Total Copper μg/L		
p-value		0.17			0.324			0.319			0.007	
	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet
Curb and Gutter	11	1.22		8	0.07		12	0.22		11	19	
Grass Swale	6	0.94	<	6	0.04	=	6	0.14	=	6	5	<

	Total Lead μg/L			Total Zinc μg/L		
p-value		0.154			0.781	
	n	median	Dunnet	n	median	Dunnet
Curb and Gutter	9	12.9		11	49.5	
Grass Swale	6	4.20	=	6	43.0	=

053383

Table 37. One-Way ANOVA Results by Type of Conveyance in Industrial Land Use, Rain Zone 3

	Hardness mg/L			Oil and Grease mg/L			TDS mg/L			TSS mg/L		
p-value		none			none			0.134			***0.014***	
	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet
Curb and Gutter							10	76.74		10	9.68	
Grass Swale							6	131.6	=	6	91.2	>

	BOD_5 mg/L			COD mg/L			Ammonia mg/L			$NO_2 + NO_3$ mg/L		
p-value		0.461			0.446			none			none	
	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet	n	median	Dunnet
Curb and Gutter	10	4.68		10	29.40							
Grass Swale	6	6.61	=	6	41.26	=						

	TKN mg/L			Dissolved Phosphorus mg/L			Total Phosphorus mg/L			Total Copper μg/L		
p-value		0.299			0.077			0.460			0.098	
	n	median	Dunnet	n	median	Dunnet	N	median	Dunnet	N	median	Dunnet
Curb and Gutter	9	0.515		5	0.046		9	0.138		9	8.57	
Grass Swale	6	0.885	=	6	0.027	=	6	0.202	=	6	22.32	=

	Total Lead μg/L			Total Zinc μg/L		
p-value		0.157			***0.007***	
	n	median	Dunnet	n	median	Dunnet
Curb and Gutter	4	4.86		9	72.86	
Grass Swale	6	15.5	=	6	198.9	>

Note. Dunnet's test determined if sites with controls produce larger concentrations ">", smaller concentrations "<" or not statistically difference "=" than sites without control at a family error of 5%.
"None" indicates no samples were collected for this constituent in the group.

053384

Total lead and total phosphorus did not have any significant differences in concentrations when comparing the two conveyance systems in both land use areas. Total copper concentrations from residential land uses in EPA Rain Zones 2 and 3 were lower when grass swales were used instead of curbs and gutters. No copper concentration differences were observed at industrial land uses having different conveyance systems.

Figure 40 shows box and whiskers plots for TSS in industrial land uses, EPA Rain Zones 2 and 3 and residential areas in EPA Rain Zone 2. The median concentrations in industrial land uses were smaller in locations where curbs and gutters were used compared to sites having grass swales. The statistical tests did not identify a significant difference between the median concentrations in residential areas in EPA Rain Zone 3 (the residential boxes have much more overlap than for the industrial sites).

Concentration Effects Associated with Varying Amounts of Impervious Cover

The reported values for imperviousness do not reflect the amount of pavement and roofs that are not directly connected to the drainage system. Directly connected impervious areas (DCIA) are also referred to as effective impervious areas (EIA). For example, imagine a park with a single paved basketball court surrounded by turf; the area of the court will be counted as part of the total impervious area, but would not be considered as part of the effective impervious area. The runoff from the paved court would likely be totally infiltrated by the grass and will not be discharged to the drainage system. In this case, even if we have a value for "total imperviousness," the "effective percentage of imperviousness" is zero.

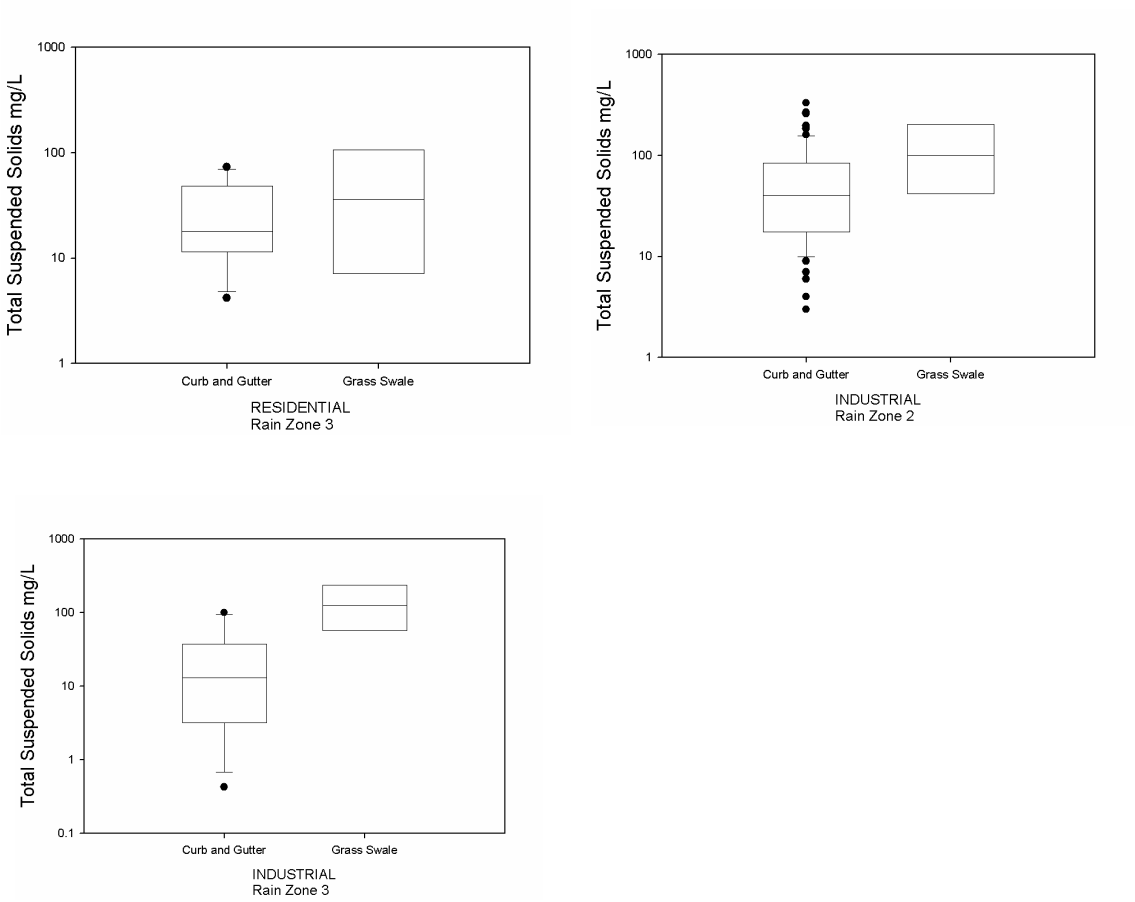

Figure 40. TSS concentration by type of conveyance (Significant differences were observed in industrial land uses)

It is therefore difficult to compare database concentrations with the imperviousness values due to these potential uncertainties in the actual effective imperviousness. Figure 41 is an example plot of the percent imperviousness values of different land uses for COD. Each vertical set of observations represent a single monitoring location (all of the events at a single location have the same percent imperviousness). The variation of COD at any one monitoring location is seen to vary greatly, typically by about an order of magnitude. These large variations will make trends difficult to identify. All of the lowest percentage imperviousness sites are open space land uses, while all of the highest percentage imperiousness sites are freeway and commercial land uses. This plot shows no apparent trend in concentration that can be explained by imperviousness. However, it is very likely that a significant and important trend does exist between percent effective imperviousness and pollutant mass that is discharged. While the relationship between imperviousness and concentration is not clear, the relationship between effective imperviousness and total runoff volume is much stronger and more obvious as the non-paved areas can infiltrate much water.

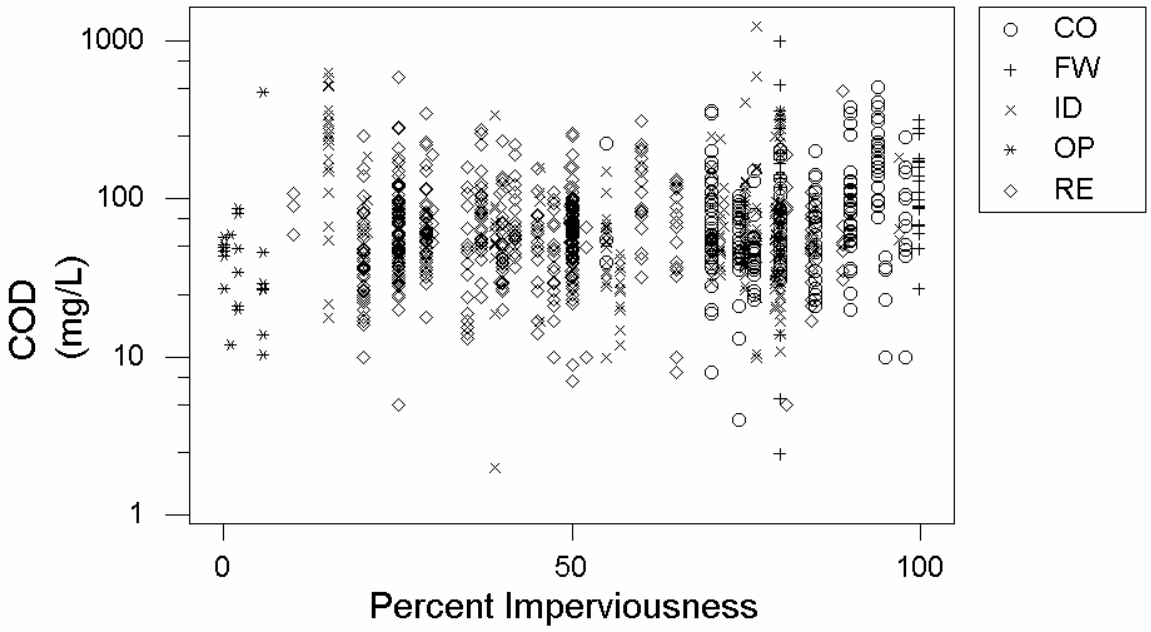

Figure 41. Plot of COD concentrations against watershed area percent imperviousness values for different land uses (CO: commercial; FW: freeway; ID: industrial; OP: open space; and RE: residential)

One important feature in the percentage of imperviousness is that most of the residential sites have low levels of imperviousness, while commercial and industrial sites usually have high percentages of imperviousness. Figure 42 shows the mean TSS concentration for residential, commercial and industrial land uses in the database. Only four of the monitored residential watersheds have percentage imperviousness values larger than 60%. Two commercial sites have less than 60% imperviousness, with the remaining commercial sites above this value. Analyses concerning the effects of impervious cover on stormwater concentrations for each land use separately are difficult as there are limited ranges of impervious cover within each land use category.

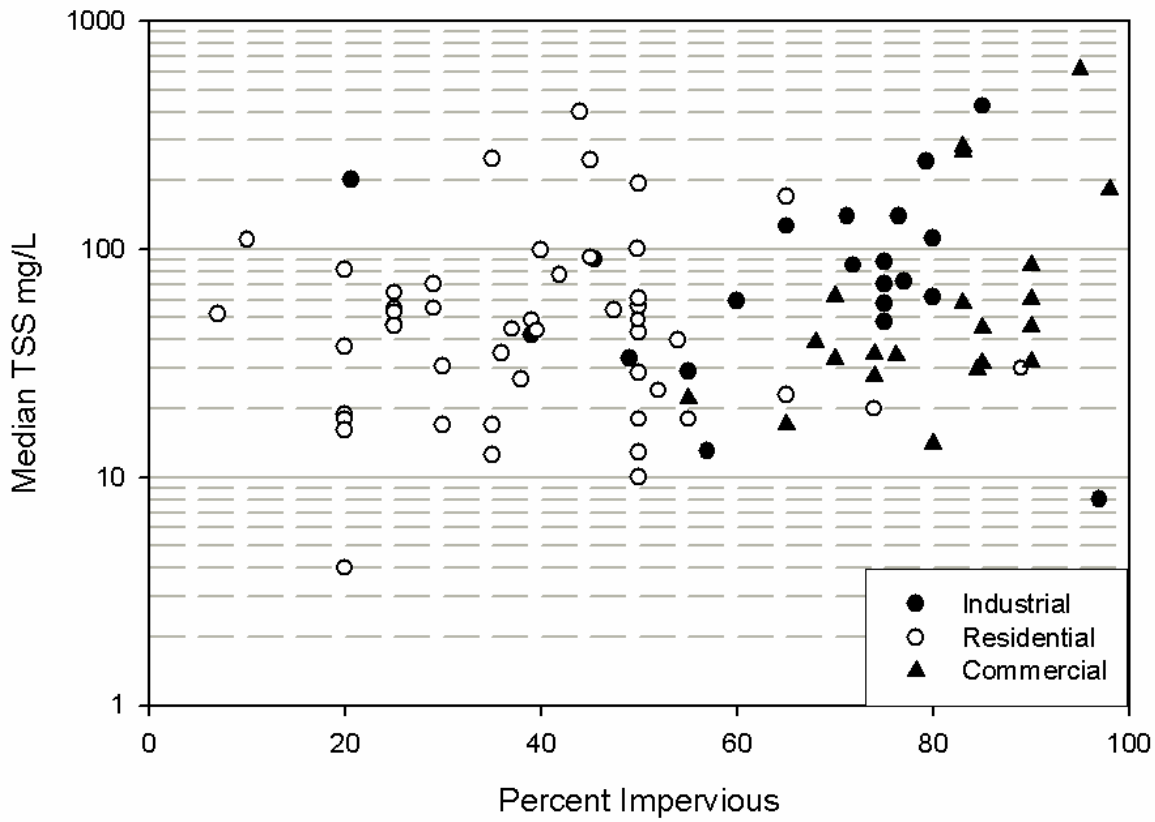

Figure 42. TSS concentrations by impervious cover and single land use

Regression analyses were used to identify possible relationships between constituent concentrations and the percentage of imperviousness for residential land use data. Table 38 shows the results from these regression analyses. Residential land uses in EPA Rain Zone 2 were examined during these analyses. Median concentrations from sites using automatic, flow-weighted samplers, and not having any controls and with curb and gutter conveyance systems were selected for analyses. Data from the site KYLOTSR3 were not used during these analyses because sewage disposal facilities were located in the test watershed. Solids and heavy metal median concentrations were higher at this location than for the remaining residential sites in the same Rain Zone.

Only nitrate-nitrite indicated a significant regression relationship between percentage of imperviousness and constituent concentration for these sites, as shown in Figure 43. In this case, the slope was negative, indicating a reduction in the concentration as the level of imperviousness increased. One possible explanation is that the nutrients are associated with landscaped areas and the use of fertilizers which all decrease with increasing impervious areas. This does not indicate that the total mass of nitrate-nitrite will be reduced. The load of this constituent depends on the total runoff volume that is discharged during the event. As the percentage of imperviousness increases, the runoff volume also increases due to lack of infiltration. Even if the concentration is shown to decrease, the total mass discharged may still increase with increasing amounts of pavement or roofs. There was not enough evidence to indicate a relationship between concentration and percentage of imperviousness for the other 11 constituents examined.

Table 38. Regression of Median Concentrations by Percentage of Impervious in Residential land Use, EPA Rain Zone 2

		Constant		Impervious			
Constituent	**n**	**Coefficient**	**p-value**	**Coefficient**	**p-value**	**R^2 adjusted**	**Significant at 0.05 level?**
TDS mg/L	10	71.94	0.002	-0.386	0.446	0	Not significant
TSS mg/L	10	74.44	0.002	-0.715	0.172	0.121	Not significant
BOD_5 mg/L	10	8.74	0.117	0.076	0.619	0	Not significant
COD mg/L	10	53.94	0.027	0.332	0.578	0	Not significant
Ammonia mg/L	10	0.319	0.052	-0.002	0.639	0	Not significant
NO_3-NO_2 mg/L	9	0.756	0	-0.009	***0.013***	0.556	Significant
TKN mg/L	9	1.817	0.003	-0.016	0.247	0.069	Not significant
DP mg/L	10	0.237	0.033	-0.003	0.349	0	Not significant
TP mg/L	10	0.561	0.002	-0.006	0.13	0.171	Not significant
Cu □g/L	11	16.51	0.005	-0.140	0.225	0.065	Not significant
Pb □g/L	11	46.64	0.336	-0.337	0.767	0	Not significant
Zn μg/L	11	98.13	0.027	-0.572	0.542	0	Not significant

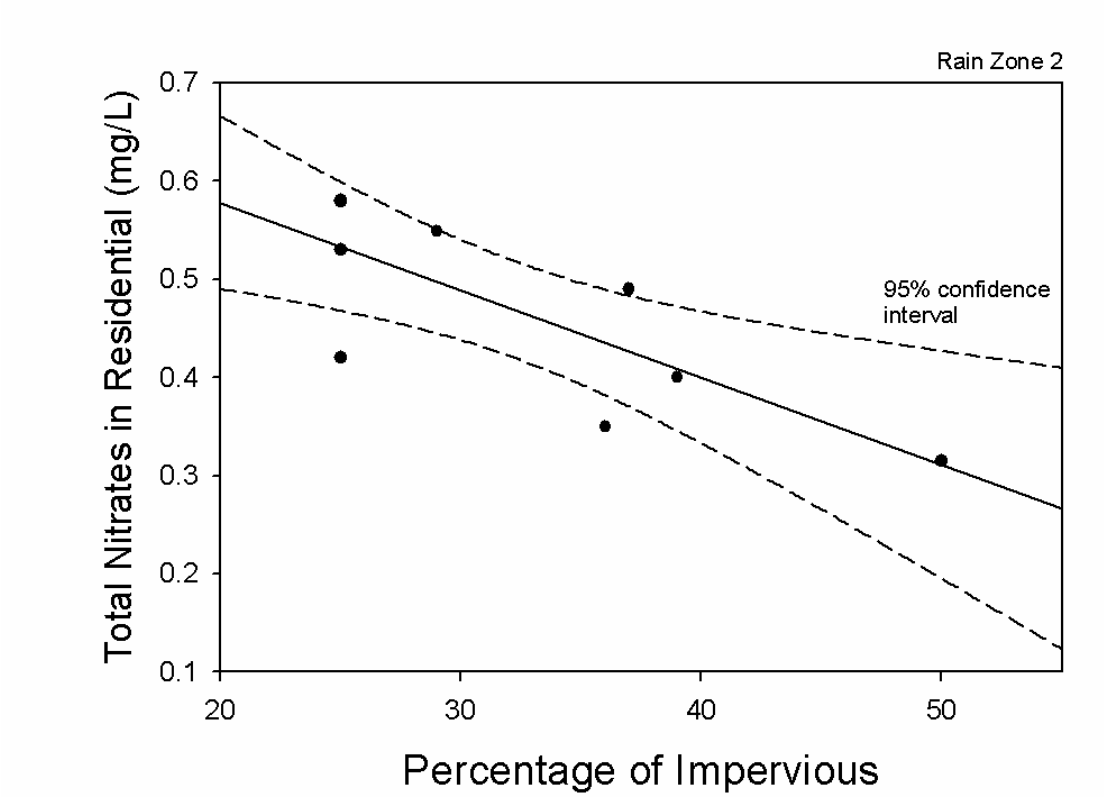

Figure 43. Total nitrates regression at different percentages of impervious

The same regression analysis was performed for commercial and industrial land uses in EPA Rain Zone 2. The results of the regression analyses are shown in Table 39.

Table 39. Regression of Median Concentrations by Percentage of Impervious in Commercial and Industrial land use, EPA Rain Zone 2

		Constant		Impervious			
Constituent	**n**	**Coefficient**	**p-value**	**Coefficient**	**p-value**	**R^2 adjusted**	**Significant at 0.05 level?**
TDS mg/L	5	-4.80	0.854	0.821	0.103	0.523	Not significant
TSS mg/L	5	-22.01	0.406	0.805	0.097	0.541	Not significant
BOD_5 mg/L	5	-1.80	0.879	0.153	0.410	0	Not significant
COD mg/L	5	1.41	0.968	0.748	0.215	0.268	Not significant
Ammonia mg/L	5	-0.05	0.906	0.005	0.439	0	Not significant
NO_3-NO_2 mg/L	5	0.01	0.985	0.007	0.438	0	Not significant
TKN mg/L	5	-0.84	0.467	0.030	0.140	0.426	Not significant
DP mg/L	5	-0.02	0.858	0.001	0.516	0	Not significant
TP mg/L	5	-0.10	0.649	0.004	0.271	0.168	Not significant
Cu μg/L	5	4.26	0.759	0.089	0.679	0	Not significant
Pb μg/L	6	15.69	0585	-0.021	0.961	0	Not significant
Zn μg/L	6	247.9	0.269	-0.949	0.765	0	Not significant

None of the median stormwater constituents in commercial and industrial areas seem to be affected by changes in impervious cover. There is not enough evidence to indicate a significant relationship between constituent concentration and percentage of imperviousness. More samples will be required to identify those regression relationships.

Seasonal Effects on Stormwater Quality

Another factor that may affect stormwater quality is the season when the sample was obtained. If the few samples collected for a single site were all collected in the same season, the results may not be representative of the whole year. The NPDES sampling protocols were designed to minimize this effect by requiring the three samples per year to be separated by at least 1 month. The few samples still could be collected within a single season, but at least not within the same week. Seasonal variations for residential stormwater data are shown in Figure 44. These variations are not as obvious as the land use or geographical variations, except for bacteria which appear to be lowest during the winter season and highest during the summer and fall (a similar conclusion was obtained during the NURP, EPA 1983, data evaluations). The database does not contain any snowmelt data, so all of the data corresponds to rain-related runoff only.

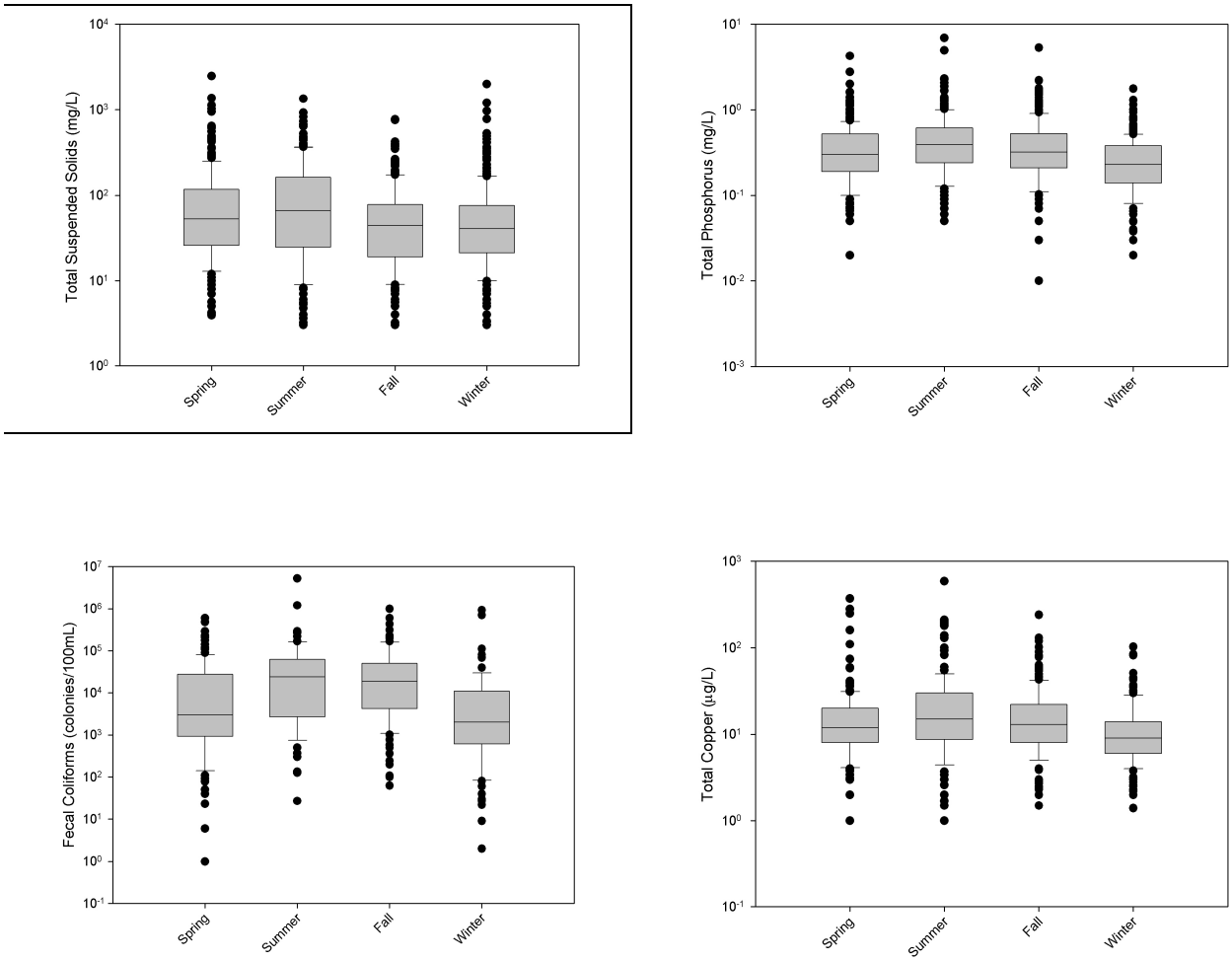

Figure 44. Example residential area stormwater pollutant concentrations sorted by season

Precipitation Depth Effects on Stormwater Quality

A common assumption is that higher runoff concentrations are associated with smaller rain events. While this has been shown to be true during controlled washoff studies (Pitt 1987), or for sheetflows taken from relatively small paved areas during rains (see Chapter 6 discussion about first flush observations), this has not been frequently detected for samples collected at outfalls for areas having a mixture of surfaces and for typical random periods of high rain intensities. Figure 45 contains several scatter plots showing concentrations plotted against rain depth. There are no obvious trends of concentration associated with rain depth for the NSQD data.

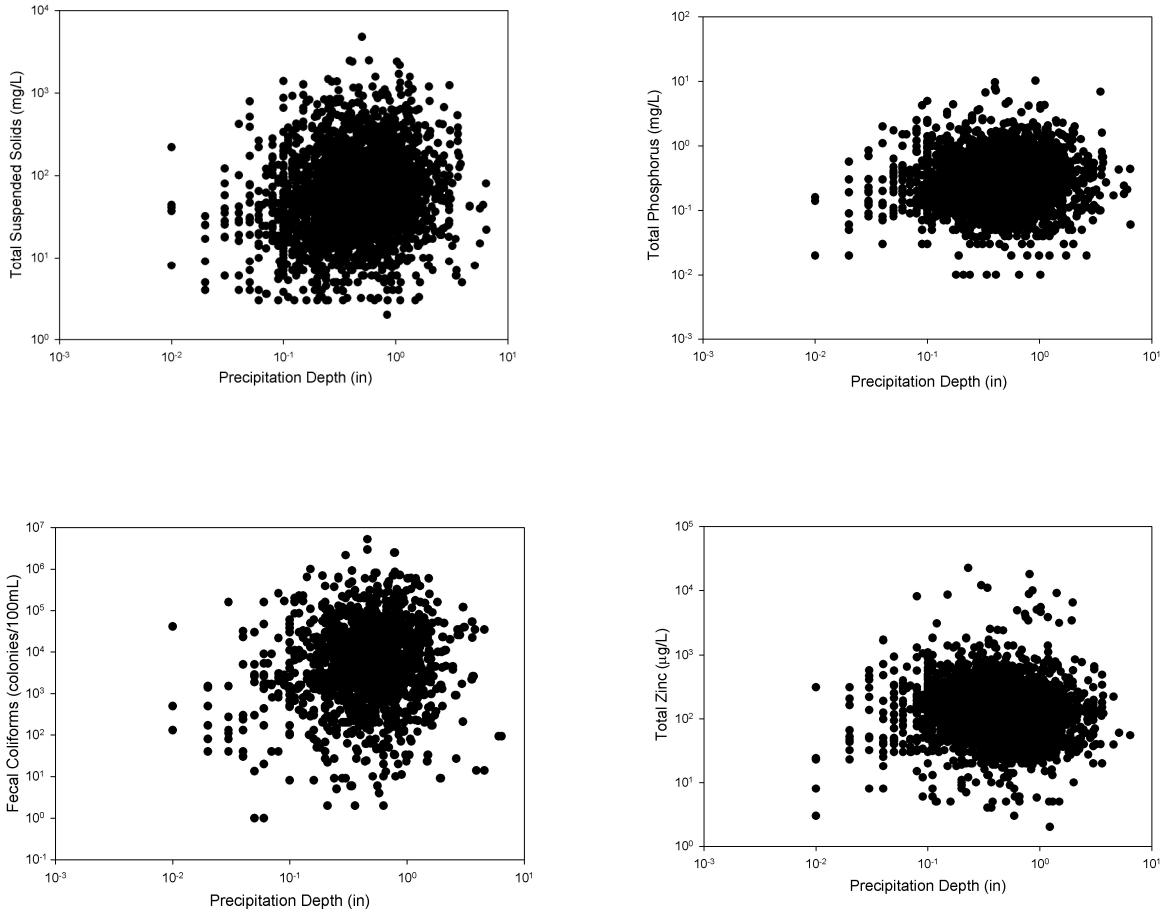

Figure 45. Examples of scatter plots by precipitation depth

Figure 46 shows scatter plots of rainfall and runoff depth for each land use. These should follow a 45 degree line for areas having very large amounts of directly connected impervious areas.

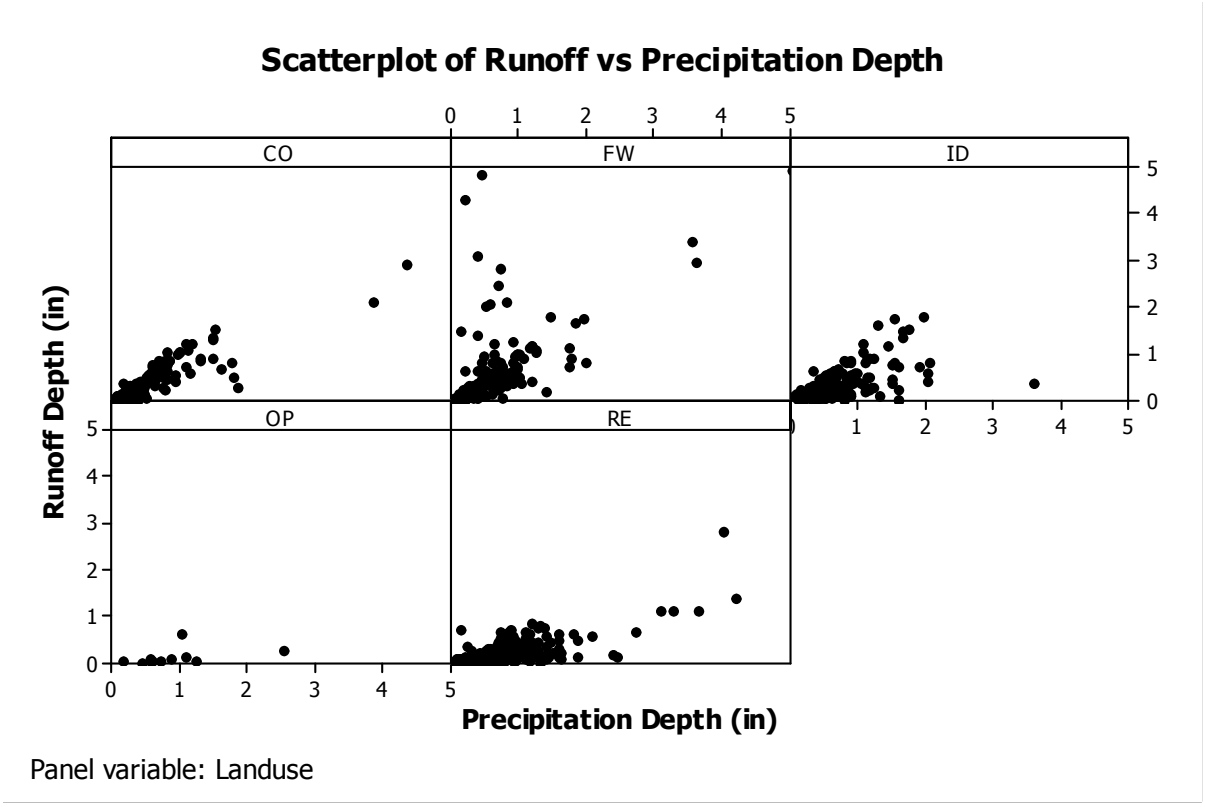

Figure 46. Precipitation depth and runoff depth plotted by land use

These plots show much greater scatter than expected. The freeway plot even indicated larger amounts of runoff than precipitation. This may have occurred due to several reasons: (1) the rainfall was not representative of the drainage area being monitored (especially possible for those sites that relied on off-site rain data); (2) the runoff monitoring was inaccurate (possible when the runoff monitoring relied on stage recording devices and the Manning's equation was applied without local calibration); (3) the drainage area was inaccurately delineated; or (4) when base flows contributed significant amounts of runoff during the event. When reviewing the runoff plots provided in some of the annual reports, significant base flows were observed. It was also apparent that these base flows were not subtracted from the total flows recorded during the rain event. The magnitude of the error would be greater for smaller rain events when the base flows could be much larger than the direct runoff quantity. Base flows commonly occur when a local spring or high groundwater levels enter the storm drainage system. In addition, runoff may still be occurring from a prior large event that ended soon before the current event started (the 3 day antecedent dry period requirement for monitored events was intended to minimize this last cause of base flows).

Antecedent Period without Rain before Monitored Event

The EPA Rain Zones with the longest reported dry interevent periods having data in the NSQD are EPA Rain Zones 6 (southern California) and 7 (Oregon). In these EPA Rain Zones, some antecedent dry periods were reported to be longer than 100 days. Monitored events with the shortest interevent periods of no rains were monitored along the east and south east coasts of the country (EPA Rain Zones 2 and 3). The mean interevent dry period in the western states was about 18 days, while eastern states had mean interevent dry periods of about 5 days. Figure 47 shows box and whisker plots of the number of days having no rain before the monitored event by each EPA Rain Zone.

Samples collected using automatic flow-weighted samplers from watersheds having curbs and gutters and without stormwater controls were used during the following analyses. Only EPA Rain Zone 2 has enough observations to evaluate possible effects of the antecedent dry period on the concentration of stormwater pollutants. Table 40 shows

the results from the regression analyses. In residential land uses, 7 out of 12 constituents indicated that antecedent dry period had a significant effect on the median concentrations. All the regression slope coefficients were positive, indicating that as the number of days having no rain increased, the concentrations also increased.

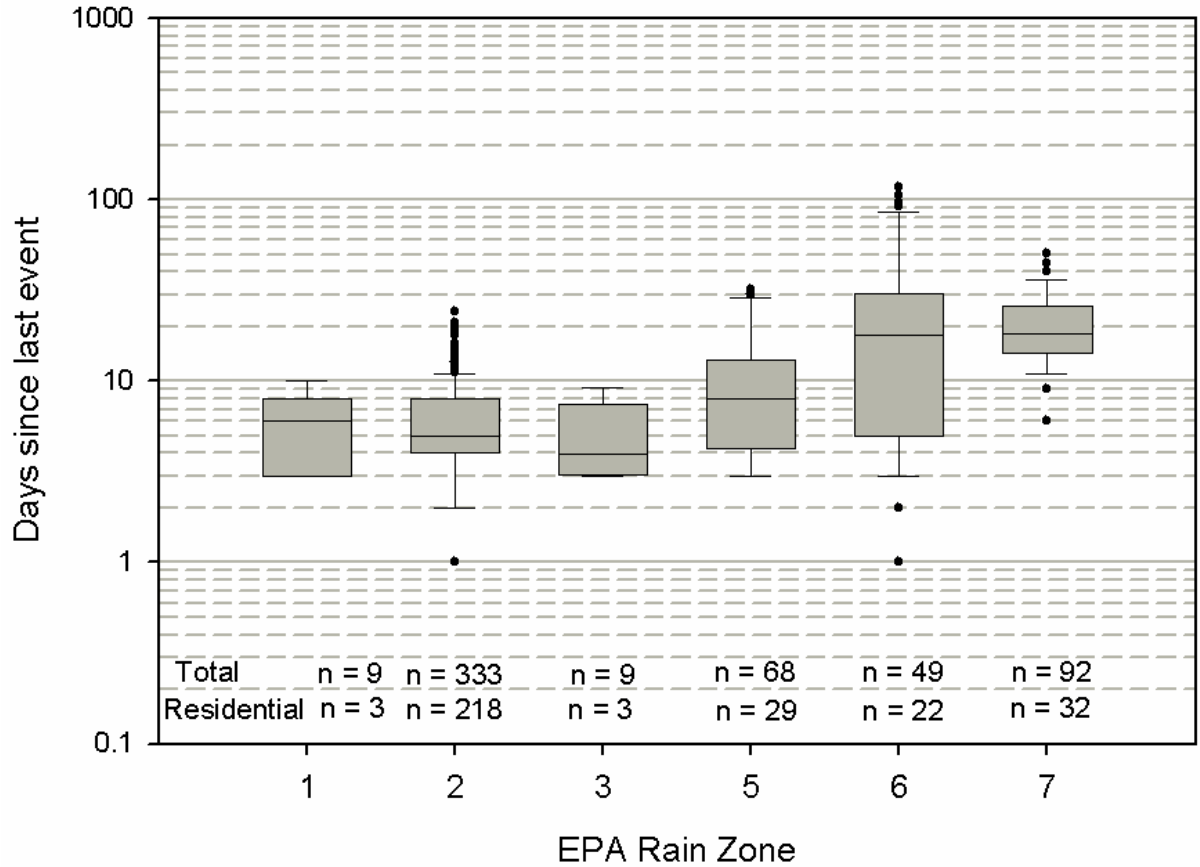

Figure 47. Box and whisker plot of dry days preceding rain event by EPA Rain Zone

Table 40. Regression of Logarithm of Constituent Concentrations by Logarithm of Antecedent Dry Period for Residential Land Use, EPA Rain Zone 2

		Constant		Days since last event			
Constituent	**n**	**Coefficient**	**p-value**	**Coefficient**	**p-value**	**R^2 adjusted**	**Significant at 0.05 level?**
Oil - Grease mg/L	35	0.737	0	-0.364	0.062	0.074	No
TDS mg/L	208	1.761	0	0.094	0.120	0.007	No
TSS mg/L	214	1.524	0	0.116	0.254	0.001	No
BOD_5 mg/L	211	0.887	0	0.211	***0.004***	0.035	Yes
COD mg/L	206	1.682	0	0.151	***0.032***	0.018	Yes
Ammonia mg/L	204	-0.826	0	0.300	***0.003***	0.039	Yes
NO_3-NO_2 mg/L	208	-0.428	0	0.160	***0.014***	0.024	Yes
TKN mg/L	208	-0.066	0.193	0.232	***0.001***	0.049	Yes
DP mg/L	203	-1.061	0	0.282	***0.002***	0.043	Yes
TP mg/L	214	-0.629	0	0.183	***0.005***	0.031	Yes
Cu μg/L	58	1.082	0	0.025	0.830	0	No
Pb μg/L	53	1.305	0	-0.311	0.277	0.004	No
Zn μg/L	58	1.872	0	-0.058	0.764	0	No

All nutrients (plus organic matter) in residential land uses showed a positive correlation between days since last event and constituent concentration. In all cases, the coefficients of determination (R^2) were smaller than 0.05, indicating that relatively little of the total variation was explained by antecedent dry period. Solids and metals were not affected by the antecedent dry period. Figure 48 shows the regression lines and 95% confidence intervals for four nutrients in residential land uses.

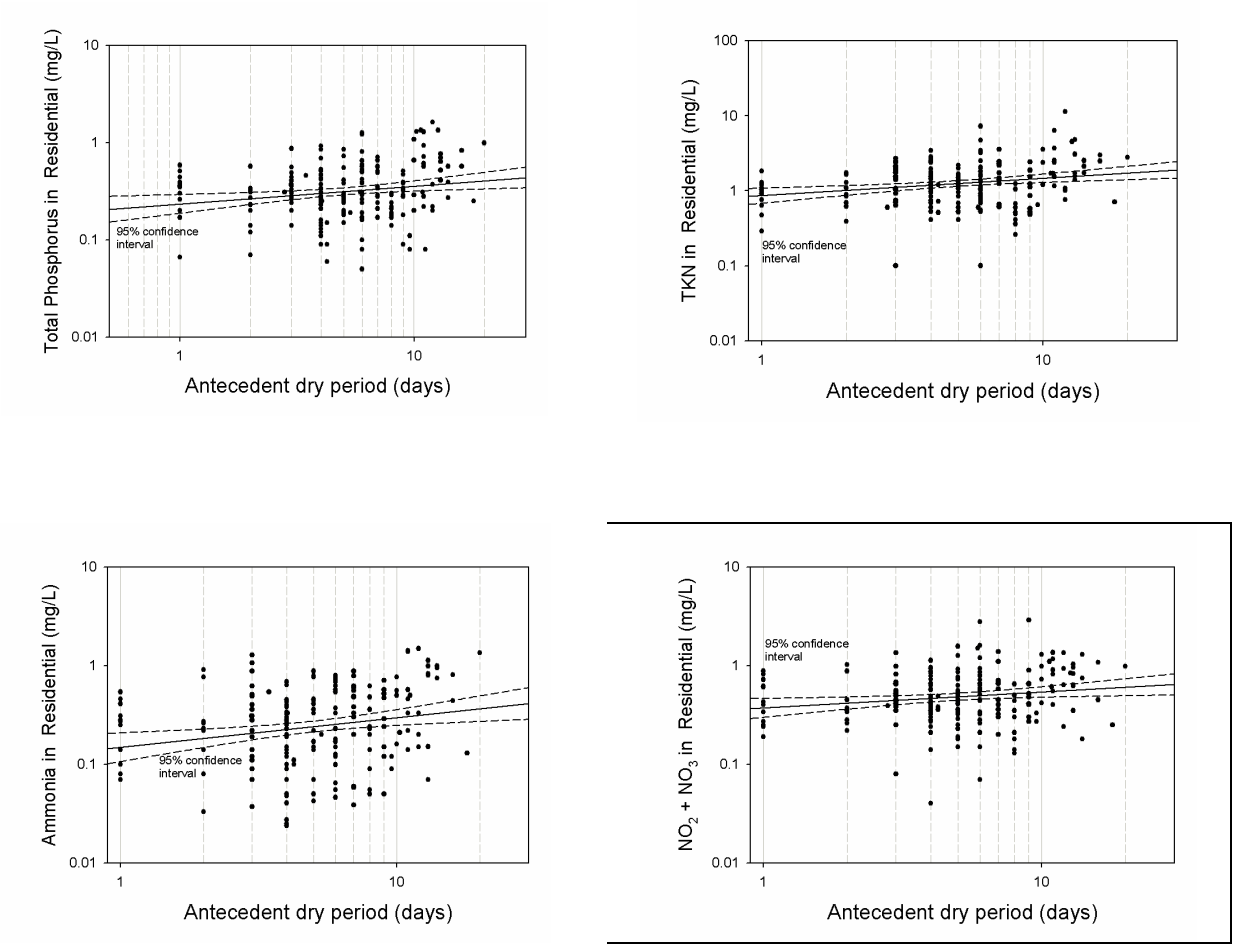

Figure 48. Nutrient concentrations affected by dry periods since last rain in residential land use

Table 41 shows the results from the regression analyses in commercial land uses. Except for nitrates, all the nutrients have positive regressions inside the 95% confidence interval. In commercial land uses, the effects of antecedent dry periods on the median concentrations were less important. Only total phosphorus and total lead had significant regression results. As in the residential case, phosphorus has a positive coefficient with a small coefficient of determination. However, lead decreases with the number of dry days before the storm.

Table 41. Regression of Logarithm of Constituent Concentrations by Logarithm of Antecedent Dry Period for Commercial Land Use, EPA Rain Zone 2

		Constant		Impervious			
Constituent	**n**	**Coefficient**	**p-value**	**Coefficient**	**p-value**	**R^2 adjusted**	**Significant at 0.05 level?**
Oil - Grease mg/L	25	0.783	0.001	-0.202	0.402	0	No
TDS mg/L	64	1.715	0	0.215	0.169	0.015	No
TSS mg/L	82	1.506	0	0.018	0.872	0	No
BOD_5 mg/L	83	0.971	0	0.149	0.176	0.01	No
COD mg/L	64	1.670	0	0.221	0.093	0.029	No
Ammonia mg/L	64	-0.591	0	0.258	0.175	0.014	No
NO2 mg/L	83	-0.235	0	-0.208	0.176	0.01	No
TKN mg/L	83	-0.006	0.949	0.196	0.109	0.019	No
DP mg/L	61	-1.329	0	0.241	0.160	0.017	No
TP mg/L	83	-0.784	0	0.198	***0.028***	0.047	Yes
Cu μg/L	33	1.081	0	0.959	0.501	0	No
Pb μg/L	33	1.498	0	-1.02	***0.001***	0.261	Yes
Zn μg/L	32	2.21	0	-0.082	0.527	0	No

Figure 49 shows the regression equations for total phosphorus and total lead for data from commercial land uses. The 95% confidence interval of the regression line for total phosphorus can include zero slope lines. This indicates that there is not a strong correlation between antecedent dry period and total phosphorus concentrations. For total lead, the reduction in concentrations with increasing dry periods is more obvious, but not very explicable.

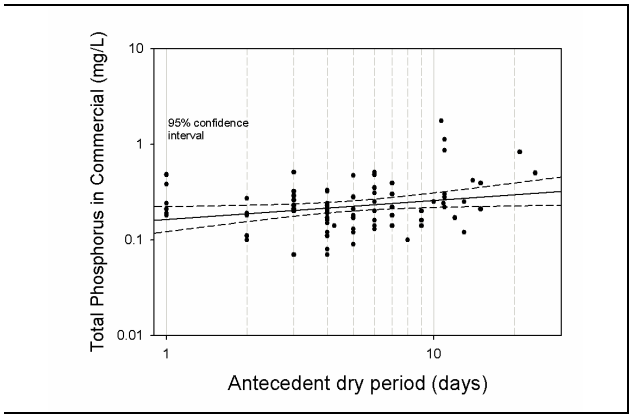

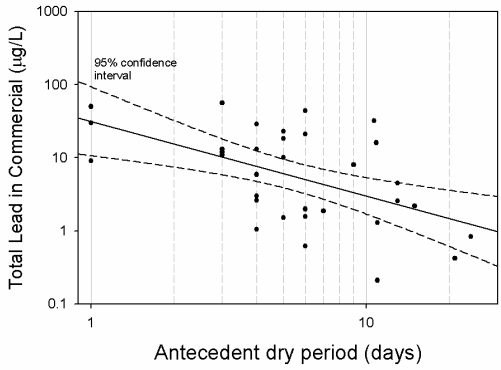

Figure 49. Total phosphorus and total lead concentrations as a function of antecedent dry period in commercial land use areas

The effect of the antecedent dry period on stormwater concentrations at industrial land uses was not significant, except for TSS, as shown on Table 42. Figure 50 is a plot of the TSS concentrations increasing with increasing dry periods.

Table 42. Regression of Logarithm of Constituent Concentrations by Logarithm of Antecedent Dry Period in Industrial Land Use, EPA Rain Zone 2

		Constant		Impervious			
Constituent	**n**	**Coefficient**	**p-value**	**Coefficient**	**p-value**	**R^2 adjusted**	**Significant at 0.05 level?**
Oil - Grease mg/L	3	0.271	0.773	-0.451	0.700	0	No
TDS mg/L	30	1.651	0	-0.009	0.958	0	No
TSS mg/L	31	1.190	0	0.656	***0.025***	0.134	Yes
BOD_5 mg/L	32	0.780	0	0.201	0.202	0.022	No
COD mg/L	29	1.685	0	0.071	0.622	0	No
Ammonia mg/L	27	-0.487	0.014	-0.084	0.753	0	No
NO2 mg/L	32	-0.154	0.233	-0.124	0.493	0	No
TKN mg/L	32	-0.151	0.215	0.218	0.207	0.021	No
DP mg/L	28	-1.176	0	0.190	0.406	0	No
TP mg/L	32	-0.966	0	0.373	0.11	0.053	No
Cu μg/L	3	1.109	0.124	0.216	0.565	0	No
Pb μg/L	3	0.882	0.197	0.119	0.787	0	No
Zn μg/L	3	2.072	0.056	0.186	0.555	0	No

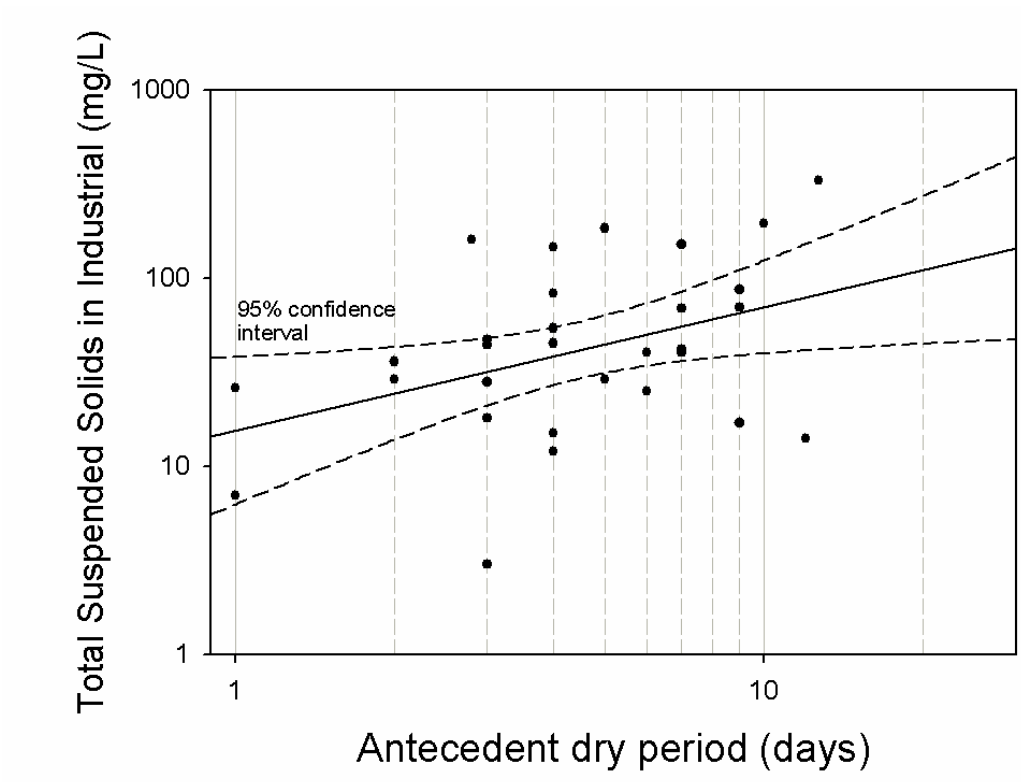

Figure 50. TSS concentrations vs. dry days since rain event in industrial land use areas

Trends in Stormwater Quality with Time

Figure 52 shows a plot of lead concentrations for residential areas only (in EPA Rain Zone 2), for the time period from 1991 to 2002. This plot shows likely decreasing lead concentrations with time. Statistically however, the trend line is not significant due to the large variation in observed concentrations ($p = 0.41$; there is insufficient data to show that the slope term is significantly different from zero). Likewise the COD concentrations have an apparent downward trend with time, but again, the slope term is not significant ($p = 0.12$).

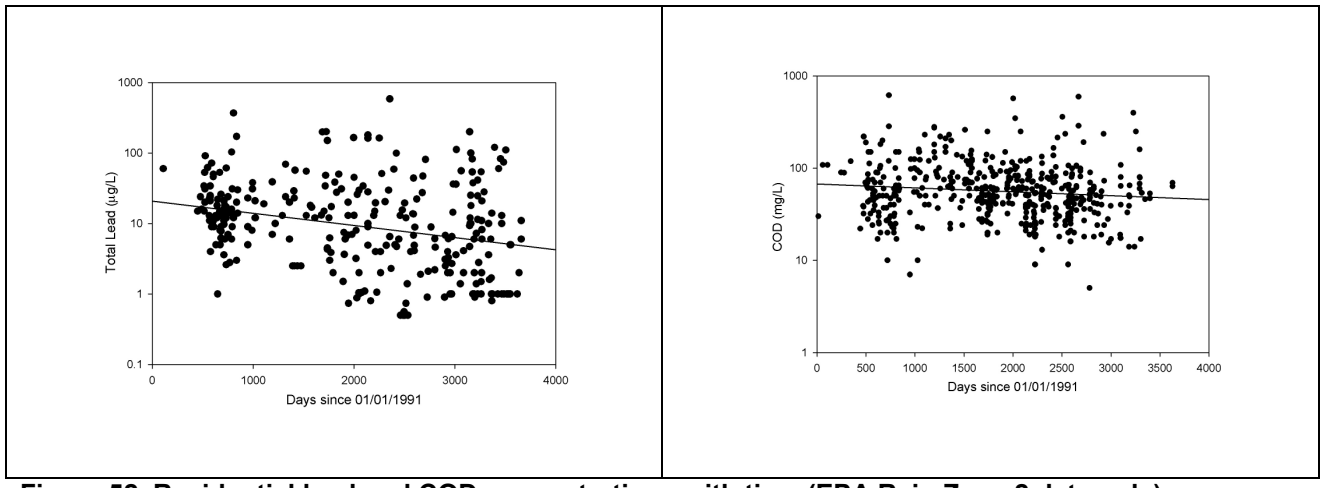

Figure 52. Residential lead and COD concentrations with time (EPA Rain Zone 2 data only)

Except for lead, it is not likely that time between the data collection efforts is the reason why the NURP and NSQD databases have different values.

Summary

Several factors were evaluated using data from the NSQD. Only residential, commercial and industrial land uses in EPA Rain Zone 2 and industrial areas in EPA Rain Zone 3 have enough samples to evaluate factors affecting stormwater concentrations. The effect of each factor cannot be extrapolated to the rest of the country. However they can be used as guidance for communities in other EPA Rain Zones. Additional data from communities that were not included in this first phase of the NSQD database would enable more complete and sensitive analyses. Also, this chapter examined most of these factors in isolation, more as sensitivity analyses and to help identify significant factors. These analyses did not consider factors together and possible interactions.

There is a significant reduction in TSS, nitrite-nitrate, total phosphorus, total copper, and total zinc concentration at sites having wet ponds, the control practice having the largest concentration reductions. No reductions in TKN concentrations were found using wet ponds, but TKN seems to be reduced by dry ponds. Locations with detention storage facilities had smaller reductions of TSS, BOD_5, COD, total lead and total zinc concentrations compared to wet pond sites. Unfortunately, there were few sites in the database having grass swales that could be compared with data from sites having curbs and gutters.

The decision to use automatic or manual sampling methods is not always clear. There were statistical differences found between both methods in residential areas for several constituents. Most communities calculate their EMC values using flow-composited sample analyses. If first flush effects are present, manual sampling may likely miss these more concentrated flows due to delays in arriving at the site to initiate sampling. If the first flush is for a very short duration, time-composited samples may overly emphasize these higher flows. Flow compositing produces more accurate EMC values than time composite analyses. An automatic sampler with flow-weighted samples, in conjunction with a bed load sampler, is likely the most accurate sampling alternative.

There is a certain amount of redundancy (self-correlation) between land use and the percentage of impervious areas, as each land use category generally has a defined narrow range of paved and roof areas. Therefore, it is not possible to test the hypothesis that different levels of impervious (surface coverage) are more important than differences in land use (activities within the area). Residential land uses cover only the lower range of imperviousness, while

commercial sites have imperviousness amounts larger than 50%. In order to perform a valid comparison test, the range of imperviousness needs to be similar for both test cases.

Antecedent dry periods before sampling was found to have a significant effect for BOD_5, COD, ammonia, nitrates, TKN, dissolved, and total phosphorus concentrations at residential land use sites. As the number of days increased, there was an increase in the concentrations of the stormwater constituents. This relationship was not observed for freeway sites. This may be associated with the very small drainage areas associated with the freeway sites (drainage areas close to 1 acre), while the drainage areas for residential, commercial and industrial areas ranged between 50 and 100 acres (Figure 2).

No seasonal effects on concentrations were observed, except for bacteria levels that appear to be lower in winter and higher in summer. No effects on concentration were observed according to precipitation depth. Rainfall energy determines erosion and washoff of particulates, but sufficient runoff volume is needed to carry the particulate pollutants to the outfalls. Different travel times from different locations in the drainage areas results in these materials arriving at different times, plus periods of high rainfall intensity (that increase pollutant washoff and movement) occur randomly throughout the storm. The resulting outfall stormwater concentration patterns for a large area having various surfaces is therefore complex and rain depth is just one of the factors involved. The next chapter examines time delivery of pollutants in more detail.

Chapter 6: Comparisons of First 30-minute Samples to 3-hour Composite Samples

Introduction

Sample collection conducted for some of the NPDES MS4 Phase I permits required both a grab and a composite sample for each event. A grab sample was to be taken during the first 30 minutes of discharge, and a flow-weighted composite sample for the entire time of discharge (up to three hours). The initial grab sample was used for the analysis of the "first flush effect," which assumes that more of the pollutants are discharged during the first period of runoff than during later periods. The composite sample was obtained with aliquots collected about every 15 to 20 minutes for at least 3 hours, or until the event ended.

First Flush

First flush refers to an assumed elevated load of pollutants discharged during the beginning of a runoff event. The first flush effect has been observed more often in small catchments than in large catchments (Thompson, *et al*, 1995, cited by WEF and ASCE 1998). In another study, large catchments (>162 Ha, 400 acres) had the highest concentrations observed at the times of flow peak (Soeur, *et al.* 1994; Brown, *et al.* 1995). The presence of a first flush also has been reported to be associated with runoff duration by the City of Austin, TX (Swietlik, *et al*. 1995). Peak pollutant concentrations can occur after the peak discharge, thus some pollutant discharges can be significant for events longer than the time of concentration (Ellis 1986). Adams and Papa (2000), and Deletic (1998) both concluded that the presence of a first flush depends on numerous site and rainfall characteristics.

In this chapter, pollutant characteristics are evaluated using the NSQD database for events that included separate samples collected during both the first 30 minutes and for the entire event (the composite sample), using nonparametric statistical methods. A better analysis of first flush conditions could be performed by using mass discharge curves that relate the total mass discharge as a function of the total runoff volume; however, this procedure requires high resolution flow and concentration information. The NSQD database only contains concentration data from composite samples (and selected first flush samples) and few flow data.

Methodology

A total of 417 storm events having paired first flush and composite samples were available from the NPDES MS4 database. The majority of the events were located in North Carolina (76.2%), but some events were also from Alabama (3.1%), Kentucky (13.9%) and Kansas (6.7%). Table 44 shows the events that were used for this analysis, separated by land use and community. All the events correspond to end-of-pipe samples in separate storm drainage systems.

Table 44. Preliminary Number of Storm Events Selected

State	Community	CO	FW	ID	IS	OP	RE	Total Events	%
AL	Jefferson County	5	2	0	0	0	6	13	3.1
NC	City of Charlotte	8	0	8	0	3	16	35	8.4
NC	City of Fayetteville	18	0	18	18	6	46	106	25.4
NC	City of Greensboro	33	0	33	0	15	33	114	27.3
KY	City of Lexington	12	3	2	0	2	18	37	8.9
KY	City of Louisville	0	0	7	0	0	14	21	5.0
NC	City of Raleigh	18	0	18	0	9	18	63	15.1
KA	City of Wichita	7	0	7	0	0	14	28	6.7
Total Events		101	5	93	18	35	165	417	
%		24.2	1.2	22.3	4.3	8.4	39.6		100

Note: CO (commercial), FW (freeway), ID (industrial), IS (institutional), OP (Open Space) and RE (residential) land uses

The initial task was to select the constituents and land uses that meet the requirements of the statistical comparison tests. Probability plots, box and whiskers plots, concentration vs. precipitation and standard descriptive statistic calculations were performed for 22 constituents for each land use and all areas combined. Nonparametric statistical analyses were performed after these initial analyses. Mann-Whitney and Fligner-Policello tests were most commonly used. Minitab and Systat statistical programs, along with Word and Excel macros, were used during the analysis.

Initial Analyses

One of the conclusions of the NURP program was that most of the constituents in stormwater generally follow a log-normal distribution, especially between the 5th and 95th percentiles (EPA 1983). This characteristic was validated using probability plots during the initial analyses. Results from first flush and composite samples were log-transformed, for different pollutant types, in each land use category.

Figure 53 shows initial statistical results for both phosphorus and COD. Elevated first flush concentrations were evident for COD compared to phosphorus. Probability plots provide useful information about the characteristics of the sample population.

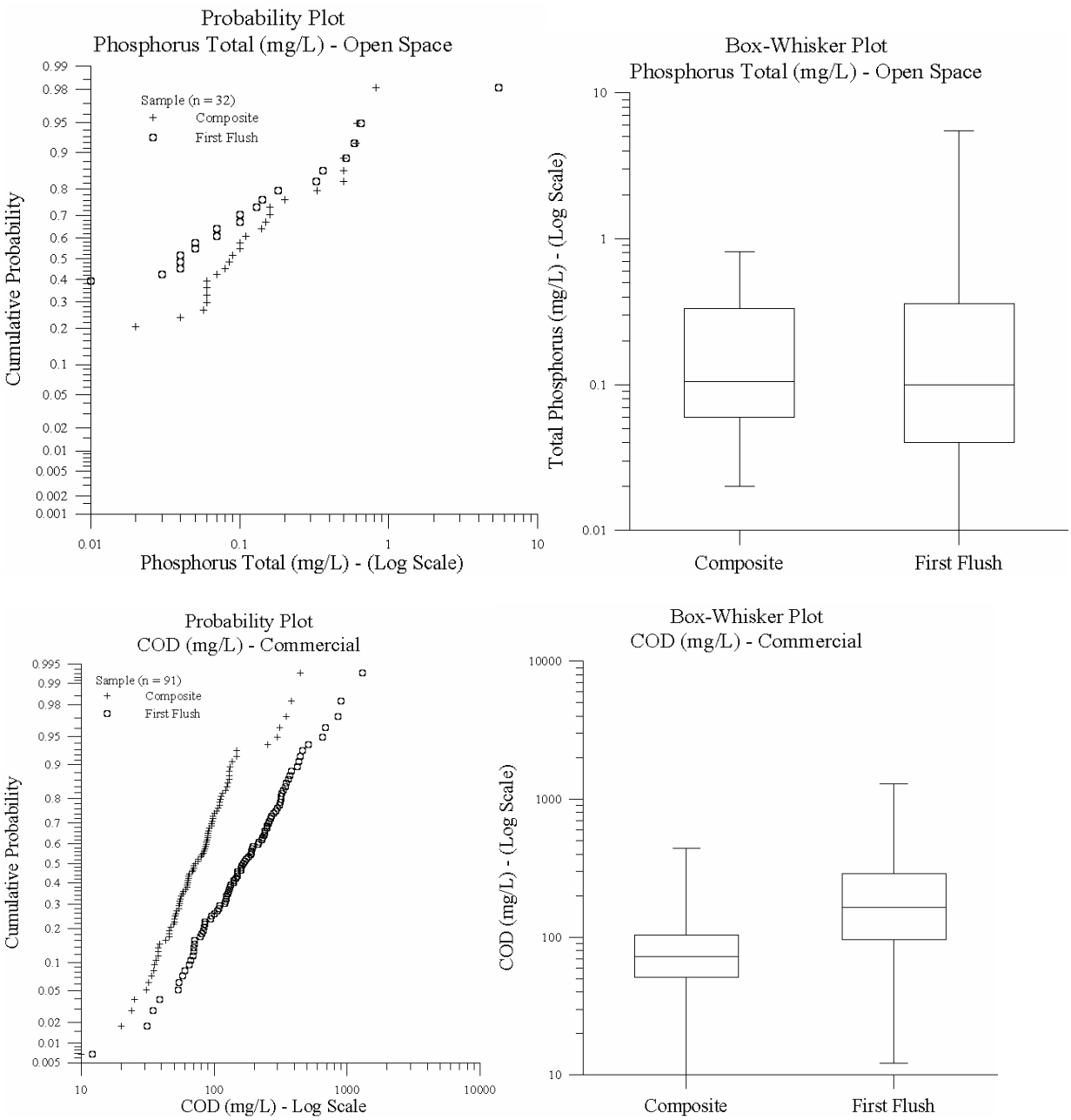

Figure 53. Cumulative probability and box and whiskers plots

Figure 53 is an example for total phosphorus observations from the open space land use. Both sample sets follow a lognormal distribution because most of the points lie on a straight line. The slopes of the lines are different, indicating unequal variances. In this case, about 40% of the first flush samples did not have detected concentrations for phosphorus, while about 20% of the composite samples had non-detected phosphorous concentrations. This plot also indicated that the median concentration of the composite samples is almost twice the median value for the first flush samples.

The next initial analysis used box plots. These plots also represent the distribution of the data, but only show the detectable concentrations. The middle line inside the box represents the median of the data. The top of the box represents the third quartile, and the bottom the first quartile. The whiskers are extended from the 5th to the 95th percentile limits. Values outside these limits are represented with asterisks. The exclusion of the non-detected values

changes the median of the data compared to the probability plots. In this example, both of the medians are similar, in contrast with the results of the probability plot. In this example, the variability of the first flush observations is also seen to be larger than the composite data set.

Descriptive statistics for each constituent and land use were calculated to determine if the distributions were symmetrical and if they had the same variance (see Appendix E). This evaluation is needed to select the most appropriate statistical tests. In some conditions, the number of sample pairs was not large enough to allow further analyses. Table 45 shows the results of the initial analysis. Samples having lognormal probability distributions and sufficient data sets were selected for further analyses.

Figure 54 shows the steps that were followed during the nonparametric analysis. The most useful test was the Fligner-Policello test. This test requires independent random samples symmetric about the medians for each data set. The advantage of this test is that it does not require normality or the same variance in each data set (Fligner and Policello 1981). The U statistic and the p-value are shown in the Appendix E for some constituents. Chakraborti (2003) presents a definition and explanation of the Mann-Whitney U test. P-values smaller than 5% (<0.05) indicate that the first flush and composite sample sets have different median concentrations at the 95%, or greater, confidence level.

Table 45. Initial Analyses to Select Data Sets for First Flush Analyses

Constituent	CO	ID	IS	OP	RE	ALL
Turbidity, NTU	Selected	No data	No data	Ned	Selected	Selected
pH, S.U.	Selected	Selected	No data	Ned	Selected	Selected
BOD5, mg/L	Selected	Selected	Box plot FF > Com	Selected	Selected	Selected
COD, mg/L	Selected	Selected	Selected	Selected	Selected	Selected
TSS, mg/L	Selected	Selected	Selected	Selected	Selected	Selected
TDS, mg/L	Selected	Selected	Selected	Selected	Selected	Selected
O&G, mg/L	Selected	Ned	Ned	Ned	Selected	Selected
Fecal Coliform, col/100mL	Selected	Ned	Ned	Ned	Selected	Selected
Fecal Streptococcus, col/100 mL	Selected	Ned	Ned	Ned	Selected	Selected
Ammonia, mg/L	Selected	Selected	Box plot FF > com.	Ned	Selected	Selected
NO_2 + NO_3, mg/L	Selected	Selected	Selected	Selected	Selected	Selected
N Total, mg/L	Selected	Selected	Ned	Selected	Selected	Selected
TKN, mg/L	Selected	Selected	Box plot FF > com.	Selected	Selected	Selected
P Total, mg/L	Selected	Selected	Selected	Selected	Selected	Selected
P Dissolved, mg/L	Selected	Selected	Selected	Selected	Selected	Selected
Ortho-P, mg/L	Ned	Selected	Ned	Ned	Selected	Selected
Cadmium Total, μg/L	Selected	Selected	Ned	Selected	Selected	Selected
Chromium Total, μg/L	Selected	Selected	Ned	Selected	Selected	Selected
Copper Total, μg/L	Selected	Selected	Selected	Selected	Selected	Selected
Lead Total, μg/L	Selected	Selected	Selected	Selected	Selected	Selected
Mercury, μg/L	Ned	Ned	Ned	Ned	Ned	Ned
Nickel, μg/L	Selected	Selected	Ned	Ned	Selected	Selected
Zinc, μg/L	Selected	Selected	Selected	Selected	Selected	Selected

* Ned: Not enough data. CO (commercial), FW (freeway), ID (industrial), IS (institutional), OP (Open Space) and RE (residential)

Nonparametric Analyses

If the number of samples is large, and the distributions are normal and have the same variance, a paired Student's t-test is usually a better test to evaluate the hypothesis and support the results of the Fligner-Policello test. To verify that the data distributions are normal, the Anderson-Darling normality test was used (Kottegoda and Rosso 1997). This method uses an empirical cumulative distribution function to check normality. In Appendix E, the p-values of the paired differences are shown. P-values larger than 5% (> 0.05) indicate that the normality requirement was met at the 95% or greater confidence level.

Finally, if the first flush and composite sample distributions are symmetrical (but not necessarily normal), and if they have the same variance, the Mann-Whitney test can be used. If the p-value is larger than 5% (>0.05), the medians of the sample distribution are assumed to be the same, at the 95% or greater confidence level. The preferred test would be the Student's t-test, if the sample characteristics warrant, followed by the Mann-Whitney test and finally the Fligner-Policello test. The selected cases are only for pairs with concentration values above the detection limits. The ratios between the first flush and composite sample median concentrations are also shown. Commercial and residential areas have the highest ratios for most constituents. The smallest ratios were found for open space sites.

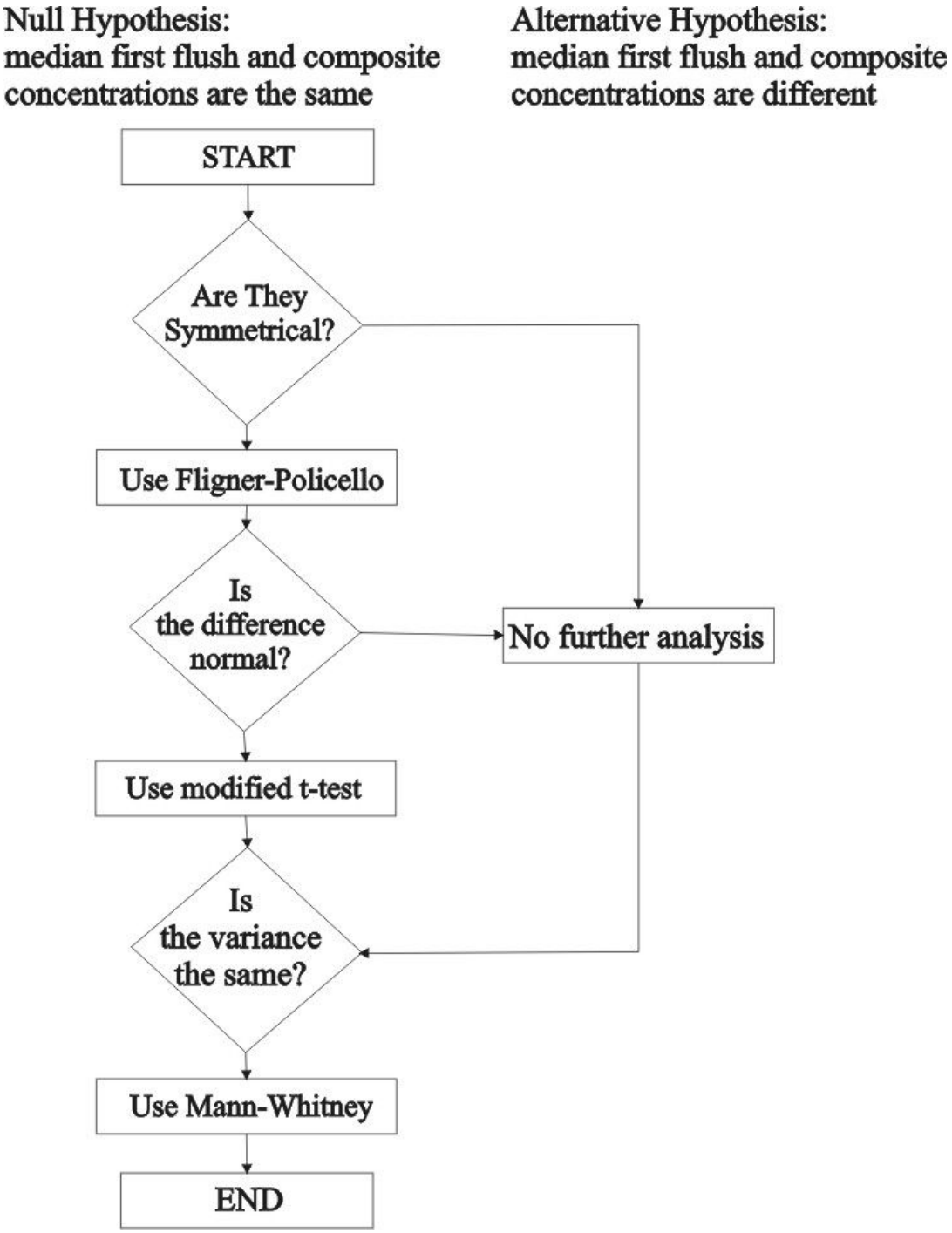

Figure 54. Analysis flow chart

Results

About 83% of the possible paired cases were successfully evaluated. The remaining cases could not be evaluated because the data set did not have enough paired data or they were not symmetrical. Table 46 shows the results of the analysis.

Table 46. Significant First Flushes Ratios (first flush to composite median concentration)

Parameter	Commercial				Industrial				Institutional			
	n	sc	R	ratio	n	sc	R	ratio	n	sc	R	ratio
Turbidity, NTU	11	11	=	1.32			X				X	
pH, S.U.	17	17	=	1.03	16	16	=	1.00			X	
COD, mg/L	91	91	≠	2.29	84	84	≠	1.43	18	18	≠	2.73
TSS, mg/L	90	90	≠	1.85	83	83	=	0.97	18	18	≠	2.12
BOD_5, mg/L	83	83	≠	1.77	80	80	≠	1.58	18	18	≠	1.67
TDS, mg/L	82	82	≠	1.83	82	81	≠	1.32	18	18	≠	2.66
O&G, mg/L	10	10	≠	1.54			X				X	
Fecal Coliform, col/100mL	12	12	=	0.87			X				X	
Fecal Streptococcus, col/100 mL	12	11	=	1.05			X				X	
Ammonia, mg/L	70	52	≠	2.11	40	33	=	1.08	18	16	≠	1.66
$NO_2 + NO_3$, mg/L	84	82	≠	1.73	72	71	≠	1.31	18	18	≠	1.70
N Total, mg/L	19	19	=	1.35	19	16	=	1.79			X	
TKN, mg/L	93	86	≠	1.71	77	76	≠	1.35			X	
P Total, mg/L	89	77	≠	1.44	84	71	=	1.42	17	17	=	1.24
P Dissolved, mg/L	91	69	=	1.23	77	50	=	1.04	18	14	=	1.05
Ortho-P, mg/L			X		6	6	=	1.55			X	
Cadmium Total, μg/L	74	48	≠	2.15	80	41	=	1.00			X	
Chromium Total, μg/L	47	22	≠	1.67	54	25	=	1.36			X	
Copper Total, μg/L	92	82	≠	1.62	84	76	≠	1.24	18	7	=	0.94
Lead Total, μg/L	89	83	≠	1.65	84	71	≠	1.41	18	13	≠	2.28
Nickel, μg/L	47	23	≠	2.40	51	22	=	1.00			X	
Zinc, μg/L	90	90	≠	1.93	83	83	≠	1.54	18	18	≠	2.48
Turbidity, NTU			X		12	12	=	1.24	26	26	=	1.26
pH, S.U.			X		26	26	=	1.01	63	63	=	1.01
COD, mg/L	28	28	=	0.67	140	140	≠	1.63	363	363	≠	1.71
TSS, mg/L	32	32	=	0.95	144	144	≠	1.84	372	372	≠	1.60
BOD5, mg/L	28	28	=	1.07	133	133	≠	1.67	344	344	≠	1.67
TDS, mg/L	31	30	=	1.07	137	133	≠	1.52	354	342	≠	1.55
O&G, mg/L			X				X		18	14	≠	1.60
Fecal Coliform, col/100mL			X		10	9	=	0.98	22	21	=	1.21
Fecal Streptococcus, col/100 mL			X		11	8	=	1.30	26	22	=	1.11
Ammonia, mg/L			X		119	86	≠	1.36	269	190	≠	1.54
$NO_2 + NO_3$, mg/L	30	21	=	0.96	121	118	≠	1.66	324	310	≠	1.50
N Total, mg/L	6	6	=	1.53	31	30	=	0.88	77	73	=	1.22
TKN, mg/L	32	14	=	1.28	131	123	≠	1.65	335	301	≠	1.60
P Total, mg/L	32	20	=	1.05	140	128	≠	1.46	363	313	≠	1.45
P Dissolved, mg/L	32	14	=	0.69	130	105	≠	1.24	350	254	=	1.07
Ortho-P, mg/L			X		14	14	=	0.95	22	22	=	1.30
Cadmium Total, μg/L	30	15	=	1.30	123	33	≠	2.00	325	139	≠	1.62
Chromium Total, μg/L	16	4	=	1.70	86	31	=	1.24	218	82	≠	1.47
Copper Total, μg/L	30	22	=	0.78	144	108	≠	1.33	368	295	≠	1.33
Lead Total, μg/L	31	16	=	0.90	140	93	≠	1.48	364	278	≠	1.50
Nickel, μg/L			X		83	18	=	1.20	213	64	≠	1.50
Zinc, μg/L	21	21	=	1.25	136	136	≠	1.58	350	350	≠	1.59

Note: n = number of total possible events. sc = number of selected events with detected values. R = result. Not enough data (X); not enough evidence to conclude that median values are different (=); median values are different (≠).

The "≠" sign indicates that the medians of the first flush and the composite data set are different. The "=" sign indicates that there is not enough information to reject the null hypothesis at the desired level of confidence (at least at the 95% level). Events without enough data are represented with an "X".

Also, shown on this table are the ratios of the medians of the first flush to the composite data for each constituent and land use combination. Generally, a statistically significant first flush is associated with a median concentration ratio of about 1.4, or greater (the exceptions are where the number of samples in a specific category is much smaller). The largest ratios are about 2.5, indicating that for these conditions, the first flush sample concentrations are about 2.5 times greater than the composite sample concentrations. More of the larger ratios are found for the commercial and institutional land use categories, areas where larger paved areas are likely to be found. The smallest ratios are associated with the residential, industrial, and open spaces land uses, locations where there may be larger areas of unpaved surfaces.

Results indicate that for 55% of the evaluated cases, the median of the first flush data set were different than the composite sample set. In the remaining 45% of the cases, both medians were likely the same, or the concentrations were possibly greater later in the events.

Approximately 70% of the constituents in the commercial land use category had elevated first flush concentrations, about 60% of the constituents in the residential, institutional and the mixed (mostly commercial and residential) land use categories had elevated first flushes, and only 45% of the constituents in the industrial land use category had elevated first flushes. In contrast, no constituents were found to have elevated first flushes in the open space category.

COD, BOD_5, TDS, TKN and Zn all had first flushes in all areas (except for the open space category). In contrast, turbidity, pH, fecal coliform, fecal streptococcus, total N, dissolved and ortho-P never showed a statistically significant first flush in any category. The different findings for TKN and total nitrogen imply that there may be other factors involved in the identification of first flushes besides land use.

Summary

It is expected that peak concentrations generally occur during periods of peak flows (and highest rain energy). On relatively small paved areas, however, it is likely that there will always be a short initial period of relatively high concentrations associated with washing off of the most available material (Pitt 1987). This peak period of high concentrations may be overwhelmed by periods of high rain intensity that may occur later in the event. In addition, in more complex drainage areas, the routing of these short periods of peak concentrations may blend with larger flows and may not be noticeable. A first flush in a separate storm drainage system is therefore most likely to be seen if a rain occurs at relatively constant intensities on a paved area having a simple drainage system.

If the peak flow (and highest rain energy) occurs later in the event, then there likely will not be a noticeable first flush. However, if the rain intensity peak occurs at the beginning of the event, then the effect is exaggerated. Figure 55 shows an example storm in Lexington, KY. Note that in this event there are two periods of elevated peaks, the first occurs one hour after the rain started, the second two hours later. If the concentration remains the same during the entire event, the maximum load will occur during the later periods having the maximum flows (the two peaks), and not during the initial period of the storm. Another factor that needs to be considered is the source of the contaminants and how fast they travel through the watershed. Streets and other impervious areas will contribute flows to the outfall monitoring location before the pervious areas in the drainage area.

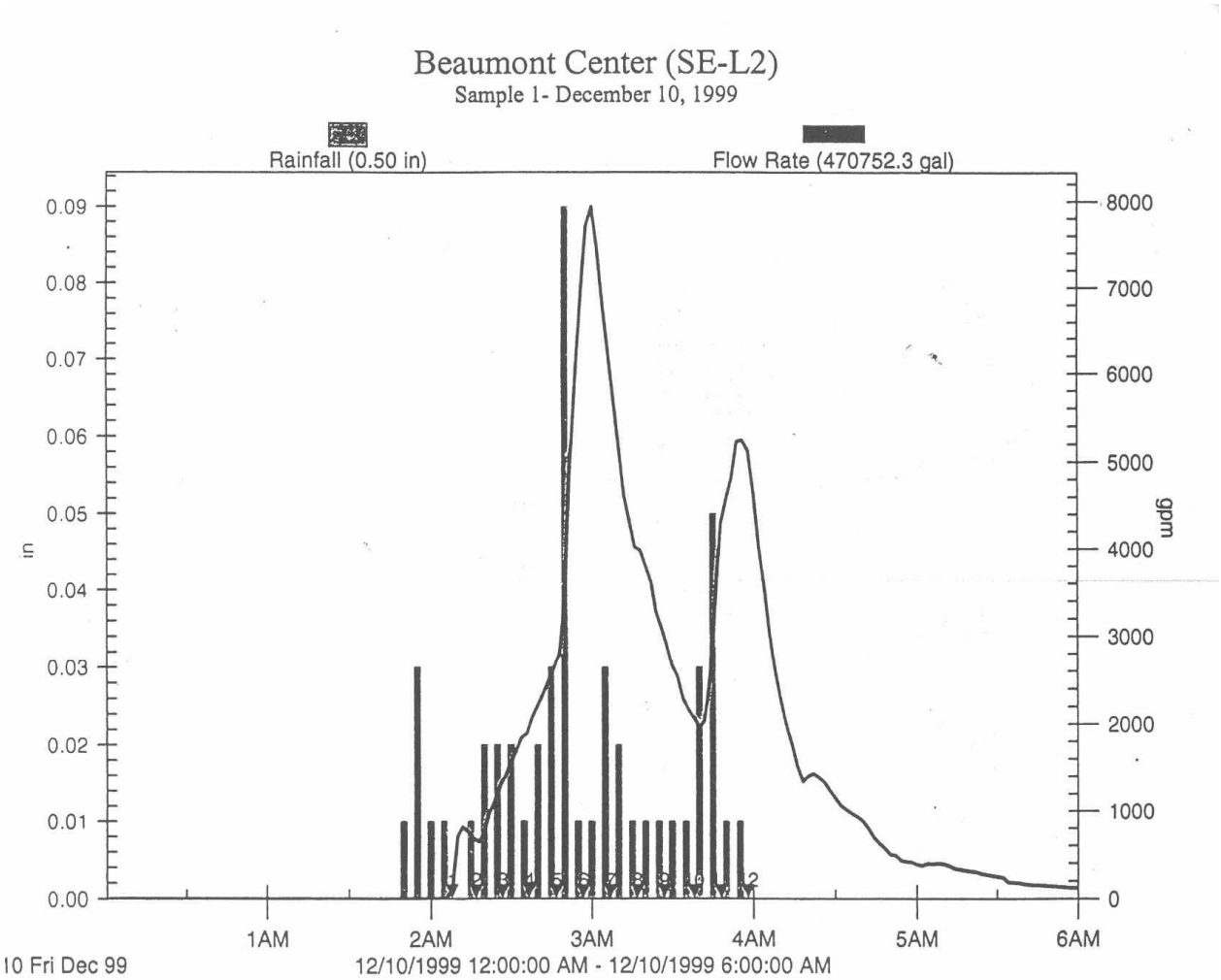

Figure 55. Hydrograph for a storm event (Source: NPDES permit Lexington–KY 2000) (1 in = 25.4 mm, 1 m^3 = 264 gal)

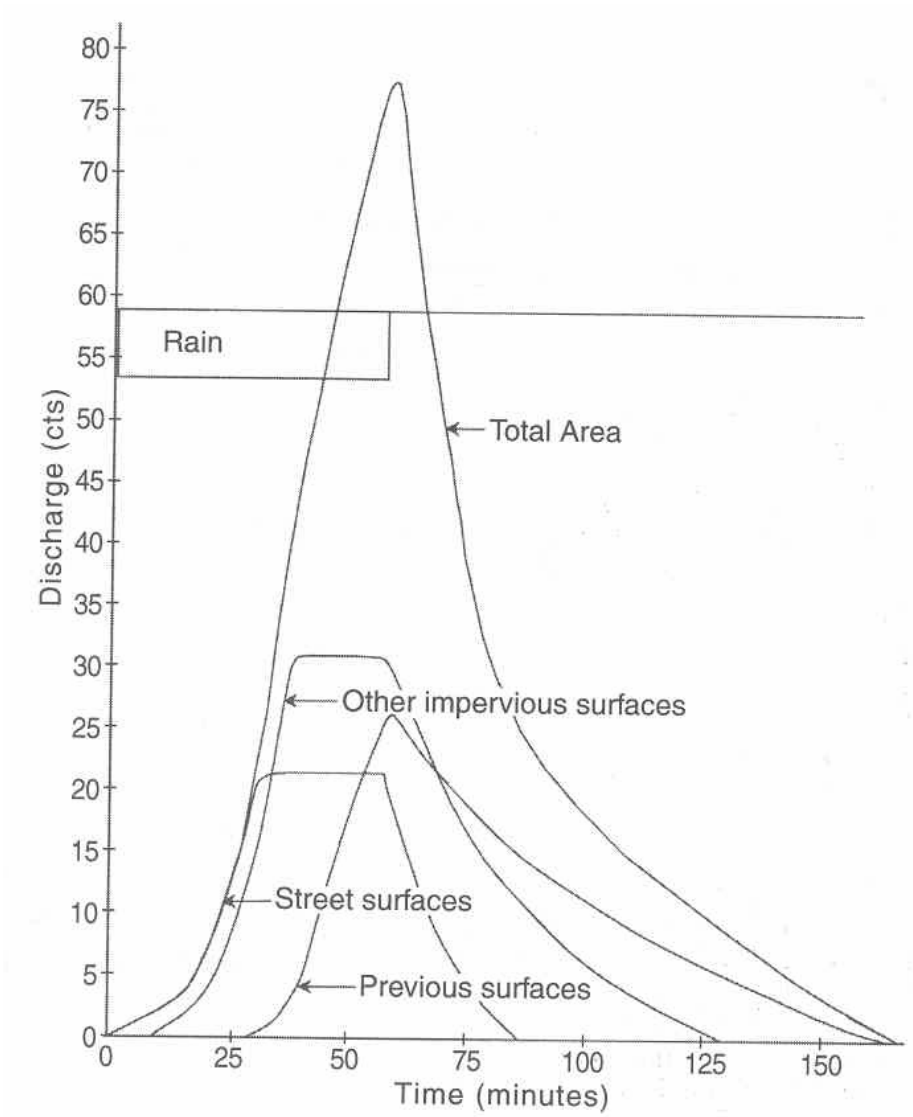

Figure 56. Contributing areas in urban watersheds (Pitt, 1999) (1 m^3/s = 35 cfs)

Figure 56 (Pitt 1999) shows that for an example constant rainfall, the source area flow contribution changes for different rain conditions in an area. If the percentage of impervious surfaces is high, many of the constituents will be discharged faster. This observation agrees with the results observed from the statistical analysis. Commercial areas have a larger frequency of high concentrations at the beginning of the event in contrast to open space areas.

Figure 57 shows that for events (< 12mm, or 0.5 in) in this example medium density residential area, most of the runoff is generated by impervious areas. The average percentage of imperviousness for the monitoring sites was examined. Commercial areas had an average of 83% imperviousness, followed by industrial areas at 70% imperviousness. Institutional and residential land uses were very similar, with 45% and 42% imperviousness respectively. The open space land use category had the smallest imperviousness area, at about 4%. As indicated in Figure 57, larger events can generate more runoff from previous areas than impervious areas. However, it is likely that most of the runoff during the MS4 monitoring activities was associated with the more common small events, and hence, impervious areas were more important.

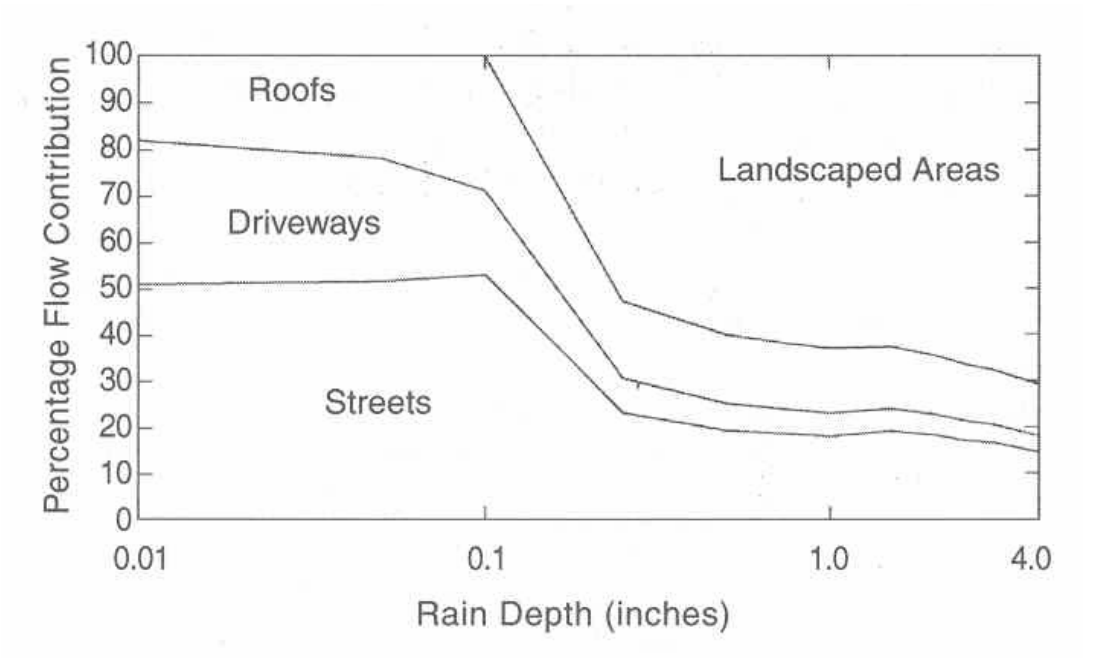

Figure 57. Contributing areas in urban watersheds (Pitt and Voorhees, 1995) (1 in = 25.4 mm)

Probability plots of the precipitation associated with each monitored event for each land use category were prepared to see if there were any significant differences in the ranges of rains observed within each land use category that could have influenced the results. Figure 58 shows that precipitation has the same distribution for almost all the different land uses. The institutional land use category shows a slightly smaller median rain, but this is likely because of the smaller number of events observed in that land use category (18 events). The median precipitation observed during the monitoring at all land uses was about 8 mm (0.3 in), indicating the importance of runoff from the impervious areas.

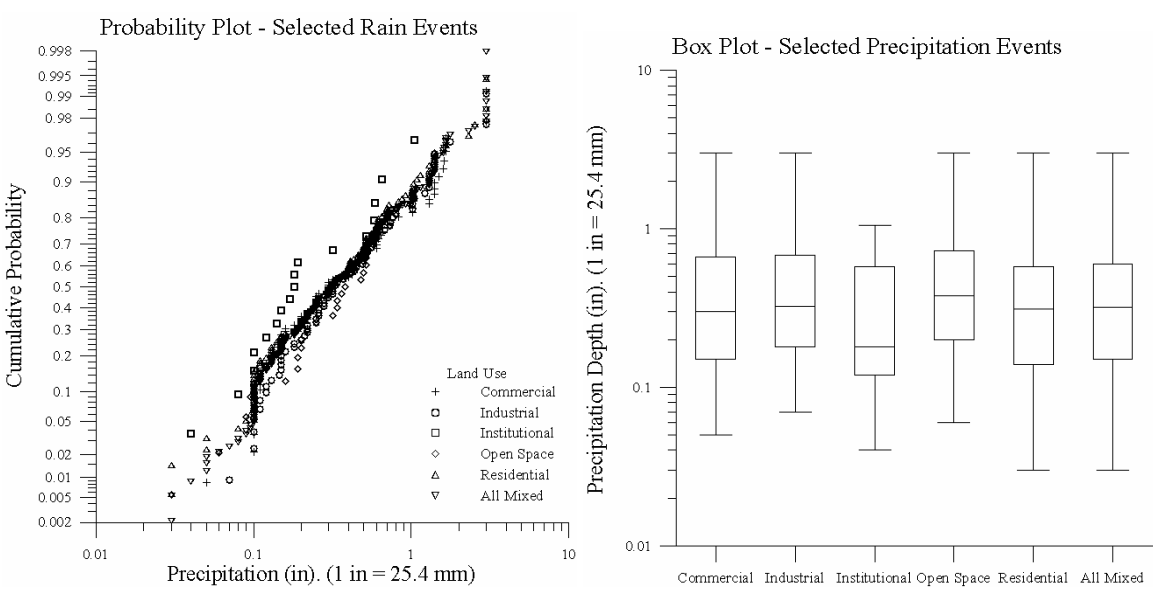

Figure 58. Probability and box and whiskers plot of selected rain events

Finally, another factor that must be considered is the effect of the sampling duration. The guidance provided for monitoring during the Phase I NPDES activities was to collect a sample during the first 30 minutes of the event, and a composite sample only during the first three hours of the event (or the complete event, if shorter than three hours). Figure 59 shows an example case when these conditions can lead to inappropriate conclusions for longer duration events.

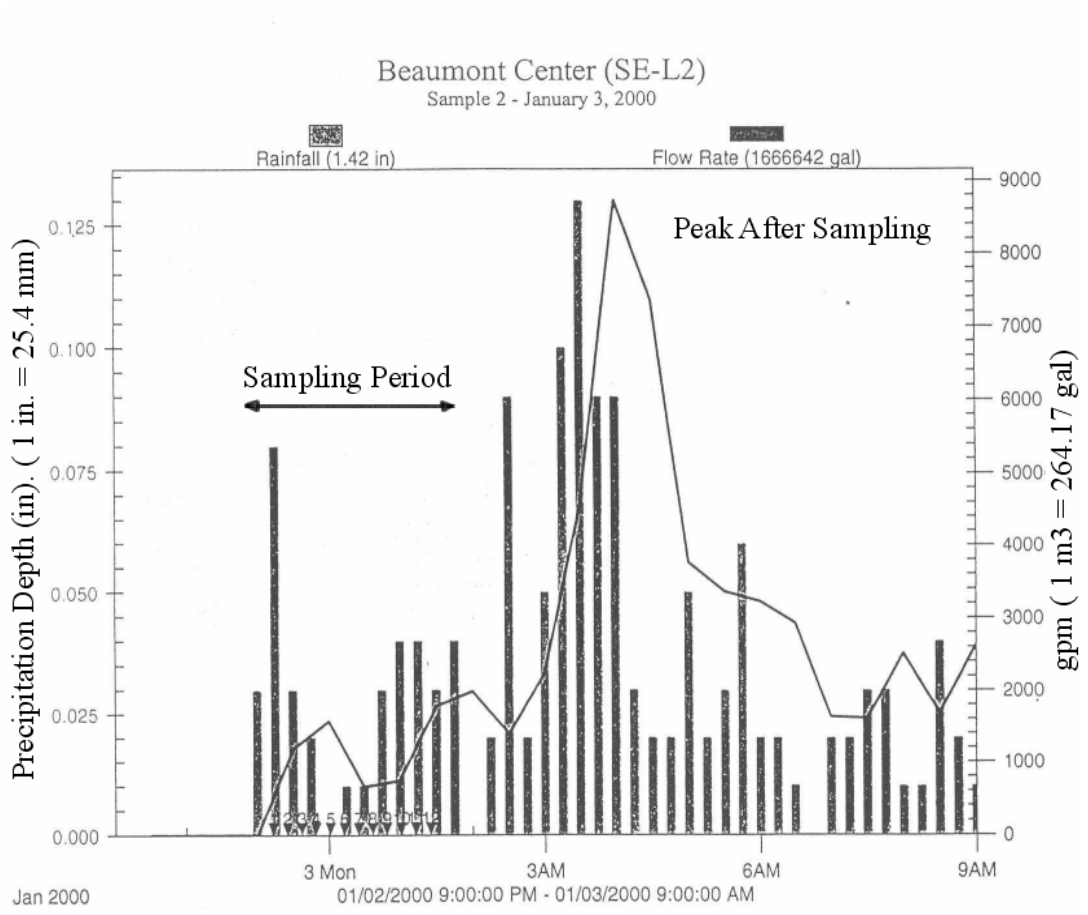

Figure 59. Example of an event with peaks after the sampling period (Source: NPDES permit Lexington-KY, 2000)

The 12 aliquots sampled during the first three hours are shown on the left side of Figure 59. The peak discharge occurred four hours after the event started, as shown on the right side of the figure, and was not represented in the sampling effort. Missing these later storm periods can lead to inappropriate conclusions. It is suggested that for stormwater monitoring, samples should be collected during the complete event and composited before laboratory analyses.

Another sampling example was presented by Roa-Espinosa and Bannerman (1995) who collected samples from five industrial sites using five different monitoring methods. Table 47 shows the ranking of the best methods of sampling based in six criteria. In this table a value between one and five points is assigned to each criterion. Five points indicates that the method is excellent in the specific criterion. Rao-Espinosa and Bannerman concluded that many time-composite subsamples combined for a single composite analysis can provide improved accuracy compared to fewer samples associated with flow-weighted sampling. They also found that time composite subsamples provide better results than samples collected during the first 30 minutes of the event alone.

Table 47. Ranking by Methods of Sampling (Roa-Espinosa, Bannerman, 1995)

Criteria	Flow Composite	Time Discrete	Time Composite	Old Source Sample	New Source Sample	First 30 Minutes
Site Selection	1	1	1	5	5	3
Cost	1	1	3	5	5	5
Technical difficulty	1	1	3	5	5	5
Accuracy	5	5	4	1	5	1
Reproducibility	5	5	5	1	5	1
Representativeness	1	1	3	5	5	1
TOTAL POINTS	14	14	19	22	30	16

Conclusion

A major goal of the present study is to provide guidance to stormwater managers and regulators. Especially important will be the use of this data as an updated benchmark for comparison with locally collected data. In addition, this data may be useful for preliminary calculations when using the "simple method" for predicting mass discharges for unmonitored areas. These data can also be used as guidance when designing local stormwater monitoring programs (Burton and Pitt 2002), especially when determining the needed sampling effort based on expected water quality variations. Additional analyses reported in other chapters expand on these preliminary examples and also investigate other stormwater data and sampling issues.

This investigation of first flush conditions indicated that a first flush effect was not present for all the land use categories, and certainly not for all constituents. Commercial and residential areas were more likely to show this phenomenon, especially if the peak rainfall occurred near the beginning of the event. It is expected that this effect will be more likely to occur in a watershed with a high level of imperviousness, but even so, the data indicated first flushes for less than 50% of the samples for the most impervious areas. This reduced frequency of observed first flushes in these areas most likely to have first flushes is likely associated with the varying rain conditions during the different events, including composite samples that did not represent the complete runoff durations.

Groups of constituents showed different behaviors for different land uses. All the heavy metals evaluated showed higher concentrations at the beginning of the event in the commercial land use category. Similarly, all the nutrients showed higher initial concentrations in residential land use areas, except for total nitrogen and ortho-phosphorus. This phenomenon was not found in the bacteria analyses. None of the land uses showed a higher population of bacteria during the beginning of the event. Conventional constituents showed elevated concentrations in commercial, residential and institutional land uses.

Chapter 7: Effects of Land Use and Geographical Location on Stormwater Quality

Model Building using the NSQD

This chapter describes the methods used to analyze stormwater characterization data in the NSQD in order to determine the best simple method that can be used to calculate the EMC for a site, given the land use, geographical location, and season. These analyses only used those events obtained at single land use sites. This chapter stresses suspended solids analysis as the prototype evaluation procedure that can be used for the other constituents. The later section of this chapter presents results of detailed analyses for other pollutants.

ANOVA Evaluation of Suspended Solids Data

Total suspended solids is one of the most important constituents in stormwater and is commonly used to measure the effectiveness of controls. Unfortunately, there is much controversy concerning TSS monitoring and laboratory analyses. Automatic samplers cannot include bed load and floatable fractions of the solids, and the samplers have reduced efficiency for larger particles (usually larger than about 300 µm). In addition, some laboratories improperly allow the samples to settle before analyses in order to obtain only the suspended portion of the sample, and not the non-filterable fraction as defined by *Standard Methods*. The TSS data in the NSQD were all obtained from outfall monitoring locations, where the amount of particles larger than 300 µm are quite rare, and the laboratories followed proper TSS analytical methods. Analysis of variance (ANVOA) statistical tests were used on natural-log transformed TSS values to identify significant groupings of data, considering both main factors and interactions. The factors examined included land use (residential, commercial, industrial, open space, and freeways), season (spring, summer, fall, and winter) and EPA Rain Zone (the nine EPA rain zones, as shown on Figure 1).

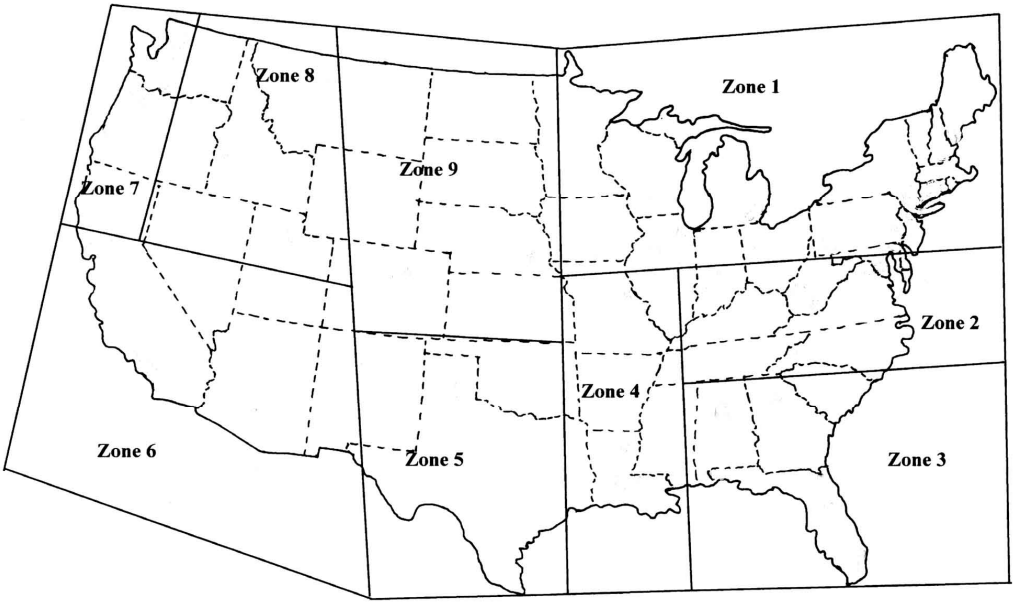

Figure 1. EPA rain zones for the continental US.

Descriptive TSS Statistics

The first step was to calculate simple descriptive statistics for TSS for each of the main factor categories. The TSS concentrations were log transformed (natural log) in order to preserve the normality assumption in the ANOVA analysis. The number of samples, mean, median, maximum, minimum, among other statistics, were calculated in each level of the main factors. Table 1 shows the descriptive statistics for these factors.

Table 1. Descriptive Statistics of the Natural Logarithm (Ln) of TSS mg/L for Single Landuse Categories

Descriptive Statistics: LNTSS by Landuse

Variable	Landuse	N	Mean	Median	TrMean	StDev
LTSS	CO	450	3.8831	3.7377	3.8469	1.1801
	FW	133	4.4644	4.5951	4.4636	1.0680
	ID	423	4.2777	4.3567	4.2842	1.1913
	OP	42	3.945	3.877	3.945	1.717
	RE	977	3.8744	3.8918	3.8650	1.1804

Variable	Landuse	SE Mean	Minimum	Maximum	Q1	Q3
LTSS	CO	0.0556	1.0986	7.7770	3.0910	4.6052
	FW	0.0926	1.0986	8.4764	3.7842	5.0593
	ID	0.0579	1.0986	7.8200	3.4965	5.0752
	OP	0.265	1.099	6.888	2.303	5.426
	RE	0.0378	1.0986	7.8087	3.0910	4.5911

Descriptive Statistics: LNTSS by Season

Variable	Season	N	Mean	Median	TrMean	StDev
LTSS	FA	555	3.8601	3.8501	3.8532	1.1550
	SP	528	4.0990	4.0431	4.0847	1.1968
	SU	400	4.0699	4.0774	4.0670	1.3387
	WI	542	3.9983	3.9512	3.9872	1.1470

Variable	Season	SE Mean	Minimum	Maximum	Q1	Q3
LTSS	FA	0.0490	1.0986	7.7770	3.0910	4.5850
	SP	0.0521	1.0986	7.8200	3.3322	4.8380
	SU	0.0669	1.0986	7.2298	3.0910	5.0876
	WI	0.0493	1.0986	8.4764	3.2958	4.7027

Descriptive Statistics: LNTSS by EPA Rain Zone

Variable	EPA_Rain	N	Mean	Median	TrMean	StDev
LTSS	1	42	3.862	3.761	3.877	1.268
	2	1161	3.7446	3.7612	3.7376	1.1086
	3	120	3.906	3.880	3.898	1.389
	4	218	4.5466	4.4426	4.5320	1.4053
	5	152	4.3056	4.3437	4.3124	1.0898
	6	159	4.6129	4.7005	4.6011	1.0135
	7	141	4.1096	4.2047	4.1142	1.0561
	8	7	4.221	3.970	4.221	0.794
	9	25	5.412	5.587	5.414	0.882

Variable	EPA_Rain	SE Mean	Minimum	Maximum	Q1	Q3
LTSS	1	0.196	1.099	6.447	2.996	4.825
	2	0.0325	1.0986	7.0867	2.9957	4.4543
	3	0.127	1.099	7.030	2.773	4.940
	4	0.0952	1.6094	7.8087	3.4657	5.6204
	5	0.0884	1.0986	7.8200	3.6636	5.1044
	6	0.0804	1.3863	8.4764	4.0431	5.1330
	7	0.0889	1.0986	6.9847	3.4340	4.7664
	8	0.300	3.367	5.858	3.829	4.477
	9	0.176	3.714	7.056	4.684	6.019

There are enough samples to identify if there are any significant differences among the levels and factors, although EOA Rain Zones 1, 8, and 9 and open space have fewer than 50 samples. The range between the minimum and

maximum values are similar for all the groups, indicating that there are not any unusual extreme high or low concentration values in the data set. The mean and median values are also close (after the natural-log transformations) indicating data symmetry for each factor level.

During the ANOVA analyses, each factor was identified as a discrete variable. The partial sum of squares was used to identify the effects of the interactions. The results of the ANOVA (using DataDesk 6.1 from MBAWare), including all the interactions are:

Dependent variables

Name	Code
LTSS	LTS

Type of analysis: OLS ANOVA

Factors

Name	Code	Nested in	F/R	Kind
Landuse	Lnd	()	Fix	Disc
Season	Ssn	()	Fix	Disc
RZone	RZn	()	Fix	Disc

Partial (Type 3) Sums of Squares Design Help

Interactions up to All - way

Add Interaction Remove Selected Terms Up Down

Source	F/R	max df	EMS	F-Denom
Const	-	1	Const	Error
Lnd	F	4	Lnd	Error
Ssn	F	3	Ssn	Error
RZn	F	8	RZn	Error
Lnd*Ssn	F	12	Lnd*Ssn	Error
Lnd*RZn	F	32	Lnd*RZn	Error
Ssn*RZn	F	24	Ssn*RZn	Error
Lnd*Ssn*RZn	F	96	Lnd*Ssn*RZn	Error
Error	R	1846		
Total		2025		

No Modifications

General Results

2026 total cases

ANOVA

Analysis of Variance For **LTSS**
No Selector

Source	df	Sums of Squares	Mean Square	F-ratio	Prob
Const	1	32463.3	32463.3	25689	≤ 0.0001
Lnd	4	16.0508	4.01271	3.1754	0.0130
Ssn	3	5.00983	1.66994	1.3215	0.2657
RZn	8	29.529	3.69113	2.9209	0.0030
Lnd*Ssn	12	5.16695	0.430579	0.34073	0.9817
Lnd*RZn	18	32.4181	1.801	1.4252	0.1095
Ssn*RZn	20	31.7578	1.58789	1.2565	0.1982
Lnd*Ssn*RZn	39	48.9396	1.25486	0.99301	0.4830
Error	1921	2427.55	1.26369		
Total	2025	2951.29			

Results for factor Lnd

The probability value for the 3-way interaction term (0.4830) shows that this interaction is not significant in the model. After deleting this three-way interaction, the new ANOVA table is:

Analysis of Variance For **LTSS**
No Selector

Source	df	Sums of Squares	Mean Square	F-ratio	Prob
Const	1	32463.3	32463.3	25693	≤ 0.0001
Lnd	4	19.8304	4.9576	3.9236	0.0035
Ssn	3	8.5914	2.8638	2.2665	0.0789
RZn	8	55.0248	6.87809	5.4436	≤ 0.0001
Lnd*Ssn	12	40.5535	3.37946	2.6746	0.0014
Lnd*RZn	18	74.5744	4.14302	3.279	≤ 0.0001
Ssn*RZn	20	40.0732	2.00366	1.5858	0.0477
Error	1960	2476.49	1.26352		
Total	2025	2951.29			

In this case, season and season-rain zone interaction seems not to be significant (probability > 0.05), while all of the remaining factors seem to be important. The mean square error (MSE) is an estimator of the variance in the model. The lower the MSE, the better the model. It was observed that deleting any other source would increase the MSE. The assumption of normality and independence of the residuals for this result was also evaluated as shown in Figure 3.

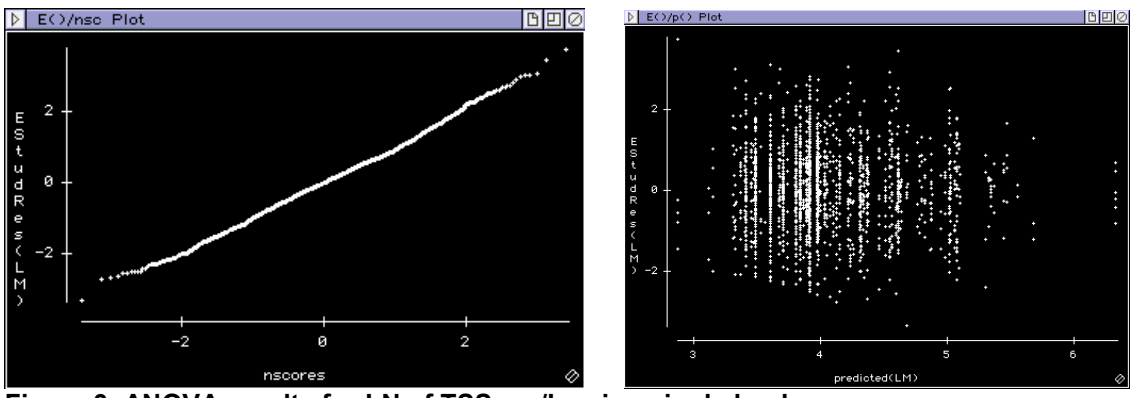

Figure 3. ANOVA results for LN of TSS mg/L using single land uses.

There are not any unusual patterns in the predicted vs. studentized residuals plot. The residuals seem to be independent and normally distributed. The next step is to check if there are any values having large influences or residuals. The potential-residual plot (potential=influence) indicates the data points that have a high influence or residual in the model. A point with an elevated influence indicates that if the point is removed from the dataset, the slope and intercept of the regression line will be affected significantly. DataDesk uses Hadi's influence measure method in preparing the residual-potential plot. The plot identifies unusual observations if they are outside an area described by a hyperbolic trend. Another useful measure is the Cook's distance that considers the influence of each case in all the values. Figure 4 shows the potential residual plot for the natural logarithm of the TSS data.

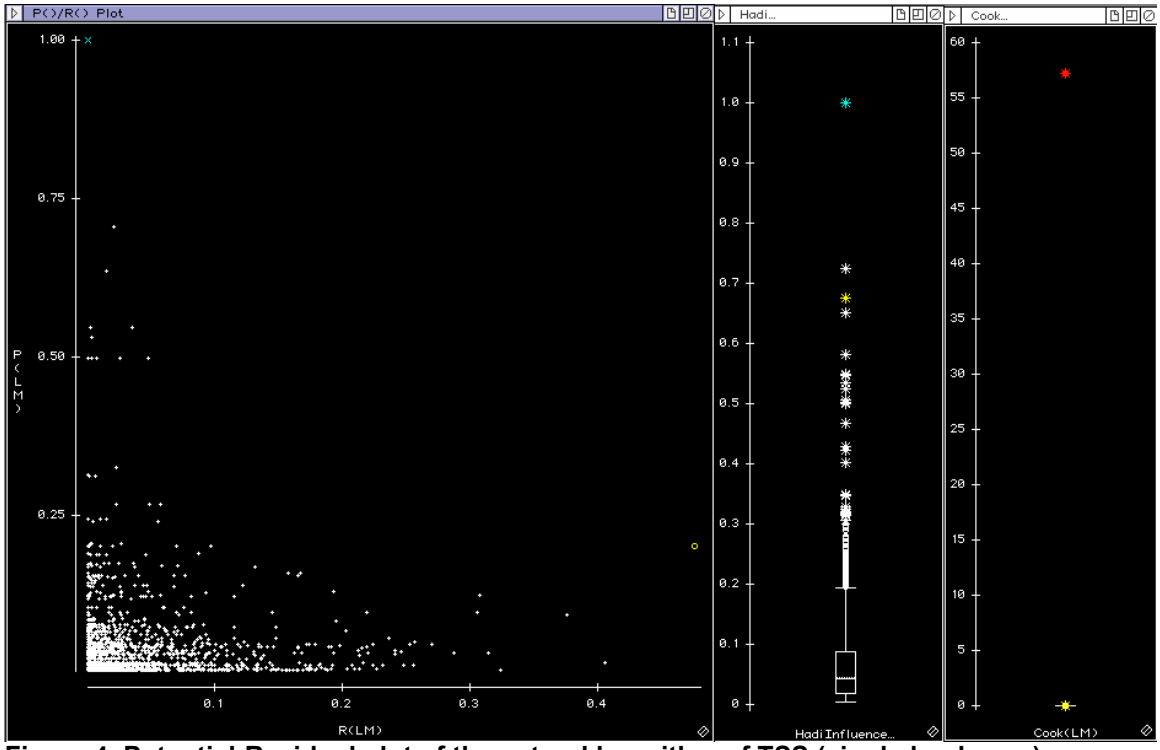

Figure 4. Potential-Residual plot of the natural logarithm of TSS (single land uses).

In this case, the potential residual plot does not indicate any unusual observations in the dataset. All the observations followed a hyperbolic trend; there are not any points outside the area described by this hyperbola. The box plot of the Hadi's influence parameter also does not show any single observation that will influence the whole dataset. The box plot of the Cook's distance indicates a potentially unusual observation. This observation corresponds to a concentration of 46 mg/L in a residential area in EPA Rain Zone 8 during the summer. The unusual characteristic of this observation is that it is the only observation in the database with these characteristics. If this observation is not included in the data plot, the results do not change. The largest influence point is an observation having a concentration of 825 mg/L in an open space area in EPA Rain Zone 2 during the spring. This concentration is not common but it can occur. These data were not deleted from the dataset. Figure 5 shows the box plot of both influence methods.

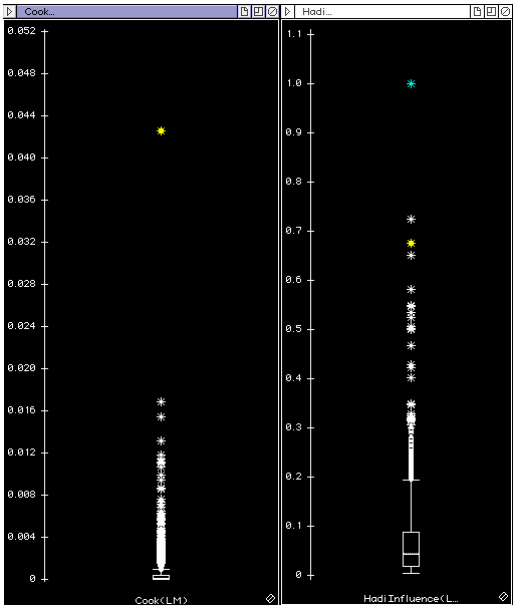

Figure 5. Influence box plot (Cook's distance and Hadi's measure methods).

Because there are no unusual observations, it is possible to evaluate the coefficients for each factor with all the data. A complete examination (all single and multiple interactions) of the coefficients is shown in Table 2.

Table 2. Significant Coefficients for the Complete Factorial Model

LN(TDS mg/L) COEFFICIENTS FOR DIFFERENT LAND USES, SEASONS AND RAIN ZONES					
	Level	**Coefficient**	**std. err.**	**t Ratio**	**prob**
Constant		4.642	0.1742	26.65	< 0.0001
Landuse	**RE**	-0.4871	0.1495	-3.258	0.0011
Season	**None**				
Rain Zone	**2**	-0.8947	0.2155	-4.152	< 0.0001
	4	0.2949	0.1463	2.016	0.0439
	9	0.976	0.4261	2.291	0.0221
Landuse*Season	**SP,OP**	-0.6637	0.3246	-2.045	0.0410
	SU,CO	-0.4617	0.1825	-2.53	0.0115
	SU,OP	0.6597	0.3021	2.183	0.0291
Landuse*Rain Zone	**1,ID**	-2.492	0.7161	-3.479	0.0005
	1,RE	-0.4554	0.2031	-2.242	0.0251
	2,RE	0.4554	0.2031	2.242	0.0251
	5,CO	-1.385	0.6483	-2.136	0.0328
Season*Rain Zone	**2,FA**	-0.3648	0.1386	-2.632	0.0086
	4,SP	0.5739	0.1666	3.444	0.0006
	4,SU	-0.5285	0.1961	-2.695	0.0071
	7,SU	0.6614	0.3321	1.991	0.0466
Landuse*Season*Rain Zone	**None**				

There are 180 possible combinations between the land uses (5), seasons (4) and rain zones (9). The estimated value for any combination is the sum of the coefficients under the conditions of the observation. If the term for a condition being examined is not shown, it was not significant and a zero value is used. Otherwise, the coefficient corresponding to the site condition is used. For example, the following is used to estimate the log value of the TSS

for an observation in EPA Rain Zone 4 during spring in a commercial land use. According to Table 2, the expected value is:

Concentration = constant + landuse + season + rain zone + landuse*season + landuse*rain zone + season* rain zone

Y = 4.642 + 0 + 0 + 0.2949 + 0 + 0 + 0.5739 = 5.511

This corresponds to an expected mean concentration of 247 mg/L. The TSS data in the database for this same group has a mean value of 299 mg/L. This difference is well within the expected error.

After calculating the expected means for each of the 180 possible combinations, a dot plot was created to determine if some groups overlap. For example, it is expected that many of the observations in EPA Rain Zones 1, 3, 4, 6, 7 and 8 will have the same expected TSS concentration values because there were no variations by season for any land uses, except for the residential area. The dot plot of the 180 combinations is shown in Figure 6.

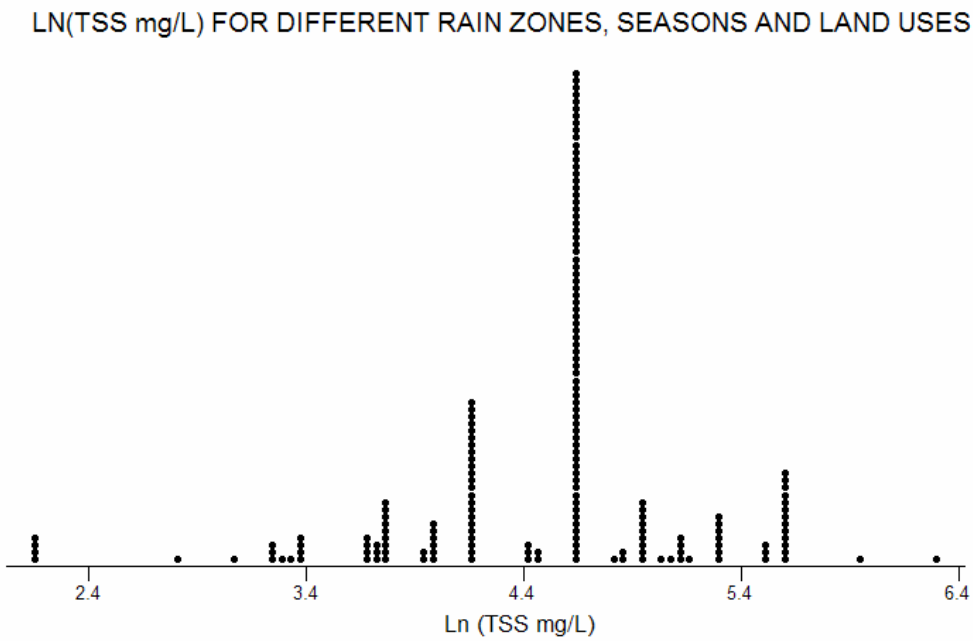

Figure 6. Dot plot of estimated concentrations of Ln TSS.

Figure 6 shows that there are about 17 different groups, at the most. The ANOVA model was reviewed to determine which of the main factors or interactions were the most important. The interaction of Land use*Rain Zone produces by itself the smallest MSE. The new ANOVA table using this interaction is shown in Table 3. The new MSE is 1.29 and is not much larger from the previous MSE using all the significant factors in the model (1.26). Table 4 shows the relevant coefficients using only the reduced model.

Table 3. ANOVA Table using Land Use – Rain Zone Interaction

General Results

2026 total cases

ANOVA

Analysis of Variance For **LTSS**
No Selector

Source	df	Sums of Squares	Mean Square	F-ratio	Prob
Const	1	32463.3	32463.3	25078	≤ 0.0001
Lnd*RZn	29	367.524	12.6732	9.7903	≤ 0.0001
Error	1996	2583.76	1.29447		
Total	2025	2951.29			

Results for factor Lnd*RZn

Table 4. Reduced Model

LN (TDS mg/L) COEFFICIENTS FOR DIFFERENT LAND USES, SEASONS AND RAIN ZONES					
	Level	**Coefficient**	**std. err.**	**t Ratio**	**prob**
Constant		4.098	0.07133	57.45	<0.0001
Landuse	**None**				
Season	**None**				
Rain Zone	**None**				
Landuse*Season	**None**				
Landuse*Rain Zone	**1,ID**	-0.8756	0.3235	-2.706	0.0069
	2,CO	-0.3258	0.0954	-3.415	0.0007
	2,FW	1.273	0.331	3.845	0.0001
	2,OP	-0.4027	0.2081	-1.935	0.0531
	2,RE	-0.3944	0.08116	-4.859	<0.0001
	3,CO	-0.5965	0.2429	-2.455	0.0142
	4,CO	0.4018	0.1705	2.357	0.0185
	4,ID	0.5327	0.1611	3.306	0.001
	4,OP	0.8354	0.3235	2.582	0.0099
	4,RE	0.3287	0.1309	2.512	0.0121
	5,CO	-0.7134	0.2528	-2.821	0.0048
	5,ID	0.8913	0.1876	4.751	<0.0001
	6,CO	0.6862	0.3504	1.958	0.0503
	6,FW	0.3606	0.1324	2.723	0.0065
	6,ID	1.229	0.2706	4.54	<0.0001
	6,RE	0.4203	0.217	1.937	0.0529
	7,FW	0.4948	0.2343	2.112	0.0348
	7,ID	0.6974	0.2429	2.87	0.0041
	7,RE	-0.5442	0.1612	-3.376	0.0007
	9,CO	0.9278	0.3859	2.404	0.0163
	9,ID	1.916	0.3859	4.966	<0.0001
Season*Rain Zone	**None**	0			
Landuse*Season*Rain Zone	**None**	0			

All land uses in EPA Rain Zone two (except for freeways) have reduced TSS values when compared with the group average. On the other hand, conditions in EPA Rain Zones 4, 6 and 9 have higher TSS values for the land uses noted. Notice also that industrial and freeway land uses increase the TSS concentrations compared with the other land uses, as expected from the one-way ANOVA tests. Of the 45 possible EPA Rain Zone and land use

interactions, 21 have significantly different coefficients and resultant TSS concentrations. All of these possible TSS concentrations, based on this model, are shown in Table 4b.

Table 4b. TSS Concentrations (mg/L) for Different Land Uses and Rain Zones (if values not shown, use 60 mg/L)

	1	2	3	4	5	6	7	8	9
Open space		40		139					
Residential		40		84		92	35		
Commercial		43	33	90	30	120			152
Industrial	25			103	147	206	121		
Freeways		215				86	99		409

Figure 7 shows the groups using the land use*rain zone model. A further reduction in the number of similar groups is not likely possible with this model.

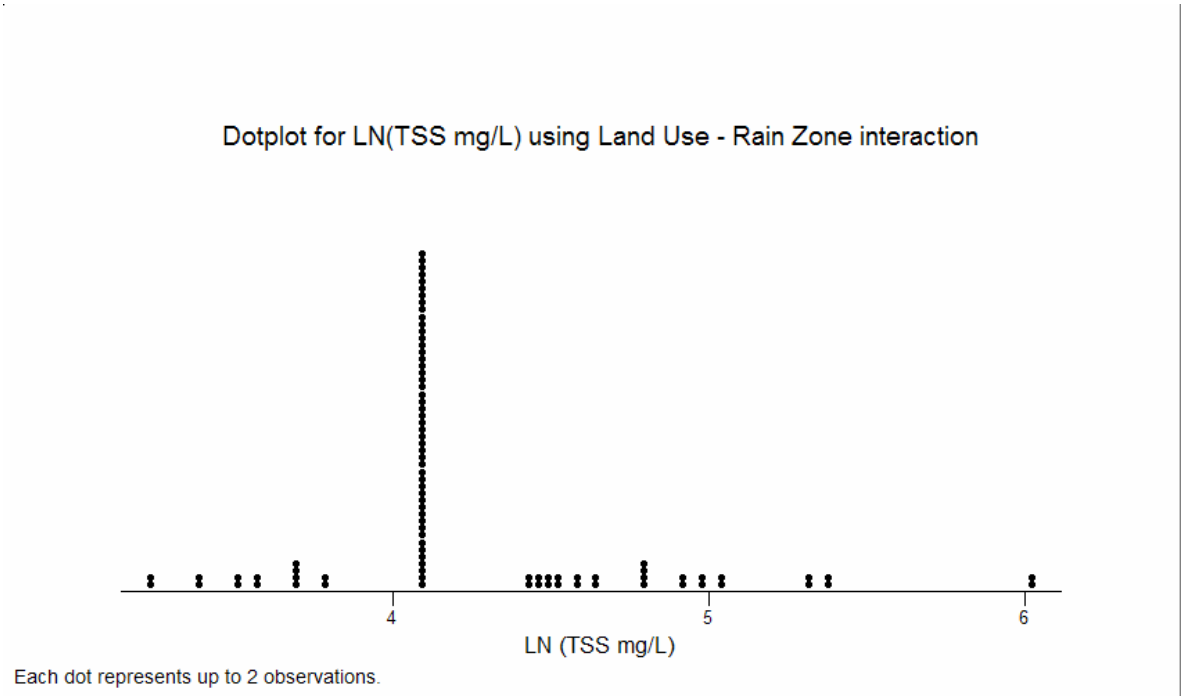

Figure 7. Dot plot using the reduced model

Out of the 45 total land use-rain zone groups, 24 (or 53%) are not affected by significant land use – EPA Rain Zone interaction terms. Seven of the 21 significant groups are smaller than the overall average condition (60 mg/L), while 14 are larger. Only 2 percent of the observations have very large concentrations, they were located in industrial land uses in EPA Rain Zone 9. Figure 8 shows the 5 groups identified with the ANOVA analysis. The variation within the groups is the same as the variation for the whole dataset. The two separate groups located in the upper tail are important. It is not recommended to merge these groups because their concentration differences are very large.

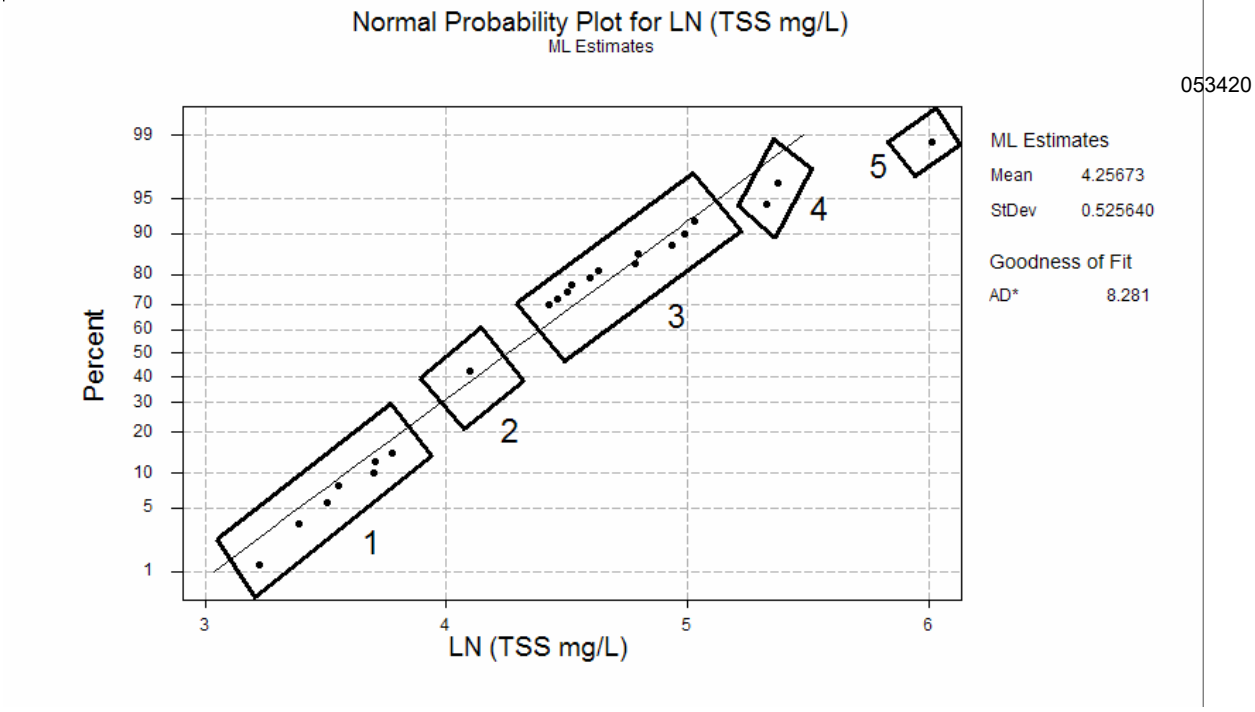

Figure 8. Probability plot using the reduced model (average of the tied points).

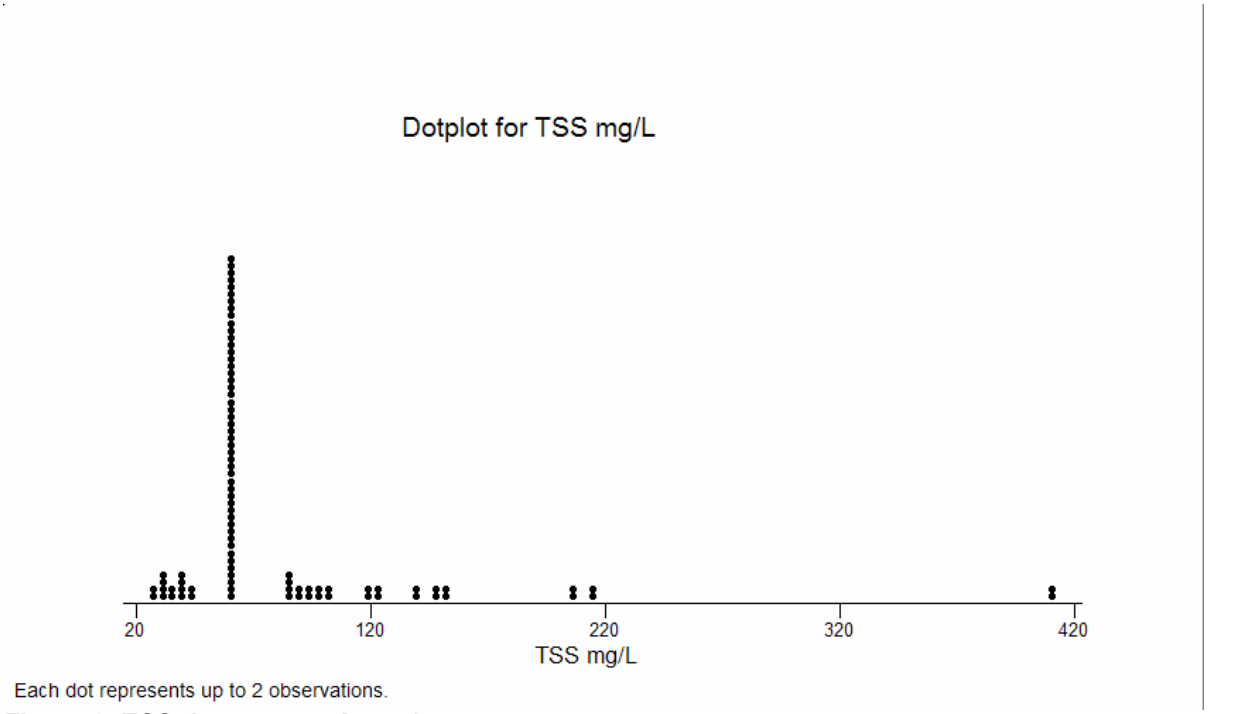

Figure 9. TSS data groups in real space.

There are 2,025 TSS observations for single land uses sites in the NSQD. These observations were classified according to the five groups identified by the above ANOVA model. Figure 11 is a box-whisker plot showing the medians, and 25th, 75th, 5th, and 95th percentiles for each of these groups.

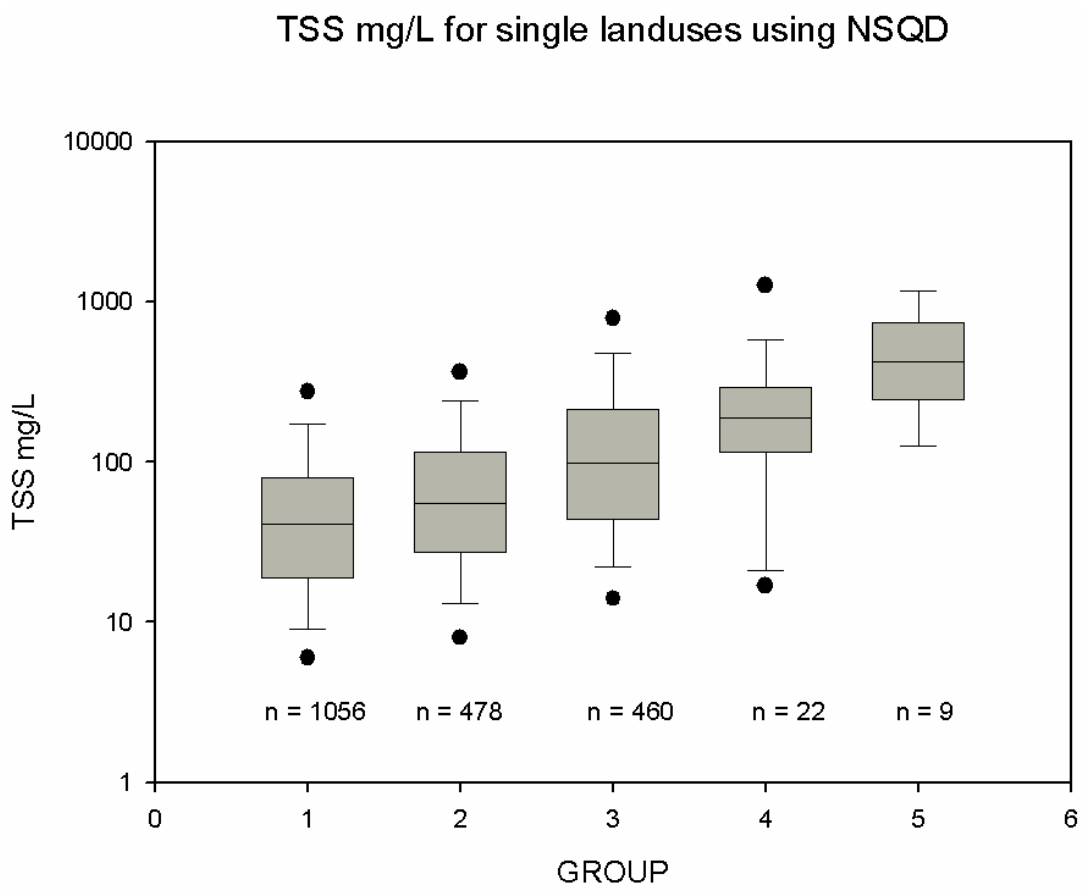

Figure 11. Box plots of five groups also showing 5th and 95th percentiles.

Figure 11 indicates that about half of the TSS single land use data in the NSQD database were in the first group (52%). Most of this data are from residential areas and EPA Rain Zone 2. Twenty-four percent of the observations were not affected by the land use – EPA Rain Zone interaction. Only 1.5% of the data are present in groups 4 and 5. These groups are significantly different than groups 1 and 2. Overall, there are three main levels of TSS concentrations in stormwater: Low (1), Medium (2) and High (3). Other minor categories correspond to groups 4 and 5 and contain the unusually high values.

Table 4c. Five TSS Concentration Categories in NSQD

	Land use*rain zone interactions (Rain Zone: land uses)	Concentrations (mean ± st. dev. ln mg/L)	Range (mean; mean – st. dev. and mean + st. dev., mg/L)	Number of single land use TSS observations in category in NSQD
Low	1: residential 2: open space; residential; commercial 3: commercial 5: commercial 7: residential	3.69±1.12	40 (13 – 123)	1056
Medium	All others not noted elsewhere	4.02±1.11	56 (18 – 169)	478
High	4: residential; commercial; industrial; open space 5: industrial 6: freeways; residential; commercial 7: freeways; industrial 9: commercial	4.60±1.20	99 (30 – 330)	460
Unusually high 1	2: freeways 6: industrial			22
Unusually high 2	9: industrial			9

To evaluate if groups 1 (low) and 2 (medium) are from the same population, a two-sample t test was calculated. The results are as follows:

```
Two-sample T for LTSSG1 vs LTSSG2

           N      Mean     StDev   SE Mean
LTSSG1  1056      3.69      1.12     0.034
LTSSG2   478      4.02      1.11     0.051

Difference = mu LTSSG1 - mu LTSSG2
Estimate for difference:  -0.3370
95% CI for difference: (-0.4577, -0.2162)
T-Test of difference = 0 (vs not =): T-Value = -5.47  P-Value = 0.000  DF = 1532
Both use Pooled StDev = 1.12
```

This test indicates that both groups are from different populations with a p value close to zero. The assumption of equal variances is also valid. The same procedure can be used to evaluate if group 2 (medium) and group 3 (high) are from the same population. The results are as follows:

```
Two-sample T for LTSSG2 vs LTSSG3

          N      Mean     StDev   SE Mean
LTSSG2  478      4.02      1.11     0.051
LTSSG3  460      4.60      1.20     0.056

Difference = mu LTSSG2 - mu LTSSG3
Estimate for difference:  -0.5789
95% CI for difference: (-0.7273, -0.4305)
T-Test of difference = 0 (vs not =): T-Value = -7.66  P-Value = 0.000  DF = 936
Both use Pooled StDev = 1.16
```

The variance of both samples are within 10%. The T statistic and p value corroborates that both distributions are from different populations. A grouped probability plot of the five groups is shown in Figure 12.

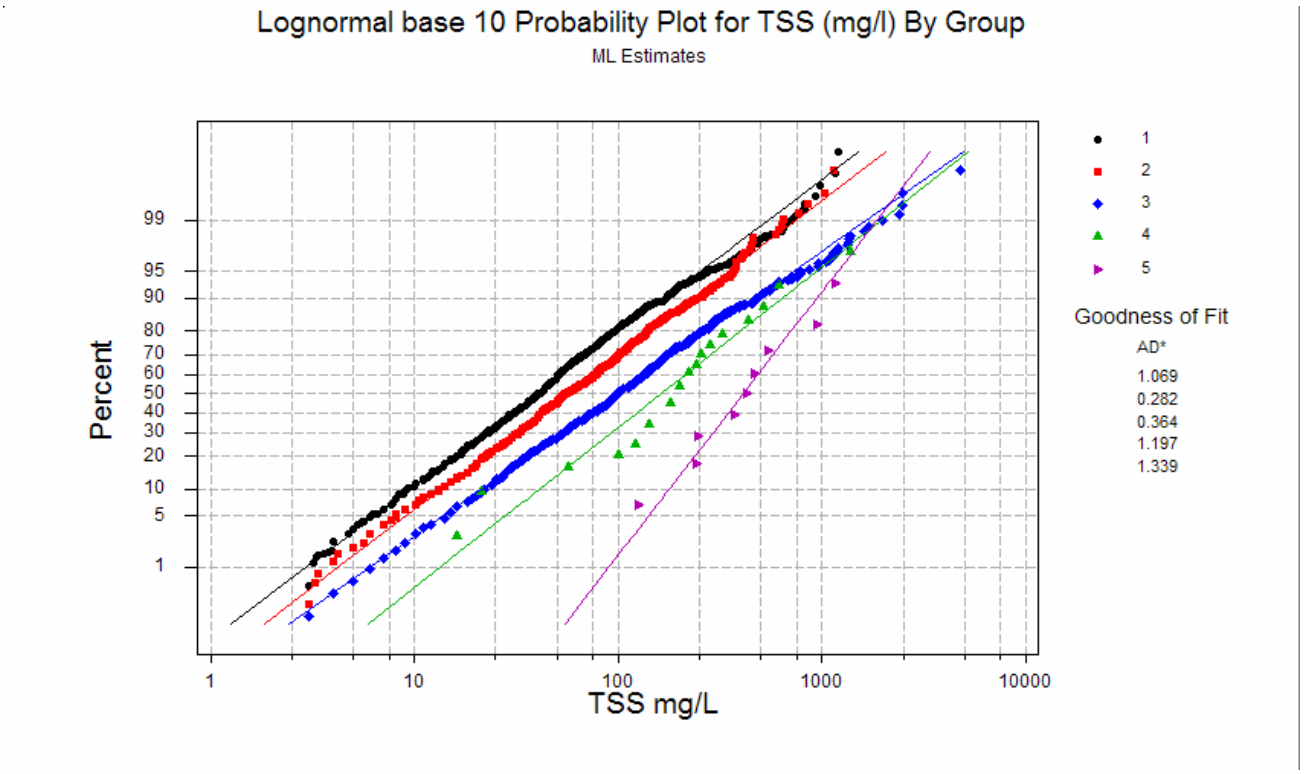

Figure 12. Probability plot of the TSS data in the NSQD using the 5 main sample groups.

The three main groups are clearly defined. Groups 4 and 5 do not have the same numbers of observations as the other groups, so the parameters are not as well described. The upper 5% of the tails in groups 1 and 2 overlap. Group 3 has a slightly larger variance (1.2 vs 1.1) compared with groups 1 and 2. The tails fit the lognormal distribution almost perfectly. The normality test using the Anderson Darling test statistic resulted in a p-value of close to zero for group 1, while for group 2, the p-value was 0.78 and for group 3, the p-value was 0.53. Group 1 fails the normality assumption because of distortion in the upper tail.

Land Use and Geographical Area Effects for All Constituents

This chapter section summarizes the analyses that were conducted to identify significant land use and geographical interactions affecting stormwater concentrations contained in the NSQD. The first step was to select the data for analysis. Only samples collected using flow-weighted automatic samplers were used, in areas not having detention ponds. Also, no sites having only a single monitored event were used.

The second step was to select the following single land uses from the NSQD. The following cross-tabulation summarizes the data counts for samples meeting the above selection criteria in the main three land uses being investigated (CO is for commercial areas, ID is for industrial areas, and RE is for residential areas). The other land uses had many instances of few observations in the EPA Rain Zones.

Tabulated statistics: Landuse, EPA_Rain_Zone

Rows: Landuse Columns: EPA_Rain_Zone

	1	2	3	4	5	6	7	8	9	All
CO	3	123	6	16	42	34	41	0	9	274
ID	3	109	16	17	47	70	33	0	3	298
RE	6	331	18	31	71	38	40	7	7	549
All	12	563	40	64	160	142	114	7	19	1121

EPA Rain Zones 1, 8 and 9 do have not enough data observations in each land use group. Therefore, only EPA Rain Zones 2 thru 7 were included in these analyses. A single land use site corresponds to a watershed with a predominant land uses, where other land uses present in the watershed represent 10% or less of the total area. Therefore, these analyses represent stormwater observations from about the southern half of the country, plus the Pacific Northwest. Data in the NSQD are much sparser in the northeastern states, the upper mid west, the northern Great Plains and western mountain states. The initial NSQD data collection efforts focused on the mid-Atlantic and southern states, while additional data also became available in the southwest and west coast states, allowing at least this partial geographical analysis.

The third step was to estimate the non-detected observations using the Cohen's Maximum likelihood method. The estimation was performed site by site; only samples collected at the same location were used to estimate the censored observations.

For these calculations, the General Linear Model (GLM) was used to identify significant two-way interactions between these land uses and the EPA Rain Zones. The associated Minitab file used is: `RECOID NOSINGLE NOPOND AU FLOW.MPJ.` In all cases, an $\alpha = 5\%$ criterion was high-lighted, although all p values are tabulated for comparison.

Significant Land Use and Geographical Interactions affecting MS4 Stormwater Quality

The following tables summarize the most common stormwater constituents and how they are affected by the interaction of land use and geographical area (residential, commercial, and industrial areas only, and for EPA Rain Zones 2 through 7). The small tables summarize the overall statistics for the constituent. The larger tables summarize a similar summary for each land use/geographical area subset of data. Overall land use summaries are also shown. Only data collected with flow-weighted automatic samplers, with no ponds, are used for these summaries, as described above. In addition, left-censored (non-detected) values were substituted using Cohen's Maximum likelihood method. Calculated p values are located at the top of each cell on this matrix describing the probability that the data in the subset is different from the overall set of data. The grayed-out cells represent conditions where the p-value is greater than 0.05, the usually selected critical value for identifying significant differences. The other cells are therefore usually interpreted as being significantly different from the overall conditions. Some of the cells have no observations and are therefore left blank, except for the zero sample size. Also, some cells are highlighted because they have few sites represented (0, 1, or 2 sites). The data in these grayed-out and highlighted cells should therefore be used with caution. Overall land use summary statistics are also shown. These could be used for those cells indicated in gray, and for those cells that have very few observations, depending on the test statistics comparing the different land uses for each pollutant (see Table XX below). These matrices display the interaction terms for geographical area (represented by EPA Rain Zone) and land use, plus the test statistics for the land uses separately. The detailed tests for statistical significance for the individual factors for each constituent are presented in Appendix F and were calculated using the General Linear Model (GLM) available in Minitab.

Table XX shows the calculated p values using the Tukey simultaneous tests and the General Linear Model for the land use effects alone. This can be used to help select the most appropriate data summary statistics to use for a specific situation, if the land use/geographical interaction data is not appropriate (with not significantly different, or too few data). If the individual cell values are not available, this table indicates that:

- Constituents that should clearly be separated by land use: copper, lead, and zinc

- Constituents that clearly did not have any significant differences for different land use categories, therefore use overall values: pH, temperature (obvious seasonal effects), TDS, and TKN
- Constituents where residential data should be separated from commercial plus industrial area data: TSS (possible) and nitrates plus nitrites
- Constituents where it is not clear; conflicts in p values when comparing different combinations of land uses: hardness, oil and grease, BOD_5, COD, ammonia, total P, and dissolved P

Table XX. Probability of Concentration Differences Between Land Use Categories (General Linear Model and Tukey Simultaneous Tests)*

Constituent	Overall Land Use p	p for Resid. vs. Commercial	p for Resid. vs. Industrial	p for Commercial vs. Industrial	Comment
pH	0.20	n/a	0.20	n/a	use overall values
temperature	0.99	1.00	1.00	1.00	use overall values (obvious seasonal effect)
hardness	***0.008***	0.18	0.24	***0.005***	not clear
oil and grease	***0.010***	***0.01***	0.89	0.06	not clear
TDS	0.065	0.15	0.81	0.06	use overall values
TSS	***<0.0001***	0.08	***<0.0001***	0.36	not clear, or resid. vs. commercial plus industrial if willing to accept slightly higher p
BOD_5	***0.002***	***0.005***	1.00	***0.004***	not clear
COD	***0.036***	***0.03***	0.62	0.45	not clear
ammonia	***0.001***	***0.0005***	0.28	0.09	not clear
nitrates plus nitrites	***<0.0001***	***0.0007***	***0.0006***	1.00	resid. vs. commercial plus industrial
TKN	0.30	0.99	0.35	0.42	use overall values
total phosphorus	***0.003***	***0.008***	1.00	***0.005***	not clear
dissolved P	***0.021***	***0.020***	0.37	1.00	not clear
copper	***<0.0001***	***<0.0001***	***<0.0001***	***<0.0001***	use individual land use values
lead	***<0.0001***	***0.0015***	***<0.0001***	***0.021***	use individual land use values
zinc	***<0.0001***	***<0.0001***	***<0.0001***	***0.0007***	use individual land use values

* the high-lighted p values are <0.05, the usual critical value to identify differences between data categories

When examining the detailed land use and seasonal interactions in the following tables, it is clear that some of the constituents do not have many significant interactions in these factors, or that there are too few observations (or sites) represented in the NSQD. In these cases, the above Table XX can be used to help select either the significant land use value, or the overall value. The constituents that have few, if any clear geographical area/land use interactions include: pH (I6), temperature, hardness, oil and grease (I5 and I7), TDS (C2), ammonia (C7), and dissolved P (R2 and R5). The values in the parentheses are the significant interaction terms (the land use and the EPA Rain Zone).

pH

Total Observations	366
Total Sites	34
Mean	7.5
Median	7.5
Standard Deviaton	0.67
Coefficient of Variation	0.09
Minimum	5.3
Maximum	9.9

		2	3	4	5	6	7	Overall
RESIDENTIAL	p	0.7469	-	-	0.1546	0.4828	-	Residential
	observ.	14	8	0	71	22	25	140
	sites	3	1		6	3	3	16
	mean	7.36	6.79		7.52	7.34	7.32	7.40
	median	7.43	6.50		7.50	7.40	7.20	7.40
	st. dev.	0.39	0.42		0.58	0.56	0.71	0.60
	COV	0.05	0.06		0.08	0.08	0.10	0.08
	min.	6.70	6.50		6.20	6.30	6.20	6.20
	max.	7.87	7.40		9.90	8.30	9.10	9.90
COMMERCIAL	p	-	-	-	0.8281	0.058	0.6767	Commercial
	observ.	0	0	0	41	27	27	95
	sites				2	2	3	7
	mean				7.70	6.74	7.36	7.33
	median				7.70	6.70	7.40	7.40
	st. dev.				0.44	0.63	0.66	0.69
	COV				0.06	0.09	0.09	0.09
	min.				6.90	5.70	5.30	5.30
	max.				9.10	8.60	8.38	9.10
INDUSTRIAL	p	0.8245	0.2146	-	0.2121	0.0056	0.6767	Industrial
	observ.	18	9	0	46	53	5	131
	sites	3	1		3	3	1	11
	mean	7.32	6.61		7.98	7.68	7.34	7.65
	median	7.31	6.50		8.00	7.70	7.40	7.70
	st. dev.	0.53	0.22		0.50	0.72	0.36	0.69
	COV	0.07	0.03		0.06	0.09	0.05	0.09
	min.	6.40	6.50		6.60	5.90	6.80	5.90
	max.	8.65	7.00		9.00	9.30	7.70	9.30

Temperature (°C)

Total Observations	303
Total Sites	22
Mean	17.8
Median	17.0
Standard Deviaton	6.3
Coefficient of Variation	0.35
Minimum	5.00
Maximum	31.5

		2	3	4	5	6	7	Overall
RESIDENTIAL	**p**	-	-	-	0.6256	0.5235	0.8447	**Residential**
	observ.	0	0	0	71	20	20	111
	sites				6	2	2	10
	mean				18.10	19.54	11.35	17.14
	median				18.00	17.25	10.35	16.50
	st. dev.				5.19	7.12	4.41	6.08
	COV				0.29	0.36	0.39	0.37
	min.				7.50	11.00	5.00	5.00
	max.				29.00	28.50	23.00	29.00
COMMERCIAL	**p**	-	-	-	0.0087	0.4802	0.1639	**Commercial**
	observ.	0	0	0	41	26	21	88
	sites				2	1	2	5
	mean				16.23	20.87	12.72	16.76
	median				17.00	20.25	11.90	15.65
	st. dev.				4.76	7.13	4.54	6.23
	COV				0.29	0.34	0.36	0.40
	min.				6.50	11.00	5.00	5.00
	max.				24.00	30.00	21.00	30.00
INDUSTRIAL	**p**	-	-	-	0.0584	0.9675	0.2401	**Industrial**
	observ.	0	0	0	47	52	5	104
	sites				3	3	1	7
	mean				19.47	20.21	9.90	19.38
	median				20.50	17.25	9.00	17.50
	st. dev.				5.84	6.40	2.70	6.36
	COV				0.30	0.32	0.27	0.36
	min.				7.00	11.50	7.00	7.00
	max.				30.00	31.50	14.00	31.50

Hardness (mg/L)

Total Observations	245
Total Sites	20
Mean	35.0
Median	29.0
Standard Deviaton	37.4
Coefficient of Variation	1.07
Minimum	1.90
Maximum	443

		2	3	4	5	6	7	Overall
RESIDENTIAL	**p**	0.2531	-	-	0.2531	-	-	**Residential**
	observ.	8	0	0	64	0	26	98
	sites	1			6		2	9
	mean	53.7			34.6		22.5	32.9
	median	38.8			31.3		19.5	30.1
	st. dev.	38.6			13.4		16.6	19.0
	COV	0.72			0.39		0.74	0.63
	min.	12.70			15.00		5.00	5
	max.	130			78		66	130
COMMERCIAL	**p**	-	-	-	0.4432	-	-	**Commercial**
	observ.	0	0	0	39	0	26	65
	sites				2		2	4
	mean				31.7		18.5	26.4
	median				28.0		16.0	26.0
	st. dev.				11.6		14.6	14.3
	COV				0.37		0.79	0.55
	min.				14.00		1.90	1.9
	max.				70		62	70
INDUSTRIAL	**p**	0.2301	-	-	0.7488	0.2737	-	**Industrial**
	observ.	11	0	0	43	8	20	82
	sites	1			3	1	2	7
	mean	110.8			43.8	13.1	21.4	44.3
	median	54.9			37.0	5.0	17.5	33.5
	st. dev.	135.8			23.6	12.9	16.2	58.9
	COV	1.23			0.54	0.98	0.76	1.76
	min.	10.00			18.00	5.00	5.50	5
	max.	443			137	34	76	443

Oil and Grease (mg/L)

Total Observations	609
Total Sites	87
Mean	17.2
Median	3.0
Standard Deviaton	130
Coefficient of Variation	7.48
Minimum	0.10
Maximum	2980

		2	3	4	5	6	7	Overall
RESIDENTIAL	p	0.7009	-	0.5378	0.7734	0.8825	0.2588	**Residential**
	observ.	92	0	31	68	24	38	253
	sites	28		2	6	3	4	43
	mean	4.41		5.26	74.45	9.74	3.21	23.66
	median	2.50		4.00	2.00	3.00	1.60	2.50
	st. dev.	4.97		6.04	369.19	29.98	5.20	193.11
	COV	1.13		1.15	4.96	3.08	1.62	77.24
	min.	0.20		0.90	0.10	0.20	0.20	0.10
	max.	32		31	2980	150	31	2980
COMMERCIAL	p	0.5325	-	0.8903	0.0043	0.4621	0.131	**Commercial**
	observ.	52	0	14	41	29	37	173
	sites	12		1	2	2	4	21
	mean	5.78		7.24	44.50	7.90	3.54	14.95
	median	3.80		4.00	4.00	4.00	2.60	3.60
	st. dev.	5.96		6.94	92.55	11.84	3.21	48.02
	COV	1.03		0.96	2.08	1.50	0.91	13.34
	min.	0.80		0.90	0.10	0.40	0.30	0.10
	max.	36		25	359	60	18	359
INDUSTRIAL	p	0.7869	-	0.5016	0.0014	0.3238	0.0124	**Industrial**
	observ.	41	0	15	43	55	29	183
	sites	13		1	3	3	3	23
	mean	5.28		3.99	26.90	6.17	4.69	10.43
	median	2.50		4.00	2.00	4.00	4.00	3.00
	st. dev.	5.51		3.64	76.52	5.58	3.44	38.13
	COV	1.04		0.91	2.85	0.91	0.73	12.71
	min.	0.40		0.50	0.10	0.30	0.60	0.10
	max.	22		14	408	24	16	408

Total Dissolved Solids (mg/L)

Total Observations	891
Total Sites	78
Mean	115
Median	68.0
Standard Deviaton	416
Coefficient of Variation	3.63
Minimum	3.00
Maximum	11200

		2	3	4	5	6	7	Overall
RESIDENTIAL	p	0.6452	0.8115	0.0608	0.5094	0.2516	0.1005	**Residential**
	observ.	268	17	31	64	34	37	451
	sites	19	4	2	6	3	4	38
	mean	87.5	92.2	228.9	77.4	108.9	56.4	95.0
	median	61.5	63.0	173.0	63.0	85.0	58.0	67.0
	st. dev.	124.1	62.3	195.9	35.0	64.6	35.5	117.8
	COV	1.42	0.68	0.86	0.45	0.59	0.63	1.76
	min.	11.00	27.00	59.00	33.00	42.00	3.00	3.00
	max.	1700	211	1096	191	280	175	1700
COMMERCIAL	p	0.0529	0.1439	0.0668	0.1313	0.689	0.8431	**Commercial**
	observ.	82	6	15	39	20	37	199
	sites	6	2	1	2	2	4	17
	mean	124.1	53.3	204.0	54.4	117.6	56.8	101.2
	median	61.0	42.0	140.0	47.0	81.5	53.0	62.0
	st. dev.	421.9	33.5	200.3	22.2	90.0	36.2	280.5
	COV	3.40	0.63	0.98	0.41	0.77	0.64	4.52
	min.	23.00	29.00	64.00	23.00	33.00	4.00	4.00
	max.	3860	120	880	120	383	124	3860
INDUSTRIAL	p	0.0938	0.1045	0.0004	0.3216	0.4684	0.0941	**Industrial**
	observ.	86	16	16	43	56	24	241
	sites	9	3	1	3	4	3	23
	mean	259.2	112.3	126.3	85.6	134.4	76.7	162.5
	median	56.5	101.6	88.0	71.0	127.0	70.5	77.0
	st. dev.	1232.4	61.5	115.9	46.5	67.0	44.1	739.0
	COV	4.76	0.55	0.92	0.54	0.50	0.58	9.60
	min.	4.50	14.00	30.00	27.00	16.00	7.00	4.50
	max.	11200	224	524	238	373	154	11200

Total Suspended Solids (mg/L)

Total Observations	979
Total Sites	103
Mean	133
Median	54.0
Standard Deviaton	258
Coefficient of Variation	1.94
Minimum	0.43
Maximum	2490

		2	3	4	5	6	7	Overall
RESIDENTIAL	**p**	0.0046	0.5206	0.503	0.0198	0.3101	0.3709	**Residential**
	observ.	309	18	30	64	33	37	491
	sites	32	4	2	6	3	4	51
	mean	64.6	37.3	376.5	102.1	112.4	75.1	91.5
	median	43.0	20.5	188.5	72.0	95.0	49.0	51.0
	st. dev.	79.8	43.3	559.0	105.4	80.2	120.5	176.3
	COV	1.24	1.16	1.48	1.03	0.71	1.60	3.46
	min.	2.55	4.20	11.00	4.00	3.00	7.00	2.55
	max.	823	180	2462	608	350	757	2462
COMMERCIAL	**p**	0.4554	0.0058	<0.0001	<0.0001	0.0011	0.1118	**Commercial**
	observ.	113	6	15	40	20	37	231
	sites	12	2	1	2	2	4	23
	mean	59.0	76.7	829.2	67.3	111.8	86.4	119.8
	median	35.0	84.5	609.0	29.5	100.5	50.0	47.0
	st. dev.	79.2	38.1	579.1	109.9	109.1	92.3	251.4
	COV	1.34	0.50	0.70	1.63	0.98	1.07	5.35
	min.	6.70	25.00	176.00	2.00	8.00	8.00	2.00
	max.	629	110	2385	640	510	380	2385
INDUSTRIAL	**p**	0.0929	0.0039	<0.0001	<0.0001	<0.0001	0.0206	**Industrial**
	observ.	101	16	16	43	57	24	257
	sites	15	3	1	3	4	3	29
	mean	68.9	69.1	335.9	244.9	503.9	182.7	222.1
	median	42.0	27.5	176.0	167.0	297.0	114.5	92.0
	st. dev.	66.9	90.2	395.9	387.2	504.6	222.4	354.4
	COV	0.97	1.31	1.18	1.58	1.00	1.22	3.85
	min.	3.00	0.43	21.00	24.00	16.00	16.00	0.43
	max.	330	320	1183	2490	2325	1080	2490

Biochemical Oxygen Demand, 5-day (BOD_5) (mg/L)

Total Observations	901
Total Sites	91
Mean	15.5
Median	9.0
Standard Deviaton	21.5
Coefficient of Variation	1.39
Minimum	0.75
Maximum	270

		2	3	4	5	6	7	Overall
RESIDENTIAL	**p**	0.0265	0.3419	0.0007	0.0014	0.7423	<0.0001	**Residential**
	observ.	290	16	31	67	15	37	456
	sites	25	4	2	6	3	4	44
	mean	14.7	9.2	19.6	9.7	32.7	7.0	14.0
	median	11.0	8.5	14.0	7.6	22.0	5.0	9.4
	st. dev.	17.0	6.5	15.2	8.6	30.4	7.7	16.3
	COV	1.16	0.71	0.77	0.89	0.93	1.10	1.75
	min.	2.00	2.00	2.00	2.40	10.00	1.34	1.34
	max.	226	28	69	50	130	41	226
COMMERCIAL	**p**	0.7121	0.0021	0.0403	0.0058	0.9511	<0.0001	**Commercial**
	observ.	114	6	15	40	13	37	225
	sites	9	2	1	2	2	4	20
	mean	15.8	29.2	22.3	6.9	46.0	10.1	15.8
	median	13.0	21.5	17.0	7.3	43.0	6.4	10.1
	st. dev.	13.5	28.8	15.4	3.1	30.3	9.8	16.5
	COV	0.85	0.99	0.69	0.44	0.66	0.97	1.63
	min.	2.93	7.30	4.00	2.50	9.00	0.75	0.75
	max.	96	83	57	17	100	42	100
INDUSTRIAL	**p**	0.1136	0.0031	<0.0001	0.9638	0.6756	<0.0001	**Industrial**
	observ.	97	16	16	46	21	24	220
	sites	13	3	1	3	4	3	27
	mean	12.5	7.1	6.0	6.4	56.6	43.7	18.0
	median	8.0	7.2	5.5	6.4	21.0	29.0	8.0
	st. dev.	17.7	4.9	3.3	2.3	72.2	38.8	32.4
	COV	1.41	0.69	0.55	0.36	1.27	0.89	4.05
	min.	1.24	1.00	2.00	2.00	1.40	4.00	1.00
	max.	147	19	14	13	270	160	270

Chemical Oxygen Demand (COD) (mg/L)

Total Observations	849
Total Sites	72
Mean	92.9
Median	60.0
Standard Deviaton	96.3
Coefficient of Variation	1.04
Minimum	2.00
Maximum	906

		2	3	4	5	6	7	Overall
RESIDENTIAL	**p**	0.0451	0.6485	-	<0.0001	0.0813	0.0007	**Residential**
	observ.	265	16	0	69	37	37	424
	sites	19	4		6	3	4	36
	mean	77.4	47.5		80.7	157.5	47.4	81.2
	median	60.0	37.0		60.0	130.0	31.0	59.5
	st. dev.	69.9	34.2		69.2	95.4	54.5	74.5
	COV	0.90	0.72		0.86	0.61	1.15	1.25
	min.	5.00	6.00		10.00	32.00	9.00	5.00
	max.	620	140		480	370	300	620
COMMERCIAL	**p**	0.7521	0.0396	-	0.0238	0.7645	0.0274	**Commercial**
	observ.	82	6	0	41	33	37	199
	sites	6	2		2	2	4	16
	mean	92.9	93.8		50.7	225.7	58.3	99.8
	median	67.5	69.0		45.0	200.0	41.0	63.0
	st. dev.	91.1	78.8		28.6	127.1	54.8	101.8
	COV	0.98	0.84		0.56	0.56	0.94	1.62
	min.	8.00	23.00		14.09	77.00	8.00	8.00
	max.	635	240		150	582	330	635
INDUSTRIAL	**p**	0.0344	0.0311	-	0.0117	0.1328	<0.0001	**Industrial**
	observ.	85	16	0	45	56	24	226
	sites	8	3		3	3	3	20
	mean	66.3	42.9		48.9	242.6	104.2	108.9
	median	54.0	35.0		35.0	225.0	84.5	60.5
	st. dev.	51.5	28.8		39.7	165.7	75.8	121.7
	COV	0.78	0.67		0.81	0.68	0.73	2.01
	min.	2.00	4.00		9.55	18.00	18.00	2.00
	max.	340	116		250	906	284	906

Ammonia (NH_3) (mg/L)

Total Observations	588
Total Sites	45
Mean	0.54
Median	0.31
Standard Deviaton	0.73
Coefficient of Variation	1.34
Minimum	0.00
Maximum	0.80

		2	3	4	5	6	7	Overall
RESIDENTIAL	p	0.3204	-	-	-	0.6461	0.238	**Residential**
	observ.	262	0	0	0	20	26	308
	sites	19				1	3	23
	mean	0.33				1.10	0.48	0.40
	median	0.25				0.96	0.11	0.26
	st. dev.	0.28				0.72	1.14	0.49
	COV	0.84				0.66	2.40	1.89
	min.	0.02				0.19	0.00	0.00
	max.	1.49				3.40	5.60	5.60
COMMERCIAL	p	0.793	-	-	-	0.0128	0.0079	**Commercial**
	observ.	82	0	0	0	23	25	130
	sites	6				1	3	10
	mean	0.56				2.30	0.42	0.84
	median	0.42				1.70	0.14	0.48
	st. dev.	0.49				1.62	0.84	1.09
	COV	0.88				0.70	1.99	2.30
	min.	0.04				0.92	0.01	0.01
	max.	2.51				7.80	4.20	7.80
INDUSTRIAL	p	0.2238	-	-	-	0.0011	0.0003	**Industrial**
	observ.	81	0	0	0	51	18	150
	sites	8				2	2	12
	mean	0.34				1.05	0.43	0.59
	median	0.28				0.83	0.30	0.35
	st. dev.	0.28				0.88	0.47	0.66
	COV	0.85				0.83	1.10	1.89
	min.	0.02				0.03	0.03	0.02
	max.	1.60				5.20	1.70	5.20

Nitrites and Nitrates ($NO_2 + NO_3$) (mg/L)

Total Observations	904
Total Sites	75
Mean	0.78
Median	0.60
Standard Deviaton	0.72
Coefficient of Variation	0.92
Minimum	0.02
Maximum	7.30

		2	3	4	5	6	7	Overall
RESIDENTIAL	p	<0.0001	<0.0001	-	<0.0001	<0.0001	-	**Residential**
	observ.	302	7	0	69	38	36	452
	sites	23	1		6	3	4	37
	mean	0.62	1.61		0.82	1.24	0.81	0.73
	median	0.49	1.29		0.66	1.15	0.75	0.60
	st. dev.	0.44	1.31		0.85	0.54	0.66	0.60
	COV	0.71	0.82		1.03	0.44	0.82	1.01
	min.	0.04	0.08		0.11	0.50	0.08	0.04
	max.	2.90	3.16		7.17	2.96	3.50	7.17
COMMERCIAL	p	<0.0001	-	-	0.001	0.0021	<0.0001	**Commercial**
	observ.	114	0	0	40	30	37	221
	sites	9			2	2	4	17
	mean	0.77			0.54	1.26	0.39	0.73
	median	0.55			0.52	1.00	0.28	0.52
	st. dev.	0.88			0.24	0.91	0.44	0.78
	COV	1.14			0.45	0.72	1.11	1.51
	min.	0.02			0.15	0.06	0.08	0.02
	max.	7.30			1.13	3.90	2.60	7.30
INDUSTRIAL	p	0.0656	0.0093	-	0.1978	0.7055	<0.0001	**Industrial**
	observ.	94	9	0	46	58	24	231
	sites	11	1		3	3	3	21
	mean	0.67	0.44		0.68	1.86	0.21	0.92
	median	0.59	0.24		0.67	1.70	0.17	0.68
	st. dev.	0.49	0.53		0.30	1.01	0.18	0.84
	COV	0.73	1.20		0.44	0.54	0.84	1.23
	min.	0.03	0.05		0.07	0.46	0.02	0.02
	max.	2.36	1.66		1.69	4.70	0.70	4.70

Total Kjeldahl Nitrogen (TKN) (mg/L)

Total Observations	936
Total Sites	83
Mean	2.03
Median	1.32
Standard Deviaton	2.30
Coefficient of Variation	1.13
Minimum	0.00
Maximum	36.0

		2	3	4	5	6	7	Overall
RESIDENTIAL	**p**	0.7294	0.3106	-	<0.0001	0.3109	<0.0001	**Residential**
	observ.	302	17	0	69	37	37	462
	sites	23	4		6	3	4	40
	mean	1.76	1.19		2.07	3.90	1.34	1.92
	median	1.32	1.00		1.40	3.50	0.70	1.33
	st. dev.	2.39	0.48		1.80	2.37	2.10	2.32
	COV	1.36	0.40		0.87	0.61	1.56	1.75
	min.	0.10	0.56		0.20	0.50	0.00	0.00
	max.	36.00	2.39		10.00	11.00	11.60	36.00
COMMERCIAL	**p**	0.0944	0.4593	-	0.0687	0.6993	0.2111	**Commercial**
	observ.	114	6	0	40	34	37	231
	sites	9	2		2	2	4	19
	mean	1.94	1.27		1.14	4.41	1.46	2.07
	median	1.44	0.97		0.87	3.65	0.80	1.39
	st. dev.	1.51	0.86		0.83	2.84	1.59	1.96
	COV	0.78	0.67		0.72	0.64	1.09	1.41
	min.	0.05	0.72		0.26	1.04	0.02	0.02
	max.	8.68	3.00		4.00	12.00	8.30	12.00
INDUSTRIAL	**p**	0.0382	0.0556	-	0.0825	0.5193	<0.0001	**Industrial**
	observ.	94	15	0	46	64	24	243
	sites	11	3		3	4	3	24
	mean	1.31	0.84		1.05	4.66	2.09	2.19
	median	0.98	0.80		0.83	3.85	1.70	1.20
	st. dev.	1.28	0.48		0.80	3.54	1.30	2.54
	COV	0.97	0.57		0.77	0.76	0.62	2.12
	min.	0.16	0.05		0.10	0.25	0.01	0.01
	max.	10.00	1.77		5.00	16.00	5.90	16.00

Total Phosphorus (P) (mg/L)

Total Observations	941
Total Sites	86
Mean	0.43
Median	0.30
Standard Deviaton	0.52
Coefficient of Variation	1.21
Minimum	0.01
Maximum	7.90

		2	3	4	5	6	7	Overall
RESIDENTIAL	**p**	0.003	0.8219	-	<0.0001	0.0038	<0.0001	**Residential**
	observ.	309	18	0	69	38	37	471
	sites	25	4		6	3	4	42
	mean	0.39	0.35		0.49	0.66	0.29	0.41
	median	0.31	0.16		0.43	0.49	0.20	0.33
	st. dev.	0.28	0.62		0.22	0.77	0.38	0.37
	COV	0.72	1.81		0.45	1.16	1.32	1.12
	min.	0.05	0.07		0.19	0.14	0.04	0.04
	max.	1.89	2.78		1.12	4.96	2.20	4.96
COMMERCIAL	**p**	0.022	0.1594	-	0.0002	0.2391	0.6938	**Commercial**
	observ.	114	6	0	40	34	37	231
	sites	9	2		2	2	4	19
	mean	0.30	0.23		0.27	0.53	0.38	0.34
	median	0.22	0.25		0.11	0.48	0.27	0.23
	st. dev.	0.24	0.15		0.66	0.34	0.53	0.41
	COV	0.82	0.62		2.47	0.65	1.40	1.80
	min.	0.06	0.07		0.02	0.16	0.02	0.02
	max.	1.75	0.46		4.27	2.00	3.30	4.27
INDUSTRIAL	**p**	<0.0001	0.1215	-	0.0013	<0.0001	<0.0001	**Industrial**
	observ.	96	15	0	45	59	24	239
	sites	13	3		3	3	3	25
	mean	0.27	0.24		0.25	1.32	0.61	0.56
	median	0.22	0.17		0.18	1.10	0.59	0.29
	st. dev.	0.23	0.24		0.22	1.23	0.32	0.78
	COV	0.85	1.00		0.89	0.93	0.53	2.70
	min.	0.01	0.03		0.05	0.14	0.06	0.01
	max.	1.29	0.90		1.28	7.90	1.40	7.90

Dissolved Phosphorus (dissolved P) (mg/L)

Total Observations	696
Total Sites	56
Mean	0.18
Median	0.12
Standard Deviaton	0.18
Coefficient of Variation	1.02
Minimum	0.01
Maximum	1.60

		2	3	4	5	6	7	Overall
RESIDENTIAL	**p**	0.0103	0.5914	-	<0.0001	0.0607	0.002	**Residential**
	observ.	255	14	0	69	20	8	366
	sites	17	4		6	1	2	30
	mean	0.19	0.08		0.29	0.28	0.03	0.20
	median	0.14	0.06		0.27	0.21	0.02	0.17
	st. dev.	0.16	0.07		0.15	0.15	0.03	0.16
	COV	0.86	0.92		0.53	0.56	0.97	0.97
	min.	0.01	0.03		0.02	0.11	0.01	0.01
	max.	1.07	0.26		0.84	0.70	0.09	1.07
COMMERCIAL	**p**	0.1317	0.0324	-	<0.0001	0.0056	0.8748	**Commercial**
	observ.	73	6	0	40	26	7	152
	sites	4	2		2	1	2	11
	mean	0.10	0.10		0.05	0.42	0.04	0.14
	median	0.07	0.06		0.05	0.39	0.03	0.07
	st. dev.	0.09	0.10		0.03	0.33	0.03	0.20
	COV	0.91	0.95		0.67	0.79	0.75	2.84
	min.	0.01	0.03		0.01	0.05	0.01	0.01
	max.	0.36	0.25		0.17	1.60	0.09	1.60
INDUSTRIAL	**p**	0.4974	0.0618	-	0.0636	0.3767	0.0194	**Industrial**
	observ.	67	11	0	46	52	2	178
	sites	6	3		3	2	1	15
	mean	0.10	0.04		0.09	0.29	0.09	0.15
	median	0.08	0.03		0.06	0.21	0.09	0.09
	st. dev.	0.08	0.03		0.08	0.26	0.07	0.18
	COV	0.75	0.64		0.89	0.90	0.83	1.99
	min.	0.01	0.03		0.02	0.05	0.04	0.01
	max.	0.45	0.10		0.39	1.50	0.14	1.50

Total Copper (Cu) (µg/L)

Total Observations	746
Total Sites	102
Mean	32.4
Median	14.0
Standard Deviaton	72.2
Coefficient of Variation	2.23
Minimum	0.71
Maximum	1360

		2	3	4	5	6	7	Overall
RESIDENTIAL	**p**	0.0017	0.0006	<0.0001	0.1063	0.0238	0.0401	**Residential**
	observ.	140	17	31	68	38	37	331
	sites	31	4	2	6	3	4	50
	mean	16.1	21.4	33.0	9.4	18.2	12.1	16.4
	median	10.0	5.0	20.0	8.0	9.5	8.0	10.0
	st. dev.	25.6	26.2	27.0	8.1	29.8	14.2	23.5
	COV	1.59	1.22	0.82	0.86	1.64	1.17	2.35
	min.	0.71	5.00	7.00	1.24	1.40	1.63	0.71
	max.	240	102	103	63	180	81	240
COMMERCIAL	**p**	0.0199	0.3758	0.0022	0.1283	0.0007	0.6792	**Commercial**
	observ.	66	6	15	38	34	37	196
	sites	12	2	1	2	2	4	23
	mean	18.5	9.7	142.8	13.3	17.7	25.7	28.0
	median	17.0	9.5	130.0	8.5	14.0	18.0	14.4
	st. dev.	9.7	4.5	99.1	16.9	14.6	25.2	45.4
	COV	0.52	0.47	0.69	1.27	0.83	0.98	3.15
	min.	1.70	5.00	5.00	2.00	1.50	3.00	1.50
	max.	49	17	384	82	63	130	384
INDUSTRIAL	**p**	<0.0001	0.0242	0.7863	0.8903	<0.0001	0.1397	**Industrial**
	observ.	54	15	15	44	66	25	219
	sites	15	3	1	3	4	3	29
	mean	19.5	20.0	257.4	21.2	90.6	46.6	60.7
	median	15.0	14.0	118.0	17.5	89.5	31.0	25.0
	st. dev.	17.0	18.3	358.0	13.3	73.4	34.1	117.9
	COV	0.87	0.91	1.39	0.63	0.81	0.73	4.72
	min.	2.20	2.00	10.00	4.00	2.00	11.00	2.00
	max.	87	59	1360	87	340	120	1360

Total Lead (Pb) (µg/L)

Total Observations	725
Total Sites	100
Mean	41.2
Median	16.0
Standard Deviaton	85.8
Coefficient of Variation	2.08
Minimum	0.13
Maximum	1200

		2	3	4	5	6	7	Overall
RESIDENTIAL	**p**	0.0233	0.1786	0.0013	0.4	0.4616	0.1456	**Residential**
	observ.	135	15	31	68	30	37	316
	sites	30	4	2	6	3	4	49
	mean	17.1	39.2	26.0	16.7	32.9	19.9	20.8
	median	7.5	5.7	14.0	11.5	24.0	11.0	10.5
	st. dev.	37.4	114.1	39.5	15.8	39.5	35.5	41.3
	COV	2.18	2.91	1.52	0.95	1.20	1.78	3.93
	min.	0.46	1.00	1.00	1.68	0.13	0.60	0.13
	max.	368	450	219	89	190	210	450
COMMERCIAL	**p**	0.2046	0.811	0.1062	0.9323	<0.0001	0.2779	**Commercial**
	observ.	66	6	15	39	34	37	197
	sites	12	2	1	2	2	4	23
	mean	20.8	11.1	96.5	30.4	15.8	42.2	31.3
	median	13.0	10.9	80.0	16.0	10.0	22.0	16.0
	st. dev.	24.4	4.1	69.1	49.6	14.8	58.8	46.1
	COV	1.17	0.37	0.72	1.63	0.93	1.39	2.88
	min.	0.21	5.00	1.00	1.57	3.00	3.00	0.21
	max.	138	16	219	300	77	290	300
INDUSTRIAL	**p**	0.0017	0.132	0.2569	0.3919	<0.0001	0.7662	**Industrial**
	observ.	48	10	15	45	69	25	212
	sites	14	3	1	3	4	3	28
	mean	22.5	16.2	214.1	37.0	142.7	47.0	80.9
	median	7.5	15.0	72.0	25.0	87.0	30.0	33.0
	st. dev.	30.8	13.9	309.6	51.5	148.0	41.4	135.7
	COV	1.37	0.85	1.45	1.39	1.04	0.88	4.11
	min.	0.56	1.00	2.00	2.23	2.00	4.00	0.56
	max.	130	40	1200	270	620	170	1200

Total Zinc (Zn) (µg/L)

Total Observations	752
Total Sites	102
Mean	207
Median	110
Standard Deviaton	370
Coefficient of Variation	1.79
Minimum	1.11
Maximum	8100

		2	3	4	5	6	7	Overall
RESIDENTIAL	p	0.0378	0.8403	0.2289	0.0036	0.0487	0.0879	**Residential**
	observ.	140	17	31	68	38	37	331
	sites	31	4	2	6	3	4	50
	mean	73	69	199	72	220	83	102
	median	56	54	130	60	155	58	70
	st. dev.	67	66	286	40	249	109	146
	COV	0.93	0.96	1.44	0.55	1.13	1.31	2.08
	min.	1.11	8.17	10.00	16.00	35.00	6.92	1.11
	max.	532	290	1580	230	1500	650	1580
COMMERCIAL	p	0.0005	0.3658	0.1004	0.0091	0.0131	0.0655	**Commercial**
	observ.	66	6	15	39	34	37	197
	sites	12	2	1	2	2	4	23
	mean	199	121	463	98	235	160	196
	median	150	106	410	63	205	92	140
	st. dev.	156	55	297	97	139	173	182
	COV	0.78	0.45	0.64	0.99	0.59	1.08	1.30
	min.	52.00	71.00	46.00	28.00	64.00	39.00	28.00
	max.	892	220	930	560	660	920	930
INDUSTRIAL	p	0.084	0.1843	0.5258	0.9216	0.4551	0.001	**Industrial**
	observ.	54	15	15	45	70	25	224
	sites	15	3	1	3	4	3	29
	mean	204	144	521	225	505	660	370
	median	173	88	320	128	425	332	255
	st. dev.	141	118	488	253	313	1566	599
	COV	0.69	0.82	0.94	1.13	0.62	2.37	2.35
	min.	10.00	25.00	120.00	28.00	70.81	47.00	10.00
	max.	550	420	1590	1400	1400	8100	8100

Chapter 8: Example Application of the National Stormwater Quality Database (TSS and Nutrient Export Calculations for Chesapeake Bay Watersheds)

Overview

This chapter is a demonstration of how the data contained in the NSQD can be used, especially in conjunction with additional urban area flow data, and rural runoff data to estimate the relative contributions of pollutants in a region. This chapter first summarizes the data used, the statistical tests performed, and the results obtained, as part of our effort to identify the most appropriate nonpoint source runoff characteristics for the Chesapeake Bay watershed, the area having most of the collected data in the NSQD.

Data Availability

Two sources of data were used to estimate nonpoint sources of pollution. The first data source corresponding to discharges from urban areas was obtained from the NSQD for the area. The second data source corresponding to discharges from agricultural land uses and forested land cover was obtained from regional data summaries provided by the EPA's Chesapeake Bay Program, "Smart Growth" project group (Office of Policy, Economics, and Innovation).

Urban Data

Data from within the Chesapeake Bay watershed, as contained in the National Stormwater Quality Database (NSQD version 1.1), were used to determine the most appropriate concentrations for urban stormwater nutrients and suspended solids. The NSQD contains information of stormwater discharge concentrations for 19 counties in Virginia and Maryland (Table 48). More than 1,300 events were monitored in these areas representing residential, commercial and industrial land uses. There were no data reported for open space or freeway land uses. The watersheds monitored in Maryland and Virginia ranged from 3.5 and 882 acres and were between 7 and 90% impervious. Reported events used in these analyses were monitored from October 1990, through December 2000.

Table 48. Urban Monitoring Locations in the Chesapeake Bay Watershed Represented in the National Stormwater Quality Database (NSQD, version 1.1)

Virginia	Maryland
Arlington County	Hartford County
Norfolk County	Baltimore County
Virginia Beach County	Baltimore City
Chesapeake County	Carroll County
Portsmouth County	Howard County
Hampton County	Anne Arundel County
Newport News County	Price George's County
Henrico County	Charles County
Chesterfield County	Montgomery County
Fairfax County	

Data for total nitrogen (the sum of total Kjeldahl nitrogen, TKN, and nitrite plus nitrate, NO_2+NO_3), total phosphorus, and total suspended solids (TSS) were evaluated for use in the Chesapeake Bay watershed.

Rural Data

Chesapeake Bay rural water quality information was reported by the USGS in: *Synthesis of Nutrient and Sediment Data for Watersheds within the Chesapeake Bay Drainage Basin* (Langland, *et al.* 1995), prepared in corporation with the EPA. This report describes the comprehensive database of nutrient and sediment data collected from 1972 through 1992 from 1,058 non-tidal monitoring stations in the Chesapeake Bay watershed. Annual discharge loads were calculated at 48 locations for total nitrogen, at 99 locations for total phosphorus, and at 33 locations for suspended sediment. Many of the stations did not have sufficient samples, or flow data to enable load calculations. The fewer locations available for suspended sediment reflect those stations that evaluated suspended sediment, and not suspended solids. Gray, *et al*. (2000) concluded that suspended solids data are not reliable indicators of suspended sediment due to the laboratory processing associated with TSS analyses. The typical pipetting, or pouring, of a subsample for gravimetric analyses typically under predicts the mass associated with sand-sized particles (> 63 micrometers). If cone or churn splitters were used, then the TSS analyses were found to be reasonable. They also found that the results using the two methods are comparable if the mass of these larger particles comprise less than about 25% of the total sample mass. Since no particle size data was available for the TSS samples, they only used information for locations that had total sediment concentrations. Outfall urban runoff samples typically have less than 20% sand, although some early season samples in northern areas where sand is used for traction control may periodically have close to 50% sand, and some source area samples can also have large sand fractions. The TSS values used in the urban component of the analyses, described previously, are expected to be acceptable, as Chesapeake Bay region samples should not be influenced by appreciable winter sand applications, and these are all outfall samples.

Langland, *et al.* (1995) calculated annual nutrient and sediment loads for the selected locations using an unbiased log-linear regression model. This model enabled them to extrapolate the results to annual conditions, and to recognize both base flow conditions (groundwater recharge to the rivers is a major nitrate source, for example) and higher flows associated with surface runoff during storm periods. This analysis also enabled them to consider the potential septic tank and atmospheric deposition contributions to the annual soluble nitrogen loads. Numerous correlation analyses of annual yields of sediment and nutrients with respect to land use, physiographic province, and rock type. They found that river basins having larger percentages of agricultural land had larger nutrient and sediment yields, and that basins that were urbanized had substantially less yields. Table 49 shows the amount of each major land use category in the watershed, and in the portions of the major states within the watershed. In all cases, the land is dominated by forest and agricultural lands, with all urban lands making up about 12% for Maryland and 9% for Virginia portions of the watershed.

Table 49. Land Uses in the Chesapeake Bay Watershed (Landland, *et al.* 1995)

	Percent of Bay Basin	Pennsylvania	Maryland	Virginia
Woody (forest)	53.9	62.5	32.6	52.4
Herbaceous (agriculture)	30.6	31.1	31.3	28.3
High intensity urban	0.6	0.3	1.2	0.6
Low intensity urban	4.0	2.9	6.4	4.5
Woody urban	1.1	0.6	1.9	1.4
Herbaceous urban	1.6	0.8	2.7	2.3
Water	7.2	11.1	20.8	9.6
Exposed	0.3	0.7	0.2	0.1
Herbaceous wetland	0.8	0	2.9	0.8
Total	**100**	**100**	**100**	**100**

Langland, *et al.* (1995) used Kendall's tau test to examine simple linear correlations between annual nutrient and sediment yields and land use, physiographic province, and rock type in the river basins above each station where the annual loads were calculate. They found that land use was the most important variable for predicting nutrient and sediment yield from a river basin. The strongest, most significant and most consistent correlations were between nutrient and sediment yields and agricultural land use. Table 50 shows selected annual yield and land use data for ten of the "load" stations evaluated by the USGS in their Chesapeake Bay report (Langland, *et al.* 1995).

Unfortunately, they did not determine the unit area yields corresponding to separate land uses. They presented these stations as representing the range of land uses for separate locations.

Table 50. Reported Mean Annual Yields and Land Use (Landland, *et al.* 1995)

		Percentage Land Use			Mean Annual Yields (lb/acre/year)	
Basin	**Area (mi^2)**	**Urban**	**Agriculture**	**Forest**	**Total Nitrogen (TKN plus nitrates)**	**Total Phosphorus**
All 127 "load" basins					6.8	0.70
Predominantly Urban Basins						
01571000	11.2	46.0	26.8	28	8.2	0.80
01589300	32.5	54.4	16.8	27	8.1	na
01593500	38.0	54.5	16.8	21	na	0.67
01646000	57.9	50.9	11.4	28	5.9	0.61
01657655	4.0	48.6	22.5	27	na	0.28
Agricultural and Urban Basins						
01586000	56.6	42.4	51.0	3.4	na	0.41
01616000	16.5	43.8	41.9	13	29.7	4.0
Predominantly Agricultural Basins						
01573810	0.38	1.4	91.0	6.7	42.1	6.3
0157608335	1.42	1.1	63.4	26	26.4	4.5
01639500	102	1.1	69.9	29	14.6	na

Summary of Data and Load Calculations

The "simple" model (Schueler 1987) was used to calculate the nonpoint discharges of TSS, total phosphorus, and total nitrogen for Anne Arundel County, Maryland, for the EPA's Chesapeake Bay Program, "Smart Growth" project (Office of Policy, Economics, and Innovation). The simple model was developed by Schueler to enable rapid calculations of pollutant discharges by multiplying the event mean concentration values for a specific land use, the volumetric runoff coefficient for that land use, and the annual rainfall. With appropriate unit conversions, the result can be expressed as the unit area annual discharge for a specific pollutant. When multiplied by the area corresponding to each of the land uses in the area of concern, the total area pollutant discharges can be calculated, and the relative sources of the discharges can be identified. When working with large watersheds, these calculated values are usually much greater than the monitored in-stream values observed at the watershed outlet, because hindered pollutant transport in the stream or river is not considered. However, it is a suitable method to identify the relative pollutant contributions of different land uses in a county, as in this example.

The volumetric runoff coefficients for each land use category were based on analyses of typical land use surface configurations (mostly the impervious area characteristics) and the rain depth was determined from 50 years of rain records from the Baltimore (BWI) airport. The urban area concentration values were obtained by statistical evaluations of the Maryland and Virginia urban area data contained in the National Stormwater Quality Database, as described in the following subsections of this chapter. The urban runoff and concentration factors are assumed to have excellent reliability. However, some of the urban categories were not represented with regional Chesapeake Bay region data, so these factors were obtained from the national averaged values in the database and are labeled with a moderate reliability. The non-urban values are labeled as having poor to very good reliability, depending on the availability of local data. The agriculture values are from regional information summarized by Staver (1995) and Hartigan (1983) and are assumed to be of very good reliability. The forestlands data are from regional Chesapeake Bay regional data collected by the EPA, Office of Policy, Economics, and Innovation (Richards, personal communication) and are assumed to be of moderate reliability. The other land categories and the extraction lands data are unknown and are of poor reliability. Fortunately, as shown on the following summary tables, the best information is associated with the agricultural, forest, and urban categories which are responsible for almost the entire calculated discharges for the county.

The runoff factors are also indicated with varying reliabilities. The urban lands data all have excellent reliability due to the use of calibrated urban data for varying conditions. The agricultural runoff data is of the poorest reliability due to the uncertainties associated with the many agricultural operations that can have dramatic effects on these values. The natural land runoff values are expected to have moderate reliabilities. The USGS (Langland, *et al*. 1995) reported values are not comparable to these discharge values due to a number of reasons, most specifically because they are in-stream values and are affected by sediment and pollutant transport. The USGS report also did not report unit area loadings for specific land uses and the preliminary calculations resulted in unrealistic results that were highly variable. Tables 51, 52 and 53 list the nutrient and suspended solids data applicable for Chesapeake Bay watershed analyses, based on the analyses performed and outlined later in this chapter.

Table 51. Commercial TSS (mg/L), Mean and COV, (a function of season and rain depth)

	<0.1 inches	0.1 to 0.35 inches	0.35 to 1 inch	>1 inch
Spring	18 (0.72)	31 (0.67)	75 (1.5)	no data
Summer	75 (1.5)	18 (0.72)	75 (1.5)	75 (1.5)
Fall	18 (0.72)	75 (1.5)	18 (0.72)	18 (0.72)
Winter	18 (0.72)	75 (1.5)	75 (1.5)	75 (1.5)

Table 51 shows that storm events with precipitation depths larger than 0.35 inches are more likely to discharge higher TSS concentrations in spring, summer and winter than fall. Table 52 shows the expected total nitrogen concentrations in commercial land uses. There is a clear variation among the seasons and precipitation depth. Storm events smaller than 0.1 inch are expected to have higher total nitrogen discharges during the fall and winter than during the summer and spring seasons. For rain events between 0.35 and 1 inch, the highest concentrations were observed during the summer and fall. Table 53 shows the average concentrations and coefficients of variation for TSS, total phosphorus and total nitrogen for residential, commercial and industrial urban land use areas. This table also includes the expected concentrations in agricultural and forested areas.

Table 52. Commercial Total Nitrogen (mg/L), Mean and COV, (a function of season and rain depth)

	<0.1 inch	0.1 to 0.35 inches	0.35 to 1 inch	>1 inch
Spring	2.0 (0.49)	3.2 (0.50)	2.0 (0.49)	no data
Summer	2.0 (0.49)	2.0 (0.49)	3.2 (0.50)	3.2 (0.50)
Fall	3.2 (0.50)	3.2 (0.50)	3.2 (0.50)	2.0 (0.49)
Winter	3.2 (0.50)	2.0 (0.49)	2.0 (0.49)	3.2 (0.50)

The total runoff discharges for the county can be determined based on the calculated total mass discharges for each land use, and the areas for each land use area. Table 54 shows the percentage of total annual runoff volume produced for each land use by season and rain depth range. About 61% of the total annual runoff volume was produced by events having more than 1 inch of rain, followed by rain events in the range 0.36 to 1 inches (31% of the annual runoff volume), rain events in the range of 0.1 to 0.35 inches (7% of the annual runoff volume), and rain events less than 0.1 inch in depth (with 1% of the annual runoff volume).

Table 53. Average Concentrations by Land Use

Land Use	Constituent	Conditions	Average (COV)
Urban - Residential	TSS		
		Summer rains (between 0.1 and 0.35 inches in depth)	143 (0.71)
		All other rains	58 (0.70)
	TP	Sites having <27% impervious cover:	
		Winter rains	0.28 (0.59)
		All other rains	0.41 (0.65)
		Sites having >27% impervious cover:	
		Winter rains (less than 0.1 inches in depth)	0.16 (0.86)
		All other rains	0.30 (0.63)
	TN	Fall rains (less than 0.1 and greater than 1 inch in depth)	1.4 (0.57)
		Winter rains (0.35 and 1 inch in depth)	1.5 (0.30)
		Fall rains (0.35 and 1 inch) and Winter rains (between 0.1 and 0.35 inches in depth)	1.9 (0.51)
		All other rains	2.4 (0.62)
		Spring and summer rains (between 0.1 and 0.35 inches in depth)	2.6 (0.38)
Urban - Commercial	TSS and TN	See tables 7.4 and 7.5	
	TP	Summer rains >1 inch and fall rains between 0.1 and 0.35 inch	0.46 (0.36)
		All other rains	0.23 (0.71)
Urban - Industrial	TSS	Fall, spring, and summer	77 (1.48)
		Winter	81 (0.93)
	TP	Rains less than 0.35 inches	0.29 (0.81)
		Rains greater than 0.35 inches	0.22 (1.05)
	TN	All conditions	2.1 (0.79)
Rural - Agricultural	Sediment		1115 lb/ac/yr (unreliable estimate)
	TN		40 lb/ac/yr
	TP		5.4 lb/ac/yr
Rural - Forest	Sediment		4500 lb/ac/yr (unreliable estimate)
	TN		0 lb/ac/yr
	TP		0 lb/ac/yr

Table 54. Fraction of Annual Flow Associated with Season and Rain Depth Categories (based on 50 years of rain records at Baltimore, BWI)

	rain range	Fraction of rain depth in category	Ultra low density residential	Low density residential	Medium density residential	High density residential	Commercial	Industrial	Institutional	Open urban land	Freeways
Winter	<0.1 inch	0.0078	0.0008	0.0011	0.0013	0.0016	0.0017	0.0014	0.0039	0.0004	0.0022
	0.1 to 0.35	0.0275	0.0109	0.0137	0.0171	0.0193	0.0184	0.0173	0.0190	0.0086	0.0180
	0.36 to 1	0.0917	0.0727	0.0786	0.0855	0.0860	0.0870	0.0874	0.0857	0.0727	0.0846
	>1	0.1025	0.1394	0.1319	0.1230	0.1202	0.1202	0.1212	0.1188	0.1420	0.1220
Spring	<0.1 inch	0.0091	0.0010	0.0013	0.0016	0.0018	0.0020	0.0017	0.0046	0.0005	0.0026
	0.1 to 0.35	0.0387	0.0153	0.0193	0.0240	0.0272	0.0259	0.0243	0.0267	0.0121	0.0253
	0.36 to 1	0.0999	0.0793	0.0857	0.0932	0.0937	0.0948	0.0953	0.0934	0.0792	0.0922
	>1	0.1075	0.1463	0.1383	0.1290	0.1261	0.1261	0.1271	0.1246	0.1489	0.1280
Summer	<0.1 inch	0.0089	0.0010	0.0010	0.0015	0.0018	0.0020	0.0017	0.0045	0.0005	0.0026
	0.1 to 0.35	0.0366	0.0145	0.0183	0.0228	0.0258	0.0245	0.0230	0.0253	0.0115	0.0240
	0.36 to 1	0.0857	0.0680	0.0735	0.0799	0.0804	0.0813	0.0817	0.0801	0.0679	0.0791
	>1	0.1438	0.1955	0.1849	0.1724	0.1686	0.1685	0.1699	0.1665	0.1991	0.1711
Fall	<0.1 inch	0.0064	0.0007	0.0009	0.0011	0.0013	0.0014	0.0012	0.0032	0.0004	0.0018
	0.1 to 0.35	0.0248	0.0098	0.0124	0.0154	0.0174	0.0166	0.0156	0.0171	0.0078	0.0163
	0.36 to 1	0.0691	0.0548	0.0593	0.0645	0.0648	0.0656	0.0659	0.0646	0.0548	0.0638
	>1	0.1391	0.1892	0.1789	0.1668	0.1631	0.1631	0.1644	0.1611	0.1926	0.1655

The flow weighting factors in Table 54 were used with the statistical analyses of the concentration data to obtain calculated long term averaged concentrations for mass loading calculations. Table 55 shows the urban area concentrations developed for Anne Arundel County using the Chesapeake Bay regional data contained in the National Stormwater Quality Database, along with concentrations and runoff quantities for other county land uses.

Table 55. Total Suspended Solids Concentrations and Volumetric Runoff Coefficients for Land Use Categories in Anne Arundel County, Maryland

Land Use Description	# of acres in 2000	TSS (mg/L)	Concentration reliability?	R_V	R_V reliability?
Large lot subdivision (1 unit/ 5- 10 ac)	0	60	excellent	0.09	excellent
Low-density residential (1 unit/ 5 acres to 2 units/acre)	33,337	60	excellent	0.14	excellent
Medium-density residential (2 to 8 units/acre)	33,791	60	excellent	0.23	excellent
High-density residential (8+ units/acre)	6,274	60	excellent	0.34	excellent
Commercial	11,670	58	excellent	0.72	excellent
Industrial	3,249	80	excellent	0.52	excellent
Institutional (schools, churches, military institutions, etc.)	9,813	58	moderate	0.49	excellent
Open urban land	4,139	50	moderate	0.08	excellent
Transportation	1,557	99	moderate	0.41	excellent
Extractive	1,686	350	poor	0.3	moderate
Deciduous forest	43,901	90	moderate	0.08	moderate
Evergreen forest	4,891	90	moderate	0.08	moderate
Mixed forest	56,621	90	moderate	0.08	moderate
Brush	2,565	90	poor	0.08	moderate
Wetlands	1,643	0	poor	0.65	moderate
Beaches	29	0	poor	0.1	moderate
Bare ground	224	1000	poor	0.3	moderate
Row and garden crops	300	357	very good	0.2	poor
Cropland	42,368	357	very good	0.2	poor
Orchards / vineyards / horticulture	63	357	very good	0.15	poor
Pasture	4,690	145	very good	0.08	moderate
Feeding operations	49	145	very good	0.2	poor
Agricultural building, breeding and training facilities	163	145	very good	0.5	poor

Urban land uses produced slightly lower TSS concentrations compared with those observed in forest areas. However the volumetric runoff coefficients for forests are smaller than any other use, except for open urban land, resulting in the likely lowest annual yields. Bare ground, cropland, vineyards, horticulture, row and garden crops and extractive activities have the highest estimated concentrations amongst the land uses examined. Total phosphorus concentrations are presented in Table 56.

In this case, the highest concentrations were assumed for croplands, row and garden crops, orchards, vineyards and horticulture. The lowest concentrations were assumed for forested areas. One order of magnitude separates the minimum and maximum concentrations. This difference can be associated with the use of fertilizers and associated nutrient discharges. For urban areas, industrial and commercial land use areas had lower phosphorus concentrations than residential land use areas. Table 57 shows the average urban area concentrations for long term analyses, based on statistical analyses examining site factors for this regional data. Only phosphorus had different concentrations associated with different site categories that were tested.

Table 56. Total Phosphorus Concentrations for Land Use Categories in Anne Arundel County, Maryland

Land Use Description	# of acres in 2000	TP (mg/L)	Concentration reliability?
Large lot subdivision (1 unit/5- 10 acres)	0	0.38	excellent
Low-density residential (1 unit/ 5 acres to 2 units/acre)	33,337	0.38	excellent
Medium-density residential (2 to 8 units/acre)	33,791	0.3	excellent
High-density residential (8+ units/acre)	6,274	0.3	excellent
Commercial	11,670	0.25	excellent
Industrial	3,249	0.23	excellent
Institutional (schools, churches, military institutions, etc.)	9,813	0.27	moderate
Open urban land	4,139	0.25	moderate
Transportation	1,557	0.25	moderate
Extractive	1,686	0.5	poor
Deciduous forest	43,901	0.1	moderate
Evergreen forest	4,891	0.1	moderate
Mixed forest	56,621	0.1	moderate
Brush	2,565	0.38	poor
Wetlands	1,643	0.38	poor
Beaches	29	0.1	poor
Bare ground	224	0.38	poor
Row and garden crops	300	1.00	very good
Cropland	42,368	1.00	very good
Orchards / vineyards / horticulture	63	1.00	very good
Pasture	4,690	0.38	very good
Feeding operations	49	0.38	very good
Agricultural building, breeding and training facilities	163	0.38	very good

Table 57. Urban Area Stormwater Concentrations

Land Use	Constituent	Conditions	Average value for long-term analyses (mg/L)
Urban – Residential	TSS		60
	TP	Sites having <27% impervious cover (ultra low and low density areas)	0.38
		Sites having >27% impervious cover (medium and high density areas)	0.30
	TN		2.1
Urban – Commercial	TSS		58
	TP		0.25
	TN		2.6
Urban – Industrial	TSS		80
	TP		0.23
	TN		2.1

Table 58 shows the summary for total nitrogen. Similar to the total phosphorus case, the largest nitrogen concentrations were predicted for croplands, vineyards, row and garden crops orchards and horticulture activities. The lowest concentrations were observed in open urban land and forested areas. The ratio between largest and smallest concentrations was approximately 2 to 1.

Table 58. Total Nitrogen Calculated Concentrations for Land Use Categories in Anne Arundel County, Maryland

Land Use Description	# of acres in 2000	TN (mg/L)	Concentration reliability?
Large lot subdivision (1 unit/5- 10 acres)	0	2.1	excellent
Low-density residential (1 unit/ 5 acres to 2 units/acre)	33,337	2.1	excellent
Medium-density residential (2 to 8 units/acre)	33,791	2.1	excellent
High-density residential (8+ units/acre)	6,274	2.1	excellent
Commercial	11,670	2.6	excellent
Industrial	3,249	2.1	excellent
Institutional (schools, churches, military institutions, etc.)	9,813	2	moderate
Open urban land	4,139	1.3	moderate
Transportation	1,557	2.3	moderate
Extractive	1,686	1.5	poor
Deciduous forest	43,901	1.5	moderate
Evergreen forest	4,891	1.5	moderate
Mixed forest	56,621	1.5	moderate
Brush	2,565	1.5	poor
Wetlands	1,643	1.5	poor
Beaches	29	1.5	poor
Bare ground	224	1.5	poor
Row and garden crops	300	2.92	very good
Cropland	42,368	2.92	very good
Orchards / vineyards / horticulture	63	2.92	very good
Pasture	4,690	2.2	very good
Feeding operations	49	2.2	very good
Agricultural building, breeding and training facilities	163	2.2	very good

Using the simple model, it is possible to calculate the total annual discharges from these different non point sources. Table 59 shows the total estimated runoff discharged by year, and the total discharges of suspended solids, total nitrogen and total phosphorus for each of the major land use categories. Urban sites produced most of the runoff and total nitrogen, followed by agricultural and forested areas. Half of the total suspended solids were produced by agricultural activities, followed by urban areas (30%), forested areas (12%), and other lands (10%). Urban and agricultural sites combined (in about equal fractions) produced almost 90% of the phosphorus loads. Forested areas only produced about 4% of the total phosphorus annual loads. The remaining phosphorus discharges were produced by other land uses.

Table 59. Discharges by Major Land Use Categories in Anne Arundel County, Maryland

	Runoff Yield		Total Suspended Solids	
	Total Discharge (ft^3/year)	Percent of Total	Total Discharge (kg/year)	Percent of Total
Urban	4.2×10^9	60.6	7.4×10^6	28.7
Agricultural	1.3×10^9	18.7	1.3×10^7	50.0
Forest	1.2×10^9	17.1	3.0×10^6	11.9
Other lands	2.6×10^8	3.7	2.4×10^6	9.4
Total County	7.0×10^9		2.6×10^7	

	Total Phosphorus		Total Nitrogen	
	Total Discharge (kg/year)	Percent of Total	Total Discharge (kg/year)	Percent of Total
Urban	3.6×10^4	46.4	2.6×10^5	60.5
Agricultural	3.6×10^4	45.8	1.1×10^5	25.0
Forest	3.4×10^3	4.3	5.1×10^4	11.9
Other lands	2.8×10^3	3.6	1.1×10^4	2.6
Total County	7.8×10^4		4.3×10^5	

The final values used during for the calculations are summarized in Tables 60 and Table 61. For each of the main land uses, the percentage of impervious areas (indicating the percentage connected and disconnected), the volumetric runoff coefficient and the TSS, total phosphorus, and total nitrogen concentrations are shown. The volumetric runoff coefficients, and curve numbers, were calculated using 50 years of precipitation data from the BWI airport in Baltimore.

Table 60. Urban Land Use Categories Used in Anne Arundel County, Maryland

Description	Note	Average percentage of Impervious areas	TSS (mg/L)	Total P (mg/L)	Total N (mg/L)	Comments
High density residential	Rv = 0.34, 47% pervious, 39.9% dir con imp, and 13.1% dis con impervious	53	60	0.3	2.1	Rv and CN calculated using 50 yrs of BWI rains and concentration factors from MD and VA MS4 data
Medium density residential	Rv = 0.23, 62.3% pervious, 24.2% directly con imp, and 13.5% disconnected impervious	37.8	60	0.3	2.1	Rv and CN using 50 yr BWI rain and concentration factors from MD and VA MS4 data
Low density residential	Rv = 0.14, 79.6% pervious, 14.9% dir con impervious, and 5.5% disconnected imp.	20.4	60	0.38	2.1	1 unit/5 ac to 2 units/ac. Calc Rv and CN using 50 years BWI rains and concentration factors from MD and VA MS4
Ultra low den residential	Rv=0.09, 90.4% pervious, 5.6%directly con imp and 4% discon impervious	9.6	60	0.38	2.1	1 unit/5 to 10 ac, calc 50 yr, concentration factors from MD and VA MS4 data
Freeways and other main roads with paved drainage	Rv = 0.41, 49.5% pervious, 50.5% dir con impervious.	50.5	99	0.25	2.3	Calc using 50 yrs of BWI rains and concentration factors from national MS4 data
Commercial (shopping centers)	Rv=0.72, 8.3% pervious, and 91.7% dir con imp.	91.7	58	0.25	2.6	50 yr of BWI rains and concentration factors from MD and VA MS4 data
Institutional (schools, churches, military, etc.)	Rv=0.49, 36.4% pervious, 61.3%dir con imp, and 2.3%discon imp.	63.6	57.9	0.35	1.57	Calculated from 50 yr BWI rains and concentration factors from national average institutional MS4 data.
Industrial (medium)	Rv=0.52, 16.7% pervious, 62.8% dir con imp, and 20.5% discon con imp.	83.3	80	0.23	2.1	CN calc using 50 yr BWI rain and concentration factors from MD and VA MS4 data.
Open urban area	Rv=0.08, 95.1% pervious and 4.9% dir con impervious.	4.9	70	0.12	1.5	CN calc from 50 yr BWI rains and concentration factors from national average urban open area MS4 data

The land uses having the largest amounts of directly connected impervious surfaces were the commercial, institutional, and industrial land use areas. Urban TSS concentrations ranged between 57 and 99 mg/L, total phosphorus concentrations ranged between 0.12 and 0.40 mg/L, and total nitrogen ranged between 1.5 and 2.6 mg/L. Table 61 shows the summaries for the other land uses.

Table 61. Other Land Use Categories Used in Anne Arundel County Calculations

Description	Note	TSS (mg/L)	Total Phosphorus (mg/L)	Total Nitrogen (mg/L)
Fallow	Straight Row. Concentration factors from prior regional data	107	1.3	4.4
Row Crops	Straight Row, small grain. Concentration factors from prior regional data	357	1	2.92
Row and garden Crops	Straight Row. Concentrations factors from prior regional data	357	1	2.92
Orchards, vineyards, horticultural	Concentration factors from prior regional data	357	1	2.92
Pasture or Range	Concentration factors from prior regional data	145	0.38	2.2
Feeding operations	Continuous forage, poor. Concentration factors from prior regional data	145	0.38	2.2
Woods or Forest Land	Deciduous forest (woods, good). Concentration factors from prior regional data	90	0.1	1.5
Woods or Forest Land	Evergreen forest (woods, good condition). Concentration factors from prior regional data.	90	0.1	1.5
Woods or Forest Land	Mixed forest (woods, good). Concentration factors from prior regional data.	90	0.1	1.5
Farmsteads	Agricultural buildings, breeding and training facilities	163	0.38	2.2
Brush	Herbaceous, fair.	90	0.38	1.5
Extractive		1000	0.38	1.5
Wetlands		0	0.38	1.5
Beaches		0	0.1	1.5
Bare ground		1000	0.38	1.5

The largest TSS concentrations were observed in extractive activities and for bare ground, or exposed soil sites. Land uses where the intensive use of fertilizers is most frequent had the largest total phosphorus and total nitrogen concentrations. The lowest nutrient concentrations were observed in forested areas.

Figure 60 shows the area distributions and the relative contributions for major sources of runoff, total suspended solids, total nitrogen and total phosphorus for sites located in Anne Arundel County in Maryland. Forested and urban land use areas represent almost 80% of the total land uses in the county. About 15% of the area is agricultural and the remaining of 5% is associated with other activities.

Urban land use areas produce almost 65% of the total runoff volume for the county, followed by agricultural and forested areas (about 15% each). As expected, impervious surfaces in urban land use areas were responsible for most of the total discharged runoff volume. Agricultural land uses produce almost half of the total TSS discharges, although they make up only about 15% of the county area. Urban land uses are the second major source of TSS in the county, contributing about 28% of the total annual TSS discharges in the county. Forested areas and other land uses contribute the smallest fractions of the total load, with almost 11% each. Urban and agricultural areas combined produced almost 90% of the total phosphorus load, in about equal percentages. Forested areas and other land uses contribute about 10% of the total countywide phosphorus load. Finally, urban land uses contributed almost 60% of the total nitrogen load for the county, followed by agricultural activities (25%), forested areas (13%) and other land uses (2%).

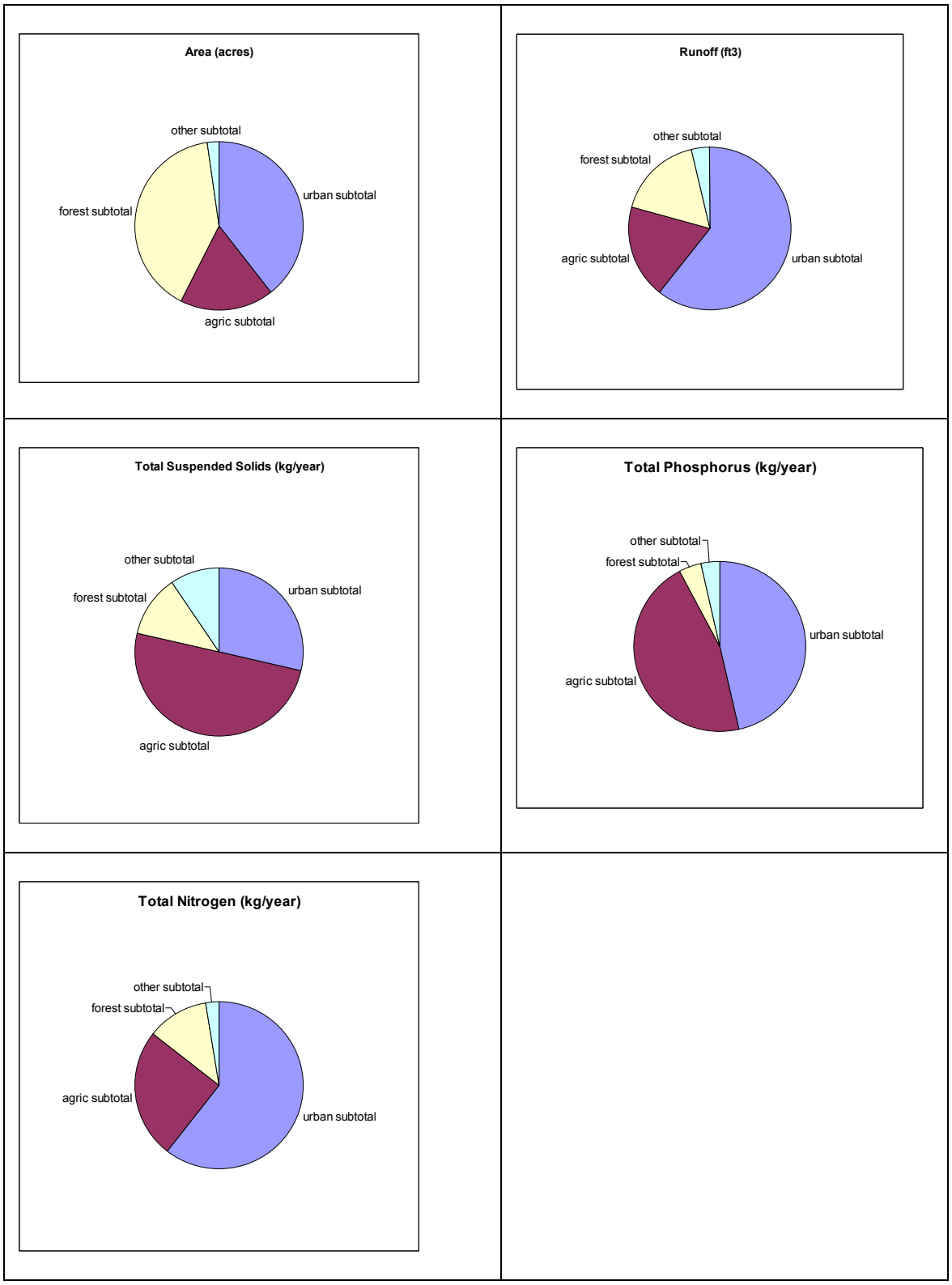

Figure 60. Sources of runoff, TSS and nutrients for different sources in Anne Arundel County

Statistical Analyses Performed

The following discussion describes the statistical analyses performed to identify the different groups in TSS, total nitrogen and total phosphorus by season and precipitations depth for the Chesapeake Bay region data. The objective of the statistical tests was to identify significantly distinct categories of the Chesapeake Bay regional data. Specifically, land use, season, precipitation, percent imperviousness, and watershed drainage area, were considered potentially important factors that would affect the concentration values. In addition, variations of reported concentrations with time were also examined. After appropriate normalization of the data, three-way and two-way ANOVA tests were used to identify the significant factors and interactions between these potentially important factors, while one-way ANOVA tests, along with parametric and nonparametric comparison tests, were used to identify groupings within the range of any one factor. As an example, one-way ANOVA analyses were performed to identify any ranges of percentage of imperviousness that produce different distributions of stormwater constituent concentrations from other ranges, while two-way ANOVA analyses were used to identify any seasonal-total precipitation interactions in the distribution of the stormwater constituent concentrations

Before ANOVA analyses can be conducted, the first step is to examine the data to ensure that it fits a normal probability distribution. If not, the data needs to be transformed. Prior tests (reported in this report) found that most all of the stormwater constituents in the NSQD fit lognormal distributions. In this case, the base 10 logarithm of the original observations adequately followed a normal distribution. Therefore, data from the same population group will fall along the same straight line. Groups in either tail that do not fall on the line can be considered different. This procedure was used in the ANOVA analyses to identify if the concentration values were statistically different for different levels of the factor, or factors, being examined. For example, if the expected values are different for different levels of imperviousness, or different seasons, then those data groupings will not follow the main probability distribution, and the ANOVA test results will indicate a likely significantly different data population. The significant ANOVA coefficients were then used to create a model to predict the concentration values for the different groups. All of the observed conditions within each group will have the same expected concentration value. Once the groups were identified, the mean and standard deviations were calculated from the original observations in the database for each observation in each group, and the data for each group are plotted on probability and box and whisker plots. The following discussion is a detailed description of the tests conducted using the Chesapeake data for total suspended solids.

Residential Area Total Suspended Solids Analyses

The ANOVA tests did not identify any significant groupings for either drainage area, or percentage imperviousness variations. Trends with time since the last rain, and for time since the initiation of the watershed monitoring were also examined, but these analyses did not identify any apparent, or significant, trends for any of the test sites. Initial data evaluations indicated a possible significant variation due to the level of imperviousness in the test watersheds, but when evaluated in conjunction with season and rain depth, these other factors were found to be the only significant factors to describe the variations in TSS concentrations in residential areas. Obviously, the percentage imperviousness values will have a large effect on the amount of runoff volume expected, so the imperviousness will be very important in affecting the mass of pollutants discharged. This is similar to data evaluations for other regions. The Maryland and Virginia data provided a great opportunity to test this hypothesized effect, because there were 13 residential area test watersheds having imperviousness values ranging from 7 to 65% (although most of the data were represented in six watersheds ranging in imperviousness from 20 to 50%). The statistical tests identified two distinct groups of residential TSS data, as represented in the following plots and tables: small summer rains (in the range of 0.1 to 0.35 inches) which had an average TSS concentration of about 143 mg/L, and all other residential conditions which had an average TSS concentration of about 58 mg/L. The following plots and data summaries describe these two data groupings.

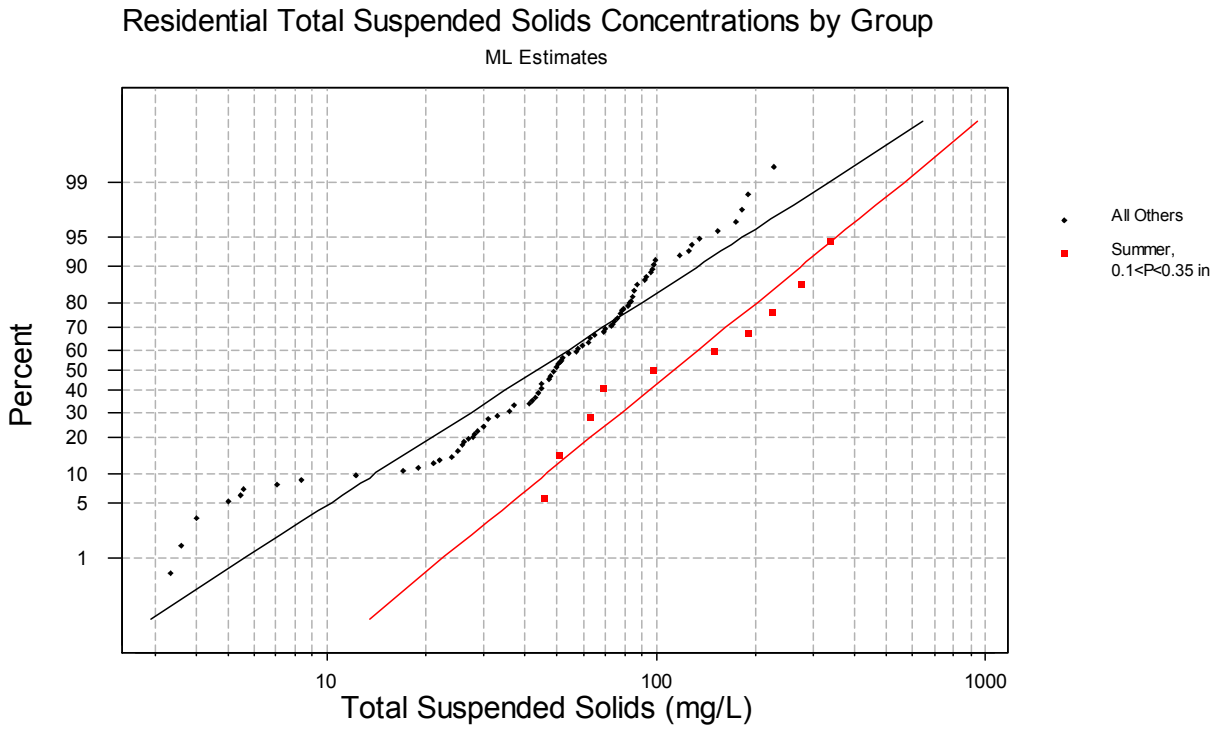

Figure 61. Residential TSS distributions by groups

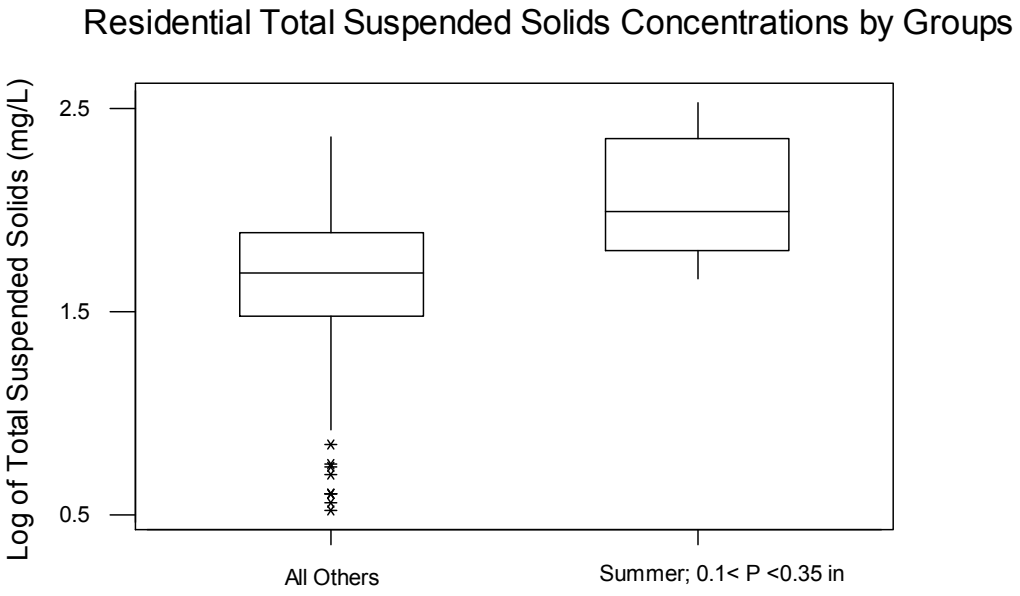

Figure 62. Residential TSS box and whiskers plot distribution by groups

Table 62. Results for Residential TSS (mg/L)

Descriptive statistics of residential TSS (mg/L) by groups:

Groups	N	Mean	Median	StDev	COV
All other rains	111	57.8	49.0	40.5	0.70
Small summer rains	11	143.0	98.0	101.6	0.71

Groups	SE Mean	Minimum	Maximum	Q1	Q3
All other rains	3.85	3.33	229.00	30.0	78.0
Small summer rains	30.6	46.0	337.0	63.0	227.0

Groups

Small summer rains (0.1 to 0.35 inches in depth):
Overall 95% confidence interval of all observed data: 29 to 439 mg/L (from fitted probability distribution)
95% confidence interval of reported median: 75 to 170 mg/L (from fitted probability distribution)

All other rains:
Overall 95% confidence interval of all observed data: 8 to 243 mg/L (from fitted probability distribution)
95% confidence interval of reported median: 37 to 51 mg/L (from fitted probability distribution)

Residential Area Total Phosphorus Data Analyses

The statistical tests of the residential total phosphorus data indicated a significant effect associated with the amount of imperviousness cover in the monitored watersheds. Sites having small amounts of impervious cover (7 to 25%) had significantly higher total phosphorus concentrations than sites having larger amounts of impervious cover (29 to 65%). Winter rains had lower total phosphorus concentrations in each group (all winter rains in the first group, and small winter rains of less than 0.1 inch in the second group). The following plots and data summaries describe these data groupings, separated by the two impervious cover categories.

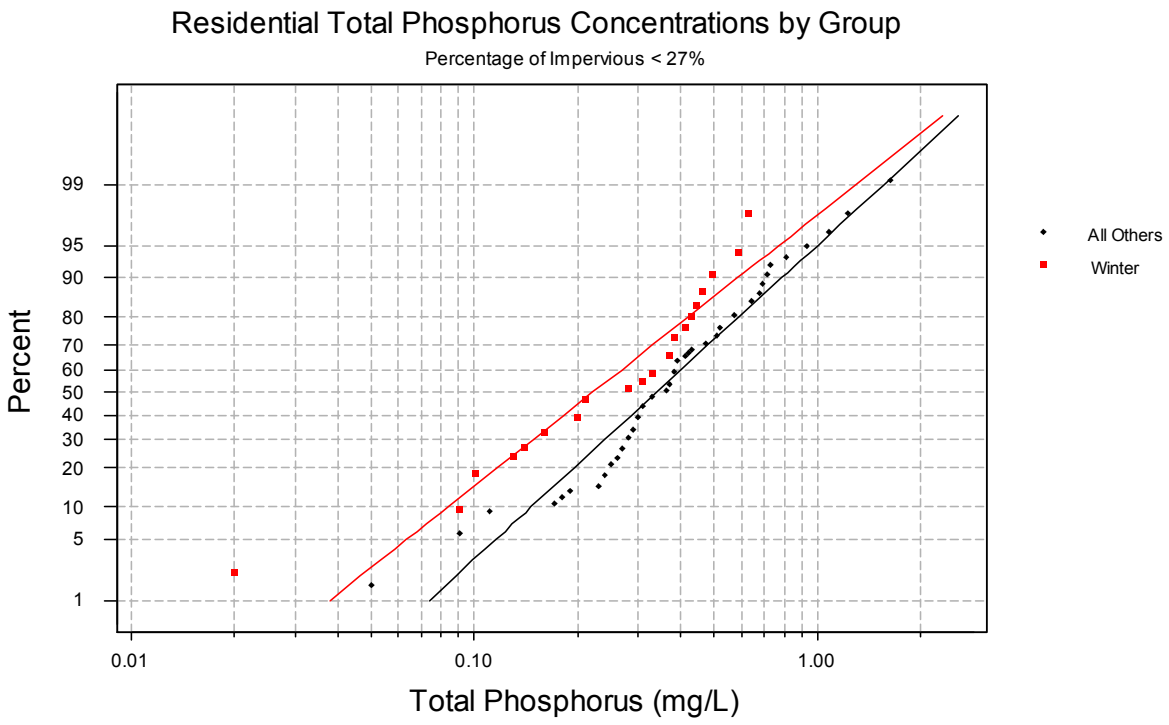

Figure 63. Residential total phosphorus concentrations for sites having < 27% impervious surfaces

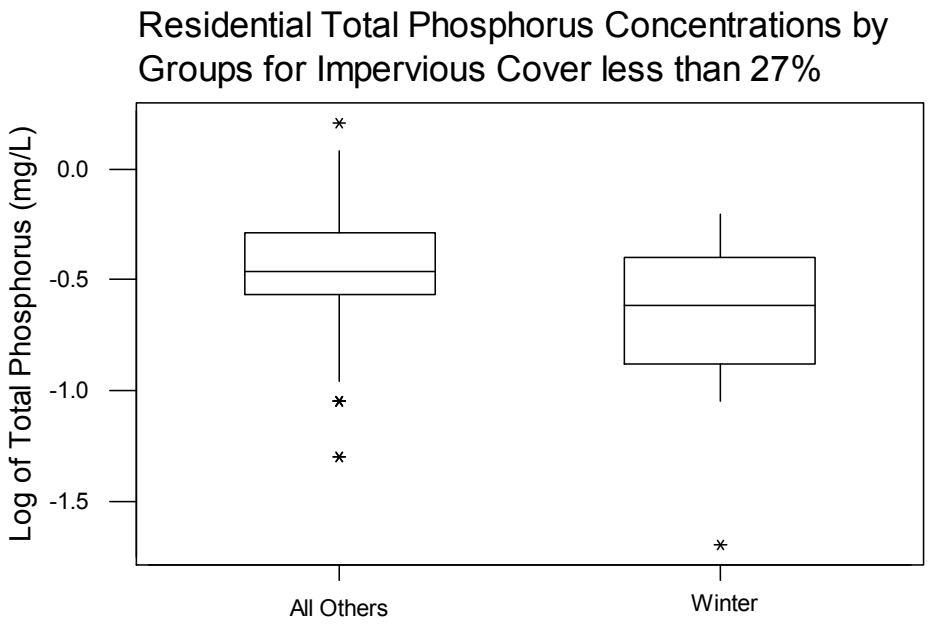

Figure 64. Box and whiskers plot for residential total phosphorus concentrations for sites having < 27% impervious surfaces

Table 63. Results for Residential Total Phosphorus (Impervious < 27%)

Descriptive statistics of residential TSS (mg/L) by groups:

Season	N	Mean	Median	StDev	COV
All other seasons	72	0.41	0.35	0.27	0.65
Winter	28	0.28	0.25	0.16	0.59

Season	SE Mean	Minimum	Maximum	Q1	Q3
All other seasons	0.031	0.05	1.62	0.27	0.52
Winter	0.031	0.02	0.63	0.13	0.40

Groups

All winter rains:
Overall 95% confidence interval of all observed data: 0.050 to 0.98 mg/L (from fitted probability distribution)
95% confidence interval of reported median: 0.17 to 0.29 mg/L (from fitted probability distribution)

All other seasons:
Overall 95% confidence interval of all observed data: 0.093 to 1.23 mg/L (from fitted probability distribution)
95% confidence interval of reported median: 0.29 to 0.39 mg/L (from fitted probability distribution)

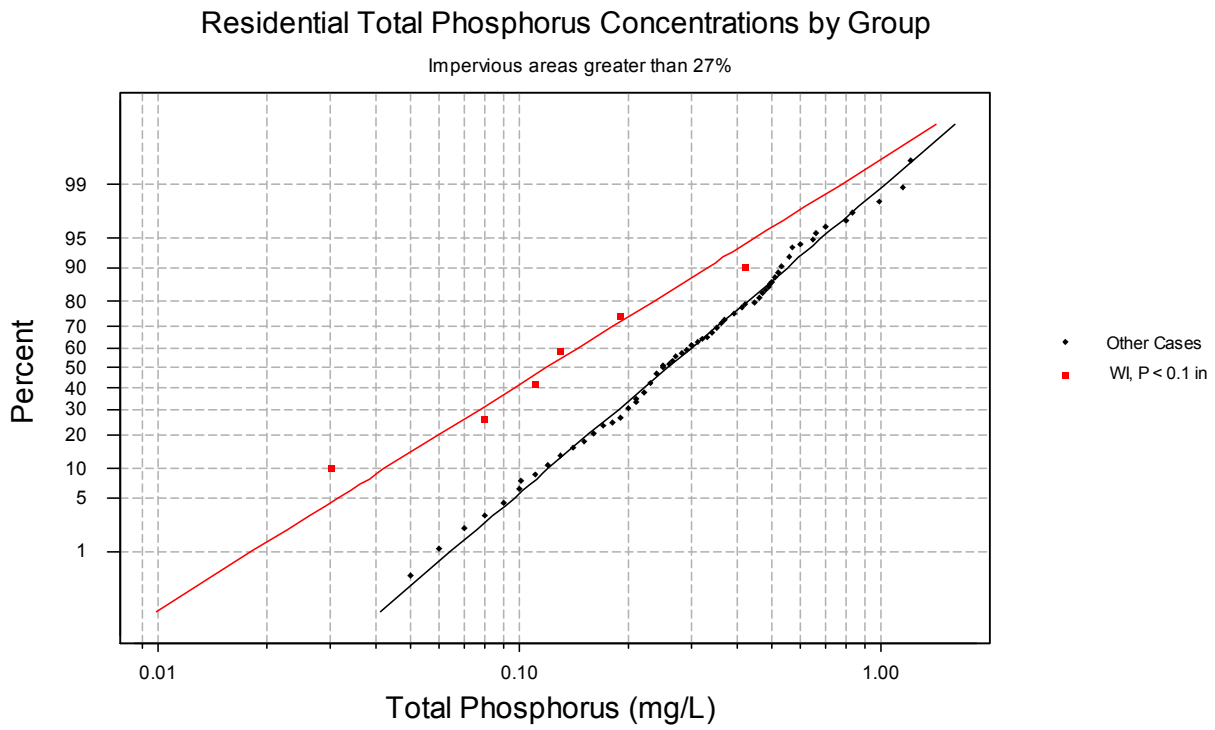

Figure 65. Residential total phosphorus concentrations for sites having > 27% impervious surfaces

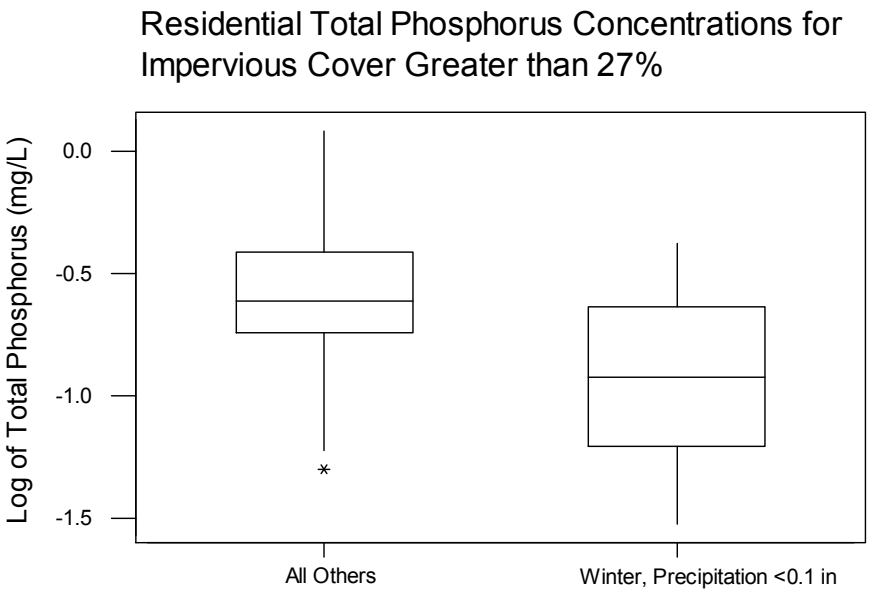

Figure 66. Box and whiskers plot for residential total phosphorus concentrations for sites having > 27% impervious surfaces

Table 64. Results for Residential Total Phosphorus (Impervious > 27%)

Descriptive statistics of residential TSS (mg/L) by groups:

Group	N	Mean	Median	StDev	COV
All others	152	0.30	0.24	0.19	0.63
Small winter rains	6	0.16	0.12	0.14	0.86

Group	SE Mean	Minimum	Maximum	Q1	Q3
All others	0.017	0.05	1.2	0.18	0.39
Small winter rains	0.057	0.03	0.42	0.068	0.25

Groups

Small winter rains <0.1 inch:
Overall 95% confidence interval of all observed data: 0.024 to 0.58 mg/L (from fitted probability distribution)
95% confidence interval of reported median: 0.062 to 0.23 mg/L (from fitted probability distribution)

All other conditions:
Overall 95% confidence interval of all observed data: 0.080 to 0.83 mg/L (from fitted probability distribution)
95% confidence interval of reported median: 0.23 to 0.28 mg/L (from fitted probability distribution)

Residential Area Total Nitrogen Data Analyses

The statistical analysis of the residential total nitrogen data identified several important interactions between season and rain depth. There were no significant factors associated with drainage area, percent imperviousness, or trend with time. Five significant groups were identified for residential total nitrogen concentrations:

1) Fall rains <0.1 and > 1 inch
2) Winter rains between 0.35 and 1 inch
3) Fall for rains between 0.35 and 1 inch, and winter rains between 0.1 and 0.35 inches
4) All other conditions
5) Spring and summer rains between 0.1 and 0.35 inches

The following plots and data summaries describe these five data groupings for residential area total nitrogen concentrations.

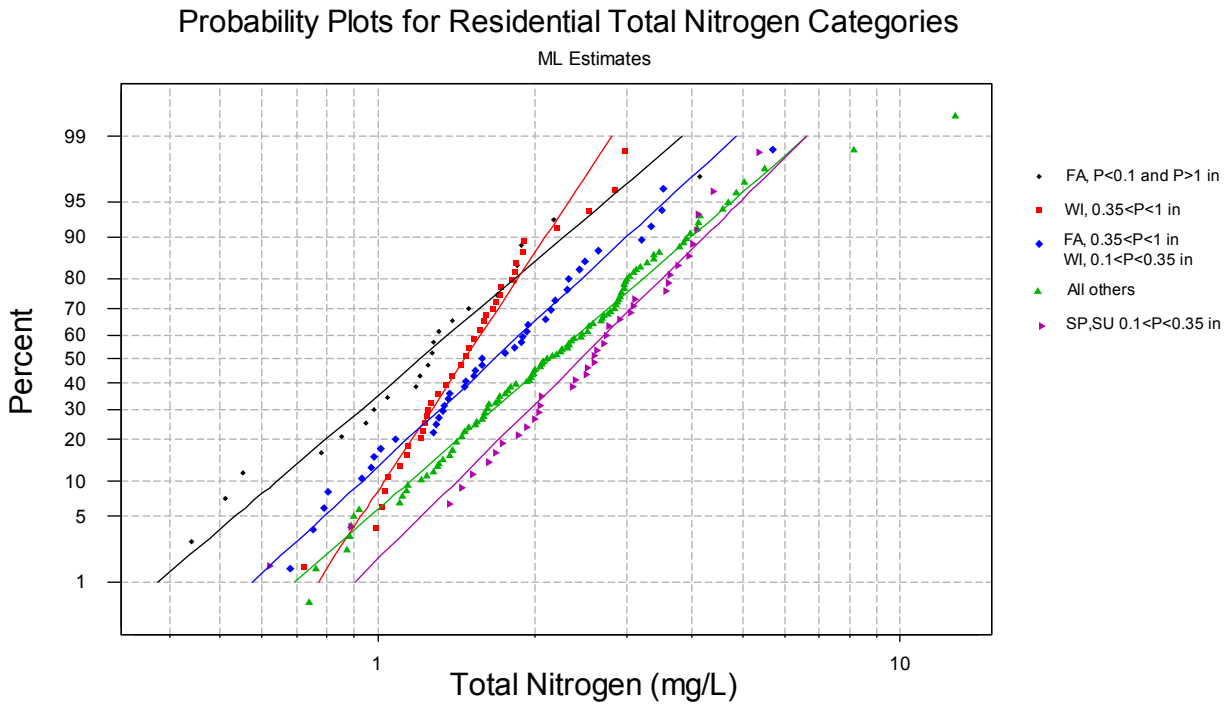

Figure 67. Residential total nitrogen concentration groups

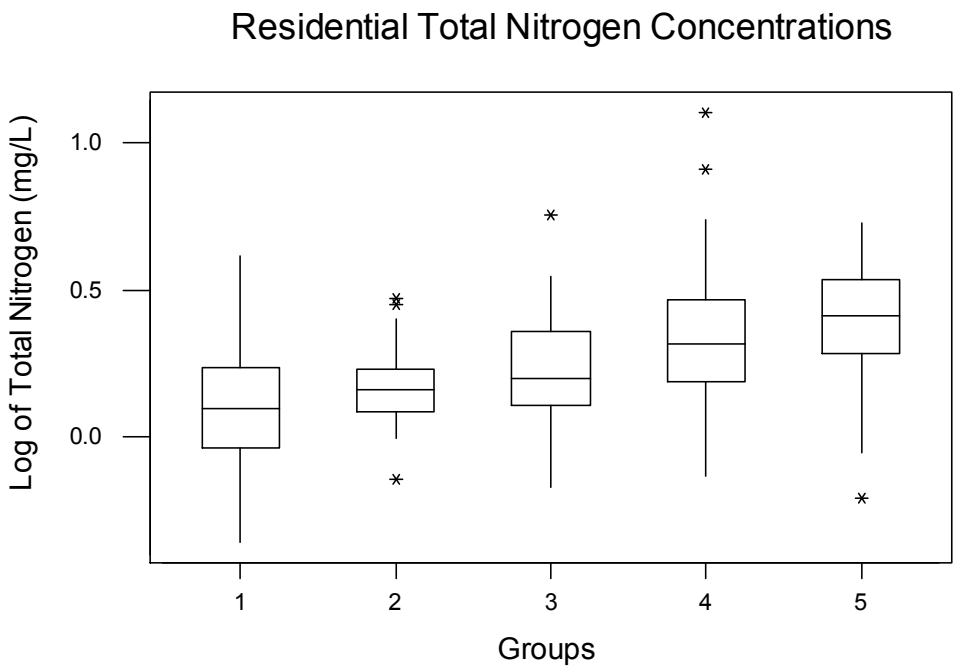

Figure 68. Box and whiskers plot for residential total nitrogen

Table 65. Results for Residential Total Nitrogen

Descriptive statistics of residential TSS (mg/L) by groups:

Groups	N	Mean	Median	StDev	COV
Fall, P<0.1 and P>1	22	1.4	1.3	0.77	0.57
Winter, 0.35<P<1	42	1.5	1.5	0.46	0.30
Fall, 0.35<P<1; WI, 0.1<P<0.35	43	1.9	1.6	0.95	0.51
All other conditions	112	2.4	2.1	1.5	0.62
Sp and Su, 0.1<P<0.35	40	2.6	2.6	1.0	0.38

Groups	SE Mean	Minimum	Maximum	Q1	Q3
Fall, P<0.1 and P>1	0.17	0.44	4.1	0.93	1.7
Winter, 0.35<P<1	0.072	0.72	3.0	1.23	1.7
Fall, 0.35<P<1; WI, 0.1<P<0.35	0.14	0.68	5.7	1.3	2.3
All other conditions	0.14	0.74	13	1.5	2.9
Sp and Su, 0.1<P<0.35	0.16	0.62	5.4	1.9	3.4

Groups
Fall, rains <0.1 inches and rains >1 inch: Overall 95% confidence interval of all observed data: 0.45 to 3.2 mg/L (from fitted probability distribution) 95% confidence interval of reported median: 0.98 to 1.5 mg/L (from fitted probability distribution) Winter, rains between 0.35 and 1 inch: Overall 95% confidence interval of all observed data: 0.85 to 2.5 mg/L (from fitted probability distribution) 95% confidence interval of reported median: 1.3 to 1.6 mg/L (from fitted probability distribution) Fall, rains between 0.35 and 1 inch; and Winter rains between 0.1 and 0.35 inches: Overall 95% confidence interval of all observed data: 0.68 to 4.1 mg/L (from fitted probability distribution) 95% confidence interval of reported median: 1.5 to 1.9 mg/L (from fitted probability distribution) Spring and Summer rains between 0.1 and 0.35 inches: Overall 95% confidence interval of all observed data: 1.1 to 5.7 mg/L (from fitted probability distribution) 95% confidence interval of reported median: 2.1 to 2.8 mg/L (from fitted probability distribution) All other conditions: Overall 95% confidence interval of all observed data: 0.82 to 5.9 mg/L (from fitted probability distribution) 95% confidence interval of reported median: 2.0 to 2.3 mg/L (from fitted probability distribution)

Commercial Area Total Suspended Solids Analyses

The commercial area total solids data appears to be affected by season and rain depth interactions, plus season and rain depth main factors. No affects associated with drainage area, or trends with time or interevent period, were identified.

Commercial Area Total Phosphorus Analyses

The commercial area total phosphorus data appears to be affected by season and rain depth interactions, plus season main factors. No affects associated with drainage area, or trends with time or interevent period, were identified.

Commercial Area Total Nitrogen Analyses

The commercial area total nitrogen data appears to be affected by season and rain depth interactions alone. No affects associated with drainage area, or trends with time or interevent period, were identified.

Industrial Area Total Suspended Solids Analyses

The industrial area total suspended solids data appears to be affected by season main factors alone. No affects associated with rain depth, drainage area, or trends with time or interevent period, were identified.

Industrial Area Total Phosphorus Analyses

The industrial area total phosphorus solids data appears to be affected by rain depth main factors alone. No affects associated with season, drainage area, or trends with time or interevent period, were identified.

Industrial Area Total Nitrogen Analyses

The commercial area total nitrogen solids data does not appear to be affected by any of the factors, or interactions examined. No affects associated with rain depth, season, drainage area, or trends with time or interevent period, were identified.

Summary

In this chapter, the NSQD was used to estimate the expected total suspended solids and nutrient mass discharges from urban, agricultural and forested sources in Anne Arundel County, Maryland, in a typical year. The parameters used in Schueler's simple method are the mean concentrations from each of these sources, the areas associated with each source, the volumetric runoff coefficient for these sources, and the rain depth associated with the period of calculation. The NSQD includes several catchments and more than 1,000 storm events in the Chesapeake Bay area which were used to determine the most appropriate urban area mean stormwater concentrations for residential, commercial and industrial land uses.

The effects associated with different seasons and rain depths on the urban area concentrations of solids and nutrients were also addressed for these regional data in this chapter. ANOVA analyses indicated that there are significant differences in the concentrations according to the seasonal period when the samples were collected, the total precipitation depth, and the interaction between these two factors for some of these pollutants and urban land uses. A stronger influence of the interactions between these factors was observed in residential areas compared with commercial or industrial land use areas.

The data summaries indicated that solids concentrations from forested and urban areas are similar, however the total runoff volume produced in forest areas is very small compared with the urban areas. For this reason, annual mass discharges from forested areas are less than half of the annual mass discharges produced from urban areas, even though the areas for these two main land use categories are similar.

Annual agricultural mass discharges of suspended solids are almost twice those calculated for urban areas. In urban areas, lower TSS concentrations occur, but a much larger fraction of the precipitation is transformed to runoff. Total urban area nitrogen mass discharges are expected to be almost twice the loads discharged from agricultural areas.

Chapter 9: Findings and Conclusions

Introduction

The purpose of this report was to examine several commonly accepted assumptions concerning stormwater characteristics (and associated management decisions) by stormwater managers and researchers. These included assumptions relating to the existence of "first flushes;" the effect of the abundance of impervious areas and the length of antecedent dry period on stormwater constituent concentrations; the influences of non-detected observations on stormwater characteristics; among others. These assumptions were evaluated using information contained in the National Stormwater Quality Database (NSQD). More than 3,765 events were monitored at 360 sites throughout the U.S. and the monitored water quality and associated information was included in the first version of the database. Most of the data were collected from residential, commercial and industrial land use areas in the eastern and southern parts of the U.S. (according to the original study design), although most geographical areas are represented.

Major Findings, as Reported in Report Chapters

Findings from Chapter 2: The National Stormwater Quality Database (NSQD) Description

• ***Drainage Areas by Land Use***. Drainage areas for each outfall varied for different land uses, with freeways having the smallest drainage areas and open space having the largest drainage areas. Generally, the median drainage areas ranged from about 40 to 110 acres, excluding the freeway sites which were only about 1.5 acres in size.

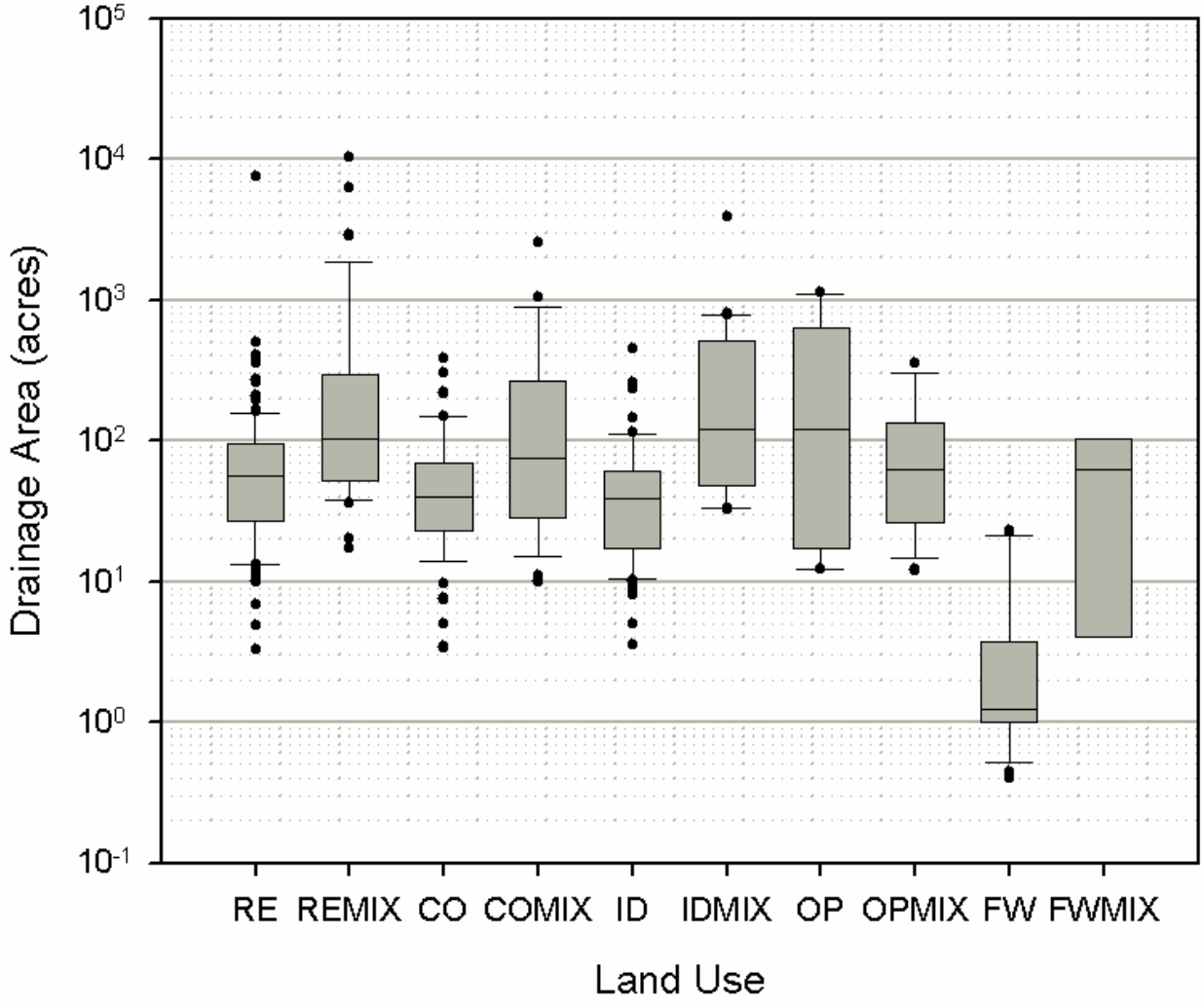

• ***Impervious Areas in each Land Use***. The percentage of impervious areas in each drainage area is obviously related to the land uses. Open space, and the open space mixed areas have the lowest fraction of impervious areas (at close to zero and about 20% respectively), while freeways and commercial land uses have the largest fractions of impervious areas (close to 100% and 85%, respectively). Residential areas have about 40% impervious surfaces. The database is not able to distinguish the directly connected vs. the partially connected impervious areas.

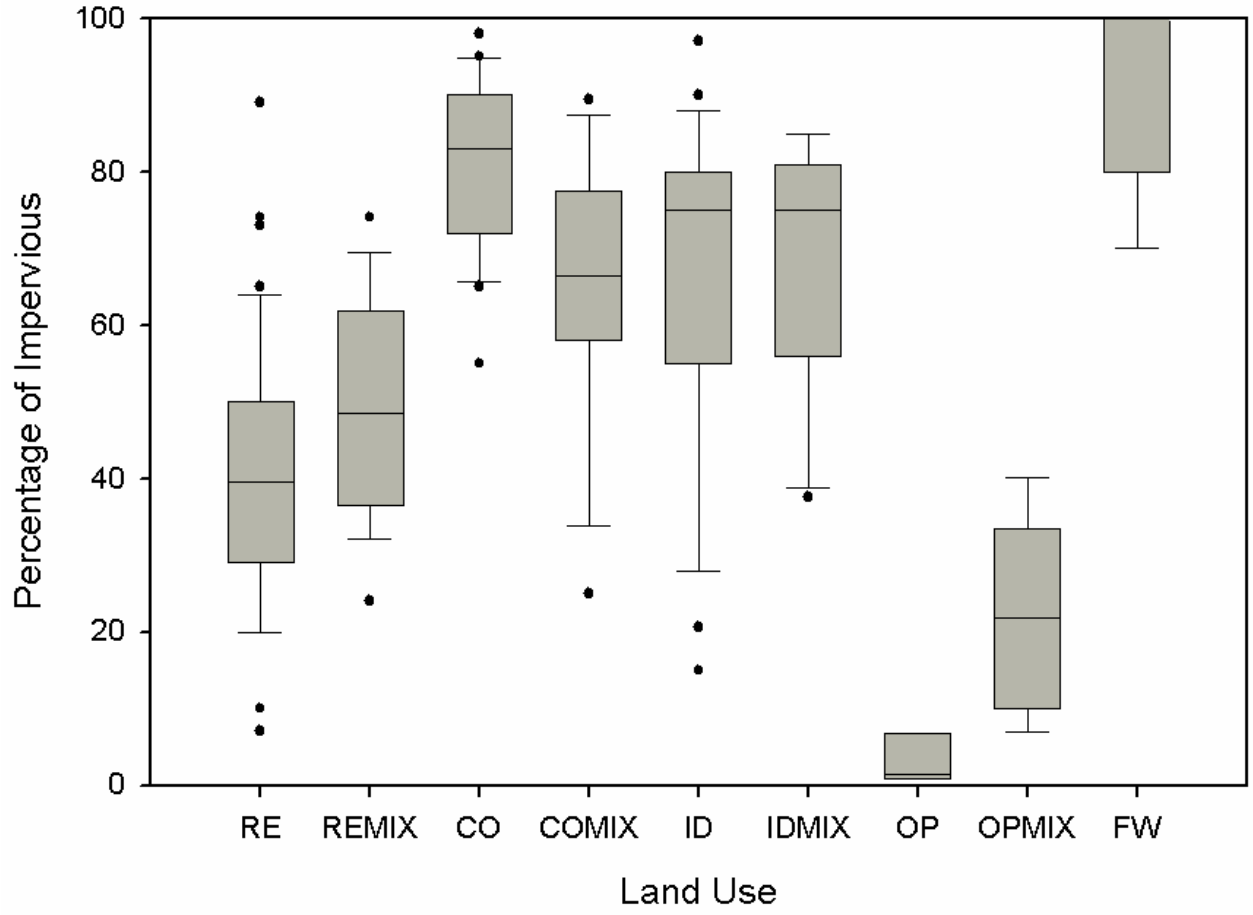

• ***Runoff Coefficients and Impervious Cover***. The reported volumetric runoff coefficients were closely related to the percentage of impervious cover. Again, the database cannot separate the directly connected impervious areas from the partially connected areas, so there is some expected variation in this relationship. This relationship significantly affects the mass discharges of pollutants. As noted later in these findings, very few significant relationships were found between the impervious covers and runoff concentrations.

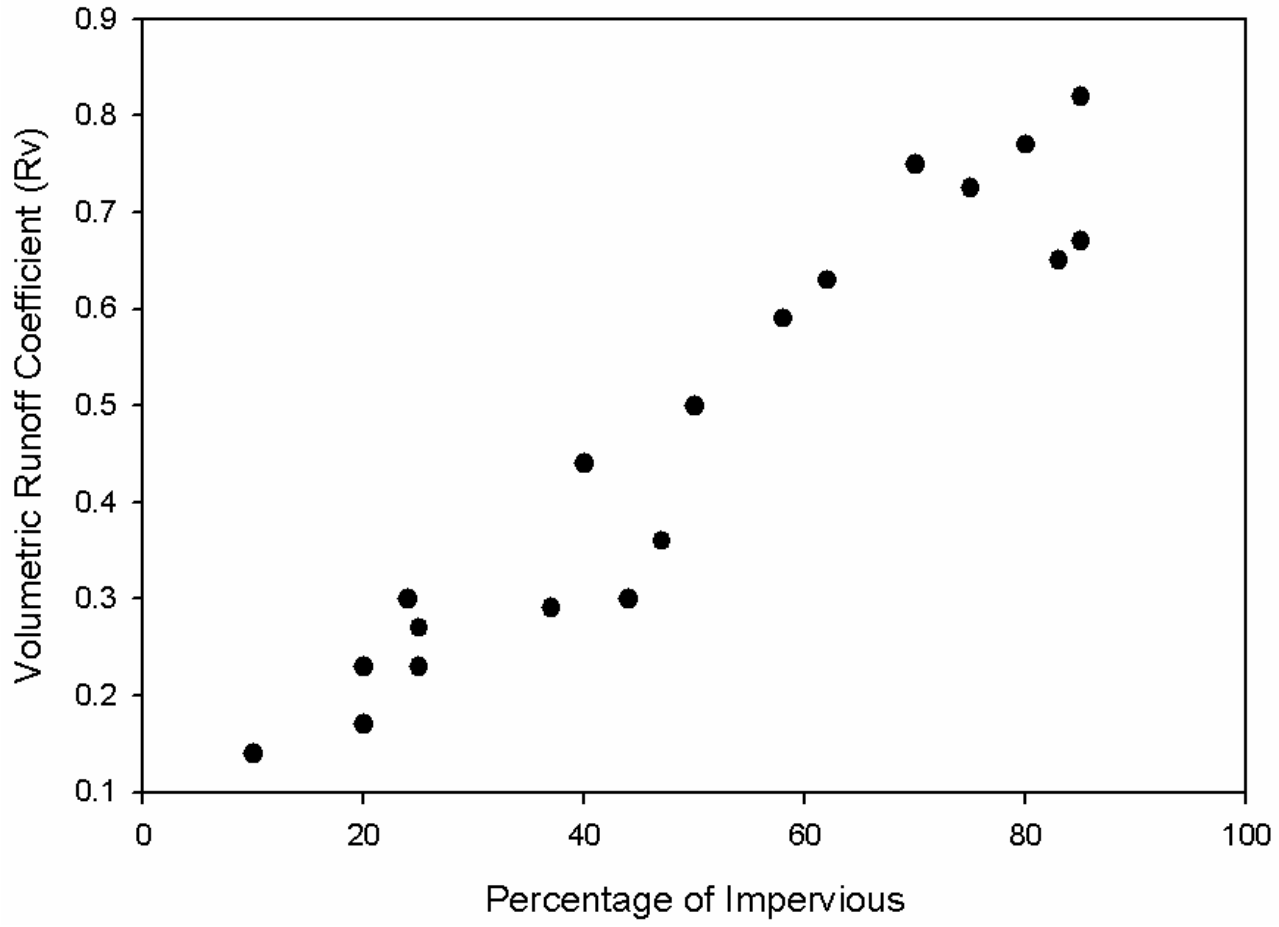

• ***Reported Monitoring Problems***. About 58% of the communities described problems during the monitoring process:

- One of the basic sampling requirements was to collect three samples every year for each of the land use stations. These samples were to be collected at least one month apart during rains having at least 0.1 inch rains, and with at least 72 hours from the previous 0.1-inch storm event. It was also required (when feasible), that the variance in the duration of the event and the total rainfall not exceeded the median rainfall for the area. About 47% of the communities reported problems meeting these requirements. In many areas of the country, it was difficult to have three storm events per year having these characteristics.

- The second most frequent problem, reported by 26% of the communities, concerned backwater tidal influences during sampling, or the outfall became submerged during the event. In other cases, it was observed that there was flow under the pipe (flowing outside of the pipe, in the backfill material, likely groundwater), or sometimes there was not flow at all.

- About 12% of the communities described errors related to malfunctions of the sampling equipment. When reported, the equipment failures were due to incompatibility between the software and the equipment, clogging of the rain gauges, and obstruction in the sampling or bubbler lines. Memory losses in the equipment recording data were also periodically reported. Other reported problems were associated with lighting, false starts of the automatic sampler before the runoff started, and operator error due to misinterpretation of the equipment configuration manual.

• ***Suggested Changes in Monitoring Requirements***:

- Base flows can commonly occur in separate storm drainage systems for a variety of reasons and they may be more important during some seasons than during others. In many cases, they cannot be avoided and should be included in the monitoring program, and their effects need to be recognized as an important flow phase.

- The rain gauges need to be placed close to the monitored watersheds. In the NSQD, about 7% of the events had site precipitation estimated using a rain gauge located at the city airport. About 16% of the events had precipitation depths estimated using their own monitoring network. Some communities had precipitation networks that were used for flood control purposes for the surrounding area. These networks can be considered better than the single airport rain gauge, but should at least be supplemented with a rain gauge located in the monitored watershed. Large watersheds cannot be represented with a single rain gauge at the monitoring station; in those cases the monitoring networks will be a better approach..

- Many of the monitoring stations lacked flow monitoring instrumentation, or did not properly evaluate the flow data. Accurate flow monitoring can be difficult, but it greatly adds to the value of the expensive water quality data.

- The three hour monitoring period that most used may have resulted in some bias in the reported water quality data. For example, it is unlikely that manual samplers were able to initiate sampling near the beginning of the events, unless they were deployed in anticipation of an event later in the day. A more cost-effective and reliable option would be to have semi-permanent monitoring stations located at the monitoring locations and sampling equipment installed in anticipation of a monitored event. Most monitoring agencies operated three to five land use stations at one time. This number of samplers, and flow equipment, could have been deployed in anticipation of an acceptable event and would not need to be continuously installed in the field at all sampling locations.

- Some of the site descriptions lacked important information and local personnel sometimes did not have the needed information. This was especially critical for watershed delineations on maps of the area. Also, few of the watershed descriptions adequately described how the impervious areas were connected to the drainage system, one of the most important factors affecting urban hydrologic analyses. In most cases, information concerning local stormwater controls was able to be determined from a variety of sources, but it was not clearly described in the annual reports.

• ***Comparisons of Stormwater Databases***. The NSQD can be compared to the older NURP database:

Comparison of NURP and NSQD Stormwater Databases

Constituent	Units	Source	Event Mean Concentrations Mean	Event Mean Concentrations Median	Number of events
Total Suspended Solids	mg/L	NURP	174	113	2000
		NSQD	79	50	3404
Biochemical Oxygen Demand	mg/L	NURP	10	8.4	474
		NSQD	11	8.6	2973
Chemical Oxygen Demand	mg/L	NURP	66	55	1538
		NSQD	71	55	2699
Total Phosphorus	mg/L	NURP	0.34	0.27	1902
		NSQD	0.37	0.29	3162
Dissolved Phosphorus	mg/L	NURP	0.10	0.078	767
		NSQD	0.11	0.078	2093
Total Kjeldahl Nitrogen	mg/L	NURP	1.7	1.4	1601
		NSQD	1.7	1.4	3034
Nitrite and Nitrate	mg/L	NURP	0.84	0.67	1234
		NSQD	0.77	0.61	2983
Copper	μg/L	NURP	67	55	849
		NSQD	18	14	2356
Lead	μg/L	NURP	175	131	1579
		NSQD	24	17	2250
Zinc	μg/L	NURP	176	140	1281
		NSQD	110	88	2888

- The nutrient, COD, and BOD_5 means and medians are very close in both databases, while the suspended solids and metals are much smaller in the NSQD than in the NURP database. As part of their MS4 Phase I application, Denver and Milwaukee (Milwaukee data not yet included in the NSQD) both returned to some of their earlier sampled monitoring stations used during their local NURP projects (EPA 1983). In the time period between the early 1980s (NURP) and the early 1990s (MS4 permit applications), they did not detect any significant differences, except for large decreases in lead concentrations, as shown in the figure below for a Milwaukee site.

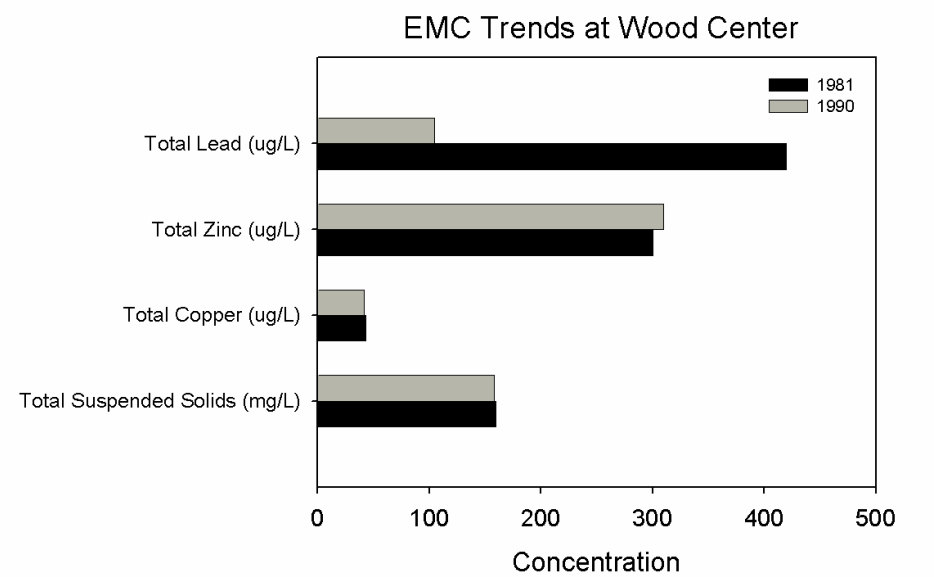

Comparison of pollutant concentrations collected during NURP (1981) to MS4 application data (1990) at the same location (personal communication, Roger Bannerman, WI DNR)

- The differences found in both the NURP and the NSQD databases are therefore most likely due to differences in geographical areas emphasized by each database. Half of the events included in the NSQD database were collected in EPA Rain Zone 2 (Maryland, Virginia, North Carolina, Kentucky and Tennessee), while half of the events contained in the NURP database were collected in EPA Rain Zone 1 (Minnesota, Wisconsin, Michigan, Illinois, New York, Massachusetts and New Hampshire). The NSQD best represents the coastal states and the southern states, while NURP best represents the upper Midwest and northeast states.

Findings from Chapter 3: QA/QC Procedures

• ***QA/QC Effort***. QA/QC takes a great deal of time and effort to ensure that the database content is correct and accurate. During this project, about 6 months were spent in collecting the majority of the information from the communities, while more than 9 months were spent in reviewing the accuracy of the data. All data was compared against original information, if at all possible, and all transcribed data was carefully compared to the source data. In addition, the behavior of the data was also carefully reviewed to identify unusual data observations. "Outliers" were not casually eliminated from the dataset unless errors were likely that could not be corrected. Comparisons to associated data and to likely data levels were the most important methods used to identify errors. In addition, unusually high and low observations were all verified.

• ***Non-Detected Analyses***. Left-censored data refers to observations that are reported as below the limits of detection, while right-censored data refers to over-range observations. Unfortunately, many important stormwater measurements (such as for filtered heavy metals) have large fractions of undetected values. These missing data greatly hinder many statistical tests. To estimate the problems associated with censored values, it is important to identify the probability distributions of the data in the dataset and the level of censoring. Most of the constituents in

the NSQD follow a lognormal distribution. When the frequencies of the censored observations were lower than 5%, the means, standard deviations and coefficients of variation were almost identical when the censored observations were replaced by half of the detection limit, or estimated using Cohen's Method. As the percentage of non-detected values increases, replacing the censored observation by half of the detection limit instead of estimating them using the Cohen's maximum likelihood method produced lower means and larger standard deviations. Replacing the censored observations by half of the detection limit is not recommended for levels of censoring larger than 15%. The censored observations in the database were replaced using estimated values using Cohen's maximum likelihood method for each site before the statistical tests in this report. Because this method uses the detected observations to estimate the non-detected values, it is not very accurate, and therefore not recommended, when the percentage of censored observations is larger than 40%.

• ***Selection of Analytical Methods***. The best method to eliminate problems associated with left-censored data is to use an appropriate analytical method. By keeping the non-detectable level below 5%, there are many fewer statistical analysis problems and the value of the datasets can be fully realized. The following table summarizes the recommended minimum detection limits for various stormwater constituents to obtain manageable non-detection frequencies (<5%). Some of the open space stormwater measurements (lead, and oil and grease, for example), would likely have greater than 5% non-detects, even with the detection limits shown. The detection limits for filtered heavy metals should also be substantially less than shown on this table.

Suggested Analytical Detection Limits for Stormwater Monitoring Programs to Obtain <5% Non-detects

	Residential, commercial, industrial, freeway	Open Space
Conductivity	20 μS/cm	20 μS/cm
Hardness	10 mg/L	10 mg/L
Oil and grease	0.5 mg/L	0.5 mg/L
TDS	10 mg/L	10 mg/L
TSS	5 mg/L	1 mg/L
BOD_5	2 mg/L	1 mg/L
COD	10 mg/L	5 mg/L
Ammonia	0.05 mg/L	0.01 mg/L
NO_2+NO_3	0.1 mg/L	0.05 mg/L
TKN	0.2 mg/L	0.2 mg/L
Dissolved P	0.02 mg/L	0.01 mg/L
Total P	0.05 mg/L	0.02 mg/L
Total Cu	2 μg/L	2 μg/L
Total Pb	3 μg/L (residential 1 μg/L)	1 μg/L
Total Ni	2 μg/L	1 μg/L
Total Zn	20 μg/L (residential 10 μg/L)	5 μg/L

Findings from Chapter 4: Stormwater Quality Descriptions Using the Three Parameter Lognormal Distribution

• ***Statistical Distributions***. Knowing the statistical distributions of stormwater concentrations is a critical step in data analysis. The selection of the correct statistical analyses tools is dependent on the data distribution, and many QA/QC operations depend on examining the distribution behavior. However, much data is needed for accurate determinations of the statistical distributions of the data, especially when examining unusual behavior. The comparison of probability distributions between different data subsets is also a fundamental method to identify important factors affecting data observations.

• ***Log-Normal Statistical Distribution***. Most of the stormwater constituents in the NSQD can be assumed to follow a lognormal distribution with little error. The use of the third parameter does not show a significant improvement in estimating the empirical distribution compared with the 2-parameter lognormal distribution. When the number of samples is very large per category (approximately more than 400 samples) the maximum likelihood and the 2-parameter lognormal distribution better fit the empirical distribution. For large sample sizes, the L-moments method usually unacceptably truncates the distribution in the lower tail. When the sample size is small (<100 samples), the

use of the third parameter does not improve the fit with the empirical distribution and the 2-parameter lognormal distribution produces a better fit than the other two methods.

• ***Effects of Data Errors***. Incorrect data observations can have a great effect on the characteristics of the dataset. For example, when only 0.5% of the sample is affected by a factor of a thousand, the coefficient of variation increases almost 12 times more than the correct value. An error of a factor of a thousand occurs periodically, especially for heavy metal values when the concentrations are reported in mg/L units when they are actually in µg/L units.

• ***Data Observations Needed***. Determining the number of data observations needed to compare two datasets with known, and similar distributions, can be readily determined. The following plot shows the power of the D test for 1%, 5%, and 10% levels of confidence of the test for samples size larger than 35. For example, assume that the maximum distance between the alternative cumulative and the estimated cumulative probability distributions is 0.2 (approximately a 20% difference in the concentrations in the datasets), and we want an 80% power (0.8) against the alternative at a 5% level of confidence. To calculate the number of required samples, we read that $\Delta(N)^{0.5}$ is 1.8 for a power of 0.8 and 5% level of confidence. Solving for $N = (1.8/0.2)^2 = 81$ samples. If we want to calculate the number of samples when the difference between the alternative cumulative and the estimated cumulative probability function is 0.05 (a difference of only 5%), with the same power and level of confidence, then 1,296 samples would be required. When the lines are very close together, it is obviously very difficult to statistically show that they are different, and many samples are needed.

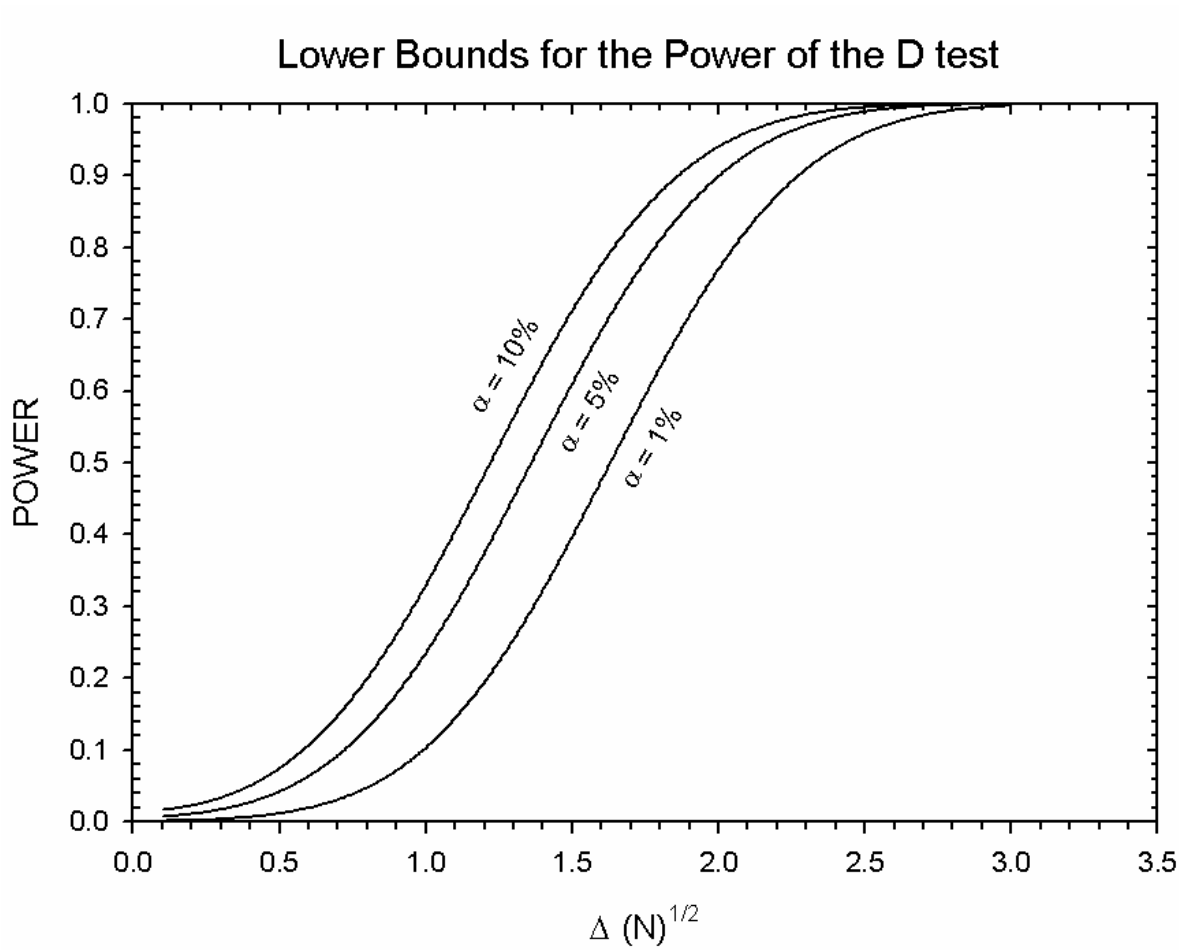

Lower bounds for the power of the D test for α = 1%, 5% and 10% (N>35) (Massey 1951)

Difference between datasets to be detected (Δ)	Percentage difference between datasets	Number of samples needed, 5% confidence, 80% power [N = (1.8/Δ)²]
0.05	5	1,300
0.10	10	320
0.25	25	52
0.50	50	13
1.00	100	3

- Obviously, a careful decision has to be made between monitoring budgets and data quality objectives. The sample needs increase dramatically as the difference between datasets become small. Typically, a difference of about 25% (requiring about 50 sample pairs) is a reasonable objective for most stormwater projects. This is especially important when monitoring programs attempt to distinguish test and control conditions associated with stormwater control practices. It is easy to confirm significant differences between influent and effluent conditions at wet detention ponds, as they have relatively high removal rates. Less effective controls are much more difficult to verify, as the sampling program requirements become very expensive.

Findings from Chapter 5: Identification of Significant Factors Affecting Stormwater Quality Using the NSQD

• ***Manual vs. Automatic Sampling***. About 80% of the NSQD samples were collected using automatic samplers. It was observed that manual sampling can result in lower TSS concentrations compared to automatic sampling procedures. This may occur, for example, if the manual sampling team arrives after the start of runoff and therefore misses an elevated first flush (if it exists for the site), resulting in reduced event mean concentrations. The following figure contains box and whisker plots comparing resultant sample concentrations when the samples were collected by automatic versus manual sampling methods, for residential land uses in EPA Rain Zone 2.

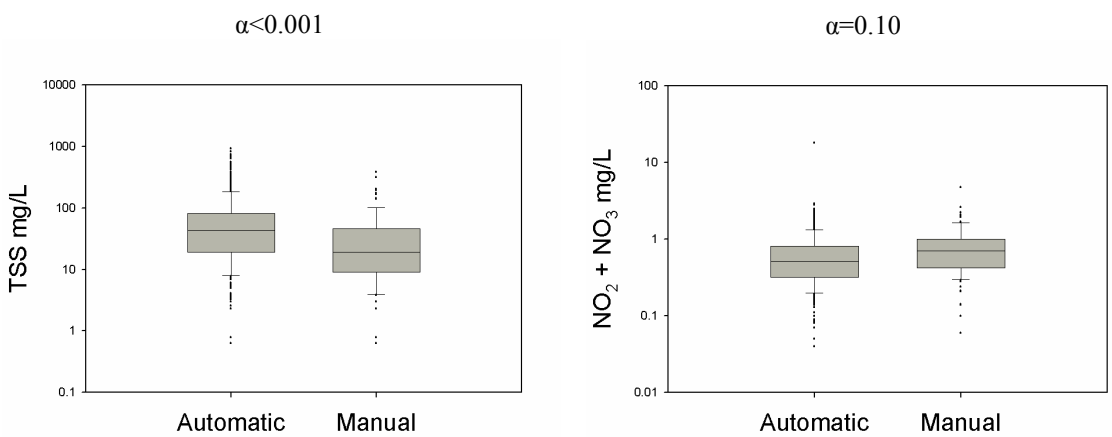

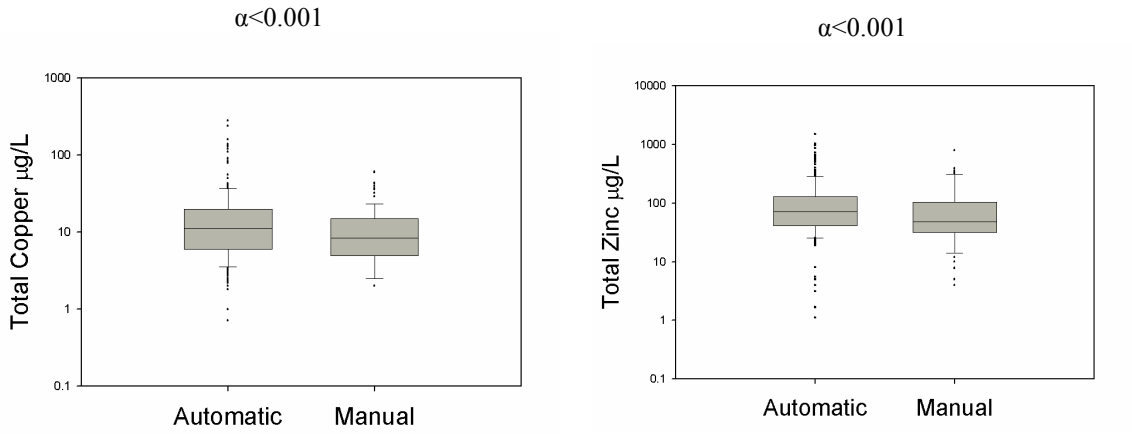

Comparison of reported concentrations in residential land use and EPA Rain Zone 2 for automatic vs. manual sampling methods

- The decision to use automatic or manual sampling methods is not always clear. There were statistical differences found between both methods in residential areas for several constituents. Most communities calculate their EMC values using flow-composited sample analyses. If first flush effects are present, manual sampling may likely miss these more concentrated flows due to delays in arriving at the site to initiate sampling. If the first flush is for a very short duration, time-composited samples may overly emphasize these higher flows. Flow compositing produces more accurate EMC values than time composite analyses. An automatic sampler with flow-weighted samples, in conjunction with a bed load sampler, is likely the most accurate sampling alternative.

• ***Sample Compositing Methods***. Time and flow-weighted composite options. were also evaluated in residential, commercial, and industrial land uses in EPA Rain Zone 2 and in industrial land uses in EPA Rain Zone 3.

- No significant differences were observed for BOD_5 concentrations using either of the compositing schemes for any of the four categories. A similar result was observed for COD except for commercial land uses in EPA Rain Zone 2, where not enough samples were collected to detect a significant difference. TSS and total lead median concentrations in EPA Rain Zone 2 were two to five times higher in concentration when time-compositing was used instead of flow-compositing.

- Nutrients in EPA Rain Zone 2 collected in residential, commercial and industrial areas showed no significant differences using either compositing method. The only exceptions were for ammonia in residential and commercial land use areas and total phosphorus in residential areas where time-composite samples had higher concentrations. Metals were higher when time-compositing was used in residential and commercial land use areas. No differences were observed in industrial land use areas, except for lead.

• ***Stormwater Controls***. The following figure shows the observed TSS concentrations in residential areas for EPA Rain Zone 2, for different drainage area stormwater controls (Channel weir: a flow measurement weir in an open channel that forms a small pool; Dry pond: a dry detention pond that drains completely between each storm event; Wet pond: a wet detention pond that retains water between events, forming a small lake or pond; Detention storage: Oversize pipes with small outlet orifices, usually under parking lots).

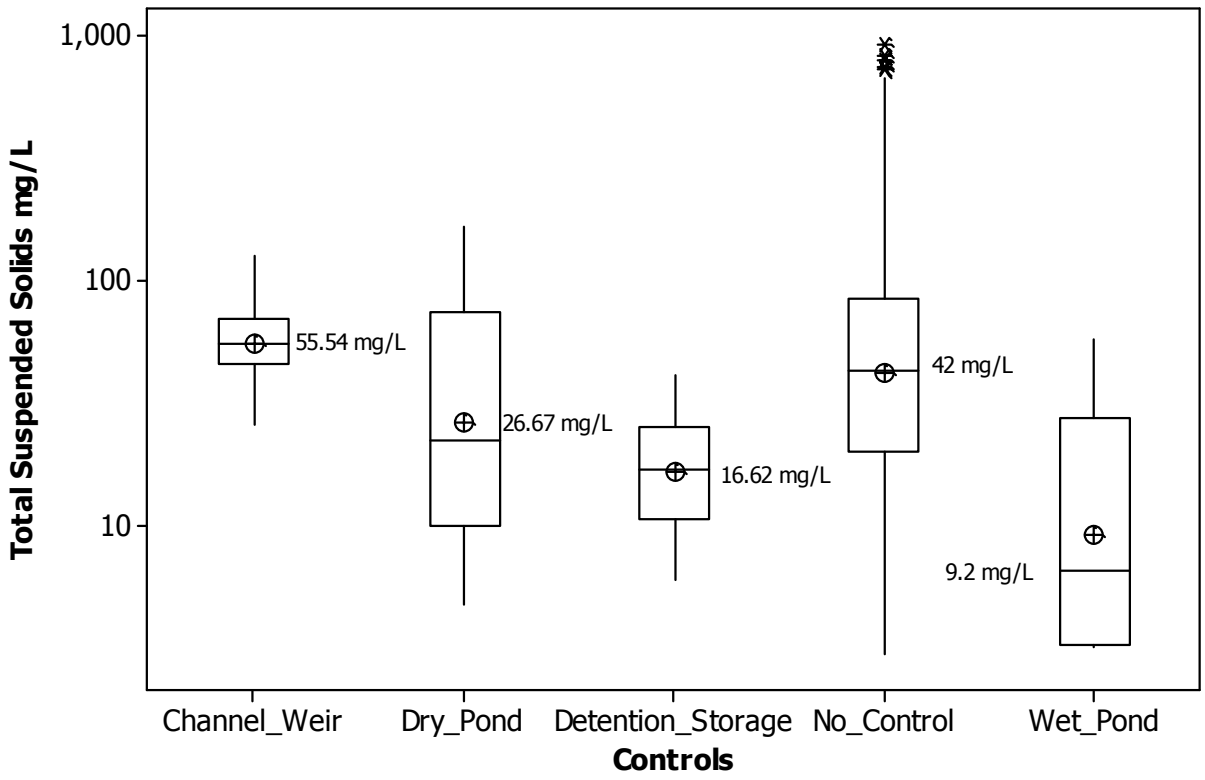

- There is a significant reduction in TSS, nitrite-nitrate, total phosphorus, total copper, and total zinc concentration at sites having wet detention ponds, the control practice having the largest concentration reductions. No reductions in TKN concentrations were found using wet ponds, but TKN seems to be reduced by dry ponds. Locations with detention storage facilities had smaller reductions of TSS, BOD_5, COD, total lead and total zinc concentrations compared to wet pond sites. Unfortunately, there were few sites in the database having grass swales that could be compared with data from sites having curbs and gutters.

• ***Concentration Effects Associated with Impervious Cover Amounts***. The following plot shows no apparent trend in TSS concentration that can be explained by impervious cover differences. However, it is very likely that a significant and important trend does exist between percent effective imperviousness and the pollutant mass that is discharged. While the relationship between imperviousness and concentration is not clear, the relationship between effective imperviousness and total runoff volume is much stronger (as noted previously) and more obvious as the non-paved areas can infiltrate much water.

- There is a certain amount of redundancy (self-correlation) between land use and the percentage of impervious areas, as each land use category generally has a defined narrow range of paved and roof areas. Therefore, it is not possible to test the hypothesis that different levels of impervious (surface coverage) are more important than differences in land use (activities within the area). Residential land uses cover only the lower range of imperviousness, while commercial sites have imperviousness amounts larger than 50%. In order to perform a valid comparison test, the range of imperviousness needs to be similar for both test cases.

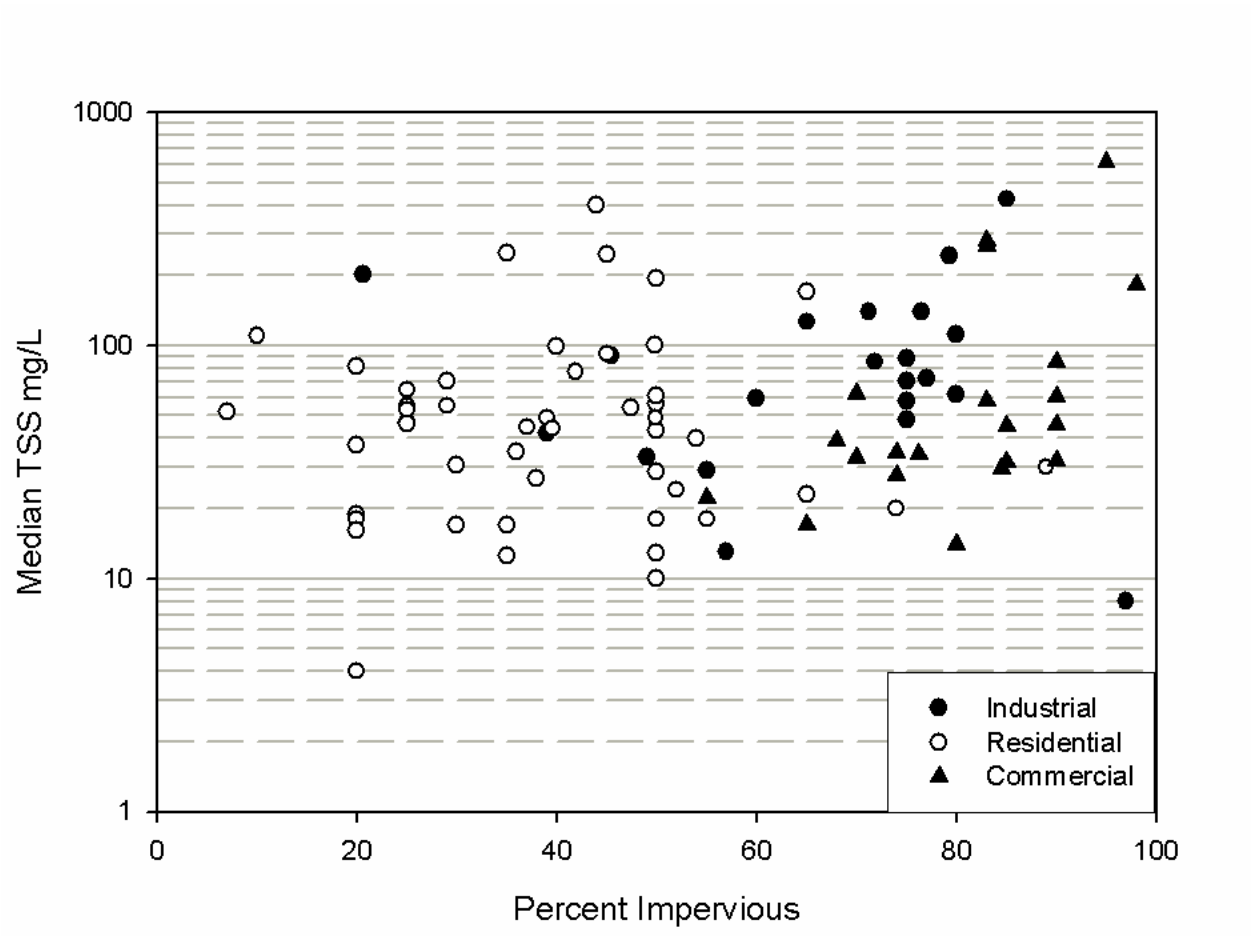

TSS concentrations by impervious cover and single land use

• ***Seasonal Effects***. Another factor that may affect stormwater quality is the season when the sample was obtained. If the few samples collected for a single site were all collected in the same season, the results may not be representative of the whole year. The NPDES sampling protocols were designed to minimize this effect by requiring the three samples per year to be separated by at least 1 month. The few samples still could be collected within a single season, but at least not within the same week. Seasonal variations for residential fecal coliform data are shown in the following figure for all residential areas. The bacteria levels are lowest during the winter season and highest during the summer and fall (a similar conclusion was obtained during the NURP, EPA 1983, data evaluations). The database does not contain any snowmelt data, so all of the data corresponds to rain-related runoff only. No other seasonal trends in stormwater quality were identified.

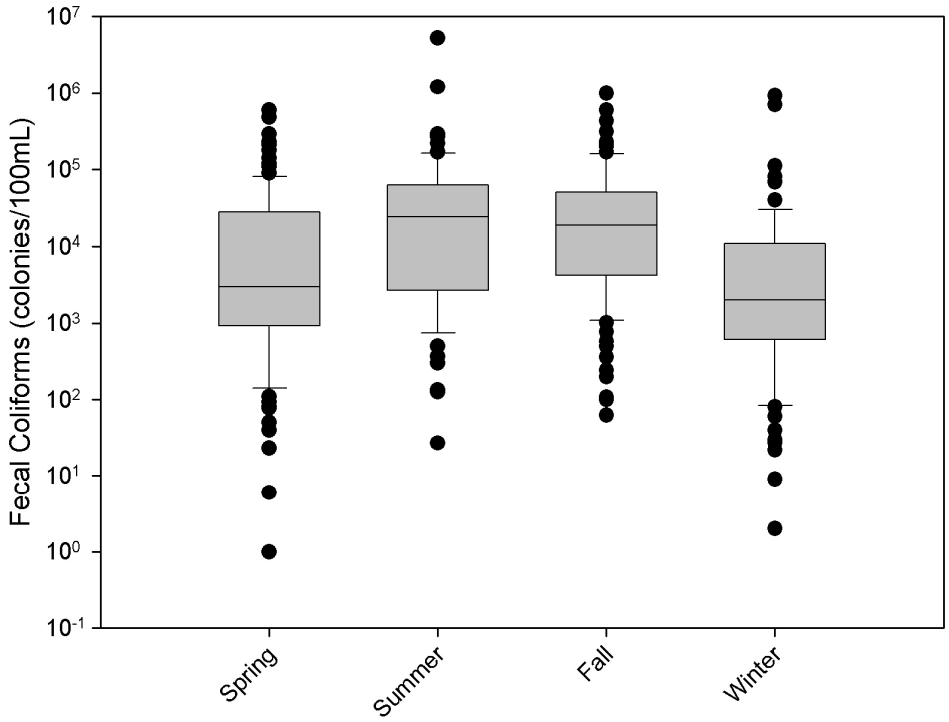

• ***Rain Depth Effects***. The following figure contains several scatter plots showing concentrations plotted against rain depth. There are no obvious trends of concentration associated with rain depth for the NSQD data..

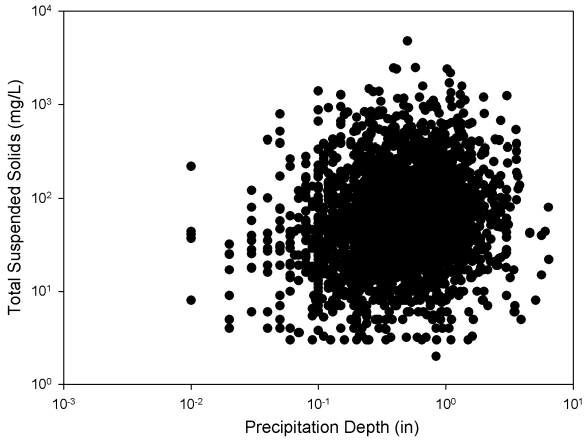

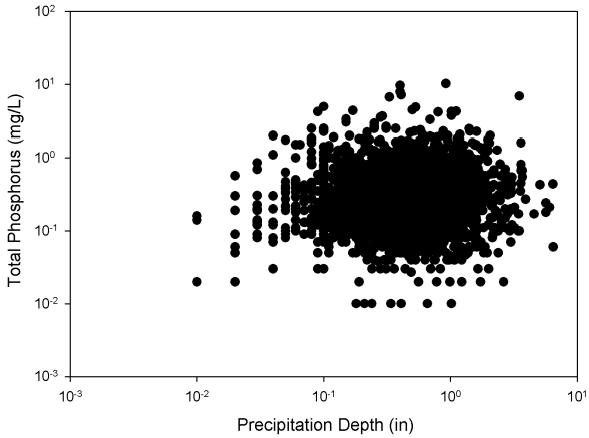

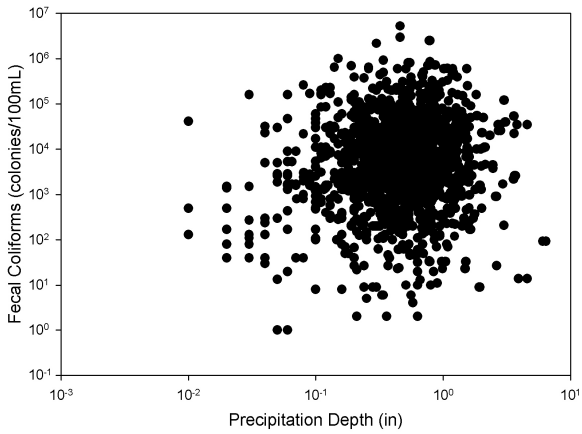

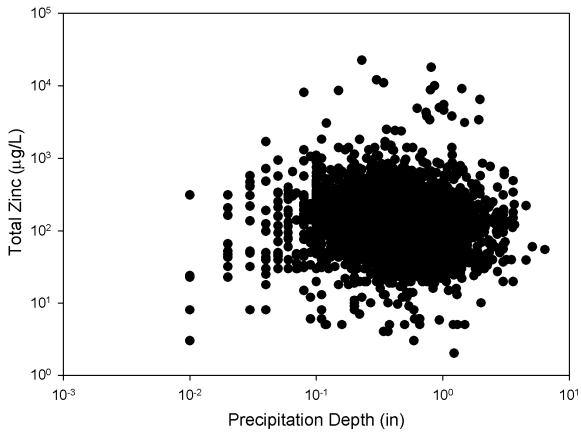

Examples of scatter plots by precipitation depth

- No effects on concentration were observed according to precipitation depth. Rainfall energy determines erosion and washoff of particulates, but sufficient runoff volume is needed to carry the particulate pollutants to the outfalls. Different travel times from different locations in the drainage areas results in these materials arriving at different times, plus periods of high rainfall intensity (that increase pollutant washoff and movement) occur randomly throughout the storm. The resulting outfall stormwater concentration patterns for a large area having various surfaces is therefore complex and rain depth is just one of the factors involved. Chapter 6 examines time delivery of pollutants in more detail.

• ***Interevent Period Effects***. The following figure shows box and whisker plots of the number of days having no rain before the monitored events by each EPA Rain Zone. Antecedent dry periods before sampling was found to have a significant effect for BOD_5, COD, ammonia, nitrates, TKN, dissolved, and total phosphorus concentrations at residential land use sites. As the number of days increased, there was an increase in the concentrations of the stormwater constituents. This relationship was not observed for freeway sites.

- Only EPA Rain Zone 2 has enough observations to evaluate possible effects of the antecedent dry period on the concentration of stormwater pollutants. In residential land uses, 7 out of 12 constituents indicated that antecedent dry period had a significant effect on the median concentrations. As the number of days having no rain increased, the concentrations also increased.

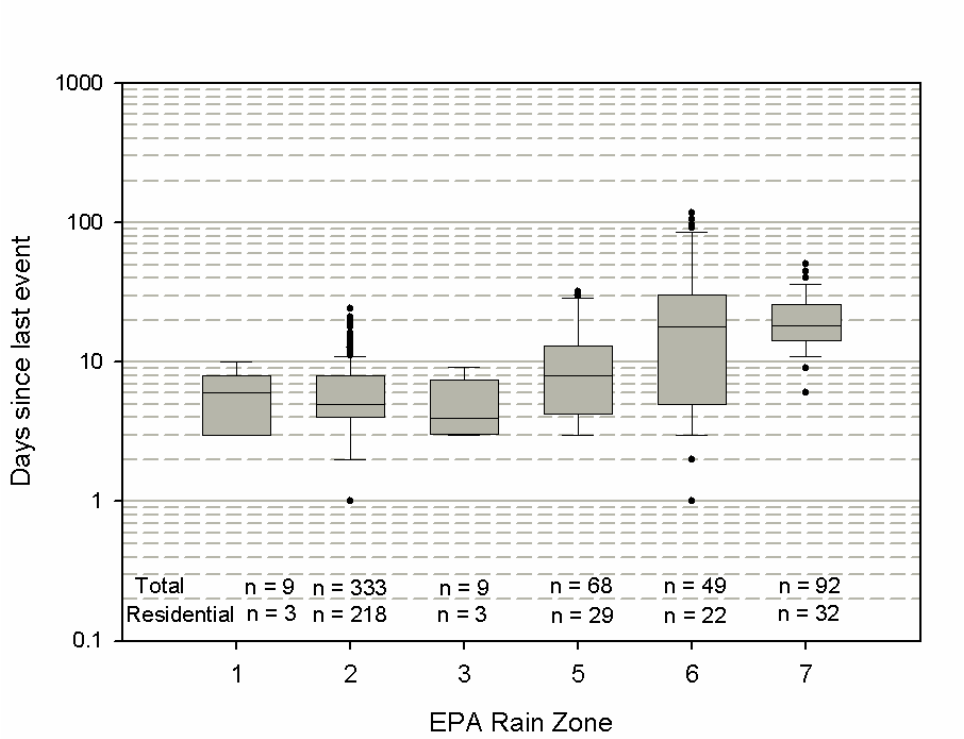

- Except for nitrates, all the nutrients have positive regressions inside the 95% confidence interval. In commercial land uses, the effects of antecedent dry periods on the median concentrations were less important. Only total phosphorus and total lead had significant regression results. As in the residential case, phosphorus has a positive coefficient with a small coefficient of determination. However, lead decreases with the number of dry days before the storm.

• ***Trends with Time***. The following plots show likely decreasing lead and COD concentrations with time. Statistically however, the trend lines are not significant due to the large variation in observed concentrations.

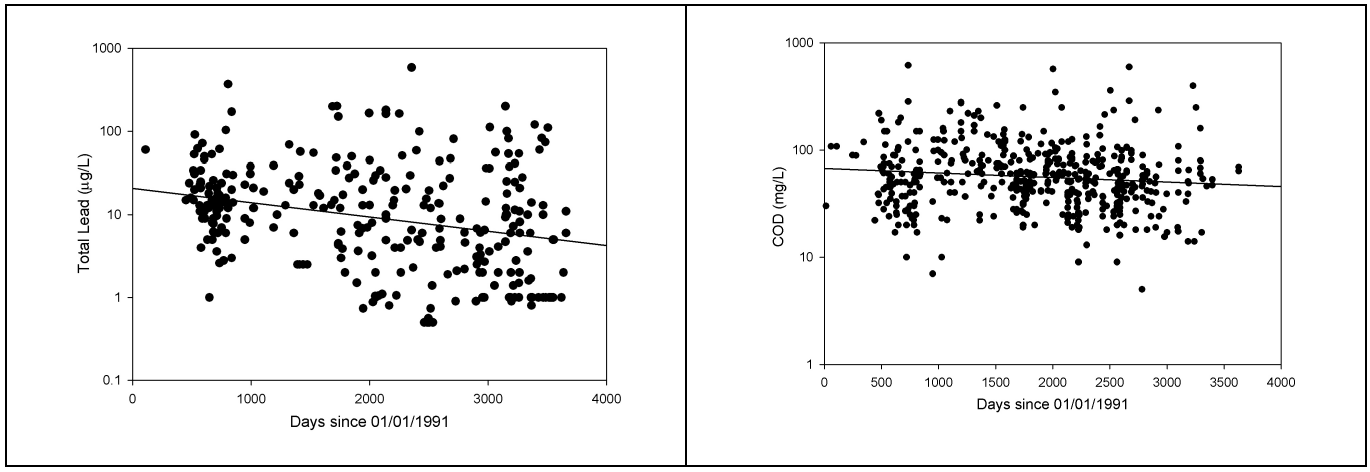

Findings from Chapter 6: Comparisons of First 30-minute Samples to 3-hour Composite Samples

• ***First-Flush Effects***. Sample collection conducted for some of the NPDES MS4 Phase I permits required both a grab and a composite sample for each event. A grab sample was to be taken during the first 30 minutes of discharge, and a flow-weighted composite sample for the entire time of discharge (up to three hours). The initial grab sample was used for the analysis of the "first flush effect," which assumes that more of the pollutants are discharged during the first period of runoff than during later periods. The composite sample was obtained with aliquots collected about every 15 to 20 minutes for at least 3 hours, or until the event ended.

- About 400 paired sets of 30-minute and 3-hour samples were available for comparisons. The following table shows the results of the analyses.

Significant First Flushes Ratios (first flush to composite median concentration)

Parameter	Commercial				Industrial				Institutional			
	n	sc	R	ratio	n	sc	R	ratio	n	sc	R	ratio
Turbidity, NTU	11	11	=	1.32			X				X	
pH, S.U.	17	17	=	1.03	16	16	=	1.00			X	
COD, mg/L	91	91	≠	2.29	84	84	≠	1.43	18	18	≠	2.73
TSS, mg/L	90	90	≠	1.85	83	83	=	0.97	18	18	≠	2.12
BOD_5, mg/L	83	83	≠	1.77	80	80	≠	1.58	18	18	≠	1.67
TDS, mg/L	82	82	≠	1.83	82	81	≠	1.32	18	18	≠	2.66
O&G, mg/L	10	10	≠	1.54			X				X	
Fecal Coliform, col/100mL	12	12	=	0.87			X				X	
Fecal Streptococcus, col/100 mL	12	11	=	1.05			X				X	
Ammonia, mg/L	70	52	≠	2.11	40	33	=	1.08	18	16	≠	1.66
$NO_2 + NO_3$, mg/L	84	82	≠	1.73	72	71	≠	1.31	18	18	≠	1.70
N Total, mg/L	19	19	=	1.35	19	16	=	1.79			X	
TKN, mg/L	93	86	≠	1.71	77	76	≠	1.35			X	
P Total, mg/L	89	77	≠	1.44	84	71	=	1.42	17	17	=	1.24
P Dissolved, mg/L	91	69	=	1.23	77	50	=	1.04	18	14	=	1.05
Ortho-P, mg/L			X		6	6	=	1.55			X	
Cadmium Total, μg/L	74	48	≠	2.15	80	41	=	1.00			X	
Chromium Total, μg/L	47	22	≠	1.67	54	25	=	1.36			X	
Copper Total, μg/L	92	82	≠	1.62	84	76	≠	1.24	18	7	=	0.94
Lead Total, μg/L	89	83	≠	1.65	84	71	≠	1.41	18	13	≠	2.28
Nickel, μg/L	47	23	≠	2.40	51	22	=	1.00			X	
Zinc, μg/L	90	90	≠	1.93	83	83	≠	1.54	18	18	≠	2.48
Turbidity, NTU			X		12	12	=	1.24	26	26	=	1.26
pH, S.U.			X		26	26	=	1.01	63	63	=	1.01
COD, mg/L	28	28	=	0.67	140	140	≠	1.63	363	363	≠	1.71
TSS, mg/L	32	32	=	0.95	144	144	≠	1.84	372	372	≠	1.60
BOD5, mg/L	28	28	=	1.07	133	133	≠	1.67	344	344	≠	1.67
TDS, mg/L	31	30	=	1.07	137	133	≠	1.52	354	342	≠	1.55
O&G, mg/L			X				X		18	14	≠	1.60
Fecal Coliform, col/100mL			X		10	9	=	0.98	22	21	=	1.21
Fecal Streptococcus, col/100 mL			X		11	8	=	1.30	26	22	=	1.11
Ammonia, mg/L			X		119	86	≠	1.36	269	190	≠	1.54
$NO_2 + NO_3$, mg/L	30	21	=	0.96	121	118	≠	1.66	324	310	≠	1.50
N Total, mg/L	6	6	=	1.53	31	30	=	0.88	77	73	=	1.22
TKN, mg/L	32	14	=	1.28	131	123	≠	1.65	335	301	≠	1.60
P Total, mg/L	32	20	=	1.05	140	128	≠	1.46	363	313	≠	1.45
P Dissolved, mg/L	32	14	=	0.69	130	105	≠	1.24	350	254	=	1.07

Ortho-P, mg/L			X		14	14	=	0.95	22	22	=	1.30
Cadmium Total, μg/L	30	15	=	1.30	123	33	≠	2.00	325	139	≠	1.62
Chromium Total, μg/L	16	4	=	1.70	86	31	=	1.24	218	82	≠	1.47
Copper Total, μg/L	30	22	=	0.78	144	108	≠	1.33	368	295	≠	1.33
Lead Total, μg/L	31	16	=	0.90	140	93	≠	1.48	364	278	≠	1.50
Nickel, μg/L			X		83	18	=	1.20	213	64	≠	1.50
Zinc, μg/L	21	21	=	1.25	136	136	≠	1.58	350	350	≠	1.59

Note: n = number of total possible events. sc = number of selected events with detected values. R = result. Not enough data (X); not enough evidence to conclude that median values are different (=); median values are different (≠).

- Generally, a statistically significant first flush is associated with a median concentration ratio of about 1.4, or greater (the exceptions are where the number of samples in a specific category is much smaller). The largest ratios are about 2.5, indicating that for these conditions, the first flush sample concentrations are about 2.5 times greater than the composite sample concentrations. More of the larger ratios are found for the commercial and institutional land use categories, areas where larger paved areas are likely to be found. The smallest ratios are associated with the residential, industrial, and open spaces land uses, locations where there may be larger areas of unpaved surfaces. Approximately 70% of the constituents in the commercial land use category had elevated first flush concentrations, about 60% of the constituents in the residential, institutional and the mixed (mostly commercial and residential) land use categories had elevated first flushes, and only 45% of the constituents in the industrial land use category had elevated first flushes. In contrast, no constituents were found to have elevated first flushes in the open space category.

- COD, BOD_5, TDS, TKN and Zn all had first flushes in all areas (except for the open space category). In contrast, turbidity, pH, fecal coliform, fecal streptococcus, total N, dissolved and ortho-P never showed a statistically significant first flush in any category.

- This investigation of first flush conditions indicated that a first flush effect was not present for all the land use categories, and certainly not for all constituents. Commercial and residential areas were more likely to show this phenomenon, especially if the peak rainfall occurred near the beginning of the event. It is expected that this effect will be more likely to occur in a watershed with a high level of imperviousness, but even so, the data indicated first flushes for less than 50% of the samples for the most impervious areas. This reduced frequency of observed first flushes in these areas most likely to have first flushes is likely associated with the varying rain conditions during the different events, including composite samples that did not represent the complete runoff durations.

- Groups of constituents showed different behaviors for different land uses. All the heavy metals evaluated showed higher concentrations at the beginning of the event in the commercial land use category. Similarly, all the nutrients showed higher initial concentrations in residential land use areas, except for total nitrogen and ortho-phosphorus. This phenomenon was not found in the bacteria analyses. None of the land uses showed a higher population of bacteria at the beginning of the event. Conventional constituents showed elevated concentrations in commercial, residential and institutional land uses.

Findings from Chapter 7: Effects of Land Use and Geographical Location on Stormwater Quality

• ***ANOVA for land use and geographical location***. All land uses in EPA Rain Zone two (except for freeways) have reduced TSS values when compared with the overall NSQD average. On the other hand, conditions in EPA Rain Zones 4, 6 and 9 have higher TSS values for the land uses noted. Industrial and freeway land uses increase the TSS concentrations compared with the other land uses, as expected from the one-way ANOVA tests. Of the 45 possible EPA Rain Zone and land use interactions, 21 have significantly different coefficients and resultant TSS concentrations. All of these possible TSS concentrations, based on this model, are shown in the following table.

TSS Concentrations (mg/L) for Different Land Uses and Rain Zones (if values not shown, use 60 mg/L)

	1	2	3	4	5	6	7	8	9
Open space		40		139					
Residential		40		84		92	35		
Commercial		43	33	90	30	120			152
Industrial	25			103	147	206	121		
Freeways		215				86	99		409

• ***Grouping of TSS Data***. The following table shows the combined groups that had statistically similar TSS concentrations. The figure also indicates that about half of the TSS single land use data in the NSQD database were in the first group (52%). Most of this data are from residential areas and EPA Rain Zone 2. Twenty-four percent of the observations were not affected by the land use – EPA Rain Zone interaction. Only 1.5% of the data are present in groups 4 and 5. These groups are significantly different than groups 1 and 2. Overall, there are three main levels of TSS concentrations in stormwater: Low (1), Medium (2) and High (3). Other minor categories correspond to groups 4 and 5 and contain the unusually high values.

Five TSS Concentration Categories in NSQD

	Land use*rain zone interactions (Rain Zone: land uses)	**Concentrations (mean ± st. dev. in mg/L)**	**Range (mean; mean – st. dev. and mean + st. dev., mg/L)**	**Number of single land use TSS observations in category in NSQD**
Low	1: residential 2: open space; residential; commercial 3: commercial 5: commercial 7: residential	3.69±1.12	40 (13 – 123)	1056
Medium	All others not noted elsewhere	4.02±1.11	56 (18 – 169)	478
High	4: residential; commercial; industrial; open space 5: industrial 6: freeways; residential; commercial 7: freeways; industrial 9: commercial	4.60±1.20	99 (30 – 330)	460
Unusually high 1	2: freeways 6: industrial			22
Unusually high 2	9: industrial			9

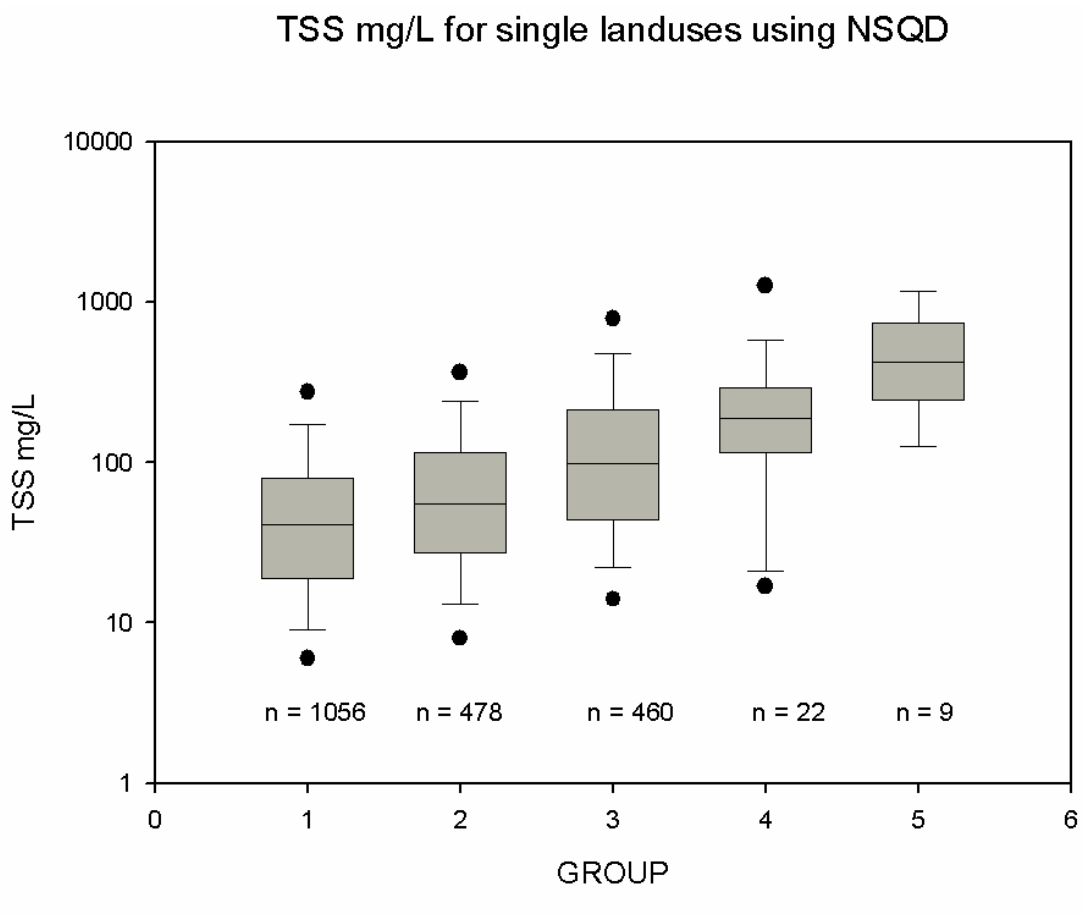

Box plots of five groups also showing 5th and 95th percentiles.

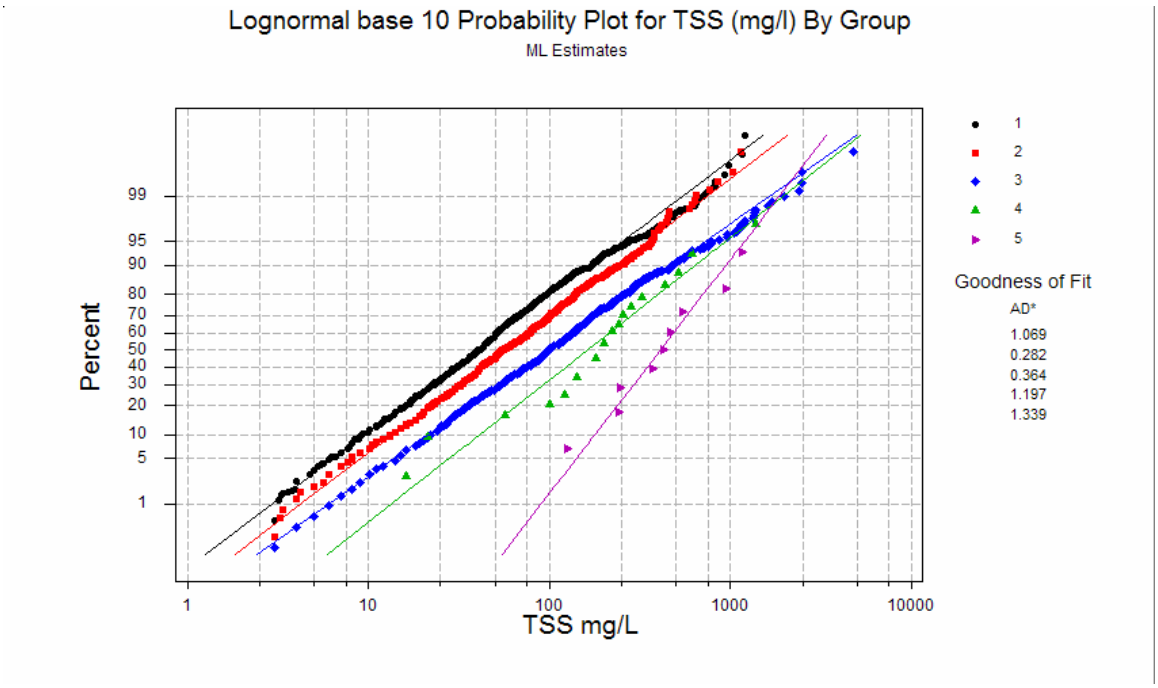

Probability plot of the TSS data in the NSQD using the 5 main sample groups.

• ***Land Use and Geographical Area Interactions.*** When examining the detailed land use and seasonal interactions, it is clear that some of the constituents do not have many significant interactions in these factors, or that there are too few observations (or sites) represented in the NSQD. The constituents that have few, if any clear geographical area/land use interactions include: pH (I6), temperature, hardness, oil and grease (I5 and I7), TDS (C2), ammonia (C7), and dissolved P (R2 and R5). The values in the parentheses are the significant interaction terms (the land use and the EPA Rain Zone). If individual land use/geographical interaction cell values are not available, the overall land use, or overall data base summary values should be used:

- Constituents that should clearly be separated by land use: copper, lead, and zinc
- Constituents that clearly did not have any significant differences for different land use categories, therefore use overall values: pH, temperature (obvious seasonal effects), TDS, and TKN
- Constituents where residential data should be separated from commercial plus industrial area data: TSS (possible) and nitrates plus nitrites
- Constituents where it is not clear; conflicts in p values when comparing different combinations of land uses: hardness, oil and grease, BOD_5, COD, ammonia, total P, and dissolved P

Findings from Chapter 8: Example Application of the National Stormwater Quality Database (TSS and Nutrient Export Calculations for Chesapeake Bay Watersheds)

• ***Mass Discharge Calculations***. This chapter demonstrates how the NSQD information can be used to make mass discharge calculations for large drainage areas. This is an example for Maryland's Anne Arundel County, an important tributary of Chesapeake Bay. TSS and nutrient concentrations for the urban land uses in the county were calculated using NSQD data for Maryland and Virginia. Various factors were found to influence these concentrations using ANOVA analyses. Specifically, season, rain depth, and impervious cover were examined for each land use category. The resulting coefficients of variation were all significantly reduced with these categories of data, as shown on the following table.

Average Concentrations by Land Use

Land Use	Constituent	Conditions	Average (COV)
Urban - Residential	TSS		
		Summer rains (between 0.1 and 0.35 inches in depth)	143 (0.71)
		All other rains	58 (0.70)
	TP	Sites having <27% impervious cover:	
		Winter rains	0.28 (0.59)
		All other rains	0.41 (0.65)
		Sites having >27% impervious cover:	
		Winter rains (less than 0.1 inches in depth)	0.16 (0.86)
		All other rains	0.30 (0.63)
	TN	Fall rains (less than 0.1 and greater than 1 inch in depth)	1.4 (0.57)
		Winter rains (0.35 and 1 inch in depth)	1.5 (0.30)
		Fall rains (0.35 and 1 inch) and Winter rains (between 0.1 and 0.35 inches in depth)	1.9 (0.51)
		All other rains	2.4 (0.62)
		Spring and summer rains (between 0.1 and 0.35 inches in depth)	2.6 (0.38)
Urban - Commercial	TSS and TN	See tables 7.4 and 7.5	
	TP	Summer rains >1 inch and fall rains between 0.1 and 0.35 inch	0.46 (0.36)
		All other rains	0.23 (0.71)
Urban - Industrial	TSS	Fall, spring, and summer	77 (1.48)
		Winter	81 (0.93)
	TP	Rains less than 0.35 inches	0.29 (0.81)
		Rains greater than 0.35 inches	0.22 (1.05)
	TN	All conditions	2.1 (0.79)
Rural - Agricultural	Sediment		1115 lb/ac/yr (unreliable estimate)
	TN		40 lb/ac/yr
	TP		5.4 lb/ac/yr
Rural - Forest	Sediment		4500 lb/ac/yr (unreliable estimate)
	TN		0 lb/ac/yr
	TP		0 lb/ac/yr

Total Suspended Solids Concentrations and Volumetric Runoff Coefficients for Land Use Categories in Anne Arundel County, Maryland

Land Use Description	# of acres in 2000	TSS (mg/L)	Concentration reliability?	R_V	R_V reliability?
Large lot subdivision (1 unit/ 5- 10 ac)	0	60	excellent	0.09	excellent
Low-density residential (1 unit/ 5 acres to 2 units/acre)	33,337	60	excellent	0.14	excellent
Medium-density residential (2 to 8 units/acre)	33,791	60	excellent	0.23	excellent
High-density residential (8+ units/acre)	6,274	60	excellent	0.34	excellent
Commercial	11,670	58	excellent	0.72	excellent
Industrial	3,249	80	excellent	0.52	excellent
Institutional (schools, churches, military institutions, etc.)	9,813	58	moderate	0.49	excellent
Open urban land	4,139	50	moderate	0.08	excellent
Transportation	1,557	99	moderate	0.41	excellent
Extractive	1,686	350	poor	0.3	moderate
Deciduous forest	43,901	90	moderate	0.08	moderate
Evergreen forest	4,891	90	moderate	0.08	moderate
Mixed forest	56,621	90	moderate	0.08	moderate
Brush	2,565	90	poor	0.08	moderate
Wetlands	1,643	0	poor	0.65	moderate
Beaches	29	0	poor	0.1	moderate
Bare ground	224	1000	poor	0.3	moderate
Row and garden crops	300	357	very good	0.2	poor
Cropland	42,368	357	very good	0.2	poor
Orchards / vineyards / horticulture	63	357	very good	0.15	poor
Pasture	4,690	145	very good	0.08	moderate
Feeding operations	49	145	very good	0.2	poor
Agricultural building, breeding and training facilities	163	145	very good	0.5	poor

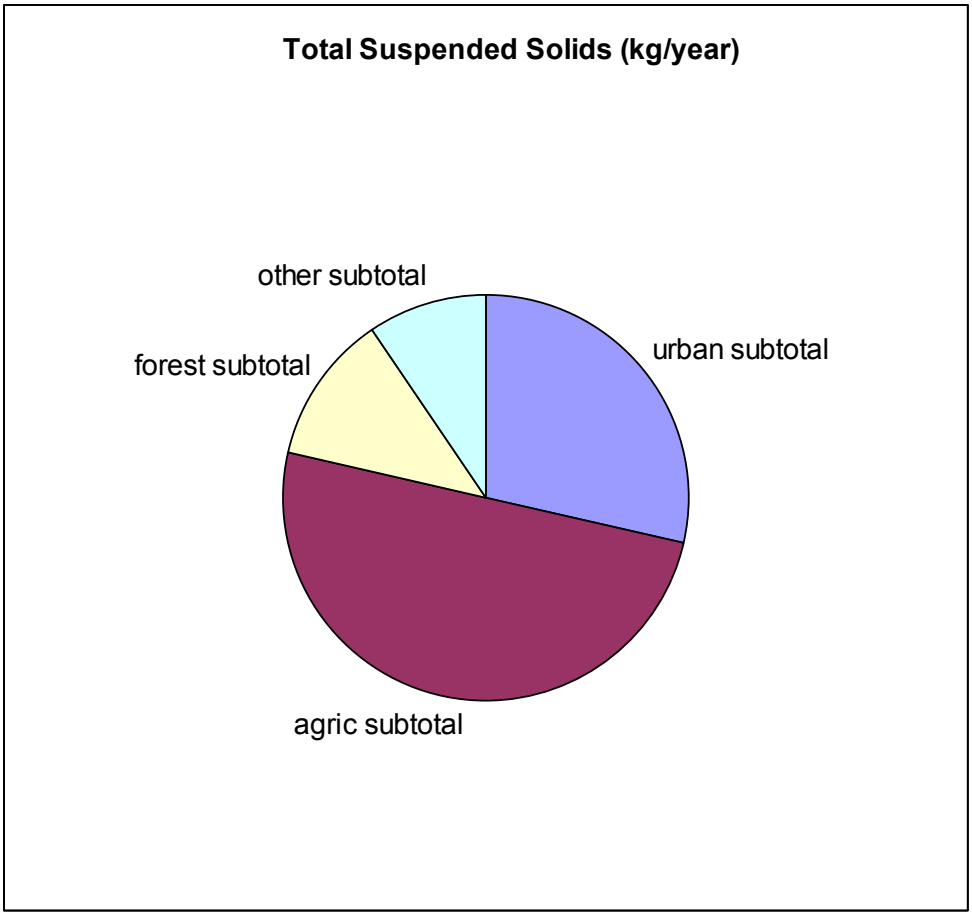

Calculated Sources of TSS for Anne Arundel County, Maryland

Research Hypotheses

The main hypothesis for this research was that commonly accepted assumptions concerning stormwater characteristics are correct and applicable for a wide range of conditions, including different land uses, precipitation depths, seasons, watershed area and geographic locations throughout the U.S. This assumption was evaluated by testing the following hypotheses:

Research Hypothesis 1. Lognormal distributions are robust descriptions of stormwater quality data and a few unusual values have little effect on dataset summary statistical descriptions.

A total of 25 constituents in 5 land uses were evaluated using the NSQD database. In 71% of the cases, lognormal distributions better described the stormwater constituent concentrations compared with gamma and exponential distributions. These last two distributions better represented 10% and 4% of the cases, respectively. In 15% of the cases, lognormal, gamma and exponential distributions did not adequately represent stormwater constituent concentrations. Constituents that mostly were not well described by any of these three distributions included: BOD_5, total arsenic, total cadmium and total copper in residential, commercial and industrial land uses.

Gamma and exponential distributions better described bacteria and nutrient concentrations in open space land use areas.

The use of the 3-parameter lognormal distribution, did not improve the description information compared with the simpler 2-parameter distribution. The 2-parameter lognormal distribution is therefore recommended for those constituents were the use of lognormal distributions produced a better fit of the data.

Unusually elevated values have a significant effect in the mean, median, standard deviation and coefficient of variation of the sample distribution. As an example, when 0.5% of the data are affected by a factor of a thousand (such as may occur when heavy metals are incorrectly expressed with mg/L units when they should be µg/L units), the coefficient of variation will be increased almost 15 times compared to the value when the extreme observations are not present. The effect on the coefficient of variation is larger as the percentage of extreme samples is reduced.

Unusually low values do not have a significant effect on the mean, median, standard deviation, or coefficient of variation, unless the percentage of samples having the low values is higher than 25%.

Research Hypothesis 2. Censored data can be adequately adjusted by substituting half of the detection limit, with little resulting effects on the mean and variance of stormwater datasets.

Replacing non-detected observations by half of the detection limit is appropriate when the percentage of left censored observations (those having concentrations lower than the detection limit) is lower than 15% of the total data set. Replacing the non-detected values with zero will have more extreme effects on these distribution summary values.

Ignoring the non-detected values will result in higher means, medians and standard deviations, and lower coefficients of variation than the true values for the distributions.

The use of the Cohen's maximum likelihood method is recommended to replace the censored observations for those constituents that have lognormal distributions. This is an appropriate method when non-paired statistical tests are to be performed, as the assignment of replacement values for specific tests in not important. However, no replacements are suitable when paired comparison tests are to be conducted, and these tests should only be conducted on the data sets having complete pairs (not using pairs where one or both parts of the pair are below detection). When calculating percentage reductions, or other comparison tests, non-detected effluent concentrations can be used, without substitutions, in calculations to determine the lower limit of removal.

When the number of non-detected observations exceed about 40% of the total number of observations, no substitution method (neither the maximum likelihood method or half of the detection limit) is suitable.

Research Hypothesis 3. Different levels of imperviousness are more important than differences in land use categories when predicting stormwater constituent concentrations.

The use of the impervious area information alone did not reduce the uncertainty about the variability of stormwater constituents. One of the main factors associated with land use concerns the activities that occur in the land use. It is expected that the use of both factors (land use and information about the surface covers in the area, such as the percentage of impervious areas) will reduce the variability of the stormwater concentrations observed, rather than when only one of these factors is considered. However, these tests were only conducted on stormwater concentrations, not on mass discharges. Increases in impervious cover are directly associated with increases in runoff volumes, and therefore in pollutant mass discharges.

When only residential area data from EPA Rain Zone 2 were used, the percentage of impervious areas was found to have a significant effect on the concentration of nitrates. The concentrations of nitrates were reduced as the percentage of impervious cover increased. This is an expected finding; when the impervious areas increase, less landscaping is likely (a major source of nutrient discharges).

No significant relationships were observed between the amount of impervious cover and any stormwater constituent concentration that was examined for industrial and commercial land use areas.

Research Hypothesis 4. Antecedent dry periods have a significant effect on stormwater constituent concentrations.

Antecedent dry periods are not the same for all the EPA Rain Zones in the country. Longer antecedent dry periods occur at west coast sites compared to other locations.

The antecedent dry periods had a positive and significant (α = 5%) effect on the concentration of 7 of 13 constituents examined: nutrients (ammonia, nitrates, TKN, total and dissolved phosphorus), COD and BOD_5 at

residential sites located in EPA Rain Zone 2. It was not significant in oil and grease, TDS, TSS, total copper, total lead and total zinc.

Only total phosphorus and total lead concentrations were affected by the antecedent dry period at commercial sites located in EPA Rain Zone 2. Total phosphorus concentrations increased with increasing days before the sampled storm. An opposite relation was observed for total lead at commercial sites.

Only TSS was affected by the antecedent dry period at industrial sites located in EPA Rain Zone 2. A positive relationship was observed, with TSS concentrations increasing as the number of antecedent dry days increased.

Research Hypothesis 5. Outfall samples collected during the "first flush" periods of storms have significantly greater concentrations than total storm composite samples.

The first flush effect was not present for all constituents and all land uses. The phenomenon was most likely to occur in commercial and high density residential land uses, watersheds having high percentages of impervious areas. It was not observed in open space areas, watersheds having low percentages of impervious areas.

TSS, COD, TDS, total copper, total lead, total zinc and TKN had observed flush concentrations that were significantly higher than the composite sample concentrations in those areas where the "first flush" was most likely to occur. pH was the only constituent that did not indicate a first flush effect. Observed elevated first flush concentrations were less than 3 times higher than the corresponding storm composite concentrations.

Recommendations for Future Stormwater Permit Monitoring Activities

• The NSQD is an important tool for the analysis of stormwater discharges at outfalls. About a fourth of the total existing information from the NPDES Phase I program is included in the database. Most of the analyses in this research were performed for residential, commercial and industrial land uses in EPA Rain Zone 2 (the area of emphasis according to the terms of the EPA funded research). Much more data are available from other stormwater permit holders that were not included in this database. Acquiring this additional data for inclusion in the NSQD is a recommended and cost-effective activity and should be accomplished as additional data are also being obtained from on-going monitoring projects.

• The use of automatic samplers, coupled with bedload samplers, is preferred over manual sampling procedures. In addition, flow monitoring and on-site rainfall monitoring needs to be included as part of all stormwater characterization monitoring. The additional information associated with flow and rainfall data will greatly enhance the usefulness of the much more expensive water quality monitoring. Flow monitoring must also be correctly conducted, with adequate verification and correct base-flow subtraction methods applied. A related issue frequently mentioned by the monitoring agencies is the lack of on-site rainfall information for many of the sites. Using regional rainfall data from locations distant from the monitoring location is likely to be a major source of error when rainfall factors are being investigated.

• Many of the stormwater permits also only required monitoring during the first three hours of the rain event. This may have influenced the event mean concentrations if the rain event continued much beyond this time. Flow-weighted composite monitoring should continue for the complete rain duration. Monitoring only three events per year from each monitoring location requires many years before statistically adequate numbers of observations are obtained. In addition, it is much more difficult to ensure that such a small fraction of the total number of annual events is representative. Also, there is minimal value in obtaining continued data from an area after sufficient information is obtained. It is recommended that a more concentrated monitoring program be conducted for a two or three year period, with a total of about 30 events monitored for each site, covering a wide range of rain conditions. Periodic checks can be made in future years, such as repeating concentrated monitored every 10 years, or so (and for only 15 events during the follow-up surveys).

• Finally, better watershed area descriptions, especially accurate drainage area delineations, are needed for all monitored sites. While the data contained in the NSQD is extremely useful, it is believed that future monitoring information obtained as part of the stormwater permit program would be greatly enhanced with these additional considerations.

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Appendix A: Sites Included in the Database

The following table shows the number of samples, land use and community for each site, along with the site ID.

Table A1. Site Name and Land Use

State	LOCATION ID	Land use	Jurisdiction	Site ID
AL	ALHUCHIP	ID	City of Huntsville	Chase Industrial Park
AL	ALHUDRAV	RE	City of Huntsville	Drake Avenue
AL	ALHUHURI	RE	City of Huntsville	Hunters Ridge
AL	ALHUMASM	CO	City of Huntsville	Madison Square Mall
AL	ALHUWERP	CO	City of Huntsville	Western Research Park
AL	ALJC004L	CO FW ID RE IS	Jefferson County	C004L
AL	ALJC004R	CO FW ID RE IS	Jefferson County	C004R
AL	ALJCC001	FW ID CO	Jefferson County	C001
AL	ALJCC002	RE OP ID CO	Jefferson County	C002
AL	ALJCC009	RE FW	Jefferson County	C009
AL	ALJCC010	RE FW	Jefferson County	C010
AL	ALJCC012	CO FW RE OP	Jefferson County	C012
AL	ALMOCREO	RE	City of Mobile	Creola
AL	ALMODAPH	CO	City of Mobile	Daphne
AL	ALMOSARA	RE	City of Mobile	Saraland
AL	ALMOSIIV	ID	City of Mobile	Mobile Site IV
AL	ALMOSITV	CO	City of Mobile	Mobile Site V
AL	ALMOSIVI	RE	City of Mobile	Mobile Site VI
AL	ALMOTHEO	ID	City of Mobile	Theodore
AZ	AZMCA001	ID	Maricopa Cnty	48th Street Drain
AZ	AZMCA002	OP	Maricopa Cnty	South Mountain Park
AZ	AZMCA003	ID	Maricopa Cnty	27th Ave at Salt River
AZ	AZMCA004	RE CO	Maricopa Cnty	Aqua Fria at Youngtown
AZ	AZMCA005	CO	Maricopa Cnty	43rd Ave at Peoria
AZ	AZMCA006	RE	Maricopa Cnty	67th Ave Olive Ave at Glendale
AZ	AZTUA001	RE	Tucson	Grant Road and Wilson Avenue
AZ	AZTUA002	RE	Tucson	Greenlee Road

Table A1. Site Name and Land Use – Continued

State	LOCATION ID	Land use	Jurisdiction	Site ID
AZ	AZTUA003	CO	Tucson	El Con Mall
AZ	AZTUA004	ID	Tucson	17th Street
CA	CAALAL03	ID RE	Alameda County	Woods Street
CA	CAALAL04	RE CO FW	Alameda County	Alice Street and 4th
CA	CAALAL07	CO RE	Alameda County	Cotter Way
CA	CAALAL09	ID	Alameda County	Pacific Street
CA	CAALAL10	ID CO RE	Alameda County	37TH ST 8TH AVE
CA	CACTA001	FW	Caltrans	3 07 Sacramento
CA	CACTA002	FW	Caltrans	4 35 Solano
CA	CACTA003	FW	Caltrans	6 205 Fresno
CA	CACTA004	FW	Caltrans	6 209 Fresno
CA	CACTA005	FW	Caltrans	7 01 Los Angeles
CA	CACTA006	FW	Caltrans	7 127 Los Angeles
CA	CACTA007	FW	Caltrans	7 128 Los Angeles
CA	CACTA008	FW	Caltrans	7 201 Los Angeles
CA	CACTA009	FW	Caltrans	7 202 Los Angeles
CA	CACTA010	FW	Caltrans	7 203 Los Angeles
CA	CACTA011	FW	Caltrans	8 01 Riverside
CA	CACTA012	FW	Caltrans	8 02 San Bernardino
CA	CACTA013	FW	Caltrans	8 03 Riverside
CA	CACTA014	FW	Caltrans	12 01 Orange
CA	CACTA015	FW	Caltrans	12 02 Orange
CO	COCSA001	CO OP RE	Colorado Springs	Sixteenth Hole Valley Hi Golf Course
CO	COCSA002	ID OP	Colorado Springs	Chestnut Street at Douglas Creek
CO	COCSA003	ID CO	Colorado Springs	Beacon Street at Buchanan Street
CO	COCSA004	RE OP	Colorado Springs	Wasatch Street at Cross Lane
CO	COCSA005	OP CO ID	Colorado Springs	Wal-Mart at Eighth Street
CO	CODEA001	CO	Denver Metro	Cherry Creek Storm Drain at Colfax Ave
CO	CODEA002	CO	Denver Metro	Cherry Creek Storm Drain at University Blvd
CO	CODEA003	RE	Denver Metro	North Sanderson Gulch Tributary at Lakewood
CO	CODEA004	ID	Denver Metro	Sand Creek Tributary at 34th and Havana
CO	CODEA005	RE	Denver Metro	Shop Creek at Parker Road
CO	CODEA006	ID	Denver Metro	South Platte River Storm Drain at 54th and Steele
CO	CODEA007	ID	Denver Metro	South Platte River Storm Drain at 7th Ave
CO	CODEA008	CO	Denver Metro	Villa Italia Storm Drain at Lakewood
GA	GAATAT01	ID	City of Atlanta	Ellsworth Industrial Drive
GA	GAATAT02	RE	City of Atlanta	Beverly Road Doncaster Drive
GA	GACLCOSI	ID	Clayton County	Southridge Industrial Park
GA	GACLCOTR	RE	Clayton County	Tara Road

Table A1. Site Name and Land Use – Continued

State	LOCATION ID	Land use	Jurisdiction	Site ID
GA	GACOC1A2	RE CO	Cobb County	Cobb Long Term 1 Pebble Creek Lot989
GA	GACOC1A3	RE	Cobb County	Cobb Long Term 1 Sewell Mill Creek Roswell Road
GA	GACOCOL2	RE CO	Cobb County	Cobb Long Term 2 Worley Rd Noonday Creek
GA	GADKCOTD	ID CO	Dekalb County	Truman Drive
GA	GAFUCOS1	RE OP	Fulton County	Johns Creek Buice Road
GA	GAFUCOS2	ID OP	Fulton County	Boat Road Blvd Grange Blvd
GA	GAFUCOS3	RE CO	Fulton County	Long Island Creek Northside Drive
ID	IDADA001	CO ID	Ada County Highway District	Koppels Site
ID	IDADA002	RE	Ada County Highway District	Lucky Drive Site
ID	IDADA003	RE FW	Ada County Highway District	Franklin Road Site
ID	IDADA004	CO ID	Ada County Highway District	Production Avenue Site
KA	KATOATWO	RE	City of Topeka	Atwood
KA	KATOBROO	RE	City of Topeka	Brookfield
KA	KATOJACK	CO	City of Topeka	Jackson
KA	KATOSTFE	ID	City of Topeka	Santee
KA	KAWIHUNT	RE	City of Wichita	Huntington
KA	KAWIMCLE	ID	City of Wichita	McLean
KA	KAWISBWY	RE CO	City of Wichita	Broadway
KA	KAWITOWN	CO	City of Wichita	Towne East
KY	KYLOTSR1	RE	City of Louisville	Buechel
KY	KYLOTSR2	ID	City of Louisville	Obannon
KY	KYLOTSR3	RE	City of Louisville	St Matthews
KY	KYLOTSR4	ID	City of Louisville	Okolona
KY	KYLOTSR5	RE CO	City of Louisville	Pleasure Ridge Park
KY	KYLOTSR6	RE CO	City of Louisville	Hurstbourne Acres
KY	KYLXEHL4	OP	City of Lexington	Lakeside golf
KY	KYLXEHL5	OP	City of Lexington	Walnut Hill Chilesburg
KY	KYLXEHL6	FW	City of Lexington	Alumni ManOwar
KY	KYLXEHL7	RE	City of Lexington	Squires Road
KY	KYLXNEL1	RE	City of Lexington	Greenbrier East
KY	KYLXNEL2	RE OP	City of Lexington	Greenbrier
KY	KYLXNEL3	CO	City of Lexington	Eastland
KY	KYLXTBL1	RE	City of Lexington	Mt Vernon
KY	KYLXTBL2	ID	City of Lexington	Leestown
KY	KYLXTBL3	OP	City of Lexington	Viley Road
KY	KYLXWHL1	CO	City of Lexington	Wilhite Drive
MA	MABOA001	RE OP	Boston	Charlestown 29J212
MA	MABOA002	RE	Boston	West Roxbury 13D077 078
MA	MABOA003	CO	Boston	Dorchester 8J102

Table A1. Site Name and Land Use – Continued

State	LOCATION ID	Land use	Jurisdiction	Site ID
MA	MABOA004	ID	Boston	Brighton 25E037
MA	MABOA005	FW ID	Boston	Hyde Park 2F120
MA	MABOA006	RE	Boston	Mount Vernon 26K099
MA	MABOA007	OP	Boston	Wesley G Ross 6G108
MD	MDAACOMW	ID	Anne Arundel	Midway industrial park MW
MD	MDAACOOD	RE	Anne Arundel County	Odenton OD
MD	MDAACOPP	CO	Anne Arundel	Parole Plaza PP
MD	MDAACORK	RE	Anne Arundel	Rolling Knolls RK
MD	MDAACOSC	CO ID	Anne Arundel	Science Drive SC
MD	MDBACOBC	ID	Baltimore County	Brien Run BC
MD	MDBACOLC	CO RE OP	Baltimore County	Long Quarter Branch LC
MD	MDBACOSC	RE	Baltimore County	Spring Branch SC
MD	MDBACOTC	ID	Baltimore County	Tobasoo creek TC
MD	MDBACOWC	RE	Baltimore County	White Marsh Run WC
MD	MDBCTYBO	ID	Baltimore City	BO
MD	MDBCTYFM	ID	Baltimore City	FM
MD	MDBCTYHA	RE CO	Baltimore City	Hamilton HA
MD	MDBCTYHO	RE	Baltimore City	Home land HO
MD	MDBCTYHR	RE	Baltimore City	Herring Run HR
MD	MDBCTYKO	CO	Baltimore City	Coppers Avenue KO
MD	MDCHCOIP	ID	Charles County	IP
MD	MDCHCOPA	RE	Charles County	PA
MD	MDCHCOPF	RE	Charles County	PF
MD	MDCHCOTG	CO ID	Charles County	TG
MD	MDCLCOBP	CO ID	Carroll County	Route 97 airport industrial BP
MD	MDCLCOCE	RE	Carroll County	Candice estates CE
MD	MDCLCOJS	CO	Carroll County	John street JS
MD	MDCLCOKW	OP RE	Carroll County	Kate Wagner KW
MD	MDCLCOSD	RE ID	Carroll County	Sunset Drive SD
MD	MDHACFBA	XX	Harford County	FBA
MD	MDHACOBP	RE	Harford County	Brentwood Park Woodland Hills
MD	MDHACOCF	CO	Harford County	Constant Friendship CF
MD	MDHACOCS	RE	Harford County	Cool Spring CS
MD	MDHACOGR	RE	Harford County	Green Ridge-II GR
MD	MDHACOIC	ID	Harford County	Greater Harford industrial centre IC
MD	MDHOCODC	CO	Howard County	Dobbin center DC
MD	MDHOCOFM	ID	Howard County	Food market FM
MD	MDHOCOGM	RE	Howard County	Green Moon GM
MD	MDHOCOMH	RE	Howard County	Murray Hill MH
MD	MDHOCOOC	ID	Howard County	Oak land centre OC
MD	MDMOCOBC	CO	Montgomery County	Burtons ville crossing BC
MD	MDMOCOCV	ID	Montgomery County	Coles villeCV

Table A1. Site Name and Land Use – Continued

State	LOCATION ID	Land use	Jurisdiction	Site ID
MD	MDMOCONV	RE	Montgomery County	Venture V
MD	MDMOCOQA	RE	Montgomery County	Quaint Acres QA
MD	MDMOCOSL	ID	Montgomery County	Southlawn lane SL
MD	MDMOCOWP	CO	Montgomery County	Wheaten plaza WP
MD	MDPGCOS1	CO	Prince Georges County	Brightseat Rd S1
MD	MDPGCOS2	RE	Prince Georges County	Flagstaff Street S2
MD	MDPGCOS3	CO ID	Prince Georges County	Maryland 50 industrial park S3
MD	MDPGCOS4	RE	Prince Georges County	Wayne Place S4
MD	MDPGCOS5	ID	Prince Georges County	John Hanson S5
MD	MDPGCOS6	ID	Prince Georges County	Pennsy Dr N3
MD	MDSHDTDV	OP ID	State Highway	DV
MD	MDSHDTPS	OP ID	State Highway	PS
MN	MNMISD01	RE	City of Minneapolis	E Harriet Pkwy W44 St
MN	MNMISD02	RE	City of Minneapolis	Luella St Orange Ave
MN	MNMISD03	ID	City of Minneapolis	Vandalia st
MN	MNMISD04	RE CO	City of Minneapolis	Charles Ave
MN	MNMISD05	RE CO	City of Minneapolis	E 29 St 31 Ave S
NC	NCCHBREV	ID	City of Charlotte	Brevi1
NC	NCCHHIDD	RE	City of Charlotte	Hiddr2
NC	NCCHHOSK	ID	City of Charlotte	Hoski2
NC	NCCHNANC	RE	City of Charlotte	Nancr1
NC	NCCHROSE	RE ID OP CO	City of Charlotte	Rosem1
NC	NCCHSHEF	OP RE	City of Charlotte	Shefo1
NC	NCCHSIMS	RE	City of Charlotte	Simsr3
NC	NCCHSTAR	CO	City of Charlotte	Starc1
NC	NCCHYARD	CO RE	City of Charlotte	Yardc2
NC	NCFV71ST	IS	City of Fayetteville	71 ST High School 100ft NE Raeford SR1409
NC	NCFVCLEA	RE	City of Fayetteville	3606 Clearwater Drive
NC	NCFVELMS	CO	City of Fayetteville	ELM Street Eutaw Shopping Center
NC	NCFVROSE	RE OP CO	City of Fayetteville	Rose Apartments 225 Tiffany Court

Table A1. Site Name and Land Use – Continued

State	LOCATION ID	Land use	Jurisdiction	Site ID
NC	NCFVSTRK	OP	City of Fayetteville	Strickland Bridge Road
NC	NCFVTRYO	RE	City of Fayetteville	1740 Tryon Rd
NC	NCFVWINS	ID	City of Fayetteville	Winslow Pine Railroad tracks
NC	NCGRATHE	CO	City of Greensboro	Athena
NC	NCGRCOUN	OP	City of Greensboro	Country Park
NC	NCGRHUST	ID	City of Greensboro	Husbands Street
NC	NCGRMERR	CO	City of Greensboro	Merrit Drive
NC	NCGRRAND	RE	City of Greensboro	Randlem Road
NC	NCGRUNIO	ID CO IS RE	City of Greensboro	Union Street
NC	NCGRWILL	RE	City of Greensboro	Willoughby
NC	NCRASIT1	OP RE	City of Raleigh	I40 400ft east S State Street
NC	NCRASIT2	RE CO	City of Raleigh	Williamson Drive Pineview Street
NC	NCRASIT3	RE CO OP	City of Raleigh	I40 Dandridge Drive Bunche Drive
NC	NCRASIT4	CO RE	City of Raleigh	Williamson Drive Wade Avenue
NC	NCRASIT5	ID OP	City of Raleigh	Pylon Drive 100ft North Hutton Street
NC	NCRASIT6	ID RE	City of Raleigh	South Wilmington Street City Farm Road
NC	NCRASIT7	CO RE ID OP	City of Raleigh	50ft east N West Street Peace Street Dortch Street
OR	ORCCA001	RE	Clackamas County	Bell Station
OR	ORCCA002	RE	Clackamas County	Lake Oswego
OR	ORCCA003	RE	Clackamas County	Milwaukie
OR	ORCCA004	RE	Clackamas County	Oregon City
OR	ORCCA005	CO	Clackamas County	Wilson Road
OR	OREUA001	CO	City of Eugene	C1 Olive Ave
OR	OREUA002	XX	City of Eugene	M1 Bailey Ave
OR	OREUA003	RE	City of Eugene	R1 Coetivy Ave
OR	ORGRA001	ID RE	City of Gresham	E 3 Boeing
OR	ORGRA002	RE CO	City of Gresham	I 13 Riverview St
OR	ORGRA003	RE	City of Gresham	K 4 Fairview Park
OR	ORGRA004	CO RE	City of Gresham	M 16
OR	ORODA001	FW	ODOT	Ashland
OR	ORODA002	FW	ODOT	Astoria

Table A1. Site Name and Land Use – Continued

State	LOCATION ID	Land use	Jurisdiction	Site ID
OR	ORODA003	FW	ODOT	Eugene
OR	ORODA004	FW	ODOT	Neskowin
OR	ORODA005	FW	ODOT	Portland
OR	ORPOA001	CO	City of Portland	C 1 Jantzen Beach
OR	ORPOA002	CO RE	City of Portland	C 2 Salmon Street
OR	ORPOA003	ID	City of Portland	I 1 Yeon Ave 35th Ave
OR	ORPOA004	ID	City of Portland	I 2 Swan Island
OR	ORPOA005	RE CO	City of Portland	M 1 Columbia Slough
OR	ORPOA006	RE	City of Portland	R 2 Sandy Boulevard
OR	ORPOA007	FW	City of Portland	T 1
OR	ORSAA001	CO RE	City of Salem	Commercial
OR	ORSAA002	CO	City of Salem	Cottage
OR	ORSAA003	ID	City of Salem	Edgewater
OR	ORSAA004	RE	City of Salem	Redleaf
PA	PAPH0864	RE	Philadelphia	Cresheim Creek
PA	PAPH0891	RE	Philadelphia	Tacony Creek
PA	PAPH1014	RE	Philadelphia	Byberry Creek
PA	PAPH1051	RE CO	Philadelphia	Wooden Bridge Run
PA	PAPH1182	OP RE	Philadelphia	North Byberry Creek
TN	TNKXTYAP	ID OP RE	City of Knoxville	Acker Place
TN	TNKXTYFC	RE FW	City of Knoxville	First Creek
TN	TNKXTYGV	RE OP	City of Knoxville	Gallaher View
TN	TNKXTYTC	OP ID IS RE	City of Knoxville	Third Creek
TN	TNKXTYWE	CO RE IS OP	City of Knoxville	Wellington Drive
TN	TNMET207	OP	City of Memphis	207 Walnut Grove
TN	TNMET211	ID	City of Memphis	211 Warford
TN	TNMET231	RE	City of Memphis	231 Raleigh Lagrange
TN	TNMET260	CO RE	City of Memphis	260 Austin Peay
TN	TNMET410	RE	City of Memphis	410 Whitehaven
TX	TXARA001	CO	City of Arlington	The Parks mall AC603
TX	TXARA002	RE	City of Arlington	R Legacy PK AR602
TX	TXARA003	RE	City of Arlington	Trib to W FK Tri AR601
TX	TXARA004	RE	City of Arlington	Trib To Johnson Creek AI604
TX	TXDAA001	ID	City of Dallas	Joes Cr 138
TX	TXDAA002	ID	City of Dallas	Bastille St 325
TX	TXDAA003	RE ID CO	City of Dallas	Knights Branch 34
TX	TXDAA004	RE	City of Dallas	White Rock Creek 86
TX	TXDAA005	RE	City of Dallas	Ash Creek 55
TX	TXDAA006	RE OP	City of Dallas	Newton Creek 189
TX	TXDCA001	OP FW	TXDOT Dallas	Mountain Creek DH902
TX	TXDCA002	OP FW	TXDOT Dallas	Bachman Branch DH901
TX	TXFWA001	OP RE	City of Fort Worth	Clear FK Trin R TRI STG1
TX	TXFWA002	OP IS	City of Fort Worth	Pylon St PY1
TX	TXFWA003	CO RE	City of Fort Worth	West Fk Trinity R BEL1

Table A1.Site Name and Land Use – Continued

State	LOCATION ID	Land use	Jurisdiction	Site ID
TX	TXFWA004	ID	City of Fort Worth	Dry Branch CRA1
TX	TXFWA005	RE CO OP	City of Fort Worth	Estrn Hills HS EH1
TX	TXGAA001	RE CO ID OP	City of Garland	Mills Branch Tributary GM404
TX	TXGAA002	ID OP	City of Garland	Trib to Duck Creek GI401
TX	TXGAA003	RE CO	City of Garland	Sleepy Hollow St GR402
TX	TXGAA004	CO RE	City of Garland	I635 Outfall at CE GC603
TX	TXHCA001	RE	Harris County	Overbluff
TX	TXHCA002	RE OP	Harris County	Cypress Trace Station
TX	TXHCA003	CO	Harris County	Steeplechase
TX	TXHCA004	ID	Harris County	Bayport
TX	TXHCA005	CO	Harris County	WillowBrook Mall
TX	TXHCA006	RE	Harris County	Little Cypress Creek
TX	TXHCA007	OP	Harris County	Hadden Road
TX	TXHOA001	OP	City of Houston	Briar Forest
TX	TXHOA002	ID	City of Houston	Eleventh Street
TX	TXHOA003	RE	City of Houston	Lazybrook
TX	TXHOA004	CO	City of Houston	Memorial City Mall
TX	TXHOA005	RE	City of Houston	Tanglewilde
TX	TXIRA001	RE	City of Irving	Bear Cr IR501
TX	TXIRA002	ID RE OP	City of Irving	Cottonwood Branch Trib IM504
TX	TXIRA003	ID CO	City of Irving	Hereford Rd II503
TX	TXIRA004	ID CO	City of Irving	Trib to ELM FK II502
TX	TXMEA001	CO FW	City of Mesquite	South mesquite I635 MC801
TX	TXMEA002	RE	City of Mesquite	South Mesquite South Parkway MC802
TX	TXMEA003	RE	City of Mesquite	South Mesquite Bruton Road MC803
TX	TXPLA001	RE CO	City of Plano	Rowlett Cr PR701
TX	TXPLA002	OP FW	City of Plano	Beck Brach PU704
TX	TXPLA003	CO OP	City of Plano	Spring Creek PC702
TX	TXPLA004	CO ID RE	City of Plano	Spring Creek PI703
TX	TXTCA001	FW OP ID	TXDOT Tarrant County	Deer Creek TH904
VA	VAARLCV2	RE	Arlington	Colonial Village CV2
VA	VAARLLP1	RE	Arlington	Little Pimmet LP1
VA	VAARLRS3	CO	Arlington	Randolph Street RS3
VA	VAARLTC4	ID	Arlington	Trades Center TC4
VA	VACHCCC4	CO	Chesterfield County	CoverLeaf Mall CC4
VA	VACHCCC5	RE	Chesterfield County	Buck Rub Drive CC5
VA	VACHCN1A	RE	Chesterfield County	Gates bluff 1A
VA	VACHCN2A	RE	Chesterfield County	Helmsley road 2A
VA	VACHCOF1	ID	Chesterfield County	unnamed OF1

Table A1. Site Name and Land Use – Continued

State	LOCATION ID	Land use	Jurisdiction	Site ID
VA	VACHCOF2	OP RE	Chesterfield County	Oak river drive OF2
VA	VACHCOF3	RE	Chesterfield County	Kings mill road OF3
VA	VACHCOF4	RE	Chesterfield County	OF4
VA	VACHCOF5	RE	Chesterfield County	Laurel oak road OF5
VA	VACPTC1A	RE	Chesapeake	Briarfield Drive C1A
VA	VACPTSF2	RE	Chesapeake	Woodards Mill SF2
VA	VACPTYC1	RE	Chesapeake	Etheridge rd Mt Pleasant Rd C1
VA	VACPTYC2	RE OP	Chesapeake	Hunningdon Lakes C2
VA	VACPTYC3	RE	Chesapeake	Horse Run Ditch C3
VA	VACPTYC4	CO	Chesapeake	Woodford Square Along Battlefield Blvd C4
VA	VACPTYC5	ID	Chesapeake	Cavalier Industrial Park C5
VA	VACPTYO1	ID	Chesapeake	Paramount Avenue O1
VA	VAFFCOF1	RE	Fairfax County	Apple Ridge Road
VA	VAFFCOF2	RE CO ID	Fairfax County	Sunset Hills Road
VA	VAFFCOF3	RE	Fairfax County	Onley Road
VA	VAFFCOF4	CO	Fairfax County	Green Look Place
VA	VAFFCOF5	RE	Fairfax County	Oakton Terrace Road
VA	VAFFCOF6	CO	Fairfax County	Fairview Park Drive
VA	VAFFCOF7	RE	Fairfax County	Lakeview Drive
VA	VAFFCOF8	RE	Fairfax County	Pumphrey Drive
VA	VAFFCOF9	RE	Fairfax County	Rock Ridge Road
VA	VAFFOF10	ID	Fairfax County	Boston Boulevard
VA	VAFFOF11	ID	Fairfax County	Prosperity Avenue
VA	VAHAHMS2	ID	Hampton	Copeland Industrial Park HMS2
VA	VAHAHMS5	RE OP	Hampton	Grays Landing HMS5
VA	VAHATYH1	CO	Hampton	Commerce Drive H1
VA	VAHATYH2	ID	Hampton	Mingee Drive H2
VA	VAHATYH3	RE	Hampton	Hampton Club H3
VA	VAHATYH4	RE	Hampton	Bay Avenue H4
VA	VAHATYH5	RE	Hampton	Willow Oaks Boulevard H5
VA	VAHCCOC1	CO	Henrico County	Dickens Place C1
VA	VAHCCOC2	CO	Henrico County	Carousel Lane C2
VA	VAHCCON1	ID	Henrico County	Tomlyn Street N1
VA	VAHCCON2	ID	Henrico County	Impala Drive and Galaxy Road N2
VA	VAHCCOR1	RE	Henrico County	Prestwick Circle R1
VA	VAHCCOR2	RE	Henrico County	Westbury Drive R2
VA	VANFTMS5	CO	Norfolk	Village avenue MS5
VA	VANFTMS6	RE	Norfolk	Robin hood road MS6
VA	VANFTMS8	CO	Norfolk	North Hampton MS8
VA	VANFTMS9	CO	Norfolk	Bay side road MS9
VA	VANFTYN1	CO ID	Norfolk	Armistead Avenue N1

Table A1. Site Name and Land Use – Continued

State	LOCATION ID	Land use	Jurisdiction	Site ID
VA	VANFTYN2	RE	Norfolk	Modoc Avenue N2
VA	VANFTYN3	RE	Norfolk	Little creek road N3
VA	VANFTYN4	CO	Norfolk	Military circle N4
VA	VANFTYN5	RE	Norfolk	Sewel's point N5
VA	VANNTMF1	RE	Newport News	Marshall Avenue MF1
VA	VANNTMF4	RE	Newport News	Chesapeake Bay Apartments MF4
VA	VANNTNN1	RE	Newport News	Glendale Road NN1
VA	VANNTNN2	RE OP	Newport News	Shields Road NN2
VA	VANNTNN3	CO	Newport News	Patrick Henry Mall NN3
VA	VANNTNN4	CO ID	Newport News	Oyster Point Park Jefferson Ave NN4
VA	VANNTNN5	CO RE ID	Newport News	Oyster Point Park Thimble Shoals Blvd NN5
VA	VANNTSF4	RE	Newport News	Central Parkway SF4
VA	VANNTSF6	RE	Newport News	Jefferson Avenue SF6
VA	VANNTYI2	ID OP	Newport News	City Line Rd I2
VA	VAPMTYP1	CO	Portsmouth	Cradock Shopping center P1
VA	VAPMTYP2	RE	Portsmouth	West park homes P2
VA	VAPMTYP3	RE CO	Portsmouth	Church land shopping center P3
VA	VAPMTYP4	RE	Portsmouth	Edgefield apartmentsP4
VA	VAPMTYP5	RE	Portsmouth	South Hampton P5
VA	VAVBTYA1	OP ID	Virginia Beach	Morris Neck Road A1
VA	VAVBTYI1	ID	Virginia Beach	Airport Industrial Park I1
VA	VAVBTYM2	RE CO OP ID	Virginia Beach	Ketlam Road M2
VA	VAVBTYR1	RE	Virginia Beach	Homestead Drive R1
VA	VAVBTYV1	RE	Virginia Beach	Bow creek V1
VA	VAVBTYV2	RE	Virginia Beach	Salem Road V2
VA	VAVBTYV3	CO OP	Virginia Beach	Haygood V3
VA	VAVBTYV4	ID	Virginia Beach	Viking Drive V4
VA	VAVBTYV5	RE OP	Virginia Beach	Holland road V5

Table A2. Site Characteristics

LOCATION ID	Area (acres)	EPA Rain Zone	% Impervious	Q	Convey ance	Control	First Sample	Last Sample	Number of Samples
ALHUCHIP	19.5	3			GS		08/27/92	09/12/00	8
ALHUDRAV	20	3			GS		09/19/01	09/19/01	1
ALHUHURI	78.3	3			CG		08/27/92	09/19/01	9
ALHUMASM	87	3			CG		08/27/92	09/19/01	9
ALHUWERP	130	3			CG		08/27/92	09/19/01	9
ALJC004L	2564	3			CG		09/19/01	01/19/02	2
ALJC004R	1047	3			CG		09/20/01	01/19/02	2
ALJCC001	336	3			CG		11/27/01	01/19/02	2
ALJCC002	750	3			CG		11/27/01	03/20/02	2
ALJCC009	112	3			CG		08/31/01	03/09/02	2
ALJCC010	167	3			CG		08/31/01	03/09/02	2
ALJCC012	244	3			CG		12/17/01	12/17/01	1
ALMOCREO	74	3			GS		02/10/93	04/15/93	3
ALMODAPH	14	3					02/16/93	04/20/93	3
ALMOSARA	64	3			GS		01/24/93	04/04/93	3
ALMOSIIV	450	3					02/11/93	04/15/93	3
ALMOSITV	304	3			CG		01/24/93	04/04/93	3
ALMOSIVI	194	3			CG		01/24/93	04/04/93	3
ALMOTHEO	27	3			GS		01/24/93	03/30/93	3
AZMCA001	39	6	80				11/10/91	07/22/98	27
AZMCA002	1120	6	1		GS		01/12/92	02/07/92	2
AZMCA003	45	6	15				12/10/91	07/22/98	27
AZMCA004	81	6	33		CG		10/27/91	08/22/92	6
AZMCA005	3.4	6	94		CG		12/04/92	08/07/98	26
AZMCA006	17.8	6	60		CG		03/07/94	09/11/98	20
AZTUA001	103	6			CG		07/25/96	12/04/01	13
AZTUA002	48.3	6			CG		08/26/96	12/04/01	12
AZTUA003	29	6			CG		08/14/96	12/04/01	11
AZTUA004	83	6			CG		09/24/96	12/11/01	11
CAALAL03	168	6			CG		02/15/90	03/25/93	20
CAALAL04	20	6			CG		03/02/90	02/27/91	5
CAALAL07	78	6			CG		01/13/90	03/17/91	5
CAALAL09	260	6			CG		01/13/90	03/17/91	9
CAALAL10	144	6			CG		03/02/90	03/19/91	8
CACTA001	0.69	6	95		CG		01/23/01	03/10/02	14
CACTA002	1.61	6	100		CG		10/28/00	03/06/02	16
CACTA003	1.85	6	70		CG		01/23/01	03/23/02	10
CACTA004	0.44	6	70		CG		01/23/01	03/23/02	11
CACTA005	0.99	6	100		CG		11/26/97	03/25/99	8
CACTA006	0.99	6	100		CG		01/25/99	03/20/99	3
CACTA007	0.99	6	100		CG		01/25/99	03/25/99	4

Table A2. Site Characteristics – Continued

LOCATION ID	Area (acres)	EPA Rain Zone	% Impervious	Q	Convey ance	Control	First Sample	Last Sample	Number of Samples
CACTA008	3.16	6	80		CG		01/17/00	01/27/02	19
CACTA009	4.18	6	80		CG		11/20/99	03/17/02	24
CACTA010	0.96	6	80		CG		11/08/99	03/17/02	26
CACTA011	0.4	6	100		CG		11/10/97	02/09/99	4
CACTA012	0.99	6	100		CG		11/13/97	02/09/99	4
CACTA013	1.41	6	100		CG		11/10/97	02/09/99	3
CACTA014	0.99	6	100		CG		11/13/97	01/25/99	4
CACTA015	0.99	6	100		CG		11/13/97	01/25/99	4
COCSA001	80	9	58.1		CG		06/03/92	11/21/92	7
COCSA002	105.6	9	37.5		CG		05/31/92	07/29/02	7
COCSA003	110.72	9	55.9		CG		06/05/92	11/21/92	7
COCSA004	209.28	9	34.2		CG		05/26/92	11/21/92	7
COCSA005	31.36	9	40.1		CG		06/10/92	12/06/92	7
CODEA001	150	9	83		CG		06/05/92	07/12/92	3
CODEA002	55	9	83		CG		04/14/92	07/12/92	3
CODEA003	269	9	20		CG		03/22/92	08/23/92	4
CODEA004	498	9	85		CG		05/21/92	07/10/92	3
CODEA005	495	9	44		CG		06/06/92	08/23/92	3
CODEA006	636	9	85		CG		06/08/92	07/10/92	3
CODEA007	56	9	85		CG		03/28/92	07/02/92	3
CODEA008	146	9	83		CG		03/28/92	05/31/92	3
GAATAT01	28	3			CG		03/08/95	02/16/97	10
GAATAT02	95	3			CG		10/04/95	02/16/97	9
GACLCOSI	18	3			CG		11/29/95	03/19/00	20
GACLCOTR	125	3			CG		05/01/95	03/16/00	24
GACOC1A2	63.6	3					01/27/96	02/28/00	17
GACOC1A3	7590.4	3					08/24/00	03/19/01	6
GACOCOL2	2947	3					01/19/95	03/12/01	22
GADKCOTD	115	3			CG	WP	12/13/93	06/06/00	25
GAFUCOS1	10339	3			GS		11/10/94	04/25/01	22
GAFUCOS2	3915	3			CG		10/30/94	04/25/01	19
GAFUCOS3	6257	3			GS		01/06/95	04/25/01	22
IDADA001	10.9	8			CG		08/11/99	04/19/01	7
IDADA002	105	8			CG		04/29/99	04/11/01	7
IDADA003	17	8			CG		04/29/99	07/30/01	9
IDADA004	18	8					04/11/01	04/11/01	1
KATOATWO	38	4	55		CG		04/27/98	09/13/02	15
KATOBROO	18.5	4	25		CG		04/27/98	09/13/02	16
KATOJACK	218	4	65		CG		04/27/98	09/13/02	16
KATOSTFE	39.5	4	75		CG		04/27/98	08/16/02	17
KAWIHUNT	36	4	50				02/09/98	10/05/01	16

Table A2. Site Characteristics – Continued

LOCATION ID	Area (acres)	EPA Rain Zone	% Impervious	Q	Convey ance	Control	First Sample	Last Sample	Number of Samples
KAWIMCLE	30	4	65				02/09/98	10/05/01	16
KAWISBWY	250	4	60				02/09/98	10/05/01	16
KAWITOWN	40	4	90				02/09/98	10/05/01	16
KYLOTSR1	96.64	2	39.6		CG		01/15/91	10/05/91	3
KYLOTSR2	108.16	2	20.6		GS		02/05/91	10/05/91	3
KYLOTSR3	134.4	2	35		CG		03/01/91	12/12/91	3
KYLOTSR4	43.52	2	45.5		GS		03/12/91	04/15/92	4
KYLOTSR5	84.48	2	68.9		CG		03/27/91	05/12/92	5
KYLOTSR6	180.48	2	63.5		CG		04/04/91	12/12/91	3
KYLXEHL4	13	2	10		GS		10/07/98	10/07/98	1
KYLXEHL5	550	2			GS		07/30/98	07/30/98	1
KYLXEHL6	1.3	2			CG		10/24/97	01/05/98	3
KYLXEHL7	4.8	2			CG		10/24/97	01/05/98	3
KYLXNEL1	32	2			GS		10/07/98	10/07/98	1
KYLXNEL2	580	2			CG	WP	07/30/98	10/07/98	2
KYLXNEL3	73	2			CG		06/03/92	09/27/96	12
KYLXTBL1	71	2			CG		06/03/92	09/27/96	12
KYLXTBL2	94	2			GS		06/30/92	09/27/96	12
KYLXTBL3	205	2			GS		06/19/92	09/21/96	5
KYLXWHL1	38	2			CG		06/03/92	09/27/96	13
MABOA001	40.4	1	74		CG		04/11/92	08/14/92	5
MABOA002	86.7	1	52		CG		04/17/92	06/24/92	3
MABOA003	5	1	55		CG		04/11/92	06/24/92	3
MABOA004	32	1	97		CG		04/11/92	06/24/92	3
MABOA005	102.7	1	38		CG		04/17/92	06/24/92	3
MABOA006	3.3	1	74		CG		06/02/01	07/17/01	3
MABOA007	12.2	1			GS		09/25/01	09/25/01	1
MDAACOMW	5	2	94	E	CG		07/31/92	09/25/92	3
MDAACOOD	28	2	41	E	CG		08/11/92	10/09/92	3
MDAACOPP	25	2	85	E	CG		08/11/92	11/14/00	26
MDAACORK	12	2	41	E	CG		08/28/92	10/30/92	3
MDAACOSC	26	2	41	E	CG		08/11/92	10/09/92	3
MDBACOBC	25.3	2	60				12/15/93	03/08/94	3
MDBACOLC	225	2	70				10/20/93	01/15/98	19
MDBACOSC	83.5	2	30				12/15/93	06/19/98	26
MDBACOTC	144.06	2					01/12/94	04/07/94	3
MDBACOWC	73	2	7				01/12/94	03/21/94	3
MDBCTYBO	48.43	2					04/16/93	03/21/94	3
MDBCTYFM	45.96	2					05/30/92	11/04/93	3
MDBCTYHA	104.4	2	32	E			05/17/95	12/14/00	66
MDBCTYHO	354.09	2					06/05/92	09/25/92	3

Table A2. Site Characteristics – Continued

LOCATION ID	Area (acres)	EPA Rain Zone	% Impervious	Q	Conveyance	Control	First Sample	Last Sample	Number of Samples
MDBCTYHR	38.8	2	54				05/30/92	10/20/93	3
MDBCTYKO	54.36	2					04/26/93	03/21/94	3
MDCHCOIP	11	2			CG		10/04/95	01/02/96	3
MDCHCOPA	10	2			CG		09/22/95	01/24/96	3
MDCHCOPF	50	2			GS		01/02/96	04/30/96	3
MDCHCOTG	10	2			CG		10/14/95	10/14/95	1
MDCLCOBP	15	2					07/21/94	12/10/94	3
MDCLCOCE	22.35	2	26	E			12/10/93	11/21/94	3
MDCLCOJS	20	2	91	E			12/21/93	11/01/94	3
MDCLCOKW	66.2	2	11	E			03/21/94	09/22/94	3
MDCLCOSD	36	2	49	E			02/21/94	11/10/94	3
MDHACFBA		2					11/05/93	11/10/94	3
MDHACOBP	69.7	2	16	E		WP	02/17/99	12/16/00	18
MDHACOCF	14.4	2					01/05/93	04/10/93	2
MDHACOCS	51	2					04/21/93	09/22/94	3
MDHACOGR	80	2					04/26/93	04/10/94	2
MDHACOIC	10	2					08/06/93	09/22/94	2
MDHOCODC	7.5	2	90		CG	WP	12/15/93	04/13/94	3
MDHOCOFM	3.5	2	77		CG	GS	12/15/93	11/01/94	3
MDHOCOGM	29.5	2	38		CG	WP	12/10/93	11/01/94	3
MDHOCOMH	19	2	65		CG	WP	12/10/93	04/13/94	3
MDHOCOOC	11.7	2	49		CG	WP	11/17/93	03/21/94	3
MDMOCOBC	14.2	2	83	E	CG		05/25/94	09/22/95	3
MDMOCOCV	11.5	2	55	E		WP	08/13/96	09/25/00	37
MDMOCONV	75.4	2	57	E	CG		05/04/94	03/08/95	3
MDMOCOQA	34.2	2	45	E	CG		05/04/94	10/27/95	3
MDMOCOSL	81	2	92	E	CG	OT	09/22/94	09/22/95	3
MDMOCOWP	70	2	96	E	CG	OT	05/25/94	10/27/95	3
MDPGCOS1	19.7	2	47	E	CG		08/11/92	01/22/97	26
MDPGCOS2	57.3	2	45	E	CG		08/11/92	09/25/00	63
MDPGCOS3	34.4	2	96	E	CG		08/11/92	03/04/93	3
MDPGCOS4	102.5	2	33	E	CG		08/11/92	03/04/93	3
MDPGCOS5	41.3	2	83	E	CG		08/11/92	03/04/93	3
MDPGCOS6	42.4	2			GS		10/23/94	08/20/97	28
MDSHDTDV	4	2			CG		06/14/99	06/06/00	8
MDSHDTPS	20	2			GS		02/11/98	06/21/00	13
MNMISD01	143	1			CG		05/06/01	10/13/01	10
MNMISD02	95	1			CG		05/06/01	10/13/01	9
MNMISD03	80	1			CG		05/20/01	11/12/01	10
MNMISD04	63	1			CG		05/06/01	11/12/01	9
MNMISD05	100	1			CG		05/20/01	11/12/01	10

Table A2. Site Characteristics – Continued

LOCATION ID	Area (acres)	EPA Rain Zone	% Impervious	Q	Convey ance	Control	First Sample	Last Sample	Number of Samples
NCCHBREV	15.1	2	75		CG		05/13/92	03/03/93	4
NCCHHIDD	20	2	30		CG		05/13/92	12/10/93	5
NCCHHOSK	17.4	2	71.83				05/13/92	03/03/93	4
NCCHNANC	10.9	2	20		GS		08/27/92	02/21/94	4
NCCHROSE	78.87	2	42.55		CG		05/13/92	08/12/92	3
NCCHSHEF	42.5	2	20.68				06/04/92	02/21/94	3
NCCHSIMS	6.8	2	50		CG		05/13/92	03/03/93	4
NCCHSTAR	14.1	2	70		GS		05/13/92	03/03/93	4
NCCHYARD	88.6	2	68.21		CG		05/13/92	03/03/93	4
NCFV71ST	36	2	45		CG		01/21/93	06/15/99	18
NCFVCLEA	12	2	20				01/04/93	04/01/99	14
NCFVELMS	40	2	90		CG		01/04/93	04/01/99	18
NCFVROSE	39.27	2	50		CG		12/17/92	06/15/99	14
NCFVSTRK	85	2	1				02/07/93	06/16/96	6
NCFVTRYO	25	2	50				01/21/93	04/01/99	18
NCFVWINS	12	2	75				01/04/93	06/15/99	18
NCGRATHE	23	2	90		CG		07/06/95	04/15/99	17
NCGRCOUN	18.5	2	2		GS		06/19/95	04/01/99	15
NCGRHUST	13	2	75		CG		06/01/95	05/14/99	16
NCGRMERR	21	2	74		CG		05/10/95	04/15/99	16
NCGRRAND	26	2	50		CG		06/01/95	06/15/99	17
NCGRUNIO	33	2	75		CG		06/01/95	01/23/99	17
NCGRWILL	13	2	20				05/19/95	05/14/99	16
NCRASIT1	21	2					05/19/93	03/16/00	9
NCRASIT2	42	2					05/19/93	03/16/00	9
NCRASIT3	110	2					05/19/93	03/16/00	9
NCRASIT4	30	2					05/19/93	03/16/00	9
NCRASIT5	32	2					05/19/93	03/16/00	9
NCRASIT6	58	2					05/19/93	03/16/00	9
NCRASIT7	467	2					05/19/93	03/16/00	9
ORCCA001	15	7			CG		11/18/92	11/18/92	1
ORCCA002	120	7			CG		11/18/92	10/14/94	6
ORCCA003	165	7			CG		03/01/93	10/14/94	5
ORCCA004	50	7			CG		11/18/92	10/14/94	6
ORCCA005	41	7			CG		11/18/92	10/14/94	6
OREUA001	380	7			CG		09/23/92	05/21/96	16
OREUA002	886	7			CG		09/23/92	05/21/96	15
OREUA003	377	7			CG		09/23/92	05/21/96	15
ORGRA001	292	7			CG		03/02/93	04/11/96	6
ORGRA002	789	7			CG		03/02/93	04/11/96	6
ORGRA003	73	7			CG		03/02/93	04/11/96	6

Table A2. Site Characteristics – Continued

LOCATION ID	Area (acres)	EPA Rain Zone	% Impervious	Q	Convey ance	Control	First Sample	Last Sample	Number of Samples
ORGRA004	64	7			CG		03/02/93	04/11/96	6
ORODA001	22.4	7			CG		12/04/95	12/04/95	1
ORODA002	1.2	7			CG		10/02/95	10/02/95	1
ORODA003	18.2	7			CG		01/07/95	01/18/96	5
ORODA004	3.6	7			CG		10/12/95	10/12/95	1
ORODA005	23.1	7			CG		01/07/95	01/18/96	6
ORPOA001	35	7			CG		05/07/91	10/25/95	13
ORPOA002	75	7			CG		05/07/91	03/03/96	16
ORPOA003	46	7			CG		05/07/91	03/03/96	14
ORPOA004	49	7			CG		08/09/91	10/25/95	13
ORPOA005	91	7			CG		05/07/91	03/03/96	14
ORPOA006	85	7			CG		05/07/91	03/03/96	13
ORPOA007	10	7			CG		05/07/91	03/03/96	14
ORSAA001	31	7			CG		01/07/95	01/14/96	6
ORSAA002	40	7			CG		01/07/95	01/14/96	6
ORSAA003	35	7			CG		01/07/95	01/14/96	6
ORSAA004	72	7			CG		01/07/95	01/14/96	6
PAPH0864	22	2	84	E	CG		09/10/92	09/25/92	2
PAPH0891	35	2	83	E	CG		09/22/92	10/09/92	2
PAPH1014	22	2	82	E	CG		09/10/92	10/09/92	3
PAPH1051	223	2	87	E	CG		09/22/92	10/09/92	2
PAPH1182	31	2	57	E	CG		09/10/92	10/09/92	3
TNKXTYAP	582.4	2	44		GS	WP	03/27/91	06/30/01	63
TNKXTYFC	2880	2	40			WP	03/06/92	06/07/01	47
TNKXTYGV	224	2	37		GS		08/14/91	08/25/99	39
TNKXTYTC	352	2	34				02/13/92	04/11/00	54
TNKXTYWE	364.8	2	60				04/08/91	05/03/00	51
TNMET207	157	2			GS	WP	06/21/00	04/23/01	5
TNMET211	45	2			CG		01/11/00	04/23/01	4
TNMET231	26	2			CG		01/11/00	04/23/01	4
TNMET260	294	2			CG		07/20/00	05/17/01	4
TNMET410	154	2			CG		06/21/00	04/23/01	4
TXARA001	38.8	5	76.2		CG		10/28/92	03/08/01	22
TXARA002	160.6	5	47.4		CG		10/28/92	03/08/01	21
TXARA003	77	5	89		CG		10/29/92	04/14/93	7
TXARA004	85.5	5	80.9			WP	12/09/92	03/28/93	7
TXDAA001	9	5	80		CG		03/03/92	09/21/92	7
TXDAA002	49.5	5	80		CG		03/03/92	03/08/01	19
TXDAA003	486.7	5			CG		12/02/97	05/04/01	21
TXDAA004	59.1	5	84.5		CG		02/22/92	04/11/01	20
TXDAA005	71.3	5	50		CG		02/12/92	09/21/92	7

Table A2. Site Characteristics – Continued

LOCATION ID	Area (acres)	EPA Rain Zone	% Impervious	Q	Conveyance	Control	First Sample	Last Sample	Number of Samples
TXDAA006	38.9	5	44.9		CG		02/22/92	03/24/01	20
TXDCA001	115.36	5	10				09/03/97	03/08/01	17
TXDCA002	12.05	5	33				01/11/98	03/08/01	9
TXFWA001	61.7	5	21.9				02/22/92	08/12/92	7
TXFWA002	151.6	5	27.7	* I	CG		02/03/92	03/08/01	21
TXFWA003	136	5	66.5		CG		03/09/92	10/28/92	7
TXFWA004	73.7	5	79.3				03/24/92	03/08/01	21
TXFWA005	150.8	5	61.4				04/17/92	03/24/01	23
TXGAA001	268	5			CG		12/02/97	03/27/01	23
TXGAA002	33.9	5	67.3				06/20/92	03/27/01	22
TXGAA003	67.3	5	55.4				09/01/92	01/23/93	7
TXGAA004	36.2	5	84.6		CG		09/01/92	01/23/93	7
TXHCA001	560	4			GS		01/29/99	03/27/01	8
TXHCA002	95	4	65				07/20/92	04/16/01	14
TXHCA003	32	4			CG		02/11/99	06/22/01	8
TXHCA004	99	4	71.25				04/07/93	03/08/01	14
TXHCA005	81	4	95		CG		06/30/92	04/07/93	6
TXHCA006	401	4	45				06/30/92	04/29/93	6
TXHCA007	872	4				WP	07/15/92	11/09/93	6
TXHOA001	44	4	5.7		GS		06/30/92	11/19/92	7
TXHOA002	232	4	76.5				06/22/92	05/31/01	16
TXHOA003	65	4	45		GS		06/22/92	03/27/01	14
TXHOA004	24	4	98		CG		07/19/92	11/22/99	12
TXHOA005	38	4	65		CG		06/22/92	07/19/01	16
TXIRA001	65.3	5	41.9		CG		09/03/92	03/24/01	22
TXIRA002	127.7	5			CG		03/18/99	05/28/01	22
TXIRA003	43.4	5	77.3			WP	08/24/92	01/09/93	7
TXIRA004	43.9	5	77.8				09/21/92	01/28/93	7
TXMEA001	45.9	5	89.4		CG		02/24/93	03/24/01	22
TXMEA002	45.4	5	49.8		CG		03/11/93	06/25/93	7
TXMEA003	46.2	5	49.9		CG	WP	02/10/93	05/23/93	7
TXPLA001	51.4	5	54.3		CG		12/09/92	04/14/93	7
TXPLA002	73.5	5					11/09/98	04/11/01	22
TXPLA003	22.7	5	73.5		CG		12/09/92	05/04/01	25
TXPLA004	49	5	81.6				01/09/93	06/09/93	7
TXTCA001	63.13	5	27				02/06/97	03/24/01	15
VAARLCV2	24.7	2	35			DS	02/11/98	01/19/01	9
VAARLLP1	38.7	2	35				10/20/99	03/04/01	8
VAARLRS3	14	2	74			DS	09/21/99	01/19/01	8
VAARLTC4	36	2	39				02/03/98	06/01/01	13
VACHCCC4	60	2	80		CG		08/12/96	12/10/01	13

Table A2. Site Characteristics – Continued

LOCATION ID	Area (acres)	EPA Rain Zone	% Impervious	Q	Conveyance	Control	First Sample	Last Sample	Number of Samples
VACHCCC5	10	2	50		CG		08/12/96	12/10/01	13
VACHCN1A	10	2	10		CG		08/19/99	01/08/01	4
VACHCN2A	60	2	20		CG		08/19/99	01/08/01	4
VACHCOF1	22.5	2					04/16/93	10/26/93	3
VACHCOF2	19.05	2	10		CG		04/16/93	10/08/98	8
VACHCOF3	13.5	2	20		CG		04/16/93	02/01/99	11
VACHCOF4	38.5	2					04/16/93	12/15/93	3
VACHCOF5	55.6	2	50		CG		04/16/93	12/10/01	16
VACPTC1A	130	2	25	E	CG GS		11/01/97	06/15/99	8
VACPTSF2	91	2	10	E	GS		04/16/93	10/26/93	3
VACPTYC1	57	2	25	E	CG		02/26/93	12/05/96	7
VACPTYC2	188	2	25	E	CG	WP	02/26/93	01/24/99	15
VACPTYC3	32	2	50	E	CG		02/26/93	02/18/99	15
VACPTYC4	28	2	85	E	CG		04/16/93	02/02/99	14
VACPTYC5	16	2	57	E	CG		03/27/93	01/15/99	15
VACPTYO1	14	2	50	E	CG		02/26/93	04/16/93	3
VAFFCOF1	32.3	2			CG		03/18/92	08/11/92	3
VAFFCOF2	20.1	2	50	E	CG	DP	07/03/92	08/01/00	14
VAFFCOF3	63.9	2			CG		06/18/92	09/02/92	3
VAFFCOF4	108.8	2	70	E	CG	WP	04/21/92	09/03/00	13
VAFFCOF5	39.7	2			CG	DP	04/16/92	09/22/92	3
VAFFCOF6	213.4	2	21	E	CG	WP	07/12/92	11/10/00	14
VAFFCOF7	49.9	2	25	E	CG		06/24/92	11/29/00	15
VAFFCOF8	57.5	2			CG		04/21/92	09/02/92	3
VAFFCOF9	63.8	2	50	E	CG	WP	07/21/92	09/02/00	13
VAFFOF10	82	2			CG		04/21/92	08/11/92	3
VAFFOF11	37.9	2	66	E	CG		06/26/97	11/29/00	11
VAHAHMS2	793	2	67	E	CG		11/26/92	01/21/93	3
VAHAHMS5	53	2	28	E			11/12/92	02/12/93	3
VAHATYH1	115	2	80	E	CG		11/12/92	05/14/99	18
VAHATYH2	47	2	70	E	CG		11/26/92	04/24/99	19
VAHATYH3	18	2	40	E	CG		11/12/92	06/20/99	17
VAHATYH4	134	2	25	E	CG		11/12/92	04/24/99	17
VAHATYH5	35	2	25	E	CG		11/12/92	04/24/99	17
VAHCCOC1	65	2	89	E	CG		11/13/92	12/20/92	2
VAHCCOC2	70	2	87	E	CG		10/30/92	01/05/93	3
VAHCCON1	75	2	89	E	CG		12/18/92	01/22/93	2
VAHCCON2	23	2	89	E	CG		11/22/92	01/22/93	3
VAHCCOR1	40	2	61	E	CG		11/03/92	01/05/93	3
VAHCCOR2	70	2	57	E	CG		11/03/92	01/05/93	3
VANFTMS5	56	2			CG		04/22/92	07/27/92	3

Table A2. Site Characteristics – Continued

LOCATION ID	Area (acres)	EPA Rain Zone	% Impervious	Q	Conveyance	Control	First Sample	Last Sample	Number of Samples
VANFTMS6	68	2					05/05/92	07/27/92	3
VANFTMS8	65	2					04/22/92	07/27/92	3
VANFTMS9	40	2					05/05/92	08/27/92	3
VANFTYN1	43	2	47		CG		04/22/92	02/12/00	28
VANFTYN2	97	2	25		CG		05/30/92	12/14/99	30
VANFTYN3	27	2	37		CG		04/22/92	12/14/99	28
VANFTYN4	43	2	70		CG		04/22/92	12/14/99	28
VANFTYN5	39	2	25		CG		06/09/92	02/18/00	28
VANNTMF1	39	2	50		CG		10/04/92	01/21/93	3
VANNTMF4	12	2	73		CG		12/28/92	03/13/93	3
VANNTNN1	75	2	40		OT		10/31/92	04/02/99	12
VANNTNN2	397	2	24		CG	DP	12/10/92	04/16/99	15
VANNTNN3	24	2	85		CG	WP	10/04/92	04/16/99	15
VANNTNN4	294	2	58		CG	WP	10/04/92	04/16/99	16
VANNTNN5	83	2	62		OT		12/28/92	04/02/99	11
VANNTSF4	111	2	30		GS		12/10/92	02/26/93	3
VANNTSF6	207	2	37		GS		10/04/92	03/03/93	4
VANNTYI2	49	2	73		GS		10/04/92	01/21/93	3
VAPMTYP1	27.2	2	68		CG		01/16/93	05/14/99	18
VAPMTYP2	101.1	2	36		CG		02/26/93	06/20/99	17
VAPMTYP3	46	2			CG		01/16/93	05/14/99	17
VAPMTYP4	35.3	2	39		CG		12/20/92	06/20/99	17
VAPMTYP5	53.5	2	14	E	CG		12/20/92	05/23/99	17
VAVBTYA1	225	2	7				07/01/92	10/30/92	5
VAVBTYI1	8	2	90				06/09/92	10/04/92	3
VAVBTYM2	310	2	35				10/04/90	10/30/92	4
VAVBTYR1	49	2	25				05/07/92	09/19/92	5
VAVBTYV1	63	2	29		OT		03/26/92	02/28/99	27
VAVBTYV2	260	2	29		OT	WP	05/07/92	02/18/99	30
VAVBTYV3	25	2	25		CG		04/12/92	02/28/99	33
VAVBTYV4	29	2	55		CG		04/12/92	03/14/99	30
VAVBTYV5	882	2	47		OT	WP	05/07/92	03/14/99	28

Appendix B: Modified Values in the Database

Description

The following table indicates the values that were modified in the database. The column "Order" corresponds to the row number in the table. The column "Problem" indicates the reason why the value was deleted or modified. In the case that the information available can solve the problem, the action was described in the column "action". The last column indicates the community where the event was located.

Table B1. Modified Values in the NSQD

Order	Constituent	Original value	Problem	Action	Location_ID
1373	TSS	10100	High	Delete	Acker Place
890	TSS	53000	High	Delete	Philadelphia
1909	TP	80.1	High - Ortho very Low	Delete	Louisville
1707	TP	35	High	Delete	Lexington
1629	TP	15.4	High	Delete	
1907	Ortho P	60.1	High	Delete	Louisville
3135	Dis Zn / Tot Zn		High Ratio	Delete Total	Boston
3118	TDS	17900	High TDS	Deleted	Boston
2893	Dis Cu / Tot Cu		High Ratio	Delete Dissolved Copper	Portland
2883	Dis Cu / Tot Cu		High Ratio	Delete Dissolved Copper	Ada County
561	Dis P / Tot P		Wrong Dissolved Values	corrected	Portsmouth
562	Dis P / Tot P		Wrong Dissolved Values	corrected	Portsmouth
563	Dis P / Tot P		Wrong Dissolved Values	corrected	Portsmouth

Table B1. Modified Values in the NSQD – Continued

Order	Constituent	Original value	Problem	Action	Location_ID
221	Dis P / Tot P		Wrong Dissolved Values	Corrected	Hampton
223	Dis P / Tot P		Wrong Dissolved Values	Corrected	Hampton
1707	Dis P / Tot P		High Values	Deleted	Lexington
1999	Dis P / Tot P		High Dissolved Value	Deleted	Cobb
2301	Dis P / Tot P		Low Total	Delete both	Fayetteville
2268	Dis P / Tot P		Low Total	Delete both	Fayetteville
2293	Dis P / Tot P		Low Total	Delete both	Fayetteville
4315	Dis P / Tot P		Low Total	Delete both	Raleigh
4306	Dis P / Tot P		Low Total	Delete both	Raleigh
4351	Dis P / Tot P		Low Total	Delete both	Raleigh
4342	Dis P / Tot P		Low Total	Delete both	Raleigh
4055	Dis P / Tot P		Low Total	Delete both	Greensboro
4070	Dis P / Tot P		Inverted	Corrected	Greensboro
4197	Dis P / Tot P		Low Total	Delete both	Greensboro
4249	Dis P / Tot P		Low Total	Delete both	Greensboro
4085	Dis P / Tot P		Low Total	Delete both	Greensboro
4217	Dis P / Tot P		Low Total	Delete both	Greensboro
4068	Dis P / Tot P		Wrong values	Corrected	Greensboro
4038	Dis P / Tot P		Low Total	Delete both	Greensboro
4134	Dis P / Tot P		Low Total	Delete both	Greensboro
4233	Dis P / Tot P		Low Total	Delete both	Greensboro
4149	Dis P / Tot P		Low Total	Delete both	Greensboro
3698	Dis P / Tot P		Low Total	Delete both	Greensboro
4024	Dis P / Tot P		Low Total	Delete both	Greensboro
2150	Dis P / Tot P		Low Total	Delete both	Fulton
1449	Dis P / Tot P		Low Total	Delete both	Knoxville
1617	Dis P / Tot P		Low Total	Delete both	Knoxville
1596	Dis P / Tot P		Low Total	Delete both	Knoxville
1616	Dis P / Tot P		Low Total	Delete both	Knoxville
1460	Dis P / Tot P		Low Total	Delete both	Knoxville
1707	TKN	290	High	Deleted	Lexington
1000	TKN	250	High	Deleted	Baltimore City
4149	TKN	147	High	Deleted	Greensboro
2699	TKN	120	High	Deleted	Maricopa
3136	NO2 NO3	1690	High	Deleted	Atlanta
3281	NO2 NO3	50	High	Deleted	Houston 06/30/92
3331	NO2 NO3	48	High	Deleted	Houston 06/30/92
3289	NO2 NO3	32.1	High	Deleted	Houston 06/30/92
3305	NO2 NO3	28	High	Deleted	Houston 06/30/92
48	COD BOD	< 5	COD low	Deleted	Chesterfield 02/03/98
737	COD	5050		Deleted	Bow creek V1

Table B1. Modified Values in the NSQD – Continued

Order	Constituent	Original value	Problem	Action	Location_ID
97	BOD		Weird Value <30	Deleted	Chesterfield 09/27/99
1895	BOD	610		Deleted	Pleasure_Ridge_Park
2676	COD BOD	4300		Deleted	Maricopa
3299	COD BOD	1260		Retyped	Houston
4087	BOD	545		Deleted	Husbands_Street
4343	COD BOD			Deleted	Williamson_Drive_Wade_Avenue
4399	COD BOD			Deleted	50ft_east_N_West_Street_Peace_Street_Dortch_Street
96	Cadmium		Weird Values Dissolved Higher	Deleted	Chesterfield 08/19/99
97	Cooper		Weird Values Dissolved Higher	Deleted	Chesterfield 09/27/99
85	Cooper		Weird Values Dissolved Higher	Deleted	Chesterfield 09/27/99
110	Lead		Weird Values Dissolved Higher	Deleted	Chesterfield 09/27/99
76	Zinc		Weird Values Dissolved Higher	Deleted	Chesterfield 09/27/99
110	Zinc		Weird Values Dissolved Higher	Deleted	Chesterfield 09/27/99
3288	Antimony		Elevated values for the same set of samples	Deleted	Houston
3304	Antimony		Elevated values for the same set of samples	Deleted	Houston
3330	Antimony		Elevated values for the same set of samples	Deleted	Houston
3281	Antimony		Elevated values for the same set of samples	Deleted	Houston
3289	Antimony		Elevated values for the same set of samples	Deleted	Houston
3305	Antimony		Elevated values for the same set of samples	Deleted	Houston
3331	Antimony		Elevated values for the same set of samples	Deleted	Houston
3276	Oil & Grease		Detection Limit is different	Replace as a detected value	Harris County
2836	Conductivity		Elevated Value. Two samples	Use mean value	Colorado Springs
4077	Turbidity		NT in cell	Move to qualifier	Greensboro
446	TDS <46		Wrong Qualifier	Delete Qualifier..	Norfolk N2
2128	TDS	0.065	Factor of a thousand.	Change value from 0.065 to 65	Fulton County
2257	TDS		Wrong value	corrected (32 mg/L)	Fayetteville
3136	TDS		Value not clear in hardcopy	Delete value <31 mg/L	Atlanta

Table B1. Modified Values in the NSQD – Continued

Order	Constituent	Original value	Problem	Action	Location_ID
2649	TDS		TDS>TS	Delete pair	Maricopa
2658	TDS		TDS>TS	Delete pair	Maricopa
2660	TDS		TDS>TS	Delete pair	Maricopa
2664	TDS		TDS>TS	Delete pair	Maricopa
2665	TDS		TDS>TS	Delete pair	Maricopa
2672	TDS		TDS>TS	Delete pair	Maricopa
2686	TDS		TDS>TS	Delete pair	Maricopa
2699	TDS		TDS>TS	Delete pair	Maricopa
2704	TDS		TDS>TS	Delete pair	Maricopa
2706	TDS		TDS>TS	Delete pair	Maricopa
2709	TDS		TDS>TS	Delete pair	Maricopa
2713	TDS		TDS>TS	Delete pair	Maricopa
2714	TDS		TDS>TS	Delete pair	Maricopa
2715	TDS		TDS>TS	Delete pair	Maricopa
2716	TDS		TDS>TS	Delete pair	Maricopa
2717	TDS		TDS>TS	Delete pair	Maricopa
2719	TDS		TDS>TS	Delete pair	Maricopa
2720	TDS		TDS>TS	Delete pair	Maricopa
2721	TDS		TDS>TS	Delete pair	Maricopa
2725	TDS		TDS>TS	Delete pair	Maricopa
2726	TDS		TDS>TS	Delete pair	Maricopa
2729	TDS		TDS>TS	Delete pair	Maricopa
2730	TDS		TDS>TS	Delete pair	Maricopa
2734	TDS		TDS>TS	Delete pair	Maricopa
2740	TDS		TDS>TS	Delete pair	Maricopa
2742	TDS		TDS>TS	Delete pair	Maricopa
2750	TDS		TDS>TS	Delete pair	Maricopa
2751	TDS		TDS>TS	Delete pair	Maricopa
3321	TSS		Wrong Detection Limit	Change for value	Houston
3154	TSS		Wrong Detection Limit	Change for <1	Atlanta
1117	TSS		Wrong Detection Limit	Deleted	Montgomery County
2543	TSS		First Flush was compared with TDS	Change for 160	Los Angeles
32	COD		Weird Detection Limit	Delete Qualifier..	Arlington
5	COD		Weird Detection Limit	Delete Qualifier. Quantification limit = 5mg/L	Arlington
16	COD		Weird Detection Limit	Delete Qualifier. Quantification limit = 5mg/L	Arlington
859	Fecal Streptococcus		Atypical Growth	Delete value >6000	Fairfax
1401	Ammonia		Typo in detection limit	Change <2 to <0.2 mg/L	Knoxville

Table B1. Modified Values in the NSQD – Continued

Order	Constituent	Original value	Problem	Action	Location_ID
2299	Ammonia		Detection Limit is different	Change for <0.05 (other sites)	Fayetteville
2886	Ammonia		Different Detection Limit	Change <0.14 to <0.20	Portland
2899	Ammonia		Different Detection Limit	Change <0.14 to <0.20	Portland
2915	Ammonia		Different Detection Limit	Change <0.14 to <0.20	Portland
2942	Ammonia		Different Detection Limit	Change <0.14 to <0.20	Portland
2956	Ammonia		Different Detection Limit	Change <0.14 to <0.20	Portland
1999	TKN		Detection Limit is Weird	Delete <0.6	Cobb County
2097	TKN		Typo in Detection Limit	Delete <0.0 for <0.2	Fulton County
2257	TKN		Rows seem to be wrong	Change 46 for 1.2	Fayetteville
2257	TDS		Rows seem to be wrong	Change 1.2 for 46	Fayetteville
2300	Nitrogen Total Organic		Value = 0, Grab = 1.46	Delete value	Fayetteville
2336	Nitrogen Total Organic		Value = 0, Grab = 1.14	Delete value	Fayetteville
13	Phosphorus Dissolved		Low Value	Change 0.009 by 0.09	Arlington
1488	Phosphorus Dissolved		Values lower than DL	Change by <0.02	Knoxville
1527	Phosphorus Dissolved		Values lower than DL	Change by 0.02	Knoxville
1580	Phosphorus Dissolved		Values lower than DL	Change by 0.02	Knoxville
4079	Beryllium		Detection limit	Change <0.6 by <0.06	Greensboro
4245	Cadmium		Detection limit	Change <0.4 by <0.04	Greensboro
2150	Cadmium		Wrong Columns	Copy 16000 in TotCol 230 Fec	Fulton
2128	Cadmium		Wrong Columns	Cd, Tot col and Fec Col in correct columns	Fulton
1107	Cadmium		LD in cell	Replace by detection limit	Howard County
1110	Cadmium		LD in cell	Replace by detection limit	Howard County
2864	Cadmium		Detection limit	Replace <2.5 by <0.5	Ada County
1107	Chromium		LD in cell	Replace by detection limit	Howard County

Table B1. Modified Values in the NSQD – Continued

Order	Constituent	Original value	Problem	Action	Location_ID
1110	Chromium		LD in cell	Replace by detection limit	Howard County
2935-3419	Cyanide		Factor of a thousand.	Multiply by 1000	Texas
18	Cyanide		Wrong Detection Limit	Changed	Arlington
29	Cyanide		Wrong Detection Limit	Changed	Arlington
35	Cyanide		Wrong Detection Limit	Changed	Arlington
2460	Conductivity	1	The value is the detection limit	Deleted	CAALA001
2871	Conductivity	2.5	Conductivity was collected in grab sample	Deleted	IDADA002
2662	DO	11.6	Evaluated by temperature	Deleted	AZMCA001
3016	DO	10.2	Evaluated by temperature	Deleted	ORODA005
3076	DO	15	Evaluated by temperature	Deleted	OREUA001
3077	DO	12.2	Evaluated by temperature	Deleted	OREUA001
3078	DO	17	Evaluated by temperature	Deleted	OREUA001
3092	DO	12.1	Evaluated by temperature	Deleted	OREUA002
3093	DO	18.4	Evaluated by temperature	Deleted	OREUA002
3097	DO	14	Evaluated by temperature	Deleted	OREUA002
3107	DO	11.5	Evaluated by temperature	Deleted	OREUA003
3108	DO	19.2	Evaluated by temperature	Deleted	OREUA003
3115	DO	16.3	Evaluated by temperature	Deleted	MABOA001
3120	DO	21.8	Evaluated by temperature	Deleted	MABOA002
3122	DO	10.2	Evaluated by temperature	Deleted	MABOA002
3126	DO	15.4	Evaluated by temperature	Deleted	MABOA004
3129	DO	14.6	Evaluated by temperature	Deleted	MABOA005
3020	HARDNESS	<1	Weight of evidence compared with conductivity and TDS	Deleted	ORODA005
4065	TSS	66	Turbidity high but TSS low, checked with other parameters	TSS to 660	NCGRHUST

Table B1. Modified Values in the NSQD – Continued

Order	Constituent	Original value	Problem	Action	Location_ID
2619	Turbidity	5.2	Grab samples higher than composite	Calculate time composite	CACTA010
2620	Turbidity	4.3	Grab samples higher than composite	Calculate time composite	CACTA010
1350 - 1351	Various		Values don't seem correct. The community changed lab after this samples	Delete event	GACLCOSI
65	TDS	1	Low value	Use <5	VACHCOF5
875	TDS	2	Low value	Use <5	VAFFOF10
1611	TDS	2	Low value	Use <5	TNKXTYWE
1645	TDS	5406	Elevated value without support	Deleted	TNMET410
2102	TDS	4000	Elevated value without support	Deleted	GAFUCOS1
2122	TDS	4100	Elevated value without support	Deleted	GAFUCOS2
2144	TDS	4200	Elevated value without support	Deleted	GAFUCOS3
2128 , 2150	Various		Values don't seem correct. The community changed lab after this samples	Delete event	GAFUCOS2,GAFUCOS3
2155	TDS	<	Missing detection limit	Deleted	GAFUCOS3
2699	TDS	1290	Elevated value without support	Deleted	AZMCA003
2965	TDS	3	Low Value	Use <5	ORPOA006
2942	TDS	4	Low Value	Use <5	ORPOA005
3691	TDS	1	Low Value	Use <5	TXIRA002
3772	TDS	1	Low Value	Use <5	TXIRA002
3119	TDS	17900	Elevated value, but other samples support it.	Keep with ?	MABOA001
16	TSS	2	Low Value	Use <5	VAARLCV2
19	TSS	1	Low Value	Use <5	VAARLRS3
48	TSS	2	Low Value	Use <5	VACHCOF2
65	TSS	1	Low Value	Use <5	VACHCOF5
76	TSS	2	Low Value	Use <5	VACHCOF5
266	TSS	2	Low Value	Use <5	VAHATYH3
498	TSS	2	Low Value	Use <5	VANFTYN4
812	TSS	1	Low Value	Use <5	VAFFCOF3
842	TSS	2.5	Low Value	Use <5	VAFFCOF6
935	TSS	2	Low Value	Use <5	MDAACORK
965	TSS	1.8	Low Value	Use <5	MDBACOSC
1160	TSS	2.87	Low Value	Use <5	MDMOCOCV
1441	TSS	1	Low Value	Use <5	TNKXTYFC
1482	TSS	1	Low Value	Use <5	TNKXTYGV

Table B1. Modified Values in the NSQD – Continued

Order	Constituent	Original value	Problem	Action	Location_ID
2014	TSS	2	Low Value	Use <5	GACOC1A2
2028	TSS	2.2	Low Value	Use <5	GACOCOL2
2143	TSS	1	Low Value	Use <5	GAFUCOS3
2235	TSS	2	Low Value	Use <5	NCFVTRYO
3143	TSS	2.99	Low Value	Use <5	GAATAT02
3149	TSS	1.83	Low Value	Use <5	GAATAT01
3150	TSS	1.98	Low Value	Use <5	GAATAT01
3265	TSS	2	Low Value	Use <5	TXHCA005
3451	TSS	0.5	Low Value	Use <5	TXDAA004
3453	TSS	0.5	Low Value	Use <5	TXDAA004
3552	TSS	0.5	Low Value	Use <5	TXFWA003
3647	TSS	0.5	Low Value	Use <5	TXGAA003
3775	TSS	2	Low Value	Use <5	TXPLA002
3776	TSS	2	Low Value	Use <5	TXPLA002
3781	TSS	1	Low Value	Use <5	TXPLA002
1314	BOD	0.73	Low Value	Use <1	MDSHDTPS
1317	BOD	0.41	Low Value	Use <1	MDSHDTPS
1322	BOD	0.91	Low Value	Use <1	MDSHDTPS
3868	BOD	0.7	Low Value	Use <1	NCCHSHEF
32	COD	<150	Unusual Detection Limit	Deleted	VAARLTC4
2250	COD	1500	Unusual elevated value, no evidence	Deleted	NCFVTRYO
3479	COD	1300	Unusual elevated value, no evidence	Deleted	TXDAA006
1897	Ammonia	60.3	Unusual elevated value, no evidence	Deleted	KYLOTSR5
1907	Ammonia	60.5	Unusual elevated value, no evidence	Deleted	KYLOTSR6
1909	Ammonia	30.4	Unusual elevated value, no evidence	Deleted	KYLOTSR6
2699	Ammonia	64	Unusual elevated value, no evidence	Deleted	AZMCA003
8	NO2 NO3	13	Unusual elevated value, no evidence	Deleted	VAARLLP1
1314	NO2 NO3	7.05	Unusual elevated value, no evidence	Deleted	MDSHDTPS
2011	NO2 NO3	6.3	Unusual elevated value, no evidence	Deleted	GACOC1A2
2030	NO2 NO3	>0.2	Unusual Detection Limit	Deleted	GACOCOL2
2140	NO2 NO3	9.3	Unusual elevated value, no evidence	Deleted	GAFUCOS3
2966	NO2 NO3	6.5	Unusual elevated value, no evidence	Deleted	ORPOA006
1905	TN	0.39	TN < NH3	Deleted both	KYLOTSR6
1907	TN	0.9	TN < NH3	Deleted both	KYLOTSR6
1909	TN	3	TN < NH3	Deleted both	KYLOTSR6

Table B1. Modified Values in the NSQD – Continued

Order	Constituent	Original value	Problem	Action	Location_ID
1600	TN	1.5	TN < NH3	Deleted both	TNKXTYWE
4324	TN	3.42	TN < TKN	Deleted both	NCRASIT3
4387	TN	6.65	TN < TKN	Deleted both	NCRASIT6
3281	TN	50.2	Unusual elevated value, no evidence	Deleted	TXHOA001
3289	TN	33	Unusual elevated value, no evidence	Deleted	TXHOA002
3305	TN	28.9	Unusual elevated value, no evidence	Deleted	TXHOA003
3331	TN	49.7	Unusual elevated value, no evidence	Deleted	TXHOA005
1907	Nitrogen Nitrite	40	Unusual elevated value, no evidence	Deleted	KYLOTSR6
1907	Phosphate Ortho	60.1	Unusual elevated value, no evidence	Deleted	KYLOTSR6
2978	Phosphate Ortho	0.8	Unusual elevated value, no evidence	Deleted	ORPOA007
3419	Phosphorus Total	0.005	Low value	Deleted	TXDAA002
4073	Antimony	0.02	Grab sample	Deleted	NCGRHUST
2006	Cadmium Total	40.16	Unusual elevated value, no evidence	Deleted	GACOC1A2
2007	Cadmium Total	42.7	Unusual elevated value, no evidence	Deleted	GACOC1A2
2036	Cadmium Total	122	Unusual elevated value, no evidence	Deleted	GACOCOL2
2128	Cadmium Total	16000	Unusual elevated value, no evidence, seems to be wrong columns	Deleted	GAFUCOS2
1131	Chromium Total	120	Unusual elevated value, no evidence	Deleted	MDMOCOWP
797	Copper Total	396	Unusual elevated value, no evidence	Deleted	VAFFCOF2
889 - 900	Mercury Total	0		Deleted	PAPH
1790	Nickel Total	200	Unusual elevated value, Detection limit 20	Change by 20	KYLXWHL1
3299	Nickel Total	325	Unusual elevated value, no evidence	Deleted	TXHOA002
3321	Nickel Total	720	Unusual elevated value, no evidence	Deleted	TXHOA004
3504	Nickel Total	0.013	Low value	Deleted	TXDCA001
3515	Nickel Total	0.01	Low value	Deleted	TXDCA002
2456	Selenium Total	0.3	Low value	Deleted	CAALA001
2457	Selenium Total	0.4	Low value	Deleted	CAALA001
2458	Selenium Total	0.068	Low value	Deleted	CAALA001
2459	Selenium Total	0.2	Low value	Deleted	CAALA001
2460	Selenium Total	0.059	Low value	Deleted	CAALA001
2461	Selenium Total	0.13	Low value	Deleted	CAALA001

Table B1. Modified Values in the NSQD – Continued

Order	Constituent	Original value	Problem	Action	Location_ID
2462	Selenium Total	0.095	Low value	Deleted	CAALA001
1082	Silver Total	290	Unusual elevated value, no evidence	Deleted	MDCLCOJS
1262	Silver Total	90	Unusual elevated value, no evidence	Deleted	MDPGCOS4
2006	Zinc Total	0.11	Low value	Deleted	GACOC1A2
2007	Zinc Total	0.19	Low value	Deleted	GACOC1A2
3704	Zinc Total	1	Low value	Deleted	TXIRA002
3777	Zinc Total	1	Low value	Deleted	TXPLA002
3514	Runoff	2.296	High Value	Deleted	TXDCA002
3515	Runoff	0.909	High Value	Deleted	TXDCA002
3201	Runoff	3.25	High Value	Deleted	KATOBROO
1364	Runoff	1.318	High Value	Deleted	GACLCOSI
2401	Runoff	1.73	High Value	Deleted	NCFVWINS

Appendix C: Methods to Estimate Non-Detected Values in Stormwater Datasets

Introduction

A few large stormwater quality databases have been prepared in the past 20 years (EPA 1983; Smullen 2002, for example). The data collected generally shows that there are important variabilities in stormwater pollutant concentrations for different land uses. Other factors that some researchers have found to be important include: imperviousness, slope, and size of the watershed. However, these databases include numerous instances where the laboratory results are reported to be "below detection." Statistical analyses can be greatly affected by these uncertain values, depending on their number and percentage of occurrence. There are several schemes that have generally been used to overcome the problems associated with these non-detected values.

The NSQD database has collected data representing more than 3,700 storm events in the U.S., including information about the location of the monitoring station, watershed characteristics, hydrology, and chemical constituents. Each community has the flexibility to choose the equipment and analytical methods to detect the constituents in the stormwater. Chemical constituents in this database had been preliminary analyzed for different land uses (Pitt, *et al*. 2003). It has been observed while preparing the NSQD database, that different methods and procedures had been used for the analyses of the samples. The use of different methods generates different detection limits in the database for the same constituent.

Datasets containing values below the detection limits (censored data) complicate the statistical analyses, even including the basic calculations of the means and variance. Most of the time, "left-censored" data are of concern (observations below the detection limit). However, there are situations where "right-censored" data may occur, especially for bacteria analyses, when the observations are greater than the upper limit of the dilution. Three main approaches to the analysis of censored data can be found in the literature: substitution, statistical estimation, and graphical methods. In this chapter, these methods will be presented using different data sets.

Analysis of Multiple Censored Data

Estimation methods for single censored data have been widely discussed in the literature. However, in the case of multiple censored data (datasets affected by several different detection limits), the situation is not the same. Helsel and Cohn (1988) continued the previous work of Guilliom and Helsel, but for multiple censored data.

Eight methods were studied in the multiple censored cases:

1) ZE: Censored data are assumed to equal zero.

2) DL: Censored data are assumed to equal the detection limit.

3) HA: Censored data are assumed to equal half the detection limit.

4) LR: Entire data set is log transformed and is assumed to be normally distributed. Censored data is estimated using least squares regression.

5) MR: Plotting positions are calculated using equations given by Hirsch and Stedinger (1987).

6) LM: Concentrations are assumed log normally distributed with parameters using the Cohen method. The mean and standard deviation of the untransformed values were estimated using the equations given by Aitchison and Brown (1969).

7) MM: This method uses the maximum likelihood method, but for the case of multiple censored data. Cohen (1976)

8) AM: Adjusted maximum likelihood procedure of Cohn (1988). The AM method is the same as the MM but makes a first order correction in the bias.

When the LR and LM methods were used, all the points below the highest of the censoring thresholds were treated as less than that censoring level. This will simplify the problem as a single censored occurrence. In the last three methods listed above, it is assumed that the data is log-normally distributed.

The results indicate that the MM and MR methods are improvements compared to the results obtained with the single threshold assumption. The MR, MM and AM methods were also compared. A higher RMSE (root mean squared error) for the moments was estimated by the MM method. The AM method present lower errors than the plotting position method (MR), but it is less robust for distributions different than log-normal. The substitution methods present a higher error than the MR or the AM methods.

One of the main problems using these methods was to assume that that the data is lognormal. There is no certainty that water quality follows this distribution. For that reason, robust methods are considered very important in water quality analysis. When data depart from the lognormal distribution, the RMSE of the mean and standard deviation values, when using the MM and AM methods, can be larger than 1000%. Helsel and Cohn (1988) indicate that in water quality data the lognormal distribution and the gamma with a coefficient of variation of two are very common. The MR model present better results when the distribution is not known.

They also evaluate the plotting position using the Weibull, Blom, and Hazel equations. There really is not an effect in the results when any of these equations are used.

If the distribution is unknown, the MR method should be chosen. If there is certainty that the distribution is lognormal, the AM method is recommended. The previous methods were evaluated with copper observations in commercial areas during the fall. Table C1 shows the original observations, and Table C2 show the log-transformed observations.

Table C1. Copper Observations in Commercial Areas

2	2	3	5	5	5	5	5.2	5.4	5.5	6	6
6	6.5	6.5	7	8	8	8.1	8.4	9	9	9	10
10	10	10	10	10	10	10	10	10	11	11	13
13	13.4	14	14	14	14	14	14	14.4	14.5	15	15
15	17	17	17	17	17.1	18	19	19	20	20	20
20	20	20	20	20	20	21	21	21	22	22	22.4
23	24	24	26	26.6	26.9	29	29	30	30	33	33.7
36	37	37	40	41.3	42	50	50	50.5	50.7	59.4	60
60	61	62	70	100	130	130	175	<10	<10	<10	<10
<10	<10	<20									

Table C2. Copper Observations in Commercial Areas – (Log Values)

0.3	0.3	0.5	0.7	0.7	0.7	0.7	0.7	0.73	0.74	0.78	0.78
0.8	0.81	0.8	0.9	0.9	0.9	0.9	0.9	0.95	0.95	0.95	1
1	1	1	1	1	1	1	1	1	1.04	1.04	1.11
1.1	1.13	1.2	1.2	1.15	1.15	1.2	1.2	1.16	1.16	1.18	1.18
1.2	1.23	1.2	1.2	1.23	1.23	1.3	1.3	1.28	1.3	1.3	1.3
1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.32	1.34	1.34	1.35
1.4	1.38	1.4	1.4	1.43	1.43	1.5	1.5	1.48	1.48	1.52	1.53
1.6	1.57	1.6	1.6	1.62	1.62	1.7	1.7	1.7	1.7	1.77	1.78
1.8	1.79	1.8	1.9	2	2.11	2.1	2.2	<1	<1	<1	<1
<1	<1	<1.30									

Figure C1 shows the probability plots when censored data was deleted, replaced by the detection limit, replaced by half of the detection limit, and estimating the values below the highest detection limit using the LR method. The results indicated that there is a bias in the mean value when the censored data is deleted or replaced by the detection limit. When data is replaced by half of the detection limit, or is estimated by the LR methods, the results are very similar. Notice that in the LR method, all the values below the highest detection limit are considered censored. This assumption changes the level of censoring from 6% to 58%, but even at this level of censoring, the results are very close to those obtained with the substitution methods. Because the transformed data seems to follows a log-normal distribution, it is possible to estimate the moments using only the upper side of the line.

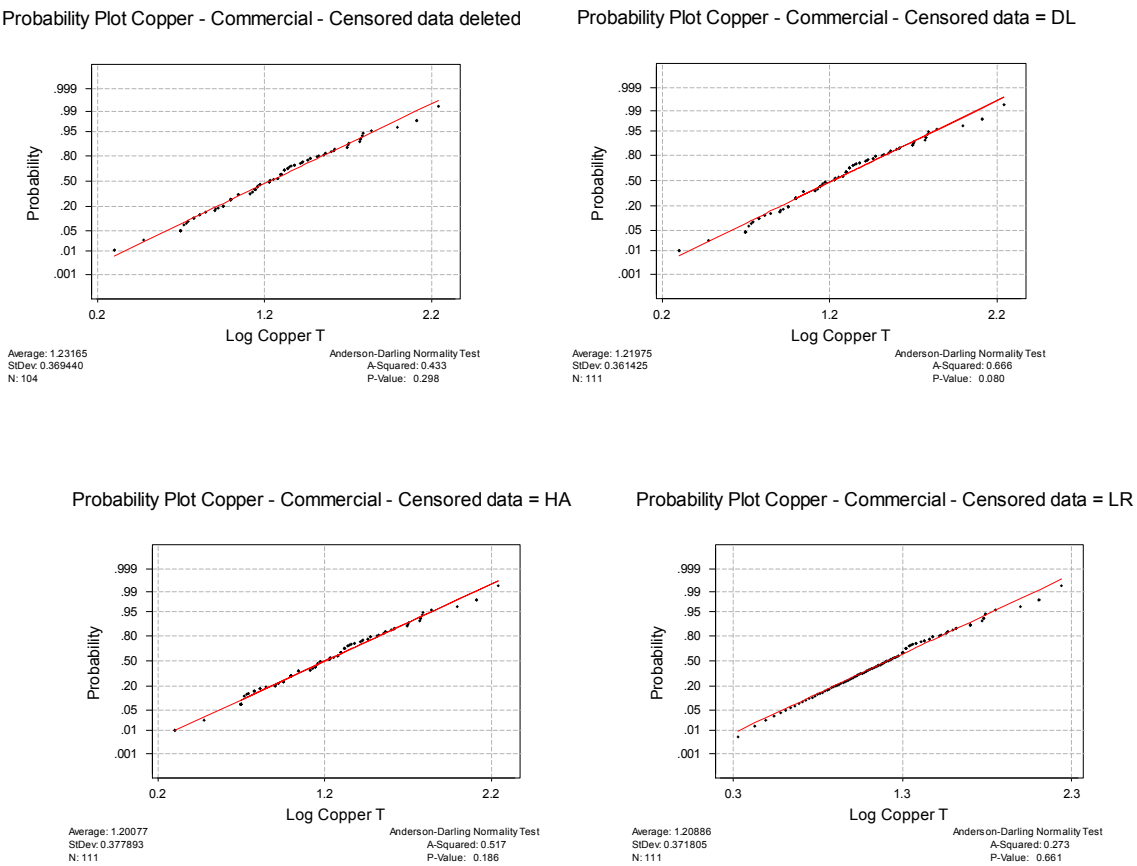

Figure C1. Probability plot for different replacements of the censored data for copper

The MR method was proposed by Hirsch and Stedinger (1987). They define a variable Aj as the number of uncensored data greater than the detection limit j and below the next detection limit. In the copper data, there are 47 uncensored observations above the highest detection limit (A3=47, DL=20). There are 34 observations between the detection limits of 20 and 10 µg/L, (A2=34, DL=10). Finally, there are 23 uncensored observations above the minimum detection limit, zero (A1=23, DL=0). This assumption must be made in the case that the smallest value in the dataset is not a censored value. The parameter Bj is defined as the number of censored and uncensored observations below the j detection limit. In the example case, there are 64 observations below the second detection limit (B3=64), 29 observations below the first detection limit (B2=29), and zero observations below the detection limit zero (B1=0). The method uses the probability of exceeding the jth detection limit pe,j to calculate the probability position of each observation.

(C.1) $$p_{e,j} = p_{e,j+1} + \frac{A_j}{A_j + B_j}\left(1 - p_{e,j+1}\right)$$

The calculations are easier going from higher to lower values. In the copper example, there are three detection limits; by definition, the probability of exceeding a fourth detection limit is zero. The probability of exceeding the third, second and first detection limits are 0.423, 0.735 and 1, respectively.

The Weibull formula was used to calculate the plotting position of the censored data in the range between the probabilities of exceeding boundaries.

(C.2) $$p(i) = (1 - p_{e,j}) + (p_{e,j} - p_{e,j+1})\frac{i}{A_j + 1}$$

This formula indicates that the values observed between the j and j+1 range are distributed according to the Weibull formula. The plotting position for the censored data follows the same concept; distribute the censored data between the limits using the Weibull formula. For the censored observations, the plotting positions can be calculated as:

(C.3) $$pc(i) = (1 - p_{e,j})\frac{i}{C_j + 1}$$

The formula calculates the position of the ith censored observation, among the C tied observations, in the jth detection limit. The probability plot is shown in Figure C2.

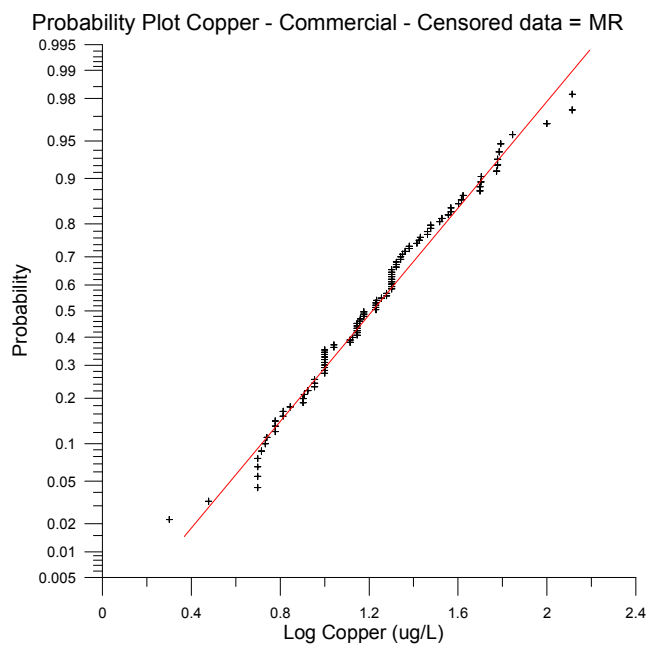

Figure C2. Probability plot using the MR method.

The MM method presented by Cohen (1976) uses the maximum likelihood method for the three parameter lognormal distribution.

(C.4) $$f(x;\mu,\sigma,\gamma)=\frac{1}{\sigma\sqrt{2\pi}(x-\gamma)}\exp\left[-\frac{\left(\ln(x-\gamma)-\mu\right)^2}{2\sigma^2}\right]$$

$$\gamma < x < \infty$$

In this distribution, X is a random variable lognormal. The method assumes that there are k censored observations and n noncensored observations. For a censored level Tj, the transformed yj will be:

(C.5) $$y_i=\ln(T_j-\gamma)$$

and,

(C.6) $$\xi_j=\frac{y_i-\mu}{\sigma}$$

Cohen created a new variable Zj that is used to solve the maximum likelihood estimators.

(C.7) $$Z_j=Z(\xi_j)=\frac{\varphi(\xi_j)}{1-\Phi(\xi_j)}$$

Where:
$\phi(\xi_j)$ = normal density function N(0,1)
$\Phi(\xi_j)$ = normal cumulative density function N(0,1)

Three simultaneous equations can be solved to estimate the parameters μ, σ, and γ.

(C.8) $$\sum_{i=1}^{n}\left[\ln(x_i-\gamma)-\mu\right]+\sigma\sum_{j=1}^{k}Z_j=0$$

(C.9) $$\sum_{i=1}^{n}\left[\ln(x_i-\gamma)-\mu\right]^2+\sigma^2\left[\sum_{j=1}^{k}\xi_j Z_j-n\right]=0$$

Cohn suggested assuming a γ value and solve for μ and σ from the first two equations. After that, the γ parameter can be recalculated using the third equation. In some cases, the parameter g does not converge. In that case the following approximation must be used.

(C.10) $$\gamma=x_k-\exp(\mu+\sigma\xi_k)$$

Where x_k is the kth order statistic in the sample.

The AM method is the best alternative in the case that the distribution is lognormal. In any other case, it was found that elevated bias and rmse are obtained in the mean and the variance (>1000%) if the distribution is different.

The National Council of the Paper Industry for Air and Stream Improvement had created seven technical bulletins about statistical methods used with environmental data sets (NCASI 1995). One of the reports presents a decision tree to select the appropriate statistical method and a description of the Cohen's multilevel MLE procedure. This method was recommended after compare it with other methods, such as replacement/deletion, D-log procedure, regression of normal order statistics balancing techniques, and graphical techniques.

The diagram indicates that in some cases of multiple detection limits, the problem can be solved using single censoring point (SCP) methods, for example when all the non-detected values are smaller than the detected values. In other situations, the simplification cannot be done and multiple censoring point (MCP) methods must be used. The Cohen's maximum likelihood method obtained the mean and variance estimates from the logarithm of the likelihood function and obtaining the partial derivate in respect to the mean and the variance. The following equation defines the log likelihood function:

(C.11) $$L(S) = -n\ln(\sigma) - \frac{1}{2}\sum_{1}^{n}\left(\frac{x_i - \mu}{\sigma}\right)^2 + \sum_{1}^{k} r_i \ln[F_i] - n\ln[\sqrt{2\pi}]$$

Where:

S = sample set containing a total of N censored observations and fully quantified values

x_i = i^{th} fully quantified value

μ = population mean

σ = population standard deviation

k = number of censored levels

r_i = number of censored values at each censored level i

n = number of noncensored observations

$F_i = F(\xi_i)$ = area under standard normal curve at f

$\xi_i = (T_i - \mu)/\sigma$, standard normal variate for the ith censoring level

$\phi(t) = (2\pi)^{-1} \exp[-t^2/2]$, ordinate value of normal variate , $f/(\xi_i)$

T_i = the limit of detection of the ith level of censoring.

The derivates are:

(C.12) $$\frac{\partial L}{\partial \mu} = \frac{n}{\sigma}\left[\frac{(\bar{x} - \mu)}{\sigma} - \sum_{1}^{k}\frac{r_i}{n} Z_i\right] = 0$$

(C.13) $$\frac{\partial L}{\partial \sigma} = \frac{n}{\sigma}\left[\frac{s^2 + (\bar{x} - \mu)^2}{\sigma^2} - 1 - \sum_{1}^{k} \frac{r_i}{n} \xi_i Z_i\right] = 0$$

Z_i = the hazard function ϕ_i/F_i.

s^2 = Sample variance.

NCASI (1995) includes the program source code for using Cohen's method, in FORTRAN and SAS. The procedure and the code presented in the technical bulletin No. 703 were used to estimate the censored observations for this NSQD research.

Appendix D: Unusual Sites Identified Using Xbar Plots

This appendix describes sites having unusual stormwater concentrations for all land uses, besides the residential areas that were described in Chapter 3.

Evaluation of the Methods Selected to Estimate Non-Detected Observations

Three methods were used to estimate appropriate substitution values for the non-detected observations: delete them ("ignore"), replace them by half of the detection limit ("HD") or estimate them using the Cohen's maximum likelihood method (an extrapolation of the probability plot of the data) ("estimate"), as presented in the preceding appendix. The following discusses the analyses for each constituent for each land use category.

Hardness

Total hardness was detected in all samples, except in industrial land use areas where less than 2% of the samples were not detected. Changes in the average, median, standard deviation and coefficient of variation were not significant if the non-detected values were ignored, estimated, or replaced by half of the detection limit. Table D1 shows that there are no important differences in the industrial land descriptions using any of these three methods.

Table D1. Summary Statistics for Estimated Observations for Total Hardness (mg/L)

	RESIDENTIAL			COMMERCIAL			INDUSTRIAL		
Land use	**Ignore**	**Estimate**	**HD**	**Ignore**	**Estimate**	**HD**	**Ignore**	**Estimate**	**HD**
Observations	250	250	250	139	139	139	138	138	138
% Detected	100.00			100.00			96.38		
Minimum	3.00	3.00	3.00	1.90	1.90	1.90	5.50	5.00	5.00
Maximum	401.00	401.00	401.00	356.00	356.00	356.00	888.00	888.00	888.00
Average	43.32	43.32	43.32	62.03	62.03	62.03	68.83	66.52	66.52
Median	32.00	32.00	32.00	38.90	38.90	38.90	39.00	38.50	38.50
Standard Dev.	44.87	44.87	44.87	65.17	65.17	65.17	104.55	103.32	103.32
Coeff. of Var.	1.04	1.04	1.04	1.05	1.05	1.05	1.52	1.55	1.55

	OPEN SPACE			FREEWAY		
Land use	**Ignore**	**Estimate**	**HD**	**Ignore**	**Estimate**	**HD**
Observations	8	8	8	127	127	127
% Detected	100.00			100.00		
Minimum	11.00	11.00	11.00	5.00	5.00	5.00
Maximum	270.00	270.00	270.00	1000.00	1000.00	1000.00
Average	145.25	145.25	145.25	57.19	57.19	57.19
Median	150.00	150.00	150.00	34.00	34.00	34.00
Standard Dev.	85.12	85.12	85.12	105.95	105.95	105.95
Coeff. of Var.	0.59	0.59	0.59	1.85	1.85	1.85

Figure A1 shows probability plots for industrial land use hardness values. The plot indicates that the mean value is smaller when the non-detected values are either estimated or replaced by half of the detection limit. The lower 40% of the distribution is displaced to the left. All the non-detected values were observed at 10 mg/L. The upper 60% of the distribution is not affected by the non-detected values.

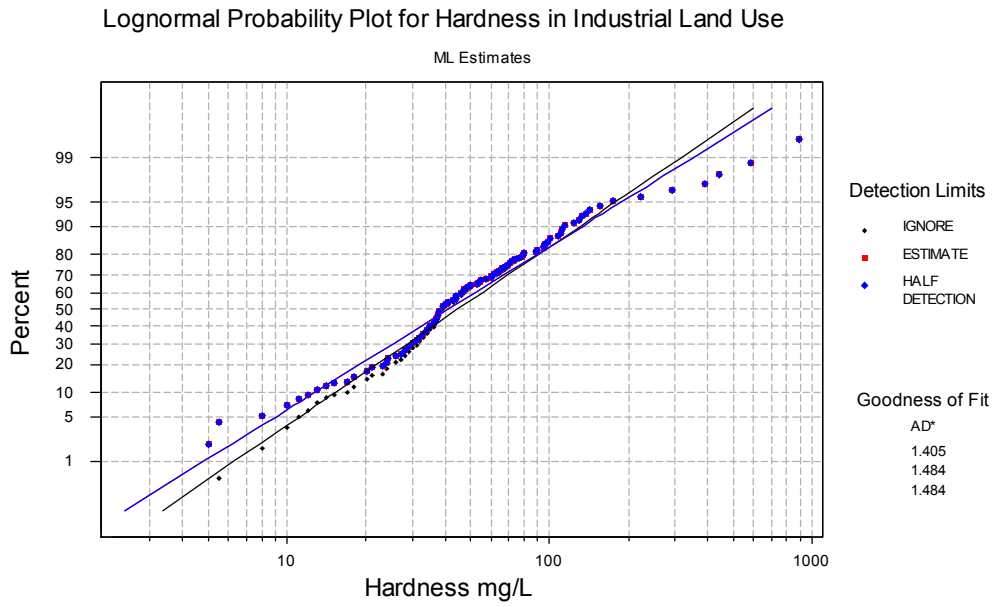

Figure D1. Estimated hardness distributions in industrial land use areas

Oil and Grease

Oil and grease had censored data for 37% and 72% of the observations. Table D2 shows the differences in the descriptive statistics using the three methods. The greatest change occurred in the coefficient of variation values for freeway sites. The mean oil and grease values increased in a range of 30% to 60% when the censored observations were ignored. The difference was below 4% when the censored observations were replaced using Cohen's maximum likelihood method, or replaced by half of the detection limit.

Table D2. Summary Statistics for Estimated Observations for Oil and Grease (mg/L)

	RESIDENTIAL			COMMERCIAL			INDUSTRIAL		
Land use	**Ignore**	**Estimate**	**HD**	**Ignore**	**Estimate**	**HD**	**Ignore**	**Estimate**	**HD**
Observations	533	533	533	308	308	308	327	327	327
% Detected	57.79			70.78			65.14		
Minimum	0.20	0.02	0.20	0.80	0.03	0.25	0.50	0.00	0.25
Maximum	2980	2980	2980	359	359	359	11000	11000	11000
Average	22.85	13.87	13.89	12.63	9.42	9.39	62.87	41.40	41.39
Median	3.85	2.50	2.50	4.70	3.00	3.00	5.00	2.50	2.60
Standard Dev.	175.53	133.76	133.76	39.75	33.80	33.81	753.77	608.56	608.56
Coeff. of Var.	7.68	9.65	9.63	3.15	3.59	3.60	11.99	14.70	14.70

	OPEN SPACE			FREEWAY		
Land use	**Ignore**	**Estimate**	**HD**	**Ignore**	**Estimate**	**HD**
Observations	19	19	19	60	60	60
% Detected	36.84			71.67		
Minimum	0.50	0.50	0.50	3.00	0.50	0.25
Maximum	3.70	3.70	3.70	30.00	30.00	30.00
Average	1.53	1.09	1.09	8.49	6.57	6.45
Median	1.30	0.50	0.50	8.00	4.65	4.65
Standard Dev.	1.07	0.93	0.93	5.28	5.42	5.52
Coeff. of Var.	0.70	0.85	0.85	0.62	0.83	0.86

The probability plot in residential land use areas indicates that the lower tail is better described with the Cohen estimated method (Figure D2). The upper tail was the same for the estimated and the half detection limit method. About 40% of the non-detected values were at the < 1 mg/L level, and another 40% were at the < 5 mg/L level. The estimated values better describe the lower tail, however there was no significant differences in the means, standard deviations and coefficients of variation. This case is very important because the level of censoring was large (42.2%). Ignoring the non-detected values increased the mean value by more than 64% and the standard deviation by more than 30%, and reduces the coefficient of variation in 20%.

The analyses for commercial land use data resulted in a similar trend as observed for the residential land use areas (Figure D3). There is a better description of the lower tail, but the mean, standard deviation and coefficient of variation values are almost the same if the censored data are replaced by half of the detection limit, or if they are estimated. The most frequent reported level of non-detected values was < 5 mg/L, followed by < 1 mg/L. The average was increased by 34%, and the standard deviation by 18%, when the censored data was ignored, and the coefficient of variation was reduced about 12% when the non-detected values were ignored.

Figure D4 shows the probability plot for oil and grease data at industrial land use areas and illustrates the case when an unusual value was present in the dataset. The maximum observation was larger by a factor of 2,200 compared with the median value of the distribution. This generates a coefficient of variation of 12 when the censored data are ignored, or 14.7 in the case when they are estimated or replaced by half of the detection limit.

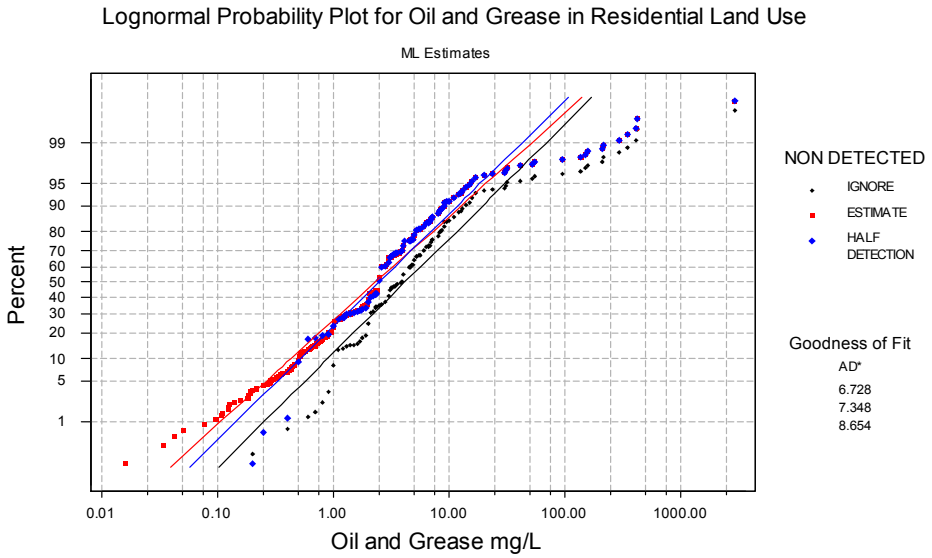

Figure D2. Estimated oil and grease distributions in residential land use areas

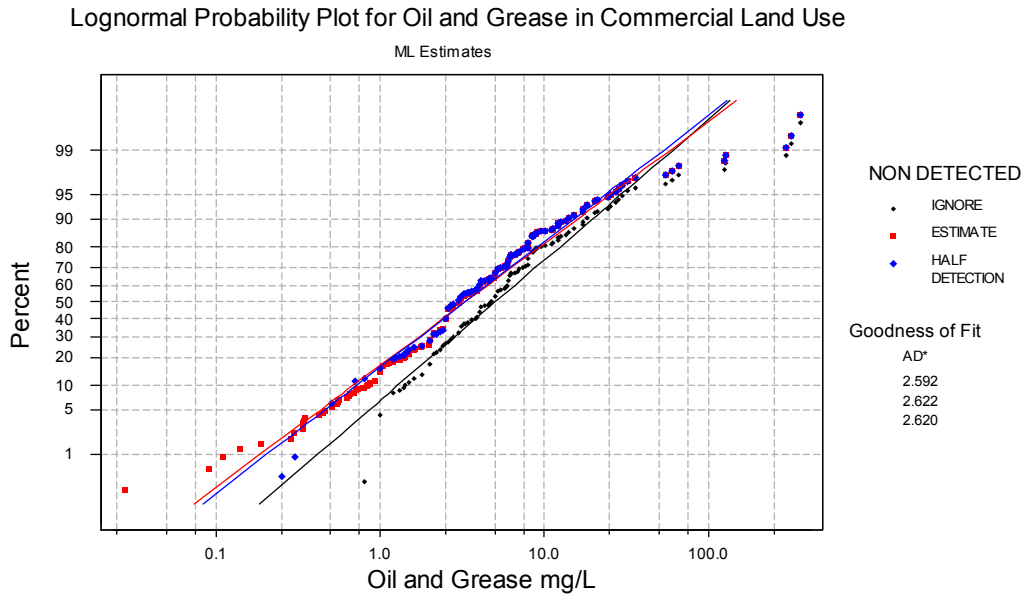

Figure D3. Estimated oil and grease distributions in commercial land use areas

The percentage of detected values for oil and grease in open space areas was very low (only 7 of 19 observations were detected) (Figure D5). Almost all of the non-detected values were at < 1 mg/L. It was not possible to use the Cohen's maximum likelihood method in this case because the percentage of non-detected values was too high. Ignoring the non-detected values will increase the mean value by almost 40% compared when the non-detected values were replaced with half of the detection limit.

The probability plot for freeway oil and grease values indicate that estimating or replacing the censored observations for half of the detection limit does not cause a significant difference in the coefficient of variation (Figure D6). The coefficient of variation was 3% larger when half of the detection limit was used instead of Cohen's method. A different situation occurs when the non-detected values were ignored. In this case, the coefficient of variation was reduced by 30% compared with the estimated method.

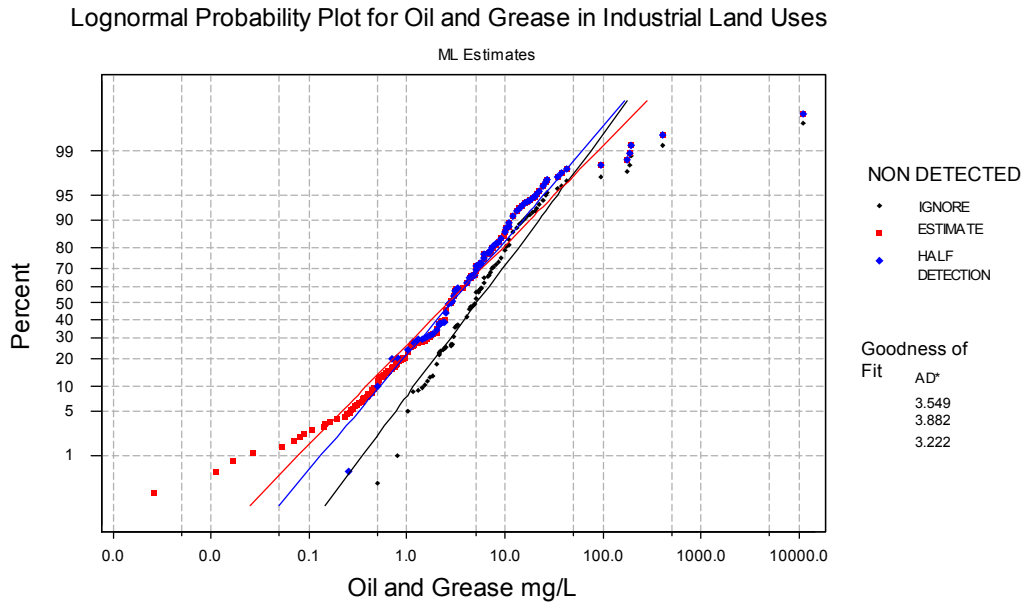

Figure D4. Estimated oil and grease distributions in industrial land use areas

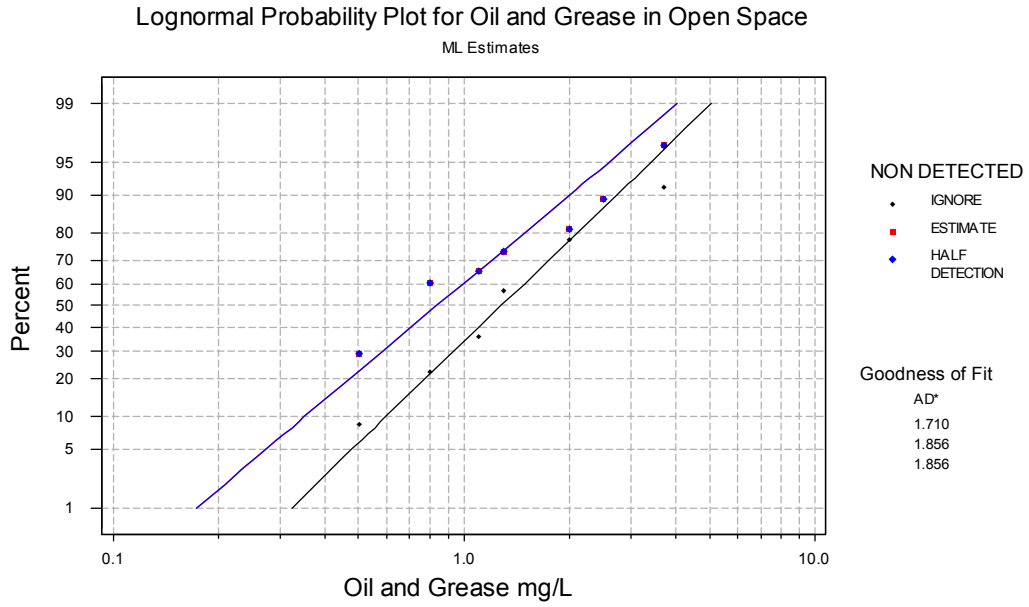

Figure D5. Estimated oil and grease distributions in industrial land use areas

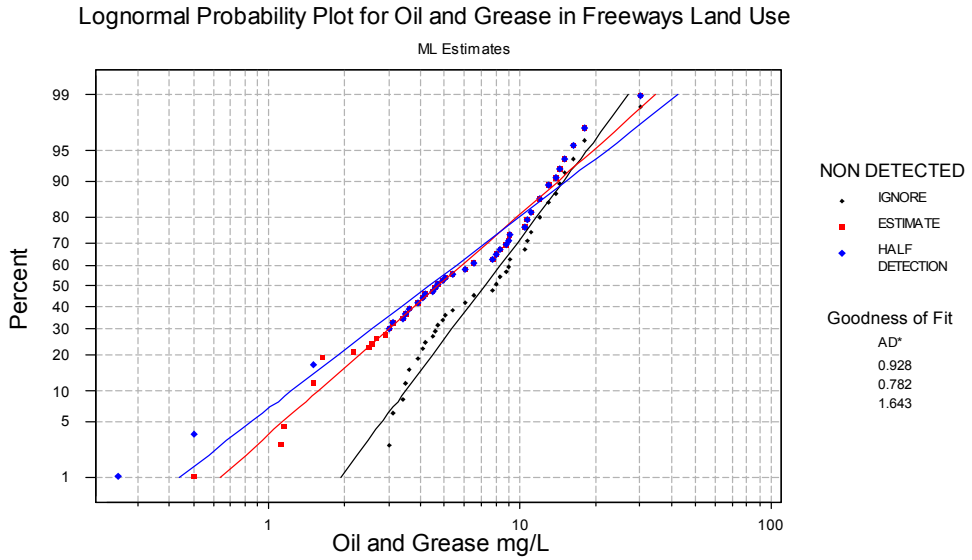

Figure D6. Estimated oil and grease distributions in freeway land use areas

Total Dissolved Solids (TDS)

In all the land use categories, the percentages of non-detected TDS values were very low. The lowest percentage was observed in open space areas, with 2% not detected. No important differences were observed in the means, standard deviations and coefficients of variation when the non-detected values were ignored, estimated using with the Cohen method, or substituting with half the detection limit. Descriptive statistics for each of the three methods are shown in Table D3.

Table D3. Summary Statistics for Estimated Observations for TDS (mg/L)

	RESIDENTIAL			COMMERCIAL			INDUSTRIAL		
Land use	**Ignore**	**Estimate**	**HD**	**Ignore**	**Estimate**	**HD**	**Ignore**	**Estimate**	**HD**
Observations	861	861	861	399	399	399	412	412	412
% Detected	99.19			99.50			99.51		
Minimum	3.00	3.00	0.50	4.00	4.00	4.00	4.50	1.78	2.50
Maximum	1700	1700	1700	3860	3860	3860	11200	11200	11200
Average	96.26	95.54	95.50	109.94	109.44	109.42	161.99	161.23	161.22
Median	72.00	70.50	70.50	74.00	74.00	74.00	91.00	89.50	89.50
Standard Dev.	102.45	102.35	102.38	208.76	208.36	208.37	582.40	581.09	581.09
Coeff. of Var.	1.06	1.07	1.07	1.90	1.90	1.90	3.60	3.60	3.60

	OPEN SPACE			FREEWAY		
Land use	**Ignore**	**Estimate**	**HD**	**Ignore**	**Estimate**	**HD**
Observations	45	45	45	97	97	97
% Detected	97.78			98.97		
Minimum	32.00	10.79	2.50	12.00	5.85	0.50
Maximum	542	542	542	470	470	470
Average	151.41	148.28	148.10	95.31	94.39	94.34
Median	124.50	119.00	119.00	77.50	77.00	77.00
Standard Dev.	109.83	110.58	110.82	76.38	76.52	76.59
Coeff. of Var.	0.73	0.75	0.75	0.80	0.81	0.81

Figure D7 shows the probability plots for residential land use TDS concentrations. The plot indicates that using half of the detection limit lowers values compared to the Cohen's maximum likelihood method. The upper 95% of the distributions are identical for the three cases. The probability plots don't indicate significant differences among the three methods for the remaining land uses. For example, Figure D8 shows the probability plots for commercial areas. The three lines overlap, except for a small fraction in the lower tail of the distribution.

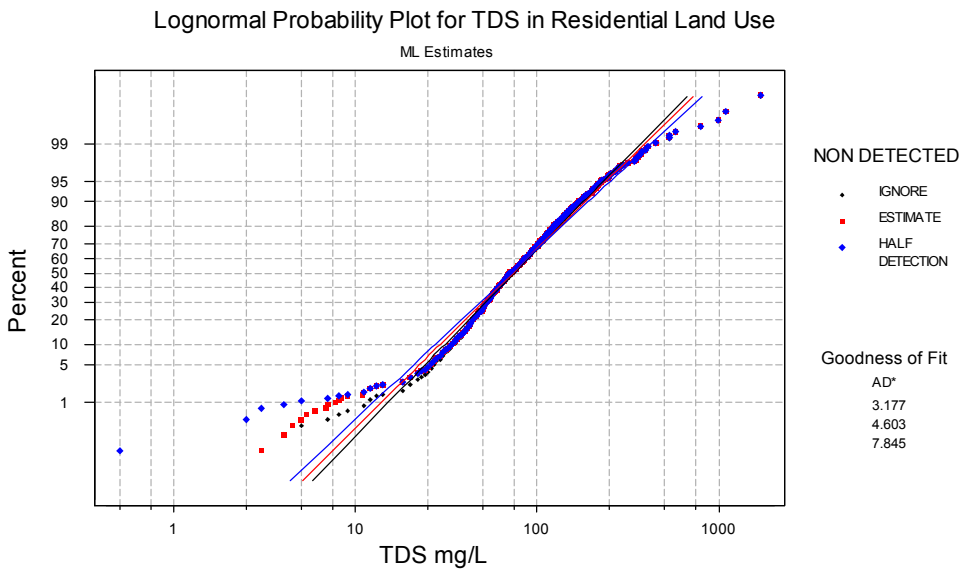

Figure D7. Estimated TDS distributions in residential land use areas

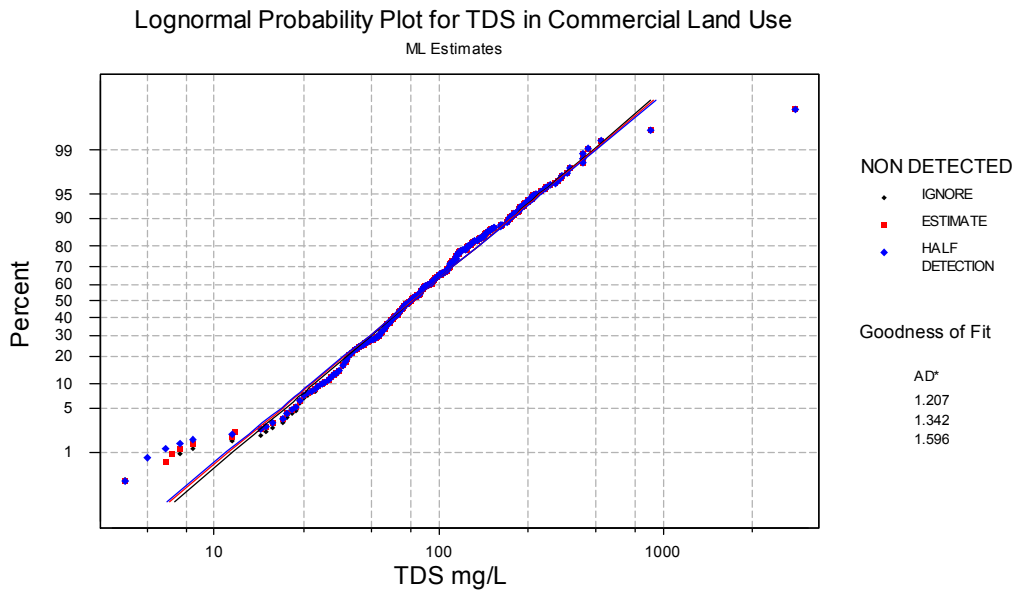

Figure D8. Estimated TDS distributions in commercial land use

Total Suspended Solids (TSS)

The results for TSS were similar to above described results for TDS, the maximum level of non-detected values was observed in open space areas, where about 5% of the observations were censored. Table D4 indicates that there are not any relevant differences in means, standard deviations or coefficients of variation for any of the three methods.

Table D4. Summary Statistics for Estimated Observations for TSS (mg/L)

	RESIDENTIAL			COMMERCIAL			INDUSTRIAL		
Land use	**Ignore**	**Estimate**	**HD**	**Ignore**	**Estimate**	**HD**	**Ignore**	**Estimate**	**HD**
Observations	991	990	991	458	457	458	427	426	427
% Detected	98.59			98.25			99.06		
Minimum	3.00	0.63	0.25	3.00	1.56	0.25	3.00	0.43	0.50
Maximum	2462	2462	2462	2385	2385	2385	2490	2490	2490
Average	99.84	98.53	98.46	110.06	108.45	108.18	142.44	141.36	141.12
Median	49.00	48.00	48.00	42.00	41.00	41.00	78.00	76.36	76.00
Standard Dev.	179.12	178.29	178.22	218.51	217.22	217.05	218.76	218.35	218.15
Coeff. of Var.	1.79	1.81	1.81	1.99	2.00	2.01	1.54	1.54	1.55

	OPEN SPACE			FREEWAY		
Land use	**Ignore**	**Estimate**	**HD**	**Ignore**	**Estimate**	**HD**
Observations	44	44	44	134	134	134
% Detected	95.45			99.25		
Minimum	3.00	1.22	0.50	3.00	3.00	0.50
Maximum	980	980	980	4800	4800	4800
Average	176.88	168.98	168.91	173.39	172.13	172.10
Median	48.50	39.00	39.00	99.00	98.50	98.50
Standard Dev.	263.04	259.44	259.49	448.85	447.39	447.41
Coeff. of Var.	1.49	1.54	1.54	2.59	2.60	2.60

The probability plots indicate that the lower values were better estimated using half of the detection limit, rather than the Cohen's method. This indicate that with large numbers observations and small percentages of non-detected values, replacing the missing data by half of the detection limit will produce similar means compared to those obtained when using the maximum likelihood method. Figure A9 shows the probability plot for TSS concentrations for residential land use areas. The three curves overlap, indicating than the three methods will produce practically the same result.

The probability plot for open space has the lower number of observations among the five land uses. In this case, the pattern observed in the three methods was almost the same. The coefficient of variation increases only 3% when the censored data was estimated with the Cohen method, or replaced by half of the detection limit.

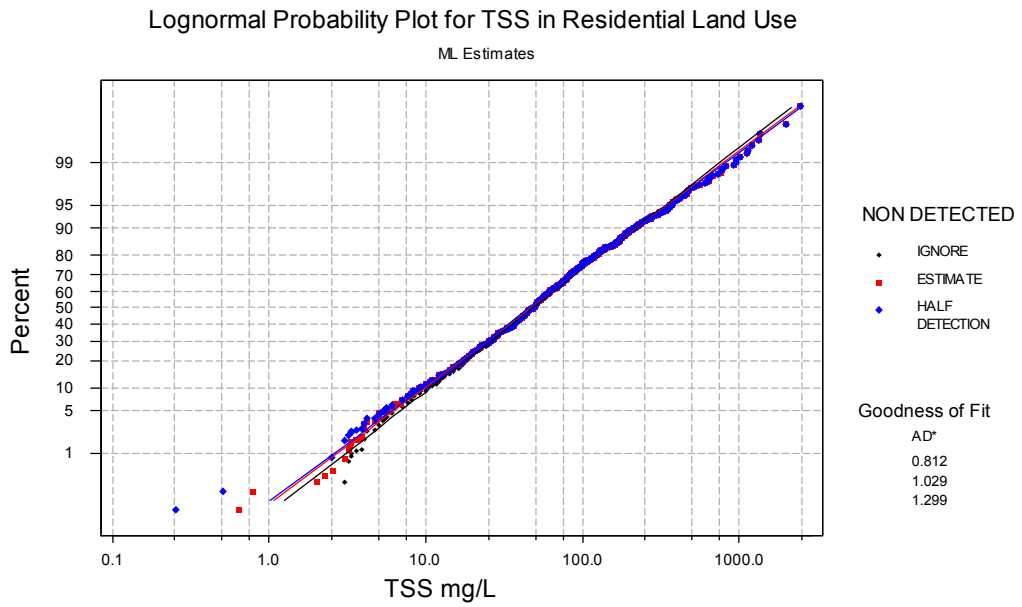

Figure D9. Estimated TSS distributions in residential land use areas

Biochemical Oxygen Demand (BOD_5)

The percentage of non-detected values for BOD_5 was higher in open space and freeway areas compared with the other land uses (Table D5). The lowest concentrations were observed in open space areas with a median BOD_5 value of 4 mg/L. Freeways, commercial and residential land use areas have similar concentrations, with 15 mg/L average BOD_5 values. The highest BOD_5 concentration was observed at an industrial land use site, however a single unusual BOD_5 observation of 6,920 mg/L had a large effect on the mean, standard deviation and coefficient of variation values.

The lognormal probability plot for industrial land use areas showed one unusual BOD_5 observation. This BOD_5 concentration was 35 times larger than the second highest observation. This unusual value increased the standard deviation almost 18 times compared with the other land uses. Figure D10 shows the probability plot for BOD_5 concentrations at industrial land use areas.

Table A5. Summary Statistics for Estimated Observations for BOD_5 (mg/L)

	RESIDENTIAL			COMMERCIAL			INDUSTRIAL		
Land use	**Ignore**	**Estimate**	**HD**	**Ignore**	**Estimate**	**HD**	**Ignore**	**Estimate**	**HD**
Observations	941	941	941	432	432	432	406	406	406
% Detected	97.56			97.45			95.32		
Minimum	1.00	1.00	0.50	2.00	0.75	0.50	1.00	0.55	0.50
Maximum	350	350	350	150	220	150	6920	6920	6920
Average	15.05	14.97	14.84	18.16	18.58	18.14	35.92	34.65	34.47
Median	9.00	9.00	9.00	11.00	11.00	11.00	9.00	9.00	9.00
Standard Dev.	22.25	22.34	22.11	20.25	22.59	20.63	351.89	343.62	343.61
Coeff. of Var.	1.48	1.49	1.49	1.12	1.22	1.14	9.80	9.92	9.97

	OPEN SPACE			FREEWAY		
Land use	**Ignore**	**Estimate**	**HD**	**Ignore**	**Estimate**	**HD**
Observations	44	43	44	26	26	26
% Detected	86.36			84.62		
Minimum	1.00	0.62	0.50	2.0	1.5	1.5
Maximum	20	20	20	89	89	89
Average	6.25	5.68	5.74	14.86	13.06	12.88
Median	5.40	4.00	4.00	8.0	6.5	6.5
Standard Dev.	4.30	4.34	4.38	18.68	17.67	17.76
Coeff. of Var.	0.69	0.76	0.76	1.26	1.35	1.38

Open space and freeway areas had the largest level of non-detected BOD_5 values. The mean value for open space areas increased by 10% when the censored data were ignored. No significance difference was observed for the variance values (Figure D11). Estimating the non-detected value using Cohen's method, or replacing the non-detected values by half of the detection limit results in almost the same means, standard deviations and coefficients of variation values.

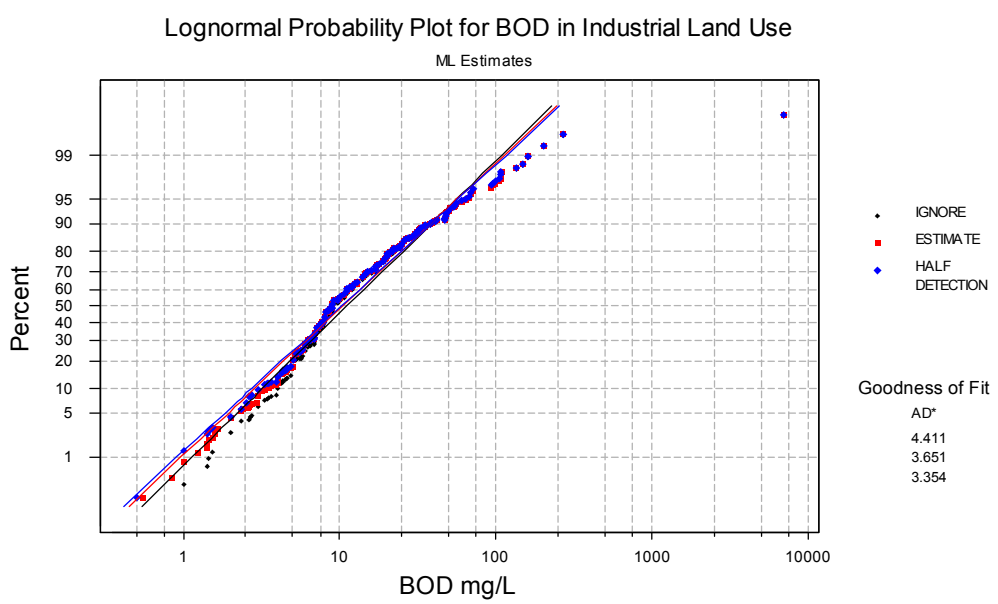

Figure A10. Estimated BOD_5 distributions in industrial land use areas

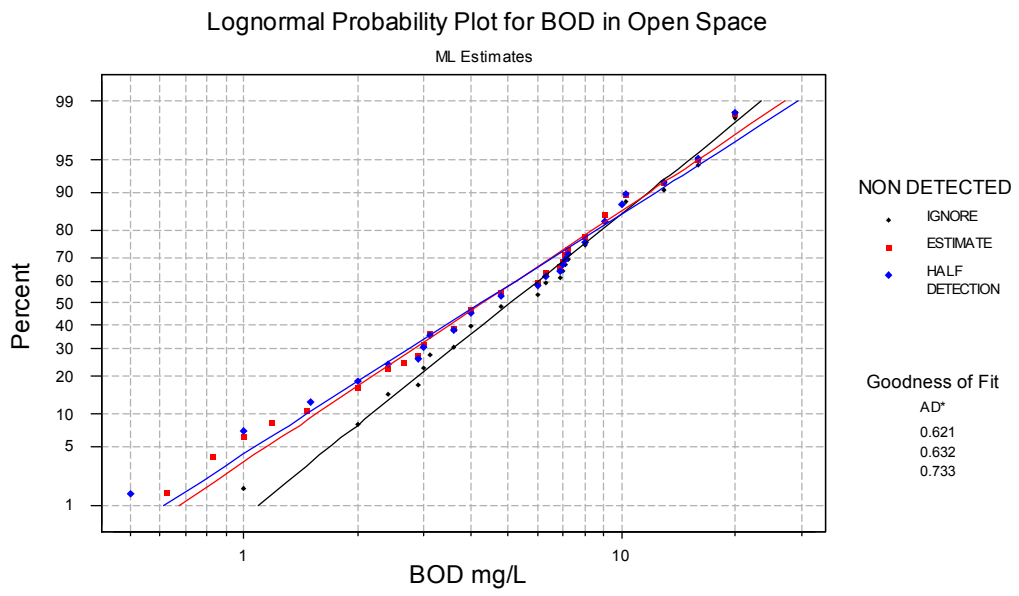

Figure D11. Estimated BOD_5 distributions for open space land use areas

Chemical Oxygen Demand (COD)

Differences in the means, averages and coefficients of variation for COD concentrations between the different methods for replacing the censored data were not important, except for the open space land use area where the level of non-detected observations was high (close to 25%) (Table D6). In the remaining land use areas, the frequency of non-detected values was smaller than 2%.

Table D6. Summary Statistics for Estimated Observations for COD (mg/L)

	RESIDENTIAL			COMMERCIAL			INDUSTRIAL		
Land use	**Ignore**	**Estimate**	**HD**	**Ignore**	**Estimate**	**HD**	**Ignore**	**Estimate**	**HD**
Observations	796	796	796	373	373	373	361	361	361
% Detected	98.87			98.39			98.89		
Minimum	5.00	1.74	0.50	4.00	1.96	0.50	2.00	2.00	2.00
Maximum	620	620	620	635	635	635	1260	1260	1260
Average	74.34	73.55	73.52	94.11	92.70	92.63	103.23	102.26	102.17
Median	55.00	53.60	53.60	60.00	59.00	59.00	60.00	59.00	59.00
Standard Dev.	69.12	69.12	69.15	94.39	94.28	94.34	127.35	126.97	127.03
Coeff. of Var.	0.93	0.94	0.94	1.00	1.02	1.02	1.23	1.24	1.24

	OPEN SPACE			FREEWAY		
Land use	**Ignore**	**Estimate**	**HD**	**Ignore**	**Estimate**	**HD**
Observations	44	44	44	67	67	67
% Detected	75.00			98.51		
Minimum	8.00	3.70	5.00	2.44	2.44	2.44
Maximum	476	476	476	1012.82	1012.82	1012.82
Average	51.47	40.93	40.76	140.99	139.10	138.96
Median	42.10	24.85	24.85	100.00	100.00	100.00
Standard Dev.	79.11	70.73	70.78	148.89	148.56	148.69
Coeff. of Var.	1.54	1.73	1.74	1.06	1.07	1.07

One characteristic of the COD probability plot is that the lower tail does not follow the trend showed by the rest of the distribution. Figure D12 shows an example COD distribution for residential land use areas. This effect is increased when the censored data is estimated or replaced by half of the detection limit.

The mean value in open space land use areas was increased by 25% when the censored data was ignored (Figure D13). In contrast, the coefficient of variation was reduced by almost 12 % when the non-detected values were ignored. No significant differences can be observed when the censored data was estimated using Cohen's method or replaced with half of the detection limit.

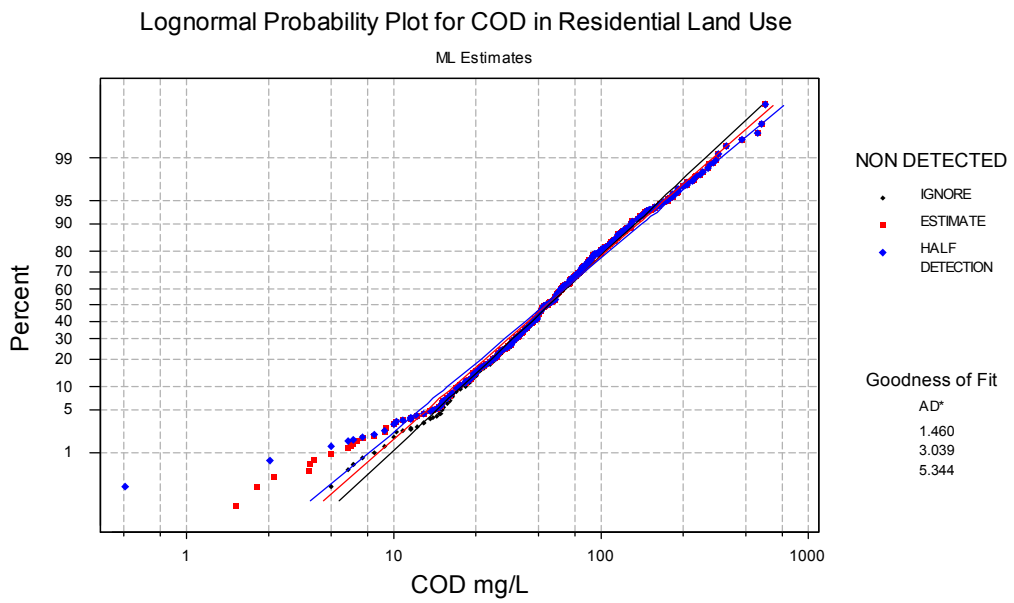

Figure D12. Estimated COD distributions in residential land use areas

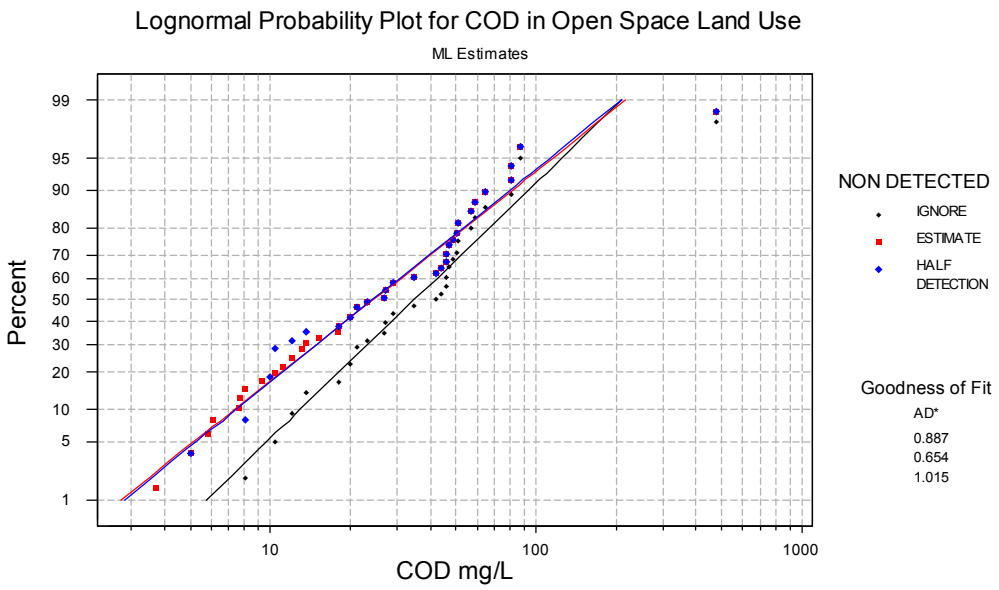

Figure D13. Estimated COD distributions in open space land use areas

Ammonia (NH_3)

Ammonia had one of the largest levels of censored observations of the common stormwater constituents examined in detail. The percentage of non-detected observations was about 20%, except for open space areas where it is more than 80%. The highest ammonia concentrations were observed at the freeway sites. Ignoring the censored observations increased the mean values by about 15%, while ignoring the non-detected values increased the coefficients of variation by almost 15%.

Table A7. Summary Statistics for Estimated Observations for Ammonia (mg/L)

	RESIDENTIAL			COMMERCIAL			INDUSTRIAL		
Land use	**Ignore**	**Estimate**	**HD**	**Ignore**	**Estimate**	**HD**	**Ignore**	**Estimate**	**HD**
Observations	595	595	595	299	299	299	253	252	253
% Detected	81.51			83.28			83.40		
Minimum	0.01	0.00	0.01	0.02	0.00	0.01	0.03	0.00	0.01
Maximum	5.60	5.60	5.60	7.80	7.80	7.80	9.84	9.84	9.84
Average	0.47	0.40	0.39	0.85	0.73	0.73	0.78	0.68	0.68
Median	0.32	0.27	0.25	0.50	0.41	0.40	0.47	0.38	0.36
Standard Dev.	0.51	0.48	0.48	1.02	0.97	0.97	0.96	0.91	0.91
Coeff. of Var.	1.09	1.20	1.22	1.20	1.32	1.33	1.23	1.35	1.35

	OPEN SPACE			FREEWAY		
Land use	**Ignore**	**Estimate**	**HD**	**Ignore**	**Estimate**	**HD**
Observations	32	32	32	79	79	79
% Detected	18.75			87.34		
Minimum	0.07	0.02	0.01	0.08	0.08	0.08
Maximum	1.80	1.80	1.80	11.87	11.87	11.87
Average	0.64	0.27	0.26	1.73	1.53	1.52
Median	0.18	0.25	0.25	1.07	0.90	0.90
Standard Dev.	0.79	0.38	0.38	2.24	2.16	2.16
Coeff. of Var.	1.24	1.43	1.44	1.30	1.41	1.42

The probability plots showed that replacing the non-detected values by half of the detection limit resulted in lower values than if the Cohen's method was used. The Anderson Darling statistic for normality increased when the censored data was estimated, indicating a better fit to a normal distribution. Figure D14 shows the probability plot for ammonia for commercial land use areas. In open space areas, the estimated values don't seem to fit the log normal distribution (Figure D15). Estimating the censored observations using Cohen's method when more than 80% of the observations were below the detection limit is certainly not recommended.

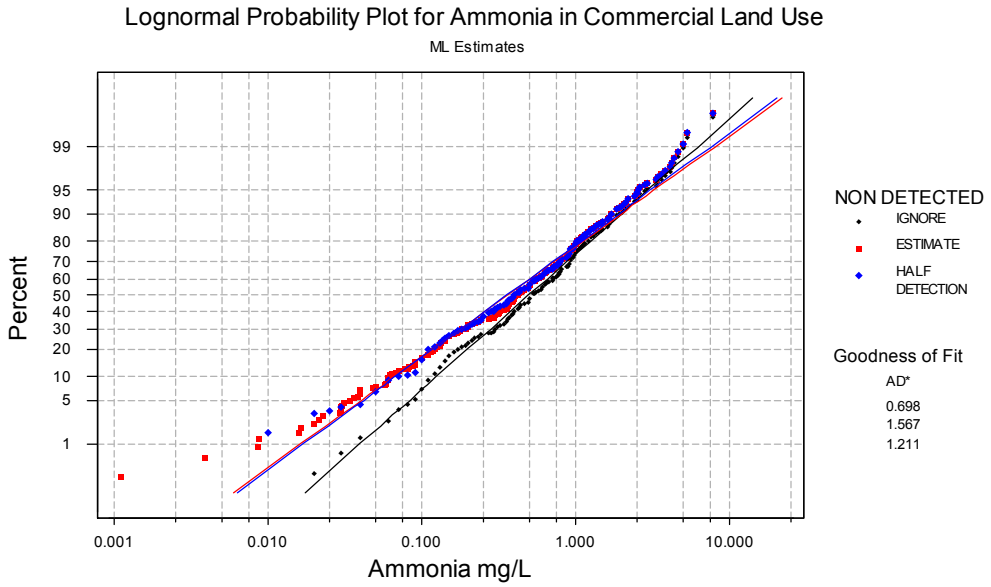

Figure D14. Estimated ammonia distributions in commercial land use areas

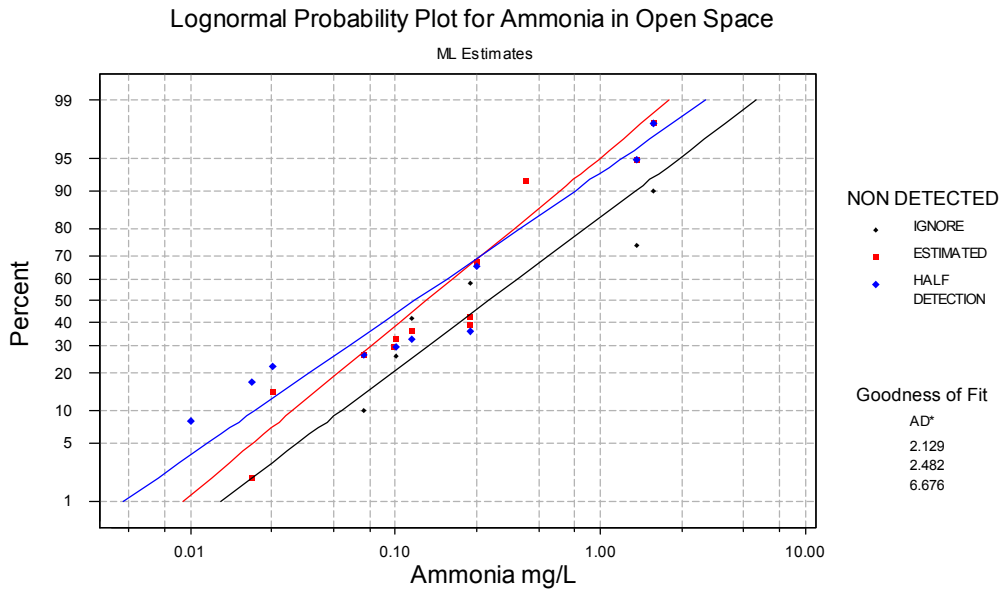

Figure D15. Estimated Ammonia distributions in open space land use areas

Nitrite and Nitrate ($NO_2 + NO_3$)

The percentages of non-detected values was smaller than 5% in all the land uses for nitrites plus nitrates, except for open space areas where the level of censored values was higher than 15%. There were no significant differences in the means, standard deviations and coefficients of variation, except for the open space data set, when the alternative substitution methods were used.

Table D8. Summary Statistics for Estimated Observations for $NO_2 + NO_3$ (mg/L)

	RESIDENTIAL			COMMERCIAL			INDUSTRIAL		
Land use	**Ignore**	**Estimate**	**HD**	**Ignore**	**Estimate**	**HD**	**Ignore**	**Estimate**	**HD**
Observations	927	927	927	425	425	425	417	417	417
% Detected	97.41			98.12			96.16		
Minimum	0.01	0.01	0.01	0.03	0.02	0.01	0.02	0.02	0.01
Maximum	18.00	18.00	18.00	8.21	8.21	8.21	8.40	8.40	8.40
Average	0.76	0.75	0.74	0.86	0.85	0.85	0.98	0.95	0.94
Median	0.59	0.58	0.58	0.61	0.60	0.60	0.73	0.72	0.70
Standard Dev.	0.87	0.86	0.86	0.91	0.91	0.91	0.87	0.86	0.86
Coeff. of Var.	1.14	1.15	1.16	1.06	1.08	1.08	0.89	0.91	0.91

	OPEN SPACE			FREEWAY		
Land use	**Ignore**	**Estimate**	**HD**	**Ignore**	**Estimate**	**HD**
Observations	44	44	44	25	25	25
% Detected	84.09			96.00		
Minimum	0.09	0.02	0.05	0.10	0.10	0.10
Maximum	3.33	3.33	3.33	3.00	3.00	3.00
Average	0.99	0.84	0.84	0.51	0.50	0.50
Median	0.59	0.50	0.50	0.28	0.28	0.26
Standard Dev.	0.88	0.88	0.88	0.63	0.62	0.62
Coeff. of Var.	0.89	1.04	1.04	1.23	1.23	1.25

The probability plots for residential, commercial and industrial land use areas show a different trend for the lower tail of the distribution up to the 10th percentile for the different methods. The departures from normality are more evident in the case when the censored observations are replaced by half of the detection limit (Figure D16). In open space areas, when the censored data was estimated or replaced, the coefficient of variation increased almost 17% due the elevated level of censoring (Figure D17). There were no observed differences in the means, standard deviations and coefficients of variation when the censored values were replaced by half of the detection limit or estimated using Cohen's method.

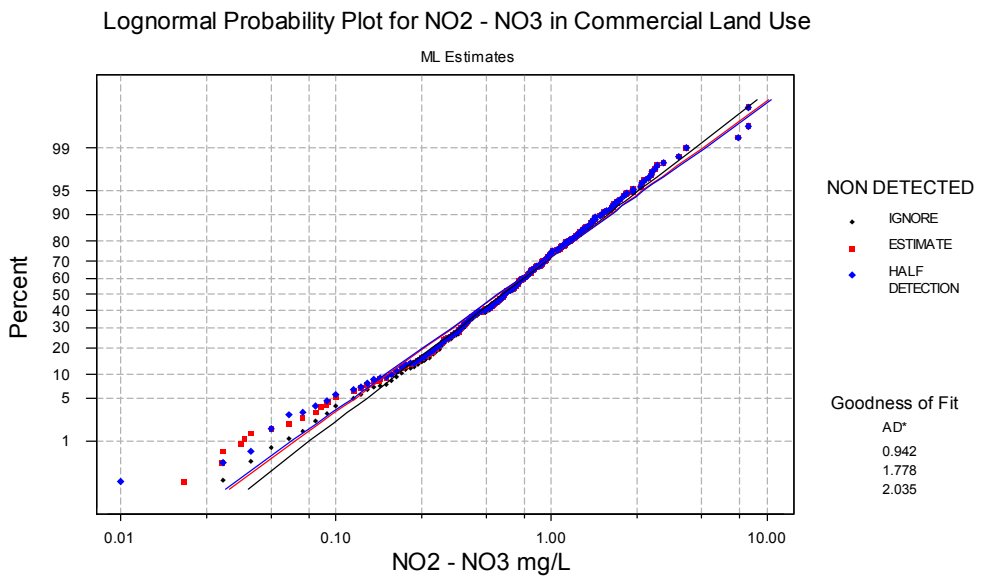

Figure D16. Estimated nitrate - nitrite distributions in commercial land use areas

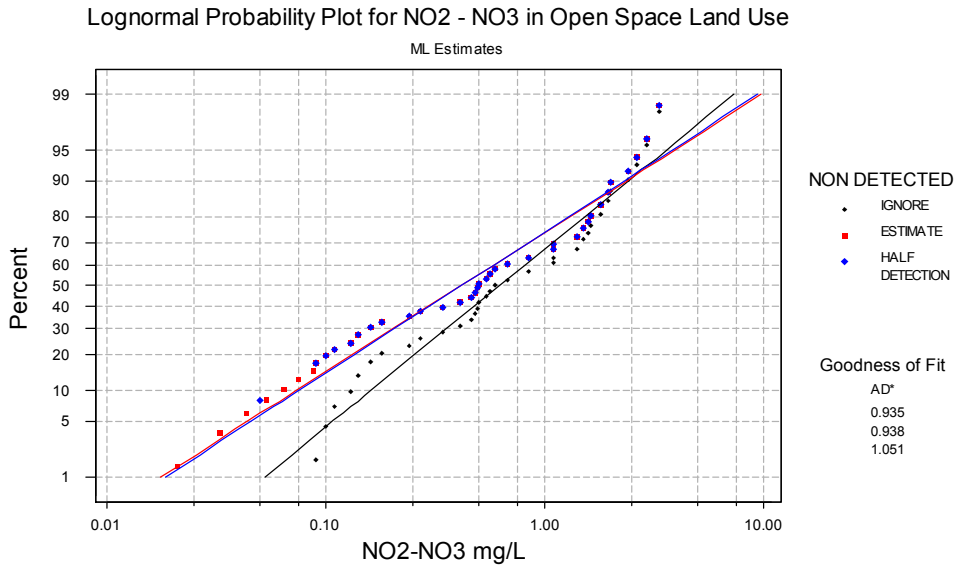

Figure D17. Estimated nitrate - nitrite distributions in open space land use areas

Total Kjeldahl Nitrogen (TKN)

The level of censoring for TKN was smaller than 4% for all land use areas except for open space areas. The highest TKN concentrations were observed in freeway areas, and the lowest TKN concentrations were observed in open space areas (Table D9). Large changes in the coefficient of variation were observed in open space areas when using Cohen's method (an increase of 15%) and when replacing the censored values by half of the detection limit (increases of 22%).

Table D9. Summary Statistics for Estimated Observations for TKN (mg/L)

	RESIDENTIAL			COMMERCIAL			INDUSTRIAL		
Land use	**Ignore**	**Estimate**	**HD**	**Ignore**	**Estimate**	**HD**	**Ignore**	**Estimate**	**HD**
Observations	957	957	957	449	449	449	439	439	439
% Detected	96.76			97.33			95.90		
Minimum	0.05	0.00	0.01	0.05	0.02	0.01	0.05	0.01	0.01
Maximum	36.00	36.00	36.00	15.00	15.00	15.00	25.00	25.00	25.00
Average	1.96	1.91	1.90	2.23	2.18	2.17	2.23	2.17	2.16
Median	1.43	1.40	1.40	1.59	1.55	1.55	1.40	1.37	1.37
Standard Dev.	2.05	2.04	2.04	2.08	2.07	2.08	2.56	2.53	2.54
Coeff. of Var.	1.05	1.07	1.07	0.93	0.95	0.96	1.15	1.17	1.18

	OPEN SPACE			FREEWAY		
Land use	**Ignore**	**Estimate**	**HD**	**Ignore**	**Estimate**	**HD**
Observations	45	45	45	125	125	125
% Detected	71.11			96.80		
Minimum	0.20	0.20	0.20	0.20	0.19	0.05
Maximum	4.70	4.70	4.70	36.15	36.15	36.15
Average	1.35	1.08	1.03	3.29	3.20	3.19
Median	0.74	0.50	0.50	2.00	1.93	1.93
Standard Dev.	1.20	1.10	1.13	4.49	4.44	4.45
Coeff. of Var.	0.89	1.02	1.09	1.37	1.39	1.39

The lognormal probability plot follows a straight line, except for the lower tail up to the 5th percentile (Figure D18). The effect on the Anderson Darling statistic is increased when the censored data is estimated. The effect is higher when the non-detected values are replaced by half of the detection limit, instead of being estimated using Cohen's maximum likelihood estimator. In open space areas when the level of censoring is elevated and the number of observations is low, the Cohen's estimated method did not follow a lognormal distribution. In Figure A19, two groups seem to exist, but it is important to mention that more than 44% of the total TKN observations were lower than 0.5 mg/L. All the censored values in this land use were located at 0.5 mg/L TKN.

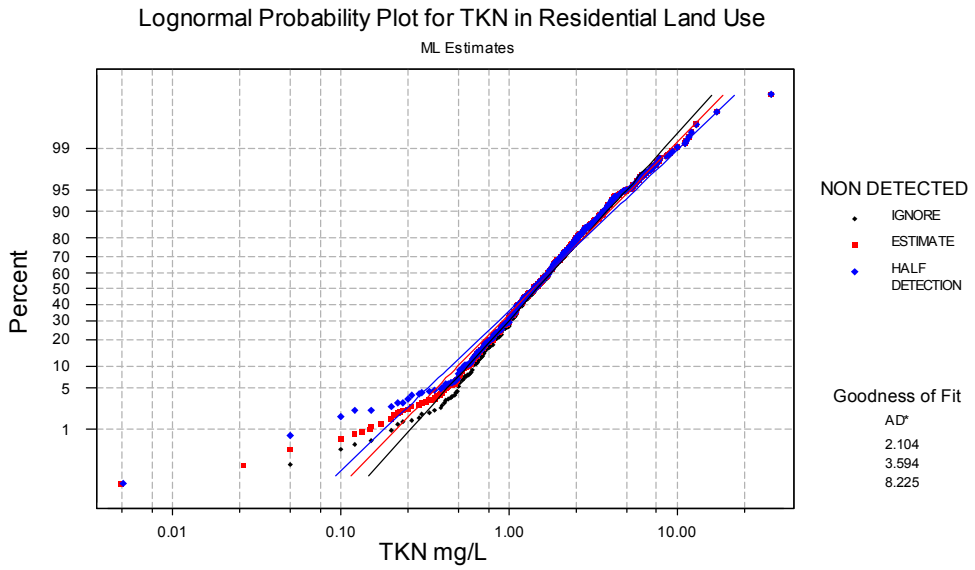

Figure D18. Estimated TKN distributions in residential land use areas

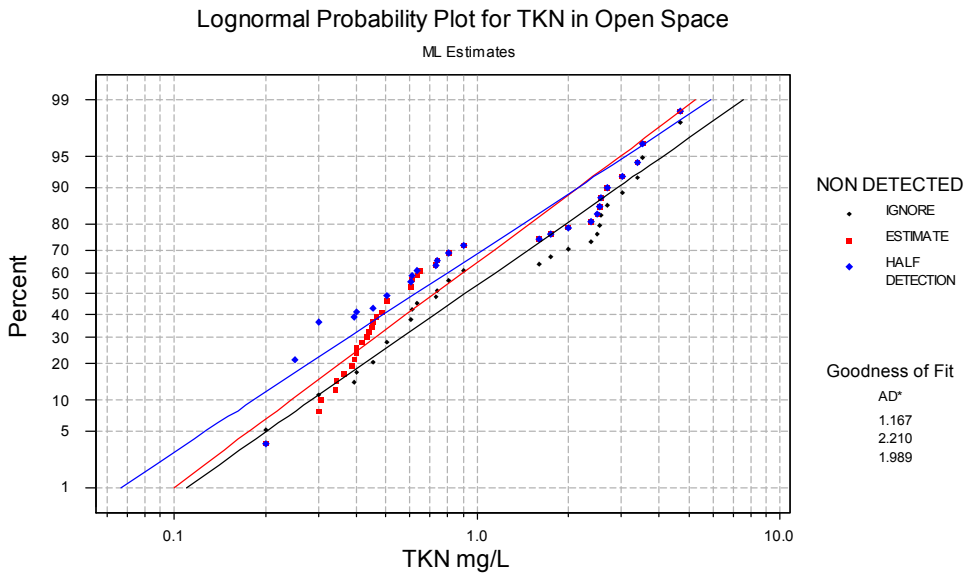

Figure D19. Estimated TKN distributions in open space land use areas

Total Phosphorus

Total phosphorus has low level of censored observations (less than 5%) at all land use areas, except for open space (where it is close to 15%) (Table D10). Variations in the coefficient of variation were not significant, except in open space areas where ignoring the censored observations reduces the coefficient of variation by almost 7%.

Table D10. Summary Statistics for Estimated Observations for Total Phosphorus (mg/L)

	RESIDENTIAL			COMMERCIAL			INDUSTRIAL		
Land use	**Ignore**	**Estimate**	**HD**	**Ignore**	**Estimate**	**HD**	**Ignore**	**Estimate**	**HD**
Observations	963	963	963	446	446	446	434	434	434
% Detected	96.88			95.74			95.85		
Minimum	0.01	0.00	0.01	0.02	0.01	0.01	0.02	0.01	0.01
Maximum	6.90	6.90	6.90	3.35	3.35	3.35	7.90	7.90	7.90
Average	0.42	0.41	0.41	0.35	0.34	0.34	0.46	0.45	0.45
Median	0.30	0.30	0.30	0.22	0.22	0.22	0.26	0.25	0.25
Standard Dev.	0.47	0.47	0.47	0.40	0.39	0.39	0.64	0.63	0.63
Coeff. of Var.	1.13	1.14	1.14	1.16	1.16	1.16	1.39	1.41	1.40

	OPEN SPACE			FREEWAY		
Land use	**Ignore**	**Estimate**	**HD**	**Ignore**	**Estimate**	**HD**
Observations	46	46	46	128	128	128
% Detected	84.78			99.22		
Minimum	0.02	0.01	0.01	0.06	0.05	0.02
Maximum	15.40	15.40	15.40	7.19	7.19	7.19
Average	0.68	0.59	0.60	0.43	0.43	0.43
Median	0.31	0.22	0.25	0.25	0.25	0.25
Standard Dev.	2.43	2.24	2.24	0.76	0.76	0.76
Coeff. of Var.	3.54	3.77	3.74	1.76	1.77	1.77

When the censored data is ignored, the observations followed a lognormal distribution. However, if the non-detected values are replaced by half of the detection limit or estimated using the Cohen method, the lower tail has lower values than expected.

There is an unusual observation 20 times higher than the second highest observation for the open space data (Figure D20). The most frequent non-detected observation was <0.5 mg/L. Replacing the censored observations by half of the detection limit produces values smaller than those estimated by Cohen's method. In the freeway plot, it was observed that the higher observations are higher than the lognormal trend. The upper 20th percentile has a different slope than the remaining observations shown on the distribution.

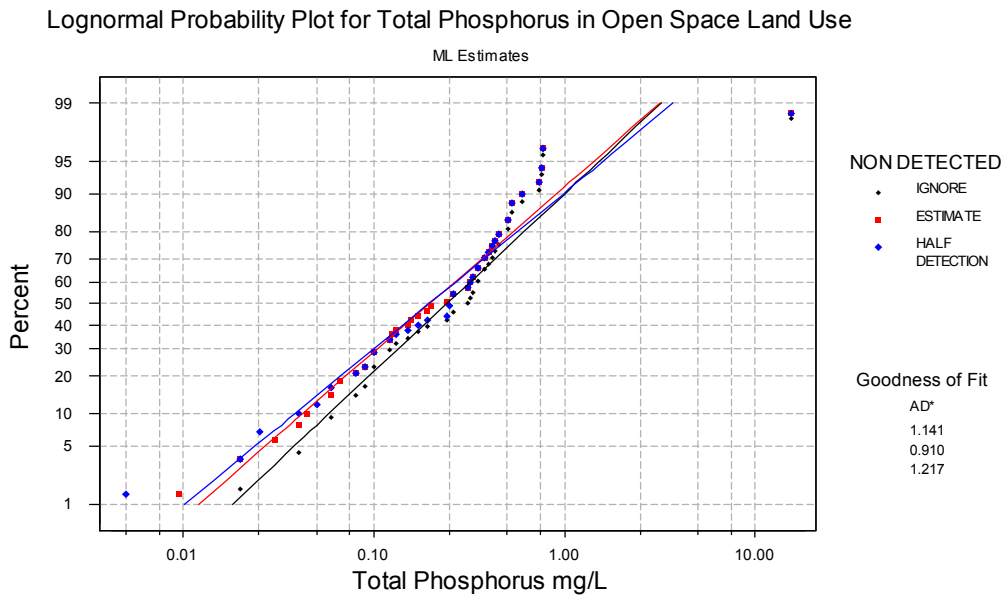

Figure D20. Estimated total phosphorus distributions in open space land use areas

Dissolved Phosphorus

Dissolved phosphorus has a large amount of non-detected values in all the land use areas (about 13 to 20%), except for freeways where only 5% of the observations were censored. In general, ignoring the non-detected values increased the means and standard deviations and reduced the coefficients of variation. Table D11 shows the descriptive statistics for dissolved phosphorus.

Table D11. Summary Statistics for Estimated Observations Dissolved Phosphorus (mg/L)

	RESIDENTIAL			COMMERCIAL			INDUSTRIAL		
Land use	**Ignore**	**Estimate**	**HD**	**Ignore**	**Estimate**	**HD**	**Ignore**	**Estimate**	**HD**
Observations	738	738	738	323	323	323	325	325	325
% Detected	84.15			81.11			87.38		
Minimum	0.009	0.001	0.005	0.01	0.00	0.01	0.003	0.003	0.003
Maximum	1.69	1.69	1.69	1.60	1.60	1.60	1.60	1.60	1.60
Average	0.23	0.20	0.20	0.21	0.18	0.19	0.17	0.16	0.16
Median	0.17	0.14	0.14	0.11	0.09	0.09	0.11	0.10	0.10
Standard Dev.	0.21	0.21	0.21	0.27	0.25	0.25	0.20	0.19	0.19
Coeff. of Var.	0.94	1.04	1.05	1.24	1.35	1.34	1.18	1.23	1.23

	OPEN SPACE			FREEWAY		
Land use	**Ignore**	**Estimate**	**HD**	**Ignore**	**Estimate**	**HD**
Observations	44	44	44	22	22	22
% Detected	79.55			95.45		
Minimum	0.010	0.003	0.005	0.06	0.01	0.01
Maximum	0.52	0.52	0.52	6.97	6.97	6.97
Average	0.18	0.16	0.17	0.78	0.75	0.75
Median	0.13	0.09	0.14	0.20	0.20	0.20
Standard Dev.	0.16	0.15	0.15	1.66	1.63	1.63
Coeff. of Var.	0.89	0.95	0.87	2.13	2.18	2.18

As in the previous cases, ignoring the censored observations results in larger mean values. There were no observed practical differences between the maximum likelihood method and replacing the non-detected values with half of the detection limit (Figure D21). , Dissolved phosphorus had the lowest level of censoring at freeway sites. The probability plot indicates that the distribution is heavy in the tails; the slope between the 20th and 60th percentiles is higher than in the tails (Figure D22).

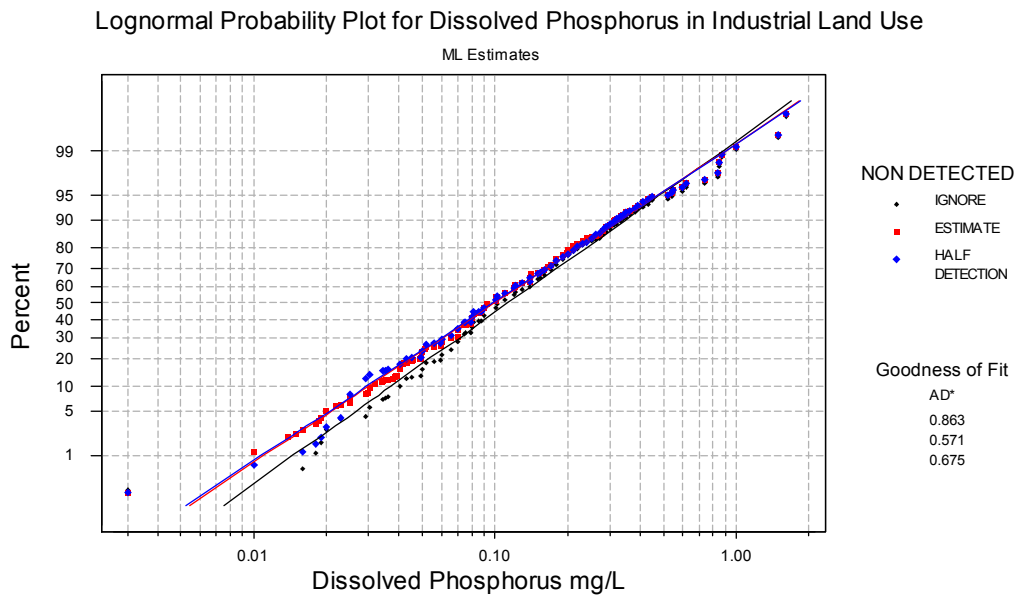

Figure D21. Estimated dissolved phosphorus distributions in industrial land use areas

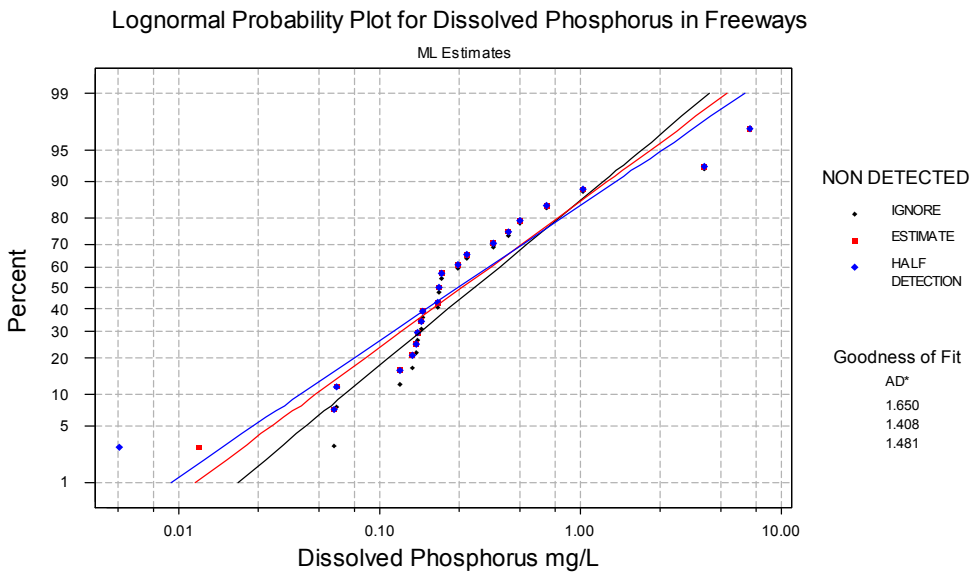

Figure D22. Estimated dissolved phosphorus distributions in freeways land use areas

Total Cooper (Cu)

The levels of censoring for copper vary from 1 to 15% among the different land uses. When the non-detected values are estimated or replaced by half of the detection limit, the coefficients of variation increased between 1% and 6%, in addition there is a reduction in the means and standard deviations. Table D12 shows the descriptive statistics for each method by land use.

Table D12. Summary Statistics for Estimated Observations for Total Cooper (μg/L)

	RESIDENTIAL			COMMERCIAL			INDUSTRIAL		
Land use	**Ignore**	**Estimate**	**HD**	**Ignore**	**Estimate**	**HD**	**Ignore**	**Estimate**	**HD**
Observations	799	799	799	387	387	387	415	415	415
% Detected	83.60			92.76			89.64		
Minimum	1.00	0.25	0.23	1.50	1.50	1.00	1.97	1.77	1.00
Maximum	590	590	590	384	384	384	1360	1360	1360
Average	21.06	18.54	18.51	29.02	27.47	27.30	47.00	43.37	42.98
Median	12.00	10.00	10.00	17.00	15.60	15.00	21.88	20.00	20.00
Standard Dev.	38.51	35.70	35.69	42.92	41.73	41.79	93.81	89.47	89.60
Coeff. of Var.	1.83	1.93	1.93	1.48	1.52	1.53	2.00	2.06	2.08

	OPEN SPACE			FREEWAY		
Land use	**Ignore**	**Estimate**	**HD**	**Ignore**	**Estimate**	**HD**
Observations	39	39	39	97	97	97
% Detected	74.36			98.97		
Minimum	2.00	2.00	2.00	5.00	5.00	5.00
Maximum	210	210	210	244	244	244
Average	19.15	15.79	15.65	48.29	47.86	47.85
Median	10.00	5.30	5.00	34.70	33.40	33.40
Standard Dev.	38.97	33.98	34.00	45.91	45.87	45.89
Coeff. of Var.	2.04	2.15	2.17	0.95	0.96	0.96

The lognormal probability plots for residential and commercial land use areas indicate that the upper 5th percentile of the copper concentrations have higher values than expected if the distribution was lognormal. This observation is important because the upper tail of the distribution has an important effect in the mean and standard deviation values of the dataset.

In open space areas, replacing the non-detected values by the Cohen's method or replacing the non-detected values by half of the detection limit, reduce the means and standard deviations of the distribution by 18% and 13%, respectively. The probability plot for freeway areas is almost a perfect lognormal trend. In this case, the level of non-detected values was only 1%, and the difference in the coefficients of variations was also 1%.

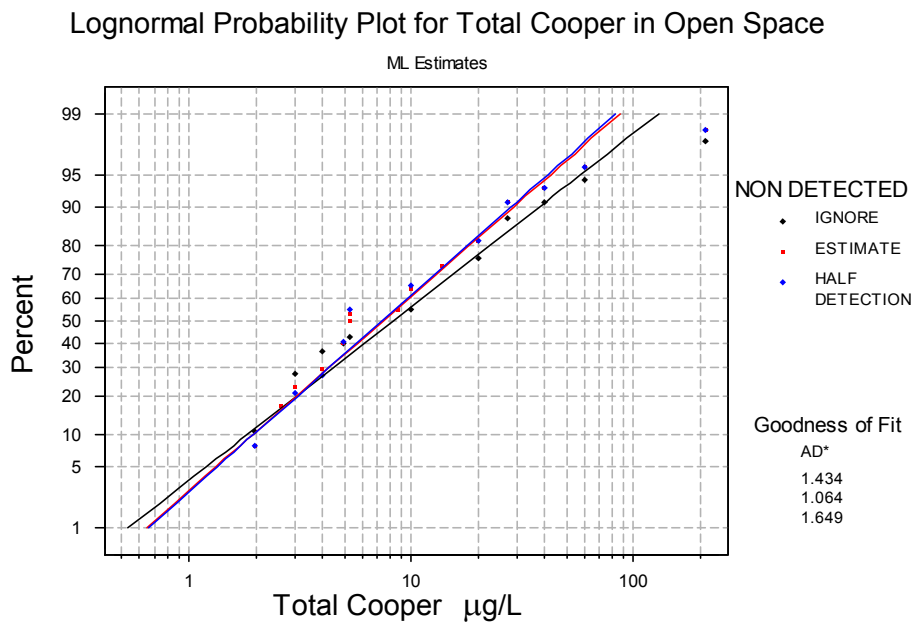

Figure D23. Estimated total cooper distributions in open space land use areas

Total Lead

The level of non-detected values for lead varied from 0 to 58%. All the observations at the freeway sites indicate a presence of lead, in addition to the highest concentration among the land uses. Open land use areas had the highest level of non-detected lead values. There was about a 10% reduction in the coefficient of variation when the censored data were ignored. Table D13 shows the descriptive statistics for each method.

The probability plots indicate that when replacing the censored data by half of the detection limit, the values are smaller than when using Cohen's method (Figure D24). Estimating the censored values reduces the Anderson Darling statistic. In open space areas, most of the censored values were observed at < 40 mg/L, < 50 mg/L and < 100 mg/L. In all land use areas, almost 80% of the lead observations were smaller than 50 mg/L. In open space areas, the estimated means, standard deviations and coefficients of variation are dubious because most of the censored observations were located in the upper part of the distribution (the frequency of non-detectable observations was quite high, at about 58%).

Table D13. Summary Statistics for Estimated Observations for Total Lead (µg/L)

	RESIDENTIAL			COMMERCIAL			INDUSTRIAL		
Land use	**Ignore**	**Estimate**	**HD**	**Ignore**	**Estimate**	**HD**	**Ignore**	**Estimate**	**HD**
Observations	788	723	788	377	355	377	411	377	411
% Detected	71.32			85.41			76.40		
Minimum	0.50	0.03	0.10	1.00	0.21	0.35	1.00	0.21	0.50
Maximum	585	585	585	689.07	689.07	689.07	1200	1200	1200
Average	26.00	21.03	22.08	37.42	34.27	33.84	70.10	59.52	57.49
Median	12.00	8.20	10.00	18.00	17.00	17.00	25.00	20.00	20.00
Standard Dev.	48.98	44.21	43.17	59.53	57.56	56.07	128.57	119.79	115.57
Coeff. of Var.	1.88	2.10	1.96	1.59	1.68	1.66	1.83	2.01	2.01

	OPEN SPACE			FREEWAY		
Land use	**Ignore**	**Estimate**	**HD**	**Ignore**	**Estimate**	**HD**
Observations	45	29	45	107	107	107
% Detected	42.22			100.00		
Minimum	0.20	0.08	0.10	1.60	1.60	1.60
Maximum	150	150	150	450	450	450
Average	28.39	19.21	23.98	48.77	48.77	48.77
Median	10.00	3.16	10.00	25.00	25.00	25.00
Standard Dev.	47.36	40.10	33.70	70.74	70.74	70.74
Coeff. of Var.	1.67	2.09	1.41	1.45	1.45	1.45

Total Zinc

The percentage of non-detected zinc values was smaller than 4%, except for open space areas where it was close to 30% (Table D14). No important changes in the coefficient of variations were observed, except for open space areas where ignoring the censored values reduced the coefficients of variation by 13%.

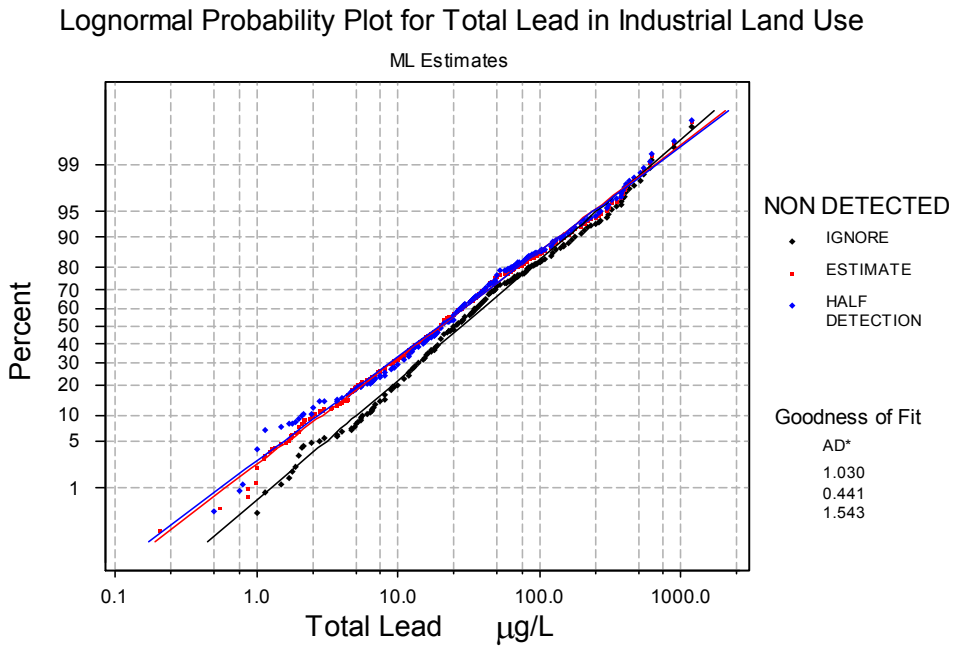

Figure D24. Estimated total lead distributions in industrial land use areas

Table D14. Summary Statistics for Estimated Observations for Total Zinc (μg/L)

	RESIDENTIAL			COMMERCIAL			INDUSTRIAL		
Land use	**Ignore**	**Estimate**	**HD**	**Ignore**	**Estimate**	**HD**	**Ignore**	**Estimate**	**HD**
Observations	810	810	810	392	392	392	432	432	432
% Detected	96.42			98.98			98.61		
Minimum	3.00	0.48	0.30	5.00	5.00	5.00	5.77	3.05	2.00
Maximum	1580	1580	1580	3050	3050	3050	8100	8100	8100
Average	116.70	113.53	113.23	225.32	224.06	223.55	318.25	315.02	314.34
Median	73.00	70.00	70.00	150.00	150.00	150.00	209.50	204.50	201.00
Standard Dev.	151.81	150.25	150.24	275.81	274.74	274.96	474.36	471.89	472.21
Coeff. of Var.	1.30	1.32	1.33	1.22	1.23	1.23	1.49	1.50	1.50

	OPEN SPACE			FREEWAY		
Land use	**Ignore**	**Estimate**	**HD**	**Ignore**	**Estimate**	**HD**
Observations	45	45	45	93	93	93
% Detected	71.11			96.77		
Minimum	5.00	2.00	2.50	6.00	6.00	2.50
Maximum	390	390	390	1829	1829	1829
Average	72.44	55.90	55.62	279.43	271.63	271.52
Median	40.00	20.00	20.00	200.00	194.49	194.49
Standard Dev.	96.88	85.85	85.99	281.16	279.87	279.98
Coeff. of Var.	1.34	1.54	1.55	1.01	1.03	1.03

The probability plot indicates that in the lower tail, replacing the non-detected observations by half of the detection limit will create smaller values than when estimating them using Cohen's method (Figure D25). In open space areas, if the censored data are estimated using Cohen's method, there is a reduction in the mean and variance of the dataset of 23% and 12%, respectively, however the coefficients of variation increased by 15% (Figure D26).

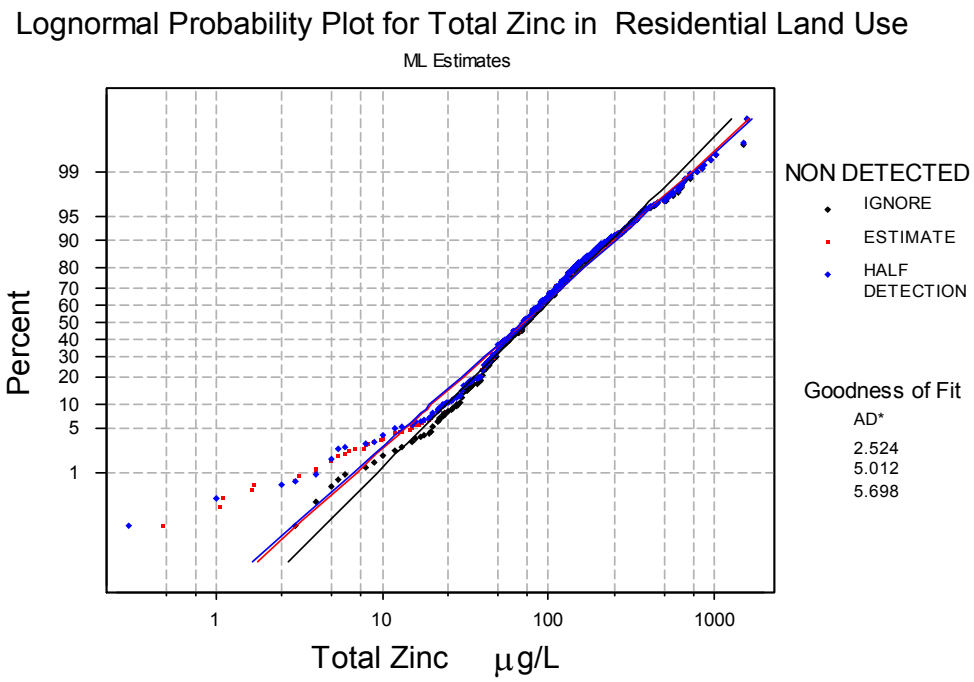

Figure D25. Estimated total zinc distributions in residential land use areas

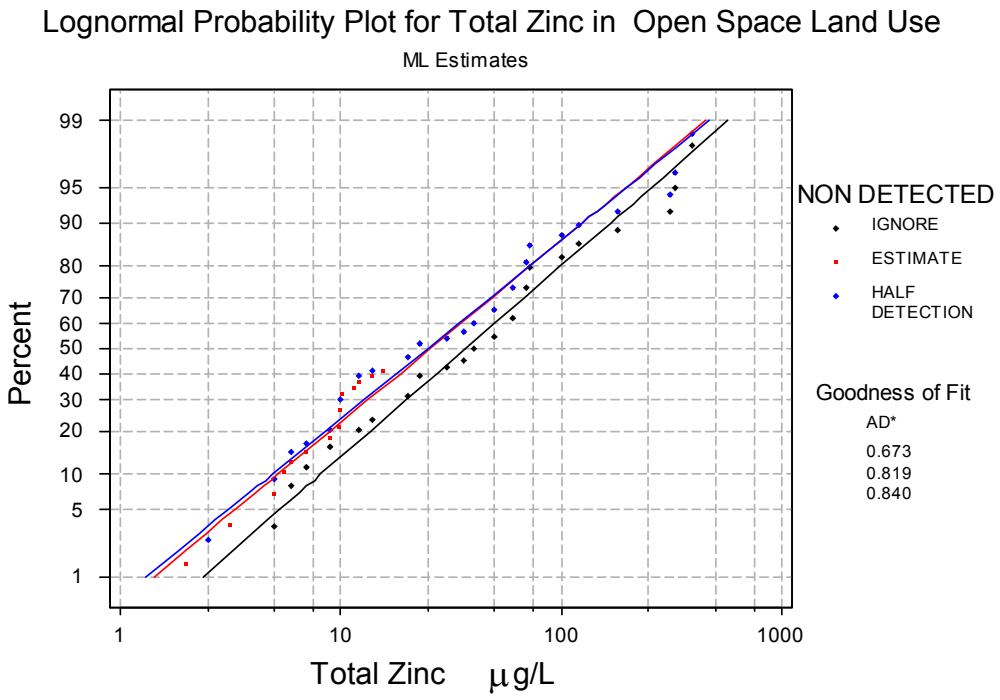

Figure D26. Estimated total zinc distributions in open space land use areas

Sites with Unusual TSS Concentrations for Different Land Uses

This section presents the continuation of the example presented in Chapter 3, where sites having unusual conditions were identified and examined more carefully to try to understand the reasons for these values. A similar procedure was followed in this appendix for the commercial, industrial and mixed land use areas to complement the Chapter 3 analyses, which were conducted for residential areas only.

Residential and Mixed Residential Locations

The box and whisker plot (Figure D27 shows TSS concentrations by rain zone and location) indicates that there is only one site that seems to have a different TSS concentration probability distribution compared to the remaining sites in this group. The site of interest is located in a residential-commercial area in Wooden Bridge Run, Philadelphia (PAPH1051), and has much lower concentrations that the other sites. Only two samples were collected at this site, and both were below 15 mg/L. The few samples available reduce the significance of this observation, however.

The results from the Xbar S chart analyses for mixed residential land uses are presented in Table D15. These analyses consider the numbers of samples and the variability of the data from each site, compared to the complete data set in the category being examined.

Table D15. Sites failing Xbar and S Chart Tests in Mixed Residential Land Use Areas

EPA Rain Zone	Sites Failing Xbar Chart Test	Sites Failing S Chart Test
ALL	9COCSA004(H) 2NCFVROSE(L) 7ORPOA005(H) 2TNKXTYGV(H) 5TXFWA005(H) 2VAVBTYV5(L)	GAFUCOS3(H)
1	None	None
2	TNKXTYGV(H) VAVBTYV5(L)	None
3	None	None
4	None	None
5	None	None
6	None	None
7	None	None
8	None	None
9	None	None

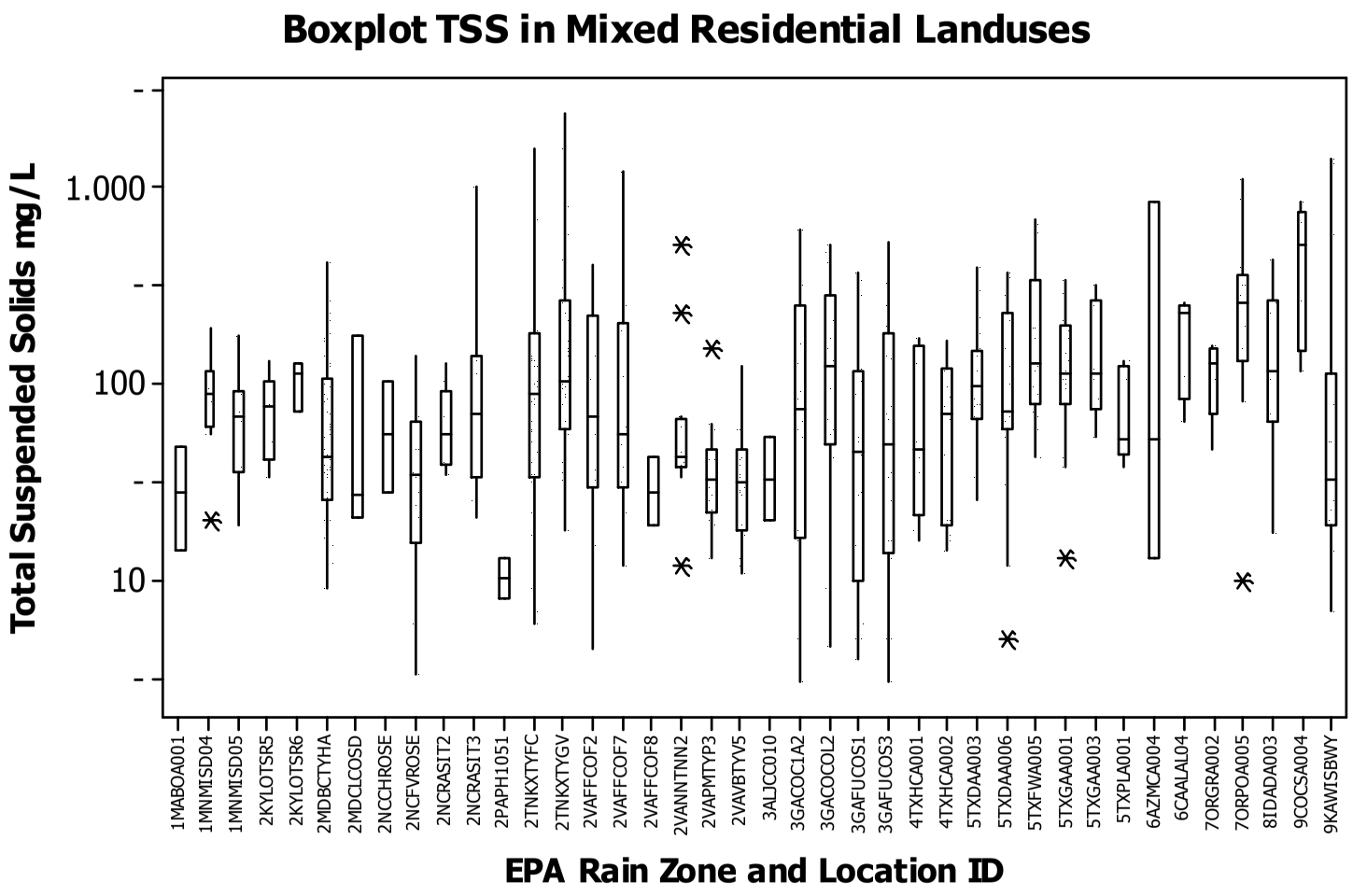

Figure D27. Box and whiskers plots for TSS concentrations at mixed residential land use areas

When 40 mixed residential sites were examined, only six sites were designated as being "out of control." These sites had unusual concentrations that were outside a band described by three standard deviations from the mean values. Two sites with means (log) below the lower control limit were located in EPA Rain Zone 2 (North Carolina and Virginia). The site located at Long Island Creek in Fulton County, Georgia, has the largest standard deviation among the mixed residential sites examined. However, the S chart indicates that this site is in control compared to other sites in EPA Rain Zone 3.

There are 21 sites located in mixed residential land use areas and in EPA Rain Zone 2, 17 sites have more than one observation each. Two sites, one above the upper control limit and one below the control limit, were observed in the Xbar chart. The site with the high median (log) value is located in Gallaher view, Knoxville, Tennessee (TNKXTYGV, 38 observations, median TSS = 105 mg/L). This site information included construction activity in the north part of the watershed, and a self-storage business, north and east of Cedar Hills apartments. The site located in Holland road, Virginia Beach (VAVBTYV5, 26 observations, median TSS = 32 mg/L) has wet ponds in the watershed that seem to control high concentrations, but the average value is the same as the other mixed residential sites.

The ANOVA analyses indicate that there is at least one EPA Rain Zone with TSS concentrations different than the other EPA Rain Zone with a p-value smaller than 1%. The Dunnett's comparison test at a family error rate of 5% indicates that EPA Rain Zones 5 and 7 have higher concentrations than those observed in EPA Rain Zone 2.
In summary, at a family error rate of 5%, higher concentrations occurred in EPA Rain Zones 5 (six sites, median TSS = 108 mg/L) and 7 (two sites, TSS = 175 mg/L) compared with EPA Rain Zone 2 (21 sites, TSS = 59 mg/L). The Kurskal-Wallis test indicates that there is a significant difference in the TSS median concentrations (with a p-value close to zero). Site TNKXTYGV has higher characteristics than the other residential mixed sites, most likely due to the noted construction activity close to the outfall location.

Commercial and Mixed Commercial Locations

Box plots Xbar and S charts and ANOVA tests were used for commercial land use data. Figure D28 identifies a site with high TSS concentration in EPA Rain Zone 4 (KATOJACK, 15 observations, median TSS = 603 mg/L). In general, it seems that sites in EPA Rain Zone 7 and 9 have higher concentrations than the other EPA Rain Zones. No other trend or variation among EPA Rain Zone was identified from the box plot.

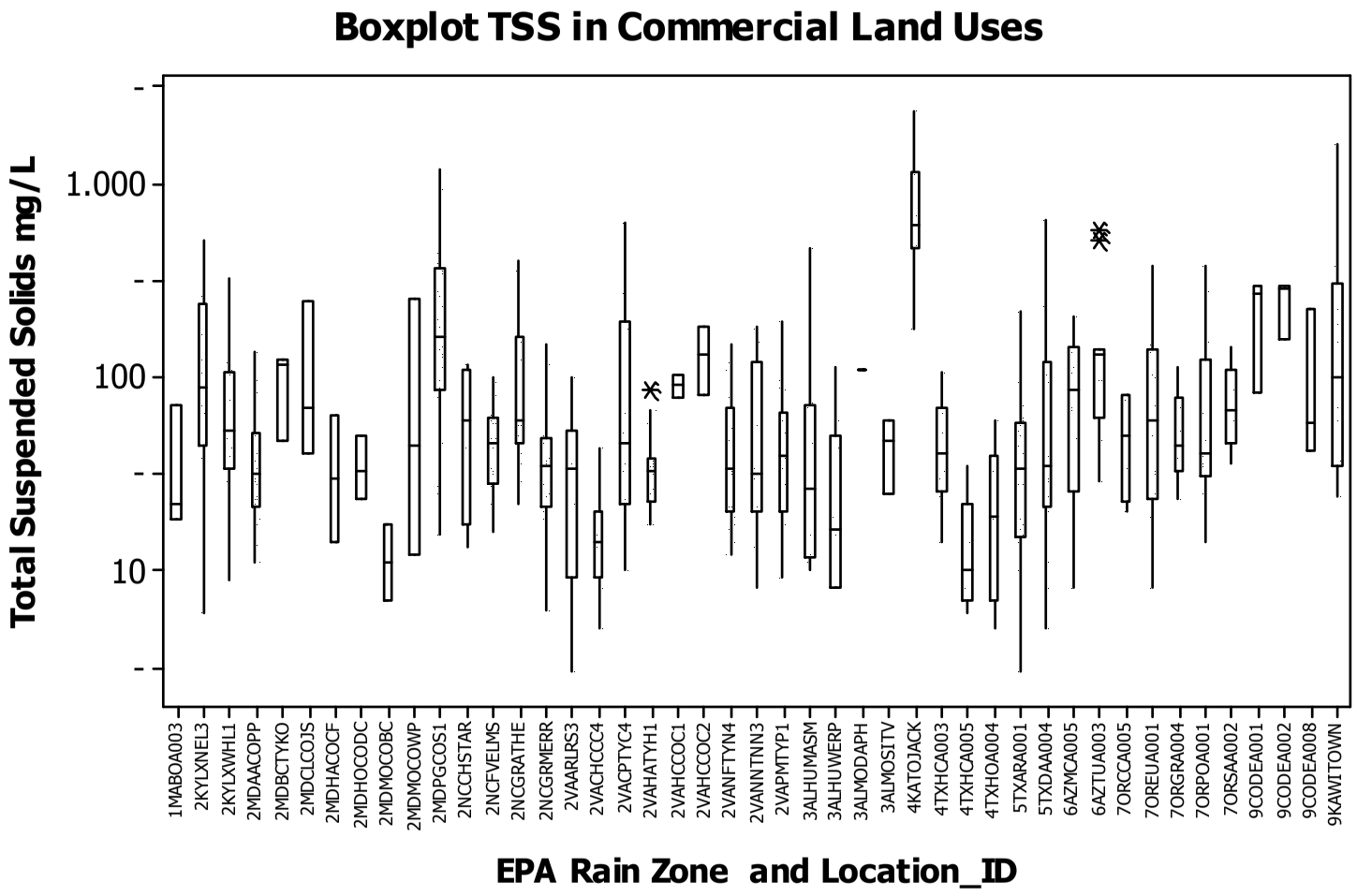

Figure D28. Box and whiskers plots for TSS concentrations at commercial land use areas

The second approach was to identify unusual sites by EPA Rain Zone using Xbar S charts. The results for commercial land uses are presented in Table D16.

Table D16. Sites failing Xbar and S Chart Tests in Commercial Land Use Areas

EPA Rain Zone	Sites Failing Xbar Chart Test	Sites Failing S Chart Test
ALL	2MDPGCOS1(H) 2VACHCCC4(L) 3ALHUWERP(L) 4KATOJACK(H) 4TXHCA005(L) 4TXHOA004(L) 9KAWITOWN(H)	None
1	None	None
2	2MDPGCOS1(H) 2VACHCCC4(L)	None
3	None	None
4	4KATOJACK(H)	None
5	None	None
6	None	None
7	None	None
9	None	None

The Xbar S plot did not indicate any trend by geographical region for the 45 sites. Sites with low concentrations were observed in EPA Rain Zones 2, 3 and 4. There were three sites identified with concentrations above the control limit, one in EPA Rain Zone 2, another in EPA Rain Zone 9, and a site identified by the box plot located in EPA Rain Zone 4.

In EPA Rain Zone 2, two sites were found outside the control limits. MDPGCOS1 is located in a shopping center in Arena Plaza, Price Georges County, Maryland. 26 samples were collected at this location. The median TSS concentration for this site is 158 mg/L. No reason was given for the high observed TSS concentrations. The second site is located at Clover Leaf Mall in Chesterfield County, Virginia (VACHCCC4, 12 observations, 60 acres, median TSS = 14 mg/L). There is no clear reason that explains the low concentrations found at this location. No sites outside the control limits were found in other EPA Rain Zones except for EPA Rain Zone 4. This outfall is located in Jackson Street in Topeka, Kansas. The high TSS concentrations may have been affected by tracking of sediment from a sand quarry close to the watershed. There were collected 16 samples collected between April 1998 and Septembers 2002.

The ANOVA test indicated that there was a significant difference among EPA Rain Zones (P-value = 0). The Dunnett's comparison test, with a family error of 5%, indicates that TSS concentrations compared with EPA Rain Zone 2 (median TSS = 48 mg/L) are larger in EPA Rain Zones 4 (median TSS= 82 mg/L) and 9 (median TSS = 128 mg/L). The median TSS concentrations at the remaining EPA Rain Zones are not statistically different than those observed in EPA Rain Zone 2.

There are 24 sites located in mixed commercial land use areas with more than one observation. EPA Rain Zone 2 has the largest number of sites (10 sites), followed by EPA Rain Zone 5 (5 sites). Figure D29 shows the box plots for mixed commercial land uses by EPA Rain Zone.

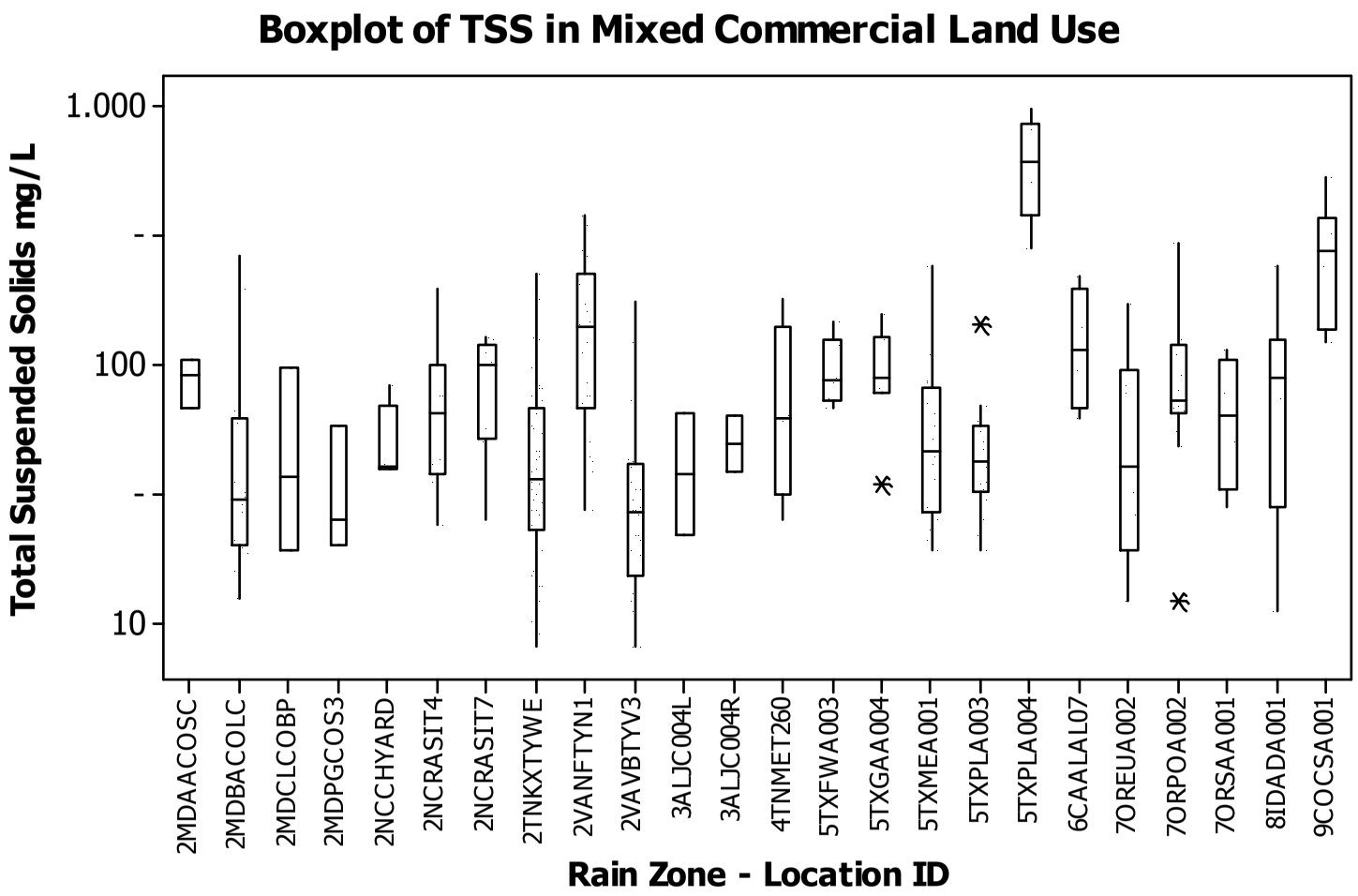

Figure D29. Box and whiskers plots for TSS concentrations at mixed commercial land use areas

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The box plot indicates that there is a mixed commercial site located in Plano, Texas, and a site in Colorado with higher concentrations than the other sites in this category. Because the low number of sites sampled by geographical region, it is not possible to identify any trend by EPA Rain Zone. Table D17 lists those sites outside the control limits by EPA Rain Zone for all of the mixed commercial sites.

Table D17. Sites failing Xbar and S Chart Tests in Mixed Commercial Land Use Areas

EPA Rain Zone	Sites Failing Xbar Chart Test	Sites Failing S Chart Test
ALL	2TNKXTYWE(L) 2VANFTYN1(H) 2VAVBTYV3(L) 5TXPLA004(H) 9COCSA001(H)	None
1	None	None
2	2VANFTYN1(H) 2VAVBTYV3(L)	None
3	None	None
4	None	None
5	5TXPLA004(H)	None
6	None	None
7	None	None
9	None	None

The Xbar chart for all mixed commercial observations indicates that sites with high TSS concentrations occurred in EPA Rain Zones 5 and 9. In EPA Rain Zone 2, three sites were outside of the control limits, two below the lower control limit and one above the upper control limit. As in the commercial site analyses, EPA Rain Zone 9 seems to have higher TSS concentrations than the other EPA Rain Zones.

The analysis by EPA Rain Zone indicates that only EPA Rain Zones 2 and 5 have sites outside the control limits. In EPA Rain Zone 2, the site with high concentrations (VANFTYN1) is located at Armistead Avenue in Norfolk, Virginia. A total of 28 observations were collected at this site. The median TSS for this location was 117 mg/L. The site having unusually low median TSS concentration was at Haygood, Virginia Beach, Virginia (VAVBTYV3). A total of 33 storms were sampled at this site. The median TSS concentration at this location was 26 mg/L. This site is 79% commercial and 13% open space. The site having unusually high TSS concentrations in EPA Rain Zone 5 is located at Spring Creek, Plano, Texas (TXPLA004). There are 7 events from this site in the database. The median TSS concentration is 575 mg/L. No information was found to explain the elevated concentrations. Another site that appears to be outside the control limits compared to all the sites, but not in its group. It is located in Sixteenth Hole Valley, Colorado Springs, Colorado. The median concentration for this site was 251 mg/L. This site has two automobile dealerships and a gas station, along with evidence of erosion observed in the aerial photograph.
The ANOVA analysis indicates that there are significant differences among EPA Rain Zones (P-value = 0) in mixed commercial land uses. The Dunnett's comparison test, with a family error of 5%, indicates that TSS concentrations compared with EPA Rain Zone 2 (median TSS = 46 mg/L) are larger in EPA Rain Zones 5 (median TSS = 72 mg/L) and 9 (median TSS = 254 mg/L). The median TSS values in the remaining EPA Rain Zones are not statistically different than those observed in EPA Rain Zone 2.

Industrial and Mixed Industrial Locations

Box plots, Xbar, S charts, and ANOVA tests were used to examine the observations from sites located in industrial land use areas. Figure D30 shows the box plots by EPA Rain Zone and location. Sites located in EPA Rain Zones 6 and 9 seem to have higher concentrations than the remaining industrial sites. A site with two unusually low concentrations was located in Boston, Massachusetts.

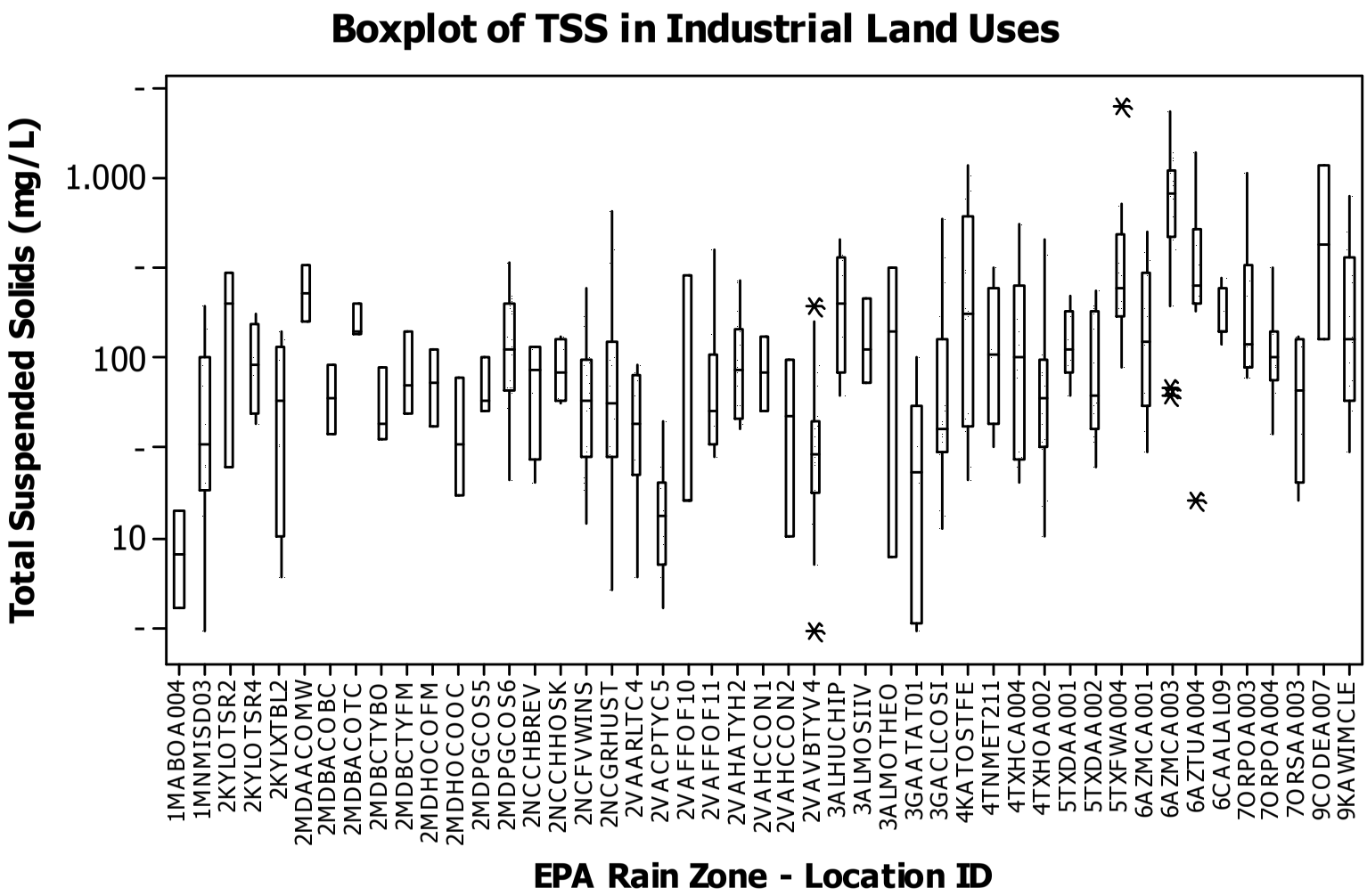

Figure D30. Box and whiskers plots for TSS concentrations at industrial land use areas

Table D18 shows those industrial sites that are outside the control limits of the pooled dataset and by each EPA Rain Zone.

Table D18. Sites failing Xbar and S Chart Tests in Industrial Land Use Areas

EPA Rain Zone	Sites Failing Xbar Chart Test	Sites Failing S Chart Test
ALL	1MABOA004(L) 2VACPTYC5(L) 2VAVBTYV4(L) 3GAATAT01(L) 5TXFWA004(H) 6AZMCA003(H) 6AZTUA004(H)	None
1	None	None
2	MDPGCOS6(H) VACPTYC5(L) VAVBTYV4(L)	None
3	None	None
4	None	None
5	TXFWA004(H)	None
6	AZMCA003(H)	None
7	None	None
9	None	None

As in the other land uses, sites with concentrations below the control limit were observed in EPA Rain Zones 1, 2 and 3. Sites with median concentrations larger than the upper control limit were located in EPA Rain Zones 5 and 6. Three sites were outside the control limits in EPA Rain Zone 2, one in EPA Rain Zone 5, and one in EPA Rain Zone 6. The two sites in EPA Rain Zone 2 with low concentrations were located in Virginia, and the site with high concentrations was located in Maryland. One of the sites located in Virginia was located in Cavalier Industrial Park in the city of Chesapeake (VACPTYC5). This 16 acres site is 92% industrial, with the remaining 8% open space. A total of 15 samples were collected from this site during the period 1993 to 1999. The median TSS concentration for this site is 13 mg/L. No additional information was observed in the aerial photos that might explain the low concentrations.

The second site was located in Viking Drive, Virginia Beach (VAVBTYV5). This 29-acre site was comprised of 55 percent impervious surfaces. There are 30 samples from this site in the database. The samples were collected between 1992 and 1999. The median TSS concentration is 29 mg/L.

The site with elevated concentrations in EPA Rain Zone 2 is located in Pennsy Drive in Riverdale, Prince George County, Maryland (MDPGCOS6). This 42.4-acre size site has a grass swale drainage system. There are 30 samples in the database from this location. The samples were collected between 1994 and 1997. The median TSS concentration is 98 mg/L. The site is located next to Glenridge Elementary School. The aerial photo shows construction activity in the northwest part of the watershed.

The site with high TSS concentrations in EPA Rain Zone 5 is located at Dry Branch, in Fort Worth, Texas (TXFWA004). A total of 21 samples were obtained at this site. The median TSS for this location is 288 mg/L. Several bare ground open space areas were observed in the aerial photograph. The site located in EPA Rain Zone 6 is at 27th Avenue at Salt River in Maricopa County, Arizona (AZMCA003). There are 27 samples from this location. The median TSS concentration is 660 mg/L. The scarce vegetation and the type of soils may be the reason of this elevated median value.

The ANOVA analysis indicates that there are significant differences among EPA Rain Zones (P-value = 0) for industrial land uses. The Dunnett's comparison test with a family error of 5%, indicates that TSS concentrations compared with EPA Rain Zone 2 (median TSS = 53 mg/L) are larger for EPA Rain Zones 4 (median TSS = 92 mg/L), 5 (median TSS = 147 mg/L), 6 (median TSS = 288 mg/L), 7 (median TSS = 120 mg/L), and 9 (median TSS

= 170 mg/L). The median TSS concentrations in EPA Rain Zones 1 and 3 are not statistically different from those observed in EPA Rain Zone 2.

The box plots in mixed industrial land uses are shown in Figure D31. Most of the box plots have the same median except for those located in EPA Rain Zone 9. The sites that fail the quality control charts are shown in Table D19. Three sites are outside the control limits for mixed industrial land uses. Two sites in Colorado and one site in North Carolina are out of control. This result is similar to those observed in the other land uses. When each EPA Rain Zone was analyzed individually, no sites were found to be out of control.

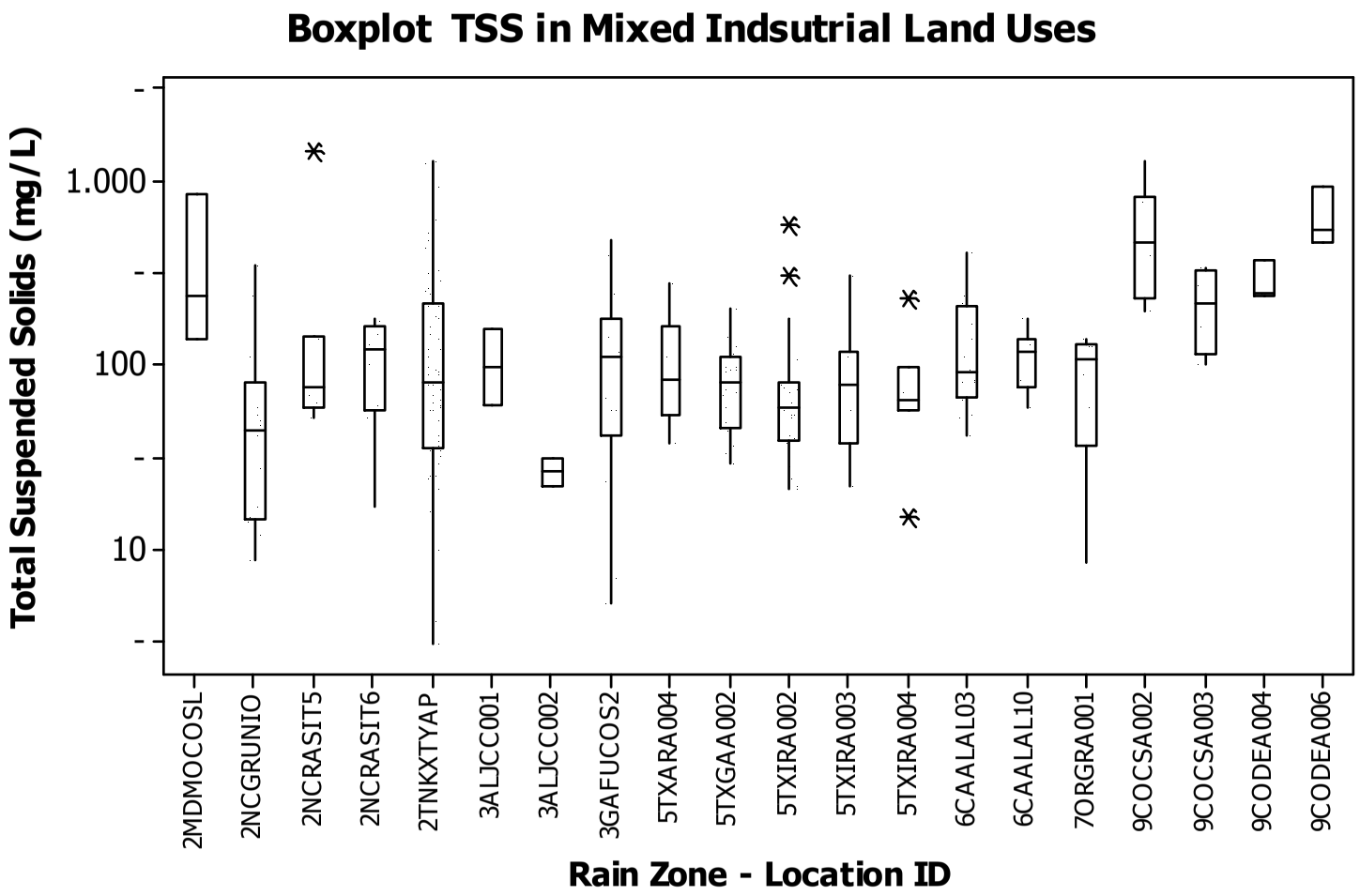

Figure D31. Box and whiskers plots for TSS concentrations at industrial land use areas

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Table D19. Sites failing Xbar and S Chart Tests in Mixed Industrial Land Use Areas

EPA Rain Zone	Sites Failing Xbar Chart Test	Sites Failing S Chart Test
ALL	9COCSA002(H) 9CODEA006(H) 2NCGRUNIO(L)	None
2	None	None
3	None	None
5	None	None
6	None	None
7	None	None
9	None	None

The ANOVA analysis indicates that there are significant differences among EPA Rain Zones (P-value = 0) at mixed industrial land use sites. The Dunnett's comparison test with a family error of 5%, indicates that TSS concentrations compared with EPA Rain Zone 2 (median TSS = 82 mg/L) are larger only for EPA Rain Zone 9 (median TSS = 341 mg/L). The median TSS concentrations in EPA Rain Zones 3, 5, 6, and 7 are not statistically different from the median TSS concentrations found in EPA Rain Zone 2.

Appendix E: First Flush Tables

Description

The following table shows the summary statistic for each constituent included in the database.

Table E1. Results of Preliminary Statistical Analysis for Total Suspended Solids (TSS)

TSS (mg/L)	Total Events	Selected Cases	Median	Median (Log)	Var (Log)	Skew (Log)	SE Skew (Log)	Test Norm. (Log) p-value	Median Ratio
Commercial Composite	90	90	54.95	1.740	0.106	0.168	0.254	0.730	1.85
Commercial First Flush	90	90	101.86	2.008	0.200	-0.508	0.254	0.016	
Industrial Composite	83	83	66.07	1.820	0.186	-0.021	0.264	0.336	0.97
Industrial First Flush	83	83	63.97	1.806	0.374	-0.157	0.264	0.055	
Institutional Composite	18	18	16.48	1.217	0.110	-0.176	0.536	0.122	2.12
Institutional First Flush	18	18	34.99	1.544	0.145	-0.164	0.536	0.846	
Open Space Composite	32	32	21.98	1.342	0.424	-0.526	0.414	0.511	0.95
Open Space First Flush	32	32	20.89	1.320	0.563	-0.126	0.414	0.847	
Residential Composite	144	144	37.50	1.574	0.217	-0.033	0.202	0.282	1.84
Residential First Flush	144	144	69.02	1.839	0.302	-0.267	0.202	0.533	
All Land Uses Composite	372	372	44.36	1.647	0.226	-0.381	0.126	0.008	1.60
All Land Uses First Flush	372	372	70.96	1.851	0.335	0.457	0.126	0	

Table E2. Results of Preliminary Test Analysis for Total Suspended Solids (TSS)

TSS (mg/L	Mann Wittn. p-value	Fligner Policello	Normality for t-Test p-value	Paired t – Test	Result
Commercial	N/A	U = 5.345 ; P = 0	0.014	N/A	Different (first flush)
Industrial	0.627	U = 0.483 ; P = 0.31	0.222	0.432	Same (no first flush)
Institutional	0.007	U = 3.095 ; P = 0	0.309	0.001	Different
Open Space	0.706	U = 0.39 ; P = 0.35	0.183	0.614	Same
Residential	N/A	U = 4.89 ; P = 0	0	N/A	Different
All Land Uses	N/A	U = 6.65 ; P = 0	0	N/A	Different

Table E3. Results of Preliminary Statistical Analysis for Turbidity (NTU)

Turbidity (NTU)	Total Events	Selected Cases	Median	Median (Log)	Var (Log)	Skew (Log)	SE Skew (Log)	Test Norm. (Log) p-value	Median Ratio
Commercial Composite	11	11	19.68	1.294	0.062	-0.984	0.661	0.186	1.32
Commercial First Flush	11	11	26.00	1.415	0.078	0.523	0.661	0.564	
Residential Composite	12	12	23.44	1.370	0.163	0.213	0.637	0.721	1.24
Residential First Flush	12	12	28.97	1.462	0.148	1.407	0.637	0.168	
All Land Uses Composite	26	26	21.73	1.337	0.109	0.204	0.456	0.406	1.26
All Land Uses First Flush	26	26	27.48	1.439	0.105	1.197	0.456	0.108	

Table E4. Results of Preliminary Test Analysis for Turbidity (NTU)

Turbidity (NTU)	Mann Wittn. p-value	Fligner Policello	Normality for t-Test p-value	Paired t – Test	Result
Commercial	0.224	U = 1.26 ; P > 0.1	0.652	0.219	Same (no first flush)
Residential	0.418	U = 0.853 ; P > 0.1	0.240	0.021	Same
All Land Uses	0.124	U = 0.673 ; P = 0.25	0.134	0	Same

Table E5. Results of Preliminary Statistical Analysis for pH

pH	Total Events	Selected Cases	Median	Var (Log)	Skew	SE Skew	Test Norm. p-value	Median Ratio
Commercial Composite	17	17	7.4	0.368	-0.299	0.550	0.527	1.03
Commercial First Flush	17	17	7.6	0.509	0.788	0.550	0.351	
Industrial Composite	16	16	6.755	0.194	0.482	0.564	0.179	1.00
Industrial First Flush	16	16	6.750	0.388	-0.854	0.564	0.307	
Residential Composite	26	26	7.213	0.195	-0.520	0.456	0.447	1.01
Residential First Flush	26	26	7.250	0.212	-0.283	0.456	0.408	
All Composite	63	63	7.2	0.302	0.102	0.302	0.562	1.01
All First Flush	63	63	7.3	0.437	0.036	0.302	0.110	

Table E6. Results of Preliminary Test Analysis for pH

pH	Mann Wittn. p-value	Fligner Policello	Normality for t-Test p-value	Paired t – Test	Result
Commercial	0.208	U = 1.28 ; P = 0.10	0.007	N/A	Same
Industrial	N/A	U = 0.428 ; P = 0.33	0.341	0.828	Same
Residential	0.308	U = 1.32 ; P = 0.09	0	N/A	Same
All Land Uses	0.219	U = 1.68 ; P = 0.05	0	N/A	Same

Table E7. Results of Preliminary Statistical Analysis for BOD_5

BOD_5 (mg/L)	Total Events	Selected Cases	Median	Median (Log)	Var (Log)	Skew (Log)	SE Skew (Log)	Test Norm. (Log) p-value	Median Ratio
Commercial Composite	83	83	15.21	1.182	0.125	0.263	0.264	0.513	1.77
Commercial First Flush	83	83	26.98	1.431	0.153	-0.241	0.264	0.390	
Industrial Composite	80	80	15.14	1.18	0.188	0.190	0.269	0.013	1.58
Industrial First Flush	80	80	23.99	1.38	0.180	-0.502	0.269	0.044	
Institutional Composite	18	18	7.48	0.874	0.151	-0.737	0.536	0.247	1.67
Institutional First Flush	18	18	12.47	1.096	0.173	-0.732	0.536	0.281	
Open Space Composite	28	28	3.79	0.579	0.148	0.523	0.441	0.242	1.07
Open Space First Flush	28	28	4.05	0.607	0.197	0.449	0.441	0.077	
Residential Composite	133	133	12.59	1.100	0.154	0.314	0.210	0.137	1.67
Residential First Flush	133	133	20.99	1.322	0.220	-0.150	0.210	0.010	
All Land uses Composite	344	344	12.53	1.098	0.184	0.073	0.131	0.003	1.67
All Land Uses First Flush	344	344	20.89	1.320	0.233	-0.385	0.131	0	

Table E8. Results of Preliminary Test Analysis for BOD_5

BOD_5	Mann Wittn. p-value	Fligner Policello	Normality for t-Test p-value	Paired t – Test	Result
Commercial	0	U = 4.85 ; P = 0	0.013	N/A	Different (first flush)
Industrial	0.007	U = 2.76 ; P = 0	0.434	0.012	Different
Institutional	0.027	U = 2.46 ; P = 0.01	0.056	0.001	Different
Open Space	0.706	U = 0.39 ; P = 0.35	0.183	0.614	Same (no first flush)
Residential	N/A	U = 4.89; P = 0	0	N/A	Different
All Land Uses	N/A	U = 6.65 ; P = 0	0	N/A	Different

Table E9. Results of Preliminary Statistical Analysis for COD

COD (mg/L)	Total Events	Selected Cases	Median	Median (Log)	Var (Log)	Skew (Log)	SE Skew (Log)	Test Norm. (Log) p-value	Median Ratio
Commercial Composite)	91	91	71.94	1.857	0.075	0.261	0.253	0.022	2.29
Commercial First Flush	91	91	164.82	2.217	0.119	-0.201	0.253	0.877	
Industrial Composite	84	84	75.34	1.877	0.100	0.167	0.263	0.014	1.43
Industrial First Flush	84	84	107.40	2.031	0.151	-0.141	0.263	0.804	
Institutional Composite	18	18	43.85	1.642	0.220	-0.456	0.536	0.567	2.73
Institutional First Flush	18	18	119.67	2.078	0.151	-0.969	0.536	0.105	
Open Space Composite	28	28	20.00	1.301	0.130	0.441	0.441	0.084	0.67
Open Space First Flush	28	28	13.43	1.128	0.211	0.731	0.441	0.013	
Residential Composite	140	140	67.92	1.832	0.095	0.271	0.205	0.008	1.63
Residential First Flush	140	140	110.41	2.043	0.138	-0.831	0.205	0.005	
All Land Uses Composite	363	363	65.92	1.819	0.123	-0.293	0.128	0	1.71
All Land Uses First Flush	363	363	112.98	2.053	0.194	-0.710	0.128	0	

Table E10. Results of Preliminary Test Analysis for COD

COD	Mann Wittn. p-value	Fligner Policello	Normality for t-Test p-value	Paired t – Test	Result
Commercial	N/A	U = 4.83 ; P = 0	0.269	0	Different (first flush)
Industrial	N/A	U = 1.67 ; P = 0.05	0.691	0.01	Different
Institutional	0.01	U = 2.94 ; P = 0	0.677	0	Different
Open Space	N/A	U = 0.269 ; P = 0.39	0.004	N/A	Same (no first flush)
Residential	N/A	U = 6.715 ; P = 0	0	N/A	Different
All Land Uses	N/A	U =9.19 ; P = 0	0	N/A	Different

Table E11. Results of Preliminary Statistical Analysis for Total Dissolved Solids (TDS)

TDS (mg/L)	Total Events	Selected Cases	Median	Median (Log)	Var (Log)	Skew (Log)	SE Skew (Log)	Test Norm. (Log) p-value	Median Ratio
Commercial Composite	82	82	73.28	1.865	0.064	-0.338	0.266	0.263	1.83
Commercial First Flush	82	82	133.97	2.127	0.065	-0.219	0.266	0.115	
Industrial Composite	82	81	97.72	1.990	0.093	-0.482	0.267	0.341	1.32
Industrial First Flush	82	81	128.82	2.110	0.126	-0.513	0.267	0.109	
Institutional Composite	18	18	52.48	1.720	0.068	-0.034	0.536	0.360	2.66
Institutional First Flush	18	18	139.64	2.145	0.090	-0.303	0.536	0.158	
Open Space Composite	31	30	69.98	1.845	0.051	0.617	0.427	0.376	1.07
Open Space First Flush	31	30	74.99	1.875	0.104	-1.483	0.427	0.005	
Residential Composite	137	133	70.31	1.870	0.119	-0.245	0.210	0.041	1.52
Residential First Flush	137	133	107.15	2.030	0.125	0.500	0.210	0.167	
All Land Uses Composite	354	342	77.62	1.890	0.083	0.188	0.132	0.334	1.55
All Land Uses First Flush	354	342	120.23	2.080	0.104	0.225	0.132	0.126	

Table E12. Results of Preliminary Test Analysis for Total Dissolved Solids (TDS)

TDS (mg/L)	Mann Wittn. p-value	Fligner Policello	Normality for t-Test p-value	Paired t – Test	Result
Commercial	0	U = 7.33 ; P = 0	0.160	0	Different (first flush)
Industrial	0.0245	U = 2.28 ; P = 0.01	0.070	0.003	Different
Institutional	0.0118	U = 2.945 ; P = 0	0.544	0	Different
Open Space	N/A	U = 0.161 ; P = 0.44	0	N/A	Same (no first flush)
Residential	N/A	U = 4.89 ; P = 0	0	N/A	Different
All Land Uses	0	U = 7.58 ; P = 0	0	N/A	Different

Table E13. Results of Preliminary Statistical Analysis for O&G

O&G (mg/L)	Total Events	Selected Cases	Median	Median (Log)	Var (Log)	Skew (Log)	SE Skew (Log)	Test Norm. (Log) p-value	Median Ratio
Commercial Composite	10	10	5.19	0.715	0.068	-0.976	0.687	0.016	1.54
Commercial First Flush	10	10	8.00	0.027	0.903	1.641	0,687	0.019	
Residential Composite	8	4	5.00	0.699	0.066	1.985	1.014	0.013	2.05
Residential First Flush	8	4	10.23	1.010	0.134	0.003	1.014	0.056	
All Land Uses Composite	18	14	5.00	0.699	0.073	-0.370	0.597	0.015	1.60
All Land Uses First Flush	18	14	8.00	0.903	0.051	0.890	0.597	0.011	

Table E14. Results of Preliminary Test Analysis for O&G

O&G (mg/L)	Mann Wittn. p-value	Fligner Policello	Normality for t-Test p-value	Paired t – Test	Result
Commercial	N/A	U = 6.198 ; P < 0.01	0.222	0.004	Different
Residential	N/A	U = 1.069 ; P > 0.1	0.049	0.306	Same
All Land Uses	N/A	U = 4.072 ; P = 0	0.036	N/A	Different

Table E15. Results of Preliminary Statistical Analysis for Fecal Coliforms

Fecal Coliforms (mpn/100 mL)	Total Events	Selected Cases	Median	Median (Log)	Var (Log)	Skew (Log)	SE Skew (Log)	Test Norm. (Log) p-value	Median Ratio
Commercial Composite	12	12	67764	4.831	1.099	-0.691	0.637	0.627	0.87
Commercial First Flush	12	12	58884	4.770	1.732	-0.388	0.637	0.228	
Residential Composite	10	9	41976	4.623	0.292	0.485	0.717	0.276	0.98
Residential First Flush	10	9	41020	4.643	0.685	0.247	0.717	0.799	
All Land Uses Composite	22	21	46238	4.665	0.745	-0.886	-0.515	0.511	1.21
All Land Uses First Flush	22	21	55976	4.748	1.269	0.501	0.501	0.391	

Table E16. Results of Preliminary Test Analysis for Fecal Coliforms

Fecal Coliforms (mpn/100 mL)	Mann Wittn. p-value	Fligner Policello	Normality for t-Test p-value	Paired t – Test	Result
Commercial	N/A	U = 0 ; P > 0.10	0.833	0.583	Same
Residential	N/A	U = 0.289 ; P > 0.1	0.016	0.973	Same
All Land Uses	N/A	U = 0.181 ; P = 0.43	0.086	0.665	Same

Table E17. Results of Preliminary Statistical Analysis for Fecal Streptococcus

Fecal Streptococcus (mpn/100 mL)	Total Events	Selected Cases	Median	Median (Log)	Var (Log)	Skew (Log)	SE Skew (Log)	Test Norm. (Log) p-value	Median Ratio
Commercial Composite	12	11	37153	4.570	0.780	-0.255	0.661	0.948	1.05
Commercial First Flush	12	11	38904	4.590	1.094	0.009	0.661	0.722	
Residential Composite	11	8	77625	4.890	0.231	-0.223	0.752	0.426	1.30
Residential First Flush	11	8	101158	5.005	0.327	-0.659	0.752	0.319	
All Land Uses Composite	26	22	43651	4.640	0.536	-0.513	0.491	0.713	1.11
All Land Uses First Flush	26	22	48417	4.685	0.705	-0.188	0.491	0.802	

Table E18. Results of Preliminary Test Analysis for Fecal Streptococcus

Fecal Streptococcus (mpn/100mL)	Mann Wittn. p-value	Fligner Policello	Normality for t-Test p-value	Paired t – Test	Result
Commercial	N/A	U = 0.281 ; P > 0.10	0.027	N/A	Same (no first flush)
Residential	N/A	U = 0.344 ; P > 0.10	0.109	0.905	Same
All Land Uses	N/A	U = 0.309 ; P = 0.38	0.033	N/A	Same

Table E19. Results of Preliminary Statistical Analysis for Ammonia

Ammonia (mg/L)	Total Events	Selected Cases	Median	Median (Log)	Var (Log)	Skew (Log)	SE Skew (Log)	Test Norm. (Log) p-value	Median Ratio
Commercial Composite	70	52	0.76	-0.122	0.147	-0.245	0.330	0.237	2.11
Commercial First Flush	70	52	1.60	0.204	0.117	-0.718	0.330	0.027	
Industrial Composite	40	33	0.62	-0.208	0.166	-0.399	0.409	0.284	1.08
Industrial First Flush	40	33	0.67	-0.174	0.201	-0.535	0.409	0.046	
Institutional Composite	18	16	0.31	-0.509	0.058	-0.038	0.564	0.273	1.66
Institutional First Flush	18	16	0.51	-0.290	0.077	0.284	0.564	0.384	
Residential Composite	119	86	0.50	-0.301	0.370	0.779	0.260	0.001	1.36
Residential First Flush	119	86	0.68	-0.168	0.172	0.195	0.260	0.519	
All Land Uses Composite	269	190	0.52	-0.284	0.251	0.501	0.176	0.002	1.54
All Land Uses First Flush	269	190	0.80	-0.097	0.176	-0.197	0.176	0.713	

* Ammonia in Open Space was found in 22 events. Only 3 events had values above the detection limit

Table E20. Results of Preliminary Test Analysis for Ammonia

Ammonia (mg/L)	Mann Wittn. p-value	Fligner Policello	Normality for t-Test p-value	Paired t – Test	Result
Commercial	N/A	U = 4.467 ; P = 0	0.028	N/A	Different
Industrial	N/A	U = 0.113 ; P = 0.46	0.262	0.985	Same
Institutional	0.0287	U = 2.484 ; P = 0.01	0.254	0	Different
Residential	N/A	U = 2.283 ; P = 0.01	0	N/A	Different
All Land Uses	N/A	U = 4.092 ; P = 0	0	N/A	Different

Table E21. Results of Preliminary Statistical Analysis for NO_2 + NO_3

NO_2 + NO_3 (mg/L)	Total Events	Selected Cases	Median	Median (Log)	Var (Log)	Skew (Log)	SE Skew (Log)	Test Norm. (Log) p-value	Median Ratio
Commercial Composite	84	82	0.75	-0.125	0.095	-0.092	0.266	0.188	1.73
Commercial First Flush	84	82	1.30	0.114	0.166	-0.790	0.266	0.007	
Industrial Composite	72	71	0.90	-0.046	0.073	-0.240	0.285	0.807	1.31
Industrial First Flush	72	71	1.18	0.072	0.116	-0.839	0.285	0.030	
Institutional	18	18	0.60	-0.222	0.122	-0.714	0.536	0.117	1.70
Institutional First Flush	18	18	1.02	0.009	0.151	0.268	0.536	0.381	
Open Space Composite	30	21	0.24	-0.620	0.290	0.468	0.501	0.141	0.96
Open Space First Flush	30	21	0.23	-0.638	0.356	0.823	0.501	0.030	
Residential Composite	121	118	0.60	-0.222	0.104	-0.196	0.223	0.504	1.66
Residential First Flush	121	118	1.00	-0.002	0.125	-0.292	0.223	0.102	
All Land Uses Composite	324	310	0.70	-0.155	0.124	-0.497	0.138	0	1.50
All Land Uses First Flush	324	310	1.05	0.021	0.162	-0.584	0.138	0	

Table E22. Results of Preliminary Test Analysis for NO_2 + NO_3

NO_2 + NO_3	Mann Wittn. p-value	Fligner Policello	Normality for t-Test p-value	Paired t – Test	Result
Commercial	N/A	U = 3.286 ; P = 0	0	N/A	Different (first flush)
Industrial	N/A	U = 1.836 ; P = 0.03	0.941	0.034	Different
Institutional	0.043	U = 2.242 ; P = 0.01	0.026	N/A	Different
Open Space	N/A	U = 0.209 ; P = 0.42	0.023	N/A	Same (no first flush)
Residential	0	U = 4.769 ; P = 0	0.023	N/A	Different
All Land Uses	N/A	U = 5.834 ; P = 0	0	N/A	Different

Table E23. Results of Preliminary Statistical Analysis for Total Nitrogen

Total N (mg/L)	Total Events	Selected Cases	Median	Median (Log)	Var (Log)	Skew (Log)	SE Skew (Log)	Test Norm. (Log) p-value	Median Ratio
Commercial Composite	19	19	1.42	0.152	0.180	-0.133	0.524	0.215	1.35
Commercial First Flush	19	19	1.91	0.281	0.203	-0.617	0.524	0.337	
Industrial Composite	19	16	2.01	0.303	0.286	-0.306	0.564	0.431	1.79
Industrial First Flush	19	16	3.61	0.557	0.349	-0.452	0.564	0.029	
Open Space Composite	6	6	1.39	0.142	0.112	-0.150	0.845	0.330	1.53
Open Space First Flush	6	6	2.12	0.326	0.248	-0.100	0.845	0.221	
Residential Composite	31	30	1.67	0.222	0.325	1.22	0.427	0.009	0.88
Residential First Flush	31	30	1.47	0.166	0.447	-0.587	0.427	0.367	
All Land Uses Composite	77	73	1.60	0.204	0.253	0.769	0.281	0.136	1.22
All Land Uses First Flush	77	73	1.95	0.290	0.331	0.599	0.281	0.071	

Table E24. Results of Preliminary Test Analysis for Total Nitrogen

Total N (mg/L)	Mann Wittn. p-value	Fligner Policello	Normality for t-Test p-value	Paired t – Test	Result
Commercial	0.220	U = 1.234 ; P = 0.11	0.329	0.013	Same
Industrial	N/A	U = 0.460 ; P = 0.32	0.759	0.161	Same
Open Space	N/A	U = 0 ; P > 0.104	0.339	0.703	Same
Residential	N/A	U = 0.106 ; P = 0.46	0.002	N/A	Same
All Land Uses	N/A	U = 0.919 ; P = 0.18	0	N/A	Same

Table E25. Results of Preliminary Statistical Analysis for TKN

TKN (mg/L)	Total Events	Selected Cases	Median	Median (Log)	Var (Log)	Skew (Log)	SE Skew (Log)	Test Norm. (Log) p-value	Median Ratio
Commercial Composite	93	86	1.63	0.213	0.085	-0.275	0.260	0.003	1.71
Commercial First Flush	93	86	2.80	0.447	0.120	-0.117	0.260	0.714	
Industrial Composite	77	76	1.69	0.227	0.116	1.157	0.276	0	1.35
Industrial First Flush	77	76	2.27	0.356	0.130	0.536	0.276	0.232	
Open Space Composite	32	14	0.61	-0.215	0.142	0.585	0.597	0.109	1.28
Open Space First Flush	32	14	0.78	-0.107	0.269	0.948	0.597	0.139	
Residential Composite	131	123	1.40	0.146	0.110	1.752	0.218	0	1.65
Residential First Flush	131	123	2.31	0.364	0.115	0.309	0.218	0.076	
All Land Uses Composite	335	301	1.50	0.176	0.114	0.856	0.140	0	1.60
All Land Uses First Flush	335	301	2.40	0.380	0.139	0.088	0.140	0	

Table E26. Results of Preliminary Test Analysis for TKN

TKN (mg/L)	Mann Wittn. p-value	Fligner Policello	Normality for t-Test p-value	Paired t – Test	Result
Commercial	N/A	U = 6.499 ; P = 0	0.126	0	Different (first flush)
Industrial	N/A	U = 1.698 ; P = 0.04	0.054	0.063	Different
Open Space	N/A	U = 0.374 ; P = 0.35	0.116	0.364	Same (no first flush)
Residential	N/A	U = 6.079 ; P = 0	0	N/A	Different
All Land Uses	N/A	U = 7.68 ; P = 0	0	N/A	Different

Table E27. Results of Preliminary Statistical Analysis for Total Phosphorus

Total P (mg/L)	Total Events	Selected Cases	Median	Median (Log)	Var (Log)	Skew (Log)	SE Skew (Log)	Test Norm. (Log) p-value	Median Ratio
Commercial Composite	89	77	0.34	-0.469	0.160	-0.454	0.274	0.129	1.44
Commercial First Flush	89	77	0.49	-0.310	0.205	0.033	0.274	0.035	
Industrial Composite	84	71	0.29	-0.538	0.130	0.495	0.285	0.003	1.42
Industrial First Flush	84	71	0.41	-0.387	0.257	-0.441	0.285	0.397	
Institutional Composite	17	17	0.17	-0.770	0.203	-0.736	0.550	0.374	1.24
Institutional First Flush	17	17	0.21	-0.678	0.066	-0.177	0.550	0.704	
Open Space Composite	32	20	0.09	-1.023	0.147	0.613	0.512	0.218	1.05
Open Space First Flush	32	20	0.10	-1.000	0.381	0.833	0.512	0.288	
Residential Composite	140	128	0.28	-0.553	0.252	1.232	0.214	0	1.46
Residential First Flush	140	128	0.41	-0.389	0.188	-0.335	0.214	0.042	
All Land Uses Composite	363	313	0.28	-0.553	0.209	0.605	0.138	0	1.45
All Land Uses First Flush	363	313	0.41	-0.391	0.238	-0.258	0.138	0.003	

Table E28. Results of Preliminary Test Analysis for Total Phosphorus

Total P (mg/L)	Mann Wittn. p-value	Fligner Policello	Normality for t-Test p-value	Paired t – Test	Result
Commercial	N/A	U = 3.089 ; P = 0	0.594	0	Different (first flush)
Industrial	N/A	U = 0.864 ; P = 0.19	0.194	0.667	Same (no first flush)
Institutional	N/A	U = 0.774 ; P = 0.22	0.044	N/A	Same
Open Space	N/A	U = 0.142 ; P = 0.44	0.091	0.527	Same
Residential	N/A	U = 2.671 ; P = 0	0	N/A	Different
All Land Uses	N/A	U = 3.641 ; P = 0	0	N/A	Different

Table E29. Results of Preliminary Statistical Analysis for Dissolved Phosphorus

Dissolved P (mg/L)	Total Events	Selected Cases	Median	Median (Log)	Var (Log)	Skew (Log)	SE Skew (Log)	Test Norm. (Log) p-value	Median Ratio
Commercial Composite	91	69	0.16	-0.788	0.152	0.467	0.289	0	1.23
Commercial First Flush	91	69	0.20	-0.699	0.212	0.904	0.289	0.005	
Industrial Composite	77	50	0.14	-0.854	0.142	1.248	0.337	0.093	1.04
Industrial First Flush	77	50	0.14	-0.839	0.160	0.406	0.337	0.043	
Institutional Composite	18	14	0.13	-0.891	0.066	-0.114	0.597	0.563	1.05
Institutional First Flush	18	14	0.13	-0.870	0.095	-0.770	0.597	0.122	
Open Space Composite	32	14	0.05	-1.301	0.111	-0.073	0.597	0.601	0.69
Open Space First Flush	32	14	0.03	-1.460	0.087	1.061	0.597	0.017	
Residential Composite	130	105	0.17	-0.770	0.117	0.152	0.236	0.458	1.24
Residential First Flush	130	105	0.21	-0.678	0.170	0.121	0.236	0.044	
All Land Uses Composite	350	254	0.15	-0.824	0.143	0.353	0.153	0.051	1.07
All Land Uses First Flush	350	254	0.16	-0.796	0.200	0.401	0.153	0.001	

Table E30. Results of Preliminary Test Analysis for Dissolved Phosphorus

Dissolved P (mg/L	Mann Wittn. p-value	Fligner Policello	Normality for t-Test p-value	Paired t – Test	Result
Commercial	N/A	U = 1.582 ; P = 0.06	0.046	N/A	Same
Industrial	N/A	U = 0.051 ; P = 0.48	0.063	0.881	Same
Institutional	0.549	U = 0.605 ; P = 0.27	0.015	N/A	Same
Open Space	N/A	U = 0.760 ; P = 0.22	0.018	N/A	Same
Residential	N/A	U = 1.702 ; P = 0.04	0.039	N/A	Different
All Land Uses	N/A	U = 1.657 ; P = 0.05	0	N/A	Same

Table E31. Results of Preliminary Statistical Analysis for Orthophosphate

Orthophosphate (mg/L)	Total Events	Selected Cases	Median	Median (Log)	Var (Log)	Skew (Log)	SE Skew (Log)	Test Norm. (Log) p-value	Median Ratio
Industrial Composite	6	6	0.16	-0.797	0.287	-0.047	0.845	0.838	1.55
Industrial First Flush	6	6	0.25	-0.607	0.356	-0.106	0.845	0.720	
Residential Composite	14	14	0.19	-0.714	0.554	2.557	0.597	0.001	0.95
Residential First Flush	14	14	0.18	-0.737	0.214	0.708	0.597	0.362	
All Land Uses Composite	22	22	0.19	-0.714	0.423	2.270	0.491	0.004	1.30
All Land Uses First Flush	22	22	0.25	-0.600	0.222	0.260	0.491	0.503	

Table E32. Results of Preliminary Test Analysis for Orthophosphate

Orthophosphate (mg/L)	Mann Wittn. p-value	Fligner Policello	Normality for t-Test p-value	Paired t – Test	Result
Industrial	0.471	U = 0.772 ; P > 0.104	0.071	0.611	Same
Residential	N/A	U = 0.022 ; P = 0.49	0	N/A	Same
All Land Uses	N/A	U = 0.460 ; P = 0.32	0	N/A	Same

Table E33. Results of Preliminary Statistical Analysis for Total Cadmium

Total Cadmium (µg/L)	Total Events	Selected Cases	Median	Median (Log)	Var (Log)	Skew (Log)	SE Skew (Log)	Test Norm. (Log) p-value	Median Ratio
Commercial Composite	74	48	0.56	-0.253	0.246	-0.325	0.343	0	2.15
Commercial First Flush	74	48	1.20	0.079	0.261	0.080	0.343	0.089	
Industrial Composite	80	41	1	0	0.124	-0.015	0.369	0.008	1.00
Industrial First Flush	80	41	1	0	0.130	0.261	0.369	0.065	
Open Space Composite	30	15	0.23	-0.638	0.282	1.074	0.580	0.183	1.30
Open Space First Flush	30	15	0.30	-0.523	0.325	0.465	0.580	0.402	
Residential Composite	123	33	0.28	-0.553	0.359	0.693	0.409	0.002	2.00
Residential First Flush	123	33	0.56	-0.252	0.264	0.512	0.409	0.061	
All Land Uses Composite	325	139	0.60	-0.222	0.269	-0.065	0.206	0.071	1.62
All Land Uses First Flush	325	139	0.97	-0.013	0.249	0.041	0.206	0.241	

Table E34. Results of Preliminary Test Analysis for Total Cadmium

Total Cadmium (µg/L)	Mann Wittn. p-value	Fligner Policello	Normality for t-Test p-value	Paired t – Test	Result
Commercial	0.006	U = 2.797 ; P = 0	0.009	N/A	Different (first flush)
Industrial	0.922	U = 0.100 ; P = 0.46	0.118	0.529	Same (no first flush)
Open Space	0.442	U = 0.765 ; P = 0.22	0.292	0.191	Same
Residential	0.038	U = 2.131 ; P = 0.02	0.015	N/A	Different
All Land Uses	0.005	U = 2.839 ; P = 0	0	N/A	Different

Table E35. Results of Preliminary Statistical Analysis for Total Chromium

Total Chromium (µg/L)	Total Events	Selected Cases	Median	Median (Log)	Var (Log)	Skew (Log)	SE Skew (Log)	Test Norm. (Log) p-value	Median Ratio
Commercial Composite	47	22	6.81	0.833	0.086	-0.051	0.491	0.911	1.67
Commercial First Flush	47	22	11.40	1.057	0.134	-0.796	0.491	0.121	
Industrial Composite	54	25	8.79	0.944	0.111	0.338	0.464	0.456	1.36
Industrial First Flush	54	25	11.99	1.079	0.155	-0.307	0.464	0.784	
Open Space Composite	16	4	2.64	0.422	0.169	-0.556	1.014	0.492	1.70
Open Space First Flush	16	4	4.50	0.653	0.015	1.291	1.014	0.355	
Residential Composite	86	31	8.00	0.903	0.169	-0.077	0.421	0.612	1.24
Residential First Flush	86	31	9.91	0.996	0.137	0.326	0.421	0.904	
All Land Uses Composite	218	82	7.50	0.875	0.140	-0.104	0.266	0.591	1.47
All Land Uses First Flush	218	82	10.99	1.041	0.141	-0.056	0.266	0.803	

Table E36. Results of Preliminary Test Analysis for Total Chromium

Total Chromium (µg/L)	Mann Wittn. p-value	Fligner Policello	Normality for t-Test p-value	Paired t – Test	Result
Commercial	0.0513	U = 2.024 ; P = 0.02	0.283	0.036	Different
Industrial	0.3032	U = 1.023 ; P = 0.15	0.216	0.320	Same
Open Space	0.3032	U = 1.586 ; P = 0.10	0.160	0.199	Same
Residential	0.6023	U = 0.519 ; P = 0.30	0.007	N/A	Same
All Land Uses	0.0547	U = 1.939 ; P = 0.03	0.001	N/A	Different

Table E37. Results of Preliminary Statistical Analysis for Total Copper

Total Copper (µg/L)	Total Events	Selected Cases	*Median*	Median (Log)	Var (Log)	Skew (Log)	SE Skew (Log)	Test Norm. (Log) p-value	Median Ratio
Commercial Composite	92	82	16.98	1.230	0.083	-0.038	0.266	0.117	1.62
Commercial First Flush	92	82	27.48	1.439	0.120	0.343	0.266	0.035	
Industrial Composite	84	76	25.00	1.398	0.079	0.184	0.276	0.344	1.24
Industrial First Flush	84	76	30.97	1.491	0.166	-0.014	0.276	0.007	
Institutional Composite	18	7	16.98	1.230	0.083	-0.228	0.794	0.167	0.94
Institutional First Flush	18	7	16.00	1.204	0.047	0.954	0.794	0.555	
Open Space Composite	30	22	5.14	0.711	0.103	0.085	0.491	0.252	0.78
Open Space First Flush	30	22	4.00	0.602	0.120	1.005	0.491	0.015	
Residential Composite	144	108	11.99	1.079	0.082	-0.677	0.233	0	1.33
Residential First Flush	144	108	16.00	1.204	0.087	0.023	0.233	0.256	
All Land Uses Composite	368	295	15.00	1.176	0.116	-0.268	0.142	0	1.33
All Land Uses First Flush	368	295	20.00	1.301	0.167	0.009	0.142	0	

Table E38. Results of Preliminary Test Analysis for Total Copper

Total Copper (µg/L)	Mann Wittn. p-value	Fligner Policello	Normality for t-Test p-value	Paired t – Test	Result
Commercial	N/A	U = 5.160 ; P = 0	0.001	N/A	Different (first flush)
Industrial	N/A	U = 1.864 ; P = 0.03	0.329	0.012	Different
Institutional	0.5224	U = 0.665 ; P > 0.099	0.318	0.029	Same (no first flush)
Open Space	N/A	U = 0.846 ; P = 0.19	0.074	0.337	Same
Residential	N/A	U = 4.029 ; P = 0	0.292	0	Different
All Land Uses	N/A	U = 5.146 ; P = 0	0	N/A	Different

Table E39. Results of Preliminary Statistical Analysis for Total Lead

Total Lead (µg/L)	Total Events	Selected Cases	Median	Median (Log)	Var (Log)	Skew (Log)	SE Skew (Log)	Test Norm. (Log) p-value	Median Ratio
Commercial Composite	89	83	16.98	1.230	0.062	0.075	0.264	0.824	1.65
Commercial First Flush	89	83	27.99	1.447	0.123	0.070	0.264	0.476	
Industrial Composite	84	71	16.98	1.230	0.160	0.527	0.285	0.081	1.41
Industrial First Flush	84	71	23.99	1.380	0.240	0.319	0.285	0.608	
Institutional Composite	18	13	7.00	0.845	0.082	0.675	0.616	0.158	2.28
Institutional First Flush	18	13	15.96	1.203	0.051	0.128	0.616	0.228	
Open Space Composite	31	16	5.00	0.699	0.381	-0.303	0.564	0.199	0.90
Open Space First Flush	31	16	4.48	0.651	0.346	-0.466	0.564	0.563	
Residential Composite	140	93	8.79	0.944	0.231	0.084	0.250	0.884	1.48
Residential First Flush	140	93	13.00	1.114	0.204	0.130	0.250	0.105	
All Land Uses Composite	364	278	13.00	1.114	0.198	-0.365	0.146	0.006	1.50
All Land Uses First Flush	364	278	19.50	1.290	0.239	-0.307	0.146	0.401	

Table E40. Results of Preliminary Test Analysis for Total Lead

Total Lead (µg/L)	Mann Wittn. p-value	Fligner Policello	Normality for t-Test p-value	Paired t – Test	Result
Commercial	0	U = 5.256 ; P = 0	0.794	0	Different
Industrial	0.083	U = 1.742 ; P = 0.04	0.167	0.016	Different
Institutional	0.004	U = 3.973 ; P = 0	0.680	0.000	Different
Open Space	0.771	U = 0.292 ; P = 0.39	0.008	0.578	Same
Residential	0.012	U = 2.59 ; P = 0	0.014	N/A	Different
All Land Uses	N/A	U = 4.77 ; P = 0	0	N/A	Different

Table E41. Results of Preliminary Statistical Analysis for Total Nickel

Total Nickel (µg/L)	Total Events	Selected Cases	Median	Median (Log)	Var (Log)	Skew (Log)	SE Skew (Log)	Test Norm. (Log) p-value	Median Ratio
Commercial Composite	47	23	5.00	0.699	0.094	0.660	0.481	0.254	2.40
Commercial First Flush	47	23	11.99	1.079	0.134	-0.606	0.481	0.523	
Industrial Composite	51	22	7.00	0.845	0.106	-0.293	0.491	0.229	1.00
Industrial First Flush	51	22	7.00	0.845	0.197	0.605	0.491	0.228	
Residential Composite	83	18	7.48	0.874	0.094	0.152	0.536	0.814	1.20
Residential First Flush	83	18	8.99	0.954	0.115	1.551	0.536	0.048	
All Land Uses Composite	213	64	6.00	0.778	0.104	0.146	0.299	0.161	1.50
All Land Uses First Flush	213	64	8.99	0.954	0.147	0.322	0.299	0.443	

Table E42. Results of Preliminary Test Analysis for Total Nickel

Total Nickel (µg/L	Mann Wittn. p-value	Fligner Policello	Normality for t-Test p-value	Paired t – Test	Result
Commercial	0.006	U = 3.005 ; P = 0	0.128	0.002	Different (first flush)
Industrial	0.715	U = 0.365 ; P = 0.36	0.203	0.484	Same (no first flush)
Residential	N/A	U = 1.143 ; P = 0.13	0.512	0.098	Same
All Land Uses	0.014	U = 2.539 ; P = 0.01	0.367	0.001	Different

Table E43. Results of Preliminary Statistical Analysis for Total Zinc

Total Zinc (µg/L)	Total Events	Selected Cases	Median	Median (Log)	Var (Log)	Skew (Log)	SE Skew (Log)	Test Norm. (Log) p-value	Median Ratio
Commercial Composite	90	90	149.97	2.176	0.089	-1.359	0.254	0	1.93
Commercial First Flush	90	90	289.07	2.461	0.139	-0.374	0.254	0.647	
Industrial Composite	83	83	225.94	2.354	0.184	0.828	0.264	0	1.54
Industrial First Flush	83	83	348.34	2.542	0.135	-0.181	0.264	0.930	
Institutional Composite	18	18	304.79	2.484	0.114	-0.227	0.536	0.878	2.48
Institutional First Flush	18	18	755.09	2.878	0.133	-0.696	0.536	0.055	
Open Space Composite	21	21	20.00	1.301	0.165	0.081	0.501	0.073	1.25
Open Space First Flush	21	21	25.00	1.398	0.075	-0.242	0.501	0.295	
Residential Composite	136	136	69.34	1.841	0.114	0.824	0.208	0.003	1.58
Residential First Flush	136	136	109.90	2.041	0.200	-0.232	0.208	0.014	
All Land Uses Composite	350	350	125.89	2.100	0.216	0.121	0.130	0.001	1.59
All Land Uses First Flush	350	350	199.99	2.301	0.268	0.437	0.130	0.020	

Table E44. Results of Preliminary Test Analysis for Total Zinc

Total Zinc(µg/L)	Mann Wittn. p-value	Fligner Policello	Normality for t-Test p-value	Paired t – Test	Result
Commercial	N/A	U = 6.156 ; P = 0	0	N/A	Different
Industrial	N/A	U = 2.087 ; P = 0.02	0.006	N/A	Different
Institutional	0.007	U = 3.1 ; P = 0	0.498	0	Different
Open Space	N/A	U = 0.023 ; P = 0.49	0.667	0.977	Same
Residential	N/A	U = 4.329 ; P = 0	0	N/A	Different
All Land Uses	N/A	U = 5.374 ; P = 0	0	N/A	Different

Appendix F: Detailed Statistical Test Results to Identify Significant Land Use and Geographical Interactions

pH

Summary
Commercial

EPA_Rain_Zone	N det/est	N ND/NZ	Mean	StDev	Minimum	Maximum
2	0	123	*	*	*	*
3	0	6	*	*	*	*
4	0	16	*	*	*	*
5	41	1	7.7039	0.438	6.9	9.1
6	27	7	6.737	0.632	5.7	8.6
7	27	14	7.363	0.662	5.3	8.38

Industrial

EPA_Rain_Zone	N det/est	N ND/NZ	Mean	StDev	Minimum	Maximum
2	18	91	7.319	0.533	6.4	8.65
3	9	7	6.6111	0.2205	6.5	7
4	0	17	*	*	*	*
5	46	1	7.9822	0.504	6.6	9
6	53	17	7.6836	0.7219	5.9	9.3
7	5	28	7.34	0.358	6.8	7.7

Residential

EPA_Rain_Zone	N det/est	N ND/NZ	Mean	StDev	Minimum	Maximum
2	14	317	7.364	0.389	6.7	7.87
3	8	10	6.788	0.416	6.5	7.4
4	0	31	*	*	*	*
5	71	0	7.5179	0.5816	6.2	9.9
6	22	16	7.341	0.559	6.3	8.3
7	25	15	7.319	0.713	6.2	9.1

Highlighted cells indicated groups with enough observations to calculate mean and standard deviation.

1. First Analysis. EPA Rain zones 5,6, and 7 Landuse: Residential Commercial Industrial

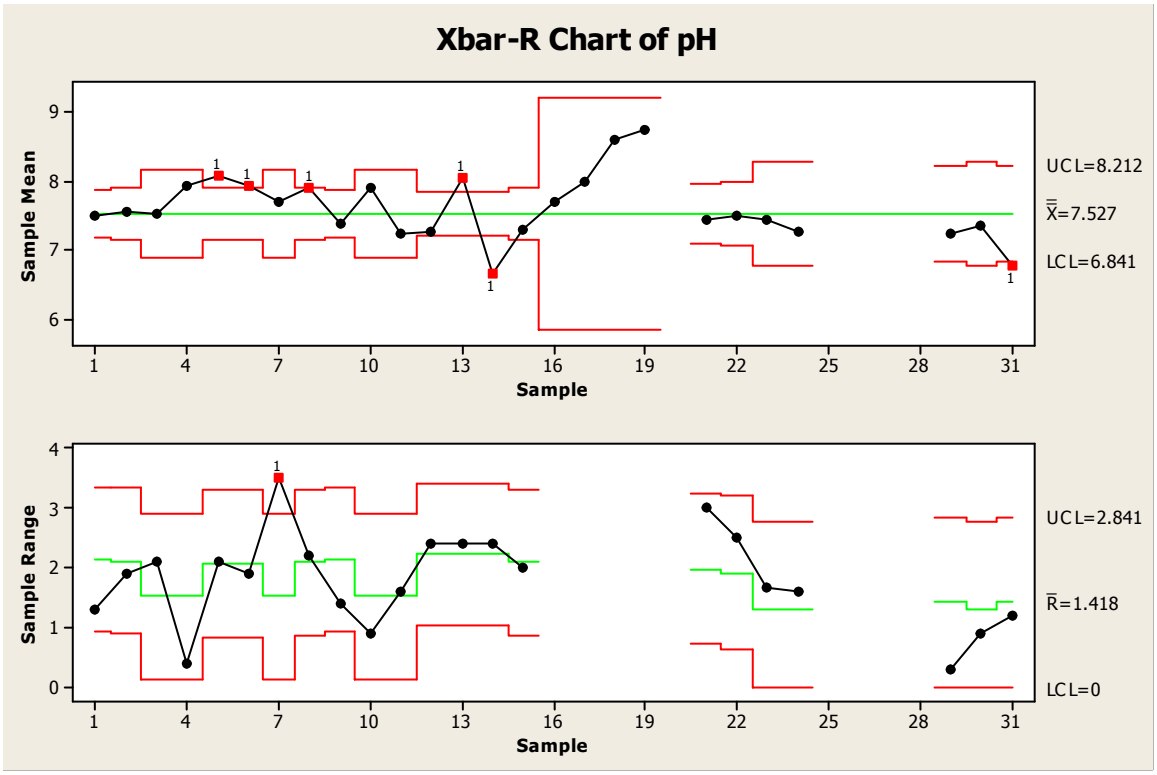

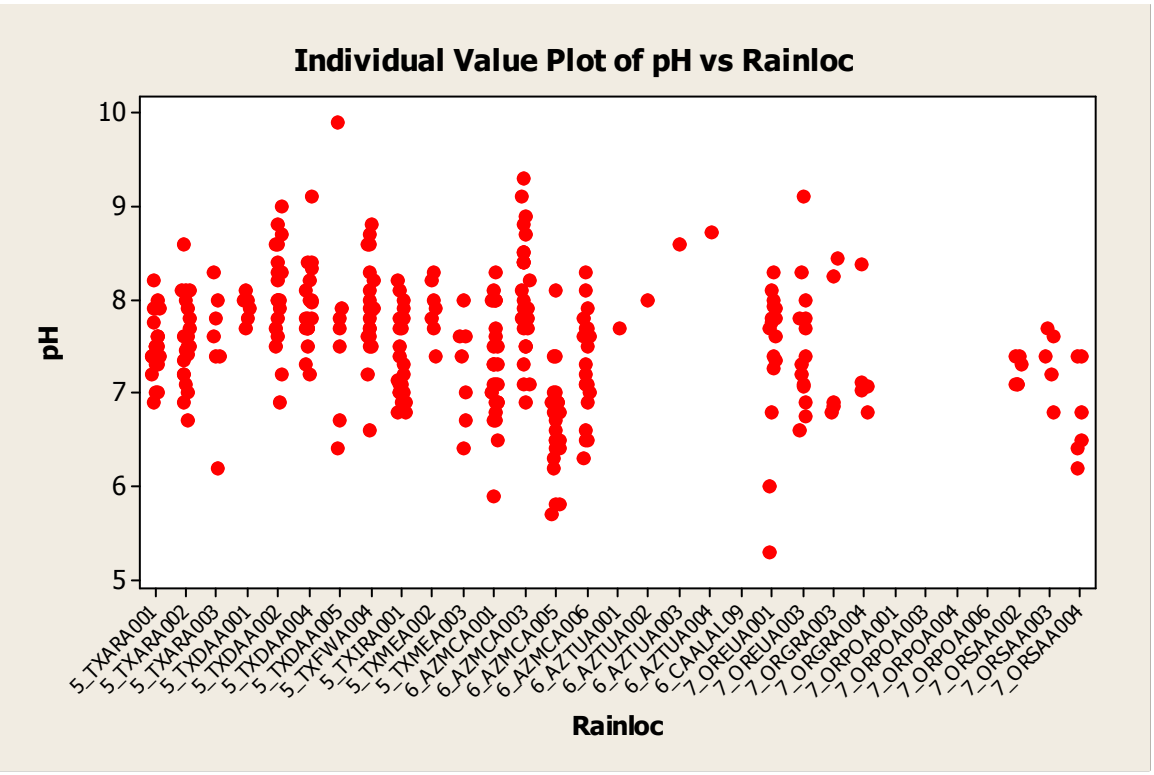

Sites with one observation or less will not be included in the analyses.

Variable	Rainloc	N	N*	Mean	Variance	Minimum	Maximum
pH	5_TXARA001	22	0	7.5073	0.1132	6.9000	8.2000
	5_TXARA002	21	0	7.563	0.220	6.700	8.600

5_TXARA003	7	0	7.529	0.449	6.200	8.300
5_TXDAA001	7	0	7.9286	0.0190	7.7000	8.1000
5_TXDAA002	19	0	8.079	0.306	6.900	9.000
5_TXDAA004	19	1	7.932	0.192	7.200	9.100
5_TXDAA005	7	0	7.700	1.270	6.400	9.900
5_TXFWA004	20	1	7.909	0.289	6.600	8.800
5_TXIRA001	22	0	7.3795	0.2017	6.8000	8.2000
5_TXMEA002	7	0	7.900	0.0933	7.400	8.300
5_TXMEA003	7	0	7.243	0.320	6.400	8.000
6_AZMCA001	26	1	7.277	0.331	5.900	8.300
6_AZMCA003	26	1	8.050	0.398	6.900	9.300
6_AZMCA005	26	0	6.665	0.271	5.700	8.100
6_AZMCA006	20	0	7.290	0.313	6.300	8.300
6_AZTUA001	1	9	7.7000	*	7.7000	7.7000
6_AZTUA002	1	7	8.0000	*	8.0000	8.0000
6_AZTUA003	1	7	8.6000	*	8.6000	8.6000
6_AZTUA004	1	6	8.7300	*	8.7300	8.7300
6_CAALAL09	0	9	*	*	*	*
7_OREUA001	16	0	7.437	0.633	5.300	8.300
7_OREUA003	14	1	7.502	0.452	6.600	9.100
7_ORGRA003	5	1	7.450	0.681	6.800	8.450
7_ORGRA004	5	1	7.280	0.393	6.800	8.380
7_ORPOA001	0	13	*	*	*	*
7_ORPOA003	0	14	*	*	*	*
7_ORPOA004	0	13	*	*	*	*
7_ORPOA006	0	13	*	*	*	*
7_ORSAA002	6	0	7.2333	0.0227	7.1000	7.4000
7_ORSAA003	5	1	7.340	0.128	6.800	7.700
7_ORSAA004	6	0	6.783	0.266	6.200	7.400

The following two plots will identify unusual sites among all the sites with pH observations. These sites will be included in the analysis, however they must be analyzed to identify potential conditions that produce these unusual observations.

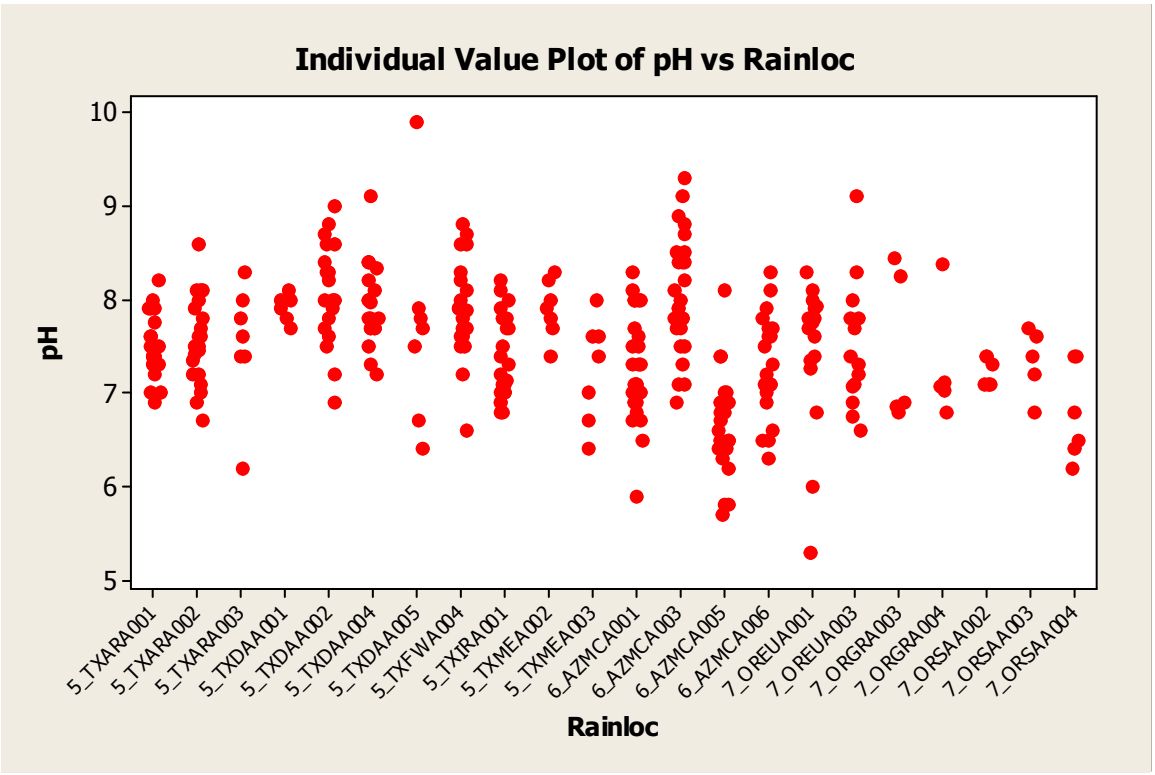

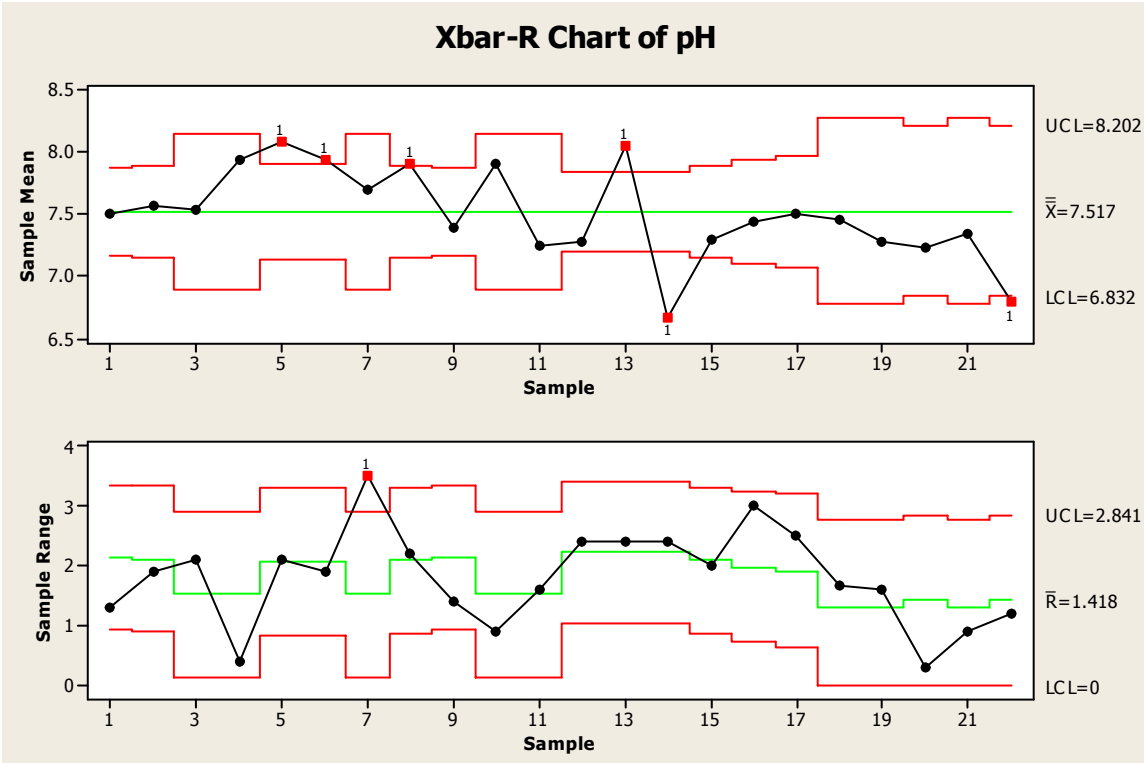

The GLM will be used to identify if there is a significant difference in PH among land use and EPA rain zone. GLM were used instead of the ANOVA model because the number of observations is not the same in each combination land use – EPA rain zone.

RESULTS:

General Linear Model: pH versus Landuse, EPA_Rain_Zone

```
Factor          Type   Levels  Values
Landuse         fixed       3  CO, ID, RE
EPA_Rain_Zone   fixed       3  5, 6, 7


Analysis of Variance for pH, using Adjusted SS for Tests

Source                  DF    Seq SS    Adj SS  Adj MS      F      P
Landuse                  2   12.1467    4.6160  2.3080   6.64  0.001
EPA_Rain_Zone            2   14.0505   16.1575  8.0788  23.26  0.000
Landuse*EPA_Rain_Zone    4    7.9699    7.9699  1.9925   5.74  0.000
Error                  304  105.5977  105.5977  0.3474
Total                  312  139.7647
```

In this case the main factors and interaction term are considered significant. Now simultaneous tests will be used to evaluate if there is a significant difference among the land uses or the EPA rain zones. Bonferroni is the most conservative method (conservative means “true error rate is less than the stated one”).

```
Bonferroni Simultaneous Tests
Response Variable pH
All Pairwise Comparisons among Levels of Landuse
Landuse = CO  subtracted from:

         Difference       SE of           Adjusted
Landuse    of Means  Difference  T-Value   P-Value
```

```
ID           0.4179     0.11470    3.644    0.0009
RE           0.1317     0.08873    1.485    0.4160


Landuse = ID  subtracted from:

         Difference       SE of           Adjusted
Landuse    of Means  Difference  T-Value   P-Value
RE          -0.2862      0.1154   -2.480    0.0411


Tukey Simultaneous Tests
Response Variable pH
All Pairwise Comparisons among Levels of Landuse
Landuse = CO  subtracted from:

         Difference       SE of           Adjusted
Landuse    of Means  Difference  T-Value   P-Value
ID           0.4179     0.11470    3.644    0.0008
RE           0.1317     0.08873    1.485    0.2982


Landuse = ID  subtracted from:

         Difference       SE of           Adjusted
Landuse    of Means  Difference  T-Value   P-Value
RE          -0.2862      0.1154   -2.480    0.0351
```

pH in industrial land use is significantly different than in residential and commercial land uses. pH in commercial and residential land uses is not significantly different.

```
Bonferroni Simultaneous Tests
Response Variable pH
All Pairwise Comparisons among Levels of EPA_Rain_Zone
EPA_Rain_Zone = 5  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
6                 -0.5284     0.08050   -6.564    0.0000
7                 -0.3941     0.11409   -3.454    0.0019


EPA_Rain_Zone = 6  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
7                  0.1343      0.1219    1.102    0.8137



Tukey Simultaneous Tests
Response Variable pH
All Pairwise Comparisons among Levels of EPA_Rain_Zone
EPA_Rain_Zone = 5  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
6                 -0.5284     0.08050   -6.564    0.0000
7                 -0.3941     0.11409   -3.454    0.0016
```

```
EPA_Rain_Zone = 6  subtracted from:

                Difference       SE of            Adjusted
EPA_Rain_Zone     of Means  Difference  T-Value    P-Value
7                   0.1343      0.1219    1.102     0.5127
```

pH in EPA rain zone 5 is significantly different than zones 6 and 7. pH in rain zones 6 and 7 is not significantly different.

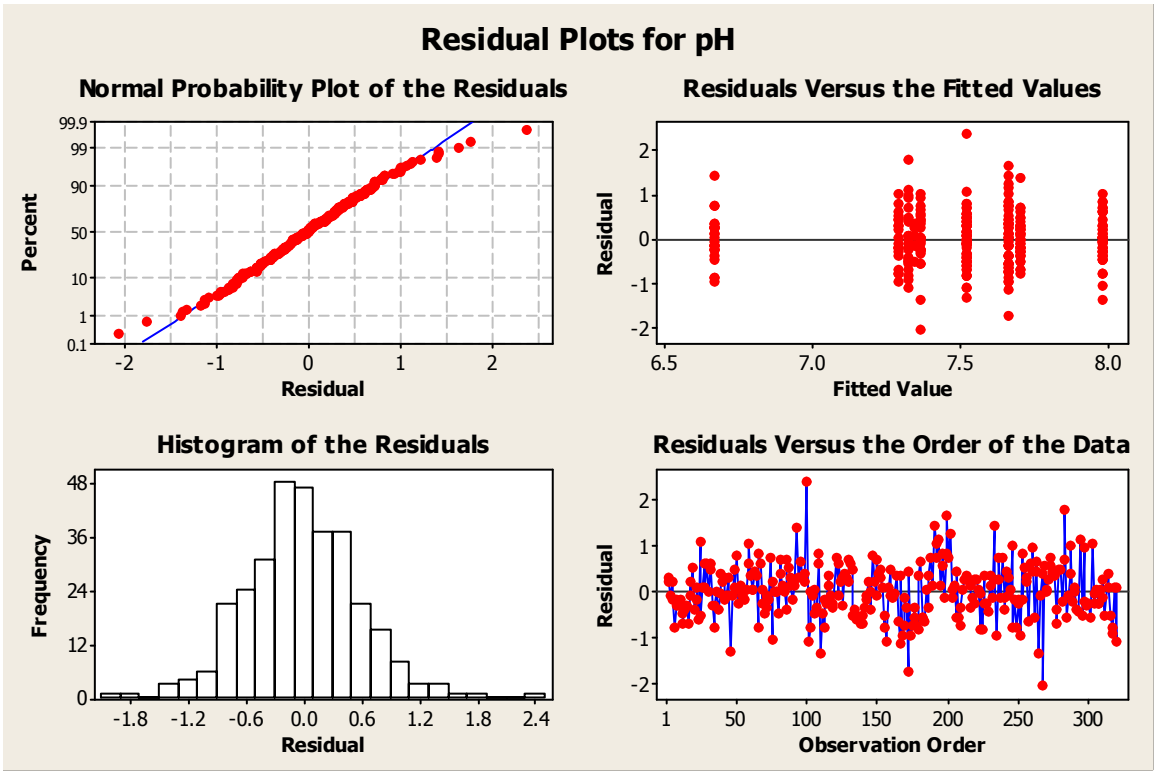

The last analysis is to inspect the residual plots to confirm that they are normally distributed around zero and there is not a specific pattern. In this case the plots indicate normality and no trend against observation order.

The final plot is the interaction plot. In this plot it is possible to identify if there in a difference in the pattern of the levels when change from one level to another. In this case, for example, it was observed that pH in region 7 is not affected by land use. In the other two rain zones, when the land use changes from residential or commercial to industrial, there is an increase in the pH.

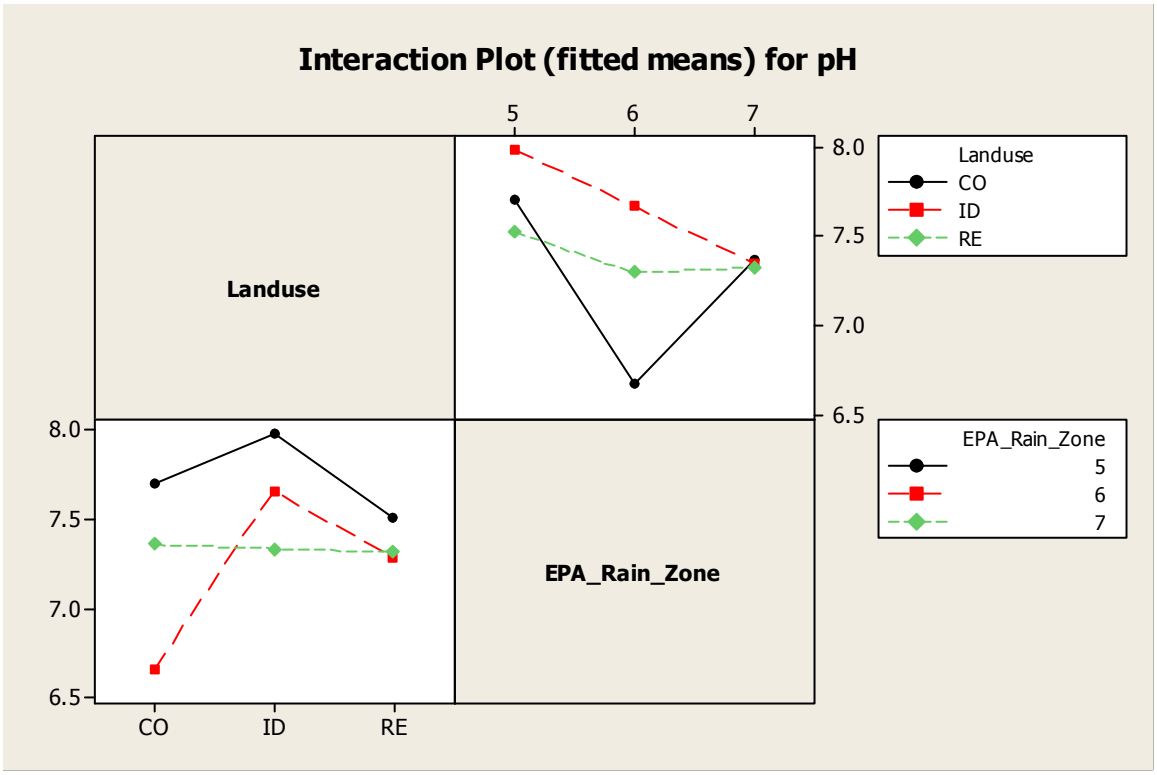

2. Second Analysis. EPA Rain zones 2, 3, 5, 6, and 7 Landuse: Residential and Industrial

Areas in Yellow are not included in the analysis

Variable	Rainloc	N	N*	Mean	Variance	Minimum	Maximum
pH	2_KYLOTSR1	3	0	7.100	0.0900	6.800	7.400
	2_KYLOTSR2	3	0	6.967	0.0633	6.700	7.200
	2_KYLOTSR3	3	0	7.367	0.343	6.700	7.800
	2_KYLOTSR4	4	0	7.025	0.422	6.400	7.900
	2_MDAACOMW	0	3	*	*	*	*
	2_MDAACOOD	0	3	*	*	*	*
	2_MDAACORK	0	3	*	*	*	*
	2_MDBACOBC	0	3	*	*	*	*
	2_MDBACOSC	0	26	*	*	*	*
	2_MDBACOTC	0	3	*	*	*	*
	2_MDBACOWC	0	3	*	*	*	*
	2_MDBCTYBO	0	3	*	*	*	*
	2_MDBCTYFM	0	3	*	*	*	*
	2_MDBCTYHO	0	3	*	*	*	*
	2_MDBCTYHR	0	3	*	*	*	*
	2_VAARLLP1	8	0	7.461	0.116	7.040	7.870
	2_VAARLTC4	11	2	7.523	0.226	6.830	8.650
	2_VACPTC1A	0	8	*	*	*	*
	2_VACPTSF2	0	3	*	*	*	*
	2_VACPTYC1	0	7	*	*	*	*
	2_VACPTYC3	0	14	*	*	*	*
	2_VACPTYC5	0	14	*	*	*	*
	2_VACPTYO1	0	3	*	*	*	*
	2_VAHATYH2	0	19	*	*	*	*
	2_VAHATYH3	0	17	*	*	*	*
	2_VAHATYH4	0	17	*	*	*	*
	2_VAHATYH5	0	17	*	*	*	*
	2_VAHCCON1	0	2	*	*	*	*

2_VAHCCON2	0	3	*	*	*	*
2_VAHCCOR1	0	3	*	*	*	*
2_VAHCCOR2	0	3	*	*	*	*
2_VANFTMS6	0	3	*	*	*	*
2_VANFTYN2	0	29	*	*	*	*
2_VANFTYN3	0	27	*	*	*	*
2_VANFTYN5	0	27	*	*	*	*
2_VANNTMF1	0	1	*	*	*	*
2_VANNTMF4	0	3	*	*	*	*
2_VANNTNN1	0	10	*	*	*	*
2_VANNTSF4	0	2	*	*	*	*
2_VANNTSF6	0	2	*	*	*	*
2_VAPMTYP2	0	17	*	*	*	*
2_VAPMTYP4	0	17	*	*	*	*
2_VAPMTYP5	0	17	*	*	*	*
2_VAVBTYI1	0	3	*	*	*	*
2_VAVBTYR1	0	5	*	*	*	*
2_VAVBTYV1	0	27	*	*	*	*
2_VAVBTYV4	0	30	*	*	*	*
3_ALMOCREO	0	3	*	*	*	*
3_ALMOSARA	0	3	*	*	*	*
3_ALMOSIIV	0	3	*	*	*	*
3_ALMOSIVI	0	3	*	*	*	*
3_ALMOTHEO	0	3	*	*	*	*
3_GAATAT01	9	1	6.6111	0.0486	6.5000	7.0000
3_GAATAT02	8	1	6.788	0.173	6.500	7.400
5_TXARA002	21	0	7.563	0.220	6.700	8.600
5_TXARA003	7	0	7.529	0.449	6.200	8.300
5_TXDAA001	7	0	7.9286	0.0190	7.7000	8.1000
5_TXDAA002	19	0	8.079	0.306	6.900	9.000
5_TXDAA005	7	0	7.700	1.270	6.400	9.900
5_TXFWA004	20	1	7.909	0.289	6.600	8.800
5_TXIRA001	22	0	7.3795	0.2017	6.8000	8.2000
5_TXMEA002	7	0	7.900	0.0933	7.400	8.300
5_TXMEA003	7	0	7.243	0.320	6.400	8.000
6_AZMCA001	26	1	7.277	0.331	5.900	8.300
6_AZMCA003	26	1	8.050	0.398	6.900	9.300
6_AZMCA006	20	0	7.290	0.313	6.300	8.300
6_AZTUA001	1	9	7.7000	*	7.7000	7.7000
6_AZTUA002	1	7	8.0000	*	8.0000	8.0000
6_AZTUA004	1	6	8.7300	*	8.7300	8.7300
6_CAALAL09	0	9	*	*	*	*
7_OREUA003	14	1	7.502	0.452	6.600	9.100
7_ORGRA003	5	1	7.450	0.681	6.800	8.450
7_ORPOA003	0	14	*	*	*	*
7_ORPOA004	0	13	*	*	*	*
7_ORPOA006	0	13	*	*	*	*
7_ORSAA003	5	1	7.340	0.128	6.800	7.700
7_ORSAA004	6	0	6.783	0.266	6.200	7.400

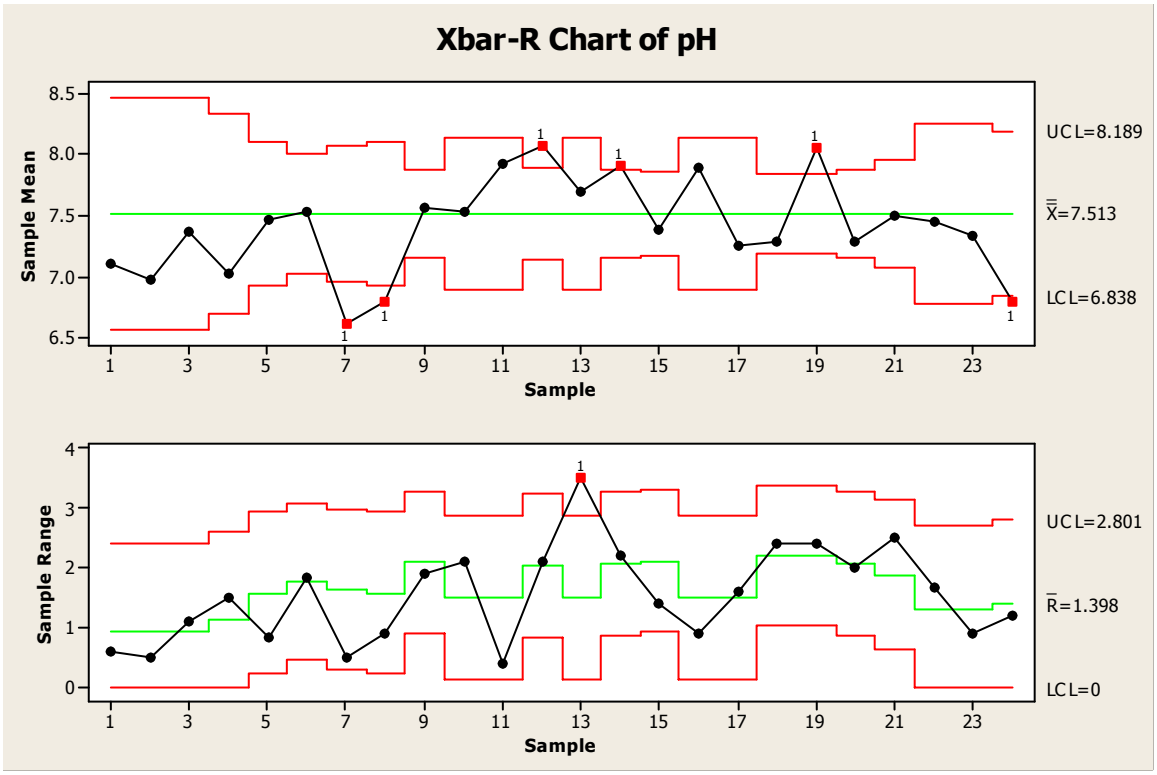

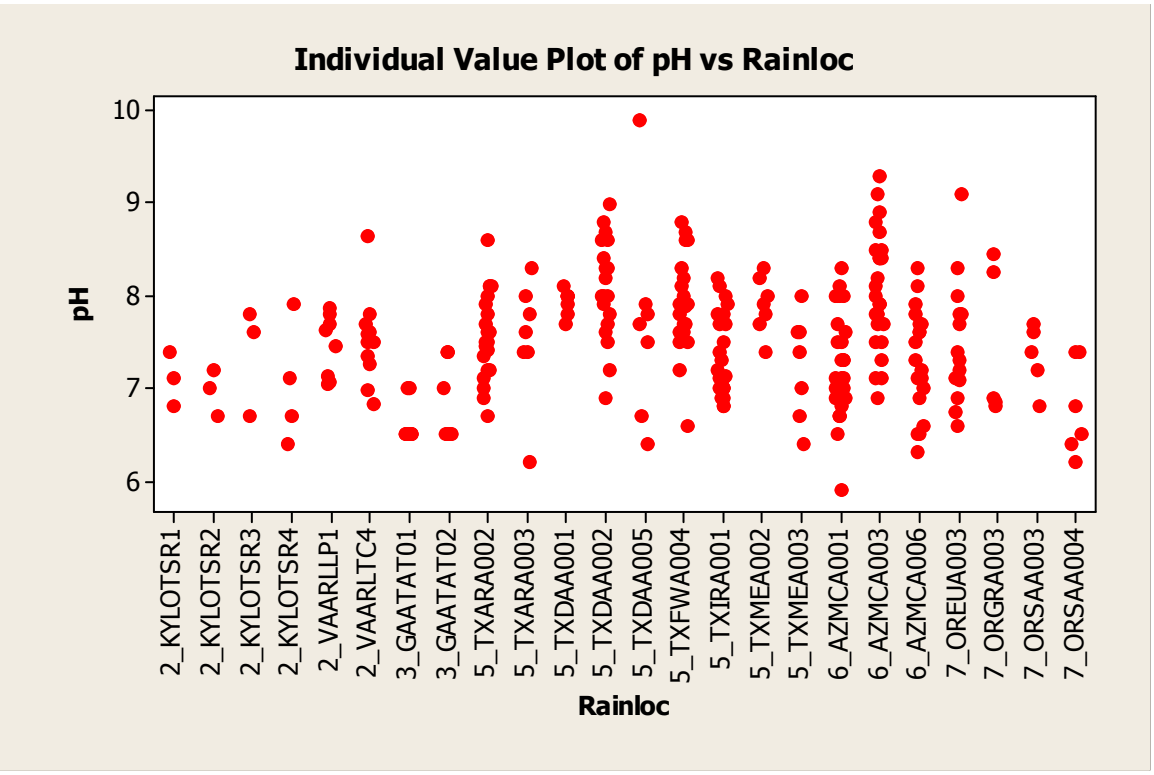

pH about 7.5 but some sites can have mean pH as low as 6.5 or high as 8.0

Results from general linear model.

General Linear Model: pH versus Landuse, EPA_Rain_Zone

```
Factor         Type   Levels  Values
Landuse        fixed       2  ID, RE
EPA_Rain_Zone  fixed       5  2, 3, 5, 6, 7

Analysis of Variance for pH, using Adjusted SS for Tests

Source                  DF    Seq SS   Adj SS  Adj MS      F      P
Landuse                  1    4.2658   0.5749  0.5749   1.68  0.196
EPA_Rain_Zone            4   18.5915  19.0338  4.7584  13.93  0.000
Landuse*EPA_Rain_Zone    4    3.0489   3.0489  0.7622   2.23  0.066
Error                  258   88.1302  88.1302  0.3416
Total                  267  114.0363

S = 0.584457   R-Sq = 22.72%   R-Sq(adj) = 20.02%
```

No significant differences by land use or interactions. Significant differences by EPA rain zone.

```
Bonferroni Simultaneous Tests
Response Variable pH
All Pairwise Comparisons among Levels of Landuse
Landuse = ID  subtracted from:

         Difference       SE of           Adjusted
Landuse    of Means  Difference  T-Value   P-Value
RE          -0.1276     0.09837   -1.297    0.1957

Tukey Simultaneous Tests
Response Variable pH
All Pairwise Comparisons among Levels of Landuse
Landuse = ID  subtracted from:

         Difference       SE of           Adjusted
Landuse    of Means  Difference  T-Value   P-Value
RE          -0.1276     0.09837   -1.297    0.1945
```

No significant differences in pH between industrial and residential land uses

```
Bonferroni Simultaneous Tests
Response Variable pH
All Pairwise Comparisons among Levels of EPA_Rain_Zone
EPA_Rain_Zone = 2  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
3                 -0.6422      0.1761   -3.647    0.0032
5                  0.4085      0.1179    3.465    0.0062
6                  0.1352      0.1294    1.045    1.0000
7                 -0.0119      0.1770   -0.067    1.0000

EPA_Rain_Zone = 3  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
5                  1.0507      0.1524    6.895    0.0000
6                  0.7774      0.1615    4.814    0.0000
7                  0.6303      0.2016    3.126    0.0198
EPA_Rain_Zone = 5  subtracted from:

               Difference       SE of           Adjusted
```

```
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
6                 -0.2733     0.09472   -2.885    0.0424
7                 -0.4204     0.15348   -2.739    0.0658


EPA_Rain_Zone = 6  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
7                 -0.1471      0.1625  -0.9054     1.000
```

pH in rain zones 3 and 5 is different than in region 2
No significant differences in pH between region 2 and 6 and 2 and 7
pH in rain zones 5, 6 and 7 is different than in region 3
No significant differences in pH between region 6 and 7 compared with region 5
No significant differences in pH between regions 6 and 7

```
Tukey Simultaneous Tests
Response Variable pH
All Pairwise Comparisons among Levels of EPA_Rain_Zone
EPA_Rain_Zone = 2  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
3                 -0.6422      0.1761   -3.647    0.0025
5                  0.4085      0.1179    3.465    0.0048
6                  0.1352      0.1294    1.045    0.8345
7                 -0.0119      0.1770   -0.067    1.0000

EPA_Rain_Zone = 3  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
5                  1.0507      0.1524    6.895    0.0000
6                  0.7774      0.1615    4.814    0.0000
7                  0.6303      0.2016    3.126    0.0153

EPA_Rain_Zone = 5  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
6                 -0.2733     0.09472   -2.885    0.0320
7                 -0.4204     0.15348   -2.739    0.0484

EPA_Rain_Zone = 6  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
7                 -0.1471      0.1625  -0.9054    0.8949
```

pH in rain zones 3 and 5 is different than in region 2
No significant differences in pH between region 2 and 6 and 2 and 7
pH in rain zones 5, 6 and 7 is different than in region 3
pH in rain zones 6 and 7 is different than in region 5
No significant differences in pH between regions 6 and 7

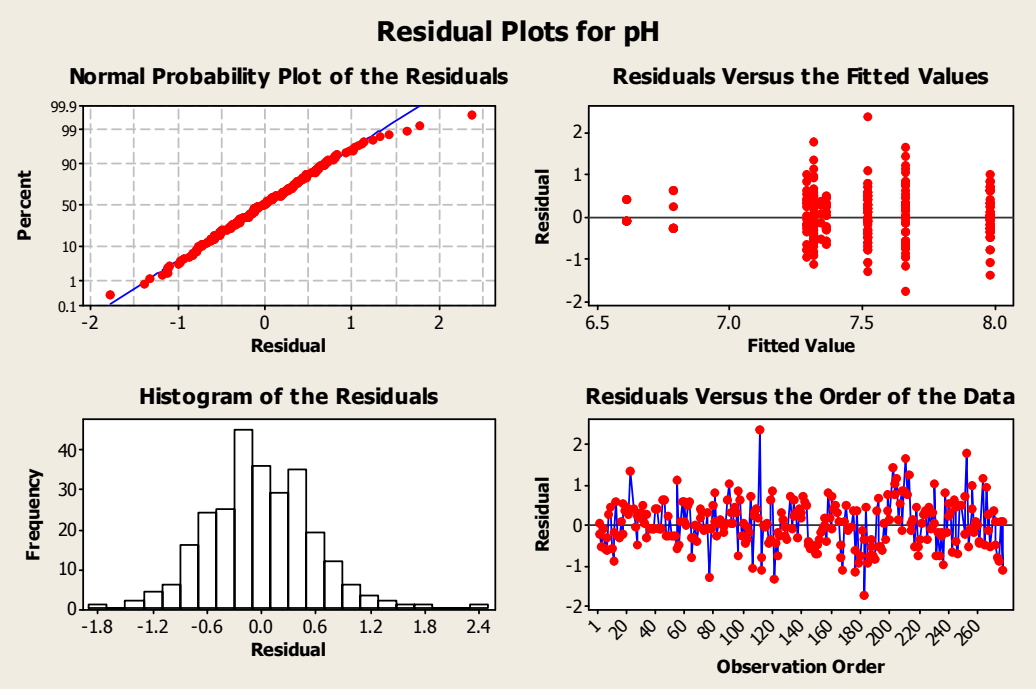

Normality of the residuals, except for three or four unusual observations. No unusual patterns in the residuals

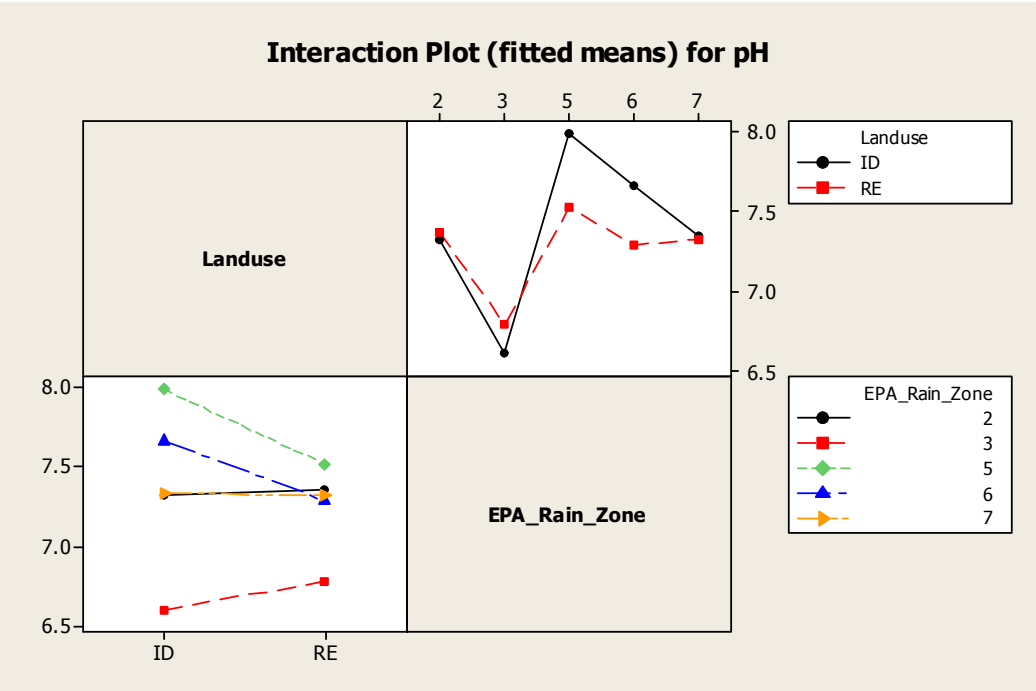

Temperature

Summary
Land use: Commercial

EPA_Rain_Zone	N det/est	N ND/NZ	Mean	StDev	Minimum	Maximum
2	0	123	*	*	*	*
3	0	6	*	*	*	*
4	0	16	*	*	*	*
5	41	1	16.229	4.762	6.5	24
6	26	8	20.87	7.13	11	30
7	21	20	12.724	4.54	5	21

Land use: Industrial

EPA_Rain_Zone	N det/est	N ND/NZ	Mean	StDev	Minimum	Maximum
2	0	109	*	*	*	*
3	0	16	*	*	*	*
4	0	17	*	*	*	*
5	47	0	19.47	5.837	7	30
6	52	18	20.213	6.395	11.5	31.5
7	5	28	9.9	2.7	7	14

Land use: Residential

EPA_Rain_Zone	N det/est	N ND/NZ	Mean	StDev	Minimum	Maximum
2	0	331	*	*	*	*
3	0	18	*	*	*	*
4	0	31	*	*	*	*
5	71	0	18.099	5.191	7.5	29
6	20	18	19.54	7.12	11	28.5
7	20	20	11.345	4.413	5	23

Analysis: Rain zone 5, 6 and 7. Land use RE, CO and ID

Descriptive Statistics: Temperature (C)

Variable	Rainloc	N	N*	Mean	Variance	Minimum	Maximum
Temperature (C)	5_TXARA001	22	0	16.65	29.37	7.00	24.00
	5_TXARA002	21	0	16.58	29.91	7.50	24.00
	5_TXARA003	7	0	15.36	14.73	10.50	21.00
	5_TXDAA001	7	0	22.64	16.81	14.50	27.00
	5_TXDAA002	19	0	19.97	35.33	7.50	30.00
	5_TXDAA004	19	1	15.737	15.654	6.500	23.000
	5_TXDAA005	7	0	19.00	11.17	15.00	23.50
	5_TXFWA004	21	0	17.96	35.39	7.00	27.10
	5_TXIRA001	22	0	19.90	31.47	9.00	29.00
	5_TXMEA002	7	0	20.14	27.73	13.00	26.00
	5_TXMEA003	7	0	16.79	14.40	12.00	23.00
	6_AZMCA001	25	2	20.74	46.94	11.50	31.50
	6_AZMCA003	26	1	20.04	35.10	12.50	29.00
	6_AZMCA005	26	0	20.87	50.79	11.00	30.00
	6_AZMCA006	19	1	19.95	49.94	11.00	28.50
	6_AZTUA001	1	9	11.800	*	11.800	11.800
	6_AZTUA002	0	8	*	*	*	*
	6_AZTUA003	0	8	*	*	*	*

6_AZTUA004	1	6	11.600	*	11.600	11.600
6_CAALAL09	0	9	*	*	*	*
7_OREUA001	15	1	13.95	21.28	5.00	21.00
7_OREUA003	14	1	12.06	22.35	5.30	23.00
7_ORGRA003	0	6	*	*	*	*
7_ORGRA004	0	6	*	*	*	*
7_ORPOA001	0	13	*	*	*	*
7_ORPOA003	0	14	*	*	*	*
7_ORPOA004	0	13	*	*	*	*
7_ORPOA006	0	13	*	*	*	*
7_ORSAA002	6	0	9.67	7.17	6.00	14.00
7_ORSAA003	5	1	9.90	7.30	7.00	14.00
7_ORSAA004	6	0	9.67	11.07	5.00	14.00

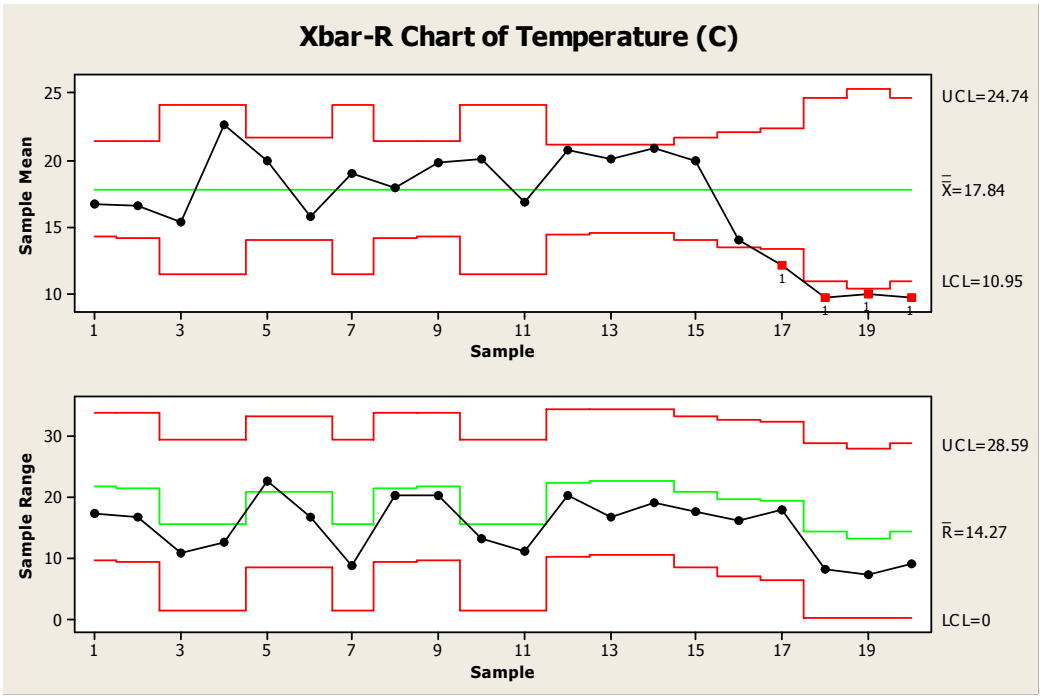

Samples in Rain zone 7 are colder than in the rain zones 5 and 6

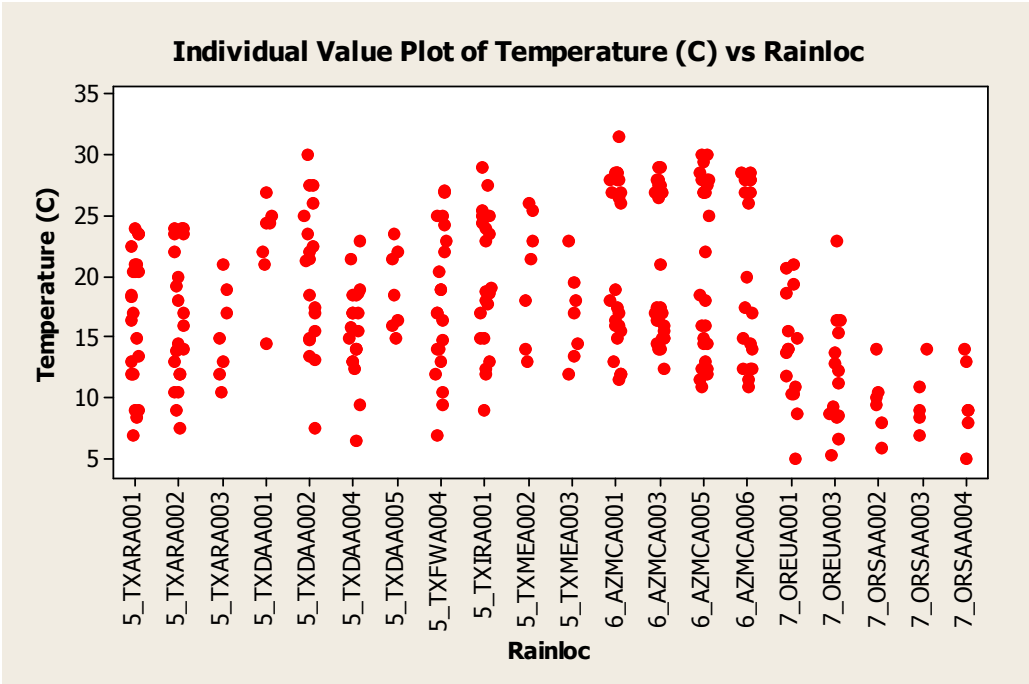

General Linear Model: Temperature (C) versus Landuse, EPA_Rain_Zone

```
Factor          Type   Levels  Values
Landuse         fixed       3  CO, ID, RE
EPA_Rain_Zone   fixed       3  5, 6, 7

Analysis of Variance for Temperature (C), using Adjusted SS for Tests

Source                  DF    Seq SS   Adj SS  Adj MS      F      P
Landuse                  2    418.05     0.87    0.44   0.01  0.986
EPA_Rain_Zone            2   1955.86  1815.42  907.71  28.34  0.000
Landuse*EPA_Rain_Zone    4    222.71   222.71   55.68   1.74  0.141
Error                  292   9351.72  9351.72   32.03
Total                  300  11948.35
```

Land use and interaction are not significant. EPA rain zone is significant.

```
Bonferroni Simultaneous Tests
Response Variable Temperature (C)
All Pairwise Comparisons among Levels of Landuse
Landuse = CO  subtracted from:

         Difference       SE of           Adjusted
Landuse    of Means  Difference  T-Value   P-Value
ID          -0.0220      1.1182  -0.0196     1.000
RE          -0.1425      0.8991  -0.1585     1.000

Landuse = ID  subtracted from:

         Difference       SE of           Adjusted
Landuse    of Means  Difference  T-Value   P-Value
RE          -0.1205       1.128  -0.1069     1.000
```

No differences among the three land uses

```
Tukey Simultaneous Tests
```

```
Response Variable Temperature (C)
All Pairwise Comparisons among Levels of Landuse
Landuse = CO  subtracted from:

         Difference       SE of           Adjusted
Landuse    of Means  Difference  T-Value   P-Value
ID          -0.0220      1.1182  -0.0196    0.9998
RE          -0.1425      0.8991  -0.1585    0.9862

Landuse = ID  subtracted from:

         Difference       SE of           Adjusted
Landuse    of Means  Difference  T-Value   P-Value
RE          -0.1205       1.128  -0.1069    0.9937
```

No differences among the three land uses

```
Bonferroni Simultaneous Tests
Response Variable Temperature (C)
All Pairwise Comparisons among Levels of EPA_Rain_Zone
EPA_Rain_Zone = 5  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
6                   2.466      0.7788    3.166    0.0051
7                  -6.610      1.1277   -5.861    0.0000
EPA_Rain_Zone = 6  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
7                  -9.075       1.205   -7.529    0.0000
```

Temperature in rain zone 5 is different than in rain zones 6 and 7. Temperature in zone 6 is different than in rain zone 7.

```
Tukey Simultaneous Tests
Response Variable Temperature (C)
All Pairwise Comparisons among Levels of EPA_Rain_Zone
EPA_Rain_Zone = 5  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
6                   2.466      0.7788    3.166    0.0044
7                  -6.610      1.1277   -5.861    0.0000

EPA_Rain_Zone = 6  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
7                  -9.075       1.205   -7.529    0.0000
```

Temperature in rain zone 5 is different than in rain zones 6 and 7. Temperature in zone 6 is different than in rain zone 7.

Bi modal probability plot. Normality assumption might not be valid. No specific pattern in the residuals. Season influence can be important.

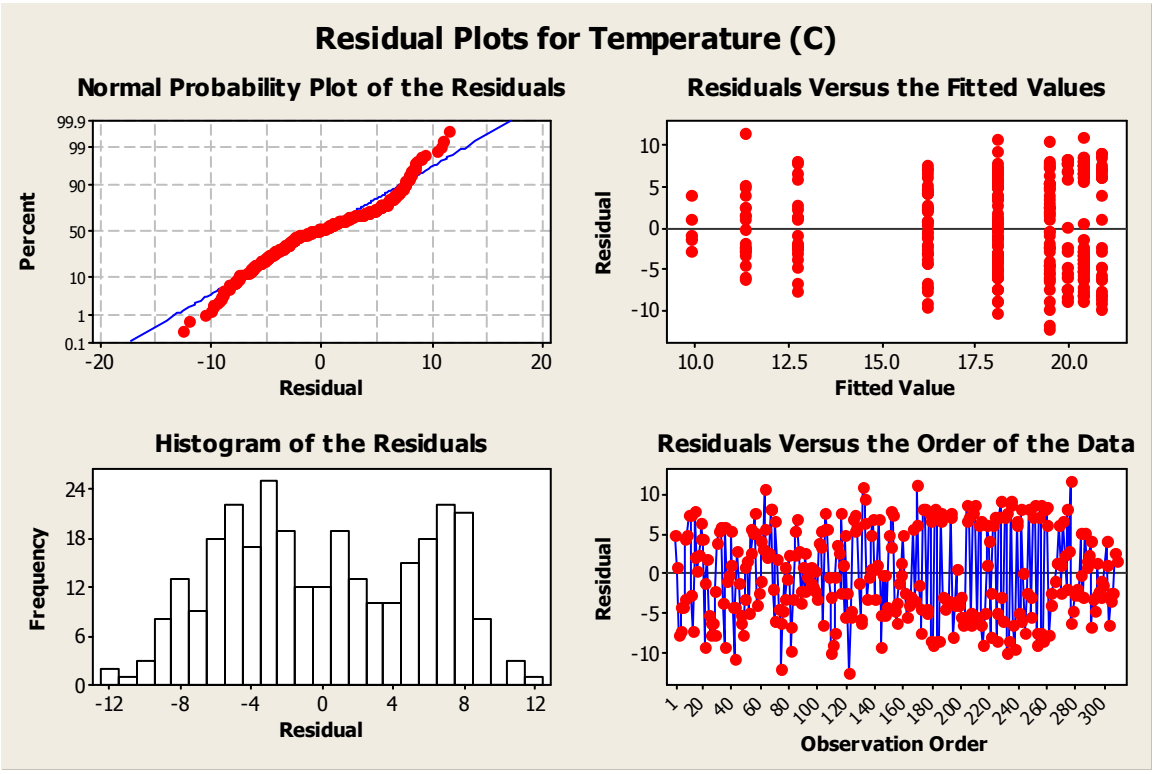
Residual Plots for Temperature (C)
Normal Probability Plot of the Residuals
Percent
Residual
Residuals Versus the Fitted Values
Residual
Fitted Value
Histogram of the Residuals
Frequency
Residual
Residuals Versus the Order of the Data
Residual
Observation Order

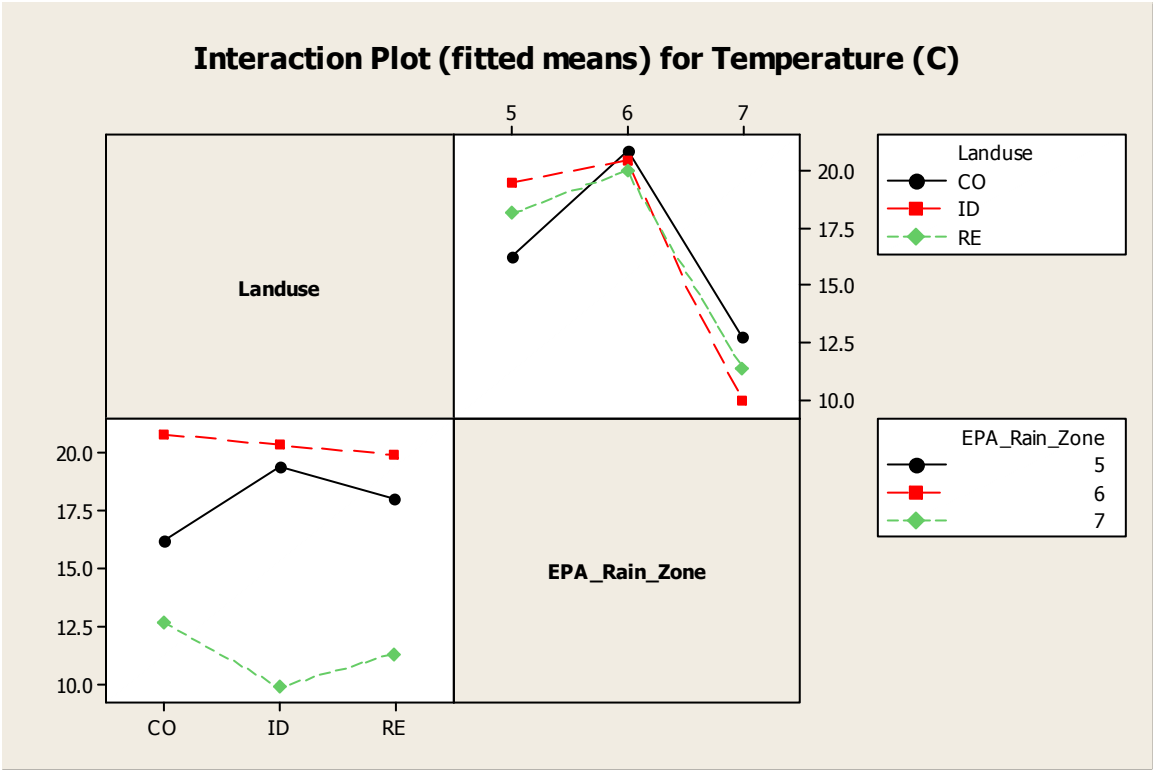
Interaction Plot (fitted means) for Temperature (C)
Landuse
EPA_Rain_Zone
CO
ID
RE
Landuse
CO
ID
RE
EPA_Rain_Zone
5
6
7

Hardness

Summary statistics in LOG base 10 scale

Land use: Commercial

EPA_Rain_Zone	N det/est	N ND/NZ	Mean	StDev	Minimum	Maximum
2	0	123	*	*	*	*
3	0	6	*	*	*	*
4	0	16	*	*	*	*
5	39	3	1.475	0.149	1.146	1.845
6	0	34	*	*	*	*
7	26	15	1.099	0.431	0.279	1.792

Land use: Industrial

EPA_Rain_Zone	N det/est	N ND/NZ	Mean	StDev	Minimum	Maximum
2	11	98	1.790	0.491	1.000	2.646
3	0	16	*	*	*	*
4	0	17	*	*	*	*
5	43	4	1.599	0.181	1.255	2.137
6	8	62	0.957	0.379	0.699	1.531
7	20	13	1.246	0.265	0.740	1.881

Land use: Residential

EPA_Rain_Zone	N det/est	N ND/NZ	Mean	StDev	Minimum	Maximum
2	8	323	1.632	0.319	1.104	2.114
3	0	18	*	*	*	*
4	0	31	*	*	*	*
5	64	7	1.511	0.154	1.176	1.892
6	0	38	*	*	*	*
7	26	14	1.237	0.332	0.699	1.820

Analysis 1. Commercial, Residential, and industrial in rain zones 5 and 7

Descriptive Statistics: LHARD

Variable	Rainloc	N	N*	Mean	Variance	Minimum	Maximum
LHARD	5_TXARA001	22	0	1.5071	0.0309	1.1461	1.8445
	5_TXARA002	18	3	1.4559	0.0109	1.3010	1.6821
	5_TXARA003	7	0	1.4717	0.00794	1.3222	1.5563
	5_TXDAA001	6	1	1.4482	0.0178	1.2553	1.5911
	5_TXDAA002	18	1	1.5986	0.0187	1.3802	2.0453
	5_TXDAA004	17	3	1.4335	0.00894	1.3075	1.6128
	5_TXDAA005	6	1	1.6287	0.0217	1.4314	1.7782
	5_TXFWA004	19	2	1.6458	0.0440	1.3838	2.1367
	5_TXIRA001	20	2	1.5032	0.0248	1.1761	1.8007
	5_TXMEA002	7	0	1.6939	0.0233	1.4914	1.8921
	5_TXMEA003	6	1	1.4145	0.0201	1.2304	1.6128
	7_OREUA001	14	2	1.4016	0.0248	1.1461	1.7924
	7_OREUA003	15	0	1.4529	0.0400	1.0792	1.8195
	7_ORGRA003	0	6	*	*	*	*
	7_ORGRA004	0	6	*	*	*	*
	7_ORPOA001	12	1	0.746	0.140	0.279	1.633
	7_ORPOA003	12	2	1.1744	0.0772	0.7404	1.8808
	7_ORPOA004	8	5	1.3540	0.0476	1.0000	1.6628

7_ORPOA006	11	2	0.9423	0.0534	0.6990	1.5315
7_ORSAA002	0	6	*	*	*	*
7_ORSAA003	0	6	*	*	*	*
7_ORSAA004	0	6	*	*	*	*

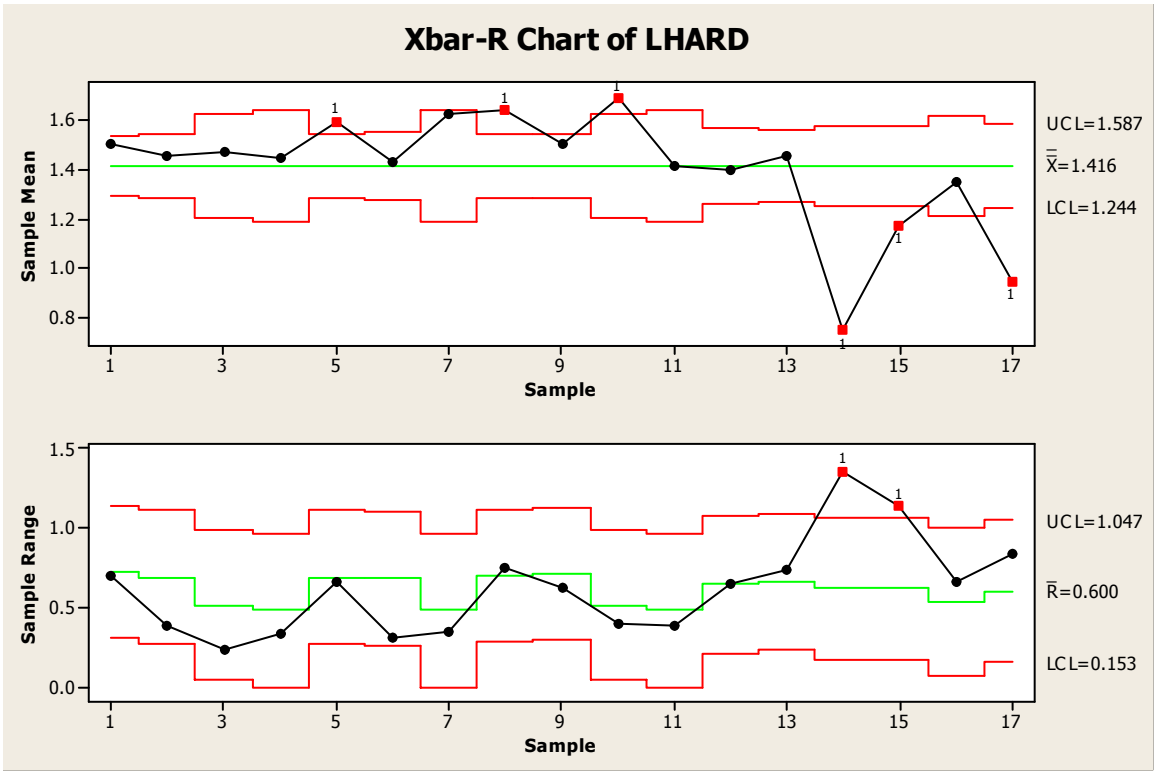

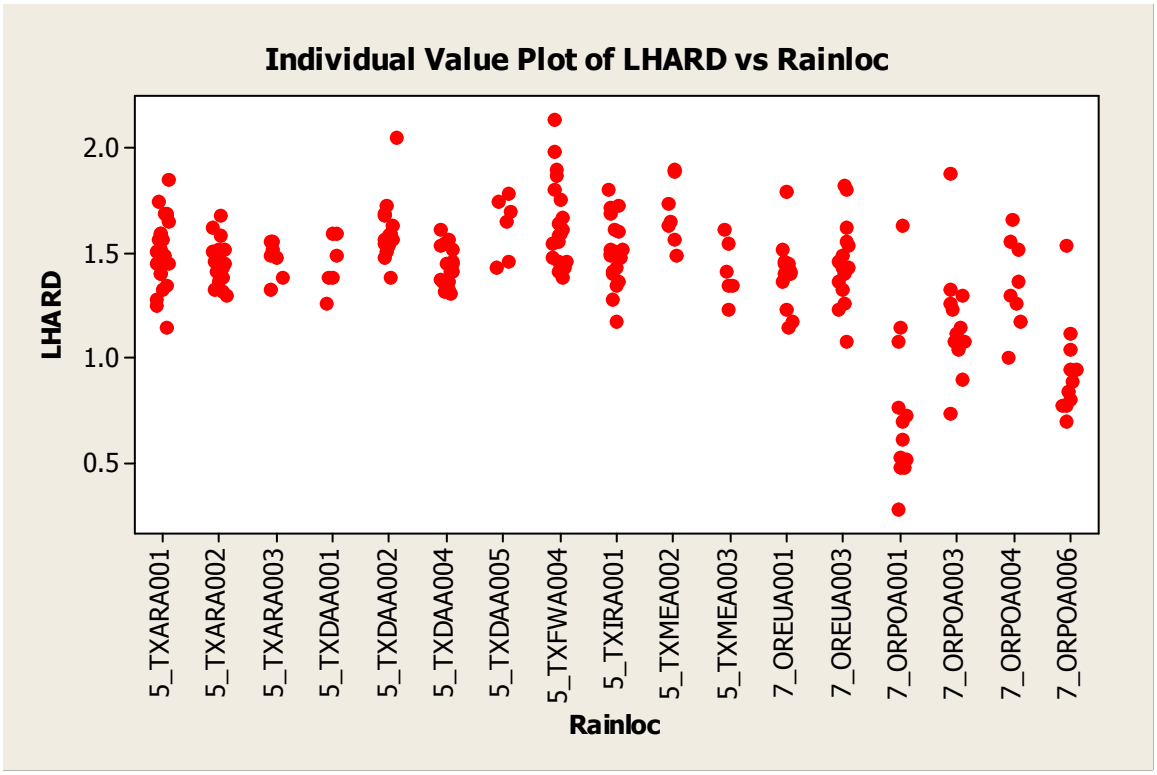

General Linear Model: LHARD versus Landuse, EPA_Rain_Zone

```
Factor          Type   Levels  Values
Landuse         fixed       3  CO, ID, RE
EPA_Rain_Zone   fixed       2  5, 7


Analysis of Variance for LHARD, using Adjusted SS for Tests

Source                  DF   Seq SS   Adj SS  Adj MS      F      P
Landuse                  2   0.8799   0.5593  0.2796   4.77  0.009
EPA_Rain_Zone            1   5.1893   5.2468  5.2468  89.42  0.000
Landuse*EPA_Rain_Zone    2   0.0981   0.0981  0.0490   0.84  0.435
Error                  212  12.4389  12.4389  0.0587
Total                  217  18.6061
```

Main factors are significant. Interaction is not significant.

General Linear Model: LHARD versus Landuse, EPA_Rain_Zone

```
Factor          Type   Levels  Values
Landuse         fixed       3  CO, ID, RE
EPA_Rain_Zone   fixed       2  5, 7

Analysis of Variance for LHARD, using Adjusted SS for Tests

Source          DF   Seq SS   Adj SS  Adj MS      F      P
Landuse          2   0.8799   0.5800  0.2900   4.95  0.008
EPA_Rain_Zone    1   5.1893   5.1893  5.1893  88.58  0.000
Error          214  12.5369  12.5369  0.0586
Total          217  18.6061
```

Main factors are significant.

```
Bonferroni Simultaneous Tests
Response Variable LHARD
All Pairwise Comparisons among Levels of Landuse
Landuse = CO  subtracted from:

         Difference       SE of           Adjusted
Landuse    of Means  Difference  T-Value   P-Value
ID          0.13487     0.04289    3.145    0.0057
RE          0.07044     0.03959    1.779    0.2298

Landuse = ID  subtracted from:

         Difference       SE of           Adjusted
Landuse    of Means  Difference  T-Value   P-Value
RE         -0.06443     0.03977   -1.620    0.3201
```

Hardness in rain commercial land use is different than in industrial land use. There are no differences in hardness between commercial and residential land use. There is no difference between residential and industrial land use for hardness concentrations (log)

```
Tukey Simultaneous Tests
Response Variable LHARD
All Pairwise Comparisons among Levels of Landuse
Landuse = CO  subtracted from:

         Difference       SE of           Adjusted
Landuse    of Means  Difference  T-Value   P-Value
ID          0.13487     0.04289    3.145    0.0054
RE          0.07044     0.03959    1.779    0.1790

Landuse = ID  subtracted from:

         Difference       SE of           Adjusted
Landuse    of Means  Difference  T-Value   P-Value
RE         -0.06443     0.03977   -1.620    0.2394
```

Same results using Tukey test.

```
Bonferroni Simultaneous Tests
Response Variable LHARD
All Pairwise Comparisons among Levels of EPA_Rain_Zone
EPA_Rain_Zone = 5  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
7                 -0.3297     0.03503   -9.412    0.0000

Tukey Simultaneous Tests
Response Variable LHARD
All Pairwise Comparisons among Levels of EPA_Rain_Zone
EPA_Rain_Zone = 5  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
7                 -0.3297     0.03503   -9.412    0.0000
```

Hardness concentrations in EPA rain zones 5 and 7 are significantly different.

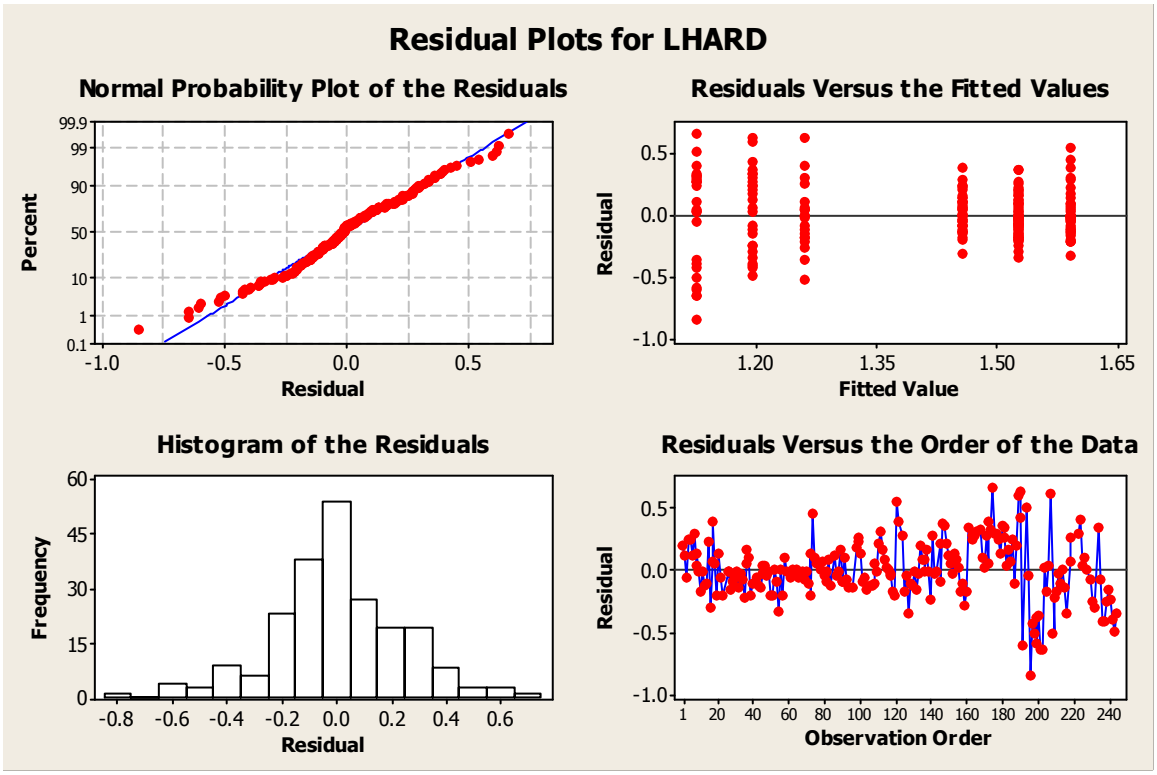

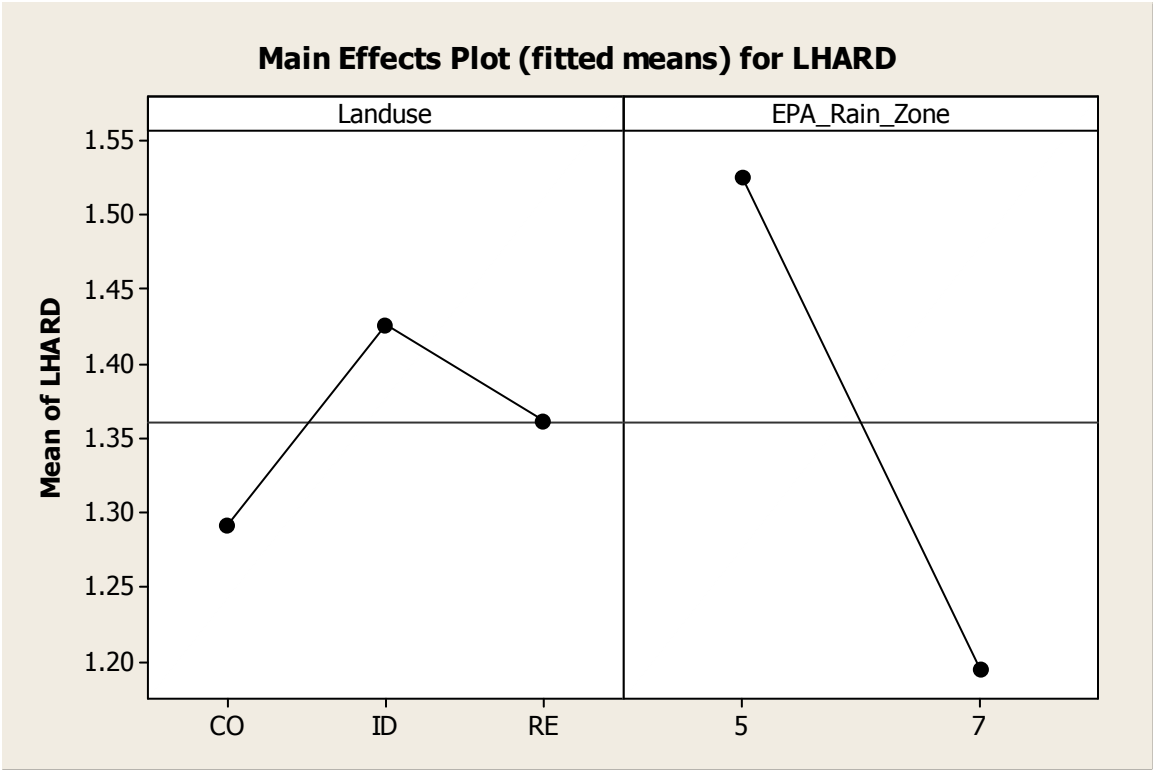

Analysis 2. Residential, and industrial in rain zones 2, 5 and 7

Variable	LndRainLoc	N	N*	Mean	Variance	Minimum	Maximum
LHARD	2_KYLOTSR1RE	0	3	*	*	*	*
	2_KYLOTSR2ID	0	3	*	*	*	*
	2_KYLOTSR3RE	0	3	*	*	*	*
	2_KYLOTSR4ID	0	4	*	*	*	*
	2_MDAACOMWID	0	3	*	*	*	*
	2_MDAACOODRE	0	3	*	*	*	*
	2_MDAACORKRE	0	3	*	*	*	*
	2_MDBACOBCID	0	3	*	*	*	*
	2_MDBACOSCRE	0	26	*	*	*	*
	2_MDBACOTCID	0	3	*	*	*	*
	2_MDBACOWCRE	0	3	*	*	*	*
	2_MDBCTYBOID	0	3	*	*	*	*
	2_MDBCTYFMID	0	3	*	*	*	*
	2_MDBCTYHORE	0	3	*	*	*	*
	2_MDBCTYHRRE	0	3	*	*	*	*
	2_VAARLLP1RE	8	0	1.632	0.102	1.104	2.114
	2_VAARLTC4ID	11	2	1.790	0.241	1.000	2.646
	2_VACPTC1ARE	0	8	*	*	*	*
	2_VACPTSF2RE	0	3	*	*	*	*
	2_VACPTYC1RE	0	7	*	*	*	*
	2_VACPTYC3RE	0	14	*	*	*	*
	2_VACPTYC5ID	0	14	*	*	*	*
	2_VACPTYO1ID	0	3	*	*	*	*
	2_VAHATYH2ID	0	19	*	*	*	*
	2_VAHATYH3RE	0	17	*	*	*	*
	2_VAHATYH4RE	0	17	*	*	*	*
	2_VAHATYH5RE	0	17	*	*	*	*
	2_VAHCCON1ID	0	2	*	*	*	*
	2_VAHCCON2ID	0	3	*	*	*	*
	2_VAHCCOR1RE	0	3	*	*	*	*
	2_VAHCCOR2RE	0	3	*	*	*	*
	2_VANFTMS6RE	0	3	*	*	*	*
	2_VANFTYN2RE	0	29	*	*	*	*
	2_VANFTYN3RE	0	27	*	*	*	*
	2_VANFTYN5RE	0	27	*	*	*	*
	2_VANNTMF1RE	0	1	*	*	*	*
	2_VANNTMF4RE	0	3	*	*	*	*
	2_VANNTNN1RE	0	10	*	*	*	*
	2_VANNTSF4RE	0	2	*	*	*	*
	2_VANNTSF6RE	0	2	*	*	*	*
	2_VAPMTYP2RE	0	17	*	*	*	*
	2_VAPMTYP4RE	0	17	*	*	*	*
	2_VAPMTYP5RE	0	17	*	*	*	*
	2_VAVBTYI1ID	0	3	*	*	*	*
	2_VAVBTYR1RE	0	5	*	*	*	*
	2_VAVBTYV1RE	0	27	*	*	*	*
	2_VAVBTYV4ID	0	30	*	*	*	*
	5_TXARA002RE	18	3	1.4559	0.0109	1.3010	1.6821
	5_TXARA003RE	7	0	1.4717	0.00794	1.3222	1.5563
	5_TXDAA001ID	6	1	1.4482	0.0178	1.2553	1.5911
	5_TXDAA002ID	18	1	1.5986	0.0187	1.3802	2.0453
	5_TXDAA005RE	6	1	1.6287	0.0217	1.4314	1.7782
	5_TXFWA004ID	19	2	1.6458	0.0440	1.3838	2.1367
	5_TXIRA001RE	20	2	1.5032	0.0248	1.1761	1.8007
	5_TXMEA002RE	7	0	1.6939	0.0233	1.4914	1.8921
	5_TXMEA003RE	6	1	1.4145	0.0201	1.2304	1.6128
	7_OREUA003RE	15	0	1.4529	0.0400	1.0792	1.8195
	7_ORGRA003RE	0	6	*	*	*	*
	7_ORPOA003ID	12	2	1.1744	0.0772	0.7404	1.8808
	7_ORPOA004ID	8	5	1.3540	0.0476	1.0000	1.6628
	7_ORPOA006RE	11	2	0.9423	0.0534	0.6990	1.5315

```
7_ORSAA003ID   0   6      *        *        *        *
7_ORSAA004RE   0   6      *        *        *        *
```

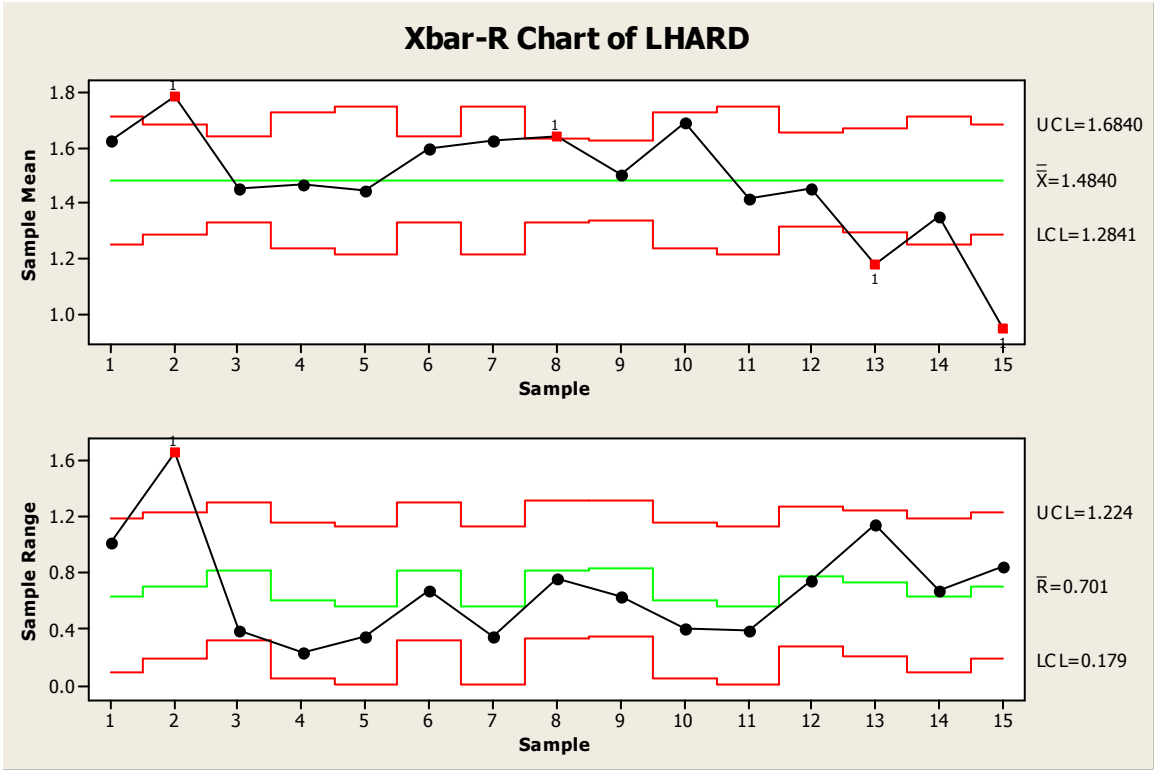

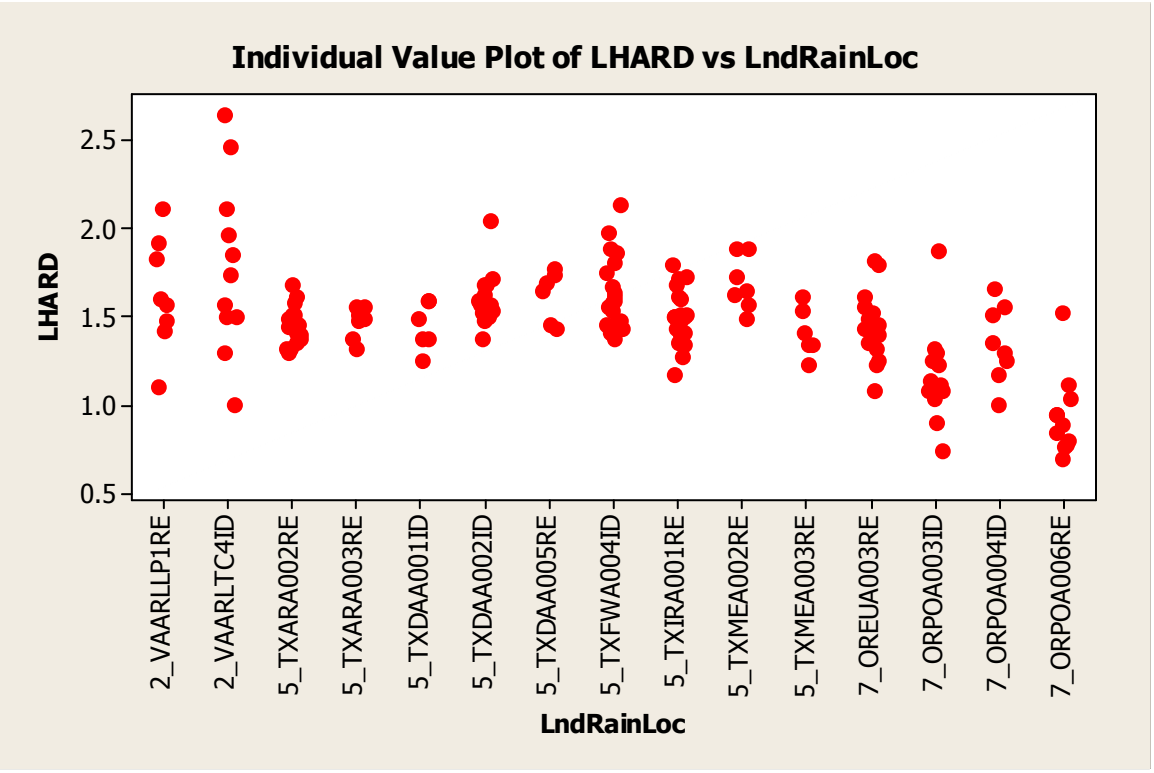

General Linear Model: LHARD versus Landuse, EPA_Rain_Zone

```
Factor         Type   Levels  Values
Landuse        fixed       2  ID, RE
EPA_Rain_Zone  fixed       3  2, 5, 7

Analysis of Variance for LHARD, using Adjusted SS for Tests

Source          DF   Seq SS   Adj SS  Adj MS      F      P
Landuse          1   0.2956   0.2296  0.2296   3.80  0.053
EPA_Rain_Zone    2   4.1525   4.1525  2.0762  34.33  0.000
Error          168  10.1597  10.1597  0.0605
Total          171  14.6078
```

Significant difference by rain zone but not by land use at 5%

```
Bonferroni Simultaneous Tests
Response Variable LHARD
All Pairwise Comparisons among Levels of Landuse
Landuse = ID  subtracted from:

         Difference       SE of           Adjusted
Landuse    of Means  Difference  T-Value   P-Value
RE         -0.07424     0.03810   -1.948    0.0530

Tukey Simultaneous Tests
Response Variable LHARD
All Pairwise Comparisons among Levels of Landuse
Landuse = ID  subtracted from:

         Difference       SE of           Adjusted
Landuse    of Means  Difference  T-Value   P-Value
RE         -0.07424     0.03810   -1.948    0.0530
```

No Significant difference by land use

```
Bonferroni Simultaneous Tests
Response Variable LHARD
All Pairwise Comparisons among Levels of EPA_Rain_Zone
EPA_Rain_Zone = 2  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
5                 -0.1643     0.06159   -2.667    0.0252
7                 -0.4718     0.06729   -7.012    0.0000

EPA_Rain_Zone = 5  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
7                 -0.3075     0.04338   -7.090    0.0000


Tukey Simultaneous Tests
Response Variable LHARD
All Pairwise Comparisons among Levels of EPA_Rain_Zone
EPA_Rain_Zone = 2  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
5                 -0.1643     0.06159   -2.667    0.0227
7                 -0.4718     0.06729   -7.012    0.0000
EPA_Rain_Zone = 5  subtracted from:

               Difference       SE of           Adjusted
```

```
EPA_Rain_Zone     of Means  Difference  T-Value   P-Value
7                  -0.3075     0.04338   -7.090    0.0000
```

Significant differences between rain zone 2 and rain zones 5 and 7. Significant differences between rain zone 5 and 7.

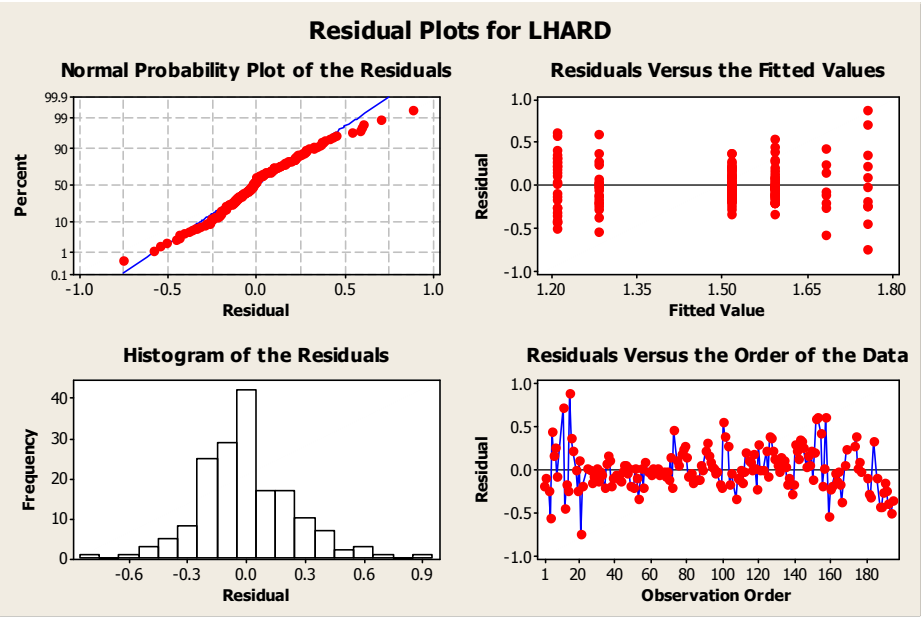

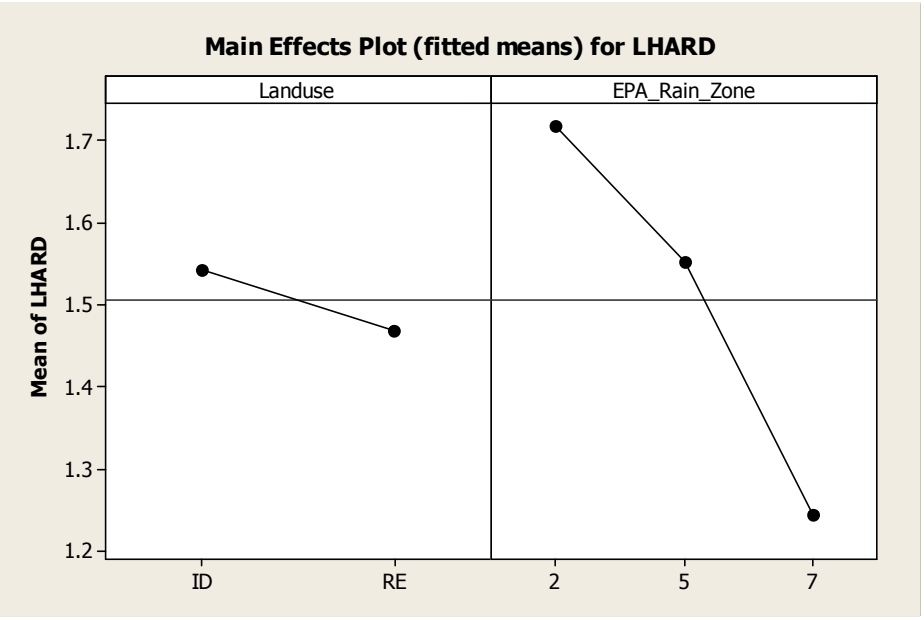

Oil and Grease

Summary statistics in LOG base 10 scale

Land use: Commercial

EPA_Rain_Zone	N det/est	N ND/NZ	Mean	StDev	Minimum	Maximum
2	52	71	0.629	0.321	-0.097	1.556
3	0	6	*	*	*	*
4	14	2	0.683	0.416	-0.068	1.398
5	41	1	0.766	0.896	-0.962	2.555
6	29	5	0.620	0.487	-0.374	1.778
7	37	4	0.414	0.358	-0.476	1.255

Land use: Industrial

EPA_Rain_Zone	N det/est	N ND/NZ	Mean	StDev	Minimum	Maximum
2	41	68	0.531	0.417	-0.415	1.342
3	0	16	*	*	*	*
4	15	2	0.443	0.402	-0.291	1.146
5	46	1	0.191	1.074	-2.583	2.611
6	55	15	0.593	0.457	-0.571	1.380
7	29	4	0.569	0.314	-0.205	1.204

Land use: Residential

EPA_Rain_Zone	N det/est	N ND/NZ	Mean	StDev	Minimum	Maximum
2	92	239	0.500	0.336	-0.742	1.505
3	0	18	*	*	*	*
4	31	0	0.531	0.401	-0.069	1.491
5	69	2	0.392	0.955	-1.470	3.474
6	24	14	0.474	0.573	-0.732	2.176
7	38	2	0.252	0.445	-0.804	1.491

Descriptive Statistics: LOAG

Variable	LndRainLoc	N	N*	Mean	Variance	Minimum	Maximum
LOAG	2_KYLOTSR1RE	0	3	*	*	*	*
	2_KYLOTSR2ID	0	3	*	*	*	*
	2_KYLOTSR3RE	0	3	*	*	*	*
	2_KYLOTSR4ID	0	4	*	*	*	*
	2_MDAACOMWID	3	0	-0.0792	0.106	-0.396	0.255
	2_MDAACOODRE	3	0	0.187	0.0909	-0.155	0.415
	2_MDAACOPPCO	22	4	0.7647	0.0919	0.1139	1.3838
	2_MDAACORKRE	2	1	0.105	0.0453	-0.0458	0.255
	2_MDBACOBCID	2	1	0.977	0.0792	0.778	1.176
	2_MDBACOSCRE	0	26	*	*	*	*
	2_MDBACOTCID	1	2	0.77815	*	0.77815	0.77815
	2_MDBACOWCRE	3	0	0.9662	0.00489	0.9031	1.0414
	2_MDBCTYBOID	1	2	1.1139	*	1.1139	1.1139
	2_MDBCTYFMID	3	0	1.014	0.104	0.699	1.342
	2_MDBCTYHORE	3	0	0.6667	0.00313	0.6021	0.6990
	2_MDBCTYHRRE	3	0	0.790	0.186	0.301	1.114
	2_MDBCTYKOCO	3	0	0.634	0.123	0.301	1.000
	2_MDMOCOBCCO	3	0	0.234	0.0882	-0.0969	0.477

2_VAARLLP1RE	8	0	0.201	0.392	-0.742	1.114
2_VAARLTC4ID	12	1	0.535	0.302	-0.415	1.322
2_VACPTC1ARE	0	8	*	*	*	*
2_VACPTSF2RE	3	0	0.39794	0.000000000	0.39794	0.39794
2_VACPTYC1RE	3	4	0.525	0.0482	0.398	0.778
2_VACPTYC3RE	2	12	0.548	0.0453	0.398	0.699
2_VACPTYC4CO	3	11	0.498	0.0302	0.398	0.699
2_VACPTYC5ID	2	12	0.39794	0.000000000	0.39794	0.39794
2_VACPTYO1ID	3	0	0.39794	0.000000000	0.39794	0.39794
2_VAHATYH1CO	3	15	0.39794	0.000000000	0.39794	0.39794
2_VAHATYH2ID	3	16	0.39794	0.000000000	0.39794	0.39794
2_VAHATYH3RE	3	14	0.39794	0.000000000	0.39794	0.39794
2_VAHATYH4RE	3	14	0.647	0.187	0.398	1.146
2_VAHATYH5RE	3	14	0.625	0.155	0.398	1.079
2_VAHCCOC1CO	2	0	0.651	0.128	0.398	0.903
2_VAHCCOC2CO	3	0	0.779	0.0724	0.559	1.079
2_VAHCCON1ID	2	0	0.676	0.155	0.398	0.954
2_VAHCCON2ID	3	0	0.39794	0.000000000	0.39794	0.39794
2_VAHCCOR1RE	3	0	0.583	0.103	0.398	0.954
2_VAHCCOR2RE	3	0	0.498	0.0302	0.398	0.699
2_VANFTMS5CO	3	0	0.498	0.0302	0.398	0.699
2_VANFTMS6RE	3	0	0.767	0.409	0.398	1.505
2_VANFTMS8CO	1	2	0.39794	*	0.39794	0.39794
2_VANFTMS9CO	1	2	0.39794	*	0.39794	0.39794
2_VANFTYN2RE	7	22	0.39794	0.000000000	0.39794	0.39794
2_VANFTYN3RE	5	22	0.725	0.235	0.398	1.477
2_VANFTYN4CO	5	22	0.630	0.268	0.398	1.556
2_VANFTYN5RE	5	22	0.7868	0.0330	0.5917	1.0414
2_VANNTMF1RE	1	0	0.39794	*	0.39794	0.39794
2_VANNTMF4RE	3	0	0.39794	0.000000000	0.39794	0.39794
2_VANNTNN1RE	2	8	0.39794	0.000000000	0.39794	0.39794
2_VANNTSF4RE	2	0	0.651	0.128	0.398	0.903
2_VANNTSF6RE	2	0	0.39794	0.000000000	0.39794	0.39794
2_VAPMTYP1CO	3	15	0.498	0.0302	0.398	0.699
2_VAPMTYP2RE	3	14	0.39794	0.000000000	0.39794	0.39794
2_VAPMTYP4RE	3	14	0.39794	0.000000000	0.39794	0.39794
2_VAPMTYP5RE	3	14	0.498	0.0302	0.398	0.699
2_VAVBTYI1ID	3	0	0.599	0.0302	0.398	0.699
2_VAVBTYR1RE	4	1	0.39794	0.000000000	0.39794	0.39794
2_VAVBTYV1RE	4	23	0.39794	0.000000000	0.39794	0.39794
2_VAVBTYV4ID	3	27	0.39794	0.000000000	0.39794	0.39794
4_KATOATWORE	15	0	0.572	0.211	-0.0429	1.491
4_KATOBROORE	16	0	0.4925	0.1225	-0.0689	1.0792
4_KATOJACKCO	14	2	0.683	0.173	-0.0679	1.398
4_KATOSTFEID	15	2	0.443	0.162	-0.291	1.146
5_TXARA001CO	22	0	0.858	0.973	-0.962	2.555
5_TXARA002RE	20	1	0.534	1.249	-1.470	2.622
5_TXARA003RE	7	0	0.0255	0.350	-0.855	0.699
5_TXDAA001ID	7	0	-0.151	0.0706	-0.519	0.301
5_TXDAA002ID	19	0	-0.0821	1.798	-2.583	2.611
5_TXDAA004CO	19	1	0.660	0.625	-0.719	2.322
5_TXDAA005RE	7	0	-0.2580	0.0129	-0.3010	0.000000000
5_TXFWA004ID	20	1	0.571	0.735	-0.981	2.265
5_TXIRA001RE	21	1	0.868	1.122	-1.012	3.474
5_TXMEA002RE	7	0	-0.00695	0.318	-0.732	0.699
5_TXMEA003RE	7	0	-0.0314	0.0623	-0.2963	0.4771
6_AZMCA001ID	26	1	0.7199	0.1590	-0.1160	1.3802
6_AZMCA003ID	27	0	0.4549	0.2412	-0.5713	1.1461
6_AZMCA005CO	26	0	0.5869	0.2482	-0.3743	1.7782
6_AZMCA006RE	20	0	0.403	0.365	-0.732	2.176
6_AZTUA001RE	2	8	0.8741	0.00168	0.8451	0.9031
6_AZTUA002RE	2	6	0.77815	0.000000000	0.77815	0.77815
6_AZTUA003CO	3	5	0.903	0.0822	0.699	1.230

6_AZTUA004ID	2	5	0.801	0.0208	0.699	0.903
6_CAALAL09ID	0	9	*	*	*	*
7_OREUA001CO	14	2	0.443	0.204	-0.476	1.255
7_OREUA003RE	14	1	0.2645	0.0742	-0.2218	0.7782
7_ORGRA003RE	6	0	-0.247	0.168	-0.804	0.362
7_ORGRA004CO	5	1	0.435	0.157	-0.203	0.869
7_ORPOA001CO	12	1	0.3800	0.0301	0.0562	0.7559
7_ORPOA003ID	12	2	0.670	0.120	-0.0486	1.204
7_ORPOA004ID	12	1	0.5210	0.0332	0.2041	0.8633
7_ORPOA006RE	12	1	0.374	0.263	-0.0969	1.491
7_ORSAA002CO	6	0	0.395	0.196	-0.253	0.934
7_ORSAA003ID	5	1	0.441	0.211	-0.205	0.903
7_ORSAA004RE	6	0	0.478	0.130	-0.0866	0.851

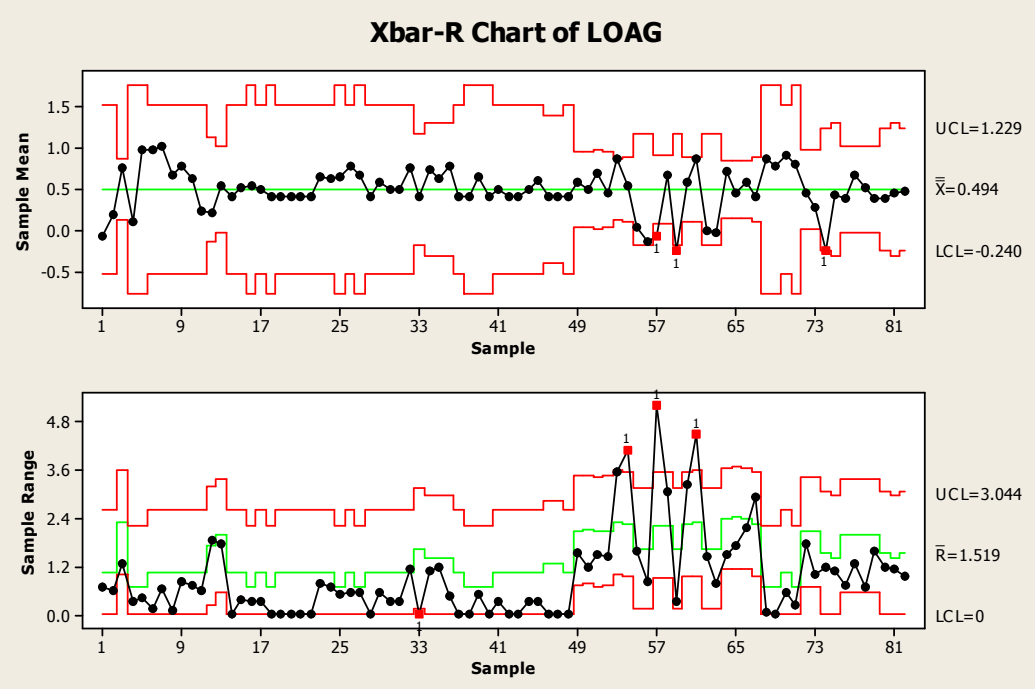

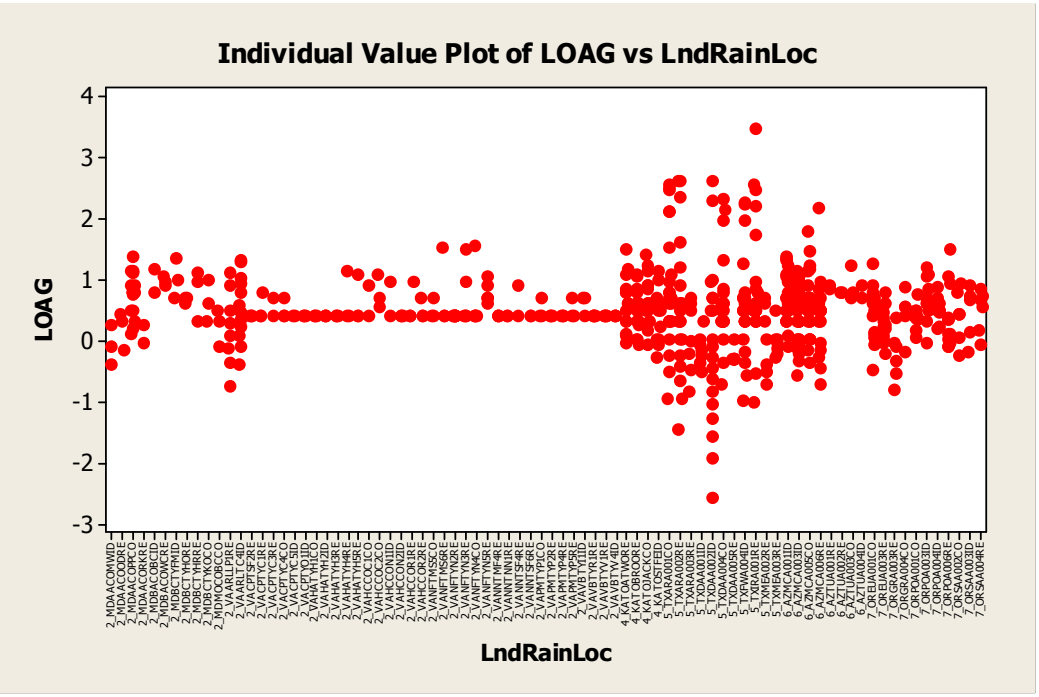

General Linear Model: LOAG versus Landuse, EPA_Rain_Zone

```
Factor          Type   Levels  Values
Landuse         fixed       3  CO, ID, RE
EPA_Rain_Zone   fixed       5  2, 4, 5, 6, 7


Analysis of Variance for LOAG, using Adjusted SS for Tests

Source                  DF    Seq SS    Adj SS  Adj MS     F      P
Landuse                  2    3.8655    3.3711  1.6856  4.60  0.010
EPA_Rain_Zone            4    3.1071    2.0783  0.5196  1.42  0.227
Landuse*EPA_Rain_Zone    8    6.2668    6.2668  0.7833  2.14  0.031
Error                  593  217.4563  217.4563  0.3667
Total                  607  230.6956
```

Land use and the interaction land use * EPA rain zone are significant.

```
Bonferroni Simultaneous Tests
Response Variable LOAG
All Pairwise Comparisons among Levels of Landuse
Landuse = CO  subtracted from:

         Difference       SE of           Adjusted
Landuse    of Means  Difference  T-Value   P-Value
ID          -0.1630     0.07104   -2.294    0.0664
RE          -0.1945     0.06667   -2.917    0.0110


Landuse = ID  subtracted from:

         Difference       SE of           Adjusted
Landuse    of Means  Difference  T-Value   P-Value
RE         -0.03148     0.06549  -0.4807     1.000
```

```
Tukey Simultaneous Tests
Response Variable LOAG
All Pairwise Comparisons among Levels of Landuse
Landuse = CO  subtracted from:

         Difference       SE of           Adjusted
Landuse    of Means  Difference  T-Value   P-Value
ID          -0.1630     0.07104   -2.294    0.0566
RE          -0.1945     0.06667   -2.917    0.0099


Landuse = ID  subtracted from:

         Difference       SE of           Adjusted
Landuse    of Means  Difference  T-Value   P-Value
RE         -0.03148     0.06549  -0.4807    0.8804
```

Oil and grease in residential is different than in commercial land use. There is not enough evidence to prove a difference between commercial and industrial or between residential and industrial.

```
Bonferroni Simultaneous Tests
Response Variable LOAG
All Pairwise Comparisons among Levels of EPA_Rain_Zone
EPA_Rain_Zone = 2  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
4                  0.0028     0.09617    0.029    1.0000
5                 -0.0998     0.06912   -1.443    1.0000
6                  0.0124     0.07843    0.158    1.0000
7                 -0.1381     0.07672   -1.800    0.7242

EPA_Rain_Zone = 4  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
5                 -0.1026     0.09701   -1.057     1.000
6                  0.0096     0.10385    0.092     1.000
7                 -0.1409     0.10256   -1.374     1.000

EPA_Rain_Zone = 5  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
6                 0.11214     0.07946   1.4113     1.000
7                -0.03832     0.07777  -0.4927     1.000

EPA_Rain_Zone = 6  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
7                 -0.1505     0.08615   -1.746    0.8125


Tukey Simultaneous Tests
Response Variable LOAG
All Pairwise Comparisons among Levels of EPA_Rain_Zone
EPA_Rain_Zone = 2  subtracted from:
```

```
                Difference       SE of           Adjusted
EPA_Rain_Zone     of Means  Difference  T-Value    P-Value
4                   0.0028     0.09617    0.029     1.0000
5                  -0.0998     0.06912   -1.443     0.5996
6                   0.0124     0.07843    0.158     0.9999
7                  -0.1381     0.07672   -1.800     0.3737

EPA_Rain_Zone = 4  subtracted from:

                Difference       SE of           Adjusted
EPA_Rain_Zone     of Means  Difference  T-Value    P-Value
5                  -0.1026     0.09701   -1.057     0.8283
6                   0.0096     0.10385    0.092     1.0000
7                  -0.1409     0.10256   -1.374     0.6446

EPA_Rain_Zone = 5  subtracted from:

                Difference       SE of           Adjusted
EPA_Rain_Zone     of Means  Difference  T-Value    P-Value
6                  0.11214     0.07946   1.4113     0.6203
7                 -0.03832     0.07777  -0.4927     0.9881

EPA_Rain_Zone = 6  subtracted from:

                Difference       SE of           Adjusted
EPA_Rain_Zone     of Means  Difference  T-Value    P-Value
7                  -0.1505     0.08615   -1.746     0.4054
```

No differences among EPA rain zones for oil and grease.

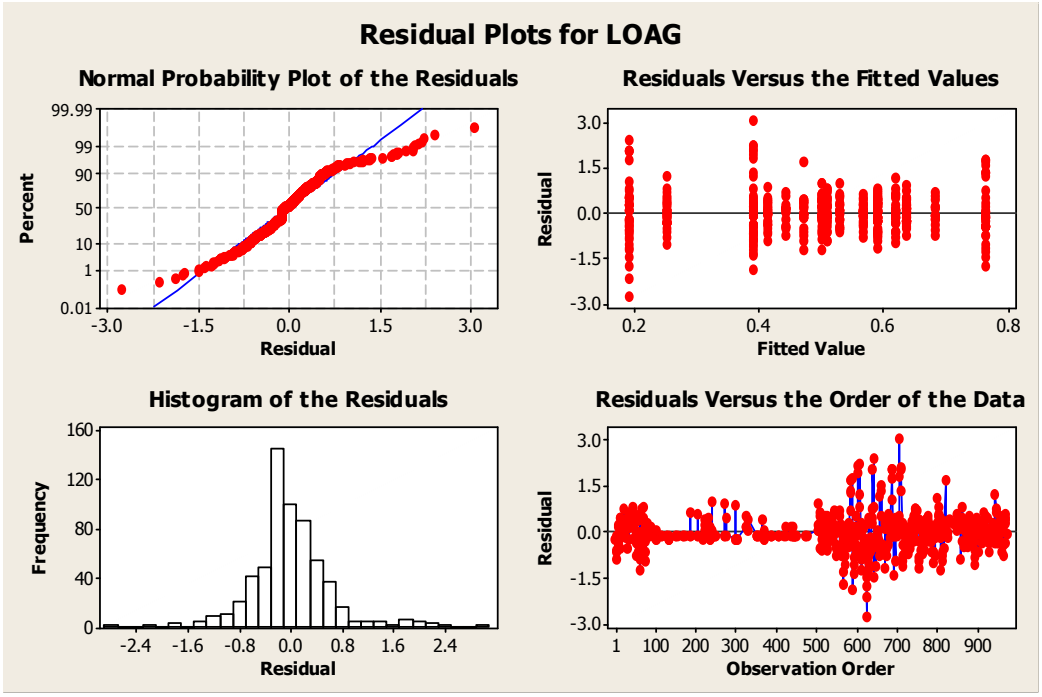

Residuals fail normality. Tails are larger compared with the normal distribution. A trend was observed in the residuals. Several observations were observed at the same value.

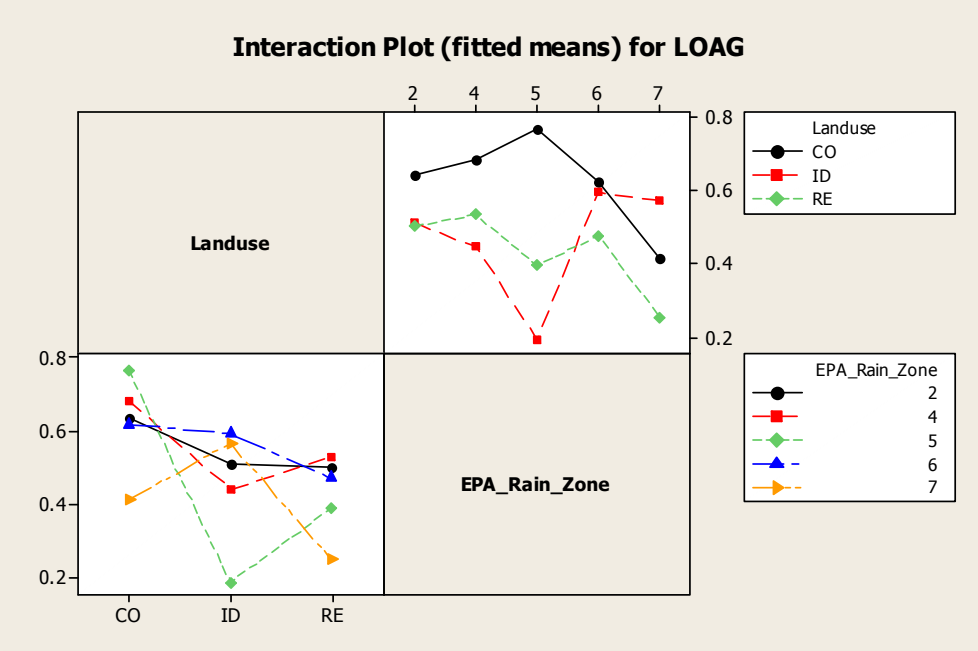
Interaction Plot (fitted means) for LOAG
Landuse
EPA_Rain_Zone
2
4
5
6
7
0.8
0.6
0.4
0.2
CO
ID
RE
Landuse
CO
ID
RE
EPA_Rain_Zone
2
4
5
6
7

Total Dissolved Solids

Summary statistics in LOG base 10 scale
Land use: Commercial

EPA_Rain_Zone	N det/est	N non detected	Mean	StDev	Minimum	Maximum
2	82	41	1.83	0.32	1.36	3.59
3	6	0	1.67	0.22	1.46	2.08
4	15	1	2.20	0.28	1.81	2.94
5	39	3	1.70	0.17	1.36	2.08
6	20	14	1.98	0.28	1.52	2.58
7	37	4	1.62	0.40	0.60	2.09

Land use: Industrial

EPA_Rain_Zone	N det/est	N non detected	Mean	StDev	Minimum	Maximum
2	86	23	1.81	0.50	0.65	4.05
3	16	0	1.97	0.30	1.15	2.35
4	16	1	2.00	0.28	1.48	2.72
5	43	4	1.88	0.20	1.43	2.38
6	56	14	2.07	0.24	1.20	2.57
7	24	9	1.79	0.32	0.85	2.19

Land use: Residential

EPA_Rain_Zone	N det/est	N non detected	Mean	StDev	Minimum	Maximum
2	268	63	1.83	0.27	1.04	3.23
3	17	1	1.87	0.30	1.43	2.32
4	31	0	2.26	0.30	1.77	3.04
5	64	7	1.85	0.18	1.52	2.28
6	34	4	1.98	0.22	1.62	2.45
7	37	3	1.64	0.38	0.48	2.24

Descriptive Statistics: LTDS

Variable	LndRainLoc	N	N*	Mean	Variance	Minimum	Maximum
LTDS	2_KYLOTSR1RE	3	0	2.149	0.254	1.806	2.728
	2_KYLOTSR2ID	3	0	2.070	0.283	1.748	2.685
	2_KYLOTSR3RE	3	0	2.469	0.0871	2.173	2.763
	2_KYLOTSR4ID	4	0	2.4105	0.0289	2.2148	2.5635
	2_MDAACOMWID	1	2	1.5185	*	1.5185	1.5185
	2_MDAACOODRE	0	3	*	*	*	*
	2_MDAACOPPCO	0	26	*	*	*	*
	2_MDAACORKRE	0	3	*	*	*	*
	2_MDBACOBCID	0	3	*	*	*	*
	2_MDBACOSCRE	0	26	*	*	*	*
	2_MDBACOTCID	0	3	*	*	*	*
	2_MDBACOWCRE	0	3	*	*	*	*
	2_MDBCTYBOID	0	3	*	*	*	*
	2_MDBCTYFMID	0	3	*	*	*	*
	2_MDBCTYHORE	0	3	*	*	*	*
	2_MDBCTYHRRE	0	3	*	*	*	*
	2_MDBCTYKOCO	0	3	*	*	*	*
	2_MDMOCOBCCO	0	3	*	*	*	*
	2_VAARLLP1RE	8	0	2.394	0.195	1.968	3.230
	2_VAARLTC4ID	12	1	2.397	0.920	0.653	4.049

2_VACPTC1ARE	8	0	1.7539	0.0230	1.4771	1.9243
2_VACPTSF2RE	0	3	*	*	*	*
2_VACPTYC1RE	7	0	1.5817	0.0433	1.3010	1.8195
2_VACPTYC3RE	14	0	1.6238	0.0404	1.3010	2.0043
2_VACPTYC4CO	14	0	1.7555	0.0379	1.3979	2.0374
2_VACPTYC5ID	14	0	1.5502	0.0264	1.2304	1.7853
2_VACPTYO1ID	0	3	*	*	*	*
2_VAHATYH1CO	18	0	1.8825	0.0395	1.3617	2.1703
2_VAHATYH2ID	18	1	1.8559	0.0104	1.6532	2.0864
2_VAHATYH3RE	17	0	1.9384	0.0498	1.6990	2.3962
2_VAHATYH4RE	17	0	1.9273	0.00830	1.7482	2.0682
2_VAHATYH5RE	17	0	1.9079	0.0691	1.6128	2.4440
2_VAHCCOC1CO	2	0	1.7634	0.000000000	1.7634	1.7634
2_VAHCCOC2CO	3	0	1.7826	0.000472	1.7634	1.8062
2_VAHCCON1ID	2	0	1.757	0.0629	1.580	1.934
2_VAHCCON2ID	3	0	1.687	0.112	1.301	1.903
2_VAHCCOR1RE	3	0	1.7663	0.0155	1.6435	1.8921
2_VAHCCOR2RE	3	0	1.689	0.0795	1.477	2.009
2_VANFTMS5CO	0	3	*	*	*	*
2_VANFTMS6RE	0	3	*	*	*	*
2_VANFTMS8CO	0	3	*	*	*	*
2_VANFTMS9CO	0	3	*	*	*	*
2_VANFTYN2RE	29	0	1.7616	0.0696	1.0414	2.2122
2_VANFTYN3RE	27	0	1.7805	0.0613	1.3424	2.2304
2_VANFTYN4CO	27	0	1.8441	0.0863	1.3802	2.4969
2_VANFTYN5RE	27	0	1.8353	0.0423	1.4150	2.2175
2_VANNTMF1RE	0	1	*	*	*	*
2_VANNTMF4RE	0	3	*	*	*	*
2_VANNTNN1RE	8	2	1.7778	0.0297	1.6021	2.1790
2_VANNTSF4RE	0	2	*	*	*	*
2_VANNTSF6RE	0	2	*	*	*	*
2_VAPMTYP1CO	18	0	1.838	0.273	1.380	3.587
2_VAPMTYP2RE	17	0	1.7789	0.0284	1.4314	2.1106
2_VAPMTYP4RE	17	0	1.7073	0.0185	1.4314	2.0212
2_VAPMTYP5RE	17	0	1.7584	0.0541	1.3979	2.1875
2_VAVBTYI1ID	0	3	*	*	*	*
2_VAVBTYR1RE	0	5	*	*	*	*
2_VAVBTYV1RE	26	1	1.8700	0.0339	1.3979	2.2553
2_VAVBTYV4ID	29	1	1.5823	0.0581	0.8451	2.0253
3_ALMOCREORE	3	0	1.712	0.0414	1.477	1.833
3_ALMODAPHCO	3	0	1.773	0.0729	1.568	2.079
3_ALMOSARARE	3	0	1.6477	0.0292	1.4624	1.7993
3_ALMOSIIVID	3	0	2.2222	0.0109	2.1139	2.3222
3_ALMOSITVCO	3	0	1.5765	0.0140	1.4624	1.6990
3_ALMOSIVIRE	3	0	1.620	0.0317	1.431	1.785
3_ALMOTHEOID	3	0	2.016	0.0646	1.813	2.301
3_GAATAT01ID	10	0	1.885	0.102	1.147	2.350
3_GAATAT02RE	8	1	2.1059	0.0522	1.7282	2.3242
4_KATOATWORE	15	0	2.2816	0.0828	1.7709	2.6474
4_KATOBROORE	16	0	2.2303	0.0962	1.8325	3.0398
4_KATOJACKCO	15	1	2.2009	0.0807	1.8062	2.9445
4_KATOSTFEID	16	1	2.0001	0.0786	1.4771	2.7193
5_TXARA001CO	21	1	1.7418	0.0397	1.3617	2.0792
5_TXARA002RE	18	3	1.7790	0.0263	1.5185	2.0719
5_TXARA003RE	7	0	1.7510	0.00375	1.6812	1.8633
5_TXDAA001ID	6	1	1.7012	0.0441	1.4314	1.9638
5_TXDAA002ID	18	1	1.8823	0.0268	1.6435	2.2967
5_TXDAA004CO	18	2	1.6562	0.0153	1.4624	1.8692
5_TXDAA005RE	6	1	1.9004	0.0201	1.7076	2.0128
5_TXFWA004ID	19	2	1.9418	0.0428	1.6532	2.3766
5_TXIRA001RE	20	2	1.9071	0.0409	1.5911	2.2810
5_TXMEA002RE	7	0	2.0181	0.0217	1.8129	2.2014
5_TXMEA003RE	6	1	1.7478	0.00446	1.6628	1.8388

6_AZMCA001ID	20	7	1.9987	0.0560	1.6435	2.5717
6_AZMCA003ID	24	3	2.1602	0.0191	1.8451	2.4857
6_AZMCA005CO	12	14	1.8548	0.0395	1.5185	2.2148
6_AZMCA006RE	16	4	1.8932	0.0345	1.6232	2.3909
6_AZTUA001RE	10	0	2.1314	0.0350	1.9031	2.4265
6_AZTUA002RE	8	0	1.9557	0.0591	1.6532	2.4472
6_AZTUA003CO	8	0	2.156	0.0933	1.748	2.583
6_AZTUA004ID	6	1	2.2375	0.0233	2.0414	2.4378
6_CAALAL09ID	6	3	1.785	0.139	1.204	2.204
7_OREUA001CO	14	2	1.8631	0.0375	1.4914	2.0934
7_OREUA003RE	15	0	1.7557	0.0890	0.9031	2.0414
7_ORGRA003RE	6	0	1.8070	0.0336	1.4771	2.0128
7_ORGRA004CO	6	0	1.515	0.121	0.903	1.845
7_ORPOA001CO	12	1	1.368	0.269	0.602	2.079
7_ORPOA003ID	11	3	1.788	0.151	0.845	2.188
7_ORPOA004ID	9	4	1.9331	0.0399	1.6232	2.1523
7_ORPOA006RE	11	2	1.519	0.175	0.775	2.243
7_ORSAA002CO	5	1	1.6984	0.00670	1.5563	1.7634
7_ORSAA003ID	4	2	1.4869	0.0130	1.3617	1.6335
7_ORSAA004RE	5	1	1.321	0.228	0.477	1.643

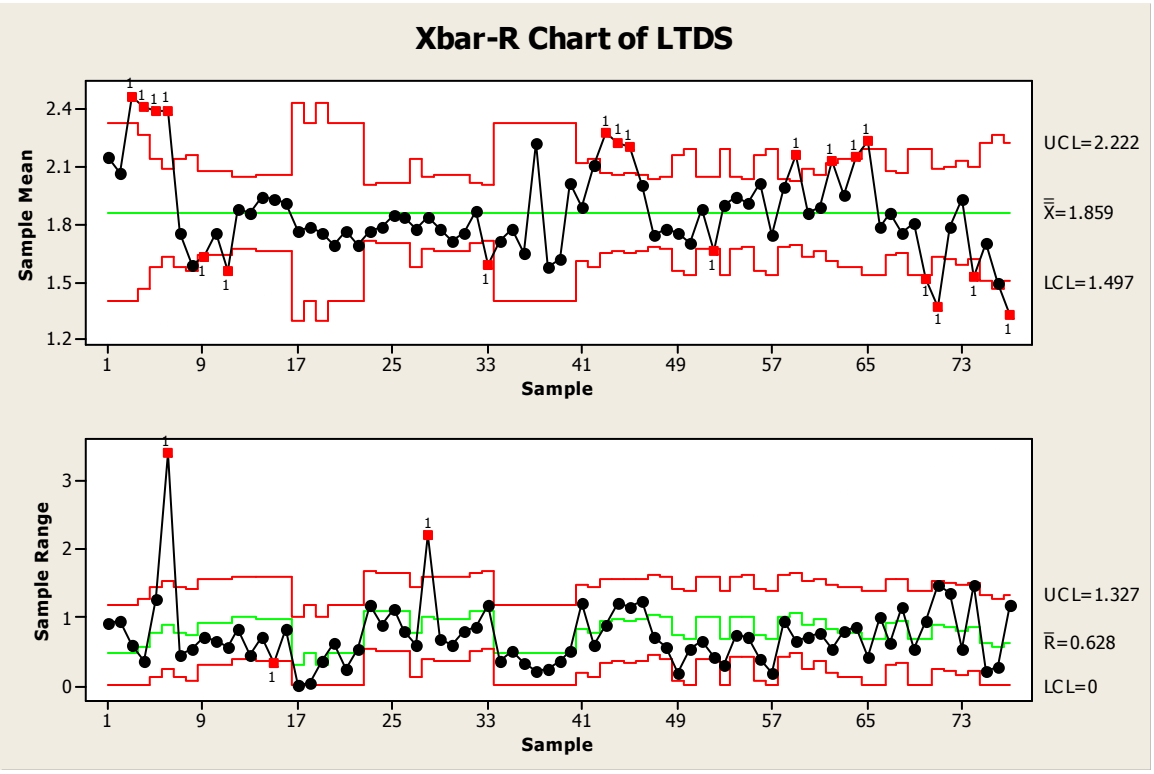

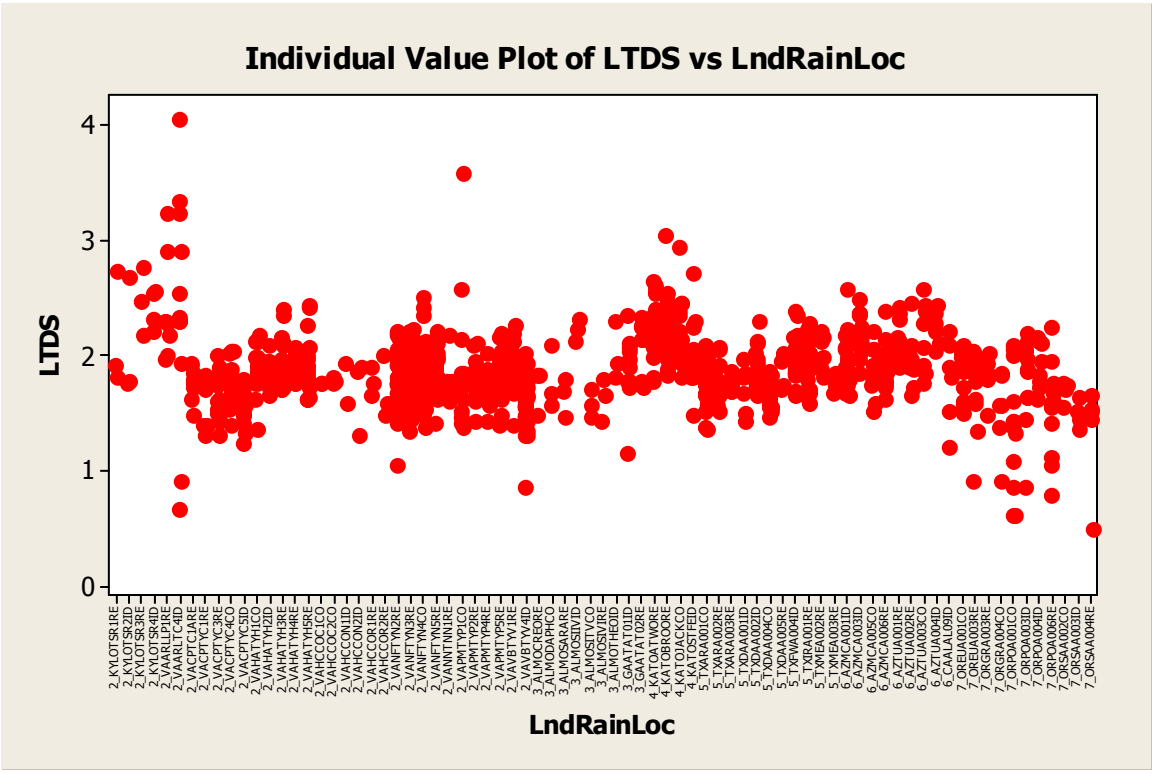

General Linear Model: LTDS versus Landuse, EPA_Rain_Zone

```
Factor          Type   Levels  Values
Landuse         fixed       3  CO, ID, RE
EPA_Rain_Zone   fixed       6  2, 3, 4, 5, 6, 7


Analysis of Variance for LTDS, using Adjusted SS for Tests

Source                   DF    Seq SS    Adj SS   Adj MS      F      P
Landuse                   2   1.13036   0.50905  0.25453   2.74  0.065
EPA_Rain_Zone             5  12.80378  10.39401  2.07880  22.37  0.000
Landuse*EPA_Rain_Zone    10   2.14609   2.14609  0.21461   2.31  0.011
Error                   872  81.04647  81.04647  0.09294
Total                   889  97.12670
```

Not significant by land use
Significant by rain zone
Significant by land use and rain zone interaction.

```
Bonferroni Simultaneous Tests
Response Variable LTDS
All Pairwise Comparisons among Levels of Landuse
Landuse = CO  subtracted from:

         Difference       SE of           Adjusted
Landuse    of Means  Difference  T-Value   P-Value
ID          0.08739     0.03829    2.283    0.0681
RE          0.06801     0.03647    1.865    0.1875
```

```
Landuse = ID  subtracted from:

         Difference       SE of           Adjusted
Landuse    of Means  Difference  T-Value   P-Value
RE         -0.01937     0.03159  -0.6134     1.000

Tukey Simultaneous Tests
Response Variable LTDS
All Pairwise Comparisons among Levels of Landuse
Landuse = CO  subtracted from:

         Difference       SE of           Adjusted
Landuse    of Means  Difference  T-Value   P-Value
ID          0.08739     0.03829    2.283    0.0583
RE          0.06801     0.03647    1.865    0.1489


Landuse = ID  subtracted from:

         Difference       SE of           Adjusted
Landuse    of Means  Difference  T-Value   P-Value
RE         -0.01937     0.03159  -0.6134    0.8128
```

No significant differences by land use

```
Bonferroni Simultaneous Tests
Response Variable LTDS
All Pairwise Comparisons among Levels of EPA_Rain_Zone
EPA_Rain_Zone = 2  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
3                  0.0143     0.05710    0.250    1.0000
4                  0.3272     0.04419    7.403    0.0000
5                 -0.0128     0.03086   -0.415    1.0000
6                  0.1830     0.03592    5.094    0.0000
7                 -0.1411     0.03570   -3.952    0.0013


EPA_Rain_Zone = 3  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
4                  0.3129     0.06813    4.593    0.0001
5                 -0.0271     0.06034   -0.449    1.0000
6                  0.1687     0.06308    2.675    0.1143
7                 -0.1554     0.06295   -2.468    0.2066


EPA_Rain_Zone = 4  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
5                 -0.3400     0.04830   -7.038    0.0000
6                 -0.1442     0.05169   -2.789    0.0809
7                 -0.4683     0.05153   -9.087    0.0000


EPA_Rain_Zone = 5  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
```

```
6                  0.1958     0.04088    4.790    0.0000
7                 -0.1283     0.04068   -3.153    0.0250


EPA_Rain_Zone = 6  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
7                 -0.3241     0.04464   -7.259    0.0000
```

TDS in EPA rain zone 2 is significantly different than in rain zones 4, 6, and 7. No significant differences between EPA rain zone 2 and rain zones 3 and 5.

TDS in EPA rain zone 3 is significantly different than in rain zones 4, 6, and 7. No significant differences between EPA rain zone 3 and rain zone 5.

TDS in EPA rain zone 4 is significantly different than in rain zones 5, and 7. No significant differences between EPA rain zone 4 and rain zone 6.

TDS in EPA rain zone 5 is significantly different than in rain zones 6, and 7.

TDS in EPA rain zone 6 is significantly different than in rain zone 7.

```
Tukey Simultaneous Tests
Response Variable LTDS
All Pairwise Comparisons among Levels of EPA_Rain_Zone
EPA_Rain_Zone = 2  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
3                  0.0143     0.05710    0.250    0.9999
4                  0.3272     0.04419    7.403    0.0000
5                 -0.0128     0.03086   -0.415    0.9984
6                  0.1830     0.03592    5.094    0.0000
7                 -0.1411     0.03570   -3.952    0.0011


EPA_Rain_Zone = 3  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
4                  0.3129     0.06813    4.593    0.0001
5                 -0.0271     0.06034   -0.449    0.9977
6                  0.1687     0.06308    2.675    0.0803
7                 -0.1554     0.06295   -2.468    0.1336


EPA_Rain_Zone = 4  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
5                 -0.3400     0.04830   -7.038    0.0000
6                 -0.1442     0.05169   -2.789    0.0591
7                 -0.4683     0.05153   -9.087    0.0000


EPA_Rain_Zone = 5  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
```

```
6                   0.1958     0.04088    4.790    0.0000
7                  -0.1283     0.04068   -3.153    0.0201


EPA_Rain_Zone = 6  subtracted from:

                Difference       SE of            Adjusted
EPA_Rain_Zone     of Means  Difference  T-Value    P-Value
7                  -0.3241     0.04464   -7.259    0.0000
```

TDS in EPA rain zone 2 is significantly different than in rain zones 4, 6, and 7. No significant differences between EPA rain zone 2 and rain zones 3 and 5.

TDS in EPA rain zone 3 is significantly different than in rain zone 4. No significant differences between EPA rain zone 3 and rain zone 5, 6 and 7.

TDS in EPA rain zone 4 is significantly different than in rain zones 5, and 7. No significant differences between EPA rain zone 4 and rain zone 6.

TDS in EPA rain zone 5 is significantly different than in rain zones 6, and 7.

TDS in EPA rain zone 6 is significantly different than in rain zone 7.

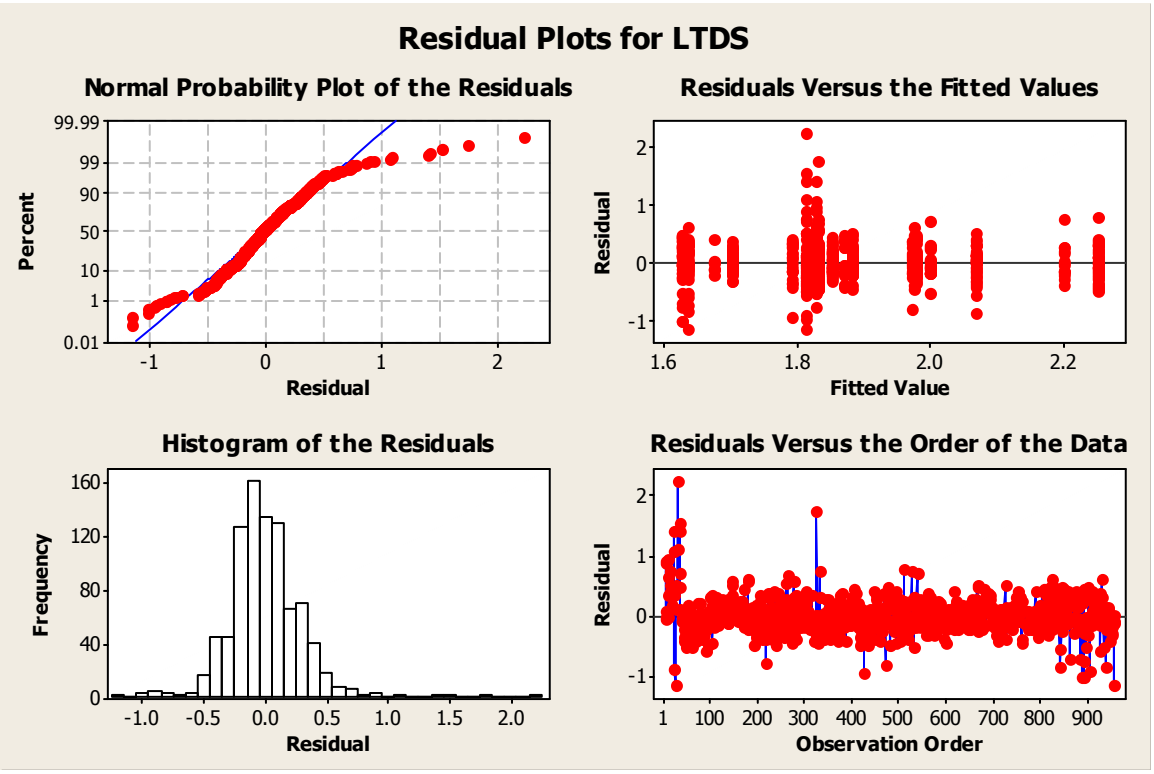

Sites in Kentucky and Arlington Virginia are different than the remaining sites in the database.

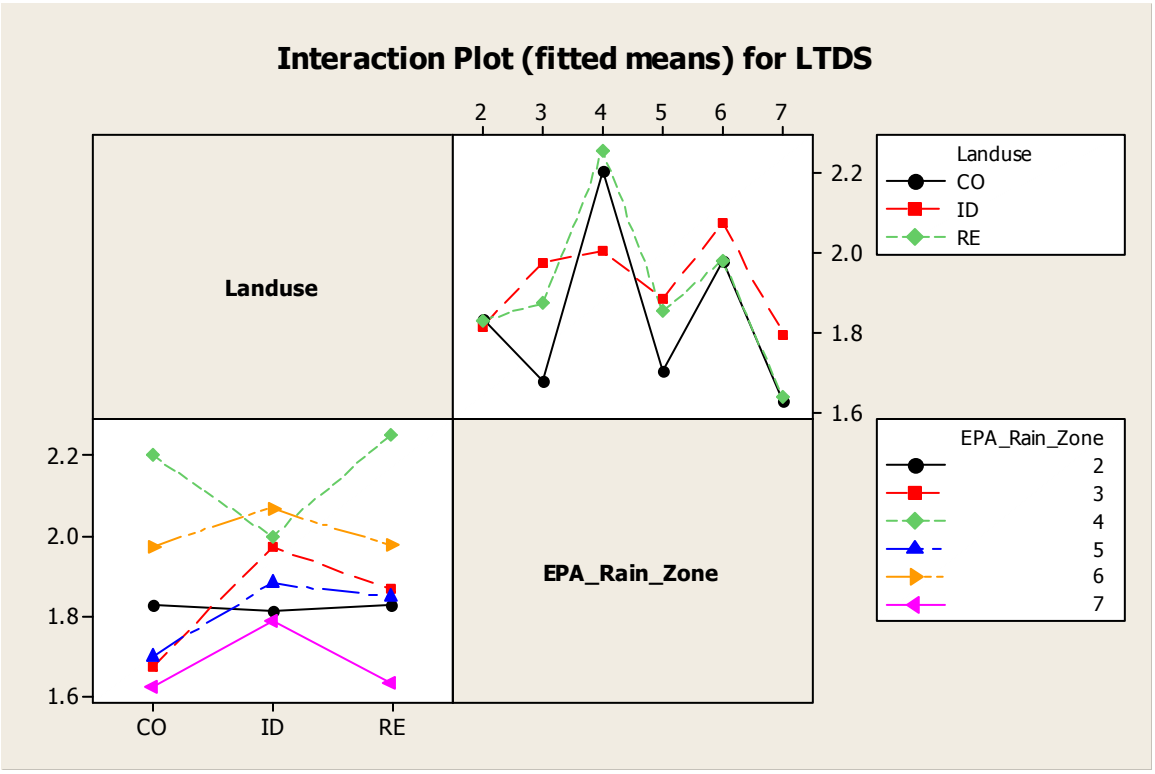
Interaction Plot (fitted means) for LTDS
Landuse
EPA_Rain_Zone
2
3
4
5
6
7
2.2
2.0
1.8
1.6
CO
ID
RE
Landuse
CO
ID
RE
EPA_Rain_Zone
2
3
4
5
6
7

Total Suspended Solids

Summary statistics in LOG base 10 scale

Land use: Commercial

EPA_Rain_Zone	N det/est	N non detected	Mean	StDev	Minimum	Maximum
2	113	10	1.59	0.36	0.83	2.80
3	6	0	1.83	0.27	1.40	2.04
4	15	1	2.82	0.31	2.25	3.38
5	40	2	1.50	0.54	0.30	2.81
6	20	14	1.87	0.45	0.90	2.71
7	37	4	1.75	0.39	0.90	2.58

Land use: Industrial

EPA_Rain_Zone	N det/est	N non detected	Mean	StDev	Minimum	Maximum
2	101	8	1.6434	0.4385	0.4771	2.5185
3	16	0	1.351	0.809	-0.367	2.505
4	16	1	2.177	0.617	1.322	3.073
5	43	4	2.1667	0.4113	1.3802	3.3962
6	57	13	2.458	0.5143	1.2041	3.3664
7	24	9	2.0825	0.3837	1.2041	3.0334

Land use: Residential

EPA_Rain_Zone	N det/est	N non sampled	Mean	StDev	Minimum	Maximum
2	309	22	1.6047	0.4328	0.4074	2.9154
3	18	0	1.346	0.454	0.623	2.255
4	30	1	2.2706	0.5227	1.0414	3.3913
5	64	7	1.8435	0.3878	0.6021	2.7839
6	33	5	1.9127	0.4257	0.4771	2.5441
7	37	3	1.681	0.3785	0.8451	2.8791

Descriptive Statistics: LTSS

Variable	LndRainLoc	N	N*	Mean	Variance	Minimum	Maximum
LTSS	2_KYLOTSR1RE	3	0	1.6270	0.00411	1.5563	1.6812
	2_KYLOTSR2ID	3	0	2.054	0.348	1.380	2.477
	2_KYLOTSR3RE	3	0	2.179	0.167	1.708	2.435
	2_KYLOTSR4ID	4	0	1.942	0.0652	1.623	2.241
	2_MDAACOMWID	2	1	2.361	0.0494	2.204	2.519
	2_MDAACOODRE	3	0	1.443	0.137	1.204	1.869
	2_MDAACOPPCO	26	0	1.5368	0.0803	1.0406	2.1276
	2_MDAACORKRE	3	0	1.625	1.077	0.513	2.568
	2_MDBACOBCID	3	0	1.764	0.0373	1.568	1.954
	2_MDBACOSCRE	26	0	1.427	0.280	0.407	2.443
	2_MDBACOTCID	3	0	2.1936	0.00870	2.1335	2.3010
	2_MDBACOWCRE	3	0	1.867	0.0719	1.708	2.176
	2_MDBCTYBOID	3	0	1.704	0.0450	1.544	1.944
	2_MDBCTYFMID	3	0	1.894	0.0537	1.690	2.146
	2_MDBCTYHORE	3	0	1.3877	0.00590	1.3010	1.4472
	2_MDBCTYHRRE	3	0	1.616	0.0787	1.342	1.903
	2_MDBCTYKOCO	3	0	1.937	0.0529	1.672	2.083
	2_MDMOCOBCCO	2	1	1.038	0.0742	0.845	1.230

2_VAARLLP1RE	8	0	1.189	0.380	0.477	2.556
2_VAARLTC4ID	13	0	1.5970	0.1206	0.7782	1.9638
2_VACPTC1ARE	8	0	1.6618	0.0595	1.3424	2.0645
2_VACPTSF2RE	0	3	*	*	*	*
2_VACPTYC1RE	7	0	1.7275	0.0159	1.5185	1.8808
2_VACPTYC3RE	14	0	1.6436	0.0620	1.2041	2.0569
2_VACPTYC4CO	14	0	1.766	0.316	1.000	2.799
2_VACPTYC5ID	14	0	1.1237	0.0902	0.6021	1.6435
2_VACPTYO1ID	0	3	*	*	*	*
2_VAHATYH1CO	18	0	1.4983	0.0383	1.2304	1.9243
2_VAHATYH2ID	19	0	1.9411	0.0732	1.6021	2.4265
2_VAHATYH3RE	17	0	1.437	0.212	0.603	2.274
2_VAHATYH4RE	17	0	1.6390	0.1167	1.1761	2.4378
2_VAHATYH5RE	17	0	1.383	0.206	0.699	2.265
2_VAHCCOC1CO	2	0	1.9552	0.00664	1.8976	2.0128
2_VAHCCOC2CO	3	0	2.094	0.0330	1.903	2.265
2_VAHCCON1ID	2	0	1.908	0.0875	1.699	2.117
2_VAHCCON2ID	3	0	1.551	0.252	1.000	1.982
2_VAHCCOR1RE	3	0	1.801	0.134	1.398	2.114
2_VAHCCOR2RE	3	0	1.675	0.0305	1.519	1.863
2_VANFTMS5CO	0	3	*	*	*	*
2_VANFTMS6RE	0	3	*	*	*	*
2_VANFTMS8CO	0	3	*	*	*	*
2_VANFTMS9CO	0	3	*	*	*	*
2_VANFTYN2RE	29	0	1.5865	0.1854	0.6021	2.3560
2_VANFTYN3RE	27	0	1.6417	0.1088	0.6021	2.2405
2_VANFTYN4CO	27	0	1.5526	0.1111	0.8264	2.1673
2_VANFTYN5RE	27	0	1.7382	0.2002	0.4771	2.3598
2_VANNTMF1RE	0	1	*	*	*	*
2_VANNTMF4RE	0	3	*	*	*	*
2_VANNTNN1RE	8	2	1.997	0.113	1.462	2.352
2_VANNTSF4RE	0	2	*	*	*	*
2_VANNTSF6RE	0	2	*	*	*	*
2_VAPMTYP1CO	18	0	1.5758	0.1205	0.9542	2.2900
2_VAPMTYP2RE	17	0	1.535	0.178	0.778	2.548
2_VAPMTYP4RE	17	0	1.5970	0.0711	0.9542	2.0212
2_VAPMTYP5RE	17	0	1.3599	0.1114	0.9542	2.0934
2_VAVBTYI1ID	0	3	*	*	*	*
2_VAVBTYR1RE	0	5	*	*	*	*
2_VAVBTYV1RE	26	1	1.9143	0.1752	0.8451	2.9154
2_VAVBTYV4ID	29	1	1.4765	0.1413	0.4771	2.2923
3_ALMOCREORE	3	0	0.984	0.0903	0.748	1.322
3_ALMODAPHCO	3	0	2.0414	0.000000000	2.0414	2.0414
3_ALMOSARARE	3	0	1.959	0.0765	1.708	2.255
3_ALMOSIIVID	3	0	2.076	0.0535	1.863	2.322
3_ALMOSITVCO	3	0	1.611	0.0368	1.398	1.771
3_ALMOSIVIRE	3	0	1.583	0.147	1.146	1.863
3_ALMOTHEOID	3	0	1.844	0.728	0.881	2.505
3_GAATAT01ID	10	0	0.986	0.513	-0.367	2.000
3_GAATAT02RE	9	0	1.183	0.119	0.623	1.794
4_KATOATWORE	15	0	2.293	0.269	1.301	3.299
4_KATOBROORE	15	1	2.248	0.296	1.041	3.391
4_KATOJACKCO	15	1	2.8203	0.0981	2.2455	3.3775
4_KATOSTFEID	16	1	2.177	0.381	1.322	3.073
5_TXARA001CO	22	0	1.4698	0.1748	0.4771	2.3385
5_TXARA002RE	18	3	1.7430	0.1094	1.1461	2.2742
5_TXARA003RE	7	0	1.598	0.123	1.114	2.057
5_TXDAA001ID	6	1	2.0691	0.0400	1.7924	2.3444
5_TXDAA002ID	18	1	1.8856	0.1023	1.3802	2.3729
5_TXDAA004CO	18	2	1.544	0.455	0.301	2.806
5_TXDAA005RE	6	1	2.179	0.134	1.740	2.547
5_TXFWA004ID	19	2	2.4638	0.1117	1.9445	3.3962
5_TXIRA001RE	20	2	1.8656	0.1851	0.6021	2.6415

5_TXMEA002RE	7	0	2.115	0.111	1.708	2.784
5_TXMEA003RE	6	1	1.7057	0.0222	1.5441	1.8921
6_AZMCA001ID	19	8	2.1062	0.1720	1.4771	2.6998
6_AZMCA003ID	24	3	2.8248	0.1505	1.7924	3.3664
6_AZMCA005CO	12	14	1.781	0.241	0.903	2.316
6_AZMCA006RE	15	5	1.730	0.240	0.477	2.294
6_AZTUA001RE	10	0	2.1178	0.0873	1.4314	2.5185
6_AZTUA002RE	8	0	1.998	0.0974	1.556	2.544
6_AZTUA003CO	8	0	1.997	0.141	1.462	2.708
6_AZTUA004ID	7	0	2.385	0.359	1.204	3.140
6_CAALAL09ID	7	2	2.2286	0.0190	2.0792	2.4472
7_OREUA001CO	14	2	1.758	0.225	0.903	2.580
7_OREUA003RE	15	0	1.774	0.166	1.279	2.879
7_ORGRA003RE	6	0	1.566	0.0616	1.176	1.914
7_ORGRA004CO	6	0	1.6843	0.0584	1.3617	2.0531
7_ORPOA001CO	12	1	1.748	0.188	1.146	2.580
7_ORPOA003ID	11	3	2.259	0.144	1.892	3.033
7_ORPOA004ID	9	4	2.0203	0.0659	1.5682	2.5011
7_ORPOA006RE	11	2	1.7331	0.0922	1.2553	2.1139
7_ORSAA002CO	5	1	1.8444	0.0486	1.5441	2.1492
7_ORSAA003ID	4	2	1.737	0.186	1.204	2.111
7_ORSAA004RE	5	1	1.427	0.261	0.845	1.903

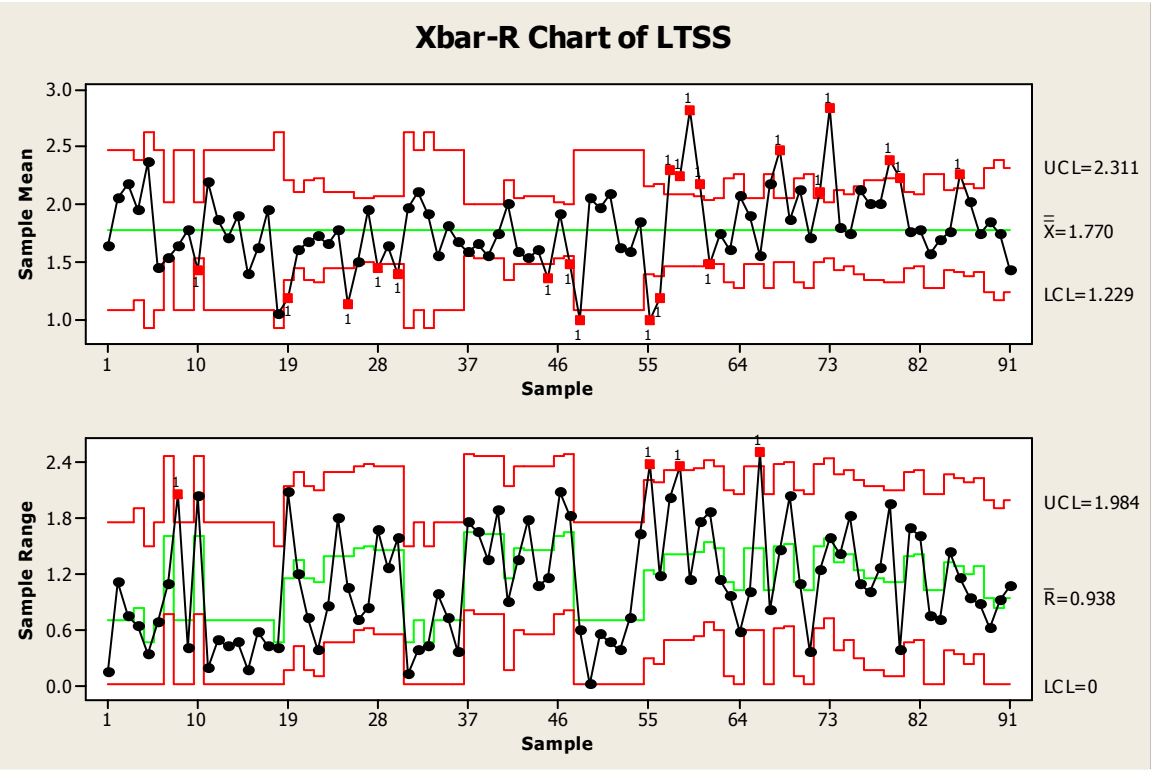

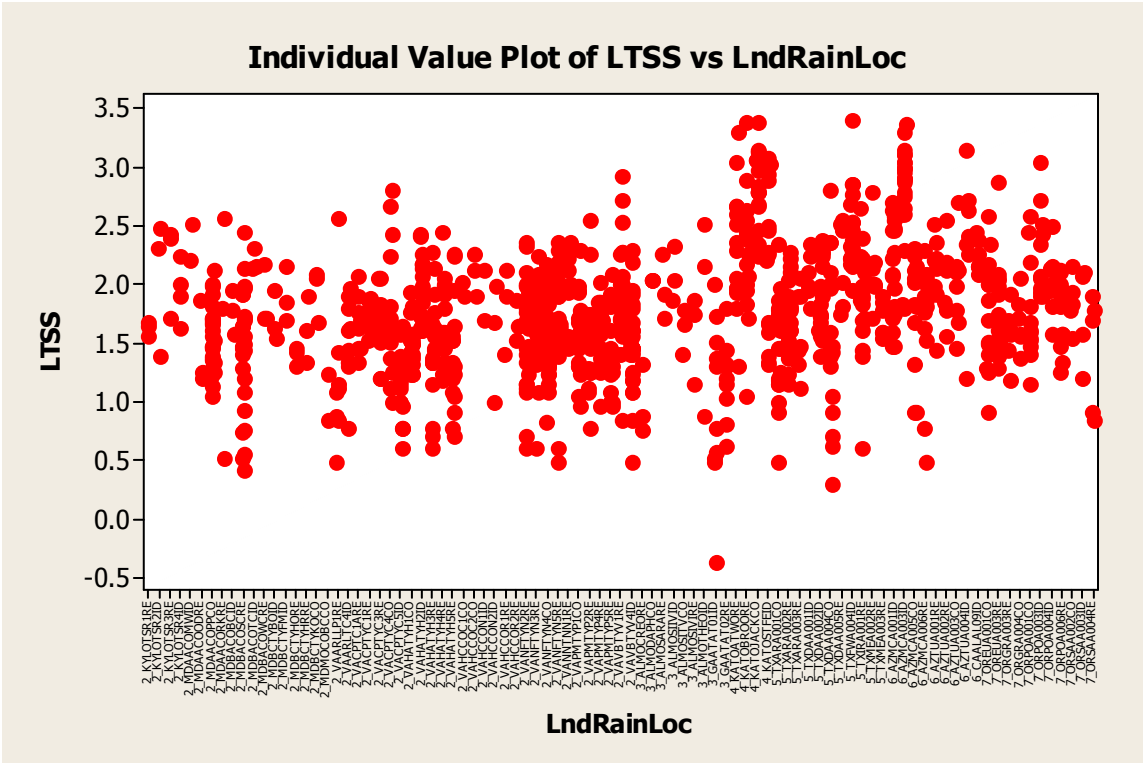

General Linear Model: LTSS versus Landuse, EPA_Rain_Zone

```
Factor          Type   Levels  Values
Landuse         fixed       3  CO, ID, RE
EPA_Rain_Zone   fixed       6  2, 3, 4, 5, 6, 7


Analysis of Variance for LTSS, using Adjusted SS for Tests

Source                  DF     Seq SS    Adj SS  Adj MS      F      P
Landuse                  2    13.6706    3.9665  1.9833  10.20  0.000
EPA_Rain_Zone            5    54.4527   45.5820  9.1164  46.88  0.000
Landuse*EPA_Rain_Zone   10    18.7052   18.7052  1.8705   9.62  0.000
Error                  961   186.8854  186.8854  0.1945
Total                  978   273.7139
```

Both main factors and interactions are significant.

```
Bonferroni Simultaneous Tests
Response Variable LTSS
All Pairwise Comparisons among Levels of Landuse
Landuse = CO  subtracted from:

         Difference       SE of           Adjusted
Landuse    of Means  Difference  T-Value   P-Value
ID           0.0857     0.05508    1.556    0.3600
RE          -0.1177     0.05245   -2.243    0.0753
```

```
Landuse = ID  subtracted from:

         Difference       SE of           Adjusted
Landuse    of Means  Difference  T-Value   P-Value
RE          -0.2034     0.04545   -4.474    0.0000



Tukey Simultaneous Tests
Response Variable LTSS
All Pairwise Comparisons among Levels of Landuse
Landuse = CO  subtracted from:

         Difference       SE of           Adjusted
Landuse    of Means  Difference  T-Value   P-Value
ID           0.0857     0.05508    1.556    0.2649
RE          -0.1177     0.05245   -2.243    0.0642


Landuse = ID  subtracted from:

         Difference       SE of           Adjusted
Landuse    of Means  Difference  T-Value   P-Value
RE          -0.2034     0.04545   -4.474    0.0000
```

No difference in TSS concentrations between commercial and industrial land uses, and commercial and residential. TSS from industrial land uses is different than TSS from residential land use.

```
Bonferroni Simultaneous Tests
Response Variable LTSS
All Pairwise Comparisons among Levels of EPA_Rain_Zone
EPA_Rain_Zone = 2  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
3                 -0.1060     0.08141   -1.303    1.0000
4                  0.8089     0.06314   12.812    0.0000
5                  0.2241     0.04307    5.203    0.0000
6                  0.4657     0.05089    9.151    0.0000
7                  0.2256     0.05043    4.473    0.0001


EPA_Rain_Zone = 3  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
4                  0.9150     0.09830    9.307    0.0000
5                  0.3302     0.08679    3.804    0.0023
6                  0.5717     0.09092    6.288    0.0000
7                  0.3316     0.09067    3.658    0.0040

EPA_Rain_Zone = 4  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
5                 -0.5848     0.06994   -8.361    0.0000
6                 -0.3432     0.07500   -4.576    0.0001
7                 -0.5833     0.07470   -7.809    0.0000

EPA_Rain_Zone = 5  subtracted from:
```

```
                Difference       SE of           Adjusted
EPA_Rain_Zone     of Means  Difference  T-Value   P-Value
6                 0.241542     0.05911  4.08597    0.0007
7                 0.001458     0.05873  0.02483    1.0000

EPA_Rain_Zone = 6  subtracted from:

                Difference       SE of           Adjusted
EPA_Rain_Zone     of Means  Difference  T-Value   P-Value
7                  -0.2401     0.06467   -3.712    0.0033
```

TSS in EPA rain zone 2 is significantly different than in rain zones 4, 5, 6, and 7. No significant differences between EPA rain zone 2 and rain zone 3.

TSS in EPA rain zone 3 is significantly different than in rain zones 4, 5, 6, and 7

TSS in EPA rain zone 4 is significantly different than in rain zones 5, 6, and 7

TSS in EPA rain zone 5 is significantly different than in rain zone 6. No significant differences between EPA rain zone 5 and rain zone 7.

TSS in EPA rain zone 6 is significantly different than in rain zone 7.

```
Tukey Simultaneous Tests
Response Variable LTSS
All Pairwise Comparisons among Levels of EPA_Rain_Zone
EPA_Rain_Zone = 2  subtracted from:

                Difference       SE of           Adjusted
EPA_Rain_Zone     of Means  Difference  T-Value   P-Value
3                  -0.1060     0.08141   -1.303    0.7838
4                   0.8089     0.06314   12.812    0.0000
5                   0.2241     0.04307    5.203    0.0000
6                   0.4657     0.05089    9.151    0.0000
7                   0.2256     0.05043    4.473    0.0001


EPA_Rain_Zone = 3  subtracted from:

                Difference       SE of           Adjusted
EPA_Rain_Zone     of Means  Difference  T-Value   P-Value
4                   0.9150     0.09830    9.307    0.0000
5                   0.3302     0.08679    3.804    0.0020
6                   0.5717     0.09092    6.288    0.0000
7                   0.3316     0.09067    3.658    0.0035


EPA_Rain_Zone = 4  subtracted from:

                Difference       SE of           Adjusted
EPA_Rain_Zone     of Means  Difference  T-Value   P-Value
5                  -0.5848     0.06994   -8.361    0.0000
6                  -0.3432     0.07500   -4.576    0.0001
7                  -0.5833     0.07470   -7.809    0.0000


EPA_Rain_Zone = 5  subtracted from:
```

```
                Difference        SE of            Adjusted
EPA_Rain_Zone     of Means   Difference  T-Value    P-Value
6                 0.241542      0.05911  4.08597     0.0006
7                 0.001458      0.05873  0.02483     1.0000


EPA_Rain_Zone = 6  subtracted from:

                Difference        SE of            Adjusted
EPA_Rain_Zone     of Means   Difference  T-Value    P-Value
7                  -0.2401      0.06467   -3.712     0.0028
```

TSS in EPA rain zone 2 is significantly different than in rain zones 4, 5, 6, and 7. No significant differences between EPA rain zone 2 and rain zone 3.

TSS in EPA rain zone 3 is significantly different than in rain zones 4, 5, 6, and 7

TSS in EPA rain zone 4 is significantly different than in rain zones 5, 6, and 7

TSS in EPA rain zone 5 is significantly different than in rain zone 6. No significant differences between EPA rain zone 5 and rain zone 7.

TSS in EPA rain zone 6 is significantly different than in rain zone 7.

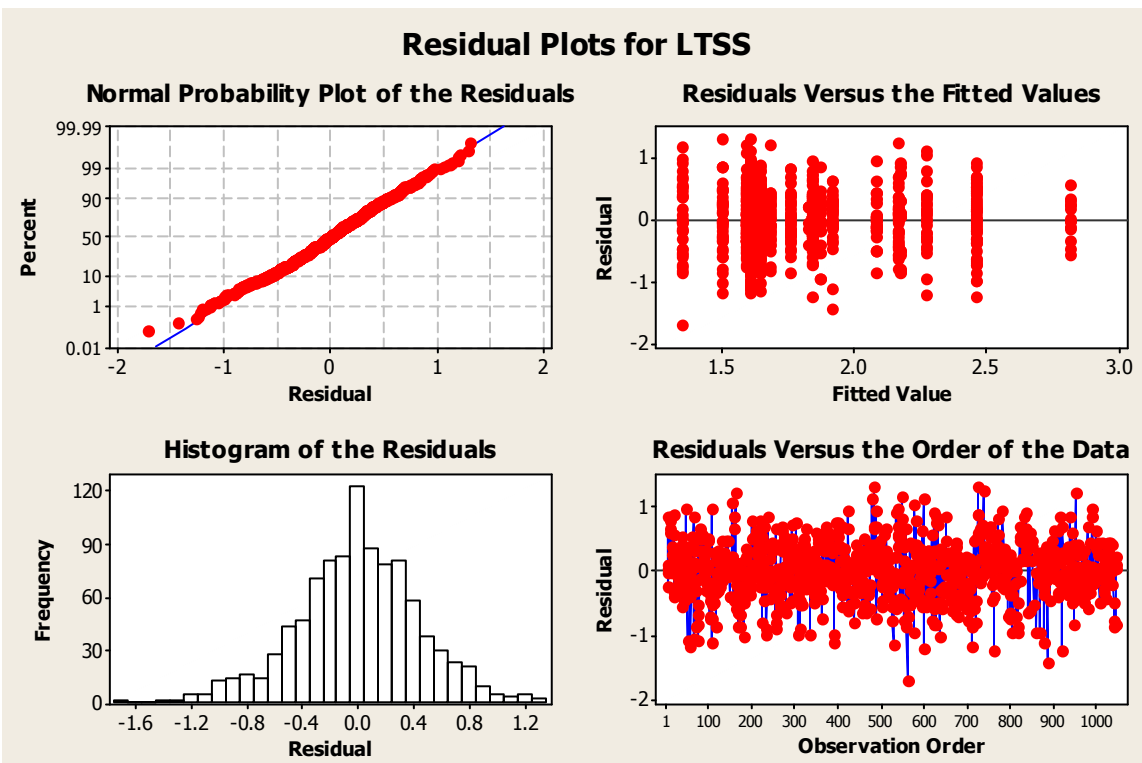

The model satisfies normality of residuals. No specific trend was observed in the residuals.

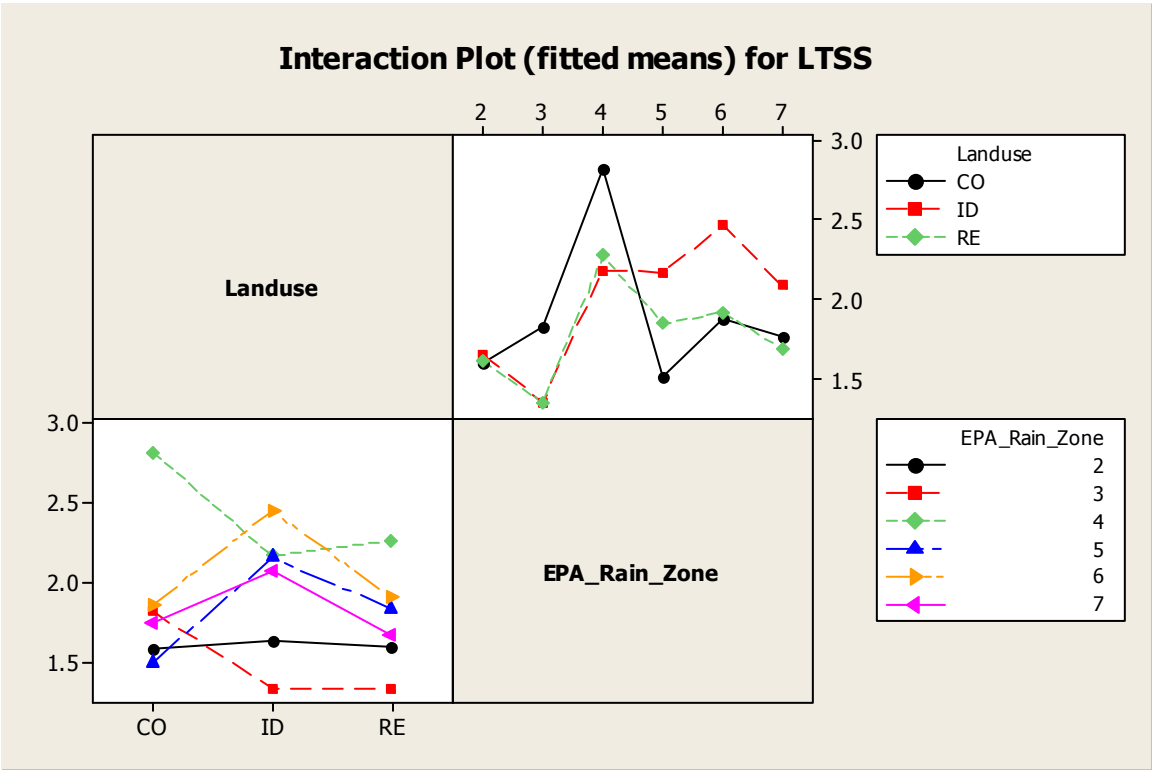
Interaction Plot (fitted means) for LTSS
Landuse
EPA_Rain_Zone
2
3
4
5
6
7
3.0
2.5
2.0
1.5
CO
ID
RE
Landuse
CO
ID
RE
EPA_Rain_Zone
2
3
4
5
6
7

Biochemical Oxygen Demand, 5 day (BOD_5)

Summary statistics in LOG base 10 scale
Land use: Commercial

EPA_Rain_Zone	N det/est	N ND/NZ	Mean	StDev	Minimum	Maximum
2	114	9	1.10	0.29	0.47	1.98
3	6	0	1.30	0.42	0.86	1.92
4	15	1	1.25	0.31	0.60	1.76
5	40	2	0.80	0.20	0.40	1.23
6	13	21	1.55	0.35	0.95	2.00
7	37	4	0.85	0.37	-0.13	1.62

Land use: Industrial

EPA_Rain_Zone	N det/est	N ND/NZ	Mean	StDev	Minimum	Maximum
2	97	12	0.93	0.35	0.09	2.17
3	16	0	0.73	0.38	0.00	1.28
4	16	1	0.72	0.25	0.30	1.15
5	46	1	0.78	0.16	0.30	1.11
6	21	49	1.45	0.56	0.15	2.43
7	24	9	1.45	0.44	0.60	2.20

Land use: Residential

EPA_Rain_Zone	N det/est	N ND/NZ	Mean	StDev	Minimum	Maximum
2	290	41	1.04	0.31	0.30	2.35
3	16	2	0.86	0.32	0.30	1.45
4	31	0	1.17	0.35	0.30	1.84
5	67	4	0.90	0.25	0.38	1.70
6	15	23	1.41	0.28	1.00	2.11
7	37	3	0.70	0.32	0.13	1.61

Descriptive Statistics: LBOD

Variable	LndRainLoc	N	N*	Mean	Variance	Minimum	Maximum
LBOD	2_KYLOTSR1RE	2	1	1.224	0.286	0.845	1.602
	2_KYLOTSR2ID	2	1	1.7794	0.0103	1.7076	1.8513
	2_KYLOTSR3RE	3	0	1.2721	0.0196	1.1139	1.3802
	2_KYLOTSR4ID	3	1	1.484	0.642	0.602	2.167
	2_MDAACOMWID	3	0	0.816	0.0842	0.602	1.146
	2_MDAACOODRE	3	0	0.9299	0.0102	0.8451	1.0414
	2_MDAACOPPCO	26	0	1.1532	0.0696	0.5658	1.6217
	2_MDAACORKRE	2	1	0.929	0.213	0.602	1.255
	2_MDBACOBCID	3	0	1.0651	0.0197	0.9031	1.1461
	2_MDBACOSCRE	12	14	1.002	0.182	0.477	1.771
	2_MDBACOTCID	3	0	0.9105	0.0128	0.8451	1.0414
	2_MDBACOWCRE	3	0	1.168	0.0808	0.845	1.380
	2_MDBCTYBOID	3	0	1.292	0.0654	1.000	1.477
	2_MDBCTYFMID	3	0	1.221	0.0684	0.954	1.477
	2_MDBCTYHORE	3	0	1.142	0.0661	0.845	1.301
	2_MDBCTYHRRE	3	0	1.3366	0.0249	1.1761	1.4914
	2_MDBCTYKOCO	3	0	1.1286	0.00910	1.0414	1.2304
	2_MDMOCOBCCO	3	0	0.920	0.167	0.602	1.380
	2_VAARLLP1RE	7	1	0.844	0.120	0.477	1.279
	2_VAARLTC4ID	13	0	0.9687	0.0439	0.5052	1.2788

2_VACPTC1ARE	8	0	0.940	0.106	0.477	1.301
2_VACPTSF2RE	0	3	*	*	*	*
2_VACPTYC1RE	6	1	0.730	0.0849	0.477	1.301
2_VACPTYC3RE	13	1	0.9777	0.0786	0.4771	1.3617
2_VACPTYC4CO	14	0	0.8804	0.0321	0.4808	1.1139
2_VACPTYC5ID	13	1	0.4737	0.0547	0.0931	1.0000
2_VACPTYO1ID	0	3	*	*	*	*
2_VAHATYH1CO	18	0	1.1351	0.0798	0.4771	1.6232
2_VAHATYH2ID	19	0	0.9623	0.0655	0.6021	1.7324
2_VAHATYH3RE	17	0	0.8799	0.0625	0.3010	1.2304
2_VAHATYH4RE	17	0	1.0430	0.0626	0.6021	1.5315
2_VAHATYH5RE	17	0	1.1146	0.1622	0.6990	2.3541
2_VAHCCOC1CO	2	0	1.3551	0.0116	1.2788	1.4314
2_VAHCCOC2CO	3	0	1.3254	0.0241	1.1461	1.4150
2_VAHCCON1ID	1	1	1.1139	*	1.1139	1.1139
2_VAHCCON2ID	2	1	1.2124	0.00879	1.1461	1.2788
2_VAHCCOR1RE	3	0	1.3331	0.0128	1.2041	1.4150
2_VAHCCOR2RE	3	0	1.0402	0.00157	1.0000	1.0792
2_VANFTMS5CO	0	3	*	*	*	*
2_VANFTMS6RE	0	3	*	*	*	*
2_VANFTMS8CO	0	3	*	*	*	*
2_VANFTMS9CO	0	3	*	*	*	*
2_VANFTYN2RE	29	0	1.1504	0.0818	0.4771	1.8325
2_VANFTYN3RE	27	0	1.1703	0.0699	0.6990	1.7782
2_VANFTYN4CO	27	0	1.1449	0.1274	0.4671	1.9823
2_VANFTYN5RE	27	0	1.0673	0.1126	0.3010	1.5682
2_VANNTMF1RE	0	1	*	*	*	*
2_VANNTMF4RE	0	3	*	*	*	*
2_VANNTNN1RE	8	2	1.069	0.154	0.602	1.820
2_VANNTSF4RE	0	2	*	*	*	*
2_VANNTSF6RE	0	2	*	*	*	*
2_VAPMTYP1CO	18	0	1.0331	0.0657	0.6990	1.4914
2_VAPMTYP2RE	17	0	0.9654	0.0587	0.4771	1.4624
2_VAPMTYP4RE	17	0	0.9154	0.0213	0.6990	1.2553
2_VAPMTYP5RE	17	0	0.8928	0.1316	0.4771	1.9494
2_VAVBTYI1ID	0	3	*	*	*	*
2_VAVBTYR1RE	0	5	*	*	*	*
2_VAVBTYV1RE	26	1	1.1097	0.0792	0.6021	1.8388
2_VAVBTYV4ID	29	1	0.8796	0.0448	0.4771	1.3424
3_ALMOCREORE	3	0	0.760	0.368	0.301	1.447
3_ALMODAPHCO	3	0	1.489	0.193	1.041	1.919
3_ALMOSARARE	2	1	0.9141	0.00403	0.8692	0.9590
3_ALMOSIIVID	3	0	0.8163	0.0258	0.6335	0.9345
3_ALMOSITVCO	3	0	1.105	0.129	0.863	1.519
3_ALMOSIVIRE	2	1	0.9460	0.00582	0.8921	1.0000
3_ALMOTHEOID	3	0	0.8242	0.0279	0.6532	0.9868
3_GAATAT01ID	10	0	0.670	0.216	0.000000000	1.279
3_GAATAT02RE	9	0	0.8641	0.0887	0.3010	1.2304
4_KATOATWORE	15	0	1.0089	0.1205	0.3010	1.5563
4_KATOBROORE	16	0	1.3221	0.0771	0.9031	1.8388
4_KATOJACKCO	15	1	1.2500	0.0989	0.6021	1.7559
4_KATOSTFEID	16	1	0.7156	0.0606	0.3010	1.1461
5_TXARA001CO	21	1	0.7764	0.0414	0.3979	1.0792
5_TXARA002RE	19	2	0.8653	0.0899	0.3802	1.6721
5_TXARA003RE	7	0	0.7098	0.0118	0.5911	0.8921
5_TXDAA001ID	7	0	0.8324	0.0319	0.5441	1.1139
5_TXDAA002ID	19	0	0.6886	0.0313	0.3010	0.9638
5_TXDAA004CO	19	1	0.8254	0.0364	0.4314	1.2304
5_TXDAA005RE	7	0	0.9312	0.0242	0.8325	1.2788
5_TXFWA004ID	20	1	0.8374	0.0109	0.6628	1.1139
5_TXIRA001RE	21	1	1.0430	0.0607	0.7559	1.6990
5_TXMEA002RE	7	0	0.8293	0.0123	0.5798	0.8921
5_TXMEA003RE	6	1	0.7328	0.0178	0.5315	0.9031

6_AZMCA001ID	6	21	1.365	0.675	0.148	2.301
6_AZMCA003ID	6	21	1.462	0.279	0.929	2.431
6_AZMCA005CO	6	20	1.462	0.114	0.954	1.820
6_AZMCA006RE	3	17	1.2479	0.00967	1.1461	1.3424
6_AZTUA001RE	6	4	1.4310	0.0583	1.2304	1.7993
6_AZTUA002RE	6	2	1.469	0.141	1.000	2.114
6_AZTUA003CO	7	1	1.629	0.136	0.954	2.000
6_AZTUA004ID	5	2	1.739	0.142	1.301	2.204
6_CAALAL09ID	4	5	1.1700	0.0397	0.8751	1.3010
7_OREUA001CO	14	2	1.0315	0.1038	0.6021	1.4771
7_OREUA003RE	15	0	0.7638	0.0964	0.3010	1.6128
7_ORGRA003RE	6	0	0.515	0.0889	0.126	0.908
7_ORGRA004CO	6	0	0.7651	0.0382	0.5051	0.9912
7_ORPOA001CO	12	1	0.732	0.232	-0.127	1.623
7_ORPOA003ID	11	3	1.7267	0.0956	1.2304	2.2041
7_ORPOA004ID	9	4	1.400	0.130	0.778	1.851
7_ORPOA006RE	11	2	0.8678	0.0835	0.4771	1.4771
7_ORSAA002CO	5	1	0.7268	0.0183	0.5798	0.8976
7_ORSAA003ID	4	2	0.8193	0.0324	0.6021	1.0253
7_ORSAA004RE	5	1	0.3976	0.0112	0.3222	0.5441

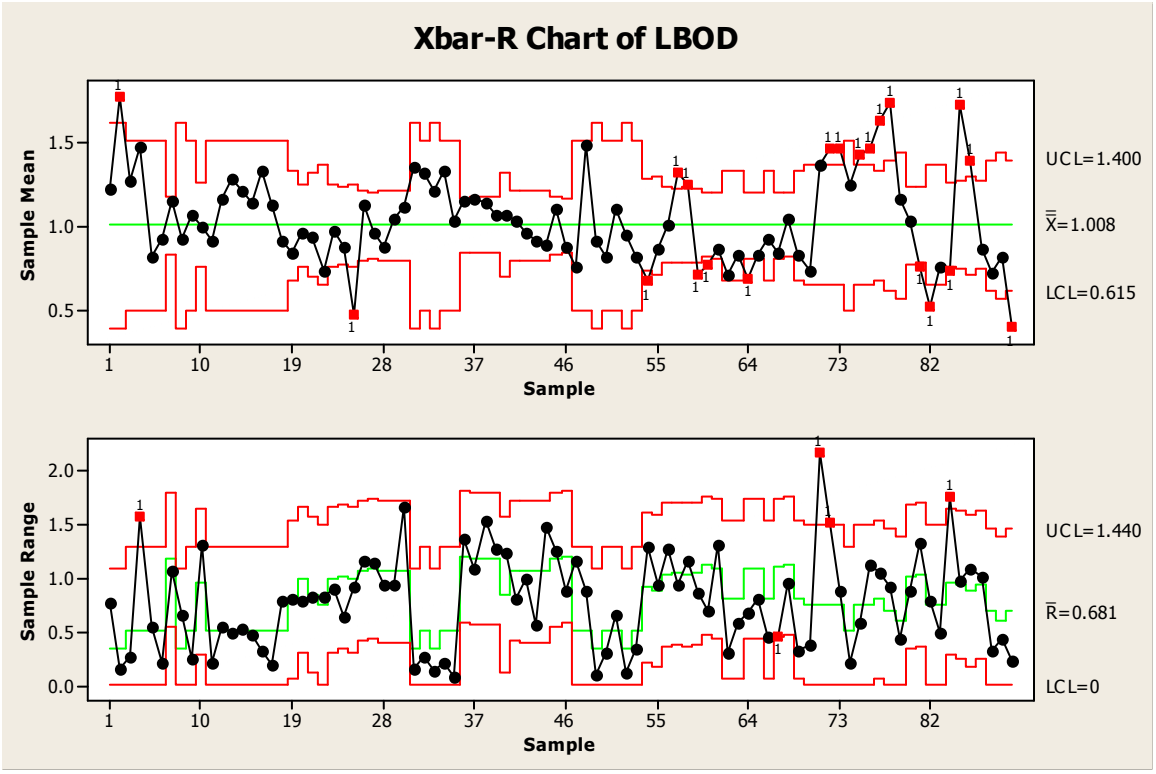

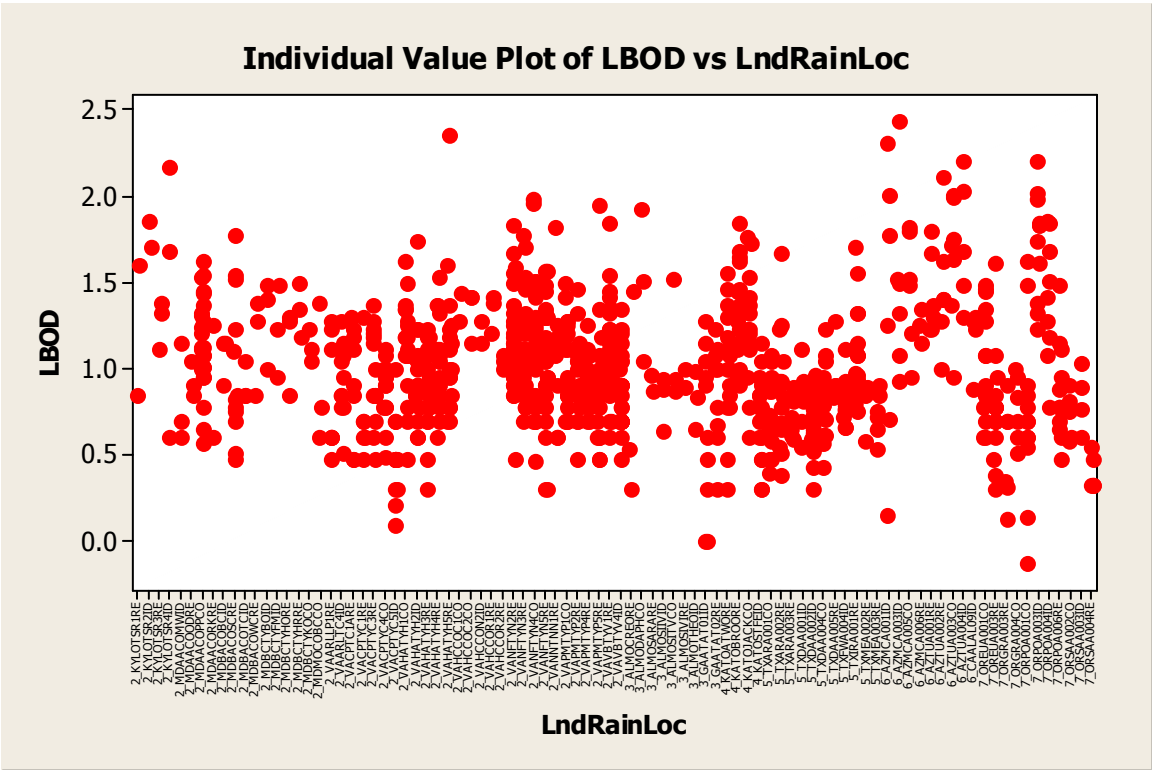

General Linear Model: LBOD versus Landuse, EPA_Rain_Zone

```
Factor          Type   Levels  Values
Landuse         fixed       3  CO, ID, RE
EPA_Rain_Zone   fixed       6  2, 3, 4, 5, 6, 7


Analysis of Variance for LBOD, using Adjusted SS for Tests

Source                  DF    Seq SS   Adj SS  Adj MS      F      P
Landuse                  2    0.6031   1.2713  0.6357   6.35  0.002
EPA_Rain_Zone            5   16.4957  15.1699  3.0340  30.30  0.000
Landuse*EPA_Rain_Zone   10   14.3460  14.3460  1.4346  14.33  0.000
Error                  882   88.3176  88.3176  0.1001
Total                  899  119.7624
```

Main Effects and Interaction are significant.

```
Bonferroni Simultaneous Tests
Response Variable LBOD
All Pairwise Comparisons among Levels of Landuse
Landuse = CO  subtracted from:

         Difference       SE of           Adjusted
Landuse    of Means  Difference  T-Value   P-Value
ID          -0.1341     0.04144   -3.237    0.0038
RE          -0.1274     0.04009   -3.178    0.0046


Landuse = ID  subtracted from:
```

Landuse	Difference of Means	SE of Difference	T-Value	Adjusted P-Value
RE	0.006708	0.03551	0.1889	1.000

Tukey Simultaneous Tests
Response Variable LBOD
All Pairwise Comparisons among Levels of Landuse
Landuse = CO subtracted from:

Landuse	Difference of Means	SE of Difference	T-Value	Adjusted P-Value
ID	-0.1341	0.04144	-3.237	0.0035
RE	-0.1274	0.04009	-3.178	0.0042

Landuse = ID subtracted from:

Landuse	Difference of Means	SE of Difference	T-Value	Adjusted P-Value
RE	0.006708	0.03551	0.1889	0.9805

BOD in commercial land uses is significantly different than in industrial or residential land uses. There is no difference in BOD concentrations between industrial and residential land uses.

Bonferroni Simultaneous Tests
Response Variable LBOD
All Pairwise Comparisons among Levels of EPA_Rain_Zone
EPA_Rain_Zone = 2 subtracted from:

EPA_Rain_Zone	Difference of Means	SE of Difference	T-Value	Adjusted P-Value
3	-0.0594	0.05913	-1.004	1.0000
4	0.0245	0.04525	0.541	1.0000
5	-0.1973	0.03063	-6.442	0.0000
6	0.4479	0.04878	9.182	0.0000
7	-0.0183	0.03629	-0.503	1.0000

EPA_Rain_Zone = 3 subtracted from:

EPA_Rain_Zone	Difference of Means	SE of Difference	T-Value	Adjusted P-Value
4	0.0838	0.07100	1.181	1.0000
5	-0.1379	0.06270	-2.200	0.4211
6	0.5073	0.07330	6.921	0.0000
7	0.0411	0.06565	0.626	1.0000

EPA_Rain_Zone = 4 subtracted from:

EPA_Rain_Zone	Difference of Means	SE of Difference	T-Value	Adjusted P-Value
5	-0.2218	0.04982	-4.451	0.0001
6	0.4234	0.06264	6.760	0.0000
7	-0.0427	0.05349	-0.799	1.0000

EPA_Rain_Zone = 5 subtracted from:

```
                Difference       SE of           Adjusted
EPA_Rain_Zone     of Means  Difference  T-Value   P-Value
6                   0.6452     0.05304   12.164    0.0000
7                   0.1790     0.04185    4.278    0.0003


EPA_Rain_Zone = 6  subtracted from:

                Difference       SE of           Adjusted
EPA_Rain_Zone     of Means  Difference  T-Value   P-Value
7                  -0.4662     0.05650   -8.250    0.0000
```

BOD5 in EPA rain zone 2 is significantly different than in rain zones 5, and 6. No significant differences between EPA rain zone 2 and rain zones 3, 4, and 7.

BOD5 in EPA rain zone 3 is significantly different than in rain zone 6. No significant differences between EPA rain zone 3 and rain zones 4, 5 and 7.

BOD5 in EPA rain zone 4 is significantly different than in rain zones 5, and 6. No significant differences between EPA rain zone 4 and rain zone 7.

BOD5 in EPA rain zone 5 is significantly different than in rain zones 6, and 7.

BOD5 in EPA rain zone 6 is significantly different than in rain zone 7.

```
Tukey Simultaneous Tests
Response Variable LBOD
All Pairwise Comparisons among Levels of EPA_Rain_Zone
EPA_Rain_Zone = 2  subtracted from:

                Difference       SE of           Adjusted
EPA_Rain_Zone     of Means  Difference  T-Value   P-Value
3                  -0.0594     0.05913   -1.004    0.9168
4                   0.0245     0.04525    0.541    0.9945
5                  -0.1973     0.03063   -6.442    0.0000
6                   0.4479     0.04878    9.182    0.0000
7                  -0.0183     0.03629   -0.503    0.9961

EPA_Rain_Zone = 3  subtracted from:

                Difference       SE of           Adjusted
EPA_Rain_Zone     of Means  Difference  T-Value   P-Value
4                   0.0838     0.07100    1.181    0.8462
5                  -0.1379     0.06270   -2.200    0.2377
6                   0.5073     0.07330    6.921    0.0000
7                   0.0411     0.06565    0.626    0.9891

EPA_Rain_Zone = 4  subtracted from:

                Difference       SE of           Adjusted
EPA_Rain_Zone     of Means  Difference  T-Value   P-Value
5                  -0.2218     0.04982   -4.451    0.0001
6                   0.4234     0.06264    6.760    0.0000
7                  -0.0427     0.05349   -0.799    0.9677


EPA_Rain_Zone = 5  subtracted from:

                Difference       SE of           Adjusted
EPA_Rain_Zone     of Means  Difference  T-Value   P-Value
```

```
6                    0.6452     0.05304   12.164    0.0000
7                    0.1790     0.04185    4.278    0.0003


EPA_Rain_Zone = 6  subtracted from:

                Difference       SE of            Adjusted
EPA_Rain_Zone     of Means  Difference  T-Value    P-Value
7                  -0.4662     0.05650   -8.250    0.0000
```

BOD5 in EPA rain zone 2 is significantly different than in rain zones 5, and 6. No significant differences between EPA rain zone 2 and rain zones 3, 4, and 7.

BOD5 in EPA rain zone 3 is significantly different than in rain zone 6. No significant differences between EPA rain zone 3 and rain zones 4, 5 and 7.

BOD5 in EPA rain zone 4 is significantly different than in rain zones 5, and 6. No significant differences between EPA rain zone 4 and rain zone 7.

BOD5 in EPA rain zone 5 is significantly different than in rain zones 6, and 7.

BOD5 in EPA rain zone 6 is significantly different than in rain zone 7.

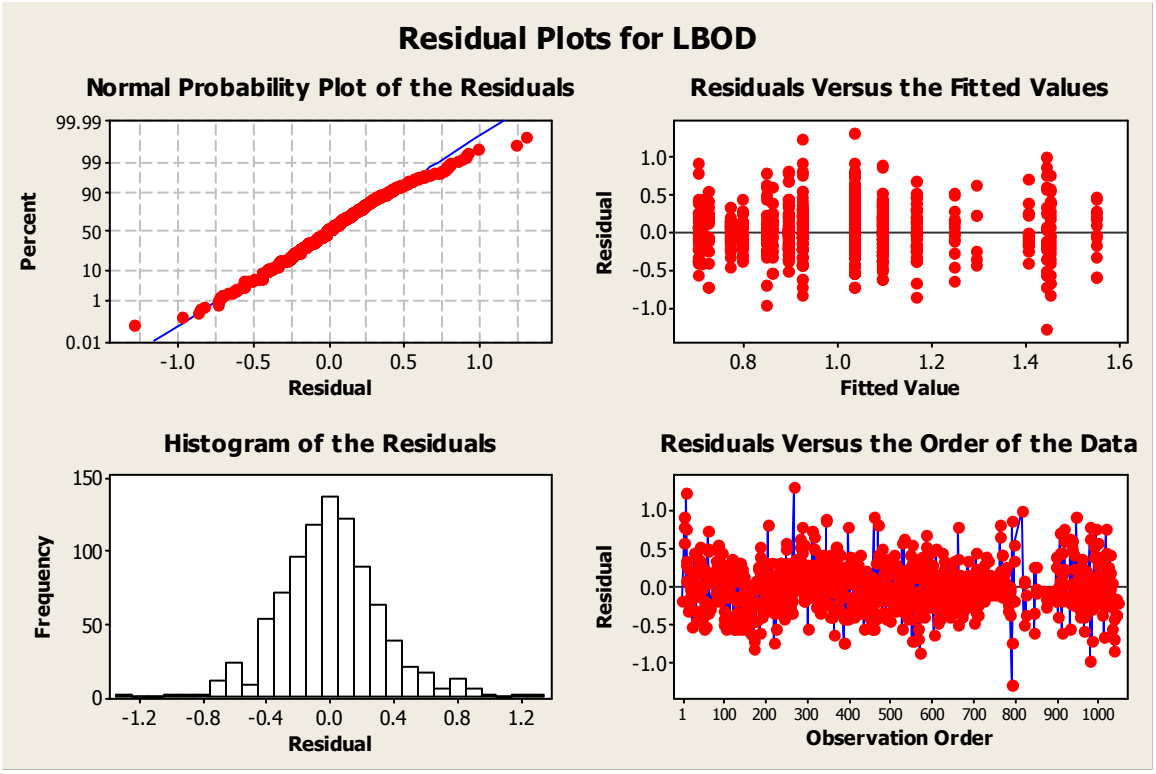

The residuals are normally distributed and did not indicate any specific trend in any of the residuals plots.

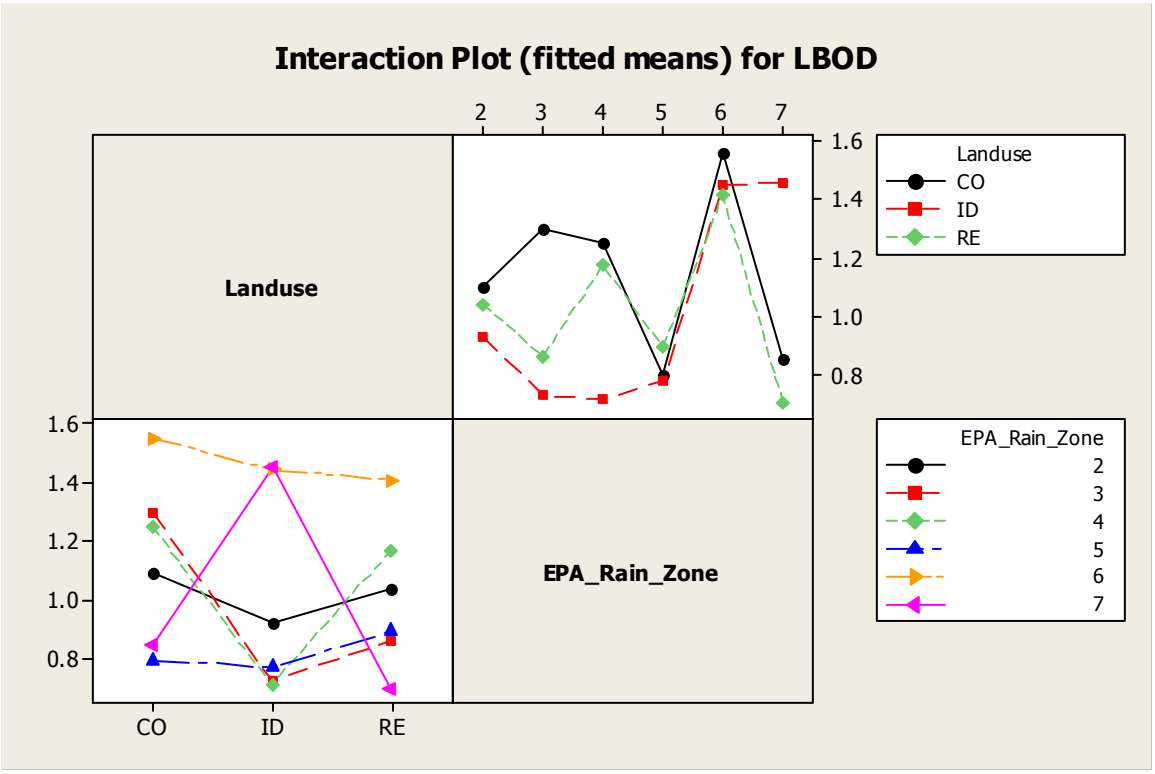
Interaction Plot (fitted means) for LBOD
Landuse
EPA_Rain_Zone
2
3
4
5
6
7
1.6
1.4
1.2
1.0
0.8
CO
ID
RE
Landuse
CO
ID
RE
EPA_Rain_Zone
2
3
4
5
6
7

Chemical Oxygen Demand (COD)

Summary statistics in LOG base 10 scale
Land use: Commercial

EPA_Rain_Zone	N det/est	N ND/NZ	Mean	StDev	Minimum	Maximum
2	82	41	1.84	0.32	0.90	2.80
3	6	0	1.85	0.35	1.36	2.38
4	0	16*	*	*	*	
5	41	1	1.65	0.22	1.15	2.18
6	33	1	2.29	0.24	1.89	2.76
7	37	4	1.65	0.30	0.90	2.52

Land use: Industrial

EPA_Rain_Zone	N det/est	N ND/NZ	Mean	StDev	Minimum	Maximum
2	85	24	1.72	0.32	0.30	2.53
3	16	0	1.52	0.36	0.60	2.06
4	0	17*	*	*	*	
5	45	2	1.59	0.29	0.98	2.40
6	56	14	2.27	0.35	1.26	2.96
7	24	9	1.90	0.33	1.26	2.45

Land use: Residential

EPA_Rain_Zone	N det/est	N ND/NZ	Mean	StDev	Minimum	Maximum
2	265	66	1.79	0.29	0.70	2.79
3	16	2	1.58	0.31	0.78	2.15
4	0	31*	*	*	*	
5	69	2	1.81	0.29	1.00	2.68
6	37	1	2.12	0.28	1.51	2.57
7	37	3	1.52	0.35	0.95	2.48

Descriptive Statistics: LCOD

Variable	LndRainLoc	N	N*	Mean	Variance	Minimum	Maximum
LCOD	2_KYLOTSR1RE	3	0	1.820	0.0899	1.477	2.033
	2_KYLOTSR2ID	3	0	2.021	0.0591	1.792	2.276
	2_KYLOTSR3RE	3	0	2.0211	0.00379	1.9542	2.0755
	2_KYLOTSR4ID	4	0	1.866	0.188	1.230	2.201
	2_MDAACOMWID	0	3	*	*	*	*
	2_MDAACOODRE	0	3	*	*	*	*
	2_MDAACOPPCO	0	26	*	*	*	*
	2_MDAACORKRE	0	3	*	*	*	*
	2_MDBACOBCID	0	3	*	*	*	*
	2_MDBACOSCRE	0	26	*	*	*	*
	2_MDBACOTCID	0	3	*	*	*	*
	2_MDBACOWCRE	0	3	*	*	*	*
	2_MDBCTYBOID	0	3	*	*	*	*
	2_MDBCTYFMID	0	3	*	*	*	*
	2_MDBCTYHORE	0	3	*	*	*	*
	2_MDBCTYHRRE	0	3	*	*	*	*
	2_MDBCTYKOCO	0	3	*	*	*	*
	2_MDMOCOBCCO	0	3	*	*	*	*
	2_VAARLLP1RE	8	0	1.634	0.0917	1.146	2.204
	2_VAARLTC4ID	12	1	1.689	0.273	0.301	2.531

2_VACPTC1ARE	8	0	1.7616	0.0272	1.5682	1.9956
2_VACPTSF2RE	0	3	*	*	*	*
2_VACPTYC1RE	7	0	1.6384	0.0163	1.3979	1.7782
2_VACPTYC3RE	14	0	1.7743	0.0347	1.3617	1.9868
2_VACPTYC4CO	14	0	1.7656	0.0859	1.3222	2.3010
2_VACPTYC5ID	14	0	1.4269	0.0263	1.0792	1.6532
2_VACPTYO1ID	0	3	*	*	*	*
2_VAHATYH1CO	18	0	1.8627	0.0432	1.5563	2.3118
2_VAHATYH2ID	18	1	1.8318	0.0641	1.4771	2.3979
2_VAHATYH3RE	16	1	1.6684	0.0473	1.3010	2.0969
2_VAHATYH4RE	17	0	1.7869	0.0674	1.3979	2.4594
2_VAHATYH5RE	17	0	1.7828	0.1187	1.3979	2.7745
2_VAHCCOC1CO	2	0	2.331	0.0572	2.161	2.500
2_VAHCCOC2CO	3	0	2.331	0.168	2.068	2.803
2_VAHCCON1ID	2	0	1.711	0.303	1.322	2.100
2_VAHCCON2ID	3	0	1.9164	0.0284	1.8062	2.1106
2_VAHCCOR1RE	3	0	2.020	0.452	1.568	2.792
2_VAHCCOR2RE	3	0	1.861	0.281	1.431	2.453
2_VANFTMS5CO	0	3	*	*	*	*
2_VANFTMS6RE	0	3	*	*	*	*
2_VANFTMS8CO	0	3	*	*	*	*
2_VANFTMS9CO	0	3	*	*	*	*
2_VANFTYN2RE	28	1	1.8351	0.0593	1.3010	2.4472
2_VANFTYN3RE	27	0	1.9130	0.0667	1.3802	2.4393
2_VANFTYN4CO	27	0	1.8261	0.1420	0.9031	2.5563
2_VANFTYN5RE	27	0	1.7853	0.1228	0.6990	2.3222
2_VANNTMF1RE	0	1	*	*	*	*
2_VANNTMF4RE	0	3	*	*	*	*
2_VANNTNN1RE	8	2	1.892	0.0926	1.415	2.371
2_VANNTSF4RE	0	2	*	*	*	*
2_VANNTSF6RE	0	2	*	*	*	*
2_VAPMTYP1CO	18	0	1.7730	0.0494	1.4150	2.3010
2_VAPMTYP2RE	17	0	1.7506	0.0579	1.2553	2.1761
2_VAPMTYP4RE	17	0	1.6401	0.0386	1.3010	1.9542
2_VAPMTYP5RE	17	0	1.5667	0.0907	1.0000	2.1761
2_VAVBTYI1ID	0	3	*	*	*	*
2_VAVBTYR1RE	0	5	*	*	*	*
2_VAVBTYV1RE	25	2	1.9476	0.0561	1.5315	2.5416
2_VAVBTYV4ID	29	1	1.7279	0.0425	1.0000	2.1761
3_ALMOCREORE	3	0	1.727	0.0784	1.505	2.041
3_ALMODAPHCO	3	0	2.086	0.0844	1.799	2.380
3_ALMOSARARE	2	1	1.980	0.0555	1.813	2.146
3_ALMOSIIVID	3	0	1.5873	0.00509	1.5051	1.6335
3_ALMOSITVCO	3	0	1.620	0.0659	1.362	1.875
3_ALMOSIVIRE	2	1	1.691	0.0299	1.568	1.813
3_ALMOTHEOID	3	0	1.644	0.0773	1.462	1.964
3_GAATAT01ID	10	0	1.468	0.187	0.602	2.064
3_GAATAT02RE	9	0	1.4183	0.0723	0.7782	1.6902
5_TXARA001CO	22	0	1.6367	0.0515	1.1489	2.1761
5_TXARA002RE	20	1	1.6190	0.0758	1.0000	2.0414
5_TXARA003RE	7	0	1.807	0.161	1.491	2.681
5_TXDAA001ID	7	0	1.751	0.0788	1.187	2.000
5_TXDAA002ID	18	1	1.4042	0.0517	0.9802	1.8129
5_TXDAA004CO	19	1	1.6646	0.0464	1.2304	2.0414
5_TXDAA005RE	7	0	2.036	0.0725	1.672	2.415
5_TXFWA004ID	20	1	1.7008	0.0699	1.3075	2.3979
5_TXIRA001RE	21	1	1.9029	0.0494	1.5647	2.3424
5_TXMEA002RE	7	0	1.9342	0.0259	1.7243	2.2041
5_TXMEA003RE	7	0	1.6826	0.0298	1.5051	1.9685
6_AZMCA001ID	25	2	2.1968	0.0824	1.6532	2.5563
6_AZMCA003ID	24	3	2.2900	0.1624	1.2553	2.8062
6_AZMCA005CO	25	1	2.2521	0.0492	1.8865	2.7076
6_AZMCA006RE	20	0	2.0422	0.0677	1.5051	2.4914

6_AZTUA001RE	9	1	2.3530	0.0416	2.0531	2.5682
6_AZTUA002RE	8	0	2.0413	0.0656	1.6232	2.5185
6_AZTUA003CO	8	0	2.4071	0.0733	1.9590	2.7649
6_AZTUA004ID	7	0	2.4926	0.0667	2.1761	2.9571
6_CAALAL09ID	0	9	*	*	*	*
7_OREUA001CO	14	2	1.6907	0.0554	1.3010	2.1139
7_OREUA003RE	15	0	1.5191	0.0972	0.9638	2.1461
7_ORGRA003RE	6	0	1.4900	0.0406	1.2304	1.7404
7_ORGRA004CO	6	0	1.574	0.0822	1.279	2.083
7_ORPOA001CO	12	1	1.643	0.177	0.903	2.519
7_ORPOA003ID	11	3	2.0934	0.0832	1.5315	2.4533
7_ORPOA004ID	9	4	1.8285	0.0710	1.3424	2.1461
7_ORPOA006RE	11	2	1.601	0.202	0.954	2.477
7_ORSAA002CO	5	1	1.6702	0.0412	1.4472	1.9590
7_ORSAA003ID	4	2	1.554	0.0746	1.255	1.839
7_ORSAA004RE	5	1	1.344	0.153	1.079	2.033

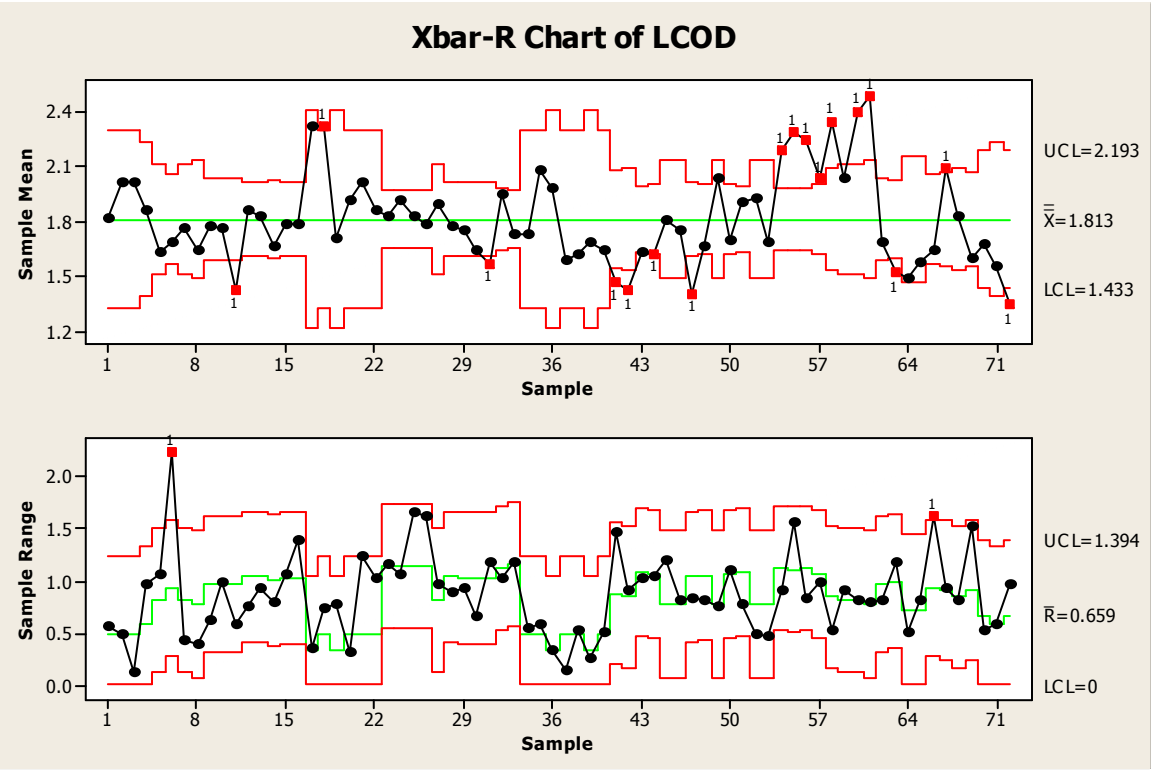

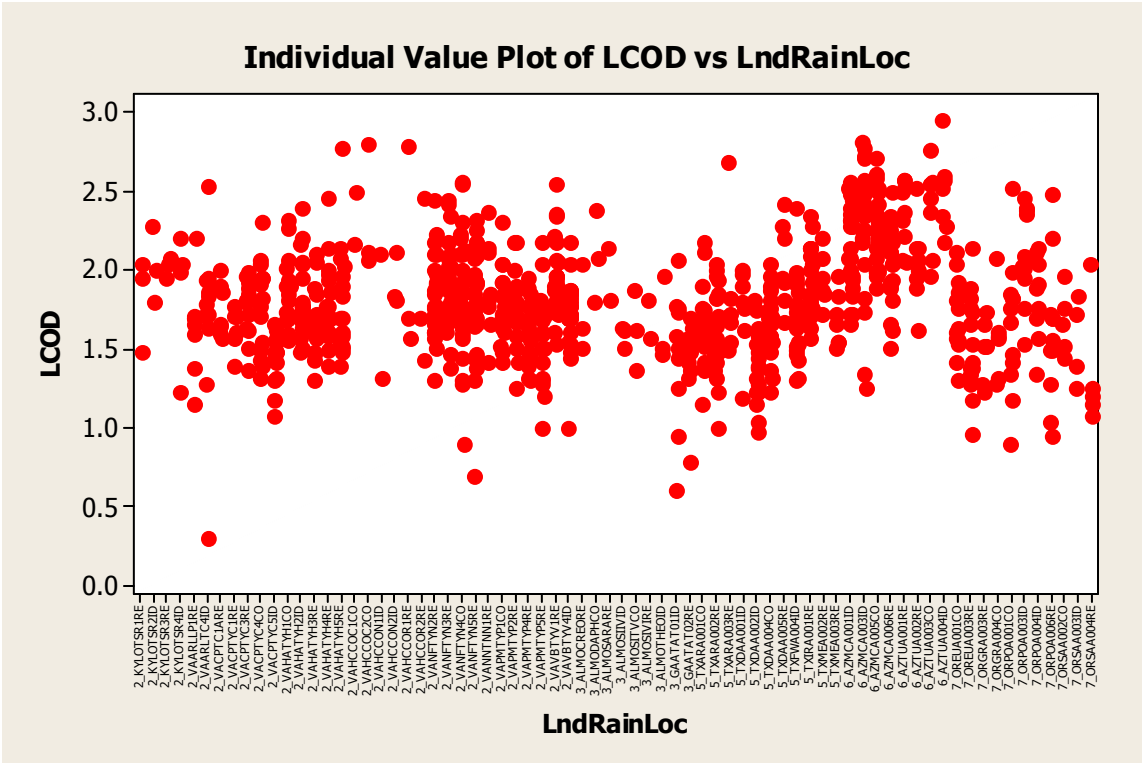

General Linear Model: LCOD versus Landuse, EPA_Rain_Zone

```
Factor          Type   Levels  Values
Landuse         fixed       3  CO, ID, RE
EPA_Rain_Zone   fixed       5  2, 3, 5, 6, 7


Analysis of Variance for LCOD, using Adjusted SS for Tests

Source                   DF     Seq SS   Adj SS  Adj MS      F      P
Landuse                   2     0.5831   0.6005  0.3003   3.33  0.036
EPA_Rain_Zone             4    28.0369  25.5423  6.3856  70.89  0.000
Landuse*EPA_Rain_Zone     8     5.2090   5.2090  0.6511   7.23  0.000
Error                   834    75.1295  75.1295  0.0901
Total                   848   108.9585
```

Main factors and interactions are significant.

```
Bonferroni Simultaneous Tests
Response Variable LCOD
All Pairwise Comparisons among Levels of Landuse
Landuse = CO  subtracted from:

         Difference       SE of            Adjusted
Landuse    of Means  Difference  T-Value    P-Value
ID         -0.05597     0.03874   -1.445     0.4468
RE         -0.09694     0.03775   -2.568     0.0312
```

```
Landuse = ID  subtracted from:

         Difference       SE of           Adjusted
Landuse    of Means  Difference  T-Value   P-Value
RE         -0.04097     0.03237   -1.265    0.6182

Tukey Simultaneous Tests
Response Variable LCOD
All Pairwise Comparisons among Levels of Landuse
Landuse = CO  subtracted from:

         Difference       SE of           Adjusted
Landuse    of Means  Difference  T-Value   P-Value
ID         -0.05597     0.03874   -1.445    0.3180
RE         -0.09694     0.03775   -2.568    0.0276


Landuse = ID  subtracted from:

         Difference       SE of           Adjusted
Landuse    of Means  Difference  T-Value   P-Value
RE         -0.04097     0.03237   -1.265    0.4148
```

COD in commercial land use is significantly different than COD in residential areas. There is not enough evidence that indicates a difference between commercial and industrial land uses or between residential and industrial areas.

```
Bonferroni Simultaneous Tests
Response Variable LCOD
All Pairwise Comparisons among Levels of EPA_Rain_Zone
EPA_Rain_Zone = 2  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
3                 -0.1301     0.05654   -2.300    0.2169
5                 -0.1008     0.02982   -3.380    0.0076
6                  0.4446     0.03210   13.854    0.0000
7                 -0.0914     0.03515   -2.600    0.0949


EPA_Rain_Zone = 3  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
5                 0.02927     0.05942   0.4926    1.0000
6                 0.57470     0.06060   9.4841    0.0000
7                 0.03866     0.06227   0.6209    1.0000


EPA_Rain_Zone = 5  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
6                0.545430     0.03693  14.7673    0.0000
7                0.009388     0.03962   0.2370    1.0000


EPA_Rain_Zone = 6  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
```

```
7                 -0.5360     0.04136   -12.96    0.0000
```

COD in EPA rain zone 2 is significantly different than in rain zones 5, and 6. No significant differences between EPA rain zone 2 and rain zones 3, and 7.

COD in EPA rain zone 3 is significantly different than in rain zone 6. No significant differences between EPA rain zone 3 and rain zones 5, and 7.

COD in EPA rain zone 5 is significantly different than in rain zone 6. No significant differences between EPA rain zone 5 and rain zone 7.

COD in EPA rain zone 6 is significantly different than in rain zone 7.

```
Tukey Simultaneous Tests
Response Variable LCOD
All Pairwise Comparisons among Levels of EPA_Rain_Zone
EPA_Rain_Zone = 2  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
3                 -0.1301     0.05654   -2.300    0.1447
5                 -0.1008     0.02982   -3.380    0.0065
6                  0.4446     0.03210   13.854    0.0000
7                 -0.0914     0.03515   -2.600    0.0703


EPA_Rain_Zone = 3  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
5                 0.02927     0.05942   0.4926    0.9881
6                 0.57470     0.06060   9.4841    0.0000
7                 0.03866     0.06227   0.6209    0.9718

EPA_Rain_Zone = 5  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
6                0.545430     0.03693  14.7673    0.0000
7                0.009388     0.03962   0.2370    0.9993

EPA_Rain_Zone = 6  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
7                 -0.5360     0.04136   -12.96    0.0000
```

COD in EPA rain zone 2 is significantly different than in rain zones 5, and 6. No significant differences between EPA rain zone 2 and rain zones 3, and 7.

COD in EPA rain zone 3 is significantly different than in rain zone 6. No significant differences between EPA rain zone 3 and rain zones 5, and 7.

COD in EPA rain zone 5 is significantly different than in rain zone 6. No significant differences between EPA rain zone 5 and rain zone 7.

COD in EPA rain zone 6 is significantly different than in rain zone 7.

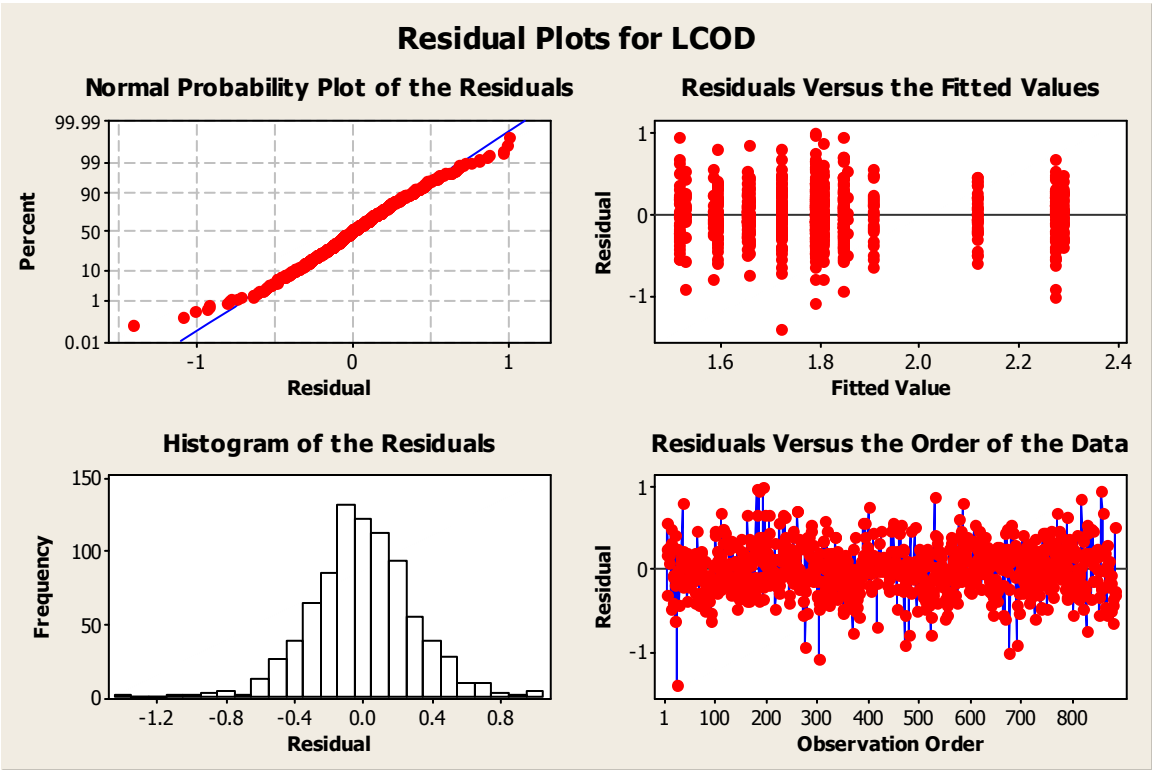

Residuals are normally distributed, no trend was observed in the residual plots.

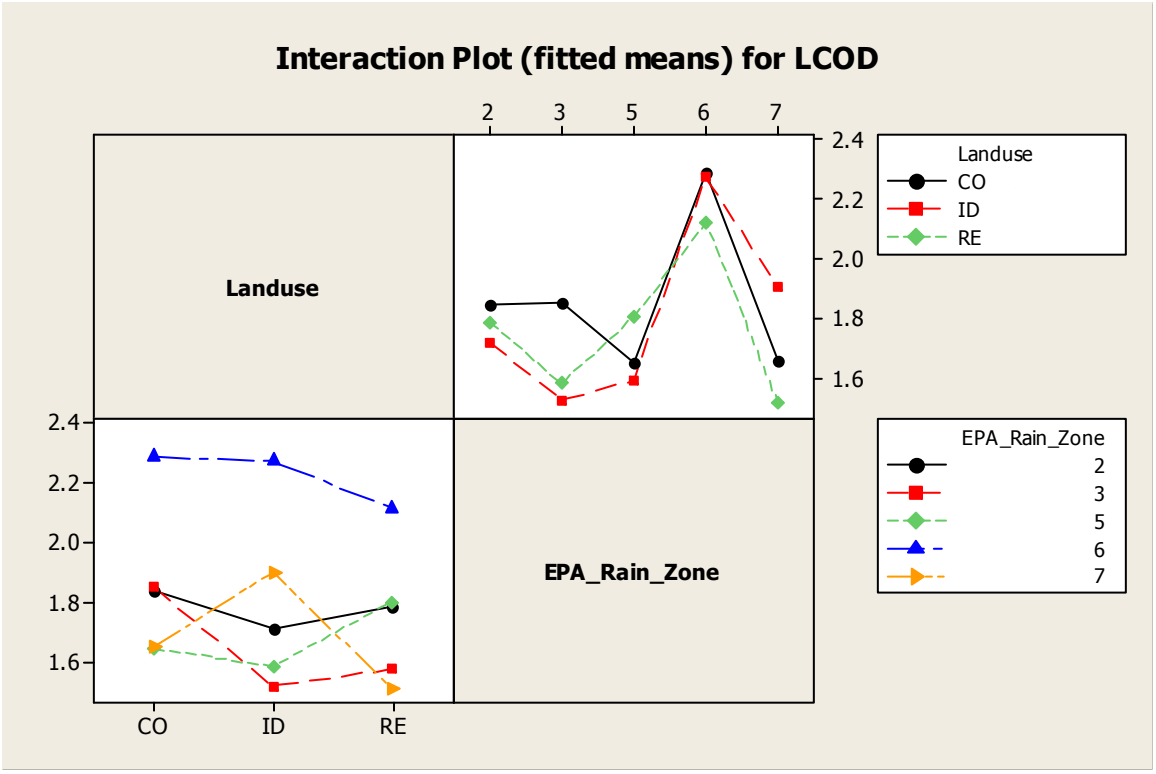

Ammonia (NH_3)

Summary statistics in LOG base 10 scale

Land use: Commercial

EPA_Rain_Zone	N det/est	N ND/NZ	Mean	StDev	Minimum	Maximum
2	82	41	-0.426	0.4129	-1.44	0.3997
3	0	6	*	*	*	*
4	0	16	*	*	*	*
5	0	42	*	*	*	*
6	23	11	0.2896	0.2415	-0.0362	0.8921
7	25	16	-0.812	0.618	-2.066	0.623

Land use: Industrial

EPA_Rain_Zone	N det/est	N ND/NZ	Mean	StDev	Minimum	Maximum
2	81	28	-0.616	0.3735	-1.675	0.2041
3	0	16	*	*	*	*
4	0	17	*	*	*	*
5	0	47	*	*	*	*
6	51	19	-0.132	0.4194	-1.5229	0.716
7	18	15	-0.591	0.469	-1.473	0.23

Land use: Residential

EPA_Rain_Zone	N det/est	N ND/NZ	Mean	StDev	Minimum	Maximum
2	262	69	-0.629	0.3846	-1.6214	0.1732
3	0	18	*	*	*	*
4	0	31	*	*	*	*
5	0	71	*	*	*	*
6	20	18	-0.049	0.3025	-0.7212	0.5315
7	26	14	-0.962	0.771	-2.662	0.748

Descriptive Statistics: LNH3

Variable	LndRainLoc	N	N*	Mean	Variance	Minimum	Maximum
LNH3	2_KYLOTSR1RE	3	0	-0.476	0.0421	-0.678	-0.268
	2_KYLOTSR2ID	3	0	-0.5191	0.00777	-0.6198	-0.4559
	2_KYLOTSR3RE	3	0	-0.503	0.0396	-0.699	-0.301
	2_KYLOTSR4ID	4	0	-0.565	0.139	-1.097	-0.284
	2_MDAACOMWID	0	3	*	*	*	*
	2_MDAACOODRE	0	3	*	*	*	*
	2_MDAACOPPCO	0	26	*	*	*	*
	2_MDAACORKRE	0	3	*	*	*	*
	2_MDBACOBCID	0	3	*	*	*	*
	2_MDBACOSCRE	0	26	*	*	*	*
	2_MDBACOTCID	0	3	*	*	*	*
	2_MDBACOWCRE	0	3	*	*	*	*
	2_MDBCTYBOID	0	3	*	*	*	*
	2_MDBCTYFMID	0	3	*	*	*	*
	2_MDBCTYHORE	0	3	*	*	*	*

2_MDBCTYHRRE	0	3	*	*	*	*
2_MDBCTYKOCO	0	3	*	*	*	*
2_MDMOCOBCCO	0	3	*	*	*	*
2_VAARLLP1RE	8	0	-0.5752	0.0480	-0.8539	-0.2218
2_VAARLTC4ID	13	0	-0.4880	0.1016	-0.9586	0.2041
2_VACPTC1ARE	8	0	-0.4120	0.0797	-0.7696	-0.0757
2_VACPTSF2RE	0	3	*	*	*	*
2_VACPTYC1RE	6	1	-0.852	0.0867	-1.291	-0.398
2_VACPTYC3RE	13	1	-0.724	0.132	-1.345	-0.0223
2_VACPTYC4CO	14	0	-0.480	0.142	-1.222	-0.0132
2_VACPTYC5ID	12	2	-1.038	0.134	-1.675	-0.585
2_VACPTYO1ID	0	3	*	*	*	*
2_VAHATYH1CO	18	0	-0.2818	0.1425	-1.0000	0.2304
2_VAHATYH2ID	16	3	-0.6322	0.0858	-1.2218	-0.2007
2_VAHATYH3RE	17	0	-0.7981	0.1527	-1.4811	-0.0969
2_VAHATYH4RE	15	2	-0.530	0.157	-1.301	0.0294
2_VAHATYH5RE	16	1	-0.4723	0.1126	-1.0000	0.1732
2_VAHCCOC1CO	2	0	-0.782	0.0217	-0.886	-0.678
2_VAHCCOC2CO	3	0	-0.176	0.0577	-0.357	0.0969
2_VAHCCON1ID	2	0	-0.7474	0.00470	-0.7959	-0.6990
2_VAHCCON2ID	3	0	-0.295	0.0970	-0.481	0.0645
2_VAHCCOR1RE	3	0	-0.4413	0.0167	-0.5229	-0.2924
2_VAHCCOR2RE	3	0	-0.778	0.0537	-1.000	-0.538
2_VANFTMS5CO	0	3	*	*	*	*
2_VANFTMS6RE	0	3	*	*	*	*
2_VANFTMS8CO	0	3	*	*	*	*
2_VANFTMS9CO	0	3	*	*	*	*
2_VANFTYN2RE	29	0	-0.5808	0.1551	-1.4320	0.1399
2_VANFTYN3RE	27	0	-0.4921	0.1784	-1.3355	0.1553
2_VANFTYN4CO	27	0	-0.3402	0.1611	-1.1902	0.3997
2_VANFTYN5RE	27	0	-0.6892	0.0991	-1.1902	0.0531
2_VANNTMF1RE	0	1	*	*	*	*
2_VANNTMF4RE	0	3	*	*	*	*
2_VANNTNN1RE	8	2	-0.6595	0.0632	-1.0458	-0.3188
2_VANNTSF4RE	0	2	*	*	*	*
2_VANNTSF6RE	0	2	*	*	*	*
2_VAPMTYP1CO	18	0	-0.657	0.188	-1.440	0.0294
2_VAPMTYP2RE	17	0	-0.746	0.204	-1.621	0.107
2_VAPMTYP4RE	17	0	-0.9851	0.0992	-1.5647	-0.4437
2_VAPMTYP5RE	17	0	-0.721	0.202	-1.605	-0.0555
2_VAVBTYI1ID	0	3	*	*	*	*
2_VAVBTYR1RE	0	5	*	*	*	*
2_VAVBTYV1RE	25	2	-0.4385	0.1138	-1.2218	0.1303
2_VAVBTYV4ID	28	2	-0.5267	0.1331	-1.3315	0.0414
6_AZMCA001ID	26	1	-0.0329	0.0850	-0.6576	0.3802
6_AZMCA003ID	25	2	-0.235	0.256	-1.523	0.716
6_AZMCA005CO	23	3	0.2896	0.0583	-0.0362	0.8921
6_AZMCA006RE	20	0	-0.0492	0.0915	-0.7212	0.5315
6_AZTUA001RE	0	10	*	*	*	*
6_AZTUA002RE	0	8	*	*	*	*
6_AZTUA003CO	0	8	*	*	*	*
6_AZTUA004ID	0	7	*	*	*	*
6_CAALAL09ID	0	9	*	*	*	*
7_OREUA001CO	8	8	-0.617	0.378	-1.472	0.000000000
7_OREUA003RE	9	6	-1.173	0.989	-2.662	0.748
7_ORGRA003RE	6	0	-1.157	0.378	-2.008	-0.208
7_ORGRA004CO	6	0	-0.974	0.0761	-1.403	-0.638
7_ORPOA001CO	11	2	-0.865	0.564	-2.066	0.623
7_ORPOA003ID	11	3	-0.531	0.175	-1.266	0.176
7_ORPOA004ID	7	6	-0.686	0.314	-1.473	0.230
7_ORPOA006RE	11	2	-0.682	0.355	-1.654	0.342
7_ORSAA002CO	0	6	*	*	*	*
7_ORSAA003ID	0	6	*	*	*	*

```
7_ORSAA004RE    0    6          *          *          *          *
```

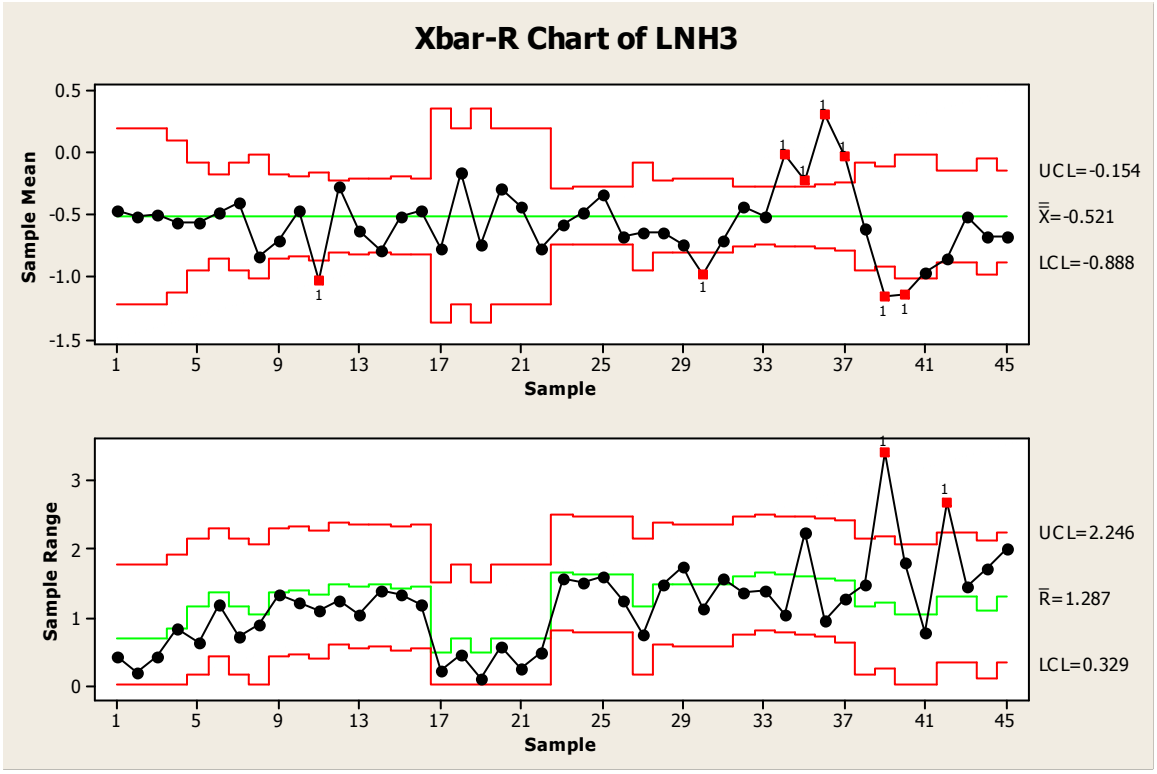

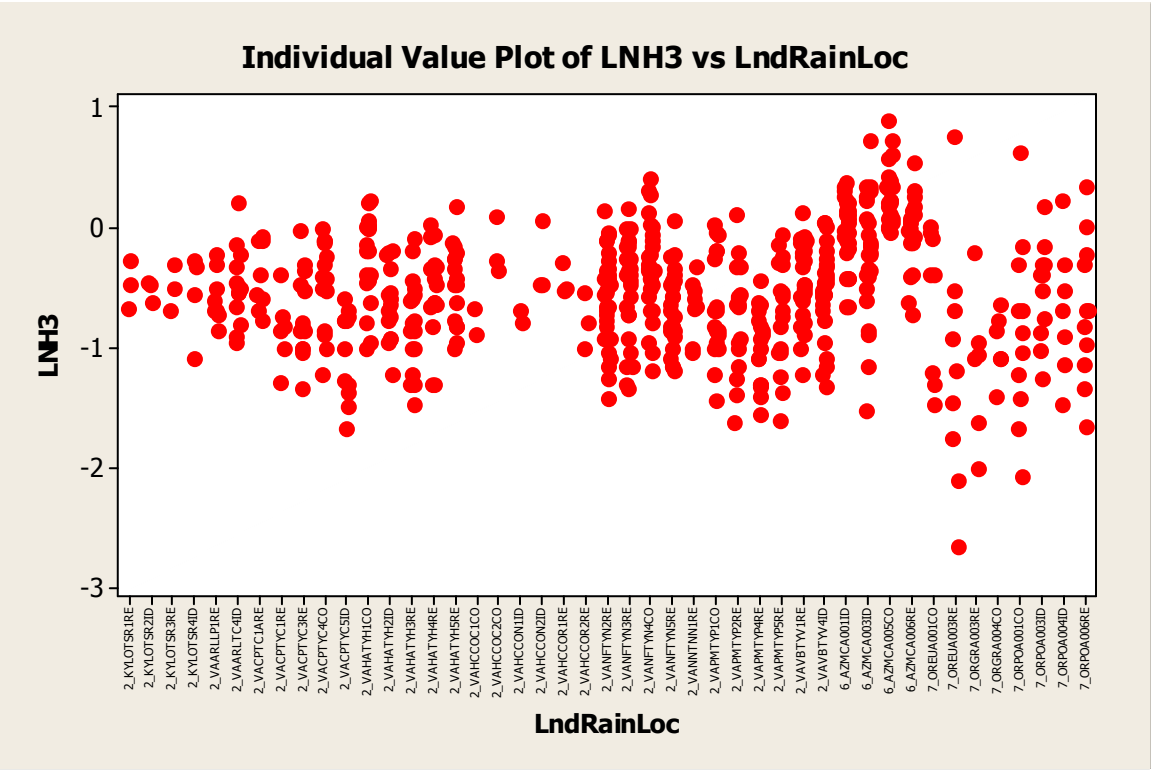

General Linear Model: LNH3 versus Landuse, EPA_Rain_Zone

```
Factor         Type   Levels  Values
Landuse        fixed       3  CO, ID, RE
EPA_Rain_Zone  fixed       3  2, 6, 7


Analysis of Variance for LNH3, using Adjusted SS for Tests

Source                  DF    Seq SS    Adj SS   Adj MS      F      P
Landuse                  2    6.6025    2.5582   1.2791   7.18  0.001
EPA_Rain_Zone            2   29.6281   29.4237  14.7118  82.60  0.000
Landuse*EPA_Rain_Zone    4    2.8313    2.8313   0.7078   3.97  0.003
Error                  579  103.1278  103.1278   0.1781
Total                  587  142.1896
```

Main factors and interactions are significant.

```
Bonferroni Simultaneous Tests
Response Variable LNH3
All Pairwise Comparisons among Levels of Landuse
Landuse = CO  subtracted from:

         Difference       SE of           Adjusted
Landuse    of Means  Difference  T-Value   P-Value
ID          -0.1302     0.06021   -2.163    0.0928
RE          -0.2306     0.06099   -3.782    0.0005


Landuse = ID  subtracted from:

         Difference       SE of           Adjusted
Landuse    of Means  Difference  T-Value   P-Value
RE          -0.1004     0.05965   -1.683    0.2786


Tukey Simultaneous Tests
Response Variable LNH3
All Pairwise Comparisons among Levels of Landuse
Landuse = CO  subtracted from:

         Difference       SE of           Adjusted
Landuse    of Means  Difference  T-Value   P-Value
ID          -0.1302     0.06021   -2.163    0.0777
RE          -0.2306     0.06099   -3.782    0.0005


Landuse = ID  subtracted from:

         Difference       SE of           Adjusted
Landuse    of Means  Difference  T-Value   P-Value
RE          -0.1004     0.05965   -1.683    0.2116
```

There is a significant difference in ammonia concentrations between commercial and residential land uses. This difference was not observed between commercial and industrial areas nor between residential and industrial areas.

```
Bonferroni Simultaneous Tests
Response Variable LNH3
All Pairwise Comparisons among Levels of EPA_Rain_Zone
EPA_Rain_Zone = 2  subtracted from:
```

```
                Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
6                  0.5929     0.05291   11.205    0.0000
7                 -0.2317     0.05669   -4.088    0.0001


EPA_Rain_Zone = 6  subtracted from:

                Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
7                 -0.8246     0.06993   -11.79    0.0000
```

Ammonia in EPA rain zone 2 is significantly different than in rain zones 6, and 7.

Ammonia in EPA rain zone 6 is significantly different than in rain zone 7.

```
Tukey Simultaneous Tests
Response Variable LNH3
All Pairwise Comparisons among Levels of EPA_Rain_Zone
EPA_Rain_Zone = 2  subtracted from:

                Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
6                  0.5929     0.05291   11.205    0.0000
7                 -0.2317     0.05669   -4.088    0.0001


EPA_Rain_Zone = 6  subtracted from:

                Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
7                 -0.8246     0.06993   -11.79    0.0000
```

Ammonia in EPA rain zone 2 is significantly different than in rain zones 6, and 7.

Ammonia in EPA rain zone 6 is significantly different than in rain zone 7.

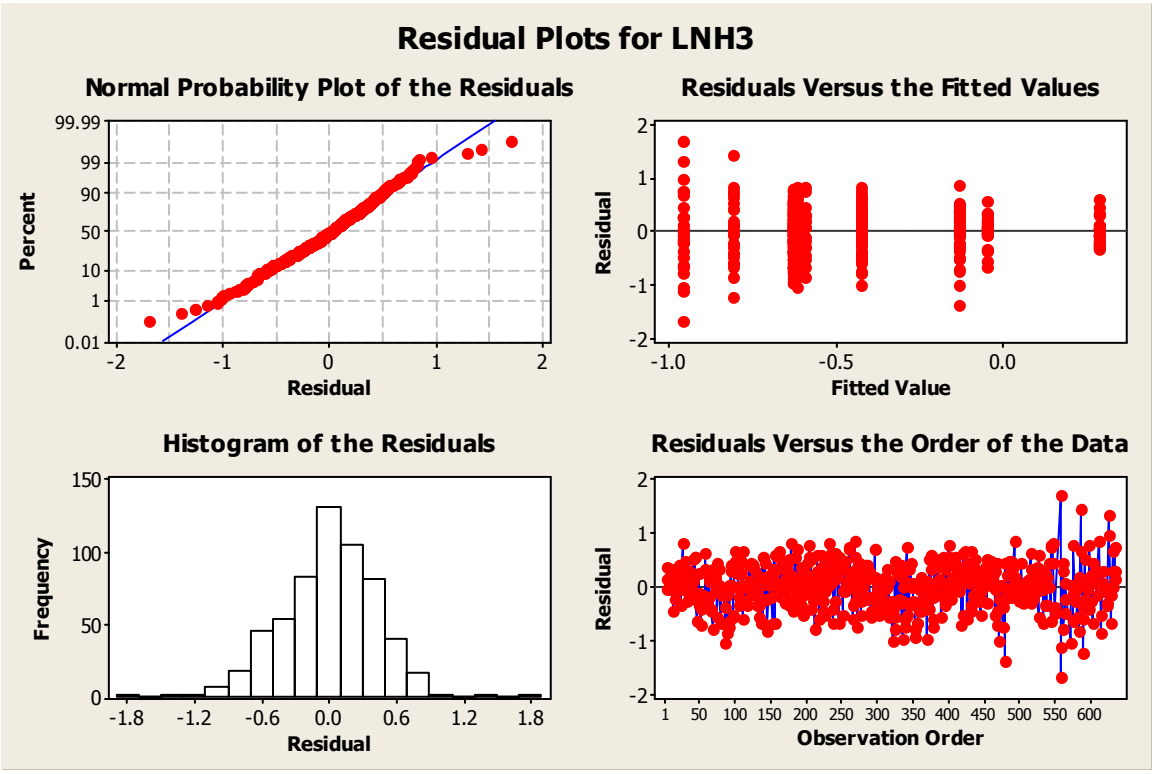

Residuals are normally distributed. There is no trend in any of the plots of residuals.

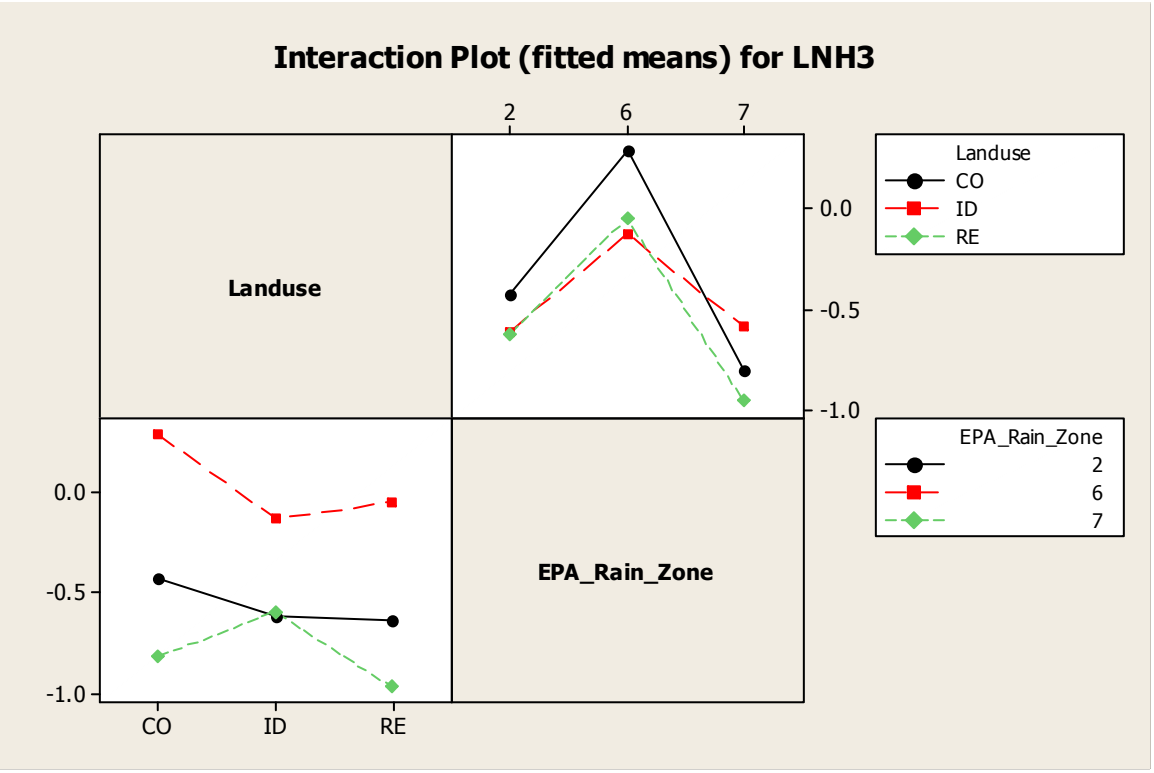

Nitrite plus Nitrate ($NO_2 + NO_3$)

Summary statistics in LOG base 10 scale
Land use: Commercial

EPA_Rain_Zone	N det/est	N ND/NZ	Mean	StDev	Minimum	Maximum
2	114	9	-0.297	0.424	-1.7096	0.8633
3	0	6	*	*	*	*
4	0	16	*	*	*	*
5	40	2	-0.313	0.2076	-0.8196	0.0531
6	30	4	-0.004	0.3379	-1.2218	0.5911
7	37	4	-0.552	0.3409	-1.0969	0.415

Land use: Industrial

EPA_Rain_Zone	N det/est	N ND/NZ	Mean	StDev	Minimum	Maximum
2	94	15	-0.308	0.3884	-1.5229	0.3729
3	9	7	-0.606	0.498	-1.347	0.22
4	0	17	*	*	*	*
5	46	1	-0.212	0.2213	-1.1612	0.2279
6	58	12	0.2018	0.2552	-0.3372	0.6721
7	24	9	-0.849	0.4197	-1.661	-0.1549

Land use: Residential

EPA_Rain_Zone	N det/est	N ND/NZ	Mean	StDev	Minimum	Maximum
2	302	29	-0.307	0.3006	-1.3979	0.4624
3	7	11	-0.068	0.659	-1.102	0.5
4	0	31	*	*	*	*
5	69	2	-0.177	0.26	-0.9586	0.8555
6	38	0	0.0566	0.1794	-0.301	0.4713
7	36	4	-0.248	0.4138	-1.1094	0.5441

Descriptive Statistics: LNO2

Variable	LndRainLoc	N	N*	Mean	Variance	Minimum	Maximum
LNO2	2_KYLOTSR1RE	0	3	*	*	*	*
	2_KYLOTSR2ID	0	3	*	*	*	*
	2_KYLOTSR3RE	0	3	*	*	*	*
	2_KYLOTSR4ID	0	4	*	*	*	*
	2_MDAACOMWID	3	0	-0.4406	0.0173	-0.5850	-0.3279
	2_MDAACOODRE	3	0	-0.1157	0.0189	-0.2147	0.0414
	2_MDAACOPPCO	26	0	-0.516	0.373	-1.710	0.520
	2_MDAACORKRE	3	0	-0.103	0.0861	-0.409	0.176
	2_MDBACOBCID	3	0	0.2635	0.0103	0.1461	0.3222
	2_MDBACOSCRE	26	0	-0.1021	0.1018	-0.6990	0.3909
	2_MDBACOTCID	3	0	-0.1204	0.0201	-0.2840	-0.0315
	2_MDBACOWCRE	3	0	-0.269	0.478	-1.067	0.146
	2_MDBCTYBOID	3	0	-0.0220	0.0510	-0.167	0.238
	2_MDBCTYFMID	3	0	0.0348	0.0288	-0.0706	0.2304
	2_MDBCTYHORE	3	0	0.0908	0.0298	-0.1079	0.2041
	2_MDBCTYHRRE	3	0	0.0661	0.0356	-0.149	0.204

2_MDBCTYKOCO	3	0	0.299	0.254	-0.108	0.863
2_MDMOCOBCCO	3	0	-0.583	0.502	-1.398	-0.108
2_VAARLLP1RE	7	1	-0.267	0.119	-0.854	0.114
2_VAARLTC4ID	13	0	-0.195	0.131	-1.128	0.176
2_VACPTC1ARE	8	0	-0.1962	0.0402	-0.4089	0.1072
2_VACPTSF2RE	0	3	*	*	*	*
2_VACPTYC1RE	7	0	-0.3717	0.0533	-0.7212	-0.0458
2_VACPTYC3RE	14	0	-0.4563	0.0803	-0.8539	0.1139
2_VACPTYC4CO	14	0	-0.1653	0.1163	-0.8539	0.4166
2_VACPTYC5ID	14	0	-0.6254	0.1134	-1.0969	-0.0862
2_VACPTYO1ID	0	3	*	*	*	*
2_VAHATYH1CO	18	0	-0.1464	0.1036	-0.7447	0.3424
2_VAHATYH2ID	18	1	-0.2455	0.1313	-1.3979	0.2480
2_VAHATYH3RE	17	0	-0.5296	0.1191	-1.3979	0.0792
2_VAHATYH4RE	17	0	-0.2830	0.0298	-0.6778	0.0128
2_VAHATYH5RE	17	0	-0.2651	0.0506	-0.5850	0.1303
2_VAHCCOC1CO	2	0	-0.4687	0.000327	-0.4815	-0.4559
2_VAHCCOC2CO	3	0	-0.127	0.194	-0.432	0.378
2_VAHCCON1ID	2	0	-0.376	0.0431	-0.523	-0.229
2_VAHCCON2ID	3	0	-0.333	0.117	-0.721	-0.0757
2_VAHCCOR1RE	3	0	-0.533	0.0660	-0.770	-0.260
2_VAHCCOR2RE	3	0	-0.416	0.259	-0.959	0.0492
2_VANFTMS5CO	0	3	*	*	*	*
2_VANFTMS6RE	0	3	*	*	*	*
2_VANFTMS8CO	0	3	*	*	*	*
2_VANFTMS9CO	0	3	*	*	*	*
2_VANFTYN2RE	29	0	-0.2116	0.0684	-0.6778	0.4624
2_VANFTYN3RE	27	0	-0.3501	0.0563	-0.8239	0.0414
2_VANFTYN4CO	27	0	-0.1988	0.0427	-0.4949	0.1903
2_VANFTYN5RE	27	0	-0.3281	0.1299	-1.3979	0.1399
2_VANNTMF1RE	0	1	*	*	*	*
2_VANNTMF4RE	0	3	*	*	*	*
2_VANNTNN1RE	8	2	-0.3008	0.0339	-0.6383	-0.0757
2_VANNTSF4RE	0	2	*	*	*	*
2_VANNTSF6RE	0	2	*	*	*	*
2_VAPMTYP1CO	18	0	-0.4410	0.0423	-0.7447	-0.0862
2_VAPMTYP2RE	17	0	-0.4302	0.0365	-0.8861	-0.0269
2_VAPMTYP4RE	17	0	-0.4084	0.0203	-0.6021	-0.1024
2_VAPMTYP5RE	17	0	-0.3531	0.1362	-1.0969	0.2068
2_VAVBTYI1ID	0	3	*	*	*	*
2_VAVBTYR1RE	0	5	*	*	*	*
2_VAVBTYV1RE	26	1	-0.3223	0.1009	-1.3979	0.0334
2_VAVBTYV4ID	29	1	-0.3656	0.1690	-1.5229	0.3729
5_TXARA001CO	21	1	-0.2736	0.0403	-0.6198	0.0531
5_TXARA002RE	20	1	-0.2077	0.1057	-0.9586	0.8555
5_TXARA003RE	7	0	-0.2473	0.00324	-0.3372	-0.1739
5_TXDAA001ID	7	0	-0.2800	0.0417	-0.5229	-0.0757
5_TXDAA002ID	19	0	-0.2060	0.0255	-0.4101	0.1461
5_TXDAA004CO	19	1	-0.3557	0.0449	-0.8196	-0.0521
5_TXDAA005RE	7	0	-0.1957	0.0210	-0.4318	0.000000000
5_TXFWA004ID	20	1	-0.1942	0.0766	-1.1612	0.2279
5_TXIRA001RE	21	1	-0.2112	0.0834	-0.8539	0.2175
5_TXMEA002RE	7	0	0.0800	0.0102	-0.0362	0.2304
5_TXMEA003RE	7	0	-0.1509	0.0277	-0.3872	0.0792
6_AZMCA001ID	26	1	0.0415	0.0387	-0.3372	0.3617
6_AZMCA003ID	26	1	0.3936	0.0258	-0.0177	0.6721
6_AZMCA005CO	23	3	0.0309	0.0776	-0.4559	0.5911
6_AZMCA006RE	20	0	0.0536	0.0189	-0.2441	0.3424
6_AZTUA001RE	10	0	0.1134	0.0473	-0.2441	0.4713
6_AZTUA002RE	8	0	-0.00679	0.0487	-0.3010	0.3010
6_AZTUA003CO	7	1	-0.118	0.247	-1.222	0.185
6_AZTUA004ID	6	1	0.0653	0.0726	-0.301	0.365
6_CAALAL09ID	0	9	*	*	*	*

7_OREUA001CO	14	2	-0.5824	0.0691	-1.0402	-0.0269
7_OREUA003RE	15	0	-0.2205	0.0712	-0.7447	0.1461
7_ORGRA003RE	6	0	0.1092	0.0518	-0.0969	0.5441
7_ORGRA004CO	6	0	-0.427	0.0738	-0.921	-0.155
7_ORPOA001CO	12	1	-0.602	0.220	-1.097	0.415
7_ORPOA003ID	11	3	-0.860	0.171	-1.607	-0.301
7_ORPOA004ID	9	4	-0.951	0.227	-1.661	-0.155
7_ORPOA006RE	10	3	-0.650	0.197	-1.109	0.146
7_ORSAA002CO	5	1	-0.493	0.0850	-0.745	-0.0458
7_ORSAA003ID	4	2	-0.587	0.0515	-0.824	-0.301
7_ORSAA004RE	5	1	0.0437	0.0363	-0.1805	0.2553

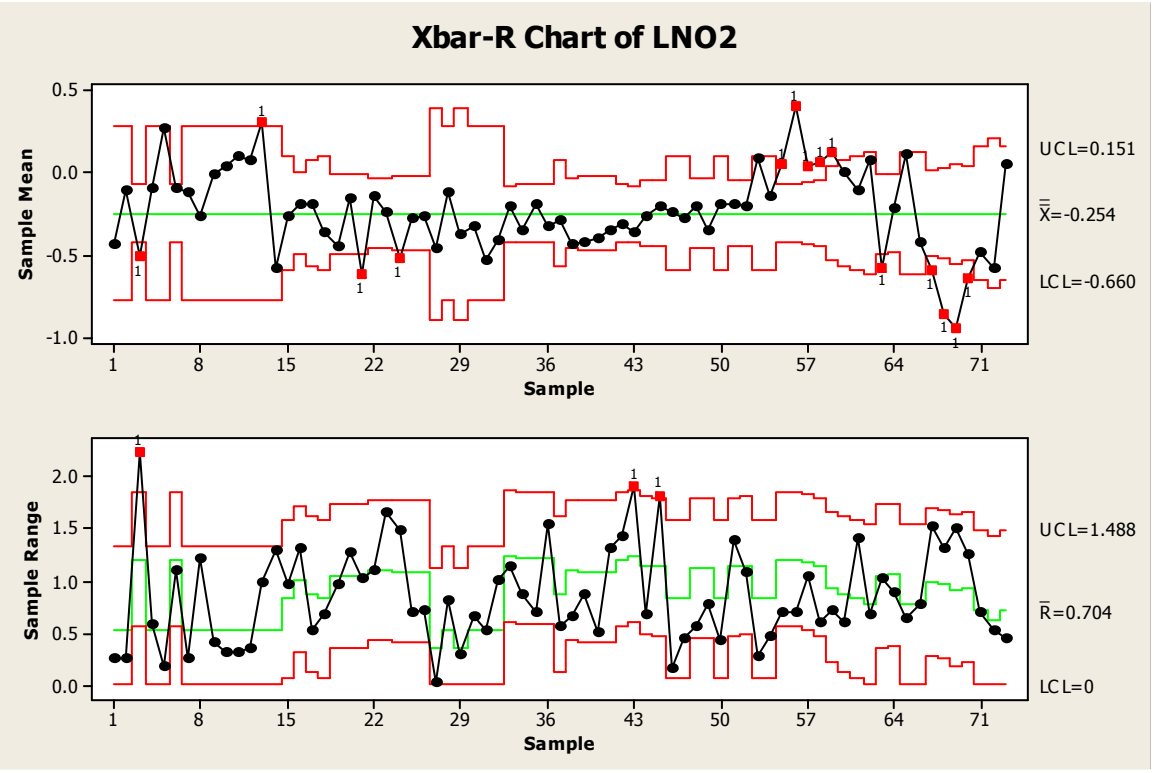

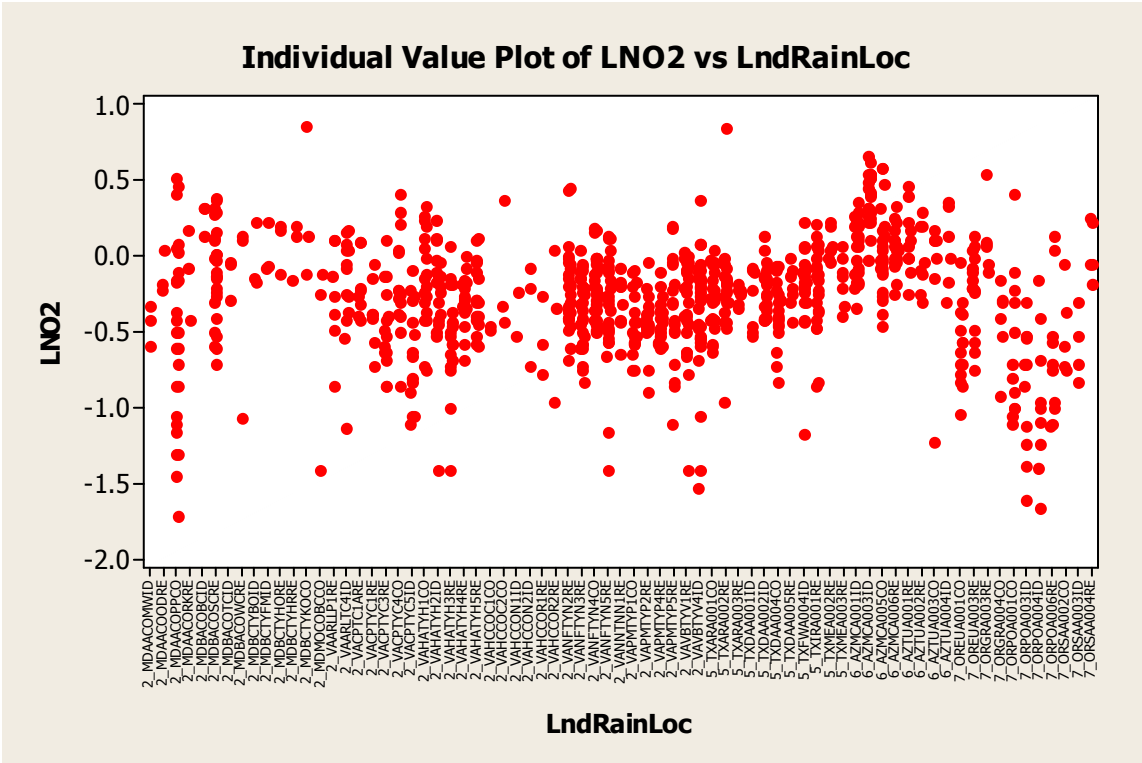

General Linear Model: LNO3 versus Landuse, EPA_Rain_Zone

```
Factor          Type   Levels  Values
Landuse         fixed       3  CO, ID, RE
EPA_Rain_Zone   fixed       4  2, 5, 6, 7


Analysis of Variance for LNO3, using Adjusted SS for Tests

Source                   DF     Seq SS   Adj SS  Adj MS      F      P
Landuse                   2     0.8956   2.0365  1.0182   9.65  0.000
EPA_Rain_Zone             3    24.1930  22.5935  7.5312  71.35  0.000
Landuse*EPA_Rain_Zone     6     6.2276   6.2276  1.0379   9.83  0.000
Error                   876    92.4598  92.4598  0.1055
Total                   887   123.7760
```

Main effects and interactions are significant.

```
Bonferroni Simultaneous Tests
Response Variable LNO3
All Pairwise Comparisons among Levels of Landuse
Landuse = CO  subtracted from:

         Difference       SE of             Adjusted
Landuse    of Means  Difference   T-Value    P-Value
ID        -0.000404     0.03497  -0.01155     1.0000
RE         0.122472     0.03309   3.70067     0.0007
```

```
Landuse = ID  subtracted from:

         Difference       SE of           Adjusted
Landuse    of Means  Difference  T-Value   P-Value
RE           0.1229     0.03281    3.745    0.0006


Tukey Simultaneous Tests
Response Variable LNO3
All Pairwise Comparisons among Levels of Landuse
Landuse = CO  subtracted from:

         Difference       SE of            Adjusted
Landuse    of Means  Difference   T-Value   P-Value
ID        -0.000404     0.03497  -0.01155    0.9999
RE         0.122472     0.03309   3.70067    0.0006


Landuse = ID  subtracted from:

         Difference       SE of           Adjusted
Landuse    of Means  Difference  T-Value   P-Value
RE           0.1229     0.03281    3.745    0.0005
```

There is not a significant difference in nitrate concentrations between commercial and industrial land uses. Nitrates in commercial land use areas are significantly different than in residential land use areas. Nitrates in industrial land use areas are significantly different than in residential land use areas.

```
Bonferroni Simultaneous Tests
Response Variable LNO3
All Pairwise Comparisons among Levels of EPA_Rain_Zone
EPA_Rain_Zone = 2  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
5                  0.0701     0.03138    2.234    0.1545
6                  0.3887     0.03418   11.372    0.0000
7                 -0.2455     0.03739   -6.567    0.0000


EPA_Rain_Zone = 5  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
6                  0.3186     0.04025    7.916    0.0000
7                 -0.3156     0.04301   -7.339    0.0000


EPA_Rain_Zone = 6  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
7                 -0.6342     0.04509   -14.07    0.0000
```

Nitrates in EPA rain zone 2 are significantly different than in rain zones 6, and 7. Nitrates in EPA rain zone 2 are not significantly than in rain zone 5.

Nitrates in EPA rain zone 5 are significantly different than in rain zones 6, and 7.

Nitrates in EPA rain zone 6 are significantly different than in rain zones 7.

```
Tukey Simultaneous Tests
Response Variable LNO3
All Pairwise Comparisons among Levels of EPA_Rain_Zone
EPA_Rain_Zone = 2  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
5                  0.0701     0.03138    2.234    0.1142
6                  0.3887     0.03418   11.372    0.0000
7                 -0.2455     0.03739   -6.567    0.0000


EPA_Rain_Zone = 5  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
6                  0.3186     0.04025    7.916    0.0000
7                 -0.3156     0.04301   -7.339    0.0000


EPA_Rain_Zone = 6  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
7                 -0.6342     0.04509   -14.07    0.0000
```

Nitrates in EPA rain zone 2 are significantly different than in rain zones 6, and 7. Nitrates in EPA rain zone 2 are not significantly than in rain zone 5.

Nitrates in EPA rain zone 5 are significantly different than in rain zones 6, and 7.

Nitrates in EPA rain zone 6 are significantly different than in rain zones 7.

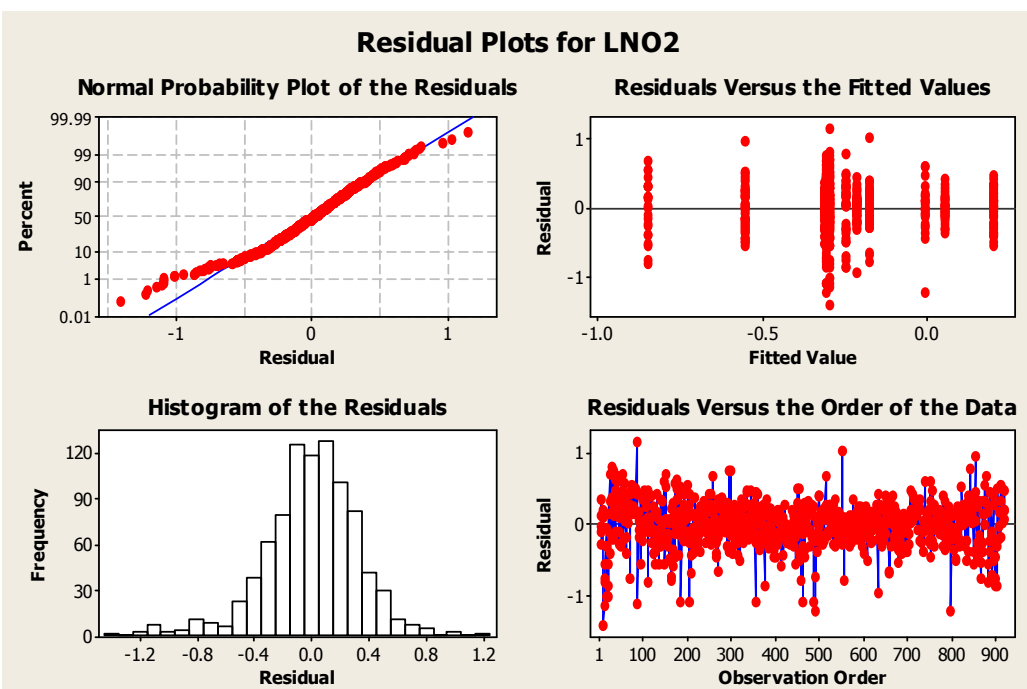

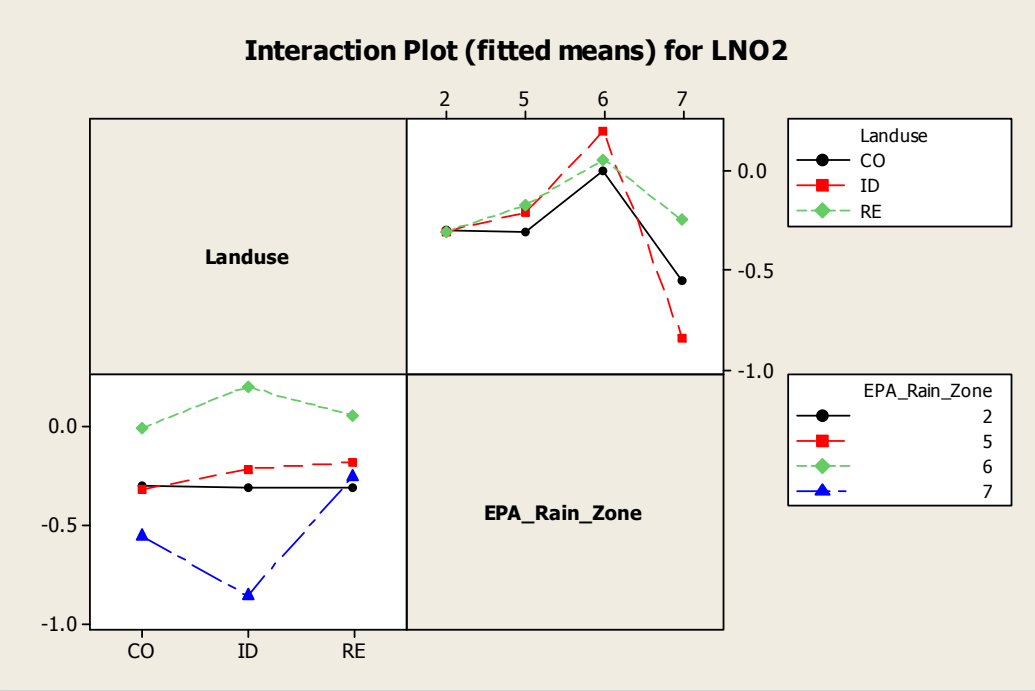
Interaction Plot (fitted means) for LNO2
Landuse
EPA_Rain_Zone
2
5
6
7
0.0
-0.5
-1.0
CO
ID
RE
Landuse
CO
ID
RE
EPA_Rain_Zone
2
5
6
7

Total Kjeldahl Nitrogen (TKN)

Summary statistics in LOG base 10 scale
Land use: Commercial

EPA_Rain_Zone	N det/est	N ND/NZ	Mean	StDev	Minimum	Maximum
2	114	9	0.174	0.331	-1.301	0.939
3	6	0	0.048	0.219	-0.143	0.477
4	0	16*	*	*	*	
5	40	2	-0.028	0.269	-0.586	0.602
6	34	0	0.567	0.264	0.017	1.079
7	37	4	-0.043	0.471	-1.696	0.919

Land use: Industrial

EPA_Rain_Zone	N det/est	N ND/NZ	Mean	StDev	Minimum	Maximum
2	94	15	0.001	0.307	-0.790	1.000
3	15	1	-0.194	0.415	-1.347	0.248
4	0	17*	*	*	*	
5	46	1	-0.074	0.294	-1.000	0.699
6	64	6	0.519	0.411	-0.602	1.204
7	24	9	0.192	0.487	-1.843	0.771

Land use: Residential

EPA_Rain_Zone	N det/est	N ND/NZ	Mean	StDev	Minimum	Maximum
2	302	29	0.125	0.299	-1.000	1.556
3	17	1	0.048	0.161	-0.252	0.378
4	0	31*	*	*	*	
5	69	2	0.187	0.338	-0.691	1.000
6	37	1	0.504	0.300	-0.301	1.041
7	37	3	-0.167	0.579	-2.314	1.065

Descriptive Statistics: LTKN

Variable	LndRainLoc	N	N*	Mean	Variance	Minimum	Maximum
LTKN	2_KYLOTSR1RE	0	3	*	*	*	*
	2_KYLOTSR2ID	0	3	*	*	*	*
	2_KYLOTSR3RE	0	3	*	*	*	*
	2_KYLOTSR4ID	0	4	*	*	*	*
	2_MDAACOMWID	3	0	0.0889	0.114	-0.222	0.447
	2_MDAACOODRE	3	0	-0.180	0.505	-1.000	0.230
	2_MDAACOPPCO	26	0	0.1408	0.1412	-0.6353	0.9385
	2_MDAACORKRE	3	0	0.0698	0.255	-0.222	0.653
	2_MDBACOBCID	3	0	0.143	0.669	-0.789	0.740
	2_MDBACOSCRE	26	0	0.1970	0.0886	-0.4656	0.8513
	2_MDBACOTCID	3	0	0.173	0.0699	0.000000000	0.477
	2_MDBACOWCRE	3	0	0.4203	0.0206	0.3010	0.5798
	2_MDBCTYBOID	3	0	0.428	0.249	0.0792	1.000
	2_MDBCTYFMID	3	0	-0.162	0.276	-0.759	0.230
	2_MDBCTYHORE	3	0	0.441	0.587	-0.408	1.079
	2_MDBCTYHRRE	2	1	1.024	0.567	0.491	1.556
	2_MDBCTYKOCO	3	0	0.360	0.0986	0.0792	0.699
	2_MDMOCOBCCO	3	0	-0.100	1.121	-1.301	0.699
	2_VAARLLP1RE	8	0	0.0813	0.0678	-0.2147	0.6021
	2_VAARLTC4ID	12	1	0.0398	0.0767	-0.4451	0.4472

2_VACPTC1ARE	8	0	0.2131	0.0243	0.0414	0.5250
2_VACPTSF2RE	0	3	*	*	*	*
2_VACPTYC1RE	7	0	0.0479	0.0500	-0.3665	0.3579
2_VACPTYC3RE	14	0	-0.0127	0.0507	-0.3872	0.4014
2_VACPTYC4CO	14	0	0.1206	0.0613	-0.3098	0.4298
2_VACPTYC5ID	14	0	-0.2955	0.0314	-0.6778	-0.0362
2_VACPTYO1ID	0	3	*	*	*	*
2_VAHATYH1CO	18	0	0.2378	0.0554	-0.2007	0.6031
2_VAHATYH2ID	19	0	0.0597	0.0511	-0.2676	0.5353
2_VAHATYH3RE	17	0	-0.1125	0.0502	-0.5850	0.2625
2_VAHATYH4RE	17	0	0.1149	0.0647	-0.3188	0.5065
2_VAHATYH5RE	17	0	0.2432	0.1077	-0.2757	1.0550
2_VAHCCOC1CO	2	0	0.423	0.153	0.146	0.699
2_VAHCCOC2CO	3	0	0.555	0.0536	0.322	0.785
2_VAHCCON1ID	2	0	0.0502	0.0184	-0.0458	0.1461
2_VAHCCON2ID	3	0	0.185	0.0362	0.000000000	0.380
2_VAHCCOR1RE	3	0	0.254	0.0710	0.000000000	0.531
2_VAHCCOR2RE	3	0	0.1728	0.0293	0.000000000	0.3424
2_VANFTMS5CO	0	3	*	*	*	*
2_VANFTMS6RE	0	3	*	*	*	*
2_VANFTMS8CO	0	3	*	*	*	*
2_VANFTMS9CO	0	3	*	*	*	*
2_VANFTYN2RE	29	0	0.1693	0.0589	-0.2840	0.8000
2_VANFTYN3RE	27	0	0.1671	0.0461	-0.2757	0.6785
2_VANFTYN4CO	27	0	0.2207	0.0879	-0.3468	0.8500
2_VANFTYN5RE	27	0	0.0499	0.1049	-1.0000	0.5670
2_VANNTMF1RE	0	1	*	*	*	*
2_VANNTMF4RE	0	3	*	*	*	*
2_VANNTNN1RE	8	2	0.2322	0.0380	-0.0132	0.5752
2_VANNTSF4RE	0	2	*	*	*	*
2_VANNTSF6RE	0	2	*	*	*	*
2_VAPMTYP1CO	18	0	0.0539	0.0448	-0.3565	0.4814
2_VAPMTYP2RE	17	0	0.0386	0.0486	-0.3872	0.4150
2_VAPMTYP4RE	17	0	-0.0385	0.0286	-0.3098	0.3385
2_VAPMTYP5RE	17	0	-0.00324	0.1173	-0.4437	0.8591
2_VAVBTYI1ID	0	3	*	*	*	*
2_VAVBTYR1RE	0	5	*	*	*	*
2_VAVBTYV1RE	26	1	0.2966	0.0338	-0.00877	0.7574
2_VAVBTYV4ID	29	1	-0.00245	0.0548	-0.4815	0.6232
3_ALMOCREORE	3	0	-0.1197	0.0221	-0.2518	0.0414
3_ALMODAPHCO	3	0	0.165	0.0739	-0.0223	0.477
3_ALMOSARARE	3	0	0.0680	0.0139	0.000000000	0.2041
3_ALMOSIIVID	3	0	-0.0372	0.00530	-0.1024	0.0414
3_ALMOSITVCO	3	0	-0.0690	0.00462	-0.1427	-0.00877
3_ALMOSIVIRE	3	0	-0.0372	0.00530	-0.1024	0.0414
3_ALMOTHEOID	3	0	-0.0690	0.00462	-0.1427	-0.00877
3_GAATAT01ID	9	1	-0.288	0.273	-1.347	0.248
3_GAATAT02RE	8	1	0.1353	0.0234	-0.0278	0.3784
5_TXARA001CO	21	1	0.00765	0.0834	-0.5857	0.5635
5_TXARA002RE	20	1	0.1097	0.1304	-0.6905	0.7324
5_TXARA003RE	7	0	-0.0632	0.0101	-0.1549	0.0792
5_TXDAA001ID	7	0	-0.0662	0.0505	-0.5229	0.1461
5_TXDAA002ID	19	0	-0.1466	0.1066	-1.0000	0.4624
5_TXDAA004CO	19	1	-0.0675	0.0613	-0.4437	0.6021
5_TXDAA005RE	7	0	0.1449	0.0322	-0.0969	0.3979
5_TXFWA004ID	20	1	-0.00875	0.0778	-0.5807	0.6990
5_TXIRA001RE	21	1	0.2761	0.1655	-0.6517	1.0000
5_TXMEA002RE	7	0	0.4255	0.0675	0.1461	0.8921
5_TXMEA003RE	7	0	0.1962	0.0328	-0.0458	0.3802
6_AZMCA001ID	26	1	0.5937	0.1516	-0.2218	1.2041
6_AZMCA003ID	25	2	0.6372	0.0666	0.000000000	1.0792
6_AZMCA005CO	26	0	0.6018	0.0581	0.1139	1.0792
6_AZMCA006RE	19	1	0.5089	0.0538	-0.0458	1.0414

6_AZTUA001RE	10	0	0.532	0.113	-0.155	0.845
6_AZTUA002RE	8	0	0.457	0.176	-0.301	0.968
6_AZTUA003CO	8	0	0.452	0.102	0.0170	0.973
6_AZTUA004ID	7	0	0.4765	0.0649	0.0414	0.7340
6_CAALAL09ID	6	3	-0.246	0.169	-0.602	0.415
7_OREUA001CO	14	2	0.0821	0.194	-0.705	0.633
7_OREUA003RE	15	0	-0.0675	0.193	-0.827	1.064
7_ORGRA003RE	6	0	-0.2582	0.0490	-0.6655	-0.0400
7_ORGRA004CO	6	0	-0.276	0.0855	-0.833	-0.0223
7_ORPOA001CO	12	1	0.0416	0.140	-0.301	0.919
7_ORPOA003ID	11	3	0.3577	0.0498	-0.0458	0.7709
7_ORPOA004ID	9	4	0.2381	0.0558	-0.0969	0.6812
7_ORPOA006RE	11	2	0.0972	0.136	-0.377	0.813
7_ORSAA002CO	5	1	-0.315	0.624	-1.696	0.301
7_ORSAA003ID	4	2	-0.366	0.978	-1.843	0.204
7_ORSAA004RE	5	1	-0.936	0.961	-2.314	0.0414

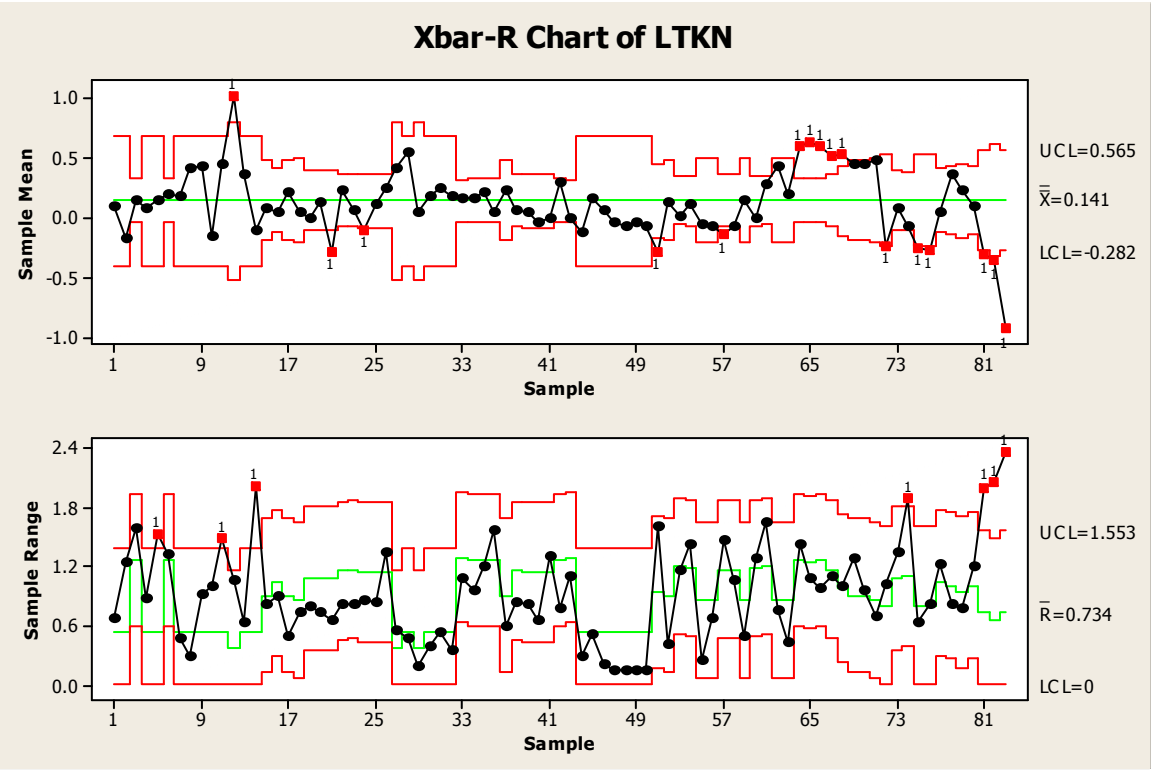

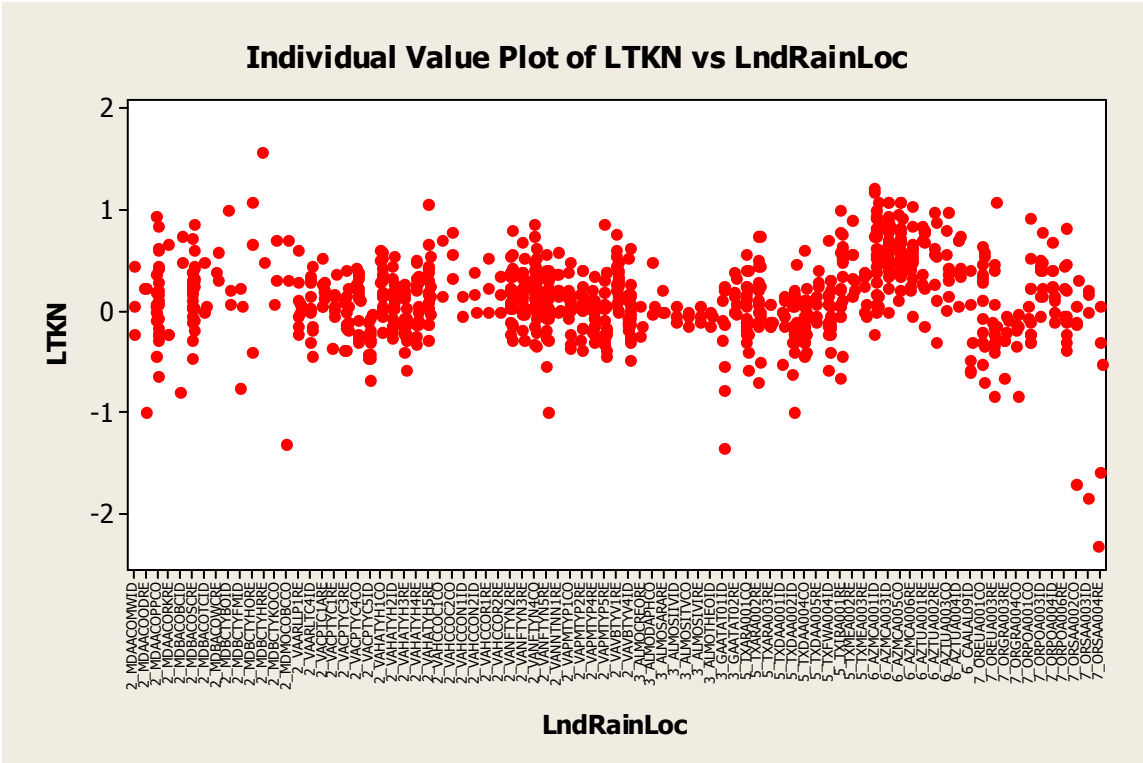

General Linear Model: LTKN versus Landuse, EPA_Rain_Zone

```
Factor          Type   Levels  Values
Landuse         fixed       3  CO, ID, RE
EPA_Rain_Zone   fixed       5  2, 3, 5, 6, 7


Analysis of Variance for LTKN, using Adjusted SS for Tests

Source                   DF     Seq SS     Adj SS  Adj MS      F      P
Landuse                   2     0.1067     0.2805  0.1403   1.20  0.300
EPA_Rain_Zone             4    26.9717    24.3602  6.0901  52.29  0.000
Landuse*EPA_Rain_Zone     8     5.2809     5.2809  0.6601   5.67  0.000
Error                   921   107.2734   107.2734  0.1165
Total                   935   139.6327
```

Land use is not significant. EPA rain zone and interaction are significant.

```
Bonferroni Simultaneous Tests
Response Variable LTKN
All Pairwise Comparisons among Levels of Landuse
Landuse = CO  subtracted from:

         Difference       SE of           Adjusted
Landuse    of Means  Difference  T-Value   P-Value
ID         -0.05489     0.04388   -1.251    0.6338
RE         -0.00419     0.04249   -0.099    1.0000


Landuse = ID  subtracted from:
```

Landuse	Difference of Means	SE of Difference	T-Value	Adjusted P-Value
RE	0.05069	0.03657	1.386	0.4980

Tukey Simultaneous Tests
Response Variable LTKN
All Pairwise Comparisons among Levels of Landuse
Landuse = CO subtracted from:

Landuse	Difference of Means	SE of Difference	T-Value	Adjusted P-Value
ID	-0.05489	0.04388	-1.251	0.4232
RE	-0.00419	0.04249	-0.099	0.9946

Landuse = ID subtracted from:

Landuse	Difference of Means	SE of Difference	T-Value	Adjusted P-Value
RE	0.05069	0.03657	1.386	0.3481

No significant differences among land uses.

Bonferroni Simultaneous Tests
Response Variable LTKN
All Pairwise Comparisons among Levels of EPA_Rain_Zone
EPA_Rain_Zone = 2 subtracted from:

EPA_Rain_Zone	Difference of Means	SE of Difference	T-Value	Adjusted P-Value
3	-0.1325	0.06384	-2.076	0.3814
5	-0.0716	0.03296	-2.174	0.3000
6	0.4300	0.03502	12.276	0.0000
7	-0.1056	0.03915	-2.698	0.0711

EPA_Rain_Zone = 3 subtracted from:

EPA_Rain_Zone	Difference of Means	SE of Difference	T-Value	Adjusted P-Value
5	0.06090	0.06763	0.9005	1.0000
6	0.56251	0.06866	8.1931	0.0000
7	0.02693	0.07085	0.3801	1.0000

EPA_Rain_Zone = 5 subtracted from:

EPA_Rain_Zone	Difference of Means	SE of Difference	T-Value	Adjusted P-Value
6	0.50161	0.04153	12.0770	0.0000
7	-0.03397	0.04507	-0.7537	1.0000

EPA_Rain_Zone = 6 subtracted from:

EPA_Rain_Zone	Difference of Means	SE of Difference	T-Value	Adjusted P-Value
7	-0.5356	0.04660	-11.49	0.0000

TKN in rain zone 2 is significantly different than TKN in rain zone 6. No differences were observed between rain zone 2 and zones 3, 5, and 7.

TKN in rain zone 3 is significantly different than TKN in rain zone 6. No differences were observed between rain zone 3 and zones 5, and 7.

TKN in rain zone 5 is significantly different than TKN in rain zone 6. No differences were observed between rain zone 5 and 7.

TKN in rain zone 6 is significantly different than TKN in rain zone 7.

```
Tukey Simultaneous Tests
Response Variable LTKN
All Pairwise Comparisons among Levels of EPA_Rain_Zone
EPA_Rain_Zone = 2  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
3                 -0.1325     0.06384   -2.076    0.2303
5                 -0.0716     0.03296   -2.174    0.1897
6                  0.4300     0.03502   12.276    0.0000
7                 -0.1056     0.03915   -2.698    0.0543

EPA_Rain_Zone = 3  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
5                 0.06090     0.06763   0.9005    0.8968
6                 0.56251     0.06866   8.1931    0.0000
7                 0.02693     0.07085   0.3801    0.9956


EPA_Rain_Zone = 5  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
6                 0.50161     0.04153  12.0770    0.0000
7                -0.03397     0.04507  -0.7537    0.9436


EPA_Rain_Zone = 6  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
7                 -0.5356     0.04660   -11.49    0.0000
```

TKN in rain zone 2 is significantly different than TKN in rain zone 6. No differences were observed between rain zone 2 and zones 3, 5, and 7.

TKN in rain zone 3 is significantly different than TKN in rain zone 6. No differences were observed between rain zone 3 and zones 5, and 7.

TKN in rain zone 5 is significantly different than TKN in rain zone 6. No differences were observed between rain zone 5 and 7.

TKN in rain zone 6 is significantly different than TKN in rain zone 7.

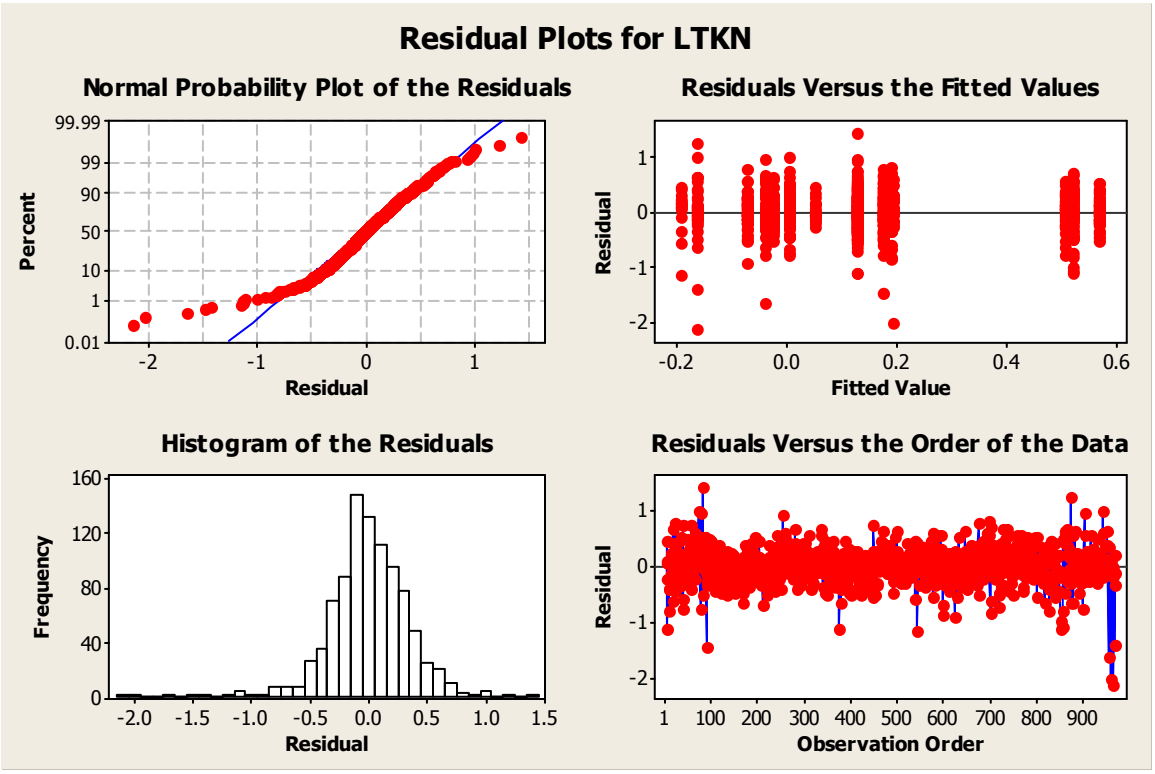
Residual Plots for LTKN
Normal Probability Plot of the Residuals
Percent
99.99
99
90
50
10
1
0.01
-2
-1
0
1
Residual
Residuals Versus the Fitted Values
Residual
1
0
-1
-2
-0.2
0.0
0.2
0.4
0.6
Fitted Value
Histogram of the Residuals
Frequency
160
120
80
40
0
-2.0
-1.5
-1.0
-0.5
0.0
0.5
1.0
1.5
Residual
Residuals Versus the Order of the Data
Residual
1
0
-1
-2
1
100
200
300
400
500
600
700
800
900
Observation Order

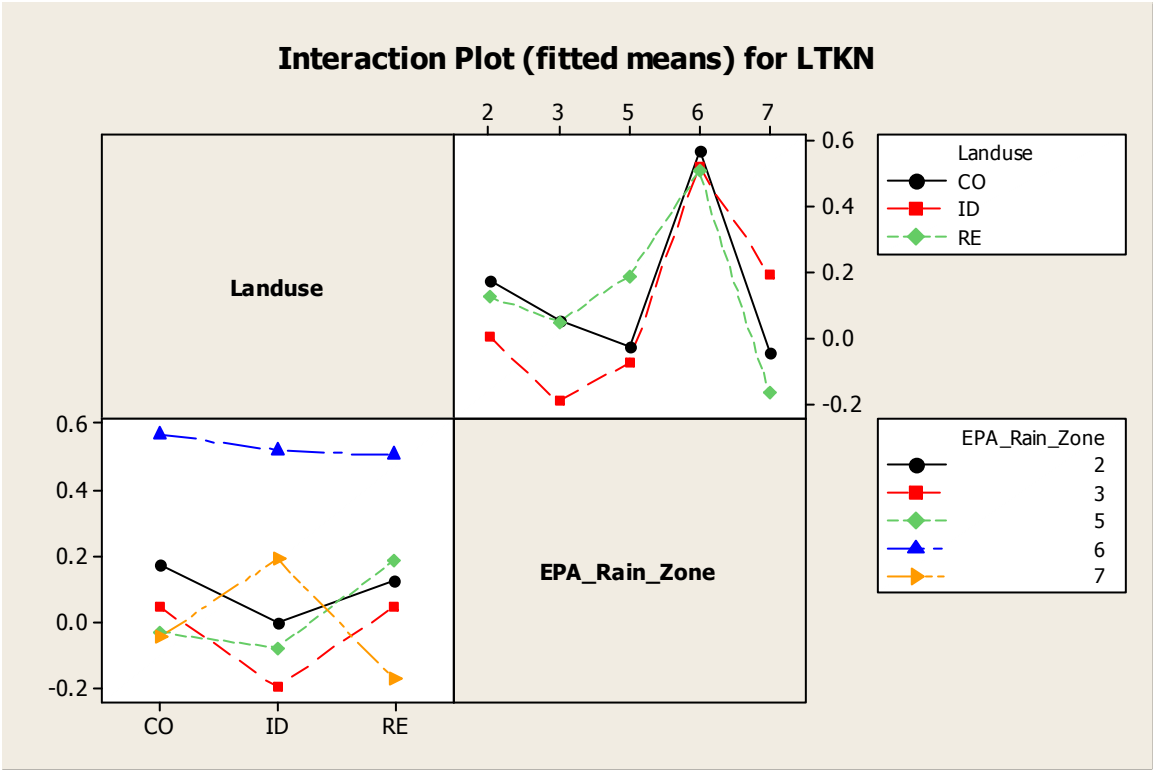
Interaction Plot (fitted means) for LTKN
Landuse
EPA_Rain_Zone
2
3
5
6
7
0.6
0.4
0.2
0.0
-0.2
CO
ID
RE
Landuse
CO
ID
RE
EPA_Rain_Zone
2
3
5
6
7

Total Phosphorus (P)

Summary statistics in LOG base 10 scale
Land use: Commercial

EPA_Rain_Zone	N det/est	N ND/NZ	Mean	StDev	Minimum	Maximum
2	114	9	-0.624	0.279	-1.222	0.243
3	6	0	-0.722	0.330	-1.187	-0.337
4	0	16*	*	*	*	
5	40	2	-0.869	0.411	-1.640	0.630
6	34	0	-0.344	0.243	-0.796	0.301
7	37	4	-0.591	0.362	-1.699	0.519

Land use: Industrial

EPA_Rain_Zone	N det/est	N ND/NZ	Mean	StDev	Minimum	Maximum
2	96	13	-0.706	0.387	-2.200	0.111
3	15	1	-0.793	0.403	-1.523	-0.046
4	0	17*	*	*	*	
5	45	2	-0.714	0.310	-1.337	0.107
6	59	11	-0.017	0.356	-0.854	0.898
7	24	9	-0.289	0.288	-1.194	0.146

Land use: Residential

EPA_Rain_Zone	N det/est	N ND/NZ	Mean	StDev	Minimum	Maximum
2	309	22	-0.503	0.281	-1.301	0.277
3	18	0	-0.724	0.409	-1.187	0.444
4	0	31*	*	*	*	
5	69	2	-0.354	0.190	-0.721	0.049
6	38	0	-0.288	0.263	-0.854	0.696
7	37	3	-0.700	0.337	-1.420	0.342

Descriptive Statistics: LTP

Variable	LndRainLoc	N	N*	Mean	Variance	Minimum	Maximum
LTP	2_KYLOTSR1RE	3	0	-0.275	0.131	-0.602	0.114
	2_KYLOTSR2ID	3	0	-0.362	0.0626	-0.585	-0.0915
	2_KYLOTSR3RE	3	0	-0.750	0.111	-1.097	-0.432
	2_KYLOTSR4ID	4	0	-0.839	0.0760	-1.155	-0.523
	2_MDAACOMWID	3	0	-0.176	0.116	-0.553	0.111
	2_MDAACOODRE	3	0	-0.301	0.138	-0.523	0.127
	2_MDAACOPPCO	26	0	-0.6324	0.0941	-1.1549	0.2430
	2_MDAACORKRE	3	0	-0.297	0.135	-0.509	0.127
	2_MDBACOBCID	3	0	-0.630	0.0436	-0.824	-0.409
	2_MDBACOSCRE	26	0	-0.5524	0.0746	-1.1549	0.0828
	2_MDBACOTCID	3	0	-0.494	0.0310	-0.620	-0.292
	2_MDBACOWCRE	3	0	-0.3122	0.00315	-0.3768	-0.2757
	2_MDBCTYBOID	3	0	-0.3988	0.00107	-0.4318	-0.3665
	2_MDBCTYFMID	3	0	-0.3982	0.000345	-0.4089	-0.3768
	2_MDBCTYHORE	3	0	-0.247	0.375	-0.921	0.276
	2_MDBCTYHRRE	3	0	-0.194	0.119	-0.409	0.204
	2_MDBCTYKOCO	3	0	-0.4426	0.0203	-0.6021	-0.3279
	2_MDMOCOBCCO	3	0	-0.794	0.0483	-1.046	-0.638
	2_VAARLLP1RE	8	0	-0.7864	0.0564	-1.0969	-0.4089
	2_VAARLTC4ID	13	0	-0.6859	0.0127	-0.8861	-0.5376

2_VACPTC1ARE	8	0	-0.4048	0.0266	-0.6990	-0.1612
2_VACPTSF2RE	0	3	*	*	*	*
2_VACPTYC1RE	7	0	-0.6056	0.0506	-1.0458	-0.4202
2_VACPTYC3RE	14	0	-0.6537	0.0247	-0.9586	-0.4089
2_VACPTYC4CO	14	0	-0.5987	0.0982	-1.0458	-0.0809
2_VACPTYC5ID	8	6	-1.484	0.162	-2.200	-1.000
2_VACPTYO1ID	0	3	*	*	*	*
2_VAHATYH1CO	18	0	-0.6584	0.0618	-1.2218	-0.3188
2_VAHATYH2ID	19	0	-0.5477	0.0780	-1.0969	-0.1192
2_VAHATYH3RE	17	0	-0.6790	0.0416	-1.1549	-0.4089
2_VAHATYH4RE	17	0	-0.5309	0.0641	-1.0458	-0.0915
2_VAHATYH5RE	17	0	-0.4149	0.0828	-1.0000	0.2095
2_VAHCCOC1CO	2	0	-0.352	0.0337	-0.481	-0.222
2_VAHCCOC2CO	3	0	-0.1647	0.0275	-0.3468	-0.0223
2_VAHCCON1ID	2	0	-0.927	0.280	-1.301	-0.553
2_VAHCCON2ID	3	0	-0.450	0.321	-1.046	0.0828
2_VAHCCOR1RE	3	0	-0.664	0.0441	-0.886	-0.469
2_VAHCCOR2RE	3	0	-0.687	0.0736	-1.000	-0.523
2_VANFTMS5CO	0	3	*	*	*	*
2_VANFTMS6RE	0	3	*	*	*	*
2_VANFTMS8CO	0	3	*	*	*	*
2_VANFTMS9CO	0	3	*	*	*	*
2_VANFTYN2RE	29	0	-0.3548	0.0564	-0.8861	0.1106
2_VANFTYN3RE	27	0	-0.5054	0.0490	-1.0000	-0.1135
2_VANFTYN4CO	27	0	-0.5751	0.0563	-1.0000	0.0492
2_VANFTYN5RE	27	0	-0.4987	0.0971	-1.3010	-0.0315
2_VANNTMF1RE	0	1	*	*	*	*
2_VANNTMF4RE	0	3	*	*	*	*
2_VANNTNN1RE	8	2	-0.2777	0.0438	-0.5086	0.0607
2_VANNTSF4RE	0	2	*	*	*	*
2_VANNTSF6RE	0	2	*	*	*	*
2_VAPMTYP1CO	18	0	-0.7819	0.0522	-1.1549	-0.2924
2_VAPMTYP2RE	17	0	-0.6677	0.0582	-1.0458	-0.0362
2_VAPMTYP4RE	17	0	-0.5667	0.0596	-1.0969	-0.1805
2_VAPMTYP5RE	17	0	-0.6325	0.0892	-1.2218	0.1004
2_VAVBTYI1ID	0	3	*	*	*	*
2_VAVBTYR1RE	0	5	*	*	*	*
2_VAVBTYV1RE	26	1	-0.3085	0.0395	-0.6990	0.1038
2_VAVBTYV4ID	29	1	-0.7816	0.0742	-1.3379	-0.0655
3_ALMOCREORE	3	0	-1.0042	0.0244	-1.1024	-0.8239
3_ALMODAPHCO	3	0	-0.5197	0.0250	-0.6198	-0.3372
3_ALMOSARARE	3	0	-0.723	0.103	-0.959	-0.357
3_ALMOSIIVID	3	0	-0.914	0.138	-1.340	-0.658
3_ALMOSITVCO	3	0	-0.923	0.124	-1.187	-0.523
3_ALMOSIVIRE	3	0	-1.031	0.0519	-1.187	-0.770
3_ALMOTHEOID	3	0	-0.476	0.385	-1.187	-0.0458
3_GAATAT01ID	9	1	-0.859	0.105	-1.523	-0.455
3_GAATAT02RE	9	0	-0.528	0.202	-1.097	0.444
5_TXARA001CO	21	1	-0.9610	0.1163	-1.6401	-0.3979
5_TXARA002RE	20	1	-0.3678	0.0441	-0.7212	0.0492
5_TXARA003RE	7	0	-0.5650	0.0168	-0.6990	-0.4089
5_TXDAA001ID	7	0	-0.577	0.0747	-1.097	-0.310
5_TXDAA002ID	18	1	-0.8226	0.0931	-1.3010	-0.0458
5_TXDAA004CO	19	1	-0.767	0.216	-1.310	0.630
5_TXDAA005RE	7	0	-0.4158	0.0144	-0.6021	-0.3188
5_TXFWA004ID	20	1	-0.6650	0.0943	-1.3372	0.1072
5_TXIRA001RE	21	1	-0.2756	0.0308	-0.6778	-0.000435
5_TXMEA002RE	7	0	-0.2835	0.0265	-0.5229	-0.0915
5_TXMEA003RE	7	0	-0.3473	0.0245	-0.5850	-0.1367
6_AZMCA001ID	26	1	-0.1577	0.1547	-0.8539	0.3979
6_AZMCA003ID	26	1	0.1312	0.0790	-0.2924	0.8976
6_AZMCA005CO	26	0	-0.3129	0.0636	-0.7959	0.3010
6_AZMCA006RE	20	0	-0.3353	0.0517	-0.8539	0.0792

6_AZTUA001RE	10	0	-0.146	0.121	-0.456	0.695
6_AZTUA002RE	8	0	-0.3468	0.0299	-0.5376	-0.0809
6_AZTUA003CO	8	0	-0.4447	0.0355	-0.6576	-0.2218
6_AZTUA004ID	7	0	-0.0404	0.0668	-0.4437	0.3560
6_CAALAL09ID	0	9	*	*	*	*
7_OREUA001CO	14	2	-0.4341	0.0579	-0.7696	-0.1079
7_OREUA003RE	15	0	-0.5909	0.0987	-1.0000	0.3424
7_ORGRA003RE	6	0	-0.6907	0.0195	-0.8861	-0.5086
7_ORGRA004CO	6	0	-0.804	0.211	-1.699	-0.418
7_ORPOA001CO	12	1	-0.630	0.200	-1.222	0.519
7_ORPOA003ID	11	3	-0.2166	0.0208	-0.4437	-0.0362
7_ORPOA004ID	9	4	-0.1989	0.0645	-0.6383	0.1461
7_ORPOA006RE	11	2	-0.665	0.121	-1.155	0.0792
7_ORSAA002CO	5	1	-0.6827	0.0113	-0.8539	-0.5654
7_ORSAA003ID	4	2	-0.688	0.138	-1.194	-0.374
7_ORSAA004RE	5	1	-1.116	0.0848	-1.420	-0.762

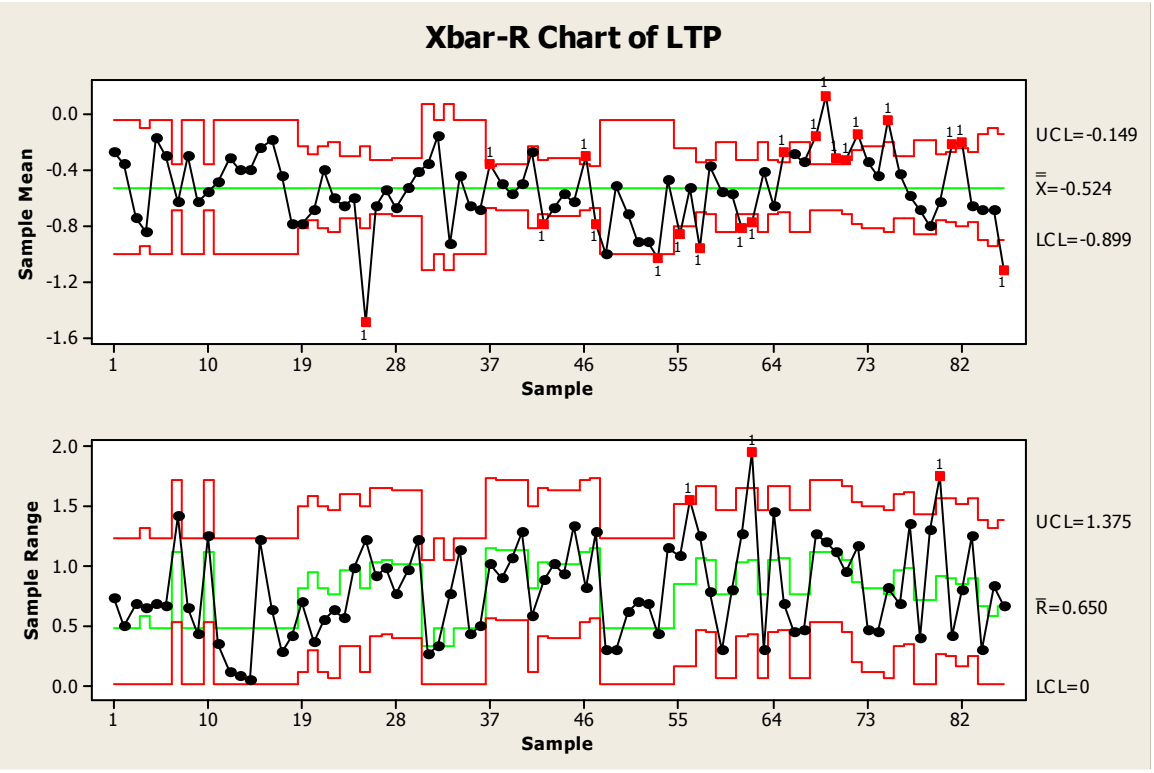

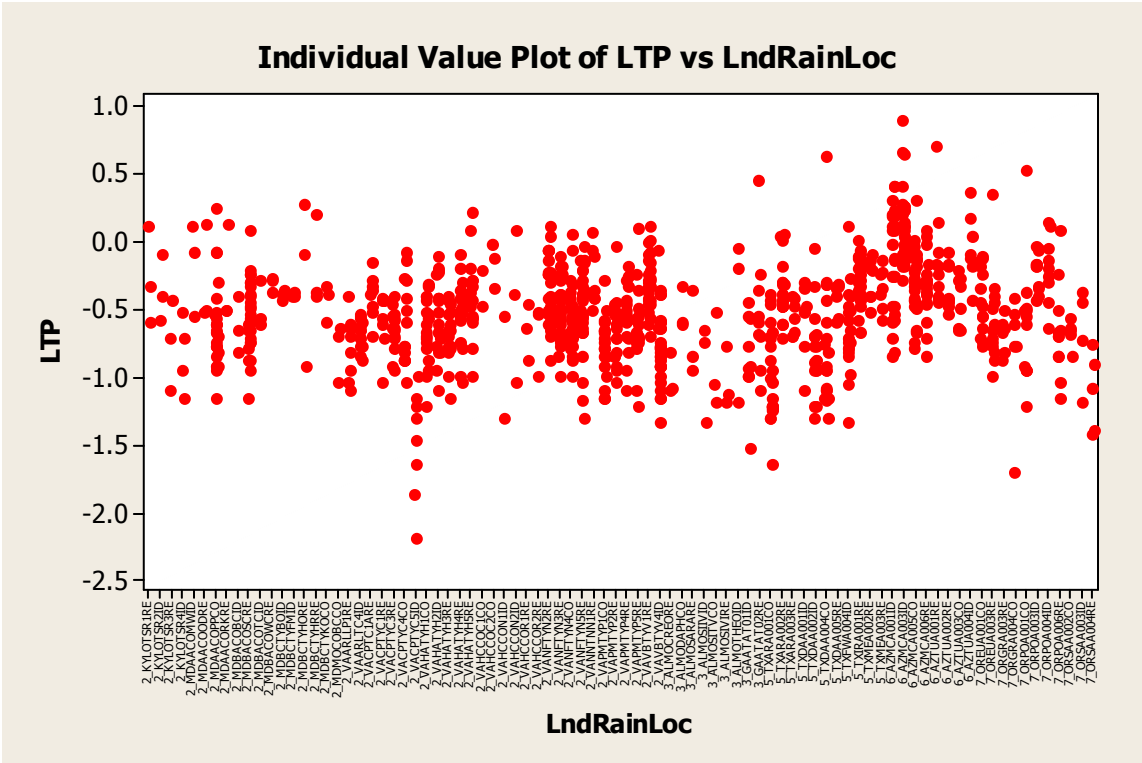

General Linear Model: LTP versus Landuse, EPA_Rain_Zone

```
Factor          Type   Levels  Values
Landuse         fixed       3  CO, ID, RE
EPA_Rain_Zone   fixed       5  2, 3, 5, 6, 7


Analysis of Variance for LTP, using Adjusted SS for Tests

Source                  DF    Seq SS   Adj SS  Adj MS      F      P
Landuse                  2    2.9935   1.1228  0.5614   5.85  0.003
EPA_Rain_Zone            4   20.6147  17.8961  4.4740  46.65  0.000
Landuse*EPA_Rain_Zone    8   12.3467  12.3467  1.5433  16.09  0.000
Error                  926   88.8109  88.8109  0.0959
Total                  940  124.7659
```

Main factors and interaction are significant in the model

```
Bonferroni Simultaneous Tests
Response Variable LTP
All Pairwise Comparisons among Levels of Landuse
Landuse = CO  subtracted from:

         Difference       SE of           Adjusted
Landuse    of Means  Difference  T-Value   P-Value
ID           0.1263     0.03989    3.166    0.0048
RE           0.1163     0.03836    3.031    0.0075



Landuse = ID  subtracted from:
```

Landuse	Difference of Means	SE of Difference	T-Value	Adjusted P-Value
RE	-0.01003	0.03304	-0.3036	1.000

Tukey Simultaneous Tests
Response Variable LTP
All Pairwise Comparisons among Levels of Landuse
Landuse = CO subtracted from:

Landuse	Difference of Means	SE of Difference	T-Value	Adjusted P-Value
ID	0.1263	0.03989	3.166	0.0044
RE	0.1163	0.03836	3.031	0.0069

Landuse = ID subtracted from:

Landuse	Difference of Means	SE of Difference	T-Value	Adjusted P-Value
RE	-0.01003	0.03304	-0.3036	0.9505

Total phosphorus in commercial land use areas is significantly different than total phosphorus in residential or industrial land use areas. There was no difference in total phosphorus concentration between residential and industrial land uses.

Bonferroni Simultaneous Tests
Response Variable LTP
All Pairwise Comparisons among Levels of EPA_Rain_Zone
EPA_Rain_Zone = 2 subtracted from:

EPA_Rain_Zone	Difference of Means	SE of Difference	T-Value	Adjusted P-Value
3	-0.1349	0.05760	-2.342	0.1941
5	-0.0345	0.02994	-1.151	1.0000
6	0.3951	0.03183	12.413	0.0000
7	0.0846	0.03548	2.385	0.1729

EPA_Rain_Zone = 3 subtracted from:

EPA_Rain_Zone	Difference of Means	SE of Difference	T-Value	Adjusted P-Value
5	0.1004	0.06112	1.643	1.0000
6	0.5300	0.06207	8.539	0.0000
7	0.2195	0.06402	3.429	0.0063

EPA_Rain_Zone = 5 subtracted from:

EPA_Rain_Zone	Difference of Means	SE of Difference	T-Value	Adjusted P-Value
6	0.4296	0.03784	11.352	0.0000
7	0.1191	0.04096	2.907	0.0373

EPA_Rain_Zone = 6 subtracted from:

EPA_Rain_Zone	Difference of Means	SE of Difference	T-Value	Adjusted P-Value

```
7                 -0.3105     0.04236   -7.330    0.0000
```

Total phosphorus in EPA rain zone 2 is different than total phosphorus in EPA rain zone 6. No difference was observed between EPA rain zone 2 and zones 3, 5, and 7

Total phosphorus in EPA rain zone 3 is different than total phosphorus in EPA rain zones 6 and 7. No difference was observed between EPA rain zone 3 and EPA rain zone 5

Total phosphorus in EPA rain zone 5 is different than total phosphorus in EPA rain zones 6 and 7.

Total phosphorus in EPA rain zone 6 is different than total phosphorus in EPA rain zone 7.

```
Tukey Simultaneous Tests
Response Variable LTP
All Pairwise Comparisons among Levels of EPA_Rain_Zone
EPA_Rain_Zone = 2  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
3                 -0.1349     0.05760   -2.342    0.1319
5                 -0.0345     0.02994   -1.151    0.7792
6                  0.3951     0.03183   12.413    0.0000
7                  0.0846     0.03548    2.385    0.1194

EPA_Rain_Zone = 3  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
5                  0.1004     0.06112    1.643    0.4699
6                  0.5300     0.06207    8.539    0.0000
7                  0.2195     0.06402    3.429    0.0055

EPA_Rain_Zone = 5  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
6                  0.4296     0.03784   11.352    0.0000
7                  0.1191     0.04096    2.907    0.0300

EPA_Rain_Zone = 6  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
7                 -0.3105     0.04236   -7.330    0.0000
```

Total phosphorus in EPA rain zone 2 is different than total phosphorus in EPA rain zone 6. No difference was observed between EPA rain zone 2 and zones 3, 5, and 7

Total phosphorus in EPA rain zone 3 is different than total phosphorus in EPA rain zones 6 and 7. No difference was observed between EPA rain zone 3 and EPA rain zone 5

Total phosphorus in EPA rain zone 5 is different than total phosphorus in EPA rain zones 6 and 7.

Total phosphorus in EPA rain zone 6 is different than total phosphorus in EPA rain zone 7.

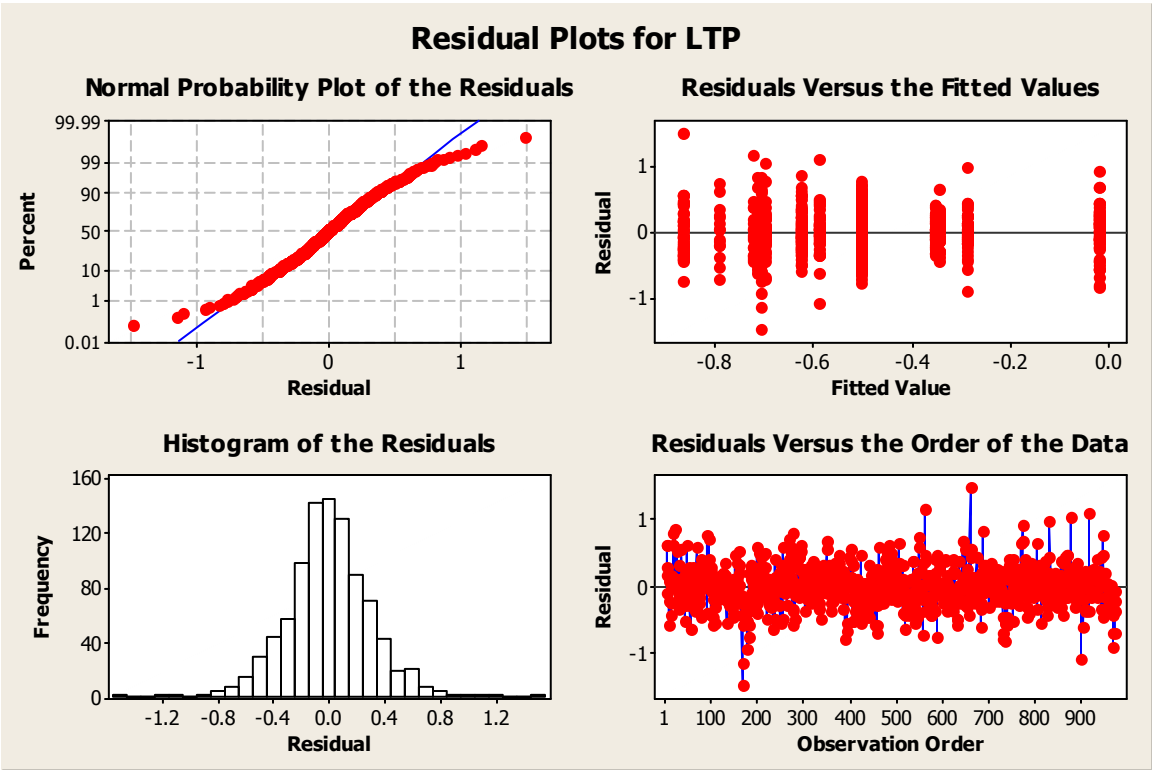
Residual Plots for LTP
Normal Probability Plot of the Residuals
Percent
99.99
99
90
50
10
1
0.01
-1
0
1
Residual
Residuals Versus the Fitted Values
Residual
1
0
-1
-0.8
-0.6
-0.4
-0.2
0.0
Fitted Value
Histogram of the Residuals
Frequency
160
120
80
40
0
-1.2
-0.8
-0.4
0.0
0.4
0.8
1.2
Residual
Residuals Versus the Order of the Data
Residual
1
0
-1
1
100
200
300
400
500
600
700
800
900
Observation Order

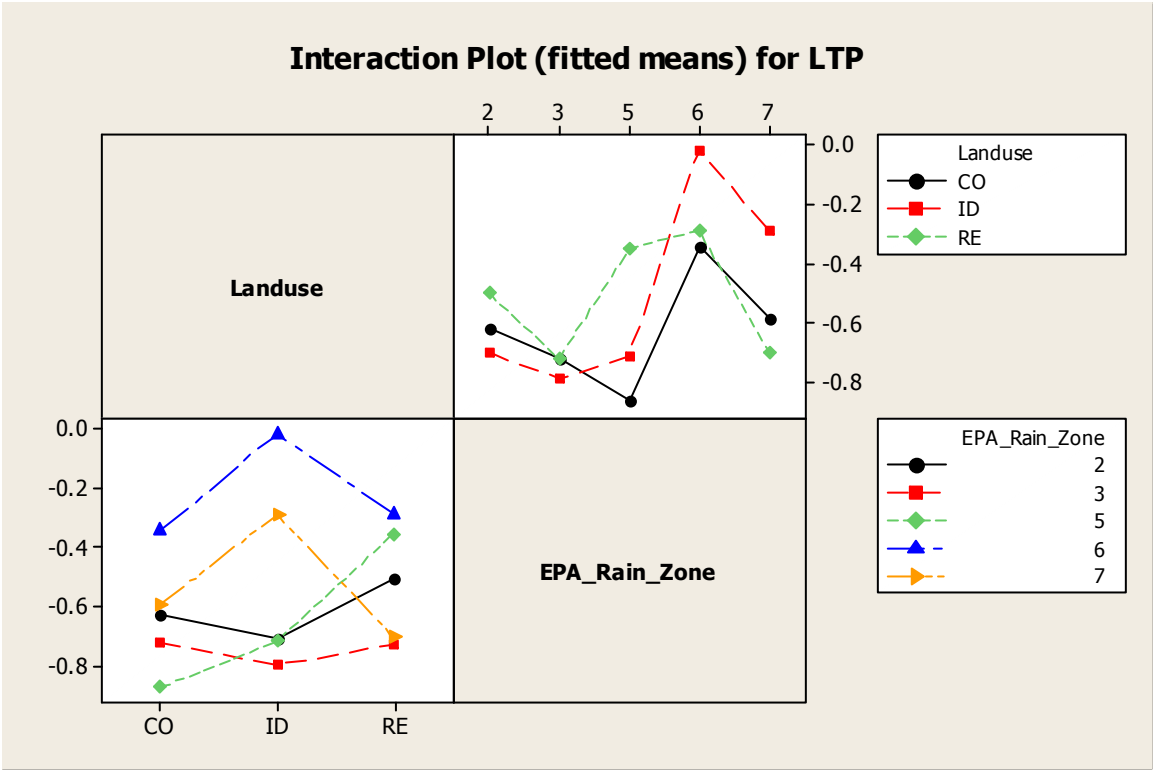
Interaction Plot (fitted means) for LTP
Landuse
EPA_Rain_Zone
2
3
5
6
7
0.0
-0.2
-0.4
-0.6
-0.8
CO
ID
RE
Landuse
CO
ID
RE
EPA_Rain_Zone
2
3
5
6
7

Dissolved Phosphorus (dissolved – P)

Summary statistics in LOG base 10 scale
Land use: Commercial

EPA_Rain_Zone	N det/est	N ND/NZ	Mean	StDev	Minimum	Maximum
2	73	50	-1.185	0.403	-2.168	-0.444
3	6	0	-1.168	0.438	-1.602	-0.602
4	0	16*	*	*	*	
5	40	2	-1.387	0.307	-2.043	-0.770
6	26	8	-0.500	0.354	-1.301	0.204
7	7	34	-1.546	0.317	-2.000	-1.051

Land use: Industrial

EPA_Rain_Zone	N det/est	N ND/NZ	Mean	StDev	Minimum	Maximum
2	67	42	-1.103	0.360	-2.000	-0.347
3	11	5	-1.460	0.213	-1.602	-0.991
4	0	17*	*	*	*	
5	46	1	-1.172	0.286	-1.745	-0.409
6	52	18	-0.654	0.310	-1.309	0.176
7	2	31	-1.150	0.415	-1.444	-0.857

Land use: Residential

EPA_Rain_Zone	N det/est	N ND/NZ	Mean	StDev	Minimum	Maximum
2	255	76	-0.869	0.370	-2.088	0.029
3	14	4	-1.247	0.320	-1.602	-0.585
4	0	31*	*	*	*	
5	69	2	-0.612	0.292	-1.770	-0.076
6	20	18	-0.609	0.213	-0.959	-0.155
7	8	32	-1.691	0.349	-2.060	-1.046

Descriptive Statistics: LDP

Variable	LndRainLoc	N	N*	Mean	Variance	Minimum	Maximum
LDP	2_KYLOTSR1RE	2	1	-0.734	0.101	-0.959	-0.509
	2_KYLOTSR2ID	2	1	-0.523	0.0620	-0.699	-0.347
	2_KYLOTSR3RE	3	0	-1.248	0.0927	-1.523	-0.921
	2_KYLOTSR4ID	2	2	-0.76955	0.000000000	-0.76955	-0.76955
	2_MDAACOMWID	0	3	*	*	*	*
	2_MDAACOODRE	0	3	*	*	*	*
	2_MDAACOPPCO	0	26	*	*	*	*
	2_MDAACORKRE	0	3	*	*	*	*
	2_MDBACOBCID	0	3	*	*	*	*
	2_MDBACOSCRE	0	26	*	*	*	*
	2_MDBACOTCID	0	3	*	*	*	*
	2_MDBACOWCRE	0	3	*	*	*	*
	2_MDBCTYBOID	0	3	*	*	*	*
	2_MDBCTYFMID	0	3	*	*	*	*
	2_MDBCTYHORE	0	3	*	*	*	*
	2_MDBCTYHRRE	0	3	*	*	*	*
	2_MDBCTYKOCO	0	3	*	*	*	*
	2_MDMOCOBCCO	0	3	*	*	*	*
	2_VAARLLP1RE	8	0	-0.8677	0.0654	-1.2218	-0.4685
	2_VAARLTC4ID	13	0	-1.0604	0.0266	-1.3979	-0.8539
	2_VACPTC1ARE	8	0	-0.7347	0.0697	-1.1549	-0.3665

2_VACPTSF2RE	0	3	*	*	*	*
2_VACPTYC1RE	7	0	-1.249	0.198	-1.958	-0.620
2_VACPTYC3RE	13	1	-0.9666	0.0406	-1.4776	-0.6383
2_VACPTYC4CO	11	3	-1.205	0.202	-2.044	-0.585
2_VACPTYC5ID	4	10	-2.0000	0.000000000	-2.0000	-2.0000
2_VACPTYO1ID	0	3	*	*	*	*
2_VAHATYH1CO	17	1	-1.279	0.208	-2.168	-0.469
2_VAHATYH2ID	17	2	-1.0041	0.0829	-1.6641	-0.5086
2_VAHATYH3RE	14	3	-1.1679	0.0293	-1.4466	-0.7696
2_VAHATYH4RE	16	1	-0.9326	0.0786	-1.4864	-0.4318
2_VAHATYH5RE	17	0	-0.6210	0.0901	-1.2100	0.0294
2_VAHCCOC1CO	0	2	*	*	*	*
2_VAHCCOC2CO	0	3	*	*	*	*
2_VAHCCON1ID	0	2	*	*	*	*
2_VAHCCON2ID	0	3	*	*	*	*
2_VAHCCOR1RE	0	3	*	*	*	*
2_VAHCCOR2RE	0	3	*	*	*	*
2_VANFTMS5CO	0	3	*	*	*	*
2_VANFTMS6RE	0	3	*	*	*	*
2_VANFTMS8CO	0	3	*	*	*	*
2_VANFTMS9CO	0	3	*	*	*	*
2_VANFTYN2RE	29	0	-0.5698	0.0803	-1.1549	-0.1675
2_VANFTYN3RE	27	0	-0.8331	0.1009	-1.4916	-0.2518
2_VANFTYN4CO	27	0	-0.9480	0.0990	-1.5633	-0.4437
2_VANFTYN5RE	27	0	-0.9455	0.1574	-1.8074	-0.3565
2_VANNTMF1RE	0	1	*	*	*	*
2_VANNTMF4RE	0	3	*	*	*	*
2_VANNTNN1RE	7	3	-0.698	0.129	-1.155	-0.0132
2_VANNTSF4RE	0	2	*	*	*	*
2_VANNTSF6RE	0	2	*	*	*	*
2_VAPMTYP1CO	18	0	-1.4390	0.0542	-1.8681	-0.9586
2_VAPMTYP2RE	17	0	-1.1321	0.0380	-1.4984	-0.7696
2_VAPMTYP4RE	17	0	-1.131	0.261	-2.088	-0.347
2_VAPMTYP5RE	17	0	-0.9125	0.1402	-1.6493	-0.0757
2_VAVBTYI1ID	0	3	*	*	*	*
2_VAVBTYR1RE	0	5	*	*	*	*
2_VAVBTYV1RE	26	1	-0.6572	0.0584	-1.2218	-0.1871
2_VAVBTYV4ID	29	1	-1.1185	0.0902	-1.7327	-0.5528
3_ALMOCREORE	3	0	-1.471	0.0519	-1.602	-1.208
3_ALMODAPHCO	3	0	-0.813	0.0811	-1.137	-0.602
3_ALMOSARARE	3	0	-1.2252	0.00516	-1.3080	-1.1805
3_ALMOSIIVID	3	0	-1.6021	0.000000000	-1.6021	-1.6021
3_ALMOSITVCO	3	0	-1.5236	0.0185	-1.6021	-1.3665
3_ALMOSIVIRE	3	0	-1.485	0.0409	-1.602	-1.252
3_ALMOTHEOID	3	0	-1.5236	0.0185	-1.6021	-1.3665
3_GAATAT01ID	5	5	-1.337	0.0670	-1.523	-0.991
3_GAATAT02RE	5	4	-0.982	0.115	-1.398	-0.585
5_TXARA001CO	21	1	-1.3512	0.1125	-2.0433	-0.7696
5_TXARA002RE	20	1	-0.6680	0.0992	-1.3979	-0.0757
5_TXARA003RE	7	0	-0.7378	0.0128	-0.8539	-0.5376
5_TXDAA001ID	7	0	-0.755	0.102	-1.222	-0.409
5_TXDAA002ID	19	0	-1.3062	0.0486	-1.7447	-0.9172
5_TXDAA004CO	19	1	-1.4267	0.0765	-2.0000	-1.0458
5_TXDAA005RE	7	0	-0.5263	0.0160	-0.7212	-0.3372
5_TXFWA004ID	20	1	-1.1893	0.0329	-1.6990	-0.8125
5_TXIRA001RE	21	1	-0.6270	0.1462	-1.7696	-0.1688
5_TXMEA002RE	7	0	-0.5001	0.0117	-0.6990	-0.3565
5_TXMEA003RE	7	0	-0.4830	0.0534	-0.8861	-0.1871
6_AZMCA001ID	26	1	-0.5093	0.1154	-1.1549	0.1761
6_AZMCA003ID	26	1	-0.7985	0.0364	-1.3086	-0.4685
6_AZMCA005CO	26	0	-0.5003	0.1250	-1.3010	0.2041
6_AZMCA006RE	20	0	-0.6088	0.0452	-0.9586	-0.1549
6_AZTUA001RE	0	10	*	*	*	*

6_AZTUA002RE	0	8	*	*	*	*
6_AZTUA003CO	0	8	*	*	*	*
6_AZTUA004ID	0	7	*	*	*	*
6_CAALAL09ID	0	9	*	*	*	*
7_OREUA001CO	0	16	*	*	*	*
7_OREUA003RE	0	15	*	*	*	*
7_ORGRA003RE	6	0	-1.587	0.118	-2.060	-1.046
7_ORGRA004CO	5	1	-1.658	0.0729	-2.000	-1.301
7_ORPOA001CO	0	13	*	*	*	*
7_ORPOA003ID	0	14	*	*	*	*
7_ORPOA004ID	0	13	*	*	*	*
7_ORPOA006RE	0	13	*	*	*	*
7_ORSAA002CO	2	4	-1.266	0.0928	-1.481	-1.051
7_ORSAA003ID	2	4	-1.150	0.172	-1.444	-0.857
7_ORSAA004RE	2	4	-2.0022	0.00380	-2.0458	-1.9586

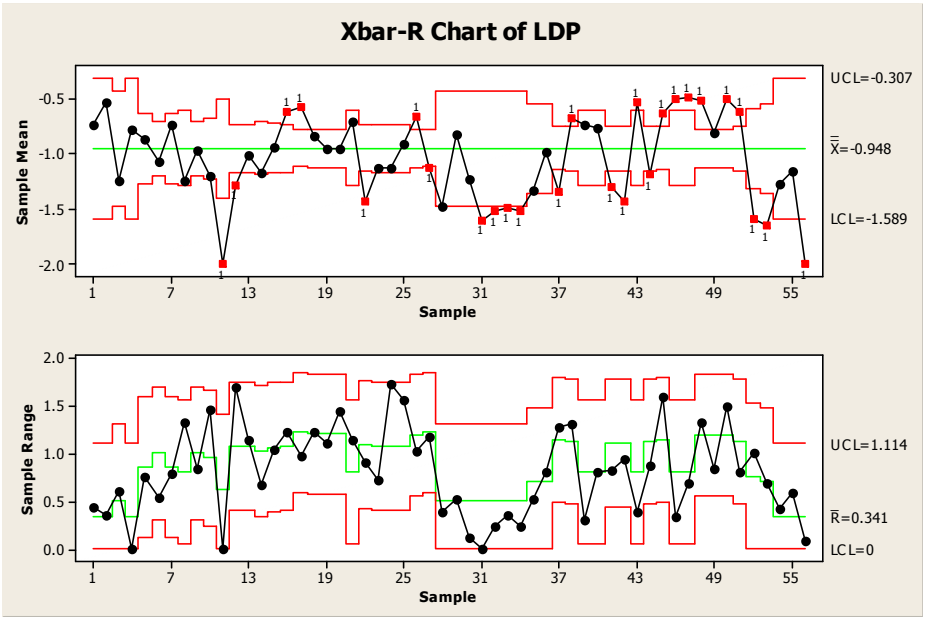

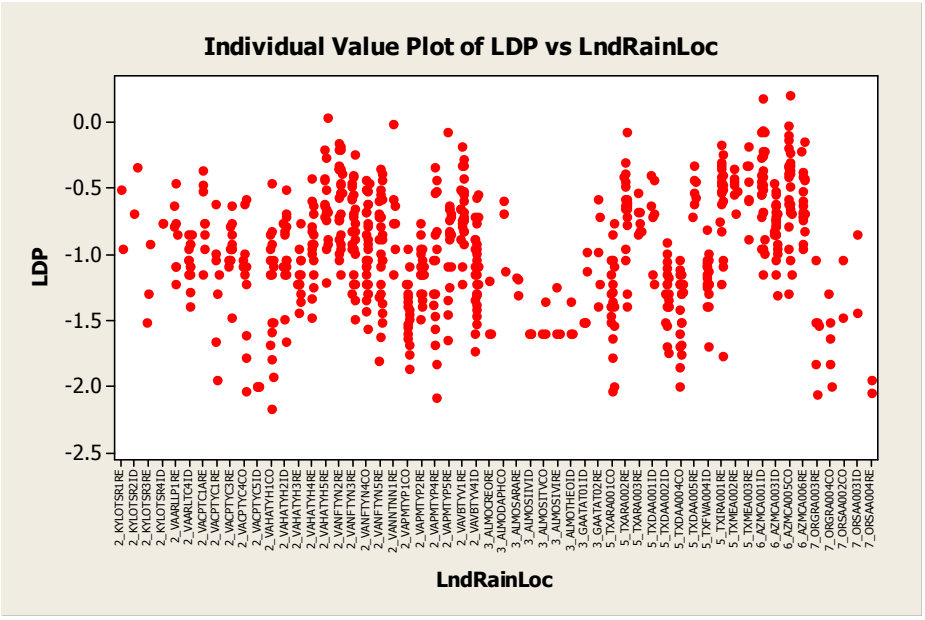

General Linear Model: LDP versus Landuse, EPA_Rain_Zone

```
Factor         Type   Levels  Values
Landuse        fixed       3  CO, ID, RE
EPA_Rain_Zone  fixed       5  2, 3, 5, 6, 7


Analysis of Variance for LDP, using Adjusted SS for Tests

Source                  DF    Seq SS   Adj SS  Adj MS      F      P
Landuse                  2   10.5050   0.9326  0.4663   3.90  0.021
EPA_Rain_Zone            4   28.0949  20.2703  5.0676  42.40  0.000
Landuse*EPA_Rain_Zone    8    9.9010   9.9010  1.2376  10.36  0.000
Error                  681   81.3873  81.3873  0.1195
Total                  695  129.8882
```

Main factors and interaction are significant in the model

```
Bonferroni Simultaneous Tests
Response Variable LDP
All Pairwise Comparisons among Levels of Landuse
Landuse = CO  subtracted from:

         Difference       SE of           Adjusted
Landuse    of Means  Difference  T-Value   P-Value
ID          0.04954     0.07029   0.7048    1.0000
RE          0.15159     0.05581   2.7163    0.0203


Landuse = ID  subtracted from:

         Difference       SE of           Adjusted
Landuse    of Means  Difference  T-Value   P-Value
RE           0.1021     0.06602    1.546    0.3678



Tukey Simultaneous Tests
Response Variable LDP
All Pairwise Comparisons among Levels of Landuse
Landuse = CO  subtracted from:

         Difference       SE of           Adjusted
Landuse    of Means  Difference  T-Value   P-Value
ID          0.04954     0.07029   0.7048    0.7606
RE          0.15159     0.05581   2.7163    0.0181


Landuse = ID  subtracted from:

         Difference       SE of           Adjusted
Landuse    of Means  Difference  T-Value   P-Value
RE           0.1021     0.06602    1.546    0.2696
```

Dissolved phosphorus in commercial land use is significantly different than in residential land use areas. No significant difference was observed between commercial and industrial land uses. No significant difference was observed between industrial and residential land uses.

```
Bonferroni Simultaneous Tests
Response Variable LDP
All Pairwise Comparisons among Levels of EPA_Rain_Zone
EPA_Rain_Zone = 2  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
3                 -0.2393     0.06929   -3.454    0.0059
5                 -0.0047     0.03529   -0.133    1.0000
6                  0.4646     0.04315   10.767    0.0000
7                 -0.4101     0.10310   -3.978    0.0008

EPA_Rain_Zone = 3  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
5                  0.2346     0.07199    3.259    0.0117
6                  0.7040     0.07615    9.244    0.0000
7                 -0.1708     0.12069   -1.415    1.0000


EPA_Rain_Zone = 5  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
6                  0.4693     0.04736    9.910    0.0000
7                 -0.4055     0.10493   -3.864    0.0012


EPA_Rain_Zone = 6  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
7                 -0.8748      0.1078   -8.113    0.0000
```

Dissolved phosphorus concentrations in EPA region 2 are significantly different than in regions 3, 6 and 7. No significant differences were observed between EPA regions 2 and 5.

Dissolved phosphorus concentrations in EPA region 3 are significantly different than in regions 5 and 6. No significant differences were observed between EPA regions 3 and 7.

Dissolved phosphorus concentrations in EPA region 5 are significantly different than in regions 6 and 7.

Dissolved phosphorus concentrations in EPA region 6 are significantly different than in region 7.

```
Tukey Simultaneous Tests
Response Variable LDP
All Pairwise Comparisons among Levels of EPA_Rain_Zone
EPA_Rain_Zone = 2  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
3                 -0.2393     0.06929   -3.454    0.0050
5                 -0.0047     0.03529   -0.133    0.9999
6                  0.4646     0.04315   10.767    0.0000
7                 -0.4101     0.10310   -3.978    0.0007


EPA_Rain_Zone = 3  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
```

```
5                  0.2346     0.07199    3.259    0.0099
6                  0.7040     0.07615    9.244    0.0000
7                 -0.1708     0.12069   -1.415    0.6176


EPA_Rain_Zone = 5  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
6                  0.4693     0.04736    9.910    0.0000
7                 -0.4055     0.10493   -3.864    0.0011


EPA_Rain_Zone = 6  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
7                 -0.8748      0.1078   -8.113    0.0000
```

Dissolved phosphorus concentrations in EPA region 2 are significantly different than in regions 3, 6 and 7. No significant differences were observed between EPA regions 2 and 5.

Dissolved phosphorus concentrations in EPA region 3 are significantly different than in regions 5 and 6. No significant differences were observed between EPA regions 3 and 7.

Dissolved phosphorus concentrations in EPA region 5 are significantly different than in regions 6 and 7.

Dissolved phosphorus concentrations in EPA region 6 are significantly different than in region 7.

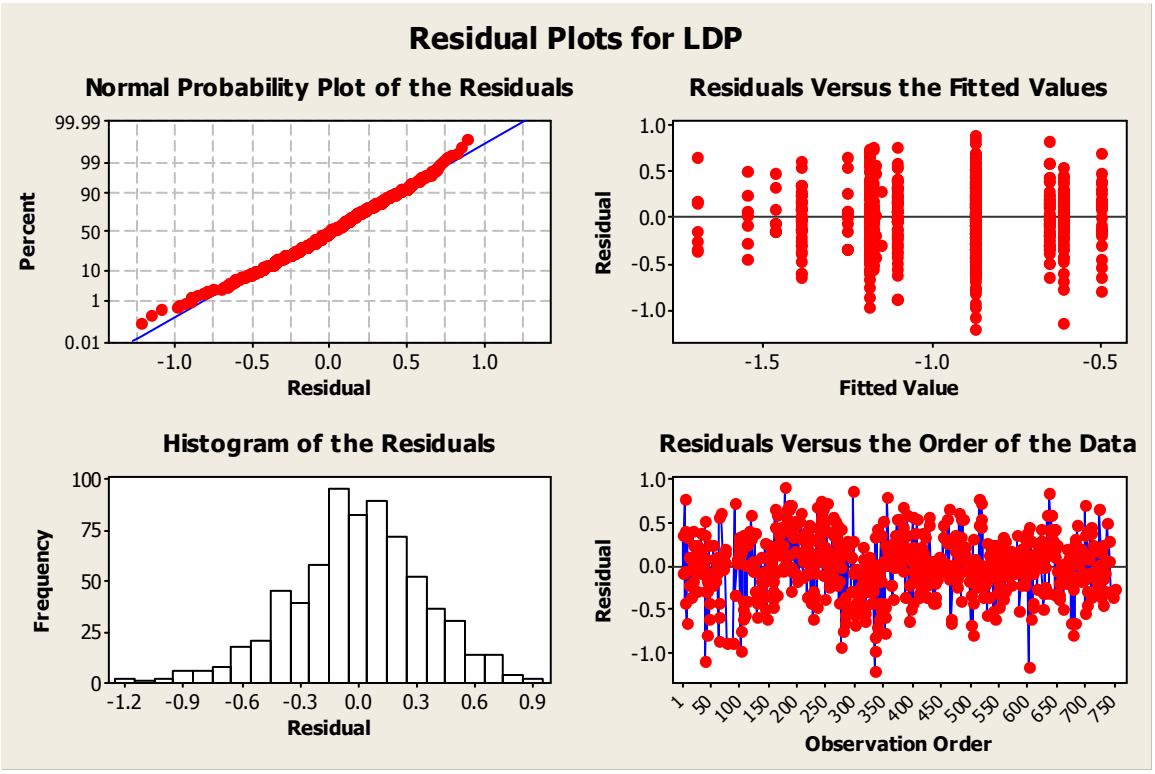

The assumption of normality of residuals is valid. No specific trend was observed in the residuals.

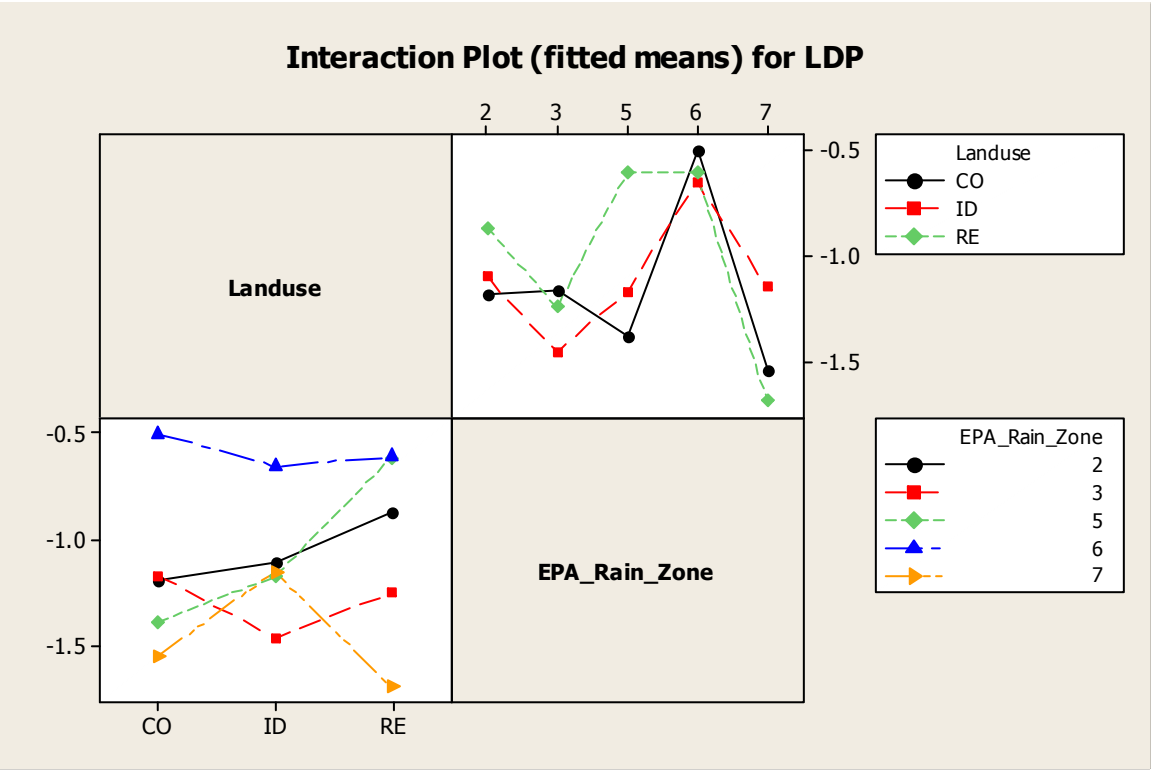

Total Copper (µg/L) (Cu)

Summary statistics in LOG base 10 scale
Land use: Commercial

EPA_Rain_Zone	N det/est	N ND/NZ	Mean	StDev	Minimum	Maximum
2	66	57	1.203	0.254	0.230	1.688
3	6	0	0.944	0.212	0.699	1.230
4	15	1	2.010	0.454	0.699	2.584
5	38	4	0.946	0.359	0.301	1.914
6	34	0	1.108	0.374	0.176	1.799
7	37	4	1.265	0.349	0.477	2.114

Land use: Industrial

EPA_Rain_Zone	N det/est	N ND/NZ	Mean	StDev	Minimum	Maximum
2	54	55	1.152	0.359	0.342	1.940
3	15	1	1.099	0.476	0.301	1.771
4	15	2	2.064	0.597	1.000	3.134
5	44	3	1.263	0.234	0.602	1.940
6	66	4	1.778	0.456	0.301	2.532
7	25	8	1.562	0.309	1.041	2.079

Land use: Residential

EPA_Rain_Zone	N det/est	N ND/NZ	Mean	StDev	Minimum	Maximum
2	140	191	1.018	0.379	-0.149	2.380
3	17	1	1.079	0.463	0.699	2.009
4	31	0	1.386	0.345	0.845	2.013
5	68	3	0.883	0.272	0.095	1.799
6	38	0	0.972	0.496	0.146	2.255
7	37	3	0.948	0.312	0.211	1.909

Descriptive Statistics: LCU

Variable	LndRainLoc	N	N*	Mean	Variance	Minimum	Maximum
LCU	2_KYLOTSR1RE	3	0	0.9813	0.0234	0.8437	1.1461
	2_KYLOTSR2ID	3	0	0.812	0.132	0.602	1.230
	2_KYLOTSR3RE	3	0	1.293	0.0627	1.079	1.568
	2_KYLOTSR4ID	4	0	1.3024	0.00452	1.2553	1.3979
	2_MDAACOMWID	3	0	1.2764	0.0126	1.1761	1.3979
	2_MDAACOODRE	3	0	1.041	0.0625	0.845	1.322
	2_MDAACOPPCO	26	0	1.1747	0.0491	0.7839	1.6876
	2_MDAACORKRE	3	0	1.001	0.0493	0.845	1.255
	2_MDBACOBCID	3	0	1.2177	0.00520	1.1761	1.3010
	2_MDBACOSCRE	26	0	1.0590	0.1588	0.3010	1.5641
	2_MDBACOTCID	3	0	1.2321	0.0204	1.0792	1.3617
	2_MDBACOWCRE	3	0	1.0698	0.0124	0.9542	1.1761
	2_MDBCTYBOID	3	0	1.502	0.0302	1.301	1.602
	2_MDBCTYFMID	3	0	1.541	0.0771	1.301	1.845
	2_MDBCTYHORE	3	0	1.4184	0.0103	1.3010	1.4771
	2_MDBCTYHRRE	3	0	2.2086	0.0287	2.0414	2.3802
	2_MDBCTYKOCO	3	0	1.4184	0.0103	1.3010	1.4771
	2_MDMOCOBCCO	3	0	1.335	0.0494	1.146	1.580
	2_VAARLLP1RE	8	0	0.779	0.265	-0.149	1.398
	2_VAARLTC4ID	12	1	0.9564	0.0466	0.4800	1.2041
	2_VACPTC1ARE	0	8	*	*	*	*

2_VACPTSF2RE	3	0	0.259	0.202	0.000000000	0.778
2_VACPTYC1RE	3	4	0.6512	0.00668	0.5798	0.7404
2_VACPTYC3RE	2	12	0.8885	0.0159	0.7993	0.9777
2_VACPTYC4CO	3	11	1.030	0.107	0.732	1.380
2_VACPTYC5ID	2	12	0.555	0.0747	0.362	0.748
2_VACPTYO1ID	3	0	1.2041	0.0145	1.1239	1.3424
2_VAHATYH1CO	3	15	1.1283	0.0283	1.0212	1.3222
2_VAHATYH2ID	3	16	1.684	0.114	1.301	1.940
2_VAHATYH3RE	3	14	0.8237	0.0296	0.6335	0.9685
2_VAHATYH4RE	3	14	1.016	0.135	0.602	1.301
2_VAHATYH5RE	3	14	0.7101	0.00776	0.6232	0.7993
2_VAHCCOC1CO	2	0	1.160	0.0282	1.041	1.279
2_VAHCCOC2CO	3	0	1.5386	0.00171	1.4914	1.5682
2_VAHCCON1ID	2	0	1.211	0.0574	1.041	1.380
2_VAHCCON2ID	3	0	1.232	0.164	0.778	1.556
2_VAHCCOR1RE	3	0	0.926	0.0402	0.699	1.079
2_VAHCCOR2RE	3	0	0.9985	0.00190	0.9542	1.0414
2_VANFTMS5CO	3	0	1.4599	0.00945	1.3802	1.5682
2_VANFTMS6RE	3	0	1.2003	0.00484	1.1461	1.2788
2_VANFTMS8CO	3	0	1.151	0.0506	0.914	1.362
2_VANFTMS9CO	3	0	1.277	0.0444	1.041	1.447
2_VANFTYN2RE	11	18	1.1917	0.0327	0.9085	1.4624
2_VANFTYN3RE	11	16	1.1920	0.0347	0.9365	1.4771
2_VANFTYN4CO	11	16	1.1798	0.0459	0.9085	1.5315
2_VANFTYN5RE	11	16	1.1569	0.0679	0.7099	1.4624
2_VANNTMF1RE	1	0	1.1461	*	1.1461	1.1461
2_VANNTMF4RE	3	0	0.6942	0.0201	0.6021	0.8573
2_VANNTNN1RE	2	8	0.5743	0.00956	0.5051	0.6435
2_VANNTSF4RE	2	0	0.6066	0.00144	0.5798	0.6335
2_VANNTSF6RE	2	0	0.7287	0.00641	0.6721	0.7853
2_VAPMTYP1CO	3	15	0.858	0.312	0.230	1.301
2_VAPMTYP2RE	3	14	1.204	0.0829	0.903	1.477
2_VAPMTYP4RE	3	14	0.9261	0.0164	0.7782	1.0000
2_VAPMTYP5RE	3	14	0.752	0.0689	0.477	1.000
2_VAVBTYI1ID	3	0	1.438	0.0942	1.114	1.724
2_VAVBTYR1RE	3	2	0.7181	0.0111	0.6435	0.8388
2_VAVBTYV1RE	4	23	0.8506	0.00764	0.7782	0.9638
2_VAVBTYV4ID	4	26	0.639	0.0500	0.342	0.881
3_ALMOCREORE	3	0	0.69897	0.000000000	0.69897	0.69897
3_ALMODAPHCO	3	0	1.0893	0.0186	0.9584	1.2304
3_ALMOSARARE	3	0	0.69897	0.000000000	0.69897	0.69897
3_ALMOSIIVID	3	0	1.279	0.0699	0.974	1.447
3_ALMOSITVCO	3	0	0.799	0.0302	0.699	1.000
3_ALMOSIVIRE	3	0	0.69897	0.000000000	0.69897	0.69897
3_ALMOTHEOID	3	0	1.419	0.184	0.942	1.771
3_GAATAT01ID	9	1	0.933	0.252	0.301	1.756
3_GAATAT02RE	8	1	1.507	0.0961	1.000	2.009
4_KATOATWORE	15	0	1.3209	0.1236	0.8451	1.9243
4_KATOBROORE	16	0	1.4468	0.1146	0.8451	2.0128
4_KATOJACKCO	15	1	2.010	0.206	0.699	2.584
4_KATOSTFEID	15	2	2.064	0.356	1.000	3.134
5_TXARA001CO	21	1	0.7802	0.0748	0.3010	1.3802
5_TXARA002RE	20	1	0.8408	0.1362	0.0951	1.7993
5_TXARA003RE	7	0	0.7522	0.0261	0.6021	0.9542
5_TXDAA001ID	7	0	0.9966	0.0398	0.6021	1.2041
5_TXDAA002ID	18	1	1.2273	0.0299	0.8451	1.4771
5_TXDAA004CO	17	3	1.1499	0.1237	0.6021	1.9138
5_TXDAA005RE	6	1	1.0149	0.0131	0.9031	1.2041
5_TXFWA004ID	19	2	1.3942	0.0419	1.1139	1.9395
5_TXIRA001RE	21	1	0.9402	0.0416	0.6021	1.2788
5_TXMEA002RE	7	0	1.0883	0.0231	0.9031	1.3979
5_TXMEA003RE	7	0	0.6396	0.0249	0.3010	0.7782
6_AZMCA001ID	25	2	1.8095	0.1090	1.0000	2.3010

6_AZMCA003ID	25	2	2.0065	0.1989	0.3010	2.5315
6_AZMCA005CO	26	0	1.2616	0.0659	0.8451	1.7993
6_AZMCA006RE	20	0	1.3454	0.1049	0.6990	2.2553
6_AZTUA001RE	10	0	0.6083	0.0739	0.1461	0.9545
6_AZTUA002RE	8	0	0.4918	0.0716	0.1461	0.8325
6_AZTUA003CO	8	0	0.6083	0.0512	0.1761	0.8325
6_AZTUA004ID	7	0	1.0509	0.0388	0.7993	1.3617
6_CAALAL09ID	9	0	1.6227	0.0779	1.2041	2.1072
7_OREUA001CO	14	2	1.4691	0.0940	1.1139	2.1139
7_OREUA003RE	15	0	0.9659	0.1075	0.5374	1.9085
7_ORGRA003RE	6	0	0.8230	0.0420	0.4472	1.0531
7_ORGRA004CO	6	0	1.0563	0.0353	0.8129	1.2695
7_ORPOA001CO	12	1	1.171	0.175	0.477	1.785
7_ORPOA003ID	12	2	1.6786	0.0705	1.3222	2.0792
7_ORPOA004ID	9	4	1.532	0.117	1.114	2.000
7_ORPOA006RE	11	2	0.975	0.153	0.211	1.690
7_ORSAA002CO	5	1	1.1697	0.0140	1.0019	1.3010
7_ORSAA003ID	4	2	1.2801	0.0322	1.0414	1.4771
7_ORSAA004RE	5	1	0.9829	0.0390	0.7782	1.3010

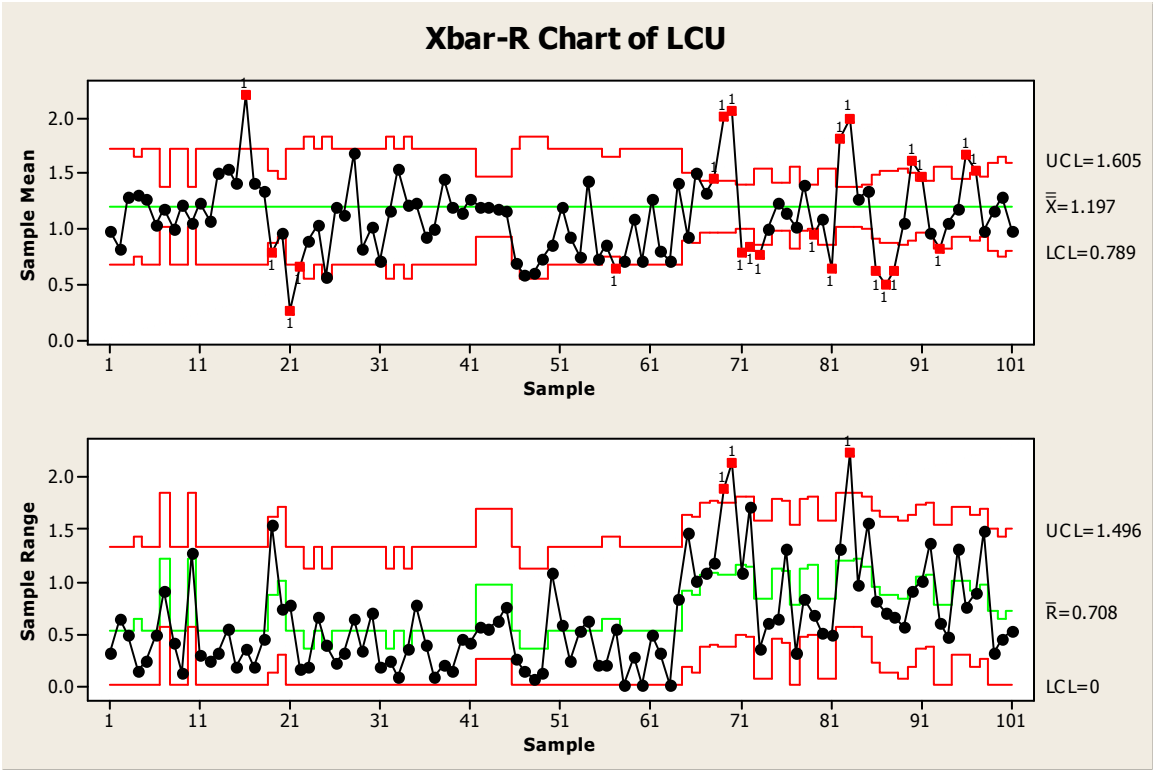

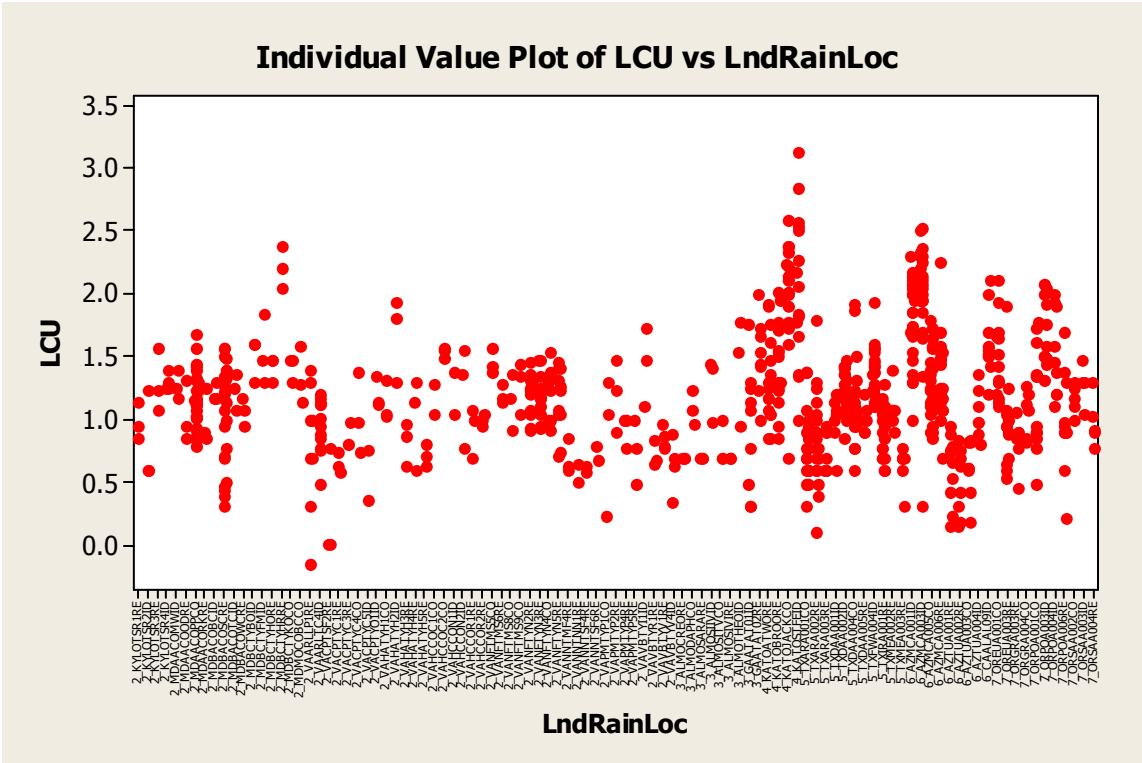

General Linear Model: LCU versus Landuse, EPA_Rain_Zone

```
Factor          Type   Levels  Values
Landuse         fixed       3  CO, ID, RE
EPA_Rain_Zone   fixed       6  2, 3, 4, 5, 6, 7


Analysis of Variance for LCU, using Adjusted SS for Tests

Source                   DF    Seq SS   Adj SS  Adj MS      F      P
Landuse                   2   27.1721  17.5268  8.7634  64.52  0.000
EPA_Rain_Zone             5   26.3863  28.2226  5.6445  41.56  0.000
Landuse*EPA_Rain_Zone    10   13.7000  13.7000  1.3700  10.09  0.000
Error                   727   98.7367  98.7367  0.1358
Total                   744  165.9951
```

Main effects and interaction are significant.

```
Bonferroni Simultaneous Tests
Response Variable LCU
All Pairwise Comparisons among Levels of Landuse
Landuse = CO  subtracted from:

         Difference       SE of           Adjusted
Landuse    of Means  Difference  T-Value   P-Value
ID           0.2403     0.04600    5.224    0.0000
RE          -0.1986     0.04333   -4.583    0.0000


Landuse = ID  subtracted from:

         Difference       SE of           Adjusted
```

Landuse	of Means	Difference	T-Value	P-Value
RE	-0.4389	0.03865	-11.35	0.0000

Tukey Simultaneous Tests
Response Variable LCU
All Pairwise Comparisons among Levels of Landuse
Landuse = CO subtracted from:

Landuse	Difference of Means	SE of Difference	T-Value	Adjusted P-Value
ID	0.2403	0.04600	5.224	0.0000
RE	-0.1986	0.04333	-4.583	0.0000

Landuse = ID subtracted from:

Landuse	Difference of Means	SE of Difference	T-Value	Adjusted P-Value
RE	-0.4389	0.03865	-11.35	0.0000

Significant differences by land use. Copper concentrations are different among the three land uses.

Bonferroni Simultaneous Tests
Response Variable LCU
All Pairwise Comparisons among Levels of EPA_Rain_Zone
EPA_Rain_Zone = 2 subtracted from:

EPA_Rain_Zone	Difference of Means	SE of Difference	T-Value	Adjusted P-Value
3	-0.08326	0.07089	-1.175	1.0000
4	0.69562	0.05582	12.463	0.0000
5	-0.09387	0.03973	-2.362	0.2763
6	0.16181	0.04106	3.940	0.0013
7	0.13418	0.04512	2.974	0.0456

EPA_Rain_Zone = 3 subtracted from:

EPA_Rain_Zone	Difference of Means	SE of Difference	T-Value	Adjusted P-Value
4	0.77889	0.08311	9.3715	0.0000
5	-0.01060	0.07329	-0.1446	1.0000
6	0.24508	0.07402	3.3111	0.0146
7	0.21745	0.07634	2.8484	0.0678

EPA_Rain_Zone = 4 subtracted from:

EPA_Rain_Zone	Difference of Means	SE of Difference	T-Value	Adjusted P-Value
5	-0.7895	0.05883	-13.42	0.0000
6	-0.5338	0.05974	-8.94	0.0000
7	-0.5614	0.06260	-8.97	0.0000

EPA_Rain_Zone = 5 subtracted from:

EPA_Rain_Zone	Difference of Means	SE of Difference	T-Value	Adjusted P-Value
6	0.2557	0.04507	5.672	0.0000
7	0.2280	0.04880	4.673	0.0001

```
EPA_Rain_Zone = 6  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
7                -0.02763     0.04989  -0.5538     1.000
```

Copper in EPA rain zone 2 is significantly different than in EPA rain zones 4, 6, and 7. No differences were observed between rain zone 2 and rain zones 3 and 5.

Copper in EPA rain zone 3 is significantly different than in EPA rain zones 4, 6, and 7. No differences were observed between rain zone 3 and rain zone 5.

Copper in EPA rain zone 4 is significantly different than in EPA rain zones 5, 6, and 7.

Copper in EPA rain zone 5 is significantly different than in EPA rain zones 6, and 7. No differences were observed between rain zones 6 and 7.

```
Tukey Simultaneous Tests
Response Variable LCU
All Pairwise Comparisons among Levels of EPA_Rain_Zone
EPA_Rain_Zone = 2  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
3                -0.08326     0.07089   -1.175    0.8491
4                 0.69562     0.05582   12.463    0.0000
5                -0.09387     0.03973   -2.362    0.1696
6                 0.16181     0.04106    3.940    0.0011
7                 0.13418     0.04512    2.974    0.0349


EPA_Rain_Zone = 3  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
4                 0.77889     0.08311   9.3715    0.0000
5                -0.01060     0.07329  -0.1446    1.0000
6                 0.24508     0.07402   3.3111    0.0120
7                 0.21745     0.07634   2.8484    0.0502


EPA_Rain_Zone = 4  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
5                 -0.7895     0.05883   -13.42    0.0000
6                 -0.5338     0.05974    -8.94    0.0000
7                 -0.5614     0.06260    -8.97    0.0000


EPA_Rain_Zone = 5  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
6                  0.2557     0.04507    5.672    0.0000
7                  0.2280     0.04880    4.673    0.0000


EPA_Rain_Zone = 6  subtracted from:

               Difference       SE of           Adjusted
```

EPA_Rain_Zone	of Means	Difference	T-Value	P-Value
7	-0.02763	0.04989	-0.5538	0.9938

Copper in EPA rain zone 2 is significantly different than in EPA rain zones 4, 6, and 7. No differences were observed between rain zone 2 and rain zones 3 and 5.

Copper in EPA rain zone 3 is significantly different than in EPA rain zones 4, 6, and 7. No differences were observed between rain zone 3 and rain zone 5.

Copper in EPA rain zone 4 is significantly different than in EPA rain zones 5, 6, and 7.

Copper in EPA rain zone 5 is significantly different than in EPA rain zones 6, and 7. No differences were observed between rain zones 6 and 7.

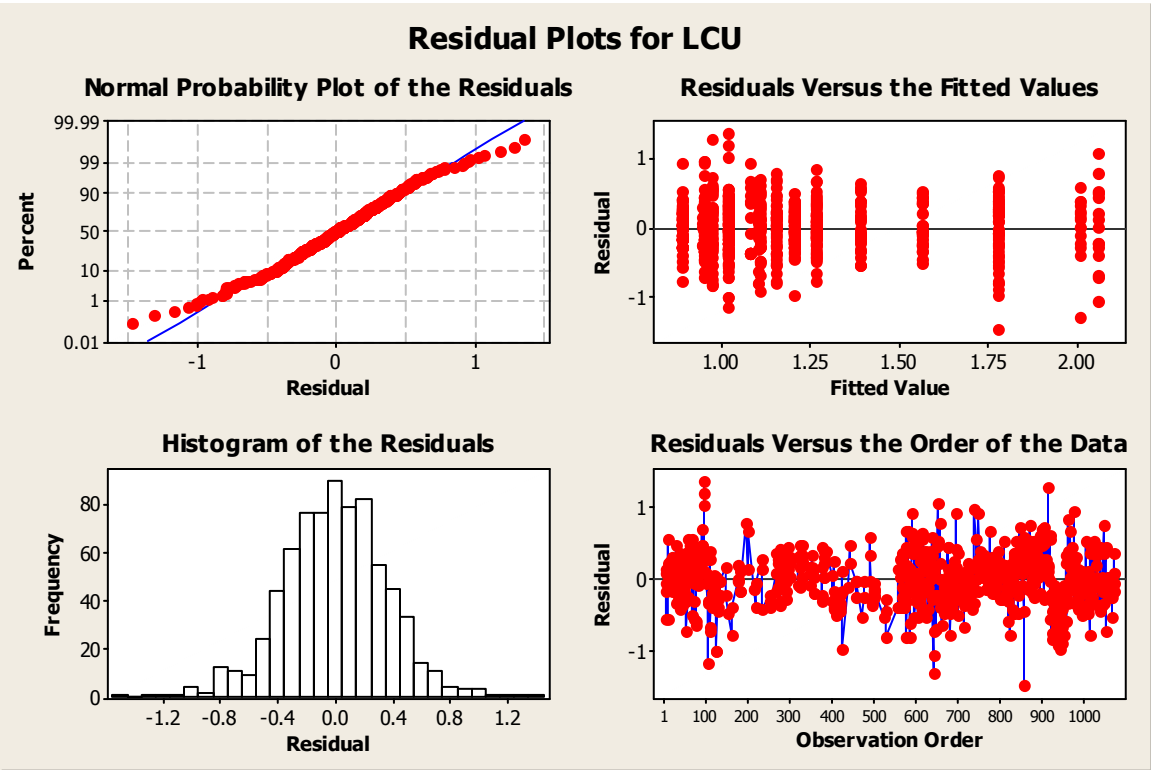

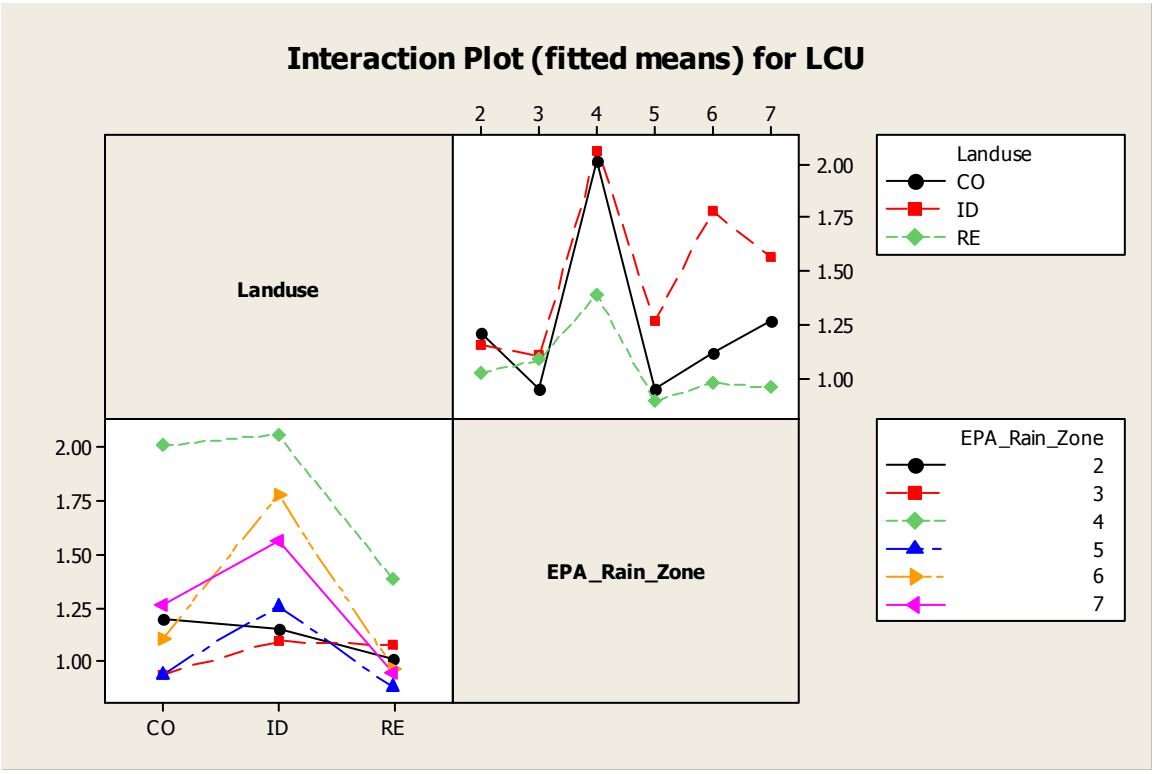
Interaction Plot (fitted means) for LCU
Landuse
EPA_Rain_Zone
2
3
4
5
6
7
2.00
1.75
1.50
1.25
1.00
CO
ID
RE
Landuse
CO
ID
RE
EPA_Rain_Zone
2
3
4
5
6
7

Total Lead (µg/L) (Pb)

Summary statistics in LOG base 10 scale
Land use: Commercial

EPA_Rain_Zone	N det/est	N ND/NZ	Mean	StDev	Minimum	Maximum
2	66	57	1.011	0.601	-0.670	2.140
3	6	0	1.016	0.185	0.699	1.204
4	15	1	1.779	0.598	0.000	2.340
5	39	3	1.245	0.424	0.196	2.477
6	34	0	1.079	0.311	0.477	1.887
7	37	4	1.388	0.434	0.477	2.462

Land use: Industrial

EPA_Rain_Zone	N det/est	N ND/NZ	Mean	StDev	Minimum	Maximum
2	48	61	0.939	0.647	-0.254	2.114
3	10	6	0.989	0.538	0.000	1.602
4	15	2	1.917	0.705	0.301	3.079
5	45	2	1.370	0.397	0.347	2.431
6	69	1	1.892	0.529	0.301	2.792
7	25	8	1.518	0.389	0.602	2.230

Land use: Residential

EPA_Rain_Zone	N det/est	N ND/NZ	Mean	StDev	Minimum	Maximum
2	135	196	0.836	0.596	-0.341	2.566
3	15	3	0.915	0.639	0.000	2.653
4	31	0	1.155	0.476	0.000	2.340
5	68	3	1.073	0.357	0.224	1.949
6	30	8	1.254	0.591	-0.874	2.279
7	37	3	0.998	0.497	-0.222	2.322

Descriptive Statistics: LPB

Variable	LndRainLoc	N	N*	Mean	Variance	Minimum	Maximum
LPB	2_KYLOTSR1RE	1	2	1.7782	*	1.7782	1.7782
	2_KYLOTSR2ID	0	3	*	*	*	*
	2_KYLOTSR3RE	0	3	*	*	*	*
	2_KYLOTSR4ID	1	3	2.1139	*	2.1139	2.1139
	2_MDAACOMWID	3	0	0.9748	0.0142	0.8451	1.0792
	2_MDAACOODRE	3	0	0.436	0.345	0.0969	1.114
	2_MDAACOPPCO	26	0	0.670	0.391	-0.670	1.531
	2_MDAACORKRE	3	0	0.096910	0.000000000	0.096910	0.096910
	2_MDBACOBCID	3	0	0.602	0.766	0.0969	1.613
	2_MDBACOSCRE	26	0	0.2642	0.2540	-0.3010	1.5911
	2_MDBACOTCID	3	0	1.762	0.0743	1.447	1.924
	2_MDBACOWCRE	3	0	0.226	0.832	-0.301	1.279
	2_MDBCTYBOID	3	0	1.424	0.226	0.875	1.699
	2_MDBCTYFMID	3	0	1.276	0.483	0.875	2.079
	2_MDBCTYHORE	3	0	1.150	0.226	0.875	1.699

2_MDBCTYHRRE	3	0	1.076	0.121	0.875	1.477
2_MDBCTYKOCO	3	0	1.522	0.137	1.117	1.845
2_MDMOCOBCCO	3	0	0.520	0.133	0.178	0.903
2_VAARLLP1RE	8	0	0.250	0.0997	-0.341	0.778
2_VAARLTC4ID	12	1	0.2128	0.0813	-0.2539	0.9031
2_VACPTC1ARE	0	8	*	*	*	*
2_VACPTSF2RE	3	0	0.65321	0.000000000	0.65321	0.65321
2_VACPTYC1RE	3	4	0.65321	0.000000000	0.65321	0.65321
2_VACPTYC3RE	2	12	1.2075	0.0175	1.1139	1.3010
2_VACPTYC4CO	3	11	1.154	0.231	0.740	1.681
2_VACPTYC5ID	2	12	0.65321	0.000000000	0.65321	0.65321
2_VACPTYO1ID	3	0	1.4696	0.0154	1.3979	1.6128
2_VAHATYH1CO	3	15	1.446	0.0495	1.279	1.699
2_VAHATYH2ID	3	16	1.513	0.176	1.041	1.845
2_VAHATYH3RE	3	14	0.7313	0.0237	0.5563	0.8451
2_VAHATYH4RE	3	14	1.2540	0.0204	1.1430	1.4150
2_VAHATYH5RE	3	14	0.862	0.227	0.371	1.322
2_VAHCCOC1CO	2	0	1.3227	0.0170	1.2304	1.4150
2_VAHCCOC2CO	3	0	1.801	0.0331	1.623	1.987
2_VAHCCON1ID	2	0	1.443	0.114	1.204	1.681
2_VAHCCON2ID	3	0	0.985	0.250	0.477	1.477
2_VAHCCOR1RE	3	0	0.990	0.0726	0.699	1.230
2_VAHCCOR2RE	3	0	1.0428	0.0158	0.9031	1.1461
2_VANFTMS5CO	3	0	1.2461	0.0118	1.1461	1.3617
2_VANFTMS6RE	3	0	1.2951	0.00778	1.2041	1.3802
2_VANFTMS8CO	3	0	1.440	0.0681	1.146	1.643
2_VANFTMS9CO	3	0	1.167	0.740	0.505	2.140
2_VANFTYN2RE	11	18	1.022	0.185	0.321	1.792
2_VANFTYN3RE	11	16	1.275	0.111	0.606	1.839
2_VANFTYN4CO	11	16	1.058	0.223	0.296	1.748
2_VANFTYN5RE	11	16	1.250	0.322	0.193	1.959
2_VANNTMF1RE	1	0	1.3802	*	1.3802	1.3802
2_VANNTMF4RE	3	0	0.65321	0.000000000	0.65321	0.65321
2_VANNTNN1RE	2	8	1.088	0.0562	0.920	1.255
2_VANNTSF4RE	2	0	0.65321	0.000000000	0.65321	0.65321
2_VANNTSF6RE	2	0	1.0051	0.0110	0.9310	1.0792
2_VAPMTYP1CO	3	15	1.382	0.0954	1.041	1.643
2_VAPMTYP2RE	3	14	2.271	0.0775	2.013	2.566
2_VAPMTYP4RE	3	14	0.890	0.0376	0.778	1.114
2_VAPMTYP5RE	3	14	0.878	0.0302	0.778	1.079
2_VAVBTYI1ID	3	0	0.973	0.307	0.653	1.613
2_VAVBTYR1RE	3	2	1.0307	0.00793	0.9368	1.1139
2_VAVBTYV1RE	4	23	1.3479	0.0214	1.1761	1.5315
2_VAVBTYV4ID	4	26	0.815	0.105	0.653	1.301
3_ALMOCREORE	3	0	0.39794	0.000000000	0.39794	0.39794
3_ALMODAPHCO	3	0	1.1099	0.0195	0.9494	1.2041
3_ALMOSARARE	3	0	0.8480	0.0279	0.6691	1.0000
3_ALMOSIIVID	3	0	1.3827	0.0259	1.2788	1.5682
3_ALMOSITVCO	3	0	0.922	0.0393	0.699	1.079
3_ALMOSIVIRE	3	0	0.877	0.0679	0.699	1.176
3_ALMOTHEOID	3	0	0.998	0.121	0.631	1.322
3_GAATAT01ID	4	6	0.687	0.494	0.000000000	1.602
3_GAATAT02RE	6	3	1.227	0.823	0.000000000	2.653
4_KATOATWORE	15	0	1.218	0.241	0.602	2.340
4_KATOBROORE	16	0	1.096	0.221	0.000000000	1.699
4_KATOJACKCO	15	1	1.779	0.357	0.000000000	2.340
4_KATOSTFEID	15	2	1.917	0.497	0.301	3.079
5_TXARA001CO	21	1	1.3634	0.0945	0.7298	2.0792
5_TXARA002RE	20	1	0.7964	0.0607	0.2243	1.2041
5_TXARA003RE	7	0	1.075	0.0717	0.699	1.380
5_TXDAA001ID	7	0	1.282	0.197	0.347	1.643
5_TXDAA002ID	18	1	1.1651	0.1032	0.6021	1.6812
5_TXDAA004CO	18	2	1.107	0.253	0.196	2.477

5_TXDAA005RE	6	1	1.599	0.0738	1.279	1.949
5_TXFWA004ID	20	1	1.5859	0.1196	1.1461	2.4314
5_TXIRA001RE	21	1	1.2757	0.0611	0.7381	1.7243
5_TXMEA002RE	7	0	1.1367	0.0644	0.8451	1.6335
5_TXMEA003RE	7	0	0.7399	0.0166	0.6021	0.9542
6_AZMCA001ID	27	0	1.5732	0.1349	0.9542	2.3010
6_AZMCA003ID	27	0	2.3438	0.2064	0.3010	2.7924
6_AZMCA005CO	26	0	0.9853	0.0598	0.4771	1.4314
6_AZMCA006RE	20	0	1.3528	0.1251	0.7782	2.2788
6_AZTUA001RE	6	4	1.460	0.212	0.699	2.114
6_AZTUA002RE	4	4	0.452	1.219	-0.874	1.806
6_AZTUA003CO	8	0	1.384	0.105	1.000	1.886
6_AZTUA004ID	6	1	1.735	0.0846	1.342	2.090
6_CAALAL09ID	9	0	1.5948	0.0671	1.2553	2.0792
7_OREUA001CO	14	2	1.439	0.230	0.477	2.362
7_OREUA003RE	15	0	1.320	0.195	0.699	2.322
7_ORGRA003RE	6	0	0.872	0.0631	0.602	1.204
7_ORGRA004CO	6	0	1.158	0.130	0.863	1.792
7_ORPOA001CO	12	1	1.563	0.140	1.146	2.462
7_ORPOA003ID	12	2	1.6963	0.0841	1.2041	2.2304
7_ORPOA004ID	9	4	1.268	0.170	0.602	1.968
7_ORPOA006RE	11	2	0.9724	0.0952	0.4771	1.5798
7_ORSAA002CO	5	1	1.103	0.120	0.591	1.491
7_ORSAA003ID	4	2	1.545	0.133	1.301	2.079
7_ORSAA004RE	5	1	0.237	0.0914	-0.222	0.522

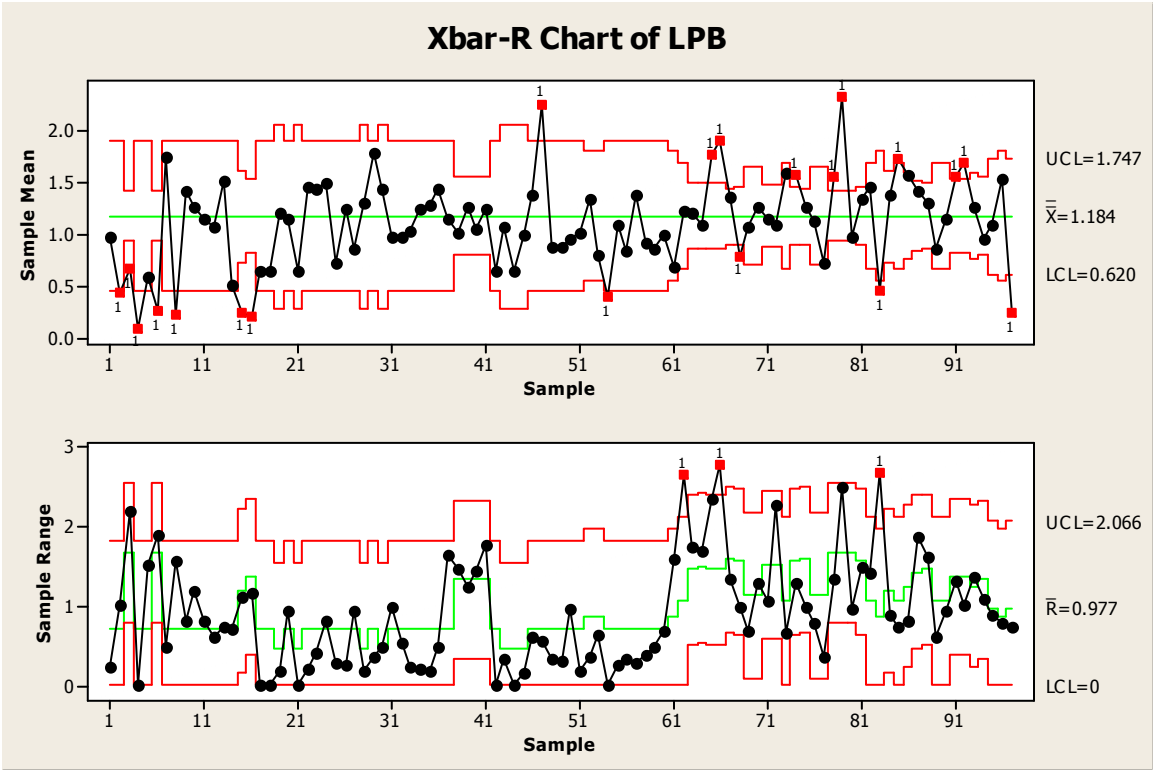

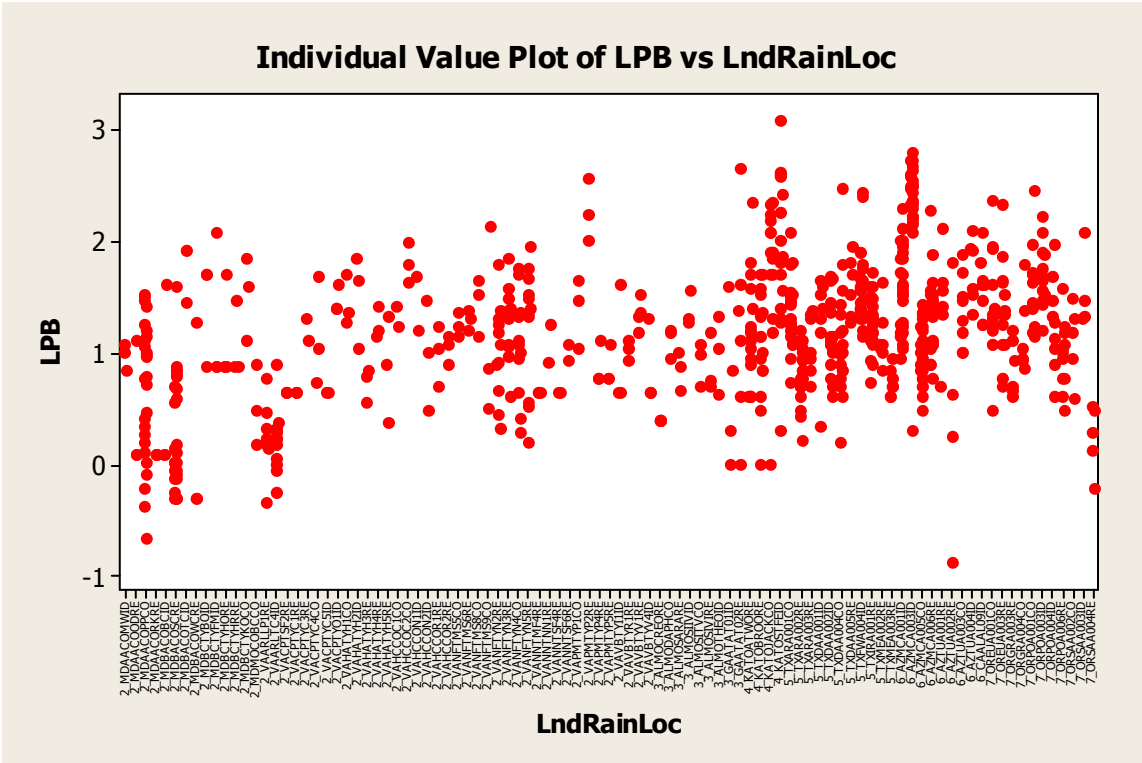

General Linear Model: LPB versus Landuse, EPA_Rain_Zone

```
Factor          Type   Levels  Values
Landuse         fixed       3  CO, ID, RE
EPA_Rain_Zone   fixed       6  2, 3, 4, 5, 6, 7


Analysis of Variance for LPB, using Adjusted SS for Tests

Source                   DF    Seq SS    Adj SS  Adj MS      F      P
Landuse                   2   31.6472   12.9341  6.4671  24.05  0.000
EPA_Rain_Zone             5   33.0307   33.4042  6.6808  24.85  0.000
Landuse*EPA_Rain_Zone    10   16.0919   16.0919  1.6092   5.99  0.000
Error                   704  189.2705  189.2705  0.2689
Total                   721  270.0403
```

Main factors and interaction are significant.

```
Bonferroni Simultaneous Tests
Response Variable LPB
All Pairwise Comparisons among Levels of Landuse
Landuse = CO  subtracted from:

         Difference       SE of           Adjusted
Landuse    of Means  Difference  T-Value   P-Value
ID           0.1802     0.06667    2.703    0.0211
RE          -0.2163     0.06184   -3.498    0.0015
```

```
Landuse = ID  subtracted from:

         Difference       SE of           Adjusted
Landuse    of Means  Difference  T-Value   P-Value
RE          -0.3965     0.05772   -6.869    0.0000


Tukey Simultaneous Tests
Response Variable LPB
All Pairwise Comparisons among Levels of Landuse
Landuse = CO  subtracted from:

         Difference       SE of           Adjusted
Landuse    of Means  Difference  T-Value   P-Value
ID           0.1802     0.06667    2.703    0.0188
RE          -0.2163     0.06184   -3.498    0.0014


Landuse = ID  subtracted from:

         Difference       SE of           Adjusted
Landuse    of Means  Difference  T-Value   P-Value
RE          -0.3965     0.05772   -6.869    0.0000
```

Copper concentrations are different among commercial, industrial and residential land uses.

```
Bonferroni Simultaneous Tests
Response Variable LPB
All Pairwise Comparisons among Levels of EPA_Rain_Zone
EPA_Rain_Zone = 2  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
3                 0.05664     0.10616   0.5336    1.0000
4                 0.70022     0.07912   8.8505    0.0000
5                 0.31270     0.05641   5.5435    0.0000
6                 0.49147     0.06017   8.1684    0.0000
7                 0.38434     0.06421   5.9861    0.0000


EPA_Rain_Zone = 3  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
4                  0.6436      0.1221    5.272    0.0000
5                  0.2561      0.1087    2.355    0.2823
6                  0.4348      0.1107    3.926    0.0014
7                  0.3277      0.1130    2.900    0.0577


EPA_Rain_Zone = 4  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
5                 -0.3875     0.08256   -4.694    0.0000
6                 -0.2087     0.08517   -2.451    0.2173
7                 -0.3159     0.08807   -3.587    0.0054


EPA_Rain_Zone = 5  subtracted from:

               Difference       SE of           Adjusted
```

EPA_Rain_Zone	of Means	Difference	T-Value	P-Value
6	0.17877	0.06462	2.766	0.0873
7	0.07164	0.06840	1.047	1.0000

EPA_Rain_Zone = 6 subtracted from:

EPA_Rain_Zone	Difference of Means	SE of Difference	T-Value	Adjusted P-Value
7	-0.1071	0.07153	-1.498	1.000

Copper concentration in EPA rain zone 2 is different than in zones 4, 5, 6, and 7. No differences were observed between rain zones 2 and 3.

Copper concentration in EPA rain zone 3 is different than in zones 4, 6, and 7. No differences were observed between rain zones 3 and 5.

Copper concentration in EPA rain zone 4 is different than in zones 5 and 7. No differences were observed between rain zones 4 and 6.

Copper concentration in EPA rain zone 5 is different than in zone 6. No differences were observed between rain zones 5 and 7. No differences were observed between zones 6 and 7.

Tukey Simultaneous Tests
Response Variable LPB
All Pairwise Comparisons among Levels of EPA_Rain_Zone
EPA_Rain_Zone = 2 subtracted from:

EPA_Rain_Zone	Difference of Means	SE of Difference	T-Value	Adjusted P-Value
3	0.05664	0.10616	0.5336	0.9948
4	0.70022	0.07912	8.8505	0.0000
5	0.31270	0.05641	5.5435	0.0000
6	0.49147	0.06017	8.1684	0.0000
7	0.38434	0.06421	5.9861	0.0000

EPA_Rain_Zone = 3 subtracted from:

EPA_Rain_Zone	Difference of Means	SE of Difference	T-Value	Adjusted P-Value
4	0.6436	0.1221	5.272	0.0000
5	0.2561	0.1087	2.355	0.1725
6	0.4348	0.1107	3.926	0.0012
7	0.3277	0.1130	2.900	0.0433

EPA_Rain_Zone = 4 subtracted from:

EPA_Rain_Zone	Difference of Means	SE of Difference	T-Value	Adjusted P-Value
5	-0.3875	0.08256	-4.694	0.0000
6	-0.2087	0.08517	-2.451	0.1390
7	-0.3159	0.08807	-3.587	0.0045

EPA_Rain_Zone = 5 subtracted from:

EPA_Rain_Zone	Difference of Means	SE of Difference	T-Value	Adjusted P-Value

```
6                 0.17877     0.06462    2.766    0.0630
7                 0.07164     0.06840    1.047    0.9018


EPA_Rain_Zone = 6  subtracted from:

                Difference       SE of            Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value    P-Value
7                 -0.1071     0.07153   -1.498     0.6659
```

Copper concentration in EPA rain zone 2 is different than in zones 4, 5, 6, and 7. No differences were observed between rain zones 2 and 3.

Copper concentration in EPA rain zone 3 is different than in zones 4, 6, and 7. No differences were observed between rain zones 3 and 5.

Copper concentration in EPA rain zone 4 is different than in zones 5 and 7. No differences were observed between rain zones 4 and 6.

Copper concentration in EPA rain zone 5 is different than in zone 6. No differences were observed between rain zones 5 and 7. No difference was observed between zones 6 and 7

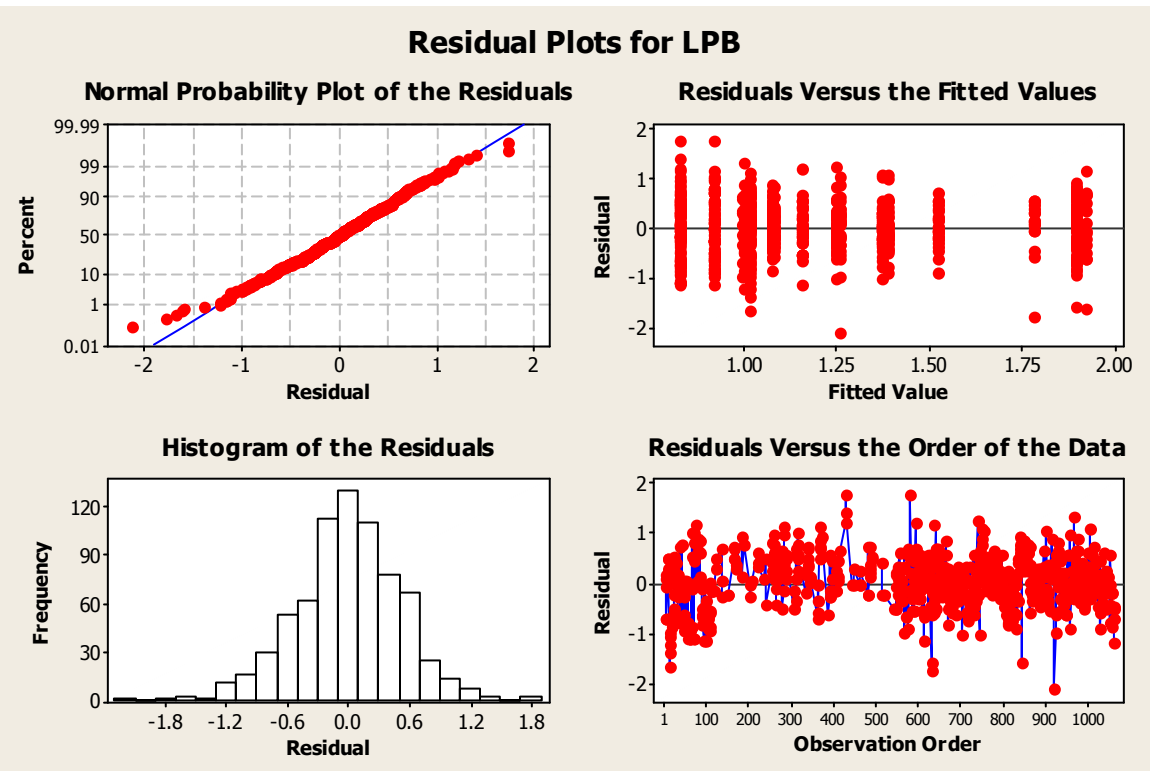

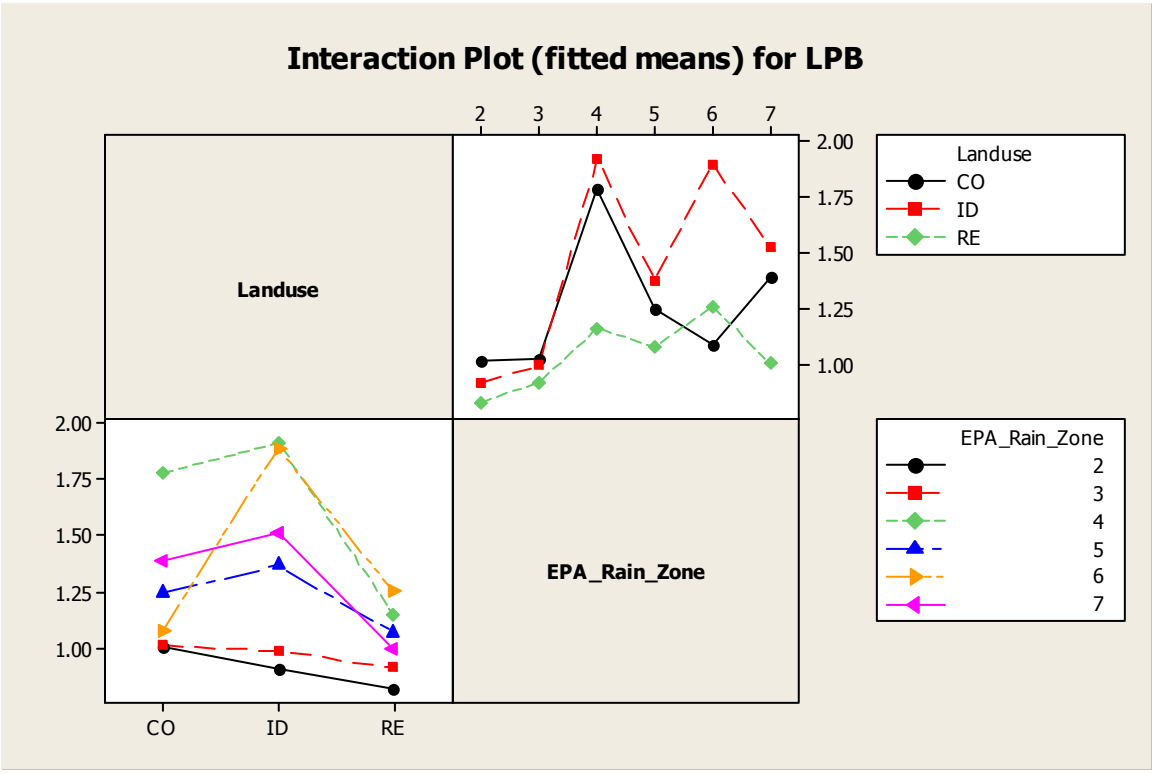
Interaction Plot (fitted means) for LPB
Landuse
EPA_Rain_Zone
2
3
4
5
6
7
2.00
1.75
1.50
1.25
1.00
CO
ID
RE
Landuse
CO
ID
RE
EPA_Rain_Zone
2
3
4
5
6
7

Total Zinc (µg/L) (Zn)

Summary statistics in LOG base 10 scale
Land use: Commercial

EPA_Rain_Zone	N det/est	N ND/NZ	Mean	StDev	Minimum	Maximum
2	66	57	2.212	0.262	1.716	2.950
3	6	0	2.050	0.179	1.851	2.342
4	15	1	2.552	0.367	1.663	2.969
5	39	3	1.878	0.287	1.447	2.748
6	34	0	2.305	0.245	1.806	2.820
7	37	4	2.060	0.325	1.591	2.964

Land use: Industrial

EPA_Rain_Zone	N det/est	N ND/NZ	Mean	StDev	Minimum	Maximum
2	54	55	2.177	0.389	1.000	2.740
3	15	1	2.037	0.334	1.398	2.623
4	15	2	2.571	0.354	2.079	3.201
5	45	2	2.161	0.399	1.447	3.146
6	70	0	2.613	0.301	1.850	3.146
7	25	8	2.478	0.477	1.672	3.909

Land use: Residential

EPA_Rain_Zone	N det/est	N ND/NZ	Mean	StDev	Minimum	Maximum
2	140	191	1.702	0.426	0.047	2.726
3	17	1	1.673	0.411	0.912	2.462
4	31	0	2.073	0.441	1.000	3.199
5	68	3	1.796	0.241	1.204	2.362
6	38	0	2.195	0.342	1.544	3.176
7	37	3	1.760	0.352	0.840	2.813

Descriptive Statistics: LZN

Variable	LndRainLoc	N	N*	Mean	Variance	Minimum	Maximum
LZN	2_KYLOTSR1RE	3	0	2.188	0.149	1.792	2.563
	2_KYLOTSR2ID	3	0	2.357	0.101	2.152	2.723
	2_KYLOTSR3RE	3	0	2.069	0.0444	1.851	2.272
	2_KYLOTSR4ID	4	0	2.2135	0.0235	1.9912	2.3243
	2_MDAACOMWID	3	0	2.2168	0.00901	2.1139	2.3010
	2_MDAACOODRE	3	0	2.155	0.0546	1.944	2.407
	2_MDAACOPPCO	26	0	2.1423	0.0330	1.7747	2.5221
	2_MDAACORKRE	3	0	1.5452	0.0211	1.3802	1.6532
	2_MDBACOBCID	3	0	2.2719	0.00602	2.1931	2.3483
	2_MDBACOSCRE	26	0	1.6532	0.0584	1.2967	2.1608
	2_MDBACOTCID	3	0	2.1928	0.0175	2.1004	2.3444
	2_MDBACOWCRE	3	0	1.931	0.0470	1.756	2.173
	2_MDBCTYBOID	3	0	2.506	0.0324	2.342	2.699
	2_MDBCTYFMID	3	0	2.3858	0.0223	2.2788	2.5563
	2_MDBCTYHORE	3	0	2.053	0.0469	1.903	2.301
	2_MDBCTYHRRE	3	0	2.0111	0.0211	1.9031	2.1761
	2_MDBCTYKOCO	3	0	2.2103	0.00351	2.1761	2.2788
	2_MDMOCOBCCO	3	0	1.8362	0.0162	1.7482	1.9823
	2_VAARLLP1RE	8	0	1.231	0.392	0.0465	1.903
	2_VAARLTC4ID	12	1	1.5903	0.0798	1.0000	1.9542

2_VACPTC1ARE	0	8	*	*	*	*
2_VACPTSF2RE	3	0	0.900	0.189	0.602	1.398
2_VACPTYC1RE	3	4	1.5096	0.0173	1.3802	1.6435
2_VACPTYC3RE	2	12	1.7897	0.0109	1.7160	1.8633
2_VACPTYC4CO	3	11	2.018	0.0775	1.716	2.265
2_VACPTYC5ID	2	12	2.449	0.0660	2.267	2.630
2_VACPTYO1ID	3	0	2.1956	0.00161	2.1584	2.2380
2_VAHATYH1CO	3	15	2.2005	0.0138	2.0969	2.3284
2_VAHATYH2ID	3	16	2.6408	0.0176	2.4900	2.7404
2_VAHATYH3RE	3	14	1.368	0.191	0.903	1.771
2_VAHATYH4RE	3	14	1.7492	0.00195	1.7160	1.7993
2_VAHATYH5RE	3	14	1.080	0.542	0.230	1.519
2_VAHCCOC1CO	2	0	1.988	0.0207	1.886	2.090
2_VAHCCOC2CO	3	0	2.7788	0.0251	2.6385	2.9504
2_VAHCCON1ID	2	0	2.507	0.0470	2.354	2.661
2_VAHCCON2ID	3	0	2.454	0.0339	2.243	2.584
2_VAHCCOR1RE	3	0	1.7427	0.0110	1.6232	1.8195
2_VAHCCOR2RE	3	0	2.182	0.230	1.820	2.726
2_VANFTMS5CO	3	0	2.371	0.0631	2.130	2.631
2_VANFTMS6RE	3	0	1.9543	0.00817	1.8692	2.0492
2_VANFTMS8CO	3	0	2.1748	0.0124	2.0899	2.3010
2_VANFTMS9CO	3	0	2.450	0.195	2.053	2.925
2_VANFTYN2RE	11	18	1.742	0.162	0.699	2.314
2_VANFTYN3RE	11	16	1.876	0.179	0.740	2.292
2_VANFTYN4CO	11	16	2.3598	0.0440	1.8808	2.6232
2_VANFTYN5RE	11	16	1.9504	0.0638	1.3617	2.3181
2_VANNTMF1RE	1	0	1.8325	*	1.8325	1.8325
2_VANNTMF4RE	3	0	1.609	0.0511	1.431	1.863
2_VANNTNN1RE	2	8	1.6048	0.00470	1.5563	1.6532
2_VANNTSF4RE	2	0	1.399	0.0287	1.279	1.519
2_VANNTSF6RE	2	0	1.6324	0.00184	1.6021	1.6628
2_VAPMTYP1CO	3	15	2.083	0.0503	1.833	2.265
2_VAPMTYP2RE	3	14	2.071	0.0392	1.869	2.265
2_VAPMTYP4RE	3	14	1.558	0.0525	1.301	1.740
2_VAPMTYP5RE	3	14	1.179	0.688	0.221	1.663
2_VAVBTYI1ID	3	0	2.466	0.0430	2.228	2.609
2_VAVBTYR1RE	3	2	1.384	0.182	0.903	1.716
2_VAVBTYV1RE	4	23	1.6995	0.00442	1.6335	1.7709
2_VAVBTYV4ID	4	26	2.159	0.0548	1.898	2.467
3_ALMOCREORE	3	0	1.579	0.636	0.912	2.462
3_ALMODAPHCO	3	0	2.149	0.0368	1.959	2.342
3_ALMOSARARE	3	0	1.6884	0.0133	1.6021	1.8195
3_ALMOSIIVID	3	0	2.319	0.0771	2.079	2.623
3_ALMOSITVCO	3	0	1.9498	0.0137	1.8513	2.0792
3_ALMOSIVIRE	3	0	1.795	0.0391	1.568	1.934
3_ALMOTHEOID	3	0	2.278	0.124	1.892	2.580
3_GAATAT01ID	9	1	1.8625	0.0591	1.3979	2.2304
3_GAATAT02RE	8	1	1.657	0.179	1.000	2.104
4_KATOATWORE	15	0	2.087	0.289	1.000	3.199
4_KATOBROORE	16	0	2.0592	0.1192	1.4771	2.7853
4_KATOJACKCO	15	1	2.5519	0.1345	1.6628	2.9685
4_KATOSTFEID	15	2	2.5707	0.1254	2.0792	3.2014
5_TXARA001CO	21	1	1.7920	0.0514	1.4472	2.4624
5_TXARA002RE	20	1	1.7226	0.0637	1.2041	2.1139
5_TXARA003RE	7	0	1.6831	0.0447	1.3010	1.9542
5_TXDAA001ID	7	0	2.0214	0.0204	1.8451	2.2304
5_TXDAA002ID	18	1	1.8553	0.0370	1.4771	2.1732
5_TXDAA004CO	18	2	1.9784	0.1037	1.6021	2.7482
5_TXDAA005RE	6	1	1.8889	0.0444	1.6021	2.1461
5_TXFWA004ID	20	1	2.4855	0.1225	1.4472	3.1461
5_TXIRA001RE	21	1	1.9164	0.0303	1.4771	2.1761
5_TXMEA002RE	7	0	1.915	0.0730	1.477	2.362
5_TXMEA003RE	7	0	1.5558	0.0131	1.4771	1.7782

6_AZMCA001ID	27	0	2.5259	0.1205	1.9031	3.0000
6_AZMCA003ID	27	0	2.7165	0.0785	1.8501	3.1461
6_AZMCA005CO	26	0	2.3006	0.0643	1.8451	2.8195
6_AZMCA006RE	20	0	2.2649	0.1261	1.6021	3.1761
6_AZTUA001RE	10	0	2.2332	0.0702	1.8451	2.6335
6_AZTUA002RE	8	0	1.974	0.113	1.544	2.556
6_AZTUA003CO	8	0	2.3194	0.0519	1.8062	2.5441
6_AZTUA004ID	7	0	2.6825	0.0302	2.5185	3.0414
6_CAALAL09ID	9	0	2.5108	0.0354	2.2553	2.8451
7_OREUA001CO	14	2	2.0880	0.0693	1.7324	2.6232
7_OREUA003RE	15	0	1.8384	0.1033	1.4771	2.8129
7_ORGRA003RE	6	0	1.6522	0.0216	1.4624	1.8865
7_ORGRA004CO	6	0	1.949	0.0690	1.591	2.312
7_ORPOA001CO	12	1	2.192	0.170	1.613	2.964
7_ORPOA003ID	12	2	2.747	0.165	2.288	3.908
7_ORPOA004ID	9	4	2.404	0.130	1.672	2.799
7_ORPOA006RE	11	2	1.9330	0.0652	1.6128	2.4914
7_ORSAA002CO	5	1	1.7955	0.00895	1.6532	1.9085
7_ORSAA003ID	4	2	1.8372	0.0131	1.6990	1.9542
7_ORSAA004RE	5	1	1.273	0.143	0.840	1.699

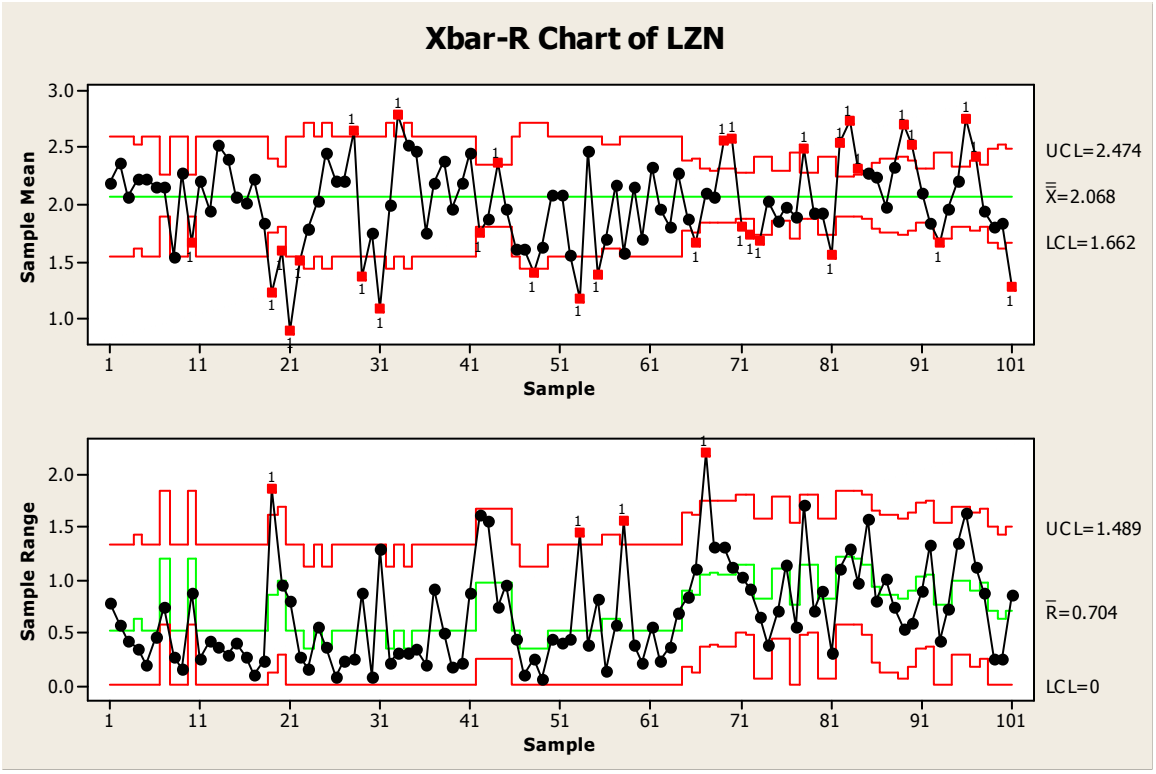

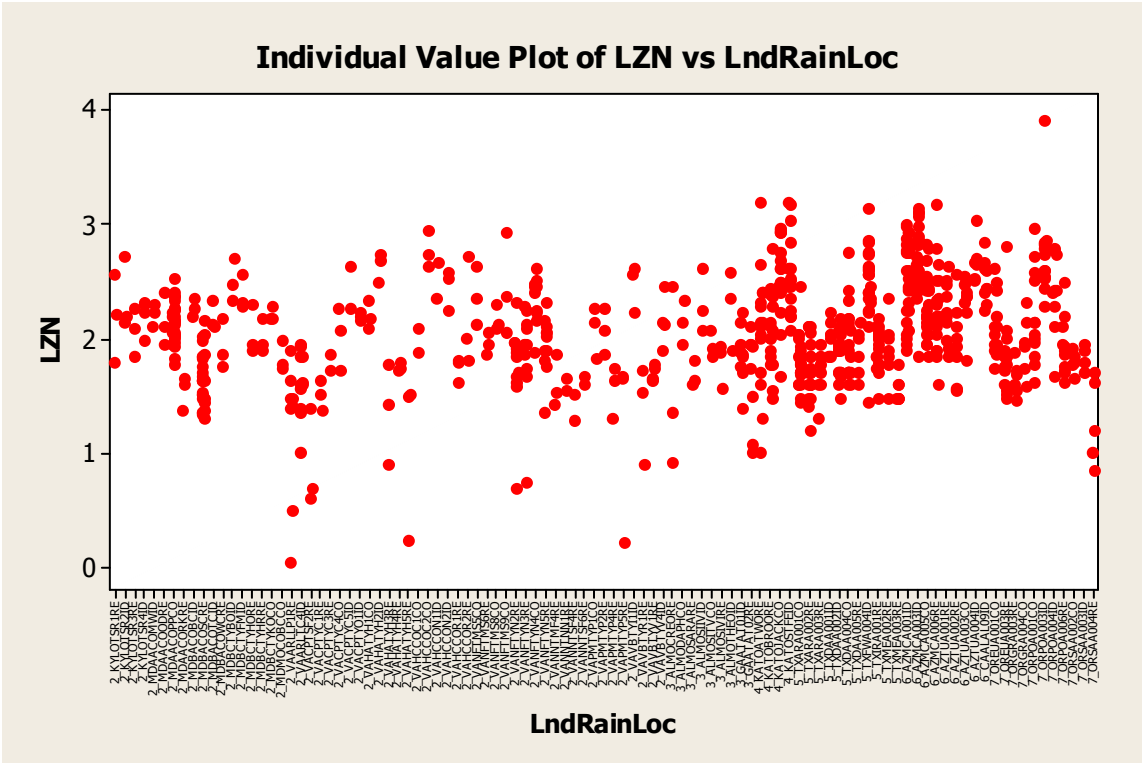

General Linear Model: LZN versus Landuse, EPA_Rain_Zone

```
Factor          Type   Levels  Values
Landuse         fixed       3  CO, ID, RE
EPA_Rain_Zone   fixed       6  2, 3, 4, 5, 6, 7


Analysis of Variance for LZN, using Adjusted SS for Tests

Source                   DF    Seq SS   Adj SS   Adj MS      F      P
Landuse                   2   41.3490  21.4483  10.7241  85.53  0.000
EPA_Rain_Zone             5   21.5544  19.7393   3.9479  31.49  0.000
Landuse*EPA_Rain_Zone    10    5.6755   5.6755   0.5676   4.53  0.000
Error                   733   91.9066  91.9066   0.1254
Total                   750  160.4855
```

Main factors and interaction are significant.

```
Bonferroni Simultaneous Tests
Response Variable LZN
All Pairwise Comparisons among Levels of Landuse
Landuse = CO  subtracted from:

         Difference       SE of           Adjusted
Landuse    of Means  Difference  T-Value   P-Value
ID           0.1634     0.04412    3.703    0.0007
RE          -0.3098     0.04160   -7.446    0.0000


Landuse = ID  subtracted from:

         Difference       SE of           Adjusted
```

Landuse	of Means	Difference	T-Value	P-Value
RE	-0.4732	0.03708	-12.76	0.0000

Tukey Simultaneous Tests
Response Variable LZN
All Pairwise Comparisons among Levels of Landuse
Landuse = CO subtracted from:

Landuse	Difference of Means	SE of Difference	T-Value	Adjusted P-Value
ID	0.1634	0.04412	3.703	0.0006
RE	-0.3098	0.04160	-7.446	0.0000

Landuse = ID subtracted from:

Landuse	Difference of Means	SE of Difference	T-Value	Adjusted P-Value
RE	-0.4732	0.03708	-12.76	0.0000

Zinc concentration is different in commercial compared with residential and industrial. Zinc concentrations in residential are different than in industrial.

Bonferroni Simultaneous Tests
Response Variable LZN
All Pairwise Comparisons among Levels of EPA_Rain_Zone
EPA_Rain_Zone = 2 subtracted from:

EPA_Rain_Zone	Difference of Means	SE of Difference	T-Value	Adjusted P-Value
3	-0.1102	0.06811	-1.618	1.0000
4	0.3684	0.05363	6.869	0.0000
5	-0.0850	0.03796	-2.240	0.3813
6	0.3412	0.03930	8.680	0.0000
7	0.0691	0.04335	1.594	1.0000

EPA_Rain_Zone = 3 subtracted from:

EPA_Rain_Zone	Difference of Means	SE of Difference	T-Value	Adjusted P-Value
4	0.47863	0.07986	5.9935	0.0000
5	0.02521	0.07030	0.3586	1.0000
6	0.45139	0.07103	6.3547	0.0000
7	0.17934	0.07335	2.4449	0.2209

EPA_Rain_Zone = 4 subtracted from:

EPA_Rain_Zone	Difference of Means	SE of Difference	T-Value	Adjusted P-Value
5	-0.4534	0.05638	-8.042	0.0000
6	-0.0272	0.05729	-0.475	1.0000
7	-0.2993	0.06014	-4.976	0.0000

EPA_Rain_Zone = 5 subtracted from:

EPA_Rain_Zone	Difference of Means	SE of Difference	T-Value	Adjusted P-Value
6	0.4262	0.04298	9.916	0.0000

```
7                  0.1541     0.04671    3.300    0.0152


EPA_Rain_Zone = 6  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
7                 -0.2720     0.04781   -5.690    0.0000
```

Zinc concentration in EPA rain zone 2 is different than in rain zones 4 and 6. There were no differences between rain zone 2 and rain zones 3, 5 and 7.

Zinc concentration in EPA rain zone 3 is different than in rain zones 4 and 6. There was no differences between rain zone 3 and rain zones 5 and 7.

Zinc concentration in EPA rain zone 4 is different than in rain zones 5 and 7. There was no differences between rain zone 4 and rain zone 6.

Zinc concentration in EPA rain zone 5 is different than in rain zones 6 and 7.

Zinc concentration in EPA rain zone 6 is different than in rain zone 7.

```
Tukey Simultaneous Tests
Response Variable LZN
All Pairwise Comparisons among Levels of EPA_Rain_Zone
EPA_Rain_Zone = 2  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
3                 -0.1102     0.06811   -1.618    0.5864
4                  0.3684     0.05363    6.869    0.0000
5                 -0.0850     0.03796   -2.240    0.2196
6                  0.3412     0.03930    8.680    0.0000
7                  0.0691     0.04335    1.594    0.6024


EPA_Rain_Zone = 3  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
4                 0.47863     0.07986   5.9935    0.0000
5                 0.02521     0.07030   0.3586    0.9992
6                 0.45139     0.07103   6.3547    0.0000
7                 0.17934     0.07335   2.4449    0.1410


EPA_Rain_Zone = 4  subtracted from:

               Difference       SE of           Adjusted
EPA_Rain_Zone    of Means  Difference  T-Value   P-Value
5                 -0.4534     0.05638   -8.042    0.0000
6                 -0.0272     0.05729   -0.475    0.9970
7                 -0.2993     0.06014   -4.976    0.0000


EPA_Rain_Zone = 5  subtracted from:

               Difference       SE of           Adjusted
```

```
EPA_Rain_Zone     of Means  Difference  T-Value   P-Value
6                   0.4262     0.04298    9.916    0.0000
7                   0.1541     0.04671    3.300    0.0124


EPA_Rain_Zone = 6  subtracted from:

                Difference       SE of            Adjusted
EPA_Rain_Zone     of Means  Difference  T-Value   P-Value
7                  -0.2720     0.04781   -5.690    0.0000
```

Zinc concentration in EPA rain zone 2 is different than in rain zones 4 and 6. There was no differences between rain zone 2 and rain zones 3, 5 and 7.

Zinc concentration in EPA rain zone 3 is different than in rain zones 4 and 6. There was no differences between rain zone 3 and rain zones 5 and 7.

Zinc concentration in EPA rain zone 4 is different than in rain zones 5 and 7. There was no differences between rain zone 4 and rain zone 6.

Zinc concentration in EPA rain zone 5 is different than in rain zones 6 and 7.

Zinc concentration in EPA rain zone 6 is different than in rain zone 7

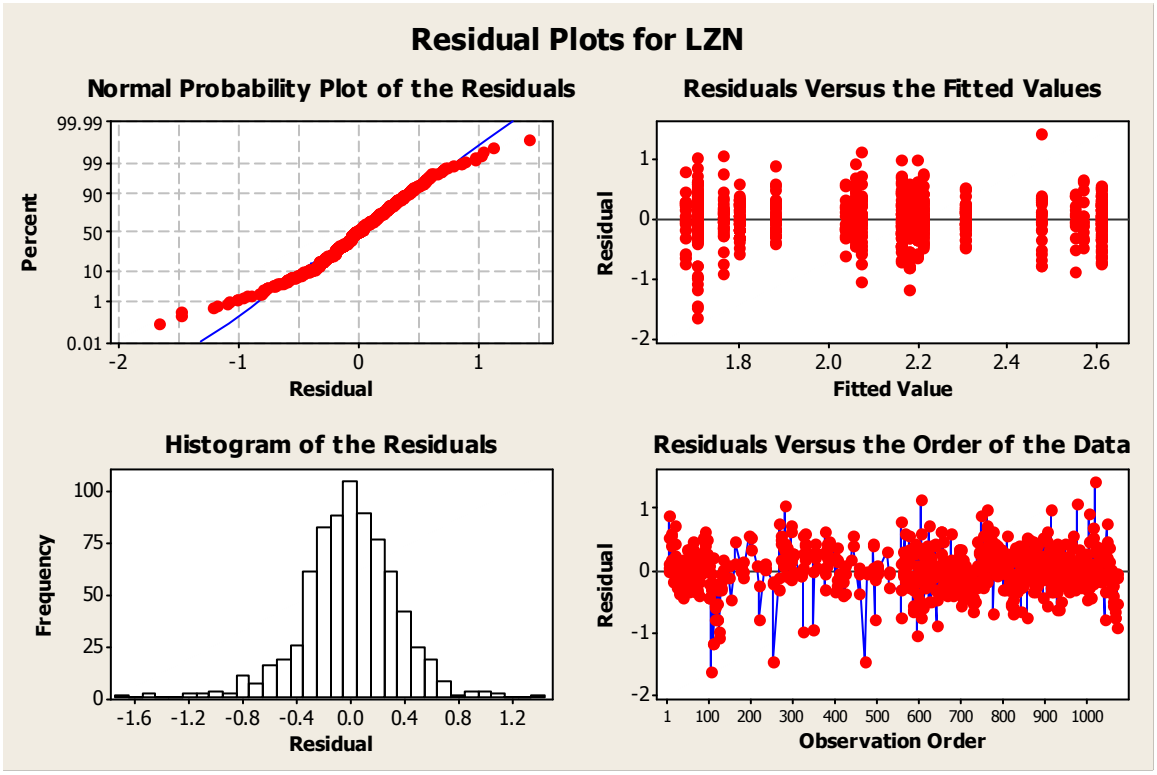

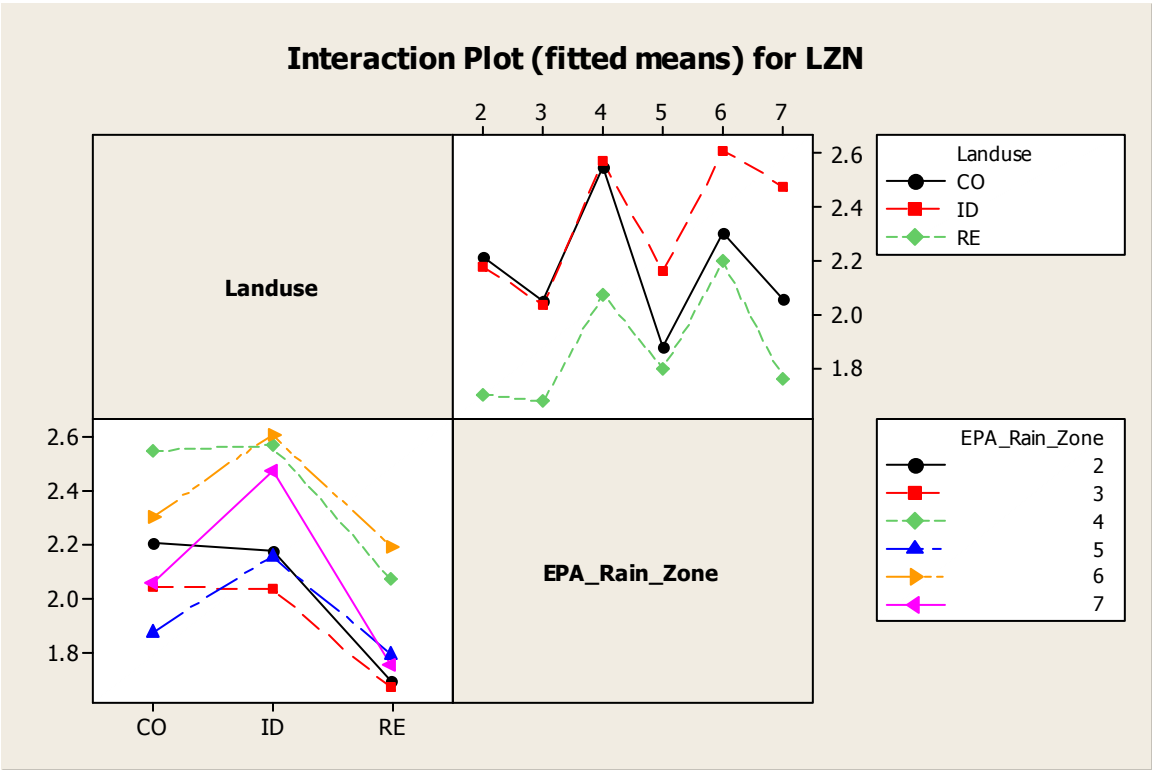
Interaction Plot (fitted means) for LZN
Landuse
EPA_Rain_Zone
2
3
4
5
6
7
2.6
2.4
2.2
2.0
1.8
CO
ID
RE
Landuse
CO
ID
RE
EPA_Rain_Zone
2
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December 2005

Managing Runoff to Protect Natural Streams: The Latest Developments on Investigation and Management of Hydromodification in California

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Southern California Coastal Water Research Project

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Proceedings of a Special Technical Workshop
Co-sponsored by:

- ***California Stormwater Quality Association (CASQA)***
- ***Stormwater Monitoring Coalition (SMC)***
- ***University of Southern California Sea Grant (USC Sea Grant)***

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University of Southern California Sea Grant (USC Sea Grant)

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Technical Report #475

EXECUTIVE SUMMARY

Stream channel downcutting, widening, and erosion due to increased surface runoff present the most profound and difficult to manage problems resulting from conversion of natural land surfaces to developed areas. Land use changes that reduce the capacity for infiltration and evapotranspiration of rainfall may result in an increase in the magnitude and frequency of erosive flows and changes in the proportion and timing of sediment delivery downstream. These effects, termed *hydromodification*, can adversely impact the physical structure, biologic condition, and water quality of streams.

This document summarizes the presentations and discussions from a workshop convened to provide an overview of key technical and managerial issues associated with hydromodification, with specific focus on California's climatic setting. The goal of this workshop was to identify key conclusions regarding the mechanisms and causes of hydromodfication and to provide managers and decision makers with a list of recommended priorities for future work in terms of both technical and managerial products.

Recent studies indicate that California's intermittent and ephemeral streams are more susceptible to the effects of hydromodification than streams from other parts of the United States (US). Physical degradation of stream channels in the central and eastern US can initially be detected when watershed impervious cover approaches 10%, although biological effects (which may be more difficult to detect) may occur at lower levels. In contrast, initial response of streams in the semi-arid portions of California appears to occur between 3% and 5% impervious cover.

Managing the effects of hydromodification requires attention to changes in runoff volume, magnitude of flows, frequency of erosive events, duration of flows, timing of high flows, magnitude and duration of base flows, and patterns of flow variability. Slope, composition of bed and bank materials, underlying geology, watershed position, and connections between streams and adjacent floodplains are also key considerations in the management of hydromodification effects.

A contemporary toolbox for assessing the effects of hydromodification consists of three technical approaches: continuous simulation modeling, physical process modeling using geomorphic metrics, and risk-based modeling. Independently and in a range of combinations, these approaches are instrumental to understanding and predicting channel responses. In conjunction with these approaches, the following research areas are recommended for enhanced understanding and assessment of hydromodification:

- Establishment of appropriate reference conditions for various stream types
- Establishment of linkage between geomorphic changes and biologic effects
- Development and calibration of linked models that provide long-term simulation of hydrologic, and resultant physical changes in channel morphology

Furthermore, ongoing monitoring programs should be established for reference streams, streams subject to effects of hydromodification, and streams where various hydromodification management strategies have been employed.

Hydromodification is best addressed with a suite of strategies including site design, on-site controls, regional controls, in-stream controls, and restoration of degraded stream systems. To improve the effectiveness of hydromodification management, it is important to identify the most appropriate set of strategies based on the type of channel, setting, stage of channel adjustment, and amount of existing and expected impervious cover in drainage catchments. Management of hydromodification could be improved by integrating it into a multi-objective strategy that addresses hydrology, water quality, flood control, and stream ecology. In addition, streams should be surveyed and classified in order to identify areas with the greatest risk of impact from hydromodification. Output from dynamic modeling can be used to develop easy to use management guides, and standard monitoring protocols and performance criteria need to be developed. These management tools should be geared toward application by land-use planners and regulators at the municipal and state levels. Finally, a hydromodification workgroup should be formed to facilitate communication and exchange of ideas and information on technical and management strategies relevant to hydromodification.

ACKNOWLEDGEMENTS

This document summarizes two days of collaborative, prescient, and enlightening discussion on one of the most daunting challenges facing aquatic resource managers. We would like to thank all workshop presenters and panelist for sharing their insight and expertise to help develop the conclusions and recommendations contained in this document. We would like to especially thank the workshop organizing committee who made this event possible. Finally, we thank the California Association of Stormwater Quality Agencies, the southern California Stormwater Monitoring Coalition, and University of Southern California (USC) Sea Grant for their generous funding and support.

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WORKSHOP OVERVIEW

The process of urbanization has the potential to affect stream courses by altering watershed hydrology. Development and redevelopment can increase impervious surfaces on formerly undeveloped (or less developed) landscapes and reduce the capacity of remaining pervious surfaces to capture and infiltrate rainfall. In addition, in semi-arid regions, development is usually accompanied by significant supplemental landscape irrigation that maintains high soil moisture conditions. Development practices also tend to reduce or eliminate native vegetation, thus reducing evapotranspiration of rainfall. Consequently, as watersheds develop, a larger percentage of rainfall becomes runoff during any given storm; runoff reaches stream channels much more rapidly, resulting in peak discharge rates that are higher than those for an equivalent rainfall prior to development. These changes to the runoff hydrograph have been termed *hydromodification*.

Hydromodification can result in adverse effects to stream habitat and water supply, and stream erosion associated with hydromodification often threatens infrastructure, homes, and businesses. In response to these effects, state and local agencies have developed, or are developing, standards and management approaches to control and/or mitigate the effects of hydromodification on natural and semi-natural stream courses.

On October 2 and 3, 2005, 26 speakers and 175 participants gathered in Ontario, California to discuss the results of recent research inside and outside of California. This technical workshop was convened to provide an overview of the key technical and managerial issues associated with hydromodification, with specific focus on California's climatic setting. The specific objectives of the workshop were:

- Exchange of information on technical and managerial approaches to hydromodification
- Identification of common conclusions regarding a general understanding of hydromodification
- Recommendation of priority needs for future work relevant to technical and managerial products in response to hydromodification issues

The workshop consisted of two evening and one all-day session. The first night, a small group of scientists and managers gathered to discuss key knowledge gaps and technical information needs. The day session was open to all attendees, who interacted with a slate of speakers summarizing technical, regulatory, and management approaches to responding to the effects of hydromodification. The workshop concluded with an evening session in which a small group discussed priority needs for future research and management tool development. The agenda for the workshop is provided in Appendix A.

This document summarizes key conclusions resulting from the presentations and discussions that occurred during the workshop. The document also provides managers and decision makers with a list of recommend priorities for future work in terms of both technical and managerial products related to hydromodification response.

INTRODUCTION TO HYDROMODIFICATION

Hydromodification is defined by the Environmental Protection Agency (EPA) as the "alteration of flow characteristics through a landscape which has the capacity to result in degradation of water resources" (http://www.epa.gov/owm/mtb/cwns/1996rtc/glossary.htm). Most often, hydromodification results from changes in land use practices or direct management of surface runoff. Consequences of hydromodification can include stream channel incision, aggradation, desiccation, and/or inundation.

Land use practices over the past several hundred years have resulted in hydromodification of western landscapes (Haltiner et al. 1996, Leopold 1968). Historically, many small streams were not connected to main river channels, but rather existed as shallow swales and wetland systems connected to larger rivers via subsurface flow. Surface hydrologic connections occurred intermittently following periodic large storm events. Increased surface runoff and channel disturbance, beginning during the cattle-grazing era circa 1700 – 1900, resulted in many of these systems becoming permanently channelized (Cooke and Reeves 1976). Channel modification through either direct alteration, or as a consequence of changes in patterns of surface runoff, e.g. through increases in impervious cover, continues today.

Hydromodification has typically resulted in channel incision and bank erosion in the upper and middle portions of the watershed, and in deposition, aggradation, and increased channel meandering in the downstream, flatter portions of the watershed. Often, as the main channel has incised, the lowered base level results in the formation of "knickpoints" (abrupt drops in the channel floor) that migrate upstream into the headwater areas. Often, these migrating "knickpoints" result in severe gully formation in lower order streams, i.e. first- through third-order streams, based on the Strahler stream ordering system. These smaller headwater streams are important from a watershed perspective because much of the sediment generation, carbon export, and initial nutrient processing occur in the upper watershed (Rheinhardt et al. 1999). The vast majority of stream miles in any given watershed exist as small headwater streams (Beschta and Platts 1986); consequently, impacts to these streams can result in profound cumulative effects to sediment and water movement patterns throughout the watershed. In many areas, the majority of remaining semi-intact streams is in the upper portions of watersheds. Notably, these areas are the most susceptible to land use change and associated effects of hydromodification. When development occurs in headwater areas rather than lower in the watershed, it tends to result in larger increases in peak discharge due to cumulative decreases in the time of concentration of rainfall to runoff (Beighley and Moglen, 2002).

Small, frequent runoff events, i.e. two-year frequency storms and smaller, demonstrate the most dramatic effects due to increased imperviousness, effects of supplemental irrigation, or other changes in land use practices (Beighley et al. 2003, Donigian and Love 2005, Hollis 1975). These small events account for the majority of long-term movement of sediment and consequently are the most deterministic of the geomorphic stability of the stream channels (Wolman and Miller 1960). However, small increases in basin impervious cover can also result in dramatic increases in runoff during 0.5-5 year flow events. For example, an increase of a few percent in impervious cover can increase the magnitude of a 1- or 2-year flood event by 20-fold (Hollis 1975, Urbonas and Roesner 1992).

Studies from parts of the country with climates more humid than California's indicate that physical degradation of stream channels can initially be detected when watershed impervious cover approaches 10%, although biological effects, which may be more difficult to detect, may

occur at lower levels (CWP 2003). Recent studies from both northern and southern California indicate that intermittent and ephemeral streams in California are more susceptible to the effects of hydromodification than streams from other regions of the US, with stream degradation being recognized when catchment's impervious cover is as little as 3-5%[1] (Coleman et al. 2005). Furthermore, supplemental landscape irrigation in semi-arid regions, like California, can substantially increase the frequency of erosive flows (AQUA TERRA Consultants 2004). However, because all streams are constantly undergoing change and adjustment, effects of impervious cover should be investigated in terms of changes in the rate of channel response in addition to the absolute magnitude of response.

Managing the effects of hydromodification requires attention to more than just the peak runoff. The work (or energy) that affects physical and biological channel structure results from movement of water and sediment controlled by runoff volume, flow magnitude and duration, frequency of erosive events, timing of high flows, and magnitude and duration of base flows (Konrad and Booth 2005, Montgomery and MacDonald 2002, Paul and Meyer 2001, Roesner and Bledsoe 2003). Changes in patterns of flow variability and increases in the frequency of high flows have been shown to have measurable effects on the community composition of stream biota (Konrad and Booth 2005). Because streams are coupled hydrologic, geomorphic, biologic systems, it is important to understand the various effects of all changes in surface runoff patterns and to develop appropriate management strategies for each potential effect.

As channels incise, they often go through a series of adjustment stages from initial downcutting, to widening, to establishing new floodplains at lower elevations (Figure 1). This process can occur over years or decades depending on the type of channel and flow regime. Sand-dominated channels may pass through the full sequence of stages in a few decades, whereas channels in more resistant materials, such as clay, may take much longer, in some cases 50–100 years (Roesner and Bledsoe 2003). Therefore, it is important to understand a channel's stage of adjustment, and target management strategies to account for current and expected future evolution of the channel form.

[1] Most studies evaluate the response of stream channels to "total impervious cover". However, a more appropriate assessment would be based on "effective impervious cover", i.e., the amount of impervious cover that is hydrologically connected to the stream channel. Assessment based on effective impervious cover is more likely to result in observed channel response at lower levels of imperviousness.

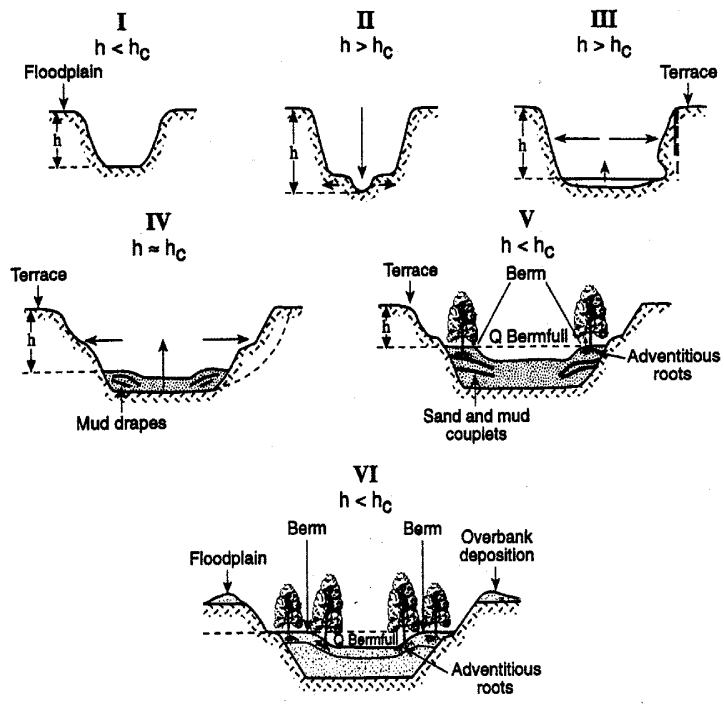

Figure 1: Stages of sand-bed channel adjustment (Schumm et al. 1984).

The pattern and rate of channel response to hydromodification will vary based on channel type and recent disturbance history (Montgomery and MacDonald 2002). Underlying geology, composition of bed and bank materials, slope, watershed position, and floodplain connectivity all affect channel response. Several stream classification systems have been developed over the years, including Shumm (1963), Montgomery and Buffington (1993), Rosgen (1994), and Church (2002). Most of these systems classify streams based on their sensitivity to change and therefore can be used to help assess, prioritize, and customize hydromodification management approaches. For example, Montgomery and Buffington (1993) define the following five channel types, listed from most to least resilient:

- Cascade
- Step pool
- Plane bed
- Pool riffle
- Dune ripple

Classification systems provide a useful starting point for evaluation of channel response to hydromodification; however, the classification systems above were developed in regions more humid and/or mountainous than those typical to California. Given differences in substrate and the extreme range of flows typically observed in arid regions, it is important to develop and regionally calibrate a classification system for dryland channels. Furthermore, the assessment of channel condition and the development of management strategies must be interpreted in terms of both spatial context (i.e. valley slope and position within the watershed) and temporal context (i.e. disturbance history) of the stream (Montgomery and MacDonald 2002). For example,

channel incision may be most dramatic in the middle portions of the watershed; however, these reaches may have stabilized, while the most active erosion and sediment production is occurring in smaller headwater channels. For these reasons, simplistic classification and assessment schemes based on channel appearance must be supported by in-depth geomorphic assessment, historical studies, and thorough understanding of physical and hydrologic processes.

Ultimately, some management strategies may vary based on the channel type, as well as the degree of current and anticipated hydromodification, while others may be more uniformly applied. For example, controlling the magnitude and duration of runoff may be an effective strategy for all stream types, while bioengineered streambank stabilization may only be effective for specific stream types under specific circumstances.

TECHNICAL APPROACHES TO ASSESSING HYDROMODIFICATION

The contemporary toolbox for assessing the effects of hydromodification consists of several technical approaches that may be combined in various ways. Continuous simulation hydrologic models can be used to assess elements in rainfall-runoff cycles and to describe conditions of flow in stream channels. These approaches can be used to assess the way changes in land cover may affect stream flow and to develop management strategies aimed at preventing or reducing such effects. A second, more involved approach, physical process modeling uses hydrologic models to predict changes in stream flow and to predict how these changes may affect the physical structure of the channel itself. This approach may couple hydraulic and sediment transport models, and/or incorporate geomorphic metrics to predict whether or not a channel will remain stable when subjected to the effects of hydromodification. Finally, risk-based assessments are used to account for the uncertainty associated with long-term cumulative effects of altered hydrology on stream channel flow, sediment transport, and stream geomorphology.

Continuous Simulation Modeling

Continuous simulation modeling provides a powerful tool for investigating the way rainfall-runoff patterns change over time with respect to normal climatic cycles and changes in land use practices. Hydrologic models integrate land use, precipitation, soils, topography, and other physical factors to simulate resultant runoff patterns. These models can be used to evaluate the way changes in the extent and distribution of impervious cover may affect flow magnitude, timing, frequency, and duration. In addition, continuous simulation models can be used to assess changes in the shear stress of channel beds and banks over time. Predicted shear stress (τ_{actual}) values can be compared to critical shear stress ($\tau_{critical}$) values associated with the onset of erosion in order to predict conditions that may result in initiation of scour. Recent studies in Ventura County have successfully used $\tau_{actual}/\tau_{critical}$ values between 1.2 - 1.5 as a threshold for initiation of channel scour along with an assessment of the frequency of occurrence of these erosive flow events (AQUA TERRA Consultants 2004). When using hydrologic models it is important to simulate runoff and erosion patterns over periods of at least 20-30 years. Short-term or single-event modeling is not sufficient to capture the continuous erosion and aggradation processes that occur during large and small storm events over extended periods of time.

Physical Process Modeling/Geomorphic Metrics

Physical process modeling aims to establish relationships between impervious cover, runoff patterns, and channel response based on field observations of changes in channel form over time. These field observations are used to derive mathematical relationships that can be used to predict channel response to changes in land use practices. Erosion Potential (E_p) is a geomorphic metric that has been used in several recent studies relevant to the effects of increased runoff associated with increases in impervious cover. The E_p represents the ratio of pre- and post-development erosive forces for a given stream type, expressed as:

$$E_p = \frac{W_{post}}{W_{pre}}$$

Where: W_{post} = Cumulative erosive energy or work after development
W_{pre} = Cumulative erosive energy or work before development

Where: Erosive energy is defined as the energy that is above the threshold of erosion for the stream boundary materials, also referred to as excess specific stream power

Values for E_p are derived for both the channel bed and bank, and the boundary that is more susceptible to erosion is used as the basis of setting response thresholds. The E_p of a stream channel should be evaluated based on long-term simulations (e.g. 50 yrs) or based on empirical data collected over extended periods of time. Geomorphic metrics can be used to project changes in channel cross-section area over time in response to increases in impervious cover, as shown in Figure 2, which describes the expected effect of increases in total impervious cover (TIMP) on channel cross-sectional area. Channel response thresholds can be inferred according to inflection points on the curve. In this plot, the upper curve is derived from southern California data; the lower curve is derived from data observed in other parts of the US. Expected threshold of response for southern California streams is approximately 4% (Coleman et al. 2005).

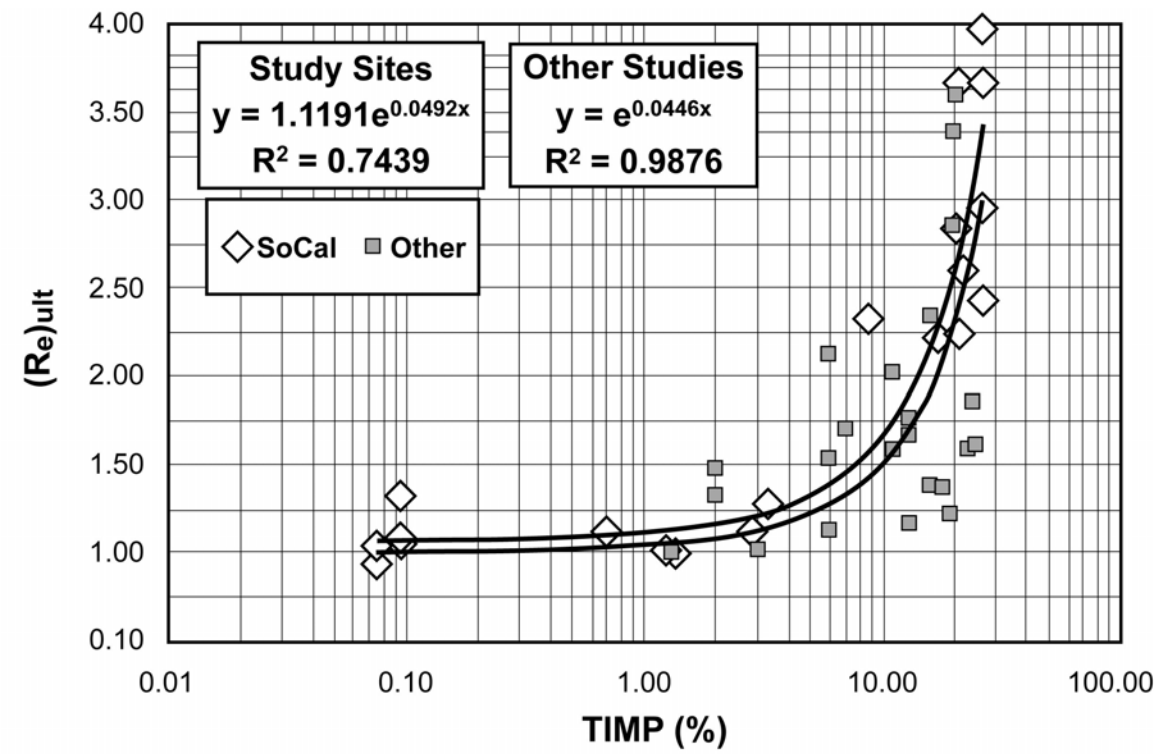

Figure 2: Enlargement curve showing expected effect of increases in total impervious cover (TIMP) on channel cross-sectional area. (Re) is the ratio of ultimate channel cross-sectional area to current cross sectional area. Upper curve is derived from data from southern California, lower curve is derived from data from other parts of the US. Expected threshold of response for southern California streams is approximately 4% (from Coleman et al. 2005 and C. MacRae).

It is important to note that curves such as those shown in Figure 2 assume a consistent hydrologic response to increased impervious cover. Long-term hydrologic simulations should be coupled with physical process models to fully explore these relationships and help validate the curves. Furthermore, different channel types respond differently to changes in runoff. Therefore, an enlargement curve, such as the one shown in Figure 2 for a single channel type, should be developed for each major channel type in a region in order to help focus the timing and location of strategic runoff management measures.

Risk-based Modeling

Unlike physical process modeling, which aims to establish response thresholds, risk-based modeling estimates the probability of channel response to increases in erosion potential associated with anticipated changes in runoff as a result of increases in impervious cover. Managers can then determine acceptable risk levels. Typically, risk-based modeling uses the output of continuous simulation or physical process models to generate time-series data relevant to flow and sediment transport. Often this type of modeling includes linear and logistic regressions, in addition to probability networks. These data are then used to estimate the risk of channel response with respect to anticipated changes in runoff volume and sediment. Figure 3 provides an example of the way logistic regression analysis can be used to estimate the likelihood of channel instability based on progressive degrees of erosion potential.

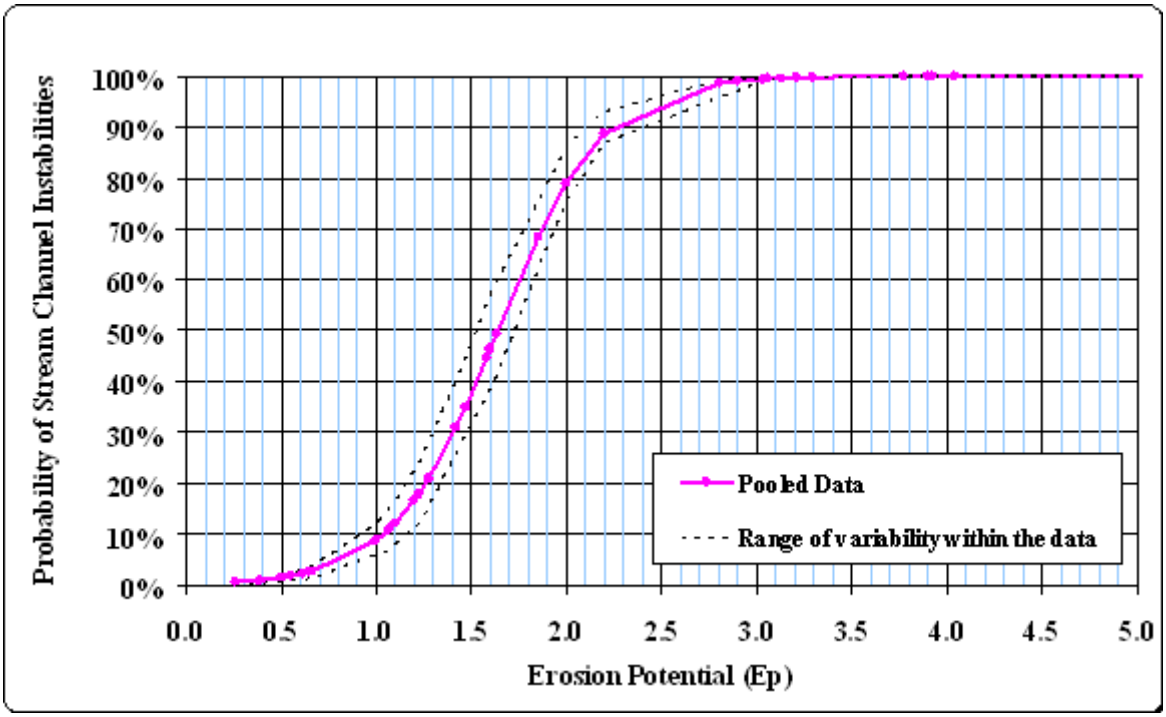

Figure 3: Logistic regression analysis showing the probability of various channel erosion potentials (from B. Bledsoe).

For studies conducted in the San Francisco Bay Area, an E_p value of 1.2 was proposed as an acceptable threshold based on a 15% probability of channel instability[2]. This was typically associated with approximately 3 - 6% impervious cover for channels in sand substrates and 10-12% for channels in clay substrates.

[2] The negotiated Ep value of 1.0 was adopted for the final Hydromodification Management Plan for Santa Clara Valley and included in a permit amendment for agencies in that area.

PRIORITY TECHNICAL NEEDS AND INFORMATION GAPS

Workshop participants identified five priority areas for additional research and data collection:

- Regional reference conditions for various stream channel types
- Links between geomorphic change and biologic effects
- Dynamic simulation models calibrated for local conditions
- Potential consequences of increased storm water infiltration from urbanized areas
- Ongoing monitoring programs to assess hydromodification impacts and to develop effective management strategies

Regional reference conditions for various stream channel types need to be established

Because most areas in the western US have been subjected to historic grazing or logging, many channels in this region have undergone some degree of change over time. Furthermore, the dynamic nature of this region's fluvial systems means that these streams are constantly undergoing some degree of change. Understanding the historic conditions of stream channels can provide valuable insight; however, historic conditions may not be the most appropriate "reference" in light of current constraints. Rather, reference should be considered a condition where stream channels are in a state of dynamic equilibrium under contemporary natural watershed processes. Once a regional reference condition is defined, data on flow, sediment movement, and geomorphology should be collected on an ongoing basis from representative reference stream reaches. These data will facilitate modeling that more effectively differentiates natural cycles from human-induced changes, especially during long wet or dry cycles where changes may be dramatic but infrequent.

Links between geomorphic change and biologic effects need to be more clearly defined

Hydromodification can cause a variety of physical changes to streams. However, hydrologic changes that are most relevant to biologic communities have not been well defined. For example, it is unclear how changes in base flow duration; peak flow magnitude, duration, and timing; or flow variability affect the structure and function of stream communities. Ultimately, there is a need to develop biologic indices to assess the effects of hydromodification and more effectively direct management strategies.

Dynamic simulation models need to be developed and calibrated for local conditions

Although continuous hydrologic simulation and physical process models have been developed for California streams, these models have not been routinely linked to the assessment of stream channel response to various forms of hydromodification. Hydrologic, physical process, and risk-based models are much more effective when used in combination and appropriately calibrated and validated for California streams. The resultant tool(s) can greatly improve assessments that predict the likelihood of stream channel response to anticipated changes in hydrology associated with changes in land use patterns. Model output may also be useful in the development of objective criteria for establishing land use practices that minimize

hydromodification effects, designing tools for best management practices (BMP) design, and evaluating the performance of management measures.

Potential consequences of increased storm water infiltration from urbanized areas need to be investigated

Infiltration of substantial volumes of storm water runoff from developed land surfaces may introduce unacceptable levels of contaminants into groundwater and/or shallow aquifers. The risk of groundwater contamination and the fate of pollutants introduced into subsurface waters need to be investigated by increased monitoring, development of coupled surface water-groundwater models, and implementation of demonstration projects.

Ongoing monitoring programs to assess hydromodification impacts and develop effective management strategies need to be designed and implemented

First, more extensive flow monitoring needs to be instituted to compensate for the difficulty of calibrating hydrologic models for un-gauged headwater streams. Second, regular geomorphic data needs to be collected from reference streams as well as streams subject to the effects of hydromodification. Routine measurement of channel cross-sections and substrate will greatly improve understanding of channel adjustment processes and allow better discrimination between natural and anthropogenic changes. Third, streams subject to various hydromodification management strategies need to be monitored and documented to support adaptive management and education on emerging techniques and strategies.

REGULATORY AND MANAGEMENT STRATEGIES

Regulatory Approaches to Address Potential Effects of Hydromodification

A variety of regulatory programs and tools exist to help in the regulation of hydromodification effects, including:

- Clean Water Act Section 401 certifications
- Total Maximum Daily Loads (TMDLs)
- Municipal storm water (MS4) permits under Section 402 of the Clean Water Act, and the associated Standard Urban Storm Water Mitigation Program (SUSMP) requirements
- Watershed Urban Runoff Management Plans (WURMPs) and the Watershed Management Initiative (WMI) which encourage municipalities to work cooperatively to manage issues such as hydromodification

In addition, California Environmental Quality Act/National Environmental Policy Act (CEQA/NEPA) processes can be used to better address hydromodification issues, especially with regard to cumulative effects.

Looking to the future, Regional Water Boards in California are considering development of numeric criteria and objectives for new development and redevelopment projects to offset and/or mitigate hydromodification effects. These objectives may involve requirements for managing flow and/or reducing effective impervious cover as well as strategies to maximize infiltration and reuse of storm water. Some Regional Boards are also considering ways to better coordinate with other regulatory agencies that have authority over hydromodification and stream alteration. Similarly, some State and Regional Water Boards are evaluating their existing regulatory authority over hydromodification and considering ways to strengthen their authority, particularly under section 401 of the Clean Water Act, or as part of
Basin Plans.

Management Approaches to Address the Effects of Hydromodification

Hydromodification is best addressed by using a suite of strategies, including site-design, restoration of degraded stream systems, as well as in-stream, on-site control, and regional controls. Managers need to identify the most appropriate set of strategies based on channel type and setting, channel adjustment stage, and amount of existing and anticipated impervious cover in the drainage catchment. However, attempting to have the post-development condition match pre-development runoff magnitude and duration should be an initial consideration for all circumstances.

Management strategies should address not only changes in peak flows but also changes in flow duration and sediment yield. Research to support development of several recent Hydromodification Management Plans indicates that post-project BMPs should ensure no change in runoff volume and cumulative duration of all flows greater than the critical flow for bed or bank mobility. Case studies of three Hydromodification Management Plans/Strategies are provided in Appendix B.

Over the long term, land-use planning, runoff management, as well as channel and floodplain restoration, should be the cornerstones of any hydromodification management strategy. The planning cycle for new development or re-development projects should begin with

hydromodification management assessment as part of the preparation of General and Specific Plans, master drainage plans, and zoning designations. Hydromodification effects must be managed with respect to long-term cycles; therefore, strategies should be adaptive. As conditions change and stream channels evolve, the management approaches must be adjusted. However, it is important to recognize that because changes to watershed hydrology are continual; it is unlikely that any management strategy will be able to achieve full hydrologic mitigation. Over the long term, some lasting physical and biological effects should be expected. Management goals should realistically reflect these anticipated changes.

The Center for Watershed Protection, the National Association of Homebuilders, the Water Environment Research Foundation, the Bay Area Stormwater Management Agencies Association, and others have developed resources that land managers can use to guide improved site design. A list of some of these resources is provided in Appendix C.

PRIORITY MANAGEMENT NEEDS

In response to rapidly developing technical tools, regulations, and management goals, workshop participants identified the following management and information priorities:

1. Establish mapping and classification of streams based on their susceptibility to hydromodification effects. Susceptibility should be evaluated with respect to both stream properties, potential for future increases in impervious cover, and concomitant changes in land use practices, such as supplemental irrigation. Such a system would help managers prioritize streams requiring protection and hydromodification management.
2. Model stream systems in ways that are useful for regulators to make decisions. Once models are validated with local data, output should be:
   - Readily understandable and usable by planners and managers
   - Easily interpreted by regulators for development of consistent requirements and evaluation criteria for the specific region
   - Readily used to develop standardized flow control sizing and design tools for BMPs, where applicable
3. Develop a series of management tools that can be easily used to make recommendations or set requirements relative to hydromodification for new development and re-development projects. These tools would utilize the results of monitoring, modeling, and assessment completed under previous projects to develop a series of plots, nomographs, checklists, or similar managerial tools. It is envisioned that ideally, tools should be developed for three different levels of analysis:

   Screening tools – Checklists or similar tools that allow planners and managers to evaluate whether or not a project is likely to involve substantial hydromodification issues.

   Effects tools – For projects that are considered likely to have hydromodification effects based on the results of the screening tool, this tool would serve as a nomograph or series of plots used to evaluate the expected magnitude or intensity of effects associated with a particular project. This tool could also be used to identify projects that should be subjected to subsequent in-depth analysis.

   Mitigation tools – Once the expected magnitude of effects are determined, this tool would be used to guide recommended mitigation and management measures. This tool could be a series of fact sheets, design criteria, and sizing standards to be used to aid in the development of standards or mitigation requirements.
4. Construct metrics and monitoring protocols to measure the effects of hydromodification on biological communities including riparian habitat.
5. Determine standard monitoring protocols for hydromodification effects and facilitate regional information sharing on project performance.
6. Evaluate the relative costs and benefits of hydromodification management at the site level (e.g. low impact development), and at the regional level (e.g. large retention and infiltration facilities). The economic costs of hydromodification have not been well documented, nor have the economic benefits of managing the physical and biological

effects of hydromodification. Information is also needed on the cost to maintain and manage hydromodification BMPs.

7. Establish recommended short-term measures for use while longer-term solutions, such as low-impact development and alternative site design are evolving.

In addition to management and information priorities, several institutional barriers were identified that may hinder effective management of hydromodification effects. Steps to overcome such barriers include:

A. Hydromodification management needs to be part of an integrated multi-objective management strategy. Stream planning and management should integrate hydromodification, water quality, flood control, and habitat management strategies as a whole rather than addressing each issue in isolation. Increased coordination between agencies, departments, and stakeholders should be strongly supported. Specifically, agencies that have authority over hydromodification and stream alteration should work toward coordinating regulatory approaches to achieve greater consistency.

B. Local ordinances need to be revised to facilitate integrating water quality and water quantity management into project design. These ordinances should be flexible enough to allow for variances from standard design requirements, such as curb and gutter and street width parameters, to help reduce impervious cover and increase infiltration.

C. Hydromodification needs to be addressed in both General and Specific Plans in terms of the location and design of new development. Site-by-site or project-specific approaches tend to be less effective and more costly to implement.

D. Better linkage between theory and practice need to be established through case studies, academic research, demonstration projects, and long-term BMPs monitoring.

E. Management of hydromodification needs to be incorporated into regional resource planning efforts, such as the Corps of Engineers Special Area Management Plans (SAMPs) or US Fish and Wildlife Service's Multi-species Habitat Conservation Plans. These regional planning efforts may be effective tools to address cumulative effects of hydromodification at the watershed scale.

F. A more effective public communication and education strategy needs to be developed. Property owners, local businesses, and community groups need to be better educated about the causes and effects of hydromodification in the context of the watersheds where they live and work. Simple definitions of streams and watersheds should be provided as part of the education strategy. Hydromodification effects need to be linked to health, aesthetic, recreational, and economic endpoints. Citizens should be made aware of simple actions, such as redirecting downspouts, using xeriscaping, and installing planter boxes, that help reduce hydromodification effects.

G. An ongoing working group should be established to coordinate research, monitoring, technology transfer, education, and management approach evaluation that includes all stakeholder groups.

CONCLUSIONS AND RECOMMENDATIONS

Presentations and discussions during the two-day hydromodification workshop resulted in the following key conclusions and recommendations:

Conclusions

- Physical degradation of stream channels in semi-arid climates of California may be detectable when basin impervious cover is between 3% and 5%. However, biological effects are probably occurring at lower levels.
- Frequent, 0.5-5 years, small runoff events, are most affected by hydromodification.
- Not all streams will respond in the same manner. Certain management strategies need to account for differences in stream type, stage of channel adjustment, current and expected amount of basin impervious cover, and existing or planned BMPs.
- Management strategies should address effects on flow magnitude, duration, and volume.
- Assessment of potential effects and suitability of possible management approaches must account for decadal scale climatic cycles and associated stream channel response.
- Improved site design is likely to be the most effective hydromodification management strategy and should be incorporated at the planning stage of a project.
- It is unlikely that all the effects of hydromodification can be fully mitigated. Changes in impervious cover will result in some changes to the flow patterns and ecology of the affected stream. Realistic management goals should be established to acknowledge long-term effects of increased impervious cover.

Recommendations

- Integrate management of hydromodification into a multi-objective strategy that addresses hydrology, water quality, flood control, stream ecology, and overall watershed and land use planning.
- Institute interim management measures until runoff management becomes a more standard and accepted element of site design, for example, low impact development principles become commonly accepted and implemented in all site designs.
- Establish and implement a stream channel classification system based on expected vulnerability of different streams to hydromodification-induced change.
- Establish appropriate regional reference conditions should for each stream type based on the established classification system.
- Develop and calibrate dynamic simulation models for local streams. Models that combine continuous hydrologic simulations, physical process models, and risk-based modeling will be the most effective.
- Establish ongoing regional hydromodification monitoring programs. These programs should collect flow and geomorphic data from reference streams, unmitigated streams impacted by hydromodification, and streams subject to hydromodification management measures. Helping to separate natural variability from urban-induced changes in stream condition should be a primary goal of such ongoing monitoring programs.
- Develop indices to assess the biological effects of hydromodification.

- Develop protocols for measuring the economic costs and benefits of hydromodification management. Assemble case studies that document these economic costs and benefits.
- Initiate a hydromodification workgroup to facilitate exchange of ideas and information on technical and managerial approaches.
- Increase public education about what can be done at homes, businesses, and in the community to address hydromodification effects.

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APPENDIX A – WORKSHOP AGENDA

HYDROMODIFICATION WORKSHOP AGENDA – October 2-3, 2005

SUNDAY EVENING, INVITED SESSION

5:00- 5:15 **Welcome and Introductions** – Eric Stein (Chair), *Southern California Coastal Water Research Project*

5:15 – 5:30 **Regulatory Perspective** – John Robertus, *San Diego Regional Water Quality Control Board*

5:30 – 6:30 ***Status of Science on Evaluating/Studying Hydromodification*** (panel discussion)

- Jeff Haltiner, *Philip Williams and Associates*
- Gary Palhegyi, *Geosytec Consultants*
- Craig MacCrae, *Aquafor Beech*
- Brian Bledsoe, *Colorado State University*
- Derek Booth, *University of Washington*

7:30 – 8:30 **Dinner and Open Discussion of Data Gaps and Areas for Future Research**

MONDAY, OPEN SESSION

8:30 – 8:40 **Welcome and Opening Remarks** – Chris Crompton (Chair), *SMC*

8:40 – 9:15 **Introduction to Hydromodification** – Jeff Haltiner, *Philip Williams and Associates*

9:15 – 10:15 ***Why is Hydromodification Such a Big Deal?*** (mini-panel discussion)

- Policy Perspective – Susan Cloke, *Los Angeles Regional Water Quality Control Board*
- Regulatory Perspective – John Robertus, *San Diego Regional Water Quality Control Board*
- Homebuilders Perspective – Marolyn Parson, *National Association of Home Builders*
- Natural Resource Perspective – Shelley Luce, *Santa Monica Bay Restoration Commission*

10:15 – 10:30 **Break ~**

10:30 – 12:30 **Hydromodification Research and Studies**

- Risk-Based Channel Stability Analysis for Urbanizing Watersheds – Brian Bledsoe, *Colorado State University*
- Changes in Streamflow Patterns from Urbanization: A Humid-Region Perspective – Derek Booth, *University of Washington*
- Modeling Urbanization Impacts and Channel Stability in Ventura County – Tony Donigian, *AQUA TERRA Consultants*
- Southern California Peak Flow study results and conclusions – Craig MacRae, *Aquafor Beech*
- Santa Clara Valley HMP Studies- Gary Palhegyi, *GeoSyntec Consultants*

12:30 – 1:30 **Lunch ~**

1:30 – 2:15 **Regulatory Response to Hydromodification**

- Northern California Perspectives – Larry Kolb, *San Francisco Bay Regional Water Quality Control Board*
- Southern California Perspectives – Xavier Swamikannu, *Los Angeles Regional Water Quality Control Board*

2:15 – 3:30 **Implementation of Hydromodification Management Practices**

- Contra Costa County – Dan Cloak, *Dan Cloak Consulting (for Contra Costa County)*
- Santa Clara Valley – Jill Bicknell, *Santa Clara Valley Urban Runoff Program*
- Newhall Land and Farming– Mark Subbotin, *Newhall Land and Farming Company*
- Control of Hydromodification Through Land Planning – Laura Coley-Eisenberg, *Rancho Mission Viejo*

3:30 – 4:30 **Panel Discussion on Implementation Issues** – Facilitated by Matt Yeager, *San Bernardino County Flood Control District*

- Rene DeShazo, *Los Angeles Regional Water Quality Control Board*
- Mark Abramson, *Heal the Bay*
- Marolyn Parson, *National Association of Home Builders*
- Jeff Haltiner, *Philip Williams and Associates*
- Jill Bicknell, *Santa Clara Valley Urban Runoff Program*

MONDAY EVENING, INVITED SESSION

5:30 – 6:00 **Welcome & Summary of Open Session** – Matt Yeager, *San Bernardino County Flood Control District*

6:00 – 7:00 **Dinner ~**

7:00 – 8:00 **Key Needs of Managers for Addressing Hydromodification** (panel discussion)

- Jeff Pratt, *Ventura County Watershed Protection District*
- Bill DePoto, *Los Angeles County Dept. of Public Works*
- Aaron Allen, *US Army Corps of Engineers - Regulatory Branch*
- Laura Coley-Eisenberg, *Rancho Mission Viejo*
- Jon Bishop, *Los Angeles Regional Water Quality Control Board*
- Rebecca Drayse, *TreePeople*

8:00 – 8:30 **General Conclusions and Outline for Workshop Report**

APPENDIX B – CASE STUDIES

Case Study 1 – Contra Costa County

Contra Costa County's Hydromodification Management Plan was developed in response to the National Pollutant Discharge Elimination System (NPDES) permit requirements from the San Francisco Bay Regional Water Quality Control Board. The goal of this Hydro-modification Management Plan (HMP) is to protect urban watersheds from ongoing hydro-modification by applying these requirements to development projects that are greater than or equal to 1 acre. They assist applicants to comply by providing designs and sizing factors. Permit conditions require municipalities to propose a plan to manage increases in flow and volume where increases could:

- Increase erosion
- Generate silt pollution
- Impact beneficial uses

The goal of these plans is to ensure that post-project runoff does not exceed pre-project rates and durations. Contra Costa's plan encourages Low Impact Development Integrated Management Practices (LID IMPs) and allows proposals for stream restoration in lieu of flow control where benefits clearly outweigh potential impacts. The plan includes four options for compliance:

1. Demonstrate project will not increase directly connected impervious area
2. Implement pre-designed hydrograph modification IMPs
3. Use a continuous simulation model to compare post- to pre-project flows
4. Demonstrate increased flows will not accelerate stream erosion

Management approaches are selected according to risk:

- Low risk = channelized systems
- Medium risk = channels in substrates with high bed and bank resistance
- High risk = all other channels

Project proponents need to develop a comprehensive analysis of management options for all high risk channels.

Case Study 2 – Santa Clara Valley

The Santa Clara Valley Urban Runoff Pollution Prevention Program's (SCVURPPP's) NPDES permit requires that increases in runoff peak flow, volume, and duration shall be managed for all projects involving one or more acres of impervious cover, where increased flow and/or volume can cause increased erosion of creek beds and banks. SCVURPPP's overall approach to creating a HMP was to conduct geomorphic and hydrologic assessments of three representative watersheds in the valley, conduct channel stability analyses to establish thresholds

for hydromodification control, develop design criteria for flow control measures, and provide guidance for best management practice implementation[3].

The performance criteria in the HMP state that post-project runoff shall not exceed estimated pre-project rates and/or durations, where the increased storm water discharge rates and/or durations will result in increased potential for erosion. Projects shall not cause an increase in Ep of the receiving stream over the pre-project (existing) condition. Furthermore, the Ep value should not be increased at any point downstream of the project. These requirements can be met with a combination of on-site and off-site control measures.

On-site controls should be designed to match flow-duration curves of post-development conditions to pre-development conditions for all flows between 10% of the 2-year peak flow and the 10-year peak flow. Example sizing of flow-duration basins are shown in Table B-1. Management measures are considered "practicable" if construction cost of treatment plus flow controls is less than or equal to 2% of project cost, excluding land value.

Table B-1: Basin Sizing Case Studies from the Santa Clara Valley Urban Runoff Program Hydromodification Management Plan (SCVURPPP Final HMP Report, 2005).

	Thompson	San Jose	Alameda
Basin Depth	4 feet	2.25 feet	2 feet
Basin Area	30 acres	0.06 acre	0.8 acre
Basin Size % DCIA	5.7% (4% catchment)	3.7% (1.7% catchment)	10% (7% catchment)
Drain Time	3 days (90% of the time)	< 1 day	1 day
Q_{cp} (low flow)	2.4 cfs	0.1 cfs	0.25 cfs
Infiltration Rate (rainfall)	0.2 inch/hour	0.2 inch/hour	0.5 inch/hour
Infiltration Rate (flow)	5.5 cfs	0.012 cfs	--

*cfs = cubic feet per second

This hydromodification management plan lays out on-site and in-stream options. Projects in highly urbanized areas with more than 90 % build out and a large percentage of impervious cover are exempt. Additional information on this program is available at www.SCVURPPP.org.

Case Study 3 – Newhall Land

Newhall Ranch is a specific plan approved for 26,000 homes in the Santa Clara watershed. Runoff from the proposed new development will be addressed by a Natural River Management Plan and a Newhall Ranch Stormwater Plan developed by the land owner.

[3] The Final HMP Report (April 2005) is available at http://www.eoainc.com/hmp_final_draft

The Natural River Management Plan is a long-term (20-year) master plan that provides for the construction of various infrastructure improvements to the Santa Clara River and tributaries. The plan maintains 15 miles of the Santa Clara River and its tributaries in a natural state with 75- to 200-foot setbacks from the river that sustains habitat quality and meets requirements for flood control. The plan calls for buried bank stabilization, instead of hardened systems, to meet county flood protection requirements and maintain habitat functions in riparian areas. Trenches have been dug far up from the streambed, filled with a compound called "sand cement" – similar to sandstone, then topped with soil, and replanted with native plant species.

The Newhall Ranch Stormwater Plan is a regional approach to storm water management that incorporates both water quality treatment and hydromodification control. The goals of this plan include:

- Reduction in percentage of impervious cover in the upper watershed using cluster design of development and maximizing open space
- Utilization of BMPs for both water quality and hydromodification source control
- Design of in-stream solutions that protect or enhance habitat.
- Incorporation of the "avoidance, minimization, mitigation" hierarchy in plan development

Case Study 4 – Rancho Mission Viejo

Rancho Mission Viejo, a private landowner, has voluntarily developed a set of land planning principles as part of a comprehensive land-use planning and resource management program for 25,000 acres in Orange County California. These planning principles will serve as self-imposed requirements, intended to minimize the effects of future development on natural streams in planning areas. Using these principles, the landowners are proposing to focus development on ridges, which are underlain by less pervious material, thereby preserving valleys which contain pervious areas that support infiltration important to creek functions.

Planning Principles:

Geomorphology/Terrains

- Recognize and account for the hydrologic response of different terrains at the sub-basin and watershed scale

Hydrology

- Emulate, to the extent feasible, the existing runoff and infiltration patterns in consideration of specific terrains, soil types, and ground cover
- Address potential effects of future land use changes on hydrology
- Minimize alterations of the timing of peak flows of each sub-basin relative to the mainstem creeks
- Maintain and/or restore the inherent geomorphic structure of major tributaries and their floodplains

Sediment Sources, Storage, and Transport

- Maintain coarse sediment yields, storage and transport processes

Groundwater Hydrology

- Utilize infiltration properties of sandy terrains for groundwater recharge and to offset potential increases in surface runoff and adverse effects to water quality
- Protect existing groundwater recharge areas supporting slope wetlands and riparian zones and maximize alluvial groundwater recharge to the extent consistent with aquifer capacity and habitat management goals

Water Quality

- Protect water quality using a variety of strategies, with particular emphasis on natural treatment systems, water quality wetlands, swales, and infiltration areas

APPENDIX C – ADDITIONAL RESOURCES

BASMAA's Start at the Source: Design Guidance Manual for Stormwater Quality Protection, 1999. Prepared by Tom Richman & Associates and CDM. Available from www.basmaa.org .

BASMAA's Using Site Design Techniques to Meet Development Standards for Stormwater Quality: A Companion Document to Start at the Source, 2003. Prepared by CDM. Available from www.basmaa.org

Better Site Design: A Handbook for Changing Development Rules in Your Community
Available for $35.00 from the Center for Watershed Protection at www.cwp.org, under the "Publications" tab.

Redevelopment Roundtable, Consensus Agreement, Smart Practices for Redevelopment and Infill Projects.
Available for free download from the Center for Watershed Protection at www.cwp.org, under the "Publications" tab; it is listed with the "Better Site Design" publications.

Builders for the Bay Program
Information about this program, which is joint project of the Alliance for the Chesapeake Bay, the Center for Watershed Protection and the National Association of Home Builders, can be found at http://www.cwp.org/builders_for_bay.htm.

The Practice of Low Impact Development
Available for $5.00 from the U.S. Department of Housing and Urban Development, at http://www.huduser.org/publications/alpha/alpha.html. It is also available for $50.00 from the NAHB Research Center's bookstore at www.nahbrc.org.

National Association of Homebuilders Research Center
"Builder's Guide to Low Impact Development" and "Municipal Guide to Low Impact Development". Available for free download from
http://www.toolbase.org/tertiaryT.asp?TrackID=&CategoryID=36&DocumentID=3834

"Growing Greener: Putting Conservation into Local Codes". Available for free download from http://www.dcnr.state.pa.us/growinggreener/growinggreener.htm.

Low-Impact Development Design Strategies: An Integrated Approach; Low-Impact Development Hydrologic Analysis
Both are available for free download from US Environmental Protection Agency's website at http://www.epa.gov/owow/nps/lid/.

Truckee Meadows Structural Control Design Manual: Guidance on Source and Treatment Controls for Storm Water Quality Management - Kennedy/Jenks Consultants
http://ci.reno.nv.us/gov/pub_works/stormwater/management/controls/pdfs/TOC.pdf

National NEMO (Non Point Education for Municipal Officials) Network - Educational Materials on the link between land use and water quality
http://nemonet.uconn.edu/

Physical Effects of Wet Weather Flows on Aquatic Habitats: Present Knowledge and Research Needs , by L.A. Roesner and B.P. Bledsoe – Water Environment Research Foundation, 2003.
http://www.werf.org

Impacts of Impervious Cover on Aquatic Systems – Center for Watershed Protection, 2003.
http://www.cwp.org/

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EXECUTIVE SUMMARY

Municipal stormwater management for local governments has evolved over time from an urban flood control function, to a water and resource management function, to an environmental protection and regulatory function. All three functions now co-exist as responsibilities of local government. This evolution has forced changes in how stormwater systems are planned, designed, constructed, operated, and financed. More specifically, the stormwater function has evolved from a basic capital construction and maintenance program supported primarily by local taxes, to a program of integrated water resource management, environmental enhancement, and recreational services requiring a multi-faceted benefit based finance system.

The focus of this guidance is to provide a resource to local governments as they address contemporary stormwater program financing challenges. The guidance includes procedural, legal, and financial considerations in developing viable funding approaches. The guidance examines a range of possible approaches to paying for stormwater management, but the focus is on guidelines for developing service/user/utility fees to support these programs. The terms service fee, user fee, and utility fee may be used interchangeably in this guidance. Chapter 2 addresses various sources of funding. Chapter 3 covers legal considerations, and implementation of stormwater funding programs is discussed in Chapter 4.

SOURCES OF FUNDING

“Needs” are the key driver of stormwater programs and funding development. Without a well defined stormwater service need, there will not be basic support and success will be less likely. When considering how to develop and finance a stormwater program it is important to prepare a business plan that identifies strategic decisions and guides the program evolution and funding decisions. Emerging trends in funding practices include increasing complexity, blended funding, multi-jurisdictional funding, cost-sharing with other public programs, broader private sector participation, and increasing influence of technology and data.

Stormwater management has historically been supported by a range of funding methods and mechanisms that reflect a mix of federal, state and local programs. While the focus of this guidance is on service fees, other stormwater program funding mechanisms include general revenue appropriations; plan review, development inspection, and special user fees; special assessments; bonding for capital improvements; in-lieu of construction fees; capitalization recovery fees; impact fees; developer extension/latecomer fees; and federal and state funding opportunities such as grants, loans and cooperative programs.

There are several criteria that are commonly used to evaluate and select methods for design of service fee rate structures. They include legality, equity, revenue sufficiency, flexibility, balance of rates with level of service, data requirements, compatibility with data processing systems, consistency with other local funding and rate policies, and revenue stability and sensitivity. The fundamental objective of a service fee/utility is attainment of equity. Service fee rate methodologies are designed to attain a fair and reasonable apportionment of cost of providing services and facilities.

Design of stormwater service fees must meet general and technical standards. A rate structure analysis is performed to determine how costs might be apportioned among those who are served in various ways by expenditures for maintenance and operations, capital improvements, and support activities. Impervious area, gross area, percentage imperviousness, and land use are the parameters most frequently used to determine rate structures. Services fees are generally cost-based and are designed to reflect the impacts that each property has on stormwater service demands. Such costs are primarily a function of the peak stormwater runoff rate, the total volume of discharge, and pollutant contributions.

There are four rate structure concepts or methodologies used as examples in this guidance that are typical of those adopted in the more than five hundred communities that have established stormwater utilities. These examples base their fees on impervious area, a combination of impervious area and gross area, impervious area and the percentage of imperviousness, and gross property area and the intensity of development.

LEGAL CONSIDERATIONS

The type of funding mechanism selected for a stormwater utility or stormwater management program has a variety of legal consequences. Taxes, service fees, special assessments, impact fees and other revenue sources can be used, but each approach will have different implications in terms of who will pay, what procedures must be followed to implement and collect the charge, and how the money can be used. If the funding approach is deemed to be a tax, then tax-exempt entities such as churches, schools, state agencies and federal government facilities will contest their obligation to pay. If a service fee approach

is used, the reasonableness of the rate structure and its relationship to the service being provided may be challenged. In many states special taxpayer approval must be sought.

The distinctions between the various funding approaches are often blurred. In general, a tax is an enforced burden imposed by sovereign right for the support of the government, the administration of law, and the exercise of various functions the sovereign is called upon to perform. Many states have constitutional or statutory restrictions on the ability of local governments to levy taxes, which do not apply to fees or charges.

User/service fees are charges based upon the proprietary right of the governing body permitting the use of the instrumentality involved. Fees have traits that distinguish them from taxes. First, they are charged in exchange for a particular governmental service which benefits the party paying the fee. Second, they are voluntary, in that the party paying the fee has the option of not utilizing the governmental service and thereby avoiding the charge. Third, the amount of the fee is designed to recover the actual cost of the service being provided. In some cases there may be little practical difference between a tax and a fee, but the legal distinctions between the two are important.

Stormwater service fees have been the subject of litigation resulting in reported opinions from at least 17 states, including many cases involving final decisions by the state's highest court. In addition, there have been unreported decisions from lower courts in states that have involved similar challenges to local stormwater fees. Based on these cases, certain common themes have emerged.

The question of whether a service charge is actually a "tax" has been the issue most frequently litigated. Other reoccurring issues involve whether or not the charge is voluntary, is it a fee or special assessment, is the fee "reasonable" and directly related to the cost of providing the service, are the properties charged fees receiving proportionate benefit from the services provided, and must fees be confined to cost of providing stormwater services alone or may any surplus be applied to capital improvements.

Determining the legality of a specific financing mechanism chosen will depend upon a close analysis of state law. Nevertheless, certain general principals emerge from the cases examined. First, for a stormwater service charge to be regarded as a fee, rather than a tax, the overall cost of the program must be reasonably related to the service being provided, and the funds raised must be segregated for use by the stormwater program. Second, the fee should be proportional to the property's contribution to stormwater runoff. Third, participation in the program should be characterized as "voluntary". And forth, in states with constitutional provisions governing the imposition of any new tax, it may be necessary to seek voter approval for a fee even if it is designed to be service-based.

The imposition of stormwater service fees on federal facilities involves a special consideration of the tax vs. fee issue. In principal, states cannot tax the United States (Chief Justice Marshall's opinion in *McCulloch v. Maryland*, 1819). On the other hand, it is well-established law that the United States must pay reasonable user fees. Furthermore, the Clean Water Act contains an express waiver of sovereign immunity for certain pollution control related fees. Importantly, this waiver applies only to fees or service charges, and not to taxes.

The United States Supreme Court has established a three-pronged test for determining whether fees imposed on federal facilities are "reasonable service charges" or taxes. First, is the fee or service charge non-discriminatory? Second, is it a fair approximation of the cost of the benefits received? And third, is it structured to produce revenues that will not exceed the regulator's total cost of providing the benefits?

IMPLEMENTING USER-FEE BASED FUNDING

The evolution in stormwater program expectations, which is motivating the movement to utility based funding, requires that more than just the revenue mechanism be evaluated. The function, service and performance of the stormwater program itself become a focal point in the effort to develop a stormwater funding mechanism.

A stormwater utility should be seen as an umbrella under which individual communities address their own local problems, priorities and practices. A stormwater utility provides a vehicle for:

- consolidating or coordinating responsibilities previously dispersed among several departments;
- generating funding that is adequate, stable, equitable and dedicated solely to the stormwater function; and
- developing programs that are comprehensive, cohesive and consistent year-to-year.

Implementing user fee based funding involves a related set of actions and activities occurring within a flexible process framework. That framework promotes "due diligence" in five key areas of focus; political, financial, legal, informational, and technical. Bringing about change in the current stormwater program and implementing user based funding requires an understanding of current needs and problems, a vision for the future and a process framework. The use of a citizens/stakeholder participation group and a business plan approach can help build a compelling case for action.

The process framework should include a “quick concept study” which assesses the advisability of proceeding; a “feasibility study” which conducts the detailed assessment of the stormwater program and funding and develops recommendations; and, the “utility implementation process”.

The utility implementation process directs the planning and implementation effort along four tracks of activity. The “Public Track” insures stakeholder involvement and education. The “Program Track” matches program structure to stakeholder expectations. The “Finance Track” insures the legality, equity and adequacy of the funding mechanism; and, the “Database Track” determines the means to compute, deliver, collect and record the charge to be imposed on each property.

The analysis of stormwater utility funding has many policy implications. Policy making usually involves the mayor and council. Day-to-day policy decisions are often made at several levels under guidance set by the mayor and council. A recommended hierarchy for review of important issues is: key staff and consultants, other involved staff, advisory committee, manager’s office, and mayor and council.

CASE STUDIES

Five case studies are examined for City of Bellevue, Washington; City of Charlotte/Mecklenburg County, North Carolina; City of Tulsa, Oklahoma; Louisville/Jefferson County Metropolitan Service District, Kentucky; and Sarasota County Stormwater Environmental Utility, Florida. For each example the following is generally provided: keynotes, community profile, formation process, service area, role and program, local government structure, organization and staffing, funding, inter-governmental cooperation, and public participation.

The City of Bellevue stormwater management program was established in 1974 and was one of the first to give equal consideration to water quantity and quality. Bellevue’s Storm and Surface Water Utility provides a full range of capital infrastructure and operational services, primarily through in-house staff. Funding is primarily derived from a user fee that is based on gross property area and a factor reflecting the intensity of development of each property. Residential fees range from $3/month to over $20 per month with an average of about $10/month. The annual operating budget is approximately $6 million. The population of Bellevue was about 117,000 in 2005.

The Charlotte/Mecklenburg County approach relies on centralized funding and regional programs for major systems combined with local management of minor stormwater systems. The County, City of Charlotte, and towns have a high degree of self-determination in deciding service levels to be provided by local systems, programs and funding. Funding of the program is primarily supported by a composite stormwater service fee that includes both regional and local

components with the County controlling the regional component and local governance controlling the local component. The City of Charlotte and small towns typically employ a blend of funding from several sources while the County relies almost entirely on the service fee.

In 2005 the population of Mecklenburg County was about three quarter million and the population of Charlotte was about 650,000. The County utility was instituted in 1994. The total stormwater budget for all entities in 2005 was over $85 million with a large part allocated to capital betterments. The fee for a single-family house is $1.06/month throughout the County. Local stormwater programs of the County, cities and towns are funded by a separate additional rate component which ranges from $0.30/month to $6.72/month in Charlotte.

The Tulsa Stormwater Management Utility was founded in response to a devastating flood that killed 14 people and caused nearly $220 million in property damage in 1984. A Department of Stormwater Management was established in 1985 centralizing responsibility for all City stormwater activities, and a stormwater utility fee was established by ordinance in 1986 to fund the program. The stormwater program budget has recently ranged from $12 million to $14 million per year. All residential properties are charged a single rate of $3.49/month, and fees for other properties are based on the amount of imperviousness on each property. The population of Tulsa was about 400,000 in 2005. The program includes comprehensive watershed management, dedicated funds for maintenance and operation, and a $200 million capital improvements program.

The Louisville approach involves a consolidation of flood control and stormwater management with a regional wastewater collection and treatment program provided by the Metropolitan Sewer District (MSD). Most of the smaller cities and towns in Jefferson County do not perform stormwater management functions. Funding of MSD is primarily from wastewater and stormwater service fees, which are independently structured and billed. The accounting is kept separately for each function.

The methodology of determining the stormwater fees in Louisville/Jefferson County is based on impervious area. There is flat rate for single-family residential properties, and differential rates for other properties based on a impervious area equivalency unit. The single-family residential stormwater service fee in was $4.41/month. Stormwater service fee revenues in fiscal year 2005 were expected to be nearly $24 million. There are more than 90 cities and towns in Jefferson County. Most, but not all, cities are included in the stormwater program. Louisville had a population of about 700,000 in 2005.

Sarasota County, Florida established a Stormwater Environmental Utility in 1989. Primary objectives of the Utility are to reduce flooding, improve surface water quality, and attain responsible development practices. A Florida Supreme Court decision in 1996 determined that the Sarasota County charge is a special

assessment rather than a service fee. As such, it is subject to the standards applicable to assessments, which emphasize apportionment of special benefit, rather than reflecting the cost of service burden imposed on properties. The benefit assessments have three components that are consistent across the service area, and one component, system capitalization, that is variable by watershed.

The Utility budget in 2005 was approximately $23 million with about $10 million for capital projects. The benefit assessment takes both pervious and impervious areas on each property into account. On average, a medium size single-family residence is assessed $6.70/month. Sarasota County had a resident population of about 340,000 in 2005. There are four cities in the County. The city of Sarasota through an inter-governmental agreement relies on the County to improve its drainage system and perform most stormwater operations. The other three cities retain responsibility for local stormwater systems.

CHAPTER 1

BACKGROUND AND INTRODUCTION

Municipal stormwater management for local governments has evolved over time from an urban flood control function, to a water and resource management function, to an environmental protection and regulatory function. All three functions now co-exist as responsibilities of local government. This evolution has forced changes in how stormwater systems are planned, designed, constructed, operated, and financed. More specifically, the stormwater function has evolved from a basic capital construction and maintenance program supported primarily by local taxes, to a program of integrated water resource management, environmental enhancement, and recreational services requiring a multi-faceted benefit based finance system.

The focus of this guidance is to provide a resource to local governments as they address contemporary stormwater program financing challenges. The guidance includes procedural, legal, and financial considerations in developing viable funding approaches. The guidance will examine a range of possible approaches to paying for stormwater management, but the focus will be on guidelines for developing service/utility/user fees to support these programs. Chapter 2 will address various sources of funding. Chapter 3 will cover legal considerations, and implementation of stormwater funding programs is discussed in Chapter 4.

WHAT IS MUNICIPAL STORMWATER

Municipal stormwater is surface water runoff from public and private lands in urban areas. Typically municipal stormwater is collected in municipal separate storm sewer systems consisting of drains, pipes, and ditches, and conveyed to nearby streams, rivers, lakes, estuaries, basins, wetlands, and oceans carrying with it a variety of urban pollutants.

The United States Environmental Protection Administration (EPA) in their Phase I Municipal Stormwater regulations defined stormwater to mean "…storm water

runoff, snow melt runoff, and surface runoff and drainage." In their Phase II stormwater regulations EPA defined a "municipal separate storm sewer" to mean in part, a conveyance or system of conveyances, including roads with drainage systems and municipal streets, that is owned or operated by a State, city, town, borough, county, parish, district, association, or other public body designed or used for collecting of conveying storm water which is not a combined sewer and which is not part of a Publicly Owned Treatment Works.

The nature of stormwater runoff from a given rainfall or snow event changes as an area urbanizes and more impervious surfaces are created and the landscape and drainage patterns are modified. The volume of runoff, rate of flow, and quality of runoff all change as a result of this urbanization.

HISTORICAL DEVELOPMENT OF STORMWATER SYSTEMS

In the late 1800's and early 1900's combined sewers were built to convey and dispose of both sanitary sewage and stormwater. Eventually, local governments began to separate storm flows from wastewater flows and separate sanitary sewer and storm sewer systems replaced combined sewer systems in many areas. Early municipal storm sewer systems were designed to discharge stormwater rapidly, and included such physical elements as curbs, gutters, inlets, storm sewers, roadside ditches, and concrete and grassed lined open channels.

Thinking began to change in the 1960's and 1970's with the recognition that efficient stormwater systems also transferred problems downstream. With a need to reduce the rate and volume of these stormwater discharges, many local governments started requiring new developments to construct stormwater detention facilities.

In the 1980's and 1990's stormwater quality became a focus of federal regulatory requirements and local governments have had to develop stormwater quality programs in response. Under an evolving regulatory mandate a few local governments are beginning to recombine dry weather flows in storm sewers with sanitary sewage and directing both to treatment plants.

NEW PARADIGM

The character of the stormwater management function has, and continues to change significantly. Originally stormwater systems were built just for conveyance, but stormwater is now a component of a comprehensive integrated urban water resource, environmental enhancement, and recreational services system. Contemporary stormwater management is a multi-dimensional function which includes quantity and quality considerations, multiple-use facilities, riparian

corridors, recreation, wetland preservation and creation, and groundwater recharge.

Stormwater has become a part of the “total” water resources picture and is the third leg of the local government water service stool consisting of water development, treatment, and distribution; sewage collection, treatment, and disposal; and stormwater quantity and quality management. Other more specific changes include recognition of stormwater as a resource; restoration of streams and rivers; preservation of riparian areas and corridors; use of detention areas as parks, playfields, and wetlands; creation and/or restoration of wetlands to provide water quantity, quality, and environmental benefits; capturing stormwater to meet water supply needs; recognition that homes near greenbelts sell for a premium; and evaluation of stormwater from a comprehensive watershed perspective.

Most of these changes recognize stormwater as a resource, but liabilities have also evolved. For example, the disposal of “polluted” stormwater and of sediments accumulated in detention/retention facilities is now a performance issue for local governments. As a result of the evolving regulatory framework stormwater quality issues are now a required part of the urban water resources service sector. The reality is that stormwater quality and quantity are joined at the hip in today’s stormwater management programs.

The new paradigm has introduced a whole new array of issues that has resulted in basic changes in stormwater planning, design, operation and maintenance, construction, and financing. These changes have also resulted in greater public expectations. In addition to the effective control of drainage and flooding, the public also expects riparian corridors, wetlands, recreation amenities, trails, visually pleasing facilities, and a continued maintenance effort. Stormwater managers now must find the resources to effectively satisfy these expectations as well as the regulatory requirements.

To meet the challenges of the new paradigm some urban stormwater programs are evolving into multi-functional operations. Table 1-1 provides a listing of major stormwater management components for a utility/service fee type program. Not all programs will be this comprehensive, but many local governments in order to meet public expectations will likely move in this direction over a period of time.

Table 1-1: Major Stormwater Management Functional Centers[1]

Administration
- General Administration
- Prog Planning and Development
- Interagency Coordination

Public Involvement & Education
- Public Awareness & Education
- Public Involvement
- Standing Citizen's Group

Billing and Finance
- Billing Operations
- Database Management
- Customer Service
- Financial Management
- Capital Outlay
- Overhead Costs
- Cost Control
- Support Services

Stormwater Quality Mgmt
- Quality Master Planning
- Retrofitting Program
- Monitoring Program
- Struc and Non-Struc BMP Progs
- Pest, Herb and Fertilizer
- Used Oil & Toxic Materials
- Street Maint Prog
- Spill Response and Clean Up
- Prog for Pub Ed and Reporting
- Leakage and Cross Connections
- Industrial Program
- Gen Com and Residential Program
- Illicit Con and Illegal Dumping
- Landfills and Other Waste Facilities
- Combined Sewer Overflow Program
- Groundwater & Wellhead Protection
- Drinking Water Protection
- Watershed Assessment & TMDL
- Septic and I&I Program

Engineering & Planning
- Des Criteria, Stds and Guidance
- Field Data Collection
- Master Planning
- Design, Field and Ops Engineering
- Hazard Mitigation
- Zoning support
- Multi-objective Planning Support
- GIS and Database Management
- Mapping
- Land Use Planning & Controls

Operations
- General Maintenance Management
- General Routine Maintenance
- General Remedial Maintenance
- Emergency Response Maintenance
- Infrastructure Management
- Public Assistance

Regulation and Enforcement
- Code Dev and Enforcement
- General Permit Administration
- Drainage Sys Insp & Reg
- Zoning and Land Use Reg
- Special Inspection Programs
- Flood Insurance Program
- Multi-Obj Floodplain Management
- Erosion Control Program

Capital Improvements
- Major Capital Improvements
- Minor Capital Improvements
- Land, Easement, and Right-of-Way

[1] Table 1-1 provided by Hector Cyre, Water Resource Associates, Inc., Friday Harbor, Washington, 2005

LEGISLATIVE PERSPECTIVE

Legislative action has dramatically changed the face of contemporary stormwater management. This includes passage of laws, adoption of regulations, and interpretation of laws and enforcement of regulations by the courts at local, state and federal levels. These legislative activities impact all aspects of stormwater management by local governments, as well as the private sector, such as developers who provide basic infrastructure as a part of their developments, industrial facilities that discharge stormwater from their properties, and those conducting ground disturbing construction activities.

Initially stormwater was considered a common enemy and was solely a local issue. Local governments constructed stormwater systems to address local drainage service needs and flooding problems. Property owners had the right to protect their property from stormwater as long as unreasonable harm was not inflicted on other properties. Today as a result of the Clean Water Act (CWA), stormwater is also a state and federal issue, and landowners are required to detain stormwater on their property and provide a level of treatment.

Passage of the 1972 CWA signaled the beginning of a serious national effort to improve the quality of the nation's streams, rivers, lakes, wetlands, estuaries, bays, and oceans. The CWA required dischargers of "point sources" of pollution such as sewage treatment plants to obtain National Pollutant Discharge Elimination System (NPDES) permits in order to discharge pollutants into the nation's waters. Initially municipal stormwater was considered a non-point source of pollution and NPDES permits were not required of municipal stormwater dischargers.

However, stormwater was defined as a point source of pollution in the early 1980's pursuant to a federal court decision brought by the Natural Resources Defense Council against the EPA. This marked the beginning of the municipal stormwater quality mandate through the NPDES permit program. In addition to NPDES permit requirements, municipal stormwater systems are also now subject to Total Maximum Daily Load (TMDL) requirements of the CWA.

NPDES permits typically require pollutant dischargers to meet numerical effluent limits at the end of the discharge pipe. Because it is difficult to apply this standard to stormwater systems, the CWA was amended in 1987. Section 402(p) was added to the CWA defining basic permit compliance requirements for municipal stormwater runoff that are different than those for typical point source discharges such as from sewage treatment plants. Section 402(p) required municipal storm sewer systems to reduce pollutants discharged from municipal stormwater systems to the maximum extent practicable (MEP). MEP is thus the standard of treatment for municipal stormwater and its definition is very important.

The following, from the Federal Register, December 8, 1999, p. 68754 publishing NPDES Phase II stormwater regulations, is EPA's interpretation of the meaning and intent of the MEP standard.

> "Maximum extent practicable (MEP) is the statutory standard that establishes the level of pollutant reductions that operators of regulated MS4s must achieve. The CWA requires that NPDES permits for discharges from MS4s 'shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods.' CWA Section 402(p)(3)(B)(iii). This section also calls for 'such other provisions as the (EPA) Administrator or the State determines appropriate for the control of such pollutants.' EPA interprets this standard to apply to all MS4s, including both existing regulated (large and medium) MS4s, as well as the small MS4s regulated under today's rule.
>
> For regulated small MS4s under today's rule, authorization to discharge may be under either a general permit or individual permit, but EPA anticipates and expects that general permits will be the most common permit mechanism. The general permit will explain the steps necessary to obtain permit authorization. Compliance with the conditions of the general permit and the series of steps associated with identification and implementation of the minimum control measures will satisfy the MEP standard.
>
> Implementation of the MEP standard under today's rule will typically require the permittee to develop and implement appropriate BMPs to satisfy each of the required six minimum control measures."

The federal/state/local relationship regarding stormwater management was fundamentally changed by the 1987 CWA amendments and subsequent regulations. There is now a federal mandate that local governments address stormwater quality through the NPDES permit mechanism, and there is federal and state oversight on how, and how well it is done. Drainage and flood control is still a discretionary activity, but stormwater quality management is now required of most all local governments

STORMWATER AS A SERVICE

Uncontrolled stormwater flows can be a danger to both the constructed and natural environments, and the control of stormwater and the pollutants it carries is a difficult and expensive task. Implementation of stormwater management programs and measures by local government, therefore, creates a service benefit for the lands and improvements so served.

Public and private properties are benefited in several ways through the new stormwater management paradigm. Benefits include recreation opportunities, community aesthetics, environmental enhancement, flood damage reduction, protection of transportation systems, development of urban trail corridors, handling of excess drainage from public and private properties, maintaining property access, protecting and providing water supply, providing regulatory compliance, protecting property values, and providing long term system maintenance. Also, where there is a community stormwater program with oversight and management, the service benefit can include system planning and engineering, development of design criteria, flood warning systems, NPDES compliance plans and BMP's; and publication of resource information.

It is important to realize that a long-term obligation is created when stormwater infrastructure is added and stormwater programs are developed. For example, all the stormwater facilities that have been constructed, and will be constructed as a result of new development or redevelopment, must be maintained in perpetuity. NPDES regulations require municipal permit holders to assure the maintenance and continuation of these new facilities and programs. Further, implementation of NPDES permit requirements will most likely intensify in the future.

The significant and continuing capital construction, operation and maintenance requirements for storm sewer systems, stormwater quality facilities, pollutant source control programs, flood control facilities, vector control, drainage corridors, detention facilities, wetlands, etc., is beyond the capacity of individual property owners, and are services provided by the local government stormwater service program.

ISSUES AND CHALLENGES FOR LOCAL GOVERNMENTS

The new stormwater paradigm presents many issues and challenges. What is to be the design and content of the stormwater program, what will it cost, who pays, who decides, and how will it be funded? Among these, cost and how to fund it is of significant importance to local government.

Local governments are expected by their citizens to provide and fund basic services such as police and fire protection, local transportation systems, sewage treatment, water supply, libraries, social services, and recreation. Stormwater quantity and quality must now be added to that list. The new paradigm requires the development of institutional and funding frameworks to support this long-term responsibility.

There are legal and equity issues imbedded in the funding considerations. Funding of stormwater systems must be relevant and proportional to services or

benefits provided, or in other words, it must be fair and legal. It will be critical for funding options, particularly those that include utility/user fees, to be based on sound legal principals to avoid challenges.

Local governments will likely be facing changing rules. Municipal stormwater management systems will need to have flexibility to adjust to changes in regulations, regulators, legislation, public demands, and court decisions. For example TMDLs are developing as a new performance issue for local governments. If stormwater discharges contain pollutants contributing to the impairment of a water of the nation, additional control requirements may be imposed and additional costs incurred.

Cost and effectiveness are major considerations for local government when developing stormwater management programs. MEP is the current CWA regulatory standard to which stormwater programs are held. Cost and effectiveness should be factors (others include regulatory compliance, public acceptance, and technical feasibility) in the selection of BMPs and in the approval by regulators of stormwater management programs.

Partnership opportunities are available to local government in implementing stormwater quality programs. Local governments can develop individual stormwater programs to meet regulatory requirements; or they can join together in partnership with other local governments, including cities, counties, and special districts in the conduct and financing of the stormwater program. There is good potential for cost savings when local governments work with others in implementing control measures required in their permit.

There are governance decisions to be made. Local governments can implement a stormwater program through an existing organization, they can set up a new department or organization, or they can develop some combination of the two. The decision could influence the funding structure that is used.

Ultimately, all issues and challenges focus attention on cost and how it is funded. The focus of this document is on service/user/utility fees which addresses an important element of the funding challenge.

CHAPTER 2

SOURCES OF FUNDING

FUNDING STRATEGIES

Money, Revenue, and Resources

In formulating a funding strategy for any local government program it is often helpful to think of a framework of money, revenue, and resources that can be selectively applied to specific needs. Cumulatively they provide the financial support required for the mix of capital, operating, and non-operating expenditures. It is important to recognize the distinctions that influence their capability and suitability for various tasks, and how they can best be orchestrated.

"Money" encompasses a range of sources and types of funds that can be tapped to support stormwater services and facilities. Appropriations of general revenues, proceeds of bond sales and special-purpose sales taxes, and transfers from other accounts represent "money" that have all been used to support stormwater programs, either on a one-time basis, temporarily, or as a part of a long-term funding strategy.

"Revenue" is a term usually used in specific reference to the cash flow generated by user fees of various sorts and other relatively consistent income streams such as charges, assessments, rentals, fines, etc. Most stormwater utilities have a periodic charge generally applied to all customers. They may also have other revenues generated through special fees applied to individual customers or classes of customers (e.g., plan review and inspection fees), special assessments, and capital recovery fees of various sorts. In some cases, revenue supports other funding mechanisms, as in the allocation of user fee revenue to service bond debt.

"Resources" that support stormwater programs take many forms, ranging from developer-contributed capital facilities, to federal and state grants and loans, to

maintenance of public drainage systems performed by homeowners' associations and private property managers, to land and easement dedications and other exactions. They also include a variety of funding mechanisms that are commonly used to structure how money and resources are applied to specific objectives, for example bond issues that are used to fund capital infrastructure and inter-fund loans to meet temporary cash flow needs.

Expensed Versus Debt Funding

Two principal categories of funding employed by stormwater management programs are expensed funding and debt funding. Most stormwater programs employ a mix of these.

Expensed funding is typified by "pay-as-you-go" strategies, in which expenditures are supported by a more or less concurrent revenue stream. For example, a city's stormwater utility may have a user fee that generates $5 million in annual revenues, an appropriation in its road budget for maintenance of roadway drainage systems of $1 million, and a total annual stormwater management budget of $6 million that essentially matches the combined income. Costs are "expensed" as they are incurred.

Debt funding is typified by bond sales, which are most commonly used to fund major capital expenditures, but debt funding may also include intergovernmental loans, warrants, and other mechanisms. Debt is sometimes also used to fund utility start-up costs, undertake system-wide remediation, or to make funds available to cooperating entities in the form of grants or loans. In all these examples, borrowing is utilized to enable a stormwater program to expedite improvements or activities so as to accomplish its goals more quickly, thereby reducing the time of exposure to certain risks. For example, bonding to build extensive flood protection works in two years rather than twenty years may be a prudent action if valuable property is protected more quickly.

CHARACTERISTICS OF SUCCESSFUL FUNDING STRATEGIES

A Business Plan Approach Is Based on Strategic Objectives

Some common characteristics are evident among successful stormwater utility programs. The most successful programs have relied heavily on a business plan model which guides both the program evolution and funding decisions. The strategy for accomplishing the program is defined, the type and magnitude of costs are projected, resource requirements are determined, and timing issues are resolved before the analysis of specific funding mechanisms takes place.

"Needs" are the key driver of program and funding strategies. Authority, capability, and a clear vision of the mission are essential, but in the absence of

compelling needs local government leaders apply their attention and resources elsewhere.

The demands of the diverse stormwater management activities identified in Table 1.1 challenge local governments' funding capabilities, and encourage them to use a variety of funding sources. State constitutions and legislation, governance structures and service responsibilities, drainage problems, needs and priorities, local politics and economics, and simply the different ways that communities conduct their business all differ and influence their decisions on stormwater program and funding strategies. These influences should cause local agencies to carefully examine their needs, and the most successful have crafted a detailed business plan as a guiding document.

Effective Stormwater Business Plans Identify Linkages and Dependencies

Stormwater business plans or program strategies contain many linkages and dependencies among program components and processes. Addressing some needs may require several years as preparatory steps are accomplished. For example, even if infrastructure improvements are the highest priority, they may have to be preceded by master planning studies, prioritization processes, engineering of specific projects, land acquisition, and contracting before a system improvement is actually realized. Formal approvals by elected officials may be needed at various points in this process, potentially creating additional delays.

Such linkages and dependencies make timing very influential in structuring the business plan. An extended schedule for addressing one program priority may present an opportunity to expedite others that do not require so much preparatory work or approvals. Routine maintenance is a function most easily expedited and can have the most immediate benefit in terms of service assurance. Regulatory measures that can be adopted at the discretion of managers and that do not require extensive analyses can also be easily activated. Other regulatory activities can involve several years, as in the case of developing and gaining adoption of design manuals. Education, public participation, and other efforts to improve water quality likewise can be initiated relatively quickly, but it may take years to demonstrate results. Some remedial repairs to deteriorated infrastructure can be accomplished quickly, although the process of identifying specific projects, prioritizing them, assembling necessary resources, acquiring land or easements, and contracting with vendors can delay others.

The negative experiences of communities that didn't recognize the relationship between program and funding strategies suggest that adopting funding strategies or mechanisms, without the benefit of a clear vision of the program strategy, creates a high potential for problems. This has proven especially true in the case of instituting stormwater utility user fees. One need only review the case law decisions in Chapter 3 of this guidance manual to find strong support for the

proposition that a clear program strategy buttresses funding decisions by local elected officials.

Community Expectations Are Represented in Business Plans

The most effective stormwater business plans recognize community expectations. In some cases, expectations must be elevated by convincing demonstrations that stormwater problems exist and can be solved. Stormwater management rarely captures public support unless problems impact the daily lives of citizens. Many drainage systems are underground and essentially invisible to the public. If they are designed, constructed, and maintained properly, most people are unaware of them. More visible problems such as potholes in roadways consistently rate higher than drainage problems. The most effective programs identify and publicize the problems they must address, seek public participation and support, and orchestrate the use of various tools and resources over time.

Effective Programs Respond to Change

Flexibility is an important attribute of utility user fee funding and the ability to change as circumstances dictate should be always be a consideration in formulating a business plan. User fees provide a stable revenue source, and offer equity advantages over traditional tax funding, but perhaps their most valuable attribute is their flexibility for funding a variety of operational and capital investment needs. A long-range program can be defined with a realistic expectation that funding will be available when needed and also suitable for changing priorities. However, as a primary funding source, a user fee may lend itself to a focus on short-term, rather than a long-term program strategy, which can be counterproductive.

Service Fee Rates Are Cost-Based

The funding philosophy represented by utility service fees of all types is that customers should pay in relation to the demands they impose on the services and facilities – characterized as a “user-pays” approach. This is a primary consideration in selecting parameters from which service fees will be calculated, and formulating a rate methodology that results in an apportionment of those cost deemed fair and reasonable by the responsible local officials. The most successful stormwater utilities are those that have clearly established and documented the rationale for linking their service fees to the cost of providing services and facilities.

Resources Are Dedicated and Stable

Whether in city, county, or special district entities, most successful stormwater utilities are accounted for as enterprise or special revenue funds that are separate and apart from the funding of general public services. As segregated accounts, enterprise and special revenue funds limit the use of revenues and other resources to a specific purpose, such as stormwater management. Also,

since reserves can be accumulated from one year to the next, there is no pressure to expedite funding at fiscal year-end if that is not prudent. This adds to program stability and efficient management of financial resources.

TRENDS IN FUNDING PRACTICES

Increasing Complexity

The emerging trends in the 21st Century suggest that funding issues will encourage tailoring of funding to specific program objectives, and funding practices will branch out in several directions. As stormwater programs become more sophisticated, unique local concerns and priorities gain greater visibility and support. Also, as more linkages are established with other governmental and even private-sector programs, the general trend in funding is toward greater complexity, and "standard practice" is increasingly likely to be supplanted by local innovations.

Stormwater utilities established in the 1970's and 1980's tended to be funded almost entirely from their service fees. Service fee rate methodologies were relatively consistent though rarely identical. They were cost-based, and rate structures were linked to peak and/or total volume of runoff by fee calculations employing parameters such as impervious area. Use of other funding methods and mechanisms in coordination with service fees was very limited.

Beginning in the 1990's a refinement trend emerged. The basic structure of funding and service fee rates remained relatively stable, but local entities began to push for more sophisticated and detailed cost, rate, and funding analysis. In part, this was due to the rapidly increasing technical capability offered by computerization and data gathering and processing. It also reflected the fact that more large cities instituted stormwater utilities as Phase I NPDES requirements were imposed. Their expectations were generally geared to more sophisticated cost and rate analyses and they often retained management and rate consultants with experience in other disciplines.

In the first decade of the 21st Century the trends in funding have been primarily in response to Phase II of the NPDES program, which impacts many more cities and towns than Phase I. This has had two somewhat conflicting effects. The introduction of a water quality objective caused many local governments to view stormwater management more broadly. However, as an increasing number of smaller cities and towns explored stormwater fee options to meet NPDES permit obligations, they tended to demand simpler and less expensive approaches than those preferred by large communities. These factors have been further compounded by federal and state initiatives to manage watersheds holistically, which is filtering down through regulatory programs and grant and loan opportunities. As a result, the key stormwater funding trends for the next decade include the following.

Blended Funding

Blending several sources of funding to support stormwater management program strategies has been a slowly emerging trend. The most successful stormwater programs are supported by several sources of funding, enabling them to spend more money to elevate the visibility of the program and improve cost accountability of specific functions or improvements.

Other sources of funding used in combination with service fees include general budget appropriations, dedicated special taxes (property, income, sales), special assessments, fees charged in lieu of requiring compliance with standards or requirements such as on-site detention, system capitalization or development impact fees to recover past expenditures or better allocate the cost of infrastructure over a period of time, and matching funds such as federal and state grants and loans. There are few constraints on local governments' authority to combine and selectively target several types and/or sources of funds to accomplish various purposes, see Appendix for examples.

Multi-jurisdictional Funding

Cooperative funding with other entities is a hallmark of many successful stormwater programs. Several factors have induced stormwater managers to participate in multi-jurisdictional funding, especially in recent years as water quality considerations became more prominent.

Stormwater runoff doesn't conform to jurisdictional boundaries. Drainage waters flow from jurisdiction to jurisdiction based on topography. Solving an upstream community's problem may become the source of a problem in another jurisdiction located downstream. Thus, the most efficient infrastructure solution for a given drainage problem may lie outside the jurisdiction where the impacts are manifested. For example, to relieve flooding a regional detention facility built in an upstream portion of a watershed in a rural unincorporated area may be less expensive and provide better protection than extensive flood protection works installed downstream within a major urban area. This may encourage several cities and towns in the downstream portion of a watershed to fund a common solution higher in the upstream reaches rather than attempt to install independent drainage improvements in each of their communities.

The availability of federal and state grants and loans and cooperative programs has also encouraged local governments to join in conducting activities associated with stormwater management. This has been a significant inducement to local governments to establish stormwater service fee funding. For example, the City of Griffin, Georgia was able to obtain more grant, loan, and shared funding from federal, state, and county sources during the first two years of its stormwater utility operation than was generated in service fees. A key factor in gaining other agencies' financial support was the City's ability to match their grants and loans with reliable local funding.

The presence of stormwater quality program mandates of state and federal agencies has also encouraged local governments to participate in cooperative programs. The emerging emphasis on stormwater quality has created both opportunities and incentives for cities, counties, and special-purpose districts to participate in cooperative efforts. Examples include public education, water quality monitoring and sample analysis, the development of drainage, erosion control, and other technical manuals, and even consolidated development plan review.

Cost-sharing With Other Public Programs

Successful stormwater utility programs have financial strength that has enabled them to venture into cost-sharing programs with entities that have different responsibilities but shared interests. Greater funding has broadened the scope of stormwater management to include related issues such as land use and development regulation, environmental protection, and habitat preservation. This in turn has revealed more opportunities for linkages with other programs, and sharing of resources to address mutual interests and needs is increasingly common.

Wastewater treatment, especially, lends itself to cooperative funding with stormwater management, due in large part to the extensive historic use of combined sanitary/stormwater sewerage systems in many areas of the country. Stormwater separation and inflow/infiltration corrections were often funded as wastewater treatment expenses in the past. Now some communities have recognized that the expense of separating stormwater and wastewater or eliminating stormwater inflows into wastewater sewer systems may be assigned to a stormwater cost center rather than wastewater. When a stormwater utility is present, the costs shift to properties that generate substantial runoff versus those that generate substantial amounts of sewage.

Watershed management practices and water quality protection also introduce opportunities to share costs with other programs. The City of Bellevue, Washington Storm and Surface Water Utility has a primary objective of preserving small streams. Protection of wetlands and construction of regional detention ponds were key elements of the City's stream preservation strategy. The Utility purchased extensive areas of wetlands and other areas along streams, and worked closely with the City's Park Department to manage them as passive-use parks and open space. Other properties used for detention and groundwater recharge have been developed into active recreation facilities such as neighborhood playgrounds, soccer pitches, and even tennis courts.

Countless other communities have built parks, greenways, and trails along streams, including examples such as the Mingo Creek linear park in Tulsa, Oklahoma and along Cherry Creek, South Platte River, and many other drainageways in the Denver, Colorado metro area. Salt Lake City, Utah modified

and improved a high school baseball field to serve as a major detention facility during severe storms and major snowmelt events.

Some communities have also used their stormwater utility funding resources to support program enhancements such as geographical information systems (GIS), upgrades to financial management and utility billing/collection systems, and transportation improvements such as construction of roadside curbs and gutters to replace open ditches. The linkage of stormwater management to other programs has justified funding in whole or in part activities such as leaf collection to reduce local flooding due to plugged inlets (e.g., Greensboro, North Carolina) and street sanding and snow removal/dumping to reduce stormwater quality pollution.

Broader Private Sector Participation

The importance of contributed capital infrastructure built by developers should not be underestimated. Though often unplanned and uncoordinated, many early components of local drainage systems that emerged in the 19th Century were built by the private sector coincidental to commercial, industrial, and residential projects. The economic boom of the 1920's spawned a major surge in private investment in public facilities, including stormwater drainage systems. In most suburban communities developed since World War II, a majority of the stormwater infrastructure has been built by developers and turned over to a public entity for long-term operation and maintenance.

More recently this approach has expanded to include cooperative efforts involving public entities and the private sector, with stormwater management requirements being integrated with other objectives. For example, a stormwater detention facility built by a developer might now be integrated with recreational facilities such as greenway corridors, golf courses, baseball fields, or soccer pitches. The financial participation in such improvements may be broadened to include several public agencies having primary responsibility for the long-term operation and maintenance of the facilities.

This trend has several important implications for stormwater managers. They will need to reach out to private-sector entities and programs to identify opportunities that serve their mutual benefit. They will need to broaden their community's vision of what stormwater management entails to ensure support for cooperative programs with private interests. Because many more developments are being built by larger, more competent and better financed development companies, local stormwater management programs will need to increase their skills and sophistication to keep pace and ensure that participation is optimized.

Increasing Influence of Technology and Data

Perhaps the most pervasive factor guiding changes in stormwater management in the past thirty years is rapid acceleration of new technology. This directly influences trends in stormwater funding practices as well as engineering and

other technical endeavors involving the availability and management of data. For example, the cost of creating or gathering data required to prepare a master account file for stormwater service fee billings has plummeted in the past decade, from as much as $6/account to less than $0.25/account depending on the parameters and rate structure involved. Satellite imagery of extensive land areas now renders digital information that is at least as precise as visual interpretation of aerial photography, with far greater consistency and reliability at much less cost.

Such increased efficiency encourages local governments to seek more sophisticated stormwater service fee rate methodologies, and to combine several funding mechanisms in much more complex approaches. However, is it practical and beneficial to refine a community's stormwater service fee rate structure when other parameters are not yet as precisely quantifiable? The trend is clearly toward more sophisticated rates, but optimizing the value of the rapidly increasing technological capability has not yet been adequately addressed.

FUNDING METHODS AND MECHANISMS

Local Governments' Funding Authority

Stormwater management has historically been supported by a range of funding methods and mechanisms that reflect the mix of federal, state, and local programs. Since this guidance is directed toward the funding of local stormwater management programs, especially stormwater utilities, we focus on the approaches used primarily by cities, counties, and special-purpose districts.

Cities and counties in most states are generally authorized by state legislation to conduct stormwater management. This general authority is supplemented in some states by home rule provisions. Cities and counties adopting such powers may gain greater latitude to undertake stormwater management functions, regardless of whether specific statutory authorization is available, subject to certain limitations and ballot approval requirements.

The changing nature of stormwater management is also providing greater flexibility in stormwater funding. Undeniably, stormwater management has now become fundamentally regulatory. Federal and state laws confer a water quality regulatory role upon local governments through the NPDES permit program. Similarly, adoption of local system design criteria and on-site control requirements for runoff quantity is rooted in a regulatory purpose of preventing problems. This regulatory foundation may expand and strengthen the local authority, especially as it relates to funding decisions. Generally speaking, locally-elected officials have greater latitude in adopting fees that are associated with regulatory purposes than for other objectives.

Funding Methods and Mechanisms

Funding methods and mechanisms commonly used for stormwater programs include:

- ► General revenue appropriations
- ► Stormwater user (service) fees
- ► Plan review, development inspection, and special user fees
- ► Special assessments
- ► Bonding for capital improvements
- ► In-lieu of construction fees
- ► Capitalization recovery fees
- ► Impact fees
- ► Developer extension/latecomer fees
- ► Federal and state funding opportunities such as grants, loans, and cooperative programs

General Revenue Appropriations

Despite the proliferation of stormwater utilities, general tax revenues remain the most common source of stormwater management funding. Substantial technical analysis is normally not needed to fund stormwater management from general revenues, which local governments may use for any legal purpose. The majority of most cities' and counties' general revenues are from taxes (e.g., property, sales, and income), exactions (e.g., franchise fees on utilities), and federal/state revenue sharing, and are simply appropriated for specific purposes, including stormwater management, through the normal budget process. Because they have limited purposes and, in most states, often do not have broad general taxing powers comparable to cities and counties, special-purpose districts are more likely to be funded through limited property taxes, special assessments and service fees.

The practice of funding stormwater management from general revenues has contributed to a dispersal of stormwater management responsibilities. Stormwater management is not typically an independent municipal function, either operationally or financially. Many city and county functions are peripherally involved in or impacted by stormwater runoff. Components of what might be collectively considered a consolidated stormwater program are often embedded in operational units such as public works, engineering, transportation, street maintenance, wastewater treatment, and even recreation. The funding of stormwater management in such cases is also typically embedded in whatever resources are assigned to the primary function. They may budget for costs that are essentially stormwater management, but not readily identifiable as such in their budgets. Such dispersion of functions and costs may obscure any discernible relationship between demands for stormwater services and facilities and how the cost burden is apportioned.

General revenues have several attractive attributes for stormwater management. Most cities' and counties' general revenues are, in the absence of other demands, sufficient to support effective stormwater management. The sources of general revenues are usually well-established, fully understood, and well-accepted by citizens and business interests. They are relatively stable from year to year, though economic downturns tend to excessively impact jurisdictions whose general revenues are highly reliant on sales and other business taxes rather than property value, which is more stable.

However, general revenues also have significant disadvantages as a source of stormwater management funding. Many worthy public purposes, including public safety and social services, are commonly funded from general revenues. Stormwater management has historically struggled to compete effectively against other needs, and major long-term reallocations of general revenues simply to enhance stormwater management capabilities are rare. In the absence of a major budget reallocation, increasing general revenues to support stormwater management implies approval of a tax increase of some sort. Neither option is politically attractive for most local officials.

Because they are not earmarked or dedicated to any specific purpose, annual appropriations of general revenues shift with elected officials' and administrators' perceived priorities. Stormwater management needs are more likely to receive better treatment in a year following severe storms and drainage problems than in a year following a drought. A lack of stable funding makes it difficult to plan and carry out a consistent, long-term program.

The sources of general revenues have little if any inherent association with the origin of stormwater management demands and costs. For example, property taxes are a major source of general revenues for many cities and counties. Such taxes are usually calculated based on the economic value of land and improvements, which have little direct relationship with stormwater runoff quantity or quality. Sales taxes are typically based on retail sales, which likewise have no identifiable link to stormwater management costs. Franchise fees are normally a percentage of the gross income of the activity utilizing the franchise rights.

Because general revenues are derived primarily from taxes and exactions imposed upon businesses and individuals, other parties that impose significant demands on stormwater systems and programs may be excluded from participating financially in solutions. For example, in cities which have state-owned properties, public universities or federal military installations, a substantial demand for stormwater services may be traced to such tax-exempt properties.

The disparity between the need for stormwater services and facilities and the source of general revenues does not end with tax-exempt properties. Some private properties, for example discount retail stores, parking lots and warehouses that have large expanses of relatively low value impervious

coverage, do not pay taxes commensurate with the demands they impose on the stormwater systems. Conversely, more valuable properties such as high-rise office and residential condominium towers that may have less impact on stormwater runoff pay substantial property taxes.

Stormwater User (Service) Fees

Stormwater utilities funded primarily through service fees are the focus of this guidance. Service fees are discussed only briefly in this section, but are covered in greater detail in other sections of this chapter. Specifically the sections on "Service Fee and Assessment Design Considerations" and "Service Fee Rate and Assessment Methodologies" further address this area.

Although user fee funding of stormwater programs is generally associated with the stormwater utility concept inaugurated in the 1970's, Billings, Montana adopted a "storm water charge" in June, 1964. Relying in part on that revenue stream, the voters of Billings also approved the issuance and sale of negotiable revenue bonds for the purpose of reconstructing and extending the City's stormwater and sanitary sewer systems. This action was challenged in court and was eventually upheld by the Montana Supreme Court in 1966[2]**.** Billings has since funded a majority of its stormwater management programs through the charge.

Billings' "storm water charge" represented a major departure from conventional stormwater funding but did not elicit widespread imitation. The transition to user fee funding did not become widespread until the early 1990's, although several cities and counties in Washington, Oregon, and Colorado established utilities during the 1970's and 1980's. The utility user fee concept has now been adopted by over five hundred cities and/or counties. It is generally referred to as the "stormwater utility" approach because it not only provides user fee funding but also incorporates accounting and management practices similar to those of other municipal utilities like water supply, wastewater treatment, and solid waste management. Similar approaches have been used in Canada and Germany.

Substantial latitude is available to local elected officials in structuring rates and fees, especially if they are associated with regulatory functions. Specific methods of calculating stormwater user fees are not mandated by law in most states, though some limitations do exist. For example, in Texas the state legislature has exempted public universities from local stormwater user fees. Most stormwater user fee rates account for conditions on properties that affect the peak rate of runoff, total volume discharged, and pollutant loadings on receiving waters. A majority are based on the amount of impervious area (roofs, paved areas, etc.),[3] which determines both the proportion of rainfall that runs off and the peak rate of discharge during and following storms.

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[2] City of Billings v. Ralph Nore, 148 Mont. 96; 417 P.2d 458 (1966)

[3] Stormwater Utility Survey 2004 – 2005, Black & Veach, Kansas City, MO, 2005

Stormwater rates have also been based on the gross area of properties and numerical factors that reflect the intensity of development. A few cities and counties have incorporated both gross area and impervious area or the percentage of imperviousness into their rate calculation. Other stormwater service fee rate parameters include land use classes, zoning classes, and water meter size, though these are generally not considered to offer comparable equity of cost allocation relative to impervious and gross area methodologies.

A stormwater user fee is highly flexible and can easily be tailored to individual situations and coordinated with other funding methods. Revenue from user fees and other funding sources can be blended together or a fee might be applied only in a limited service area rather than the entire jurisdiction, excluding other areas which do not require service or are impractical to serve. No fixed practice prevails; though most cities apply their user fees city-wide and many counties define more limited service areas where urban/suburban conditions exist.

User fees are also authorized for some types of special-purpose districts, which may apply them district-wide or designate them only for specific service zones. Such approaches can be combined, as in the case of a stormwater utility that has both a general service fee and also administers special-purpose improvement districts to fund localized improvements or services.

The stability of a dedicated user fee revenue stream ensures that long-range scheduling of capital improvements and operations can be done with reasonable assurance. User fees may also free up general revenues and other resources allocated to stormwater management for other purposes.

The greatest potential disadvantages of stormwater user fees are high visibility of the charge and the cost of its development and implementation. Regardless of technical distinctions between "taxes", "exactions", "assessments", and "service charges", any form of government funding may be viewed by some citizens as a "tax" and thus be unpopular. However, the high visibility of a defined stormwater user fee might also be beneficial if it convinces a community that long-standing flooding or pollution problems will be addressed.

The cost of developing and implementing utilities reflects the size of a community or the complexity of processes employed. Some of the formative costs such as program and cost analyses are essentially common to all situations. Others are “unit” costs. For example, data must be assembled to populate a master account file for billing. The cost of implementing a utility user fee is a function of the number of accounts, and the total cost typically amounts to eight to twelve weeks of the revenue stream that is created. This includes all costs associated with the necessary program and financial analyses, data assembly, modification of billing and other information systems (or activation of a new system), and public education and involvement.

Plan Review, Development Inspection, and Other Special Fees

A variety of special user fees could reasonably be included under the scope of a stormwater utility or adopted separately to support regulatory measures. Most often they are related to special services provided to a limited group, as opposed to user fees that are generally applicable to utility customers. Such fees apportion the costs only among those who require the service or cause the need for the regulatory measure.

Fees for the performance of regulatory activities are usually associated with protecting the public health, safety, and welfare in some manner. Some regulatory activities may be mandated by federal and/or state requirements or as conditions of NPDES or other permits. Regardless, to the extent special fees are associated with a regulatory function (e.g., development regulation); authority to institute them is typically a product of the police powers of the governance entity.

Special fees may also have other applications, such as a cost recovery mechanism that assigns certain expenses to a specific group. For example, experience has demonstrated that maintenance of on-site detention systems is frequently ignored or deferred by property owners, or alterations may be intentionally or unintentionally made to such facilities. Inspections may be necessary to ensure that on-site systems are properly maintained and not altered from their approved design. Placing the cost of such inspections on the specific property owners through special fees relieves the general taxpayers or utility ratepayers of the expense.

Special fees typically provide only a small additional amount of revenue for a stormwater utility, but enhance the equity of cost apportionment. Adoption of such fees may require that other fees associated with regulatory reviews, inspections, or special services be evaluated to ensure that individuals are not being charged twice for the same service.

Special Assessments

Special assessments have been used to fund capital improvement and operation of stormwater systems since colonial times. The assessment concept is predicated on apportioning costs in proportion to the direct and special benefits individually derived by specific properties. It has been applied to funding of various public facilities, ranging from sidewalks and roads to flood control channels and dikes. In application to stormwater management, the special assessment mechanism has evolved as the management paradigm changed.

The chief drawback of the traditional special assessment methodology is that the distribution of costs must be proportionate with the direct and special benefit accruing to each property being assessed. Although standards differ from state to state, generally the benefits must be definable, measurable in some economic manner, and available to the property being assessed within a practical timeframe. In most cases, general benefits accruing to all properties as a

consequence of a stormwater improvement or activity cannot be used to justify a special assessment.

The courts have established substantially different standards for special assessments versus service fees. Broader latitude is given to local elected officials in setting service fee rates, and especially those associated with regulatory purposes. Special assessments must conform to more restrictive technical standards based on apportioning costs to reflect the value of benefits accruing to individual properties. Fully complying with the standards the courts have set for special assessments may therefore require more precise and costly data than is needed to support a service fee, which must simply be fair and reasonable.

Special assessments for drainage are most workable in relatively localized or specific applications. For example, improving a ditch or channel that directly serves a few properties or a relatively small service area is an appropriate project for special assessment funding. A special assessment is less suitable for capital projects that serve a wide area, and may be wholly unsuited to facilities providing a general benefit to the community at large.

Much of what must be done to effectively manage stormwater quality may not be directly and specially beneficial to individual properties. Thus, special assessments are not widely used as a primary funding mechanism for that purpose, though in recent years several benefit assessment areas have been instituted in Southern California to support local water quality programs, and Florida counties fund stormwater management through assessments (as so defined in a Florida Supreme Court decision) that are similar to many stormwater service fees.

Bonding for Capital Improvements

The expense of major capital infrastructure, land, and equipment has posed a significant challenge for stormwater programs whose annual revenues and resources are limited. As a result, local governments have used bonding to fund major capital improvements for many years.

Bonds are sometimes used to fund operations as well as capital improvements, though that practice is not generally viewed as prudent and some states prohibit or limit such uses of bonding. However, some stormwater management costs can be viewed either as a capital or operating expense. For example, remedial repairs to aging infrastructure might legitimately be viewed as either a capital expenditure or an operating expense.

Bonds are not a revenue source, but rather a method of borrowing money to fund expenditures. Debt service of bonds is commonly derived from general revenues, service fees, or special assessments. In some cases, specific funding mechanisms or sources are identified in bond covenants. For example, a bond

might be issued with debt service to be paid from a special local option sales tax or a special assessment upon properties served by the improvement.

The chief advantage of bonding is that it allows expenditures that far exceed current revenues and resources. Construction of major improvements can be expedited in advance of what could be funded from annual budget appropriations by spreading the costs over time, much like a home mortgage or automobile loan enables a buyer to acquire assets they could not afford to buy for cash.

In the case of stormwater management, expediting a capital project by several years through bonding may result in significant public and private savings if flooding, other damaging impacts, and inflation of land acquisition and construction costs are avoided. The major disadvantage of bonding is that it is essentially a loan that incurs an interest expense, increasing the total cost of capital projects.

Two types of bonding are available, revenue bonding and general obligation bonding. General obligation bonding incurs a debt that has first standing with regard to public assets and is backed by the "full faith and credit" of the issuing agency. All revenues and resources of the entity, including various taxes, may be used to service a general obligation debt. Revenue bonding is supported and ensured only by specified revenues, such as service fees or assessments. As a result, the bond market sometimes imposes higher interest rates on revenue bonds and/or dictates that excess revenue be generated (termed coverage) to reduce the risk of non-payment. Recent experience suggests that the bond market has recognized the stability typical of stormwater utility service fee income, and has priced stormwater revenue bonds favorably.

Cities and counties in some states are also authorized to issue bond debt that is backed by the full faith and credit of the issuer but has debt service funded from a designated revenue source. This is commonly referred to as “double-barreling” of bonds. The full faith and credit provision is simply a fall-back if the revenue stream should fall short. Such bond issues typically attain the bond rating and interest rate of the issuing agency’s general obligation debt, but the entity’s general tax revenues and statutory debt limits are not burdened.

In-lieu of Construction Fees

In-lieu of construction fees are not specifically authorized under most state laws, but might be adopted in some circumstances as one element of a comprehensive stormwater utility user fee rate methodology or as a regulatory fee. Such fees have been charged in lieu of requiring construction of on-site stormwater systems for many years.[4]

[4] For example, Tulsa, Oklahoma instituted fees in lieu of requiring on-site stormwater detention improvements on each and every development project in more than a dozen watersheds during the 1970’s, and used the revenue to defray a portion of the expense of regional detention facilities in those areas.

In-lieu of construction fees are sometimes confused with impact fees. However, an in-lieu of construction fee is usually a substitute for requiring on-site solutions such as detention storage. They may be used even in instances when an on-site system would work but an offsite regional facility is preferable.

In contrast, impact fees are generally used to pay for off-site measures to compensate for the service-demand effects of development that are not solvable on-site. For example, the impact of a shopping center on stormwater runoff might be resolved either by requiring an on-site detention system or by building a regional facility off-sight that is paid for (in part) through the in-lieu of construction fee. Shopping center traffic that clogs nearby roads cannot be solved on-site, but an impact fee might be used to pay for additional traffic lanes and/or signalization to mitigate the impact.

The need for in-lieu of construction fees associated with stormwater management stems from problems that have emerged with on-site measures to mitigate development impacts. Experience has shown that requiring developers to install individual on-site detention and water quality facilities can lead to a regulatory and/or maintenance problem for a local government. Alternative regional solutions may be more efficient and reliable in controlling runoff volumes and pollutant discharges into public stormwater systems and streams. However, on-site systems are typically funded by the developers whereas the general public usually pays for regional systems. An issue of equity arises if general taxpayers or ratepayers have to fund regional solutions to mitigate the impacts of private development projects rather than requiring on-site control.

The flexibility to address issues either by on-site mitigation or by alternative actions elsewhere is advantageous if the financial conundrum can be resolved. An in-lieu of construction fee offers a practical option that may be preferable to both developers and local governments. Developers simply pay a fee in-lieu of designing and building an on-site system or facility, and the local government obtains financial support for more efficient and reliable regional systems.

The most significant disadvantage of in-lieu of construction fees is that they rarely generate sufficient revenue to fund construction of regional detention facilities, enlarge conveyance systems, or install water quality facilities in a timely manner. Also, they do not fund maintenance. This dictates that other revenues must be available to initially build and maintain regional facilities, and taxpayers or ratepayers are the parties burdened with those costs. However, over time, in-lieu of construction fees can contribute a meaningful component of the total long-term funding of regional facilities and equitably compensate those who have initially borne the costs.

In-lieu of construction fees are not necessarily easy to implement. They demand well-refined capital improvement plans and analyses of on-site versus regional alternatives, from which the alternative cost of the regional options can be

reliably determined as the basis for setting the fees. This may necessitate detailed and costly analysis of potential regional facilities when a simple regulatory approach would suffice. At least a portion of the cost of preparing suitable analyses and documentation should be incorporated into the structure of in-lieu fees.

Capitalization Recovery Fees

Capitalization recovery fees are also known as system development charges, capital facilities fees, utility expansion charges, and by other titles. They are not specifically provided for by authorizing legislation in most states, but have been incorporated into various utility user fee rate structures for many years.

Capitalization recovery fees are sometimes confused with impact fees and even with in-lieu of construction fees. Capitalization recovery fees are most often intended to recover a fair share of the prior public investment in infrastructure capacity installed to accommodate future development. The fees are applied to developers who make use of that provisional capacity when they develop projects. In some instances, capitalization fees may also be used to attain suitable apportionment of future capital costs. This is particularly applicable in cases where funds have been accumulated in preparation for major capital projects.

There are several ways of structuring and calculating capitalization charges, including the growth-related cost allocation method, the system buy-in approach, the marginal incremental cost approach, and the value of service methodology. They differ from in-lieu of construction fees and impact fees primarily in terms of: 1) the fundamental purpose of the charges; 2) the timing of improvements versus when the charges are collected; and 3) their relationship to the specific facilities that are funded through user fees. In most cases, capitalization recovery fees are related solely to capital costs, though some justification may exist in certain circumstances for incorporating long-term operating expenses.

Capitalization charges provide a mechanism whereby developers participate in paying for capacity that was previously built into public systems in anticipation of their needs or which is planned for the future and for which funding is being accumulated in anticipation of building the improvements. In effect, they allow a deferral of participation in the capital cost of facilities until a property is developed and either makes use of the provisional capacity already in place or buys into the previously accumulated fund reserves intended to build future improvements. The use of such fees for stormwater management capital costs is clearly appropriate since most drainage systems are consciously designed to provide capacity to accommodate future development in an economical manner.

Whether a stormwater capitalization charge is appropriate in specific cases may be related to the user fee rate methodology that is employed. For example, many stormwater user fees are based solely on impervious area where only

developed properties are charged. Undeveloped properties do not have impervious area and therefore are not charged. However, the capital facilities being funded by the fee are normally designed with future conditions in mind. This initially results in excess capacity being built into the system, which is paid for solely by currently developed properties. A capitalization charge may therefore be an appropriate recapture mechanism to ensure a fair and reasonable allocation of the capital costs among all properties using the facilities over time.

If the rate methodology allows user fees to be charged to undeveloped properties, a recovery mechanism may not be needed at the time properties are developed. The rate structure might have a system capitalization component that assigns an appropriate proportion of the capital costs to undeveloped properties based on expectations of the future developments and their stormwater system demands.

Impact Fees

Impact fees have been adopted by local government entities for a variety of public infrastructure components. They are based on the cost of mitigating development impacts of individual developments by building public off-site improvements where impacts can't be solved on-site. For example, traffic impact fees support the cost of additional lanes and/or signalization to accommodate the added traffic generated by projects such as shopping malls and high-rise condominiums. Such impacts cannot be effectively addressed by on-site facilities. Impact fees have also been employed to meet communities' park and recreation standards and other objectives.

Standards and requirements have evolved for adopting and applying such fees and have been institutionalized in legislation in several states. Some of these statutes impose so many administrative burdens and limitations on use of the impact fee revenues that they are essentially impractical. At least one state, Georgia, has adopted legislation that specifies limited uses of developer impact fees that do not include stormwater management. Specific applications of impact fees have also been the subject of a great deal of litigation nationally. An unusual aspect of impact fees is that state courts around the country have been notably inconsistent. Recent cases that have reached the United States Supreme Court have added some clarity. The following is a summary of pertinent cases provided by David Burchmore, author of Legal Considerations, Chapter 3.

> City of College Station v. Turtle Rock Corporation, 680 S.W.2d 802 (Texas 1982)
> College Station adopted an ordinance requiring developers to dedicate land or pay an in-lieu fee for new parks. Turtle Rock paid the fee and sued. The Texas Supreme Court ruled that the ordinance was

"reasonable" and "accomplished a legitimate goal substantially related to public health, safety, welfare."

Nollan v. California Coastal Commission, 483 U.S. 825 (1987)
Nollan wanted to replace his beachfront bungalow with a larger house. The Coastal Commission required public access across his property to the beach and an adjacent park. Nollan sued. The US Supreme Court supported Nollan, stating there was no "essential nexus" between imposed conditions and impact of use.

Northern Illinois Builders Association v. County of Du Page, 165 Ill. 2d 25 (Ill. 1995)
NIBA challenged the legality of two State enabling acts and three County ordinances imposing road impact fees. The court declared the first act and the first ordinance unconstitutional, and the second act and second ordinance constitutional. Monies collected under the first ordinance were ordered returned.

In Hillis Homes v. Snohomish County, 97 Wash. 2d 804 (Wash. 1982), the state Supreme Court invalidated an impact fee imposed on residential development to help pay for schools on the ground that the exaction was in effect a tax intended to raise revenue, rather than a fee intended to regulate land use, and that only the state legislature could levy such a tax.

Florence Dolan v. City of Tigard, 512 U.S. 374 (1994)
Ms. Dolan wanted to expand her hardware store and pave her parking lot. Tigard requested dedication of an adjacent floodplain and bikeway. Dolan refused and sued. The US Supreme Court ruled there was no "essential nexus" and that the City failed to demonstrate that the benefits justified the requirements.

Erlich v. City of Culver City, 114 S. Ct. 2731 (1994)
The Supreme Court extended the Dolan analysis from property dedications to development fee exactions. Erlich was the owner of a defunct private health and tennis club, and sought a building permit to construct condominium townhouses on the project site. The city approved the permit but conditioned it on payment of numerous fees, including $280,000 to enable the city to build tennis courts that would replace the facilities lost with the demolition of the tennis club. Erlich refused, and sued claiming that the fee exactions bore no relationship to the impact caused by the project. The Supreme Court granted certiorari, vacated the judgment of the lower court dismissing the case for failing to state a takings claim under the Fifth Amendment, and remanded the case "for further consideration in light of Dolan."

Impact fees are typically limited to situations in which the impact of new development on existing infrastructure systems is: 1) measurable and certain; 2) of definable geographic or systemic extent; and 3) quantifiable in terms of the incremental capital investment that will be required to maintain (not attain) an adequate service level in the face of the added growth attributable to the subject development. The final point is critically important in terms of stormwater management systems. Impact fees cannot be used to bring inadequate existing systems up to an adequate service level. Nor can they be used to address the impacts of other past, present, or future developments. Thus, they are not useful in correcting many deficiencies that already exist in stormwater systems. Impact fee revenues must also be earmarked for specific projects or uses, must be expended relatively quickly, and, if not, must be returned to the developer, often with interest.

Developer Extension/Latecomer Fees

Developer extension/latecomer fees are a good example of resources available to stormwater management entities that do not directly generate income but support attainment of important objectives. They are not a revenue mechanism, but rather a means of apportioning capital costs among several properties as they are developed. The most common use of this type of fee around the country is for water and sanitary sewer system extensions.

Extensions to utility systems and other infrastructure improvements are often built by developers. Under the developer extension/latecomer fee concept, the initial developer is later compensated for providing the facilities by fees applied to subsequent developers that tap onto or otherwise make use of the improvements. Although such fees are not specifically authorized in legislation in most states, they can be adopted as part of a comprehensive stormwater user fee rate structure or negotiated on a case by case basis.

A developer extension/latecomer fee works in the following way. Developer "A" proposes a project that requires a stormwater (or water, or sewer) system with "x" capacity for its own purposes. However, practical design considerations indicate that a larger system should be installed to properly serve other nearby properties that are currently undeveloped. Developer "A" therefore is required to build a larger system than necessary simply to serve his or her own property, and incurs an additional cost. Property owners subsequently tapping into the improved system when their development occurs are charged a one-time fee, and the fee is then transferred to Developer "A". This type of fee is structured so that Developer "A" and all other users of the facilities ultimately bear a fair proportion of the capital cost. The management entity typically receives no revenue from the fee, although some charge administrative expenses on top of the capital cost.

Federal and State Funding

Federal and state funding for local stormwater management takes many forms, including technical support, facility construction, cooperative programs, and grants and loans for various purposes. Local governments are generally authorized to make use of federal and state government funding, such as the State Revolving Fund Loans financed by EPA to achieve CWA objectives, for various purposes including stormwater management, flood control, and water quality protection.

SERVICE FEE AND ASSESSMENT DESIGN CONSIDERATIONS

The remainder of this chapter will focus on service fees and to a lesser extent assessments.

There are many reasons for local governments to adopt service fees to fund their stormwater programs. These include: 1) generation of sufficient revenue to meet capitalization and operational expenses; 2) customizing the apportionment of costs among various segments of the community; 3) support a growth management strategy, facilitate life-cycle asset management, or help segregate costs related to unfunded federal and/or state mandates; and 4) diminish a general revenue budget problem by moving stormwater off that source of funding and substituting service fees. Regardless of the specific motivation, the process of designing a stormwater utility funding strategy introduces the need for a higher level of analysis than that required for general fund revenue allocations.

Design of both service fees and assessments must meet general and technical standards. Standards differ between fees and assessments, and vary from state to state as a result of constitutional, legislative, and case law differences as addressed in Chapter 3. Selection of a preferred approach is not a purely technical issue. It is not required that the very best technical approach be selected. A user fee rate structure that fits local practices and meets basic industry standards may serve a community better than a highly detailed, very expensive approach that is confusing to the public. In many cases, decisions are influenced by practical considerations like public perceptions of equity, implementation and upkeep costs, timing, and ease of understanding. The following considerations are among those commonly used to evaluate and select preferred methods for design of user fee rate structures.

Legality

Nearly thirty (30) percent of the respondents to a recent national survey of stormwater utilities indicated that their stormwater utility funding decisions had

been subjected to a legal challenge of some sort.[5] That such a high percentage would be contested on legal grounds is probably not surprising given that the funding decisions and user fee rate structures involve money. The legal issues are addressed more thoroughly in Chapter 3, Legal Considerations, however the following is provided to help provide context for service fee and assessment design considerations.

Stormwater management is clearly a function that falls within the general authority of cities and counties in most states. Managing and funding that function as a utility is now an accepted practice, and both cities and counties have the latitude to adopt stormwater user fees in many states. The courts in several states have determined that there are certain characteristics that determine whether a charge is a tax, service fee, special assessment, or exaction. Although the detailed findings in the various states differ, they are influenced by both intent of the legislative body and the structure and application of the funding methods and charging mechanisms. Procedural issues that may have an impact on the legality of service fees and assessments include the following:

- ► What was the intent of the jurisdiction in establishing the charge, and how are funds being used?
- ► Was the service fee adopted simply to counter a budget deficit, or was it predicated on meeting stormwater program costs?
- ► Does the rate structure satisfy general standards of how service fees should be applied to individual properties?
- ► Are similar fees charged to similarly-situated properties or customers?
- ► Are charges to disparate properties or parties consistent and balanced?
- ► Did the local board or council act with adequate knowledge and consideration of the issues?
- ► Were all procedural steps scrupulously followed?
- ► Was adequate publication of notice of intent given for all of formal actions taken by elected officials?

Equity

Attainment of equity is a fundamental objective in the design of both fees and assessments, and one of the primary justifications commonly cited for establishing a utility. Equity has both technical and perceptual aspects. Service

[5] Survey of Stormwater Phase II Communities, National Association of Flood and Stormwater Management Agencies, Washington, DC, July 1999

fee rate methodologies are designed to attain “equity” as a fair and reasonable apportionment of cost of providing the needed services and facilities. Fees are expected to have a substantial relationship to the cost of providing the services and facilities to each customer. In contrast, assessments seek to equitably apportion benefits derived from facilities or services as the means of applying the cost of them. Exactions, such as stormwater impact fees, are not necessarily required to meet standards applicable to fees or assessments, but must exhibit a rational nexus or linkage between the exaction and the purpose of the fee. Taxes generally have to meet only the standards contained in authorizing legislation.

Equity must be weighed against simplicity and clarity. The best utility rate structures generate charges that clearly and simply relate to the services and facilities being provided. A utility service fee rate structure might be highly equitable in terms of assigning costs according to service demands, yet still be deficient politically if it is too complex for the public to grasp the linkage between service, costs, and charges. In the case of stormwater management, most people can understand that replacing natural earth with impervious pavement or structures will diminish infiltration of water and increase runoff. Thus, rate structures based in some manner on impervious area and gross area are common. A realistic objective is to be consistent within generally accepted technical standards that most people will view as fair.

Courts in most states have usually deferred to the judgment of local elected officials in determining what constitutes equity in local applications and have demonstrated a reluctance to intervene in the details of rate or assessment design. Applications accepted by various courts suggest that the relationship must only be sufficient to satisfy reasonable common sense. This leaves the structure and level of service fees, assessments, and some exactions largely at the discretion of locally elected officials. As a result, details of service fee rate methodologies, assessment formulae, and some exaction charges can vary significantly. However, a governance body may not act arbitrarily and capriciously in setting rates and the resulting service fees may be illegally discriminatory or confiscatory.

Technical Foundations

Stormwater service fee rate design practices are derived from an understanding of hydrology and stormwater runoff from individual properties. A rate structure analysis is performed to determine how costs might be apportioned among those who are served in various ways by expenditures for operations, capital improvements, and support activities. Since stormwater facilities and services cannot be metered or directly measured, they must be represented by one or more parameters believed to reflect the service demands and therefore the costs.

Timing is a consideration in formulating rate methodologies and setting the amount of fees. The structure of a rate methodology is intended to recover pertinent costs over a given period of time, most commonly a budget period or, in the case of bonded capital projects, a debt service period. For example, infrastructure is provided to collect, convey, and discharge stormwater runoff in a manner consistent with prudent design and applicable water quality standards. The resulting system capitalization is generally applicable to all properties served by the improvements, ranging from those at the top of the hill to those at the bottom of the hill who are protected from upland drainage. By using different rate parameters and finance mechanisms, a rate designer can alter the apportionment of costs among such customers over time.

Expensing capitalization costs through annual budgets focuses the financial impact on rates that customers pay during the budget period in which projects are constructed. Bonding to finance projects spreads capitalization cost over the debt service period. Accepted rate design standards do not dictate that costs be allocated on an annual, debt-service period, or service life basis. That is left to the discretion of locally elected officials. What is expected is that apportionment of costs is generally consistent with the service demands of the properties served by the facilities.

Life-cycle costing of stormwater infrastructure is an emerging issue. Because a large proportion of the cost of stormwater capital infrastructure is initially borne by private developers, their costs have not been allocated directly to stormwater ratepayers in most cost and rate analyses. However, much of the stormwater infrastructure built by developers is transferred to public stormwater service providers, and the long-term expense of recapitalizing the improvements as they wear out becomes a public cost. Cost of sustaining such infrastructure has not, however, been incorporated into financial planning and analyses of most local governments or stormwater utilities.

With the advent of the stormwater utility concept, the perspective on long-term life cycle accounting of stormwater infrastructure has begun to change. Most water, wastewater, electrical and other utilities have incorporated the life-cycle cost of capital assets in their rate projections and financial reporting for many years. In 1999 the Governmental Accounting Standards Board (GASB) introduced Statement 34 on infrastructure reporting which introduces comparable accounting for capital assets into general governmental practice. This reinforces the standard of full accounting for life-cycle costs of stormwater systems and facilities, and mandates incorporating them into cost and rate analyses.

Origin of Costs

Conditions on individual properties, which collectively dictate what types of systems, programs, and activities must be provided, are primary factors influencing stormwater costs. The objective of service fee rate design is to craft a schedule of fees for various users that reflect the cost of efficiently meeting

their cumulative service demands. Modern stormwater assessment design objectives are more often reflective of the cost of providing benefits to the subject properties rather than value of the benefit, which was the traditional approach employed when assessment were based on property value.

“Service” can be defined in much broader terms than just operational activities and physical facilities directly attributable to a given property’s stormwater runoff. For example, it is clearly a service to upland properties that their stormwater runoff is collected and safely conveyed to a discharge point. Such service relieves them of the responsibility of disposing of their runoff, and reduces their potential liability for downstream impacts. At the same time, a service is also clearly being provided to downhill properties in the form of protection from the upstream runoff. Flood protection and regulatory programs that protect floodprone areas reduce public emergency and recovery costs. Drainage of roads and sidewalks facilitates mobility essential for public safety services, commerce, education, and other aspects of modern life. Stormwater quality management protects and enhances environmental health.

Precision is not a defined standard in formulation of costs or service fee rates. Cost analyses produce estimates, some of which can be more exact than others. The cost of operating a particular piece of equipment can be rather accurately projected, but watershed capital infrastructure plans may provide only an engineer’s estimate of the future cost of acquiring land and constructing a stormwater facility. An estimate may be a valid reference point for incorporating projected capital costs into rate structure and fee analyses, but the actual costs may vary from the estimate. And the rate structure and/or fees may have to be adjusted from time to time.

A variety of approaches are used in assigning costs among customers. Some communities have opted to localize capital costs by watershed to attain a high degree of association of their infrastructure costs with the property owners served. Localizing capital costs by watershed is also common practice when stormwater utilities employ special assessments. Most, however, have determined that their system capitalization costs are relatively consistent, that the service provided by such improvements is not limited to individual properties in specific areas, and allocation of the costs can reasonably be applied to the entire jurisdiction or utility service area. They reason, for example, that adequate drainage system capitalization along roadways is a service to the entire community.

A community’s historic approach to capitalizing stormwater infrastructure may influence rate design. Many communities have historically funded stormwater system capitalization from general revenues, spreading the cost throughout the community, though facilities may not have been equally capitalized throughout the jurisdiction. After spreading the cost community-wide for years but not attaining uniform service capability, it would be inappropriate to localize future

capital costs by watershed even if that approach more closely reflects the origin of cost for specific facilities to be built by the stormwater utility.

Revenue Sufficiency

If a service charge is adopted, it is essential that the enhanced stormwater program provide visible results. A new fee that doesn't achieve a higher level of service is more likely to face opposition than one that provides demonstrable improvements. In order to ensure that is attained, a service fee, along with any other funding sources, must generate sufficient revenue.

Flexibility

A service fee offers extraordinary flexibility compared to other funding methods. Within reason, a rate structure can be designed to apportion costs as a board, council, or commission wishes. There is no absolute prescription that must be followed. For example, some communities charge properties located in floodplain areas less than upland areas, but the City of Boulder, Colorado imposes a surcharge for floodplain properties. Some communities only charge developed properties, while others also charge service fees to undeveloped lands.

The latitude given to local elected officials to make various decisions regarding the design of a rate structure is a distinct contrast to taxation concepts based on property value and assessments based on benefit. Taxation methods generally allow little flexibility, and cannot be selectively applied or tailored to specific needs. Although assessment methodologies are generally more flexible than taxes, they must reflect direct and special benefit.

A service fee rate structure can also be augmented by secondary funding mechanisms and altered by modifications to tailor the cost allocation to the local situation. For example, many stormwater utilities use credits to recognize on-site control systems or activities that reduce the public expense of stormwater management. Such credits can be creative. The City of Griffin, Georgia negotiated a service fee credit with the local school district. The district agreed to teach an environmental education program that satisfied most of the City's NPDES permit public education mandate. Mecklenburg County (Charlotte), North Carolina offers a partial service fee credit to industrial properties that have their own NPDES permits.

Balance of Rates with Level of Service

A general legal standard for a utility service fee rate structure is that it must be fair and reasonable. The resultant charges must bear a significant relationship to the cost of providing services and facilities. The balance between rates and service levels does not have to be precise or perfectly consistent. If significant differences in service levels prevail over time, however, a rate structure should reflect the variance to a reasonable degree. This can be accomplished in several ways. The rate structure itself might be altered in some way. The rate charged

per equivalent unit of the service might be reduced or increased. A modifying factor or surcharge might be applied to the basic rate to reflect a lower or higher service level provided to a specific geographical area or customer group.

Data Requirements

The data requirements of various rate structures differ, sometimes significantly. Two general rules usually prevail: 1) new data costs more than existing data; and 2) each additional increment of precision costs more than the previous one. As a result, many communities prefer to use existing data and apply a rate structure that is relative simple and gross. The number of parameters necessary to calculate a service fee for each customer is an important cost consideration, but it is not necessarily less costly to use a single parameter rather than two or more. If complete and accurate data is readily available from an existing source, it does not necessarily cost more to assemble a master account file based on a more precise parameter or several parameters, though that is usually the case.

Industry standards for stormwater service fee rate structures have coalesced around a few data parameters that have a demonstrated relationship to the cost of stormwater services and facilities. Impervious area is a common parameter, not only because it is closely related to runoff rates and pollutant loadings but also because many communities already have that data in the form of planimetric polygons defining building footprints, paving, etc contained in their geographical information systems. If, however, the data is available only as line definitions and not in closed polygons, the polygons have to be created to measure the area. This may involve interpreting satellite imagery, aerial photographs and property line maps, and may make impervious area a more expensive parameter to implement. In some cases, an algorithm can be applied to the line segment data to join segments into polygons that can be measured, but that approach requires a significant amount of quality assurance review.

The data requirements associated with implementing and maintaining a stormwater service fee depend more on the subtleties of the rate methodology and the use of modifying factors than on the basic parameters selected. If an impervious area method were to be applied to all properties individually, impervious area information would have to be generated for residential as well as non-residential parcels. However, if a simplified residential service fee is utilized, data requirements and costs might be reduced by as much as 70 percent regardless of the type of rate methodology employed.

Implementation costs of a tiered residential rate structure are usually higher than for a single flat-rate residential service fee. A two-tier or three-tier simplified rate structure for residences requires some additional analysis of the residential housing stock subject to the charge. If information available from other databases could be used to determine the proper assignment of residential properties to different tiers, the impervious area of individual properties would not have to be carefully measured. However, experience has shown that grouping

residential properties is only slightly less demanding than precisely measuring the impervious area on each property.

The cost of implementing an impervious area rate structure is a function of the number of properties that must be measured, the accuracy standards adopted for data, and the measurement technique employed. Techniques available for determining the impervious area and gross area of individual properties range from very time-consuming and expensive on-site measurements to photo-interpretive methods using scaled aerial photographs or satellite imagery. Cost of developing impervious area data has ranged from less than $1 to over $6 per unit, depending primarily on whether or not a simplified residential rate is used.

Accuracy standards also influence the cost of both initial implementation and subsequent data maintenance. Use of an equivalency unit for grouping properties into ranges subject to a rate schedule allows less exacting data standards to be used without diminishing the percentage of properties that are correctly charged according to the rate schedule. Automating the maintenance of the data file can significantly reduce the on-going administrative expense. If building permit applicants are required to provide impervious area coverage figures, the information can be transferred directly to a service fee master account file.

Some counties and cities use both gross and impervious area or gross area and a second data parameter reflecting the intensity of development (percentage of imperviousness) instead of the actual impervious area. These approaches involve two parameters, but do not necessarily increase the cost of implementation and upkeep if the required data is readily available from existing sources. Intensity of development can be interpreted relatively quickly and cheaply for each property, and properties can be assigned to general categories instead of assigning unique development intensities to each one.

A mistake sometimes made by cities and counties when they first adopt a rate structure is to use a parameter simply because they have an existing database, not because it correlates with the cost of stormwater services and facilities. For example, at least a few cities and towns have used water meter size or even water use as a stormwater service fee parameter, simply because the data was readily available. This can lead to serious problems if the stormwater rate structure is challenged in court because there is little if any correlation between such factors and the cost of providing stormwater management.

Compatibility with Data Processing Systems

The cost of implementing and applying a stormwater utility service fee includes the work required to assemble a master account file comprised of customer names and the data required to calculate a billing. A master account file must also be linked to or integrated in some manner with a billing system that enables

the service fee to be delivered to the proper party, payments received and processed, and proper accounting to be performed. All of these typically involve extensive use of a computer data processing system and one or more databases.

Degree of compatibility of a preferred service fee rate methodology with existing databases and data processing systems directly influences the cost of long-term maintenance and operation of utility funding. Service fee billing, collection, and accounting costs are often less if a stormwater charge can be added to an existing system rather than creating a new means of delivering the billing and processing payments.

A majority of city stormwater utilities bill their service charges on water, wastewater, solid waste, electric, gas, and other municipal utility service bills. Many counties are primarily rural service governments that do not operate such utilities, so another approach is needed. Most counties have local property tax assessment, billing, and collection responsibilities. Therefore, county stormwater utility service fees in some states are added to their property tax billings. Some counties have opted to prepare separate service fee billing systems so as to avoid any confusion between property taxes and stormwater service fees. Special service districts either integrate the master account file and billing with existing water, wastewater, or other billing systems or, in some states, they are able to attach stormwater billing to a county or city property tax billing.

Consistency with Other Local Funding and Rate Policies

Most urban communities have a variety of funding mechanisms in place and adopted policies that portray local practices. If, for example, a community has water and sewer service fee rate structures that use residential flat rates, a simple residential stormwater fee would probably be very acceptable. If, however, local water and sewer rates are very complex, the general public's expectations are likely to be geared to that level of refinement. A flat-rate stormwater service fee for all residential properties might not be perceived as sufficiently accurate.

Revenue Stability and Sensitivity

Fortunately, stormwater service fee rate structures are not prone to some of the revenue stability and sensitivity problems of water and wastewater (sewer) methodologies. Stormwater costs and rates are generally associated with providing and maintaining a provisional system capacity that is fully utilized only infrequently, rather than with delivering a certain amount of water or collecting and treating a relatively consistent quantity of wastewater each day. As a result, the revenue stream of a stormwater service fee is not susceptible to conservation measures like water and wastewater utilities. Stormwater utilities do not have to increase rates as a result of customers reducing their consumption of a commodity like potable water.

SERVICE FEE RATE AND ASSESSMENT METHODOLOGIES

Rate Design

Conventions are emerging as stormwater utility service fees and assessments become increasingly common. Impervious area, gross area, percentage imperviousness, and land use are the most frequently used parameters.

Service Fees

In most instances, service fees are cost-based, i.e., they are designed to reflect the impacts that each property has on stormwater service demands and thus the cost of providing facilities and operational and support activities. Such costs are primarily a function of peak stormwater runoff rate, total volume of discharge, and pollutant contributions, but design practices for stormwater service fees and assessments have yet to settle upon a single common standard or even a generally-accepted best model for calculating charges.

Empirical studies have demonstrated that impervious surface area on a property is the single most significant factor influencing all of these impacts. Impervious area is also relatively easy to identify and quantify numerically and is the most common parameter used in stormwater service fee calculations. However, the impact of a given area of impervious surface may also be influenced by its shape, slope, surface condition, vegetation, and nature of its discharge to a conveyance conduit or channel.

Location of impervious and pervious areas on a given site is also important in determining the degree of runoff mitigation that results due to the presence of pervious areas. Runoff from an impervious parking area draining across a broad grass slope of permeable soil to a roadside ditch may be significantly less compared to that of a similar impervious area collected and drained by storm sewers. This has led some to focus on “directly-connected impervious area” in their stormwater rate structures.

Percentage of imperviousness is also significant because pervious surfaces may mitigate runoff impacts from a given property. Relatively few stormwater service fee methodologies employ impervious percentage directly in the calculation of service fees, but it is indirectly accounted for in methodologies that use a combination of gross area and impervious area or gross area and intensity of development.

Permeability of soil and vegetative conditions may also influence the mitigation effects attained from pervious areas. However, soil and vegetative conditions are rarely considered because they can vary dramatically, even across a single site. There are very few reliable and accurate soil inventories, soil conditions may be altered in the course of development, and vegetative effects vary significantly from season to season.

Assessments

Modern urban stormwater benefit assessment parameters are different than those employed in earlier times. Stormwater assessments were historically derived from ditch law practices applied to drainage and protection of agricultural areas. Since agricultural income was closely tied to the area protected or improved by the drainage practices, property area was the most common parameter for apportioning the benefit and impervious area was not a common consideration. Because the systems subject to drainage and ditch law assessments were geographically and functionally limited, built to protect acres owned by relatively few farmers, assessments would typically be based on acreage each owned. In later periods, property value was often used as the parameter for assessment calculations.

In contrast, the service area of modern urban stormwater districts or utilities is typically much larger with thousands of properties and owners. In addition, urban stormwater management may not always have a distinct benefit that is direct and special to individual properties. Therefore, use of the special assessment process for urban drainage projects must carefully evaluate area to be served, benefit to be provided, and relationship of benefit to individual parcels which might be assessed. Present-day assessment calculations are frequently based on parameters similar to those employed for stormwater service fees, i.e., impervious area, gross area, and development intensity. Additional discussion of this topic is included in the section covering Special Assessments in this chapter.

Uniform and Tiered Charges

A majority of rate structures currently in force employ uniform (flat-rate) or tiered fees for some or all customers rather than a calculated charge based on conditions on each property. The most common form is a flat-rate for detached single-family residential properties, coupled with discrete rates applied to non-residential properties. Two or three tiers of residential rates are common in communities that have a diverse housing stock. Some rate methodologies also apply uniform or tiered rates of various sorts to other classes of customers. For example, individual mobile home parks, condominiums and townhouses are sometimes billed flat rates per unit.

Rate structures that classify and group properties by development intensity or land use and apply a fixed rate to the classes are a form of tiering. For example, gross area/intensity of development rate structures commonly group properties into five to ten descriptive classes ranging from undeveloped or very lightly developed to very heavily developed. Such rate methodologies also typically group customers into gross area increments, so dual tiers of area and development intensity are used in the fee calculation formulae. A few communities have adopted very simple rate structures that charge residential properties one flat rate and all other properties another. Given the diversity of non-residential development conditions, this approach does not attain a high degree of equity in apportionment of costs of service.

Service and Equivalency Units

Many communities have opted to use various service units or equivalent unit values in their utility rate methodologies. For example, water rates are often based on metered use of gallons or cubic feet of water, which are units of service. Solid waste charges are frequently based on service units such as the size and number of bins or the tonnage of waste dumped at a transfer station. Stormwater service units or equivalency unit values are usually based on impervious area or gross area, and are most commonly derived from the typical or average condition on a single-family residential property. Terms like "equivalent residential unit" or "equivalent service unit" are commonly used to describe these values.

Service units or equivalency units are typically applied as "block charges", where customers are billed for increments of use. Water customers may be billed in increments of 1000 gallons or 100 cubic feet, rather than for a precise number. Such practices have been adapted to stormwater service fees. For example, Columbia County, Georgia uses an impervious area stormwater rate structure and charges each customer a fixed rate for each 100 square feet of impervious coverage.

Some communities have opted to use a combination of flat rates for single-family residential customers with an equivalency unit applied to other types of properties. For example, an average residential property in a given community might be determined to have 3,000 square feet of impervious area (including roofs, drives, walks, patios, etc), and this value might be used as a service or equivalency unit for other customers. All single-family residential properties might be charged for one equivalent unit, or two or more tiers of that increment might be applied to residential properties. The impervious area on other types of properties would be measured and that figure divided by 3,000 to determine the number of equivalent units that each should be charged. It is common practice to bill for each equivalent unit or fraction thereof, effectively rounding up to the next full unit.

Water and sewage rate structures often include increasing or declining fee schedules to encourage or discourage consumption, in which incremental "blocks" are defined. For example, in water and sewer rates the first 10,000 gallons used or discharged in a month would be charged at one rate, the next 10,000 gallons at another, and so on. This practice is not common in stormwater rates, though a few jurisdictions that bill undeveloped as well as developed properties employ declining rates to moderate the charges on large undeveloped tracts of land.

One of the benefits of a service or equivalency unit value is that it allows easy comparisons of charges among dissimilar customers. For example, under the assumptions used in describing an impervious area rate methodology previously, a commercial or other non-residential property with ten times as much

impervious area as a typical residence (assumed to be 3,000 square feet) would be charged for ten units of use. A “big-box” retail store (or small shopping center or industrial site) with 600,000 square feet of impervious coverage (about fourteen acres) would be billed for 200 units.

Classification and Grouping of Like Customers

Classification and grouping of like customers having similar characteristics and/or service demands is a common practice in utility service fee rates. For example, wastewater treatment demands and costs are related not only to the volume of the waste to be treated, but also to the type of constituents found in the wastewater and their strength or concentration. Some users discharge wastes to public sewers that are radically different than a typical residence. Therefore, wastewater rates for some commercial and industrial customers may include both a volume component and a strength component.

This particular wastewater rate practice has not been directly adapted to stormwater rates, but a comparable classification or grouping of like customers based on their impacts on stormwater services and facilities has been incorporated into some rate structures. For example, all single-family detached residential properties are often grouped in a single user class or into tiers and each class is then billed a common rate. In a gross area/intensity of development rate methodology, properties having like land use may be grouped in a single intensity of development classification, e.g., all commercial office properties might be deemed heavily developed for rate calculation purposes. Industrial properties or those undergoing land disturbance activities might be grouped for NPDES impacts and erosion/sediment control service demands.

Service Fee Credits

Many communities have modified basic stormwater rate design practices to accommodate local circumstances. Perhaps the most widely-used modification to basic rate structures is application of a credit adjustment to service fees. Credits are typically conditional, i.e., they are premised on continuing specified performance by the customer. If the specified performance is not maintained, credits may be rescinded. The concept is similar to industrial pre-treatment credits commonly provided wastewater customers to reduce strength of sewage discharged into public systems.

Stormwater service fee credits are most commonly provided for properties that have on-site detention or retention facilities. In most cases detention or retention systems are designed to approximate pre-development conditions or to meet capacity limitations of downstream facilities. Such controls reduce capacity requirements (and cost) of downstream systems and may, if properly designed and maintained, enhance water quality. Credits have also been given for facilities or activities that assist in provision of services or reduce the public cost of providing services.

Credits have also been adopted in some jurisdictions for properties subject to and in compliance with National Pollutant Discharge Elimination System (NPDES) permits and for public and private schools providing approved water quality education programs. The rationale for the latter credit is that education is a minimum control measure in NPDES Phase 2 stormwater discharge permits. If not provided by local schools educational programs the service would have to be performed by the stormwater management entity at additional cost to the ratepayers.

Various means are employed to provide service fee credits to properties having on-site detention. For example:

- ► Boulder, Colorado, for properties providing on-site detention, has administratively adopted the practice of reducing the normal service fee twenty (20) percent for an on-site detention system that meets standards for a 5-year storm. Systems that meet 100-year storm requirements are eligible for an eighty (80) percent reduction.

- ► Bellevue, Washington changes the intensity of development classification of properties with detention systems to that of very lightly developed land, resulting in a variety of percentage reductions, depending on the intensity of development classification that would normally be applied to the subject property.

- ► Charlotte, North Carolina allows up to fifty (50) percent credit for peak runoff attenuation and up to twenty-five (25) percent credit for flow volume reductions.

Practices elsewhere reduce service fees between thirty-three (33) percent and seventy-five (75) percent in recognition of on-site control that reduces runoff rates. In most situations the long-term impact on revenue resulting from this type of adjustment is minor, typically no more than one or two percent. Ratepayers who do not have on-site systems have to pay slightly more to cover the minor deficit resulting from the credits.

The primary intent of credits is to recognize reductions in the cost of public stormwater services and facilities that can be attributed to private systems or activities. Credits only partially compensate developers who install and properly maintain facilities. Rarely do they offset loss of space such facilities occupy or the degree to which on-site systems disrupt the layout of commercial properties and subdivisions. Nor do most credits consider water quality impacts of on-site systems, or their influence on the cost of stormwater quality management. However, they do marginally improve equity of service fee cost allocations.

The balance of fees with level of service required and provided is, at least in theory, improved by use of credits. On-site control of peak flow of stormwater

runoff means that a property requires less service from the public stormwater system. Downstream reductions in peak runoff allow a higher level of service from a given size of facility or enable a community to build smaller systems in the future. A reduction in pollutant discharges into the public system could translate into lower NPDES permit compliance costs.

Developers' engineers can provide the information required to incorporate a credit for on-site measures. An allowable runoff release rate based on pre-development conditions and required on-site storage capacity can be used to determine the effectiveness of each on-site facility for crediting purposes.

Example Stormwater Rate Methodologies

The rate structure concepts used as examples in this guidance are typical of those adopted in the more than five hundred communities that have established stormwater utilities or special districts. Direct comparison with rate methodologies used in specific communities is not productive, however, since the general approaches examined in this guidance should be viewed in the specific context of the local needs, priorities, and circumstances of each community.

Generally speaking, any rate methodology that incorporates gross area tends to reduce the proportion of the service costs allocated to commercial and other intensely developed properties and increase the proportion of costs assigned to residential and less intensively developed properties.

Example stormwater rate methodologies examined in this guidance base stormwater fees on:

- impervious area;
- a combination of impervious area and gross area;
- impervious area and the percentage of imperviousness; and
- gross property area and the intensity of development.

Impervious Area

Stormwater rate structures based solely on impervious area have been widely used. They are simple, the concept is easily understood by the general public, and is generally perceived as equitable. Impervious area rate methodology reflects a philosophy of allocating costs based on each property's contribution of runoff to the system. Large expanses of roofs and paving in shopping centers and other commercial and industrial business areas are highly visible to the general public, and most people understand the hydrologic impact of covering natural ground with paving and rooftops. The approach is generally consistent with local service fee rate practices for wastewater services, wherein fees are

based on the amount of water used and strength of effluent discharged to the public treatment works.

Numerous technical studies, references, and citations in engineering literature technically validate the equity of an impervious area rate methodology. The coefficient of runoff value in hydrologic engineering tables closely approximates the percentage of impervious coverage. Empirical evidence gathered in the field by monitoring changes in runoff before and after development verifies that impervious coverage is the key factor influencing peak stormwater runoff. Data gathered during the National Urban Runoff Program (NURP) in the 1970's and 1980's and subsequent research showed that impervious area is the most dominant factor in pollutant loadings conveyed by stormwater runoff.

The impervious area approach may introduce a "timing" problem in the acquisition of capital assets. Impervious area service fees typically are applicable only to developed properties, but stormwater capital improvements are designed to accommodate future growth. Present ratepayers may be paying for capacity provisions far beyond their own use, and undeveloped properties (not subject to an impervious area fee) would not be charged for their future needs. Other funding mechanisms, such as development impact fees or system development charges, can be used in concert with an impervious area rate methodology to ensure that undeveloped properties ultimately participate in the cost of capital improvements designed with capacity to serve them.

An impervious area rate methodology is highly stable and insensitive to property alterations by ratepayers. The rate of revenue growth using an impervious area methodology would more or less correspond to the pace of development. Economic downturns would tend to diminish the addition of new impervious area and the stormwater revenue growth, while rapid growth would add to it. Reductions in impervious coverage on individual properties are rarely justified merely to reduce stormwater fees. Alterations that would reduce stormwater fees are essentially infeasible under all the rate structure scenarios examined in this guidance.

Most impervious area rate structures include simplified single-family residential service fees, often applied as flat-rate charges. Charges to non-residential properties may be structured in a variety of ways under an impervious area methodology. In some cases the single-family residential property, "equivalent unit" value, or ranges of impervious area (100, 500, or 1,000 square feet) are used as a billing unit.

Impervious area service fees are usually calculated by dividing the amount of impervious area on each parcel by an equivalent unit or a range value to determine the number of billing units and multiplying a charge per unit. Very few use the exact amount of impervious area on each property because the accuracy

of the impervious area data typically available does not support such a precise calculation.

The following example illustrates how service fees based on impervious area might be calculated. Assume that a typical single-family residential property is determined to have 3,000 square feet of impervious area including driveway and patio area as well as roof coverage. An annual rate of $.02 per square foot of impervious coverage would result in a typical residence being charged $60.00 per year, or $5 per month.

If a flat-rate fee were applied to all single-family residences, an equivalency value equal to the impervious area of the typical single-family residence might be used to determine charges to other properties, including multi-family apartments. The 3,000 square foot increment might also be used as a range value in the rate structure, with all non single-family residential properties grouped into impervious area ranges of 3,000 square feet which serve as a billing unit.

All properties in a given range are typically charged the same fee even though they might have slightly different impervious area. For example, using an equivalency unit of 3,000 square feet of impervious coverage, two commercial properties with 21,000 square feet of impervious area would be charged for seven equivalent units (7 X $60 = $420/year) even if their gross property areas differed. A large shopping center or discount store with 600,000 square feet of impervious coverage would be charged $12,000.

An impervious area rate methodology is not highly flexible or subject to judgment in its application to specific properties. It is based on a single parameter that can be accurately measured, although modifying factors might be applied to the basic rate calculation. Approaches based on parameters like intensity of development allow substantially more judgment to be applied, both in the design of the rate methodology and in its application to specific properties.

Other funding mechanisms can be blended with an impervious area service fee. For example, a system development charge could be adopted to recapture a system capitalization component from properties as they are developed. Other revenue sources can be used to supplement service fees, such as general revenue support for an NPDES stormwater quality program.

Impervious Area and Gross Area

Both total property area (gross area) and impervious coverage of properties influence amount, peak rate, and make up of stormwater discharged to public drainage systems. A combined impervious area and gross area rate methodology can account for both factors. Most stormwater rate methodologies utilize one or the other parameter in calculation of fees. A few (including Denver, Colorado) use both parameters to derive percentages or ratios used in rate calculations.

The concept underlying an impervious/gross area rate methodology is relatively easy to explain and grasp. It is consistent with the public's general understanding of hydrology and the impact that both gross area and impervious coverage have on stormwater runoff. This type of rate methodology tends to allocate more of the cost burden to lightly developed and undeveloped properties than methodologies that are based strictly on impervious area. Depending on the weighting factors and/or cost allocations, however, smaller properties that are almost entirely covered with impervious surfaces could conceivably be charged more than larger properties that are undeveloped or very lightly developed with little impervious coverage.

An impervious/gross area rate methodology requires that the mix of impervious and gross area in the service fee calculation be “tuned” to properly reflect the significance accorded to each parameter. This can be achieved in at least two ways: 1) by applying weighting factors to gross and impervious area; or, 2) by allocating certain costs of service to each parameter. Weighting assigned to gross and impervious area should be consistent with the local hydrologic conditions, patterns of development, program requirements (e.g., operating versus capital needs), balance of stormwater quantity and quality program costs, and the community's perceptions.

Rates could be structured in a variety of ways under this approach to reflect the importance assigned to each parameter. Units of gross area might be charged a basic rate, with a surcharge applied to units of impervious coverage. Alternatively, cost of service might be apportioned between impervious area and gross area instead of assigning specific costs to each parameter. For example, eighty (80) percent of total stormwater cost of service might be allocated to impervious area and twenty (20) percent to gross area.

Coefficients of runoff used in hydrologic engineering suggest that gross area to impervious area ratios in a service fee calculation might be as low as 1:4 or as high as 1:40. If costs are allocated to the two parameters, the significant influence of impervious coverage on peak runoff and pollutant loading suggests that seventy-five (75) percent or more of the costs should be assigned to the impervious area component of the rate.

Solely for the purpose of illustrating how fees might be calculated using an impervious/gross area methodology, assume that each 100 square feet of gross area might be charged $.10 (ten cents) per year. A surcharge of $1.60 per year might be applied to each 100 square feet that is covered by impervious area. This would yield an effective ratio of 1:17 between areas that are pervious and those that are impervious (i.e., areas covered by impervious surfaces would be charged seventeen times as much as areas that are not). That ratio is generally consistent with the difference in peak runoff between undeveloped and developed properties.

Applying the example values cited above to a twelve thousand (12,000) square foot residential property with 3,000 square feet of impervious coverage would result in a total service fee of $60 per year or $5 per month. The charge for the gross area of the property (12,000/100 @ $.10 = $12/year) would be added to the charge for the impervious coverage (3,000/100 @ $1.60 = $48/year). An undeveloped 12,000 square foot property would be charged $12/year in this scenario.

Applying the same values to a small commercial property of 30,000 square feet having 21,000 square feet impervious (70 %), the annual service fee would be $366 per year (30,000 sq ft / 100 x $0.10 = $30/year for the gross area and 21,000 sq ft / 100 x $1.60 = $336/year for the impervious coverage). Thus, the stormwater service fee would be more than six times as much as that for the example 12,000 square foot residential property even though the example commercial property is only two and one-half times larger in gross area. The proportionately greater increase reflects more intense development of the larger parcel in this example (70 % impervious coverage versus 25 % for the residential example).

Using the same formula, if it is assumed that a 600,000 square foot shopping center is completely covered with impervious rooftops and paving, the annual service fee would be $10,200 (600,000 sq ft / 100 x $0.10 = $600 for the gross area plus 600,000 sq ft / 100 x $1.60 = $9,600 for the impervious coverage). In both commercial examples cited, the gross area/impervious area rate methodology results in slightly lower fees for the non-residential properties than does the impervious area methodology examined previously, but that is purely a function of assigned values and is subject to modification.

A gross area/impervious area rate methodology facilitates charging undeveloped properties a service fee. Charging undeveloped properties would broaden the rate base, especially if extensive rural areas were included in the utility service area. It would also enable some operating and capital expenses to be distributed among all properties, although system development charges or other funding methods to recapture financial participation in infrastructure capitalization may still be needed. Using the above example values, an undeveloped 12,000 square foot property might be charged $ 12 per year (12,000 sq ft / 100 x $0.10), an undeveloped 30,000 square foot property would be charged $ 30 per year (30,000 sq ft / 100 x $0.10), and an undeveloped 600,000 square foot would be charged $600 per year (600,000 sq ft / 100 x $0.10). Because charges to very large undeveloped acreages quickly escalate, such rate methodologies might need to have a schedule of incrementally declining charges as the size of properties increases.

A residential flat-rate charge could also be used with this methodology, using a sample of residences to determine how much gross and impervious area is

typical in a given community. The residential rate could constitute equivalent unit values for both parameters. Obviously, different rates for gross area and impervious area might be applied in all of the above examples to meet the cost of services and facilities or apportion costs differently.

Both gross area and impervious area data are needed for this methodology, adding to the cost of developing a master account file, although fee calculations could be relatively simple. The gross area on each property might be divided by a billing unit increment (100 square feet in example above) and multiplied times a charge per unit. The same could be done for impervious area, with the two sub-totals added together to generate service fee amounts. Adjustments and credits might be applied to either or both of the parameters.

Cost of implementation and upkeep of this type of rate methodology is influenced by the cost of assembling data for a master account file and the computer programming associated with billing/collection and billing inquiry processes. Using a flat-rate charge for one or more classes of properties would substantially reduce costs. Maintenance of information might also be simplified by requiring data from developers' engineers and/or architects when plans are submitted.

Potential revenue capacity of this type of rate structure is somewhat greater than the impervious area approach because it could conceivably charge both undeveloped and developed properties. For the residential component, the revenue stream would probably be equal to or greater than other methods described in this guidance, depending on weighting factors and rates assigned and/or allocation of costs.

This approach is comparable to the other rate structure options in its stability and insensitivity to external influences. Being based on gross area and impervious area, there is little that can be done by a property owner to reduce parameters that drive the amount of the service fee.

Applying weighting factors or allocating costs to gross area and impervious area makes this approach especially flexible. A broad range of weights could be assigned to gross area and impervious area to account for unusual conditions, presence of modifying considerations like on-site detention or water quality impacts, or runoff mitigation normally realized on large undeveloped tracts. System development charges and other secondary funding methods could also be coordinated with parameters used in this type of rate structure.

Impervious Area and Percentage of Impervious Coverage

This type of rate methodology is currently used by the City/County of Denver, Colorado. Under this rate structure amount of impervious area and impervious percentage are both used to calculate service fees, dictating that data on both impervious and gross area be used. Gross area is not relevant to the service fee calculation, except that it is needed to determine the percentage of

imperviousness. Under this approach impervious area of each property is charged at varying rates depending on the percentage of imperviousness of the subject property. Each square foot of impervious area is typically charged more as the percentage of imperviousness increases. Because this rate methodology is based on impervious area, undeveloped lands are often not charged.

Some anomalies may occur in service fees that result from this type of rate methodology. Consider two properties of different sizes with the same amount of impervious coverage. Because its percentage of imperviousness could be a lot higher, the smaller property could be charged more than the larger property.

The key determinant of charges to individual properties (and of overall revenue capacity) under this rate concept is the schedule of charges per unit of impervious coverage. Properties may be divided into several classes based on their percentage of imperviousness (referred to as “ratio groups” or “imperviousness classes”), and a varying rate per impervious area unit might be applied to each class. For example, properties having ten (10) percent imperviousness or less might be charged $.06 per year for each 100 square feet of impervious coverage, while properties with eleven to twenty percent imperviousness might be charged $.15 per year for each 100 square feet. Proportionately higher values are usually applied as the percentage of impervious coverage increases.

Being based on two parameters which are accurately measurable, impervious area and gross area, from which the percentage of imperviousness is calculated, this approach gives an impression of greater accuracy than some other options. Judgment is introduced to the service fee calculation in the form of different charges for various imperviousness classes.

A community’s perception of equity resulting from this rate methodology may be mixed, and may depend on the number of classes or ranges used for percentage imperviousness and schedule of rates assigned to them. To the extent that a shift in the distribution of costs toward heavily developed properties benefits single-family residences, homeowners would likely see a lower bill than under other rate structures. They might view the balance of services and charges favorably. However, charges for intensely developed commercial properties would not be as favorable as they would bear a much higher proportion of cost of service.

Table 2-1, below, presents a schedule that is typical of what might be applied under this approach.

Table 2-1: Example Schedule of Rates

(per 100 square feet of Impervious Coverage)

Impervious Percentage	***Annual Rate/100 Sq. Ft. of Impervious Area***
1 to 10 %	$.50
11 to 20 %	$1.35
21 to 30 %	$2.00
31 to 40 %	$2.70
41 to 50 %	$3.35
51 to 60 %	$4.00
61 to 70 %	$4.70
71 to 80 %	$5.40
81 to 90 %	$6.00
91 to 100 %	$7.70

A typical residential property has between twenty and forty percent impervious coverage. Some houses are much larger but have a much lower percentage of imperviousness because they are on very large lots or acreage. Recent trends toward very large residential subdivisions with smaller lots and larger structures are resulting in much more intense residential development and increased stormwater runoff. This is being mitigated to some extent by the use of green design practices, such as retention of stormwater in rain gardens and detention ponds.

Both the size and density of residential development are common reference points in the design of impervious area/percentage of impervious area stormwater rates. An average residence in an urban community might have a 12,000 square foot lot and 3,000 total square feet of impervious area (25 %) including driveways and patios. When an impervious area/percentage of impervious area methodology is used, an annual service fee for such a residence under the example schedules of charges might be $60/year (3,000 sq ft/100 x $2), or $5.00/month. The previously-cited example of a commercial property of 30,000 square feet with 21,000 square feet of impervious coverage, 70 % imperviousness, would be billed $987/yr under this methodology with the schedule of rates shown in the table (21,000 sq ft/100 x $4.70 = $987). The 600,000 square foot commercial shopping center example property (100 % impervious) would be charged $46,200/yr. (600,000 sq ft / 100 x $7.70 = $46,200).

This example illustrates just one approach to a schedule of rates for different percentages of impervious coverage. With the same residential service fee as in the impervious and gross area/impervious area rate methodology examples

($60/year), the service fee both for the small commercial and the large retail shopping center would be much greater. It is entirely a function of the rate assigned to each range of imperviousness.

Obviously, care must be taken in designing the schedule of rates to ensure that appropriate allocations of cost of service result. It must also be recognized that this methodology can create anomalies relative to service fees as compared to other rate methods. These calculations are a function of specific schedule of rates used in this example and could be changed by adjusting the schedule.

This rate concept would require that both gross area and impervious area data be gathered. Incorporating a simplified charge for single-family residences could significantly reduce the number of properties requiring specific data. Future maintenance of data for developing properties could be accomplished by requiring that gross area and impervious area data is supplied by each developer's engineer or architect as part of project plans.

This approach would require that the file record be larger than for some other options in order to accommodate use of two parameters. A rate methodology could be written to calculate percentage of imperviousness and assign a property to a classification, or ratio group, based on the data. Some specialized programming might be required for this, but programming expenses would not be significantly greater than for other options.

Revenue capacity of this type of rate structure is greater than most of the other options examined in this guidance, especially if a highly progressive schedule is used. In Denver, Colorado this methodology generates perhaps twice as much revenue per square mile as some of the other rate methodologies because the very heavy weighting applied to the percentage of imperviousness results in much higher charges for intensely developed properties.

The stability and sensitivity of this rate methodology is consistent with the other options considered. Even using a highly progressive schedule of rates, the level of service fees would probably not induce property owners to remove impervious area from their properties. It simply is not cost-effective for most property owners to reduce the impervious area just to reduce a stormwater service charge.

Despite being based on two parameters, this rate concept retains a fair degree of flexibility. Flexibility is directly related to how classes of imperviousness are defined and the schedule of rates assigned. By tailoring number and size of the classes and schedule of rates, flexibility comparable to the other rate structures is achievable. Modifying factors and secondary funding methods such as system development charges can also be used.

Gross Area and Intensity of Development

Rate structures based on the gross area of each property and its intensity of development are currently used by the cities of Bellevue and Tacoma, Washington and Cincinnati, Ohio. An intensity of development factor is usually very similar to the coefficient of runoff. The term "intensity of development factors" is commonly used rather than a "coefficient of runoff", because the relationship of intensity of development to stormwater runoff is easily grasped.

If applied to every parcel, this type of rate methodology requires that gross area be determined for all residential as well as non-residential properties and an intensity of development rating be assigned to each. Most communities using this method have opted to apply a simplified service fee or schedule of fees to one or more categories of single-family residential parcels, but there is no uniform practice. Non-residential properties are usually categorized into five to ten descriptive groups ranging from “undeveloped” to “very heavily developed”. If a flat-rate residential charge is not used, all residential properties are typically assigned to one or two of the intensity of development categories.

Local development patterns may influence how residential properties are treated under this rate methodology. Only one residential intensity of development category might be needed in a community that has highly uniform residential development. More categories might be appropriate in another community that has residential lots ranging from 3,000 square feet to several acres.

Typically, the intensity of development values range from a low figure ranging between .02 and .20 for undeveloped or lightly developed properties up to .85 or even .95 for industrial and commercial uses. This approach groups similar properties and applies average values to all assigned to a given classification. For example, all apartments might be classified as multi-family residential with an intensity of development factor equal to .65 instead of assigning individual ratings ranging from .50 to .85 to individual apartment developments. The gross area parameter is the controlling element of rate calculation for all parcels in a given classification. An apartment building on 40,000 square feet of gross lot area would usually be billed one-half the amount charged to an equivalent apartment building on an 80,000 square foot property.

Calculation of service fees can be structured in several ways under a gross area/intensity of development rate structure. When a simplified residential charge is used, the service fee usually compares conditions on non-residential properties to a defined average specified for residential properties. For example, a typical residence is assumed to have a gross lot area of 12,000 square feet and an intensity of development of 0.25, and a commercial property of 30,000 square feet has an intensity of development of 0.70. The commercial property has an area 2.5 (30,000 sq ft/12,000 sq ft) times larger than the residential lot, and has an intensity of development 2.8 (0.70 / 0.25) times greater. The

example commercial property's stormwater charge would, therefore, be seven times that of the charge to a typical single family residence (2.5 x 2.8 = 7.0).

Using the example properties previously cited, the 12,000 square foot residential property assigned an intensity factor of .25 would be charged $5/month or $60/year (12,000 sq ft x 0.25 / 100 x $2.00/sq ft = $60/year). The 30,000 square foot commercial property with 21,000 square feet of impervious coverage assigned an intensity factor of 0.70 would be charged $35/month or $420/year (30,000 sq ft x.70 / 100 x $2.00/sq ft = $420/year). A 600,000 square foot shopping center property fifty times as large as the single-family residential property assigned an intensity of development factor of .90 would be charged $900/month or $10,800/year (600,000 sq ft x .90 / 100 x $2.00/sq ft = $10,800/year).

This approach allows service charges to undeveloped as well developed properties. For example, Bellevue, Washington assigns a very low intensity of development factor to undeveloped lands. It results in service fees that are about one-ninth (11 percent) of charges for comparably sized residential properties and even a lower percentage when compared with more intensely developed commercial or industrial parcels. Even at relatively low rates, this could generate a substantial amount of additional revenue compared to the impervious area rate methodology applicable only to developed properties when used in jurisdictions with extensive undeveloped areas.

The perceived equity of this type of rate structure is normally equal to or greater than that of other approaches, but the methodology requires a careful explanation to the community. Simplifying terminology associated with the rate methodology is desirable. That is why many jurisdictions use a phrase like "intensity of development factor".

Adjustments to individual bills or even entire classes of properties can be achieved by reducing or increasing the intensity of development factor for an individual parcel or for a class or other grouping. It is common for jurisdictions using this approach to assign an "effective" intensity of development to individual properties in response to service fee appeals, leaving the door open for adjustments that achieve a fair and reasonable rate when anomalous conditions exist.

Data requirements associated with this type of rate methodology would be less than for other options. Gross area information can often be extracted from existing databases and/or maps. Assignment of an intensity of development factor would require that judgment be used in reviewing conditions on each parcel, possibly using aerial photographs. Some additional work would be needed in the event that undeveloped properties were to be charged.

This type of rate structure tends to push a greater proportion of the cost of service onto residential and other lightly developed properties than methodologies based on impervious area, although the differential has diminished as average housing size has increased. Overall revenue capacity could be increased by also charging undeveloped properties. Like other stormwater rate structures examined in this guidance, revenue capacity of the gross area/intensity of development approach is relatively stable and insensitive to external influences

Flexibility of an intensity of development rate structure is equal to or somewhat better than other methods because of latitude available in defining categories and assigning intensity of development factors. A great deal of engineering judgment is involved in determining the intensity of development (coefficient of runoff) of a parcel in a given situation, and the engineering literature offers rather broad ranges of development intensity values. For example, values from .25 to .45 are not unusual for single-family residential parcels.

CHAPTER 3

LEGAL CONSIDERATIONS

OVERVIEW

The type of funding mechanism selected for a stormwater utility or stormwater management program has a variety of legal consequences. Taxes, user fees, special assessments, impact fees and other revenue sources can be used, but each approach will have different implications in terms of who will pay, what procedures must be followed to implement and collect the charge, and how the money can be used. If the funding approach is deemed to be a tax, then tax-exempt entities such as churches, schools, state agencies and federal government facilities will contest their obligation to pay. In many states special taxpayer approval must be sought. If a user fee approach is used, the reasonableness of the rate structure and its relationship to the service being provided may be challenged. If impact fees or special assessments are used, there will be limitations on how and where the funds can be applied.

The distinctions between the various funding approaches are often blurred. In general terms, a tax is an enforced burden imposed by sovereign right for the support of the government, the administration of law, and the exercise of various functions the sovereign is called upon to perform. In some cases there may be little practical difference between a tax and a fee, but the legal distinctions between the two are important. Many states have constitutional or statutory restrictions on the ability of local governments to levy taxes, such as requirements for special voter approval or super-majority votes in the state legislature, which do not apply in the case of fees or charges that are levied by the exercise of local regulatory authority.

State-imposed limits on property taxes have been part of the fiscal landscape for decades, but the nature of those limits changed dramatically in 1978, when California voters adopted Proposition 13, which rolled back property taxes to 1 percent of market value and limited annual increases in property values for tax purposes. Arizona, Massachusetts, New Mexico and Washington adopted very

strict limits soon after passage of Prop 13, and Colorado, Missouri, Montana and Oregon followed suit. Many states that do not fall under the strict limitation category require voter approval for local tax increases, and others require super-majority approval for tax hikes in the state legislature.

User fees are charges based upon the proprietary right of the governing body permitting the use of the instrumentality involved. Such fees have certain common traits that distinguish them from taxes. First, they are charged in exchange for a particular governmental service which benefits the party paying the fee in a manner not shared by other members of society. Second, they are voluntary or paid by choice, in that the party paying the fee has the option of not utilizing the governmental service and thereby avoiding the charge. Third, the amount of the fee is designed to recover the actual cost of the service being provided, rather than to raise general revenues for other government purposes.

The boundary between special assessments and user fees is not always clear. Generally, a fee is exchanged for a service rendered or a benefit conferred, and some reasonable relationship exists between the amount of the fee and the value of the service or benefit, while a special assessment is a specific levy designed to recover the costs of improvements that confer local and peculiar benefits upon property within a defined area.

Impact fees are one-time payments from property developers to municipal, county or school district governments for off-site improvements necessitated by new development. Such fees may be authorized by state enabling statutes or, in some states, may be imposed without legislative approval under the general home rule or regulatory authority granted by state constitutions and statutes. Impact fees differ from user charges in that they typically fund capital expenditures, not current services.

The legality of various funding mechanisms for stormwater management programs is primarily a question of state law. This guidance cannot survey or analyze the legal implications of different approaches in all 50 states, but it can highlight certain common issues that have arisen to date. Careful research will be needed to determine an appropriate fee structure in your jurisdiction, which will depend on the constitutional and statutory provisions governing the authority of local governments and special purpose districts in your state, as well as the case law interpreting those provisions.

For example, *City of Wichita, Kansas v. Kansas Taxpayers Network,* 874 P.2d 667 (Kan. 1994) involved the interpretation of certain substantive and procedural aspects of the city's home rule authority under Kansas law. Similarly, in *Densmore v. Jefferson County,* 813 So. 2d 844 (Ala. 2001), the Plaintiffs challenged a 1995 state statute as a "local" act (under Alabama state law) that had not been properly advertised under the state constitution. The Alabama Supreme Court held that the statute had been properly enacted in accordance

with the applicable state procedures. In *Billings v. Nore,* 148 Mont. 96; 417 P.2d 458 (1966), the Montana Supreme Court was called upon to determine, among other things, whether a stormwater ordinance enacted by the City of Billings was an administrative function or a legislative action that could be subject to repeal by special voter initiative under Montana law.

Stormwater management program fees have been the subject of litigation resulting in reported opinions from at least 17 states, including many cases involving final decisions by the state's highest court:

- Montana – 1966
- Colorado – 1986 and 1993
- Kentucky – 1989 and 1996
- Ohio – 1990
- Oregon – 1992 and 1993
- Kansas – 1994
- Florida – 1995, 1998 and 2003
- Washington – 1997
- Virginia – 1998
- Tennessee – 1998
- Michigan – 1998 and 2001
- North Carolina – 1998 and 1999
- South Carolina – 1999
- Alabama – 2001
- California – 2002
- Georgia – 2004
- Illinois – 2005

In addition, there have been unreported decisions from the lower courts in these and other states that have involved similar challenges to local stormwater fees, for example cases involving the cities of Tacoma and Bellevue, Washington (ca. 1984); and Atlanta, Georgia (1999).

In several instances, the results of such litigation have required a legislative "fix" to provide the proper authorization for the financing mechanism employed by the local stormwater utilities. In the state of Washington, for example, Washington RCW 90.03.525 was enacted to impose a stormwater charge on the Washington Department of Transportation at a level equal to 30% of the rates charged to other landowners. In North Carolina, GS Ch. 153A-277 was enacted in the wake of the 1999 state supreme court decision, in order to authorize the collection of fees for compliance with federal and state environmental regulations as well as for more traditional drainage services. In other cases, the courts have been called upon to determine the applicability or legality of existing statutory provisions authorizing the creation and funding of local stormwater utilities, such as Fla. Stat. § 403.031 and S.C. Code Ann. § 48-14-10.

COMMON THEMES

Based upon these cases, certain common themes or central issues have emerged. The question whether a stormwater service charge is actually a "tax" has been the issue most frequently litigated, along with related inquiries into whether the charge is actually a special assessment that cannot be levied against the parties challenging the fee. Subsidiary issues such as whether the charge is reasonably related to the cost of the services provided, and whether it is fairly imposed on the properties that are benefited by those services, have also been explored.

Tax vs. Fee

The most commonly litigated issue is whether a municipal stormwater service charge is a valid user "fee" or an impermissible "tax." This issue has frequently arisen in cases brought by tax exempt organizations such as churches, schools, and state agencies such as departments of transportation. As discussed in further detail below, it is also the central issue when local stormwater fees are levied against federal government facilities, which are exempt from local taxation but not from the requirement to pay normal utility charges.

The great majority of recent cases favor the position that stormwater service charges are a fee. Such cases continue to be filed because public perception has been shaped by the historical fact that stormwater drainage costs have traditionally been financed through general revenues, and, as noted above in Chapter 2, any new form of government funding is likely to be viewed as a "tax" regardless of technical distinctions in the manner in which it is structured. This phenomenon can be observed in cases such as those from California and Michigan where taxpayer groups are the plaintiffs and stormwater utility fees are derided as a "rain tax." In Oregon, where a state constitutional amendment (section 11b) defined a "tax" as "any charge imposed by a governmental unit upon property or upon a property owner as a direct consequence of ownership of that property except incurred charges and assessments for local improvements," the state tax court characterized a city storm drainage fee as follows:

> Respondent's storm drainage charge is exactly the kind of "johnny-come-lately" charge on property the public anticipated and intended to limit. Storm drainage systems are traditional municipal facilities. Like city streets, parks, street lights and street signs, storm drains are viewed as part of the infrastructure benefiting the public generally. Local governments may not avoid the limits of section 11b simply by calling something a "service" and requiring payment of a "fee." If that were the case, a city could impose a fire or police protection fee on all persons using improved property. These kinds of serpentine maneuvers, if accepted, would eviscerate the constitutional limitation. . . . [S]ection 11b was adopted as an

> initiative measure by angry, frustrated voters. Local governments which use sophistry, rationalization and self-justification in an attempt to evade the impact of [that section] do their citizens a disservice. *Roseburg School District v. City of Roseburg*, 12 OTR 329; 1992 Ore. Tax LEXIS 33 (Ore. Tax. Ct. 1992).

Although this decision was subsequently reversed by the Oregon Supreme Court, as described below, it is illustrative of the sentiment that continues to inspire protracted litigation on this issue in states across the country.

Found Not to Be a Tax

Stormwater funding mechanisms have been upheld as valid user fees in the cases arising in Kentucky (1989), Colorado, Florida, Washington, Tennessee, South Carolina, Georgia and Illinois.

In *Long Run Baptist Ass'n v. Louisville MSD*, 775 S.W.2d 520 (Ky. App. 1989), the Plaintiffs challenged the constitutionality of a stormwater service charge that was based on an "Equivalent Surface Unit" approach (1 ESU for all residential parcels; 1 ESU per 2500 sq. ft. for commercial and industrial parcels). The court of appeals found that the service charge was not a "tax" and was reasonable and uniform in its application.

In *City of Littleton v. State,* 855 P.2d 448 (Colo. 1993), the City sought to collect unpaid stormwater management fees from state-owned school properties. The Colorado Supreme Court found the charge was not a tax or special assessment, but a service fee reasonably designed to meet the overall costs of the service provided. The court also found that the portion of fee used to construct and maintain the drainage system was essential to provision of the services.

In an earlier case, *Zelinger v. City and County of Denver,* 724 P.2d 1356 (Colo. 1986), the Colorado Supreme Court denied a class action challenge to the City and County of Denver's Ordinance No. 160, which dealt with fees and service charges assessed for the city's storm drainage facilities. The plaintiffs claimed that the ordinance unconstitutionally denied equal protection and due process guarantees to property owners and also contended the ordinance was an unconstitutional property tax. The supreme court disagreed and affirmed the trial court's decision that the ordinance was rationally related to a legitimate state purpose of financing the maintenance and construction of new storm sewers, and that it established a valid service charge rather than an unconstitutional tax because the funds raised by the fee were not used for general revenue purposes but were segregated and used solely to pay for the costs of the "operation, repair, maintenance, improvement, renewal, replacement and reconstruction of storm drainage facilities."

In *Smith v. Spokane County,* 948 P.2d 1301 (Wash. App. 1997), the state court of appeals found that a fee charged for funding certain "Aquifer Protection Areas" was not an unconstitutional tax and would be upheld if it was reasonable and designed to cover only the costs of the program. In reaching this decision, the court relied upon an earlier Washington Supreme Court decision, in *Teter v. Clark County,* 704 P.2d 1171 (Wash. 1985), which held that charge for a county storm and surface water utility was not a tax but a valid regulatory fee.

In *Vandergriff v. City of Chattanooga,* 44 F. Supp. 2d 927 (E.D. Tenn. 1998), city taxpayers challenged validity of a local stormwater ordinance on various state and federal constitutional grounds. The federal District Court found the ordinance imposed a fee, not at tax, because the charges were based on use of the stormwater system, and applying a portion of fees to construct or expand facilities as well as to defray cost of operating the system was explicitly authorized by state statute.

In *South Carolina v. City of Charleston,* 513 S.E.2d 97 (S.C. 1999), the State of South Carolina brought a declaratory judgment action to determine whether city was authorized to impose stormwater fees on state facilities pursuant to a state statute, S.C. Code Ann. § 48-14-10, which authorized local governments to establish a “stormwater utility” and to fund it either through a fee or a tax assessment. The City of Charleston created its utility by local ordinance, and opted to fund it through a fee. The state argued that although denominated a fee, the charge involved was really a tax. The state supreme court found that the plain, ordinary and unambiguous language of the statute allowed local governments to fund the utility through either a fee or an assessment, and that the city had chosen to use a fee, which could properly be imposed on State property.

In *McCleod v. Columbia County,* 599 S.E. 2d 152 (Ga. 2004), the County imposed a stormwater fee based on impervious area of developed property. Property owners challenged the fee as an invalid tax. Noting that a charge is generally not a tax if it provides compensation for services rendered, the Georgia Supreme Court held in a unanimous decision that the fee was "not arbitrary and bears a reasonable relationship to the benefits received by the individual developed properties in the treatment and control of stormwater runoff."

An earlier, unpublished decision from the Georgia Superior court, *Fulton County Taxpayers Association v. City of Atlanta*, No. 1999CV05897, 1999 WL 1102795 (Ga. Super. Ct. Sept. 22, 1999), came to a different conclusion. However, the City of Atlanta stormwater utility charge, unlike the charge involved in the *McLeod* case, contained no provision for a landowner who has no street frontage or a landowner who has his or her own manner of disposing of stormwater runoff, such as ponds or other systems, to “opt out” or obtain a credit against the stormwater fee. The fee was also struck down because it was similar to a tax

used to raise money for general purposes. The city did not satisfy the court that the funds were dedicated to stormwater and water quality improvements.

In *Church of Peace v. City of Rock Island*, 2005 Ill. App. LEXIS 448 (2005), an Illinois appeals court found that the stormwater fee levied by the City of Rock Island is not a tax and that churches are not exempt from payment of the fee. The court found that, under Illinois law, a tax may be distinguished from a fee by observing that a tax is a charge having no relation to the service rendered and is assessed to provide general revenue rather than compensation. A fee, on the other hand, is proportional to a service or benefit rendered. Using this analysis, the court found the stormwater service charge was clearly a fee, because there was a direct and proportional relationship between imperviousness and stormwater runoff, thus creating a rational relationship between the amount of the fee and the contribution of a parcel to the use of the stormwater system. The court also found that the fee at issue was “voluntary,” because the “opt-out” provisions in the ordinance meant that persons choosing not to avail themselves of the stormwater drainage system provided by the city could do so and avoid paying the fee.

Found to Be a Tax

Stormwater fees have been struck down as invalid taxes requiring explicit voter approval under specific state laws or constitutional amendments (“taxpayer rebellion” provisions) in California and Michigan, and were also rejected in two lower court decisions interpreting a similar provision in Oregon before the later of those decisions was reversed by the Oregon Supreme Court.

In *Howard Jarvis Taxpayers Ass'n v. City of Salinas*, 98 Cal. App. 4th 1351 (2002), the City established a storm drainage fee on all developed property, based on impervious area. Taxpayers challenged the fee as a "property related" fee requiring voter approval under the Article XIII.D of the state constitution, which was added in the 1996 elections as a result of Proposition 218, the “Right to vote on Taxes Act.” The trial court found that the fee met an exception in the constitutional provision for “water and sewer services,” but the appellate court reversed because the fee was not directly based on or measured by use.

In *Bolt v. City of Lansing,* 587 N.W.2d 264 (Mich. 1998), the City established a stormwater fund to pay for sewer separation costs, based on an "equivalent hydraulic area" formula. The Appeals Court (1997) found it was a "user fee" and not a "tax." The Michigan Supreme Court, in a divided 4-3 decision, found that City was charging landowners a “rain tax,” requiring voter approval under the so-called “Headlee Amendment” to the state constitution, because the charge was being used to pay for the capital investment on the utilities and services. On remand to the lower court, the decision was found to be prospective only, and no refunds of previously collected fees were required. That decision was upheld by the Supreme Court in 2001.

However, in *Roseburg School District v. City of Roseburg,* 851 P.2d 595 (Or. 1993), the Oregon Supreme Court found that city's storm drainage utility fee was not a tax on property that would have been subject to the limitations of Article XI.11b of the Oregon Constitution (adopted in 1990 by a initiative petition known as "Ballot Measure 5"). The city had structured the utility fee in an effort to avoid the constitutional restriction, by making it "a fee for service and not a charge against property." The court found it significant that unpaid charges did not become a lien against the property, and that the person responsible for payment could seek a reduction or elimination of the storm drainage service charge by demonstrating that the service was not being used.

An earlier case decided by the Oregon Tax Court went the other way. *Denney v. City of Gresham*, 12 OTR 194, 1992 Ore. Tax LEXIS 7 (1992). In that case the user charge was related to the amount of impervious surface area on a property: $2.75 per month for all "residential property," and $2.75 per month for each 2,500 square feet of impervious surface on all other property, such as multifamily, commercial and industrial. The tax court found that the only way an owner of an improved property could avoid the charge was to destroy the improvements, removing impervious surfaces. The court also found that the charge could not be "controlled" or "avoided" by any practical means.

The City of Roseburg explicitly designed its ordinance to avoid the outcome in *City of Gresham*. The Oregon Tax Court was not persuaded, finding the charge to be a tax as it had in the *Gresham* case. *Roseburg School District v. City of Roseburg*, 12 OTR 329; 1992 Ore. Tax LEXIS 33 (1992). However, the Oregon Supreme Court found the refinements made in Roseburg's ordinance sufficient to distinguish it from the *City of Gresham* case and reversed the tax court's decision.

Voluntary Service and "Opt-Out" Provisions

One element that has been found to influence the question whether a stormwater service charge is a tax or a fee is whether the user has a choice to accept or decline the service (sometimes phrased in terms of whether there is a "voluntary contractual relationship" between the user and the service provider). In the *City of Roseburg* case, for example, the tax court found that it was "unrealistic to speak as if the property had a choice as to whether it allows runoff. Where the charge is being imposed on existing property, the 'choice' which can be obtained only through modification of the property is not a real choice." The tax court was not persuaded by the city's argument that the owner could control the fee by reducing or eliminating the discharge or water from the subject property. (The Oregon Supreme Court avoided the issue, and reversed the tax court on the ground that the Roseburg fee was not imposed upon the owner of real property as a direct consequence of ownership; rather, the fee was imposed on the occupant to whom the city water service was billed.)

In the recent *City of Rock Island* case, on the other hand, the Illinois appeals court found that the opt-out provisions of a similar ordinance were sufficient to make the charge voluntary. The Illinois court held that, "[w]hile it might be cost prohibitive for each plaintiff to construct its own storm water run-off containment system, each would certainly be able to calculate the cost of doing so versus the cost of paying for the use of the City's system. Voluntary participation involves nothing more than weighing the competing costs of participation."

The federal courts have addressed the same issue on several occasions. In *United States v. Columbia, Missouri*, 914 F.2d 151, 155-56 (8th Cir. 1990), the Eighth Circuit found that even the profit component of the city's water and electric utility rates was not an impermissible tax on the federal government, because [t]he United States' obligation to pay the [fee] arises only from its consensual purchase of the City's property; it does not arise automatically, as does tax liability, from the United States' status as a property owner, resident, or income earner. When the United States purchases water, electricity, and related services, and then pays the utility bill, it does so as a vendee pursuant to its voluntary, contractual relationship with the City."

On the other hand, in *United States v. City of Huntington, West Virginia*, 999 F.2d 71, 72-73 (4th Cir. 1993), the Fourth Circuit concluded that a city ordinance imposing a "fire service fee" and a "flood protection fee" on the United States, premised "on the basis of square footage of the buildings" was a tax, and not a user fee, based in part upon the fact that the charge was an "enforced contribution to provide for the support of government." The court found that "liability for the 'user fee' charged by the City arises from the General Services Administration's and United States Postal Service's status as property owners and not from their use of a city service." *Id*. at 74.

In the ongoing litigation involving the stormwater fees imposed by the City of Cincinnati (discussed further below), the courts have sent conflicting signals as to the importance of the "voluntary" nature of the fee. In the original Court of Claims decision, *City of Cincinnati v. United States,* 39 Fed. Cl. 271 (1997), the court held that the storm drainage charge, which was imposed on all property owners within the city and was not the product of a voluntary purchase decision by the federal government, constitutes a tax, not a fee for services, and therefore could not be exacted from a federal entity such as NIOSH.

On appeal, the Court of Appeals for the Federal Circuit agreed that the storm drainage service charge was not imposed as a result of a consensual arrangement between the city and the United States, as would be true in the case of a voluntary purchase of utilities or other services, and found that the stormwater drainage service charge was an assessment imposed on the United States involuntarily, by virtue of its status as a property owner. However, the Court of Appeals did not agree that this fact was dispositive of the question whether the service charge was a permissible fee for services or an

impermissible tax. The Court of Appeals stated that "[t]here may be some instances in which a municipal assessment is involuntarily imposed but would nonetheless be considered a permissible fee for services rather than an impermissible tax." *Cincinnati v. United States*, 153 F.3d 1375, 1378 (6th Cir. 1998).

Whether or not a service charge is mandatory or voluntary is thus a factor to be considered, but is not necessarily determinative of the question whether the charge is a tax or a fee. The Georgia Supreme Court has suggested that whether a charge is voluntary is a factor because, if it is not mandatory, it cannot be a tax. *McCleod v. Columbia County,* 599 S.E. 2d 152 (Ga. 2004) (finding that the county stormwater ordinance was not a tax in part because property owners could reduce the amount of the charge by creating and maintaining private stormwater management facilities).

The reverse, however, is not necessarily true – a charge which is mandatory may or may not be deemed a tax, depending on the circumstances of the particular case. Thus, mandatory fees for various types of municipal services have been upheld by a number of courts in recent years. *See, e.g., Bloom v. City of Fort Collins*, 784 P.2d 304, 304-05 (Colo. 1989) (approving mandatory transportation utility fee); *State of Hawaii v. Medeiros*, 973 P.2d 736, 741-42 (summarizing the declining importance of voluntariness in fees in many state courts); *Hochstedler v. St. Joseph County Solid Waste Mgmt. Dist.*, 770 N.E.2d 910, 916 (Ind. Ct. App. 2002) (approving mandatory recycling charge as a permissible fee); *Rogers v. Oktibbeha County Bd. of Supervisors*, 749 So. 2d 966, 967 (Miss. 1999) (upholding mandatory garbage disposal fee on residents who did not use county's disposal system). *See generally* Reynolds, "Taxes, Fees, Assessments, Dues, and the "Get What You Pay For" Model of Local Government," 56 Fla. L. Rev. 373, (April, 2004).

Fee vs. Special Assessment

The issue whether a stormwater service charge is a "user fee" or a "special assessment," giving rise to different procedural requirements, has arisen in Florida (2003) and Colorado.

In *Gainesville v. State of Florida,* 863 So. 2d 138 (Fla. 2003), the state DOT refused to pay the city's stormwater fee, and the city sued. A settlement was reached in 2001, but when the city sought to validate a bond issue for its stormwater utility in 2003 the state DOT objected, arguing that the fee (based on impervious area using an "Equivalent Residential Unit" formula) was not a "user fee" but a "special assessment" that did not apply to state agencies. The bonds that were issued by the city could not be approved if fees were invalid, since the stormwater fees were pledged as collateral for those bonds. The Florida Supreme Court found that the fees were valid user fees, and the bonds were validated. The city was supported in the Supreme Court by an *amicus* brief

jointly filed by the Florida Stormwater Association and several environmental groups, including Earthjustice and the Audubon Society.

In the earlier case of *City of Cocoa v. School Board of Brevard County*, 711 So. 2d 1322 (Fla. App. 1998), a Florida appeals court found that a stormwater utility fee was neither a "special assessment" nor an "impact or service availability fee," from which school districts were exempted by statute. The trial court had apparently determined that no portion of the fees sought by the city were "user" fees, but the appeals court determined that the record was not sufficient to establish that the school districts were "involuntary" users of the stormwater utility and remanded the case for further proceedings to determine whether the program established by the city was a valid utility established pursuant to the statutory authority granted by the Florida legislature in Fla. Stat. § 403.031(17). That statute authorized the funding of local stormwater management programs "by assessing the cost of the program to the beneficiaries based on their relative contribution to its need," with regular service bills "similar to water and wastewater services."

In *City of Littleton v. State, supra*, both the trial court and the state appeals court had found that the city's stormwater management fee constituted a special assessment under Colorado state law, which could not be charged against the state agencies involved in the case. The Colorado Supreme Court reversed, after reviewing the factors to be considered in determining the nature of a charge imposed by a municipality against property owners within its jurisdiction. Distinguishing between ad valorem property taxes, excise taxes, special assessments, and special fees, the court recognized that the essential characteristic of a special assessment is that it confers some special benefit to the subject property.

In this case, the services for which the fees were charged did not specially benefit the property owned by the agencies. The court stated that "[c]reating the capacity to remove excess water from property and prevent flooding are general services benefiting all property owners. While the performance of these services prevents diminution of the value of land, such services and the facilities necessary to the performance thereof do not directly enhance the value of the property . . . ." Consequently, the court concluded that the city's stormwater charge was not a special assessment, but a service fee reasonably designed to meet overall costs of the service for which the fee was imposed. Although a portion of the fee billed by the city was used to defray costs of constructing and maintaining a drainage system, such costs were found to be reasonably related and essential to the provision of the contemplated services.

Related to Cost of Services

Inquiry into whether the amount of the fee is "reasonable" and directly related to the cost of providing the services rendered has been conducted in cases from Kentucky, Colorado, Virginia, North Carolina and Georgia. One aspect of this

question that is often examined is whether the fees are reasonably related to the actual contribution of the property to the volume of stormwater runoff, or whether all properties are assessed a fixed amount regardless of size.

In *Twietmeyer v. City of Hampton*, 497 S.E. 2d 858 (Va. 1998), the City sued owners of seven residential properties for failure to pay fee based on flat rate. The property owners argued a flat rate fee was not based on contribution to stormwater runoff. The Court found that the city ordinance was not unreasonable because non-residential properties were charged a fee 5 times higher than residential properties ($12.50 per month rather than $2.50 per month).

In one case in North Carolina, the costs of complying with certain elements of U.S. EPA's "Phase II" municipal stormwater permit program were found to go beyond the costs to construct and operate the stormwater drainage system, and the city was ordered to refund that portion of the fee. *Smith Chapel Baptist Church v. City of Durham*, 517 S.E. 2d 874 (N.C. 1999). The City assessed fees on all developed property, based on impervious area. The state Supreme court found in a 1998 opinion that such fees were not covered by a particular state statute, but were nevertheless authorized under the state constitution. However, in its subsequent 1999 opinion after rehearing, the Supreme Court held that the applicable state statute limited fees to the actual cost of providing the stormwater drainage system, and did not cover the entire stormwater management program – in particular, costs incurred solely for compliance with federal environmental regulations (the Phase II stormwater permit requirements). A subsequent amendment to the statute was required to address this issue.

Properties Benefited

The question whether the properties burdened by the fees are receiving a proportionate benefit from the services provided has been examined in Florida (1995), Kentucky (1996) and Alabama.

In the often-cited case of *Sarasota County v. Sarasota Church of Christ*, 667 S. 2d 180 (Fla. 1995), the City imposed a stormwater utility fee on all developed property. The Church argued that the ordinance imposed a tax because it benefited the community at large and church received no specific benefit. The Florida Supreme Court held that the fee was valid because all properties with impervious surfaces benefited from the stormwater services.

In *Kentucky River Authority v. City of Danville, Kentucky,* 932 S.W.2d 374 (Ky. App. 1996), the city argued that it received no benefit from the activities of the Authority. The court disagreed, holding that the preservation of the watershed was a benefit that accrued to all within its boundaries. The court likened the fee to emission fees collected from entities that emit air pollutants and are used to fund the state air program, noting that although there may be no direct or immediate benefit to the payer of the fees, the use of the air and the contamination of it are sufficient to justify the imposition of the fee.

In *Densmore v. Jefferson County, supra*, the Plaintiffs alleged that a county stormwater fee was an unconstitutional tax with no relationship to benefit received by property owners. The Alabama Supreme Court held that the fees were valid because the benefit conferred on property owners need not relate directly to the exact amount paid.

Application to Capital Improvements

Whether or not the fees must be confined to the actual cost of providing stormwater services alone, or whether any surplus can be collected and applied to the cost of system expansion and capital improvements has been litigated in Ohio, Tennessee, Colorado and North Carolina.

In *Wooster v. Graines,* 556 N.E. 2d 1163 (Ohio 1990), the City of Wooster adopted an ordinance to establish a storm drainage utility for maintaining, repairing and improving the sewer system (fees were based on impervious area). The owner of a shopping center refused to pay, claiming the fee was invalid because city accumulated a surplus to fund capital improvements in new areas. The Ohio Supreme Court held that the ordinance was valid because sewer funds were segregated and reserved for future sewer projects in Wooster.

Application of stormwater fees to capital construction costs was also upheld in the *City of Littleton, Vandergriff,* and *Smith Chapel Baptist Church* cases, discussed above.

FEDERAL FACILITIES

The imposition of stormwater fees on federal facilities involves a special consideration of the tax vs. fee issue. The general principle that states cannot tax the United States derives from Chief Justice Marshall's opinion in *McCulloch v. Maryland*, 17 U.S. (4 Wheat.) 316, 4 L. Ed. 579 (1819). Although the immunity of the federal government and its instrumentalities has been the source of often conflicting decisions, "the one constant . . . is simple enough to express: a State may not, consistent with the Supremacy Clause, U.S. Const., Art. VI, cl. 2, lay a tax 'directly upon the United States'. . . . The Court has never questioned the propriety of absolute immunity from state taxation." *United States v. New Mexico*, 455 U.S. 720, 733, 71 L. Ed. 2d 580 , 102 S. Ct. 1373 (1982).

On the other hand, it is well-established law that the United States must pay reasonable user fees. For instance, charges for services from city-owned utilities are clearly fees for which the federal government would be liable to the same extent as any other customer. *See United States v. Harford County, Maryland*, 572 F. Supp. 239, 241 (D. Md. 1983) ("The federal government has . . . recognized its obligation to pay state or county charges based on the quantum of water or sewer services rendered.")

Furthermore, the Clean Water Act contains an express waiver of sovereign immunity for certain pollution-control related fees. Clean Water Act § 313(a) ("Federal facilities pollution control") expressly provides that:

> Each department, agency or instrumentality of the executive, legislative, and judicial branches of the Federal Government . . . shall be subject to, and comply with, all Federal, State, interstate, and local requirements . . . respecting the control and abatement of water pollution in the same manner, and to the same extent as any nongovernmental entity <u>including the payment of reasonable service charges</u>. . . . This subsection shall apply notwithstanding any immunity of such agencies, officers, agents, or employees under any law or rule of law.

Importantly, this waiver applies only to fees or service charges, and not to taxes. As seen in the numerous state cases discussed above, this distinction is often difficult to make in practice. The United States Supreme Court has established a three-pronged test for determining whether fees imposed by local governments on federal facilities are "reasonable service charges" or taxes (*Massachusetts v. United States*, 435 U.S. 444 (1978)):

- Is the fee or service charge non-discriminatory?
- Is it a fair approximation of the cost of the benefits received?
- Is it structured to produce revenues that will not exceed the regulator's total cost of providing the benefits?

Under the *Massachusetts* case, 1) the federal government must not be treated any differently in the enforcement of the fee requirement than other regulated entities; 2) the fee charged must be a fair approximation of the benefits received to be considered "reasonable;" and 3) the fee must be structured to produce revenues that will not exceed the total cost to the state of the benefits supplied. This test has been applied to environmental fees in several cases, most notably the long-running litigation involving the New York State Department of Environmental Conservation (NYSDEC) and the U.S. Department of Energy (USDOE).

That series of cases involved the question of whether certain hazardous waste regulatory charges imposed by New York on federal installations were "reasonable service charges" within the meaning of the sovereign immunity waiver provision in the Resource Conservation and Recovery Act, 42 U.S.C. 6961. In January 1989, NYSDEC brought four consolidated actions in New York State Supreme Court against USDOE to recover unpaid environmental program regulatory charges, including hazardous waste program and waste transporter program charges, assessed by the NYSDEC against ten federal facilities from 1983 to 1989. USDOE counterclaimed for a refund of approximately $ 400,000

and related relief for regulatory charges already paid. Those actions were subsequently removed to the District Court for the Northern District of New York.

Arguing that the waste regulatory charges were unreasonably high, USDOE asserted that in every year between 1983 and 1989, "total waste regulatory charges exceeded [NYSDEC]'s actual services [to the ten federal facilities] by a ratio of approximately nine to one ($1,163,591.58 vs. $ 126,792.13)." The District Court denied both parties' motions for summary judgment because neither party had submitted evidence "as to the value of the overall benefits the facilities receive in light of the programs and services made available to them by [NYSDEC] should the need for such assistance ever arise." *New York State Department of Environmental Conservation v. United States Department of Energy*, 772 F. Supp. 91, 99-100 (N.D.N.Y. 1991).

In later proceedings, the District Court granted NYSDEC's motion for partial summary judgment and denied USDOE's motion for summary judgment. *New York State Department of Environmental Conservation v. United States Department of Energy*, 850 F. Supp. 132 (N.D.N.Y. 1994) ("NYSDEC II"). The District Court explained that the *Massachusetts* test "requires only a rational relationship between the method used to calculate the fees and the benefits available to those who pay them." *Id*. at 143. The Court found such a relationship in this case because (1) larger facilities are more expensive to regulate and require more services than smaller facilities; (2) all services which NYSDEC provides pursuant to these regulatory programs, whether used or not, are available to the United States should they be needed in the future; and (3) the total receipts from these regulatory fees have been substantially less than the actual costs of these programs – all of which demonstrates that NYSDEC's method of calculating its charges results in a fair approximation of the cost of the use of the system.

Following two additional decisions by the district court in 1997 and 1999, the case reached the Second Circuit Court of Appeals. *Jorling v. United States Department of Energy*, 218 F.3d 96 (2d Cir. 2000). At that point, only the reasonableness of the hazardous waste fee was at issue. USDOE did not dispute the first or third parts of the *Massachusetts* test. It acknowledged that NYSDEC's waste regulatory charges were non-discriminatory and were not structured to produce revenues that would exceed the total cost to NYSDEC of the benefits to be supplied. However, it disputed the second part of the *Massachusetts* test, challenging the District Court's finding that no reasonable jury could find that the waste regulatory charges did not meet the "fair approximation" component of the *Massachusetts test*. USDOE argued that the charges cannot meet that component of the test because the charges from 1983 to 1989 exceeded the cost of supplying the services actually received by a nine to one ratio.

The Court of Appeals found that, under *Massachusetts*, a fair approximation of the use of the service adequately serves as a surrogate for an otherwise complicated and expensive attempt to allocate costs. The court cited *Brock v. Washington Metropolitan Area Transit Authority*, 254 U.S. App. D.C. 190, 796 F.2d 481, 485 (D.C. Cir. 1986) for the proposition that "*Massachusetts* did not hold that a user fee must represent retrospectively a close approximation of the actual, historical benefit to the user. Rather, *Massachusetts* held only that the method used to calculate the fee must rationally be designed to approximate prospectively the benefit to the user." The court also found that the *Massachusetts* test applies not only to services used but also to services available for use. Based on these principles, that court found that NYSDEC's waste regulatory charges meet the "fair approximation" component of the *Massachusetts* test, because the method of calculating the hazardous waste program charges was reasonably designed to fairly approximate use of the hazardous waste system's available services, and thereby to approximate the cost of supplying such services to particular generators of waste or operators of waste facilities.

The principles established in the *Massachusetts* case and explored in the *NYSDEC* litigation are currently the subject of ongoing litigation between the City of Cincinnati and the U.S. Department of Health & Human Services (HHS). The National Institute of Occupational Safety and Health (NIOSH), a part of HHS, refused to pay stormwater fees due under a 1985 city ordinance using formula based on size of property and "intensity of development" factor to determine "equivalent runoff units." The city initially attempted to bring suit in Federal Court of Claims based on "implied contract" for services. In *City of Cincinnati v. United States,* 39 Fed. Cl. 271 (1997), the Court of Claims dismissed the claim as an unconstitutional "tax" based on property size rather than services actually used. In *City of Cincinnati v. United States,* 153 F.3d 1375 (Fed. Cir. 1998), the Court of Appeals for the Federal Circuit upheld the lower court's dismissal of the case, but only because there was no "implied in fact" contract between the city and the federal government, and the Court of Claims therefore lacked jurisdiction to hear the case. The Court of Appeals expressly declined to rule whether or not the city's storm drainage service charge was a tax or a fee.

In October 2003, the City re-filed its claim in U.S. District Court, asserting jurisdiction under the Tucker Act and the Declaratory Judgment Act. *City of Cincinnati v. United States,* Case No. 03-731 (S.D. Ohio, filed 10/23/03). The United States filed a Motion for Judgment on the Pleadings in February 2004, arguing *res judicata* and lack of subject matter jurisdiction. In May 2004, the City moved for leave to file an Amended Complaint based on its local ordinance and the waiver of sovereign immunity in CWA § 313. The case was still pending before the District Court for the Southern District of Ohio as of October 2005.

SUMMARY AND CONCLUSIONS

Although stormwater management fees have been upheld in the majority of states where they have been challenged, the passions inspired by the general public perception that any new governmental fee is a disguised and unlawful tax ensures that challenges to such fees will continue to arise. Determining the legality of the financing mechanism chosen for any municipal or county stormwater program will depend upon a close analysis of local state law. Nevertheless, certain general principles emerge from the cases discussed above.

(1) In order for a stormwater service charge to be regarded as a fee, rather than a tax, the local government should be prepared to demonstrate that the overall cost of the program is reasonably related to the value of the service being provided, and that the funds raised are segregated for use by the stormwater program and not for general revenue purposes.

(2) The fee should be structured so that the amount charged to particular properties is proportional to those properties' contribution to stormwater runoff. The distinction may be as simple as a different fee for residential and commercial properties, or as elaborate as a sliding scale based upon "impervious area" or degree of development.

(3) Some provision should be made so that participation in the program can be characterized as "voluntary," whether it is accomplished through an "opt-out" provision for properties with their own stormwater management facilities or a more complex system of credits or offsets based upon the amount of volume actually contributed to the public stormwater system.

(4) In states such as California, Michigan and others with special constitutional provisions governing the imposition of any new tax, it may be wise to seek the requisite voter approval for implementation of local stormwater funding programs even if they are designed and intended to be fee-based rather than tax supported.

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CHAPTER 4

IMPLEMENTING USER-FEE BASED FUNDING

OVERVIEW

The dynamic change which has occurred in the expectations placed on the municipal stormwater program has overwhelmed traditional stormwater program funding. This has driven the exploration of new funding strategies and given rise to the increasing popularity of user fee/utility based approaches.

The breadth of the changes motivating this exploration has required that not just funding mechanisms be explored. The services delivered by the municipal stormwater program, the quality of those services, the degree to which they satisfy local expectations, and the degree to which they satisfy stakeholders needs, become critical elements in structuring user fee based funding. In the eyes of stakeholders, implementing a new stormwater funding mechanism is secondary to receiving good stormwater system service. The performance of the stormwater program, as perceived by the program's stakeholders, therefore, becomes a focal point of the effort to develop a functional stormwater funding program.

Implementation of user fee based funding involves a related set of actions and activities. These occur within a flexible framework that promotes due diligence in five key areas of focus: political, financial, legal, informational and technical. In some communities a simple vote of the governing body is all that is needed to implement a funding mechanism. In these cases, little program education, stakeholder involvement, and background information may be needed to secure the necessary authorization. In most cases, however, a much more involved process is necessary to bring about program and funding actions. This chapter discusses this framework and process.

FORCES DRIVING ACTION

As described in Chapter 1, over the last thirty years stormwater programs have gone through significant shifts in basic philosophy, approach and service expectation. Originally stormwater programs were intent on efficient drainage, taking runoff quickly to nearby streams. Resulting flooding then caused local communities to change their basic philosophy from "efficient drainage" to one of "flood control" through the imposition of detention requirements and stricter floodplain controls.

Later still the concept of "stormwater master planning" began to replace ineffective detention programs. Then, in the late 1980's stormwater program managers were faced with the need to also address stormwater quality through NPDES and other regulatory programs.

Today there is a convergent set of stormwater program forces that has moved stormwater to a full-fledged urban utility service stature similar to water and wastewater. These forces can vary from community to community, but generally can include:

- aesthetic and regulatory demands for "greener" environmentally friendly stormwater systems, sometimes without clear definition of what that means, or a track record in concept performance or sustainability;
- multi-objective disaggregated stormwater system components that integrate conservation and preservation practices, sometimes called, Low(er) Impact Development;
- integration of stormwater infrastructure planning and design with site layout and function, sometimes called Better Site Design;
- redevelopment that incorporates "micro-systems" of pollution removal
- a plethora of commercial and industrial site controls;
- the need, often mandated through endangered or threatened species considerations, to integrate ecological assessments and designs;
- mandated public education and involvement in stormwater program conception and implementation, and the emergence of non-profit interest groups;
- demanding regulatory requirements evolving in a fast changing legal arena, and on again/off again numeric pollutant criteria;
- ongoing program needs for maintenance and capitalization of the system, often with extended levels of service; and
- significant reductions in general fund dollars for stormwater programs concurrent with the doubling of stormwater program costs.

THE STORMWATER UTILITY, PROGRAM CONCEPT AND DUE DILIGENCE

Utility Program Concept

The stormwater utility is an umbrella under which individual communities can address their own specific needs in a manner consistent with local problems, priorities, and practices. A stormwater utility provides a vehicle for:

- ► consolidating or coordinating responsibilities that were previously dispersed among several departments and divisions;
- ► generating funding that is adequate, stable, equitable and dedicated solely to the stormwater function; and
- ► developing a program that is comprehensive, cohesive and consistent year-to-year.

A stormwater utility is equitable because the cost is borne by the user on the basis of demand placed on the drainage system. It is stable because it is not as dependent on the vagaries of the annual budgetary process as are taxes. And it is adequate because a typical stormwater program can be financed with charges within the limits of the customer's willingness to pay.

No two successful utilities are identical just as no two cities are just alike. Therefore, it is not prudent to follow a pre-fabricated "one size fits all" approach, but to carefully seek to understand the make-up of the community, its problems, its goals, and its resources. There must be a clear understanding of the community's stormwater related systems, capabilities, and issues.

Some communities have simply attempted to clone a stormwater program or utility rate methodology of another city or county. Some consulting firms have attempted to sell a uniform approach. A local community should carefully guard against such a temptation. A stormwater program, rate structure, or billing methodology cloned from somewhere else rarely can sustain intense scrutiny by a staff, advisory committee, elected officials, or interest groups or the community at-large if the program utility doesn't meet local needs. Such programs often fail.

The real danger of the cloning approach is that it inevitably falls short of meeting the local stormwater program expectations because it is not founded on addressing them. As was mentioned in Chapter 2, the local problems, needs, and circumstances must drive the form, priorities, and pace of the program. The success of leading stormwater utility programs is based on tailoring the program and financing strategies to the local needs and solving real short-term and long-term stormwater problems.

Due Diligence

"Due diligence" is the process of insuring that the community's program and funding expectations will be met. It includes the formulation and execution of a plan with appropriate levels of investigation, establishment of facts, estimation of future prospects, framing of assumptions and risks, and establishment of a plan of action and funding. It can also result in a decision not to act.

Attempted stormwater utility implementations have failed for a number of reasons, most of which have to do with inadequate due diligence. For example, some key reasons given in failure post mortems include:

- Not understanding the process and cutting key corners
- Failure to establish stakeholder support
- Failure to identify and account for hurdles
- Inadequate legal assessment of the authority for a particular rate structure
- Failing to work with media
- Inability to focus the stormwater program on citizen felt needs
- Inaccurate databases without ability to appeal
- Poor citizen or customer service
- Rate structures without rational nexus
- Rate structures too complex to explain and seemingly inequitable
- Failure to understand political timing

Due diligence must be pursued along four major areas of concern, or tracks. These tracks, which are foundational to the utility implementation process and which are discussed in the implementation section of this chapter, are as follows:

- **Public** – are there appropriate levels of involvement of key stakeholders, is the general public handled correctly, is the media appropriately involved, is customer service accounted for, are staff and political leadership elements accounted for and handled appropriately?
- **Program** – does the program make sense, is it compelling, is it within the community's ability and willingness to pay, does it meet citizen perceptions, is it action oriented?
- **Finance** – are legal tests satisfied, is it simple yet fitted to the local situation, does it have the perception of equity, are proper steps followed, does it support the stormwater program?
- **Database** – is the database accurate within legal requirements, is there an appeals process, is it maintainable within reasonable cost constraints, are anomalies accounted for, is customer service appropriate and responsive?

The cost of appropriate due diligence is not insignificant but should be kept in perspective. Experience has shown that, should a stormwater utility fail it takes

five to seven years for there to be a staff and political willingness to make another attempt. The opportunity cost of failure is then five to seven years of lost revenue. For example, for a stormwater utility that raises $2,000,000 per year the opportunity cost of failure is $10 to $14 million. The cost to do a thorough job of due diligence in this example, however, is rarely more than $350,000, one to three months' revenue.

Additional benefits of appropriate up front due diligence include:

- Better initial and long-term public knowledge and cooperation leading to greater support and participation.
- A funding rate structure that matches and meets short and long term program needs leading to stable, adequate funding.
- A stormwater program that can meet both the capital and operations needs of the local community, leading to better services and ability to meet regulatory demands.
- More efficient long-term database maintenance, leading to lower operating costs and better customer service.

Those communities that have cut corners in due diligence normally find themselves hampered in their ability to manage the database, meet customer expectations, solve flooding problems, meet regulatory needs, and modify the program or utility to meet changing demands. A process can be developed that facilitates such change while maintaining the effectiveness of the stormwater program and the utility.

CREATING MOMENTUM AND A PROCESS FOR PROGRAM ACTION

The ability to bring about action that moves a stormwater program forward and produces the necessary funding, depends on the ability to bring key leaders to an understanding of the problems, and a vision of the solutions. To achieve this understanding and to create such a vision requires a logical and acceptable process which leads a community to action.

Understanding Problems

Understanding of the problems involves building a "compelling case for action". In every community there are good, even compelling, reasons to improve the way stormwater programs are executed. It might be a popular stream that is becoming increasingly impacted, a lack of riparian park space, decaying drainage infrastructure and mounting complaints, unfunded regulatory mandates, local flooding, financial pressures, loss of fish, beach closings, a roadway or bridge collapse, or law suits. Such issues draw the attention and energy of stakeholders and leaders to opportunities for action.

Assembling a "compelling case" is step one in developing this understanding and bringing about action. People in general are motivated along two complimentary courses of persuasion – information (data) and stories. Some people want facts and statistics (data), while others are moved to action by horror stories and pictures. When we begin to quantify the community's perception of program need or make the case for change and new funding, we seek to address both types of people. Table 4-1 gives some examples taken from successful stormwater utilities.

Information	Stories
• Statistics on repair costs • Cost information • Infrastructure information • Lost revenue or tourist dollars • Regulatory Facts • Backlog information on flooding • Unfunded mandate information	• Flooding pictures • Horror stories • Movies • Testimonials • Environmental or aesthetic appeals • Drawings of a future greenway, trail, etc.

Table 4-1: Building Blocks for a Compelling Case

Building a compelling case and knowing when, how, and to whom to present it is more of a political and technical art form than it is a science. But taking time to build informed consent to move forward and to support program change and new funding methods is vitally necessary.

Vision for the Future

People rarely rally around simply solving problems. It is in creating a vision for what could or should be that causes people to begin to support the concept of a stormwater utility as a vehicle for action.

Building vision is a process of moving from recognizing problems, needs, issues and opportunities to seeing the way things could be. It involves seeing what others have done and showing how practical solutions can create significant improvement in the quality of life.

An artist's rendering of what an ugly polluted stream could become can help rally people. A seminar or workshop with representatives from other places telling about wonderful changes in their community gets people leaning into change. Sometimes simply showing how problems would be solved brings about a determination to move forward.

Bringing About Action

Leaders often agree that there must be action to bring about recommended improvements but are not sure how to begin. The use of a citizen's stakeholder group is an effective technique which facilitates development of problem understanding and of the vision for the future, and is a useful part of the process for action. Ten to fifteen people who adequately represent key positions or ideas can move together through the process.

Sometimes these meetings are over-controlled by well-meaning facilitators, or a citizen's group is asked to merely react to a fully developed solution. In both cases creativity can be stifled, citizen's can lose interest, and input can deteriorate. But if allowed true input, the group will have ownership of the plan and will often help sell it.

An effective tool in bringing about action is the business plan approach as discussed in Chapter 2. Facts are fine, but process, such as that produced by a stormwater business plan, moves things forward, formulating a road map and structure for action.

Business planning has not been a normal approach for local government. Local government has not typically thought of itself in terms of what it is selling, how it measures success, and who the customer is. A generic business plan asks and answers the following questions:

- Who we are?
- What business are we in?
- What's going on now?
- Where do we want to go?
- How do we want to get there?
- What are the steps to make it happen?
- How will we know when we have arrived and, how can we demonstrate it to someone else?
- How we will pay for it?

The business plan model, which measures goals in "program efficiency" and "program effectiveness", must be somewhat modified for local government use. Resistance to getting lost in too many technical details will help move the business plan to a useful conclusion.

Process Framework

The development of problem understanding and a future vision, and the exercise of such tools and techniques as a stormwater business plan and citizens impact groups require a structured format to insure a successful outcome. In this case, that outcome would be a utility structure for a comprehensive stormwater program. Figure 4-1 illustrates an overall process framework for development of

a utility funding mechanism. Only the first and third steps might be considered absolutely necessary. The steps are:

- ► Quick Concept Study – answers the question: "does the proposal make sense", and if the answer is "yes" the work goes forward.
- ► Feasibility Study – creates both information and momentum for implementation, and is used as an intermediate step if success is not fairly certain.
- ► Utility Implementation – is the process of working in a coordinated and logical way through the details of planning implementation and due diligence.

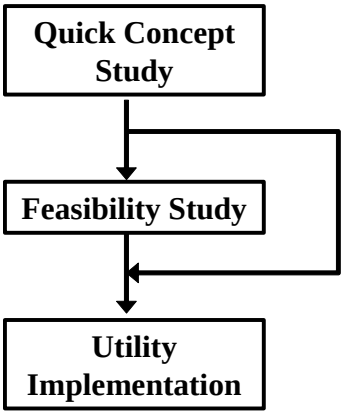

Figure 4-1: Overall Process Framework

PROCESS FRAMEWORK, QUICK CONCEPT STUDY

The purpose of this step is to assess the basic advisability of pursuing a stormwater program and funding assessment with the potential of implementing a stormwater user fee. Designed to be low cost, fast paced, and focused, it:

- ► Tests the water with very little political, financial, or emotional investment,
- ► Can normally be authorized without an RFP,
- ► Operates "under the radar" as an internal quick study,
- ► Builds internal vision for going forward,
- ► Can happen very quickly, taking only days to complete.

A consultant team or in-house facilitator typically takes the staff through a consideration of the following questions, and the answers leading to both a program and funding direction:

- ► What is the local government currently doing in terms of stormwater management?
- ► Why should the local government pursue a study and potential funding method like this, what is the compelling case?
- ► What stormwater program priorities should guide the local government in the next three to five years?
- ► What larger program improvements should be made and what would be the costs? What is the revenue potential of a utility fee or other major revenue source?
- ► What are the major hurdles or potential "show stoppers" to going forward?
- ► What are the immediate next steps should a "GO" decision come out of this study?

Integrated into this study is the potential for staff presentation of the findings and an educational/informational overview of a stormwater utility funding mechanism.

PROCESS FRAMEWORK, FEASIBILITY STUDY

The purpose of the feasibility study is to assess the local government's existing stormwater management program, to make recommendations for future directions and changes, and to assess the feasibility of funding the program with a stormwater utility (user fee) and other methods.

Figure 4-2 illustrates a typical "roadmap" for the feasibility study.

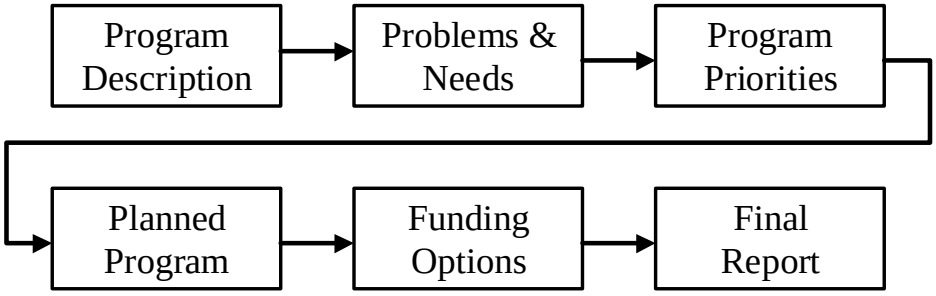

Figure 4-2: Feasibility Study Roadmap

Typically a group of citizens and staff are taken through a consideration of the following questions, the answers leading to both a program and funding direction:

- ► What is the local government currently doing in terms of stormwater management?
- ► What are the stormwater related problems, issues, needs, resources, and opportunities currently faced by the local government?
- ► What stormwater program priorities should guide the local government in the next three to five years?
- ► What specific program improvements should be made and what will be the costs?
- ► What is (are) the best way(s) to pay for these program improvements?
- ► How should the funding method(s) be implemented?

The feasibility study is used when there is an inclination to go forward with a stormwater utility but sufficient support has not been developed to insure adoption of a utility ordinance. The feasibility study essentially accomplishes the first few steps in establishing a stormwater utility without the commitment from elected officials to make the final decision.

The feasibility study can be a worthwhile endeavor because it:

- ► is low risk; even if implementation of a utility is found infeasible, the study is a success because it accurately determined a “no go” decision was best;
- ► tests the water before committing to a user fee, giving political leaders a sense of safety because the approach is phased and involves others in the “go” decision;
- ► provides broader backing and wider support among the community and brings them into the process early;
- ► builds momentum and support toward a “go” decision through logical consideration of program needs and concerns;
- ► provides an early warning of hurdles and pitfalls;
- ► saves time and money because implementation costs can be defined and may be lowered by anticipation and planning; and
- ► develops sufficient legal due diligence to allow for borrowing of the implementation costs, with later payback from the user fee revenue stream.

The advantage of this kind of feasibility study over some other approaches is its initial focus on problem solving. The focus of the feasibility study is not just revenue generation but program improvement. This initial concentration on

identifying and solving problems is key, and follows the process for bringing about action discussed previously.

Often the use of a citizen's group serves as the vehicle for taking the local government through the business plan approach and the roadmap in Figure 4-2. This can be accomplished in four to seven meetings and can be very participation oriented.

Other forms of stakeholder participation in the feasibility study can involve:

- citizen review of a previously completed consultant study where it is presented in a series of meetings with comment sought;
- public forums where issues are openly discussed by a panel with questions and input sought from the audience; or
- study groups where a specific need, such as flooding, is investigated leading to solution concepts and identification of funding needs.

PROCESS FRAMEWORK, UTILITY IMPLEMENTATION

Regardless of the use of a feasibility study, the implementation of a successful user fee follows four "tracks" of activity. Figure 4-3 outlines these four tracks in an overall utility implementation flow chart. It is crucial that these four tracks are coordinated and timed to occur as shown. While there are almost infinite variations on this figure, the key activities within the figure are all important and should not be skipped.

For larger communities there can be a manager for each of the four tracks. For smaller projects a single manager can handle multiple tracks, though it often makes sense and increases project success for each track to have an experienced expert in the lead.

The Public Track

Though not resulting in an "operational" part of the utility, this track serves the whole process. It involves four basic phases: planning the public involvement and information process; conducting the involvement and public education process; carrying out the implementation campaign; and monitoring utility implementation and customer service.

Often a citizen's stakeholder group is involved. A citizens group can assist in the work of all four tracks and is particularly useful in establishing policy and priorities and to serve as eventual proponents of the recommended action.

Stormwater utilities are rarely infeasible technically, and legal constraints can usually be overcome. It is in development of public, stakeholder, and political

support that the difficulties often arise. Thus the Public Track is often the key to success of utility development efforts.

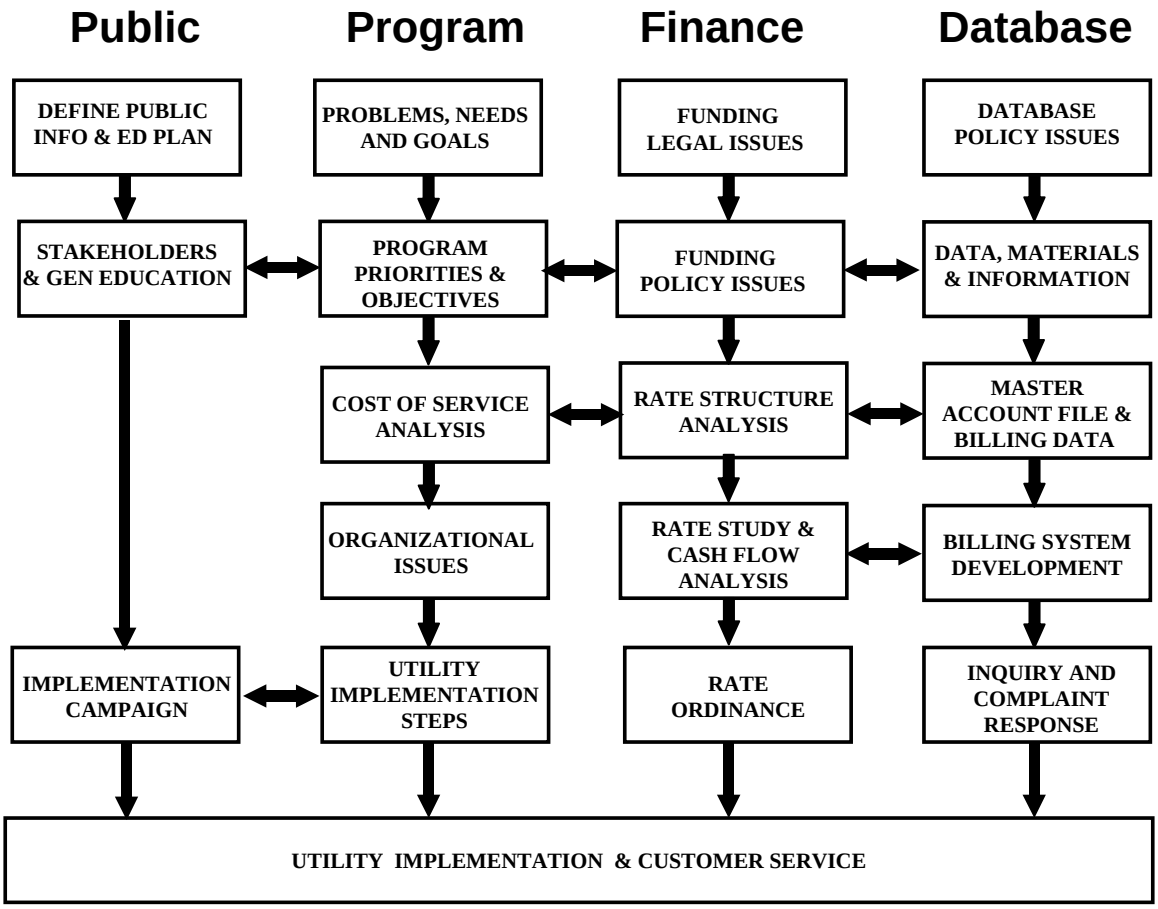

Figure 4-3: Utility Implementation Approach

It is important to remember that there are many "publics" in a local community, and that each has a stake or special interest in a stormwater utility with reasons to both support and oppose it. The following are examples:

"Public"	"Special Interest"
► Developers	Regulatory and Financial
► Environmentalists	Stormwater Quality, Habitat
► Neighborhoods	Flooding, Convenience, Property Values
► Clubs	Participation, Voice
► Social, Ethnic, Economic	Locations, Jobs, Costs
► Tax Exempt Entities	Utility vs. Tax
► Political Leaders	Timing, Message, Process
► Media	Is it "News"?
► Commercial/Industrial Entities	Costs, Credits, Service
► Technical Specialists	Standards, Criteria and Procedures

Early in the process, preferably during a feasibility study, a Public Information and Education Plan (PI&E Plan) which asks the following questions should be developed. This plan serves as the roadmap for the work of the Public Track.

- ► Who is the public?
- ► What is the message?
- ► When do we send the message?
- ► How is the message sent?
- ► What is the emergency response when trouble occurs?

Well crafted information, strong media involvement, a speakers' bureau, videos, citizen speakers, billboards, mailers, and public meetings, have all been used in effective public information programs. There is no one right approach as each community and sub-element within the community, may obtain its information and make decisions differently. In one, key decisions are made by leading business leaders. In another the council may make the decisions with little input. In one community environmental interests prevail; while in another, solving flooding is key. In some places environmental justice and the economically disadvantaged are primary, while for others it is not. Thus, it is important to understand the character and makeup of the community.

The Program Track

This track assesses the basic problems, needs and goals, establishes program priorities, lays out a three to five year program, develops a costing of that program, and finally, sets up implementation steps. The program is the final determinant of the revenue plan, utility rate and rate structure, although due regard must be given to the customer's willingness to pay for stormwater given other demands on citizens' resources.

The program is also what sells the utility concept, and it is the Program Track process which addresses the most fundamental of questions. How do we convince citizens and stakeholders of the need for an alternate funding source? Or, how do we craft a stormwater program that meets the needs of the local community without exceeding available funding?

The program track begins by identifying the compelling case discussed previously (problems/needs). This is translated into three to seven key program priorities and the new stormwater program is formulated with a cost of service analysis, into a detailed three to five-year program plan. Longer term planning in less detail is also useful.

Normally, for multiple jurisdiction utilities, the governance questions must be addressed in a preliminary way, early in the process. But it is normally prudent to address organizational and management issues at the end of the Program Track. It is better to first focus on the functions of the stormwater program rather on who

might perform them. This defers potential organizational issues to the end where they are more easily resolved by the completed program planning information.

The basic elements of a stormwater management program, which must be addressed by the Program Track, include both operational and financial functions. These might include:

- ► Operations and Maintenance
- ► Regulation and Enforcement
- ► Engineering and Planning
- ► Capital Construction
- ► Administration and Finance
- ► Regulatory Compliance
- ► Billing and Collections

The final assessment and planning step in the Program Track is the identification of the steps required to implement a utility. Those steps include a determination of the mix of revenue types to be used, the structure of the utility rate and the administrative functions which will implement and support the utility. These factors/elements are addressed in more detail in Chapter 2 of this guidance. The legal foundations of the revenue mix are addressed in Chapter 3 and are a principal focus of the Finance Track of the Utility Implementation Approach shown in Figure 4-3 of this chapter.

The Finance Track

The Finance Track sets up the legal and financial basis for the stormwater funding program. In this track the planning process examines legal parameters of the revenue options, explores and establishes policies which will govern the revenue program, analyzes factors which will determine the structure of the rates to be levied, determines the revenue needed, and develops ordinances needed to implement revenue policies, rates, enforcement and equities.

It is in this track that fundamental questions concerning financing of the stormwater program are addressed. Who should pay for the stormwater program? What is the appropriate cost share to be borne by each benefited segment of the community? When or how frequently should payment occur; and what mix of revenue types or methods should be used to accomplish this payment such as fees, assessments, taxes, and/or utility?

In addition to these policy questions, the Finance Track also addresses legal questions. What revenue authority already exists? What legal authority is needed to implement the desired revenue mix; and what legal foundation is needed to support the levy of each of the individual revenue types (nexus, benefits, service)? A more detailed discussion of these issues is found in Chapter 2 and 3 of this guidance.

It is very important to have established a logical and rational nexus for each revenue policy decision, for the rates to be charged, and for ancillary charges, credits, and offsets. The Finance Track establishes the myriad of basic financing policies needed. Then, based on appropriate legal authorities and foundations, and on program input, it moves from development of a revenue structure to meet the program needs, to a rate structure study and cash flow analysis and finally to an ordinance.

It must be stressed that the Finance Track must work in support of the Program Track. The development and implementation of a stormwater funding program in general, and a utility in particular, must be intricately linked to the functions, goals and beneficiaries of the stormwater program to assure both equity and adequacy of the revenue levies. Revenue levies not consistent with benefits or services received; or not adequate to address identified heeds, will quickly lose community support.

The Database Track

The Database Track has application to many stormwater revenue types, but is of foundational importance to the implementation of a stormwater utility. This tract has five main purposes:

- ► to determine the appropriate database and fields,
- ► to develop the master account file,
- ► to develop a mechanism to deliver the bill to the customer,
- ► to determine database maintenance processes, and
- ► to monitor customer service.

The Database Track is that portion of the planning process in which the decisions made in the preceding tracks are used to create the administrative infrastructure which will compute the revenue levy for each parcel, deliver the bill, record the payment, and monitor the results. The process involves policy assessment and development, evaluation of database options, design of the master account file and selection of a billing and record system. A database can also provide the means to track complaints and service deficiencies. During the Database Track, the revenue program policy decisions made in the Finance Track are given form and application, producing an actual revenue levy on real properties.

The master account file is a derivative of the rate methodology selected. For example, an impervious rate methodology requires the estimation of the impervious surfaces on each parcel. However, the availability of data could also influence the rate methodology decision. Should, for example, land use data be available then it might make sense to construct a rate methodology that uses development intensity factors to reflect the impervious fraction. In some cases the tax assessors file has sufficient number of relevant fields and accuracy to allow for a surrogate of development intensity without a lot of hand work. Addressing these decisions necessitates the connectedness of the Database

Track and the Finance Track as shown in Figure 3. An expanded discussion of rate methodologies is found in Chapter 2.

Some data sources may not be helpful. GIS coverage's, not made to generate stormwater billings and "impervious coverage's", may not contain all the impervious areas of properties. Often they simply approximate buildings and use lines to outline parking lots. Also, parcel information, scanned from paper files, is often warped in relation to the real world. The database developer must search for the best available information or develop information from scratch.

Newer methods involving satellite imagery are coming into popularity for larger areas, low tree cover, and limited budgets. There are, however, significant accuracy problems and the success of such a method depends on the image processing skills of the technician as much as technical specifications of the imagery.

There are generally four options for billing systems. The most common is to use an existing utility system, such as water or wastewater. This has advantages in that stormwater looks like water and wastewater and the charge is clearly a fee for service, not a tax. Another advantage is that delinquencies are low, and it may be possible to turn off water for partial payment of the combined bill even though the customer may have intended to pay the non-stormwater portion of the bill.

Billing the fee on a tax bill may have advantages and disadvantages as well. Using the tax parcel file has the advantage that stormwater is essentially a parcel-based function, creating a direct relationship to the vast majority of the parcels. A disadvantage is that the tax bill is mailed once per year for the majority of properties complicating program cash flow.

The stormwater bill can be placed on another type of utility bill (e.g. electric) but that typically lacks a clear nexus. The last option is to create a stand-alone billing system. This has all the advantages of control and focus, and all the disadvantages of high cost and lack of ability to enforce collections.

Recently local communities are looking at integrating the database support of many of their functions related to infrastructure and customer service. For example, some, or all of the following functions can use overlapping databases:

- Utility Billing systems
- Geographical Information Systems
- Dedicated Stand-alone Systems
- Maintenance Management Systems
- Customer Service Systems
- Complaint Tracking
- Accounting and Financial Management
- Property Tax Systems

Depending on the rate methodology the following fields may be required in the database:

Occupant	Impervious area*
Owner	Parcel ID number
Service address	Runoff coefficient*
Property address	Equivalent stormwater units*
Customer type	Customer account number
Land use code*	User fee
Gross area*	Optional fee or information fields

[* Factors which are required for various stormwater fee rate methodologies.]

POLICY ISSUES

The implementation of user fee or utility based funding for stormwater has numerous policy implications. The policies aggregate around the key issue of deciding how service charges should be implemented and applied to specific properties in a consistent and fair manner.

Timing of policy analysis is also important. Some issues must be decided early in the process, such as the extent to which a utility is to be the sole, primary, or secondary revenue source. Other issues will be addressed much later, such as the choice of the billing systems. Still other issues will not arise until the utility is functioning, such as the disposition of specific appeals and requested rate/levy adjustments.

Thought must also be given as to who will make specific policy decisions. The Council formally adopts through ordinance or policy edict many of the major policies which guide the municipality's stormwater revenue program. Although policy-making in the highest sense is reserved to the Mayor and Council, day-to-day policy decisions are, in fact, often made at several levels. .

The Mayor may make some policy decisions based on Council positions. Other policy decisions are made by municipal management and staff administrators pursuant to general directives spelled out by the Mayor and Council. It is important to recognize the need for and functioning of this dispersed policy-making environment, and create a defined hierarchy for the review of important issues. The following is a sample of possible decision levels. Issues which could be decided at each level must be determined by each community.

- key staff and consultants
- other involved staff
- advisory committee
- manager's office
- municipal council/mayor

An initial screening of issues for the purpose of weighing their significance and determining the appropriate decision level must consider the following:

- impacts of policy decision alternatives on costs and manpower;
- the potential impact on the equity of the utility rate;
- the relationship of each specific issue to other policy issues;
- the priority and timing associated with the issue given the municipality's objective of implementing alternative funding for stormwater management,
- the appropriate level(s) of municipal government at which the issue should be addressed and resolved.

Policy issues in the development of a stormwater utility can be divided into those dealing primarily with program, funding, and billing technical issues. Following is a list of typical policy issues in these three tracks:

Program Related Policy Issues (Program Track):

Program Mission
Program Service Description
Extent of Service
Stormwater Quality Strategy
Privatization
Relationship with other Programs
Public Relations
Major Program Priorities
Service Area
Levels of Service
Organization and Staffing
Interlocal Agreements and Responsibilities
Public Input or Advisory Groups

Funding Related Policy Issues (Finance Track):

Types of Stormwater Services Funded
Prior Investment
Accounting Method Rate
Basic Funding Methodology
Secondary Funding Methods
Credits Equiva
Public Streets and Property
Basis for Cost Distribution
Future Use of Stormwater Systems
Methodology
Modification Factors
Overall Funding Strategy
lent Residential Unit (ERU) Base
State and Federal Property

Billing Related Policy Issues (Database Track):

Billing and Collection Methods
Independent Database system Tie-in
Appeals and Adjustments
Collections and Delinquencies
Property Liens
Management Reporting
Use of other Databases
Number and Type of Data Fields
Rounding and Ranges
Impervious Measurement Accuracy
Customer Service Procedure
Information to Put on Bill
Billing Cost Allocations
Case Exceptions Including:
  Multiple Owners
  Multi-Story Condominiums
Consolidated Billing
New Stand-alone System
Modification of Existing Billing System
Billing Period
Water or Tax Bill Tie-in
Enforcement Procedural Issues
Master Account File Development Process
Accuracy Requirements
Resolution Procedures for Discrepancies
Impervious Area Methodology
Use of Street Centerline Data
Master Acct File Database Maintenance and Updating Process
Billing Owners or Tenants
Undivided Interest, Common Areas
Stormwater Only Accounts
Use of GIS, Mapping or CADD

SCHEDULE

Figure 4-4 illustrates a typical schedule using the four track process for utility establishment. The schedule shows that a comfortable time frame is 18 months from start to finish. The “M” letters indicate milestone meetings.

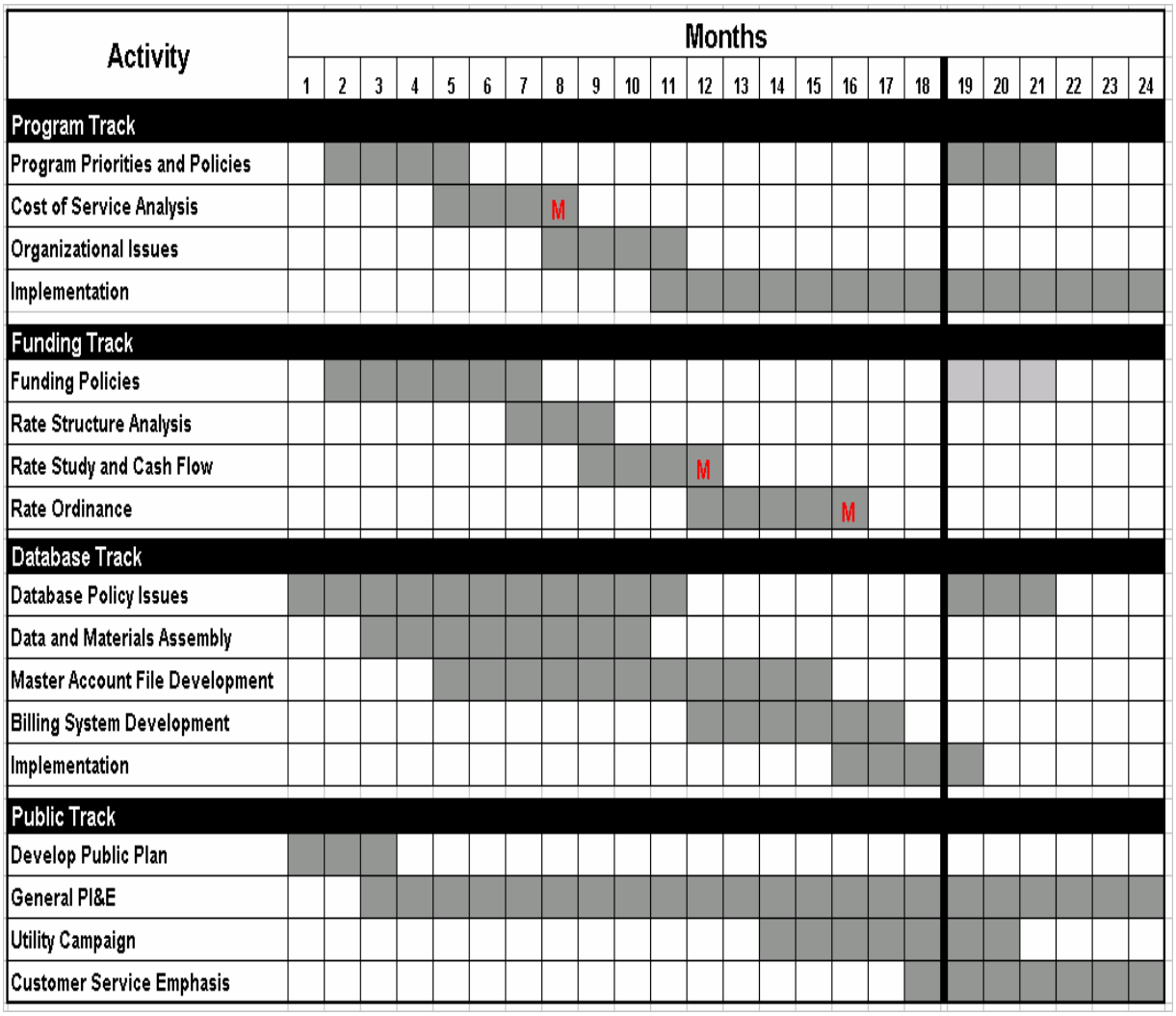

Figure 4-4: Utility Implementation Schedule

The critical path through the process can shift due to the requirements for citizen involvement, political timing, billing timing, and database development.

APPENDIX

EXAMPLE STORMWATER UTILITY PROGRAMS

CITY OF BELLEVUE, WASHINGTON

Keynotes

► The Bellevue stormwater management program was one of the first in the United States (established in 1974) and also the first to give equal consideration to water quality and quantity (flood) control.

► Bellevue's Storm and Surface Water Utility provides a full range of capital infrastructure and operational services, primarily through its in-house staff. In addition to roadway drainage systems, it is responsible for an extensive stream system outside road rights-of-way. It also provides an erosion and sediment control program.

► The Bellevue Utility is governed by the City Council and administered by professional staff as part of a consolidated Utilities Department (water, wastewater, stormwater management, and solid waste).

► Funding of the Bellevue stormwater program is primarily derived from a user fee.

► Key funding policies include:

- a user fee rate methodology based on gross property area and a factor reflecting the intensity of development of each property, with residential fees being discrete to each property and ranging from less than $3/month to more than $20/month;
- retiring debt from an earlier very aggressive bonding program that constructed capital infrastructure improvements to the urban stormwater systems in the city.
- A forward looking R& R funding program to replace infrastructure as it nears the end of its usable life (now pay-as-you-go R & R fund)

Key operational practices include:

- consistent, watershed-based, master planning of stormwater systems with emphasis on water quality and quantity control and aquatic wildlife habitat management; and
- stormwater management functions performed by a staff responsible only for stormwater management, including NPDES permit compliance.

Community Profile

Bellevue is a city of 117,000 citizens. It is the business and cultural center of an area of more than 250,000 referred to in local parlance as “The Eastside”, in reference to its location on the east shore of Lake Washington across from Seattle. Two major highway bridges cross Lake Washington to connect The Eastside with Seattle and thousands of people commute across the bridges each morning and evening. Bellevue is just 10 miles by road from Seattle across either bridge, and has emerged in the past twenty years as a business center in its own right. It has a daytime population of 172,000, with approximately 131,000 jobs, and is home to five of the top twenty-five publicly-traded business corporations in Washington State. Other major corporations such as Microsoft and Costco are headquartered in nearby Eastside communities.

Bellevue is a relatively young community, both in terms of history and demographics, although its population is aging now that the suburbanization has spread even farther east toward the Cascade Mountains. The current median age is Bellevue is 37, up from 28 just 25 years ago. It is an affluent community with high quality of life expectations, and ranks second in Washington State in both retail sales and property values. The per capita income is approximately $42,000/year.

Founded as a community in 1869, Bellevue was incorporated as a city government in 1953, with a population of less than 3,000. As suburban sprawl emanated from Seattle and multi-lane highway bridges spanned Lake Washington, Bellevue quickly transformed from a market crop agricultural area (primarily fruits and vegetables) to the local business center for The Eastside area. It became a preferred address in the region and underwent rapid suburban development in the 1960’s. By 1970 the population had reached 60,000.

The City expanded to its current 31 square miles through several annexations. As it grew, the City absorbed more than a dozen special-purpose agencies that provided local water and sewer services to the neighborhoods that now comprise Bellevue. These formed the basis of its Utilities Department. The City assumed governance responsibility for a full slate of urban community services, including stormwater management. However, other than storm sewer system construction improvements built by residential subdivision and commercial developers and in association with road construction projects, the community did very little stormwater management until about 1970.

Fortunately, the City had developed so rapidly that most of its open streams remained and served as the primary drainage conduits for stormwater runoff. Unfortunately, by 1970 the increased runoff from new pavement and roof tops was overtaxing the capacity of the natural channels that had evolved over thousands of years. Runoff was also causing extensive erosion, sedimentation in the streams, pollution of Lake Washington, and local flooding problems.

Formation Process

The Bellevue Storm and Surface Water Utility is generally regarded as the first stormwater utility in the United States. It was established in January, 1974. A master account file was developed and service fees were initiated as the primary funding mechanism later that year. The Utility was charged with developing and implementing a comprehensive program strategy that would address both water quantity control and water quality protection. Its first priorities were to enforce erosion and sediment control standards and prepare watershed master plans for system capitalization in nearly a dozen small drainage basins in the city.

Service Area

The Bellevue Storm and Surface Water Utility is responsible for stormwater management, flood control, and erosion and sediment control throughout the City's 31 square mile incorporated area.

Role and Program

Bellevue's Utility has broad authority for all aspects of stormwater quantity and quality management. Much of the success the Bellevue Utility experienced is attributed to the detailed program strategy that was assembled by the staff following its formation in 1974 and continuously refined since. It has provided a clear, cohesive vision of the City's objectives and priorities, and drove the transition in organization and funding. The program strategy proved to be critically important in retaining the support of the City Council when the initial service fee (1974) was challenged by citizens and businesses who perceived it to be "just another tax".

During the 1970s the Utility prepared a Drainage Master Plan (capital projects only) and initiated a program to acquire properties and easements and build the facilities identified in the Plan. The Plan consciously sought to preserve the open drainage system by limiting the peak flow of runoff into and through the streams. Engineering estimates suggested that significant savings would result if the open system could be retained by installing regional detention storage facilities at various points along the watercourses. That analysis proved correct, despite rapidly inflating land prices that drove costs up quickly.

The regional detention control strategy was augmented by regulatory standards requiring on-site detention on new development and aggressive soil erosion control measures. The design standards reduced post-development peak runoff to approximately the same as pre-development conditions. Implementation of the

Utility, plus the Master Plan project, justified the initial assembly of the City's geographical information system (GIS), which was then incrementally expanded to serve other City programs.

Other priorities were also addressed while the Master Plan was being developed. The Utility staff immediately became directly involved in land use and development reviews. Routine maintenance of drainage systems was significantly increased. In the late 1970s the City became the largest grantee of the National Urban Runoff Program (NURP), the Environmental Protection Agency's first major investigative study of water quality/stormwater runoff relationships. This placed Bellevue on the leading edge of stormwater quality management in the United States. It also attracted cooperative projects and funding from other state and federal agencies, most notably for stream monitoring and system construction. The Bellevue stormwater program continues to be one of the most highly regarded in the United States. The Utility service fees have evolved through several iterations, and are now relatively more sophisticated and precise than most.

Following the initial formation and implementation period, the Utility continued to expand its programs and build capital projects during the 1980s and 1990s. The infrastructure improvements identified in the initial Master Plan and subsequent updates were completed. A remedial maintenance program was initiated to repair and replace aging drainage systems before they failed. Aggressive development review and inspection efforts were instituted. Bellevue now has eleven major regional detention sites with 650 commercial and 335 neighborhood detention facilities in residential subdivisions. There are also several hundred on-site detention systems located on commercial properties. Several of the regional and neighborhood systems are wetlands that contribute environmental benefits as well as flood control during storms.

The maintenance program attained a fully preventive level of service within ten years. It was rigorously programmed, and remedial repairs became increasingly important as the systems aged and deteriorated. A permanent citizens' advisory commission was established to provide the City Council with community perspectives on stormwater issues. Public information and education morphed into public participation, with "stream teams" composed of interested citizens conducting various projects and activities to protect and improve the City's many small stream corridors. Volunteers are trained to collect scientific data at low cost for monitoring and adaptive management purposes.

One incident dramatically demonstrates the success that Bellevue achieved through its utility. In 1990 the Puget Sound region in western Washington State was struck by an intense and extended rain event over the four-day Thanksgiving holiday weekend. More than $20 million of flood damage occurred in other parts of King County, which is the 1,200 square mile governance jurisdiction that includes Seattle, Bellevue, and other cities. Snohomish County (immediately

north of King County) had more than twenty bridges damaged. One of the multi-lane Lake Washington floating bridges was under repair at the time. Stormwater invaded the floating structure and caused it to sink in rather dramatic fashion. Replacement of the bridge cost over $200 million.

In spite of such widespread problems during this extended storm event, Bellevue's stormwater system worked so effectively during and following the storm that the City did not even have to call out its maintenance crews in response to any problems. Several of the Utility's regional detention systems filled to their capacity, but they worked as designed together with the privately owned commercial systems and overflow was minimal. The drainage and stream systems absorbed the impact without major damage.

Governance Structure

The Bellevue Storm and Surface Water Utility program is guided by policies set by the seven-member City Council. Overall city administration is directed by a professional city manager who supervises a number of major departments including Utilities.

Organization and Staffing

The stormwater management program in Bellevue is administered by the Utilities Department, which also provides water and wastewater management services. The staffing level for stormwater management has been relatively constant for the last decade, fluctuating between 45 and 50 full-time equivalent (FTE) positions.

Funding

The Bellevue Utility is supported primarily by periodic user fees charged to virtually all properties in the city, including the roads and highways. The Utility's annual operating budget now is approximately $6 million. Capital expenditures for the latest fiscal year (FY 2003/2004) were budgeted to be $2 million on projects having a total estimated cost of $21 million. Several of the capital projects are long-term, incremental efforts to stabilize lengthy sections of stream channels and replace aging infrastructure. Total annual expenditures from the Storm and Surface Water Utility fund are nearly $10 million, including debt service payments on capital improvement bonds.

The initial service fee was based on impervious area, and billed only developed properties. In response to the citizen's committee formed to examine the fee concept in 1975, the City shifted to a rate methodology based on gross area and development conditions of every property. As a result, both developed and undeveloped properties are charged for stormwater management in Bellevue. The City Council has also enacted several rate increases over the years as the program revenue requirements grew.

Regardless of whether a property is in residential or commercial use, the rate methodology employs increments of one hundred (100) square feet to calculate the fees for each property, resulting in highly discrete charges. Service fees for single-family residential properties now range from less than $3 to more than $15/month, with a typical charge of approximately $10/month. The Utility is fully self-supporting and has never received allocations of general City revenues. A majority of its revenues are generated by the service fees, but the Utility also continues to receive federal and state grants and loans in support of specific activities and facilities. It also sponsors cooperative projects with private developers, other public agencies such as the local school district and neighboring general governments, and homeowners' associations in residential neighborhoods.

Inter-governmental Cooperation

The Bellevue Utility works closely with other jurisdictions in the region, but its physical location on a ridge between two major lakes reduces the degree to which it shares watersheds with neighboring cities and King County. The development of one major regional detention area illustrates the type of cooperation that the Utility has been able to obtain from other agencies. The Municipality of Metropolitan Seattle (Metro) (now King County) wished to locate its Eastside Transit Maintenance Facility in Bellevue in the mid-1970s because of the site's favorable central location. The City required that Metro (which coincidentally was also the wastewater treatment provider for the Greater Seattle area) preserve a small stream that traverses the property. Utility staff worked with Metro to optimize the use of the site for bus maintenance while also enhancing the stream corridor and installing containment controls to provide peak flow attenuation in the stream. Much of the collaborative effort was directed toward water quality management. Today, the utility works with other jurisdictions to develop capital facilities, protect water quality, manage lakes, and enhance aquatic habitat.

Public Participation

Public participation has been a hallmark of the Bellevue Utility since its inception in the late 1960s. A group of citizen activists approached the Bellevue City Council in 1969, requesting that the City government initiate studies and other actions to solve emerging drainage problems. They were especially concerned with the environmental impacts on the streams, their habitat, and riparian resources. The City Council appointed several of the citizens to an advisory committee to recommend a strategy for meeting with the challenge. Over the next three years the committee reported back to the City Council with a series of recommendations, the most significant of which (in hindsight) was that the City should establish a dedicated source of funding for its stormwater management program. The recommendations emerged as Bellevue's Storm and Surface Water Utility early in 1974.

In response to complaints about the initial user fees, a second citizen advisory committee was established that included several critics of the service fees, one of whom was challenging the Utility in court. That committee reviewed the initial decision to form the Utility. They concluded that the objectives, program strategy and policies were appropriate and recommended that the City continue with the service fee approach, but that citizens vote on the funding. This reassessment of the concept was pivotal in the ultimate success of the Utility concept in Bellevue. In their report to the City Council the committee cited the strategic plan developed for the Utility as a principal reason for supporting the concept. A series of advisory elections followed, which guided the evolution of the service fee funding methodology.

The public's participation in the work of the Bellevue Utility continues to be a hallmark of the community's approach and a key factor in its success. A permanent Storm and Surface Water Utility Commission formed in the late 1970's. It now guides Utility policy and advises the City Council on program and funding decisions not only for stormwater management issues, but for other utility programs as well. Volunteer groups are sponsored by the Utility and provide support for stream protection, collection and disposal of household waste and hazardous materials (paint, etc), and multiple use of riparian corridors along the City's streams.

CITY OF CHARLOTTE/MECKLENBURG COUNTY, NC

Keynotes

- ► The Charlotte/Mecklenburg County approach to stormwater management relies on centralized funding and regional programs for large systems combined with local management of minor stormwater systems and associated program elements. The County and individual towns have a high degree of self-determination in deciding the service level to be provided by local systems and programs, funding, and assignment of functional activities.

- ► Mecklenburg County provides the smaller towns with the option of a menu of available services, but the decision to use the County, City of Charlotte, in-house, or privately contracted vendors resides with the individual local entities. The City of Charlotte has a Phase 1 NPDES permit and the County and smaller communities have a Phase 2 permit.

- ► North Carolina statutes allow both counties and cities to establish stormwater utilities and adopt service fees to fund stormwater quantity and quality control efforts. However, a specific limitation in the statute prohibits creation of overlapping county and city utilities. Initially, the City of Charlotte established a utility. A year after, the utility was restructured to provide a countywide utility, with complementary programs run by the City and County to avoid any conflict with the statute.

- The Mecklenburg County Stormwater Utility is governed by the Board of County Commissioners and administered by professional staff. The City of Charlotte also has a substantial stormwater management program governed by the City Council and administered by the City Engineering and Property Management Department. Other City departments such as the Department of Transportation are also important players since they often provide maintenance of the stormwater systems in the roadways. City and town councils in the smaller communities in Mecklenburg County govern their local stormwater programs.

- Funding of the Charlotte/Mecklenburg County stormwater program is primarily supported by a composite stormwater service fee that includes both major (draining larger than one square mile) and minor (draining less than one square mile) components. The individual towns more often employ a blend of funding from several sources.

- Policies are adopted by the Board of County Commissioners and the city and town councils in the respective communities that are involved in stormwater management. Key funding policies include:

  - a composite regional major and minor service fee based on a consistent impervious area rate methodology;
  - County control of the major component of the composite service fee; and
  - local governance (county/city/town) control of the local component of the minor service fee.
  - the City of Charlotte has initiated a very aggressive bonding program to construct $198 million in improvements to the local urban stormwater systems in the city over five years.

  Key operational practices include:

  - consistent, watershed-based, planning of stormwater systems;
  - centralized stormwater quality management, including NPDES permits; and
  - a stormwater services menu provided to smaller entities by the County
  - Billing and collections and customer service are provided throughout all jurisdictions countywide by the City of Charlotte.

- Stormwater management staffing in the County and towns varies widely. Mecklenburg County and the City of Charlotte have relatively large and skilled staffs capable of managing both stormwater quantity and quality programs, while the smaller towns typically have few staff and rely on the County, City of Charlotte, or private vendors to provide contracted

services. The combined Charlotte/Mecklenburg County staffing exceeds 150 full-time equivalent positions.

Community Profile

Charlotte/Mecklenburg County is the largest urban center between Washington D. C. and Atlanta. Major businesses include banking, transportation, distribution, communications, and manufacturing. The City of Charlotte, Mecklenburg County, and smaller neighboring towns have collaborated in the development of one of the most highly regarded stormwater management programs in the United States.

Mecklenburg County is the core of a six-county metropolitan area that has a total population of 1.5 million. Approximately one half reside within Mecklenburg County, with 650,000 people residing in the City of Charlotte. Only 70,000 Mecklenburg County residents live in areas that are not within incorporated cities or towns.

The County encompasses about 526 square miles, nearly 280 of which are in Charlotte. Charlotte and the smaller towns in the County have adopted policies for on-going annexation. It is anticipated that there will be no remaining unincorporated areas of the County within a decade or so, but County government will continue to provide designated services such as floodplain management county-wide.

Mecklenburg County established a storm drainage district early in 20th century which built and maintained large, open-channel drainage systems to serve those portions of local watersheds with a tributary area of more than one square mile. Improved channels were provided throughout the County, regardless of whether the channel was located in an incorporated city or town government or in the unincorporated area. Of course many of the channels crossed the jurisdictional boundaries of the cities, towns, and county.

Improvement and operation of drainage systems to serve areas smaller than one square mile in the incorporated jurisdictions were left up the local government. The City of Charlotte and the smaller towns were nominally responsible for the small watershed systems. The County improved and maintained the smaller systems in the unincorporated area. Many of the smaller systems were installed by developers as residential subdivisions and commercial projects were constructed. This approach was employed for over seventy years, with mixed success. The larger channels tended to be funded adequately and were improved from time to time, while the smaller systems were largely ignored unless specific problems developed.

Today Mecklenburg County and the City of Charlotte manage different but complementary stormwater programs. The City and County work together in order that services to the community will not be duplicated. The County remains

responsible for managing FEMA regulated floodplains and their channels county-wide. This is comprised of a network of "named" large creeks (like McMullen Creek, Little Sugar Creek, and Briar Creek) that drain watersheds larger than one square mile. The City of Charlotte and the smaller towns are responsible for maintaining the smaller creeks and tributaries that feed into the large creeks. Both the county and town stormwater programs provide services for drainage pipes, ditches and drains on public property and within easements on private property in their respective jurisdictions.

Formation Process

Formation of the Mecklenburg County stormwater utility involved a relatively complex, and occasionally contentious, process that spanned over three years. This was in large part a function of local politics, but the North Carolina legislative authorization for stormwater utilities heavily influenced the process.

Initially, the County and City of Charlotte attempted to cooperatively identify a mutually agreeable approach to instituting a utility. An advisory committee comprised of County, City, and diverse interest group representatives met for more than a year to assess how local needs might best be addressed. Unfortunately, they reached a stalemate regarding which entity should be the lead management entity. This reflected the past history and differing needs of the County and City.

Since the early 1900's, Mecklenburg County had provided and maintained drainage improvements along creeks throughout the County below the point where the tributary area totaled 640 acres (one square mile). Such regional systems were locally termed the "regulated floodways". Drainage systems serving smaller watersheds in the unincorporated areas were also the responsibility of the County, but the cities and towns were responsible for the local drainage systems within their jurisdictions. The City of Charlotte Department of Transportation had maintained its urban stormwater systems associated with roads for many years, but drainage systems located outside road corridors had not been aggressively managed or maintained. When discussion of the utility option began in 1989, the County's principal priority was to enhance its regional systems, while the City's priority was to improve the local drainage systems. Both entities were concerned about their upcoming NPDES permits at that point.

North Carolina legislation was adopted in the late 1980's which allowed counties and cities to establish stormwater utilities. However, it specified that only one entity could establish a utility where two or more local entities provided drainage systems and services. Because Mecklenburg County managed the regulated floodways throughout the County, including areas in incorporated cities and towns, the County staff wished to have a utility that was county-wide. However, there was some reluctance among the County Commissioners to lead that approach. Once it was clear that a cooperative approach was not moving

forward, the City of Charlotte determined that it could not defer its solutions and would institute a stormwater utility to support its local drainage system programs including funding for compliance with Phase I stormwater requirements. The City utility was instituted by the City Council and service fees were initiated in January, 1993.

Once it became clear that the City was proceeding independently, the County Board of Commissioners determined that it would proceed with formation of its utility. This caused both entities to revisit the issue of a single county-wide utility. It was determined that the County utility would supplant the City utility as a legal entity when it was formally instituted in 1994. The structure and control of budgets, rates, and fees was a key to this agreement. This process was facilitated by the fact that the County and City had retained the same consultant team to assist both parties from the beginning of the process. That enabled the entities to arrive at consistent governance, rate, and program decisions, and implementation of the master account files and billing systems was eased.

Another aspect of the County and City of Charlotte negotiations involved the provision of services in the smaller towns that surround Charlotte. In order to obtain their agreement to participate in regional solutions and application of County utility service fees within their jurisdictions, the County agreed to extend control over many key policy issues such as rates to their elected Councils.

A permanent, nine-member Storm Water Advisory Committee (SWAC) is appointed by the Charlotte City Council, Mecklenburg County's Board of Commissioners, and Town Councils of Cornelius, Davidson, Huntersville, Matthews, Mint Hill, and Pineville. SWAC members represent diverse neighborhood, business, institutional, and environmental interests.

Service Area

The total area of Mecklenburg County is approximately 526 square miles. The City of Charlotte is approximately 280 square miles of the County, while the smaller six towns collectively contain (or maintain through Extra Territorial Jurisdiction) the remaining area of the County. North Carolina annexation laws allow aggressive annexation policies to be pursued by cities and towns. At the time the stormwater utility was being formed Charlotte and the satellite cities and towns had reached separate agreements on their respective spheres of influence which will control future annexations as urban/suburban development occurs. The County remains essentially a rural services provider, and the city and towns are urban services providers. Annexations tend to occur each year to two as urban/suburban development spreads into the unincorporated areas. This has directly influenced the initial division and gradual shift of stormwater management responsibilities.

Pursuant to state legislative limitations, the Mecklenburg County stormwater utility is the single, county-wide stormwater utility and encompasses the

incorporated areas by inter-governmental agreement. The individual cities and towns are stormwater service agencies within their respective jurisdictions, but utility service fees to support their programs are levied by the Board of County Commissioners.

It was decided that the County and, to a lesser degree, the City of Charlotte would support the smaller cities and towns stormwater management efforts by offering a "menu" of services to them. Since Mecklenburg County remained responsible for the regional drainage facilities throughout the County and also for the rural drainage systems in the unincorporated areas, it was judged to be best suited to provide those services to the smaller towns. Since the City of Charlotte performs street drainage maintenance, it was determined that it would offer similar services to the smaller cities and towns, though most currently maintain those systems in-house. (It should be noted that county governments in North Carolina do not operate road systems. There are state highways and city streets and highways only – no county roads. Thus, the State of North Carolina Department of Transportation is an important player in road-associated stormwater management in unincorporated areas of the state and is also responsible for some roads within incorporated cities and towns.)

One of the most notable differences in stormwater services in Charlotte/Mecklenburg is that systems located outside road rights-of-way and easements are also maintained by the City if "public water" is present. That includes runoff from any public street or property. This policy enables the City to actively manage nearly all of the drainage systems rather than just those components located in roadways. As a result, the County and municipal stormwater programs apply much more effort to stream protection and enhancement than in most communities.

Role and Program

Mecklenburg County and the City of Charlotte both continue to have substantial stormwater management roles and programs. The County has an engineering and operational staff geared to management of major drainage systems serving watersheds of more than one square mile and rural drainage systems serving smaller watersheds in the unincorporated areas. The City of Charlotte has a stormwater engineering staff in the City Engineering and Property Management Department and an operational staff in its Department of Transportation. Charlotte has a Phase 1 NPDES permit, which is supported by contracted County forces that provide water quality monitoring and data management. The County and towns have a Phase 2 permit.

Although the County focuses its program on the larger creeks, the role of both agencies is primarily urban stormwater management simply because the area is now extensively urbanized. Flood protection is an important objective, but the area is subject only to small drainage system flooding rather than major river flooding along the Catawba River, which traverses the County. The Catawba is

controlled by a series of dams and impoundments such as Lakes Norman and Wylie. The County's efforts focus on the regulated floodways of the major creeks throughout the County. Drainage systems in the unincorporated areas that are not within road corridors are also managed, but these are a lower priority. The State of North Carolina Department of Transportation is responsible for roadway drainage systems throughout the unincorporated area, and for some systems in the incorporated cities and towns.

Mecklenburg County recently consolidated several previously dispersed functions into a Land Use and Environmental Services Agency (LUESA). Its scope of responsibility includes floodplain management, stormwater services, water quality, land development, zoning, groundwater protection, on-site wastewater management, private water well permits, and others that were integrated in a Water and Land Resources organization. The County's objective in consolidating these programs in one operating unit is to ensure a clean and livable environment through the protection and enhancement of water and land resources.

The County's program also provides floodplain management county-wide. Federal flood insurance provisions mandate that floodplains be delineated where tributary watershed areas exceed 640 acres, which corresponds to the drainage area definition employed by Mecklenburg County for the major streams management program throughout the cities, towns, and unincorporated areas. The program relies on regulations that limit intrusions into the floodplain. The County's Water and Land Resources group maintains the flood insurance mapping for the entire County. Improvements to and maintenance of the major drainage channels carried out by the County provide effective flood control during most storms. The County also performs floodplain and stormwater service inspections for the cities and towns and is responsible for the small drainage systems in unincorporated areas.

The City of Charlotte program focuses on local drainage systems both within and outside road corridors. Its program heavily oriented toward infrastructure management, and the City recently initiated a capital improvement program that will invest $198 million in construction of system betterments to the local urban stormwater systems over the next five years, utilizing bonds and service fees.

Governance Structure

Mecklenburg County has a single, county-wide stormwater utility governed by the nine-member Stormwater Advisory Committee created for the purpose of levying varying service charges across the County and seven municipal jurisdictions. The utility service fees within incorporated areas are levied pursuant to inter-governmental agreements with the respective city and town councils. Decisions on program content, level of service fees, and how to provide service (in-house, inter-agency, outside contract, etc) in the incorporated areas are the province of the cities and towns. The seven city and town councils set the stormwater service

fees applicable to improvement and maintenance of the smaller systems within their limits, and the County Council adopts them as part of their rate methodology.

This stormwater management governance structure has now been in place for over a decade, and has enabled all of the local jurisdictions to perform stormwater management at the level desired by their local elected officials. Most of the smaller towns simply use the same rates that the County applies in the unincorporated area, although the Town of Davidson has opted to charge a lower service fee.

Organization and Staffing

The organization and staffing of the stormwater management units in Mecklenburg County, the City of Charlotte, and the smaller satellite cities and towns varies greatly. The County and City of Charlotte have in-house staffs of approximately thirty and seventy-five people (respectively) with the full range of engineering and operational skills required to administer their respective programs. Both also make substantial use of outside consultants and contractors. In addition, the City stormwater program pays the City's annually to maintain drainage systems located in roads. The smaller towns' stormwater staffs range from a portion of one full time equivalent position to several people dedicated to the stormwater management function. They rely heavily on the County, City of Charlotte, and outside contractors for engineering and operational support. Day to day activities associated with NPDES compliance, including extensive monitoring, is provided primarily by the County.

The differences in and dispersion of responsibilities among the County and the towns has resulted in the creation of some innovative concepts. For example, the City of Charlotte developed a program to expedite construction of small capital projects and remedial repairs. A list of pre-qualified local construction firms is maintained, and unit price bids are obtained annually for certain common activities and materials. When a complaint about a drainage problem is received, a City stormwater inspector determines the priority ranking of the problem. If it is in a high priority category (such as home flooding, street flooding, or other safety issue), a qualified vendor on the list is called in, any required engineering is done immediately (often in the field), and a work order is issued. This program enables the City to respond to many complaints within 30 to 60 days, which has gained high community and City Council approval. The County has a similar program.

Funding

The County stormwater utility service fee is the primary source of funding for stormwater management in Mecklenburg County. The total stormwater budget for all entities in Mecklenburg is over $85,000,000. A large part of this is for capital betterments to the systems primarily within the City of Charlotte. The

City's budget for capital projects in the current fiscal year is over $40 million, and the City's annual stormwater operating budget is an additional $32 million.

A consistent impervious area rate methodology is used throughout the County, with a flat rate for single-family detached residential properties and an equivalency unit of 2,613 square feet of impervious coverage applied to all other properties. Single-family residential customers are billed for one equivalent unit. The equivalent unit flat rate applied to single-family residential customers for the regional component of the program is $1.06/month throughout the County. The local stormwater program elements provided by the County and City and towns are funded by a separate rate component.

Because Mecklenburg County has a composite fee comprised of the regional system component and local fees determined by the City and towns, the rates vary by jurisdiction. Charlotte and Mecklenburg County have a dual flat-rate user fee for single-family residential properties, with the break being at 2,000 square feet of impervious coverage. The City's current single-family charges are $5.18/month and $6.72/month. The County's are $3.33/month and $4.03/month for the local component of the rates in the unincorporated areas. The local component of the rates applied in the other towns range from $.30/month to over $2.00/month.

Additional funds have also been appropriated for stormwater management by many of the entities, resulting in some novel blending and dedication of resources. For example, even after its utility service fee was adopted, the Charlotte City Council decided to continue to appropriate approximately the same amount from general revenues for stormwater management as was previously budgeted (about $5 million annually). Those funds were specifically assigned to water quality programs to avoid a potential problem within the state authorizing legislation (which was later rectified by statute). This allowed the City's initial service fee rate to be approximately sixteen (16) percent lower than would otherwise have been required to meet the cost of services and facilities. After the stormwater utility had been in place for three years, one-half of the general revenue support for stormwater management was incrementally reduced over a four year period, which transformed the City's general government capital program. The City continues to make a general fund contribution to the stormwater program..

Inter-governmental Cooperation

The strong emphasis on local control of the small-watershed programs combined with the regional responsibilities of Mecklenburg County has resulted in a great deal of collaboration and mutual support by the participating entities. Financial management offers a good example. Administration of the service fee master account file billing and collection is provided by the City of Charlotte's Finance Department. Accounting for the individual programs is performed separately by each entity.

This approach extends to engineering and operational functions as well. The County and City of Charlotte perform master planning and engineering for watersheds and drainage systems, often by employing outside consultants. Because the local watersheds cross many jurisdictional boundaries, this function commonly involves and benefits the smaller towns as well. The City of Charlotte is undertaking a $198 million capital projects program that will construct new drainage systems, improve existing facilities, and repair known deficiencies over five years. Some improvements will be done outside the City to attain the most efficient solutions to problems within Charlotte, resulting in incidental service benefits to other entities. The County and City of Charlotte operational forces also provide various services to the smaller towns per operating agreements or on an ad hoc basis at their request. The County performs over $1 million of monitoring, analysis, and data processing services for the City's Phase 1 NPDES compliance program. The water quality programs, including NPDES compliance efforts, also involve the County, City of Charlotte, and satellite communities in many cooperative efforts such as public education.

The City and County have also consolidated stormwater customer service. Service requests are coordinated through a single telephone contact number, [704] 336-RAIN (which translates to [704] 336-7246). Regardless of which local governance jurisdiction a person resides in, he or she can file complaints or inquiries and receive service assistance from the customer service center.

The Charlotte/Mecklenburg stormwater program receives support from several federal and state agencies for various program components. For example, the United States Geological Survey (USGS) operates a dense hydrologic data-collection network of seventy two (72) rain gauges and forty five (45) stream flow gauges within the city and County. The network of gauges provides valuable data for the documentation and interpretation of water-resources information, including rainfall and flooding events. During a rain event, data is transmitted from these gauges to base stations located at USGS and the Charlotte Mecklenburg Government Center (CMGC) where developing flood conditions are monitored by emergency services staff. In addition to rainfall and stream level data, four stations in the system are also set up to continuously collect water quality indicators such as temperature, conductivity, PH and dissolved oxygen levels in a stream. The cooperative program with the USGS has been in place without interruption since 1961.

Public Participation

Perhaps one of the most outstanding features of the Charlotte/Mecklenburg experience has been the high level of on-going public participation in the stormwater utility program from its formative stage. The County and City of Charlotte assembled a community advisory group and a technical guidance committee to assist with the feasibility investigation when they first considered a combined program. The City continued that effort with a committee of more than

twenty persons representing diverse interests as it formulated its initial utility concept. The County then initiated its own utility implementation effort, again with support and guidance from a committee.

Prior to its initial stormwater utility billing, the City conducted an extensive (and costly) public education program to explain the purpose of the stormwater utility and service fee concept. They also introduced the program to the media in the city with factual materials, and obtained strong support from the editorial board of influential local newspaper. Prior to the initial billing, notifications were sent to the largest ratepayers and explanations of the fee and its associated credit system were provided in several general and personal meetings with businesses and the local Chamber of Commerce. As a result, the Chamber of Commerce supported the utility program with its membership. A series of public information brochures were prepared and placed in public buildings, and articles highlighting drainage problems in the city were placed in the print media. A guest commentary article authored by the City was printed in a weekend edition of the major Charlotte newspaper.

After a detailed study of billing alternatives, the City decided to append the stormwater service fee to the Charlotte/Mecklenburg Utilities Department water and sewer billing as a separate line item. On the day the first stormwater service fee billings were mailed, a ground-breaking ceremony was held for a construction project to resolve a highly-visible, long-standing drainage problem. It received heavy coverage by local television news programs. The message of the day was that the City had begun to address its substantial backlog of known drainage problems, “And, by the way, you (i.e., the public) will be receiving a new line item on your utility bill to support this effort”. It might have easily been “There’s a new fee in town. What are they doing with your money?”

The City also prepared very well for public response to the initial service fee billing by assembling and training a cadre of special customer service agents, retained through a temporary employment agency. A contact telephone number was printed on the billings to direct calls to this group of specialists, relieving the potential burden on the utility billing customer service staff that normally responded to water and sewer billing inquiries. The twelve special customer service agents were retained for sixty days, or two full billing cycles. As the inquiries tapered off, the number of special agents was reduced accordingly, with all inquiries eventually being shifted to the in-house customer service staff, who had also received training on the proper responses to various questions.

In total, the City of Charlotte spent approximately $250,000 (in the early 1990s) to educate the community about the local stormwater needs and utility program, and prepare for the initial service fee billing. This represented approximately two weeks of the utility service fee revenue stream at that time, but resulted in a high level of public acceptance. There was (of course) some opposition by tax-limitation advocacy groups, but the high level of accountability provided by the

dedication of funding dispelled most of their objections. Within two years, a City Council member who represented that interest tax-limitation group stated publicly that, if every City program was as well run as efficiently and responsively as the stormwater utility, there would be no need for tax-limitation advocacy.

The high level of community education and involvement continues, with many educational materials, activities, and actively-involved support groups. The City commonly provides hyetographs from its rain gauging network on its website following severe rainfall events that cause flooding. This has educated the general public regarding the high variability of intense thunderstorm rainfall that occurs across Mecklenburg County, and reassures the public that the staff is aware of what is happening. The City's stormwater capital improvements program, funded in large part by sale of bonds, also features extensive public education and participation programs, such as Adopt-A-Stream and Storm Drain Marking.

CITY OF TULSA, OKLAHOMA

Keynotes

- ► The Tulsa Stormwater Management Utility was founded in response to a devastating one-day urban drainage system flood that killed 14 residents and did nearly US$200 million damage to public and private properties in 1984.

- ► Tulsa's Stormwater Management Program provides a full range of capital infrastructure and operational services. In addition to roadway drainage systems, it is responsible for an extensive stream system outside road rights-of-way. The City has a Phase 1 NPDES permit.

- ► Since forming its Utility, Tulsa has received over $100 million in federal support for capital infrastructure improvements, removal of structures from flood-prone areas, and hydrological data gathering.

- ► Funding of the Tulsa day-to-day stormwater program is primarily derived from a user fee.

- ► Key funding policies include:

    - o a user fee rate methodology based on the impervious area of each property, with residential fees being a single rate;
    - o use of general obligation bond sales and sales tax revenues to fund construction of capital infrastructure improvements; and
    - o aggressive pursuit of federal grants and loans to supplement local resources.

Key operational practices include:

- watershed-based master planning of stormwater systems throughout the City, with emphasis on flood control; and
- stormwater management functions performed by in-house staff, including NPDES permit compliance.

Community Profile

The City of Tulsa was incorporated as a municipality in 1898. With the discovery of oil in nearby Red Fork in 1901, Tulsa grew quickly and reached a population of more than 7,000 by 1907. After Oklahoma became the 46th state in the United States in 1907, the City voters adopted its first city charter on July 3, 1908. The City was governed by three elected commissioners from 1909 through 1989, when the voters amended the charter to adopt a mayor/council form of government. The Mayor is now elected every four years (at large) and nine City Council members are elected to two-year terms from geographic districts.

Tulsa lies in the heart of a fertile forested region of rolling hills in northeastern Oklahoma. It is the second largest city in Oklahoma, located 90 miles northeast of the state capital, Oklahoma City. The average annual rainfall is thirty-nine (39) inches. The region is sometimes referred to as “Tornado Alley” in recognition of the severe storms that often occur in the Spring. Violent windstorms are often accompanied by extraordinarily intense rainfall, which has been a key factor in Tulsa’s stormwater management problems and search for solutions.

The land area of the City today is approximately 198 square miles. It has a population of 392,000. The economy of the community is highlighted by higher education (seven universities), energy, telecommunications, and transportation/warehousing. Tulsa has an in-land deep water port located on the McClellan-Kerr Arkansas River Navigation System, offering a Foreign Trade Zone, two industrial parks and liquid and dry cargo storage.

Tulsa has grown up with flooding. Some consider it a “poster child” example of the stormwater management struggles that local governments experience. Many of the causes of Tulsa’s problems are a function of its location: the city is on a major river (the Arkansas), in a region of violent storms, and was initially developed on the American frontier, where one had a right to do as he (or she) wished with the land - including building structures in inappropriate, flood-prone locations.

Local flood records are sparse before 1900. In 1908, only a year after statehood, Arkansas River flooding at Tulsa caused $250,000 in damages (over $25 million in 2004 dollars). By 1920, the town had outgrown its raw, boomtown youth. As riches mounted from the oil industry and investors and speculators poured in, Tulsa grew into a wealthy city of 72,000. But development edged ever closer and closer toward the river banks. On June 13, 1923, the Arkansas River

flooded Tulsa's waterworks, caused $500,000 in damages ($20 million in 1994 dollars), and damaging homes leaving 4,000 citizens homeless. City fathers responded with Tulsa's first land-use plan, which envisioned upland boulevards and housing. In the lowlands, such as the Mingo Creek riparian stream corridor east of town, the plan indicated there would be generous parks and recreational trails.

Significant flooding occurred again in 1943. In response to the flooding, the U. S. Army Corps of Engineers (COE) built levees around Tulsa's oil refineries along the Arkansas River as a World War II national defense measure. By 1950, in the post-war building boom, housing fanned out onto the floodplains to the south and east of the downtown area. Land that had periodically flooded with little harm now was awash in wave after wave of development and, periodically, urban flooding. By the late 1950's, flooding of newly developed subdivisions along the Arkansas River spurred calls for flood control. In 1964, the COE completed Keystone Dam on the Arkansas River, fifteen miles upstream from Tulsa. For years to come, Tulsans would believe that the Arkansas River was forever tamed.

Tulsa enjoyed another economic boom based on energy resources in the 1960s, when the city's population grew 25 percent. Tulsa's rapid growth resulted in the paving and piping of vast areas of pastures and meadows, and new buildings continued to spill into the lowlands along the creeks and streams that etch the area. The rapidly urbanizing Mingo Creek watershed was annexed to the city in 1966. Localized floods struck every two to four years during the 1960s and early 1970s, but the response was classic “flood relief”: emergency response and recovery, reconstruction as quickly as possible, and denial of the possibility that damaging floods could reoccur. Victims petitioned for neighborhood flood control, with limited success.

A flood in the Spring of 1970 caused $163,000 in damages in the rapidly developing Mingo and Joe Creek watersheds. The City responded by joining the federal government’s National Flood Insurance Program's (NFIP) "emergency program" and promising to adopt federal floodplain regulations. In August 1971, the NFIP issued its block rate maps. A month later, floods hit Flat Rock, Bird and Haikey Creeks inundating many suburban neighborhoods once again. In December that year, Bird Creek flooded again. Tulsa joined the NFIP's "regular" program, adopted a new 100-year flood standard, and promised to regulate floodplain land use.

In April and May, 1974 floods left $744,000 in damages (over $6 million in 2004 dollars) on Bird Creek. Violent storms June 8 of that year caused widespread flooding on Joe, Fry, Haikey and Mingo Creeks, with more than $18 million in damages ($80 million in 2004 dollars). On September 19, 1974 Mingo Creek flooded yet again. For some citizens, it was the third flood in less than a year. Angry, drenched victims waded out of the floods to demand help from City

officials. They contended the City wasn't enforcing its NFIP regulations. They tried to halt development, to avoid deeper flooding until existing problems could be solved. Developers objected strenuously. Thus began a community debate over floodplain management, locally called "Tulsa's great drainage war," that was destined to last more than a decade. The city responded with a plan to widen part of Mingo Creek, including clearance of 33 houses in the most flood-prone area. The houses were removed just before the next flood in May, 1976.

The May, 1976, flood marked a milestone in Tulsa's search for solutions. A three-hour, 10-inch deluge was centered over the headwaters of Mingo, Joe and Haikey Creeks. The resulting flood killed three citizens and caused $40 million in damages ($140 million in 2004 dollars) to more than 3,000 buildings. By this time, the victims were becoming skilled lobbyists and gathering sympathizers citywide. They virtually stormed City Hall to demand solutions. Newly elected city commissioners responded with a wave of actions. They enacted a floodplain building moratorium; hired the city's first full-time hydrologist; developed comprehensive floodplain management policies, regulations and drainage criteria; enacted stormwater detention regulations for new developments; instituted a fledgling flood alert and warning system; and began master drainage planning for major creeks. In 1978, an earth change (erosion and sediment control) ordinance was also adopted, giving the city control over alterations to Tulsa's landscape, including floodplains and stream channels.

In the early 1980s the federal United States government developed the federal Inter-agency Hazard Mitigation process to curb repetitive flood losses. After flood disasters, federal teams were dispatched to identify hazard mitigation opportunities, i.e., ways to make the response to each disaster reduce the scope of the next one. The mitigation concept focused on correcting the causes of losses, including removing, raising, or flood proofing the most vulnerable of the damaged buildings. Tulsans worked with the Federal Emergency Management Agency (FEMA) to develop the process. Tulsa's early exposure to the new FEMA mitigation program was to have a significant impact on the city's response to future floods.

On the three-day weekend marking the Memorial Day holiday in May, 1984, the worst flood in Tulsa’s history struck. After a muggy Sunday a stalled cool weather front produced thunderstorms that dumped some fifteen (15) inches of rain overnight in just twelve hours. The rainfall was centered over the Mingo Creek watershed, but also extended across most of the city. The results were disastrous. The flooding killed 14, injured 288, damaged or destroyed nearly 7,000 buildings, and left $180 million in damages ($425 million in 2004 dollars). The Mingo Creek corridor alone accounted for $125 million of the damages. It was truly a localized, urban stormwater system flood. Local streams flooded while the nearby Arkansas River remained well below flood levels.

Problems continued in the years following despite formation of Tulsa's stormwater utility in 1985. In 1986, a major flood of the Arkansas River tested the new stormwater management program. It also served as a reminder of the finite protection provided by the Keystone Dam upstream from the city. Between September and October 1986, unrelenting upstream rains filled the Keystone Reservoir to capacity, forcing the COE to release water at the rate of 310,000 cubic feet per second. Downstream flooding was inevitable. At Tulsa, a privately maintained levee failed, causing $1.3 million ($5million in 2004 dollars) in damages to 64 buildings. The City fielded its hazard-mitigation team and cleared 13 substantially damaged structures, and more widespread damage was avoided.

Formation Process

A newly elected mayor and street commissioner had been in office for only 19 days when the Memorial Day flood struck in May, 1984, but both knew the issues well. In the darkest hours of their community's worst flood, they pledged to make their response reduce the likelihood that such a disaster would ever be repeated. Before daylight, they had assembled the city's first Flood Hazard Mitigation Team to develop the City's strategy. Within days, a new approach to Tulsa flood response and recovery was born.

The flood response effort was only the beginning. A unified stormwater program was created, with City leaders committing to make Tulsa flood-safe. As ultimately completed, the program included relocation of 300 flooded homes and a 228-pad mobile home park, $10.5 million in flood control works, and $2.1 million for master drainage plans. The total capital program topped $30 million, mostly from local capital sources, flood insurance claim checks, and federal funds.

The devastation of the 1984 flood persuaded Tulsans that a coordinated, comprehensive stormwater management program was needed from the rooftop to the river. A Department of Stormwater Management was established in 1985, centralizing responsibility for all city flood, drainage, and stormwater programs. A stormwater utility fee was established by ordinance in 1986 to fund the program. The utility fee ensured stable funding for maintenance and management, independent of fickle political winds. The service fee ordinance allots all fee revenues exclusively for floodplain and stormwater management activities. Over several years an extensive system of recreational greenways was created along the Mingo Creek and other streams, providing bicycle and walking paths as well as green space areas. When the Memorial Day flood devastated Tulsa in 1984, the City had 57 detention ponds. By 2000, there were 85 detention ponds plus many other stormwater facilities including improved conveyance channels.

Service Area

The Tulsa Stormwater Utility is responsible for stormwater management throughout the City's 198 square miles.

Role and Program

Simply establishing a stormwater utility could not instantly correct Tulsa's stormwater and flooding problems. A comprehensive, long-range stormwater program strategy was formulated by the utility staff, coupled with extensive capital infrastructure master planning during the 1980s. The City's objective was to manage stormwater both within public rights-of-way and easements and along the many creeks that drain the hilly terrain of the community.

The Public Works Department, in conjunction with a Stormwater Drainage Advisory Board and numerous citizen groups, developed a phased implementation program for projects identified in the City's basin drainage plans. The projects were funded in part by a combination of stormwater fees, sales tax revenues or bond issues. Construction of the improvements identified in the master planning project proceeded quickly based on the assured funding capability provided by the stormwater service fee. The City was also able to obtain more than $100 million of COE funding for various capital improvements to the stormwater systems.

By the early 1990s, FEMA ranked Tulsa first in the nation for its floodplain management program, allowing Tulsans to enjoy the nation's lowest flood insurance rates. The program was also honored with FEMA's 1992 Outstanding Public Service Award; and the Association of State Floodplain Managers has twice given Tulsa its Local Award for Excellence. This represented a significant turn around in just eight years following the devastating flood of 1984. Since adoption of the FEMA community rating system, Tulsa has had one of the best ratings including a 2.0 rating in 2005.

Today, Tulsa's floodplain and stormwater management program is based on respect for the natural systems. It is nationally regarded as a pacesetting program, and includes comprehensive watershed management, dedicated funds for maintenance and operation, a prototype flood alert system, and a $200 million capital improvements program.

Tulsa's drainage systems have not been tested by a catastrophic rainfall since 1986, but the system has handled less intense rainfall events well. City leaders believe improved maintenance, continuing capital projects, stringent regulations, and aggressive citizen awareness programs will reduce but cannot entirely eliminate future flood losses.

A powerful testimony to the program is that, since comprehensive regulations were adopted in 1977, the city has no record of flood damages to any building that complies with those regulations. Implementation of the user-pays service fee funding is also given enormous credit by staff and elected officials because it enabled the City to elevate its capital investment and operational expenditures to a level that complements regulatory measures by resolving inadequacies in the systems that had existed for decades.

Tulsa has instituted an aggressive floodplain program. The City's long experience with flooding showed that the National Flood Insurance Program's minimum standard is insufficient for Tulsa. Therefore, the city's regulations exceed NFIP's standard in several important ways. The NFIP floodplain maps are based on existing development. However, unless plans and regulations are based on future watershed urbanization, new development may well flood as uphill urbanization increases runoff. Tulsa enforces the NFIP minimum regulations and maps to retain eligibility for federal flood insurance but, in addition, the City enforces its own more extensive maps and regulations. Those regulations are based on ultimate watershed urbanization as forecast in the City's comprehensive plan.

The Tulsa stormwater program is much more than flood control. The City is also building parks in the floodplains, sports fields in stormwater detention basins, and greenway trails on creek banks. It has forged strong partnerships with federal and state agencies. Tulsans now enjoy the lowest flood insurance rates in the country, and the community is reaping benefits from national awards and favorable publicity. Tulsa's progress has been called an example of what can happen when a community fully commits to solving urban stormwater problems.

Organization and Staffing

The City staff was reorganized following a City Charter change in 1989 that substituted the mayor/council for a government for the commission approach. A new Department of Public Works consolidated all public works services, including stormwater management, but the dedicated stormwater service fee funding was retained. Today, stormwater management is an accepted and integrated part of the city's services.

Funding

The City's stormwater management program budget has ranged from $12 million to $14 million during the past three years. Current service fees are based on impervious area and are set at $3.49/month per "equivalent service unit" (ESU). The ESU is defined as 2,650 square feet of impervious coverage, representative of the average condition on single-family residential properties. Service fee revenues total over $12 million. Where does the stormwater fee money go?

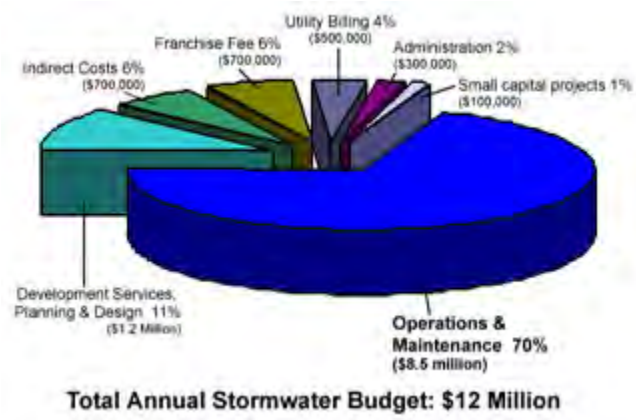

Expenditures for the City's FY 2002 are shown in the pie chart to the left. As it shows, stormwater fees are used primarily for maintenance of stormwater detention facilities, stream channels, pumping stations, culverts, ditches and other drainage facilities. After storms and when needed at other times, crews remove material blocking stormwater flow in channels and detention sites. On average, the City crews clean more than 22 miles of ditches and clear about 5 miles of drainage pipe each year. They remove tons of silt from channels and reconstruct eroded earthen channels.

Inter-governmental Cooperation

Tulsa assists the suburban satellite communities that surround it in their stormwater management efforts, but most of its attention to inter-governmental cooperation has involved federal agencies that offer funding for specific priorities such as flood protection and hydrologic monitoring and analysis.

Public Participation

The City of Tulsa involved the community in many of the major decisions as it formulated and implemented its stormwater utility program and associated funding mechanisms. A citizen advisory committee guided the initial response to the devastating flood in May, 1984, which included assembling a consulting team to assist with utility feasibility analysis and implementation.

Once the utility was formed and user fees were in place, the citizen advisory group shifted its attention to the content of the program and, especially, the capital improvement planning to address flooding problems. They have continued to be a major political force in support of the utility. The City also instituted a variety of community education and involvement initiatives aimed at improving flood emergency awareness, water quality management, and utilization of water resources in the riparian corridors.

LOUISVILLE/JEFFERSON COUNTY (KY) METROPOLITAN SERVICE DISTRICT (MSD)

Keynotes

- ► The Louisville approach involves a consolidation of flood control and stormwater management with a regional wastewater collection and

treatment program provided by the Metropolitan Sewer District, or MSD. Most of the smaller cities and towns in Jefferson County do not perform stormwater management functions.

► The MSD was authorized by special state legislation in 1946, and established by Jefferson County and the City of Louisville. The MSD service area is virtually county-wide. Its Board is appointed by the now consolidated Metro government council which directs the amalgamated County and City.

► MSD is funded principally by wastewater and stormwater service fees, which are independently structured, billed, and accounted for.

► Stormwater service fee attributes include:

- an impervious area rate methodology;
- a flat rate charge for single-family residential properties; and,
- differential rates for other properties based on an impervious area equivalency unit.

► Key operational practices include:

- watershed-based master planning throughout the County;
- a consolidated NPDES permit administered by MSD; and
- a broad range of functions that include a major flood control program responsible for approximately 29 miles of levees and protection works and fifteen large pump stations along the Ohio River.

► The MSD has a staff of more than 600 that performs both wastewater and stormwater administrative, engineering, operational, regulatory, and infrastructure improvement/management functions. The staff is extensively cross-trained to obtain efficient operations.

Community Profile

Louisville, 365 square miles and population 700,000, is the largest city in Kentucky. It is located on the south shore of the Ohio River, and was founded in 1778 by frontier explorer and military hero George Rogers Clark. It is located in Jefferson County, which is named for Thomas Jefferson, who was the Governor of Virginia when the city was founded and later served as the third President of the United States. It soon became a major shipping center along the Ohio River, which reaches almost 1,000 miles into the Midwest of the United States. Among other noteworthy claims to fame, it is the home of the Louisville Slugger baseball bat and hosts the Kentucky Derby, one of the premier annual horse races in the world. The county and city governments were recently consolidated into a “metro” government as provided for by state law.

As a community located on a major river, Louisville has always been concerned about flood control and stormwater management. Repetitive major flooding incidents of low areas along the river led eventually to the construction of more than 20 miles of flood protection levees and large pump stations beginning in the early 1900s. In the 1980's local officials determined that effective management of both the major flood control works and the smaller urban drainage systems required a consolidated program. The Louisville/Jefferson County Metropolitan Sewer District (MSD), then the regional wastewater service provider, was tapped to take over all stormwater management responsibilities.

Following detailed studies, MSD adopted a dedicated stormwater service fee to fund a full range of stormwater management and flood control services and facilities. The MSD stormwater service fee is separate from the agency's wastewater fee, though the staff is extensively cross-trained to efficiently perform both functions. The user fee has been tested in court and sustained at the Kentucky Court of Appeals level. MSD's responsibilities have been expanded to include stormwater quality in recent years in response to federal NPDES requirements.

Formation Process

The MSD was formed by the City of Louisville and Jefferson County pursuant to a state authorizing statute. Shifting the County's and City's flood control and stormwater management responsibilities to the MSD was accomplished by actions of the Board of County Commissioners and City's Board of Aldermen. The political decision to shift flood control and stormwater management to MSD was essentially made before the program and funding development and implementation work began, which enabled the process to be completed in just eight months. There was very little public participation in the formation process, though a concentrated effort to inform and educate the public about the new service fees was initiated immediately prior to the first MSD stormwater service fee billing.

Jefferson County had more than ninety cities and towns when the stormwater management function was appended to the MSD wastewater program. Towns of the fourth, fifth, and sixth class (per population as specified by state statutes) had no option whether or not to be included in the MSD stormwater program. Cities of the third and second class had statutory authority to decline to be included, but there were no second class cities in the County at that time (1986). A few of the third class cities declined to be included, and still are not. This created gaps and inconsistencies in stormwater services across the County as MSD's program grew. Those gaps still create some problems for both MSD and those cities.

Service Area

MSD's stormwater service area is now approximately 280 square miles and encompasses nearly all of Jefferson County. It is similar to but not precisely the

same as the wastewater collection and treatment service area. Substantial portions of the former City of Louisville have combined wastewater/stormwater sewers. Outlying areas have separated sewers and many open drainage components (creeks, ditches, roadside drainage).

Role and Program

MSD has two major program responsibilities, wastewater collection/treatment and stormwater management/flood control. Flood control is particularly important because Jefferson County is located on the Ohio River. Large areas of Louisville were historically flooded by the Ohio River, and an extensive system of flood protection levees and pump stations was constructed following the flood of record in1937. Maintenance of the flood protection works was originally a county responsibility under U.S. Army Corps of Engineers oversight. That function was transferred to MSD along with stormwater management responsibilities. MSD also assumed responsibility for development-associated erosion and sediment control programs, though it does not have land use authority.

Governance Structure

MSD has a seven member Board of Directors, included a chairperson, appointed by the Louisville/Jefferson County Mayor and Metro Council. The MSD Board guides policy and sets service fee rates.

Organization and Staffing

MSD has an appointed administration and a substantial staff of over 600 management, engineering, operational, and support personnel. It has reduced staff count from more than 860 in 1995 in part by outsourcing some operations. MSD continues to perform many stormwater management functions in-house. Outside contracting is used to attain greater efficiency or when special expertise or equipment is required. The engineering and operational staffs are highly cross-trained to perform both wastewater and stormwater services.

Funding

The wastewater and stormwater components of the MSD program are funded by separate service fees that are independent and dedicated to each purpose in terms of rates, revenues, expenditures, and accounting. The current single-family residential stormwater service fee is $4.70/month. Rates are based on impervious area, and an equivalency unit of 2,500 square feet is used to normalize non-residential charges to the single-family residential flat rate. Each equivalent unit on developed non-residential properties is charged $4.70/month. Consistent with MSD's wastewater rate practices, the stormwater service fee rate is adjusted annually to meet budget projections. Total stormwater service fee revenues in Fiscal Year 2006 (July 2005) are expected to be nearly $26,700,000.

Inter-governmental Cooperation

Because MSD provides a centralized flood control/stormwater management program for nearly all of Louisville/Jefferson County, the need for inter-government collaboration is low in comparison to the other communities cited in this guidance document. Coordination with the cities that opted out of the MSD stormwater service area is sought, and MSD performs many planning, public education, and other development review functions that are beneficial to those cities.

Public Participation

MSD's stormwater program was initiated with little public participation, but the agency has sought out public involvement in many aspects of its stormwater services over the years since then. Infrastructure management, most notably construction and remedial repair programs, is administered by teams that work closely with local elected officials and community groups to prioritize and undertake projects. Community relations are facilitated by a telephone hot line for service inquiries and complaints, and a designated staff is assigned to assuring effective response to customers. The staff maintains close contact with elected officials as capital improvement and remedial repairs projects are developed and undertaken. MSD also conducts numerous community involvement efforts associated with stormwater quality programs, and has developed brochures and other materials that are available throughout the community.

SARASOTA COUNTY (FL) STORMWATER ENVIRONMENTAL UTILITY

Keynotes

- ► The Sarasota County approach provides a strong, centralized stormwater management planning, improvement and operations program conducted by a large staff of more than 120 persons, with additional support for related activities performed by about 50 employees of other County work groups. The primary objectives of the Stormwater Environmental Utility are to reduce flooding, improve surface water quality, and attain responsible development practices.

- ► A Florida Supreme Court decision in 1996 determined that the Sarasota County stormwater charge is a special assessment rather than a service fee. As such, it is subject to the standards applicable to assessments, which emphasize the apportionment of special benefit (that not available generally to all) and rational nexus rather than the reflecting the demand burden (cost of service) imposed by each person or property on the public stormwater systems and programs.

- Sarasota County is a charter county governed by a five-member Board of Commissioners and directed by a professional County Administrator. The Public Works Business Center includes the Stormwater Environmental Utility. There are four cities in Sarasota County. The city of Sarasota relies on the County to improve its drainage system and perform most stormwater operations. The other three cities retain responsibility for local stormwater systems.

- The Sarasota County stormwater utility is funded by benefit assessments on properties in the County and by inter-governmental agreement in the City of Sarasota. The assessments have three components that are consistent across the service area, and one component (system capitalization) that is variable by watershed. The benefit assessments are billed on the County's property tax bills.

- Under constitutional changes adopted in 1968, Florida counties may adopt charters that give local elected officials great latitude in determining the functions of their county and the preferred method of funding. Sarasota County has adopted such a charter. The Florida Statutes Chapters 125 (County Government), 163 (Intergovernmental Programs), 197 (Tax Collections, Liens, and Sales), and 403 (Environment Control) also specifically enable both cities and counties to establish utilities and adopt service fees and special assessments, or otherwise influence how they organize for and fund stormwater management. The Florida Statutes also enable counties to use such other revenues as they determine to be appropriate, or guide their manner of doing so.

- Key policies adopted by the Board of Commissioners and practices instituted by the staff are applicable throughout Sarasota County and in the City of Sarasota. Core funding policies include:

  - Capital investments will be funded by benefit assessments peculiar to each watershed; and
  - funding of customer service and administration, master planning, and maintenance will be funded by benefit assessments that are the same for all watersheds.

  Key operational practices include:

  - watershed-based master planning has been conducted throughout the County (26 watersheds), and capital improvements are being made;
  - centralized stormwater quality management is performed by the County stormwater utility to ensure compliance with the local NPDES permit; and
  - a flood protection and response program is provided county-wide.

- Sarasota County has a large staff (120 +/-) within the Stormwater Environmental Utility and also allocates substantial portions of other employees' time to stormwater management activities (50 +/-). Master planning is contracted to private vendors.

Community Profile

Sarasota County is located on the Gulf of Mexico on Florida's West Coast approximately sixty miles south of Tampa. It was formed when Sarasota County separated from Manatee County in 1921. The area was first homesteaded in the 1840's, but true development did not occur until the railroads arrived at the beginning of 20th century. Citrus fruit growing, other agriculture, and tourism were the basis of the economy for many years, and the County was the winter home of the famed Ringling Brothers circus for decades. The County has become a regional healthcare and commercial business center since the end of World War II.

Sarasota County encompasses 620 square miles and has a resident population of 340,000. The population swells significantly during the winter months when many "snow birds" flee the harsh winters of the Northeast and Midwest United States for the balmy climate of Florida. There are three incorporated cities and one town in the County.

Stormwater management in Sarasota County was not a high priority before the 1980's, when the County increased regulatory activities in response to the pressures of urban/suburban development and the problems associated with drainage in a low-lying coastal community. A Stormwater Environmental Utility was formed in 1989, and studies led to the adoption of a user fee. Sarasota County's stormwater utility is perhaps best known for a Florida Supreme Court decision in 1996, which found that the County was authorized by state statutes to establish the utility and enact a special assessment to support capital improvements and operational programs.

Formation Process

Sarasota County's initial stormwater management program was an outgrowth of its Aquatic Plant Control Department, which was consolidated into the Transportation Department in 1981. In 1989 the Board of County Commissioners established the Stormwater Environmental Utility. An inter-governmental agreement was signed with the City of Sarasota in 1991 and revised in 1997.

Service Area

The Sarasota County stormwater service area encompasses the unincorporated portion of the County plus the city of Sarasota. The County is not responsible for areas lying within other incorporated municipalities in the County.

Role and Program

The Stormwater Environmental Utility is responsible for the County's NPDES permit, and performs master planning for those portions of watersheds that lie wholly or partially in the County. However, it does not perform monitoring associated with the NPDES permit. The Utility is also responsible for capital improvements to and maintenance of the stormwater systems in the unincorporated areas and within the city of Sarasota. County programs are limited to those facilities located in publicly-owned properties and rights-of-way and those within dedicated easements. Systems located on private property and not subject to easements are the responsibility of the property owners. The Utility is also responsible for regulation of the use, storage, and disposal of sediments, herbicides, and other materials, and performs public relations, customer service, development review, and administration of the master account files for benefit assessments. Street sweeping is done by the Road and Bridge Division (Public Works) using sweepers purchased by the Stormwater Environmental Utility. Water Quality monitoring and enforcement is performed by the County's Environmental Services/Pollution Control Department.

Governance Structure

The Stormwater Environmental Utility is a separate account unit operating as a division of the Public Works Business Center. It is governed by the five-member Board of County Commissioners and is within the County Administrator's organizational control.

Organization and Staffing

As a division of the Public Works Business Center, the Stormwater Environmental Utility interacts extensively with other County units. The Utility staff numbers 120 (+/-), and it also financial supports a portion of the personnel expense associated with nearly 50 other County employees whose roles involve them in various aspects of stormwater management.

Funding

The Stormwater Environmental Utility budget in 2005 is approximately $20,000,000, with about $6,000,000 being for capital projects. Funding for the Stormwater Environmental Utility is derived primarily from a composite special benefit unit assessment that has four components. The benefit assessment is based on a calculation methodology that takes both pervious and impervious areas on each property into account. An equivalency unit approach is employed that has several rate classifications for residential properties and individual charges for non-residential that reflects the hydrology of each property. The equivalency unit is referred to as the "Equivalent Stormwater Unit", or ESU, and represents an "effective impervious area" of 3,153 square feet.

The ESU was determined by statistical analysis to be the average condition on single-family residences in the County, i.e. the total area and condition of an

average single-family residence burdens the stormwater systems and programs in the manner attributable to 3,153 square feet of impervious coverage. The effective impervious area for non-residential properties is determined by applying a formula that considers both impervious and pervious areas on each property and the conditions present in each case. For example, the pervious areas of citrus groves and orchards are treated differently than pervious areas in pasture or meadow because of the land management practices in the citrus groves and orchards which alter the hydrology. "Urban pervious" surfaces, such as contoured mown lawns, have a much higher effective impervious value than other pervious conditions.

Three benefit unit assessment components are uniform throughout the service area, customer service (administration), master planning, and maintenance. The customer service benefit assessment is a fixed value for each account rather than a charge per ESU, and is presently $3.20/year. The master planning and maintenance benefit unit assessments are uniform throughout the County, and are based on the number of ESU on each property. The master planning assessment is currently $17.92/ESU/year, and the maintenance assessment is $59.33/ESU/year. On average, a medium size single-family residence is assessed $80.45 annually for these three components of the benefit assessment, or approximately $6.70 per month.

The capital infrastructure investment component of the benefit unit assessment is reflective of the costs in each designated watershed, and currently varies from $12 to $141 per ESU per year across the County. The result is that the total assessment applicable to comparable properties in different watersheds may be significantly different.

Credits are provided for in the County's assessment methodology, primarily in relation to the capital improvement benefit assessments. Calculation of the credits is based on three factors, runoff quantity, runoff quality, and peak discharge rate. The stormwater assessments are billed annually along with the County's property taxes. Collection of delinquent billings is accomplished by a lien process similar to that applicable to property taxes.

Inter-governmental Cooperation

The Sarasota County stormwater program is closely coordinated with the cities' programs in the area, especially in terms of NPDES permit compliance, master planning and construction of major systems, and flood control/emergency response. The city of Sarasota has contracted with the County to provide stormwater management services, but three other municipalities retain responsibility for management of the local drainage systems in their communities.

Public Participation

Public participation is focused primarily on NPDES education/involvement mandates, master planning, flood and emergency awareness, and capital project construction. The Utility conducts two public meetings during the master planning process (26 watersheds), and local meetings in areas where capital projects are to be built. The staff also makes presentations at the request of neighborhood association, professional organizations, and special interest groups. The County also responds to inquiries from the city council in the City of Sarasota.

053877

ROOFTOPS TO RIVERS

Green Strategies for Controlling Stormwater and Combined Sewer Overflows

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Natural Resources Defense Council
June 2006

053878

ABOUT NRDC

The Natural Resources Defense Council is a national nonprofit environmental organization with more than 1.2 million members and online activists. Since 1970, our lawyers, scientists, and other environmental specialists have worked to protect the world's natural resources, public health, and the environment. NRDC has offices in NewYork City, Washington, D.C., Los Angeles, San Francisco, and Beijing. Visit us at www.nrdc.org.

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As an environmental strategy, green infrastructure addresses the root cause of stormwater and combined sewer overflow (CSO) pollution: the conversion of rain and snow into runoff. This pollution is responsible for health threats, beach closings, swimming and fishing advisories, and habitat degradation. Water quality standards are unlikely to be met without effectively managing stormwater and CSO discharges. Green infrastructure—trees, vegetation, wetlands, and open space preserved or created in developed and urban areas—is a strategy for stopping this water pollution at its source.

The urban landscape, with its large areas of impermeable roadways and buildings—known as impervious surfaces—has significantly altered the movement of water through the environment. Over 100 million acres of land have been developed in the United States, and with development and sprawl increasing at a rate faster than population growth, urbanization's negative impact on water quality is a problem that won't be going away. To counteract the effects of urbanization, green infrastructure is beginning to be used to intercept precipitation and allow it to infiltrate rather than being collected on and conveyed from impervious surfaces.

Each year, the rain and snow that falls on urban areas in the United States results in billions of gallons of stormwater runoff and CSOs. Reducing runoff with green infrastructure decreases the amount of pollution introduced into waterways and relieves the strain on stormwater and wastewater infrastructure. Efforts in many cities have shown that green infrastructure can be used to reduce the amount of stormwater discharged or entering combined sewer systems and that it can be cost-competitive with conventional stormwater and CSO controls. Additional environmental benefits include improved air quality, mitigation of the urban heat island effect, and better urban aesthetics.

Green infrastructure is also unique because it offers an alternative land development approach. New developments that use green infrastructure often cost less to build because of decreased site development and conventional infrastructure costs, and such developments are often more attractive to buyers because of environmental amenities. The flexible and decentralized qualities of green infrastructure also allow it to be retrofitted into developed areas to provide stormwater control on a site-specific basis. Green infrastructure can be integrated into redevelopment efforts ranging from a single lot to an entire citywide plan.

Case Study Program Elements and Green Infrastructure Techniques

	PROGRAM ELEMENTS		TYPE OF GREEN INFRASTRUCTURE USED				
City	Used for Direct CSO Control	Established Municipal Programs & Public Funding	Green Roofs	Rain Gardens/ Vegetated Swales & Landscape	Permeable Pavement	Downspout Disconnection/ Rainwater Collection	Wetlands/ Riparian Protection/ Urban Forests
Chicago	✔	✔	✔	✔	✔	✔	
Milwaukee	✔	✔	✔	✔			✔
Pittsburgh	✔		✔	✔		✔	✔
Portland	✔	✔	✔	✔		✔	
Rouge River Watershed			✔	✔	✔		✔
Seattle	✔	✔	✔	✔		✔	
Toronto		✔	✔			✔	✔
Vancouver		✔	✔	✔	✔		✔
Washington			✔	✔	✔		

053882

The aerial photograph at left of Washington, DC, shows the amount of green space and vegetation present in 2002. The photo at right shows how this same area would look in 2025 after a proposed 20-year program to install green roofs on 20% of city buildings over 10,000 square feet.

Photos courtesy of the Casey Trees Endowment Fund

Nonetheless, wider adoption of green infrastructure still faces obstacles. Among these is the economic investment that is required across the country for adequate stormwater and CSO control. Although green infrastructure is in many cases less costly than traditional methods of stormwater and sewer overflow control, some municipalities persist in investing only in existing conventional controls rather than trying an alternative approach. Local decision makers and organizations must take the lead in promoting a cleaner, more environmentally attractive method of reducing the water pollution that reaches their communities. NRDC recommends a number of policy steps local decision makers can take to promote the use of green infrastructure:

1. Develop with green infrastructure and pollution management in mind. Build green space into new development plans and preserve existing vegetation.

2. Incorporate green infrastructure into long-term control plans for managing combined sewer overflows. Green techniques can be incorporated into plans for infrastructure repairs and upgrades.

3. Revise state and local stormwater regulations to encourage green design. A policy emphasis should be placed on reducing impervious surfaces, preserving vegetation, and providing water quality improvements.

The case studies that begin on page 17 offer nine examples of successful communities that have reaped environmental, aesthetic, and economic benefits from a number of green infrastructure initiatives.

The table on page v provides a summary of information contained within the case studies.

053883

Introduction

Water pollution problems in the United States have evolved since the days when Ohio's Cuyahoga River was on fire. Increasingly, water pollution from discrete sources such as factory pipes is being overshadowed by overland flows from streets, rooftops, and parking lots, which engorge downstream waterways every time it rains. This stormwater has nowhere to go because the natural vegetation and soils that could absorb it have been paved over. Instead, it becomes a high-speed, high-velocity conduit for pollution into rivers, lakes, and coastal waters.

Most U.S. cities have separate stormwater sewer systems through which contaminated stormwater flows directly into waterways through underground pipes, causing streambank scouring and erosion and dumping pet waste, road runoff, pesticides, fertilizer, and other pollutants directly into waterways. In older cities, particularly in the Northeast and Great Lakes regions, stormwater flows into the same pipes as sewage and causes these combined pipes to overflow—dumping untreated human, commercial, and industrial waste into waterways. Stormwater pollution has been problematic to some extent for as long as there have been cities, but the volume of stormwater continues to grow as development replaces porous surfaces with impervious blacktop, rooftop, and concrete.

Contaminated stormwater and raw sewage discharges from combined sewer overflows (CSOs) are required to be controlled under the Clean Water Act, but progress is slow because the problems are large and multi-faceted and because the solutions are often expensive. A substantial influx of additional resources is needed at the federal, state, and local levels, but fresh thinking is needed also. Some U.S. cities are already taking steps to successfully build green infrastructure into their communities.

The green roof at Ford Motor Company's Premier Automotive North American Headquarters in Irvine, CA, was designed to visually mimic the natural landscape. PHOTO COURTESY OF ROOFSCAPES, INC.

Emerging green infrastructure techniques present a new pollution-control philosophy based on the known benefits of natural systems that provide multimedia pollution reduction and use soil and vegetation to trap, filter, and infiltrate stormwater. The cities already using green infrastructure are finding that it is a viable alternative to conventional stormwater management. Although used widely overseas, particularly in Germany and Japan, the use of green infrastructure in the United States is still in its infancy; however, data indicate that it can effectively reduce stormwater runoff and remove stormwater pollutants, and cities that have implemented green design are already reaping the benefits (see the case studies on page 17).

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The Growing Problem of Urban Stormwater

Development as we have come to know it in the United States—large metropolitan centers surrounded by sprawling suburban regions—has contributed greatly to the pollution of the nation's waters. As previously undeveloped land is paved over and built upon, the amount of stormwater running off roofs, streets, and other impervious surfaces into nearby waterways increases. The increased volume of stormwater runoff and the pollutants carried within it continue to degrade the quality of local and regional water bodies. As development continues, nature's ability to maintain a natural water balance is lost to a changing landscape and new impervious surfaces.

The trees, vegetation, and open space typical of undeveloped land capture rain and snowmelt, allowing it to largely infiltrate where it falls. Under natural conditions, the amount of rain that is converted to runoff is less than 10% of the rainfall volume.[1,2] Replacing natural vegetation and landscape with impervious surfaces has significant environmental impacts. The level of imperviousness in a watershed has been shown to be directly related to the health of its rivers, lakes, and estuaries. Research indicates that water quality in receiving water bodies is degraded when watershed imperviousness levels are at or above 10% and that aquatic species can be harmed at even lower levels.[3]

Both the National Oceanic and Atmospheric Administration (NOAA) and Pennsylvania State University estimate that there are 25 million acres of impervious surfaces in the continental United States.[4] This quantity represents nearly one-quarter of the more than 107 million acres—almost 8% of non-federal land in the contiguous United States—that had been developed by 2002.[5] In urban areas, it is not uncommon for impervious surfaces to account for 45% or more of the land cover.

This combination of developed land and impervious surfaces presents the primary challenge of stormwater mitigation. Existing stormwater and wastewater infrastructure is unable to manage stormwater in a manner adequate to protect and improve water quality. Standard infrastructure and controls fail to reduce the amount of stormwater runoff from urban environments or effectively remove pollutants.

TABLE 1: Effects of Imperviousness on Local Water Bodies[a,b,c]

Watershed Impervious Level	Effect
10%	• Degraded water quality
25%	• Inadequate fish and insect habitat • Shoreline and stream channel erosion
35%–50%	• Runoff equals 30% of rainfall volume
>75%	• Runoff equals 55% of rainfall volume

[a] Environmental Science and Technology, *Is Smart Growth Better for Water Quality?*, August 25, 2004, http://pubs.acs.org/subscribe/journals/estjag-w/2004/policy/jp_smartgrowth.html (accessed December 6, 2004).
[b] U.S. EPA, *Protecting Water Quality from Urban Runoff*, Nonpoint Source Control Branch, EPA 841-F-03-003, February 2003.
[c] Prince George's County, Maryland Department of Environmental Resources, *Low-Impact Development Design Strategies*, January 2000.

THE DEFICIENCIES OF CURRENT URBAN STORMWATER INFRASTRUCTURE

Stormwater management in urban areas primarily consists of efficiently collecting and conveying stormwater. Two systems are currently used: separate

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Bioswales on Portland's Division Street infiltrate and treat stormwater runoff.

Photo courtesy of the Portland Bureau of Environmental Services

stormwater sewer systems and combined sewer systems. Separate stormwater sewer systems collect only stormwater and transmit it with little or no treatment to a receiving stream, where stormwater and its pollutants are released into the water. Combined sewer systems collect stormwater in the same set of pipes that are used to collect sewage, sending the mixture to a municipal wastewater treatment plant.

Separate Stormwater Sewer Systems

The large quantities of stormwater that wash across urban surfaces and discharge from separate stormwater sewer systems contain a mix of pollutants, shown in Table 2, deposited from a number of sources.[6,7] Stormwater pollution from separate systems affects all types of water bodies in the country and continues to pose a largely unaddressed threat. In 2002, 21% of all swimming beach advisories and closings were attributed to stormwater runoff.[8] Table 3 shows the percentage of assessed (monitored) waters in the United States for which stormwater has been identified as a significant source of pollution.[9]

Combined Sewer Systems

While pollution from separate sewer systems is a problem affecting a large majority of the country, pollution from combined sewer systems tends to be a more regional problem concentrated in the older urban sections of the Northeast, the Great Lakes

TABLE 2: Urban Stormwater Pollutants

Pollutant	Source
Bacteria	Pet waste, wastewater collection systems
Metals	Automobiles, roof shingles
Nutrients	Lawns, gardens, atmospheric deposition
Oil and grease	Automobiles
Oxygen-depleting substances	Organic matter, trash
Pesticides	Lawns, gardens
Sediment	Construction sites, roadways
Toxic chemicals	Automobiles, industrial facilities
Trash and debris	Multiple sources

TABLE 3: Urban Stormwater's Impact on Water Quality

Water Body Type	Stormwater's Rank as Pollution Source	% of Impaired Waters Affected
Ocean shoreline	1st	55% (miles)
Estuaries	2nd	32% (sq. miles)
Great Lakes shoreline	2nd	4% (miles)
Lakes	3rd	18% (acres)
Rivers	4th	13% (miles)

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TABLE 4: Pollutants in CSO Discharges[a]

Pollutant	Median CSO Concentration	Treated Wastewater Concentration
Pathogenic bacteria, viruses, parasites		
• Fecal coliform (indicator bacteria)	215,000 colonies/100 mL	< 200 colonies/100mL
Oxygen depleting substances (BOD_5)	43 mg/L	30 mg/L
Suspended solids	127 mg/L	30 mg/L
Toxics		
• Cadmium	2 µg/L	0.04 µg/L
• Copper	40 µg/L	5.2 µg/L
• Lead	48 µg/L	0.6 µg/L
• Zinc	156 µg/L	51.9 µg/L
Nutrients		
• Total Phosphorus	0.7 mg/L	1.7 mg/L
• Total Kjeldahl Nitrogen	3.6 mg/L	4 mg/L
Trash and debris	Varies	None

[a] U.S. EPA, Report to Congress: Impacts and Control of CSOs and SSOs, Office of Water, EPA-833-R-04-001, August 2004.

region, and the Pacific Northwest. Combined sewers, installed before the mid-twentieth century and prior to the use of municipal wastewater treatment, are present in 746 municipalities in 31 states and the District of Columbia.[10] They were originally used as a cost-effective method of transporting sewage and stormwater away from cities and delivering them to receiving streams. As municipal wastewater treatment plants were installed to treat sewage and protect water quality, the limited capacity of combined sewers during wet weather events became apparent.[11]

During dry periods or small wet weather events, combined sewer systems carry untreated sewage and stormwater to a municipal wastewater treatment plant where the combination is treated prior to being discharged. Larger wet weather events overwhelm a combined sewer system by introducing more stormwater than the collection system or wastewater treatment plant is able to handle. In these situations, rather than backing up sewage and stormwater into basements and onto streets, the system is designed to discharge untreated sewage and stormwater directly to nearby water bodies through a system of combined sewer overflows (CSOs). In certain instances, despite the presence of sewer overflow points, basement and street overflows still occur. Even small amounts of rainfall can trigger a CSO event; Washington D.C.'s combined sewer system can overflow with as little as 0.2 inch of rainfall.[12]

Because CSOs discharge a mix of stormwater and sewage, they are a significant environmental and health concern. CSOs contain both expected stormwater pollutants and pollutants typical of untreated sewage, like bacteria, viruses, nutrients, and oxygen-depleting substances. CSOs pose a direct health threat in the areas surrounding the CSO discharge location because of the potential exposure to bacteria and viruses. Estimates indicate that CSO discharges are typically composed of 15–20% sewage and 80–85% stormwater.[13,14] An estimated 850 billion gallons of untreated sewage and stormwater are discharged nationally each year as combined sewer overflows.[15] Table 4 shows the concentration of pollutants in CSO discharges.

POPULATION GROWTH AND NEW DEVELOPMENT CREATE MORE IMPERVIOUS SURFACES

Current levels of development and imperviousness are a major, and largely unabated, source of water pollution. Projections of population growth and new development indicate that this problem will get worse over time and that mitigation efforts will become more costly and difficult. Although the nation has collectively failed to adequately address the current levels of stormwater runoff and pollution, we have also failed to implement emerging strategies that would minimize further pollution increases. Absent the use of state-of-

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the-art stormwater controls, each new acre of land developed and each new parcel of impervious surface will introduce new pollution into our waterways.

Recent studies also indicate that stormwater pollution may soon start to increase at a higher rate than in the past. Over the past two decades, the rate of land development has been two times greater than the rate of population growth. Between 1982 and 1997, while the U.S. population grew 15%, the amount of developed land in the continental United States grew 34%, an increase of 25 million acres.[16,17] The 25 million acres developed during this 15-year period represent nearly 25% of the total amount of developed land in the contiguous states. This rapid development pattern is alarming not only because of the conversion of a large and growing percentage of the remaining undeveloped land, but also because of the increase in stormwater runoff that accompanies development.

If the relationship between land development and population growth continues, a significant amount of land will be developed in the coming decades. The anticipated 22% growth in U.S. population from 2000 to 2025 will add an additional 68 million acres of development.[18] By 2030, half of the total square footage of buildings—200 billion square feet—will have been built after the year 2000.[19]

Much of this population growth and new development will occur in coastal regions, a particular concern because urban stormwater runoff is already the largest source of ocean shoreline water pollution. Although coastal counties comprise only 17% of the total acreage of the contiguous United States they are home to more than 50% of the U.S. population. Because of high population concentrations on limited land areas, coastal counties contain a higher percentage of development than interior counties. In 1997, 27 million acres of coastal counties had been developed, accounting for nearly 14% of the total land area. By contrast, 71 million acres, about 4% of the total land area of interior counties, had been developed.[20] Based on these trends, increased population and development in these coastal environments is likely to not only lead to greater amounts of impervious surfaces in coastal watersheds, but also higher percentages of imperviousness. Conventional methods of stormwater control will not be able to adequately manage the higher amount of stormwater pollution implied by this increased imperviousness.

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Controlling Stormwater in Urban Environments

The foremost challenge of reducing stormwater pollution and CSO discharges is finding an effective method of reducing the amount of stormwater created in urban environments. Methods currently used to manage stormwater largely fail to address the underlying problem of imperviousness.

Stormwater collected in separate systems typically is not treated before being discharged. In instances where treatment is provided, it usually consists of filtration to remove suspended solids, debris, and floatables. Because dissolved materials and nutrients are difficult to treat in urban stormwater and little has been done to abate the scouring, erosion, and other physical impacts of stormwater discharges, treatment efforts have been largely ineffective at diminishing stormwater-related water pollution.

Most municipal stormwater discharges are regulated as point sources under the Clean Water Act (CWA) and require a National Pollutant Discharge Elimination System (NPDES) permit. However, end-of-pipe treatment and control typical of other permitted point-source discharges are often impractical for urban stormwater, because of the large volumes of stormwater; generated and space constraints in urban areas. Permits for urban stormwater require municipalities to develop a stormwater management plan and to implement best management practices.[1] These management measures are typically used in lieu of specific pollutant removal requirements. "Performance-based" standards are generally not required, and minimum control measures are sufficient for compliance.

As a result, compliance with urban stormwater permits does not necessarily result in improved water quality. Municipalities that develop programs to actually reduce stormwater pollution are motivated to do so because of their proximity to unique or valued water bodies or because of a need to protect drinking water supplies. Some of the more aggressive and innovative stormwater programs are located around sensitive or important water bodies like the Chesapeake Bay, the Great Lakes, or Puget Sound. Federal regulations require states to identify quality-limited waterways and determine the reduction in the Total Maximum Daily Load (TMDL) of those pollutants necessary to meet water quality standards, but these pollutant load-reduction requirements are not often translated into effective stormwater management programs.[2]

Municipalities are required to implement short-term and long-term strategies to reduce overflows from combined sewer systems, but significant numbers of overflows continue to occur. The CWA prohibits the dry weather discharge of untreated sewage and requires wet weather CSO discharges to be limited and to control discharges of solids and floatables. Federal regulations also require that municipalities develop long-term CSO control plans that detail procedures and infrastructure modifications necessary to minimize wet weather overflows and meet water quality standards.[3] The long-term control plans focus primarily on managing stormwater impacts on combined sewer systems.

Mitigating CSOs is costly. The 2000 Clean Watersheds Needs Survey (CWNS) estimated that $56 billion (2005 dollars) in capital investment was needed for CSO control.[4] Separating combined sewer lines

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and building deep storage tunnels are the two currently preferred methods of CSO control. The costs for separating combined sewers, disconnecting stormwater inlets from the combined sewer system, and directing them to a newly installed separate storm sewer system range from $500 to $600 per foot of sewer separated, or $2.6 million to $3.2 million for each mile of combined sewer to be separated.[5] While sewer separation will eliminate CSO discharges and the release of untreated sewage, the trade-off is an increase in the volume of untreated stormwater discharges.

Deep storage systems are large underground tunnels with millions of gallons of storage capacity that are built to hold the excess surge of combined sewer stormwater during wet weather events. These systems eventually direct the detained wastewater to the municipal treatment plant as combined sewer flow rates subside. If sized, constructed, and operated properly, deep tunnels can significantly reduce CSO discharges. However, deep tunnels take many years to build and are very costly. Several cities have begun or plan to begin deep tunnel projects costing hundreds of millions or billions of dollars, as outlined in Table 5.

Current stormwater management for separate and combined sewer systems is ineffective because it focuses on the symptoms (large stormwater volumes) rather than the problem (development patterns and imperviousness). Capturing, retaining, and trying to improve the quality of vast quantities of urban stormwater runoff is often more difficult and expensive than reducing the amount of stormwater generated from the outset through strategies to reduce imperviousness and maximize infiltration and filtration. On a municipal level, costs can be decreased when these techniques are incorporated into redevelopment and ongoing infrastructure replacement efforts. Comprehensive stormwater management programs can be used to minimize the effect of impervious surfaces and manage precipitation and stormwater with the use of natural processes. These "green" approaches are often less expensive and more effective than current stormwater and CSO controls.

GREEN ALTERNATIVES

Newer, flexible, and more effective urban stormwater and CSO strategies are being adopted in North America. Cities are beginning to introduce green infrastructure as a component of comprehensive stormwater management plans aimed at reducing stormwater runoff, CSOs or both. This approach is significant in that it can be used to address the stormwater problem "at the source" through efforts aimed at restoring some of the

TABLE 5: Examples of Deep Storage Tunnel Projects

City	Project Duration	Completion Date	Storage Capacity	Cost
Chicago, IL[a,b]	40+ years	2019	18 billion gallons	$3.4 billion
Milwaukee, WI[c,d]	17 years (Phase 1)	1994	405 million gallons	$2.3 billion
	8 years (Phase 2)	2005	88 million gallons	$130 million
Portland, OR[e]	20 years	2011	123 million gallons	$1.4 billion
Washington, DC[f]	20 years after construction begins	n/a	193.5 million gallons (proposed)	$1.9 billion (projected)

[a] Tudor Hampton, "Chicago Engineers Move Fast to Finish Epic Tunneling Feat," *Engineering News-Record*, August 18, 2003, http://www.enr.com/news/environment/archives/030818a.asp (accessed February 16, 2005).
[b] Metropolitan Water Reclamation District of Greater Chicago, *Combined Sewer Overflow Public Notification Plan*, http://www.mwrd.org/mo/csoapp/CSO/cso.htm (accessed December 15, 2005).
[c] Milwaukee Metropolitan Sewerage District, *Collection System: Deep Tunnel System*, http://www.mmsd.com/projects/collection8.cfm (accessed November 11, 2004).
[d] Milwaukee Metropolitan Sewerage District, *Overflow Reduction Plan*, http://www.mmsd.com/overflows/reduction.cfm (accessed November 11, 2004).
[e] Portland Bureau of Environmental Services, *Working for Clean Rivers*, http://www.portlandonline.com/bes/index.cfm?c=32123 (accessed November 15, 2004).
[f] D.C. Water and Sewer Authority, "WASA Proposes Plan to Control Combined Sewer Overflows to Local Waterways: Combined Sewer Long Term Control Plan," *The Reporter*, Summer 2001.

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Street planters in Portland, OR, are used in highly developed urban areas to introduce green space and manage stormwater runoff.
Photo courtesy of the Portland Bureau of Environmental Services

natural hydrologic function of areas that have been urbanized. Green infrastructure can also be used to limit development in sensitive headwaters regions and groundwater recharge areas to avoid the segmentation and isolation of natural environmental areas and resources.

Green infrastructure can be applied in many forms. It traditionally has been thought of as the interconnected network of waterways, wetlands, woodlands, wildlife habitats, and other natural areas that maintain natural ecological processes.[6] In practice, installing green infrastructure means preserving, creating, or restoring vegetated areas and natural corridors such as greenways, parks, conservation easements, and riparian buffers. When linked together through an urban environment, these lands provide rain management benefits similar to natural undeveloped systems, thereby reducing the volume of stormwater runoff. With green infrastructure, stormwater management is accomplished by letting the environment manage water naturally: capturing and retaining rainfall, infiltrating runoff, and trapping and absorbing pollutants. For example, the Village Homes community in Davis, California, uses a system of vegetated swales and meandering streams to manage stormwater. The natural drainage system is able to infiltrate and retain a rainfall volume greater than the 10-year storm without discharging to the municipal storm sewer system.

Green infrastructure can be used to restore vegetation and green space in highly impervious city areas. Planting street trees and other urban forestry initiatives can reduce stormwater runoff because urban tree canopies intercept rainfall before it hits the pavement and is converted to stormwater. Trees with mature canopies can absorb the first half-inch of rainfall.[7]

Recently the concept of green infrastructure has been broadened to include decentralized, engineered stormwater controls. These green techniques are designed to mimic the functions of the natural environment and are installed to offset the impacts of urbanization and imperviousness. Green management techniques are used to minimize, capture, and treat stormwater at the location at which it is created and before it has the opportunity to reach the collection system. Engineered systems commonly used in urban areas include green roofs, rain gardens, rain barrels and cisterns, vegetated swales, pocket wetlands, and permeable pavements.

Most green stormwater controls actually consist of green growth, including vegetated systems like green roofs and rain gardens, but other "green"

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Urban trees intercept rainfall before it hits the ground and is converted to stormwater runoff.
PHOTO COURTESY OF THE LOW IMPACT DEVELOPMENT CENTER

controls, like permeable pavements, are not vegetated but designed to provide the water detention and retention capabilities of natural systems. Green infrastructure also encourages downspout disconnection programs that redirect stormwater from collection systems to vegetated areas or that capture and reuse stormwater, such as rain barrels. Downspout disconnection removes stormwater volume from collection systems and allows green infrastructure components to manage the runoff.

Green infrastructure offers numerous benefits when used to manage stormwater runoff. Many green techniques reduce both stormwater volume and pollutant concentrations and, in contrast to conventional centralized controls, provide flexibility in how and where stormwater management is accomplished. The use of green infrastructure protects natural resources and lessens the environmental impacts of development by not only addressing stormwater, but also by improving air quality and community aesthetics.

1. Stormwater volume control and pollutant removal. Green infrastructure is effective for managing stormwater runoff because it is able to reduce the volume of stormwater and remove stormwater pollutants. Reducing the amount of urban runoff is the most effective stormwater pollution control. This reduces the amount of stormwater discharged from separate stormwater sewer systems and aids combined sewer systems by decreasing the overall volume of water entering the system, thus reducing the number and size of overflows. Another large benefit of green infrastructure is that nearly every green technique results in the removal of stormwater pollutants. The natural processes employed by green infrastructure allow pollutants to be filtered or biologically or chemically degraded, which is especially advantageous for separate storm sewer systems that do not provide additional treatment before discharging stormwater. The combination of runoff reduction and pollutant removal is an effective means of reducing the total mass of pollution released to the environment. Because of this, open areas and buffer zones are often designated around urban streams and rivers to provide treatment and management of overland flow before it reaches the waterway.

2. Decentralized, flexible, site-specific solution. Green infrastructure differs from other stormwater management methods because it provides the opportunity to manage and treat stormwater where it is generated. This decentralized approach allows green infrastructure

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A RiverSafe RainBarrel installed at the Jane Holmes nursing residence in Pittsburgh, PA, by the Nine Mile Run RainBarrel Initiative. PHOTO COURTESY OF RIVERSIDES

techniques to be installed at numerous locations throughout the city. Green infrastructure is flexible, allowing it to be applied in a wide range of locations and circumstances, and can be tailored to newly developed land or retrofitted to existing developed areas. This enables green infrastructure to be used on individual sites or in individual neighborhoods to address localized stormwater or CSO problems, or incorporated into a more widespread municipal stormwater management program.

3. Green design and the development problem. Projected population growth and development will strain an aged and often inadequate infrastructure system by introducing new areas of imperviousness and additional volumes of stormwater. Strategies will need to be adopted to manage urban growth and its impacts on water quality. The use of green infrastructure offers an alternative to existing development patterns and a new method of developing urban areas. Green infrastructure currently is being used to manage existing stormwater problems, but has the potential to significantly effect how future development contributes to stormwater and sewer overflow problems by preserving and incorporating green space into newly developed areas and by addressing the established connection between imperviousness and stormwater pollution.

4. Ancillary benefit. Green infrastructure is also attractive because it can be used to achieve multiple environmental goals. Funds spent on conventional stormwater management are used only for water infrastructure. In addition to stormwater management benefits, green infrastructure improves air quality by filtering air pollution and helps to counteract urban heat island effect by lowering surface temperatures. For example, many of the green infrastructure projects in Chicago, while also providing stormwater management, were initially installed to mitigate urban temperature increases and improve energy efficiency. Green infrastructure also improves urban aesthetics, has been shown to increase property values, and provides wildlife habitat and recreational space for urban residents. This multi-benefit environmental approach ultimately provides control programs that are more diverse and cost-effective than projects aimed solely at stormwater control.

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Economic Benefits of Green Solutions

The cost of stormwater control is a major factor in the successful implementation of pollution control programs. A large investment is required to adequately address CSOs and stormwater runoff. In addition to the $56 billion necessary to control CSOs, the Environmental Protection Agency (EPA) has identified $6 billion of documented needs for municipalities to develop and implement stormwater management programs required by the Phase I and II stormwater regulations, as well as $5 billion in documented needs for urban runoff control.[1,2] However, the EPA estimates that while $5 billion has been documented, up to $16 billion may be needed for urban runoff control.[3] These costs present a significant burden to municipal governments challenged with funding these programs.

Of course, natural stormwater retention and filtration is provided by Mother Nature for free. The high costs associated with urban stormwater result from the destruction of free, natural stormwater treatment systems—trees, meadows, wetlands, and other forms of soil and vegetation. For example, researchers at the University of California at Davis have estimated that for every 1,000 deciduous trees in California's Central Valley, stormwater runoff is reduced nearly 1 million gallons—a value of almost $7,000.[4] Clearly, preserving trees reduces polluted stormwater discharges and the need for engineered controls to replace those lost functions. When those trees are cut down and their functions are lost, those costs are passed on to municipal governments, which then pass them on to their citizens. So, while the bulk of this report is about how to integrate green infrastructure into the developed world, protecting and enhancing those areas that have not yet been developed is often the cheapest, most effective way to keep contaminated stormwater out of urban and suburban streams.

The Nine Mile Run RainBarrel Initiative used 500 RainBarrels to achieve CSO reduction for the ALCOSAN treatment plant in Pittsburgh. PHOTO COURTESY OF RIVERSIDES

THE COSTS OF BUILDING GREEN IN NEW DEVELOPMENTS

Green infrastructure in many instances is less costly than conventional stormwater management programs or centralized CSO approaches and may

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provide an opportunity to decrease the economic burden of stormwater management. Studies in Maryland and Illinois show that new residential developments using green infrastructure stormwater controls saved $3,500 to $4,500 per lot (quarter- to half-acre lots) when compared to new developments with conventional stormwater controls.[5,6] These developments were conceived and designed to reduce and manage stormwater runoff by preserving natural vegetation and landscaping, reducing overall site imperviousness, and installing green stormwater controls. Cost savings for these developments resulted from less conventional stormwater infrastructure and paving and lower site preparation costs. Importantly, in addition to lowering costs, each of the sites discharges less stormwater than conventional developments. Adding to the cost savings, developments utilizing green infrastructure normally yield more lots for sale by eliminating land-consuming conventional stormwater controls, and lots in green developments generally have a higher sale price because of the premium that buyers place on vegetation and conservation development.[7,8]

OUTFITTING EXISTING DEVELOPMENTS WITH GREEN INFRASTRUCTURE

The economics of retrofitting existing urban areas with stormwater controls differ from new development. Urban stormwater retrofits can be expensive and complicated by space constraints, although this is not always the case. Based upon the costs of their pilot projects, city officials in Seattle and Vancouver (discussed in the case studies on pages 29 and 33), believe that the costs of future green infrastructure installations will be similar to or slightly more than conventional stormwater controls.[9,10] The analysis conducted by the city of Vancouver indicates that retrofitting green infrastructure into locations with existing conventional stormwater controls will cost only marginally more than rehabilitating the conventional system, but introducing green infrastructure into new development will cost less.[11] However, while green infrastructure may be more expensive in some instances, municipalities believe that the additional benefits of green controls—including the creation of more aesthetic city space and the significant reduction in water pollution—justify the added cost. In addition, green infrastructure can be incrementally introduced into urban environments, allowing the costs to be incurred over a longer period of time.

TABLE 6: Cost of Conventional Urban Stormwater and CSO Controls[a]

Control	Cost Equation[b]	Cost to Manage 10 Million Gallons
Surface storage	$C = 5.184V^{0.826}$	$35 million
Deep tunnels	$C = 7.103V^{0.795}$	$44 million
Detention basins	$C = 62{,}728V^{0.69}$	$300,000
Retention basins	$C = 69{,}572V^{0.75}$	$390,000

[a] James Heaney, et al., *Costs of Urban Stormwater Control*, National Risk Management Research Laboratory, Office of Research and Development, EPA-600/R-02/021, January 2002.
[b] Cost equations adjusted to 2005 dollars. Volume equals millions of gallons. Cost for surface storage and deep tunnels is millions of dollars.

The EPA has developed cost curves for conventional urban stormwater controls relating stormwater storage capacity to control cost. The costs in Table 6 do not include any associated costs for construction and infrastructure. These costs represent the generally accepted costs of stormwater control and provide a baseline to which green infrastructure costs can be compared.

In many instances, green infrastructure costs compare favorably with the costs of conventional controls. However, cost comparisons for individual, small-scale retrofit projects are not likely to favor green controls. In urban areas, green infrastructure will be most cost-effective when it is incorporated as part of an overall redevelopment effort or when large improvements to infrastructure are required. In these instances, the costs of green infrastructure are minimized relative to the scope and costs of the overall project. While green infrastructure may be more costly than conventional stormwater or CSO controls in certain instances, the added costs should be weighed against the enhanced stormwater control and other environmental benefits gained from their use.

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Policy Recommendations for Local Decision Makers

Although green infrastructure has been shown to reduce stormwater runoff and combined sewer overflows and improve water quality, its adoption across the country has been slow. Cities that have incorporated green infrastructure into their stormwater management programs have often done so because of direct efforts to encourage alternative stormwater approaches. The following recommendations can be used to encourage the use of green infrastructure in municipalities.

1. Get development right the first time. Reducing or preventing stormwater runoff is the most effective way to minimize pollution because it prevents pollutants from being transported to water bodies. Incorporating green infrastructure into the earliest stages of community development can negate or limit the need for larger-scale, more expensive stormwater controls. Minimizing imperviousness, preserving existing vegetation, and incorporating green space into designs all decrease the impact that urbanization has on water quality. Used in this way, green infrastructure design is a more cost-effective strategy, often costing less to develop per lot while yielding more lots at an increased sale price.[1,2]

2. Incorporate green infrastructure into long-term control plans for managing combined sewer overflows. Cities with combined sewer systems are required to develop long-term plans to reduce sewer overflows enough to meet water quality standards.[3] Green infrastructure has proven to be valuable in reducing inflows into combined sewer systems and should be integrated into such plans. Rather than relying solely on conventional, centralized storage projects to reduce CSO volumes, municipalities should considering using green techniques, which can be integrated into redevelopment projects and infrastructure repairs and upgrades. Each year Portland, Oregon's downspout disconnection program diverts 1 billion gallons of stormwater from the collection system and has been used to help alleviate localized combined sewer system backups in city neighborhoods.[4]

3. Revise state and local stormwater regulations to encourage green design. Most state and local stormwater regulations focus on peak flow rate control. To encourage more effective stormwater management, these regulations should be revised to require minimizing and reducing impervious surfaces, protecting existing vegetation, maintaining predevelopment runoff volume and infiltration rates, and providing water quality improvements. These requirements encourage green infrastructure because it can meet each of these objectives. Portland, Oregon, requires on-site stormwater management for new development and redevelopment in both CSO and separate sewer areas of the city and encourages use of green infrastructure to comply with the regulation (more details about Portland's development regulations can be found in the case study on page 24).

New Jersey's stormwater management standards require 300-foot riparian buffers and stipulate a preference for nonstructural best management

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The vegetated infiltration basins in the Buckman Heights Apartments courtyard in Portland, OR, receive and infiltrate stormwater from building roofs and sidewalks.

Photo courtesy of Portland Bureau of Environmental Services

practices (BMPs). These standards also institute water quantity as well as *quality* regulations. The water quantity standards require no change in groundwater recharge volume following construction and that infiltration be used to maintain pre-development runoff volumes and peak flow rates. Any increase in runoff volume must be offset by a decrease in post-construction peak flow rate. Water quality standards require a reduction in stormwater nutrient loads to the "maximum extent feasible" and total suspended solids (TSS) reductions of 80%. If the receiving water body is a high-quality water or tributary, the required TSS reduction is 95%.[5]

Berlin, Germany, has incorporated the Green Area Factor (GAF) into its regulations. Based on land use and zoning, the GAF sets a greening target for each property that provides the required ratio of vegetated elements to impervious surface. Once property owners apply for a building permit, they are required to satisfy the green target goal. Property owners select green infrastructure practices from an approved list and determine compliance by calculating the proportion of the property dedicated to the greening target. Selected green infrastructure practices are weighted according to their effectiveness at meeting environmental goals.[6]

To date, the U.S. federal government has declined to set performance standards for stormwater discharges from development or to add specifics to the "maximum extent practicable" standard set by the Clean Water Act for discharges from municipalities.[7] Since the federal government has failed to show leadership in this area, state and local entities must do so.

4. Establish dedicated funding for stormwater management that rewards green design. Adequate funding is critical for successful stormwater management programs. The billions of dollars necessary to mitigate stormwater pollution and combined sewer overflows require federal funding to augment state and municipal funding. To encourage its use, dedicated stormwater funding sources could identify a preference for green infrastructure or establish a funding scale based upon the relative use of green management techniques.

Many jurisdictions are creating stormwater utilities similar in function to water and wastewater utilities. Stormwater utilities allow for the assessment and collection of a user fee dedicated to a stormwater management program. Other jurisdictions dedicate a certain portion of collected local tax revenue to a

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stormwater fund. Establishing a dedicated fund removes stormwater management from general revenue funding, which is subject to variable funding and competes with other general taxation programs for money. Stormwater utilities, where allowed by enabling legislation, are popular because of the ability to determine a user rate structure and as a complement to incentive programs.[8,9]

5. Provide incentives for residential and commercial use of green infrastructure. Various incentives are already in place to encourage green infrastructure use in a number of cities. For example, Portland, Oregon, allows additional building square footage for buildings with green roofs, and Chicago provides a density bonus option for buildings with vegetative cover on the roof.[10,11] The city of Chicago also provided 20 $5,000 grants to install small-scale commercial or residential green roofs in early 2006.[12] Also beginning in 2006, Portland will provide up to a 35% discount in its stormwater utility fee for properties with on-site stormwater management.[13] Maryland provides credits for using green infrastructure when determining compliance with its stormwater regulatory requirements. Six different credits, all related to green infrastructure design, are available.[14] Several cities fund or subsidize downspout disconnection programs; Portland's program pays homeowners $53 per downspout disconnected or the city will disconnect the downspouts for free.

6. Review and revise local development ordinances. Local zoning requirements and building codes often inadvertently discourage the use of green infrastructure. Provisions requiring downspouts to be connected to the stormwater collection system prohibit disconnection programs and the use of green space for treatment of rooftop runoff. Mandatory street widths and building setbacks can unnecessarily increase imperviousness. Stormwater treatment requirements that favor centralized collection and treatment and prescribe treatment options offer little opportunity or incentive to use green infrastructure. Jurisdictions should review their applicable stormwater and wastewater ordinances and revise them to remove barriers to green infrastructure use and encourage more environmentally friendly regulations.[15]

7. Preserve existing trees, open space, and stream buffers. Too often, development removes nearly all existing natural features. Simply preserving trees, open space, and stream buffers and incorporating them into the community will help maintain water quality and manage stormwater runoff while lessening the need for additional stormwater controls. For example, New Jersey's stormwater management standards require 300-foot riparian buffers for new developments and redevelopments to protect water quality.[16]

8. Encourage and use smart growth. Smart growth can be used to limit sprawl and reduce the introduction of impervious surfaces. Smart growth policies can identify and protect sensitive environmental areas and direct development to locations with adequate infrastructure. By limiting sprawl and discouraging development in sensitive areas, smart growth may increase population densities and imperviousness in previously urbanized areas. Smart growth strategies should be coupled with green infrastructure to limit the stormwater and infrastructure effects of a potential increase in urbanization.

9. Get the community involved. Green infrastructure presents an opportunity for community outreach and education. Downspout disconnections, rain barrels, rain gardens, and green roofs may individually manage a relatively small volume of stormwater but collectively can have a significant impact. Portland's downspout disconnection program, for example, now diverts 1 billion gallons of stormwater away from the combined sewer system each year. Green infrastructure can be introduced into a community one lot at a time.

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Conclusion

While development, imperviousness, and urbanization have all taken their toll on downstream waterways, current stormwater and combined sewer overflow (CSO) mitigation efforts have failed to adequately address the problem or improve water quality because they are focused on end-of-pipe solutions. Current levels of development and imperviousness have degraded the nation's water quality, and future population growth and development will only exacerbate the problem. Additional development will make stormwater and CSO control solutions even more difficult and costly.

Green infrastructure offers the opportunity to not only develop new areas in a more environmentally efficient manner, but also to rehabilitate existing developed areas. Urbanization and development alter how water is distributed throughout the environment. Much greater volumes of stormwater are generated and discharged to receiving water bodies in developed areas than would be in the natural environment. Green infrastructure is providing measurable water quality improvements, most notably in stormwater volume reduction and CSO mitigation.

Some jurisdictions and cities have chosen green infrastructure as a preferable method of stormwater or CSO control based upon the specific needs and goals of the municipality. Others have installed green infrastructure to experiment with innovative stormwater or combined sewer overflow pilot projects. But all of these efforts demonstrate how it can be successfully integrated into urban communities.

A common driver among the cities using green infrastructure is compliance with regulatory requirements. The catalyst for Portland, Oregon's active program, for example, is a need to satisfy a number of environmental commitments, including a consent decree to limit CSO discharges, Safe Drinking Water Act standards influencing the quality of infiltrated stormwater, and emerging TMDL load and waste load allocations.[1] Other cities with combined sewer systems, or those that discharge stormwater to sensitive receiving waters, face similar requirements. Such regulations only increase the opportunities for creativity and willingness on the part of municipal decision makers to actively promote and introduce green infrastructure. City leaders are finding that when faced with the simultaneous challenges of regulatory requirements, infrastructure limitations, and financial constraints, green infrastructure often emerges as an appropriate means of satisfying each.

Another commonality among cities that have incorporated green infrastructure into their stormwater and CSO control plans is a commitment from city personnel. Whether elected officials or professional staff, these city leaders have recognized the benefits of green infrastructure and have successfully communicated its value to the public. These cities have also been innovative with their regulations and environmental policies, looking for existing and alternative avenues to encourage adoption of new stormwater and CSO control strategies. These efforts are often popular because of the public's positive response to the "greenscaping" that has accompanied the programs. As many local decision makers have already found, using green infrastructure in place of or in combination with less effective conventional methods of handling stormwater runoff can have benefits beyond just economic cost savings and reduced pollution.

Case Studies

The following nine case studies illustrate efforts in North America to incorporate green infrastructure into urban stormwater and combined sewer overflow (CSO) control strategies, but this is not an exhaustive list. Several factors were used to select case-study cities. Among them were extent and duration of program efforts, availability of information and quantifiable data, geographic location, and the number and type of green infrastructure elements practiced.

Chicago, Illinois

Progressive environmental change through creative use of green infrastructure

Population: 2.9 million

Type of green infrastructure used: green roofs; rain gardens, vegetated swales, and landscape; permeable pavement; downspout disconnection/rainwater collection

Program elements: used for direct CSO control; established municipal programs and public funding

Historically, Chicago has been known more for its industrial horsepower than for progressive environmental ideas. Rivers like Bubbly Creek still bear the names they earned from the pollution they once contained. Stories of the city's sewage and pollution problems from as early as the 1880s still persist as popular legends. However, recent initiatives show that Chicago is emerging as a leader in green development, with an extensive green roof program, environmentally sensitive demonstration projects, and municipal policies that encourage decentralized stormwater management. The city has been particularly creative in its approach, using green infrastructure projects to not only manage stormwater runoff but also to address other environmental issues, such as mitigating urban heat island effects and improving energy efficiency in buildings.

Stormwater Collection Through Expansion of the Combined Sewer System

While the city's past environmental infrastructure projects have had dubious goals, the water quality of Lake Michigan, the city's drinking water source, has long been a concern. In the early 1900s, sewage and stockyard pollution from the Chicago River prompted Chicago officials to reverse the course of the South Branch of the river away from Lake Michigan and to the Mississippi River in an effort to improve the lake's water quality.[1] Water issues remain a concern for the city more than a century later. The city manages one of the largest wastewater collection and treatment systems in the world and contends with flooding, surface water quality impairment, and CSOs. Urban runoff challenges are exacerbated by the magnitude of infrastructure needed to serve Chicago's population. The city itself has over 4,400 miles of sewage infrastructure that cost about $50 million annually to maintain.[2] Approximately 3 million people call Chicago home, and the population of the entire six-county metro region surrounding the city exceeds 8 million; the region's population is projected to increase 20% by 2030.[3] Impervious surfaces cover approximately 58% of the city.[4]

Chicago has pursued a number of initiatives to improve stormwater collection, the most ambitious being a $3.4 billion project to collect and store stormwater and sewage from the combined sewer system.[5]

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The green roof at Chicago's City Hall introduces vegetation in the heart of downtown. Temperatures above the Chicago City Hall green roof average 10° to 15°F lower than a nearby black tar roof. During the month of August this temperature difference may be as great as 50°F. The associated energy savings are estimated to be $3,600 per year.
Photo courtesy of Roofscapes, Inc.

In the 1970s, the Metropolitan Water Reclamation District began construction of the primary control solution for CSOs—the Tunnel and Reservoir Plan (TARP). In 2003, with only part of the system operational, more than 44 billion gallons of stormwater were captured; 10 billion gallons, however, were released as CSOs.[6] Approximately 2.5 billion gallons of storage are currently available in the TARP system. An additional 15.6 billion gallons of storage will be available when two more reservoirs are added to the system; construction is scheduled for completion in 2019.[7,8] When complete, the system will handle most of Chicago's CSO discharges, storing combined runoff and sewage until it can be sent for secondary treatment at a wastewater treatment plant.

Chicago's Green Roof Program

Although the Metropolitan Water Reclamation District has committed to this massive public works project, the city has also pursued several initiatives to install green infrastructure that promotes on-site stormwater management, including green roofs, permeable paving projects, rain barrels, and green buildings. Much of this investment in green infrastructure has paralleled the increase in population and building within the city over the last decade. And, unlike the past, the Chicago River is now seen as a public amenity rather than a liability.

Chicago's thriving green roof program began with a 20,300 square foot demonstration roof on its own city hall. The green roof retains more than 75% of the volume from a one-inch storm, preventing this water from reaching the combined sewer system.[9] The program has led to more than 80 green roofs in the city, totaling over one million square feet.[10] A 2003 Chicago Department of the Environment study found that runoff from green roof test plots was less than half of the runoff from conventional stone and black tar roof plots; the difference was even larger for small storms. The city encourages the use of green roofs by sponsoring installations and demonstration sites and by providing incentives. A density bonus is offered to developers who cover 50% or 2,000 square feet (whichever is greater) of a roof with vegetation. In early 2006, the city provided 20 $5,000 grants for green roof installations on small-scale commercial and residential properties.[11]

Other Green Infrastructure Innovations: Chicago's Citywide Commitment

Chicago has employed other green technologies to reduce urban runoff. To address localized flooding caused by runoff from one alley, the city removed the

asphalt from the 630 foot long, 16 foot wide alley and replaced it with a permeable paving system. Now, instead of generating stormwater runoff, the alley will infiltrate and retain the volume of a three-inch, one-hour rain event.[12] The permeable pavement requires little maintenance and has a life expectancy of 25 to 35 years.[13] In this same ward, vegetated swales are also being used for stormwater management.

In June 2004, Chicago has embarked on a city-wide green building effort. Chicago Mayor Richard M. Daley presented The Chicago Standard, a set of construction principles designed for municipal buildings. The standards are based on the Leadership in Energy and Environmental Design (LEED™) Green Building Ration System[14] and emphasize sustainability, water efficiency, energy effects, and indoor air quality as well as stormwater management. For both the green roof and green building efforts, Chicago has created municipal demonstration projects to develop professional expertise in the city on these technologies.

Chicago Center for Green Technology. The centerpiece of the city's green building efforts is the Chicago Center for Green Technology. The Chicago Department of Environment transformed this property from a 17-acre brownfield full of construction debris to the first municipal building to receive the LEED™ platinum rating.[15] The 34,000 square foot center serves as an educational facility and rental space for organizations and businesses with an environmental commitment. Four 3,000 gallon cisterns capture stormwater that is used for watering the landscaping. The site also features a green roof, bioswales, permeable paving, and a rain garden. Chicago Department of Environment models indicate that Green Tech's stormwater management technologies retain more than 50% of stormwater on site—for a three-inch storm, the site releases 85,000 gallons of stormwater to the sewer system instead of the expected 175,000 gallons.[16] The success of the Green Tech project spurred several other green building projects, including three new green libraries; a new police station to be monitored for a national case study; green renovations on a firehouse and police headquarters; and the Green Bungalow Initiative, a pilot project to affordably retrofit four of Chicago's historic bungalows with green technologies and monitor any corresponding energy savings. The program has thus far shown average energy savings for the green bungalows of 15% to 49%.[17]

The city has also pursued public outreach programs, engaging homeowners through its recent rain barrel and rain garden programs. In the fall of 2004 city residents purchased more than 400 55-gallon rain barrels for $15 each.[18] The program cost the city $40,000 excluding city labor. The Department of Environment estimates the pilot project has the potential to divert 760,000 gallons annually from the combined sewer system, a relatively small number compared to the total amount of stormwater runoff in the city. However, the program was targeted to areas with a high frequency of basement flooding, meaning the program may have a more significant impact in these localized areas. Since the water in rain barrels can be used for other purposes such as landscaping, this program has additional conservation benefits as well. The city also began a complementary rain garden program, planting four rain gardens along with signage explaining benefits.

Chicago has also complemented its ground-level initiatives with two studies on the effectiveness of green infrastructure technologies. The first is the monitoring study of the green roof box plots. The second is a 2004 Department of Environment Stormwater Reduction Practices Feasibility Study that used hydraulic modeling to assess the effectiveness of best management practices for the Norwood Park sewershed. The study found that downspout disconnection would achieve peak flow reductions in the 1,370-acre area by 30% for a six-month or one-year storm if all homes in the 80% residential area disconnected their downspouts from the sewer system.[19,20] This would potentially reduce peak flow in the CSO outfall pipe by 20% and water levels in the sewer system by eight inches to two feet. The study also showed that three-inch and six-inch-deep rain gardens installed at each home could reduce total runoff by approximately 4%

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and 7%, respectively, for the same six-month or one-year storm events.

For Additional Information

Chicago Department of the Environment: http://egov.cityofchicago.org/city/webportal/portalEntityHomeAction.do?entityName=Environment&entityNameEnumValue=05

Milwaukee, Wisconsin

Investing in green infrastructure to improve water quality

Population: 587,000

Type of green infrastructure used: green roofs; rain gardens, vegetated swales, and landscape; wetlands, riparian protection, or urban forests

Program elements: used for direct CSO control; established municipal programs and public funding

Like many municipalities with a combined sewer system, Milwaukee has a history of exposure to frequent CSO events and was faced with finding a viable overflow control strategy. To reduce the number of CSOs and their impact on the water quality of Lake Michigan and its tributaries, the Milwaukee Metropolitan Sewerage District (MMSD), the regional wastewater treatment agency, built a deep tunnel storage system in the 1980s and 1990s. MMSD invested $3 billion during this period to reduce overflows. As a complement to this large capital investment, MMSD is investing in green infrastructure projects to reduce stormwater inflow into the combined sewer system and mitigate stormwater runoff.

MMSD manages wastewater from 28 municipalities with a combined population of about 1.1 million people in a 420 square mile service area. All 28 communities own and operate their own sewer systems, which drain into 300 miles of regional sewers owned by MMSD. The district's two wastewater treatment plants each process about 80 to 100 million gallons of wastewater on a dry day.[21] Treated wastewater is discharged to Lake Michigan, which also serves as the city's drinking water supply.[22] The city of Milwaukee and the village of Shorewood own and operate combined sewers, which make up 5% of MMSD's total service area. Combined sewer overflow points are located along rivers that flow into Lake Michigan.[23] The $2.3 billion Deep Tunnel System project, completed by MMSD in 1994, provided 405 million gallons of underground sewer storage. Begun in 1986, the 19.4-mile-long system collects and temporarily stores the large quantities of stormwater and wastewater that are conveyed through the sewers during wet weather events.[24]

Prior to the system becoming operational, Milwaukee averaged 50 to 60 CSO events a year, which discharged 8 to 9 billion gallons of sewage and stormwater. The Deep Tunnel System was designed to limit CSOs to 1.4 events per year; in the first 10 years of operation, from 1994 until 2003, annual average CSO discharges were 1.2 billion gallons from 2.5 average annual events.[25,26] Heavy rains in the spring of 2004 resulted in 1 billion gallons of CSO discharges during a two-week period.[27] Although the Deep Tunnel System has substantially reduced CSO events, excessive quantities of stormwater can still trigger overflows, and MMSD has committed an additional $900 million to an overflow reduction plan.[28]

Milwaukee's Green Infrastructure Approach

As an additional strategy to limit CSO discharges, MMSD has begun to install green infrastructure within the combined sewer area to decrease the volume of stormwater entering the system. One of the first initiatives was a disconnection program that redirected building downspouts from the combined sewer system to rain barrels. Overflow from the rain barrels is directed to pervious areas and rain gardens. In a cooperative cost-sharing arrangement with public entities and private businesses in the city, MMSD partnered with others to install more than 60 rain gardens to receive and treat roof runoff. The total combined cost of these pilot projects was approximately $170,000.[29]

The Highland Gardens housing project. Seven green roofs have been installed in the Milwaukee region.

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The green roof atop MMSD's headquarters, shown just after installation, demonstrates how stormwater flow into the city's sewer system could be reduced.
Photo courtesy of MMSD

One of these is at the Highland Gardens housing project, a 114-unit mid-rise for senior citizens and people with disabilities. A 20,000 square foot green roof was installed at a cost of $380,000. The roof will retain 85% of a two-inch rainfall. The remaining 15% of the water volume is directed to rain gardens and a retention basin used for on-site irrigation.[30] These management strategies prevent stormwater from being discharged to the collection system.

MMSD has installed or helped finance four other green roofs to reduce stormwater runoff. The first was a 3,500 square foot structure on the roof of MMSD's headquarters building in downtown Milwaukee. Native species of grasses and flowering plants were selected for the roof vegetation. The cost of the green roof was just under $70,000.[31] A second green roof was installed on the University of Wisconsin-Milwaukee's Great Lakes Water Institute. MMSD contributed $110,000 of the $233,000 needed to install the 10,000 square foot unit. A third green roof was installed on the city's Urban Ecology Center, with MMSD contributing $40,000 of the total project cost. The fourth green roof is at the Milwaukee County Zoo, to which MMSD contributed half of the $73,000 cost.[32]

Measuring the Effectiveness of Milwaukee's Green Infrastructure

The rain gardens and MMSD-financed green roofs were installed in 2003 and 2004. A monitoring program evaluating the effectiveness of the systems at managing stormwater is being conducted with initial results expected in early 2006. To determine the potential impacts of the green infrastructure program, MMSD conducted a modeling analysis. The modeling effort showed that application of downspout disconnection, rain barrels, and rain gardens in residential areas would reduce each neighborhood's contribution to the annual CSO volume 14% to 38%. Additional modeling results showed the volume of stormwater sent to the treatment plants from the neighborhoods was reduced 31% to 37% and stormwater peak flow rates were reduced 5% to 36%, depending upon the size of the rain event.[33] (The model assumed a high participation rate for residential areas. Volume and peak flow reductions would not be as great with a lower participation rate.)

The effect of green infrastructure in commercial areas was also modeled. The use of green roofs, rain gardens, and green parking lots is predicted to reduce commercial area contributions to CSO volume by 22% to 76%, but would not decrease—and could even increase—the volume of stormwater sent to the

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treatment plants. Stormwater peak flow rates from commercial areas are predicted to be reduced 13% to 69% with the introduction of green infrastructure.[34]

MMSD has allocated more than $5.5 million for fiscal years 2002 through 2014 for rain water rerouting programs intended to prevent stormwater from entering the combined sewer system. An additional $4.5 million has been allocated for fiscal years 2003 through 2009 to promote, install, and monitor green infrastructure practices aimed at reducing stormwater.[35]

MMSD is also purchasing and protecting open space to reduce stormwater runoff and improve water quality in its urban waterways. The capital budget designates funds to purchase privately owned wetlands to prevent development and establish conservation easements. More than $27 million has been allocated for fiscal years 2000 through 2011. As of fiscal year 2005, 775 acres had been purchased in three watersheds for just under $5.8 million.[36] A greenways initiative will identify lands that compose greenway connections, linkages between sites, delineated environmental corridors, isolated natural wetlands, open space, and riparian wetlands. Linkages between these areas will be acquired to protect and establish greenways along jurisdictional waterways or their tributaries. Preferential consideration is given to land that provides stormwater or flood management benefit.[37]

For Additional Information

Milwaukee Metropolitan Sewerage District:
http://www.mmsd.com/home/index.cfm

Pittsburgh, Pennsylvania

"Restorative development" beautifies land and cleans water

Population: 325,000

Type of green infrastructure used: green roofs; rain gardens, vegetated swales, and landscape; downspout disconnection/rainwater collection; wetlands, riparian protection, or urban forests

Program elements: used for direct CSO control

Pittsburgh is a postindustrial city struggling to repair the environmental degradation wrought by its manufacturing past. The city's development as a steel powerhouse and mining center is intrinsically tied to its geographic and hydrologic setting. The city has developed around the confluence of three rivers—the Allegheny, the Monongahela, and the Ohio. Over the past two decades Pittsburgh's metropolitan population has declined, partly due to the collapse of the steel industry. The city's population decreased by 9.5% in the 1990s and the entire metropolitan area saw a decline of 1.5%, trends that were significantly greater than other same-size cities in the northeastern central area.[38] The "steel city" is left with pollution nuisances like brownfields and slag heaps, as well as a shrinking urban center and a considerable sewage overflow problem.

It is precisely because of this industrial reputation and declining urban center that Pittsburgh has had the opportunity and the incentive to redevelop and reclaim large land parcels and turn them into greenways and parks. The restoration, described as "restorative redevelopment," is motivated by a desire to restore habitat, beautify land, increase parkland, and raise property values—in all, generally making Pittsburgh a more attractive city.[39] Pittsburgh's efforts in alternative stormwater management have been a combination of government-sponsored restoration of green space and privately funded demonstration sites. The impetus for Pittsburgh's green restoration comes largely from the private sector, charitable foundations, and citizens' groups.

Water Pollution from Pittsburgh's Sewer System

Pittsburgh clearly has a need for supplemental stormwater management projects. The city's stormwater runoff contributes to frequent CSOs. In 2003, red-flag advisories for impaired water quality were issued on 111 out of 139 summer recreation days (from May 15 to October 1). In 2004, 125 red-flag advisories were issued.[40] The metropolitan area contains more than 300 combined sewer outfalls and over 4,000 miles of underground pipes. Many of these outfalls are upstream of drinking water intakes. Solving Pittsburgh's wet weather sewage problems is a complicated problem that is

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The green roof surrounding the executive offices on the Heinz 57 Center in Pittsburgh not only provides environmental benefits, but also creates green space for outdoor meetings and employee enjoyment 14 stories above the ground.
Photo courtesy of Roofscapes, Inc.

exacerbated by the fragmented nature of the collection and treatment system. While there is one treatment plant operated by the Allegheny County Sanitary Authority (ALCOSAN) in the metro area, there are 83 separate municipalities, each responsible for maintaining their own collection system. Many pipes are in a state of disrepair, and ALCOSAN estimates that repairing the system using traditional sewage infrastructure strategies will cost more than $3 billion. This investment includes an expansion of the wastewater treatment plant capacity over the next 20 years from 225 million gallons per day (mgd) to 875 mgd to reduce CSOs. However, 565 mgd of this increased capacity would only provide primary treatment.[41]

Against this troubled environmental background, the private sector and citizens' groups in Pittsburgh have taken an active role to design and implement green infrastructure projects. Several demonstration projects have focused specifically on stormwater capture or treatment.

Pittsburgh's Green Infrastructure Commitment

Pittsburgh's Phipps Conservatory and Botanical Gardens is undergoing a major expansion and, when complete, will boast over 15,000 square feet of green roofs.[42] The conservatory will capture rainwater from its glass roofs and store it in a cistern to be used later to regulate water levels in ornamental ponds. The facility will feature a green roof test garden and a 30-by-100-foot rain garden in a low-lying site near the impervious parking areas.[43]

The McGowan Institute for Regenerative Medicine, built on a brownfield site, collects rainwater from the roof for gray water needs and irrigation. The facility reuses 57% of rainwater falling on the site, retaining 168,000 gallons of stormwater annually.[44]

As a LEED™ Gold certified building, Pittsburgh's David L. Lawrence Center is the world's first certified green convention center. Through stormwater reclamation, the facility reduces its potable water use by approximately 60%. It has an in-house water treatment plant to recycle black water and features a stainless steel roof that reduces total suspended solids in stormwater runoff.[45] By capturing and reusing rainwater on-site, each of these projects decreases the amount of stormwater that would have otherwise entered the combined sewer system.

Nine Mile Run and Frick Park. One of Pittsburgh's key restoration efforts is the $7.7 million project currently under way at Nine Mile Run, one of the

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last remaining daylit streams in the city. [46] The stream flows underground through several neighborhoods and daylights in Frick Park, a 455-acre natural and recreation area. Before its confluence with the Monongahela River, Nine Mile Run collects stormwater runoff from a seven-mile watershed with 43% impervious surfaces.[47] A number of environmental problems contribute to the stream's impairment. To accommodate development, Nine Mile Run was culverted and no longer flows in its natural meandering pattern, inhibiting its function as a wildlife habitat. In wet weather conditions, stormwater discharges increased stream flow in Nine Mile Run, eroding much of the stream bank. The altered hydrology in the watershed leaves little water in the stream during dry weather conditions, making it unable to support aquatic life. The stream also borders a 238-acre mountain of slag; runoff from the slag increased the natural pH of the stream. As with most Pittsburgh waterways, Nine Mile Run is also the conduit for many combined sewer overflows.

The Army Corps of Engineers is undertaking the main portion of the project to clean up Nine Mile Run under authority of Section 206 of the Water Resources Development Act of 1996. The project is a large-scale effort that will include the construction of woody and herbaceous wetlands to provide both wildlife habitat and stormwater filtration. The stormwater management component of the project takes advantage of Pittsburgh's porous and permeable soils to capture recharge and attempts to prevent pollutants in stormwater from reaching the stream. In an effort to repair the stream and re-create more natural conditions, the new river design adds meanders and pool and riffle sequences, undoing channelization. The project also fits into the city of Pittsburgh's larger Riverfront Development Plan, which includes land conservation along stream banks to prevent runoff and erosion and increased set-asides for recreational trails along Nine Mile Run.[48] The restoration effort will add an estimated 100 acres to Frick Park.

The restoration would not be as effective without corresponding attempts to reduce sources of wet weather pollution to Nine Mile Run. The municipal contribution to the project, $2.7 million, is designated to repair sewer lines, preventing leakages due to old, failing pipes. The city has also partnered with a developer to transform the slag heap, a brownfield site, into a 710-home residential development. Aiding in this effort are groups like 3 Rivers Wet Weather Demonstration Program and the Nine Mile Run Watershed Association. The community groups commissioned an engineering study to determine where rain barrels would be most effective in reducing the stormwater runoff that contributes to CSOs. The organizations installed 500 large rain barrels (132 gallons each) in critical neighborhoods.[49] The groups focused on the educational component of the project to make homeowners aware of lot-level solutions to stormwater management.

For Additional Information

Nine Mile Run Watershed Association:
http://www.ninemilerun.org/

Portland, Oregon

Making green infrastructure a policy priority

Population: 539,000

Type of green infrastructure used: green roofs; rain gardens, vegetated swales, and landscape; downspout disconnection/rainwater collection

Program elements: used for direct CSO control; established municipal programs and public funding

Portland has actively promoted funding and education for innovative stormwater management since 1998 and boasts numerous green applications throughout the city. These projects feature many types of green infrastructure technologies, including bioswales, green roofs, infiltration planters, and sustainable street design. The city has been at the leading edge of the green infrastructure movement and is beginning to accumulate significant data on the effectiveness of decentralized stormwater management technologies.

As with many cities, part of the motivation to achieve more successful stormwater strategies comes from a history of pollution and a desire to repair nearby ecosystems. One of Portland's primary

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Vegetated curb extensions decrease stormwater runoff in Portland neighborhoods.

Photo courtesy of the Portland Bureau of Environmental Services

ecological concerns is the Willamette River, which in the course of its flow takes with it a considerable volume of combined sewer overflow. In 2004, Portland experienced 50 overflow events and discharged 2.8 billion gallons of combined overflow into local waterways.[50] In some areas, undersize combined sewers cause basement sewer backups, requiring homeowners to sanitize their basements after sewage backs up into their homes. Stormwater has also transported toxic pollution into area water bodies. Portland Harbor, the industrialized lower portion of the Willamette, was designated an EPA superfund site for contaminated sediments. Investigations into the contribution of overland stormwater flow and other sources of this heavy-metal pollution are under way.

Portland's Dual Approach to Managing CSOs

To alleviate these pressing CSO management problems, Portland has pursued a dual approach, expanding its public infrastructure and pursuing lot-level strategies to manage stormwater.[51] The "Big Pipe" is Portland's primary combined sewage control solution, adding capacity to the overloaded sewer system. In recent years, the city has made considerable progress toward reducing overflows. The constructed capacity, along with other projects, has virtually eliminated CSOs to the Columbia Slough, which discharges into the Willamette River, and has eliminated or controlled eight Willamette River CSO outfalls. When the projects are completed in 2011, CSOs to the Willamette will be reduced by 94%.[52] These strategies are estimated to cost around $1.4 billion and are funded by local sewer charges.[53]

To complement the large infrastructure projects, Portland is installing green infrastructure as an innovative stormwater management approach. Green infrastructure is gaining popularity in Portland for several reasons, including climate, development patterns, and policy institutionalization. Portland's rainfall occurs mostly in small frequent storms, exactly the type of precipitation event green infrastructure technologies are most successful at mitigating. About half of Portland's land area is impervious, 25% attributable to streets, and 40% attributable to rooftops.[54,55] These surfaces create an opportunity and a need for green infrastructure development.

Portland has also encouraged sustainable stormwater management through a series of policy initiatives. City code now requires on-site stormwater management for new development and

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redevelopment. Portland's stormwater manual encourages the use of green infrastructure techniques to meet this objective. Together, the city of Portland's Bureau of Environmental Services (BES) and the EPA jointly fund the Innovative Wet Weather Program, a grant program for stormwater management projects that focus on water quality improvement. In 2004, budgeted expenditures for a long list of proposed projects totaled almost $3 million.[56] New city-owned buildings are required to have a green roof that covers at least 70% of the roof area; the remaining roof area must be covered with Energy Star roofing material.[57] The city offers a zoning bonus, allowing for additional square footage for buildings featuring a green roof, and in 2006 it will begin offering a stormwater fee discount of up to 35% for properties with on-site stormwater management.[58,59] These programs are built upon the successful participation in the downspout disconnection program, in which homeowners can receive $53 per downspout disconnected from the combined sewer system. The city estimates that more than 45,000 households participate in the program, allowing infiltration of more than 1 billion gallons of stormwater annually.[60,61] The on-site stormwater management requirement, along with incentive programs for installing green infrastructure, will likely lead to more widespread applications throughout the city.

Street-level stormwater management. In 2003, Portland installed the Northeast Siskiyou Street vegetated curb extensions to capture stormwater while creating an attractive landscaped area. To assess the effectiveness of the technology and gather data for future projects, the city conducted flow tests to ensure water would be infiltrated in the right-of-way. The vegetated curb extensions reduced peak flow from a 25-year storm event (approximately two inches in six hours) by 88%.[62] This is enough retention to protect local basements from flooding. The curb extensions also reduced total runoff (2,000 gallons in the simulation) to the combined sewer system by 85%.[63] The project took about two weeks to install and cost approximately $15,000.[64] Portland has also installed curb extensions on Southeast Ankeny Street and is planning additional green street projects at the intersection of Southwest 12th Avenue and SW Montgomery Street and the intersection of Northeast 131st Avenue and Northeast Fremont Street.

Portland's "ecoroofs." In 1996, the first green roof in Portland was installed. In the years since, Portland has begun an initiative to install and monitor green roofs at sites throughout the city. The city prefers the term "ecoroofs" to illustrate that even in the dry season when roofs are not as green, the roofs can still perform well.[65] Portland also uses the term to emphasize the economic benefits of the vegetated technology. The city conducted extensive monitoring studies on Hamilton West Apartments, a 10-story building with two ecoroof components, one measuring 2,520 square feet and the other 2,620 square feet. Based on two years of monitoring data, BES found that the four- to five-inch thick, 25-pound-per-square-foot ecoroof retained 58% of rainfall, preventing it from becoming stormwater runoff. Monitoring has also shown that the ecoroofs absorb almost 100% of the rainfall from Portland's warm season precipitation events.[66]

Some of Portland's other interesting stormwater sites include the Oregon Museum of Science and Industry, where swaled medians were installed around the museum parking lot to capture stormwater. The museum saved $78,000 by installing the green infrastructure technology over a traditional collection system.[67] The Liberty Centre Parking Garage installed infiltration planters as a stormwater retrofit. These planters accept runoff from more than 36,000 square feet of impervious surfaces and can retain the entire volume of a storm slightly smaller than the typical two-year storm event. The cost for this retrofit was $75,500.[68] The Oregon Convention Center rainwater garden collects stormwater from 5.5 acres of roof area.[69] The garden simulates a mountain stream, doubling as an attractive landscape space. The project is designed to handle the runoff from a 25-year storm. A recent stormwater management project is a ring of interconnected bioswales

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around the New Seasons Market at Seven Corners Southeast Division Street. This project reduces impervious surfaces and will remove 1 million gallons of stormwater annually from the combined sewer system.[70] All of these projects will be eligible to apply for the stormwater fee discount when it is fully implemented in mid-2006.

New Directions in Portland's Green Infrastructure: The Stormwater Trading Program

The city was recently awarded a $288,000 U.S. EPA grant for a feasibility study to determine the viability of a stormwater trading program. As conceptualized, the trading program would allow developers who were unable to satisfy the on-site stormwater management requirement to privately finance or buy credits for stormwater mitigation elsewhere within the city, provided that the purchased credit met water quality and discharge volume requirements. The initial cost of the stormwater credits would likely be based on the cost of a publicly financed program. The first phase of the study will determine if the approach is economically beneficial and if the program can provide acceptable environmental results. If the trading approach is determined to be feasible, later phases of the study will outline the model approach, determine the geographic trading area, select appropriate best management practices, and develop economic models for program valuation. In later phases, the city also plans to demonstrate the operation of the trading system through pilot program implementation.[71]

For Additional Information

Portland Bureau of Environmental Services:
http://www.portlandonline.com/bes

Rouge River Watershed, Michigan

Cleaning up the watershed with green approaches to stormwater management

Population: 1.5 million

Type of green infrastructure used: green roofs; rain gardens, vegetated swales, and landscape; permeable pavement; wetlands, riparian protection, or urban forests

The Rouge River Watershed in southeast Michigan covers nearly 450 square miles and is home to the historically industrial city of Detroit. Fifty percent of the watershed is urbanized, and more than 1.5 million people live within its boundaries.[72] As a tributary and major pollution source to the Detroit River, the Rouge River was designated an Area of Concern by the International Joint Commission in the Great Lakes.[73,74] With industrial and municipal wastewater discharges believed to be effectively permitted and controlled, the focus of the water restoration efforts in the watershed has shifted to addressing wet weather pollution. Stormwater runoff was responsible for creating excessive flow within the river, damaging stream banks and riparian habitat, introducing pollutants, and causing CSOs.

In 1992, the Wayne County, Michigan Department of the Environment initiated the Rouge River Project to address wet weather pollution within the watershed. The project is funded by U.S. EPA grants and municipal funding and serves as a national demonstration project for reclaiming degraded urban rivers.[75] An assessment of the watershed in the mid-1990s found that stormwater runoff had many deleterious effects on water quality and river health. Increased river flows from stormwater discharges had eroded 60% to 90% of the river banks on the Rouge River's major branches.[76] Soil washed from the river banks was deposited along the river bottom downstream, degrading natural stream habitats. Stormwater runoff and pollution had not only contributed to a decline in river fish populations, but also a number of consumption bans and advisories. Nutrient loadings caused seasonal decreases in river oxygen levels, and increased river bacteria counts and resulted in swimming advisories.[77]

Evaluating the most effective means of improving the water quality of the river, the Rouge River Project adopted a watershed-based approach for wet weather pollution control. The first step in this approach was the 1997 adoption of the Michigan NPDES General Stormwater Permit. The permit is unique because the watershed communities requested permission from the U.S. District Court overseeing the river cleanup to develop a draft permit acceptable to the communities and state and federal regulators. The

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At more than 10 acres, the largest green roof in the world sits atop Ford's Rouge River Manufacturing Complex. The green roof is one component of a renovation designed to make the facility more environmentally sustainable. Photos courtesy of Green Roofs for Healthy Cities

consensus effort resulted in a watershed-based permit that required each community to develop a watershed management plan and stormwater pollution prevention initiative. The U.S. EPA has supported Michigan's request to continue to use the general permit in lieu of permits that would be required by the Phase II regulations.[78,79]

Watershed Restoration Through Green Infrastructure

Green infrastructure practices have been used as part of watershed management plans to address stormwater pollution. Although highly urbanized, more than 50 miles of riparian parklands are publicly maintained with the watershed.[80] Watershed restoration efforts have also included the use of created and existing wetlands for stormwater management. The Inkster Wetlands demonstration project uses 14 acres of wetlands adjacent to the Rouge River to treat stormwater before it enters the river. Three separate wetlands areas are part of the project and are composed of forested, emergent, scrub, and open water wetlands. Approximately nine of the 14 acres are constructed wetlands.[81] Prior to the project, discharge pipes routed stormwater past the existing wetlands and directly to the river. In addition to creating new wetlands for stormwater treatment, the demonstration project rerouted stormwater through the existing wetlands. The project was completed in 1997 at a cost of $465,000.[82] A five-year monitoring study evaluated the effectiveness of the wetlands at improving the quality of the stormwater runoff. In addition to dampening stormwater flows, the wetlands reduced concentrations of total suspended solids by 80%, total phosphorus by 70%, BOD by 60%, and heavy metals by 60%.[83]

Ford Motor Company's green roof. Located along the Rouge River, Ford Motor Company's 88-year-old, 600-acre Rouge River Manufacturing Complex in Dearborn, Michigan, recently underwent a $2 billion renovation. The renovation of Rouge River was unique because of Ford's decision to make the manufacturing plant a more environmentally sustainable facility. Green infrastructure was an important component of this effort. The complex includes a 450,000 square foot green roof to retain stormwater, lower energy costs, and extend roof life.[84,85] At over 10 acres, the green roof is the largest in the world and is anticipated to absorb the first inch of rainfall.[86] Vegetated swales, planted with indigenous species, are used throughout the site to reduce stormwater discharges and encourage infiltration. New trucks rolling off the assembly line are taken to an outdoor parking lot paved with permeable pavement. A two- to three-foot gravel storage bed beneath the lot filters pollutants from the stormwater and provides storage capacity.[87] The renovation of the site also included the planting of more than 1,500 trees, 20,000 bushes, and 85,000 flowering perennials.[88,89]

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For Additional Information

Rouge River Wet Weather Demonstration Project: http://www.rougeriver.com

Seattle, Washington

Using green infrastructure solutions to save sensitive waters

Population: 587,000

Type of green infrastructure used: green roofs; rain gardens, vegetated swales, and landscape; downspout disconnection/rainwater collection

Program elements: used for direct CSO control; established municipal programs and public funding

Located along the shores of Puget Sound and home to rivers and creeks that serve as salmon spawning grounds, Seattle is connected to the vitality of its water bodies. The 84 square mile city is highly urbanized and has an average annual rainfall of 37 inches, which occurs primarily during the region's wet months from November to February.[90] Stormwater runoff has long been identified as a threat to the aquatic habitat of Puget Sound and the sensitive salmon streams. Controlling stormwater in the urban watersheds is a complicated task in a city where the majority of development predated stormwater regulations.[91] Consequently, water quality in the region has been impaired and the hydrology of rivers and creeks has been altered because of increased stormwater volumes and flow rates.

Using Natural Drainage Systems to Manage Stormwater Runoff

In the late 1990s, the city decided to install green infrastructure in an effort to mitigate urban stormwater runoff. Seattle Public Utilities (SPU), the agency responsible for water and stormwater programs, developed pilot projects using the concept of natural drainage systems (NDS). The NDS program's goal was to develop a stormwater management system that resembled natural hydrologic functions lost to urbanization.[92] The initial outcome of this program has been innovative neighborhood and stormwater system designs with results exceeding initial expectations.

The Viewlands Cascade. Early this decade four NDS pilot projects were completed and have since been monitored to determine their effectiveness. These projects were designed to reduce stormwater runoff to Pipers Creek, a tributary of Puget Sound and home to wild coho salmon and both steelhead and cutthroat trout. The Viewlands Cascade was the first of these projects and uses a series of 16 stepped vegetated cells to collect stormwater runoff from approximately 72 acres. The system was designed to reduce the volume and flow rate of stormwater runoff by encouraging infiltration and vegetative uptake. The estimated construction cost was $225,000.[93]

Hydrologic monitoring of the Viewlands Cascade indicates that the system decreases stormwater runoff volume 75% to 80% and peak flow rates by 60%.[94] Performance is greater than average for small and medium storm events and considerably less than average for large events. Overall, during a three-year monitoring period, half of the total volume of stormwater that entered the cascade system was retained and not discharged to Pipers Creek.[95] The Viewlands Cascade replaced a partially concrete drainage ditch. Modeling indicates that the new cascade system retained three times as much stormwater volume and held stormwater in the system over 2.5 times longer when compared to the original drainage ditch.[96] In addition, the water quality of the stormwater discharged has improved because of the natural vegetation's biological and chemical removal capabilities.

The SEA Street Project. The 2nd Avenue Street Edge Alternative (SEA) Street project was the second pilot project and one of the better known green infrastructure projects in the country. The project redesigned an entire 660-foot block of 2nd Avenue with a number of green infrastructure techniques, with the goals of reducing stormwater runoff and providing a livable community. SPU worked collaboratively with residents during the process to develop the final street design.

The original 25-foot-wide straight street was replaced with a 14-foot-wide curvilinear street. Vegetated swales, designed to infiltrate and treat

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This private residence in Seattle, WA, incorporates stormwater controls and vegetative gardens.
Photo courtesy of Seattle Public Utilities

stormwater, were installed within the right-of-way on both sides of the street. Street parking was replaced with designated angled parking slots, and a sidewalk was installed on one side of the street. The final constructed design reduced imperviousness more than 18% and added 100 evergreen trees and 1,100 shrubs.[97] The original construction cost bid was $244,000. The final total project cost was approximately $850,000, with the substantial increase attributed to costs associated with significant community outreach and coordination as well as design modifications to address community concerns.[98]

Hydrologic monitoring of the project indicates a 99% reduction in total potential surface runoff. Stormwater retention capacity has increased since the project was completed. Stormwater runoff has not been recorded at the site since December 2002, a period that included the highest ever 24-hour recorded rainfall at SeaTac Airport. Reasons for the increased stormwater retention are unclear, but it is speculated that the maturing vegetation takes up more water and increasingly aids infiltration.[99]

Design estimates originally anticipated that the site would attenuate up to 0.75 inches of rain. Monitoring has indicated that the site is able to attenuate a substantially larger rainfall amount. The SEA Street design was expected to reduce total stormwater discharge from the site by 42% and by 66% when compared to a conventional Seattle street with curb and gutter. A modeling analysis indicates that if a conventional curb and gutter system had been installed along 2nd Avenue instead of the SEA Street design, 98 times more stormwater would have been discharged from the site.[100] The SEA Street design has been so popular that local residents have requested that their traditional streets be retrofitted.

Both the Viewlands Cascade and 2nd Avenue SEA Street have been successful at managing stormwater runoff. There is, however, a large functional difference between the two projects. The Viewlands Cascade collects and treats runoff from a designated drainage area once it has been generated as an end-of-pipe treatment focused on reducing peak stormwater flows; the 2nd Avenue SEA Street is designed as a source control strategy intended to prevent the discharge of stormwater from the project site. The success of both projects demonstrates that green infrastructure is adaptable and may be used in various capacities. SPU has incorporated both designs into a number of projects recently completed or currently under construction.

The 110th Street Cascade. The 110th Street Cascade is also located in the Pipers Creek Watershed and is

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designed to treat runoff from a 28-acre drainage basin. Monitoring at the cascade is measuring flow rate and water quality.[101] Completed in early 2005, the Broadview Green Grid project reconstructed an entire neighborhood's drainage system in a 32-acre sub-basin in the Pipers Creek Watershed. The project used both SEA Street designs and cascade systems. The north-south streets in the project area were reconstructed using the SEA Street design. Each of these streets discharges to an east-west flowing system of vegetated swales and cascades.[102] The Pinehurst Green Grid, a second neighborhood scale reconstruction project, is in the construction phase.

The High Point Redevelopment is under construction and is one of the city's largest recent redevelopment efforts. Forty blocks will be redeveloped in a 129-acre mixed income housing area to eventually contain 1,600 units. The project area is 65% impervious and densely populated. The NDS design will incorporate approximately 22,000 feet of vegetated and grassy swales and is scheduled for completion in 2007.[103] In 2004, the NDS program received an Innovations in American Government Award from Harvard University's Kennedy School of Government. The award, accompanied by a $100,000 grant, highlights effective government projects.[104]

In addition to the NDS design concept, the city of Seattle also promotes rainwater harvesting. The 327,000 square foot King Street Center uses three 5,400 gallon tanks to collect rainwater from the building's roof. The collected rainwater is filtered and pumped through a dedicated piping system for toilet flushing and landscaping needs. The system provides 1.4 million of the approximately 2.2 million gallons—60%—of the toilet flushing water needed annually and reduces the stormwater discharged from the building by the same amount.[105]

In March 2005, SPU began the second phase of a subsidized rain barrel and cistern program intended to distribute the rainwater-harvesting devices throughout the city. The first phase of the program distributed 1,500 rain barrels at a reduced rate to private homeowners.[106] In addition, SPU initiated the Freemont rainwater harvesting study on March 1, 2005. The project, conducted with the cooperation of 10 single-family residential homeowners in the combined sewer area, is studying the effectiveness of slowly draining cisterns to retain peak stormwater runoff. The costs of the program will be compared to the costs of detaining an equal volume of wastewater in centralized vaults before being metered out to the municipal wastewater treatment plant. The project will also test the acceptance and effectiveness of rain gardens in the residential area.[107]

Another approach to mitigating stormwater runoff is green roofs. The city of Seattle has installed four green roofs over the past several years. In order to evaluate the ability of these green roofs to reduce stormwater runoff, the city is embarking on a multiple-year data collection initiative. The goal is to provide information that can be used to modify the city's stormwater code and potentially provide incentives to encourage the construction of green roofs in both public and commercial applications.

Seattle has also begun an urban forestry initiative to reduce stormwater runoff. A master plan for planting trees on city streets implemented in 1999 established a goal of increasing the city's tree canopy from 27% of city surface area to 40%.[108]

For Additional Information

Seattle Public Utilities Natural Drainage Systems: http://www.ci.seattle.wa.us/util/About_SPU/Drainage_&_Sewer_System/Projects/Natural_Drainage_Systems/NATURALDR_20031203121352.asp

Toronto, Ontario, Canada

A long-term "Water Pollution Solution" focuses on green infrastructure

Population: 2.5 million

Type of green infrastructure used: green roofs; downspout disconnection/rainwater collection; wetlands, riparian protection, or urban forests

Program elements: established municipal programs and public funding

Covering 240 square miles along the shores of Lake Ontario, Toronto is the largest city in Canada,

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with 2.5 million residents. The entire Toronto metropolitan region has a population of 4.5 million people spread out over 560 square miles. This vast urban expanse is also home to an extensive infrastructure network with 2,800 miles of storm sewers and over 2,600 outfalls.[109] Like the Great Lakes cities in the United States, Toronto's urban stormwater is a leading cause of water pollution in Lake Ontario and its tributaries and necessitates expensive investments directed toward CSO mitigation and stormwater management. Toronto and its surrounding watersheds are part of an Area of Concern under a Remedial Action Plan (RAP), a policy designation derived from amendments to the 1972 bilateral Canada-U.S. Great Lakes Water Quality Agreement. The Toronto RAP covers Toronto Bay and six watersheds: Etobicoke Creek, Mimico Creek, Humber River, Don River, Highland Creek, and Rouge River. Goals include the restoration of drinkable, fishable, swimmable, and aesthetically pleasing water and habitat areas.[110] The RAP explicitly highlights pollution from urban stormwater runoff as one of the primary sources of ecosystem degradation to this region.[111]

Faced with the difficult challenge of limiting stormwater runoff and pollution, Toronto has developed a unique policy approach for managing stormwater with the goal of eliminating adverse effects of wet weather flows and achieving measurable improvement in ecosystem health within the watershed.[112] In July 2003, Toronto's City Council approved a 25-year stormwater plan, the Water Pollution Solution, formerly called the Wet Weather Flow Management Plan. This plan is a comprehensive strategy to deal with surface water quality and quantity, sewage overflows, and habitat protection. Toronto's approach includes increasing traditional methods of stormwater storage capacity and improving conveyance structures, but it also includes greener approaches, especially for some short-term solutions.

Toronto's Four Principles of Stormwater Management

The Wet Weather Plan is explicitly based on four innovative principles for stormwater management: (1) recognizing rainwater and snowmelt as a valuable resource; (2) managing wet weather flows on a watershed basis; (3) implementing the hierarchy of wet weather practices beginning with "source," then "conveyance," and lastly, "end-of pipe" solutions; and (4) educating communities and involving the public.[113] Capital costs for the program are estimated to be around $800 million; operational and maintenance costs are expected to be around $13 million annually.[114] The city has earmarked $200,000 annually for community projects that contribute to the Water Pollution Solution.[115]

Toronto's program involves a significant downspout disconnection effort to prevent runoff from entering both the stormwater and combined sewer systems. The city will disconnect residences for free and provide splash guards or rain barrels to protect residential foundations. As of June 2000, Toronto estimated that approximately 20,000 homes had been disconnected.[116] Downspout disconnection efforts have been targeted at areas that either experience localized flooding or have a significant runoff impact on Toronto's beaches.

Toronto has made extensive use of the natural filtering and flood control capacity of wetlands and vegetated areas to help achieve the goals of the RAP. The city has embarked on wetland and stream restoration programs to facilitate stormwater management that will achieve cleaner streams and enhanced wildlife habitat. Toronto is committing $106 million for the capital costs to restore over 40 miles of streams, and expects operation and maintenance costs for this stream restoration to be roughly $500,000 per year.[117] Several wetlands have already been restored, including Chester Springs Marsh, a 7.5 -acre wetland restored on the site of an old landfill. This particular wetland was restored specifically to prevent nutrients and pollutants from reaching the Don River. Wetlands originally performed this filtering function before the Don was channeled in the late 19th century.[118] The recovered area has witnessed a substantial increase in the number of species that visit the site, spurring city plans to build and restore several more wetlands.

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Toronto's green roofs. Toronto has also become a center for green roof technologies. While not explicitly part of the stormwater plan, the green roof initiatives are expected to have an impact on stormwater mitigation. Based on an Environment Canada study, the nonprofit industry association Green Roofs for Healthy Cities estimates that greening 6% of Toronto's roofs would cost about $36 million over 10 years and would retain almost 1 billion gallons of stormwater annually.[119] In 2002, several Canadian organizations announced the Green Roof Infrastructure Demonstration Project, a public-private partnership that will fund more than $800,000 in green roof costs.[120]

Toronto currently has over 100 green roofs, including an intensive installation on the Toronto City Hall and an extensive installation on the gymnasium roof of the Eastview Neighbourhood Community Centre.[121] The National Research Council's Institute for Research in Construction installed a monitoring system on the Eastview roof to measure both quality and quantity of stormwater runoff.[122] Early findings from an upcoming study to investigate the potential for widespread green roof installations in Toronto (*The Municipal Cost Savings Benefits of Green Roofs*) indicate 57% average annual flow reductions from the Eastview green roof plots compared to traditional roofs.[123] The plots also showed peak flow rates of 25% to 60% during summer and 10% to 30% in late fall of those measured from conventional roofs.[124] These preliminary monitoring results were achieved before vegetation had reached maturity.

A Ryerson University study evaluated the municipal level benefits and costs of wide-scale implementation of green roofs in Toronto. For the study, a Geographic Information Systems (GIS) database was used to model and aggregate environmental benefits and a methodology was developed to monetize these benefits. The study assumed that green roofs would be installed on all city flat roofs more than 3,750 square feet and would cover at least 75% of the roof. Using this assumption, more than 12,000 acres of green roofs, representing 8% of the total land area in the city, could be installed in Toronto.[125]

The study findings estimated nearly $270 million of municipal capital cost savings and more than $30 million in annual savings with this number of installed green roofs. Five primary benefits were quantified in the study: (1) reduced stormwater flows into the separate storm sewer system, (2) reduced stormwater flows into the combined sewer system, (3) improved air quality, (4) mitigated urban heat island effects, and (5) reduced energy consumption. The study estimated more than $100 million in stormwater capital cost savings, $40 million in CSO capital cost savings and nearly $650,000 in CSO annual cost savings.

The researchers anticipate that the only costs to the city will be those to promote green roofs, although the city will also likely incur costs to monitor design and construction of the green roofs. The cost to retrofit existing roofs with green roofs is likely to be borne by private industry during the normal maintenance cycle. Recent green roof projects in Canada have averaged $6 to $7 per square foot, suggesting a total cost of $3 billion to $3.7 billion for 12,000 acres of green roofs.[126,127] While the total cost to install the green roofs is large, it would be spread across numerous building owners and developers. The additional cost of a green roof for the minimum area roof in the study, 3,750 square feet, would be $22,000 to $27,000.

For Additional Information

City of Toronto—Protecting Water Quality: http://www.toronto.ca/water/protecting_quality/index.htm

Vancouver, B.C., Canada

Creative green design for city parks and roads

Population: 600,000

Type of green infrastructure used: green roofs; rain gardens, vegetated swales, and landscape; permeable pavement; wetlands, riparian protection, or urban forests

Program elements: established municipal programs and public funding

Situated 25 miles north of the U.S.-Canadian border and bounded on three sides by water,

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Vancouver is the third largest city in Canada. While the city covers an area of 44 square miles, the entire metropolitan area is nearly 1,100 square miles and home to approximately 2 million people.[128] Almost 90% of the 44 square mile city center is developed.[129] Often recognized as one of the best cities in the world in which to live, Vancouver was ranked third in a 2005 survey assessing the quality of life in 215 cities worldwide.[130] However, even one of the world's most highly regarded cities is not immune to the effects of urbanization and stormwater runoff.

Vancouver sits in the Fraser River Valley, the most productive salmon fishery in the world. An estimated 800 million juvenile salmon from five different species migrate along the Fraser River each year. Eighty additional species of fish and 79 species of birds rely on the Fraser River and its estuary for critical habitat and migratory routes.[131,132] With Rocky Mountain snow melt composing the majority of the source water in Vancouver, good water quality has historically been an attribute of Vancouver area watersheds. But within the past half century, urbanization and stormwater have begun to degrade the area's waters. Combined sewers constitute more than 60% of the city's collection system, and combined sewer overflows and separate stormwater runoff have been identified as leading causes of local water pollution.

Creating More Permeable, Pedestrian-Friendly Green Space

The city has begun using green infrastructure to address a range of environmental problems. Because Canada is a signatory of the Kyoto Protocol, many of Vancouver's green infrastructure efforts are focused on climate and air benefits, but some are specifically targeted at stormwater. To address stormwater runoff from roadways, Vancouver has initiated a number of innovative street design projects as part of the city's Greenways Program. The program is focused on introducing pedestrian-friendly green space into the city to connect trails, environmental areas, and urban space. This greenway initiative has also developed innovative strategies to manage roadway stormwater. One of these projects is the Crown Street redevelopment project.

Prior to the redevelopment project, stormwater runoff from Crown Street flowed untreated into the last two remaining salmon-bearing creeks in Vancouver.[133] In 2001, residents along a 1,100-foot block of the street petitioned the city to rehabilitate the deteriorating street using conventional curb and gutter. In response, the city recommended a naturalized streetscape

Crown Street just after construction and prior to swale planting.

Photo courtesy of City of Vancouver Greenways Program

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Vancouver's first Country Lane installed in 2002.
Photo courtesy of City of Vancouver Greenways program

design modeled after the Seattle SEA Street design. The naturalized design narrowed the impervious street width from 28 feet to 21 feet (certain one-way sections of the road were narrowed to 10 feet) and incorporated roadside swales with structurally supported grass to collect and treat stormwater through infiltration. The redesigned street will retain 90% of the annual rainfall volume on site; the remaining 10% of runoff will be treated through a system of vegetated swales before discharging.[134,135] Construction was completed in early 2005 at a cost of $707,000.[136] A conventional curb and gutter design would have cost approximately $364,000; however, because Crown Street was the first of its kind in the city, an estimated $311,000 was spent on additional aesthetic design features and consultant fees that would not be necessary for future projects. Eliminating the project-specific additional costs would bring the cost of retrofitting existing streets with naturalized street design projects in line with conventional drainage systems; however, the city estimates that installing naturalized street designs in new developments will be less expensive than conventional drainage systems.[137,138] In cooperation with the University of British Columbia, Vancouver will monitor the street for the next five years to assess the quality of stormwater runoff. Results will be compared with a nearby curb and gutter street to confirm modeling projections.

The Country Lane Program. Another example of green design within Vancouver's Streets Department is the Country Lane Program to replace traditional highly impervious alleys and lanes with a more permeable alternative. Asphalt lanes are replaced with two concrete or gravel strips surrounded by structural grass (structural grass is supported by a grid and soil structure that prevents soil compaction and root damage). Connections from the country lane to residences are constructed of permeable materials, including paving blocks, broken concrete sections, and structural grass or gravel. Three Country Lanes were installed as a pilot project to introduce green space and encourage on-site infiltration of stormwater. The initial cost of a Country Lane was approximately $71 per linear foot, which is four times greater than the typical alley cost of $18 per foot.[139,140] The city estimates that the cost of a Country Lane in 2006 will decrease to $30 per linear foot.[141,142]

The city is also installing infiltration bulges along roadways to collect and infiltrate street stormwater runoff. These installations are being done in conjunction with the Greenways program's efforts to improve

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Infiltration bulges capture and infiltrate stormwater before it reaches the collection system.

Photo courtesy of City of Vancouver Greenways program

transportation corridors by making them more pedestrian friendly. The city is extending curbs at intersections out into the street to lessen the crossing distance and improve the line of sight for pedestrians. The city's stormwater catch basins are located at roadway intersections; when the bulges were constructed, the city was initially relocating these catch basins outside of the bulges. Now, in certain instances, the Streets Department is installing permeable soils and vegetation within these bulged sections to introduce green space and collect stormwater. The catch basins are left in place within the bulges and any stormwater that does not infiltrate into the soil overflows into the stormwater system. This new design not only reduces the amount of stormwater runoff, but is also less costly for the city. Because the stormwater infiltration bulges are installed in conjunction with planned roadway improvements, the only additional costs associated with the stormwater project are the costs of a steel curb insert to allow stormwater to enter the bulge and additional soil excavation costs. These additional costs are more than offset by the $2,400 to $4,000 cost of relocating the catch basins. To date, the city has installed nine infiltration bulges, three of which are maintained by local volunteers as part of a Green Streets program where local residents adopt city green space.[143]

Vancouver's green roofs. In addition to the street initiatives, Vancouver has also used green infrastructure in other applications. Green roofs have been used extensively in the greater Vancouver area, with more than 30 installations.[144] One of the best known of these roofs is installed on the Vancouver Public Library's Central Branch building. The 20,000 square foot green roof was installed in 1995 and planted as an artistic representation of the Fraser River. Monitoring of the roof during an eight-month period in 2003 and 2004 showed a 48% reduction in the volume of stormwater runoff from the roof when compared to a conventional roof. Peak stormwater flows were also reduced between 5% and 30% during the region's wet winter months; in the drier summer, peak flows were reduced more than 80%. As with other green roofs, peak reductions were the greatest for smaller, less intense storms and least for larger rain events.[145]

Biofiltration in Vancouver's parks. Vancouver has designed and installed two biofiltration systems, utilizing natural and reclaimed green space to treat stormwater runoff. One hundred sixty-seven acres of neglected, largely paved land were reclaimed and re-greened to create Hastings Park. The park provides Vancouver residents with green space in

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a highly urbanized section of the city. Within the park is the biofiltration system referred to as the Sanctuary. This system receives stormwater runoff from a 300-acre residential area to the south of the park and uses natural biological processes to treat the runoff prior to discharging it to the Burrard Inlet.[146] The biofiltration pond was designed in conjunction with the sewer separation project that installed a new separate stormwater collection system in the neighborhood bordering the park. The Sanctuary also provides additional aesthetic and environmental benefits by serving as valuable habitat for wildlife and birds.[147,148]

A second biofiltration system is used in Stanley Park, a 1,000-acre urban park in Vancouver. The park is bisected by the Stanley Park Causeway, a major commuter route. Prior to the construction of the biofiltration wetlands, causeway runoff flowed untreated into the Lost Lagoon, Beaver Lake, and adjacent forests. To manage and treat this stormwater, runoff was directed to a wetland constructed within the Lost Lagoon. The wetland uses natural filtration and biological processes to treat the stormwater before it is discharged to the lagoon. The innovative stormwater wetland was built to harmonize with the existing green space of the park and to provide habitat for plants and wildlife. Areas of the wetland not open to the public provide necessary space for birds to remain undisturbed by human activity.[149,150]

For Additional Information

City of Vancouver Streets Design—Environmentally Sustainable Options: http://www.city.vancouver.bc.ca/engsvcs/streets/design/enviro.htm#lanes

Washington, D.C.

Using green infrastructure to combat years of river pollution

Population: 563,000

Type of green infrastructure used: green roofs; rain gardens, vegetated swales, and landscape; permeable pavement

Washington, D.C., sits at the confluence of the Potomac and Anacostia rivers and is home to a third, Rock Creek. These rivers in the nation's capital have historical and symbolic importance. The Potomac River is designated an American Heritage River and is often synonymous with the seat of the country's federal government. Unfortunately, Washington's rivers are also significantly affected by the large amount of urbanization surrounding them. Approximately 65% of the District is covered with impervious surfaces.[151] Development and urbanization have taken a toll on the natural features within the city; over the past 30 years, the District has lost 64% of its areas with heavy tree cover and experienced a 34% increase in stormwater runoff.[152]

Cleaning Up Washington's Most Polluted Waters Through Green Infrastructure

One-third of the city is served by a combined sewer system dating to the beginning of the 1900s and earlier. Estimated annual CSO discharges to the city's three rivers are 2.5 billion gallons.[153,154] The Anacostia River, which receives 60% of the CSO discharges, is one of the most polluted in the nation. Fifty percent of brown bullhead catfish collected for study from the river had cancerous liver tumors and approximately 25% had cancerous skin tumors.[155] The city's approved long-term CSO control plan (LTCP) will cost approximately $1.9 billion and focuses primarily on a deep tunnel system and sewer separation, but also recognizes the importance of incorporating green infrastructure within the city.

Low Impact Development at the Navy Yard on the Anacostia River. The Washington Navy Yard, along the banks of the Anacostia River, has been a notorious source of the river's water quality problems. The base has been subject to decades of military pollution and has been a main source of toxic water pollution. In 2001, the Navy Yard installed a number of green infrastructure pilot projects to manage stormwater runoff. Downspouts were disconnected and directed to rain barrels, and permeable pavement, rain gardens, and tree box filters were installed. These

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The first commercial high-elevation green roof in Washington, DC, will be monitored to determine how much it lowers air temperature.
Photo courtesy of the Casey Trees Endowment Fund

retrofits cost approximately $500,000 and are providing on-site management of stormwater previously directed to the combined sewer system. Monitoring of the site is ongoing and is determining the stormwater volume reductions, stormwater discharge frequency, and water quality improvements.[156]

Washington's green roofs. Washington's first commercial high-elevation green roof was installed in 2004. The 3,500 square foot green roof was a collaborative effort between two nonprofit organizations and the real estate company that owns the building. The air temperature of the green roof is being monitored and compared to the temperature of a 1,000 square foot section of the roof that was not converted.

Installing green roofs across the District is projected to provide a significant reduction of stormwater runoff and CSO volume. Based on computer modeling by Limno-Tech, Inc., Casey Trees has measured the effects of installing 20 million square feet of green roofs, 20% of the roof area for all city buildings over 10,000 square feet, over the next 20 years. Modeling results based on this coverage scenario show a citywide reduction in runoff of 1% and CSO discharges of 15%. The green roofs are anticipated to retain and store 430 million gallons of rainwater annually and increase proposed deep tunnel storage capacity by 30 million gallons because of the decrease in rooftop runoff.[157]

Incorporating green infrastructure into DC's CSO and stormwater programs. The District's efforts with green infrastructure have not progressed as far as those in other case-study cities. However, a convergence of events presents the city with an opportunity to integrate green approaches into its overall stormwater and CSO control efforts. The 20-year implementation schedule to complete the LTCP provides an ideal window to incorporate green infrastructure into the District's pollution control plans. The District of Columbia Water and Sewer Authority (WASA), the regional agency responsible for implementing the LTCP, has allocated $3 million of the overall LTCP budget for advocating and assisting with green infrastructure retrofits.[158] Major redevelopment is also planned along the Anacostia River to complement the construction of the city's new baseball stadium.

Some of the most significant barriers to incorporating green infrastructure, or any stormwater or CSO controls, into existing urban areas are the cost and challenge of retrofitting these systems into built-out and space-constrained areas. The LTCP work and

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Anacostia redevelopment lower these barriers because of the large capital investment that will accompany the projects and substantial overhaul and upgrade of associated infrastructure. These projects offer the opportunity to integrate green infrastructure from the start and take advantage of the associated cost savings. The city will also have the opportunity to learn from several major cities that have been successfully integrating green infrastructure into stormwater and CSO mitigation plans.

A number of the policy recommendations described earlier in this report could be used effectively to encourage green infrastructure. The District currently charges a nominal stormwater fee to its residents and commercial properties located in the separate sewer area. The stormwater fee could be restructured, similar to Portland, Oregon's model, to allow a rate reduction for those properties that install green infrastructure or manage stormwater on site. To be an adequate incentive, the current annual stormwater fee would need to be significantly increased. A similar system could be adopted in the combined sewer area as well. Private grant programs, like the Chesapeake Bay Foundation's green roof grant program, currently exist as an incentive to install green infrastructure in the city. The District should complement these efforts with a city-administered financial assistance program for green infrastructure.

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Storm Water Panel Recommendations to the California State Water Resources Control Board

The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities

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Background

The NPDES storm water permit program came into being as a result of the 1987 amendments to the federal Clean Water Act and its implementing regulations. In California, the State Water Resources Control Board (State Water Board) and the nine Regional Water Quality Control Boards (Regional Water Boards) implement the NPDES storm water program.

The Clean Water Act amendments, Section 402(p) require that discharges of storm water from large and medium municipal separate storm sewer systems (MS4s) and discharges of storm water associated with industrial activities be in compliance with NPDES permits. MS4 permits require that the discharge of pollutants be reduced to the maximum extent practicable (MEP). Discharges associated with industrial activities, were required to meet the technology based standards of best available technology economically achievable (BAT) or best conventional pollutant control technology (BCT), and to meet water quality standards.

In 1990, USEPA promulgated regulations (40 CFR Part 122.26) for the NPDES storm water program. These regulations clarified what industrial activities were subject to storm water permit. Construction that resulted in a land disturbance of five or more acres was included as an industrial activity subject to NPDES storm water permit. The regulations also delineated what was to be included in permit applications and the programmatic elements that were to be in a permit and storm water management program for MS4s or storm water pollution prevention plan for industrial activities.

California's Permits

In 1990, MS4 permits were issued to Santa Clara County by the San Francisco Bay Regional Water Board and to Los Angeles County by the Los Angeles Regional Water Board. These permits were appealed to the State Water Board. The primary basis of the appeals was the lack of numeric limits in the permits. The entities that brought the appeals argued that the permits needed to include numeric limits, as the discharges of pollutants must not only be reduced to the MEP, but they must also meet water quality standards. The State Water Board, in hearing these appeals, determined that it was not feasible at the time to develop numeric limits for MS4 permits, and that water quality standards could and should be achieved through the implementation of best management practices (BMPs). Since this ruling, the Regional Water Boards have typically not included numeric limits in storm water permits.

The State Water Board has adopted NPDES General Permits for the Discharge of Storm Water Associated with Industrial Activities and for the Discharge of Storm Water Associated with Construction Activities. Both of these permits contain language stating that developing numeric limitations is infeasible.

Court Decisions

In addition to these actions on MS4 permits at the State level, there have been a number of rulings from the federal courts regarding the NPDES Storm Water program.

One of the most significant is from the federal court, 9th District Court of Appeals from 1999. In its published opinion on Defenders of Wildlife vs. Browner, the Court held that MS4 permits need not require strict compliance with water quality standards. Rather, compliance was to be based upon the MEP standard. However, the permitting authority (the State Water Board/Regional Water Boards for California) could at their option require compliance with standards. The State Water Board through the permit and appeals process has in fact required that the discharges from MS4s meet water quality standards, but has stated that compliance with numeric standards can be achieved through the implementation of BMPs in an iterative fashion.

The Browner decision also found that discharges of storm water associated with industrial activities must be in strict compliance with water quality standards.

In 2004 the State Water Board conducted a public hearing on a draft General Industrial Storm Water permit. This draft permit met with significant opposition from non-government or non-industrial organizations (NGOs) due to the absence of numeric limits. Staff revised the draft permit to include the benchmarks contained in the USEPA multi-sector general permit. This change resulted in strong opposition from the regulated community.

The concerns that have been raised by the NGOs and the regulated community are similar, though they do not necessarily agree on the best way to address them. Both believe that permitting has become overly complex, and that it is extremely difficult, if not impossible to objectively determine if a facility, operation or municipality is in compliance with its permit requirements. The NGOs argue that requiring storm water permittees to comply with numeric effluent limits will result in an easier way to measure compliance. The regulated community agrees, to a degree, but they argue that it is not simply a matter of selecting a number that is suitable for a POTW or industrial waste discharge. Due to the unique nature of storm events and storm water discharges, any numeric limit that is placed in a storm water permit must take into consideration the episodic nature of storm events and be truly representative of storm water discharges. In addition, the regulated community has argued that there are going to be pollutants in storm water discharges that did not originate in the MS4 (run on) or that they do not have the means to control, and therefore should be given special consideration.

In response to these arguments, State Water Board directed staff to convene a panel of storm water experts to examine the feasibility of developing numeric

limits for storm water permits. Specifically, this panel of experts was asked to consider the following:

> "Is it technically feasible to establish numeric effluent limitations, or some other quantifiable limit, for inclusion in storm water permits? How would such limitations or criteria be established, and what information and data would be required?"
>
> "The answers should address industrial general permits, construction general permits, and area-wide municipal permits. The answers should also address both technology-based limitations or criteria and water quality-based limitations or criteria. In evaluating establishment of any objective criteria, the panel should address all of the following:
>
> (1) The ability of the State Water Board to establish appropriate objective limitations or criteria; (2) how compliance determinations would be made; (3) the ability of dischargers and inspectors to monitor for compliance; and (4) the technical and financial ability of dischargers to comply with the limitations or criteria."

Staff invited 10 individuals from the academic and scientific community to participate on the panel. Of the 10, eight agreed to participate. These eight met in a public session on September 14, 2005 and heard presentations from the regulated and NGO communities. They also heard comments from the public at large. They met again on September 15, 2005 to discuss the public comments and to begin to formulate a response. It was also decided at this meeting that they would form sub-committees to address municipal (MS4), industrial and construction discharges separately. These sub-committees worked on drafts statements for each of these, circulating them over the course of a number of months.

The panel met again in private session on April 3 and 4, 2006. The purpose of these meetings was to address unresolved issues and to develop the final response to the State Water Board. It was also decided to combine the three working statements into one Statement of Findings. The following discussion is the panel's findings and is broken into three program element areas: municipal, construction, and industrial.

Panel's Findings on Feasibility of Numeric Effluent Limits Applicable to Municipal Activities

Municipal Observations

1. The current practice for permitting, designing, and maintaining municipal stormwater treatment facilities (called BMPs herein) on the urban landscape does not lend itself to reliable and efficient performance of the BMPs because:

    - Permitting agencies, including EPA, States, and local governments, have rarely developed BMP design requirements that consider the pollutants and/or parameters of concern, the form(s) that the pollutants or parameters are in, the hydrologic and hydraulic nature of how they pollutants and flow arrive, and then the resulting unit processes (treatment and/or flow management processes) that would be required to address these pollutants or parameters.
    - The permitting agencies generally are not accountable for the performance of the BMP, and thus give much leeway to the developer with respect to the type of BMPs to be constructed, and to the details of the design, although some states do have detailed design standards and have conducted performance tests to identify acceptable devices for their area.
    - The developer is not responsible in most all cases for the performance of the BMP, so the treatment facilities are designed to minimize the cost and/or area of the facility and/or ease of permitting, not maximize the pollutant removal efficiency and/or flow management of the BMP
    - Because BMPs are not held to any, or very few, long-term performance criteria, they are typically not maintained except for aesthetic purposes. Very few stormwater agencies are responsible for BMP maintenance on private property, and public facilities are maintained mostly in response to clogging and/or resultant drainage or aesthetic problems. Even for stormwater agency facilities, maintenance is often limited.

2. The principal reasons for the failure of BMP performance is improper BMP selection, design and/or lack of maintenance.

    - The California BMP Handbooks and other local requirements leave too much of the BMP selection and design to the discretion of the designer, and thus do not address many if not all of the receiving water quality issues

- BMPs need to be *designed to facilitate maintenance*; this is rarely done because it costs the developer money and the BMP designer is rarely responsible for the maintenance.

- Given the amount of debris in urban runoff, and the fact that the hydraulic capacity of many BMPs may be exceeded several to many times per year, BMPs require more maintenance than other types of stormwater control facilities. Since urban BMP maintenance is generally left to untrained homeowner associations and maintenance personnel for commercial properties, inadequate maintenance is a near certainty. Even stormwater agencies often do not have and/or apply the resources necessary to maintain agency owned BMPs.

3. Improvements in the design of municipal BMPs, including residential and commercial as well as municipally owned facilities are necessary to ensure better performance (i.e. sizing, geometry, inlet and outlet design, etc.) and to specifically target receiving water quality issues.

<u>The Problem with Existing Effluent Limit Approaches</u>

Effluent limit approaches usually focus only on conventional water quality constituents that may not be solely or at all responsible for the receiving water beneficial use impairments in urban receiving waters. The important stressors that affect many use impairments can include one or more of the following and may vary in importance from system to system:

- The effect of increased flows and/or volumes (i.e. hydromodification) that can lead to stream channel erosion/sedimentation with resulting habitat destruction

- Sediment contamination (such as enrichment of urban stream sediments with fine-grained heavily polluted particulates; large organic debris masses causing low sediment DO; settled bacteria causing large bacteria gradients with sediment depth etc.)

- Impaired aesthetic value (caused by gross floatables, noxious sediments, etc.)

- Unsafe conditions (caused by dangerous debris, highly fluctuating stream flows and stages, etc.)

- Dissolved and suspended pollutants that are bioavailable in the water column and/or result in downstream sediment contamination

- Elevated temperatures from urban heating effects on runoff and on open conveyances and permanent pool BMPs

It is very difficult to determine specific causative agents or the level of control needed, for a specific beneficial use impairment in a receiving water body. The *Stormwater Effects Handbook: A Tool Box for Watershed Managers, Scientists, and Engineers* (Burton, G.A. Jr., and R. Pitt, ISBN 0-87371-924-7. CRC Press, Inc., Boca Raton, FL. 2002. 911 pages) was written to be used as a guide for stormwater managers to identify their local receiving water problems and to assist in identifying the causative factors. The methods described would need to be applied to a specific area or region to obtain an understanding of local conditions and problems. Although expensive, comprehensive investigations such as these should be considered an investment to help minimize wasteful expenditures due to the application of inappropriate control practices in a watershed.

Monitoring for enforcement of numeric effluent limits would also be challenging. While spot checks could be made at some of the many outfalls in an area, there is wide variation in stormwater quality from place to place, facility to facility, and storm to storm. Coefficients of variation approaching 1 or higher are not uncommon and there are few factors that can be used to significantly reduce this variation. Analysis of the National Stormwater Quality Database indicates that geographical location and land use are the most important factors affecting stormwater quality for most constituents. Some are also affected by the antecedent dry period before the rain and more highly developed watersheds (containing large fractions of impervious areas) often show elevated “first-flush” concentrations in the first portion of the storms for some, but not all pollutants. Since the storm-to-storm variation at any outfall can be high, it may be unreasonable to expect all events to be below a numeric value. In a similar circumstance, there are a number of storms each year that are sufficiently large in volume and/or intensity, to exceed the design capacity volume or flow rates of most BMPs. Assessing compliance during these larger events represents yet another challenge to regulators and the regulated community.

Technical Issues

Even for conventional pollutants, there presently is no protocol that enables an engineer to design with certainty a BMP that will produce a desired outflow concentration for a constituent of concern. A possible exception is removal of Total Suspended Solids in extended detention basins, and some types of media filters. The typical approach for evaluating BMP pollutant removal efficiency has been *percent removal*; but observed removal efficiencies vary greatly from facility to facility and it has been demonstrated that percent removal varies directly with the inflow concentration.

Few, if any, BMPs are designed using the first principles laws of physics, chemistry and/or biology for pollutant removal and/or flow-duration control. It will

take a substantial research effort, including data gathering on well-designed BMPs, to develop design criteria for the removal of pollutants with confidence intervals that enable us to make reliable estimates of the median and variance of the effluent concentrations to be expected from the various types of BMPs. Until this is done, it will be very difficult to assign legally enforceable numerical effluent limitations to any particular BMP.

Drawing upon the body of knowledge that currently exists regarding pollutant removal efficiency, it is possible to estimate mean effluent concentrations and variances for a number of constituents for different types of BMPs, albeit not in a legally enforceable sense. Effluent concentration distributions for a number of BMPs are available in the International BMP Database (www.bmpdatabase.org) from more then 250 studies throughout the US. The following outlines key issues that have been identified regarding the technical feasibility of setting objective criteria for both existing areas and new or redeveloping areas:

- Effluent concentration estimates could be made for a given constituent and a particular BMP from a larger number of BMPs than available in the BMP Database using literature values of percent removal and local or national data on stormwater runoff EMC data. However, the results from this work would be significantly less reliable then the BMP Database data as it could be biased if the influent concentrations for the studied BMP types did not match general urban runoff.
- Designing the facility more rigorously with respect to the physical, chemical and biological processes (e.g. unit processes) that are active in the BMP would give confidence that the BMP would perform at least as well, if not better than the average performance determined from the literature. A WEF/ASCE task force is currently updating their Urban Runoff Quality Management Manual of Practice; design guidance of BMPS will make better use of the physical, chemical, and biologic processes taking place in the BMP before, during and after a storm event. This manual will build upon recent research efforts employing a unit process based approach for BMP design and selection. These research efforts were supported by the Water Environment Research Foundation (WERF) and the National Cooperative Highway Research Program (NCHRP).
- A BMP *designed* and *constructed* according to a set of criteria described above, could be ***presumed*** to deliver an effluent with a mean constituent concentration and variance similar to the performance numbers developed from the literature ***if it is properly maintained***. Enforcement would comprise periodic inspection of the facility using a checklist of items to be inspected. While not an effluent limit, this seems practical and quantifiable.

- Most all existing development rely on non-structural control measures, making it difficult, if not impossible to set numeric effluent limits for these areas because little is known about the quantity and quality performance of non-structural controls. However, certain development characteristics in some existing development areas that minimize the amounts of impervious areas in a drainage area have been shown to be quite effective in reducing adverse hydromodifications in the receiving waters, and should be encouraged.

Municipal Recommendations

It is not feasible at this time to set enforceable numeric effluent criteria for municipal BMPs and in particular urban discharges. However, it is possible to select and design them much more rigorously with respect to the physical, chemical and/or biological processes that take place within them, providing more confidence that the estimated mean concentrations of constituents in the effluents will be close to the design target. Moreover, with this more rigorous design and an enforceable maintenance program, it can be presumed that these facilities will continue to deliver effluent qualities that are reasonably close to the design effluent concentrations over the life of the facility. And if proper maintenance is performed (enforced), the facilities can be expected to perform throughout their design life at the same or better efficiency as when newly constructed. Depending on the pollutants and parameters of concern and BMP choices, it is very likely that treatment trains of structural BMPs will be required in many cases.

For catchments not treated by a structural or treatment BMP, setting a numeric effluent limit is basically not possible. However, the approach of setting an "upset" value, which is clearly above the normal observed variability, may be an interim approach that would allow "bad actor" catchments to receive additional attention. For the purposes of this document, we are calling this "upset" value an ***Action Level*** because the water quality discharged from such locations are enough of a concern that most all could agree that some action should be taken. Action Levels could be developed using at least three different approaches. These approaches include: 1) consensus based approach; 2) ranked percentile distributions; 3) statistically-based population parameters.

The consensus-based approach would be to agree upon effluent concentrations that all parties feel are not acceptable. For example, most parties would likely agree that an average concentration of dissolved copper above 100 ug/l from an urban catchment would not be acceptable. This would be an Action Level value that would trigger an appropriate management response. This approach may not directly address the issue of establishing numeric effluent criteria and achieving desired effluent quality, but the consensus-based approach would ensure that the "bad actor" watersheds received needed attention.

The ranked percentile approach (also a statistical approach) relies on the average cumulative distribution of water quality data for each constituent developed from many water quality samples taken for many events at many locations. The Action Level would then be defined as those concentrations that consistently exceed some percentage of all water quality events (i.e. the 90th percentile). In this case, action would be required at those locations that were consistently in the outer limit (i.e. uppermost 10th percentile) of the distribution of observed effluent qualities from urban runoff.

The statistically based population approach would once again rely on the average distribution of measured water quality values developed from many water quality samples taken for many events at many locations. In this case, however, the Action Level would be defined by the central tendency and variance estimates from the population of data. For example, the Action Level could be set as two standard deviations above the mean, i.e. if measured concentrations are consistently higher than two standard deviations above the mean, an Action situation would be triggered. Other population based estimators of central tendency could be used (i.e. geomean, median, etc.) or estimates of variance (i.e. prediction intervals, etc.). Regardless of which population-based estimators are used (or percentile from above), the idea would be to identify the [statistically-derived] point at which managers feel concentrations are significantly beyond the norm.

The ranked percentile and population-based estimators are highly dependent upon the data sets used to calculate them. There are a number of options that were considered by the Panel, but ultimately they were broken into two distinct categories. The first category was for new development/redevelopment and the second was for built out urban environments. For new development/redevelopment, the panel recommends using the data set associated with the international BMP database (www.bmpdatabase.org). This data set represents the variety of water quality from the most up to date, best conducted and reported BMP studies. The database effort does not limit itself to BMPs types or designs; it focuses on technically sound monitoring studies and reporting information. Therefore there could be some screening of studies to those thought to be well designed BMPs to then develop effluent quality distributions and statistics on performance. Certainly, there is no expectation that urban stormwater managers could improve water quality beyond what would be reported in this dataset.

In built-out urbanized environments, there are greater opportunities to examine various data sets for setting Action Levels. For the Panel, these opportunities were a function of spatial scale. The first opportunity would be at the local scale. Some urban stormwater monitoring programs have been in existence for 10 years or longer. Examples include the Los Angeles County Department of Public Works, City of Sacramento, Orange County, San Diego County, amongst others. Using permit specific data sets may make sense if issues of climatic variability or

localized geomorphology are important. The next scale would be to combine these California municipal permit monitoring data sets, especially if lack of data for specific constituents of concern in any one location or region is an important issue. The largest scale would be the National Stormwater Quality Database (NSQD) from municipal monitoring programs across the nation (http://unix.eng.ua.edu/~rpitt/Research/ms4/Paper/Mainms4paper.html). This data set includes monitoring data from urban areas such as residential, commercial, industrial, freeway, institutional, and mixed use which is especially useful if small sample size limits the use of local data. One advantage of using smaller (and local), rather than larger, spatial scales is the ability to update data sets for revising Action Levels. The NSQD may not be updated for quite some time, but local data sets can be updated periodically (annual amendments, 10-year rolling averages, every permit cycle, etc). Ultimately, Action Levels would be expected to become lower as outliers are removed from data sets and as improved water quality data are collected through targeted management actions. It may be appropriate to eliminate older data sets as well over time.

One element to consider when comparing monitoring data to Action Levels is the concept of a design volume for water quality (also known as the Water Quality Capture Volume – WQCV, WEF #23 and ASCE publication #87, 1998) or a design flow rate. The WERF and NCHRP efforts mentioned above include recommendations regarding design sizing using continuous simulation techniques for both volume-based and rate-based BMPs. The Panel acknowledged that several to more times each year, the runoff volume or flow rate from a storm will exceed the design volume or rate capacity of the BMP. Stormwater agencies should not be held accountable for pollutant removal from storms beyond the size for which a BMP is designed.

A Technically Sound and Pragmatically Enforceable BMP Design and the Permit Process

The diagram below provides guidance for determining what BMPs are required in a newly developing watershed. Under ***Condition 1*** where the receiving water quality is not impaired, determination of the appropriate BMP would be by Best Professional Judgment (BPJ). Any of the "state approved" BMPs could be used. The permittee would be required to design the treatment facilities in accordance with the California BMP Handbook, ***which should be revised as a criteria manual***, rather than a guidance manual *and include more physiobiochemically based design criteria designed to address an agreed upon set of "Pollutants and Parameters of Concern" based upon knowledge of the pollutants and parameters that generally are of concern in urban runoff, with perhaps some differences on receiving water type.*

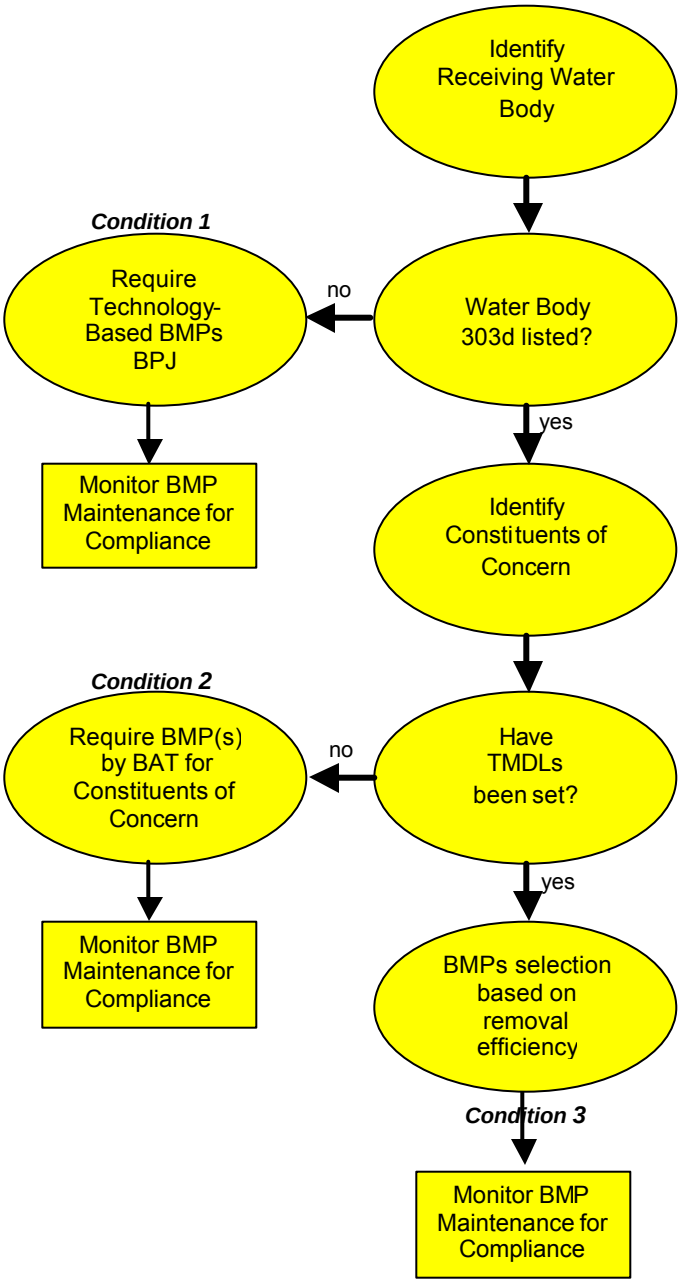

A detailed maintenance plan and schedule would be required that includes:

1. Actions to be taken and when,
2. Designation of the party legally accountable for the facility maintenance, and
3. A whole-life cost estimate for the facility that include maintenance.

Compliance with the design criteria and the maintenance plan and schedule would constitute achievement of the design effluent criteria. In the event of failure by the responsible party to perform the required maintenance and/or to perform it to the required level of quality, the whole-life cost schedule could be used to determine the consideration that the defaulting responsible party would pay to the new responsible party that takes over the maintenance.

Under ***Condition 2*** where water quality impairment exists but a TMDL has not yet been performed, BAT would be required, which means applying the BMPs that can practicably (to be defined) be employed to produce the lowest effluent concentrations (e.g. the lower grouping of BMP effluent quality) of the constituent(s) of concern. Several types of BMPs may fulfill the BAT standard if these BMPs have performance that is not statistically or practically differentiable. This case will allow flexibility in choosing among that sets of BMPs that demonstrate superior performance. As in the case of C*ondition 1,* compliance with the maintenance plan and schedule would constitute compliance with the design effluent criteria.

Condition 3, which occurs when a TMDL has been specified for the BMP or for the tributary watershed, may (or may not be) actually be less stringent that *Condition 2* if the TMDL allows for a higher effluent concentration of the constituents of concern than that discharged by a BAT facility. The same requirements would apply for the design criteria, and the maintenance plan and schedule would constitute the guarantee of design effluent concentrations from the BMP.

<u>Strategies for Stormwater Management to Protect Urban Water Environments</u>

Stormwater effluent limits can become very complex if all the issues are to be directly addressed. If complex, they are not likely to be workable. However, too much simplification can also lead to ineffective programs. Therefore, a reasonable first step is needed, based on local data. Compliance monitoring (e.g. BMP inspections) is also needed to ensure that the goals are likely to be met. Most likely goals will have to be revised over time. The overall strategy should contain these objectives:

- Effectiveness
- Affordability
- Enforceability, and
- Flexibility

Table 1 - Effects of Urbanization on Hydrologic Regime in Colorado and Georgia

Location	Annual Precipitation	Mean Storm Depth*	Runoff Events per Year		Annual Runoff (mm)	
	Millimeters per Year	Millimeters	Undeveloped	Developed	Undeveloped	Developed
Fort Collins, CO	335	11	27	47	12	124
Atlanta, GA	1262	18	48	78	36	500
* Values obtained from Fig. 5.3 ASCE MOP (1998)						

Runoff volume and peak flows have been recognized as two of the most important stormwater factors needing control. **Table 1** (Roesner and Nehrke) shows that urbanization dramatically changes the hydrologic regime of urban waterways. In both Atlanta (a higher rainfall area) and Fort Collins (a semiarid area), the number of runoff events per year on developed land increases by a factor of 2 times the number of runoff events that occur in the undeveloped state; and the runoff volume increases by a factor of ten! The peak flows also increase dramatically as shown in **Figure 1** below, but as also seen on the figure, the peak flow frequency curve can be adjusted back to its predevelopment character by the proper application of runoff controls. But while these controls restore the peak flow frequency to its natural regime, the duration of flows at the low end (but still channel "working") of the flow frequency curve is greatly increased, which raises potential for channel scour in stream channels with erosive soils.

Figure 1 - Exceedance Frequencies for Detention Basins in Fort Collins, Colorado

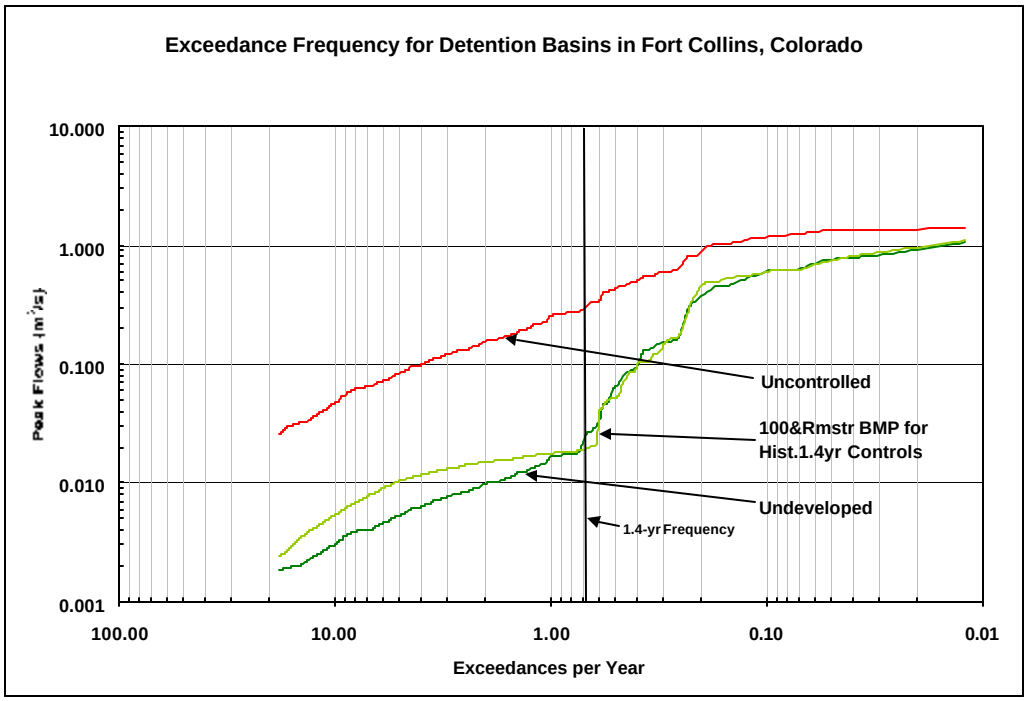

Since many of the stormwater pollutants are strongly associated with particulates, stormwater particulate control is also often a component of stormwater control programs. Therefore, an effective stormwater control strategy that could be encouraged is a combination of several practices, listed below in the order of increasing events:

- On-site stormwater reuse, evapotranspiration and infiltration for the smallest storms and up to specific targeted events, depending on site limitations (soil characteristics and groundwater contamination potential) (usually by conservation design emphasizing infiltration, disconnecting paved areas, etc.)
- Treatment of excess runoff that cannot be infiltrated, again, up to a specific targeted runoff volume (usually by sedimentation or filtration) For pollutants of concern, it should be demonstrated that the BMP(s) need to include the physical, biological, and/or chemical treatment processes that address the typical pollutants of concern and/or specific pollutants in the case of 303D listed water bodies or those with established TMDLs.
- Control of energy discharges for the channel forming events (such as through storage-release, focusing on flow-duration analyses and peak flow frequency analyses). To be most effective, this should to be completed under a watershed management plan and not site-by-site.
- Provide safe drainage for damaging events (conventional drainage, plus secondary drainage systems)
- In watersheds that are already experiencing damaging flow impacts to streams, it could be in many circumstances much more cost-effective (and effective period) to develop through a watershed plan a natural stream stabilization approach that could address both the existing development and the remaining smaller infill or otherwise smaller new development. In these cases, requiring the remaining new development to implement flow-duration control would not solve the issue in a measurable way and resources would be better spent restoring the functions of the creek with instream enhancements.

Panel's Findings on Feasibility of Numeric Effluent Limits Applicable to Construction Activities

Construction Observations

Regarding the question of the technical feasibility of Numeric Limits for stormwater discharges from construction activities, the Panel bases its recommendations on the following observations.

1. Limited field studies indicate that traditional erosion and sediment controls are highly variable in performance, resulting in highly variable turbidity levels in the site discharge.
2. Site-to-site variability in runoff turbidity from undeveloped sites can also be quite large in many areas of California, particularly in more arid regions with less natural vegetative cover and steep slopes.
3. Active treatment technologies involving the use of polymers with relatively large storage systems now exist that can provide much more consistent and very low discharge turbidity. However, these technologies have as yet only been applied to larger construction sites, generally five acres or greater. Furthermore, toxicity has been observed at some locations, although at the vast majority of sites, toxicity has not occurred. There is also the potential for an accidental large release of such chemicals with their use
4. To date most of the construction permits have focused on TSS and turbidity, but have not addressed other, potentially significant pollutants such as phosphorus and an assortment of chemicals used at construction sites.
5. Currently, there is no required training or certification program for contractors, preparers of soil erosion and sediment control Stormwater Pollution Prevention Plans, or field inspectors.
6. The quality of stormwater discharges from construction sites that effectively employ BMPs likely varies due to site conditions such as climate, soil, and topography.
7. The States of Oregon and Washington have recently adopted similar concepts to the Action Levels described earlier.

Construction Recommendations

It is the consensus of the Panel that active treatment technologies make Numeric Limits technically feasible for pollutants commonly associated with stormwater discharges from construction sites (e.g. TSS and turbidity) for larger construction sites. Technical practicalities and cost-effectiveness may make these technologies less feasible for smaller sites, including small drainages within a larger site, as these technologies have seen limited use at small construction sites. If chemical addition is not permitted, then Numeric Limits are not likely feasible. Whether the use of Numeric Limits is prudent, practical or necessary to more effectively achieve nonpoint pollution control is a separate question that

needs to be answered, but is outside the scope of this Panel. However, Action Levels are likely to be more commonly feasible. For small sites or smaller drainages within larger sites, or where chemicals cannot be used, the Panel recommends that Action Levels be specified.

Advanced systems lend themselves to Numeric Limits because of historically reliable treatment, while non-active controls are less predictable. Advanced systems have been in use in some form since the mid-1990s. At this time, there are two general types of systems. With each general system the stormwater is retained on-site, treated, and released more slowly. One system employs polymer coagulation and sedimentation. The second system employs polymer coagulation with direct filtration. Both types of systems are considered reliable, and can consistently produce a discharge less than 10 NTU. These systems have been used successfully at many sites in several states since 1995 to reduce turbidity to very low levels. Non-active erosion and sediment control BMPs, while effective when applied and adequately maintained, produce more highly variable in effluent quality, making setting Numeric Limits difficult, if not impossible.

An important consideration in setting Numeric Limits or Action Levels is that in many locations in California the natural background turbidity and/or TSS levels in stormwater runoff are quite high. This is particularly true in semi-arid or arid regions, which tend to have less vegetative cover. For example, natural runoff concentrations in Emerald Creek, on the Newport Coast, above any developed areas have been over 5,000 mg/l during runoff events. The Los Angeles County Monitoring Data sets included an open land use watershed that also showed TSS levels significantly above other types of urban land uses. Therefore, it is important to consider natural background levels of turbidity or TSS in setting Numerical Limits or Action Levels for construction activities. The difficulty in determining natural background concentrations/levels for all areas of the state could make the setting of Numeric Limits or Action Levels impractical from an agency resource perspective.

While the Panel concludes that Numeric Limits or Action Levels are technically feasible, the Panel has several reservations and concerns.

1. The active treatment systems have generally been employed on sites five acres or larger. While the systems are technically feasible for sites of any size, including sites or drainages as small as an acre or less, the cost may be prohibitive. The cost-effectiveness of active treatment systems is greatly enhanced for large drainage areas, at which construction occurs for an extended period of time, over one or more wet season. There is also a more “passive” active system that is employed in New Zealand that uses captured rainfall to release the chemical into flows entering a detention system that requires less instrumentation and flow measurement infrastructure. Even more passive systems such as the use of polymer

logs and filter bags are currently under development for small sites. Regardless, the Panel recommends that the Board give particular attention to improving the application of cost-effective source controls to small construction sites.

2. In considering widespread use of active treatment systems, full consideration must be given to whether issues related to toxicity or other environmental effects of the use of chemicals has been fully answered. Consideration should be given to longer-term effects of chemical use, including operational and equipment failures or other accidental excess releases.
3. Consideration should be given to the seasonality of applying Numerical Limits. There may be sites where summer only construction that complies with Action Levels may be preferred to year-round that sites that include winter construction that complies with Numeric Limits. In such cases, applying Numeric Limits to summer construction may be a disincentive to scheduling active grading during dry periods. Allowing summer only construction sites to comply with action levels would discourage winter construction activities.
4. Consideration should be given to whether Numeric Limits would apply to all construction sites or only those with significant disturbed soil areas (e.g. active grading, un-vegetated and/or un-stabilized soils). A site could meet certain conditions to be considered “Stabilized” for the runoff season.
5. Where Numeric Limits are not feasible or where they would not apply during designated seasons or site conditions, the Panel recommends that the Board consider the concept of Action Levels for sites where only traditional erosion and sediment controls are applied or construction sites that are considered “stabilized” for the runoff season. An Action Level indicates a failure of BMPs (within some storm size limits).
6. The Board should consider Numeric Limits or Action Levels for other pollutants of relevance to construction sites, but in particular pH. It is of particular concern where fresh concrete or wash water from cement mixers/equipment is exposed to stormwater.
7. The Board should consider the phased implementation of Numeric Limits and Action Levels, commensurate with the capacity of the dischargers and support industry to respond.
8. The Panel recommends that a Numeric Limit or Action Level should be compared to the average discharge concentration. The minimum number of individual samples required to represent the average discharge concentration for a storm will need to be defined.
9. The Board should set different Action Levels that consider the site’s climate region, soil condition, and slopes, and natural background conditions (e.g. vegetative cover) as appropriate and as data is available. With active treatment systems, discharge quality is relatively independent of these conditions. In fact, active treatment systems could result in turbidity and TSS levels well below natural levels, which can also be a problem for receiving waters.

10. The Board should consider whether the Numeric Limits or Action Levels should differ between receiving waters that are water quality limited with respect to turbidity, sediment or other pollutants associated with construction, from those water bodies that are not water quality limited.
11. The Panel recommends that Numeric Limits and Action Levels not apply to storms of unusual event size and/or pattern (e.g. flood events). The determination of Water Quality Capture Volume should consider the differing climate regions to specify these events.
12. The Board should set Numeric Limits and Action Levels to encourage loading reductions as appropriate as opposed to only numeric concentrations. Examples include phased construction (e.g. limited exposed soil areas or their duration), infiltration, and spraying captured runoff in vegetated areas as means to reduce loading.
13. The Panel is concerned that the monitoring of discharges to meet either the Action Levels or Numeric Limits may be costly. The Panel recommends that the Board consider this aspect.

Panel's Findings on Feasibility of Numeric Effluent Limits Applicable to Industrial Activities

Industrial Observations

The Panel believes that Numeric Limits are feasible for some industrial categories. Industries have control over their facilities. They control access, construction practices, product substitution to affect pollution prevention and the types of treatment systems to be used to mitigate stormwater runoff. There are many treatment systems or prevention practices that have been in place for lengthy periods, extending back to the 1980s in many cases. For example, there is much known today about construction materials, such as roofing materials (roofing composition, gutters, paints and coatings, products that abrade or tend to create solids or litter, etc). Other examples include development of pervious surfaces, or infiltration methods.

The decision for the value of Numeric Limits should be made in one of two ways. When there is a TMDL that defines the permissible load for a watershed, the Numeric Limits should be set to meet the TMDL. Consideration must be given for both the pollutant concentration as well as the volume of runoff, since both contribute to the impacts that required the TMDL to be implemented.

When there is no TMDL, the Numeric Limits should be based upon sound and established practices for storm water pollution prevention and treatment, using an approach analogous to that used in the NPDES wastewater process in the 1970s. In this approach phased, Numeric Limits were first set that were based upon the use of best currently available technology, and permittees were given a defined period for compliance. Permits were established based upon industry types or categories, with the recognition that each industry has its own specific problems and financial viability.

To establish Numeric Limits for industrial sites requires a reliable database, describing current emissions by industry types or categories, and performance of existing BMPs. The current industrial permit has not produced such a database for most industrial categories because of inconsistencies in monitoring or compliance with monitoring requirements. The Board needs to reexamine the existing data sources, collect new data as required and for additional water quality parameters (the current permit requires only pH, conductivity, total suspended solids, and either total organic carbon or oil and grease) to establish practical and achievable Numeric Limits.

In cases where the industrial activity is similar to activities covered by the MS4 permit (roofs, parking lots, etc), the approach or limits for industries should be the same as for MS4 permittees. In cases where the industrial activity is similar to land disturbance activities (e.g. landfills, gravel mines, etc.), there exists data and design experience with runoff control, capture and advanced treatments systems (e.g. systems using polymer to enhance total suspended solids removal – see

the construction section) that may make Numeric Limits feasible for new facilities, and the approach and limits should be the same as for construction permittees. The same conditions and issues related to active treatment discussed in the construction section apply here.

In cases where there is less certainty in the data for both stormwater characterization or BMP performance to establish Numeric Limits, there maybe sufficient data to establish Action Levels. Action Levels set for industrial sites that discharge to MS4s should not exceed those set for MS4 permittees.

The Panel recognizes that existing and new facilities may have to be treated differently and recommends the approach in **Table 2**.

Table 2- Approach to Establish Numeric Limits or Action Levels at Existing or New Facilities

		Numeric Limits	Action Levels	Notes
Existing Facility	Indoor	No	Yes, similar to MS4	
	Outdoor	Yes if data are adequate for the specific industrial activity and BMP	Yes, using industrial database	Action Levels should approach MS4 action levels.
New Facility	Indoor	Yes – BMP Database		Technology based, similar to MS4 New Development
	Outdoor	No, unless sufficient data exist for the specific industrial activity and BMP	Yes when sufficient data are available	

Industrial Recommendations

The Panel has several reservations and concerns:

- The Panel recognizes the inadequacy of current monitoring data sets and recommends improved monitoring to collect data useful for establishing Numeric Limits and Action Levels.
- Required parameters for future monitoring should be consistent with the type of industrial activity instead of the current parameters (i.e., monitor for heavy metals when there is reasonable expectation that the industrial activity will cause greater heavy metals concentrations in the storm water).
- Insofar as possible, the Panel prefers the use of California data (or National data if it can be shown to be applicable to CA) in setting Numeric Limits and Action Levels.
- The Panel recognizes that economies of scale exist for large facilities and large groups of single facilities.
- Industrial facilities that do not discharge to MS4s should have to implement BMPs for their non-industrial exposure (e.g., parking lots, roof runoff) similar to commercial facilities in MS4 jurisdictions.
- Regardless of Action Levels or Numeric Limits, the permittees should implement a suite of minimum BMPs – good housekeeping, employee training, preventing materials from exposure to rain, etc.
- SIC categories are not a satisfactory way of identifying industrial activities at any given site. The Board should develop a better method of characterizing industrial activities that can impact storm water.
- The Panel recognizes this is a large task and recommends prioritizing the implementation of this approach to achieve the greatest reduction of pollutants statewide.
- Increasingly, a number of industries have moved industrial activities indoors, preventing storm water pollution. The Panel recognizes that these facilities should be granted some sort of regulatory relief from industrial Numeric Limits or action levels, but should still be required to comply with MS4 permit requirements.

The Panel recognizes the need to make progress in monitoring and reducing storm water discharge from industrial facilities, but urges the Board to consider the total economic impact and not unduly penalize California industries with respect to industries outside of California.

SAN GABRIEL RIVER REGIONAL MONITORING PROGRAM

Submitted to the

Los Angeles Regional Water Quality Control Board

by

Los Angeles County Sanitation Districts

December 31, 2004

Revised August 11, 2006

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Executive Summary

This report presents a design for an integrated regional monitoring program for the San Gabriel River watershed, the San Gabriel River Regional Monitoring Program (SGRRMP). This report satisfies an NPDES permit requirement of the Los Angeles County Sanitation Districts for the Long Beach, Los Coyotes, Whittier Narrows, San Jose Creek, and Pomona Water Reclamation Plants, and fulfills the fundamental purpose of providing a framework for monitoring at the watershed scale. It proposes to accomplish this by:

- Expanding the monitoring of ambient conditions related to key beneficial uses to the entire watershed
- Attempting to improve the coordination and cost-effectiveness of disparate monitoring efforts
- Providing a framework for periodic and comprehensive assessments of watershed condition.

The program design, which was partially implemented through a set a cooperative efforts in 2005, was developed by a multi-stakeholder workgroup and addresses five core management questions, including:

1. What is the condition of streams in the watershed?
2. Are conditions at areas of unique interest getting better or worse?
3. Are receiving waters near discharges meeting water quality objectives?
4. Is it safe to swim?
5. Are locally caught fish safe to eat?

While there is a wide range of beneficial uses defined in the Water Quality Control Plan for the Los Angeles Region (Basin Plan) that are broadly applicable to the San Gabriel River watershed and the core management questions, the recommended regional monitoring program focuses on a subset of these beneficial uses that relate primarily to habitat conditions and to recreational use of the watershed:

- Warm Freshwater Habitat (WARM)
- Cold Freshwater Habitat (COLD)
- Estuarine Habitat (EST)
- Wildlife Habitat (WILD)
- Water Contact Recreation (REC1)
- Commercial and Sport Fishing (COMM).

These captured the regulatory, management, and public interest priorities of the stakeholders represented on the workgroup, as well as reflecting the primary objectives of traditional permit monitoring in the watershed. Table Ex.1 shows which beneficial uses are addressed by each core management question.

An evaluation of the design of existing monitoring programs, and the information they currently produce, demonstrated that only Question 3 is being answered with any degree of completeness, although current compliance monitoring efforts have not recently been examined for consistency and efficiency. For example, there are insufficient monitoring sites in the upper watershed to answer Question 1 (condition of streams) for that area and there is no routine monitoring of bacterial indicators needed for answering Question 4 (swimming safety). The summary of existing monitoring (Summary of Existing Monitoring Programs in the San Gabriel River Watershed) is included as a companion document with this report.

The overall program design (Figures Ex.1 and 2) addresses each of the five core management questions in turn, providing the rationale for the recommended design approach, selection of indicators and monitoring frequency, appropriate data products, and coordination with other efforts, as well as a preliminary estimate of costs. The design recommendations are summarized briefly in Table Ex.2.

Portions of the proposed program related to Questions 1 and 2 were implemented in 2005, through a set of cooperative efforts and one-time compliance monitoring offsets. In addition, specific design recommendations were developed for Questions 3 – 5. Sections 6 (related to compliance monitoring) and 10 (related to implementation and costs) describe a proposed set of permanent compliance monitoring offsets that will be sufficient to fully fund the program on an ongoing basis.

The design of the regional monitoring program is based on clear statements of rationale and criteria for decisionmaking about design options. The implementation plan is based on experience gained during the first year's monitoring effort, as well as on standardized costs that were used for developing budgets and examining tradeoffs among monitoring options. These building blocks provide tools that can be used to adapt the SGRRMP over time in response to improved knowledge and/or shifting management information needs.

The regional monitoring program described here reflects a high degree of consensus among a broadly representative group of stakeholders in the watershed. It represents a significant advance towards regional integration of monitoring efforts and assessment of watershed condition. However, it is important to recognize that, while the program will enhance the ability to assess the status of some beneficial uses, it will not provide the means, across the entire watershed, for fully determining compliance with water quality objectives, defining impairment, or meeting the requirements of the 303d listing/delisting process (Table Ex.3). Such purposes require more spatially and temporally intensive sampling efforts that are fulfilled by only some of the components of the proposed monitoring program.

Table Ex. 1. Beneficial uses addressed by each component of the SGRRMP.

Beneficial use	Q1: Stream condition	Q2: Unique areas	Q3: Discharges	Q4: Safe to swim	Q5: Safe to eat fish
Warm freshwater habitat	X	X	X		
Cold freshwater habitat	X	X	X		
Estuarine habitat		X	X		
Wildlife habitat	X	X	X		
Water Contact recreation				X	
Commercial, sport fishing					X

Table Ex.2. Summary of the recommended SGRRMP design to address each of the five core management questions.

Question	Approach	Sites	Indicators	Frequency
Q1: Stream condition	Randomized design for streams in entire watershed, except 1st and 2nd order[1] streams	30 in Year 1 10 new in each following year	Triad: bioassessment, water chemistry, toxicity	Annually, in spring
Q2: Unique areas	Fixed stations in estuary and freshwater	12 in freshwater • 4 high[2] value • 5 confluence of tribs/mainstem • 3 background 4 in estuary	Freshwater: • Riparian habitat • Triad: bioassessment, water chemistry, toxicity • Riparian habitat Estuary: • Full suite water quality • Sediment chemistry, toxicity, infauna	 Annually, in spring Annually, in spring Annually, in spring Annually, in spring Annually, in spring
Q3: Discharges	Improve coordination Improve efficiency Reduce overlap			
Q4: Safe to swim	Focus on high-use areas Defer to health depts. for details	6 lake and river areas 5 background 1 estuary	Total coliforms, E. coli, Enterococci	Adjusted based on degree of use and proximity to source(s)
Q5: Safe to eat fish	3-yr pilot study Focus on: • Popular fishing sites • Commonly caught species • High-risk chemicals	Minimum 2 each in lakes, river, estuary	Commonly caught fish at each location Mercury, DDTs, PCBs, arsenic, selenium	Annually in late summer

[1] Stream order is defined by a tributary's position in the branching network, with 1st order streams being headwater streams, 2nd order streams those with one tributary above them, and so on.
[2] High value sites are locations of relatively isolated unique habitat

Table Ex.3. Summary of potential management uses of information produced by the proposed SGRRMP.

Core question	305b	303d	TMDL	Health advisories
Q1: Stream condition	X		X	
Q2: Unique areas	X	X	X	
Q3: Discharges	X	X	X	
Q4: Safe to swim	X	X	X	X
Q5: Safe to eat fish	X	X	X	X

Figure Ex.1. Distribution of monitoring stations for the first year of the random watershed component of the regional monitoring program, as well as current compliance monitoring sites under the major discharge permits in the watershed.

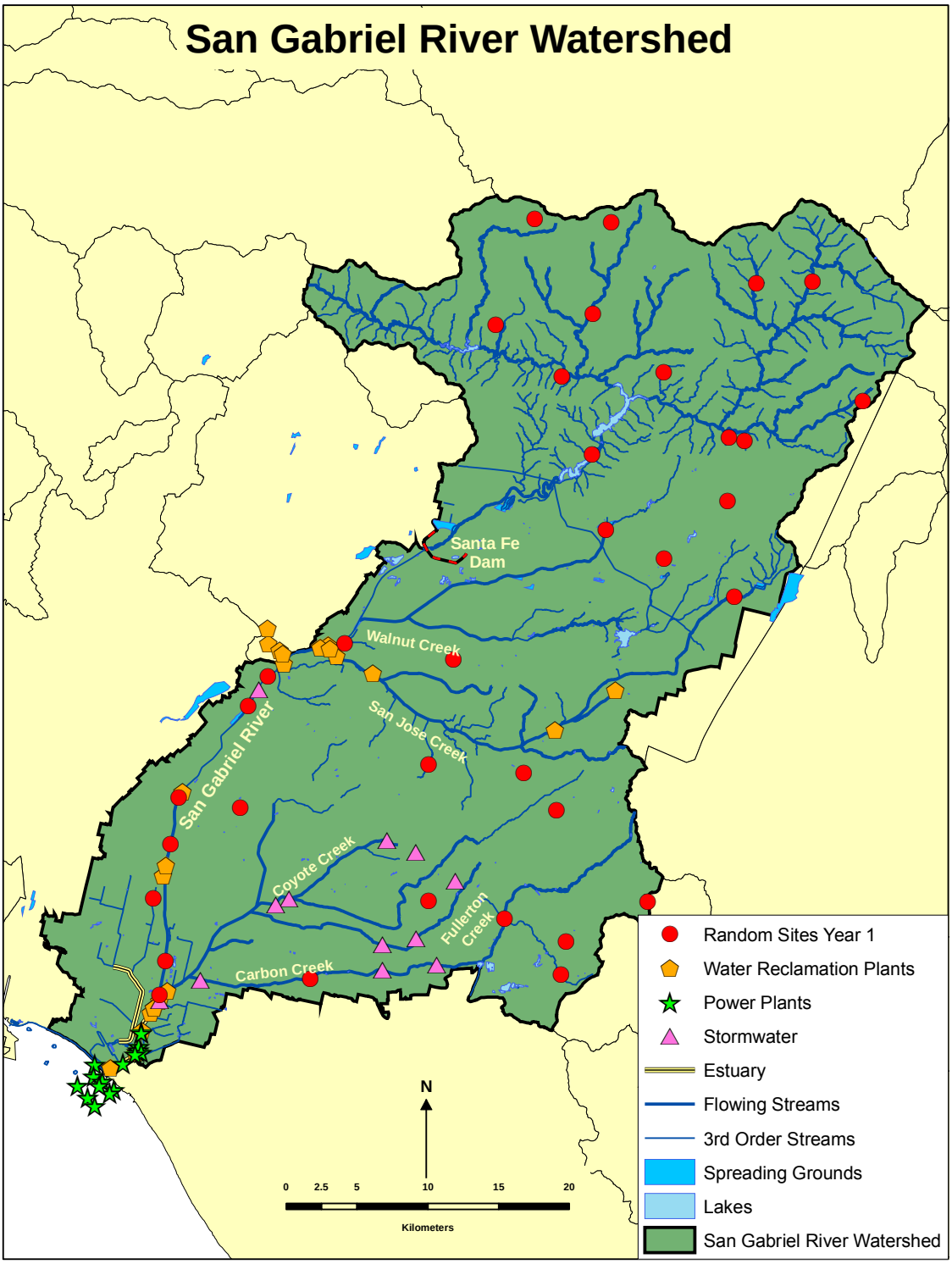

Figure Ex.2. Distribution of monitoring stations for all other components of the regional monitoring program, including fish tissue, swimming (body contact recreation), and sites of unique interest.

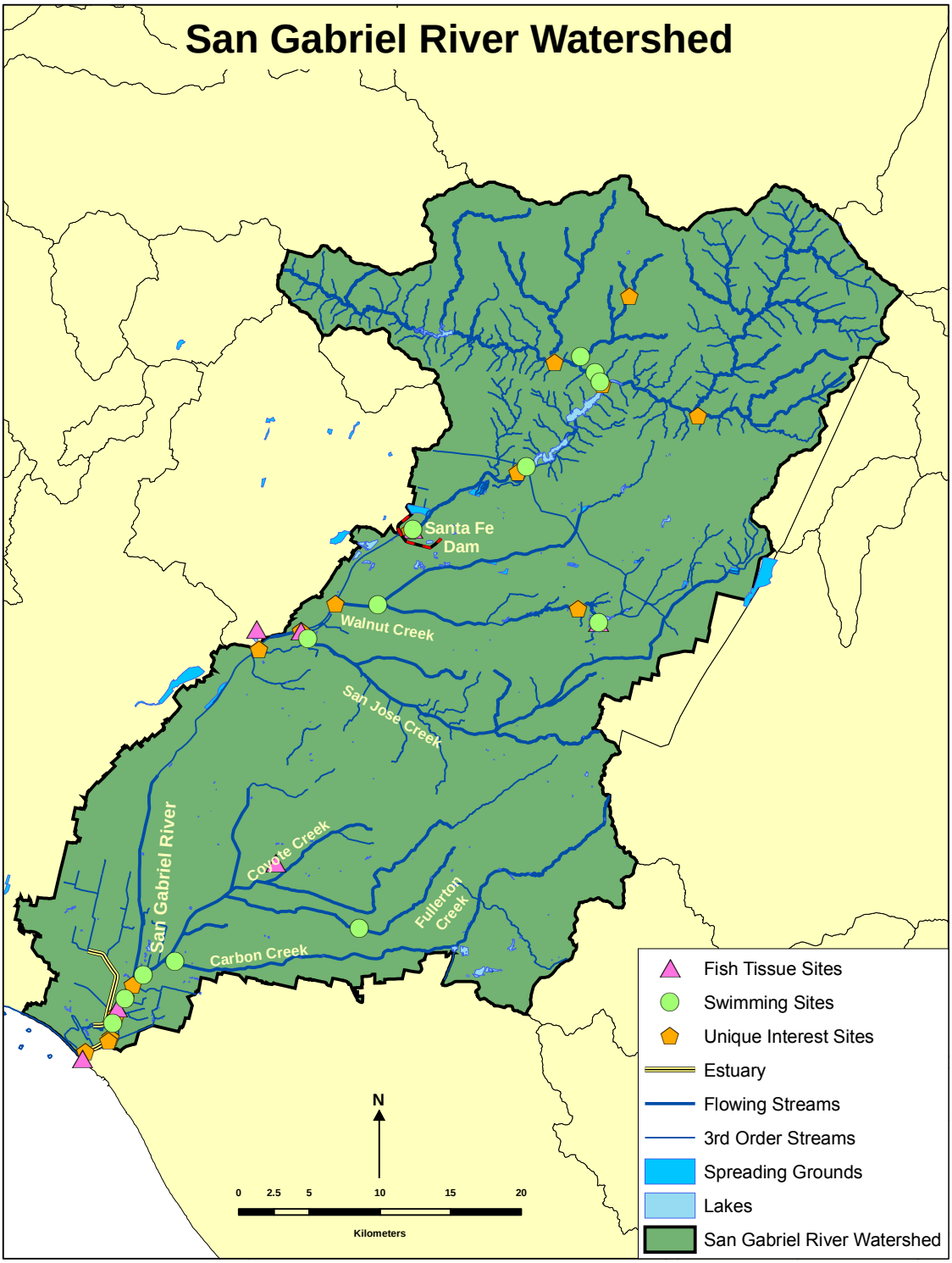

1.0 Introduction

1.1 Regional setting

The San Gabriel River Watershed is located in the eastern portion of Los Angeles County. It is bound by the San Gabriel Mountains to the north, the San Bernardino Mountains to the east, the watershed divide with the Los Angeles River to the west, and the Pacific Ocean to the south. The San Gabriel River's headwaters originate in the San Gabriel Mountains and the River terminates at the San Pedro Bay/Los Angeles and Long Beach Harbor complex, which is semi-enclosed by a 7.5 mile breakwater.

The 689 sq. mi. watershed consists of extensive areas of undisturbed riparian and woodland habitats in its upper reaches. Much of the watershed of the West Fork and East Fork of the river is set aside as a wilderness area; other areas (primarily lower elevation) in the upper watershed are subject to heavy recreational use. The upper watershed also contains a series of flood control and water conservation dams. Further downstream, towards the middle of the watershed, are large spreading grounds utilized for groundwater recharge. The watershed is hydraulically connected to the Los Angeles River watershed through the Whittier Narrows Reservoir via the Rio Hondo (normally only during high storm flows). The lower part of the river and its major tributaries flow primarily through concrete-lined channels in a heavily urbanized portion of the county before becoming a soft bottom channel once again near the ocean in the city of Long Beach. Approximately 26% of the land area of the watershed is developed.

Tertiary-treated effluent from five publicly-owned treatment works (POTWs) enters the river in the lower part of the watershed (which is partially channelized) while two power generating stations discharge cooling water into the river's estuary. The five POTWs have treatment capacities ranging from 15 million gallons per day (MGD) to 100 MGD. These facilities produce approximately 163 MGD (183,000 acre-feet/year) of recycled water, of which about 37% is reused through groundwater recharge, landscape irrigation, industrial processing and other applications. The rest is discharged to surface waters. The power plants together are permitted to discharge up to about 2,000 MGD. The watershed is also covered under two NPDES municipal stormwater permits (for Los Angeles and Orange Counties). Thirty-nine of the 109 permittees with separate NPDES permits (mostly industries) in the watershed discharge directly to the San Gabriel River. Twenty-one discharge to Coyote Creek and twelve discharge to San Jose Creek.

Of the 534 dischargers enrolled collectively under the general industrial storm water permit in the watershed, the largest numbers occur in the cities of Industry, Irwindale, Pomona, and Santa Fe Springs. Auto wrecking, lumber, metal plating, trucking, and die-casting are a large component of these businesses. About two-thirds of the facilities are greater than one acre in size and about 80 of them are larger than ten acres

There are 175 construction sites enrolled individually under the construction storm water permit. The sites are fairly evenly divided between residential and commercial and a similar number of sites are found in both the upper and lower watershed. About one-half of them occur on sites that are larger than ten acres.

1.2 Background

The development of a watershed-wide monitoring program for the San Gabriel River watershed is a direct response to a NPDES permit requirement established by the Los Angeles Regional Water Quality Control Board (LARWQCB) for the Los Angeles County Sanitation Districts' (LACSD) Long Beach, Los Coyotes, Whittier Narrows, San Jose Creek, and Pomona Water Reclamation Plants. For purposes of discussion, this program is termed the San Gabriel River Regional Monitoring Program (SGRRMP). This requirement stemmed, not from any specific contamination problem or discharge condition, but instead from a broader desire by LARWQCB staff for more integrated information about ambient conditions across the watershed as a whole and about patterns and trends in those conditions. This was a natural response to the growing awareness that watersheds involve habitats, physical features, and processes (both human and natural) that stretch across typical regulatory and management boundaries and are not well captured by current compliance monitoring systems. The regional monitoring design proposed here can be seen as a watershed-scale counterpart to existing larger-scale regional monitoring efforts in the southern California region (e.g., the state's Surface Water Ambient Monitoring Program (SWAMP), U.S. EPA's Western Environmental Monitoring and Assessment Program (EMAP), and the regional Bight Program) that attempt to address questions and concerns about regional condition and trends. The program presented here is unique in its intent to incorporate local and site-specific issues within a broader watershed-scale perspective.

In addition to these broader goals, this effort considered improving the overall cost effectiveness of monitoring efforts in the watershed. To this end, a number of recommendations are presented that are intended to reduce redundancies within and between programs, target constituent lists more directly on contaminants of concern, and adjust monitoring locations and sampling frequencies to better respond to management priorities.

The regional monitoring program is designed to complement and/or coordinate with the State Water Resources Control Board's SWAMP effort in the San Gabriel River watershed and with U.S. EPA's Western EMAP. This includes both the coordination of sampling effort and the use of consistent field sampling and laboratory analysis methods. In addition, the proposed program uses tools developed by the California Department of Fish and Game and the Southern California Wetlands Recovery Project for the regional assessment of biologic conditions in streams and channels, as well as monitoring design approaches developed by the Stormwater Monitoring Coalition's (SMC) model stormwater monitoring program (SCCWRP technical report #419, www.sccwrp.org/pubs/techrpt.htm).

The proposed SGRRMP does not exist in a vacuum. There are other efforts either planned or underway in the watershed intended to address similar or complementary questions about overall stream status. Primary among these are the LARWQCB's SWAMP effort and the volunteer monitoring efforts currently being planned by the Friends of the San Gabriel River and the San Gabriel Mountains Regional Conservancy. Coordination among these efforts could take several forms, including:

- Collaboration on planned monitoring efforts to defray financial and logistical costs
- Coordination and standardization of field sampling, laboratory analysis, and data management methods. Such efforts would be similar to the methodological intercalibration exercises conducted by SCCWRP as part of the periodic Bight Program
- Collaboration, either in terms of financial or in-kind support, on preparation of periodic watershed reports that integrate and synthesize monitoring data at the watershed scale.

1.3 Methods

The SGRRMP reflects the collaborative work of a workgroup impaneled by SCCWRP at the request of LACSD. The technical committee included representatives from state and federal regulatory agencies, key permittees in the watershed, other resource management agencies, and several conservation organizations active in the watershed (see Acknowledgements). This report, and its companion document (Summary of Existing Monitoring Programs in the San Gabriel River Watershed), summarizes current monitoring efforts in the watershed and makes specific recommendations about modifications needed to better answer management questions at the watershed scale. In the process of developing these recommendations, the workgroup attempted to balance the desire for consistency, standardization, and regional efficiency with reasonable requirements for program-specific differences in design needed to address program- and site-specific issues.

There are three boundary conditions that helped to structure and direct this effort. First, efforts focused on receiving water monitoring. Monitoring of the effluent from water reclamation plants and the power generating stations was not considered, reflecting LACSD's permit specification of a watershed-wide (or regional) monitoring program. Second, the proposed regional program includes the estuary in its definition of the watershed, although distinct monitoring approaches are proposed for the estuary and the freshwater portion of the watershed. Third, as described more fully in Section 1.4 Implementation, the SGRRMP does not include a detailed implementation plan, but does include general recommendations and a preliminary cost estimate.

1.4 Implementation

The integrated monitoring program described below is structured around a set of core management questions. These questions reflect specific concerns about different aspects of the San Gabriel River watershed and the impacts of human activities on these. For each question, the SGRRMP describes a monitoring design, including its overall approach and rationale, indicators to be measured, recommended monitoring sites and frequencies, and expected data products. The SGRRMP also identifies recommended modifications to some existing efforts that would bring them into line with the proposed regional program.

The proposed program clearly recognizes that any final decisions about modifications to existing monitoring efforts and/or about the initiation of new efforts will depend on detailed negotiations among the major stakeholders in the watershed. Thus, decisions about certain design details, coordination among related efforts, available resources and funding, logistics, phasing, and reporting remain to be resolved by the parties. This is a realistic acknowledgement of the diversity of core questions, the large number of stakeholders, and the range of existing monitoring efforts, some permit-based and some not. Thus, the proposed regional monitoring program described below is intended as a carefully considered starting point for detailed implementation discussions among an expanded group of stakeholders.

2.0 Principles and Framework for Regional Monitoring

2.1 Design principles and framework

The details of monitoring guidance that addresses the core management questions and their related objectives corresponds to a set of basic principles that provide an overall set of boundary conditions for monitoring design:

- Monitoring should be focused on decision-making; data not helpful in making a decision about clearly defined regulatory, management, or technical issues should not be collected.
- The level of monitoring effort should reflect the potential for impact, with more monitoring allocated to situations where the potential impact (in terms of both the probability of an impact's occurrence and its extent and magnitude) is higher and less monitoring to situations where such potential is lower or where monitoring is not likely to provide useful information.
- Monitoring designs should be integrated into a logically consistent whole, in which all aspects of the design support the core management question, and strive for both cost effectiveness and scientific rigor.
- Monitoring should be adaptive, in terms of its ability to both trigger follow-on studies as needed and make necessary mid-course corrections based on monitoring findings.

The proposed regional program fits within a larger context for monitoring program design being adopted throughout the southern California region. In this scheme, currently used in large ocean discharge permits and some stormwater permits, monitoring activities are organized into three categories:

Core monitoring includes long-term monitoring, intended to track compliance with specific regulatory requirements or limits, to conduct ongoing assessments, or to track trends in certain important conditions over time. Thus, core monitoring generally occurs at fixed stations that are sampled routinely over time.

Regional monitoring includes cooperative studies that provide a larger-scale view of conditions and can be used to assess the cumulative results of anthropogenic and natural effects on the environment. Regional monitoring also helps to place particular impacts in perspective by comparing local results (i.e. core monitoring) to the breadth and depth of human impacts and natural variability found throughout a larger region.

Special projects include specific targeted studies included as adaptive elements within core or regional monitoring designs. These are shorter-term efforts, with a specified beginning, middle, and end, intended to extend or provide more insight into core monitoring results, for example, by investigating the specific sources that may be contributing to a receiving water problem.

Within this overall structure, the regional program design described here focuses on both core (Questions 2, 3, 4, and 5) and regional (Question 1) monitoring, with references to special projects as needed.

2.2 Core management questions

The workgroup identified a subset of the beneficial uses in the region's Basin Plan that served as the central focus for the proposed regional monitoring design. These beneficial uses relate primarily to habitat conditions and to recreational use of the watershed and include:

- Warm Freshwater Habitat (WARM)
- Cold Freshwater Habitat (COLD)
- Estuarine Habitat (EST)
- Wildlife Habitat (WILD)
- Water Contact Recreation (REC1)
- Commercial and Sport Fishing (COMM).

These captured the regulatory, management, and public interest priorities of the stakeholders represented on the workgroup, as well as reflecting the primary objectives of traditional permit monitoring in the watershed. This short list did not, however, include other significant uses of water in the watershed, particularly Municipal and Domestic Supply (MUN), and Ground Water Recharge (GWR). While clearly important, these uses are being managed and monitored by other agencies and programs whose efforts have little if any overlap with monitoring focused on the uses listed above. As a result, these other efforts did not provide the immediate opportunity for regional coordination that was a central goal of the workgroup's efforts.

The workgroup articulated five core management questions, related to the priority beneficial uses:

- Question 1: What is the condition of streams in the watershed?
- Question 2: Are conditions at areas of unique interest getting better or worse?
- Question 3: Are receiving waters near discharges meeting water quality objectives?
- Question 4: Is it safe to swim?
- Question 5: Are locally caught fish safe to eat?

The summary of existing monitoring in the watershed (see next section) provided a basis for assessing the degree to which each core question is currently being addressed. This assessment formed the starting point for the development and description of regionalized monitoring designs targeted at each management question. In some cases, this required the development of new designs where little or no effort currently exists. In others, it involved the coordination and standardization of existing efforts that have been implemented independently and/or piecemeal over a period of years.

3.0 Existing Monitoring

The starting point for the workgroup's considerations was the set of monitoring activities now taking place in the watershed (see companion document, Summary of Existing Monitoring Programs in the San Gabriel River Watershed). That review focused on existing compliance monitoring because it represents the largest pool of available effort for meeting the goals of the regional monitoring program. Special studies, occasional characterizations, and other sporadic efforts were not included in the review. However, other broader efforts (e.g., volunteer watershed monitoring) are integrated as appropriate into the set of regional designs.

There appear to be four basic types of monitoring designs currently utilized by the agencies conducting routine monitoring in the watershed, including:

- End of watershed designs that typically measure the cumulative mass emissions from all discharges, primarily during wet weather storms
- Dispersed watershed designs that assess overall conditions and impacts in freshwater habitats, primarily in dry weather
- Site-specific watershed designs that assess conditions and trends in freshwater or estuarine habitats of particular interest, primarily in dry weather
- Dry-weather reconnaissance designs focused on identifying sources of pollution to the municipal stormwater system.

While all of these approaches can be found in the watershed, not every agency uses all four, as illustrated in Table 3.1.

The summary highlights two important features of existing monitoring efforts in the San Gabriel River watershed. First, the bulk of monitoring effort is concentrated around major discharges from water reclamation plants and power generating stations. Second, there are large inconsistencies among programs and program components in terms of the rationale for station location, the constituent list sampled, and the frequency of measurement. Many such differences reflect a logical amount of variety, given the different activities and responsibilities of each monitoring agency. In addition, however, these existing monitoring programs have to some extent accreted over time, with new elements being added as permits are renewed. Thus, programs have not all been designed from a regional perspective, with the goals of balancing efforts throughout the watershed, or of ensuring consistency among programs.

The workgroup then assessed, in qualitative terms, the degree to which the existing monitoring system, taken as a whole, addresses each of the core management questions:

Question 1: What is the condition of streams in the watershed?
Not answerable for the watershed as a whole. Not answerable for the upper watershed. Answerable only in part for the lower watershed because monitoring stations are sited to assess discharge compliance, not watershed condition

Question 2: Are conditions at areas of unique interest getting better or worse?
Not answerable because these have not been identified and therefore monitoring has not been focused on them.

Question 3: Are receiving waters near discharges meeting water quality objectives?
Answerable, although monitoring effort has not been examined for consistency and efficiency.

Question 4: Is it safe to swim?
Not answerable because there is no health-related monitoring targeted at recreational areas.

Question 5: Are locally caught fish safe to eat?
Not answerable because there is no fish tissue monitoring targeted at recreational fishing locations and catch.

Only one of the five core management questions is currently being addressed to any degree, not a surprising conclusion, given that the existing monitoring system has been designed primarily to evaluate specific permit requirements of point-source discharges in the lower watershed. This information confirmed the workgroup's initial impression that a number of key management questions remain unanswered and provides a basis for consideration, during the SGRRMP's implementation phase, of the potential reallocation of certain monitoring efforts.

Table 3.1. Generalized distribution of monitoring approaches across the separate ongoing, routine monitoring programs in the San Gabriel River watershed. Special studies and "one-time" characterizations not included.

Program	End of watershed	Dispersed watershed	Site-specific watershed	Recon-naissance
AES (power plant)			X	
LACSD			X	
LACDPW	X	X		
LA Dept. Water and Power			X	
Orange County Stormwater				X
US Forest Service			X	

4.0 Question 1: What is the Condition of Streams in the Watershed?

This question focuses on the beneficial uses:

- Warm Freshwater Habitat (WARM)
- Cold Freshwater Habitat (COLD)
- Wildlife Habitat (WILD),

and reflects concerns related to the status of streams in the watershed as a whole, rather than issues at specific or fixed sites.

Potential assessment questions that address such concerns include:

- What is the percentage of perennial streams that support their designated beneficial uses of Warm Freshwater Habitat, Cold Freshwater Habitat, and Wildlife Habitat?
- Is the percent of streams in the watershed/region which support the beneficial uses of Warm Freshwater Habitat, Cold Freshwater Habitat, and Wildlife Habitat increasing or decreasing over time?
- What is the distribution of benthic conditions (as reflected in IBI (Index of Biotic Integrity) scores) in streams of the watershed?
- What proportion of streams have an altered/degraded benthic community structure (i.e., IBI scores substantially below reference or best attainable condition)?

In overview, the monitoring design (Table 4.1) recommended to address such questions has the following elements:

- A randomized, or probabilistic, sampling scheme that includes the entire watershed, with the exception of 1st and 2nd order and ephemeral streams, down to the upper boundary of the estuary
- The watershed is treated as a single stratum, with sample subpopulations defined for the upper and lower watershed, and for the San Gabriel River mainstem below Whittier Narrows, to ensure a representative distribution of sampling sites
- Sampling conducted at 30 sites in the first year and then continued with ten new randomly selected sites in each subsequent year (Figure 4.1)
- Monitoring occurring in the spring and structured around the Triad approach, which includes bioassessment, aquatic toxicity, and water chemistry
- Measures of physical habitat characteristics collected coincident with bioassessment, including both the California Department of Fish and Game method and the California Rapid Assessment Method (CRAM).

The types of data products resulting from this monitoring design and appropriate for answering Question 1 may include:

- Cumulative frequency distribution plots of key individual indicators or metrics and of synthesized Triad results or condition scores
- Estimates of the stream reach miles in the watershed above/below benchmarks of interest for key indicators and for synthesized Triad results

- Maps of the areal distribution of monitoring sites in the watershed above/below benchmarks of interest for key indicators and for synthesized Triad results
- Estimates of difference in status between the upper and lower watershed, and between the mainstem and tributaries
- Trends over time in the estimates of watershed condition.

The following subsections provide details on the design approach selected, as well as on the recommended indicators and the sampling sites and frequencies. Data from the random watershed design will most probably not be ideally suited for use in the 303d listing process. This is because new sites will be sampled each year and a random, or probability based, design is not intended to support conclusions about the condition of specific locations. However, the State's current listing policy does not preclude the use of data from programs not expressly designed for listing purposes, and data from the random design could potentially apply to river reaches if enough random sites happen to fall in a specific reach over a three-year period.

4.1 Design approach

A random, probability-based design is best suited to addressing the core management question about the status of the watershed's streams as a whole. The strength of such an approach is that it will support conclusions about conditions across the entire watershed, and about any strata (or discrete subdivisions) defined within the watershed. The drawback is that it will not support conclusions about conditions at specific sites.

In probability based designs, such as used by the SWAMP, EMAP, and Bight Programs, stations are located randomly in order to provide the ability to draw statistically valid inferences about an area as a whole, rather than about just the site itself. Such designs can allocate monitoring sites randomly throughout the entire region, or can subdivide the region into a number of strata that are relatively homogeneous. For example, watershed strata could be based on relative amount of urbanization, general habitat type, or channel morphology. Whatever the stratification scheme, the basic design principle is that samples are allocated randomly among strata, with the number of samples per stratum based on a consistent weighting factor (e.g., area of the respective strata). The level of sampling effort required in probability based designs depends, as in all designs, on the specific questions being asked, the underlying levels of variability in the data, and on the level of precision needed for decision making. The primary intent of this component of the SGRRMP is to answer questions about the frequency of sampled areas above or below different benchmarks of interest. Given that the confidence limits around the cumulative frequency curve are widest at the 0.5 point on the curve, the workgroup made a subjective decision to accept a 15% confidence limit for this statistic (see Section 4.1.2).

The design effort for this component of the regional monitoring program involved developing rigorous answers to a series of subsidiary questions to define the detailed aspects of the overall management question:

- Which type of aquatic resources will be monitored?
- Where in the watershed will monitoring occur?
- How will stream quality/condition be defined?
- How will the conditions of streams be measured?
- How frequently will monitoring occur?

These questions are addressed in the following sections.

4.1.1 Target population and sampling frame

The target population is the ecological resource about which information is desired. The target population is defined as:

- The San Gabriel River watershed down to the upper end of the estuary
- Where flowing surface water exists for the large majority of the year
- Channels (both natural and modified) that fit the definition of "waters of the US" along with the adjacent riparian vegetation that would typically fall under the jurisdiction of the California Department of Fish and Game.

More detailed definitions and descriptions of these boundary conditions follow.

Questions about the condition of streams in the freshwater portion of the watershed are dealt with separately from those related to the estuary, which are addressed under Question 2. Focusing strictly on freshwater simplifies the selection of sampling sites and indicators for Question 1, because it removes the need to create a separate sampling stratum and a parallel set of indicators for brackish water. The boundary between the San Gabriel River and the estuary for purposes of this program is situated at the point where the concrete apron in the river is replaced by a soft bottom, which occurs just upstream of Atherton Drive.

The target population is also defined as those portions of the watershed's stream network where flowing water exists for the majority of the year. Major impoundments in the watershed were excluded from the target population. These impoundments include the areas behind Cogswell, San Gabriel, Morris, Santa Fe, Puddingstone, and Whittier Narrows Dams, and Legg and Peck Lakes. Flowing surface water is defined as those channels coded as perennial in the National Hydrographic Dataset (NHD) and confirmed as such by the workgroup. The NHD data layer for perennial streams was adjusted based on the workgroup's personal knowledge of the status of streams in the watershed. Segments that have no flow except during storms or during rare circumstances (e.g., controlled discharge) were recoded as non-flowing. Flowing surface water was defined to include water from all sources, including natural (local) and imported water, urban runoff, and treated effluent from water reclamation plants. This resulted in some artificially perennial stream segments in the lower watershed being recoded as flowing. Again in the lower watershed, some segments that are actually underground stormdrain channels were removed from the dataset. In the upper watershed, the NHD layer was modified based on the workgroup's best understanding of the typical condition of the streams with regard to year-round flow.

Some portions of the target population (i.e., the smaller creeks and streams in the upper reaches of the watershed) are both difficult to access (and therefore more costly to sample) and much less likely to contain flowing water. Removing hard-to-access streams from the target population, simply on the basis of their relative ease of access, would bias the watershed assessment. This is because hard-to-access streams will, by definition, be less impacted than those with easier access. The SWAMP design for the Los Angeles County portion of the Santa Clara River watershed dealt with this problem by systematically removing 1st and 2nd order streams from the target population. The SGRRMP design for Question 1 addresses these related issues by removing 1st and 2nd order and ephemeral streams from the target population, solely on the basis of their size, rather than their relative degree of access. The implication of this decision is that monitoring results will not be applicable to these smaller headwater streams.

Because the amount and location of flowing water in the watershed can shift seasonally, the definition of the sampling frame (a representation of the target population used to select the

sample sites and that must have the attributes needed to implement the monitoring design) should also include a time frame. There are a number of issues related to the choice of sampling period. In general, flow is greater and more streams contain flowing water in the winter and spring. However, storms during these seasons can also scour channels and remove invertebrate communities. Streams that contain flowing water in the fall may be more likely to have more persistent, and less variable, invertebrate communities. In terms of managed flows, LACSD's Pomona and Long Beach Water Reclamation Plants discharge much less water in the summer, when demand for reclaimed water is higher, while they discharge much more in the winter. As a result, they mimic the natural flow regime and do not require special consideration when determining the timing of bioassessment sampling. In addition recharge/release of imported water and captured storm flows by the Los Angeles County Department of Public Works (LADPW) affects the amount and location of flowing water.

The choice of sampling period is also affected by the potential for coordination among existing programs and the availability of interpretive tools. The EMAP and SWAMP sampling periods are in the spring, and both of these programs use a bioassessment indicator, as will the SGRRMP (see Section 4.2 Indicators). In contrast, the two permittees that now conduct bioassessment monitoring (LACSD and LADPW) are required in their permits to do so in the fall, using the same basic protocol employed by EMAP and SWAMP.

The proposed random watershed monitoring design recommends bioassessment sampling in the spring, after an antecedent dry period long enough to ensure that a benthic invertebrate community is likely to have developed after any scouring from storm flows during the wet season. The recommendation for spring sampling is based on the value of data compatibility with the EMAP and SWAMP efforts and the fact that both permittee programs are relatively new. In addition, the California Department of Fish and Game's Index of Biotic Integrity (IBI) for evaluating bioassessment data is currently only established for the spring. However, efforts are underway to develop an IBI that is applicable to a mid-spring through mid-fall index period. Once this IBI becomes available, and/or when sufficient data are available to intercalibrate bioassessment results from spring and fall periods, then it may become possible to sample in either the spring or the fall, adding flexibility to the program.

4.1.2 Strata, subpopulations, and sampling requirements

Stratification can be used to subdivide the watershed into more homogeneous sections to better answer questions about differences between distinct portions of the watershed. However, sampling requirements in randomized designs increase linearly with the number of strata. Thus, the value of increased resolution must be balanced against the associated increase in cost and effort, because each stratum requires a full complement of sampling sites.

An alternative to stratification is to subsample specific areas of the watershed, yet still treat the watershed as a single stratum. This approach ensures representation of all subpopulations by distributing samples in desired proportions across the various sections of the watershed. The advantage of this approach is that it does not require a complete set of samples for each area of interest. The disadvantage is that it does not allow comparison between the subpopulations of the watershed.

The San Gabriel River watershed displays clear differences between its upper and lower portions in terms of channel morphology and habitat, and most probably in water quality and quantity as well (given the relative absence of urbanization in the upper watershed). In addition to these subdivisions, the workgroup identified the mainstem of the San Gabriel River as an area of particular interest.

The SGRRMP design treats the watershed as one overall stratum with three subpopulations. This decision was based primarily on the fact that the primary purpose of Question 1 is to assess the entire watershed, and not to specifically address either particular sites or comprehensively monitor all the streams in the watershed.

The number of sites sampled under the random design depends on the desired confidence level in the data. A larger sample size translates to less uncertainty associated with differences or trends in the data, and vice-versa. Data from the randomized design will be used to produce cumulative frequency distributions of the indicator measures. These distribution curves can then be used to make descriptive statements about the proportion of the stratum (i.e., the watershed) that is above or below any particular threshold level of interest, for example, an IBI score of 35. The confidence level attached to these estimates of proportion depend on the size of the error bars around the cumulative frequency distribution curve. As with all statistical estimates, the larger the error bars, the less the confidence of the estimate. The error bars around the binomial cumulative frequency distribution curve are widest at a proportion, or "p", of 0.5, that is, halfway along the curve. Thus, selecting a sampling intensity that ensures the error bars will be acceptable at $p = 0.5$ means that, even in the worst case, useful estimates can be produced. The error bars associated with several representative levels of sampling effort are as follows:

- 50 sites + / - 12%
- 30 sites + / - 15%
- 12 sites + / - 24%.

Thirty samples per stratum were determined to provide a reasonable level of confidence for assessment, the same level of sampling intensity selected by the Bight Program. Defining two or three distinct strata would require a total of 60 to 90 sampling sites, an unrealistic number for a program of this nature. However, the procedure for drawing the random samples includes a requirement that the three portions of the watershed will be treated as subpopulations, with samples distributed to ensure a representative number of samples in each subpopulation. For purposes of the sample draw, the boundary between the upper and lower portions of the watershed is Santa Fe Dam. The first year's sampling sites, drawn randomly from the target population, are shown in Figure 4.1.

4.1.3 Sampling frequency and intensity

The recommended sampling frequency and intensity were selected to balance the twin goals of achieving the assessment threshold of 30 sites as quickly as possible, while also keeping in mind the longer-term relevant management timeframes. Relevant management timeframes (e.g., permit renewals, 305b reports) are several years long and longer-term monitoring of the results of natural processes that affect the watershed does not necessarily require frequent monitoring on an annual timescale. Thus, a complete assessment of the entire watershed on an annual basis is not necessary.

The recommended design is frontloaded. This involves sampling 30 sites during the first year of the program and ten newly selected random sites in each subsequent year. This would enable managers to carry out a valid assessment after the first year, which would increase the immediate value of the program. Sampling ten new sites in each subsequent year would have the benefits of:

- Sampling the entire watershed over a period of time

- Producing a new set of 30 sites on a three-year schedule appropriate to management timeframes
- Spreading sampling out over a number of years, which would tend to smooth or average year-to-year variability
- Keeping the level of effort to a level that realistically could be funded.

4.2 Indicators

Monitoring of overall stream status is recommended to be based on the Triad approach, in which bioassessment (and its associated suite of physical habitat measurements), aquatic toxicity, and water column chemistry data provide a variety of perspectives on conditions at a site. It is especially suited to situations where the primary concern is the relationship between water quality and habitat or ecosystem condition, and no single or simple suite of indicators affords an unambiguous measure of status. The Triad of measurements provides an opportunity to assess whether there are apparent linkages between observed levels of chemicals of concern and impacts on test organisms and/or the instream community itself (although it is widely recognized that, in general, the instream benthic community is most dependent on physical habitat features).

4.2.1 Bioassessment

Bioassessment, a measure of the structure of one or more components of the instream biological community, provides a direct measure, from one perspective, of the ecological status of instream communities. There are alternative approaches to stream bioassessment, for example, those used by Western EMAP, the U.S. Forest Service, and the California Department of Fish and Game. While similar in their basic approach (which involves measurement of various aspects of the instream benthic invertebrate fauna), all differ somewhat in their details, with none having emerged as a clear standard. The State of California's SWAMP has established a bioassessment subcommittee with the goal of resolving which method(s) to use for its monitoring efforts. A decision about which specific method to use in the SGRRMP has therefore been deferred pending the resolution of this issue.

In addition to differences in technical approaches for assessing instream animal communities, there are two alternative approaches for collecting the physical habitat measurements that are typically part of the bioassessment method (Table 4.2). The first is associated with EMAP and the California Department of Fish and Game's IBI. Because these methods monitor stream macroinvertebrates, their physical habitat measurements focus on the physical features in streams that are useful in explaining patterns in macroinvertebrate community structure. A second approach is the California Rapid Assessment Method (CRAM), being developed and evaluated by the Southern California Wetlands Recovery Project. CRAM is a rapid assessment tool that does not measure macroinvertebrates but whose primary emphasis is on the overall biology of the system, including the geomorphology, vegetation, riparian zone, and floodplain. Because both methods of measuring physical habitat involve on-site measurements, reflect complementary aspects of the stream and riparian system, and do not involve significant time to implement, the SGRRMP design includes both the IBI and CRAM sets of physical (and biological) habitat measures (Table 4.2).

4.2.2 Aquatic toxicity

Aquatic toxicity provides another measure of potential impact, although the use of test organisms in the laboratory makes this a less direct indicator of site-specific impact than the bioassessment leg of the Triad. On the other hand, aquatic toxicity tests can help identify potential impacts from chemical contaminants.

A key design decision is whether to use a single test species or multiple species. One currently popular standard approach is to use a fish (fathead minnow (*Pimephales promelas*)), an arthropod (*Ceriodaphnia dubia*), and a plant (*Selenastrum capricornutum*), although the *Pimephales promelas* is generally regarded as not very sensitive to many toxicants. *Selenastrum capricornutum* is also problematic because ammonia retards its growth but other nutrients may cause it to grow faster, making it difficult to interpret test results. Another option would be to use two arthropod test species, for example, *Ceriodaphnia dubia* and *Hyalella azteca*. However, this approach has been criticized because such taxonomically similar test species would most likely result in a relatively narrow response range to potential toxicants. The use of a single test species is open to the same criticism.

The recommended SGRRMP design for toxicity testing under Question 1 is to use two species (*Ceriodaphnia dubia* and *Pimephales promelas*) in the upper watershed during the first year of the program and *Ceriodaphnia dubia* alone in the remainder of the watershed. If no toxicity to *Pimephales promelas* is found, then this species will be dropped and the program in subsequent years will use only *Ceriodaphnia dubia*.

This decision was based on the fact that the goal of the random component of the watershed program is to provide an overall assessment of the general level of toxic effects in the watershed, rather than to conduct a detailed examination of site-specific toxicity impacts. In addition, past toxicity testing in the watershed has documented only minimal toxicity in certain areas, and that only for *Ceriodaphnia dubia*. Finally, *Pimephales promelas* is sensitive primarily to ammonia and ammonia levels have significantly decreased now that the LACSD treatment plants have implemented nitrification/denitrification processes. Taken together, this information strongly suggested that a single test species (*Ceriodaphnia dubia*) would be sufficient to meet the program's purposes. However, the U.S. EPA toxicity study currently underway concentrates only on the lower watershed, and there remains some residual concern about the potential for toxicity in the poorly studied upper watershed. The inclusion of *Pimephales promelas* in the upper watershed during the program's first year should address these concerns.

4.2.3 Water chemistry

Water chemistry data (Table 4.3) help to put the bioassessment and aquatic toxicity data into context, as well as provides direct measures of some potential sources of human impact. Some parameters (e.g., hardness, anions, cations) are also useful in general watershed characterization and in describing basic physical characteristics of the aquatic environment.

Water chemistry parameters selected for measurement include the range of contaminants that past monitoring data have shown to be the source of most water quality problems in the watershed and that are appropriate for broad watershed assessment and/or contribute to standards development. A longer list of contaminants is measured at the compliance monitoring sites associated with specific discharges (see Section 6.0 and companion report, Summary of Existing Monitoring Programs in the San Gabriel River Watershed). Bacterial indicators are not included among the recommended parameters because single, unreplicated samples collected once a year from a shifting set of random sites were considered to provide little useful information, especially in light of the well-known variability inherent in bacterial indicator measurements.

4.3 Coordination with other efforts.

There are other efforts either planned or underway intended to address similar or complementary questions about stream status throughout the watershed. The first of these is the LARWQCB's SWAMP effort (with its focus on assessing hydrologic units). This program plans for a total of 30 random watershed sites in the Los Angeles and San Gabriel River watershed, to be sampled once every five years, with 15 allocated to the San Gabriel River watershed. While the total of 30 sites is sufficient for probability based estimates on the combined watershed, the 15 sites planned for the San Gabriel River watershed are not adequate, by themselves, for this purpose. The LARWQCB sampled their 15 sites in the San Gabriel River watershed during 2005 in coordination with the SGRRMP, thus reducing the financial and logistical impact on the SGRRMP.

In addition to the SWAMP effort, a variety of support was provided to the SGRRMP in its first sampling season (2005) by a number of other agencies and/or programs, including:

- U.S. EPA
- California Department of Fish and Game
- Los Angeles County Sanitation Districts
- Los Angeles County Department of Public Works
- Orange County Stormwater Program
- Southern California Coastal Water Research Project
- San Gabriel Mountains Regional Conservancy.

The support included logistical coordination, field sampling, laboratory analyses, and data management. The LARWQCB authorized a set of one-time compliance monitoring offsets to permit LACSD and LADPW to shift a limited amount of monitoring effort to meet the requirements of the new program.

The SGRRMP's random watershed monitoring design already includes specific elements intended to coordinate with SWAMP, including:

- Use of the Triad approach
- Intent to use the bioassessment method(s) selected by the SWAMP bioassessment committee
- The decision to monitor in the spring
- Agreement in principle to standardize chemical measurements and methods to the greatest extent possible.

In addition, the SGRRMP workgroup envisions ongoing coordination as needed with the agencies involved in the first year's sampling effort.

Table 4.1. Design overview for the random watershed component of the regional monitoring program, which recommends a Triad approach of bioassessment, aquatic toxicity, and water chemistry.

Design element	Description	Details
Design approach	Probabilistic design	All channels with flowing water, except for 1st and 2nd order and ephemeral streams Excludes impoundments Watershed treated as one stratum with three subpopulations
Number of sites	30 in year 1 10 in subsequent years	All sites selected randomly Ensure representative distribution across upper and lower watershed, and mainstem
Sampling frequency	Yearly in spring	
Bioassessment indicator	Stream macroinvertebrates Physical habitat measurements	Macroinvertebrate sampling method not defined Both IBI/EMAP and CRAM physical habitat measurements
Aquatic toxicity indicator	Basic scan	*Ceriodaphnia dubia* and *Pimephales promelas* in 1st year *Ceriodaphnia dubia* only in subsequent years if no *Pimephales promelas* impacts found
Water chemistry indicator	ICP total trace metals (34 metals) Conventional chemistry (hardness, pH, dissolved oxygen, etc.) Nutrients Organophosphate pesticides (19)	

Table 4.2 Physical habitat parameters sampled in the EMAP and California Department of Fish and Game (CDFG) approaches compared to the California Rapid Assessment Method (CRAM) approach.

Aspect of system	EPA P-Hab and CDFG physical habitat quality	California Rapid Assessment Method
Hydrology	Channel flow status: amount of flow - coverage of entire streambed	Hydroperiod: presence of "intact" baseflow and peak flow regimes
		Water source: lack of artificial sources of dry season flow
Hydrology/physical structure	Velocity/depth regime: presence of pools, riffles and runs	Physical patch richness: presence of riffles, runs, pools, snags, mounds, bars, etc
Physical structure/substrate	Sediment deposition: deposition and bar formation	
Physical structure/substrate	Embeddedness: composition of channel bed (e.g. cobble, boulders)	
Physical structure	Channel alteration: presence of channelization or bank hardening	Hydrologic connectivity: connection between stream and adjacent floodplain
Physical structure	Bank stability: presence of erosion along banks	
Biogeochemistry		Organic matter accumulation: presence of organic matter in various stages of decay
Physical structure/habitat	Epifaunal substrate/available cover: presence of submerged habitat, such as snags, cobble beds etc	Topographic complexity: cross section of the stream contains a variety of different habitats such as bars, runs, ponds
Physical structure/habitat	Frequency of riffles, frequency and distance between riffles	
Habitat	Vegetation protection: extent and diversity of habitat along the streambanks	Biotic patch richness: Diversity of habitat types

Aspect of system	EPA P-Hab and CDFG physical habitat quality	California Rapid Assessment Method
Habitat	Riparian vegetative zone width: width of riparian zone and presence of human activities	Buffer: 3 metrics evaluating the extent, width, and condition of the buffer
Habitat		Connectivity: connectivity with upstream and downstream reaches
Habitat		Vertical biotic structure: extent of different height classes of vegetation
Habitat		Interspersion and zonation: spatial diversity and complexity of habitats - presence of habitat mosaic
Habitat		Invasive plant species: percent coverage of invasive plant species
Habitat		Native plant species richness: number of codominant native plant species

Table 4.3 Details of the water chemistry parameters recommended to be measured in the random watershed component of the program.

Category	Parameters	General assessment use	Standards development use
General physical characteristics	Hardness, alkalinity, total dissolved solids (TDS), total suspended solids (TSS)	Basic physical characteristics Useful in watershed characterization Gross measures of water quality	
DO and pH		Actual measurement can depend on time of day, but important in interpreting toxicity results related to ammonia Ancillary data for interpreting benthos and algae data	Provide basic information about pH levels throughout watershed to help evaluate applicability of existing standards
Total and dissolved organic carbon		Basic physical characteristics Gross measures of water quality Useful in assessing algae problem, supplements nutrient measures	Biotic Ligand Model development
Total suspended solids		Basic physical characteristics Gross measures of water quality Surrogate for turbidity	
Metals	Total and dissolved metals for watershed characteristics, patterns (ICP list of 34 metals)	Metals can speciate, so total metals simpler to measure Mercury not an issue in streams but is a potential problem in reservoirs	Biotic Ligand Model development
Nutrients	Nitrate, nitrite, total Kjeldahl nitrogen, ammonia, total phosphate, orthophosphate	Useful for gross description of conditions Ancillary data for interpreting benthos and algae data	Provide basic information about nutrient levels throughout watershed prior to standards development
Organophosphate pesticides	ICP list (19, incl. chlorpyrifos, diazinon, malathion)	Interest in patterns of pesticide distribution Random design may not provide spatial intensity needed	

Figure 4.1. Location of the 30 random watershed sites sampled during the first year of the program.

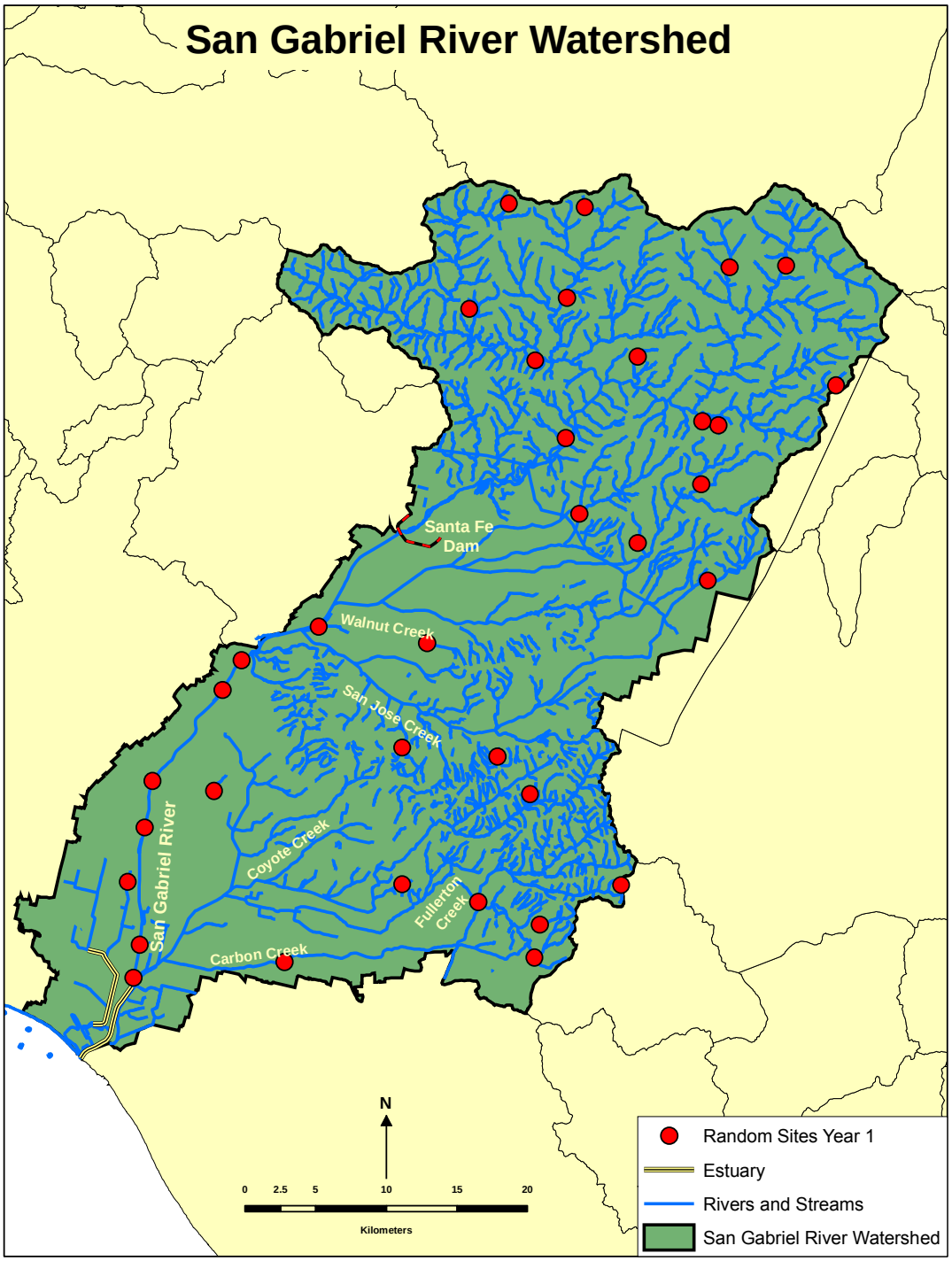

5.0 Question 2: Are Conditions at Areas of Unique Interest Getting Better or Worse?

This question focuses on the beneficial uses:

- Warm Freshwater Habitat (WARM)
- Cold Freshwater Habitat (COLD)
- Wildlife Habitat (WILD)
- Estuarine Habitat (EST),

and reflects concerns related to the status and trends of condition at specific, fixed locations or areas in the watershed, including the estuary at the bottom of the watershed. These locations are ones the workgroup agreed represented a type of natural habitat that is relatively scarce in the region, is at an elevated risk of impact because of intense recreational use, or has the potential to provide information about trends in key portions of the watershed.

Potential assessment questions that address such concerns include:

- Are areas of valued habitat supporting their designated beneficial uses of Warm Freshwater Habitat, Cold Freshwater Habitat, Wildlife Habitat, and/or Estuarine Habitat?
- What is the condition of specific areas of valued habitat, and is this condition getting better or worse over time?
- How do habitat and water quality conditions at valued habitat areas compare to conditions in other portions of the watershed?
- What are the patterns and trends in general water mass characteristics (e.g. temperature and salinity) in the estuary?
- What is the condition of sediment quality in the estuary?
- What is the condition of water quality and habitat at key confluence locations (where major tributaries enter the mainstem) that are likely to reflect cumulative impacts from discrete portions of the watershed?
- What are the differences in habitat or water quality between subwatersheds, as reflected by conditions at confluence sites?
- What are the trends over time in the relative differences between subwatersheds?

The component of the regional monitoring program to address these questions is intended primarily as a trend monitoring effort and has the following three recommended elements (Table 5.1):

- For high value / high risk sites in the freshwater portion of the watershed:
  - A fixed design that focuses on four specific locations and three minimally impacted sites
  - An emphasis on habitat conditions rather than water quality
  - Sampling will take place in the spring to coordinate with monitoring for Question 1
  - Monitoring will be structured around the CRAM approach (Table 4.2)
- For the estuary:
  - A fixed design including four existing stations monitored by LACSD
  - An emphasis on water quality and sediment quality
  - Sampling of conventional water quality parameters at an undetermined frequency
  - Annual sampling of a broader list of water quality parameters

  - Annual sampling of sediment chemistry, sediment toxicity, and benthic infauna
- For confluence sites where major tributaries enter the mainstem:
  - A fixed design that focuses on five specific locations
  - Monitoring based on the Triad of bioassessment, water quality, and aquatic toxicity
  - Sampling will take place in the spring to coordinate with monitoring for Question 1.

The types of data products resulting from this monitoring design and appropriate for answering Question 2 may include:

- For high value / high risk sites in the freshwater portion of the watershed:
  - Site-by-site summaries of the quantitative scoring of CRAM attributes and trends in these over time
  - Site-by-site comparisons of CRAM attributes between high value / high risk and minimally impacted sites
  - Site-by-site interpretations and conclusions of habitat status and trends
- For the estuary:
  - Graphical and map-based descriptions of spatial and temporal patterns of descriptive water mass characteristics (e.g., temperature, salinity)
  - Graphical and mapbased descriptions of spatial and temporal patterns of sediment chemistry, sediment toxicity, and benthic infaunal community structure (sediment Triad)
  - Evaluation of sediment Triad data with reference to the pending statewide Sediment Quality Objectives
- For confluence sites:
  - Descriptions of water quality conditions (e.g., conventional chemistry, total metals, organophosphate pesticides)
  - Comparisons across sites of water quality conditions
  - Trend plots and maps of changes in measures of condition over time.

Over time, information from the confluence locations may also be useful in assessing differences between subwatersheds, directing management attention to specific subareas of the watershed, improving understanding of the nature of cumulative effects, and tracking the effectiveness of management actions at a subwatershed scale.

The following subsections provide details on the design approach selected, as well as on the recommended indicators and the sampling sites and frequencies.

5.1 Design approach

This question reflects concerns related to the status of particular locations in the watershed that are of heightened interest because they meet one or more of the following criteria:

- They represent unique habitat value
- Valued habitat is at higher risk because of concentrated human use
- They are confluence points where major tributaries enter the mainstem, providing an ability to monitor cumulative impacts from major portions of the watershed
- They provide a measure of natural background or context against which to evaluate trends in other portions of the watershed.

The primary goal of this component of the program is to track trends over time and provide early warning of potential degradation so that management action can be taken. The appropriate design

is therefore a set of fixed sites monitored systematically over time with consistent and readily interpretable methods.

5.1.1 Freshwater portion of the watershed

The workgroup identified specific sites (Figure 5.1) that fit into the following three categories:

- Specific areas of valued and/or at-risk habitat
  - Los Cerritos Wetland
  - Santa Fe Dam scrub habitat near the head of the lake
  - Walnut Creek County Park
  - Whittier Narrows
- Confluence points where major tributaries enter the mainstem
  - Confluence of East and West Forks of San Gabriel River
  - Mainstem of San Gabriel River below Morris Dam, at the bottom of the canyon
  - Confluence of Walnut creek and mainstem of San Gabriel River
  - Confluence of San Jose Creek and mainstem of San Gabriel River
  - Confluence of Coyote Creek and mainstem of San Gabriel River
- Minimally impacted sites that provide a measure of natural background or context
  - Three sites being used for the SCCWRP Natural Loadings Study
    - Cattle Canyon, tributary to the East Fork of San Gabriel River
    - Bear Creek, tributary to the West Fork of San Gabriel River
    - Upper North Fork of San Gabriel River.

The two stormwater mass emissions stations monitored by LADPW (San Gabriel River at Spring Street and Coyote Creek at Del Amo Boulevard) capture the large majority of loads to the system. These data provide additional context for understanding spatial patterns and temporal trends in the watershed.

The Los Cerritos Wetland represents a special case because it is not currently hydrologically connected to the San Gabriel River, and has its own distinct watershed. However, it is recommended for inclusion in the regional program because:

- Coastal wetlands are extremely valuable habitats in southern California
- The area was at one time a part of the San Gabriel River estuary and thus the larger watershed
- It is not yet developed and thus meets criteria for protection.

The development of a SGRRMP monitoring design for the Los Cerritos Wetland should be deferred until this can be coordinated with the recommendations that emerge from the Wetlands Recovery Project's effort to develop a regional wetlands monitoring program.

Monitoring for all other sites should occur during non-storm conditions in the spring, and coincide with the random watershed monitoring to the greatest extent possible.

5.1.2 Estuary

The estuary as a whole is considered an area of special interest because of the regional scarcity of estuarine habitat in southern California. Current monitoring in the estuary includes several compliance stations sampled by the power generating stations and four stations sampled by LACSD as part of its NPDES monitoring program. The power plant monitoring effort is considered as a portion of the compliance monitoring system (see Section 6.0) because it is directly associated with discharges into the estuary. However, the four LACSD stations are

addressed within this component because they represent general locations of interest useful for characterizing and assessing the estuary.

Recommended monitoring focuses on both water and sediment quality. It is presumed that longer-term impacts will appear primarily in the sediment, because this is where particle-bound contaminants are expected to settle out. Annual sampling is recommended for sediment constituents and for a longer list of water quality parameters. Conventional water quality parameters are recommended for more frequent sampling, on a schedule to be defined during the subsequent detailed implementation phase.

5.2 Indicators

5.2.1 Freshwater portion of the watershed

For the minimally impacted sites and the high value / high risk sites (with the exception of the Los Cerritos Wetland), recommended monitoring should be based on the CRAM set of habitat metrics (Table 4.2). This recommendation is based on the fact that the primary questions in this aspect of the program relate to the status and trends of habitat, rather than water quality. Comparison studies have shown that the CRAM indicators are more stable, less influenced by short-term events, and thus more suitable for longer-term trend monitoring than are the standard bioassessment indicators. For the Santa Fe Dam and Whittier Narrows sites, it will be necessary to define the specific zone for which CRAM will be appropriate, since CRAM generally does not apply to upland sites.

For the confluence sites, recommended monitoring is based on the Triad approach used in Question 1 (bioassessment, water chemistry, aquatic toxicity) (Tables 4.3, 5.1).

5.2.2 Estuary

LACSD monitoring in the estuary currently focuses on a water chemistry constituent list related to their upstream discharges. These are not directly relevant to the estuary because the point discharge input from upstream is, at this location, swamped by the influence of the ocean. This judgment is supported by both historical water quality data and more recent toxicity testing, which show little if any evidence of water quality concerns in the estuary. The recommended water chemistry monitoring is therefore focused on conventional chemistry (e.g., dissolved oxygen, hardness), which will be useful in describing and tracking trends in general water mass characteristics. A longer list of constituents (yet to be defined but including contaminants such as metals and pesticides) is recommended for annual sampling.

Annual sediment sampling should include sediment chemistry, sediment toxicity, and benthic infauna in order to obtain a more complete picture of sediment quality and to be consistent with the approach being developed for the State Water Resources Control Board’s (SWRCB’s) Sediment Quality Objectives.

5.3 Coordination with other efforts

There are different opportunities available for coordination related to the freshwater and the estuary portions of this component of the SGRRMP.

For the freshwater portion, as described in Section 4.3, there are other broad monitoring efforts planned for the San Gabriel River watershed, in addition to the ongoing compliance monitoring conducted by LACSD around its water reclamation plants, and the stormwater mass emissions

sites monitored by LADPW and planned by the Orange County Stormwater Program. These provide opportunities for coordination and standardization, particularly with regard to:

- The four SWAMP directed sites planned for the base of four subwatersheds (Walnut Creek, West Fork, North Fork, East Fork), which will use the Triad approach to monitor aquatic condition
- The monitoring designs being developed by the Friends of the San Gabriel River and the San Gabriel Mountains Regional Conservancy, which will focus on both water chemistry and habitat
- The existing compliance monitoring being conducted by LACSD at the confluences of both San Jose Creek and Coyote Creek with the mainstem
- Stormwater mass emissions monitoring.

For the estuary portion, there are several opportunities for coordination and standardization, including:

- Power generating station monitoring program(s) that have sites adjacent to two of the LACSD estuary stations
- The Bight Program's bays and estuaries component
- The SWAMP site planned for the bottom of the estuary, which will sample a broad range of indicators, including sediment chemistry in addition to those planned for the tributaries.

Coordination with all these programs can include efforts to standardize field sampling, laboratory analysis, and data management methods. Coordination with SWAMP, the Bight Program, and the Friends and Conservancy programs can take the form of cooperative sampling efforts to defray costs. Coordination with the power generating station(s) can take the form of cooperative sampling and/or consolidating stations.

5.4 Special projects

There are two related special projects underway to improve understanding of the hydrodynamics and water quality of the estuary. Both are modeling efforts, although each has a somewhat different focus.

The first modeling effort is being conducted by SCCWRP. Its goal is to begin to collect the data necessary to understand the physical, chemical and biological dynamics in the San Gabriel River estuary in order to develop a model that links sources of pollutants and their fate and transport throughout the year. This effort is being carried out in collaboration with efforts underway by U.S. EPA and the LARWQCB to develop watershed models for the San Gabriel River watershed. The SCCWRP model can be applied to the development of watershed TMDL targets and/or site-specific water quality objectives for the estuary.

The SCCWRP study has a number of distinct steps:

- Develop a hydrodynamic model
- Develop a watershed model
- Define the inputs to a water quality model
- Describe the transformation processes that occur in the estuary
- Collect data to calibrate and validate the water quality model.

The hydrodynamic model will use the physical description of the estuary to describe water movement. Inputs to the water quality model will be defined using discharge records and a model of stormwater runoff. Finally, water quality data will be collected to validate the model incorporating all these factors.

Both dry and wet weather conditions in the estuary will be modeled. However, the sampling and monitoring efforts to calibrate and validate the model will be focused on the dry season. Wet weather inputs will be simulated using a calibrated watershed model of the San Gabriel River and Coyote Creek watersheds. Land use and water quality monitoring data will be used to quantify wet weather inputs to the water quality model. Validation of the wet weather component of the estuary can be accomplished with additional resources, should they become available.

The second effort is being conducted by LADWP and AES Corporation (operator of one of the electric generating stations in the estuary) to provide additional input to decision making about the formal hydrological classification of the estuary as either an estuary or ocean/bay. LADWP and AES, respectively, operate the Haynes and Alamitos Generating Stations, which discharge into the estuary. These discharges had been classified as ocean discharges and the LARWQCB's recent classification of these discharges as estuarine discharges has important implications for the operation of the generating stations, since different thermal standards apply in the ocean and in estuaries.

The LADWP and AES modeling project has been developed to evaluate the hypothesis that the lower San Gabriel River, from a location somewhere downstream of the 7th Street Bridge to the mouth of the river, is an embayment created by saline power plant discharges, which meet the saline waters of the San Pedro Bay. The hypothesis further assumes that, since both power plants draw intake water from Alamitos Bay/San Pedro Bay and discharge that bay water to the lower San Gabriel River, and since the salinity of the water in the vicinity of the discharges is consistent with the salinity of bay/ocean water, the lower San Gabriel River in the vicinity of the power plant discharges is best understood as an extension of the San Pedro Bay. If this hypothesis is substantiated, then, from a location somewhere upstream of the 7th Street Bridge to the upstream extent of saltwater in the river channel, the lower San Gabriel River could be understood as a saltwater and fresh water mixing zone of variable salinity that could be considered the estuary.

The modeling effort will characterize the salinity, temperature, and mixing characteristics of the lower San Gabriel River. Field sampling under a variety of tidal, flow, and plant operation regimes will provide data for a three-dimensional model of the mixing area. This model will be used to define the mixing area between the base flow and the power plant discharge, thus providing additional insight into the functional upstream and downstream boundaries of the estuarine mixing zone.

Table 5.1. Design overview for the locations of unique interest component of the regional monitoring program, which will use different indicators for the freshwater and estuary portions of the watershed.

Design element	Description	Details
Design approach	Fixed sites	Treat freshwater and estuary portions separately
Number of sites	12 in freshwater 4 in estuary	Freshwater: • High value/risk areas (4) • Major confluences (5) • Minimally impacted sites (3) Estuary: • Existing LACSD sites (4)
Sampling frequency	Freshwater: • Yearly in spring Estuary: • Yearly sediment • Yearly expanded water chemistry	
Freshwater indicators	Riparian zone habitat	CRAM metrics and attributes
	Water chemistry at confluences	General physical characteristics DO and pH Dissolved organic carbon Total suspended solids Metals Nutrients Organophosphate pesticides
	Bioassessment at confluences	Macroinvertebrate sampling method not defined Both IBI/EMAP and CRAM physical habitat measurements
	Aquatic toxicity at confluences	Ceriodaphnia dubia and Pimephales promelas in 1st year Ceriodaphnia dubia only in subsequent years if no Pimephales promelas impacts found
Estuary indicators	Water chemistry and sediment	Water chemistry: • Yearly expanded list, including metals, bacteria, OP pesticides • More frequent conventional (e.g., salinity, hardness) Sediment: • Yearly sediment chemistry (metals, pesticides, DDT/PCB, sediment toxicity, infauna

Figure 5.1. Monitoring sites to address questions related to unique freshwater and estuarine sites.

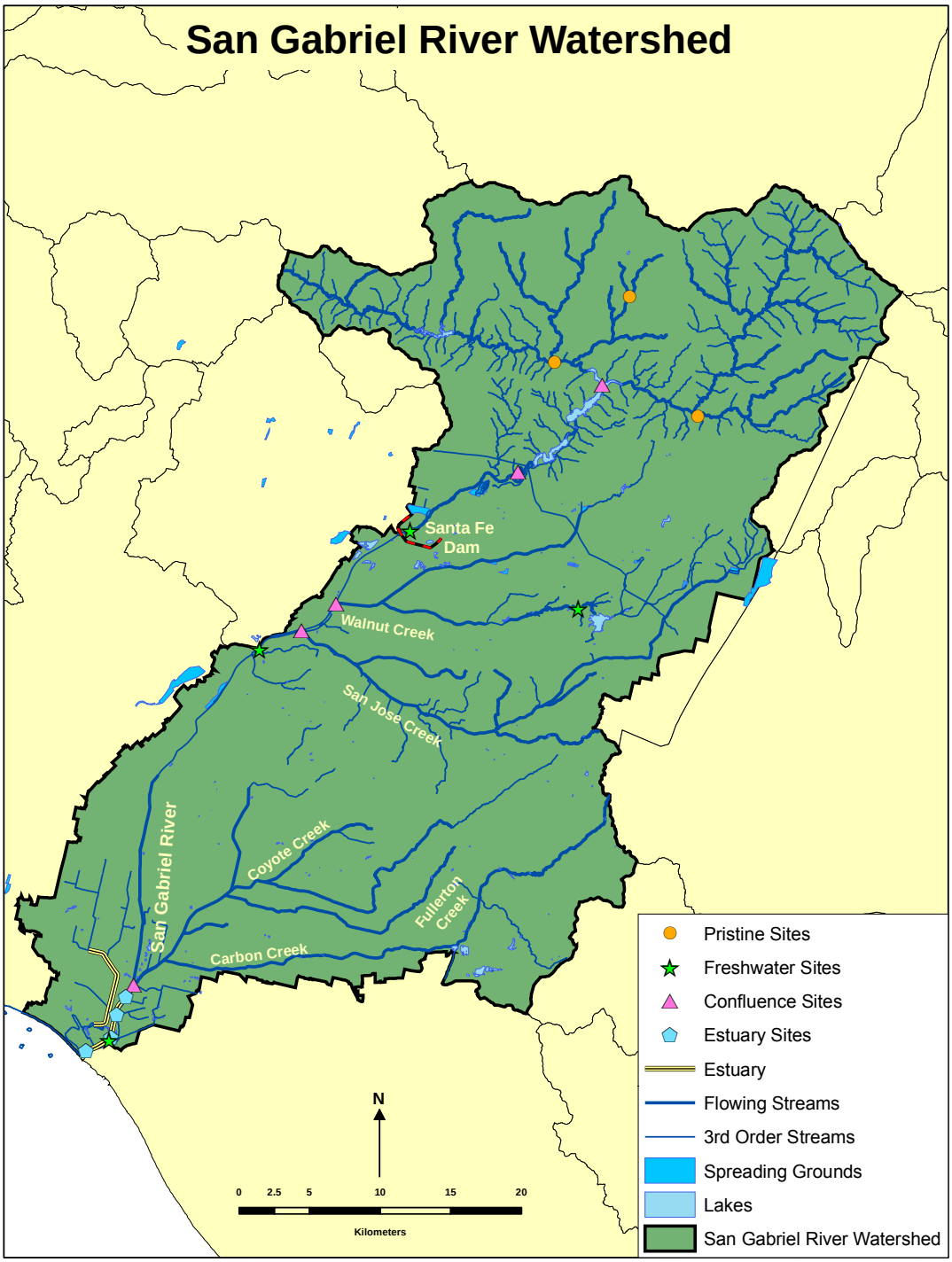

6.0 Question 3: Are Receiving Waters Near Discharges Meeting Water Quality Objectives?

This question focuses on the beneficial uses:

- Warm Freshwater Habitat (WARM)
- Wildlife Habitat (WILD)
- Estuarine Habitat (EST),

and reflects concerns related to potential impacts from point source discharges into the San Gabriel River and its tributaries, as well as into the estuary. (Note: the Cold Freshwater Habitat beneficial use designation only occurs in the upper watershed, above the LACSD discharges and the LADPW mass emissions stations and is therefore not included under this question.)

Potential assessment questions that address such concerns include:

- Do sites influenced by point sources support their designated beneficial uses of Warm Freshwater Habitat, Wildlife Habitat, and Estuarine Habitat?
- At sites influenced by point discharges, what is the concentration of chemical contaminants and the status of biological indicators?
- Is the concentration of chemical contaminants downstream of point source discharges above water quality objectives?
- Is the value of biological indicators outside the range of control, reference, or background levels?
- What is the frequency of exceedances of water quality objectives?
- Is the frequency of exceedances of water quality objectives getting better or worse over time?

In overview, the monitoring design recommended to address such questions has the following elements:

- Water chemistry monitoring at a regular frequency above and below each LACSD discharge point
- Toxicity testing on a regular frequency above and below each LACSD discharge point
- Bioassessment monitoring on a regular frequency below each LACSD discharge point
- Expanded bioassessment monitoring above each LACSD discharge point if the downstream bioassessment results are below the range expected for that habitat type
- Water, sediment, and biological community monitoring around the power plant discharges in the estuary.

The types of data products resulting from this monitoring design and appropriate for answering Question 6 may include:

- Site-by-site summaries of each sampled data type (tables of individual measurements and relevant averages)
- Site-by-site interpretations and conclusions based on synthesized results (narrative conclusions, decision trees specifying adaptive responses to monitoring results)
- Comparisons across sites for each sampled data type (tables highlighting differences, maps)
- Comparisons across sites for synthesized results (narrative conclusions, decision trees, maps)
- Trend plots over time of increases / decreases in parameters of interest.

Finalizing the specific details of constituent lists and monitoring frequencies, and of station locations in the estuary, will require additional evaluation of historical data and consideration of scientific and cost tradeoffs that were beyond the scope of this design effort. This follow-on work is envisioned to take place during the implementation phase of the SGRRMP. The existing network of compliance monitoring stations (Figure 6.1) will provide a starting point for this process.

The following subsections summarize the overall design recommendations and provide a set of criteria for guiding a subsequent more detailed design effort.

6.1 Design approach

The approach for compliance monitoring is constrained to some extent by explicit regulatory requirements that specify the manner in which comparison to water quality objectives should occur. Any adjustments intended to improve the coordination and efficiency of current compliance monitoring must therefore be carefully evaluated to ensure they are consistent with these requirements. The workgroup's evaluation was based on examination of historical monitoring and other data from the watershed and addressed the following design criteria:

1. Does the relative cost of monitoring at the existing frequencies match their respective information content and decision-making value?
2. Are monitoring sites located to provide independent measures of conditions, or are they so close together that they are duplicative?
3. Are there constituents that are currently monitored that rarely or never occur, or do not provide useful information, and that are therefore candidates for a reduced sampling frequency?
4. Does the list of monitored constituents reflect current knowledge about the nature of known and potential contamination problems in the watershed?
5. Are detection limits appropriate?
6. Do upstream – downstream station pairs have the ability to identify discharge impacts?
7. Has the monitoring design been coordinated to the greatest extent possible with other regional monitoring efforts (e.g., other SGRRMP components, SWAMP, Bight Program)?

Each of these questions is addressed in turn in the following subsections. A consideration of questions 1 – 3 led to recommendations for adjustments to LACSD's compliance monitoring program sufficient to fund the regional monitoring program on an ongoing basis. The mechanism for this monitoring offset and an analysis of the costs involved is contained in Section 10.

6.1.1 Monitoring frequency

The workgroup recommended a reduction in monitoring frequency from weekly to monthly at LACSD's compliance monitoring stations. LACSD currently measure a wide range of water quality parameters weekly at monitoring stations upstream and downstream of each water reclamation plant (WRP) discharge (21 stations) and in the estuary (four stations). The monitored parameters are shown in Table 6.1. Note that the parameter list for the inland WRP stations and the estuary stations is the same with one exception. Coliforms are measured weekly at the WRP stations and only monthly at the estuary stations.

An analysis of representative indicators (pH, DO, ammonia) from four monitoring stations examines the implications of moving to monthly monitoring. Values for many other monitored parameters were below detection limits often enough that their plots were not as informative with

regards to the potential differences between the information value of weekly versus monthly monitoring schedules. Figure 6.2 shows plots of weekly data and various subsets and averages of the weekly data for comparison, including:

1. Weekly data (the current monitoring design)
2. Date from Week 1 of each month, meant to mimic a monthly monitoring frequency
3. The average of the first and second weeks of each month
4. The average of the third and fourth weeks of each month
5. The average of all the data from each month.

Items # 3 – 5 are intended to reveal whether a single monthly sample would be likely to miss patterns (e.g., peaks, trends) that only become more visible when more frequent data points are averaged or smoothed. After inspecting these plots, the workgroup agreed unanimously that monthly data provided just as much insight into patterns in receiving water chemistry as did weekly monitoring data.

6.1.2 Monitoring sites

The workgroup recommended that LACSD receiving water station R9E be removed and monitoring terminated at this station. Station R9E, at the bottom end of Coyote Creek, is intended to provide a measure of cumulative conditions in this tributary just before it joins the mainstem of the San Gabriel River. However, R9E is sometimes influenced by cross-channel sheet flow coming down the San Gabriel River past station R9W, and R9E can often be sampled only at low tide because the tidal influence can extend up to this point. When this happens, sampling at R9W can readily be moved upstream a few hundred yards. However, this is not productive at R9E because station RA is less than 100 yards upstream of R9E and this would essentially involve duplicative sampling of station RA. Because there are no additional inputs to the Coyote Creek channel between RA and R9E, the workgroup unanimously agreed that continued monitoring at R9E does not provide any additional information not already provided by RA.

6.1.3 Monitoring parameters: Useful information

The workgroup recommended that water column chlorophyll a be removed from the list of parameters monitored at the LACSD monitoring stations. Water column chlorophyll a had been added to the list of routine aquatic chemistry parameters in an attempt to better track algal growth that occurs in response to nutrient enrichment. However, it is benthic algae that are of concern and water column chlorophyll a has no functional relationship to benthic algal growth. Thus, this parameter provides no useful management or scientific information and the workgroup agreed unanimously that chlorophyll a should be removed from the list of aquatic chemistry parameters.

6.1.4 Monitoring frequency: Bioassessment Index Period

LACSD is currently required by their NPDES permits to conduct annual bioassessment monitoring in the fall. However, SWAMP calls for bioassessment monitoring in spring. Therefore, to achieve desired consistency with SWAMP and other bioassessment programs, the workgroup recommended that LACSD conduct annual permit-required bioassessment monitoring in spring instead of fall. It was also recommended that LACSD conduct annual bioassessment monitoring according to the current version of the California Stream Bioassessment Procedure that is employed by the California Department of Fish and Game (CDFG), but which may be somewhat modified from the method required by LACSD's current NPDES permits. These two adjustments to LACSD's bioassessment monitoring program would ensure that all bioassessment data collected (i.e., by SWAMP, CDFG, SGRRMP, and LACSD) in the watershed is comparable.

6.1.5 Monitoring parameters: Watershed problems

The workgroup agreed that the current list of monitoring parameters addressed concerns about the most pressing water quality problems facing the watershed. While there is some concern about newer contaminants, the workgroup also agreed that periodic priority pollutant scans and careful evaluations of the sources of elevated toxicity would provide information that could be used to adjust the scope of routine compliance monitoring as needed.

6.1.6 Detection limits

The issue of detection limits is being addressed by individual permittees in their permit negotiations with their respective Regional Boards. In general, the workgroup recommended that ideally detection limits be adequate to assess compliance with relevant water quality objectives and support related TMDL development.

6.1.7 Upstream – Downstream station pairs

The workgroup considered this issue primarily with regard to the value of paired bioassessment samples. Within the watershed, physical habitat sometimes differs between upstream and downstream monitoring sites and bioassessment monitoring results from throughout California show that habitat can have a dominant effect on the biological community. In addition, the IBI is not yet considered to be refined enough to provide the basis for the rigorous site-by-site comparisons needed for compliance monitoring and numeric biological criteria have not been developed. The workgroup considered recommending that only stations downstream of discharges be monitored for bioassessment. However, the permittees believe that it is important to maintain this paired monitoring for at least a few more years, until the relationships between the upstream and downstream stations are better characterized. The workgroup did recommend that bioassessment results at the downstream stations be evaluated by comparison to the regional background established by the random watershed sites. This would provide a more representative and stable basis of evaluation than would the comparison to individual upstream stations.

Table 6.1. Aquatic chemistry parameters sampled on a weekly and/or monthly basis at the Districts' receiving water monitoring stations (Generalized list; constituents and frequencies vary by receiving water station).

Parameter	Frequency
Temperature	weekly
pH	weekly
Dissolved Oxygen	weekly
Chlorine	weekly
Total Coliform *	monthly
Fecal Coliform *	monthly
Turbidity	monthly
BOD	monthly
Settleable Solids	monthly
TSS	monthly
Oil & Grease	monthly
TDS	monthly
Conductivity	monthly
Chloride	monthly
Sulfate	monthly
Boron	monthly
Fluoride	monthly
Ammonia-N	weekly
Nitrate-N	weekly
Nitrite-N	weekly
TKN	weekly
Total Phosphorus	weekly
Ortho Phosphorus	weekly
MBAS	monthly
NID	monthly
Total Hardness	weekly
Arsenic	monthly
Silver	monthly
PAHs	monthly

* Coliforms are sampled weekly at the inland WRP stations.

Figure 6.1. Existing network of compliance monitoring stations.

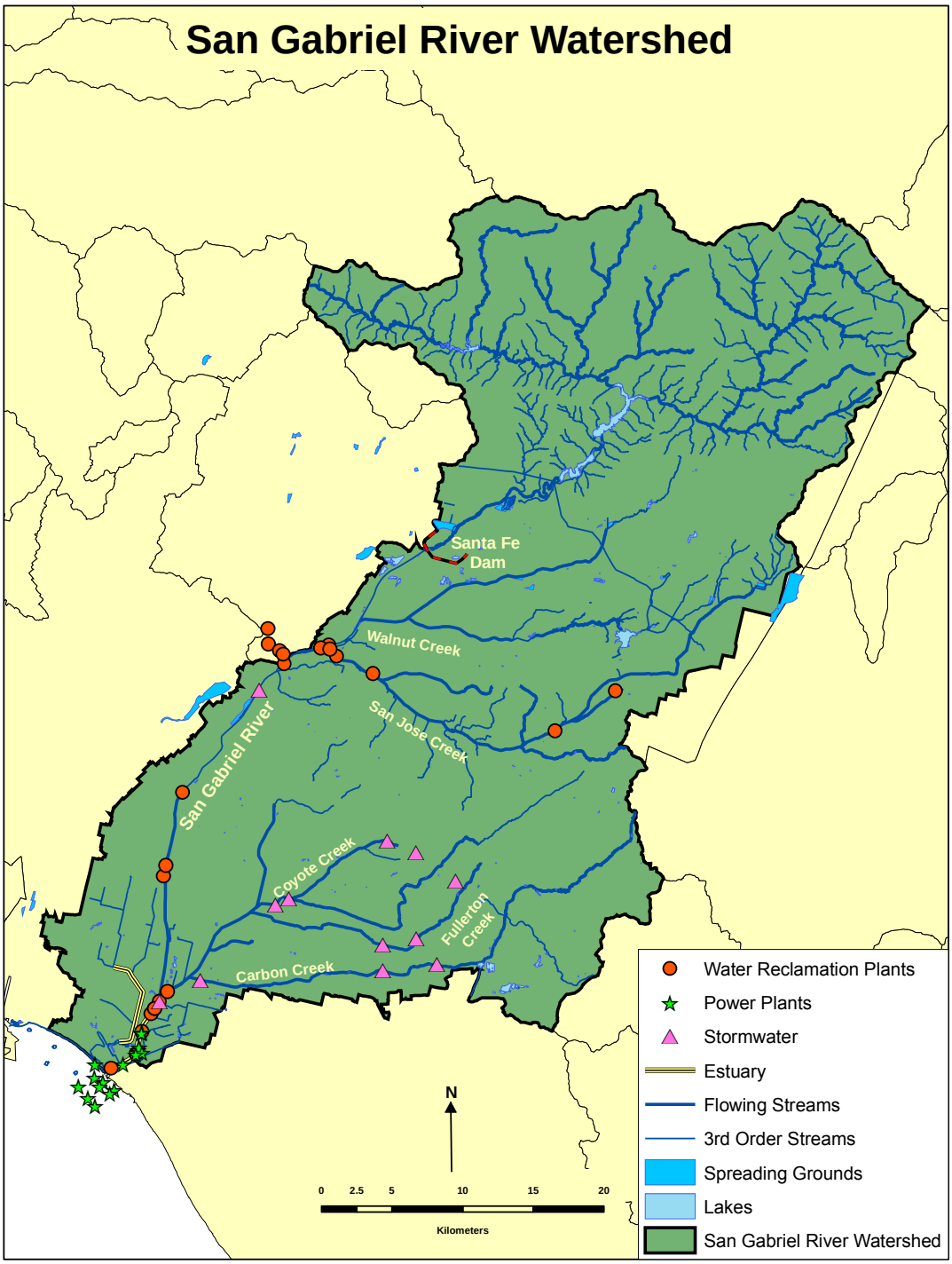

Figure 6.2.a. Time series plot of pH at station RA2.

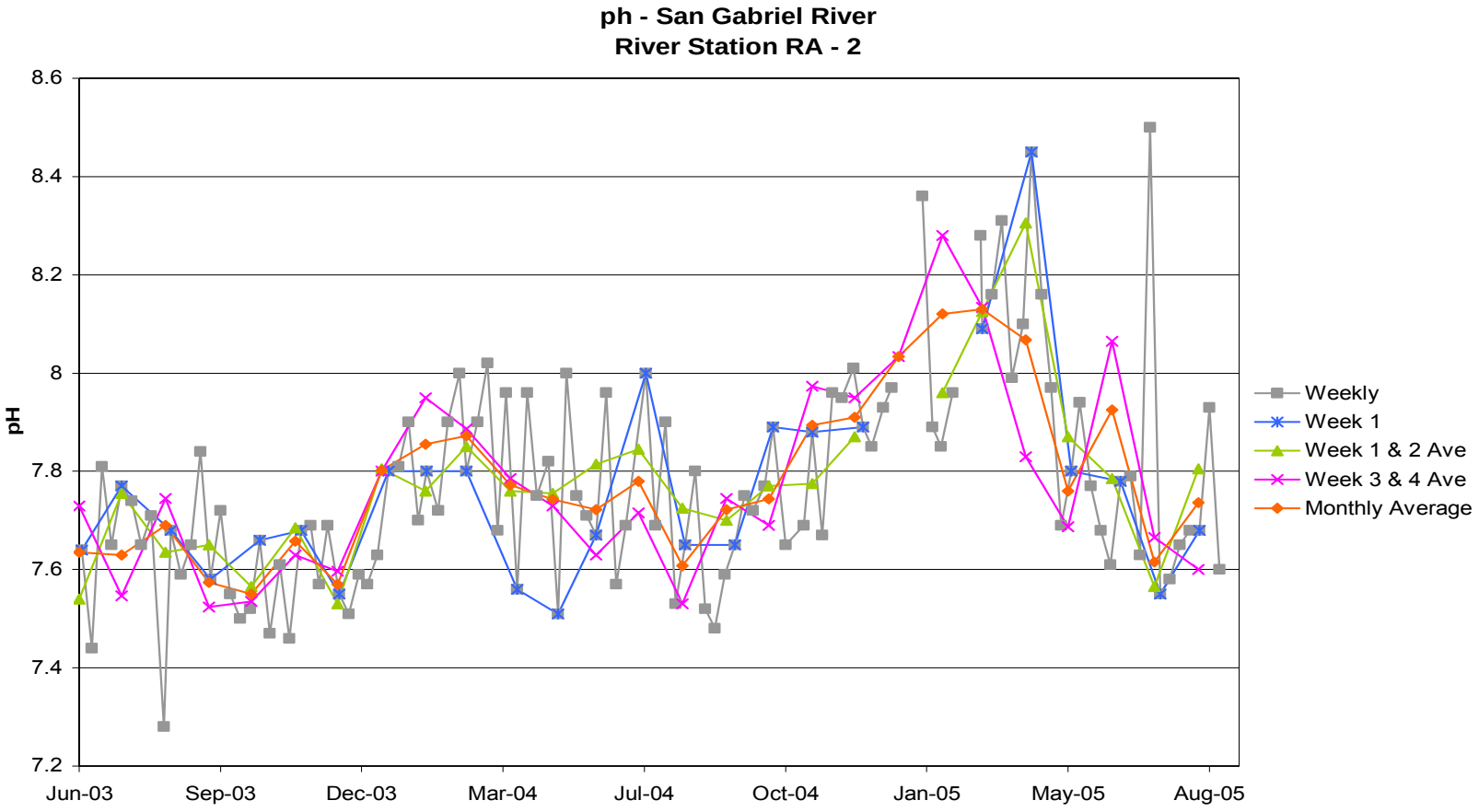

Figure 6.2.b. Time series plot of DO at station RA2.

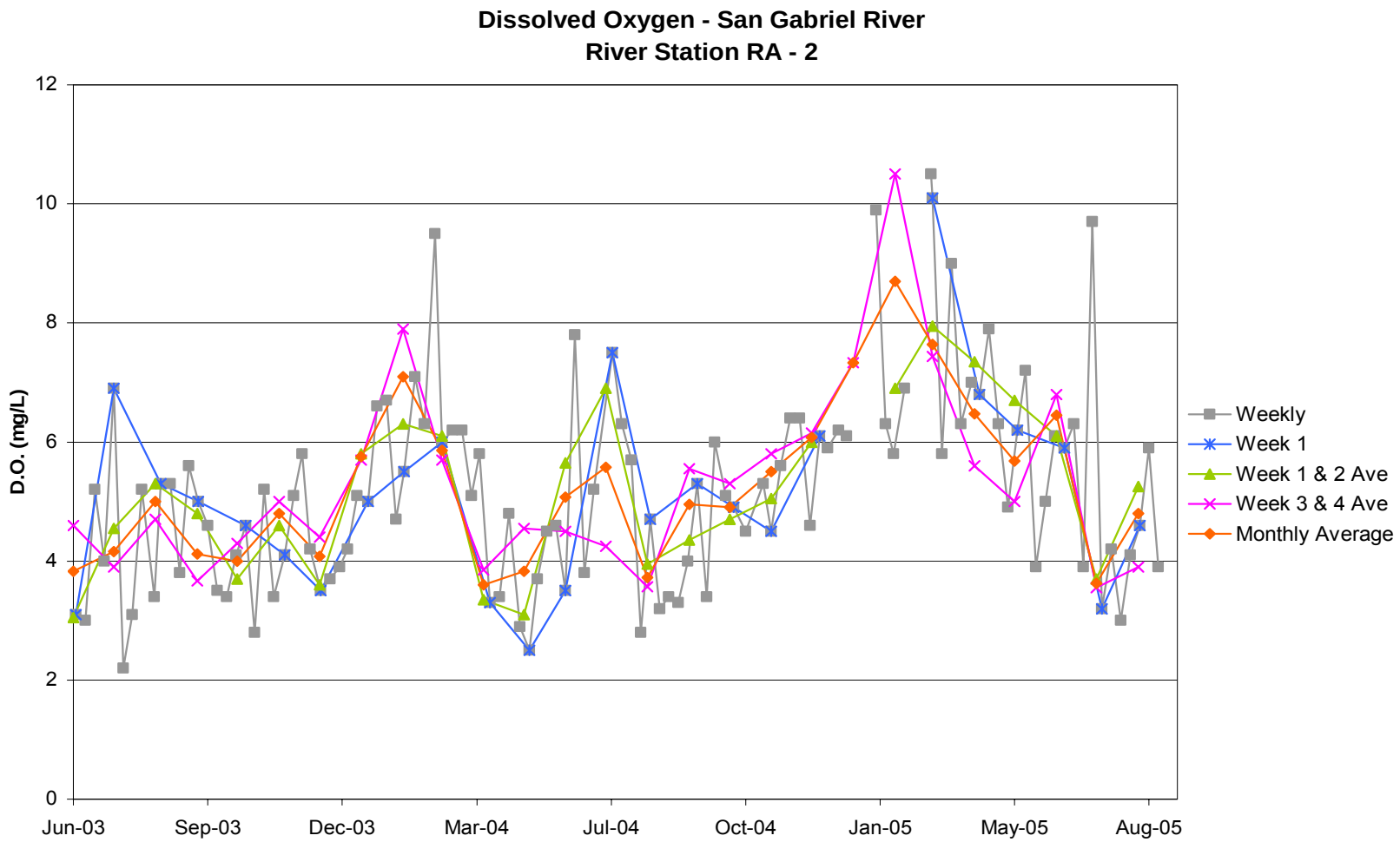

Figure 6.2.c. Time series plot of ammonia at station RA2.

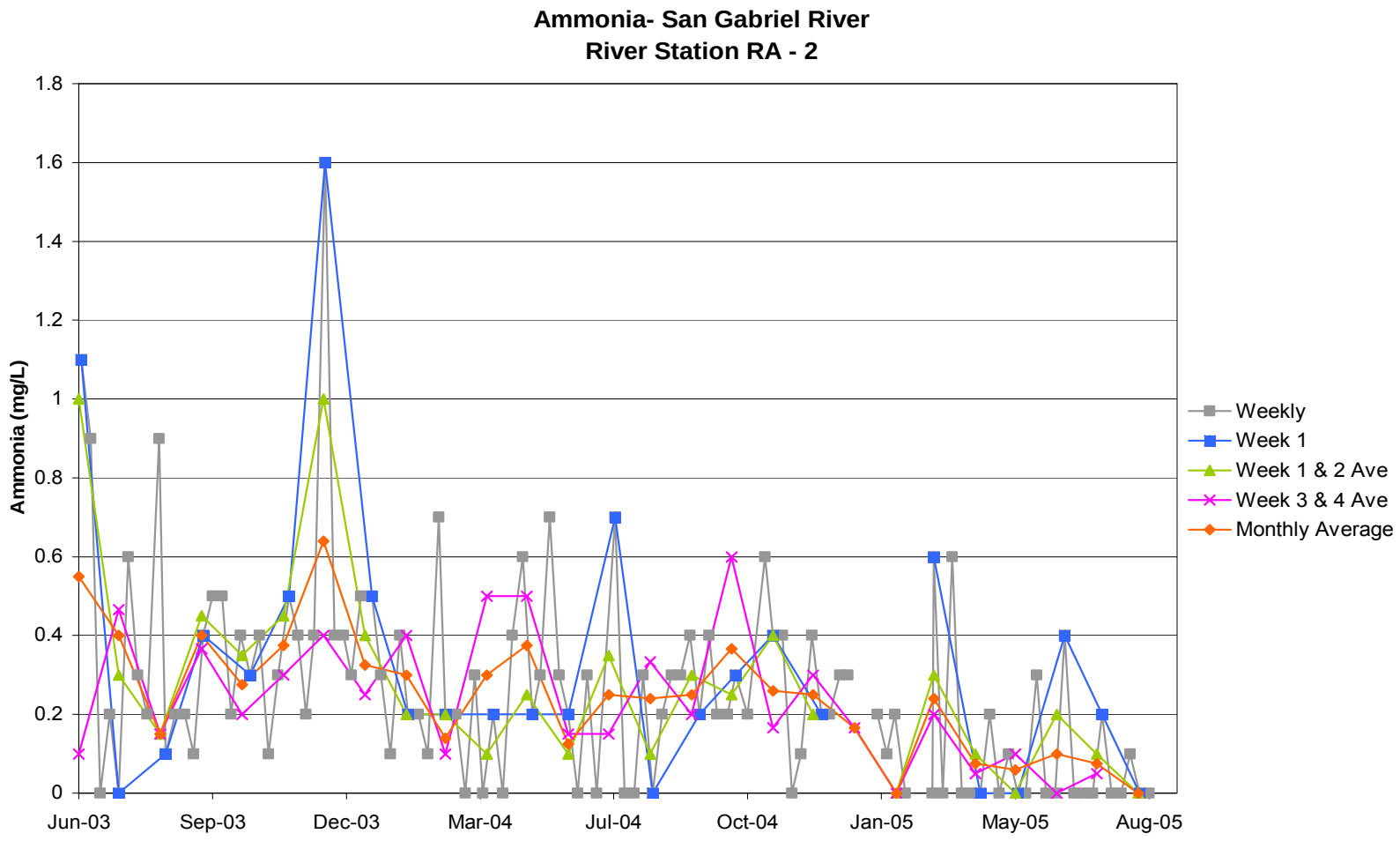

Figure 6.2.d. Time series plot of pH at station R11.

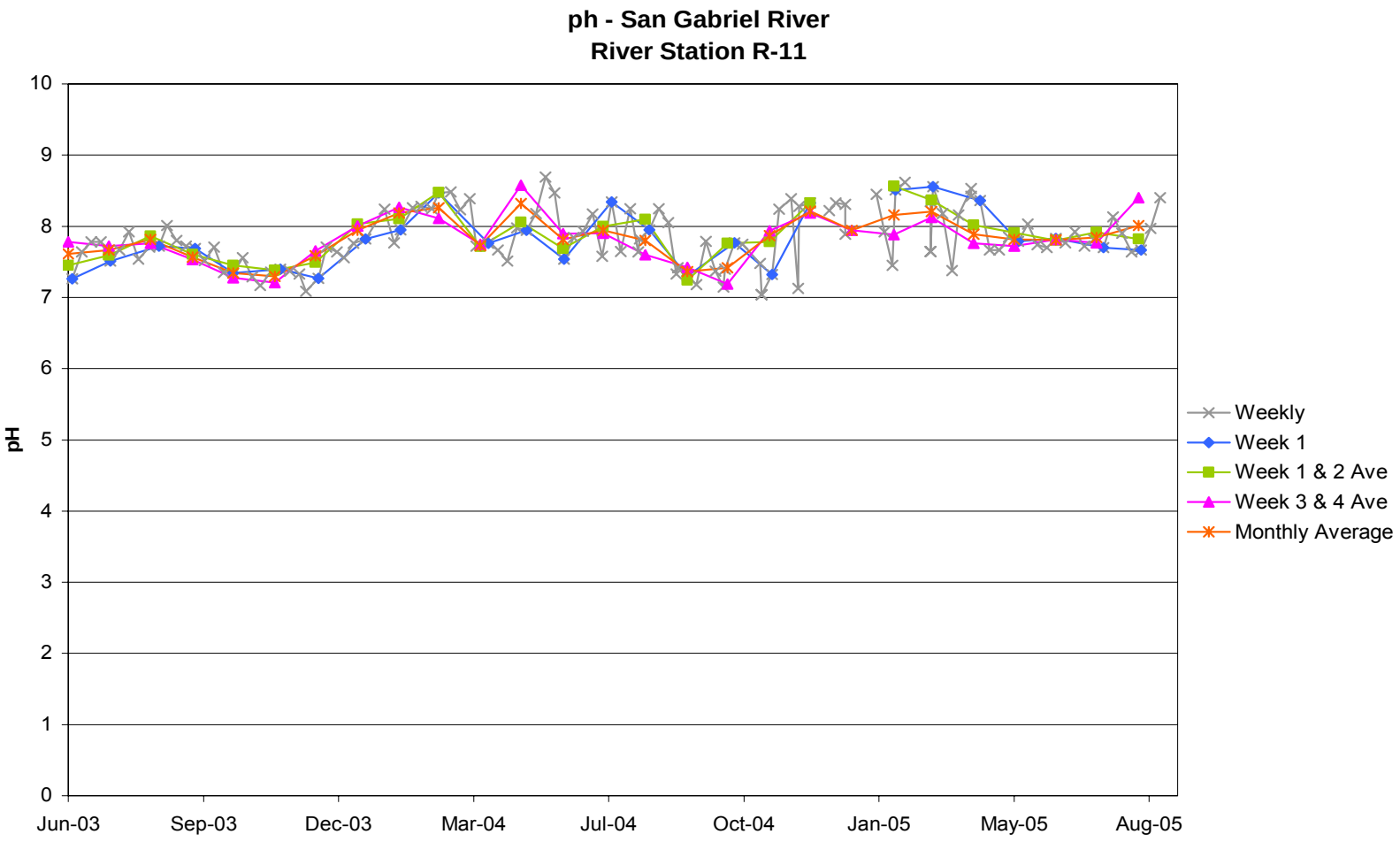

Figure 6.2.e. Time series plot of DO at station R11.

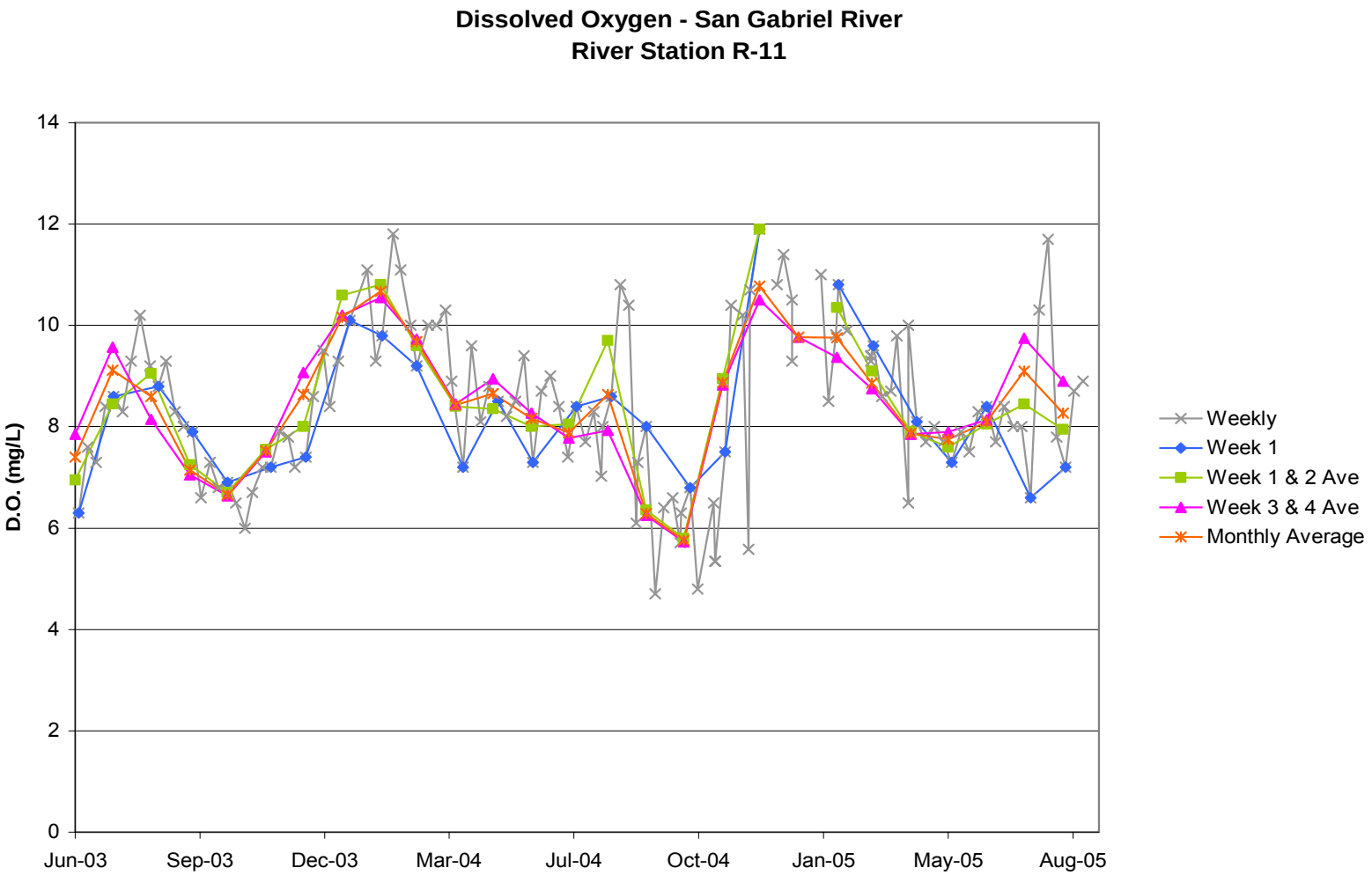

Figure 6.2.f. Time series plot of ammonia at station R11.

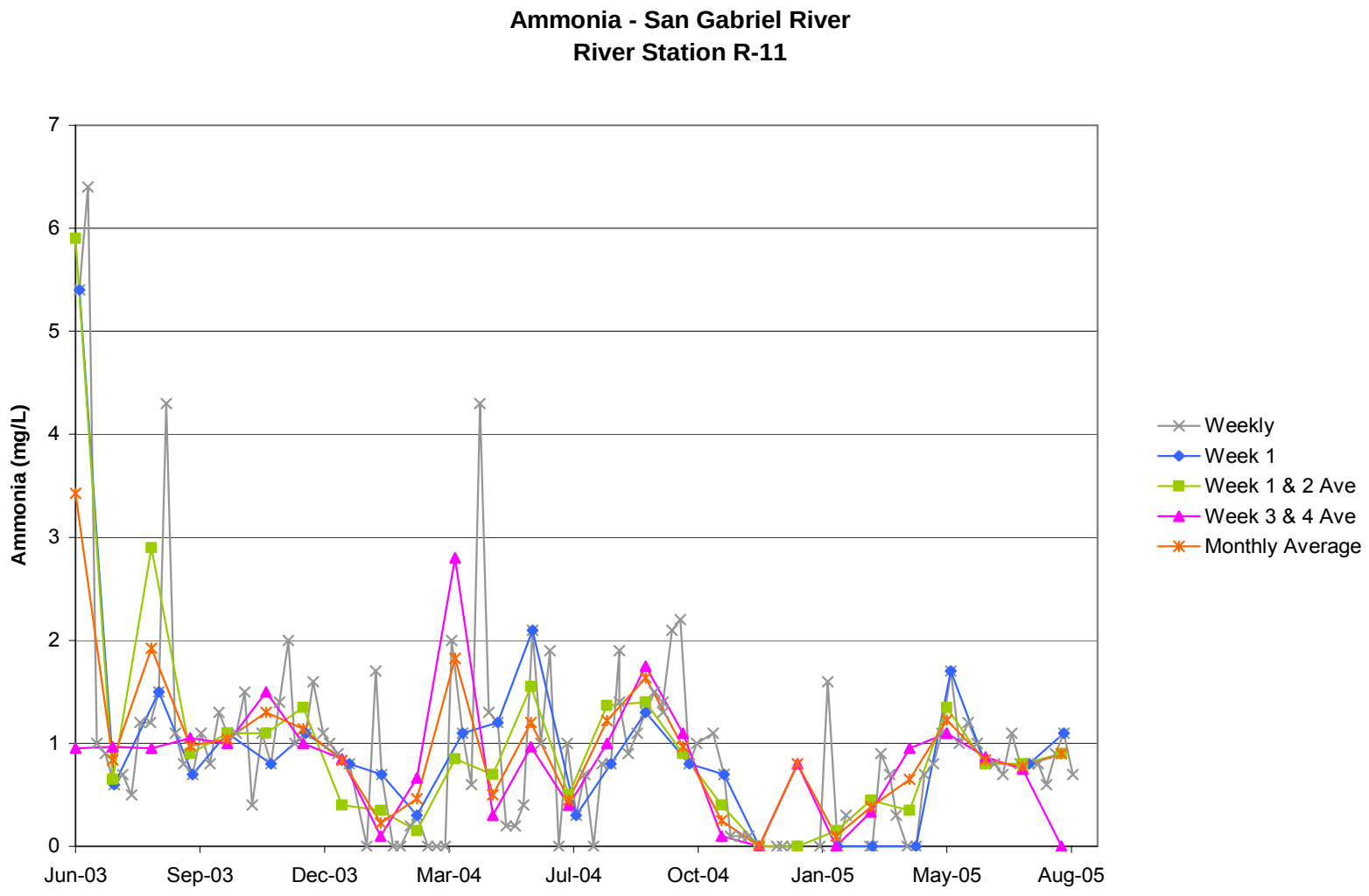

Figure 6.2.g. Time series plot of pH at station R7.

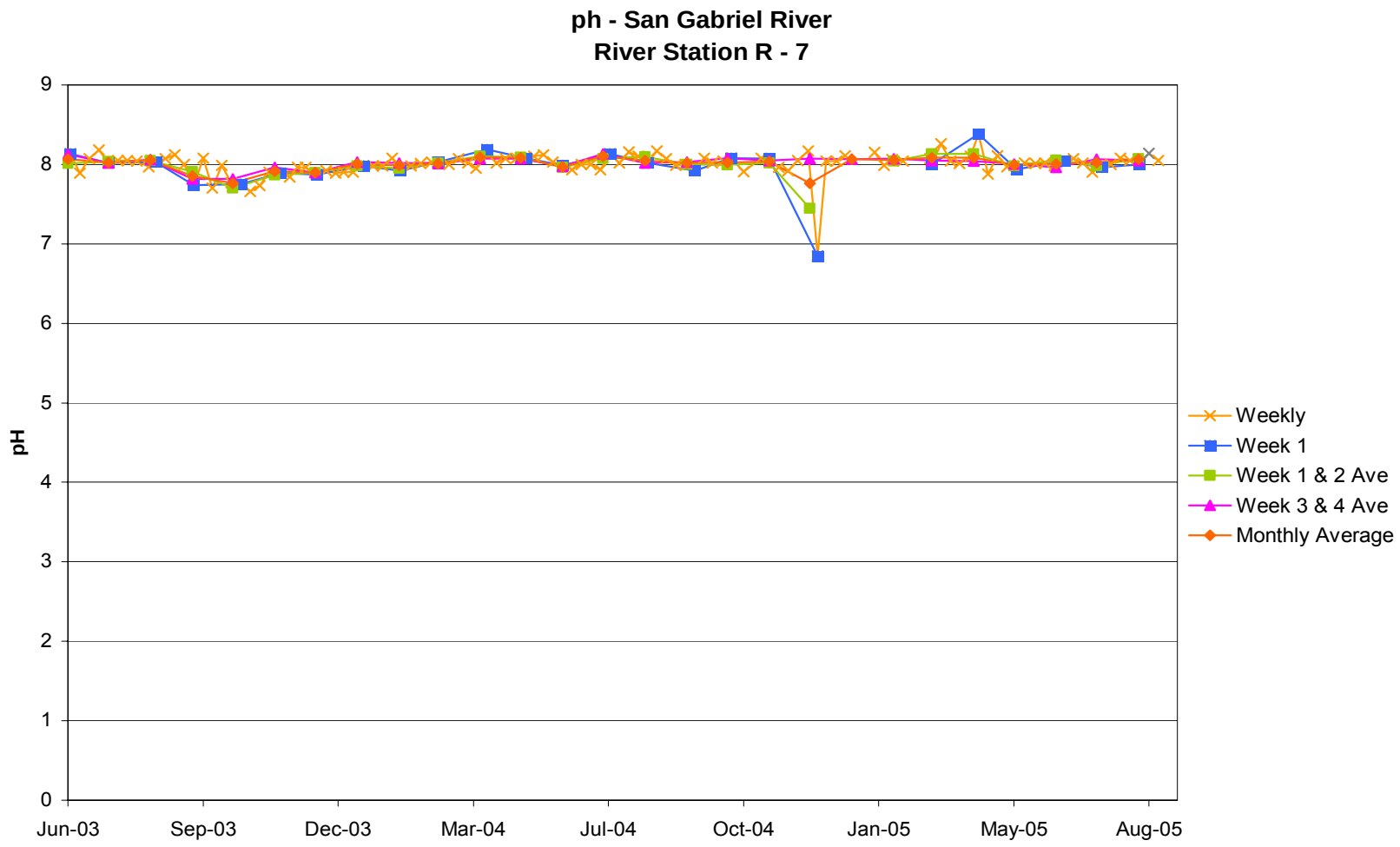

Figure 6.2.h. Time series plot of DO at station R7.

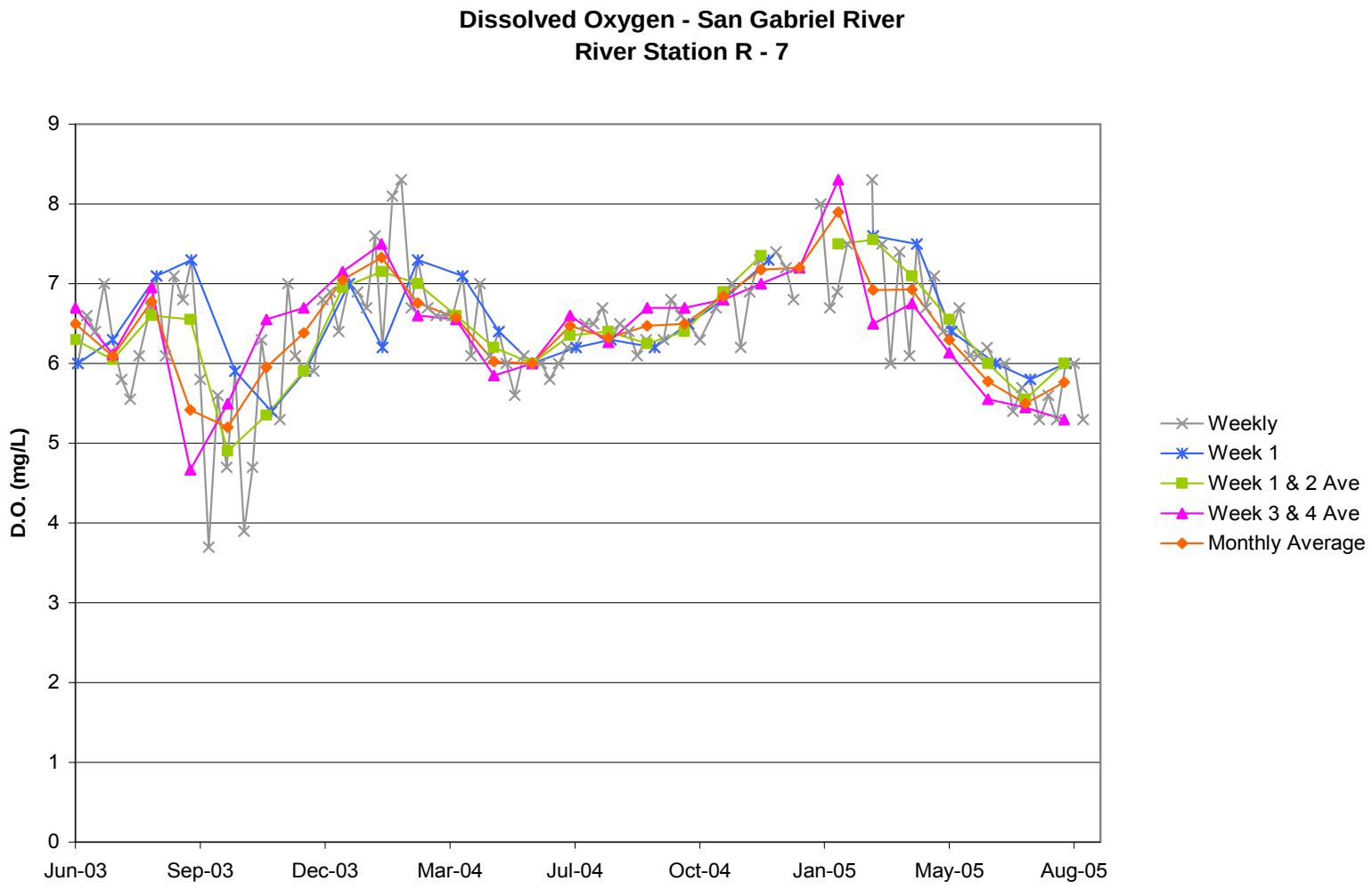

Figure 6.2.i. Time series plot of ammonia at station R7

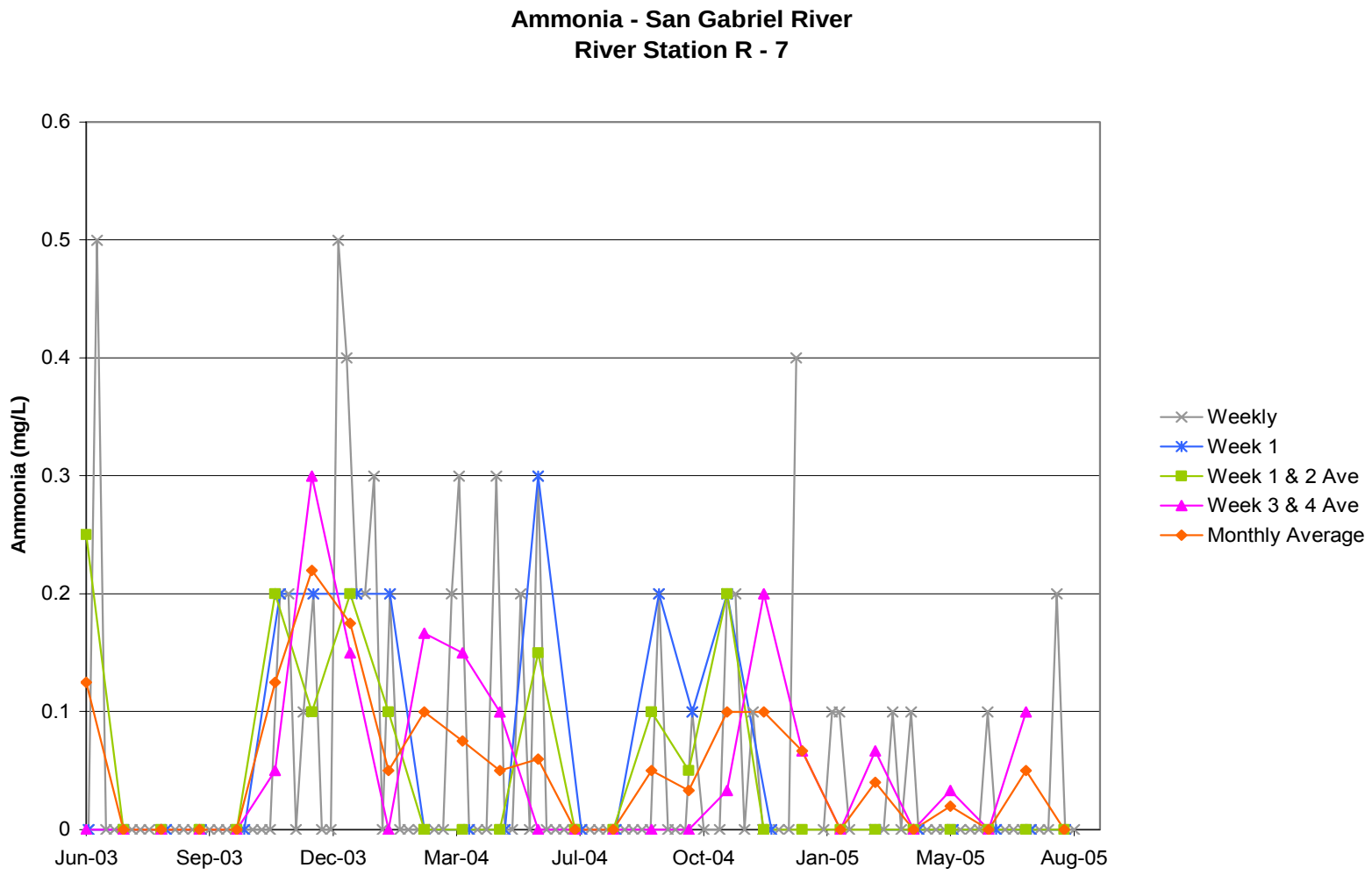

Figure 6.2.j. Time series plot of pH at station R4.

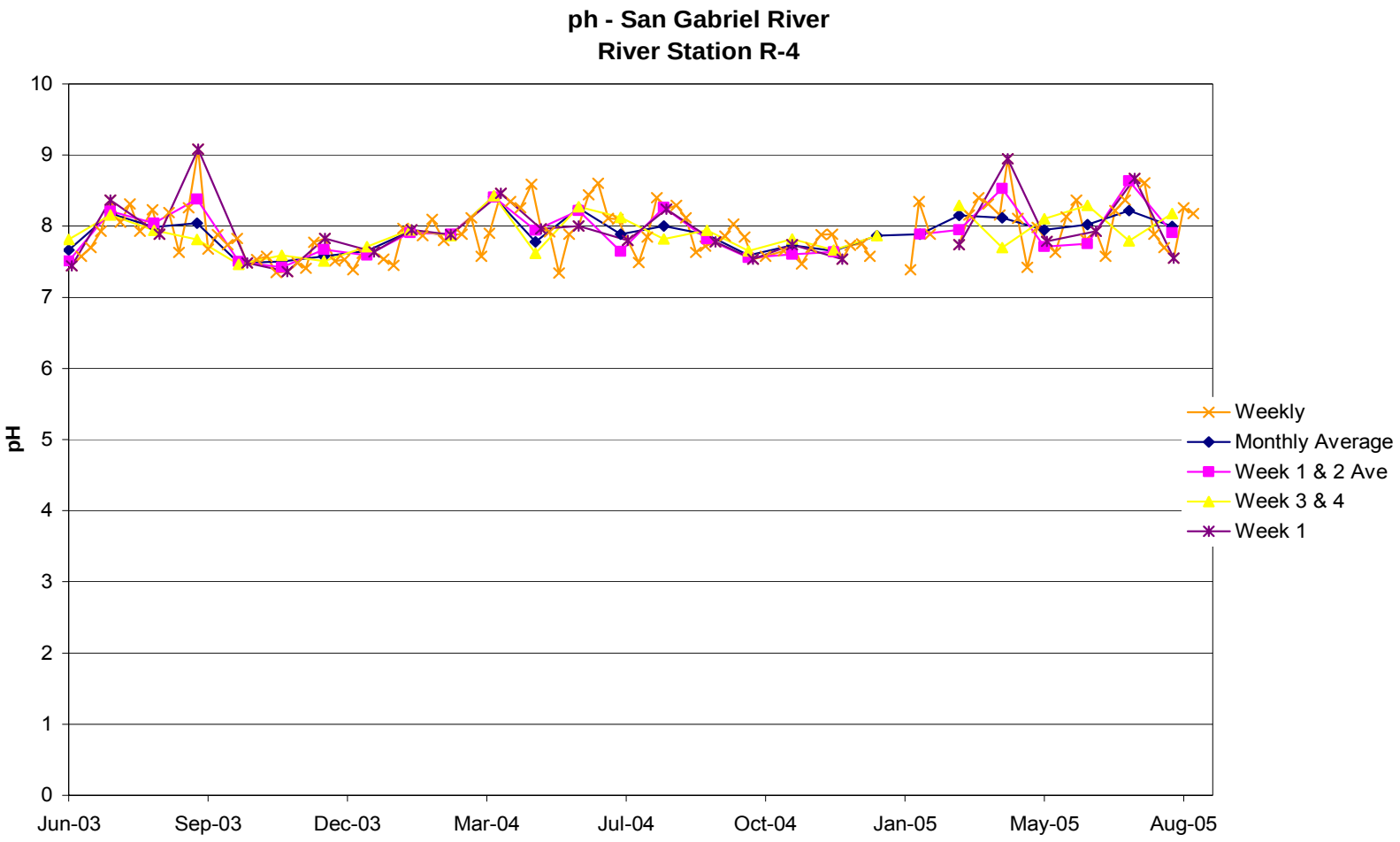

Figure 6.2.k. Time series plot of DO at station R4.

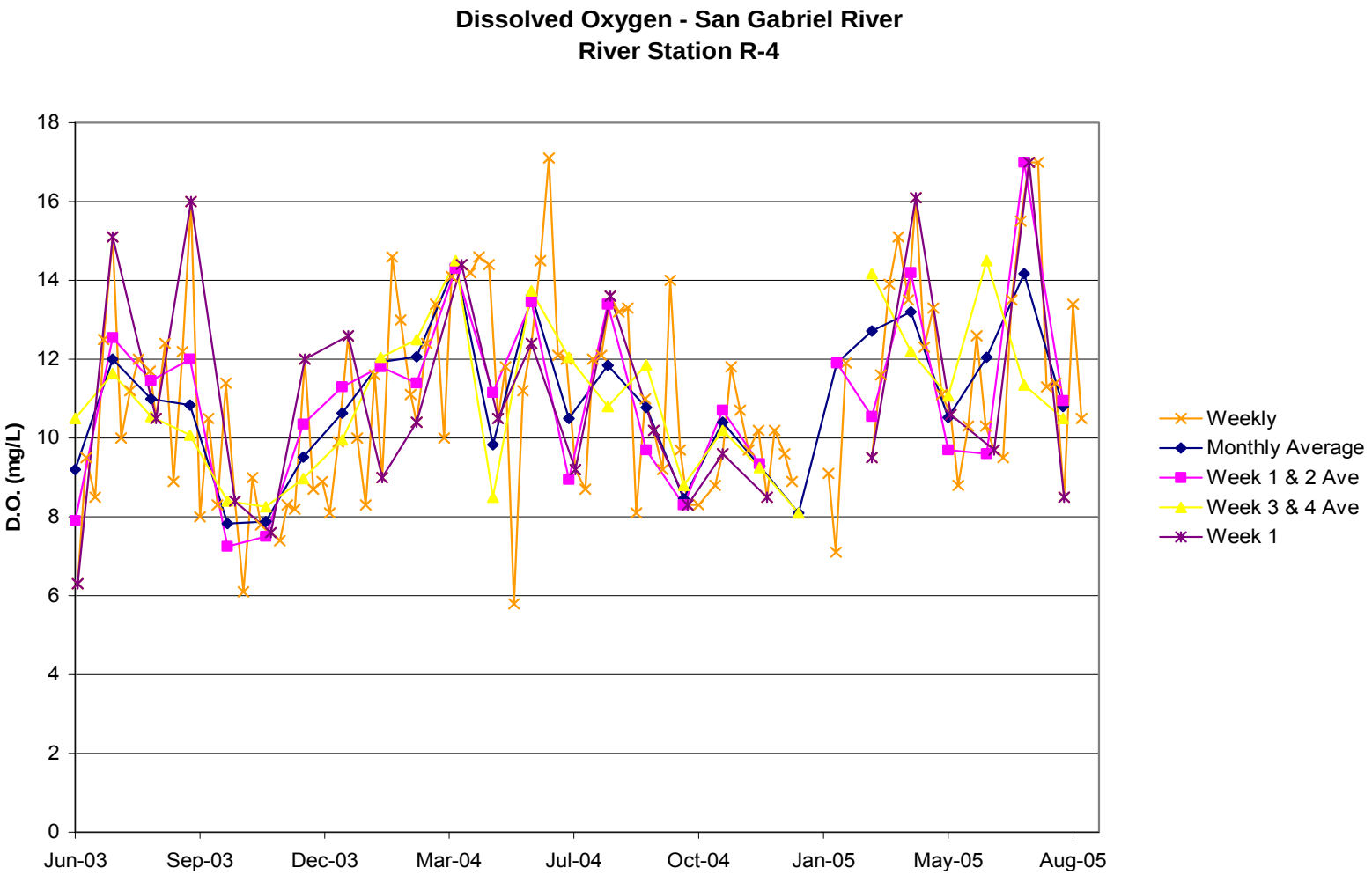

Figure 6.2.l. Time series plot of ammonia at station R4.

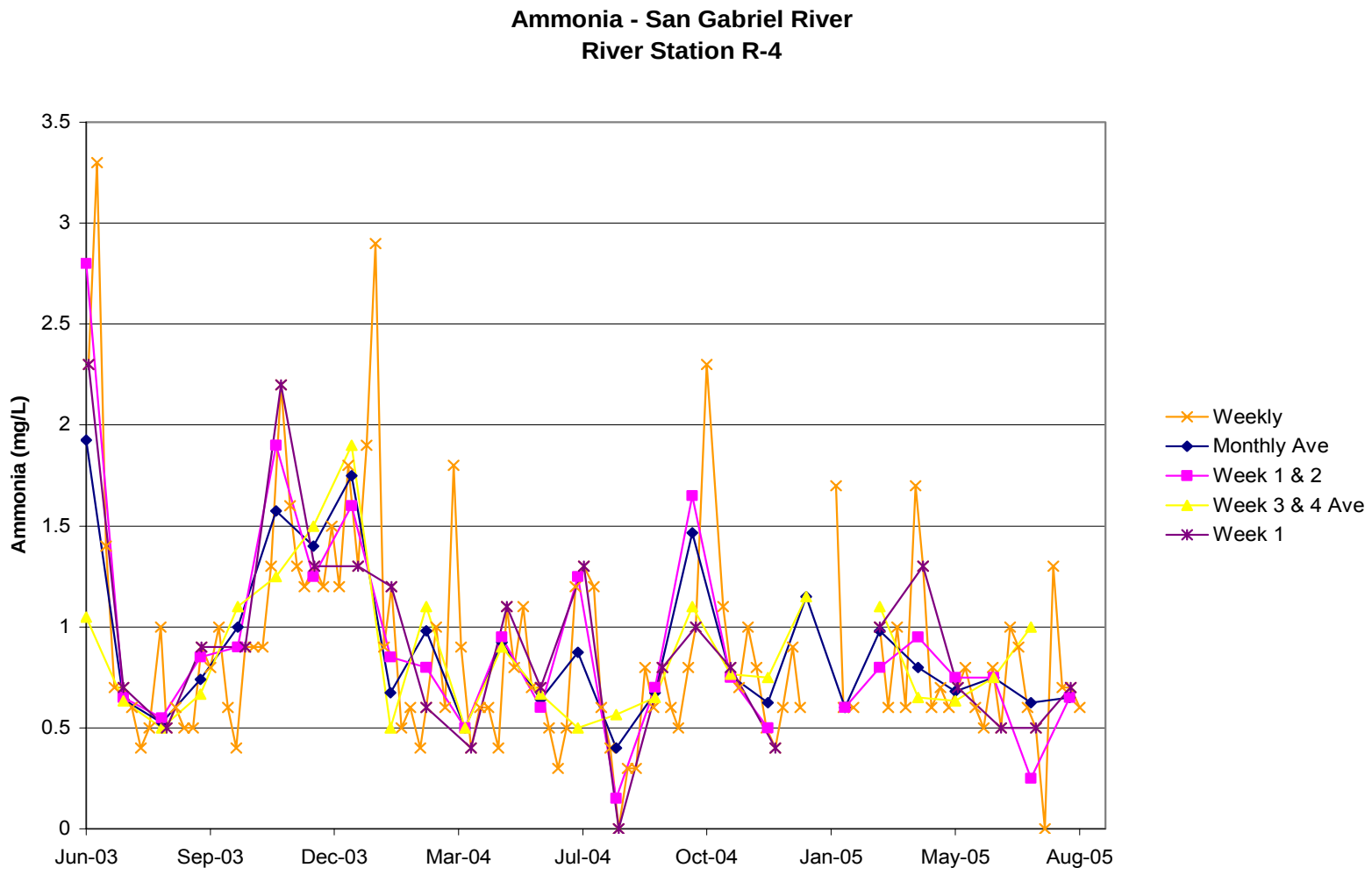

7.0 Question 4: Is It Safe to Swim?

This question focuses on the beneficial use:

- Water Contact Recreation (REC1),

and reflects concerns about the risk posed to recreational users of the San Gabriel River and the recreational lakes in the watershed by pathogen contamination.

Potential assessment questions that address such concerns are:

- Are bacterial indicator levels at body contact recreation areas above health standards, or adopted water quality objectives?
- What is the relative risk of body contact recreation at locations in the watershed with high concentrations of recreational use?
- What is the average level of bacterial indicators at sentinel sites in the watershed?

This information could be used by Los Angeles and Orange County public health agencies to help manage health risk. There is currently only limited monitoring at recreational sites. Monitoring at sentinel sites will be conducted by the regional monitoring program. Monitoring at recreation areas could be conducted in cooperation with volunteer agencies and/or with the respective County health departments.

In overview, the monitoring design recommended to address such questions has the following elements:

- A focus on sites with heavy recreational use
- Monitoring frequency at these sites adjusted in terms of degree of use and proximity to source(s)
- Weekly monitoring at sentinel sites to assess average levels of indicator bacteria throughout the watershed, with weekly monitoring at the head of the estuary
- Use of *E. coli* and perhaps fecal coliforms as indicators.

The types of data products resulting from this monitoring design and appropriate for answering Question 4 may include:

- Frequent (weekly, monthly depending on the circumstance) and site-by-site measures of bacterial indicator values
- Comparisons of bacterial indicator values with relevant standards or objectives on spatial and temporal scales that match sampling scales as closely as possible (e.g., data tables that highlight exceedances)
- Site-by-site and regional trends over time in the numbers of exceedances
- Periodic ratings of the relative risk of swimming at each site
- Ability to adopt new indicators as they are approved.

The following subsections provide details on the recommended design approach, as well as on the recommended indicators and the sampling sites and frequencies. The workgroup recommended that the detailed design and implementation of this program component be developed in collaboration with health departments.

7.1 Design approach

While there are Basin Plan standards for inland waters designated for REC1 use, there is currently only limited monitoring focused on such use conducted by the Los Angeles County Department of Health Services (LACDHS). LACSD does monitor bacterial indicators at its receiving water stations associated with discharges, but many of these are in concrete lined channels and none of them are known swimming locations.

The recommended monitoring approach (Table 7.1) includes three separate components, one that focuses on high-priority recreational use areas, another that targets representative sentinel sites throughout the lower watershed, and a third that monitors at a high frequency at the bottom of the watershed.

7.1.1 Recreation areas

For those locations where people commonly swim, the monitoring approach prioritizes monitoring effort using a framework developed by the Beach Water Quality Workgroup for ocean beaches. In this framework (illustrated in the following Figure 7.1), monitoring intensity is scaled according to the intensity of use and the proximity to potential sources of pathogen contamination, which can change seasonally.

Figure 7.1 Prioritization framework developed by the Beach Water Quality Workgroup for allocating monitoring effort to swimming areas.

Degree of Use	Proximity to Source(s)	
	Close →	Far
High use	Daily monitoring	Weekly – monthly monitoring
↓		
Low use	Weekly – monthly monitoring	No monitoring

Based on the collective knowledge of the workgroup, the most popular swimming locations in the watershed (Figure 7.2), ranked in terms of intensity of use, are:

- Puddingstone Lake, managed by the Los Angeles Department of Parks and Recreation
- Santa Fe Dam, managed by the Los Angeles Department of Parks and Recreation
- East Fork of the San Gabriel River
- Canyon area of the mainstem San Gabriel River below the confluence of the West and East Forks
- West Fork of the San Gabriel River below Cogswell Dam, predominantly the first ½ mile of the West Fork
- North Fork of the San Gabriel River just upstream of its confluence with the West Fork.

For planning purposes, it was agreed that monitoring would be conducted weekly during the swimming season (May 1 through September 30) at these sites. For planning purposes, three locations per site will be sampled. However, the numbers and locations of sites, and their monitoring frequencies, may change after further consultation with LACDHS.

Sources of pathogen contamination include human contact recreation, wildlife, communities along the East Fork, and two large private campgrounds (Follows Camp and Camp Williams). There are no United States Forest Service public campgrounds along the East Fork and only one day-use area. This is occasionally (and illegally) used as an overnight campground. If there are no

communities or campgrounds in an area, then the matrix would collapse to the one axis of degree of use. In general, use is highest in the summer, with little if any swimming occurring during the winter.

At this point, and given LACDHS' primary responsibility for human health issues, it would be premature to specify in detail the numbers and locations of monitoring locations at each site without substantive input from and coordination with LACDHS. However, it is most likely that a random approach to site selection would not be useful for public health management because swimming occurs at specific sites and is not distributed throughout the watershed.

7.1.2 Sentinel sites

A number of sentinel sites spread throughout the lower watershed will provide an overall picture of the degree to which water quality objectives are being met (or exceeded). The sites identified by the workgroup include the following:

- At the bottom of Coyote Creek above the POTW outfall (LACSD station RA1)
- At the bottom of San Gabriel River (possibly at LACSD station R9W)
- San Jose Creek above the LACSD outfall
- Walnut Creek below Big Dalton Wash
- Somewhere on Fullerton, Carbon, or Brea Creeks, with the exact location to be determined following consultation with the Orange County Stormwater Program.

Where possible, these stations should be located just above confluences, but they do not necessarily need to be located at existing monitoring sites. Monitoring will be conducted weekly during the swimming season in order to ensure the ability to assess compliance with bacterial water quality objectives.

Twice weekly monitoring year round will also be conducted at a single site in the estuary at the 7th Street bridge. The purpose of this station is to make a link between estuary conditions and beach conditions, where monitoring is frequent.

7.2 Indicators

Monitoring is recommended to focus on *E. coli*, since that is the major public health criterion, but could also include fecal coliforms, since there is a Basin Plan objective for this indicator.

7.3 Coordination with other efforts

The development of this program component must be coordinated with the LACDHS. Further coordination with the Orange County Health Care Agency may be required if popular swimming locations in the Orange County portion of the watershed are identified.

There are likely to be only limited opportunities for coordination of this program component with others components of the SGRRMP. Only the compliance monitoring component (Question 3) includes bacteria indicators in its list of monitored constituents, and monitoring sites for assessing human health risk that are selected in terms of the prioritization scheme described above will most likely not correspond to sites chosen to address water quality and/or habitat concerns. In addition, bacteria monitoring for human health typically occurs on a schedule that is much more frequent than the yearly sampling envisioned for much of the rest of the regional monitoring program.

In addition to the health departments, the regional monitoring program is investigating the possibility of collaborative monitoring efforts with volunteer groups.

Table 7.1. Design overview for the recreational swimming component of the regional monitoring program.

Design element	Description	Details
Design approach	Fixed sites	Treat swimming, sentinel, and estuary sties separately
Number of sites	6 swimming • 3 locations / site 5 sentinel 1 head of estuary	Popular swimming locations Just above major confluences 7th Street bridge
Sampling frequency	Swimming: • Weekly in swim season Sentinel: • Weekly in swim season Estuary: • Twice weekly year round	 May 1 through September 30 May 1 through September 30
Indicators	Swimming & sentinel Estuary	E. coli Fecal coliform, total coliform, Enterococcus

Figure 7.2. Recommended monitoring locations to address potential human health risks from body contact recreation.

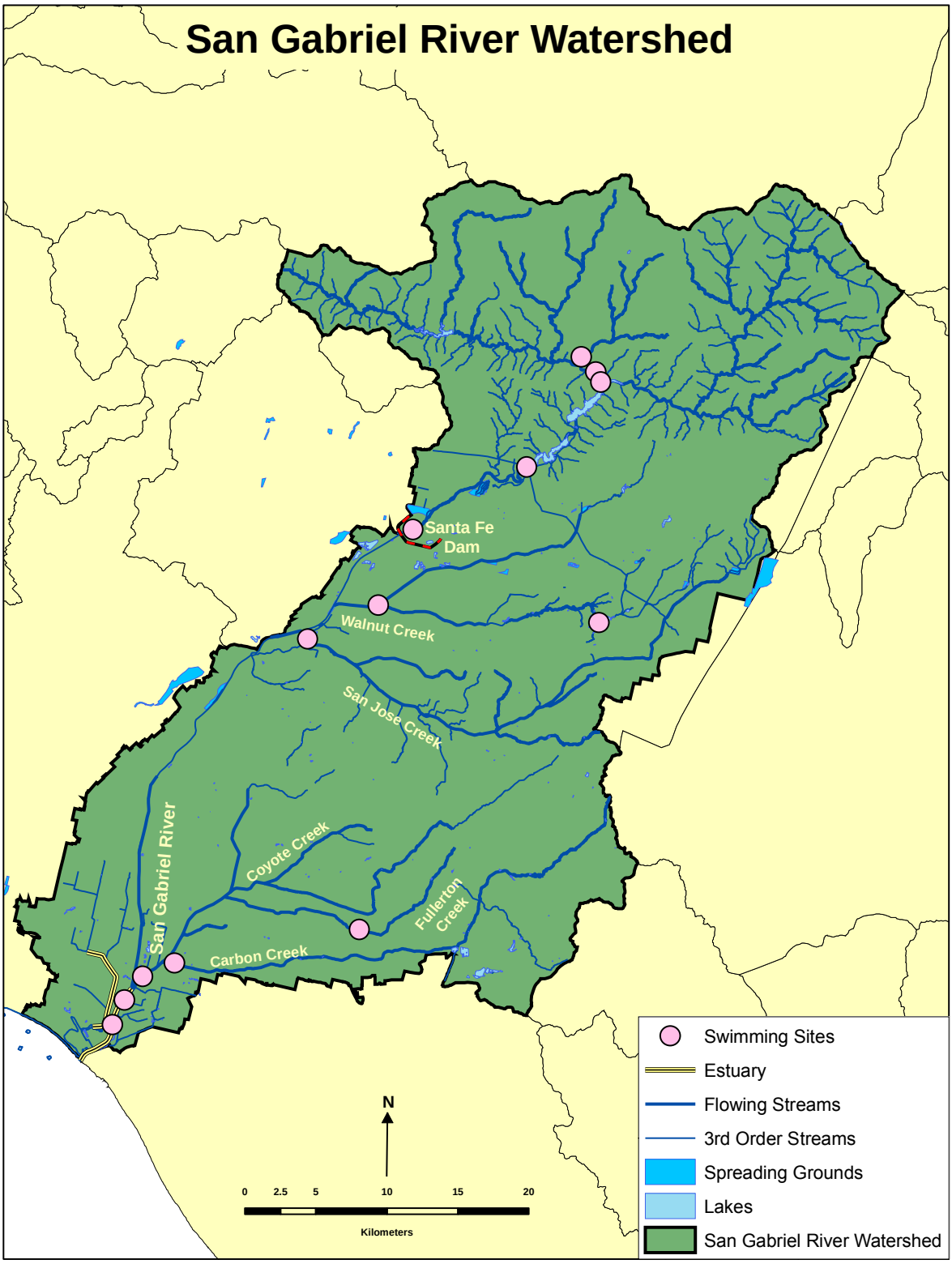

8.0 Question 5: Are Locally Caught Fish Safe to Eat?

This question focuses on the beneficial use:

- Commercial and Sport Fishing (COMM),

and reflects concerns related to the safety of eating locally caught fish.

Potential assessment questions that address such concerns include:

- At frequently fished sites, estimate the concentration of or verify previous estimates of chemical contaminants in commonly consumed fish target species. Compare these levels to advisory levels and critical thresholds of potential human health risk
- At frequently fished sites, track the trends in tissue concentrations of chemical contaminants in commonly consumed fish target species.

In overview, the monitoring design (Table 8.1) recommended to address such questions has the following elements:

- Initial three-year pilot program to provide the basis for a long-term monitoring design
- Sample annually in summer
- Focus on six locations (two each in lakes, river, and estuary) where fishing is most frequent
- Focus on fish species most commonly caught and consumed at each site
- Focus on the five chemicals (mercury, DDTs, PCBs, arsenic, and selenium) that contribute most to human health risk in California's coastal and estuarine fishes.

The types of data products resulting from this monitoring design and appropriate for answering Question 5 may include:

- Site-by-site measures of tissue concentrations of key chemical contaminants in commonly consumed fish species
- Site-by-site measures of the frequency with which such tissue concentrations exceed advisory levels and/or critical thresholds of potential human health risk
- Trends over time in both tissue concentrations and the frequency of exceedances of advisory levels and critical thresholds.

The following subsections provide details on the design approach selected, as well as on the recommended indicators and the sampling sites and frequencies.

8.1 Design approach

The fish tissue monitoring design is based on the principles that sampling should focus on:

- Locations where recreational fishing is occurring and has traditionally occurred
- Species of fish that are most commonly caught and eaten
- Chemical constituents that contribute the most to human health risk.

While these main features of the design have been determined, a three-year pilot program is recommended to be implemented to resolve specifics of the design (e.g., sites, target species, composite size, tissue(s) sampled, monitoring frequency) for the long term. Some of this

information may result from the pilot program itself and some from an angler survey and fish consumption study currently being conducted by SCCWRP for the SWRCB, the LARWQCB, and LACSD. The goal of this study is to describe level of angling effort and fish consumption patterns in six watersheds (Ventura River, Santa Clara River, Calleguas, Malibu, Los Angeles River, and San Gabriel River) to support TMDL development and other management initiatives.

Table 8.2 summarizes current knowledge about recreational fishing activities in the estuary and freshwater portions of the watershed. Of these sites, seven (Figure 8.1), thought to be the focus of the most frequent and consistent fishing effort, were selected for the pilot program:

- Puddingstone Reservoir
- Legg Lake
- Salt water end of estuary at River's End Café
- At 7th Street Bridge, near freshwater end of estuary
- San Gabriel River near the confluence with San Jose Creek
- Santa Fe Dam or headlands
- Mirada Lake.

These sites represent three lake, two estuary, and two river locations.

Sampling is recommended to occur annually in August. There are a number of potential sources of temporal variability, including seasonal changes in:

- Fish populations and assemblages
- Tissue concentrations due to spawning cycles
- Angling effort
- Angling populations (e.g., children vs. adults)
- Tissue types (e.g., more roe at some seasons)
- Stocking schedule
- Water flow due to variable storm magnitudes.

However, attempting to control for all these potential sources of variability would require a complex design with substantially higher levels of sampling and tissue analysis. In addition, annual tissue sampling during the summer would make SGRRMP data consistent with other large regional monitoring efforts (e.g., EMAP, SWAMP, Bight Program) that use the spring or summer as their index sampling period.

While the pilot program recommends sampling annually for three years, the long-term program may have different sampling frequency, depending on the specific information needed for decision-making. For example, if tissue levels of target chemicals are far above accepted screening values or action levels, and 303d delisting and/or removal of consumption advisories is unlikely, then infrequent sampling, perhaps once every ten years, may be appropriate for long-term trend tracking. Conversely, if tissue levels or target chemicals are far below screening values or action levels, and there is no information to suggest they will rise rapidly, then infrequent sampling may also be called for. However, if tissue levels are near values at which key management decisions would be made, then annual (or more frequent) sampling would be needed. This framework is summarized in Table 8.3.

Table 8.3. Conceptual framework for determining sampling frequency for fish tissue monitoring.

Tissue level relative to decision threshold	Sampling frequency
Far above	Infrequent, every 10 years
Near	Frequent, annual or greater
Far below	Infrequent, every 10 years

8.2 Indicators

Indicators fall into two major categories, the species of fish to be sampled and the chemical constituents to measure in their tissue.

The species of fish to be sampled depend on the sampling site, since different species are most common in the salt and freshwater portions of the estuary, in the various lakes, and in the river itself. These differences reflect both ecological conditions, the history of introduced species, and stocking practices. Table 8.1 summarizes current knowledge about the fish most commonly caught at each of the pilot program sites and this information should be checked against the results of the SCCWRP angler survey and fish consumption study and updated as needed. In addition, an initial reconnaissance survey may be required to finalize the list of target species at each site. This survey could be based on field collections, interviews with anglers, or a combination of both. It is recommended that stocked fish **not** be sampled. Available information indicates that stocked fish are generally caught very quickly after their release into the watershed. As a result, their tissue levels are most likely representative of their feedstock. There is no routine monitoring of tissue chemistry in the hatcheries managed by California Department of Fish and Game.

Muscle tissue from fish collected at each location would be composited into a single sample for analysis. Based on the results of SCCWRP's angler survey and fish consumption study, additional tissue types may be sampled. The number of fish to be collected at each location will follow U.S. EPA's recommendation of 3-10 fish per composite sample. Statistical power analyses using the pilot program data may help to refine this guideline, although there may be practical limits on the fish that can be caught with reasonable amounts of sampling effort.

Chemical analyses will focus on mercury, DDT, PCBs, arsenic, and selenium. These are chemicals known to occur in the watershed and that have been documented in risk analyses as potentially important sources of elevated human health risk. Dioxin was not included because there are no known sources in the watershed. Organophosphate pesticides were not included because they are not overly bioaccumulative. Furthermore, these pesticides were not found in fish tissue in a study of Newport Bay (SCCWRP technical report #436, www.sccwrp.org/pubs/techrpt.htm), which is at the bottom of a watershed with much higher pesticide use than the San Gabriel River watershed.

8.3 Coordination with other efforts

There are a number of other monitoring efforts and special studies that this program component could potentially coordinate with. These include the ongoing regional monitoring programs that include fish tissue monitoring (EMAP, SWAMP, Bight Program), as well as individual NPDES permit programs that currently include fish tissue monitoring, or may do so in the near future. These include the ocean POTW monitoring programs, the planned Regional Harbors Monitoring Program requested by the San Diego Regional Water Quality Control Board, and the developing

Toxics TMDL for Newport Bay. In addition to the angler survey and fish consumption study described above, which will provide data needed for refining the design of this program component, an ongoing SCCWRP study of contaminants in Newport Bay food webs may provide useful insight into the processes influencing patterns of fish tissue contamination.

Coordination with these other efforts can take two forms:

- Standardization of sampling protocols, target analytes, and laboratory analysis methods
- Integration and synthesis of monitoring data to improve understanding of regional patterns of human health risk, fish contamination patterns, and the processes that affect these.

Table 8.1 Design overview for the pilot study for the fish tissue component of the regional monitoring program, which will focus on species commonly caught and consumed at popular recreational fishing locations.

Design element	Description	Details
Design approach	3-yr pilot study Focus on: • Popular fishing sites • Commonly caught species • High-risk chemicals	Pilot study to resolve details of site selection, target species, sampling frequency, composite size for long-term
Number of sites	7 for pilot	3 sites in lakes, 2 each in river, estuary
Sampling frequency	Annually in late summer for pilot	
Target species	Appropriate to each site	Lakes: carp, rainbow trout, catfish, bass, sunfish River: carp, catfish, sunfish, bluegill Estuary: tilapia, mullet, smelt, halibut, croakers
Tissue chemistry indicators	High human health risk	Mercury, DDT, PCBs, arsenic, selenium

Table 8.2 Locations in the San Gabriel River watershed where fishing has been known to occur. Pilot program sites shown in italics. Where information exists, the fish species most commonly caught at each location are also shown. Data gaps would be filled as part of the three-year pilot study.

Fishing location	Detail	Fish caught
Estuary		
Saltwater / brackish portion	Bridges over the river at: • Marina Drive • Haynes intake channel • *River's End Café / breakwater (salt water end of estuary)* • College Drive (west side) • Below 7th Street / end of Lampson (freshwater end of estuary)	Tilapia Mullet (near mouth) Smelt Halibut Croakers Look also at Haynes impingement data
Freshwater end (inland of I-405)	Above tidal prism, where concrete changes to earthen channel	Carp or tilapia
River / streams		
Above Whittier Narrows	Soft bottom, lake-like area Confluence of San Jose Creek and San Gabriel River	Sunfish, bluegill, carp, catfish?
Santa Fe Dam Reservoir		Not known in detail
Santa Fe Dam to Morris Reservoir	About 4-6 miles Natural channel, sometimes dry	Not known in detail
West Fork to Cogswell to San Gabriel Reservoir (Hwy 39)		Trout (stocked), others?
Other upstream areas		Not known in detail
Lakes & reservoirs		
Puddingstone Reservoir		Carp, rainbow trout (stocked), catfish, bass
Legg Lake		Rainbow trout (stocked), catfish, bass, sunfish
Laguna Lake (Fullerton)	Stocked with unknown fish	?
El Dorado Lakes	Mercury listing Stocked with unknown fish	Rainbow trout stocked in upper lakes
Santa Fe Dam Park Lake (same as Santa Fe Dam Reservoir)		Rainbow trout (stocked)
San Gabriel Reservoir		Rainbow trout (stocked)
Crystal Lake	Turning into a meadow	

Figure 8.1. Recommended sites for fish tissue monitoring, based on knowledge of popular recreational fishing locations.

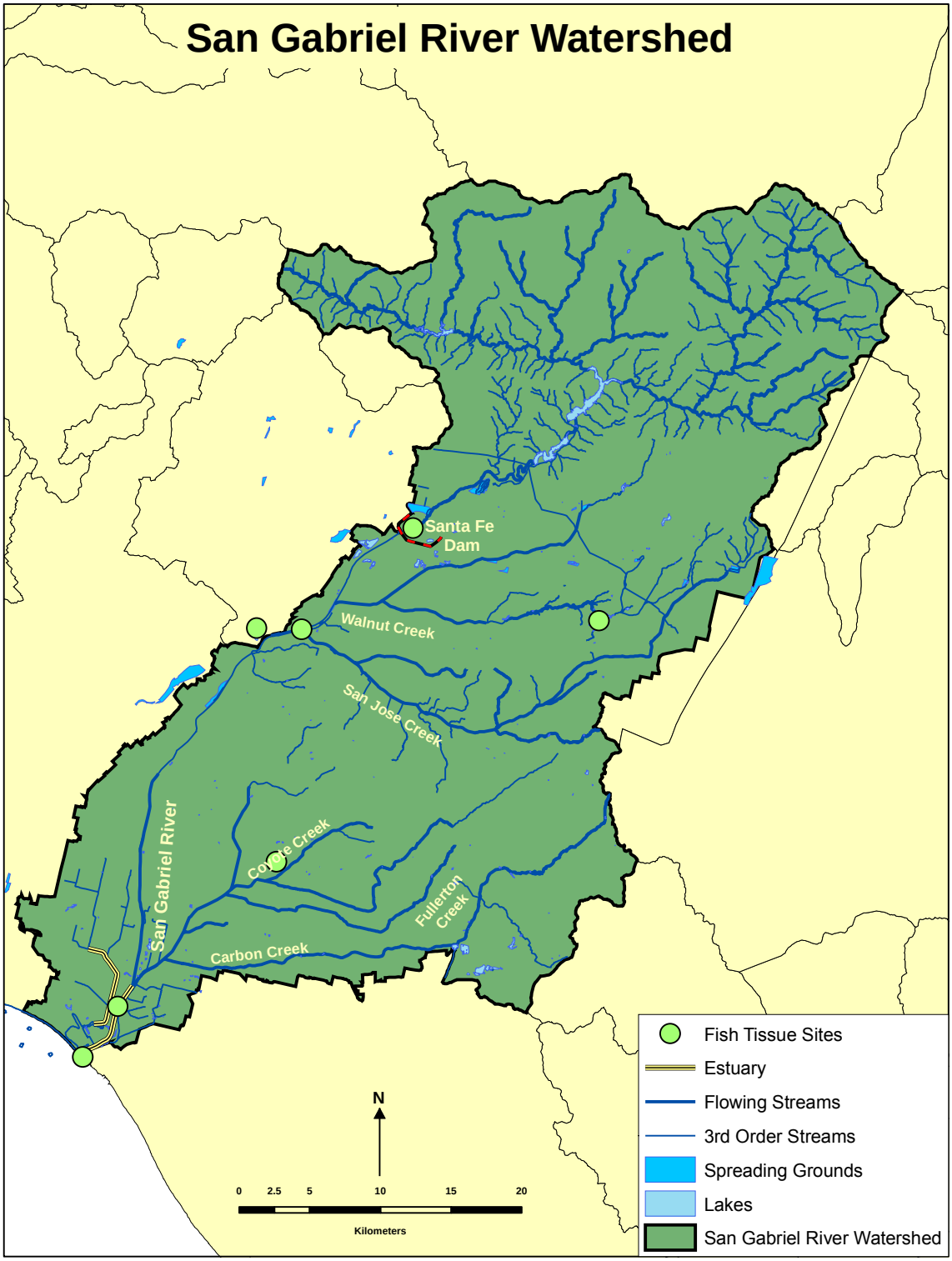

9.0 Assessment, Data Management, and Program Stewardship

Several aspects of the regional monitoring program management and long-term stewardship were addressed by the workgroup and implemented to some degree during the program's first year of operation. These include:

- Reporting
- Data management and integration
- Program management and stewardship.

9.1 Reporting

The SGRRMP will yield its full value only to the extent that the data it produces are consistently organized, synthesized, compared to relevant data from other sources, and reported in a manner accessible to its various audiences in the public and the management, scientific, and advocacy communities.

The workgroup strongly recommended that a periodic (perhaps every five years) and thorough report on the state of the watershed be conducted. This would furnish the motivation for the technical and organizational steps needed to synthesize monitoring information on a watershed scale, including:

- Developing and implementing data management protocols and standardized data transfer formats
- Framing agreements with other regional and watershed-specific programs to share data
- Fostering effective collaboration in the synthesis and interpretation of data from the watershed
- Articulating useful questions that can serve as focal points for data analysis and interpretation
- Devising data presentation and reporting formats suited to each of several potential audiences
- Identifying potential modifications to the monitoring plan
- Identifying potential special studies to address specific questions on watershed condition or the processes that affect them.

All of these activities require focused and consistent effort, because they involve a wide variety of data types from several sources, as well as the thoughtful input of scientists and other staff from many organizations. They will occur only if they are motivated by a clear goal, such as production of a watershed report, and are led by a single entity with responsibility for managing and coordinating the effort involved.

The SGRRMP is preparing a report on the results of the 2005 monitoring effort, which focused on Questions 1 and 2 and included both random and targeted watershed sites. In addition to straightforward data summaries, the workgroup has begun to define a number of higher-level analyses that would integrate different data types to present more comprehensive assessments of watershed condition and trends. This report will be produced during the first half of 2006, with the goal of providing a template for future annual reports, which would then build toward the more comprehensive periodic (e.g., once every five years) state of the watershed report.

9.2 Data management and integration

The success and efficiency of the data analysis and reporting effort will depend on the program's ability to readily acquire, transfer, and integrate data from a number of sources. There are two

reasons for this. First, some elements of the program's monitoring design will necessarily be implemented by different agencies and/or contractors. Second, analyzing and interpreting the program's data, and placing it in a relevant context, will sometimes require integrating the program's data with research and/or monitoring results from other sources.

Building blocks and/or models for data acquisition, transfer, and integration already exist, and will be further developed in the future. As a result, it will not be necessary for the program to develop its own unique data management procedures and database system. For data acquisition and transfer, the Stormwater Monitoring Coalition (SMC) and the SWAMP have developed standard data transfer and reporting formats that are readily applicable to most of the data types the program will use. Participants in the program's first year's monitoring effort successfully used one or the other of these formats to report data to SCCWRP, which has agreed to manage the 2005 data. In addition, SCCWRP is actively working with SWAMP's data managers to complete a set of data entry templates that will automatically convert a wide range of data types to SWAMP format. This will not only make it easy for contractors and program participants to transfer and share data for the reporting activities, but it will also lay the groundwork for the program to submit its data to SWAMP for inclusion in the statewide database.

In addition, SCCWRP has agreed to provide to the Los Angeles and San Gabriel Rivers Watershed Council (Watershed Council) and its contractors (see next subsection) the database tables it has created to manage the program's data. This will enable the Watershed Council to manage and work with SGRRMP monitoring data while the details of the statewide database are being completed. Ideally, the statewide database would serve as the permanent home for the program's data.

9.3 Program stewardship

The workgroup recommended that a single entity take on the primary role of coordinating the annual monitoring and producing the periodic SGRRMP watershed assessment, and suggested the Watershed Council as a candidate for this role. The Watershed Council agreed to take on this role and has begun to actively coordinate the logistics for the 2006 monitoring effort. The detailed scope of the Watershed Council's role will be finalized as part of the proposed funding mechanism (see Section 10) that is anticipated to be implemented in 2006. The workgroup envisions that the Watershed Council will retain one or more consultants to perform some or all aspects of the field work, laboratory analysis, data management, and data analysis/reporting. The Watershed Council would oversee all activities of the consultants.

10.0 Implementation: Offsets, Costs, and Funding Mechanism

The SGRRMP was partially implemented in its first year, 2005, with the random and targeted watershed components that address Questions 1 and 2 completed. The random watershed component in 2005 involved sampling at 30 stations, while monitoring in subsequent years will involve only 10 stations per year. The 2005 effort was implemented and funded through a wide variety of one-time compliance monitoring offsets, in-kind support, and cooperative efforts with other programs.

It is anticipated that the program will be operated on a more sustainable basis beginning in 2006. The Watershed Council will provide overall management and coordination (see Section 9 for more detail). It is proposed that the program be funded through a set of approved permanent compliance monitoring reductions or offsets for LACSD (see subsections 10.3.1 – 10.3.4), with the savings redirected to the Watershed Council under the terms of a cooperative agreement between the Watershed Council and LACSD, subject to approval by the Board of Directors for both agencies. The Watershed Council would administer these funds, contracting as needed with specific entities to perform field sampling, laboratory analyses, data management and analysis, and reporting. Any surplus funds from the annual offset would be accumulated to fund the more intensive periodic watershed assessment effort and to conduct more in-depth monitoring and laboratory analyses. Substantive changes to the regional monitoring program's structure or goals would be subject to agreement by the LARWQB Executive Officer, the Watershed Council, and LACSD, in consultation with the SGRRMP technical workgroup. Adaptive or routine adjustments to monitoring locations, constituent lists, and laboratory procedures, as well as the design and implementation of special studies intended to follow up on monitoring results, would be agreed on by LARWQCB staff, the Watershed Council, and LACSD, in consultation with the SGRRMP technical workgroup.

10.1 In-kind Support

In addition to the proposed LACSD offsets (see Section 10.3) that will provide a more permanent funding basis for the program, a number of other specific forms of in-kind support are planned on an ongoing basis. Any adjustments to sampling locations or times by LACSD and LADPW will require approval of the LARWQCB. In-kind support includes:

- LACSD will conduct triad sampling (bioassessment, aquatic chemistry, toxicity testing) at its compliance stations R11 and RA as part of the targeted watershed component
- LACSD will request that all of its bioassessment sampling be moved from fall to spring
- LADPW will perform four bioassessment sites in the lower watershed (three targeted sites, one random site) and will make needed adjustments in sampling locations and timing to accomplish this.
- LADPW will shift its bioassessment sampling at Walnut Creek from the fall to the spring as part of the targeted watershed component
- Orange County Stormwater Program will sample one random site in those years when a random site falls within Orange County.

10.2 Implementation costs

The estimated costs to conduct the monitoring recommended for the overall SGRRMP are contained in Table 10.1. These costs were derived using a standardized set of costs for each category of sample collection and laboratory analysis to accommodate the fact that it is not yet known which specific agencies and/or contractors will be conducting field sampling and

laboratory analyses. Where multiple costs were available from workgroup members, these were averaged to obtain a single figure. Some costs, however, were available from only one source. The overall estimated annual cost of the SGRRMP is $1,667,501 for ongoing monitoring, analysis, and reporting. This is somewhat of a moving target because the compliance monitoring requirements under Question 3 are routinely revised in response to permit and other regulatory actions.

The portion of the total program costs that are related to compliance monitoring under Question 3 is $1,318,336. The cost estimate suggested to the workgroup that the new components of the SGRRMP (i.e., Questions 1, 2, 4, and 5), which total $349,165 (for sample collection and laboratory analysis only) from the second year onward, could be funded with only moderate readjustments to compliance monitoring programs (Question 3) and/or additional funds or in-kind support from other agencies, citizen monitoring groups, grants, etc. (see next subsection for details on the funds available from compliance monitoring offsets).

The purpose of using standardized costs is to provide a common benchmark for planning and implementation. The organizations monitoring in the San Gabriel River watershed not only use different consulting companies and laboratories to conduct field sampling and laboratory analyses, but also present costs in a variety of ways (e.g., some include facility overhead and staff benefits, or QA/QC costs, while others do not), all of which make it extremely difficult to directly compare costs and evaluate potential tradeoffs in the monitoring design. Thus, the standardized costs presented in Table 10.1 will, in some cases, diverge from actual current expenses incurred by individual monitoring programs. More importantly, the costs in Table 10.1 will almost certainly differ somewhat from the costs the Watershed Council will incur as it implements the program.

Some assumptions were required in developing the standardized cost estimate. This is because certain details of the watershed design cannot be finalized until sampling actually begins and because some aggregation and averaging of costs was required in order to show all costs on the same basis. These assumptions include:

- All site visit costs (except for some for Question 3) are from the SWAMP costing template and are the same for all sample types and locations. This may be somewhat unrealistic. For example, site visits to collect bacteria samples under Question 4 may be less expensive than sites visits for collection of water chemistry samples under Questions 1 and 2, and collection of sediment samples in the estuary under Question 2 may be more expensive than collection of CRAM measurements at freshwater stations under Question 2.
- QA/QC costs are assumed to be embedded in the unit costs for each type of analysis. This assumption is not universally true for all cost estimates used, since some laboratories include such costs in the baseline analysis charge as a matter of course and others do not. Information to take the cost estimates to this next level of detail was not available, nor was it considered necessary for this stage of the costing process.
- In addition, 5% is added to sampling and analysis costs for field QA/QC duplicates.
- Unit costs for bioassessment samples (including set up, sampling, taxonomy) were obtained and were adjusted to reflect the site visit costs applied to all samples.
- Question 2: Conventional water quality sampling at the four estuary stations four times per year.
- Question 3: 25 LACSD receiving water stations, two LADPW stormwater mass emissions stations, and three shared LADWP/AES receiving water stations. LADWP and AES share

nine additional receiving water stations in San Pedro Bay, but these are not included in this cost estimate, which focuses on the San Gabriel River and its estuary.

- Question 3: For site visits at LACSD discharge sites with extremely easy access and well-established routines, a site visit cost of $250 was applied to weekly sampling at each of 25 receiving water stations.
- Question 3: LACSD costs reflect the current monitoring program, before applying the offsets described in Section 10.3.
- Question 3: Only the NPDES receiving water monitoring by LADWP/AES is included. The Reasonable Potential Analysis (RPA) monitoring conducted by these agencies is not included.
- Question 3: Includes two storm and two dry weather samples at each of two mass emissions stations monitored by LADPW.
- Question 3: The Orange County Stormwater Program's three mass emissions stations are not included because monitoring has not yet begun. Once monitoring does begin, it will include three storm and three dry weather samples per year at each station, sampled for water chemistry and toxicity.
- Question 4: Six swimming sites, three locations per site, sampled weekly for the five month swimming period (May through September), with three sites sampled during a single field trip.
- Question 4: Five watershed sentinel sites, sampled weekly for the five month swimming period (May through September), with all five locations sampled during a single field trip. This field trip will include one estuary site during the swimming season.
- Question 4: One estuary (bottom of watershed) site, sampled twice weekly throughout the year. This will require two separate field trips per week during the October through April period and one trip per week during the swimming season.
- Question 5: Seven sites have been recommended for the pilot program, but it is not known at this time how many different species, and therefore composite samples, will be collected at each site. The estimate assumes three composite samples per site per visit.
- For all DO, pH, and conductivity samples, the estimate assumes that data from a multi-parameter probe will suffice. This is included in the site visit cost. If actual lab analyses are required, then the individual costs in the spreadsheet will need to be applied.

10.3 Funding mechanism

Section 6.1 described three specific adjustments to LACSD's compliance monitoring that would improve efficiency and free up funds to support the regional monitoring program. These included:

- Shifting from weekly to monthly monitoring at 21 inland and four estuary receiving water stations
- Removing station R9E from the monitoring program
- Removing chlorophyll a from the list of monitored constituents
- Switching permit-required bioassessment monitoring to the spring season instead of fall, and conducting bioassessments according to the method that is currently employed by the California Department of Fish and Game (CDFG)

The following subsections detail the projected cost savings from each of these actions. Despite the presence of some unavoidable costing assumptions, LACSD, LARWQCB, and the other members of the workgroup all agreed that they would form the basis for calculating the resource exchange to the Watershed Council.

The actual transfer of funds from LACSD to the Watershed Council would be accomplished under the terms of a cooperative agreement between the Watershed Council and LACSD, subject to approval by the Board of Directors for both agencies.

10.3.1 Moving to monthly sampling

The following table summarizes the cost savings for moving to monthly monitoring at the 25 LACSD receiving water stations. Costs for receiving water stations at Pomona and San Jose Creek water reclamation plants (WRPs) and estuary stations are calculated separately from other inland receiving water stations because some constituents are monitored at different frequencies. The following table shows that moving to monthly monitoring at the 25 receiving water stations will save $31,577 per month for the inland and estuary stations, for a yearly cost savings of $378,924.

Station Type	Monthly Analysis Cost		Monthly Staging Cost		Monthly Station Total		Monthly Savings
	Weekly	Monthly	Weekly	Monthly	Weekly	Monthly	
WRP (11)	3053	1726	613	141	3666	1867	19789
Estuary/R9E (5)	2245	1209	613	141	2858	1350	7540
POM (3)	2135	2135	613	141	2748	2276	1416
SJC (6)	1153	1153	613	141	1766	1294	2832
Total (25)							31577

10.3.2 Removing chlorophyll a

Chlorophyll a costs $54.68 per sample. Cost savings from removing chlorophyll a from all the stations can be estimated as follows, assuming a monthly monitoring frequency:

$54.68 x 19 stations* x 12 months = $12,467

*Chlorophyll a analysis is not required for the 6 San Jose Creek WRP receiving water stations.

10.3.3 Deleting a redundant station

The cost savings from removing station R9E, assuming a monthly sampling frequency and that chlorophyll a has been removed from the parameter list are:

[$1,154 (analysis cost) + $141 (staging cost)] x 12 = $15,540

10.3.4 Total annual cost savings

The total annual cost savings from implementing these three adjustments thus are:

$378,924 + $12,467 + $15,540 = $406,931

This amount is more than adequate to cover the estimated costs (about $349,165) of the four aspects of the watershed program that are not directly related to discharge compliance monitoring. These include the random and targeted watershed monitoring, along with bacteria monitoring at key swimming and sentinel sites, and the pilot program for fish tissue monitoring.

Given that the actual scope and cost of these four program elements may change as they are implemented on a routine basis, the original cost estimate may increase. In addition, the budget in Table 10.1 contains routine administrative and other program costs, and some funds should be set aside to support the periodic and more intensive watershed assessment.

Table 10.1. Estimated costs for the San Gabriel River Regional Monitoring Program. Estimates are based on standardized costs that reflect an average of costs across programs to facilitate regional cost comparisons and planning.

SGRRMP Planning Costs		SGRRMP Program Elements ------>	Q1: Random Watershed Out Years	Item Cost (Random Watershed Out Years)	Q2: Unique Areas - Freshwater	Item Cost (Unique Areas - Freshwater)	Q2: Unique Areas - Estuary	Item Cost (Unique Areas - Estuary)	Q3: Discharges	Item Cost (Discharges)	Q4: Safe to Swim	Item Cost (Safe to Swim)	Q5: Safe to Eat Fish (Pilot Program)	Item Costs (Safe to Eat Fish)	Total units	Total Cost (Total Units x cost/unit)
Analysis or Service to be Performed	Description	Unit Cost (per sample)														
Sediment and/or Water Sample Collection	Collect sed and/or water samples; conduct multiparameter probe reading as possible; includes all sample shipping. For close access, drive-up/walk-in sites only. Sample collection costs not only include field time/costs, but also field data entry, pre-trip preparation, and post-trip	$931	10	$9,310	12	$11,172	16	$14,896	30	$27,930					38	$35,378
	For LACSD sites at water reclamation plants with extremely easy access.	$250							1352	$338,000					0	$0
	Bacteria-only collection in which 3 or 6 sites per day are sampled	$500									66	$33,000			64	$33,000
	Weekly Bacteriological Collection (head of estuary, non-swim season)	$250									82	$20,500			82	$20,500
	Fish collected w/ non-marine (TSM style)	$2,107											5	$10,535	5	$10,535
	Fish collected within marine/estuarine (CFC style)	$1,689											2	$3,378	2	$3,378
Trace Organic Chemistry	Full Scan (pesticides and pcb congeners; no PAH's) - sediment	$1,030													0	$0
	Full Scan (chlorinated pesticides and pcb congeners; no PAH's) - tissue	$195											21	$4,095	21	$4,095
	Full Scan (chlorinated pesticides and pcb congeners; no PAH's) - water	$195							316	$61,620					0	$0
															0	

SGRRMP Planning Costs		SGRRMP Program Elements ------>	Q1: Random Watershed Out Years	Item Cost (Random Watershed Out Years)	Q2: Unique Areas - Freshwater	Item Cost (Unique Areas - Freshwater)	Q2: Unique Areas - Estuary	Item Cost (Unique Areas - Estuary)	Q3: Discharges	Item Cost (Discharges)	Q4: Safe to Swim	Item Cost (Safe to Swim)	Q5: Safe to Eat Fish (Pilot Program)	Item Costs (Safe to Eat Fish)	Total units	Total Cost (Total Units x cost/unit)
	Full Scan (pesticides and pcb congeners) + PAH's - sediment	$1,764													0	$0
	Semi-volatile organics	$250							108	$27,000					0	$0
	Base neutral extractables - water	$260							4	$1,040					0	$0
															0	
	Triazine herbicides - water	$311							4	$1,244					0	$0
															0	
	VOCs (full list including MTBE+BTEX) - water	$187							104	$19,448					0	$0
															0	
	ICP OP Pesticide scan - water	$151	10	$1,510	5	$755			108	$16,308					15	$2,265
	Chlorpyrifos & Diazinon only- sed	$492													0	$0
Trace Metal Chemistry	Sediment ICP-MS metals suite (Includes Al, Cr, Mn, Ni, Cu, Zn, Ag, Cd, Pb, As--all costs): Se not included--see below	$195					4	$780	3	$585					4	$780
	Tissue ICP-MS metals suite (Includes Al, Cr, Mn, Ni, Cu, Zn, Ag, Cd, Pb, As, Se--all costs)	$402													0	$0
	Water ICP-MS metals suite--unfiltered "total" (Includes Al, Cr, Mn, Ni, Cu, Zn, Ag, Cd, Pb, As, Se--all costs)	$247	10	$2,470	5	$1,235	4	$988	316	$78,052					19	$4,693
	Water ICP-MS metals suite--filtered "dissolved" (Includes Al, Cr, Mn, Ni, Cu, Zn, Ag, Cd, Pb, As, Se--all costs)	$272					4	$1,088	4	$1,088					4	$1,088
															0	
	Surcharge for salinity >3 ppt water trace metals analyses (using high resolution ICP-MS, to get highest reporting limits)	$112					4	$448							4	$448
															0	
															0	

SGRRMP Planning Costs		SGRRMP Program Elements ------>	Q1: Random Watershed Out Years	Item Cost (Random Watershed Out Years)	Q2: Unique Areas - Freshwater	Item Cost (Unique Areas - Freshwater)	Q2: Unique Areas - Estuary	Item Cost (Unique Areas - Estuary)	Q3: Discharges	Item Cost (Discharges)	Q4: Safe to Swim	Item Cost (Safe to Swim)	Q5: Safe to Eat Fish (Pilot Program)	Item Costs (Safe to Eat Fish)	Total units	Total Cost (Total Units x cost/unit)
	Mercury in tissue	$113											21	$2,373	21	$2,373
															0	
	Arsenic and selenium in tissue	$225											21	$4,725	21	$4,725
Conventional Water Chemistry	Major anions scan: ortho-phosphate, nitrate, nitrite, chloride, sulfate	$177	10	$1,770	5	$885	16	$2,832	1356	$240,012					31	$5,487
	Total Phosphate	$33	10	$330	5	$165	16	$528	1356	$44,748					31	$1,023
	Boron	$37			5	$185	16	$592							21	$777
	Cyanide	$40							316	$12,640					0	$0
	TKN	$53	10	$530	5	$265	16	$848	1356	$71,868					31	$1,643
	TDS	$35							312	$10,920					0	$0
	TSS	$22	10	$220	5	$110	16	$352	316	$6,952					31	$682
	Volatile suspended solids	$22							4	$88					0	$0
	Total phenols	$58							4	$232					0	$0
	Ammonia	$35	10	$350	5	$175	16	$560	1356	$47,460					31	$1,085
	Chlorophyll-a (syringe-filtered)	$71													0	$0
	Alkalinity	$22	10	$220	5	$110	16	$352	4	$88					31	$682
	Hardness (should do if doing metals in freshwater)	$36	10	$360	5	$180	16	$576	1356	$48,816					31	$1,116
	Suspended Sediment Concentration (SSC)	$65													0	$0
	DO	$22													0	$0
	pH	$10													0	$0
	Conductivity	$14													0	$0
	DO, pH, EC: multiparameter probe, no additional cost		10		5		16		1356						31	
	TOC	$71							4	$284					0	$0

SGRRMP Planning Costs		SGRRMP Program Elements ------>	Q1: Random Watershed Out Years	Item Cost (Random Watershed Out Years)	Q2: Unique Areas - Freshwater	Item Cost (Unique Areas - Freshwater)	Q2: Unique Areas - Estuary	Item Cost (Unique Areas - Estuary)	Q3: Discharges	Item Cost (Discharges)	Q4: Safe to Swim	Item Cost (Safe to Swim)	Q5: Safe to Eat Fish (Pilot Program)	Item Costs (Safe to Eat Fish)	Total units	Total Cost (Total Units x cost/unit)
	DOC	$71	10	$710	5	$355	16	$1,136							31	$2,201
	Turbidity	$18							316	$5,688					0	$0
	O&G	$85							316	$26,860					0	$0
	COD	$27							5	$135					0	$0
	BOD	$55							316	$17,380					0	$0
	Surfactants (MBAS)	$40							316	$12,640					0	$0
	Temp (multiparameter probe, no additional cost)								1352						0	
Sediment Physical Characteristics	Sediment Total Organic Carbon (TOC)	$60					4	$240							4	$240
	Sediment grain size (%silt/clay = fines only)	$60													0	$0
	Sediment grain size - full analysis (phi scale)	$130					4	$520							4	$520
Bacteriology and Pathology	Total & fecal coliform, Enterococcus	$45							1356	$61,020	104	$4,680			104	$4,680
	E.coli	$40									506	$20,240			506	$20,240
Biological Assessment	Bioassessment site collection, sorting, taxonomy, QA, report	$1,600	10	$16,000					26	$41,600					10	$16,000
	CRAM measurements in conjunction with bioassessment	$600	10	$6,000											10	$6,000
	CRAM measurements only	$300			12	$3,600									12	$3,600
	Benthic infauna sample sorting, taxonomy, QA, (no sample collection)	$650					4	$2,600	3	$1,950					4	$2,600
Toxicity Testing - Salt Water Origin	Water (salt water)														0	
	Larval Development (sea urchin, abalone, bivalve)	$662													0	$0
	Larval Development at Sediment Water Interface	$689													0	$0
	Sea Urchin Fertilization	$662													0	$0
	Mysid Juvenile 96-h Survival	$551													0	$0

SGRRMP Planning Costs		SGRRMP Program Elements ------>	Q1: Random Watershed Out Years	Item Cost (Random Watershed Out Years)	Q2: Unique Areas - Freshwater	Item Cost (Unique Areas - Freshwater)	Q2: Unique Areas - Estuary	Item Cost (Unique Areas - Estuary)	Q3: Discharges	Item Cost (Discharges)	Q4: Safe to Swim	Item Cost (Safe to Swim)	Q5: Safe to Eat Fish (Pilot Program)	Item Costs (Safe to Eat Fish)	Total units	Total Cost (Total Units x cost/unit)
	Additional Sample Dilutions	$441													0	$0
	Sediment														0	
	Amphipod 10-d Survival (*Rhepoxynius* or *Eohaustorius*)	$855					4	$3,420							4	$3,420
	Amphipod 10-d Survival (*Ampelisca*)	$965													0	$0
	Polychaete 20-d Growth & Survival (*Neanthes*)	$1,048													0	$0
Toxicity Testing - Fresh Water Origin	Water (fresh water)														0	
	Mysid Juvenile 96-hr Survival	$551													0	$0
	Ceriodaphnia 96-hr Survival	$386	10	$3,860					52	$20,072					10	$3,860
	Additional sample dilutions (after 100%) for *Ceriodaphnia* 96-hr test	$221													0	$0
	Ceriodaphnia 96-hr Survival in-situ	$607													0	$0
	Ceriodaphnia 7-day Survival & Reproduction (one of EPA 3-spp)	$717							104	$74,568					0	$0
	Additional Sample Dilutions for *Ceriodaphnia* 7-day test	$525													0	$0
	Pimephales (fathead minnow) 7-day test (one of EPA 3-spp)	$717													0	$0
	Selenastrum (algae) test (one of EPA 3-spp)	$717													0	$0
	Sediment														0	
	Amphipod 10-d Survival (*Hyalella*)--acute	$882													0	$0
	Amphipod 28-d Survival (*Hyalella*)--chonic (recommended)	$1,103					4	$4,412							4	$4,412
	Additional species 10-d acute (estimate)	$882													0	$0
	Sediment / Water Interface (consult as to species)	$689													0	$0
5% Field Duplicate QA/QC Sample Cost	5% of laboratory analysis costs	$8,639													0	$8,639

SGRRMP Planning Costs		SGRRMP Program Elements ------>	Q1: Random Watershed Out Years	Item Cost (Random Watershed Out Years)	Q2: Unique Areas - Freshwater	Item Cost (Unique Areas - Freshwater)	Q2: Unique Areas - Estuary	Item Cost (Unique Areas - Estuary)	Q3: Discharges	Item Cost (Discharges)	Q4: Safe to Swim	Item Cost (Safe to Swim)	Q5: Safe to Eat Fish (Pilot Program)	Item Costs (Safe to Eat Fish)	Total units	Total Cost (Total Units x cost/unit)
DFG Miscellaneous	Regional proportional share of statewide cost of DFG pass-thru subcontract ovrhd, coordination/logistics/management cost (*will calculate after know total $ each region in each subcontract)	*different for each region													0	$0
	Sampling/Cruise Reports - $525 per sampling seasonal event	$679													0	$0
	Regional Annual Interpretive Report / Publication	Negotiate													0	
SUBTOTAL COST FOR EACH PROGRAM COMPONENT:				$43,640		$19,192		$37,168		$1,318,336		$78,420		$25,106		
Programmatic sampling-related costs (QAPP, CRAM training, site recon)																$10,000
Programmatic reporting-related costs (Data management, data analysis, reporting)																$25,000
Programmatic management costs (Workgroup, project management, Watershed Council)																$42,000
Provision for special studies																$20,000
Provision for periodic State of the Watershed Report																$20,000
Technical assistance and support																$20,000
TOTAL COST EXCLUDING DISCHARGE (Q3):																$349,165

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Fundamentals of Urban Runoff Management

TECHNICAL AND INSTITUTIONAL ISSUES

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Fundamentals of Urban Runoff Management: Technical and Institutional Issues

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The North American Lake Management Society (NALMS) support for this effort is most appreciated. NALMS' mission is to forge partnerships among citizens, scientists, and professionals to foster the management and protection of lakes and reservoirs for today and tomorrow. Lakes and reservoirs are used more now than ever and water pollution is a key problem in maintenance of lake health. NALMS supports the development, communication, and use of excellent science and cutting-edge management to further lake protection goals.

We hope this manual will provide information that can be used to further NALMS' goals.

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Preface

In 1994, the Watershed Management Institute, through the Terrene Institute and in conjunction with the U.S. Environmental Protection Agency (EPA), published *Fundamentals of Urban Runoff Management: Technical and Institutional Issues*. That manual combined technical and institutional information to provide a handy resource for practitioners and regulators for both erosion and sediment control and stormwater management. The manual was well received.

As luck would have it, in 2001 several of the original authors met up at a conference, and began to discuss the amount of new information available and our desire to update the previous work. The idea was planted and communication between the original authors began. Most of the authors wanted to contribute so we went about looking for a vehicle for distribution. As two of the previously involved organizations were not available, discussions began with the North American Lake Management Society (NALMS) which felt the manual would provide a resource for its members and anyone working with stormwater impacts on aquatic habitats. Discussion began with the EPA for funding assistance, which was subsequently approved.

If the new information represented only an evolution or increase in the data available, this book would probably not have been pursued. Rather, there has been a significant shift in program direction that represents a movement from the historic mitigation-based approach for stormwater treatment to a more source-based approach. The main reason for this shift in thinking is based on an increased recognition that streams are a valued aquatic resource that should be protected.

This change in thinking necessitated a philosophical shift from larger stormwater practices on streams to the use of practices on individual subdivisions and even individual lots. Linking stormwater goals to aquatic resource protection mainly necessitated this change in approach. Much more information continues to become available to demonstrate the significant shift necessary to protect and enhance aquatic resources. We are pleased that this new edition of *Fundamentals of Urban Runoff Management* can play a role in that shift.

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CHAPTER 1

Introduction

Discussion

To begin, this chapter sets out some of the reasons for updating *Fundamentals of Urban Runoff Management*. These include:

- The shifting emphasis and impacts of stormwater management programs and regulations;
- The Storm Water Phase II Rule published on December 8, 1999, which greatly expanded the scope and coverage of the Phase I program;
- The increased emphasis on the Total Maximum Daily Load (TMDL) approach to stormwater management;
- Changing hydrologic approaches that increasingly consider long-term continuous simulation of rainfall to more accurately size BMPs;
- The increase in the quantity and quality of water data;
- The increased prominence of biomonitoring and biocriteria; and
- New and improved stormwater management practices.

Shifting Program Emphasis

When the original *Fundamentals* manual was written in 1994, programs were focused on limiting peak discharges and providing water quality treatment. The performance of practices for quality treatment was more assumed than realized. In addition, there was little widespread documentation of practice performance and the relationships between hydrology and water quality. Aquatic ecosystems were also not recognized to any great degree. There was an assumption that removal of contaminants would be good for the environment, but at the time few studies had been done to verify the accuracy of that assumption. There has since been significant work done in this regard, with one of the studies (Horner et al., 2001) assessing the effectiveness of structural practices to protect stream aquatic resources from a watershed-wide perspective. They make a number of interesting statements, although some need to be further documented. Key findings were:

- Until watershed total impervious area exceeds 40 per cent, biological decline was more strongly associated with hydrologic fluctuation than with chemical water and sediment quality decreases. Accompanying hydrologic alteration was loss of habitat features, such as large woody debris and pool cover, and deposition of fine sediments.
- Structural BMPs at current densities of implementation demonstrated less potential than the non-structural methods (riparian buffers, vegetation preservation) to forestall resource decline as urbanization starts and progresses. There was a suggestion in the data, however, that more thorough coverage would offer substantive benefits in this situation. Moreover, structural BMPs were seen to help prevent further resource deterioration in moderately and highly developed watersheds. Analysis showed that none of the options is without limitations, and widespread landscape preservation must be incorporated to retain the most biologically productive aquatic resources.

- Structural BMPs can make a substantive contribution to keeping stream ecosystem health from falling to the lowest levels at moderately high urbanization and, with extensive coverage, to maintaining relatively high biotic integrity at light urbanization.

Clearly, we are finding that you cannot separate water quantity and water quality issues if aquatic resource protection is a program goal. Some people, mainly from an anecdotal perspective, have recognized this, but now increasing amounts of literature support that fact. What has clearly come out of recent research is the relationship of land use to aquatic system health and well-being: it isn't just pollutants that are an issue.

Phase II Storm Water Rule

The Storm Water Phase II Rule published on December 8, 1999 greatly expanded the extent of the Phase I program. This was done by requiring operators of municipal separate storm sewer systems (MS4s) and operators of small construction sites (greater than one acre) to obtain National Pollutant Discharge Elimination System (NPDES) permits that implement programs and practices to control polluted stormwater runoff.

The expansion of Phase II is directed toward municipalities with populations under 100,000, which were not covered in Phase I. There are a number of variations to the general requirement, best set out in fact sheets developed by the EPA (Storm Water Phase II Final Rule Fact Sheet Series).

The bottom line is that most municipalities and federal facilities in the U.S. are now covered by the Storm Water Program and must implement programs and practices that control stormwater runoff. The minimum control measures required by the EPA as essential to an effective stormwater management program are:

- Public education and outreach on stormwater impacts;
- Public involvement/participation;
- Construction site stormwater runoff control;
- Post-construction stormwater management in new development and redevelopment;
- Pollution prevention/good housekeeping for municipal operations; and
- Illicit discharge detection and elimination.

Increased Emphasis on the TMDL Approach

The Total Maximum Daily Load (TMDL) approach to stormwater management has existed for a number of years (originally identified in the *Clean Water Act*, 1972). For various reasons TMDLs have now assumed much more priority on a national and state basis than was the case historically. A number of TMDLs done around the country are now serving as templates to be followed. The approach is evolving fairly rapidly with new guidance information available almost on a routine basis.

Biannually, states, territories, and authorized tribes must list those impaired waters that do not meet applicable water quality standards. Lists submitted to the EPA must identify the pollutants that cause the impairment and the water bodies targeted for TMDL development. TMDLs must then be established at levels necessary to achieve applicable water quality standards, along with a margin of safety that takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality.

A TMDL specifies the amount of a particular pollutant that may be introduced into a water body and allocates the total allowable pollutant load among sources. The TMDL provides a roadmap for efforts to attain and maintain state water quality standards. TMDLs consider both point and nonpoint source pollutant loadings in determining the overall state of a receiving system and allow prioritization of efforts to achieve compliance with water quality standards.

The core of a TMDL is a computer model or simulation that predicts outcomes for various pollutants on a watershed basis. Most models in use today have been around for quite some time and are generally understood in terms of data entry and model process. Where improved data is especially important in the TMDL process is for pollutant loadings from various land uses and performance data for BMP treatment expectations. More data is absolutely essential if the TMDL process is to provide for a reasonable consideration of alternatives in a given watershed and selection of a preferred approach. There are huge issues related to funding, both public and private, and the anticipated outcome must be defined as much as possible.

Changing Hydrologic Approaches

While stormwater management has historically relied on event-based approaches to BMP design, more practitioners are now considering long-term continuous simulation of rainfall to accurately size BMPs. By considering actual long-term rainfall records in a given area, a better gauge of performance may be obtained. Analysis of continuous rainfall data over a given time, possibly supplemented by simulation of much longer terms, may give a different performance expectation than would be expected using an event-driven sizing approach. This will have a major influence on models used for analysis and on existing design standards and sizing methodologies.

Better Water Quality Data

Water quality data is becoming much more available than was the case historically. In the past, early monitoring was based to a very large extent on the results of the National Urban Runoff Program (NURP) done in the late 1970s and early 1980s. The NURP study provided a national perspective on water quality issues, but there are now many other studies done in the U.S. and around the world, notably Australia, Canada, England, New Zealand, and a number of European countries.

Another excellent source of water quality data for practice performance is the International Stormwater Management Best Management Practices Database, which provides access to BMP performance data for about 200 studies conducted over the past 15 years. This data was compiled by the Urban Water Resources Research Council of the American Society of Civil Engineers (ASCE) to provide consistent and scientifically defensible data for BMP designs and related performance. That information is available at www.bmpdatabase.org.

In addition, considerable research is being done on the performance of wetland systems, filter systems, and newer practices such as rain gardens. Many proprietary practices are also becoming more commonly used. The development of proprietary systems will continue; this should be encouraged, subject to collection of good monitoring data that would justify their use. Some of that data is already available.

Increased Prominence of Biomonitoring and Biocriteria

While there remains an important role for chemical monitoring, biological indicators are increasingly recognized as a necessary component of stormwater monitoring and assessment.

Chemical monitoring provides a picture over the period monitoring is done, while sediment sampling provides a rate of accumulation. Biological monitoring adds to the picture by providing an overall health rating of the receiving system, including a compilation of the effects of stressors on aquatic organisms, a perspective that is not available through chemical or sediment monitoring. As such, it can be considered the third leg of the monitoring stool: without all three legs the picture is not complete.

Improved and New Practices

Stormwater Management

This is an exciting time to be considering stormwater management and means of reducing impacts related to society's use of land. Initial stormwater management efforts focussed on control of water quantity related to flooding impacts. Flood control programs were generally initiated in response to a local flooding event and involved channel modifications, detention dams, or floodplain regulation. As the issue of water quality became more recognized, the existing infrastructure of flood control programs was generally modified to incorporate water quality concerns.

The approach at the time was to modify existing water quantity practices to also provide water quality improvement; however, the overall design philosophy was still directed toward large, on-line stormwater treatment systems that first and foremost provided control of downstream flooding and through design approaches (wet ponds) provided water quality treatment. There was little consideration of the stream or receiving system as an important resource. That lack of importance changed in the early 1990s. It was also recognized that one practice could not provide treatment for a wide range of pollutants: filter systems, wetlands, and biofiltration practices were all investigated for pollutant reduction.

As a result, stormwater management has become a very different entity than it was in the 1980s. There is much more emphasis on practices at the headwaters of perennial streams, and practices are being much more targeted to the pollutants generated through specific land use activities than was done historically.

Finally, there are new practices being developed as variations of their historic counterparts. Filter systems are being used with filter media other than sand, infiltration practices are being considered on a wider basis, and newer practices (at least from a U.S. perspective) such as rain gardens, green roofs, and water re-use are being advocated. These really are exciting times.

Erosion and Sediment Control

Erosion and sediment control practices have not evolved to the same extent as those for stormwater. The suite of practices in use has remained pretty much the same since the early 1970s. That can't be good. Other components that have more recently begun to emerge consider temporary and permanent revegetation, phasing work to limit open areas, and chemical flocculation of sediment ponds to provide for enhanced sediment discharge reduction, especially of clay soils. More attention to erosion and sediment control practices is needed for improved treatment to be achieved.

Where From Here

As both our understanding and practices evolve, more emphasis will be placed on the "treatment train" concept, where several types of stormwater practices are used together and integrated into a comprehensive stormwater management system. Although this is obvious when multiple issues are considered (such as stormwater quantity, quality and aquatic ecosystem protection), it is also sometimes needed when considering a single issue. For example, stormwater quality may include a variety of contaminants to be managed, but processes that facilitate one type of pollutant in one practice may not facilitate removal of a pollutant in another phase (liquid versus particulate). The treatment train approach to stormwater management will become increasingly important to reduce overall stormwater impacts on the urban environment.

For erosion and sediment control programs, technology must improve and approaches further refined for aquatic resource protection to be realized. An aggressive stormwater management program will not realize its goals if the receiving systems are severely impacted during the construction phase of a project. In addition to significant sediment loads, the amount of stormwater exiting a construction site can be significantly increased, causing downstream channel instability concerns. Erosion and sediment control must be given greater attention by regulators and designers. It is a positive step, therefore, that the Phase II program is also emphasizing erosion and sediment control on smaller sites than did the Phase I program.

Most importantly, if we are to reverse the existing trend of aquatic and terrestrial destruction that so defines traditional development, we must alter our existing approach to land use. There may be areas of significant habitat, groundwater recharge, or steep slopes where intensive land development is simply not appropriate. Those areas should protected, regardless of their location, and urban planners should instead insist on higher densities in other areas. Stream corridors should be protected, riparian cover established (or re-established), water re-use emphasized to reduce the use of potable water in addition to reducing stormwater runoff, and the use of green roofs should be expanded,

Figure 1-1: Stormwater Treatment Train

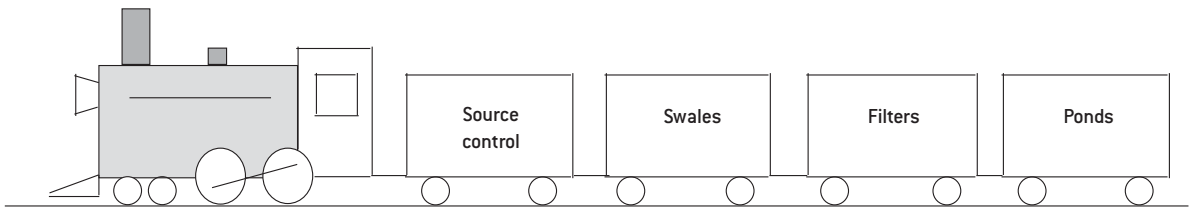

especially for redevelopment opportunities. Finally, stormwater management implementation should be done as an integral component of site development and as an urban retrofit.

We are approaching a point where we now have the tools to eliminate further declines in receiving systems, and in a number of situations actually improve on existing conditions.

Concluding Thoughts

Stormwater management has historically been an afterthought – when thought of at all – to the site development process. Development tends to first lay out streets, lots, and public areas, and then consider how to deal with any required stormwater management concerns. As long as stormwater management remains an afterthought, even the best resource protection intentions are doomed to fail.

In the same regard, we too often design for minimum standards in environmental areas, with no factor of safety. If a code says to stay out of wetlands, we stay out of them, barely. In the same regard, if we have a design standard of 80 per cent reduction in TSS, that is what designers will design for – very seldom does someone intentionally design for a higher standard. We really ought to consider a factor of safety in land development to allow for better assurance of a desired outcome.

We must also recognize that we have not yet fulfilled our potential understanding of how best to protect the environment. We are learning, and we hope to apply our increasing knowledge to better outcomes, but stormwater management is an inexact science and there are huge pressures on land use, along with infrastructure provision, to be considered. We aren't alone in our efforts, although it may seem like it at times. People all around the world are dealing with the same problems and developing innovative solutions we have not yet thought of.

All of us have never-ending jobs in teaching other staff members, politicians, members of the design and construction community, and the public. At the same time, we must never cease to be students, always willing to learn and apply new information and insight for the betterment of the environment.

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CHAPTER 2

Water Quantity Impacts of Urban Land Use

Urban runoff is a by-product of the land's interaction with rainfall. Since, by definition, urban runoff remains on and moves along the land's surface, it is the most visible of the many forms into which rainfall is converted. This chapter provides the technical fundamentals of the rainfall-runoff … process. It also describes ways that land development alters this process and quantifies some of the adverse impacts.

So began Chapter 2 of the 1994 edition of *Fundamentals of Urban Runoff Management*. And while it still can serve as the opening paragraph of this new Chapter 2, our technical knowledge of both urban runoff hydrology and the effects of land use change has grown considerably in the intervening years. As a result, the technical content of this new chapter goes beyond the original version, including new and updated topics. However, in presenting this technical information, the chapter's goal remains the same: to present the information not as an end in itself, but so as to assist in the development of urban runoff management programs. The arrival of the EPA's Stormwater Phase II Final Rule in 1999, which requires municipalities and other entities to develop such programs by 2003, highlights the value of such assistance.

The volume of stormwater runoff produced by a rain event, the rates, velocities, and depths at which it flows, and the pollutants that it carries depend on several factors. In addition to the quantity, intensity, and duration of the rain itself, the resultant runoff will be determined by the characteristics, condition, and relative areas of the various surfaces on which it falls. As explained in detail in the following sections, these characteristics include the type of surface cover, the surface slope, and the texture, density, and permeability of the surface and subsurface soils. Conditions that affect stormwater runoff also include the thickness and quality of the surface cover and the amount of water already stored both on the surface and within the soil profile.

Conversely, stormwater runoff also affects the surfaces upon which it is created and/or that it flows across. These effects include both the deposition of pollutants captured from the atmosphere by the falling rain and the mobilization and removal of pollutants previously stored on the surfaces. The most readily visible effects are erosion and sedimentation, where forces created by the moving runoff become large enough to dislodge, suspend, and transport soil particles and associated pollutants downstream. This process continues until slower velocity areas are encountered, whereupon the particles drop out of the runoff and back onto the surface. Depending on the type and character of the surface cover, this process of dislodging soil particles and mobilizing pollutants can be aided by the impact of the falling raindrops themselves. Further erosion, sedimentation, and pollutant loading can occur downstream in swales, channels, streams, and rivers, depending on the rate, depth, velocity, and duration of the runoff flowing in them.

From the above, three key conclusions can already be reached:

- Since the volume, rate, and velocity of runoff from a particular rain event will depend upon the characteristics of the surfaces on which the rain falls, changes to these surfaces can significantly change the resultant runoff volume, rate, and velocity. Changes normally associated with land development and urbanization that increase

impervious cover and decrease soil permeability can significantly increase runoff.

- Since pollutant mobilization and soil erosion are the direct result of excessive runoff rates and durations, changes in land surfaces can also significantly increase both surface and channel erosion rates and runoff pollutant loadings.
- In developing urban runoff management programs, the greater the knowledge of the rainfall-runoff process, the more effective the resultant program will be.

While the details of the rainfall-runoff process are highly complex and much remains to be learned about them, the fundamentals are readily understandable, particularly when presented in a direct, concise manner. That is the goal of this chapter. Equipped with the information presented here, those involved in developing urban runoff management programs at all levels, as well as those responsible for complying with them, can base their efforts on a sound understanding of the basic hydrologic processes at the core of their program.

This chapter provides readers with basic information on the rainfall-runoff process. It also highlights some of the important unknowns and uncertainties of the process and recommends ways to acknowledge and account for them in computation methods and program requirements. Using this information, the chapter also provides information on the adverse impacts land use change and urbanization can have on runoff quantity and the damaging consequences of excessive increases in runoff rates, volumes, and velocities.

Next, the chapter utilizes this rainfall-runoff information to illustrate how various practices can either avoid or control such impacts. This broad approach not only helps ensure that decisions made during the development of an urban runoff management program are based on an informed understanding of runoff fundamentals, but also helps readers to better understand the more technically complex topics presented in subsequent chapters.

The chapter concludes with a list of recommended textbooks, research papers, and other references. These works were selected from a constantly growing body of technical information on urban runoff and the impacts of land use change based upon their seminal or definitive role in the field of urban runoff management. In light of the chapter's broad scope and emphasis on learning the fundamentals first, these references can be used to expand readers' knowledge beyond the pages of this book.

It is important to note that, as our understanding of urban runoff processes and impacts continues to grow, so does the scope and requirements of the programs we've developed to manage them. Following along and, at times, inspiring this growth has been an increasing emphasis on and understanding of runoff fundamentals. It is this greater understanding that has allowed us to progress from relatively simple runoff quantity controls in the 1970s to the integrated quantity and quality programs of today. It has also allowed us to expand the scope and applicability of both our mathematical models and the various measures and practices we can now use to implement their findings. For example, the growing use of nonstructural measures and low-impact development practices essentially began with a detailed re-examination of the fundamental principles of the hydrologic cycle which, in turn, became the basis for their design and implementation. Therefore, it is hoped that the runoff fundamentals presented in this chapter will continue to inspire and direct the development of urban runoff programs with ever greater scopes, goals, and accomplishments.

Reality vs. Theory

In most complex technical matters, differences exist between reality and theory. That is because theories developed to explain or simulate reality can only go so far. Typically, there are aspects of reality that are not entirely understood and, therefore, are either ignored or simplified in the theory. Recognizing these differences is important when developing and implementing a technology-based regulatory program such as one that manages urban runoff. The "real" runoff processes that occur during an actual storm event can be extremely complex and can be influenced by an equally complex, highly variable set of factors and circumstances. Due to this complexity, the theories on which we base our runoff computations and models cannot include all aspects and factors.

For example, the mechanics of infiltration that govern the amount and rate at which rain will enter a soil (and therefore the amount and rate that will become runoff) are difficult to precisely discern. They can include the forces that govern the movement of water entering and moving through the void spaces within

the soil as well as the intensity of the rainfall, the sizes, shapes, and chemical characteristics of the soil particles, the number and size of the void spaces between the soil particles, the amount of moisture already stored within the soil void spaces at the onset of rainfall, the slope and relative smoothness of the soil surface, and the type and character of the cover on the surface. Further complications include the fact that many of these forces and factors typically change over time, not only from storm to storm, but during a single storm event. This inherent complexity of the process, coupled with the complexity and variability of the factors that influence it, makes it difficult to develop a comprehensive theory that can precisely predict the resultant runoff from a specific rainfall event.

At first glance, this difficulty in precisely predicting runoff volumes, rates, and velocities from rainfall events does not bode well for the development of a regulatory program intended to effectively manage that runoff and its impacts. However, an awareness of these difficulties and the complexities, uncertainties, and variability that cause them can help us develop assumptions, simplifications, and representative values that enable us to overcome these difficulties and produce accurate, reliable, and safe runoff estimates. This ability further underscores how important it is for runoff management program developers to possess an understanding of runoff fundamentals.

Generally, there are three analytic techniques typically employed to overcome the complexities and uncertainties of estimating runoff and produce safe, usable results. The first involves analyzing the various processes that help convert rainfall to runoff and determining the relative influence each of their many factors may have on the process's outcome. Those parameters that are found to exert very small influence on the outcome or answer are typically dropped from further consideration in the computations or, if their presence is needed for mathematical rigor, they are assigned a nominal value. At times, factors that have minimal influence individually but, when combined, can have a meaningful and estimable effect on the outcome are grouped together and assigned a value that reflects that combined influence. Such factors are often referred to as lumped parameters in recognition of their combined contribution to the outcome. Mathematical models that utilize such parameters to estimate runoff from rainfall are known as lumped parameter models.

The second analytic technique that is used at times to address the complexities and uncertainties normally associated with runoff computations is an outgrowth of the first technique. Following the identification and analysis of the factors or parameters that influence the various rainfall-runoff processes, those factors that are found to exert a meaningful influence are further analyzed for the ways and amounts in which they do so. Sometimes called sensitivity analysis, this procedure fixes the value or influence of all other significant factors and then allows the parameter in question to vary over a range of possible or probable values. Each time the parameter value changes by a certain percentage of its total value range, both the qualitative and quantitative effects of such a change on the outcome or answer are noted. Once the entire range of parameter values is evaluated, the parameter's influence can be assessed. This assessment can indicate to the runoff modeler how much the outcome or answer will vary due to certain changes in parameter value. The assessment also indicates which direction (i.e., higher or lower) the answer will move. For example, does an increase in parameter value cause the answer to similarly increase or, in fact, to decrease? While direction influences can be readily determined for certain parameters in simple, generally steady-state rainfall-runoff models merely by analyzing their basic equations and algorithms, more complex, dynamic models may require more extensive sensitivity analysis.

Once the sensitivity and direction of a model parameter is understood, the second analytic technique then assigns it a value that the runoff modeler considers to be both a) reasonably representative of its typical value for the circumstances under consideration, and b) safe for the application or action that the model results will be used for. "Typical" values in many models are usually determined from representative numbers of actual parameter measurements taken either in the field or the laboratory. "Safe" values are based upon the parameter's directional influence and the acceptable risk inherent in the application of its results.

For example, in designing a stormwater facility to reduce peak runoff rates and pollutant loads from a land development site, a key design parameter would be the ability of the site's soils under developed conditions to infiltrate rainfall. While there may be extensive data available to the designer upon which to select a typical infiltration value, the designer may also allow the desire for a safe value (and, consequently, a safe design) to influence the final selection. As a result, the designer may select an infiltration rate for the developed site that is somewhat lower than the typical value, knowing that

its use value will result in greater runoff volume and peak rate to the facility which, in turn, would require a somewhat larger facility size than if the typical value was selected. Once again, the selection of a safe parameter value may be a matter of experience and professional judgment when using simple, generally steady-state rainfall-runoff models or may require extensive statistical analysis when using more complex ones.

Selection of safe design parameters may also be complicated by the design itself. For example, in the design described above, the selected infiltration rate for the site soils under developed conditions was lower than the actual or typical rate in order to achieve a conservative facility design. However, let's assume that the required peak outflow rate from the facility could not exceed the peak rate from the site in existing or predeveloped conditions. In computing this predeveloped peak rate, use of a lower than actual soil infiltration value would not be considered safe, since it would result in a peak rate from the predeveloped site (and, therefore, the stormwater facility under developed site conditions) that was greater than the actual predeveloped site rate. In order to select a safe value, the designer would instead need to select a soil infiltration rate for the predeveloped site that was actually higher than the actual value.

As illustrated by these examples, a stormwater facility designer must understand the basics of the rainfall-runoff process in order to consistently select safe parameter values. We cannot be sure that our assumptions, computations, and, ultimately, our runoff management programs are inherently safe unless we understand the fundamental aspects of urban runoff well enough to identify all pertinent factors and parameters and understand their effects. This conclusion once again revisits the "learn the fundamentals first" theme of this chapter.

It should be noted that the use of a "safe" parameter value cannot typically be relied on to address process complexity and uncertainty when attempting to estimate runoff from actual rain events. Such events are often described as "historic" events to distinguish them from synthetic design storms, which are typically based upon a hypothetical arrangement of rainfall depths, intensities, and durations that are often used to design stormwater facilities. Estimating runoff from actual rainfall events is often necessary to demonstrate the accuracy of a particular rainfall-runoff model or to provide feedback that can be used to improve its accuracy. Such procedures are known as model calibration and verification, where a model's algorithms and/or parameter values are adjusted so that its predicted outcomes match the recorded outcomes from actual or historic storm events. Once so adjusted (or calibrated), the model is then used to predict the outcomes for one or more additional historic storms. The predicted results from the calibrated model are then compared with the additional storms' recorded outcomes to verify or validate that the model remains accurate for storms other than the one by which it was calibrated. When estimating outcomes for actual rain events, the selection of model parameter values must usually be based only on the parameter's actual value (or values) during the actual event, a process that requires considerably more understanding of the rainfall-runoff process and usually event-specific records of parameter data.

The third analytic technique addresses the complexities and uncertainties normally associated with runoff computations by including such uncertainties in the runoff computations. To do so requires a rainfall-runoff model that will simulate a large number of storm events. While doing so, the model will allow the value of the uncertain parameter to vary from event to event or even within a particular event based upon the way the parameter may be expected to vary in reality. Such variations may follow a particular pattern (e.g., exponentially or logarithmically) so that, while the actual parameter value for a particular rain event may not be known, the overall range of values and the pattern by which the parameter value varies within that range is known or can be reasonably estimated. Equipped with such information and utilizing a technique known as Monte Carlo simulation (Pitt and Voorhees, 1993), the model will allow the parameter value to vary within the known range and pattern either randomly or in accordance with prescribed probabilities. The results produced by the model can then be statistically analyzed to determine an appropriate answer. Depending upon the parameter, such variations in parameter value can represent a more accurate way to address parameter value uncertainty than selecting typical and/or safe values. However, use of Monte Carlo simulations requires the use of generally more sophisticated rainfall-runoff models and long-term rainfall input data. Further discussion of such models is presented in later sections of this chapter.

In summary, the above section presented the following ideas and information:

- Inherent complexities in the rainfall-runoff process lead to differences between the theories, equations, and models we use to estimate runoff

rates and volumes and the actual amounts that may occur;

- To safely address these differences, we utilize both our understanding of rainfall-runoff fundamentals and techniques such as sensitivity analysis to select equation or model input parameters that will produce answers that are accurate and safe; and
- In certain instances where appropriate data and models are available, we may actually allow an input parameter to vary during the computations rather than using a single value for it. Known as Monte Carlo simulation, it produces a range of possible answers that can then be statistically analyzed to produce an accurate and safe answer.

Finally, the role of urban runoff management program developers should not be overlooked in the above. That's because the theories, equations, models, and input parameter values they choose to incorporate into their programs will influence and even require designers to follow certain procedures, include certain parameters, and/or select certain data values. As such, it is just as important for the program developer to understand the fundamentals of the rainfall-runoff process.

The Rainfall-Runoff Process

As described in the chapter's opening paragraph, runoff represents a by-product of the land's interaction with rainfall. As such, changes in the character or cover of the land can cause changes in runoff volumes, rates, and velocities. However, to better understand the rainfall-runoff process, it is important to realize that it is only a portion of a larger, cyclical process that is constantly taking place. This process, known as the hydrologic cycle, involves all of the forms water can take as it continually moves on, above, and within the earth.

The hydrologic cycle is illustrated in Figure 2-1. Due to its cyclical nature, there are no starting or ending points in the hydrologic cycle, just points along the way as water moves between the earth's surface and atmosphere, changing its form as necessary. Selecting the atmosphere as a starting point, Figure 2-1 demonstrates how water vapor is converted into rainfall and other forms of precipitation and is pulled by gravity toward the earth's surface. On the way, some of the precipitation may be converted back to water vapor and remain suspended in the atmosphere, while the remainder continues to fall. Upon reaching the earth's surface, precipitation can follow one of several routes. It can be stored in surface depressions or infiltrate into

Figure 2-1: The Hydrologic Cycle

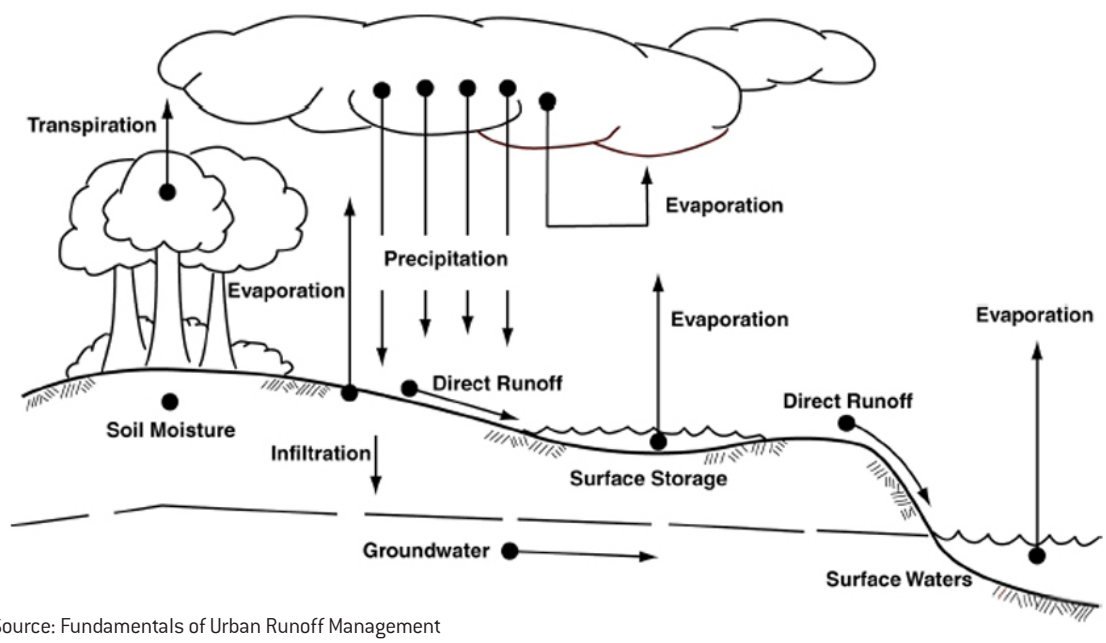

Source: Fundamentals of Urban Runoff Management

the soil. Once there, it can be taken up by plant roots and, through the transpiration process, returned to the atmosphere as water vapor or remain in the soil as soil moisture.

Other infiltrated precipitation may continue to move down, again by gravity, until it reaches the groundwater table, which can then re-emerge on the surface as flow in waterways. Precipitation stored on the surface can be evaporated into the atmosphere, along with that intercepted by vegetation. Finally, a certain amount of the original precipitation can become runoff, moving across the earth's surface to waterways and bodies, including the oceans. Once there, evaporation can then return the water to the atmosphere, where precipitation can resume.

It is important to recognize two basic aspects of the hydrologic cycle. First, the movement of water from the atmosphere to the earth is exactly balanced by its movement in the opposite direction. We know this is true because, as noted in the 1994 *Fundamentals of Urban Runoff Management*, the skies would get very cloudy or inland property owners would eventually have ocean or lakeside views if it weren't. From the standpoint of urban runoff management, we can use this mass balance to help estimate how much water may exist in each of the hydrologic cycle's available forms, including runoff.

Second, due to the interaction between all of the various water forms within it, the hydrologic cycle is not easily separated into discrete components. Depending on actual conditions, the precipitation that became runoff from a parking lot may join flow in an adjacent stream, or moisture in the soil surrounding the lot, or groundwater moving below the lot. In fact, the water that was originally parking lot runoff and then groundwater may eventually become flow in the stream or evaporate back into the atmosphere where the precipitation originated.

Despite its complexity and interrelationships, experience and research has demonstrated that, to be successful, an urban runoff management program must not only be based upon an understanding of the hydrologic cycle, but must also utilize as many water forms and processes within the cycle as possible. As such, it is no longer sufficient to target and regulate only the runoff process. Instead, the program must also utilize the infiltration, transpiration, and even the evaporation processes to optimal levels in order to manage urban runoff and prevent the adverse runoff impacts of the land use changes caused by urbanization. Coordinated use of all available hydrologic cycle components and processes allows a program to move beyond simple runoff control to true runoff management, limiting the amount of rainfall that becomes runoff to begin with as well as managing the runoff that is ultimately created. In doing so, the program can also provide protection of groundwater resources, waterway and wetland baseflows, and soil moisture levels necessary for healthy vegetated covers.

In summary, the above section presented the following ideas and information:

- The hydrologic cycle represents the complex, interrelated movement of water in various forms on, above, and under the earth's surface.
- Despite its complexity, there are fundamental concepts and processes in the hydrologic cycle that can be readily grasped and utilized.
- To be successful, an urban runoff management program must be based upon the hydrologic cycle and utilize as many of its concepts and processes as possible.

Runoff Estimation: Typical Parameters

As noted above, the actual process by which rainfall is converted to runoff is complex with variable and, at times, unknown factors. Fortunately, from years of research, experimentation, and experience, the essential factors or parameters that most strongly govern or influence the process have been identified. These fundamental or typical parameters are described below.

Rainfall

Since runoff is considered its by-product, rainfall can readily be considered the most significant factor in estimating runoff. Actual rainfall amounts and patterns measured at gages are used to estimate the runoff from real or historic rain events. Hypothetical or synthetic design rainstorms are frequently used for design and regulatory purposes. Actual rainfalls can also be used to check the results produced by a design storm method or can even serve as the design storm itself if it has the appropriate magnitude, duration, and probability. This

is particularly true for long-term rainfall records, which can provide superior results to design storms in certain instances (James and Robinson, 1982). As a result, the use of such rainfall records can be expected to grow in the future, particularly in the analysis and management of runoff quality, as more data becomes available and computer programs are developed to utilize it. Long term records may also serve as a valuable indicator of climate change impacts on rainfall, in which care must be taken in their use.

In general, our interest in rainfall not only focuses on real and hypothetical events, but also on both small and large rainfall amounts. From statistical analyses and experience, we know that small rainfalls occur much more frequently than large ones. As such, relatively small rainfalls are typically associated with runoff pollution and erosion problems and their associated environmental consequences, while larger rainfalls are typically associated with flooding and its associated threat to lives and property. The following examples highlight these various interests and the use of data from real rainfall events.

Figure 2-2 depicts radar-based total rainfall estimates in the United States during a 24-hour period ending at 8 a.m. on July 13, 2004. From the scale at the bottom of the figure, it can be seen that the greatest rainfall occurred in the northeastern United States, particularly in New Jersey and Delaware. Figure 2-3 presents a more detailed view of the rain event in this area. As can be seen in the figure, 24-hour rainfall totals of more than 11 inches fell in Kent County, Delaware, and more that 13 inches fell in Burlington County, New Jersey. As documented by the National Weather Service (NWS), U.S. Geological Survey (USGS), and the N.J. Department of Environmental Protection, this rain event resulted in record or near-record flooding on several southern New Jersey waterways, including Rancocas Creek and the Cooper River. The rain also led to the failure of 21 dams in Burlington County. An analysis of the rain event in the county by the NWS indicated that the event had an estimated average recurrence interval or frequency of approximately 1,000 years. As described later in this chapter, such an event would statistically have only a 0.1 percent chance of occurring in any given year.

Rainfall data from such an extreme rain event is not only useful in analyzing the runoff, flooding, and damage caused by the event itself. The data may also be used to evaluate the design of dams, spillways, and other hydraulic structures produced through the use of hypothetical design rainfall events or, where appropriate, may even serve as the design storm itself. Such use would depend upon the total depth, duration, and probability of the actual rain event compared with the required design frequency of the structure.

At the opposite end of the rainfall depth and frequency spectrum, data from much smaller and more

Figure 2-2: 24-Hour Rainfall in Millimeters Ending 8 a.m., July 13, 2004

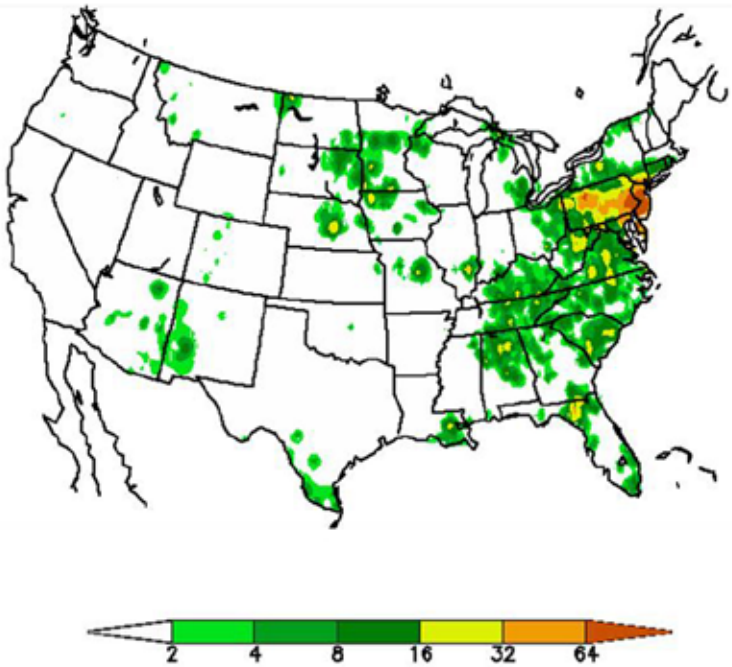

common rain events can also be used in the analysis and design of certain hydraulic structures. As described above, such rainfalls are not typically associated with structures intended to withstand the effects of a very large, rare rainfall event, such as a dam's spillway. Instead, they would be intended to reduce pollutant loadings in runoff and waterway flows or prevent surface or waterway erosion. Such rainfall data can also be used to evaluate the impacts that land development practices and policies have on producing pollution and erosion problems in the first place.

Figure 2-4 depicts the rainfall depth from approximately 750 storm events recorded at Newark Liberty International Airport in Newark, New Jersey between 1982 and 1992. It was taken from the long-term precipitation records contained in the computer program WinSLAMM – Source Loading and Management Model (Pitt and Voorhees, 1993). Such data can be used in programs like WinSLAMM and the EPA's Stormwater Management Model (SWMM) to estimate runoff amounts over the long periods of time which problems such as runoff pollution and erosion typically take to manifest. Assuming that the length and accuracy of the rainfall data is sufficient, structure designs and practice evaluations based upon such data can be considerably more robust than those based upon hypothetical or synthetic design storms (James, 1995).

This increased robustness is due to the uncertainties associated with the rainfall-runoff process noted above and the ways in which they are addressed differently

Figure 2-3: 24-Hour Rainfall in New Jersey-Delaware, July 12-13, 2004

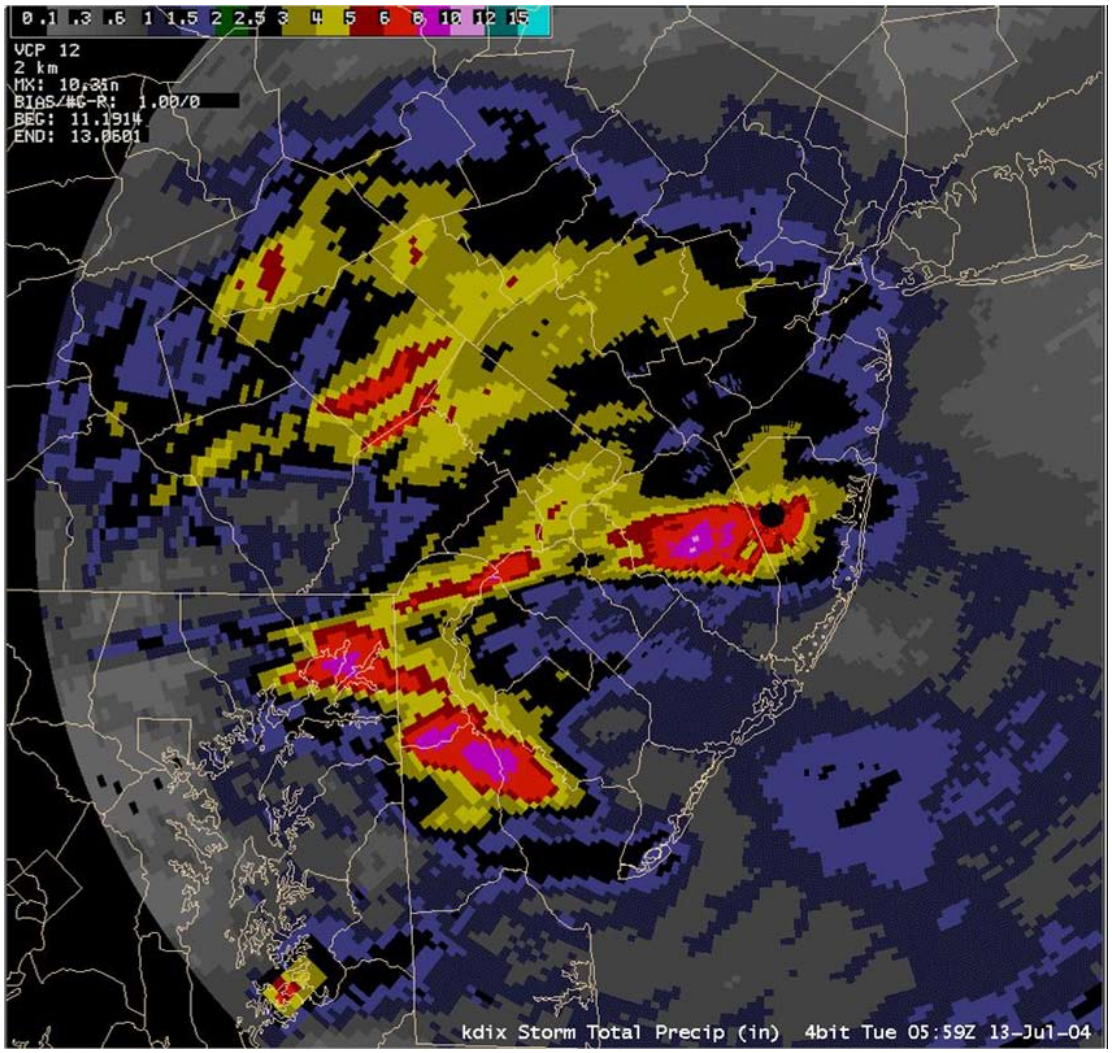

Source: National Weather Service, Mt. Holly, New Jersey Forecast Office

through the use of long-term rainfall records versus single-event design storms. When using a hypothetical design storm approach, decisions must be made as to the total amount of rain, how long it will fall, how it will vary in intensity (if at all) over this duration, how long it has been since the previous rain fell and, if significant, in what time of year the event will occur. Such decisions must be made by the designer or modeler, either actively through the development of an appropriate design storm or by default through the selection of a previously developed, standardized design storm often specified by an urban runoff management program. Selecting fixed values for each of these factors can and often will affect the resultant runoff estimate.

However, when using a suitably long and accurate record of actual rainfall, these decisions do not have to be made. Instead, the long-term rainfall record contains all of these factors, and its use allows them to vary over a naturally-occurring range of values. The result is a similarly varied series of runoff estimates that reflect this natural range of conditions. Analyzing this resultant runoff series with relatively simple statistical techniques can then produce results for a storm with a particular depth, frequency, duration, etc.

Despite this enhanced robustness or accuracy and its applicability to a range of analytic and design problems, the use of actual rainfall data, either from single, extreme events or over long time periods, is not without its problems. First and foremost is the availability of such data. While the number of recording rain gages in the United States is constantly increasing along with their reliability and data accessibility, there still remain many areas with inadequate gage coverage.

Second, the data record available must be sufficiently long for the intended use. Even the design of practices or facilities that must control the runoff from relatively high-frequency, low-depth rain events can require up to five to ten years of continuous rainfall data. The design of facilities such as dams and flood control works to control much lower frequency, higher recurrence interval events would typically require several decades of data at a minimum, unless one or more events in the available record can be accurately designated as statistically extreme. In these cases, such as the one illustrated in Figure 2-3, such extreme events may be used, with suitable caution, as design storms or, more typically, to supplement or evaluate the results produced by a hypothetical design storm.

Third, the data must have been recorded in time increments suitable for the event analysis or facility design in question. As explained more fully in following sections, rainfall data that has been recorded in time increments that approach or even exceed the length of time it will take for an area of land to respond to rainfall may be suitable for estimating total runoff volumes from rainfall events, but are generally not appropriate for predicting peak runoff rates or runoff hydrograph shapes. Use of such data can cause rounding and other errors that can lead to underestimated peak runoff rates, hydrographs, and, in certain models, runoff volumes (James and Robinson, 1982; Pitt and Voorhees, 2003).

An additional problem typically cited in the past with using actual rainfall data, particularly long-term records, was difficulty inputting, storing, and processing large amounts of rainfall data. It should be noted that this problem has been largely eliminated through the vastly larger data storage capacities and higher data processing

Figure 2-4: Rainfall Data for Newark, New Jersey, 1982 to 1992

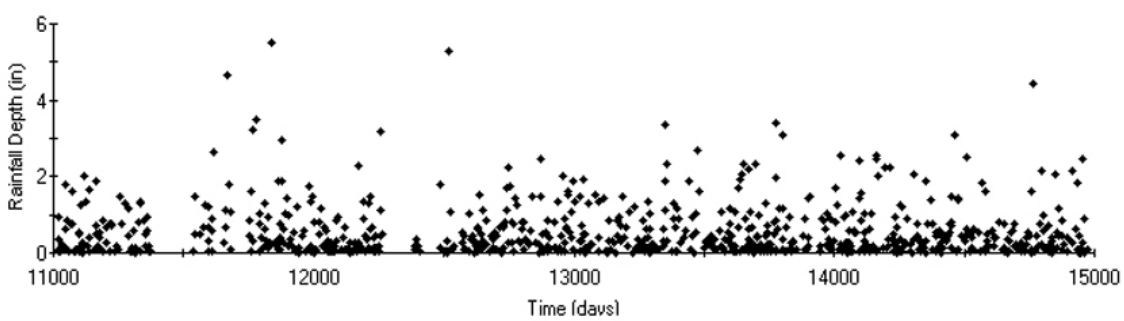

Source: WinSLAMM Version 8.7

speeds of modern computers. If any computer-related problems remain in this area, it may be in the relatively limited number of computer programs that can accept long-term rainfall data.

As a result, the use of hypothetical or synthetic design storms in urban runoff management programs remains relatively high. The data used to develop such storms is obtained from statistical compilations and extrapolations of real rainfall data collected over a statistically significant period of time. Figure 2-5 presents such a compilation. It depicts rainfall depth-duration-frequency curves for Newark, New Jersey based on hourly rainfall collected at Newark Liberty International Airport between 1948 and 2000. The curves predict the expected rainfall depth for a given period of rainfall and storm frequency, with the storm frequency expressed as an average exceedance probability in years. For example, the expected 100-year, 1-hour rainfall depth at the airport would be approximately 2.8 inches, while similar frequency storms for 2-, 6-, and 24-hour periods would have depth of approximately 3.8, 5.5, and 8.4 inches, respectively. Similar curves can be developed for average rainfall intensity, which is obtained by dividing the rainfall depth by the rainfall period.

The curves in Figure 2-5 were developed by the Hydrometeorological Design Studies Center (HDSC) of the National Weather Service and were published in 2004 in the National Oceanic and Atmospheric Administration's (NOAA) *Atlas 14 – Precipitation Frequency Estimates*. Rainfall data for this and other U.S. locations is available at the HDSC Precipitation Data Frequency Center (PFDS) at http://hdsc.nws.noaa.gov/hdsc/pfds/. Additional rainfall data is also available through various publications and agencies throughout the country.

Rainfall data such as that shown in Figure 2-5 can be used in a variety of ways. If the total rainfall depth for a specific storm frequency and rainfall period is needed (for example, to estimate total runoff volume to a stormwater facility), the depth can be taken directly from charts or associated tables like the one in Figure 2-5. As described above, the depth can also be converted

Figure 2-5: Rainfall Depth-Duration-Frequency Data for Newark, New Jersey

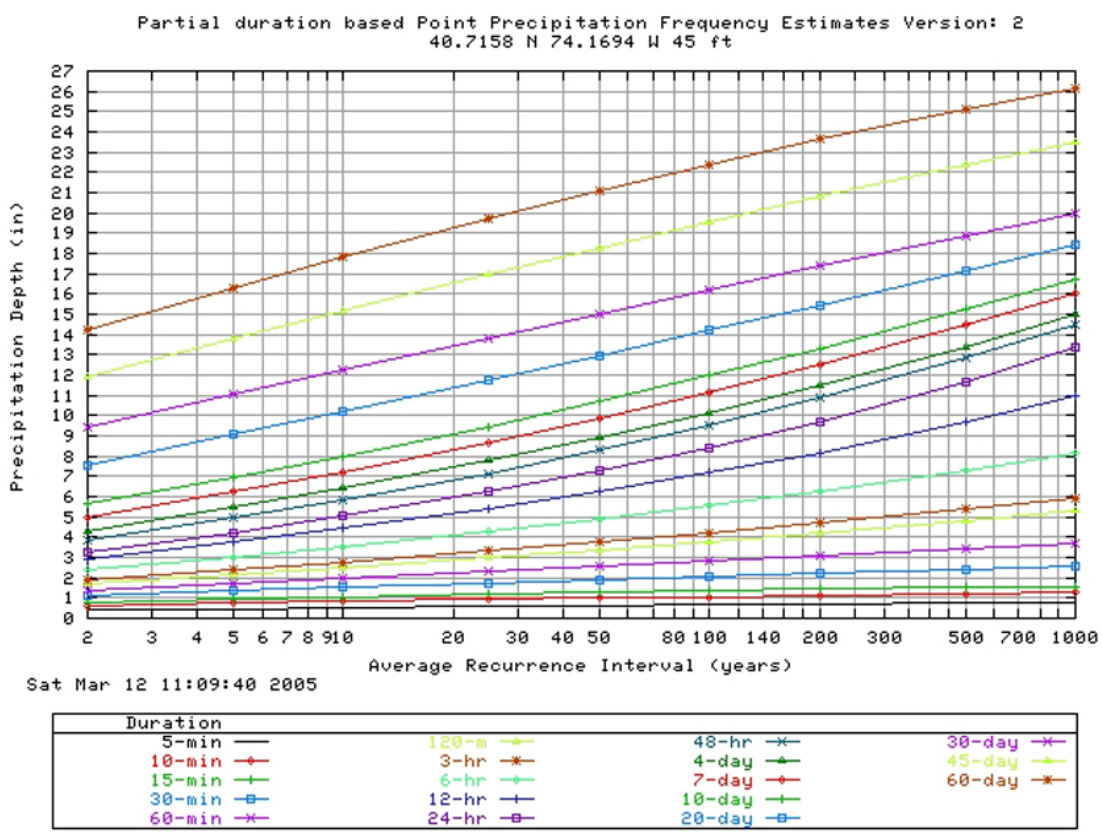

Source: NOAA Atlas 14 – Precipitation Frequency Estimates

to an average rainfall intensity in instances where a peak runoff rate is required (for example, to select the appropriate size of a storm sewer).

In addition, rainfall data like that shown in Figure 2-5 can be used to construct an entire hypothetical design storm. Such storms are typically needed when some or all of the runoff hydrograph (a depiction of how the runoff rate varies with time) is needed, not just the total runoff volume or peak runoff rate. Hydrographs are typically necessary for the analysis or design of any drainage area or stormwater facility where the variation of runoff rate over time is critical. Such areas include two or more subareas of a larger watershed that are added together to determine a combined peak rate or hydrograph. Time-sensitive stormwater facilities include wet ponds and detention basins.

The rainfall data in Figure 2-5 could be used, for example, to construct a 24-hour, 100-year hypothetical design storm for Newark by allowing the rain intensity to vary in such a way that the various 100-year rainfalls for durations less than 24 hours occur over the storm's total 24-hour duration. For example, such a storm would have maximum 1-, 2-, 6- and 12-hour rainfalls of 2.8, 3.8, and 5.5 inches respectively falling within its total 24-hour rainfall of 8.4 inches. It should be noted that, as shown in Figure 2-5, each of these rainfall-duration combinations have a 100-year frequency.

Figure 2-6 depicts the temporal distribution of four hypothetical design storms that are regularly used for drainage area runoff analysis and stormwater facility design. All four storms have varying rainfall intensities over their 24-hour length. They were developed by the Natural Resources Conservation Service (NRCS) of the U.S. Department of Agriculture and are used in NRCS rainfall-runoff methods and models. They have also been adopted for use by many urban runoff management programs throughout the country. Coordinates of the various NRCS design storm events can be obtained from the NRCS State Conservation Engineer in each state.

As shown in Figure 2-6, the rainfalls associated with each of the four NRCS hypothetical design storms is expressed as a percent of the total 24-hour rainfall. As such, an entire design storm for a given frequency can be computed simply by selecting a 24-hour rainfall depth with that frequency and applying it over the 24-hour period to the various rain depths in the appropriate design storm. An example of such a design storm with a 100-year frequency for Newark, New Jersey is shown in Figure 2-7. It was developed by multiplying the

Figure 2-6: NRCS Design Storm Distributions

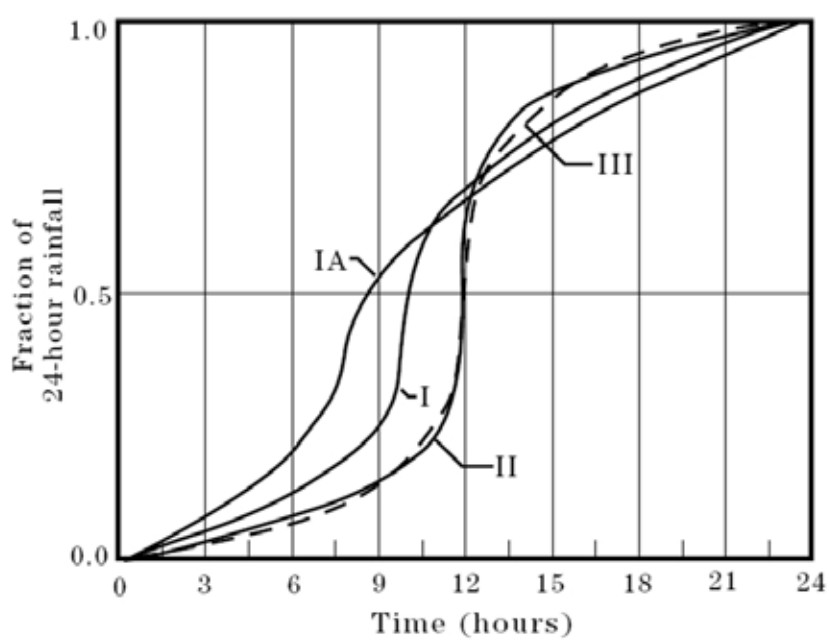

Source: NRCS Technical Release 55

100-year frequency, 24-hour rainfall for Newark by the various rainfall depths shown in Figure 2-6 for the Type III design storm which the NRCS has designated as the most appropriate of the four design storms shown in Figure 2-6 for the city.

There are some interesting and helpful observations that can be made about the four different NRCS design storm distributions shown in Figure 2-6, all of which would have the same total rainfall at the end of the 24-hour event. First, it can be seen that the Types II and III storms are distributed more or less symmetrically about the storm's 12-hour midpoint, while Types I and IA are not. Second, in the Type II and III storms, the rain falls at lower intensities at the beginning and end of each storm (evidenced by the relatively flat slope of the curves between hours 0 and 9 and between hours 15 and 24) than the Type I and IA storms. As a result of these lower starting and ending rainfall intensities, the Type II and III storms have greater intensities during their middle periods and these high intensity periods last longer than the Type I and IA. In fact, as can be seen in Figure 2-7, fully 50 percent of the total rain depth of 8.4 inches falls in the middle two hours (between hours 11 and 13) of the Type III storm for Newark, New Jersey. Finally, the high-intensity rainfall periods in the Type II and III storms occur later than the Types I and IA. As a result of these differences, the Type II and III design storms can be expected to produce higher peak runoff rates than the Type I and IA storms for the same total 24-hour rainfall. This illustrates the complexities and influences that must be considered when developing or selecting a hypothetical design storm.

In addition to the four NRCS design storms, several other hypothetical design storm distributions have been developed and adopted by various jurisdictions and agencies with urban runoff management programs. These include the City of Austin, Texas; the State of New Jersey; the South Florida Water Management District, and the U.S. Army Corps of Engineers. And as additional rainfall data is collected and statistically analyzed, modifications to existing hypothetical distributions or the development of entirely new ones may be necessary in the future.

Finally, our discussion of rainfall would not be complete without mentioning rain that may have fallen during prior storms. While most of the runoff from a storm may have long since drained away, some is likely to still be present as soil moisture or stored in surface depressions in the drainage area. The exact amount of such water, referred to as the antecedent rainfall or

Figure 2-7: NRCS 100-Year Type III Design Storm for Newark, New Jersey

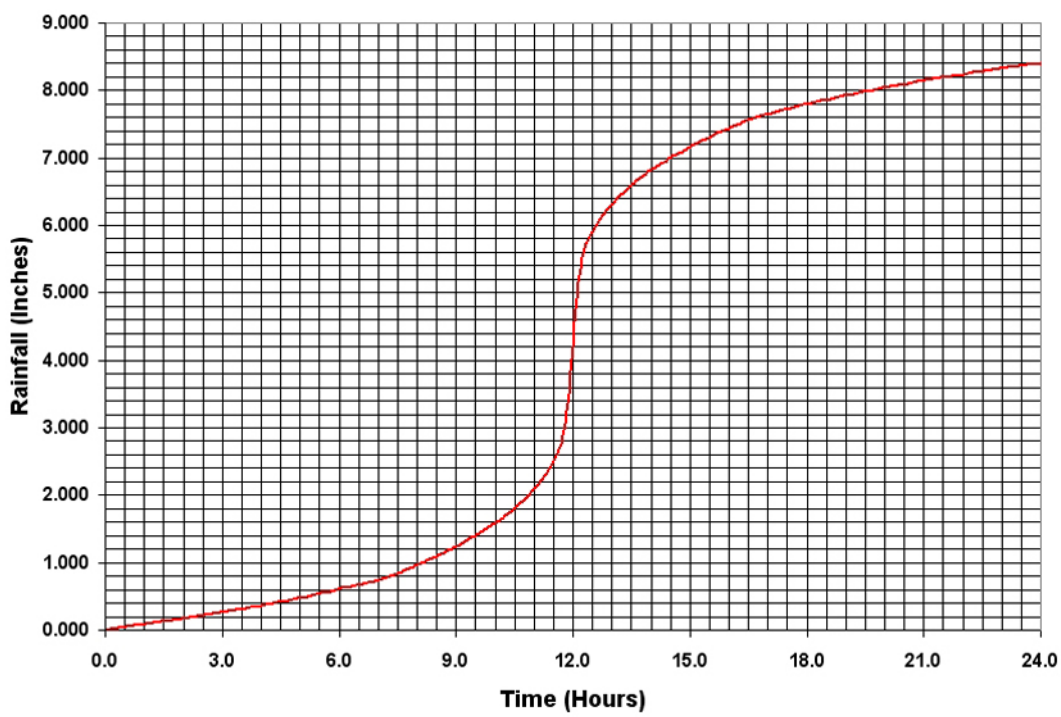

moisture condition, can influence the amount of runoff from a subsequent design storm by affecting how much of that storm's rain can infiltrate into the soil or be stored in the depressions. As such, its effect must be quantified in all rainfall-runoff computations.

Antecedent moisture conditions are particularly critical when recreating real storm events or analyzing both real and design storms with relatively low rainfall depths. For real storms, the antecedent moisture conditions can be estimated from the rainfall data for the antecedent period. When using a design storm, however, many runoff estimating methods assume for simplicity that average antecedent conditions exist in a drainage area prior to the start of the design storm. As a result, the frequency of the runoff event will equal that of the rainfall that produced it, an occurrence that is not always true. Such assumptions highlight the advantage of using long-term rainfall data, where the actual antecedent rainfall condition for each storm can be directly estimated from the prior event's data. More sophisticated methods allow the analyst to vary the antecedent condition to judge its sensitivity to the answer or to increase the conservatism or "safety" (as discussed above) of the answer.

In summary, the above subsection presented the following ideas and information:

- In estimating runoff, rainfall from both actual and hypothetical storm events may be used;
- Various hypothetical design storms have been developed and are used in many runoff estimation methods and runoff management programs;
- Hypothetical design storms can produce reliable results, particularly for large, relatively infrequent storms where the depth of the rainfall dominates the rainfall-runoff process;
- Conversely, design storms may be less reliable for smaller, more frequent storms where antecedent rainfall, climate, soil type, slope, and cover have greater influence on the resultant runoff;
- Design storms may need periodic updating or replacement as additional rainfall data is collected and analyzed;
- Data from actual rain events may be used to supplement or check design storm results;
- Suitable, actual rain data may also be used for design purposes, provided it represents a sufficiently long period of time or severity of storm;
- The use of long-term rain data to estimate runoff from smaller, more frequent storms is increasing as more suitable data and computer models become available; and
- Long term rain data may also serve as an indicator of climate change on rainfall. If verified, such effects must be taken into consideration when using such data.

Time

Time plays a critical role in the actual rainfall-runoff process and, as such, plays a similar role in the various theoretical methods used to simulate it. This is not surprising, since the gravitational, thermodynamic, and other natural forces involved in the creation of runoff from rainfall are constantly changing with, and therefore influenced by, time. These influences can be exceptionally complex. The following discussion presents a simplified description of how time affects runoff estimates.

Two fundamental measures or lengths of time are important when performing runoff estimates from rainfall. The first is the runoff response time of the drainage area to a rainfall input. This response time indicates how quickly the runoff created by a given amount of rain drains to the outlet of the drainage area and how quickly the rate of that runoff will change as the rainfall rate changes. In more sophisticated estimating methods, this response time may also affect the volume of runoff produced by the rain.

Several terms and definitions can be used to describe this response time; most are applicable to a particular runoff estimating technique. The most common term is Time of Concentration (TC), which the USDA Natural Resources Conservation Service and others define as the time it takes runoff (once it has begun) to flow from the most distant point in the drainage area to the drainage area's outlet. Numerous procedures, equations, and nomographs are available for estimating TC, including those presented in Chapter 3 of the *NRCS Technical Release 55 – Urban Hydrology for Small Watersheds* (TR-55), which is used as the hydrologic basis of many urban runoff management programs.

Regardless of the method used to estimate TC, it is important to recognize its direct effect on the resultant rate of runoff, including the peak rate. As noted above, TC is a measure of how quickly the runoff from a given

amount of rain throughout a drainage area can flow to the area's outlet. Stated differently, it represents how much time it takes the runoff produced throughout the drainage area to concentrate at the outlet. The more quickly a fixed volume of runoff can concentrate at the outlet, the more runoff will exist at any point in time at that outlet. As such, the TC will directly affect the overall shape of the runoff hydrograph, including the peak runoff rate. The shorter the TC, the higher the runoff rate, including the peak. In light of these effects, it can be seen that whether we seek to estimate a peak runoff rate or an entire runoff hydrograph for a given rainfall, we must compute a reasonably accurate estimate of TC.

In computing runoff peaks and hydrographs, TC can also assist us in another way. Since most rainfall data, whether for a real event or hypothetical design storm, is rarely provided in a continuous form over time but rather in discrete time increments, we must assume an average rate of rainfall will occur during each of these time increments. Since TC is a measure of how quickly the rate of runoff will vary due to changes in rainfall rate, we can use it to determine how small of a time increment we must divide our rain event into to produce an accurate runoff peak or hydrograph.

For example, a drainage area that takes six hours to respond at its outlet to rain falling within it will show little change in runoff rate from a change in rainfall intensity lasting only a few minutes. Therefore, using a time increment of 30 to 60 minutes (during which rain is assumed to fall at an average rate) would be appropriate. However, using a 30-minute time increment for a drainage area that responds in 15 minutes would not be appropriate, since the assumption of a uniform rainfall rate during each 30-minute storm increment would mask any shorter-term variations in rainfall rate that would have a significant effect on the resultant runoff rate. Such time increment-induced errors are examples of the "rounding errors" described above that may occur in the use of actual rainfall data. This also illustrates the problem that can be encountered when attempting to find actual rainfall data in sufficiently short time increments.

The second fundamental period of time in rainfall-runoff computations is the effective event time. When computing only a peak runoff rate from a drainage area, this time is typically based upon the time the area can respond to rainfall and, as a result, can be set equal to the drainage area's TC. When performing such computations, therefore, we are interested only in a period of rainfall within a longer storm event; namely, the period with the greatest rainfall rate or intensity. For example, if we wish to estimate the peak 10-year rate of runoff from a drainage area in Newark, New Jersey with a 30-minute TC, we would use a 10-year recurrence interval, 30-minute rainfall of 1.5 inches from Figure 2-5.

However, if we wish to estimate the total runoff volume for a 10-year storm event, the effective event time will have to include the entire storm duration in order to obtain the total rain depth. While such times are readily available when using data from actual rain events, they must be carefully selected when using a hypothetical design storm. For example, while Figure 2-5 indicates that a 10-year, 1.5-inch period of rainfall would last for 30 minutes (see previous paragraph), it gives no indication of the total duration or depth of the storm in which that 1.5-inch, 30-minute rainfall would occur, other than the fact that it would last for at least 30 minutes. However, it could also be part of a longer, much larger storm event.

In addition, when designing certain runoff treatment or control practices such as infiltration basins, the effective event time may also include some additional period of time following the end of the rainfall event. This additional time, known as the inter-event dry period (Wanielista and Yousef, 1993), reflects the time by which the practice artificially prolongs or extends a drainage area's response time (through its slow release of stored runoff) and, therefore, the effective event time. As a result, when developing or selecting an appropriate hypothetical design storm to estimate total runoff depth, judgment must be used to ensure that the total event time is appropriate for the design or analysis at hand.

In summary, the above subsection presented the following ideas and information:

- Time plays a critical role in the rainfall-runoff process and the various methods and models used to simulate it.
- This role includes influencing the various rates of runoff that may occur during a rain event, including the peak runoff rate, and, in certain methods, the total volume of runoff.
- There are two fundamental lengths of time that are important when performing rainfall-runoff computations.
    - The first one is the time a drainage area takes to respond to the rain falling within it. This time, typically expressed as the

area's Time of Concentration, can be used to both estimate peak runoff rates and determine the maximum time interval that rainfall data should be divided into to produce reliable hydrograph estimates.
    - The second one is the effective rainfall event time. When estimating peak runoff rates, this time is typically based upon a drainage area's rainfall response time as expressed by its Time of Concentration.
- When estimating total runoff volume, however, the effective event time must span the entire rainfall event in order for a total rainfall depth to be obtained.
- When designing runoff management practices such as infiltration basins that artificially extend an area's response time, the effective event time may include an additional period of time beyond the total rainfall duration known as the inter-event dry period.

Drainage Area

The concept of drainage area is fundamental to any rainfall-runoff analysis. It is the area that contributes runoff to a particular point in a drainage system typically referred to as the drainage area's outlet. For this reason, it may also be known as a watershed, since it represents the area that "sheds" water or rainfall to the outlet. However, this term is typically applied to larger areas draining to streams and rivers. Catchment is another term used at times instead of drainage area, as it represents the area that "catches" rainfall and delivers a portion of it as runoff to the outlet.

Both a drainage area's size and various characteristics about its soils, cover, slope, and response time are typically used to estimate runoff from rain falling within it. Of these, the drainage area size is a primary consideration. It is usually determined from a combination of topographic maps, waterway and storm sewer plans, and field reconnaissance. Most runoff estimating methods assume a linear relationship between drainage area and runoff volume. Therefore, a 20 percent error in estimating a drainage area's size will, among other impacts, directly result in a similar error in the estimated runoff volume. This relationship is important when determining the required accuracy of drainage area size computations and the required time and effort to achieve it.

Two important drainage area characteristics for estimating runoff are its shape and slope. As discussed above, a drainage area's response time will influence the rate of runoff from a given rain event, with shorter response times producing greater runoff rates than longer ones. A drainage area with generally steep slopes can therefore be expected to respond faster to rainfall and concentrate a greater amount of runoff over a given period of time. Similarly, the length that the runoff must travel to the drainage area's outlet can also affect the response time, with elongated drainage areas with relatively longer travel lengths typically producing lower runoff rates than more rounded ones with shorter travel lengths.

It is important, however, to avoid over-generalizing the effects of drainage area shape and slope on runoff rates, particularly for complex drainage areas and watersheds with multiple branches or tributaries. Each drainage area within an overall watershed has its own unique shape, slope, flow length, and complexity, all of which can have a direct effect on response time and resultant runoff rates. Therefore, a representative response time, typically expressed as its Time of Concentration, should be estimated as accurately as possible for each drainage area based upon these characteristics.

The variation in ground surface within portions within a drainage area, particularly those that create surface depressions and other irregularities, can also have a direct effect on the area's response time, runoff rate, and even runoff volume. Depending upon their depth and size, surface depressions can slow the rate of runoff movement and concentration as well as store a portion of the runoff. This not only increases the drainage area's peak runoff rate but the runoff volume as well. Such runoff delays and storage, in combination with such factors as antecedent rainfall, surface wetting, soil infiltration, and interception by vegetation, typically are greatest at the inception of rainfall and as such produce an effect known as initial abstraction. This is the amount of initial rainfall that must occur before runoff at the drainage area outlet begins. Depending on a drainage area's surface depressions and irregularities, along with its soils and covers, the initial abstraction can significantly affect the volume of runoff and the size and timing of its peak rate. Therefore, the effects of initial abstraction should not be overlooked, particularly for small rainfall depths where the initial abstraction amount is a significant percentage of the total rainfall.

In summary, the above subsection presented the following ideas and information:

- The concept of a drainage area that catches rainfall and drains the resultant runoff to its outlet is fundamental to runoff estimation.
- Most runoff estimation methods assume a linear relationship between drainage area size and runoff volume.
- In general, the slope and shape of a drainage area can influence the rate of runoff, including the peak rate.
- Localized surface irregularities, in combination with soil and cover characteristics, can store or abstract an initial amount of rainfall and both delay the start of runoff and reduce runoff volume and rates.

Soils

The surface and subsurface soils within a drainage area can play a direct role in determining the volume and rate of runoff from rainfall. As a result, various soil characteristics are included in most runoff estimating methods. These characteristics include the texture, structure, permeability, thickness, and moisture content of the various layers within the soil profile. Soil texture, structure, and thickness can help determine how much rain a soil can absorb and retain, with granular soils such as sands possessing greater storage capacity than silts and clays. Similarly, a thin layer of soil on top of bedrock will have less storage capacity than a deeper soil with similar texture. Permeability will affect the rate at which rainfall can enter and move through a soil and, therefore, the volume and rate of any resultant runoff. A soil's moisture content at the start of rainfall is not only a measure of its available storage capacity but can also influence its permeability rates. Rain falling on a pervious drainage area whose soils are saturated from antecedent rain events can produce runoff volumes and rates similar to a drainage area that is largely impervious.

Soil texture, permeability, and thickness data can be found in numerous sources, including laboratory tests of soil samples taken from various drainage area locations. County Soil Surveys, developed cooperatively by the USDA Natural Resources Conservation Service and various state agencies, are generally reliable sources of such information. Depending upon the Survey date, the drainage area size, the required degree of accuracy, and the sensitivity of soil characteristics in the selected runoff estimation method, field verification of Soil Survey information may be necessary. Such verification can also be used to assess soil structure, which can also influence resultant runoff amounts.

The relationship between soil texture and permeability should be noted. The relatively large percentage of void space within granular soils such as sands creates not only significant storage volume but also relatively high permeability rates. As a result of these two features, sands can be expected to produce less runoff volume than silts or clays, which have less void space and permeability. In certain instances, this relationship can permit a soil's permeability to be estimated from its texture.

As discussed above, soil permeability, texture, and moisture content in combination with vegetation and surface depressions and irregularities can also affect the amount of initial rainfall that is abstracted before runoff begins. This initial abstraction can significantly affect the volume of runoff and the size and timing of its peak rate. Therefore, the effects of drainage area soils on initial

Table 2-1: Summary of Ocean County, New Jersey Soil Compaction Study Results

Study Site	Mean Bulk Density (g/cm3)	Mean Permeability (in/hr)
Woods	1.42	15
Cleared Woods	1.83	0.13
Subdivision Lawn 1	1.79	0.14
Subdivision Lawn 2	2.03	0.03
Athletic Field	1.95	0.01
Single House	1.67	7.1
Source: Ocean County Soil Conservation District et al., 1993		

abstraction should not be overlooked, particularly for small rainfall depths.

Finally, research continues to confirm that compaction can significantly modify or damage a soil structure, resulting in decreasing storage volumes and permeability rates and increased runoff. Research conducted in New Jersey (Ocean County Soil Conservation District et al., 2001) demonstrated that soils compacted either by construction equipment or post-construction use can experience significant reductions in permeability. A summary of this research is shown in Table 2-1. It compares the bulk density (as a measure of soil structure) and permeability rates of soils with generally similar sandy soil textures at various sites. The Woods site shown in the table represents an undisturbed condition with natural soil structure. The Cleared Woods site represents a disturbed condition where the vegetation and organic ground layer have been cleared by heavy equipment without significant regrading. The Subdivision Lawns 1 and 2 and Athletic Field sites represent highly disturbed areas where both clearing and regrading by heavy equipment have occurred. The bulk density and permeability values summarized in the table are the mean of three replications in a soil layer 20 inches below the surface.

As shown in the table, the mean soil permeability of the Cleared Woods and Subdivision Lawn 1 are approximately 100 times lower than the 15 inches per hour mean permeability at the undisturbed Woods site. Greater reductions can be seen at the Subdivision Lawn 2 and Athletic Field sites, where mean permeabilities ranging from 500 to 1000 times lower than the Woods site were measured. The mean permeabilities for the various disturbed sites are similar to those found for impervious areas such as roads, highways, and parking lots (Pitt, 1991).

Further research in Alabama into the effects of compaction on both sandy and clayey soils (Pitt et al.,

Figure 2-8: Alabama Compaction Test Results for Sandy Soils

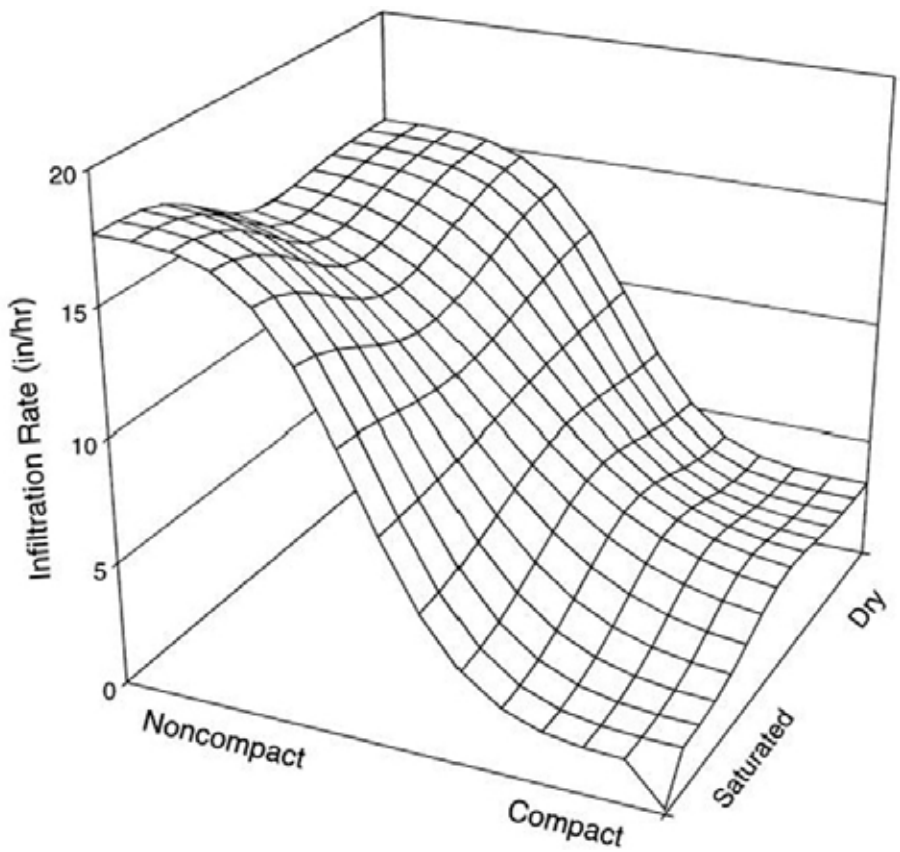

Source: Pitt et al., 1999

1999) confirmed the impacts to sandy soils previously demonstrated in Ocean County. Based upon more than 150 infiltration tests in disturbed urban soils, this research also demonstrated that such effects were generally independent of soil moisture in such soils. However, the research also found that, while compaction had similar effects on clayey soils with low moisture content, these effects were of minor significance when the moisture content approached saturated levels. A graphical summary of this research is shown in Figures 2-8 and 2-9.

From the results shown in Table 2-1 and Figures 2-8 and 2-9, it is felt that the effects of compaction on the rainfall-runoff process can no longer be ignored, particularly for sand and other coarse grained soils. As a result, inclusion of appropriate factors in runoff estimation methods is warranted when predicting runoff from a future, developed drainage area with such soils. However, this may require additional research data in order to reliably predict the degree of expected compaction and its impacts on soil permeability and runoff. Further study of the long-term effects of compaction, and whether natural weathering processes can restore some or all of the lost soil structure and permeability, are also required. Until such research is concluded, the results of the New Jersey and Alabama studies and a conservative or "safe" design approach may be used as guidance.

Potential measures to address the adverse impacts of soil compaction may be found in the results for the Single House site shown on the bottom row of Table 2-1. According to the Ocean County Study report, this site was not constructed through widespread regrading with heavy equipment typical of large tract construction, but instead through limited regrading with relatively light construction equipment. According to the results in Table 2-1, the lawn area at this site had a mean permeability rate of 7.1 inches per hour. While this is less than half the tested mean of 15 inches per

Figure 2-9: Alabama Compaction Test Results for Clayey Soil

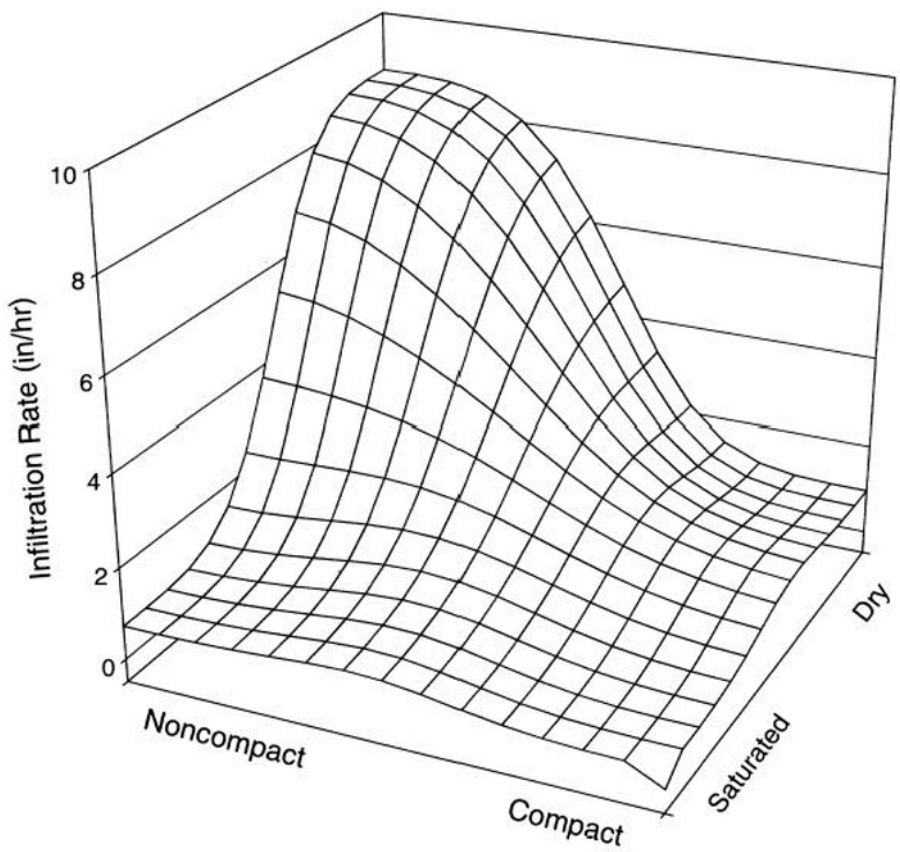

Source: Pitt et al., 1999

hour for woods, it nevertheless represents a relatively high permeability rate, particularly in comparison with the other, more highly disturbed sites in the table. This relatively high disturbed site permeability rate may indicate that the adverse impacts of compaction may be avoided or reduced through the use of site design techniques and construction practices and equipment that minimize site disturbance, regrading, and construction equipment weight and movement.

The Alabama research also presents a potential measure to address soil compaction through the addition of large amounts of compost to the soil. Tested on a glacial till soil, this measure was shown to significantly increase soil permeability at the expense, however, of an increase in nutrients in the runoff. Such soils also produced superior turf with little or no need for maintenance fertilization.

In summary, the above subsection presented the following ideas and information:

- Soil characteristics such as texture, permeability, and thickness can greatly influence the rainfall-runoff process and are therefore included in most runoff estimation methods.
- These characteristics can affect both the amount of initial rain that must fall before runoff begins and the total volume and peak rate of runoff.
- The general relationship between soil texture and permeability may allow the latter to be estimated from the former.
- Soil moisture content at the start of rainfall can significantly modify a soil's storage capacity and permeability rate.
- Compaction can also significantly modify a granular soil's undisturbed storage capacity and permeability rate.

Land Cover

In addition to the soils at and below the land surface within a drainage area, the type of cover on the soils' surface directly affects the rainfall-runoff process and is an important factor in most runoff estimation methods. Land covers can range from none (i.e., bare soil) to vegetated to impervious. Important vegetation characteristics include type, density, condition, extent of coverage, degree of natural residue or litter at the base, and degree of base surface roughness. Important impervious surface characteristics also include surface roughness, age and condition, connectivity, and the presence of cracks and seams. Connectivity describes whether runoff from an impervious surface can flow through a direct connection to a downstream swale, gutter, pipe, channel, or other concentrated flow conveyance system, or whether the runoff can flow onto and be distributed over a downstream pervious area, where a portion can infiltrate into the soil. As a result, unconnected impervious surfaces typically produce less runoff volume than directly connected ones.

All of the above characteristics can affect the volume of resultant runoff by influencing the amount of rainfall that is either stored on the land and vegetated surfaces or infiltrated into the soil. These characteristics can also affect a drainage area's response time or Time of Concentration and, consequently, the rate and duration of runoff. For example, TC equations developed by the NRCS indicate that runoff flowing as sheet flow across relatively smooth impervious surfaces will travel approximately 10 times faster than it would across a wooded area. The surface storage and delaying effects of land cover, particularly vegetation, can also help increase the amount of initial abstraction, thereby decreasing the runoff volume from a drainage area.

Land cover data sources, frequently used in combination, include field reconnaissance, aerial photographs, satellite imagery, and geographic information system (GIS) databases for existing drainage area conditions. Land cover under proposed or future conditions can be estimated from zoning maps, development regulations, proposed land development plans, and build-out analyses.

In estimating runoff from rainfall, it is interesting to compare the different responses from the impervious portions of a drainage area with those with pervious land covers such as turf grass, woods, or even bare soil. At the start of rainfall, the initial abstractions of both the impervious and pervious surfaces must be overcome before runoff begins. While the initial abstractions for typical impervious covers like roofs, roadways, parking lots, and sidewalks are considerably less than for areas with pervious covers, they nevertheless exist (Pitt and Voorhees, 1993). However, having a lower value, the initial abstraction for the impervious surfaces is overcome first, and the impervious surfaces will begin to produce runoff. This will continue until the larger initial abstraction of the pervious covers is also overcome. At this point, both the impervious and pervious portions of a drainage area will produce runoff.

Once runoff has started, it is generally accepted that its amount will increase exponentially as rainfall continues. This nonlinear relationship between rainfall and the runoff it produces is more pronounced for pervious land covers than impervious ones, which typically have a near constant or linear rainfall-runoff response once runoff begins. These different initial abstractions and rainfall-runoff responses result in the relative percentage of runoff produced from each type of cover varying considerably, depending upon the total rainfall amount.

This difference is illustrated in Figure 2-10. It depicts the relative percentage of total runoff volume produced for a given amount of rain from various runoff source areas at a typical medium density residential housing site with clayey soils. As shown in the figure, site runoff would be entirely comprised of runoff from those site areas with impervious covers (i.e., streets, driveways, and roofs) from the start of rainfall until approximately 0.1 inches have fallen. However, as rainfall continues and overcomes the initial abstraction of the site's pervious landscaped areas, runoff from these areas also begins. When the rainfall has reached approximately 1 inch, approximately 50 percent of the site runoff is produced by these pervious areas. This increase in runoff percentage continues as rainfall continues, reaching approximately 70 percent at a total rainfall depth of 4 inches.

Such relationships are useful to urban stormwater management programs because they identify the critical runoff source areas that have the greatest impact on various program objectives. If a program objective is to address the runoff quality and pollution impacts caused predominantly by small, frequent rainfalls, then the control of impervious surfaces and the runoff from them is important. If flood or erosion control is critical, then all land covers may be important, since they all contribute important percentages of the total site runoff during the larger rainfall normally associated with these types of problems.

In summary, the above subsection presented the following ideas and information:

- The type, character, extent, and condition of the various land covers within a drainage area can have a significant effect on initial rainfall abstractions and resultant runoff volumes, rates, and durations.
- There are typically many sources of land cover data, including aerial photographs, GIS databases, field reconnaissance, and land development plans.

Figure 2-10: Relative Runoff Contributions from Various Source Areas at Medium Density Residential Site with Clayey Soils

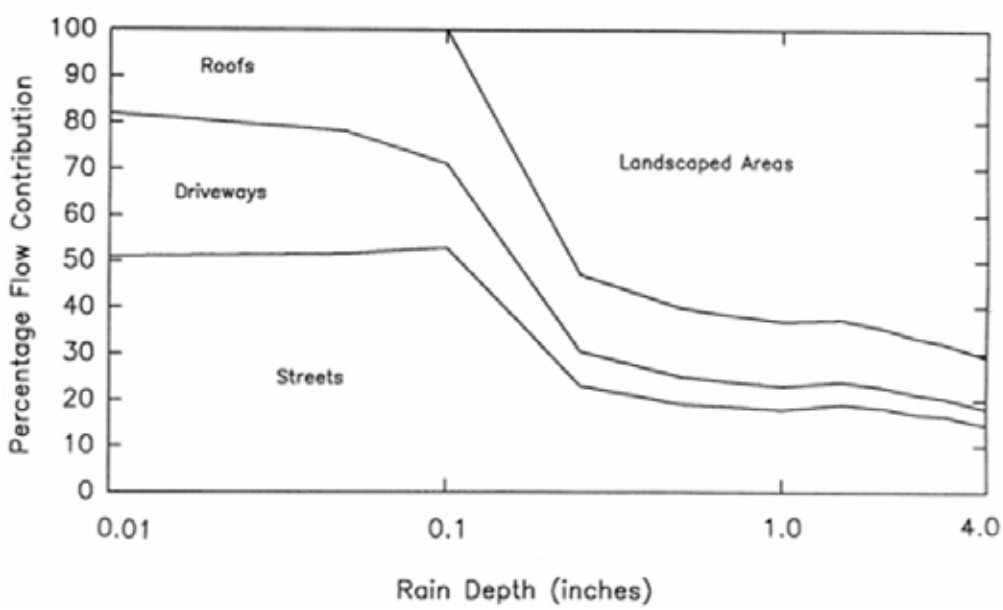

Source: Pitt and Voorhees, 1993

- Pervious and impervious covers respond differently to rainfall. The relative percentage of the total runoff from each varies with the total amount of rainfall.
- Impervious areas typically produce the majority of runoff from small rainfalls, while the percentage from pervious areas typically increases with increasing rainfall.
- Runoff from impervious areas can also vary, depending upon their roughness, condition, and connectivity. Directly connected impervious areas can produce significantly more runoff volume than unconnected ones.

Runoff Estimation: Methods and Models

There are numerous methods currently available to estimate runoff from rainfall. In general, most methods will include some if not all of the parameters described in the previous section. Exactly what method to utilize and what parameters to include typically depends upon available parameter data and the desired results.

Using desired results as a basis, runoff estimation techniques can be broadly grouped into the following three categories:

1. Runoff Volume Methods
2. Peak Runoff Rate Methods
3. Runoff Hydrograph Methods

Each category will generally utilize certain parameters and equations and, therefore, will require certain types and ranges of data. A brief description of each category is presented below. As can be seen from the descriptions, the number of parameters increases as we proceed down the list.

Runoff Volume Methods

When an estimate of runoff volume is desired, typical parameters include total rainfall, drainage area size, and soil and land cover characteristics. Soil characteristics will generally include estimates of initial abstraction amounts, soil infiltration rates, and some measure of antecedent moisture condition. Infiltration rates may be fixed at a constant rate or may vary throughout the event, typically in an exponential manner. A more sophisticated method may include consideration of drainage area slope. A similarly sophisticated method may also include rainfall intensity and total storm duration, although, in general, time-based parameters are not included, particularly those based upon a single design storm. However, runoff volume estimating methods which utilize long-term rainfall data will typically consider time in the form of interevent dry periods and the amount of soil moisture depletion that may occur during each one.

Peak Runoff Rate Methods

Methods that produce estimates of peak runoff rate from a given storm event typically include all or most of the parameters utilized in runoff volume methods. However, as the term "rate" implies, time plays a more important role and, consequently, more time-based parameters are typically included. These include an estimate of the drainage area's Time of Concentration as well as the peak rainfall intensities over this period. Simplified methods utilize a single, average rainfall intensity over the entire TC while more sophisticated ones allow the use of several, shorter-term intensities within the overall TC.

Runoff Hydrograph Methods

When an entire runoff hydrograph is desired, additional time-based parameters and data are required in addition to the parameters used in runoff volume or peak runoff rate methods. First, since a runoff hydrograph is a measure of runoff rate resulting from all or a portion of a rainfall event, rainfall data throughout the entire event is required, typically divided into time periods equal to at least 20 percent to 25 percent of the drainage area's TC. In addition, some measure of the movement of runoff through the drainage area over time is also required. Once again, simplified methods typically assume a linear relationship, while more sophisticated ones utilize a nonlinear one based upon such mathematical techniques as unit hydrographs and kinematic wave equations.

In comparing the above descriptions of the three general runoff estimation methods, several observations can be made. First, as noted above, the number of time-based parameters increases as we move from estimating runoff volume to peak rates and then entire

runoff hydrographs. This relationship can tell us which type of method is needed when designing or analyzing a particular stormwater management facility or practice. That is, a stormwater management measure such as an infiltration basin that is relatively insensitive to the rate of runoff inflow can often be designed from estimates of total runoff volume only. However, designing a stormwater facility such as a detention basin that is sensitive to the rate of runoff inflow will typically require a runoff hydrograph.

This relationship between stormwater facility type and required runoff method can also guide us toward the type of rainfall data that may be utilized in facility design. Since records of total storm depth are generally more available than records of incremental rainfall over short time increments, an infiltration basin designer will be much more likely to have a choice between actual long-term rainfall data and a single design storm approach than a detention basin designer would. Similarly, the designer of a stormwater facility to control the runoff from relatively small, frequent rainfalls is more likely to be able to choose between a long-term data and a design storm approach than the designer of a facility to control runoff from large, relatively infrequent events. This is because the first designer requires a relatively short period of rainfall record, which is presently more available than the longer-term records required by the second designer.

In addition, as noted above, the number and range of included parameters increases as we move from the runoff volume estimation methods to the runoff peak and then the runoff hydrograph methods. This increasing data and computational complexity can also signal a decrease in the certainty of the estimates produced by these methods. As a result, whether using long-term data or a single design storm approach, we can generally expect our estimates of total runoff volume to be more reliable and accurate than our estimates of peak runoff rate and, to an even greater extent, entire runoff hydrographs. This realization should guide our selection of design parameters and facility features so that the inherent safety of the facility design increases with decreasing estimation certainty.

Finally, as our concerns for runoff quality and the environment have grown, there has been an increasing interest in estimating the runoff from relatively small rainfalls. In recognition of this interest, it is important to note a second categorization of runoff estimation methods that is based upon the range of applicable rainfall depths. At the time of the 1994 publication of the original *Fundamentals of Urban Runoff Management*, the NRCS Runoff Equation and its variants had become the standard method for estimating runoff volume from rainfall. As clearly stated in various NRCS publications such as TR-55, this method was and remains intended for runoff depths of 0.5 inches or more. In many instances, this would require a minimum total rainfall depth of approximately two to three inches which, in many locations, would have an average frequency or recurrence interval of one year or more.

While these rainfall depths and frequencies typically represented the lower limits of interest or jurisdiction of runoff management programs in 1994, research and experience has pointed toward the need to manage the runoff from smaller rainfall amounts in order to optimize control of runoff quality and water ecosystem problems (Pitt and Voorhees, 1993). Therefore, it has likewise become important to develop and utilize newer runoff estimation methods suitable for these lower rainfall depths. Equations such as those developed by Pitt and Voorhees and by the Center for Watershed Protection for the State of Maryland have been shown to be particularly reliable for such rainfall depths. Use of the NRCS Runoff Equation for runoffs less than the official NRCS limit, which may be necessary in certain existing runoff management programs and computer models, should only be made with caution and a thorough understanding of the method's assumptions, limitations, and sensitivities. Similar caution should be used when using a method intended for small rainfalls to estimate runoff from larger events.

In summary, the above section presented the following ideas and information:

- Runoff estimation methods can be categorized by the type of result they produce.
- In general, the three basic method types are those that estimate runoff volume, peak runoff rate, and runoff hydrographs.
- Each method utilizes a certain combination of parameters, equations, and assumptions.
- As you proceed from estimating runoff volume to peak runoff rate and then runoff hydrographs, the degree of complexity and range of parameters typically increases as well, particularly of those associated with time.
- This increased complexity can also signal a decrease in reliability of results, indicating the need for increased discretion and data accuracy

to ensure effective and safe stormwater facilities and practices.

- The type of estimation method required to design a stormwater facility will depend upon the facility's sensitivity to changes in inflow over time.
- Methods that utilize long-term rainfall data and single design storms are both available. Which approach can be utilized will depend upon the range of rainfalls to be controlled, the facility's sensitivity to time, and the availability of suitable rainfall data and computer programs.

Impacts of Land Use Change

Typically, a land development project will result in modifications to several of the factors associated with the rainfall-runoff process. These can include replacing indigenous vegetation with both impervious land covers and planted vegetated covers such as turf grass. Such land covers are less permeable and have fewer surface irregularities and surface storage, resulting in increased runoff volumes and longer runoff durations. This problem may be compounded by increases in drainage area size through surface regrading and conveyance system construction, which can make a larger area contribute runoff to a particular location. Soil compaction during construction may further increase the volume of runoff from the turf grass and other constructed pervious areas.

The land cover changes described above can also cause significant reductions in initial abstraction, creating a lower rainfall threshold in order for runoff to begin. This lower threshold can be particularly damaging, for it results in runoff to downstream waterways from rainfalls that previously did not produce any runoff, hypothetically causing an infinite increase in the runoff from such rains. This also compounds the increased runoff volume impacts by creating a greater number of runoff producing storm events and increasing the frequency of runoff and pollutant loadings in downstream waterways.

In addition to being less permeable, impervious and turf grass land covers are typically more efficient in transporting runoff across their surfaces, resulting in decreases in a drainage area's Time of Concentration and a corresponding increase in runoff rates, including the peak runoff rate. Such increases, which can be compounded by the replacement of natural conveyance systems with more efficient constructed ones such as gutters, storm sewers, and drainage channels, can cause an increase in flow velocity in downstream waterways which, when combined with the increased flow duration, can create new or aggravate existing waterway erosion and scour.

Finally, the decrease in infiltration and resultant increase in runoff indicates that less rainfall may be entering the local or regional groundwater, resulting in the depletion or complete eradication of waterway baseflows and the lowering of the groundwater table. While research into these impacts has at times produced somewhat conflicting results (Center for Watershed Protection, 2003), the negative impacts to baseflows

Table 2-2: Land Development Impacts Example, Pre- and Post-Development Site Conditions

Development Condition	Site Land Cover	Average Initial Abstraction
Pre-developed	Woods	1.6
Post-developed	25% impervious and 75% turf grass	0.9

Table 2-3: Land Development Impacts Example, Pre- and Post-Development Runoff Volumes

Storm Frequency	24-Hour Rainfall (Inches)	Estimated Runoff Depth	
		Pre-Developed	Post-Developed
2-year storm	2.8	0.1	0.6
10-year storm	4.0	0.5	1.3

and groundwater levels caused by land use changes have become a generally accepted tenet of urban runoff management programs.

Such impacts can be quantified through a hypothetical land development example utilizing the NRCS Runoff Equation. The pre- and post-developed land uses and covers are summarized in Table 2-2. As shown in the table, the wooded land cover that exists in the pre-developed condition will be changed to a combination of 75 percent turf grass and 25 percent impervious cover that is directly connected to the site's drainage system. Our example will assume a relatively granular site soil, identified as a Hydrologic Soil Group B soil in the NRCS method, and will analyze the impacts of the site development for both a 2- and 10-year, 24-hour rainfall. The resultant pre- and post-developed runoff volumes for both storm events are summarized in Table 2-3.

A review of Table 2-2 indicates that the average initial abstraction for the post-developed site will be approximately 40 percent smaller than for the pre-developed one, decreasing by 0.7 inches from 1.6 to 0.9 inches. This means that while a minimum of 1.6 inches of rainfall is required to produce runoff from the pre-developed site, only 0.9 inches on average will be necessary under post-developed conditions. It should be noted that this post-developed initial abstraction is an average value for the combined turf grass and impervious cover site and that only approximately 0.1 inches of rain should be necessary to produce runoff from the impervious portions. This means that runoff volumes to downstream waterways are not only expected to increase but that this runoff will now be occurring from rain events between approximately 0.1 and 1.6 inches that previously produced no site runoff or waterway flow. This will significantly increase the number of times when runoff and associated pollutants will be flowing to and through downstream waterways.

A review of Table 2-3 indicates the extent of the estimated runoff volume increases that can be expected due to the proposed land use change. As shown in the table, the total 2-year runoff volume from the site is estimated to increase by 500 percent following development from approximately 0.1 to 0.6 inches. The estimated 10-year volume increase, while smaller, is nevertheless significant, increasing from approximately 0.5 to 1.3 inches or by approximately 160 percent. This also indicates that the quantity impacts of land use change are more acute for smaller, more frequent rainfalls – a distinct problem for waterways that are particularly sensitive to such storm events.

The potential impacts of this increased frequency and volume of development site runoff to downstream waterways is illustrated in Figure 2-11, which depicts the changes to a stream cross section in Maryland between 1950 and 2000 (Center for Watershed Protection, 2003). As shown in the figure, both the width and depth of the cross section have increased considerably between

Figure 2-11: Effects of Urbanization on Maryland Stream Cross Section

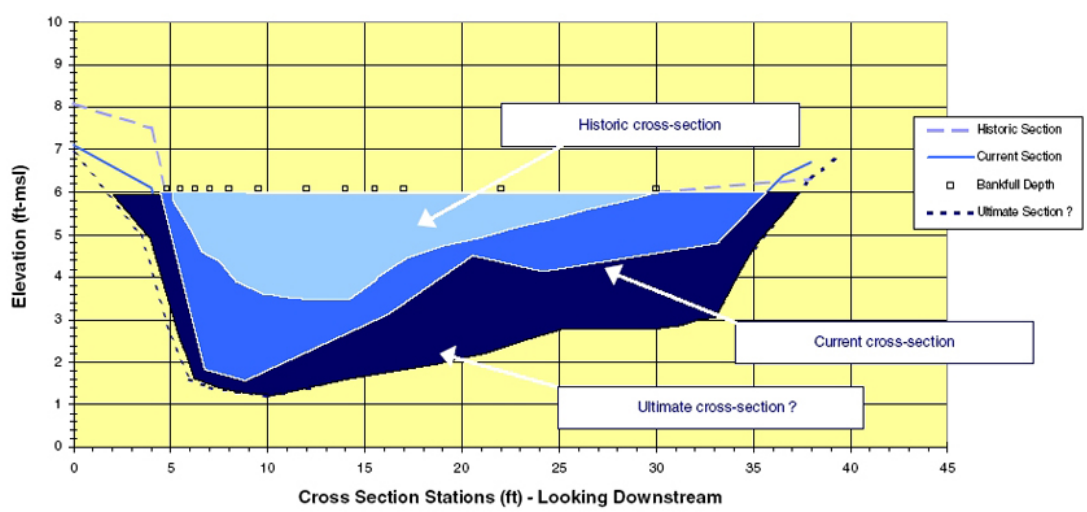

Source: Center for Watershed Protection, 2003

the 1950 or "Historic" configuration and the 2000 or "Current" condition. It should be noted that, over this time period, sufficient land development has occurred in the stream's drainage area to increase the total impervious land cover from approximately 2 percent to 27 percent. The "Ultimate" cross section shown in the figure is an estimate of the final cross section size in response to this degree of urbanization. Additional research indicates that stream channel areas can enlarge by two to eight times due to drainage area urbanization (Center for Watershed Protection, 2003).

In addition to channel cross section enlargement, other physical impacts of increased runoff volumes, rates, frequencies, and durations include (Center for Watershed Protection, 2003):

- Channel bank undercutting;
- Channel bottom incision;
- Loss of aquatic habitat;
- Increase in sediment yield and transport;
- Loss of riparian cover; and
- Increase in water temperature.

Utilizing the results from a number of research studies, the Center for Watershed Protection has developed a relatively simple model that demonstrates a direct relationship between drainage area urbanization (as measured by the percentage of impervious land cover in the drainage area) and the general quality of the stream to which the area's runoff drains. This model is depicted in Figure 2-12. It indicates that as total impervious cover in a drainage area increases, the quality of the stream decreases. This model has been widely adopted as a predictor of the adverse effects that can occur if drainage area development continues in an unmanaged or unregulated way.

In summary, the above section presented the following ideas and information:

- Land use changes can increase impervious land cover, decrease soil permeability and vegetated cover, reduce initial abstractions, and shorten runoff response times.
- Such changes can result in increased volumes, rates, durations, and frequencies of surface runoff and waterway flows.

Figure 2-12: Center for Watershed Protection's Impervious Cover Model

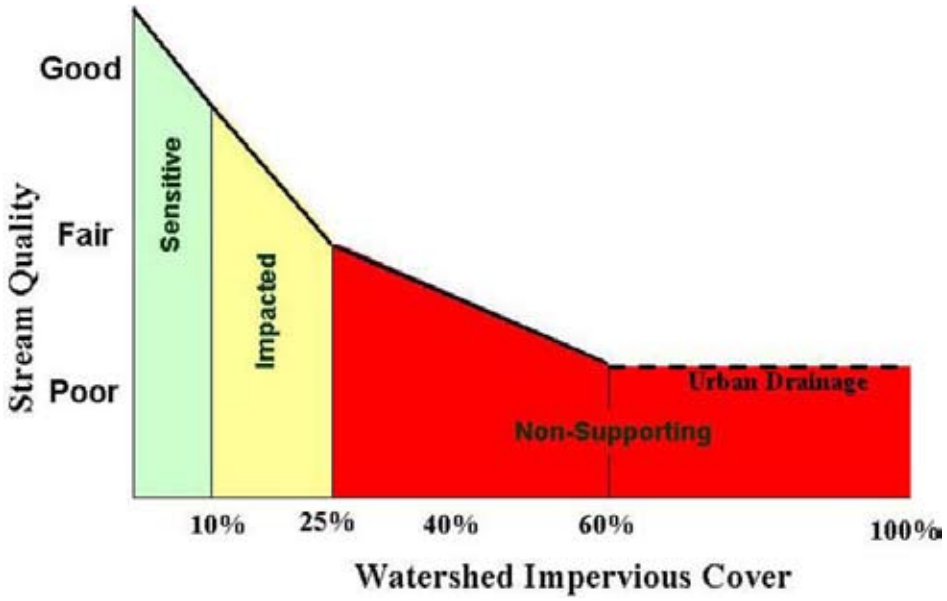

Source: Center for Watershed Protection, 2003

- Such increases can adversely impact waterways through channel enlargement, bank undercutting, aquatic habitat destruction, increased sediment loadings, and increased water temperatures.
- Such impacts have been extensively documented through research.

Summary and Conclusions

This chapter demonstrates how an understanding of the fundamentals of the rainfall-runoff process is critical to the development and operation of an effective urban runoff management program. Such fundamentals include:

1. The rainfall-runoff process is complex, and no perfect runoff estimation methods exist.
2. However, through informed assumptions and an understanding of the fundamentals, we can generally overcome these complexities and produce reasonable, reliable, and safe runoff estimates.
3. Several types of runoff estimation methods are available, utilizing a range of parameters and data including both actual long-term rainfall data and single event design storms.
4. The type and accuracy of the required runoff estimate and the availability of the required data will largely determine the runoff estimation method to be used.
5. The impacts of land use change include increased runoff and waterway flow volumes, rates, durations, and frequencies.
6. These increases can cause significant physical damage to waterways and aquatic habitats as well as biological, chemical, and environmental damage to ground and surface waters. Further information on these quality impacts are presented in Chapters 3 and 4.
7. Management of land use changes and preservation of the rainfall-runoff process for undeveloped conditions can prevent or mitigate such damage.
8. Structural stormwater management measures can also be used to reduce or control the runoff impacts of land use changes both during and after site construction. These measures are described in detail in Chapters 8 and 9.

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CHAPTER 3

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CHAPTER 3

Water Quality Impacts of Urbanization

This chapter focuses on the physio-chemical aspects of water quality by examining the characteristics, sources, and patterns of urban runoff pollutants. Stormwater runoff from urbanized areas carries with it a wide variety of pollutants from diverse and diffuse sources. Based on data collected over many decades, throughout the country, it is apparent that there is a great deal of variability in urban runoff pollutant composition and concentrations. Representing all recognized classes of water pollutants, these runoff contaminants originate not only from land-use activities in the drainage area where runoff is collected but also occur as atmospheric deposition from areas outside the watershed of the receiving water body. In addition, exchanges between surface and groundwater can also be a pathway for pollutants. For example, landfill leachate or buried toxic waste can easily contaminate groundwater, which can then become a source of pollutants to surface waters. On the other hand, pollution can be transported via urban surface runoff and can result in the contamination of groundwater or surface receiving water bodies. The multiple sources of urban runoff pollution on, above, and below the surface represent a complex set of watershed conditions. They determine the effects that drainage from the watershed will have on natural receiving water, and represent a challenge for management.

The impact of stormwater runoff pollutants on receiving water quality depends on a number of factors, including pollutant concentrations, the mixture of pollutants present in the runoff, and the total load of pollutants delivered to the water body. Water pollutants often go through various physio-chemical processes before they can impact an aquatic biota. During their transport by surface waters and stormwater runoff, losses such as sedimentation can reduce the total stress burden on aquatic organisms, although the reduction may not be permanent (e.g., sediments can be resuspended). Physical, chemical, and biological processes can also cause transformations to different physical (particulate versus dissolved) or chemical (organic or inorganic) forms. Depending on the environmental conditions and the organisms involved, transformations can cause enhanced (synergistic) or reduced stress potential.

Water pollution is not the only condition in the watershed that causes ecological stress. Chief among other stresses is modified hydrology from increased stormwater runoff flow volumes and peak rates discharged from urbanized landscapes. Conversely, stress can come from decreased dry weather baseflows resulting from reduced groundwater recharge in urban areas. Finally, aquatic biota can be affected by the various stresses in whatever form they arrive. Biota may have an easier time dealing with a few rather than many stressors, especially when they act in a synergistic manner. Of course, populations of aquatic organisms do not live in isolation but interact with other species, especially in predator-prey relationships. These interactions have many implications for the ecosystem. For example, the loss of one species from a pollution problem will likely result in the decline or elimination of a major predator of that species. These and other physical or biological stressors will be discussed in detail in the next chapter.

Background

Stormwater Pollutant Sources

Stormwater runoff from urbanized areas is generated from a number of sources, including residential areas, commercial and industrial areas, roads, highways, and bridges. Essentially, any surface that does not have the capability to store and infiltrate water will produce runoff during storm events. These are known as impervious surfaces. As the level of imperviousness increases in a watershed, more rainfall is converted to runoff. In addition to creating greater runoff volumes, impervious surfaces (roads, parking lots, rooftops, etc.) are the primary source areas for pollutants to collect within the built environment (Figure 3-1). Runoff from storm events then carries these pollutants into receiving waters via the stormwater conveyance network. Land-use (e.g., residential, commercial, and industrial) and human activities (e.g., industrial operations, residential lawn care, and vehicle maintenance) characteristic of a drainage basin largely determine the mixture and level of pollutants found in stormwater runoff (Weibel et al., 1964; Griffin et al., 1980; Novotny and Chester, 1981; Bannerman et al., 1993; Makepeace et al., 1995; Pitt et al., 1995).

Atmospheric deposition of pollutants is typically divided into wet-fall and dry-fall components. These inputs can come from local sources, such as automobile exhaust, or from distant sources such as coal or oil power plant emissions. Regional industrial and agricultural activities can also contribute to atmospheric deposition as dry-fall. Precipitation also carries pollutants from the atmosphere to earth as wet-fall. Depending on the season and location, atmospheric deposition can be a significant source of pollutants in the urban environment. The USGS has estimated that up to 25 percent of the nitrogen entering the Chesapeake Bay likely comes from atmospheric deposition (USGS, 1999).

The types of land-use activities present in a drainage basin are also important in determining stormwater quality. The method of conveyance within the built environment is influential as well. The traditional means of managing stormwater runoff in urban areas has been to construct a network of curb-and-gutter streets, drain-inlet catch basins, and storm drain piping to collect this runoff, transport it quickly and efficiently away from the urbanized area, and discharge the stormwater into receiving waters.

Separate storm sewer systems convey only stormwater runoff. Water conveyed in separate storm sewers is frequently discharged directly to receiving waters without treatment. Stormwater can also bypass the stormwater infrastructure and flow into receiving waters as diffuse runoff from parking lots, roads, and landscaped areas. In cases where a separate storm sewer

Figure 3-1: Stormwater Runoff Pathways and Pollutant Sources

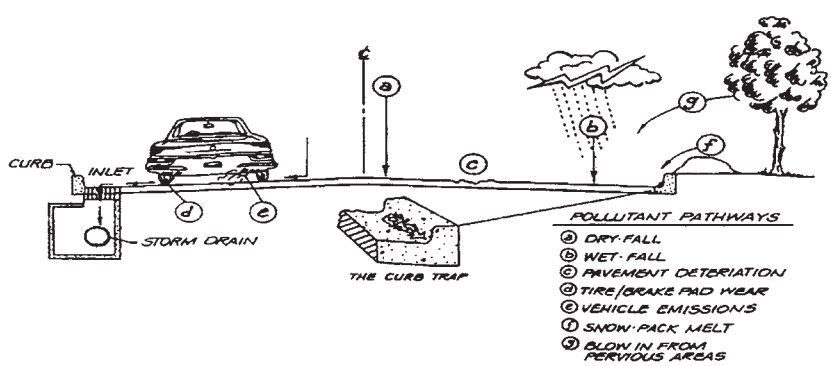

Streets provide several pathways for stormwater pollutants. Atmospheric pollutants settle or are washed onto the street during rain events (a, b). Pavement fragments also contribute to stormwater pollution (c). Vehicles contribute emissions and tire and brake pad particles (d, e). Snow collected at the street edge melts and contributes salts (f). Leaves and pollen from trees are blown into the street (g). Curb and gutter systems channel polluted stormwater directly into streams.

Source: Schueler, 1995

system is present, sanitary sewer flows are conveyed to the municipal wastewater treatment plant (WWTP) in a separate sanitary sewer system.

In a combined sewer system, stormwater runoff may be combined with sanitary sewer flows for conveyance. During low flow periods, flows from combined sewers are treated by the WWTP prior to discharge to receiving waters. During large rainfall events, however, the volume of water conveyed in combined sewers can exceed the storage and treatment capacity of the wastewater treatment system. As a result, discharges of untreated stormwater and sanitary wastewater directly to receiving streams can occur in these systems. These types of discharges are known as combined sewer overflow (CSO) events.

Urban streets are typically significant source areas for most contaminants in all land-use categories. Parking lots and roads are generally the most critical source areas in industrial and commercial areas. Along with roads, lawns, landscaped areas, and driveways can be significant sources of pollution in residential areas. In addition, roofs can contribute significant quantities of pollutants in all land-use types (Bannerman et al., 1993). The quantity of these pollutants delivered to receiving waters tends to increase with the degree of development in urban areas.

Historically, as urbanization occurred and storm drainage infrastructure systems were developed in this country, the primary concern was to limit nuisance and potentially damaging flooding due to the large volumes of stormwater runoff that were generated. Little, if any, thought was given to the environmental impacts of such practices on water quality. Due to the diffuse nature of many stormwater discharges, it is difficult to quantify the range of pollutant loadings to receiving waters that are attributable to stormwater discharges. Awareness of the damaging effects stormwater runoff is causing to the water quality and aquatic life of receiving waters is a relatively recent development, as is stormwater quality treatment.

Stormwater Runoff Pollutants

Stormwater runoff from urban areas can contain significant concentrations of harmful pollutants that can contribute to adverse water quality impacts in receiving streams. Impacts on beneficial uses can include such things as beach closures, shellfish bed closures, limits on fishing, and limits on recreational contact in waters that receive stormwater discharges. Contaminants enter stormwater from a variety of sources in the urban landscape. In general, these pollutants degrade water quality in receiving waters associated with urbanizing watersheds. Stormwater pollution is often a contributing factor where there is an impairment of beneficial use and/or an exceedance of criteria included in water-quality standards (WQS).

Research has identified stormwater runoff as a major contributor to water quality degradation in urbanizing watersheds (Field and Pitt, 1990; Makepeace et al., 1995; Pitt et al., 1995; Herricks, 1995; CWP, 2003). Stormwater or urban runoff typically contains a mixture of pollutants, including the following major constituents:

- Sediment;
- Nutrients (nitrogen and phosphorus);
- Chlorides ;
- Trace metals ;
- Petroleum hydrocarbons ;
- Microbial pollution ; and
- Organic chemicals (pesticides, herbicides, and industrial).

Sediment is one of the most common and potentially damaging pollutants found in urban runoff. Sediment pollutant levels can be measured as Total Suspended Solids (TSS) and/or Turbidity. TSS is a measure of the total mass of suspended sediment particles in a sample of water. The combination of flow and TSS gives a measure of sediment load carried downstream. Turbidity measures the scattering of light by suspended sediment particles in a water sample. Turbidity and TSS in stormwater runoff can vary significantly from region to region, as well as within a local area, depending on the sources of sediment contributing to the runoff load. The size distribution of suspended particles, as well as the composition of particulate (e.g. organic vs. inorganic) can have a significant influence on the measured turbidity or TSS of a water sample. Current research indicates that particle size distribution (PSD) may be an important parameter to measure when evaluating the sediment component in surface waters or stormwater runoff (Bent et al. 2001; US-EPA 2001; Burton and Pitt 2002).

Sediment in stormwater runoff can come from the wash-off of particulate material from impervious surfaces in already urbanized areas and/or from active construction sites in urbanizing areas. Streets, parking

lots, lawns, and landscaped areas have been identified as the primary source areas for sediment in the urban environment (CWP, 2003). Construction site runoff has the potential to contain very high levels of sediment, especially if proper erosion and sediment control (ESC) best management practices (BMP) are not employed. The TSS concentration from uncontrolled construction sites can be more than 150 times greater than that found in natural, undeveloped landscapes (Leopold, 1968). Uncontrolled runoff from construction sites has been shown to have a TSS ranging from 3,000 to 7,000 mg/l (CWP, 2003). When proper ESC BMP techniques are utilized, the TSS level can typically be reduced by at least an order of magnitude, if not more (CWP, 2003).

Nutrients (nitrogen and phosphorous) are essential elements in all aquatic ecosystems. However, when these nutrients are found at excessive levels, they can have a negative impact on aquatic systems. Common sources of nutrients such as nitrates and phosphates include chemical fertilizers applied to lawns, golf courses, landscaped areas, and gardens. Residential lawns and turf areas (e.g., sports fields, golf courses, and parks) in urbanizing watersheds have been shown to be "hot spots" for nutrient input into urban runoff (CWP, 2003). In general, lawns and turf areas contribute greater quantities of nutrients than other urban source areas. In fact, research suggests that nutrient concentrations in runoff from lawns and turf areas can be as much as four times greater than those from other urban nutrient source areas (Bannerman et al., 1993; Steuer et al., 1997; Waschbusch et al., 2000; Garn, 2002).

Sources of nutrients such as nitrates and phosphates include chemical fertilizers applied to lawns, golf courses, landscaped areas, and gardens. In addition, nutrient pollution can originate from failing septic systems or from inadequate treatment of wastewater discharges from an urban WWTP. Atmospheric deposition of nutrient compounds from industrial facilities or power generation plants is also a source of nutrients in the built environment. Soil erosion and other sediment sources can also be significant nutrient sources, as nutrients often tend to be found in particulate form. Research indicates that human land-use activity can be a significant source of nutrient pollution to stream and wetland ecosystems (Bolstad and Swank, 1997; Sonoda et al., 2001; Brett et al., 2005). Many studies have linked nutrient levels in runoff to contributing drainage area land uses, with agricultural and urban areas producing the highest concentrations (Chessman et al., 1992; Wernick et al., 1998; USGS, 1999). Snowmelt runoff in urban areas can also contain elevated levels of nutrients (Oberts, 1994).

Excessive nutrient levels in urban runoff can stimulate algal growth in receiving waters and cause nuisance algal blooms when stimulated by sunlight and high temperatures. The decomposition that follows these algal blooms, along with any organic matter (OM) carried by runoff, can lead to depletion of dissolved oxygen (DO) levels in the receiving water and bottom sediments. This can result in a degradation of habitat conditions (low DO), offensive odors, loss of contact recreation usage, or even fish kills in extremely low DO situations.

Nitrate is the form of nitrogen found in urban runoff that is of most concern. The nitrate anion (NO_3) is not usually adsorbed by soil and therefore moves with infiltrating water. Nitrates are present in fertilizers, human wastewater, and animal wastes. Nitrate contamination of groundwater can be a serious problem, resulting in contamination of drinking water supplies (CWP, 2003). High nitrate levels in drinking water can cause human health problems.

Phosphates (PO_4) are the key form of phosphorus found in stormwater runoff. Phosphates in runoff exist as soluble reactive phosphorus (SRP) or orthophosphates, poly-phosphates, and as organically bound phosphate. The poly-form of phosphates is the one that is found in some detergents. Orthophosphates are found in sewage and in natural sources. Organically bound phosphates are also found in nature, but can also result from the breakdown of phosphorus-based organic pesticides. Very high concentrations of phosphates can be toxic.

Chlorides are salt compounds found in runoff that result primarily from road de-icer applications during winter months. Sodium chloride (NaCl) is the most common example. Although chlorides in urban runoff come primarily from road deicing materials, they can also be found in agricultural runoff and wastewater. Small amounts of chlorides are essential for life, but high chloride levels can cause human illness and can be toxic to plants or animals.

Metals are among the most common stormwater pollutant components. These pollutants are also referred to as trace metals (e.g., zinc, copper, lead, chromium, etc.). Many trace metals can often be found at potentially harmful concentrations in urban stormwater runoff (CWP, 2003). Metals are typically associated with industrial activities, landfill leachate, vehicle maintenance, roads, and parking areas (Wilber and Hunter,

1977; Davies, 1986; Field and Pitt, 1990; Pitt et al., 1995). In one study in the Atlanta (GA) metropolitan area, zinc (Zn) was found to be the most significant metal found in urban street runoff (Rose et al., 2001). Similar results were found in the Puget Sound (WA) region (May et al., 1997). A study in Michigan found that parking lots, driveways, and residential streets were the primary source areas for zinc, copper, and cadmium pollution found in urban runoff (Steuer et al., 1997).

Most of the metal contamination found in urban runoff is associated with fine particulate (mostly organic matter), such as is found deposited on rooftops, roads, parking lots, and other depositional areas within the urban environment (Furguson and Ryan, 1984; Good, 1993; Pitt et al., 1995; Stone and Marsalek, 1996; Crunkilton et al., 1996; Sutherland and Tolosa, 2000). However, a significant fraction of copper (Cu), cadmium (Cd), and zinc (Zn) can be found in urban runoff in the dissolved form (Pitt et al., 1995; Crunkilton et al., 1996; Sansalone and Buchberger, 1997).

Petroleum hydrocarbon compounds are another common component of urban runoff pollution. Hydrocarbon sources include vehicle fuels and lubricants (MacKenzie and Hunter, 1979; Whipple and Hunter, 1979; Hoffman et al., 1982; Fram et al., 1987; Kucklick et al., 1997; Smith et al., 1997). Hydrocarbons are normally attached to sediment particles or organic matter carried in urban runoff. The increase in vehicular traffic associated with urbanization is frequently linked to air pollution, but there is also a negative relationship between the level of automobile use in a watershed and the quality of water and aquatic sediments. This has been shown for polycyclic aromatic hydrocarbon (PAH) compounds (Van Hoffman et al., 1982; Metre et al., 2000; Stein et al., 2006). In most urban stormwater runoff, hydrocarbon concentrations are generally less than 5 mg/l, but concentrations can increase to 10 mg/l in urban areas that include highways, commercial zones, or industrial areas (CWP, 2003). Hydrocarbon "hot spots" in the urban environment include gas stations, high-use parking lots, and high-traffic streets (Stein et al., 2006). A Michigan study showed that commercial parking lots contributed over 60 percent of the total hydrocarbon load in an urban watershed (Steuer et al.,

Table 3-1: Pollutants Commonly Found in Stormwater and Their Forms

Pollutant Category	Specific Measures
Solids	Settleable solids Total suspended solids (TSS) Turbidity (NTU)
Oxygen-demanding material	Biochemical oxygen demand (BOD) Chemical oxygen demand (COD) Organic matter (OM) Total organic carbon (TOC)
Phosphorus (P)	Total phosphorus (TP) Soluble reactive phosphorus (SRP) Biologically available phosphorus (BAP)
Nitrogen (N)	Total nitrogen (TN) Total kjeldahl nitrogen (TKN) Nitrate + nitrite-nitrogen (NO3+NO2-N) Ammonia-nitrogen (NH3-N)
Metals	Copper (Cu), lead (Pb), zinc (Zn), cadmium (Cd), arsenic (As), nickel (Ni), chromium (Cr), mercury (Hg), selenium (Se), silver (Ag)
Pathogens	Fecal coliform bacteria (FC) Enterococcus bacteria (EC) Total coliform bacteria (TC) Viruses
Petroleum hydrocarbons	Oil and grease (OG) Total petroleum hydrocarbons (TPH)
Synthetic organics	Polynuclear aromatic hydrocarbons (PAH) Pesticides and herbicides Polychlorobiphenols (PCB)

1997). Lopes and Dionne (1998) found that highways were the largest contributor of hydrocarbon runoff pollution.

Microbial pollution includes bacteria, protozoa, and viruses that are common in the natural environment, as well as those that come from human sources (Field and Pitt, 1990; Young and Thackston, 1999; Mallin et al., 2000). Many microbes are naturally occurring and beneficial, but others can cause diseases in aquatic biota and illness or even death in humans. Some types of microbes can be pathogenic, while others may indicate a potential risk of water contamination, which can limit swimming, boating, shellfish harvest, or fish consumption in receiving waters. Microbial pollution is almost always found in stormwater runoff, often at very high levels, but concentrations are typically highly variable (Pitt et al., 2004). Sources of bacterial pollution in the urban environment include failing septic systems, WWTP discharges, CSO events, livestock manure runoff, and pet waste, as well as natural sources such as wildlife. Young and Thackston (1999) showed that bacterial concentrations in stormwater runoff were

Table 3-2: Pollutants Commonly Found in Stormwater and Their Sources

Pollutant	Potential Sources
Hydrocarbons (gasoline, oil, and grease)	Internal combustion engines Automobiles Industrial machinery
Copper (Cu)	Building materials Paints and wood preservatives Algicides Brake pads
Zinc (Zn)	Galvanized metals Paints and wood preservatives Roofing and gutters Tires
Lead (Pb)	Gasoline Paint Batteries
Chromium (Cr)	Electro-plating Paints and preservatives
Cadmium (Cd)	Electro-plating Paints and preservatives
Pesticides	Agriculture and grazing Residential and commercial use
Herbicides	Agriculture and grazing Residential and commercial use Roadside vegetation maintenance
Organic compounds	Industrial processes Power generation
Bacteria and pathogens	Human sewage Livestock manure Domestic animal fecal material
BOD	Agriculture and grazing Human sewage
Nutrients (N and P)	Agriculture and grazing Lawn and landscape fertilizer
Fine sediment	Agriculture and grazing Timber harvest Pavement wear Construction sites Road sanding

directly related to the level of watershed and impervious surface area. Mallin and others (2000) also found that bacterial pollution problems were much more common in urbanized coastal watersheds than in undeveloped catchments. There is also evidence that microbial populations can survive and possibly even grow in urban stream sediments and in sediments found in storm sewer systems, making the stormwater infrastructure a potential source of microbial pollution (Bannerman et al., 1993; Steuer et al., 1997; Schueler, 1999).

Pesticides, herbicides, and other organic pollutants are often found in stormwater flowing from residential and agricultural areas throughout the U.S. (Ferrari et al., 1997; USGS, 1999; Black et al., 2000; Hoffman et al., 2000). Among the many pesticides and herbicides commonly found in urban runoff and urban streams are the following:

- Diazinon;
- Chlorpyrifos;
- Chlordane
- Carbaryl;
- Atrazine;
- Malathion;
- Dicamba;
- Prometon;
- Simazine; and
- 2,4-D.

Toxic industrial compounds such as PCBs can also be present in urban runoff (Black et al., 2000). Studies in Puget Sound confirm these findings (Hall and Anderson, 1988; May et al., 1997; USGS, 1997; Black et al., 2000). In many cases, even banned pesticides such as DDT or other organo-chlorine based pesticides (e.g., chlordane and dieldrin) can be found in urban stream sediments. The EPA estimates that nearly 70 million pounds of pesticides and herbicides are applied to lawns and other surfaces within the urban environment of the U.S. each year (CWP, 2003). These pesticides or herbicides vary in mobility, persistence, and potential aquatic impact. Many pesticides and herbicides are known or suspected carcinogens and can be toxic to humans and aquatic biota. However, most of the known health effects require exposure to higher concentrations than are typically found in the urban environment. However, the health effects of chronic exposure to low levels of pesticides and herbicides are generally unknown (Ferrari et al., 1997).

In urban runoff, most pollutants are associated with fine sediment or other natural particulates (e.g., organic matter). This condition differs between the specific pollutants. For example, depending on overall chemical conditions, each metal differs in solubility. For in-stance, lead (Pb) is relatively insoluble, while zinc (Zn) is relatively soluble. The nutrients phosphorus (P) and nitrogen (N) typically differ substantially from one sample to another in dissolved and particulate forms.

In addition to pollutants, other water quality characteristics affect the behavior and fate of contaminants in receiving water. These characteristics include:

- Temperature – critical to the survival of cold-water organisms. Temperature also affects solubility and ion mobility;
- PH – an expression of the relative hydrogen ion concentration on a logarithmic scale of 0-14, with a pH < 7.0 being acidic, a pH of 7.0 being neutral, and a pH > 7.0 representing basic conditions;
- Dissolved oxygen (DO) – a measure of molecular oxygen dissolved in water, critical to the survival of aerobic aquatic biota. In addition, DO levels can affect the release of chemically bound constituents from sediments;
- Alkalinity or acid neutralizing capacity (ANC) – the capacity of a solution to neutralize acid of a standard pH, usually the result of its carbonate and bicarbonate ion content, but conventionally expressed in terms of calcium carbonate equivalents;
- Hardness – an expression of the relative concentration of divalent cations, principally calcium (Ca) and magnesium (Mg), also conventionally expressed in terms of calcium carbonate equivalents; and
- Conductivity – a measure of the ability to conduct an electrical current as a result of its total content of dissolved substances.

These physio-chemical characteristics can affect pollutant behavior in several ways. For example, metals generally become more soluble as pH drops below neutral and hence become more bioavailable to organisms (Davies, 1986). Alternatively, the chemical elements creating hardness work against the toxicity of many heavy metals. Low DO levels can also make some metals more soluble. Anaerobic conditions in lake bottoms often lead to the release of phosphorus from sediments, as iron changes from the ferric to the

ferrous form (Welch, 1992). As discussed earlier, most of the pollutant composition of urban stormwater runoff stems from particulate material or fine sediment from surface soil erosion (e.g., construction site erosion) and from wash-off of solids accumulated on impervious surfaces throughout the urban environment (e.g., streets, highways, parking lots, and rooftops).

Pollutant Fate and Transport

In general, the primary transport mechanism for most urban pollutants is stormwater runoff. The physio-chemical effects of watershed urbanization tend to be more variable than the hydro-geomorphic or physical habitat impacts discussed previously. As indicated above, stormwater can contain a variety of pollutants and the pollutants typically found in stormwater come from a variety of sources (see Tables 3-1 and 3-2). These pollutants most often occur as mixtures of physio-chemical constituents, which depend on the land uses found in the contributing drainage basin as well as the type and intensity of human activities present. In general, the more intense the level of urbanization, the higher the pollutant loading, and the greater the diversity of land-use activities, the more diverse the mixture of pollutants found in stormwater runoff.

The transport and fate mechanisms of stormwater pollutants in receiving waters tend to be highly variable and site-specific. Pollutants are often transported from source areas (roads, parking lots, lawns, etc.) to receiving waters via roadside ditches, stormwater pipes, or by atmospheric deposition (Figure 3-2). In general, the concentration of pollutants found in stormwater runoff is much higher than that found in receiving waters, due mostly to dilution and removal mechanisms. There is evidence of a "first flush" effect for some constituents such as metals and hydrocarbons, especially in highly impervious and connected drainage areas (Pitt et al., 1995; Sansalone and Buchberger, 1997; Pitt et al., 2004).

As was discussed earlier, most stormwater pollutants are typically found in particulate form, attached to fine sediment particles and organic matter (Pitt et al., 1995). This is especially true for nutrients, organics, and metals. In most cases, the particulate forms of toxic pollutants, such as metals tend to be less "bio-available" (Herricks, 1995).

Sedimentation is the most common pollutant fate or removal mechanism because many pollutants tend to be associated with fine particulate material and/or organic matter (Pitt et al., 1995). However, pollutants can also be transformed from particulate form to dissolved form due to changes in water chemistry (pH, hardness, DO, etc.) at the sediment-water interface. Microbial activity can also transform toxic compounds, such as heavy metals, in sediments from inorganic forms to more toxic organic forms, which also tend to be more soluble (Herricks, 1995). In addition, scouring of sediments during stormflow events and associated changes in water chemistry during these sporadic events can mobilize polluted sediments and release toxic substances into the water column where biological uptake can occur. Large quantities of sediments can be transported by stormflows in urbanizing creeks, resulting in resuspension and redeposition of pollutants. Because of the potential for accumulation of pollutants in sediment and the potential of sediments as sources of toxics, polluted sediments likely play an important role in many of the biological impacts associated with stormwater runoff. In general, most pollutants, especially metals, are found in particulate forms within the water column, or sediments and pollutant concentrations tend to be higher for smaller sediment particle sizes (Novotny and Chester, 1989; Ferguson and Ryan, 1984; Herricks, 1995; Makepeace et al., 1995; Pitt et al., 1995).

Figure 3-2: Pollutant Movement in the Hydrologic Cycle

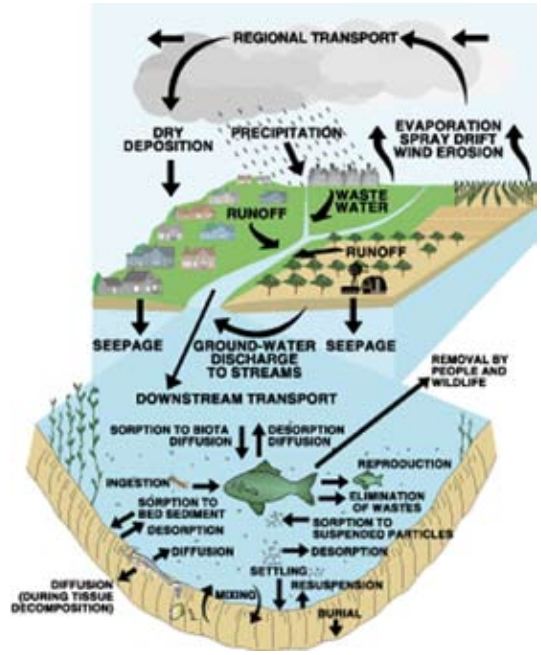

Source: USGS, 1999

Table 3-3 summarizes urban runoff pollutant sources and shows that most pollutant categories have diverse sources. Likewise, the major sources emit contaminants in most pollutant categories. The atmosphere also contributes some pollution to runoff. Thus, urban runoff is a multifaceted and complex problem to manage.

Quantifying Urban Runoff Pollutants

Urban Runoff Measurement

The concentrations of water-quality constituents tend to be highly variable, depending on a number of environmental factors. These factors may include:

- Drainage basin area or potential runoff volume;
- Drainage system characteristics (e.g., piping, ditches, etc.);
- Drainage basin land use and land cover (LULC);
- Rainfall volume, intensity, and antecedent dry period;
- The presence of pollutant source areas or "hot spots"; and
- Pollutant deposition or build-up rates.

Water pollutants are typically quantified by concentrations and loadings. Concentration is the mass of pollutant per unit volume of water sample, usually expressed as mg/l or ug/l. It is a measure of the pollutant content at the instant the sample is taken. If the pollutant level is higher than an aquatic organism can tolerate, the concentration represents an acute effect that could be lethal or affect the performance of some physiological function as long as the concentration persists. The effects of pollutant concentrations have been established through bioassays exposing test organisms in standard laboratory procedures. However, these simple, static tests completely omit the dynamic patterns and other complexities associated with urban runoff. Toxicity of pollutants will be discussed in more detail in Chapter 4.

Loading is the mass of pollutants delivered to a water body over a period of time and is usually given on an annual basis as kg/yr or lbs/yr. When ascribed to a particular land use, loading is sometimes termed yield or simply export per unit area of the land use (kg/ha-y or lbs/acre-y). It represents the cumulative burden over the extended period and hence the potential chronic effects on receptor organisms. With few exceptions (e.g., phosphorus loading to lakes), testing has not established the biological significance of loadings and the way they are delivered to a water body. Thus, loading is mainly used to make comparisons, for example, of total pollutant burden before and after development or with and without a certain control strategy. Pollutant loadings are also the basis for regulation under the Total Maximum Daily Load (TMDL) program that is part of the CWA.

Table 3-3: Urban Runoff Pollutant Sources and Constituents

Pollutant source	Solids	Nutrients	Pathogens	Oxygen Demand	Metals	Oils	Organics
Soil erosion	x	x		x	x		
Fertilizers		x					
Human waste	x	x	x	x			
Animal waste	x	x	x	x			
Vehicle fluids	x		x	x	x	x	
Internal combustion						x	
Vehicle wear	x			x	x		
Household chemicals	x	x		x	x	x	x
Industrial processes	x	x		x	x	x	x
Paints and preservatives					x	x	
Pesticides				x	x	x	

A quantitative estimate of water quality is needed to assess impacts from development actions or to predict the benefits of a management plan. This estimation process is sometimes called water quality modeling, although the term modeling is sometimes restricted to computer-based approaches. Water quality assessments are often based on annual pollutant loading estimates, although short-term loadings or concentrations are sometimes used. Long-term loadings tend to diminish the large fluctuations to which short-term phenomena are subject. Therefore, we can generally estimate long-term loading with more assurance than concentrations. Water quality sampling methods and monitoring programs will be covered in Chapter 5.

Urban Runoff Patterns

Because of the difficulty in determining runoff pollutant concentrations during dynamic flow conditions, the expense of sampling, and the analysis required to produce even a partial picture, the accepted practice is to determine an event-mean concentration (EMC). The event-mean concentration (EMC) is the concentration of a particular constituent that is representative of a specific environmental condition, usually with respect to a specific storm event. The NURP study defined the EMC as the total mass of pollutant contained in a runoff event divided by the total volume of runoff or flow for the event. The EMC can also be found by analyzing a single sample composited from a series of samples taken at points throughout the runoff event and combined in proportion to the flow rate existing at the time of sampling. This is often termed a flow-proportional or flow-weighted composite sample (EPA, 1997). The flow or runoff pattern of an event is customarily pictured on a hydrograph, which is a graph of flow rate (water volume per unit time) versus time. The integrated area under the curve is the total event runoff volume; the product of volume and EMC is the pollutant loading for the event. The sum of loadings for all events in an interval (e.g., a year) represents the cumulative pollutant burden during that time. In addition to its expediency, basing impact assessment on the EMC is justified from a biological standpoint because the EMC best represents the cumulative toxicity that organisms are exposed to during a storm event.

Based on the inherent variability of stormwater pollutant composition, the concentrations of water quality constituents are often estimated based on probability (i.e., the ability to state the probability of exceeding any selected concentration) or using statistically valid estimations of actual concentrations. Estimating the probability of concentrations can theoretically be used to estimate maximum or any other level, but it is usually restricted to the EMC. As stated earlier, an EMC is the concentration of a particular constituent that is representative of a specific environmental condition. For example, the EMC of TSS in a stream during a storm event could be based on multiple flow-weighted composite storm samples. Generally, to estimate an EMC, a large data -set is required to establish the underlying probability distribution for the locale or, alternatively, an assumption of the distribution and a smaller local data set to fit the distribution.

Most water quality studies have demonstrated that urban runoff pollutant concentrations typically fit a "log-normal" probability distribution (i.e., their logarithms are normally distributed). This is the characteristic distribution of data in cases where the distribution range is much higher than the mean and most values are in the lower portion (Little et al., 1983).

While pollutant magnitudes in urban runoff typically follow characteristic patterns over short and long time spans, they vary greatly over space and time. The short term can be defined as a period of hours during one or a sequence of storm events. Measurements at discrete points through such a period often reveal a pattern of pollutant concentration that is higher during the beginning of the storm event and tapering off as the storm continues. The so-called "first flush" of runoff during the first minutes often contains a relatively high concentration of contaminants, which then drops substantially and fluctuates at a lower level for the remainder of the runoff event. Analysis of climatological data throughout the U.S. indicates that most of the total annual runoff is produced by numerous small storms and the initial runoff from large storms. Theoretical reasons and some empirical demonstrations indicate that the majority of pollutant loadings for some constituents are generated by these smaller flow volumes (Burton and Pitt, 2002).

The first flush sometimes does not appear, or is less pronounced, when rainfall is not intense or follows soon after an earlier storm that cleans the surfaces. In addition, recent studies have shown that the first flush effect is usually only observed in highly impervious drainage areas such as parking lots or roads (Pitt et al., 2004). It has also been demonstrated that the first flush

phenomenon may only be applicable to certain pollutants, including metals, hydrocarbons, and fine sediment (Pitt et al., 2004). In some cases, a secondary spike can also appear if a sudden burst of intense rain drives material off surfaces not completely cleaned by the initial runoff. In summary, runoff concentrations can assume an almost infinite variety of patterns depending on rainfall intensity, antecedent dry period (ADP) length and conditions, pollutant deposition during the ADP, and surface characteristics in the drainage basin.

Urban Runoff Pollution Characteristics

Several studies have attempted to quantify the level of various constituents in urban runoff. As mentioned earlier, these levels tend to vary depending on the land-use and human activities found in the contributing drainage area. The earliest comprehensive study of the water quality characteristics of urban runoff was the EPA (1983) National Urban Runoff Program (NURP). Between 1978 and 1983, EPA examined stormwater quality from separate storm sewers in different land uses. The NURP project studied 81 outfalls in 28 communities throughout the U.S. and included the monitoring of approximately 2,300 storm events. The data was compiled for several land-use categories, although most of the information was obtained from residential lands. Table 3-4 summarizes the NURP findings. NURP also produced graphs for each pollutant to determine the EMC at each site and the EMC medians from all sites nationwide (EPA, 1983). These plots can help estimate concentration exceedance probabilities at other locations. Such estimates are best made with specific site data including rainfall patterns, land-use data, geological data, and other characteristics similar to those of the location of interest. Using a regional or nationwide database is less satisfactory. Local stormwater data may be available from National Pollutant Discharge Elimination System (NPDES) monitoring programs.

Since NURP, other important studies have been conducted that characterize stormwater. The USGS National Water Quality Assessment (NAWQA) Program examined runoff quality from more than 1,100 storms at nearly 100 monitoring sites in 20 metropolitan areas (USGS, 1999). Table 3-5 summarizes the general findings of the USGS studies with respect to surface water quality. These USGS studies investigated specific urban pollutants including nutrients, metals, pesticides, and herbicides. The NAWQA studies also identified a close relationship between land use and water quality in agricultural and urban areas.

As an example, the NAWQA program found that insecticides such as diazinon and malathion were commonly found in surface water and stormwater in urban areas (USGS, 1999). This research found that almost every urban stream sampled had concentrations of insecticides that exceeded at least one EPA guideline or water-quality standard. Most urban streams had concen-

Table 3-4: Pollutants Commonly Found in Stormwater and Their Sources

	NURP Mean EMC	NURP Mean EMC
Pollutant	Median Urban Site	90th Percentile Urban Site
TSS (mg/l)	141-234	424-671
BOD (mg/l)	10-13	17-21
COD (mg/l)	73-92	157-198
TP (mg/l)	0.37-0.47	0.78-0.99
SRP (mg/l)	0.13-0.17	0.23-0.30
TKN (mg/l)	1.68-2.12	3.69-4.67
NO2-N (mg/l)	0.76-0.96	1.96-2.47
Total Cu (ug/l)	38-48	104-132
Total Pb (ug/l)	161-204	391-495
Total Zn (ug/l)	179-226	559-707

Notes: EMC = Event Mean Concentration; TSS = Total Suspended Solids; BOD = Biological oxygen Demand; COD = Chemical oxygen Demand; TP = Total Phosphorus; SRP = Soluble Reactive Phosphorus; TKN = Total Kjeldahl Nitrogen

Source: NURP, 1983

trations that exceeded a water-quality guideline in 10 to 40 percent of samples taken throughout the year (USGS, 1999). Urban streams also had the highest frequencies of occurrence of DDT, chlordane, and dieldrin (all of these compounds have been banned from use in the U.S. for decades) in sediments and fish tissue (USGS, 1999). In the Puget Sound region, the mixture of pesticides found in urban streams was directly related to the type of land use found in the contributing upstream drainage area (Ebbert et al., 2000). The NAWQA studies also found that the highest levels of organochlorine compounds, including pesticides and PCBs, were found in aquatic sediment and biota in urban areas (USGS, 1999). The main source of these complex mixtures of insecticides found in urban streams was identified as business, household, or garden use in developed areas, with urban runoff being the primary transport mechanism into urban streams and other receiving waters. A study in the Puget Sound region that correlated retail sales of specific pesticides with levels of those same pesticides found in local streams confirms this finding (Bortleson and Ebbert, 2000).

The NAWQA research also found that concentrations of phosphorus exceeded the EPA target goal (TP<0.1 mg/l) for the control of nuisance algal growth in over 70 percent of the urban receiving waters tested (USGS, 1999). As mentioned above, excessive algal or aquatic plant growth due to nutrient enrichment can lead to low levels of DO (hypoxia), which can be harmful to aquatic biota. Urban runoff can contain high levels of nutrients in the form of fertilizers washed off lawns and landscaped areas. In most cases in the NAWQA studies, enrichment of receiving waters occurred in small watersheds dominated by agricultural, urban, or mixed land use (USGS, 1999). The NAWQA research also found that nitrate contamination of groundwater aquifers and drinking water supplies had the potential to be a human health risk in urbanizing areas with high nitrate concentrations in stormwater runoff.

The Federal Highway Administration (FHWA) also analyzed stormwater runoff from 31 highways in 11 states during the 1970s and 1980s (FHWA, 1995). Other regional databases also exist, mostly using local NPDES data. Other studies have confirmed the NURP findings and improved the level of knowledge with regard to stormwater pollution impacts (Field and Pitt, 1990; Bannerman et al., 1993; Makepeace et al., 1995; Pitt et al., 1995). Table 3-6 illustrates the range of pollutant levels for typical urban runoff from a number of studies.

Highway runoff is often viewed as a separate and distinct form of stormwater. Because vehicle traffic tends to be the predominant pollution source in the highway environment, runoff from roads tends to have a characteristic signature (Novotny, 2003). Several studies have been conducted to characterize highway runoff (Stotz, 1987; Driscoll et al., 1990; Barrett et al., 1998; Wu et al., 1998; Kayhanian and Borroum, 2000; Pitt et al., 2004). In general, runoff from urban highways with greater average daily traffic (ADT) volumes tends to have higher pollutant concentrations than runoff from less-traveled highways (lower ADT). Most research studies have not found any direct correlation between ADT alone and pollutant concentrations for the great majority of pollutants (Masoud et al., 2003). However, ADT is almost always one of the more influential factors in determining runoff pollutant composition and concentration. Other parameters determining the quality of highway runoff include those that control pollutant build-up and wash-off. In addition to ADT, these factors include drainage catchment area and land use, antecedent dry period between storm events, and rainfall intensity and volume. Table 3-6 shows data from highways in comparison to other urbanized areas.

In a study in Southern California (Tiefenthaler et al., 2001), samples of stormwater runoff from parking lots

Table 3-5: Relative Levels of Pollution in Streams Throughout the U.S.

WQ Parameter	Urban Areas	Agricultural Areas	Undeveloped Areas
Nitrogen	Medium	Medium-high	Low
Phosphorus	Medium-high	Medium-high	Low
Herbicides	Medium	Medium-high	Low
Pesticides	Medium-high	Low-medium	Very low
Metals	High	Medium	Very low
Toxic Organics	High	Medium	Very low
Source: USGS, 1999			

were analyzed for a number of metals including Fe, Zn, Cu and Pb as well as polycyclic aromatic hydrocarbons (PAH). These metals and PAH had the highest mean concentrations of any constituents analyzed. Zinc (Zn) was found in particularly high concentrations, which were 3 times higher after dry periods. These pollutants were found to accumulate regardless of how much the parking lot was used or maintained. In this study, all of the samples from parking lot runoff contained toxins, and all samples of parking lot runoff were toxic. (Tiefenthaler et al., 2001). In addition, the longer the antecedent dry period before a storm event, the higher

Table 3-6: Typical Levels of Metals Found in Stormwater Runoff (ug/L)

Metal	Stormwater Median (90th Percentile)[a]	Mean (sd)[b]	Median (COV) Urban Stormwater[c]	Range for Highway Runoff[d]	Range for Parking Lot Runoff[e]
Zinc (Zn)	160 (500)	215 (141)	112.0 (4.59)	56-929	51-960
Copper (Cu)	34 (93)	33 (19)	16.0 (2.24)	22-7033	8.9-78
Lead (Pb)	144 (350)	70 (48)	15.9 (1.89)	73-1780	10-59
Cadmium (Cd)	n/a	1.1 (0.7)	1.0 (4.42)	0-40	0.5-3.3
Chromium (Cr)	n/a	7.2 (2.8)	7.0 (1.47)	0-40	1.9-10
Arsenic (As)	n/a	5.9 (2.8)	3.3 (2.42)	0-58	n/a
Mercury (Hg)	n/a	n/a	0.2 (1.17)	0-0.322	n/a
Nickel (Ni)	n/a	10 (2.8)	9.0 (2.08)	0-53.3	2.1-18
Silver (Ag)	n/a	n/a	3.0 (4.63)	n/a	n/a

Notes: n/a = not available.
Sources: [a]NURP, 1983. [b]Schiff et al., 2001. [c]Pitt et al., 2002. [d]Barrett et al., 1998. [e]SCCRP, 2001.

Table 3-7: Pollutants Commonly Found in Stormwater and Their Sources – 1983 (NURP) and 1999 Databases

Pollutant	Data Source	Mean EMC	Median EMC
TSS (mg/l)	Pooled NURP	78 174	55 113
BOD (mg/l)	Pooled NURP	14 10	12 8
COD (mg/l)	Pooled NURP	53 66	45 55
TP (mg/l)	Pooled NURP	0.32 0.34	0.26 0.27
SRP (mg/l)	Pooled NURP	0.13 0.10	0.10 0.08
TKN (mg/l)	Pooled NURP	1.73 1.67	1.47 1.41
NO2-N and NO3-N (mg/l)	Pooled NURP	0.66 0.84	0.53 0.66
Total Cu (ug/l)	Pooled NURP	14 67	11 55
Total Pb (ug/l)	Pooled NURP	68 175	51 131
Total Zn (ug/l)	Pooled NURP	162 176	129 140

EMC = Event Mean Concentration
COD = Chemical oxygen Demand
TKN = Total Kjeldahl Nitrogen
TSS = Total Suspended Solids
TP = Total Phosphorus
BOD = Biological oxygen Demand
SRP = Soluble Reactive Phosphorus

Source: Smullen et al., 1999

the concentration of pollutants and the higher the toxicity found in runoff samples (Tiefenthaler et al., 2001). In an arid climate such as Southern California, pollutants tend to build up during extended dry periods and then be washed off during heavy rainfall events that are typical of the climate. In this study, a pronounced first flush of toxins was observed at the beginning of storm events (Tiefenthaler et al., 2001). More intense rains reduced pollutant concentrations, however. Regardless of the intensity of the storm event, most loose pollutants were washed from the parking lot surface in the first 15 minutes (Tiefenthaler et al., 2001). The first flush of TSS was the most evident at the relatively low rainfall intensity of 6 mm/hour (Tiefenthaler et al., 2001). The key factor influencing the first flush of TSS was found to be rainfall duration instead of intensity. TSS concentrations dropped during the course of the storm, however. During longer storms, greater rainfall intensity did not reduce zinc concentrations. Intensity only increased the concentration of pollutants in the first minute of the storm (Tiefenthaler et al., 2001). Results indicated that the most wash-off of pollutants from parking lots occurred during small storms. This especially includes Pb and Zn (Tiefenthaler et al., 2001).

In 1999, an analysis of stormwater data collected since the original NURP study was conducted to update the event-mean concentration (EMC) values for typical urban stormwater quality (Smullen et al., 1999). This data review found only a few major differences between the NURP data and the pooled data from three national databases (see Table 3-7). In general, the pooled data was very comparable with the NURP data, with a few notable exceptions. The study found that the level of TSS in runoff was significantly

Table 3-8: Summary of Event-Mean Concentration (EMC) Data for Stormwater Runoff in the U.S.

Pollutant	Data Source	Mean EMC	Median EMC	Number of Events Sampled
TSS (mg/l)	Smullen and Cave, 1998	78.4	54.5	3047
BOD (mg/l)	Smullen and Cave, 1998	14.1	11.5	1035
COD (mg/l)	Smullen and Cave, 1998	52.8	44.7	2639
TP (mg/l)	Smullen and Cave, 1998	0.32	0.26	3094
SRP (mg/l)	Smullen and Cave, 1998	0.13	0.10	1091
TN (mg/l)	Smullen and Cave, 1998	2.39	2.00	2016
TKN (mg/l)	Smullen and Cave, 1998	1.73	1.47	2693
NO2-N and NO3-N (mg/l)	Smullen and Cave, 1998	0.66	0.53	2016
Total Cu (ug/l)	Smullen and Cave, 1998	13.4	11.1	1657
Total Pb (ug/l)	Smullen and Cave, 1998	67.5	50.7	2713
Total Zn (ug/l)	Smullen and Cave, 1998	162	129	2234
Total Cadmium (ug/l)	Smullen and Cave, 1998	0.7	0.5	150
Total Chromium (ug/l)	Bannerman et al., 1996	4.0	7.0	164
PAH (mg/l)	Rabanal and Grizzard, 1995	3.5	N/R	N/R
Oil and Grease (mg/l)	Crunkilton et al., 1996	3	N/R	N/R
FC (cfu/100ml)	Schueler, 1999	15,000	N/R	34
Diazinon	US-EPA, 1998	N/R	0.025	326
Atrazine	US-EPA, 1998	N/R	0.023	327
MTBE	Delzer, 1996	N/R	1.6	592

Notes: EMC = Event Mean Concentration; BOD = Biological oxygen Demand; TN = Total Nitrogen; PAH = Poly-aromatic Hydrocarbons; TSS = Total Suspended Solids; COD = Chemical oxygen Demand; SRP = Soluble Reactive Phosphorus; N/R = Not Reported; FC = Fecal Coliform Bacteria; TP = Total Phosphorus; TKN = Total Kjeldahl Nitrogen

Source: CWP, 2003

lower than in the NURP study, perhaps indicating that erosion and sediment control (ESC) best management practices (BMP) implemented since 1983 were somewhat effective. Metals were also generally lower in the 1999 study than in the NURP data, especially lead (Pb), likely due to the elimination of leaded gasoline. This study also highlighted the fact that the variability of stormwater quality can depend on contributing land use, seasonal factors (e.g., precipitation patterns), and geographic region.

The Center for Watershed Protection (CWP) has also compiled a database of national stormwater runoff water-quality data (CWP, 2003). This data is summarized in Table 3-8.

There can be significant regional differences in urban runoff water quality due to a variety of environmental factors. To a large extent, underlying geology and soils determine the natural background level of many water-quality constituents, such as nutrients or metals. In addition, soils and topography have a strong influence on erosion potential and sediment production. One of the most influential factors impacting runoff water quality are a region's precipitation characteristics. Annual rainfall, precipitation patterns, mean storm event volume, and the range of rainfall intensities all have been demonstrated to influence runoff water quality (Driver and Tasker, 1990). For example, the western U.S. tend to have distinct „wet" and „dry" seasons, whereas the eastern U.S. and Midwest generally have more dispersed, year-round precipitation. Within the western U.S., the Pacific Northwest tends to have most of its rainfall in long-duration, low-intensity storms, whereas the Southwest tends to see more short, high-intensity storm events. Because of these factors, stormwater runoff EMC levels for nutrients, sediment, and metals have a tendency to be higher in arid or semi-arid regions and to decrease slightly when annual rainfall increases (CWP, 2004).

Table 3-9: Event Mean Concentration (EMC) Values for Stormwater Runoff Pollutants for Various U.S. Climatic Regions

Location	National	Phoenix, AZ	San Diego, CA	Boise, ID	Denver, CO	Dallas, TX	Marquette, MI	Austin, TX	MD	KY	GA	FL	MN
Mean Annual Rainfall (in)	N/A	Low (7)	Low (10)	Low (11)	Low (15)	Med (28)	Med (32)	Med (32)	High (41)	High (41)	High (41)	High (41)	Snow (*)
Pollutant													
TSS (mg/l)	78	227	330	116	242	663	159	190	67	98	258	43	112
TN (mg/l)	2.39	3.26	4.55	4.13	4.06	2.70	1.87	2.35	N/R	2.37	2.52	1.74	4.30
TP (mg/l)	0.32	0.41	0.70	0.75	0.65	0.78	0.29	0.32	0.33	0.32	0.33	0.38	0.70
SRP (mg/l)	0.13	0.17	0.40	0.47	N/R	N/R	0.04	0.24	N/R	0.21	0.14	0.23	0.18
Cu (ug/l)	14	47	25	34	60	40	22	16	18	15	32	1	N/R
Pb (ug/l)	68	72	44	46	250	330	49	38	13	60	28	9	100
Zn (ug/l)	162	204	180	342	350	540	111	190	143	190	148	55	N/R
BOD (mg/l)	14	109	21	89	N/R	112	15.4	14	14.4	88	14	11	N/R
COD (mg/l)	52	239	105	261	227	106	66	98	N/R	38	73	64	112
# Sample Events	3000	40	36	15	35	32	12	78	107	21	81	66	49
Reference	1	2	3	4	5	6	7	8	9	10	11	11	12

Notes:
EMC = Event Mean Concentration
COD = Chemical oxygen Demand
SRP = Soluble Reactive Phosphorus
TSS = Total Suspended Solids
TP = Total Phosphorus
N/R = Not Reported
BOD = Biological oxygen Demand
TN = Total Nitrogen

References:
1 – Smullen and Cave, 1998
2 – Lopes et al., 1995
3 – Schiff, 1996
4 – Kjelstrom, 1995
5 – DRCOG, 1983
6- Brush et al., 1995
7 – Steuer et al., 1997
8 – Barrett et al., 1995
9 – Barr, 1997
10 – Evaldi et al., 1992
11 – Thomas and McClelland, 1995
12 – Oberts, 1994

Source: CWP, 2004

In colder regions, where snow is a significant form of precipitation, snowmelt can be a major source of urban runoff pollutants (Novotny and Chester, 1981). Snow tends to accumulate during the winter, and pollutants can build up in the snowpack due to atmospheric deposition, vehicular emissions, litter, and the application of de-icing products (e.g., salt and/or sand). As a result, relatively high concentrations of some pollutants can be detected during snowmelt events and in runoff from treated roads (CWP, 2004). The main concerns with regard to the hazards of chlorides in stormwater runoff include groundwater contamination, trace metal leaching from sediments, stratification of receiving water bodies, and direct toxic effects on aquatic biota (Marsalek, 2003).

A study in Minnesota measured pollutants in urban streams and found that as much as half of the annual sediment, nutrient, hydrocarbon, and metal loads could be attributed to snowmelt runoff (Oberts, 1994). High levels of chloride (road salt), BOD, and TSS have also been reported in snowmelt runoff (La Barre et al., 1973; Oliver et al., 1974; Horkeby and Malmquist, 1977; Pierstorff and Bishop, 1980; Scott and Wylie, 1980; Novotny and Chester, 1981; Boom and Marsalek, 1988; Marsalek, 2003). Table 3-9 summarizes stormwater runoff pollutant concentrations for different climatic regions of the U.S. (CWP, 2004).

In the decades between the NURP data being collected and now, much has been accomplished with regard to urban runoff source control, the treatment of stormwater runoff, and improvements in receiving water quality. The most comprehensive analysis of stormwater runoff quality is currently underway. In 2001, the University of Alabama and the Center for Watershed Protection (CWP) were awarded an EPA Office of Water grant to collect and evaluate stormwater data from a representative number of NPDES (National Pollutant Discharge Elimination System) MS4 (municipal separate storm sewer system) stormwater permit holders. The initial version of this database, the National Stormwater Quality Database (NSQD, 2004) is currently available from the CWP.

In the NSQD project, stormwater quality data and site descriptions are being collected and reviewed to describe the characteristics of national stormwater quality, to provide guidance for future sampling needs, and to enhance local stormwater management activities in areas having limited data. Over 10 years of monitoring data collected from more than 200 municipalities throughout the country have a great potential in characterizing the quality of stormwater runoff and comparing it against historical benchmarks. This project is creating a national database of stormwater monitoring data collected as part of the existing stormwater permit program, providing a scientific analysis of the data as well as recommendations for improving the quality and management value of future NPDES monitoring efforts (Pitt et al., 2004). Table 3-10 summarizes the NSQD findings to date. Table 3-11 shows a comparison between NURP and NSQD findings. Figure 3-3 shows a sample of the NSQD findings for one common urban runoff constituent (TSS).

Urban Wetland Water Quality: Puget Sound Case Study

In a study of Puget Sound Basin freshwater wetlands (Azous and Horner, 2001), many water quality parameters exhibited upward trends with increased urbanization. Median pH levels were particularly elevated in highly urbanized wetlands while DO experienced more modest increases. Median conductivity and NH3 levels were also significantly higher in urbanized wetlands than in non-urbanized wetlands. Finally, similar rates of increase in median concentrations of total suspended solids (TSS), soluble reactive phosphorus (SRP), fecal coliforms (FC), lead (Pb) and zinc (Zn) were found with each step in the urbanization process (Azous and Horner, 2001).

In the wetlands studied, low concentrations predominated, indicating minimal water quality impacts. Concentrations of lead (Pb), however, tended to violate water quality criteria for the protection of aquatic life (Azous and Horner, 2001). In both urbanized and non-urbanized wetlands, wetland morphology type was associated with varying levels of water quality parameters. Morphology refers to the shape, perimeter length, internal horizontal dimensions, and topography of the wetland as well as to water pooling and flow patterns. Higher levels of DO, pH, conductivity, NO3+NO2-N, SRP, FC, and Pb were found in flow-through wetlands. Flow-through wetlands (FT) are channelized and have clear flow gradients, while open water wetlands (OW) contain significant pooled areas with little or no flow gradient (Azous and Horner, 2001). A large proportion of FT wetlands is found in urban areas, due to wetland

Table 3-10: Median Values for Selected Stormwater Parameters for Standard Land-Use Categories

WQ Parameter	Residential	Commercial	Industrial	Freeways	Open Space
TSS (mg/l)	48	43	77	99	51
BOD (mg/l)	9.0	11.9	9.0	8.0	4.2
COD (mg/l)	55	63	60	100	21
FC (mpn/100ml)	7750	4500	2500	1700	3100
NH3 (mg/l)	0.31	0.50	0.50	1.07	0.30
NO2 + NO3 (mg/l)	0.60	0.60	0.70	0.30	0.60
TKN (mg/l)	1.40	1.60	1.40	2.00	0.60
SRP (mg/l)	0.17	0.11	0.11	0.20	0.08
TP (mg/l)	0.30	0.22	0.26	0.25	0.25
Cd total (ug/l)	0.5	0.9	2.0	1.0	0.5
Cd dissolved (ug/l)	ND	0.3	0.6	0.7	ND
Cu total (ug/l)	12	17	22	35	5
Cu dissolved (ug/l)	7	8	8	11	ND
Pb total (ug/l)	12	18	25	25	5
Pb dissolved (ug/l)	3	5	5	2	ND
Ni total (ug/l)	5	7	16	9	ND
Ni dissolved (ug/l)	2	3	5	4	ND
Zn total (ug/l)	73	150	210	200	39
Zn dissolved (ug/l)	33	59	112	51	ND

Notes: TSS = Total Suspended Solids; BOD = Biochemical Oxygen Demand; COD = Chemical Oxygen Demand; FC = Fecal Coliform; TKN = Total Kjeldahl Nitrogen; SRP = Soluble Reactive Phosphorus; TP = Total Phosphorus; ND = Not Detected

Source: NSQD, 2004

Table 3-11: Comparison of Median Stormwater Quality for NURP and NSQD

WQ Parameter	Overall		Residential		Commercial		Open Space	
	NSQD	NURP	NSQD	NURP	NSQD	NURP	NSQD	NURP
COD (mg/l)	53	65	55	73	63	57	21	40
TSS (mg/l)	58	100	48	101	43	69	51	70
Pb total (ug/l)	16	144	12	144	18	104	5	30
Cu total (ug/l)	16	34	12	33	17	29	5	11
Zn total (ug/l)	116	160	73	135	150	226	39	195
TKN (mg/l)	1.4	1.5	1.4	1.9	1.60	1.18	0.60	0.97
NO2 + NO3 (mg/l)	0.60	0.68	0.60	0.74	0.60	0.57	0.60	0.54
TP (mg/l)	0.27	0.33	0.30	0.38	0.22	0.20	0.25	0.12
SRP (mg/l)	0.12	0.12	0.17	0.14	0.11	0.08	0.08	0.03

Notes: COD = Chemical Oxygen Demand; TSS = Total Suspended solids; TKN = Total Kjeldahl Nitrogen; TP = Total Phosphorus; SRP = Soluble Reactive Phosphorus

Source: NSQD, 2004

filling, stream channelization, and higher peak runoff flows, and this may help explain why pollutant levels trends are higher in these wetlands (Azous and Horner, 2001).

In the Puget Sound wetlands study, soil samples were collected once from each wetland during the summer dry period (July through September) for several years. Soil samples were taken from 3m to the side of vegetation transect lines wherever soils appeared transitional or completely different. These transitions were determined by small soil core samples or vegetation changes. Overall, two to five samples were collected from each wetland, with an average of four samples collected. The number of samples collected was related to the size and zonal complexity of the wetlands. Samples were taken from inlet zones in particular, because oxidation reduction potential (ORP) and one metal were found in significantly different levels in these locations. Soil samples were collected with a corer composed of a 10 cm (4 in) diameter ABS plastic pipe section ground to a sharp tip. A wooden rod was inserted horizontally through two holes near the top to provide leverage to twist the corer into the soil. Core samples were taken to a depth of 15 cm (6 in) and preserved by immediately placing them in bags sealed with tape. A standard 60-cm (2-ft) deep soil pit was also excavated at each sampling point not inundated above the surface. This pit was observed for depth to water table, horizontal definition (thickness of each layer and boundary type between), color (using Munsell notations), structure (grade, size, form, consistency, moistness), and the presence of roots and pores (Azous and Horner, 2001).

Sediment samples exhibited similar trends in urban and flow-through wetlands as the water quality parameters discussed previously. Median pH levels increased with each successive level of urbanization (Azous and Horner, 2001). Metals, including Pb, Zn, As (arsenic) and Cu (copper) also generally tended to increase with urbanization. As with water quality samples, sediment metal concentrations did not exceed severe effect thresholds based on the Washington State Department of Ecology. Some Cu and Pb mean and median concentrations exceeded lowest effect thresholds (Azous and Horner, 2001). While these metals tended to be found in greater concentrations in urban wetlands, they can also be found at elevated levels in non-urban wetlands.

Figure 3-3: Sample NSQD Findings

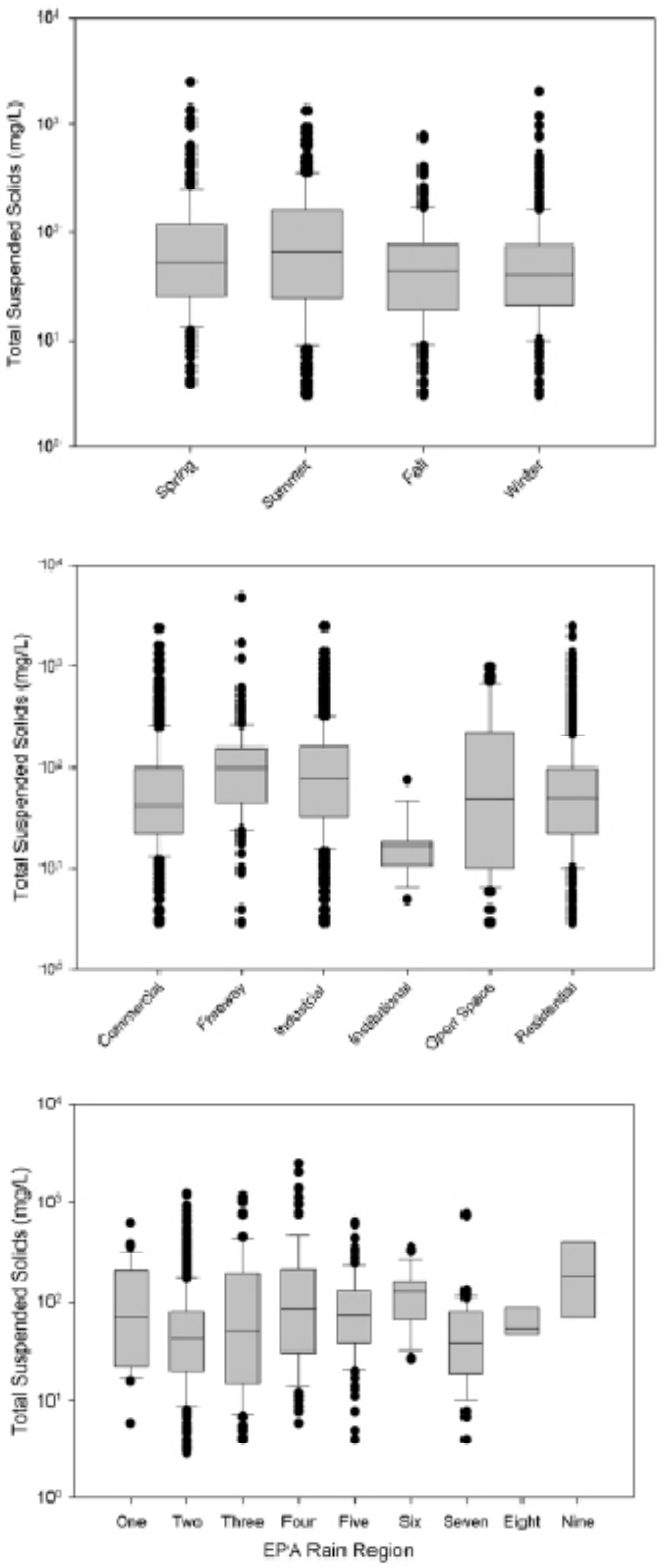

Source: NSQD, 2004

High Cu, Pb and TPH levels were seen in the two most impacted urban wetlands (Azous and Horner, 2001). Thus, local conditions may be more important factors in determining soil metal concentrations. Possible factors include the delivery of metals via precipitation, atmospheric dry-fall, dumping of metal trash, and leaching from old constructed embankments (Azous and Horner, 2001).

The impact of human activity and development on water quality varies widely between wetlands of different urbanization levels. For moderately urbanized wetlands, there is a mixed picture. Median total dissolved nitrogen concentrations (ammonia, nitrate, and nitrite) have been found to be more than 20 times higher than dissolved phosphorus, but phosphorus is the most important factor limiting plant and algal growth. As would be expected, these wetlands exhibit slightly elevated pH levels (median pH = 6.7). Dissolved oxygen is well below saturation, at times below 4 mg/l. Dissolved substances tend to be higher than in non-urbanized wetlands but are also somewhat variable. Suspended solids are only marginally higher than in non-urbanized wetlands but are also variable (Azous and Horner, 2001).

In highly urbanized wetlands, water quality samples revealed higher nutrient levels. Unlike non-urbanized or even low-moderately urbanized wetlands, these wetlands are likely to have median NO3 + NO2-N concentrations above 100 mg/l and total phosphorus (TP) over 50mg/l (Azous and Horner, 2001). In one study, FC and EC were shown to be significantly higher in highly urbanized wetlands. Many of these wetlands were within watersheds with low-density residential development (Azous and Horner, 2001).

An effort was made to correlate water quality conditions with watershed and wetland morphological characteristics. Acidity (pH), TSS, and conductivity showed the strongest ability to predict watershed and morphology characteristics. Pollutants such as TP, Zn and FC, which are often absorbed to particulates, also exhibited strong correlations with watershed conditions and morphology (Azous and Horner, 2001). On the other hand, forest cover was the best predictor of these water quality parameters. The next best land cover predictors of water quality were the percentage of impervious surface, forest-to-wetland areal ratio and morphology (Azous and Horner, 2001). A rise in the total impervious area will facilitate the delivery of TSS and increase conductivity. TSS and conductivity are directly and indirectly harmful to wetland biological communities (Azous and Horner, 2001).

These results suggest that a range of deforestation and development exists after which water quality will become degraded. Effective impervious area, which is the amount of land drained by a storm drainage system, was more predictive of water quality than total impervious area. As total impervious area approaches a range of 4 to 20 percent and forested area declines to between 0 to 15 percent, water quality will begin to decline (Azous and Horner, 2001).

Wetlands in developing areas are especially vulnerable to erosion caused by construction, which contributes to sediment levels. During these periods, both mean and median TSS values increase, although mean values show the greatest change. After construction is completed, and more surface area is covered with structures and vegetation, these values return to their approximate values before development. The sediments contributed by this erosion carry pollutants such as phosphorus and nitrogen (Azous and Horner, 2001).

Development also affects soils in wetlands. In the Puget Sound Basin wetlands, somewhat elevated pH levels prevailed. These soils were often aerobic, although many times their redox potentials were below levels at which oxygen is depleted. Metals such as Cu, Pb and Zn were higher in developing areas but did not usually approach severe effects thresholds (Azous and Horner, 2001). In a synoptic study of 73 wetlands, about 60 percent of which were urban and the rest non-urban, Pb levels were significantly different in both the inlet and emergent zones (Azous and Horner, 2001). In some soil samples, high toxicity levels were probably caused by the extraction and concentration of naturally occurring organic soil compounds during laboratory analysis. Samples from two wetlands, however, probably contained anthropogenic toxicants because the results indicated toxicity in the absence of any visible organic material (Azous and Horner, 2001).

For each region studied in the Puget Sound area, a regression was developed between the presence of crustal metals and toxic metals in relatively unimpacted wetlands. If the concentration of a toxic metal was above a 95 percent confidence level, it was probable that the metals were of anthropogenic origin. The results of this analysis echoed those described previously for urbanized wetlands. The regressions revealed a greater degree of toxic metal enrichment in the most urban wetlands (Azous and Horner, 2001).

Estimating Urban Runoff Pollutant Loading

The watershed assessment process provides the framework for evaluating watershed conditions and quantifying watershed characteristics (US-EPA, 2005). The objectives of the watershed assessment effort, pollution source information, and the water-quality data available largely determine what will be the most appropriate method for quantifying pollutant loading. In general, the approach chosen should be the simplest approach that meets the objectives of the watershed management program. Pollutant loading estimates are generally developed using a model or models.

Models can be useful tools for watershed and receiving-water assessments because they facilitate the analysis of complex systems and provide a method of estimating pollutant loading for a large array of land-use scenarios. Models are only as good as the data used for calibration and verification. There will always be some uncertainties present in all models and these uncertainties should be quantified and understood prior to using the selected model. Many models utilize literature-based values for water-quality concentrations to estimate pollutant loads (US-EPA 2005). Models have also become a standard part of most TMDL programs (US-EPA 1997). There are several recognized approaches used for estimating pollutant loadings for a drainage area or watershed basin. The three general approaches include:

- Unit-area loading;
- Simple empirical method; and
- Complex, computer-based models.

Unit-Area Loading

This method utilizes published *yield-values* to estimate pollutant loading for a specific land use. As mentioned earlier in this chapter, loading is the mass of pollutants delivered to a water body over a period of time and is usually given on an annual basis as kg/yr or lbs/yr. When ascribed to a particular land use, loading is sometimes termed yield or simply export per unit area of the land use (kg/ha-y or lbs/acre-y). Table 3-12 presents typical loadings for a number of pollutants and land uses. Although this table presents no ranges or statistics on the possible dispersion of these numbers when measurements are made, the variation is usually substantial from place to place in the same land use and from year to year at the same place.

This method is least likely to give accurate results because of the general lack of fit between the catchment of interest and the data collection location(s). To apply this method, consult a reference like Table 3-12, select the areal loading rate for each land use, multiply by the areas in each use, and sum the total loading for the pollutant of interest.

This method can be improved by producing some measure of uncertainty or error in the estimates. To do so, it is necessary to establish ranges of areal loadings from published literature or actual sampling, estimate

Table 3-12: Typical Pollutant Loadings (lbs/acre-yr) From Different Land Uses

Land-Use	TSS	TP	TKN	NH_3-N	NO_2-N and NO_3-N	BOD	COD	Pb	Zn	Cu	Cd
Commercial	1000	1.5	6.7	1.9	3.1	62	420	2.7	2.1	0.4	0.03
Parking Lot	400	0.7	5.1	2.0	2.9	47	270	0.8	0.8	0.06	0.01
High-Density Residential	420	1.0	4.2	0.8	2.0	27	170	0.8	0.7	0.03	0.01
Medium-Density Residential	250	0.3	2.5	0.5	1.4	13	50	0.05	0.1	0.03	0.01
Low-Density Residential	65	0.04	0.3	0.02	0.1	1	7	0.01	0.04	0.01	0.01
Highway	1700	0.9	7.9	1.5	4.2	n/a	n/a	4.5	2.1	0.37	0.02
Industrial	670	1.3	3.4	0.2	1.3	n/a	n/a	0.2	0.4	0.10	0.05
Shopping Center	440	0.5	3.1	0.5	1.7	n/a	n/a	1.1	0.6	0.09	0.01

Source: Based on Table 2.5 in Burton and Pitt, 2002

maximum and minimum and mean or median values of each pollutant, and then evaluate to determine if uncertainty or error could change the conclusions. Table 3-13 presents loading rate ranges based on unpublished data collected in the Pacific Northwest (PNW). The PNW regional data provided values for total phosphorus and total nitrogen for most land uses and all pollutants in road runoff, except fecal coliform. Accordingly, the regional data have narrower ranges than the remainder. Data such as that shown in Table 3-13 should be used with caution, because the concentrations of most pollutants vary considerably depending on regional characteristics in land use and climate, among other factors.

The use of published yield or unit-area loading values from specific sources, rather than for land-use categories, is also feasible. For example, a study in Maryland (Davis et al., 2001) examined the loading rates of metals (zinc, lead, copper, and cadmium) from several common sources in the urban environment. These included building siding and rooftops as well as automobile brakes, tires, and oil leakage. Loading estimates (mean, median, maximum, and minimum) were developed for each of these sources for all four metals (Davis et al., 2001). Specific data of this sort could be very useful for a variety of management scenarios.

Simple Empirical Method

The "Simple Method" was first developed by Schueler (1987) and further refined by the Center for Watershed Protection (CWP, 2003). This method requires data on watershed drainage area and impervious surface area, stormwater runoff pollutant concentrations, and

Table 3-13: Pollutant Loading (kg/ha-yr) Ranges for Various Land Uses

Land-Use Category		TSS	TP	TN	Pb	In	Cu	FC
Road	Minimum	281	0.59	1.3	0.49	0.18	0.03	7.1 E+07
	Maximum	723	1.50	3.5	1.10	0.45	0.09	2.8E+08
	Median	502	1.10	2.4	0.78	0.31	0.06	1 .8E+08
Commercial	Minimum	242	0.69	1.6	1.60	1.70	1.10	1.7E+09
	Maximum	1,369	0.91	8.8	4.70	4.90	3.20	9.5E+09
	Median	805	0.80	5.2	3.10	3.30	2.10	5.6E+09
Single family Low density Residential	Minimum	60	0.46	3.3	0.03	0.07	0.09	2.8E+09
	Maximum	340	0.64	4.7	0.09	0.20	0.27	1.6E+10
	Median	200	0.55	4.0	0.06	0.13	0.18	9.3E+09
Single family High density Residential	Minimum	97	0.54	4.0	0.05	0.11	0.15	4.5E+09
	Maximum	547	0.76	5.6	0.15	0.33.	0.45	2.6E+10
	Median	322	0.65	5.8	0.10	0.22	0.30	1.5E+10
Multifamily Residential	Minimum	133	0.59	4.7	0.35	0.17	0.17	6.3E+09
	Maximum	755	0.81	6.6	1.05	0.51	0.34	3.6E+10
	Median	444	0.70	5.6	0.70	0.34	0.51	2.1E+10
Forest	Minimum	26	0.10	1.1	0.01	0.01	0.02	1 .2E+09
	Maximum	146	0.13	2.8	0.03	0.03	0.03	6.8E+09
	Median	86	0.11	2.0	0.02	0.02	0.03	4.0E+09
Grass	Minimum	80	0.01	1.2	0.03	0.02	0.02	4.8E+09
	Maximum	588	0.25	7.1	0.10	0.17	0.04	2.7E+10
	Median	346	0.13	4.2	0.07	0.10	0.03	1.6E+ 10
Pasture	Minimum	103	0.01	1.2	0.004	0.02	0.02	4.8E+09
	Maximum	583	0.25	7.1	0.015	0.17	0.04	2.7E+ 10
	Median	343	0.13	4.2	0.010	0.10	0.03	1.6E+ 10

Source: Horner, 1992

annual precipitation. With the Simple Method, land use can be divided into specific types, such as residential, commercial, industrial, and roadway. Using this data, the annual pollutant loads for each type of land use can be calculated. Alternatively, generalized pollutant values for land uses such as new suburban areas, older urban areas, central business districts, and highways can be utilized. Stormwater pollutant concentrations can be estimated from local or regional data or from national data sources. Tables 3-6 through 3-11 contain the type of data required for this method.

As has been discussed, stormwater pollutant concentrations tend to be highly variable for a number of reasons. Because of this variability, it is difficult to establish different concentrations for each land use. The original Simple Method Model used NURP data for the representative pollutant concentrations. Utilizing a more recent and regionally specific database would, in general, be more accurate for this purpose. If no regional or local data exists, the Simple Method could be utilized using a median urban runoff value, derived from NURP data (US-EPA 1982), of 20,000 MPN/100ml.

Data from other sources can supplement the NURP values, and the use of EMC data from local measurements should yield superior estimates. Pollutant load values from extensive regional or local sampling programs could be the most useful. For example, water-quality studies from Western Washington and Oregon, which are compatible, have been combined to form a data set for different land use categories in the PNW Chandler (1993 and 1994) These studies found a distinction between residential, commercial, and industrial land use-related EMC values and the results of the NURP research. On the other hand, a study that only includes a small number of EMC data cannot accurately determine average runoff concentrations and may not be useful in supplementing or replacing recognized EMC values such as the NURP data. If this is the case, previously published data sets should be used instead. Additionally, it is not always advisable to obtain additional EMC data due to the additional expenses involved. It may be better to use a cost-effectiveness analysis to determine if increasing the amount of EMC data is worth it. This is especially true in light of the fact that a great deal of data is typically available, for example from municipal NPDES stormwater permit applications, that can be used to estimate runoff concentrations from a variety of land uses.

The Simple Method estimates pollutant loads for chemical constituents as a product of annual runoff volume and pollutant concentration, as (CWP, 2003):

$$L = 0.226 * R * C * A$$

where: L = Annual load (lbs)

R = Annual runoff (inches)

C = Pollutant concentration (mg/l)

A = Area (acres)

0.226 = Unit conversion factor

Figure 3-4: Relationship Between Stormwater Runoff and Impervious Surface Area

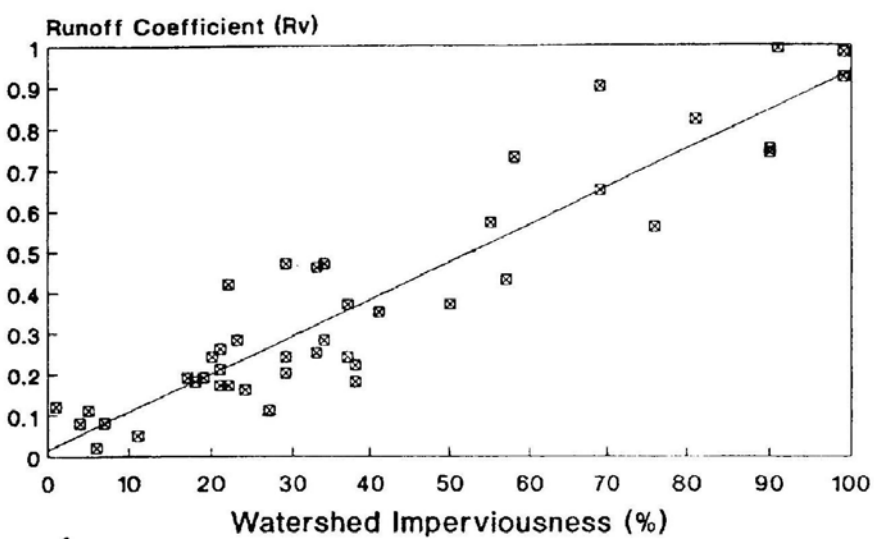

Source: Schueler, 1995

For bacteria, the equation is slightly different to account for the differences in units. The modified equation for bacteria is (CWP, 2003):

$$L = 1.03 * 10\text{-}3 * R * C * A$$

where: L = Annual load (Billion Colonies)

R = Annual runoff (inches)

C = Bacteria concentration (#/100 mL)

A = Area (acres)

1.03 * 10-3 = Unit conversion factor

The Simple Method calculates annual runoff as a product of annual runoff volume and a runoff coefficient (Rv). Runoff volume is calculated as (CWP, 2003):

$$R = P * Pj * Rv$$

where: R = Annual runoff (inches)

P = Annual rainfall (inches)

Pj = Fraction of annual rainfall events that produce runoff (usually 0.9)

Rv = Runoff coefficient

In the Simple Method, the runoff coefficient is calculated based on impervious cover in the sub-watershed. This relationship is based on empirical data. Although there is some variability in the data, watershed imperviousness does appear to be a reasonable predictor of Rv (Figure 3-4). The following equation represents the best-fit line for the data set (N = 47, R2 = 0.71) based on data collected by Schueler (1987). This model uses different impervious cover values for separate land uses within a sub-watershed.

$$Rv = 0.05+0.9Ia$$

Where: Ia = Impervious fraction

Limitations of the Simple Method

The Simple Method should provide reasonable estimates of changes in pollutant export resulting from urban development activities. However, several caveats should be kept in mind when applying this method. The Simple Method is most appropriate for assessing and comparing the relative stormflow pollutant load changes of different land-use and stormwater management scenarios. It provides estimates of storm pollutant export that are probably close to the "true" but unknown value for a development site, catchment, or sub-watershed. However, it is very important not to overemphasize the precision of the results obtained. The simple method provides a general planning estimate of likely storm pollutant export from areas at the scale of a development site, catchment, or sub-watershed. More sophisticated modeling may be needed to analyze larger and more complex watersheds.

In a comparison of several PNW watersheds, Chandler (1993 and 1994) found that the Schueler (1987) Simple Model loading estimates usually agreed, within a factor of two, with estimates made by much more involved and expensive modeling procedures. Chandler (1993 and 1994) utilized the Simple Model in four case-study comparisons with more complex models, including the EPA Stormwater Management Model (SWMM) and the Hydrologic Simulation Program FORTRAN (HSPF) model. Chandler (1993 and 1994) concluded that there was no compelling reason for using complex models when estimating annual pollutant loading under most situations.

In addition, the Simple Method only estimates pollutant loads generated during storm events. It does not consider pollutants associated with baseflow volume. Typically, baseflow is negligible or non-existent at the scale of a single development site, and can be safely neglected. However, catchments and sub-watersheds do generate baseflow volume. Pollutant loads in baseflow are generally low and can seldom be distinguished from natural background levels. Consequently, baseflow pollutant loads normally constitute only a small fraction of the total pollutant load delivered from an urban area. Nevertheless, it is important to remember that the load estimates refer only to storm event-derived loads and should not be confused with the total pollutant load from an area. This is particularly important when the development density of an area is low.

Computer-Based Models

There are a wide variety of computer models available today that can be used for surface water and stormwater quality assessments. Many of these models are available in the public domain and have been developed and tested by resource agencies. Regionally or locally specific versions of many of these models are also common. In comparison to the approaches outlined previously, computer-based models provide a more complex approach to estimating pollutant loading and also often offer a means of evaluating various management alternatives (US-EPA, 2005). Detailed coverage of these models is beyond the scope of this chapter. The US-EPA *Handbook for Developing Watershed Plans* (US-EPA, 2005)

contains a comprehensive discussion of computer-based models in Chapter 8 of that publication.

Examples of comprehensive computerized models include Stormwater Management Model (SWMM), Better Assessment Science Integrating Point and Non-Point Sources (BASINS), the Hydrologic Simulation Program Fortran (HSPF), Source Loading and Management Model (SLAMM), Storage, Treatment, and Overflow Runoff Model (STORM), and Spatially Referenced Regression on Watershed Attributes (SPARROW). These are only a few of the computer-based pollutant-loading estimation models available (see US-EPA 2005 Table 8-4 for a more complete listing).

In general, computer-based models contain hydrologic and water quality components and have statistical or mathematical algorithms that represent the mechanisms generating and transporting runoff and pollutants. The hydrologic components of both SWMM and HSPF stem from the Stanford Watershed Model, first introduced almost 25 years ago, and produce continuous hydrograph simulations. In addition to these relatively complex computer-based models, there are numerous "spreadsheet" level models that have been developed by local and regional water-quality practitioners. In almost all cases, computer-based models need to be calibrated and validated using locally appropriate water-quality data (US-EPA, 2005), which, depending on the watershed under study, can be a time-consuming and relatively costly effort.

Most computer-based models structure the water quality components on a mass balance framework that represents the rate of change in pollutant mass as the difference between pollutant additions and losses. Additions, considered to be pollutant deposition, are computed as a linear function of time. Soil erosion is usually calculated according to the Universal Soil Loss Equation (USLE). Losses are represented by a first-order wash-off function (i.e., loss rate is considered to be a function of pollutant mass present); other losses are modeled in mathematically similar ways. For example, both organic matter decomposition and bacterial die-off are considered first-order reactions. Some models, like SWMM, have both a receiving water and runoff component. These models treat some of the transformation processes that can occur in water (e.g., dissolved oxygen depletion according to the Streeter-Phelps equation or FC die-off using the Mancini equation). However, no model can fully represent all of these numerous and complex processes.

The BASINS model is a physical process-based analytical model developed by the US-EPA and typically used for watershed-based hydrologic and water-quality assessments. For example, BASINS was used to model the East Fork of the Little Miami River (Tong and Chen, 2002). The HSPF model can be used as a component of the BASINS model (Bergman et al., 2002) or as a stand-alone model (Im et al., 2003). The SPARROW model is a statistical-regression, watershed-based model developed by the USGS (Smith et al., 1997) and used primarily for water-quality modeling (Alexander et al., 2004). Many computer-based models utilize regression equations to describe pollutant characteristics (Driver and Tasker, 1990).

There are also a number of so-called "build-up and wash-off" models that simulate pollutant build-up on impervious surfaces and use rainfall data to estimate wash-off loading. The main limitation of these models is that model-controlling factors can greatly vary with surface characteristics, so calibration with actual field measurements is needed. These models can work well with calibration and can model intra-storm variations in runoff water quality, which is a key advantage. These models are often used for ranking or prioritizing, but not for predicting actual runoff water quality. SLAMM was developed to evaluate the effects of urban development characteristics and runoff control measures on pollutant discharges. This model examines runoff from individual drainage basins with particular land-use and control practices (Burton and Pitt 2002).

Most models require substantial local data to set variable parameters in the calibration and verification phases. They also require considerable technical skill and commitment from personnel. Therefore, only those prepared to commit the resources to database development and expertise should embark on using these models. Most models used today also utilize the geographic information system (GIS) for data input and presentation of results.

In many situations, the use of computer-based models may not be merited, but in other cases, it may be helpful in determining the magnitude of the water-quality problem or aid in finding a solution. Computer models can also extend data collected and enhance findings. In addition, they can be quite useful in running a variety of scenarios to help frame the water quality problem. Examples of this include worst-case, full build-out scenarios or potential BMP scenarios to estimate the effectiveness of a range of treatment options. In any case, model selection should be linked

to the project objectives and must be compatible with the data available. In almost all cases, using the simplest model that will meet the project objectives is likely the best course to take. In all cases, models should be calibrated and verified with independent, local or regionally specific data.

A good example of a watershed-scale, computer-based model dealing with multiple water-quality parameters and their impact on receiving waters is the Sinclair-Dyes Inlet TMDL Project in the Puget Sound, Washington (Johnston et al. 2003). This model has a watershed component (HSPF) linked to a receiving-water model (CH3D) that includes dynamic loading from the contributing watershed and hydro-dynamic mixing in the receiving waters of Sinclair-Dyes Inlet. The results of this model can be viewed at www.ecy.wa.gov/programs/wq/tmdl/sinclair-dyes_inlets/index.html

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CHAPTER 4

Bio-physical Impacts of Urbanization on Aquatic Ecosystems

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CHAPTER 4

Bio-physical Impacts of Urbanization on Aquatic Ecosystems

The Clean Water Act (CWA) describes water quality as the combination of chemical, physical, and biological attributes of a water body. This chapter deals mainly with the biological and physical effects of watershed development on aquatic ecosystems. Physio-chemical water quality was discussed in detail in the previous chapter. The physio-chemical effects of urbanization, commonly referred to as water pollution, are discussed in this chapter only as they apply to their impact on aquatic biota. The wide array of pollutants entering aquatic ecosystems along with urban runoff can cause numerous potential biological effects. Other biological stresses often associated with modification of the hydrologic regime or changes in physical habitat also typically accompany watershed development. The goal of this chapter is to provide a synthesis of the current scientific research that covers the cumulative effects of urbanization on aquatic ecosystems, including streams, rivers, lakes, wetlands, and estuaries. Table 4-1 summarizes the impacts of urbanization on these aquatic systems.

The majority of this chapter focuses on freshwater lotic (flowing waters) or stream-river ecosystems, but lentic (non-flowing) systems, such as lakes and wetlands, are also covered, as are estuaries and nearshore areas, to a lesser extent. As Table 4-1 shows, the impacts of urbanization include chemical effects such as degraded water quality; physical effects such as altered hydrology, degraded habitat, and modified geomorphology; and biological effects including altered biotic interactions, food web (trophic) changes, chronic (sublethal) toxicity, and acute (lethal) toxicity. This chapter also presents illustrations of the complex, interdisciplinary nature of aquatic biological impacts. Subjects covered include the role of urban runoff in lake eutrophication, metals found in stormwater runoff and their effects on aquatic organisms, thermal impacts of riparian encroachment, and the fish habitat impacts of watershed development and stormwater runoff. How the many urban stressors might affect the biota in a receiving water is very complex, imperfectly understood, and hard to forecast with assurance. The multiple stressors that often accompany urbanization can interact synergistically or antagonistically. In addition, the receptor organisms under stress can interact with one another. The sum total of these interactions within an aquatic ecosystem represents the cumulative impacts of urbanization.

Background

One of the confusing aspects of water-quality management is that often only the chemical component of water quality is considered. Water-quality criteria are the main regulatory tools used in managing receiving waters. These are typically concentrations of specific chemical pollutants set so as to protect human health and beneficial uses of receiving waters (including aquatic biota) from adverse impacts. However, relying solely on these water-quality criteria to manage urban runoff is often not an effective approach, because biological and

Table 4-1: Summary of the Impacts of Urbanization on Aquatic Ecosystems

Environmental Concern	Potential Impact	Cause/Source
Increase in runoff-driven peak or bankfull stream flows	Degradation of aquatic habitat and/or loss of sensitive species	Increased stormwater runoff volume due to an increase in basin imperviousness
Increase in runoff-driven flooding frequency and duration	Degradation of aquatic habitat and/or loss of sensitive species	Increased stormwater runoff volume due to an increase in basin imperviousness
Increase in wetland water level fluctuations	Degradation of aquatic habitat and/or loss of sensitive species	Increased stormwater runoff due to an increase in basin imperviousness
Decrease in dry season baseflows	Reduced aquatic habitat and less water for human consumption, irrigation, or recreational use	Water withdrawals and/or less natural infiltration due to an increase in basin imperviousness
Streambank erosion and stream channel enlargement	Degradation of aquatic habitat and increased fine sediment production	Increase in stormwater runoff driven stream flow due to an increase in basin imperviousness
Stream channel modification due to hydrologic changes and human alteration	Degradation of aquatic habitat and increased fine sediment production	Increase in stormwater runoff driven stream flow and/or channel alterations such as levees and dikes
Streambed scour and incision	Degradation of aquatic habitat and loss of benthic organisms due to washout	Increase in stormwater runoff driven stream flow due to an increase in basin imperviousness
Excessive turbidity	Degradation of aquatic habitat and/or loss of sensitive species due to physiological and /or behavioral interference	Increase in stormwater runoff driven stream flow and subsequent streambank erosion due to an increase in basin imperviousness
Fine sediment deposition	Degradation of aquatic habitat and loss of benthic organisms due to fine sediment smothering	Increase in stormwater runoff driven stream flow and subsequent streambank erosion due to an increase in basin imperviousness
Sediment contamination	Degradation of aquatic habitat and/or loss of sensitive benthic species	Stormwater runoff pollutants
Loss of riparian integrity	Degradation of riparian habitat quality and quantity, as well as riparian corridor fragmentation	Human development encroachment and stream road crossings
Proliferation of exotic and invasive species	Displacement of natural species and degradation of aquatic habitat	Encroachment of urban development
Elevated water temperature	Lethal and non-lethal stress to aquatic organisms – reduced DO levels	Loss of riparian forest shade and direct runoff of high temperature stormwater from impervious surfaces
Low dissolved oxygen (DO) levels	Lethal and non-lethal stress to aquatic organisms	Stormwater runoff containing fertilizers and wastewater treatment system effluent
Lake and estuary nutri-ent eutrophication	Degradation of aquatic habitat and low DO levels	Stormwater runoff containing fertilizers and wastewater treatment system effluent
Bacterial pollution	Human health (contact recreation and drinking wa-ter) concerns, increases in diseases to aquatic or-ganisms, and degradation of shellfish harvest beds	Stormwater runoff containing livestock manure, pet waste, and wastewater treatment system effluent
Toxic chemical water pollution	Human health (contact recreation and drinking water) concerns, as well as bioaccumulation and toxicity to aquatic organisms	Stormwater runoff containing toxic metals, pesticides, herbicides, and industrial chemical contaminants
Reduced organic matter (OM) and large woody debris (LWD)	Degradation of aquatic habitat and loss of sensitive species	Loss or degradation of riparian forest and floodplain due to development encroachment
Decline in aquatic plant diversity	Alteration of natural food web structure and function	Cumulative impacts of urbanization
Decline in aquatic invertebrate diversity	Alteration of natural food web structure and function	Cumulative impacts of urbanization
Decline in amphibian diversity	Loss of ecologically important species	Cumulative impacts of urbanization
Decline in fish diversity and abundance	Loss of ecologically important species	Cumulative impacts of urbanization

ecological impacts can occur in an ecosystem at levels well below these chemical criteria.

This dilemma can be explained by several factors characteristic of the typical urbanized environment. As discussed earlier, water quality is assessed not just by chemical criteria, but there are physical and biological aspects to consider as well. These impacts include the modification of natural hydrologic regime, geomorphic changes in ecosystem structure, the degradation of physical habitat, disruption of ecological function or processes, and the biological changes to be discussed in this chapter.

Even from the perspective of conventional chemical toxicity alone, conventional (regulatory) water-quality criteria do not represent the complex and variable exposure patterns related to urban runoff or the cumulative impacts of long-term exposure to stormwater pollutant loadings. These criteria also do not account for any physio-chemical transformations that occur in the natural or built environment. In addition, there are numerous potential interactions within the ecosystem that cannot be accounted for using chemical criteria alone. As noted in the previous chapter, stormwater pollutant concentrations are often well below acute toxicity levels as well as below chronic toxicity levels. This is typically because the quantity of urban runoff usually dilutes pollutant levels in receiving waters (see discussion in Chapter 3). However, continued stormwater runoff inputs into streams, lakes, wetlands, and estuaries, even at low contaminant concentration levels, may eventually lead to long-term biological damage. Cumulative stress from poor water quality can result in chronic toxicity effects or bioaccumulation impacts. Pollutant accumulations in aquatic sediments can also have a long-term negative impact on benthic organisms or the embryonic stages of aquatic organisms that utilize the benthic environment.

Direct and indirect (or downstream) impacts of water quality degradation are another issue related to urban runoff impacts. In most cases, both scales of impact are present. Direct impacts are those that are present in surface waters that receive stormwater runoff directly from developed (e.g. impervious) drainage areas. Studies of direct impacts tend to focus on the hydrologic or geomorphic aspects of urban runoff. Indirect impacts are those that impact receiving waters downstream of the source, such as rivers, lakes, nearshore areas, and estuaries. In general, indirect impacts are mainly due to the physio-chemical water-quality effects of urbanization, but there is some overlap between the two scales.

Hydrologic Impacts

Landscape Alteration

Urbanization is one of the most widespread and rapidly growing forms of landscape modification affecting aquatic ecosystems. Just over 5 percent of the total surface area of the U.S. is covered by development (e.g. urbanization) related land use (EOS, 2004). Although the total land area currently occupied by urbanization (i.e., residential, commercial, and industrial development) remains relatively low in comparison to agricultural or other human land-use activities, the trend toward greater urbanization continues (Elvidge et al., 2004). According to the 2000 United States Census (USCB, 2001), approximately 30 percent of the population lives in urban areas and 50 percent in suburban areas, with the remaining 20 percent in rural areas. From an ecosystem perspective, the ecological footprint of urbanization has been shown to be significant in many cases (Folke et al., 1997). For example, it has been estimated that urbanized areas produce more than three quarters of global greenhouse gas emissions (Grimm et al., 2000). Urban development and related human activities can also produce very high local extinction rates for natural biota and can often result in the spread of exotic or invasive species (McKinney, 2002).

Urbanization can be characterized as an increase in human population density, coupled with an increase in per capita consumption of natural resources and extensive modification of the natural landscape, creating a built environment that is inherently not sustainable over the long term and often continues to expand into natural areas (McDonnell and Pickett, 1990). The landscape alterations accompanying urbanization tend to be more long lasting than other human land uses. For example, throughout much of New England, native forest cover has been steadily increasing in area over the last century, restoring areas impacted by historic logging and agriculture, whereas urbanized areas of the same region continue to persist or have significantly expanded (Stein et al., 2000). Generally, in urbanizing watersheds, water pollution and stormwater runoff are related to human habitation and the resultant increase in human land uses.

Savani and Kammerer (1961) first discussed the relationship between natural land cover and developed land use with respect to the stages of urbanization. This

early research identified four stages of urbanization, each associated with characteristic changes in the hydrologic regime. These stages are rural, early urban (now called low-density suburban), middle urban (high-density suburban), and late urban. According to Savani and Kammerer (1961), during the rural stage of development, infiltration and evapo-transpiration are still the key components of the water cycle because the landscape is still predominantly unchanged from a hydrologic perspective. The early urban stage is characterized by large-lot development, where much of the natural vegetation is retained and impervious surfaces are just beginning to affect the basin hydrology. In the middle urban or suburban stage, impervious surfaces are beginning to dominate the landscape, with residential and commercial land uses being the most common. In the late urban stage, nearly all the natural vegetation has been removed, and impervious surfaces dominate the watershed landscape.

One of the most obvious manifestations of watershed development is the proliferation of impervious surfaces in the urbanizing landscape. Impervious surfaces can be broadly defined as any portion of the built environment that does not maintain the natural hydrologic regime. Impervious surfaces tend to inhibit or prevent infiltration and groundwater recharge. Impervious areas also tend to have less evapo-transpiration than natural areas. From a hydrologic perspective, development alters the natural landscape by removing native vegetation, disregarding local topography, and disturbing (through removal and/or compaction) the natural soil structure. Urbanization is typically accompanied by a reduction in rainfall interception, evapo-transpiration, and infiltration (Figure 4-1). Figure 4-2 shows the progression of impervious surface area and the changes in the hydrologic regime as development increases.

Impervious surfaces include roads, parking lots, sidewalks, driveways, and building rooftops. To a lesser extent, lawns, landscaped areas, golf courses, and parks can also be impervious (Schueler, 1995). These turf or landscaped areas are often directly connected to impervious areas and can contribute a significant fraction of the total runoff from built areas (Schueler, 1995). In addition, construction sites, agricultural croplands, quarries, and other areas of bare ground also contribute runoff volume. Impervious surface area tends to be correlated to human population density (Stankowski, 1972).

Although water resource degradation from urban runoff pollution is often considered the leading cause of ecological damage, this is not always the primary cause of water quality problems. The shift in the natural hydrologic regime from an infiltration-dominated scheme to one dominated by surface runoff resulting from watershed urbanization can have significant ramifications on river and stream hydrology (Dunne and Leopold, 1978). Due to the loss of infiltration, there is a reduction in groundwater recharge that can lead to lower dry-weather baseflows in surface waters. The relationship between imperviousness and runoff is

Figure 4-1: Comparison between the hydrologic regime for a natural, undeveloped watershed (upper) and an urbanized watershed in the Pacific Northwest

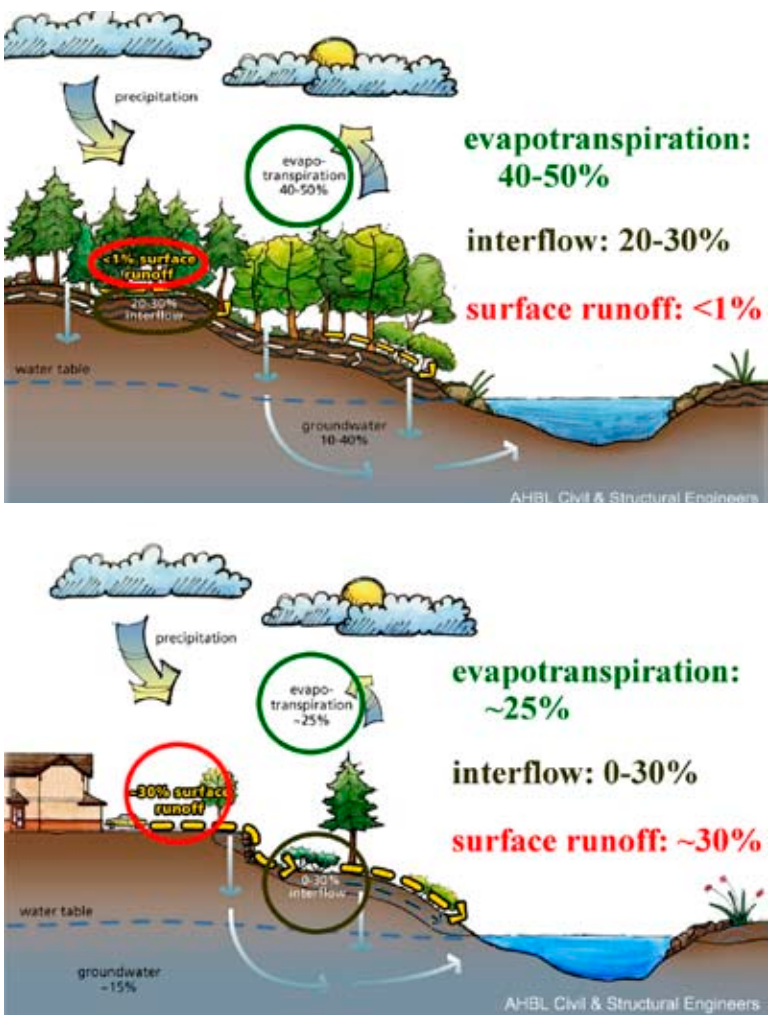

illustrated in Figure 4-3. The runoff coefficient reflects the fraction of rainfall volume that is converted to runoff. Runoff coefficient tends to closely track the percentage of impervious surface area in a given watershed, except at low levels of development where vegetation cover, soil conditions, and slope factors also influence the partitioning of rainfall. Impervious surfaces are hydrologically active, meaning they generate surface runoff instead of absorbing precipitation (Novotny and Chesters, 1981).

The total fraction of a watershed that is covered by impervious surface areas is typically referred to as the percent total impervious area (%TIA). The %TIA of a watershed is a landscape-level indicator that integrates several concurrent interactions influencing the hydrologic regime as well as water quality (McGriff, 1972; Graham et al., 1974; Dunne and Leopold, 1978; Alley and Veenhuis, 1983; Schueler, 1994; Arnold and Gibbons, 1996; May et al., 1997; EPA, 1997). Another impervious term commonly used in urban watershed work, especially in the modeling arena, is effective

Figure 4-2: Typical Progression of Hydrologic Changes in Urbanizing Watersheds as Imperviousness Increases With Development

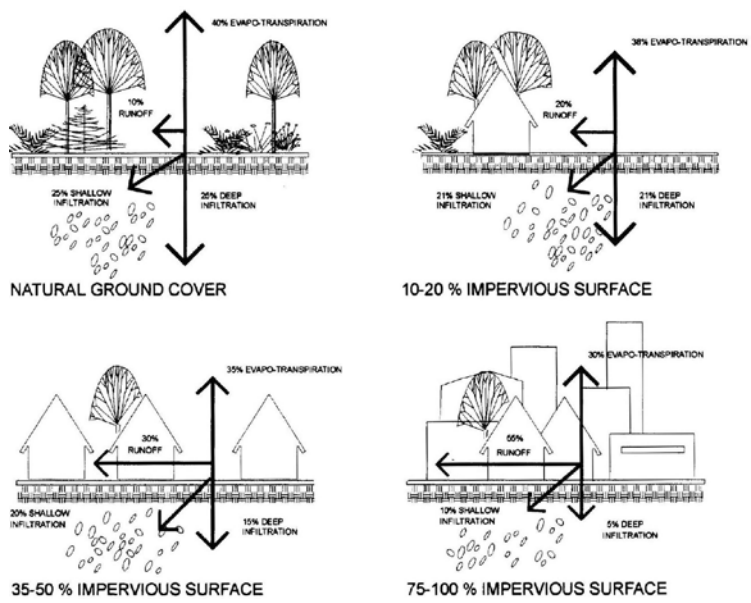

Source: Schueler, 1994

Figure 4-3: Relationship Between Imperviousness and Stormwater Runoff

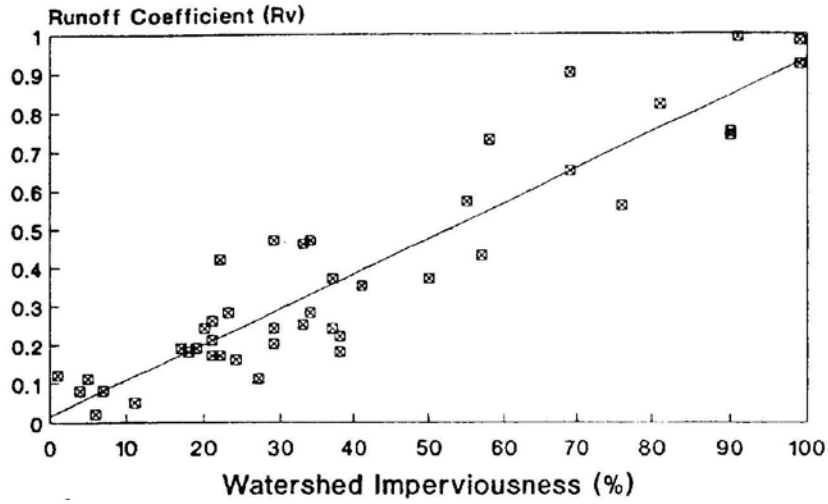

Source: Schueler, 1994

impervious area (%EIA). The %EIA is that portion of the impervious surfaces that is directly connected (via open channels or stormwater piping) to the natural drainage network (Alley and Veenhuis, 1983).

Another useful indicator of landscape-scale changes in watershed condition is the fraction of the basin that is covered by natural vegetation. In many areas, forest cover is the key parameter, but in other regions, prairie or shrub-savannah could be the key natural vegetation community. In any case, native vegetation tends to be adapted to local climate conditions and soil characteristics, making it the land cover that best supports the natural hydrologic regime. In general, urbanization tends to reduce natural vegetation land cover, while increasing impervious surface area associated with the variety of land uses present in the built environment. In most regions, the fraction of the watershed covered by natural vegetation is inversely correlated with imperviousness. For example, in the Puget Sound region of the Pacific Northwest, forest cover and imperviousness are strongly interrelated (see Figure 4-4), as are road density and imperviousness (see Figure 4-5).

Figure 4-4: Relationship Between Forest Cover and Impervious Surface Area in Urbanizing Watersheds in the Puget Sound Region of the Pacific Northwest

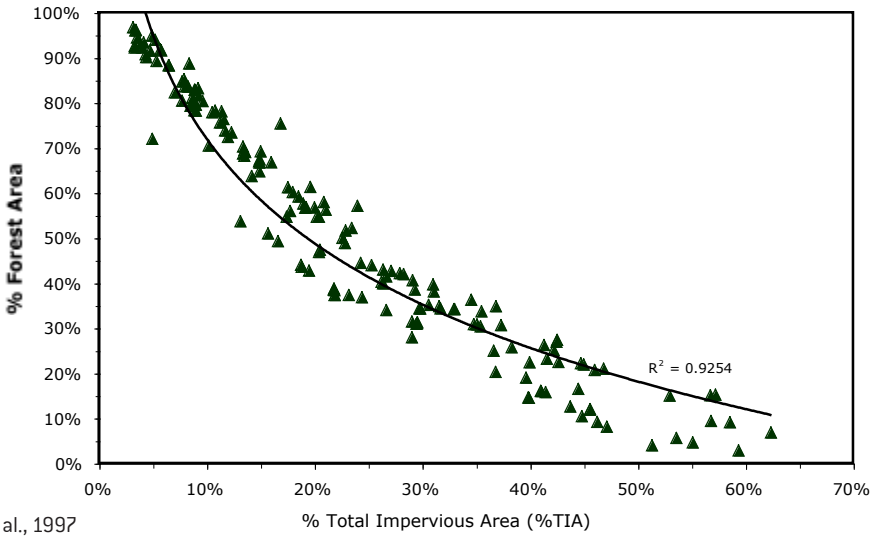

Source: May et al., 1997

Figure 4-5: Relationship Between Road Density and Impervious Surface Area in Urbanizing Watersheds in the Puget Sound Region of the Pacific Northwest

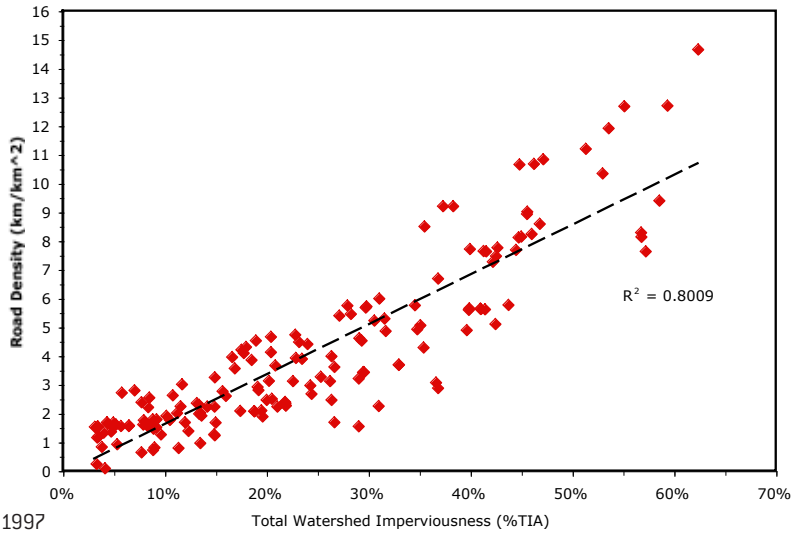

Source: May et al., 1997

Hydrological analyses suggest that maintaining forest cover is more important than limiting impervious-area percentages, at least at rural residential densities where zoning effectively limits the range of imperviousness to relatively low levels (typically < 10 percent TIA). However, without clearing limitations, the area of natural forest cover can vary widely (Booth et al., 2002). Consequently, both types of land-cover control (i.e., forest retention and impervious limitation) are likely critical to protecting aquatic resources. In rural areas, at the lower end of the development spectrum, current research indicates that retention of forest cover may be more important than limiting impervious surfaces (Booth et al., 2002). Degraded watersheds with less than 10 percent imperviousness and less than 65 percent forest cover are common ("cleared rural"); in contrast, virtually no watersheds with more than 10 percent imperviousness that have also retained at least 65 percent forest cover ("forested urban") exist in the Puget Sound region (Booth et al., 2002).

A study from western Washington illustrates the changes in hydrologic function that occur during the development process (Burges et al., 1998). To estimate the hydrologic balance for two basins in close proximity, an approach was used combining hydrologic modeling and simple monitoring. At the time of the study, both basins were in suburban areas, but one was relatively undeveloped, while the other was suburban in land use. Before being developed, the Novelty Hill and Klahanie basins were hydrologically similar. Both study basins are in the same geological region and were once largely forested. Novelty Hill was significantly deforested, and 30 percent of the area was covered with impervious surfaces. In this study, Novelty Hill had a faster flow response, higher peak flow, and longer time of discharge. Also, there was more flow response when there was preceding wetness in the soil. For the annual water balance in this basin (the difference between precipitation and catchment outflow), 69 to 88 percent of annual precipitation left as groundwater recharge or evapo-transpiration (Burges et al., 1998). Because the soil at Novelty Hill is deeper and less disturbed than at Klahanie, it takes more precipitation to saturate. In the developed Klahanie basin, 44 to 48 percent of the annual precipitation left as catchment outflow, as opposed to about 12 to 30 percent in Novelty Hill (Burges, et al., 1998). One of the most interesting findings of this study was that runoff from what are considered pervious areas such as lawns and landscaped areas accounted for 40 to 60 percent of the total annual runoff in the developed basin (Burges et al., 1998). In addition, the loss of local depressional storage likely influences hydrologic function of lawns and landscaped areas converted from natural forested areas. This study also illustrates that imperviousness encompasses much more that just paved surfaces.

Urban Hydrologic Regime

This section focuses on changes in runoff and stream-flow because they are common in urbanizing watersheds and often cause dramatic changes in basin hydrology. Hydrologic change also influences the whole range of environmental features that affect aquatic biota-flow regime, aquatic habitat structure, water quality, biotic interactions, and food sources (Karr, 1991). Although runoff and stream-flow regime are important, they are by no means the only drivers of aquatic health.

As has been discussed, urbanization alters the hydrologic regime of surface waters by changing the way water cycles through a drainage basin. In a natural setting, precipitation is intercepted or delayed by the forest canopy and ground cover. Vegetation, depressions on the land, and soils provide extensive storage capacity for precipitation. Water exceeding this capacity travels via shallow subsurface flow and groundwater and eventually discharges gradually to surface water bodies. In a forested, undisturbed watershed, direct surface runoff occurs rarely or not at all because precipitation intensities do not exceed soil infiltration rates. Figures 4-1 and 4-2 illustrates this shift in hydrologic regime.

During the initial phases of urbanization, clearing of native vegetation reduces or eliminates interception storage and the water reservoir in soils. Loss of vegetation and "duff" (mostly composting vegetative material) from the understory takes away another storage reservoir. Site grading eliminates natural depressions. Impervious surfaces, of course, stop any infiltration and produce surface runoff. Even when surfaces remain pervious, building often removes, erodes, or compacts topsoil. The compacted, exposed soil retards infiltration and offers much less storage capacity. Development typically replaces natural drainage systems with hydraulically efficient pipe or ditch networks that shorten the travel time of runoff to the receiving water (Hirsch et al., 1990).

The many changes brought on by urbanization tend to alter streamflow patterns in characteristic ways.

Figure 4-6 illustrates typical hydrographs (flow rate versus time) for a stream before and after watershed urbanization. The hydrograph emphasizes the higher peak flow rate of urbanized basins compared to natural landscape conditions. The area under the hydrograph curves represents the total runoff volume, which is significantly greater for the urbanized condition. In addition, there is typically less "lag time" between rainfall and runoff when more impervious surfaces exist. The construction of an engineered stormwater drainage network also invariably increases the drainage density of urbanizing basins (Graf, 1977). Typically, these engineered conveyance systems are designed to efficiently remove water from the natural drainage network and so reduce the time necessary for overland flow to reach stream channels. The net effect of these urban watershed changes is that a higher proportion of rainfall is translated into runoff, which occurs more rapidly, and the resultant flood flows are therefore higher and much more "flashy" than natural catchments (Hollis, 1975).

In general, the hydrologic changes associated with urbanization can be traced primarily to the loss of natural land cover (vegetation and soil) and the increase in impervious surfaces in the watershed (Dunne and Leopold, 1978). The impact of urbanization and impervious surfaces on watershed hydrology has been studied for many decades. Wilson (1967) studied the impact of urbanization on flooding in Jackson, Mississippi. Early research by Leopold (1968) reported that a two- to five-fold increase in peak streamflow was common in urbanizing basins, although some streams showed an even greater rise, especially in arid areas. Seaburn (1969) studied the effects of urbanization on stormwater runoff on Long Island, New York, finding similar results. Hammer (1973) also found that peak streamflows increased with greater watershed urbanization. A decline in groundwater recharge is also common in urbanizing watersheds, due to greater impervious areas and less infiltration (Foster et al., 1994). Bharuri et al., (1997) also quantified the changes in streamflow and related decreases in groundwater recharge associated with watershed urbanization in the Midwest.

Hollis (1975) studied the impact of urbanization on flood recurrence interval. This research found that, in general, floods with a return period of one year or longer are not affected by a watershed impervious level of approximately 5 percent. In addition, small flooding events and peak streamflows may be increased by up to 10 times that found under natural conditions. Hollis (1975) found that under typical (~30 percent imperviousness) urbanized conditions, 100-year floods can be doubled in magnitude due to the greater runoff volume. Finally, the hydrologic effect of urbanization tends to decline, in relative terms, as flood recurrence intervals increase (Hollis, 1975). The findings of these studies indicate that it is not uncommon for a flood event with a 10-year recurrence interval to shift to a more frequent 2-year interval. Hollis (1975) also found that the discharge rates of small, frequent floods tend to increase by a greater percentage of pre-development rates than those of large, infrequent floods.

Figure 4-6: Changes in Stream Hydrology as a Result of Urbanization

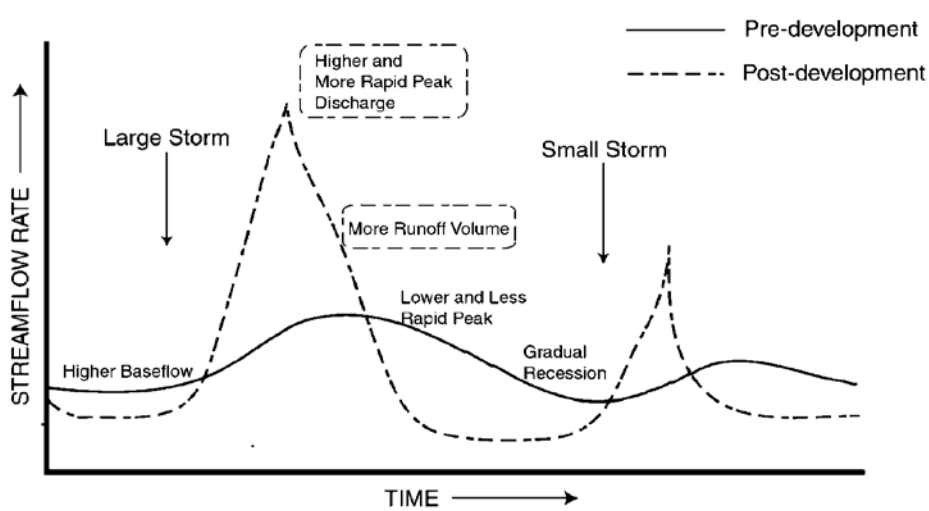

Source: Schueler, 1994

In addition, the frequency of bankfull flows can be significantly increased in urbanizing stream basins. In western Washington State, a computer model capable of continuous simulation was used to study the hydrology of two similar watersheds (Booth, 1991). It compared a fully forested basin with a developed (approximately 40 percent impervious area) basin. The model predicted that the pre-development discharge that occurs only once in five years would occur in 39 of 40 years after urbanization. These alterations in hydrologic characteristics can result in a significant change in the disturbance regime of a typical stream ecosystem (Booth, 1991).

In a study in the Toronto area of Ontario, Canada (Snodgrass et al., 1998), the bankfull streamflow recurrence period was 1.5 years under natural conditions. Storms that result in bankfull flows were generally found to be in equilibrium with the natural resisting forces (e.g., stream bank vegetation) that tend to stabilize the stream channel. As watersheds urbanized, the streamflows that were bankfull flows occurred more frequently, up to about every 0.4 years in Toronto (Snodgrass et al., 1998).

A study in the upper Accotink Creek watershed in northern Virginia related the increase in impervious surface area from development to changes in streamflow over the period 1949 to 1994 (Jennings and Jarnagin, 2002). Over this period, the percent TIA increased from 3 percent to 33 percent. Over the same period, streamflow discharge response to precipitation events increased significantly, as did the frequency of peak events (Jennings and Jarnagin, 2002).

Other studies have shown similar results. In a stream study in Washington State, the flow rate that had been reached only once in 10 years on average before development, increased in frequency to about every two years after urbanization (Scott, 1982). In a similar study in Korea, the peak discharge of runoff increased and the mean lag time of the study stream decreased due to urbanization over a period of two decades (Kang et al., 1998).

Another important characteristic of highly impervious, urbanized watersheds is the production of runoff during even relatively small storm events. Under natural conditions, small precipitation events generally produce little, if any, runoff. This is due to the interception and evapo-transpiration of rainfall by native vegetation as well as to the absorption of rainfall by the upper soil horizon and rainfall held in natural depressions where it eventually infiltrates or evaporates. It has been estimated that natural depressional storage is typically at least 4 times that of impervious surfaces (Novotny and Chesters, 1981). A study in Australia found that the average peak discharge for urban streams was 3.5 times higher than the peak flow for rural streams (Neller, 1988).

Booth (1991) noted that in addition to high-flow peaks being amplified in urban stream hydrographs in the Puget Sound region, new peaks also appeared. These new peaks were the result of small storms, most of which produced no runoff under pre-development conditions but generated substantial flows under the urbanized condition. Therefore, it can be concluded that watershed development does more than just magnify peak flows and flooding events; it also creates entirely new high-flow events due to runoff from impervious surfaces.

Yet another characteristic of urban streams is the more rapid recession of stormflow peaks (see Figure 4-6). In addition, the baseflow conditions in urban streams are typically lower in urbanized watersheds. This has been observed for wet season baseflows in the Puget Sound region (Konrad and Booth, 2002) and in the Chesapeake Bay region (Klein, 1979). In arid regions, there may also be a noticeable decrease in dry season baseflow due to watershed development (Harris and Rantz, 1964). A study in Long Island, New York revealed the extent of seasonal hydrologic shifts in urban streams. In several undeveloped watersheds, stream baseflow constituted up to 95 percent of annual discharge. That proportion dropped to 20 percent after development (Simmons and Richard, 1982).

Rose and Peters (2001) examined streamflow characteristics that changed during the period from 1958 to 1996 in a highly urbanized watershed (Peachtree Creek), compared to less urbanized watersheds and non-urbanized watersheds, in the vicinity of Atlanta, Georgia. Data was obtained from seven U.S. Geological Survey (USGS) stream gages, 17 National Weather Service rain gages, and five USGS monitoring wells. The fraction of the rainfall occurring as runoff in the urban watershed was not significantly greater than in the less urbanized watersheds, but this ratio did decrease from the higher elevation and higher relief watersheds to the lower elevation and lower relief watersheds. For the 25 largest stormflows, the peak flows for the urban creek were 30 to 100 percent greater than the peak flows in the streams located in the less developed areas. In the urban stream, the streamflow also decreased more rapidly after storms than in the other streams. The low flow in the urban creek was 25 to 35 percent lower than in the less developed streams, likely caused by decreased infiltration

due to the more efficient routing of stormwater and the paving of groundwater recharge areas.

In an extensive stream research project in Wisconsin, the observed decrease in stream baseflow was found to be strongly correlated with watershed imperviousness (Wang et al., 2001). Similarly, an urban stream study in Vancouver, British Columbia, Canada, monitored 11 urbanizing small-stream watersheds. Baseflow and groundwater recharge were consistently lower in watersheds with more than 40 percent impervious cover (Finkebine et al., 2000). Both of these studies found linkages between these shifts in hydrologic regime and both habitat degradation and the decline in biological integrity in the urbanizing streams.

Sheeder and others (2002) investigated the hydrograph responses to dual rural and urban land uses in three small watersheds. Two important conclusions were deduced from this investigation. First, in all cases, the researchers found two distinct peaks in stream discharge, each representing different contributing areas to direct discharge with greatly differing curve numbers and lags, representative of urban and rural source regions. Second, the direct discharge represented only a small fraction of the total drainage area, with the urban peak becoming increasingly important in relation to the rural peak as urbanization increases and the magnitude of the rain event decreases.

Nagasaka and Nakamura (1999) examined the influences of land-use changes on the hydrologic response and the riparian environment in a northern Japanese area. Temporal changes in a hydrological system and riparian ecosystem were examined with reference to land-use conversion in order to clarify the linkages between the two. The results indicated that the hydrological system had been altered since the 1970s, with increasing flood peaks of 1.5 to 2.5 times, and the time of peak flow appearances shortening by seven hours. The ecological systems were closely related to and distinctly altered by the changes that had occurred in the local land use. A similar study in southern California found comparable results (White and Greer, 2002).

Adjacent to water bodies, floodplain encroachment eliminates another storage zone needed to diminish high flows. When the channel cannot contain the greater flow, flooding results. Clearing riparian vegetation removes the wood supply that helps slow down the flow and, in many cases, prevent bed and bank erosion. Clearing also eliminates shade, refuge, and food supply. Urban residents and high streamflows remove remaining wood, further decreasing the stream's opportunity to dissipate energy without flooding or damaging the channel (Dunne and Leopold, 1978). In addition, any channel modifications (e.g., streambank armoring, levee construction, or diking) that inhibit stream-floodplain interactions can have serious consequences for downstream flooding.

Biological and Ecological Effects of Urban Hydrologic Change

As discussed above, the hydrologic impacts of watershed urbanization include the following:

- Greater runoff volume from impervious surfaces;
- Higher flood recurrence frequency;
- Less lag time between rainfall, runoff, and streamflow response;
- Higher peak streamflow for a given size storm event;
- More bankfull or higher streamflows – flashier flows;
- Longer duration of high streamflows during storm events;
- More rapid recession from peak flows;
- Lower wet and dry season baseflow levels;
- Less groundwater recharge; and
- Greater wetland water level fluctuation.

All of these characteristics represent alterations in the natural hydrologic regime to which aquatic biota have adapted over the long term. These are significant hydrologic changes that can negatively impact aquatic biota directly or indirectly. Direct impacts include washout of organisms from their preferred habitat and the physiological stress of swimming in higher flows. Indirect impacts are centered on the degradation of in-stream habitat that occurs as a result of the higher urban streamflows. These higher flows result in changes in channel geomorphology and physical habitat (to be discussed in detail in the next section), including stream bank erosion, stream channel instability, elevated levels of turbidity and fine sediment, channel widening or incision, stream bed scour, and the washout of in-stream structural elements (e.g., large woody debris or LWD).

An extensive study comparing an urban (Kelsey Creek) and a non-urban (Big Bear Creek) stream in

the Puget Sound region found that hydrologic changes from urbanization were the principal reasons that the urban stream failed to match its non-urban counterpart in diversity and size of salmonid fish populations and other biological indices (Pederson, 1981; Richey et al., 1981; Perkins, 1982; Richey, 1982; Scott et al., 1982). The study found that Kelsey Creek had significantly higher stormflows and flood flows, as well as lower baseflows, than Bear Creek. This shift in hydrologic regime resulted in extensive habitat degradation and stream channel alteration from the natural condition.

Another study in the Puget Sound region looked at the streamflow records of six small lowland streams over a 40-year period. Four of the study streams exhibited a significant increase in urbanization and two remained relatively undeveloped over the study period. Each of the urbanized basins experienced a significant increase in flood frequency, while the undeveloped basins showed no discernable shift in flood frequency. Salmon spawning-count data for the developed basins showed a systematic decline in salmon abundance, while the undeveloped basins showed no evidence of decline. The data implies a link between salmon population decline and either increased flood frequency or an associated degradation in habitat (Moscrip and Montgomery, 1997).

The Puget Sound Lowland Stream Research Project (May et al., 1997), one of the most comprehensive studies of the cumulative impacts of urbanization, also found that the shift in hydrologic regime in urbanizing small-stream watersheds was the primary cause of degraded habitat conditions, reduced stream biological integrity, and declining salmon diversity. In the Pacific Northwest, the importance of hydrologic alteration and its effects on stream habitats and the salmonid resource is widely recognized. A significant share of the urban runoff management effort goes into controlling water quantity to attempt to retain pre-development hydrologic patterns. With respect to resource protection, in most other urbanized areas, more attention is generally paid to quality control than to controlling quantity to maintain stream channel integrity. Yet, the same hydrologic modification problems have been noted elsewhere (Wilson, 1967; Seaburn, 1969; Hammer, 1972; Klein, 1979).

Finally, a comprehensive literature review conducted by Bunn and Arthington (2002) identifies the key principles and ecological consequences of altered flow regimes resulting from human modification of the watershed. These principles establish the linkages between flow regime and aquatic biodiversity as indicated in Figure 4-7. Their first principle is that flow is a major determinant of physical habitat in streams, which in turn determines the biotic composition of stream communities. Under this principle, channel geomorphic form, habitat structure, and complexity are determined by prevailing flow conditions. Urban examples of this have been discussed above, including the impact of flashy urban flows on benthic macroinvertebrates and native fish. The biotic communities of streams are largely determined by their natural flow regimes. This is true for aquatic insects and other macroinvertebrates (Resh

Figure 4-7: Aquatic Biodiversity and Natural Flow Regimes

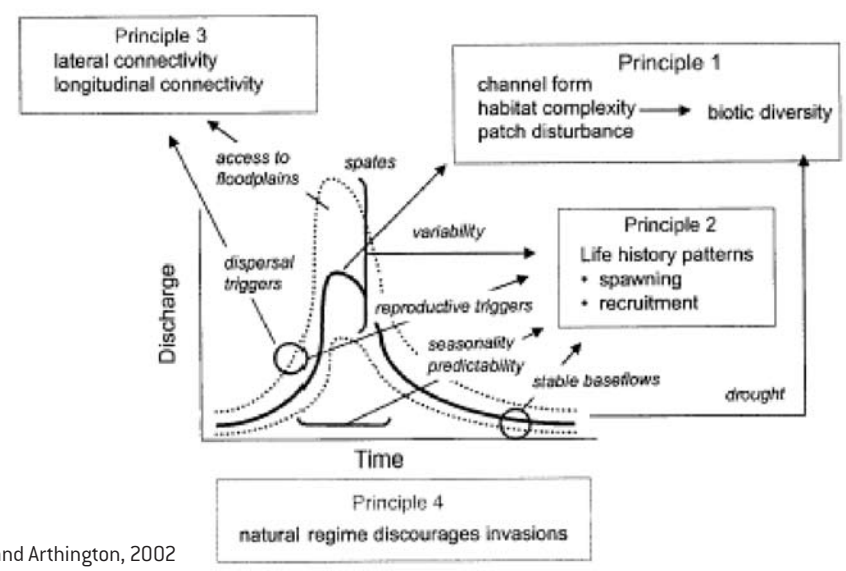

Source: Bunn and Arthington, 2002

et al., 1988) as well as fish (Poff and Ward, 1989; Poff and Allen, 1995; Poff et al., 1997).

The second principle is that aquatic species have evolved life history strategies primarily in direct response to the natural flow regime (Bunn and Arthington, 2002). For example, the timing and spatial distribution of salmon migration and spawning in the Pacific Northwest is largely determined by the natural flow regimes in each watershed (Groot and Margolis, 1991).

The third principle states that the maintenance of natural patterns of longitudinal and lateral connectivity is essential to the long-term viability of many populations of aquatic biota in flowing waters (Bunn and Arthington, 2002). Lateral connectivity refers to maintaining a connection between the active stream channel and the floodplain-riparian zone (Ward et al., 1999). This connection is often severely disrupted or lost altogether in urban streams where channelization and stream bank armoring are common. Longitudinal connectivity is disrupted by fragmentation of the riparian corridor by road or utility crossings (discussed in a later section) and the construction of in-stream migration barriers. The construction of dams and diversion structures, as well as road-crossing culverts that block fish passage, can significantly influence the viability of stream fish populations. In-stream barriers can block adult migration upstream to spawn, restrict juvenile fish access to rearing or refugia habitat, and disrupt the flow of large woody debris (LWD) and organic matter (OM) within the stream ecosystem. The river continuum concept (Vannote et al., 1980) illustrates the importance of connectivity within a stream ecosystem (Figure 4-8).

Figure 4-8: River Continuum Concept

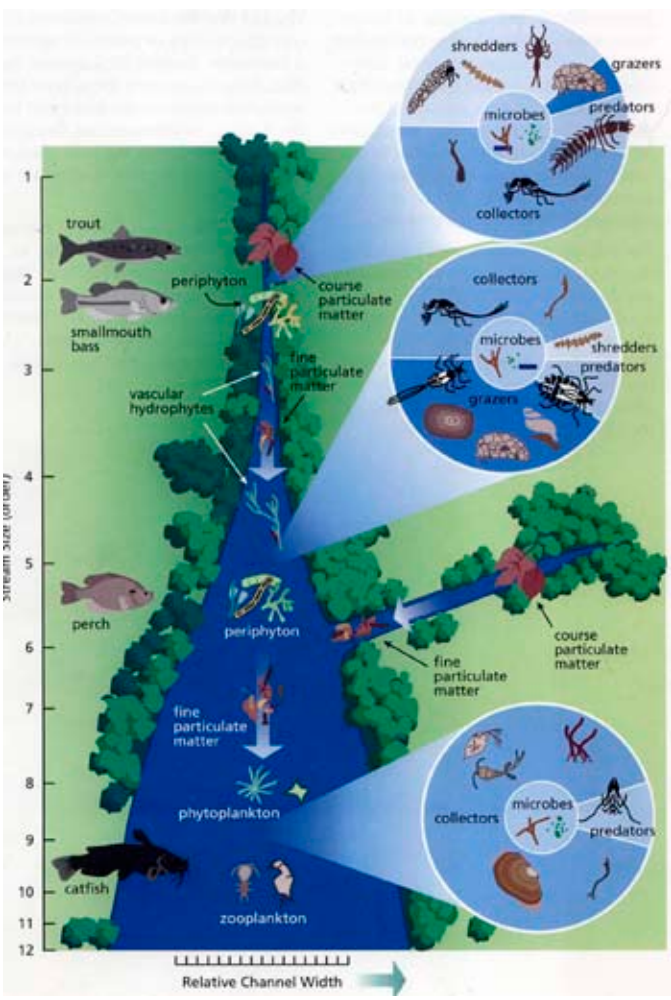

Source: Modified from Van Note et al., 1980

The fourth and final principle states that the survival of invasive, exotic, and introduced (non-native) species is facilitated by altered flow regimes (Bunn and Arthington, 2002). The most successful exotic and invasive fish are often those that are either habitat generalists or adaptable to changing conditions (Moyle, 1986). Both these strategies are favorable to survival in urbanized hydrologic regimes. In addition, the long-term persistence of invasive fish is much more likely in aquatic systems that are permanently altered by human activity, as is the case for urbanized watersheds (Moyle and Light, 1996).

Urban Freshwater Wetland Hydrology

Wetlands provide many ecological functions for the watershed in which they are located. These functions include hydrologic, ecological, and water-quality components. Wetlands provide water storage features dispersed throughout the watershed landscape. Riparian wetlands provide natural flood storage volume. Most wetlands also provide critical storage

capacity during periods of precipitation that provides for stream and groundwater recharge during dry periods. Wetlands also provide key habitat features for a variety of wildlife species.

The King County Urban Wetland Research Project studied the impacts of urbanization on freshwater wetlands in the Puget Sound lowland eco-region (Azous and Horner, 2003). Water level gages were used to determine wetland water level fluctuation (WLF). WLF is defined as the difference between base water level (BL) prior to a storm event and the crest or maximum water level (CL) for the event (WLF = CL – BL). This research found that WLF depends on a variety of watershed and wetland characteristics, but typically exceeded the natural range when basin imperviousness reached 10 percent TIA (Taylor, 1993; Azous and Horner, 2003). Similar results were found in freshwater wetlands in New Jersey (Ehrenfeld et al., 2003) and in tidal wetlands around the country (Thom et al., 2001). In a study in Saint Paul, Minnesota, Brown (1988) found that stormwater runoff quantity was related to both the amount of impervious surface area and the wetland-lake area in a basin.

In the Puget Sound urban wetland study, the WLF caused by watershed urbanization was not found to be consistently related to plant species richness but turned out to be an important factor in certain habitat types nonetheless, most notably in emergent wetlands. The frequency and duration of freshwater wetland flooding events was related to plant richness in all Puget Sound wetlands (Azous and Horner, 2003). The highest species richness at all water depths was found in wetlands with an average of less than three flooding events per month. Wetlands with a cumulative duration of flooding events lower than three days per month also had the highest species richness (Azous and Horner, 2003). While frequency affected plant richness at all water depths, duration particularly compounded the impact of frequency on vegetation found in water over two feet deep. When frequency and duration were analyzed together, it was found that the highest richness was found in wetlands with both an average of less than three events per month and a cumulative duration of flooding that was shorter than six days per month. These two factors were found to be more important than water depth in predicting plant richness (Azous and Horner, 2003).

In the Puget Sound lowland eco-region, watershed urbanization was found to have a negative impact on both native lentic and terrestrial-breeding amphibian richness. Wetlands with increasing urbanization in their contributing watersheds were significantly more likely to have lower amphibian richness than wetlands in less urbanized or natural watersheds (Azous and Horner, 2003). This relationship was linked to increased runoff into urban wetlands as well as a resultant increased WLF. When average WLF exceeded 20 cm, the number of native amphibian species declined significantly (Azous and Horner, 2003). It is thought that the greater WLF may have a disproportionate negative impact on amphibian breeding habitat and/or higher egg-embryo mortality due to desiccation of egg masses (Azous and Horner, 2003). Urbanized land-use activity in areas immediately adjacent to wetlands (within buffer zones) also decreased native amphibian richness (Azous and Horner, 2003). In general, wetlands adjacent to larger areas of forest are more likely to have richer populations of native amphibians.

Wetland WLF and flooding can also affect the richness of bird species. Increased flooding events may inundate nesting sites and disperse pollutants that bioaccumulate in birds through the aquatic food chain (Azous and Horner, 2003). Increased runoff and high WLF can alter cover, nesting habitat, and the distribution of birds' food sources. It was not possible, however, to establish that changes in population are directly related to land use since it is difficult to control for all habitat factors besides urbanization. In general, average bird species richness was inversely related to the level of urbanization (Azous and Horner, 2003).

The findings of the Puget Sound lowland eco-region urban wetland study consistently indicated that placing impervious surface on some 10 percent of a watershed creates significantly negative hydrologic, habitat, and ecological responses (Azous and Horner, 2003). To complicate the picture, development located immediately adjacent to the wetland (wetland buffer area and surrounding development), rather than away from it, can also have a significant influence on hydrologic conditions, habitat quality, and water quality (Azous and Horner, 2003).

Physical Impacts

Geomorphic Changes

Urbanization and the resultant hydrologic changes outlined above can cause significant alterations of natural stream morphological characteristics. The direct and indirect impacts of urbanization can affect longitudinal stream channel characteristics such as sinuosity and gradient. In addition, lateral characteristics such as stream channel bankfull width (BFW) and bankfull depth (BFD) can be altered as the stream expands to accommodate the higher runoff-driven flows brought on by watershed urbanization. Figure 4-9 illustrates the process of channel enlargement in urbanizing streams. Neller (1989) and Booth and Henshaw (2001) both reported that stream channels in urbanized watersheds had cross-sectional areas that were significantly larger than would be predicted based on catchment area and discharge alone.

Channel enlargement can be a gradual process that follows the pace of urbanization, or it can frequently occur abruptly in response to particular storms (Hammer, 1972; Leopold, 1973; Booth, 1989; Booth and Henshaw 2001). Even in cases where the stream has been stable for many years, abrupt and sometimes massive changes in channel dimensions can occur in a single large storm once urbanization progresses to some critical level. In addition to causing accelerated channel enlargement, the higher and more frequent bankfull flows characteristic of urbanizing streams can also cause stream bank erosion, floodplain degradation, and a loss of channel sinuosity (Arnold et al., 1982).

During the construction phase of development, surface erosion of exposed areas can increase the supply of sediment available to runoff. This deposition of excess sediment can result in streambed aggradation and overbank deposition in floodplain areas. After construction is complete in a sub-basin, the external supply of sediment is reduced, but bankfull flows continue to increase as runoff from impervious surfaces increases. This can lead to increased stream bank erosion and channel enlargement as the stream tries to accommodate the increased streamflows (Paul and Meyer, 2001).

Channel enlargement tends to occur more often in urban streams that have some grade-control structures, such as in-stream LWD or road culverts. In these cases, the stream will generally erode the banks in order to widen the cross-sectional area to carry the higher urbanized flows. Culverts and other artificial grade-control structures can often cause downstream scour or upstream sediment deposition if not properly installed or maintained. Culverts in urban streams can often become migration barriers for aquatic biota such as anadromous fish or amphibians. In addition, if not properly sized for urban streamflows, culverts can cause significant localized flooding.

It has been hypothesized that urban streams will eventually adjust to their post-development hydrologic

Figure 4-9: Changes in Stream-Channel Geomorphology Due to Urbanization

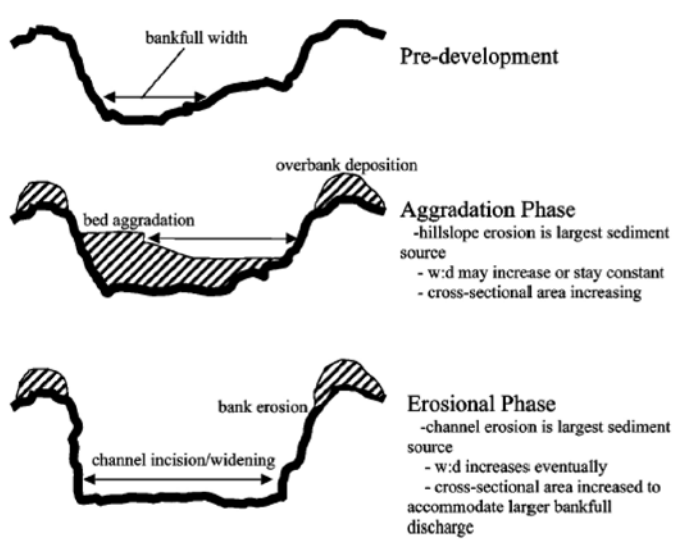

Source: Neller, 1989

regime and sediment supply. There is evidence that this is the case in some regions, such as Vancouver, British Columbia, Canada (Finkebine et al., 2000) and in the Puget Sound region (Booth and Henshaw, 2001) where some urban streams seem to have stabilized several decades after build-out was completed.

In other situations, rapid channel down-cutting, known as incision, can be especially dramatic in urbanizing streams, particularly in regions with unconsolidated soils or where in-stream (e.g., LWD) structure is lost (Shields et al., 1994). In the Pacific Northwest, incision can result when increased flow and loss of LWD that dissipates energy occur in relatively steep channels with easily erodible substrate (Booth, 1991). While all channel damage is ecologically detrimental, incision is especially problematic because it removes virtually all habitat and supplies great quantities of sediment that do further damage downstream (Booth and Henshaw, 2001).

Land-use encroachment into floodplain areas and flood-control measures such as dikes and levees can also simplify and straighten a stream channel. This can exacerbate downstream channel alterations (Graf, 1975). In addition to channel modifications carried out during urban development, many streams have residual channelization impacts from past agricultural activities. Stream bank armoring or "rip-rapping" used to mitigate stream bank erosion can actually worsen downstream flooding and stream bank erosion problems. Storm event flows are unable to spread out onto the floodplain, and the increased velocities are transferred downstream along with the elevated sediment loads. There can also be a direct loss of channel migration zone (CMZ) as well as floodplain disconnection, as stream banks are armoring and development encroaches. Trimble (1997) demonstrated that channel enlargement due to the increase in watershed urbanization-driven flows caused extensive stream bank erosion, which accounted for 66 percent of the sediment transported downstream in an urban stream in San Diego, California.

Research in several locations suggests that flows larger than a two- to five-year frequency discharge can be sufficient to create large-scale channel disruption (Carling, 1988; Sidle, 1988; Booth, 1990). More than anything else, the greatly increased incidence of these flows explains the ecological vulnerability of urban streams. In addition to stream bank erosion and streambed scour or incision, higher urban streamflows can physically destroy or wash out in-stream structural elements, such as LWD. This can have a negative feedback effect on the stream channel. As higher flows wash out more and more LWD, the channel becomes even more unstable and more susceptible to further geomorphic degradation. Under these conditions, stream channels can actually "unravel" as the combined effects of channel incision, enlargement, and erosion continue to impact the stream system (Horner et al., 1997).

Two similar studies, one in Maine (Morse, 2001) and one in the Puget Sound region (May et al., 1997), demonstrated that stream bank erosion was related to the level of watershed imperviousness and linked directly to the shift in hydrologic regime. This is not to say that stream bank erosion and other geomorphic changes are only driven by urbanization. Booth (1991) and Bledsoe (2001) both reported that geomorphic change in response to urbanization depends on other factors, such as underlying geology, vegetation structure, and soil type.

Stream bank erosion and streambed scour resulting from the urban streamflow regime described previously can result in the production of excessive quantities of fine sediment (Nelson and Booth, 2002). This increase in sediment yield can be especially acute during the construction phase of development when runoff from bare ground on construction sites can carry very high sediment loads. This change in sediment transport regime can change a stream from a meandering to a braided and aggrading channel form (Arnold et al., 1982).

The shift in sediment transport regime that typically accompanies urbanization can also result in excessive sedimentation of streambed habitats. Streambeds can also become embedded and ecologically non-functional with frequent deposits of fine sediment. In the Puget Sound region, it was found that the percentage of fine sediment in stream substrates used by salmon for spawning increased along with watershed urbanization (May et al., 1997).

When a watershed is finally fully built out, this situation can actually reverse as impervious surfaces become the dominant landscape feature. Under fully urbanized basin conditions, there is often a lack of sediment delivered to stream channels (Wolman, 1967; Booth, 1991; Pizzuto et al., 2000). Under highly urbanized conditions, streambeds can become armored and are, for the most part, ecologically non-functional (May et al., 1997).

As discussed above, the geomorphologic impacts of watershed urbanization include the following:

- Stream channel enlargement and instability;
- Stream bank erosion and fine sediment production;

- Stream channel incision or down-cutting;
- Streambed scour and fine sediment deposition;
- Increase in streambed embeddedness;
- Riparian buffer (lateral) encroachment;
- Riparian corridor (longitudinal) fragmentation;
- Channelization and floodplain encroachment;
- Stream bank armoring and loss of CMZ;
- Increased sediment yields, especially during construction;
- Washout of in-stream LWD;
- Simplification of the natural drainage network, including loss of headwater channels and wetlands and lower drainage density;
- Modification of natural in-stream pool-riffle structure; and
- Fish and amphibian migration barriers (e.g., culverts and dams).

Degradation of Riparian Integrity

Riparian vegetation or the streamside forest is an integral component of all stream ecosystems. This is especially true of forested regions like the Pacific Northwest. A wide, nearly continuous corridor of mature forest, off-channel wetlands, and complex floodplain areas characterizes the natural stream-riparian ecosystems of the Pacific Northwest (Naiman and Bilby, 1998). Native riparian forests of the region are typically dominated by a complex, multi-layered forest of mature conifers mixed with patches of alder where disturbance has occurred in the recent past (Gregory et al., 1991). The riparian forest also includes a complex, dense, and diverse understory and ground cover vegetation. In addition, the extensive upper soil layer of forest "duff" provides vital water retention and filtering capacity for the ecosystem. A typical natural riparian corridor in the Puget Sound lowlands also includes a floodplain area, a channel migration zone (CMZ), and numerous off-channel wetlands. Natural floodplains, an unconstrained CMZ, and complex riparian wetlands are critical components of a properly functioning aquatic ecosystem (Naiman and Bilby, 1998). Organic debris and vegetation from riparian forests also provide a majority of the organic carbon and nutrients that support the aquatic ecosystem food web in these small lowland streams. In short, the riparian community (vegetation and wildlife) directly influences the physical, chemical, and biological conditions of the aquatic ecosystem. Reciprocally, the aquatic ecosystem affects the structure and function of the riparian community.

In addition to the characteristics of the riparian forest described above, the most commonly recognized functions of the riparian corridor include the following:

- Providing canopy-cover shade necessary to maintain cool stream temperatures required by salmonids and other aquatic biota. Regulation of sunlight and microclimate for the stream-riparian ecosystem (Gregory et al., 1991).
- Providing organic debris, leaf litter, and other allochthonous inputs that are a critical component of many stream food webs, especially in headwater reaches (Gregory et al., 1991; Naiman et al., 2000; Rot et al., 2000).
- Stabilizing stream banks, minimizing stream bank erosion, and reducing the occurrence of landslides while still providing stream gravel recruitment (Naiman et al., 2000).
- Interacting with the stream channel in the floodplain and channel migration zone (CMZ). Retention of flood waters. Reduction of fine sediment input into the stream system through floodplain sediment retention and vegetative filtering (Naiman et al., 2000).
- Facilitating the exchange of groundwater and surface water in the riparian floodplain and stream hyporheic zone (Correll, et al., 2000).
- Filtering and vegetative uptake of nutrients and pollutants from groundwater and stormwater runoff (Fischer et al., 2000).
- Providing recruitment of large woody debris (LWD) into the stream channel. LWD is the primary in-stream structural element and functions as a hydraulic roughness element to moderate streamflows. LWD also serves a pool-forming function, providing critical salmonid rearing, flow refugia, and enhanced instream habitat diversity (Fetherston et al., 1995; Rot, 1995; Rot et al., 2000).
- Providing critical wildlife habitat including migration corridors, feeding and watering habitat, and refuge areas during upland disturbance events (Gregory et al., 1991; Fischer et al., 2000; Hennings and Edge, 2003). Providing primary habitat for aquatic habitat modifiers such as beaver and

many other terrestrial predators or scavengers associated with salmonid populations.

Based on the results of research in the Puget Sound region (May et al., 1997), the term *riparian integrity* was adopted to describe the conditions found in natural lowland stream-riparian ecosystems. These properly functioning conditions can serve as a template for evaluation and management of riparian areas. As used here, riparian integrity includes both structural and functional elements characteristic of the natural stream-riparian ecosystem. Land-use activities and development encroachment pressure can have a negative impact on native riparian forests and wetlands, which are intimately involved in stream ecosystem functioning. Riparian integrity includes the following components:

- Lateral riparian extent (so-called "buffer" width);
- Longitudinal riparian corridor connectivity (low fragmentation);
- Riparian quality (vegetation type, diversity, and maturity); and
- Floodplain and channel migration zone (CMZ) integrity.

In general, urban riparian buffers have not been consistently protected or well managed (Schueler, 1995; Wenger, 1999; Horner and May, 1999; Moglen, 2000; Lee et al., 2004). This is certainly true of the Puget Sound region (Figure 4-10). Several factors reduce the effectiveness of riparian buffers in urbanizing watersheds. The surrounding land use may overwhelm the buffer, and human encroachment continues to occur in spite of established buffer zones. Buffers that are established by regulation during the construction phase of development are rarely monitored by jurisdictional agencies. Over the long term, oversight and management of buffer areas is often taken on by property owners, who frequently are not familiar with the purpose or proper maintenance of the buffer (Booth, 1991; Schueler, 1995; Booth et al., 2002).

Ideally, the riparian corridor in a developing or developed watershed should mirror that found in the natural ecosystems of that region. Due to the cumulative impacts of past and present land use, this is often not the case (Figure 4-11). One example of this is the fragmentation of riparian corridors by roads, utility crossings, and other man-made breaks in the corridor continuity (Figure 4-12). Results from studies in the Pacific Northwest and other regions indicate that streams with a high level of riparian integrity have a greater potential for maintaining natural ecological conditions than streams with urbanized riparian corridors (May and Horner, 2000; Hession et al., 2000; Snyder et al., 2003). However, buffers can provide only a partial mitigation for urban impacts on the stream-riparian ecosystem. At some point in the development process, upland urbanization and the accompanying disturbance is likely to overwhelm the ability of buffers to mitigate for urban impacts.

There are certain problems associated with the loss of functional riparian floodplain corridors around streams

Figure 4-10: Relationship Between Riparian Buffer Width and Impervious Surface Area in Urbanizing Watersheds in the Puget Sound Region of the Pacific Northwest

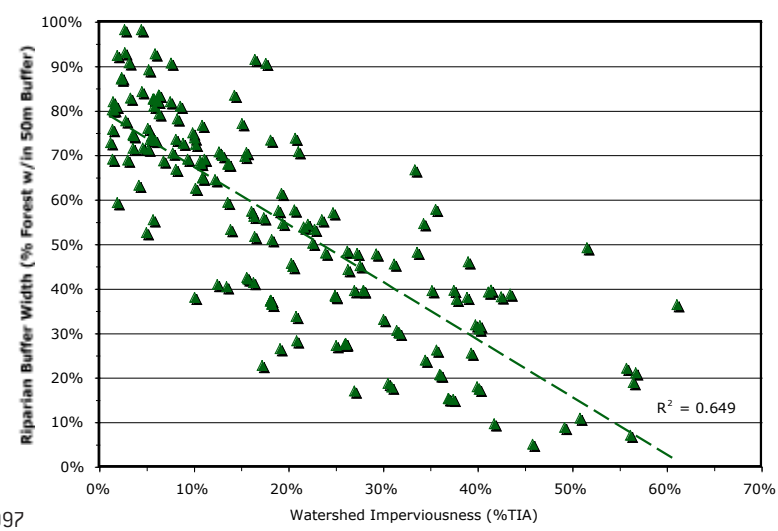

Source: May et al., 1997

in urbanizing watersheds. These include changes in food web dynamics, higher stream temperatures, loss of instream habitat complexity (LWD), invasive species, stream bank erosion and greater inputs of sediment, excessive nutrient inputs, inflows of anthropogenic pollutants, and loss of wildlife habitat.

Stream temperature is regulated mainly by the amount of shade provided by the riparian corridor. This is an important variable affecting many instream processes such as the saturation value for dissolved oxygen (DO) in the water, OM decomposition, fish egg and embryonic development, and invertebrate life history (Paul and Meyer, 2001). Removal of riparian vegetation, reduced groundwater recharge, and the "heat island" effect associated with urbanization all can affect water temperature of streams, lakes, rivers, wetlands, and nearshore marine areas.

Invasive or exotic plants are another problem common to urban stream and wetland buffers. Human encroachment and landscaping activities can introduce

Figure 4-11: Relationship Between Riparian Quality and Impervious Surface Area in Urbanizing Watersheds in the Puget Sound Region of the Pacific Northwest

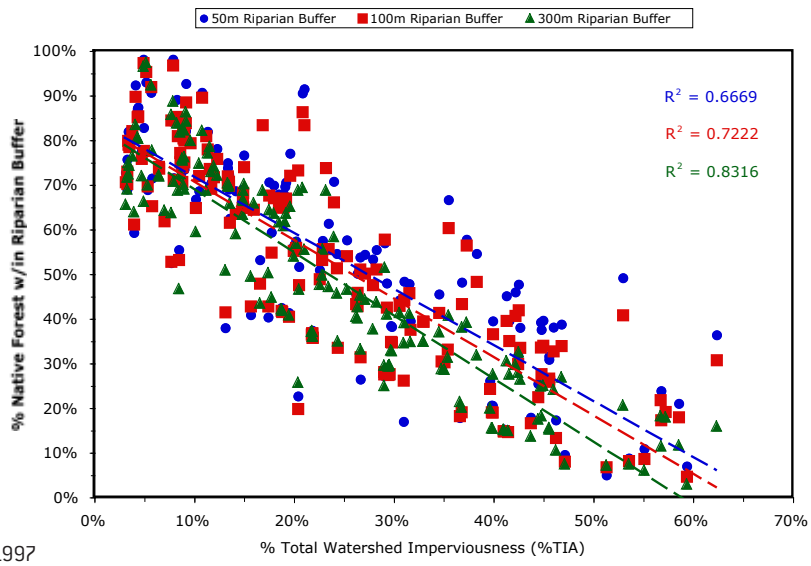

Source: May et al., 1997

Figure 4-12: Relationship Between Riparian Corridor Fragmentation and Impervious Surface Area in Urbanizing Watersheds in the Puget Sound Region of the Pacific Northwest

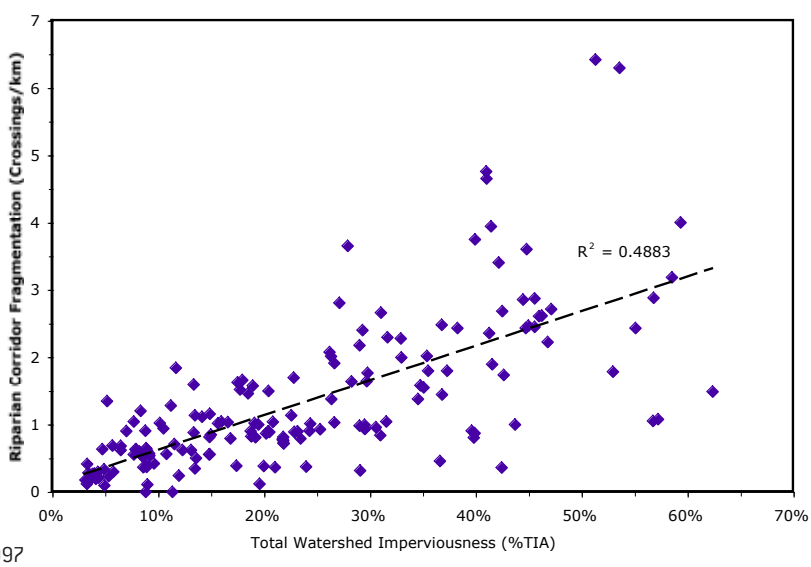

Source: May et al., 1997

exotic or invasive species into the riparian zone. These plants often out-compete native species, which can result in nuisance levels of growth.

Based on our current level of knowledge, the extent and configuration of urban riparian corridor buffers needed to protect the natural structure and function of the stream-riparian ecosystem cannot be described using a simple formula. Because of regional, watershed-scale, and site-level differences, as well as political issues, this is a fairly complex problem. The ecological and socio-economic value of the resource being protected should be considered when a riparian buffer or management zone is established. In addition, the local watershed, site, and riparian vegetation characteristics must be considered as well. The type and intensity of the surrounding land use should also be factored into the equation so that some measure of physical encroachment and water-quality risk is made. Finally, the riparian functions that need to be provided should be evaluated. Figure 4-13 illustrates how this might be done (Sedell et al., 1997).

Effects of Urbanization on Stream Habitat and Biota

Degradation of aquatic habitat is one of the most significant ecological impacts of the changes that accompany watershed urbanization. The complex physical effects from elevated urban streamflows, stream channel alterations, and riparian encroachment can damage or destroy stream and wetland habitats. In addition to the indirect effects of habitat degradation or loss, aquatic biota can be directly affected by the cumulative impacts of urbanization.

Biological degradation is generally manifested more rapidly than physical degradation. Aquatic biota tend to respond immediately to widely fluctuating water temperatures, water quality, reduced OM inputs or other food sources, more frequent elevated streamflows, greater wetland water level fluctuations, or higher sediment loads. These stressors may prove to be fatal to some sensitive biota, impair the physiological functions of others, or encourage mobile organisms to migrate to a more habitable environment.

Ecological and biological effects of watershed urbanization include the following:

- Loss of instream complexity and habitat quality due to increase in bankfull flow frequency and duration.
- Reduced habitat due to channel modifications, and reduced baseflows causing crowding and increased competition for refuge and foraging habitat.
- Shifts in populations and communities of environmentally sensitive organisms to biota more tolerant of degraded conditions. Reduced biota abundance and biodiversity.
- Scouring and washout of biota and structural habitat elements from urban stream channels.
- Sediment deposits on gravel substrates where fish spawn and rear young and where algal and invertebrate food sources live. Reduced survival of egg and embryonic life stages.

Figure 4-13: Relationship Between Riparian Function and Buffer Width

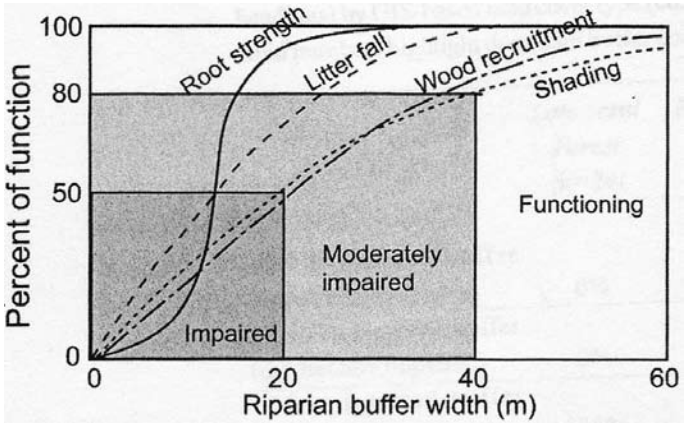

Source: FEAMT, 1993

- Direct loss of habitat due to the replacement of natural stream channels and wetlands with engineered drainage channels and stormwater treatment ponds.
- Loss of ecologically functional pool-riffle habitat characteristics in stream channels. Loss of deep-water cover in rearing habitat and loss of spawning habitat.
- Aesthetic degradation and loss of recreational beneficial uses.
- Direct effects of suspended sediment on aquatic organisms, like abrasion of gills and other sensitive tissues, reduced light for photosynthesis, reduced visibility for catching food and avoiding predators, and transport of metallic, organic, oxygen-demanding, bacterial, and nutrient pollutants.
- Reduction in pool area and quality. Loss of refuge habitat for adult and juvenile fish.
- Loss of riparian vegetation, resulting in stream bank erosion, loss of shading and temperature regulation, reduced leaf-litter and OM input, loss of overhanging vegetation cover, and reduced LWD recruitment.
- Loss of LWD function, including hydraulic roughness, habitat formation, and refugia habitat.
- Increased summer temperatures because of lower baseflow and less water availability for heat absorption. Decline in DO from the lower oxygen solubility of warmer water.
- Less dilution of pollutants as a result of lower baseflows, which in turn results in higher concentrations and shallower flow that can interfere with fish migrations and localized movements.
- Increased inorganic and organic pollutant loads with potential toxicity impacts.
- Increased bacterial and pathogen pollution, which can result in an increase in disease in aquatic biota and humans.
- Elevated nutrient loading and resultant eutrophication of lake, wetland, and estuarine habitats. Reduced DO as a possible result of eutrophic conditions, which in turn reduces usable aquatic habitat.
- More barriers to fish migration, such as blocking culverts and diversion dams.
- Overall loss of habitat quality, complexity, and diversity due to channel and floodplain simplification or loss.

Numerous studies have documented the effect of watershed urbanization on the degradation of instream habitat and the decline of native biota. These include research from almost all parts of country and from developed countries around the world. The earliest research efforts to study the cumulative impacts of urbanization on small-stream habitat and stream biota were conducted in the Puget Sound region (Richey, 1982; Scott, 1982; Steward, 1983) and in the Chesapeake Bay region (Ragan and Dietermann, 1975; Ragan et al., 1977; Klein, 1979). These were followed by even more comprehensive studies in the same regions and in other parts of the country. This section describes the findings of this body of research (see Table 4-2 for a research summary).

As discussed earlier, one of the most common effects of watershed urbanization on instream habitat is the loss of habitat quality, diversity, and complexity. This is the so-called "simplification" of urban stream characteristics. In undisturbed, properly functioning stream systems, the natural (mainly hydrologically driven) disturbance regime maintains the stream in a state of dynamic equilibrium. This means that the stream ecosystem is stable, but not static. Changes occur on several spatial and temporal time scales (Figure 4-14).

These changes can be small and subtle, such as a riparian tree falling into a creek (LWD recruitment) and forming a new pool habitat unit as the result of the hydro-geomorphic interaction of the streamflow and the LWD. Changes can also be large and catastrophic, such as those occurring during major flooding events that can rearrange the entire channel form of a stream system. Natural streams tend to have a level of redundancy and complexity that allows them to be resilient in responding to disturbance. Streams may change over time as a result of natural habitat-forming processes (flooding, fire, LWD recruitment, sediment transport, OM and nutrient cycling, and others), but they continue to support a complex stream-riparian ecosystem and a diverse array of native biota.

As mentioned above, the first Puget Sound stream research project compared ecological and biological conditions in an urbanized stream (Kelsey Creek) and a relatively natural stream (Big Bear Creek). Urbanized Kelsey Creek was found to be highly constrained by the encroachment of urban development, with 35

Table 4-2: Summary of Research on Urban Stream Habitat, Water-Quality (WQ), and Biota					
Research Study	Habitat	WQ	Fish	Macro-invertebrates	Location
Ragan & Dietermann, 1975		x	x		MD
Klein, 1979	x	x	x		MD
Richey, 1982	x				WA
Pitt and Bozeman, 1982		x	x	x	CA
Steward, 1983			x		WA
Scott et al., 1986	x		x		WA
Jones and Clark, 1987		x		x	VA
Steedman, 1988				x	OT
Limburg & Schmidt, 1990		x	x		NY
Schueler & Galli, 1992			x		DC
Booth & Reinelt, 1993	x				WA
Lucchetti & Fuerstenberg, 1993			x		WA
Black & Veatch, 1994	x		x	x	MD
Weaver & Garman, 1994			x		VA
Lenat & Crawford, 1994	x	x	x	x	NC
Galli, 1994	x		x		DC
Jones et al., 1996	x	x		x	VA
Hicks & Larson, 1997	x				MA
Booth & Jackson, 1997	x				WA
Kemp & Spotila, 1997			x	x	PA
Maxted & Shaver, 1997	x			x	DE
May et al., 1997	x	x	x	x	WA
Wang et al., 1997	x		x		WI
Dali et al., 1998	x		x	x	MD
Harding et al., 1998	x		x	x	NC
Horner & May, 1999	x		x	x	WA
Kennen, 1999		x		x	NJ
MNCPPC, 2000	x		x	x	MD
Finkenbine et al., 2000	x				BC
Meyer & Couch, 2000	x		x	x	GA
Wang et al., 2000	x		x		WI
Horner et al., 2001	x		x	x	WA/TX/MD
Nerbonne & Vondracek, 2001	x		x	x	MN
Stranko & Rodney, 2001	x				MD
Wang et al., 2001	x		x		WI
Morse et al., 2002	x	x		x	ME

percent of the stream banks armored with "rip-rap" and the floodplain-riparian zone also highly modified. Bear Creek, on the other hand, had less than 10 percent stream bank armoring and a natural riparian corridor and CMZ. Road-crossing bridges and culverts were frequent on Kelsey Creek, but not on Bear Creek (Richey, 1982). LWD and other natural habitat complexity features common in Bear Creek were also lacking in Kelsey Creek (Steward, 1983).

In the Puget Sound comparison of urban and non-urban streams, Kelsey Creek, an urban stream, experienced twice the bed scour of its non-urban counterpart (Scott, 1982). As a consequence, sediment transport was three times as great in Kelsey Creek (Richey, 1982) and fines were twice as prevalent in its substrates (Scott, 1982). The invertebrate communities in different benthic locations produced 14 to 24 taxa in Bear Creek but only six to 14 in Kelsey Creek (Pedersen, 1981; Richey, 1982). Salmonid fish diversity also differed. Bear Creek had four salmonid species of different age-classes, whereas Kelsey Creek had only one non-anadromous species mainly represented by the 0- to 1-year age class (Scott, 1982; Steward, 1983). Although we cannot explicitly determine the relative roles of hydrology and habitat quality, much evidence shows that hydrologic alteration and the related sediment transport were most responsible for the biological effects (Richey, 1982).

Several studies in the Pacific Northwest examined various aspects of the influence of urban hydrology on salmon and salmon habitat. Data shows a significant decrease in young salmon survival in both large and small streams when events occur that are equal to or larger than the natural five-year frequency discharge. Since the frequency of events increases tremendously after urbanization, salmonids experience great difficulty in urban streams. These investigations also pointed out the relationship between urbanization level and biological integrity. The study rated channel stability along numerous stream reaches and related it to the proportion of the watershed's impervious areas. Stability was significantly higher where imperviousness was less than 10 percent (Booth and Reinelt, 1993). The study rated habitat quality along streams in two basins according to four standard measures. Marked habitat degradation occurred at 8 to 10 percent total impervious area (TIA). Population data on cutthroat trout and less tolerant coho salmon from streams draining nine catchments did not show a distinct threshold. They indicated, however, that population shifts are measurable with just a few percent of impervious area and become substantial beyond about 10 to 15 percent (Lucchetti and Fuerstenberg, 1993). Later studies in the same region confirmed this decline in salmonid abundance and diversity, as well as the degradation of salmon habitat at very low levels (5 to 10 percent TIA) of imperviousness in small urban streams (May, 1997; May et al., 1997; Horner and May, 1999).

More recent research projects in the Puget Sound region (May et al., 1997) and in Vancouver, British Columbia (Finkenbine et al., 2000) found that the degradation of instream and riparian habitat quality,

Figure 4-14: Stream Ecosystem Disturbance Regime

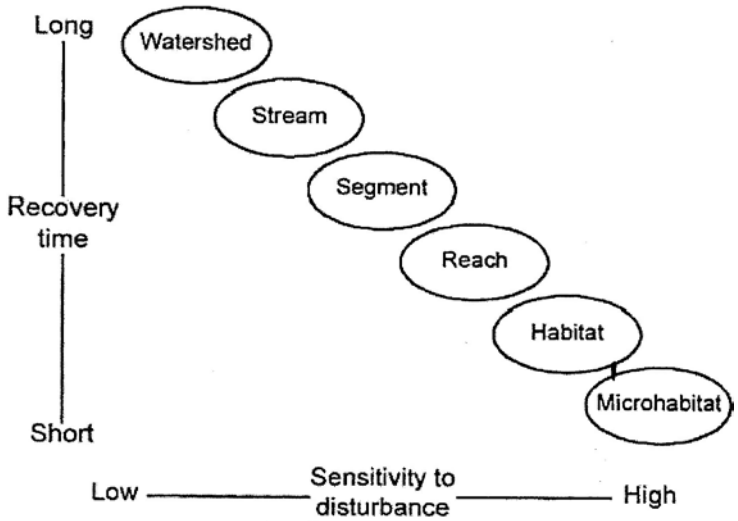

Source: Naiman, 1992

diversity, and complexity are common features of urban streams. There appears to be a linear decline in most measures of habitat quality in relationship to the level of watershed urbanization or imperviousness. Instream LWD, which is a critical habitat complexity element in streams in forested watersheds, tends to become scarce when %TIA approaches the 10 to 20 percent range (May et al., 1997; Horner et al., 1997; Finkenbine et al., 2000). Streambed quality also declines as urbanization increases (May et al., 1997; Horner et al., 1997; Finkenbine et al., 2000). This decline in benthic habitat is typically characterized by higher levels of fine-sediment deposition, substrata embeddedness, streambed coarsening, and frequent streambed scour events.

Similar to these studies in the Pacific Northwest, Morse (2003) observed that both instream habitat and water quality in small urbanizing streams in Maine declined in a linear fashion. Studies in Delaware (Maxted and Shaver, 1997), Wisconsin (Wang et al., 1997), and Minnesota (Nerbonne and Vondracek, 2001) confirm this trend. These findings have also been replicated in other countries, most notably in Australia (Davies et al., 2000) and New Zealand (Allibone et al., 2001).

This simplification of the stream channel and loss of instream habitat complexity results in a restructuring of the stream fish community in the urbanized creek. Urban impacts had a much greater impact on coho salmon (*Oncorhynchus kisutch*) than on cutthroat trout (*Oncorhynchus clarki*), which appear to be more tolerant of urban stream conditions (Scott et al., 1986). Pitt and Bissonnette (1984) and Lucchetti and Fuerstenberg (1993) also found similar results in other studies of streams in the Puget Sound lowland eco-region. Coho salmon, which normally out-compete cutthroat trout in natural streams, appear to be more sensitive to changes associated with urbanization and therefore decline in abundance as urban development increases (May, 1997; May et al., 1997; Horner et al., 1997; Horner and May, 1999). Figure 4-15 illustrates the shift in salmonid species found in urbanizing streams in the Puget Sound lowland eco-region.

Ragan and Dietermann (1975) attributed the loss of fish species diversity in urban streams in the Chesapeake eco-region of Maryland to the cumulative effects of urban development. A study in Ontario, Canada (Steedman, 1988) also found a shift in fish community structure due to the cumulative impacts of watershed land use and riparian corridor encroachment. Similar results were seen for fish community structures in New York (Limburg and Schmidt, 1990), Virginia (Weaver and Garman, 1994), Pennsylvania (Kemp and Spotila, 1997), North Carolina (Harding et al., 1998), and Georgia (Gillies et al., 2003).

A study in Mississippi found that instream habitat quality in urbanizing stream channels impacted by high-flow incision was significantly inferior to the quality of reference stream channels in undeveloped watersheds. In addition, the reference streams had greater mean

Figure 4-15: Relationship Between Stream Biological integrity, as Measured by Salmon Diversity, and Watershed Development, as Measured by Impervious Surface Area, in Urbanizing Watersheds in the Puget Sound Region of the Pacific Northwest

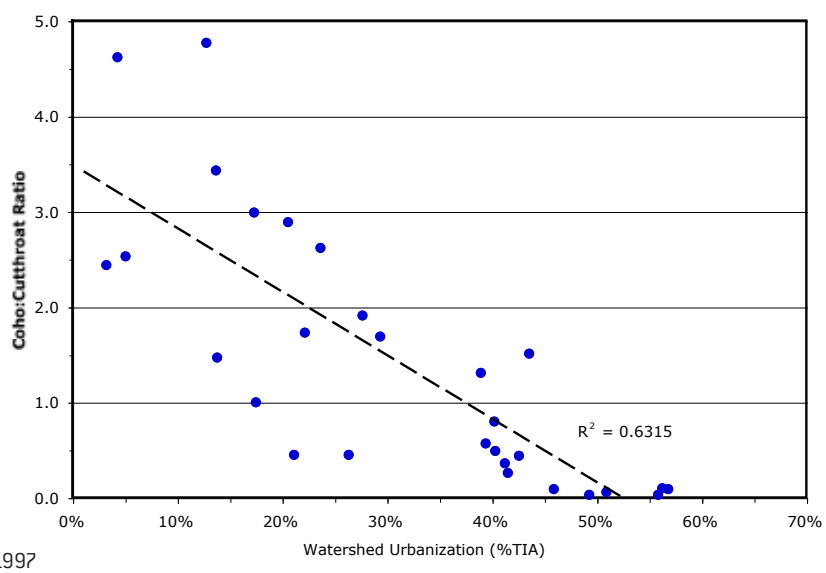

Source: May et al., 1997

water depths, more channel complexity in the form of woody debris, and more deep pool refuge habitat than the impacted streams. Relative to the reference streams, fish assemblages in the incised stream channels were composed of smaller fish and fewer species (Shields et al., 1994).

In several extensive studies of urbanizing streams in Wisconsin, a significant relationship was found between watershed land use and instream habitat as well as stream fish communities (Wang et al., 1997; Wang et al., 2000; Wang et al., 2001). In these studies, stream fish abundance and diversity both declined as watershed development increased above the 8 to 12 percent total impervious range. These studies also compared agricultural impacts to urban impacts, finding that urbanization was more severe and longer lasting. Habitat destruction and water-quality degradation were found to be the main contributing factors to the overall decline in stream ecosystem health. In addition, natural riparian vegetation (buffer) conditions had a significant influence on instream habitat conditions and appeared to at least partially mitigate some of the negative impacts of watershed urbanization (Wang et al., 2001).

A study in Washington, DC (Galli, 1991) investigated the local thermal impacts of urban runoff on stream ecosystems and reached the following conclusions:

- Air temperature was the strongest influence on stream water temperature.
- Average stream temperature increased linearly with stream sub-basin imperviousness.
- Some temperature criteria violations occurred just above 10 percent TIA and increased in severity and frequency with more imperviousness.
- All tested structural stormwater treatment facilities under best management practice (BMP) that had a surface discharge caused some violations of temperature criteria under both baseflow and storm runoff conditions.
- Based on the findings from a literature review, the investigators concluded that the thermal conditions produced by urban runoff and treatment facilities could cause succession from cold-water diatoms to warm-water filamentous green and blue-green algal species, as well as severe impacts on cold-water invertebrates and fish. A shift from cold-water community composition to warm-water organisms and exotic species is very possible in highly urbanized watersheds.

It should be noted that the life cycles of native fish can differ significantly even among closely related species. Attention must be paid to the life history specifics and habitat requirements of the various species of concern in the urban watershed being managed before any decisions are made on conservation, restoration, or mitigation of stormwater runoff impacts. Different fish carry out their migrations, reproduction, and rearing

Figure 4-16: Relationship Between Stream Biological integrity, as Measured by the Benthic-Macroinvertebrate Index of Biotic Integrity (BIBI), and Watershed Development, as Measured by Impervious Surface Area, in Urbanizing Watersheds in the Puget Sound Region of the Pacific Northwest

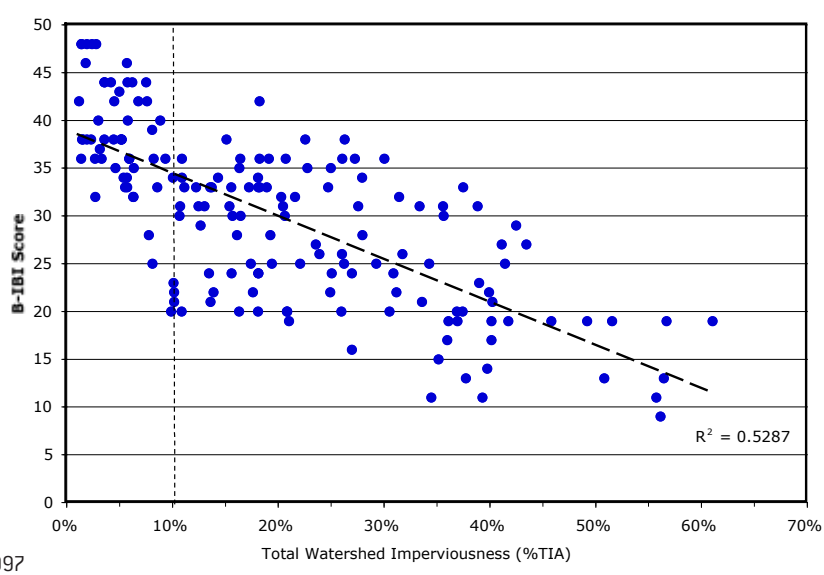

Source: May et al., 1997

at different times and have freshwater stages of various lengths. Management must ensure that all life stages (egg, embryonic, juvenile, and/or adult) have the habitat conditions needed at the right time and that no barriers to migration exist.

The Ohio Environmental Protection Agency (OEPA) has an extensive database relating watershed development and land use to fish abundance and diversity. This data suggests that there are multiple levels of fish response to increasing urbanization. At the rural level of development (under 5 percent urban land use), sensitive species begin to disappear from streams. In the 5 to 15 percent urban land-use range (suburban development), habitat degradation is common and fish continue to decline in abundance and diversity. In addition, aquatic invertebrates also decline significantly. Above 15 percent watershed urbanization, habitat degradation, toxicity effects from physio-chemical water pollution, and nutrient enrichment result in severe degradation of fish fauna (Yoder et al., 1999). There have been similar findings in studies in Alabama (Onorato et al., 2000) and North Carolina (Lenat and Crawford, 1994).

The cumulative effects of urbanization, including altered hydrologic and sediment transport regimes as well as channel modifications and degraded instream habitat, were also found to cause a shift in the aquatic insect communities of urban streams in the Puget Sound region (Pedersen and Perkins, 1988; May et al., 1997; Horner and May, 1999; Morley and Karr, 2002). This relationship between watershed urbanization, stormwater runoff pollution, and aquatic insect community taxonomic composition has also been observed in small stream studies in northern Virginia (Jones and Clark, 1987; Jones et al., 1994), Pennsylvania (Kemp and Spotila, 1997), New Jersey (Kennen, 1999), and Maine (Morse, 2002). These findings have also been replicated in other countries, most notably in Australia (Walsh et al., 2001) and New Zealand (Collier and Winterbourn, 2000).

Aquatic insects and other macroinvertebrates have been found to be useful indicators of environmental conditions in that they respond to changes in natural land cover and human land use (Black et al., 2004). Overall, there tends to be a decline in taxa richness or species diversity, a loss of sensitive species, and an increase in tolerant species (such as chironomids) due mainly to the cumulative impacts of watershed urbanization: altered hydrologic and sediment transport regimes, degradation of instream habitat quality and complexity, stream bed fine sediment deposition, poor water quality, and the loss of native riparian vegetation. In many cases, the myriad of aquatic insects and benthic macroinvertebrates sampled from streams or wetlands are combined into a set of indices to standardize comparisons between stream samples. Often the mayflies (Ephemeroptera), stoneflies (Plecoptera), and caddisflies (Trichoptera) are combined into an "EPT" index. In some cases, multi-metric indexes have been developed that include several measures of the characteristics of the stream macroinvertebrate community. The EPA Rapid Bioassessment Protocol (RBP) and the Benthic Index of Biotic Integrity (BIBI) are examples of this (Karr, 1998). Figure 4-16 illustrates the BIBI scores for urbanizing streams in the Puget Sound lowland eco-region.

Ecological Impacts of Urban Stormwater Runoff Quality

Background

In addition to the hydrologic and physical impacts of stormwater runoff generated by the urbanization process, there are water-quality impacts to aquatic ecosystems and biota that result from exposure to the pollutants found in urban runoff. Stormwater runoff from urbanized areas is generated from a number of sources including residential areas, commercial and industrial areas, roads, highways and bridges. Essentially, as discussed earlier, any surface that does not have the capability to store and infiltrate water will produce runoff during storm events. These are the previously discussed impervious surfaces. As the level of imperviousness increases in a watershed, more rainfall is converted to runoff.

Impervious surfaces (roads, parking lots, rooftops, etc.) are the primary source areas for pollutants to collect within the built environment. Runoff from storm events then carries these pollutants into natural waters via the stormwater conveyance network. The land use (e.g., residential, commercial, and industrial) and human activities (e.g., industrial operations, residential lawn care, and vehicle maintenance) characteristic of a drainage basin largely determine the mixture and level of pollutants found in stormwater runoff (Weibel et al., 1964; Griffin et al., 1980; Makepeace et al., 1995; Pitt et al., 1995).

As was discussed in detail in the previous chapter, stormwater is a form of non-point source (NPS) pollution and typically contains a mixture of pollutants, including metals, petroleum hydrocarbons, and organic toxicants (i.e., pesticides, herbicides, and industrial chemicals). The National Urban Runoff Program (NURP) identified stormwater as a significant source of potentially toxic pollutants to receiving waters (EPA, 1983). Other studies have confirmed the NURP findings and improved the level of knowledge with regard to stormwater pollution impacts (Ragan and Dietermann, 1975; Pitt and Bozeman, 1982; Field and Pitt, 1990; Bannerman et al., 1993). Two of the most common stormwater pollutant components are petroleum hydrocarbon compounds and metals (e.g., zinc, copper, lead, chromium, etc.). Hydrocarbon sources include vehicle fuels and lubricants (Hoffman et al., 1984; Fram et al., 1987; Smith et al., 2000). Metals are also associated with vehicle maintenance, roads, and parking areas (Wilber and Hunter, 1977; Davies, 1986; Field and Pitt, 1990; Pitt et al., 1995). Pesticides, herbicides, and other organic pollutants are also commonly found in stormwater flowing from residential and agricultural areas (Pereira et al., 1996; USGS, 1997; Fan et al., 1998; Black et al., 2000; Foster et al., 2000; Hoffman et al., 2000). Studies in Puget Sound confirm these findings for our region (Hall and Anderson, 1986; May et al., 1997; USGS, 1997; Black et al., 2000). In many cases, even banned pesticides such as DDT or other organo-chlorine-based pesticides (e.g., chlordane and dieldrin) can be found in urban stream sediments. Toxic industrial compounds such as PCBs can also be present in urban runoff (Black et al., 2000). In general, the more intense the level of urbanization, the higher the pollutant loading, and the greater the diversity of land-use activities, the more diverse the mixture of pollutants found in stormwater runoff (Herricks, 1995; Makepeace et al., 1995; Pitt et al., 1995).

As discussed in the previous chapter, the transport and fate mechanisms of stormwater pollutants in receiving waters tend to be highly variable and site-specific. Pollutants are often transported from source areas (roads, parking lots, lawns, etc.) to receiving waters via roadside ditches, stormwater pipes, or by atmospheric deposition. In general, the concentration of pollutants found in stormwater runoff is much higher than that found in receiving waters, due mostly to dilution and removal mechanisms. In addition, most stormwater pollutants are typically found in particulate form, attached to fine sediment particles and organic matter (Pitt et al., 1995). This is especially true for nutrients, organics, and metals. In most cases, the particulate forms of toxic pollutants tend to be less "bio-available" (Herricks, 1995).

Because of the potential for accumulation of pollutants in sediment and the potential of sediments as sources of toxics, polluted sediments likely play an important role in many of the biological impacts associated with stormwater runoff. In general, most pol-

Figure 4-17: Stream Ecological Integrity Conceptual Diagram

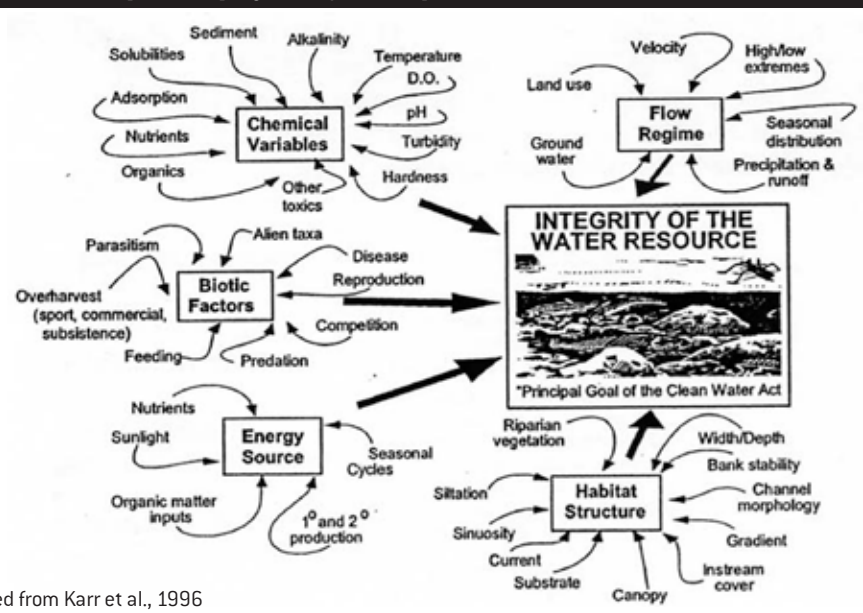

Source: Adapted from Karr et al., 1996

lutants, especially metals, are found in particulate forms within the water column or sediments, and pollutant concentrations tend to be higher for smaller sediment particle sizes (DePinto et al., 1980).

As discussed earlier, physical variables such as flow regime and instream habitat are important to native biota, as are chemical factors like water or sediment quality (Figure 4-17). Human activities in urbanizing watersheds can lead to both physio-chemical pollution and biophysical alterations of stream habitats. The evaluation of cumulative ecological urban impacts can be problematic where both types of stressors occur. The relative importance of one stressor as compared to another is difficult to quantify, especially when antagonistic or synergistic effects are present. For example, effects of contaminants can also be masked by instream or riparian habitat degradation. All of these variables need to be quantified in order for a complete assessment of the impact of stormwater on human health, aquatic ecosystems, and instream biota to be developed (Horner et al., 1997).

Stormwater Toxicity in Freshwater

Current stormwater monitoring and impact assessment programs indicate that the most likely cause for degradation of biological integrity in receiving waters is a combination of physical habitat degradation, changes in the hydrologic regime, food web disruptions, and long-term exposure to anthropogenic contaminants (Pitt, 2002). However, chronic or acute exposure to potentially toxic contaminants may be especially problematic for benthic organisms such as macroinvertebrates and for organisms that have a benthic life stage (e.g., salmonids during their embryonic development stage). Acute toxicity of aquatic biota due to exposure to stormwater runoff in receiving waters is rare (Pitt, 2002).

Current research appears to indicate that even when stormwater toxicity is high, it is only for short periods of time during episodic storm events. It has been hypothesized that relatively short periods of exposure to toxic compounds at the levels normally found in stormwater are not sufficient to produce mortality in aquatic organisms. This is often based on the assumption that most of the toxic chemicals found in stormwater are found in particulate form and are not bioavailable. This school of thought holds that most of the toxicity problems observed in urban receiving waters are a result of illegal discharges or dumping and that the risk from stormwater and sediment-bound toxics is low. However, this view tends to ignore the cumulative impacts of frequent exposures of organisms in receiving waters to stormwater as well as the potential release of toxics from sediments due to changes in ambient water chemistry. In reality, urban stormwater runoff has been found to cause significant receiving water impacts on aquatic biota (Burton and Pitt, 2001).

Evaluation of stormwater or receiving water quality is a complex and expensive project. The type and quantity of stormwater constituents are highly variable, depending on land use and human activities in the source area of concern. There are also numerous confounding factors that influence how stormwater interacts with receiving waters. In addition, the relationship between observed biological effects on receiving water and possible causes (including stormwater-related toxicity) are especially difficult to identify, let alone quantify. Countless antagonistic and synergistic chemical relationships exist among the constituents in stormwater runoff and receiving waters. Physio-chemical transformations can render toxic substances harmless or create toxic mixtures from individually harmless compounds. Contaminants can also be associated with suspended sediment particles or mobilized from streambed sediments due to scour during high-flow events (Mancini and Plummer, 1986). It is likely that in most situations, multiple stressors and cumulative impacts play a significant role in the decline of biological integrity.

Many studies have shown the detrimental effects of stormwater runoff on receiving water biota. However, few studies have demonstrated a direct cause-and-effect relationship between stormwater and toxicity to aquatic biota. Beginning with the National Urban Runoff Program or NURP (EPA, 1983), numerous studies have focused on determining the chemical characteristics of stormwater. An update of the NURP stormwater data was conducted in 1999 (Smullen et al., 1999). There have also been several studies on the toxicological effects of stormwater on aquatic biota.

Pitt and Bozeman (1982) studied the impacts of urban runoff on stream water quality and biological conditions in Coyote Creek in the San Francisco Bay area. The results of this study indicated that water and sediment quality were significantly degraded by urban stormwater runoff (Pitt and Bozeman, 1982). There was also some evidence of bioaccumulation of urban pollutants in plants, fish, and macroinvertebrates resident to the system (Pitt and Bozeman, 1982).

Studies of urban streams in Bellevue, Washington examined the ecological and biological impacts of stormwater runoff (Perkins, 1982; Richey, 1982; Scott et al., 1982; Pitt and Bissonette, 1983). These studies documented the physio-chemical water quality and instream habitat degradation due to watershed development and stormwater runoff. Massive fish kills in Kelsey Creek were also observed during one of these studies. These fish kills were attributed to illegal dumping of toxic chemicals into local storm drains.

Medeiros and Coler (1984) used a combination of laboratory flow-through bioassay tests and field experiments to investigate the effects of urban stormwater runoff on fathead minnows and observed chronic effects of stormwater toxicity on growth rates in the test organisms.

Hall and Anderson (1988) studied the effects of urban land use on the chemical composition of stormwater and its toxicity to aquatic invertebrates in the Brunette River in British Columbia. This study found that land-use characteristics and the antecedent dry period between rainfall events had the greatest influence on stormwater quality and toxicity. Toxicity in this study followed the land-use sequence commercial>industri al>residential>open space (Hall and Anderson, 1988). This study also identified the "first flush" effect as being significant from a toxicity standpoint. The longer the dry build-up period between storms, the higher the pollutant load and the greater the toxicity of stormwater runoff (Hall and Anderson, 1988).

A study of stormwater toxicity in Birmingham, Alabama utilized toxicity screening as the primary detection method (Pitt et al., 1995). Of the stormwater source area samples collected, 9 percent were classified as extremely toxic, 32 percent were moderately toxic, and 59 percent showed no evidence of toxicity. Vehicle service and parking areas had the highest levels of pollutants and potential toxicants. Metals and organics were the most common toxicants found in stormwater samples.

A field study in Milwaukee, Wisconsin investigated the effects of stormwater on Lincoln Creek (Crunkilton et al., 1997). Streamside toxicity testing was conducted using flow-through aquaria with fathead minnows. In addition, instream biological assessments were conducted along with water and sediment quality measurements. The results of the flow-through tests showed no toxicity in the fathead minnows until 14 days after exposure and 80 percent mortality after 25 days of exposure, indicating that short-term toxicity testing likely underestimates the toxicity of stormwater in receiving waters.

A study in North Carolina found that stormwater runoff from vehicle service and fueling stations had consistently elevated levels of polyaromatic hydrocarbon (PAH) compounds, MTBE, and other potentially toxic contaminants (Borden et al., 2002).

Runoff from agricultural or landscaped areas can also contain significant levels of potential toxicants, especially pesticides and herbicides (Liess et al., 1999; Thomas et al., 2001; Neumann et al., 2002; Arnold et al., 2004). These toxicants are also common in stormwater runoff from residential and urban landscaped areas (Pitt et al., 1995).

Sediment contaminated by stormwater runoff also has a detrimental effect on receiving water biota. Many of the observed biological effects associated with stormwater runoff and urban receiving waters may be caused by contaminated sediments, especially those impacts observed on benthic organisms. In addition, mortality of benthic invertebrates can be high in urban streams, especially during low flow periods, suggesting that toxicity associated with exposure to contaminated sediment, concentration of toxics in the water column, and/or ingestion of contaminated OM particulate is to blame (Pratt et al., 1981; Medeiros et al., 1983; Black et al., 2000).

Studies of urban stream sediments have shown the effects of metal toxicity on early life stages of fish and invertebrates (Boxall and Maltby, 1995; Hatch and Burton, 1999; Skinner et al., 1999; Lieb and Carline, 2000). Developmental problems and toxicity have been attributed to the contaminant accumulation in sediments and the remobilization of contaminated sediments during storm events (Skinner et al., 1999). Hatch and Burton (1999) also observed significant toxicity at a stormwater outfall site where sediments were found to be contaminated by multiple stormwater-related pollutants. Lieb and Carline (2000) showed that metals were more prevalent in stream sediments downstream of a stormwater treatment pond than upstream in a natural area. However, no acute toxic effects were noted. Zinc (Rose et al., 2000) and copper (Boulanger and Nikolaidis, 2003) are the most common metals found in urban sediments contaminated by stormwater runoff. These metals can be quite mobile under typical conditions found in urban receiving waters, but in most cases, a majority of the metal ions are bound to fine sediment particles and are not generally bioavailable. Examples of elevated levels of stormwater-related toxicants accumulating in urban

stream sediments are numerous (Pitt, 2002). The levels of metals in urban stream sediments are typically orders of magnitude greater than those in the water column (DePinto et al., 1980; Pitt and Bozeman, 1982; Scott et al., 1983; May et al., 1997). Similar results are found when analyzing marine sediments from urban estuaries with stormwater discharges (Long et al., 1996; Morrisey et al., 1997; Bolton et al., 2003).

Stormwater Toxicity in Estuarine-Nearshore Areas

The effects of watershed development and stormwater runoff extend into marine waters at the mouths of streams (sub-estuaries) and in the nearshore environment of coastal regions. As with freshwater receiving waters, these impacts include physical, chemical, and biological effects.

Several studies on the toxic effects of water pollution on salmon have been conducted in the Puget Sound region and the Lower Columbia River Estuary in the Pacific Northwest (McCain et al., 1990; Varanasi et al., 1993; Casillas et al., 1995; Casillas et al., 1998; Collier et al., 1998). In these studies, there were demonstrable chronic toxilogical effects (immuno-suppression, reduced disease resistance, and reduced growth) of PAHs, PCBs, and other organic pollutants seen in juvenile and adult salmon.

A study of the Hillsborough River in Tampa Bay, Florida investigated the impacts of stormwater runoff on estuarine biota (MML, 1984). Plants, animals, sediment, and water quality were all studied in the field and supplemented by laboratory bioassay tests. No significant stormwater toxicity-related impacts were noted.

In a study of multiple stormwater discharge sites in Massachusetts Bay, high levels of PAH compounds were found in receiving waters and estuarine sediments (Menzie et al., 2002). Land use was a critical factor in determining pollutant composition and concentrations, with urbanized areas (mixed residential, commercial, and industrial land uses) having the highest pollutant (PAH) levels. No toxicity testing was conducted.

A study of stormwater discharges from Chollas Creek into San Diego Bay, California, indicated measurable toxic effects to aquatic life (Schiff et al., 2003). This study found that a toxic plume from the freshwater creek extended into the estuary, with the highest toxicity observed closest to the creek mouth. The toxicity decreased with increasing distance from the mouth due to mixing and dilution. Toxicity identification evaluation (TIE) methods were used, and it was found that trace metals from stormwater runoff were most likely responsible for the plume's toxicity to the sea urchins used in this study (Schiff et al., 2003).

A study of the water quality impacts of stormwater runoff into Santa Monica Bay, California also identified toxic effects in the estuarine receiving waters (Bay et al., 2003). As in the San Diego study, the freshwater plume from an urbanized stream (Ballona Creek) was responsible for the toxicity observed in marine organisms. Stormwater-transported metals (mainly zinc) were identified as the most likely toxic constituent. The only toxic effects noted were chronic, not acute. As in the previously discussed study, the toxicity decreased with increasing distance from the mouth due to mixing and dilution (Bay et al., 2003). Sediments in estuarine areas were also found to be highly contaminated by stormwater pollutants (Schiff and Bay, 2003).

Several studies on the toxic effects of stormwater runoff on native biota have been conducted in the Puget Sound region. One of the first studies looked at the uptake of aromatic and chlorinated hydrocarbons by juvenile chinook (McCain et al., 1990). This study found no acute toxicity, but identified numerous potential chronic impacts on growth and survival. In a related study, juvenile chinook salmon from both a contaminated urban estuary and a non-urban estuary were studied for two years (Stein et al., 1995). Exposure to aromatic and chlorinated hydrocarbons was measured, and both PAH and PCB levels in fish from the urban estuary were significantly higher than in fish from the non-urban estuary. The results of these studies indicate that out-migrant juvenile salmon have an increased exposure to chemical contamination in urban estuaries during their residence time in these habitats. This exposure was determined to be sufficient to elicit biochemical responses and to have the potential for chronic toxicity effects (Stein et al., 1995).

Runoff from urban areas can also contain significant levels of pesticides and herbicides at levels that have been shown to be potentially toxic to native biota (Bortleson, 1997; MacCoy and Black, 1998; Voss et al., 1999; Black et al., 2000; Hoffman et al., 2000). In a study conducted by King County, Washington, pesticides and herbicides in runoff and urban streams were linked to retail sales of the same pesticides within the urban watersheds under study (Voss and Embrey, 2000). The most common pesticides and herbicides detected during storm

events included diazinon, 2-4-D, dichlorbenil, MCPP, prometon, and trichlopyr (Voss and Embrey, 2000).

Diazinon has been shown to have neurotoxic effects on salmon (Scholz et al., 2000). At sublethal levels, it was shown to disrupt homing behavior in chinook salmon by inhibiting olfactory-mediated responses (Scholz et al., 2000). This may have significant negative consequences for the survival and reproductive success of native salmonids.

Short-term exposures to copper (such as during storm runoff events in urban areas) have also been demonstrated to have sublethal effects on coho salmon by inhibiting the olfactory nervous system (Baldwin et al., 2003). In this study, the neurotoxic effects of copper were found to be dose-dependent, having a measurable effect over a broad range of concentrations. These effects occurred rapidly upon exposure to copper. It was concluded that short-term exposures can interfere with olfactory-mediated behaviors in juvenile coho salmon and may impact survival or migratory success of native salmonids (Baldwin et al., 2003).

Impacts of Contaminated Aquatic Sediment on Benthic Organisms

At some point in their life cycle, many aquatic organisms have their principal habitat in, on, or near sediment. Examples of this include benthic macroinvertebrates that spend almost their entire larval stage in contact with sediments. In the Pacific Northwest, salmonids also spend an extensive portion of their embryonic life stage within the benthic environment of their natal stream. In addition to functioning as benthic habitat, sediments can also capture and retain pollutants introduced by urban runoff. Pollutants enter sediments in several ways. The most direct path is the settling of suspended solids. Sediments deposited by urban runoff can physically degrade the substrata by filling interstitial spaces utilized as habitat by benthic organisms or by reducing DO transfer within the benthic environment. Dissolved pollutants can also move out of solution and into sediments by such mechanisms as adsorption of metals and organics at the sediment surface ion exchange of heavy metals in water with native calcium, magnesium, and other minerals in sediments, as well as the precipitation of phosphorus (Burton and Pitt, 2002).]

Most aquatic sediments have a large capacity to receive such contaminants through these processes. Also, many of the particulate pollutants are conservative. Once in the sediment, they do not decompose or significantly change form. These conservative pollutants include refractory organic chemicals relatively resistant to biodegradation as well as all metals. Consequently, these types of pollutants progressively accumulate in sediments. Over the long term, discharge of even modest quantities of pollutants can result in sediment concentrations several orders of magnitude higher than in the overlying water. These contaminant reservoirs can be toxic to aquatic life they come in direct contact with, as well as contaminate reservoirs far beyond the benthic (bottom-dwelling) organisms by bio-magnification through the food web (Burton and Pitt, 2002).

Historically, water quality has received more attention than sediment contamination. In the past 10 to 15 years, this approach has changed because of mounting evidence of environmental degradation in areas that meet water quality criteria. However, sediment toxicity investigations are limited because we lack accepted testing methods and do not understand the factors that control contaminant bioavailability. The result is an approach that emphasizes bioassay exposure techniques, either in situ or in the laboratory, along with chemical analysis of the sediments, overlying water, and/or sediment interstitial water. Very few studies have focused on the eco-toxicology of contaminated sediments in the natural environment (Chapman et al., 1998).

Case Study: Urban Stormwater and Metal Toxicity

Metals are a significant pollution component of urban stormwater runoff and non-point source (NPS) pollution. Heavy metals are of particular interest because many cannot be chemically transformed or destroyed and are therefore a potential long-term source of toxicity in the aquatic environment (Allen et al., 2000). Although the specific metals and their concentrations may vary widely depending on the anthropogenic sources present, they are common to almost all water pollution. Many trace metals are important as micronutrients for both plants and animals, playing essential roles in metabolism and growth. These include iron (Fe), zinc (Zn), copper (Cu), and Manganese (Mn), to name a few. Nutrient requirements vary between

species, life stages, and sexes, but normal concentrations of these micronutrient trace metals are low and typically fall within a narrow acceptable band. Exposure to concentrations outside the optimal range can have deleterious or even toxic effects. Other trace metals which are not essential, such as lead (Pb), cadmium (Cd), and mercury (Hg) can be toxic at very low levels, either acutely or due to chronic/long-term exposure. Aluminum (Al), chromium (Cr), and nickel (Ni) are also found in urban runoff.

Anthropogenic sources of metal pollution are common throughout the environment. These include industrial processes, mining, and urban storm runoff. Urban runoff can contain a wide variety of trace metals from sewage discharges, fossil-fuel combustion, automobile traffic, anti-corrosion products, and various industrial sources. In general, the concentration, storage, and transport of metals in urban runoff or streams are closely related to OM content and sediment characteristics. Fine sediment, especially organic material, has a high binding capacity for metals, resulting, as mentioned above, in generally higher levels of metal contamination in sediments than in the water column (Rhoads and Cahill, 1999).

Several studies have been conducted to characterize the levels of metals in stormwater runoff, receiving waters, and sediments (Bryan, 1974; Wilbur and Hunter, 1979; Pitt et al., 1995; May et al., 1997; Neal et al., 1997; Sansalone and Buchberger, 1997; Barrett et al., 1998; Wu et al., 1996; Wu et al., 1998; Allen et al., 2000). Generally, the levels of various metals in stormwater are quite variable and dependent on a number of factors, including background watershed characteristics, land use practices, and specific sources (see discussion in Chapter 3).

Certain urban-stream organisms, including algae, arthropods, mollusks, and annelids, have exhibited elevated levels of metal concentrations (Davis and George, 1987). Ecological responses to metals occur at all levels in the ecosystem and include the loss of sensitive taxa, both chronic and acute toxicity effects, and altered community structure.

One study (Pitt et al., 1995) of urban stormwater samples, using the Micro-Tox toxicity-screening procedure, found that less than 10 percent of samples were classified as extremely toxic, a bit over 30 percent were moderately toxic, and the majority (about 60 percent) showed no evidence of toxic effects. The Micro-Tox methodology was only used to compare relative toxicities of various samples and not as a measure of absolute toxicity or to predict long-term toxic effects of stormwater on receiving waters. It does point to the fact that in all but a few heavily polluted systems, the level of toxicants in urban runoff is typically near detection limits (Pitt et al., 1995).

The toxicity of metals to aquatic plants and organisms is influenced by chemical, physical, and biological factors. Water chemistry characteristics such as temperature, pH, alkalinity, and hardness all affect metal toxicity. Physical aspects of exposure, such as metal speciation, duration of exposure, intensity of exposure events, and inorganic or organic ligand binding, also have a significant bearing on metal toxicity (Davies, 1986). Bioavailability of metals, the life stage of the affected organisms, organism health, and the natural sensitivity of the species involved are also important determinants of metal toxicity. Aquatic toxicology data generally indicates that the ionic fraction of metals constitutes the primary toxic form (Roline, 1988).

Acute toxicity to aquatic organisms can be manifested as a wide range of effects, from reduced growth rate to mortality. Laboratory studies on the mechanism of toxicity of zinc to fish in general indicate that zinc causes death via gill hypoxia (excess mucous secretion and suffocation) and gill tissue necrosis (Davies, 1986). Osmoregulatory failure appears to be the most likely effect of acute copper toxicity. Lead and mercury affect the central nervous system coordination of activity in fish, as well as interfering with cellular osmoregulation (Pagenkopf, 1983). The metal species present in solution and the ambient water chemistry can have a significant influence on metal toxicity. Consideration of total metal concentration alone can be misleading because chemical speciation of trace metals significantly affects the bioavailability to aquatic organisms and thus the ultimate toxicity (Davies, 1986). For the most part, organisms assimilate uncomplexed metal ions more readily than complexed forms. Increases in pH, alkalinity, and hardness generally decrease metal toxicity. Hardness (Ca^{+} and Mg^{++}) has an antagonistic effect on metal toxicity in that the calcium and magnesium ions compete with metal ions for uptake sites on the gill surfaces, thus reducing the toxic effects of the metal ions (Davies, 1986). Alkalinity reduces metal toxicity through the buffering mechanism of the carbonate system. Under pH control, the carbonate and bicarbonate ions complex metal ions into soluble or insoluble, less toxic forms (Pagenkopf, 1983). In most cases, in alkaline waters, metals do not reach toxic levels until their concentration overwhelms the natural buffering capacity of the carbonate system.

Organic ligands can also complex metal ions, thus reducing toxicity by binding metals to particulates and making them relatively non-bioavailable. Metal toxicity generally increases when ambient temperature rises, due to the combined effects of an increase in both organism metabolism and chemical activity. Light intensity may also have a synergistic affect on the toxicity of some metals.

Chronic toxicity of metals is generally most apparent in the embryonic and larval stages of aquatic organisms and the early life stages of aquatic plants. As a period of rapid development, the early life stage is the most sensitive stage of the organism's life cycle for metal toxicity in general and other toxicants as well. Embryogenesis is a particularly sensitive period for fish with regard to metals (Davies, 1986). The period of larval settlement is the critical phase in invertebrate life history, although invertebrates as a whole are generally less sensitive than fish to trace/heavy metal toxicity (Nehring, 1976;Winner et al, 1980; Pratt et al, 1981; Garie and McIntosh, 1986). Chronic and sublethal effects of metals include reduced growth rates, developmental or behavioral abnormalities, reproductive effects, interference with metabolic enzyme systems, anemia, neurological defects, and kidney dysfunction (Davies, 1986). Due to the greater sensitivity of young organisms to metals, any exposures during embryonic development or rearing periods can, apart from the immediate effects, also manifest themselves in the adult organisms. There has been some indication that fish exposure to very low levels of metals during early life stages can result in an acclimation effect, making them somewhat more resistant to future periodic exposures (Davies, 1986). As with most toxicants, metal toxicity also increases with exposure period. Therefore, the intermittent nature of urban runoff may be less harmful to some aquatic life forms than continuous exposure to elevated metal concentrations would. Bioaccumulation of metals in organisms is also highly variable, depending on the particular metal, its chemical form, the mode of uptake, and the storage mechanisms of the organism. In low alkalinity (soft) waters, most metal species are of the "free" form. In alkaline (hard) waters, more metal ions are complexed, but some portion may remain in the ionic forms, especially if the buffering capacity of the natural water is overwhelmed. System pH also plays a major role in determining the speciation of the metal forms in freshwater (Davies, 1986). The rate of chemical (metals) reactions or chemical kinetics is also important to understanding the overall metal toxicity process. Such reactions as complexation do not occur instantaneously in natural waters. In the case of stormwater, runoff time scales may not allow sufficient time for complexation to take place, thus mitigating or negating the toxicity-reducing buffering effects (Pitt et al., 1995).

The use of aquatic insects and other macroinvertebrates as indicators of the biological integrity of lotic ecosystems is not new. One of the earliest field studies (Nehring, 1976) involved using aquatic insects as biological monitors of heavy metal pollution in the analysis and prevention of fish kills. Macroinvertebrates are generally more tolerant of metal pollution than most species of fish found in western streams (salmonids, sculpins, etc.) and tend to bioaccumulate metals in proportion to the in-water concentration (Nehring, 1976). In contrast to the more mobile fish species, macroinvertebrates are relatively sessile organisms. They also constitute an important part of the lotic food web, being the primary food source of most stream fishes. This makes them a useful surrogate for the economically and culturally important fish that inhabit the streams of the western states. In addition, some species of macroinvertebrates turned out to be more sensitive to metal pollution than others. This concept of "tolerant" and "sensitive" groups/species has become an important aspect of macroinvertebrate-based indices of pollution (Winner et al., 1980). In general, stoneflies (Plecoptera) and mayflies (Ephemeroptera) are sensitive to metal pollution, caddisflies (Trichoptera) are moderately sensitive/tolerant, and midges (Chironomids) are metal pollution-tolerant (Garie and McIntosh, 1986).

Field studies into the impact of urban runoff on lotic systems often use macroinvertebrate community structure as an indicator of ecosystem degradation. Many studies have found that, although urban runoff is the causal agent of ecosystem disruption, the impacts of stormwater pollution events are not just short-term. Partitioning of pollutants, especially metals, into sediments has been shown to have long-term ecological consequences on the primarily benthic-dwelling macroinvertebrate community structure (Pratt et al, 1981). In many cases, analysis of stormwater samples will not detect significant metals either in the dissolved or particulate form, but sediment samples will show metal accumulation bound to organic and inorganic ligands (Whiting and Clifford, 1983). Urban stormwater pollution is by its nature sporadic and acts as a physical and chemical pulse on the receiving water ecosystem. Higher levels of urban pollutants, such as metals and hydrocarbons, are typically found during "flushing"

storm events (Pitt et al., 1995). Also coincident with these elevated pollution level events is increased flow over the period of the storm. These "scouring," high-energy flows have been shown to have a negative synergistic impact on benthic populations (Borchardt and Statzner, 1990). Some benthic species tend to migrate downstream or "drift" during stormflow conditions or pollutant events, while others try to avoid exposure by burrowing into the substrate.

One of the first comprehensive studies of the effects of urban runoff on benthic macroinvertebrates in streams was conducted on the East Coast (Garie and McIntosh, 1986). This was a typical upstream (control) compared to downstream (impacted) site study. Lead, zinc, and chromium were the predominant metals found in the stormwater. Macroinvertebrate diversity (number of taxa) and changes in community composition were used as the primary measures of impact. The results of this study again showed that there are both "tolerant" and "sensitive" species with regard to metal toxicity and urban runoff impact. The study also confirmed that elevated pollutant concentrations during urban runoff storm events were short-term and transient in nature, and it was hypothesized that the real impact on macroinvertebrate communities lay in long-term exposure to metals accumulating in the benthic sediments. This points out one of the potential flaws of using macroinvertebrates as biological surrogates for fish in that fish are generally not exposed to the sediment chemistry that the benthos are. Another very comprehensive study conducted in the Pacific Northwest showed that, although macroinvertebrate community structure was significantly changed due to urbanization impacts, the fish population structure of impacted and control streams remained largely the same (Pedersen and Perkins, 1986). Apparently, salmonids feed on available benthos and do not select for specific trophic groups or species. This is not to say that a shift in benthic community structure is not a good indicator of urban impact, but one must be careful in extrapolating the results of one group of organisms to other biota, even if they are closely linked within the food web. The PNW study also demonstrated a lack of consistency when trying to use complex macroinvertebrate diversity indices to gauge the level of urban impact. Natural variability was generally too high and effectively masked any well-defined correlations.

Aquatic insect sampling and analysis has, however, been shown to be very useful as a tool for assessing other impacts of metal pollution. The usefulness of benthic macroinvertebrates as monitors of bioavailable metal concentration and long-term bioaccumulation of metals has been demonstrated (Kiffney and Clements, 1993). Still other studies have highlighted the synergistic (negative) impacts of metals and other habitat degradations on aquatic ecosystems in general (Clements, 1994; Hoiland and Rabe, 1992). Finally, the persistence of sediment metal levels and resultant long recovery times has been shown for macroinvertebrate communities exposed to prolonged pollution inputs in the field (Chadwick et al., 1985).

Urban Runoff and Eutrophication

Watershed urbanization generally leads to higher nutrient (phosphorus and nitrogen) concentrations in stormwater runoff (Omernik, 1976). Phosphorus is generally found in particulate form, but the more bioavailable, dissolved forms are also common. Nitrogen is typically found in the nitrate or ammonium form. Sources of nutrients in urbanizing catchments include lawn and garden fertilizers, wastewater (failing septic systems and WWTP discharges), and fine sediment from erosion or street runoff. Although nutrient pollution is often associated more with agricultural activities, urbanization can contribute significant quantities of nutrients to receiving waters (Omernik, 1976).

Eutrophication is the process through which excess nutrients cause overall algal biomass increases, especially during "bloom" periods. This is due to increased loading of the nutrient that had previously been in shortest supply relative to need. This limiting nutrient is usually either phosphorus or nitrogen, but most often, and most consistently, it is phosphorus in freshwater lakes. In estuarine or marine nearshore areas, nitrogen is typically the limiting nutrient. In addition to promoting larger quantities of algae, nutrient enrichment typically changes the composition of the algal community. One-celled diatoms give way to filamentous green forms, followed by blue-green forms (some toxic) with a larger nutrient supply (Welch, 1980; Welch et al., 1988; Welch et al., 1989; Welch et al., 1992).

As discussed earlier, urban areas have a number of nutrient sources, and nutrient loadings increase with the development level. Eutrophication degrades lake and estuarine ecosystems in several ways. The filamentous algae are poorer food than diatoms to herbivores because

of their structure and, sometimes, bad taste and toxicity. Filamentous algae clog water intakes and boat propellers and form odorous masses when they wash up on beaches. They also reduce water clarity, further limiting beneficial uses. When a large biomass dies at the end of the bloom, its decomposition by bacteria creates high oxygen demand, which can result in severely depressed DO levels (Welch, 1980; Shuster et al., 1986; Walker, 1987). In addition to algal blooms and the associated negative impacts, eutrophication may result in an overall increase in other nuisance plants, including a variety of submerged or emergent aquatic macrophytes. Some of these plant communities may include invasive species such as hydrilla, Eurasian milfoil, purple loosestrife, and reed canary grass (Welch 1980).

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CHAPTER 5

Aquatic Monitoring and Program Design

Obtaining conclusive data on urban water resources and stormwater runoff is difficult and expensive. Therefore, monitoring programs that collect data must be carefully designed to be cost-effective. This chapter suggests a general process for designing programs, whether the monitoring subject is natural or runoff water, sediments, or biological community characteristics or organisms. The recommended system thus applies to the design of monitoring programs whose elements are detailed in Chapters 6 and 7.

This process originated in research to improve monitoring program design in urban runoff and related fields (Reinelt, Horner, and Castensson, 1992; Reinelt, Horner, and Mar, 1988; Mar et al., 1986). Burton and Pitt (2002) have written very extensively on all aspects of monitoring program design and execution. Their Chapter 4 covers the program design aspects of monitoring and presents a number of case studies. Some citations to that work are given in this and the two following chapters. Those who wish to pursue any subject in detail should consult Burton and Pitt, using their helpful 37-page index.

The suggested analytical process has five steps:

1. Specify monitoring program objectives;
2. Determine the level of effort to devote to the analysis;
3. Perform a systematic analysis appropriate to the problem and objectives;
4. Use the analysis results to tentatively specify monitoring program elements; and
5. Evaluate the tentative monitoring program for cost-effectiveness and finalize according to evaluation results.

Each of these steps entails numerous tasks and decisions that are essential to arriving at a well-founded monitoring program design. Ultimately, the purpose of working through these steps is to determine the best combination of program elements that will achieve the objectives with an acceptable level of assurance in the results at known cost.

Monitoring Program Design Steps

Step 1: Specify Monitoring Program Objectives

Establishing objectives for environmental monitoring is essential, even though they cannot always be specified in great detail. Thoughtful statements, agreed upon by all concerned, should guide the monitoring program design and conduct. Objectives follow from the nature of the problem or the particular decision-making need that requires data collection.

Every monitoring program should, if possible, formulate objectives at two levels, general and specific. General objectives describe what must be accomplished to solve the overall problem or meet the need. Examples are:

- Determine if a water body meets water quality standards applying to it.
- Define water quality conditions in a lake prior to shoreline development.
- Determine long-term trends in sediment accumulation of metals in a poorly flushed bay.

- Find and quantify the contamination source that has closed a shellfish bed to harvesting.
- Calibrate and verify a specific runoff rate simulation model.
- Assess the relative health of a benthic macroinvertebrate community.

Specific objectives relate directly to measurements and produce results to meet the general objectives. Some examples related to the fourth general objective above are:

- Determine the annual fecal coliform loadings contributed by agricultural, septic drain field, and urban runoff sources.
- Identify individual sources of fecal coliform loading that should be addressed to achieve 70 percent reduction in total annual loading.

These objectives can be stated in more detail and more specifically when Step 3 of the general design process is completed. For example, more analysis could permit recasting the second specific objective as:

- Rate individual sources of fecal coliform loading in terms of annual loading generated and potential for reduction, and identify the best combination of sources to address that would lead to a 70 percent reduction in total annual loading.

This chapter emphasizes the point that an environmental monitoring program should be regarded as a type of scientific experiment. The rigor of the scientific method promotes careful design of the program to make as sure as possible that it will yield answers with a known level of certainty. Accordingly, it is sometimes appropriate to state objectives in terms of a scientific hypothesis. An example would be:

- Determine the best way to target source controls to pollution sources, with the "null hypothesis" being that the annual loadings of a pollutant do not significantly differ between Source A and Source B, and the "alternative hypothesis" being that they do differ with statistical significance.

Step 5 explores this subject further. It supplies methods that allow the monitoring program designer to judge the likelihood of the hypotheses being successfully tested with the funds available.

Objectives form the foundation for the entire monitoring program. They should be consulted frequently in its development to make sure that decisions made along the way comply with the intentions represented by objectives. At the same time, they should not be overly rigid, in case circumstances change. In some cases, new information will make it possible to sharpen the objectives. In others, the findings through analysis may point out a lack of realism in the initial objective statements and suggest how they should be modified accordingly. Ultimately, the assessment in Step 5 will determine if the objectives are achievable with an acceptable level of assurance within the funds available. If this is unlikely, it is much better to change them to something that can be met and still fulfil a purpose than to proceed with a program that has little probability of success.

Using this process ensures careful decision-making at each step and counters the tendency to use a generic monitoring strategy that may not relate to the program goals. Exercising discipline to make careful assessments is the best way to be cost-effective in monitoring.

Step 2: Determine the Level of Effort

The effort put into monitoring program design can range from relatively simple and inexpensive to thorough and costly, depending on the objectives for the particular program. The development of specific objectives is an iterative process of adjusting goals in light of the quantity and type of information available, the detail of additional information needed, the resources of the designers, and the urgency to begin monitoring.

Available information can help target new monitoring and substantially reduce costs. Therefore, designers should incorporate this information in their analysis, using techniques in this manual. Some problems may not be worth extensive effort, while others require it. For example, existing data can help determine whether there is a problem in a particular location without necessitating the expense and effort of sampling. On the other hand, monitoring to allocate resources for solving problems in a large, complex watershed may require a substantially greater level of analysis.

Even if little guidance information exists and the designer has limited time and resources, at least the basic analytical process should be applied. After developing a preliminary information base, the designer can always review the systematic analysis of the problem and objectives in more detail later.

Step 3: Perform a Systematic Analysis

As the core of the process, Step 3 requires the most effort. The analyst should give priority to key factors thought to pertain to the issue. This systematic analysis is often referred to as a watershed analysis. The term "watershed" broadly signifies an area that drains a land surface to a point of interest. While a watershed can be a small catchment with a simple drainage system, for now we will limit the term to include only landscapes of some size and complexity draining through a network of artificial and natural conveyances to a natural water body. Thus, the analysis involves surveying watershed characteristics, identifying the most critical potential problems and sources, and highlighting the most critical places, times, and biological units that manifest these problems.

A watershed inventory involves collecting the level of data appropriate to the needs of the project. While the level of detail may vary, the inventory should include developing a basin map; identifying such features as land uses, soils, topographic information, and hydrologic data; and identifying potentially critical locations relative to the objectives adopted in Step 1. For example, if these objectives pertain to pollution sources, some possible locations of interest are earth-moving sites, industrial areas, and major traffic concentrations. If the objectives focus on aquatic resources, areas to recognize might be sites like fisheries and other productive resource areas, rare or endangered resources, and stream reaches vulnerable to major channel damage. Obtaining any available data on these features, as well as field reconnaissance, are key tasks in a watershed inventory. This includes identifying any already existing site data for possible use in Step 5 of the process.

Identifying critical problems and sources should be a systematic process of formulating a broad list and then narrowing it by prioritizing items, with the level of effort chosen in Step 2 dictating the scale of the analysis. For example, to find the principal sources of water quality deterioration in a river draining a large watershed, we may suspect that certain areas and activities need attention. However, this conclusion should be tested through some quantified, comparative estimates of pollution quantities, using models like those outlined in Chapter 3. Such models may be overly generalized, simplified, and not calibrated locally, but their purpose is not to reach a final decision but to guide the design of a monitoring program. Even with little effort, the simplest model can often bring objectivity and rigor to the analysis.

Identifying critical places, times, and receptor organisms presents a more difficult problem. We must at least conceptualize the relationship between problem and timing and the potential damage for habitats, species, and life stages. While models can sometimes help, they are usually too simple or inconvenient to be sufficient. Ideally, the specialists (e.g., water quality engineer, hydrologist) will work closely with an ecologist familiar with the water body, its ecology, and its natural history, to judge these critical factors.

It is advisable to review the original objectives for their continued appropriateness. Objectives will likely need to be modified or specified with increased knowledge.

Step 4: Tentatively Specify Monitoring Program Elements

General Considerations

If performed properly, the systematic analysis of Step 3 will provide sufficient information to give provisional shape to the monitoring program. In this step, it should be tentatively specified:

- What to sample;
- Where to sample;
- When to sample;
- How many samples to take at each site on each occasion (replicates);
- How to sample; and
- What to analyze in samples.

The philosophy behind this process is to base decisions on these program aspects on case-specific objectives and analysis. Working from prescribed sampling scopes and frequencies and standard lists of analyses should be avoided.

The list above represents the monitoring program elements that require tentative but concrete decisions, so a cost-effectiveness evaluation according to Step 5 can be conducted. Along with these basic decisions, some attention should be given at this point to the following additional elements:

- How to handle samples;
- Data quality objectives;

- Quality assurance/quality control checks; and
- How to analyze data.

Tentative judgments on these elements of a monitoring program will be further evaluated in Step 5 for their ability to meet the objectives with a known level of assurance and cost. These will be finalized after any necessary adjustments have been made and become the monitoring program design. The following two chapters on physical and chemical monitoring and biological community and toxicity assessment present details on each element, as appropriate to each monitoring topic.

What to Sample

This monitoring program element is the most straightforward one, specifying the medium or media to sample. It refers to the water body, runoff stream, sediment, habitat, biological community, or organism(s) from which samples are to be drawn.

Where to Sample

The question where to take samples must be carefully considered with respect to the established objectives and the analysis performed under Step 3. Obviously, the more locations samples are collected from, the higher the cost will be. Thus, the decision on each sampling point must be taken with an eye to its contribution to fulfilling the objectives.

In the study of urban waters, where to sample is often dictated or strongly guided by the objective of comparing two or more spatial conditions, e.g., a location affected by runoff discharge versus an unaffected one, a location served by a best management practice (BMP) versus one that is not. In experimental parlance, the affected spot is often referred to as the "treatment" site, in the sense that its condition is "treated" by the discharge or the BMP, while the other location is frequently termed the "control" or "reference" site. Accordingly, a comparative monitoring program can be termed a "control/treatment design." The term "control" stems from laboratory experimentation, where the investigator generally has a much higher degree of influence on the situation than in studies in the natural environment. The term "reference," which implies a basis for comparison rather than maximum influence, is thus often preferred in environmental monitoring. These concepts illustrate once again that a monitoring program should be regarded as a type of scientific experiment.

The comparison of two or more conditions can, and often should, be approached very systematically as a "paired watershed" monitoring program design in which the treatment site (or each of several treatment sites) is paired with the reference site. The rationale, as well as the methods, for paired watershed monitoring have been thoroughly developed over the last 15 years. The appendix to this chapter summarizes them in some detail and gives references for those interested in more information. Ultimately, this technique entails not only spatial considerations (i.e., where to sample) but also temporal ones (i.e., when to sample). This program element will be discussed below.

When to Sample

Fulfilling objectives and keeping monitoring costs within budget depends as strongly on decisions about when to sample as on where to sample. Also, the comparison objectives for urban water monitoring studies are often temporal rather than (or in addition to) spatial; i.e., the task is to compare two or more conditions separated in time. Examples would be: comparing the health of a macroinvertebrate community before and after major development in the watershed, or comparing storm runoff event mean concentrations of pollutants before and after the institution of BMPs.

As pointed out in the appendix to this chapter, it is advisable to employ, whenever possible, a reference station or stations and a control/treatment design in conjunction with temporal comparisons. The reference serves as a basis to distinguish natural variability or some other source of effect from the treatment that is the actual focus of the study. This monitoring program design lowers the risk of attributing an outcome to the treatment that is in fact the result of one or more extraneous factors. Designs of this type are sometimes referred to as before/after, control/treatment designs (BACT).

Beyond comparisons over a certain time period, there are other important considerations that enter into the decision when to sample:

- Seasonal considerations – Numerous conditions potentially instrumental to urban water monitoring objectives vary over the year. E.g., (1) many lakes stratify thermally in the summer and, depending on the climate, in the winter as

well, with key implications for physical, chemical, and biological conditions; (2) living organisms pass through annual life cycles that must be recognized in scheduling their sampling; (3) pollutant delivery to water bodies accelerates in high runoff periods, while pollutants already present can concentrate in less diluted form during dry periods.

- Diurnal considerations – Some key conditions vary over the course of the day. These include (1) water temperature, dissolved oxygen, and sometimes pH in response to the photosynthetic and respiratory activities of aquatic life; (2) the variation in routine most organisms display over the course of a day, which may influence the ability to sample them.
- Considerations related to flow variation – Flow can vary depending on stochastic environmental conditions (e.g., runoff pattern in response to rainfall) and more predictable circumstances under human management (e.g., flow release from a dam).

All these factors may influence the decision when to sample. It is almost always inappropriate to devise a regular sampling schedule, as often occurs when schedules are adapted to the staff's regular work schedule.

Replicates

A replicate is a duplicate sample collected and handled in exactly the same way as the initial sample. Replicates are an important part of monitoring programs, not only for quality assurance/quality control (QA/QC) purposes, but also to define potential variability introduced from various sources. This subject will be elaborated on later in the chapter. Suffice it to say for now that, just like each sampling location and occasion, each replicate adds cost. Hence the number of replicates must be carefully considered in relation to the overall objectives, specific QA/QC requirements, and the budget.

How to Sample

This question regards the choice of sampling gear and its operation, clearly factors that affect costs and the achievement of objectives. These subjects are covered in depth in Chapters 6 and 7.

What to Analyze in Samples

The question of monitoring topics also directly affects costs and outcomes. It is covered in detail in the next two chapters.

How to Handle Samples

Once decisions are made about how samples will be collected and analyzed, handling them correctly is generally tightly standardized. Proper handling procedures ensure against alteration of samples between the time of collection and analysis, which would give false results. Chapters 6 and 7 cover the subject as appropriate to each monitoring type.

Data Quality Objectives

Data quality objectives, sometimes abbreviated as DQO, are statements (generally quantitative) representing the standards to which data will be held for acceptance and consideration in data analysis. They can be regarded as part of the set of overall objectives stated in Step 1. DQO achievement is assessed through quality assurance/quality control checks. The next two chapters on specific monitoring types give examples.

Quality Assurance/Quality Control

The effectiveness and credibility of any monitoring program depends on its quality assurance/quality control program, the control exercised on a data collection to assure, to the extent possible, a sound basis for drawing conclusions. The QA/QC program provides quantitative measurements of the "goodness" of the data. The most fundamental QA/QC concepts, applying in one way or another to every type of aquatic monitoring program, are:

- Representativeness – Results are representative when they truly reflect the population of interest, as framed in the objectives. The term "population" is used here in the general sense, referring to the aggregate of units from which samples will be drawn. Some examples are: (1) For a general stormwater runoff monitoring program, the population would be the full range of runoff events (the "units") over the whole duration of flow; whereas for a first-flush program, the population would encompass the full range,

but over just the rising limb of the hydrograph (or some selected fraction of it). (2) For a river sediment contamination monitoring program, the population would be the complete distribution of sediment types (size fractions, etc.) in the reach of interest. (3) For a stream riparian cover assessment program, the population would be the cover types (vegetation, surfaces, etc.) of the lands extending a selected distance to either side of the stream centerline (or bank-full location) over the reach of interest. The objectives help determine what would be representative within their boundaries. There is clearly a tension in monitoring program design between selecting a representative number of units on the one hand, while staying within the bounds of feasibility and affordability on the other. The analysis outlined in Step 5 is an aid in resolving this tension.

- Accuracy – Accuracy is the agreement between the measurement of a variable in a sample and its true value. The term "error" refers to the discrepancy between the measured and true values (Error = Measured value – True value). Relative error expresses the error as a percentage deviation from the true value:

  Relative error (percent) = (Error/True value) x 100

QA/QC programs assess accuracy by testing samples that have set values of the variable being measured. These tests should be done blind (without the analyst knowing the value) to avoid bias.

- Precision – Precision is the agreement among replicate measurements. It is measured in absolute terms as the standard deviation of the set of replicates. More useful is relative deviation, which is the standard deviation being expressed as the percentage of the mean of the replicate values:

  Relative deviation (percent) = (Standard deviation/ Mean of measured values) x 100

Precision can, and generally should, be assessed with both field and laboratory replicates. Field replicates are separate samples collected simultaneously at the same source location and analyzed separately. They are used to assess total sample variability (i.e., field plus analytical variability). Laboratory replicates are repeated analyses of a variable performed on the contents of a single sample. They are used to assess analytical precision. Duplicate analyses of a single sample usually suffice for well-proven procedures in the laboratory. The extent of replication depends on overall objectives, data quality objectives, and monitoring program optimization for cost effectiveness (see Step 5). In the absence of any specific considerations arising from these factors, it is common for 5 to 10 percent of field samples and 5 to 10 percent of laboratory procedures to be duplicated to get some measure of precision.

Additional QA/QC terms and procedures apply to specific monitoring types, as covered in Chapters 6 and 7. Laboratory physical and chemical analyses of water and sediment samples in particular are subject to extensive further QA/QC checks.

Regardless of the monitoring type, QA/QC is best advanced by having well-qualified and -trained personnel involved at every point in the process. The quality of laboratory service should be ensured by writing detailed contract specifications, including the QA/QC checks to be performed, standards for acceptance, and action to be taken should results be unacceptable.

Data Analysis

Thinking about data analysis early is essential to ensure that measurements produce data that can be assessed to achieve program objectives. For example, it would be fruitless to collect sediment samples along a longitudinal transect (parallel to flow) and later try to define the extent of variability in the vicinity of a particular discharge. The connection between what one is trying to learn and how one is going to use data to gain that knowledge is not always as obvious as it should be. At this stage, each stated objective should be coupled with the data analysis scheme set out in the preliminary monitoring program design. The design should be finalized after Step 5 has been performed. It is, of course, still possible to implement additional data analysis procedures that may suggest themselves later on, but starting out with a sound basic plan is highly advisable.

The data analysis options in the areas of graphing, statistics, and multivariate analyses are almost unlimited. Exploring them all is far beyond the scope of this book. Chapters 6 and 7 present some techniques that have proven to be useful.

Step 5: Evaluate the Tentative Monitoring Program and Finalize

General Considerations

This step is an evaluation of the tentative monitoring program according to Step 4. It takes into account the total numbers of samples and analyses anticipated, as well as the allocation of effort among sampling locations and occasions, replicates, and analyses. These factors directly determine the program's cost and probable effectiveness. Monitoring programs frequently fail to provide the desired information, even when performed flawlessly, because the samples are insufficient to achieve an accepted level of statistical assurance. This failure results from a high variability in flow and natural aquatic systems that complicates monitoring. For example, variability prevents us from ascertaining with a high level of statistical confidence that an average water quality condition meets a certain criterion or that a new discharge creates a change in a biological community.

Sources of variability include spatial differences in a landscape or water body, differences over time (temporal variability), and measurement errors. Careful consideration of seasonal, diurnal, and flow-related factors in relation to the objectives, as discussed under Step 4, can help reduce this variability. Better techniques, if available, can reduce measurement errors. Otherwise, replicate samples will have to be collected in order to quantify the measurement error component. One strategy in dealing with sources of natural spatial and temporal variability, unless they are enormous, is to increase sample numbers, but this strategy raises cost.

The basic task in this step is to determine the number of samples (stations, occasions, and replicates) needed to meet the objectives, considering variability and budget limits. Using the optimal number of samples to reach a conclusion will result in either the maximum confidence level for a set budget, or in minimum cost for a set assurance level. These options, which represent two ways to maximize the monitoring program's cost-effectiveness, can only be applied if some data are already available to give statistical measures of central tendency (e.g., mean or median) and variance. In that case, statistical methods can be applied to the optimization problem.

In some cases, uncontrollable natural variability will be too great to achieve confidence in a certain program element within a feasible budget. In this case, the designer will have to either delete this element or reduce costs in other areas and redirect resources. The options are to reduce the sampling stations, occasions, replicates, the number of analyses prescribed, the costs of various program elements, or some combination thereof. This decision is often unpalatable because it can demand, for example, cutting geographic coverage or not analyzing for a water quality measure that is traditionally included. However, the designer must choose and target the program according to objectives and circumstances, rather than conduct a program that gives inconclusive or misleading answers.

Mar et al. (1986) present some straightforward strategies for optimizing monitoring program designs in common situations, which will be summarized in the following sections. Other situations may arise in designing aquatic monitoring programs, and different statistical methods exist to handle the various scenarios. Burton and Pitt (2002) summarizemany of these circumstances and techniques in their Table 5-3, with elaboration in the accompanying text. Other references with extensive coverage of the subject are Gilbert (1987) and Zar (1998).

Determining a Mean Value

Determining a mean value applies, for example, when an average water quality condition is compared to a regulatory criterion. In basic statistics, t-distribution defines the confidence interval for the mean of a normally distributed population (set of values) as estimated from a data set. The t-distribution is used to determine sample numbers if the data are demonstrated or assumed to have a normal probability distribution (Figure 5-1(A)), or if they can be transformed (e.g., by taking their logarithms) to yield a normal distribution.

Figure 5-2 presents the results of an analysis based on the t-distribution for three confidence levels. The curves show the number of samples required as a function of precision. Precision here is the ratio of the difference in the estimated and actual mean ($x - \mu$, the error that will be accepted) to the standard deviation (σ, the variation or "noise" in the data). To use the graph, the monitoring program designer consults available data to get estimates of the mean and standard deviation and decides on the acceptable error and confidence level. For the case of an acceptable error equal to the standard deviation (precision = 1) and an 80 percent confidence, for example, four samples suffice. Demanding a precision of 0.1, however, requires hundreds of samples.

If no data are available for this exercise, monitoring program designers have several options. They can conduct a pilot program to obtain a limited data set; however, this choice would require spending time and money. The alternative is to use data from a similar location or estimate values using professional judgment. Either course has obvious drawbacks in accuracy, but both are usually superior to making an educated guess of the sample numbers and allocation with qualitative, but no quantitative, analysis. Even that option is better, though, than blindly specifying monitoring program elements without any analysis.

Detecting Change

Detecting change applies, for example, when the size or composition of a biological community is evaluated at two different points in time. Programs designed to detect change require different statistics than those that simply identify means. This type of problem is phrased as a statistical hypothesis test in which the null hypothesis (H_o) is that the populations are from the same distribution at both points in time; the alternative hypothesis (H_1) is that they are from different distributions.

Figure 5-1 illustrates terminology needed for this type of evaluation. The shaded area of Figure 5-1(A) represents the probability (a) of a Type I error (H_o was rejected when it was, in fact, true). Figure 5-1(B) shows distributions at both points in time, in which the difference in means represents an apparent change of magnitude (δ). The hatched area represents the probability (α) of a Type II error (H_o was accepted when it was, in fact, false). The quantity (l – ß) is termed the power of a statistical hypothesis test. Figure 5-1(C), in comparison to the other two graphs, illustrates the variation effect, as represented by the standard deviation, on power. For a given change, δ, the power increases as the standard deviation decreases.

Figure 5-3 provides a graphic way to establish the number of samples needed to detect change. To use the

Figure 5-1: Hypothesis-Testing Fundamentals

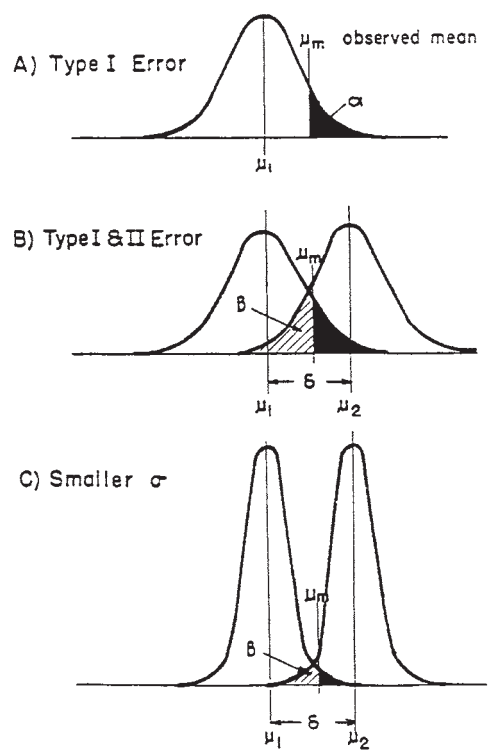

μ_1 and μ_2 are the means of two populations of measurements; their difference represents a change δ; α and β are the probabilities of the Types I and II errors, respectively.

Source: Mar et al., 1986

Figure 5-2: Number of Samples Versus Precision

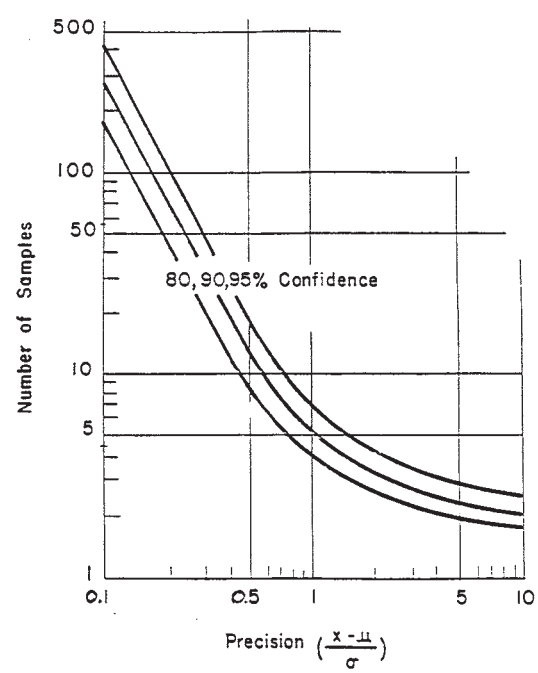

Precision is the ratio of the allowable error to the standard deviation of the population of measurements.

Source: Mar et al., 1986

graph, the monitoring program designer consults any available data to estimate the standard deviation and decides on the magnitude of change to be detected ($\delta = \mu_1 - \mu_2$) and the power. Suppose, for example, that the objective is to detect a change of 5 units in a population previously characterized to have a standard deviation of 8 units with statistical power of 0.8. The ratio of change to standard deviation is 0.625, requiring 20 samples. This plot shows that to detect changes of less than 50 percent of the standard deviation, the program requires a large number of samples.

Monitoring Costs

The statistical methods previously illustrated show how to measure the value of added information in the form of more samples in promoting program effectiveness. To optimize the program, cost estimation must accompany these methods. Given the cost and value of added data, a trade-off analysis can be performed to obtain the most cost-effective program within the existing con-straints. Costs are accounted as follows:

$$TC = C_o + (T)(C_t) + (S)(T)(C_s) + (R)(S)(T)(C_r)$$

Figure 5-3: Power Curves Relating Number of Samples to Change to be Detected

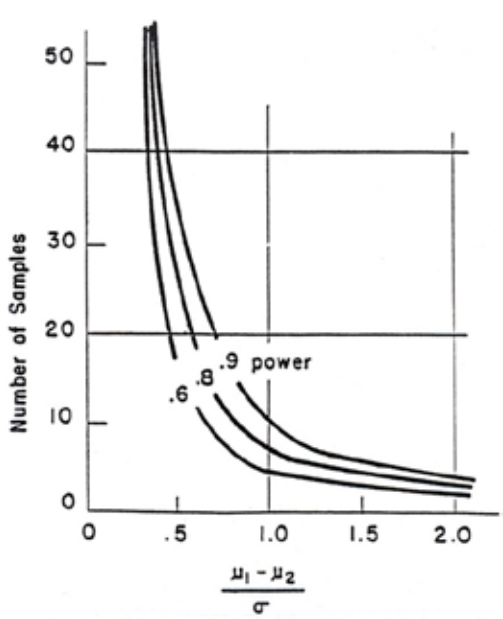

σ is the standard deviation

Source: Mar et al., 1986

where: TC = Total cost;

C_o = Fixed overhead cost;

C_t = Fixed cost for each sampling occasion;

C_s = Cost associated with visiting each sampling station;

C_r = Cost to collect and analyze each sample;

T = Number of sampling occasions;

S = Number of sampling stations; and

R = Number of replicates on each occasion at each station.

C_o represents such costs as maintaining staff and space for the overall program to support all the work outside of going out to take samples and analyzing them (e.g., equipment inventory, monitoring program design, data analysis, reporting, administration). C_t is the cost of mobilizing for a sampling date (e.g., acquiring sampling supplies, paying a daily vehicle charge). C_s represents the expenses of travel to field locations and time spent collecting samples and delivering them to the site of analysis. Finally, C_r is the price of analyzing one sample, plus any cost, other than staff time, of the sample collection and handling process (e.g., chemical preservative). It should be noted that, regardless of these considerations concerning finances and ability to draw conclusions in the face of natural variability, some field (as well as laboratory) replicates must be taken for QA/QC purposes. If cost accounting can be done in this manner, monitoring program optimization can be performed relatively easily.

Note that (R)(S)(T) = the total number of sam-ples. For a given total, the three quantities can be varied so long as their product remains the same. If measurement error is larger than natural varia-tion, then adding replicates would reduce uncer-tainty more than adding stations or occasions. However, if spatial or temporal variation domi-nates, adding stations or occasions, respectively, would be a better strategy.

Optimization Examples

Example 1

The first example concerns selecting sample numbers to estimate mean values. Suppose three variables (A, B, and C) are to be monitored to establish their annual means at a site with 90 percent confidence. Table 5-1(a) gives variability from hypothetical pilot data and meas-

urement costs of each. Overhead cost is equal among designs and is not considered in the calculations. This example illustrates optimizing the monitoring program for a given budget (Designs 1 and 2) and a given level of assurance (Design 3):

- Design 1 – Collect three samples for each variable (fixed cost of $420). What is the minimum error that can be attained for each variable?
- Design 2 – Collect four samples for each variable (fixed cost of $560). What is the minimum error that can be attained for each variable?
- Design 3 – A fixed error of = 40 percent of the mean is required for each variable. What design (sample numbers) provides this level of certainty at the minimum cost?

Table 5-1(b-d) summarizes the evaluation. Comparing Design 2 to Design 1 indicates that an in-creased but equal number of samples would only slightly improve the estimate of the mean for each variable. The estimate for variable B would still be highly uncertain relative to the others. However, as Design 3 shows, allocating more samples to the variable with the greatest variation, and with the most improvement results per dollar spent, provides an overall more cost-effective design. With this design, the estimate of the mean of variable B is expected to improve greatly, with some increase in the error for variable A but little for C, at about the same cost as Design 2.

In most actual cases, a simple analysis like this is insufficient, since uncertainties can result from several factors, including measurement er-rors and spatial and temporal variability. Generally, an analysis should be performed to inves-tigate each cost and variance component and their effects on the design to allocate the effort among

Table 5-1: Monitoring Program Optimization Hypothetical Example for Estimation of Means

(a) Sample Costs and Variability

Input Data	Variable A	Variable B	Variable C
Total cost per sample	$100	$10	$30
Standard deviation (% of mean)	10	100	20

(b) Design 1 (optimization for fixed budget, three samples of each variable)

Variable	Cost	Precision[a]	Error (% of Mean)[b]
A	$300	2.4	24
B	$30	2.4	240
C	$90	2.4	48
Total	$420		

(c) Design 2 (optimization for fixed budget, four samples of each variable)

Variable	Cost	Precision[a]	Error (% of Mean)[b]
A	$400	2.2	22
B	$40	2.2	220
C	$120	2.2	44
Total	$560		

(d) Design 3 (optimization for fixed allowable error of = 40 percent of the mean of each variable)

Variable	Error (% of Mean)	Precision[c]	Number of Samples[a]	Cost
A	40	4.0	3	$300
B	40	0.40	18	$180
C	40	2.0	3	$90
Total				$570

Notes: [a] From Figure 5-2 for 90 percent confidence.
[b] Error = Precision x Standard deviation.
[c] Precision = Error/Standard deviation.

sampling locations, occasions, and repli-cates. Example 2 illustrates this type of analysis.

Example 2

The second example concerns selecting sample numbers to determine whether or not the mean value of a variable at a particular location (one station) changes over time. A pilot sampling program estimated the standard deviation at 8 units, 10 sampling occasions, and two replicates. The standard deviation is estimated to decrease or increase by 0.5 unit with each added or subtracted sampling occasion, respectively, and to decrease or increase by 0.2 unit with each added or subtracted replicate, respectively. Change should be detectable with statistical power of 0.8. Cost components are: C_o = \$15,000; C_t = \$300; C_s = \$150; and C_r = \$500. This example illustrates optimizing the monitoring program for a given budget (Design 1) and a given level of detectability (Design 2):

- Design 1 – What is the optimum allocation of sampling occasions and replicates to minimize the detectable change for a budget of \$30,000?
- Design 2 – What is the optimum allocation of sampling occasions and replicates to minimize the cost of detecting a change of 5 units or smaller?

Table 5-2(a-b) summarizes the evaluation. In Design 1, reducing occasions in favor of replicates did not lower detectability. Increasing occasions to 16 with a single sample taken each time reduced detectability substantially. Lack of replication generally would not be acceptable for QA/QC purposes, and a replicate sample would be collected and analyzed on at least one sampling occasion, preferably two. A small budget increase or slight loss of detectability would be necessary to accommodate the replication. In Design 2, reducing occasions in favor of replicates raised cost, whereas increasing to 12 occasions without replication yielded the lowest cost. The same qualification stated for Design 1 pertains to replication.

Table 5-2: Monitoring Program Optimization Example for Determination of Change

(a) Design 1 (optimization for fixed budget of \$30,000)					
Sampling Occasions	Replicates[a]	Total Samples[a]	Standard Deviation (Sd)	δ/sd[b]	δ
10	2.0	20	8.00	0.63	5.0
8	2.9	23	8.83	0.57	5.0
14	1.2	17	6.15	0.67	4.1
16	1.0	16	5.21	0.68	3.5
(b) Design 2 (optimization for fixed detectability of δ = 5 units)					
Sampling Occasions	Replicates[a]	Total Samples[a]	Standard Deviation (Sd)	δ/sd[b]	Total cost
10	2	20	8.00	0.63	\$28,150
8	3	24	8.80	0.57	\$29,550
12	1	12	7.20	0.69	\$24,750

Notes: [a]Replicates were calculated using the total cost equation for the fixed budget, which yielded replicates per sampling occasion, generally not an integral number. In reality replicates would be randomly assigned to sampling occasions to produce the approximate specified allocation between occasions and replicates.
[b]From Figure 5-3 for 0.8 statistical power.

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Paired Watershed Study Design

Description of the Approach

The paired watershed approach is applicable to the assessment of both wet weather effects and technology performance and represents a means of connecting the two. The basic approach requires at least two watersheds, control and treatment, and two periods of monitoring, calibration and treatment. A control watershed is one that experiences essentially no change during both monitoring periods. It is subject to year-to-year or seasonal variations in large-scale factors, such as meteorological changes and natural biological cycles, that are beyond the control of study personnel. A treatment watershed is one in which a planned change (the "treatment") has been imposed between the two monitoring periods. This change can consist of a land development project that could potentially affect an aquatic ecosystem or application of a source control, or a structural best management practice (BMP) that could mitigate a negative effect. One control watershed can serve as a basis of comparison for treatments in different watersheds, and both types of watersheds can be replicated if desired.

During the calibration period, the two types of watersheds are treated identically, and paired data are collected. The basis (and implicit assumption) of the paired watershed approach is that these data represent a quantifiable relationship between the two types of watersheds and that this relationship is valid until a major change is made in the treatment watershed(s). The relationship is expressed as a linear regression of a variable measured in the (future) treatment case on the variable measured in the control case. It is further presumed that a new relationship will be established after application of the treatment and that this relationship can be quantified through post-treatment monitoring. The difference between the two relationships, if demonstrable through statistical analysis, will constitute a measure of the treatment effect (e.g., the impact of the development or the effectiveness of the management technique). This protocol is derived from work sponsored by the U.S. Environmental Protection Agency Office of Wetlands, Oceans, and Watersheds and performed by the Rural Clean Water Program at North Carolina State University (Clausen and Spooner 1993).

Advantages and Disadvantages

It should be noted that the data for the paired watersheds do not have to be statistically the same during the calibration period. Rather, it is the relationship between the paired observations that should remain the same over time, except under the influence of the treatment. Often, in fact, the paired data sets differ considerably. This difference, which is virtually inescapable in environmental systems, substantiates the value of a paired watershed approach: the technique does not assume initial equivalence in the two situations subject to comparison, which would rarely occur in reality; it does, however, assume a predictable relationship between the two.

The paired watershed approach has several other advantages besides avoiding the need to find systems that are initially similar in all important respects. Naturally variable factors such as weather are statistically controlled over the years of study, so that observed change can be attributed to the treatment in a cause-and-effect fashion. There is no need to measure all factors that could conceivably cause change, since their effects are embedded in the relationship derived during calibration. Also, the study can be completed in a shorter time than is generally possible in trend studies.

At the same time, the approach has some disadvantages and limitations. Response to the treatment is likely to be gradual, extending the length and cost of

the study. Moreover, it is vulnerable to out-of-the-ordinary events like floods. Although, as mentioned above, paired watersheds do not have to be initially identical, effective application of the procedure generally requires that they be similar and in close proximity. The results will be compromised if the control watershed changes significantly during the course of the study.

Some statistical problems can arise, but they are usually avoidable if recognized and ameliorated by the monitoring program design. If, for example, the calibration period is too short, serially correlated data can result, meaning that successive observations are not independent of one another. This autocorrelation tends to increase variance and thus affect the number of observations needed to detect a difference (Gilbert, 1987; Ott, 1995). However, it is a more limiting factor in trend studies than in the demonstration of a differing relationship before and after treatment. Generally, it can be overcome by extending the calibration period over a full season, a year, or longer, depending on the objectives of the study. Another problem can occur if the treatment effect is strong enough to cause variances between the calibration and treatment periods to be unequal. Unequal variances violate the underlying assumption of the analysis of variance (ANOVA) procedure, which is applied to demonstrate the difference between the two relationships. Fortunately, ANOVA is robust, even with considerably heterogeneity of variances, so long as sample numbers are nearly equal (Zar, 1998).

Example Applications

Following are some applications for a paired watershed study design.

- Response of aquatic biota to watershed development during construction, after construction, or both;
- Comparison of sediment transport and deposition with two construction phase erosion and sediment control strategies;
- Detectability of a lawn pesticide in water and sediments with and without homeowner education;
- Storm peak flows, discharge volumes, and stream bed incision with advanced versus conventional runoff retention/detention;
- Water pollutant baseflow and storm event mean concentrations downstream of a constructed wetland with urban runoff treatment compared to downstream of an urban area without treatment;
- Fish presence and abundance downstream of a constructed wetland compared to the situation without treatment;
- Phosphorus loadings to a lake from a development with extensive roof runoff infiltration versus loadings from a development with piped roof drainage;
- Flow quantity, water pollutants, and benthic invertebrate community measures in a stream draining a watershed with state-of-the-art source and treatment controls compared to a stream draining a watershed with the legal minimum stormwater management;
- Fecal coliform concentrations in shellfish tissue from marine bays receiving flow from watersheds with and without intensive animal waste management efforts; and
- Rapid bioassessment attributes of a stream with a wide, continuous, naturally vegetated riparian zone compared to one with a narrow, disrupted, poorly vegetated riparian area.

Procedure

Monitoring Program Objectives

As with all monitoring programs, the development of objectives to guide the program design is the essential first step. For paired watershed studies, the requirements for effective utilization of the procedure, as well as its limitations as set out in this protocol, have to be recognized and formulated objectively. Once developed and refined, objectives should be used as in any other monitoring program to specify the program elements.

Watershed Selection

It is recommended that paired watersheds be selected to:

1. Be initially similar in physiographic and biological features, such as size, general morphology, slope, location, soils, and land cover;
2. Be similar in past, present, and future human influence, except for the treatment being tested;

3. Be in a steady state at the outset of the study, meaning that they have not experienced substantial change over a number of years prior to the study;
4. Be small enough to make uniform treatment throughout the treatment watershed possible; and
5. Have a stable channel at the measurement point, especially for flow monitoring.

Frequently, circumstances (e.g., a development proposal that has been approved for a specific plot of land) will dictate which watershed is to be the control and which one is to be the treatment location. If there is flexibility, any possible bias can be avoided by assigning control and treatment status randomly, for example by coin toss.

Calibration Period

Perform the monitoring program designed for the calibration period and obtain a data set of paired observations in the control and future treatment watersheds. Analyze the data as follows. It is most convenient to use a computerized statistical analysis package for most of the calculations.

1. Test to determine whether or not the data are normally distributed using a procedure such as the Schapiro-Wilk test (Zar, 1998). If the distribution is not normal, logarithmically transform the data and test for normality again. Most water quality and hydrologic data associated with stormwater runoff have been found in previous investigations to be log-normally distributed (Novotny and Olem, 1994). In the absence of testing, this distribution is usually a safe assumption for this type of data.
2. Using the log-transformed data, test for the equality of variances between watersheds using the F-test (Zar, 1998).
3. Examine residual plots to check for independence of errors (Zar, 1998).
4. Derive regression equations for each measurement variable (e.g., flow, water quality concentration or mass loading, a biological variable) in the form:

   $T = b_0 + (b_1)(C) + e$

   where T and C are the logarithms of values of measurement variables for future treatment and control watersheds, respectively; b_0 and b_1 are regression coefficients representing intercept and slope, respectively; and e is the residual error.
5. Test the statistical significance of the regression relationships by ANOVA. The test assumes that regression residuals are normally distributed, have equal variances between treatments, and are independent, as tested in Steps 1-3. If a relationship is not significant, either additional calibration monitoring should be performed to attempt to derive a significant relationship, or the variable should be discarded in favor of another one with a significant relationship.
6. Test to determine if sufficient calibration sample numbers have been collected to detect a difference of a given size, should one occur during treatment.

a. Decide on the fraction, f, of the mean value of the measurement variable during the calibration period that should be detectable after treatment. Base the selection on the objectives of the study, experience, and feasibility. The smaller the desired detectable difference, the more samples will be required in both calibration and treatment periods.

   For example, if a pollutant event mean concentration (EMC) in a stream is EMC_1 = 30 μg/L before treatment, and the goal is to reduce EMC to EMC_2 = 10 μg/L by installing a BMP, f = 0.67 represents the change that needs to be detected to determine whether or not the goal was achieved. There is no point in specifying a smaller f, at the cost of more sampling, for this objective.

b. Express the difference, d, that is to be detected in EMC_1 as $d = (f)(\log EMC_1)$, since the data have presumably been log-transformed.

c. Obtain the mean square residual variance, S_{yx}^2, from the regression significance test performed in Step 5.

d. Obtain the F-statistic from statistical tables. For n_1, the degrees of freedom for the numerator mean square, use (a –1), where a is the number of watersheds. If a control/treatment pair is being studied, (a – 1) = 1. If a control and two treatment watersheds are being investigated, (a – 1) = 2, etc. For n_2, the degrees of freedom for the denominator mean square, use $(n_1 + n_2 - a)$, where n_1 is the number of samples taken during

the calibration period and n_2 is the number of samples to be taken during the treatment period (assumed at this point to be equal to n_1 for one treatment watershed, 2 x n_1 for two treatment watersheds, etc.). For a, the probability of the Type I error, it is most common to use 0.05.

e. Compute the ratio S_{yx}^2/d^2.

f. Compute the quantity: $[(n_1)(n_2)/(n_1 + n_2)]\{1/[F(1 + (F/(n_1 + n_2 - 2)))]\}$.

g. If the ratio computed in Step d is greater than the quantity computed in Step e, there are an insufficient number of samples to detect the specified difference. In that case, it is necessary to elect some combination of the following strategies: (1) specify a larger detectable difference, if consistent with objectives; (2) schedule more calibration period samples; and/or (3) schedule more treatment period samples.

7. Test to determine if residual errors about the regression are smaller than the expected BMP effect, which indicates how much deviation from the calibration regression is necessary for the treatment data to be significantly different.

Treatment Period

Perform the monitoring program designed for the treatment period and obtain a data set of paired observations in the control and treatment watersheds. Analyze the data as follows, again using a convenient statistical analysis package.

1. Derive new regression equations representing the treatment period for each measurement variable (e.g., flow, water quality concentration or mass loading, a biological variable) in the same form as for the calibration period.
2. Perform the same tests on the data as specified in Steps 1-3 for the calibration period.
3. Test the statistical significance of the treatment regression relationships by ANOVA. The test assumes that regression residuals are normally distributed, have equal variances between treatments, and are independent, as tested in Step 2. If a relationship is not significant, either additional treatment monitoring should be performed to attempt to derive a significant relationship, or the variable should be discarded in favor of another one with a significant relationship.
4. Perform an analysis of covariance (ANCOVA) comparing the calibration and treatment regression relationships. This analysis will demonstrate the significance of the differences between calibration and treatment regression equations overall and between their slopes and intercepts. The treatment effect is considered to be significant if these differences are significant, but insignificant (at least under the test conditions) otherwise.

Displaying and Interpreting Results

It is useful to graph deviations from expected values as if there were no treatment effect as a function of time during the treatment period. There is often interest in expressing the percentage difference in mean values with and without treatment, especially to express the effectiveness of a BMP. The analyses should be performed as follows:

1. Compute expected values without treatment from the calibration regressions.
2. Subtract the values from Step 1 from the observed values in the treatment watershed.
3. Plot versus time, obtaining a graph that visually illustrates the trend created by the treatment effect.
4. Compute the means of expected values without treatment, found in Step 1, and the means of observed values in the treatment watershed. Then find the percentage increase or decrease compared to the expected mean represented by the observed mean. It is not appropriate to make this calculation based on the observed values in the control watershed during either the treatment or calibration period, because generally, the control and treatment watersheds are not equivalent, even without the treatment effect.

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CHAPTER 6

Physical and Chemical Monitoring

Flow Monitoring

Introduction

Flow, or discharge, is a basic hydraulic characteristic affecting morphological development of stream channels, flooding behavior, bed and bank erosion, and sediment deposition. It therefore is a principal governing factor in habitat development. Furthermore, flow directly affects aquatic organisms through its velocity, against which fish must swim and non-motile organisms maintain their attachment. Flow is expressed in terms of its instantaneous rate, volume per unit time in units such as meters/second (m/s) and feet/second (ft/s), and the total volume over a designated period of time.

Measurements of flow rate, volume, or both are needed for many purposes in urban water resources work. Hydrologic studies require these data to determine the generation of surface runoff in response to precipitation. Water quality investigations need flow measurements to estimate pollutant mass loading (mass per unit time), the product of pollutant concentration and flow rate. Biological tasks sometimes need flow information for purposes such as assessing if minimum instream flows required for biota are being provided.

Performing these monitoring tasks can require flow measurement in controlled or uncontrolled open channels. In hydraulics, an "open channel" is any conveyance where flow is not constrained or under pressure. Therefore, closed pipes and culverts are open channels if they are not flowing full, a normal situation in runoff conveyance systems. When the geometry is regular and absolutely stable, the conveyance is termed "controlled," as in pipes, culverts, many lined ditches, and channels where a weir or flume can be installed. Otherwise, the channel is "uncontrolled," the situation usually found in natural streams.

Controlled open channel flow monitoring is performed using some type of flow meter. Flow meters actually detect stage and convert that reading to flow rate using an equation. In controlled flow, the equation is a standard formulation for the primary flow control device.

Flow meters are also used in long-term gauging of uncontrolled channels, if there is a way to relate stage sensed by the meter to discharge. In streams and rivers, the relationship is generally, according to a stage-discharge relationship developed at a location, expected to remain stable. If a continuous gauging record is not needed to achieve the monitoring objectives, a staff gage in conjunction with a stage-discharge relationship provides the observer with a flow rate estimate. In smaller conveyances, discharge is usually estimated from stage readings using the standard equation of open channel flow, Manning's equation. For short-term monitoring and developing a stage-discharge relationship in uncontrolled channels, the options are measuring with a current meter or a tracer.

There are also situations in urban water resources monitoring programs where pipes are submerged or flow full; in other words, they are not open channels. In these situations, which are often termed surcharged pipes, different equipment and measures must be used. While many types of flow meters exist for these pressurized flows, the most appropriate ones for situations encountered in urban water resources monitoring are ultrasonic Doppler and electromagnetic devices.

Flow Surveys in Uncontrolled Open Channels

Current Meter Method

Current meters measure flow velocity. Their use involves measurements in a number of segments across the channel and at one or two depths, depending on the total depth. Flow rate can then be estimated as the product of velocity and segment cross-sectional area and summed over all segments. A series of such determinations over time allows approximation of total flow volume during the period. The current meter method is most appropriate in natural streams and other relatively wide-open channels that can be divided into a number of segments. The technique is less accurate in very narrow channels that cannot be so subdivided, because the banks create edge effects that exert disproportionate influence. If narrow channels cannot be controlled using a weir or flume, flow rate can be estimated using Manning's equation (covered under *Using Flow Meters in Controlled and Uncontrolled Open Channels*).

Relating flow rate estimates over a range of flow conditions to water surface elevation produces a stage-discharge relationship. This relationship then allows calibrating a flow meter for continuous gauging or a staff gage for non-automated readings. The problem is that it is difficult to perform enough current meter surveys to generate a complete stage-discharge relationship, particularly with the difficult working conditions and relative rarity of high-flow events.

Newer current meters are digital, while mechanical meters are still in use too. Whatever current meter is selected, it should be able to measure velocities down to 0.03 m/s (0.1 ft/s) in depths as little as 0.1 m (0.3 ft), preferably less. All meters must be recalibrated at least once a year.

Mechanical current meters are simple and durable instruments. Some newer mechanical meters measure stage and velocity simultaneously, eliminating the need for calculating a stage-discharge relationship (Burton and Pitt, 2002). Direct-reading, digital instruments automatically calculate flow rate in the segment using mean velocity at each measurement point and the segment cross-sectional area of the subsection. The most advanced digital current meters use Doppler measurements of sonic pulses reflected as sound waves from particles in the water moving toward the meter. These meters have been more expensive and less durable than alternative instruments but have improved in these respects recently (Burton and Pitt, 2002). Figure 6-1 pictures a propeller-type instrument with digital readout. Refer to Appendix A to this chapter for the recommended measuring procedure using a current meter.

Proper site selection improves the accuracy of flow measurements at all discharge levels. Consider the following criteria when establishing a discharge measurement station. However, all criteria listed can rarely be met. Be aware of the site's limitations and possible effects on measurement. The station should be located in a channel reach (i.e., longitudinal section) with the following characteristics:

Figure 6-1: Turbo-Propeller Digital Current Meter

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- Generally, the channel should be straight for 100 m (328 ft) upstream and downstream of the measuring location; for smaller streams of only a few meters in width, the straight section should be at least 20 times the width upstream and downstream.
- Flow should be confined to one channel at all discharge stages (i.e., the channel should contain no surface or subsurface bypasses).
- The bed should be subject to minimal scour and relatively free of plant growth.
- Banks should be stable, high enough to contain maximum flows to be measured, and free of brush.
- The station should be located at a sufficient distance upstream so that flow from tributaries and tides does not affect stage-discharge measurements.
- All discharge stages should be measurable within the reach, but it is not necessary to measure low and high flows at the same cross section within the reach.
- The site should be readily and safely accessible.

The specific cross section in which a station is located within a channel reach should have the following characteristics:

- Banks should be relatively high and stable.
- The channel should be straight with parallel banks.
- Depth and velocity must meet minimum requirements for the method and instruments used.
- The bed should be relatively uniform, with minimal boulders and without heavy aquatic growth.
- Flow should be uniform and free of eddies, slack water, and excessive turbulence.
- Sites should not be located downstream of areas with rapid changes in stage or velocity.

Tracer Methods

Tracers include biodegradable, non-toxic, fluorescent dyes and salts that are detectable by photometric and conductometric measurements, respectively. Rhodamine WT fluorescent dye has been a common choice, because it has a lower detection limit, is less toxic, has lower sorption to particles, and decays more slowly than other options (Burton and Pitt, 2002). Flow rate is calculated from the tracer's travel time or degree of dilution.

Although tracer surveys can be less convenient and more time-consuming in natural waters compared to current meter methods, they are more precise (Burton and Pitt, 2002). Tracers can be indispensable in shallow streams, especially those with irregular bottoms where traditional current meters are difficult or impossible to use. Other applications of tracers are the measurement of transport and diffusion of discharge into receiving waters and the determination of retention time.

Flow Meters in Controlled and Uncontrolled Open Channels

Where the water surface in an open channel is perfectly parallel to the channel bottom, the flow is termed "normal." A primary control device, such as a weir or flume, is usually needed to produce normal flow. Where it exists, an automatic, recording flow meter programmed with a standard weir or flume equation can be used to register flow rates and volume. Otherwise, the channel is uncontrolled, and the water surface has an irregular profile. In this situation, using a flow meter requires programming into the meter a stage-discharge relationship derived either from a current meter or tracer survey or, more commonly, Manning's equation.

Flow meters detect stage in several different ways. Most common in urban water resources monitoring are meters that sense depth by releasing a regularly spaced stream of air bubbles at the channel invert and detecting the back pressure resisting the bubble release, which varies with depth as a consequence of the static head of water (Figure 6-2). This type of meter is relatively easy to use and is usually not affected by wind, turbulence, foam, air temperature gradients, or drying between events. However, it is susceptible to error when current velocity exceeds 1.5 to 1.8 m/s (5 to 6 ft/second), a result of the Bernoulli effect of pressure drop around an obstruction in high velocity flow. Also, this meter should not be used when the channel bottom slope exceeds 5-7 percent.

Three other methods of sensing depth are also in fairly frequent use (see Figure 6-2): (1) the shaft encoder, a counter-weighted float on a pulley that sends an electronic signal to a data logger; (2) the pressure transducer,

which converts static pressure to an electronic signal transmitted to a data logger, and (3) the ultrasonic sensor. These flow meters can also control an automatic sampler to collect flow-proportional composite samples. The shaft encoder requires a standpipe housing removing it from the influence of velocity. Pressure transducers can be upset by contaminants, drying between events, and sudden temperature changes. A number of agents can interfere with an ultrasonic sensor, including surface-fouling materials or organisms, wind, noise, turbulence, foam, and air temperature gradients. Compensation routines and shifting from sound to the electromagnetic spectrum can alleviate some of these problems. All these options should only be used in preference to a bubbler-type meter where these interferences are absent or can be countered in some way. They do offer possible alternatives for high velocity flows.

In non-normal flow, Manning's equation is usually employed to estimate flow rates from a stage record, in preference to developing a stage-discharge relationship with current meter measurements. As pointed out earlier, covering the full flow range and accuracy in relatively small channels is problematic with current meters. The fundamental form of Manning's equation is:

$$Q = A R^{0.67} s^{0.5}/n$$

where: Q = Flow rate (m^3/s);

A = Channel cross-sectional area (m^2);

R = Hydraulic radius (m) = A/wetted perimeter;

s = Water surface slope (m/m); and

n = Manning's roughness coefficient (dimensionless).

In the English system of units, a multiplier of 1.49 on the right side of the equation gives Q in ft^3/s if geometric variables are in ft or ft^2:

$$Q = 1.49\ A\ R^{0.67}\ s^{0.5}/n$$

Because of uncertainties in estimating slope, depth, and n, the latter of which comes from textbook tables, the accuracy obtained from using Manning's equation is not as great as with a weir or flume. In addition, care should be taken when using the equation for low-flow events, when channel roughness, and therefore n, have more influence than in higher flow. When using Manning's equation as the basis for flow rate determination, place the selected stage sensor in the channel where:

- The cross section is uniform;
- The slope and roughness are constant;
- The channel is free of rapids, bends, abrupt falls, contractions, expansions, and backwater; and
- The channel is straight for at least 60 m (200 ft) upstream.

Because of uncertainties in estimates of slope, depth, and roughness, flow rate determinations using Manning's equation can lack accuracy, especially in an irregular geometry like a natural stream. Also, using Manning's equation is best avoided when measuring flow in channels that convey high solids loads, generally flow quite shallow, or both.

The options are to use a weir or flume, preferably, or to calibrate a stage-discharge relationship from current readings. These options are easier if the conveyance is above ground. If the flow in question is confined in a

Figure 6-2: Bubble Flow Meter, Shaft Encoder, and Pressure Transducer

Bubbler Flow Meter

Shaft Encoder

Pressure Transducer

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pipe or culvert, it may be possible to obtain a flume that can be inserted in an existing manhole or, more expensively, to install a plastic manhole that contains a flume. These devices are made in a number of different flume sizes and types.

Weirs and flumes are devices designed to establish a predictable and accurate relationship between flow and stage by controlling hydraulic conditions at the measurement point. Basic textbooks on fluid mechanics and hydraulics present standard equations to convert stage readings to flow rate. They also cover control device installation and other conditions that must exist to maximize accuracy.

A weir is a planar object, usually a vertical plate, built across the channel so that water flows over the top edge or through a regular opening (notch). The three most common opening geometries are rectangular, trapezoidal (known as a Cipoletti weir), and triangular (V-notch) (Figure 6-3). Each type has a unique discharge equation linking flow to water height above the notch low point, which is programmed into the software of the flow meter. Weirs are easily fabricated from inexpensive materials and can be used in an irregularly shaped channel, a situation in which a standard equation would be difficult to apply reliably. On the other hand, weirs can retain sediments that alter the environment, and they can cause flooding and overflow past the notch with higher than expected flow, invalidating the weir equation. Also, free fall of water over the weir is a prerequisite for validity. Weirs are often inappropriate in a natural stream because of potentially negative biological effects, especially blockage of fish movements.

A flume is a specially built reach of channel, sometimes a prefabricated insert, that has a converging section, a throat, and a diverging exit section. The flume's area, slope, or both are designed to differ from those of the channel, inducing velocity increase and corresponding water surface level change. Flumes are less subject than weirs to problems with sediment deposition, flooding, and overflow. Several flume configurations are available off the shelf, with the H flume being the most common because of proven performance, relatively low cost, and a wide range of relatively accurate measurement capability at flows commonly experienced in urban water monitoring (approximately 0.01 to 1 m^3/s = 0.35 to 35 ft^3/s). H flumes (Figure 6-3) are available from suppliers for typically encountered ranges. Designs are also available for smaller flows (HS flume) and larger ones (HL flume). Like weirs, each flume type has a characteristic discharge equation that can be programmed in the flow meter. It is usually impossible or inadvisable to mount a flume in a natural stream.

Surcharged Pipe Instrumentation

Ultrasonic Doppler velocity sensors measure the shift in frequency of waves reflecting off particles in the flow and convert the measurements to an estimate of the average particle velocity. High or changing solids concentrations, air bubbles, and foulants can interfere with them.

Electromagnetic velocity sensors operate under Faraday's principle, in which a conductor (water) moving through an electromagnetic field generates a voltage proportional to the velocity. They are less subject to the problems affecting ultrasonic meters but can be upset by electrical noise.

Figure 6-3: V-Notch Weir and H-flume (with Instrument Shelter)

V-Notch Weir

H-flume (with Instrument Shelter)

There is no alternative to using one of these instruments in a surcharged case. They can also be used in open channel flow and are generally more accurate than flow meters relying on a stage-discharge relationship. However, their purchase cost is higher.

Water Quality Monitoring

Introduction

The essential tasks in sampling natural waters and runoff are to obtain a sample that properly represents the water of interest according to the program objectives, and to prevent its deterioration and contamination before and during analysis. These tasks break down into sample collection, sample handling, sample analysis, and quality assurance/quality control (QA/QC). Sample collection, in turn, involves considerations of what, where, and when to sample; how many samples to take; and how to sample. Thoughtful, thorough planning and performance of these steps should produce representative samples and fulfil the objectives. The following section outlines how to organize these tasks. At the end, it also covers data analysis.

In preparing for sampling, a good, helpful laboratory can save a lot of work and ensure that field personnel are properly equipped to take valid samples in return for the business. Many states now certify laboratories for water quality analysis. A lab should be chosen based on experience or trusted recommendations. When preparing for sampling, ask the laboratory to provide the proper sample containers for the analyses they will perform and (of crucial importance) to clean those containers as designated in U.S. Environmental Protection Agency (1983) and American Public Health Association (1998) procedures to avoid contamination that will invalidate the sample. Obtain one or more coolers that will be adequate in size to transport all samples on ice after collection until they reach the laboratory.

A single container can typically be used to hold samples that will be analyzed for several variables with compatible preservatives. For example, conductivity, pH, total suspended solids, and turbidity analyses can usually be performed on samples from one container, and all nutrient analyses can usually be performed on samples from a second container. Appendix B specifies sample containers for common water quality variables as well as other information that will be considered later.

Preparations should also consider QA/QC, covered in detail below. At the preparation stage, it is necessary to pick up extra containers for field replicates and field blanks. A field replicate is a repeated sample, taken at exactly the same spot in exactly the same way, immediately after the primary sample. The general rule is to select randomly 5 to 10 percent of samples for field replication. The random selection can be made by assigning each sampling location and occasion an identifying number and then using a random number generator on a calculator to pick the 5 to 10 percent to be replicated. A field blank is simply a container of distilled water that is carried into the field and returned to the laboratory without disturbance. Its purpose is to indicate if transport has introduced contamination to samples. The field blank should be part of the lab's standard QA/QC procedures for pathogen samples and sometimes for nutrient work.

Sampling personnel should give close attention to safety considerations. Some key ones are:

- Do not allow effluents, contaminated receiving waters, sharp underwater objects, or chemical reagents to contact skin; use rubber boots and gloves.
- Do not enter confined spaces, which may have inadequate air flow and concentrated harmful gases. If the objectives require sampling in such areas, obtain the services of a crew with special training and all of the right equipment.
- Use a proper tool to remove manhole covers, and never leave an open manhole unattended.
- Wear a hard hat if there is any possibility of falling objects.
- Wear a reflective vest if there is traffic near the sampling area, and set up rubber traffic cones if necessary to divert vehicles far enough away.
- When sampling, do not enter a channel with a velocity greater than 75 cm/s (2.5 ft/s) or deeper than waist height; sample from a bank or bridge instead. Have a safety rope ready in all cases when personnel enter the water.

Sample Collection

What and Where to Sample

Once monitoring objectives are well defined, what and where to sample are fairly straightforward considerations; one samples the water body or runoff stream at the place or places where information can answer the questions represented by the objectives. The principal consideration in this regard comes up when paired sampling is performed. As pointed out in Chapter 5, pairing monitoring stations is advantageous in reducing or eliminating the confounding effects of variability on interpreting results. Paired stations can be on different water bodies or different points on the same water body, one affected and one unaffected by a certain condition. Paired stations must be selected carefully to be as similar as possible in all respects except the effect being studied. Refer to the appendix to Chapter 5 for guidance in station selection and other aspects of paired monitoring program designs.

When to Sample

Deciding when to sample is a key and intricate consideration in obtaining representative samples that will serve the defined monitoring program objectives. Natural water bodies and stormwater runoff experience substantial variability over time. This variability must be accounted for to get reliable answers to the questions the program sets out to answer. The chief sources of temporal variability over extended time spans are seasonal changes and stochastically varying meteorological events. Over shorter time intervals, variability is a function of such phenomena as diurnal light and temperature fluctuations and differing precipitation intensity during the course of storms.

To make good decisions about when to sample, there is simply no substitute for working out beforehand what one wants to learn and, following this, what conditions must be observed to gain the desired knowledge. In most cases, an appropriate sampling schedule will not be uniform over time, since the events creating the conditions of interest are very rarely uniform either. It will therefore almost always be necessary to emphasize certain periods over others to accomplish the objectives within cost limitations. In a stormwater runoff study, for instance, emphasis might be placed on times of highest runoff, when pollutant delivery is greatest, and of lowest flow, when pollutants concentrate most.

Since stochastic meteorological events drive many of the cases of interest in urban water resources monitoring, randomly selecting sampling occasions should be seriously considered. For estimating total suspended solids concentrations and mass loadings, Leecaster, Schiff, and Tiefenthaler (2002) compared two random sampling program designs versus three schemes stratified by season or storm size. They found that simple random sampling of all storms or of medium and large storms had the lowest standard error and the least bias in estimating concentrations, although these designs yielded no advantage in loading estimation.

While randomization can be appropriate in many situations, the program may be best served by having some limiting criteria. For example, it would not be a good use of resources to mobilize for sampling every storm, when some would not have enough precipitation to produce runoff, and some would come with a very short dry period since the preceding runoff. The best course could be to deviate from strict randomization to attain an emphasis that best serves objectives. This strategy would be a stratified random design. For the example of emphasizing periods of highest and lowest runoff, the stratification would allocate more samples to each of these intervals than to times of intermediate flows. The storms within each period would then be selected randomly.

In general, then, it is a practical necessity to have weather forecasts to target the most productive sampling times for the given objectives and anticipate their start. Weather service or university websites, an independent weather forecasting consultant, or some combination of these can be used for this purpose. Since it is very difficult to predict accurately the depth, intensity, and duration of rainfall, it is recommended that the monitoring team be prepared to work during any storm that has a high probability of generating the amount and pattern of rainfall designated for sampling.

Criteria for storms that will be targeted for sampling are commonly established according to the following factors: minimums in rainfall quantity anticipated to be necessary to produce enough runoff to sample, storm duration, and antecedent period without measurable rain. How these criteria should be set numerically depends on local experience, hydrologic modeling, or both. Somewhat typical criteria, as minimums, are 0.15 to 0.25 inch (4 to 6 mm) of expected rain, 1 to 3 hours in duration, and 48 to 72 preceding hours without measurable rain.

A related issue is how long to continue monitoring. An outer limit for many programs relying on sample composites over time is 24 hours, because maximum holding times prescribed for some constituents in water will be exceeded if processing does not start shortly beyond that point. If the quantities of interest are relatively stabile, though, the time can be extended to get more complete coverage of a hydrograph. The minimum sampling time is best judged in terms of collecting a minimum number of aliquots in a composite and covering a designated minimum proportion of a total hydrograph before flow returns to the pre-existing condition. Typical criteria are at least 8 to 12 aliquots and 75 to 90 percent of the hydrograph.

How Many Samples to Take

Another issue that affects representativeness in sampling is the question on how many different occasions to take samples at each site. This decision is highly influenced by the available budget as well as by the objectives. Making the decision is a classic use for the statistically based methods for choosing sample numbers presented in Chapter 5.

The main difficulty in using these statistical methods concerns the pilot data set, which must be available to define variability. Site-specific data are often not available, and even reliable data from a similar setting may be lacking. Therefore, the temptation to use more arbitrary rules to select sample numbers is strong. Professional judgment based on extensive local experience is the best fallback if there are no suitable pilot data. Site- and case-specific factors have a strong bearing on the sample size necessary to meet the program's objectives.

Thompson et al. (1997) randomly selected from historical highway runoff records to create alternative test sequences of runoff events. They calculated mean concentrations of total suspended solids, total dissolved solids, total organic carbon, and zinc, as well as their 95 percent confidence intervals. The researchers compared results from these test monitoring programs with the actual sequences to see how quickly the sample mean approached the mean of the population established historically. They found that estimates of the means became approximately constant after 20 samples and that variances also stabilized. While Thompson et al. (1997) concluded that approximately 15 to 20 samples are required to provide reasonable mean concentration estimates of these water quality variables, they also cautioned about the possible influence of factors like seasonality on the numbers and allocation of samples.

How to Sample

General Considerations

Water can be collected manually or with automatic samplers in several ways, each with advantages and disadvantages:

- Grab samples – collected once per sampling occasion at a location, usually manually;
- Discrete samples – collected at a series of specific points in time at a location;

Figure 6-4: Multiple-Variable Probe and Data Logger

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- Composite samples – made up by combining a number of samples taken at different times or locations (vertically or horizontally distributed) to represent a time interval or a spatial area; and
- Continuous samples – made up by collecting a fraction of all passing flow to produce an uninterrupted composite sample.

Grab sampling is low-cost but tends not to be very representative because of the temporal and spatial variability usually associated with urban water resources and stormwater runoff. Thorough coverage with discrete samples provides the most complete picture of water quality but creates a large and often unaffordable analytical burden.

Continuous sampling is entirely feasible, using single- or multiple-purpose electronic probes and associated recording instrumentation (termed datasondes), for a number of variables: dissolved oxygen, temperature, pH, conductivity, salinity, total dissolved solids, and oxidation-reduction potential (Figure 6-4). For other variables, continuous sampling is problematic because many substances are impossible to detect electronically at environmental concentrations. Samples must usually be accumulated in an automatic sampler, retrieved, and delivered to a laboratory for analysis. This rather labor-intensive process might be manageable for variables with relatively long allowed holding times, but it is usually impracticable for those that must be filtered, analyzed, or both while very fresh. In these cases, which represent much of the monitoring of urban water resources and runoff, the best strategy is often to take a composite sample over a period of hours and repeat it on other occasions to form a representative database that meets objectives.

With composite sampling being a mainstay in urban water monitoring, the basis for compositing is an important question. Given the temporal variability that usually occurs, collecting aliquots for the composite at equal time intervals is generally not representative. A much better basis is compositing in proportion to flow; i.e., weighting individual samples in the composite in direct proportion to how much of the total flow they represent. For this purpose, usually a flow meter is used in conjunction with an automatic sampler, which triggers sample collection according to flow registration. The section *Automatic Samplers: General Considerations* below further discusses flow-proportional compositing. If there is a flow record, it is possible to produce flow-proportional composites manually. Then flow-proportional subsample volumes are extracted from samples previously taken at equal time intervals and combined.

Whether water samples are taken with manual or automatic samplers, care should be taken to select equipment that does not change the characteristics of the sample through contact with parts made of contaminating materials. Modern automatic water samplers use Teflon, stainless steel, and non-reactive plastics in tubing and other parts that come in contact with sample water.

An important consideration in sampling is to obtain sufficient quantity for the anticipated analyses. In manual sampling, it is normally easy to collect more than enough volume. Quantity becomes more of an issue in setting up automatic samplers, both to represent the event well and collect sufficient volume. The section *Automatic Samplers: Programming Considerations* below covers how to resolve this issue. Appendix B gives amounts required for common analyses. It is always a good idea to collect excess sample volume, if possible, to allow for rinsing instrument sensors with the sample itself, replicating analyses for QA/QC purposes, and re-analyzing if QA/QC criteria are violated. The best rule is to collect 2.5 times the total recommended volume for all anticipated analyses, but actually obtaining that quantity may not be possible in automatic sampling.

In addition to the duties associated with collecting samples, personnel visiting sampling stations should always take copious field notes. These observations are often invaluable later in understanding and interpreting results. The records should include, as appropriate:

- Date;
- Time of sample collection or visit;
- Name(s) of sampling personnel;
- Weather and flow conditions preceding and during visit;
- Number and type of samples collected;
- Calibration results for field instrumentation;
- Field measurements;
- Log of photographs taken;
- Comments on the working condition of the sampling equipment;
- Deviations from sampling procedures; and
- Unusual conditions (e.g., water color or turbidity, presence of oil sheen, odors, and land disturbances).

Manual Sampling

While automatic samplers are now more used in urban water work, they are much more expensive than manual samplers, still require substantial operator attention, and cannot be used in all situations. Manual samplers are still the necessary or better choice for sampling lakes and rivers that are relatively wide, deep, or both. They also give the flexibility to cover more locations than automatic samplers, which require a considerable installation effort.

Most manual samplers are one of two types: simple dipper pails (Figure 6-5) or cylinders with open ends that are shut with a remotely operated messenger tripping closure lids. Several designs of the second type have long been on the market, two common ones being the Van Dorn (Figure 6-5) and the Kemmerer bottles. Samplers of this type are typically cylinders lowered into the water with both end closures held open. When the sampler reaches the desired depth (determined from a marked line attached to it), a messenger is dropped down the line to trip the closure mechanism. The sampler is then drained through a spigot into sample bottles. Sample bottle rinsing can be accomplished by overflowing two or three bottle volumes. In recent years, these standbys have been redesigned, using materials that will not contaminate samples intended for analysis of metals and organic chemicals. Manual pump samplers are also available, generally for use in fast currents from a bridge.

In the case of streams, rivers, ditches, and other channels, it usually must be assumed for practicality that relatively homogeneous conditions prevail over the width and depth dimensions of the water. Small systems are generally more homogeneous than large ones. As a result of this assumption, samples for water quality in flowing channels are usually collected in midstream and at one depth. In the absence of any special considerations, collection at half of full depth is recommended. Environmental conditions in channels can differ longitudinally and with changing flows. These conditions especially affect particle transport (see 'Special Considerations for Sampling Solids' below). Therefore, sampling programs often require multiple stations and sample collection in a range of flow conditions in dry and wet weather.

Most channel sampling is conducted on foot in shallow flows. When wading, the individual collecting samples should face upstream. This orientation minimizes contamination of the sampled water that would be caused by the sampler's presence. The container should enter the water with the opening down to minimize collection of material from the surface layer. Unless a preservative has been added to the sample bottle before collection, it should be rinsed with two or three volumes of water by filling and totally emptying the sample bottle several times before capping. Several dip samples should be collected and composited. If the protocol for for the intended analyte(s) calls for adding a preservative to the sample bottle, it should be tilted down just slightly from the horizontal and should not be rinsed.

When sampling on foot is impossible or unsafe, some device must be lowered from overhead to reach the water. If a bridge spans a large channel, a Van Dorn

Figure 6-5: Polyethylene Dip Sampler, Swing Sampler, and Van Dorn Bottle

Polyethylene Dip Sampler

Swing Sampler

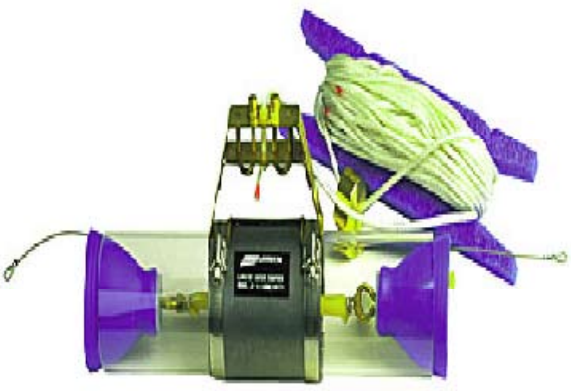

Van Dorn Bottle

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or similar sampler can be used if the current is not too great. In higher currents, a weighted, stainless steel bucket can be lowered on a line to a depth of 30 cm (1 ft) below the surface and then raised.

Other considerations prevail when sampling standing or tidal waters. When sampling a freshwater reservoir (e.g., a lake or wastewater lagoon) or relatively static estuary deeper than about 2 meters (6 ft), it is necessary to take into account the possibility of thermal stratification and the consequent variation in environmental conditions with depth. Depending on the program's objectives, samples might be drawn from the relatively uniform surface (epilimnion) or deep (hypolimnion) zones, in the transition area between them, or some combination of these. Sample locations will generally be accessed by boat, from which the sample can be taken with a Van Dorn or similar sampler.

Sampling in wetlands, shallow channels, and sheet flows is often complicated by shallow depth and patchy physical and vegetation structure. Sampling for dissolved oxygen analysis in shallow water without entraining atmospheric oxygen is especially difficult. The problem can be overcome by placing the sample bottle inside a larger stoppered bottle that is evacuated with a hand pump and then drawing the sample through a tube from the source to the sample bottle (Figure 6-6). In extremely shallow locations, it is best to use equipment like this for all water column sampling in order to avoid collecting sediments and organic debris from the bottom. Whether just one sample or several spatially distributed ones are collected, depends on the program's objectives and the water body's structure.

Any time the variable to be measured can easily exchange with the atmosphere, the sample bottle must be filled to overflowing, capped without trapping any air, and double-checked visually to be sure there are no air bubbles. The leading examples are dissolved oxygen and volatile organic compounds. The best practice, which should be followed whenever possible, is to cap the sample bottle under water. When this is impossible because of accessibility, it is acceptable to drain from a Van Dorn or similar sampler into the bottle that will be used for analysis, overflow it, and cap while water flows. It is never acceptable to pour from a sampler into a sample bottle for these analyses. In inaccessible locations where a messenger-activated sampler will not work, a special grab sampler allowing bottle opening and closure under water must be used.

Figure 6-6: Shallow Water Sampling Apparatus

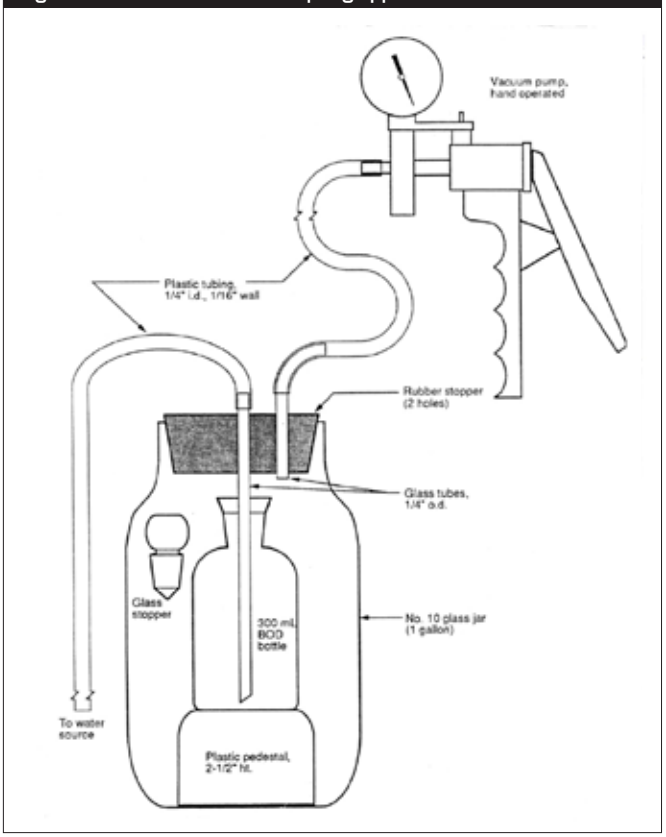

Automatic Samplers: General Description

Automatic samplers offer a number of advantages over manual methods, as well as drawbacks associated with the expense of purchasing and installing them and the occasional unreliability of any electromechanical equipment. In any event, they are a necessity for many urban water monitoring programs. It is usually infeasible for human sampling personnel to function over extended flow events and produce a representative, flow-related composite sample or series of discrete samples. Attempting to do so still requires a flow meter, as well as expenditure of a significant portion of the capital and effort needed for a coordinated flow meter and automatic sampler setup.

While automatic samplers are indispensable in modern urban water monitoring programs, they must be installed and operated with care to produce data reliably. In most settings, they should be in secure housing to minimize the risk of damage and vandalism. Success usually requires experienced personnel for installation

and maintenance when needed. Less experienced staff can be trained to program and attend the sampler and flow meter routinely. These operators must be at the sampling site frequently to check equipment operating condition, prepare for events, reprogram settings depending on expected flow conditions, change containers, and, of course, remove and handle samples.

Several manufacturers produce automatic samplers and compatible flow meters (Figure 6-7). While there is some variability in features, the most commonly used samplers have similar standard elements and capabilities. As mentioned above, modern samplers use materials for water-contacting parts that will not contaminate samples with metals or organics that may be subject to analysis. They can generally either deposit samples in a composite chamber or in multiple bottles arranged circularly in a base. Sampler base designs typically allow preserving samples by placing ice around them, and some manufacturers offer refrigerated units as an option. Samplers usually offer the hardware and software for flexible programming capability, allowing monitoring over a fairly wide range of conditions as well as data logging. They can be powered by line current with voltage step-down, 12-volt batteries, or, in many cases, solar panels. Many can utilize telemetry to reduce the need for human intervention and conveniently download data.

Automatic samplers employ vacuum suction to pull samples and have limitations on both the horizontal and vertical distances from which they can draw. While there is some difference among models, these limits are approximately 30 meters (100 ft) and 7 meters (23 ft), respectively. Beyond these distances, a submerged pump can be used to discharge samples into a container from which the automatic sampler draws.

There are a number of precautions in placing sampler intakes to avoid problems and unrepresentative samples. Both these risks can be reduced by situating intake so as to avoid sediments being scoured from the bottom and drawn into the line. The end of a flume for flow measurement, which will often be present, is an excellent spot for the sampler intake. If there is no flume, a good way to avoid sediment entrainment is by locating intakes on top of a small anchored piece of concrete. Water velocity should be above 100 cm/s (0.3 ft/s) to avoid the accumulation of particulates and ensure that all sediments are sampled (Burton and Pitt, 2002). Sampler intakes should not be located downstream of any treated wood structures whenever heavy metals or organic compounds are subject to analysis. Intakes in pipes should generally be elevated and in a turbulent zone to reduce blockage by debris. Pipe flow is often vertically stratified, and elevation tends to produce a more representative sample (Burton and Pitt, 2002).

A water level actuator, depth sensor, or rain gage can initiate sampling. Most commonly used is the flow meter's depth sensor, generally located just upstream of the sampling point in a control section (e.g., in a flume or behind a weir). The calibrated stage-discharge relationship provides flow measurements that determine, in conjunction with the programming, when collection should take place to provide a representative sample.

Automatic compositing can be done either on a time- or a flow-proportional basis. Time-based samples are drawn in equal volumes at equally spaced intervals, regardless of flow conditions. They do not closely rep-

Figure 6-7: Examples of Automatic Samplers

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resent the flow hydrograph and pollutant mass loading delivery, unless the time interval is relatively short. In its most common configuration, flow-proportional sampling weights the volume of a sample taken in proportion to the flow volume that has passed since the preceding sample. This method is the most convenient way of obtaining a sample representative of the overall event. In operation, the flow meter sends a signal to the sampler after a predetermined increment of flow to draw a predetermined volume of water.

Automatic samplers are now sometimes being used in conjunction with datasondes for continuous measurement of basic water quality variables (see listing above). For examples of using this combination of instruments, refer to Wilcock et al. (1995), St. Croix Watershed Research Station (1999), Baxter (2003,) Hall et al. (2004), and Buchanan (2006). Portable autoanalyzers are now coming on the market for potential use in association with automatic samplers for measuring other variables in the field. These instruments have long measured nutrients in the laboratory and are now coming into field service, especially in seawater monitoring applications. A portable incubator and microbial autoanalyzer is also available and could help in getting more representative bacteria data, given the problems in avoiding contamination with composite sampling and the consequent need to rely on grab samples.

Automatic Samplers: Programming Considerations

Thoughtful attention to programming will yield better data from automatic samplers. There will be less wasted effort in taking, and possibly expensively analyzing, samples that are not representative in terms of the monitoring program's objectives. The sampler must be programmed with: (1) the volume to collect each time an individual sample is drawn, and (2) the total number of samples to collect. The flow meter must be programmed with the flow pace, or flow quantity increment, i.e., the additional flow volume registered by the meter that will signal the samplers to draw water. The volume, number of samples, and flow pace must be balanced according to three considerations: (1) obtaining adequate quantity for laboratory analyses; (2) avoiding overfilling the sample containers, which results in unusable samples; and (3) sampling at points spaced sufficiently close to represent the runoff hydrograph relatively well. With faulty programming, small flow events can fail to produce enough quantity, and the hydrograph of large ones may not be well represented.

The more closely spaced in time the sampling points are, the more representative the sample will be. However, this consideration must be balanced with overfilling risk and, in case of battery power supply, the charge life relative to anticipated sampling duration. There is no certain way of specifying volume, number of samples, and flow pace at the outset of a new monitoring effort, but programming can be improved as experience with the site accrues. The best strategy, at least initially, is to use the smallest sample volume found to work well and, in case of compositing, the largest available container to add assurance against overfilling. Specifying flow pace and number of samples is usually hindered at the beginning by lack of information on flow volumes produced at the site by typical runoff events.

Common recommendation for the individual sample volume is in the vicinity of 100 mL. This quantity might be decreased to as little as perhaps 50 mL, if the list of analyses is relatively short, if there seems to be substantial overfilling risk, if there is a desire to sample at quite closely spaced points, or in case of some combination of these circumstances. It might be increased to perhaps 150 mL or even higher if there is concern about obtaining sufficient sample volume for analyses, and overfilling is not risky, so long as enough samples can be taken to represent the hydrograph well.

Deciding on the number of samples is best done with some analysis of expected flow patterns and the resulting hydrographs. The first thing to consider is how many samples the container can hold. For example, the commonly used 20-liter (5-gallon) carboy can hold 400 50-mL or 200 100-mL aliquots, which is not much of a limitation. Deep-cycle marine batteries are capable of drawing at least 300 samples before they need a recharge, which also does not pose much limitation in most cases. If the sampler were programmed to collect 200 samples for compositing over an anticipated 24-hour flow period, a sample could be collected every 7.2 minutes, offering excellent hydrograph coverage. However, a somewhat longer interval between samples would still give good coverage and at the same time leave carboy volume available for more insurance against overfilling. With experience, the setting can always be reconsidered for possible adjustment.

Flow pace is the total flow volume expected over a sampling period, divided by the number of samples. Obviously, volume will differ with conditions. Performing this programming step is easier if there is an existing flow record. The next best foundation is a good hydrologic model to forecast potential volume. In the absence

of either of these assets, even a simple hydrologic model like the Rational Method can provide some basis. For example, the total runoff volume from a rainstorm can be approximated by multiplying the expected precipitation quantity, the area of the contributing catchment, and a runoff coefficient representing the catchment, along with appropriate conversion factors.

While good, strategic programming is the best way to balance the various considerations, there are some options if the circumstances create problems that make a balance impossible, or if the programming fails because of an unexpected occurrence. If somebody is at the sampling site or in touch by telemetry or anticipates a problem (e.g., overfilling), that person can either reprogram or change bottles or both. If the conflict between small flow event sample volume and large event hydrograph coverage cannot be resolved by programming alone, a possibility raised by Burton and Pitt (2002) is to substitute an enlarged container such as a Teflon-lined or stainless steel drum for the standard sample base. A smaller glass jar can then be suspended inside the large container to collect samples during relatively small events, while the overflow during bigger ones is collected in the large container.

Special Considerations for Sampling Solids

Solid particles are constituents of urban waters that are of interest both in their own right and as transport media for other pollutants. In aquatic monitoring programs, they are almost always represented by total suspended solids (TSS) analysis on a bulk sample intended for analyzing all constituents, dissolved or particulate. Dissolved substances are uniformly distributed in flowing and standing waters, but particles are often stratified vertically, horizontally, or both. Ideally, sampling would represent the actual distribution of particles. However, achieving this is likely to be complex and labor-intensive, making true representation infeasible in many routine monitoring programs. Still, with recognition of the issue, those designing and performing monitoring programs may often be able to avoid patently unrepresentative solids sampling and institute improvements whenever possible.

A number of factors are responsible for spatial stratification of particles (URS Greiner Woodward-Clyde, 1999). To start with, particles in water vary substantially in shape, size, and mass. These differences stem from watershed characteristics such as soils and topography, as well as from meteorological and hydraulic conditions like antecedent dry period, rainfall intensity, and flow rate and velocity. The conveyance (e.g., stream, pipe, ditch) represents another class of influences. The point in time of measurement (early in the flow event, during first flush, if there is one, versus later) also has a bearing.

Sediments larger than 60 μm in diameter are particularly susceptible to gravity and are not distributed evenly throughout the water column. In sinuous streams, particles can be distributed differently horizontally based on size, because of the differential velocity at the outside versus the inside of meanders. However, lighter particles, such as clays and silts, tend to be distributed more uniformly than larger ones (Burton and Pitt, 2002). Solids in these size fractions also generally have more environmental significance than the heavier particles, since they travel farther, affect more aquatic organisms, and collectively have much greater surface area for transporting other pollutants. Therefore, they are the implicit emphasis of many urban water monitoring programs, and the frequent stratification of larger particles is not such a large issue.

Even so, there are some sampling strategies that can reduce what stratification impact there may be on the program's representativeness. The easiest one is to orient the automatic sampler intake in the downstream direction. Neither manual nor automatic samples should be taken in conditions promoting solids stratification (e.g., at a tight bend in a stream or where there is a strong velocity differential with depth).

Several more burdensome strategies exist for consideration when either stratifying conditions cannot be avoided or the program's objectives depend on representing the relatively large solids well. One is to take multiple samples spatially distributed to cover the anticipated variability (vertical, horizontal, or both) and then composite them. This strategy is effectively limited to manual sampling, and it is difficult to get enough information on flow at multiple points to composite the samples proportionately. Isokinetic samplers (Figure 6-8) overcome the fundamental problem causing poor representation of large solids (namely, that sample intake is usually at lower velocity than the flow from which the sample is drawn) by pumping the sample at the same velocity as the flow. The higher the flow velocity, the more representative an isokinetic sample is likely to be. If the stratification is vertical, manual depth-integrating samplers (Figure 6-8) exist to represent the distribution. These samplers point directly into the flow; thus, the sample enters approximately isokinetically. Raising

the sampler from the invert to the surface produces an integrated sample.

Water Sample Handling

The principal problem in any monitoring program is obtaining a sample that represents the conditions being investigated. When samples are taken from the field, they are removed from their original context and can undergo significant changes. Some of the key variables of common interest are particularly prone to alteration, including dissolved oxygen, metals and nutrient speciation and solubility, pathogens, and volatile organic compounds. The key to avoiding modification following sampling is to practice proper sample handling procedures. These procedures involve careful sample labeling and tracking, preserving samples as recommended, and beginning analytical processing within maximum holding times established for the respective water quality variables.

To avoid mistakes, label a sample bottle with an indelible marker before going into the field. The label should include:

- Sampling station;
- Date of collection (day/month/year);
- Time of collection (24-hour format, added in field);
- Name of person(s) performing sampling;
- Preservative added (if any); and
- Analyses to be performed.

Once the sample is collected, it should be capped with a lid also labeled with the station and date, as well as with the time if samples are taken over time. The bottle should then be sealed and the seal also marked with matching sample information. The seal should remain unbroken until the sample is ready to be opened for laboratory processing.

A tracking record for each sample registers possession as the sample travels from collection through analysis, making misplaced samples easier to find. Samples involved in litigation, especially, require formal chain-of-custody records. Analytical laboratories typically develop these forms appropriate to their services and supply them to customers.

Appendix B gives recommended preservation techniques and maximum holding times for common analytes. The specified maximum intervals between the time a sample is taken and the time it is analyzed vary widely for the different variables and constituents. Some key parameters must be determined in the field immediately after collection, including temperature, pH, dissolved oxygen, and chlorine residual. Other field determinations are, however, often less precise than laboratory analysis. Properly preserved samples can be carried back to the laboratory for replication of field analyses within 24 hours to add reliability. Once a sample reaches the laboratory, filtering for those analyses requiring it should be done within 24 hours. Samples should then be preserved at a temperature of 4°C, unless they are preserved with nitric acid for

Figure 6-8: Isokinetic Sampler and Depth-Integrating Sampler

Isokinetic Sampler

Depth-Integrating Sampler

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metals analysis. The principal references for more detail on sample handling as well as analysis are the American Public Health Association's (1998) *Standard Methods* (available by subscription on-line as of 2004) and the U.S. Environmental Protection Agency's (1983) methods manual.

Sample Analysis

Appendix C classifies into physical and chemical groups the many substances and characteristics that can be measured in water and sediments. The list represents hundreds of quantities, most among the organic chemicals, that could be analyzed. Clearly, judicious choice among all of these possibilities demands reliance on carefully developed objectives representing what one is trying to accomplish with the monitoring program. Among the information in Appendix B are the recommended analytical techniques for common analytes from the larger list. Excepting those few analyses that must be performed immediately in the field, most are laboratory procedures.

A leading issue in sample analysis is the ability to detect and numerically measure within defined bounds of certainty the quantities of interest. Relative to waste streams like industrial and municipal effluents, constituents of natural waters and even urban runoff are often present in low concentrations. These amounts could still be biologically significant, though, and thus the focus of monitoring program objectives.

There are a number of ways in which detection levels can be specified. But however the laboratory itself quantifies detectability, it should be capable of reliably giving results down to the reporting limits (RLs), the lowest concentration of a variable that can be reliably quantified within specified limits of precision and accuracy. Another approach to estimating limits is to use method detection limits (MDLs), the minimum that can be measured with 99 percent confidence that the concentration is above zero. Reliable RLs are often higher than MDLs. Laboratories frequently report values between MDL and RL but flag them to indicate uncertainty in the quantification. Appendix B gives RLs for common analytes as well as methods typically used for their measurement.

A key to achieving detectability in line with program objectives and overall good service is to select a laboratory carefully. Check a candidate laboratory's accreditation, if an accrediting program exists, and seek recommendations from past customers. Most importantly, write detailed specifications on sample handling procedures, methods, detection limits, and QA/QC requirements, using this chapter's recommendations. It is best to establish a contract with the laboratory spelling out all terms.

Simple field test kits have been marketed for years to perform many of the routine analyses. While these kits are easy to use, they have disadvantages for most urban water monitoring. For most analyses, their detection sensitivity is too low relative to concentrations usually encountered in natural waters and urban runoff, and they are subject to interferences that can be removed in more sophisticated laboratory analyses. They also pose the problem of distracting field workers with the time needed to perform analyses and properly handling reagents that may be toxic. Miniaturized laboratory instruments and multi-parameter testers, such as spectrophotometers and titration kits, represent improvements at least in detectability; but these instruments are quite expensive.

Quality Assurance/Quality Control

General Considerations

The effectiveness of any monitoring effort depends on a QA/QC program. This program provides quantitative measurements of the "goodness" of the data. For some variables, QA/QC involves calibration of instruments with known standards. To obtain measures of accuracy and precision, QA/QC may further involve analyses of blanks, replicate samples, control samples, and spiked samples. QA/QC also embraces cleaning and handling, as well as assessment measures taken with sampling equipment and containers to avoid contamination and validate the success of that endeavor.

Two of the most basic considerations in QA/QC were defined in Chapter 5: accuracy – agreement between the measurement of a variable in a sample and the true value; and precision – agreement among replicate analyses of a sample or among analyses performed on replicate samples. Other terms commonly used in both field and laboratory QA/QC programs are:

- Calibration samples – Samples prepared from distilled-deionized water that contain a known concentration of a specific substance or will

produce a known instrument response; used for all instrumental analyses. Calibration samples are typically run at the beginning of an analytical series to set up the instrument and, often, during the course of the series, when they are often referred to as control samples or check standards.

- Blanks – Samples prepared from distilled water, perhaps with reagents added, to represent zero concentration of a specific substance, or to produce an instrument response that indicates zero concentration; used for nutrients, metals, and organics to check contamination.

Blank samples are taken from distilled, reagent grade, analyte-free, deionized water that is used to rinse sample bottles and sampler apparatus. There are a number of types of blanks: (1) instrument blanks – passed through measurement instruments; (2) calibration blanks – tested to discover contamination in auxiliary chemicals used to prepare calibration samples; (3) reagent or method blanks – checked with all analytical reagents added to detect contamination from these sources; (4) transport or field blanks – transported to the sampling location and treated like a sample thereafter to check for contamination introduced in the field; and (5) equipment blanks – pumped through sampling equipment.

QA/QC involves steps at various times in the process: prior to sampling, in the field, during laboratory analyses, and following up to evaluate and properly report results. The next several sections give general QA/QC guidelines for these steps. More detailed information is available in U.S. Environmental Protection Agency (1979).

Preliminary and Field QA/QC

Avoiding sample contamination requires careful cleaning of samplers, sample bottles, and laboratory equipment. Some general guidelines for cleaning are presented here. Analytical procedures for certain variables specify additional requirements. The recommended procedures should be applied to samplers, sample containers, and all laboratory glassware and implements that will come into direct contact with samples during collection, storage, or analysis.

To avoid the contamination of samples by residues or materials commonly found in sampling equipment, sampler apparatus and containers, including automatic sampler tubing and strainer, should be washed first with phosphorus-free detergent, followed by a tap water rinse. Tubing and containers should be treated with 10 percent hydrochloric acid, ultra-pure deionized water, and methanol rinses (omit acid for strainer). Follow cleaning with air drying. After the decontamination procedures have been completed, cap containers and seal other apparatus with aluminum foil. Keep all equipment in a clean, protected area.

Laboratory equipment should always be washed with detergent (generally phosphorus-free), rinsed with tap water, and rinsed an additional three times with ultra-pure deionized water. An ultrasonic cleaner can minimize the need for hand scrubbing. Following the water rinses, perform acid washing with high-purity acids as appropriate (sulfuric acid for nutrient analyses or nitric acid for metals testing). After acid washing, rinse equipment completely at least six times with ultra-pure deionized water and air dry.

If QA/QC criteria given later are not met, thoroughly review the cleaning operation to determine if inadequate cleaning procedures could be causing contamination.

The field QA/QC program consists of instrument calibration, field sample replication, and transport and equipment blanks. It is important to calibrate field instruments like pH and dissolved oxygen meters exactly as specified by the manufacturer. In many cases, the calibration should occur either once with each batch (up to 20) of samples, every few hours when the meter is stationary and continuously powered, each time the meter is turned on or the range is changed, or each time it is moved from one place to another. It is recommended that pH meters be calibrated with two buffers (e.g., pH 4.0 and 7.0) and checked with a third.

Field replicates are repeated samples, collected simultaneously or nearly so at the same location to provide an evaluation of total sample variability (i.e., field plus analytical variability). Generally, duplicates are sufficient for field replication, requiring one extra set of sample containers. As a rule, 5 to 10 percent of sample collections should be duplicated, allocated randomly. This frequency is not burdensome in manual sampling but can be when using automatic samplers. The most careful programs rotate a separate sampler and associated tubing among sites to obtain the requisite number of field duplicates. In addition, equipment blank samples should be collected on 5 percent of occasions and transport blanks carried along on at least 10 percent of site visits, randomly allocated in both cases.

Laboratory QA/QC

Laboratory QA/QC begins with properly registering sample receipt, using a tracking form or custody-transfer record appropriate for the monitoring program. While the layout of these forms varies considerably, they generally include:

- Sampling and laboratory personnel (delivering and receiving sample and perhaps others);
- Delivery date and time;
- Sample identifiers;
- Sampling date and time;
- Sample matrix (e.g., water, sediment);
- Sample container type;
- Sample condition (e.g., preserved, on ice, warm, etc.); and
- Requested analyses.

Performing the remaining laboratory QA/QC procedures is generally the responsibility of the laboratory staff and not directly the province of urban water monitoring personnel. However, these personnel must specify and contract for sufficient QA/QC to meet the monitoring program's objectives as well as assess if it is carried out properly. Therefore, this section outlines typical laboratory QA/QC procedures. A monitoring program may not use all of the procedures mentioned, but all should be considered at the outset and dispensed with only if there is a good reason for doing so.

The next consideration is proper calibration of laboratory instruments. Specialized instruments (e.g., conductivity meters, turbidimeters) should be calibrated at least once with each batch of samples and whenever the instrument range is changed. A batch is considered to be up to 20 samples. Other constituents are analyzed on multiple-purpose instruments like spectrophotometers (nutrients), inductively coupled plasma-mass spectrometers (metals), and gas chromatograph-mass spectrometers (organics). These instruments should be calibrated at the outset of analyses with a calibration blank and a range of at least three concentrations spanning the complete anticipated range in the samples (e.g., 20, 50, and 100 percent of expected upper limit). Control samples should be run at two concentrations (e.g., 20 and 90 percent of the upper limit) with every sample batch.

Following is a list of other laboratory QA/QC procedures. In general, every monitoring program should strongly consider specifying at least the first four, as appropriate for the analyses to be performed. The latter two are often routine with laboratories. Those operating urban water monitoring programs should request the results if available, if they do not choose to write them into the specifications.

- Laboratory replicates – Replicate analyses should be performed on randomly selected sample bottles, generally at the rate of 5 to 10 percent for each analyte, to assess analytical precision. Usually, duplicate analyses are sufficient for procedures that are well proven in the laboratory.
- Method blanks – A method blank should be run with each batch of samples for each analyte requiring reagent addition, passage through an instrument, or both. A result exceeding the reporting limit is an indication of possible contamination. An investigation of contamination might include running an instrument blank, which can distinguish contamination originating in the instrument from a source in the reagents.
- Spiked samples – Spiked samples are prepared by adding known concentrations of a specific substance to an environmental sample. One set of spiked sample analyses should be performed on each batch for analytes subject to interferences from other substances in the water, often termed matrix interferences. Generally, nutrients, metals, and organics are candidates for this procedure. To perform it, a sample is first split into three portions. One part is analyzed for the constituent of interest as usual. The others are spiked with this constituent at a particular concentration, producing a pair of matrix spikes (MSs), together known as matrix-spike duplicates (MSDs). MSD analysis provides measures of both spike recovery and replicability (see *Data Quality Assessment* below).
- Surrogate samples – A surrogate is a type of spiked sample for checking extraction efficiency applied to samples from which organics (e.g., total petroleum hydrocarbons, volatile organic chemicals, pesticides) are extracted and analyzed. Surrogate standards are "non-target" compounds that behave similarly to the constituents of interest when analyzed. A thorough program applies the procedure to every sample, including calibration samples, blanks, and spiked samples, and evaluates recovery.

- External samples (also known as standard reference materials, SRMs) – External samples are prepared by a source outside of the monitoring program to known concentrations of the analytes of interest. To evaluate accuracy, the laboratory should have a set schedule to submit these reference samples to analysts without divulging the concentrations.
- Split samples – Splits are samples divided for independent analysis between two or more parties as a measure of precision. Laboratories should establish arrangements with each other for periodic sample trading.

Data Quality Assessment

Data quality assessment involves steps at the laboratory level and, after receipt of the data, by monitoring program personnel. The laboratory should assess compliance with specific data quality objectives related to the various QA/QC procedures and undertake designated corrective actions if necessary and if at all possible. Monitoring program personnel should review the laboratory's performance in this regard and evaluate field QA/QC results and the completeness and representativeness of the overall program.

The various QA/QC results are assessed quantitatively as follows. Table 6-1 gives suggested data quality objectives as criteria to judge results, as well as actions to take if they are not met.

- Laboratory duplicates – Express precision as the relative percent difference (RPD):
  $RPD = 100(C_1 - C_2)/(C_{avg})$
  where: C_1 = Larger of two values;
  C_2 = Smaller of two values; and
  C_{avg} = Average of two values = $C_1 + C_2/2$
- Method blanks – Compare to RLs, MDLs, and measured sample values. Elevated readings signal probable contamination and reduce ability

Table 6-1: Suggested Data Quality Objectives and Actions to Take

QA/QC Procedure	Data Quality Objective[a]	Action[b]
Laboratory duplicates	Total suspended solids – RPD ≤ 20 Particle size distribution – RPD ≤ 30 Nutrients – RPD ≤ 20 Total hardness – RPD ≤ 10 Metals – RPD ≤ 20	
Pesticides – RPD ≤ 20	Reject batch results if RPD > 2 times objective. Flag batch results as estimates if RPD = 1-2 times objective.	
Method blanks	Maximum detected blank value ≤ 2 times RL	Reject batch results if blank value > 2 times RL. Flag as an estimate if sample measurement < 5 times a detected blank value. Investigate possible contamination sources in the field and laboratory. As needed, make use of equipment and instrument blanks and review all cleaning procedures.
Spiked samples	%R = 75-125	Reject batch results if %R < 50 or > 150. Flag batch results as estimates if %R = 50-75 or 125-150 (except do not flag if measurement < RL and %R = 125-150).
Surrogate samples	%R = 50-150	Reject batch results if %R < 50 or > 150.
External samples	%R within control limits established by the laboratory based on historical performance	Review and correct all relevant procedures if %R outside control limits and reanalyze control samples until objective met.

Notes: [a] RPD – Relative percent difference; RL – Reporting limit; %R – Percent recovery
[b] When data quality objectives are not achieved, reanalyze the affected batch, beginning with preliminary processing steps like filtering, if possible.

to quantify concentrations with confidence, particularly low values.

- Spiked and surrogate samples – Express percent recovery (percent R) as:

  percent R = 100(S – U)/C

  where: S = Measured concentration in spiked or surrogate sample;

  U = Measured concentration in untreated sample (zero if not detected); and

  C = Actual concentration of spike or surrogate added.

The precision of spiked or surrogate sample analysis can also be assessed as RPD using the two MSD results.

- External samples – Express accuracy as percent recovery (percent R) using the formula:

  percent R = 100(M – T)/T

  where: M = Measured value; and

  T = True value of external standard.

In addition to tracking the laboratory's QA/QC performance and treating the data accordingly, monitoring program personnel should make assessments of:

- Field replicates – Poor replication could result from problems in the field or in the laboratory. If laboratory QA/QC shows that the laboratory is not the source, field notes and field procedures should be reviewed and corrected as necessary. Data from the sampling occasion are suspect, and judgment must be rendered on whether or not those data should be used or, if they are, flagged as estimates. Use the same RPD criteria as applied to laboratory duplicates to assist judgment.
- Sample holding times – Exceedence of designated holding times is cause for evaluating the acceptability of results, with judgment and overall QA/QC performance determining if and how the data will be used.
- Completeness – There should be evaluation and reporting of how completely the monitoring program fulfilled the coverage anticipated by the original objectives. One rather arbitrary criterion is that the program should produce as valid samples at least 95 percent of the targeted numbers; i.e., that analyzed data be reported for a minimum of 95 percent of the collected samples.
- Representativeness – It should be evaluated and reported how well the monitoring program reflected the scope of coverage anticipated by the original objectives. Criteria set during the monitoring program design should be brought into this evaluation (e.g., hydrograph coverage, rainfall quantities, antecedent dry period length, etc.).

How to Analyze Data

Handling Data Below Reporting Limits

Data sets from urban water monitoring programs frequently exhibit values below reporting limits, termed non-detected (ND) or censored data. This situation is particularly prevalent with dissolved metals and organic chemicals. The initial task in data analysis is to decide how to handle such values quantitatively in conjunction with higher numbers. Statisticians and others have debated numerous philosophies and techniques for handling censored data. The choice of method can substantially affect calculations performed on the data, particularly when ND values are proportionately numerous in the data set.

Kayhanian, Singh, and Meyer (2002) outlined and applied five methods to calculate the multi-event averages of event mean concentrations (EMCs) for 16 pollutants in highway runoff and used the averages to estimate mass loadings. Non-detected values among the pollutants ranged from 2 to 88 percent of the total measurements. Mass loading estimates produced by the five methods differed by less than 1 to more than 70 percent. The lower the reporting limit and the percent not detected, the lower the disagreement was. There was little consistency in the tendency of any method to give relatively high or low estimates. The authors did not recommend any one method. It appears from their results that a simple conventional technique like assigning a value of half the reporting limit to non-detected data gives results very similar to more sophisticated methods if the percentage not detected is relatively small (< 5 to 10 percent). With a larger proportion of censored data, a statistician's assistance should be enlisted to apply one of the other methods.

Graphing

The variety of possible objectives for urban water monitoring programs and the many different statistical and

numerical data analysis methods available mean that any extensive treatment of these topics is beyond the scope of this book. The reader interested in references relevant to urban water resources should consult a statistical text like Zar (1998) or, for exploring the relationships among variables, a multivariate data analysis reference like Everitt and Dunn (2001). It can be said that, before any of these methods are applied to most cases, the data should be explored graphically.

Figure 6-9: Box Plot Structure

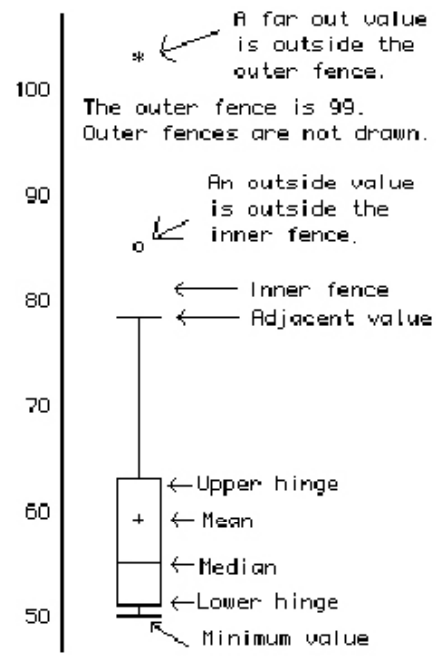

Graphing too can take many different forms. The most basic is probably the scatter plot, in which a water quality variable is graphed against an independent variable like time, distance, or some condition thought to have a possible influence on it (e.g., a land use characteristic or another water quality variable). The scatter plot can be studied for the existence of a trend, which might suggest a follow-up statistical or numerical analysis (e.g., linear regression with an apparent linear trend).

Another very useful graph is the box plot (Figure 6-9). The box embraces relatively high and low values (e.g., upper quartile or decile [75th or 90th percentile] and lower quartile or decile [25th or 10th percentile]), with a bar to signify the median value (50th percentile). "Whiskers" extend from the box to indicate maximum and minimum values that are not outliers. Outliers are defined in various ways (e.g., more than 1.5 box lengths or 3 standard deviations above or below the box) and are shown individually.

Probability plots also find considerable use in analyzing urban water resources data. A probability plot graphs the cumulative probability of measurements falling above or below given values. A special form much used in this work is the log-probability plot to investigate if the data have a log-normal distribution (Figure 6-10).

Figure 6-10: Lognormal Probability Plot Example

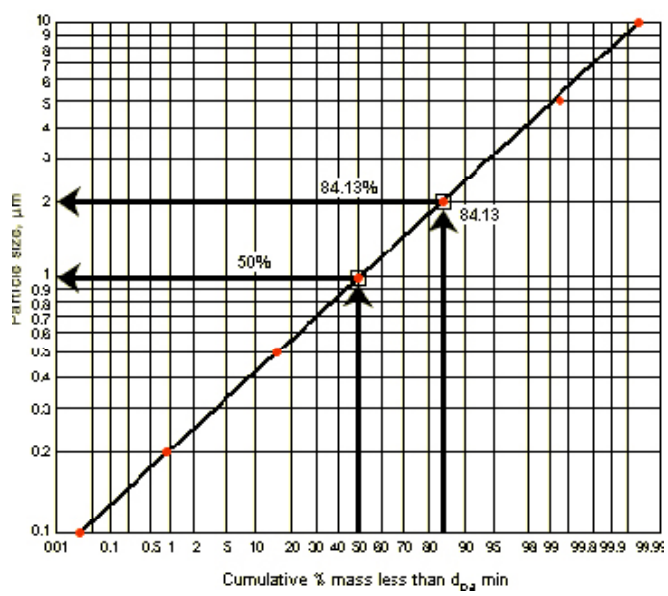

If the probability plot of logarithmically transformed data is linear or nearly so, the log-normal distribution can be safely concluded. Water quality data are often found to have this distribution, and it is therefore frequently assumed without testing; but performing the simple graphical exercise even without formal statistical assessment adds assurance to data analysis.

Pollutant Mass Loading Estimation

Mass loading is the product of water volume times pollutant concentration. It is usually computed over a period of time, commonly a year. It is ideal and feasible to have a continuous flow record over the entire period to establish volume. However, there is almost never anywhere near complete coverage of concentration for a period of any length. Therefore, mass loading estimates must be made with only a partial record of events, usually made up of a series of EMCs from sampled events. To obtain a good loading estimate, it is obligatory that the sampled events be representative of the period of interest. As discussed earlier, representativeness is an important aspect of monitoring program design at the outset, and of data quality assessment at the conclusion of monitoring. Charbeneau and Barrett (1998) made the case that averaging EMCs is appropriate for estimating long-term mass loadings, which are affected more by volume than concentration. This advice reinforces the advisability of obtaining a continuous and complete flow record.

If the EMCs have a log-normal probability distribution, as they usually do in water quality data sets, they cannot be simply averaged. In that case, the appropriate expression for the mean EMC (a) is (Marsalek, 1990):

$$a = \mathrm{Exp}(\mu + s^2/2)$$

where: Exp signifies exponentiation on the base of the natural logarithms, e;

μ = Mean of natural logarithms of EMCs; and

s^2 = Variance of natural logarithms of EMCs.

The confidence interval (CI) surrounding the estimate can also be calculated by (Marsalek, 1990):

$$CI = a\ \mathrm{Exp}\{\pm \varphi\ [s^2/n + 2\ (s^2)3/(n-1)]^{0.5}\}$$

where: + is used for the upper confidence limit;

- is used for the lower confidence limit;

φ = 1.96 for 95 percent confidence interval or 1.69 for 90 percent confidence interval; and

n = Number of EMC values used to estimate mean.

Assessment of BMP Performance

BMP performance is a frequent subject of urban water monitoring programs. Most often, performance has been expressed in terms of efficiency as a percentage of entering pollutants captured by the device. Efficiency can be computed according to pollutant concentrations or loadings and in several ways. A cooperative project of the U.S. Environmental Protection Agency and the American Society of Civil Engineers established a National Stormwater Pollutant Database and prescribed methods for analyzing efficiency, pointing out six different ways to compute it (URS Greiner Woodward-Clyde et al., 1999). In a comparative example calculation, efficiencies ranged widely, depending on the computation method, in some cases by more than an order of magnitude.

Reliance on efficiency as the chief performance measure stems from wastewater practices that preceded the development of the stormwater management field. This measure generally provides a reasonably good picture of effectiveness in treating municipal and industrial effluents. However, stormwater and its management differ from these effluents in important respects: (1) flow is intermittent instead of, usually, continuous; (2) both flow rates and pollutant concentrations are generally more variable in stormwater; (3) long storage periods in some stormwater BMPs separate influent and effluent hydrologic characteristics widely in time; and (4) extended exposure to the soil and atmosphere in many stormwater BMPs subtracts water through infiltration and evapotranspiration. Therefore, calculating efficiency from point-in-time inlet and outlet concentration measurements, which is a common practice in wastewater work, is generally not valid in stormwater BMP monitoring.

The best way of setting up the efficiency calculation to recognize these realities of stormwater dynamics is as a comparison of the summation of inlet and outlet mass loadings:

Efficiency = (Sum of inlet loadings – Sum of outlet loadings)/ Sum of inlet loadings

Obtaining a good estimate of efficiency depends on having continuous flow records at the inlet and outlet and sufficient event mean concentration measurements to estimate loading within acceptable error bounds. If these data are adequate, estimating efficiency in this way will account for the effects of intermittent flow, variability, lag between inflow and outflow, and water

loss. The resulting efficiency will reflect interdiction of pollutant transport through physical, chemical, and biological treatment mechanisms, as well as from flow quantity reduction through water loss. As URS Greiner Woodward-Clyde et al. (1999) pointed out, though, this and other similar methods they reviewed still will not tell if pollutant removal from inlet to outlet is statistically significant. To make that judgment, they put forth the method they called log-normal statistical efficiency, which uses an analysis of variance procedure. The interested reader should consult the original source for details.

Beyond the issue of how to calculate efficiency lies the matter of its adequacy as the only performance measure for stormwater BMPs. The relative variability of pollutant concentrations that can be found in stormwater affects efficiency. It has frequently been noted that efficiency of a given BMP tends to drop as the influent pollutant concentrations decline. The reason for this phenomenon is probably that it is relatively easy to achieve a large initial reduction by capturing the most treatable flow components (e.g., the largest solids making up the TSS) but increasingly harder to gain additional efficiency operating on the less treatable components (e.g., the smaller solids). While a relatively "clean" influent is often associated with low efficiencies, though, the effluent concentration often tends to be similar to that discharged by the same BMP treating a "dirtier" influent at a higher efficiency. Therefore, BMP performance should be judged by both efficiency of mass loading reduction and effluent quality.

The California Department of Transportation (2004) analyzed by linear regression effluent concentrations as functions of influent concentrations for a range of pollutants and various types of ponds, biofilters, and media filters. In some cases, the regressions were not statistically significant and the effluent concentrations were fairly uniform regardless of influent quality, whereas in others, significant regression equations were derived to forecast effluent (C_{eff}) in relation to influent (C_{inf}) concentrations:

$$C_{eff} = m\, C_{inf} + b$$

where: m = Slope of the regression line; and

b = Vertical-axis intercept of regression line.

The intercept b represents the irreducible minimum C_{eff}, the best quality effluent the BMP is capable of.

Sediment Monitoring

Introduction

Urban runoff and other diffuse sources of pollution are highly variable from place to place, and even in one place over time, in effluent quality and environmental effects. Therefore, these sources and their effects are difficult to characterize. They are often more dilute in contamination than industrial and municipal wastewater sources, and their negative impacts may be more the result of cumulative, chronic effects than of short-term, acute ones. Sediment monitoring offers the opportunity both to perform measurements on a component of the environment that does not vary so rapidly and to assess the potential for cumulative effects as well. Because of these advantages, sediment monitoring deserves more attention in urban water resource monitoring programs than it currently receives.

Sediments influence the environmental fate of many toxic and bioaccumulative substances in aquatic ecosystems. Specifically, sediment quality is important because many toxic contaminants found only in trace amounts in water can accumulate to elevated levels in sediments. As such, sediments serve both as reservoirs and as potential contaminant sources to the water column. Sediments tend to integrate contaminant concentrations over time and can represent long-term sources of contamination. Sediment-associated contaminants can also directly affect benthic full-time residents and other organisms that utilize bottom habitats for essential biological processes (e.g., spawning, incubation, rearing). Sediments, therefore, provide an essential link between chemical and biological processes. By understanding this link, environmental scientists can develop assessment tools and conduct monitoring programs to evaluate the health of aquatic systems more accurately.

Sediment monitoring has a great deal in common with water quality monitoring, particularly in the areas of objectives, the determination process for sample numbers, sample handling, commonly performed laboratory analyses, QA/QC, and data quality assessment. In these areas, provisions similar to those for water quality apply, except where supplemented or modified by special considerations given here. This section emphasizes subjects where the two types of monitoring differ, particularly locations, timing, and collection of samples and data analysis and interpretation. On the

latter subject, an important issue in using sediment data is whether contaminants, especially metals, found in sediments are natural or from human activity. Research in Florida pioneered interpretive techniques to assist in making this judgment and design watershed management strategies accordingly. This section will highlight these methods after covering the basics of sediment monitoring.

Sample Collection

What and Where to Sample

As with all monitoring, sediment monitoring programs should be designed with respect to clear, comprehensive, specific objectives. One common general objective for sediment monitoring programs is to determine the level of sediment contamination existing, perhaps for comparison with quality criteria, dredging, or targeting sediment capping. In this case, it will probably be appropriate to composite a number of samples from the area of interest. Other common purposes for sediment monitoring are to determine the spatial variability of contamination, or to compare two or more areas or different situations. The best sampling design in this case would be to collect replicate samples from each area for separate analyses, with a composite from each as the fallback strategy if budget is limited. In all of these situations, the number depends on the areas' sizes, pollutant variability, acceptable uncertainty, and the cost of sampling. Three samples from an area, analyzed separately or composited, are a minimum for statistical purposes.

Another consideration in locating sampling stations concerns the variability of contaminant levels as a function of sediment grain sizes. The finer solids tend to concentrate pollutants more than the larger particles because of their greater surface area per unit volume available for surface processes of attachment (e.g., adsorption). The relative distribution of particles by size depends on hydrodynamic conditions, with the finer ones tending to deposit in slower flowing areas and the larger ones in faster moving locations. How to decide what flow regimes to sample depends, once again, on objectives and should be carefully considered.

Concerning sediment depth to sample, most monitoring is intended to document recent contamination and relatively short-term trends; hence, samples are most frequently collected from the surficial sediments (typically, the top 5 to 15 cm). Deeper sampling should probably be considered only when the objectives are directed at longer-term or historical trends.

When to Sample

Sediment monitoring has the considerable advantages over water column monitoring of integrating pollutants over time and being much less transient. Still, currents do redistribute sediments, and this phenomenon must be considered in monitoring program design. With reference to the program's objectives, the designer can decide how important this factor is and, if it matters, how to structure sampling seasonally. Obviously, if very short-term trends in a stream are the focus of objec-

Figure 6-11: Ekman Dredge and Ponar Dredge

Ekman Dredge

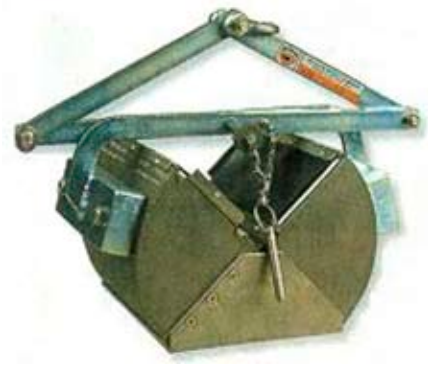

Ponar Dredge

Presented as examples only and does not constitute endorsement of the products by the U.S. Environmental Protection Agency or the North American Lake Management Society

tives, sediment monitoring must occur when sediments are being deposited during the storm season. If the overall potential effect of a winter's deposition on fish spawning in the early fall is the issue, monitoring must occur after the cessation of winter runoff and before spawning starts. If comparisons are to be made based on samples taken once a year for several years, monitoring should take place at the same time each year. If sediment monitoring is to occur in a relatively stable lake or wetland system, seasonal timing probably matters less. A clear statement of objectives should make these decisions quite easy to make.

How to Sample

Samplers available for sediment monitoring include scoops, corers, and dredges. The basic type to choose and the particular selection among the alternatives depend on the water body, the conditions, and the program objectives. Scoops can be ordinary shovels or fashioned from common materials for use in shallow water while wading. Some corers are meant for hand use, while others are for deep water. They are usually not appropriate for sediment sampling in streams unless they are being used for frozen core samples (Burton and Pitt, 2002). Dredges are usually most appropriate for dropping from a boat or bridge.

Samplers should be cleansed in the same way as containers used for water samples for analyses of nutrients, bacteria, metals, and organic chemicals. When the objective is to analyze certain quantities without contamination, the collector must be made from special materials. Again, the same guidelines prevail as presented for analyses of the same quantities in water; e.g., sediments to be subjected to volatile organic compound analysis must contact only Teflon.

- One of the most commonly used sediment samplers is the Ekman dredge (Figure 6-11). It is small and light and the easiest among the options to set. Because of its light weight, the Ekman dredge can collect samples only from soft mud, silt, or sand. However, for the same reason, it is the best choice where fine particles are likely to be disturbed by the force produced by objects moving through water. Depending on the required amount of sediment that must be collected, its relatively small size can necessitate collecting replicates to obtain sufficient quantity. Setting the dredge with a pole in shallow water increases the depth and success of sample collection. The Ekman dredge must be tripped with a messenger, similar to a Van Dorn water sampler. If the depth is not known, it is a good idea to touch the bottom with the dredge, pick it up a few feet, and move over a few feet before slowly lowering it back down to the bottom. If the sediment is compacted, or if there is a lot of gravel, rocks, or large debris, the heavier Peterson or Ponar (Figure 6-11) dredges must be used for sampling.
- Both the Peterson and Ponar dredges are large enough (14 to 32 kg, 30 to 70 lbs) to usually require winches for raising and lowering, although models small enough to be raised and lowered by hand are available. Small sticks that can prevent the Ekman dredge from closing will be crushed by these two dredges. Because of their larger sizes, much more water is displaced, and thus fine sediment is easily swept away before the jaws close. Gently lowering these dredges the last few feet can reduce the problem. These larger dredges can collect a larger surface area, but still only sample the top few centimeters of sediment. Attaching weights to them is one way to increase the depth of their bite. The Peterson and Ponar dredges are held open by their own weight and tripped by letting the line go slack.
- Whatever the type of dredge, a smooth retrieval is desirable to avoid losing some of the sample. It is a good idea to place a bucket under the dredge and haul it out of the water within the bucket to avoid letting some of the sample escape with the dripping water.

Less common in general urban water resources work are bedload samplers, which collect the sediments that travel along the stream bed. These samplers are box or basket traps located on the bed with open ends facing into the current. Some bedload samplers are embedded in the stream bottom with a slot opening even with the sediment surface.

Special Considerations for Sample Handling

Sediment samples should generally be passed through a 2-mm sieve to remove twigs, leaves, and other debris larger than any of the sediment particles. For some objectives, it is appropriate to separate the sample further by particle size. If the analysts wish to distinguish

contaminant levels in fine sediments versus larger ones or versus an overall bulk sample, a subsample of fines should be separated out by sieving through a sieve of appropriate opening size (e.g., 63 mm).

Special Considerations for Sample Analysis

As with water samples, the variables to specify for laboratory analysis depend on the program's objectives, required certainty, costs, and available budget. With sediments, in comparison to water, there is a much higher potential to detect trace substances like the less prevalent metals, pesticides, polynuclear aromatic hydrocarbons, PCBs, etc.; and these measurements are often the principal subjects for analysis.

In addition to contaminants, sediment samples should generally be analyzed for:

- Grain size distribution;
- Moisture content;
- PH; and
- Organic content (as loss on ignition, also termed volatile organic solids, or total organic carbon).

Grain size distribution is important information in interpreting the relative ability of the sample to concentrate contaminants depending on the relative surface area of its makeup. Knowing the moisture content permits expressing results in terms of dry weight of bulk sample, which is superior to expression in terms of wet weight, which is variable. The pH is a key factor in the relative solubility of metals. A relatively acidic pH can mean that metals have dissolved in the water instead of adsorbed to solids; it does not necessarily indicate that they are low in the overall environment. Physicochemical processes by which contaminants associate with solids are related to the amount of organics present. For example, organics provide small pores for adsorption of synthetic organic chemicals.

Special Considerations on How to Analyze Data

General Guidelines

Sediment contaminant concentrations should be expressed in mass of pollutant per unit dry weight of sediment (e.g., mg zinc/dry kg of sediment, which is equivalent to parts per million). Quantities that occur in smaller amounts can be expressed in μg/kg, which is equivalent to parts per billion.

A useful way of expressing sediment contamination is the enrichment ratio, which is the ratio of the pollutant concentration in a sample to the concentration in a reference sample. The reference should be a sample that is equivalent in every way possible but stems from a location considered to be unaffected or minimally affected by the contamination sources influencing the sample being quantified.

Assessing Sediment Contamination Source

In the past, determining whether aquatic sediments were anthropogenically enriched with metals was a difficult process requiring comprehensive site-specific assessments. In recent years, Florida researchers have developed a practical approach for judging the likelihood of human versus natural sources, relying on normalization of metal concentrations to a reference element (Florida Department of Environmental Protection 1988). In Florida, normalization of metal concentrations to aluminum concentrations in estuarine sediments proved the most promising method of comparing metal levels regionally. Further research in Florida, Canada, and Washington State indicated that other crustal metals little influenced by anthropogenic sources (e.g., lithium) can also be appropriate reference elements for assessing sediments. Lithium is sometimes a better basis in areas whose geology is strongly influenced by glacial erosion. The Washington work extended application of the technique from estuarine to freshwater wetland sediments.

To understand this assessment tool, it is helpful to know the geochemical processes that govern the behavior and fate of metals in water. Natural sediments are predominantly composed of debris from weathering of rocks. Acids formed in the atmosphere or from the breakdown of organic matter (e.g., carbonic, humic, fulvic acids) mix with water and form leaching solutions. These leaching solutions break down rocks and carry away the products in solution or as solid debris. This debris is chiefly composed of chemically resistant minerals, such as quartz and clay minerals, which are the alteration products of other aluminosilicate minerals. Naturally occurring metals can substitute for aluminum in the aluminosilicate structure, where they

are tightly bound and not prone to being released in water. In contrast, dissolved metals from natural and anthropogenic sources adsorb to particulate matter, a more loosely bound configuration. These metals are generally more subject to release back into the dissolved form by physical or chemical changes in the water.

The tool for interpreting metal concentrations in sediments is based on demonstrated, naturally occurring relationships between metals and aluminum (or an alternative like lithium). These natural relationships were used to develop guidelines to distinguish natural sediment deposits from anthropogenically contaminated sediments. This tool is based on a statistical linear regression analysis with aluminum (or lithium) as the independent variable and another metal of interest as the dependent variable. A plot of the regression line

Figure 6-12: Lead Versus Aluminum in Biscayne Bay Sediments

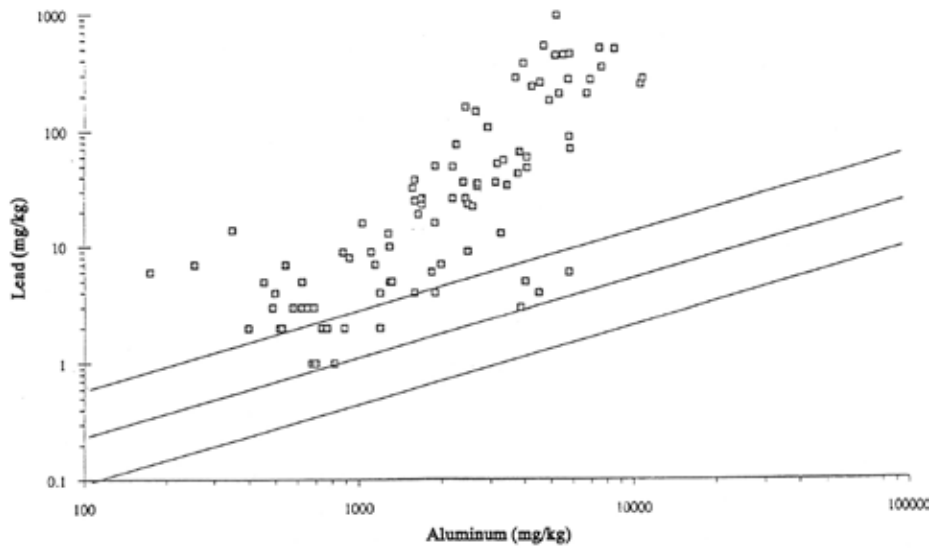

Source: Adapted from Florida Department of Environmental Protection, 1993

Figure 6-13: Nickel Versus Aluminum in Puget Sound Area Freshwater Wetland Sediments

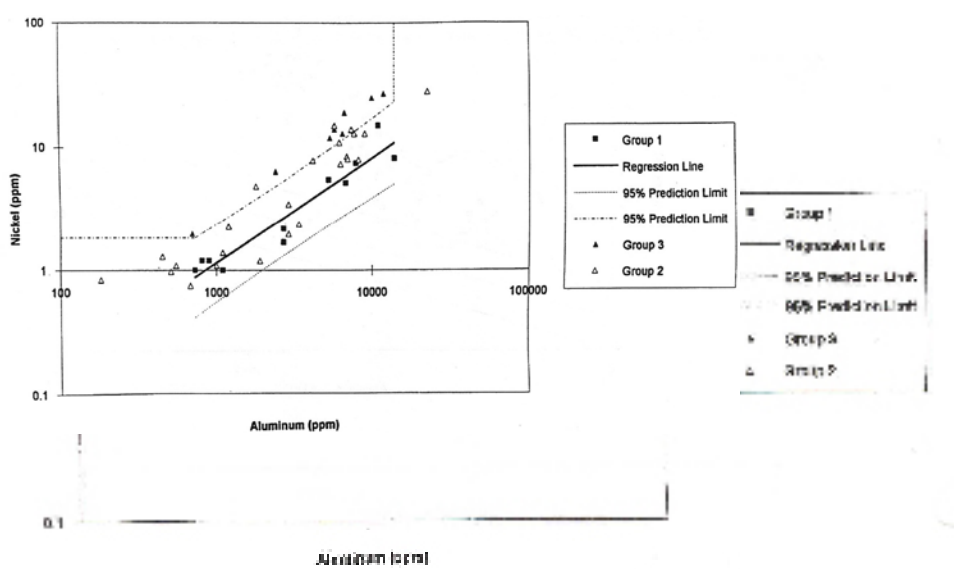

Source: Adapted from Valentine 1994, Azous and Horner 2001

and 95 percent confidence lines on either side brackets the region expected to contain sediments with the metal primarily originating from natural sources. Figure 6-12 shows the relationship for lead versus aluminum in Biscayne Bay (Florida) sediments. All points lying above the upper confidence limit are regarded as anthropogenically contaminated.

For Puget Sound area (Washington) freshwater wetlands, the regression was first performed using data from a set of wetlands whose watersheds had relatively little urbanization (Group 1 in Figure 6-13 for nickel versus aluminum; Valentine, 1994; Azous and Horner, 2001). Then data were plotted from moderately and heavily urbanized sets (Groups 2 and 3, respectively, in Figure 6-13). The figure shows that, for nickel, all of the Group 3 samples fall above the 95 percent confidence line, as do a majority of the Group 2 samples. While aluminum as the reference yielded the better regression in the example, for other metals, lithium as the reference resulted in a superior regression for this glaciated region.

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Measurement Procedure Using a Current Meter

1. Extend a measuring tape at right angles to the direction of flow and measure the width of the cross section. Record measurements on a data sheet. Leave the tape strung across the stream.
2. Divide the width into segments using at least 20 points of measurement. If previous flow measurements have shown uniform depth and velocity, fewer points may be used; smaller streams may also require fewer points. Measuring points should be closer together where depths or velocities are more variable. Cross sections with uniform depth and velocity can have equal spacing.
3. Record the distance from the initial starting bank and the depth.
4. Record the current velocity at each measuring point. Horizontal (from left to right bank) and vertical (top to bottom) variation of stream velocity may influence streamflow measurements. To correct for vertical differences, measuring at certain depths can yield acceptable estimates of the mean velocity over a vertical profile. If the depth exceeds 0.8 m (2.5 ft), velocities should be measured at 20 percent and 80 percent of full depth and averaged to estimate mean velocity. In the depth range 0.1 to 0.8 m (0.3 to 2.5 ft), take the velocity at 60 percent of the full depth (measured from the surface) as an estimate of the mean over the profile. Measuring velocity in water shallower than 0.1 m (0.3 ft) is difficult with conventional current meters. If much of the reach of interest is very shallow, or flow is too slow for current meter measurement, consider installing a control section and V-notch weir.
5. Calculate flow as a summation of flows in partial areas (Figure 6-A-1) using the following equation:

$$q_n = v_n d_n (b_{n+1} - b_{n-1})/2$$

where: b_{n-l} = Distance from initial point n to the preceding point n-1 (m [ft]);

b_{n+l} = Distance from initial point n to the following point n+1 (m [ft]);

d = Mean depth of partial area n (m [ft]);

v = Average current velocity in partial area n (m/sec [ft/sec]); and

q = Discharge in partial area n (m^3/sec [ft^3/sec]).

Figure 6-A-1: Variables Used to Calculate Stream Discharge Using the Current Meter Method

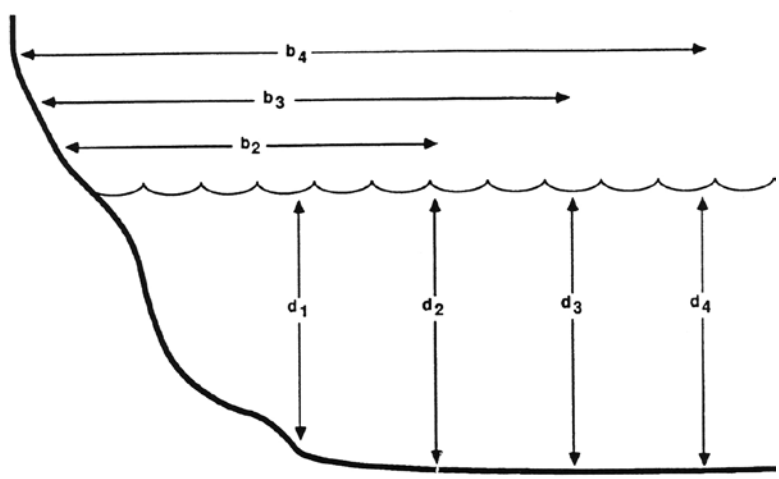

Recommended Sampling and Analysis Procedures for Water Quality Variables						
Variable	Container[a]	Preservation[b]	Maximum Holding Time	Analytical Methods[c]	Reporting Limit	Unit
Miscellaneous						
pH	P, G	None (field)	None	EPA 150.1; SM 4500-H^+	0.1	pH
Dissolved oxygen	Gd[d]	None (field)[e]	None[e]	EPA 360.1, 360.2; SM 4500-O	0.1	mg/L
Conductivity	P, G		28 days	EPA 120.1; SM 2510	1	µS
Total hardness	P, G	HNO_3 to pH < 2	6 months	EPA 130.1, 130.2; SM 2340B	0.5	mg/L
Alkalinity	P, G		24 hours	EPA 310.1, 310.2; SM 2320	0.1	mg/L
Biochemical oxygen demand	Gd[d]		24 hours (6 preferred)	EPA 405.1; SM 5210	3	mg/L
Chemical oxygen demand	P, G	H_2SO_4 to pH < 2	28 days	EPA 410.1; SM 5220	10	mg/L
Residual chlorine	P, G	None (field)	None	EPA 330.5; SM 4500-Cl	0.1	mg/L
Cyanide	P, G	NaOH to pH > 12	14 days	EPA 335.2; SM 4500-CN^-	3	µg/L
Solids						
Total suspended solids	P, G		7 days	EPA 160.2; SM 2540D	1	mg/L
Total dissolved solids			7 days	EPA 160.1; SM 2540C	1	mg/L
Turbidity			48 hours	EPA 180.1; SM 2130	0.05	NTU
Particle size distribution				SM 2560	1	µL/L
Nutrients						
Total phosphorus	P, G	H_2SO_4 to pH < 2	28 days	EPA 365.1; SM 4500-P F	5	µg/L
Soluble reactive phosphorus			48 hours	EPA 365.1; SM 4500-P F	2	µg/L
Ammonia-nitrogen			28 days	EPA 350.1; SM 4500-NH_3	10	µg/L
Nitrate + nitrite-nitrogen			28 days	EPA 353.1; SM 4500-NO_2, NO_3	10	µg/L
Total nitrogen			28 days	SM 4500-N	10	µg/L
Total Kjeldahl nitrogen			28 days	EPA 351.1; SM 4500-N_{org}	100	µg/L

Recommended Sampling and Analysis Procedures for Water Quality Variables *continued*						
Variable	Container[a]	Preservation[b]	Maximum Holding Time	Analytical Methods[c]	Reporting Limit	Unit
Metals						
Silver	P, Teflon, or borosilicate glass	HNO_3 to pH < 2	48 hours to filter for dissolved, 6 months to analyze	EPA 200.8; SM 3125	0.2	µg/L
Aluminum					25	µg/L
Arsenic					0.5	µg/L
Cadmium					0.2	µg/L
Chromium (total)					1	µg/L
Copper					1	µg/L
Nickel					2	µg/L
Lead					1	µg/L
Zinc					1	µg/L
Chromium (Cr^{+6})				EPA 218.4; SM 3500-Cr	50	µg/L
Selenium				EPA 270.2, 270.3; SM 3500-Se	2	µg/L
Mercury	G or Teflon	5 mL/L of 12 N HCl or BrCl[f]	48 hours to filter for dissolved, 28 days to analyze	EPA 245.2; SM 3112	0.5	µg/L
Pathogens						
Fecal coliforms	Sterile P, G	None[g]	8 hours	SM 9221, 9222	1	cfu/100 mL or MPN/100 mL
Escherichia coli				SM 9221, 9222	1	cfu/100 mL or MPN/100 mL
Total coliforms				SM 9221, 9222	1	cfu/100 mL or MPN/100 mL
Enterococci				SM 9230	1	col/100 mL
Total petroleum hydrocarbons						
TPH-gasoline	G		14 days	EPA SW 8015	50	µg/L
TPH-Diesel			7 days to extract, 40 days to analyze	EPA SW 8015	50	µg/L
TPH-motor oil			7 days to extract, 40 days to analyze	EPA SW 8015	50	µg/L
Oil and grease		HCl or H_2SO_4 to pH < 2	28 days	SM 5520	5	µg/L

Recommended Sampling and Analysis Procedures for Water Quality Variables *continued*

Variable	Container[a]	Preservation[b]	Maximum Holding Time	Analytical Methods[c]	Reporting Limit	Unit
Pesticides						
Organochlorines	Amber glass		7 days to extract, 40 days to analyze	EPA SW 8081. 8085; SM 6630	0.01-0.1	µg/L
Organophosphorus				EPA SW 8085	0.01-0.1	µg/L
Nitrogen				EPA SW 8085	0.01-0.1	µg/L
Carbamates				EPA SW 8321	0.07-3.5	µg/L
Herbicides				EPA SW 8085; SM 6640	0.1-1.0	µg/L
Miscellaneous organics						
Polynuclear aromatic hydrocarbons	Amber glass	None[g]	7 days to extract, 40 days to analyze	EPA SW 8270, 8310; SM 6440	0.05	µg/L

[a] P – plastic (polyethylene); G – glass.
[b] Hold all samples on ice in the field and at 4°C in the laboratory, in addition to any preservation listed. HNO_3 – nitric acid; H_2SO_4 – sulfuric acid; HCl – hydrochloric acid.
[c] EPA – from U.S. Environmental Protection Agency (1983); SM – from American Public Health Association (1998); EPA SW – from U.S. Environmental Protection Agency (1986).
[d] Biochemical oxygen demand bottle.
[e] Can be chemically fixed in the field and titrated in the laboratory.
[f] Filter for dissolved sample analysis before preservation.
[g] Normally none except holding at 4°C but add sodium thiosulfate in the presence of chlorine.

Types of Water and Sediment Quality Variables

Note: Abbreviations and customary units of measurement are in parentheses; mL – milliliters; L – liters; mg – milligrams; µg – micrograms; µL – microliters.

- Measures of solids – Impacts include light and visibility reduction, abrasion of sensitive aquatic animal tissues, transport of other pollutants, and sediment deposition.
  - Settleable solids (mL/L).
  - Total suspended solids (TSS, mg/L) – Trapped by 0.45-micrometer filter.
  - Total dissolved solids (TDS, mg/L) – Passed through 0.45 micrometer filter and measured gravimetrically after sample evaporation.
  - Turbidity (Nephelometric Turbidity Units, NTUs) – Represents light-scattering ability of suspended particles.
  - Particle size distribution (PSD, % by volume larger than or smaller than given sizes; diameters at which selected % occur [e.g., d_{10}, d_{50}]; µL particle volume/L water volume) – Determined by an electronic particle counter.
- Nutrients – Increases cause eutrophication, excessive nuisance algal growth accompanied by change in algae types (tendency toward filamentous); oxygen depletion upon death and decay.
  - Phosphorus (µg/L in natural waters, sometimes mg/L in effluents) – Most often responsible for eutrophication in fresh waters.
    - Total phosphorus (TP).
    - Soluble reactive phosphorus (SRP), sometimes orthophosphate-phosphorus, which makes up most of SRP.
  - Nitrogen (µg/L in natural waters, sometimes mg/L in effluents) – Most often responsible for eutrophication in salt waters.
    - Ammonia nitrogen (NH_3-N or NH_4^+-N) – Also toxic in high concentrations.
    - Nitrate- (NO_3^-), nitrite- (NO_2^-), and nitrate+nitrite-nitrogen.
    - Total Kjeldahl nitrogen (TKN) – Ammonia plus organic nitrogen.
    - Total nitrogen (TN).
- Metals (µg/L in natural waters, sometimes mg/L in effluents) – Many are toxic to aquatic life, and some bioaccumulate and biomagnify; the first three are most often detected in stormwater runoff and natural waters.

  Copper (Cu)
  Lead (Pb)
  Zinc (Zn)
  Antimony (Sb)
  Arsenic (As)
  Beryllium (Be)
  Cadmium (Cd)
  Chromium (Cr), +3 and +6 valences, total
  Mercury (Hg)
  Nickel (Ni)
  Selenium (Se)
  Silver (Ag)
  Thallium (Th)

Metals can be measured as dissolved, "total recoverable," or both. Dissolved metals have the most immediate toxic effects, but those in solid state can dissolve and also accumulate in sediments and affect life there.

Calcium (Ca) and magnesium (Mg) are non-toxic metals that reduce solubility and therefore harmful effects of other metals and together produce what we call "water hardness." Water quality criteria are based on hardness. Whenever the objective is to determine if natural water metals criteria are met, hardness should be determined and expressed as "mg/L calcium carbonate, $CaCO_3$."

- Pathogens (no. colonies/100 mL, with no. colonies often expressed as most probable no. [MPN]) – Criteria and limits are in terms of "indicators" that may not be disease-causing themselves but are intended to indicate the presence of fellow-traveling direct pathogens. Analysis of specific pathogens is almost never done in routine environmental work, indicators are extremely variable, and pathogen methods are arguably the least satisfactory in aquatic science.
    - Fecal coliforms – Present in the bodies of all warm-blooded animals.
    - Total coliforms – Some have natural sources, especially soils.
    - Enterococci – Closer indicator of human disease potential than fecal coliforms but not much advantage in environmental variability.
- General measures of organics:
    - Biochemical oxygen demand (BOD, mg/L) – Commonly used to monitor sewage and other effluents high in rapidly decomposable organics.
    - Total organic carbon (TOC, mg/L).
    - Chemical oxygen demand (COD, mg/L).
- Petroleum and its products:
    - Oil and grease (mg/L).
    - Total petroleum hydrocarbons (TPH, mg/L) – Often divided into fractions such as Diesel and gasoline.
- Specific organic chemicals (μg/L) – Many are toxic to aquatic life, and some bioaccumulate and biomagnify.
    - Only pentachlorophenol, certain pesticides, and polychlorinated biphenyls (PCBs) have water criteria for natural waters.
    - Other groups may be represented in effluent limitations and are sometimes detected in natural waters; examples:
        - Volatile organic chemicals (VOCs) – Components of solvents and fuels, most but not all containing chlorine or bromine (benzene and its relatives are exceptions); many are carcinogenic; easily lost from samples to atmosphere and very reactive with other substances.
        - Organophosphorus pesticides (e.g., the commonly used diazanon).
        - Polynuclear aromatic hydrocarbons (PAHs) – Combustion by-products often found in stormwater runoff and sometimes in natural waters.
        - Numerous other industrial and commercial chemicals with various formulations.
- Miscellaneous quantities.
    - Temperature (° Celsius).
    - pH – On 0-14 scale, with 0-6.99 signifying acidic, 7.00 neutral, and 7.01-14 alkaline.
    - Dissolved oxygen (DO, mg/L).
    - Conductivity (microsiemens/centimeter, μS/cm) – Measures ability of water to conduct an electric current because of presence of all dissolved substances, most of which are of natural mineral origin and are not pollutants.
    - Total residual chlorine (mg/L) – Toxic to aquatic life.
    - Cyanide (μg/L) – Toxic to aquatic life.

CHAPTER 7

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CHAPTER 7

Biological Monitoring and Assessment

Introduction

Scope of Biological Monitoring and Assessment

Traditionally, monitoring surface waters to assess their ecological health and the effects of pollution discharges has relied upon physical and chemical measurements of samples from the water column. This approach originated when the emphasis was on the effects of discharges such as wastewater treatment plants and industrial effluents. These discharges are continuous and generally have a lower degree of variability in flow and water quality than intermittent sources like urban stormwater runoff. Judgment of the effects of relatively uniform discharges on aquatic organisms is based to a large extent on bioassays exposing test species to concentration ranges of pollutants. While these standard procedures deviate from the reality of stresses in natural systems in many respects, they do reflect uniform effluents better than intermittent, more variable ones. When attention turned to these latter discharges, the need for a more direct means of assessing actual ecological effects became apparent. This chapter outlines techniques of biological community assessment to detect the effect of diffuse sources of pollution on aquatic life.

Intermittent discharges create shock loadings to a water body, and the ecological effects depend on many variables and complex interactions. Moreover, many runoff pollutants become attached to sediment particles and settle quickly, exerting detrimental effects over a long period. Furthermore, the high peak flow rates and volumes of urban runoff degrade habitat (e.g., channel and bank erosion) and elevate sediment deposition, the effects of which are not detected by water quality monitoring.

Monitoring biological communities is the most integrated approach to surface water quality assessment and management. While water quality data reflect short-term conditions that exist when a particular sample is collected, biological communities accurately indicate overall environmental health because they continuously inhabit receiving waters and react to various long-term physical and chemical influences. Aquatic organisms also integrate a variety of environmental influences, hydrologic and other physical aspects, chemical effects, and interactions among the biota themselves.

Biological assessment involves integrated analyses of structural and functional components of the aquatic communities. Bioassessments are best used to detect aquatic life impairments and assess their relative severity. Once impairment is detected, additional chemical and biological toxicity testing can identify the causative agent(s) and the source. Both biological and chemical methods are critical in successful pollution control and environmental management programs. They are complementary, not mutually exclusive, ways to enhance overall program effectiveness.

In summary, key advantages of bioassessments are (after Barbour et al., 1999):

- Biological communities reflect the overall ecological integrity of all elements of complex systems.
- Over time, biological communities integrate the effects of various stressors operating at different levels, providing a measure of response to fluctuating environmental conditions.

- By assessing the integrated response to highly variable pollutant inputs, biological communities provide a practical approach for monitoring runoff source impacts and the effectiveness of best management practices.
- Routine monitoring of biological communities can be relatively inexpensive, particularly when compared to the cost of assessing toxic substances.
- The public is highly interested in the status of biological communities as a measure of environmental health.

In the broadest sense, biological community assessment embraces monitoring of both habitat features and biota in both the plant and animal kingdoms. Habitat features of importance to aquatic life are very numerous and even extend outside of the aquatic environment itself to the riparian zone. Primary producers are found among the macrophytic rooted plants and the periphyton attached to surfaces in the water. Benthic macroinvertebrates are both consumers of aquatic and terrestrial primary production and food sources for fish. Clearly, the potential subjects for monitoring biological communities are so numerous and diverse that designing a feasible monitoring program that will give needed answers highly depends on formulating carefully considered, comprehensive objectives as covered in Chapter 5.

There has been much progress in aquatic bioassessment through benthic macroinvertebrate monitoring. This segment of the community directly represents the ability of the resource to sustain life, which habitat assessment does not. Relative to fish, the invertebrates are much less mobile. They therefore register conditions in a particular location better and are considerably easier to monitor. Progress accelerated when researchers developed indices representing overall benthic macroinvertebrate communities instead of attempting to interpret the significance of measures on individual species or genera.

Beginning in the 1980s, researchers, agencies in some states, and the U.S. Environmental Protection Agency began to develop and codify procedures to guide biological monitoring and assessment. The early developments culminated in issuance of Rapid Bioassessment Protocols for Use in Streams and Rivers: Benthic Macroinvertebrates and Fish (Plafkin et al., 1989), updated as Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates and Fish (Barbour et al., 1999). The Rapid Bioassessment Protocols (RBPs) give complete coverage of monitoring the three biotic communities named in the title, as well as habitat. Burton and Pitt (2002) summarized key provisions of the habitat, benthic macroinvertebrate, and fish protocols, as well as related methods from the state of Ohio, in their Appendices A to C. This chapter does not repeat the extensive material in these references but helps guide potential users to the resources they can find within the protocols, with specific attention to habitat and invertebrate monitoring. It also exemplifies some of the subject matter with case studies representing individual approaches found to work well. The chapter also briefly covers aquatic toxicity assessment, which is not a part of the RBPs.

Reference Conditions for Biological Monitoring

The issue of reference conditions is critical to the interpretation of biological surveys. The term "reference" is more appropriate when applied to a foundation for comparison in studies within the natural environment than "control," which is commonly used in laboratory experimentation. A reference site is a location unaffected by the variable(s) whose effects are to be measured at a "treatment" or "test" site according to the objectives adopted for the monitoring program. In this context, the term "treatment" refers to the influence created by the variable(s) of interest. If the reference site is carefully chosen, equivalent measurements of conditions there and at the test location should elucidate the type and extent of effects created by the test variable(s). As with so much else in monitoring program design, selecting a good reference site depends strongly on clear, complete objective statements. In practice, test variables in urban water resources work are often measures of impact, such as the quantity and water quality of a discharge, or of BMP performance.

Barbour et al. (1996a) described two general types of references, site-specific and regional. The first type represents measurements of conditions either upstream of an intervention, such as a discharge or BMP installation, or from a "paired" watershed. The appendix to Chapter 5 explores paired watershed monitoring program design in some detail. Site-specific references are established at the outset of a monitoring program, in relation to its

specific objectives. Regional references, on the other hand, consist of measurements from a population of sites relatively unaffected by the usual influences being studied within a fairly homogeneous region and habitat type. These sites usually serve as bases for comparison for various monitoring programs within the region for which they are suited.

Two major concerns always attend the designation of reference sites. One regards the similarity in all conditions except the test variables between the reference and treatment sites. Dissimilarity introduces potential alternative explanations for any observed effect. The second question is the degree that influences to be tested could still have on a reference site. This latter question is particularly evident in urban water work, where the urban influences could be so all-pervasive that there are no true references. In reality, this matter must often be resolved by settling for the "best attainable" conditions (Horner et al., 2002), locations that are not "pristine" but where human presence is sufficiently muted to offer the ability to distinguish clearly what are the effects of stronger influences.

Barbour et al. (1996a) noted the advantages of site-specific upstream references: (1) if carefully selected, the habitat quality is often similar to that measured downstream, thereby reducing complications in interpretation arising from habitat differences; and (2) impairments due to upstream influences from other sources are already factored into the reference conditions. Where feasible, effects should be bracketed by establishing a series or network of sampling stations at points of increasing distance from the test location, although this strategy can greatly raise costs. These stations will provide a basis for delineating impact and recovery zones. In significantly altered systems (e.g., channelized or heavily urbanized streams), suitable reference sites are usually not available. In these cases, historical data or simple ecological models can be used to establish reference conditions, although with less confidence than afforded by direct measurement.

While site-specific reference conditions represented by the upstream-downstream, or paired-site approach are desirable, Hughes (1995) pointed out three problems associated with their use: (1) they provide limited capacity for extrapolation beyond the site-specific; (2) they hence involve a substantial assessment effort that is likely to have little value in future monitoring; and (3) in many cases there are too few reference sites, often only one, for statistical assessment of measurement uncertainties.

Regional reference sites can overcome these disadvantages of site-specific references. The concept of systematically regionalizing reference site establishment got a major boost with Omernik's (1987) ecoregional framework for interpreting spatial patterns in state and national data. The geographical framework is based on regional patterns in land-surface form, soil, potential natural vegetation, and land use. Geographic patterns of similarity among ecosystems can be grouped into ecoregions and sub-ecoregions. Naturally occurring biotic assemblages, as components of the ecosystem, would be expected to differ among ecoregions but be relatively similar within a given ecoregion.

Establishing and characterizing a set of reference locations represents a substantial investment for a region. But this investment can pay off over time in more revealing and certain interpretations of monitoring findings than those that are possible with complete reliance on site-specific referencing. Nevertheless, site-specific references will still be required to meet certain objectives.

Habitat Monitoring

Introduction

An evaluation of habitat quality is crucial to achieving many objectives in the assessment of ecological integrity. Raven et al. (1998) pointed out that habitat and biological diversity are closely linked. In the most general sense, "habitat" incorporates all aspects of the physical and chemical environment, along with the interactions among living organisms. This broad spectrum makes the number of possible monitoring subjects a very long list, which for feasibility must be pared in relation to the objectives being pursued. Usually, the definition of habitat is narrowed to the quality of the internal (to the water body) and external riparian environments that influence the structure and function of the aquatic community. The RBPs adhere to this definition. This more restricted definition still leaves many possible conditions for consideration as monitoring subjects, and the attendant need to apply objectives to focus on the most crucial ones.

The presence of an altered habitat structure is one of the major potential stressors of aquatic systems (Karr

et al., 1986). A degraded habitat, often from hydrologic modification, can sometimes obscure investigations of the biological effects of contaminated water, sediments, or both. Habitat monitoring should be strongly considered, along with physical, chemical, and biological monitoring, when the objective is to distinguish such effects. Habitat knowledge is essential to pairing stations for study (i.e., upstream and downstream or in paired watersheds). Because conditions are usually not identical from site to site, some habitat data can help in interpreting measurements from paired sites. Where physical habitat quality at a test site is similar to that of a reference, detected impacts can be attributed to water quality factors or other stressors. In the opposite situation of dissimilar habitats, the location with more degraded habitat could be limited more by that condition than other stressors. With all its potential value, though, habitat monitoring cannot replace or be a surrogate for biological measurements when the objective is to discern the condition of biotic populations or communities. Biological quality cannot be safely deduced from habitat conditions and must be measured directly, if that is the focus of objectives.

The following subsections on monitoring program elements preserve the same terminology with regard to "sampling" that was used in preceding monitoring chapters. Of course, tasks in habitat monitoring frequently do not involve sampling in the same context as collecting a parcel of water or sediment. Instead, habitat monitoring usually involves tasks like measuring dimensions and observing and then describing (and also perhaps scoring) environmental attributes. Nevertheless, this chapter maintains the terminology, both for consistency in language and to emphasize that the same set of decisions must be made in properly designing habitat monitoring programs as in any other monitoring effort.

What to Sample

As pointed out in the introduction, potential variables for habitat monitoring are very numerous. Researchers and agency staff based at local, state, and federal levels have collectively devised many standard variable lists and protocols for guiding habitat monitoring. Locally and regionally derived lists typically represent the concerns of the area (e.g., anadromous fish spawning and rearing habitat features in the Pacific Northwest, conditions for resident warm-water and cold-water fish species in the Upper Midwest) and usually should not be transferred in whole to other places.

The RBPs prescribe a series of descriptive, measured, and scored variables in their habitat monitoring protocol. The descriptive set consists of:

- Stream characterization;
- Watershed characterization;
- Riparian vegetation;
- Aquatic vegetation; and
- Sediment and substrate.

Measured quantities are:

- Instream features (measured or estimated dimensional characteristics, mostly);
- Large woody debris; and
- Basic water quality variables (temperature, conductivity, dissolved oxygen, pH, and turbidity).

The RBPs recommend scoring the following variables in four categories from optimal to poor quality for organism support, with five numerical scores to represent distinctions within each category. In some cases, variables do not apply to both high- and low-gradient streams but only one.

- Epifaunal substrate and available cover – Includes the relative quantity and variety of natural structures in the stream, such as cobble (riffles), large rocks, fallen trees, logs and branches, and undercut banks available as refugia, feeding areas, or sites for spawning and nursery functions of aquatic macrofauna.
- Embeddedness – Refers to the extent to which rocks (gravel, cobble, and boulders) and snags are covered or sunken into the silt, sand, or mud of the stream bottom. Generally, as rocks become embedded, the surface area available for macroinvertebrate and fish shelter, spawning, and egg incubation decreases.
- Pool substrate characterization – Evaluates the type and condition of bottom substrates found in pools. Firmer sediment types (e.g., gravel, sand) and rooted aquatic plants support a wider variety of organisms.
- Velocity/depth combinations – Patterns of velocity and depth are included for high-gradient streams under this parameter as an important feature of habitat diversity. The best streams in most high-gradient regions will have all four

patterns present: (1) slow-deep, (2) slow-shallow, (3) fast-deep, and (4) fast-shallow.

- Pool variability – Rates the overall mixture of pool types found in streams according to size and depth. The four basic types of pools are large-shallow, large-deep, small-shallow, and small-deep.
- Sediment deposition – Measures the amount of sediment that has accumulated in pools and the changes that have occurred to the stream bottom as a result of deposition.
- Channel flow status – The degree to which the channel is filled with water.
- Channel alteration – A measure of large-scale changes in the shape of the stream channel.
- Frequency of riffles or bends – A way to measure the sequence of riffles and thus the heterogeneity occurring in a stream. Riffles are a source of high-quality habitat and diverse fauna.
- Channel sinuosity – Evaluates the meandering of the stream. A high degree of sinuosity provides for diverse habitat and fauna, and the stream is better able to handle surges when it fluctuates as a result of storms.
- Bank stability – Measures bank erosion or the potential for erosion.
- Bank vegetative protection – Measures the amount of vegetative protection afforded to the stream bank and the near-stream portion of the riparian zone.
- Riparian vegetative zone width – Measures the width of natural vegetation from the edge of the stream bank out through the riparian zone.

For example, categories and scores for embeddedness are shown in Table 7-1.

As mentioned earlier, work in various places has identified habitat variables providing the most crucial information for regional biota. A systematic, objective process of singling out, from the multitude of possibilities, those variables giving the best return of important information permits streamlining habitat monitoring. For example, May (1996) used a partial least-squares correlation analysis to identify the most effective physical habitat measures of Puget Sound area lowland stream quality, in relation to the ability to support benthic macroinvertebrate communities. The resulting variables are:

- Large woody debris frequency;
- Large woody debris volume;
- Glide habitat (as percent of wetted area);
- Pool habitat (as percent of wetted area);
- Pool frequency;
- Cover on pools (vegetation cover as percent of total pool area);
- Stream bank stability; and
- Embeddedness.

Several investigators have developed regional indices representing habitat quality based on multiple variables. An index is useful to express relative habitat quality among different locations in the same or different streams. The indices have generally been composed of scores assigned to observations (and in some cases measurements) in categories, usually a simplified version of the RBP scoring illustrated above. Since these indices are not a mathematical combination of measurements themselves, they have customarily been labeled "qualitative." The Ohio Environmental Protection Agency's (1989) Qualitative Habitat Evaluation Index (QHEI) incorporates substrata, instream cover, channel morphology, riparian width and cover, and pool, glide, and riffle characteristics. May's Qualitative Habitat

Table 7-1: Embededness Categories and Scores

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
Embeddedness	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment.	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.
Score	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
Source: Barbour et al., 1999				

Index (QHI) is made up of 15 variables scored in four quality categories and combined additively.

Where to Sample

The usual variability of habitat and impossibility of monitoring throughout the ecosystem inevitably raises the question of where it is best to monitor. Barbour et al. (1999) advised in the RBPs that, when sampling water bodies with complex habitats, a complete inventory of the entire reach is not necessary. They add, however, that the sampling area should be representative of the reach, incorporating riffles, runs, and pools if these habitats are typical of the stream in question. Mid-channel and wetland areas of large rivers, which are difficult to sample effectively, can be avoided. Sampling effort should be concentrated in near-bank habitats where most species occur.

When to Sample

If habitat knowledge is essential to the objectives, it should be monitored simultaneously with biological sampling. Simultaneous monitoring saves effort and therefore costs. While habitat is not invariable over time, it is likely to vary less, and more slowly, than the biota of interest. Therefore, it is appropriate for the biological monitoring schedule to control timing of habitat work.

How Many Samples to Take

Overall, the same representativeness and statistical considerations covered in Chapter 5 and (for water quality and sediment monitoring) in Chapter 6 also apply to habitat monitoring. When true sampling is required, composite sampling, as opposed to individual small replicates, is the norm for RBP investigations to characterize stream reaches. However, taking too few samples for a composite can be a major source of variance. Replication is strongly encouraged for precision evaluation of the methods.

How to Sample

As with guidance on what to sample in habitat monitoring, there are numerous guides on performing the various monitoring tasks. The RBPs contain field data sheets and associated text guidance. Prior to formulating his own system, May (1996) assessed more than 10 general purpose protocol documents, most from the Pacific Northwest, and a number of additional special purpose procedures. He incorporated the most appropriate features from these resources to arrive at a comprehensive procedure applicable to wadeable streams supporting or potentially supporting anadromous salmon in and near urban areas. The reader launching a habitat monitoring program has the choice of proceeding with the national RBPs, at least at first, or seeking out already developed regional methods. Such methods may already have adapted the RBPs for regional circumstances. These methods should be evaluated for the intended purposes, and either used if applicable or adapted with guidance by the objectives and the modifications made by others when they needed different techniques.

Chapter 6 emphasized the importance of careful, complete field notes while taking water quality samples. Field notes are, if anything, even more important for habitat monitoring, since they constitute the only record of many measurements and observations of habitat attributes. Any reader contemplating or performing habitat monitoring should consult the Chapter 6 discussion of field notes. The safety of the record should be ensured in all cases, but particularly for habitat monitoring, by keeping more than one copy of field notes in different locations.

Quality Assurance/Quality Control

Habitat monitoring QA/QC is less developed and formalized than for water quality and sediment monitoring. The RBPs recommend the following steps:

- Train field personnel in the assessment techniques being used.
- Calibrate the judgment criteria for each habitat variable and for the stream settings in which they will be assessed. Calibration involves determining if generally recommended scoring systems apply in these settings by employing them, as a preliminary step, across a representative range

of conditions and then adjusting them if warranted.

- Make periodic checks of assessment results using pictures of monitoring reaches and discussions among the personnel involved. A more advanced form of this step would be independent assessments by participants, a form of replication for precision evaluation.

How to Analyze Data

To a large extent, routine data analysis in habitat monitoring accompanies or is a nearly immediate outgrowth of monitoring itself. The scoring systems and indices described above represent straightforward means of analyzing raw data. The Snohomish County [Washington State] Public Works Department (2002) took a somewhat more advanced approach to index formulation, using the procedure for developing indices of biological integrity (IBIs) to derive an index of habitat integrity (IHI). The following section on Benthic Macroinvertebrate Monitoring covers the IBI procedure. The variables identified by Snohomish County as being most instrumental were:

- Fine sediment ratio – Bed surface ratio of fine sediment (< 6.3 mm) to larger particles;
- Unstable banks ratio – Ratio of unstable to stable bank length;
- Hydrologically modified banks ratio – Ratio of hydrologically modified to unmodified bank length;
- Pool functional area ratio – Ratio of pool areas to non-pool areas;
- Pools per unit bankfull width; and
- Large woody debris and stumps per unit bankfull width.

Benthic Macroinvertebrate Monitoring

Introduction

Benthic macroinvertebrates live in close association with the bed (benthic area) of a water body, are visible to the human eye, and do not possess an internal skeleton. They include the juvenile forms of insects, which typically emerge to the terrestrial world as adults; mollusks (e.g., snails, clams); crustaceans (e.g., crayfish, shrimps, amphipods); and various worms. They have some but not a high degree of mobility. As biological monitoring subjects, benthic macroinvertebrates have a number of advantages (Barbour et al., 1999):

- Macroinvertebrate assemblages are good indicators of localized conditions. Because many have limited migration patterns or a sessile mode of life, they are particularly well suited for assessing site-specific impacts (e.g., in upstream versus downstream studies).
- Macroinvertebrates integrate the effects of short-term environmental variations. Most species have a complex life cycle of approximately one year or more. Sensitive life stages respond quickly to stress; the overall community responds more slowly.
- An experienced biologist can often detect degraded conditions with only a cursory examination of the benthic macroinvertebrate assemblage. Macroinvertebrates are relatively easy to identify to family; many taxa intolerant of human-induced stresses can be identified to lower taxonomic levels with relative ease.
- Benthic macroinvertebrate assemblages are made up of species that constitute a broad range of trophic levels and pollution tolerances, thus providing strong information for interpreting cumulative effects.
- Sampling is relatively easy, requires few people and inexpensive gear, and has minimal detrimental effect on the resident biota.
- Benthic macroinvertebrates serve as a primary food source for fish, including many recreationally and commercially important species.
- Benthic macroinvertebrates are abundant in most streams. Many small streams (first and second or-

ders), which can have a diverse macroinvertebrate fauna, only support a limited fish fauna.

- Most public agencies that routinely collect biosurvey data focus on macroinvertebrates. Many regions already have background macroinvertebrate data.

Where to Sample and How Many Samples to Take

As with all other monitoring, allocation of sampling effort should be based on the set objectives and weighing of variability and costs to acquire the desired information with a sufficient level of assurance. Benthic macroinvertebrates generally vary greatly in spatial dimensions in response to the substrata, depth, velocity, overhanging and aquatic vegetation, and other conditions. Therefore, a statistical analysis will often dictate a very large number of samples to arrive at a reliable estimate of population sizes. There has been a definite trend away from population estimates and the diversity indices that were applied in analysis of population data, except for basic research purposes. The environmental management field has moved instead toward benthic indices of biotic integrity (B-IBIs). The section *How to Analyze Data* below covers the concepts and methods associated with B-IBIs.

If the objective is to develop a B-IBI or use an existing one, the first question is whether to sample a single habitat type (e.g., a stream riffle) or multiple habitats (e.g., beneath overhanging vegetation, in addition to a riffle). The RBPs present protocols for both options. The original RBPs (Plafkin et al., 1989) emphasized the sampling of a single habitat, a riffle or run, as a means to standardize assessments among streams having those habitats. The revised RBPs (Barbour et al., 1999) still considered this approach to be valid, because macroinvertebrate diversity and abundance are usually highest in cobble substrate (riffle/run) habitats. Where cobble substrate is the predominant habitat, this sampling approach provides a representative sample of the stream reach. However, some streams naturally lack much of that substrate. In cases where the cobble substrate represents less than 30 percent of the sampling reach in reference streams, one or more other habitats should be sampled. Habitats to sample should be selected based on the habitat availability in the reference state, and not in potentially impaired streams. Absence in an impaired stream of a habitat that occurs in the reference will, of course, influence the results, which is appropriate in comparing conditions.

The RBPs define five habitat types that support benthic macroinvertebrates (Barbour et al., 1999):

- Cobble (hard substrate) – Prevalent in riffles (and runs), which are a common feature throughout most mountain and piedmont streams; dominant in many high-gradient streams;
- Snags – Accumulated woody debris that has been submerged for a relatively long period (not recent deadfall and not large logs, which are generally difficult to sample adequately);
- Vegetated banks – Submerged lower banks having roots and emergent plants associated with them;
- Submerged macrophytes – Aquatic plants rooted on the bottom of the stream; and
- Sand (and other fine sediment) – Usually the least productive macroinvertebrate habitat in streams, although the most prevalent in some streams.

The RBPs recommend using a kick net for single-habitat sampling and a D-frame net for multiple-habitat work (refer to *How to Sample* below). The protocols prescribe the types and numbers of locations each net type should be used in. They specify compositing all samples to represent the habitat.

B-IBIs have been developed principally through single-habitat (riffle) monitoring programs using Surber samplers (refer to *How to Sample* below). Using a statistical bootstrap algorithm, Fore and Karr (unpublished manuscript cited by Karr and Chu, 1997) analyzed how many samples taken in this way are needed for a relatively precise quantification of metrics making up the B-IBI. They concluded that using the mean of three replicates taken within the riffle habitat is sufficient and that using five replicates yields little additional precision.

Another consideration is sufficient sampling to obtain an adequate number of invertebrates to be representative. There is disagreement on this point, with Karr and Chu (1997) recommending the collection, identification, and counting of at least 500 individuals per habitat for B-IBI metrics computations, a larger number than that cited in the RBPs. These authors believe that sampling sufficient organisms is far more important than the way in which sampling is organized. It is certainly true that larger numbers give more preci-

sion but also that taxonomic work is time-consuming and therefore expensive. Like all other decisions in monitoring program design, this one ultimately comes down to the objectives, environmental variability, and available budget. The dilemma illustrates once more the importance of considering and defining these factors at the outset of the program and then relying on them in making decisions.

With most objectives aimed at impact or BMP assessment, ideal sampling locations for the three replicates consist of rocks 5 to 10 cm (2 to 4 inches) in diameter resting on pebbles in a water depth of 10 to 40 cm (4 to 16 inches) within the main flow of the stream (Karr and Chu, 1997). The three locations should be selected through a random process. On grid paper, map a fairly homogeneous reach approximately 50 to 100 meters (164 to 328 ft) in length, if the riffle is at least this extensive. Each square represents a potential Surber sampling spot of 1 ft square. Eliminate any grids that lie beneath undercut banks, overhanging vegetation, or other bank influences. Number the remaining grids. Use a random number generator to select three grids for sampling.

Upon occasion, urban water resources monitoring programs may have objectives more far-reaching than the routine ones. In these cases, a more sophisticated sampling program design could be warranted. For example, variability within a habitat type could be explored by sampling along several transects within it. These transects could be placed randomly or purposely in locations representing different substrata. A sample allocation strategy more sophisticated than the simple random approach outlined above (e.g., stratified random sampling, systematic sampling) could better apply in these cases.

When to Sample

Many invertebrates are found in aquatic systems throughout the year. Still, seasonal factors cause shifts in numbers and relative dominance. Insects emerge in response to temperature and light. Large flows can wash out organisms and deplete the community for a time. Therefore, timing should be considered relative to objectives. If the objective is to determine the maximum production capability of the system, sampling should occur when conditions are stable and elevated temperature and light are stimulating biological activity, but before there is substantial emergence (i.e., spring or early summer). If the objective is to compare conditions among streams, sampling should occur in all of them over a short time span. If the intention is to make comparisons over a period of years, monitoring must be scheduled for the same time each year.

As an example, monitoring of human development effects in the Pacific Northwest has concentrated on sampling each September for several good reasons (Karr and Chu, 1997): water flows are generally fairly stable and safe for field work then, before the fall and winter rains, and invertebrates tend to be abundant. Sampling in September also minimizes disturbance of the spawning redds of anadromous salmonids.

How to Sample

In the RBPs, Barbour et al. (1999) described five sampling devices commonly used in macroinvertebrate assessment work (all with the standard 500-μm mesh size nytex screen):

- Kick net – 1 x 1 meter (3.3 x 3.3 ft) net attached to two poles; most efficient for sampling cobble substrate where velocity of water will transport dislodged organisms into net; designed to sample 1 m^2 of substrate at a time; can be used in any depth from a few centimeters to just below 1 meter;
- D-frame dip net – Frame 0.3 meter (1 ft) wide x 0.3 meter (1 ft) high and shaped like the letter "D" attached to long pole; net is cone- or bag-shaped for capture of organisms; can be used in a variety of habitat types, either as a kick net or for "jabbing," "dipping," or "sweeping";
- Rectangular dip net – Frame the same size as a D-frame net and also attached to a long pole; net is cone- or bag-shaped; sampling is conducted similarly to the D-frame device;
- Surber sampler – Frame 0.3 x 0.3 meter (1 x 1 ft) placed horizontally on cobble substrate to delineate a 0.09 m^2 (1 ft^2) area; vertical section of frame has the net attached and captures the dislodged organisms from the sampling area; restricted to depths of less than 0.3 m (1 ft); and
- Hess sampler – Cylindrical metal frame approximately 0.5 m (1.6 ft) in diameter sampling

an area of 0.8 m^2 (8.6 ft^2); an advanced design of the Surber sampler intended to prevent escape of organisms and contamination from drift; restricted to depths of less than 0.5 m (1.6 ft).

The RBPs give complete advice on using the kick net and D-frame dip net samplers recommended for single- and multiple-habitat work, respectively. Important techniques in using a Surber sampler are:

1. Sample from downstream to upstream to avoid early disturbance of later sampling spots.
2. Stand downstream of the sampling point, place the sampler with the net opening facing upstream, and brace the sampler's frame in place firmly.
3. Starting with rocks closest to the net opening, rub rocks by hand to dislodge invertebrates into the net; place rocks in a bucket of water for later inspection and hand picking of any remaining animals.
4. Thoroughly disturb the pebble layer with a small rake or large spike to a depth of at least 10 cm (4 inches) for at least 1 minute; collect any rocks appearing and save them in the bucket.
5. Lift the frame off the bottom slowly and tilt the net up and out of the water while keeping the open end upstream.
6. Invert the net (and removable receptacle, if the net has one) into a white wash pan; repeatedly dip the net in the stream to concentrate debris in the bottom and empty into the pan each time.
7. Take great care to capture all individuals in the net, using a magnifying glass and forceps to spot and remove animals as necessary.
8. With a small amount of water in the pan, pick through the collection to find all invertebrates and place them in a sample jar about half full of ethyl alcohol preservative and sitting in the pan to avoid spillage; again take great care to capture all individuals, using a magnifying glass and forceps as necessary.
9. Pick invertebrates from the rocks and bucket using the same care and place them in the sample jar.
10. Properly label the sample jar (see *Quality Assurance/Quality Control* below).

How to Handle Samples

Once preserved in 100-proof ethyl alcohol, invertebrate samples are stable for a reasonable period until identification. Because they do deteriorate, the taxonomic work should occur as soon as possible and certainly within months of collection.

The main issue in sample handling is whether or not to subsample to reduce the burden of sorting and identification. Authorities are divided on the wisdom of subsampling. As pointed out earlier, Karr and Chu (1997) believe in the necessity of a sample of 500 animals minimum, which removes subsampling as a consideration unless the collection is particularly rich. Courtemanch (1996) argued against subsampling but recommended a volume-based procedure if it must be done. The RBPs (Barbour et al., 1999) embrace subsampling and cite justification for it. They present a fixed-count approach based on a 200-organism subsample but applicable to any size (e.g., 100, 300, 500). The subsample must be sorted and preserved separately from the remaining sample for quality control checks.

Quality Assurance/Quality Control

QA/QC procedures are less developed for biological than for water quality and sediment monitoring but more complete than for habitat monitoring. The following recommendations are primarily derived from and based on the RBPs (Barbour et al., 1999).

For QA/QC of field work:

1. Prepare sample labels on a medium resistant to deterioration in alcohol with the sample identification code, date, stream name, sampling location, and collector's name. Place labels inside sample containers. Label the outside of the container with the same information. Also, include this information on chain-of-custody forms.
2. After sampling has been completed at a given site, all nets, pans, etc. that have come in contact with the sample should be rinsed thoroughly, examined carefully, and picked free of organisms or debris. Any additional organisms found should be placed into the sample containers. The equipment should be examined again prior to use at the next sampling site.

3. Duplicate sampling at 10 percent of the sites, minimum, to evaluate precision and repeatability of results for the sampling technique and collection personnel.

Recommended laboratory QA/QC procedures are:

1. Laboratory QA/QC personnel or a qualified co-worker should examine at least 10 percent of the sorted samples in each lot. (A lot is defined as a special study, basin study, entire index period, or individual sorter.) The worker will examine the grids chosen and the tray used for sorting and look for organisms missed by the sorter. Organisms found will be added to the sample vials. If the QA/QC worker finds fewer than 10 organisms (or 10 percent in larger subsamples) remaining in the grids or sorting tray, the sample passes; if more than 10 (or 10 percent) are found, the sample fails. If the first 10 percent of the sample lot fails, the worker will check a second 10 percent of the lot. Sorters in training will have their samples 100 percent checked until the trainer decides that training is complete.
2. After laboratory processing is complete for a given sample, all sieves, pans, trays, etc., that have come in contact with the sample should be rinsed thoroughly, examined carefully, and picked free of organisms or debris. Add organisms found to the sample residue.
3. Maintain a voucher collection of all samples and subsamples. These specimens should be properly labeled, preserved, and stored in the laboratory for future reference. A taxonomist (the reviewer) not responsible for the original identifications should spot check samples corresponding to the identifications on the bench sheet.
4. A reference collection of each identified taxon should be maintained and verified by a second taxonomist. The word "val." and the first initial and last name of the person validating the identification should be added to the vial label. Specimens sent out for taxonomic validations should be recorded in a "taxonomy validation notebook" showing the label information and the date sent out. Upon return of the specimens, the date received and the finding should also be recorded in the notebook, along with the name of the person who performed the validation.
5. Record information on samples completed through the identification process in the "sample log" notebook to track the progress of each sample within the sample lot. Update tracking of each sample as each step is completed (i.e., subsampling and sorting, mounting of specimens, taxonomy).
6. Maintain a library of basic taxonomic literature to aid identification of specimens, and update it as needed. Taxonomists should participate in periodic training on specific taxonomic groups to ensure accurate identifications.

How to Analyze Data

There has been a certain loss of confidence in diversity indices for interpretation of trends responding to impacts of human actions and management strategies. As a result, several different kinds of community indices have been introduced. These indices more fully exploit the data resulting from community monitoring and relate more closely to community structure and processes than do diversity indices. Terms applied to the indices include invertebrate community index (ICI) and benthic index of biotic integrity (B-IBI). Indices of these types are composed of metrics representing aspects of both elements and processes within the macroinvertebrate assemblage. Although these indices have been regionally developed, they are typically appropriate over wide geographic areas, usually with some modification of metrics for regional circumstances (Barbour et al., 1995).

Fore and Karr (1994) outlined the general procedure for B-IBI development as follows:

1. Develop metrics appropriate for the geographic area that respond to known sources of human influence.
2. Test the metrics developed in Step 1 with a second, independent data set.
3. Develop an index based on proven metrics; test the index on a third, independent data set.
4. Fine-tune the index.

The key to successful B-IBI development is selection of metrics. The most effective metrics are those having ecological relevance, exhibiting response across a range of human influence, and distinguishing well between relatively pristine and degraded sites. Four

studies published from 1995 through 1997 that tested potential metrics in detail serve as a basis for general recommendations, presented in Table 7-2 (DeShon, 1995; Barbour et al., 1996b; Fore et al., 1996; Smith and Voshell, 1997). While these metrics were found to have wide applicability, their utility should be checked regionally and replaced by others if they are found to be superior.

Some basic statistical and graphing procedures are useful in the initial identification of potential metrics. If an index is being constructed to study biological response to increasing urbanization, for example, bivariate correlation analyses relating all potential metrics to an urbanization measure can show the strongest associations. The seven to ten metrics with the highest correlations should be reviewed to judge if any represent very similar attributes and might be dropped. Also, metrics in the next tier of correlation coefficients should be reviewed to see if they represent different attributes that might be an asset to index development. Based on these reviews, decide on the composition of metrics that should be used for an initial trial B-IBI.

The next step in index development is scoring metrics. Continuing with the example, plot each of the tentatively selected metrics versus the urbanization measure. Through visual assessment of the graphs, assign ranges of the urbanization variable representing relatively high to low development, typically in five steps, although there may be situations where one less step or one or two more are appropriate. Again working visually, determine what range of each biological metric is consistent with each urbanization range. Assign scores

Table 7-2: Definitions of Best Candidate Benthic Metrics and Predicted Direction of Metric Response to Increasing Perturbation

Category	Metric	Definition	Expected Reaction to Impairment
Richness	Total # Taxa	Measure of richness of macroinvertebrate Taxa	Decrease
	# EPT Taxa	# of taxa in the EPT insect orders	Decrease
	# Ephemeroptera Taxa	# of mayfly taxa	Decrease
	# Plecoptera Taxa	# of stonefly taxa	Decrease
	# Trichoptera Taxa	# of caddisfly taxa	Decrease
Composition	% EPT	% mayfly, stonefly, and caddisfly larvae	Decrease
	% Ephemeroptera	% mayfly nymphs	Decrease
Tolerance/Intolerance	# Pollution Intolerant Taxa	Richness of perturbation-sensitive species	Decrease
	% Tolerant Taxa	% macrobenthos tolerant of perturbation	Increase
	% Dominant Taxa	Measure of the dominance of the most numerous taxon. Can also be calculated for 2nd, 3rd, 4th and 5th most dominant taxa.	Increase
Feeding	% Filterers	% macrobenthos which filter water or sediment for FPOM	Variable
	% Grazers and Scrapers	% macrobenthos that scrape or graze at periphyton	Decrease
Habit	# of Clinger Taxa	# insect taxa	Decrease
	% Clingers	% insects with fixed retreats or adaptations to attach to surface in moving water	Decrease

Source: Barbour et al. 1999, as compiled from DeShon 1995, Barbour et al. 1996b, Fore et al. 1996, Smith and Voshell 1997

to each metric range from 1 for the lowest interval to 5 for the highest. The B-IBI is the sum of all metric scores, with the maximum possible B-IBI being the product of the number of metrics and the maximum score (5). The tasks outlined here complete Step 1 in the general procedure. Steps 2 and 3 should follow.

In fine-tuning the index (Step 4), it is advisable to perform some statistical and numerical tests to evaluate the index's performance for its intended purpose. These tests can involve linear regressions and multivariate techniques like discriminant function analysis and logistic regression to create models relating B-IBI and independent variables like the urbanization measure. During these analyses, metrics can be removed and added to the index (e.g., R^2, the coefficient of determination for regressions) to see if these alterations result in improvement in measures of model effectiveness.

Toxicity Assessment

Introduction

Toxicity assessment is not a routine activity in urban water monitoring. Many assessment procedures exist, although some have limited usefulness in the usually variable environment of waters affected by runoff from diffuse landscape sources. Therefore, this coverage will just summarize the field in a general manner. Burton and Pitt (2002) provide considerable detail in their Chapter 6 and Appendix D.

Toxicity assessment options can be classified as:

- Toxicity screening procedures – An instrumental analysis to express toxicity to a microorganism of an environmental sample relative to a control sample;
- Whole-effluent toxicity (WET) tests – Controlled laboratory exposure of a test species to various strengths of a natural or wastewater sample;
- Sediment toxicity tests – Controlled laboratory exposure of a test species in vessels containing sediments as well as water, generally over a somewhat extended period;
- In situ toxicity tests – Confined exposure of a test species in the natural environment; and
- Tissue analysis – Measurement of substances in organism tissues to determine their bioaccumulation.

Toxicity Screening Procedures

The most common screening procedure is the Microtox test. Microtox is a trademark of AZUR Environmental. The Microtox Acute Toxicity Test is a 15-minute exposure, metabolic inhibition test that uses freeze-dried luminescent bacteria (Vibrio fischeri NRRL B-11177) to assess the acute toxicity of water, soil, or sediment samples. The test system is comprised of the Model 500 Analyzer, Microtox reagent and test solutions, a personal computer, and MicrotoxOmni™ Software for capturing and analyzing test data. Toxicity is expressed in terms of reduction in light output with exposure to the sample relative to a control. If a series of dilutions of the sample has been tested, which is the standard protocol, and if light reduction exceeds 50 percent, EC50 (the 50 percent effective concentration) can be calculated to express the sample dilution that reduces light output by half compared to the control.

Microtox is a convenient and relatively inexpensive way of identifying the potential for generalized toxicity to aquatic biota of interest. However, it does not provide evidence of the source(s) of toxicity or of actual toxicity to those organisms. To achieve this, more probing analyses must be performed with more specific objectives. Still, the procedure provides urban water resource managers with a tool to identify the need for and plan additional work.

Whole-Effluent Toxicity (WET) Tests

WET tests are bioassays most commonly performed on species long considered to be good laboratory test specimens. The species most often used are the alga Selenastrum capricornutum; the invertebrates (zooplanton) Daphnia magna, Daphnia pulex, and Ceriodaphnia dubia; and the fish Pimephales promelas (fathead minnow). Juvenile rainbow trout (Salmo gairdneri) have also been used quite frequently. The U.S. Environmental Protection Agency (1991) recommended simultaneous WET tests on a fish, an invertebrate, and an alga. National Pollutant Discharge Elimination System (NPDES) permits sometimes require at least fathead minnow and zooplankton bioassays.

WET tests are performed in laboratory containers, most commonly with acute exposures to a number of test organisms over 48 or 96 hours, although longer,

chronic tests certainly can be and often have been conducted. A series of dilutions of the sample from 100 percent to 0 (control) strength elucidates a range of effects. In acute tests, the effects are normally simply lethality or non-lethality. Their results are usually expressed in terms of the LC50, the sample concentration lethal to 50 percent of the organisms present, often with the length of the testing period also indicated (e.g., LC50-48 h, LC50-96 h). Chronic assays reveal degrees of sublethal effects, such as effects on mobility, growth, or reproduction.

WET tests have the advantage of being guided by well-standardized procedures under a high degree of control. However, they represent a very artificial environment that makes it difficult to extrapolate results to natural systems. They use organisms that are rarely inhabitants of the ecosystem of interest and omit inter-species interactions (e.g., competition, predation) present in the natural environment. WET tests reflect only one type of stressor, contaminants dissolved in water, and omit the effects of other key stressors, like hydrology-driven phenomena and sediment contamination. Very importantly for urban water resources investigations, they miss the pulse exposures of stormwater runoff.

Some work has been done to address these shortcomings but has not advanced far. For example, Herricks and colleagues experimented with time-scale toxicity testing (Herricks, Milne, and Johnson, 1994, 1998; Brent and Herricks, 1998, 1999). This research was designed to assess the effects of brief exposures, such as would occur in storm runoff episodes, based on sublethal responses during a post-exposure observation period. The results exhibited both delayed effects and, sometimes, organism recovery, which suggests that toxicity tests used to monitor brief exposures should use environmentally relevant exposure durations and post-exposure observations.

Sediment Toxicity Tests

Methods for long-term, chronic testing of sediment toxicity are relatively new (U.S. Environmental Protection Agency, 2000). Using invertebrates as test specimens, these procedures require 42 days or longer to run and are thus relatively expensive. They are mentioned here just to alert urban water resources managers, who may encounter more attention to sediment contamination in the future.

In Situ Toxicity Tests

The basic approach to in situ toxicity testing is to confine test species in a container, expose them to the environment being studied, and observe their lethal or sublethal responses. A number of media exist for in situ toxicity testing, including instream artificial substrates, baskets containing rock or mesh, glass slides, side-stream chambers, and cages. All of these devices require protection from high flows, and they must be secured to the bed of the water body (Burton and Pitt, 2002).

In situ testing has a number of advantages. Like other types of field analysis, this type of testing avoids the extensive artificiality of laboratory conditions and the difficulties of extrapolating laboratory results to the field. Naturally, it also incorporates environmental conditions that are difficult or impossible to produce in the laboratory, such as sunlight; suspended solids; diurnal effects of oxygen and temperature; spatial and temporal variation of physicochemical constituents; stressor magnitudes, frequencies, and durations; presence of natural substrata; and other factors (Burton and Pitt, 2002). Of particular importance in urban water resources investigations, the test organisms are subject to the multiple stresses and actual exposure patterns of episodic stormwater runoff events.

There are also some disadvantages associated with in situ toxicity testing. Test species can be affected by transportation stress and starvation in enclosures. Protecting test media from high flow can artificially alter the effects of flow on organisms. They may not experience the same sediment transport patterns as free-living individuals. Containment removes interactions with other species and other members of the same species. Unprotected devices are also subject to disturbance by humans and animals.

In situ tests provide the best information about toxicity when used in conjunction with the results of other monitoring. In accordance with program objectives, these additional assessments might include monitoring of water quality, sediment quality, or both; habitat conditions; and benthic macroinvertebrates.

Tissue Analysis

Inorganic and organic chemicals accumulate in the tissue of organisms through chronic exposure to polluted waters and sediments as well as through the ingestion of food. The goal of any evaluation of bioaccumulation is to relate body-residue concentrations of toxins to effects in aquatic species. Accomplishing this goal allows the response to toxins to be linked directly to sources of contamination. While many factors affect the bioavailability of toxins in the environment, it is the amount of exposure in the receiving species that causes the toxic response. Despite the potential usefulness of this approach, it has not been pursued much through development of standard test procedures and long-term studies (Burton and Pitt, 2002).

An alternative to the use of test species are semi-permeable membrane devices (SPMDs). SPMDs are polymeric tube bags containing a lipid compound, which mimics uptake and concentration of contaminants in living tissue. Comparisons of concentrations of target compounds in SPMDs and test species have shown that they often provide similar results (Burton and Pitt, 2002).

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CHAPTER 8

Impact Avoidance

Avoiding impacts to aquatic ecosystems can only be achieved through careful site design and implementation of source control and management practices. However, any one stormwater management tool is unlikely to achieve the stormwater management objectives for a given development on its own. It is therefore necessary to consider the objectives early in the design process, when competing demands can be carefully balanced and an integrated approach achieved. This approach reduces both the need for and the size of treatment devices, as well as their construction and maintenance costs and obligations. Achieving an overall stormwater management objective by using a treatment train approach that combines a number of different tools or practices is essential to successful program implementation.

It is important to recognize that limiting hydrological modification is just as important as water quality treatment if aquatic resource protection is to be achieved. Hydrologic change also influences the whole range of environmental features that affect aquatic biota – flow regime, aquatic habitat physical structure, water quality, biotic interactions, and food sources. In addition to the hydrological change resulting from urban development, there are changes to the runoff delivery system. Soil compaction or impervious surfaces convert what was once subsurface groundwater flow to overland surface water flow. Thus the precipitation over a small watershed reaches the stream with a typical delay of just a few minutes, instead of what once was a lag of hours, days, or even weeks. The result is a dramatic change in flow patterns in the downstream channel, with the largest flood peaks doubled or more and the more frequent storm discharges increased as much as tenfold.

Many of the effects of stormwater are, by themselves, relatively small. When considered on a watershed basis, however, their cumulative effect is substantial, such as in the case of flooding due to gradual increases in upstream impervious areas. To manage these effects, we need to understand them on a watershed basis, where the effects are discernible, but prevent them on an individual site basis, where the physical changes to the hydrological cycle are made. This is the role of watershed management plans: as a range of approaches to achieve overall watershed objectives, they are a key tool for integrated stormwater management.

This chapter is divided into two major components: site (and watershed) resource protection and enhancement, and source control. The section on site resource protection and enhancement includes discussion of riparian buffers, upland forests, wetlands, steep slopes, and the importance of soils. The section on source control provides discussion of site practices, including low impact design to avoid adverse impacts from residential and commercial areas.

It is important to reiterate that both components can and should be applied on a site-by-site basis as well as on a watershed basis to provide maximum downstream aquatic system protection.

The final section of this chapter sets out information on various new approaches.

Site Resource Protection and Enhancement

The site resources referred to here are those natural features or site characteristics that, to a large extent, provide a benefit to receiving systems just by existing. They serve the general public by continuously reducing peak rates and volumes of stormwater runoff, provide water quality treatment, and prevent damage to improved or natural lands either on site, where the site resources exist, or downstream of those resources.

Site resources have intrinsic and other values for habitat and biodiversity beyond their stormwater functions. These include a wide variety of items, but those discussed here are considered primary resources that should be recognized and considered in site development and use. The following site resources (some of which are less obvious than others) are considered important primarily for their stormwater management benefits. They will be discussed in further detail in the following sections.

- Terrestrial ecology and landscape form;
- Headwater streams;
- Wetlands;
- Floodplains;
- Riparian buffers;
- Vegetation;
- Soils;
- Slopes/topography;
- Other natural features; and
- Linkage with site development.

Site resources often overlap. For example, a riparian buffer may lie within a floodplain, or, conversely, a forested area may form part of a riparian buffer. In this chapter, they are discussed individually, although their benefits may be, and generally are, overlapping and cumulative.

Most readers are probably already familiar with the following terms and discussion. Recognition of their values cannot be overemphasized, but they are often overlooked during the site development phase. Too often, we consider "low impact" approaches such as swales, bioretention, infiltration, or rain gardens to be stormwater management practices. Those practices impact the natural environment less than more traditional practices such as ponds, but they are only part of the solution. There has to be a fundamental shift in how we use land if we are to protect aquatic resources. Too often, we shape the land to fit a style of development. We have to start thinking about how to shape our use to fit the land. Any approach is only as strong as its weakest component. Doing half of what is needed is good from an evolutionary context, but resource protection may not result.

Terrestrial Ecology and Landscape Form

Where natural features are located on a site is just as important as the characteristics of the natural features themselves. There are several basic principles of ecology that can be used to improve the quality of receiving environments. These principles, detailed below, apply to all site resources:

- Retain and protect native vegetation (forest, regenerating forest, wetlands) – these ecosystem types have important intrinsic values and provide different habitats for native flora and fauna as well as different ecological functions.
- Allow natural regeneration processes to occur (e.g., pasture => scrub => forest; wet pasture => wetland).
- Undertake weed and pest control of invasive, non-native species to improve the natural succession potential of native vegetation. Allow natural processes and seed dispersal mechanisms to occur.
- Replant and restore with native plants to provide vegetation cover that is characteristic of what would once have been there and/or that reflects other local remnants in the area.
- Restore linkages with other natural areas or ecosystems (e.g., by using waterways and riparian areas, linking fragmented forest remnants, linking wetland ecosystems and freshwater ecosystems to terrestrial forest/scrub remnants).
- Our knowledge is limited, and we do not know what we are doing yet. When we design a bridge or a building, we include a factor of safety. We do not normally include a factor of safety for

the environment, and that lack of additional protection is reflected in the continuing decline of aquatic resources.

It is important to retain natural areas (including scrub, forest, and wetlands) on a site for their biological diversity and intrinsic values, which include the following:

- They are important as characteristic examples of biodiversity in a region or district.
- They contain a diversity of species or ecosystem types.
- They may contain rare or special features or unusual ecosystem types.
- They are valuable as habitats for native species.
- They have the ability to sustain themselves over time (e.g., through available seed sources, active regeneration, the level of weeds and pests and outside influences controlled).
- They are of adequate size and shape to be viable.
- They provide a buffer to habitats or natural areas from outside influences. These may include scrub on edges of native wooded areas or intact sequences from estuarine to terrestrial, from freshwater to terrestrial, from valley bottom to ridge top. They also provide linkages with other natural areas (corridors for birds or invertebrates).

Long-term ecological viability is the ability of natural areas to retain their inherent natural values over time. This includes the ability of a natural area to resist disturbance and other adverse effects, as well as the ability of its component plant and animal species to regenerate and reproduce successfully. Complex ecosystems often have a messy or "wild" appearance to them as their complexity increases. A mature forest can take hundreds of years to develop, so seeing one indicates a lack of recent disturbance.

Headwater Streams

A stream is a natural body of water that includes a free-flowing area of concentrated flow, an area having pools of water, a spring outfall, and/or a wetland. In the context of a stream, the area of concentrated flow has defined banks and bottom, not including areas of sheet or shallow concentrated flow such as swales.

Nationwide, as shown in Table 8-1, 73 percent of the total length of all streams in the U.S. are first- and second-order streams. These streams tend to be filled

Example of wetlands and native wood areas.

in, enclosed, and developed over. If one of our goals is to protect third-order and larger streams, that goal cannot be attained if first- and second-order streams are destroyed. Imagine, if you will, that 73 percent of your arteries were clogged or significantly impaired: your state of health could certainly never be considered good. Unless first- and second-order streams are protected, expectations for larger streams have to be reduced. This thought could have a substantial impact on how we develop land and on our normal practice of enclosing first-order streams to allow development to proceed on top of what was once a natural system. Once we enclose a stream and build on top of it, that stream is gone. How many times have all of us remembered a stream that we played in as children and found that stream now gone? It is a sad but recurring story.

Wetlands

Wetlands include permanently or intermittently wet areas, shallow water, and land water margins that support a natural ecosystem of plants and animals adapted to wet conditions. They occur on water margins or on land that is temporarily or permanently wet. Wetlands are a major habitat for freshwater fish as well as for frogs, birds, and invertebrates. Almost half (42 percent) of the total U.S. threatened and endangered species depend upon wetlands for survival. Wetlands have unique hydrological characteristics that can be irreversibly modified by activities such as drainage.

There can be few other vegetation classes that have suffered as severely during human times as wetlands have. There are many reasons for this, mainly related to the fact that wetlands are on flat land, suited to agriculture, and generally display a vegetation that is held in low esteem by the average person. These changes have occurred despite the value of wetlands as wildlife habitats, regulators of flooding, their intrinsic values, and their benefits for recreation and scientific research. Nevertheless, a far larger area than that remaining today has been lost through drainage or filling.

The vast majority of wetlands are less than 10 acres in size. It is also reasonable to assume that there are many more in the less than two-acre category, but they are generally not reported. This is especially true in headwater areas of watersheds, where very small wetlands may be present.

It is important to recognize that even without the presence of humans, wetland systems are being modified and eliminated by a natural ecological ageing process: succession. The filling and conversion of wetlands into more terrestrial types of ecosystems occurs naturally, but at a relatively slow rate. The intervention of humans into the process accelerates this conversion process from a period of hundreds of years to a very short time frame that can be measured in years.

In addition to the beneficial values shown in Table 8-2, the above list can be expanded to incorporate stormwater quality treatment. Natural systems have

Table 8-1: Relationship Between Stream Order and Other Stream and Floodplain Measures for Nontidal Streams of the United States; Meters (m), Kilometers (km)

Stream					Floodplain	
Order	Number	Length (km)	%	Cum %	Width (m)	Area (km^2)
1	1570000	2526130	48.4	48.4	3	7578
2	350000	1295245	24.8	73.2	6	7771
3	80000	682216	13.1	86.3	12	8187
4	18000	347544	6.7	92.9	24	8341
5	4200	189218	3.6	96.5	48	9082
6	950	97827	1.9	98.4	96	9391
7	200	47305	0.9	99.3	192	9083
8	41	22298	0.4	99.7	384	8562
9	8	10002	0.2	99.9	768	7682
10	1	2896	0.1	100.0	1536	4448

Source: Brinson, 1993

complex mechanisms, and the following list describes the major processes occurring in wetlands that allow them to provide water quality enhancement functions. These mechanisms include:

- Settling/burial in sediments;
- Uptake of contaminants in plant biomass;
- Filtration through vegetation;
- Adsorption on organic material;
- Bacterial decomposition;
- Temperature benefits; and
- Volatilisation.

Floodplains

Floodplains occupy those areas adjacent to stream channels that become inundated with stormwater during large rainfall/runoff events. For the most part, rainfall is the main cause of flooding, although surges by wind-driven currents can exacerbate the problem or (in unique situations) actually cause the flooding problem. Flooding problems result from two main components of precipitation: the intensity and duration of rainfall, and its areal extent and distribution.

The form of the stream channel and its associated floodplain in part determine the size of the flood, particularly its depth and areal extent. A small watershed and wide floodplain will result in a shallow, but widespread flood. A deep channel and steep slopes, on the other hand, will result in deeper flooding, but on a small areal extent.

The many benefits that floodplains provide are partly a function of their size and lack of disturbance. But what makes them particularly valuable ecologically is their connection to water and the natural drainage systems of wetlands, streams, and estuaries. The water quality and water quantity functions they provide overlap with the landscape functions of tract size and ecosystem complexity to make them exceptionally valuable natural resources.

Table 8-2: Summary of Wetland Functions and Values

Function/Value	Description
Flood control	Attenuation of peak flows
	Storage of water
	Absorption by organic soils
	Infiltration to groundwater
Flow augmentation	Maintenance of streamflow during drought
Erosion control	Increased channel friction
	Reduction in stream velocity
	Reduction in stream scour
	Channel stability through vegetative roots
Water quality	Sedimentation
	Burial of pollutants in sediments
	Adsorption of pollutants to solids
	Uptake by plants
	Aerobic decomposition by bacteria
	Anaerobic decomposition by bacteria
Habitat for wildlife	Food
	Shelter/protection from predators
	Nursery area for early life stages
Fisheries habitat	Freshwater mussels, crayfish, fish
Food chain support	Food production (primary production)
Recreation/aesthetics	Enjoyment of nature
Education	Teaching, research

Floodplains provide flood storage and conveyance during periods when flow exceeds channel boundaries. In their natural state, they reduce flood velocities and peak flow rates by out of stream bank flow of stormwater through dense vegetation. They also promote sedimentation and filter pollutants from runoff. In addition, having a good shade cover for streams provides temperature moderation of streamflow. Maintaining natural floodplains also promotes infiltration and groundwater recharge while increasing or maintaining the duration of low surface streamflow. Another function of floodplains is the temporary storage of floodwaters. If floodplains were not protected, development would, through placement of structures and fill material in the floodplain, reduce their ability to store and convey stormwater when necessary. This, in turn, would increase flood elevations upstream of the filled area and increase the velocity of water traveling past the flow area that has been reduced by fill material. Either of these conditions could cause safety problems or significant damage to private property.

Natural floodplains are fertile and support a high rate of plant growth that in turn supports and maintains biological diversity. They provide breeding and feeding grounds for fish and wildlife and habitat for rare and endangered species.

Ground cover in natural wooded floodplains tends to be composed of leaf and dense organic matter. Organic soils have a lower density and higher water-holding capacity than mineral soils, due to their high porosity or the percentage of pore spaces. This porosity allows floodplain soils generally to store more water than mineral soils would in upland areas.

Riparian Buffers

Although reduction of pollutants can be a function of riparian buffers, they also contribute significantly to other aspects of water quality and physical habitat. Habitat alterations, especially channel straightening and removal of riparian vegetation, continue to impair the ecological health of streams more often and for longer time periods than do pollutants.

When considering riparian buffer systems, it is helpful to examine the variety of benefits that are gained by their protection or implementation.

Example of a Small Headwater Wetland

Temperature and Light

The daily and seasonal patterns of water temperature are critical habitat features that directly and indirectly affect the ability of a given stream to maintain viable populations of most aquatic species. Considerable evidence shows that the absence of riparian cover along many streams has a profound effect on the distribution of a large number of species of macroinvertebrates and fish.

In the absence of shading by a forest canopy, direct sunlight can increase stream temperatures significantly (up to 12° C), especially during periods of low streamflow in summer. Riparian buffers have been shown to prevent the disruption of natural temperature patterns as well as to mitigate the increases in temperature following upstream deforestation.

Habitat Diversity and Channel Morphology

The biological diversity of streams depends on the diversity of habitats available. Woody debris is one of the major factors in aquatic habitat diversity. It can benefit a stream by:

- Stabilizing the stream environment by reducing the severity of the erosive influence of streamflow;
- Increasing the diversity and amount of habitat for aquatic organisms;
- Providing a source of organic carbon; and
- Forming debris dams and slowing stream velocities.

Loss of the riparian zone can lead to loss of habitat through stream widening, where forest is not replaced by permanent vegetation, or through stream narrowing, where forest is replaced by grass. In the absence of woody vegetation, bank erosion and channel straightening can occur. The accelerated streamflow velocity allowed by straight channels promotes channel erosion that may exceed the overland sediment load entering the stream. This process can eventually lead to the development of wide, shallow streams that support fewer species.

Food Webs and Species Diversity

The two primary sources of natural food energy input to streams are litterfall from streamside vegetation and algal production within the stream. Total annual food energy inputs are similar under shaded and open canopies, but the presence or absence of a tree canopy has a major influence on the balance between litter input and primary production of algae in the stream.

Example of a wooded floodplain in a local park

Having a stream exposed to sunlight for most of the day promotes algal growth and proliferation of algal grazing species. This proliferation reduces species diversity. The diversity of the macroinvertebrate community in a stream protected by a riparian buffer is much greater than the diversity of a stream that does not have a riparian canopy. This diversity is important, because it occurs in a very small area that goes from lowland wetter soil conditions to upland fairly rapidly and thus promotes very different vegetative types. Also, riparian buffer areas are adjacent to streams and therefore to floodplains. Through periodic out-of-bank flow, floodplains are depositional zones for fertile sediments, which is why areas adjacent to streams have always been considered so productive from an agricultural perspective.

Pollutant Removal

Riparian vegetation removes, sequesters, or transforms nutrients, sediments, and other pollutants. The removal function depends on two key factors:

- The capability of a particular area to intercept surface and/or groundwater-borne pollutants; and
- The activity of specific pollutant removal processes (filtration, adsorption, biological uptake, etc.).

Sediment trapping in riparian forest buffers is facilitated by physical interception of surface runoff that causes flow to slow and sediment particles to be deposited. Channelized flow is not conducive to sediment deposition and can, because of its higher velocities, cause erosion in the riparian buffer.

Channel Stability and Flood Flow Protection

Streams are dynamic systems that are characterized by change. In-stream stability and stream bank erosion at a given point are heavily influenced by the land use and condition in the upstream watershed. However, vegetation – especially woody vegetation – is essential for stabilizing stream banks. Forested buffer strips have a direct effect on stream bank stability by providing not only deep root systems that hold the soil in place more effectively than grasses, but also a degree of roughness capable of slowing runoff velocities and spreading flows during large storm events. While slowing flood velocities may increase flood elevations upstream and in the buffer, downstream flood crest and damage may be significantly reduced. These processes are also critical for building floodplain soils.

Example of a small stream with riparian cover

Vegetation

Vegetation cover has changed considerably as man's influence on his environment has expanded, with the most dramatic changes occurring in the past century. Almost every kind of vegetation imaginable exists in the U.S., and each of them has suffered from our use of the land. As we have already discussed wetlands, it would be of value here to discuss forest land, which has a number of components whose characteristics determine its effectiveness in terms of water quantity and quality.

Stormwater Runoff Reduction

Woody vegetation and forest floor litter have a significant impact on the total volume of rainfall converted to runoff. Runoff volumes from forested areas are much lower than volumes from other land uses. This lesser volume in runoff acts to minimize downstream erosion and instability problems. This can clearly be shown by some of the runoff curve numbers listed in Table 8-3 that are provided in the Natural Resources Conservation Service (NRCS) Technical Release No. 55 for various land uses. Some of those curve numbers are provided here to demonstrate the differences that vegetation variety has, in conjunction with soil conditions, on curve numbers. The higher the curve number the greater the runoff.

Using the curve number approach, relationships can be drawn (hypothetically) regarding the amount of forest that would have to be planted to compensate for imperviousness. That ratio, depending on soils and slopes, can be approximately 6:1, meaning that it takes six times as much wooded area to compensate for a given amount of impervious surface. This considers only volume, but prevention of concentrated flow, absence of soil compaction due to development, etc. also need to be considered.

Soil Structure

Forest soils are generally regarded as effective nutrient traps. Most nutrients are retained (and recycled) in the leaf litter and shallow soil layers. The ability of a forest soil to remove nutrients in surface and groundwater is partially dependent on soil depth, ground slope, density of vegetation, permeability, extent and duration of any shallow water table, and its function as a groundwater discharge zone.

Organic Litter Layer

The organic litter layer in a forest buffer provides a physical barrier to sediment movement. It also maintains surface porosity, higher infiltration rates, increased populations of soil mycorrhizae (a symbiotic relationship of plant roots and the mycelium of fungi that aids in decomposition of litter and translocation of nutrients from the soil into the root tissue), and provides a rich source of carbon essential for denitrification. The organic soil provides a reservoir for storage of nutrients to be later converted to woody biomass.

A mature forest can absorb as much as 14 times more water than an equivalent area of grass. The absorptive ability of the forest floor develops and improves over time. Trees release stored moisture to the atmosphere through transpiration, while soluble nutrients are used for growth.

Table 8-3: Curve Numbers for Various Land Covers

Cover type/land use	Hydrological condition	A	B	C	D
Impervious areas		98	98	98	98
Woods	poor – no forest litter	45	66	77	83
	good – litter and brush	30	55	70	77
Pasture	good	39	61	74	80
Lawns/open space	good – full grass cover	39	61	74	80

Forested Areas

Trees have several advantages over other vegetation in improving water quality. They aggressively convert nutrients into biomass. They are not easily smothered by sediment deposition or inundation during periods of high water level. Their spreading root mats resist the development of gullies and stimulate biological and chemical soil processes. They produce high amounts of carbon needed as an energy source for bacteria involved in the denitrification process. A forest's effectiveness in pollution control will vary with the age, structural attributes and species diversity of its trees, shrubs and understory vegetation.

To consider the involvement of a forested area in water quality treatment, there are a number of functions that define that performance. These functions can be broadly defined as physical and biological functions and include the following:

Physical Function

The forest floor is composed of decaying leaves, twigs, and branches that form highly permeable layers of organic material. Large pore spaces in these layers catch, absorb, and store large volumes of water. Flow of stormwater through the forest is slowed down by many obstructions. Suspended sediment is further removed as runoff flows into the vegetation and litter of the forest floor. This sediment is readily incorporated into the forest soil. With a well-developed litter layer, infiltration capacities of forest soils generally exceed rainfall and can also absorb overland flows from adjacent lands.

Biological Function

Forest ecosystems serve as filters, sinks, and transformers of suspended and dissolved nutrients. The forest retains or removes nutrients in a variety of ways. It rapidly incorporates biomass, stores it long term, improves soil nutrient holding capacity by adding organic matter to the soil, reduces leaching of dissolved nutrients in subsurface flow from uplands by evapotranspiration, provides bacterial denitrification in soils and groundwater, and prevents erosion during heavy rains.

Soils

Soils possess several outstanding characteristics as a medium for life. They are relatively stable structurally and chemically. The underground climate is far less variable than above-surface conditions. The atmosphere remains saturated or nearly so, until soil moisture drops below a critical point. Soil affords a refuge from high and low extremes in temperature, wind, evaporation, light, and dryness. These conditions allow soil fauna to make easy adjustments to the development of unfavorable conditions. On the other hand, soil hampers movement. Except for organisms such as worms, space is important. It determines living space, humidity, and gases.

A wide diversity of life is found in the soil. The number of species of bacteria, fungi, protists, and representatives of nearly every invertebrate phylum found in soil is enormous. It has been estimated that approximately 50 percent of the earth's biodiversity occurs in soil. Dominant among the soil organisms are bacteria, fungi, protozoans, and nematodes.

As detailed by the NRCS soil classification systems, all soils are contained within the following four categories:

- Group A soils have low runoff potential and high infiltration rates even when thoroughly wetted. They consist chiefly of deep, well to excessively drained sands or gravels and have a high rate of water transmission (greater than 0.3"/hour).
- Group B soils have moderate infiltration rates when thoroughly wetted and consist chiefly of moderately deep to deep/moderately well to well drained soils with moderately fine to moderately coarse textures. These soils have a moderate rate of water transmission (0.15 – 0.3"/hour).
- Group C soils have low infiltration rates when thoroughly wetted and consist chiefly of soils with a layer that impedes downward movement of water and soils with moderately fine to fine texture. These soils have a low rate of water transmission (0.05 – 0.15"/hour).
- Group D soils have high runoff potential. They have very low infiltration rates when thoroughly wetted and consist chiefly of clay soils with a high swelling potential, soils with a permanent high water table, soils with a claypan or clay layer at or near the surface, and shallow soils

over nearly impervious material. These soils have a very low rate of water transmission (0 – 0.05"/hour).

Soils having greater infiltration rates also have reduced runoff potential. From a groundwater recharge and stormwater runoff perspective, prioritizing development on Group C and Group D soils would be more desirable than allowing development on Group A or Group B soils. If the overall development density was set at a given level, clustering that development on poorer soils would result in less of an increase in stormwater runoff than development on soils with greater infiltration rates. This would also have significant beneficial effects on groundwater recharge that could help maintain stream baseflows as a watershed develops. Maintaining highly permeable soils in open space areas would provide a better approach to baseflow maintenance than artificial infiltration in smaller selected areas that would come with long-term maintenance concerns.

Slopes/Topography

Steeper slopes also increase the erosion potential of the soil. Looking at the Universal Soil Loss Equation (USLE) (now the Revised Universal Soil Loss Equation – RUSLE), you can gain an understanding of the importance of slope in the calculation of soil loss. The slope length factor (LS) demonstrates that there is a direct relationship between slope and calculated soil loss. The Universal Soil Loss Equation (USLE) is a simple empirical formula that was developed approximately 30 years ago and derived from the theory of erosion processes. The general form of the equation is:

$$A = (R)(K)(LS)(C)(P)$$

where:

A = Calculated soil loss (tons/ha)

R = Rainfall energy factor

K = Soil erodibility factor

LS = Slope-length factor

C = Cropping management (vegetative cover) factor

P = Erosion practice factor.

The greater the slope, the greater the soil loss. In calculating the LS term, LS is based upon the length and steepness of a given slope. If the slope length is kept constant, its doubling (log-log relationship) causes the LS factor to approximately double. This means that a slope of 2 percent (100 m length) has an LS factor of 0.29, where a slope of 4 percent has an LS factor of 0.6. A slope of 16 percent has an LS factor of 5. A slope of 16 percent has 17 times the soil loss of a 2 percent slope, all other factors being equal. In other words, disturbance of steep slopes has a dramatic impact on site soil loss.

By identifying steeper slope areas in the initial stages of project planning for a new development, portions of a site that have increased potential for erosion can be identified. This process would allow for site development to occur in a less destructive manner or for more stringent erosion and sediment control practices to be implemented during site development.

Other Natural Features

Every site has natural features that would have substantial stormwater management benefits if they were integrated into the development approach. The previously discussed ones are important individually, but there are others that are important as well and should be integrated to provide a better site management approach.

Depression Storage and Evapotranspiration

Of the rainfall that strikes roofs, roads, and pervious surfaces, some is trapped in the many shallow depressions of varying size and depth present on practically all ground surfaces. The specific magnitude of depression storage varies from site to site. Depression storage commonly ranges from 1/8 to 3/4 inches for flat areas and from 1/2 to 1-1/2 inches on grasslands of forests. Significant depression storage can also exist on moderate or gentle slopes with some estimation for pervious surfaces being between 1/4" to 1/2" of water and even more on meadows and forest land. Steeper slopes would obviously have smaller values.

When using traditional hydrologic procedures, depression storage is contained in an initial abstraction term. This term includes all losses before runoff begins. It includes water retained by vegetation, evaporation,

and infiltration. It is highly variable but generally correlated with soil and cover parameters.

Prior to urbanization, watersheds have a significant depressional storage factor. The urbanization process generally reduces that storage in addition to significantly modifying the land's surface. The combination of site compaction, site imperviousness, and reduced depression storage causes dramatic increases in downstream flood potential and channel erosion.

Information from one watershed study indicated that long-term average annual predicted runoff varied from less than 12" (18 percent of rainfall) to greater than 24" (greater than 35 percent of rainfall). The 12" coincided with subwatersheds under permanent forest cover, while the 24" coincided with subwatersheds in predominantly agricultural land use and on low infiltration soils. There is a clear statement in these statistics that significant volume reductions in runoff exist in forested watersheds compared to volumes of runoff from agricultural land cover.

The infiltration of water into the surface soil is responsible for the large abstraction (loss) of rainwater in natural areas. The infiltration capacity of most soils allows low-intensity rainfall to totally infiltrate, unless the soil voids become saturated or the underlain soil is much more compact than the top layer. High-intensity rainfalls generate substantial runoff because the infiltration capacity at the upper soil surface is surpassed, even though the underdrain soil might still be dry.

Natural Drainage Systems

Natural site drainage features exist on every site. The most common of these features is an already existing flow path for stormwater runoff. Water doesn't travel down a hill in a straight line. Straight channels or pipes are something that humans have developed to accelerate the passage of water downstream as quickly as possible. During site development, the tendency is to place water in conveyance systems, open or enclosed, which follow the shortest distance to site outfalls.

Shortening the flow distance effectively increases the slope that water travels on, accelerates the flow of water, and increases the ability of water to scour downstream receiving systems. When water travels over a meandering flow path, energy is dissipated, which reduces the erosion potential. Shortening flow lengths reduces energy expended and increases the available erosion-producing energy. Stream channels will meander regardless of the degree of human alteration. Replicating existing flow paths and lengths to the extent possible promotes channel stability and increases function and value.

The additional functions provided by meandering channels in comparison to straight channels are also simply related to the length of the aquatic resource and the time that the water is in contact with the various biotic and abiotic processing mechanisms: the additional length of meandering channels provides a greater total quantity of aquatic resource and its associated functions and values.

Soil Compaction

Areas have increased runoff after development for a number of reasons. The most important cause is usually the increased amount of pavement and roof areas. However, urban soils also undergo major modifications that result in increased runoff. These soil modifications may mostly affect infiltration, but other soil changes also occur. Specifically, reductions in the organic content of the surface soil layers and removal of plants will reduce the evapotranspiration losses and contribute to increases in runoff. This is especially important in areas where surface soils are relatively shallow and located above impermeable layers.

The soil compaction during construction and use likely causes most of the reduced infiltration capacity of urban soils. In addition, many more subtle changes will also occur. Many of these changes contribute to the reduction of measured infiltration, such as the replacement of native plants that typically have much deeper root systems with shallow-rooted grasses. The removal of the native soils results in the removal of organic matter, mature and deep-rooted plants, and the soils themselves, often exposing a deeper soil material that is much less able to allow infiltration or evapotranspiration. There are a number of options to address this concern:

- In areas of significant site disturbance, and where there is less than three feet of cut or where cuts or fills of at least three feet are intended to facilitate site development, the expected permeability of the soil may be reduced. Stormwater management calculations, which

detail post-construction hydrology, should use a modified approach to soil classifications.

- In areas of significant soil disturbance, and where there is less than two feet of cut or fill, soil classifications are not modified, but the approved permit should contain a construction requirement to the effect that significantly disturbed soils in areas where those soils remain pervious should be chisel-plowed. Chisel-plowing will break the surface crust of the disturbed soil and allow for a greater infiltration rate. This would provide a good foundation for the placement of topsoil and prevent topsoil slippage on slopes that become saturated.
- Avoid compaction altogether by keeping equipment out of areas preserved for open space.
- Making soil amendments, or otherwise modifying soil structure and chemical characteristics, is becoming an increasingly popular stormwater management practice. However, little information is available to quantify benefits and problems associated with their use.

Linkage with Site Development

The above natural site features all provide stormwater management benefits if considered and integrated into the initial site development plan. They cannot be considered an afterthought of the site planning stage. If stormwater considerations are neglected until the overall site plan has been developed, there are too many site conflicts to provide an effective site management plan that protects aquatic resources. At this point, issues related to levels of imperviousness, location of utilities, and lot layouts prevent integration of site features into a development approach, and it is too late for aquatic resource protection.

It is vital that a pre-development site inventory plan be drafted and submitted with the site development and stormwater management plan. It would also be advantageous to have a narrative submitted that details what steps have been taken to incorporate natural site features into the site development plan. This approach will require a rethink away from the traditional site development approach that has existed for many years.

Source Control

Source control is often considered in a traditional context such as industrial site source control. At the same time, there are now other source control components that aim to eliminate the source of a pollutant from potentially entering the receiving system and control impacts on any kind of land use. This approach constitutes a considerable expansion of the traditional use of the term.

Traditional Source Control

Source control and management procedures attempt to reduce or avoid pollutants getting entrained in stormwater runoff. These practices assume that the pollutant source is necessary for the successful operation of the business or activity, and seek to control the release of pollutants or remove them before they come into contact with stormwater. For example, service stations inherently use trade oils and gasoline as their main business activity, but they are required to cover the service area and shut off stormwater pipes during tanker deliveries to prevent the discharge of petroleum products to the environment via stormwater drains.

The EPA advocates that businesses that handle chemicals or produce wastewater carry out an environmental audit to identify actual and potential pollutant sources. An action plan should then be developed to eliminate any actual pollution and minimize the risk of potential pollution.

Source control practices identify pollutant sources and construct physical works to prevent them from coming into contact with stormwater. The classic example is the above ground storage tank with a berm constructed around it. The berm volume is greater than the volume of the storage tank.

Other examples include:

- Physical control structures such as berming, spill containment;
- Covering stockpiles of soil, waste products;
- Directing washwater to sanitary sewers; and
- Covering "dirty" work areas such as truck washes or oil changing bays.

Numerous procedures can be designated as management practices, from local government initiatives to regularly removing gutter dusts before they get entrained in stormwater to industrial protocols for handling chemicals. The common factor is that there is a process to be followed that minimizes the risk of pollutant transfer to stormwater.

Local government initiatives include:

- Street vacuuming;
- Education initiatives; and
- Recycling.

Industry initiatives include:

- Refueling procedures;
- Chemical handling procedures;
- Staff training regarding proper disposal areas for wastes, chemicals, etc.; and
- Proper storage of chemicals, fuel etc.

Significant information on traditional source control is available from the EPA website, so further detail is not being provided here.

Eliminating the Pollutant Source

When considering a given pollutant, it is becoming more recognized that treatment represents the "ambulance at the bottom of the cliff." Treatment cannot be expected to remove all pollutants of concern nor to totally eliminate a particular one. Questions are increasingly being asked as to where specifically a pollutant found in a watershed is coming from. It may be that removing the pollutant source is more economical than attempting to remove the pollutant once it is in the water column.

A good example of a source control was the removal of lead from gasoline in the 1980s, a source control activity that has led to the reduction of lead levels in receiving environments. In the same regard, older roofs were recognized in the Baltimore NURP study as being a significant source of copper. Painting those roofs, using a different material if the roof has to be replaced, or preventing new copper roofs would be an effective approach to copper reduction. The Chesapeake Bay Program has been addressing nutrients and has targeted phosphorus for years. An effective approach to phosphorus reduction has been the elimination of phosphorus from detergents.

More and more we have to ask ourselves why a certain pollutant is being found. It may be that we can't eliminate it from a local context and must consider either regional or national initiatives to eliminate the source, but changes can only be made if we understand cause and effect. It is expected that significant efforts will be expended to consider more benign materials from a water quality perspective.

Source Control in the Broader Context

Sir Isaac Newton (1643-1727) theorized in one of his laws that "for every action there is an equal and opposite reaction." This law is very true, and the only way to reduce or eliminate reactions is to reduce or eliminate actions. The whole premise behind source control in the broader context is to reduce actions and thereby reduce the inevitable reactions. Using or disturbing less of a site results in less potential downstream impact. There are a number of names given to this approach, including low impact design, conservation design, water sensitive urban design, or sustainable urban drainage systems. These will be discussed in more detail later in the chapter.

Each proponent of a given approach will claim that theirs is the most encompassing of all essential elements, but the argument revolves more around details than around concepts. There are, however, a number of essential components that are needed in all of the approaches. They include the following:

- Reducing site disturbance;
- Reducing impervious surfaces;
- Distributing flow and reducing efficiency of flow conveyance;
- Implementing integrated stormwater management;
- Creating or protecting natural areas;
- Clustering development; and
- Reusing water (where possible).

Each of these items will be discussed individually with regard to their importance in the overall context. Having only one or several of these elements in place will provide a benefit, but overall resource protection will need to incorporate all of them to maximize benefits. Even with all of these elements, it is necessary to consider those items listed earlier in the chapter relating to site resource protection and enhancement. In addition, there may still be a need to provide structural stormwater management.

Reducing Site Disturbance

There are two contexts to consider in a discussion of overall site disturbance:

- Construction-generated sediment loads; and
- Permanent stormwater issues related to quantity and quality of runoff.

Erosion and Sediment Control

Any discussion of erosion and sediment control has to break the term down into its two basic components, "erosion" and "sediment control." When land is disturbed at a construction site, the erosion rate increases with removal of ground cover, normally vegetative, which protects soils from erosion. The major problem with erosion is the movement of soil off-site and the subsequent impact of sedimentation on the receiving environment.

The high yield from the urbanizing catchment stems from the considerable portion of its ground area that is bared for construction (in one watershed, for example, approximately 28 percent at the time of the study). The yield from the sub-watersheds undergoing 100 percent construction was estimated to be approximately 16,800 t/km^2/yr, or hundreds of times the yield from undisturbed or stable areas of the watershed.

Reducing the limits of site disturbance by leaving steeper areas natural, not exposing erodible soils, and maintaining a vegetative cover can all reduce the amount of work that sediment control practices must do and reduce downstream sedimentation. A simple way to consider how site development can affect sediment yield is to once again look at the Revised Universal Soil Loss Equation.

$$A = R \times K \times (L\ S) \times C \times P$$

where:

A = Soil loss (tonnes/hectare/year)

R = Rainfall erosion index (J/hectare)

K = Soil erodibility factor (tonnes/unit of R)

LS = Slope length and steepness factor (dimensionless)

C = Vegetation cover factor (dimensionless)

P = Erosion control practice factor (dimensionless).

Clearly, changing the vegetative cover, or reducing area of disturbance or slope being disturbed all have a significant effect on soil loss.

By clustering development on a portion of a site while protecting critical areas, overall site disturbance is reduced, which in turn reduces sediment yield.

In addition to sediment as a pollutant, site disturbance will also affect the quantity of water that leaves a construction site. A clear example of this are again the NRCS runoff curve numbers for average antecedent runoff conditions shown in Table 8-4.

Table 8-4: Runoff Curve Numbers Compared to Construction Curve Numbers

Cover type/land use	Hydrological condition	A	B	C	D
Woods	poor – no forest litter	45	66	77	83
	good – litter and brush	30	55	70	77
Meadow	-	30	58	71	78
Lawns/open space	good – full grass cover	39	61	74	80
Bare soil	-	77	86	91	94

A simple TR-55 analysis can show that runoff is dramatically increased during the construction phase of site development. Sediment control practices are very seldom designed to provide water quantity control, especially for channel erosion. Thus, as can be seen, the greater the area of disturbance, the greater the peak discharge and total volume of runoff. If stream channel protection is a program goal, the erosion that the permanent stormwater system is intended to reduce or prevent (even if using permanent source controls) may occur prior to implementation of those permanent controls.

Permanent Stormwater Management

The effects of urbanization on soil structure can be significant. A common approach to site development is to clear most, if not all, of the site being developed. Existing vegetated areas are often cleared even when in non-essential locations. The clearing and grading of areas that will remain pervious results in significant compaction of those areas. This compaction reduces expected infiltration rates and increases overland flow.

In addition to soil structure, forested areas and wetlands should be seriously considered for retention if aquatic resource protection is a program goal.

Reducing Impervious Surfaces

There have been many studies relating impervious surfaces to aquatic system impact. We are seeing now (as mentioned in the introduction) that impervious surface considerations alone are an imperfect barometer of ecosystem health. But even so impervious surfaces have a profound impact on the generation of stormwater runoff, the conveyance of that runoff to drainage systems, and the subsequent problems that result from a water quantity and quality standpoint.

Stormwater considerations have to be an integral component of site development if impervious surface coverage is to be addressed at all. Items such as road widths, amounts of off-street parking spaces, driveway lengths, roof areas, and sidewalks must all be given careful consideration if impervious surfaces are to be reduced.

Another problem related to impervious surfaces is the creeping increase of impervious surfaces once land has been developed. Residential properties designed to have a maximum impervious surface of 50 percent may find subsequent levels of 70 percent or more as people increase driveway widths, patios, etc. This impervious surface area creep can have a significant effect on local drainage design if storm drain pipes are sized for a level of imperviousness that is exceeded.

Example of a very wide street

Distributing Flow and Reducing Efficiency of Flow Conveyance

The construction of efficient conveyance systems accelerates the flow of water from the top of a watershed to streams, estuaries, and coastlines. The traditional approach of catch pits draining into piped systems and rapid delivery to the receiving system accelerates flow dramatically beyond natural drainage conveyance and prevents potential water loss through infiltration.

Efficient conveyance was a drainage goal of the 1960s and early 1970s, when water was considered the common enemy. A common pattern of watershed development has been for development to occur from the mouth of the watershed upwards over time. This generally resulted from initial development depending on travel by water. This historical approach meant that upstream landuse was generally pasture, agriculture or forest having natural flow of drainage across the land and into streams. As the upstream watershed developed, downstream flows were increased and the delivery of stormwater downstream was accelerated.

That approach has evolved over the past 30 years, first to on-line ponds and later to off-line ponds. As we have looked closer at cause and effect, we are now realizing that "inefficiency" at the top of the watershed will provide significant benefits over the traditional approach. There is greater recognition that disconnecting drainage systems from their outlet can provide downstream benefits.

An example of possible disconnection is the consideration of curbing on streets. With a local requirement for curbing, flow is immediately concentrated adjacent to the curb and travels along the curb until it must enter a catch basin. As a result, stormwater flows are concentrated at the top of the watershed, delivered to a catch pit, and placed into a stormwater pipe whose outfall is into a receiving system or, hopefully, into a stormwater management structure. The net effect is an increase in peaks, volumes, and pollutant delivery downstream. We need to look for opportunities to disconnect drainage systems to provide better resource protection.

Implementing Integrated Stormwater Management

Stormwater management has historically been considered an afterthought and has to be integrated into the overall site development planning process. There are two key components of stormwater design: prevention and mitigation.

Prevention

Prevention includes land-use planning, not only on a site basis but taking into account the relationship between the individual site and the sub-watershed. This is an important context when considering wildlife corridors or riparian buffers. In all cases, the goal should be to use the simplest approach possible. This relies on the use of natural site features (wetlands, forested areas, meadows) in conjunction with source control practices such as green roofs, rain gardens, swales, filter strips,

Example of an "ancient" approach to drainage

revegetation, and water reuse. The key element of these source control practices is to reduce the total volume of runoff while providing water quality treatment. While initial efforts in stormwater design were directed at centralizing runoff for control and treatment, newer concepts aim to disperse the runoff as much as possible. An example of this would be the elimination of curbing in a subdivision, which would tend to disperse flows rather than concentrating them. This is a significant shift in thinking.

Mitigation

Mitigation has clearly been the focus of program implementation over the past 20 years. Practices that fit into this category include ponds, wetlands, filter systems, and hydrodynamic separators. The use of these practices assumes that water quantity and water quality cannot be addressed through prevention. They tend to represent the "ambulance at the bottom of the cliff."

While prevention is the most desirable outcome, some mitigation will always be necessary. The key point with mitigation is to reduce to the extent possible the amount of work that must be performed. In addition, not all mitigation practices are created equal. A given development may primarily have suspended solids issues, and a pond may prove effective here, while nutrients, metals, or organics may be a primary consideration elsewhere. Mitigation needs to be considered in the context of the problem that it is addressing.

Having a good understanding of prevention and mitigation allows us to consider aspects of prevention that would reduce downstream effects of stormwater runoff.

Creating or Protecting Natural Areas

In many site development situations, the creation of a meadow as open space would have significant stormwater management benefits for both water quantity and water quality. If well designed and constructed, the area could become an attractive amenity to a community and enhance the value of the properties.

In a similar fashion, reforesting of steep slopes or protection of natural woody vegetation elsewhere on a site would have long-term benefits in a stormwater context. Whereas traditional stormwater practices clog or fill in over time, thus reducing their effectiveness, areas that have been revegetated become more effective over time and bring with them a reduced maintenance responsibility. Forested areas intercept rainfall and have an organic leaf and branch ground cover that acts to retain water. In addition, trees use and store nutrients for

Subdivision without curbing or catch pits

long periods of time and, as discussed above, moderate temperatures during the summer.

As wildlife corridors could be re-established as well, there could be significant wildlife benefits.

Wetlands are also very valuable and productive ecosystems whose maintenance or enhancement would have significant benefits. These benefits, as discussed above, include flood control, low streamflow augmentation, erosion control, water quality, and habitat.

Clustering Development

As a source control tool, clustering is very important and may be considered, in conjunction with protection or enhancement of site resources, a keystone of the overall source control. Without clustering, protection of important site features is impossible. From a stormwater management standpoint, clustering minimizes stormwater and pollutant load generation and is clearly preventive in nature.

Although some density bonuses may be considered to encourage use of clustering, clustering in a strict sense usually begins after the decision on overall site density has been made. In some cases, clustering may provide different types of development, including single- and multi-family development. Clustering may involve lot design and arrangement only, or it may involve changing the types of residences. The challenge is to maximize benefits such as open space in conjunction with developer-desired outcomes.

Clustering benefits include:

- Reduced imperviousness;
- Reduced pollutant generation;
- Preservation of natural site values;
- Habitat and wildlife values;
- Passive recreation and open space amenities; and
- Cost reduction.

In consideration of clustering, it is important to overcome barriers to its use. These barriers may include minimum lot sizes, inflexibility by local jurisdictions, the time that the permitting process may take and uncertainty by developers that the proposal would be acceptable. Local government needs to revisit code requirements to facilitate implementation of innovative approaches.

Commonly used components of a water tank

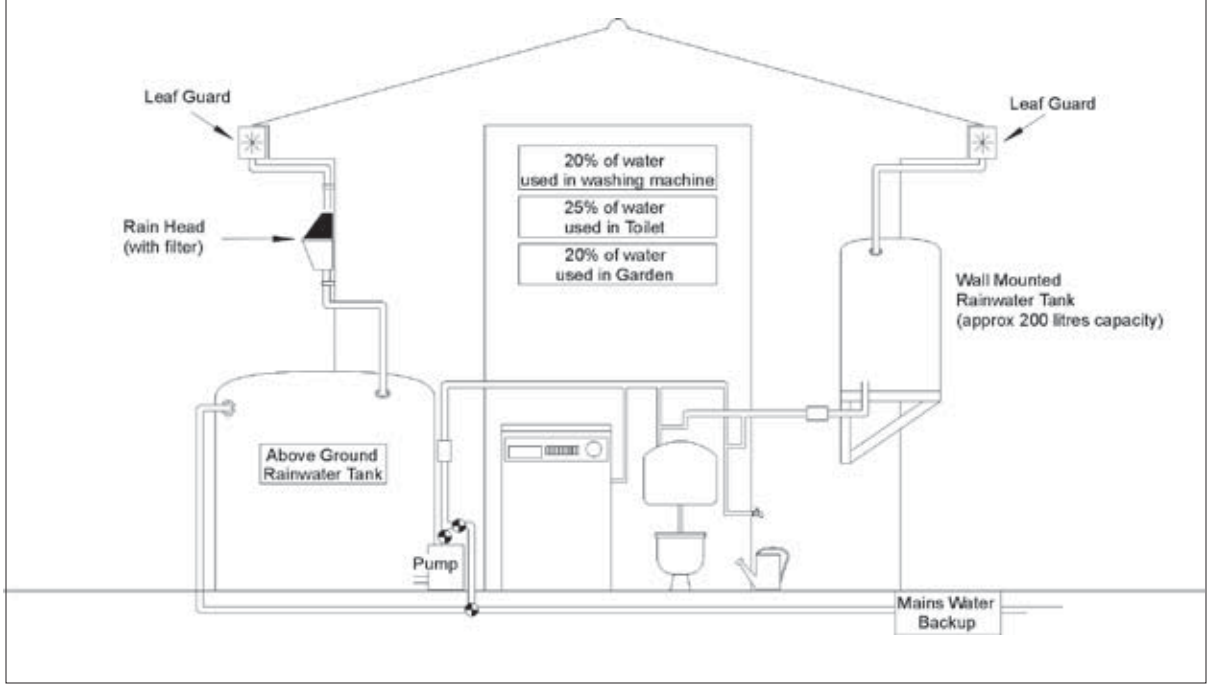

Reusing Water

At this point, it would be beneficial to discuss the use of rainwater tanks as a stormwater management source control practice. They are primarily water quantity management devices but do have minor water quality benefits, depending on the amount of atmospheric deposition in a given area or the pollutant load that may result from the roof itself (zinc, copper, etc.). They have been used for centuries for supplying household and agricultural water.

Approximately 60 percent of domestic water use goes to toilet flushing, laundry, and garden watering. If roof runoff could be stored and used for those purposes, it would not contribute runoff during storm events and represent a reduced volume downstream. This could be part of an overall strategy for stormwater management in which roof areas do not contribute runoff. Benefits could be even greater for industrial sites that use water in their daily operations.

Rainwater tanks are not a stand-alone solution for quality and quantity issues in a watershed, but they can be implemented as a part of an integrated approach toward:

Water tank capturing roof runoff

- Reducing stormwater volumes entering the receiving waters through the use of stormwater captured and used on site;
- Reducing flows into downstream stormwater treatment practices;
- Reducing peak stormwater flows from the sub-watershed by providing permanent or temporary storage;
- Reducing sanitary sewer overflows by reducing the rates and volumes of stormwater that enters directly or indirectly into sanitary sewers;
- Reducing roof-generated pollutants entering water bodies; and
- Reducing demand for potable water, which leads to more effective use of water resources.

Rainwater tanks can be used in residential, commercial and industrial developments. The applications include the following:

- Treating roof runoff and accordingly reducing the size of the downstream treatment devices. In this case, the roof runoff, after storage in the tank system, would enter the receiving waters separately, while the ground runoff would be routed via the downstream treatment practice. An example of this would be industrial or commercial sites, where the roofs are treated by tanks while parking areas are treated by rain gardens or swales. Another example are high-density subdivisions, where tanks address roofs and the rest of the area is treated by wetlands.
- Managing stormwater in infill developments where the existing drainage system capacity is already exceeded for the design storm (generally 1 in 10 year capacity). There are different types of rainwater tanks to suit the available space and required volume.
- In conjunction with other practices, working toward hydrological neutrality in order to mitigate adverse effects of a development.
- Providing treatment, peak attenuation, and non-potable water supply benefits as multi-purpose devices. When coupled with adequate roof areas, they become financially self-supporting for reasonably large non-potable water demands.

Figure 8-1: Watershed Information – Intended Growth, Stream Slope, Sensitive Areas

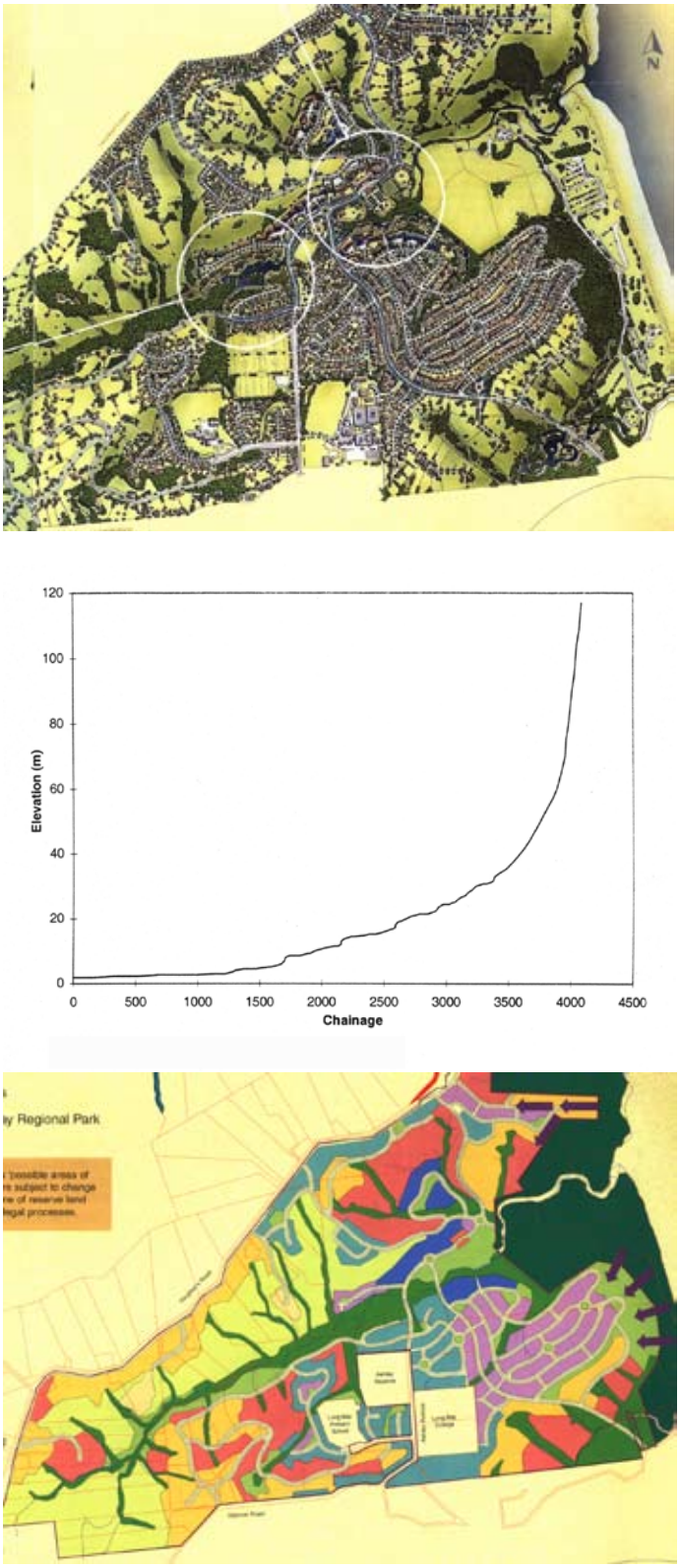

An Example from a Watershed-Wide Context

While implementation of source controls on a site-by-site basis is essential, the optimum level for consideration of source control is on a watershed basis. If clustering is valuable on an individual site basis, its consideration on a watershed scale could have huge benefits in terms of existing resource protection and enhancement, while the desired level of development could still be accounted for. The following example shown in Figure 8-1 is put forth to demonstrate the value of source control from a watershed perspective. Expected development of this watershed will accommodate 8,000 new residents.

The headwaters of the watershed are on steeper land, and the intention is to protect first-order streams and avoid mass earth movement during the developing phase. As a result, density is approximately one house per acre. In other words, those areas have a lot yield based on an average density of one house per acre, but clustering is encouraged. Average lot sizes are expected to be approximately 20,000 ft^2, which means that overall site development will disturb about half of each site. The gullies and first-order streams are protected and revegetated where necessary. Site stormwater controls will be rain gardens, swales, filter strips, and water reuse for each house. Using this approach, traditional stormwater practices such as ponds or wetlands are not necessary.

Downstream of the headwaters, the land flattens out. All perennial streams are

protected and riparian corridors re-established. Lots are approximately 10,000 ft^2, and development will take a more conventional approach, although rain gardens and water tanks will still be used on individual lots. Due to increasing imperviousness, stormwater management will take the form of constructed wetlands located on ephemeral watercourses that provide water quality and quantity control.

The lower area of the watershed will be intense development, including commercial, institutional, high-density residential, and town development. Again, all of the perennial streams are protected and riparian corridors established. Stormwater management in this portion of the watershed will use constructed wetlands as the primary stormwater practice. Upon completion of the development approach, there will be pedestrian movement adjacent to the riparian corridors throughout the watershed.

A major focus of this approach is the protection and enhancement of aquatic resources. The watershed has historically been pasture with significant stock access to streams that has severely impacted on aquatic resources. Through substantial revegetation throughout the watershed, especially in the headwaters, removal of fish blockages where they currently exist, and implementation of stormwater management throughout the watershed while accommodating significant urban growth, it is hoped that aquatic resource values can improve as urbanization occurs.

Various New Approaches

There are a variety of approaches around the world that have a similar foundation in minimizing our impact on receiving systems. They all differ in certain aspects that would make them interesting to investigate further.

Low Impact Design (LID)

LID's basic tenet is to create a hydrologically functional landscape that mimics the natural hydrologic regime. This objective is accomplished by:

- Mimimizing stormwater impacts to the extent practicable. Techniques include reducing imperviousness, conserving natural resources and ecosystems, maintaining natural drainage courses, reducing the use of pipes, and minimizing clearing and grading.
- Providing runoff storage measures dispersed uniformly throughout a site's landscape with the use of a variety of detention, retention, and runoff practices.
- Maintaining pre-development time of concentration by strategically routing flows to maintain travel time and control the discharge.

University of Maryland rain garden monitoring site

- Implementing effective public education programs to encourage property owners to use pollution prevention measures and maintain the on-lot hydrologically functional landscape management practices.

LID does not rely on the conventional end-of-pipe or in-the-pipe structural methods but instead uniformly or strategically integrates stormwater controls throughout the urban landscape.

Conservation Design

Conservation design is a design approach to site development that protects and incorporates natural site features into the stormwater management program. There is a subtle difference between conservation design and LID in that a primary emphasis of conservation design is to incorporate natural site features into the site development process and thereby reduce or eliminate the need for structural stormwater management. As a central tenet, maintenance of natural site features plays a greater role in conservation design than it does in LID. Clustering development on a smaller portion of a site provides greater retention of natural site features that assist in stormwater management. This is a small difference, though, that can be incorporated into LID, but it is more clearly stated in the conservation design approach.

The site features to be protected and incorporated are similar to those discussed earlier in the chapter and include the following items:

- Wetlands;
- Floodplains;
- Forested areas;
- Meadows;
- Riparian buffers;
- Soils; and
- Other natural features.

In short, the point of conservation design is to do more with less. Design principles (which are identical to the ones used in LID) include:

- Achieving multiple objectives;
- Integrating stormwater management and design early into the site planning and design process;
- Prevention rather than mitigation;
- Managing stormwater as close to the point of origin as possible, minimizing collection and conveyance; and
- Relying to the maximum on natural processes within the soil mantle and the plant community.

Water Sensitive Urban Design (WSUD)

WSUD is similar to LID and conservation design and has been developed in Australia to address issues there. WSUD is a philosophical approach to urban planning and design that aims to minimize the hydrological impacts of urban development on the surrounding environment. Stormwater management is a subset of WSUD directed at providing flood control, flow management, water quality improvements, and opportunities to harvest stormwater to supplement potable water

Bioretention in Sydney

Rain garden in Auckland

for non-potable uses (that is, toilet flushing, garden irrigation, etc.).

Key planning and design objectives of WSUD are:

- Protecting and enhancing natural water systems in urban developments;
- Integrating stormwater treatment into the landscape by incorporating multiple-use corridors that maximize the visual and recreational amenity of developments;
- Protecting water quality draining from urban development;
- Reducing runoff and peak flows from urban developments by employing local detention measures and minimizing impervious areas;
- Adding value while minimizing drainage infrastructure development costs.

WSUD recognizes that opportunities for urban design, landscape architecture, and stormwater management infrastructure are intrinsically linked. The practices that promote long-term success of a stormwater management scheme are called Best Planning Practices (BPPs) and Best Management Practices (BMPs). They can apply to greenfield land development sites, redevelopment sites in built-up areas, and, in some instances, to retrofits in fully urbanized watersheds. The scale of application can range from individual houses, streetscapes and precincts, to whole watersheds.

Sustainable Urban Drainage Systems (SUDS)

SUDS is a design approach for urban drainage in England and Wales that includes long-term environmental and social factors in decisions about drainage. It takes account of the quantity and quality of runoff and of the amenity value of surface water in the urban environment. Many existing urban drainage systems can cause problems of flooding, pollution or damage to the environment and are not proving to be sustainable.

Drainage systems can be developed in line with the ideals of sustainable development by balancing the different issues that should be influencing the design. Surface water drainage methods that take account of quantity, quality, and amenity issues are collectively referred to as SUDS. These systems are more sustainable than conventional drainage methods because they:

- Manage runoff flowrates, reducing the impact of urbanization on flooding;
- Protect or enhance water quality;
- Are sympathetic to the environmental setting and the needs of the local community;
- Provide a habitat for wildlife in urban watercourses; and
- Encourage natural groundwater recharge (where appropriate).

They do this by:

- Dealing with runoff close to where the rain falls;
- Managing potential pollution at its source now and in the future; and
- Protecting water resources from point pollution (such as accidental spills) and diffuse sources.

Low Impact Urban Design and Development (LIUDD)

Low impact urban design and development is a design approach used in Auckland, New Zealand whose concepts and approach are similar to all of the above-mentioned ones. LIUDD presents an alternative approach to site and watershed development from a stormwater management perspective. Its basis lies in the recognition that the volume of stormwater discharged from a site may be of equal importance to limiting pollution discharge. The low impact urban design and development approach is another stormwater management tool for reducing the adverse impacts of stormwater runoff. There are two primary areas of interest addressed in this design approach:

- Erosion and sediment control during construction, and
- Permanent stormwater management.

The Auckland approach recognizes that much of the technical information for LIUDD has been developed from a design perspective but is doing considerable work to address the institutional barriers to successful implementation of LIUDD. Local land use plans tend to have enough flexibility to allow for case-by-case implementation of the approach; the major problem regards codes of practice or engineering standards. These can include minimum street width, requirements for curbing, side walks, and other criteria that prevent LIUDD

from being implemented. Significant efforts have gone into removing these barriers where they exist.

In addition, there are several case studies of LIUDD approaches on a watershed basis. Monitoring of watercourses for quantity, quality, and biology has been done prior to development initiation. It will take approximately 10 years for ultimate development to occur in these watersheds, and monitoring will be done both during and post-construction to evaluate the benefits of LIUDD on a watershed basis.

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CHAPTER 9

Erosion and Sediment Control

Erosion and sediment management practices have not evolved to the extent that stormwater management practices have over the past 10 years. There are, however, other components that have more recently begun to emerge. These components include considering temporary and permanent revegetation, phasing work to limit open areas, using chemical flocculation of sediment traps to provide enhanced sediment discharge reduction (especially of clay soils), and also looking at innovative ways of offsetting the residual impacts that result from sediment yields. If improved treatment is to be provided, however, more attention needs to be given to advancing erosion and sediment control practices. It is also important to note that erosion and sediment control is increasingly being looked at as an essential component of the overall site development package. The linkages between this early stage of site development and the longer-term approach to stormwater management can not be separated if we are to protect our downstream aquatic environments.

For erosion and sediment control programs, technology must continue to improve and approaches must be further refined if aquatic resource protection is to be realized. An effective stormwater management program is not going to achieve its goals if the receiving systems are severely impacted during the construction phase of a project. In addition to significant sediment loads, the construction phase of site development can increase the total volume and peak rates of stormwater exiting a site and cause downstream channel instability concerns. It is a positive step, therefore, that the Phase II program is also emphasizing erosion and sediment control on smaller sites as an essential permit component.

While this chapter can be read alone, it should be considered in conjunction with the rest of the manual to achieve a full appreciation of the development cycle and all the aspects that contribute to it.

Regulatory Nature of Erosion and Sediment Control

Phase II of the National Pollutant Discharge Elimination System (NPDES) specifies that a program to reduce pollutants has to be developed, implemented, and enforced in any stormwater runoff from construction activities that result in a land disturbance of greater than or equal to one acre. Reduction of stormwater discharges from construction activity disturbing less than one acre must be included in your program if that construction is part of a larger common plan of development or sale that would disturb one acre or more.

The program must include the development and implementation of, at a minimum:

- A regulatory mechanism to require erosion and sediment controls, as well as sanctions to ensure compliance, to the extent allowable under state, tribal or local law;
- Requirements for construction site operators to implement appropriate erosion and sediment control best management practices;
- Requirements for construction site operators to control waste such as discarded building materials, concrete truck washout, chemicals, litter, and sanitary waste at the construction site that may have adverse impacts on water quality;

- Procedures for site plan review that incorporate consideration of potential water quality impacts;
- Procedures for receipt and consideration of information submitted by the public; and
- Procedures for site inspection and enforcement of control measures.

It is important to note that examples of sanctions to ensure compliance include non-monetary penalties, fines, bonding requirements, and/or permit denials for non-compliance. The EPA recommends that procedures for site plan review include the review of individual pre-construction site plans to ensure consistency with local erosion and sediment control requirements.

Procedures for site inspections and enforcement of control measures could include steps to identify priority sites for inspection and enforcement based on the nature of the construction activity, topography, and the characteristics of soils and receiving water quality. Additional educational and training measures for construction site operators should also be considered. Phase II of the NPDES program provides for regulatory flexibility that would require pollution prevention plans for non-sediment generated pollutants.

Phase II of the NPDES municipal requirements provides an excellent platform from which erosion and sediment control can be more effectively managed.

Principles of Erosion and Sediment Control

Erosion and sediment management must always be thought of as two separate components, erosion control and sediment control.

Erosion is the process whereby the land surface is worn away by the action of water, wind, ice, or other geological processes. The resultant displaced material is known as sediment, with sedimentation being the deposition of this eroded material. Accelerated erosion is primarily caused by human activities and is a much more rapid process than natural erosion.

The basic erosion process consists of detachment, transport, and sedimentation, with water often being the key eroding agent and transport medium. When considering erosion, the following seven main types need to be looked at:

- Splash erosion is commonly caused by raindrop impact. This impact can break up the soil surface with a net effect of moving soil particles down the slope.
- Sheet erosion occurs when intensity of rainfall exceeds the infiltration rate. Sheet erosion refers to the uniform removal of soil in thin layers by the forces of raindrops and overland flow.

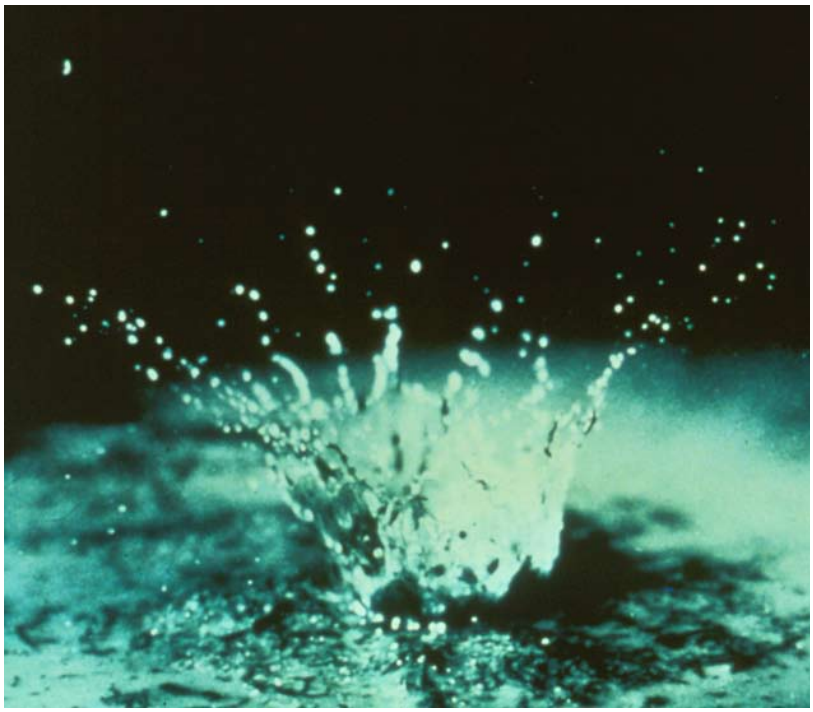

Raindrop impact

- Rill erosion is the removal of soil by runoff moving in concentrated flows. The velocity and the turbulence of the flow increase in these concentrated flow paths, with the resultant energy detaching and transporting soil particles.
- Gully erosion is the next step from rill erosion, where gullies form that are usually distinguished by being greater than 300 mm in depth. The potential for gullies to transport significant amounts of sediment is large, and from an erosion control standpoint, they should be avoided.
- Tunnel erosion is the removal of subsurface soil by subsurface water, while the surface soil

remains intact. This produces large cavities beneath the ground surface that can eventually lead to collapse of the surface material.

- Channel erosion occurs once the water in concentrated flow reaches the stream system. This erosion is essentially caused when the water velocity increases such that scouring or undercutting of the stream banks occurs. Channel erosion is noted to have a direct relationship with watershed urbanization, with increased flows and increased erosion occurring once a watershed is urbanized.
- Mass movement is the erosion of soil or rock by gravity-induced collapse. It can be triggered by heavy rainfall and increased groundwater pressure, or by streams undercutting the base of a slope where works are occurring.

It is also important to understand the factors that influence the erosion process. These four factors (discussed below) are climate, soil characteristics, topography, and ground cover. They also form the basis of the Universal Soil Loss Equation, which will be discussed in detail later in the chapter.

Climate

Climate is a key factor, with rain being the driving force of erosion. The erosive power of rain is determined by rainfall intensity and the droplet size. The annual pattern of rainfall and temperature change is also critical in that it determines the extent and growth rate of vegetative cover, the key tool in prevention of erosion.

Soil characteristics

All soil characteristics, including texture, organic matter content, structure, and permeability are important. Sand, silts, and clays are the major soil particle classes, and it is critical to understand the soils you are working with to be able to assess the erodibilty of these different particles. Organic matter is critical in improving soil structure and increasing the permeability and water-holding capacity of the soil. Soil permeability in itself is important, with soils with higher permeability producing less runoff than soils with a low permeability. Soil structure is also important in that compacted soil will result in runoff as opposed to infiltration.

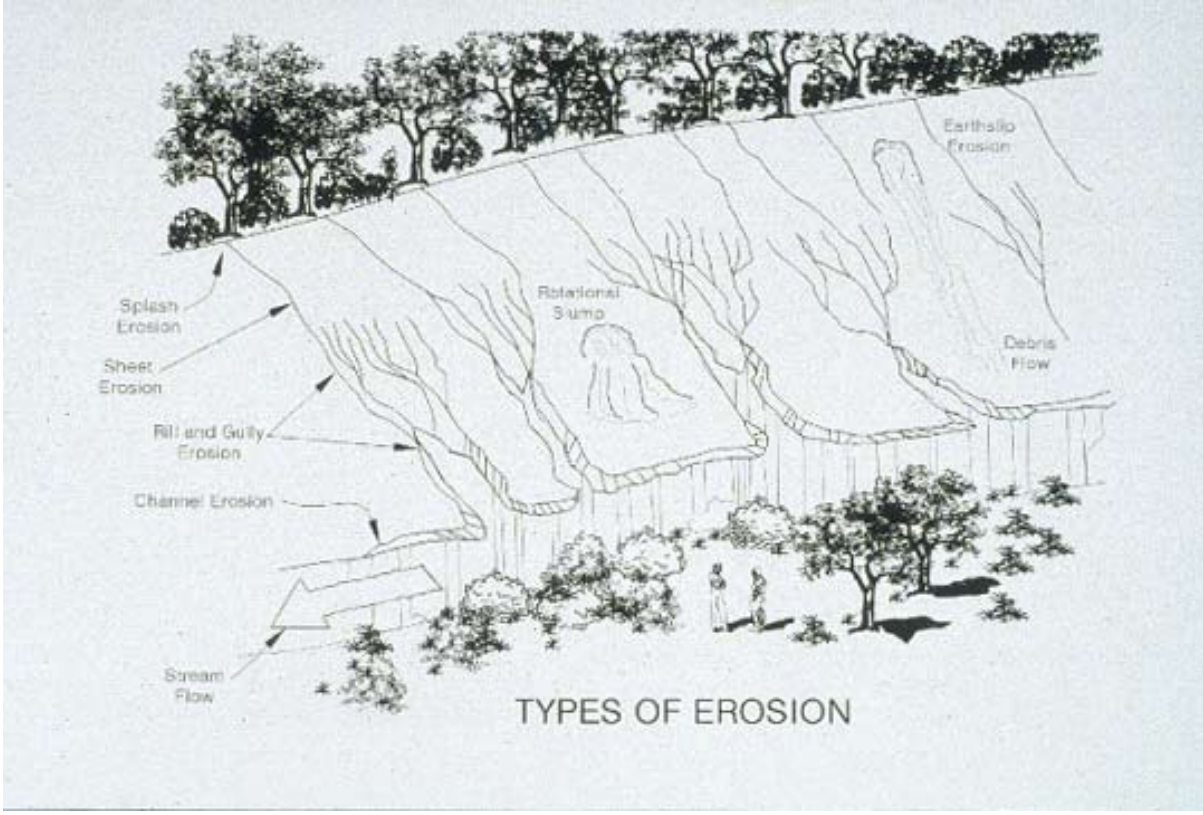

In this context it should be noted that soil compaction is also a major issue that needs to be considered. Soil compaction during construction and use is likely to cause most of the reduced infiltration capacity of urban soils. This aspect of construction activities is often not given due attention, in spite of the fact that the reduced infiltration is known to result in increased runoff and associated effects (Pitt et al., 2002).

Topography

Topography is important primarily from a slope length and angle perspective. The shape of the slope also plays an important part, with the base typically being more susceptible to erosion than the top due to runoff arriving at the base at a faster, more concentrated rate. Reference should be made to section 8.9 of this chapter for an illustration of slope versus sediment yields.

Ground Cover

Ground Cover includes vegetation and surface treatment such as mulches and geotextiles. This aspect is the most important and effective form of long-term erosion control. Good ground cover provides direct instant protection, slows runoff, and maintains the soil's ability to absorb water.

Evapotranspiration

Evapotranspiration is a further factor often not considered. In some areas, however, it is critical in that minimal rainfall and high evapotranspiration in the summer period can lead to soil moisture deficit. This becomes a critical factor when the question of establishing vegetative cover for erosion control arises, because it can lead to the necessity of considering alternative methodologies to establish a vegetative cover.

Once the principles of erosion and sedimentation are understood, it is much easier to also understand the importance of erosion control and sediment control. Erosion control is based on prevention of erosion in the first instance and includes controls such as revegetation, contour slope drains, project phasing, and time frame limitations. The specific designs of some erosion control mechanisms are discussed later in this chapter.

Sediment Control is based on prevention of sedimentation and of sediment leaving the site in question. Sediment control is never 100 percent effective, but with effective erosion control, it can go a long way toward minimizing downstream effects of sediment discharge.

When assessing construction operations, the emphasis must always be on the prevention of erosion in the first instance. Only after this has been fully assessed should the operation consider the sediment control options for the site. These options may have numerous components, but they will always include perimeter controls. It is important, however, to recognize that sediment control can also include controls such as sediment traps and ponds within a site that may reduce reliance on the perimeter controls installed.

Assessing Sediment Generation of Construction Sites

The most important physical property of a soil particle is its size. The size of the particle can be determined in a number of ways. The nominal diameter refers to the diameter of a sphere of the same volume as the particle, and the sieve diameter is the minimum length of the square sieve opening through which a particle will fall. Recognizing the size of material on an earthworks site can increase the awareness of how easy or difficult it can be to remove sediment once it is in suspension. This helps target the erosion and sediment controls. Clay is considered to be less than 0.002 mm in diameter, silt between 0.002 and 0.063 mm, and sands greater than 0.063 mm. While sands and silts are more erodible than clays, they settle easier, whereas clays, a cohesive material that can form quite strong bonds once in suspension, are very difficult to trap with sediment control mechanisms. This places the emphasis on sites with clay soil dominance on erosion control methodologies.

The Universal Soil Loss Equation (USLE) is a simple model that was originally developed for agricultural practices and is now recognized as a suitable sediment yield estimation tool for activities such as earthworking operations. Rather than providing an accurate estimate of actual total sediment yield, the most beneficial use

of the USLE has proven to be the identification of variations of sediment yields across a particular site. To achieve this, it is critical that a site is divided up into logical sectors, based on gradient, slope length, and surface cover. Other factors to consider are the proximity and nature of the receiving environment. Once completed, the USLE will allow the erosion and sediment control methodology to be tailored to suit the variations across the site.

The USLE is based on the following factors:

Rainfall Erosion Index (R)

This factor is a measure of the erosive force and intensity of the rain in a normal year. It is based on the energy and the maximum 30-minute intensity for all major storms in an area during an average year. It is derived from probability statistics resulting from analyzing rainfall records of individual storms.

Soil Erodibility Factor (K)

This represents the ability of the surface to resist the erosive energy of rain. Texture is the principle factor affecting K, but structure, organic matter, and permeability also contribute. Adjustments are made to the K factor as the site works progress, reflecting the percentage of clay, silts and sands within a soil structure. In calculating the K factor, an allowance is also made for the percentage of organic matter that is contained within the soil.

Length-Slope Factor (LS)

This is a numeric representation of the length and slope angle of a site. It is the ratio of soil loss per unit area on a site to the corresponding loss from a 22.1-meter-long experimental site with a 9 percent slope. Representative slope length and gradients are assessed for the separate sediment sources and depicted in a table. It should be noted that the potential sediment generation on a site increases geometrically with an increase in gradient. It is therefore essential that bare area and slope length are minimized on steeper gradients. This may be achieved by staging works, progressively stabilizing completed areas and installing contour drains to reduce slope lengths.

Ground Cover Factor (C)

This is the ratio of soil loss under specified conditions to that of a bare site. Where the soil is protected against erosion, the C Factor will reduce the soil loss estimate. This factor also takes into account the effectiveness of the vegetation and mulch in preventing the detachment and transport of soil particles.

Erosion Control Factor (P)

This factor reflects the roughness or smoothness of the earthworks surface with the rougher surface having a lesser value. As examples, bare soil that is compacted and smooth would have a P factor of 1.3 while a rough irregular surface such as contour plowing would have a value of 0.8. The lower value results in reduced erosion.

Once the values for R, K, LS, C, and P have been derived, the value for estimated sediment generated can be calculated. To estimate the quantity of sediment likely to be discharged to the receiving environment, it is necessary to multiply this result by the areas of exposure, the sediment delivery ratio, the sediment control measure efficiency, and the duration of exposure. Areas of the site, or the entire site, that are demonstrated to exhibit high sediment yields can then be managed accordingly.

It is important to also be aware that the sediment that is generated will be mobilized as either bedload or as suspended sediment. Bedload is moved at or near the bottom of the stream, while suspended sediment is mixed with the waters of the receiving environment.

Impacts of Sediment Discharge on Receiving Environments

Irrespective of the erosion and sediment controls employed, construction activities lead to sediment generation and to a subsequent sediment discharge with, among others, visual, recreational, and ecological impacts. These activities can be appropriately managed by the respective authorities through a range of tools inclusive of both regulatory and educational initiatives. One of the key tools in the educational component is a specific guideline for erosion and sediment control.

The range of guidelines available typically provide a comprehensive guide for erosion and sediment control, detail the specific policies and rules applying to the site in question, and essentially work toward minimization of adverse environmental effects of sediment discharge through appropriate use and design of specific measures.

The guidelines should detail both principles and practices emphasizing the importance of both non-structural and structural measures to be implemented on sites.

In terms of the regulatory component, permits are key tools that are utilized to minimize impacts from sediment discharge. It is also recognized that compliance inspections of these permits are an important aspect of ensuring that environmental objectives are achieved. Associated with this key tool is an enforcement role which, when combined with all other relevant program aspects, will provide a suitable implementation mix.

There are many effects associated with sediment discharge. Runoff from construction sites is by far the largest source of sediment in urban areas under development. Soil erosion removes over 90 percent of sediment by tonnage in urbanizing areas where construction activities occur. The following values illustrate some of the measured sediment loads associated with construction activities found across the United States.

- York County Soil and Water Conservation District 1990 – Sediment loading rates vary from 36.5 to 1000 tons/acre/year, which is 5 to 500 times greater than those from undeveloped land.
- Franklin County, Florida – Sediment Yields
    - Forest: less than 0.5 ton/acre/year
    - Rangeland: less than 0.5 ton/acre/year
    - Construction Site: 30 tons/acre/year
    - Established Urban: less than 0.5 ton/acre/year
- Washington Department of Ecology, 1989 – Erosion rates range from 50 to 500 tons/acre/year for construction activities. Natural erosion rates from forest are 0.01 to 1.0 ton/acre/year.
- Wisconsin Legislative Council, 1991 – Erosion rates range from 30 to 200 tons/acre/year, which is noted to be 10 to 20 times those of croplands.

As summarized above, the huge potential for sediment to be generated from land bared through construction activities is significantly greater than for many other land uses.

A study undertaken in Auckland, New Zealand measured sediment yields from various land uses over time and predicted the average annual soil loss for these land uses. Construction sites were shown to have a predicted average annual soil loss of up to 400 times that of a pastoral site. The study also demonstrated that sediment yields would increase markedly with larger storm events. The significantly higher levels of sediment that occur as a result of land disturbance activities need to be identified within the specific program and to have the appropriate policy backing to ensure that these issues can be addressed.

The following effects can result from sediment discharges.

Biological Effects

Large amounts of sediment in a waterway are harmful to fish and other aquatic life. Aquatic life can be physically smothered by a build-up of sediment in the stream bed. Aquatic life not actually covered by deposits of silt can sustain damage to their gill and mouthparts due to the abrasive nature of the silt. The juvenile stages of many species are particularly vulnerable. Sedimentation may also significantly alter habitats, for example by destroying spawning grounds.

Algae, the major food supply for stream life, can be scoured off the rocks in the stream bed by sediment. Other links in the food chain may also be affected and the surviving animals forced to migrate elsewhere if they can.

Turbidity (cloudiness of the water) from suspended solids in the water may stop animals feeding because they cannot see their prey. It can also affect aquatic life by increasing heat absorption and therefore the temperature of the water. It also stops light penetrating the water, slowing down photosynthetic activity and subsequent plant and algae growth.

Other Pollutants

Sediment transports other pollutants such as lead, hydrocarbons, agricultural nutrients, and toxic substances into streams and harbors. There they can accumulate and affect aquatic life. Control of the pollutants transported by sediment is simply achieved by controlling the generation and movement of sediment itself.

Stream Blockage

Sediment deposition can lead to the infilling of affected water bodies. This in turn can lead to a reduction in their hydraulic efficiency, an increase in susceptibility to flooding, and restrictions to access. While such sediment deposition has environmental impacts, the removal works also have potential for serious environmental effects.

Effects on Consumable Water Resources

High loadings of suspended solids affect the use of water for irrigation, stock, and domestic water supplies. Sediment in irrigation water clogs pump filters and sprinkler nozzles. In domestic and stock water supplies, it can lead to unacceptable drinking quality. Removing sediment from drinking water can be an expensive operation. Furthermore, sediment can form a threat to the useful life of dams.

Aesthetic Values

Sediment discharges into streams, lakes, or coastal waters detract from their aesthetic qualities. Clean, clear water is perceived as being much more conducive to recreation than "dirty," sediment-laden water. The purely scenic value of water bodies such as key harbor areas is enhanced by their degree of clarity.

Damage to Property and Public Utilities

Construction activities can inundate lower-lying properties or roadways with sediment if adequate control measures are not in place.

Effect of Sediment on Matters of Cultural Significance

Construction activities often disturb items and matters of cultural and archaeological importance. The effects can vary from a direct effect on these matters, such as significant destruction or alteration of a physical site, through more indirect effects such as impacts on cultural values.

Erosion Control Measures

Erosion control mechanisms typically include the following measures.

Earth Dike

A temporary berm or ridge of compacted soil, located in such a manner as to channel water to a desired location.

Its purpose is to direct runoff to a sediment trapping device, thereby reducing the potential for erosion and off-site sedimentation. Earth dikes can also be used for diverting clean water away from disturbed areas.

Earth dikes are often constructed across disturbed areas and around construction sites such as graded parking lots and subdivisions. The dikes shall remain in place until the disturbed areas are permanently stabilized.

Runoff Diversion Channel/Berm

A non-erodible channel or berm for the conveyance of runoff constructed to a site-specific cross section and grade design. To either protect work areas from upslope runoff (clean water diversion), or to divert sediment-laden water to an appropriate sediment retention structure.

Contour Drain

A temporary ridge or excavated channel, or a combination of ridge and channel, constructed to convey water across sloping land on a minimal gradient. To

Example of an earth dike flow diversion

periodically break overland flow across disturbed areas in order to limit slope length and thus the erosive power of runoff, and to divert sediment-laden water to appropriate controls or stable outlets.

Benched Slope

Modification of a slope by reverse sloping to divert runoff to an appropriate conveyance system. The purpose is to limit the velocity and volume, and hence the erosive power of water moving down a slope and therefore minimize erosion of the slope face.

Contour drain

Slope benches

Rock Check Dam

Small temporary dam constructed across a channel (excluding perennial watercourses), usually in series, to reduce flow velocity. May also help retain sediment. The primary purpose of a rock check dam is to reduce the velocity of concentrated flows, thereby reducing erosion of the channel. While trapping some sediment, they are not specifically designed to be utilized as a sediment retention measure.

Top Soiling

The placement of topsoil over a prepared subsoil prior to the establishment of vegetation. This serves to provide a suitable soil medium for vegetative growth for erosion control while providing some limited short-term erosion control capability.

Temporary and Permanent Seeding

The planting and establishment of quick-growing and/or perennial vegetation to provide temporary and/or permanent stabilization on exposed areas. Temporary seeding is designed to stabilize the soil and to protect disturbed areas until permanent vegetation or other erosion control measures can be established. It may be used where the area to be stabilized needs temporary stabilization but is not yet up to final grade and requires further earthworks.

Hydroseeding

The application of seed, fertilizer, and a paper or wood pulp with water in the form of a slurry which is sprayed over the area to be revegetated. To establish vegetation quickly while providing a degree of instant protection from rain drop impact.

Examples of rock check dams

This form of revegetation facilitates the establishment of vegetation on steep slopes and also allows a mixture of appropriate seeds to be utilized dependent upon the site conditions. It is, however, dependent upon the availability of appropriate hydroseeding contractors with suitable machinery.

Mulching

The application of a protective layer of straw or other suitable material to the soil surface to protect it from the erosive forces of raindrop impact and overland flow.

Straw mulch being applied

Turf being applied to topsoil

Mulching also helps to conserve moisture, reduce runoff and erosion, control weeds, prevent soil crusting, and promote the establishment of desirable vegetation.

Turfing

The establishment and permanent stabilization of disturbed areas by laying a continuous cover of grass turf. Provides immediate vegetative cover in order to stabilize soil on disturbed areas.

Geosynthetic Erosion Control Systems

The artificial protection of channels and erodible slopes utilizing artificial erosion control material such as geosynthetic matting, geotextiles or erosion matting. Immediately reduces the erosion potential of disturbed areas and/or reduces or eliminates erosion on critical sites during the period necessary to establish protective vegetation. Some forms of artificial protection may also help to establish protective vegetation.

Stabilized Construction Entrance

A stabilized pad of aggregate on a filter cloth base located at any point where traffic will be entering or leaving a construction site. To assist in minimizing dust generation and disturbance of areas adjacent to the road frontage by giving a defined entry/exit point.

Pipe Drop Structure/Flume

A temporary pipe structure or constructed flume running from the top to the bottom of a slope. A pipe drop structure or a flume structure is installed to convey surface runoff down the face of unstabilized slopes in order to minimize erosion on the slope face.

Stabilized construction entrance

Level Spreader

A non-erosive outlet for concentrated runoff constructed so as to disperse flow uniformly across a slope. To convert concentrated flow to sheet flow and release it uniformly over a stabilized area to prevent erosion.

Surface Roughening

Roughening a bare earth surface with horizontal grooves running across the slope or tracking with construction equipment. To aid in the establishment of vegetative cover from seed, to reduce runoff velocity and increase infiltration, and to reduce erosion and assist in sediment trapping.

Rock Outlet Protection

A section of rock protection placed at the outlet end of culverts, conduits, and channels.

Its purpose is to reduce the velocity and energy of water such that the flow will not erode the receiving downstream reach.

This practice applies where discharge velocities and energies at the outlets of culverts, conduits, and channels are sufficient to erode the next downstream reach.

Sediment Control Measures

Sediment control mechanisms typically include the following measures.

Temporary Swale

A temporary excavated drainageway.

Its purpose is to prevent runoff from entering disturbed areas by intercepting and diverting it to a stabilized outlet or to intercept sediment-laden water and divert it to a sediment trapping device.

Conditions where this practice applies:

- To divert flows away from a disturbed area and to a stabilized area;
- To shorten overland flow distances intermediately across disturbed areas;
- To direct sediment-laden water along the base of slopes to a trapping device; or
- To transport off-site flows across disturbed areas such as rights-of-ways.

Flow spreading

Surface roughening

Examples of pipe and flume downdrains

Sediment Retention Trap and Pond

A temporary device formed by excavation and/or embankment construction in order to intercept sediment-laden runoff and provide an impoundment for suspended sediment to settle out. To treat sediment-laden runoff and reduce the volume of sediment leaving a site in order to protect downstream environments from excessive sedimentation and water quality degradation.

Sediment ponds and traps

Sediment ponds and traps

Silt Fence

A temporary barrier of woven geotextile fabric used to intercept runoff, reduce its velocity, and impound sediment-laden runoff from small areas of disturbed soil. To detain flows from runoff so that deposition of transported sediment can occur through settlement. Silt fences can only be used to intercept sheet flow. They cannot be used as velocity checks in channels or placed where they will intercept concentrated flow.

Super Silt Fence

A temporary barrier of geotextile fabric over chain link fence used to intercept flows, reduce their velocity, and impound sediment-laden runoff from small catchment areas. To reduce runoff velocity and allow the deposition of transported sediment to occur.

Silt fence

Super silt fence

Straw Bale Barrier

Temporary barrier of hay bales used to intercept and direct sediment-laden surface runoff from small areas to a sediment retention facility so that deposition of transported sediment can occur.

Stormwater Inlet Protection

A barrier across or around a cesspit (stormwater inlet) that is designed to intercept and filter sediment-laden runoff before it enters a reticulated stormwater system via a cesspit.

Earth Dike

A temporary berm or ridge of compacted soil (inclusive of topsoil) to create impoundment areas where ponding of runoff can occur and suspended material can settle before runoff is discharged.

Sump/Sediment Pit

A temporary pit constructed to trap and filter water for pumping to a suitable discharge area. The design is based on a perforated vertical standpipe placed in the center of a pit that is then backfilled with aggregate.

Perimeter Dike/Swale

A temporary ridge of soil excavated from an adjoining swale located along the perimeter of the site or disturbed area.

Its purpose is to prevent off-site storm runoff from entering a disturbed area as well as prevent sediment-laden storm runoff from leaving the construction site or disturbed area.

A perimeter dike/swale is constructed to divert flows from entering a disturbed area, along tops of slopes to prevent flows from eroding a slope, or along the base of slopes to direct sediment-laden flows to a trapping device. The perimeter dike/swale shall remain in place until the disturbed areas are permanently stabilized.

Non-Sediment-Related Pollutants from Construction Sites

Concrete washings, water blasting, equipment washing, concrete and tile cutting are all works occurring at construction sites that can pollute waterways unless care is taken. These pollutants are known to cause problems due to their highly alkaline nature. They contain oxides, heavy metals, or, possibly, petroleum products.

There are, however, practices that can be followed to ensure that the effects from these activities do not create adverse effects. These can include the following:

- When washing operations generate fine sediments (silts or clays), make sure the wash water is confined, filtered or diverted across to a soak area. If discharge is necessary, it should go into a sanitary sewer, not the stormwater system.
- Do not wash equipment on site unless there is a designated washout area where wash water soaks into the ground or is treated.
- When waterblasting, contain dirty waste runoff. Chemical additives should not be discharged to the stormwater system. Utilize filter cloth to filter out paint flakes and sediment prior to discharge.
- Slurry from directional drilling must be allowed to settle, with the water soaking to ground or taken off-site to an appropriate disposal location.

Inlet protection

Sediment dewatering pit

Innovative Practices

While the previously detailed erosion and sediment controls are typical traditional controls and will be reasonably effective for most sites, there are many circumstances where more specific innovative practices should be employed. Erosion and sediment controls need to be significantly advanced in this area to ensure protection of the receiving environment.

Innovative practices should be considered on all sites, particularly those that show high sediment yields, and include the following structural and nonstructural measures.

Mulching

It is acknowledged that when land is disturbed for construction and other activities, the rate of erosion increases as unvegetated surfaces are subjected to raindrop impact and overland flow. While the benefits of stabilization of soils to minimize erosion have been supported by research for some time, it is important to recognize that the application of mulch has been somewhat inconsistent. It is critical that mulching becomes an integral part of any earthworks site and forms a part of all erosion and sediment control plans.

Investigation results demonstrate that:

- Established grass cover and mulching topsoil surfaces are the most effective way of reducing sediment discharge.
- Clay- and silt-size particles typically form the greatest proportion of sediments discharged from construction sites that have effective sediment controls, and the discharge of these particles is minimized through mulching the surface in question.
- Mulched topsoil areas produce up to 95 percent less sediment discharge than bare subsoil surfaces.

A study done in the U.S. in the mid-1980s (Maryland Department of Natural Resources) looked at a number of parameters that could affect the discharge of sediments from a construction site. One component of the study was to look at the benefits of temporary stabilization techniques as an erosion control tool. The results of this project demonstrated the various stabilization techniques and the impact of slope on sediment loadings. They are illustrated in Figure 9-1. It is important to note that there is a clear trend not only for sediment loading to increase with slope angle, but also for it to decrease as vegetative cover increases.

Figure 9-1: Relationship Between Vegetative Cover and Slope Versus Sediment Yield

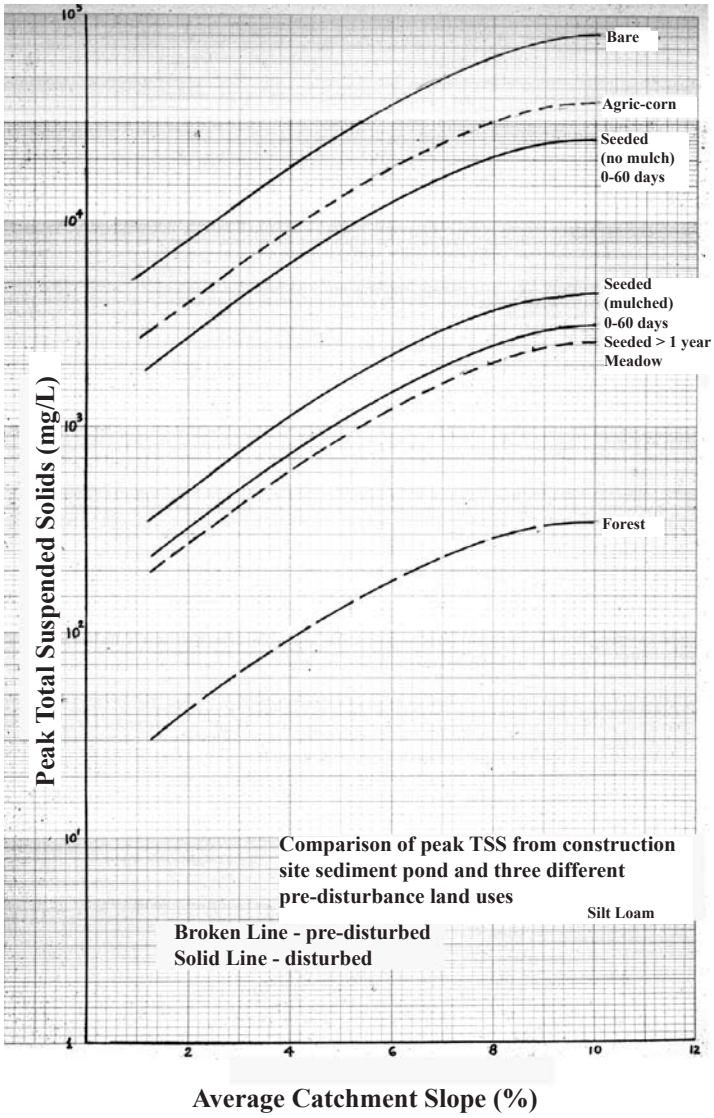

Chemical Treatment of Runoff

One method of enhancing the retention of suspended sediment in earthworks runoff is the use of flocculant. In recent advancements, liquid flocculant can be added directly to sediment retention pond inflows via a rainfall-activated system. The flocculant causes individual particles to be destabilized (neutralizing electrical charges that cause particles to repel each other), accelerating the coagulation and settlement of particles that may otherwise be discharged from the pond.

The key purpose of using flocculation is to treat sediment-laden runoff to an extent greater than standard sediment control practices and to reduce the volume of sediment leaving a site.

Flocculation may be used to enhance the retention of sediment on earthworks sites where there are concerns about the scale of works, potential effects on sensitive receiving environments, or cumulative discharges, or where it may not be feasible to construct standard sediment control practices.

Flocculation using the system illustrated below is simply incorporated into the design of a sediment retention pond. The catchment draining into the pond needs to be considered carefully throughout the period of flocculation, as the components making up the flocculation system are sized on the catchment characteristics, including area and soil type. The rainfall-activated flocculation system outlined in this section is based on the use of polyaluminum chloride (PAC). Other aluminum coagulants, including alum (aluminum sulphate), may be suitable for use; however, methodologies may need to be adapted to produce appropriate outcomes.

The general components of the flocculation system include a rainfall catchment tray, header tank, displacement tank, and flocculant reservoir tank, as detailed below.

Rainfall from the watershed-sized rainfall tray drains to a header tank. The header tank provides storage capacity to avoid dosing during initial rainfall following a dry period and to attenuate dosing at the beginning and end of a rainstorm (to simulate the runoff hydrograph). The header tank provides:

- Zero flocculant discharge until a pre-selected quantity of rain has fallen, to allow for initial infiltration and saturation of dry ground before runoff commences;
- A slow start to the dosing rate to allow for the response time of runoff flowing off the site at the beginning of a storm; and
- An extension of the dosing period beyond the rainfall period to provide treatment of runoff that occurs following cessation of rainfall.

From the header tank, the rainwater discharges by gravity into a displacement tank which floats in the flocculant reservoir. As the displacement tank fills with rainwater, flocculant is displaced through the outlet in the reservoir tank and then flows by gravity to the

Example of an on-site chemical flocculation system

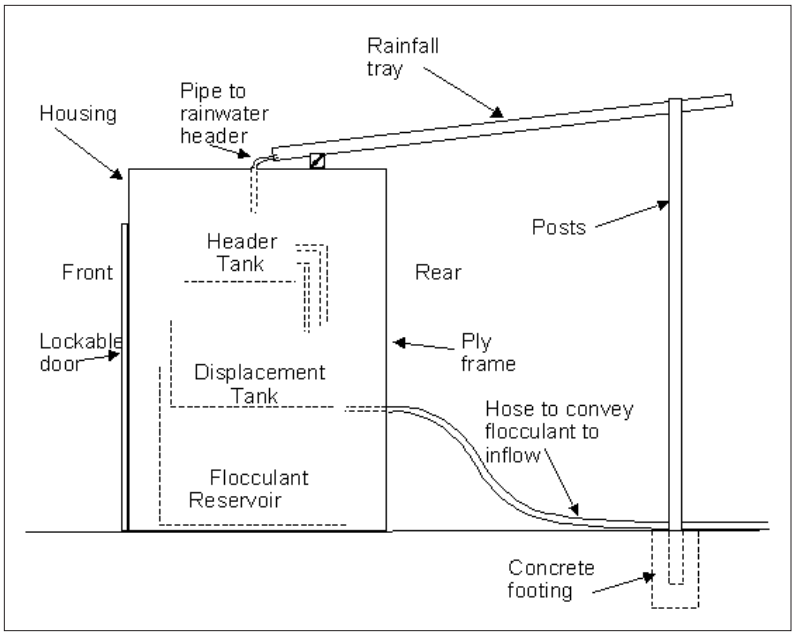

Schematic of a chemical flocculation system

dosing point. The dosing point should be selected in an area of high turbulence in the pond inflow channel.

The zero (flocculant) discharge rainfall volume can be adjusted manually for site characteristics by adding or removing water from the header tank.

It is important that the pH of the soils in the area in question is understood. The pH of soils should be tested prior to and during construction, as the exposure of different soil horizons may alter the runoff pH. Dosing with aluminum-based flocculant should cease where the pH drops below 5.5, as the toxicity of the aluminum fraction of the flocculant increases below this level, potentially placing at risk receiving environment organisms.

The use of flocculation will lead to more frequent sediment retention pond maintenance. The sediment containing the flocculant is not considered to be toxic, as the aluminum is bound up with the soil particles. It is common practice for the accumulated sediment to be dried on site and incorporated into fills.

Flocculants can provide an alternative to traditional sediment control practices. Dependent upon the nature of the site, they can ensure that adequate controls are implemented when site conditions restrict options.

Performance of flocculants for sediment removal has proved the approach to be very effective at removal of pond sediments, especially for finer silt and clay particles. Monitoring of 21 sediment ponds demonstrated that efficiencies ranged between 90 and 99 percent removal of suspended sediments. In circumstances where flows exceeded pond design criteria, efficiencies were also notably enhanced.

Roof area of flocculation unit

The key features of this approach are the following:

- They are simple to install and maintain.
- They do not require electrical power.
- They are rainfall-activated.
- They dose the critical storm.
- They are easily transportable and reusable.
- They are cost-effective (around $1,500 plus maintenance and operational costs).
- They require no dedicated staff.

Low Impact Design (LID)

The principles behind LID are based upon using an analysis of existing site conditions as a baseline from which to commence site planning. The site conditions provide an inventory of the full range of natural systems such as soils, geology, vegetation, habitat, and the cultural and archaeological factors associated with the site. The more the complex and integrated nature of the conditions is understood, the better the earthworks and building program can be fitted on the site with reduced impact. LID is similar to erosion control in that it is a preventative approach reducing the amount of sediment generated by practicing the principles through planning processes.

Only after a full site analysis and inventory has been undertaken can the erosion and sediment control plan be developed and full control mechanisms considered.

While considered innovative, LID should be built into all erosion and sediment control methodologies. It needs to be the first step considered in the management of a site.

In addition to the LID principles detailed above, a further innovative consideration is one associated with limiting the season within which construction activities can occur. A policy of this nature is utilized in Auckland, New Zealand, where construction activities over a certain size require specific approval to continue work over the winter

months. The rationale behind this practice is the increase in rainfall which is expected over the winter period in addition to lower ground temperatures and reduced evapotranspiration, which creates some difficulties in establishment of vegetative cover for stabilization. Dependent upon the site vicinity to receiving environments, many construction activities can not continue under these conditions due to the increased sediment yields and the difficulties that will be experienced.

While the practice of not working over this high-risk period is one that needs to be considered on a site-by-site basis, it does provide a further tool in the erosion control tool box and can go a long way toward prevention of sediment discharge and the associated problems.

Watershed-Wide Considerations

While this chapter focuses primarily on development activities, it is important that the issue of sediment discharge from development activities is not considered in isolation. Pollution (sediment) budgets on a watershed-wide basis may assist in determination of the prime sources of pollution within the watersheds of concern. This concept is one that needs further consideration, and while it would provide good generic information, it is recognized as being a difficult study to undertake.

The above demonstrates some of the innovative practices that currently exist and can be employed as part of an erosion and sediment control plan. There are many more practices in this category, and programs need to consider them in association with the traditional measures available.

Ten Commandments of Erosion and Sediment Control

It is important that all the principles and practices that apply be put into the context of a program and site development. To assist in this process, a set of "commandments" can be considered on all development sites. These "commandments" have been adopted by many programs and are utilized on a regular basis when erosion and sediment control are considered. They provide a checklist and also demonstrate the key aspects that should always be considered.

1. Minimize Disturbance

Some parts of sites should not be opened up, and where construction is required, ensure this is undertaken carefully to avoid sensitive areas. These sensitive areas include wetlands, streams, and steep slopes. This component is clearly linked to the planning phase of all developments, and if you can plan to only undertake earthworks on land that is suitable for this activity, you will go a long way toward reducing accelerated erosion. LID also

Minimal disturbance for earthmoving

attempts to limit total site disturbance. Working with existing site contours, as opposed to mass earthworking, will reduce overall site sediment discharge.

2. Stage Construction

Where possible, stage construction such that it is undertaken in manageable segments that can include revegetation and therefore limit the erosion potential. Sites that expose the whole area at one time constitute a considerable risk with a significant potential for erosion of large sediment yields.

3. Protect Steep Slopes

Associated with minimization of disturbance, steep slopes should always be avoided. This is clearly demonstrated by the Universal Soil Loss Equation, according to which these slopes can generate the biggest percentages of sediment yields. Runoff should also be diverted away from these slopes. Where slopes will be disturbed and revegetation is required, techniques over and above those traditionally utilized will need to be considered.

4. Protect Watercourses

Again associated with the minimization of disturbance, existing streams and drainage patterns need to be identified and protected as part of the planning phase of the development cycle. These systems are critical components of our receiving environments. If work is required that disturbs these areas, specific careful management is required.

5. Stabilize Exposed Areas Rapidly

The best way to prevent erosion is to fully stabilize the soils to prevent raindrop impact and scour. This may require stabilization during the development as well as stabilization at the completion of the earthworking phase. To provide the vegetative cover required, it may be necessary to look further than tradition conventional grass sowing and move toward methodologies such as straw mulching as a standard practice.

6. Install Perimeter Controls

The key behind effective sediment control is to treat only the runoff that is required to be treated. Essentially, treat only dirty water and keep clean water clean. The best way of achieving this is to employ perimeter controls that divert clean water safely to a point of discharge. Perimeter controls can also act to ensure that dirty water does not leave the site, as well as direct sediment-laden water to the necessary controls within the site.

7. Employ Detention Devices

A further critical feature associated with erosion control measures is the use of sediment traps and ponds. These work on the principle of detaining sediment-laden runoff, and while never 100 percent effective, they are a critical component. These measures need to be designed to local standards and must be able to withstand the rainfall conditions for the area while not overtopping.

8. Register and Attend Local Contractor or Designer Education Courses

9. Make Sure the Erosion and Sediment Control Plan Evolves as Site Development Proceeds

10. Assess and Adjust

These last three commandments refer to ensuring that you have appropriately trained personnel on site, that your erosion and sediment control plan adjusts as the site evolves, and that continual monitoring and assessment of the site occurs.

These "ten commandments" can be easily transferred to any program. It is important to note the emphasis they place on nonstructural techniques. Since these principles focus on the prevention of erosion in the first instance, they take pressure off the sediment control measures. This does not mean that the sediment control measures are not necessary, but that maintenance and overloading of these structures is not as frequent if there is less sediment entering.

Essential Program Elements

For the erosion and sediment program to be successful, it is critical that its institutional aspects evolve along with its technical aspects.

The ultimate goal of any erosion and sediment control program is to minimize or reduce adverse

water quantity and quality impacts. This cannot be accomplished without an effective, efficient, and comprehensive institutional foundation. There must be adequate legal authority, performance standards, design assistance and guidance, program funding and staffing, commitment to enforcement, comprehensive approaches to research, and program evaluation and evolution. All of these program elements must have a solid institutional foundation that exists prior to any practices being constructed. In addition, regardless of the best of intentions, the program must have political support, which is translated into funding and other necessary program support components.

Essential program elements include:

- Basic goals;
- Authority and implementation structure (relationship and linkage to other local government programs);
- Performance standards;
- Exempted and waived activities;
- Design guidelines and assistance;
- Inspection procedures;
- Funding;
- Staffing;
- Educational activities;
- Compliance and enforcement;
- Maintenance; and
- Evaluation and evolution.

Design Plans

Detailed plans should be submitted and reviewed for larger site disturbances. The threshold size of the site in question should relate to the use of practices that require engineered design. If sediment traps are used, detailed designs should be submitted for review, and formal local agency approval should be obtained prior to works commencing. This threshold could also relate to areas where watershed size exceeds the ability of a particular practice to treat the runoff. An example of this is a silt fence, where concentrated flow would exceed design criteria.

Inspection Documentation and Frequency

An integral part of the inspection process is the question of how often inspections are considered necessary. During the construction process, site conditions can change rapidly, and assurance of adequate site control may necessitate frequent site visits by the inspector. Inspection frequency needs to be flexible, corresponding to shifts in the intensity of activity going on at construction sites.

When active construction is occurring, erosion and sediment control inspections should be conducted on a specified, appropriate frequency. This frequency will depend on the level of activity and may be developed during the construction period. When work on the site stops temporarily, inspections should still occur periodically to ensure that work has not resumed and that erosion and sediment controls are being maintained and still working. That inspection can be a 'windscreen inspection' to verify that construction has not initiated. It would be good to conduct a walk-around inspection at least once a month or after significant rainfall events to ensure that site controls are still functioning as required.

After completing the inspection, the inspector should leave an inspection report with the contractor, sending a copy to the developer and possibly the property owner. The report should serve as a site report card, clearly documenting proper installation and maintenance of site controls as well as any deficiencies in site control implementation. If there are areas of non-compliance, the inspection report initiates a "paper trail," which is integral to successful enforcement actions. To improve the effectiveness of inspections, it is important to establish standard, well-documented inspection procedures. These procedures should specify in detail the actions an inspector conducts at a site, set out options and list steps to be taken when site compliance is inadequate, and establish a process to be initiated if there is a disagreement on site.

Clarification of Roles on Site

A clear, formal statement of individual responsibility always benefits program implementation. The agreement should clearly define roles and levels of responsibility. When setting out these roles, it is important to be cognizant of the legal responsibilities of each authority.

Adequacy and Use of Guidelines

Program implementation will only be effective if there is a 'level playing field' where everyone has an equal responsibility to implement erosion and sediment control practices. There are several approaches that need to be jointly considered:

- Educational activities;
- Mandatory requirements where the regulated community recognizes their obligations; and
- Inspection and enforcement. A site presence will demonstrate to contractors and developers that program implementation is important. Enforcement procedures are also important in public recognition of program responsibility and obligation.

Adequacy of Erosion and Sediment Control Implementation

The purpose of program implementation is to ensure good site control to minimize sediment discharge into receiving waters. Program structure can take many forms, but it is the end result of resource protection that is the reason for program implementation.

Erosion and sediment control practices can be considered individual components of an environmental treatment train. Site control cannot rely upon one single practice to provide effective control. It will take a number of practices working in conjunction with one another to achieve that goal.

Permit Processing

Permits are a key tool utilized to enable erosion and sediment control objectives to be transferred and implemented on specific sites. Therefore, processing of permits is a very important first step in ensuring that these objectives are reflected on the ground and that all relevant parties understand the key issues and solutions associated with the development of a site.

The Erosion and Sediment Control Law is the key to minimizing adverse effects from construction and therefore needs to be considered "up front" by the developer and appropriately approved by the respective local authorities. This will ensure that controls required are documented and form a condition of the permit, thus making compliance and enforcement an easier task. In terms of the type and level of information required, this should include: contour plan, measures proposed, design criteria and justification, construction sequence, staging details, and maintenance. By including all this information on one plan, the contractor can also access the detail without second-guessing.

An environmental effects analysis is a second area of information that could be supplied as part of the permit application. This enables the developer to gain an understanding of the values of the receiving environment and adjust the erosion and sediment control plan accordingly to reflect this. The process of the developer undertaking this task also has a significant educational effect. Not only will it eventually change the attitude of developers toward erosion and sediment control, but it will also ultimately lead to significant improvements to site implementation. It also needs to be mentioned that the immediate receiving environment, such as on-site stream systems, needs careful consideration.

It is important that the development cycle is considered as a whole and sight is not lost of other key areas. The obvious area in this regard is the long-term stormwater discharge that is detailed in other parts of this document. There is little value in implementing a satisfactory erosion and sediment control program only to find all the benefits compromised by ineffective stormwater management over the long term.

Environmental Goals and Clear Guidance

Development and documentation of clear goals for the various receiving environments is critical. This should also include detail of the steps that can be taken to achieve these goals. This information could be included within an updated Erosion and Sediment Control Guideline.

Permit Inspection and Enforcement

Ensuring compliance with program requirements makes for a level playing field where all the players have the same responsibilities. Failure to take enforcement action can lead to widespread problems on other sites.

Enforcement is made more difficult by the fact that no one wants to be considered a "bad guy." Inspectors and program administrators need to recognize that, at times, they will have to act as "policemen." To facilitate these actions, the programs framework should specify the procedures, options, and remedies to be followed by staff when conducting compliance and enforcement activities.

As-built Requirements/ Pre-construction Meetings

As-built plans, especially for sediment ponds or traps, are extremely helpful in assessing the adequacy of implementation. Sediment ponds or traps are structural practices, and their performance depends to a large extent on adequacy of construction. Will there be leakage around the outfall pipe, has compaction been adequately done, and are design elevations reflected in construction? Sometimes these questions cannot be answered by an inspector, and having as-built requirements will provide further assurance that construction was adequately done.

Pre-construction meetings between the inspector, developer, designer, and contractor can provide an excellent starting point, where any questions regarding site implementation, timing, and phasing can be resolved. Important elements of erosion and sediment control implementation can be emphasized. Pre-construction meetings are important in getting a project off to a good start. Too often, site construction gets quickly out of control, and getting effective erosion and sediment control implementation becomes extremely difficult.

Mandatory or Voluntary Educational Programs

Generally, educational programs should be voluntary. However, there are certain program elements that can benefit from, or even depend on, mandated educational programs. An example of this would be a requirement that a responsible person from an individual contracting company attend an erosion and sediment control training program. This program could last one day and explain why implementation of erosion and sediment control is important and how to construct individual practices. The States of Delaware and Maryland, for example, have a mandatory contractor certification program that requires every site contractor to have at least one individual responsible for site controls attend a course in erosion and sediment control. To date, thousands of people have attended these programs, and they have proven popular with attendees.

Individuals attending these programs generally enjoy outdoor, water-related activities, and relating these activities to the program's goals leads to a more personal commitment by attendees. This greatly enhances program effectiveness.

If an educational program is mandatory, it must be available on a regular basis. This allows individuals who need this training to attend sessions and carry out their function under the program. Educational activities for the general public generally cannot be offered on a regular basis but rather when opportunities become available.

Educational programs aimed at the construction industry present a special challenge because of the constant turnover of employees. This implies a need for courses to be held on a more frequent basis. A contractors' course can last from a half day to one day. It needs to stress general information about erosion and sediment control as well as problems and solutions, along with information about the contractors' specific responsibilities and obligations.

While design guidance manuals or guidelines are extremely important, consultants can benefit greatly from periodic workshops on design aspects. These workshops can explain the rationale behind practice selection and design criteria, provide supplementary, up-to-date information on designing practices, and include case studies that illustrate good and bad examples of design and use of practices. Having a good relationship with the design community reduces potential problems in all aspects of program implementation.

Workshops conducted on a periodic basis could be used not only to disseminate information, but also to obtain feedback regarding program implementation, conduct case studies, bring in experts to discuss a specific issue, and demonstrate new strategies or products.

Program Requirements

It has been emphasized throughout this chapter that erosion and sediment control is an important part of the development cycle. It needs to be undertaken with consideration of all the aspects previously mentioned.

There are, however, the big "Cs" of an erosion and sediment control program that, similar to the ten commandments, should always be considered. They are:

- COMPREHENSIVE management of land use, water resources, and infrastructure throughout a catchment is necessary.
- CONTINUITY of erosion and sediment control and stormwater management programs over a long period of time will be required to address these problems.
- COOPERATION between all statutory bodies, the public sector and the private sector is essential to prevent and solve problems.
- COMMON SENSE in our institutional approach is essential.
- COMMUNICATION is crucial: between entities involved in program implementation; between implementing agencies and those being regulated; with politicians to gain their support; and with the general public to convey how normal activities can cause pollution and how to become part of the solution.
- COORDINATION of efforts for cost-effective implementation to maximize benefits is indispensable.
- CREATIVITY in technology and in our approach to solving this complex problem is critical.
- CASH in terms of program support and implementation of necessary controls is essential.
- COMMITMENT to solving these problems is of the utmost importance. Whether our children will have clean water, a high quality of life, and a vibrant economy will depend on our sincerity of effort.

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CHAPTER 10

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CHAPTER 10

Structural Stormwater Management Facilities

The full range of stormwater best management practices (BMPs) currently available to manage urban runoff includes both nonstructural measures and structural facilities. Nonstructural stormwater management measures, which can influence the amount of runoff and associated pollutants that are produced from a storm event, are discussed in detail in Chapter 7. This chapter presents technical information on the wide range of structural stormwater management facilities that are presently available to the developers and administrators of urban runoff management programs.

Unlike their nonstructural counterparts, structural stormwater management facilities generally do not influence the quantity and quality of stormwater runoff initially produced by rainfall. Instead, they respond to that initial runoff in a variety of ways, depending upon their basic operating principles and structural characteristics. These principles and characteristics include the relative ability of each to control runoff quantity and improve runoff quality, the mechanisms and materials they use to do so, the means by which they discharge their outflows, and their method of construction. As a result, these basic principles and characteristics can also be used to group the numerous types of structural facilities into broader categories as well as identify key design, construction, operation, and maintenance needs of each.

Compared to the 1994 *Fundamentals of Urban Runoff Management* that was the forerunner of this book, presenting a detailed chapter on structural stormwater management facilities is more difficult today. This is due to a number of reasons. In the intervening decade, the range of available types of structural facilities and the number of design variations have grown considerably. In addition, research into structural facility components, performance, operation, cost, construction, and ancillary impacts has also grown by a similar amount. These two factors have, in turn, increased the amount of available information that could be included in such a chapter. In addition, this knowledge growth rate is expected to continue in the future, increasing the likelihood that any information included in the chapter will quickly become obsolete. Finally, unlike 1994, there are many excellent structural facility design manuals that are readily available today from other public and private sources.

Therefore, rather than providing detailed design, construction, and maintenance specifications for each of the many structural stormwater management facilities currently available, this chapter will assist readers in selecting the most appropriate facilities, whether its for a particular development site or an entire urban runoff management program. It will do so by reviewing the basic operating principles and associated component and site needs of each facility type. It will then use this information to organize the large number of individual types into more general categories that should make it easier to both understand and select the optimum

structural facilities. Finally, the chapter will provide an overview of key planning considerations and design requirements for each type of facility. This information will be supplemented by references to specific structural facility design manuals prepared by others that can be used to obtain for more detailed information.

Providing assistance in selecting the most appropriate structural stormwater management facility or facilities is important for several reasons. In addition to addressing the specific requirements of a development site or the overall needs of an urban runoff management program, it should be noted that the EPA's Stormwater Phase II Final Rule requires operators of small municipal separate storm sewer systems (or MS4s), which include municipalities and highway agencies, to develop and implement a runoff management program that utilizes best management practices (BMPs) to address post-construction runoff from land development and redevelopment sites. These BMPs are to include a combination of nonstructural measures and structural facilities, which the MS4 program developers are required to identify. NPDES permitting authorities, typically comprised of state governments and tribes, are also encouraged to develop a menu of BMPs to assist MS4 program developers in this process. As such, it can be seen that selecting the most appropriate structural BMPs for a runoff management program is an important component of the program's overall success.

Prior to the presentations on BMP selection, however, the chapter will begin with a discussion of two key design parameters that pertain to all structural stormwater management facilities:

1. The maximum rainfall for which runoff must be treated.
2. The minimum level of runoff treatment that must be provided.

In the past, the maximum rainfall amount, often referred to as the facility's design storm, has at times been the source of confusion and misunderstanding, which has affected the performance of both specific structural facilities and the overall urban runoff management program that created them. Similar confusion over required or attainable treatment levels during that design storm (and smaller events) has also adversely impacted both facility and program performance, albeit for somewhat different reasons. The discussions will attempt to reduce some of this confusion and promote better understanding of these two fundamental program parameters.

Design Storms

As described in the EPA's Stormwater Phase II Final Rule, urbanization can adversely impact streams, ponds, lakes, and other water bodies in two general ways. The first is caused by an increase in the type and amount of pollutants in stormwater runoff, which can harm aquatic life through both direct physical contact and their food chain. These impacts are described in detail in Chapter 3. The second cause is the increase in the volume of runoff that is delivered to and must be conveyed by water bodies. As described in Chapter 2, excessive increases in runoff volume can cause erosion and scour which, in turn, can harm aquatic life through a loss of both habitat and food sources, even without an increase in pollutant loading. In addition, excessive volume increases can cause flooding that can damage property and threaten human safety.

As a result, an effective urban runoff management program must address the impacts of land development and redevelopment on both runoff quality and quantity. However, while these requirements are easily stated and understood in general terms, there are some specific program requirements that must be determined in order to achieve them. One of these requirements is the exact amounts of rainfall and/or runoff that the program must address, both for runoff quality and quantity purposes. However, in attempting to do so, some complications arise. First, as discussed in Chapter 2, the amount of rain produced by a given storm event can range from a trace amount to a foot or more, depending upon location, season, and other meteorological factors. The amount of resultant runoff from these rainfalls can also vary, depending not only upon the specific rain depth but a number of other factors unassociated with the rainfall. The fact that rain events generally vary in a random way from storm to storm further complicates our efforts to select appropriate rainfall or runoff amounts.

One could turn to the EPA's Stormwater Phase II Final Rule for guidance. However, a review of the requirements for post-construction stormwater management reveals only general language regarding the need to develop a stormwater program that will reduce runoff pollution from land development and redevelopment projects to the maximum extent practicable. There is no mention of maximum or design storm depths, durations, or frequencies upon which to base specific program requirements, other than some discussion of controlling pollutant impacts on an average

annual basis. As stated elsewhere in the final Rule, this lack of specificity on EPA's part is, in fact, deliberate, since it allows states and other regulated entities to develop program requirements and design parameters that specifically address their unique stormwater needs and problems. It also allows the EPA to improve and expand their stormwater regulations in an iterative manner, with greater specificity included in future versions of the Rule based upon the knowledge gained from previous ones. Unfortunately, while such customization and ongoing improvement of a nationwide rule is commendable, it also complicates the present task facing local program developers.

We can begin to find some answers by dividing up the urban runoff management program into the two major components described above: runoff quantity and runoff quality control. These are addressed separately below.

Runoff Quantity Control

From a risk perspective, increases in runoff quantity in the form of flooding can have direct impacts on all forms of life, including human. Therefore, while the potential for a loss of human life due to development-induced flooding may be relatively small, the effect or cost of such a loss is unquestionably large. As a result, the maximum design storm level for runoff quantity control must also be large in order to reduce the risk to an acceptably small amount. For that reason, many urban runoff management programs typically select large maximum design storm levels to address the quantitative runoff effects of land development and redevelopment. In keeping with the requirements of the National Flood Insurance Program (and many associated state floodplain management programs), the 100-year storm has typically been used as the maximum design storm for the control of runoff quantity increases.

However, to effectively manage runoff quantity increases caused by land development and redevelopment, it is not sufficient to simply exercise control over the maximum design storm. That is because runoff quantity increases caused by land development can also be expected to occur during smaller storms, and such increases, combined with their increased frequency of occurrence, can also cause significant flood and, in particular, erosion damage. In fact, on a percentage basis, the runoff volume increase experienced during smaller storms is typically greater than that which occurs during the maximum design storm. As a result, runoff quantity control must extend over a range of storm events up to and including the maximum design storm, which should be seen only as the upper limit of a range of necessary control.

For these reasons, it is common for an urban runoff management program to require runoff quantity control for a number of specific storm frequencies. For example, the New Jersey Stormwater Management Rules promulgated by the state's Department of Environmental Protection require runoff quantity control for the 2-, 10-, and 100-year storm events. In Maryland, the state's Department of the Environment requires runoff quantity control for the 1-, 10-, and 100-year storms in certain areas of the state to provide channel, overbank, and extreme flood protection. Many other states, counties, and municipalities have similar quantity control requirements.

However, although an appropriate range of design storms have been identified for runoff quantity control, the necessary level or degree of control must still be determined. To do so, we must first consider what runoff quantities are actually increased by land development and what can be done to either prevent or mitigate them. As discussed in detail in Chapter 2, land development and redevelopment projects that increase site imperviousness and drainage system efficiency will cause increases in both the site's total runoff volume and the peak runoff rate. As described in Chapter 2, both research and analysis have shown that increases in either of these quantities can cause downstream flooding, erosion, and habitat damage. As such, to be effective, it will be necessary for an urban runoff management program to address the increases in both runoff volume and peak runoff rate. And since increases in peak runoff rate are caused, at least in part, by runoff volume increases, it should be possible with a single set of controls to affect both quantity parameters.

Which returns us to the question of what level or degree of quantity control is necessary. An obvious first choice would be to require no increases in total runoff volume or peak runoff rate between pre- and post-developed site conditions, applied to a range of storm events up to a maximum 100-year storm. And as discussed in Chapter 8, Impact Avoidance, this is perhaps the most effective way to prevent the environmental damage and safety threats posed by runoff quantity increases. However, while limiting post-development peak runoff rates to pre-developed levels has proven

to be readily achievable at most development sites regardless of site characteristics, similar control of post-development runoff volumes has proven to be more difficult. This is due, in part, to the different processes needed to control runoff rate and volume and, in part, to the very nature of land development itself. Regarding the different processes, reduction of post-development peak runoff rates can be accomplished through the temporary storage and slow release of the developed site's runoff. This can be accomplished through the construction of stormwater detention basins and related facilities that typically do not require any special site conditions other than sufficient space for construction and a downstream discharge point that can safely accept the basin's outflow. Both of these can usually be provided at most development sites with, at worst, a limited loss of developable land.

Reducing post-development runoff volumes to pre-developed rates, however, can be significantly more difficult if not impossible to achieve at many development sites. For unlike peak rate reductions that only require temporary storage of runoff, runoff volume reductions require what could be described as permanent runoff reductions. That is to say, reducing post-developed runoff volumes to pre-developed amounts requires the increased volume caused by the development to be infiltrated into the site's soils and not to be allowed to leave the site. While such infiltration can be possible at sites with granular, highly permeable soils with deep groundwater and bedrock levels, it can be difficult or impossible to achieve on sites with relatively impermeable soils and/or shallow depths to groundwater or bedrock. Even at permeable soil sites, achieving the required infiltration rates and volumes may be difficult due to the fact that the development has increased impervious coverage of the site, consequently reducing the area of pervious cover over which the infiltration can occur. Therefore, while the total volume of infiltration required under post-development conditions is essentially equal to pre-developed conditions, it must be achieved over a smaller area. This effectively increases the required soil infiltration rates, sometimes to unachievable levels. This problem can be compounded by excessive groundwater mounding, which can affect the infiltration facility itself and/or adjacent structures or systems such as basements and septic system disposal fields. Finally, the potential for groundwater contamination by the stormwater-borne pollutants infiltrated with the site's runoff may also prevent the use of infiltration.

As a result, the goal of maintaining pre-developed site runoff volumes, however desirable, has proven elusive in many areas. As a consequence, alternative quantity control measures have been sought. The most popular to date appears to be simply requiring post-developed peak runoff rates to not exceed pre-developed ones for a range of storm events through the use of on-site stormwater detention. However, despite both its popularity and apparent logic, research conducted in New Jersey and elsewhere has shown that, in addition to ignoring runoff volume increases, such a requirement can be, at best, ineffective and, in certain instances, actually detrimental: in a number of cases, downstream peak runoff rates turned out to be greater than those that would have occurred if the requirement (and associated on-site detention) had not been imposed. The results of one key research effort are summarized below.

The South Branch Rockaway Creek Stormwater Management Study was conducted by the Natural Resources Conservation Service (NRCS) and the New Jersey Department of Environmental Protection (NJDEP) in 1986. Among its many findings, the study demonstrated how ineffectual and, at certain locations, harmful a policy of maintaining post-development runoff rates at pre-developed levels can be. The study analyzed the 12.3 square mile watershed in west-central New Jersey under present (i.e., 1986) and ultimate development conditions. It then simulated the effects of a runoff quantity control policy that simply required no increase in predeveloped peak runoff rates for a land development site.

The results of that simulation are summarized in Tables 10-1, 10-2, and 10-3. Shown in the tables are the estimated peak 2-, 10-, and 100-year discharges at three of the study's eight points of analysis for both present and ultimate levels of development. The three points of analysis are located at the upper, central, and lower portions of the watershed as shown in Figure 10-1. The upper location (Point 1) has a total drainage area of approximately 0.6 square miles and has only a single subarea discharging to it, while the central and lower locations (Points 4 and 8, respectively) have increasingly larger drainage areas and, as such, receive the outflows from increasingly greater numbers of subareas. Point 4 has a total drainage area of approximately 7.3 square miles and receives runoff from 16 watershed subareas, while Point 8, which is located near the mouth of the South Branch, has a total drainage area of 12.3 square miles and receives runoff from all 23 subareas delineated for the study.

The tables contain three sets of peak discharges at each location for each storm frequency. The first set of peak discharges represents existing development levels at the time of the 1986 study, while the second set represents ultimate development of the watershed in accordance with current zoning but without any runoff rate controls. The third set of peak discharges also represents ultimate development conditions but with the requirement that peak runoff rates from future developments could not exceed those under existing development levels. These requirements, which were contained in the current land development ordinances of the watershed's municipalities, were achieved in the study by allowing each watershed subarea to represent a future development site, each with its own on-site detention basin that achieved the required peak rate reduction for the 2-, 10-, and 100-year storms.

As can be seen in all three tables, ultimate development of the South Branch Rockaway Creek watershed will cause increases in existing 2-, 10-, and 100-year peak runoff rates at all three points of analysis summarized in the tables. For example, Table 10-1 indicates that the existing 2-year peak runoff rate at Point 1 is estimated to increase from 136 CFS to 186 CFS under ultimate development conditions. Similarly, Table 10-3 indicates that the existing 100-year peak runoff rate at Point 8 is estimated to increase from 3840 CFS to 4660 CFS under ultimate development conditions. Similar increases can be seen in the tables for all points of analysis and storm events.

Further review of the tables also indicates how effective the watershed's 1986 peak runoff rate controls will be. As described above, these runoff quantity controls required peak developed site outflows not to exceed those under existing development for the 2-, 10-, and 100-year storms. At Point 1 (which is located in the upper portion of the watershed at the outlet of a single development site), this requirement will effectively control the peak increases caused by that development at that location for all three storm events. For example,

Table 10-1: Summary of Peak 2-Year Discharges, South Branch Rockaway Creek Stormwater Management Study

Point of analysis	Existing peak discharge (CFS)	Ultimate development without peak controls		Ultimate development with peak controls	
		Peak (CFS)	% of existing peak	Peak (CFS)	% of existing peak
1	136	186	136%	132	97%
4	594	901	152%	726	122%
8	419	690	165%	665	159%

Table 10-2: Summary of Peak 10-Year Discharges, South Branch Rockaway Creek Stormwater Management Study

Point of analysis	Existing peak discharge (CFS)	Ultimate development without peak controls		Ultimate development with peak controls	
		Peak (CFS)	% of existing peak	Peak (CFS)	% of existing peak
1	472	558	118%	464	98%
4	2100	2660	127%	2350	112%
8	1770	2280	129%	2250	127%

Table 10-3: Summary of Peak 100-Year Discharges, South Branch Rockaway Creek Stormwater Management Study

Point of analysis	Existing peak discharge (CFS)	Ultimate development without peak controls		Ultimate development with peak controls	
		Peak (CFS)	% of existing peak	Peak (CFS)	% of existing peak
1	896	1020	114%	882	98%
4	4320	5330	123%	4750	110%
8	3840	4660	121%	4710	123%

as shown in Table 10-1, the 2-year peak runoff rate at Point 1 following development in accordance with the peak rate controls described above would be 98 percent of the existing 2-year peak rate. Similar peak rates are achieved at Point 1 for the 10- and 100-year storms as shown in Tables 10-2 and 10-3, respectively.

However, further review of the tables indicates that the effectiveness of the peak rate requirement will decrease as the South Branch continues downstream through the watershed, receiving runoff from more development sites and their on-site detention basins. For example, Table 10-1 indicates that the developed 2-year peak runoff rate with peak rate controls at Point 4, which is located in the central portion of the watershed, will be 726 CFS or approximately 22 percent greater than the existing 2-year peak rate of 594 CFS. Continuing downstream, the developed 2-year peak runoff rate with peak rate controls at Point 8, which is located at the lower end of the watershed, will be 665 CFS or approximately 59 percent greater than the existing 2-year peak rate of 419 CFS.

Similar results can be seen in Tables 10-2 and 10-3 for the 10- and 100-year storms. As with the 2-year storm, the peak rate controls for both events are fully effective at Point 1 which is immediately downstream of a single development site and on-site detention basin. However, at lower locations in the watershed with multiple development site and on-site basins contributing flow, the developed peak rates begin to exceed the existing rates and approach those for developed conditions without peak rate controls. For example, as shown in Table 10-2, the developed 10-year peak runoff rate at Point 8 with peak rate controls will be 2250 CFS, which is not only 27 percent greater than the existing 2-year peak rate but only 30 CFS or 2 percent less than the estimated 10-year peak rate at this location without any peak rate controls. This loss of effectiveness is greatest for the 100-year storm at Point 8 where, as shown in Table 10-3, the peak developed runoff rate with peak rate controls of 4710 CFS will not only exceed the existing peak rate of 3840 CFS but also the developed peak rate without controls of 4660 CFS. In other words, not only have the peak rate controls failed to maintain existing peak runoff rates throughout the watershed following ultimate development, they have actually caused developed peak rates to exceed those that would have occurred if no controls had been imposed.

Figure 10-1: South Branch Rockaway Creek Watershed Points of Analysis

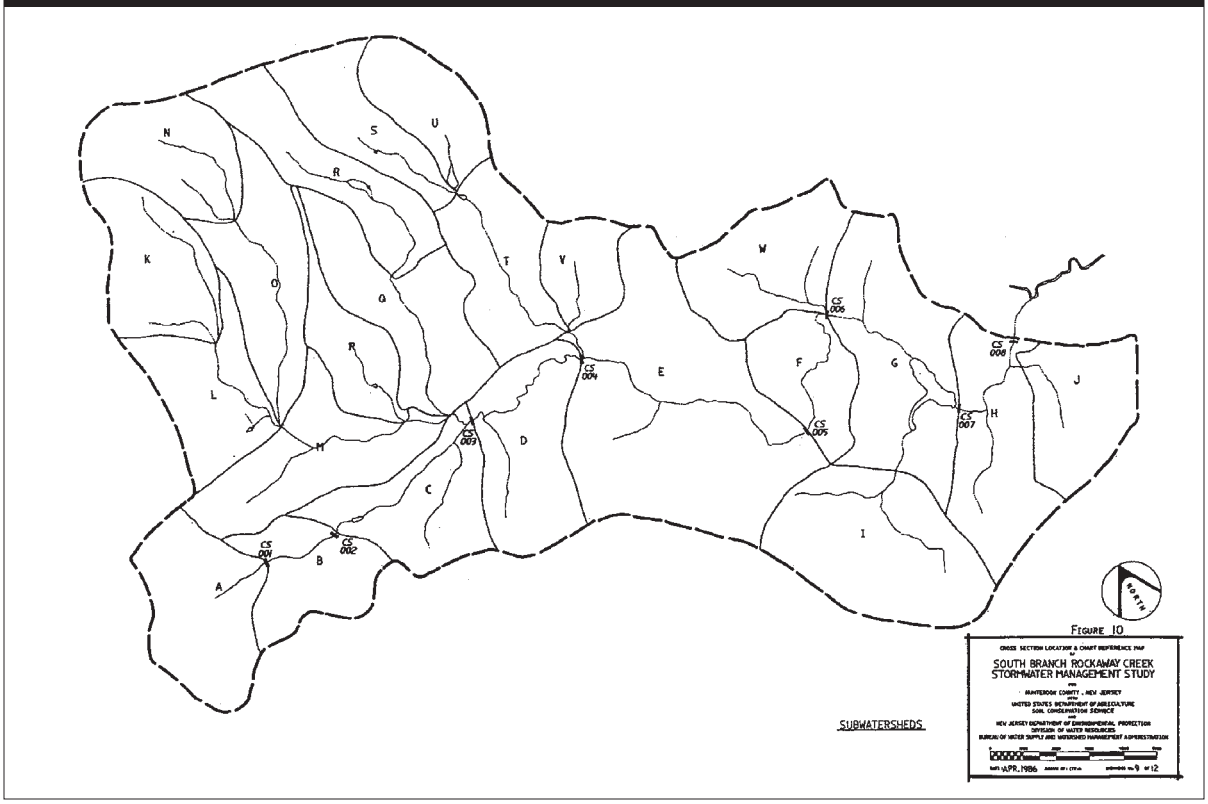

From the above, it can be seen that selecting a runoff quantity control that simply requires peak developed site runoff rates not to exceed those under existing or pre-developed conditions may prove ineffective. This ineffectiveness may even reach levels where the peak runoff rates produced by the controls, which were intended to prevent the adverse runoff quantity impacts of land development, actually exceed those that would have occurred if the controls had not been imposed. As a result, instead of preventing the adverse runoff quantity impacts of land development, the peak rate controls actually made them worse.

Based on an analysis of the South Branch Rockaway Creek study and the development of similar studies, several reasons can be found for these unfortunate results. They include alterations in the timing of runoff from land development sites caused by both the site's more efficient drainage systems and its on-site detention facility that achieves the required peak rate reductions. An additional and perhaps more significant reason for the ineffectiveness of the peak runoff rate controls is a failure to recognize and address the runoff volume increases that are also typically caused by land development. A simplified explanation of this complicated effect is illustrated in Figure 10-2. The figure depicts the runoff hydrograph from a development site under both pre-developed and developed conditions. The developed condition hydrograph is based on reducing the peak rate of runoff created by the development to a rate equal to the pre-developed peak. This is the same peak rate control used in the South Branch Rockaway Creek Stormwater Management Study discussed above and has been achieved by temporarily storing and slowly releasing the runoff hydrograph from the developed site similar to the South Branch study.

As can be seen in Figure 10-2, the pre- and post-developed peak runoff rates from the development site are indeed equal. However, further examination of the hydrograph shows several key dissimilarities. First, the two peak runoff rates occur at different times, with the pre-developed hydrograph peaking at Hour 12.5, approximately 0.5 hours before the post-developed one. This is due, at least in part, to the timing effects of the site's new drainage system and on-site detention basin. Second, due in part to this peak time difference, there is a period of approximately 0.9 hours (between approximately Hours 11.9 and 12.8) when the post-developed runoff rates are less than those for

Figure 10-2: Comparison of Pre- and Post-Developed Site Hydrographs with Peak Rate Control

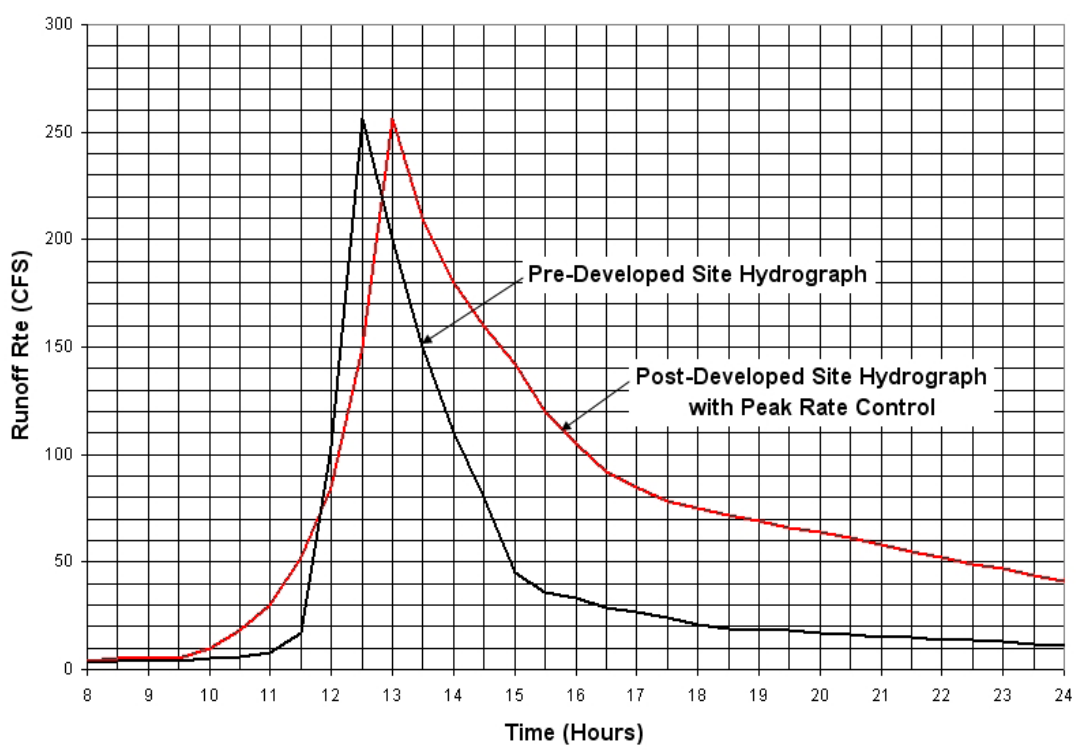

pre-developed conditions. However, starting at Hour 12.8 and continuing beyond the end of the x-axis at Hour 24.0, the post-developed condition runoff rates exceed the pre-developed ones by amounts that range from approximately 25 percent to over 200 percent. From the detailed discussion in Chapter 2 regarding the quantitative impacts of urbanization, it can be seen that these increased runoff rates are the result of the increased runoff volume caused by the site development. This increased runoff volume (represented by the area beneath the hydrograph plot) requires the non-peak post-developed runoff rates to generally exceed those for pre-developed conditions.

In addition, these higher non-peak runoff rates are the primary reason why the developed peak rates with peak rate controls at Points 4 and 8 in the South Branch Rockaway Creek Stormwater Management Study exceeded those for existing or pre-developed conditions. Looking again at Figure 10-2 and assuming that it represents the runoff at Point 1, the following can be seen: if the peak runoff rates downstream at Points 4 and 8 were produced, in part, by the runoff at Hour 12.8 or later at Point 1, then the post-developed peak rates at these locations would exceed the pre-developed peak. That is because, as described above, the post-developed flows at Point 1 starting at Hour 12.8 will be greater than the pre-developed rates, even though the peak rate controls produced the same peak rate at Point 1. For example, if the pre-developed peak runoff rate at Point 4 is produced, in part, by the pre-developed rate at Point 1 at Hour 14, then the post-developed rate at Point 4 can be expected to increase (despite the same peak rate at Point 1) because, as shown on Figure 10-2, the post-developed rate at Point 1 will be approximately 70 percent greater than the pre-developed one.

The above findings further highlight the value of maintaining both existing runoff peaks and runoff volumes following land development or redevelopment. However, recognizing how difficult it may be to achieve the site infiltration rates required to do this, how else may the problem of peak runoff rate increases downstream of development sites be addressed? Fortunately, additional watershed-level studies similar to the South Branch Rockaway Creek Stormwater Management Study offer some answers. These answers are illustrated below in a discussion of two such studies performed in New Jersey during the same time period as the South Branch study.

The two studies in question were performed to both confirm the peak runoff rate increase problem highlighted by the South Branch study and to develop answers to it. The studies were based in the Middle Brook watershed in Somerset County and the Devils Brook watershed in neighboring Middlesex County. Details of both studies are presented in the reference section of this chapter. Both watersheds are located in the central portion of New Jersey. The 16 square mile Middle Brook watershed is characterized by forest cover and steep ground slopes formed by the Watchung Mountains, while the 22 square mile Devils Brook watershed has significantly flatter ground slopes and a combination of forest cover along with existing residential and agricultural land uses.

In the Middle Brook Watershed study, the pre-developed land use was assumed to be entirely forest, while the Devils Brook Watershed study was based upon existing development levels at the time of the study. As a result of these factors, the two studies taken together are felt to be generally representative of the range of potential topographic, geologic, and land development conditions that may be encountered in an urban runoff management program. Finally, it should be noted that, due to generally fair to poor soil permeability in both watersheds and, in the case of the Middle Brook, shallow depth to bedrock due to the mountainous terrain, maintaining pre-developed runoff volumes was not considered feasible. This was particularly the case for the large runoff increases created during the 10- and 100-year storms whose control was vital to preventing existing erosion and flooding problems in both watersheds from worsening with future development.

Included in each study's scope was the investigation of an idea developed through the analysis of pre- and post-developed runoff hydrographs similar to those in Figure 10-2. The idea was this: Could the downstream runoff increases described above be avoided by reducing the post-developed peak runoff rate from a land development site to less than the existing rates? While such a control would not decrease the post-developed runoff volume, could a reduction in post-developed peak runoff to rates less than pre-developed conditions cause sufficient flattening of the post-developed hydrograph to maintain pre-developed peak rate not only at but downstream of land developments? The results of these two studies are summarized below.

First, both studies confirmed the problem of increased post-developed peak runoff rates highlighted by the South Branch Rockaway Creek Stormwater Management Study. For example, the Devils Brook watershed study demonstrated an increase in down-

stream peak runoff rates despite a peak rate control that maintained pre-developed peaks at each development site in the watershed. These results are illustrated in Figures 10-3 through 10-5. They depict for the 2-, 10-, and 100-year storms, respectively, the post-developed peak rates with the peak rate control described above at various points of analysis in the watershed expressed as a percentage of the pre-developed peaks at those locations. The points of analysis used in the study are numbered consecutively and increase in value in a downstream direction. As can be seen in Figure 10-3, the 2-year peak post-developed rates generally increase

Figure 10-3: Comparison of 2-Year Pre- and Post-Developed Peak Rates with Peak Rate Controls, Devils Brook Watershed

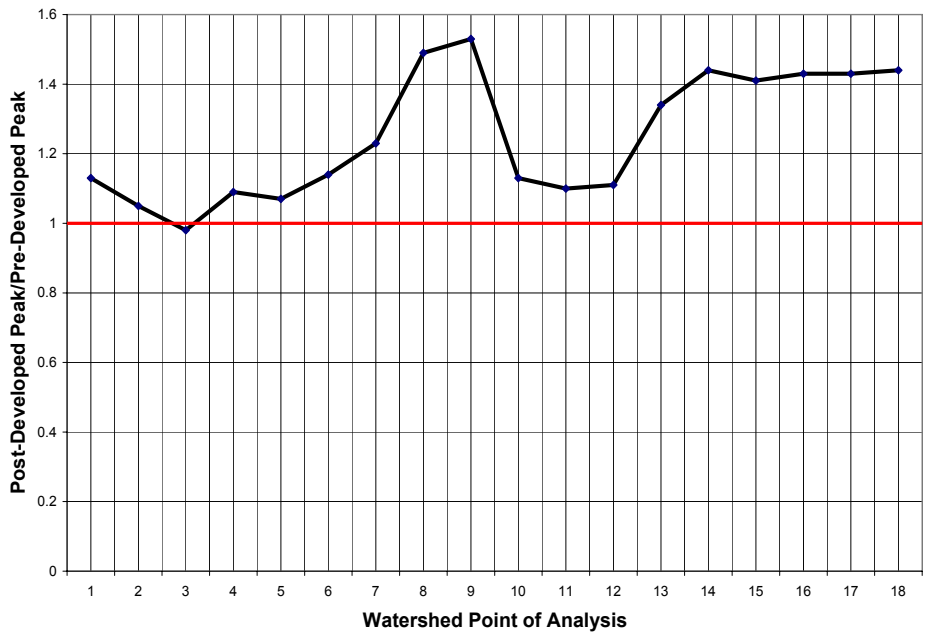

Figure 10-4: Comparison of 10-Year Pre- and Post-Developed Peak Rates with Peak Rate Controls, Devils Brook Watershed

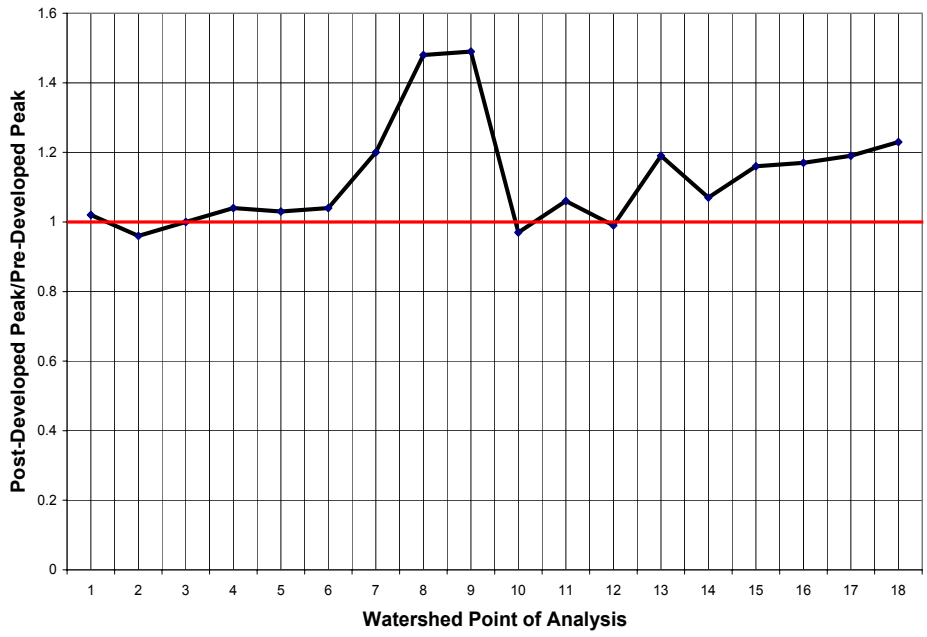

in a downstream direction from the upper to lower portions of the watershed (i.e., the displayed values exceed 1.0) despite the peak post-developed runoff from each watershed subarea (again assumed to represent a future development site) being equal to the pre-developed rate. At Point of Analysis 18 at the mouth of the watershed, the post-developed peak runoff rate is approximately 42 percent greater than the pre-developed rate. Similar results are shown for the 10- and 100-year storms in Figures 10-4 and 10-5, with post-developed peak rates ranging as high as 20 percent to 45 percent greater than pre-developed. It should be noted that qualitatively similar results were also encountered in the Middle Brook Watershed study.

Having confirmed the peak rate increase problem caused by setting post-developed peak runoff rates equal to pre-developed rates, both studies then investigated the effectiveness of reducing post-developed peak runoff rates from land development sites to rates less than, rather than equal to, predeveloped peak rates. As noted above, existing erosion and flooding problems in both watersheds made effective runoff quantity control a vital requirement in both watersheds. Because of this need and the inability to control runoff volume increases through infiltration, it was necessary to develop effective peak rate controls that avoided the peak rate increase problems highlighted by the South Branch Rockaway Creek study. After several iterations, the peak runoff rate control criteria presented in Table 10-4 were selected for each development site in the watersheds. As shown in the table, the Middle Brook Watershed study investigated the downstream effectiveness of reducing the post-developed peak runoff rates from development sites for the 2-, 10-, and 100-year storms to 50 percent, 65 percent, and 80 percent, respectively, of the pre-developed peak site rates. In the Devils Brook Watershed study, the percentages of the pre-developed 2-, 10-, and 100-year peak runoff rates were 40 percent, 65 percent, and 65 percent, respectively.

The results of applying the Devils Brook peak rate reduction factors shown in Table 10-4 are illustrated in Figures 10-6 to 10-8. As shown in Figure 10-6,

Figure 10-5: Comparison of 100-Year Pre- and Post-Developed Peak Rates with Peak Rate Controls, Devils Brook Watershed

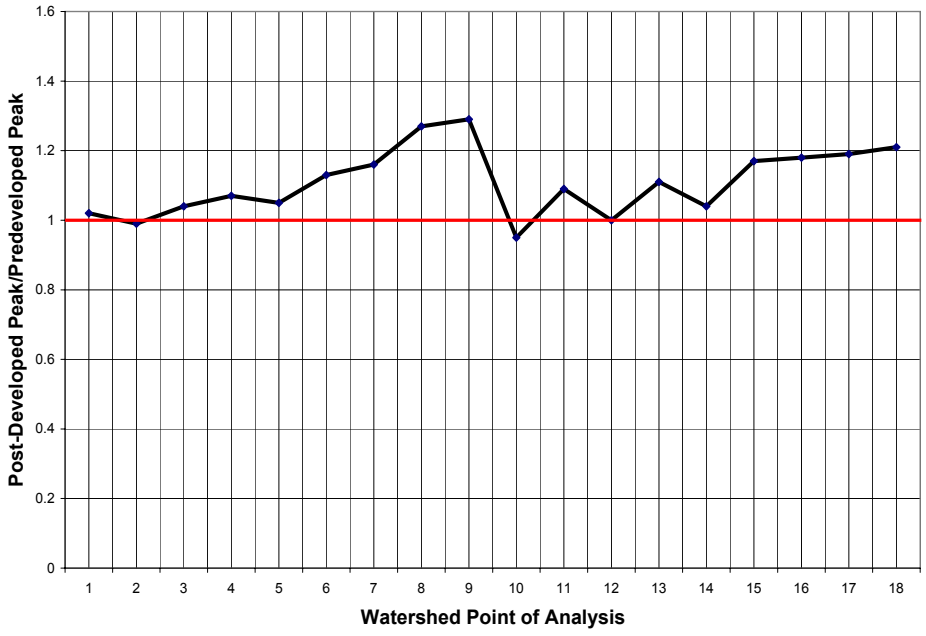

Table 10-4: Final Peak Runoff Rate Reduction Factors, Middle Brook and Devils Brook Watershed Studies

Watershed	Required Post-Developed Peak Site Outflow Rates Expressed as Percentage of Pre-Developed Peak Rate		
	2-Year Storm	10-Year Storm	100-Year Storm
Middle Brook	50%	65%	80%
Devils Brook	40%	65%	65%

requiring future development sites in the Devils Brook watershed to reduce their post-developed 2-year peak runoff rates to 40 percent of their pre-developed rates achieved the desired goal, namely, to not allow ultimate watershed development to increase pre-developed 2-year runoff rates anywhere in the watershed. Unlike the 2-year storm results shown in Figure 10-3, where post-developed peak site rates were allowed to equal pre-developed ones, Figure 10-6 shows that, by reducing peak site rates to 40 percent of pre-developed peaks, the post-developed 2-year peak runoff rates throughout Devils Brook remain at or below pre-developed levels.

Figure 10-6: Comparison of 2-Year Pre- and Post-Developed Peak Rates with Peak Rate Controls, Devils Brook Watershed

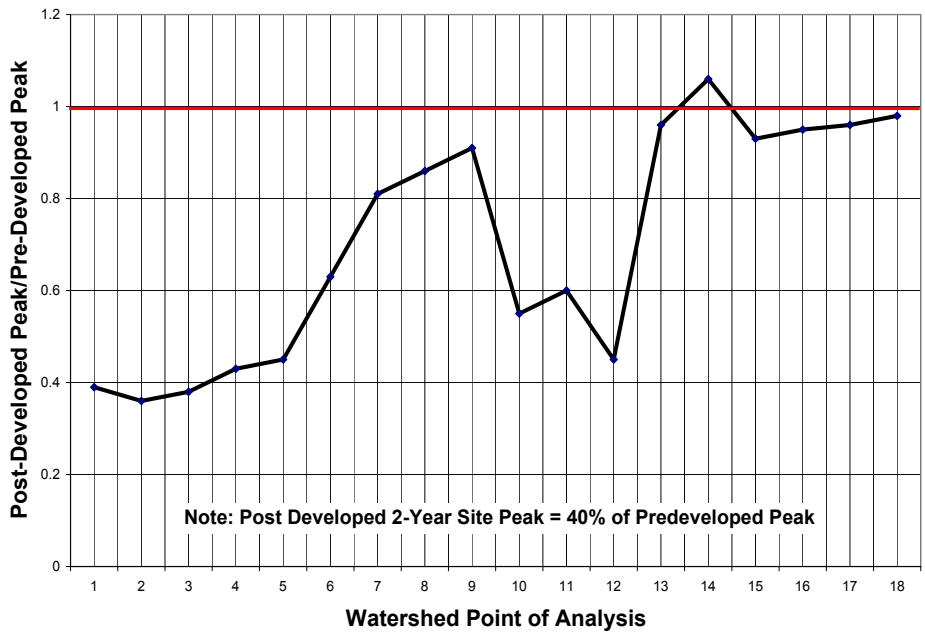

Figure 10-7: Comparison of 10-Year Pre- and Post-Developed Peak Rates with Peak Rate Controls, Devils Brook Watershed

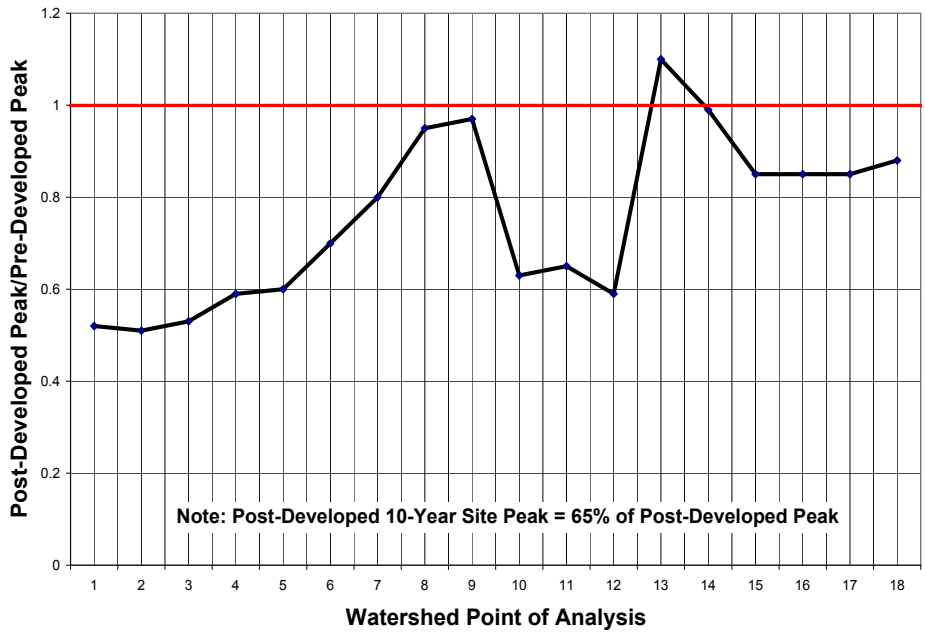

A single exception to these results occurs at Point of Analysis 14 where the post-developed peak 2-year rate exceeds the pre-developed one by approximately 5 percent. Similar results are shown for the 10-year rates in Figure 10-7 with, again, a small exceedance at Point of Analysis 13. For the 100-year storm, Figure 10-8 shows that the post-developed 100-year peak runoff rates remain without exception at or below pre-developed levels throughout Devils Brook. This contrasts with the results shown in Figure 10-5, where allowing post-developed peak site runoff rates to equal pre-developed conditions resulted in post-developed peak increases

Figure 10-8: Comparison of 100-Year Pre- and Post-Developed Peak Rates with Peak Rate Controls, Devils Brook Watershed

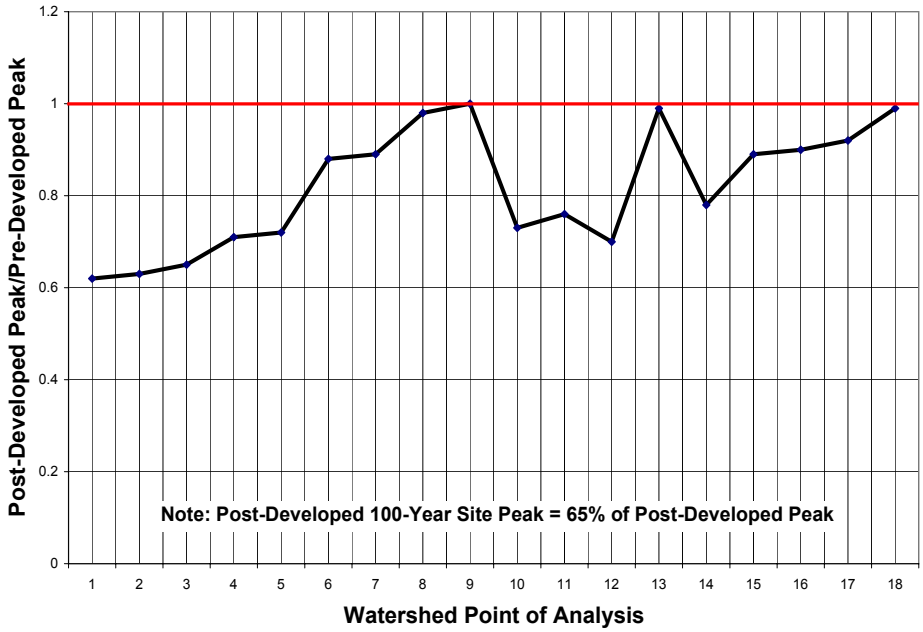

Figure 10-9: Comparison of 2-Year Pre- and Post-Developed Peak Rates with Peak Rate Controls, Middle Brook Watershed

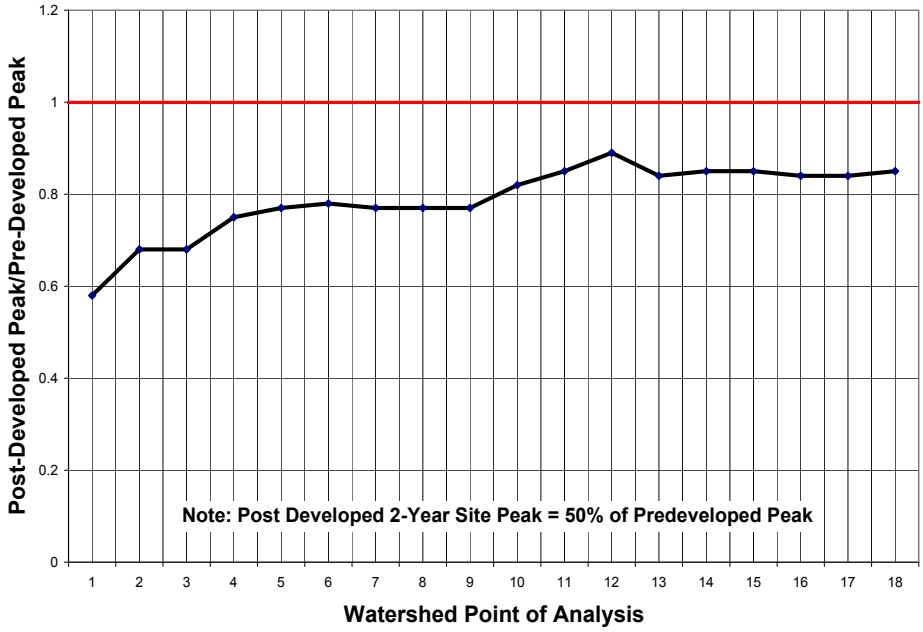

throughout most of the waterway, ranging as high as 30 percent at Point of Analysis 9.

The results of applying the Middle Brook peak rate reduction factors shown in Table 10-4 are illustrated in Figures 10-9 to 10-11. As shown in Figure 10-9, requiring future development sites in the Middle Brook watershed to reduce their post-developed 2-year peak runoff rates to 50 percent of their pre-developed rates also achieved the goal of not increasing pre-developed 2-year peak runoff rates anywhere in the watershed following ultimate development. Figure 10-6 shows that the post-developed 2-year peak runoff rates throughout

Figure 10-10: Comparison of 10-Year Pre- and Post-Developed Peak Rates with Peak Rate Controls, Middle Brook Watershed

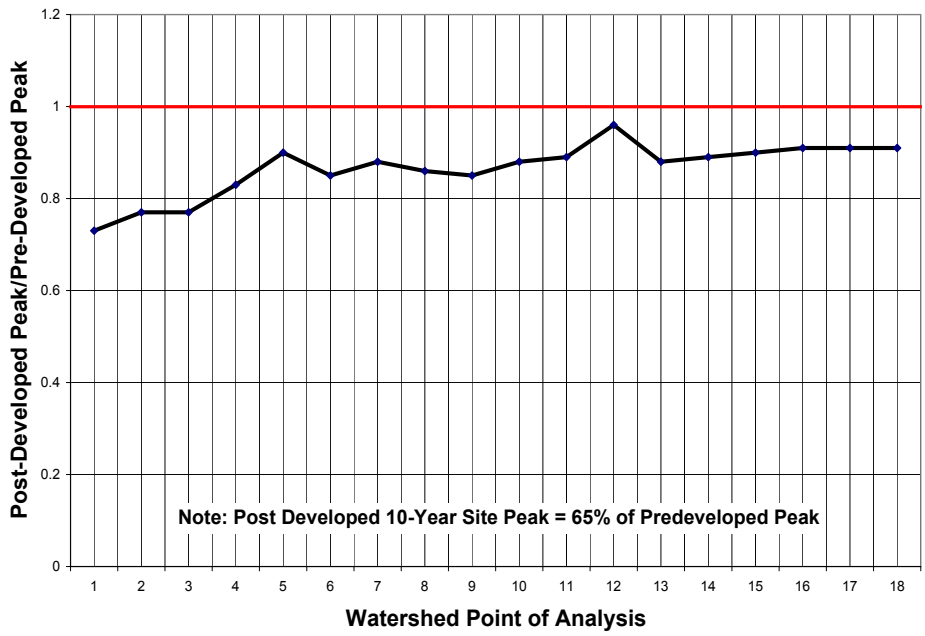

Figure 10-11: Comparison of 100-Year Pre- and Post-Developed Peak Rates with Peak Rate Controls, Middle Brook Watershed

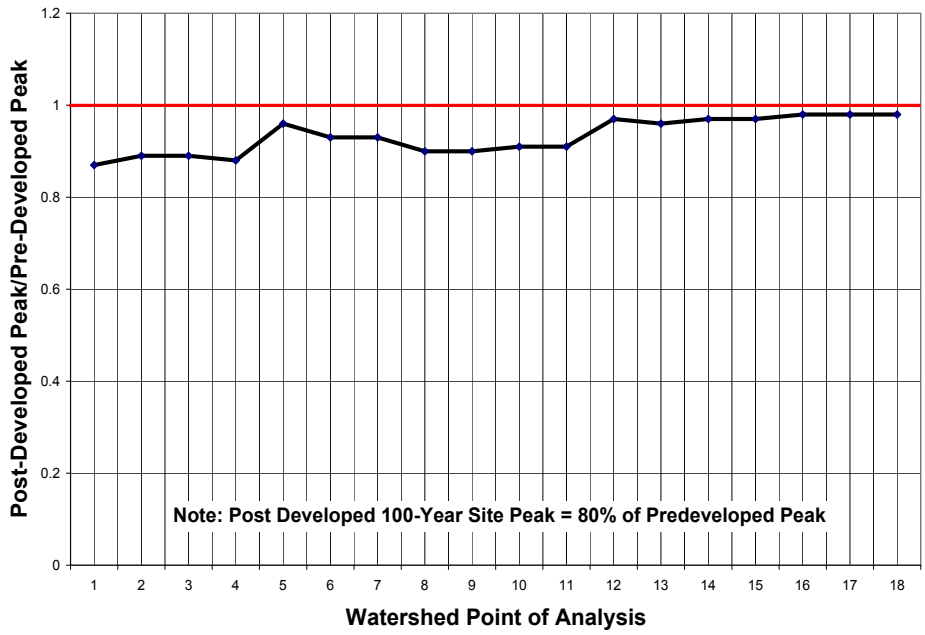

Middle Brook remain at or below pre-developed levels. Similar results are shown for the 10- and 100-year storms in Figures 10-10 and 10-11, where post-developed 10- and 100-year peak site runoff rates are required to be 65 percent and 80 percent, respectively, of the pre-developed peak site rates.

A simplified explanation of the reasons why the peak rate reduction factors used in the Middle Brook and Devils Brook watershed studies were effective in preventing downstream peak runoff rate increases is presented in Figure 10-12. The figure once again depicts the pre- and post-developed site hydrographs shown in Figure 10-2, with the peak of the post-developed hydrograph equal to the pre-developed peak. As noted in the discussion of Figure 10-2, the post-developed runoff rates for this level of peak rate control are less than pre-developed for only approximately 0.9 hours or from Hour 11.9 to 12.8. However, also shown in Figure 10-12 is a post-developed site hydrograph with a peak runoff rate equal to 50 percent of the pre-developed rate as analyzed in the Middle Brook study. An examination of this hydrograph shows that, under this level of peak rate control, post-developed runoff rates are less than pre-developed for approximately 2 hours (from approximately Hour 11.8 to 13.8), or more than twice as long as the post-developed site hydrograph with a peak equal to pre-developed. This increased time period offers greater opportunity for this and other post-developed site hydrographs with similar levels of control to combine downstream in such a way as to produce a total downstream peak that is no greater than the pre-developed peak at that location.

From the above, it becomes apparent that, at least for the study watersheds described above, simply requiring land development and redevelopment sites to match their pre-developed peak runoff rates will not prevent increases in peak downstream runoff rates. As such, the development-induced runoff quantity impacts of flooding, erosion, and habitat damage described in detail in Chapter 2 will not be avoided even with the imposition of runoff quantity requirements in the watersheds' runoff management programs. Based upon the results of the studies described above, the State of New Jersey has adopted statewide 2-, 10-, and 100-year peak rate reduction factors of 50 percent, 75 percent, and 80 percent, respectively, for all land development and redevelopment projects that disturb at least an acre of ground surface. These requirements are contained in the state's Stormwater Management Rules (N.J.A.C 7:8) promulgated by the New Jersey Department of Environmental Protection (NJDEP).

Figure 10-12: Comparison of Pre- and Post-Developed Site Hydrographs with Various Peak Rate Controls

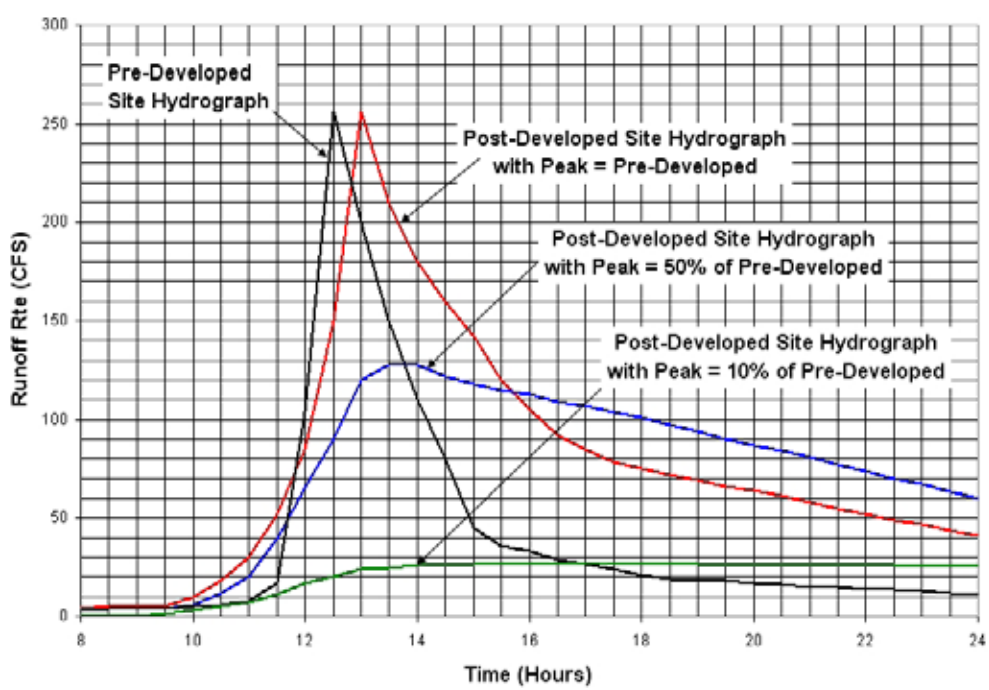

At this point, it is important to note more recent research into the effectiveness of peak reduction factors to control runoff volume increases. From a flood prevention standpoint, limiting downstream post-developed peak discharge rates on a waterway to levels no greater than pre-developed (as achieved through the use of development site peak rate reduction factors described above) should be effective in preventing increases in existing waterway flood depths and limits. However, research conducted since the Middle Brook and Devils Brook studies, including McRae in 1997 and Bledsoe in 2002, indicates that limiting downstream waterway discharges to pre-developed levels may not be sufficient to prevent development-induced erosion damage along the waterway. This is due, once again, to the increase in total site runoff volume caused by the development (and highlights once again the desirability of preventing runoff volume increases where possible through site design and post-development runoff infiltration).

As shown in Figure 10-12, the two post-development site hydrographs with peaks equal to 100 percent and 50 percent of predeveloped will both have runoff rates that exceed pre-developed rates for an extended period of time. As noted above, this is due to the greater runoff volume under post-developed conditions, represented by the area under the hydrographs, that causes a longer overall duration of runoff than under pre-developed conditions. This longer runoff duration means a similarly longer period when the runoff will create shear and other forces along the downstream waterway's bed and banks. If these forces are greater at times than certain critical levels, which are based upon various waterway properties, erosion will occur even if the runoff rate is less than pre-developed. In fact, it can be seen that, as the peak post-developed site runoff rate becomes a smaller percentage of the pre-developed rate, the duration of post-developed runoff can be expected to increase. If this increased time includes longer periods of excessive channel forces, reducing post-developed site peak runoff rates may actually cause greater erosion than higher post-developed peaks.

In response to this research, some jurisdictions, including the State of Maryland, have adopted significantly lower peak rate reduction factors for erosion control than the 2-year 50 percent reduction factor required by New Jersey. As described in Chapter 2 of the October 2000 Maryland Stormwater Design Manual, the rationale for this greatly increased control of frequent storm events typically associated with waterway erosion is that "runoff will be stored and released in such a gradual manner that critical erosive velocities during bankfull and near-bankfull events will seldom be exceeded in downstream channels." Or, as one might add, at least not exceeded for durations longer than under pre-developed conditions.

This rationale is illustrated with the final post-developed site hydrograph shown in Figure 10-12. With a peak runoff rate equal to only 10 percent of the pre-developed peak, it can be seen that there is not only a considerably longer period when post-developed runoff rates are less than pre-developed (between approximately Hours 10 and 17 in Figure 10-12) but that, even beyond Hour 17, the post-developed runoff rates only exceed the pre-developed rates by a small percentage and have absolute values considerably less than the pre-developed peak.

In conclusion, it is important to note that all of the studies and research discussed above are highly complex and that their specific findings pertain to particular watersheds and water bodies. Nevertheless, while conducting similar studies of the watersheds and water bodies under the jurisdiction of a new urban runoff management program would be the most accurate way of determining appropriate runoff volume controls for that program, the results discussed above can be (and have been) used effectively to formulate general quantity requirements.

In summary, the above subsection on runoff quantity control design storms presented the following ideas and information:

- Runoff quantity controls are necessary in order to prevent the adverse flooding, erosion, and habitat impacts that can be caused by land development and redevelopment.
- In order to prevent this wide range of impacts, the maximum design storm for runoff quantity control is typically set at the 100-year storm frequency.
- The most effective runoff quantity controls are those that limit both post-developed site runoff volumes and peak rates to levels no greater than pre-developed site conditions.
- Limiting post-developed runoff volumes to pre-developed amounts may be difficult or impossible to achieve at certain development sites due to insufficient soil permeability, soil thickness, and other site factors.
- Where post-developed runoff volumes cannot be maintained at pre-developed amounts, requiring

post-developed peak site runoff rates to be less than pre-developed rates has been shown to be more effective than allowing post-developed peaks to equal pre-developed peaks.

- The required percent reduction below pre-developed peak rates can range from approximately 10 percent to 50 percent for frequent storm events such as the 1- or 2-year storm to 60 percent to 80 percent of the 100-year storm.
- Exact determination of required peak rate reduction factors requires detailed watershed and water body data and analyses.

Runoff Quality Control

As noted at the start of this section on design events, it is necessary for an effective urban runoff management program to address both the quantitative and qualitative impacts of urbanization. That is because the land development and redevelopment activities associated with urbanization can have adverse safety and environmental impacts due to changes in both stormwater runoff quantity and quality. And similar to runoff quantity controls, the establishment of effective runoff quality controls includes the determination of a maximum rainfall or runoff amount that such controls will apply.

In seeking information on appropriate runoff quality design event limits, one encounters problems similar to those described above for runoff quantity design events. A review of the EPA's Stormwater Phase II Final Rule once again does not yield any specific requirements (for reasons explained in the final Rule text). Therefore, a review of the requirements of established urban runoff management programs is the next logical avenue of pursuit. However, a review of these programs shows that the concept of a runoff quality design event has been the source of some confusion and misunderstanding, which has diminished the success of certain programs. As a result, this section will attempt to address these misunderstandings and promote the selection of effective and understandable design event levels.

As with runoff quantity, a runoff quality design event represents the maximum event depth, measured either by rainfall or runoff, that must be met by a runoff management program's stormwater quality requirements. As such, it represents an upper limit on the performance of structural facilities designed and constructed to prevent the adverse runoff quality impacts of land development. This immediately raises three questions regarding the maximum runoff quality design event:

1. Should the maximum design event be based upon rainfall or runoff?
2. What should the maximum design event depth be?
3. Is a total event depth sufficient, or is a temporal distribution also required?

Each of these questions is addressed below.

Rainfall or Runoff

In addressing the first question, some additional and intriguing questions are raised. First, since the goal of the urban runoff management program is to prevent adverse impacts to stormwater runoff, shouldn't the runoff quality design event be based upon the runoff from a development, rather than the rainfall that produces it? At first look, an affirmative answer to this question would appear logical. And in fact, many existing urban runoff management programs have chosen to do that. In simplified form, these programs require that a certain level of quality treatment be provided to a fixed amount of runoff. And while the level of treatment may vary, depending on the type of development or pollutant and/or the proximity and value of a downstream water body or other resource, the amount of runoff to be treated, typically expressed as a depth over the development site's area, usually remains the same.

For example, many municipal, county, and state runoff management programs currently require treatment of the first inch of runoff, averaged over the total site area, from a proposed development site. This requirement is imposed regardless of the type of development. In some programs, this is done to simplify the computations needed to meet the requirement, while in others, it is considered the best or at least a suitable maximum runoff quality design event.

However, the use of runoff in general and a constant or fixed amount in particular as the runoff quality design event can cause significant disparities in the levels of water quality control provided by different types of developments. In addition, these disparities unfortunately result in certain development types normally associated with greater pollutant loadings than others being allowed to provide lower overall levels of quality

treatment. The example presented below illustrates this problem.

For example, let's apply the 1 inch runoff requirement to both a single family residential and a commercial development site, each one acre in area. The development characteristics of each site are summarized in Table 10-5. Both sites are assumed to have soils belonging to Hydrologic Group C as defined by the Natural Resource Conservation Service's (NRCS) Technical Release 55 – Urban Hydrology for Small Watersheds (TR-55), which has become something of a standard for computing runoff volumes and rates from land development sites. As shown in Table 10-5, 20 percent of the proposed residential site and 85 percent of the proposed commercial site will be covered with impervious surfaces. The remainder of both sites will be turf grass that will be assumed to be in good hydrologic condition as defined in TR-55. According to the parameters defined by the TR-55 methodology, the impervious surfaces at both sites will have a Runoff Curve Number (CN), which is a measure of a surface's runoff potential, of 98, while the turf grass surfaces will have a CN of 74. (See Table 2-2a in TR-55 for more details of these various CNs.) It should be noted that the proposed impervious coverages for each development type in Table 10-5 are identical to those specified for these land uses in Table 2-2a. As such, they can be considered typical of these two types of development.

Utilizing the runoff volume computation methodology contained in TR-55, which is based upon the NRCS Runoff Equation, for an average runoff depth of 1 inch from both the proposed residential and commercial sites, we can compute the rainfall depths that would be required at each site. These results are summarized in Table 10-6. As shown in the table, it will be necessary for approximately 2.6 inches of rain to fall on the proposed residential site to produce the required 1 inch of runoff that must receive runoff quality treatment. However, at the proposed commercial site, only 1.4 inches of rain will be necessary to produce the same 1 inch runoff treatment volume. When we remember from Chapter 2 that different rainfall depths of equal duration, which we must assume are occurring at our two proposed development sites, are associated with different probabilities or recurrence intervals, we can see that this disparity in required rainfall depth means that the two sites are not provided equal levels of runoff quality treatment.

This disparity can be illustrated by analyzing the recurrence interval of each required rainfall depth. To do so, we will need to locate our proposed sites somewhere in the country, since the recurrence interval of a certain rainfall will depend upon its geographic location. We will also need to assume a duration of the rainfall that produced the 1-inch design event volume (although it is interesting to note that many programs do not specify a duration, an omission that prevents any determination of design event probability). Assuming that both sites are located in central New Jersey and assuming that both rainfalls have a 24-hour duration, we can quickly perform a simplified statistical analysis of 24-hour rainfall records for this part of the state in order to produce estimates of each rainfall's recurrence intervals. The results of our simplified analysis, based upon rainfall data developed by the Hydrometeorological Design Studies Center of the National Weather Service, are shown in Table 10-6 and illustrated in Figure 10-13.

From the above results, it can be seen that by requiring both the proposed residential and commercial sites to treat up to an equal runoff depth of 1 inch, the residential site will provide the required treatment for all storms up to a 2.6 inch rainfall, which for a 24-hour storm duration will have a recurrence interval of approximately 0.8 years or 10 months. However, the same

Table 10-5: Residential and Commercial Site Characteristics, Runoff Quality Design Event Example

Development Type	Area (Acres)	% Impervious Cover	% Pervious Cover	Pervious Cover Type	Impervious Cover CN	Pervious Cover CN
Residential	1.0	20%	80%	Grass	98	74
Commercial	1.0	85%	15%	Grass	98	74

Table 10-6: Required Rainfall Depths and Recurrence Intervals, Runoff Quality Design Event Example

Development Type	Average Site Runoff (Inches)	Required Site Rainfall (Inches)	Rainfall Recurrence Interval (Months)
Residential	1.0	2.6	10
Commercial	1.0	1.4	2

size commercial site will only be required to treat the runoff from all storms up to a 1.4 inch rainfall, which will have a recurrence interval of approximately 0.2 years or 2 months. Stated another way, the proposed commercial site will only be required to provide one fifth the level of runoff quality protection of the residential site, measured on a recurrence interval or probability basis. And when the higher expected pollutant loadings from the commercial site are taken into consideration, this disparity in treatment or protection levels becomes even more detrimental to the goals of the urban runoff management program.

The above illustrates that rainfall and not runoff should be used to specify the maximum water quality design storm. That is because, unlike runoff, a rainfall depth is independent of development type, surface cover, and other site features. And as a series of random events with sufficient records of past occurrences, rainfall can be statistically analyzed to produce depth-probability or depth-recurrence interval relationships. These relationships can be used, in turn, to select the correct rainfall depth for a desired or required level of protection that can be applied uniformly to all developments, regardless of type. However, as shown in the above example, using a fixed runoff depth instead of rainfall allows the probability or recurrence interval of the design event to vary with the development site's rainfall-runoff characteristics. And since each type of development will generally have different characteristics, the resultant runoff depth and, more importantly, level of water quality protection will vary with the development type, and in a direction that allows those levels to decrease with increasing imperviousness.

One additional point should be noted. Many programs that have adopted a runoff depth as the basis of their quality design storm have done so on the assumption that only the impervious surfaces at a proposed development site will produce runoff under such storm conditions. As a result, there will be a relatively constant relationship between rainfall and runoff that will avoid the variable recurrence interval or level of protection problem discussed above. Other programs do use a rainfall depth, but then only compute the resultant runoff from the site's impervious surfaces. However, a review of the runoff computations for both the residential and commercial sites in the above example shows that this will only be true at sites with highly permeable soils with large initial abstractions or surface storage volumes. In the above example, the pervious portions of the residential site that were assumed to have grass cover were the source of more than half the total average 1-inch site runoff depth that required runoff quality treatment. Even the grass areas at the largely impervious commercial site in the example contributed approximately to the total 1 inch of runoff from the site. Therefore, those programs that

Figure 10-13: Estimated Design Event Rainfall Depths and Recurrence Intervals

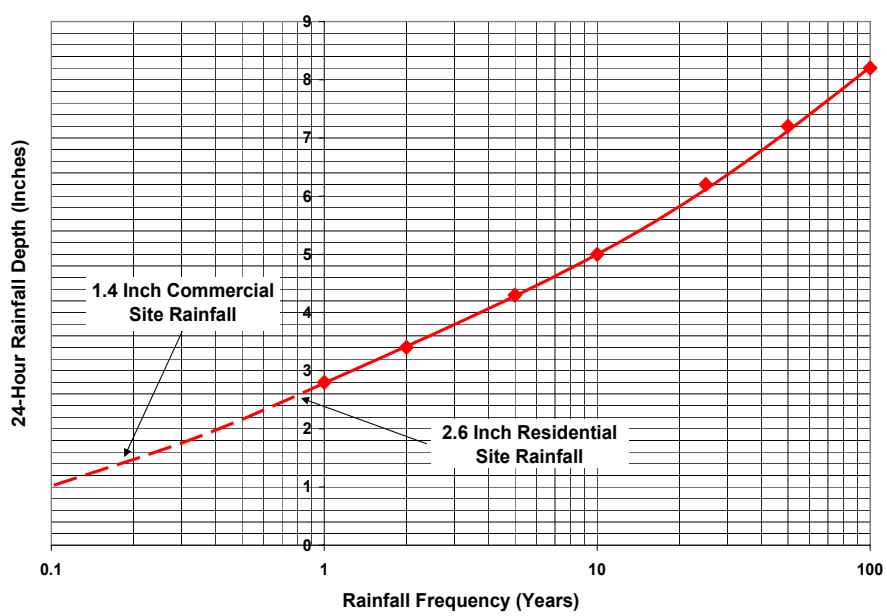

do not include pervious surface runoff must consider whether such runoff can be safely ignored in the design of structural runoff quality treatment facilities.

Maximum Event Depth

Regarding the question of maximum design storm depth, one must consider the overall level of runoff quality protection that is being sought by the urban runoff management program. Since nonpoint source pollutant loadings and associated runoff quality impacts are discussed or otherwise addressed on an annual basis in many research studies and most stormwater regulations, including the EPA's Stormwater Phase II Final Rule, most existing urban runoff management programs use the same one-year period as the time basis for their runoff quality requirements. For example, many programs require specified levels of pollutant removal or treatment measured on an average annual basis. Therefore, if the time basis of the runoff quality requirement is one year, the largest likely storm that may occur in that one-year period would be the logical choice for a maximum design storm. As a result, many runoff management programs either use or formerly used a maximum annual rainfall as the maximum runoff quality design storm depth.

However, it should be noted that for most, if not all, structural stormwater facilities, some degree of runoff quality treatment is provided even for rain events that exceed the maximum design storm. This will occur primarily during those storm periods when the actual runoff volume and/or rate is less than the maximum design level, although some degree of treatment (albeit at a reduced rate) may occur during periods of overflow when the actual volume and/or rate exceeds the maximum design level. This is true for both online and offline structural facilities. As a result, the use of a maximum design storm depth less than the maximum annual storm appears justifiable.

Presently, the use of a rainfall depth that, in combination with all smaller storms, will on average produce 90 percent of the average annual rainfall (or impervious surface runoff) at a land development site appears to be a standard technique for selecting a maximum runoff quality control design storm depth in many current urban runoff management programs. Other programs use a variation of this technique by specifying some percentage of the 1- or 2-year rainfall as the maximum design storm depth, again based upon the finding that the resultant rainfall will represent approximately 80 to 90 percent of annual average rainfall or impervious surface runoff at the development site. Determination of the required depth typically requires a suitably long rainfall record with adequate areal coverage that can then be statistically analyzed to determine average annual rainfall patterns and depths. Depending upon the variation in average annual rainfall throughout a program's jurisdiction, one or more design depths may need to be specified. Examples of various maximum runoff quality design storm depths in current state stormwater management programs are summarized in Table 10-7.

Design Storm Distribution

The decision of whether a maximum design storm depth alone is sufficient or whether a temporal distribution of that design depth is also needed will depend in large measure on the types of structural facilities that might be used to meet the urban runoff management programs' runoff quality control requirements. If all of the potential structural facilities will provide the required level of runoff quality control primarily through some form of storage and slow, regulated release that results in the peak outflow rate being a small percentage of the peak inflow rate, then a maximum design storm depth may be sufficient. This is due to the fact that in such facilities, the total volume of inflow is the domi-

Table 10-7: Maximum Runoff Quality Design Storm Depths Examples

State Program	Maximum Quality Storm Depth
Connecticut	1.00 Inches
New Jersey	1.25 Inches in 2 Hours
New York	0.8 to 1.3 Inches Depending Upon Location
Maryland	0.9 to 1.0 Inches Depending Upon Location
Washington	72% of 2-Year, 24-Hour Storm

nant design factor, and the various rates at which the inflow may occur have little influence on overall facility size or details. Typical examples of such volume-based structural facilities include infiltration basins, retention basins (also known as wet ponds), wetlands, and even extended detention basins where the peak outflow is a small percentage of peak inflow.

However, if the potential structural facility types include those that do not rely to any great extent on runoff storage but instead treat runoff at flow rates essentially unchanged from their inflow rates, then it will be necessary to specify both a maximum design storm depth and the manner in which that depth will occur over time. This is because the dominant design factor for such facilities is the maximum inflow rate, not the total inflow volume, and it will therefore be necessary to determine that maximum runoff rate. This will require knowledge of the total duration of the design storm and the manner in which the rain fell during that time period. A design storm distribution will also be required for volume-based facilities if the peak outflow rate is sensitive not only to total inflow volume but also to inflow rates. This can generally be assessed by comparing the peak inflow and resultant outflow rates. If the peak outflow rate is greater than approximately 10 percent of the peak inflow rate, then such inflow rate sensitivity probably exists, or at the least needs to be checked, and a design storm distribution will also be required. Typical examples of peak rate-based structural facilities include swales, filter strips, and hydro-mechanical devices including the growing number of manufactured runoff treatment devices.

Having determined the need for a design storm distribution to accompany a program's maximum design storm depth, the logical next question is: what type of distribution? And the answer can be found in the same discussion of recurrence interval or level of runoff quality protection that was presented in the section above on design storm depths. Presumably, a runoff management program's design storm depth, which, when converted to runoff over a drainage area, will determine the total runoff volume of the design storm, will be based upon some measure of probability or recurrence interval, such as a 1- or 2-year, 24-hour storm or a 90 percent rainfall depth. As such, this probability or recurrence interval will establish the level of runoff quality protection or control that will be provided by volume-based structural stormwater management facilities designed to treat the associated runoff volume. However, as noted above, there are certain types of structural facilities such as swales, filter strips, and especially hydro-dynamic devices that do not provide volume-based treatment and whose designs are not based upon a total runoff volume but upon a peak design storm runoff rate. To ensure that these peak rate-based facilities provide the same level of runoff quality control or treatment as volume-based ones, it will be necessary to use a design storm distribution that produces peak runoff rates that have the same probability or recurrence interval as the design storm's total rainfall depth.

To do so, this design storm distribution must have certain important characteristics. First, since it will be used to design stormwater management facilities for a range of development sites and Times of Concentration (see Chapter 2), the design storm distribution must be able to produce peak runoff rates with the same recurrence interval for all of them. As a result, the design storm distribution must consist of varying rainfall rates throughout its duration, with the maximum rainfall intensities for each time period up to the total design storm duration all having the same probability or recurrence interval; namely, the recurrence interval of the storm's total rainfall depth. For an urban runoff management program that utilizes a 24-hour design storm depth, an appropriate design storm distribution could be one of the dimensionless rainfall distributions developed by the Natural Resources Conservation Service (NRCS) for Technical Release 55 – Urban Hydrology for Small Watersheds (TR-55). Each of these distributions meets the maximum rainfall intensity criteria described above; namely, each contains a range of intensities and durations with the same probability or recurrence interval and, as such, can be used to produce the peak runoff rates for a range of Times of Concentrations.

However, it is important to emphasize at this point that the use of any of the NRCS design storm distributions in TR-55 requires the design storm depth to have been based upon 24-hour rainfall data and be assumed to fall over a 24-hour period. Using any of the TR-55 distributions to compute a peak runoff rate or entire hydrograph for a rainfall with a total duration other than 24 hours will result in incorrect runoff rates and inconsistent recurrence intervals between the total design storm runoff volume and peak runoff rate. As described above, this will lead to inconsistent levels of protection between volume-based and peak rate-based structural facilities. This also applies to the use of the NRCS design storm distributions for a design event runoff volume of unspecified duration.

For these reasons, an urban runoff management program that uses a design storm duration other than 24 hours must also develop an appropriate design storm distribution. For example, New Jersey's Stormwater Management Rules specify the use of a 1.25-inch, 2-hour runoff quality design storm. Based upon a statistical analysis of New Jersey rainfall data, such a rainfall has a recurrence interval of approximately 0.8 years or 10 months. Therefore, to insure that peak rate-based runoff treatment facilities will provide the same level of protection as volume-based facilities, it was necessary to vary the intensity of the 1.25 inches of rain over the total 2-hour duration in such a way that the resultant peak runoff rate for any Time of Concentration up to 2 hours would have the same 10 month recurrence interval.

The resultant New Jersey stormwater quality design storm distribution is shown in Figure 10-14 and Table 10-8. Figure 10-14 depicts a nonlinear rainfall distribution with the maximum intensity (indicated by the slope of the line) occurring in the middle of the 2-hour storm duration. This general shape is similar to several other design storm distributions, including the various TR-55 design storms, with the centrally located maximum rainfall intensity and overall symmetric shape considered to have average runoff potential. In addition, a review of Table 10-8 shows how, for a range of rainfall periods up to the total 2-hour duration, the maximum rainfall intensities occurring in those periods have the same 10-month recurrence interval as the overall 1.25 inch, 2-hour design storm. These various intensities were determined from the same statistical analysis of New Jersey rainfall data used to determine the recurrence

Figure 10-14: New Jersey 1.25-Inch/2-Hour Stormwater Quality Design Storm Distribution

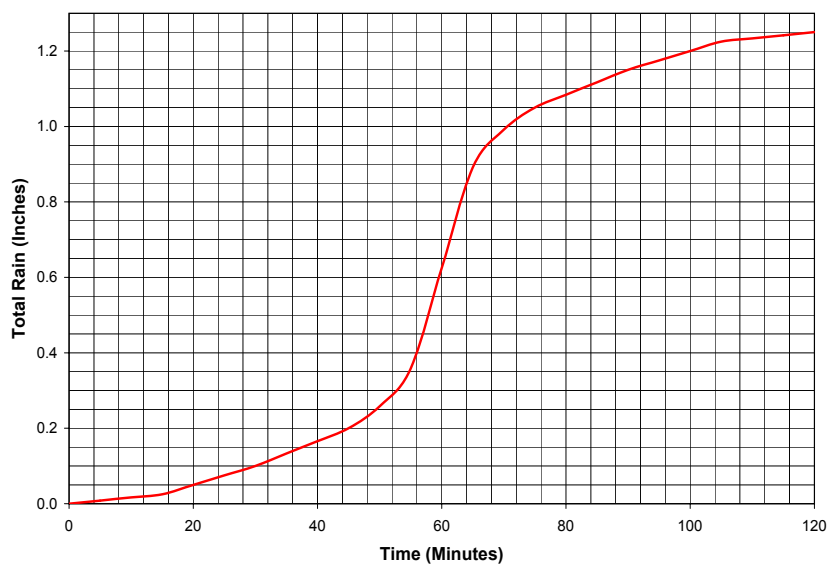

Table 10-8: New Jersey 1.25-Inch/2-Hour Stormwater Quality Design Storm, Maximum Rainfalls and Probabilities for Various Time Periods

Time Period (Minutes)	Maximum Rainfall (Inches)	Maximum Rainfall Intensity (Inches/Hour)	Average Recurrence Interval
10	0.53	3.2	10 Months
20	0.73	2.2	10 Months
30	0.85	1.7	10 Months
60	1.05	1.05	10 Months
90	1.20	0.80	10 Months
120	1.25	0.625	10 Months

interval of the overall 1.25 inch, 2-hour design storm. As a result of these specific rainfall intensities and durations within the overall 2-hour duration, both volume- and peak rate-based structural stormwater management facilities design in accordance with this design storm will provide the same level of runoff quality protection and control.

In summary, the above subsection on runoff quality control design storms presented the following ideas and information:

- Runoff quality controls are necessary in order to prevent the adverse impacts on water quality, aquatic organisms, and habitat that can be caused by land development and redevelopment.
- In order to prevent these impacts, the maximum design event for runoff quality control is typically based upon a percentage of the maximum annual rainfall or runoff.
- The selection of a runoff quality design event depth should be based upon a standard rainfall depth and duration with an appropriate probability or average recurrence interval. This allows a consistent level of runoff quality treatment or control to be achieved for all land development and redevelopment sites.
- Use of a standard runoff depth instead of rainfall causes inconsistencies in the level of runoff quality treatment or control between different development types, with the sites with the greatest amount of impervious cover providing the lowest level of treatment.
- In order to achieve consistent levels of runoff quality treatment or control between volume-based structural facilities such as basins and wetlands and peak rate-based facilities such as swales and hydro-dynamic devices, it is necessary to also specify a temporal distribution of the design storm rainfall.
- This distribution must be capable of producing peak design storm runoff rates that are identical to the probability or average recurrence interval of the total design storm depth. As such, a nonlinear distribution based upon site- or area-specific rainfall intensity-duration-frequency data is required.

Long-Term Rainfall-Runoff Simulation

To complete our discussion of design events, it is important to revisit a topic discussed in detail in Chapter 2; namely, the use of continuous rainfall-runoff simulation based upon long-term rainfall records to determine suitable levels of runoff quantity and, in particular, quality control at a land development site. Depending upon the extent and detail of the available rainfall data and the suitability of the simulation techniques for the project in question, the use of such analytic tools and data can produce results that are superior to the single, maximum design approach described above. This is true for several reasons, most notably the increased accuracy or certainty of results achieved by analyzing the actual rainfall events that occurred at a land development site over an extended time period over the use of a single design storm that is presumed to represent that long-term rainfall. Other advantages include the ability of continuous simulation to include the variability of rainfall depths and occurrences and the interaction between sequential events into the analysis. Since the required rainfall record length should be several multiples of the desired design storm level, continuous simulation is currently more appropriate for runoff quality than quantity control due to the typically lower treatment or control levels required for quality control. Nevertheless, depending upon the rainfall record length and desired level of protection, runoff quantity control analysis and design based upon long-term simulation can also provide superior results to a single design storm approach.

As discussed in Chapter 2, factors that may complicate or even prevent the use of long-term simulation typically include the lack of adequate rainfall data, either in overall length, time increment, or proximity to the development site. Other factors include lack of adequate calibration and verification data, increased analysis time and costs, and the lack of an appropriate simulation model. Despite these complications, an urban runoff management program should always include provisions that allow such an approach to be utilized, particularly to address runoff quality impacts. Programs should also devote some portion of their overall runoff management efforts to developing such analytic tools for eventual future use. For example, the Washington Department of Ecology has sponsored the development of the Western Washington Hydrology Model (WWHM), a continuous runoff simulation model based upon the

computer program HSPF (Hydrological Simulation Program – Fortran). According to the department, its plans for the WWHM include improving the model so that it can eventually provide users with the appropriate runoff quality flow rate for land development sites in the western portion of the state, rather than relying on the design storm approach currently utilized by the department. As rainfall data and continuous simulation models become more available, use of this approach is expected to increase.

In summary, the above section on design storms presented the following ideas and information:

- Effective urban runoff management requires control of both the runoff quantity and quality impacts of land development and redevelopment.
- Levels of quality and quantity control can be established through the selection of appropriate design events.
- In order to ensure uniform levels of control, design events should be based upon rainfall rather than runoff amounts and should also have a specified duration that will allow recurrence interval determination.
- A design storm will also require a rainfall distribution over its duration if both volume-based and peak rate-based structural stormwater management facilities are included in the urban runoff management program.
- Such distributions must produce peak runoff rates with the same probability or recurrence interval as the total design storm depth.
- Where available and feasible, continuous rainfall-runoff simulation using long-term rainfall records can produce superior results to a single design storm approach.
- Urban runoff management programs should both monitor and promote the development of continuous simulation techniques and data.

Treatment Levels

In developing a list of suitable structural stormwater management facilities to address the runoff quality requirements of an urban runoff management program, two questions are immediately raised:

1. What runoff pollutants should be treated?
2. What treatment levels should be provided?

These questions are both complex and inter-related. Their answers depend primarily on the conditions within the geographical boundaries of an urban runoff management program. These conditions include, among many others, present runoff quality and quantity levels; the presence, extent, and severity of any existing water body impairments; existing and future land uses, development levels, and water body uses; and related needs such as water supply, sewage treatment, and recreation. It can be seen that such issues pertain to the entire scope of an urban runoff management program and not just to its structural facility component.

A review of the EPA's Stormwater Phase II Final Rule illustrates both the area-dependent and complex nature of these two issues. As discussed above, the final Phase II Rule does not contain specific requirements for either the types of runoff pollutants that must be addressed or the levels of treatment that must be provided by the various owners of small municipal separate storm sewer systems (MS4s). According to the final Rule, this is intentional, for it allows the individual MS4 owner to evaluate and select the pollutants and treatment levels necessary to both achieve the program's goals and comply with NPDES requirements. In addition, the lack of specificity in the final Rule also affords the EPA, designated NPDES permitting authorities, and Phase II permittees the time and opportunity to further investigate stormwater runoff processes, pollutants, and impacts and to introduce more specific requirements into the Rule as problems require and future solutions allow. This process will be supplemented by the ongoing process of determining total maximum daily loads (TMDLs) of specific pollutants for impaired water bodies.

Nevertheless, before a comprehensive list of effective structural stormwater management facilities can be compiled for an urban runoff management program, or a specific facility selected for a land development proposal, both questions must be addressed. This is due to the fact that not all structural stormwater management

facilities can effectively treat the same runoff pollutants or provide similar levels of treatment. Therefore, the program's runoff treatment and control goals must be understood before structural facility selection can begin. Information regarding the identification of pollutants of concern and the establishment of required treatment or control levels can be found in Chapters 3 through 6.

The remainder of this section will focus on a third question that logically follows from the first two discussed above; namely, once key runoff pollutants and required treatment or removal rates have been identified, how does an urban runoff management program go about specifying what structural facilities can be used to meet these treatment requirements? Without such information, the program's runoff treatment goals can obviously only be stated, but never met with any certainty.

However, analysis of this question raises more complex ones, including what runoff pollutants can each type of structural facility effectively treat and, more importantly, what specific level of treatment can each type provide. Specific answers to these questions, the second in particular, depend upon several highly variable factors, including the concentration and total load of the pollutant, the volume and various rates of the runoff that transports it, antecedent rainfall and runoff conditions, and even the season or time of year. The variability of both applicable pollutants and levels of treatment can be seen by reviewing the sampling results of actual structural facilities taken over a number of storm events. Depending upon the pollutant, the reduction in pollutant load or mean concentration achieved by the structural facility can vary considerably from event to event, with even negative reductions achieved at times, particularly for nutrients. Such variability makes it extremely difficult to determine a structural facility's exact pollutant removal rate and illustrates why pollutant removal criteria are typically based upon average annual conditions.

In light of these questions and complexities, a review of current urban runoff management programs indicates that there are two general approaches to the task of specifying an appropriate set of structural stormwater management facilities to meet a program's runoff quality goals. A discussion of each approach is provided below. Solely for the purposes of these discussions, the two approaches have been assigned the following names:

1. Specified Facility Approach
2. Specified Treatment Approach

The discussions presented below are intended to illustrate the distinguishing features of each approach and identify some of the advantages and disadvantages of each. Nothing presented in these discussions should be considered to favor one approach over the other.

Specified Facility Approach

Following the selection of the program's pollutants of concern and their required level of treatment or control, a list of structural stormwater management facilities considered capable of providing such treatment must be selected. The selection process is typically based upon both model studies and field sampling of each structure type over a range of conditions. Typically, such activities were previously conducted by others with the results taken from a literature search or from one of the growing number of pollutant removal performance databases. At times, this data is supplemented by research conducted or sponsored by the program itself. From this information, a list of structural facilities considered capable of providing the program's required level of runoff quality treatment can be developed using the specified facility approach.

In the specified facility approach, exact pollutant removal performance values for the structural facilities on the program list do not have to be determined. Instead, the list identifies those structural facilities considered capable of meeting the program's treatment requirements. As a result, the specific question "Exactly how much pollutant reduction can a facility achieve?" is replaced by the relative and, therefore, more easily answered question "Can the facility achieve enough?" In this approach, it is also not even necessary to assign a numerical value to the required level of treatment. The program only needs to match up a required level of treatment with a list of capable or acceptable structural facilities.

An example of the specified facility approach can be found in the Stormwater Management Manual for Western Washington, developed by the Washington State Department of Ecology. In Chapter 4 of Volume I of this manual, the department defines four levels of required treatment in the western portion of the state, depending upon a range of factors, including the type of proposed land development, the intensity of traffic or other site uses, and the presence of impacted water bodies downstream. However, quantitative values for these four levels of treatment, expressed either as

pollutant removal rates or other standard performance measures, are not specified. Next, the manual presents a list of structural facilities that are considered capable of providing each level of required treatment. Subsequent volumes of the manual then provide details on the hydrologic, hydraulic, and structural design of the various facilities.

The overall selection process is illustrated in the chart shown in Figure 10-15. In the figure, which is based upon Figure 4.1 in the Western Washington Manual, the various structural facilities considered acceptable for each required level of runoff treatment can be seen in various boxes around the chart's perimeter following the designation of each required treatment level. What should be noted is the lack of any specific treatment levels, either in the form of required program levels or actual facility performance values.

A variation of the specified facility approach can be found in the Maryland Stormwater Design Manual published by the state's Department of the Environment. In Chapter 1 of that manual, the required levels of post-development runoff treatment are stated. They include 80 percent removal of post-development total suspended solids (TSS) load and 40 percent of post-development total phosphorus load. In Chapter 2, the manual provides a detailed listing of acceptable

Figure 10-15: Structural Stormwater Management Facility Selection Chart from the Stormwater Management Manual for Western Washington

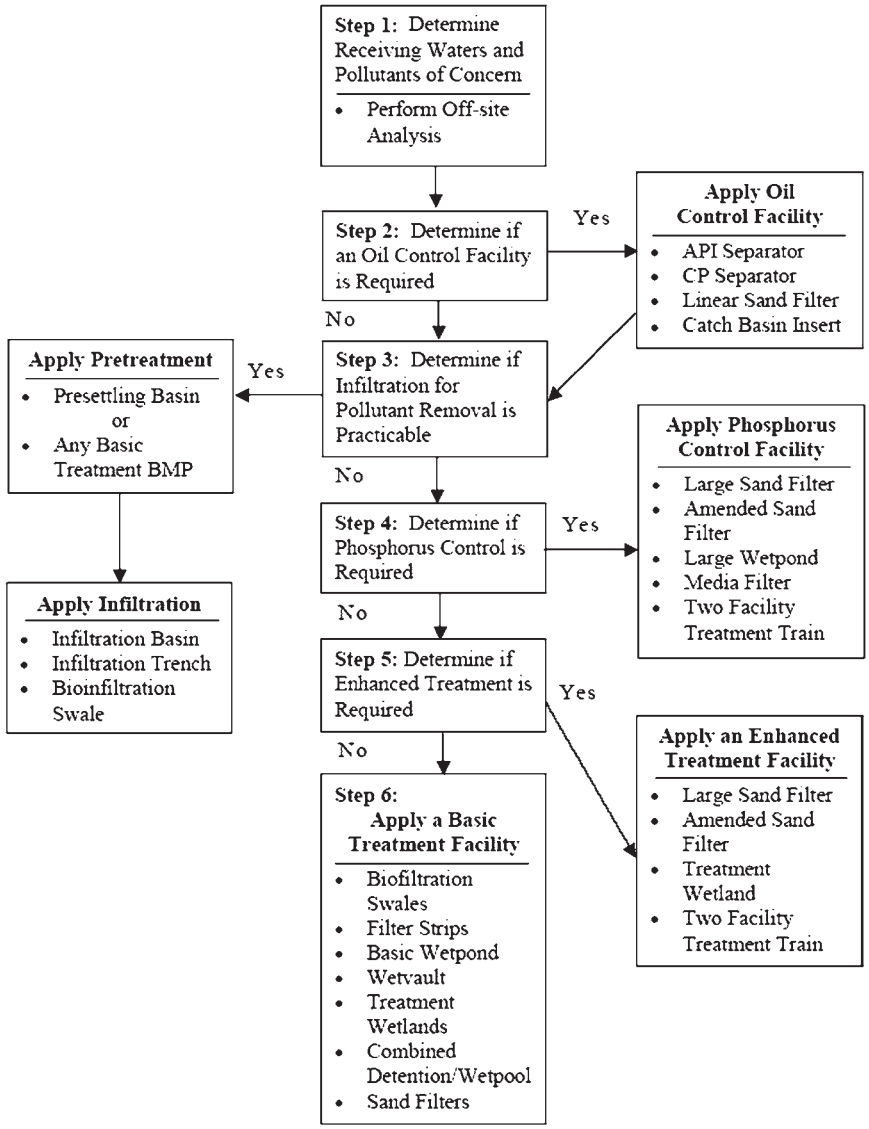

structural facilities considered capable of meeting these required treatment levels. Detailed sizing and structural criteria for these facilities are provided in subsequent chapters and appendices. However, similar to the Western Washington Manual, the Maryland Manual does not provide specific pollutant removal performance values for the selected facilities. Instead, it states in Chapter 1 that any of the structural facilities can be assumed to meet the program's required TSS and phosphorus removal levels if it is sized to capture the required runoff quality control volume, designed in accordance with the specific structural criteria contained in the manual, and both constructed and maintained properly.

From the above examples, it can be seen that the specified facility approach is in keeping with the minimum requirements for post-construction stormwater management contained in the EPA's Stormwater Phase II Final Rule. As stated in the final Rule, owners of small municipal separate storm sewer systems (MS4s) are required to "develop and implement strategies which include a combination of structural and/or nonstructural best management practices (BMPs) appropriate for the community." Such BMPs should also "minimize water quality impacts and attempt to maintain pre-development runoff conditions." As in the two examples above, no structural facility performance values are specified, only the need to achieve suitable protection levels with acceptable structural facilities.

As noted above, the advantage of the specified facility approach is the avoidance of any need to provide specific performance data for structural stormwater management facilities. In light of the uncertainties regarding such data and the difficulties in selecting (and possibly defending) representative values, this advantage can be significant. However, there are certain disadvantages that urban runoff management program developers should be aware of. These include the need to identify all acceptable structural facilities for each level of runoff quality control. In the case of the Western Washington Manual, this required the development of four sets of acceptable structures, one for each of the state's required treatment levels. As the number of required treatment levels increases, this can become cumbersome to administer and use, particularly when different portions of a proposed development site fall under different treatment requirements. It should be noted that this problem is addressed very effectively in the Western Washington Manual by the structural facility selection chart shown in Figure 10-15.

A second disadvantage of the specified facility approach is that is promotes, to a certain degree, the site design philosophy that a single structural facility can be used to meet all of the program's runoff treatment requirements. In providing a list of equally acceptable facilities, it is left to the site designer to simply select a single one best suited to site conditions in order to meet program requirements. Providing such a list can, albeit unintentionally, limit site design creativity and lead to the repetitive use of one or a few structural facilities that can earn program approval. It should be noted that both the Western Washington and Maryland Manuals address this issue by continually promoting site design creativity and the incorporation of structural facilities and nonstructural measures. For example, the introduction to the Maryland Manual states:

> *It is hoped that the design standards and environmental incentives provided below will produce better methods and advance the science of managing stormwater by relying less on single BMPs for all development projects and more on mimicking existing hydrology through total site design policies.*

A final disadvantage may occur in programs with multiple pollutant removal requirements. Since not all structural facilities are equally effective at treating certain pollutants, it is not uncommon to provide a series of facilities in a treatment train approach in order to meet the removal requirements for all of the required pollutants. In such cases, one facility may be selected to provide the required levels of treatment for pollutant A, followed by a second facility for pollutant B. However, since there are no specific performance values for the selected facilities for each pollutant and, therefore, no way to incorporate these values into the facility designs, each must be designed to meet all of the requirements specified for that facility by the program. This can result in overdesign, which may not be detrimental from a runoff protection standpoint but from cost, land disturbance, safety, and/or maintenance standpoints. Programs may respond to this problem by preparing alternative design standards for structural facilities used in series or treatment trains. However, this can increase the effort needed to create, administer, and design under the program.

Specified Treatment Approach

The specified treatment approach is the second method of determining acceptable structural stormwater management facilities for an urban runoff management program. Under this approach, both required treatment levels for each pollutant of concern and a list of structural facilities are developed and specified by the program. However, in contrast to the specified facility approach, the list of structural facilities includes specific pollutant removal rates or other performance measures for each facility type. This allows a site designer to select a single or combination of facilities that meet the program's treatment levels based upon their respective performance values.

An example of the specified treatment approach can be found in the New Jersey Stormwater Best Management Practices Manual published by the state's Department of Environmental Protection (NJDEP). In Chapter 4 of the manual, the NJDEP establishes a required TSS removal rate of 80 percent for land development and redevelopment projects, as well as the removal of nutrients to the maximum extent feasible. The chapter also provides a list of approved structural facilities that includes adopted TSS, total phosphorus, and total nitrogen removal rates for each. These removal rates can then be used to select appropriate facilities to meet the required treatment levels. Subsequent chapters in the manual provide design details for each facility type.

The various structural facilities and adopted removal rates are summarized in Table 10-9. It should be noted that the range of TSS removal rates shown for extended detention basins, vegetative filters, and wet ponds reflects varying facility designs. For example, for extended detention basins, the 40 percent to 60 percent TSS removal range pertains to extended detention times varying from 12 to 24 hours. For wet ponds, the 50 percent to 90 percent TSS removal range is based upon both the relative size of the pond's permanent pool and the use of extended detention above the permanent pool level. The 60 percent to 80 percent range of TSS removal rates for vegetative filters is based upon the type of vegetation used in the filter, which can range from turf grass to indigenous woods.

The above shows that one of the advantages of the specified treatment approach is that in providing designers and reviewers with quantitative measures of facility effectiveness, it also provides a demonstrable method of using structural stormwater management facilities either individually or in series to meet the program's pollutant treatment requirements. This allows designers a greater degree of freedom in selecting and locating structural facilities on a land development site. It also allows certain structural facilities such as extended detention basins or turf grass filters, that would not be sufficient by themselves, to be included in a site design. Under the specified facility approach, such facilities, which are relatively easy and inexpensive to design, construct, and maintain, may not be allowed. In addition, by providing a range of removal rates, the specified treatment approach allows designers to adjust a facilities design to optimize its size and features to meet the program's required treatment rates.

As stated above, the primary disadvantage of the specified treatment approach is the required development of appropriate removal rates for the program's pollutants of concern. This requires a considerable amount

Table 10-9: Approved Structural Facilities and Adopted Pollutant Removal Rates, New Jersey Stormwater Best Management Practices Manual

Structural Facility Type	Adopted TSS Removal Rate (%)	Adopted Total Phosphorous Removal Rate (%)	Adopted Total Nitrogen Removal Rate (%)
Bioretention Basin	90	60	30
Constructed Wetland	90	50	30
Extended Detention Basin	40 – 60	20	20
Infiltration Basin	80	60	50
Manufactured Treatment Device	Subject to NJDEP Verification		
Pervious Paving	80	60	50
Sand Filter	80	50	35
Vegetative Filter	60 – 80	30	30
Wet Pond	50 – 90	50	30

of research and review in order to develop appropriate removal rates that are accurate not only for a specific facility type but also relative to other types. This must be done for each pollutant of concern in the program. Once this process is completed, the existence of specific, quantitative removal rates may inadvertently imply an accuracy that does not exist. The New Jersey Manual addresses this concern with the following text:

> *It is important to note that the TSS removal rates shown in [Chapter 4] have been based upon several sources of BMP research and monitoring data as well as consultation with numerous stormwater management experts. As demonstrated by that research, actual TSS removals at specific BMPs during specific storm events will depend upon a number of site factors and can be highly variable. As such, the TSS removal rates presented in Table 4-1 are considered representative values that recognize this variability and the state's need to develop and implement a statewide stormwater management program.*

Another disadvantage to the specified treatment approach is the need to address structural facilities in series or a treatment train. While this was also required with the specified facility approach, the specified treatment approach requires a methodology by which the total pollutant removal rate of the structure series can be determined. In the New Jersey Manual, a simplified equation is presented that allows the determination of the total pollutant removal rate of two separate structural facilities operating in series. The equation is presented below:

$$R = A + B - [(A \times B)/100]$$

where:

R = Total Pollutant Removal Rate

A = Pollutant Removal Rate of the Upstream BMP

B = Pollutant Removal Rate of the Downstream BMP

The equation assumes that the removal rates shown in Table 10-9 for a specific facility remain the same regardless of the facility's location in the series. Recognizing the limitations of this assumption, the manual also provides the following guidelines for arranging the various facilities in the most effective order:

1. Arrange the BMPs from upstream to downstream in ascending order of TSS removal rate. In this arrangement, the BMP with the lowest TSS removal rate would be located at the upstream end of the treatment train. Downstream BMPs should have progressively higher TSS removal rates.
2. Arrange the BMPs from upstream to downstream in ascending order of nutrient removal rate. Similar to 1 above, the BMP with the lowest nutrient removal rate would be located at the upstream end of the treatment train in this arrangement. Downstream BMPs should have progressively higher nutrient removal rates.
3. Arrange the BMPs from upstream to downstream by their relative ease of sediment and debris removal. In this arrangement, the BMP from which it is easiest to remove collected sediment and debris would be located at the upstream end of the treatment train. In downstream BMPs, it should be progressively more difficult to remove sediment and debris.
4. These guidelines should generally be applied in the order presented above. As such, a series of BMPs would be preliminarily arranged in accordance with their relative TSS removal rates (Guideline 1). This preliminary arrangement would then be refined by the BMPs' relative nutrient removal rate (Guideline 2) and then their ease of sediment and debris removal (Guideline 3). Two or more iterations may be necessary to select the optimum arrangement, which should also include consideration for site conditions and the abilities and equipment of the party responsible for the BMPs' maintenance.

The Future

In addition to the two general approaches discussed above, a third approach to designating acceptable structural stormwater management facilities for runoff quality control holds great promise for the future. Under this approach, loadings of a program's pollutants of concern would be estimated from a continuous rainfall-runoff simulation based upon long-term records for actual rain events. These loadings would then be introduced to one or a series of structural facilities that would achieve load reductions on an event-by-event basis based upon both the event and facility characteristics. Upon completion, a comparison could be made over a selected time period between pre- and post-development pollutant loadings.

Utilizing this approach, an urban runoff management program could require specific pollutant treatment or removal levels based upon site location, development type, and/or type and condition of the downstream water body. Such treatment levels could range, for example, from no increase in existing pollutant loadings for low-intensity developments or unimpaired downstream water bodies to a specific decrease in existing loadings for high-intensity developments or impaired downstream water bodies. Reductions in existing loadings may also be appropriate for redevelopment projects in highly urbanized areas with highly impaired water bodies in order to restore such water bodies and address environmental justice issues in such areas.

While the data, models, and other analytical tools are already available and being used for specific development proposals, the application of this approach to a program-wide basis remains in the future. As noted above, the development to date of the Western Washington Hydrology Model (WWHM) by the Washington Department of Ecology represents an initial step toward such an approach. Further movement is expected with the continued development and application of TMDLs for impaired water bodies. A comparison of the two structural facility designation approaches discussed earlier in this section indicates that the specified treatment approach appears initially somewhat better suited to advance toward this more detailed program type.

In summary, the above section on pollutant treatment levels and structural facility performance presented the following ideas and information:

- After identifying pollutants of concern and determining appropriate treatment or removal levels, a list of acceptable structural stormwater management facilities capable of achieving these treatment levels needs to be specified.
- At present, there are two general approaches used to specify such a list.
- The specified facility approach is based upon specifying a list of acceptable structural facilities that will meet the program's runoff quality requirements without specifying facility pollutant treatment performance values.
- The specified treatment approach also specifies a list of acceptable structural facilities along with specific pollutant treatment performance values for each.
- Both approaches have advantages and disadvantages. In general, the specified facility approach requires less initial development. However, the specified treatment approach offers more options in the selection of structural facilities and appears more suited for future development.
- Future urban runoff management programs are expected to be based upon long-term, continuous simulation of runoff and both pollutant generation and treatment.

Structural Facility Selection and Design Criteria

Similar to the 1994 *Fundamentals of Urban Runoff Management*, this section of the structural stormwater management facilities chapter will present information on the selection, siting, and design of structural facilities. However, in the period between the 1994 edition and the present book, the amount of detailed, reliable, and readily available information on these topics has grown at what seems like an exponential rate. The 1994 *Fundamentals* book contained more than 35 pages of structural facility selection criteria, performance data, and design details for seven types of structural facilities, consisting of wet ponds, extended detention basins, oil separators, wetlands, infiltration practices, swales, and sand and leaf compost filters. Much of the information contained in those pages had previously received limited distribution or had been unpublished. However, at the time of this chapter's writing, a single internet search of "structural stormwater management facilities" yields 224,000 sites, while "best management practices manual" yields an additional 6,690,000.

In light of this almost incomprehensible wealth of structural stormwater management facility information, this chapter will take a different approach to providing structural facility selection, siting, and design information. Instead of adding to this vast body of information (and raising the number of structural facility sites to 224,001), it recommends in Table 10-10 those information sources, available through the internet, that it considers exceptional and worthy of note by urban runoff management program developers and administrators. It should be noted that there are many other outstanding sources not mentioned below and that the order of those that are should not be taken as an indication of relative quality or value.

Table 10-10: Recommended Structural Stormwater Management Facility Selection, Siting, and Design Information Sources

Source:	The Stormwater Manager's Resource Center
By:	The Center for Watershed Protection
Site:	http://www.stormwatercenter.net/SMRC_home_test.htm)
Comments:	Outstanding internet site with slideshows, fact sheets, and even a stormwater manual builder.
Source:	NPDES Stormwater Home Page
By:	U.S. Environmental Protection Agency
Site:	http://cfpub.epa.gov/npdes/home.cfm?program_id=6
Comments:	Nothing like going to the Source for information. And there's plenty, including the Stormwater Phase II Final Rule, fact sheets, and outreach materials.
Source:	Guide for Best Management Practice Selection in Urban Developed Areas
By:	American Society of Civil Engineers
Site:	https://www.asce.org/bookstore/book.cfm?book=4058
Comments:	Concise guide that covers all of the pertinent facility selection criteria.
Source:	Stormwater Management Manual for Western Washington
By:	Washington Department of Ecology
Site:	http://www.ecy.wa.gov/programs/wq/stormwater/manual.html
Comments:	One of the most comprehensive stormwater management manuals available. Includes extensive structural facility design criteria and explanations.
Source:	Maryland Stormwater Design Manual
By:	Maryland Department of the Environment
Site:	http://www.mde.state.md.us/Programs/WaterPrograms/SedimentandStormwater/stormwater_design/index.asp
Comments:	Outstanding stormwater management manual with numerous structural facility design examples and sample computations.
Source:	New Jersey Stormwater Best Management Practices Manual
By:	New Jersey Department of Environmental Protection
Site:	http://www.njstormwater.org/bmp_manual2.htm
Comment:	Comprehensive stormwater manual that includes extensive structural facility design, construction, and maintenance criteria, including adopted pollutant removal performance rates.
Source:	Wisconsin Stormwater Manual
By:	Wisconsin Department of Natural Resources
Site:	http://www.dnr.state.wi.us/org/water/wm/nps/stormwater/publications.htm#uwex
Comment:	Extensively researched stormwater management manual with concise presentation of structural facility design criteria.
Source:	Stormwater Treatment Devices: Design Guideline Manual
By:	Auckland Regional Council
Site:	http://www.arc.govt.nz/arc/environment/water/stormwater-tp10.cfm
Comment:	Includes well-researched chapters on numerous structural stormwater management facilities. Proves that both runoff and runoff management expertise know no borders.

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U.S. Environmental Protection Agency and American Society of Civil Engineers, "International Stormwater Best Management Practices (BMP) Database," January 2005.

U.S. Environmental Protection Agency, "National Pollution Discharge Elimination System – Regulations for the Revision of the Water Pollution Control Program Addressing Storm Water Discharges," Federal Register Volume 64 Number 235, December 8, 1999.

Urban Water Infrastructure Management Committee, "Guide for Best Management Practice (BMP) Selection in Urban Developed Areas," American Society of Civil Engineers, 2001.

Washington Department of Ecology, "Stormwater Management Manual for Western Washington," September 2003.

Wisconsin Department of Natural Resources, "Wisconsin Stormwater Manual," 2000.

CHAPTER 11

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CHAPTER 11

Low Streamflow Augmentation and Groundwater Recharge

This is a difficult chapter to write. There is considerable discussion about issues related to low streamflow and the impacts of imperviousness on streamflow, but reality is a bit more elusive. Some researchers have noted that urbanization decreases low flows, others have found that baseflows have increased as urbanization has occurred, and some studies have not been able to support a conclusion either way.

As a result, this chapter will attempt to discuss the issue objectively and make recommendations where appropriate. Clearly, it is a difficult issue to quantify, as very few studies have been conducted over a time scale that is long enough to assess trends or establish very basic issues such as flow change resulting from increased impervious surfaces. Several case studies will be presented that argue both sides from a trend perception.

Stormwater professionals are increasingly aware both of the impacts that stormwater volumes have on sizing of stormwater practices and the possible impacts of additional volumes on receiving system health. A number of practices are available to reduce total stormwater runoff, including water reuse and practices that increase retention of water in the soil mantle, but reducing surface runoff is not the same as maintaining groundwater recharge. There are many situations where both types of practice (volume reduction and recharge) must be used in conjunction if downstream receiving system protection is to be provided.

If an effective policy is to be developed, there must be an understanding of groundwater/surface water interaction, recharge/discharge zones, and hydrogeology. It is also important to be aware of the ambiguity that surrounds the issue so that an intelligent discussion and a better understanding of possible variables can result.

It is important to note that the following discussion does not address the impacts caused by the use of groundwater as a water supply source. While aquifer drawdown by water supply wells can result in the loss of groundwater resources, the issue is beyond the scope of this manual.

General Understanding

First, it is important to define what low streamflow is.

> *Low streamflow is that flow that occurs during periods of little rain, typically in mid-late summer and can be highly variable over time primarily due to watershed geology, climate, and topography. It can also be affected by many other factors.*

When it is not raining and runoff into streams through the drainage system has ended, the flow in the stream is derived from groundwater. If groundwater levels are reduced so that they decline below the stream bed invert, the stream loses its ability to have perennial flow. It then becomes an ephemeral stream and loses the potentially rich biologic atributes that a perennial stream can have.

Baseflow is influenced by groundwater gradient, hydrogeologic properties (eg. permeability) of the aquifer materials, and the properties of the materials at the surface water/groundwater interface. With urbanization,

the main change is in groundwater gradient. Areas with steeper gradients are likely affected differently than areas of low hydraulic gradients. Recharge areas will be affected more than discharge areas. Examples of two types of aquifers are shown in Figure 11-1.

Our study of stormwater over the years has focused on imperviousness as an effects indicator. Impervious cover does significantly increase peak rates of discharge and volumes. The perception is that impervious cover will reduce groundwater recharge and cause water levels in urban streams to decline during dry periods. The groundwater table is not replenished, as surface runoff during storms will carry water away that would otherwise infiltrate into the ground.

From a stormwater management perspective, we initially controlled runoff by detention practices that might mitigate downstream flood increases, but detention ponds, and even retention ponds (due to bottom sealing) have not resupplied water to groundwater. Infiltration practices are among the few urban practices that provide groundwater recharge at least as a byproduct.

Attempts to detect the effect of impervious surfaces on stream baseflow are very difficult due to the need for long-term data from watersheds where the hydrological record has existed prior to watershed development and extended throughout the development period. Too often, gauging stations are discontinued or are on watersheds so large that development on a subwatershed level will not show significant change. In addition, groundwater supply may come from an area outside of a subwatershed or from an area that has not been developed.

As a result, most of our understanding stems from a rational expectation that imperviousness reduces groundwater recharge, which then translates into reduced stream baseflow.

Various Influences on Stream Base Flow

Transpiration, Evaporation, and Evapotranspiration

Transpiration, the process by which water from plants is discharged into the atmosphere as vapor, depends essentially on the same factors as those which control evaporation, namely air temperature, wind velocity, and solar radiation. Transpiration also varies with the species and density of plants and to a certain extent with the moisture content of the soil, in that a certain minimum amount of water must be available to the plant roots.

Evaporation is the process whereby liquid water becomes water vapor. It includes vaporization from water surfaces, land surfaces, and snow fields, but not from leaf surfaces.

Evapotranspiration, the combination of evaporation and transpiration, is the consumptive use of plants, or

Figure 11-1: Two Common Types of Aquifers

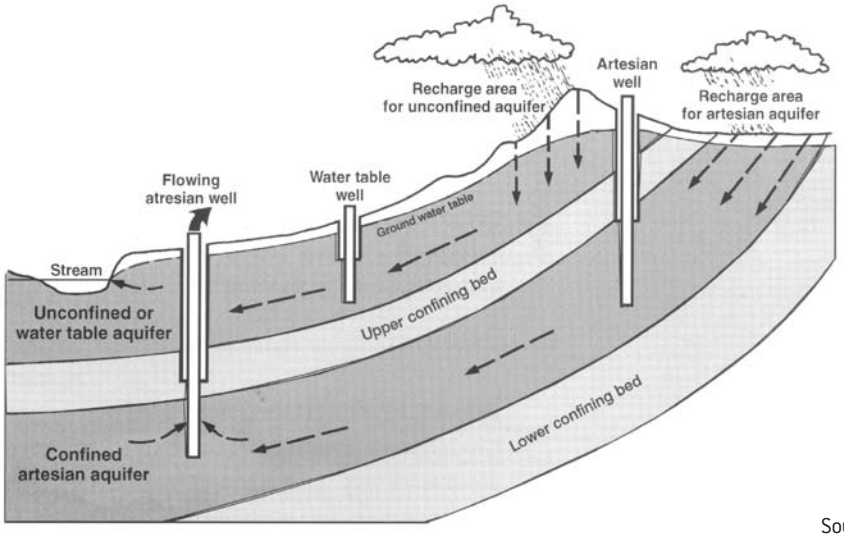

Source: Arc, 2003

the total amount of water absorbed by vegetation for transpiration or building of plant tissue, plus evaporation from the soil. Evapotranspiration has a significant effect on water yield from a watershed. It has to be considered on a seasonal as well as an annual basis to allow a good understanding of fluctuation and total amounts.

Timing of Groundwater Response

The effect of land use change on watershed yield is not instantaneous. While the evaporated and runoff components may respond relatively quickly to a land use change, increased recharge to a groundwater system may not express itself as a corresponding increase in surface discharge for many years. The timing of effects of a large-scale land use change on watershed yield will be different throughout the range of groundwater systems within a watershed.

Timing is effected by both shape and profile of a groundwater system, and these two factors have significant impacts on where surface discharge may occur in different land use scenarios. Another timing factor is the depth of unsaturated zone above the aquifer. This does not affect the equilibrium discharge conditions, but it will affect the timing of the response to recharge change, since aquifer heads will need to increase to a higher level before surface discharge can occur.

Predictors of groundwater response times are an essential part of predicting likely effects of land use change on low streamflow.

Leakage

Storm drains and sanitary sewers can function in two different ways. On the one hand, they may intercept groundwater, convey it downstream, and thus reduce groundwater levels in the vicinity where the water was intercepted.

On the other hand, sanitary sewer pipes may augment groundwater by leaking into adjacent soil and elevating groundwater levels through continuous flow.

The same could occur if potable water lines leaked. Water supply systems may have significant influence on groundwater levels, because leakage from a pressurized water main would occur all of the time, not just during storm events.

Both of these situations are common in urban utilities and may to some degree offset impervious surface impacts.

Compaction

The issue of compaction is extremely important when considering infiltration and subsequent impact on base stream flow.

Infiltration of rainfall into pervious surfaces is controlled by three mechanisms:

- The rate of entry of water through the soil/plant surface;
- The rate of movement of water through the vadose (unsaturated) zone; and
- The rate of drainage from the vadose zone into the saturated zone.

During periods of rainfall excess, long-term infiltration is generally the least of these three rates. The runoff rate after depression storage is filled is the amount by which the rainfall intensity exceeds the infiltration rate. The infiltration rate typically decreases during periods of rainfall excess. Storage capacity is recovered when the drainage from the vadose zone is faster than the infiltration rate.

The surface entry rate of water may be affected by the presence of a thin layer of silts and clay particles at the surface of the soil and vegetation. These particles may cause a surface seal that would decrease a normally high infiltration rate. The movement of water through the soil depends on the characteristics of the underlying soil. Once the surface layer is saturated, water cannot enter soil faster than it is being transmitted away, so this transmission rate affects the infiltration rate during longer events. The depletion of available storage in the soil affects the transmission and drainage rates, and the storage capacity of soils depends in turn on the soil thickness, porosity, and the soil-water content. The effective porosity of the soil is again affected by many factors, such as soil texture, root development, soil insect and animal bore holes, structure, and presence of organic matter.

The infiltration of water into the surface soil is responsible for the largest abstraction of rainwater in natural areas. The infiltration capacity of most soils allows low-intensity rainfall to totally infiltrate, unless the soil voids become saturated or the underlain soil is much more compact than the top layer. High-intensity rainfalls generate substantial runoff because the infiltration capacity at the upper soil surface is surpassed, even though the underlain soil might still be very dry.]

Urban development increases runoff due to a number of reasons, including impervious surfaces, but urban soils may also be significantly compacted during the urban

development phase of land conversion. Soil compaction due to construction significantly reduces infiltration capacity of urban soils. For one, it will reduce the organic content of the surface layers, generally seen as a reduction of topsoil depth in a post-, compared to a pre-development condition. Also, urban land development generally involves massive site clearance of vegetation and movement of dirt with large areas of cut and fill, all of which require heavy earth-moving equipment that compacts soils. These areas, even vegetated, have significantly reduced ability to infiltrate rain into the ground, which further reduces groundwater recharge. In addition, the use of exotic plants over native vegetation may result in roots being shallower. Urban soils are very shallow to begin with, and the lack of penetration into the ground reduces infiltration rates further. A pre-development condition for a site may be forest with deep-rooted woody vegetation or meadow with shrubby plants that also have deeper roots. Prairie grasses have exceptionally deep roots that improve soil infiltration rates.

Percentage of Baseflow Versus Streamflow

A number of studies have discussed percentages of baseflow versus total streamflow. In all studies reviewed, the percentage of baseflow versus stormflow decreases as watershed imperviousness increases. That is not a surprising result, as impervious surfaces have profound effects on overland flow rates and volumes. But at the same time, a reduction in percentage of baseflow versus total streamflow does not necessarily mean that baseflows in a given stream are decreasing as a result of watershed development. It only means that a greater percentage of flow is now "quickflow" or stormflow.

The Auckland Regional Council study on the Oteha stream found the baseflow ratio reduced from 0.79 to 0.4 between 1982 and 2002. But baseflow is highly variable and shows no real trend. Rainfall variation in this study had a bigger influence than urbanization. There may be a lag effect where effects may be more rapid in high permeable materials such as sands or gravels.

Recognizing that watershed hydrology is determined by rainfall, land cover (which also affects evapotranspiration), soils, slopes, and conveyance, a reduction in the percentage of flow that is baseflow may not necessarily mean that baseflow itself is decreasing at all. There may be a reduction in evapotranspiration that allows a percentage increase in total streamflow as less is sent back to the atmosphere.

Trends would indicate the potential for decreasing groundwater recharge, but the effect has not been clearly defined. We know what level of recharge is necessary to maintain stream baseflow. What we do not know are the compounding factors or sources of other influences on groundwater recharge. Studies around the U.S. and New Zealand would indicate that there are situations where post-development baseflows are higher than pre-development, which presents a problem with establishing recharge requirements.

Case Studies

There are a number of case studies that may provide a greater understanding of the baseflow issue.

North Carolina (Evett et al., 1994)

Baseflow and precipitation trends at U.S.G.S. gage sites were studied in four urban centers and surrounding rural areas. The flows in these areas decreased in recent years. While the results tend not to support the development/reduced baseflow discussion, they did show that trends in precipitation alone cannot account for the decreased flow in urban and rural streams. Regional land use effects could be exerting some negative effect on the rural streams as well.

Explanations given in the study were the following:

- The urbanization effect on baseflow exists but may be too small to show up in the statistics.
- Some substrate types are less vulnerable to reduced groundwater recharge than others.
- The streams studied were large and of mixed land use. Factors outside the station area may have exerted an effect at the measuring point.

It was concluded from the study that there is some support for the theory that urbanization causes a decrease in low streamflows over time, but statistically, the results are inconclusive. It appears more likely that most small streams, both urban and rural, are experiencing decreasing low flows over time to a greater degree than would result from decreasing trends in precipitation alone.

Long Island, New York (Simmons and Reynolds, 1992)

This study and an earlier one (Simmons and Reynolds, 1982) attributed the alteration of flow components to the installation of sanitary sewers for the conveyance of treated wastewater to tidewater, the routing of stormwater directly to streams, and an increase in impervious surfaces throughout the watersheds. They reported as much as a 70 percent reduction in baseflow in streams draining Long Island between 1948 and 1985.

Upper Chattahoochee River Basin, Georgia (Calhoon, Frick, and Buell, 2003)

The baseflow component of total streamflow in Peachtree Creek has declined from approximately 50 to 30 percent since continuous streamflow measurements began in 1958. Equilibrium in the baseflow decline does not appear to have been reached in this watershed, and it can be extrapolated that without any additional increase in urbanization, further declines in baseflow will occur. Conversely, baseflow components of total streamflow in Snake Creek and the Chestatee River, watersheds that had little to no urban development, have been more consistent over time.

An extrapolation done in the study shows that for each percent increase in impervious area, there is a corresponding decrease in baseflow of approximately 2 percent.

It must be pointed out that the study did not actually look at baseflow level reduction but rather considered it as a percentage of total streamflow. The relative contribution of baseflow to total flow was reduced, but no conclusions can be stated regarding actual reductions in stream baseflow as a result of urbanization.

Upper River Rouge Watershed (Richards and Brabec, undated)

Analysis of discharge data from the Upper River Rouge at Detroit shows a gradual increase in baseflow and streamflow since 1932. The trend was consistent even in the late 1990s when the precipitation decreased over a three-year period. It is possible that changes in seasonal precipitation distribution account for some of this increase in baseflow. Most of the recharge in a watershed occurs in the dormant season, particularly in the late fall, when evapotranspiration fluxes are low. Climate changes that increase the proportion of precipitation falling in the dormant season could increase baseflow with no apparent increase in annual precipitation. Thus, if a drop in evapotranspiration is the cause of the trend, its decrease has to be related to either the presence of imperviousness or changes in the type and aerial extent of vegetation which are reducing the efficiency of evapotranspiration.

Another interesting possibility discussed is that climate changes have decreased the driving force for evapotranspiration over the study period. A decrease in evapotranspiration will increase the amount of water available for recharge. Annual potential evapotranspiration (estimated using the Thornwaite method) over the period of interest suggests that the driving force for evapotranspiration has not changed significantly. Total streamflow and surface runoff have increased significantly over the time period.

Australia (Zhang, L., et al., June 2003)

There have been a number of studies in Australia that estimate response of groundwater systems to changes in recharge that arise from land use changes. A primary emphasis of some of these studies is concern over expansion of saline land surfaces and rising river salinities that occur in many parts of Australia.

In addition, Australia is a very dry climate, and other studies have considered the effects that large-scale afforestation has on the volume of streamflow and the associated water allocations. The impact of afforestation on mean annual flow is well known, but efforts have been underway to better understand its impact on seasonal flow or flow regime. It was found that blue gum plantations would significantly reduce low flow and hence increase flow variability. Results indicated that the maximum reduction in mean annual flow would be 8 percent for Lake Eidon and 14 percent for Goulburn Weir if all suitable areas were planted.

New Zealand (Herald, 1989)

Monthly streamflow yields and flow duration curves for watersheds of pastoral, urban construction, and fully urbanized land covers were compared. Due to missing data, it was not possible to compare annual water budgets for the study watersheds. However, comparison of the area-specific yields for the periods for which data were available provided a useful index for the magnitudes of change likely to occur as urban development proceeds.

Groundwater recharge was markedly reduced as a result of urban development. An index of monthly groundwater recharge showed substantial recharge in the pastoral watersheds during four months of the study period, but only limited recharge in the urban construction watershed during three months, and no recharge in the urban watershed. An intuitive assumption commonly suggested in the literature is that the reduced groundwater recharge subsequent to development leads to a reduction of low flows. However, although results of the study show an increase in total discharge and a decrease in groundwater recharge, low flows were also seen to increase in both frequency and magnitude. These findings may suggest that more sustained low flows result from the urban watershed responding more rapidly to lower-intensity and shorter-duration rainfall than pastoral watersheds.

General Discussion

There is probably truth in both the assumption that infiltration to groundwater is reduced by urban impervious surfaces and that evaporative losses may be reduced since both interception storage and depression storage are often reduced by urban development. The net effect of these changes is commonly an increase in total runoff. When considering low streamflow or baseflow, the issue is one of prediction from a trend perspective.

This is an important issue, as designing for infiltration on a watershed basis may result in groundwater levels potentially being higher than during the pre-urbanization period. At the same time, disregard for potential drop in groundwater levels due to urbanization may result in loss of perennial streams and their associated aquatic ecology.

The important point to recognize is that the two issues are not necessarily at the opposite ends of the "hydrological spectrum." Through watershed-wide approaches, we can consider the variables that have the greatest effect on stream baseflows.

The historical approach of predominantly using wet or dry stormwater management ponds cannot address the issue. Any analysis of extending pond outflow durations will not address overall changes to groundwater recharge or discharge, because no stormwater ponds, no matter how large, can delay wintertime rainfall sufficiently for it to become summertime runoff. Yet exactly this magnitude of delay does occur under pre-development conditions, because far more of the precipitation is stored as groundwater than can ever be stored in stormwater ponds. This stored precipitation is also released from the groundwater much more slowly than from a pond. Therefore, we have to rethink our traditional approaches to stormwater management if we consider stream baseflow protection an important program issue.

The specific issues that seem to relate to variations of stream baseflow are:

- Watershed imperviousness;
- Compaction of soils;
- Loss of watershed evapotranspiration;
- Existence of significant natural recharge areas; and
- Leakage of water and sewer pipes.

With all that said and done, we need to recognize that there are adverse impacts to the urbanization of previously undeveloped land. If we are going to continue with traditional development approaches, we will lose many of those resources that attract us to a given location. If we can implement a stormwater program that addresses these items, stream baseflow impacts can be better predicted and designed for.

Recommendations

When considering recommendations for an approach to low streamflow maintenance, we need to address the items mentioned in the *General Discussion* section of this chapter. In addition, there are obvious overlaps with other chapters, especially Chapter 8, Impact Avoidance. We have to recognize the value of natural site features, including existing vegetation, and protect those features.

Reduce the Impact of Watershed Imperviousness

Urban land use will continue to create and maintain impervious surfaces. Roads must shed water for safety reasons, and structures cannot leak. With that said, we can reduce the impact of those impervious surfaces through a number of different actions, including the following:

Disconnection of Impervious Surfaces from the Historic Drainage System

This approach would mean disconnecting roof runoff from the historic drainage system. The basic approach here is to reduce the efficiency of the stormwater conveyance system by slowing the water down and allowing greater contact with vegetation and soil.

Green Roofs

Green roofs are being considered much more as a mainstream practice than they have been historically. In the early 1980s, rooftop storage was a measure considered for detention of stormwater to reduce potential increases in peak flow. At that time, it was eliminated as a practice because roof leakage was a problem. Using an impermeable membrane in conjunction with better site control will reduce leakage concerns. A good design approach for green roofs can provide significant hydrological benefits for smaller storms and improve evapotranspiration potential.

Water Reuse

Water reuse is a good practice even if stream baseflow is not an issue. Use of roof runoff for water reuse reduces not only the total volume of stormwater runoff but also demand for public supply. Unlike evapotranspiration, which is very seasonal in benefit, water reuse provides benefits all year, as long as there is water use in a residential, commercial, or industrial property. Water reuse can be very beneficial on industrial properties where water is essential for day-to-day operations.

Bioretention Practices

Bioretention practices include rain gardens, filtration systems that use organic materials, swales, and filter strips. Studies have detailed volume reductions for these types of practices in the range of 20 to 35 percent, and a recent study in Melbourne detailed a 54 percent annual reduction of total runoff. That is a significant reduction in runoff volume. Bioretention practices can be used in very urban environments such as parking areas, or along roads as swales.

Infiltration Practices

In an urban environment, putting water into infiltration will help maintain groundwater recharge and take out some of the stormflow and pollutants, which provides multiple benefits. Infiltration practices are especially appropriate on small sites where total drainage to the practice is fairly small. Having more practices serving smaller drainage areas, rather than fewer practices serving larger ones, is desirable, as clogging may reduce overall effectiveness and total clogging of one or more systems is not as critical if there are more practices serving the same property. In addition, when imple-

Melbourne bioretention practice where total volume study was done

Example of an infiltration practice used for groundwater recharge

menting infiltration practices, it is important to put a greater effort into providing infiltration in recharge areas and less effort into discharge areas. There is still concern about long-term performance of infiltration practices, and an aggressive program of site inspection and maintenance is necessary to ensure that proper maintenance is accomplished.

It is important that all of the above practices be used in a "treatment train" approach to protecting stream baseflow. Possibilities for a reduction of "effective" imperviousness exist on any new development and can often be considered cost-effectively as a retrofit. In Auckland, a number of industrial sites have instituted water reuse on sites that are completely impervious, and benefits include reduced water charges for plant operation in addition to reduced stormwater quantity and quality concerns.

Revegetation of steep slopes and footprinting house locations in a development to minimize surface runoff

Example of a porous block parking area

Minimize the Impact of Soil Compaction

The easiest way to reduce soil compaction is to keep construction equipment off site areas that are to be left in a natural state. That is often not possible due to maximum development for profit margins. Still, there are a number of ways in which this concern can be addressed and soil permeability improved:

1. Where cuts or fills of at least two feet are intended to facilitate site development, the expected permeability of the soil may be reduced. Stormwater management computations that detail post-construction hydrology should use a modified approach to soil classifications.
2. In areas of significant site disturbance, and where there is less than two feet of cut or fill, soil classifications are not modified, but the approved site permit should contain a construction requirement that significantly disturbed soils in areas where those soils remain pervious should be chisel-plowed. Chisel-plowing will break the surface crust of the disturbed soil and allow for a greater infiltration rate. This would provide a good foundation for the placement of topsoil and prevent slippage of the topsoil on slopes that become saturated.
3. Use of soil amendments (compost, polyacrylamides) or otherwise modifying soil structure and chemical characteristics is becoming more popular. At present, there is little information to quantify benefits or problems with their application.
4. Rather than using a minimum depth of topsoil that is stockpiled and disposing of the rest off-site, the depth of topsoil that is retained on site should be maximized. This topsoil can act as a sponge during rainfall. One good requirement would be to maintain, to the extent possible, the same volume of topsoil on a property post-development that existed prior to development.
5. Woody vegetation should be planted in open space areas to improve root depth penetration. There will be a period of time when compacted soils reduce permeability, but long-term benefits will be obtained.

Maintain Watershed Evapotranspiration

In a number of places in this manual the value of vegetation has been stressed. Maintaining evapotranspiration in a watershed is an effective balance to prevent increases in groundwater levels. For years, people have been planting willow trees in areas of high water table to reduce groundwater levels. Native vegetation, deeper roots, protection of existing woody vegetation, or planting more vegetation all provide a wealth of benefits, including seasonal drawdown of groundwater and maintaining a balance for groundwater recharge. The above-mentioned Australian study on afforestation shows that woody vegetation can have a significant impact on baseflow. Those study results can be considered in an urban context where woody vegetation has been removed and groundwater levels could increase.

Leave Areas of Significant Recharge Natural

In every watershed, there are areas where significant groundwater recharge occurs. In general, these areas are away from stream channels but not situated on steep slopes. They are sandy soils and sandy loam soils that have high infiltration rates. In existing wooded areas, these soils act as a sponge for any rainfall that lands on them. Before development occurs in a given watershed, watershed planning should detail environmentally sensitive areas that include areas of significant groundwater recharge. Those areas should be targeted for limited growth and site disturbance. Watershed areas with limited recharge capability would be more suitable for higher levels of site disturbance and development.

Prevent Water and Sewer Pipe Leakage

Older water supply and wastewater pipe systems certainly leak. Design criteria for both also have a factor of safety for pipe sizing that accounts for infiltration or exfiltration. Newer construction techniques can minimize that historic leakage problem, but this is only done on an emergency basis or where pipe systems must be upgraded to account for increased demand.

Wastewater systems are in the unenviable position of having exfiltration concerns when the pipe is above the water table and infiltration concerns when it is adjacent to a stream and in the water table. As a result, there is both the potential to augment groundwater flows and to reduce groundwater levels.

The actual impact of this is not expected to be significant. If you assume 10 houses per hectare with each house using 200 m^3 of water per year, and there is a 20 percent leakage of water into the ground, monthly increases are expected to be only 3 mm over those generated from inputs of rainfall. This is a negligible increase that would be expected to have a limited effect on groundwater levels.

Concluding Comments

One very important point in considering stream baseflow is the need for planning from a watershed perspective. The protection of, for example, a sensitive trout or salmon stream can only be achieved if it is considered entirely from a watershed perspective. Many program priorities can be addressed by a standardized approach that incorporates impact avoidance principles. Protecting stream baseflows will rely to some degree on these principles, but it will also require fairly detailed land use considerations if the goal of stream baseflow maintenance is to be achieved.

The bottom line of the discussions presented in this chapter is that we need more information in more areas to be able to make predictions for the impact of development on stream baseflow. We do not even have a clear understanding of whether stream baseflow will increase or decrease. There is certainly an expectation that stream baseflows will decrease with increasing watershed imperviousness, but existing studies cannot verify whether that is true.

We cannot expect people to pay thousands of dollars to implement practices that may provide a stream lowflow benefit but may also have little value or even increase groundwater levels above the pre-development one.

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CHAPTER 12

Watershed Management Approaches

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CHAPTER 12

Watershed Management Approaches

The complexity of urban runoff quality and quantity problems has been documented and discussed throughout this book. This chapter discusses the benefits, challenges, and technical requirements of using a watershed-based approach to address these problems and to manage urban runoff in a truly comprehensive manner. To accomplish this, the chapter presents the following topics:

- What is a watershed?
- What is watershed management?
- Why use a watershed management approach to manage urban runoff?
- Which aspects of urban runoff can watershed management address?
- What are the technical and program requirements of watershed management?
- What challenges and difficulties can be expected when utilizing a watershed-based approach?

The chapter also includes information on the development of total maximum daily loads (TMDL), a federally mandated, watershed-based approach to addressing water quality problems along specific water bodies. The chapter concludes with a look at what future watershed management efforts may encounter and address.

As with many of the topics presented in the original 1994 *Fundamentals of Urban Runoff Management*, much has been written regarding watershed management over the last 11 years. This growth is expected to continue and even accelerate in the future due, in part, to the almost limitless range of problems and solutions that could be addressed through a watershed-based approach. A recent Internet search for information on "watershed planning" returned over one million hits.

Not surprisingly, EPA has a number of guidance documents available on watershed management, including the website www.epa.gov/watertrain, which provides online training in a variety of watershed management issues. The site includes a number of topics including watershed change, analysis and planning, watershed ecology, and watershed management practices and community issues. It serves as an excellent starting point to acquire a greater understanding of watershed management issues.

In light of this vastly greater amount of information, it is not the purpose of this new chapter on watershed management to simply repeat or cite information that is readily available from others. Instead, the chapter will discuss those watershed management issues that, in general, have not been considered or addressed by either researchers or program managers. These discussions will seek to identify not only the benefits of watershed-based runoff management planning but also the short- and long-term commitments that must be made to develop an effective watershed plan that will not diminish in value or effectiveness over time. Clearly, watershed-based approaches have proven to be essential components of successful stormwater management and resource protection programs. Identifying not only the benefits but the challenges associated with watershed management in this chapter should increase the number of successful watershed management efforts.

What is a Watershed?

A watershed is a geographical area from which stormwater runoff, and the pollutants and other materials borne by that runoff, drain to a down gradient central collector such as a stream, lake, or estuary. As such, a watershed is often named for the water body that conveys this runoff at the outlet. The term watershed means just that – an area of land that, from rainfall, produces or "sheds" water in the form of runoff and delivers it to a specific point. Figure 12-1 shows a series of watershed maps: the first details ephemeral and perennial streams, the second shows intended land use, and the third shows riparian cover and locations of stormwater wetlands.

A watershed's size is in part defined by the topography of the surrounding land and upon the location chosen as its outlet. Often the latter reflects a point where runoff rates and/or sediment or other pollutant loadings need to be computed. Depending upon the resultant size, a watershed may also be described as a drainage area or catchment, although these terms normally apply to areas smaller than those typically considered watersheds. As the larger of these areas, watersheds can be considered to be comprised of a collection of drainage areas, catchments, or subwatersheds. A watershed may alternately be referred to as a basin, particularly by federal agencies such as the U.S. Army Corps of Engineers. Whatever term is used, the general concept remains the same: When a raindrop falls within a watershed and produces runoff, that runoff will ultimately pass through the watershed's outlet.

Figure 12-1: Watershed Maps Showing (From Top) Stream Networks, Land Use and Riparian Corridors, and Stormwater Practices

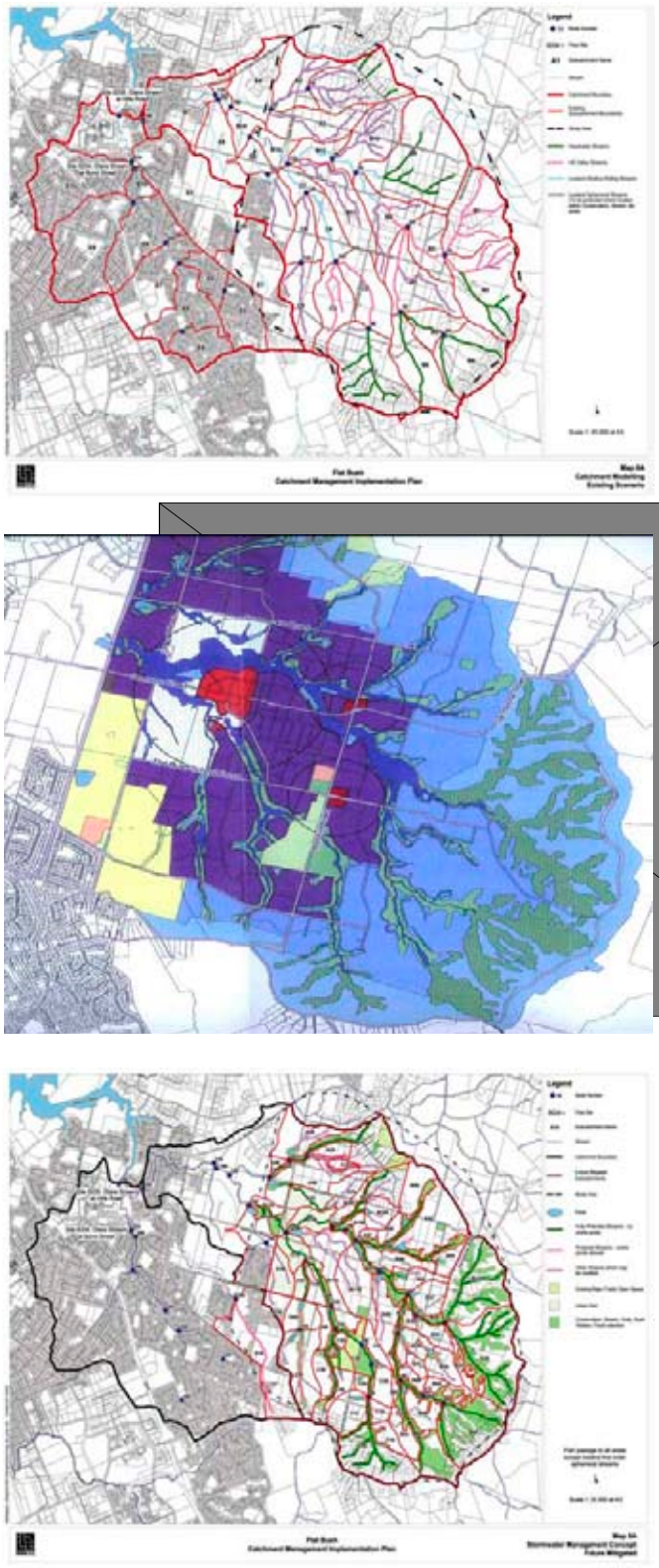

What is Watershed Management and Why Should it be Done?

If the goal of an urban stormwater runoff management program is to address a runoff-related problem or protect a water resource at a particular location, and a watershed represents the entire area of land that contributes runoff to that location, using a plan that addresses the problem or protect the resource that is based upon managing runoff over the entire watershed is a technically sound strategy. By basing the plan on the entire watershed rather than a single location or portion

within it, all of the relevant factors contributing to the problem can be included in the planning process. In addition, this approach increases the number of potential solutions to the problem or threat.

This logic can be used to both describe what watershed management is and why it should be pursued. Basing urban runoff management decisions on the entire watershed provides a flexible framework for considering and integrating all pertinent factors and resources into both the analysis of runoff-related problems and threats and the development of their solutions. Watershed management also allows multiple problems to be prioritized and multiple solutions, including their development, implementation, and funding, to be sequenced in the most efficient and effective manner. And where alternative solutions exist, watershed management provides the framework by which they can be comparatively evaluated using the broadest set of factors.

Similarly, if a regulatory, policy, or program approach to a problem or threat is considered to be the most effective solution, watershed management offers the most comprehensive and effective means by which such solutions can be identified, developed, and implemented. Such results cannot be achieved using a localized, piecemeal, or site-specific approach. As previously discussed in Chapters 1 and 2, this is particularly true of the EPA's TMDL approach which defines the pollutants of greatest concern and then uses regulations and discharge permits to achieve required pollutant load reductions from dischargers. Such a result can be achieved only through a watershed-based analysis and implementation effort.

In light of all the above information, it may be more intriguing to ask why watershed management should not be done rather than why it should be.

Watershed-based urban stormwater management continues to expand, a trend that is expected to continue in the future as more runoff-related issues are identified and our watershed management skills and databases increase. The next section of this chapter will discuss those urban runoff- and water resource-related areas that either should or could be addressed from a watershed management perspective.

The Watershed Management Universe

Runoff Quantity Considerations

Runoff quantity impacts have been addressed with a watershed management approach for several decades. Watershed managment was initially used to control or reduce flooding, but now is commonly employed to control development-induced impacts caused by increases in pollutant loading, peak runoff rates and volumes. Such controls have been achieved through structural, nonstructural, and regulatory measures. The various watershed management plans described in detail in Chapter 10 are all examples of this proven use of watershed management.

More recently, watershed management tools have been increasingly used to investigate how to protect stream channels from erosion due to the increased runoff volumes resulting from watershed development. Many questions regarding the mechanisms by which such erosion occurs and the runoff controls required to prevent it, remain unanswered and further research and analysis are needed. Nevertheless, there is growing consensus that a stream channel's physical structure can only be protected if watershed development is designed to occur without causing significant change in watershed runoff rates and volumes. Such results are the fundamental goal of the newer low impact design approaches discussed in detail in Chapter 8. Developing the site design strategies, measures, and requirements necessary to achieve these results can clearly best be done on a watershed-wide basis. Attempting to develop and implement them on a site-by-site basis will be far less successful, and in many cases will not work.

Runoff Quality Considerations

Water quality problems and threats are also best addressed on a watershed basis. This approach can not only best identify the overall extent and severity of the problem or threat, but it also has the greatest potential to identify all of the relevant sources or causes. For example, if downstream water resource protection damage is the problem, such as in the Chesapeake Bay and Puget Sound runoff management programs,

watershed-based studies are necessary to determine all causes of degradation. Once such a determination has been made, the same watershed-based framework can be utilized to develop a comprehensive range of structural and nonstructural solutions, oversee their implementation, and administer their financing, operation, maintenance, and/or enforcement.

Addressing the causes or sources of runoff quality problems can be used to further illustrate the power of watershed management and its advantages over a limited, site-by-site or piecemeal approach. For example, watershed-based studies of the Upper Waitemata Harbour in New Zealand (NIWA, 2004) demonstrated how a single sub-watershed discharging to the harbor estuary accounted for virtually all of the zinc that was damaging this important aquatic resource. This knowledge will allow the development of a focused zinc control program in the subject watershed only, thereby avoiding the considerable time, effort, and other resources that would have been wasted developing and implementing similar controls throughout all of the estuary's watersheds. Furthermore, the framework established by this watershed management approach can further be used to determine the optimum combination of structural, nonstructural, and regulatory solutions to address the zinc problem. Once again, such results can only be achieved by utilizing a watershed-based approach.

Wastewater Considerations

Watershed management principles and capabilities can be extended to address both wastewater and water supply issues. This applies to both combined sewer overflows (CSOs) and combined sewer systems (systems where both sanitary and stormwater are conveyed to a plant for treatment). In both cases, a watershed-based approach is essential to addressing runoff quality or water body impacts. In the case of a CSO, segregating stormwater from wastewater would eliminate the discharge of untreated wastewater into the receiving system. As for combined sewer systems, separation of wastewater from stormwater would then allow smaller stormwater flows to discharge untreated where they would have gone to a wastewater treatment plant. Very clearly, prioritization needs to be made on water quality issues when combined sewers are considered. In addition, it is absolutely necessary to include consideration of combined wastewater systems in a watershed-based context if the goal is downstream water resource protection. If funding is limited to a given level, a greater return on the expenditure may be realized by prioritizing separation of combined systems ahead of implementing nonpoint source controls on urban area runoff. Such decisions can only be made using a watershed-based approach.

Similarly, the use of separate wastewater systems is important when considering watershed management. The frequency and volume of overflows from a combined sewer system may have a significant effect on receiving water quality. If the combined wastewater and stormwater system is so undersized due to both system age and ongoing watershed urbanization that damaging overflows occur on a frequent basis, upgrading the combined sewer system to reduce the frequency of such overflows may in fact be the best approach to improving receiving water quality. New development or redevelopment in such a watershed may still have stormwater requirements placed on them, but the expenditure of public funds would target the combined sewer system upgrade. Once again, such solutions can only be identified and developed through watershed management.

Water Supply Considerations

There are also situations where continuing watershed urbanization can have significant water supply impacts and where a watershed management approach can best be used to address them. For example, if current public water supplies are inadequate and the expansion of the system is either infeasible or too expensive, the new development will need to rely on on-site groundwater sources of potable water. At such developments, both groundwater recharge to increase the supply of water and water reuse to reduce its demand will help to ensure the success of this water supply strategy.

In addition, both water reuse and groundwater recharge can not only be a valuable water supply tool but they can also reduce development site stormwater runoff volumes. For example, approximately 60 percent of average annual residential water use is for toilet, laundry, and outdoor use. If the water needed for these activities could be obtained from roof runoff that was captured and stored, it would be removed from the stormwater drainage system. Such reuse then becomes a volume reduction practice in addition to reducing

reliance on potable water. Runoff volume reductions can also be achieved if a portion of a development's site runoff can be recharged into the groundwater.

The effectiveness of such practices can best be evaluated through a watershed management approach that includes consideration of both public water supply and stormwater management needs. Such a watershed-based approach could then include cost considerations to determine whether such on-site measures could effectively replace the need to expand off-site public sources. Benefits of water reuse can become even greater for commercial or industrial sites which traditionally use significant amounts of water. The historic provision of cheap, high-quality water has limited consideration of water reuse in the past, but the additional need to consider volume reduction practices on a stormwater program should lead to greater consideration of water reuse in the future. This is only possible if the issue is considered from a watershed management perspective.

Watershed Management as a Means to Managing Growth

Historically, stormwater runoff impacts have often been considered as simply the effects of land development and watershed growth that can be addressed through management practices after such growth has been planned. This is based on the expectation that stormwater management practices can be relied on to adequately mitigate the effects of almost any type and degree of watershed development. This expectation has led many planners to exclude considerations of stormwater management capabilities and limitations from land development and growth decisions and to include them in the planning process only as a response to those decisions. However, recent studies, including those detailed in earlier chapters of this book, have highlighted the limitations of stormwater management and have demonstrated that adverse, long-term impacts on receiving waters due to watershed development can occur despite the level of stormwater management controls applied to that development. In such cases, the abilities and limitations of stormwater management practices must be considered an integral part of land development and watershed growth decisions and not simply turned to as a response after the fact.

In addition to the specific examples described in the research, there are general examples that highlight this problem. For example, the headwaters of a watershed have very steep slopes that significantly reduce the range of effective stormwater management practices that may be used to address the impacts of development. In other portions, clay soils may preclude the use of infiltration or other runoff volume management practices that would ordinarily be expected to prevent increases in runoff volume. Or conversely, highly permeable sandy soils in any area may achieve significant aquifer recharge and should be left undisturbed rather than built upon and mitigated by stormwater management measures that cannot achieve the same long-term recharge as the existing, natural systems. If such stormwater management factors are not identified and considered during the development of master plans, zoning ordinances, and other land use planning processes, the final development types and levels authorized by those processes may have adverse impacts that exceed the capabilities of the available stormwater management practices. However, if such factors are identified and included in the land use planning process, such impacts can be avoided through the selection of development types, levels, and locations that can be controlled by available stormwater management measures. Unfortunately, land use and development decisions are often reached without regard for stormwater management possibilities and constraints. This can lead to land use decisions that will have severe and even irreversible impacts that could have been avoided.

During land use planning efforts for a given watershed, decisions should be made as to what level or degree of development, if any, can be allowed to occur with a reasonable expectation that the available stormwater management practices in the watershed will be able to manage the resultant adverse stormwater impacts. Only those development levels and types that are controllable by available stormwater management practices should be allowed in the watershed and included in the watershed's land use plans and regulations. Such land use planning and regulation decisions can only be made through a watershed management approach.

Finally, the watershed management approach provides planners and regulators with both the opportunity and framework to combine stormwater management considerations with other traditional land use planning factors, such as:

- Wetlands;
- Floodplains;
- Existing vegetation;
- Soils;
- Slopes;
- Riparian corridors;
- Historic or cultural sites; and
- Terrestrial ecology and landscape form.

Using New Development to Address Retrofit Needs

Typically, the selection of required stormwater management practices for a proposed land development is based only on preventing the adverse runoff impacts of the development itself. While this may prevent a worsening of existing runoff quantity and quality problems, it does not address already existing quantity or quality problems in the watershed and its water bodies. Addressing these problems typically requires retrofits in existing developed areas. However, due to a number of factors, including lack of available space, higher property values, and greater design and construction constraints, stormwater retrofits can be very difficult, expensive, and disruptive to implement.

However, watershed management planning can provide both land developers and runoff program managers with the tools and framework to incorporate retrofit requirements into the design of a proposed development's on-site stormwater management practices. While this will typically require a larger sized practice or a greater number of practices to be incorporated into the proposed development's design, many of the design and construction complexities normally encountered in retrofits can be avoided. In addition, design and construction of a single, larger on-site stormwater management practice can usually be achieved with less cost and required land than a standard on-site practice combined with a separate, off-site retrofit practice. While the program would be responsible for compensating the developer for the extra design, construction, and land costs of the larger practice, the watershed management approach could also serve to establish a watershed stormwater utility or other assessment program that could be used to generate the required compensatory funds.

While combining retrofit measures with those required for new land developments can appear to be a logical and effective way to address existing runoff and water resource problems, the decision to do so can be very complex and require consideration of many on-site, off-site, and program-related factors. However, it can be seen that such decisions can be much better supported by a watershed-based urban runoff management program than one based upon individual development sites.

In conclusion, an effective urban runoff management program must be pragmatic and based on technically sound data and definitive objectives. The program not only needs to be aware of the required improvements, but where are how those improvements can best be accomplished. This is especially true in an existing urban environment where retrofit options are limited and expensive. These need-to-know answers can best be obtained through a watershed management approach.

Watershed Management Decisions and Considerations

While extolling the capabilities, benefits, and even virtues of watershed management may not require a significant commitment of time, money, and effort, developing and operating an urban runoff management program based upon a watershed management approach certainly can. This is not unusual, since the aspects that yield the most comprehensive and beneficial outcomes, whether they are programs, structures, products, services, or relationships, are usually those that require and receive the most input. Nevertheless, it would be helpful at this point to review some of the important decisions and commitments that must be made to achieve an effective and efficient watershed management program. These range from issues that must be addressed both prior to and following program startup. Unfortunately, there have been far too many instances where a watershed study was completed and then put on a shelf and never touched again. There are a number of issues that need to be considered before going down the watershed management path.

Watershed Model Selection

As discussed in detail in Chapter 2, the actual process of converting rainfall into runoff is extremely complex. This complexity increases when one begins to include not only the rate or volume of runoff but also pollutant loadings and impacts to water resources. In light of these complexities, the actual physical processes are replaced with mathematical equations and models that are used to predict the results or outcomes of the real processes under various conditions, assumptions, and constraints. Such models may be based upon a single real or hypothetical rainfall-runoff event or a long, continuous series of actual events based upon a similarly long event data record. Since the equations and algorithms that a model is based upon are only approximations of the actual rainfall-runoff processes, the results of actual runoff events are typically needed to adjust and check or, as modelers say, calibrate and verify the model's predictions in order for it to be reliable.

Typically, the complexity of the actual processes also limits the scope or predictive capabilities of rainfall-runoff models. While large advances in model theory and computing power have been made in recent years, along with advances in the range and precision of available databases, there are still relatively few computer models that even attempt to simulate more than a few rainfall-runoff processes or parameters. Those that do sometimes suffer from the effort to predict only a limited range of parameters. For every broad-based computer model that can predict a large range of parameters, there are easily a half dozen more narrowly focused models that can more accurately predict a specific parameter in that range.

Due to the amount of data that must be processed and the number of equations that must be solved, virtually all rainfall-runoff models are run or exercised (another modeling term) on computers. In addition, virtually all watershed management efforts require the use of one or, at times, multiple computer models in order to accurately and efficiently analyze all of the pertinent factors, processes, and conditions. As a result, selection of the appropriate computer model or models is one of the most important decisions associated with watershed-based runoff management. And since model selection typically occurs in the earlier phases of the process, there is generally a limited amount of watershed, resource, or problem information available to base model selection on. As a result, successful watershed modeling efforts are typically performed by those with prior knowledge of a particular model's capabilities, requirements, and limitations and extensive experience in its use.

In selecting a computer model for a watershed management plan or program, the selection process should be relatively straightforward. Based upon a desire to produce the best possible plan, the selected model should be the one that produces the best results. The difficulties, however, come in defining what constitutes 'best', a quality that can be measured from several different reference frames. Some of these include:

- **Applicability and accuracy of predictions** – The selected model must be able to predict the answers or outcomes required by the watershed plan with the required level of accuracy. If, for example, the goal of the plan is to reduce annual TSS and nutrient loadings in runoff, the model must be able to predict these parameters in this time frame.
- **Soundness of model theory and equations** – While the accuracy of model predictions can be checked to some extent against real event data, such checks are usually limited to a relatively narrow range of parameter values and input conditions. Therefore, they cannot be solely relied upon in judging a model's accuracy. The model's theoretical basis, assumptions, equations, and algorithms must all be scientifically sound, reliable, and defensible.
- **Extent, availability, and cost of required input data** – In watershed modeling, data needs can be measured both in terms of the cost required to obtain it and the relative value of the results it produces. With regards to required data, model selection must begin with consideration for overall data acquisition costs in order to ensure that such costs are compatible with the overall watershed management plan budget. Next, the relative value of such an expenditure must be evaluated to determine if the value of the results produced by the acquired data is worth the cost of acquisition. At this point in the model selection process, model input data can be considered an investment in the model's output. Is the cost of the investment in obtaining the required data worth the value of the answers returned by that investment? Unfortunately,

many well-intentioned modeling efforts are thwarted by excessively high data acquisition costs or diminished by the lack of value produced by that expenditure of program or plan funds.

- **Model familiarity and ease of use** – Of these two model selection factors, model familiarity may be the most important, since a modeler's familiarity with a particular model is usually reflected in the ease with which they use it. However, model familiarity does not only pertain to data acquisition and input requirements, model operating commands, and output options and review procedures. It also includes knowledge of a model's capabilities, limitations, computer requirements, operating bugs, accuracy, precision, and flexibility, as well as the ability, effort, and techniques required to efficiently calibrate and verify it. In other words, model familiarity may be described as the ability to know whether a model's predictions are acceptably accurate and, when they are not, to know how to improve them. Ease of use should also not solely be considered in terms of the number and simplicity of operating commands. Since most watershed-based rainfall-runoff models require a significant amount of geographic data such as subwatershed sizes, land uses and land covers, soil characteristics, slopes, and pollutant loadings, data input can involve considerable effort unless it can be automated. Similarly, model output analysis can be cumbersome and costly unless the model includes sufficient analytical tools, or results can be easily exported to other analytic software.

From the above, it can be seen that the best model for a watershed management plan or program is the optimum combination of capability, accuracy, data needs, ease of use, and past experience. In more general terms, the best model can be seen to be the one that meets output needs without being overly complicated or data-intensive.

Finally, it should be noted that, while model selection typically occurs near the start of a watershed management effort, it should not be the first activity. Too many watershed studies or management plans have begun with model selection, followed by a determination of the study's goals or required answers. In such cases, the answers sought by the study end up being determined by the model's capabilities. Instead, the goals, objectives, and desired answers should be determined first, followed by the selection of the best or most appropriate model capable of achieving them.

Data Needs

Closely linked to model selection is the data required to drive the model or to achieve the level of accuracy that is needed for a required or desired output. As noted above, data acquisition can be an extremely time-consuming and expensive component of the overall watershed planning effort. It is essential to know the data needs of a specific model before initiating the watershed modeling effort. Questions need to be answered regarding the general availability of required data and how time-consuming and costly its acquisition will be.

Typically, types of required watershed model data include the following:

- Rainfall;
- Topography;
- Watershed boundaries;
- Soil and subsurface characteristics;
- Existing and future land use and land cover;
- Runoff conveyance systems and outfalls;
- Wastewater overflow locations and details;
- Existing stormwater management structures;
- Existing water quality data;
- Groundwater levels; and
- Receiving water conditions and characteristics.

In performing the watershed study or analysis, it may be necessary to link watershed conditions with the receiving water responses to determine the effectiveness or benefits of various stormwater management or treatment options. This can be a complex process that may require significant receiving water data from which to predict results. For example, in Figure 12-2, samples of sediments in estuarine areas of the Waitemata Harbour and Manukau Harbours in Auckland, New Zealand were first obtained to provide historic rates of accumulation of metals over time. Then toxicity levels were determined along with trends toward increasing toxicity over time. Figure 12-3 shows changes in zinc and lead over time. Both figures demonstrate the concern that must be given to reducing zinc and copper levels in urban stormwater. Failure to implement a zinc and copper reduction program will cause

environmental problems in the future. The second figure also shows the reduction in lead in urban stormwater, which probably relates to elimination of lead in gasoline. Based on this information, watershed modeling of the pollutant inputs lead, zinc, and copper was used to both predict future impacts and assess the ability of various stormwater management practices, including source control and runoff treatment measures, to prevent them. This modeling effort was then used to determine the level of pollutant reduction needed to alter the rate of pollutant accumulation in the harbors. While this was a very expensive modeling approach, it was justified first by the need to reduce or reverse pollutant concentrations in bottom sediments and second by the fact that the model could also be used to identify the necessary pollutant control approaches and implement them in a cost-effective manner based upon derived benefits.

Data Accuracy

Modeling in general and watershed modeling in particular are only as good as the data used in the model. Input data errors can cause significant errors in model output. Since these model outputs could result in the expenditure of millions of dollars for implementation and additional millions for subsequent operation

Figure 12-2: Sediment Sampling Program for Waitamata and Manukau Harbours

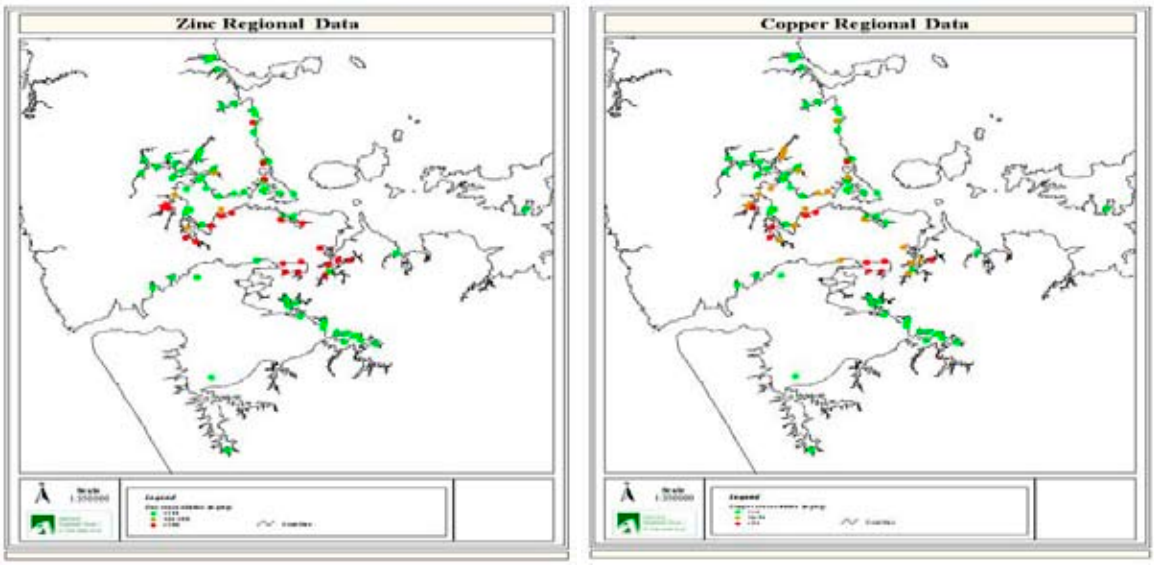

Figure 12-3: Consideration of Zinc, Lead and Copper in a Receiving Environment Showing Concentration Changes Over Time

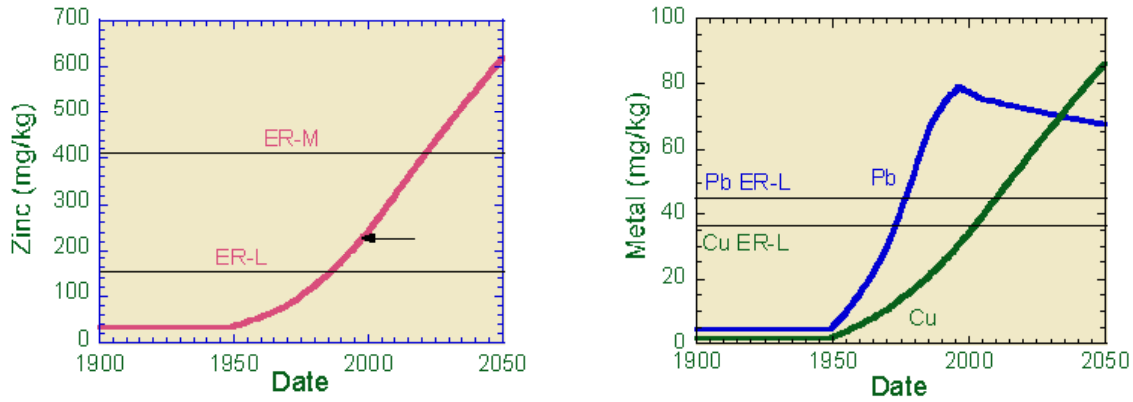

and maintenance, input data must be accurate if such amounts are to be well spent. Required input data accuracy can be determined by the extent to which its variation will affect model results.

From a review of past watershed modeling efforts, certain types of model inputs that require improved accuracy have been identified. These include unit runoff pollutant loadings for various land uses and pollutant removal performance data for various stormwater treatment practices. Available data for these two key model input parameters are highly variable and, as a result, can usually only be relied upon to make planning level decisions. Land use loading data is particularly variable and can be read interpreted differently by different people. Experience is the best guide in determining unit loadings for various land uses, so it is important to involve experienced individuals in this component.

In addition, the lack of common input data collection and reporting protocols has meant that much data is not transferable from one watershed study to another. While this situation has been improving recently, it should still be considered indicative of general watershed study conditions. The American Society of Civil Engineers (ASCE) Stormwater Database (www.bmpdatabase.org) is a good start in terms of a consistent protocol for collection of performance data for various practices. At the present time, its data should be considered preliminary, and practices such as constructed wetlands will have variable performance data depending on location.

Another area where input data is extremely limited is the combined effect of runoff treatment practices arranged in series and the performance benefits that can be gained by that approach. Many stormwater management programs, publications, and experts have promoted this stormwater "treatment train" approach for many years. However, we still have only a general understanding of the performance of such an approach, and while we believe in its quality, we need more quantitative information to gain a better understanding of it, particularly for modeling purposes.

A Stepwise Approach Toward Comprehensive Results

It is unrealistic to expect to solve all runoff and water body quantity and quality problems through a watershed management process in the short term. Improvements to actual runoff and receiving water conditions will generally require an iterative process. However, this reality does not prevent significant progress being made in the short to medium term as priorities are identified and addressed through watershed management efforts. Additionally, a long-term vision for watershed-based stormwater management needs to be identified.

Furthermore, since large-scale land development activities have occurred for at least the last century in many urbanized areas, it may similarly have taken a hundred years for receiving waters to reach their present impacted condition. Therefore, it appears reasonable to expect that it will take considerable time for these waters to show significant recovery. For example, many older urbanized areas may still have galvanized metal roofs that, until replaced with a more runoff-neutral material, will continue to be a significant source of zinc to a receiving water and its aquatic environment. Sources of such pollutants need to be identified and strategies developed to address them. Some strategies may be placed in the 'too hard' basket for now and dealt with in the future, while others can be addressed immediately, depending on their relative importance and the availability of funding. Once an overall watershed management plan has been developed, an implementation strategy must be developed with public input to determine the degree to which improvements can be made and when.

Throughout this overall development and implementation period, small steps can be taken to make improvements or reduce the rate of system decline. While such steps are being taken, more information on both impacts and planned solutions will become available, along with new tools or approaches that may augment already identified actions. In other words, it is important to continually take manageable steps toward comprehensive watershed management and not delay the entire process by placing things in the 'too hard' basket. An initial, limited watershed management effort can provide information on the magnitude of a runoff or receiving water problem as well as on the next steps necessary to address it. While certain components of an overall watershed management planning effort may appear too complex or impractical to be implemented in short term, they should nevertheless be developed whenever possible. Their implementation may become more feasible over time as practical, technical, institutional, and social obstacles are overcome by increased research, knowledge, interest, and funding.

The Need to Update

Development of a watershed management plan and the implementation of its recommendations should only be considered the first step toward receiving water protection or restoration. A second, more difficult and less recognized step is the periodic update of model inputs and outputs to evaluate potential and necessary changes to the plan. Regardless of the accuracy of the original land use data, it is reasonable to expect a different and perhaps greater degree of land development than initially considered.

In addition, initial assumptions about impervious surface coverage will probably have to be adjusted upward over time. Experience has shown that residents can be expected to erect sheds, widen driveways, construct house additions, and create an impervious surface creep above the levels initially used in the watershed management plan development. Furthermore, land that was expected to remain rural may have experienced urbanization sooner or at a rate faster than initially anticipated, and model updates will have to be performed in order to take the effects of these land use changes into account. Without such updates, an initial model can be completed and its results published and acted on, only to become outdated along with the plan it yielded in a couple of years' time.

Therefore, it is important that sufficient funding also be allocated for future updates to ensure that both the model and the plan remain current and effective. If such funding cannot be provided either in the initial project budget or in subsequent annual plan operating budgets, the model's accuracy and the plan's effectiveness will be diminished.

Gaining Acceptance

Once a watershed management model is developed and a range of implementation options identified, it is important to gain plan acceptance from those who will be impacted by such implementation. This could involve residents, farmers, industries, transportation agencies, and local, county, and regional governments. To accomplish this, there will have to be significant public education and public input activities throughout the watershed management plan's development.

This acceptance is necessary due to the nature of the required implementation measures. While the plan may target a specific industry or sector of the watershed in which change can be achieved through the regulatory process, in many stormwater management situations it will be necessary to change human behavior in order to achieve plan goals. And even where plan implementation can be achieved solely through regulation, it will still be necessary to have public funds allocated to developing, administering, and enforcing such regulations. Approval of such allocation and expenditure will proceed more smoothly and with a greater chance of success if those with an interest or stake in the plan's outcome are informed and involved. If the plan's implementation is to proceed as effectively and efficiently as possible, fundamental questions such as the following must be addressed during its development stage:

- Why is there a problem?
- What is causing it?
- What steps are necessary to correct it?
- How much will it cost?
- What will the outcome be?
- How will I be affected?

The advantage of public involvement throughout plan development is that community expectations can be a significant motivator in getting plan recommendations funded or regulations implemented. Seeking out and involving the plan's stakeholders is the key to simplifying plan approval and implementation.

Total Maximum Daily Load (TMDL)

Total maximum daily loads or TMDLs are tools for implementing state water quality standards and management/restoration goals for a specific water body throughout its watershed. A TMDL is an implementation plan that identifies the allowable loading of a specific pollutant a water body can receive from both point and nonpoint sources without violating state water quality standards. Selection of appropriate TMDLs for a water body is based on the relationship between pollutants from both point and nonpoint sources in the watershed and instream water quality conditions. Unlike technology-based stormwater best management practices (BMPs), which ordinarily do not have specific

numeric requirements or performance values, the use of TMDLs provides the basis for state governments to establish specific numeric pollution controls for a water body. And since the development of TMDLs requires an understanding of pollutant sources and loadings throughout the water body's watershed, they also provide states with both the technical and regulatory basis to undertake watershed-based stormwater management.

The TMDL approach has four major features:

- Targeting of priority problems and pollutants;
- Endorsement and ecouragment of high levels of stakeholder involvement;
- Development of integrated solutions that make use of the expertise and authority of multiple agencies; and
- Measurement of success through monitoring and other data gathering.

The TMDL process represents a view of water quality protection that considers watersheds to be the fundamental unit by which to manage water quality.

The TMDL approach to stormwater management has existed for a number of years, having originally been identified in the original 1972 Clean Water Act. For a number of reasons, including the 1999 promulgation of the EPA's Stormwater Phase II Final Rule, the TMDL approach has recently achieved much higher priority in both national and state water quality programs than it had in the past. There are a number of TMDLs that have been established for a range of water bodies around the country that are now serving as templates or models for future ones. The TMDL approach is evolving fairly rapidly, with new guidance information becoming available on a regular basis.

TMDLs are established for impaired water bodies where standard, technology-based stormwater management measures (i.e., BMPs) are not considered capable of correcting the impairment and restoring the water body to required levels. As contained in Section 303(d)(1) of the Clean Water Act and 40 CFR Section 130.7, where technology-based limits or other pollution control requirements (i.e., stormwater BMPs) are not sufficient to achieve compliance with water quality standards, a TMDL must be established.

TMDL determination must also include a margin of safety that, as described in 40 CFR Section 130.7, is intended to address "any lack of knowledge concerning the relationship between effluent limitations and water quality." This margin of safety may be provided in two ways:

- By using conservative assumptions in calculating the loading capacity and wasteload allocations; or
- By establishing wasteload allocations that are lower than the defined loading capacity.

When evaluating the need for a TMDL for a water body, the first step is to determine whether a technology-based approach will be adequate to ensure that water quality standards are met. This determination will typically be based on available data regarding pollutant levels in the water body and a determination of which pollutants exceed water quality standards. Water quality standards can be considered to represent the water body's assimilative capacity, or the amount of pollutant a water body can assimilate without causing or contributing to a violation of water quality standards.

The next step is to allocate the water body's total assimilative capacity for a particular pollutant between point and nonpoint sources of that pollutant in the watershed. This allocation process must take into account natural background loadings and, as discussed above, include a margin of safety to account for any uncertainties. The resultant TMDL for that pollutant is the sum of the nonpoint, point, and background loadings, and a margin of safety as illustrated in the following equation:

$$TMDL = LC = \sum WLA + \sum LA + MOS$$

where:

LC = Loading capacity

WLA = Wasteload allocation (for point sources)

LA = Load allocation (for non-point sources)

MOS = Margin of safety.

TMDLs can be expressed in terms of mass per time, toxicity, or other appropriate measures. The final TMDL is then used to develop numeric discharge permit limitations for point dischargers and pollutant discharge standards for nonpoint sources. The nonpoint discharge standards based upon the TMDL will typically be technology-based, although numeric limitations may be justified in certain instances. The relative pollutant contributions from point and nonpoint sources are a key factor in TMDL development, and their determinations may require a significant data collection and analysis effort.

As with all watershed-based management efforts, the availability of resources is a major factor in TMDL development. The EPA has estimated the costs to imple-

ment required TMDLs to range from approximately $1 billion to $4.3 billion per year, depending on the efficiency of TMDLs. Additional EPA cost estimates are summarized below:

- The cost of measures to implement TMDLs for presently identified impaired waters is estimated to be between $900 million and $2.3 billion per year if the problem is approached through the implementation of TMDLs that strictly seek the lowest cost alternatives among all sources of the impairments.
- If the TMDL program was implemented based on an assessment of the reduction needed for the water body and an allocation that includes all sources of impairment, without strict attention to the most cost-effective allocations, these costs would be expected to rise to between $1 billion and $3.4 billion per year.
- In the event that the impaired waters were addressed using a least flexible TMDL scenario, these costs might rise to as high as between $1.9 billion and $4.3 billion per year. In this unlikely scenario, states would simply tighten discharge permits and other national requirements, regardless of the individual contributions of different sources, through a uniform and inflexible approach. This scenario would not benefit from the site-specific tailoring to local conditions that should result from development of a more careful allocation.
- When a moderately cost-effective TMDL program that looks for readily available, cost-effective solutions is used to allocate pollution reduction responsibilities, the costs for both point and nonpoint sources are reduced.
- The nonpoint pollution control measures expected to be implemented under each option would generate some partly offsetting cost savings (e.g., by reducing the frequency of application and the amount of fertilizer used), but these specific savings could not be calculated.

It must be clearly stated that, while it is certainly expensive to address our runoff pollution and water body impairment problems through watershed-based planning and management programs, it will be even more expensive not to follow this approach. The long-term health and well-being of our water resources and, therefore, our society depend on making intelligent decisions and taking effective watershed-based action today.

Regulatory Framework

Once the watershed modeling has been completed and appropriate regulations and requirements developed, a framework for administering these findings must be developed. Presented below are brief discussions of a number of possible regulatory approaches.

Voluntary Compliance

This approach focuses primarily on educating the watershed's population to encourage them to modify behaviors or practices that are causing, contributing to or exacerbating the identified stormwater problems. It may also include cost-sharing assistance if such funding is available. This approach has historically been used to reduce runoff pollution from agricultural lands through changes in farming practices and materials. It has also been used in urban and suburban areas, where residents are asked to reduce their individual pollution contributions by modifying such activities as vehicle washing, hazardous material disposal, lawn care, waste recycling, and litter disposal. Educational measures can include brochures, videos, seminars, demonstrations, group meetings, and other outreach measures and activities.

Permit Requirements for Point Source Discharges

This is a traditional regulatory approach for wastewater discharges that can be adapted to a watershed-based runoff management program. The TMDL program discussed above is an example of how permit limitations for individual point dischargers can be part of a watershed- based approach to runoff management and water resource protection.

This is also an area where pollution trading can provide significant benefits. Where one industry may have great difficulty meeting their discharge requirements, they may trade with another one in the watershed that has excess compliance capacity. This type of cooperation

is only possible in a watershed management situation in which benefits of such an approach can be identified and quantified.

Requirements for Land Development

Many states and local authorities have watershed-wide stormwater management requirements for proposed land developments. These requirements can be considered a baseline for development in general, but those general requirements may not be adequate to protect a given resource or watershed receiving system. A general requirement such as an 80 percent reduction in total suspended solids may not provide sufficient protection for a particularly sensitive receiving environment. It may also not provide protection if pollutants other than sediments are a particular concern. For example, a BMP that focuses on capturing sediments may not capture a sufficient level of metals or remove an adequate amount of dissolved nutrients to protect or improve downstream receiving systems.

Since permit requirements based on a watershed management plan are clearly based on a cause/effect approach, they provide a greater certainty that the program goals may be attained. This makes them defensible to those impacted by them.

Source Controls

Another technique that can be used to fulfil the pollutant reduction requirements of a watershed management program is the elimination of the pollutant at its source. An excellent example of this is the banning of phosphorus in laundry detergents in areas tributary to the Chesapeake Bay. Another example from Auckland, New Zealand is based on a roof materials runoff study that identified soluble zinc as a significant pollutant from various roof types. A policy requiring treatment of runoff from such roofs at new development sites quickly led to a shift away from those roof types to more benign roofing materials. In a related way, reducing the extent of new impervious surfaces such as streets, sidewalks, and parking lots can be an effective source control approach to reducing downstream flooding and related runoff quantity impacts.

Development Fees

Under this approach, fees from development and redevelopment projects are collected to provide a funding source for projects and activities identified in the watershed management plan. The approach has been used for many years and still remains a viable implementation option, particularly in watersheds with extensive existing urbanization and associated runoff impacts. It necessitates taking the water quality impairment study to a more refined level where specific projects are identified and await funding. It is important to clearly identify those projects for which the fees will be spent in the watershed management plan to avoid the possibility of the fees being used for other, non-stormwater purposes.

General Discussion

In addition to the approaches discussed above, there are certainly other techniques and approaches that can be used to implement the requirements of a TMDL or watershed management plan. Some or even all of them can be used in combination in a specific watershed. Furthermore, approaches such as source controls may be used at a number of levels that involve regulation of specific products, general population education, and industrial site pollution reduction practices.

If the watershed is already highly urbanized, developer levies may be a significant means of funding existing stormwater system improvements. Retrofit and regulations for redevelopment may include treatment or source controls based on the watershed management plan that help restore site runoff quantity and quality.

Regulation of new development in a relatively undeveloped watershed presents a good opportunity to use the results of a watershed management plan to prevent problems from occurring in the first place. Determining and prioritizing where urban growth can best occur, in conjunction with the protection of existing natural features and aquatic resources such as streams and wetlands, is key to downstream resource protection. This approach is neither pro- nor anti-development; it is based on the concept that better balance between development and environmental interests may be achieved if watershed-specific issues are considered in conjunction with development approaches.

The Future

Clearly, we are following a fairly steep learning curve in developing new approaches to stormwater and aquatic resources issues. We have evolved from a position where runoff was considered the common enemy to the widespread use of runoff treatment practices, source controls, and regional facilities. However, there are still many unanswered questions, and we must maintain our desire and ability to continually strive for improvement. Fortunately, as discussed below, there are a number of recent advances and improvements in our ability to effectively manage urban runoff that bode well for the future.

Availability of More and Better Tools

Computer-based watershed modeling of both runoff quantity and quality is evolving rapidly with excellent recent advances. More programs are now capable of considering stormwater practices in series or performing continuous, long-term rainfall-runoff simulation. For example, recent work at the Cooperative Research Centre for Catchment Hydrology in Australia has produced the Model for Urban Stormwater Improvement Conceptualization or MUSIC. This model provides a flexible tool for watershed modeling, considers stormwater practices in series, and is now being updated to consider whole or life costs for stormwater management practices.

Another computer model that has evolved significantly over the past five years is the Source Loading and Management Model (SLAMM) developed by John Voorhees and Robert Pitt and maintained by USGS. This model was originally developed in the 1970s to gain a better understanding of the relationship between sources of pollutants and runoff quality. It has been continually expanded since and now includes a wide variety of source area, conveyance system, and outfall control practices.

Both of these models are supported by their developers, which is an important consideration in model selection. At this time, both are recommended primarily for planning purposes, but their accuracy and output detail are expected to increase through continued research and development.

Accuracy and Consistency of Data

In addition to improved computer models, it is vital that our store of available data continue to increase and improve. Too often, money can be spent on plan implementation but not on data collection. Every year, more streamflow gages are discontinued, even though the data they provided was extremely valuable. The same applies to water quality and aquatic resource monitoring.

It is also important to have improved consistency in the data that is collected. As noted earlier, the ASCE has made an attempt to provide a protocol for the collection of data related to stormwater practice performance, but similar protocols need to be used for water quality characterization and receiving water evaluation. We will only be able to maximize the value of the data that is collected if we increase its consistency and reliability.

One way to achieve this is to not cut corners on data collection for a specific watershed study. Both rainfall and runoff data must be representative of the entire watershed and not merely portions of it. In data collection, you get what you pay for, and data collected for a specific watershed study must be accurate enough to ensure confidence in the results. There may come a time when data collection needs may be considerably reduced as past experience and new understandings combine to produce new modeling techniques that are less data-dependent. Until that time, however, we have to continue to pursue necessary data collection so that answers may be provided with an acceptable level of confidence.

Linkage of Cause and Effect

If we aggressively implement source control throughout a watershed, as well as all of the stormwater practices that we want to, what will be the impact on downstream water resources? While there are some situations where we know the answer, there are many others where it is unclear and we have to assume we are following the right course.

To a general public that is being asked to fund many different activities, there has to be greater certainty that their taxes will result in a given benefit. Stormwater management has historically been based on an assumption of benefit, but that is not going to be good enough in the future. We have to use case studies of implementation on a watershed basis to evaluate the effectiveness of our activities. This can only be done

if implementation throughout a watershed allows us to monitor the results, but we have to recognize that evaluation process as an integral component of the overall watershed management planning process.

It is important that the goals of a watershed management plan be measurable in specific terms. In addition, the measurable improvements should address quantity, quality, ecological and user related improvement. These include such improvements as reductions in sediment load, return of sea grasses, reduction in anoxic zones, increase in abundance and diversity of certain aquatic species, greater recreational opportunities, reduction in flood damages, and/or increased property values. In addition, the achievement of these goals and the terms they are expressed in must have meaning and value, not only to the plan developers and administrators but also to the watershed stakeholders, government leaders, and the general public.

The cost of watershed management plan development and implementation has reached sufficiently high levels to now register on the economic radar screen, and as a result, program developers and administrators are going to be held much more accountable in the future.

Greater Community Recognition

In light of the complexities of watershed management plan development, we are often tempted to operate in relative isolation without much consideration for public input or involvement. However, once a watershed management project is initiated, it is vital that focus groups be established that represent all elements of the community, especially those who will be impacted by the plan's results. As mentioned above, people will support stormwater initiatives in many situations if they understand the purpose of the initiative and the benefits of successful implementation. Public outreach is an essential component of watershed management, and there are numerous guidance documents available on many different websites.

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CHAPTER 13

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CHAPTER 13

Maintenance of Stormwater Management Practices

An important component of any successful urban runoff management program is the effective and efficient maintenance of the stormwater management practices it creates. This chapter presents the key elements of a comprehensive maintenance program for such practices, including both structural facilities and nonstructural measures. Program elements include regulatory aspects, pre-construction planning and design considerations, post-construction inspection and maintenance activities.

As described throughout this book, an effective urban runoff management program requires the successful execution of several steps during a land development project. These steps include:

- Comprehensive project planning to analyze site conditions and identify potential adverse environmental impacts of the project;
- Intelligent and informed design of stormwater management practices that will prevent or minimize these adverse impacts without excessive operation or maintenance demands;
- Competent review of facility and measure designs to ensure compliance with the requirements of the urban runoff management program;
- Proper facility construction and measure implementation according to approved plans and applicable permit conditions; and
- Proper and effective maintenance of facilities and measures following their construction to ensure long-term operation and safety.

Although maintenance is listed as a separate step at the end of the above list, both research and experience have shown that to be truly effective, maintenance considerations must be included in all project steps, starting with the development of the urban runoff program, continuing through the project's design and review phases, and ending with the actual maintenance activities (N.J. Department of Environmental Protection, 1989). As the range of stormwater management practices expands beyond structural facilities to also include a wide variety of nonstructural measures (and, consequently, a similarly expanded range of owners, designers, and maintainers), the need for maintenance awareness throughout the entire land development process has become more important than ever.

Despite the importance of comprehensive stormwater management practice maintenance, several factors can complicate or hinder its performance. One is the authority to perform inspections and enforce maintenance requirements. A second factor is operation and maintenance costs. As we attempt to address a wider range of environmental impacts with stormwater management practices, their complexity grows, resulting in greater and more specialized operation and maintenance demands. A third factor is the inherent institutional difficulties of adequately managing the wide range of available practices through their respective planning, design, construction, and operation phases through a regulatory program.

However complex, the benefits of a comprehensive stormwater management practice maintenance program are substantial. Therefore, the goal of this chapter is to provide information that highlights these benefits and helps overcome the complications. The chapter begins with an overview of key maintenance program

elements. It also discusses the particular operation and maintenance challenges posed by nonstructural stormwater management measures, which are becoming an increasingly important component of many urban runoff management programs. The chapter then explores the interrelationship between effective stormwater management practice maintenance and the practice's planning, design, permitting, and construction phases. Finally, it presents various options for funding stormwater management practice maintenance by public entities.

Operation and Maintenance Program Overview

An effective maintenance program for stormwater management practices has a number of key elements. These include:

- Regulations that help ensure that maintenance is addressed from the practice's pre- to post-construction phases;
- Pre-construction planning and design standards that help reduce and facilitate post-construction maintenance;
- A design review and approval process that helps ensure proper application of the program's maintenance-based planning and design standards;
- Construction inspection activities that ensure proper construction in accordance with the practice design;
- Post-construction monitoring and enforcement of maintenance obligations;
- Responsible ownership that recognizes the importance of regular and thorough maintenance;
- Adequate funding of inspection and maintenance activities; and
- Effective and efficient performance of maintenance activities.

Details of each of these elements are discussed below. This discussion highlights the strong interrelationship between all of the elements and the important role they play individually and jointly in achieving safe and effective practice operation and thorough and efficient maintenance.

Regulatory Aspects

A successful urban stormwater management program must contain strong, effective requirements that ensure that the stormwater management practices it creates are adequately maintained. These requirements must have a sound legal basis and pertain to both structural stormwater management facilities and nonstructural stormwater management measures. They must consider all aspects of a facility's or measure's creation, from planning and design through construction to post-construction operation. In doing so, they must address practice owners, designers, construction inspectors, and maintenance personnel. They must also ensure adequate inspection and maintenance funding, effective enforcement, and efficient record keeping. Details of each of these program components are discussed below.

Legal Authority

In order for an urban stormwater management program to effectively address the maintenance of stormwater management practices, it must include written requirements for such maintenance. For example, the Stormwater Management Rules of the New Jersey Department of Environmental Protection (NJDEP), as published in Section 7:8 of the New Jersey Administrative Code (NJAC), require the designers of structural stormwater management practices to consider several maintenance aspects in their design. As stated at NJAC 7:8-5.7-a-2:

> *Structural stormwater management measures shall be designed to minimize maintenance, facilitate maintenance and repairs, and ensure proper functioning.*

NJAC 7:8-5.7-a-3 further states:

> *Structural stormwater management measures shall be designed, constructed, and installed to be strong, durable, and corrosion resistant.*

Finally, at NJAC 7:8-5.8, the following is required:

> *The design engineer shall prepare a maintenance plan for the stormwater management measures incorporated into the design of a major development. The maintenance plan shall contain specific preventative maintenance tasks*

and schedules, cost estimates including the cost of sediment, debris, or trash removal, and the name, address, and telephone number of the person or persons responsible for preventative and corrective maintenance (including replacement).

It is important to note that all program maintenance requirements must receive thorough legal review prior to promulgation. Perhaps the most critical aspect of this review are the legal implications of a program that establishes planning and design standards and, in many instances, oversees construction inspections of stormwater management practices. It must be clear to all involved in the program that, unless otherwise declared, the ultimate responsibility for the safe and proper design, construction, and performance of a stormwater management practice rests with the design and construction professionals who participated in its creation and not with program reviewers and inspectors.

An example of this approach can be found in the NJDEP's Dam Safety Standards as published in Section 7:20 of the state's Administrative Code (NJAC 7:20). As stated at NJAC 7:20-1.4-f:

No action shall be brought against the State or the Department or is agents or employees for the recovery of damages caused by the partial or total failure of any dam or reservoir or through the operation of any dam or reservoir upon the grounds that the Department is liable by virtue of any of the following:

1. The approval of the dam or reservoir, or approval of flood handling plans during construction.

2. The issuance or enforcement of orders relative to maintenance or operation of the dam or reservoir.

3. Control, regulation, and inspection of the dam or reservoir.

4. Measures taken to protect against failure during an emergency.

Structural and Nonstructural Practices

The need for thorough maintenance of structural stormwater management facilities should be self-evident, particularly of those intended to reduce nonpoint source pollution and improve runoff quality through the removal of trash, debris, suspended solids, and harmful chemical and biological agents. It is clear that removing these from the stormwater runoff that passes through a structural facility means that they will consequently be deposited in the facility and that failure to remove them in a timely way can result in outlet blockage, loss of detention storage, and excessive structural loads. Each of these consequences can lead to reduced facility performance and, ultimately, facility failure. The physical character of the structural facility itself, in combination with the consequences of poor maintenance described above, illustrates the importance of thorough maintenance: the visualization of a trash-laden outlet structure or a sediment-filled pond makes it easy to appreciate the importance of an effective maintenance program.

However, as the range of stormwater management practices expands beyond traditional structural facilities to include new nonstructural measures, the importance of maintenance can become less apparent. This is because the reduced physical character of nonstructural stormwater management practices may result in a similarly diminished appreciation of the importance of their maintenance. While it may be easy to visualize how such nonstructural practices as open space preservation, protection of indigenous vegetation, steep slope avoidance, and impervious surface limitations can directly impact the quantity and quality of runoff, the lack of tangible physical attributes of such nonstructural measures may weaken the connection between practice and maintenance that is so readily discernible at structural facilities. As a result, there is the chance that an urban stormwater management program will fail to recognize and impose adequate maintenance requirements upon the program's nonstructural measures. This can significantly diminish the program's overall effectiveness, because in spite of their lack of physical characteristics, nonstructural stormwater management measures also require regular, thorough maintenance, albeit through somewhat nontraditional requirements that reflect their nonstructural character.

Therefore, maintenance of nonstructural practices may require new ways of visualizing stormwater management practice operation and new definitions of maintenance actions. For example, in the case of preserved open space, steep slopes, or groundwater recharge areas, maintenance of these nonstructural practices may mean literally that – maintaining the existence of these areas by preventing their elimination, modification, or abuse. Similarly, the movement of runoff and the filtering and deposition of solids in a vegetated buffer or filter strip may not be as easy to

visualize and understand as a wet pond, wetland, or similar structural facility. Nevertheless, these processes do occur, and the resulting accumulation of solids must be addressed through regular, thorough maintenance. While a plot of turf or meadow grasses or a stand of indigenous trees may not have the distinct structural features of a wet pond's permanent pool or a sand filter's sand bed, these nonstructural measures are nonetheless performing pollutant removal functions similar to their structural counterparts and consequently deserve similar maintenance.

There is another important difference between structural facilities and nonstructural practices that can have disturbing consequences for an urban stormwater management program. In addition to the general lack of readily discernable physical features and the need for somewhat nontraditional maintenance actions, nonstructural practices may also differ from structural facilities in both their total number and their location on a land development or redevelopment site. In general, structural facilities are typically located at a centralized location that receives runoff from a significant portion of the development site. This is normally done to minimize construction mobilization costs and to take advantage of the construction efficiency and economy inherent in large facility size. Stated in other terms, it normally requires considerably less land and money to construct a single, somewhat larger stormwater management facility to serve a particular drainage area than to do so with two or more smaller facilities. In addition, a single structural facility typically requires less overall maintenance effort and expense, and since it is a readily visible and recognized stormwater management practice, it is easier to monitor its performance and condition and enforce required maintenance activity.

Furthermore, due to the limited number, regional effectiveness, and centralized location of structural stormwater management facilities, their maintenance is typically the responsibility of a limited number of public or private entities such as municipal Public Works Departments or property owners' associations. Such entities typically have sufficient legal, financial, and organizational authority to allow them to not only accept and perform required facility maintenance but to allow others to effectively bring enforcement actions against them if they fail to meet their maintenance obligations.

However, it is not uncommon for numerous nonstructural stormwater management measures to be distributed throughout a development site, with each one receiving and treating runoff from only small portions of the overall site. This happens for a number of reasons, the most notable being the fundamental intent or goal of nonstructural stormwater management. As described in detail in Chapter 8, Impact Avoidance, the intent of nonstructural stormwater management is not to respond to the runoff produced by a development site the way structural practices do, but instead to intervene in the rainfall-runoff process in order to minimize the amount of runoff and associated impacts produced by the development. Stated in ideal terms, development site runoff responds to nonstructural practices, while structural practices respond to site runoff. To achieve this, however, nonstructural practices must generally be distributed throughout the site in order to optimally intervene in the rainfall-runoff process.

Other factors can also contribute to the number of nonstructural practices at a land development site being larger than the number of structural ones. These include the physical, chemical, and biological processes that must occur to effectively treat and convey stormwater runoff. Due to their relatively low design depths, widths, and/or heights, nonstructural stormwater management measures can typically manage only relatively small rates and volumes of runoff when compared to structural facilities. As a result, the relative size of their tributary drainage areas must also be small, requiring a greater number of nonstructural measures throughout the development site.

Finally, there is a relationship between nonstructural measure character, size, and efficiency that further promotes the use of more rather than fewer nonstructural measures at a land development site. Since, in addition to their smaller overall size, they have significantly less height, depth, and other distinct physical characteristics, nonstructural measures can more readily be located in the rear, side, and even front yard setback areas on individual development lots. For example, vegetated buffers, preserved open space areas, and pervious areas downstream of unconnected impervious surfaces can easily be located in setback areas. They can also serve as both active and passive open space areas. Since setback and open space areas are typically required at land development sites, using them to also locate nonstructural stormwater management measures can increase site utilization efficiency and even reduce overall site disturbance. It can also reduce or, in certain instances, even eliminate the need for a larger, centralized structural facility, which is typically too large to

fit within required setback areas and often prohibited in required open space areas.

As a result, nonstructural stormwater management measures can be located on numerous individual lots throughout a land development site. While this conforms to nonstructural stormwater management principles and can increase land utilization efficiency and preserve open space, the maintenance implications can be troubling. For unlike a limited number of centralized structural facilities, a widely dispersed array of nonstructural measures will involve a similarly wide range of individual property owners, each with a different level of interest, ability, and resources to perform required measure maintenance. In addition, maintenance monitoring and inspection by regulatory agencies will be more difficult due to the greater number and dispersed locations of the nonstructural measures. Enforcement of maintenance requirements may also be more difficult due to the direct responsibility of individual property owners rather than a single, representative owners' association. Record keeping and other administrative functions can also be expected to be more complex and costly.

Therefore, it is important for an urban stormwater management program to recognize the maintenance challenges posed by its nonstructural stormwater management component and take appropriate steps to address them. This should include the following:

- Recognize the increased complexity and nontraditional character of nonstructural stormwater management measure maintenance.
- Identify the potential for and consequences of maintenance neglect and measure modification and elimination by private property owners.
- Review available maintenance inspection and enforcement options against such property owners.
- Include in the urban runoff management program only those nonstructural measures that the program's administrators can reasonably guarantee will remain functional in the future.
- Develop a property owner education program on nonstructural measure purpose, operation, and maintenance.
- Adopt appropriate maintenance inspection and enforcement measures.

Design Review

The success of both structural and nonstructural stormwater management practices, including their operation and maintenance, will depend to a great extent on the scope, accuracy, and basis of the planning and design standards used to create them. However, to be effective, such standards must be incorporated into the urban stormwater management program. In addition, it must be ascertained prior to its construction that a stormwater management practice has been designed in accordance with them. As a result, a design review and approval process must also be included in the urban stormwater management program. Such a process can be integrated into existing development review programs such as those conducted by planning boards, boards of adjustment, regional or state agencies, and sewer and water utilities. Lacking such existing programs, a new program must be developed with proper legal authority and appropriate submission, review, and approval requirements and procedures. In such cases, it may be possible to reach an agreement with an existing program at another level of jurisdiction to share or trade off actual project reviews in order to save time, effort, and expense and improve review coordination between agencies.

Construction Inspection

The success of both structural and nonstructural stormwater management practices also depends upon the accuracy and quality of their construction. Similar to design review, inspection of the construction is therefore essential to achieving both individual measure and overall program success. An effective construction inspection program includes:

- A sufficient number of adequately trained and experienced inspectors;
- Inspection standards and procedures for all phases and aspects of facility or measure construction including materials, dimensions, strengths, and construction equipment and practices;
- Pre-construction meetings to review inspection procedures and construction requirements prior to the start of construction;

- Periodic construction meetings to review progress, address problems, and anticipate and avoid future difficulties; and
- Post-construction documentation including the development, review, approval, and recording of as-built drawings.

Post-Construction Monitoring and Enforcement

Once construction is complete and the stormwater management practices are put into operation, monitoring of their maintenance must be performed to ensure compliance with the maintenance requirements contained in the urban runoff management program's regulations and/or a specific maintenance plan. Such monitoring can be performed directly by the urban stormwater management program agency or the practice owner. Monitoring by the practice owner should include the submission of monitoring reports to the program agency at least once per year. In addition, the program must also have provisions for noncompliance. Such provisions can include, in reverse order of severity:

- Informal, discretionary procedures to deal with isolated or inadvertent maintenance noncompliance;
- Formal, prescribed procedures and measures to address chronic or intentional noncompliance;
- Emergency measures to respond to noncompliance matters that pose an immediate health or safety threat; and
- Maintenance assumption in the case of total maintenance default and abandonment.

Finally, successful post-construction monitoring includes provisions for legal access to the stormwater management practice by program personnel through easements, right-of-ways, and access and inspection agreements with the practice owner. Bonds, letters of credit, and other financial instruments can also be required from the owner to finance emergency measures and overall maintenance assumption by the program agency.

Interagency Coordination

With the promulgation of the EPA's Stormwater Phase II Final Rule, municipal, county, and state governments throughout the country are developing new or upgrading existing stormwater management programs in order to comply with their Phase II Stormwater permits. Under such conditions, it is important that these various levels of government coordinate their efforts to maximize consistency and minimize conflicts between the various programs, including their maintenance components. This can perhaps best be achieved through a hierarchical approach that recognizes both the role each level of government should play in managing urban runoff and the relative proximity each level has to the actual stormwater management practices that must be properly maintained.

This approach can begin at the state program level with language that both mandates proper stormwater management practice maintenance and establishes general or minimum requirements to ensure it is achieved. Such requirements can include the need to design and construct stormwater management practices that require the least practical maintenance effort and cost, as well as the need to prepare a maintenance plan that details the actual maintenance tasks and equipment necessary to perform them. These general requirements can also specify what types of entities can and cannot be assigned maintenance responsibility and establish general record keeping and reporting requirements. Finally, it is important that, having established general maintenance standards and requirements, state and other higher levels of government recognize that those at the municipal and county level will have a more direct physical and regulatory relationship with the actual stormwater management practices and their owners. This recognition should come in the form of state program language that allows municipalities, counties, and other local government entities to both establish more specific maintenance standards and requirements and to decide the optimal procedures for implementing them. As noted in the 1997 *Operation, Maintenance, and Management of Stormwater Management Systems* (Watershed Management Institute, 1997), a key to a successful stormwater management practice maintenance program is providing the flexibility to attain maintenance standards within the institutional framework of the overall stormwater management program, whether at the state, regional, county, and/or municipal level.

For their part, local government entities must recognize that the general or minimum maintenance standards established for them by higher levels of government only represent the framework of an effective maintenance program. This recognition should then prompt the development and refinement of more specific maintenance standards, procedures, and guarantees that address local regulatory, physical, political, economic, and social conditions. This process begins with the identification of these conditions and the development and promulgation of specific maintenance standards for the various types of projects and stormwater management practices expected within a given jurisdiction.

Summary

The above section on the regulatory aspects of stormwater management practice maintenance presented the following ideas and information:

- To be successful, an urban stormwater management program must include provisions for effective maintenance of stormwater management practices.
- These maintenance provisions should address all applicable types of stormwater management practices, including structural facilities and nonstructural measures. Maintenance of nonstructural stormwater management measures poses unique challenges for an urban stormwater management program.
- The program's maintenance provisions must also encompass all phases of a stormwater management practice's development, from planning and design to construction and, ultimately, operation and maintenance. To do so, the program should include design review, construction inspection, and maintenance inspection, enforcement, and default procedures.
- The maintenance provisions must have a sound legal basis that allows the program to both impose maintenance requirements and check for compliance.
- Interagency coordination of maintenance standards will help avoid conflicts and duplication.

Planning and Design Considerations

It is self-evident that the efforts of planners, designers, and reviewers of stormwater management practices will directly affect the runoff performance of these practices. However, the efforts of these individuals can also have a direct effect on the amount, frequency, and difficulty of required practice maintenance. Research into the maintenance aspects of more than 50 structural stormwater management facilities in New Jersey indicated that approximately two thirds of the maintenance problems encountered at these facilities were at least partly due to shortcomings in the planning, design, and review process (N.J. Department of Environmental Protection, 1989). These shortcomings included:

- Inadequate planning and design standards in the urban runoff management program;
- Inadequate investigation and analysis of facility site conditions;
- Inadequate understanding of facility function and operational needs;
- Inattentive or inept design and design review; and
- Lack of consideration for facility maintenance needs.

The results of these shortcomings included increased maintenance complexity, effort, and cost, reduced facility performance, and decreased facility safety (Watershed Management Institute, 1997). According to the New Jersey research, some of the resultant maintenance problems "were virtually unsolvable without massive infusions of time, money, and hard work."

Fortunately, enlightened and focused planning, design, and review requirements and procedures can eliminate these shortcomings and actually improve maintenance effectiveness and efficiency. This, in turn, can lead to high levels of long-term practice performance and safety. It is therefore important that an urban stormwater management program require planners, designers, and reviewers to include maintenance as a key consideration in their efforts. In addition, the program should provide them with maintenance-based planning and design standards that help achieve the favorable program results described above.

In general, planning and design standards that help minimize and facilitate stormwater management practice maintenance typically include the following

consideration for four important aspects: durability, constructability, maintainability, and accessibility. Discussions of each is presented below.

Durability

The required use of strong, durable materials, appurtenances, and fasteners can greatly reduce the maintenance required at a structural stormwater management facility. These long-term savings typically exceed the one-time expense of providing higher quality products, which justifies their inclusion in the program's maintenance standards. Durability extends across the entire range of facility components, from concrete outlet structures to vegetative covers and landscaping.

Durability

BAD: Inappropriate materials and poor construction increases maintenance effort and cost.

GOOD: Durable materials and sound construction decreases them.

Constructability

It must be remembered that a stormwater management practice must be properly constructed before it can produce any long-term runoff management benefits with reasonable levels of inspection and maintenance. This high degree of construction quality requires skilled, experienced, and properly equipped constructors and attentive and knowledgeable inspectors. However, achieving high quality construction begins with the creation of stormwater management practices at the planning and design levels that reflect the realities of construction. These realities require that a practice possess a reasonable degree of simplicity, standardization, and component availability. Required materials and equipment should be readily available and construction techniques safe and feasible. Construction plans and specifications, which are the constructors' and inspectors' instruction manual, must be clear, concise, and informative. They must contain all necessary information in a format and form that assists rather than hinders use in the field under all weather conditions. This is not meant to stifle creativity and imagination in the selection and design of a particular stormwater management practice. However, practices or components that require particularly new or complex construction materials, techniques, equipment, or sequencing must be given additional attention in the construction documents in the form of extra detailing, notes, warnings, and references.

Constructability

To help ensure sound construction, required construction materials and procedures should be as standard as practical. Unique procedures and complex components should be thoroughly described and detailed in construction documents.

Maintainability

Throughout the planning, design, and review process, every attempt should be made to both minimize and facilitate required maintenance. This approach must guide a wide range of decisions, from the type of selected stormwater management practice to its location, configuration, materials, and the techniques and equipment required to both construct and maintain it. The questions governing these decisions include:

- Is the type of selected stormwater management practice and its various components compatible with the physical conditions and constraints of its location?
- Are the selected materials durable? Are they reasonably available for both construction and replacement purposes?
- Are proposed slopes steep enough to promote proper drainage but flat enough to permit safe access and mobility of inspection and maintenance personnel?
- Can required levels of construction quality be reasonably achieved?
- Are the amount, cost, and complexity of required maintenance within the owner's ability to provide it?

Under optimum planning, design, and review conditions, all of the above questions will be answered affirmatively before the design of the stormwater management practice is completed and approved.

Accessibility

According to the New Jersey stormwater management facility maintenance research cited earlier (NJDEP, 1989), lack of accessibility was a major hindrance to stormwater management practice maintenance, with the access to approximately one third of practice components inspected in the field considered inadequate and, at times, unsafe. Lack of safe, adequate access can quickly defeat all planning, design, and review efforts to provide durable, constructable, and maintainable stormwater management practices as well as an owner's efforts to train, equip, fund, and motivate maintenance personnel. In other words, small oversights regarding access can create large maintenance problems. Personnel access to a stormwater management practice and its various components must include not only the personnel themselves, but their equipment and materials as well. Access can range from legal access through an easement or right-of-way to a stormwater management practice to physical access to the interior of its outlet structure through a hatch and ladder rungs.

Efforts to facilitate access and enhance safety during the planning, design, and review phases can often yield significant savings in subsequent inspection and maintenance efforts. For example, a maintenance inspector conducting a post-storm inspection of several stormwater management facilities for excessive debris build-up can complete their task more efficiently if a facility is visible from a road, driveway, or other location accessible by their vehicle. Similarly, the cost to remove

Maintainability

BAD: Lack of adequate bottom slope in dry detention basin causes unintended ponding that prevents mowing and cleaning.

GOOD: Adequate bottom slope in dry detention basin creates intended dry bottom that can be regularly mowed and cleaned.

any debris noted during the inspection can be reduced if the maintenance personnel have ready access to it. Similar to durability, the long-term savings achieved through enhanced accessibility typically exceed the one-time expense of providing it.

Another important but less noted aspect of stormwater management practice accessibility is how readily visible a particular practice is to people other than maintenance personnel. According to the New Jersey stormwater management facility maintenance research cited earlier, structural stormwater management facilities that were readily visible to pedestrians, motorists, customers, employees, and others not responsible for facility maintenance were more than twice as likely to receive high levels of maintenance than less visible ones. Less visible facilities were in turn three times more likely to receive fair to poor maintenance. This leads to the conclusion that visual accessibility may be equal in importance to physical and legal access for maintenance purposes.

Finally, attempts to minimize and facilitate stormwater management practice maintenance during the planning, design, and review phases can be aided by a series of questions that planners, designers, and reviewers should pose to themselves and each other. These questions include:

Who will perform the maintenance?

Will specialists be required for some or all of the maintenance or can it be performed by someone with general maintenance skills and equipment? The person or agency that will actually be performing the required maintenance must be identified with sufficient accuracy during the planning, design, and review phases so that their level of ability, equipment, and expertise can be taken into consideration.

What maintenance must be performed?

Each type of stormwater management practice requires specific and, at times, unique maintenance tasks. These tasks should be identified prior to final practice selection so that planners, designers, and reviewers can ensure that they correspond to the abilities and equipment of the designated maintainers. In addition, preparing a list of all required maintenance tasks may prompt a redesign that produces a shorter task list.

Accessibility

Lack of access can defeat the best maintenance program requirements and intentions.

BAD: Lack of depressed curb hinders access to practice by maintenance personnel and equipment.

GOOD: Readily accessible practices are easier and cheaper to maintain.

When will maintenance be required?

Once a day, week, month, or year? Recurring maintenance costs can be substantial over the life of the practice. In addition, certain stormwater management practices and their components require maintenance at specific times of year or only under certain weather conditions. For example, the turf grass in an extended detention basin or grass filter strip can only be moved in dry weather. How will maintenance and operation be affected if prolonged periods of wet weather are common? Finally, are emergency repairs or debris removal possible during a storm event, perhaps during nighttime hours? Addressing such questions during the planning, design, and review phases will be easier than during an actual post-construction emergency and can produce more appropriate practice selections and improved practice designs.

Where will maintenance be required?

Will maintenance personnel be able to get to the area or component that requires maintenance, along with their equipment and materials? Once there, will they have a safe, stable place to work in? In addition, where will the sediment, debris, and other material removed from the practice be disposed? This question becomes more critical when the character of the removed material (such as toxic or hazardous materials) affects the disposal location. Once again, addressing these questions during the planning, design, and review phases will be easier than during the first cleanout effort.

How will maintenance be performed? What equipment, training, and/or materials will be necessary? Will any safety equipment or procedures be necessary? Is a certain maintenance task exceptionally difficult, dangerous, and/or expensive? Can such conditions be eliminated through additional design effort or through selection of a different stormwater management practice?

All of the above questions are intended to make planners, designers, and reviewers more aware of maintenance tasks, schedules, costs, and problems and to encourage them to address these issues during the planning, design, and review phases of the practice. The goal of minimum maintenance cannot be achieved without doing so.

Summary

The above section on planning and design standards presented the following ideas and information:

- The efforts of planners, designers, and reviewers can have a direct effect on the amount, frequency, cost, and complexity of maintenance required at a stormwater management practice.
- As a result, a successful urban runoff management program must include planning, design, and review requirements that minimize and facilitate maintenance and provide specific guidance on how to achieve it.

Accessibility

GOOD AND BAD: Ladder rungs allow access to structure bottom, but large grating openings are hazardous to maintenance personnel.

GOOD: Lightweight, noncorroding aluminum top gratings are safe to stand on and easy to lift.

- Durability, maintainability, constructability, and accessibility are key planning and design considerations.
- Who, what, where, when, and how maintenance will be conducted are key questions that planners, designers, and reviewers can ask themselves and each other.

Public Maintenance Financing

Regardless of the combined efforts of regulators, planners, designers, reviewers, constructors, and inspectors, successful stormwater management practice maintenance cannot be achieved without adequate funding of required maintenance activities. This funding is not only needed for the direct costs of performing required maintenance tasks, but also to meet the costs of equipment, training, disposal, record keeping, and administration. When maintenance is financed and performed by a private entity such as a property or building owner, there is typically a wider range of available funding sources than if the maintenance is publicly financed. Private funding sources may include rental and lease incomes, tenant fees, service charges, or incorporating maintenance costs into company overhead, product prices, and/or service rates.

Maintenance financing by a public entity such as a municipal or county government can be more difficult, typically due to fewer funding sources, funding competition from other government activities, and the need to secure funding a year or more in advance through the government's budgeting process. This section will review these difficulties and explore ways in which they can be avoided and maintenance funding maximized.

Before reviewing potential funding sources, it is helpful to look at some of the reasons why a public entity would assume the responsibility for stormwater management practice maintenance and its financing. Most obvious is the case where the public entity is required to construct or implement a stormwater management practice to serve its own properties, roadways, buildings, and other public facilities. Such cases are expected to become more numerous with the arrival of the EPA's Phase II Stormwater Rules and associated NPDES permits, which require public entities to implement practices at new public facilities that disturb an acre or more of land.

In addition, a public entity such as a municipality or county may choose to assume the maintenance of a stormwater management practice at a privately-owned project or development in order to ensure it receives adequate care. While most public entities prefer that such maintenance remain in the responsibility of the practice's private owner, research has shown that the level and quality of private maintenance in many instances can be inadequate. As a result, a local government with overall responsibility for public health and safety as well as specific NPDES permit obligations may decide that the best way to meet these obligations and responsibilities is to perform the required maintenance itself. In other instances, a public entity may have been forced to assume maintenance responsibility of a private stormwater management practice due to the owner's failure to adequately perform it. Such assumption typically occurs some time after the practice's construction.

Whatever the reasons, once a public entity becomes responsible for stormwater management practice maintenance, it must develop and implement a program to finance the required maintenance activities. This is true whether the public entity performs the maintenance itself or hires an outside company or agency to do it. There are some general characteristics of a successful maintenance financing program that warrant special consideration (Livingston et al., 1997). These characteristics are summarized below:

- The success of any public financing program is determined in part by the amount and quality of program information provided to the public. This information must explain the purpose of and need for the stormwater management practice maintenance activities as well as sufficient details of the financing program. The information must be able to convince the public and their elected officials that it is in their interests to adequately fund the public entity's stormwater management practice maintenance activities.
- A public financing program should be based upon a stable, reliable source of funds. Stormwater management practice maintenance is a long-term activity that requires a funding source that will remain viable throughout the life of the maintenance program.

- Whenever possible, a public financing program should fit readily into the billing, collection, and bookkeeping operations of the public entity's existing financial system.
- A public financing program should include provisions not only for the actual maintenance activities but also for record keeping, accounting, and other administrative tasks.
- The fee or rate structure for a public financing program should be equitable, readily understandable, and defensible. It must be perceived by the public as being fair, reasonable, and based upon accurate information and sound decisions.
- In addition, the fee or rate structure should be flexible enough to allow both regular and emergency updating to address changes in maintenance program scope, schedule, and costs.
- Finally, a public financing program must be consistent with all applicable laws and regulations. To ensure such consistency, the program must be reviewed by legal counsel prior to its implementation.

In general, there are three funding sources typically available for public stormwater management practice maintenance (NJDEP, 1989) activities:

1. General Tax Revenues
2. Dedicated Contributions
3. Stormwater Utility Fees

Details of each funding source are presented below, including suggested criteria for evaluating the suitability of each for a particular public entity.

General Tax Revenues

General tax revenues are an obvious source of funding for public maintenance of stormwater management practices. Since taxes are raised to provide for a community's health, safety, and welfare as well as to meet its legal obligations, it can be shown that failure to provide adequate stormwater management practice maintenance can threaten these important objectives. As a result, the use of general tax revenues remains a popular source of funding for stormwater management practice maintenance. To obtain this funding, however, requires preparation of annual maintenance program budgets based upon forecasts or predictions of future maintenance obligations and costs. Low forecasts can lead to budget shortfalls that can prevent the performance of all required maintenance activities, while excessively high forecasts can hinder efforts to secure necessary funding.

Other aspects of the budgeting process can complicate the use of general tax revenues to fund public stormwater management practice maintenance. As part of a government's overall operating budget, stormwater management practice maintenance must compete for funding with all other government operations included in the budget, including police, fire, sanitation, and administrative services. It is in such competitive situations that the value of an effective public information program regarding urban stormwater management noted above becomes apparent. The legal obligation to comply with the maintenance requirements of a municipality's or county's NPDES permit can also give the maintenance program added importance during the budgeting process.

Nevertheless, several other difficulties may exist. First, it may be difficult to justify the use of general tax revenues from the entire community to maintain a stormwater management practice that only directly benefits a portion of that community. Second, the need to provide funding for unforeseen, emergency, or other one-time non-stormwater events occurring in the community may result in the diversion of normal, expected funding away from the stormwater management practice maintenance program. Finally, in light of the public's traditional resistance to tax increases, which can manifest itself at times in the adoption of tax increase caps and even tax cuts, it may be difficult to obtain required funding increases necessitated by increased maintenance costs. As a result, general tax revenues can be both the most readily available and least stable source of maintenance program funding. This realization has led to development of the alternative approaches described below.

Dedicated Contributions

The use of dedicated contributions to finance public maintenance of stormwater management practices is based upon the principle that those creating the need for the stormwater management practice and its maintenance should bear the cost. It applies to stormwater management programs in which a public entity assumes the maintenance responsibility for a stormwater manage-

ment practice that has been created to serve a privately-owned land development or project. In exchange for the maintenance responsibility, the developer makes a one-time contribution to the public entity to fund the long-term required maintenance. This contribution is then periodically drawn upon by the public entity as the maintenance is performed. As a guarantee, the contribution is typically made prior to final approval of the development. It is placed in a dedicated account that can only be used to finance maintenance of that particular stormwater management practice. Accurate bookkeeping practices must be followed to ensure appropriate use of the funds.

In one sense, the use of dedicated contributions to finance public stormwater management practice maintenance can be considered an extension of the permit or inspection fees traditionally charged by local governments or other public entities to review and/or inspect the construction of a privately-owned development, building, or other project. In this case, the permit or inspection fee is used to offset the administrative and inspection costs incurred by the public entity. The dedicated contribution system extends this concept by applying the "fee" paid in the form of a dedicated contribution 1) only to a specific project or practice and 2) over an extended period of time. The application to a specific project requires, as mentioned above, a dedicated account in which to deposit the contribution and track withdrawals, while use of the contribution over an extended period of time requires consideration of both interest earnings and cost increases.

One key to a successful dedicated contribution financing system is an accurate method for estimating the long-term maintenance costs and then converting that amount into an equivalent one-time payment. Factors that should be considered when estimating the payment include:

- The type and maintenance needs of the specific stormwater management practice to be maintained, including the type, size, and location of the practice as well as the characteristics of the runoff it will receive;
- The number of years that maintenance must be provided;
- The present annual costs of practice maintenance, including maintenance activities, equipment repair and replacement, materials, insurance, record keeping, and other administrative tasks;
- Anticipated maintenance cost increases due to increases in salaries, overhead, materials and equipment costs, insurance premiums, and disposal costs; and
- The anticipated interest rate earned by the contribution over the life of the maintenance financing.

The use of dedicated contributions to finance stormwater management practice maintenance has many advantages (Livingston et al., 1997). The most important one may be that it provides a secure and stable maintenance funding source if properly managed. In addition, the source of the maintenance funding can be directly linked to the need for maintenance, eliminating the need to justify the expenditure of general revenues on a particular facility or area. Difficulties include the need for accurate estimates of annual maintenance costs which, in turn, require similarly accurate estimates of the required time, materials, and equipment. Administrative and insurance costs must also be accurately estimated along with potential cost increases for all aspects of the maintenance program. The duration of the maintenance program and the interest that may be earned on the one-time contribution during this period can also be difficult to accurately estimate. Typically, conservative estimates are used in order to provide a safety factor. The actual computation of the one-time contribution is based upon standard economic principles for capital recovery through a series of payments (Grant and Ireson, 1960). Formulas can be found in standard economics textbooks, particularly those that deal with the principles of engineering economics.

A final difficulty with the use of dedicated contributions is the fact that they are only directly applicable to the maintenance of new, privately-owned and financed stormwater management practices. They cannot be readily used to finance the public maintenance of new, publicly-owned measures or any existing public maintenance activities without special considerations and conditions. Consequently, full public financing of stormwater management practice maintenance may require the combined use of general tax revenues for publicly-owned practices and dedicated contributions for privately-owned ones.

Stormwater Utility Fees

The uncertainties associated with the use of general tax revenues to finance stormwater management practice maintenance has recently led many communities to create a specialized agency known as a stormwater utility. This agency is assigned responsibility for stormwater management practice maintenance within its jurisdictional area. To finance this maintenance, the utility is allowed to charge property owners within it jurisdiction a fee or other assessment. The amount of the fee is typically related to the property's stormwater impacts and, consequently, its dependence on a well-maintained stormwater management practice. In some instances, the utility's responsibilities may also include storm sewer construction and maintenance, waterway stewardship, and other drainage, erosion, and flood control activities.

The use of utility fees to finance publicly-owned water and sewerage systems began in the early 1990s, and they continue to be a stable source of funding for such systems. Over the last decade, the use of this public financing technique has been extended to the operation and maintenance of stormwater management systems. Once the utility has been established, it offers many advantages over other public financing sources. It can provide maintenance funds for both existing and proposed stormwater management practices. It does not have to compete with other government programs and needs. Moreover, the relationship between the fees for stormwater management practice maintenance and the benefits of performing it is more obvious in this approach. However, first the utility must be created and an equitable fee structure established. This entails the legal and physical establishment of an entirely new entity with sufficient staff and resources to properly function. This requirement can pose the greatest obstacle to the use of utility fees to finance public maintenance of stormwater management practices.

The utility rate structure must be based on several considerations (Livingston et al., 1997). It must, of course, reflect the costs of providing the stormwater management practice maintenance and other services for which the utility was established. But first and perhaps foremost is the premise that the fee is based upon the need for the stormwater management practice maintenance rather than the benefits provided by it. As a result, the fee structure can be based upon characteristics of the assessed properties that influence the volume of runoff they produce, such as their total area, the area of their impervious surfaces, or the type of land use. However, the fee structure should also remain as simple as possible in order to facilitate understanding of and, as a result, acceptance by those paying it. Simplicity will also facilitate utility administration and implementing future rate changes.

Summary

The above section on the public financing of stormwater management practice maintenance presented the following ideas and information:

- Successful implementation of a public stormwater management practice maintenance program requires adequate and stable funding sources.
- The reasons why a public entity would assume the maintenance of a stormwater management practice include direct ownership of the practice, the need or desire to have direct control over a privately-owned practice, and maintenance default by the owner.
- There are three general sources of funds for public stormwater management practice maintenance: 1) general tax revenues, 2) dedicated contributions, and 3) utility charges.
- The use of these financing techniques involves legal, financial, and economic considerations that must be thoroughly addressed before such use can begin.

Summary and Conclusions

This chapter demonstrates the importance of stormwater management practice maintenance and describes key features of an effective maintenance program. Such features include:

1. Legal authority to require and enforce stormwater management practice maintenance;
2. Planning and design standards that minimize and facilitate maintenance;
3. Design review procedures to ensure compliance with these standards;
4. Construction inspection procedures to ensure that the practice is being constructed in accordance with the design plans;
5. Post-construction monitoring to ensure proper maintenance is being conducted;
6. Recognition of the unique maintenance needs of nonstructural stormwater management practices; and
7. Ensuring that adequate and stable funding is available for maintenance.

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Rural Roads: A Construction and Maintenance Guide for California Landowners

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Many thousands of miles of privately maintained rural roads extend throughout California, and they are used for resource management as well as residential and recreational access by over 500,000 landowners (fig. 1). The California Department of Forestry and Fire Protection (CAL FIRE) estimates that another 2.7 million acres of forest and rangeland will be developed over the next 40 years, requiring the construction of thousands of miles of new roads (CAL FIRE 2003). Poorly located, designed, or maintained roads are the primary cause of water quality degradation in rural watersheds.

This publication is designed to help rural landowners understand how to improve and maintain existing roads. It also provides guidance on planning new roads. It is written for people who have little to no previous experience in managing a road. If you have recently purchased a rural parcel or have become responsible for road maintenance on an existing parcel—or otherwise feel unprepared for maintaining roads—this publication should help you. It mainly addresses single-lane dirt or rock-surfaced rural roads, also known as "low-volume" roads because they are not expected to carry high traffic levels.

This publication should enable you to

- understand the basic principles of good road design and maintenance
- recognize current and potential road erosion and drainage problems
- consider remedial treatments that may be needed
- develop rough estimates for the costs of road improvements and maintenance
- communicate clearly with contractors who may perform work on your roads

Figure 1. Low-volume road that has been newly graveled and out-sloped, San Bernardino County. *Photo:* Richard Harris.

UC PEER REVIEWED

Figure 2. This cross drain delivers sediment from the roadside ditch under the road surface to a nearby stream. The road fill is also eroding. *Photo:* Jared Gerstein.

WHY WORRY ABOUT ROAD DESIGN AND MAINTENANCE?

Road maintenance should be considered an unavoidable necessity of living in a rural area. Landowners should take the time to learn about roads because when they are well designed and maintained they have fewer impacts on the environment, are more reliable, and cost less to maintain than problem roads.

Environmental impacts

Rural roads are a major source of sediment that ends up in stream channels (fig. 2). This is especially true for unpaved roads located near streams that are used year-round. Sediment delivered to streams from roads causes streams to run muddy and take a long time to clear after storms. Sediment can end up depositing in pools and adversely affect habitat for fish and other aquatic organisms.

Reliability

Poorly designed, located, or maintained roads have a higher risk of failing during storms than roads that are well constructed and maintained. Adequately sized culverts, free-flowing ditches, and properly drained road surfaces are essential elements of a reliable road network. Without these elements in place, even a moderate winter storm can render a road impassable.

Cost of repetitive maintenance

The bottom line is that it can be extremely expensive to maintain roads that are designed, located, or constructed poorly. It is usually more cost effective to identify and remedy chronic road problems than to treat only the symptoms of the problem year after year. For example, it will cost less in the long run to install proper drainage structures and rock surfacing on a road that gets muddy and rutted every winter than to regrade the road surface every spring.

UNDERSTANDING ROAD COMPONENTS

Although roads vary in their configuration and design, they have common elements that affect their functionality and durability. Roads must create a flat surface for vehicle travel on sloped land. To do this, part of the hillslope is cut away (the *cut slope*) and the removed soils are placed below (the *fill slope*) and compacted to create a flat bench or *traveled way*. This is called *cut-and-fill* construction (fig. 3). A *balanced cut-and-fill* project uses all the cut material to generate the fill. In *full-bench* construction, the cut is made wide enough to accommodate the entire traveled way (fig. 4). The cut mate-

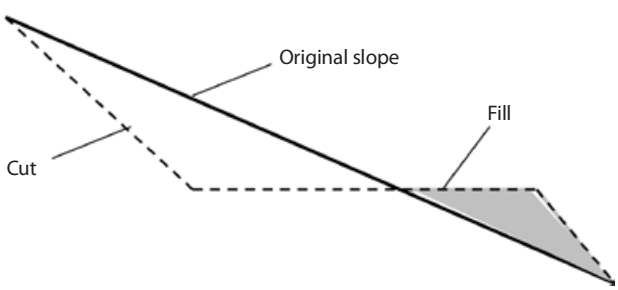

Figure 3. Cut-and-fill road construction design. *Source:* Kramer 2001.

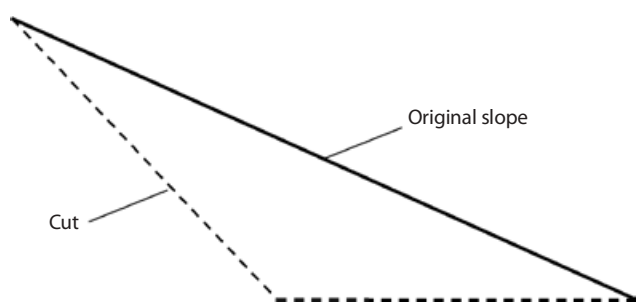

Figure 4. Full-bench road construction design. *Source:* Redrawn from Kramer 2001.

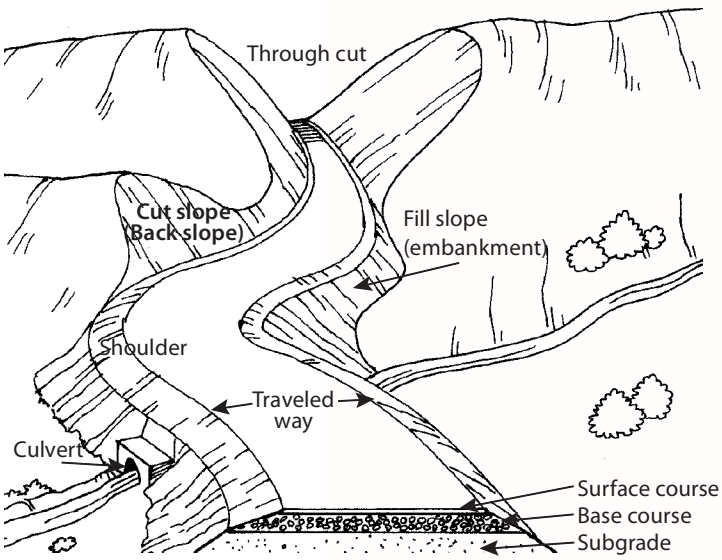

Figure 5. Components of a road. *Source:* Keller and Sherar 2003.

rial is not used in the road construction and must be hauled (*end-hauled*) to an off-site disposal area. Full-bench construction reduces the risk of fill slope failure but is usually more expensive due to hauling costs.

Ideally, a road should consist of three layers (fig. 5). The *subgrade* is the bottommost layer at the level of the in-place material. The *base course* is the main load-spreading layer and typically consists of gravels or gravelly soils, with sand and/or clay intermixed. The *surface course* or *surfacing* may consist of native materials, imported rock, or asphalt. It is placed on top of the base course to improve rider comfort, provide structural support, and weatherproof the road for wet season use. As a practical matter, many rural roads are not constructed in this way but consist entirely of native materials encountered during grading. This can be a factor contributing to poor performance.

All roads must incorporate features to drain water off the road surface and allow it to cross from one side to the other. Road drainage is the key to a road's integrity. *Culverts* are metal, concrete, or plastic pipes set beneath the road surface to drain ditches, springs, or streams crossed by the road. Culverts move water from the inside of the road (next to the cut slope) through a pipe to the outside of the road (to the fill slope or edge of bench). *Ditches* are used to collect water that accumulates from the road surface or hillslope on the inside or cut-slope side of an in-sloped road. *Ditch relief culverts* drain the accumulated water from the inside ditch to the outside of the road.

Besides culverts, common stream-crossing structures include bridges and low-water crossings or fords. *Bridges* usually cause fewer environmental impacts than culverts because they may not alter the natural channel form or require placement of fill in the channel. However, they are often more expensive to install than culverts. *Low-water fords* involve modifying and sometimes hardening a swale or stream channel to allow vehicles to drive through during low-flow periods (figs. 6 and 7). Less fill is introduced to the stream channel; however, vehicles driving through may input sediment to the stream continuously. Fords are typically impassable during high flows and so are rarely suitable for permanent roads.

Figure 6. Low-water crossing on a perennial stream, San Bernardino County. *Photo:* Richard Harris.

Figure 7. Concreted low-water crossing placed on bedrock outcrop in intermittent stream. *Photo:* Angela Wilson, Central Valley Regional Water Quality Control Board.

Figure 8. Rolling dips installed to drain an out-sloped road. *Source:* Bill Weaver, Pacific Watershed Associates.

Figure 9. Water bars installed on a road after timber harvesting. *Source:* Angela Wilson, Central Valley Regional Water Quality Control Board.

Rolling dips are constructed breaks in the road grade designed to drain water directly from the road surface to the outside of a road without using an inside ditch or ditch relief culvert (fig. 8). They require vehicles to slow their speed of travel.

A *water bar* is a mound of soil and an accompanying ditch on the road surface that interrupts water flow and diverts it off the road surface (fig. 9). It is typically not passable by vehicles and so is not used on permanent roads. A *berm* is a ridge of rock, soil, or asphalt usually found on the outside of a road shoulder to control surface water. It directs runoff to specific locations where water can be discharged without causing erosion. *Armoring* is the placement of a layer of rock on cut or fill slopes or ditches to prevent water from eroding the soil.

UNDERSTANDING ROAD DESIGN AND DRAINAGE

Draining water from the road surface quickly, without letting it concentrate, is key to preventing erosion and thus to maintaining a stable driving surface. Two characteristics influence how well water drains from the road surface: the steepness of the road (i.e. its *grade* or *gradient*), and the shape and cross slope of the traveled way. The gradient of the road is determined by its location and routing; thus, it cannot be changed without moving the road. The cross-sectional shape and slope of a road are the primary design features that may be manipulated to improve drainage.

Figure 10. These ruts were created by wet-weather use of an unsurfaced, poorly drained road. *Photo:* Angela Wilson, Central Valley Regional Water Quality Control Board.

Gradient

Roads with a gentle gradient are easiest to maintain as long as the slope is adequate to drain the water off the road surface. In general, road grades need to be a minimum of two percent to facilitate drainage, so that water will not accumulate on the surface and saturate the subgrade. Saturated subgrades in combination with repetitive splash erosion due to vehicle traffic are responsible for potholes and ruts (fig. 10). Steeper roads drain water more quickly, but this allows the water to develop more erosive power, necessitating measures to prevent erosion and destabilization.

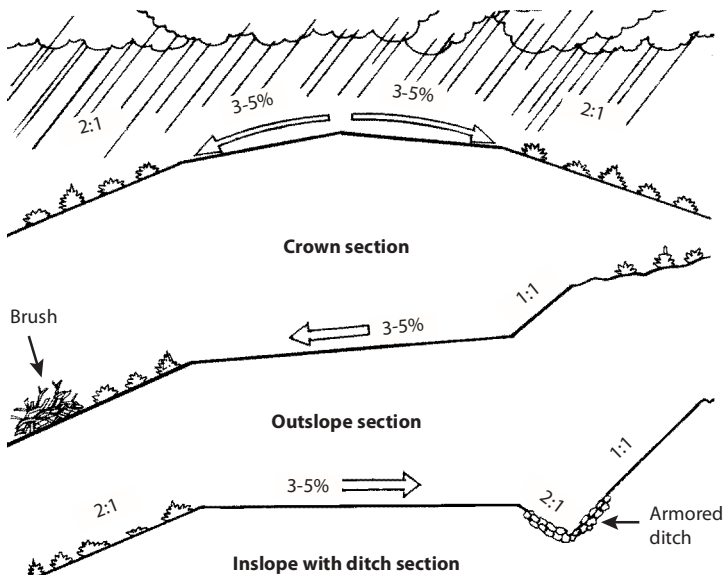

Figure 11. Typical road drainage options. *Source:* Keller and Sherar 2003.

Shape and slope of the surface

The shape and slope of the road surface determines how water will drain from it (fig. 11). In-sloped, out-sloped, and crowned roads drain water differently. The surface of an *in-sloped* road has a gentle tilt towards the cut slope of the hillside. Water collecting on the surface is drained into a ditch constructed between the road surface and the cut slope. Until recently, most roads in California were designed and constructed as in-sloped roads. When constructed in native materials, in-sloped roads are prone to erosion. Erosion can occur in the ditch, due to concentrated flow; on the road surface when ditch capacity is exceeded; or at the outfalls of culverts and cross drains receiving ditch flow. Ditch relief culverts must be installed frequently to accept ditch flow and dispose of it in a nonerosive manner.

Out-sloped roads are built with a slight angle of the road surface towards the fill slope. This allows the road surface runoff to sheet flow in a dispersed manner over the fill slope onto the adjacent hillside. Continuously concentrated runoff is avoided. Assuming that the fill slope and hillside are adequately vegetated or otherwise protected, no erosion occurs. Without a ditch, no ditch relief culverts are needed. This minimizes costs, reduces the chance of road failure due to culvert plugging, and may require less road width. Fill slopes may be armored to avoid erosion. Out-sloped roads may be difficult to drain on steep hillslopes and on road grades over 10 to 12 percent. They may be unsafe in areas with slippery soils or snow cover or in places where roads become icy, especially on curves where momentum would carry vehicles to the edge.

Crowned roads disperse water to each side of the road. They often require a system of ditches and cross drains which can be difficult to create and maintain. Therefore, they work best on two-lane roads with gentle grades or on the crest of hills.

UNDERSTANDING THE TYPE OF ROAD NEEDED

Deciding what kinds of roads you need for access to and on your property is an important step towards good stewardship. This includes considering whether or not existing roads are adequately designed for the intended uses. In some cases, existing roads may need to be upgraded to accommodate your uses or entirely new roads may be required.

The appropriate road design depends on the intended use. Roads with relatively high traffic levels, heavy truck use, or all-season use require a higher design standard and possibly a higher level of maintenance. In any case, the guiding principles should be to minimize erosion and ensure that the road is designed and maintained according to its use.

All-season roads

These are used year-round and are intended to be in continuous service for the foreseeable future. In rural subdivisions, these tend to be the “community roads” that run across multiple parcels and collect traffic from individual driveways. On timberlands or ranches, these permanent roads are the “haul roads” that can be used year-round, but receive most traffic during the dry season. Typically, all-season roads have rock

Figure 12. Grass cover on the surface of a road used for dry-season access.
Source: Julie Bawcom, California Geological Survey.

or other surfacing (at least on steep hills and near stream channels) and bridges or culverts at stream crossings. They may be in-sloped, out-sloped, or crowned alone or in combination. They may be graded and resurfaced regularly to maintain a smooth running surface.

Seasonal roads

These may be constructed to a lower standard because they are used only during the dry season (fig. 12). They are often permanent roads so they require provisions for drainage even if they are not used in the winter. Rock surfacing may not be required. Fords, rather than culverts or bridges, may be used at stream crossings, particularly if the streams do not flow in the summer. Seasonal roads may have a steeper gradient than all-season roads and utilize an out-sloping drainage design. They may be closed after seasonal use and winterized by installation of water bars and revegetation of the road surface.

Temporary roads

These are used for only a short time and for a dedicated purpose, such as a timber harvest. Use is generally confined to the dry season and design standards may be minimal. Construction should minimize the volume of material excavated by following existing contours and cutting as little as possible. The road is closed after use, although the road bed may be retained for future use. Adequate closure should include removal of stream-crossing structures and associated fills along with installation of water bars to prevent any accumulation of water on the road surface. If vegetation cannot grow back on the road surface, it may be necessary to break up compaction and loosen the soil by 'ripping' it with a bulldozer. When closed, the entrance to the road should be blocked off to prevent all vehicle access.

ROAD DESIGN PRINCIPLES

Construction

- Minimize the number and length of roads in the watershed.
- Minimize the width of the road and the area disturbed during construction.
- Minimize road gradient. Gradient should be 12 percent or less.
- Use balanced cut-and-fill construction in gentle terrain.
- Avoid construction on steep slopes over 60 percent. Use full-bench construction where slopes over 60 percent cannot be avoided.
- Minimize cuts, fills, and vegetation clearing. Construct cut slopes on a ¾:1 or flatter slope.
- Build fill slopes on a 1½:1 or flatter slope.

Streams

- Stay as far away from streams as possible and minimize the number of crossings.
- Design crossings with adequate capacity to pass the 100-year storm flow plus the debris and sediment carried through the culvert during the storm.

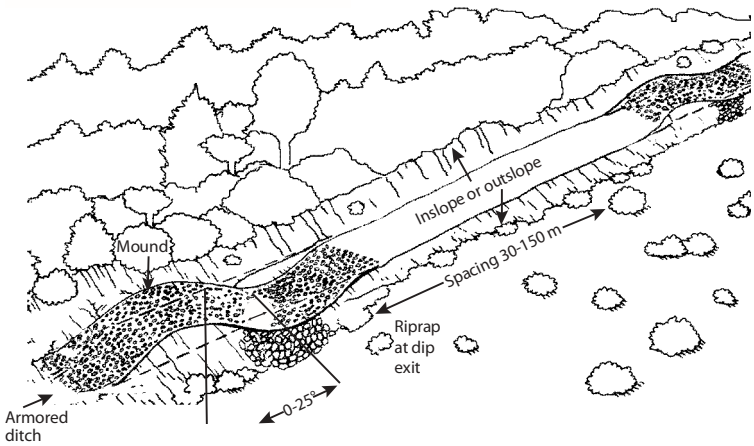

Figure 13A. Rolling dip on an out-sloped road. Proportions are exaggerated for clarity. (In practice, rolling dips can be subtle and still be effective.) *Source:* Keller and Sherar 2003.

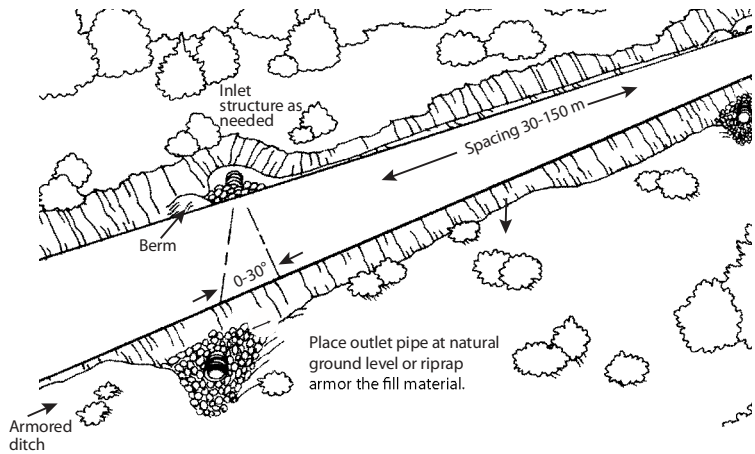

Figure 13B. Installation of ditch relief culverts on an in-sloped road section. *Source:* Keller and Sherar 2003.

- Reduce the potential for streams to be diverted onto the road surface by installing dips and trash barriers on streams that are not fish bearing.
- Protect crossing outlets with erosion control measures or downspouts.
- Facilitate fish passage, preferably by installing bridges, on fish-bearing streams.
- Use special techniques to cross meadows and other wet areas.

Drainage

- Provide adequate road surface drainage and minimize the concentration of runoff.
- Out-slope roads whenever practical. Road surfaces should slope 3 to 5 percent for road grades less than 10 percent. Install rolling dips for drainage (fig. 13A).
- In-slope road surfaces at an angle of 3 to 5 percent. Install ditch relief culverts (fig. 13B).
- Crown road sections with gentle slopes to prevent standing water on the road.
- Avoid wet and unstable areas.

Table 1. Rolling dip and ditch relief culvert recommendations

Road grade (%)	Soil erodibility	
	Low to non-erosive soils (ft)	Erosive soils (ft)
0–3	400	250
4–6	300	160
7–9	250	130
10–12	200	115
12+	160	100

Source: Adapted from Keller and Sherar 2003.

Table 2. Water bar spacing recommendations

Road or trail grade (%)	Soil erodibility	
	Low to non-erosive soils (ft)	Erosive soils (ft)
0–5	250	130
6–10	200	100
11–15	150	65
16–20	115	50
21–30	100	40
30+	50	30

Source: Adapted from Keller and Sherar 2003.

LOW-VOLUME ROAD DRAINAGE PRINCIPLES

Situating and designing roads correctly from the outset will save a landowner years of worry and maintenance costs caused by avoidable road problems. The key to proper road design is to abide by established guidelines and hire good help. These guidelines can also be used to address maintenance problems on existing roads.

It is often said that the three most important considerations for road design are drainage, drainage, drainage! Drainage features should include ditch relief culverts for in-sloped roads and rolling dips for out-sloped roads. Rolling dips or ditch relief culverts of at least 12 inches in diameter should be spaced as necessary to effectively drain the road, and no further apart than every 400 feet (table 1). Adequate drainage control during the winter is also critical for seasonal and temporary roads. Water bars should be installed every 250 feet or closer when the road is closed (table 2). Drainage features should be spaced more closely on roads with steep grades or erodible soils composed of silt or fine sands. (A conversion table is provided at the end of this publication for calculating equivalents between English and metric systems of measurement.)

Figure 14. This fill slope erosion was caused by a plugged cross-drain inlet that diverted ditch flow over the road surface. *Photo:* Angela Wilson, Central Valley Regional Water Quality Control Board.

RECOMMENDED ROAD MAINTENANCE PRACTICES

Even properly designed and constructed roads need inspection and maintenance to function well and avoid road and environmental damage. Maintenance should be performed when needed. The longer the delay in needed maintenance, the more damage will occur and the more costly the repairs will be (fig. 14).

Maintenance should focus on correcting problems that may lead to road failure. This involves ensuring that the established drainage system is not compromised. Culverts plugged with debris often lead to ditch or stream water flowing on to the road surface, which can cause surface erosion or even wash away the entire road prism. Preventing such occurrences should be a top priority. Closing a road during the rainy season can reduce damage caused by vehicles and avoid substantial maintenance costs.

KEY MAINTENANCE PRACTICES

- Inspect roads regularly, especially before the winter season and following heavy rains.
- Keep ditches and culverts free from debris.
- Remove slide material from the road or ditches where it blocks normal drainage.
- Regrade and shape the road surface periodically to maintain proper surface drainage.
  - Keep rolling dips shaped and graded.
  - Keep the downhill side of the road free of berms unless they are intentionally placed to control water or traffic.
  - As necessary, apply surfacing such as aggregate or pavement to protect the roadbed.
- Avoid disturbing soil and vegetation in ditches, shoulders, and on cut-and-fill slopes.
- Maintain an erosion-resistant surfacing such as grass or rock in ditches.
- Close the road during very wet conditions.
- Carry a shovel in your vehicle during the rainy season to clean out ditches, redirect water off the road surface, etc.

The key to good maintenance is identification of maintenance needs through frequent inspections. Road inspections should focus on identifying areas where problems may occur in future storms (fig. 15). All parts of the road including the road surface and cut-and-fill slopes should be inspected, as well as drainage structures such as culverts, bridges, and water bars. Ideally, inspections should be done in time to allow for repairs before the rainy season.

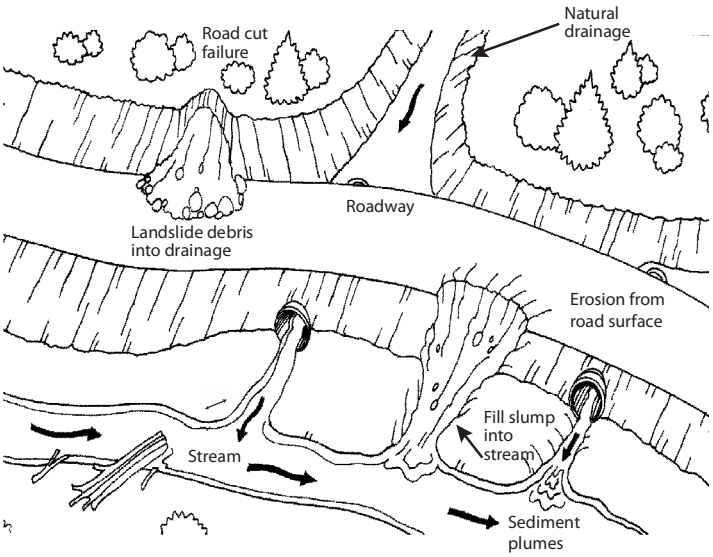

Figure 15. Road system problems to look for during a road inspection. *Source:* Keller and Sherar 2003.

Figure 16. Culvert plugged with sediment at inlet. *Photo:* Angela Wilson, Central Valley Regional Water Quality Control Board.

Figure 17. Culvert with rusted bottom and breakage caused by sediment. *Photo:* Angela Wilson, Central Valley Regional Water Quality Control Board.

WHAT TO LOOK FOR DURING A ROAD INSPECTION

- Culverts: Clear debris and sediment from culvert inlets (see figs. 16 and 17). Straighten bent culvert ends. If erosion has occurred at outlets, install energy dissipaters or armoring.
- Bridges: Inspect bridge abutments. Remove logs or branches lodged in the bridge structure.
- Water bars: Confirm that the water bars are working properly and directing drainage off the side of the road. Inspect the area downslope of the water bars for evidence of rills or gullies indicating that the slope requires additional protection from concentrated roadside drainage.
- Rolling dips: If erosion has occurred at the outside edge of the dip, install energy dissipaters or armoring.
- Inside ditches: Use a shovel to clear debris from the ditch. Avoid grading in ditches.
- Cut-and-fill slopes: Inspect for rilling, slumping, or cracks. Install more drainage structures if problems are found. Remove unstable material with an excavator.

RECOGNIZING AND FIXING COMMON ROAD PROBLEMS

Many road problems are quite easy to detect because they result in reduced driving comfort (e.g., rutting, potholes or wash boarding, erosion of portions of the roadbed, and deposition of soil on the road surface). Obvious problems such as these may cause impacts to streams and aquatic organisms by, for example, depositing sediment or creating barriers to fish passage. Road treatments can be designed to alleviate problems for traffic as well as aquatic habitat without much additional cost. Appropriate treatments for specific kinds of problems are identified here. Before initiating a treatment on your property, it is advisable to consult a professional erosion control or geotechnical specialist.

Figure 18. Water collecting on a forest road because of poor drainage. *Photo:* Jared Gerstein.

Potholes, Gullies, Extensive Rilling, Mud, and Other Road Surface Problems

Symptom

Potholes, ruts, and mud on the surface of the road are symptoms of drainage problems (fig. 18). A properly designed and maintained road will have very little standing or running water on the road surface, even during rain storms.

Finding the underlying problem

In order to locate the source of the problem, follow the water. Water may be originating from springs in the cut bank or under the road, from small creeks diverted onto the road surface, or from retained rain water due to improper drainage. The problem may also be caused by a combination of these.

First, look for springs on the cutbank or under the road. Water-loving vegetation, such as ferns or rushes, is a good indicator of the existence of springs. After a storm ends, puddles will dry out elsewhere on the road but remain much longer where you have springs. If no springs are found, look for streams diverting water onto the road surface. Small swales that are dry most of the year may flow during rain storms; go look for them while it is raining. Look for the original stream on the downhill side of the road.

If the road is retaining rain water on the surface during and shortly after rains, the road may need to be reshaped in order to drain water more efficiently. It is common for roads that have been poorly maintained for years to develop berms on one or both sides of the road, preventing water from draining from the road surface.

Solutions

Possible treatments for spring seepage onto roads are installing deeper inboard ditches and culverts to drain the water under the road, building up the road surface with base rock, or others as appropriate. Stream diversions onto the road surface may be treated by installing a culvert or rocked dip to place the stream back in its natural channel. Standing water due to poor drainage should be treated by changing the shape of the road to out-sloped, in-sloped, or crowned. Breach berms at strategic nonerosive locations to allow drainage and prevent their re-creation during grading. Out-sloping roads and installing rolling dips should be done whenever possible. Rock surfacing may also need to be added.

Dysfunctional Ditches

Symptom

One of the liabilities of a ditch system is the possibility of ditches plugging with debris, causing water to flow onto the road surface. Ditch water "captured" by the road surface can cause severe erosion (fig. 19) and even wash out the road completely.

Finding the underlying problem

Water may flow out of a ditch onto a road when the capacity of the ditch is exceeded. This occurs when the volume of runoff exceeds the ditch capacity or, more commonly, when a ditch relief culvert is plugged with debris. In the latter instance, the plugged cul-

Figure 19. Erosion caused by ditch water leaving the ditch and traveling across the road. *Photo:* Susan Kocher.

vert may be located at the point where water flows onto the road or it may be uphill from there. Once the plugged culvert is located, examine its size and alignment. If a culvert plugs regularly, especially with sediment, there may be a design problem. If the culvert is less than 18 inches in diameter, it may be too small. If the culvert is installed at too sharp of an angle at the inlet, ditch water may not be directed into the culvert at high flow. If the cross-drain grade is too flat, sediment may settle out in the culvert rather than passing through it, causing blockage.

Solution

Once the plugged culvert is located, material blocking the culvert inlet should be removed. If this is the first time the culvert has plugged and the blockage was caused by a recently fallen tree or branch, simply removing the blockage may be sufficient. If the culvert repeatedly plugs, it may be undersized or misaligned and need to be replaced or realigned. In some cases, excess sediment may be evidence of upslope instabilities that need to be addressed.

Symptom

Another liability of ditch systems can be inadequate cross drains. Without a sufficient number of cross drains or ditch relief culverts, ditch water may become increasingly concentrated, gain erosive power, and cause ditch erosion in larger storms. Deeply incised ditches can be a hazard to driving, especially when they become large enough to accommodate a car tire (fig. 20).

Finding the underlying problem

Ditches incise when they carry too much flow for their design capacity and they erode rather than spill water out onto the road. Too much flow in the ditch occurs because there are not enough ditch relief structures and/or because there are sources of water other than road runoff contributing to ditch flow. Examine the ditch system to see if the ditch has captured the flow from a stream channel or spring and diverted it down the ditch. If not, the most likely problem is too few ditch relief culverts or cross drains.

Figure 20. Eroding inboard ditch on an in-sloped road. This is a symptom of inadequate cross drains for conveying ditch flow across the road. *Photo:* Richard Harris.

Solution

Ditch-captured stream channels should be treated by installing a culvert under the road and reconnecting the stream channel to its original course below the road. Problems arising from inadequate drainage should be treated by adding more ditch relief culverts. A more effective long-term solution may be to out-slope the road, if feasible, and remove the ditch altogether. Armoring ditches without treating the underlying drainage problem may reduce erosion in the short term but is not considered a permanent solution.

Symptom

Ditches may become filled in with sediment, rock, or woody debris (fig. 21). This reduces their

Figure 21. Cut bank failure blocking inboard ditch. Cut bank failures cause operational and maintenance problems, especially when chronic. *Source:* Keller and Sherar 2003.

capacity to convey ditch flow. The inlets to ditch relief culverts can become filled with sediment, causing ditch water to flow over and erode the road surface.

Finding the underlying problem

Examine the cut slope along the road to identify the source of the sediment. A slump or failure in the cut slope may have delivered dirt and rocks to the ditch. Or, a tree or branch may have fallen into the ditch, causing sediment to accumulate. Sediment may have accumulated in sections of ditch that have a flat gradient.

Solution

Filled-in ditches should be cleaned out with hand tools or heavy equipment, depending on the scale of the problem. If this is a recurring problem, the cut slope may need treatment to reduce its chances of slumping. A number of slope stabilization techniques are available and can be developed with the help of a professional erosion control or geotechnical specialist. Road surface sediment can be reduced by rocking the road. A ditch relief culvert may need to be installed before the grade flattens out, to carry water through the culvert before the sediment settles out in the ditch.

Gullies Caused by Roads

Symptom

Gullies are caused when increased or concentrated flow from the road system flows onto erosive soil. Most often, gullies originate from a road system's drainage features. They can be identified by their bare dirt banks and occurrence in places where natural streams do not occur, such as smooth hillslopes or ridges (fig. 22). Gullies may or may not threaten the roadbed itself, but they are always a significant source of sediment and thus a detriment to streams.

Figure 22. Gully caused by through-cut on road at base of steep road section. *Photo:* Jared Gerstein.

Finding the underlying problem

Inspect for gullies at the outlets of ditch relief culverts and rolling dips or where inboard ditches leave the road at a corner. Most gullies are caused by a concentration of water from the road and ditch system. Walk the road system to identify the drainage structures releasing flow that leads to gullies. Gullies can also occur when a stream has been diverted out of its natural channel. If this is the case, it is important to locate the original stream channel by walking up the gully to find where it starts.

Another cause of gullies can be culverts that have been installed improperly, with outlets set on the hillside rather than back in the natural channel. Examine culverts located at the origin of the gully flow to see if misalignment is causing the erosion.

Solution

The solution to gullies is to remove the concentrated flow from the soil it is eroding. Gullies should be dewatered by returning the flow to a controlled conveyance, either back into the ditch or stream system from which the flow escaped, or by realigning the culvert that allowed its escape. Alternatively, flow can be rerouted around the most erosive soils by installing downspouts. The goal of the treatment is typically to stabilize the gully and halt further erosion since it usually is not feasible or cost effective to fill in and restore a gully's original slope.

Stream Crossings

Stream crossings on roads can be the most significant source of sediment to streams. They are also the most likely locations to become impassable during a storm. Because of their importance to both stream health and accessibility, these sites should be carefully watched and maintained. Typical problems include culvert plugging, fill eroding, outlet scouring, and blocking of the migration of fish and other aquatic life such as amphibians.

Symptom

Culverts that convey streams under roads must be large enough to transport the flow plus the tree branches, sediment, and rocks that often accompany the flow during large rain storms (fig. 23). Stream culverts may plug when debris blocks the inlet, allowing water to overtop the crossing and possibly wash out the crossing and road altogether.

Finding the underlying problem

Culverts that plug frequently with debris may be undersized for the flow of the stream and the debris it carries, or they may be misaligned, blocking the flow of water and debris through the culvert. When material collects behind a culvert, it is likely that the culvert is too small.

Figure 23. This culvert is nearly plugged by woody debris, endangering the road. *Photo:* Angela Wilson, Central Valley Regional Water Quality Control Board.

Solution

The ideal treatment for an undersized culvert is replacement with a larger one, capable of carrying flow and debris. Appropriately sizing a culvert for the stream and watershed it drains is a fairly technical task and should be done by a knowledgeable professional (Cafferata et al. 2004). In some relatively simple cases, it may be feasible to install trash and debris racks upstream from the culvert to capture and retain the debris so that it does not flow into the culvert (fig. 24). This, however, should be discouraged on fish-bearing watercourses because debris accumulations may become a barrier to migrating fish. Remember that debris racks need to be cleaned regularly to continue to function.

Symptom

Installing a culvert to convey a stream under a road involves placing a significant amount

Figure 24. A trash rack installed upstream to protect a culvert from plugging. *Source:* Keller and Sherar 2003.

of fill in the channel above and below the culvert, and then building the road base on that fill. The fill over the culvert may erode, narrowing the traveled way (fig. 25).

Finding the underlying problem

Road fill is most often eroded by water plunging from the outlet of a culvert that is too short. "Shotgun" culverts shoot the water down to the streambed while eroding the fill under the culvert. Inspect road culverts at the downslope ends, looking for any that stick out into the air rather than carry their flow to the base of the fill slope.

Solution

The most thorough solution to shotgun culverts is to replace them with longer pipes that are placed at the grade of the natural stream channel rather than high in the fill above the stream. Alternatively, a downspout or rock armor can be added below the outlet if erosion has not been too severe (fig. 26).

Symptom

Culverts may create barriers to fish migration (fig. 27). Problems include excessive water velocity, insufficient water depth, lack of a downstream jump pool, and excessive jump height. Culverts that are relatively

Figure 25. Eroding fill slope and culvert failure due to plugging at inlet and diversion of flow across the road. *Photo:* Bill Weaver, Pacific Watershed Associates.

Figure 26. Rock armoring at ditch relief culvert outfall to reduce potential for downstream erosion. Note also the berm around the fill slope to prevent road runoff from eroding it. Also, straw mulch has been placed on the fill slope to reduce erosion. *Photo:* Jared Gerstein.

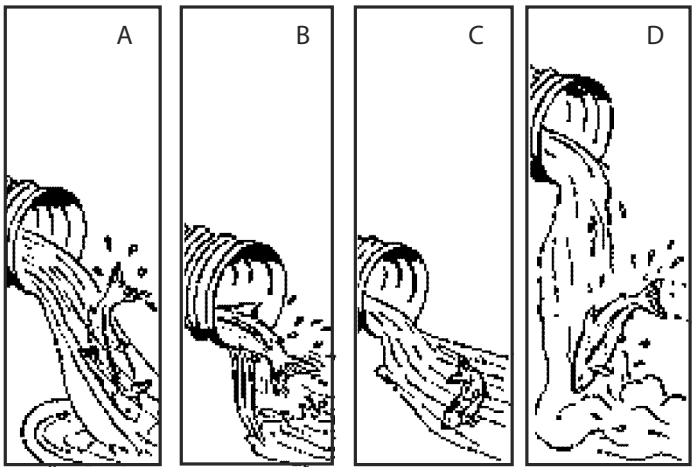

Figure 27. Barriers to fish migration caused by culverts. *Source:* Keller and Sherar 2003.

small for the size of the stream accelerate the speed of the flow, sometimes rendering it too fast for an adult or juvenile fish to swim against when heading upstream (fig. 27A). Culverts too large for the stream they carry may dissipate the flow to the point where it is too shallow for the fish to navigate (fig. 27B). Culverts with no natural resting place downstream may not allow fish to find a spot from which to make their jump (fig. 27C). Some culverts may be positioned too high above the stream and so require a jump that is too high for an adult or juvenile fish to make (fig. 27D).

Finding the underlying problem

All culverts and bridges over fish-bearing streams should be inspected for the existence of problems such as those shown in figure 27. Some barrier problems will be quite obvious. Unfortunately, many are not. Therefore, the best way to identify whether your crossings are blocking fish is to consult a fisheries biologist from a state, federal, or local agency.

Solution

Replacement of problem culverts with bridges and arched culverts of adequate size is preferred because they modify the channel less and so avoid many problems that can block migration (fig. 28). Appropriate assistance should be sought in designing and constructing crossings where migrating fish must be accommodated. Contact your local Department of Fish and Game office. In some cases, passage through existing culverts may be improved by installing baffles or weirs to slow and funnel stream water. In other cases, the upstream and/or downstream channels may be modified to create resting pools and reduce the jump height.

GETTING ROAD WORK DONE

There are some things that a landowner can do to maintain his or her roads and there are other actions that are best left to professionals. If you are contemplating new road construction or major road upgrading and you are not experienced with this work, you need to get help. County public works and planning departments, your local California Department of Forestry and Fire Protection or Resource Conservation District office, UC Cooperative Extension Office, and your neighbors may be able to recommend someone who can help you plan and implement a road construction or improvement project. Depending on your location and the type of work, you may even qualify for grants and cost sharing programs (see "Sources").

Figure 28. An arched pipe installed on a fish-bearing stream to minimize impacts on fish habitat and migration. *Source:* Keller and Sherar 2003.

Before undertaking extensive road work, it is important to have a good plan. You may retain professionals trained in road assessment to evaluate your roads in relation to your land management and use objectives. The objectives might be to reduce maintenance costs, to reduce sediment production, to protect natural resources, or to

Figure 29. Bulldozer clearing out a road ditch. *Photo:* Jared Gerstein.

Figure 30. Installation of a new culvert after the old one was excavated. *Photo:* Jared Gerstein.

assure accessibility in all conditions. A road assessment may be used to help decide whether a road is worth maintaining in its current condition and location. Many roads were built in locations because of property boundaries, with little regard for geologic, geomorphic, biologic, or hydrologic conditions. If the road is tied to an easement and there are multiple landowners, relocation may not be an option. If a road is a chronic problem, however, relocation should be considered because it may be the cheapest and most effective remedy. A thorough road assessment will help you decide the best course of action and develop a plan for implementing road work.

Constructing or upgrading a road may require the services of a licensed civil engineer. Especially difficult projects may require other professionals including a licensed geologist or structural engineer. Simpler projects may only require a qualified equipment operator or grading contractor. When choosing an engineer or a contractor, it is important to carefully review their qualifications to do the work, their experience, and their ability to perform on time and on budget. Always ask for references and always follow up by checking them. Never hire someone who is not adequately insured against liabilities resulting from the work. You also want to make sure your contractor is licensed. Get the contractor's license number, and check with the State Contractors Licensing Board to see if there are any complaints or violations for the operator you intend to hire.

Routine road maintenance is another matter and there are many things you can do to ensure that your roads function well under all weather conditions. In some instances when a road is shared by several landowners, there may already be a road association or homeowners' association that is responsible for road maintenance. Generally, if you do not know if you are part of a road association, you probably are not. Road and homeowners' associations assess landowners a fee used to offset costs for road maintenance. The fee is either paid on a yearly basis or as the need for maintenance arises. If you have a neglected road that serves several properties and there is no road maintenance agreement between them, you might consider initiating one. One of the major problems in rural areas is "orphan roads" that no one takes responsibility for maintaining.

For the roads on your property that are your sole responsibility, the key to good maintenance is a system of inspection and record-keeping. Inspections should be performed on all your roads and stream crossings before the winter, during storm events, and after the winter. Use the diagnostic tips previously described to identify

maintenance needs. Simple tasks such as culvert and ditch clearing can be performed by most landowners (fig. 29). More complex tasks, such as roadside brushing, remedial grading repair, or installation of culverts (fig. 30), will probably require outside assistance. Keeping good maintenance records can help landowners evaluate the cost of correcting on-going problems and judge whether road upgrading projects would be cost effective. It is also essential for tax purposes.

ELEMENTS OF GOOD ROAD MAINTENANCE RECORD KEEPING

- Identify and prepare sketch maps of problem areas and treatments applied.
- For each site, describe the problem, when it started, and what caused it.
- Document the things done to fix the problem.
- List the equipment and labor hours needed to fix the problem.
- Quantify the amount of armor or rock imported to fix the problem (cubic yards).
- Quantify the amount of sediment or spoils removed (cubic yards).
- Measure the length, width, and depth of any erosion features.
- Take photos before and after the maintenance activities.

PERMITS FOR ROAD WORK

Depending on where you live, extensive road work may require a grading permit from the county public works or planning department, particularly if the project involves new road construction. Not all counties have grading ordinances but all have stipulations in their building codes that apply to grading for home sites and driveways. These are typically triggered by the extent of planned disturbance. Before undertaking any grading on your property, check with your county planning staff.

If you are planning on crossing or otherwise altering a stream or creek, you may be required to obtain a Streambed Alteration Agreement from the California Department of Fish and Game. Activities requiring these agreements include installing culverts, bridges, or fords; rip-rapping the banks of stream channels; or skidding logs across temporary crossings. Many projects that require a Streambed Alteration Agreement will also require a permit from the U.S. Army Corps of Engineers. If the project involves a stream that has anadromous fish (i.e., salmon, cutthroat trout, or steelhead), additional consultation or permits may be required from the National Marine Fisheries Service or from the U.S. Fish and Wildlife Service. Your local Department of Fish and Game staff should be aware of the permit requirements of these agencies.

Figure 31. Bulldozer reshaping road surface to out-sloped condition to improve drainage. *Photo:* Jared Gerstein.

ESTABLISHING A WRITTEN CONTRACT FOR ROAD WORK

Landowners should establish a clear written contract for contractors providing road services. Contracts should include the necessary road specifications and standards to be constructed or maintained. The various parts of a new road to be constructed should be listed, including the subgrade and surface and the cut-and-fill slope. The standards to which these should be built, including the width of the subgrade and surface, slope of cut and fill, and depth and size of the base and surface rock, should be specified.

TYPES OF EQUIPMENT USED IN ROAD MAINTENANCE

A variety of heavy equipment may be used when constructing or maintaining a road. *Bulldozers* are often used to make road cuts, shape the road, and develop the subgrade (fig. 31). *Excavators* can be used to replace crossings and develop new road alignments (fig. 32). *Backhoes* have many uses, including replacing small crossings, loading rock, and road shaping. *Graders* are used for final road shaping, spreading surface rock, and smoothing the surface (fig. 33). *Dump trucks* are used to transport rock to the construction site and to haul away any excess cut materials (fig. 33). *Rollers* are specialized to roll over the road surface and compact rock and road materials.

ROAD WORK COSTS

Upgrading an existing road is less expensive than constructing a new one, but may still involve substantial costs. Cost depends on the heavy equipment used, hourly equipment rental or contract rates, the skill and experience of the operator, design standards of the road, and the choice of the specific drainage structures and features to be installed. Examples of costs for road improvements are listed in table 3. When

Table 3. Costs to modify and improve existing roads

Activity	Ideal equipment	Cost rate*	Production rates†	Costs
out-sloping road and filling ditch	motor grader with rippers	$140/hr	500 ft/hr for a 20 ft wide road	$280/1,000 ft
installing rolling dip	small dozer with rippers (John Deere 450)	$130/hr	1 hr each (30 to 40 ft long on flat roads) 2 hr each (50 to 100 ft long on steep roads)	$130 to $260 each
removing berm or cleaning ditch	motor grader	$140/hr	1,000 ft/hr	$140/1,000 ft
rock-surfacing road (1.5 in. minus crushed)	dump truck spread	$25 to $50/ yd^3 delivered‡	4 in. deep × 20 ft wide = 250 yd^3/1,000 ft road	$6,250 to $12,500/1,000 ft
installing ditch relief culvert (40 ft of 18 in. culvert)	backhoe or tractor, laborer	$120/hr or $95/hr $55/hr	3 hr each + culvert ($35/ft + $25 coupler + $165 labor)	$1,950 each
installing stream crossing (36 in. × 40 ft culvert with 200 yd^3 fill)	excavator, small dozer, water truck, laborer	$175/hr $130/hr $95/hr $55/hr	$2,350 culvert (w/coupler) + $1,225 excavator +$910 dozer + $190 water truck + $165 labor + $125 tamper	$4,965 each
installing culvert downspout	hand labor, equipment (>24 in. culvert)	$55/hr $125/hr	2 hr labor for 20 ft × 24 in. 3 hr labor for 40ft × 36 in.	$110 + materials $375 + materials
straw mulching of bare soils areas	labor	$55/hr $7.50/straw bale incl. tax/delivery	1 bale/600 ft^2 to 700 ft^2 + spreading at 4 bales/hr	$36 to $40/1,000 ft^2
upgrading road completely	motor grader, skip loader, dump truck water truck riding compactor	$140/hr $110/hr $85/hr $95/hr $95/hr	Average mid-slope road requiring stream crossing upgrades	$45,000 to $77,000 per mi

Source: Adapted from CDFG 2004 by Joe Carri Jr.
Notes: *Additional equipment mobilization costs apply (4-hour minimum for small equipment and an 8-hour minimum for large equipment).
†Production rates do not account for rocky soil or soft soil conditions.
‡Trucking and material costs for bulk rock or sand assume a round trip time from 1 to 2$^1/_2$ hours. Longer hauls require additional trucking costs.

Figure 32. Excavator removing a crossing, including culvert and fill. *Photo:* Jared Gerstein.

Figure 33. A grader spreading the gravel on the road surface placed by a dump truck. *Source:* Joe Hoffman, Plumas National Forest.

Figure 34. Outlet of a concrete culvert (30 inches in diameter) before the project. The culvert was placed too high in the fill, resulting in a 10-foot drop to the channel at the outlet. This caused erosion of the road fill and stream banks, eventually undermining the outer section of the culvert. *Photo:* Jared Gerstein.

Figure 35. The culvert was replaced with a metal pipe (48 inches in diameter) at the correct slope. The road surface was lowered, reducing the fill volume by 100 cubic yards. The outlet and fill were armored to prevent future diversion. *Photo:* Jared Gerstein.

using different equipment, the rates for some treatments may differ from those listed here. Tasks accomplished by manual labor, such as culvert downspout installation and straw mulching for erosion control, are much less expensive than tasks requiring heavy equipment. Installing rolling dips is substantially less expensive than installing ditch relief culverts because only one type of equipment and one worker is needed, and there is no culvert to purchase. The most expensive aspect of building or upgrading a permanent rural road is placing rock on the roadbed and road surface. The drainage structures and road shaping need to be done first, but rock surfacing is the final ingredient necessary to make the road durable for year-round travel.

ROAD WORK CASE STUDIES

Some examples of road upgrading projects are described below. These projects were undertaken by private landowners, the U.S. Forest Service, and the University of California.

Tom Long Watershed

The Tom Long Watershed in Humboldt County is like many other rural areas that have been subdivided for residential use. The road system was put in for harvesting timber during the 1950s and '60s. Harvesting was only done during the dry season and roads were only intended to handle seasonal access. In the 1970s the watershed was subdivided into 40-acre parcels with the layout based largely on the location of the original logging roads. No formal road association or methods for funding road betterment or maintenance were established in the subdivision process. After the subdivision, roads were maintained on an emergency basis, meaning that bridges and culverts were only replaced if the road was no longer passable. Roads were rarely graded and rock surfacing was seldom if ever applied. The watershed became notorious for some of the worst roads in the region.

In the late 1990s residents organized in response to the threat of increased water quality regulation and out of exasperation with degraded road conditions. Following an evaluation of the road system, a number of sites were identified for remedial treatment. The highest priority sites were problem roads and crossings nearest the fish-bearing reaches of Tom Long Creek (figs. 34 and 35). Eventually, remedial work included replacing and upgrading 17 culverts and fixing two active creek diversions at a cost of approximately $120,000. The majority of the work was funded with a combination of local, state, and federal grant dollars intended to improve fisheries and water quality conditions.

These efforts addressed major issues, but road surfacing, drainage, and other needed improvements have not been completed. All this work requires funding, especially for equipment operators, and funds available from grant programs are limited. Gradually, the work will get accom-

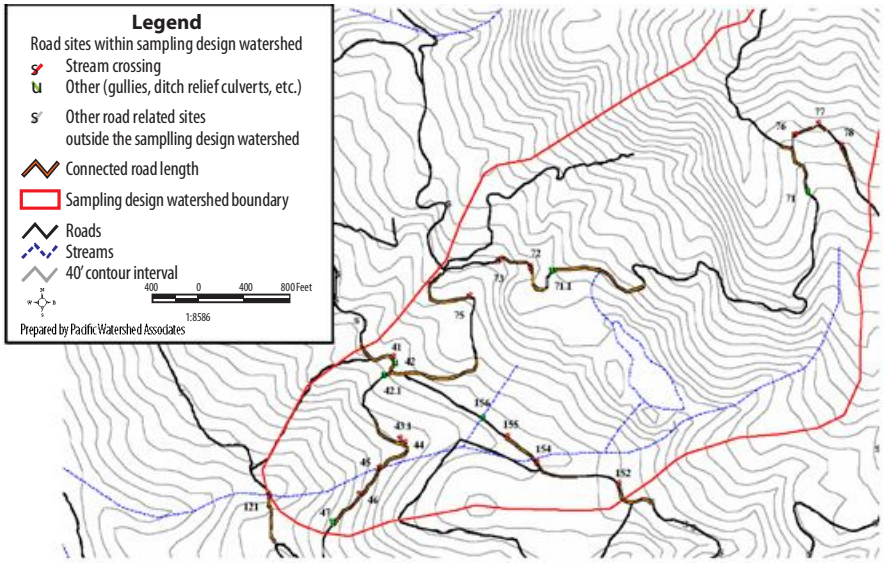

Figure 36. Road upgrading sites at the experimental watershed, Hopland Field Research and Extension Station. *Source:* Bill Weaver, Pacific Watershed Associates.

plished. As one resident said, "The grant resources enabled us to complete the root canals in the watershed and now we have to find the money to pay for the routine cleanings."

University of California Hopland Field Station Research and Extension Center

Over a period of about five years, beginning in the late 1990s, the University of California implemented a program to upgrade the road system at Hopland Field Station Research and Extension Center, located in Mendocino County. The work was largely funded by grants from the Department of Fish and Game (1999 SB 271 funds), Fisheries Restoration Grant Program. After an inventory and assessment of roads throughout the property, over 200 stream crossings and sections of road were prioritized for remedial treatment (fig. 36). Proposed treatments included replacement of culverts, installation of rolling dips and ditch relief culverts, and other measures intended to improve drainage, reduce sediment production, and generally reduce maintenance problems.

The entire program was implemented successfully by 2004. Although some newly installed culverts and fills experienced significant erosion during the first winter after construction, most post-project adjustments have diminished over time. Nearly all treatments have performed well, with a few fill failures at the outlets of rolling dips during spring 2006 (with very high precipitation). Maintenance needs and costs have declined dramatically. Personnel at the Field Station Center are especially satisfied with the superior performance of rolling dips as an alternative to cross drains for both reducing maintenance requirements and adequately draining road surfaces.

Pinchard Creek Project

The U.S. Forest Service partnered with Sierra Pacific Industries and Plumas County to upgrade a section of national forest road with serious erosion problems. The road's native surface was very erosive and lacked drainage structures. The surface was heavily rutted with rills over 2 inches deep and over 20 feet long (fig. 37). Road cut banks were unstable and eroding with more than 5 cubic yards of material moved, 40 percent of which was delivered to the stream channel. Roadside ditches were overloaded and degrading. One stream-crossing culvert entrance was more than 30 percent blocked with sediment and debris.

The project involved out-sloping the road surface, covering it with crushed rock, and installing drainage dips (fig. 38). Two years after the completion of the project, no surface ruts or road bank erosion has occurred, roadside drainage ditches are stable with little or no sediment delivery to the stream, and culvert entrances remain clear (fig. 39). The cost of the project was $221,603, with 35 percent from National Forest road maintenance funds, 9 percent from Sierra Pacific Industries, and 56 percent from the Plumas County Resource Advisory Committee.

Figure 37. Pinchard Creek road with rilling along the road surface before the project, 2002. *Photo:* Joe Hoffman, Plumas National Forest.

Figure 38. Pinchard Creek road immediately after project construction, 2002. *Photo:* Joe Hoffman, Plumas National Forest.

Figure 39. Pinchard Creek road two years after project construction, 2004. Note that the road surface remains in good shape without additional maintenance. *Photo:* Joe Hoffman, Plumas National Forest.

BEST MANAGEMENT PRACTICES DURING CONSTRUCTION

Construction of a new road necessarily involves a great deal of earth moving and soil disturbance. It is important that construction be managed wisely to avoid environmental impacts and damage to your property. One important thing a landowner can do is visit the site regularly during construction to ensure that the job is being done correctly. Sometimes plans made before construction are no longer feasible due to site constraints, and new decisions must be made. You need to be accessible to your contractor to help make these decisions when the situation arises.

Some general principles for best practices during construction are listed below:

- Minimize grading and soil disturbance.
- Develop an erosion control plan that includes measures on cut-and-fill slopes, drainage outlets, and disturbed areas (fig. 40).
- Avoid construction and soil disturbance in the winter.
- If construction does occur in the rainy season, ensure that the site has been storm proofed with erosion control measures when rains are forecast.
- Avoid incorporating logs or brush in the fill slope.
- Haul away excess sediment generated rather than side cast it onto the slope.
- Locate any stockpiled sediment in areas where it can be protected from erosion and will not deliver sediment to streams.
- Do not service or fuel heavy equipment where spills could enter a watercourse.

POST-PROJECT ADJUSTMENT

No matter how well planned and executed a road project has been, winter rains and traffic will lead to some adjustment of the final as-built condition during the first winter after improvements are made. Assuming that the road is in otherwise stable terrain, the adjustments will usually be minor and easily corrected. Adjustments may include some erosion of cut-and-fill slopes or culvert inlets and outlets (fig. 41). Road inspections should be done frequently during the new road's first winter season to identify any emerging problems for remediation. Developing problems may be averted with timely action. Plan for follow-up maintenance and put aside funds to perform the maintenance.

Figure 40. Using a portable blower to spread straw mulch on a disturbed road site. *Photo:* Julie Bawcom, California Geological Survey.

Figure 41. Fill surface erosion occurring after a road upgrading project. *Photo:* Bill Weaver, Pacific Watershed Associates.

SOURCES

For information on grants and cost sharing programs, check the online guides at

http://ceres.ca.gov/foresteward/html/financial.html
http://www.calwatershedfunds.org/
http://cwp.resources.ca.gov/grant_programs.html

For more information on road design and maintenance, consult the following resources:

Caferrata, P., T. Spittler, M. Wopat, G. Bundros, and S. Flanagan. 2004. Designing watercourse crossings for passage of 100-year flood flows, wood and sediment. California Forestry Report No. 1. Sacramento: California Department of Forestry and Fire Protection.

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Kramer, B. 2001. Forest road contracting, construction, and maintenance for small woodland owners. Research Contribution No. 35, Corvallis: Oregon State University, Forest Research Laboratory.

USDA Forest Service. Riparian roads video short course. Oregon State University Forestry Sciences Laboratory Web site, http://www.fsl.orst.edu/geowater/RRR/.

Weaver, W. E., and D. K. Hagans. 1994. The handbook for forest and ranch roads: A guide for planning, designing, constructing, reconstructing, maintaining and closing wildland roads. Ukiah, California: Pacific Watershed Associates for the Mendocino County Resource Conservation District.

Wiest, R. L. 1998. A landowner's guide to building forest access roads. Radnor, PA: U.S. Department of Agriculture, Forest Service. Northeastern Area, State and Private Forestry NA-TP-06-98.

Metric Equivalents

English unit	Metric equivalent
1 inch (in)	2.54 centimeters cm)
1 foot (ft)	0.3048 meters (m)
1 mile (mi)	1.609 kilometers (km)
1 acre	0.4047 hectares (ha)

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SOURCES, PATTERNS AND MECHANISMS OF STORM WATER POLLUTANT LOADING FROM WATERSHEDS AND LAND USES OF THE GREATER LOS ANGELES AREA, CALIFORNIA, USA

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EXECUTIVE SUMMARY

Storm water runoff and the associated contaminants from urban areas is one of the leading sources of water quality degradation in surface waters (US EPA 2000). Runoff from pervious and impervious areas (i.e., streets, parking lots, lawns, golf courses and agricultural land) carries accumulated contaminants (i.e., atmospheric dust, trace metals, street dirt, hydrocarbons, fertilizers and pesticides) directly into receiving waters (Novotny and Olem 1994). Because of the environmental effects of these contaminants, effective storm water monitoring and management requires identification and characterization of the sources, patterns, and mechanisms that influence pollutant concentrations and loads. Concentrations and loads of pollutants in urban storm water have been documented in some portions of the country (Hoffman et al. 1984; Buffleben et al. 2002; Simpson et al. 2002); however, little is known about the mechanisms and processes that influence spatial and temporal factors that affect the magnitude and patterns of constituent loading from specific land uses. Specifically, storm water managers need to understand how sources vary by land use type, how patterns of loading vary over the course of a single storm, how loading varies over the course of a storm season, and how applicable national or regional estimates of land use-based loading are to southern California.

To investigate these issues, the Southern California Coastal Water Research Project (SCCWRP) conducted a storm water sampling program over five seasons (2000-01 through 2004-2005). Constituent concentrations were measured over the entire storm duration from eight different land use types over 11 storm events in five watersheds in the greater Los Angeles, CA region (Figure ES-1). In addition, runoff samples were also collected from twelve mass emission sites (in-river) during 15 different storm events. A total of 71 site-events were sampled, comprised of 33 land use site-events and 38 mass-emission site events. These data were collected to better characterize contributions of specific land use types to loading of bacteria, trace metals, and organic compounds and to provide data for watershed model calibration. The specific goals of this study were (1) to examine constituent event mean concentrations (EMC), fluxes, and mass loadings associated with storm water runoff from representative land uses; (2) to investigate within storm and within season factors that affect constituent concentrations and fluxes; (3) to evaluate how constituent loadings compare to loadings from point sources, and (4) to assess how the concentrations of constituents in runoff compare to published data and water-quality criteria.

To understand the complex spatial and temporal patterns that affect storm water runoff in the greater Los Angeles region, runoff and constituent concentrations from a variety of land uses and mass emission sites were sampled over a range of different storm sizes and antecedent conditions. Between 10 and 15 discrete grab samples were collected for each site-event and the samples analyzed individually to provide time vs. concentration plots (i.e., pollutographs) for each site-event. Samples were analyzed for a broad range of constituents including trace metals, organic compounds and bacteria. Storms were targeted to capture early vs. late season conditions and large vs. small rainfall events. Understanding both intra-storm and inter-storm variability provides a more complete assessment of factors that influence constituent loading, and will allow us to develop dynamic watershed models that are able to predict pollutant runoff from specific land use types and watersheds under a variety of conditions.

General Conclusions

1. Storm water runoff from watershed and land use based sources is a significant contributor of pollutant loading and often exceeds water quality standards

Results of this study indicate that urban storm water is a substantial source of a variety of constituents to downstream receiving waters. Substantially high constituent concentrations were observed throughout the study at both mass emission (ME) and land use (LU) sites. Constituent concentrations frequently exceeded water quality criteria. Storm water concentrations of trace metals exceeded California Toxic Rule (USEPA 2000) water quality criteria in more than 80% of the wet weather samples collected at ME sites. This was partly due to industrial land use sites where 100% and 87% of runoff samples exceeded water quality criteria for zinc and copper, respectively. Furthermore, fecal indicator bacteria (FIB) at both ME and LU sites consistently exceeded California single-sample water quality standards. In fact levels of FIB at the recreational (horse) and agricultural LU sites were as high as those found in primary wastewater effluent in the U.S., with densities of 10^6-10^7 MPN/100mL.

2. All constituents were strongly correlated with total suspended solids

Land use had a strong influence on constituent concentrations. Total suspended solids (TSS) was strongly correlated with constituent EMCs at most land use sites, although not all correlations were statistically significant. This correlation was primarly influenced by highly urbanized land uses and a single undeveloped open space land use. High TSS loads in rivers contribute to water quality impairments, habitat loss and to excessive turbidity resulting in impairments in recreational, fish/wildlife, and water supply designated uses of the rivers. These results suggest that controlling TSS at specific land uses may result in reducing other particle-bound constituents.

3. Storm water EMCs, fluxes and loads were substantially lower from undeveloped open space areas when compared to developed urbanized watersheds

Storms sampled from less developed watersheds (i.e., Santa Monica Canyon and Arroyo Sequit) produced constituent EMCs and fluxes that were one to two orders of magnitude lower than comparably sized storms in urbanized watersheds (i.e., Los Angeles River and Ballona Creek) (Figure ES-2). Furthermore, the higher fluxes from developed watersheds were generated by substantially less rainfall than the lower fluxes from the undeveloped watersheds, presumably due to increased impervious surface area in developed watersheds. Stein and Yoon (2007) reported similar wet weather runoff results from undeveloped land uses while investigating pollutant contributions from natural sources. The contrasts between the different watershed scale mass-emission sites were also apparent at the small, homogeneous land use sites.

4. Land use based sources of pollutant concentrations and fluxes varied by constituent

No single land use type was responsible for contributing the highest loading for all constituents measured. For example industrial land use sites, contributed higher storm EMCs and fluxes of all trace metals than other land use types. (Figure ES-3). Recreational (horse) land use sites contributed significantly higher storm fluxes for *E. coli* while agricultural land use sites contributed the highest TSS fluxes. Substantially higher TSS fluxes were also observed at the industrial sites. PAHs were not preferentially generated by any one land use type, rather

analyses of individual PAHs demonstrated a consistent predominance of high molecular weight (HMW) PAH compounds indicative of regional pyrogenic PAHs (i.e., atmospheric deposition) as a major source material of the PAHs found in urban storm water.

5. Storm water runoff contributed a similar range of constituent loading to regional point sources

Storm water runoff of trace metals from the urban watersheds in this study produced a similar range of annual loads as those from point sources; such as large publicly owned treatment plants (Table ES-1). Nevertheless, when combined with dry estimates of pollutant loading from Stein and Tiefenthaler (2005), the total non-point source contribution from all watersheds in the greater Los Angeles area far exceeds that of the point sources (Table ES-1).

6. The Los Angeles region contributed a similar range of storm water runoff pollutant loads as that of other regions of the United States

Comparison of constituent concentrations in storm water runoff from land use sites from this study reveal median EMCs that are comparable to current U.S. averages reported in the National Storm water Quality Database (NSQD; Pitt *et al*, 2003) (Figure ES-4). Comparison to the NSQD data set provides insight to spatial and temporal patterns in constituent concentrations in urban systems. Similarities between levels reported in the NSQD and this study suggest that land-based concentrations in southern California storm water are generally comparable to those in other parts of the country.

7. Storm water runoff concentrations improved over time when compared with the Nationwide Urban Runoff Program (NURP.

Results showed an improvement in water quality between constituent concentrations reported by NURP in 1983 and those observed in this study (Los Angeles River Watershed (LARW). Long-term overall trends of decreasing median constituent EMCs were observed at all land uses with the exception of total zinc, which showed an increase in median EMCs over the course of the studies (Figure ES-4). For example, lead concentrations have exhibited a 10-fold reduction over the last 20 years. Relatively low lead concentrations may reflect fate and transport characteristics of the particular systems sampled. However, a more likely explanation is that low concentrations of lead observed in these studies can be attributed to regulations banning the use of leaded gasoline.

8. Peak concentrations for all constituents were observed during the early part of the storm

Constituent concentrations varied with time over the course of storm events. For all storms sampled, the highest constituent concentrations occurred during the early phases of storm water runoff with peak concentrations usually preceding peak flow (Figure ES-5). In all cases, constituent concentrations increased rapidly, stayed high for relatively short periods and often decreased back to base levels within one to two hours. In contrast, the developed LU (recreational (horse) site; Figure ES 1-5c) had a peak concentration followed by intra-storm variable concentrations that mimicked flow. Although the pattern of an early peak in concentration was comparable in both large and small developed watersheds (Ballona Creek; Figure ES-5a, Los Angeles River Figure ES-5b), the peak concentration tended to occur later in the storm and persist for a longer duration in the smaller developed watersheds. Therefore

monitoring programs must capture the early portion of storms and account for intra-storm variability in concentration in order to generate accurate estimates of EMC and contaminant loading. Programs that do not initiate sampling until a flow threshold has been surpassed may severely underestimate storm EMCs.

9. The magnitude of a mass first flush effect at land use sites was a function of watershed size

Storm mass loading is a function of both concentration and magnitude of flow at various points during a storm. Cumulative mass loading of constituents from ME sites generally exhibited a weak "first flush" for trace metals and bacteria. For PAHs, a moderate first flush was observed where between 40% and 60% of the load was discharged during the first 25% of storm volume. In contrast to the ME sites, cumulative mass loading plots from small, homogenous land use sites exhibited moderate first flush for all constituents sampled. When all developed sites were analyzed together, the magnitude of the first flush effect decreased with increasing watershed size (Figure ES-6). The inverse relationship between first flush and catchment size has several potential mechanistic explanations including differences in relative pervious area, spatial and temporal patterns in rainfall, and pollutant transport through the catchment. Ultimately, the differences in first flush, whether due to imperviousness, travel time, or rainfall variability, suggest that management strategies aimed at capturing constituent loads should focus on more than just the initial portion of the storm at moderate to large catchments.

10. Highest constituent loading was observed early in the storm season with intra-annual variability driven more by antecedent dry period than amount of rainfall

Seasonal differences in constituent EMCs and loads were consistently observed at both ME and LU sites. In general, early season storms (October – December) produce significantly higher constituent EMCs and loads than late season storms (April-May), even when rainfall quantity was similar (Figure ES-7). This suggests that the magnitude of constituent load associated with storm water runoff depends, at least in part, on the amount of time available for pollutant build-up on land surfaces. The extended dry period that typically occurs in arid climates such as southern California maximizes the time for constituents to build-up on land surfaces, resulting in proportionally higher concentrations and loads during initial storms of the season. This seasonal pattern suggests that focusing management actions on early season storms may provide relatively greater efficiency than distributing lower intensity management actions throughout the season.

Further Research

This study establishes the relative contributions of land uses and watersheds to constituent loading in receiving water bodies. Having statistically significant data sets at regional, seasonal, and land use levels enables modelers to use the information for more sensitive calibration of models that may be used for contaminant load allocations. Similarly, these data sets can assist storm water engineers in the design of more effective monitoring programs and better performing treatment practices (i.e., BMPs) that address specific rainfall/runoff conditions.

Further research is needed to directly assess the relationship between constituent concentrations and particle-size distributions in storm water runoff from mass emission and land use sites to better understand the fate, transport and treatment of constituents in urban runoff.

Storm water borne metals, PAHs and (to a lesser extent) bacteria are typically associated with particulates to varying degrees depending on the constituent and the size distribution of suspended solids in the storm water runoff. Furthermore, the particle size distribution, and constituent partitioning can change over the course of a storm event (Furumai et al. 2002, Stein and Yoon 2007). Understanding the dynamic partitioning of constituents to various size particles is important to being able to estimate temporal and spatial patterns of constituent deposition in estuaries and harbors, and should be an area of future investigation.

Our understanding of the mechanisms of constituent loading from urban land uses could also be improved by estimating the percent of directly connected impervious area (DCIA) in each land use category (i.e., percent rooftop, sidewalks, paved driveways and streets) and its impacts on storm water runoff concentrations and loads. This could allow identification of critical source areas, which in turn could provide for more precise estimates of loading and more focused application of best management practices.

Table ES-1. Mean annual (± 95% confidence intervals) trace metal loading in the Los Angeles coastal region from different sources (mt = metric tons).

	Mean Annual Load / Year (mt ± 95% CI)		
Source	Total Copper	Total Lead	Total Zinc
Point Source Data[1,2] (2000-05)			
Large Publicly Owned Treatment Plants (POTWs)	10.9 ± 6.8	0.8 ± 0.8	13.9 ± 7.6
Low Volume Waste Power Generating Stations (PGS)	0.01	0.00	0.09
Wet Weather Runoff (2000-05)			
Los Angeles River	1.6 ± 1.2	1.4 ± 1.5	9.8 ± 9.4
Ballona Creek	0.7 ± 0.4	0.6 ± 0.3	4.3 ± 2.5
Dominguez Channel	0.4 ± 2.4	0.2 ± 1.1	2.1 ± 11.0
Total Annual Wet Weather Runoff	**2.7 ± 4.0**	**2.2 ± 2.9**	**16.2 ± 22.9**
2000-02 Dry Weather Urban Runoff [3,4]			
Los Angeles River	2.9 ± 19.9	0.1 ± 1.2	10.4 ± 80.6
Ballona Creek	0.2 ± 0.3	0.1 ± 0.4	0.7 ± 0.6
Total Annual Dry Weather Runoff	**3.1 ± 20.2**	**0.2 ± 1.6**	**11.1 ± 81.2**

[1]SCCWRP Biennial Report 2004-06 (Lyons G, Stein E).
[2]SCCWRP Biennial Report 2003-04 (Steinberger A, Stein E); PGS data represents year 2000 only.
[3]American Water Resources Association in Press (Stein E, Ackerman D).
[4]Water, Air and Soil Pollution, 2005. Vol. 164 (Stein E, Tiefenthaler L).

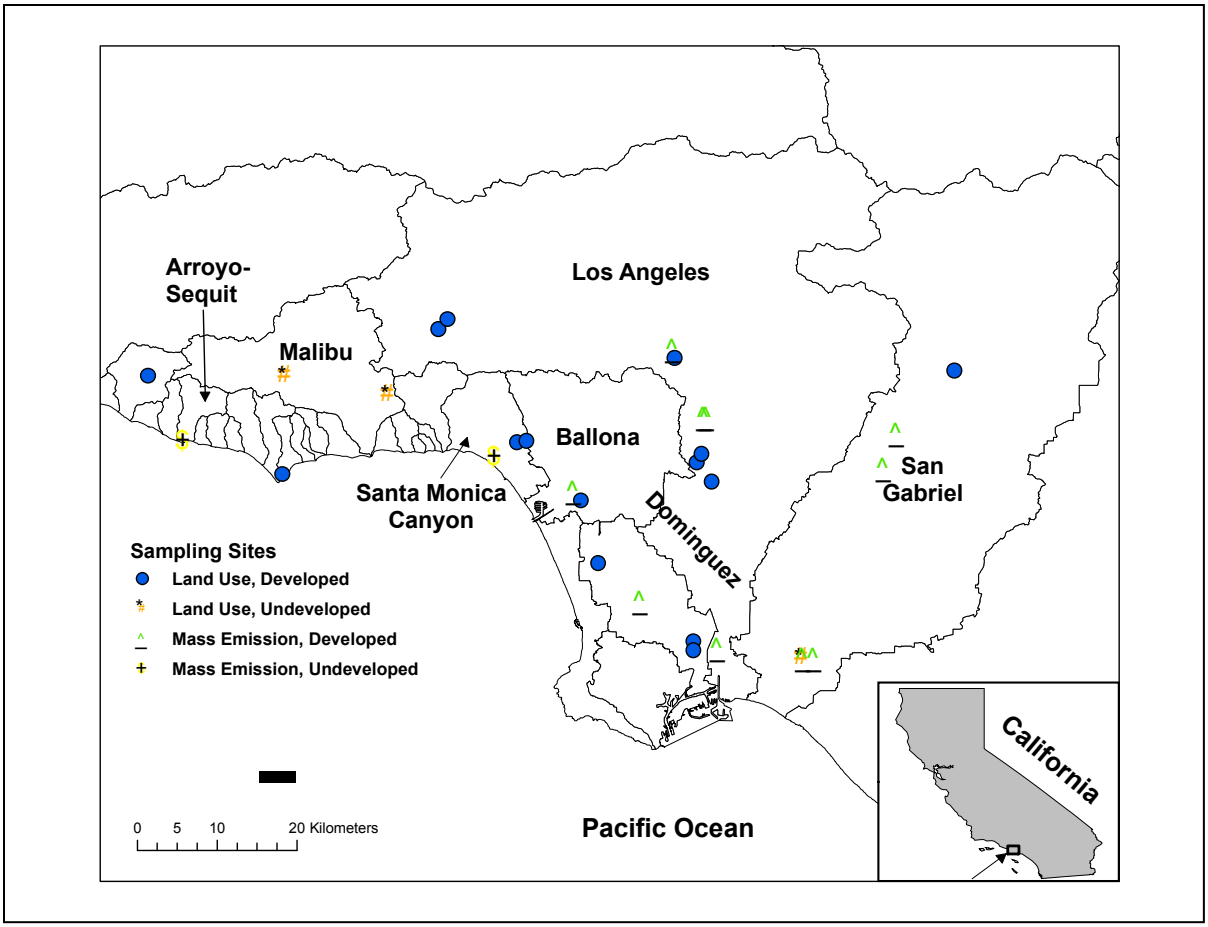

Figure ES-1. Map of in-river mass emission and land use sampling sites and watersheds within the greater Los Angeles region, California, USA.

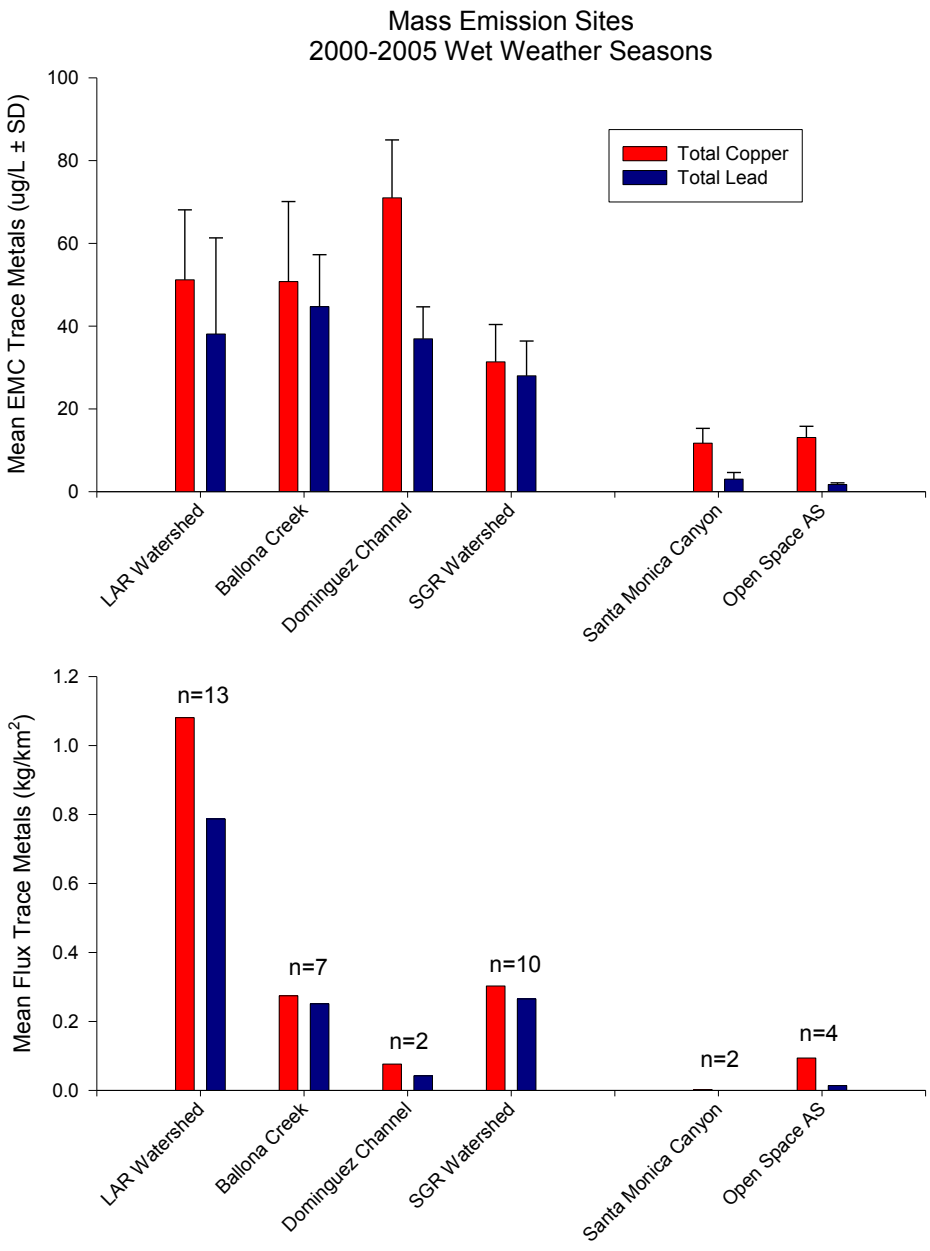

Figure ES-2. Average event mean concentrations (EMCs; a) and fluxes b) of total copper and lead loading from southern California watersheds during the 2000-2001 to –2004-2005 storm seasons. A similar pattern of higher loadings for the mass emission sites was observed for all other constituents measured in the study as well. Los Angeles River (LAR), San Gabriel River (SGR), and Arroyo Sequit (AS), number of storm events (n), and standard deviation (SD).

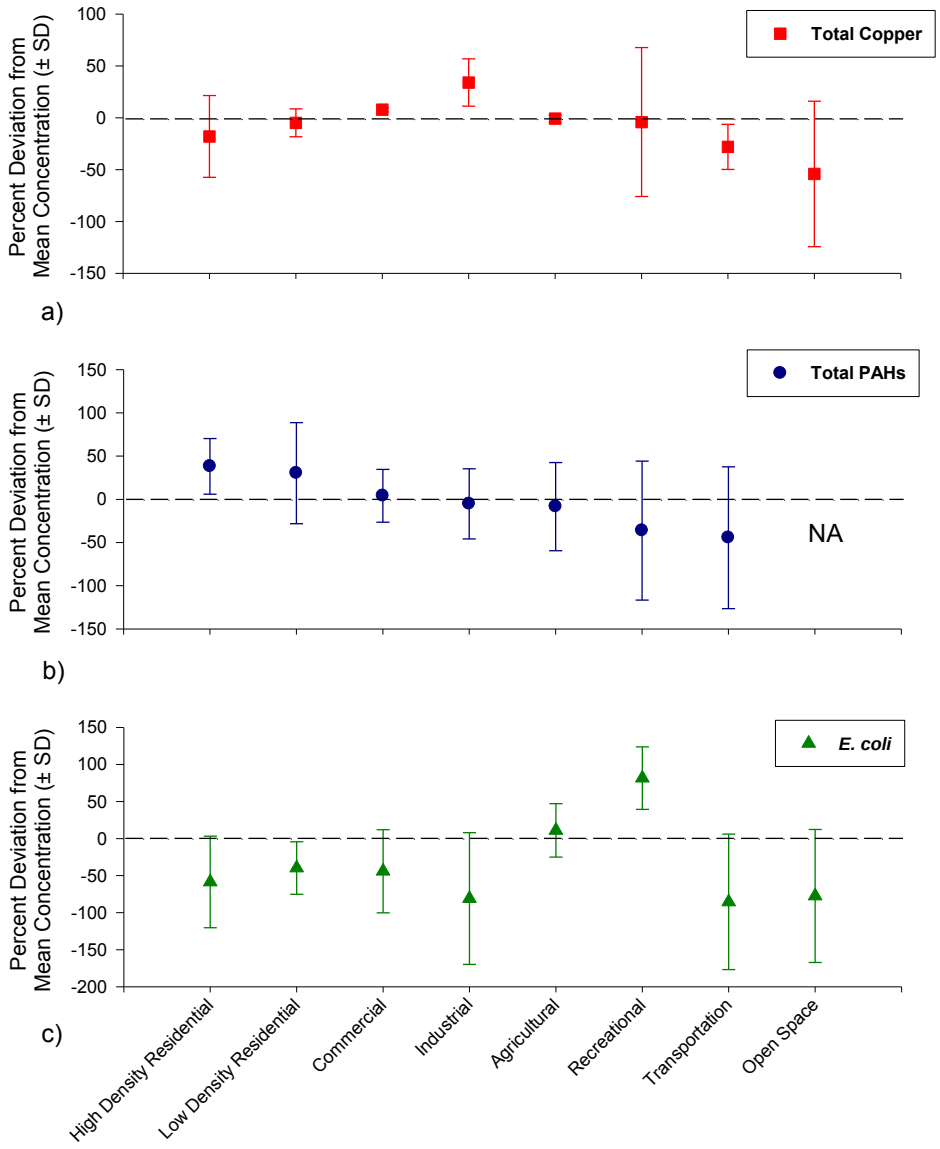

Figure ES-3. Percent deviation from mean concentration of total PAHs a), total copper b) and *E. coli* c) in storm water runoff from land use sites during the 2001-2005 storm seasons. The dashed line represents the overall mean concentration for each constituent. Standard deviation (SD). Not analyzed (NA).

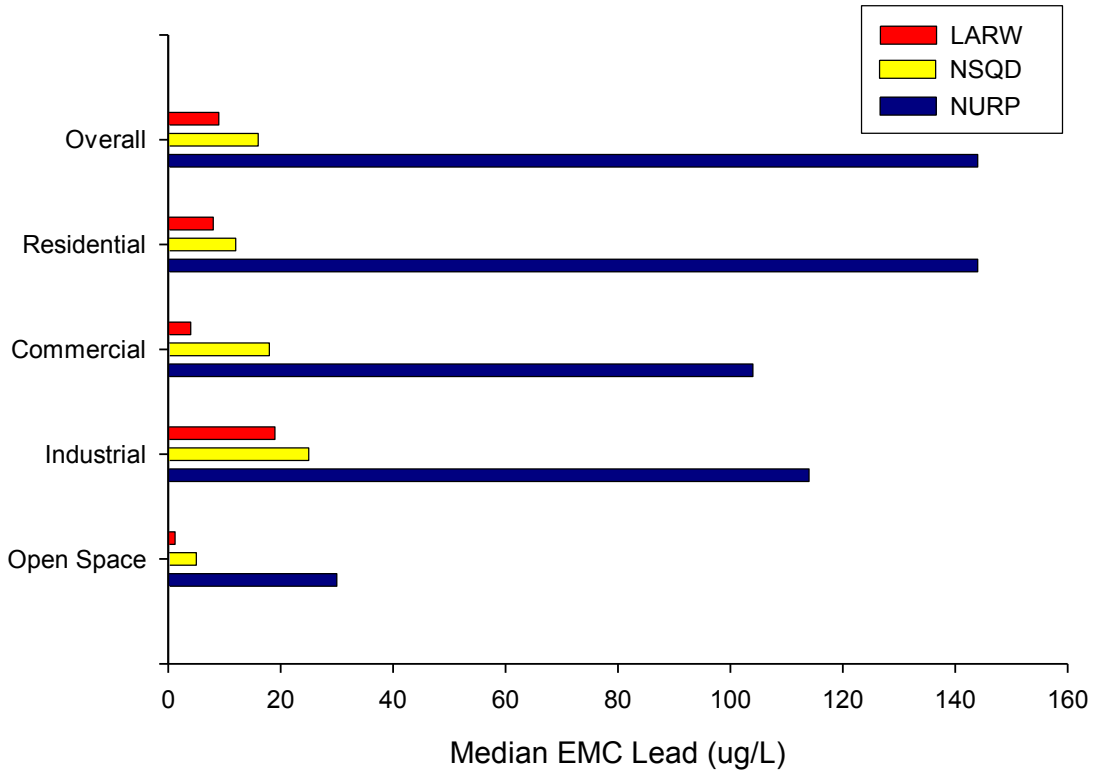

Figure ES-4. Comparison of median lead event mean concentration (EMCs) at specific land use sites during the 1983 Nationwide Urban Runoff Program (NURP, U.S. EPA 1983a), to the 1990 National Storm water Quality Database (NSDQ, Pitt et al. 2003) monitoring study and the 2001-2005 Los Angeles River Wet Weather (LARW) study. A similar pattern was observed for other constituents with the exception of zinc, which showed an increase in median EMCs over the course of the studies.

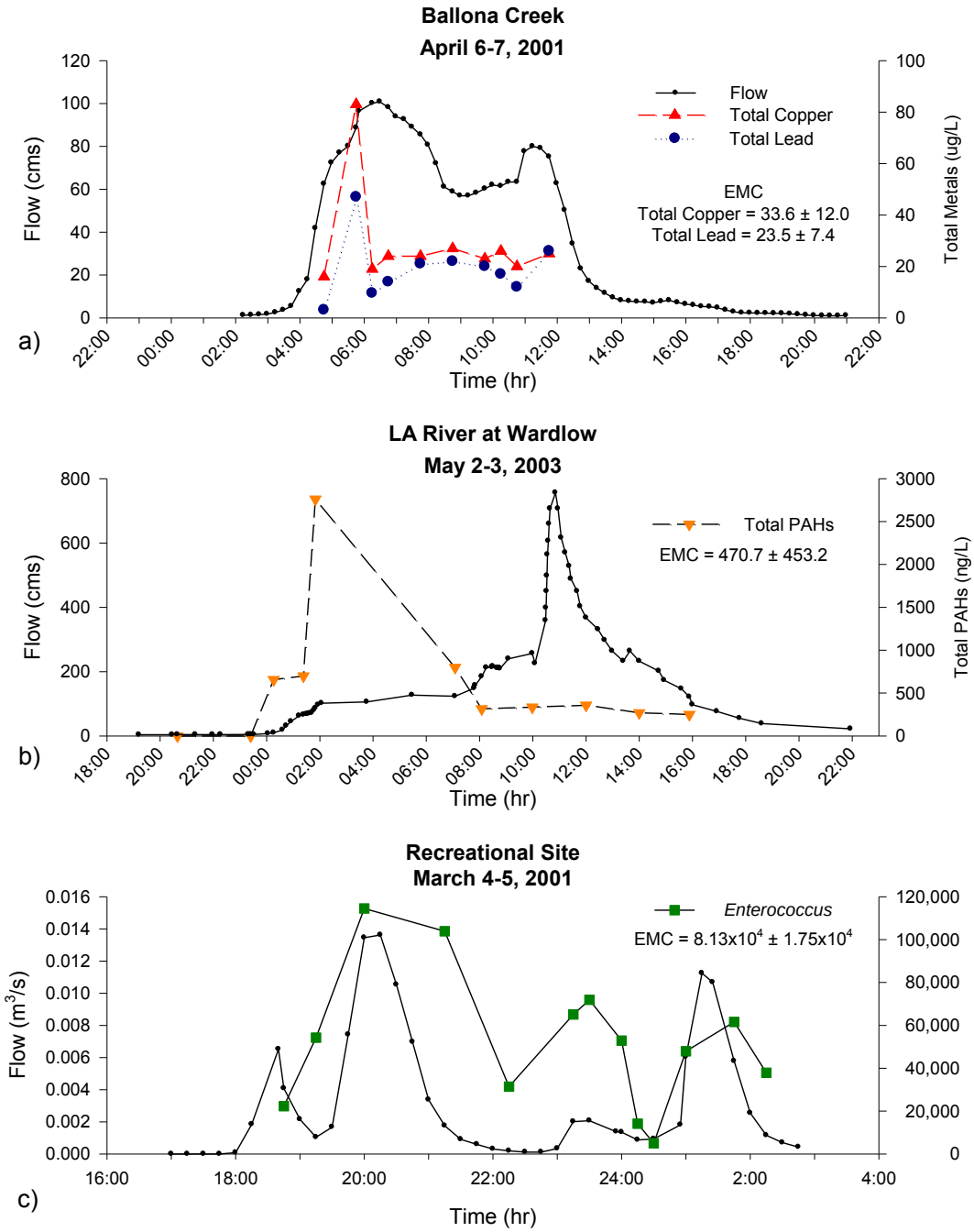

Figure ES-5. Variation in constituent concentrations with time for a storm event in the developed Ballona Creek a) and Los Angeles River watersheds b) and the developed recreational (horse) land use site c).

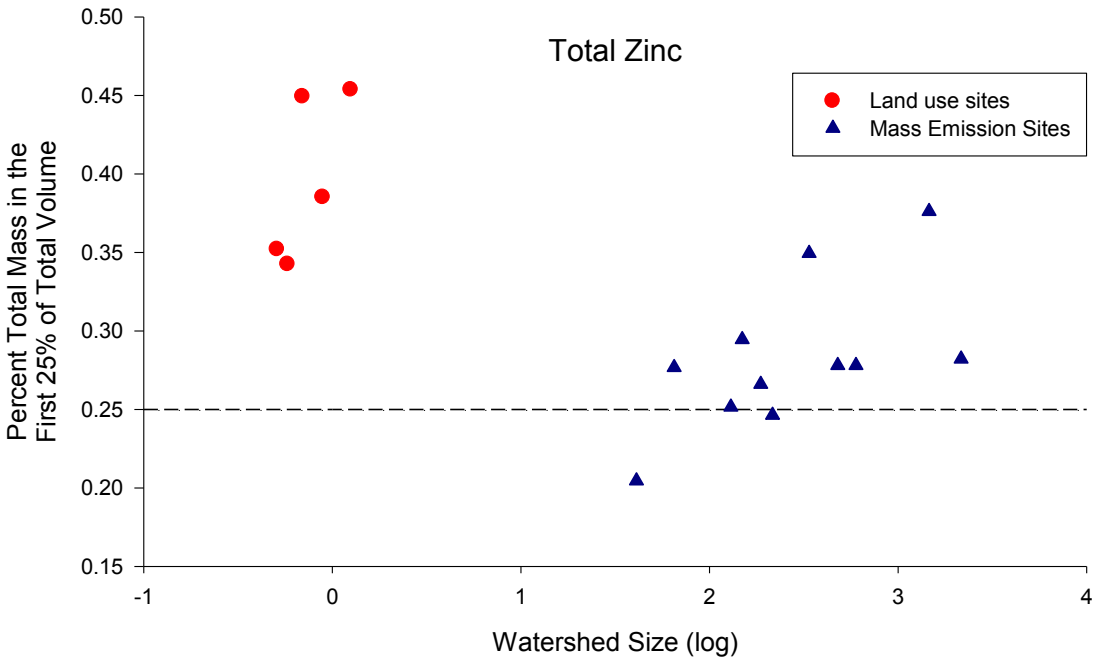

Figure ES-6. First flush patterns of total zinc (a) in relation to watershed size. Watershed size data is log transformed.

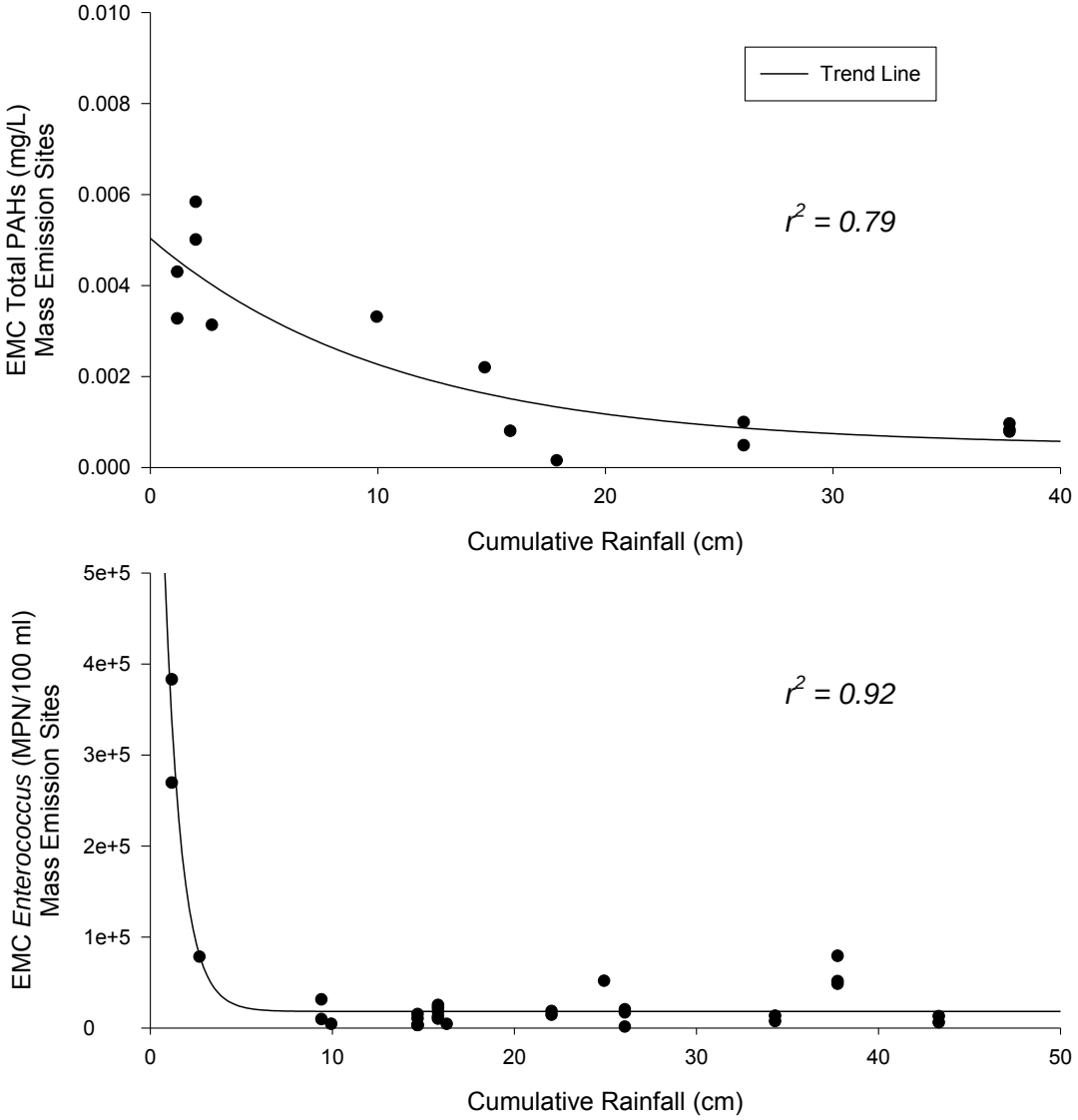

Figure ES-7. Cumulative annual rainfall versus event mean concentration (EMC) for a) polycyclic aromatic hydrocarbons and b) *E. coli*. Plots show data for mass emission sites only.

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LIST OF ACRONYMS

AV	Acoustic Doppler Velocity
BMP	Best Management Practices
BST	Bacterial Source Tracking
CDF	Cumulative Density Frequency
CTR	California Toxics Rules
DCIA	Directly Connected Impervious Area
E. coli	*Escherichia coli*
EMC	Event Mean Concentration
FIB	Fecal Indicator Bacteria
FWM	Flow Weighted Mean
HMW	High Molecular Weight
ICPMS	Inductively Coupled Plasma-Mass Spectroscopy
LARW	Los Angeles River Wet-weather
LMW	Low Molecular Weight
ME	Mass Emission
NPDES	National Pollutant Discharge Elimination System
NSQD	National Storm water Quality Database
NURP	National Urban Runoff Program
PAHs	Polycyclic Aromatic Hydrocarbons
PCs	Principal Components
PCA	Principle Component Analysis
SCCWRP	Southern California Coastal Water Research Project
TSS	Total Suspended Solids
USEPA	United States Environmental Protection Agency

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SECTION 1. INTRODUCTION

Urban storm water runoff has been identified as a major cause of degradation of surface water quality (Characklis and Wiesner 1997, Davis et al. 2001, Buffleben et al. 2002). Studies in southern California have documented trace metals, polycyclic aromatic hydrocarbons (PAHs) and fecal indicator bacteria (FIB) as major constituents of concern in storm water runoff (Buffleben et al. 2002, McPherson et al. 2002; Gigliotti 2000; Menzie et al. 2002). As a result numerous stream reaches in the greater Los Angeles Basin are listed as impaired waterbodies under Section 303(d) of the Clean Water Act for a range of constituents (LARWQCB 1998a and 2002).

Past monitoring and assessment efforts have provided important insight into the general patterns of storm water loading. Previous studies have documented that the most prevalent metals in urban storm water are zinc, copper, lead, and to a lesser degree nickel and cadmium (Sansalone and Buchberger 1997, Davis et al. 2001). Recent FIB studies using *Escherchia coli* (*E. coli*), *Enterococcus* spp. and total coliforms (Noble et al. 2003 and Stein and Tiefenthaler 2005) have documented freshwater outlets such as storm drains to be especially high contributors of bacterial contamination. Routine storm water monitoring programs focus on quantification of average concentration or load at the terminal watershed discharge point. While important for overall status and trends assessment, such monitoring provides little insight into the mechanisms and processes that influence constituent levels in storm water.

To effectively manage storm water, managers need to gain a deeper understanding of factors that affect storm water quality. In particular, managers need to understand the sources, processes and mechanisms that affect runoff and associated constituent loading. Specifically, managers need to understand how sources vary by land use (LU) type, how patterns of loading vary over the course of a single storm, how loading varies over the course of a storm season, and how applicable national or regional estimates of LU based loading are to southern California. Such information is critical to designing and implementing effective management strategies and for calibrating watershed models that can be used to evaluate proposed strategies.

The goal of this study is to quantify the sources, patterns of concentrations, fluxes, and loads of trace metals, PAHs and fecal indicator bacteria from representative land use types in the greater Los Angeles, California region. In addition to quantifying differences between land use categories, our goal is to investigate within storm and within season patterns in order to identify mechanisms that influence patterns of constituent loadings. Finally, we compare the estimates of storm water metals, total suspended solids (TSS) and *E. coli* loading to data from point and non-point sources and to existing water quality standards to provide context for the magnitude of importance of storm water to overall metals, TSS and *E. coli* loading for the region.

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SECTION 2. METHODS

Study Areas

Storm water runoff was sampled from 19 different land use (LU) sites and 12 mass emission (ME) sites throughout the greater Los Angeles area (Figure 2-1). The 19 LU sites represented homogeneous distributions of eight land use types including high density residential, low-density residential, commercial, industrial, agricultural, recreational (horse), transportation or open space. The LU sites ranged in size from 0.002 to 2.89 km^2 (see Appendix A for more detailed land use information). In contrast to the smaller, homogeneous LU sites, ME sites had much larger catchments and consisted of heterogeneous land use distributions that commingle and ultimately discharge to recreational beaches and harbors along the Pacific Ocean. There were 10 urban ME sites and two nonurban ME sites sampled. Developed land use ranged from 49% to 94% of total watershed area in the 10 urban watersheds. Developed land use comprised less than 5% of the watershed area in the two non urban watersheds examined in this study. The 12 ME sites ranged in size from 31 to 2,161 km^2.

Rainfall

All of the LU and ME sites were sampled during the 2000–2001 through 2004–2005 storm seasons. Winter storms typically occur between October and May, providing 85% to 90% of the annual average rainfall (38.4 cm; Ackerman and Weisberg 2003). Annual precipitation in Los Angeles can be highly variable. For example, the 2004-2005 rainfall season brought 94.6 cm of precipitation to downtown Los Angeles making it the second wettest season in Los Angeles since records began in 1877 (National Weather Service; http://www.wrh.noaa.gov/lox/). In contrast, the 2001-2002 rainfall season totaled a mere 11.2 cm, 27 cm below the seasonal average. Consequently, the study period encompassed a wide range of precipitation conditions.

Sampling and Analysis

Twenty discrete storms were sampled, with each site sampled between one to seven individual storm events (Tables 2-1a and 2-1b). Rainfall amounts ranged from 0.12 to 9.68 cm and antecedent conditions ranged from 0 to 142 d without measurable rain. Rainfall at each site was measured using a standard tipping bucket that recorded in 0.025-cm increments. Antecedent dry conditions were determined as the number of days following the cessation of previous measurable rain. Water quality sampling was initiated when flows were greater than base flows by 20%, continued through peak flows, and ended when flows subsided to less than 20% of base flow. Because watersheds in southern California have highly variable flows that may increase orders of magnitude during storm events, these criteria are considered conservative. Flow at ME sites was estimated at 15-min intervals using existing, county-maintained flow gauges, or stage recorders in conjunction with historically derived and calibrated stage-discharge relationships. At ungauged ME sites and previously unmonitored LU sites, stream discharge was measured as the product of the wetted cross-sectional area and flow velocity. Velocity was measured using an acoustic Doppler velocity (AV) meter. The AV meter was mounted to the invert of the stream channel, and velocity, stage, and instantaneous flow data were transmitted to a data logger/controller on query commands found in the data logger software.

Between 10 and 15 discrete grab samples per storm were collected at approximately 30 to 60 min intervals for each site-event based on optimal sampling frequencies in southern California described by Leecaster et al. (2001). Samples were collected more frequently when flow rates were high or rapidly changing and less frequently during low-flow periods. All water samples were collected by one of three methods: 1) by peristaltic pumps with Teflon® tubing and stainless-steel intakes that were fixed at the bottom of the channel or pipe pointed in the upstream direction in an area of undisturbed flow, 2) by direct filling of the sample bottle either by hand or affixed to a pole, or 3) by indirect filling of intermediate bottles for securing large volumes. After collection, the samples were stored in precleaned glass bottles on ice with Teflon®-lined caps until they were shipped to the laboratory for analysis.

Chemical Analysis

Total Suspended Solids (TSS)

Total suspended solids (TSS) were analyzed by filtering a 10-mL to 100-mL aliquot of storm water through a tared 1.2-μm Whatman GF/C filter. The filters plus the solids were dried at 60°C for 24 h, cooled, and weighed.

Trace Metal Analysis

Whole samples (particulate plus dissolved) were prepared by nitric acid digestion followed by analysis using inductively coupled plasma-mass spectroscopy (ICPMS) according to USEPA Method 200.8 (US EPA 1991). Target analyses included aluminum, antimony, arsenic, beryllium, cadmium, chromium, copper, iron, lead, mercury, nickel, selenium, silver, and zinc. Quality assurance measurements indicated that all laboratory blanks were below method detection limits with duplicate samples within 10% reproducible difference.

Polycyclic Aromatic Hydrocarbon (PAHs) Analysis

Total PAH (∑PAH) was computed as the sum of the 26 individual PAH compounds quantified (Table 2-2). The individual PAHs were divided into low-molecular-weight (LMW) PAH compounds (<230, two to three rings) and high-molecular weight (HMW) PAH compounds (>230, four to six rings) for source analysis. The 26 specific PAHs were extracted, separated, and quantified by capillary gas chromatography coupled to mass spectrometry according to U.S. Environmental Protection Agency (US EPA) method 625 (US EPA 1991).

Fecal Indicator Bacteria Analysis

Concentrations of *E. coli* and *Enterococcus* spp.were measured by defined substrate technology using kits supplied by IDEXX Laboratories, Inc. (Westbrook, ME) according to the manufacturer's instructions. Briefly, 10-fold and 100-fold dilutions of the water samples were made with deionized water containing the appropriate media and sodium thiosulfate, mixed to dissolve, dispensed into trays (Quanti-Tray/2000), and heat sealed. *E. coli* was measured using the Colilert-18 reagents, while *Enterococcus* spp. were measured using Enterolert reagents. Samples were incubated overnight according to the manufacturer's instructions and inspected for positive wells. Conversion of positive wells from these tests to a most probable number (MPN) was done following Hurley and Roscoe (1983).

Data Analysis

Data analyses was broken into three sections; 1) comparison between LU sites; 2) comparison between developed and undeveloped watershed; and 3) assessment of within-season and within-storm variability. Comparison between LU sites focused on event mean concentrations (EMCs), load, flux, and principle components analysis (PCA). Prior to analysis constituent concentrations were log-transformed to improve normality. In all cases, non-detectable results were assigned a value of 1/2 the minimum detection limit, based on the inability to log transform a value of zero.

The EMC was calculated using Equation 1:

$$EMC = \frac{\sum_{i=1}^{n} C_i * F_i}{\sum_{i=1}^{n} F_i} \qquad \text{(Equation 1)}$$

where: EMC = flow-weighted mean for a particular storm; C_i = individual runoff sample concentration of ith sample; F_i = instantaneous flow at the time of ith sample; and n = number of samples per event. Constituent concentrations were log-transformed prior to calculations to improve normality. In all cases, non-detectable results were assigned a value of one-half the minimum detection limit, based on the inability to log transform a value of zero. Mass loading was calculated as the product of the EMC and the storm volume. Flux estimates facilitated loading comparisons among watersheds of varying sizes. Flux was calculated as the ratio of the mass load per storm and watershed area. Differences in concentration or flux between LU sites were tested using a one-way ANOVA, with a significance level (p) <0.05 , followed by Tukey-Kramer *post-hoc* test for multiple comparisons (Sokal and Rohlf 1969).

The PCA was used to identify the most important factors (i.e., groups of parameters, storm size and storm season) controlling data variability (Helene *et al*. 2000, SAS Inc. 2003, http://www.sas.com/textbook). As a multivariate data analysis technique, PCA reduces the number of dependent variables without sacrificing critical information (Qian et al. 1994). The number of principal components (PCs) extracted (to explain the underlying data structure) was defined by using the Kaiser criterion (Kaiser 1960) where only the PCs with eigenvalues greater than unity are retained. Scores derived from the PCA were plotted along the first two PC axes and examined visually for relationships that differentiate constituent concentrations among subclasses (e.g., land use types). PCA and ANOVA were used in a two-step process: The PCA was used to identify factors influencing variability and to group data into different sets based on the factors identified. ANOVA was then used to test for significant differences between the classes identified by the PCA.

The second analysis that compared developed and undeveloped ME sites followed similar approach as the LU sites focusing on EMCs, load, and flux. Differences between watershed types were determined using ANOVA.

The third analysis bifurcated into two approaches. The first compared seasonal patterns of total metal loading by plotting mass emissions against storm season (early = October to December, mid = January to March, and late = April to May) and cumulative annual rainfall. For this analysis, all ME sites were analyzed as a group to examine differences between early- and late-season storms across the sampling region.using ANOVA. The second approach compared flow and constituent concentration within-storm events. This comparison examined the time-concentration series relative to the hydrograph plots using a pollutograph. A first flush in concentration from individual ME storm events was defined as a circumstance when the peak in concentration preceded the peak in flow. This was quantified using cumulative loading plots in which cumulative mass emission was plotted against cumulative discharge volume during a single storm event (Bertrand-Krajewski et al. 1998). When these curves are close to unity, mass emission is a function of flow discharge. A strong first flush was defined as ≥75% of the mass was discharged in the first 25% of runoff volume. A moderate first flush was defined as ≥30% and ≤75% of the mass discharged in the first 25% of runoff volume. No first flush was assumed when ≤30% of the mass was discharged in the first 25% of runoff volume.

Further Analyses for Individual Constituents

Total Metal Comparison to The California Toxics Rules (CTR)

In order to investigate the percent of samples exceeding water quality standards total metals concentrations were compared to the California Toxics Rules (CTR) for inland surface waters (acute freshwater aquatic life protection standards, US EPA 2000). The standards for total copper, total lead and total zinc are 14.00, 81.65, and 119.82 respectively based on a hardness value of 100 mg/L.

The formula for calculating the acute objectives for copper, lead, and zinc in the CTR take the form of the following equation:

$$CMC = WER * ACF * \exp[(ma)(\ln(hardness)+ba]$$

Where: WER = Water Effects Ratio (assumed to be 1), ACF = Acute conversion factor (to convert from the total to the dissolved fraction), m_A = slope factor for acute criteria, and b_A = y intercept for acute criteria.

The CTR allows for the adjustment of criteria through the use of a water-effect ratio (WER) to assure that the metals criteria are appropriate for the site-specific chemical conditions under which they are applied. A WER represents the correlation between metals that are measured and metals that are biologically available and toxic. A WER is a measure of the toxicity of a material in site water divided by the toxicity of the same material in laboratory dilution water. No site-specific WER has been developed for any of the waterbodies in the Los Angeles River or San Gabriel River watersheds. Therefore, a WER default value of 1.0 was assumed. The coefficients needed for the calculation of objectives are provided in the CTR for most metals.

PAH Source Identification

PAHs were also analyzed to examine sources of PAHs. First, the FWM concentrations from the homogenous land use sites were compared. Differences between land use sites were investigated using a one-way analysis of variance (ANOVA) with a $p < 0.05$ significance level (Sokal and Rohlf 1969). Next, the relative proportion of individual PAH compounds and their ratios were evaluated to determine if the sources of PAHs suggested a pyrogenic (i.e., combustion by-products) or petrogenic (i.e., unburnt petroleum) signature. The ratio of fluoranthene (F) to pyrene (P; F/P) and the ratio of phenanthrene (P) to anthracene (A; P/A) were used to determine pyrogenic versus petrogenic sources of PAH. Pyrogenic sources predominate when F/P ratios approach 0.9 (Maher and Aislabe 1992). Pyrogenic sources predominate when P/A ratios ranged from 3 to 26 (Lake et al. 1979, Gschwend and Hites 1981).

Correlations between TSS, Flow and FIB

To explore the potential link between storm water runoff, TSS and FIB concentrations Spearman Rank correlation coefficients (a nonparametric measure of correlation) were computed between FIB, TSS and stream flow (Townsend 2002).

Cumulative Density Frequency Plots (CDFs) - Bacteria

Fecal indicator bacteria were used to assess whether storm water samples met State of California water quality thresholds by examining the relative frequency of exceedence for all storms combined at both ME and LU sites. Fecal indicator bacterial counts were plotted on logarithmic scales (a scale that minimizes differences and allows widely varying numbers to be shown) and compared to the CA single-sample criterion to estimate percent exceedances. The CA single-sample standard (assembly bill AB411) for ocean beaches has limits of 104 *Enterococcus* spp. bacteria in 100 ml of water, 400 *E. coli* colonies (400 MPN/100ml) and 10,000 total coliforms colonies (10,000 MPN/100mL). Cumulative density frequency plots (CDFs) were produced to compare observed bacterial concentrations to the CA quantitative standards and to calculate accumulated relative exceedance percentages.

An additional data analysis element examined the incidence of exceedences of California's AB411 water quality standards for fecal indicator bacteria compared to the size of the watershed. Watersheds were broken into small (<25 km^2), medium (20 km^2 - 99 km^2), and large (>100 km^2), with at least three watersheds falling into each category.

Constituent Comparison to Nationwide Results

Existing data sets provide insight into land use based loading, but do not provide the mechanistic understanding needed by storm water managers. Between 1977 and 1983 the U.S. EPA funded The Nationwide Urban Runoff Program (NURP), which compiled discharge data from separate storm sewers in different land uses to receiving waters. This project used 81 sites in 28 cities throughout the U.S. and included the monitoring of approximately 2,300 individual storm events (US EPA 1983a). The utility of the NURP data set is somewhat limited because it is 23 years old and only contains data from storm drains (vs. in-river measures). The National Storm water Quality Database (NSQD) was created in 2003 by the University of Alabama and the Center for Watershed Protection to examine more recent storm water data from a

representative number of National Pollutant Discharge Elimination System (NPDES) municipal separate storm sewer system (MS4) storm water permit holders (Pitt et al. 2003). The NSQD includes Phase I storm water monitoring data from 369 stations from 17 states and 9 rain zones and a total of 3,770 individual storm events between 1992 and 2003. Unfortunately, the NSQD does not contain any samples from the arid west. Furthermore, neither the NURP nor the NSQD provides time variable measurements that provide an understanding of the temporal processes that affect storm water loading.

Table 2-1a. Summary of storm events sampled at mass emission sites during 2001-2005 in Los Angeles, CA, USA.

Mass Emission Sites	Date of Storm Event	Size (km^2)	Rainfall (cm)	Antecedant Dry Days	Mean Flow (cm/s)	Peak Flow (cm/s)
Los Angeles River Developed Watersheds						
LA River above Arroyo Seco	1/26 - 1/27/2001	1460	1.80	1	27.3	114.0
	2/9 - 2/11/2001		1.42	1	22.4	165.2
	2/12 - 2/13/2001		9.68	0	62.6	262.5
LA River at Wardlow	1/26 - 1/27/2001	2161	1.80	1	15.0	50.9
	2/9 - 2/11/2001		1.42	1	1.4	6.0
	5/2 - 5/3/2003		3.56	4	209.9	756.7
	2/2 -2/3/2004		1.14	6	90.4	375.6
Verdugo Wash	1/26 - 1/27/2001	65	1.80	1	15.0	50.9
	2/9 - 2/11/2001		1.42	1	13.9	90.2
	11/12 - 11/13/2001		9.68	0	68.5	368.2
	10/31 - 11/1/2003		1.74	30	56.5	155.0
Arroyo Seco	2/9 - 2/11/2001	130	3.56	12	2.9	13.5
	4/7/2001		1.78	30	7.8	21.8
Ballona Creek	2/18 - 2/19/2001	338	1.50	3	38.1	107.0
	4/7/2001		1.24	31	32.6	100.9
	11/24 - 11/25/2001		1.52	11	53.1	396.2
	5/2 - 5/3/2003		2.03	4	52.8	134.4
	10/31 - 11/1/2003		2.03	30	62.0	148.1
	2/2 -2/3/2004		2.21	29	55.0	213.9
	2/21 -2/22/2004		3.41	18	44.8	95.6
Dominguez Channel	3/17 - 3/18/2002	187	0.28	10	4.8	14.0
	2/21 -2/22/2004		1.52	18	14.7	35.5
Undeveloped Watersheds						
Santa Monica Canyon	2/9 - 2/11/2001	41	3.74	1	0.1	1.1
	4/7/2001		3.05	50	0.6	3.0
Open Space Arroyo Sequit	5/2 - 5/3/2003	31	5.03	3	0.0	0.0
	2/25 -2/26/2004		4.12	1	3.4	21.9
	12/27 -12/28/2004		5.05	17	0.0	0.2
	1/7/05		5.54	2	0.3	0.9

Table 2-1b. Summary of storm events sampled at land use sites in Los Angeles, California USA during 2000/01-2004/05 storm seasons.

Land-use Type	Date of Storm Event	Size (km^2)	Rainfall (cm)	Antecedant Dry Days	Mean Flow (cm/s)	Peak Flow (cm/s)
High Density Residential (#1)	2/9 - 2/11/2001		1.93	2	0.082	0.563
	2/18 - 2/19/2001	0.52	0.61	4	0.060	0.233
High Density Residential (#2)	3/17 - 3/18/2002		0.20	10	0.000	0.003
	2/17/2002	0.02	0.89	19	0.001	0.006
	2/2 -2/3/2004		1.19	29	0.004	0.025
High Density Residential (#3)	12/28/2004	1.0	3.25	0	0.009	0.080
	2/11/2005		1.35	13	0.004	0.016
Low Density Residential (#1)	2/18 - 2/19/2001		0.61	4	0.068	0.097
	3/4 - 3/5/2001	0.98	1.42	6	0.017	0.071
	2/2 -2/3/2004		2.26	29	0.030	0.143
Low Density Residential (#2)	3/17 - 18/2002	0.18	2.13	19	0.008	0.116
Commercial (#1)	2/17/2002	2.45	0.74	19	0.337	1.340
Commercial (#2)	2/17/2002	NA	0.89	19	0.002	0.008
Commercial (#3)	2/18 - 2/19/2001		0.81	4	0.003	0.008
	4/7/2001	0.06	2.03	31	0.008	0.018
	3/17 - 18/2002		0.12	9	0.000	0.001
Industrial (#1)	2/9 - 2/11/2001		0.81	14	0.253	1.801
	2/18 - 2/19/2001	2.77	0.41	3	0.205	0.774
	3/17 - 18/2002		0.25	27	0.000	0.003
Industrial (#2)	2/17/2002	0.001	0.74	19	0.000	0.002
Industrial (#3)	4/7/2001	0.004	2.06	25	0.008	0.017
Industrial (#4)	3/15/2003	0.01	4.50	10	0.117	0.375
Agricultural (#1)	2/18 - 2/19/2001		0.81	5	0.014	0.042
	3/4 - 3/5/2001	0.98	8.13	3	0.021	0.053
	3/17 - 3/18/2002		0.23	9	0.012	0.031
	2/2 -2/3/2004		1.17	29	0.023	0.128
Agricultural (#2)	4/7/2001	0.8	2.06	25	1.723	3.801
Recreational (horse)	2/18 - 2/19/2001	0.03	0.61	4	0.015	0.044
	3/4 - 3/5/2001		1.42	6	0.003	0.014
Transportation (#1)	4/7/2001	0.01	3.05	25	0.022	0.057
Transportation (#2)	2/17/2002	0.002	0.74	19	0.001	0.006
Open Space (#1)	2/24-25/2003	9.49	3.00	11	0.160	0.360
Open Space (#2)	2/24-25/2003	2.89	2.57	11	0.180	0.680

Table 2-2. List of the 26 individual polycyclic aromatic hydrocarbon compounds measured during the study. Compounds were divided into low-molecular-weight (LMW) compounds (<230, two to three rings) and high-molecular-weight (HMW) compounds (>230, four to six rings) for source analysis.

LMW Compounds	Weight	No. Rings	HMW Compounds	Weight	No. Rings
1-Methylnaphthalene	156+170	2	Benz[a]anthracene	228	4
1-Methylphenanthrene	192+206	3	Benzo[a]pyrene	252	5
2,3,5-Trimethylnaphthalene	155+170	2	Benzo[b]fluoranthene	252	5
2,6-Dimethylnaphthalene	156+170	2	Benzo[e]pyrene	252	5
2-Methylnaphthalene	156+170	2	Benzo[g,h,i]perylene	276	6
2-Methylphenanthrene	192+206	3	Benzo[k]fluoranthene	252	5
Acenaphthene	154	2	Chrysene	228	5
Acenaphthylene	152	3	Dibenz[a,h]anthracene	278	5
Anthracene	178	3	Fluoranthene	202	4
Biphenyl	154	2	Indeno[1,2,3-c,d]pyrene	276	6
Fluorene	166	3	Methylanthracene	222	5
Naphthalene	128	2	Perylene	252	5
Phenanthrene	178	3	Pyrene	202	4

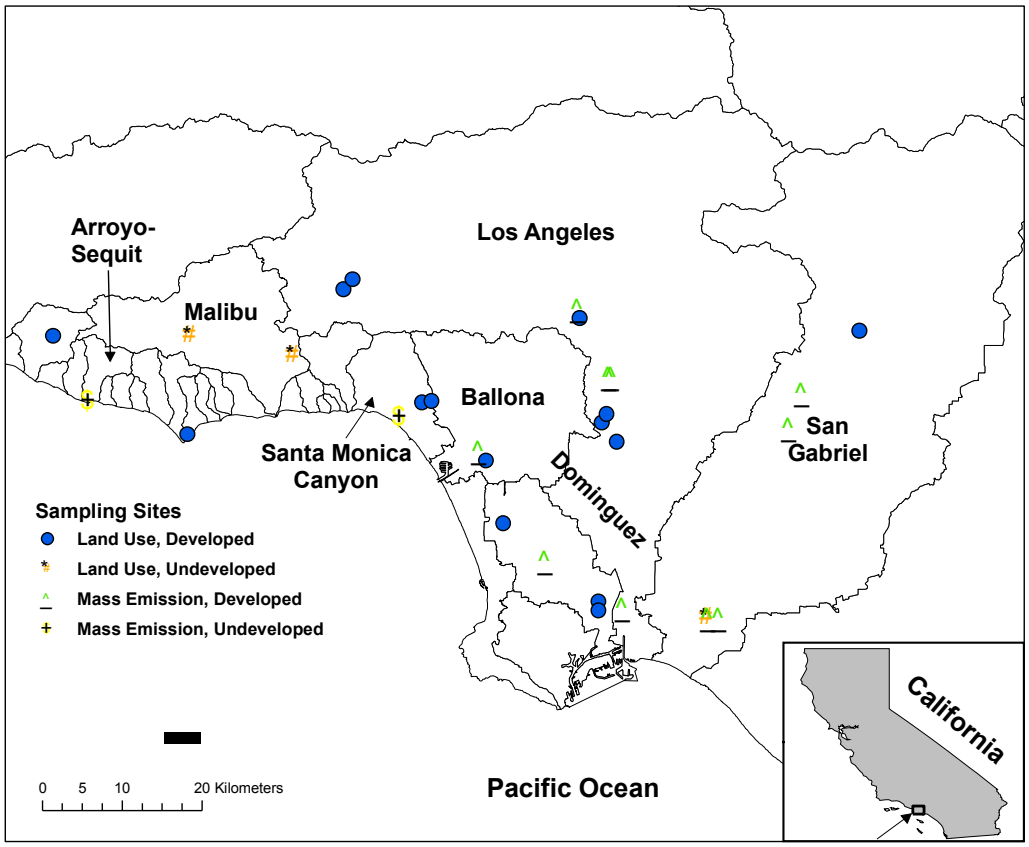

Figure 2-1. Map of watersheds with land use and mass emission sampling sites within the greater Los Angeles region, California USA. Undeveloped >90% open space.

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SECTION 3. TRACE METALS AND TOTAL SUSPENDED SOLIDS

Results

Comparison Between LU Sites

Industrial LU sites contributed a substantially higher flux of copper and zinc compared to the other LU sites evaluated (Figure 3-1). For example, mean total copper flux from the industrial LU was 1,238.0 g/km^2 while mean total copper flux from high density residential and recreational (horse) LU was 100.5 g/km^2 and 190.1 g/km^2, respectively. Trace metal flux from undeveloped LU sites was lower than those observed in developed LUs. For example, mean copper flux at open space LU sites was 23.6 g/km^2. In contrast to copper and zinc, the mean flux of total lead was greatest at agriculture, high density residential, and recreational (horse) LU sites (Figure 3-1). The mean flux of total lead at these three LU sites was at least an order of magnitude greater than any other LU sampled.

Industrial LU had the greatest mean EMC for copper and zinc relative to all other LU sites (Figure 3-2). For example, zinc EMCs at the industrial LU averaged 599.1 µg/l compared to 362.2 µg/l and 207.7 µg/l for commercial and high density residential LU sites, respectively. High density residential had the greatest EMC for lead relative to all other LU sites (Figure 3-2). For example, lead EMCs at high density residential LU averaged 28.4 µg/l compared to 24.1 µg/l and 7.8 µg/l for industrial and agricultural LU sites, respectively. Mean EMCs for all three metals from undeveloped LU sites were lower than those observed in developed LU sites. For example, mean copper, lead, and zinc EMCs from open space LU sites was 7.6 µg/l, 1.2 µg/l, and 23.2 µg/l, respectively.

Both industrial and agricultural LU sites contributed substantially higher fluxes of TSS compared to the other LU sites evaluated (Figure 3-1). For example, mean TSS flux from the industrial and agricultural LU sites were comparable around 3,150.3 kg/km^2 while mean TSS flux from recreational (horse) and high density residential LU was 2,211.1 kg/km^2 and 91.1 kg/km^2, respectively. Mean TSS flux from undeveloped LU sites were comparable to the remaining developed LU sites. For example mean TSS flux from open space LU sites was 513.8 kg/km^2 compared to 160.8 kg/km^2 and 94.0 kg/km^2 for low density residential and commercial LU sites, respectively.

Recreational (horse) LU had the greatest mean TSS EMC compared to all other LU sites. For example, TSS EMCs at the recreational (horse) LU averaged 530.7 mg/l compared to 111.1 mg/l and 92.0 mg/l for agricultural and industrial LU sites, respectively. Mean TSS EMCs from undeveloped LU sites were comparable to those observed in developed agricultural and industrial LU sites. TSS EMCs from open space LU sites averaged 134.8 mg/l.

Results of the PCA indicated that the land use was a predominate source of variability and that land use categories can be grouped based on differences in their intrinsic runoff and loading characteristics (Figure 3-3). Two Principal Components (PCs) had eigenvalues greater than one, with PC1 and PC2 accounting for 63% and 17% of the total variance, respectively. Factor loadings indicated that PC1 and PC2 described concentrations of copper, cadmium, lead, nickel, zinc, and TSS. The two dimensional plot of scores from PC1 and PC2 revealed that

industrial, recreational (horse), and open space LU types were distinct from other LU types based on the concentrations of these constituents. Comparison of the PC scores (or eigenvectors) using a one-way ANOVA indicated that both industrial (group D) and recreational (horse) (group F) sites were significantly different ($p < 0.001$) than open space (group H) sites. All other LU types were indistinguishable.

Comparison Between Developed and Undeveloped Watersheds

The contrasts between the different small, homogeneous LU sites were also apparent at the watershed scale (Figure 3-4). Total copper, total lead and total zinc EMCs and fluxes were significantly greater at ME sites from developed compared to undeveloped watersheds (ANOVA, $p = <0.001$). For the 15 storm events measured, the mean flux of total copper, total lead and total zinc from developed ME watersheds was 0.6, 0.5 and 3.0 kg/km^2 respectively. The mean flux of total copper, total lead and total zinc from undeveloped ME watersheds were 0.06 kg/km^2, 0.01 kg/km^2 and 0.1 kg/km^2 (Figure 3-1), respectively. Furthermore, the higher fluxes from developed ME watersheds were generated by substantially less rainfall than the lower fluxes from the undeveloped ME watersheds (2.8 ± 0.8 cm for storms in developed ME watersheds vs. 4.4 ± 0.8 cm for storms in undeveloped ME watersheds), presumably due to increased impervious surface area in developed watersheds. Similarly, total copper, total lead, and total zinc mean EMC concentrations from developed ME watersheds significantly exceeded those from undeveloped ME watersheds (46.1 ± 14.8 µg/L, 36.3 ± 15.3 µg/L, 251.9 ± 76.9 µg/L vs. 12.6 ± 3.0 µg/L, 2.2 ± 0.8 µg/L, and 27.0 ± 8.4 µg/L, respectively; ANOVA, $p = <0.001$).

The TSS concentrations from less developed ME watersheds were within the same order of magnitude as those from more developed ME watersheds. For example, annual TSS EMCs for developed ME watersheds averaged 246.3 mg/L for Los Angeles River compared to 217.0 mg/L for the undeveloped ME watersheds. However, TSS fluxes were substantially higher for developed ME watersheds. For the 15 storm events measured, mean TSS flux from the developed Los Angeles River and San Gabriel River watersheds were 3,116.8, and 398.8 kg/km^2 respectively, while mean TSS flux from undeveloped watersheds was 62.8 kg/km^2.

Within-Season and Within-Storm Variability

There were significant seasonal differences in total metal loading ($p < 0.001$). Early season storms had significantly higher total metal load than late season storms both within and between watersheds, even when rainfall quantity was similar (Figure 3-5). For example, the two early-season storms from Ballona Creek in water years 2001-2002 and 2003-2004 had total copper loadings that were approximately four times larger (ranging from 154.7 ± 16.0 to 160.8 ± 9.4 kg) than the two storms that occurred at the end of the rainy season (42.6 ± 3.8 to 64.2±4.6 kg), despite the early- and late-season storms resulting from comparable rainfall. The results for total lead and total zinc showed a similar pattern.

Trace metal concentrations varied with time over the course of storm events (Figure 3-6). For all storms sampled, both the highest trace metal concentrations and the peak flow occurred in the early part of a storm event. In all cases, metal concentrations increased rapidly, often preceding peak flow. Concentrations stayed high for relatively short periods and often decreased

back to base levels within one to two hours. In contrast, the undeveloped watershed (Arroyo Sequit; Figure 3-6a) had appreciably lower peak concentrations than the developed watershed (Ballona Creek; Figure 3-6b). Although the pattern of an early peak in concentration was comparable in both undeveloped and developed watersheds, the peak concentration tended to occur later in the storm and persist for a longer duration in the undeveloped watersheds. Due to the small number of storms sampled in undeveloped watersheds, consistency of these patterns is inconclusive.

Cumulative mass loading of all trace metals from ME sites showed little variation over flow implying there was a weak "first flush" effect at these locations (Figure 3-7). In contrast, cumulative mass loading plots for total copper, lead and zinc from LU sites exhibited moderate first flush patterns in the residential, commercial, industrial, agricultural and open space LU categories. When all developed catchments were analyzed together, the magnitude of the first flush effect decreased with increasing watershed size (Figure 3-8). For the developed LU sites that had catchments generally less than 3 km^2 in size, between 30 and 50% of the total copper, total lead and total zinc load was discharged during the first 25% of storm volume. For the ME sites, where runoff was integrated across larger and more diverse landscapes, between 15 and 35% of the total mass of copper, lead, and zinc was discharged during the first 25% of storm volume.

Discussion

Concentrations, flux, and loading in storm water runoff exhibited some key patterns with important implications for managers tasked with controlling trace metals. First, the magnitude of trace metal concentrations and loads were higher at industrial land uses than other land use types. High pollutant loading from industrial sites observed in this study results, at least in part, from intrinsic properties of the industrial land use themselves. These intrinsic properties include high impervious cover (typically greater than 70%) and on-site source generation. Other authors have reported similar results. Sanger et al. (1999) reported that total metal concentrations in runoff from industrial catchments tended to be higher than those from residential and commercial catchments. Park and Stenstrom (2004) used Bayesian networks to estimate pollutant loading from various land uses in southern California and concluded that zinc showed higher EMC values at commercial and industrial land uses. Bannerman et al. 1993 identified industrial land uses as a critical source area in Wisconsin storm water producing significant zinc loads. Bannerman *et al.* 1993 further suggested that targeting best-management practices to 14% of the residential area and 40% of the industrial area could significantly reduce contaminant loads by up to 75%. In this study high density residential sites had considerably higher lead EMCs than low density residential sites. This difference likely results from greater impervious cover and higher source generation at high density residential sites. High density sites typically have greater road surface and more vehicular use, resulting in more lead. In addition, higher impervious cover more effectively conveys accumulated pollutants to streams and creeks. Substantially higher TSS fluxes were also observed at the industrial sites, which may explain the high trace metal concentrations often associated with fine particles. The City of Austin (City of Austin 1990) found lead and zinc EMCs were related to the TSS EMCs. Consequently, controlling TSS at industrial sites may also result in reducing other constituents with the same particle sizes.

A second key conclusion that may affect storm water management is that seasonal flushing was consistently observed at both land use and mass emission sites. This suggests that the magnitude of trace metal loads associated with storm water runoff depends, at least in part, on the amount of time available for build-up on land surfaces. The extended dry period that typically occurs in arid climates such as southern California maximizes the time for trace metals to build-up on land surfaces, resulting in proportionally higher concentrations and loads during initial storms of the season. Similar seasonal patterns were observed for polycyclic aromatic hydrocarbons (PAHs) in the Los Angeles region (Sabin and K. 2004, Stein et al. 2006). Han et al. (2006) also reported that antecedent dry period was the best predictor of the magnitude of pollutant runoff from highways. Other researchers (Anderson and Rounds 2003, Ngoye and Machiwa 2004) have reported corresponding temporal trends for other particle-bound contaminants. This seasonal pattern suggests that focusing management actions on early season storms may provide relatively greater efficiency than distributing lower intensity management actions throughout the season.

A third key conclusion is that trace metal concentrations varied throughout the duration of storm hydrographs. The greatest total metal concentrations occurred at or just before the peak in flow of the storm hydrograph for nearly every storm sampled. This hydrograph/pollutograph pattern was also observed for PAHs in the greater Los Angeles area (Stein et al. 2006). Tiefenthaler et al. (2001) observed similar pollutographs that showed peak suspended-sediment concentrations preceding the peak in discharge for the Santa Ana River. Similar time vs. concentration relationships were observed by Characklis and Wiesner (1997), who reported that the maximum concentrations of zinc, organic carbon and solids coincided with early peak storm water flows. The early occurrence of peak concentrations indicates that monitoring programs must capture the early portion of storms to generate accurate estimates of EMC and contaminant loading. Programs that do not initiate sampling until a flow threshold has been surpassed may severely underestimate storm EMCs.

Despite a strong and consistent pattern of high metal concentrations early in the storm hydrograph, cumulative mass loading plots exhibited only a moderate first flush of total copper, lead and zinc at the small land use sites and a weak first flush at the larger mass emission sites. Lee et al. (2002) also found that the magnitude of first flush varied by constituent, with metals generally showing the weakest first flush. Furthermore, first flush phenomena were strongest for small catchments and generally decreased with increasing catchment size. Han et al. (2006) reported that first flush characteristics increased with decreasing drainage area size. Characklis and Wiesner (1997) reported that storm water runoff of trace metals from the urban areas of Houston exhibited no discernable first flush effect; however, these measurement were from larger mass emission catchments.

The inverse relationship between first flush and catchment size has several potential mechanistic explanations including relative pervious area, spatial and temporal patterns in rainfall, and pollutant transport through the catchment. Smaller LU catchments have increased impervious area that allows contaminants to be easily washed off relative to larger ME watersheds with less impervious area that requires greater rainfall energy to washoff particles and associated contaminants. In our study, industrial, commercial and high-density residential LU sites were comprised of 72%, 72% and 33% imperviousness, respectively. In contrast, the

larger ME watersheds (>40 km^2) ranged from 32 to 59% impervious area. The undeveloped ME watersheds, which had the least within storm variability, were comprised of only 1% imperviousness. Pitt (1987) also found a first flush on relatively small paved areas that he associated with washoff of the most available material.

A corollary to the relationship between imperviousness and catchment size is travel time. Travel time becomes a factor because contaminants are rapidly delivered to the point of discharge within smaller, more impervious catchments relative to larger, less impervious catchments. In our study, the time of travel in the larger ME watersheds like Ballona Creek or Los Angeles River was estimated in hours while travel times in the small LU catchments was minutes. As a result, not all first flush in smaller catchments upstream arrive at a ME site at the same time, effectively diluting short peaks in concentration. Hence, the different times of concentration (i.e., travel times) from various portions of the watershed may obscure first flush patterns at larger mass emission sites.

Spatial and/or temporal differences in rainfall further complicate first flush in large watersheds. Adams and Papa (2000) and Deletic (1998) both concluded that the presence of a first flush depends on numerous site and rainfall characteristics. In smaller catchments, rainfall distribution is more uniform compared to larger watersheds. When rainfall is distributed uniformly, then particles and associated pollutants are potentially washed off at the same time. In larger catchments, rainfall lags between various parts of the watershed may take hours and rainfall quantity and/or duration may not be similar between subwatersheds. Ackerman and Weisberg (2003) quantified rainfall temporal and spatial variability and determined that these factors were an important consideration in hydrologic inputs to the coastal ocean of southern California. Ultimately, the differences in first flush, whether they were due to imperviousness, travel time, or rainfall variability, suggest that management strategies at most moderate to large catchments should focus on more than just the initial portion of the storm if the goal is to capture a majority of metals load.

Urban storm water runoff from this study appeared worthy of management concern because it represented a large mass emission source that frequently exceeded water quality criteria (Table 3-1). Cumulatively, the annual average loading of total copper, lead, and zinc from the Los Angeles River, Ballona Creek, and Dominguez Channel exceeded the mass emissions from industrial point sources such as power generating stations and oil refineries by orders of magnitude. Annual storm water loading from these three watersheds also rivaled, or exceeded, trace metal emissions from point sources such as publicly owned treatment works. One significant difference between these point sources and urban storm water is that southern California has a completely separate sanitary sewer collection system and urban storm water receives no treatment prior to discharge into estuaries or the coastal ocean. Assuming a hardness of 100 mg/L and that 15% of the total metals in storm water occur in the dissolved fraction (Young *et al.* 1980), storm water concentrations of copper and zinc exceeded California Toxic Rule (US EPA 2000) water quality criteria in more than 80% of the wet weather samples collected at mass emission sites. This was partly due to industrial LU sites where 100% and 87% of runoff samples exceeded water quality criteria for zinc and copper, respectively. Commercial LU sites exceeded water quality criteria in 79% and 72% of its runoff samples, respectively. Only 8% to 9% of the runoff samples exceeded the water quality criterion for lead at commercial

or industrial LU sites. Hall and Anderson (1988) concluded that industrial and commercial land use sites were the major source of trace metals most often considered toxic to aquatic invertebrates, with runoff from the commercial sites proving most frequently toxic to the test organism.

The focus on LU sites in this study enabled the comparison of median EMCs with data sets collected from other parts of the nation (Table 3-2). All of the median EMCs for total copper at LU sites from Los Angeles were greater than, or equal to, median EMCs at LU sites reported in the NSQD (Pitt et al. 2004). With the exception of the open LU, all of the median EMCs for zinc were greater at LU sites in Los Angeles than median EMCs at LU sites reported in the NSQD. In contrast, all of the median EMCs for lead were lower at LU sites in Los Angeles than median EMCs at LU sites reported in the NSQD. Of the 15 LU – EMC combinations, all but one of the median EMCs (industrial zinc) were lower in Los Angeles than median EMCs reported by NURP (US EPA 1983; Table 3-2). Unlike the NSQD that was focused on data from the 1990's, NURP data was collected during the 1970's. Therefore, the differences between median EMCs from NURP and median EMCs from Los Angeles were also a function of time. Certainly this factor affected median EMCs for lead, which was phased out of gasoline in the mid-1980s (Marsh and Siccama 1997, Hunt et al. 2005).

Further research is needed to directly assess the relationship between trace metal concentrations and particle-size distributions in storm water runoff from mass emission and land use sites to better understand the fate, transport and treatment of trace metals in urban runoff. Storm water borne trace metals are typically associated with particulates to varying degrees depending on the metal and the size distribution of suspended solids in the storm water runoff. Furthermore, the particle size distribution, and metal partitioning can change over the course of a storm event (Furumai et al. 2002). Understanding the dynamic partitioning of trace metals to various size particles is important to being able to estimate temporal and spatial patterns of trace metal deposition in estuaries and harbors, and should be an area of future investigation. Our understanding of the mechanisms of metal loading from urban land uses could also be improved by estimating the percent of directly connected impervious area (DCIA) in each land use category (i.e., percent rooftop, sidewalks, paved driveways and streets) and its impacts on storm water runoff concentrations and loads. This could allow identification of critical source areas, which in turn could allow for more focused application of best management practices.

Table 3-1. Mean annual (± 95% confidence intervals) trace metal loading from different sources (mt = metric tons).

	Mean Annual Load / Year (mt ± 95% CI)		
	Total Copper	Total Lead	Total Zinc
Point Source Data[1,2] (2000-2005)			
Large Publicly Owned Treatment Plants (POTWs)	10.9 ± 6.8	0.8 ± 0.8	13.9 ± 7.6
Low Volume Waste Power Generating Stations (PGS)	0.01	0.00	0.09
Wet Weather Runoff (2000-2005) [3]			
Los Angeles River	1.6 ± 1.2	1.4 ± 1.5	9.8 ± 9.4
Ballona Creek	0.7 ± 0.4	0.6 ± 0.3	4.3 ± 2.5
Dominguez Channel	0.4 ± 2.4	0.2 ± 1.1	2.1 ± 11.0
Total Annual Wet Weather Runoff	**2.7 ± 4.0**	**2.2 ± 2.9**	**16.2 ± 22.9**

[1]SCCWRP Biennial Report 2004-06 (Lyons G, Stein E).
[2]SCCWRP Biennial Report 2003-04 (Steinberger A, Stein E); PGS data represents year 2000 only.
[3]This study

Table 3-2. Comparison of Nationwide Urban Runoff Program (NURP) and National Storm water Quality Database to trace metals concentrations from specific land uses in the Los Angeles, California USA region. Median event mean concentration (EMCs) are in µg/L .

	Constituent Median EMC (µg/L)		
Land use Type	Total Copper	Total Lead	Total Zinc
Overall			
LARW[1]	20	9	151
NSQD[2]	16	16	116
NURP[3]	34	144	160
Residential			
LARW[1]	18	8	103
NSQD[2]	12	12	73
NURP[3]	33	144	135
Commercial			
LARW[1]	17	4	156
NSQD[2]	17	18	150
NURP[3]	29	104	226
Industrial			
LARW[1]	33	19	550
NSQD[2]	22	25	210
NURP[3]	27	114	154
Open Space			
LARW[1]	8	1	23
NSQD[2]	5	5	39
NURP[3]	NA[4]	30	195

[1]2001-2005 This Study
[2]The National Storm water Quality Database (NSDQ), Pitt et al. (2003)
[3]Nationwide Urban Runoff Program (USEPA 1983a)
[4]NA = Not analyzed

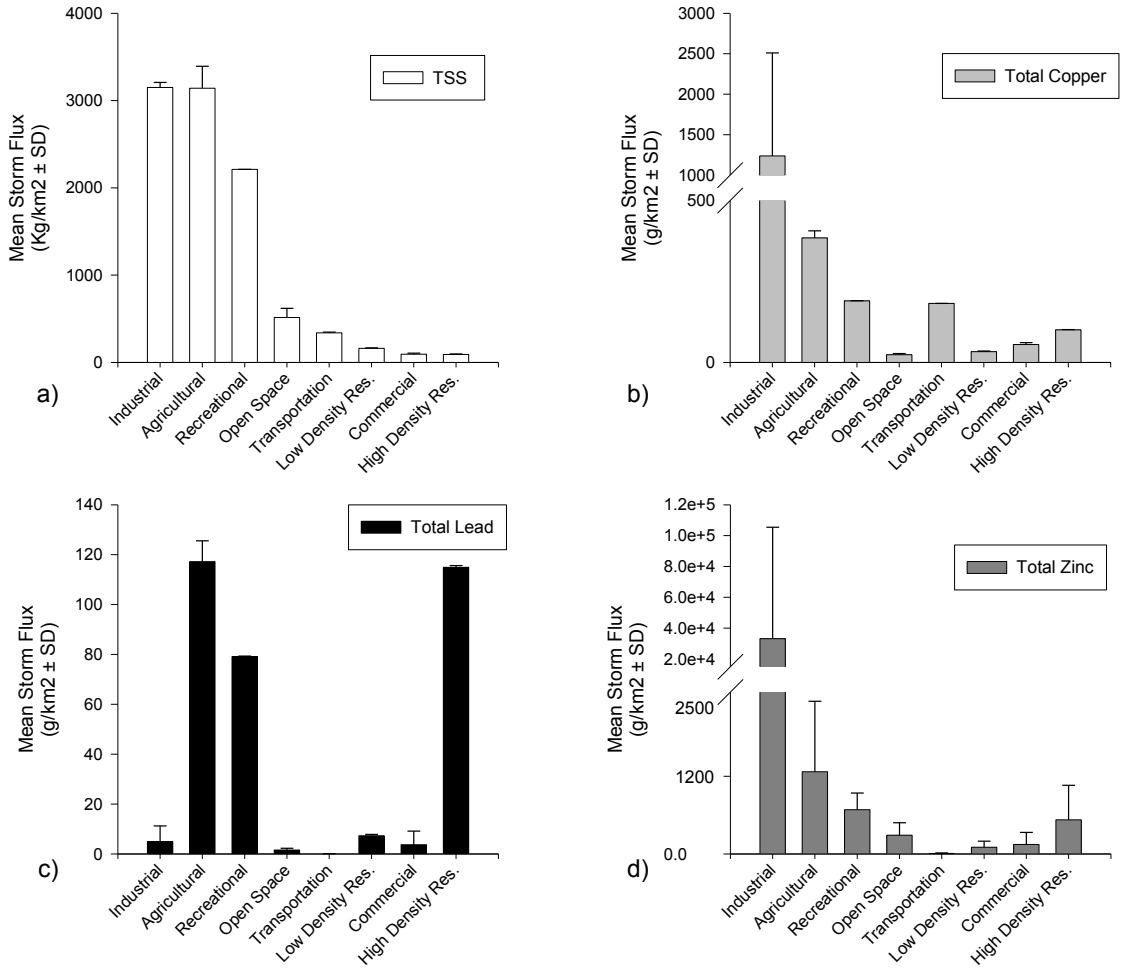

Figure 3-1. Mean storm flux of total suspended solids (TSS; a), total copper b), total lead (c), and total zinc (d) at land use sites during 2000/01-2004/05 storm seasons. Standard deviation (SD).

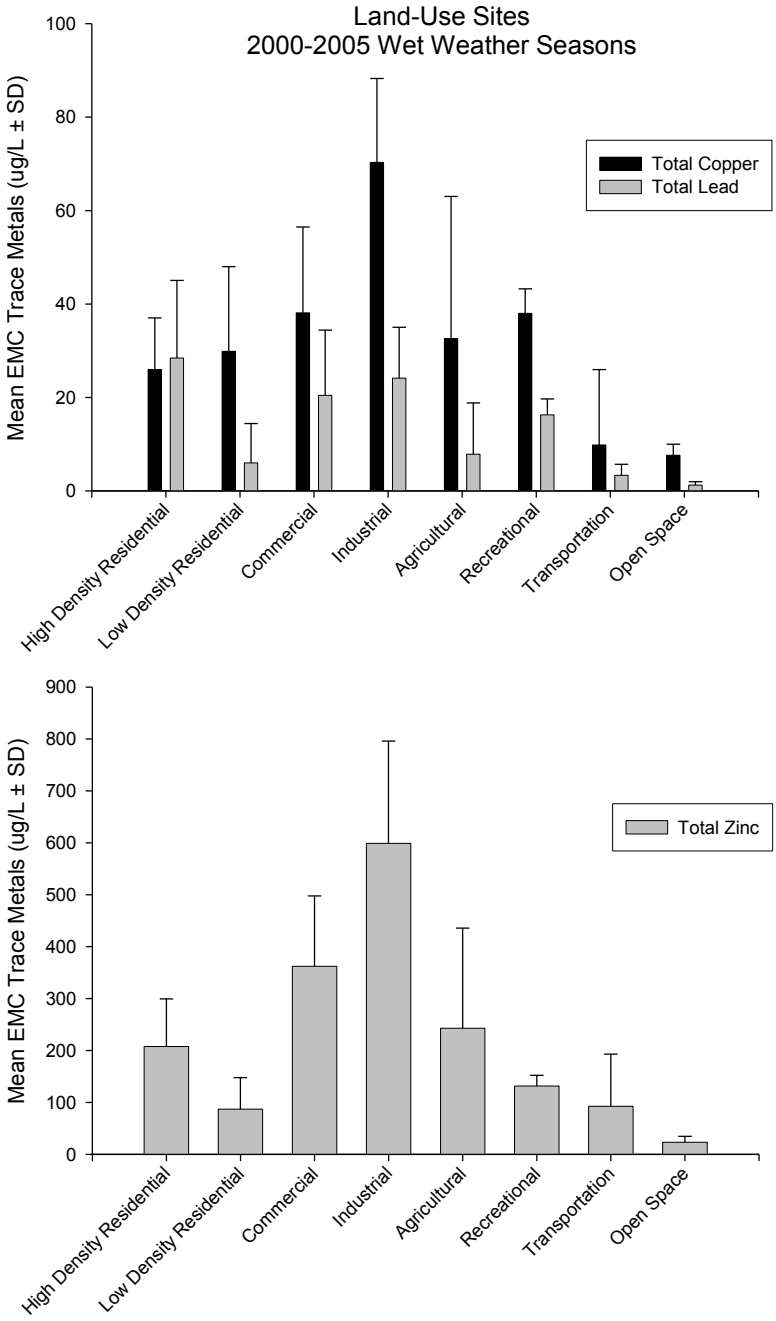

Figure 3-2. Mean storm EMCs of total copper and total lead (top) and total zinc (bottom) at specific land use sites during the 2000/01-2004/05 storm seasons. Standard deviation (SD).

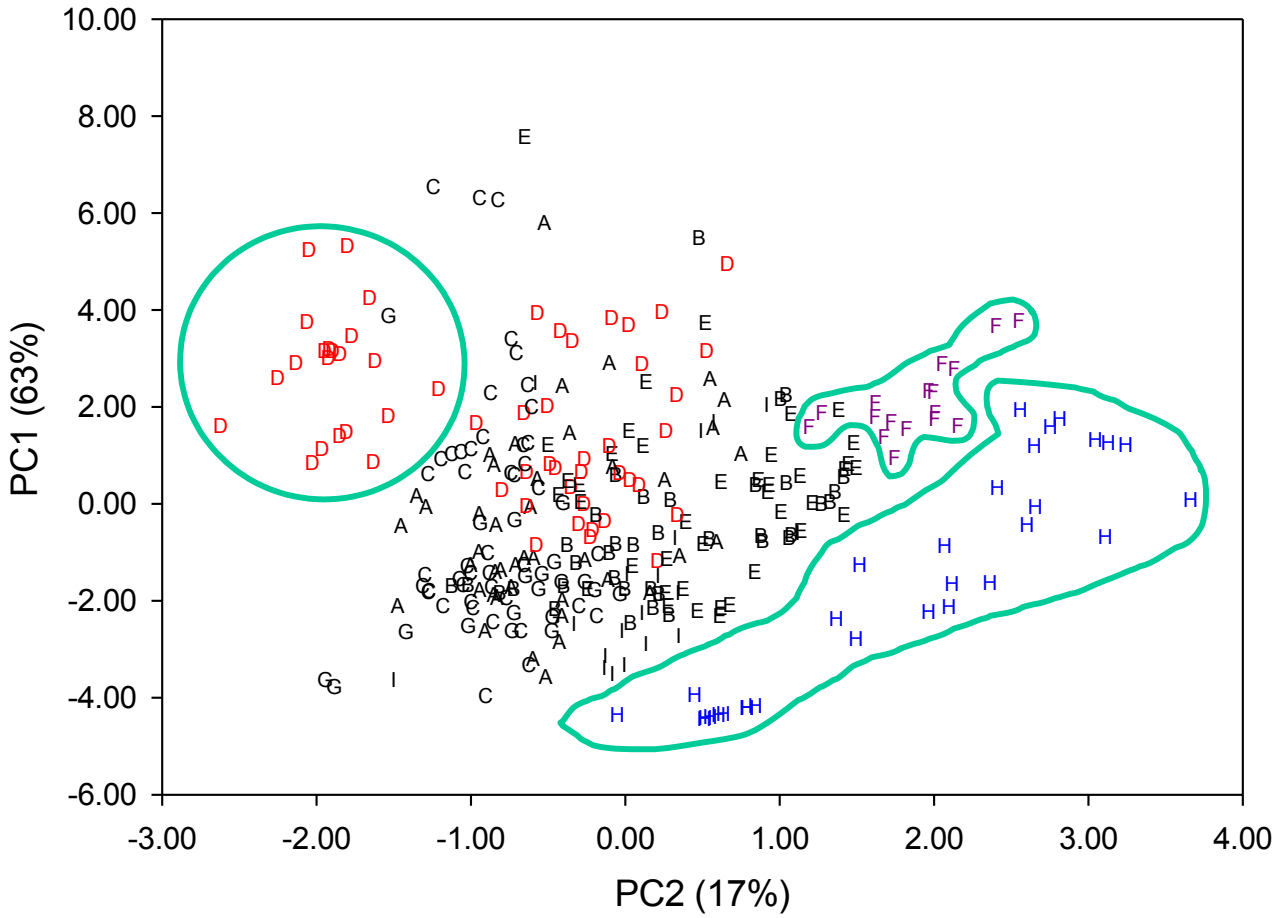

Figure 3-3. Plot of two principle components explaining 63% (y axis) and 17% (x axis) of the variation between trace metal concentrations at land use sites during 2000/01–2004/05 storm seasons. High density residential-Los Angeles River (A), Low density residential(B), C ommercial (C), Industrial(I) , Agricultural(E), Recreation (horse; F), Transportation(G), Open space(H), and High density residential-San Gabriel River (I).

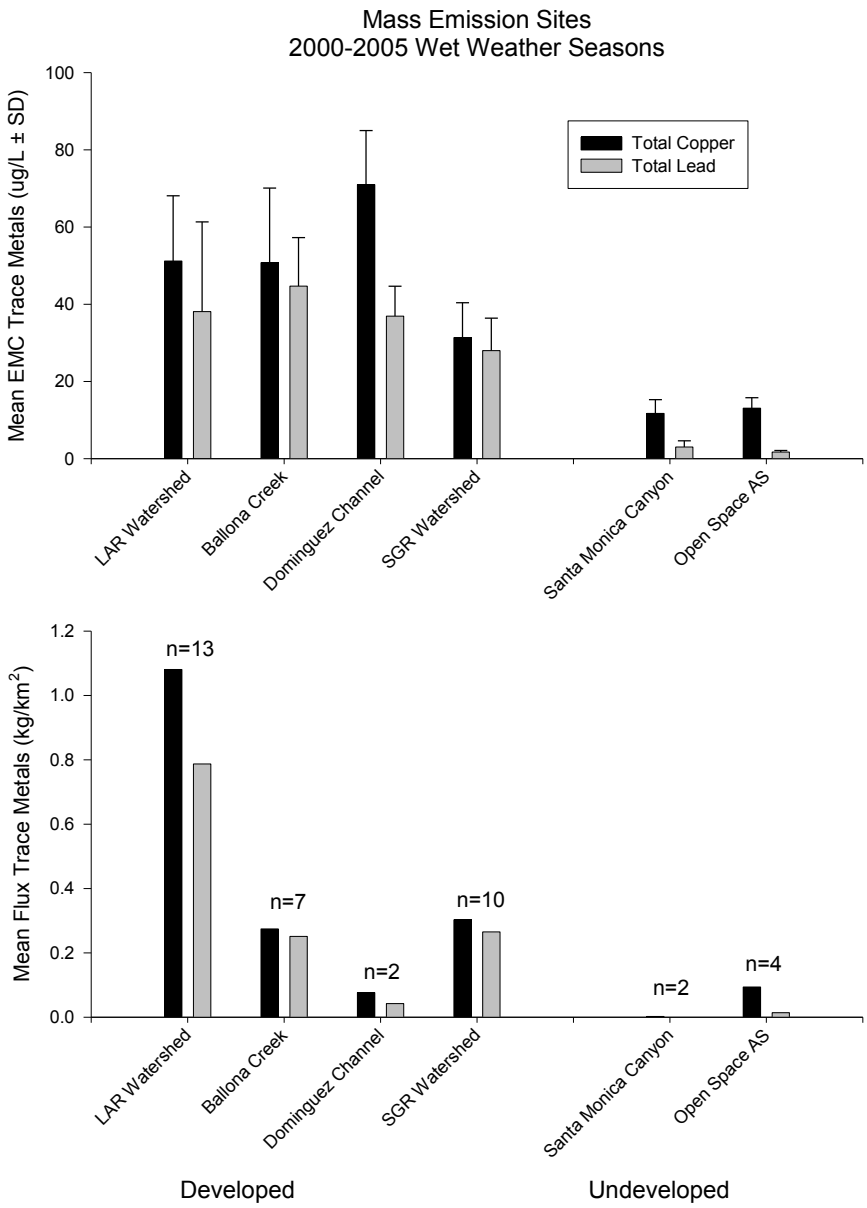

Figure 3-4. Average event mean concentrations (EMCs; top) and fluxes (bottom) of total copper and lead during the 2000/01 to 2004/05 storm seasons. Los Angeles River (LAR), San Gabriel River (SGR) and Arroyo Sequit (AS), number of storm events (n), and standard deviation (SD).

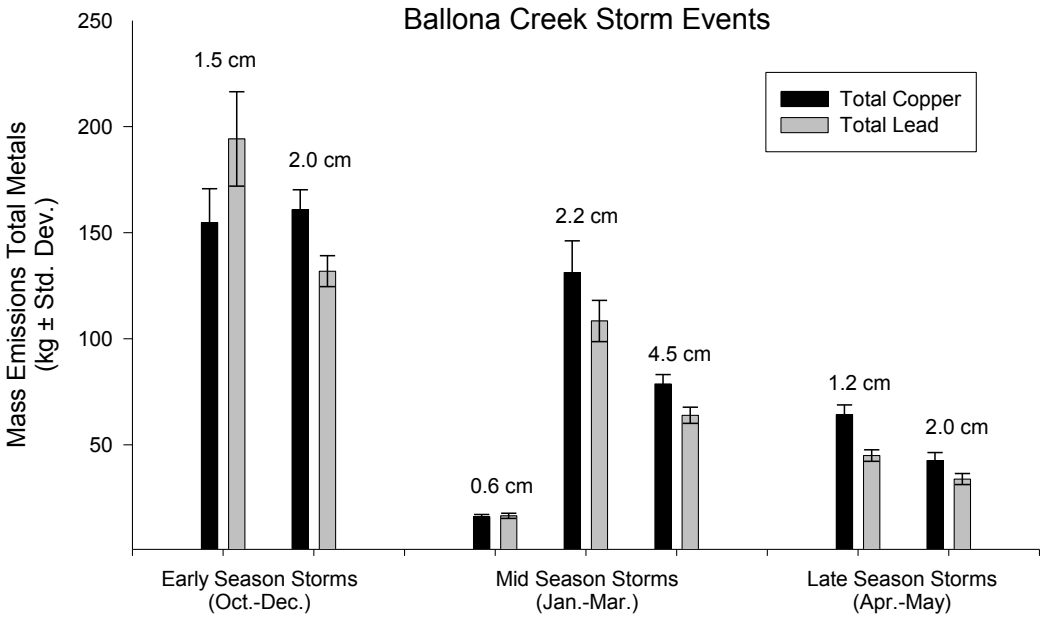

Figure 3-5. Metals loadings from early, mid, and late season storms in Ballona Creek during 2000/01 – 2004/05 storm seasons for total copper and total lead. The numbers above the bars in the graph indicate total event rainfall.

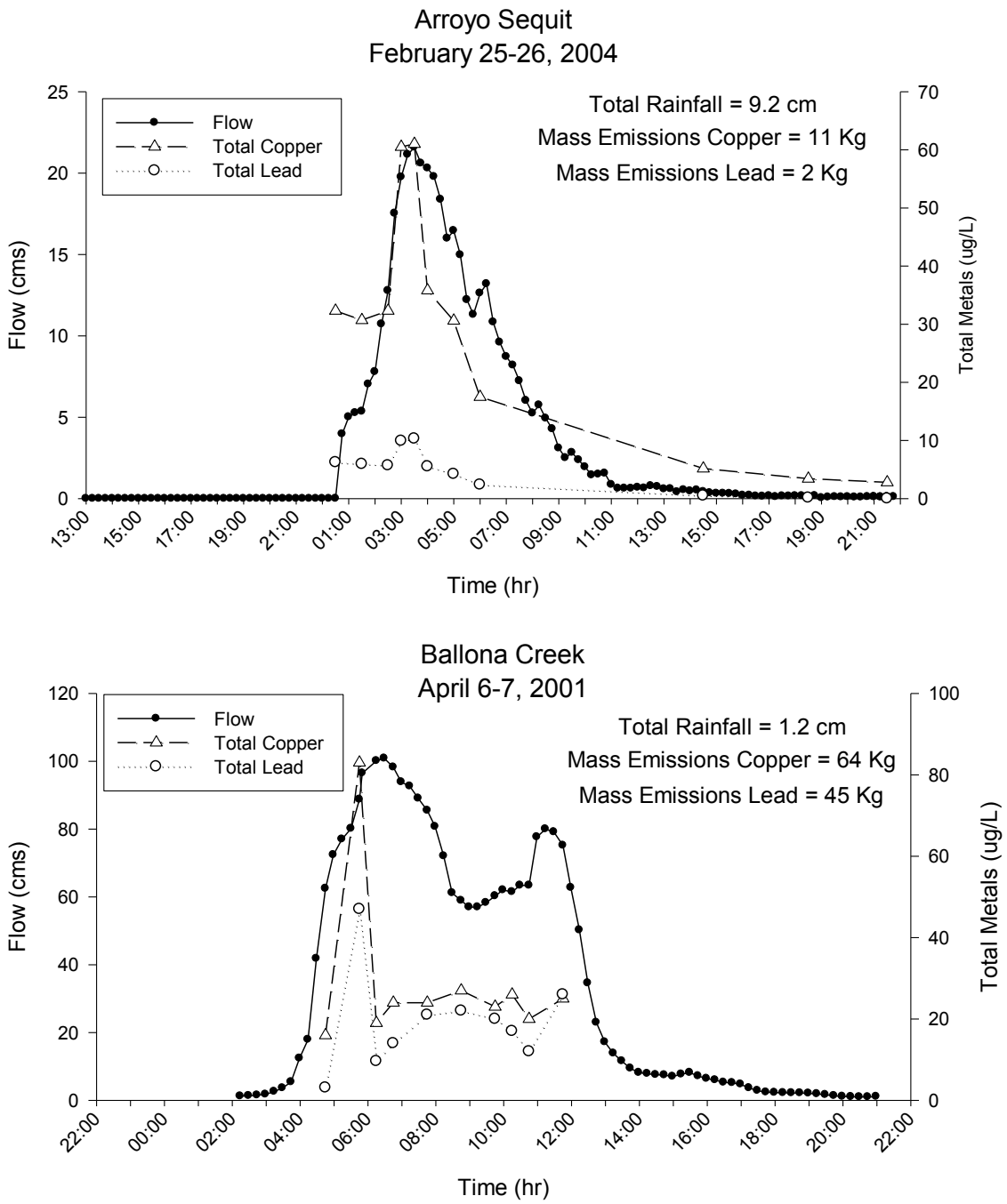

Figure 3-6. Variation in total copper and lead concentrations with time for a storm event in the undeveloped Arroyo Sequit watershed (top) and developed Ballona Creek watershed (bottom).

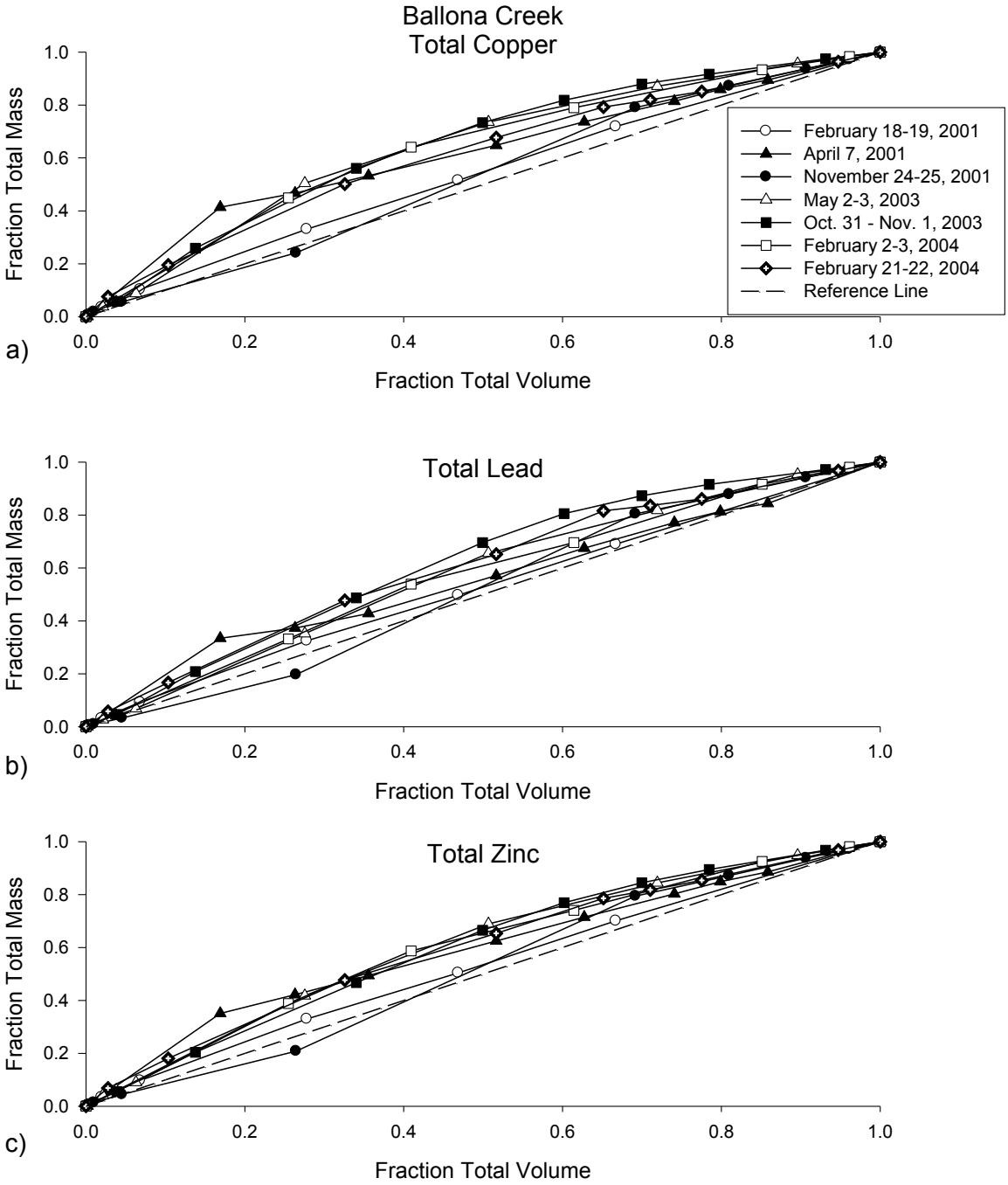

Figure 3-7. Cumulative load duration curves for total copper (a), total lead (b), and total zinc (c) for seven storms in the developed Ballona Creek watershed. Reference line indicates a 1:1 relationship between volume and mass loading. Portions of the curve above the line indicate proportionately higher mass loading per unit volume (i.e., first flush). Portions below the line indicate the reverse pattern.

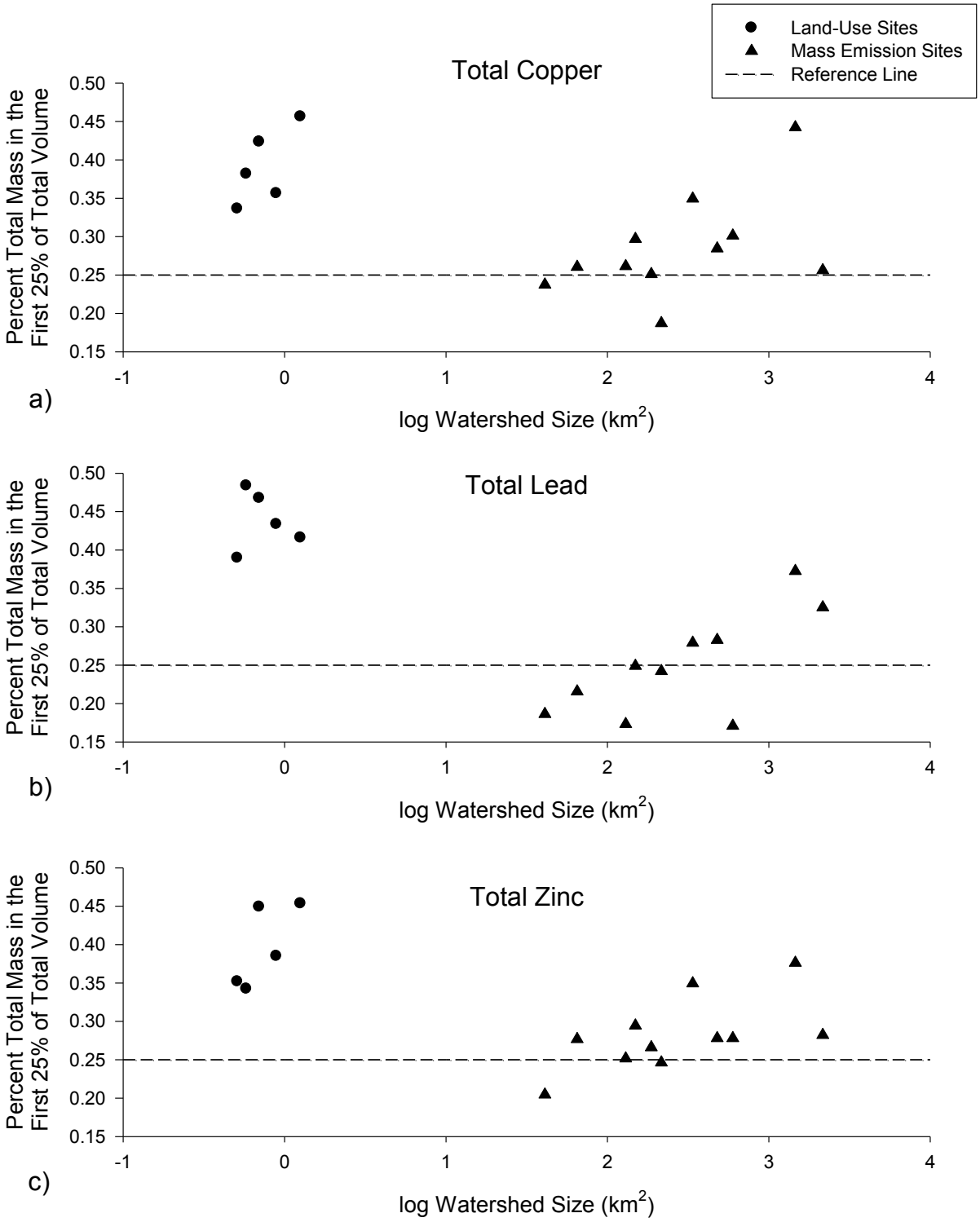

Figure 3-8. First flush patterns of total copper (a), total lead (b), and total zinc (c) in relation to watershed size. Dashed reference line indicates 25% of total mass loading in first 25% of total volume.

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SECTION 4. POLYCYCLIC AROMATIC HYDROCARBONS (PAHS)

Results

PAHs from Developed and Undeveloped Watersheds

In-river total PAH loads, concentrations, and fluxes were higher for developed versus undeveloped watersheds. For the 14 storm events measured, mean PAH load from developed watersheds was 5.6 ± 5.1 kg/storm, while mean load from undeveloped watersheds was 0.03 ± 0.02 kg/storm. Similarly, mean total PAH concentration from developed watersheds exceeded that from undeveloped watersheds (2,655.0 ± 1,768.1 ng/L vs 452.2 ± 444.9 ng/L; Tables 4-1 and 4-2). Flux of PAHs from developed watersheds was 46 times greater than that from undeveloped watersheds (Table 4-1). Mean PAH flux from the developed watersheds was 35.6 ± 69.8 g/km^2 compared to 0.75 ± 0.77 g/km^2 for the undeveloped watersheds. When the anomalously high fluxes from the Dominguez watershed are removed, flux from the developed watersheds was 7.8 ± 8.6 g/km^2, which is still greater than 10 times that of the undeveloped watersheds. Furthermore, the higher fluxes from developed watersheds were generated by substantially less rainfall than the lower fluxes from the undeveloped watersheds (1.85 ± 0.97 cm for storms in developed watersheds vs. 6.11 ± 4.32 cm for storms in undeveloped watersheds).

Annual PAH Loading in Storm water Runoff

The estimated annual output rate of total PAHs in the Los Angeles River watershed during the 2002–2003 water year was around 34.9 kg/year (Table 4-1). During this same period, Ballona Creek had an estimated annual output rate of approximately 20.0 kg/year into Santa Monica Bay. The following water year (2003–2004), the storm-water runoff discharge rate from Ballona Creek increased by a factor of four (72.9 kg/year). For comparative purposes, during the same time period, the Los Angeles River watershed discharged an estimated 150.6 kg/year of total PAHs into Santa Monica Bay. Annual output rates for undeveloped watersheds could not be estimated because those sites are not gauged, and consequently annual storm volumes are not available for estimation of annual PAH loads.

Effect of Rainfall Patterns

Antecedent dry period (expressed as cumulative rainfall) was strongly correlated with total PAH concentration, load, and flux in an exponentially nonlinear manner (r^2 = 0.54–0.81; Figure 4-1). Early-season storms have significantly higher PAH loads than late-season storms both within and between watersheds, even when rainfall quantity is similar. For example, the two early-season storms from Ballona Creek in water years 2002 and 2003 had total PAH loadings that were approximately four times larger (ranging from 7.9–8.3 kg) than the two storms that occurred at the end of the rainy season (1.1–1.8 kg), despite the early- and late-season storms resulting from comparable rainfall. When all watersheds are analyzed together, PAH concentration and load decrease with increasing cumulative rainfall until approximately 10 cm (average annual rainfall is 33 cm), beyond which the effect is markedly less dramatic (Figure 4-1).

PAH Variability Within Storms

The greatest total PAH concentrations occurred during the rising limb of the storm hydrograph for nearly every storm sampled. For example, peak concentrations (2,761 and 2,276 ng/L, respectively) occurred before the peak in flow (757 and 101 cms) in both the Los Angeles River and Ballona Creek (Figure 4-2). In the Los Angeles River example, peak total PAH concentrations occurred almost 8 h before the peak in storm flow. In the Ballona Creek example, a second peak in flow (75 cms) was also preceded by a second peak in total PAH concentration (1,015 ng/L).

Despite a strong and consistent pattern of first flush in concentration, cumulative mass loading plots exhibited only a moderate first flush of PAHs. Between 40% and 60% of the total PAH load was discharged in the first 25% of storm volume for the storms examined in this study. The mass loading plots for Ballona Creek (Figure 4-3) illustrate a consistent pattern of higher mass loading in the early portions of the storm, with a slightly stronger first flush in late-season storms. Land use sites showed a similar pattern of higher mass loading in the early portions of the storm however mid season storms (i.e., January-March) exhibited the strongest first flush.

Potential Sources of PAHs

Sources of PAHs were investigated by comparing concentrations and loads in runoff from homogeneous land uses sites. For all land use sites samples, mean PAH flux was between 0.33 and 140 g/km^2, while FWM concentration was between 4.6E ± 02 and 4.4E ± 03 ng/L (Table 4-3). Despite some apparent differences between land uses (e.g., high-density residential having higher concentrations and industrial having higher flux), no significant differences were observed in either concentration or flux among land use category (p = 0.94 and 0.60, analysis of covariance, with rainfall as a covariate).

The relative proportion of individual PAH compounds can be used to determine the source of PAHs in storm water. The HMW PAHs dominated LMW PAHs in runoff from all storms analyzed, suggesting a pyrogenic source. During the May 2–3, 2003, storm, HMW PAHs in runoff from the Los Angeles River and Ballona Creek accounted for 72% of the total PAH concentrations from these watersheds (Figure 4-4 and Table 4-2). Similarly, HMW PAHs in runoff from the Dominguez channel watershed in Los Angeles County, California, USA, accounted for 74% of the total PAH concentrations from its watershed. Even in the undeveloped Arroyo Sequit watershed, HMW PAHs accounted for 63% of the total PAH concentrations. In all storms and at all sites, the HMW compounds fluoranthene and pyrene were the dominant HMW PAHs. Analysis of the distribution of PAHs within each storm event shows that HMW PAHs are predominant uniformly throughout each storm regardless of land use (Figure 4-5). The exceptions were the industrial oil refinery and the agricultural sites, where the proportions of HMW and LMW PAHs were comparable throughout the storm. In all cases (except the oil refinery and agricultural sites), the relative contribution of LMW PAH compounds averaged 14 to 30% of the total PAH mass. Phenanthrene was the most dominant LMW PAH, comprising 7 to 21% of the total PAH contribution (Table 4-2).

The F/P ratio was between 0.9 and 1.2 for all storms in this study, indicating a strong predominance of pyrogenic PAH sources (Table 4-2). Furthermore, the P/A ratio was nearly always less than 21, once again indicating a strong predominance of pyrogenic PAH sources

(Table 4-2). Only one storm, March 17–18, 2002, at the Dominguez channel site, had a potential petrogenic source; the F/P ratio was 0.9, but the P/A ratio was .74. This result is consistent with the data from the land use sites, as the Dominguez watershed contains four major oil refineries. As with the distribution of HMW versusLMW PAHs, the F/P and P/A ratios indicate a consistent pyrogenic source for all lands use and mass emission sites regardless of the point within the storm (Figure 4-6). Again, the exception was at the industrial oil refinery, where the P/A ratio is low until the peak runoff occurs, at which time it rises to between 17 and 20. For both Ballona Creek and the Los Angeles River, a moderate, transient increase in the P/A ratio occurs coincident with the time of peak flow (Figure 4-4).

Discussion

Anthropogenic sources of total PAHS in storm-water runoff from urbanized coastal watersheds appears to be a significant source of PAHs to the southern California Bight. Estimates from this study based on FWM concentrations and gauged annual discharge volume indicate that during the study period approximately 92.8 and 32.7 kg/year of total PAH were discharged annually from the Los Angeles River and Ballona Creek watersheds, respectively. Over the same time period, the combined treated wastewater discharge from the city and county of Los Angeles (~2.8 x 10^6 m^3/d) discharged an estimated 740 kg of PAHs to the southern California Bight (Steinberger et al. 2003). The main difference between the two types of discharges is the delivery of the load to the coastal oceans; the treated wastewater discharge occurs in small, steady doses that occur daily, while storm-water loading occurs over the 10 to12 precipitation events that this region averages annually. The impact of the total PAHs in storm water discharged from urbanized watersheds is also reflected in receiving waterbody impacts. Regional monitoring of the southern California Bight revealed that the highest concentrations of PAHs were associated within bay and harbor areas that receive inputs from urbanized coastal watersheds (Noble et al. 2003). Bays and harbors only accounted for 5% of the total area of soft-bottom habitat but contained approximately 40% of the total PAH mass residing in southern California Bight surficial sediments. A second concern is the cost of remediating PAH in dredged materials. Total PAH is one of the most commonly occurring contaminants in dredged materials from San Pedro Bay (Steinberger and Schiff 2003). While some of these contaminants likely arise from port and industrial activities, they are colocated at the mouths of the Los Angeles River and Dominguez Channel watersheds, which is likely a contributing source.

The impact of PAH contributions on receiving waters from urbanized watersheds are not constrained to the southern California Bight. The National Status and Trends Program, which samples sediments and tissues in estuaries and coastal areas nationwide, repeatedly finds elevated PAHs near urban centers (Daskalakis and O'Conner 1995). San Pedro Bay (CA, USA) ranked third nationwide in total PAH concentration in mussel tissue during 2002. The top two locations are Elliott Bay (WA, USA) and Puget Sound (WA, USA), both located near urban centers. On the East Coast, Long Island Sound (NY, USA) adjacent to New York City was ranked fourth.

The annual watershed loading of PAHs estimated from this study are lower than those estimated from two studies in the eastern United States. Hoffman et al. (1984) estimated 680 kg/year of PAH loading from the 4,081 km^2 Narragansett Bay watershed in Rhode Island, USA. Similarly, Menzie et al. (2002) estimated 640 kg/year of PAH loading from the 758 km^2

Massachusetts Bay, USA, watershed. This difference may be explained by several factors. First, PAH loading relies on washoff of aerially deposited materials (the process by which airborne toxic contaminants enter coastal waters via aerial fallout). Watersheds in the western United States typically experience less than one-third rainfall and runoff volumes than comparably sized watersheds in the eastern United States. The lower volumes of annual runoff likely translate to lower loads. This may seem counter-intuitive; however, if the primary pollutant source to the land surface is aerial deposition (vs. being generated by activities within the land use), there is a practical limit to the amount of material that can accumulate. Previous studies have shown that physical processes such as wind or turbulence from traffic can limit pollutant accumulation on roads and other impervious surfaces (Pitt and Shawley 1981, Asplund et al. 1982, Kerri et al. 1985). Chemical processes, such as volatilization or oxidation can also limit the accumulation of potential pollutants on impervious surfaces (Hewitt and Rashad 1992). Because of the asymptotic nature of PAH buildup, loading to receiving waters is controlled by the frequency and magnitude of runoff events that "cleanse" impervious surfaces and provide subsequent opportunity for additional material to accumulate. A second reason for higher estimated PAH loading in the eastern United States is that PAHs are generated predominantly from concentrated point sources, such as coal-fired power plants. Southern California does not have coal-fired power plants; rather, PAHs are predominantly from mobile sources (cars, trucks, and trains), which discharge more diffusely across the region.

Concentrations in runoff from land use sites in this study were between 0.03 and 7.84 µg/L; these values are similar to those observed in previous studies by others. For example, Mahler et al. (2004) reported PAH concentrations between 5.1 and 8.6 µg/L in parking lot runoff, and Menzie et al. (2002) reported concentrations between 1 and 14 µg/L from a broad range of land uses.

In contrast to the results of this study, storm-water monitoring by local municipalities in southern California consistently report no detectable PAHs in storm water. This discrepancy is likely attributable to two factors. First, the practical PAH detection limit used by local municipalities is typically between 1 and 5 µg/L, which is acceptable by U.S. EPA regulatory guidelines. However, the mean FWM concentrations in storm water during this study were often lower than this level. The second factor is the sampling design used for regulatory-based monitoring. Most local municipalities are mandated to collect a storm composite sample that do not emphasize (and may completely miss) the first flush of total PAH that was observed. We almost always observed the greatest peaks in total PAH concentrations during initial storm flows, up to 8 h before peak flow. This pronounced first flush suggests that in highly urbanized watersheds, particle-bound PAHs may be rapidly mobilized from impervious land surfaces during the early portions of storms. Similar first-flush patterns in PAH concentrations during storms were observed by Hoffman et al. (1984) and (Smith et al. 2000). Furthermore, (Buffleben et al. 2002; University of California, Los Angeles, Los Angeles, CA, USA, unpublished data) also observed that peak PAH concentrations in Ballona Creek occur up to 14 h before peak flow.

Seasonal flushing at mass emissions sites was one phenomenon not previously reported by others. Seasonal flushing occurred when early-season storms consistently discharged higher PAH loads than storms of a similar size or larger later in the season. This seasonal effect was correlated with the length of antecedent dry condition but not with rainfall quantity. The lack of

a meaningful relationship between rainfall quantity and PAH loading has been reported in several other studies (Eaganhouse et al., Hoffman et al. 1984). Hoffman et al. (1984) suggested that the lack of a clear relationship was due to the complex spatial and temporal dynamics associated with rain patterns, which may affect runoff patterns more than the total amount of rainfall during a given storm. In addition, differential particle wash-off from land surfaces may mask any differences associated with total rainfall. The strong relationship between PAH flux and antecedent dry period suggests that storm-event PAH loads are a function primarily of the amount of time available for PAHs to build up on the land surfaces between subsequent rain events. The PAH loads from land surfaces during later-season storms (i.e., after 10 cm of accumulated rainfall) may reflect contributions from wet deposition or from localized accumulation; however, we currently lack the data to answer this question definitively. Analysis of PAH concentration in wet deposition would help improve our understanding of the sources of PAHs during the latter part of the storm season. Environmental managers can use this knowledge of temporal patterns of PAH loading to focus efforts on storm capture or treatment during the early portions of storms and during the earliest storms of the year.

Sources of PAHs in Storm water

Several lines of evidence implicate aerial deposition and subsequent wash-off of combustion by-products as the main source of PAH loading in storm water. First, the flux of total PAHs among large developed watersheds were similar throughout the urbanized region of Los Angeles, suggesting a similar regional source of PAHs. If urban land use distribution strongly influenced PAH loadings, then flux would have differed by watershed based on differential urban land use practices. In fact, no difference was observed in PAH concentrations in runoff between various urban land uses, which differs from the findings of previous studies from the eastern United States (Ngabe et al. 2000). Menzie et al. (2002) concluded that residential and commercial land uses generated higher PAH concentrations than other land use types because of secondary petrogenic sources that enhanced the regional pyrogenic source of PAHs. Hoffman et al. (1984) found that runoff from industrial and highway sites had higher PAH concentrations than residential runoff but accounted for these differences in runoff dynamics as opposed to unique sources.

Second, the relative abundance of individual PAHs in runoff indicates a strong pyrogenic source indicative of combusted fossil fuels. The typical distribution of PAHs observed from mass emission sites (Figure 4-7) was similar to the distribution of PAHs observed in dry deposition collected in Los Angeles by Sabin et al. (2004). Furthermore, in this study, HMW PAH consistently comprised approximately 73% of the total PAH concentration regardless of land use. Hoffman et al. (1984) reported comparable results in their study of urban runoff in Rhode Island's Narragansett Bay watershed, where HMW PAHs accounted for 71% of the total inputs to Narragansett Bay. A more recent study by Menzie et al. (2002) of PAHs in storm-water runoff in coastal Massachusetts identified similar HMW PAH compounds as observed in this study (chrysene, fluoranthene, phenanthrene, and pyrene) as the primary PAH compounds in storm water. Similarly, (Soclo et al. 2002) found that high PAH loads associated with storm-water runoff to the Cotonou Lagoon in Benin were characterized by HMW PAHs that appear to be derived from atmospheric deposition. The consistent predominance of HMW PAHs throughout all storms, even during the period of first flush, further indicates a consistent regional source, such as aerial deposition. If specific land uses were generating secondary petrogenic

wash-off as suggested by Menzie et al. (2002), the distribution of PAHs would have changed during the storm; however, we did not observe any differences within storms. The exception to this pattern was for the industrial oil refinery site, where the signature of petrogenic PAHs was more pronounced. This makes sense given the obvious petrogenic source associated with this land use type. Nevertheless, the pyrogenic signature was still prevalent at this land use, especially during the latter portions of the storm.

The PAH sources can also be inferred by examining ratios of particular PAHs in runoff samples. We used both the fluoranthene/pyrene (F/P) and phenanthrene/anthracene (P/A) ratios. Small F/P ratios close to 0.9 suggest that individual PAHs are associated with combustion products (Maher and Aislabie 1992); in contrast, large F/P ratios suggest petrogenic sources of PAHs (Colombo et al. 1989;Table 4-4). Both the F/P and the P/A ratios observed in this study indicate that aerial deposition of combustion by-products is likely the dominant source of PAHs in the watersheds that drain to the greater Los Angeles coastal region, and this source is consistent during all portions of storm-water runoff. Several additional ratios have been used to assess the different sources of PAHs. Takada et al. (1990) used methylated/parent PAH ratios as indicators of PAH sources. Results showed that PAHs in runoff from residential streets had a more significant contribution from atmospheric fallout of other combustion products. Zakaria et al. (2002) explained their low ratios of methylphenanthrene to phenanthrene (MP/P; <0.6) to mean that combustion- derived PAHs are transported atmospherically for a long distance and serve as background contamination. The ratios of methylphenanthrene to phenanthrene in our study (0–0.2) also suggest a strong contribution of aged urban aerosols to overall PAH loads (Nielsen 1996, Simo et al. 1997, Hwang et al. 2003)**.** Watersheds in the greater Los Angeles area are heavily urbanized; therefore, ample opportunity exists for combustion-derived aerosols that generate particulate matter to be deposited on land surfaces. The petrogenic signature seen in the Dominguez Channel can be explained by the presence of slightly different sources in this watershed. The Dominguez watershed contains a high density of oil refineries and other industrial land uses that drain directly to the Ports of Los Angeles and Long Beach. The presence of multiple oil refineries discharging to a single stream explains the concentration of petrogenic PAHs in this area.

Conclusions based on ratios of specific PAH compounds should be used with some caution, especially because a relatively limited set of PAHs were analyzed in this study. Furthermore, if reference (or source) samples were not analyzed, it is always a good idea to use these ratios on a relative basis. Nevertheless, the preponderance of evidence from this study, combined with the well-documented fact that atmospheric deposition (both wet and dry) is the major source of contamination in arid and semiarid climates, such as that existing in southern California (Sabin et al. 2004, Gunther et al. 1987), supports the conclusions of this study: The predominant source of PAHs in urban storm water in the greater Los Angeles area is from aerial deposition and subsequent wash-off of PAHs associated with combustion byproducts.

Table 4-1. Storm-water polycyclic hydrocarbon mass emissions from in-river sampling locations. Annual loads are based on water year, as indicated in the foot notes. Cubic meters per second(cms); Standard deviation (SD); Polycyclic aromatic hydrocarbons (PAH); and Event mean concentration(EMC).

							Total PAHs					
Mass Emission Sites	Size km^2	Date of Storm Event	Rainfall (cm)	Antecedant Dry Days	Mean Flow (cms)	Peak Flow (cms)	EMC ng/L	EMC SD	Flux (kg/km^2)	Mass Emissions (kg)	Mass Emissions SD	Annual Total PAH (kg/year)
LA River above Arroyo Seco	1460	11/12 - 11/13/2001	1.73	127	62.6	262.5	3,256.80	846.70	0.0049	7.16	0.35	3.74[a]
LA River at Wardlow	2161	5/2 - 5/3/2003	3.56	4	209.9	756.7	470.70	453.20	0.0023	4.90	0.32	34.9[b]
		2/2/04	1.14	29	90.4	375.6	3,559.33	1,185.50	0.0	13.93	0.99	150.6[c]
										Mean Load:		92.8 ± 81.8
Verdugo Wash	65	11/12 - 11/13/2001	1.83	11	68.5	368.2	4,283.70	2,043.20	0.2236	14.54	0.83	NA[d]
		10/31 - 11/1/2003	1.74	30	56.5	155.0	4,992.30	1,093.30	0.1529	9.94	0.46	NA
Arroyo Seco	130	2/9 - 2/11/2001	3.56	12	2.9	13.5	788.80	177.80	0.0009	0.11	0.01	2.79[e]
		4/6 - 4/7/2001	1.78	30	7.8	21.8	816.50	258.50	0.0016	0.20	0.01	
Ballona Creek	338	4/6 - 4/7/2001	1.24	31	32.6	100.9	948.70	379.90	0.0054	1.81	0.13	20.5[e]
		11/24 - 11/25/2001	1.52	11	53.1	396.2	3,118.90	1,104.80	0.0246	8.30	1.78	17.3[a]
		5/2 - 5/3/2003	2.03	4	52.8	134.4	981.70	583.00	0.0032	1.08	0.12	20.0[b]
		10/31 - 11/1/2003	2.03	30	62.0	148.1	5,821.20	1,814.90	0.0233	7.87	0.54	72.9[c]
										Mean Load:		32.7 ± 26.8
Dominguez Channel	187	3/17 - 3/18/2002	0.28	10	4.8	14.0	3,293.40	791.80	0.0013	0.24	0.01	NA
		2/21 - 2/22/2004	1.52	18	14.7	35.5	2,182.10	745.20	0.0123	2.31	0.09	NA
Santa Monica Canyon	41	4/6 - 4/7/2001	3.05	50	0.6	3.0	766.8	247.2	0.0002	0.01	0.00	NA
Open Space Arroyo Sequit	31	2/25 - 2/26/2004	9.17	2	3.4	21.9	137.6	0.0	0.0013	0.04	0.00	NA

[a]Water year 2002 = October 2001-September 2002
[b]Water year 2003 = October 2002-September 2003
[c]Water year 2004 = October 2003-September 2004
[d]NA = annual storm volumes not available; consequently, annual loads could not be estimated
[e]Water year 2001 = October 2000-September 2001

Table 4-2. Total polycyclic aromatic hydrocarbons (PAHs) and selected polycyclic aromatic hydrocarbon ratios. Event mean concentration (EMC); High-molecular-weight compounds (HMW).

Mass Emission Sites	Date of Storm Event	EMC ∑PAHs (ng/L)	EMC Pyrene (ng/L)	Pyrene/ ∑PAHs (%)	Fluoranthene/ Pyrene Ratio	Phenanthrene/ Anthracene Ratio	EMC Phenanthrene (ng/L)	Phenanthrene/ ∑PAHs (%)	HMW (%)	Dominant Sources of Origin
LA River above Arroyo Seco	11/12 - 11/13/2001	3256.8	427.9	13.1	1.1	8.0	291.3	8.9	76.4	Pyrogenic
LA River at Wardlow	5/2 - 5/3/2003	470.7	133.5	28.4	1.1	20.9	97.3	20.7	69.7	Pyrogenic
	2/2/04	3559.3	401.0	11.3	1.0	7.5	278.1	7.8	71.8	Pyrogenic
Verdugo Wash	11/12 - 11/13/2001	4283.7	593.8	13.9	1.1	7.8	373.0	8.7	83.5	Pyrogenic
	10/31 - 11/1/2003	4992.3	677.9	13.6	0.9	11.6	341.8	6.8	82.0	Pyrogenic
Arroyo Seco	2/9 - 2/11/2001	788.8	131.9	16.7	1.0	8.6	101.2	12.8	81.7	Pyrogenic
	4/6 - 4/7/2001	816.5	135.0	16.5	1.1	7.2	101.9	12.5	84.6	Pyrogenic
Ballona Creek	4/6 - 4/7/2001	948.7	177.9	18.8	0.9	4.9	89.6	9.4	88.7	Pyrogenic
	11/24 - 11/25/2001	3118.9	428.8	13.8	1.0	8.1	302.9	9.7	71.8	Pyrogenic
	5/2 - 5/3/2003	981.7	237.4	24.2	1.0	4.3	122.3	12.4	74.6	Pyrogenic
	10/31 - 11/1/2003	5821.2	786.2	13.5	1.1	10.2	473.0	8.1	82.7	Pyrogenic
Dominguez Channel	3/17 - 3/18/2002	3293.4	534.6	16.2	0.9	74.9	508.2	15.4	77.5	Petrogenic
	2/21 - 2/22/2004	2182.1	308.8	14.2	1.1	6.4	210.5	9.6	69.7	Pyrogenic
Santa Monica Canyon	4/6 - 4/7/2001	766.8	134.9	17.6	1.0	4.1	73.8	9.6	86.5	Pyrogenic
Open Space Arroyo Sequit	2/25 - 2/26/2004	137.6	14.3	10.4	1.2	10.2	17.2	12.5	63.0	Pyrogenic
	Mean ∑PAHs (ng/L)	2,300.00								

Table 4-3. Event mean concentration (EMC) and mass loading of polycyclic aromatic hydrocarbons (PAHs) from land use sites. Site numbers indicate different sites within a given land use category. SD = standard deviation; NA = watershed size not available.

							Total PAHs		
Land-use Type	Size (km^2)	Date of Storm Event	Rainfall (cm)	Dry Days	Mean Flow (cms)	Peak Flow (cms)	Flux (kg/km^2)	EMC (ng/L)	EMC SD
High Density Residential #1	0.02	2/17/02	0.89	21	0.001	0.006	1.8E-03	1.92E+03	7.03E+02
High Density Residential #1	0.02	2/2/04	1.19	2	0.0042	0.0251	2.0E-02	3.31E+03	1.00E+03
High Density Residential #2	0.52	3/17 - 3/18/2002	0.20	27	0.000	0.003	1.1E-05	7.84E+03	5.99E+03
High Density Residential #3	1.0	12/28/04	3.25	0	0.009	0.080	2.45E-06	7.11E+00	2.97E+00
High Density Residential #3	1.0	2/11/05	1.35	13	0.004	0.016	5.4E-08	5.06E-01	1.28E-01
Mean High Density Residential #1							***7.2E-03***	***4.4E+03***	***2.6E+03***
Mean High Density Residential #3							**1.2E-06**	**3.8E+00**	**1.6E+00**
Low Density Residential #1	0.98	3/4 - 3/5/2001	2.67	3	0.017	0.071	7.2E-05	1.55E+02	5.54E+01
Low Density Residential #1	0.98	2/2/04	2.26	2	0.030	0.143	3.3E-03	3.3E+03	1.6E+03
Low Density Residential #2	0.18	3/17 - 3/18/2002	2.13	9	0.008	0.116	1.7E-03	8.86E+02	1.82E+02
Mean Low Density Residential							***1.7E-03***	***1.4E+03***	***6.0E+02***
Commercial #1	NA	2/17/02	0.89	20	0.002	0.008	NA	2.27E+02	1.63E+02
Commercial #2	2.45	2/17/02	0.74	20	0.337	1.340	7.7E-03	4.43E+03	2.05E+03
Commercial #3	0.06	4/6 - 4/7/2001	2.03	31	0.008	0.018	8.2E-05	3.00E+01	1.95E+01
Commercial #3	0.06	3/17 - 3/18/2002	0.12	9	0.000	0.001	2.9E-06	2.08E+02	6.93E+01
Mean Commercial							***2.6E-03***	***1.2E+03***	***5.8E+02***
Industrial #1	0.004	4/6 - 4/7/2001	2.06	31	0.008	0.017	5.7E-03	1.36E+02	6.85E+01
Industrial #2	0.001	2/17/02	0.74	20	0.000	0.002	2.9E-03	6.31E+02	3.42E+02
Industrial #3	2.77	3/17 - 3/18/2002	0.25	9	0.000	0.003	6.6E-06	4.41E+03	2.29E+03
Industrial #4	0.01	3/15/03	4.50	9	0.117	0.375	5.6E-01	8.89E+02	7.55E+02
Mean Industrial							***1.4E-01***	***1.5E+03***	***8.6E+02***

Table 4-3. Continued

Land-use Type	Size (km^2)	Date of Storm Event	Rainfall (cm)	Dry Days	Mean Flow (cms)	Peak Flow (cms)	Total PAHs Flux (kg/km^2)	Total PAHs EMC (ng/L)	Total PAHs EMC SD
		3/4 - 3/5/2001	2.74	3	0.021	0.053	4.3E-04	6.83E+02	7.77E+02
Agricultural #1	0.98	3/17 - 3/18/2002	0.23	10	0.012	0.031	2.0E-05	4.55E+02	1.72E+02
		2/2/04	1.17	2	0.0228	0.128	5.3E-04	1.43E+03	2.09E+03
Mean Agricultural							***3.3E-04***	***8.6E+02***	***1.0E+03***
Recreational (horse)	0.03	3/4 - 3/5/2001	1.42	3	0.003	0.014	1.8E-03	4.58E+02	2.97E+02
Mean Recreational							***1.8E-03***	***4.6E+02***	***3.0E+02***
Transportation #1	0.01	4/6 - 4/7/2001	3.05	31	0.022	0.057	1.4E-02	3.63E+02	2.53E+02
Transportation #2	0.002	2/17/02	0.89	47	0.001	0.006	3.7E-03	5.95E+02	3.16E+02
Mean Transportation							***8.9E-03***	***4.8E+02***	***2.8E+02***

Table 4-4. Selected polycyclic aromatic hydrocarbon ratios and their source signature ranges.

Indicator	Pyrogenic	Petrogenic	Reference
Fluoranthene / Pyrene Ratio	0.9 - ≤1	>1	Maher and Aislabie, 1992
Phenanthrene / Anthracene Ratio	3 - 26	>26	Gschwend and Hites, 1981; Lake et al., 1979
Methylphenanthrene / Phenanthrene Ratio	<1.0	2 - 6	Hwang et al., 2003

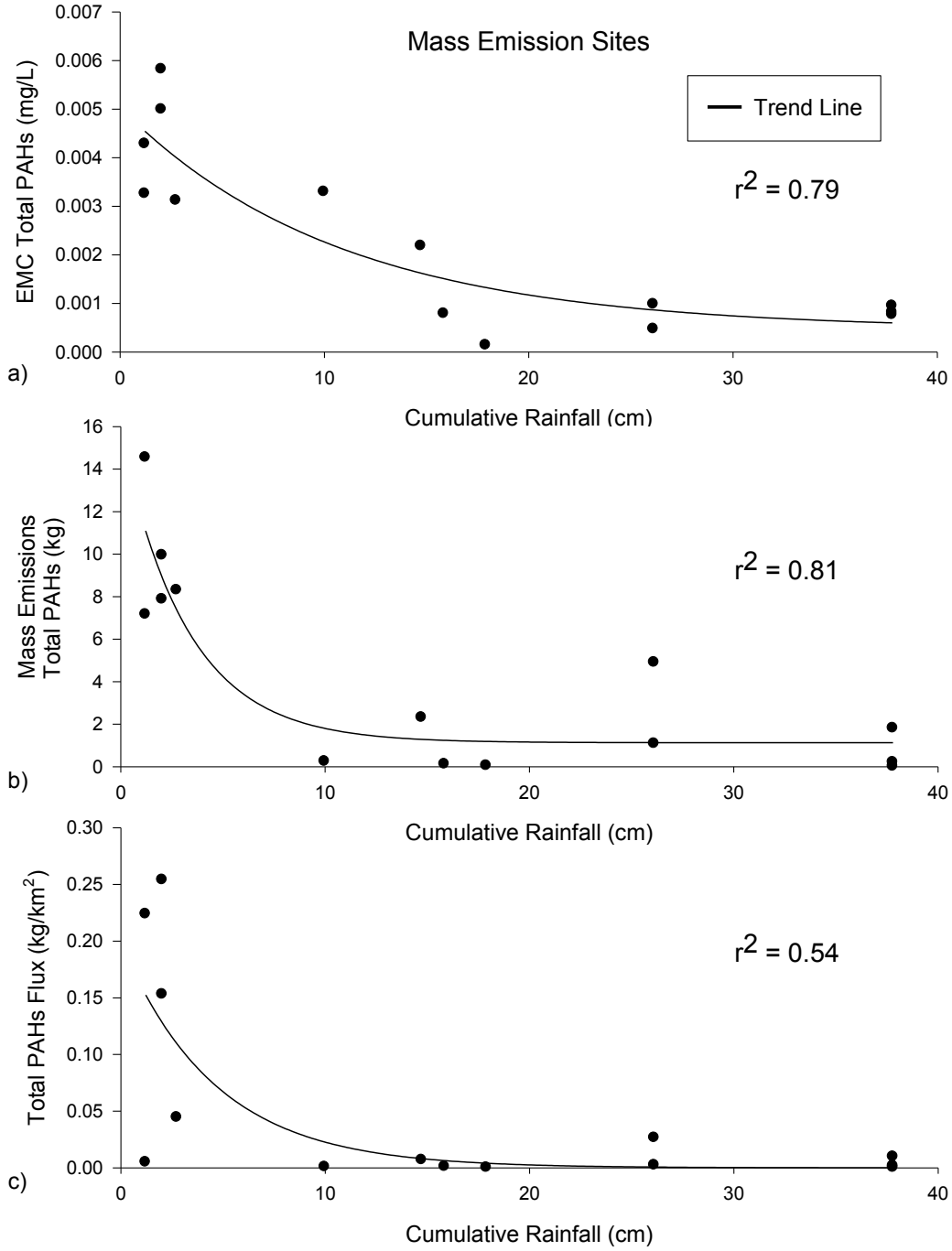

Figure 4-1. Cumulative annual rainfall versus polycyclic aromatic hydrocarbon (PAH) event mean concentration (EMC; a), load (b), and flux (c). Plots show data for mass emission sites only.

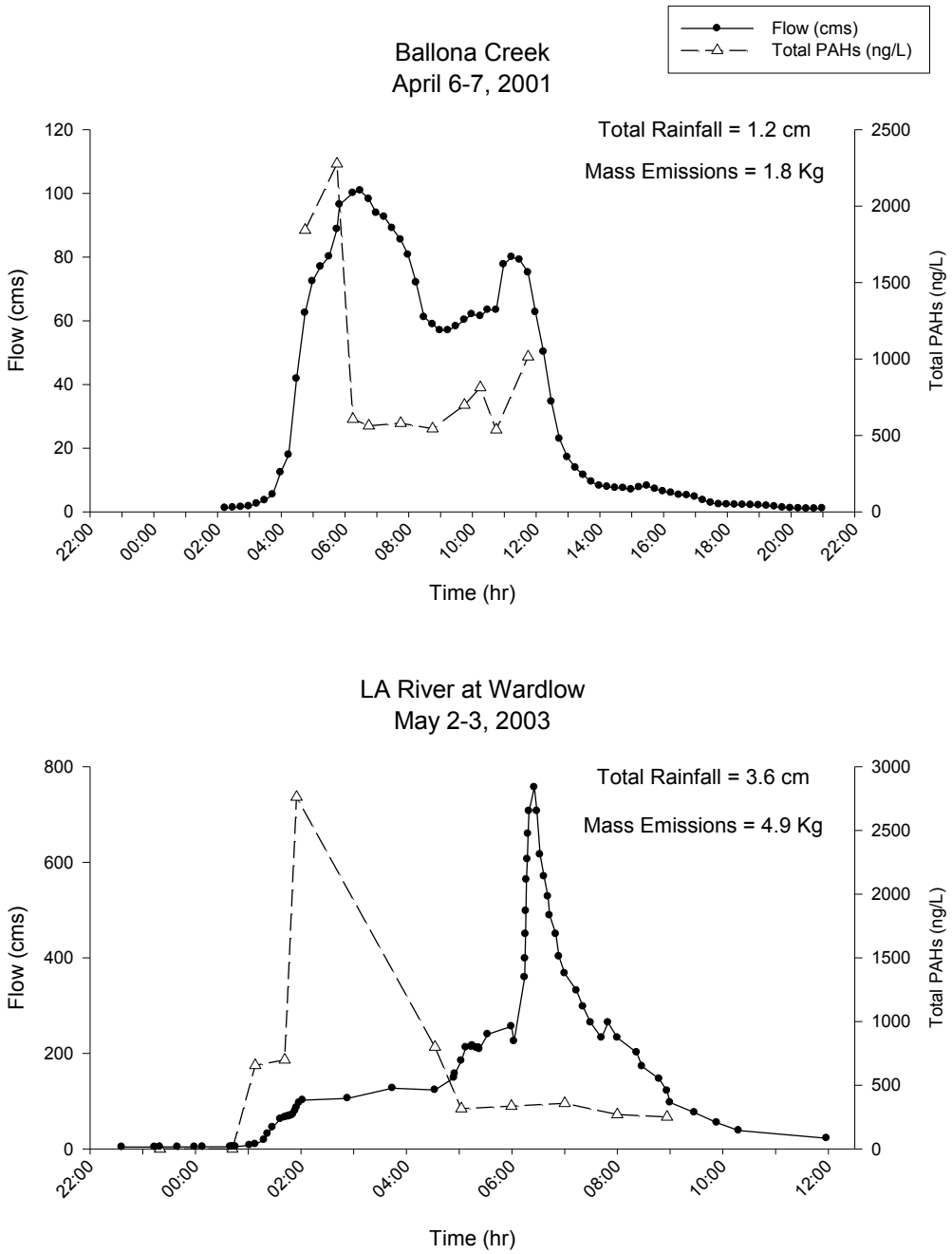

Figure 4-2. Variation in polycyclic aromatic hydrocarbon (PAH) concentrations with time for storm events in Ballona Creek (top) and Los Angeles River (bottom).

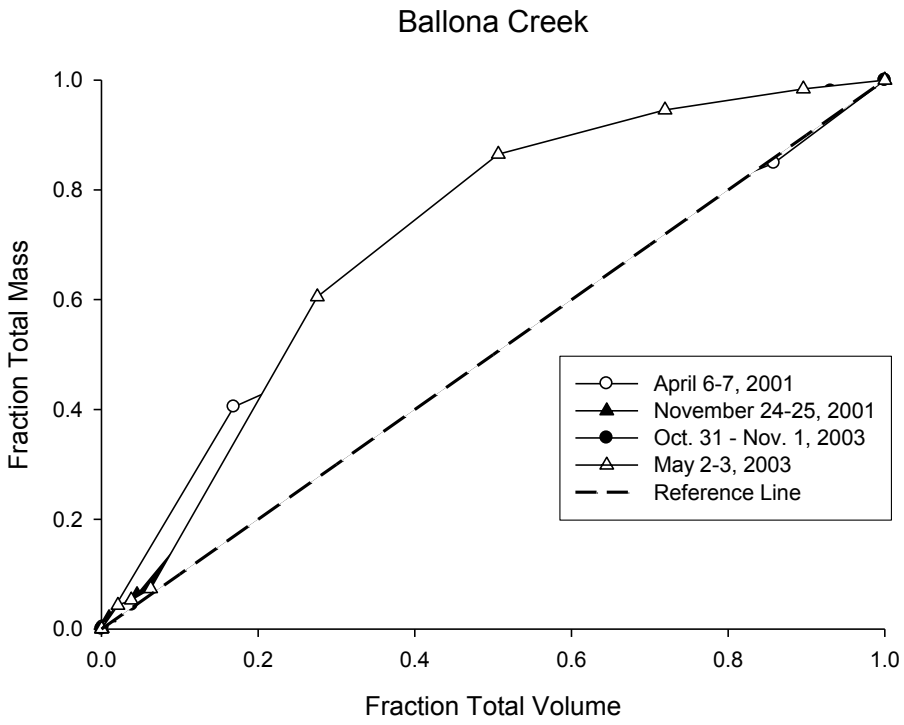

Figure 4-3. Cumulative polycyclic aromatic hydrocarbon mass loading for four storms in Ballona Creek. Plots show percent of mass washed off for a given fraction of the total runoff. Reference line indicates a 1:1 relationship between volume and mass loading. Portions of the curve above the line indicate proportionately higher mass loading per unit volume (i.e., first flush). Portions below the line (if any) indicate the reverse pattern.

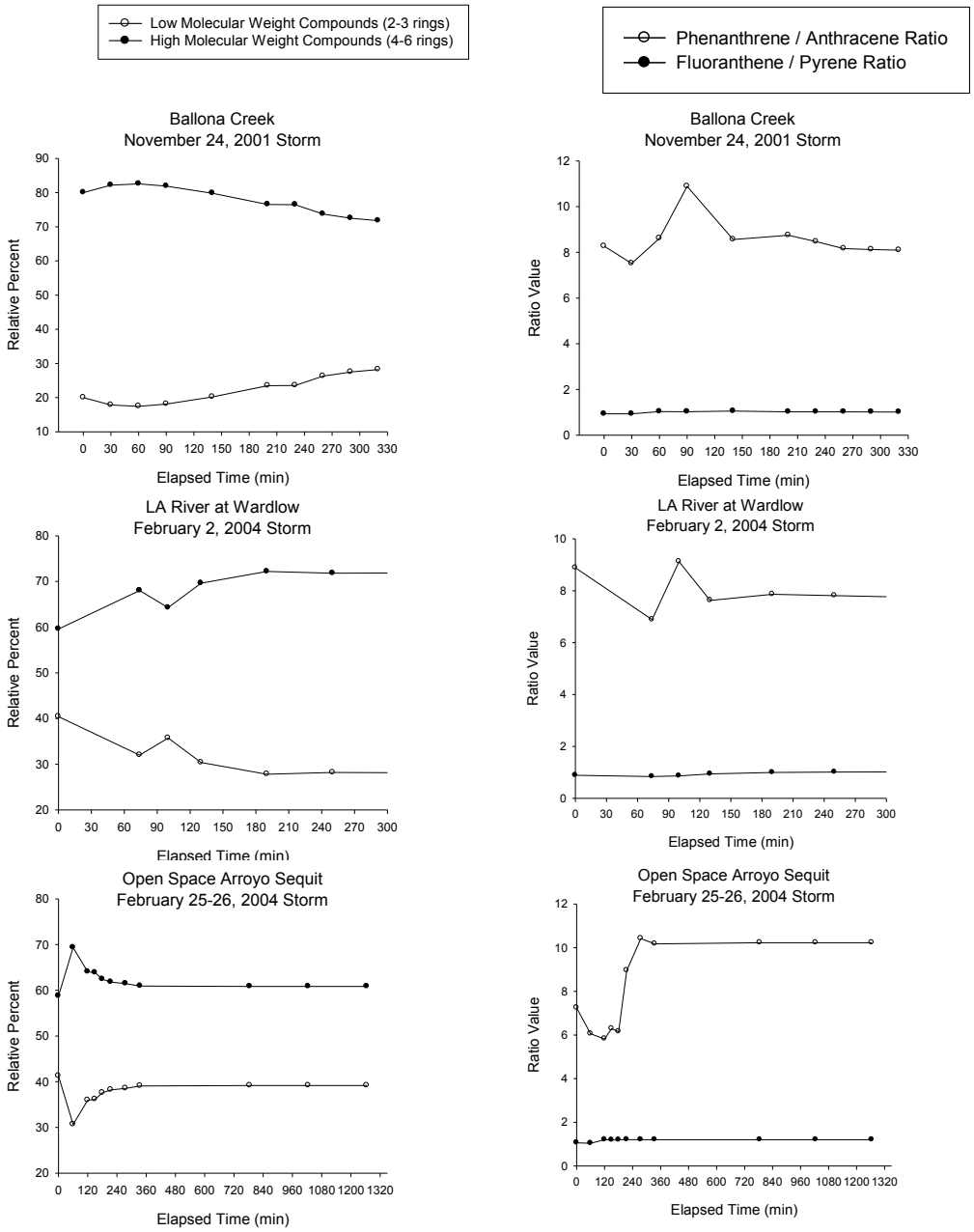

Figure 4-4. Distribution of polycyclic aromatic hydrocarbons (PAHs) within storms for mass emission sites. Plots on the left (a–c) show distribution of high- versus low-molecular-weight PAHs throughout individual storms. Plots on the right (d–f) show phenanthrene/anthracene (P/A) and fluoranthene/pyrene (F/P) ratios throughout individual storms. Peaks in the P/A ratio correspond to peak storm flows.

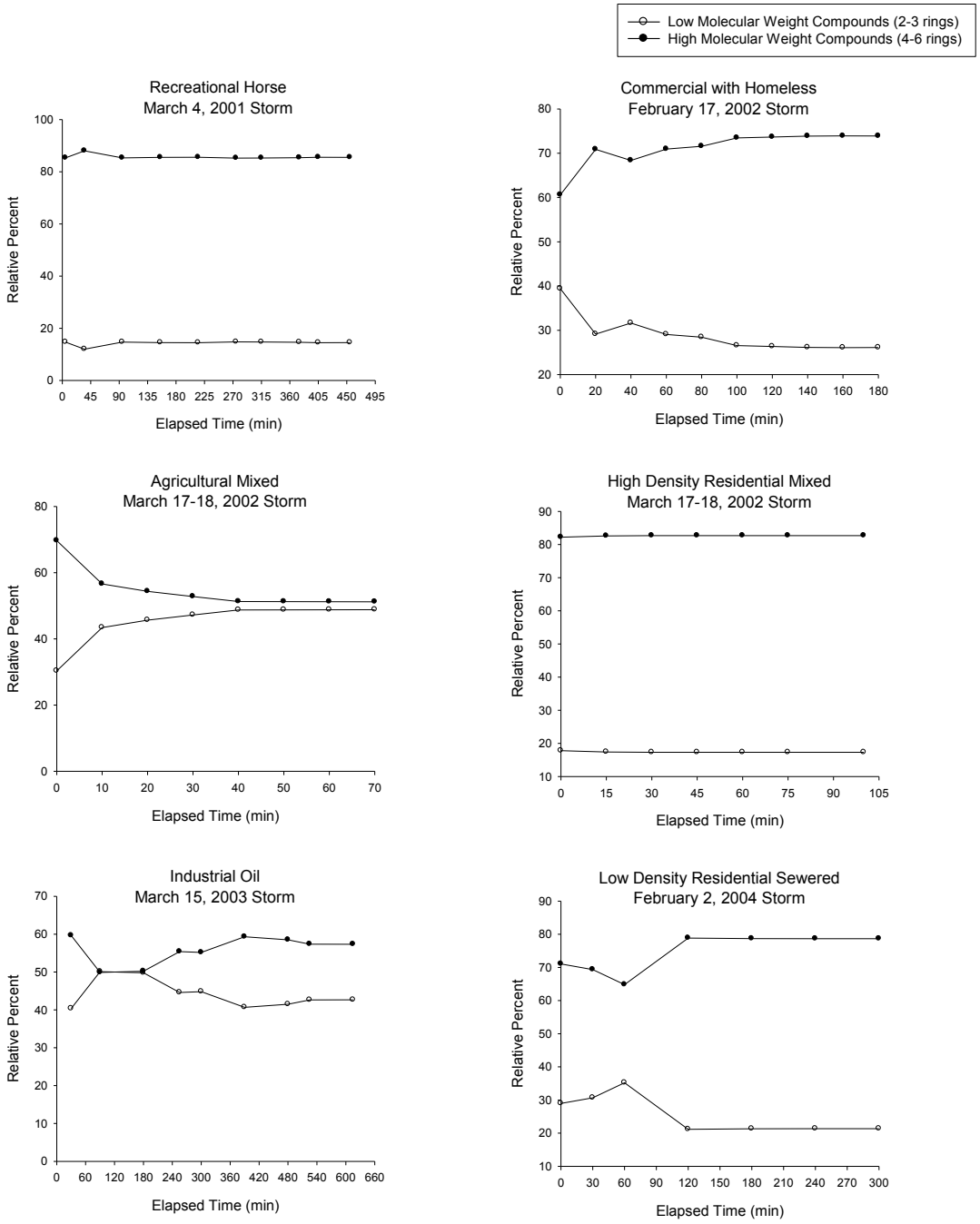

Figure 4-5. Distribution of polycyclic aromatic hydrocarbons (PAHs) within storms for representative land use sites (a–f). Plots show distribution of high- versus low-molecular-weight PAHs throughout individual storms. Data are shown for six sites that represent the results observed for the 15 land use sites where data were collected.

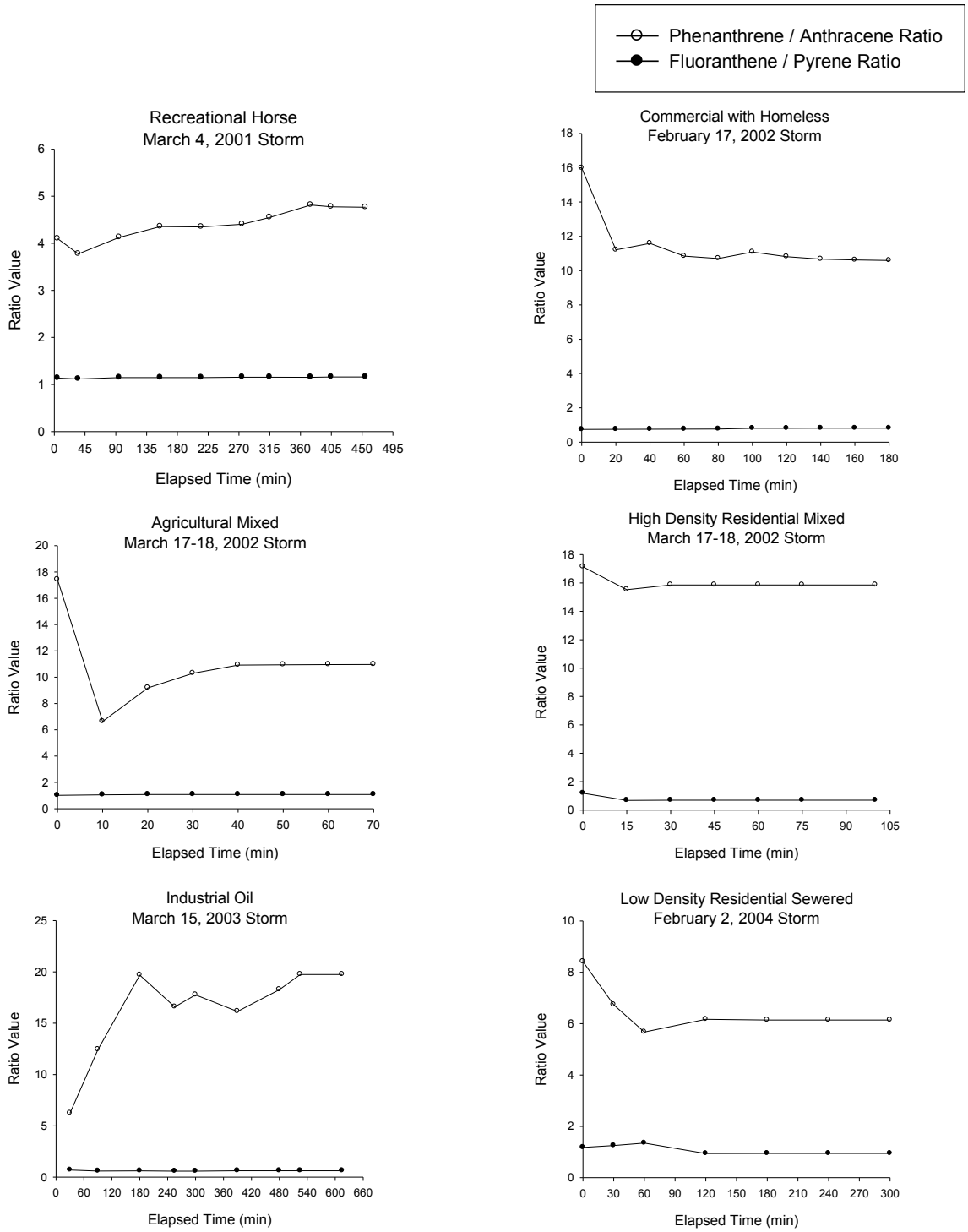

Figure 4-6. Distribution of polycyclic aromatic hydrocarbons within storms for representative land use sites. Plots (a–f) show phenanthrene/anthracene (P/A) and fluoranthene/pyrene (F/P) ratios throughout individual storms. Data are shown for six sites that represent the results observed for the 15 land use sites where data were collected.

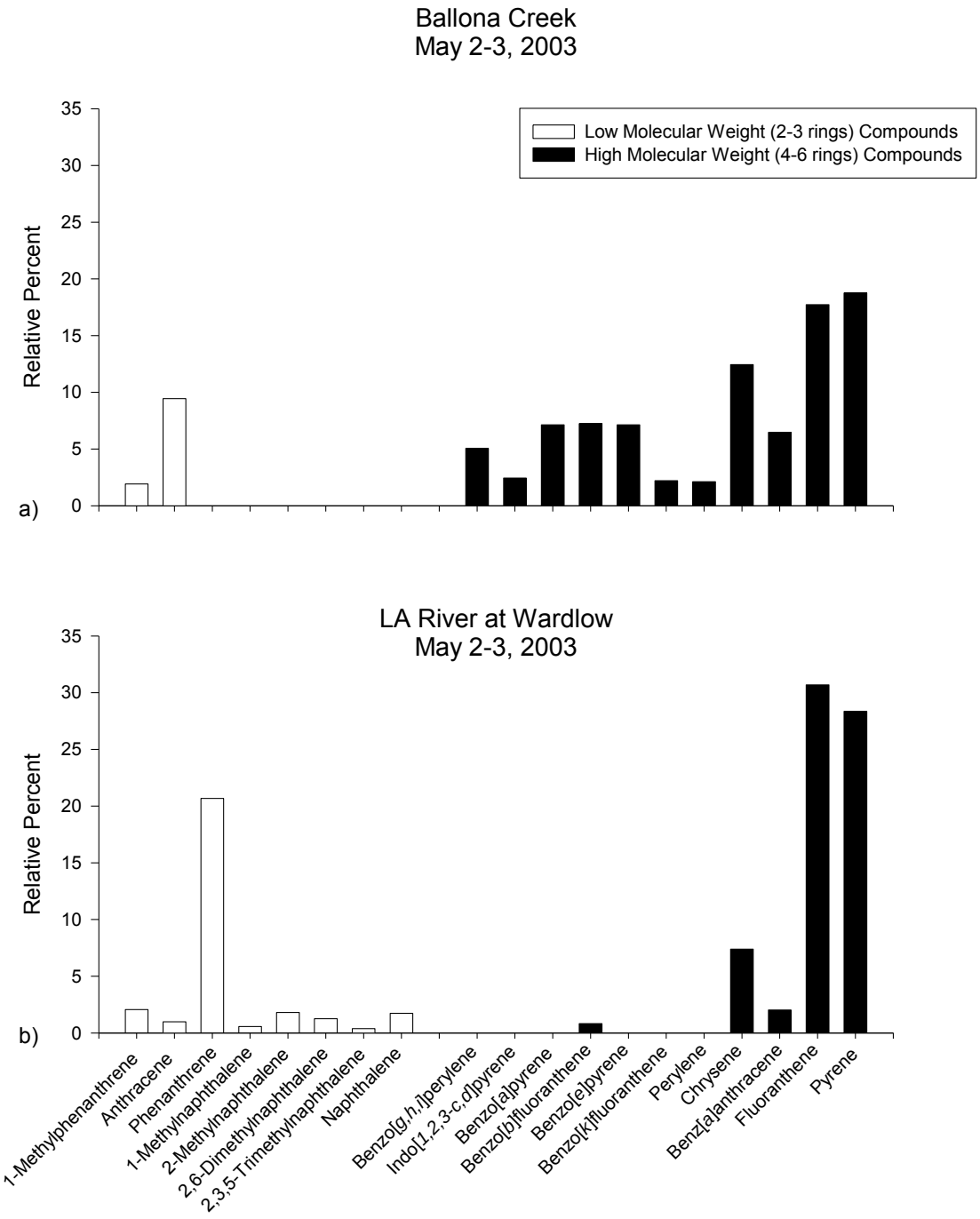

Figure 4-7. Relative distribution of individual polycyclic aromatic hydrocarbon compounds for Ballona Creek (a) and Los Angeles River (b) on May 2–3, 2003.

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SECTION 5. FECAL INDICATOR BACTERIA (FIB)

Results

FIB from Developed and Undeveloped Watersheds

E. coli, *Enterococcus* spp. and total coliforms occurred at all ME sites at concentrations that consistently and uniformly exceeded CA water quality standards (Figure 5-1). Mean *E. coli*, *Enterococcus* spp. and total coliforms EMCs and fluxes were significantly greater at ME sites from developed compared to undeveloped watersheds (ANOVA, p = 0.006). For example the mean EMC at the developed Ballona Creek watershed was two orders of magnitude higher than at the undeveloped Open Space Arroyo Sequit watershed (10^4 MPN/100 mL vs. 10^2 MPN/100 mL, respectively; Fig. 5-1a). Bacteria EMCs were typically higher in the Los Angeles River compared to the other watersheds sampled.

Bacterial flux from ME sites exhibited a similar pattern as that observed for the EMCs. For example, *E. coli* fluxes were two orders of magnitude higher at the developed Ballona Creek watershed versus the undeveloped Arroyo Sequit watershed (i.e., 10^{12} colonies/km^2 vs. 10^{10} colonies/km^2, respectively; ANOVA, p = 0.02, Figure 5-1b). Similarly, *Enterococcus* spp., and total coliforms fluxes were substantially higher for the developed watersheds versus the undeveloped watershed, but these differences were not statistically significant. Furthermore, the higher fluxes from developed watersheds were generated by substantially less rainfall than the lower fluxes from the undeveloped watersheds (2.07 ±1.22 cm for storms in developed watersheds vs 6.49 ±3.79 cm for storms in undeveloped watersheds).

FIB Concentration and Flux from Specific Land-use Types

Figure 5-2 shows the median FIB concentrations for the storm events sampled for each LU category. Mean *E. coli*, EMCs from the recreational LU site were significantly higher than the commercial, high density residential, industrial and transportation LU sites (i.e., $5.3\text{x}10^5$ MPN/100mL ± $1.7\text{x}10^5$, p=0.004, Appendix B-15) and were an order of magnitude higher than mean EMCs observed at ME sites. Agricultural LU sites contributed the second highest mean indicator bacteria EMCs but were not statistically different from all other LU sites (i.e., $4.0\text{x}10^4$ MPN/100mL ± $1.4\text{x}10^4$ *E. coli*, $1.2\text{x}10^5$ MPN/100mL ± $9.6\text{x}10^4$ *Enterococcus* spp. and $6.4\text{x}10^5$ MPN/100mL ± $9.6\text{x}10^4$ total coliforms).

Direct comparison of flux showed that storm water from agricultural, recreational and industrial LU sites had the highest mean FIB fluxes. Most of the developed LU types exhibited comparable fluxes of 10^{11} colonies/km^2 (Appendix B-15). In contrast, the agricultural LU contributed substantially higher flux of both *Enterococcus* spp. and total coliforms (e.g. mean *Enterococcus* flux = 10^{14} colonies/km^2 (Appendix B-15). Mean FIB fluxes at the open space LU were comparable to those observed at developed LU sites (e.g. 10^{12} colonies/km^2; Appendix B-15).

Correlation between FIB and TSS Concentration

A simple Spearman's correlation matrix (Table 5-1) of TSS, stream flow and FIB indicates that *E. coli* was significantly positively correlated (p <0.0001) with TSS from agricultural, recreational and open LU sites. *E. coli* concentration from low-density residential

and industrial LU sites were weakly correlated with TSS. *Enterococcus* spp. was significantly correlated (p <0.0001) with total suspended solids from low-density residential, agricultural, recreational and transportation LU sites and all correlations with the exception of the low-density residential site were positive. *Enterococcus* spp. counts from commercial and open LU sites were weakly and positively correlated with TSS. Both *E. coli* and *Enterococcus* spp. had correlation coefficients (Spearman's *rho* or ρ) between 0.5 and 0.8, indicating that similar processes may have controlled the effect of TSS on each of these parameters. FIB concentrations were only significantly correlated (p <0.0001) with stream flow at the commercial, high-density residential and agricultural LU sites.

California Bacterial Water Quality Standards

Bacteria concentrations exceeded the California beach water quality single-sample water quality standard in almost all of the samples collected during this study. Concentrations of FIB at many LU sites were as high as those found in primary wastewater effluent (10^6-10^7 MPN/100ml). Cumulative density frequency plots showed 98%, 94% and 92% of the in-river storm water samples for *Enterococcus* spp., *E. coli* and total coliforms bacteria exceeded CA ambient water quality standards (Figure 5-3). Similar results were observed at LU sites. Approximately 80% of all samples exceeded water quality thresholds at LU sites for at least one indicator (i.e., *E. coli* exceedence = 83%; Figure 5-3). The above comparisons are based on receiving water quality standards. If compared to the proposed freshwater standards, which are approximately 60% lower than the receiving water standards, the exceedances would be slightly higher.

Large-sized watersheds (>100 km^2) exhibited the greatest frequency of water quality threshold exceedences (Figure 5-4). More than any other indicator, concentrations of *Enterococcus* spp. were responsible for the majority of water quality threshold exceedences across all three watershed size categories, exceeding thresholds 98% of the time for both large and medium-sized watersheds (25-100 km^2), and 96% of the time for small-sized watersheds. *E. coli* and total coliform concentrations followed a decreasing frequency of exceedences in terms of watershed size (i.e., large > medium > small).

Temporal Patterns in Indicator Bacteria Loading

Effect of Rainfall Patterns: Indicator bacteria from LU sites showed little variation when evaluated for seasonal differences between early- and late- season storms. In contrast, antecedent dry period (expressed as cumulative annual rainfall) was strongly correlated with FIB concentrations from ME sites in an exponentially non-linear manner (r^2 = 0.67-0.92; Figure 5-5). Early-season storms generally had higher *Enterococcus* spp. and total coliforms EMCs than late-season storms both within and between watersheds with an inflection point at approximately 10 cm, even when rainfall quantity was similar. For example, the early-season storm from Ballona Creek in water year 2004 had an *Enterococcus* spp. EMC two times larger (3.0×10^4 MPN/100mL) than the storm that occurred at the end of the rainy season in water year 2003 (1.6×10^4 MPN/100mL), despite the early- and late-season storms resulting from comparable rainfall (approx. 3.0 cm). The results for *E. coli* EMCs from early- and late- season storms were comparable. When all watersheds are analyzed together *E. coli*, *Enterococcus* spp. and total coliforms concentrations decrease with increasing cumulative annual rainfall until approximately

10 cm (average annual rainfall is 33 cm), beyond which the effect is markedly less dramatic (Figure 5-5).

With-in Storm Variability

FIB concentrations varied with time and as a function of flow over the course of storm events. Figures 5-6 and 5-7 show the pattern of change throughout storm events for *E. coli* and *Enterococcus* spp.. In all cases, bacterial concentrations increased markedly preceding peak flow (compared to base flow level). *Enterococcus* spp. concentrations stayed high for a relatively short period at the developed Ballona Creek site (2.4 x 10^5 MPN/100mL) and then decreased back to base levels within two hours (Figure 5-6a). In contrast, *E. coli* concentrations were more variable exhibiting two separate peaks around 2.6 x 10^4 MPN/100mL and an order of magnitude lower than *Enterococcus* spp. concentrations (Figure 5-6b)[1]. Although the pattern of an early peak in concentration was comparable in both undeveloped and developed watersheds, in the undeveloped watersheds the peak concentration tended to occur later in the storm and persist for a longer duration (i.e., three to four hours; Figure 5-7). Furthermore, flow continued above base flow conditions for a longer duration in the undeveloped watersheds however FIB concentrations steadily decreased following the early peak in storm. We cannot make conclusions about the consistency of these patterns given the small number of storms sampled at undeveloped watersheds.

Discussion

The relatively higher bacteria concentrations from recreational and agricultural LU sites may be due to several sources. Sources of bacteria include domestic pet and wildlife wastes that are deposited, stored, or applied to the land, a fact that may account for the high *E. coli* and *Enterococcus* spp. EMCs, and overall mean flux of 1.4 x 10^{13} and 1.1 x 10^{14} colonies/km^2, respectively observed at the agricultural sites during this study. In contrast, land use sites, such as industrial areas and built-out residential areas, have proportionately less direct sources of fecal material and have lower sediment concentrations in storm water than do mixed LU and developing areas (i.e., recreational, Mallin 1998, Burnhart 1991). This difference in source material may be a factor that accounts for why these LU sites had lower indicator bacteria EMCs and fluxes.

The association of bacteria with storm water particles may also explain differences in *E. coli* and *Enterococcus* spp. concentrations from different LU sites. Correlations of FIB with TSS from recreational and agricultural LU sites indicate associations with particulate material, but it is unclear if that particulate material resulted from soils transported to the stream from these LU sources or from erosion and resuspension of sediment already in the streambed from upland sources. Other studies have implicated streambed sediment and its resuspension (Matson et al. 1978, Francy et al. 2000, Embrey 2001) as sources and principal transport vectors for bacteria. The higher indicator bacterial concentrations at the recreational and agricultural land use sites indicate that bacteria associated with these areas may be directly associated with sources at those sites. Another possible explanation for the high FIB concentrations at agricultural sites may be

[1] Unfortunately FIB samples were not collected prior to 3:30 AM due to failure to be on site when storm commenced.

due to the regular application of fertilizers, algaecides and fungicides (Niemi 1991, Cook and Baker 2001). Assessing particle size distribution over the entire storm duration at these LU sites may provide a clearer or consistent particle source association. Interestingly, indicator bacteria concentrations were only significantly correlated ($p<0.0001$) with stream flow at the commercial and high-density residential LU sites even though bacteria in streams are commonly associated with suspended particles (Schillinger and Gannon, 1985, Hunter et al. 1999), either because they were transported to the streams attached to the particles, they were bound to streambed sediment (Matson et al.1978) that has been resuspended (Grimes 1975, Matson et al.1978, Hunter et al. 1999) or because of specific bacterial affinities for sediment particles (Scholl and Harvey 1992, Bolster et al. 2001) that may occur in the water column. Although bacterial transport has been correlated with stream stage (Hunter et al. 1992) and stream flow during storms and also tends to be associated with the transport of suspended sediment (Davis et al. 1977), these associations are not always evident (Qureshi and Dutka 1979). In the Los Angeles River watershed the lack of correlations at specific LU sites with stream flow may indicate that contributing sources or processes for bacteria were different from storm to storm.

Comparison of FIB concentrations in runoff from LU sites from this study reveal median *E. coli* EMCs that are comparable to current U.S. averages reported in the National Stormwater Quality Database (NSQD; Maestre et al. 2003), but lower than concentrations reported in the Nationwide Urban Runoff Program (NURP) database (U.S. EPA 1983a; Figure 5-8). The exception is that median total coliform values from all LU sites in Los Angeles, CA are substantially higher than those observed in the rest of the U.S. (Table 5-2). The similarities in median event-mean *E. coli* concentrations from LU sites across the U.S. measured since 1992 (reported by the NSQD) and those observed 13 years later during this study demonstrate that the issue of fecal bacteria contamination in urban watersheds is not improving over time.

Seasonal comparisons of wet weather FIB concentrations to dry weather concentrations from the urbanized Ballona Creek watershed during 2002-03 revealed that contributions from wet weather far exceeded those from dry weather (Table 5-3). Freshwater outlets such as storm drains are found to be especially high contributors of indicator bacteria contamination (Stein and Tiefenthaler 2005, Noble et al. 2000, Bay and Schiff 1998). Nevertheless, the highest mean dry-weather *E. coli* concentrations (7,457 MPN/100 ml) found in samples from Ballona Creek were still an order of magnitude lower than the lowest mean *E. coli* storm EMC from this study (43,305 MPN/100 ml; Table 5-3, $p<0.03$ E. coli; $p<0.04$ *Enterococcus* spp.; $p<0.02$ total coliforms). Wet versus dry sampling events have been compared by other studies in the southern California region (Noble et al. 2006, Schiff et al. 2003, Noble et al. 2003). These studies also found a higher number of exceedences of water quality standards during wet weather for all indicators, especially at storm water outflows and storm drains.

Consistently higher bacteria levels during early season storms likely reflect bacteria buildup during dry periods that "flushes" to rivers during early season storms. Bacteria concentrations in rivers were strongly influenced by the length of antecedent dry condition but not with amount of rainfall. The strong relationship between indicator bacteria EMC and antecedent dry period suggests that the magnitude of bacterial load associated with storm water runoff depends on the amount of time available for build up on land surfaces, and that storm size is a less reliable predictor of the magnitude of bacterial loading. Since indicator bacteria

continue to reproduce in the environment and reproduction is favored in aerobic temperate waters, low flow and high temperature conditions that typically occurs in southern California between May and October likely allows indicator bacteria concentrations to build-up on land surfaces, resulting in proportionally higher bacteria concentrations and loads during the initial storms of the season. A similar seasonal pattern (i.e., 10 cm cumulative annual rainfall threshold) was observed for polycyclic aromatic hydrocarbons (PAHs) and trace metals in the Los Angeles region (Stein et al. 2006, Sabin et al. 2004, Tiefenthaler et al. in press). Han et al. (2006) also reported that antecedent dry period was the best predictor of the magnitude of pollutant runoff from highways. Other researchers (Anderson and Rounds 2003, Ngoye and Machiwa 2004) have reported corresponding temporal trends for other particle-bound contaminants. This seasonal pattern suggests that focusing management actions on early season storms may provide relatively greater efficiency than distributing lower intensity management actions throughout the season.

FIB concentrations in storm water were highly variable, with concentrations often ranging by factors of 10 to 100 during a single storm. The greatest bacteria concentrations occurred at or just before the peak in flow of the storm hydrograph for nearly every storm sampled. This hydrograph/pollutograph pattern was also observed for PAHs (Stein et al. 2006) and trace metals (Tiefenthaler et al. in press) in the greater Los Angeles area. Tiefenthaler et al. (2001) observed similar pollutographs that showed peak suspended-sediment concentrations preceding the peak in discharge for the Santa Ana River. Similar time vs. concentration relationships were observed by Characklis and Wiesner (1997), who reported that the maximum concentrations of zinc, organic carbon and solids coincided with early peak storm water flows. Bacterial counts typically vary by up to five orders of magnitude on daily, seasonal, and inter-annual scales. The extreme variability in FIB makes storm water bacteria concentrations difficult to accurately estimate. Furthermore, as living organisms, many processes that do not influence other constituents, such as re-growth of environmentally adapted strains, die-off, and random fluctuations in population size, may affect bacterial counts (Ferguson et al. 2005). Therefore, more frequent monitoring over longer time periods and for the entire duration of storms is necessary in order to make assessments of “typical” bacterial counts and accurate estimates of EMC and FIB loading.

Further research is needed to directly assess the relationship between indicator bacteria concentrations and particle-size distributions in storm water runoff from mass emission and LU sites to better understand the fate, transport and treatment of indicator bacteria in urban runoff. Storm water borne bacteria are typically associated with particulates to varying degrees depending on the indicator bacteria and the size distribution of suspended solids in the storm water runoff. Furthermore, the particle size distribution, and bacteria partitioning can change over the course of a storm event (Furumai et al. 2002). Understanding the dynamic partitioning of indicator bacteria to various size particles is important to being able to estimate temporal and spatial patterns of bacterial deposition in estuaries and harbors, and should be an area of future investigation. Our understanding of the mechanisms of indicator bacteria loading from urban LU sites could also be improved by estimating the percent watershed impervious surface coverage in each LU category (i.e., percent rooftop, sidewalks, paved driveways and streets) and its impacts on storm water runoff concentrations and loads. This could allow identification of critical source areas and allow for more targeted application of best management practices.

Table 5-1. Correlations between total suspended solids (TSS) and stream flow with respect to fecal indicator bacteria (FIB) during storm condition. Within a table cell, the upper row shows Spearman's correlation coefficient (ρ), the middle row shows probability (p) that the null hypothesis of no correlation is true, and the lower row shows number of samples (n). Numbers in bold indicate correlations that are significant (p <0.04).

	Total Suspended Solids			Stream Flow		
	E. coli	*Enterococcus* spp.	Total Coliforms	*E. coli*	*Enterococcus* spp.	Total Coliforms
High Density Residential	-0.0815 0.6060 42	0.0226 0.8860 42	-0.0196 0.9010 42	0.6110 **<0.0001** 42	-0.0564 0.7050 42	0.0656 0.66 42
Low Density Residential	-0.3640 **0.0268** 37	-0.6030 **<0.0001** 37	-0.1800 0.2850 37	0.2390 0.1280 37	0.0400 0.8000 37	-0.2690 0.0851 37
Commercial	0.2460 0.0958 47	0.3540 **0.0149** 47	0.4160 **0.0038** 47	0.7720 **<0.0001** 47	0.8190 **<0.0001** 47	0.7960 **<0.0001** 47
Industrial	-0.3890 **0.0035** 55	-0.3040 **0.0244** 55	-0.1300 0.3440 55	-0.2510 **0.0421** 55	-0.2480 **0.0447** 55	-0.1330 0.285 55
Agricultural	0.5530 **<0.0001** 44	0.6160 **<0.0001** 44	0.3560 **0.0178** 44	0.2810 **0.0440** 44	0.4360 **0.0015** 44	0.6880 **<0.0001** 44
Recreational (horse)	0.6940 **<0.0001** 20	0.7670 **<0.0001** 20	0.7320 **<0.0001** 20	-0.0162 0.9370 20	0.5870 **0.0027** 20	-0.0921 0.664 20
Transportation	0.5190 **0.0190** 20	0.7410 **<0.0001** 20	0.6720 **0.0011** 20	-0.7120 **0.0080** 20	0.3920 0.1970 20	-0.3470 0.253 20
Open	0.6700 **<0.0001** 30	0.4610 **0.0106** 30	0.1740 0.3550 30	0.2550 0.0980 30	0.2230 0.1490 30	-0.1990 0.198 30

Table 5-2. Comparison of Nationwide Urban Runoff Program (NURP) and National Stormwater Quality Database data to fecal indicator bacteria concentrations from specific land uses in the Los Angeles, California, USA region. Median event mean concentration (EMCs) are in (MPN/100mL). NA = not analyzed.

Land Use Type	Median EMC (MPN/100mL)	
	E. coli	Total Coliform
Overall		
LARW[1]	3,922	40,559
NSQD[2]	5,091	11,000
NURP[3]	20,000	NA
Residential		
LARW[1]	6,331	55,426
NSQD[2]	8,345	5,467
NURP[3]	17,000	NA
Commercial		
LARW[1]	3,939	22,291
NSQD[2]	4,300	NA
NURP[3]	16,000	NA
Industrial		
LARW[1]	1,546	39,595
NSQD[2]	2,500	12,500
NURP[3]	14,000	NA
Open Space		
LARW[1]	5,374	25,565
NSQD[2]	7,200	NA
NURP[3]	NA	NA

[1]2001-2005 Los Angeles River Watershed Wet Weather Study
[2]The National Stormwater Quality Database (NSDQ), Pitt et al. (2003)
[3]Nationwide Urban Runoff Program (U.S. EPA 1983a)

Table 5-3. Comparison of seasonal concentrations of fecal indicator bacteria (FIB) from the Ballona Creek watershed. Event mean concentration (EMCs) in MPN/100mL.

	Ballona Creek					
Fecal Indicator Bacteria	Dry Weather[1] EMC (MPN/100 mL)			Wet Weather EMC (MPN/100 mL)		
	Min	Max	n	Min	Max	n
E. coli	693	7,457	3	8,304	43,305	6
Enterococcus spp.	727	2,173	3	14,438	78,368	6
Total Coliforms	21,763	40,556	3	127,635	678,973	6

[1]Data summarized from Water, Air and Soil Pollution, 2005. Vol. 164 (Stein E, Tiefenthaler L)

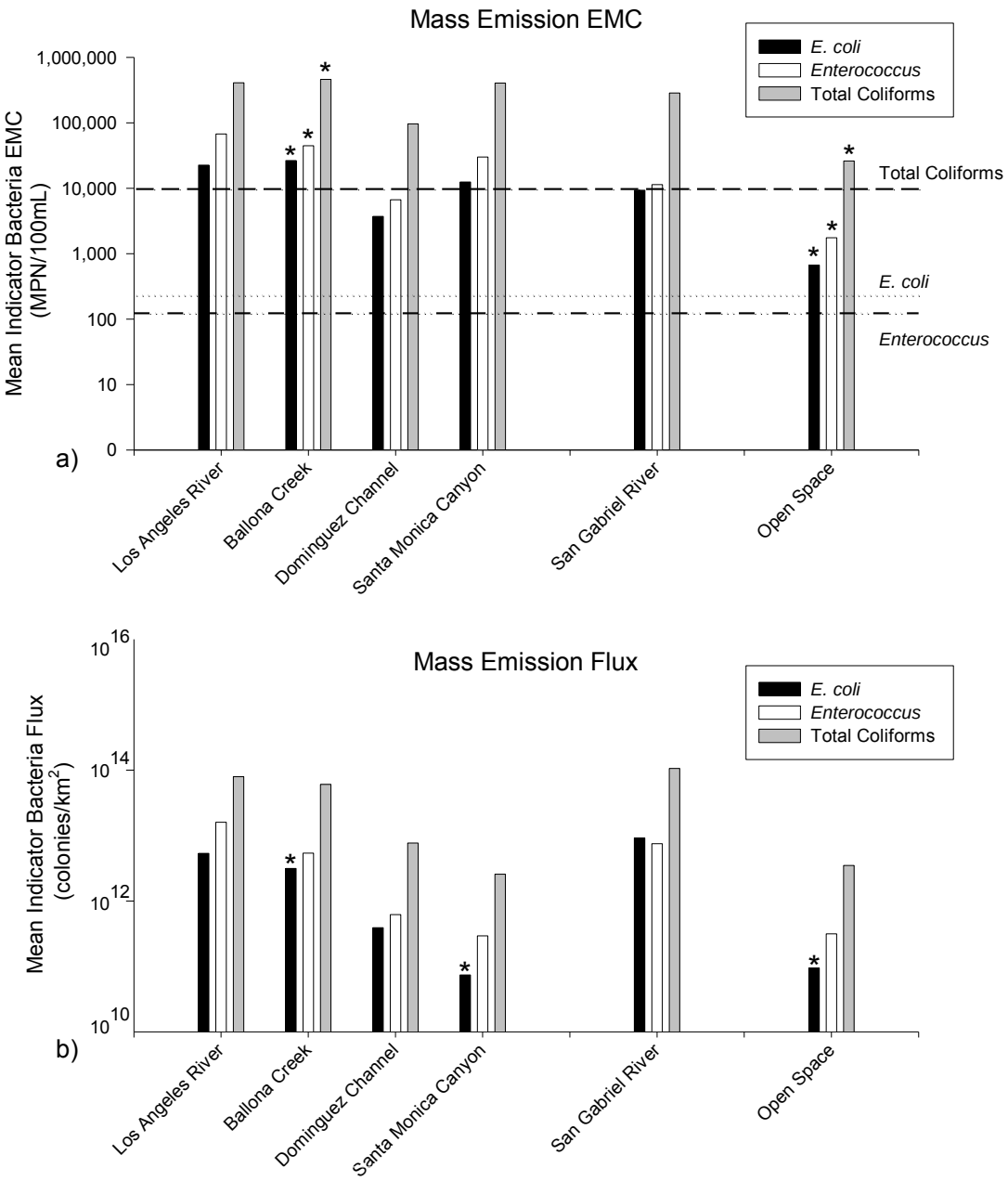

Figure 5-1. Mean storm EMCs (a) and fluxes (b) of *E. coli*, *Enterococcus* spp. and total coliform concentrations at specific southern California watersheds during the 2000/01-2004/05 storm seasons. Dotted lines indicate California beach water quality standards.

~~Will be updated~~

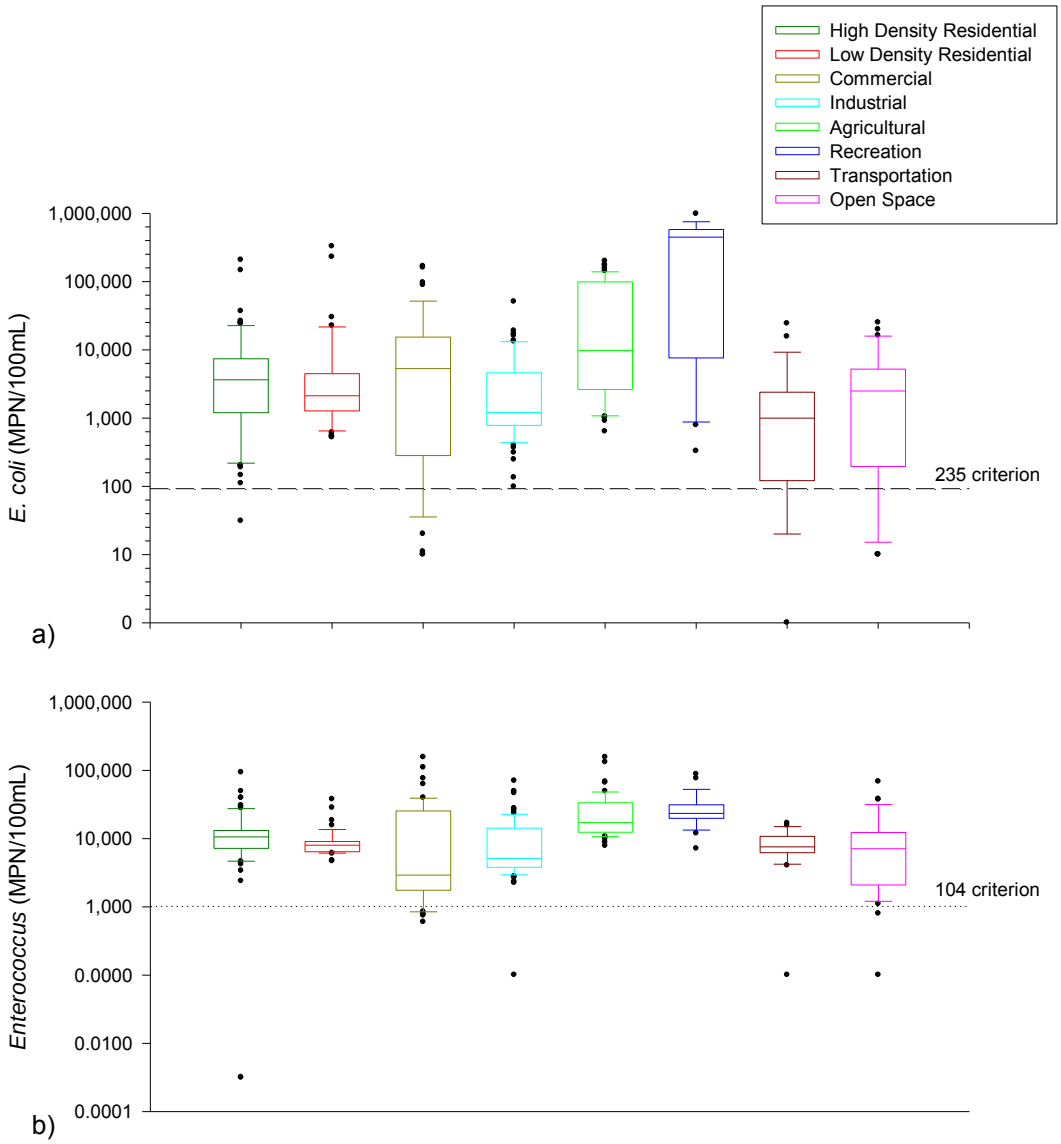

Figure 5-2. Distribution of *E. coli* (a) and *Enterococcus* spp. (b) concentrations during the 2000-2005 wet seasons from land use (LU) sites.

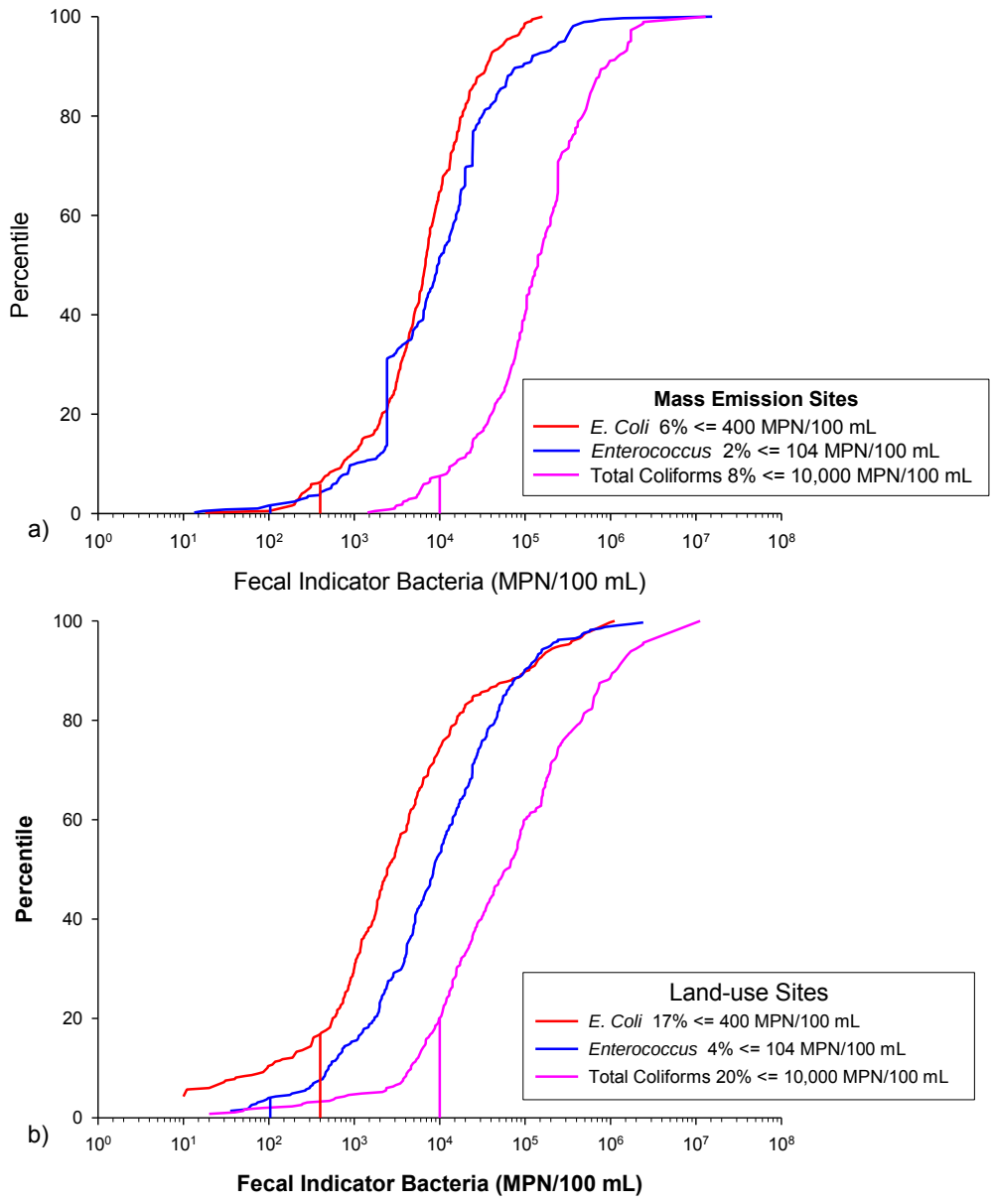

Figure 5-3. Cumulative density frequency plots (CDFs) of mass emission (ME; a) and land use (LU) sites (b) relative to beach water quality standards.

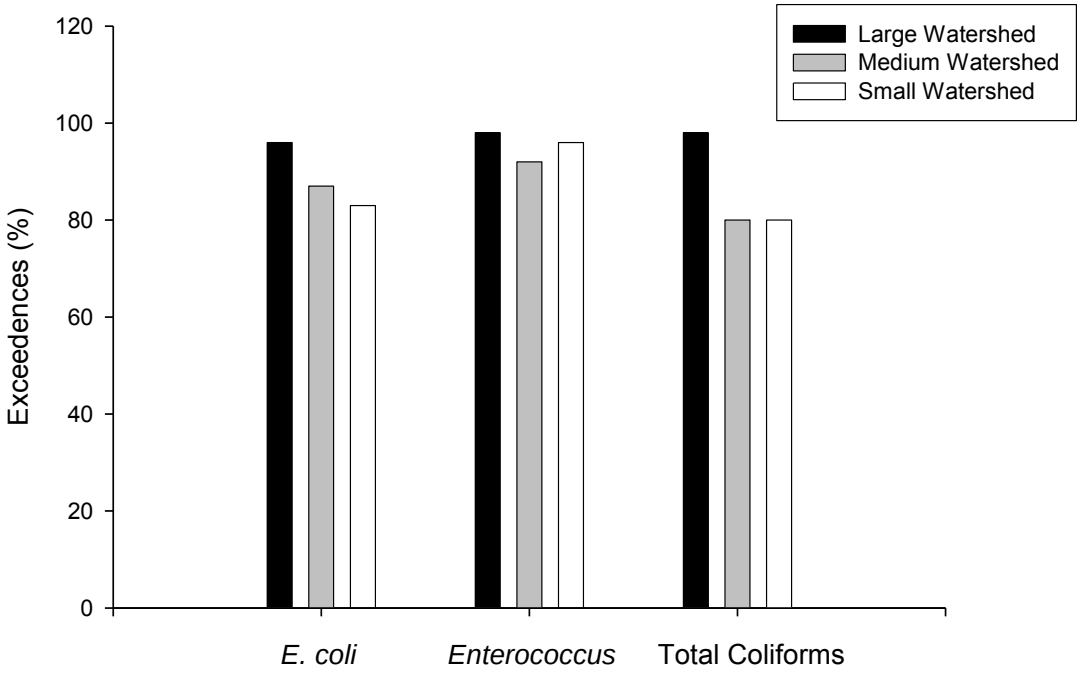

Figure 5-4. Comparison of water quality threshold exceedences at mass emission (ME) and land use (LU) sites with watershed size (small: <25 km^2, 25-100 km^2, >100 km^2).

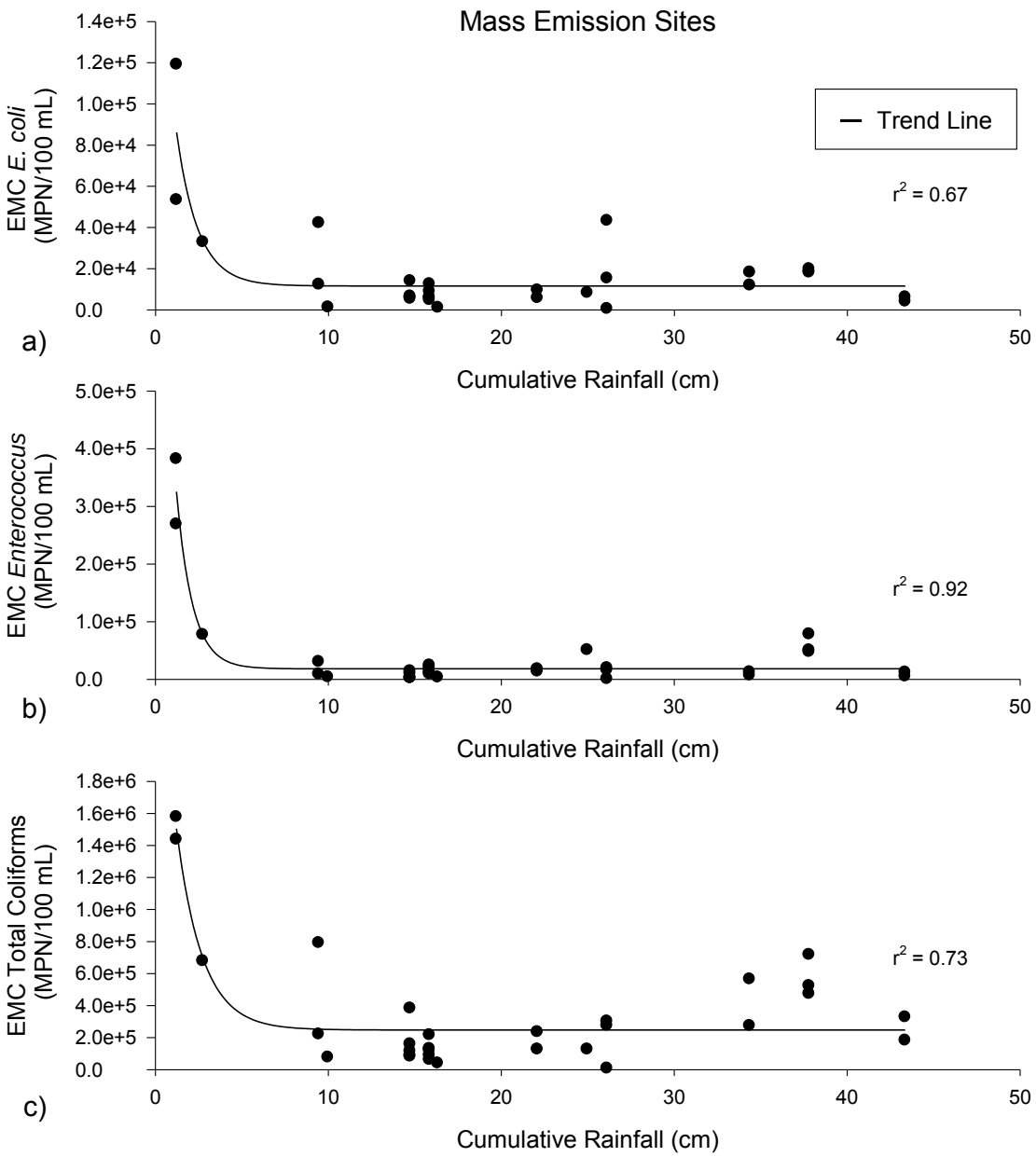

Figure 5-5. Cumulative annual rainfall versus event mean concentration (EMC) for *E. coli* (a), *Enterococcus* spp. (b), and total coliforms (c) during 2000-2005 storm seasons for mass emission (in-river) sites only.

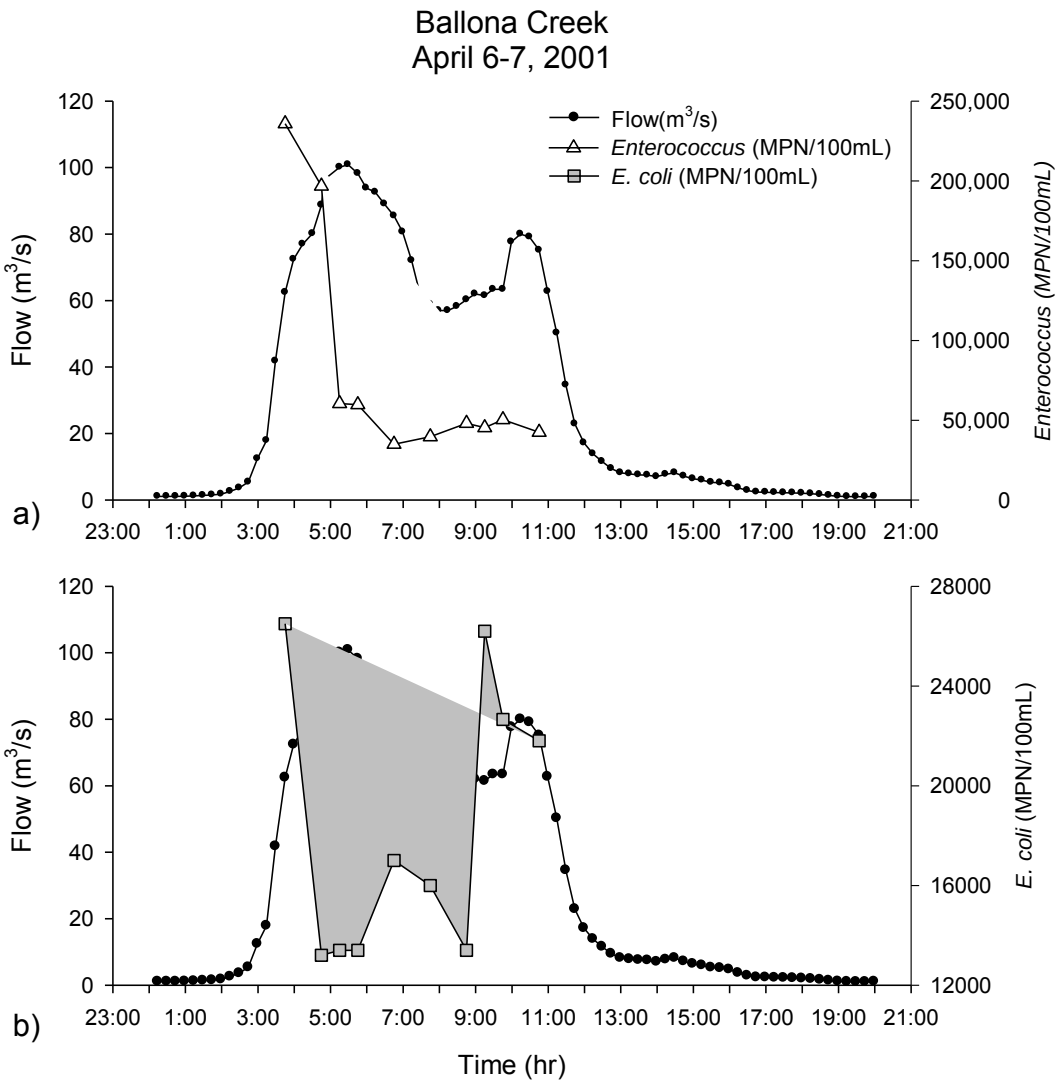

Figure 5-6. ***Enterococcus*** **spp. (a) and** ***E. coli*** **(b) concentrations with time for a storm event from the developed Ballona Creek watershed.**

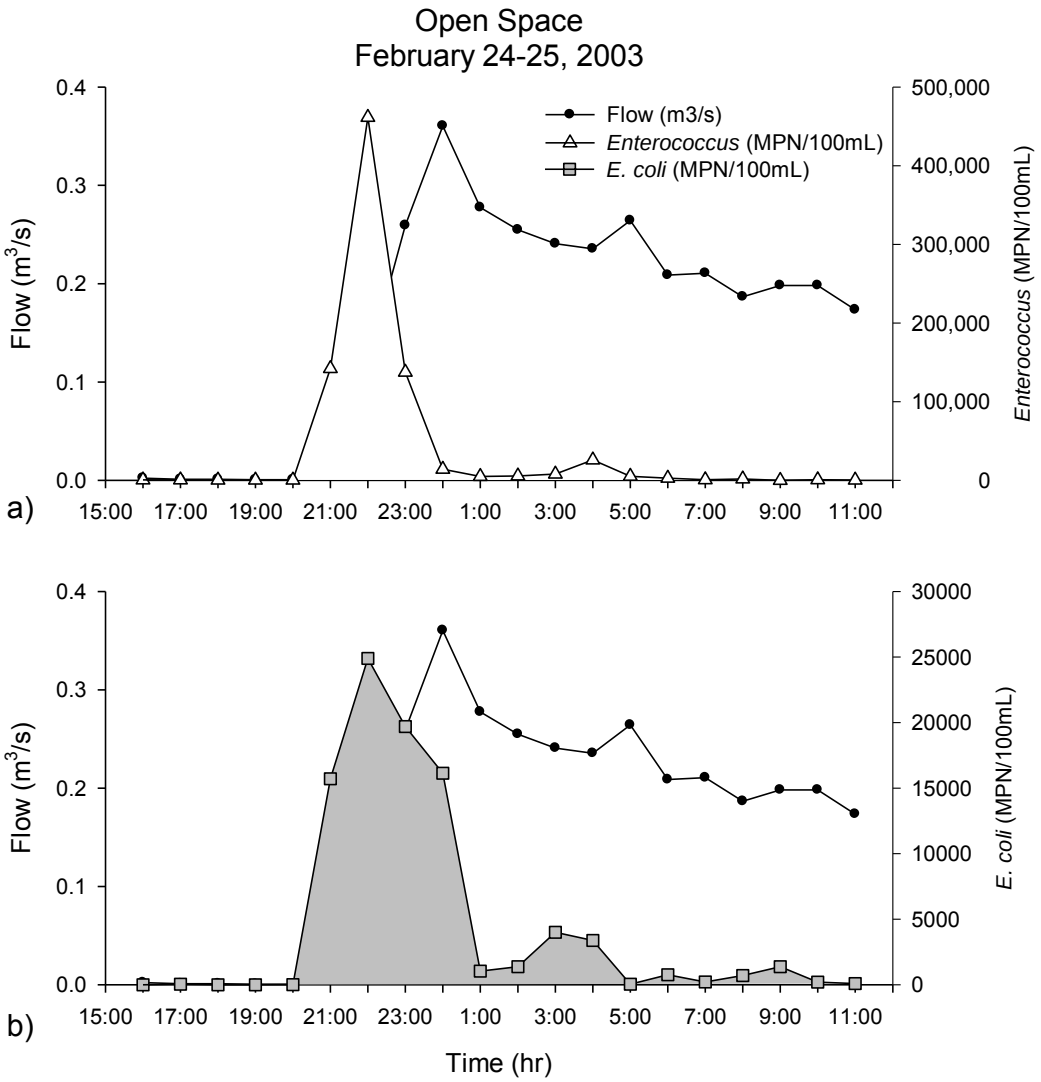

Figure 5-7. *Enterococcus* spp. (a) and *E. coli* (b) concentrations with time for a storm event from the open space land use site.

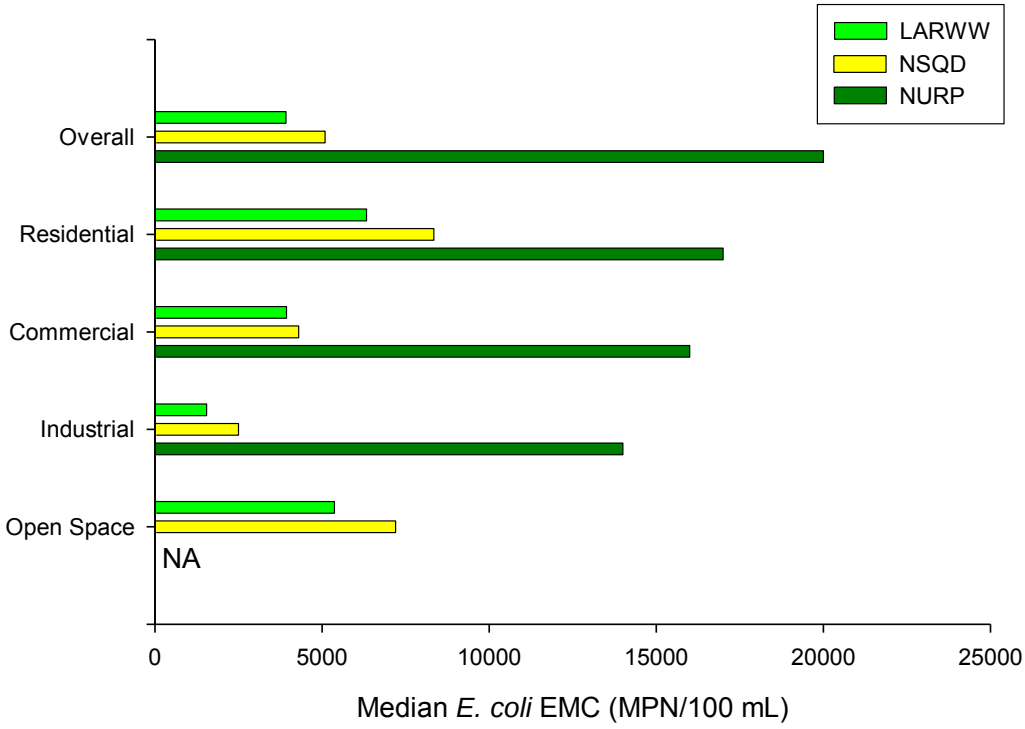

Figure 5-8. Comparison of median *E. coli* event mean concentration (EMCs) at specific land use (LU) sites during the 1983 Nationwide Urban Runoff Program (NURP, U.S. EPA 1983a), to the 1990 National Stormwater Quality Database (NSQD, Pitt et al. 2003) monitoring study and the 2001-2005 Los Angeles River Wet Weather (LARWW) study. Median EMCs are in (MPN/100mL). NA = not analyzed.

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APPENDIX A: Detailed Description of Land Use Categories

ftp://ftp.sccwrp.org/pub/download/DOCUMENTS/TechnicalReports/510_APPENDIX_A.pdf

APPENDIX B: Trace Metal, TSS and Bacteria EMCs, Fluxes and Loadings at Mass Emission and Land Use Sites

ftp://ftp.sccwrp.org/pub/download/DOCUMENTS/TechnicalReports/510_APPENDIX_B.pdf

APPENDIX C: First Flush Patterns of Trace Metals at Mass Emission and Land Use Sites

ftp://ftp.sccwrp.org/pub/download/DOCUMENTS/TechnicalReports/510_APPENDIX_C.pdf

APPENDIX D: Probability Density Frequency Plots (PDFs) of Fecal Indicator Bacteria at Land Use Sites in the Greater Los Angeles, CA Region

ftp://ftp.sccwrp.org/pub/download/DOCUMENTS/TechnicalReports/510_APPENDIX_D.pdf

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3

Urban Stormwater Retrofit Practices

Version 1.0

August 2007

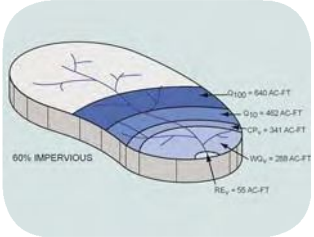

CENTER FOR WATERSHED PROTECTION

Manual 3

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Urban Subwatershed Restoration Manual No. 3

URBAN STORMWATER RETROFIT PRACTICES

Version 1.0

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Foreword

Writing this manual has been a labor of love for many current and former Center staff who have been involved in urban retrofitting in dozens of urban watersheds over the past few decades. The experience we have gained in Sligo Creek, the Kensico Reservoir, Longwell Branch, the Bronx River, Little Lick Creek, Watts Branch, Powhatan Creek, Watershed 263, and many other small watersheds have enabled us to develop and refine better methods to find, design and build retrofits faster and more cost-effectively. This manual outlines our most recent ideas on how retrofits can help restore small urban watersheds.

This manual could not have been written without the help of many retrofit experts. Special thanks are extended to Ted Brown, P.E. (Biohabitats, Inc.), Rich Claytor, P.E. (Horsley Witten Group) and Tim Schueler, P.E. (McKim and Creed) for their ongoing input on the art and science of retrofitting over the past five years. I am also indebted to current Center staff that contributed their hard won experience and knowledge to the effort: Jennifer Zielinski, Dave Hirschman, Mike Novotney and Sally Hoyt. Lisa Fraley-McNeal deserves special thanks for her great retrofit artwork and for updating our national pollutant removal database. Most of all, I am grateful to Tiffany Wright for her tireless work and dedication to quality in producing this manual and seven others in the Urban Subwatershed Restoration Manual Series.

The technical content and readability of the manual were greatly improved due to the insightful comments of Rich Claytor, Tim Schueler, Ted Brown, Dan Harper (Montgomery County DEP), and Dave Hirschman.

Also, since retrofitting is about envisioning the prospects for restoration, we want to credit the many individuals who provided photos to help visualize the process, including Lincoln Kan, City of Mississauga, Ontario; Dr. Bill Hunt, North Carolina State University; Gary Oberts, EOR, Inc.; Tim Schueler, McKim and Creed; Derek Booth, Stillwater Sciences; Roger Bannerman, Wisconsin DNR; Tom Liptan, Portland Bureau of Environmental Services; Rich Claytor, Horsley Witten Group; Martin Covington, Carroll County, MD; Sonal Sanghavi, MD State Highway Administration; Seattle SEA Streets program; and the staff of the Center for Watershed Protection.

Thanks are also due to our EPA project officer, Bryan Rittenhouse, for his support during the two years it took to produce this manual under a cooperative agreement with U.S. EPA Office of Wastewater Management (CP-83276401).

In closing, I hope our readers discover how much fun it can be to embark on the search for storage and build retrofits that improve watershed health. Good hunting!

Sincerely,

Tom Schueler
Director of Watershed Practices

About the Restoration Manual Series

Over the last four years, the Center for Watershed Protection has produced a series of 11 manuals that describes the techniques to restore small urban watersheds. The entire series of manuals was written to organize the enormous amount of information needed to restore small urban watersheds into a format that can easily be accessed by watershed groups, municipal staff, environmental consultants and other users. The contents of the manuals are organized as follows:

Manual 1: An Integrated Framework to Restore Small Urban Watersheds

The first manual, published in 2004, introduces the basic concepts and techniques of urban watershed restoration, and sets forth the overall framework we use to evaluate subwatershed restoration potential. The manual emphasizes how past subwatershed alterations must be understood in order to set realistic expectations for future restoration. Toward this end, the manual presents a simple subwatershed classification system to define expected stream impacts and restoration potential. Next, the manual defines seven broad groups of restoration practices, and describes where to look in the subwatershed to implement them. The manual concludes by presenting a condensed summary of a planning approach to craft effective subwatershed restoration plans.

Manual 2: Methods to Develop Restoration Plans for Small Urban Watersheds

The second manual was published in 2005 and contains detailed guidance on how to put together an effective plan to restore urban subwatersheds. The manual outlines a practical, step-by-step approach to develop, adopt and implement a subwatershed plan in your community. Within each step, the manual describes 32 different desktop analysis, field assessment, and stakeholder involvement methods used to make critical restoration management decisions.

Manual 3: Urban Stormwater Retrofit Practices

This manual, published in 2007, focuses on stormwater retrofit practices that can capture and treat stormwater runoff before it is delivered to the stream. The manual describes both off-site storage and on-site retrofit techniques that can be used to remove stormwater pollutants, minimize channel erosion, and help restore stream hydrology. Guidance on choosing the best locations in a subwatershed for retrofitting is provided in a series of 13 profile sheets. The manual then presents a method to assess retrofit potential at the subwatershed level, including methods to conduct a retrofit inventory, assess candidate sites, screen for priority projects, and evaluate their expected cumulative benefit. The manual concludes by offering tips on retrofit design, permitting, construction, and maintenance considerations.

Manual 4: Urban Stream Repair Practices

The fourth manual was published in 2005 and concentrates on practices used to enhance the appearance, stability, structure, or function of urban streams. The manual offers guidance on three broad approaches to urban stream repair – stream cleanups, simple repairs, and more sophisticated comprehensive repair applications. The manual emphasizes the powerful and relentless forces at work in urban streams, which must always be carefully evaluated in design. Next, the manual presents guidance on how to set appropriate restoration goals for your stream, and how to choose the best combination of stream repair practices to meet them.

The manual also outlines methods to assess stream repair potential at the subwatershed level, including basic stream reach analysis, more detailed project investigations, and priority screenings. The manual concludes by offering practical advice to help design, permit, construct and maintain stream repair practices in a series of more than 30 profile sheets.

Manual 5: Riparian Management Practices

This manual was originally envisioned to provide guidance on how to restore the quality of forests and wetlands in the stream corridor, though it was never officially completed. The Center completed several manuals from 2005 to 2007 that fully address this topic including the three parts of the *Urban Watershed Forestry Manual* and the six *Wetlands and Watersheds* articles produced for USDA and U.S. EPA, respectively.

Manual 6: Discharge Prevention Practices

The sixth manual covers practices used to prevent the entry of sewage and other pollutant discharges into the stream from pipes and spills. The manual describes a variety of techniques to find, fix and prevent these discharges that can be caused by illicit sewage connections, illicit business connections, failing sewage lines, or industrial/transport spills. The manual also briefly presents desktop and field methods to assess the severity of illicit discharge problems in your subwatershed. Lastly, the manual profiles different "forensic" methods to detect and fix illicit discharges. The Center never completed the full manual, but a major portion of the topic is covered in a 2004 manual entitled *Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessments* (Brown *et al.*, 2004)

Manual 7: Watershed Forestry Practices

The seventh manual reviews subwatershed practices that can improve the quality of upland pervious areas, which include techniques to improve conditions, revegetate pervious areas, and restore natural area remnants. When broadly applied, these techniques can improve the capacity of these lands to absorb rainfall and sustain healthy plant growth. This manual also outlines methods to assess the potential for these techniques at both the site and subwatershed scale. This manual was published under separate cover as the *Urban Watershed Forestry Manuals*.

Manual 8: Pollution Source Control Practices

Pollution source control practices reduce or prevent pollution from residential neighborhoods or stormwater hotspots. Thus, the topic of the eighth manual is a wide range of stewardship and pollution prevention practices that can be employed in subwatersheds. The manual presents several methods to assess subwatershed pollution sources in order to develop and target education and/or enforcement efforts that can prevent or reduce polluting behaviors and operations. The manual outlines more than 100 different "carrot" and "stick" options that can be used for this purpose. Lastly, the manual presents profile sheets that describe 21 specific stewardship practices for residential neighborhoods, and 15 pollution prevention techniques for control of stormwater hotspots.

Manual 9: Municipal Good Housekeeping Practices

The ninth manual, published in 2007, focuses on how municipal operations can directly support subwatershed restoration efforts. The manual contains a municipal operations analysis to help local stormwater managers target the municipal operations and activities that can improve water quality. The 10 areas include municipal hotspots, municipal construction, road maintenance, street sweeping, storm drain cleanouts, stormwater hotlines, landscaping and park maintenance, residential stewardship, stormwater maintenance, and employee training. The manual presents guidance on how municipalities can modify these 10 programs to promote subwatershed restoration goals. It presents a series of profile sheets that recommends specific techniques to implement effective municipal programs.

Manual 10: The Unified Stream Assessment (USA): A User's Manual

The Unified Stream Assessment (USA) is a rapid technique to locate and evaluate problems and restoration opportunities within the urban stream corridor. The tenth manual is a user's guide that describes how to perform the USA, and interpret the data collected to determine the stream corridor restoration potential for your subwatershed.

Manual 11: The Unified Subwatershed and Site Reconnaissance (USSR): A User's Manual

The last manual examines pollution sources and restoration potential within upland areas of urban subwatersheds. The manual provides detailed guidance on how to perform each of its four components: the Neighborhood Source Assessment (NSA), Hotspot Site Investigation (HSI), Pervious Area Assessment (PAA) and the analysis of Streets and Storm Drains (SSD). Together, these rapid surveys help identify upland restoration projects and source control to consider when devising subwatershed restoration plans.

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Chapter 1: Basics of Stormwater Retrofits

Stormwater retrofits help restore watersheds by providing stormwater treatment in locations where practices previously did not exist or were ineffective. They are typically installed within the stream corridor or upland areas to capture and treat stormwater runoff before it is delivered to receiving waters. Retrofits are the primary practice used to restore subwatersheds since they can remove pollutants, promote more natural hydrology and minimize stream channel erosion. This manual provides detailed guidance on how to effectively retrofit subwatersheds.

This chapter introduces the basics of stormwater retrofits and how they are integrated with other restoration practices to meet subwatershed objectives. Nine sections guide the design team through the search for storage by answering the following questions:

1.1 How is retrofitting different from traditional stormwater design?

1.2 What restoration objectives can be achieved by subwatershed retrofitting?

1.3 How much stormwater storage is needed in the retrofits to meet objectives?

1.4 How much storage can be found in a subwatershed to achieve this target?

1.5 What subwatershed locations are most suited for retrofit sites?

1.6 What stormwater treatment options best meet restoration objectives?

1.7 What desktop and field methods are needed to systematically find them?

1.8 How much does it cost to retrofit an entire subwatershed?

1.9 What are the best strategies to deliver multiple retrofits across a subwatershed?

Chapter 2 describes 13 different locations in a subwatershed where retrofitting may be possible. A profile sheet describes each retrofit location and presents tips on how to find candidate sites using desktop searches and how to assess them in the field. The individual profile sheets provide guidance on permitting, design, construction and delivery issues and outline methods to estimate retrofit construction costs.

Chapter 3 briefly reviews the eight major stormwater treatment options that can be employed in stormwater retrofits and presents a technique to estimate pollutant reduction at individual retrofit sites.

Chapter 4 describes how to systematically assess retrofit potential at the subwatershed level and the individual site. The chapter outlines an eight-step process to guide designers through initial retrofit scoping to final construction. Methods are presented to identify candidate sites in a subwatershed that have the greatest potential for retrofitting. The chapter describes how to perform a Retrofit Reconnaissance Investigation to generate the most feasible sites. Guidance is also provided on how to develop and rank initial concept designs for retrofit projects, and create a subwatershed retrofit inventory. The chapter concludes with general tips to support final retrofit design, construction, maintenance and evaluation.

This manual should be read in the context of several others in the *Urban Subwatershed Restoration Manual Series*, particularly:

- No. 1 An Integrated Framework to Restore Small Watersheds
- No. 2 Methods to Develop Restoration Plans for Small Urban Watersheds
- No. 4 Urban Stream Repair Practices
- No. 7 Watershed Forestry Practices
- No. 8 Pollution Source Control Practices

1.1 Why Retrofitting is Different

Most retrofit designers have some prior experience designing new stormwater practices. It is important, however, to note the many ways that retrofit design differs from the design of new stormwater treatment practices (Table 1.1). Retrofitting requires a different way of thinking; it requires sleuthing skills to determine what can work at highly constrained sites. Designers need to simultaneously envision restoration possibilities and anticipate potential problems. Designers must be extremely creative to find and design effective stormwater solutions within the built environment that produce desired subwatershed results.

The design, permitting and construction of retrofits are almost always more complex, expensive and time consuming than new stormwater practices. Also, since most projects are sponsored by the public sector, they must meet high standards for performance, community benefit and appearance. Designers should seek to maximize restoration objectives and not merely design toward a rule. The ethical bar for retrofit design is also higher – designers must ensure that their proposed retrofit adds to watershed function and does not impair existing wetlands, streams and forests. The goal is not just to get approval for a development project or secure a stormwater permit, but rather to create a project that will look good, perform well for many decades, and have a reasonable maintenance burden.

1.2 Restoration Objectives for Stormwater Retrofits

The retrofit process begins with a diagnosis of how subwatershed development is currently degrading stream quality. The reader should consult Manual 1 for an extended discussion of the Impervious Cover Model and how it can be used to diagnose the severity of problems in a subwatershed and determine restoration potential.

Setting restoration objectives early in the retrofitting process is extremely important. Restoration objectives define the purpose of retrofitting and target the specific subwatershed problems to be solved. A good set of restoration objectives helps identify what pollutants need to be treated, how much storage is needed and where the most cost-effective locations are in the subwatershed. Communities around the country have chosen many different restoration objectives to guide their retrofitting efforts, as described below.

Fix Past Mistakes & Maintenance Problems: Traditionally, communities have used retrofits to improve their existing stormwater infrastructure (e.g., to fix drainage problems, deal with under-sized culverts, protect water and sewer lines threatened by erosion or to address chronic maintenance problems within individual stormwater practices). These infrastructure retrofits are localized to address a specific problem and are seldom done on a subwatershed-wide basis. The type of

Table 1.1: Why Retrofitting is Different from New Stormwater Design	
Urban Retrofit Practices	**New Stormwater Practices**
Construction costs are 1.5 to 4 times greater	Designers seek least costly options
Requires significant data collection	Much of the data may be borrowed from past designs
Assessment and design costs are higher	Focus on low cost design and construction
Sized to meet subwatershed restoration objectives (or best one can do)	Sized to meet local stormwater design standards
Typically installed on public land	Installed at new development projects
Urban soils often cannot support infiltration	Soils may support infiltration
Fingerprinted around existing development and infrastructure	More flexibility on where to locate practices on the site
Must be acceptable to adjacent neighbors and landowners	Aesthetics are not always a major design factor
Most are publicly maintained and the public expects that they will be	Most require private maintenance, which is not frequently performed
Not all candidate sites are feasible	Nearly all sites are made to work
Often tied into existing stormwater conveyance system	Usually creates the new stormwater conveyance system
Integrated with other restoration practices	Stand-alone practice
Public investment in watershed infrastructure	Private investment in stormwater infrastructure
Site visit is prerequisite for design	Design may occur without site visit

storage usually is tailored to solve the specific problem at the site.

Solve Chronic Flooding Problems: Another common retrofit objective is to solve flooding problems at vulnerable locations within a subwatershed. This retrofitting approach focuses on specific reaches or flood prone areas. Upstream storage retrofits may be investigated to reduce flood damage n subwatersheds that were developed prior to local stormwater or floodplain management requirements. These large retrofits are sized to provide storage for extreme flood events (e.g., 25 to 100 year peak discharge control).

Stormwater Demonstration and Education: Many communities embark on retrofitting to demonstrate new stormwater practices on public lands or promote stormwater education and stewardship. As a result, demonstration retrofits are installed on a localized rather than subwatershed-wide basis. Most demonstration retrofits are sized to treat the water quality volume and introduce new stormwater technologies. Well-designed and highly visible demonstration retrofits are a good tactic to garner greater support to finance more widespread retrofitting efforts in the future.

Trap Trash and Floatables: The objective for these retrofits is to keep trash and floatables out of receiving waters. The basic approach combines pollution prevention, storage retrofits and improved catch basins to trap trash and floatables before they enter receiving waters. Since trash is fairly easy to trap, most retrofits are sized based on a fraction of the water quality volume, although they typically require intensive maintenance after every major storm event. Retrofit programs to reduce trash have been

conducted in diverse cities such as New York City, Los Angeles, Baltimore, Albuquerque, and the District of Columbia.

Reduced Runoff Volumes to Combined Sewers: In recent years, communities have recognized that on-site retrofits can greatly reduce stormwater inputs to combined sewers, thereby reducing the frequency and size of sewage overflows in urban subwatersheds. This retrofit strategy can greatly reduce the size and cost of traditional combined sewer overflow (CSO) abatement systems such as deep tunnels or storage pipes. In many cases, on-site retrofits only need to reduce a fraction of the water quality volume to become a cost-effective technique to reduce CSOs. Rooftop treatment or disconnection is the most common approach to reduce runoff volumes, and they have been applied in diverse settings such as Philadelphia, Pittsburgh, Portland, Milwaukee, and the District of Columbia.

Renovate the Stream Corridor: This objective focuses on installing retrofits to improve the quality of a stream corridor, whether it is a greenway, stream valley park or chain of wetlands or lakes. The retrofits are located in or near the stream corridor, and are intended to improve water quality, create wetland and wildlife habitat, daylight urban streams, naturalize the stream corridor or demonstrate creative stormwater practices. Some progressive communities that have utilized retrofits to renovate the stream corridor include the Staten Island Bluebelt, Minnehaha Creek in Minneapolis, and the Rouge River in Michigan.

Reduce Pollutants of Concern: Pollutant reduction is often a primary objective of local retrofit programs. The reduction may be driven by a TMDL, a local watershed restoration plan or regional directive to reduce pollutant loads. The pollutant of concern may include sediment, nutrients, bacteria, metals and toxins. Retrofits are then systematically applied across a subwatershed to achieve a pre-designated pollutant reduction goal. Retrofits are typically sized based on a target water quality volume, although individual retrofits may be under or over-sized. Examples of communities that have retrofit subwatersheds to maximize pollutant removal include the Staten Island Bluebelt, communities in Maryland; North Carolina; Austin, TX; Santa Monica, CA; and Burlington, VT.

Systematically Reduce Downstream Channel Erosion: A few communities have sought to reduce downstream channel erosion by installing retrofits in urbanizing subwatersheds. This approach requires systematic installation of channel protection storage retrofits throughout the stream corridor. The strategy works best in impacted subwatersheds where the greater storage volume needed for channel protection can be more easily found. In recent years, this restoration objective has been linked to reduced nutrient loads derived from eroding streambanks. Two notable subwatersheds where channel protection has been a primary restoration objective include Watts Branch and Minebank Run in Maryland.

Support Stream Restoration: This objective uses upstream retrofits to provide hydrologic control to support downstream restoration projects. Individual retrofits are installed above specific stream reaches where stream restoration is planned. The retrofits may provide recharge, water quality and/or channel protection, depending on the specific design needs of the downstream project. The retrofits regulate the volume, duration, frequency, or peak discharge of stormflow, thereby creating a more stable

and predictable hydrologic regime for the new stream (see Manual 4). The long-term success of many stream repair restoration projects is contingent on effective upstream retrofits. Notable examples of paired retrofit/stream repair projects on individual streams include Accotink Creek, VA, and Watts Branch, Longwell Branch and Wheaton Branch (MD).

Comprehensive Watershed Restoration: The ideal objective is a comprehensive approach to restore subwatersheds that integrates retrofits in the context of other stream repair, riparian reforestation, discharge prevention, upland reforestation, pollution source control and improved municipal practices (Manual 1).

1.3 Rainfall, Runoff and Retrofits

Once core retrofit objectives are selected, they need to be translated into subwatershed sizing criteria. For this reason, the retrofit team must understand the relationship between rainfall, runoff and retrofits in their community. Retrofitting is fundamentally driven by the distribution of rainfall events. This section introduces the concept of the rainfall frequency spectrum, and how it can be used to define the target runoff volumes for retrofitting.

In the course of a year, many precipitation events occur within a community. Most events are quite small but a few can be several inches deep. A rainfall frequency spectrum describes the average frequency of the depth of rainfall events that occur during a normal year (adjusted for snowfall). Figure 1.1 provides an example of a typical rainfall frequency spectrum that shows the percent of rainfall events that are equal to or less than the indicated rainfall depth. As can be seen, the majority of storms are relatively small but a sharp upward inflection point occurs at about one-inch of rainfall.

The rainfall frequency spectrum outlines five different zones that define targets for different stormwater treatment objectives, as follows:

Recharge: targets rainfall events that create little or no runoff but contribute much of the annual groundwater recharge at a site (denoted as **Rev**)

Water Quality: targets rainfall events that deliver the majority of the stormwater pollutants during the course of a year (denoted as **WQ**v**)**

Channel Protection: targets storms that generate bankfull and sub-bankfull floods that cause stream channel enlargement (denoted as **Cpv**)

Overbank Floods: targets large and infrequent storm events that spill over to the floodplain and cause damage to infrastructure and streamside property (denoted as $\mathbf{Qp_{10}}$).

Extreme Storms: controls the largest, most infrequent and most catastrophic floods that threaten structures and public safety (e.g., commonly known as the 100-year storm; denoted as $\mathbf{Qp_{100}}$).

In general, retrofitting focuses on the lower end of the rainfall frequency spectrum (i.e., managing runoff for recharge, water quality and channel protection). Subwatershed retrofitting to control overbank floods or extreme storms is rarely attempted since it is hard to get enough retrofit storage to manage runoff at this end of the spectrum. As a result, flood mitigation projects are normally installed to prevent problems

within a specific flood-prone reach and not on a subwatershed-wide basis.

This manual primarily focuses on water quality treatment, although reference is often made to runoff reduction and channel protection. Table 1.2 illustrates the geographic variability in the rainfall frequency spectrum across the nation. The retrofit team can use the table to develop localized retrofit sizing criteria or they can derive their own rainfall frequency spectrum using the guidance presented in Table 1.3.

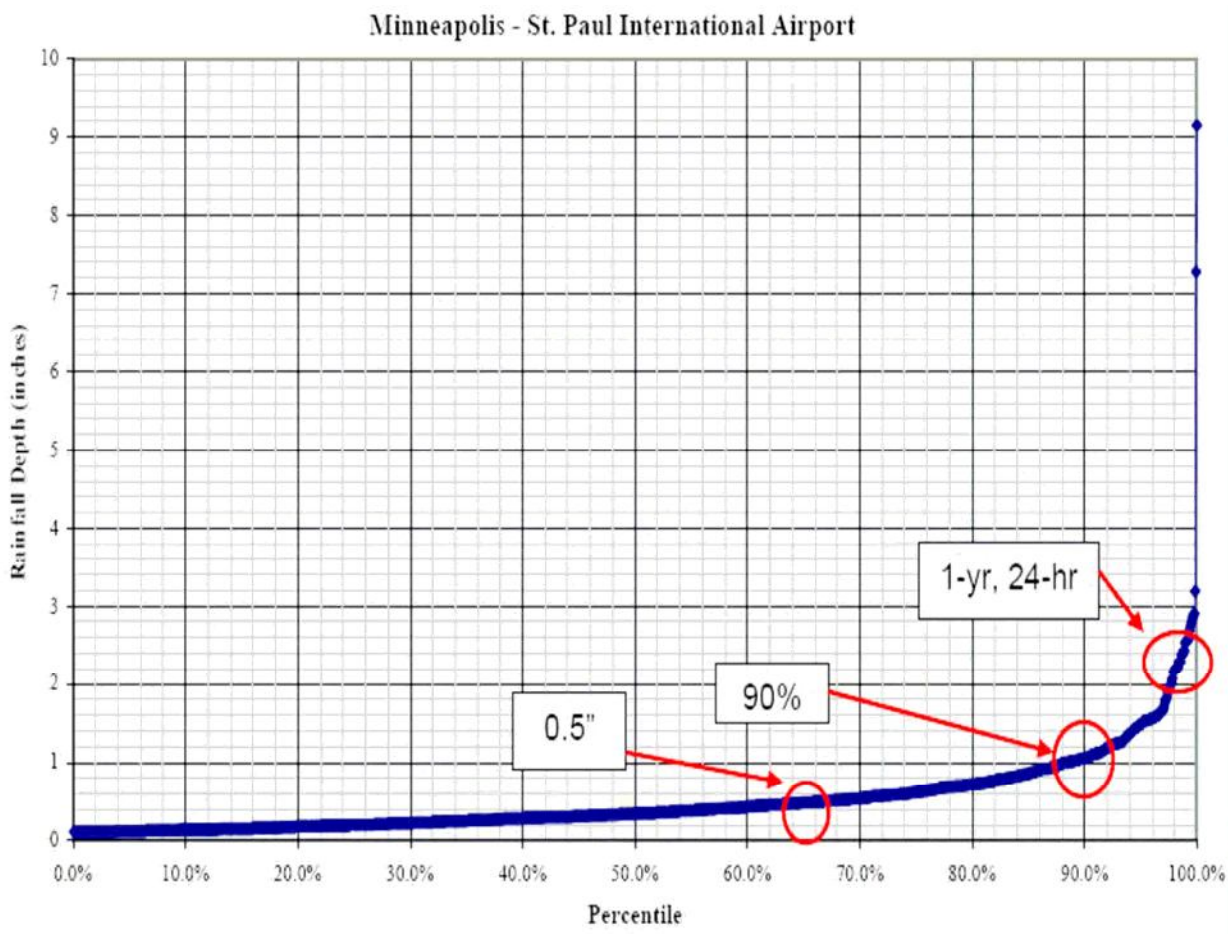

Figure 1.1: Rainfall Frequency Spectrum for Minneapolis-St. Paul Airport, 1971-2000

Table 1.2: Rainfall Statistics and Frequency Spectrum Data for Select US Cities

City	Precipitation		Rainfall event: Depth in inches[1]				
	Annual Inches	Days[2]	50%	75%	90%[3]	95%	99%[4]
Atlanta, GA	50	77	0.5	0.9	1.6	2.1	3.4
Knoxville, TN	48	85	0.4	0.7	1.2	1.5	2.4
New York City, NY	44	74	0.4	0.7	1.2	1.7	2.7
Greensboro, NC	43	73	--	--	1.6	--	2.7
Boston, MA	43	76	0.4	0.6	1.2	1.6	2.6
Baltimore, MD	42	71	0.4	0.8	1.2	1.6	2.5
Buffalo, NY	41	88	0.3	0.5	0.8	1.1	1.8
Washington, DC	39	67	0.4	0.8	1.2	1.7	2.4
Columbus, OH	39	79	0.3	0.6	1.0	1.3	2.1
Kansas City, MO	38	63	0.4	0.7	1.1	1.7	3.2
Seattle, WA	37	90	--	--	1.3	1.6	1.7
Burlington, VT	36	79	0.3	0.5	0.8	1.1	1.7
Dallas, TX	35	32	--	--	1.1	--	3.2
Austin, TX	34	49	--	--	1.4	--	3.2
Minneapolis, MN	29	58	0.3	0.6	1.0	1.4	2.4
Coeur D'Alene, ID	26	88	0.2	0.3	0.5	0.7	1.1
Salt Lake City, UT	17	44	0.2	0.4	0.6	0.8	1.2
Denver, CO	16	37	--	--	0.7	--	--
Los Angeles, CA	13	22	--	--	1.3	--	--
Boise, ID	12	38	--	--	0.5	--	--
Phoenix, AZ	8	29	--	--	0.8	--	1.1
Las Vegas, NV	4	10	--	--	0.7	--	0.8

Notes: Dashed lines indicate no data available to compute.

1. Excludes rainfall depths of 0.1 inches or less
2. Average days per year with measurable precipitation
3. The 90% storm is frequently used to define the water quality volume
4. The 99% storm is equivalent to the one year storm and is used to define the channel protection volume.

Table 1.3: How to Create a Local Rainfall Frequency Spectrum (RFS)

1. Obtain a long-term rainfall record from adjacent weather station (daily precipitation is fine, but try to obtain at least 30 years of daily record). NOAA has several websites with long-term rainfall records (See http://ols.nndc.noaa.gov)

2. Edit out small rainfall events than are 0.1 inch or less (also edit out snowfall events that do not immediately melt)

3. Using a spreadsheet or simple statistical package, analyze the rainfall time series and develop a frequency analysis to determine the percentage of rainfall events greater than or equal to a given numerical value (e.g., 0.2, 0.5, 1.0, 1.5 inches, etc).

4. Construct a curve showing rainfall depth versus frequency, and create a table showing rainfall depths values for 50, 75 90, 95 and 95% frequencies.

5. Use the data to define the recharge (20-50%), water quality event (90%) and one-year storm (99%).

Notes: *If a community is large or has considerable variation in elevation or aspect, the RFS analysis should be conducted at multiple stations. Other regional and national rainfall analysis such as TP-40 (NOAA) or USGS should always be used for rainfall depths or intensity greater than one-year in return frequency (e.g., 2, 5, 10, 25, 50 or 100 year design storm recurrence intervals)*

The rainfall frequency spectrum provides a strong basis to set targets for the desired water quality, runoff reduction or channel protection volume to seek in a subwatershed, as described below:

Setting Water Quality Volume Targets for Retrofitting: The water retrofit goal is to capture and treat the 90% storm, as defined by the local rainfall frequency spectrum. This criterion optimizes runoff capture resulting in high load reduction for many stormwater pollutants. The rainfall depth associated with the 90% storm varies geographically, but typically ranges between 0.8 and 1.2 inches for most parts of the country (see Table 1.2). Once the water quality storm has been selected, it is relatively easy to define the retrofit storage volume needed at both the site and subwatershed scale using the data provided in Table 1.4.

Several practical implications arise when setting the water quality target volume for a subwatershed - particularly when it comes to finding enough retrofit sites to meet it. In general, when the target volume is large, fewer retrofit sites can be found that have adequate space to capture and treat it. An optimization point exists between the target volume and expected number of retrofit locations, as shown in Figure 1.2.

One curve shows how the fraction of subwatershed treatment increases when the capture volume becomes progressively greater. The second curve shows how the number of feasible retrofit sites declines as a function of a higher capture volume. An optimization point exists in most subwatersheds where the two curves intersect. The retrofit optimization point also reflects the degree of subwatershed impervious cover- shifting towards 0.25 inches in highly developed subwatersheds and as much as 1.25 inches in lightly developed ones. This optimization point is an important factor to define early in the retrofit scoping process.

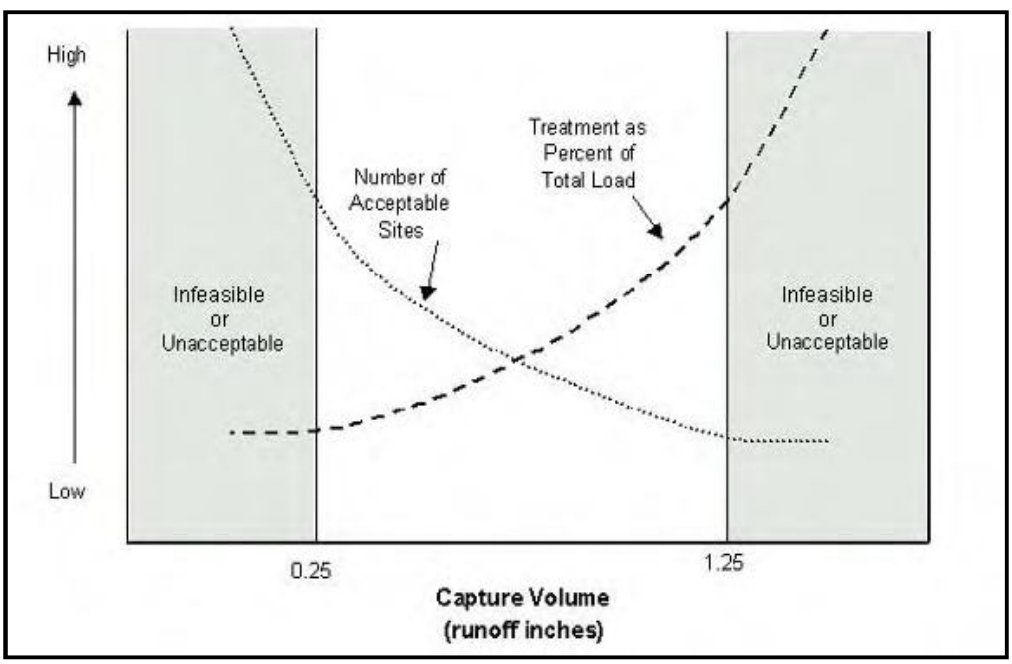

Figure 1.2: Optimization point for retrofit treatment.

Table 1.4: An Estimate of WQv for Select US Cities (in order of descending annual rainfall)

City	90% Rainfall Event (in.)	Subwatershed Imperviousness (%)			
		10%	30%	60%	90%
		WQv (cubic feet/acre)[1]			
Atlanta, GA	1.6	813	1,859	3,427	4,995
Greensboro, NC	1.6	813	1,859	3,427	4,995
Austin, TX	1.4	711	1,626	2,998	4,371
Seattle, WA	1.3	661	1,510	2,784	4,058
Los Angeles, CA	1.3	661	1,510	2,784	4,058
Knoxville, TN	1.2	610	1,394	2,570	3,746
New York City, NY	1.2	610	1,394	2,570	3,746
Boston, MA	1.2	610	1,394	2,570	3,746
Baltimore, MD	1.2	610	1,394	2,570	3,746
Washington, DC	1.2	610	1,394	2,570	3,746
Kansas City, MO	1.1	559	1,278	2,356	3,434
Dallas, TX	1.1	559	1,278	2,356	3,434
Columbus, OH	1.0	508	1,162	2,142	3,122
Minneapolis, MN	1.0	508	1,162	2,142	3,122
Buffalo, NY	0.8	407	929	1,713	2,497
Burlington, VT	0.8	407	929	1,713	2,497
Phoenix, AZ	0.8	407	929	1,713	2,497
Denver, CO	0.7	356	813	1,499	2,185
Las Vegas, NV	0.7	356	813	1,499	2,185
Salt Lake City, UT	0.6	305	697	1,285	1,873
Coeur D'Alene, ID	0.5	254	581	1,071	1,561
Boise, ID	0.5	254	581	1,071	1,561

[1] The WQv values provided above were estimated based on the methodology presented in Table 1.3 and the depth of rainfall associated with the 90% events shown in Table 1.2.

Setting Runoff Reduction Volume Targets: The target storage volume for runoff reduction ranges from 20 to 50% of the target WQv and can be attained through canopy interception, rooftop disconnection, infiltration, rainwater harvesting, evaporation or long-term storage. The specific target volume for runoff reduction is defined based on local subwatershed characteristics, and the desired degree of CSO relief, groundwater recharge or baseflow maintenance. Runoff reduction volumes are deceptively low in comparison to other target volumes. Designers should be aware that most storage retrofits do not reduce much runoff volume, so that dozens or even hundreds of small on-site retrofits may be needed to achieve runoff reduction objectives.

Setting Channel Protection Volume Targets: The recommended channel protection criterion is 24 hours of extended detention for the runoff generated by the 1-year 24-hour design storm. This is generally equivalent to the rainfall depth for the 99% storm depicted in Table 1.2. Runoff is stored and gradually released over a 24-hour period so that critical erosive velocities in downstream channels are not exceeded during the entire storm hydrograph. As a very rough rule, the storage capacity needed to provide channel protection is about 60% of the one-year storm runoff volume. Designers will normally need to

define actual channel protection volumes using hydrologic and hydraulic models that simulate specific channel conditions and subwatershed characteristics (See Appendix C for further guidance).

Channel protection storage generally exceeds the water quality storage volume by 20 to 40% in most regions of the country (Figure 1.3). There are some interesting exceptions where Cpv storage is actually less than the WQv storage – most notably in arid and semi-arid regions and the Pacific Northwest where rainfall events are frequent but not particularly intense. It may seem counterintuitive that the Cpv could ever be higher than the WQv, since the rainfall depth associated with the 99% storm must always be greater than the 90% storm. The key difference is in the different way the *treatment volume* is defined for each kind of storage. The WQv is defined as 100% of the runoff volume produced by the 90% rain depth; whereas the Cpv is estimated as 60% of the runoff volume produced for the 99% rain depth.

Both WQv and Cpv storage may be needed to attain certain subwatershed objectives, which effectively doubles the total storage volume needed. The best conditions to find enough channel protection storage are in sensitive or impacted subwatersheds that have a high existing pond density and/or abundant public land in stream corridors. In many cases, channel protection treatment is not possible for the subwatershed as a whole, but may be feasible for individual stream reaches where stream repairs are being proposed.

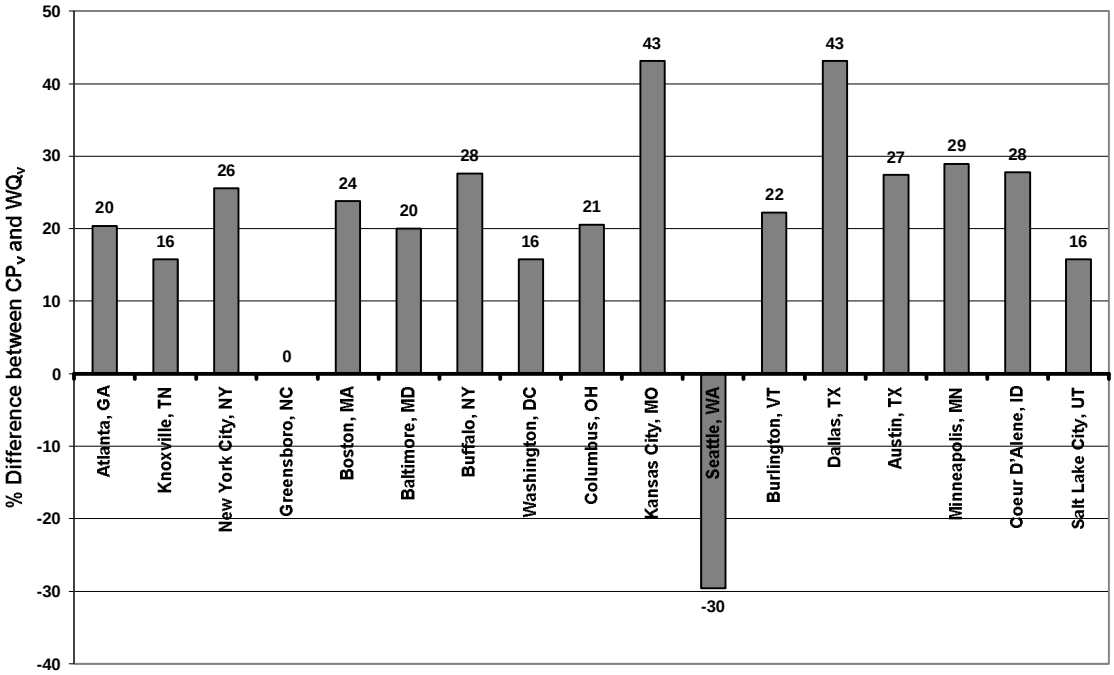

Figure 1.3: Difference in CPv storage and WQv storage for select U.S. cities.

1.4 The Search for Subwatershed Storage

Subwatershed treatment is an important concept when assessing retrofit potential. Designers need to calculate the total water quality treatment volume needed to meet the restoration objectives. The feasibility of capturing and treating this volume will be different in every subwatershed. Conceptually, subwatershed treatment is represented by the following equation:

Total volume = Storage retrofits + on-site retrofit storage + future redevelopment treatment

The redevelopment term reflects future opportunities to provide stormwater treatment within the subwatershed as land is redeveloped. While redevelopment is not an explicit component of the retrofitting process, it is important to update existing stormwater criteria to take advantage of these long-term opportunities to install new treatment.

The challenge of retrofitting is to find enough storage to make a real difference in a subwatershed. The estimated storage needed for a 5,000 acre subwatershed as a fraction of impervious cover can be seen in Figure 1.4. The required storage volume can consume a significant percentage of subwatershed area, particularly when channel protection and flood control storms are being managed.

Retrofitting becomes more and more difficult and costly to pursue as subwatershed imperviousness increases. At lower levels of impervious cover, it is generally possible to find needed storage volumes for water quality and, sometimes, channel protection. Available land to provide water quality and/or channel protection is harder to come by at higher levels of subwatershed impervious cover (45-60%).

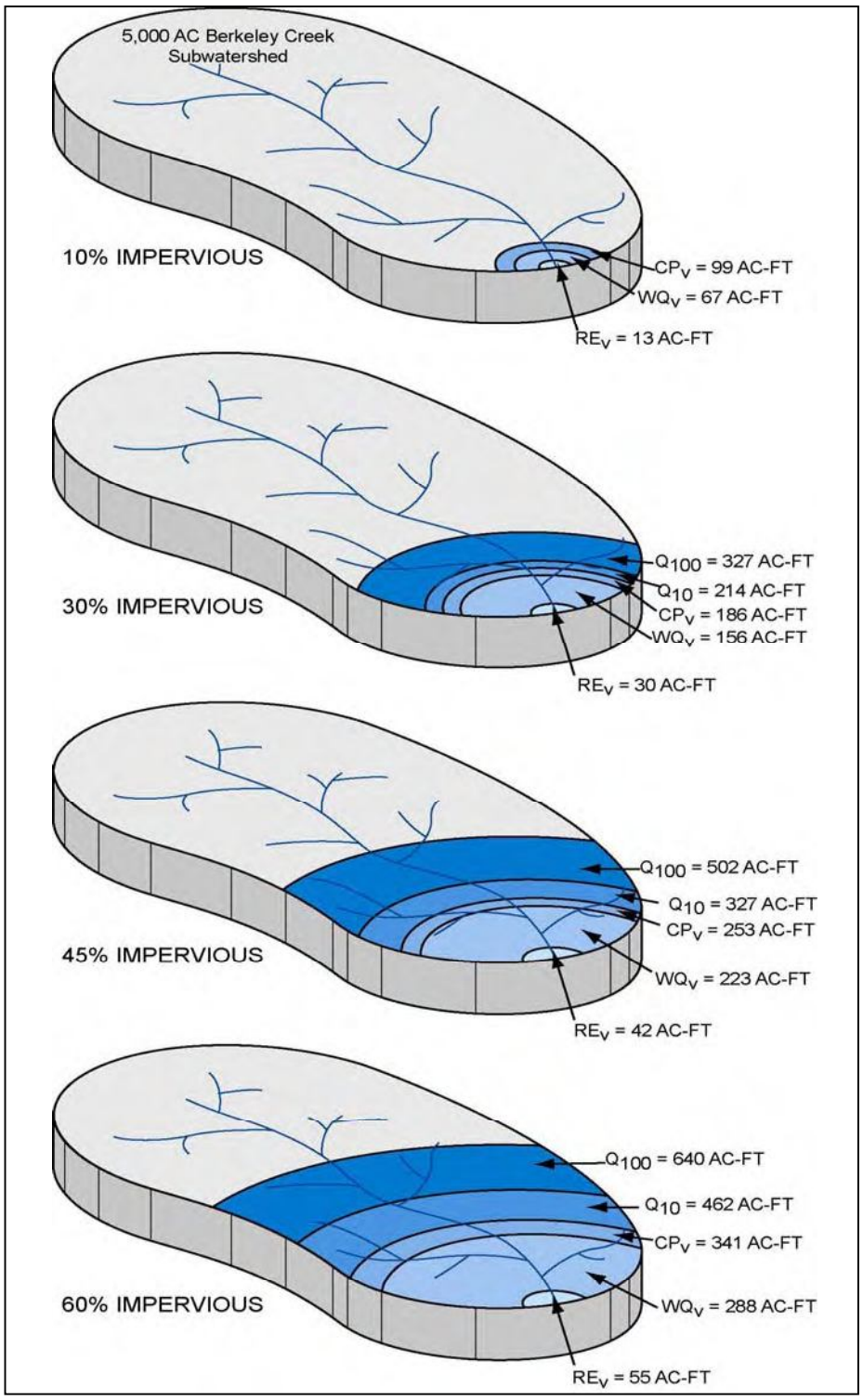

Figure 1.4: The Range of Retrofit Opportunities and Goals as a Function of Impervious Cover
(Note: Areas shown reflect one-foot depth of treatment)

1.5 The Range of Retrofit Practices

Retrofits can be classified by the amount of subwatershed area they treat. *Storage retrofits* treat drainage areas ranging from five to 500 acres. By contrast, *on-site* residential retrofits may individually treat as little as 500 square feet of contributing drainage area. On-site, non-residential retrofits normally treat less than five acres of contributing drainage area, and frequently less than one.

Storage and on-site retrofits represent two different approaches to attain treatment storage and involve different design and assessment methods (Table 1.5). As a general rule, storage retrofits are the most cost-effective approach to meet most subwatershed restoration objectives, although both retrofit approaches may be needed to get the desired level of subwatershed treatment.

Storage Retrofit Classification: Storage retrofits are classified using common locations in a subwatershed where large storage volumes can be found (Figure 1.5). The six major storage retrofit locations are described in detail in Table 1.6. Most storage retrofits are located on publicly owned or controlled land, and rely on some combination of extended detention, wet pond, constructed wetland or bioretention for stormwater treatment.

On-Site Retrofit Classification: On-site retrofits are classified based on the type or location of impervious area they treat, such as individual rooftops, small parking lots, streets, stormwater hotspots and other small impervious areas (Figure 1.6). The seven on-site retrofit locations are described in Table 1.7. On-site retrofits treat the quality and/or reduce the volume of runoff generated by small urban source areas and rely on bioretention, filtering, infiltration, swales or rooftop treatment. On-site retrofits are an effective strategy in ultra-urban subwatersheds that lack space for storage retrofits, and can also provide excellent opportunities to improve public awareness and involvement. Most on-site retrofits are normally installed on private land but involve some form of public delivery.

Table 1.5: Two Different Approaches to Retrofitting

Storage Retrofits	On-site Retrofits
Serve 5 to 500 acres	Serve 0.1 to 5 acres
Generally constructed on public land	Generally constructed on private land
May need dozens in a subwatershed	May need hundreds in subwatershed
Assessed at subwatershed scale	Assessed at catchment/neighborhood scale
Moderate cost per impervious acre treated	High cost per impervious acre treated
Impractical in ultra urban areas	Practical in ultra urban areas
Permitting can be extensive	Few permits are needed
Can provide all stormwater targets	Only provide recharge and water quality
Public construction	Public delivery
Utilize ED, wet pond, and wetlands	Rely on bioretention, filtering, infiltration, swales and other treatment practices

Figure 1.5: Six different storage retrofit options can be used.

Table 1.6: The Six Most Common Storage Retrofit Locations in a Subwatershed	
Where to Look	**How to Get Storage**
SR-1 **Add** **Storage to Existing Ponds**	Add water quality treatment storage to an existing pond that lacks it by excavating new storage on the pond bottom, raising the height of the embankment, modifying riser elevations/dimensions, converting unneeded quantity control storage into water quality treatment storage and/or installing internal design features to improve performance
SR-2 **Storage Above Roadway Culverts**	Provide water quality storage immediately upstream of an existing road culvert that crosses a low gradient, non-perennial stream without wetlands. Free storage is created by adding wetland and/or extended detention treatment behind a new embankment just upstream of the existing roadway embankment
SR-3 **New** **Storage Below Outfalls**	Flows are split from an existing storm drain or ditch and are diverted to a stormwater treatment area on public land in the stream corridor. Works best for storm drain outfalls in the 12- to 36- inch diameter range that are located near large open spaces, such as parks, golf courses and floodplains.
SR-4 **Storage** **in Conveyance System**	Investigate the upper portions of the existing stormwater conveyance system to look for opportunities to improve the performance of existing swales, ditches and non-perennial streams. This can be done either by creating in-line storage cells that filter runoff through swales and wetlands or by splitting flows to off-line treatment areas in the stream corridor
SR-5 **Storage in Road Right of Ways**	Direct runoff to a depression or excavated stormwater treatment area within the right of way of a road, highway, transport or power line corridor. Prominent examples include highway cloverleaf, median and wide right of way areas.
SR-6 **Storage** **Near Large Parking Lots**	Provide stormwater treatment in open spaces near the downgradient outfall of large parking lots (5 acres plus).

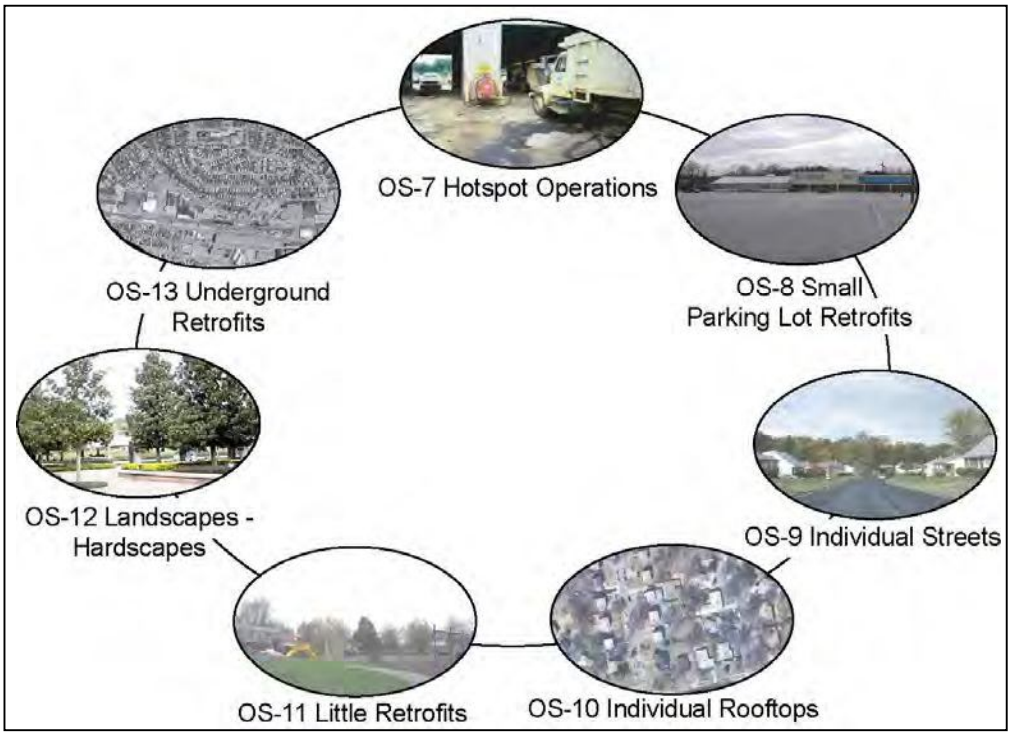

Figure 1.6: These seven retrofit options are available for on-site treatment.

Table 1.7: The Seven Most Common On-Site Retrofit Locations in a Subwatershed

Where	How
OS-7 **Hotspot Operations**	Install filtering or bioretention treatment to remove pollutants from confirmed or severe stormwater hotspots discovered during field investigation
OS-8 **Small Parking Lots**	Insert stormwater treatment within or on the margins of small parking lots (less than five acres). In many cases, the parking lot is delineated into a series of smaller on-site treatment units.
OS-9 **Individual Streets**	Look for opportunities with the street, its right of way, cul-de-sacs and traffic calming devices to treat stormwater runoff before it gets into the street storm drain network
OS-10 **Individual Rooftops**	Disconnect, store and treat stormwater runoff generated from residential and commercial rooftops close to the source.
OS-11 **Little Retrofits**	Convert or disconnect isolated areas of impervious cover and treat runoff in an adjacent pervious area using low tech approaches such as a filter strip
OS-12 **Hardscapes Landscapes**	Reconfigure the plumbing of high visibility urban landscapes, plazas and public spaces to treat stormwater runoff with landscaping and other urban design features.
OS-13 **Underground**	Provide stormwater treatment in an underground location when no surface land is available for surface treatment. Use this as a last resort at dense ultra-urban sites.

1.6 Stormwater Treatment Options for Retrofitting

Eight different stormwater treatment options can be used for retrofitting (Figure 1.7). Each treatment option differs greatly in its pollutant removal capability, hydrologic benefit and retrofit suitability. More detailed information about each stormwater treatment option can be found in Chapter 3 and Appendix I. Some of the basic differences are compared in Table 1.8.

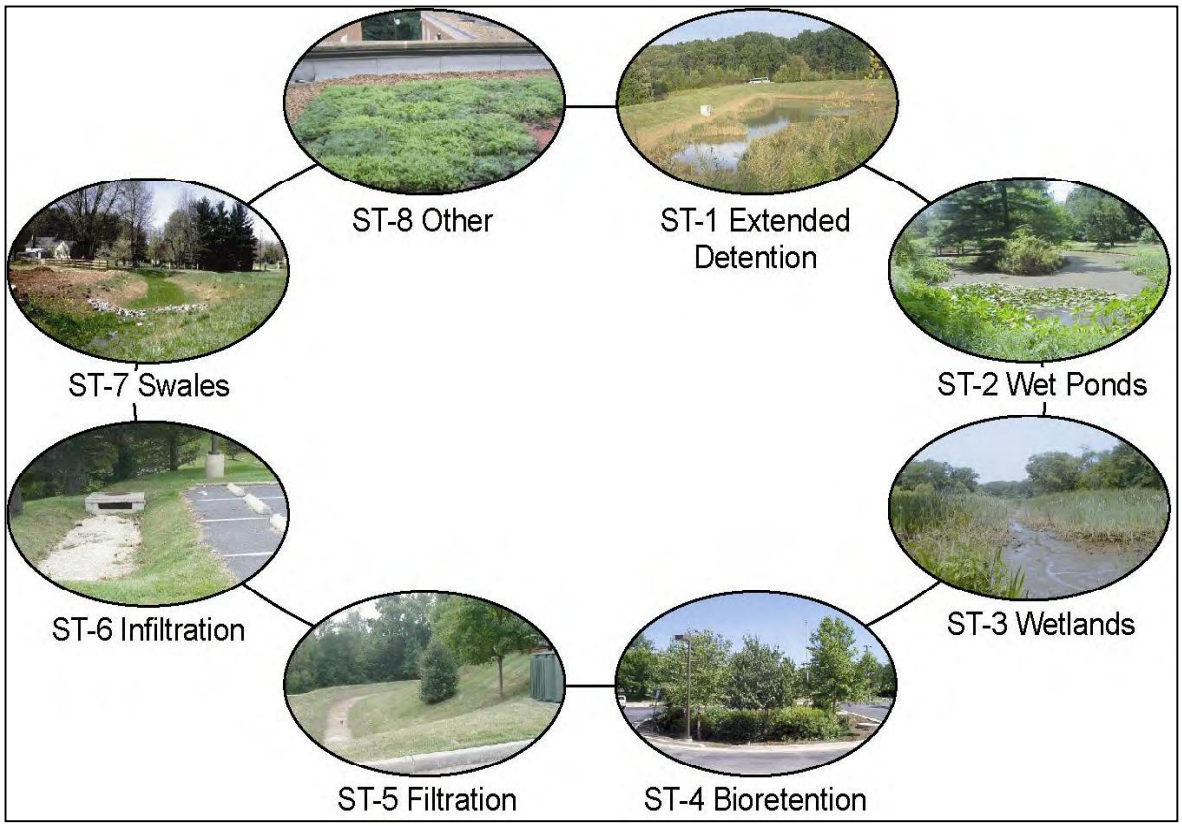

Figure 1.7: Eight stormwater treatment options are available for retrofitting.

Table 1.8: Stormwater Treatment Options for Retrofitting	
Stormwater Treatment Option	**How it Works**
ST-1 **Extended Detention**	This option relies on 12 to 24 hour detention of stormwater runoff after each rain event within a pond, with portions of the pond drying out in between storm events. Extended detention (ED) allows pollutants to settle out, and if enough storage is available, can also provide downstream channel protection.
ST-2 **Wet Ponds**	Wet ponds consist of a permanent pool of standing water. Runoff from each new storm enters the pond and partially displaces pool water from previous storms. The pool also acts as a barrier to re-suspension of sediments and other pollutants removed during prior storms.
ST-3 **Constructed Wetlands**	Constructed wetlands are shallow depressions that receive stormwater for treatment. Runoff from each new storm displaces runoff from previous storms, and the residence time of several days to weeks allows multiple pollutant removal processes to operate.
ST-4 **Bioretention**	Bioretention is an innovative urban stormwater practice that uses native forest ecosystems and landscape processes to enhance stormwater quality. Bioretention areas capture sheet flow from impervious areas and treat the stormwater using a combination of microbial soil processes, infiltration, evapotranspiration, and plants.
ST-5 **Filtering Practices**	Filter practices function by filtering runoff through an engineered media and collecting treated runoff in an underdrain. The media may consist of sand, soil, compost, or a combination of these.
ST-6 **Infiltration Practices**	An infiltration trench is a rock-filled chamber with no outlet that receives stormwater runoff. Stormwater runoff passes through some combination of pretreatment measures, such as a swale or sediment basin, before entering the trench where it infiltrates into the soil.
ST-7 **Swales**	Swales are a series of engineered, vegetated, open channel practices that are designed to treat and attenuate stormwater runoff for a specified water quality volume.
ST-8 **Other Retrofit Treatment**	These on-site practices provide treatment of roof runoff using rain gardens, rain barrels, green roofs, cisterns, stormwater planters, dry wells, or permeable pavers.

1.7 Basic Steps in Stormwater Retrofitting

An eight step process is recommended to systematically search for retrofit storage in a subwatershed (Figure 1.8). The process begins with retrofit scoping and concludes with maintenance of the constructed retrofit. Chapter 4 provides more information on each step of the retrofit process.

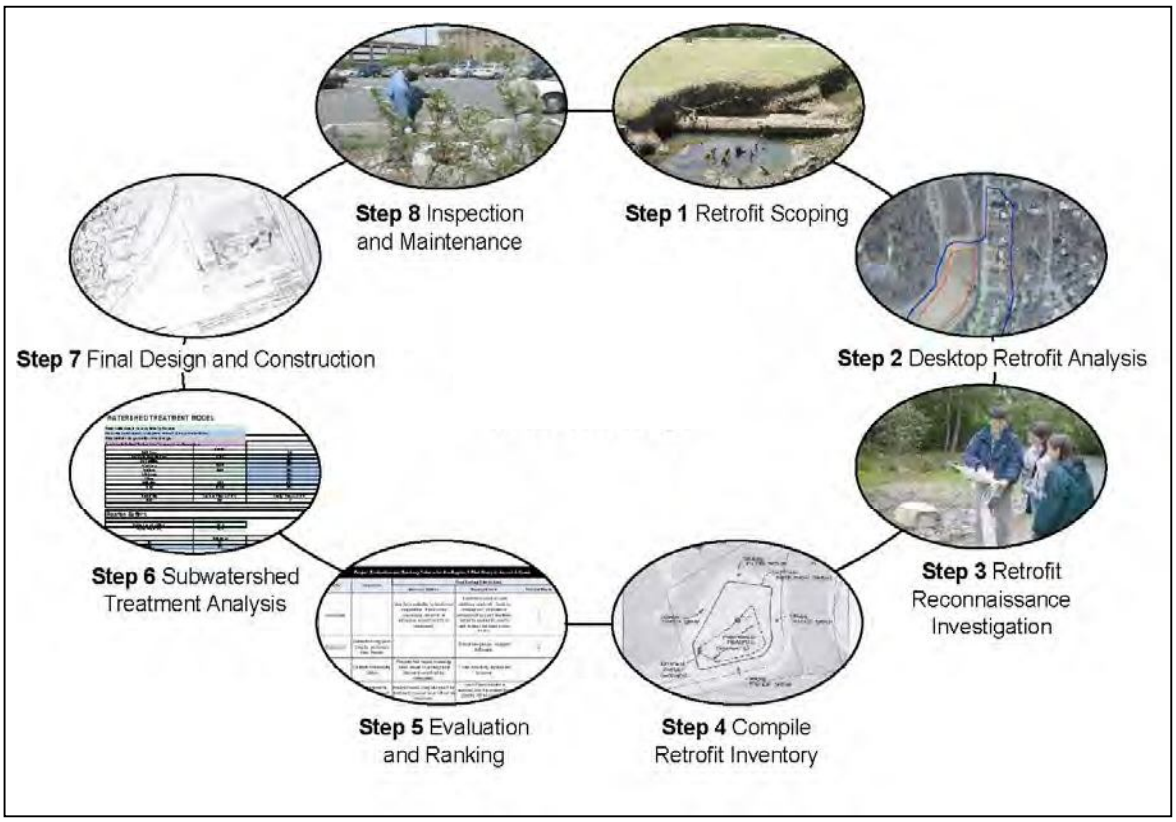

Figure 1.8: The eight basic steps of the stormwater retrofitting process.

1.8 Retrofit Economics

The first generation of retrofits primarily focused on demonstrating that retrofits could achieve restoration objectives, with little attention devoted to finding the least costly restoration solution. The next generation of retrofits, however, will need to demonstrate that they represent the most cost effective solution to the restoration problem they are designed to address. Appendix E contains an analysis of construction cost data from nearly 100 retrofit projects installed around the country. Some key findings on retrofit economics from the 2006 cost survey are shared below.

Retrofitting can be a costly enterprise. The cost to construct retrofits is 1.5 to 4 times greater than the cost to construct stormwater practices at new development sites. The extra costs for retrofits are related to site constraints, higher excavation costs, greater design complexity, more construction contingencies, additional engineering studies, enhanced landscaping and the experimental nature of many designs. Given that many retrofits are prototypes, it is expected that unit costs may decline in the future as contractors gain more familiarity with them.

There may be rare instances when retrofit costs can be based on new practice cost equations, but only when: land is abundant to provide maximum flexibility in site layout, site topography is such that a neutral earth balance can be attained and no major investments are contemplated for special plumbing, environmental permits, utility relocation or major landscaping. Appendix I presents new practice cost equations for retrofit sites that meet these rare conditions.

Figure 1.9 compares the median and quartile range in base construction cost for 18

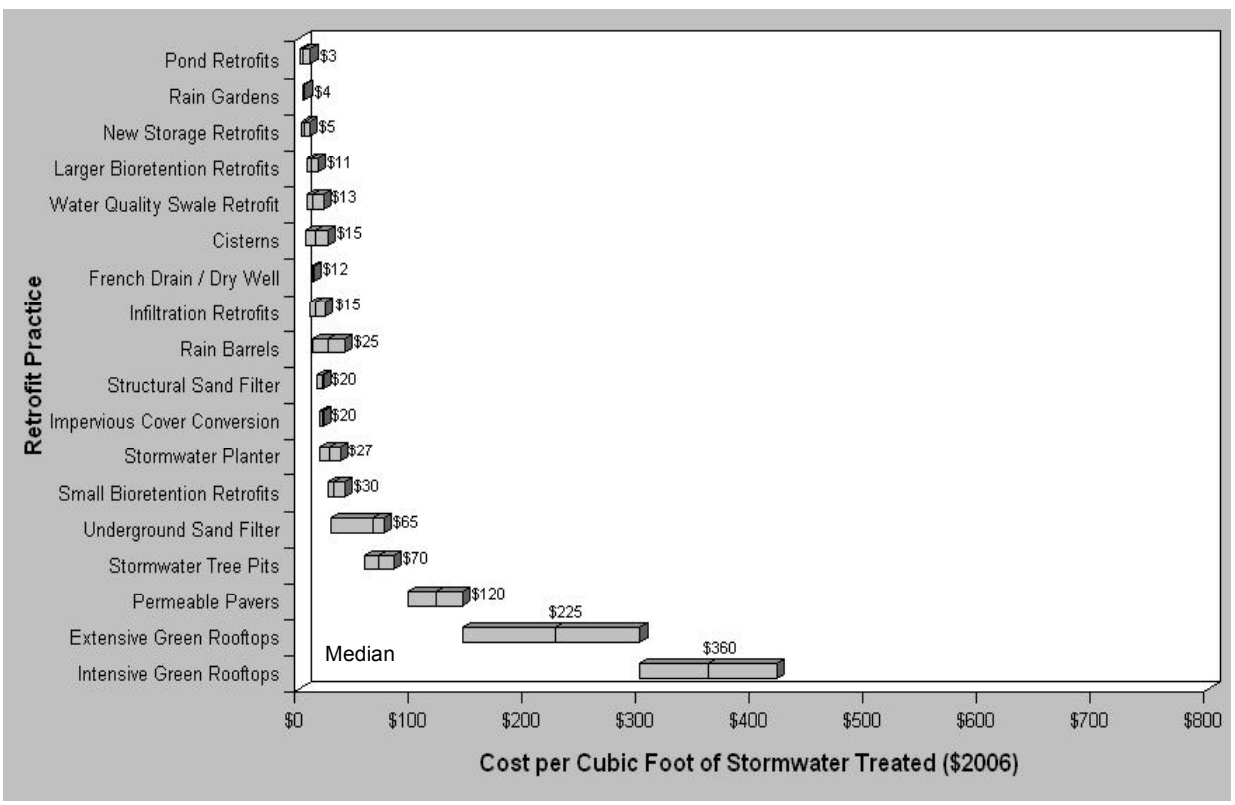

Figure 1.9: Range of base construction costs for various retrofit options.
(Note: Boxes show 25% and 75% quartiles; the line represents the median)

different retrofit techniques. As can be seen, pond retrofits, rain gardens and new storage retrofits are the least expensive to construct, whereas ultra-urban techniques such as underground filters, tree pits, permeable pavers and green rooftops are the most expensive. The design team should carefully review these unit costs during initial scoping to ensure they are targeting the most cost-effective retrofits in a subwatershed.

Storage retrofits are generally more cost-effective than on-site retrofits, primarily due to economies of scale related to the large drainage areas they treat. In general, retrofits serving the smallest drainage areas tend to have the greatest unit cost. This finding suggests that designers should try to exhaust all possibilities for storage retrofits in a subwatershed before they embark on an on-site retrofit approach.

Construction costs for the same retrofit technique can vary by two orders of magnitude. For example, the unit construction cost for the least and most expensive pond retrofits ranged from $1,350 to $107,000 per impervious acre treated. An even wider range was reported for bioretention retrofits ($2,000 to $327,000 per impervious acre). Designers should always look for key factors that can drive up the cost of retrofitting when they evaluate individual retrofit sites. A refined approach to calculate accurate cost estimates for individual retrofit projects is described in Appendix E.

The design and engineering (D&E) costs for both on-site and storage retrofits ranges from 32 to 40% of base construction cost (higher end when environmental permits must be secured). Total D&E costs for retrofits are higher than new stormwater practices, given their higher base construction costs. Land acquisition costs for all storage retrofits are assumed to be zero since they are generally constructed on public land. However, land acquisition costs must be added if land rights or easement need to be secured to build a project. On-site retrofits also have a hidden cost to persuade owners to install them on private land. The program cost to promote and deliver on-site retrofits may rival actual construction costs. Lastly, the retrofit costs shown here do not include the cost to find, assess and rank retrofits at the subwatershed level (see Chapter 4 for unit costs and scoping guidance).

The most important number is the aggregate cost to construct retrofits across an entire subwatershed. Returning to the 5,000 acre subwatershed example, assume that 70% retrofit coverage is desired. If it is further assumed that storage retrofits are used to obtain 80% of the subwatershed treatment and on-sites for the remainder, it is possible to get a sense of the number and cost of retrofits needed for the subwatershed (Table 1.9). At 10% subwatershed impervious cover, the retrofit bill is nearly $7 million and climbs to $20 to 40 million at higher levels of subwatershed impervious cover. While most communities spread out this investment over 5 or 10 years, it clearly underscores the need to devise creative retrofit delivery strategies to get the job done.

Table 1.9: Long Term Costs to Retrofit a 5,000 Acre Subwatershed				
Subwatershed Impervious Cover	**Impervious Acres Treated**	**Number of retrofits required**	**Base Construction Costs**	**Total Restoration Cost**
10%	353	OS = 141 SR = 6	$1,582,500 $3,579,000	$6,700,000
30%	1,088	OS = 435 SR =17	$4,892,500 $10,965,000	$20,600,000
45%	1,650	OS = 660 SR = 26	$7,425,000 $16,740,000	$31,400,500
60%	2,194	OS = 878 SR = 35	$9,900,000 $22,000,000	$41,500,000

Assumptions:
- 50 acres treated per storage retrofits and 0.5 acre treated per on-site retrofit
- 70% of the entire subwatershed area to be retrofit
- 80% of the watershed is treated by storage retrofits; 20% is treated with on-site retrofits
- Storage retrofits are equally split between pond retrofits and new facilities
- 25% of on-sites are on residential land and 75% are non-residential sites.
- Cost per impervious acre treated are: $9,500 for pond retrofits; $15,500 for new storage facilities; $15,000 for residential on-sites; $25,000 for non-residential on-site retrofits
- Total cost includes D&E at 32% of base construction cost

1.9 Strategies to Deliver Retrofit Projects at the Subwatershed Level

Subwatershed retrofitting is a major long-term commitment where dozens or even hundreds of individual retrofit projects are built over a multi-year timeframe. As previously noted, retrofitting can be quite costly and is normally the single largest expense involved in watershed restoration. Given the large number of retrofit projects, their high cost and the long timeframe over which they are built, it is important to discuss the strategies on how retrofits can be delivered in a widespread manner.

This section describes a multi-pronged strategy to sustain public investment in retrofitting over many years. The strategy involves multiple ways to deliver retrofits on both public and private land (Figure 1.10). Many stormwater managers mistakenly believe that retrofitting primarily involves capital construction projects built on public land. Much greater subwatershed coverage, however, can be achieved by a creative combination of financing, education, subsidies, permit coordination and stormwater regulations. To some extent, the retrofit delivery methods are sequential in nature -- the first methods are easier to implement early; whereas, latter methods provide expanded treatment in the future.

Demonstration Retrofits are the usually the first retrofit delivery method. The best sites are located on public land that is highly visible or receives heavy foot traffic, such as community parks, greenway trails, local schools or the city hall. Severe municipal hotspots, such as public works yards, may also be good candidate sites. Demonstration

retrofits are normally financed by state or federal water quality grants. Demonstration retrofits can be installed at any stage of the retrofit process, particularly when they can test a new or innovative retrofit technique.

Although demonstration retrofits serve only a small fraction of subwatershed area, they are an excellent early action project for several reasons. First, retrofits can educate residents about urban stream impacts and restoration potential through interpretive signs, tree planting and other stewardship measures. Second, demonstration retrofits show restoration partners and stakeholders what the retrofit "product" looks like, which helps to increase community acceptance for future projects. Third, demonstration projects enable local agency staff to gain valuable retrofit design and construction experience that can be used to deliver other retrofits later.

Retrofits on Public Land: The next retrofit delivery method involves construction of storage retrofit projects on public land in the subwatershed. These retrofits are typically located in stream valleys, parks, public right of way and publicly-owned stormwater infrastructure. Public land retrofits are easier to deliver because they do not require land acquisition and can provide community benefits. Storage retrofits are preferred because they can cost-effectively treat the greatest fraction of subwatershed area. Experience has shown that it is possible to treat as much as 30 to 50% of a subwatershed through public land retrofits, particularly if the community owns land in the stream corridor.

Most public retrofits are financed by long-term capital construction budgets dedicated to retrofits or waterway improvements. Consequently, it may take a decade to construct all of the feasible public land retrofits. This phase of retrofit delivery also requires an agency commitment to efficiently manage construction of multiple retrofit projects over time. Another good retrofit strategy is to integrate retrofits into ongoing municipal stormwater maintenance programs, particularly if the facilities are located on public land. The capital budget for stormwater maintenance can be modified to allocate funds to retrofit older ponds to improve their performance at the same time major maintenance problems are being corrected.

Encourage On-site Retrofits in Neighborhoods: This phase of retrofit delivery educates homeowners to persuade them to install low cost on-site retrofits on their property, such as rooftop disconnections, rain barrels or rain gardens. The most effective campaigns educate the public about need to restore watersheds, provide some simple construction tips, and direct interested residents where they can get more specific information and technical assistance. Local governments may wish to hire local watershed groups to "retail" technical assistance directly to neighborhoods and community associations. While it is doubtful that more than 5% of subwatershed residents will install on-site retrofits though education alone (Manual 8), the relatively low cost of the education program and its outreach and awareness benefits make it a good delivery investment at the outset of the retrofitting process.

Bundle Retrofits into Municipal Construction Projects: The next method incorporates retrofit delivery into other municipal construction capital projects. Communities are constantly investing in streetscaping, transportation projects, school construction, park improvements, water and

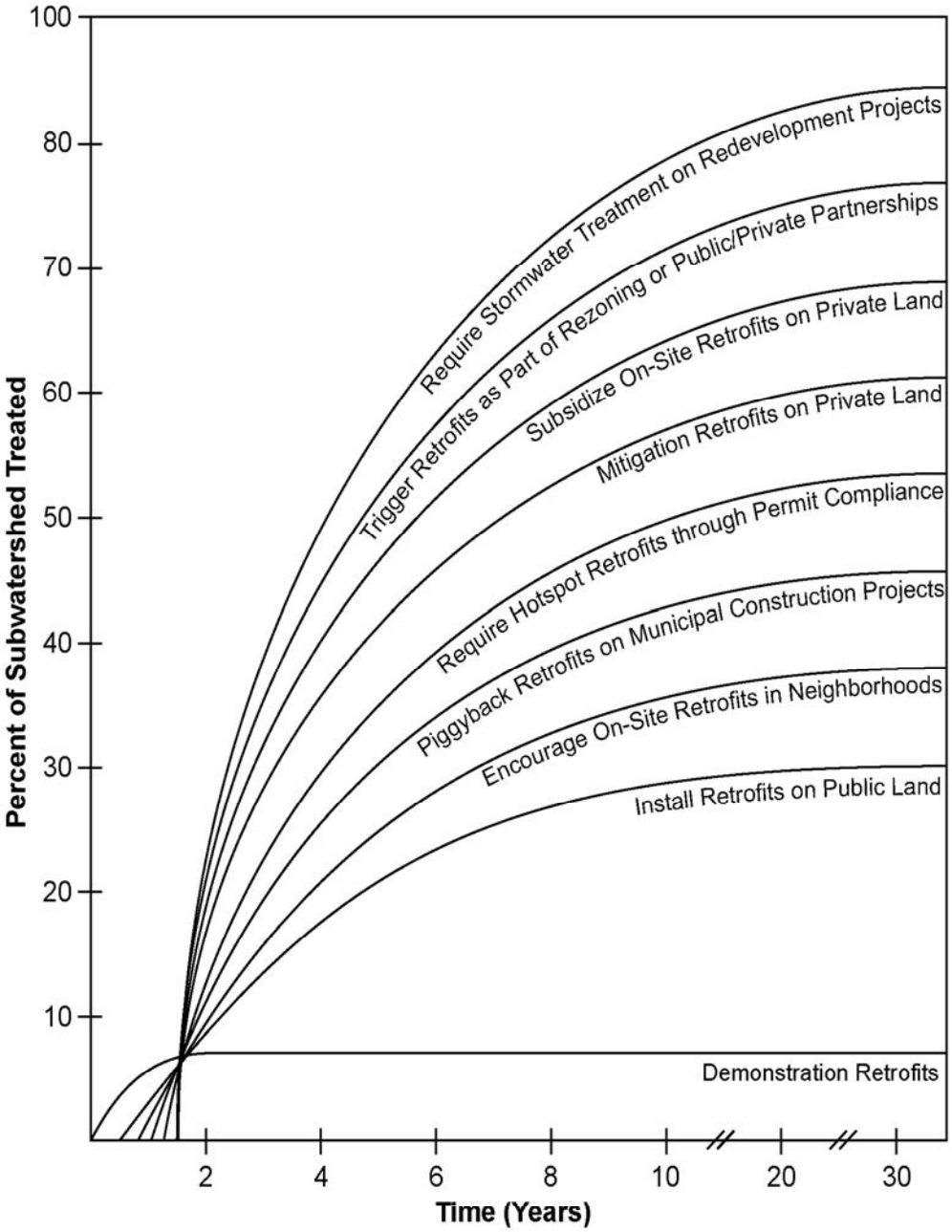

Figure 1.10.Ways to maximize retrofit delivery throughout the watershed

sewer line rehabilitation, drainage improvements and neighborhood revitalization. The strategy is to bundle retrofits into routine capital projects. In some cases, the match is relatively easy, e.g., including a storage retrofit as part of a culvert upgrade or installing water quality features into drainage improvements. Other bundled retrofits require much greater interagency education and coordination efforts since many agencies do not consider watershed restoration as part of their primary mission. The bundling strategy is definitely worth the effort since capital budgets for other municipal construction categories exceed water resource spending by a factor of 100 to 500 (U.S. Census, 2006). The largest municipal construction

categories include schools, roads, water supply and wastewater treatment, parks and recreation and municipal building.

While some agencies may initially resist efforts to incorporate retrofits into their capital budgets, several recent trends may make it more appealing. First, many units of local government are now subject to municipal stormwater permits and are no longer exempt from treating the quality of the stormwater produced by their construction projects. Bundling retrofits into existing construction projects makes stormwater compliance easier. Second, municipal project managers are often subject to the same environmental permitting requirements as the private sector, and may find that constructing retrofits conveniently meets their off-site mitigation needs. Third, many communities have formally adopted policies to promote sustainable development and/or low impact design practices in their own municipal construction projects. Several progressive communities, such as Santa Monica, CA and Austin TX, have specified a minimum set-aside for construction of on-site stormwater retrofits in their municipal contracting process (CWP, 2006).

Require Hotspot Retrofits Through Permit Compliance: Stormwater hotspots deserve special attention when it comes to retrofit delivery, given their severe water quality impacts and unique regulatory status. The goal is to construct on-site retrofits to treat the quality of runoff from all severe stormwater hotspots in a subwatershed, using existing authority under industrial and/or municipal stormwater permits (see Retrofit Profile Sheet OS-7). The basic argument is that hotspot runoff violates water quality standards and warrants immediate treatment.

Hotspot retrofits are identified based on two systematic levels of subwatershed field inspection -- a Hotspot Site Investigation to identify severe hotspots (HSI- Manual 11) and a more intensive Hotspot Compliance Inspection to determine whether a structural retrofit is needed to treat hotspot runoff at the site (HCI- Manual 2). In this case, the cost of retrofitting is borne by the hotspot owner, although the locality may also incur costs to find them and enforce compliance.

Stormwater managers should carefully review their existing water quality or illicit discharge ordinances to determine if they actually possess the authority to inspect and enforce compliance over the full range of hotspot sites expected in a subwatershed. If not, local ordinances should be revised to provide for this manner of retrofit delivery. Since many hotspots are small businesses, communities should also consider non-regulatory tools to improve compliance, including employee training, technical assistance and even cost-sharing (see Manual 8).

Mitigation Retrofits on Public or Private Land: This method of retrofit delivery matches the mitigation needs of private and quasi-public entities to specific storage retrofits in the subwatershed. As might be imagined, this retrofit delivery method requires exceptional interagency communication and coordination. Developers, highway agencies, utilities and others often seek opportunities to meet off-site environmental mitigation needs (wetlands, water quality trading, stormwater fees or permit conditions). Existing projects in the subwatershed retrofit inventory can be extremely attractive to permit applicants since the feasibility of the projects is already established and they are located on public land.

Over time, stormwater managers should strive to integrate their retrofit program with any stormwater mitigation, water quality trading or wetland banking efforts that may exist in the community. Most water quality experts predict that water quality trading systems will be common in the future as a cost-effective way to meet TMDLs, wastewater permits or regional nutrient limits. Care should be exercised with mitigation retrofits since they have the potential to be a zero-sum gain, particularly when both the impact and the mitigation occur in the same subwatershed (i.e., the benefit of the mitigation is cancelled out by the impact from the mitigated project). Also, the retrofitting agency may be hesitant about inheriting costly monitoring or maintenance conditions specified in a mitigation permit.

Subsidize On-site Retrofits on Private Land: This retrofit delivery method involves targeted programs to subsidize landowners to install on-site retrofit practices on private land. Such programs go beyond mere education and normally include targeted direct technical assistance and economic incentives to make them happen. The cost of this retrofit delivery method may equal the cost of constructing several large storage retrofits, and may be financed either through grants, operating funds, or a line item in the capital budget.

About a dozen communities have subsidized on-site retrofit delivery at the neighborhood level, primarily to disconnect rooftop runoff from the combined sewer system. Neighborhood adoption rates as high as 15 to 50% have been reported, depending on the extent of the subsidy and the convenience of the retrofit (Profile Sheet OS-10). Economic incentives include direct cash subsidies, tax credits, discounts on water bills or stormwater utility fees, municipal installation, and provision of free rain barrels.

Trigger Retrofits as Part Public/Private Partnership: Local governments are often a major financial partner in redevelopment and rezoning projects designed to promote neighborhood or commercial revitalization. The community may subsidize development by granting payment in lieu of taxes, tax credits, low interest financing or parcel acquisition. Given the taxpayer investment in these development partnerships, the public should expect that these projects will incorporate sustainable stormwater practices and landscaping features to enhance their community benefit. Consequently, stormwater managers should maximize the use of on-site retrofits during urban design to make sure the final projects are compatible with the water quality goals of the subwatershed plan. These retrofit opportunities seldom appear in the retrofit inventory, so stormwater managers will need to frequently coordinate with local urban planners and economic development agencies to find the best targets of opportunity.

Require Stormwater Treatment for Redevelopment Projects: If a subwatershed still has considerable development potential, stormwater managers should make sure they are imposing the most stringent stormwater criteria possible so that increased pollutant loads generated by new development do not offset loads reduced through retrofitting. If existing stormwater quality criteria are outdated, stormwater managers should update local stormwater criteria to maximize pollutant removal performance.

The infill and redevelopment process provides an excellent opportunity to achieve stormwater treatment where it previously did not exist. The amount of subwatershed

treatment that can be achieved by imposing redevelopment stormwater criteria is impressive over the long run. The urban landscape is in constant flux, with sites being continually vacated, demolished and redeveloped all the time. The same is true with public infrastructure. The design or service life of most structures and infrastructure is measured in decades, e.g., buildings (50 to 60 years), parking lots (20 to 30 yrs), bridge decks (40 to 50 yrs) and drainage infrastructure (30 to 50 yrs).

Thus, over several decades, it is quite likely that a sizeable fraction of every subwatershed will undergo redevelopment, infill, or infrastructure rehabilitation. Each of these represents an opportunity to retrofit stormwater treatment into the urban landscape. Therefore, an effective retrofit delivery strategy requires redevelopment and infill projects to address stormwater treatment in some manner. Guidance on developing effective and flexible stormwater treatment criteria for redevelopment projects can be found in CWP (2007).

Most communities are reluctant to impose more stringent stormwater criteria because of the small size, sharply higher compliance costs, and physical constraints facing redevelopment projects. While on-site compliance is difficult, it does not imply that stormwater treatment criteria should be waived. Rather, it means that special stormwater criteria need to be developed for redevelopment projects that provide incentives to reduce impervious cover, increase forest cover, or promote the use of smart site practices during redevelopment (CWP, 2004a).

Local stormwater managers may want to consider a fee-in-lieu approach at redevelopment and infill sites. The basic concept is to waive on-site stormwater requirements in exchange for a fee that is used by the local stormwater authority to build retrofit storage elsewhere in the subwatershed. The fee is usually derived based on the cost to retrofit an equivalent acre of impervious cover using a more economical storage retrofit. In other cases, the fee-in-lieu is based on the average cost to remove a pound of nutrients. Several communities have adopted a fee-in-lieu as an equitable and cost-effective way to treat runoff from small urban sites. Guidance on setting an appropriate fee schedule can be found in Winer (2003).

Chapter 2: 13 Subwatershed Locations Near You

This chapter outlines some practical ways to find retrofit storage in 13 different locations in a subwatershed. Thirteen profile sheets describe how to find, assess, design and construct retrofit storage. This locational approach to retrofits helps designers to envision restoration opportunities throughout urban subwatershed. Figure 2.1 illustrates the best locations for both storage and on-site retrofit practices. Each location presents different opportunities and challenges to successfully obtain retrofit

Figure 2.1: Various locations for both storage and on-site retrofits

storage. Table 2.1 compares differences between each retrofit location, in terms of how easy they are found, simplicity of design, ease of permitting/approvals and treatment costs. As can be seen, storage retrofits are generally easier to find and have low treatment costs, although their design and permitting is more complex. By contrast, most on-site retrofits are harder to find and have moderate to high treatment costs, although they are generally easier to design and get permitted.

The retrofit team should carefully choose which subwatershed retrofit locations to investigate when scoping their initial retrofit effort. The general capability of each retrofit location to provide various kinds of stormwater treatment is depicted in Table 2.2.

Table 2.1: Comparison of Retrofit Locations

Subwatershed Location	Retrofit Design Issue			
	Easy to find from desktop?	Simple to design?	Easy to get permits?	Low treatment cost?
SR-1 Add Storage to Existing Ponds	●	○	⦿	●
SR-2 Storage Above Roadway Culverts	●	○	○	●
SR-3 New Storage Below Outfalls	⦿	○	⦿	⦿
SR-4 Storage In the Conveyance System	⦿	○	⦿	⦿
SR-5 Storage in Transport Right-of-ways	●	○	⦿	●
SR-6 Storage Near Large Parking Lots	●	○	⦿	⦿
OS-7 Hotspot Operations	○	⦿	●	○
OS-8 Small Parking Lots	⦿	⦿	●	⦿
OS-9 Individual Streets	○	⦿	●	○
OS-10 Individual Rooftops	○	R● N⦿	R● N⦿	R⦿ N○
OS-11 Little Retrofits	○	●	●	●
OS-12 Landscapes/Hardscapes	○	●	●	⦿
OS-13 Underground	○	○	⦿	○
Key: ● Yes ⦿ Moderate ○ No R = Residential N = Non-residential				

Table 2.2: Retrofit Options and Stormwater Treatment Provided

Subwatershed Location	Stormwater Treatment Provided			
	Water Quality	Runoff Reduction	Channel Protection	Flood Control
SR-1 Add Storage to Existing Ponds	●	○	●	○
SR-2 Storage Above Roadway Culverts	●	○	●	⦿
SR-3 New Storage Below Outfalls	●	⦿	⦿	⦿
SR-4 Storage In the Conveyance System	●	⦿	⦿	⦿
SR-5 Storage in Transport Rights-of-ways	●	⦿	●	⦿
SR-6 Storage Near Large Parking Lots	●	⦿	●	⦿
OS-7 Hotspot Operations	●	○	○	○
OS-8 Small Parking Lots	●	●	⦿	○
OS-9 Individual Streets	●	●	⦿	○
OS-10 Individual Rooftops	⦿	●	○	○
OS-11 Small Impervious Areas	●	●	○	○
OS-12 Landscapes/Hardscapes	●	⦿	○	○
OS-13 Underground	●	⦿	○	○
Key: ●Full ⦿ Partial ○ Rarely				

Each retrofit profile sheet follows a common organization:

Basic Description – This section describes where the retrofit fits into the landscape, how it works, and which stormwater treatment options are most commonly used.

Ideal Conditions for the Retrofit – This section notes the site conditions that lead to a successful retrofit at that location.

Situations Where the Retrofit Is Difficult – This section outlines common site constraints that can indicate a retrofit is difficult or impossible to implement at that location.

Alternative Restoration Projects – This section outlines alternative restoration projects that may be worth pursuing when a retrofit is not feasible at a site.

Desktop Searches for Good Locations- Simple GIS and mapping tricks can help narrow down the list of potential subwatershed retrofit locations to a manageable number. This section presents guidance on how to quickly and efficiently find candidate retrofit sites to investigate in the field.

What to Look For When Investigating Sites – This section provides field crews with step by step guidance on how to investigate retrofit feasibility in the field. Detailed tips are offered on how to determine available treatment area, assess site constraints and develop a concept plan.

Typical Feasibility, Approvals and Permitting – Many hurdles must be overcome to build retrofit projects. This section outlines the most common feasibility, approval and environmental permits that come into play at each location, along with tips and strategies to secure them.

Retrofit Design – This section outlines key issues for the team to consider in the retrofit design process and the range of special studies that are needed to support it. The section concludes with a step by step design process for each retrofit location.

Construction Considerations – Retrofit construction is always challenging. This section helps designers anticipate and address common construction problems at each retrofit location.

Retrofit Delivery Issues – Many on-site retrofits are needed to make a difference in a subwatershed, so this section presents effective strategies to deliver them on a widespread basis. Tips are also given on how to multiply on-site retrofit delivery through education, incentives, and out-sourcing methods.

Construction Cost – Each retrofit location has a unique construction cost, which must be understood to rank and prioritize the most cost-effective retrofits for a subwatershed. This section presents median retrofit construction cost estimates to use for planning purposes during concept design. Cost ranges are also presented, along with site-specific factors that can increase or decrease the cost of individual retrofits to further refine cost estimates.

SR-1	Storage Retrofits **MODIFY EXISTING PONDS**	

The first place to look for retrofit storage is within existing ponds. Stormwater ponds are an extremely attractive retrofitting target, particularly when they have existing dry detention or flood control storage. The most common approach is to combine extended detention, wet pond or constructed wetland storage to improve water quality. In other cases, bioretention can be provided in the bottom of dry ponds. Some ponds may have enough capacity to provide Cpv to protect downstream channels from bank erosion. Even modern ponds can be enhanced by retrofits.

Five strategies can be used to retrofit storage into an existing pond:

- Excavate the pond bottom
- Raise the embankment
- Modify the riser
- Steal existing flood control storage
- Fix internal design geometry and/or add forebay

Designers often combine several strategies together to enhance the performance of existing ponds (Figure 1).

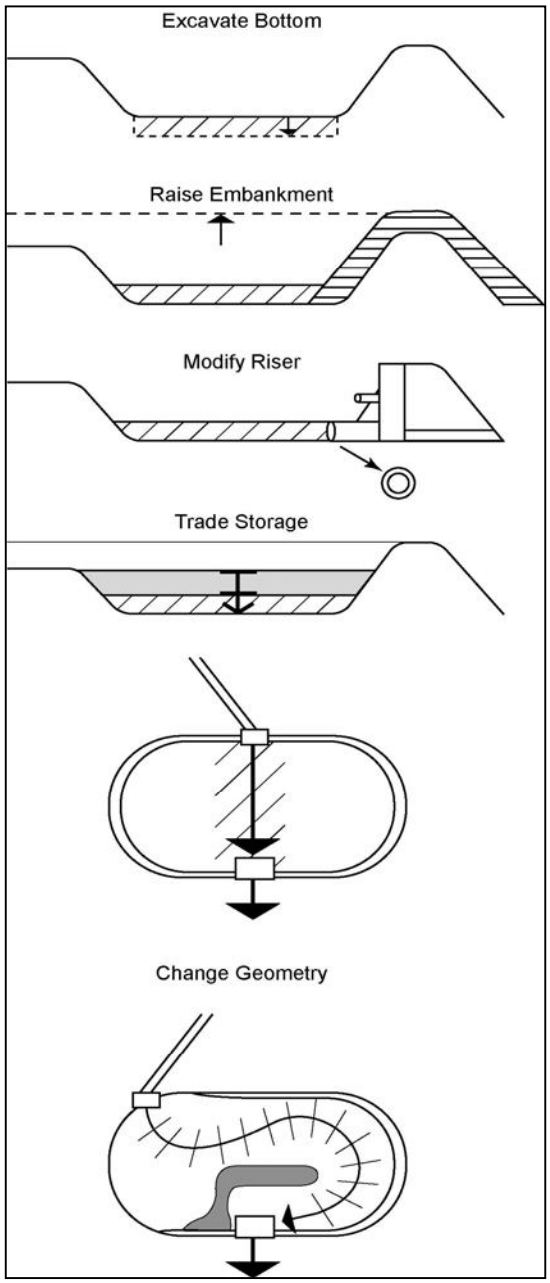

Figure 1: Five strategies to retrofit a pond

Pond retrofits are ideal since land costs are minimal, and construction costs are about 40% less than a new retrofit pond. In addition, since the land is already devoted to stormwater management, most easements are already in place. Pond retrofits also need fewer permits and approvals compared to other storage retrofits. Pond retrofits are often favored by adjacent residents since

they correct maintenance problems and improve pond appearance.

Ideal Conditions for Pond Retrofits

The following types of ponds are ranked in descending order of retrofit potential.

- Regional flood control or detention ponds
- Dry stormwater detention ponds
- Dry extended detention ponds
- Farm and ornamental ponds
- Public golf course ponds
- "Modern" stormwater quality ponds

Another way to analyze pond retrofit potential is to understand the different eras and corresponding design standards under which ponds were built in a community over time. The precise evolution of stormwater pond design differs in each community and should be investigated during the retrofit scoping process. Most communities have followed the following general sequence of stormwater management. Stormwater systems constructed prior to 1970 were primarily comprised of underground pipes, with limited surface land devoted to a few large flood control projects. Between 1970 and 1990, however, many communities built large stormwater detention ponds to control peak flood discharges. Detention ponds in this era often have great retrofit potential for water quality or even channel protection (Figure 2).

Ponds constructed in recent years were designed to treat stormwater quality, and therefore have less retrofit potential. They are still worth investigating, however, since many suffer from basic design flaws that impair their performance (single cells, multiple inlets, short-circuiting, short flow paths and lack of wetland features). Indeed, synoptic studies of recent stormwater ponds constructed in the field suggest that as many as 90% of "modern" ponds have significant design flaws (Figure 3).

Situations Where Pond Retrofits Are Difficult

Several conditions can make it hard to retrofit a pond:

- Older and/or highly urban subwatersheds where development occurred prior to the advent of stormwater pond requirements
- Dry ponds that have utilities running through the pond bottom or are used for dual purposes (e.g., recreational ball fields)
- Older ponds that have lost their original flood storage capacity due to additional upstream development, sediment deposition or both
- Stream corridors with flood prone structures present in the flood plain
- Landlocked ponds that cannot be accessed by construction equipment

Figure 2: Older stormwater detention ponds are an attractive retrofit target

Figure 3: The performance of many "modern" ponds can be improved through retrofitting

Alternative Restoration Practice at Pond Sites

Even when a pond retrofit is not feasible, other restoration practices may be suitable for the site:

- Tree planting within acceptable portions of the pond and its buffer (Cappiella *et al*., 2006a)
- Planting wetland plant species in pond benches
- Notifying owner to perform maintenance tasks to restore pond function
- Including the pond in a local Adopt-a-Pond program (Sturm, 2003)

Desktop Searching for Pond Retrofits

Pond retrofit sites can be quickly found if a community has a good GIS database that shows surface land devoted to stormwater practices. These maps should be closely scrutinized to look for ponds with contributing drainage areas greater than 5 acres. Some communities lack maps or databases of their stormwater infrastructure.

In these situations, pond retrofit sites can be discovered by analyzing recently flown aerial photos (Figure 4).

Dry ponds are among the best retrofit sites, so the presence of water alone is not always a good retrofit indicator. It is helpful to define the age of subwatershed development to find areas built within a particular stormwater design era that is well suited for retrofitting. Some designers go further and analyze topography at potential pond sites to get a first estimate of the contributing drainage area.

Once a subwatershed has been scanned for decent pond sites, the next step is search through local stormwater agency files to see if original as-built drawings or design computations exist. Few communities have digitized pond design review files for older ponds that are best suited for retrofits. Some designers may put off this search until after

Figure 4: Dry ponds are easy to pick up on fine resolution aerial photos

the field reconnaissance to ensure that a pond retrofit is indeed feasible for the site.

What to Look for when Investigating a Pond

The first step during a retrofit reconnaissance is to check out the existing plumbing of the pond and compare it to as-built drawings, if they exist. The crew should quickly check the:

- Condition and elevation of pond inlet(s), internal flow path, outlet, riser and emergency spillway.
- Condition of pond outlet to determine if it is damaged or prone to clogging.
- Changes in the pond since it was originally constructed, such as excessive sediment deposition, maintenance problems or woody growth.
- Physical integrity of the dam or embankment, looking for signs of seepage, settlement, sloughing or animal burrows.

Next, the crew walks above and below the pond to:

- Look at upstream pipes or channels for possible headwater effects
- Look downstream of the pond outfall for possible scour problems to correct
- Quickly verify the contributing drainage area, particularly when multiple inlet pipes are present.

The last step of the pond reconnaissance involves choosing which combination of the five pond retrofit strategies will produce the most cost-effective treatment storage. The crew evaluates the feasibility of each retrofit strategy by looking at:

Excavating the pond bottom – The crew checks the bottom of the pond to see if it can be excavated to provide more storage. The ideal situation is a dry, flat pond bottom with no evidence of standing water. Use a soil auger to check for moisture and presence of hydric soils.

Raising the embankment – The crew looks for available space at the toe of the embankment to determine if there is enough room to support the wider footprint needed to raise embankment height. The crew should also quickly check the proposed new embankment elevation against the invert elevation of pond inlet pipes to assess potential for tailwater problems.

Trading storage – The crew then looks for multiple riser outlets which may indicate detention storage for design storms in the 2 to 25 year range (Figure 5). In many cases, the storage for these design storms can be converted to provide water quality treatment.

Modifying the pond riser - The best situations are dry detention ponds that have a large diameter low flow outlet that can be constricted by attaching an orifice plate, an anti-vortex device and appropriate trash rack. A weir wall can also be used to provide the restriction (Figure 6). If a concrete riser is present, check to see if more weir capacity is needed to pass larger overbank and extreme storms. Try to get a general sense whether the existing detention pond is over-sized.

Modifying internal design – The crew should check to see whether the internal flow path can be extended, wetland elements added, or a forebay installed.

Figure 5: Multiple outlets are a clue that storage trading is a possibility

Figure 6: A dry pond retrofit may include the installation of a weir wall

Feasibility, Permitting and Approvals for Pond Retrofits

Pond retrofits normally involve fewer environmental permits and landowner approvals than other storage retrofits, but may require several analyses.

Since retrofits will modify pond hydraulics, designers often need to secure dam safety permits, particularly if the dam hazard classification changes or the dam was never permitted to begin with. Pond safety standards vary regionally, so check with the appropriate local or state dam safety review authority. In many cases, dam safety criteria may have changed since the pond was originally built, so significant upgrades to the riser, embankment or emergency spillway may be needed to conform to newer and more stringent standards.

Pond retrofits that require conversion of flood storage into water quality storage may result in partial loss of 2, 5 or 10 year peak discharge control. While this may not materially affect the pond's flood control function, designers will need approval from the local stormwater review authority. The authority may require additional hydraulic modeling to ensure that proposed retrofit will not harm downstream property or structures. A dam breach analysis may also be required.

Landowner permission may be needed to retrofit privately-owned ponds. Owners may be willing to grant permission, since the land is already dedicated for stormwater, prior easements may exist, and the retrofit may upgrade the condition of the existing pond.

If the pond retrofit converts dry storage to wet storage, it is important to determine whether an adequate water balance exists to maintain a permanent pool at a constant water elevation. Under-sized pond retrofits that have fluctuating water levels are unsightly and may create nuisance problems. Converting dry storage into wet pond and/or constructed wetlands can also create real or perceived concerns about mosquitoes, drowning, tree loss and resident geese on the part of adjacent residents and landowners.

Some responses to these concerns are provided in Chapter 4.

Designers should not automatically assume that pond retrofits do not require wetland, waterway disturbance or forest conservation permits. Portions of older ponds may have evolved into forest or wetlands, so check with local and/or state permitting agencies to determine their current regulatory status. While utility conflicts are not common in most ponds, sewers may exist underneath (Figure 7).

The feasibility of pond retrofits that rely on excavation is often a matter of earthwork balance. Some designers will prepare a rough grading plan during concept design to determine whether earthwork balance at the proposed retrofit is reasonable by looking at the proposed depth of grading and the required minimum pond side slopes that must be maintained.

Pond Retrofit Design Issues

Pond retrofits have unique design issues compared to new pond construction:

Pond retrofits are challenging when there is limited room to squeeze in the target WQv storage and also include modern pond design features. Forebays, micropools and benches all tend to reduce the already limited treatment volume available at the pond retrofit. As a general rule, designers should compromise on storage before they dispense with design features related to performance, maintenance access or safety. Examples of good pond retrofits that incorporate key design features are shown in Figures 8 and 9.

Figure 7: Conflict with a major sewer was avoided by using a berm and a three cell design in this retrofit.

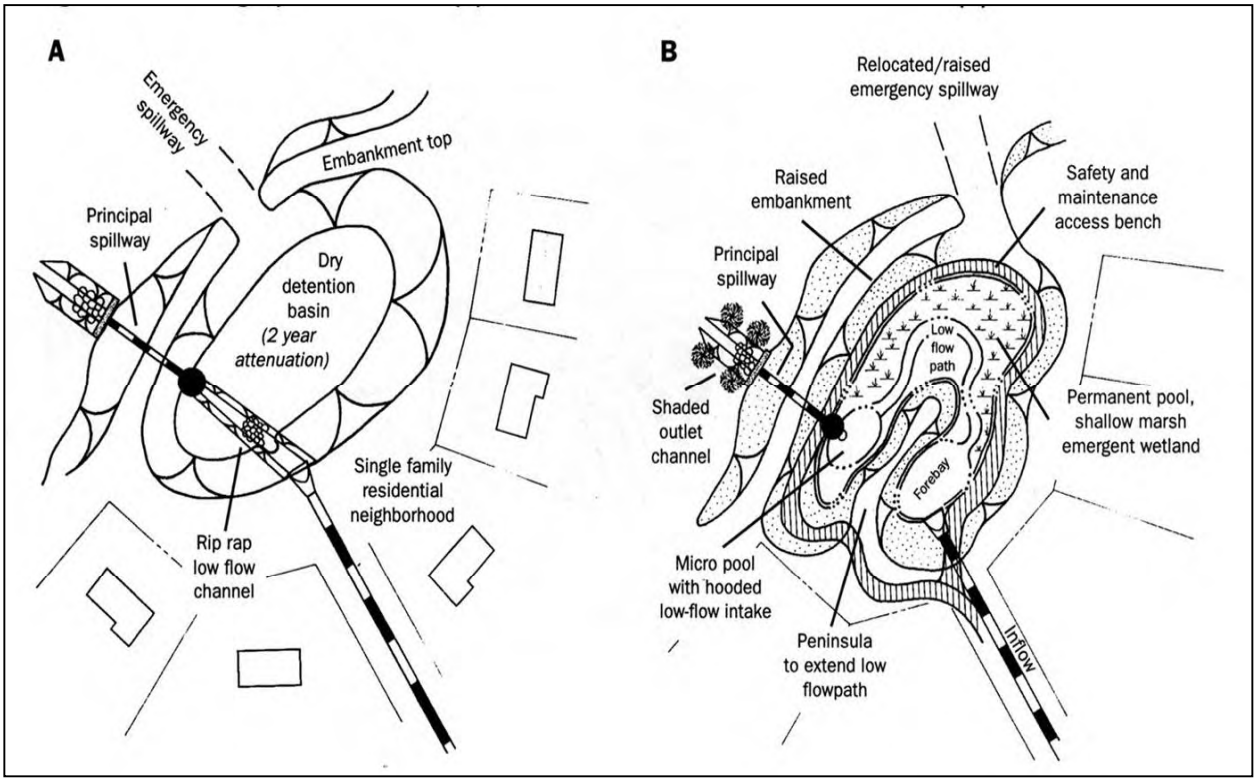

Figure 8: Schematic showing conversion of a dry pond to a shallow marsh

Figure 9: The Rolling Stone retrofit: before and after

Earthwork balance is often tough at pond retrofits since there is little room to spoil excavated material on-site, and soggy soils may not be suitable for embankment fill. Designers need to be creative in keeping material on-site, since off-site hauling of wet sediments can be very expensive. Designers should look for areas at the site where excavated sediments can be de-watered prior to spoiling or hauling. Pond retrofits should include access roads to enable heavy equipment to reach forebays and outlet works to perform maintenance. Designers should avoid using ED as the sole stormwater treatment option at a pond retrofit site. Extensive pond and buffer landscaping should also be a design priority to enhance neighborhood acceptance. Pond retrofits should include signs to educate residents about the stream protection benefits they provide.

Most research suggests that ponds do not cause major mosquito breeding problems and can provide habitats for their predators. Still, designers should include measures that maintain constant outflows, create habitat for predator fish, and provide aquatic benches to support emergent vegetation.

Designers may need to secure temporary or permanent easements for construction and maintenance access, if they were not reserved as part of original pond construction. Pond retrofits can alleviate chronic maintenance problems at failing stormwater practices. Figure 10 shows how a clogged infiltration basin was converted into an extended detention pond with a micropool.

Design Support

Soil borings generally make or break a pond retrofit, and reveal important clues about their feasibility and cost. Soil borings help:

Figure 10: Retrofitting can improve the function of this failed highway practice.

- Ascertain the physical characteristics of excavated material
- Determine its adequacy for use as structural fill or spoil
- Define the depth to groundwater and/or bedrock
- Provide data to develop structural designs for outlet works (e.g., risers and weir walls).
- Determine potential excavation problems and issues with embankment integrity

Several soil borings should be taken along the embankment and the bottom of dry ponds. Soil cores may be needed to ascertain the quality and consistency of bottom sediments in wet ponds.

Other design support needed for modeling pond retrofits includes:

- Updated aerial photos to define the land cover for the contributing drainage area (particularly if it has changed since the pond was first constructed).
- Surveys to define current hydraulic cross-sections of the storm drain network leading to the pond.
- Survey crews may need to establish the current bathymetry, storage and pipe/riser elevations for the pond, if as-built drawings do not exist.

Pond Retrofit Design Process

The retrofit design process analyzes the existing hydrologic and hydraulic characteristics to find opportunities to obtain greater WQv and Cpv storage. Some examples of retrofits created by reallocating storage are shown in Figure 10.

The complexity of the pond retrofit design process depends on the nature of the proposed pond alterations. For example, retrofits that merely install forebays or trash racks, or plant wetland benches do not require detailed retrofit design. Any retrofit that reduces existing flood control storage volume, changes pond storage allocations, alters water elevations, or influences riser performance should undergo the following basic design process:

Step 1: Determine the design objective for the retrofit (e.g., WQv and/or Cpv). Analyze the original design computations/plans to determine the original design objectives for the existing pond (e.g., 2 year, 10 year, 100 year peak discharge control). Check with local review authority to determine whether any existing peak discharge storage can be converted into WQv storage. Existing storage can be reallocated to WQv and Cpv storage as long as it does not create unacceptable downstream flooding conditions. The designer should consult with the local stormwater review authority to determine the hydraulic/hydrologic modeling requirements, as well as the appropriate design storms.

Step 2: Compute the target WQv and/or Cpv storage volume for the proposed retrofit (in acre-feet), based on current drainage area and impervious cover.

Step 3: Determine which combination of the five pond retrofit strategies can be employed at the retrofit to achieve the desired target storage volume. This is done iteratively by analyzing contours of new pond dimensions created by excavation or analyzing the pond's existing stage/storage/discharge curve. Once the designer is confident that the target volume can be obtained, they can begin pond modeling.

Step 4: The designer should analyze existing pond computations to create a new model. Model inputs may need to be updated to

reflect changes in contributing drainage area, land use, or storm drain infrastructure leading to the pond. In addition, the original pond dimensions and water surface elevations may need to be revised if topographic or bathymetric surveys indicate they have significantly changed. This is particularly common for older wet ponds where past sediment deposition may have reduced pond capacity.

Step 5: Model the hydrology and hydraulics of the existing pond using the new input deck to determine if it still meets current stormwater and dam safety criteria.

Step 6: Redo pond contours (if re-grading or excavation is anticipated), modify riser dimensions and alter appropriate water surface elevations to conform to the proposed retrofit. Check to make sure they collectively meet target volumes.

Step 7: Route the appropriate design storms through the new pond retrofit and analyze effect on riser performance, water surface elevations, and downstream flooding conditions. This is normally an iterative process.

Step 8: Provide specifications for retrofit design features

Construction Considerations for Pond Retrofits

The construction sequence for pond retrofits can be fairly complex and include the following elements:

- Check construction access routes to the retrofit to determine if any curbs, pavement, manholes, landscaping or other site features will be disturbed during construction and will require repairs.
- Pond retrofits often have limited space for temporary stockpiling and construction staging. In some cases, there may be no alternative but to store equipment within the pond, which may increase the risk that it will be damaged during flood events.
- Clearing/grubbing may be needed for construction access if trees have grown up because the pond has not been regularly mowed.
- Dewatering of bottom sediments and pumping are needed at many pond retrofits to manage groundwater inflow during the excavation process (Figure 11). The proper disposal of these muddy waters must be addressed in the erosion and sediment control plan.
- Temporary diversion of both stormwater runoff and baseflow is generally needed during construction. Cofferdams can be constructed within the pond to isolate construction areas and bypass pond inflows.

Figure 11: Dewatering is needed to excavate bottom sediments.

- A complex construction sequence is needed when embankments are reinforced or outlet structures are replaced. The erosion and sediment control plan will need to be carefully phased to prevent pond sediment from being discharged.

- Fencing and signs should be posted around the limits of disturbance and staging areas to minimize public access during construction.

- If the retrofit forebay is under-sized, accelerate the sediment removal schedule in the maintenance plan (Figure 12).

Typical Costs for Pond Retrofits

Construction cost can be challenging to calculate for pond retrofits, although modifying an existing pond is generally cheaper than constructing a new pond. A planning level cost estimate for converting an existing dry pond into a wet pond or constructed wetland is provided in Table 1. Costs will also vary from region to region based on prevailing labor rates. Several site factors that tend to drive up or reduce construction costs are detailed in Table 2.

Figure 12: This under-sized forebay filled up with sediment within five years of retrofit construction.

Table 1: Estimated Construction Costs for Pond Retrofits (2006 $/impervious acre treated)			
Retrofit Type	**Median Cost**	**Range**	**Design & Engineering (%)**
Modify Existing Pond [1]	$ 11,150 [2]	$ 3,600 to $37,000	32 [3]

[1] Does not apply to simple changes in pond geometry or enhanced pondscaping
[2] Adjust based on site-specific construction cost inflators/deflators in Table 2
[3] Use a 40% value in major environmental or dam safety permits are needed

Table 2: Site-Specific Factors that Influence the Cost of Pond Retrofits	
Factors that Decrease Cost	**Factors That Increase Cost**
• Available weir space • Neutral earthwork balance • Simple adjustment to low flow pipe in riser • Existing pond is dry • No major changes to riser or embankment • 2 or 10 year storage can be sacrificed • No utility conflicts • Wide setback from pond to structures • No wetland or in-stream permits needed • Existing access is adequate	• Changes to concrete risers or replacement • Need to haul excavated material offsite or import fill to the site • Working in-stream/pond baseflow • Existing pond is wet or has saturated soils; dewatering needed to excavate bottom • Change in dam safety classification • Embankment reinforcement needed • Land-locked ponds with poor access • Wetland mitigation needed for project • New access ramps must be installed

SR-2	Storage Retrofits	
	STORAGE ABOVE ROADWAY CROSSINGS	

Road crossings can be modified to provide temporary water quality storage above an existing road culvert. Storage is obtained by installing a new embankment above the crossing to get "free" storage (Figure 1). The new embankment protects the roadway embankment from seepage effects. Available storage can also be increased by excavating areas adjacent to the upstream channel. In general, crossing retrofits are applied to non-perennial stream channels to avoid permitting problems (i.e., zero and first order streams).

A control structure is normally installed through the new embankment that connects with an upstream micropool (Figure 2). The control structure typically consists of a gabion or concrete weir or a riser/barrel. The micropool has a small permanent pool sized to be at least 10% of the total WQv.

Extended detention, constructed wetlands and wooded stormwater wetlands are recommended treatment options for crossing retrofits (see Figure 3). Road crossings may also contain enough storage to provide channel protection storage. Crossing retrofits are ideal because they take advantage of free upstream storage, which reduces excavation costs. Crossing retrofits are complicated because many environmental permits and landowner approvals are needed to construct them.

Ideal Conditions for Crossing Retrofits

The best situation for a crossing retrofit is when:

- The existing culvert has sufficient hydraulic capacity to pass desired storm flows.
- Upstream land is in public ownership .
- Channel has ephemeral flow (e.g., zero or first order stream).
- Upstream channels are low gradient, are connected to the floodplain, and have short streambanks.
- The retrofit is timed to coincide with scheduled repair/replacement of the existing culvert.
- The retrofit is upstream of a proposed stream restoration or wetland mitigation project.

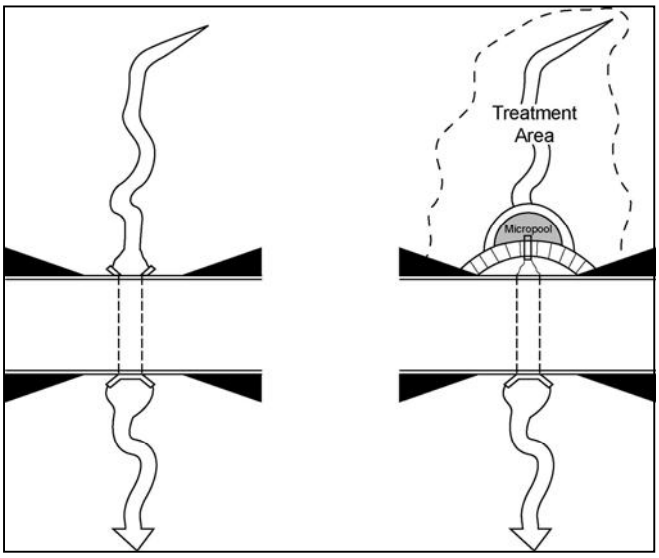

Figure 1: Strategy for getting free storage above a road crossing

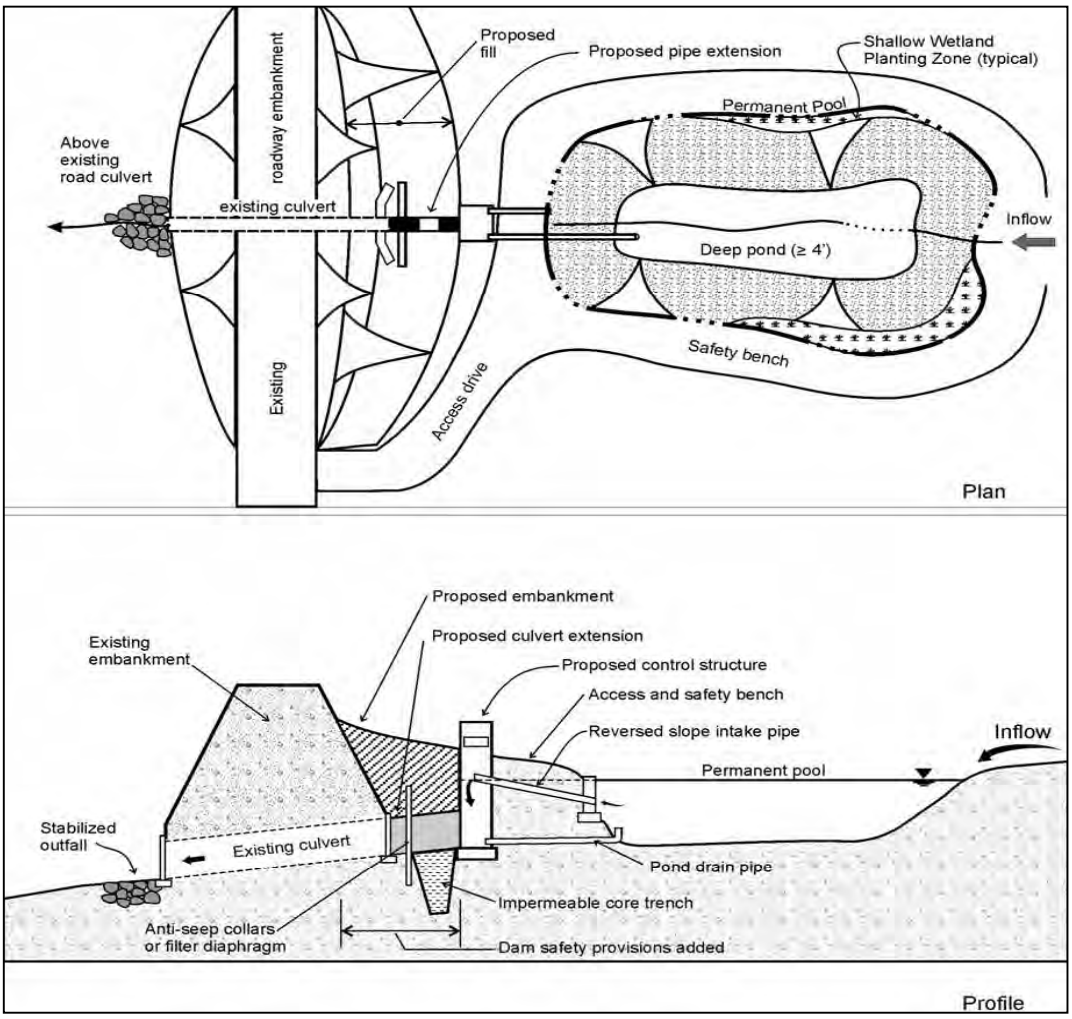

Figure 2: Typical plan and profile of crossing retrofit showing secondary embankment

Situations Where Crossing Retrofits are Difficult

Crossing retrofits are generally not a good option when the:

- Existing culvert lacks hydraulic capacity but is not scheduled for replacement.
- Stream has perennial or intermittent flow (e.g., second order stream or larger) or is used by migratory fish.
- Proposed upstream storage area contains high quality wetlands or mature forests.
- The project storage area contains sewer lines or other utilities that often run adjacent to streams or parallel to the road.
- Contributing drainage area to the crossing is greater than 250 acres
- Upstream channel has a steep gradient, is deeply incised, or has a confined floodplain.
- Existing structures encroach into the floodplain and would be subject to a greater flooding risk.

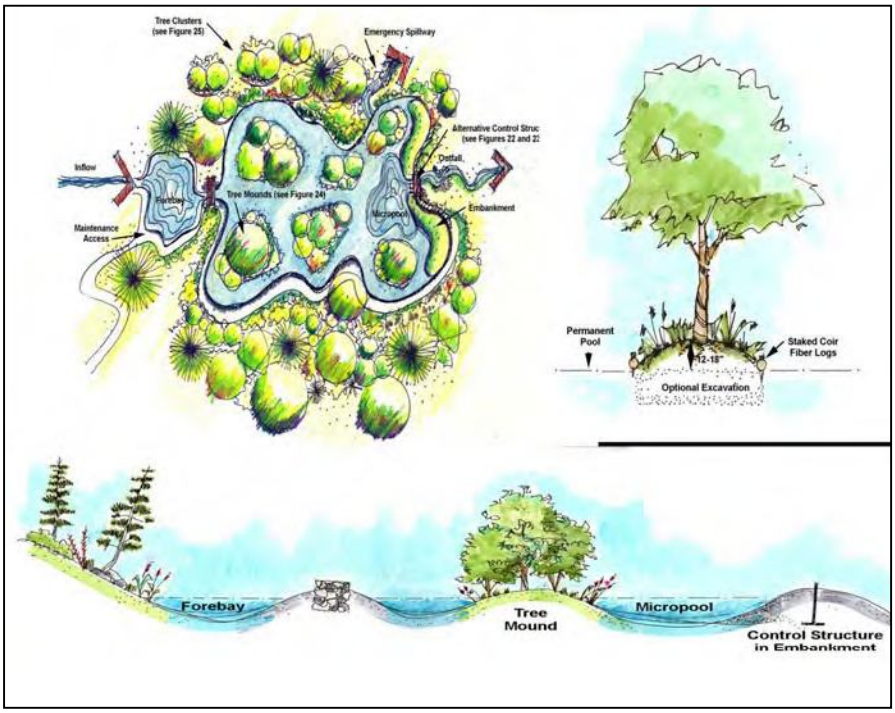

Figure 3: Wooded wetlands are a preferred stormwater treatment option for crossing retrofits.

Alternative Restoration Projects at Crossing Sites

Road crossings are a prime location for many restoration practices, even when a crossing retrofit is not feasible. Designers may wish to consider:

- Upstream wetland restoration
- Culvert repair or replacement (see Profile Sheet R-27 and R-28 in Manual 4)
- Culvert modification to increase tidal flushing in coastal creeks or wetlands
- Fish barrier removal (see Profile Sheet R-30 in Manual 4)
- Downstream stream repair (see Manual 4)
- Riparian reforestation
- Stream adoption (see Profile Sheet C-2 in Manual 4)

Desktop Searching for Crossing Retrofits

Road crossings are generally quite easy to spot on fine-resolution aerial photos or maps (Figure 4). If good GIS data are available to characterize the drainage network, headwater stream layers (zero, first and second order) can be superimposed over the local and state road network to locate

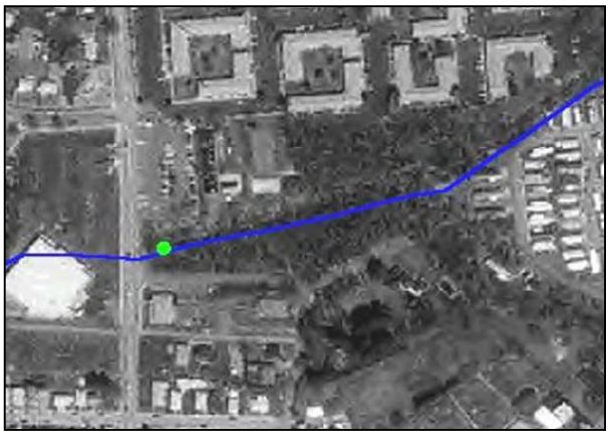

Figure 4: Crossing retrofits are easy to find when road network and drainage layers are superimposed.

potential sites to visit in the field. Ditch lines and headwater streams do not show up well on most maps, so designers may need to define them based on topography above the crossing. If topography is available, it is relatively easy to derive an initial estimate of the contributing drainage area to the proposed retrofit (which some designers may want to know before going out in the field). If a Unified Stream Assessment has already been completed in the stream corridor, the team may want to review the stream crossing (SC) impact forms to find potential sites.

What to Look for When Investigating Crossing Retrofits

The feasibility of crossing retrofits can be quickly determined by assessing the culvert, upstream storage conditions, and downstream conflicts (Figure 5):

1. Evaluate the culvert - The crew should check out the existing plumbing of the culvert to determine its:

- Alignment in relation to the stream
- Invert elevation in relation to the road
- Culvert diameter, material, and condition (including headwalls and endwalls)
- Sediment deposition within the culvert that may reduce its hydraulic capacity.

Next, the crew assesses how easy it will be to get construction equipment down the steep slopes from the roadway embankment to the retrofit. If the elevation difference is minor, it may be possible to construct an access ramp. Many underground utilities often run parallel to the road, so the crew should look for surface utility indicators such as manholes or venting stacks.

2. Evaluate upstream storage potential - The crew then estimate the potential storage volume available upstream. The best way to do so is to envision a triangle with its base parallel to the road crossing and its apex at the point upstream at the same elevation as the roadbed. Walking upstream, the crew paces off the distance to the apex, and then walk in a perpendicular direction to each bank until the roadway elevation is attained. Using this method, the crew can get a rough measure of the boundaries of available surface area (Figure 6). Using a tape measure and lock level, the crew then records the vertical distance from bottom of the culvert pipe to the roadbed. The acre-feet of free storage can then be determined based on the geometry of the prism.

The crew can use a hand auger to get a quick sense of whether the floodplain soils are suitable for excavating additional storage (or whether wetland indicators are present that may cause permitting problems). Lastly, the crew should note any wetlands, mature forest cover or underground utilities that might reduce the available treatment area.

Figure 5: Field crews measure culvert dimensions and examine upstream and downstream conditions.

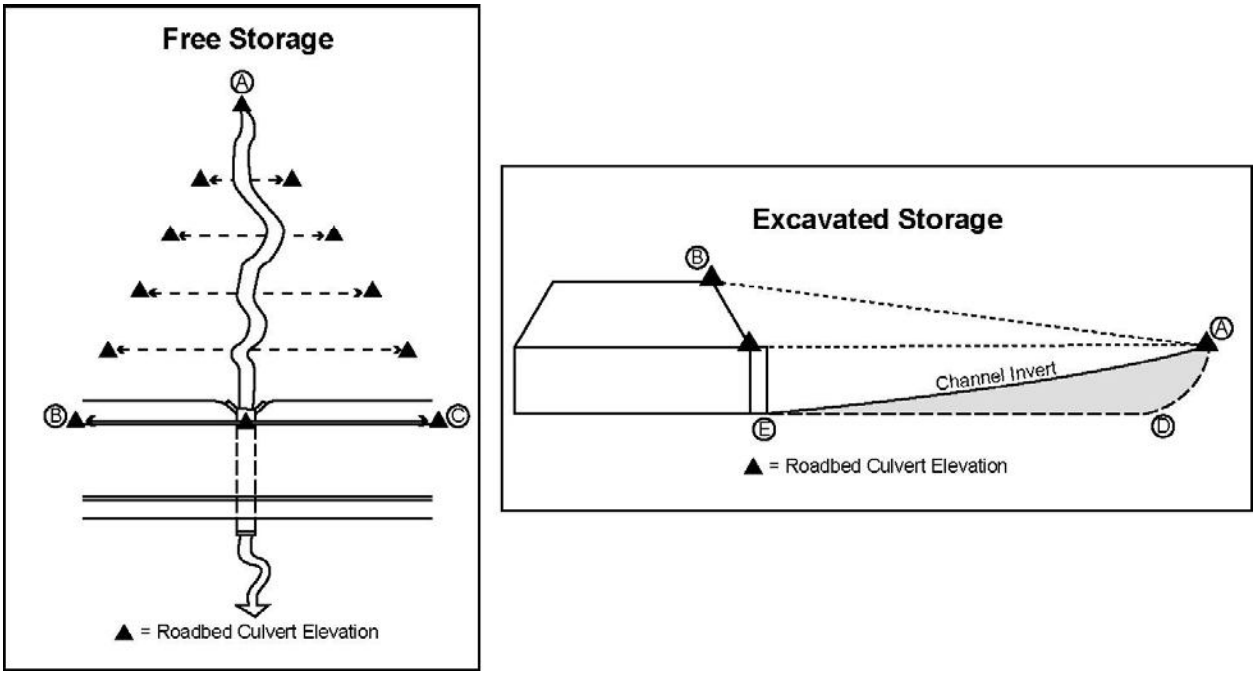

Figure 6: Estimating free storage using the triangle approach

Crews estimate the area of free storage by visualizing an ABC triangle extending with its base parallel to the road and its apex at the upstream elevation as the roadbed (panel a). The depth of free storage is defined by the triangle BEA (panel b) plus any additional excavated storage defined by the EDA triangle.

3. Understand downstream conditions - The crew then turns its attention to the downstream end of the culvert, and measures the vertical distance from the culvert invert to the stream bed, and quickly estimates the rate of flow over the culvert lip (if any). The crew records whether a scour hole exists immediately below the culvert, and whether it is acting as a stream grade control. The crew may need to walk several hundred feet downstream to get a sense of stream morphology and look for any flood prone structures in the stream corridor.

Feasibility, Approvals and Permitting for Crossing Retrofits

Crossing retrofits have many permitting and approval hurdles. The in-stream nature of crossing retrofits triggers numerous environmental permits related to fish passage, forests, floodplains, wetlands and waterway construction. Most permitting agencies are understandably reluctant to allow embankments or other obstructions to be placed across perennial streams. Some agencies may permit crossing retrofits if the existing stream is highly altered or channelized, and does not support aquatic life. The best permitting situation is when the stream is first order or smaller, and has negligible flow. Additional guidance on environmental permits is provided below.

Crossing retrofits nearly always require wetland and waterway disturbance permits as many stream channels are regarded as jurisdictional under Sections 401 and/or 404 of the Clean Water Act. The stream corridor in the proposed retrofit area may contain riparian wetlands that are also subject to the same permits. If stream channels or riparian wetlands are high quality and have functional value, the site should be dropped from consideration. It makes little sense to degrade the function of an existing watershed element in order to restore a new one.

Designers should also consider how future inundation in the proposed retrofit area will affect the quality of existing forests or wetlands (Figure 7). Research has shown that stormwater ponding and water level fluctuations degrade wetland quality (Wright *et al.*, 2007). Similarly, chronic inundation can kill sensitive tree species (Cappiella *et al.*, 2006b). Even though hydrological changes are not technically regulated under most state and federal wetland protection programs, ethical retrofit designers should never degrade the quality of existing forests and wetlands.

Fish passage is a key issue to assess at crossing retrofits. State fishery biologists should be consulted to determine if migratory or resident fish are currently using the upstream segment. The existing culvert often acts as a barrier to upstream fish migration, but if fish are present, the retrofit should be dropped from consideration. Instead, designers should investigate whether culvert repair or replacement is a viable option at the crossing (see Profile Sheets R-27 to R-29 in Manual 4).

Crossing retrofits can potentially increase floodplain elevations above or adjacent to the proposed treatment area. Many zero and first order streams lack a defined or regulatory floodplain, but if one exists, designers may need to secure a permit from the local or state floodplain management authority.

The second key hurdle is getting approval from the local or state highway review authority to modify roadway embankments or culverts and secure easements needed for construction and maintenance access. The highway agency will certainly want to ensure that the proposed design will not saturate existing roadway embankments nor change the condition and flow capacity of

Figure 7: Sedimentation and increased water level fluctuation can harm sensitive forests and wetlands.

the existing culvert. Designers should coordinate closely with highway review staff early in the design process, particularly if the control structure is located outside of their right-of-way or will be maintained by a different party.

The highway agency will want to know who is responsible for maintenance and how it will be paid for. The most common arrangement is a maintenance agreement between the highway agency and the local public works department, although in some cases, a third party landowner might be involved. The highway agency will expect a written maintenance agreement that clearly defines the duties, schedules and contingencies for future maintenance.

Crossing Retrofit Design Issues

The design of crossing retrofits entails the following unique design issues:

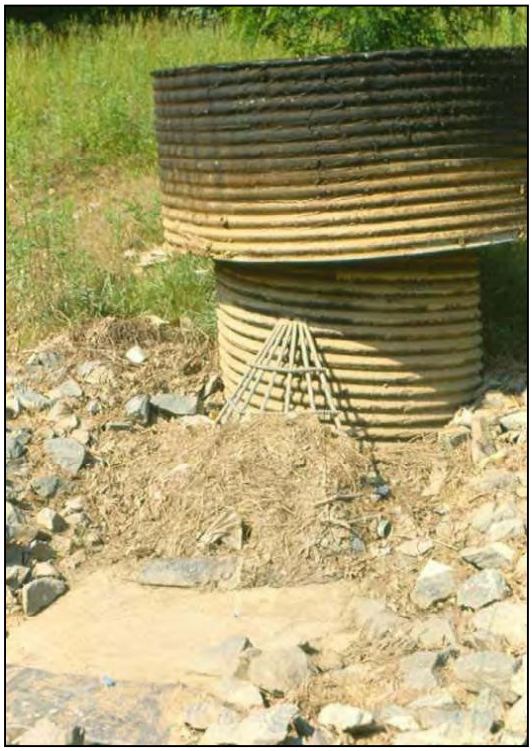

Figure 8: Designers should anticipate clogging problems by woody debris at crossing retrofits.

Crossing retrofits are particularly prone to clogging by organic debris, woody vegetation and sediment delivered from upstream sources (Figure 8). Over-sized forebays or micropools are strongly recommended. Trash racks are also needed to protect the control structure and require careful design so that they don't get clogged by woody debris. Reverse slope pipes extending to mid-depth of the micropool are often a good design solution.

Safe and easy access to the micropool or forebay must be provided, as both need to be frequently maintained to remove accumulated sediment and debris. Specialized equipment that can access tight sites may be needed to remove trapped materials.

Another key issue is how to minimize the amount of excavation needed for a crossing retrofit while still achieving the desired water quality volume. Off-site hauling of excavated materials can be very expensive, so designers should try to maximize "free" storage and look for nearby areas where excavated soils can spoiled without losing treatment or floodplain capacity.

The design of each crossing retrofit should always be done in the context of downstream geomorphology. Designers should evaluate whether downstream stabilization and/or grade control are needed to protect the crossing retrofit.

Design support

Crossing retrofits require numerous studies to confirm their feasibility and support final design:

- The contributing drainage area to the crossing retrofit should be accurately delineated using GIS or CAD. If

boundaries are questionable, they should be ground-truthed.

- Any forest or wetlands that will be disturbed or inundated by the retrofit should be delineated and their functional value assessed (Figure 9). Designers should consult foresters to determine what upstream tree and wetland species might be harmed by chronic inundation and/or ponding.

- Soil borings should be taken on the embankment, in the vicinity of the proposed control structure and at two points within the proposed treatment area. As a general rule, alluvial material is not useable as structural fill. Soil borings are critical to assess retrofit constructability factors, such as:

  – bearing capacity of risers
  – potential use of fill
  – compaction/composition of embankment
  – depth to groundwater

- Designers should obtain the original culvert design file and review any upstream calculations that exist. If the pipe/channel network has changed since the culvert was installed, designers should survey upstream channel cross-sections and elevations.

Figure 9: Surveys of forest and wetland conditions should always be performed in the proposed treatment area.

- Downstream studies may be needed to assess the impact of the proposed retrofit on fish passage, stream geomorphology or floodplain elevations. Designers should consider whether the retrofit will alter the sediment regime enough to actually increase the potential for downstream channel erosion. If a retrofit effectively captures sediment bed load, it may starve the downstream channel and create a “hungry” stream.

Design Process

The design process for crossing retrofits is generally done in a step-wise process:

Step 1: Check with the appropriate review authority to determine what design storms the culvert is expected to pass.

Step 2: Determine the target WQv or Cpv storage needed at the retrofit based on current drainage area and impervious cover, and compare to the estimated acre-feet of storage that can be obtained behind the secondary embankment (i.e., free storage and excavated storage).

Step 3: Model current upstream hydrology delivered to the culvert based on prior computations. New model input parameters may need to be derived if upstream land use, drainage divides, or storm drain infrastructure has changed since the crossing was originally designed.

Step 4: Run the appropriate design storm flows through the culvert to determine if it has adequate capacity to meet current hydraulic design criteria. If so, proceed with

upstream pond design. If not, investigate whether culvert replacement might be integrated into the overall retrofit design.

Step 5: Determine where the control structure will be located and determine the most appropriate material and elevations for the secondary embankment. Evaluate retrofit dimensions to verify that the storage obtained still meets the minimum target volume.

Step 6: Route design storms through the secondary embankment and old culvert to confirm they still meet current standards for design capacity. A dam breach analysis may be needed, depending on the height of the secondary embankment and its proximity to the roadway.

Step 7: Check how proposed water elevations will influence utilities and other structures in the floodplain. Compare manhole elevations to the proposed retrofit surface elevations to avoid the submerging sanitary system.

Step 8: Perform any additional analyses requested by the highway review authority.

Construction Considerations for Crossing Retrofits

Crossing retrofits involve several construction considerations that are not often associated with standard stormwater ponds (Figure 10):

- Staging and access are always challenging at crossing retrofit sites, given steep side-slopes, access through narrow easements on private lands, or confined upstream corridors (Figure 11).

- Designers should meet with contractors frequently during construction.

Figure 10: Two examples of crossing retrofits

- The online nature of crossing retrofits creates an inherent construction risk. Any construction equipment stored in the stream or floodplain will always be at risk from flood damage. Weather forecasts should be frequently consulted during in-stream work.

- Designers should carefully think about how they will work in the stream to address erosion and sediment control. Most sites will need dewatering during excavation and a method to bypass “clean” stream flows and storm runoff around the disturbed area (usually as a temporary diversion and pumping of

baseflow around the treatment cell and to the culvert).

- The secondary embankment often needs to be cast in place or formed on-site. Special construction techniques, equipment and experienced contractors are often needed.

- Crossing retrofits constructed near a road require a plan to resolve conflicts between traffic and construction equipment that ensures the safety of motorists, pedestrians, and construction workers. If regular ingress/egress to the road is needed, the highway agency may require a “maintenance of traffic” permit.

- Crossing retrofits should be inspected shortly after construction to check for clogging potential, excessive sediment deposition or changes in vegetative condition.

Crossing Retrofit Costs

Crossing retrofits tend to cost less than new retrofit ponds because they utilize free upstream storage. Their design and permitting costs, however, are often higher than other storage retrofit options. Planning level cost estimates are provided in Table 1, and site-specific factors that increase/ decrease construction costs are outlined in Table 2. More detailed cost estimates will need to be developed as actual concept designs are pursued further.

Figure 11: Construction access and staging is always a challenge for crossing retrofits

Table 1: Estimated Construction Costs for Crossing Retrofits (2006 $/ impervious acre treated)			
Retrofit Type	**Median Cost**	**Range**	**Design & Engineering (%)**
New Storage Retrofit [1]	$ 19,400 [2]	$ 9,000 to $32,000 [3]	40[4]

[1] Use appropriate pond equation in Appendix I if retrofit site satisfies new development site conditions
[2] Construction costs should be reduced based on the proportion of free storage that is available above the crossing. This fraction of storage should be priced using the pond retrofit estimator
[3] Adjust based on site-specific construction cost inflators/deflators in Table 2
[4] Increases to 45% if major environmental permits or highway agency design review is required

Table 2: Site Specific Factors that Influence Crossing Retrofit Project Cost	
Factors that Decrease Construction Cost	**Factors That Increase Construction Cost**
• Free upstream storage (little need to excavate) • Treatment area contains no trees or wetlands • Staging areas available adjacent to floodplain • No access roads are needed to get to site • Useable compactable fill available close by • Existing roadway embankment suitable	• Culvert needs to be replaced • Sewer or utility relocation • Hauling excavated materials off-site • Wetland or forest permits required • Wetland mitigation required

SR-3	Storage Retrofits **NEW STORAGE BELOW OUTFALLS**	

This retrofit creates new treatment adjacent to the stream corridor near the terminus of an existing storm drain outfall. Outfall retrofits are designed off-line by splitting flow from the existing storm drain pipe (or ditch) and diverting it to a stormwater treatment area formed by an existing depression, excavation or constructed berm (Figure 1). A flow splitter allows larger storms to remain in the existing pipe (or ditch) and bypass the retrofit. Typical stormwater treatment options at outfall retrofits are a combination of extended detention, pond or constructed wetland storage (Figure 2). Constructed wetlands are preferred in floodplains where groundwater elevations are high and space is available. Bioretention may also work if the outfall has no dry weather flow and a small contributing drainage area (Figure 3).

Outfall retrofits are ideal because they are close to the stream and maximize the upland drainage area treated. In addition, their off-line location usually means fewer stream permitting problems. Lastly, outfall retrofits only need to be designed to provide the desired storage for water quality and/or channel protection; larger flood flows bypass the retrofit.

Ideal Conditions for Outfall Retrofits

Most communities have hundreds or even thousands of stormwater outfalls discharging to their stream network. Only a fraction of these outfalls are suitable for storage retrofits. The best outfall retrofit sites usually have:

- A 12 to 36 inch diameter outfall discharging above stream or floodplain
- A wide stream corridor in public ownership
- At least 150 feet of unobstructed easement over the buried pipe

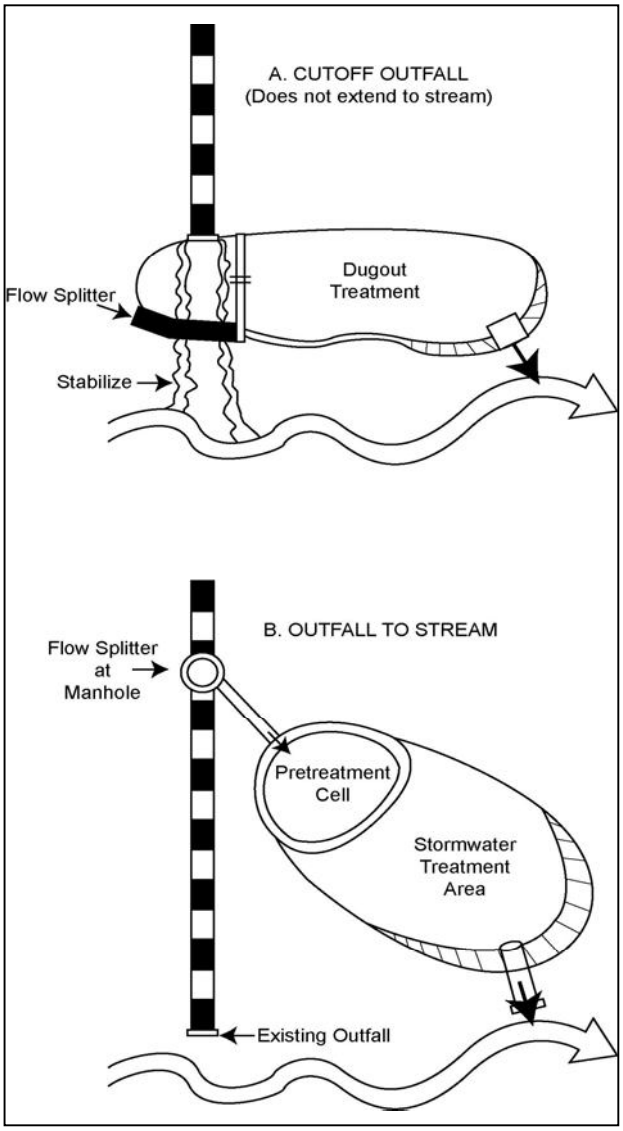

Figure 1: Two strategies for outfall retrofits in the stream corridor

- Enough pipe/channel gradient to divert flows for treatment and return them to the stream via gravity flow
- A good existing manhole to split flows and 5 to 10 feet of head to drive the retrofit
- Unutilized turf available on one or both sides of pipe
- A cutoff outfall (i.e., an outfall that discharges to the floodplain well short of the stream channel; Figure 4)

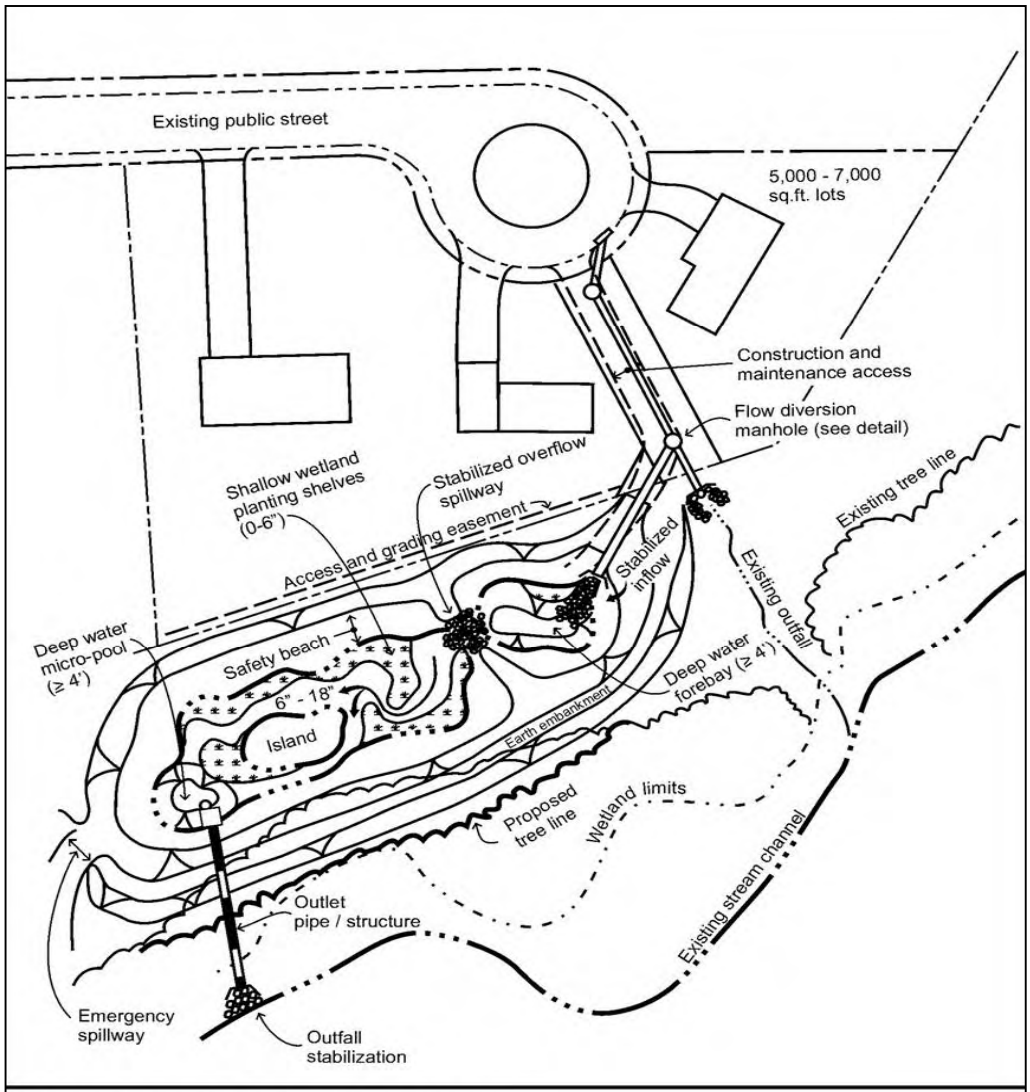

Figure 2: Splitting flow from the storm drain pipe to a constructed wetland in the stream corridor.

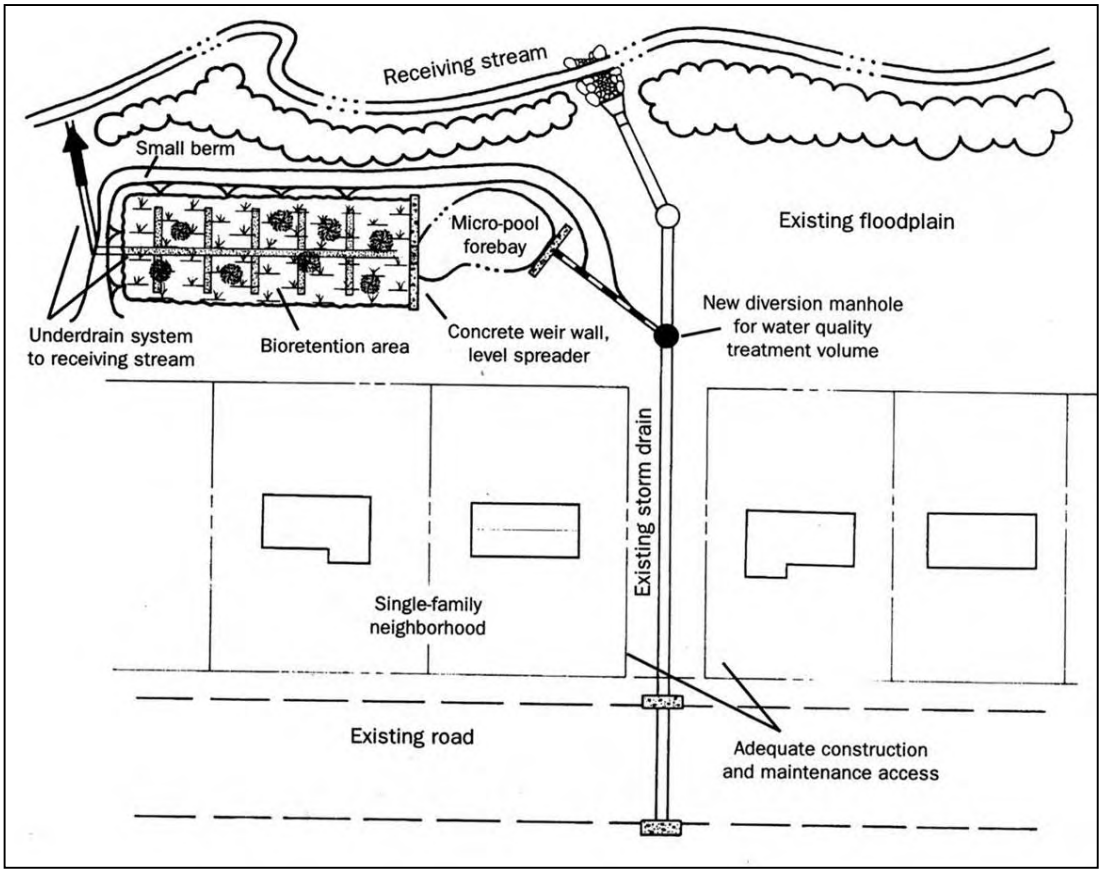

Figure 3: Schematic showing flow being split to an off-line bioretention facility.

Situations Where Outfall Retrofits are Difficult

Several factors make it difficult or impossible to get storage at an outfall, including sites where:

- Private land must be purchased
- Stream corridors are confined and lack land for surface treatment
- Stream valley parks where tree clearing would be controversial
- Very large outfalls (Pipe diameter greater than 60 inches)
- Perennial flow exists in the storm drain pipe or ditch
- Steep gradients or steep stream valley slopes limit available storage volume
- Low gradient causes unacceptable backwater conditions in the pipe system
- Outfall is subject to tidal or storm surges

Figure 4: Example of a "cutoff" outfall discharging well away from the stream

- Fill would need to placed in the floodplain

Restoration Alternatives at Outfall Sites

Other restoration alternatives can be employed when storage retrofits are not feasible, such as:

Outfall Stabilization – Problem outfalls that exhibit excessive scour, head cutting or generate high sediment loads are a good candidate for outfall stabilization. This is common for urban streams where outfalls discharge down steep hill-slopes above stream channels and floodplain terraces (Figure 5). Outfall stabilization may include structural measures such as plunge pools, micropools and other energy dissipation practices. Eroding gullies may also be stabilized with bioengineering techniques that combine soil fill and woody vegetation together.

Stream Daylighting - This may be a good option at sites where a pipe outfalls to a stream and is located too far underground to split. The storm drain pipe can be removed to create a naturalized stream channel. Guidance on designing stream daylighting projects at stormwater outfalls is provided in Profile Sheet R-27 of Manual 4.

Riparian Reforestation – Tree planting is always a preferred option at open spaces in the stream corridor that lack enough room for storage retrofits.

Desktop Search for Outfall Retrofits

The best place to look for outfall retrofits is the transition zone between the upland storm drain network and the stream corridor. Within this narrow zone, there may be many opportunities to install outfall retrofits:

If a community has good GIS coverage of its storm drain and stream network, it is quite easy to superimpose both layers to find points where they coincide with open land adjacent to the stream corridor (Figure 6). If drainage features such as ditch lines are

Figure 5: Reconstruction and/or bioengineering may be needed to stabilize outfalls that discharge down steep slopes.

Figure 6: Outfall retrofit sites can be discovered by overlaying storm drains, streams and adjacent open land.

available on the GIS, they should also be included in the search. The designer should search for publicly owned land parcels at least two acres in size that are associated with storm drain outfalls with a diameter greater than 12 inches and less than 36 inches. Some designers also analyze topography to get an initial estimate of the contributing drainage area to each outfall.

Stormwater outfall data may have been previously assessed during stream corridor surveys such as the Unified Stream Assessment (USA). The key USA impact forms to review include the outfall form (OT) and the impacted buffer (IB) form.

What to Look for During Outfall Investigations

The crew should first determine whether or not a flow splitter is needed to direct runoff for retrofit treatment. If so, the feasibility investigation is done in a step-wise manner, as follows:

1. Confirm the outfall diameter as it gives an indication of probable storm flows and drainage areas (Table 1). Record the shape, diameter, material and condition of the storm drain pipe (Figure 7). Measure the rate of dry-weather flow, if present. If the flow is suspicious, conduct a discharge prevention investigation to determine if it is an illicit discharge, using the methods outlined in Brown *et al.* (2004).

2. Check out the plumbing of the storm drain system in relation to the invert of the stream channel (Figure 8). Record the approximate vertical distance between the elevation of the outfall invert, the stream bottom and the top of bank.

3. Define available treatment area on either side of the proposed split and then establish the point where split flows will enter the proposed treatment area. Use hand auger to get a sense of soil conditions and depth to water table.

4. Determine if further excavation or berms will be needed to obtain more storage in the treatment area, and estimate the probable depth of storage.

5. Look for the best place to bring treated flows back into the stream that minimizes tree loss. It may be possible to install a level spreader to discharge sheet flow across the remaining floodplain at smaller outfall retrofits.

Table 1: Guide for Estimating Drainage Area Based on Outfall Diameter

Pipe Diameter (inches)	Discharge (cfs)	Avg Velocity (fps)	Drainage Area (est. acres)
6	1	4	0.1 to 1
12	3	6	1 to 2
24	25	10	2 to 5
36	90	12	5 to 25
48	150	14	25 to 100
60	350	18	100 to 200
Note: For pipes flowing full, with one percent slope			

6. Locate upgradient manholes that delimit the underground storm drain pipe. Manholes are installed at junctions where storm drain pipes change in size, slope, or direction. The maximum distance between manholes is usually about 200 to 400 feet. Walk off the distance of unobstructed storm drain pipe or ditch contributing to the outfall. Remember that pipe gradient does not always follow surface topography, so pop a few manholes to establish pipe depths and get a general sense of underground pipe gradient.

Figure 7: Crews measure the diameter, condition and invert elevation of the storm drain outfall.

7. Define uppermost manhole or point along the pipe where it is possible to effectively split flows. It is desirable to have at least five to 10 feet of elevation gain from this point to the stream invert. Given standard manhole spacing, this distance may only be one to two manholes up the storm drain system.

8. Record approximate retrofit dimensions and sketch on concept plan.

Feasibility, Approvals and Permitting for Outfall Retrofits

Storage retrofits are only feasible at a limited number of outfalls within a subwatershed. Key feasibility factors include:

Head - Outfall retrofits need enough hydraulic head to drive stormwater flows by gravity from the split to the stream. Outfalls located in flat terrain or tidal areas often lack the five to 10 feet of head needed to make an outfall retrofit work, and may cause

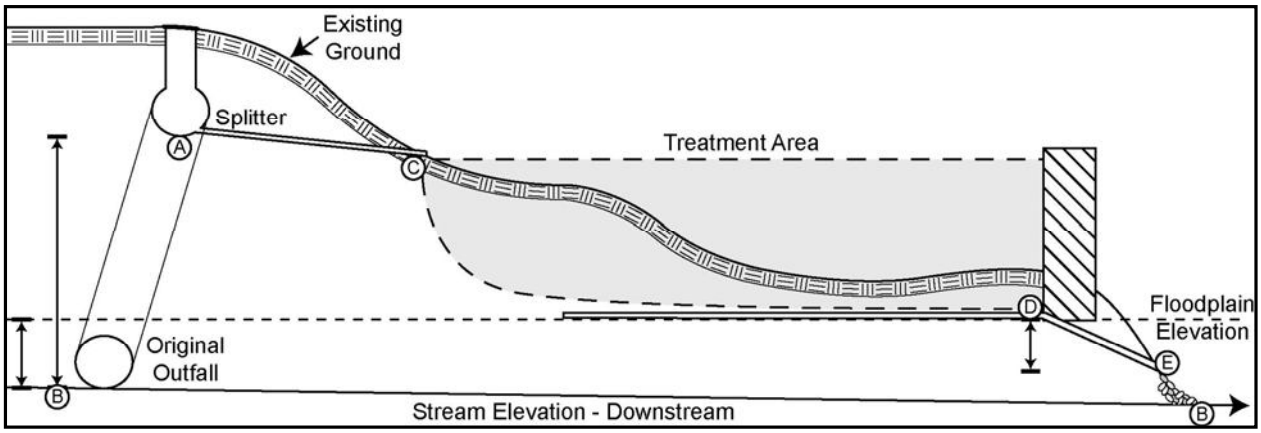

Figure 8: Design points for outfall retrofits

Several design points are of interest for outfall retrofits including (a) the location and elevation of the proposed split (b), the invert elevation of the original outfall, (c) the location and elevation of the discharge to the treatment area (d) the maximum depth of the treatment area and (e) the discharge point back to the stream. Designers need to maximize head through the retrofit, but also account for the influence of floodplain, seasonally high water table and erosive forces working on the stream bank.

tailwater and backwater problems (i.e., ponding backs water up above the split in the storm drain system, or high stream flows back water up into the treatment area).

Space – Since outfall retrofits are located in confined urban stream corridors, they are subject to severe space constraints (Figure 9). The proposed treatment area should be at least 2-5% of the contributing drainage area (depending on the proposed depth of treatment). Look carefully for surface indicators of utilities that reduce available treatment area. Sanitary sewers are a frequent problem as they often run parallel to the stream corridor. The designer should understand utility guidelines with respect to minimum sewer setbacks and the maximum permissible flood elevations to submerge manholes.

Soil Conditions at Proposed Treatment Area. The water table is often close to the surface of the floodplain, and it serves as a practical limit to the depth of excavation (and a clue that a pocket wetland may be ideal for the site). If soils appear to be hydric, designers should undertake a wetland delineation.

Outfall retrofits may require several environmental permits and landowner approvals. Since outfall retrofits are located in the stream corridor, they frequently create impacts to floodplains, wetlands and streamside forests that trigger environmental permits. If either high quality wetlands or mature forest are located within the proposed treatment area, the project should be dropped, unless there is a compelling case that existing habitats are so degraded that the proposed retrofit would restore them.

Easements for construction access or future maintenance may need to be secured at outfall sites that are effectively landlocked or have steep slopes descending to the stream corridor.

Designers should give special consideration to any changes in floodplain elevations, particularly if berms or embankments are needed to increase retrofit storage capacity. A floodplain study may be needed to determine whether any proposed floodplain fill will cause unacceptable changes in floodplain elevations. If the retrofit is located primarily within the floodplain, a

Figure 9: Field crews look for large areas of open land adjacent to the stream corridor.

dam safety permit may be required.

Designers should always model the effects of large flood events on the integrity of the retrofit. Floodplain permits are usually not a problem if the treatment storage is obtained by excavation.

Outfall retrofits are well suited for parks and other public lands. They may also be feasible on private land although designers may need to secure an expanded easement to accommodate the retrofit. In either case, the designer will need to satisfy the local park authority or landowner that the retrofit will:

- Not result in major loss of streamside forest (Figure 10). Any tree clearing should be fully reforested
- Not conflict with stream corridor uses such as footpaths, bike trails and picnic areas (ideally, the designer would incorporate these amenities into the design)
- Not create any new safety risks, particularly if the public has access to the site
- Create an attractive water feature or natural habitat area
- Utilize pondscaping, native plants and interpretive signs to educate the public
- Reduce mowing and other ongoing maintenance operations

Outfall Retrofit Design Issues

The key design element associated with outfall retrofits is the flow splitter that diverts the appropriate runoff volume into the proposed treatment area. Flow splitters use weirs or orifices to divert flows into the retrofit and bypass larger flows around it (Figure 11). The Achilles heel of splitters is clogging, so designers should always incorporate sumps and hoods within the flow splitter to protect the outlet pipe.

Designers need to be aware of backwater effects and hydraulic grade lines when sizing flow splitters to prevent unacceptable up-pipe conditions.

Another key issue involves how to discharge treated runoff back into the stream to prevent scour and erosion at the new outfall

Figure 10: Sensitive layout of outfall retrofit in a park to avoid tree clearing.

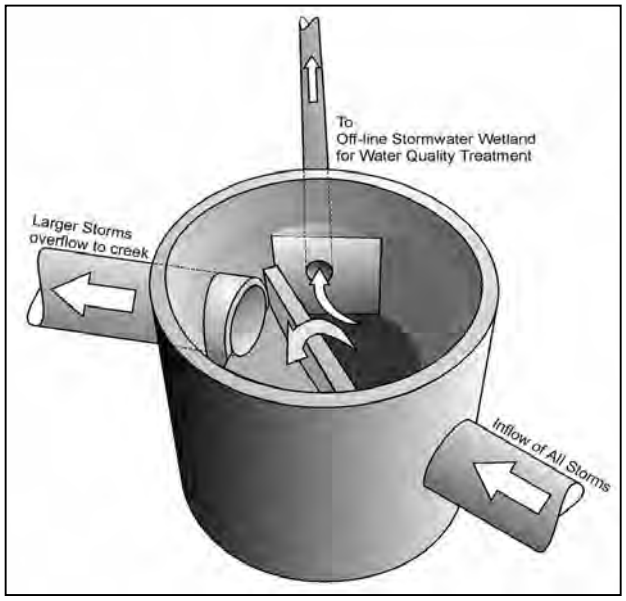

Figure 11: Detail of a flow splitter constructed in a manhole to divert flow for offline treatment.

location. This is a particular concern when there is a considerate drop to an incised urban stream with steep banks (Figure 12). Hard stream stabilization techniques are often needed to protect the new outfall from the erosive energy of the stream during bankfull floods (See Manual 4). Designers should also carefully fingerprint the outfall pipe to protect mature streamside trees and wetland features.

Designers frequently have limited space within the proposed treatment area to include design features such as forebays, benches and micropools. In general, it is better to sacrifice WQv storage than to drop these pond features. Baffles or small berms can be used to extend the flow path within the treatment area and thereby increasing residence time and enhancing pollutant removal performance.

Design Support

Several studies may be needed to support the design of outfall retrofits:

- Search for existing construction drawings of the upstream storm drain network

Figure 12: Designers may need to stabilize retrofit outfalls in incised urban streams.

- Update land cover in the contributing drainage area if it has changed over time
- Survey the invert elevations of the current storm drain system at least three manholes above the proposed split.
- Assess the condition of existing storm drain pipes
- Survey elevations within the proposed treatment area
- Take soil borings to determine depth to groundwater and excavation conditions
- Delineate wetlands and/or forest stand structure, if either is present

Design Process

The following step-wise design approach is recommended for outfall retrofits:

Step 1: Determine the target WQv storage needed at the retrofit site based on current drainage area and impervious cover to the proposed split. Conduct a rough grading analysis to determine the available storage volume (in acre-feet) within the proposed treatment area. If the target volume can be attained, proceed to the next step.

Step 2: Redo the upstream hydrology model for the existing storm drain pipe at the proposed point where flow will be split away from the pipe. Update the model input deck to account for any changes in land use, land cover, drainage divides the drainage network since the pipe system was originally designed.

Step 3: Check to see if the current pipe is flowing full or under pressure. If so, flow splitting may cause back up of flows into the upstream pipe network.

Step 4: Determine the rate and volume to divert for water quality treatment. Select an appropriate flow splitting method; several examples are shown in Figure 13.

Figure 13: Three examples of flow splitters to divert runoff for off-line treatment.

Montgomery County DEP has developed useful flow splitter design guidance which is available at http://permittingservices.montgomerycountymd.gov/permitting/docs/FLOWSPL.pdf

Step 5: Conduct a backwater analysis to determine the extent of the hydraulic grade line under the appropriate design storm scenarios to ensure the practice will not result in nuisance flooding. Good design guidance has been developed by King County, Washington, and is available at http://dnr.metrokc.gov/wlr/dss/kcbwdoc.htm

Step 6: Route the water quality storm through the proposed treatment area, locate and size the new overflow to the stream, and verify that it will be stable under expected stream velocities.

Construction Considerations for Outfall Retrofits

The flow splitter is always a key construction consideration for outfall retrofits. Designers should always make sure they work closely with the contractor to get flow splitter elevations right, ensure joints are water tight and provide easy access for maintenance. The flow splitter should be frequently inspected after construction to ensure it functions properly and does not clog.

The advantage of a flow splitter is that it eliminates the need for a temporary diversion during construction. Storm flows continue to pass through the original storm drain pipe until the treatment area has been constructed. Once the treatment area is stabilized with vegetation, the flow splitter can be “turned on” to direct runoff for treatment.

Some in-stream work may be needed to construct a stable discharge to the stream. Designers should install appropriate in-stream erosion and sediment control practices during this phase of retrofit construction.

If the proposed site has high groundwater levels, construction logistics become very challenging. Soupy soils make excavation more difficult, and may require dewatering devices and specialized construction equipment.

Outfall Retrofit Costs

Construction costs for outfall retrofits are shown in Table 2 for various regions of the country. Table 3 outlines several site-specific factors that can increase or decrease median construction cost. Design and engineering costs for outfall retrofits tend to be higher because of additional studies needed to support the design of the flow splitter. Maintenance costs may be slightly higher at outfall sites to keep the flow splitter from clogging.

Table 2: Estimated Construction Costs for Outfall Retrofits (2006 $/impervious acre treated)

Retrofit Type	Median Cost	Range	Design & Engineering (%)
New Storage Retrofit [1]	$ 19,400 [2]	$ 9,000 to $32,000	40[3]

[1] Use appropriate pond equation in Appendix I if the retrofit site satisfies new development site conditions
[2] Adjust based on site-specific construction cost inflators/deflators in Table 2
[3] Increases to 45% if major environmental permits or highway agency design review is required

Table 3: Site-specific Factors that Influence Outfall Retrofit Project Costs

Decreases Costs	Increases Costs
• Simple pipe daylighting to depression • Limited off-site hauling of soil • Shallow wetland reduce excavation • Short pipe lengths into/out of treatment area • Minimal stabilization is needed at stream	• Bridges needed for trails or pathways • Installing a new manhole to split flows • Existing storm drain pipe needs replacement • Utilities need relocation • High water table makes excavation soupy • Wetland or floodplain permits needed

SR-4	Storage Retrofits **TREATMENT IN THE CONVEYANCE SYSTEM**	

This retrofit obtains storage within altered zero and first order stream channels that comprise about half of the channel network in most subwatersheds. These channels lack perennial flow, have minimal floodplains and typically have a contributing drainage area of 15 to 50 acres in humid regions. Conveyance retrofits create storage, bioretention or wetland cells in an existing ditch, swale or non-perennial stream channel (Figure 1). Conveyance retrofits are particularly appropriate in small headwater channels that have been channelized and/or hardened in the past.

There are two basic design variants for the conveyance retrofit – *in-channel* designs where stormwater treatment storage is obtained within the channel and *off-channel* designs where the treatment storage is provided in cells adjacent to the channel.

In-channel retrofits obtain storage by:

- Installing small weir walls or checkdams in the channel to provide more storage
- Converting a channel or ditch into dry swale or wet swale
- Creating a linear series of wetland or bioretention treatment cells in the channel

Off-channel retrofits split storm flows from the channel to an adjacent depression or excavated treatment area (Figure 1). Off-channel retrofits can be effective when floodplain reconnection or wetland creation

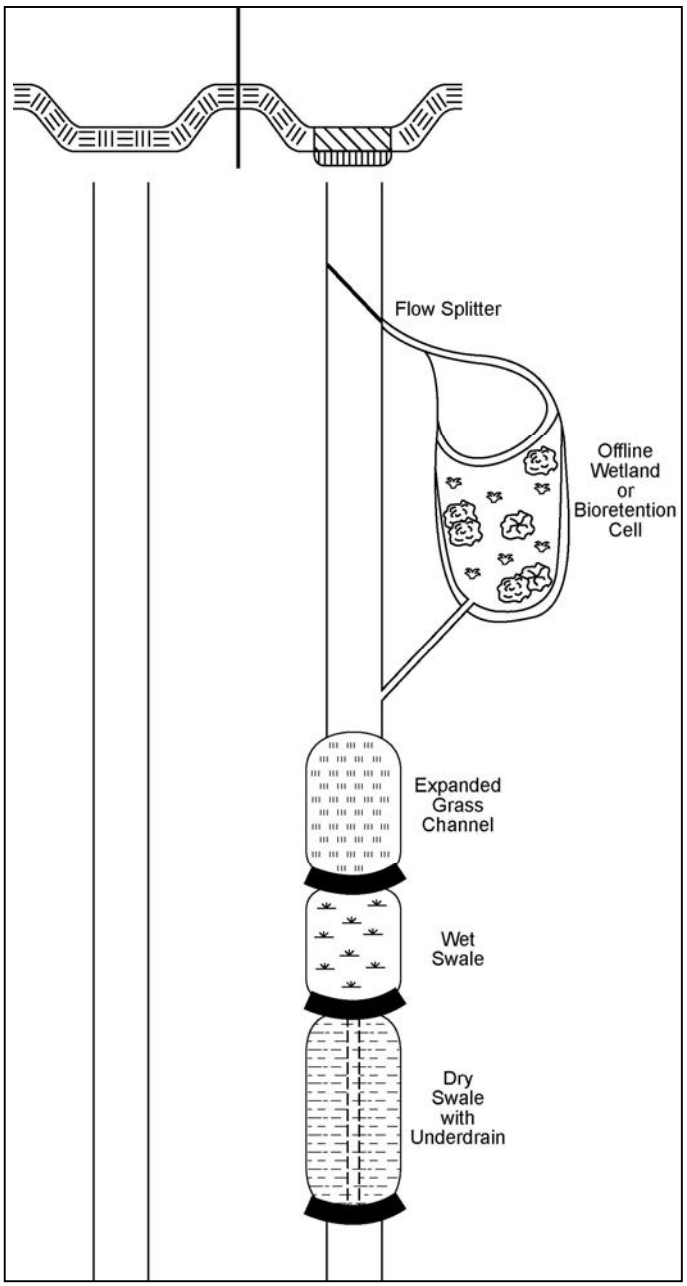

Figure 1: Both in-channel or off-channel treatment are possible in a conveyance.

is a subwatershed restoration objective. Constructed wetlands and bioretention are preferred for off-channel applications since they minimize the need for major excavation and embankments.

The stormwater conveyance system is a good location for storage retrofits since the land is usually located in a dedicated easement or right of way.

Ideal Conditions for Conveyance Retrofits

The ideal conditions for a conveyance retrofit are when the channel has:

- Gradient ranging between 0.5 and 2.0%
- Contributing drainage area of 15 to 30 acres of in humid regions with tight soils. Minimum drainage areas for conveyance retrofits are greater in arid and semi-arid regions with permeable soils.
- Been altered to promote efficient drainage (e.g., ditch, swale or concrete-lined channels; Figure 2)
- Less than three feet of elevation difference between the top of bank and the channel bottom
- Been used for roadway drainage in the right of way
- An unutilized parcel of public land located adjacent to the channel.

Figure 3 illustrates several examples of good candidate sites in the conveyance system for retrofit storage.

Situations Where Conveyance Retrofits are Difficult

Conveyance retrofits are generally not a good idea when the existing channel:

- Is in natural condition and has adjacent mature forests or wetlands
- Is rapidly degrading/incising or has a

Figure 2: Four opportunities within the conveyance system for retrofitting.

Figure 3: De-channelization and other stream repair practices are preferred when the conveyance system has perennial flow.

knickpoint advancing upstream
- Has a channel gradient of 5% or more and/or steep side slopes
- Has perennial flow
- Is located close to a residential neighborhood
- Is privately owned or lacks a drainage easement

Restoration Alternatives for Channels

Even if a storage retrofit is not feasible, several restoration practices can still be employed in the channel:

- Natural channel design or de-channelization (Profile sheets CR-31 to CR-33 in Manual 4)
- Riparian reforestation
- Wetland restoration

Desktop Search for Conveyance Retrofits

Potential sites for conveyance retrofits are found by superimposing the stream and drainage network layers over a land ownership map. The GIS system in most communities, however, seldom shows fine drainage features such as zero-order streams and ditch lines (Figure 4). Alternatively, it may be worth looking at drainage easements recorded on plats or entered into a local stormwater maintenance database. If local mapping is inadequate, potential sites can be found by inspecting high resolution aerial photographs or LIDAR topography (1 foot or better resolution).

If a Unified Stream Assessment (USA) has been conducted in the upper reaches of the subwatershed, potential conveyance retrofit sites can be found by examining the impacted buffer (IB) and channel modification (CM) impact forms.

What to Look for in the Field at Conveyance Sites

The field crew assesses the feasibility of a conveyance retrofit in the field by inspecting the channel reach, adjacent lands and downstream conditions.

1. Evaluate channel conditions

- Quickly estimate channel slope using a tape measure, a simple rod, or a lock-level.
- Measure the distance from the top and bottom of the channel and measure a full cross-section every 100 feet.
- Evaluate soil conditions underneath the channel using a hand auger, and record the presence of wetlands, hydric soils, standing water, erosion or perennial flow.
- Note the condition of vegetation in the existing channel and estimate the roughness of the channel and its floodplain.
- Look for signs that channel is under-capacity due to recent upstream development or past sedimentation (e.g., erosion of channel side slopes, poor vegetative stabilization, out of bank debris).

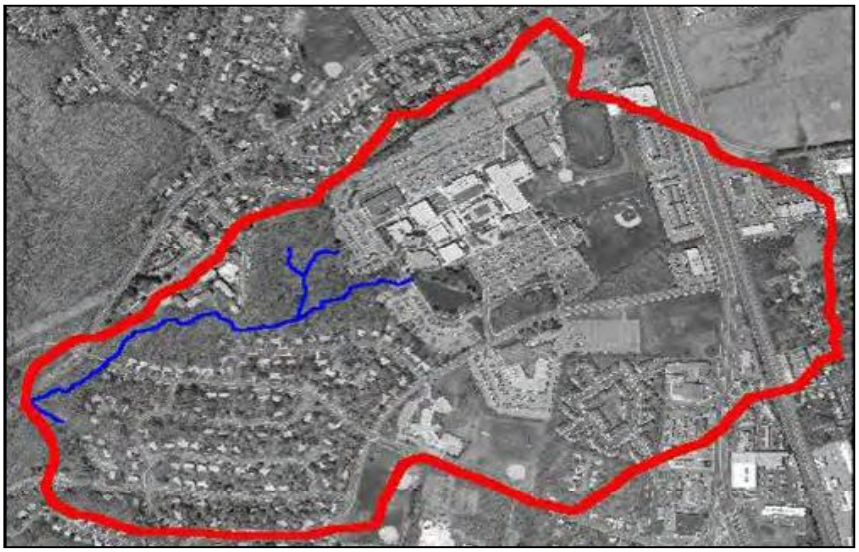

Figure 4: Most ditch lines and zero-order streams do not show up on local GIS maps.

2. Evaluate adjacent treatment potential.

The crew then looks at available land to right or left of the channel to:

- Measure the width available for treatment, such as depressed turf areas
- Look for surface indicators of underground utilities
- Find potential access points to get into the channel and places where construction equipment can be staged and stored
- Note adjacent land uses for any signs of encroachment (e.g., fencing, yard waste, dumping.)

3. Evaluate downstream conditions.

The crew then walks several hundred feet in a downstream direction to get a sense of where the channel becomes a perennial stream. The crew should look for signs of perennial flow, wetlands, and advancing knickpoints.

The site inspection helps to determine whether a conveyance retrofit is feasible and whether it should be located in or off the channel. The crew then sketches the proposed treatment area and indicates the recommended stormwater treatment option(s) on the field sheet. The proposed treatment area may need to be adjusted back in the office based on further research on land ownership, easements and utilities.

Feasibility, Approval and Permitting for Conveyance Retrofits

Conveyance retrofits are subject to many feasibility constraints, permits and approvals. Major feasibility constraints for in-channel and off-channel conveyance retrofits include:

Narrow Easement Width - Most drainage easements are seldom wider than 20 feet and are centered on the drainage feature. As a result, conveyance retrofit sites tend to be extremely tight and linear in nature (Figure 5). Designers will often seek to secure wider easements to increase treatment area or allow construction access.

Figure 5: Not a lot of room to work with - most stormwater easements are very narrow.

Channel Capacity - Most open channels are designed to convey a certain design storm event within a given cross-section. Recent development in the contributing drainage area, however, can produce greater peak flows that exceed the channel's original capacity. If channel geometry is furthered modified by a conveyance retrofit, it could increase flooding risk for adjacent properties and downstream structures. Therefore, designers should maintain the required hydraulic channel capacity established by the local drainage authority, and ensure that in-channel treatment areas can withstand the erosive velocities associated with the maximum design storm.

Available Head – The gradient of the channel is important. For off-channel designs, at least three to four feet of head is needed to divert runoff from channel to the proposed treatment area and then bring it back to the channel. Similarly, several feet of head are needed for in-channel designs to filter runoff and collect it an underdrain. Therefore, extremely low gradient channels are poor candidates for retrofits unless they are designed as wet swales. On the other hand, steep channel gradients often preclude in-channel retrofits.

Adjacent Utilities – Drainage easements are often used as a conduit for water, sewer and other utilities. Therefore, designers should check for possible utility conflicts, particularly for off-channel designs that split flow across the channel.

Conveyance retrofits have a few unique environmental permit issues. For example, zero and first order streams occupy a curious regulatory zone. In humid regions, the regulatory 100-year floodplain only begins when the channel has picked up about 35 to 50 acres of contributing drainage area. The same stream channels lack perennial flow, so they may not be regulated under various local, state or federal environmental permits. If the proposed retrofit is in a regulated floodplain, designers will need to perform floodplain analyses to ensure it does not increase flood elevations. If wetlands and forests are present, designers should pursue the appropriate permit review.

Designers should **never** retrofit a natural channel unless it has been previously altered for drainage purposes (Figure 6). Natural zero- and first-order channels provide major watershed functions, including groundwater recharge and discharge, pollutant removal and aquatic habitat (Meyer *et al.*, 2007; Cappiella and Fraley-McNeal, 2007; Schollen *et al.*, 2006). The destruction of a natural zero-order stream to install a conveyance retrofit simply exchanges one watershed function for another.

Figure 6: Three examples of natural features in zero-order streams that should not be disturbed.

Conveyance Retrofit Design

Conveyance retrofits entail several unique design issues:

The first issue is whether to go with an in-channel or off-channel design. While this decision is dictated by site constraints, off-channel designs are generally preferred, particularly when the contributing drainage area is large. When off-channel areas are treated, designers will need to install an effective flow splitter across the channel that can handle sediment deposition and clogging by trash and woody debris. One technique for flow splitting is shown in Figure 7.

Designers also need to choose whether the channel will be primarily managed as a man-made treatment system or as a natural stream corridor feature. The choice is generally made based on the condition of the existing channel and the aesthetic preferences of adjacent landowners. Natural landscaping and bio-engineering techniques should always be considered to soften its appearance.

If designers need to expand existing stormwater easements, they will need to negotiate with multiple landowners bordering the channel. Most property

Figure 7: One technique for splitting flow from the conveyance channel for off-channel treatment.

owners may grant an expanded easement if the proposed retrofit also solves an existing drainage or maintenance problem. It is also important to check to see if the easement is dedicated to the public or just to the private owner.

Designers need to calculate the erosive velocity and/or shear stress that channel soils will be exposed to over a wide range of design storms. Designers may need to reinforce the channel with geotextile fabric to prevent erosion and practice failure.

Since conveyance retrofits occur in the headwaters of the urban stream network, designers should anticipate the long term stability of the future channel. Designers should make sure the downstream end of the retrofit is protected by a fixed grade control structure to prevent an upwardly migrating knickpoint from undermining it (Figure 8). In addition, any flow splitters, weirs or checkdam installed across the existing channel should be fully armored with rock above and below the structure to prevent undercutting. The wingwalls should also extend several feet into each bank to prevent outflanking.

Since conveyance retrofits rely on vegetation for stability, designers should carefully choose grass or wetland plant species and devise a realistic plan to manage vegetation growth in future years.

Design Support

Conveyance retrofits may require several studies to support design, including:

- Legal research on drainage and stormwater easements. Few communities routinely record these in their GIS, so designers may need to analyze original development plans or even individual property deeds to confirm their boundaries
- Original design capacity computations for the existing channel
- Delineation of the contributing drainage area and land cover if either has substantially changed since the channel was originally designed
- Soil borings or test pits to determine underlying soil conditions in the channel, as well as the depth to bedrock or water table
- Surveys of current channel cross-sections and elevations and to confirm

Figure 8: Crews should look downstream for advancing knickpoints that could undermine in-channel treatments.

locations and depths of any suspected utilities.

Design Process

The design process for a conveyance retrofit depends on whether it is an in-channel or off-channel design. In both cases, hydrologic and hydraulic models are used to assess proposed water elevations with respect to channel capacity, property impacts, and potential utility submergence. The following step-wise design process is recommended for in-channel retrofits:

Step 1: Compute the desired target water quality volume for the retrofit site (in acre-feet), given its current drainage area and impervious cover. Compare this to the estimated WQv available within in-channel treatment cells. Water quality storage can be created above or below the existing channel. Storage below the channel is obtained by dry swales, bioretention swales, or excavated wetland cells, none of which alter the hydraulic capacity of the channel. Storage above the channel is obtained using weirs, berms or checkdams that do alter channel hydraulic capacity (Figure 9). If the target volume can be achieved, proceed to the next step.

Step 2: Check with the local review authority to confirm which hydraulic capacity design standards apply to (e.g., conveyance of 10-year design storm). Roadway conveyance design standards may vary based on road classification.

Step 3: Revise the existing hydrologic model for the existing open channel section (or create new one). The model input deck may need to be modified if the upstream channel or its contributing drainage area has changed since it was originally constructed. Verify that the existing channel has adequate hydraulic capacity to pass the design storm.

Step 4: Repeat the modeling process for the final retrofit channel dimensions to determine whether proposed changes in slope, channel geometry or roughness can still accommodate the local design storm for safe conveyance.

Step 5: Use Manning equation to ensure that minimum residence time is achieved for the water quality design storm within the channel treatment area. A minimum target is 10 to 20 minutes of residence time for the channel, not accounting for any infiltration into the treatment cells. Evaluate the channel geometry to ensure that flow spreads evenly over the bottom of the channel.

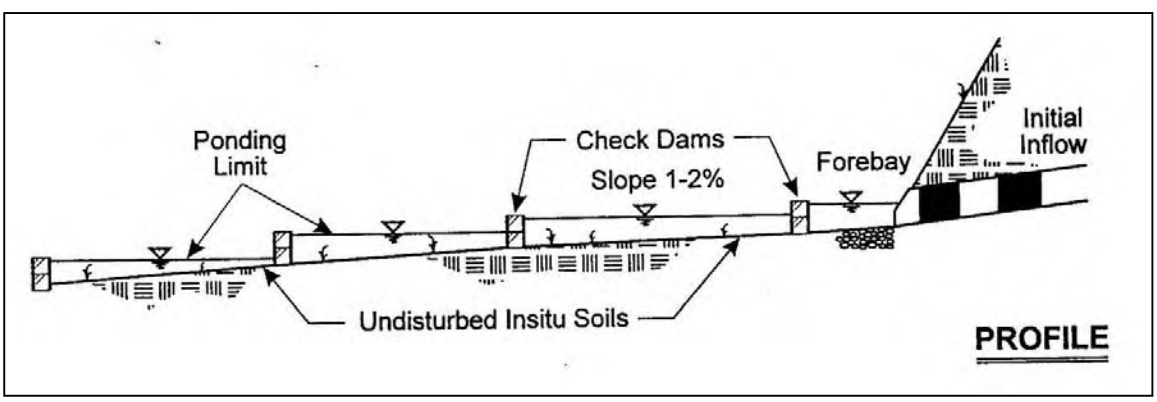

Figure 9: Getting storage on the surface of a conveyance channel using checkdams.

Step 6: Velocity control is a significant design consideration with in-channel retrofits to minimize sediment re-suspension and prevent erosion. Velocity may be reduced by further reducing channel slope, increasing the channel width, increasing roughness, or using geotextile reinforcement. Scour analysis may be needed to size the diameter of stone needed to stabilize checkdams, biologs or weir walls.

Step 7: Employ a grade control to fix the downstream elevation of the retrofit in larger naturalized channels. A rock vortex weir may be appropriate to fix the retrofit (See Profile Sheets R-18 to R-21 in Manual 4). An entrenched stone checkdam should suffice for smaller conveyance channels. The design process for off-channel retrofits is very similar to outfall retrofits (See Profile Sheet SR-3). Several examples of conveyance retrofits are presented in Figure 10.

Construction Considerations for Conveyance Retrofits

Conveyance retrofits can be challenging to construct for several reasons. Construction access and staging areas are always at a premium given that most drainage easements are very narrow (10 to 50 feet). Designers often need to get temporary easements to store construction equipment and materials (Figure 11). Bid documents should specify specialized construction equipment that can work in tight and narrow spaces (such as bobcats).

Even though most conveyance retrofits lack perennial flow, designers should consider the effect of storm flow when it comes to erosion and sediment control. In particular, erosion control fabrics are recommended to anchor the bottom of the channel (see Profile Sheet R-10 in Manual 4). Sod may be needed to anchor steeper channel side-slopes.

Designers will need to find a way to bypass or pump around storm flows during retrofit construction. The construction schedule should be compressed to complete work as soon as possible and rapidly stabilize the channel so the retrofit is not washed out by an early storm. Contractors should consult weather forecasts before commencing work, and contingency items should be included in contracts to allow for replacement of plant material and temporary channel repairs.

Conveyance Retrofit Costs

A planning level cost for conveyance retrofits can be developed based on the stormwater treatment options employed (Table 1). In general, off-channel designs are more costly than in-channel designs due to the need to construct a flow splitter. Construction costs for conveyance retrofits are extremely variable, and designers should always look at site-specific factors shown in Table 2 to adjust their final cost estimate.

Figure 10: Four examples of conveyance retrofits.

Figure 11: Specialized equipment is needed to work within tight project boundaries.

Table 1: Estimated Construction Costs for Conveyance Retrofits (2006 $ per impervious acre treated)			
Retrofit Type	**Median Cost[3]**	**Range**	**Design & Engineering (%)[4]**
In-channel treatment [1]	$ 45,400	$ 25,400 to $62,600	32
Off-channel treatment [2]	$ 68,100	$38,100 to $93,900	32

[1] Based on average cost for water quality retrofit which may be high if the existing channel requires little surface grading
[2] Costs for off-channel treatment assumed to be 1.5 times more expensive due to need for flow splitters and channel reconnections
[3] Adjust the median cost to account for site-specific construction cost inflators/deflators shown in Table 2
[4] May increase to 40% if zero order streams are regulated under section 404 or if deed research is needed for multiple landowners

Table 2: Site-specific Factors that Influence Conveyance Retrofit Construction Cost	
Factors that Decrease Costs	**Factors That Increase Cost**
• Wide drainage easement available • Public land available for off-channel treatment • Existing channel is over-capacity • Single property owner • Ability to construct with small equipment • Surface treatment in swale (wet swales)	• Need to negotiate additional access easements • Poor construction access • Wetland permitting • Legal research on easements • Multiple property owners to notify • Flow splitter needed

SR-5	Storage Retrofits **STORAGE IN TRANSPORT RIGHTS-OF-WAY**	

Highways contain un-used land within their right-of-way where storage can be obtained by diverting highway runoff into a depression or excavated area. Highways frequently cross local drainage divides, which reduces contributing drainage area and makes the corresponding WQv storage more manageable. In most cases the contributing drainage area to a highway retrofit is less than 10 acres.

The most common stormwater treatment options for highway retrofits are ponds and constructed wetlands, although linear bioretention and swales may also be feasible in wider medians and rights-of-way (Figure 1). In general, infiltration is not recommended as a stormwater treatment option, unless they contain enough pretreatment to fully capture and contain a 10,000 gallon spill.

Highway retrofits are ideal because their runoff pollutant concentration is high. Land costs are negligible since the retrofit is located in the dedicated right of way. Highway agencies have stronger incentives to retrofit to comply with emerging stormwater permit requirements, watershed mitigation needs and hazardous material spill liability. Lastly, highway agencies are often “good maintainers” and may see retrofits as a means of reducing their ongoing maintenance operations.

Ideal Conditions for Highway Retrofits

The best conditions to shoehorn storage retrofits into the highway system occur at:

- Cloverleaf interchanges (Figure 2)
- Depressions created by approach ramps
- Open section drainage within a right-of-way that is wider than 30 feet and located down-gradient from the road and free of utilities
- Drainage leading to bridges that cross streams with extensive floodplains
- Highway drainage that can be diverted to adjacent public land
- Targets of opportunity in highway widening/realignment construction projects

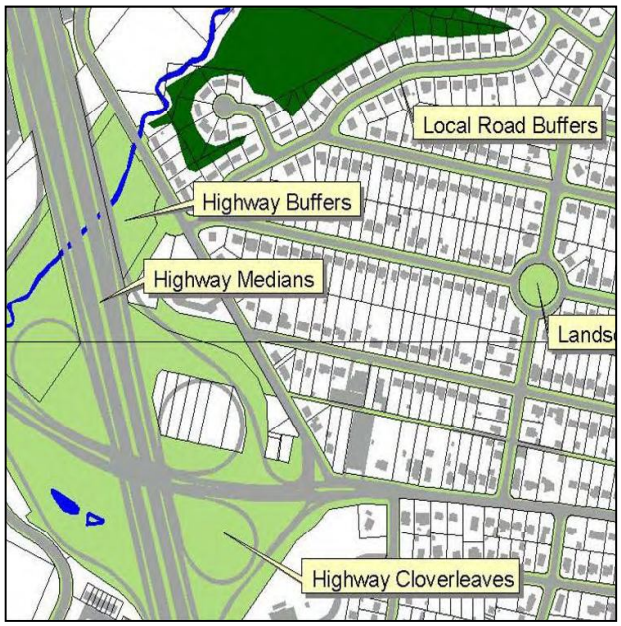

Figure 1: Highway corridors present numerous retrofitting opportunities.

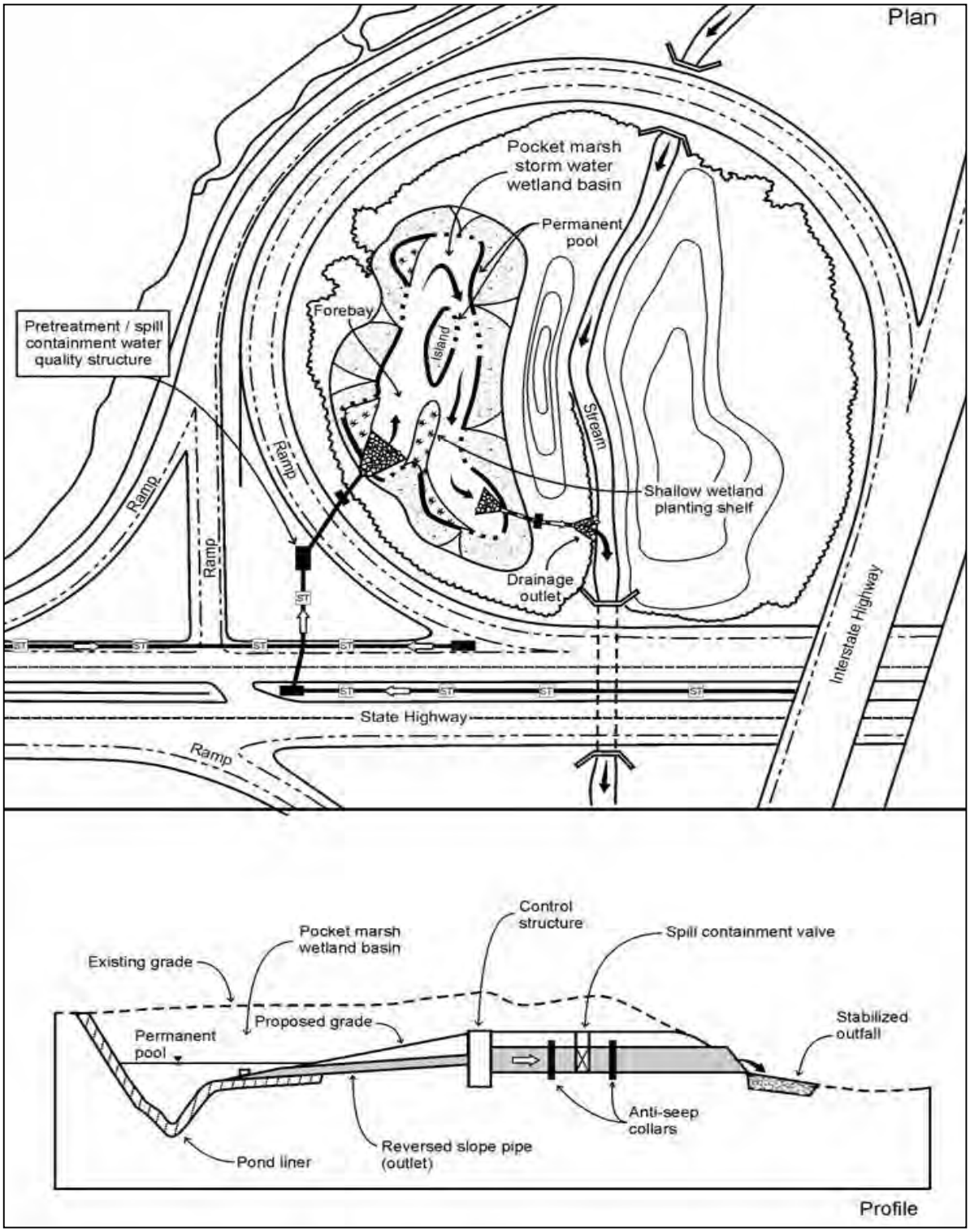

Figure 2: Plan and profile of wetland retrofit within cloverleaf interchange.

Situations Where Highway Retrofits are Difficult

Retrofitting is not a good idea at highway sites that:

- Are likely to be widened or expanded in the future to handle increased traffic flow
- Have guard rails, steep side-slopes or limited sight distance
- Require lane closures to provide construction or maintenance access
- Are slated to be used as a staging area for future road construction projects

Restoration Alternatives at Highway Sites

If a storage retrofit is not feasible, the site may still be suitable for reforestation (Figure 3) using the highway tree planting methods outlined in Cappiella *et al.* (2006a).

Desktop Search for Highway Retrofits

Potential highway retrofit sites can be found using several methods. The quickest is to visually examine aerial photos, since major highway features tend to really standout (Figure 4). A more systematic method is search existing local, state or federal highway right-of-way GIS layers against open land and the stream network. The combined land area in open space and right of way should generally meet a minimum acreage threshold of one acre. Most highway agencies have good maps of their road drainage, so try to get copies to take into the field (Figure 5). These maps should be analyzed to find any existing highway stormwater treatment practices that might be suitable for retrofitting.

Figure 3: Reforestation may be a viable option if a retrofit is not feasible.

Figure 4: Highway retrofits really standout in aerial photos, although highway drainage does not.

Figure 5: Many highway agencies have good GIS data on their stormwater infrastructure.

Highway drainage maps are a great help since highways often define (and frequently alter) the topographic boundaries of the contributing drainage area. Some designers may want to analyze these maps to initially estimate drainage area to potential highway retrofit sites before they go out in the field. Designers should also coordinate with highway planners about future road construction plans that could influence proposed retrofit sites. For example, an otherwise fine treatment area might be slated for construction staging in a future road construction project.

What to Look for During Field Investigations at Highway Retrofits

Highway retrofit sites can be dangerous, so safety is paramount. Crews should wear blaze orange safety vests, don hardhats, and look for safe places to park vehicles and cross traffic lanes to access the site. Crews should always get authorization from the highway agency to access potential retrofit sites. Better yet, highway engineers should be invited to share their knowledge about road safety, drainage and history. It is advisable to get highway drainage maps before going out in the field, since highway drainage can be complex and confusing to determine in the field. As a general rule, sites that are hazardous to access will be poor retrofit candidates. Assuming a site is reasonably safe, the crew should:

Check to see whether the highway has open or closed drainage and try to delimit the upstream drainage divide. The actual drainage can be difficult to ascertain because of subtle grades, or pipes that buck grade, so the crew may need to consult as-built drawings to solve the drainage puzzle.

Sketch out the contributing drainage area and flow path and compare against highway design drawings. Most highway retrofits have fairly small drainage areas, so several retrofits may be needed for full treatment. As a rule, keep in mind that each 100 feet of a 10 foot travel lane equates to about 0.022 acres of drainage area. Look for obvious depressions in a down gradient direction that can provide treatment without major excavation.

Remember that available treatment area needs to be adjusted to account for standard highway safety setbacks. For example, a 15 to 50 foot setback from edge of pavement is normally required for sight distance and traffic safety. Similarly, many highway agencies insist that road side-slopes be maintained at a grade of 6:1 (h:v) or better in the absence of guard rails.

The crew should measure available head, which is usually fixed by the invert of the receiving highway drainage system. In most cases, at least six feet of head is needed to drive pond or wetland retrofits.

Feasibility, Approvals and Permitting for Highway Retrofits

The greatest hurdle is getting approval from the local/state or federal highway agency that owns the retrofit site.

Early coordination with the appropriate highway agency is essential. Designers should thoroughly understand all agency road design requirements such as setbacks from pavement, sight lines, pool depths, minimum freeboard, access and drainage capacity, and treat them as a given during retrofit assessment and design. The highway agency will want to ensure that the proposed design will not saturate existing roadway embankments nor diminish the flow capacity of existing highway drainage.

In most cases, retrofit construction will temporarily interrupt traffic flow, so the reviewing agency will want to know how traffic flow will be maintained, and may require a separate permit known as a "maintenance of traffic" plan.

Highway agencies are keenly interested in the maintenance implications of the retrofit and who will pay for it. The highway agency maintaining the right-of-way will normally maintain the new retrofit, and will expect that safe access and spill control be addressed. The approving agency will expect a written maintenance agreement that clearly defines the duties, schedules and contingencies for future maintenance operations. The reviewing agency will want assurances that the proposed retrofit will not interfere with routine highway maintenance operations such as pulling ditches or mowing.

Most highway retrofits do not involve environmental permits, although it is good practice to minimize any major tree loss or wetland impact. In some regions, the wetland permitting authority may regulate wetlands that were unintentionally created by original highway construction, so be sure to consult them about their jurisdictional status. Highway agencies usually have numerous wetland mitigation needs, so designers may want to utilize constructed wetlands as the stormwater treatment option to make the retrofit more attractive.

If trees are cleared during construction that remove an existing visual screen or noise barrier, expect significant concerns from adjacent residents about the loss of trees.

Design of Highway Retrofits

Highway retrofits involve several unique design considerations, including:

Road design criteria - Designers need to fully understand and satisfy all highway design criteria relating to safety and maintenance to have any chance of getting the retrofit approved by the review agency. For example, most agencies will require a minimum 30 foot "clear zone" from the road shoulder to allow vehicles to recover when they run off the road.

Design for higher pollutant loadings - Highway runoff can be a significant source for sediment, hydrocarbons, heavy metals and other pollutants, so designers should select the best stormwater treatment option that maximize removal of the pollutant of concern. Highway runoff also contains high inputs of litter and debris that can cause clogging, reduce treatment capacity and increase retrofit maintenance burdens.

Pretreatment - Over-sized pretreatment is recommended for most highway retrofits. The pretreatment cell should comprise at least 25% of the entire WQv storage.

Safe and direct maintenance access - Highway agencies will always insist on safe and direct access for heavy equipment to the retrofit. Operationally, this means a retrofit design that avoids steep slopes, reduces the need for lane closures, allows for safe highway ingress/egress and enables vehicles to turnaround easily.

Compatibility with ongoing highway maintenance - Highway crews need to efficiently maintain hundreds of miles of ditch, shoulder and right of way every year. Designers should consult them to determine how the proposed retrofit will influence their routine maintenance operations, and be prepared to adjust the design accordingly.

Maintenance of traffic - Temporary lane closures are often needed at critical points in retrofit construction to ensure the safety of both construction workers and motorists. A detailed construction sequence must be formulated to safely segregate traffic and construction equipment. The retrofit maintenance plan should also specify how traffic will be managed to permit maintenance access.

Wintertime operation - Designers in northern climates should always consider how snow management will impact the proposed retrofit. For example, high chloride inputs can harm vegetation, so landscaping plans should specify salt tolerant plant species. If road sanding loads are high, designers should incorporate additional storage and/or pretreatment. Lastly, designers should anticipate the direct impact of snow plowing, dumping and melting on the retrofit and its vegetation, as well as the risk of damage to inlets and curbs from snow plows.

Spill Containment - Accidents and spills are a common occurrence along highways, so it is wise to incorporate spill containment features into highway retrofits. Ponds, wetlands and pretreatment cells should contain a butterfly shut-off valve so that spills can be rapidly contained within the retrofit. If underlying soils are permeable, it may be advisable to install liners to prevent downward migration of polluted stormwater. Figure 6 shows a large surface sand filter in Austin, Texas that has a hazardous material diversion chamber located prior to the filtering treatment area.

Sediment Disposal - Sediments that accumulate in highway retrofits have a small but higher risk of being classified as hazardous waste due to stormwater runoff and spills. Visual inspections are recommended prior to sediment removal operations to determine if further testing is needed. If the visual inspection indicates sediments are discolored or malodorous, sediment testing can determine whether they need to be disposed in a conventional landfill or special hazardous waste facility.

Figure 6: Spill containment should be a feature in highway retrofit designs.

Design Support

Highway retrofits require several special studies to support design, including:

- Interview highway planners about future uses at the proposed site.
- Review as-built surveys to delineate the contributing drainage area and drainage network. If these are not available, surveys may be needed to confirm drainage areas and elevations.
- Take soil borings at the proposed treatment area since the original soils have been severely altered and compacted by mass grading during initial road construction.
- If the proposed retrofit is located close to the right-of-way boundary, conduct plat research to define ownership and establish easements.

Design Process

The highway review agency will dictate the design process for each retrofit site. The design process will also depend heavily on the type of stormwater treatment selected (Figure 7).

Construction Considerations for Highway Retrofits

Construction of highway retrofits are challenging given the volume and speed of nearby traffic.

- Contractors should diligently follow the maintenance of traffic plan to ensure worker and motorist safety.
- Highway retrofits tend to be quite tight for material and equipment staging.
- Erosion and sediment controls should be scrupulously maintained since these retrofits are visible to passing motorists

Highway Retrofit Costs

Cost data are fairly sparse for highway retrofits. For planning purposes, construction costs can be assumed to be equivalent to the cost to construct a new retrofit facility, as shown in Table 1. Construction cost estimates should be adjusted to account for site-specific factors that can influence highway retrofit construction, as shown in Table 2.

Figure 7: Two examples of retrofits located in the highway right of way.

Table 1: Estimated Construction Costs for Highway Retrofits (2006 $ per impervious acre treated)			
Retrofit Type	**Median Cost**	**Range [2]**	**Design & Engineering**
New storage retrofit [1]	$19,400	$9,000 to $32,000	32% [3]

[1] Use appropriate pond equation in Appendix I if retrofit site satisfies new development site conditions
[2] Adjust based on site-specific construction cost inflators/deflators in Table 2
[3] Increases to 40% if extensive highway agency design review approval is needed

Table 2: Site Specific Factors that Influence Highway Retrofit Projects	
Factors that increase costs	**Factors that decrease costs**
• Need to excavate to get storage • Off-site hauling • Need new maintenance access • Gates and fencing • Erection of temporary construction barrier • Spill controls	• Existing depression • Open section roads • Gentle side slopes • Low traffic volumes • Cooperative highway review agency • Retrofit contributes to mitigation needs

SR-6	Storage Retrofits **LARGE PARKING LOT RETROFITS**	

Large parking lots are a good retrofit opportunity to treat runoff quality. Large parking lots are defined as five acres or greater in size (including any connected rooftops – Figure 1). Common examples include lots serving municipal buildings, high schools, regional shopping malls, stadiums, auto dealerships, airports, commuter lots, hospitals and big box retail stores. Larger parking lots are normally served by extensive storm drain systems and contain numerous inlets, underground pipes and outfalls.

This retrofit strategy excavates centralized treatment storage in unutilized land located downgradient of the lot (Figure 2). Common stormwater treatment options include extended detention, ponds, constructed wetlands or a large bioretention area.

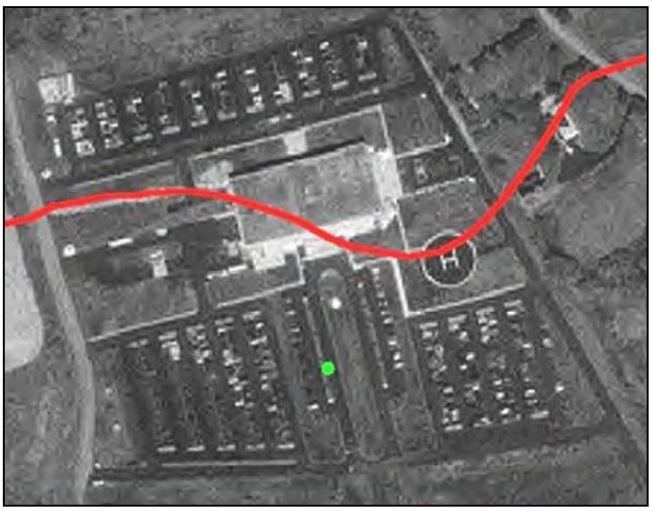

Figure 1: Large parking lots are a key retrofit target.

Centralized retrofits are not the only retrofit strategy for parking lots; an on-site retrofit strategy for small parking lots is described in Profile Sheets OS-8 and OS-13. The centralized retrofit strategy is generally more cost-effective on a per acre treated basis than an on-site strategy.

Large parking lots are an ideal retrofit because they generate more stormwater runoff and pollutants on a unit area basis than any other land use in a subwatershed.

Ideal Conditions for Parking Lot Retrofits

Parking lots built in the last few decades are good retrofit opportunities since local codes often require more generous setbacks for screening, landscaping and noise reduction. Recently developed suburban commercial zones are only about 70% impervious, suggesting that a decent fraction of the site may be available for surface treatment (Cappiella and Brown, 2001). Other good retrofit situations are:

- Parking lots serving large institutions, corporate campuses and colleges that tend to have even lower percentage of impervious cover for the whole site.
- Municipally-owned parking lots such as commuter lots, park access, and schools adjacent to open areas
- Industrial parking lots designated as stormwater hotspots
- Any parking lot served by an existing stormwater detention pond (use SR-1)

Figure 2: Down gradient open land reserved in setbacks is ideal for treatment.

Situations Where Parking Lot Retrofits Are Difficult

Several conditions make it difficult to retrofit a large parking lot:

- Parking lot is smaller than five acres in size (but try on-site parking lot retrofits described in Profile Sheet OS-8)
- Older lots located in highly urban areas, such as downtown central business districts
- Parking lots that discharge directly to waterfronts or waterways
- Open space adjacent to the parking lot is designated as a jurisdictional wetland, stream buffer or forest reserve.

Restoration Alternatives at Large Parking Lots

Even if a storage retrofit is not feasible, it may still be possible to install other restoration practices inside the parking lot or along its margins, such as:

Reforestation - in open spaces, parking lot islands and setbacks using the planting methods outlined in Cappiella *et al.* (2006a).

Pollution prevention practices - particularly when the lot is used for vehicle storage or is frequently resealed (see Profile Sheets H-4 and H-11 in Manual 8).

Regular vacuum sweeping and litter control - to keep gross solids and trash from entering the storm drain system.

Desktop Searching for Parking Lot Retrofits

It is fairly easy to find large parking lots since they stand out on aerial photographs or recent land use maps (Figure 3). Alternatively, a GIS search can match large contiguous parking areas/rooftops greater than 5 acres in size with adjacent open land in public or institutional ownerships. Some topographic analysis may be useful to confirm that the open land is actually downgradient from the lot.

The contributing drainage area is defined as the sum of the lot area and the footprint of the buildings it serves. It is helpful to estimate the contributing drainage area before investigating the lot in the field.

Figure 3: Large parking lots and potential off-site treatment area are easy to find on aerial photos.

What to Look for When Investigating Parking Lot Retrofits

The retrofit recon for a large parking lot is fairly straightforward, and is best done when parking demand is lowest (e.g., weekends, daytime or evening, depending on the use), and while it is raining.

1. *Confirm the size and use of the parking lot* - The crew should walk the entire lot to get a sense of its total area and whether it is connected to rooftop drainage. A simple rule of thumb is that 400 square feet of impervious cover are associated with each individual parking stall (Schueler, 1994) so that one acre of impervious cover is created for every 100 parking spaces (rooftop drainage not included). The crew can get a good sense of the acreage of the parking lot by quickly estimating the number of parking spaces in the lot, and multiplying it by 400 (Figure 4).

2. Assess parking lot grade - While most parking lots seem to be flat, they have subtle grading to key curb or drop inlets. If stormwater plans exist for the lot, they should be taken out in the field. The crew should sketch the existing plumbing by tracing the storm drain inlets toward the low point of site and looking for obvious points of discharge into adjacent open space (Figure 5). The crew should look for additional stormwater outfalls and pull a manhole or two to see how deep the pipes are underground. The crew may also want to see if there are good locations to cut the curb to divert surface runoff to a treatment area.

3. Estimate the boundaries of the treatment area – The crew should pace the approximate boundaries of the proposed treatment area, taking care to look for surface indicators of underground utilities that may reduce it. The size of the proposed treatment area can then be compared to the contributing drainage area estimated in Step 1. As a general rule, the proposed treatment area needs to be at least 3 to 5% of the contributing drainage area. Alternatively, the crew can directly compute the target WQv using the 3600 cubic feet per impervious acre rule, assuming that the contributing drainage area is 100% impervious.

4. *Evaluate head* - The crew then visually estimates the elevation difference between the invert of the storm drain outfall from the parking lot and the elevation at the proposed treatment area. Like most other storage retrofits, hydraulic head is needed to accommodate the depth of treatment and drive the retrofit by gravity flow. A

Figure 4: Stall counting is a quick way to estimate parking lot area.

Figure 5: The crew should check out the internal plumbing of the lot to see where runoff goes.

minimum of four to six feet of head is needed to make storage retrofits feasible at most parking lots (Figure 6). The crew may want to inspect soil conditions in the proposed treatment area using a soil auger to determine how deeply the retrofit could be excavated.

5. Sketch out the proposed design - Based on the foregoing information, the crew should have a good sense of the best stormwater treatment option for the site and whether a flow splitter is needed to direct stormwater into the proposed treatment area. The preliminary concept should then be sketched on the RRI field form.

6. Consider on-site parking lot options. If the recon indicates a storage retrofit cannot work, the crew should break up the lot into smaller drainage units to determine if some or all of it can be served by on-site retrofits located within the lot or along its margins (see Profile Sheet OS-8).

Feasibility, Approvals and Permitting for Large Parking Lot Retrofits

The biggest hurdle is getting permission to retrofit the open space parcel without having to acquire the land. The problem is pronounced when the adjacent land is not owned by the same landowner. Just because a parcel is open today doesn't mean that it is not slated for future development. Some initial research is needed to determine the development status of the open parcel. The best situation is when the parcel cannot be developed because it is contained within a required easement, open space, or setback.

Underground utilities are another common hurdle for parking lot retrofits. Sewer, water, gas and other utilities can be challenging obstacles to design around or relocate. Above-ground lighting, signs and overhead wires can also be a problem, but are somewhat easier and cheaper to relocate. If the parking lot outfall discharges to a floodplain or stream corridor, designers should check to see if the flows will impact wetlands, floodplains or forests.

Figure 6: The invert elevation of the storm drain pipe underneath the lot is a critical design factors.

Parking Lot Retrofit Design

The basic design of parking lot retrofits is fairly standard, but there are a few issues worth noting:

Designers may need to install flow splitters within the parking lot to divert runoff from the storm drain pipe to a more desirable area for water quality treatment (see Profile Sheet SR-3)

Large parking lots generate a lot of trash, litter and debris and can have high sediment loadings due to winter sand applications. Consequently, designers should provide over-sized and accessible pretreatment (e.g., forebays) and plan on a more frequent sediment removal schedule (Figure 7).

Designers should consult with the facility manager to gain a better understanding of temporary or seasonal parking lot maintenance practices that can influence retrofit design, such as deicing applications, snow storage, sweeping, and vehicle washing (Figure 8). Designers should landscape the retrofit to improve its appearance, particularly when it is located in a highly visible area.

Figure 7: While ponds are most common, larger bioretention areas can provide effective treatment.

Note: a two-cell design with forebay would have worked better for this site

Figure 8: Designers should check to see if the proposed treatment area can be used for winter snow storage.

Design Support

Design support for parking lot retrofits may include several tasks:

- Secure as-built drawings of the original parking lot design from the local review authority. If they are not available, drainage area may need to be re-delineated and surveyors may need to take spot elevations of parking lot plumbing.
- Research zoning, easement and plat records to determine the future development potential of the proposed treatment area
- Take standard soil test pits in the proposed treatment area
- Conduct parking demand studies to confirm that the existing lot has enough capacity to meet current and reasonable future parking needs
- Delineate any forests or wetlands that may be present in the proposed treatment area (or any other wetlands or forests

that may receive stormwater discharges from the new retrofit).

Design Process

The basic design process for large parking lot retrofits is essentially the same as a new stormwater facility, unless flow splitters or curb cuts are used to divert stormwater runoff to an off-line treatment area.

Construction Considerations for Parking Lot Retrofits

Large parking lot retrofits involve the same basic construction sequence as new stormwater ponds, although a few logistical issues arise if the lot is being actively used:

A small portion of the lot may need to be closed for construction access, staging and storage. Both construction and staging areas should be temporarily fenced to keep the public out. Traffic management plans may be needed to segregate construction ingress and egress traffic from existing motorists. Construction should be scheduled to avoid obvious spikes in parking demand such as the holiday shopping season.

Parking Lot Retrofit Costs

The cost to construct parking lot retrofits is generally assumed to be equal to the cost to construct a new retrofit facility (Table 1). Cost equations for specific stormwater treatment options may also be used to get a more accurate estimate (See Appendix J). The cost estimate should be adjusted to account for numerous site-specific factors that can influence retrofit construction costs shown in Table 2.

Table 1: Estimated Construction Costs for Large Parking Lot Retrofits (2006 $ per acre of impervious cover treated)

Retrofit Type	Median Cost	Range [2]	Design & Engineering (%)
New storage retrofit [1]	$19,400	$9,000 to $32,000	32

[1] Use appropriate pond equation in Appendix I if the retrofit site satisfies new development site conditions
[2] Adjust based on site-specific construction cost inflators/deflators in Table 2

Table 2: Site-specific Factors that Influence Large Parking Lot Retrofit Project Costs

Factors that Decrease Cost	Factors that Increase Cost
• Public land or cooperative landowner • Storage via embankment rather than excavation • Off-line design • Existing storm drain discharges near surface • Use of ED wetland as treatment option • No environmental permits needed • Staging and stockpiling areas away from lot	• Off-site hauling • Need to secure stormwater easements • Pavement repair due to construction equipment • Reworking the storm drain system underneath the parking lot • Relocating downstream storm drain or channel • Flow splitting • Land acquisition

OS-7	On-site Retrofits
	HOTSPOT OPERATIONS

These retrofits provide on-site water quality treatment at confirmed stormwater hotspots, defined as any operation that generates higher concentrations of stormwater pollutants and/or has a higher risk of spills, leaks or illicit discharges. Pollution prevention practices such as covering, secondary containment, and employee training should always be considered first. However, when prevention practices are not sufficient to provide full treatment, on-site retrofits are needed to treat the quality of runoff from the stormwater hotspot (Figure 1).

The preferred stormwater treatment option at hotspot operations are filtering practices (Figure 2 and Profile Sheet ST-5). Alternatively, bioretention without exfiltration may be used (Profile Sheet ST-4). The use of infiltration is strongly discouraged due to the risk of groundwater contamination.

Hotspots are good locations for on-site retrofits since they contribute higher stormwater pollutant loads than any other urban source area. Second, many communities have the regulatory authority to compel private landowners to install onsite retrofits to comply with municipal or industrial stormwater requirements.

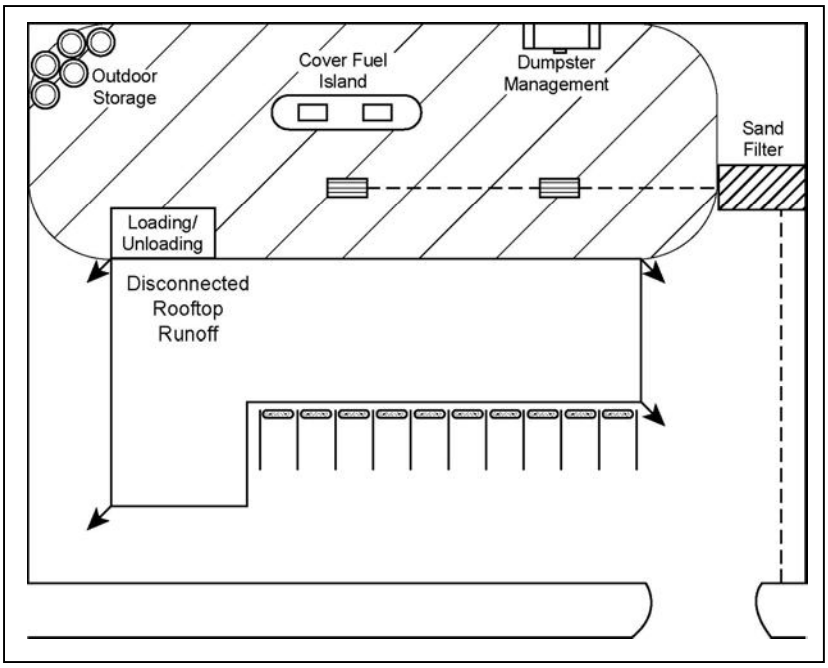

Figure 1: Schematic showing typical treatment at hotspot generating areas.

Figure 2: Sand filters are the preferred stormwater treatment option for hotspot retrofits.

Ideal Conditions for Hotspot Retrofits

Retrofits should always be considered for any operation:

- Found to be a severe hotspot during a hotspot site investigation
- Covered by an existing industrial stormwater permit or specifically designated as a stormwater hotspot in the local water quality ordinance
- Where site investigation shows that pollution prevention practices alone are not sufficient to remove pollutants in stormwater runoff

Situations Where Hotspot Retrofits are Difficult

Most subwatersheds contain dozens or even hundreds of potential stormwater hotspots, but only a fraction of them require on-site stormwater treatment. Hotspots do not need retrofits when:

- Field investigations indicate that the hotspot is not severe
- Legal responsibility to manage the property is unclear (e.g. operator leases the space from property owner)
- Community does not offer technical assistance to help operators install low cost stormwater treatment options
- Site is severely constrained by a lack of head or space

Alternative Restoration Projects at Stormwater Hotspots

A nonstructural approach can effectively prevent pollution from many stormwater hotspot operations. Manual 8 contains 15 different profile sheets that describe pollution prevention practices that can be applied to stormwater hotspots:

H-1 Vehicle Maintenance and Repair
H-2 Vehicle Fueling
H-3 Vehicle Washing
H-4 Vehicle Storage
H-5 Loading and Unloading
H-6 Outdoor Storage
H-7 Spill Prevention and Response
H-8 Dumpster Management
H-9 Building Repair and Remodeling
H-10 Building Maintenance
H-11 Parking Lot Maintenance
H-12 Turf Management
H-13 Landscaping/Grounds Care
H-14 Swimming Pool Discharges
H-15 Unique Hotspot Operations

Desktop Searching for Stormwater Hotspots

The team can isolate areas to search for hotspots in the field by reviewing maps depicting commercial, industrial or municipal land use (Figure 3). Local knowledge can also be helpful. A more systematic approach for finding hotspot sites

involves searching local business databases using standard industrial codes (SIC). Methods for conducting an SIC database search can be found in Appendix A of Manual 8. Another approach to find potential stormwater hotspots is to search databases of industrial operations that hold stormwater permits.

What to Look for When Investigating Hotspots

Procedures to inspect and rank stormwater hotspots are described in the Hotspot Site Investigation (HSI) component of the Unified Subwatershed and Site Reconnaissance (see Manual 11). The HSI involves a rapid visual assessment to inspect site operations that may cause a stormwater hotspot. If a site is ranked as a confirmed or severe hotspot, then the crew looks into the "plumbing" at the site to determine whether additional stormwater treatment is needed beyond standard pollution prevention practices.

Five steps are used to assess the feasibility of on-site treatment at a stormwater hotspot:

1. Define hotspot generating area – In the first step, the crew defines the approximate area of the hotspot generating area (HGA) which is defined as the actual area at the site that is generating higher levels of pollutants (Figure 4). The HGA is usually associated with:

- Vehicle Operations
- Outdoor Materials
- Waste Management
- Physical Plant Maintenance
- Intensive Turf/Landscaping

The HGA often comprises only a fraction of total site area, although more than one may be present at larger sites. The crew should sketch the approximate boundaries of the HGA on the site map.

Figure 3: Hotspots are too small to find on aerial photos but can be found by searching business databases.

2. Evaluate pollution prevention practices - The crew then evaluates whether the HGA can be fully treated by non-structural practices such as covering, secondary containment, or employee training. Full treatment is operationally defined as no exposure of the polluting operation to rainfall or runoff. If full treatment cannot be obtained, the crew moves to the next step.

3. Evaluate hotspot connection to public storm drain system - The crew walks the site to understand how the plumbing of the private storm drain system connects to the public storm drain system (Figure 5). In simple terms, this means tracing the path of runoff from the HGA as it crosses the site and enters offsite drainage. The crew should look for all connections to the storm drain system to determine if they are illegal or illicit. Some connections to the storm drain

Figure 4: Common hotspot generating areas to look for during a site investigation: vehicle service/fueling (a); bulk outdoor storage(b); dumpsters (c); truck washouts (d) irrigation/fertilization (e); and chemical drums (f).

system may be located inside a building or under a roof (e.g., shop drains). The existing plumbing then sketched on the site map.

4. Select stormwater treatment option - The crew then evaluates the feasibility of a sand filter or bioretention to treat the hotspot. Head is usually the key feasibility constraint and is defined as the vertical distance between the elevation of the stormwater inlet and the bottom elevation of the existing storm drain system to which it discharges. Most stormwater filter and bioretention designs require three to 10 feet of head. If the entry point is not feasible for a retrofit, the crew moves down-gradient in the storm drain system to look for a more suitable treatment area.

5. Get retrofit design information - Once a suitable treatment area is found, the crew records details to assist in future design efforts, such as the adjusted drainage area, surface and pipe slopes, and notes on soil and subsurface conditions.

Figure 5: A crew member checks for a connection between the HGA and the storm drain system (sometimes it's obvious).

Feasibility and Permitting for Hotspot Retrofits

The major feasibility issue for hotspot retrofits is whether a community has legal authority to enforce on-site treatment of stormwater quality at existing hotspots (i.e., without having to wait until stormwater requirements are triggered by new development or redevelopment applications).

The review of hotspot retrofit designs is fairly straightforward, assuming the local stormwater review authority has experience with filtering and bioretention practices. The review authority may wish to add conditions to maintenance agreements that require testing sediments to ensure trapped sediments are safe for landfill disposal (i.e., are not considered hazardous waste). Communities may obtain greater compliance if they offer direct technical assistance to owners/operators on how to implement stormwater treatment and pollution prevention practices.

Hotspot Retrofit Design

Several key design issues arise when dealing with hotspot retrofits:

The design of each retrofit should control the specific pollutants generated at the stormwater hotspot (e.g., oil, sediment, metals). Manual 8 provides guidance on the types of pollutants generated by different hotspot operations. The designer should also interview the owner/operator to fully understand the operations that routinely occur at the site throughout the year (Figure 6). For example, an otherwise ideal retrofit location may interfere with business operations or impede traffic. In other cases, the hotspot generating area may change with

the season of the year (particularly for outdoor storage).

Pretreatment is essential for hotspot retrofits. Sand filters or bioretention areas should have a two-cell design that enables the first cell to capture and contain spills or transitory flows. If the site experiences chronic flows, the crew should conduct a discharge prevention investigation to determine whether the source of the flow constitutes an illicit discharge (for methods, consult Brown *et al.* 2004). Continuous or chronic dry weather flows should never be discharged into a hotspot retrofit.

Hotspot retrofits require more frequent routine maintenance compared to storage retrofits. Designers should develop a clear plan with specific maintenance tasks, schedules, costs and vendors. Hotspot retrofits should be located on the surface (or just below it) to allow direct access for maintenance and sediment removal. Hotspot retrofits must be clearly marked or posted so they can be easily recognized as a stormwater treatment practice during routine inspections.

Some hotspot sites are so confined that only underground treatment can work (see Profile Sheet OS-13). Designers should avoid

Figure 6: Designers should interview operators to understand seasonal operations

infiltration or any other practice that connects to groundwater (e.g., swales and exfiltrating bioretention).

Design Support

Designers may need key information to support the design of hotspot retrofits:

- Secure original as-built drawings of site drainage.
- Mark the location and elevation of existing utilities.
- Survey the pipe system to determine permissible pipe invert elevations.
- Survey the site to at least a tenth of a foot to determine the precise grade and contributing drainage area to the proposed retrofit. The designer may also want to check these boundaries during an actual storm event.
- Extend soil borings to a depth two feet below the bottom of the proposed retrofit.
- Conduct a discharge prevention investigation if chronic or continuous dry-weather flows are observed.

Design Process

The design process of most hotspot retrofits is fairly straightforward, and involves six steps:

Step 1: The pollutant(s) of concern discovered during the site inspection should be the focus of design.

Step 2: Disconnect or divert any rooftop runoff that “runs on” to the HGA (which helps reduce the water quality storage volume needed for the retrofit)

Step 3: Further minimize the size of the HGA by covering and secondary containment measures.

Step 4: Choose the most effective stormwater treatment option for the retrofit based on site conditions and the pollutant of concern (normally a sand filter or bioretention with an underdrain).

Step 5: Size the retrofit to capture the entire runoff volume from the locally required WQv storm event. Hotspot retrofits should provide extensive pretreatment storage.

Step 6: If the retrofit will bear loads, perform computations to determine if structural reinforcement is needed to withstand expected vehicle loads.

Delivery Considerations for Hotspot Retrofits

Many communities have authority to require on-site retrofits as part of municipal or industrial stormwater permit compliance (although relatively few have exercised it). Widespread compliance, however, can seldom be achieved by permitting alone - technical assistance, employee training, business recognition and even cost-sharing may be needed to encourage small businesses to retrofit their hotspots. Manual 8 describes a carrot and stick approach to obtain greater hotspot compliance.

Construction Considerations for Hotspot Retrofits

Several considerations are important when constructing hotspot retrofits:

- Construction phases should be compressed to minimize interference with existing operations or parking.
- Inspectors should ensure that the top of the filter bed is completely level, the retrofit is water tight, and the connection between private and public storm drains is secure.
- Runoff should be diverted around the retrofit during construction.
- Retrofit maintenance tasks, costs, schedules and vendors should be clearly outlined in the Stormwater Pollution Prevention Plan developed for the site. Employees and facility managers should review the plan annually to schedule maintenance work.

Hotspot Retrofit Costs

The cost to construct hotspot retrofits is primarily based on the stormwater treatment option selected and the specific design variant employed (see Table 1). Other site-specific factors that can drive up the cost of a hotspot retrofit are described in Table 2.

Table 1: Estimated Construction Costs for Stormwater Hotspot Retrofits (2006 $ per cubic foot treated)			
Stormwater Treatment Option	**Median Cost**	**Range**	**Design & Engineering (%)[6]**
Surface Sand Filter [1]	$ 5.00	$ 3.00 to $ 8.00	35
Structural Sand Filter [2]	$ 20.00	$ 16.00 to $ 22.00	35
Underground Sand Filter [3]	$ 65.00	$ 28.00 to $ 75.00	35
Multi-chamber Treatment Train	$ 80.00	$ 66.00 to $ 94.00	35
Large Bioretention [4]	$ 10.50	$ 7.50 to $ 17.25	35
Small Bioretention [5]	$ 30.00	$ 25.00 to $ 40.00	35

[1] Surface filter in pervious area with minimal concrete or structural features
[2] Two cell surface or perimeter sand filter with concrete structures
[3] Underground filter that can bear traffic loads
[4] Retrofit serving more than 0.5 acres of CDA with underdrain and bottom liner
[5] Retrofit serving less that 0.5 acres of CDA with connection to storm drain system
[6] Higher design & engineering for employee training in pollution prevention and maintenance

Table 2: Factors that Influence Construction Costs for Hotspot Retrofit Projects	
Factors that Decrease Cost	**Factors that Increase Cost**
• Ability to cover or contain runoff from HGA • Redirecting runoff passing thru HGA • No major changes to existing plumbing • Treatment available on turf or landscaping area • HGA can be reduced through non-structural practices	• Filter needs to bear traffic loads • Grates or bollards needed to protect it • Underground treatment • Pavement repairs needed after construction • Full treatment of the water quality storm

OS-8	On-site Retrofits **SMALL PARKING LOT RETROFITS**	

This on-site retrofit strategy treats the quality of runoff from existing parking lots less than five acres in area. Surface retrofits can be installed within the parking lot, along its perimeter, or in adjacent pervious areas (Figure 1). A wide range of stormwater treatment options can be adapted for this retrofit, including:

- Impervious Cover Reduction
- Permeable Pavers
- Bioretention Islands
- Perimeter Bioretention
- Perimeter Sand Filter
- Filter Strips
- Infiltration
- Dry Swales

Parking lots are an ideal location for on-site retrofits since they generate extremely high unit area runoff volumes, pollutant loads and temperature spikes. Parking lot retrofits also have great demonstration value due to their high visibility. Figure 2 presents numerous examples of small parking lot retrofit techniques, and a design schematic is shown in Figure 3.

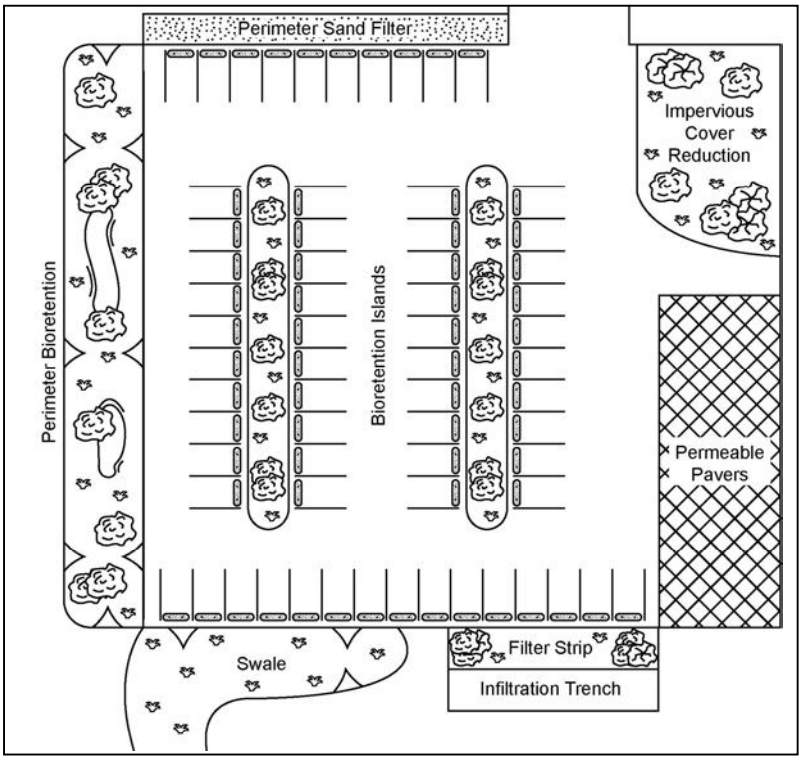

Figure 1: Many different retrofit strategies can be employed to retrofit parts of a smaller lot.

Figure 2: Examples of retrofits employed at small parking lots: permeable pavers (a); dry swale (b); perimeter sand filter (c); grass filter//infiltration trench (d;) filter strip (e); internal bioretention (f); underground infiltration (g) and island bioretention (h).

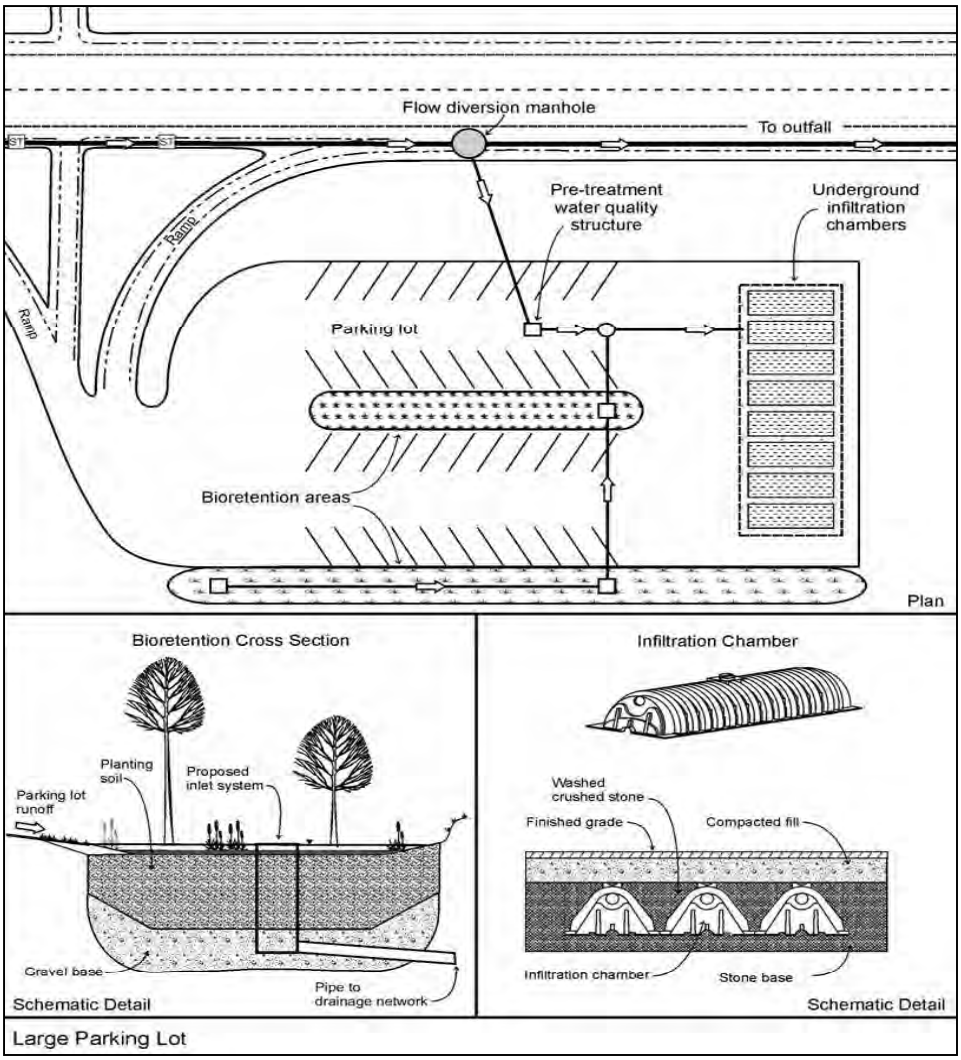

Figure 3: Schematic showing multiple practices treating small parking lot.

Ideal Conditions for Small Parking Lot Retrofits

The best conditions to retrofit small parking lots are when:

- Communities retrofit a municipally-owned parking lot as a demonstration project
- New parking lots are constructed as part of redevelopment or infill projects
- Existing parking lots are slated for resurfacing, reconfiguration or renovation (their normal design life is about 15 to 25 years)
- Local stormwater regulations trigger water quality control at time of lot renovation or rehabilitation
- Parking lots were built with generous landscaping, open space, screening or frontage setbacks
- Parking lots are not fully utilized because they were designed using excessive parking demand ratios (Figure 4)

Situations Where Small Parking Lot Retrofits are Difficult

Small parking lot retrofits can potentially reduce available parking area, so they are generally not a great option in the following situations:

- Over-crowded parking lots
- Older parking lots built prior to modern design standards for screening, drainage, and landscaping
- Owners are reluctant to sacrifice parking spaces and/or are unwilling to perform future maintenance
- Dry or wet utilities run underneath the parking lot
- The parking lot is located in flat terrain and lacks adequate head
- The parking lot is already served by an effective stormwater treatment practice.

Alternative Restoration Practices for Small Parking Lots

Even if an on-site retrofit is not feasible, the following restoration practices may still be viable:

- *Tree planting* in parking islands, lot margins and setbacks.
- *Vacuum sweeping and litter control* in the parking lot (Figure 5).
- *Parking lot pollution prevention practices*, especially for vehicle storage and parking lot maintenance (see Profile Sheets H-4 and H-11 in Manual 8).

Figure 4: Ideal conditions for retrofitting small parking lots include: adjacent open land (a); unutilized setbacks along margins (b); under-utilized lots (c); and lots needing repair or rehabilitation (d).

Desktop Searching for Small Parking Lots

Small parking lots are generally quite easy to spot on aerial photographs or GIS data layers (Figure 6). A more systematic approach may restrict the search to parking lots in municipal or institutional ownership where permission to retrofit may be easier to get. Otherwise, the feasibility small parking lot retrofits is normally determined in the field.

Figure 5: Routine parking lot sweeping can reduce litter collection in storm drains.

Figure 6: Orthophotos can help find small parking lots and for concept sketches.

What to Look for When Investigating Small Parking Lots

1. *Confirm the size and use of the parking lot* - The crew should estimate the total lot area and any connection with rooftop drainage. Many parking lots are merely a continuation of rooftop drainage, so the crew should check whether rooftop leaders are connected to the parking lot. The size of the parking lot can be estimated using the stall-counting method described in Profile Sheet SR-6. The crew should evaluate parking lot use/capacity to see if some spaces can be sacrificed for stormwater treatment without reducing existing parking needs.

2. Eyeball parking lot grade and subdivide into smaller drainage units - This is the tricky part of retrofitting small parking lots. While they appear to be flat, lots have subtle grading to promote drainage to drop inlets or curb cuts. Crews should walk the entire parking lot and trace the surface flow path draining toward the low point(s). The crew can then break up the parking lot into smaller drainage units where flow can be directed to different on-site treatment areas. Curb cuts can also be used to split flows from smaller drainage units to on-site treatment areas.

3. Evaluate each on-site treatment area for available space - Potential treatment areas include any unutilized turf, landscaping or paved areas located downgradient from the lot. This may include parking lot islands, the perimeter or margins of the lot, landscaping areas, frontage setbacks and other open space. An on-site retrofit is normally feasible if the proposed treatment area is five to 10 percent of the size of its contributing drainage area.

The crew may want to use a hand auger at the proposed treatment area to get a sense of underground soil quality and infiltration rates. As always, the crew should look for surface indicators of underground utilities that might reduce available area. The crew should carefully review parking lot grading again to get an accurate estimate of the actual contributing area to each on-site retrofit treatment area (and note whether the lot must be regraded during construction).

4. Determine how the treatment area can be reconnected to the existing storm drain system and measure the bottom invert of the downstream storm drain. The crew should measure the elevation of pipe inverts of the storm drain pipe closest to the treatment area. These inverts establish what elevation is needed to tie the underdrain from the proposed retrofit area into the storm drain system (Figure 7). In general, four to five feet of elevation above this invert is needed to drive storm water through the proposed retrofit. Designers can avoid the head problem by disconnecting the contributing drainage area from the storm drain system through filter strips, curb cuts, infiltration or permeable pavers.

Figure 7: Understanding the plumbing: measuring pipe inverts at drop inlets.

5. Sketch the proposed treatment area(s) and indicate the recommended stormwater treatment option on the RRI field form.

Feasibility, Approvals and Permitting for Small Parking Lot Retrofits

Small parking lots are subject to normal retrofit feasibility constraints. Given the wide range of available stormwater treatment options, however, it is usually possible to find an on-site retrofit option that can treat at least a portion of the lot.

The biggest hurdle is getting permission from the parking lot owner to install the retrofit, which usually means the best sites are located on municipal or institutional land. A stormwater easement may be needed to connect to the downstream storm drain system.

Small parking lot retrofits seldom require many environmental permits. It is advisable to interview the facility manager to understand seasonal uses and pollutant loadings (Figure 8). A grading permit and stormwater design approval may be required by the local stormwater review authority.

Small Parking Lot Retrofit Design

Design Support

- Original drawings from the development plan that show the storm drain profile and inverts.
- Soil borings or test pits to determine soil quality and infiltration rates.

Figure 8: Interview property managers to anticipate seasonal uses and pollutant loads.

- Survey data to get accurate delineation of contributing drainage area (e.g., to a tenth of a foot).
- Spot elevations of the storm drain inverts if original drawings do not exist.
- Marking the location and depth of any underground utilities
- Parking demand studies during peak use (daytime, evening, weekend) to document lot capacity.

Design Process

The design of small parking lot retrofits is fairly straightforward, and depends on the type of stormwater treatment option. In general, the design process is the same as a new stormwater practice. Specific design considerations include:

- Hydraulic analyses may be needed on the existing storm drain system to ensure nuisance ponding will not occur, particularly in situations where head is limited
- The location of the retrofit may be dictated by the space needed for construction access
- It may be possible to direct sheet flow over to a parking lot filter strip as shown in Figure 9.

Construction Considerations for Small Parking Lot Retrofits

Retrofit construction may result in temporary closure of portions of the parking lot, so designers should sequence construction to occur quickly during periods of minimal parking use. Other construction considerations include:

- Install temporary fencing to prevent public access to the construction site.
- Specify smaller construction equipment to minimize damage to the parking surface and avoid soil compaction.
- Make provisions for temporary parking during construction, if needed.
- Make sure the construction budget includes contingency costs to repair existing pavement, curbs, pavement markings, trees or landscaping that might be damaged during construction.
- Include care and replacement warranties to ensure landscaping material survives beyond the first growing season.

Costs for Small Parking Lot Retrofits

The cost to construct small parking lot retrofits depends on the stormwater treatment option selected (Table 1). Retrofit costs will be higher, if any of the site-specific factors outlined in Table 2 occur at the project site.

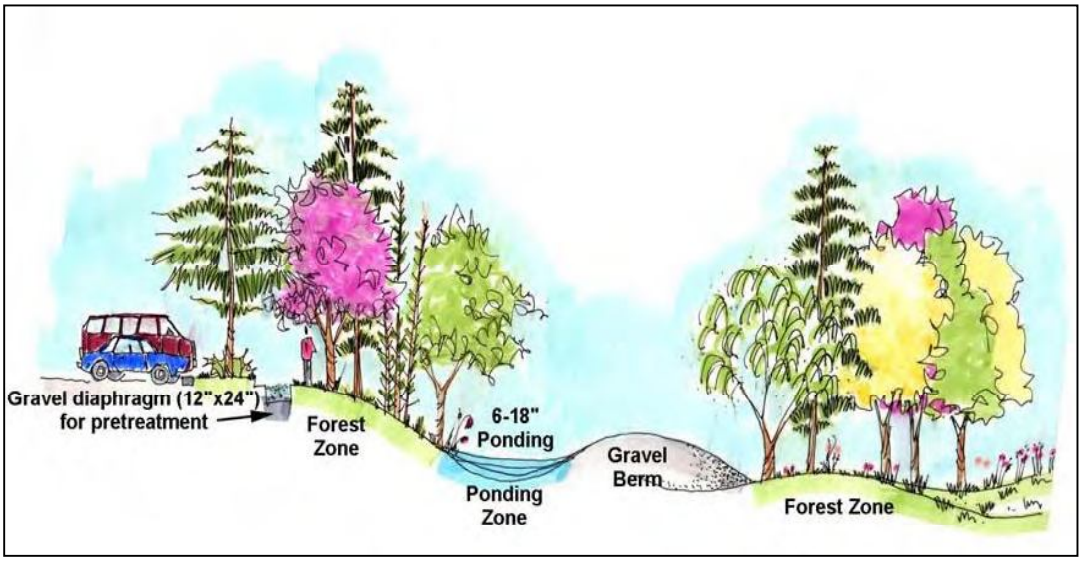

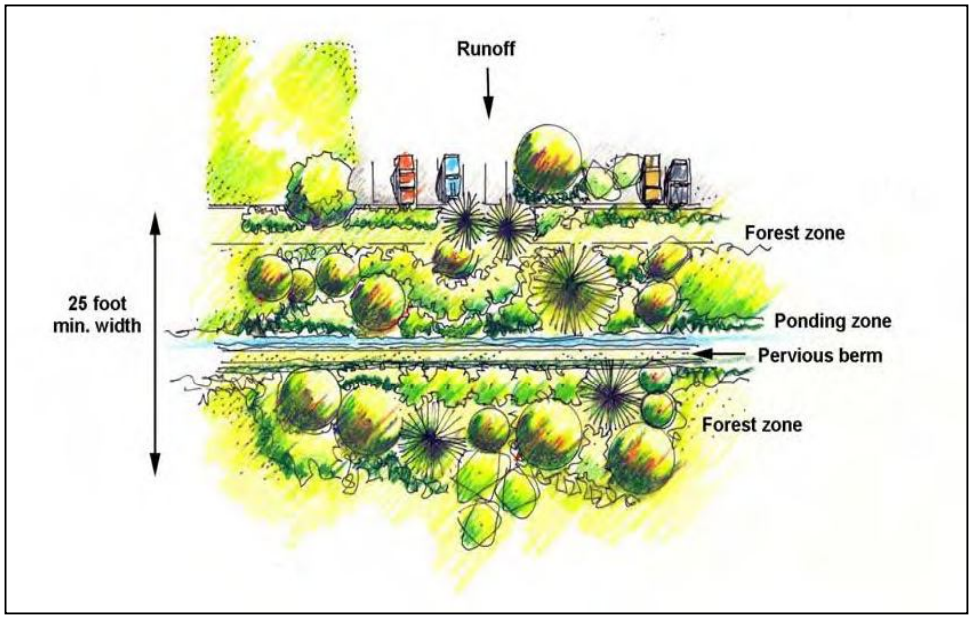

Figure 9: Plan and profile view of simple forested filter strip design for a parking lot.

Table 1: Estimated Construction Costs for Small Parking Lot Retrofits (2006 $ per cubic foot treated)			
Stormwater Treatment Option	**Median Cost**	**Range**	**Design & Engineering (%)**
External Bioretention [1]	$ 10.50	$ 7.50 to $ 17.25	32
Internal Bioretention [2]	$ 30.00	$ 25.00 to $ 40.00	32
Surface Sand Filter [3]	$ 5.00	$ 3.00 to $ 8.00	32
Perimeter Sand Filter [4]	$ 20.00	$16.00 to $ 22.00	32
Filter Strip [5]	$ 5.00	$ 3.50 to $ 10.00	15
Parking Lot Swales [6]	$ 12.50	$ 7.00 to $ 22.00	15
Perimeter Infiltration [7]	$ 15.00	$ 10.00 to $ 23.00	32
Permeable Pavers [8]	$ 120.00	$ 96.00 to $ 144.00	15
IC Conversion [9]	$ 20.00	$ 18.50 to $ 21.50	15

[1] Located outside of the parking lot
[2] Bioretention installed within parking lot islands or elsewhere on the lot
[3] Non-structural surface sand filter located on the perimeter of parking lot
[4] Structural sand filter within the parking lot that bears load
[5] Grading, level spreader and re-vegetation at perimeter of parking lot
[6] Water quality swale draining a portion of the parking lot
[7] Infiltration with pretreatment at perimeter of parking lot
[8] Permeable paver blocks within lot, along with subgrade preparation
[9] Demolition and removal of IC with soil and grass replacement

Table 2: Factors that Influence Construction Cost of Small Parking Lot Retrofits	
Factors that Decrease Cost	**Factors that Increase Cost**
• Parking lot is under-capacity • High soil infiltration rates • Use of filter strips, swales or infiltration • Lot is scheduled for rehabilitation • Wide setbacks along lot perimeter	• Design to bear traffic loads • Additional landscaping and tree planting • Complicated construction sequence • Need to repave lot • Need for underdrains

OS-9	On-site Retrofits **INDIVIDUAL STREETS**	

This group of on-site retrofits provides stormwater treatment within the roadbed or right of way of individual streets. A wide range of retrofit strategies can be employed depending on whether the street has open or closed drainage:

- Install stormwater treatment within open section drainage
- Convert enclosed drainage into open section and install stormwater treatment practices
- Divert stormwater for surface treatment before it enters the storm drain
- Make storm drain pipes less efficient at delivering stormwater by promoting infiltration in the storm drain pipe.

Stormwater treatment options for open section street retrofits include dry swales, grass channels, bioretention cells and wet swales. Streets with closed drainage may utilize street bioretention, expanded tree pits, cul-de-sac bioretention, catch basin inserts or perforated storm drain pipes. Figure 1 illustrates the many different ways stormwater treatment can be applied to street retrofits.

Streets are a significant urban pollutant source area and act as the primary conduit to move stormwater runoff from rooftops, lawn and driveways. Street retrofits treat stormwater near the source, improve neighborhood appearance, calm traffic and act as a focal point to educate adjacent residents about stormwater quality. Creative techniques to retrofit streets are shown in Figures 2 through 4.

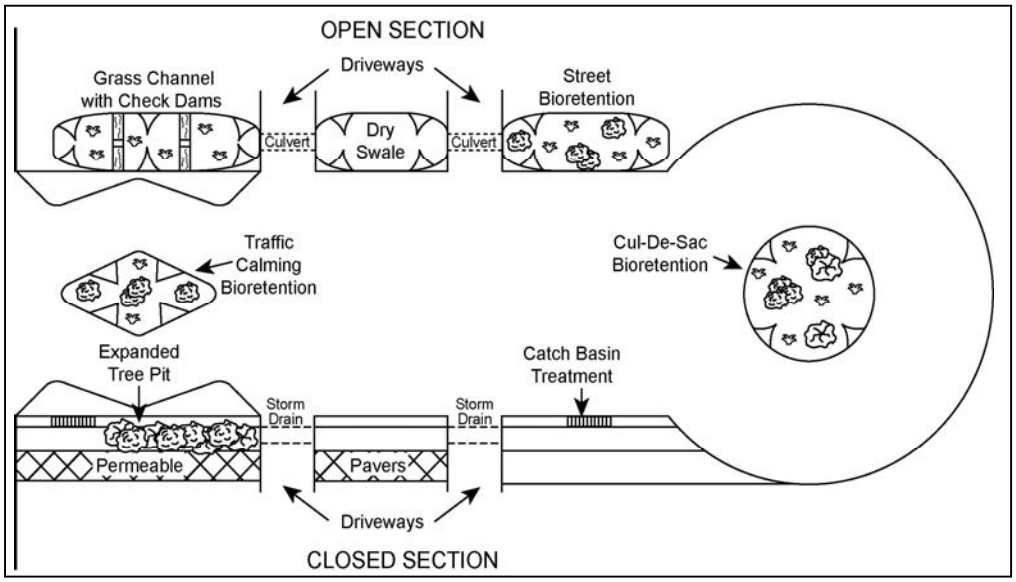

Figure 1: Retrofit strategies depend on whether the street has open of enclosed drainage.

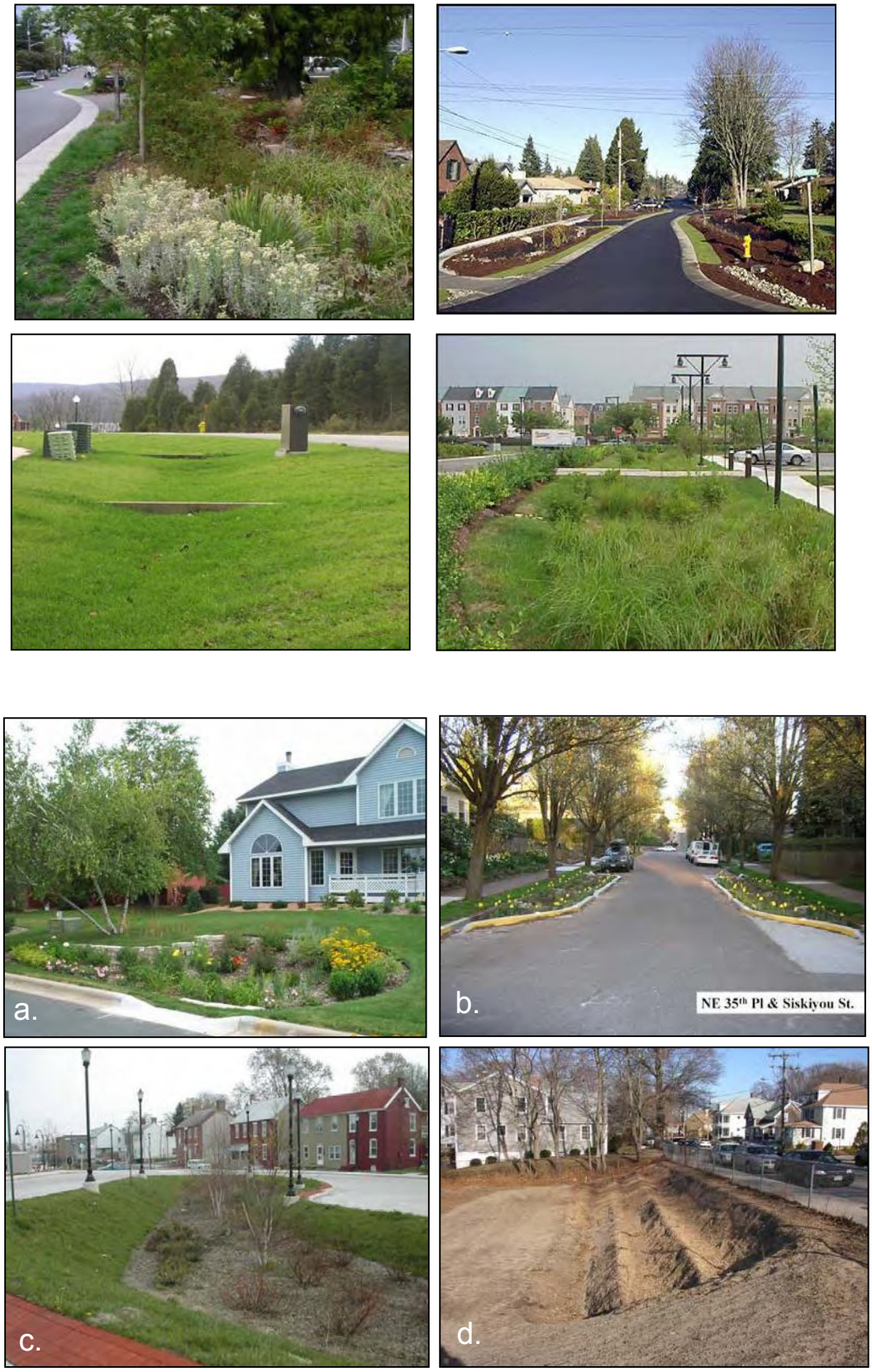

Figure 3: Innovative street retrofits include: curb cuts to rain gardens (a), surface bioretention in traffic calming measures (b), larger bioretention pocket in multi-family residential (c), and curb cuts to cascading bioretention cells (d).

Figure 4: More street retrofit ideas: SEA streets swale (a); close-up of Portland street bioretention (b) and bioretention in street medians (c/d).

Ideal Conditions for Street Retrofits

Most communities maintain hundreds or even thousands of residential street miles (Law, 2006). Key suitability factors for street retrofits are shown in Figure 5 and include:

- Streets classified as having a moderate to severe pollution severity, as measured by field surveys.
- Neighborhoods that request traffic calming devices to slow residential speeding
- Streetscaping projects or neighborhood revitalization efforts where street drainage can be modified
- Bundling retrofits as part of upcoming water and/or sewer rehabilitation projects
- Wider streets that serve large lots (1/2 acre lots and up)
- Wide street right of ways that provide room for stormwater treatment options
- Streets where utilities are located underneath the pavement or on only one side of the street

Figure 5: Ideal conditions for street retrofits include a wide right of way (a), excessively wide streets (b), open section drainage channels (c), and large cul-de-sacs (d).

Situations Where Street Retrofits are Difficult

Only a fraction of residential streets are good candidates for retrofits (Figure 6). Retrofits are not a good idea for streets that:

- Are not currently scheduled for streetscaping or renovation
- Have longitudinal slopes greater than 5%
- Are classified as arterial or connector roads
- Have extensive upland contributing drainage area
- Are slated to be widened to accommodate future traffic capacity
- Have mature street trees or intensive residential landscaping
- Have a narrow right of way or heavy on-street parking demand
- Have very small lot sizes (i.e., the driveway effect)
- Lack an active homeowners association
- Have wide sidewalks on both sides of the street

Figure 6: Conditions that make street retrofits difficult include: small lots and multiple driveways (a), on-street parking demand (b), underground and overhead utilities (c), and mature street trees (d).

Alternative Restoration Projects for Streets

Alternative restoration projects that can be applied to streets include:

- Street Sweeping
- Storm Drain Cleanouts
- Storm Drain Marking (see Profile Sheet N-21 in Manual 8)
- Watershed Education and Stewardship
- Neighborhood Pollution Source Controls (Manual 8)
  - Natural Landscaping
  - Soil Erosion Repair
  - Safe Car Washing
  - Driveway Sweeping
  - Car Fluid Recycling

Desktop Searching for Street Retrofits

The first place to look for potential street retrofits is the municipal capital improvement budget, which indicates future street or sewer improvements scheduled in a subwatershed where retrofits might be bundled. In addition, the team may want to focus on neighborhoods with a history of drainage or basement flooding problems. An advanced GIS query can narrow down the number of streets by looking at street feasibility criteria such as slope, right of way width, open section drainage, presence/absence of sidewalks, parking lanes and adjacent lot size.

If a USSR has been conducted, Street and Storm Drain (SSD) or Neighborhood Source Assessment (NSA) forms should be reviewed. These forms calculate a pollution severity index for streets, and help rank potential street retrofit sites. The forms and associated photos also provide insights into the condition of the sidewalk zone and street pavement.

What to Look for when Investigating Streets

The crew investigates the general condition of the street and its right-of-way in three areas:

1. The crew observes the following conditions at the street:

- Pavement width
- Longitudinal and lateral slope
- On-street parking demand
- Traffic volume
- Pavement condition
- Pollutant accumulation in curbs or gutters
- Distance between driveways

2. Next the crew inspects the right-of-way and front yards to ascertain the:

- Condition of sidewalk zone
- Setback distance of houses
- Homeowner encroachment
- Density of vegetative cover
- Presence/absence of street trees

3. The crew then notes the location and elevation of the downstream discharge point or its entry into the storm drain system.

If a street has open section drainage, the retrofit crew should record:

- Existing channel cross-section and sideslope dimensions
- Grade/head available, using a 100 foot tape measure
- Available width free of underground or overhead utilities (one or both sides of street)
- General condition of the ditch line (e.g., vegetative cover and density, evidence of erosion, standing water)
- Average distance between driveway culverts

The crew records different retrofit feasibility factors for streets with enclosed storm drains:

- Location of all storm drain inlets, recording size and type (curb vs. grate).

- The crew should pull manholes or inlet grates at proposed retrofit locations and measure the depth, invert and gradient of underground storm drain pipes (Figure 7).

- If catch basins are present in the inlet, crews should measure the depth of pool water, trapped sediment or organic debris

- The crew should look for street covers and markings that indicate the presence of underground utilities that might interfere with construction.

- Locations on the street where treatment could be provided before runoff enters a storm drain inlet (e.g., cul-de-sacs, sidewalk zone, expanded tree planters, etc). Normally, the best locations are just upstream from inlets where curb cuts can divert runoff for treatment.

Figure 7: Crews check storm drains, grate inlets or manholes to determine depth of enclosed storm drainage.

The crew then sketches a preliminary concept design for the proposed street retrofit on the RRI field form.

Feasibility and Permitting for Street Retrofits

Street retrofits require extensive consultation and community relations, since they are located in the front yards of residents. These retrofits can only proceed if they are strongly endorsed by the entire neighborhood. Street retrofits should always reinforce other neighborhood concerns, such as traffic calming, street trees, improved drainage, enhanced landscaping and pedestrian safety. In addition, designers should anticipate resident concerns about trash accumulation, mowing, on-street parking, standing water and nuisance conditions.

Since street retrofits are a new concept, designers may need approval or support from multiple agencies (e.g., water, sewer and dry utilities, and forestry, public safety and road maintenance agencies). Each of these parties has a strong interest in what happens in the street right of way, so designers will need to coordinate with each to satisfy their concerns.

Street Retrofit Design

Street retrofits have several unique design issues.

Since street retrofits affect many adjacent residents, designers should place a premium on enhancing neighborhood appearance and landscaping. Mature street trees should be considered sacred and never be cleared.

Retrofit designs should always try to separate sidewalks from the street edge to promote greater pedestrian safety. Other

street design standards that influence retrofitting include minimum turning radius, curb height, and handicapped access requirements. Some reviewers may want to see calculations of gutter spread to ensure street ponding is kept to an acceptable level.

Designers should choose plant species that can be realistically maintained by adjacent owners. For example, turf and herbaceous plants may require more ongoing maintenance than trees and shrubs.

The high compaction of the road corridor often makes infiltration an unsuitable stormwater treatment option. If soils are limiting, the retrofit will need an underdrain that ties into the existing storm drain system.

Utilities constrain the location of street retrofits, so designers should become familiar with the minimum vertical and horizontal setback requirements for underground and overhead utilities.

Third pipe or in-pipe storage are an alternative design for enclosed street sections. In a third pipe system, a perforated pipe with gravel bedding carries low flows (OME, 2002). Higher flows fill the low flow pipe and are conveyed through the traditional storm drain pipe. In-pipe storage requires oversized storm drain pipes and orifice plates to restrict the storm flow rate.

The responsibility for routine landscaping and structural repairs should be legally established when individual homeowners are expected to maintain a retrofit located in the street right of way.

Design Support

Several studies are needed to support the design of street retrofits:

- As-built drawings and design computations for the street, storm drains and sewers.
- Door to door notification of residents about the project
- Road, pipe, channel, curb and catch basin elevations and locations.
- Soil borings or test pits to determine soil quality and infiltration rate
- Depth and location of underground utilities. Many dry utilities (e.g., phone, cable, gas, and electric) are installed well after initial construction and may not be drawn on original engineering plans. In addition, water and sewer laterals from the house to the street are seldom shown on development plans. Each type of utility must be located prior to street retrofit design.

Design Process

The retrofit design process depends on whether the street has open or closed drainage, and what stormwater treatment option is employed. The design process for open section street retrofits is similar to that described for conveyance retrofits (Profile Sheet SR-4) and consists of four steps:

Step 1: Delineate the drainage area to each proposed street retrofit and compute target WQv storage needed. Confirm that available storage in the proposed retrofit can meet the target volume

Step 2: Model the existing hydraulic capacity of the open channel based on the design storm established by the local review authority.

Step 3: Determine whether water quality treatment cells will be created by checkdams, constrictions at driveway culverts, expanded channel cross-sections or replacement of existing soils with a more

permeable media. The designer should also carefully consider how runoff will pass under driveways and sidewalks (Figure 8).

Step 4: If channel dimensions change due to the street retrofit, designers should redo the hydraulic analysis for the two-year design storm (to ensure conditions are non-erosive) and that the channel can still safely accommodate the 10-year storm.

The design process for closed section retrofits depends on whether runoff is treated at the surface or within the pipe. If runoff is diverted at the road surface prior to entry to the storm drain pipe, no hydraulic modeling is needed. The design of surface retrofits is generally dictated by the design guidelines for the specific stormwater treatment option employed. Several additional retrofit design considerations may also apply:

- Some reviewers may want to see evidence that the surface retrofit will not saturate the roadbed
- Since surface retrofits parallel the road, designers should examine how any changes in longitudinal slope will influence temporary street ponding.
- Designers should show how runoff rates in excess of the treatment volume will bypass the retrofit and return to the storm drain system.

Figure 8: Designers need to find creative ways to pass runoff across driveways and sidewalks.

A hydraulic analysis is needed when an enclosed pipe is converted into an open channel. Designers should follow the design process for stream daylighting described in Profile Sheet R-27 in Manual 4.

Street Retrofit Delivery Considerations

A community should consider developing a comprehensive program to coordinate the delivery of neighborhood street retrofit, education and municipal stewardship services. Since street retrofits are a new concept, communities may want to construct demonstration projects to convince local skeptics. Seattle's SEA Streets program is an excellent example of how street retrofits can be delivered on a widespread basis (Figure 9). Neighborhoods across Seattle now compete for the privilege of getting a street retrofit, and their popularity has greatly expanded funding for streetscaping projects. Over time, communities should look for creative ways to incorporate street retrofits into the design of all municipal streetscaping, water and sewer rehabilitation, and neighborhood revitalization projects.

Construction Considerations for Street Retrofits

The high neighborhood visibility of street retrofits requires a very sensitive construction approach that responds to neighborhood concerns. Some key considerations include:

- Every neighborhood tree seems to have its own advocate, so remove as few mature trees as possible.
- Construction crews should have an on-site supervisor experienced in community relations who can quickly respond to resident complaints and resolve them.
- The construction sequence should strive to provide continuous driveway and sidewalk access for local residents (Figure 10).
- A maintenance of traffic plan will be needed on busier residential streets.
- Erosion and sediment control needs to be taken extremely seriously throughout retrofit construction.
- Street retrofit inspections should focus on getting the correct elevations, grades and cross sections for the pipe or channel, assuring proper connection of underdrains to the storm drain system, and rapidly stabilizing areas with vegetation and landscaping.

Street Retrofit Costs

Construction costs for street retrofits largely depend on the stormwater treatment option used (Table 1). It is generally less expensive to retrofit open-section streets than closed-section streets. Some street-specific factors that influence the cost of street retrofits are outlined in Table 2.

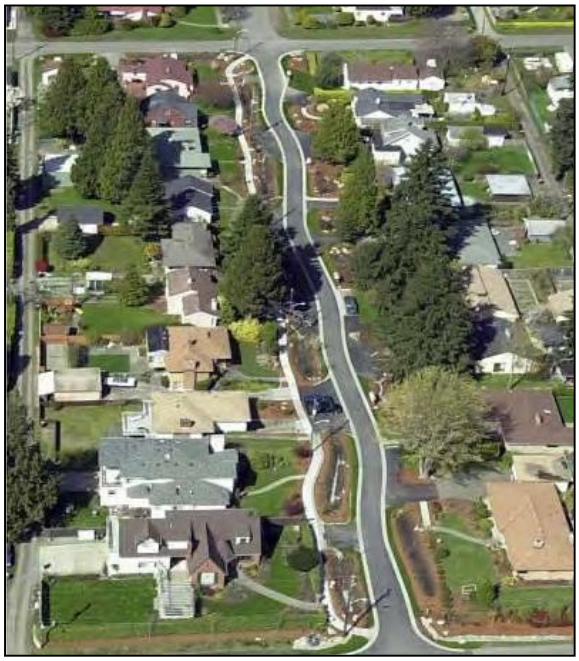

Figure 9: Aerial shot of Seattle SEA Streets retrofit.

Figure 10: Construction sequencing is critical to maintain driveway access and minimize disruption to homeowners.

Table 1: Estimated Construction Costs for Various Street Retrofits (2006 $ per cubic foot treated)			
Stormwater Treatment Option	**Median Cost**	**Range**	**Design & Engineering[7] (%)**
Water Quality Swale [1]	$ 12.50	$7.00 to $22.00	35
Dry Swale [2]	$ 23.00	$ 13.00 to 31.50	35
Bioretention Cells [3]	$ 30.00	$ 25.00 to $40.00	35
Street Bioretention [4]	$ 18.00	$15.00 to $24.00	35
Stormwater Tree Pits [5]	$ 70.00	$ 58.00 to $83.00	35
Daylight Enclosed Pipes [6]	$ 46.00	$ 26.00 to 63.00	40

[1] Conversion of existing grass channel into water quality swale
[2] Channel conversion, using urban bioswale costs reported by Hoyt (2007)
[3] Construction of new bioretention in street right of way
[4] Surface bioretention using curb extensions and other methods
[5] Expanded tree pits to treat stormwater on more urban streets
[6] Conversion of enclosed drainage to dry swale or bioretention. No cost data available; assumed to be twice the cost of dry swale
[7] Higher design & engineering for neighborhood consultation and utility negotiations

Table 2: Site-specific Factors that Reduce the Cost of Street Retrofit Projects	
Factors that Reduce Costs	**Factors that Increase Costs**
• Open section retrofits • No modification of road surface • Wide street right of way • Active civic or neighborhood group • Utilities located under pavement	• Closed section retrofits • Multiple driveways • Utility relocation • Legal resources to define right-of-way or easements • Additional landscaping

OS-10	On-site Retrofits
	INDIVIDUAL ROOFTOPS

This group of onsite retrofits captures, stores, treats and then gradually releases runoff from individual rooftops. The goal is to systematically retrofit as many residential and non-residential rooftops as possible within a given subwatershed. The many different ways that rooftops can be retrofit are portrayed in Figure 1. A variety of stormwater treatment options can be employed for rooftop retrofits as shown below:

Residential rooftops

- Simple Disconnection
- Rain Barrels
- Rain Gardens
- French Drain/Dry Wells

Non-residential rooftops

- Simple Disconnection
- Rain Gardens
- Stormwater Planters
- Cisterns
- Green Rooftops

Examples of rooftop retrofit techniques are shown in Figures 2 through 4. Additional details on each technique can be found in the Rooftop Retrofit Design Sheets provided in Appendix F. Rooftop retrofits are ideal when a comprehensive delivery system is developed to implement them on a widespread basis. From a cost-benefit standpoint, it makes more sense to target residential rooftops first since they comprise a greater fraction of subwatershed area and are less expensive on a unit-area treated basis.

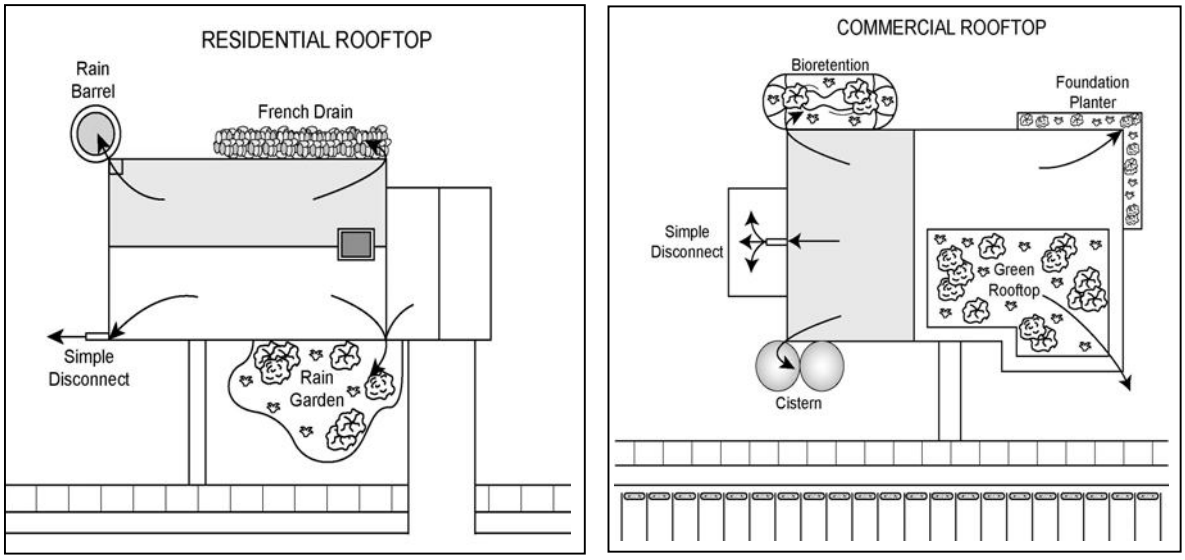

Figure 1: A variety of retrofit strategies can be applied to treat the quality of runoff from residential and commercial rooftops.

Figure 2: Residential rooftops can be treated by french drains (a), rain barrels (b), or rain gardens (c&d).

Figure 3: Runoff from larger rooftops can be treated in cisterns (a), infiltration areas (b), or bioretention planting beds (c).

Rooftop retrofits are particularly well-suited in subwatersheds where runoff reduction is a major restoration goal (e.g., to reduce the volume of stormwater runoff entering a combined sewer system). Retrofitting rooftops for water quality purposes is less effective since rooftop runoff tends to be cleaner than other urban source areas (with the possible exception of metals). On the other hand, incremental rooftop retrofitting can be an effective long range strategy to control runoff in highly urban subwatersheds.

Ideal Conditions for Rooftop Retrofits

The ideal conditions to retrofit residential rooftops are when a neighborhood:

- Has no basements (if infiltration is used)
- Has homes where roof leaders are directly connected to storm drain system
- Is located in a subwatershed where stormwater reductions can reduce combined sewer overflows
- Has a strong neighborhood association, environmental concern or community activism
- Has medium density residential lot sizes in the 0.25 to 1.0 acre range.

Rooftop retrofits work best in non-residential settings when the rooftop:

- Is being built as part of redevelopment or infill project
- Is owned or being built by a municipality or a cooperative institution
- Can discharge to landscaping or open space adjacent to the building
- Has reached the end of its design life and needs replacement.
- Is large, flat and directly connected to the storm drain system
- Owner is interested in green building certification

Figure 4: Green rooftops can also treat the quality of runoff from flat rooftops.

- Retrofit can provide supplemental irrigation to existing landscaping arid climates)

Situations Where Rooftop Retrofits are Difficult

Most communities have thousands of rooftops but not all of them can be retrofit. Some common situations where residential rooftops are not feasible include:

- Neighborhoods with basements and sump pumps
- Large residential lots where most roof leaders are already disconnected (<1 acre lots)
- Small residential lots (less than 4,000 square feet) that lack room for a retrofit
- Neighborhoods that lack environmental awareness or community organization
- Lots that lack yards or have poor vegetative cover
- Lawns with extremely compacted or tight soils

There are also situations where non-residential rooftops are difficult to retrofit:

- No open space or landscaping areas are present near building
- Rooftop has internal building drains (i.e., no downspouts)
- Building has a basement or its foundation lacks waterproofing

Alternative Restoration Methods for Rooftops

If rooftop retrofits are impractical, it is still possible to educate their occupants to adopt neighborhood stewardship or pollution prevention practices (Manual 8).

Desktop Searching for Rooftop Retrofits

A search is not very helpful in finding individual rooftop retrofit sites, although the average age and lot size in a neighborhood are worth assessing, since homes built to the same drainage standards tend to have similar retrofit potential (Figure 5). Rooftop retrofit potential can also be assessed using the Neighborhood Source Assessment of the USSR (Figure 6). Another GIS search option is to look for specific neighborhoods that deliver stormwater into combined sewers or have historic flooding or drainage problems. Rooftop retrofits alone may not solve these problems, but can play a role in a larger package of retrofit solutions.

A GIS search that defines older commercial, industrial or institutional zones that are near the end of their design life may help find good candidates for non-residential rooftop retrofits. A search of all municipal buildings in a subwatershed may also be warranted to assess their suitability for demonstration retrofits.

Figure 5: Desktop searches should emphasize neighborhood age to define rooftops built in the same design era.

Figure 6: The Neighborhood Source Assessment (NSA) of the USSR is a useful method to determine the extent of downspout connections in a neighborhood.

What to Look for When Investigating Rooftops

Rooftop retrofit potential can be discovered through a simple neighborhood investigation:

1. Interview homeowners to gauge their willingness and preferences for retrofitting and understand their home drainage issues
2. Evaluate general rooftop conditions in the neighborhood (e.g., pitch, gutters, overhead tree canopy)
3. Pace the width and depth of the average home and estimate the contributing roof area to each roof leader (Figure 7)
4. Trace the pathway of the roof leader to the storm drain system in the street. If the roof leader is plumbed directly to the storm drain, note the depth and location of the pipe connection.
5. Measure the length of the flow path from the roof across pervious areas such as lawn and landscaping that may be suitable for disconnection
6. Use screwdriver or soil auger to get a sense of lawn compaction and soil quality
7. Determine the most suitable retrofit technique for each roof leader using the flow chart in Figure 8. Note that more than one retrofit technique may be needed for each residential roof.

The investigation for non-residential rooftops is much the same, although roof drainage area is larger and more complex (Figure 9). The crew should first look at more cost-effective options such as bioretention, cisterns and disconnection. If the owner is interested in green rooftops, the crew will need access the roof to assess its age, condition and structural capacity.

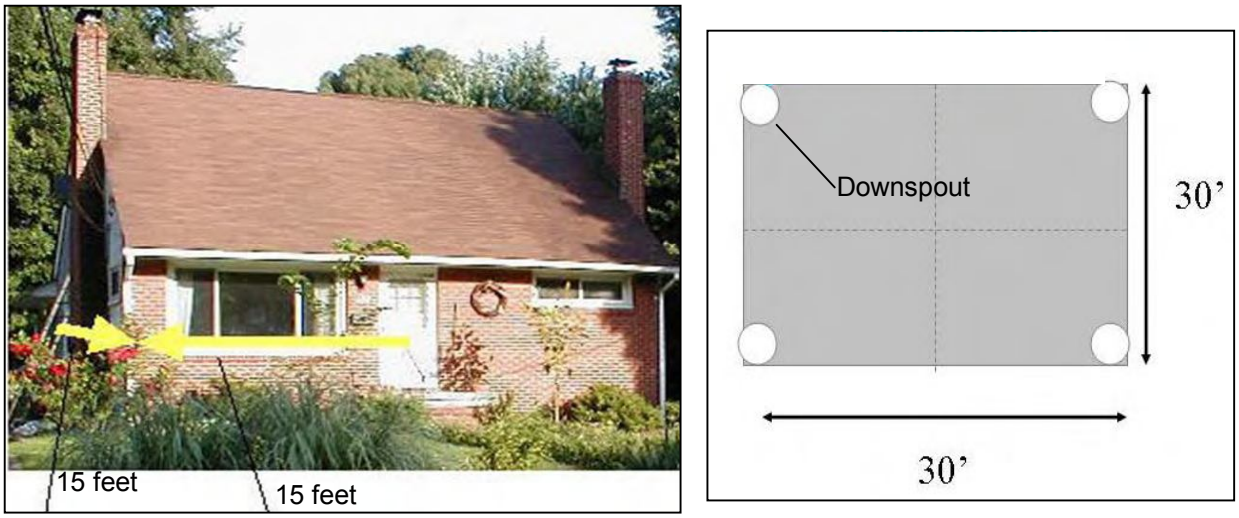

Figure 7: Sizing of residential retrofits is based on simple measurements of roof area draining to each downspout.

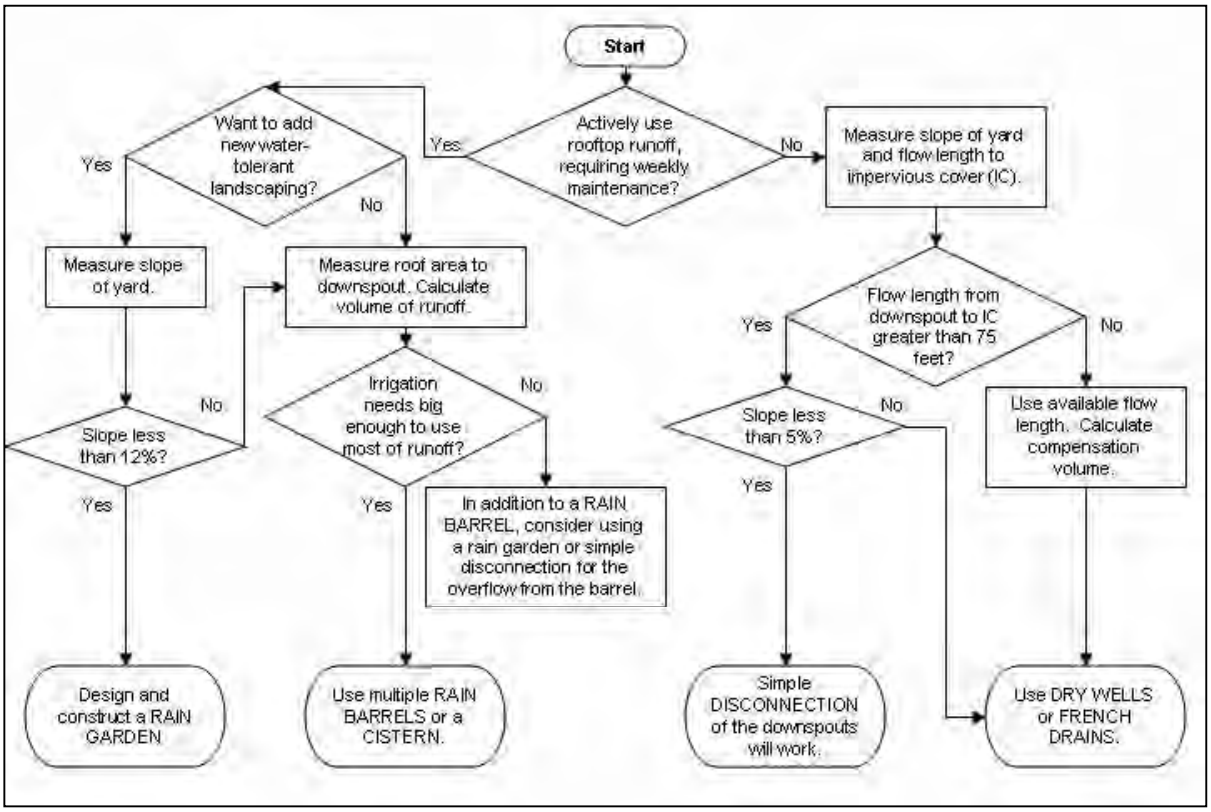

Figure 8: This simple flow chart helps homeowners decide whether simple disconnection, rain barrels, french drains or rain gardens are most appropriate for their lot.

Feasibility and Permits for Rooftop Retrofits

Since residential rooftop retrofits are installed and maintained by private landowners, the real hurdle is convincing them to do so. Some excellent publications exist on how to address perceived concerns about maintenance, algae and mosquito control (see Appendix F). Few environmental permits or approvals are needed, unless a stormwater plan is required under the redevelopment process. Designers may need to submit documentation about the retrofit to qualify for green building certification.

Rooftop Retrofit Design

The design requirements and level of engineering support are different for each rooftop retrofit. Some are exceedingly simple, while others involve complex structural engineering. The designer should consult the individual rooftop retrofit design sheets in Appendix F for the relevant design process.

Rooftop Retrofit Delivery Considerations

Because each rooftop retrofit treats a small area, dozens or hundreds are needed to make a measurable difference in a subwatershed. Consequently, an effective delivery system is needed to make rooftop retrofits happen, which normally involves a combination of targeted education, technical assistance and financial subsidies to individual homeowners or business community (Figure 10). In some cases, communities may need to modify their current building codes to permit green rooftops and cisterns. Several excellent examples of effective local rooftop retrofit delivery programs are presented in Table 1. These innovative programs have achieved a residential adoption rates ranging from 13 to 55%. Many of their educational and program materials are a good starting point to craft a local retrofit delivery system.

Figure 9: Retrofitting of non-residential rooftops is more complex.

Figure 10: Education and public involvement are key tools to maximize delivery of rooftop retrofits.

Table 1: Case Studies of Rooftop Retrofit Delivery	
Municipal Program	**Delivery Mechanisms and Financial Incentives**
City of Bremerton, WA *Cooperative Approach to CSO Reduction* CSO reduction. Disconnection of downspouts became mandatory in the City's combined sewer area. 33% of notified properties were assessed. Of these, the 16% that were contacted were disconnected.	Outreach campaign through by utility bill inserts, billboards, radio, buses and newspaper ads, workshops, direct mail, instructional videos, cable TV, and website. Free downspout assessments by 4 City staff, disconnections done by private contractor or homeowner. $25 to $500 mini-grants to support residential disconnection
Pittsburgh, PA *Nine Mile Run Rain Barrel Initiative* CSO reduction, water quality improvement and inflow & infiltration reduction in pilot subwatershed. 13% of contacted owners participated.	Local watershed association, directed outreach campaign via direct mail, door-to-door canvassing and newspaper, posters and radio ads. Free rain barrel assessment and installation by trained student volunteers (Student Conservation Association and AmeriCorps)
City of Portland, OR *BES Downspout Disconnection Program* CSO reduction in targeted combined sewer sheds. 40%-55% disconnection achieved in many sewer sheds	Direct outreach by door-to-door canvass, direct mail, and community events. Churches, youth and civic groups promote disconnection as a fundraising activity (get a finders fee of $13 per downspout). 9 AmeriCorps volunteers coordinate program and outreach. City provides free disconnections and gives a $53 credit per disconnection on sewer bill

Table 1: Case Studies of Rooftop Retrofit Delivery	
Municipal Program	**Delivery Mechanisms and Financial Incentives**
City of Austin, TX *Rainwater Harvesting Programs* Water conservation and stream protection	Outreach by utility bill inserts, website, and seminars. Installation is the responsibility of the owner. Rebates for installation (up to $500 for residential, $40,000 for commercial). Discounted Rain Barrels ($60/each; maximum 4). State of Texas sales tax exemption for rainwater harvesting equipment.
Minneapolis, MN *Landscaping for Rainwater Management* Reduce flooding and improve water quality at the neighborhood scale	Outreach via neighborhood association, website, and workshops. Downspout assessment by specific consultant. Homeowner installation. Subsidized assessment. Matching grants ($50-$400) for rain gardens, rain barrels, gutter redirection.
Milwaukee, WI *Every Drop Counts* CSO reduction and water quality improvement	Outreach by website, newsletters, garden class, and farmers market. Homeowner installation of discounted rain barrels ($23/each; maximum 5)
Montgomery County, MD *Rainscapes* Enhance water quality and stream habitat	Outreach by website and workshops. Free “make your own rain barrel” workshops. Homeowner installation
Bremerton, WA http://www.cityofbremerton.com/content/downspoutdisconnections.html Fulton, MN http://www.fultonneighborhood.org/lfrwm.htm Pittsburgh, PA http://www.ninemilerun.org/programs/stewardship/rainbarrel/ Portland, OR http://www.portlandonline.com/bes/index.cfm?c=32144 Austin, TX http://www.ci.austin.tx.us/watercon/default.htm Milwaukee http://www.mmsd.com/programs/every_drop_counts1.cfm Montgomery Co http://www.rainscapes.org	

Rooftop Retrofit Construction Considerations

Construction considerations vary for each rooftop retrofit technique; specific guidance can be found in the rooftop retrofit design sheets provided in Appendix F.

Rooftop Retrofit Costs

The cost to construct rooftop retrofits varies from virtually nothing at all to more than a million dollars per impervious acre treated, depending on the rooftop retrofit technique employed. Table 2 presents some planning level estimates for the different rooftop retrofit techniques. Appendix F presents more detailed data construction and maintenance costs. Stormwater managers should also account for program administration costs to deliver rooftop retrofits.

Table 2: Estimated Construction Costs for Rooftop Retrofit Techniques (2006 $ per cubic foot treated)			
Rooftop Retrofit Technique	**Median Cost**	**Range**	**Design & Engineering (%)**
Simple Disconnection [1]	$ 2.00	$1.00 to $3.00	5
Rain Barrel [2]	$ 25.00	$ 12.50 to $ 40.00	5
French Drain/Drywell [3]	$ 12.00	$ 10.50 to $13.50	5
Rain Garden [4]	$ 4.00	$ 3.00 to $ 5.00	5
Installed Rain Garden [5]	$ 10.00	$ 5.00 to $ 10.00	32
Bioretention Cell [6]	$ 30.00	$ 25.00 to $40.00	32
Stormwater Planters [7]	$ 27.00	$ 18.00 to $36.00	15
Cistern [7]	$ 15.00	$ 6.00 to $ 25.00	15
Extensive Green Rooftop [8]	$225.00	$ 144.00 to $300.00	32
Intensive Green Rooftop [9]	$360.00	$300.00 to $420.00	32

[1] Surface diversion of downspout over appropriate pervious area using flexible pipes
[2] Average cost for eight cubic foot barrel serving one typical roof leader
[3] Three foot deep stone trench serving two roof leaders
[4] Volunteer homeowner installation (materials cost only with minimal landscaping)
[5] Residential, but professionally designed/installed with extensive landscaping treatment
[6] Larger commercial application, treats up to ½ acre of rooftop in existing landscaping area.
[7] Commercial application, see rooftop retrofit design sheets in
[8] Commercial rooftop with shallow soil media, see
[9] Commercial rooftop with deeper soil media and need to structurally reinforce roof

OS-11	On-site Retrofits **LITTLE RETROFITS**	

Little retrofits are simple on-site practices that treat runoff from directly connected impervious areas less than one acre in size (Figure 1). Examples include sidewalks, bike paths, driveways, basketball and tennis courts, vacant lots, compacted ball fields, paved play areas, and other surfaces that are impermeable to rainfall. Recommended stormwater treatment options for little retrofits include swales, infiltration, filter strips, impervious cover conversion, impervious cover disconnection and soil compost amendments.

Collectively, small impervious areas comprise less than 5% of total impervious area in a subwatershed. So why bother with little retrofits? The reason is that small impervious areas are easy to retrofit because they are isolated within larger pervious areas. Many small impervious areas fall below minimum area thresholds that trigger stormwater management requirement and were therefore built without consideration for engineered drainage or stormwater practice.

Figure 1: Examples of little retrofits serving small impervious areas: a rain garden treating runoff from a trail (a); surface sand filter treating tennis court (b); and bioretention treating a small courtyard (c).

Little retrofits are ideal because they are low cost, require less sophisticated design and can solve localized drainage and erosion problems. In many cases, they can be constructed by watershed groups, homeowners associations or property managers with minimal engineering background.

Ideal Conditions for Little Retrofits

The best conditions for little retrofits are when the retrofit:

- Is located on publicly-owned land such as a park or school
- Would serve an educational or demonstration function
- Is in close proximity to a large pervious area
- Would alleviate an existing drainage or erosion problem
- Can take advantage of soils with a high infiltration rate
- Can be linked with a planned reforestation project for the site (Figure 2)

Other Restoration Alternatives

If a little retrofit doesn't work at a site, reforestation is always a restoration option.

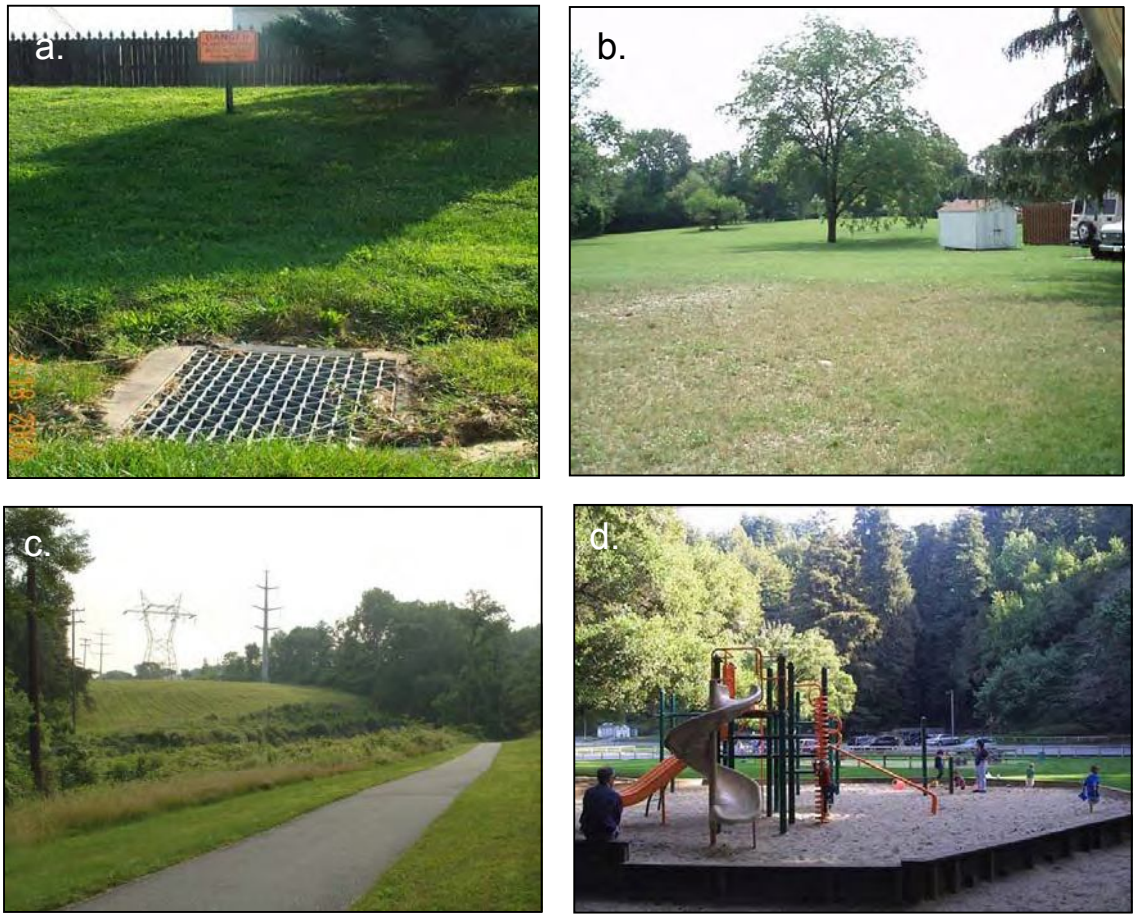

Figure 2: Common areas for little retrofits include pervious areas with drainage problems (a); parks and open space (b); bike trails (c); and playgrounds (d).

Desktop Searching for Little Retrofits

Little retrofits are simply too small to be worth a desktop GIS search or even an analysis of fine resolution aerial photos. They are generally found during field investigations of larger sites. The team may want to look for school properties and tax reverted vacant lots before going out in the field (Figures 3 and 4).

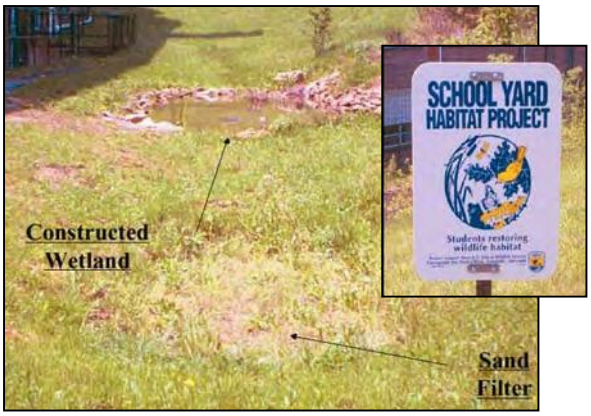

Figure 4: Compost amendments and tree planting are a good little retrofit strategy for vacant lots.

What to Look for During the Investigation

The feasibility of little retrofits is assessed by examining how stormwater works on the site. Crews can diagnose runoff problems by looking for signs of erosion, gullies or sediment deposition in the flow path.

1. The crew should first check to see if the impervious cover is really needed. If not, replace the impervious cover with soil, compost amendments and vegetation.
2. The crew then walks in a down-gradient direction to follow the flow path from the impervious area to the storm drain or channel system
3. If a direct connection exists, find the best place where sheetflow can be split or diverted into a pervious area for treatment. Next, choose the most appropriate and cost-effective stormwater treatment option
4. If no storm drain exists, check to see if runoff flows to an adjacent impervious area.
5. If there is no direct connection to the storm drain system, no retrofit is needed but consider reforestation as an alternative.

Feasibility and Permitting for Little Retrofits

Few environmental permits are needed for little retrofits, although it is a good idea to prepare an erosion and sediment control plan for construction. Landowner approval may need to be secured, although permission is not hard to get if it solves an existing drainage or erosion problem. Most communities will not require a stormwater design plan, although it may be helpful to get technical advice from an engineer or landscape architect. Indeed, little retrofits can be a good opportunity to involve civil engineering and landscape architecture students from local colleges.

Little Retrofit Design

This class of retrofits is largely sized based on simple design rules and seldom require modeling or engineering to support design (Figure 5). Little retrofits rely on the common-sense knowledge of park managers, site superintendents or watershed group staff.

Soil Investigation - Soil properties often dictate whether or not infiltration will work for a little retrofit. The crew may choose one of the following methods to determine soil infiltration rates:

- Observe how the site responds to rainfall during a storm to see if water ponds or infiltrates and discover the flow path through the site.
- Local cooperative extension offices can provide low cost or free tests to establish soil drainage qualities

Figure 5: While little retrofits require minor engineering, it is advisable to get some technical help.

- A low-tech infiltration test can be performed by digging a hole, filling it with water, and timing how long it takes to disappear. Dig below the topsoil to the proposed ponding depth (e.g., 6 inches). If the water infiltrates in the hole within 24 hours, the site may be suitable for an infiltration practice, although 12 hours or less is preferred.
- A soil auger can bore down below the bottom of the retrofit to determine if clay layers exist that would impede infiltration.

Plant Selection and Layout – To choose the right plants for the little retrofit, it is advisable to consult with a local partner, such as a master gardener, cooperative extension agent, landscape architect, or community forester. Most states also recommend native species. Where possible, ask the plant expert to do an on-site visit. In some cases, soil amendments that incorporate two inches of compost into the top six inches of soil can improve both infiltration and plant survival.

Flow paths - Learning the flow path helps determine the location and the drainage area of a little retrofit. Some simple field observations and measurements can define the flow path and drainage:

- Visit during a rain storm to see where water flows.
- Spray the area with a hose or dump a bucket of water to simulate rain.
- Roll a tennis ball to see which direction it travels over a smooth impervious surface.
- Use two stakes, a string, and a hanging level to measure elevation difference. Pound a stake into the ground or have someone hold it on an impervious surface. Tie the string to each stake, and hang the level on the taut string. Adjust the string on the stakes until the string is level. Measure from the string to the ground and compare the distances. Use this method to determine the slope of a proposed site.

Sizing - Some simple rules can be applied to size the little retrofit once the location and drainage area are known. For example, the following guidance can be used to disconnect impervious areas over a vegetated filter strip:

- The contributing flow path from impervious cover should not exceed 75 feet.
- The pervious area disconnection length must exceed the contributing flow path. The recommended minimum length over which runoff is spread is 75 feet. Make sure that the runoff cannot “reconnect” by flowing back onto an impervious surface within 75 feet.
- Pervious areas used for disconnection, including swales and filter strips, should have a slope no greater than 5%.
- The total impervious area draining to a single point shall not exceed 1,000 square feet.

Rain gardens and infiltration practices can be sized as a fraction of the impervious surface that drains to them. In general, the surface area of the practice should be about 10 to 20% of the impervious drainage area. Additional guidance on these practices can be found in Appendix F.

Stabilizing the Retrofit Site – Silt fences should be installed for little retrofits that involve more than a few hundred square feet of soil disturbance. Apply grass seed and soil amendments immediately after digging and use a seeding mix that grows well during the season when construction is scheduled.

Little Retrofit Delivery Considerations

The best delivery mechanism for little retrofits is to establish a mini-grant program for local watershed groups, community associations, garden clubs or service organizations who can provide volunteer labor for construction (Figure 6). Local watershed groups or municipal staff can also provide technical assistance to develop little retrofits project plans. Municipal agencies may want to develop short and simple specifications for little retrofits; excellent examples have been developed by Hoyt and Zielinski (2006). It is also a good idea to install interpretive signs to describe how the little retrofit works (Figure 7).

Little Retrofit Costs

The costs to construct little retrofits are generally quite low, as shown in Table 1.

Figure 6: Example of interpretative signage with a little retrofit.

Figure 7: Little retrofits are a great way to involve volunteers in watershed restoration.

Table 1: Estimated Construction Costs for Little Retrofits (2006 $ /cubic foot treated)			
Retrofit Option	**Median Cost**	**Range**	**Design & Engineering (%)**
IC Conversion [1]	$ 20.00	$ 18.50 to 21.50	5
Soil Compost Amendments [2]	$ 8.00	$ 3.15 to $11.40	5
Filter Strip [3]	$ 5.00	$ 3.50 to $ 10.00	5
Simple Infiltration [4]	$ 7.50	$ 5.00 to $ 11.50	5
Rain Garden (volunteer) [5]	$ 4.00	$ 3.00 to $ 5.00	5
Rain Garden (contractor) [6]	$ 7.50	$ 5.00 to $ 15.00	15
Bioretention [7]	$ 10.50	$ 7.50 to $ 17.25	32

[1] Demolition and removal of existing concrete or asphalt, and applying topsoil and hydroseed to establish vegetation
[2] Simple redirection of flow from impervious area to a pervious area using flow spreader, curb cut or checkdam split
[3] Deep tilling, mixing of nine inches of compost, and reseeding
[4] Re-grading, level spreader and reseeding to establish vegetation
[5] Directing runoff into shallow infiltration trench
[6] Volunteer installation, materials and equipment rental only
[7] Professionally installed with more extensive landscaping
[8] Professionally designed and installed bioretention cell serving more than 0.5 acres of CDA

OS-12	On-site Retrofits **LANDSCAPES-HARDSCAPES**	

This class of retrofits relies on landscaping to treat stormwater in highly urban settings. Examples include commercial landscaping areas, plazas, waterfronts, urban streetscapes, and pocket parks (Figure 1). While these urban landscapes occupy a trivial amount of total subwatershed area, they are included here because they represent a great opportunity to demonstrate retrofits in highly visible locations. The basic strategy is to treat stormwater as a landscaping resource and design amenity using innovative practices such as rain gardens, stormwater planters, expanded tree pits or permeable pavers (Figure 2).

Scaping retrofits are ideal because they have strong demonstration and education value, are frequently maintained, and may lower landscaping maintenance costs through reduced mowing, greater tree survival, or less irrigation.

Ideal Conditions for Scaping Retrofits

- Commercial, municipal, institutional and urban park settings
- Redevelopment and infill projects
- Public spaces with high exposure
- Area where urban water features are being designed as an amenity
- Downtown central business districts
- Waterfront developments
- Development constructed through public/private partnerships
- Neighborhood beautification and revitalization projects

Figure 2: Landscape architects can creatively use stormwater as a resource in foundation planters (a); permeable pavers (b); bioretention (c); and stormwater tree pits (d).

Situations Where Scaping Retrofits Don't Work

- No party is willing to undertake routine maintenance
- Retrofit would need to be shut down in winter to avoid ice problems

Alternative Restoration Practices

Even if a retrofit is not possible, other restoration projects may apply including:

- Reduced fertilizer and pesticide use (see Profile Sheet H-13 in Manual 8)
- Planting native plants
- Urban forestry practices
- Smart Site practices for redevelopment and infill that minimize impervious cover (CWP, 2004a)

Desktop Searching for Scaping Retrofits

A GIS search for scaping retrofits is probably overkill. It is much more effective to work with community planners and urban designers to discover public projects where scaping retrofits could be incorporated into the early planning stage. Local city planners, park designers, landscape architects or arborists may also know about opportunities for scaping retrofits in upcoming projects. They should be encouraged to view

stormwater as a resource and landscaping as a water quality solution.

What to Look for During the Investigation

There really is no field investigation for scaping retrofits. Designers simply participate in the urban design process to look for opportunities to insert scaping retrofits. The following concepts should be kept in mind when designing scaping retrofits:

Hydrology - Keep in mind that scaping retrofits will receive more runoff to the planting area than would otherwise be supplied by rainfall. Designers should compare the surface area delivering runoff to the surface area of the planting area itself. If the ration is more than 5:1, the scaping retrofit should have an underdrain so that plants don't become water logged. If the ratio is greater than 10:1, the design should include a surface overflow.

Plants - The real trick in scaping retrofits is to match the right plant materials to the expected moisture conditions created by the retrofit. Depending on the seasonal rainfall regime, plants may be exposed to long periods of drought followed by short periods of full saturation. At the same time, landscape architects want to select plants that meet their design objectives for form, function and color. Designers may want to consult regional plant and tree lists developed for stormwater or urban forestry that outline their tolerance for inundation, drought, chlorides, shade and other factors (Cappiella *et al.*, 2007).

Soil Media - Scaping retrofits require the creation of special soil media to meet both stormwater and landscaping needs. From a stormwater standpoint, the media should promote rapid drainage through the bed, but also have a layer of organic material to bind pollutants. A common soil mixture contains 50% sand, 30% non-clayey topsoil, and 20% well-aged compost. From a landscaping perspective, the soil media needs to be dense enough to support trees and shrubs, and retain enough moisture and nutrients to ensure growth during dry periods. The surface of the planting bed is also a key design consideration. Designers may want to use native rock, river stone or bank run gravel to provide a more durable surface than mulch and create a more artistic impression.

Water Features - Scaping retrofits are an opportunity to combine functional landscape treatment with art (Echols and Pennypacker, 2007). The aesthetic possibilities are endless, but frequently involve a cascading flow of water through chutes and ladders, much as it does in a natural stream.

Plaza and Sidewalk Drainage - This approach reduces stormwater runoff by connecting impervious areas with landscaped areas. Permeable pavers or porous concrete can further limit runoff generation from hard surfaces. These pavers come in a variety of textures and patterns, and are durable enough to hold up to pedestrian traffic. Sidewalks and plazas should be sloped toward the landscaping areas.

Rooftop Drainage - External downspouts of buildings can be designed to feed into landscaped areas or foundation planters so rooftop runoff becomes a source of supplemental irrigation. The drop from the roof to the ground can also create mini-waterfalls, drive water wheels and rain chimes, or create a cascade effect.

Expanded Tree Pits - Expanded street tree pits capture and treat stormwater and provide better growing conditions for street trees (Figure 3 and Cappiella *et al.*, 2006a). The basic design provides additional root volume for individual trees and links the soil media so that trees can share root volume. Runoff is graded into the pits through curb cuts or grate inlets and an underdrain ties into the existing storm drain system to promote rapid drainage. Pollutant removal is achieved by filtering through the soil media. A plan and profile view of the expanded tree pit design is illustrated in Figures 4 and 5. The expanded tree pit design was originally developed for urban street trees, but can be adapted for any situation where trees are desired in an urban hardscape.

Figure 3: Urban areas are a harsh environment and trees often get too little or too much runoff.

Feasibility and Permitting of Scaping Retrofits

No major permits and approvals are needed for scaping retrofits, beyond those required for the larger construction project of which they are a part.

Scaping Retrofit Design

Urban landscapes are intensely used and require frequent maintenance, so designers may want to consider the following design elements:

- *Heavy pedestrian traffic* – Scaping retrofits should include a barrier to pedestrian entry to prevent soil compaction and plant damage, such as bollards or iron fences.

Figure 4: Urban foresters can treat stormwater using creative street tree planters.

- *Potential vandalism* - Scaping retrofit materials should be durable enough to withstand vandalism.
- *Trash and litter* – Scaping retrofits will collect litter that previously washed into the storm drain system. Designers may need to create a maintenance plan that includes daily or weekly trash clean outs. If the retrofit is located in a public space, maintenance crews will need training on how to access the retrofit to remove trash.

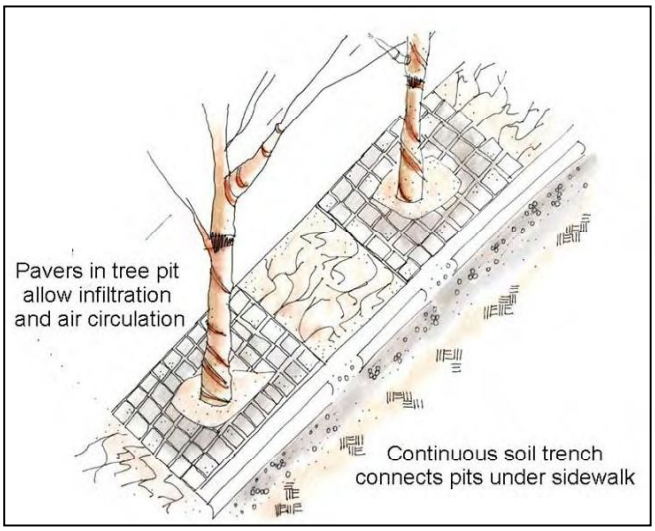

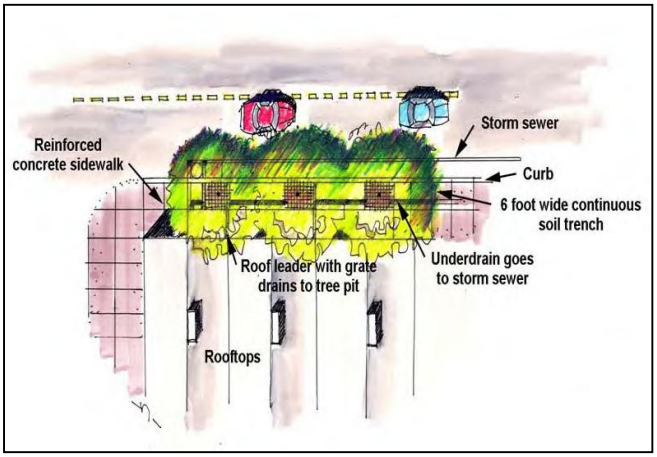

Figure 5: Plan and profile detail on stormwater tree pit design with shared rooting space.

- *Public safety* – Providing adequate lighting and avoiding dense vegetation can address concerns about crime and personal safety
- *Need for supplemental irrigation* – Even plants accustomed the wet/dry cycles of stormwater may require watering for the first year or two to become established.

Scaping Retrofit Delivery Considerations

The primary delivery mechanism is to train landscape architects on water-sensitive design (France, 2003). Education of urban foresters, arborists, urban designers, park managers, maintenance crews and architects can also encourage widespread adoption of scaping retrofits.

Scaping Retrofit Costs

The costs for scaping retrofits depend on the nature of the urban design project. The best way is to generate an initial construction cost estimate is to look at the cost for individual scaping retrofit techniques as shown in Table 1.

Table 1: Estimated Construction Costs for Scaping Retrofits (2006 $/cubic foot treated)			
Stormwater Treatment Option	**Median Cost**	**Range**	**Design & Engineering (%)**
Small Bioretention [1]	$ 30.00	$ 25.00 to $ 40.00	32
Permeable Pavers [2]	$ 120.00	$ 96.00 to $ 144.00	32
Stormwater Planters [3]	$ 27.00	$ 18.00 to $ 36.00	32
Water Quality Swale [4]	$ 12.50	$ 7.00 to $ 22.00	32
Stormwater Tree Pits [5]	$ 70.00	$ 58.00 to $ 73.00	32
IC Conversion [6]	$ 20.00	$ 18.50 to $ 21.50	15

[1] Designed bioretention cell in highly urban area serving less than 0.5 acre CDA with a landscape architect doing planting plan
[2] Replacement pavers for courtyard or plaza with some subgrade preparation
[3] Foundation planters capture rooftop runoff in an enclosed landscape box – see Appendix F
[4] Conversion of existing surface flow path to a more effective water quality swale
[5] Expanded tree pits with shared rooting space to treat stormwater in highly urban streets
[6] Breakup and removal of existing impervious area followed by revegetation with turf

OS-13	On-site Retrofits **UNDERGROUND RETROFITS**	

Underground retrofits are the on-site retrofit of last resort due to their high cost. They make sense when other on-site retrofits cannot fit on the surface, or land acquisition costs are too high. Underground retrofits are normally restricted to small sites that generate high pollutant loadings discharging to sensitive waters. Common methods of underground treatment are shown in Figure 1 and include:

- Infiltration galleries
- Underground sand filter
- Underground detention pipes
- Multi-chamber treatment train (MCTT)
- Proprietary stormwater treatment devices

This class of retrofits applies to ultra-urban subwatersheds that lack surface area for stormwater treatment (Figure 2). The most common form of treatment is the underground sand filter which provides effective pollutant removal. Underground sand filters make sense when water quality and public health issues are paramount.

Ideal Conditions for Underground Retrofits

The most ideal situations for underground retrofits are in:

- Ultra-urban areas that lack available space on the surface for treatment
- Redevelopment or infill projects where stormwater treatment requirements are triggered
- Severe stormwater hotspots or central business districts
- Sites where untreated direct stormwater discharges to extremely sensitive waters (e.g., intake for drinking water supply, swimming beaches, harbors, shellfish beds, waterfronts; Figure 3)
- Sites where pretreatment is needed prior to another retrofit
- Regions that have underlying soils with exceptionally good infiltration rates (e.g., glacial till, outwash plains, sandy plains)
- Parking lots that cannot be served by a surface retrofit
- Public works yards where crews can perform frequent maintenance

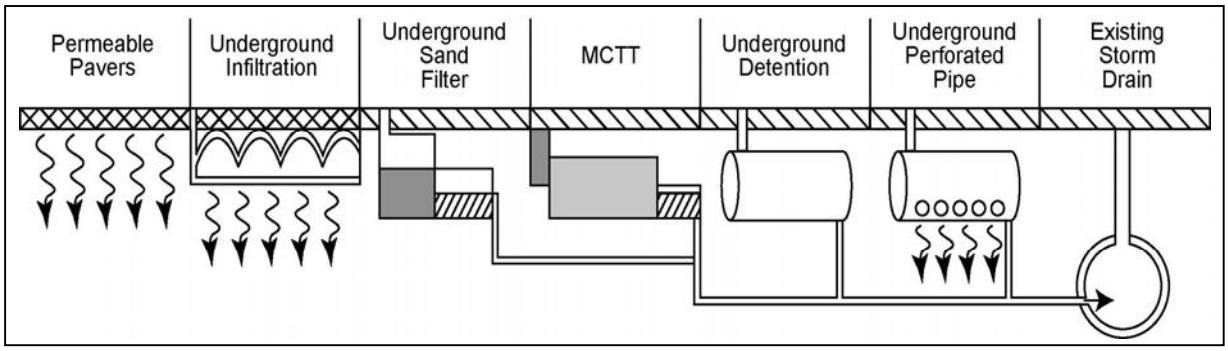

Figure 1: Numerous strategies can be used for underground retrofits.

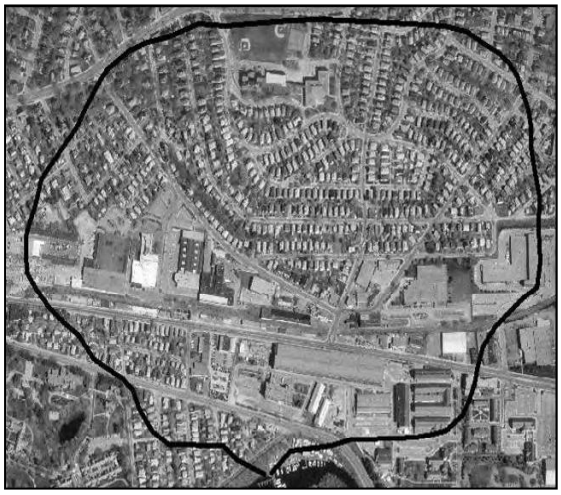

Figure 2: Underground retrofits are typically used in ultra-urban watersheds that lack surface area for other retrofits.

Figure 3: Large underground sand filter under construction to treat runoff near a drinking water intake.

Situations Where Underground Retrofits Are Difficult

Underground retrofits are problematic when:

- Excavation is limited by bedrock or a high water table
- Multiple utilities run underneath the site
- Terrain is flat and/or adequate head is lacking to drive the retrofit
- The receiving storm drain system is only a few feet below ground level
- Owner/operator is unwilling or unable to frequently maintain it

Restoration Alternatives in Ultra Urban Areas

It can be extremely expensive to retrofit ultra-urban subwatersheds using underground retrofits. Alternatives for improving stormwater quality in these subwatersheds include non-structural practices, such as:

- Intensive street sweeping (Manual 9)
- Regular cleanouts of storm drain inlets (Manual 9)
- Pollution prevention practices (see Manual 8)
- Detection and elimination of illicit discharges (see Brown *et al.*, 2004)
- Municipal housekeeping practices (Manual 9)

Desktop Searching for Underground Retrofits

There is generally no reason to conduct a desktop search to find underground retrofit sites. It may be helpful to consult a soils map to assess potential infiltration rates, but keep in mind that most urban soils are highly altered and compacted due to prior construction and no longer retain their original soil properties.

What to Look for when Investigating Underground Retrofits

Crews should consider underground retrofits only when all other surface retrofit options have been exhausted. Underground retrofits are extremely difficult to assess in the field since it is often hard to understand what is happening underground. The crew should

look for indicators of underground utilities and pop any manholes or grates to determine the invert elevation and diameter of the storm drain pipe that will accept runoff from an underground retrofit.

Feasibility and Permitting for Underground Retrofits

Available head is the primary feasibility factor restricting underground retrofits. The difference in the surface elevation and the pipe elevation defines the head available, which in turn sets the maximum depth of underground treatment. Anywhere from four to 12 feet of head are needed depending on the retrofit design variant.

Underground retrofits require approval by the local stormwater review authority who may lack experience with this class of retrofits. The review and inspection of underground retrofits is more complex than other stormwater practices, and may involve:

- Underground injection permits (if the retrofit infiltrates)
- Confined space safety issues and other OSHA requirements
- Certification that the retrofit is water-tight (if the retrofit does not infiltrate)
- Maintenance contracts to ensure that trapped pollutants are routinely removed

Underground Retrofit Design

Several key design issues are involved in underground retrofits:

To infiltrate or not - The designer should be very clear on the retrofitting objective for the site. If runoff reduction is the goal, infiltration is desirable (Figure 4). On the other hand, filtering is recommended to remove stormwater pollutants to improve water quality. Infiltration should never be considered at stormwater hotspots to minimize the potential for groundwater contamination. Most urban soils have been severely altered and compacted by past earthmoving, so several borings and infiltration tests are essential for underground retrofits.

Structural reinforcement - Most underground retrofits are installed underneath parking lots and roads, so designers may need to perform a structural analysis to determine whether the retrofit has adequate load bearing capacity or needs structural reinforcement.

Visibility - Underground retrofits are out of sight and out of mind, so designers should include observation wells to monitor retrofit water levels and clearly mark the location of all access points on the ground, in pollution prevention plans and in maintenance records (Figure 5).

Easy sediment removal - Designers should provide multiple access points to maintain the retrofit and carefully think through how crews can safely remove trapped sediments. Designers should look at manhole diameters, grates, ladders and other features to make it

Figure 4: Where soils permit, infiltration galleries can be used to treat stormwater underground.

easy for crews to access the retrofit. It is preferable if sediment removal can be done with specialized equipment such as a vactor truck or hydraulic suction, as opposed to manual removal (Figure 6). Many underground retrofits will require confined space entry training to access the site.

Two cell design - Pretreatment is needed to handle high loads of sediment, trash, and organic debris and to contain spills and transitory illicit discharges. Underground retrofits should have a two cell design. The first pretreatment cell can be wet or dry, and should comprise at least 25% of the target WQv.

Use of proprietary treatment devices - The cost and complexity of underground retrofits can be reduced when proprietary stormwater treatment practices are specified. Designers, however, should clearly understand the capabilities and limitations of these practices when it comes to actual pollutant removal.

Construction Considerations for Underground Retrofits

Underground retrofits involve several unique construction considerations:

- Worker safety is important during excavation or trenching, particularly if the retrofit will be more than four feet deep.
- Workers should be trained in confined space entry procedures.
- Designers should be present when contractors are pouring concrete and should carefully inspect all work since it is not easy to remedy problems once the retrofit is paved over.
- Inspectors should make sure underground retrofits are water tight unless they are expected to infiltrate stormwater.
- Inspectors should make sure the connection to the accepting storm drain pipe is at the proper elevation.

Figure 5: Out of sight means out of mind – make sure inspectors can access underground retrofits.

Figure 6: Mechanized rather than manual sediment removal is always preferred.

Costs for Underground Retrofits

Underground retrofits normally cost at least an order of magnitude more to construct than surface retrofits (Table 1). The higher cost is attributed to:

- Greater need for excavation and off-site hauling
- Underground storage materials
- Structural reinforcement to bear traffic loads
- Poor urban soils
- Need to provide excellent maintenance access
- Cast-in-place construction

In addition, underground retrofits tend to be more expensive to maintain**.** The cost differential for underground retrofits can narrow if land acquisition is needed for surface retrofits, or if effective proprietary stormwater practices are employed.

Table 1: Estimated Construction Costs for Underground Retrofits (2006 $ /cubic foot treated)

Stormwater Treatment Option	Median Cost	Range	Design & Engineering (%)
Underground Infiltration [1]	$ 180.00	$ 144.00 to $ 216.00	32
Underground Sand Filter [2]	$ 65.00	$ 28.00 to $ 75.00	32
Multi-Chamber Treatment Train	$ 80.00	$ 66.00 to $ 94.00	32
Porous Concrete [3]	$ 65.00	$ 50.00 to $ 85.00	32
Proprietary Practices	$ 5.00	$ 3.00 to $ 20.00	15

[1] Removal of existing impervious cover, 12 inch stone subgrade or plastic arches and installation of pervious surface (permeable pavers, porous asphalt/concrete)
[2] Two cell underground watertight concrete vault with sand filter
[3] Removal of existing impervious cover, six inch stone and typical porous concrete application

Chapter 3: Stormwater Treatment Options For Retrofitting

Retrofitting involves choosing the most appropriate and effective stormwater treatment option at the individual retrofit site that can achieve local restoration objectives. Designers can choose from among as many as eight different stormwater treatment options when retrofitting (Figure 3.1). Each stormwater treatment option differs greatly in its pollutant removal capability, stormwater benefits and retrofit suitability. In many cases, more than one stormwater treatment option can be used at a retrofit site. This chapter provides general guidance to help designers choose the best options for their particular retrofit situation.

This chapter is not intended to be a treatise on stormwater design, as many stormwater design manuals already exist. Rather, it outlines how each stormwater option is modified in the context of retrofitting.

The ensuing series of profile sheets describes how each stormwater option can be adapted for retrofitting, and are organized as follows:

- **How They Operate -** How does the stormwater treatment option work to improve the quality of stormwater runoff?
- **Typical Retrofit Applications -** Which retrofit locations in a subwatershed are best for using the stormwater treatment options?

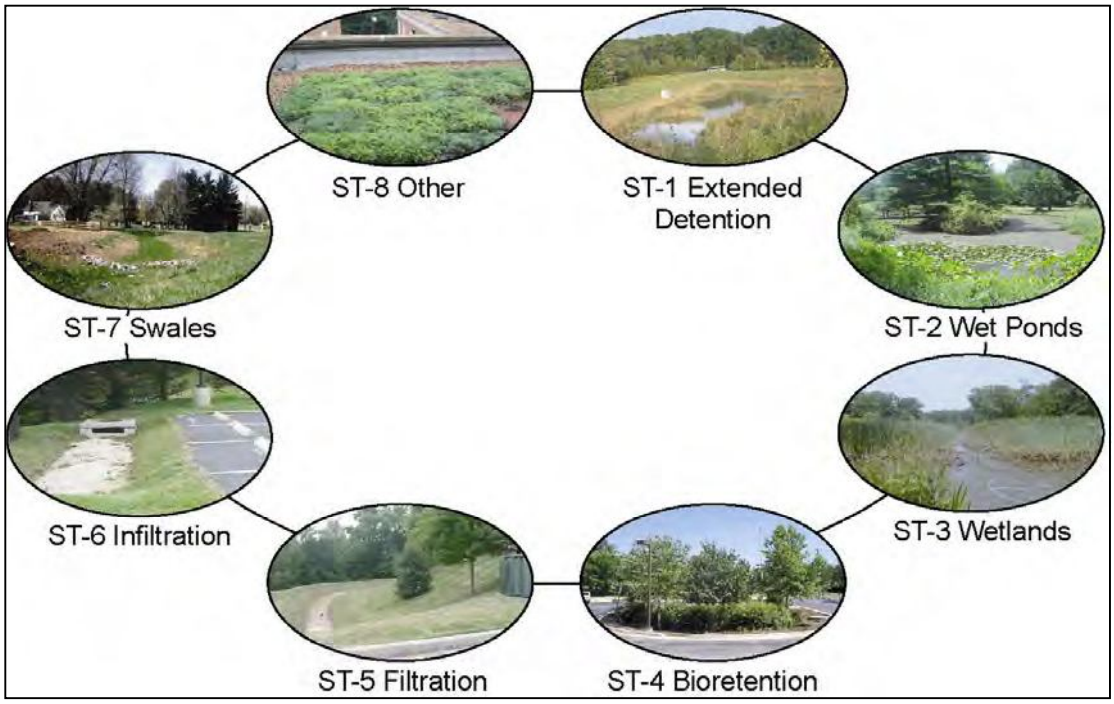

Figure 3.1: Eight stormwater treatment options are available for retrofitting.

- **Pollutant Removal Capability -** What are the primary pollutant removal mechanism(s) and the expected pollutant removal rates for each stormwater treatment options?

- **Other Stormwater Benefits Provided** – Can the stormwater treatment options provide additional stormwater management objectives such as groundwater recharge or channel protection?

Several matrices are provided to help designers choose the most appropriate stormwater treatment option for their retrofit site (Tables 3.1 to 3.3). The first matrix indicates which stormwater treatment options are preferred at each retrofit location, the second compares their ability to meet various restoration objectives, and the last rates their capability to remove different pollutants of concern.

These profile sheets can be used in conjunction with the retrofit location profile sheets contained in Chapter 3 to build a retrofit concept at a given site.

Designers may also wish to consult Appendix I to learn more about how each stormwater treatment option can be adapted for retrofitting. Each design sheet provides further information on the following topics:

- Typical Feasibility Constraints in Developed Watersheds
- Common Community and Environmental Concerns
- Retrofit Design Issues
- Retrofit Maintenance Issues
- Adaptations for Special Climates and Terrain
- Installation Costs
- Internet Design Resources

Table 3.1: Stormwater Treatment Options Used in Different Retrofit Locations

Subwatershed Location	Stormwater Treatment Option							
	ST-1 Extended Detention	ST-2 Wet ponds	ST-3 Wetlands	ST-4 Bio-retention	ST-5 Filters	ST-6 Infiltration	ST-7 Swales	ST-8 Other
SR-1 Existing Ponds	●	●	●	⦿	⦿	○	○	○
SR-2 Roadway Culverts	●	⦿	●	○	○	○	○	○
SR-3 Below Outfalls	●	●	●	⦿	⦿	○	○	○
SR-4 Conveyance	⦿	○	●	●	○	○	●	○
SR-5 Transport ROW	●	●	●	●	⦿	○	⦿	○
SR-6 Large Parking Lots	●	●	●	⦿	⦿	⦿	○	○
OS-7 Hotspots	○	○	○	●	●	X	○	○
OS-8 Small Parking Lots	○	○	○	●	●	●	●	●
OS-9 Individual Streets	○	○	○	●	⦿	⦿	●	○
OS-10 Rooftops	○	○	○	●	○	⦿	○	●
OS-11 Little Retrofits	○	○	○	●	⦿	●	●	●
OS-12 Hard/Landscape	○	○	⦿	●	⦿	⦿	⦿	●
OS-13 Underground	⦿	○	○	⦿	●	⦿	○	○

KEY
● = Preferred stormwater treatment option
⦿ = Feasible in some circumstances
○ = Seldom used for the retrofit
X = Not recommended under any circumstances

Table 3.2: Ability of Stormwater Treatment Options to Address Retrofit Objectives

Retrofit Objective	Stormwater Treatment Options							
	Extended Detention	Wet Ponds	Wetlands	Bio-retention	Filtering	Infiltration	Swales	Other
Correct Past Mistakes	●	●	●	●	⦿	●	●	⦿
Reduce Flood Damage	●	●	●	○	○	⦿	○	○
Education/ Demonstration	⦿	⦿	●	●	●	●	●	●
Trap Trash and Floatables	●	●	●	⦿	●	○	○	○
Reduce Flows to Combined Sewer	⦿	○	⦿	●	○	●	⦿	●
Renovate Stream Corridor	⦿	●	●	●	○	⦿	⦿	○
Remove Pollutant of Concern	*Varies depending on pollutant, see Table 3.3*							
Reduce Bank Erosion	●	⦿	⦿	⦿	○	⦿	⦿	⦿
Support Stream Repair	●	⦿	●	⦿	⦿	●	⦿	○
Full Watershed Restoration	●	●	●	●	●	●	●	●

KEY
● = Primary stormwater treatment option to address objective
⦿ = Secondary stormwater treatment option
○ = Supplemental stormwater treatment option

Table 3.3: Comparison of Pollutant Removal Capability

Stormwater Treatment Option	Stormwater Pollutant						
	TSS	TP	TN	Metals	Bacteria	Organic Carbon	Oil & Grease
Extended Detention	⦿	X	○	○	○	X	⦿
Wet Ponds	●	⦿	○	⦿	⦿	○	⦿
Wetlands	⦿	⦿	○	○	⦿	X	●
Bioretention	⦿	X	○	●	●	⦿	●
Filtering	●	⦿	○	⦿	⦿	⦿	●
Infiltration	●	⦿	○	●	?	●	●
Swales	●	X	○	⦿	X	⦿	●
Rooftop	*Varies*						

KEY
● = Excellent Removal (76 to 100%)
⦿ = Good Removal (51 to 75%)
○ = Fair Removal (26 to 51%)
X = Low Removal (0 to 25%)
? = Unknown Removal

NOTES
See Profile Sheets in Chapter 2 for precise removal rates and ranges and Appendix B for documentation on derivation of removal rates

ST-1	Stormwater Treatment Options	
	EXTENDED DETENTION	

This option relies on 12 to 24 hour detention of stormwater runoff after each rain event. An under-sized outlet structure restricts stormwater flow so it backs up and is stored within a pond or wetland. The temporary ponding enables particulate pollutants to settle out and reduces the effective shear stress on downstream banks. Extended Detention (ED) differs from stormwater detention, which is used for peak discharge or flood control purposes and often detains flows for just a few minutes or hours. ED is normally combined with other stormwater treatment options such as wet ponds and constructed wetlands to enhance retrofit performance and appearance (Figure 1). The most common design variations for ED retrofits include:

- Micropool Extended Detention (Water Quality)
- Micropool Extended Detention (Channel Protection)
- Wet Extended Detention Pond
- ED Wetlands

Schematics of each ED retrofit design variation are provided in Figure 2. ED is an ideal stormwater treatment option because it is cost-effective, versatile and safe, and is also the preferred stormwater treatment option for providing downstream channel protection.

Typical ED Retrofit Applications

ED is an attractive option to retrofit existing ponds (SR-1), and can also be utilized for other storage retrofits with the possible exception of the conveyance system (SR-4). ED is generally not suited for on-site retrofit applications. Dry ED ponds should seldom be considered as a standalone retrofit strategy, unless downstream channel protection is a priority.

Figure 1: This shallow wetland was designed with extended detention. (Rolling Stone retrofit, Montgomery County, MD)

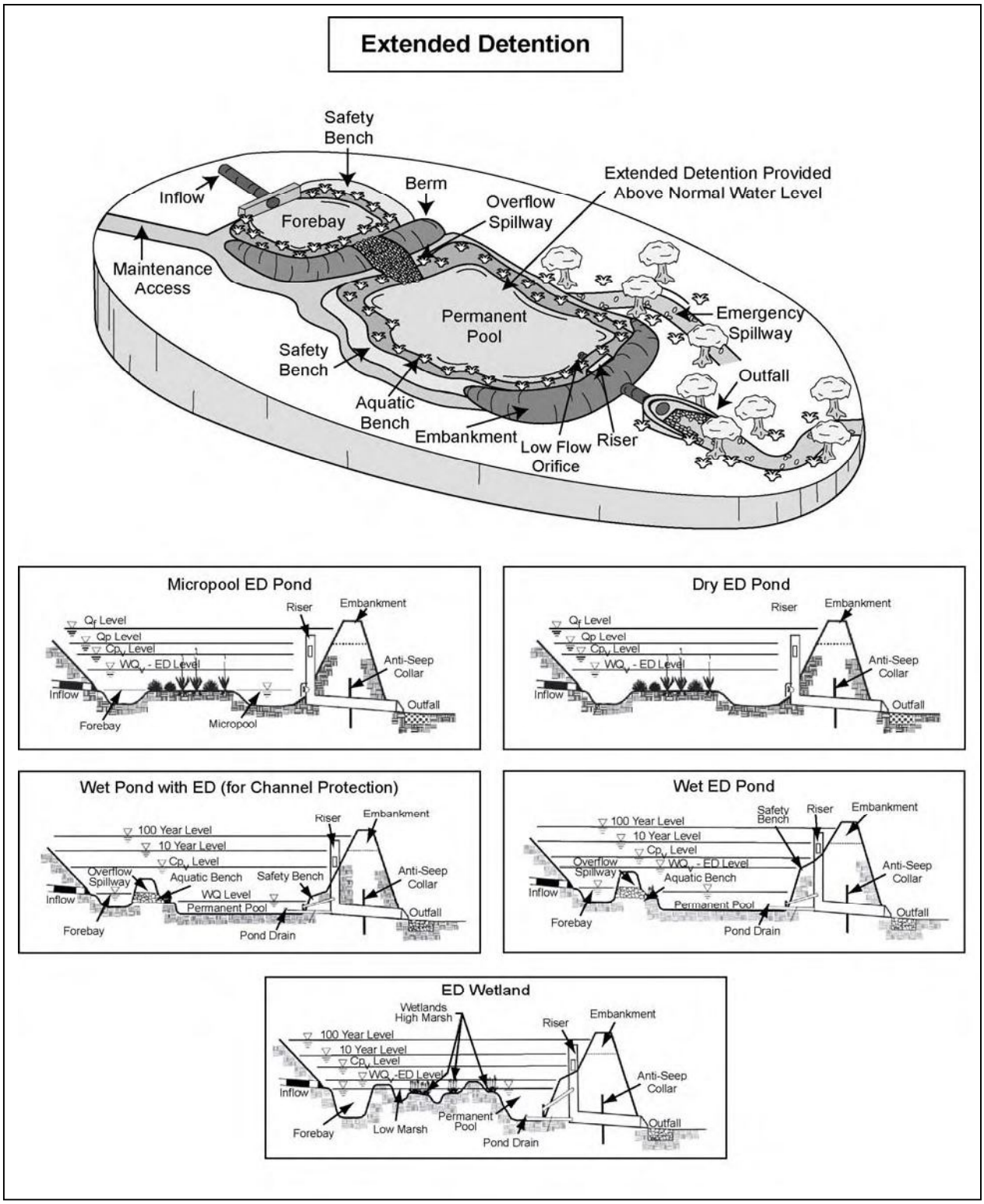

Figure 2: Extended Detention Schematics

ED Pollutant Removal Capability

ED ponds rely on gravitational settling as their primary pollutant removal mechanism. Consequently, they generally provide fair to good removal for particulate pollutants but low or negligible removal for soluble pollutants, such as nitrate and soluble phosphorus (Table 1). ED generally has the lowest overall pollutant removal rate of any stormwater treatment option. As a result, ED is normally combined with wet ponds or constructed wetlands to maximize pollutant removal rates.

Several site-specific factors can have a strong influence on ED pollutant removal rates. Designers should review the design factors in Table 2 to compute the expected pollutant removal rates for the individual retrofit using the design point method.

Table 1: Range of Reported Removal Rates for Dry Extended Detention Ponds

Pollutant	Low End	Median	High End
Total Suspended Solids	50	70	80
Total Phosphorus	15	20	30
Soluble Phosphorus	-10	-10	40
Total Nitrogen	25	25	35
Organic Carbon	15	25	35
Total Zinc	25	30	60
Total Copper	30	30	50
Bacteria	0	40	90
Hydrocarbons	40	70	80
Chloride	0	0	0
Trash/Debris	65	80	85
See Appendix D for data sources and assumptions used to derive these removal rates Low End and High End are the 25th and 75th quartiles			

Table 2: Design Point Calculation to Estimate Pollutant Removal for ED Retrofits

Design Factors	X	Points
Wet ED or Multiple Cell Design		+ 2
Exceeds target WQv by more than 25%		+ 1
Exceeds target WQv by more than 50%		+ 2
Off-line design		+ 1
Flow path greater than 1.5 to 1		+ 1
Sediment forebay		+ 1
Constructed wetland elements included in design		+ 1
On-line design		- 1
Flow path less than 1:1		- 1
Pond SA/CDA ratio less than 2%		- 2
Does not provide full WQv volume		- 2
Pond intersects with groundwater		- 2
NET DESIGN SCORE (max. of 5 points)		

An important factor influencing pollutant removal rates is whether ED is combined with another treatment option, such as a wet pond or stormwater wetland. As a general rule, if more than 50% of the target WQv is provided by a wet pond or constructed wetland, then the higher pollutant removal rate for the treatment option should be applied (see Profile Sheets ST-2 and ST-3).

Other Stormwater Benefits Provided by ED

ED retrofits can provide other stormwater benefits to address other restoration objectives:

Recharge: Dry ED pond retrofits can provide modest groundwater recharge benefits. Strecker *et al.* (2004) reported up to 30% runoff reduction for a large population of monitored dry ED ponds, presumably due to infiltration through the bottom soils of the basin. Recharge benefits will be reduced if the ED pond has impermeable or compacted soils, a liner, or a permanent pool of water.

Channel Protection: ED ponds are the primary means to protect downstream channels if full channel protection storage can be provided at the retrofit site. It should be noted, however, that channel protection normally requires about 20-40% more storage volume than that needed for water quality treatment (see Figure 1.3 in Chapter 1). Consequently, designers may have difficulty finding adequate space to retrofit channel protection storage at tight sites. Guidance on estimating channel protection storage volume for individual retrofit sites can be found in Appendix C.

ST-2	Stormwater Treatment Options	
	WET PONDS	

Wet ponds consist of a permanent pool of standing water that promotes a better environment for gravitational settling, biological uptake and microbial activity (Figure 1). Runoff from each new storm enters the pond and partially displaces pool water from previous storms. The pool also acts as a barrier to re-suspension of sediments and other pollutants deposited during prior storms. When sized properly, wet ponds have a residence time that ranges from many days to several weeks, which allows numerous pollutant removal mechanisms to operate.

Wet pond retrofits can be employed in several different design configurations:

- Wet Pond
- Wet ED Pond
- Wet Pond with ED for Channel Protection
- Pond Wetland System

Figure 2 illustrates each wet pond design variation. Wet ponds are an ideal retrofit treatment option due to their high and reliable pollutant removal performance, community acceptance and amenity value. Wet ponds can also provide channel protection above the permanent pool in some retrofit situations.

Figure 1: Wet ponds can provide additional pollutant removal through settling

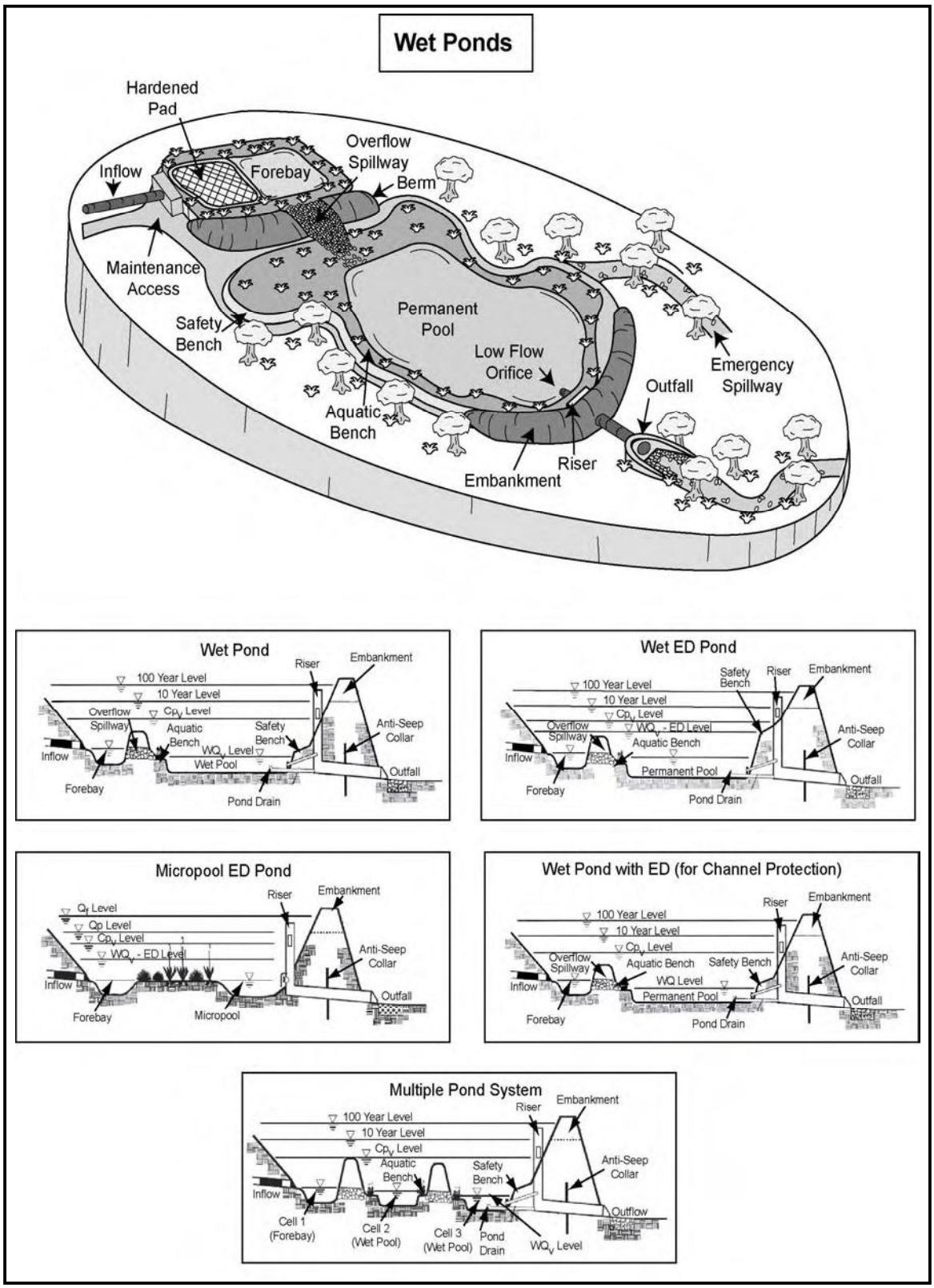

Figure 2: Schematics for various wet pond variations

Typical Retrofit Applications

Wet ponds can be used as either a primary or secondary treatment option in most storage retrofit situations. Wet ponds are not recommended for conveyance retrofits (SR-4) and most on-site retrofit applications.

Wet Pond Pollutant Removal Capability

Many pollutant removal mechanisms operate in the water column and bottom sediments of wet ponds including gravitational settling, algal uptake, adsorption, ultra-violet radiation and microbial processes. Many wet ponds have been intensively monitored in the past three decades and researchers consistently report moderate to high removal rates across the full range of stormwater pollutants (Table 1). Wet ponds generally have higher pollutant removal rates than other stormwater treatment options reviewed in this chapter.

Wet pond research has revealed many site-specific conditions and design factors than can enhance or detract from the median removal rates (Table 2). In general, the walkaway volume of a retrofit is when it cannot provide at least 35% of the target WQv. In addition, if more than 50% of the target water quality volume is provided by ED, the lower removal rates outlined in Profile Sheet ST-1 should be applied. Designers can review the design factors and site conditions in Table 2 to evaluate whether their individual retrofit design will perform better or worse than normal, using the design point method.

Other Stormwater Benefits Provided by Wet Ponds

Wet pond retrofits have limited potential to provide other stormwater benefits:

Groundwater Recharge: Due to their standing water and sealed bottoms, wet ponds do not offer much benefit in terms of groundwater recharge.

According to Strecker *et al.* (2004), wet ponds reduce incoming runoff volumes by less than 5%, most of which is accomplished by evaporation rather than soil infiltration.

Channel Protection: When site topography permits, extended detention can be stacked above the permanent pool to provide downstream channel protection. Designers should note that the CPv storage is typically 20 to 40% greater than the WQv storage so it is often hard to provide full channel protection at tight retrofit sites. Guidance on estimating the channel protection volume needed at individual retrofit sites can be found in Appendix C.

Table 1: Range of Reported Removal Rates for Wet Ponds			
Pollutant	**Low End**	**Median**	**High End**
Total Suspended Solids	60	80	90
Total Phosphorus	40	50	75
Soluble Phosphorus	40	65	75
Total Nitrogen	15	30	40
Organic Carbon	25	45	65
Total Zinc	40	65	70
Total Copper	45	60	75
Bacteria	50	70	95
Hydrocarbons	60	80	90
Chloride	0	0	0
Trash/Debris	75	90	95
See Appendix D for data sources and assumptions used to derive these removal rates Low End and High End are the 25th and 75th quartiles			

Table 2: Design Point Calculation to Estimate Pollutant Removal for Wet Pond Retrofits		
Design Factors	**X**	**Points**
Wet ED or Multiple Pond Design		+ 2
Exceeds target WQv by more than 50%		+ 2
Exceeds target WQv by more than 25%		+ 1
Off-line design		+ 1
Flow path greater than 1.5 to 1		+ 1
Sediment forebay at major outfalls		+ 1
Wetland elements cover at least 10% of surface area		+ 1
Single cell pond		- 1
Flow path less than 1:1		- 1
On-line design		- 1
Pond SA/CDA ratio less than 2%		- 2
Does not provide full WQv volume		- 2
Pond intersects with groundwater		- 2
NET DESIGN SCORE (max of 5 points)		

ST-3	Stormwater Treatment Options **CONSTRUCTED WETLANDS**	

How Constructed Wetlands Work

Constructed wetlands are shallow depressions that receive stormwater inputs for treatment. Wetlands are typically less than one foot deep (although they have deeper pools at the forebay and micropool) and possess variable microtopography to promote dense and diverse wetland cover (Figure 1). Runoff from each new storm displaces runoff from previous storms, and the long residence time allows multiple pollutant removal processes to operate. The wetland environment provides an ideal environment for gravitational settling, biological uptake, and microbial activity.

Constructed wetlands can be a stand-alone treatment option, or be combined with other stormwater treatment options in several configurations:

- Shallow Marsh
- ED Wetland
- Pond Wetland
- Wet Swales

Each constructed wetland design variation is illustrated in Figure 2.

Constructed wetlands are ideal because they replicate natural wetland ecosystems, provide efficient and reliable pollutant removal and have low construction costs (if ample space is available at the retrofit site). Well-designed stormwater wetlands enjoy widespread community acceptance, and possess high amenity and habitat value. Depending on site topography, constructed wetlands can also provide downstream channel protection when ED storage is stacked above the normal water level of the wetland.

Figure 1: This wetland was constructed to treat stormwater from a nearby commercial area.

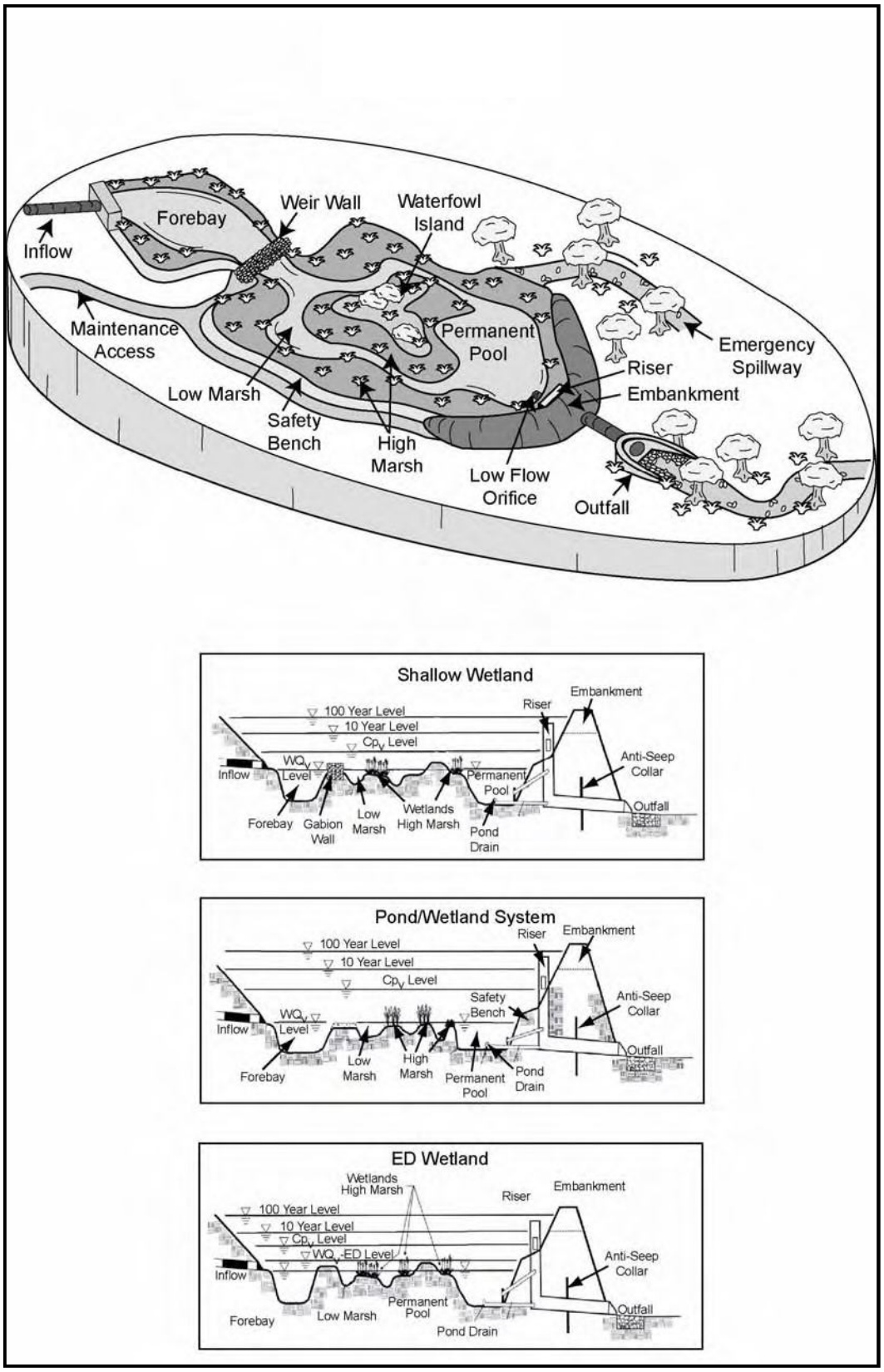

Figure 2: Schematics of three wetland variations

Typical Retrofit Applications for Constructed Wetlands

Constructed wetlands can be the primary or secondary form of stormwater treatment in the following storage retrofit applications:

- **SR-1** Excavate shallow wetland in bottom of pond or add aquatic benches to wet pond
- **SR-2** Create wooded wetlands above road crossings (often with ED)
- **SR-3** Divert runoff from pipe to shallow wetland treatment cells in floodplain
- **SR-4** Install offline shallow wetland cells or in-line wet swales in the conveyance system
- **SR-5** Install wetland cells in highway cloverleaf or create wet swales in highway right of way
- **SR-6** Create wetland treatment cell adjacent to large parking lots

Constructed wetlands are seldom used for on-site retrofit applications, although several may incorporate some wetland elements.

Pollutant Removal Capability of Constructed Wetlands

Constructed wetlands utilize a range of physical, chemical, microbial and biological mechanisms to remove pollutants. Wetland vegetation and sediments provide a growth media for microbes and filter and settle pollutants attached to sediments. Researchers have studied a large population of stormwater wetlands, and have concluded their removal rates are similar to wet ponds, but are somewhat more variable, especially for nutrients and organic carbon (Table 1).

Key design factors and site conditions that increase or decrease pollutant removal rates within constructed wetland retrofits are outlined in Table 2. The recommended walkaway volume for wetland retrofits is when they provide less than 35% of the target WQv. Constructed wetlands that allocate more than 50% of their storage for ED should use the lower removal rates for ED ponds shown in Profile Sheet ST-1. The median pollutant removal rates at individual retrofit sites can be adjusted to account for runoff capture volume and other site factors using the design point method (Table 2).

Other Stormwater Benefits Provided by Constructed Wetlands

Constructed wetlands can offer additional stormwater benefits:

Runoff Reduction: Constructed wetlands are capable of reducing 5 to 10% of the incoming runoff volume through evaporation and seepage losses, according to Strecker *et al* (2004). This minor reduction is not likely to provide a meaningful groundwater recharge benefit.

Channel Protection: Designers can stack ED above constructed wetlands to provide channel protection storage, although the frequent changes in water levels will degrade the quality and density of wetland cover. Designers can avoid the “bounce” problem by limiting the vertical depth of extended detention. Guidance on estimating the channel protection volume needed at an individual retrofit site is provided in Appendix C.

Table 1: Range of Reported Removal Rates for Constructed Wetlands			
Pollutant	**Low End**	**Median**	**High End**
Total Suspended Solids	45	70	85
Total Phosphorus	15	50	75
Soluble Phosphorus	5	25	55
Total Nitrogen	0	25	55
Organic Carbon	0	20	45
Total Zinc	30	40	70
Total Copper	20	50	65
Bacteria	40	60	85
Hydrocarbons	50	75	90
Chloride	0	0	0
Trash/Debris	75	90	95
See Appendix D for data sources and assumptions used to derive these removal rates Low End and High End are the 25th and 75th quartiles			

Table 2: Design Point Calculation to Estimate Pollutant Removal for Wetland Retrofits		
Design Factors	**X**	***Points***
Pond-Wetland or Multiple Cell Design		+ 2
Pond-Wetland or Multiple Cell Design		+ 2
Exceeds target WQv by more than 50%		+ 2
Complex wetland microtopography		+ 2
Exceeds target WQv by more than 25%		+ 1
Flow path greater than 1.5 to 1		+ 1
Wooded wetland design		+ 1
Off-line design		+ 1
No forebay or pretreatment features		- 1
Wetland intersects with groundwater		- 1
Flow path is less than 1:1		- 1
No wetland planting plan specified		- 2
Wetland SA to CDA ratio is less than 1.5%		- 2
Does not provide full WQv volume		- 2
NET DESIGN SCORE (max of 5 points)		

ST-4	Stormwater Treatment Options	
	BIORETENTION	

Bioretention is a landscaping feature adapted to treat stormwater runoff at retrofit sites (Figure 1). Individual bioretention areas serve drainage areas of one acre or less. Surface runoff is directed into a shallow landscaped depression that incorporates many of the pollutant removal mechanisms that operate in forested ecosystems. The filter is composed of an 18 to 48 inch deep sand/soil bed with a surface mulch layer. During storms, runoff temporarily ponds six to nine inches above the mulch layer and then rapidly filters through the bed. Normally, the filtered runoff is collected in an underdrain and returned to the storm drain system (Figure 2). The underdrain consists of a perforated pipe in a gravel jacket installed along the bottom of the filter bed.

In other cases, bioretention can be designed to infiltrate runoff into native soils. This can occur at sites with highly permeable soils, a low groundwater table, and a low risk of groundwater contamination. This design features the use of a “partial exfiltration” system that promotes greater groundwater recharge. Underdrains are only installed beneath a portion of the filter bed or are eliminated altogether, thereby increasing stormwater infiltration.

Figure 1: Bioretention created in a parking lot turn-around

Bioretention creates an ideal environment for filtration, biological uptake, and microbial activity, and provides moderate to high pollutant removal. Bioretention can become an attractive landscaping feature with high amenity value and community acceptance. In the right landscape setting, bioretention can be a cost effective and flexible retrofit option.

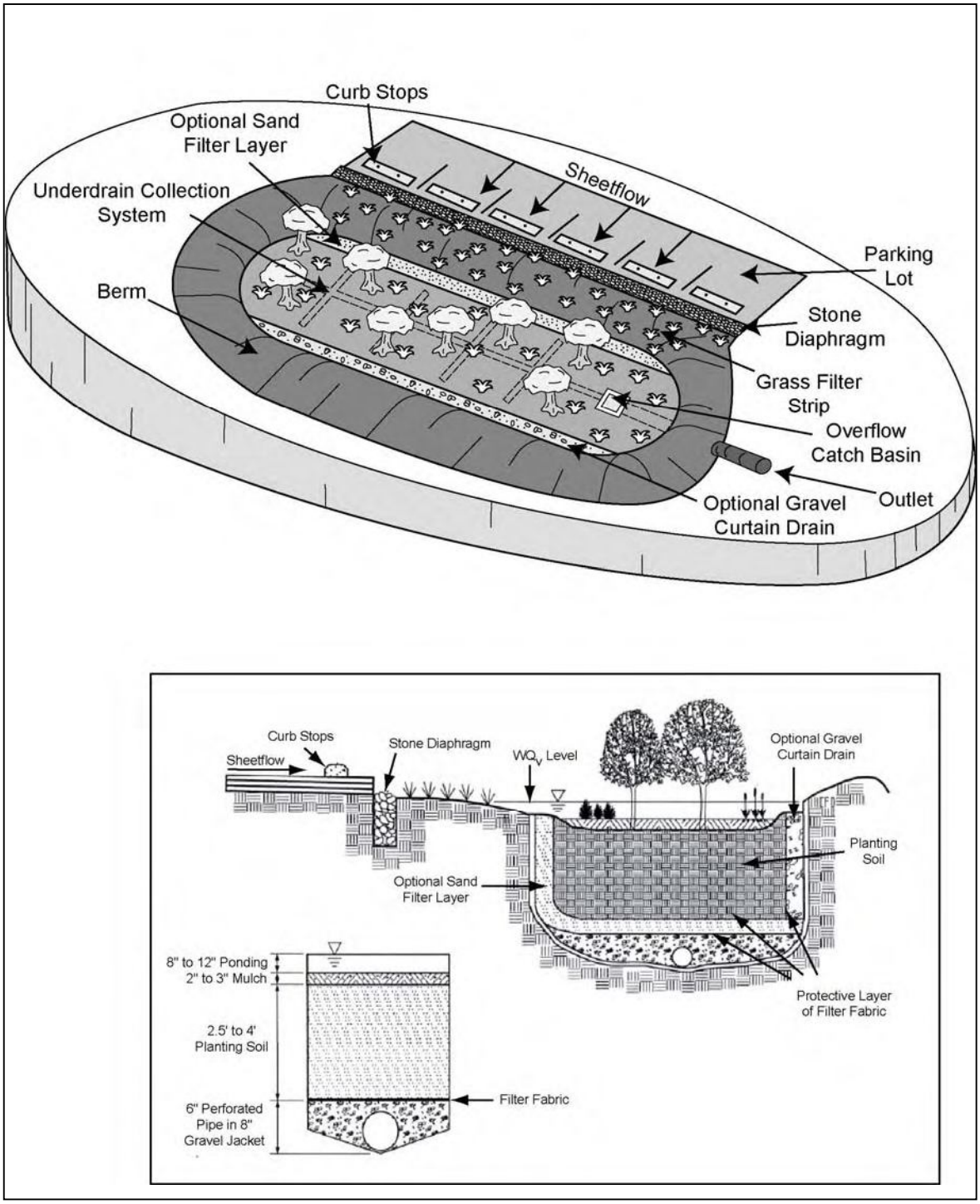

Figure 2: Bioretention schematic with underdrain

Typical Retrofit Applications for Bioretention

Bioretention is an extremely versatile stormwater treatment option for both storage and on-site retrofits that can fit within unused land at a variety of different sites. Common bioretention retrofit opportunities include:

- **SR-1** Install bioretention in bottom of dry pond
- **SR-3** Split flows from smaller pipes to a large bioretention area
- **SR-4** Create series of on-line or off-line bioretention cells
- **SR-5** Install two-cell bioretention area
- **SR-6** Divert flow to two-cell bioretention area
- **OS-7** Install bioretention w/ underdrain to treat hotspot
- **OS-8** Install bioretention within parking lot islands or perimeter
- **OS-9** Incorporate bioretention in streetscapes, tree pits, cul-de-sacs or traffic calming measures
- **OS-10** Install rain-garden to treat residential or commercial rooftop runoff
- **OS-12** Utilize bioretention as a landscape feature

Estimated Pollutant Removal by Bioretention

Until recently, only a handful of monitoring studies had measured the pollutant removal performance of bioretention areas. The most recent studies indicate that bioretention provides effective pollutant removal for many pollutants as a result of sedimentation, filtering, plant uptake, soil adsorption, and microbial processes. Table 1 summarizes bioretention pollutant removal rates for a variety of common stormwater pollutants.

The recommended walkaway volume for bioretention is about 50% of the target water quality volume. Another notable factor is whether the underlying soils have enough permeability to dispense with an underdrain. If an underdrain is not needed, pollutant removal will be enhanced by the greater infiltration of runoff into the soil and may approach the higher pollutant removal rates achieved by infiltration practices (see Profile Sheet ST-6). From the standpoint of nutrient removal, it is strongly recommended that the phosphorus index of topsoil mixed into the bioretention media be tested.

Table 2 can be used to adjust the median removal rates for individual retrofit projects by using the design point method.

Other Stormwater Benefits Provided by Bioretention

Bioretention retrofits can provide important stormwater benefits under certain site conditions.

Recharge: Bioretention has been shown to reduce runoff volume by 35 to 50% through evapotranspiration and infiltration of runoff, according to Hunt *et al.* (2006) and Traver (2006). Runoff reduction exceeding 90% has been reported for deeper filter beds that lack underdrains and are situated on permeable soils (Horner *et al.*, 2003).

Channel Protection: The feasibility of storing the channel protection volume within bioretention areas has not yet been demonstrated, although the impressive runoff reduction rates suggests that widespread use of bioretention could be an effective element of a larger strategy to protect downstream channels from erosion.

Table 1: Range of Reported Removal Rates for Bioretention Areas			
Pollutant	**Low End**	**Median**	**High End**
Total Suspended Solids	15*	60*	75*
Total Phosphorus	-75	5	30
Soluble Phosphorus	-10	0	50
Total Nitrogen	40	45	55
Total Zinc	40	80	95
Total Copper	40	80	100
Bacteria	20	50	80
Hydrocarbons	80	90	95
Chloride	0	0	0
Trash/Debris	80*	90*	95*
* Adequate pretreatment must be provided to reduce sediment loads to bioretention areas or clogging and practice failure may result See Appendix D for data sources and assumptions used to derive these removal rates Low End and High End are the 25th and 75th quartiles			

Table 2: Design Point Calculation to Estimate Pollutant Removal for Bioretention Retrofits		
Design Factors	**X**	**Points**
Exceeds target WQv by more than 50%		+ 3
Exceeds target WQv by more than 25%		+ 2
Tested filter media soil P Index less than 30 (phosphorus only)		+ 3
Filter bed deeper than 30 inches		+ 1
Two cell design with pretreatment		+ 1
Permeable soils; no underdrain needed		+ 2
Upflow pipe on underdrain		+1
Impermeable soils; underdrain needed		- 1
Filter bed less than 18 inches deep		- 1
Single cell design		- 1
Bioretention cell is less than 5% of CDA		-1
Does not provide full water quality storage volume		- 2
Filter media not tested for P Index (phosphorus only)		- 3
NET DESIGN SCORE (max of 5 points)		
NET PHOSPHORUS SCORE (max of 5 points)		

ST-5	Stormwater Treatment Options	
	FILTRATION	

Stormwater filters are a useful practice to treat stormwater runoff from small, highly impervious sites. Stormwater filters capture, temporarily store, and treat stormwater runoff by passing it through an engineered filter media, collecting it in an underdrain and then returning it back to the storm drain system (Figure 1). The filter consists of two chambers; the first is devoted to settling, and the second serves as a filter bed (with sand or an organic filtering media).

Stormwater filters are a versatile retrofit option that offers moderate pollutant removal performance. They are especially attractive for on-site retrofits where space is limited, because they consume very little surface land and have few site restrictions. Filters are the preferred option to treat runoff from
stormwater hotspot sites.

There are several design variations of the basic sand filter that enable designers to retrofit challenging sites or improve pollutant removal rates. The most common design variants include:

- Surface Sand Filters
- Surface Organic Media Filters
- Underground Sand Filters
- Perimeter Sand Filters
- Multi-Chamber Treatment Train (MCTT) Filter

Surface Sand Filter
The surface sand filter is designed with both the filter bed and sediment chamber located at ground level (Figure 2). Surface sand filters are designed off-line so that only the desired WQv is directed to the filter for treatment. The surface sand filter is the least expensive filter option, and has been the most widely used.

Organic Media Filter
Organic media filters are essentially the same as surface filters, with the sand replaced with an organic filtering medium (Figure 3). Two notable examples are the peat/sand filter (Galli, 1990a) and the compost filter system. Organic filters achieve higher pollutant removal for metals and hydrocarbons due to the increased cation exchange capacity of the organic media.

Figure 1: Surface Sand Filter

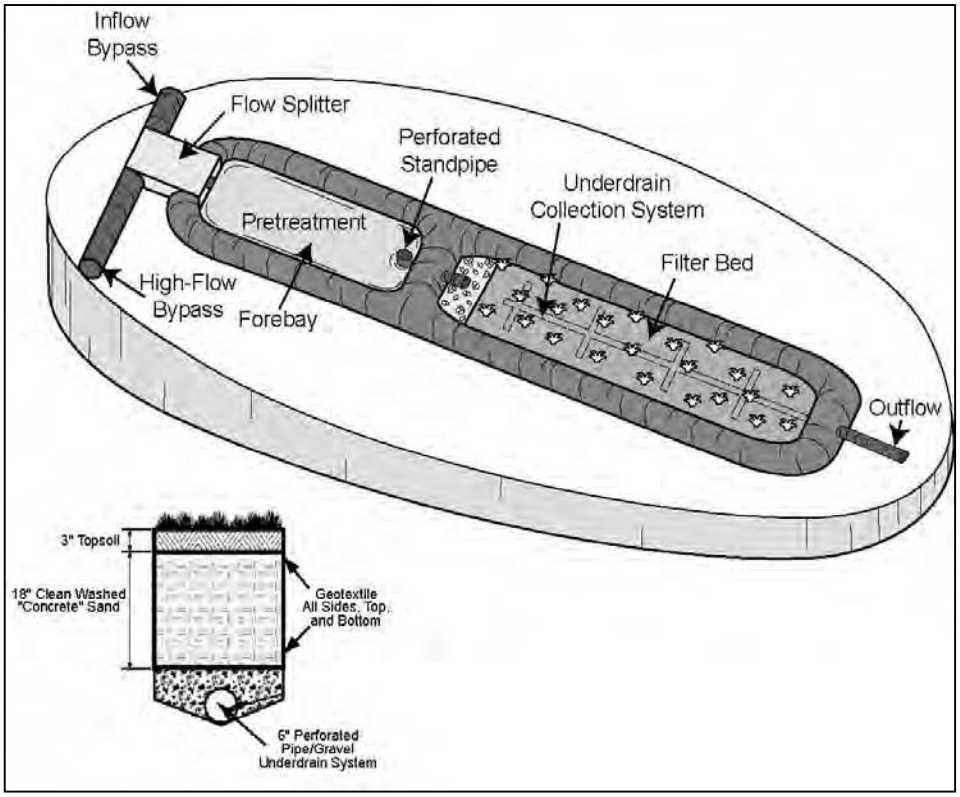

Figure 2: Schematic of a surface sand filter

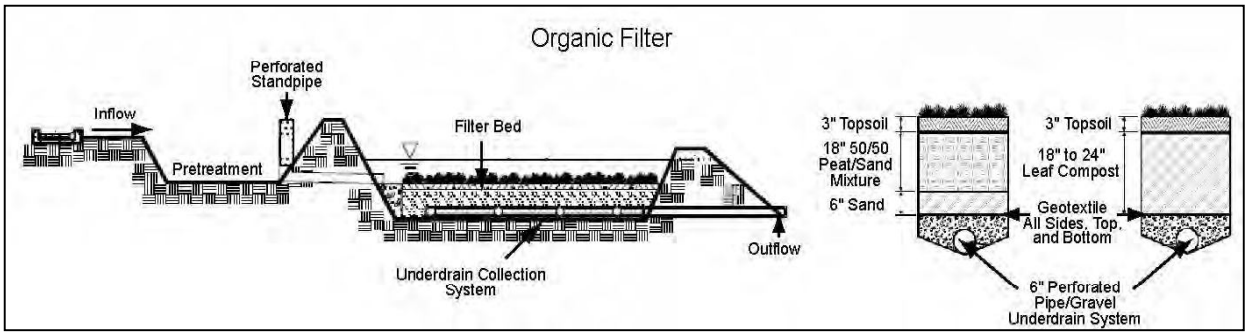

Figure 3: Schematic of an organic filter

Underground Sand Filter

The underground sand filter is modified to install the filtering components underground and is often designed with an internal flow splitter or overflow device that bypasses runoff from larger stormwater events around the filter (Figure 4). Underground sand filters are expensive to construct, but consume very little space and are well suited to ultra-urban areas.

Perimeter Sand Filter

The perimeter sand filter also includes the basic design elements of a sediment chamber and a filter bed. In this design, however, flow enters the system through grates, usually at the edge of a parking lot. The perimeter sand filter is usually located on-line, with all flows entering the system, but larger events bypass treatment by entering an overflow chamber. One major advantage to the perimeter sand filter design

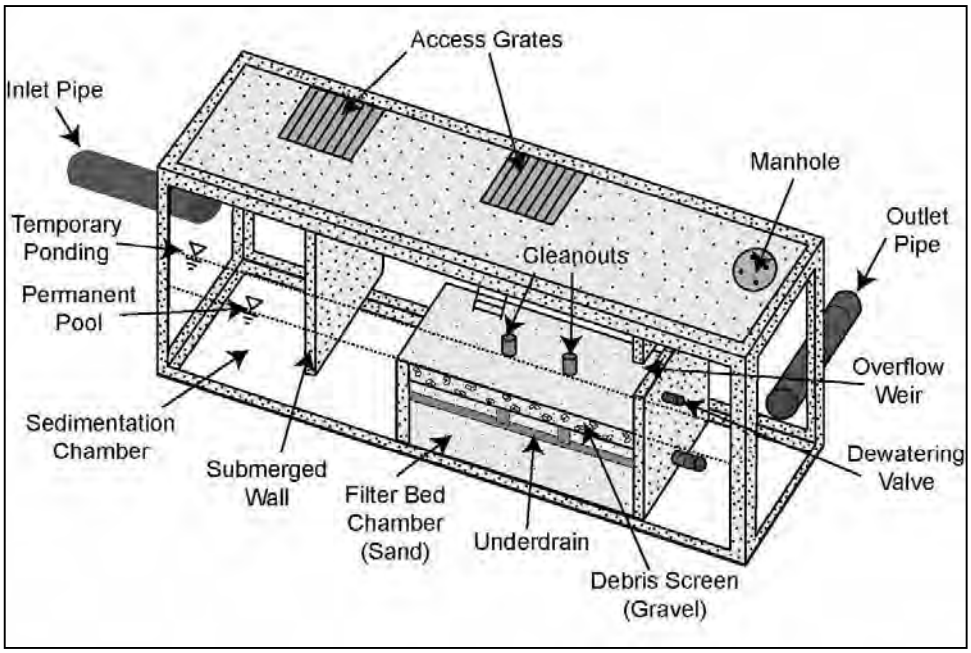

Figure 4: Underground filter schematic

is that it requires little hydraulic head and is therefore a good option for retrofit sites with low relief.

Multi-Chamber Treatment Train (MCTT)
The MCTT is an advanced underground sand filter developed by Pitt *et al*. (1997) that consists of three chambers (Figure 5). Stormwater enters into the first screening chamber where large sediment particles are trapped and highly volatile compounds are removed. The second chamber promotes settling of finer sediments and further removal of volatile compounds and floatable hydrocarbons using fine bubble diffusers and sorbent pads. The final chamber provides filtration using a peat sand filter to remove remaining metals and toxicants. The top of the filter bed is covered by a filter fabric to evenly distribute flow. Monitoring has shown the MCTT can achieve very high pollutant removal rates. Due to its high cost, it is best applied to severe stormwater hotspots.

Typical Retrofit Application for Stormwater Filters

Filter retrofits are particularly well suited to treat runoff from stormwater hotspots and smaller parking lots. Other retrofit opportunities may occur during redevelopment of commercial sites or when existing parking lots are renovated or expanded. While stormwater filters are seldom used as a storage retrofit in humid climates, they may be a more attractive option in arid and semi-arid climates. Some typical retrofit applications for stormwater filters include:

- **SR-3** Split flow from storm drain pipe to a surface sand filter
- **SR-6** Treat flow from large parking lot to a surface sand filter

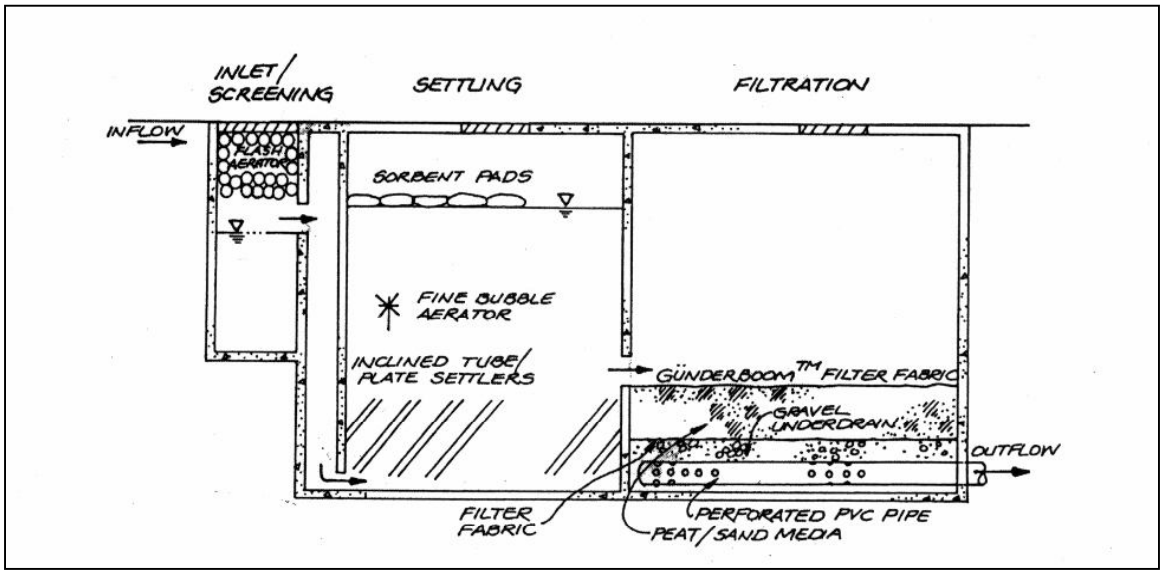

Figure 5: Drawing of a Multi-Chamber Treatment Train

- **OS-7** Treat flow from a hotspot operation using various sand filter designs
- **OS-8** Treat flow from small parking lot using surface or perimeter sand filter
- **OS-13** Treat runoff in an underground sand filter or MCTT

Filters can work on most commercial, industrial, institutional or municipal sites and can be located underground if surface area is not available. Filters are usually designed only for water quality treatment.

Stormwater Filter Pollutant Removal

Stormwater filters depend mainly on physical treatment mechanisms to remove pollutants from stormwater runoff including gravitational settling in the sedimentation chamber, straining at the top of the filter bed, and filtering and adsorption onto the filter media. Microbial films often form on the surface of the filter bed which can also enhance biological removal.

Table 1 reports the range in reported removal rates for 15 sand and organic filters reviewed in the CWP national pollutant removal database (excluding vertical sand filters and the MCTT). As a group, stormwater filters provide consistent removal of most pollutants, with the exception of soluble nutrients, such as soluble phosphorus and nitrate-nitrogen.

Several site-specific conditions and design factors have a strong influence on stormwater filter pollutant removal rates. Table 2 outlines how these factors can be used to adjust median removal rates using the design point method for individual retrofit projects.

If the retrofit is under-sized, pollutant removal rates will be near the lower end of the range. The recommended walkaway volume for stormwater filters is 50% of the target WQv. Another important factor is whether organic material is included in the filter bed media, which can enhance performance with respect to hydrocarbons and metals.

Other Stormwater Benefits Provided by Stormwater Filters

Stormwater filter retrofits can seldom address other stormwater management objectives beyond water quality treatment. Since they have an impermeable liner and underdrain, they cannot recharge groundwater. They usually lack enough storage capacity to provide meaningful channel protection.

Table 1: Range of Reported Removal Rates for Stormwater Filters

Pollutant	Low End	Median	High End
Total Suspended Solids	80	85	90
Total Phosphorus	40	60	65
Soluble Phosphorus	-10	5	65
Total Nitrogen	30	30	50
Organic Carbon	40	55	70
Total Zinc	70	90	95
Total Copper	35	40	70
Bacteria	35	40	70
Hydrocarbons	80	85	95
Chloride	0	0	0
Trash/Debris	85*	90*	95*
See Appendix D for data sources and assumptions used to derive these removal rates Low End and High End are the 25th and 75th quartiles			

Table 2: Design Point Calculation to Estimate Pollutant Removal for Filtering Retrofits

Design Factors	X	Points
Exceeds target WQv by more than 50%		+ 3
Exceeds target WQv by more than 25%		+ 2
Site is a severe or confirmed hotspot		+ 2
Organic media used within filter bed (all pollutants except N/P)		+ 2
Two cells with at least 25% WQv allocated to pretreatment		+ 1
Filter bed SA is at least 2.5% of CDA		+ 1
Filter bed exposed to sunlight		+ 1
Off-line design w/ storm bypass		+ 1
Dry pretreatment		- 1
On-line design, w/o storm bypass		- 1
Underground design (except MCTT)		- 1
Filter design is hard to access for maintenance		- 2
Does not provide full WQv volume		- 3
NET DESIGN SCORE (max of 5 points)		

ST-6	Stormwater Treatment Options	
	INFILTRATION	

Infiltration practices capture and temporarily store stormwater runoff before infiltrating it into underlying soils where most pollutants are trapped. Infiltration can be an ideal on-site retrofit to treat stormwater runoff as long as minimum geotechnical requirements are met. Infiltration retrofits consists of a rock-filled chamber with no outlet. Stormwater runoff must first pass through some form of pretreatment, such as a swale or sediment basin. Runoff is then stored in the voids between the stones, where it slowly infiltrates into the soil matrix over a few days (Figure 1). Alternatively, proprietary materials such as perforated corrugated metal pipe, plastic arch pipe, or plastic lattice trays can be substituted for stone to increase storage capacity. A schematic of a typical infiltration trench is provided in Figure 2**.**

Where favorable soil conditions exist, infiltration can improve water quality, increase groundwater recharge and reduce runoff volumes. Infiltration practices are particularly desirable in subwatersheds that seek to reduce runoff volumes to prevent combined sewer overflows.

Figure 1: Infiltration Trench

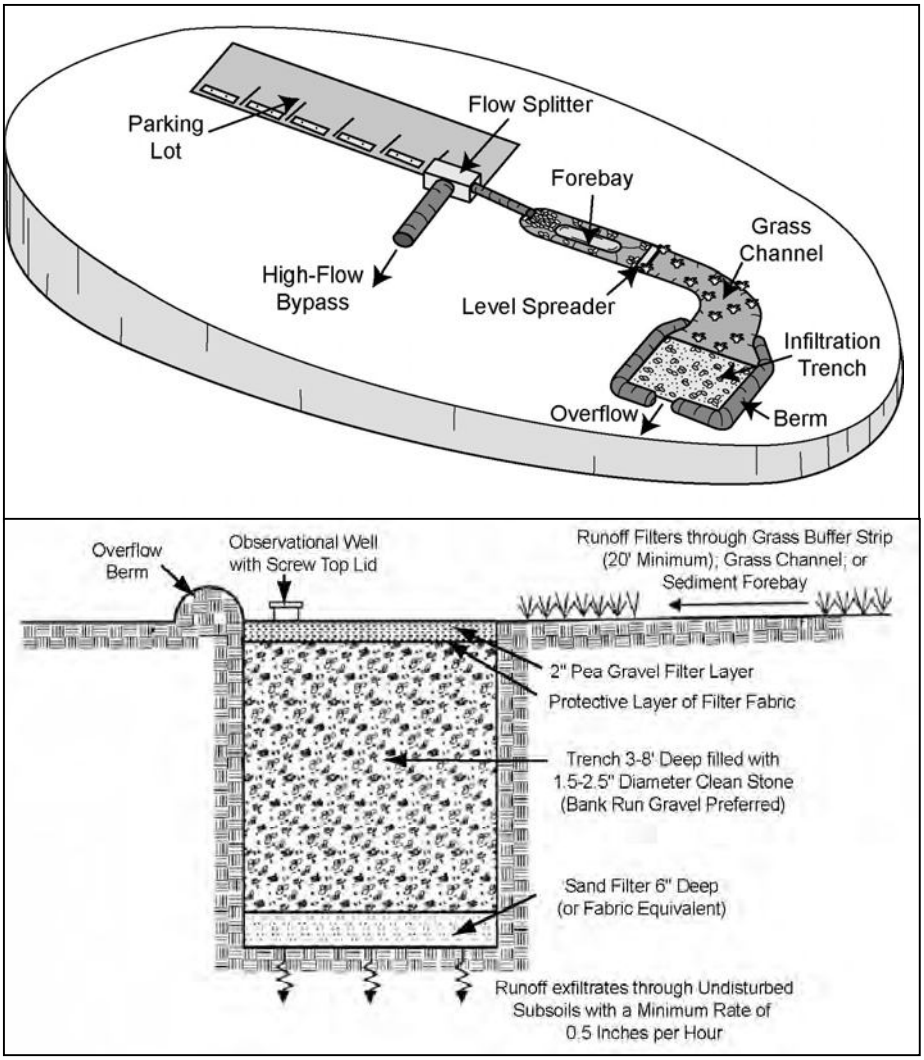

Figure 2: Schematic of an infiltration trench

Other Stormwater Benefits Provided by Stormwater Filters

Stormwater filter retrofits can seldom address other stormwater management objectives beyond water quality treatment. Since they have an impermeable liner and underdrain, they cannot recharge groundwater. They usually lack enough storage capacity to provide meaningful channel protection.

Typical Retrofit Application

Infiltration retrofits can be located on small, unused portions of a site and consume as little as 2-5% of site area. They are effectively used in narrow linear areas along setbacks or property boundaries. Where soils are acceptable, infiltration can treat runoff in the following retrofit locations:

- **OS-8** Infiltration trenches along margins of small parking lot or use of permeable pavers
- **OS-9** Perforated storm drain pipes to infiltrate street runoff
- **OS-10** Simple disconnection of roof leaders over appropriate soils or use of french drains/dry wells to infiltrate rooftop runoff

- **OS-11** Disconnection of small impervious surfaces
- **OS-12** Permeable pavers in urban hardscapes
- **OS-13** Underground infiltration galleries

Infiltration is seldom used for storage retrofits unless underlying soils have exceptional infiltration capability. It is important to confirm that retrofit soils can support adequate infiltration, since past grading, filling, disturbance, and compaction can greatly alter original soil infiltration qualities. The greatest opportunity for infiltration retrofits exists in sensitive or impacted subwatersheds, where some of the original soil structure may still exist. By contrast, most soils in non-supporting subwatersheds are not likely to be suitable for infiltration. Some regions of the country still have excellent soils that allow for widespread implementation of infiltration retrofits (e.g., glacial tills, sand).

Pollutant Removal by Infiltration Retrofits

Infiltration retrofits utilize several pollutant removal mechanisms including filtering, soil adsorption and transfer to groundwater. Theoretically, nearly all the pollutants that enter an infiltration practice should be removed except for soluble pollutants that travel through groundwater and return downstream. It is important to note that infiltration retrofits **are not** intended to treat sites with high sediment or trash/debris loads, as they will cause the practice to clog and fail.

Very few infiltration practices have been monitored, so only limited pollutant removal data has been published. Designers should therefore regard the infiltration pollutant removal rates shown in Table 1 as an initial estimate until more performance monitoring data becomes available.

Several site-specific and design factors can have a strong influence on infiltration pollutant removal rates (Table 2). As always, removal rates for individual retrofit projects should be adjusted to account for site-specific design factors that can enhance or diminish pollutant removal using the design point method. The most important design factor is the size of the individual retrofit in relation to the target WQv treatment. Pollutant removal rates diminish for under-sized infiltration retrofits; the recommended walkaway volume is about 50% of the target WQv.

Other Stormwater Benefits Provided by Infiltration

Infiltration retrofits are desirable because they confer other stormwater benefits:

Groundwater Recharge: Infiltration of stormwater runoff is the preferred means to provide groundwater recharge within a subwatershed. When designed properly, they can infiltrate the entire runoff reduction or WQv to keep stormwater runoff out of combined sewers.

Channel Protection: While infiltration practices are not specifically designed to store the channel protection volume, their ability to reduce runoff volumes should help protect downstream channels from erosion. If suitable soils are present across a subwatershed, infiltration may be an effective channel protection strategy**.**

Table 1: Range of Reported Removal Rates for Infiltration Practices			
Pollutant	**Low End**	**Median**	**High End**
Total Suspended Solids	60*	90*	95*
Total Phosphorus	50	65	95
Soluble Phosphorus	55	85	100
Total Nitrogen	0	40	65
Organic Carbon	80	90	95
Total Zinc	65	65	85
Total Copper	60	85	90
Bacteria	25	90	95
Hydrocarbons	85	90	95
Chloride	0	0	0
Trash/Debris	90*	95*	99*
* Adequate pretreatment must be provided to reduce sediment loads to infiltration practices or clogging and practice failure may result See Appendix D for data sources and assumptions used to derive these removal rates Low End and High End are the 25th and 75th quartiles			

Table 2: Design Point Calculation to Estimate Pollutant Removal for Infiltration Retrofits		
Design Factors	**X**	**Points**
Exceeds target WQv by more than 50%		+ 3
Exceeds target WQv by more than 25%		+ 2
Tested infiltration rates between 1.0 and 4.0 in/hr		+ 2
At least two forms of pretreatment prior to infiltration		+ 2
CDA is nearly 100% impervious		+ 1
Off-line design w/ cleanout pipe		+ 1
Underdrain utilized		- 1
Filter fabric used on trench bottom		- 1
CDA more than 1.0 acre		- 1
Soil infiltration rates < 1.0 in/hr or > 4.0 in/hr		- 2
Pervious areas or construction clearing in CDA		- 2
Does not provide full WQv volume		- 3
NET DESIGN SCORE (max of 5 points)		

ST-7	Stormwater Treatment Options	
	SWALES	

Swales utilize the stormwater conveyance system to provide treatment in either storage or on-site retrofit applications. Swales have moderate pollutant removal capability, can reduce runoff volume and increase groundwater recharge. Swales are designed to treat the WQv within an open channel. The three design variants are the dry swale, wet swale, and grass channel.

Dry swales are a linear soil filter system that temporarily stores and then filters the desired WQv (Figure 1). Dry swales are similar to bioretention areas in that they rely on a fabricated soil bed on the bottom of the channel. Existing soils are replaced with a sand/soil mix that meets minimum permeability requirements. Dry swales provide a good environment for filtration, biological uptake, and microbial activity. Stormwater treated by the soil bed flows into an underdrain, which conveys treated runoff back to the conveyance system further downstream. The underdrain system is typically created by encasing a perforated pipe within a gravel layer on the bottom of the swale.

Wet swales are linear wetland cells that intercept shallow groundwater to maintain a wetland plant community (Figure 2). Saturated soils support wetland vegetation, which provides an ideal environment for gravitational settling, biological uptake, and microbial activity.

Grass channels are open channels that provide limited water quality treatment using rate-based design criteria. Grass channels reduce flow velocities and increase filtration capacity. Grass channels generally cannot provide the same degree of pollutant removal as dry or wet swales.

All three swale designs provide significantly better water quality treatment than the conventional roadside ditch. Schematics of the dry and wet swale designs are illustrated in Figure 3.

Figure 1: Dry Swale

Figure 2: Wet Swale

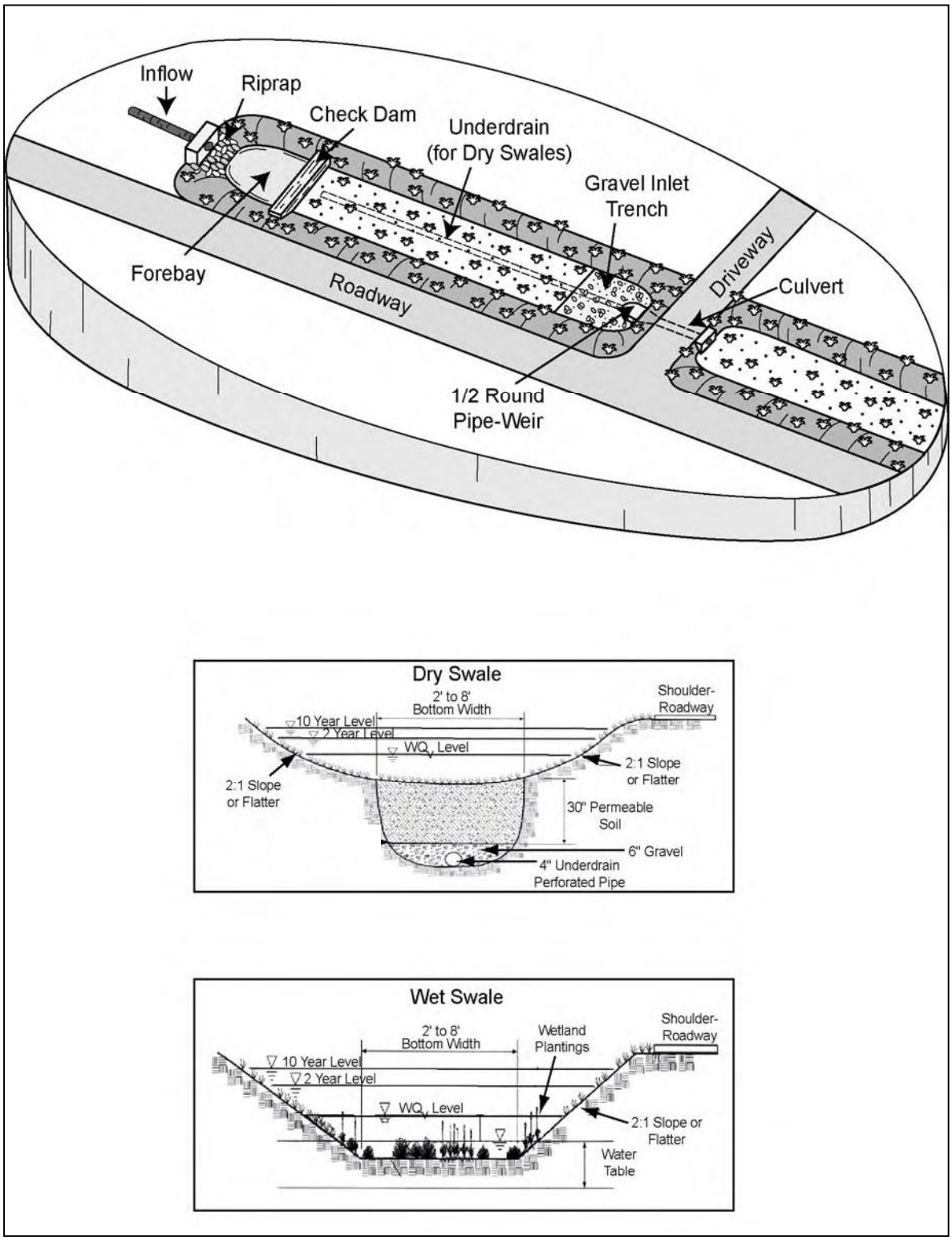

Figure 3: Schematic of a dry and wet swale

Typical Swale Retrofit Application

Most swale retrofits require that an existing open channel be widened, deepened, reduced in gradient, or some combination of all three. Swales are particularly well suited to treat runoff from low and medium density residential streets and small parking lots. Typical retrofit situations where swales can be applied include:

- **SR-4** Install dry swale or grass channel within existing conveyance system
- **OS-8** Install swales along margins of small parking lots
- **OS-9** Install swale retrofit along open section street or convert closed section street into dry swale
- **OS-11** Direct runoff to swale as means to disconnect a small impervious area

Estimating Pollutant Removal Capability of Swale Retrofits

The primary pollutant removal mechanisms operating in swales are settling, filtering infiltration and plant uptake. The reported pollutant removal rates for swales are highly variable. Table 1 shows the range in removal rates for swales that have been specifically designed for stormwater treatment (e.g., dry swales, wet swales and biofilters). Please note that the median removal rates should be cut in half if the proposed retrofit is a grass channel.

Designers may find it difficult to define the expected removal rate for a swale retrofit. Many site conditions and design factors can enhance or diminish their pollutant removal rates (Table 2). A reasonable estimate for each individual swale retrofit can be developed using the design point method. A primary factor influencing swale removal rates is the proportion of the WQv that is actually infiltrated or stored within retrofit treatment cells. A second influential factor is how the retrofit is sized in relation to the target WQv-- the recommended walkaway volume is about 50% of the target WQv.

Table 1: Range of Reported Removal Rates for Swales

Pollutant	Low End	Median	High End
Total Suspended Solids	70	80	90
Total Phosphorus	-15	25	45
Soluble Phosphorus	-95	-40	25
Total Nitrogen	40	55	75
Organic Carbon	55	70	85
Total Zinc	60	70	80
Total Copper	45	65	80
Bacteria	-65	0	25
Hydrocarbons	70	80	90
Chloride	0	0	0
Trash/Debris	0	0	50

See Appendix D for data sources and assumptions used to derive these removal rates
Low End and High End are the 25th and 75th quartiles

Table 2: Design Point Calculation to Estimate Pollutant Removal for Swale Retrofits		
Design Factors	***X***	***Points***
Exceeds target WQv by more than 50%		+ 3
Dry or wet swale design		+ 2
Exceeds target WQv by more than 25%		+ 2
Longitudinal swale slope between 0.5 to 2.0%		+ 1
Velocity within swale < 1 fps during WQ storm		+ 1
Measured soil infiltration rates exceed 1.0 in/hr		+ 1
Multiple cells with pretreatment		+ 1
Off-line design w/ storm bypass		+ 1
Longitudinal swale slope < 0.5% or > 2%		- 1
Measured soil infiltration rates less than 1.0 in/hr		- 1
Swale sideslopes more than 5:1 h:v		- 1
Swale intersects groundwater (except wet swale)		- 1
No pretreatment to the swale or channel		- 1
Swales conveys stormflows up to 10 year storm		- 2
Does not provide full WQv volume		- 2
Grass channel		- 3
NET DESIGN SCORE (max of 5 points)		

Other Stormwater Benefits Provided by Swales

Swales retrofits can provide other stormwater benefits, including:

Groundwater Recharge: Swales can reduce runoff volumes by an average of 40% through infiltration on the swale bottom and across side-slopes, according to Strecker *et al*. (2004). Some research studies have reported as much as 80 to 90% runoff reduction for dry swales that are heavily landscaped with trees and shrubs to promote greater evapotranspiration (Horner *et al.*, 2003).

Channel Protection: While most swales are not designed to provide channel protection storage, the high degree of runoff reduction suggests that they have some potential to protect downstream channels from erosion. It may be possible to capture and detain the entire channel protection volume at small sites.

ST-8	Stormwater Treatment Options **Other Retrofit Treatment**	

This stormwater treatment option includes a diverse group of on-site techniques that capture, store and partially treat rooftop runoff in residential areas and highly urban landscapes, including:

Residential Rooftops

- Rainbarrels
- Rain Gardens
- French Drains/Drywells

Non-Residential Settings

- Cisterns
- Green Rooftops
- Permeable Pavers
- Stormwater Planters

Each rooftop technique has a unique ability to reduce runoff, remove pollutants or recharge groundwater and differs greatly in its design, installation cost and maintenance needs. A full description of each treatment option is provided in the series of fact sheets provided in Appendix F.

Typical Retrofit Applications

Many of these practices are primarily used to treat runoff from individual rooftops (OS-10), but stormwater planters and permeable pavers can also be applied to retrofit small parking lots (OS-8) and urban landscapes/hardscapes (OS-12).

Pollutant Removal Capability

These techniques can provide partial or full treatment of the target WQv, depending on site conditions. The pollutant removal rate for each technique varies greatly, so designers should consult the appropriate fact sheet in Appendix F to get an accurate estimate.

Benefits, Constraints, Concerns and Design, Construction and Maintenance Issues

Taken as a group, these stormwater treatment techniques are suitable for use in small, on-site retrofits and have few site constraints. Individually, each technique has numerous siting, design, and maintenance issues which are described in Appendix F.

Installation Costs for Other Stormwater Retrofits

The installation costs for this group of retrofits are compared in Table 1.

Table 1: Installation Costs for Other Stormwater Retrofits (per cubic foot treated)		
Retrofit Type	**Median Cost**	**Cost Range**
Residential Settings		
Rain Barrels	$ 25.00	$ 12.50 to $ 40.00
Rain Gardens:		
Volunteer Installation	$ 4.00	$ 3.00 to $ 5.00
Professional Installation	$ 7.00	$ 5.00 to $ 10.00
Professional Landscaping	$ 12.00	$ 10.00 to $ 15.00
French Drains/Drywells	$ 12.00	$ 10.50 to $ 13.50
Non-Residential Settings		
Cisterns	$ 15.00	$ 6.00 to $ 25.00
Intensive Green Rooftops	$ 360.00	$ 300.00 to $ 420.00
Extensive Green Rooftops	$ 225.00	$ 144.00 to $ 300.00
Permeable Pavers	$ 120.00	$ 96.00 to $ 144.00
Stormwater Planters	$ 27.00	$ 18.00 to $ 36.00
Rain Gardens	$ 12.00	$ 10.00 to $ 15.00
Note: See Appendix E for documentation and cost assumptions		

Chapter 4: The Search For Storage - Finding Retrofit Opportunities at the Subwatershed Level

The search for storage requires considerable creativity by the retrofit team. The team should possess a practical understanding of hydrology, hydraulics, and stormwater engineering and a knack for sleuthing current infrastructure to envision possibilities for better stormwater treatment. This chapter presents the methods developed by the Center to investigate retrofit potential at the subwatershed level. The basic eight step retrofit process is portrayed in Figure 4.1. This systematic approach is cost effective and can be used for both larger storage retrofits and smaller on-site retrofits. The purpose and tasks associated with each retrofit step are described in Table 4.1.

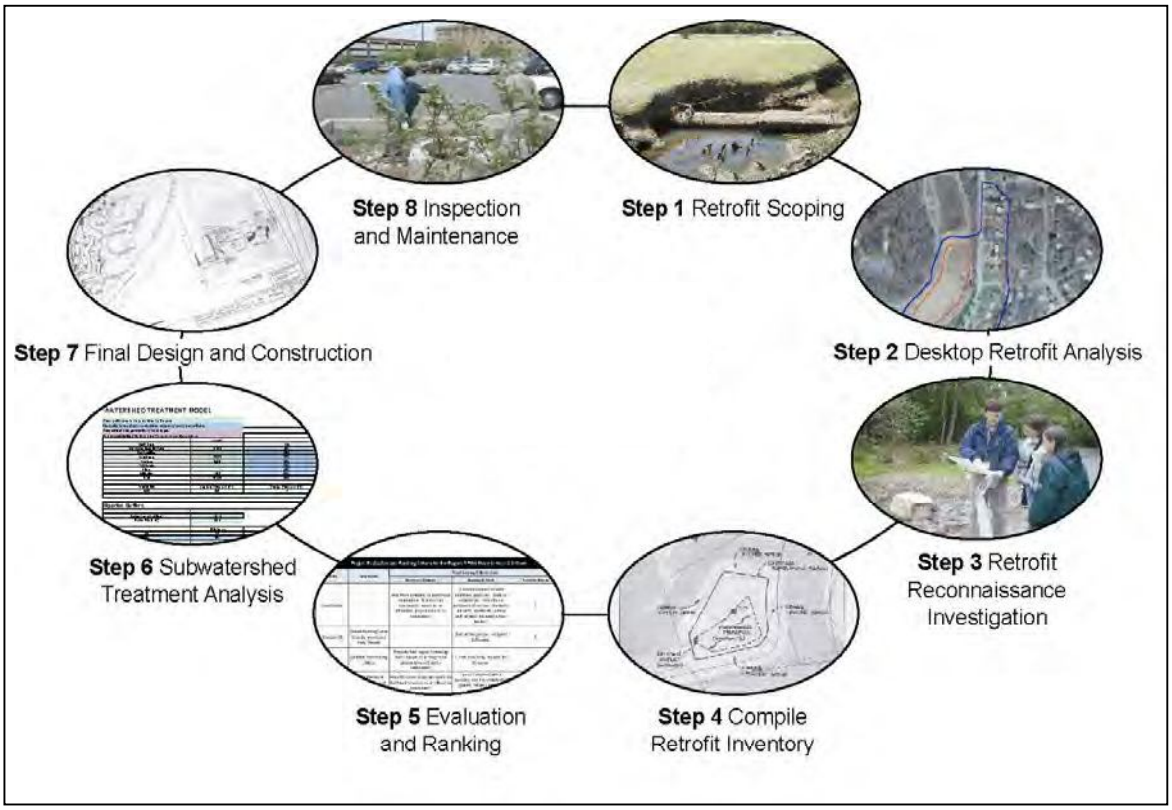

Figure 4.1: The eight steps of stormwater retrofitting

Table 4.1: Purpose of the Eight Steps in the Stormwater Retrofitting Process

Step and Purpose	Key Tasks
Step 1: Retrofit Scoping Refine the retrofit strategy to meet local restoration objectives	• Screen for subwatershed retrofit potential • Review past, current and future stormwater • Define core retrofitting objectives • Translate into minimum performance criteria • Define preferred retrofit treatment options • Scope out retrofit effort needed
Step 2: Desktop Retrofit Analysis Search for potential retrofit sites across the subwatershed	• Secure GIS and other mapping • Conduct desktop search for retrofit sites • Prepare base maps for RRI
Step 3 : Retrofit Reconnaissance Investigation Investigate feasibility of retrofit sites in the field	• Advanced preparation • Evaluate individual sites during RRI • Finalize RRI sheets back in office
Step 4: Compile Retrofit Inventory Develop initial concepts for best retrofit sites	• Complete storage retrofit concept designs • Finalize on-site retrofit delivery methods • Assemble retrofit inventory
Step 5: Retrofit Evaluation and Ranking Choose the most feasible and cost-effective sites	• Neighborhood consultation • Develop retrofit screening criteria • Create retrofit project priority list
Step 6: Subwatershed Treatment Analysis Determine if retrofits can achieve subwatershed restoration objective	• Compute pollutant removal by storage retrofits • Compute pollutant removal by on-site retrofits • Compare against restoration objective
Step 7: Final Design and Construction Assemble design package to lead to successful retrofit construction	• Secure environmental permits • Obtain landowner approval and easements • Perform special engineering studies • Put together final design package • Contract and project management
Step 8: Inspection, Maintenance & Evaluation Ensure retrofits are working properly and achieving subwatershed objectives	• Construction inspection • Retrofit maintenance • Project tracking and monitoring

Step 1: Retrofit Scoping Process

Retrofitting should be fundamentally guided by the specific restoration goals chosen for the subwatershed, so the team should carefully scope out what they want to achieve at the outset. The retrofit scoping process involves six basic tasks:

Task 1. Screen for subwatershed retrofit potential (Optional)

Task 2. Review past, current and future stormwater management

Task 3. Define the core retrofitting objective

Task 4. Translate objectives into minimum retrofit treatment performance criteria

Task 5. Define the preferred methods of stormwater treatment

Task 6. Estimate retrofitting effort needed in the subwatershed

Task 1 Screen Subwatersheds for Retrofit Potential (Optional)

In some cases, the team needs to analyze a large group of subwatersheds to identify the ones with greatest retrofit potential. The team can perform a modified Comparative Subwatershed Analysis (CSA) to screen subwatershed retrofit potential across a larger watershed (see Manual 2). It is relatively easy to screen the most promising subwatersheds with stormwater retrofit potential from a desktop, assuming basic GIS layers are available. Once the watershed has been subdivided into subwatersheds, retrofit screening metrics can be derived to discriminate among all of the subwatersheds. These simple metrics provide important clues about the comparative potential to find either storage or on-site retrofits within a subwatershed (Tables 4.2 and 4.3).

Each screening metric can be weighted and analyzed in a simple spreadsheet to determine the comparative retrofit potential of a group of subwatersheds. Both the screening factors selected and their relative weight will be unique for each watershed, and should be customized to reflect local retrofit objectives. Priority subwatersheds can then be selected based on their individual total scores.

Table 4.2: Subwatershed Metrics to Evaluate Storage Retrofit Potential

Screening Metric	What It Says About Retrofit Potential
Current Impervious Cover	Subwatersheds with moderate IC have greater retrofit potential since they offer a greater range of candidate sites and require less total stormwater storage to meet subwatershed objectives. (% of subwatershed)
Density of Stormwater Ponds	A high pond density indicates strong retrofit potential given the large number of possible sites to employ pond retrofits. (# of ponds per square mile)
Headwater Road Crossings	A high number of headwater road crossings increases potential for installing storage retrofits upstream of road crossings. (# of crossings per stream mile)
Available Area in Stream Corridor	Subwatersheds with more available open area in the stream corridor possess a greater number of potential sites for many types of storage retrofits, including new storage facilities split from outfalls. (acres per stream mile)
Density of Stormwater Outfalls	A high density of stormwater outfalls within a subwatershed indicates greater retrofit potential since every outfall represents a possible storage retrofit site, if flows can be split from the pipe to a down gradient treatment area. (number of mapped outfalls per stream mile)
Publicly Owned Land	Subwatersheds with a high percentage of publicly owned land have greater retrofit potential because publicly owned lands are the preferred location for storage retrofits. (% of subwatershed)
Subwatershed Stream Density	High stream density generally indicates greater retrofit potential since it suggests that more stream corridor is available to locate retrofit practices. (stream miles per square mile)
Large Area of Contiguous Impervious Cover	A high number of large parking lots or other contiguous impervious areas in a subwatershed present more opportunities for storage retrofits. (number of commercial parcels >5 acres per subwatershed)

Table 4.3: Subwatershed Metrics to Evaluate On-site Retrofit Potential

Screening Metric	What It Says About Retrofit Potential
Average Age of Development	The age of development helps to determine the potential for on-site retrofits, since the nature of rooftop connections is associated with the building codes and practices of different eras. (decades)
Publicly Owned Land	Subwatersheds with a high percentage of publicly owned land have greater retrofit potential because publicly owned lands are the preferred location for on-site retrofits. (% of subwatershed)
Medium and Large Lot Residential Land	Subwatersheds with a high proportion of residential land have greater on-site retrofit potential, although this frequently needs to be confirmed by field assessments. (% of subwatershed)
Stormwater Hotspot Density	Subwatersheds with a greater hotspot density are expected to generate higher stormwater pollution loads, and may be targeted for on-site retrofits and pollution prevention practices. (no. of hotspots / square mile)
Industrial Land	Subwatersheds with a high % of industrial land have high on-site retrofit potential, since many industrial operations are already regulated and may need to install on-site retrofits to comply with stormwater permits. (% of subwatershed)
Presence of Combined Sewers	Subwatersheds that are served by combined sewers have greater on-site retrofit potential, since local utilities have a strong interest in reducing the runoff volumes delivered to the system that cause overflows. (presence or absence)
Subwatershed Redevelopment Potential	Subwatersheds undergoing redevelopment present great opportunities to cost effectively incorporate stormwater retrofits as a component of the overall site design and construction. (% of subwatershed)
Active Homeowner Assocation or Watershed Group	Subwatersheds with active groups have an existing network to promote on-site retrofit delivery.

Task 2 Review Past, Current and Future Stormwater Management

The team should understand past, current and future stormwater practices and design criteria within the community to identify retrofit possibilities. The following questions help the team find the best opportunities to treat runoff quality.

- What types of stormwater practices were installed in the subwatershed in the past? Can their performance or function be improved?
- Could ongoing flooding problems or drainage complaints be resolved through retrofitting?
- Are maintenance inspections performed on stormwater infrastructure in the subwatershed? If so, could the effectiveness of existing practices be upgraded through retrofits or maintenance repairs?
- What, if any, municipal stormwater permit requirements could support retrofitting?
- What is the future development potential within the subwatershed? Will future development projects be designed to more stringent stormwater management criteria?
- Are current stormwater sizing criteria and design standards for new development capable of meeting restoration or pollutant reduction goals?

- What are the prospects for achieving additional retrofit coverage through redevelopment and infill development?
- What opportunities exist to incorporate retrofits into future capital projects in the subwatershed?

The answers to these questions help the team understand how to deliver retrofit projects at the subwatershed level.

Task 3 Define Core Retrofitting Objectives for Subwatershed

The team should carefully define their core retrofitting objectives and designate a primary pollutant of concern. In some cases, the objective may have already been developed in the process of preparing a local subwatershed plan. If not, the team may want to:

- Analyze existing stormwater quality monitoring data to identify the pollutant(s) of concern.
- Consult with state water quality agencies to find out which pollutants are causing local water quality impairment.
- Review any pollutant load reduction goals contained in a Total Maximum Daily Loads (TMDL) for the subwatershed, watershed or basin.
- Consult with aquatic ecologists to determine if fishery restoration is a realistic objective.
- Evaluate current and future Impervious Cover Model predictions to set achievable subwatershed restoration objectives, as subwatershed impervious cover can fundamentally constrain retrofitting objectives (Appendix A of Manual 1).
- Assess whether runoff reduction is needed to reduce combined sewer or sanitary sewer overflows. Determine whether retrofits are needed to complement planned stream restoration projects in the subwatershed.
- Review past stream assessments to evaluate stream habitat quality and the possible need for channel protection.

The outcome from this task may be a narrative or numeric description of the restoration objectives chosen for the subwatershed (Table 4.4). The team also designates a pollutant of concern and identifies the type of retrofit storage needed to meet the core subwatershed restoration objective (Table 4.5).

Table 4.4: Examples of Subwatershed Restoration Objectives

Subwatershed Objective	Action Required
Correct Past Mistakes	Address 50% of chronic drainage complaints
Reduce Flood Damage	Reduce incidence of events that inundate structures and roadways. Ensure "no damage" conditions for 50-year storm.
Trap Trash, Debris and Floatables	Capture 90% of trash and debris delivered to storm inlets
Create Wetland/Wildlife Habitat	Create or restore 100 acres of habitat in the subwatershed
Recharge Groundwater	Ensure 70% recharge rate for the first one inch of rainfall across the subwatershed
Reduce Bank Erosion	Reduce Q of channel-forming flow to acceptable shear stress levels
Support Downstream Repairs	Ensure that Q of channel-forming flow does not exceed stream repair design levels at build-out
Reduce Nutrient Loads	Reduce phosphorus load by 25% or to 0.30 pounds/acre/year across the subwatershed
Reduce Bacteria Loads	Reduce bacteria load to allocated levels for stormwater in TMDL
Reduce Metal/Toxin Loads	Provide treatment for 90% of confirmed hotspots

Table 4.5: Stormwater Treatment Needed to Meet Common Retrofit Objectives

Retrofit Objective	Stormwater Treatment Model			
	Water Quality	Runoff Reduction	Channel Protection	Flood Control
Correct Past Mistakes	○	○	⦿	●
Reduce Flood Damage	○	○	○	●
Education/Demonstration	●	●	⦿	○
Trap Trash and Floatables	⦿	●	○	○
Reduce Flows to CSOs	⦿	●	○	○
Renovate Stream Corridor	●	○	⦿	X
Reduce Pollutant of Concern	●	X	●	X
Reduce Bank Erosion	○	⦿	●	○
Support Stream Restoration	●	⦿	●	X
Full Watershed Restoration	●	●	⦿	X

KEY
● Always ⦿ Usually ○ Sometimes X Never

Table 4.6: Ability to Meet Retrofit Objectives at Various Levels of Impervious Cover

Retrofit Objective	Subwatershed Impervious Cover			
	10 to 25%	25 to 40%	41 to 60%	61 to 100%
Correct Past Mistakes	●	●	⦿	○
Reduce Flood Damage	●	●	⦿	○
Education/Demonstration	●	●	●	●
Trap Trash and Floatables	●	●	⦿	○
Reduce Flows to CSOs	●	●	⦿	⦿
Renovate Stream Corridor	●	●	⦿	○
Reduce Pollutant of Concern	●	●	●	⦿
Reduce Bank Erosion	●	⦿	○	×
Support Stream Restoration	●	⦿	○	×
Full Watershed Restoration	●	⦿	○	×

KEY
● Objective can normally be widely achieved across a subwatershed
⦿ Objective may be feasible, depending on individual reach characteristics
○ Objective can only be achieved in isolated reaches in the subwatershed
× Objective is generally not achievable in the subwatershed

Task 4 Translate Objectives into Minimum Retrofit Treatment Performance Criteria

This task translates restoration objectives into performance criteria to guide future retrofitting efforts. Typically, this means defining a minimum level of treatment needed across a subwatershed to reduce the pollutant of concern to an acceptable level. This may be quantified either as a desired level of pollutant reduction (e.g., 25% total phosphorus reduction) or a target percentage of the subwatershed that will be treated by effective retrofits (e.g., 50% of subwatershed area). The maximum treatment area is often constrained by subwatershed impervious cover (Table 4.6). In most subwatersheds, it is hard to find enough feasible storage retrofits to treat more than 50% of subwatershed area. If the design team seeks a higher treatment percentage, they will need to consider on-site retrofits. The retrofit team may want to consult Table 4.7 to estimate the aggregate WQv storage needed in their subwatershed.

The retrofit team should also establish a minimum WQv storage needed for individual retrofit projects that achieve a minimum removal rate for the pollutant of concern. This is needed to eliminate retrofits that are so under-sized they cannot perform their primary pollutant removal function. The team would “walkaway” from a site when a retrofit falls below this volume or consider an alternative restoration practice. The walkaway volume for most stormwater treatment options ranges from 35 to 50% of the target WQv (see Chapter 3).

Task 5 Define the Preferred Methods of Retrofit Treatment

In this task, the team chooses the preferred stormwater treatment option(s) and retrofit locations for a subwatershed. This is also when the team decides whether to focus on storage retrofits, on-site retrofits, or both. Decisions on which stormwater treatment

Table 4.7: Steps to Determine The Retrofit Water Quality Volume

1. Define Area and Impervious Cover
The area and impervious cover for the retrofit site or the subwatershed as a whole can be directly measured. For operational purposes, impervious cover (I) is defined as any area of the site/subwatershed that is not covered by vegetation, and is expressed as a percentage.

2. Compute Subwatershed Runoff Coefficient
The volumetric runoff coefficient is defined based on the following equation:

$Rv = 0.05 + 0.009 (I)$

3. Choose Appropriate Water Quality Storm (S)
Choose the depth of rainfall associated with the 90% storm from the appropriate rainfall frequency spectrum.

The depth in inches can be converted into a unit area retrofit treatment scaling factor (X) by multiplying the depth (S) by 12, and then multiplying 43,560 square feet. The team may also want to define a smaller minimum walk-away volume for individual sites.

4. Compute Water Quality Volume (WQv)
The Water Quality Volume (WQv) expresses the acre feet of runoff that must be treated in an acceptable stormwater retrofit practice, and is computed as:

$WQv = (Rv)(S)(A) (X)$
Where = A = site or subwatershed area in acres

5. Compute Treatment Area Needed
Divide the WQv by an assumed depth of retrofit treatment to determine the estimated surface area (in acres) needed for retrofit treatment (usually ranges between 3 and 6 feet).

options to employ are usually based on their comparative ability to remove the pollutant of concern. For example, if the primary restoration objective is to reopen a public beach closed due to high fecal coliform levels, then the team would rely on stormwater practices with high and reliable bacteria removal rates. The team can analyze the more detailed pollutant removal tables provided in Chapter 3 to make an informed choice. Keep in mind that this task is only intended to justify using one treatment option over another when more than one could be used at the site.

Stormwater treatment options also differ in their ability to meet restoration objectives, such as channel protection or runoff reduction. Other key factors in choosing the preferred stormwater treatment options are construction cost, hydrologic benefits and community acceptance. Chapter 3 and Appendix I provided comparative data on stormwater treatment options.

Next, the team must decide whether to search for storage retrofits or a combination of storage and on-site retrofits in the subwatershed. A storage retrofit approach is quicker, less expensive and usually more cost-effective, but may not achieve adequate treatment throughout the subwatershed or meet all restoration objectives. If the team elects to go with a storage retrofit approach, then they should decide which subwatershed locations are worth concentrating on during their field investigations (Chapter 2).
If on-site retrofits are employed, the team will need to choose which general land uses

to target for widespread delivery (e.g., individual neighborhoods, municipal land, stormwater hotspots). Thousands of on-site retrofit opportunities are available in most subwatersheds, so the team needs to focus on areas with the greatest potential project delivery. Publicly owned lands such as municipal buildings, public works yards, schools and parks are often the first target for on-site retrofits, followed by privately owned stormwater hotspots, cooperating institutions or individual neighborhoods.

Task 6 Estimate Retrofitting Effort Needed in the Subwatershed

Once the team agrees on key retrofit scoping issues, it can estimate the staff effort needed to complete a retrofit investigation across the subwatershed. Generally, the effort needed to conduct the desktop analysis steps is driven by subwatershed size, whereas the field and design tasks are driven by the number of retrofit sites assessed. Table 4.8 presents guidance to estimate staff time to conduct various retrofit assessments for a 10-square mile subwatershed.

Step 2: Desktop Retrofit Analysis

In this step, the team searches for potential retrofit locations by completing three office tasks:

- Secure GIS layers and other mapping data
- Conduct a desktop search for retrofit sites
- Prepare the base field maps for the RRI

Task 1 Secure GIS Data and Other Mapping

A watershed-based Geographic Information System (GIS) can be employed in every step of the retrofitting process (Table 4.9). While a GIS is an ideal way to store, organize and evaluate retrofit data, aerial photos or existing paper maps can also be used. Table 4.10 outlines the essential and optional mapping layers needed to support the retrofit process and if they are needed in GIS format. Guidance on how to access individual data layers from federal and state sources can be found in Appendix A of Manual 2.

The most essential GIS layers for a desktop retrofit search are topography, hydrology, and aerial photos. Many of the data layers recommended in Table 4.10 can be derived from other GIS data, or may be available on paper maps.

Table 4.8: Estimated Retrofitting Effort in a 10 Square Mile Subwatershed

Task	Unit	Staff Time
Retrofit Scoping *	Hrs / subwatershed	16
Secure GIS Mapping Layers *	Hrs / subwatershed	40
Retrofit CSA *	Hrs / subwatershed	40
Desktop Search for Retrofit Sites	Hrs / subwatershed	8
Prepare Base Maps for the RRI *	Hrs / subwatershed	24
Advance Field Preparation *	Hrs / subwatershed	8
Conducting the RRI	Hrs / site	2 (for storage retrofit) 1 (for on-site retrofit)
Project concept design	Hrs / site	8 (for storage retrofit) 2 (for on-site retrofit)
Assemble inventory	Hrs / site	2
Project ranking and evaluation	Hrs / subwatershed	40
Subwatershed treatment analysis	Hrs / subwatershed	60
* When conducting investigations across several subwatersheds within a watershed, cost savings may be realized for these tasks as some or all of the effort may be applicable to all subwatersheds.		

Table 4.9: How Watershed GIS is Used in Each Step of the Stormwater Retrofit Process

Step	Description	Purpose
1	Retrofit Scoping	Screen subwatersheds with best retrofit potential using comparative retrofit metrics.
2	Desktop Retrofit Analysis	Search for potential retrofit sites and prepare field maps for the Retrofit Reconnaissance Investigation.
3	Retrofit Reconnaissance Investigation	Confirm drainage and impervious area to sites in concept design and investigate retrofit feasibility factors.
4.	Retrofit Inventory	Store key data on concept designs for best retrofit sites.
5.	Retrofit Evaluation and Ranking	Develop project locator map and develop metrics for project ranking.
6.	Subwatershed Treatment Analysis	Develop input parameters for subwatershed treatment analysis modeling exercise.
7.	Final Design and Construction	Maintain and track retrofit project files with design computations, technical support, permit approvals, as-built plans and inspection records.
8.	Inspection, Maintenance and Evaluation	Track status of retrofit construction, inspection and maintenance in the subwatershed.

Table 4.10: Mapping Layers Recommended for Retrofitting		
Mapping Data	**Data Status**	**Needed as GIS?**
Hydrogeomorphic Features		
Topography		
5-foot	Essential	Essential
2-foot	Nice to have	Nice to have
1-foot or finer	Nice to have	Nice to have
Hydrology	Essential	Essential
Wetlands	Essential	Recommended
100-year floodplain	Essential	Recommended
Soils	Essential	Recommended
Boundaries		
Watershed / subwatershed boundaries	Essential	Essential
Parcel boundaries	Essential	Recommended
Municipal boundaries	Recommended	Recommended
Land Use and Land Cover		
Aerial photos	Essential	Essential
Land use / land cover	Essential	Essential
Zoning	Nice to have	Nice to have
Roads	Recommended	Recommended
Buildings	Recommended	Recommended
Parking lots	Recommended	Recommended
Driveways	Recommended	Recommended
Sidewalks	Recommended	Recommended
Turf cover	Recommended	Recommended
Forest cover	Recommended	Recommended
Utilities		
Sanitary sewer lines	Essential	Nice to have
Storm drain network	Essential	Nice to have
Stormwater practices	Recommended	Nice to have
Stormwater outfalls	Recommended	Nice to have
Combined sewers	Recommended	Nice to have
Other utilities	Essential	Nice to have
Note: Other mapping layers might be needed in certain subwatersheds: conservation areas and easements; geology and karst areas; hazardous waste/materials sites; impaired stream segments; permitted NPDES dischargers; rare, threatened or endangered species; stream monitoring stations; underground storage tanks		

Task 2 Conduct a Desktop Search for Retrofit Sites

The team rapidly searches and screens potential retrofit sites in this task to save time in the field. In practice, as much as 3-10% of subwatershed area may be needed to install retrofit practices. Further, this land must be located in the right place and be controlled by the right landowners. These land requirements would seem to be unattainable in most subwatersheds. In reality, many excellent retrofit opportunities can be discovered through detailed map work, given a practiced eye and some imagination. The simple desktop search relies on a visual inspection of recent aerial photography.

A more systematic search for storage retrofit sites is always recommended when

subwatershed GIS data are available. The search criteria outlined in Table 4.11 can be used to screen down to a manageable list of potential sites. While GIS is seldom used to search for individual on-site retrofits, it can help identify general subwatershed locations where they are most feasible. Potential on-site retrofit sites can be found by analyzing prior USSR surveys conducted for the subwatershed. Table 4.12 describes the useful on-site retrofit information that can be gleaned from USSR data.

Table 4.11: Desktop Search Criteria for Different Retrofits

Retrofit Location	What to Look For
SR-1: Existing Pond	Evaluate stormwater layer to find existing stormwater ponds with a contributing drainage area greater than 5 acres *or* Superimpose topography, drainage layers and aerial photos to identify low points in the drainage network where dry ponds may exist.
SR-2: Roadway Culvert	Superimpose topography and headwater stream layers (zero, first and second order) over the local and state road network to identify road crossings.
SR-3: Below Outfall	Superimpose publicly-owned stream corridor land parcels at least two acres in area with storm drain outfalls with a diameter greater than 12 inches and less than 60 inches.
SR-4: Conveyance System	Superimpose ditch lines, zero-order streams, conveyance easements or open channels with open land adjacent to the drainage network
SR-5: Transport Right-of-Way	Compare local, state or federal highway right-of-way layers against the stream or drainage network to identify open spaces one acre or greater *or* review highway agency GIS for existing stormwater infrastructure or treatment practices suitable for retrofitting.
SR-6: Large Parking Lot	Match large contiguous parking areas/rooftops greater than 5 acres in size with adjacent open land in public or institutional ownership, or owned by the same landowner.
OS-7: Hotspot Operation	Review land use maps to identify commercial, industrial, or municipal land uses *or* search permit databases to identify industrial operations that hold stormwater permits.
OS-8: Small Parking Lot	Search for parking lots less than five acres in size that are municipally or institutionally owned.
OS-9: Individual Street	Screen for streets that meet street retrofit feasibility criteria, such as slope, right-of-way width, open section drainage, presence/absence of sidewalks and parking lanes.
OS-10: Individual Rooftop	Superimpose property ownership layers with aerial photos or planimetric data to locate large municipal, institutional, commercial or industrial buildings that may be assessed for demonstration rooftop retrofits *or* look for clusters of building permit data that indicates areas experiencing active redevelopment
OS-11: Little Retrofit	A desktop search is not helpful in finding specific locations for little retrofits, although a GIS can help find tax reverted vacant lots and publicly owned parcels, such as parks, schools, recreation centers to investigate in the field.
OS-12: Landscape/ Hardscapes	A desktop search is not helpful in finding specific locations for landscaping and hardscaping retrofits although it can find the general public spaces with high exposure and outdoor amenities, such as parks, schools, central business districts, spaces etc.
OS-13: Underground	A desktop search is not helpful in finding specific locations for underground retrofits, although storm sewer and utility maps are essential for field investigations.

Table 4.12: How the USSR Helps Find On-site Retrofits

Neighborhood Source Assessment
- Examines the percentage of homes with connected rooftops, and other feasibility factors relating to on-site stormwater retrofits
- Evaluates potential storage retrofits of existing stormwater ponds in common areas

Hotspot Site Investigation
- Rates the severity of each hotspot with regard to its potential to generate stormwater runoff or illicit discharges
- Examines the feasibility of on-site storm water retrofits

Pervious Area Assessment
- Evaluates retrofit potential within large parcels of open land (2 acres or greater)

Streets and Storm Drain Analysis
- Ranks the severity of pollutant accumulation on roads and within storm drain systems, and the potential for street sweeping and storm drain cleanouts
- Assesses parking areas for on-site retrofit potential

Task 3 Prepare the Base Field Maps for the RRI

Field maps are needed to conduct the Retrofit Reconnaissance Investigation (RRI). The level of mapping detail is largely determined by available data and preferences of the field crew. The basic purpose of a field map is to orient field crews about where they are in a subwatershed, help them accurately record findings, and record basic topographic and site data.

The base field map should include aerial photography, topography (minimum of 5-foot contours) and hydrology. The map should also show candidate storage retrofit sites and their corresponding drainage areas. Some teams may also add the existing storm drain network and stormwater practices to the base map to make field investigations easier.

A maximum map scale of 1:2,400 is generally recommended for the base map (1” = 200’). Map scales greater than 1:6,000 (1” = 500’) make it hard to find smaller retrofits, key ditch lines and first order streams. Base maps should contain a standard map scale with scaleable intervals (e.g., 25 feet, 50 feet, 100 feet) so distances and areas can be easily determined in the field (Figure 4.2).

It may be worth taking other maps into the field for reference purposes; in particular, land use, wetland, property ownership or utility maps can reveal possible site constraints. While these layers could be added to the base map, they tend to clutter it and make it hard to read. The crew can

Figure 4.2: This sample base map includes aerial photography, 5-foot contours, hydrology, and locations of sites to be assessed.

always analyze these maps after the RRI is done to assess individual retrofit feasibly.

Step 3: The Retrofit Reconnaissance Investigation

The RRI is a rapid field assessment of potential storage and on-site retrofit sites conducted across a subwatershed. The purpose of the RRI is to verify the feasibility of candidate sites and to produce information to support initial concept designs. The RRI involves a careful assessment of site-specific information to determine if a retrofit will actually work at a specific site. Three tasks are needed to complete an RRI:

1. Advance preparation in the office
2. Evaluate individual retrofit sites using RRI form
3. Finalize RRI forms back in the office

Task 1 Advanced Preparation

The retrofit team leader is responsible for gathering the equipment and materials needed for field work, as outlined in Table 4.13. The equipment is used to either document a retrofit site (e.g., GPS unit and digital camera) or assess basic site constraints (e.g., measuring tape, pocket rod, soil auger, and manhole puller). Several dozen blank copies of the RRI field form should be copied on three-hole paper and organized into a three-ring binder (see Appendix A for a blank RRI form). The RRI form can also be entered into a hand-held data storage device.

A retrofit field guide summarizes subwatershed retrofit objectives, sizing rules, standard setbacks, wetland indicators and other information to assist the crew. The level of detail provided in the field guide is calibrated to the retrofit experience of the field crews. Experienced crews generally need little guidance, whereas less experienced crews may need more consistent information on retrofit options. The guide ensures that all crews take a similar retrofitting approach – looking for specific types of retrofits per the subwatershed objectives, following the same sizing rules, etc. A template for customizing a retrofit field guide for an individual watershed can be found in Appendix A

Table 4.13: Getting Ready for the RRI

Equipment	Base Map
• Clipboards and pencils • GPS unit • Digital camera • Scale and pocket calculator • 100-foot measuring tape • Pocket rod or local level • Soil auger • Manhole puller, tennis ball • Safety gear (cell phone, first aid kit, etc.)	• Aerial photos • Topography (5-foot contours) • Hydrology • Storm drain network • Existing stormwater practices • Street names • Sites to be assessed and contributing drainage areas
Materials	**Supplementary Maps (If Available)**
• Field forms • Retrofit field guide • Authorization letters • Contact numbers for emergency assistance • Photo IDs and business cards	• Road map • Land use • Wetlands • Property ownership • Utility maps (if not available as GIS)

Authorization letters are recommended if crews are assessing sites in or near private property (Figure 4.3). The letters should be printed on local government letterhead and include the following information:

- Name and contact information of someone who can be contacted to answer questions about the project
- Purpose of the inventory and explanation of what the field crew is doing
- Dates and times that the field work will be conducted
- Company and names of staff conducting the field work

It is a good idea to mail copies of the authorization letter to property owners in advance of the field work. Field crews should carry several copies of the letter to give to suspicious residents, and remember to leave a copy on the windshield of field cars. The crew should be supplied with a list of emergency contact numbers to report any leaks, spills, or other water quality problems they encounter to the appropriate local authorities (Figure 4.3).

A retrofit inventory crew normally consists of two people who can visit from 10 to 15 sites each day. Typically, one member of the field team is responsible for completing the RRI form, while the other takes digital photographs and generates GPS points. Both crew members should work together to investigate the site and to brainstorm potential retrofit concepts. Ideally, at least one crew member should have prior retrofitting experience or be well versed in stormwater engineering. The second crew member should have a basic understanding of hydrology, subwatershed retrofit objectives, and the types of plumbing indicators to look for at a site. Since retrofitting requires creativity, consider mixing field crews. For example, pairing an engineer with a biologist or a landscape architect may result in a retrofit that achieves stormwater treatment goals, but is also more sensitive to biological impacts and native vegetation. The crew leader should arrange for an orientation before going out in the field to ensure crews:

- Understand overall retrofit objectives and the preferred methods of stormwater treatment
- Agree on how to complete the RRI form and properly assign site IDs
- Understand the symbols used on the base maps
- Know who to call in case of emergencies.

Preliminary routes can be planned for the subwatershed to visit the candidate retrofit sites. Well-planned routes will help maximize efforts, but flexibility is also important. Field conditions are often different than expected and new retrofit opportunities may be discovered in the field that were not identified in the office.

Task 2 Evaluate Individual Retrofit Sites Using RRI Form

The crew completes the seven parts of the RRI form at each individual retrofit site:

1. Header Information
2. Site Description
3. Drainage Area to Proposed Retrofit
4. Existing Stormwater Management
5. Proposed Retrofit
6. Site Constraints
7. Sketch and Notes

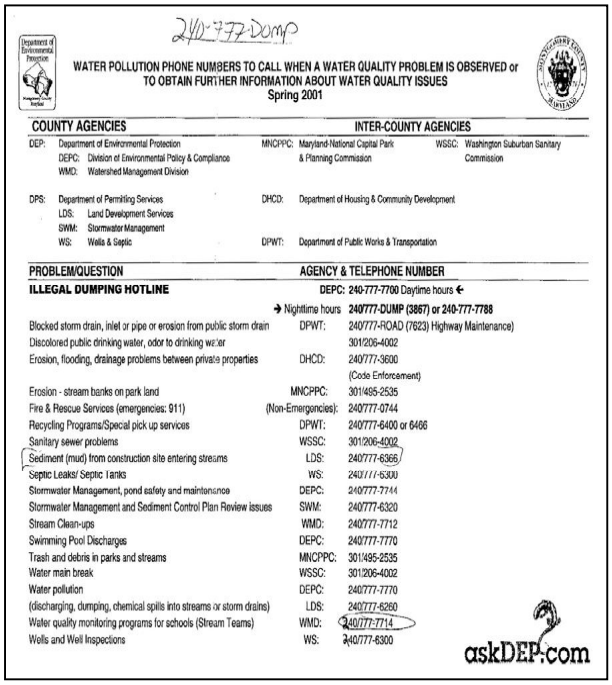

240-777-Dump

WATER POLLUTION PHONE NUMBERS TO CALL WHEN A WATER QUALITY PROBLEM IS OBSERVED or TO OBTAIN FURTHER INFORMATION ABOUT WATER QUALITY ISSUES
Spring 2001

COUNTY AGENCIES		INTER-COUNTY AGENCIES			
DEP:	Department of Environmental Protection	MNCPPC:	Maryland-National Capital Park & Planning Commission	WSSC:	Washington Suburban Sanitary Commission
DEPC:	Division of Environmental Policy & Compliance				
WMD:	Watershed Management Division				
DPS:	Department of Permitting Services	DHCD:	Department of Housing & Community Development		
LDS:	Land Development Services				
SWM:	Stormwater Management				
WS:	Wells & Septic	DPWT:	Department of Public Works & Transportation		

PROBLEM/QUESTION	AGENCY & TELEPHONE NUMBER	
ILLEGAL DUMPING HOTLINE	DEPC:	240-777-7700 Daytime hours ←
	→ Nighttime hours	240/777-DUMP (3867) or 240-777-7788
Blocked storm drain, inlet or pipe or erosion from public storm drain	DPWT:	240/777-ROAD (7623) Highway Maintenance)
Discolored public drinking water, odor to drinking water		301/206-4002
Erosion, flooding, drainage problems between private properties	DHCD:	240/777-3600 (Code Enforcement)
Erosion - stream banks on park land	MNCPPC:	301/495-2535
Fire & Rescue Services (emergencies: 911)	(Non-Emergencies):	240/777-0744
Recycling Programs/Special pick up services	DPWT:	240/777-6400 or 6466
Sanitary sewer problems	WSSC:	301/206-4002
Sediment (mud) from construction site entering streams	LDS:	240/777-6366
Septic Leaks/ Septic Tanks	WS:	240/777-6300
Stormwater Management, pond safety and maintenance	DEPC:	240/777-7744
Stormwater Management and Sediment Control Plan Review issues	SWM:	240/777-6320
Stream Clean-ups	WMD:	240/777-7712
Swimming Pool Discharges	DEPC:	240/777-7770
Trash and debris in parks and streams	MNCPPC:	301/495-2535
Water main break	WSSC:	301/206-4002
Water pollution	DEPC:	240/777-7770
(discharging, dumping, chemical spills into streams or storm drains)	LDS:	240/777-6260
Water quality monitoring programs for schools (Stream Teams)	WMD:	240/777-7714
Wells and Well Inspections	WS:	240/777-6300

askDEP.com

Westchester gov.com

Andrew J. Spano
County Executive

Soil and Water
Conservation District

Stephen Coleman
Chair

June 13, 2006

To Bronx River Watershed Landowners and Others:

The Bronx River Watershed Coalition, comprised of representatives of municipalities, state agencies and not-for-profit organizations and administered by the Westchester County Department of Planning and Soil and Water Conservation District, has partnered with the Center for Watershed Protection to conduct upland assessments and other fieldwork in the Bronx River watershed. The goal of these assessments is to identify priority restoration projects in the watershed. Once projects are identified, we will work cooperatively and assist landowners and any other appropriate entities to improve water quality and fish and wildlife habitats in the watershed.

This letter is to notify you that fieldwork for this endeavor will be conducted between 8:00 a.m. and 6:00 p.m. from June 13, 2006 through June 14, 2006. Field crews will conduct as much of the assessments as possible from their cars and will make every effort to avoid private property.

If you have any questions, please contact John Smith with the Westchester County Department of Planning/Soil and Water Conservation District at (123) 456-789 or john.smith@localgov.com.

Thank you for your assistance.

Sincerely,

Bronx River Watershed Coalition and Center for Watershed Protection

Westchester County Soil & Water Conservation District • Westchester County Department of Planning
432 Michaelian Office Building • 148 Martine Avenue • White Plains, NY 10601 • (914) 995-4422 • (914) 995-3780 fax
Website: www.westchestergov.com.

Figure 4.3: List of Emergency Contact Numbers (left) and Sample Authorization Letter (right)

An RRI form should be filled out for every candidate retrofit site visited, even if it appears infeasible. The next section provides guidance on how to complete each part of the RRI form.

<u>Task 2a: Complete Header Information</u>
Upon arrival at a candidate site, the retrofit crew documents some basic background information, such as:

- The name of the watershed, subwatershed, and the unique site ID number
- Date the site was visited and names of crew conducting the investigation
- Photographs taken at the site, including the specific camera used and the numbers of photographs taken
- Site coordinates, the specific GPS unit used to take them, and landmarks (LMK).

As a general convention, the unique site ID should reflect the subwatershed in which the retrofit is located, and indicate the retrofit location type (e.g., SR-3). An example of unique site ID nomenclature guidance is provided in Figure 4.4. Some crew leaders like to assign a unique site ID number prior to going into the field. If ID numbers are pre-assigned, the crew should be given a range of unassigned numbers to record any unexpected retrofit opportunities encountered in the field. If a GPS unit is unavailable, the site location should be estimated and marked on the base map.

Bronx River Watershed Plan Field Investigations
Unique Site ID Nomenclature Guidance

Unique Site ID = Subwatershed Acronym — Investigation Acronym Sequential Number

Subwatershed Name	Subwatershed Acronym
White Plains Reservoirs	WPR
Kensico Reservoir	KR
Manhattan Park Brook	MP
Davis Brook	DB
Clove Brook	CB
Bronx River Middle Direct Drainage	BRM
Bronx River Lower Direct Drainage	BRL
Bronx River Upper Direct Drainage	BRU
Sprain Brook	SB
Grassy Sprain Brook	GSB
Grassy Sprain Brook Direct Drainage	GSD
Hartsdale Brook	HB
Fox Meadow Brook	FMB
Fulton Brook	FB
Troublesome Brook	TB

Investigation Type	Acronym
Hotspot Site Investigation	H
Neighborhood Source Assessment	N
Pervious Area Assessment	P
Retrofit Reconnaissance Investigation	R

Sequential Numbering begins at "1" for each subwatershed

Examples:
MPB-R1; MPB-R2; MPB-R3; MPB-R4…
HB-R1; HB-R2; HB-R3; HB-R4…

Figure 4.4: An example of unique site ID nomenclature guidance provided to retrofit teams in advance of field work.

Task 2b: Describe the Site

The retrofit crew then takes a few moments to generally describe the proposed retrofit site, including:

- The street address or name of the adjacent business or property owner.
- Whether the property is publicly or privately owned.
- The approximate location of the proposed storage or on-site retrofit

The crew then estimates the available treatment area for the footprint of the retrofit as defined by the largest contiguous unutilized area that has:

- No surface indicators of underground utilities
- No mature forests or wetlands
- Standard setback distances to structures, roads or shorelines

The crew estimates the area in acres (or square feet) either by pacing or drawing a rough footprint on the base map and scaling approximate dimensions, using common area formulas for rectangles, triangles, or circles. More accurate estimates can be generated using a planimeter back in the office.

Task 2c: Evaluate Drainage Area and Plumbing to Proposed Retrofit

The crew then delineates the drainage area to the proposed retrofit site and estimates its total area and impervious cover. Although boundaries can be hard to define, crews need to confirm the drainage area to estimate the target storage volume to size the retrofit. If possible, the crew can delineate the drainage area for larger storage retrofits before going out into the field.

In some cases, maps are not adequate to delineate drainage boundaries, so the crew will need to investigate the drainage area in the field. This entails walking or driving around the site and observing drainage features that define its boundaries. The crew should begin at the proposed retrofit site and move upstream following common

indicators of stormwater plumbing such as open channels, curbs and gutters, storm drain inlets, manholes, outfalls, evidence of overland flow, and surface topography (Figure 4.5). The crew then marks the projected drainage boundaries on the field map using topography as a guide. Once the boundaries are established, drainage area may be roughly estimated using a scale. Next, the crew estimates the impervious cover for the retrofit drainage area. This can be done in the office using planimetric GIS data, aerial photography, or average land use/impervious cover relationship (provided in the field guide in Appendix A).

The drainage area investigation for on-site retrofits must be completed in the field and is basically a micro version of the process done for storage retrofits (Figure 4.6). The crew walks the site in an up-gradient direction to look for rooftop drainage, downspouts, curb cuts, and drainage divides. Subtle grades can be deceiving, so the crew may want to roll a tennis ball to determine probable flow paths. The estimated drainage boundaries to the proposed on-site retrofit can be marked on the RRI field form. The area can be estimated by pacing or a tape measure. In addition, the crew should make a visual estimate of impervious cover for the contributing drainage area.

The crew then investigates existing plumbing at the site to look for retrofit opportunities. Crews should look for key stormwater infrastructure indicators to sketch out the existing drainage patterns at the site. The job is much easier if as-built plans are available for the site (Figure 4.7). Each storage and on-site retrofit location has different plumbing. Tables 4.14 and 4.15 provide some tips on what to look for in the field at each retrofit location.

Roof Downspout

Roof Drainage at Curb

Concrete Drainage Chute

Concrete Pilot Channel

Drainage Channel

Drainage Channel

Curb and Gutter

Storm Drain Inlet

Overland Flow to Inlet

Storm Drain Inlet with Pipes Flowing In and Out

Drop Inlet

Outfall

Outfall

Overland Concentrated Flow

Surface Topography

Figure 4.5: Examples of Stormwater Infrastructure Indicators

The on-site investigation starts at this curb cut, which allows runoff to flow down a hillside, eventually causing a headcut discovered during a USA.

The field team determines that there is a drainage divide near the garage in the background. The curb cut is in the center of the photo, near the tree.

Runoff from the rooftop is within the drainage area.

Staff assumes the drainage divide in the other direction is near the buildings in the background.

A drainage divide is identified near the bench.

At first glance, the roof downspouts appear to be connected to an underground storm drain system.

Further investigation reveals the weephole at the curb. The rooftop for this building is within the drainage area.

Staff continue around the building to a parking lot. The drainage divide is identified near the red car.

Staff documents the drainage area to the curb cut.

Figure 4.6: Investigating the drainage area at an apartment complex

Figure 4.7: While comparing an existing stormwater treatment practice to the original plans, the retrofit team realizes that the trash rack was never installed.

Table 4.14: What to Look for When Investigating Storage Retrofit Locations
SR-1: Existing Pond
• Check the condition and elevation of pond inlet(s), internal flow path, outlet, riser and emergency spillway. Check the condition of pond outlet to determine if it is damaged or prone to clogging. Look for excessive sediment deposition, chronic maintenance problems, and woody growth. • Walk above and below the pond to look for possible headwater effects and scour problems to correct, and verify the drainage area. • Decide which retrofit strategy to use: excavate pond bottom, raise embankment, steal flood control storage, modify the riser, improve internal design geometry or add forebay.
SR-2: Above Roadway Culvert
• Evaluate the culverts alignment and invert elevation in relation to the stream, its diameter, material and condition, and potential to create a hydraulic jump. Note any sediment deposition. • Estimate the potential storage volume available upstream using prism method. Get a quick sense of whether the floodplain soils are suitable for excavation to get additional storage, Record the presence of any upstream wetlands, mature forest cover or underground utilities. • Evaluate downstream conditions – Measure the vertical distance from the culvert invert to the stream bed, estimate the rate of flow over the culvert lip, look for scour holes, and look for any flood prone structures in the floodplain.
SR-3: Below Outfall
• Determine whether or not a flow splitter is needed to direct runoff for treatment. • Record the size, diameter, material and condition of both the storm drain pipe and outfall. • Measure the vertical distance between the elevation of the outfall invert, the stream bottom and the top of bank. • Define available treatment area below either side of the proposed split and then establish the point where split flows will enter proposed treatment area. Get a sense of soil conditions and depth to water table. • Look for the best place to bring treated flows back into the stream.
SR-4: In the Conveyance System
• Evaluate channel conditions, including slope, depth, cross-section, soil conditions, vegetative cover, roughness, and signs that it is over-capacity. • Evaluate adjacent treatment potential to the right or left of the channel, including available width, indicators of utilities, potential access points, turf areas in depressions, and adjacent land uses. • Walk several hundred feet in a downstream direction to get a sense of where the channel transforms into a perennial stream, looking for signs of perennial flow, wetlands, and advancing knickpoints.
SR-5: In Transport Right-of-Way
• Check to see whether the highway has open or closed drainage and try to delineate the upstream drainage divide (generally smaller ditches and smaller diameter pipes are preferred). • Sketch out the contributing drainage area and flow path and compare against highway design drawings. • Look for obvious depressions in a down gradient direction that can provide treatment without major excavation. • Ensure that space is available to account for standard highway safety setbacks. • Measure the hydraulic head available for stormwater treatment.
SR-6: Large Parking Lot
• Confirm the size and use of the parking lot. • Assess parking lot grade and sketch the existing plumbing. • Estimate the boundaries of the treatment area. • Evaluate head and conduct a cursory inspection of soil conditions. • Determine if a flow splitter is needed to direct stormwater into the proposed treatment area.

Table 4.15: What to Look for When Investigating On-Site Retrofit Locations
OS-7: Hotspot Operation
• Define the hotspot generating area (HGA) • Evaluate pollution prevention practices • Evaluate hotspot connection to public storm drain system • Define the contributing drainage area to the hotspot generating area
OS-8: Small Parking Lot
• Confirm the size and use of the parking lot • Eyeball parking lot grade and subdivide into smaller drainage units • Evaluate each on-site treatment area for available space • Determine how the treatment area can be reconnected to the existing storm drain system
OS-9: Individual Street
• Investigate existing street conditions, current uses of the right-of-way/front yards, and the location and elevation of the downstream discharge point of entry into storm drain system • If open section drainage, note channel characteristics, utility conflicts, and distance between driveway culverts • If closed section drainage, note locations and characteristics of all storm drain inlets and catch basins
OS-10: Individual Rooftop
• Talk to homeowners to gauge their willingness, retrofit preferences and past home drainage issues • Evaluate general rooftop conditions in the neighborhood and estimate the contributing roof area to a typical roof leader • Measure the length of the flow path from the roof across pervious areas • Use screwdriver or soil auger to get a sense of lawn compaction and soil quality
OS-11: Little Retrofits
• Check to see if the impervious area is really needed • Walk in a down-gradient direction and follow the flow path from the impervious area to the storm drain or channel system • Find a place where sheetflow can be split or otherwise diverted into a pervious area for treatment • Check to see if there is runon to adjacent impervious area (look for evidence of erosion)
OS-12: Landscape – Hardscape
• Look for opportunities to eliminate impervious areas, to treat rooftop runoff and to expand existing tree pits • Ensure sidewalks and plaza areas are sloped towards treatment areas • Compare the surface area delivering runoff to the surface area of the planting area • Determine where treatment areas will overflow • Note potential conflicts with pedestrian traffic and access
OS-13: Underground
• Look for indicators of underground utilities • Pop any manholes or grates to determine the invert elevation and diameter of the storm drain pipe that will accept runoff from the underground treatment area

Task 3: Size the Proposed Retrofit

At this point, the crew considers how to translate subwatershed objectives into a retrofit design for the site and collect information needed for retrofit ranking later on. This involves computing the target and actual storage volumes at the proposed retrofit site and choosing the best stormwater option.

Task 3a. Compute the Retrofit Storage Volume

The crew estimates the target storage volume needed for the retrofit site established earlier during retrofit scoping – water quality, runoff reduction, or channel protection. The normal target for water quality is to capture and treat the 90% storm, as defined by the local rainfall frequency

spectrum (see Chapter 1). The target storage volume is computed as a standard rainfall depth across the drainage area, using the following simple equation:

$V_t = P/12 * Rv * DA$

Where:
V_t = Target storage volume (acre feet)
P = Target rainfall depth (in inches for the 90% storm)
Rv = Runoff Coefficient = 0.05 + 0.009(IC)
DA = Drainage Area (acres)
12 = Conversion factor (inches to feet)

If channel protection is a main concern, the basic goal will be to provide 24 hours of extended detention for the runoff generated from the 1-year 24-hour design storm. As a rule of thumb, the target storage capacity for channel protection is about 60% of the one-year storm runoff volume. The following equation can be used to estimate target storage for channel protection:

$V_t = P/12 * IC/100 * DA * 0.6$

Where:
V_t = Target storage volume (acre feet)
P = One-year 24-hour storm depth (inches)
IC = Impervious Cover (%)
DA = Drainage Area (acres)
12 = Conversion factor (inches to feet)
0.6 = Pond routing factor

Task 3b. Compute Available Retrofit Storage

The crew then estimates how much storage volume or surface area is actually available at the retrofit site. To compute available storage, the retrofit crew should revisit its earlier estimate of available treatment area (i.e., the retrofit footprint drawn on the field map). The crew then determines the maximum depth of the proposed retrofit. The maximum depth is normally set by the elevation of the storm drain or channel that the retrofit will discharge to as well as the average depth for the stormwater treatment option employed (Table 4.16). For ponds and wetlands, the retrofit crew may then use the following equation to estimate available storage:

$V_{av} = 2/3 * d * SA$

Where:
V_{av} = Available storage at the site (acre-feet)
d = Estimated max depth (feet)
SA = Surface area of the facility (acres)
2/3 = average volume factor

Available storage can also be estimated based on the typical surface area or depth requirements of different stormwater treatment options (Table 4.16). These simple rules assume treatment of a one inch rainfall and are used to quickly gain a sense of the surface area needed for water quality treatment.

Task 3c. Choose the Best Treatment Option

The crew concludes by prescribing the best combination of stormwater treatment options for the retrofit site that maximizes removal of the pollutant of concern, minimizes construction cost and addresses major site constraints (Figures 4.8 and 4.9). More guidance on stormwater treatment options can be found in Chapter 3 and Appendix I.

Task 4: Evaluate Retrofit Site Constraints

The crew inspects the site to look for possible feasibility constraints for the proposed retrofit. Potential constraints vary depending on the retrofit location and stormwater treatment options employed.

However, the crew should always look for the following general constraints:

- *Adjacent Land Uses:* The crew should observe current land use and activities within and adjacent to the proposed retrofit. Often, retrofits are rendered infeasible due to competing uses (e.g., the available treatment area is already being used as a dog park, ball field or overflow parking area; Figure 4.10). In one case, an otherwise great retrofit site was eliminated because it was needed for an emergency helicopter landing area for an adjacent hospital.
- *Conflicts with Existing Utilities:* The crew should walk the site looking for surface indicators of dry or wet underground utilities. Figure 4.11 illustrates some common indicators for sanitary sewers, water lines, gas, electric, and cable utilities. The crew should not forget overhead utilities, as tree growth in some retrofits could create future conflicts. The approximate location and depth of any utilities should be noted on the concept sketch to help the crew get more precise information when they return to the office.

Table 4.16: Drainage Area – Surface Area Relationships

Stormwater Treatment Option	% of Contributing Drainage Area	Average Depth (ft)
Dry ED Ponds	1 to 3%	6
Wet Pond	1 to 3%	6
Constructed Wetland	3 to 5%	2
Bioretention	5 to 10%	1-2
Sand Filters	0 to 5%	2
Infiltration	0 to 5%	1-2
Swales	5 to 15%	2
Filter Strips	5 to 15%	1
Other Retrofits		
Dry wells	Each dry well can treat 500 sf of roof	1
Rain barrel (50 gal)	Max area draining to rain barrel 500 sf	3-5
Cistern (500 gal)	Max area draining to cistern 1000 sf	5-10
Planter boxes	Max area draining to box 15,000 sf	1.0
Green roofs	1 to 1 ratio of impervious area treated	0.5
Permeable pavers	1 to 1 ratio of impervious area treated	0
Rain gardens	10% of rooftop area	1

Extended Detention at Existing Pond

Underground Sand Filter at a Hotspot

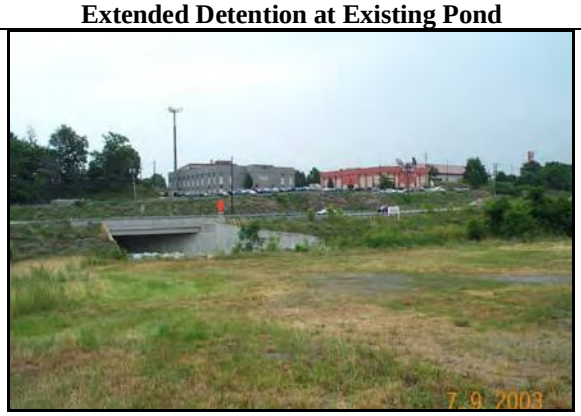

Created Wetlands Above Roadway Culvert

Bioretention at a Small Parking Lot

Wet Pond Below Outfalls

Swale Along an Individual Street

Figure 4.8: Choosing the right stormwater treatment option for the retrofit location

Created Wetlands Within Conveyance

Bioretention Adjacent to Individual Rooftop

Extended Detention Within Transport ROW

Stormwater Tree Pit Within a Hardscaped Area

Bioretention at a Large Parking Lot

Underground Sand Filter at Existing Inlet

Install berm or baffle to lengthen flow path

Remove concrete pilot channel; excavate for pretreatment and forebay

Figure 4.9: Choosing the right stormwater treatment option for the retrofit location

Figure 4.10: The potential retrofit location (left) may be eliminated since it is used as recreational space in conjunction with the adjacent playground.

- *Construction and Maintenance Access:* The crew should check whether heavy equipment can access the retrofit site during construction and future maintenance operations. The crew should look for the best point of entry and note its width and slope. Good maintenance access is defined as the ability to access proposed inlets, outlets and forebays from a paved road that has a slope no greater than 12% and a width of 12 to 20 feet. The access should permit vehicles to turn-around and be vested as a permanent easement. The crew should note whether retrofit constraints would interfere with existing traffic or parking lot use.

- *Wetland, Floodplain and Forests:* Crews should always try to anticipate potential environmental permitting issues related to any wetlands, floodplains, mature forests or stream channels present at the site. Ideally, the crew should have some experience in plant identification, and indicate whether any follow-up surveys might be needed for future permitting. The crew should also note the presence of any invasive plants that might influence how the vegetation will be managed at the retrofit site.

- *Soils:* The crew can use a soil auger or screw driver to get a general sense of how underlying soils will influence retrofit design and construction costs. The crew should look for signs of compaction, poor infiltration, shallow bedrock, or a high water table. The soils analysis will be cursory, but should allow the crew to determine if more detailed soil or geotechnical investigations will be needed to support retrofit design.

Task 5: Complete Field Sketch and Notes

Space is provided on the RRI form for sketches and notes. The crew should sketch a plan view of the proposed storage retrofit and adjacent areas (Figure 4.12). The plan view should include both existing and proposed site conditions, drainage paths, and stormwater conveyance system. A profile view may be sketched for more complex storage retrofits and for on-site retrofits where elevations are tight, available head is limited, or existing storm drain inlets and outlets may present design challenges down

the road. Rough cross sections should also be sketched for unique retrofit design elements, such as weirs, risers, and flow splitters. The goal of the sketch is to provide enough information to fully convey all aspects of the proposed retrofit so that another designer could pick it up and proceed with final concept design.

For on-site retrofits, a plan view sketch of the entire site is usually warranted if multiple retrofits are proposed for the same site. In some cases, a generic concept sketch can be substituted when many similar on-site retrofits will be installed (e.g., rain gardens installed in multiple homes in a particular neighborhood). The narrative that accompanies the generic concept sketch design should note any design adaptations to consider during implementation and recommend the best delivery mechanism to make it happen.

Task 6. Finalize RRI Forms Back in the Office

The retrofit crew normally finalizes the RRI form back in the office. The crew often needs more information to complete the field concept, evaluate is feasibility and determine if another restoration project is more appropriate for the site. Crews often suffer from fatigue after field work and may put off finishing the RRI form or doing quality control. As time elapses, however, crews forget important site details and may have a hard time translating the field sketch into a good concept design. Crews should finalize the RRI form while it is still fresh in their minds using the following punchlist of common quality control issues:

- *Confirm property ownership for the site:* Consult parcel data or local databases to determine ownership at each retrofit location, and obtain landowner contact information.
- *Confirm drainage area:* Site-specific mapping data, such as storm drain maps, pond design calculations, or fine-scale topo are used to get a final accurate estimate of the contributing drainage area to the retrofit.
- *Confirm drainage area impervious cover:* Aerial photography, planimetric GIS data or impervious cover coefficients can provide a good estimate of impervious cover.
- *Analyze utility and soil maps:* Site-specific utility maps should be consulted to confirm the available treatment area is actually suitable for retrofitting. Refer to local soils maps to get a general sense of soils at the site.
- *Complete concept design sketch:* A final plan and profile view of the proposed retrofit should be drawn to scale so that accurate numbers can be computed for the actual retrofit storage volume. Most concept sketches should be redone on two-foot contours, and the team leader should make sure any missing elements from the field recon are added.
- *Confirm volume computations:* In many cases, either the target or available storage volume may change as a result of the preceding steps. Therefore, the team leader should always review the final retrofit volume computations.
- *Review existing stormwater practice as-built drawings:* If these drawings are available, they are a great design resource for pond and conveyance retrofits since they provide valuable details on the workings and purpose of

stormwater practices that are complex, overgrown or hard to access.

- *Confirm storm drain invert elevations:* If detailed storm drain maps are available, it is useful to confirm spot elevations. It doesn't matter if these maps are old and non-digital, as they contain more precise elevation data than shown on GIS. Make sure, however, to use consistent topographic benchmarks.

The retrofit team then makes a final recommendation on whether the site is suitable to proceed to concept design. Generally, a decision to stop is made when a site is severely constrained or cannot meet the walkaway volume. A feasible retrofit should not be eliminated from consideration until the retrofit ranking process is completed. In the event that a retrofit is not feasible, the RRI form provides space to suggest an alternative restoration project (Table 4.17).

Sewer Stacks

Fire Hydrant – Water Line

Electric Box Grates

Overhead Wires

Gas Meter

Cable Box

Figure 4.11: Examples of Some Common Utility Indicators

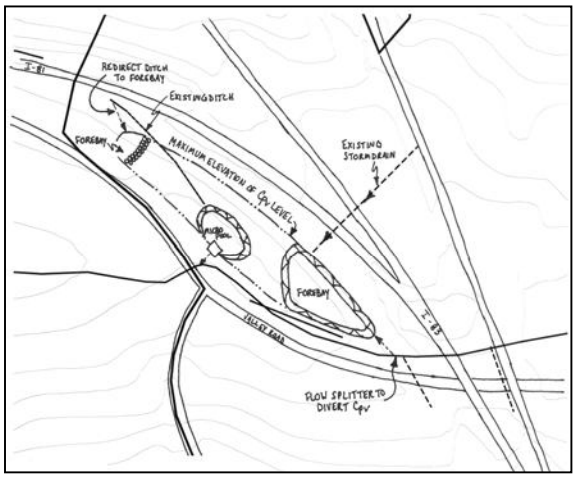

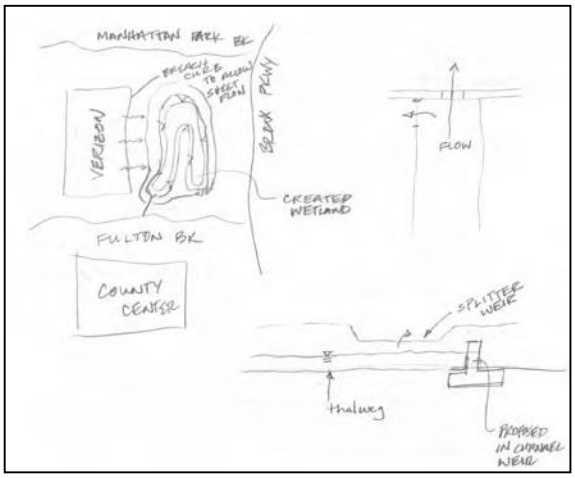

Figure 4.12: Examples of Retrofit Field Sketches

Table 4.17: Alternative Restoration Projects to Consider When Retrofit Is Not Feasible

Storage Retrofits	On-Site Retrofits
SR-1: Existing Ponds • Reforest pond and its buffer • Plant wetland plant species in benches • Notify owner to perform maintenance • Designate for local Adopt-a-Pond program **SR-2: Above Roadway Culverts** • Upstream wetland restoration • Culvert repair or replacement • Fish barrier removal • Downstream stream repair • Riparian reforestation • Stream adoption **SR-3: Below Outfalls** • Outfall stabilization • Stream daylighting • Riparian reforestation **SR-4: In the Conveyance System** • Natural channel design • De-channelization • Riparian reforestation • Wetland restoration **SR-5: In Transport Right-of-Way** • Reforestation • Spill controls **SR-6: Large Parking Lot** • On-site parking lot retrofits • Reforestation • Pollution prevention practices • Regular vacuum sweeping and litter control	**OS-7: Hotspot Operations** • Pollution prevention • Spill prevention and response • Secondary containment **OS-8: Small Parking Lots** • Tree planting • Vacuum sweeping and litter control • Parking lot pollution prevention practices **OS-9 Individual Streets** • Street sweeping • Storm drain cleanouts • Storm drain marking • Commercial pollution prevention practices **OS-10 Individual Rooftop** • Watershed education • Neighborhood stewardship practices • Reforestation **OS-11 Little Retrofit** • Reforestation • Erosion Repair **OS- 12 Landscape/Hardscape** • Reduced fertilizer and pesticide use • Use of native plants • Urban forestry practices • Smart site practices for redevelopment **OS-13 Underground** • Intensive street sweeping • Regular cleanouts of storm drain inlets • Pollution prevention practices • Detection and elimination of illicit discharges

Step 4: Compile the Retrofit Inventory

This step produces concept designs for individual retrofit sites, and compiles them in a retrofit inventory for the entire subwatershed, in three simple tasks:

Task 4.1: Prepare Storage Retrofit Concept Designs

After the field investigation, the team prepares a concept design to assess retrofit feasibility and compare it against other proposed retrofits for the subwatershed. A concept design for a storage retrofit is neither a final design nor a detailed construction drawing. Concept designs are often expressed as a percentage of effort to get to final design. At this stage of the retrofit process, a 15% design is usually sufficient, but a 30% design may be needed for larger or more complex storage retrofit projects. A 15% design consists of a decent sketch, an analysis of project feasibility, storage calculations, pollutant load reduction estimates and planning-level construction cost estimate. A 30% design has more detailed engineering computations and some preliminary hydrology and other modeling to determine the size and feasibility of the retrofit.

The design team begins by analyzing the final RRI form for the storage retrofit. The designer then appends additional items to complete the concept design:

Project Feasibility: Designers should outline the specific hurdles needed to actually implement the retrofit by specifically referencing the type and number of environmental permits needed, landowner approval or easements that must be secured, special engineering studies needed to support final design and any access issues that may complicate retrofit construction. The designer should also indicate the probability of acceptance by neighbors or the landowner.

Storage Calculations: Designers should present their final calculation of the target WQv storage for the retrofit and confirm its actual storage volume (in acre-feet).

Pollutant Removal Rate: Designers can compute the pollutant load delivered to the retrofit using the Simple Method (taking input parameters directly from the RRI form). Next, designers adjust the median removal rate for the pollutant of concern, based on a review of site conditions and design factors for the individual retrofit using the design point method. Appendix B provides detailed guidance on how to perform both calculations. The final product is a pollutant removal estimate expressed in terms of lbs/year.

Initial Cost Estimate: A preliminary cost estimate can be derived based on impervious area treated using the retrofit unit cost data presented in Chapter 2. All cost estimates should be adjusted for any unusual site factors that might drive up construction costs. Designers should also indicate whether any of the following factors will be need to be addressed to construct the retrofit:

- Land acquisition
- Poor construction access
- Hauling material off-site
- Utility relocation
- Multiple environmental permits

Task 4.2: Finalize On-Site Retrofit Delivery Methods

Concept designs for on-site retrofits are slightly different. They are primarily intended to show how on-site retrofits can be delivered on a widespread basis over a neighborhood or specific land use. The designer should estimate the number of homes, yards, businesses or other individual units where the on-site retrofit could potentially be applied across the subwatershed. For example, Neighborhood Source Assessment data can estimate the number of residential rooftops that could be treated or disconnected. The remainder of an on-site concept plan consists of the following sections:

Generic Sketch: A final generic concept design drawing of the basic on-site retrofit approach should be prepared, along with notes on any site-specific constraints that may require minor design adaptations.

Delivery Mechanism: Designers should describe the proposed delivery mechanism for the proposed on-site retrofit, such as resident education, direct technical assistance, workshops, door-to-door outreach, free construction materials or financial incentives. Profile Sheets OS-10 and OS-11 provide specific guidance on potential delivery mechanisms for common on-site retrofits.

Target Implementation Rate: Designers should estimate a realistic rate of adoption or implementation for the on-site retrofit, which is obviously linked to the delivery mechanism selected.

Aggregate Pollutant Removal: The team then estimates the aggregate pollutant load treated by individual on-site retrofits, and selects a reasonable pollutant removal rate to determine the total pollutant load reduction. Table 4.18 presents an example of how to estimate pollutant removal through the delivery of rain gardens in three residential neighborhoods.

Aggregate Treatment Costs: The same scaleable process can define the aggregate cost for on-site retrofits (Table 4.19). Designers estimate unit costs for each individual installation and retrofit delivery, and then scale up at the neighborhood level. In the rain garden example, the combined cost for retrofit installation and delivery is nearly $20,000 per impervious acre treated, or about $13,250 per pound of phosphorus removed.

Task 4.3 Assemble the Retrofit Inventory

Three simple tasks are performed to compile an inventory of all stormwater retrofits that can be implemented in a subwatershed:

1. *Conduct final quality control on individual retrofit concept designs*: Final project concept designs should be reviewed one last time for accuracy and thoroughness, preferably by someone not on from the original field crew. The team leader should ensure that all field forms, digital photos, sketches, field notes, and other project data are organized into a single project folder. Individual retrofit concepts are then finalized in the form of a two to four-page retrofit summary that includes the feasibility assessment, sketch, narrative and initial cost estimate.

2. *Assemble the retrofits into a master binder and spreadsheet or GIS*: Individual retrofit summaries are then assembled into a master binder (Figure 4.13). A spreadsheet can be created that organizes retrofits by their unique site

ID, impervious area treated, retrofit location, stormwater treatment option prescribed, pollutant reduction and cost. The spreadsheet may also serve as an index for corresponding section of the master binders. When completed, the master binder serves as the subwatershed retrofit archive.

3. *Produce a subwatershed retrofit locator map and inventory summary table*. The front-end of the retrofit inventory should contain a subwatershed retrofit locator map to organize retrofit data needed for evaluation and ranking (Figure 4.14).

Table 4.18: Example of How On-site Pollutant Removal Is Computed

Neighborhood	Total # of Rooftops	Roofs Treated[1]	Total IC (acres) [2]	Total TP Load (lbs/yr) [3]	Removal Rate [4]	TP Reduced [5]
A	200	25%	0.91	2.12	65%	1.38
B	500	40%	4.59	10.69	65%	6.95
C	300	30%	2.29	5.34	65%	3.47
Total	1,000	-	7.79	18.15	-	11.80

Notes:
[1] Assumes aggressive delivery program using door to door outreach, direct technical assistance and homeowner financial incentives
[2] Assumes 1,000 square feet of rooftop treated in rain garden per house
[3] Total P using Simple Method: C = 0.30, P = 40 inches, Rv = 0.95
[4] Median bioretention TP removal rate in Chapter 3
[5] pounds of TP removed per year

Table 4.19: Deriving Neighborhood Scale Cost Estimates for On-site Retrofits

Neighborhood	# Rooftops Treated [1]	Unit Costs [2] (Per Home)	Delivery Cost [3]	Total Cost [4]
A	50	$ 350	$ 75	$ 21,250
B	200	$ 350	$ 125	$ 95,000
C	100	$ 350	$ 50	$ 40,000
Total	350	-	-	$ 156,250

Notes
[1] Each 1,000 sf of roof produces 83 cubic feet of runoff
[2] Assume volunteer rain garden installation @ 4.00 cf with 5% Design & Engineering
[3] Unit cost for different retrofit delivery programs (per house)
[4] Total cost for installation and delivery for 350 homes

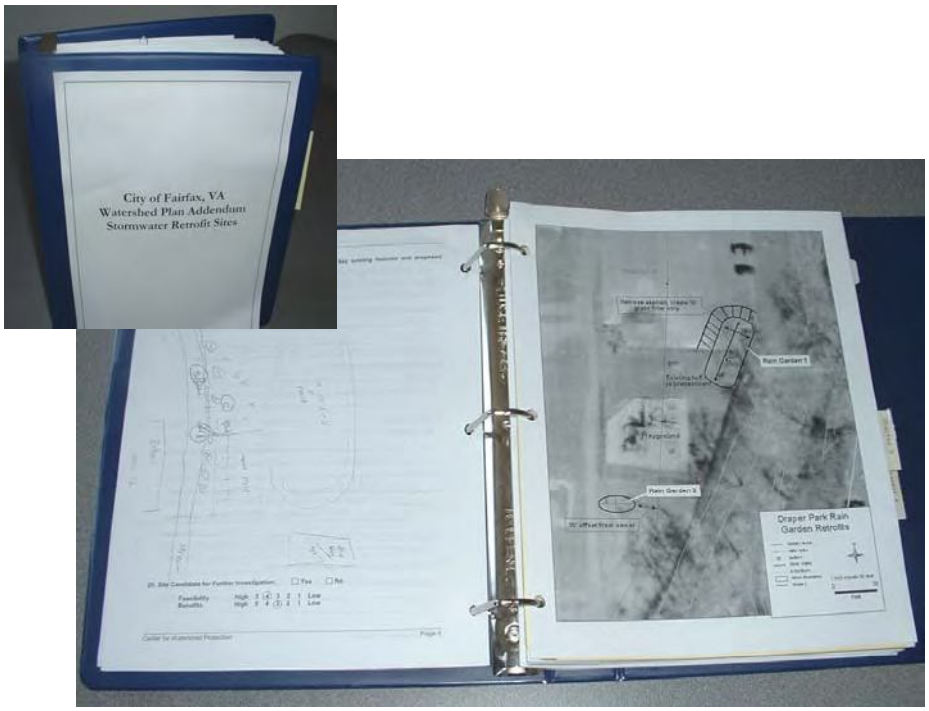

Figure 4.13: This binder was used to keep all completed retrofit forms, preliminary concept designs and a table of all retrofit sites visited.

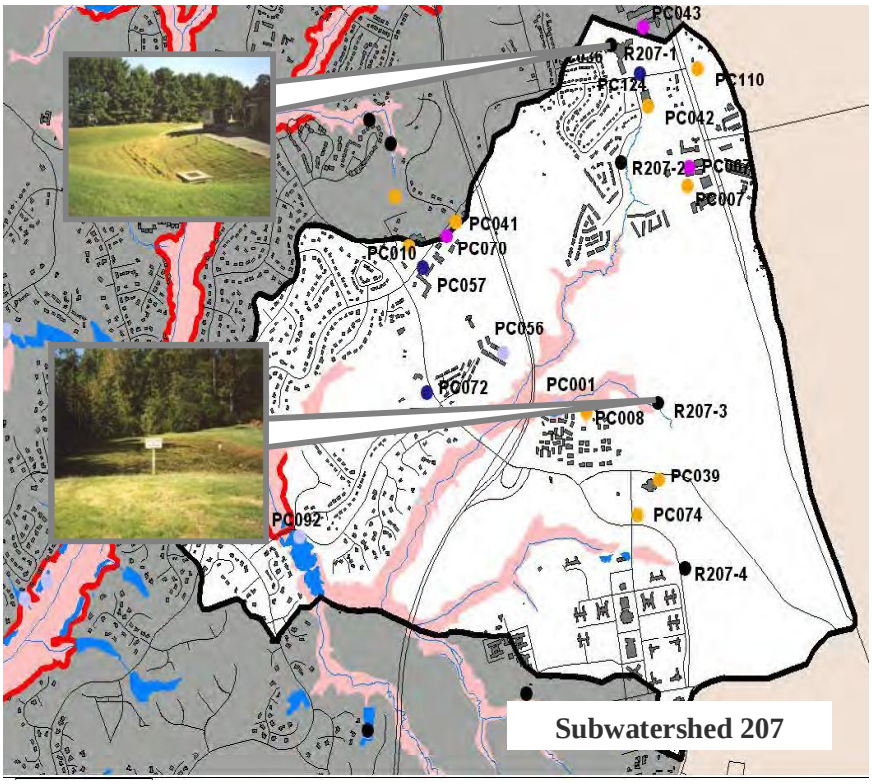

Figure 4.14: Example of a retrofit locator map created for a subwatershed retrofit archive.

Step 5: Rank the Proposed Retrofits

The next step involves prioritizing the best retrofits for future implementation. Since most communities have limited capital budgets for retrofit design and construction, they need a prudent and cost effective strategy to guide implementation. The ranking process involves three basic tasks:

5.1. Consult neighbors and stakeholders to get project input
5.2. Choose retrofit screening criteria
5.3. Create a retrofit priority list

Task 5.1 Consult Neighbors and Stakeholders to Get Project Input

Storage retrofits can significantly alter the local landscape, and neighbors and landowners often have many real or perceived concerns about retrofit practices. It is wise, therefore, to get neighborhood input before costly field surveys and engineering studies are performed for retrofits that may get dropped later because of community opposition.

Every storage retrofit recommended for final design and permitting should be presented to the public at least once. Residents who are informed in advance about the benefits of retrofitting are more likely to accept projects. Consequently, it is important to give them an early opportunity to comment on proposed retrofits and respond to their concerns prior to final ranking and project design. Some of the more common concerns residents express are that storage retrofits will:

- Result in the loss of existing trees
- Increase unwanted public access to their backyards
- Pose safety risks for children, such as drowning in deep pools
- Create mosquito breeding conditions and increase potential for West Nile Virus
- Attract vermin, snakes, or rats
- Produce ragweed and other plants that cause allergies
- Become a poorly maintained eyesore
- Cause noise and neighborhood disturbance during construction
- Detract from property values
- Eliminate an existing public or private use of open land
- Waste taxpayer money that could be spent elsewhere in the community

The retrofit team should anticipate these concerns and be ready to respond to them in an even-handed manner. Table 4.20 outlines common perceptions, realities and design responses for many common retrofit concerns. These objections should never be ignored or glossed over since many residents are already somewhat suspicious of local government.

Neighborhood consultation is normally scheduled in the evening to coincide with a regular homeowner or civic association meeting (Figure 4.15). The meetings should

Figure 4.15: Landowner concerns can be addressed during neighborhood consultation meetings.

clearly explain exactly what is being proposed, what will happen during construction, and what the retrofit will look like when finished. Subwatershed maps, project renderings, and photos of similar storage retrofits can all help show residents what to expect.

The meeting should also include a presentation on why retrofits are needed and the planning process that led to the proposed retrofit. Neighborhood meetings are also an excellent way to educate residents about neighborhood pollution sources, stewardship practices and available municipal stewardship services. Most of all, the meeting should be structured to give adjacent residents the opportunity to voice their concerns, issues and questions about the retrofit. Additional tips on conducting effective neighborhood consultation meetings can be found in Profile Sheet 19 in Manual 2.

Task 5.2 Choose Retrofit Screening Factors

The next task chooses the best combination of screening factors to compare individual retrofit project concept designs (see Table 4.21). The screening factors should allow a direct and fair comparison among both storage and on-site retrofits in a subwatershed. Next, a relative weight is assigned to each screening factor that reflects its perceived influence on retrofit project success. Then, the retrofit team then analyzes the range of scores among all retrofits to determine the scoring rules that will be used to award or deduct points from individual projects.

Task 5.3: Create Retrofit Priority List

The design team pulls pertinent information from the retrofit inventory to score individual retrofit projects according to the scoring system developed in the preceding task (Figure 4.16). Individual project scores are entered into a spreadsheet and totaled. Project scores are then ranked from highest to lowest to establish the retrofit priority list. High scoring projects should be double-checked to look for hidden "project killers." This occurs when a retrofit project has a high total score, but has a low or zero score for one or more individual screening factors (suggesting that it is hard to implement). Examples of stormwater retrofit ranking factors are provided in Table 4.22. The application of a scoring system to a hypothetical group of retrofit projects is shown in Table 4.23.

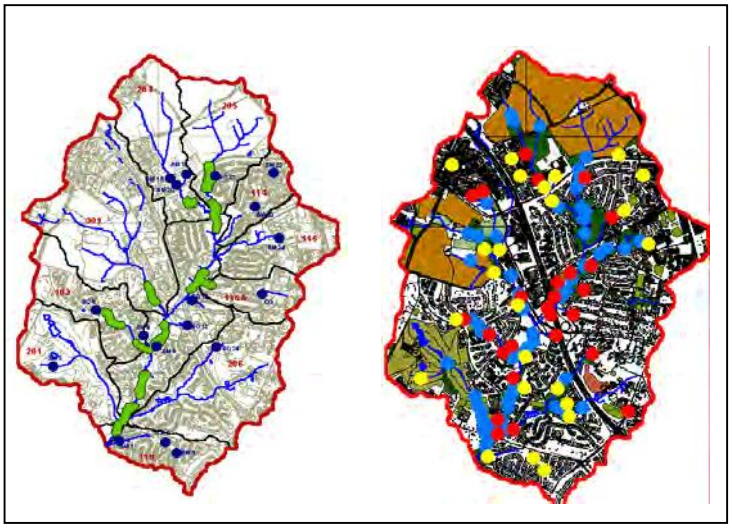

Figure 4.16: Scoring helps identify priority retrofit sites (left) from all potential retrofit sites visited (right)

Table 4.20: Perception, Reality, and Response to Common Neighborhood Concerns about Storage Retrofits

Perception	Reality	Potential Design Responses	Supporting Resources
Loss of Mature Trees	*High with poor retrofit layout*	Survey trees prior to layout…Fingerprint retrofit around mature tree…Specify tree protection measures during construction Reforest at least 2:1 for cleared trees.	Cappiella *et al*. (2006a)
Drowning	*Low: w/ proper design*	Use shallow wetlands rather than deep pool…Safety and aquatic benches around micropools and forebays…Side-slope controls in pond buffer...Fence sharp drop offs	Marcy and Flack (1981); Jones and Jones (1982); Eccher (1991)
Mosquitoes	*Low to Medium: depending on design*	Aquatic benches… Deeper pools … Stock w/ *Gambusia* if native…Avoid undersized retrofits…Avoid stagnation…Education about mosquito habitat…Regular maintenance including mosquito management….Mowing and removal of overgrown wetland vegetation	Schueler (1995b); Hunt and Lord (2006b); Hunt *et al*. (2005); Santana *et al* (1994); Ladd and Frankenburg (2003); Walton (2003)
Vermin (ticks, rats, snakes)	*Low*	Regular mowing of publicly used areas. Manage to grow into forest	Hunt and Lord (2006b) Cappiella *et al.* (2006b)
Odors	*Medium*	Avoid under-sized retrofits in residential areas…Keep constant inflows…Install aeration devices or fountains…Remove dead algae and rooted plants as part of maintenance…Increase pond depth	
Looks Ugly	*Low to Medium*	Pondscaping...Involve landscape architect in retrofit design…Irregular shorelines…Increase landscaping budget…Minimize concrete surfaces and paint risers…Tree conservation…Screening plantings…Reforestation	Schueler, 1992; MDE (2000); Echols and Pennypacker (2006); France (2003)
Vegetation Growth	*Medium*	Regular mowing…Allow trees to grow in pond buffer…Landscape maintenance contracts	Hunt and Lord (2006b)
Maintenance	*High*	Defined maintenance agreements…Designate retrofit in adopt-a-pond…Public maintenance	NVPDC (2000) and Sturm (2003), CWP (2004b)
Trash/Debris	*High*	Wetland benches…Annual shoreline cleanups…Enforcement of illegal dumping/littering	Hunt and Lord (2006b)
Property Values	*Low*	Well designed wet ponds and wetlands increase property value (dry ponds they replace decrease property value)	Emerling-DiNovo (1995); Land and Water (1996); Schueler (1995a)
Polluted Sediment	*Low*	Assess upland hotspot uses before design. Install pretreatment…Include spill containment…Offsite sediment disposal…Resident education…No swimming signs	Hey and Schaefer (1983); Dewberry and Davis (1990); Yousef and Lin (1990); Schueler (1994a)
Lost Community Uses	*Med to High*	Ask neighbors about how the parcel is used…Check out site on a weekend to see how it is being used	
Bad Neighbor	*Low*	Incorporate trails, interpretive signs, gazebos, benches and monitoring into the design	
Construction Issues	*Medium*	Incorporate measures into construction contracts…Weekday construction…Silence vehicle back-up alarms…Noise suppression enclosures on equipment…Close engine housing panels…Stringent ESC controls…Traffic and parking management	
Resident Geese	*Medium to High*	Minimize turf cover in retrofit buffer…Use stormwater wetland…Install aquatic benches…Place a grid of string across the pond to prevent easy landing…Let neighborhood dogs roam	Hunt and Lord (2006); Rodewald (2001) Schueler (1992)

Table 4.21: Examples of Potential Retrofit Screening Factors
Cost Per Treated Area: This screening factor expresses cost in terms of the acres of impervious cover treated by the retrofit, and is preferred to total construction cost since it allows storage and on-site practices to be directly compared.
Cost Per Pollutant Removed: If pollutant reduction is the primary retrofit objective, projects should be screened based on the relative cost to remove pollutants. This requires a little more analysis to compute pollutant loads delivered to the retrofit site using the methods in Appendix B and then adjusting them based on the expected pollutant removal rate for the retrofit.
Stream Channel Protection Capability: If stream channel protection is a primary retrofit objective, this factor rates how the retrofit will help to reduce channel erosion through either storage of the channel protection volume or runoff reduction.
Compatibility with Core Subwatershed Objective: This factor rates how well the proposed retrofit conforms to the core retrofitting objective for the subwatershed. Maximum points are awarded for retrofits that directly support all objectives (e.g., provide maximum removal of pollutant of concern). Fewer points are awarded for retrofits that only indirectly support subwatershed objectives, and no points are awarded if the retrofit does not address subwatershed objectives in a meaningful way.
Maintenance Burden: Retrofit projects differ greatly in their long-term maintenance burden. The long-term maintenance needs of each retrofit should be assessed and points deducted if vegetation management, sediment removal and clogging are expected to be problems. Points may also be deducted if maintenance is not clearly vested with a responsible party.
Landowner Cooperation: This screening factor rates the willingness of private or public landowners to allow the retrofit to be installed on their property. Points are deducted for projects where permission is uncertain, easements must be secured, or landowners are uncooperative.
Permitting Burden: Some retrofit projects require many different permits and approvals before ground can be broken. In many cases, permitting agencies may require special studies, impose costly permit conditions, or disapprove the project altogether. Points are deducted for projects subject to multiple permits or to a single difficult permit (e.g., wetlands disturbance).
Synergy with Other Restoration Practices: This factor evaluates whether the retrofit can be integrated with other restoration practices at the same site or stream reach to maximize restoration benefits. An example would be a storage retrofit located above a stream restoration project.
Neighborhood Acceptance: This factor ranks the community acceptance of the retrofit based on feedback from neighborhood consultation meetings. Points are deducted for controversial projects, or for situations where concerns are raised about safety, forest loss, aesthetics, public access, construction noise and impact on property values. Maximum points are awarded for projects that get enthusiastic neighborhood support and have prospects for actual community involvement during construction or maintenance.
Access: This factor assesses the ability to get heavy construction equipment to the retrofit site for construction and maintenance. Points are deducted for sites with steep or unstable side-slopes, where construction access disrupts neighbors, when significant tree clearing is required, or when easements for access or maintenance must be secured from a private landowner.
Use of Innovative Practices: Some retrofits are preferred because they utilize an innovative design or technology that has not yet been implemented in the community. These projects are often awarded extra points because of their demonstration value.
Partnership Opportunities: This screening factor awards points based on the number of potential restoration partners that may be involved in project implementation. Projects with many partners or a new partner are normally awarded more points since they can leverage resources available for future retrofits.
Public Visibility: This factor examines the visibility and potential education value of the proposed retrofit. Points are awarded for projects that have public access, experience heavy use, are linked to trails and bikeways or have opportunities for signage and education. Points are deducted for projects situated on private land, out of view or restricted or prohibited access.
Habitat Creation: This factor evaluates whether the retrofit can create new terrestrial or aquatic habitat features or connect existing habitat features. Maximum points are awarded for projects that emphasize wetland, vernal pool, forest, or in-stream habitat creation.
Other Community Benefits: This factor is a sort of grab bag that evaluates the retrofit with respect to any additional community benefits it may provide (recreation, increased property values, education, open space, trails, greenways, neighborhood revitalization, etc.).

Table 4.22: Example Stormwater Retrofit Ranking Criteria

Stormwater Retrofit Ranking Criteria (35 Total Points Possible)		Possible Points
1.	**Impervious Area Treated**	**5**
	Less than 100 acres	[1]
	101-250 acres	[3]
	Greater than 250 acres	[5]
2.	**Water Quality Target**	**10**
a.	**Runoff Depth Treated (inches per impervious acre)**	**5**
	Less than 0.25	[1]
	0.26 - 0.50	[3]
	0.51 - 1.00	[5]
b.	**TP Pollutant Load Reduction**	**5**
	Less than 20%	[1]
	21% to 49%	[3]
	50% or more	[5]
3.	**Planning Level Construction Cost (per acre of drainage area)**	**5**
	Greater than $10,001	[1]
	$5,00 to $10,000	[2]
	$2,501 to $5,000	[3]
	$1,001 to $2,500	[4]
	Less than $1,000/acre	[5]
4.	**Ownership**	**5**
	Assumed Private	[0]
	Public	[5]
5.	**Access**	**5**
	Poor	[1]
	Good	[3]
	Excellent	[5]
6.	**Project Visibility**	**5**
	Poor (site is on private property or cannot be seen from the street)	[1]
	Good (site adjacent to a street)	[3]
	Excellent (site adjacent to a highly traveled street or public property)	[5]

Table 4.23: Example Stormwater Retrofit Prioritization

ID	Ranking Factors														
	Impervious Area Treated		Runoff Depth Treated		Pollutant Load Reduction		Planning Level Cost		Ownership		Construction Access		Project Visibility		Total Points
	(ac)	(pts)	(in / imp ac)	(pts)	(adjusted RR)	(pts)	(per ac)	(pts)		(pts)		(pts)		(pts)	(pts)
R-17	2.9	1	0.5	3	55	5	$8,070	2	Public	5	Excellent	5	Excellent	5	**26**
R-03	413.3	5	0.5	3	15	1	$200	5	Private	0	Excellent	5	Excellent	5	**24**
R-08	0.3	1	0.5	3	65	5	$14,700	1	Public	5	Good	3	Excellent	5	**23**
R-02	2.7	1	1.0	5	35	3	$8,430	2	Private	0	Excellent	5	Excellent	5	**21**
R-16	6.5	1	0.5	3	60	5	$7,260	2	Private	0	Excellent	5	Excellent	5	**21**
R-18	159.8	3	0.5	3	10	1	$330	5	Private	0	Excellent	5	Good	3	**20**
R-06	11.7	1	1.0	5	15	1	$1,950	4	Private	0	Excellent	5	Good	3	**19**
R-04	264.2	5	0.1	1	40	3	$80	5	Private	0	Poor	1	Poor	1	**16**
R-05	7.0	1	1.0	5	60r	5	$15,000	1	Private	0	Good	3	Poor	1	**16**

Step 6: Conduct a Subwatershed Treatment Analysis

Subwatershed treatment is defined as the proportion of subwatershed area that is effectively treated by stormwater retrofits. In simple terms, it refers to the fraction of subwatershed area (or impervious area) served if all proposed retrofits are built. A Subwatershed Treatment Analysis (STA) evaluates whether the proposed combination of stormwater retrofits can achieve enough treatment to meet subwatershed restoration objectives. The STA requires the use of the Watershed Treatment Model (Caraco, 2001) or a similar model to estimate the reductions in the pollutant of concern. Detailed guidance on performing an STA is provided in Manual 2. The retrofit inventory should contain all of the information needed to support an STA, so it can be done in three short tasks.

Task 6.1 Compute Pollutant Removal by Storage Retrofits: This task computes the aggregate pollutant reduction achieved by individual retrofit projects at the subwatershed level. The pollutant removal estimates developed for the final concept designs can be directly inserted into the WTM to compute the cumulative benefit of the proposed suite of retrofits.

Task 6.2 Compute Pollutant Removal by On-site Retrofits: A similar approach is used to determine pollutant load reduction benefits for on-site retrofits. Once again, the design team consults the on-site retrofit concept designs, and estimates the total contributing drainage area treated in the subwatershed using the scaling methods outlined in Step 4. In some cases, a further discount in pollutant removal is needed to prevent double counting (e.g., on-site retrofit located above downstream storage retrofit).

Task 6.3: Compare Subwatershed Results to Restoration Objectives: The STA quickly computes whether the proposed suite of retrofits can achieved the pollutant reduction goals established in the scoping phase. In most cases, the initial list of priority retrofits will fall short of the mark. In this event, the team can re-prioritize retrofits, propose more retrofits (e.g., on-site retrofits), look for addition pollutant reductions via pollution source controls or discharge prevention, or revise subwatershed objectives.

An example of how to calculate an STA for a hypothetical watershed is shown in Figure 4.17. The community seeks to reduce pollutant load by 25% to restore an urban lake. The design team proposes retrofitting the 4.5 square mile subwatershed with four storage retrofits and on-site retrofits in one target neighborhood. The proposed retrofits capture drainage from 1,379 acres and treat 62% of subwatershed impervious cover. For

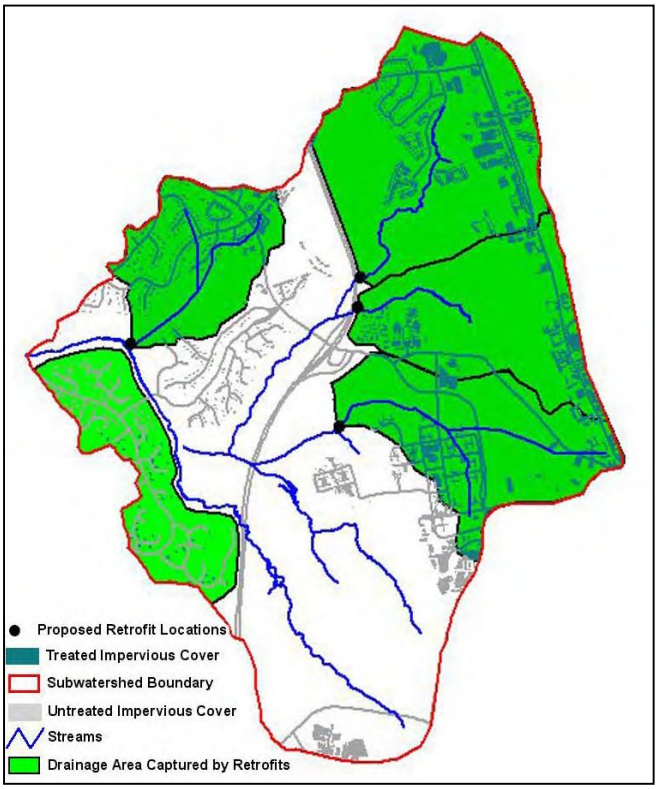

Figure 4.17: Subwatershed Treatment Analysis Example

each proposed retrofit, the drainage area, imperviousness, and pre-retrofit pollutant load were calculated, as shown in Table 4.24. The retrofit team then inserted adjusted removal rates based on the design point method for each individual retrofit project and performed an STA for the subwatershed as a whole. Based on the results, the team concluded that the proposed retrofits were capable of reducing pollutant loads by 251 lbs/yr. Given the total subwatershed loading of 789 lbs/yr, this produced an expected subwatershed pollutant reduction of about 32%, which exceeded the target reduction goal.

Step 7: Final Design and Construction

The final step of retrofit implementation involves design and actual construction. Costs involved in final design and permitting of storage retrofits may range from 32 to 50% of base construction cost.

The process of constructing a retrofit involves five tasks:

7.1 Secure Environmental Permits
7.2 Obtain Landowner Approvals and Easements
7.3 Perform Special Engineering and Surveying Work to Support Design
7.4 Put Together the Design Package
7.5 Contract and Construction Management

Task 7.1 Secure Environmental Permits

Permitting issues for storage retrofits can involve impacts to existing wetlands, forests and floodplains. Table 4.25 provides a summary of typical surveys needed for environmental permits. While good designers try to avoid or minimize impacts, some are unavoidable to meet reasonable storage targets. Permitting agencies will scrutinize the project to make sure impacts are minimized and are clearly outweighed by the expected environmental benefits of the proposed retrofit. Designers should take a step back and be their own worst critic – this is often when ethical designers choose to walk away from a proposed retrofit because it may do more harm than good. Designers will always need to use their best professional judgment to balance potential impacts that are hard to predict against the benefits to be provided by the retrofit.

Table 4.24: Computation of Storage and On-Site Retrofits

Unique Site ID	Stormwater Treatment Option	Drainage Area (acres)	Pre-Retrofit Pollutant Loading (lbs./year)	Median Pollutant Removal Efficiency (%)	Design Points	Adjusted Removal Efficiency (%)	Pollutants Removed (lbs)
R-1	Extended Detention	231	86.7	20	+ 1	25	21.7
R-2	Wet Pond	333	138.2	50	-3	40	55.3
R-3	Constructed Wetlands	485	214.0	50	+ 5	75	160.5
R-4	Extended Detention	325	27.0	20	+ 3	40	10.8
OS-1	Bioretention rain gardens at 50 houses	3.8	8.9	65	-1	30	2.7
	Untreated	1501	314	-	-	-	0
Total		2878	789				251 (32%)

Task 7.2 Obtain Landowner Approval and Easements

The retrofit team should never underestimate the time and effort involved in getting approvals to proceed with retrofit construction (Table 4.26). Approval issues are magnified when a retrofit is located on private property, or when easements must be secured for construction or maintenance access. Approvals are somewhat more manageable when the retrofit is located on public land, but still require a great deal of interagency coordination and negotiation. Most owners want to know the long-term maintenance arrangements for the retrofit and who will be the maintainer.

If property ownership or boundaries are in doubt, the designer should check with the local planning authority on plat requirements and review procedures and hire a survey crew to document property boundaries. Designers should not assume that property owners will be willing retrofit partners. Owners may need to be educated about retrofit benefits and offered some incentives to gain approval.

Task 7.3 Perform Special Engineering and Surveying Work to Support Design

A number of special engineering studies and field surveys are needed to directly support final design of retrofit projects. The exact type and number of surveys depends on the complexity of the retrofit and site conditions. While these studies increase overall costs for project design, they help the designer anticipate potential construction problems, secure needed approvals, and ensure proper retrofit function. Some common engineering studies and field surveys associated with storage retrofits are shown in Table 4.27.

Task 7.4 Put Together the Design Package

Final design translates the retrofit concept into a construction drawing and specifications (Figure 4.18). Designers assemble a final design package, attached secured permits and approvals, and prepare bid documents to construct the retrofit project. The design package for retrofit projects incorporates the same elements used to construct stormwater projects at new development sites, including:

- Hydrologic and hydraulic modeling computations
- Detailed topographic mapping
- Property line establishment
- Site grading and earthwork estimates
- Structural design
- Geotechnical investigations
- Erosion and sediment control plans
- Construction sequencing and staging
- Planting plans
- Bid specifications

Table 4.25: Typical Environmental Permits Needed for Storage Retrofits

Permits	SR-1 Pond	SR-2 Culvert	SR-3 Outfall	SR-4 Conveyance	SR-5 ROW	SR-6 Parking Lot
Wetland delineation	⦿	●	⦿	●	⦿	○
Wetland functional assessment	⦿	⦿	⦿	⦿	⦿	○
404 wetland permit	⦿	●	⦿	⦿	⦿	○
Forest stand delineation	⦿	●	⦿	⦿	⦿	⦿
Forest inundation analysis	⦿	●	⦿	○	○	○
Forest conservation permit	⦿	●	⦿	⦿	○	⦿
Fish passage survey	⦿	●	○	○	○	○
Section 401 WQC Permit	●	●	●	⦿	⦿	⦿
Floodplain alteration permit	⦿	⦿	●	⦿	○	○
Dam safety review permit	●	●	⦿	○	○	○
Local ESC Permit	●	●	●	●	●	●

Key: ● Frequently needed; ⦿ Sometimes needed; ○ Seldom needed

Table 4.26: Key Approvals and Easements for Storage Retrofits

Approval or Easement	SR-1 Pond	SR-2 Culvert	SR-3 Outfall	SR-4 Conveyance	SR-5 ROW	SR-6 Parking Lot
Local SWM review	●	●	●	●	●	●
Highway approval	⦿	●	⦿	⦿	●	⦿
Park authority approval	○	⦿	⦿	⦿	○	⦿
Access easements	●	●	●	⦿	⦿	⦿
Expanded drainage easements	⦿	⦿	⦿	⦿	⦿	⦿
Maintenance escrow	⦿	⦿	⦿	⦿	⦿	⦿
Neighborhood consultation	●	⦿	⦿	●	○	⦿
Landowner notification	●	⦿	⦿	●	⦿	●

Key: ● Frequently needed; ⦿ Sometimes needed; ○ Seldom needed

Table 4.27: Special Engineering and Survey Work to Support Storage Retrofit Design

Engineering or Survey Work	SR-1 Pond	SR-2 Culvert	SR-3 Outfall	SR-4 Conveyance	SR-5 ROW	SR-6 Parking Lot
Updated land cover in CDA	●	●	⦿	⦿	⦿	○
Soil borings	●	●	●	●	●	●
Soil infiltration testing	○	○	⦿	⦿	⦿	⦿
Soil depth to groundwater	●	●	●	●	⦿	⦿
Site topo survey (1 ft)	●	●	●	●	●	●
Spot elevations and inverts	●	●	●	●	●	●
Hydraulic cross section of upstream channels/pipe	⦿	⦿	⦿	⦿	⦿	○
Tailwater/backwater analysis	⦿	⦿	●	⦿	⦿	○
Floodplain analysis	⦿	⦿	⦿	⦿	○	○
Dam hazard analysis	●	⦿	○	○	○	○
Culvert capacity	○	●	○	⦿	○	○
Downstream channel stability	⦿	●	⦿	●	⦿	⦿
Easement research	●	⦿	⦿	●	⦿	●
Utility surveys	●	●	●	●	●	●
Traffic studies	○	⦿	○	○	●	⦿
Parking demand studies	○	○	○	○	○	●
Discharge investigation	⦿	⦿	●	⦿	○	○
As-built conditions	⦿	⦿	⦿	⦿	⦿	⦿
Existing H&H routing	●	●	○	⦿	○	○
Upstream geomorphology	○	⦿	○	○	○	○
Downstream geomorphology	⦿	●	○	●	○	○
Water balance analysis	⦿	○	⦿	○	○	○

Key: ● Frequently needed ⦿ Sometimes needed ○ Seldom needed

Retrofits often involve a host of special construction considerations that should be reflected in the design package. Some common construction issues are described in Table 4.28, and in the retrofit profile sheets presented in Chapter 2.

Task 7.5 Contract and Construction Management

There are three basic approaches to moving a retrofit project into the construction phase:

- *In-House Construction Crews:* Use crews from public works, transportation, or parks departments to construct the retrofit.
- *Bid As A "Retrofit-Only" Project:* One or a group of retrofits can be packaged for bidding, so that the contractors are only bidding on the actual retrofit work.
- *Bundle Retrofits With Larger Project:* Retrofits can be put into a bigger construction package for road work, parking lot improvement, school or park renovations, drainage projects, etc.

The pros and cons of each approach are outlined in Table 4.29.

The main issue for a local program is to institutionalize retrofit construction, so that the effort can be sustained over a long time period. In that regard, all three approaches may be important for a successful local program. Also, the retrofit team should become familiar with local and state procurement procedures, and find the most efficient ways to move projects from the drafting board to the site.

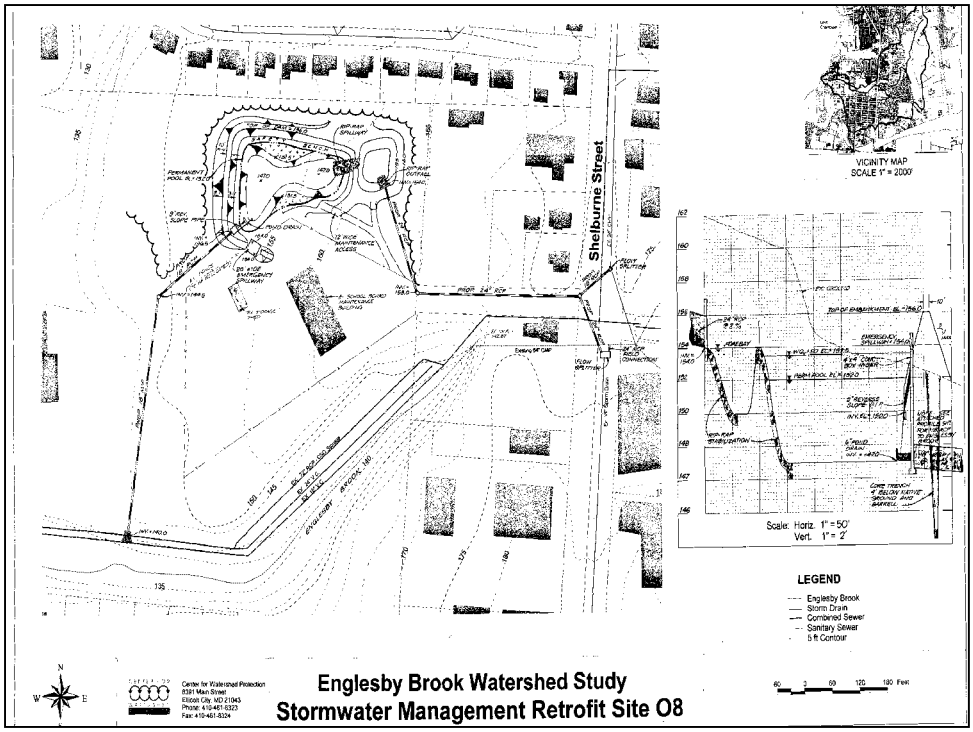

Figure 4.18: Construction drawings and specifications are part of the final retrofit design package

Table 4.28: Special Construction Considerations for Storage Retrofits

Construction Issue	SR-1 Pond	SR-2 Culvert	SR-3 Outfall	SR-4 Conveyance	SR-5 ROW	SR-6 Parking Lot
Temporary Stockpiling	●	◉	◉	●	●	●
Tight Construction Staging	●	●	◉	●	●	◉
Dewatering / Pumping	●	●	●	◉	○	○
Temporary SW Diversion	●	●	◉	◉	○	○
In-Stream ESC work	○	●	◉	◉	○	○
Traffic Barriers/Management	○	●	○	○	●	●
Fencing to Exclude Public	●	◉	◉	◉	◉	●
Flow Splitter Inspection	○	○	●	◉	◉	◉
Retrofit Equipment Washout	◉	●	◉	●	○	○
Off-Site Hauling	●	●	●	●	◉	◉
Utility Marking	●	◉	◉	◉	●	●
Specialized Equipment	◉	●	●	●	●	○

Key: ● Frequent problem; ◉ Sometimes a problem; ○ Seldom a problem

Step 8: Inspection, Maintenance and Evaluation

Stormwater retrofitting is a continuous process, given that maintenance responsibility lasts throughout the entire life of the retrofit practice. Construction inspection, and retrofit evaluation tasks are all essential to ensure that it functions properly over its design life.

Task 8.1 Construction Inspection

Construction inspections are critical, since retrofits involve unique design elements on highly constrained sites. Contractors may also not be familiar with specialized construction techniques or innovative retrofit practices. Therefore, designers should frequently inspect the retrofit throughout the construction process, answering contractor questions, approving design field modifications, holding regular progress meetings, conducting construction testing, and reviewing construction records.

A final construction inspection is needed prior to completion of the as-built certification (Figure 4.19). If improvements are needed, inspectors compile a punchlist for the contractor of items to correct. As-built certification ensures the retrofit installation is constructed according to construction plans, and is a useful resource for future maintenance inspections.

Table 4.29: Pros and Cons of Different Ways to Secure Construction		
Approach	**Pros**	**Cons**
1. In-House Crews	• Cost-effective • Allows for on-the-job training of local staff • Spreads retrofit understanding and ethic across organization	• Usually takes longer • Crews may not have access to needed equipment • Specialized skills may be lacking • Can be difficult to secure time and resources to get job done – routine tasks need to be deferred
2. Bid as Retrofit-Only	• Can attract specialized and skilled contractors interested in stormwater work • Can proceed at its own schedule • For smaller projects, procurement procedures can be simpler	• Often difficult to get reasonable bids on small, specialized, or unfamiliar work • Inefficient in terms of mobilization and construction tasks • Often requires same level of project management as larger projects
3. Bundle Retrofit With Larger Project	• Can be efficient way to secure construction • Leverages skills and resources of capital projects staff • Best way to get reasonable bid	• Must negotiate "add-on" to budgets that are usually tight • Selected contractor may be unfamiliar with retrofit work • Schedule is subject to vagaries of larger project • Retrofit component may not be priority for local CIP inspectors

Figure 4.19: A final inspection is needed to identify and correct any problems before as-built certification

Task 8.2 Retrofit Maintenance

Successfully retrofit programs plan and budget for future retrofit maintenance. The public and key restoration partners normally have high expectations that the appearance of retrofits installed on public land will be kept up. At the same time, retrofits normally require more frequent maintenance compared to new stormwater practices for several reasons. First, many retrofits tend to be slightly undersized and may require more frequent cleanout. Also, since space is at a premium, maintenance access and staging can be complicated. Lastly, retrofits often contain design features such as flow splitters, pretreatment cells and overflows that are prone to clogging. Therefore, communities will need to explicitly define how their retrofits will be maintained over time. Excellent guidance on developing an effective local maintenance program can be found in CWP (2007).

When retrofits become part of public stormwater infrastructure, communities need to take the several steps to ensure their future performance and longevity:

- Develop a specific maintenance plan for each retrofit that contains specific maintenance tasks, schedules and vendors, and clearly outlines any third party responsibilities.
- Perform annual retrofit maintenance inspections
- Create and maintain a retrofit tracking system to store essential information on the design, construction and maintenance history of individual retrofits.
- Allocate at least 15% of the retrofit capital budget for ongoing maintenance.
- Retain a maintenance call contractor so the community can quickly respond to unexpected or chronic retrofit maintenance problems.
- Train municipal maintenance crews on unique maintenance and vegetation management practices associated with retrofits on golf courses, parks, highways and municipal lands.
- Consider an on-going education program to remind homeowners on how to maintain their retrofits that may have been subsidized by the community.

Task 8.3 Retrofit Project Evaluation

Every stormwater retrofit is an experiment – designers need to measure whether the retrofit projects they build are really working as designed. Two approaches can be used to monitor the performance of retrofit practices. The first approach is a simple visual assessment of the structural or vegetative integrity of a group of retrofits, whereas the second approach seeks to measure the pollution removal performance associated with an individual retrofit (see Manual 2).

The visual assessment approach involves inspecting groups of retrofits to assess their function, longevity, and survival over time. This may include inspections of hydraulic performance and physical integrity, survival of the aquatic plant community, or potential impacts to the upland plant community. The visual assessments provide key performance data to improve future retrofit design and construction.

Performance monitoring relies on intensive stormwater monitoring of individual retrofits to sample their pollutant removal capability. This may be measured directly through storm sampling of pollutant mass into and out of the retrofit, or indirectly through sampling of pollutant accumulation in bottom sediments.

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3 Urban Stormwater Retrofit Practices

Appendices

August 2007

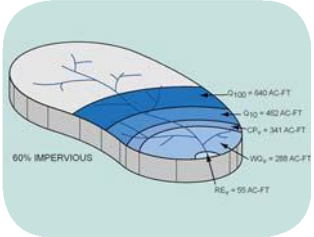

Center for Watershed Protection

Manual 3

Appendix A: Retrofit Reconnaissance Investigation Form and Retrofit Field Guide Template

WATERSHED:	SUBWATERSHED:	UNIQUE SITE ID:	
DATE:	ASSESSED BY:	CAMERA ID:	PICTURES:
GPS ID:	LMK ID:	LAT:	LONG:

SITE DESCRIPTION

Name:_____
Address:_____

Ownership: ☐ Public ☐ Private ☐ Unknown
If Public, Government Jurisdiction: ☐ Local ☐ State ☐ DOT ☐ Other:_____

Corresponding USSR/USA Field Sheet? ☐ Yes ☐ No If yes, Unique Site ID:_____

Proposed Retrofit Location:

Storage
- ☐ Existing Pond
- ☐ Above Roadway Culvert
- ☐ Below Outfall
- ☐ In Conveyance System
- ☐ In Road ROW
- ☐ Near Large Parking Lot
- ☐ Other:_____

On-Site
- ☐ Hotspot Operation
- ☐ Individual Rooftop
- ☐ Small Parking Lot
- ☐ Small Impervious Area
- ☐ Individual Street
- ☐ Landscape / Hardscape
- ☐ Underground
- ☐ Other:_____

DRAINAGE AREA TO PROPOSED RETROFIT

Drainage Area ≈ _____
Imperviousness ≈ _____%
Impervious Area ≈ _____

Notes:

Drainage Area Land Use:
- ☐ Residential
  - ☐ SFH (< 1 ac lots)
  - ☐ SFH (> 1 ac lots)
  - ☐ Townhouses
  - ☐ Multi-Family
- ☐ Commercial
- ☐ Institutional
- ☐ Industrial
- ☐ Transport-Related
- ☐ Park
- ☐ Undeveloped
- ☐ Other:_____

EXISTING STORMWATER MANAGEMENT

Existing Stormwater Practice: ☐ Yes ☐ No ☐ Possible
If Yes, Describe:

Describe Existing Site Conditions, Including Existing Site Drainage and Conveyance:

Existing Head Available and Points Where Measured:

PROPOSED RETROFIT

Purpose of Retrofit:
☐ Water Quality ☐ Recharge ☐ Channel Protection ☐ Flood Control
☐ Demonstration / Education ☐ Repair ☐ Other:_____

Retrofit Volume Computations - Target Storage:

Retrofit Volume Computations - Available Storage:

Proposed Treatment Option:
☐ Extended Detention ☐ Wet Pond ☐ Created Wetland ☐ Bioretention
☐ Filtering Practice ☐ Infiltration ☐ Swale ☐ Other:_____

Describe Elements of Proposed Retrofit, Including Surface Area, Maximum Depth of Treatment, and Conveyance:

SITE CONSTRAINTS

Adjacent Land Use:
☐ Residential ☐ Commercial ☐ Institutional
☐ Industrial ☐ Transport-Related ☐ Park
☐ Undeveloped ☐ Other:_____

Possible Conflicts Due to Adjacent Land Use? ☐ Yes ☐ No
If Yes, Describe:

Access:
☐ No Constraints
Constrained due to
☐ Slope ☐ Space
☐ Utilities ☐ Tree Impacts
☐ Structures ☐ Property Ownership
☐ Other:_____

Conflicts with Existing Utilities:
☐ None
☐ Unknown

Yes	Possible	
☐	☐	Sewer
☐	☐	Water
☐	☐	Gas
☐	☐	Cable
☐	☐	Electric
☐	☐	Electric to Streetlights
☐		Overhead Wires
☐	☐	Other:_____

Potential Permitting Factors:

Dam Safety Permits Necessary	☐ Probable	☐ Not Probable
Impacts to Wetlands	☐ Probable	☐ Not Probable
Impacts to a Stream	☐ Probable	☐ Not Probable
Floodplain Fill	☐ Probable	☐ Not Probable
Impacts to Forests	☐ Probable	☐ Not Probable
Impacts to Specimen Trees	☐ Probable	☐ Not Probable

How many?_____
Approx. DBH_____

Other factors:_____
_____

Soils:

Soil auger test holes:	☐ Yes	☐ No
Evidence of poor infiltration (clays, fines):	☐ Yes	☐ No
Evidence of shallow bedrock:	☐ Yes	☐ No
Evidence of high water table (gleying, saturation):	☐ Yes	☐ No

Unique Site ID:_____

054760

SKETCH

Unique Site ID:_____

DESIGN OR DELIVERY NOTES

FOLLOW-UP NEEDED TO COMPLETE FIELD CONCEPT

- ☐ Confirm property ownership
- ☐ Confirm drainage area
- ☐ Confirm drainage area impervious cover
- ☐ Confirm volume computations
- ☐ Complete concept sketch
- ☐ Obtain existing stormwater practice as-builts
- ☐ Obtain site as-builts
- ☐ Obtain detailed topography
- ☐ Obtain utility mapping
- ☐ Confirm storm drain invert elevations
- ☐ Confirm soil types
- ☐ Other:_____

INITIAL FEASIBILITY AND CONSTRUCTION CONSIDERATIONS

SITE CANDIDATE FOR FURTHER INVESTIGATION:	☐ YES	☐ NO	☐ MAYBE
IS SITE CANDIDATE FOR EARLY ACTION PROJECT(S):	☐ YES	☐ NO	☐ MAYBE
IF NO, SITE CANDIDATE FOR OTHER RESTORATION PROJECT(S):	☐ YES	☐ NO	☐ MAYBE

IF YES, TYPE(S):_____

Unique Site ID:_____

THIS RRI FIELD GUIDE TEMPLATE SHOULD BE COMPLETED WITH LOCAL DATA AND ADAPTED TO MEET THE NEEDS OF LOCAL RETROFIT FIELD CREWS

UNIQUE SITE ID NOMENCLATURE GUIDANCE

Unique Site ID = Subwatershed Acronym –Sequential Number

Subwatershed Name	Subwatershed Acronym

Investigation Type	Acronym
Retrofit Reconnaissance Investigation	R

Sequential Numbering begins at "1" for each subwatershed

DELINEATING DRAINAGE AREA AND ESTIMATING CURRENT IMPERVIOUS COVER

Simple Pipe – Drainage Area Ratios	
Pipe Diameter (inches)	**Drainage Area (approx. acres)**
6	0.1 to 1
12	1 to 2
24	2 to 5
36	5 to 25
48	25 to 100
60	100 to 200

Land Use / Impervious Cover Relationships	
Land Use Category	**Impervious Cover (%)**
Agriculture	1.9
2 Acre Lot Residential	10.6
1 Acre Lot Residential	14.3
½ Acre Lot Residential	21.2
1/4 Acre Lot Residential	27.8
1/8 Acre Lot Residential	32.6
Townhome Residential	40.9
Multifamily Residential	44.4
Light Industrial	53.4
Commercial	72.2

RETROFITTING OBJECTIVES

Core Retrofitting Objectives:	
Designated Pollutant(s) of Concern:	
Type of Storage Needed:	

Event	Depth (inches)
Water Quality Storm	
Minimum Water Quality Depth (“walkaway” volume)	
Runoff Reduction Depth	
1-year 24-hour Storm (channel protection)	

Event	Depth (inches)
2-year 24-hour Storm	
10-year 24-hour Storm	
100-year 24-hour Storm	

PREFERRED STORMWATER TREATMENT OPTIONS

Ability of Stormwater Treatment Options to Address Retrofit Objectives

Retrofit Objective	Stormwater Treatment Option							
	Extended Detention	Wet Ponds	Wetlands	Bioretention	Filtering	Infiltration	Swales	Other
Correct Past Mistakes	●	●	●	●	⦿	●	●	⦿
Reduce Flood Damage	●	●	●	○	○	⦿	○	○
Education / Demonstration	⦿	⦿	●	●	●	●	●	●
Trap Trash & Floatables	●	●	●	⦿	●	○	○	○
Reduce Flows to Combined Sewer	⦿	○	⦿	●	○	●	⦿	●
Renovate Stream Corridor	⦿	●	●	●	○	⦿	⦿	○
Reduce Bank Erosion	●	⦿	⦿	⦿	○	⦿	⦿	⦿
Support Stream Repair	●	⦿	●	⦿	⦿	●	⦿	○
Full Watershed Restoration	●	●	●	●	●	●	●	●

KEY
● = Primary stormwater treatment option to address objective
⦿ = Secondary stormwater treatment option
○ = Supplemental stormwater treatment option

Comparison of Pollutant Removal Capability

Stormwater Treatment Option	Stormwater Pollutant						
	TSS	TP	TN	Metals	Bacteria	Organic Carbon	Oil & Grease
Extended Detention	⦿	X	○	○	○	X	⦿
Wet Ponds	●	⦿	○	⦿	⦿	○	⦿
Wetlands	⦿	⦿	○	○	⦿	X	●
Bioretention	⦿	X	○	●	●	⦿	●
Filtering	●	⦿	○	⦿	⦿	⦿	●
Infiltration	●	⦿	○	●	?	●	●
Swales	●	X	○	⦿	X	⦿	●
Rooftop	*Varies*						

KEY
● = Excellent Removal (76 to 100%)
⦿ = Good Removal (51 to 75%)
○ = Fair Removal (26 to 51%)
X = Low Removal (0 to 25%)
? = Unknown Removal

NOTES
See Profile Sheets in Chapter 2 for precise removal rates and ranges and Appendix B for documentation on derivation of removal rates

COMPUTING THE RETROFIT STORAGE VOLUME

The ***water quality target volume*** can be determined using the following equation:

$$V_t = P/12 * Rv * DA$$

Where:
- V_t = Target storage volume (acre feet)
- P = Target rainfall depth (in inches for the 90% storm)
- Rv = Runoff coefficient = 0.05 + 0.009 (IC)
- DA = Drainage area (acres)
- 12 = Conversion factor (inches to feet)

To calculate ***channel protection target volume***, use the following equation:

$$V_t = P/12 * IC/100 * DA * 0.6$$

Where:
- V_t = Target storage volume (acre feet)
- P = 1-year 24-hour storm depth (inches)
- IC = Impervious cover (%)
- DA = Drainage area (acres)
- 12 = Conversion factor (inches to feet)
- 0.6 = Pond routing factor

COMPUTING AVAILABLE RETROFIT STORAGE

For ponds and wetlands, use the following simplified equation to estimate available storage:

$$V_{av} = 2/3 * d * SA$$

Where:
- V_{av} = Available storage at the site (acre-feet)
- SA = Surface area of the facility (acres)
- d = Estimated max depth (feet)
- 2/3 = Average volume factor

For other stormwater treatment options, available storage can be estimated based on the typical surface area or depth requirements of different stormwater treatment options:

Drainage Area – Surface Area Relationships		
Stormwater Treatment Option	**% of Contributing Drainage Area**	**Average Depth (ft)**
Dry ED Ponds	1 to 3%	6
Wet Pond	1 to 3%	6
Constructed Wetland	3 to 5%	2
Bioretention	5 to 10%	1-2
Sand Filters	0 to 5%	2
Infiltration	0 to 5%	1-2
Swales	5 to 15%	2
Filter Strips	5 to 15%	1
Other Retrofits	**Sizing Considerations**	**Average Depth (ft)**
Dry wells	Each dry well can treat 500 sf of roof	1
Rain barrel (50 gal)	Max area draining to rain barrel 500 sf	3-5
Cistern (500 gal)	Max area draining to cistern 1000 sf	5-10
Planter boxes	Max area draining to box 15,000 sf	1.0
Green roofs	1 to 1 ratio of impervious area treated	0.5
Permeable pavers	1 to 1 ratio of impervious area treated	0
Rain gardens	10% of rooftop area	1

MINIMUM SETBACKS

Minimum Distance… *	To Be Maintained From…
10 feet	Property Line
25 feet	Building Foundation
100 feet	Septic System Fields
100 feet	Private Well
1,200 feet	Public Water Supply Well
400 feet	Surface Drinking Water Source
100 feet	Surface Water
Do not submerge	Sewer Line
10 feet	Dry Utilities
15 feet	Overhead Wires
10 feet	Road (Seepage)
30 feet	Highway
*** Confirm that these common setbacks are consistent with local regulations**	

EMERGENCY CONTACT INFORMATION

Field Crew #1 cell phone:	
Field Crew #2 cell phone:	
Fire, non-emergency:	
Police, non-Emergency:	
Illegal dumping hotline:	
Blocked storm drain inlet or pipe:	
Erosion or drainage problems on private property:	
Erosion or drainage problems on public property:	
Sanitary sewer problems:	
Sediment from construction site entering stream:	
Septic leaks / septic tanks:	
Stormwater pond safety or maintenance issue:	
Swimming pool discharge:	
Trash and debris in parks and streams:	
Water main break:	

Appendix B: Defining Retrofit Pollutant Load Reduction

Appendix B: Defining Retrofit Pollutant Load Reduction

I. The Simple Method

The Simple Method estimates the annual pollutant load exported in stormwater runoff from small urban catchments (Schueler, 1987). The Simple Method sacrifices some precision for the sake of simplicity and ease of use, but is a reasonably accurate way to predict the pollutant load reduced by individual stormwater retrofits. The annual pollutant load exported in pounds per year from the contributing drainage area to a retrofit can be determined by solving the equation provided in Table B.1. Each of the terms in the equation can be extracted from data contained in a retrofit concept design.

Depth of Rainfall (P)

P represents the depth of precipitation that falls on the contributing drainage area of the retrofit site during the course of a normal year. Annual rainfall data for select U.S. cities can be obtained from Table 1.2 or derived from local rainfall gages with reliable, long-term (> 20 years) records.

Correction Factor (P_j)

Some of the storms that occur during a given year are so minor that they generate no stormwater runoff. The rainfall from these small storms produce is stored in surface depressions and either evaporates into the air or infiltrates into the ground. To account for these storms, the correction factor (P_j) is used. The design team can analyze local rainfall-runoff patterns to determine the value of P_j or simply use prior analyses from the Washington DC area that indicate Pj is approximately 10% of the annual rainfall depth (Schueler, 1987). The default value for P_j should be 0.9 unless local rainfall-runoff analyses are available.

Runoff Coefficient (R_v)

The runoff coefficient (R_v) is a useful measure of a development site's response to rainfall events. In theory, it is calculated using the equation provided in Table B.2.

Table B.1: Pollutant Load Export Equation

$$L = [(P)(Pj)(Rv) \div (12)^a](C)(A)(2.72)^a$$

Where:
L = Average annual pollutant load (pounds)
P = Average annual rainfall depth (inches)
P_j = Fraction of rainfall events that produce runoff
R_v = Runoff coefficient, which expresses the fraction of rainfall that is converted into runoff
C = Event mean concentration of the pollutant in urban runoff (mg/l)
A = Area of the contributing drainage (acres)

[a] 12 and 2.72 are unit conversion factors

Table B.2: The Runoff Coefficient
$R_v = R/P$ Where: R = Volume of storm runoff (watershed-inches) P = Volume of storm rainfall (watershed-inches)

The designer is trying to solve the equation for R and does not know the value of R_v. A study of rainfall/runoff relationships for many small watersheds across the U.S. showed that R_v has a distinctly linear relationship with impervious cover (Schueler, 1987). The runoff coefficient increases in direct proportion to the percent impervious cover (I) present in a catchment. The resulting equation shown in Table B.3 can be used to estimate R_v for the contributing drainage area to a retrofit site.

Site Area (A)

The contributing drainage area (A, in acres) can be directly obtained from the drainage area provided in the retrofit concept plan.

Table B.3: Calculating the Runoff Coefficient
$R_v = 0.05 + 0.009(I)$ Where: I = The amount of impervious cover on the site, expressed as a percentage of the total site area. "I" should be expressed as a whole number within the equation (i.e. a site that is 75% impervious would use I = 75 when calculating R_v)

Pollutant Concentration (C)

The last input data needed is the event mean concentration (EMC) of the stormwater pollutant of concern (C) for the retrofit site. Ideally, local stormwater quality monitoring data would be used to define the value of C, although such data may not be available. As an alternative, designers can consult national stormwater quality monitoring databases that define event mean concentration statistics derived from a large population of runoff monitoring samples. The National Stormwater Quality Database (NSQD) is an extremely helpful tool to define expected EMCs for a wide range of different stormwater pollutants (Pitt *et al.*, 2004). Table B.4 summarizes EMCs for more than 20 common stormwater pollutants in runoff from residential, commercial, industrial, roadway and open space land uses. An updated NSQD is scheduled for release in late 2007.

Some designers may want to choose an alternative EMC value to represent a particular stormwater hotspot or because an on-site retrofit serves a single urban source area. While much less monitoring data is available to characterize hotspot runoff, some of the published data significantly depart from the EMC values predicted by the NSQD. Designers may wish to consult Table B.5 in these situations.

<u>Proper Use of the Simple Method</u>

Several caveats should be observed when applying the Simple Method:

- The Simple Method provides an estimate of the stormwater pollutant load exported from individual retrofit sites less than one square mile in area. More sophisticated water quality simulation models are needed to analyze larger drainage areas.

- It is important to remember that the Simple Method do not represent the total pollutant load exported from a retrofit site, particularly when the contributing drainage area is large enough to generate

appreciable baseflow. The baseflow pollutant load can safely be neglected at the scale of a retrofit site, until the contributing drainage area exceeds about a hundred acres. For example, in a large, sparsely developed subwatershed (e.g. impervious cover of less than 5%), as much as 75% of the annual storm water runoff volume may occur as baseflow instead of surface runoff (Schueler, 1987). In this case, the pollutant load carried by baseflow may be equivalent to the amount of pollution carried by surface runoff.

Table B.4: Summary of Pollutant EMCs in Stormwater Runoff

	All Data	Residential	Commercial	Industrial	Freeways	Open Space
# of Storms Sampled	*3,765*	*1,042*	*527*	*566*	*185*	*49*
Median Event Mean Concentrations (mg/L or ppm, except where noted)						
TDS	80	72	72	86	77.5	125
TSS	59	49	43	81	99	48.5
BOD_5	8.6	9.0	11.0	9.0	8.0	5.4
COD	53	54.5	58	58.6	100	42.1
Fecal Coliform[1]	5,091	7,000	4,600	2,400	1,700	7,200
NO2 + NO3	0.60	0.60	0.6	0.69	0.28	0.59
TKN	1.4	1.5	1.5	1.4	2.0	0.74
Total N	2.0	2.1	2.1	2.09	2.28	1.33
Dissolved P	0.13	0.18	0.11	0.10	0.20	0.13
Total P	0.27	0.31	0.22	0.25	0.25	0.31
Dissolved Cu[2]	8.0	7.0	7.57	8.0	10.9	--
Total Cu[2]	16	12	17	20.8	34.7	10
Dissolved Zn[2]	52	31.5	59	112	51	--
Total Zn[2]	116	73	150	199	200	40

Source: Pitt *et al.*, 2004.
[1] MPN/100 mL, which represents the most probable number (MPN) of bacteria that would be found in 100 mL of water
[2] Cu and Zn values are shown in μg/l

Table B.5: Summary of Pollutant EMCs Associated with Stormwater Hotspots						
	TSS	Total P	Total N	Fecal Coliform[1]	Total Cu[2]	Total Zn[2]
Land Use	Median Event Mean Concentrations (mg/L or ppm, except where noted)					
Lawns	602	2.1	9.1	2,400	17	50
Landscaping	37	--	--	9,400	94	263
Residential Roof	19	0.11	1.5	26	200	312
Commercial Roof	9	0.14	2.1	110	7	256
Industrial Roof	17	--	--	580	62	1390
Res/Comm Parking Lot	27	0.15	1.9	180	51	139
Industrial Parking Lot	228	--	--	270	34	224
Driveway	173	0.56	2.1	1,700	17	107
Local Residential Street	172	0.55	1.4	3,700	25	173
Commercial Street	468	--	--	1,200	73	450
Gas Station	31	--	--	--	88	290
Auto Recycler	335	--	--	--	103	520
Heavy Industry	124	--	--	--	148	1600

Sources: Claytor *et al.,* 1996; Steuer *et al.,* 1997; Bannerman, 1993; and Waschbuch, 2000.
[1] MPN/100 mL, which represents the most probable number (MPN) of bacteria that would be found in 100 mL of water
[2] Cu and Zn values are shown in μg/l

II. Calculating Pollutant Loads and Pollutant Load Reduction

Pollutant load reduction by individual stormwater retrofits is computed in a six-step process, as shown in Table B.6, and described below:

Step 1: Calculate CDA Impervious Cover

This step calculates the impervious cover (I) present in the drainage area contributing to the proposed retrofit. Operationally, impervious cover is defined as any hard surface in the catchment that cannot infiltrate rainfall, such as rooftops, roads, sidewalks, driveways and any other compacted gravel or dirt surfaces. As a general rule, man-made surfaces that are not vegetated should be considered impervious. Chapter 4.3 describes the methods used to measure or estimate impervious cover in the retrofit contributing drainage area (Cappiella and Brown, 2001). Unless upland restoration practices remove or disconnect impervious cover in the contributing drainage area, impervious cover before and after the retrofit will be the same.

Step 2: Calculate Pre-Retrofit Pollutant Load

The second step computes the pollutant load exported from the drainage area prior to the retrofit using the equation shown in Table B.7.

Step 3: Identify the Stormwater Retrofit

This step identifies the stormwater treatment option(s) that will be applied to the retrofit site, which can be taken directly from the retrofit concept design.

Table B.6: Process for Calculating Pre- and Post-Retrofit Pollutant Loads	
Step	**Task**
1	Calculate Site Imperviousness
2	Calculate the Pre-Retrofit Pollutant Load
3	Identify the Stormwater Retrofit
4	Determine the Retrofit Pollutant Removal Efficiency
5	Calculate the Post-Retrofit Pollutant Load
6	Calculate the Pollutant Load Reduction of the Retrofit

Table B.7: Method for Calculating Pre-Retrofit Pollutant Loading

$L_{pre} = [(P)(Pj)(Rv)/12^{a}](C)(A)(2.72)^{a}$

Where:
L_{pre} = Average annual pollutant load exported from the site prior to stormwater retrofitting (pounds)
P = Average annual rainfall depth (inches)
P_j = Fraction of rainfall events that produce runoff
R_v = Runoff coefficient
C = Event mean concentration of the pollutant in urban runoff (mg/l)
A = Area of the contributing drainage area (acres)

[a] 12 and 2.72 are unit conversion factors

Step 4: Use the Design Point Method to Determine Retrofit Pollutant Removal Efficiency

Median pollutant removal rates for each stormwater treatment option are presented in Chapter 3. These rates need to be adjusted to account for site-specific factors and design features than can enhance or reduce their pollutant removal rates using the design point method. The method consists of a series of tables that award or deduct points for certain site-specific conditions and design factors present at the individual retrofit site. The designer selects the appropriate design point table for the stormwater treatment option they plan to use, reviews the proposed retrofit design and computes a total retrofit design score. If the design score is positive, the removal rate for the pollutant of concern is increased using the equation provided in Table B.8. If the retrofit score is negative, the removal rate is reduced using the equation provided in Table B.9.

The example provided in Box B.1 illustrates the use of the design point method on a hypothetical retrofit site. Note that the net design score excludes the design factors that only influence phosphorus removal, while the net phosphorus score includes them. The designer should use the net phosphorus score to adjust the phosphorus removal rate and the net design score to adjust the removal rates for all other pollutants.

Table B.8: Adjusting Removal Rates for Retrofits with a Positive Design Score

Adjusted RR = Median RR + [(DS ÷ 5) ∗ (High End RR – Median RR)]

Where:
RR = Removal rate (%)
DS = Design score

Note: A maximum of five positive design points is allowed

Table B.9: Adjusting Removal Rates for Retrofits with a Negative Design Score

Adjusted RR = Median RR + [(DS ÷ 5) ∗ (Median RR – Low End RR)]

Where:
RR = Removal rate (%)
DS = Design score

Note: A maximum of five negative design points is allowed

Box B.1: Applying the Design Point Method

A bioretention retrofit is being proposed to serve a contributing drainage area that is one acre in size and 35% impervious. After review of the retrofit concept design, the designer awards the following points for the project:

Negative Factors that Reduce Removal Rates

- Does not provide full WQ_v, due to space constraints
- Filter bed less than 18 inches deep, due to limited available head
- Single cell design, due to space constraints
- Underdrain needed, to address cold climate conditions and impermeable soils

Positive Factors that Enhance Removal Rates

- Filter media soil P-Index less than 30, to enhance phosphorus removal
- Upflow pipe on underdrain, to enhance nitrogen removal

Design Factors	***X***	***Points***
Exceeds target WQv by more than 50%		+ 3
Exceeds target WQv by more than 25%		+ 2
Tested filter media soil P Index less than 30 (phosphorus only)	**X**	+ 3
Filter bed deeper than 30 inches		+ 1
Two cell design with pretreatment		+ 1
Permeable soils; no underdrain needed		+ 2
Upflow pipe on underdrain	**X**	+1
Impermeable soils; underdrain needed	**X**	- 1
Filter bed less than 18 inches deep	**X**	- 1
Single cell design	**X**	- 1
Bioretention cell is less than 5% of CDA		-1
Does not provide full water quality storage volume	**X**	- 2
Filter media not tested for P Index (phosphorus only)		- 3
NET DESIGN SCORE (max of 5 points)		**- 4**
NET PHOSPHORUS SCORE		**- 1**

Since both design scores are negative (-4 and -1), the median pollutant removal rates are decreased using the equation provided in Table B.9. The adjusted removal rates for the retrofit are shown below:

Total Suspended Solids	24%	Bacteria	26%
Total Phosphorus	-11%	Hydrocarbons	82%
Total Nitrogen	41%	Chloride	0%
Total Zinc	48%	Trash/Debris	82%
Total Copper	48%		

The example shows why it is so important to maximize site and design factors to enhance the pollutant removal performance of the retrofit. In many cases, the designer may revise their concept design to include design features that can attain a higher net design point score.

Step 5: Calculate Post-Retrofit Pollutant Load

This step calculates the pollutant load exported from the drainage area contributing to the retrofit using the equation shown in Table B.10.

Table B.10: Method for Calculating Post-Retrofit Pollutant Loading

$L_{post} = L_{pre} * [1 - (RR)]$

Where:
L_{post} = Annual pollutant load exported from the site after stormwater retrofit (pounds/yr)

RR = Adjusted removal rate (%) calculated in Step 4

L_{pre} = Annual pollutant load exported from the site before the stormwater retrofit (pounds/year)

Step 6: Calculate the Pollutant Load Reduction of the Retrofit

The final step calculates the pollutant load reduced by the proposed stormwater retrofit, which is simply the post-retrofit pollutant load, subtracted from the pre-retrofit pollutant load (Table B.11).

Table B.11: Method for Calculating the Pollutant Load Reduction of the Retrofit

$LR = L_{post} – L_{pre}$

Where:
LR = Annual pollutant load removed by the proposed retrofit (pounds/year)

L_{post} = Annual pollutant load exported from the site after stormwater retrofitting (pounds/year)

L_{pre} = Annual pollutant load exported from the site prior to stormwater retrofitting (pounds/year)

III. Design Point Tables

This section presents the design point tables for seven stormwater treatment options.

1. ED Retrofits		
Design Factors	***X***	***Points***
Wet ED or Multiple Cell Design		+ 2
Exceeds target WQv by more than 25%		+ 1
Exceeds target WQv by more than 50%		+ 2
Off-line design		+ 1
Flow path greater than 1.5 to 1		+ 1
Sediment forebay		+ 1
Constructed wetland elements included in design		+ 1
On-line design		- 1
Flow path less than 1:1		- 1
Pond SA/CDA ratio less than 2%		- 2
Does not provide full WQv volume		- 2
Pond intersects with groundwater		- 2
NET DESIGN SCORE (max. of 5 points)		

2. Wet Pond Retrofits		
Design Factors	***X***	***Points***
Wet ED or Multiple Pond Design		+ 2
Exceeds target WQv by more than 50%		+ 2
Exceeds target WQv by more than 25%		+ 1
Off-line design		+ 1
Flow path greater than 1.5 to 1		+ 1
Sediment forebay at major outfalls		+ 1
Wetland elements cover at least 10% of surface area		+ 1
Single cell pond		- 1
Flow path less than 1:1		- 1
On-line design		- 1
Pond SA/CDA ratio less than 2%		- 2
Does not provide full WQv volume		- 2
Pond intersects with groundwater		- 2
NET DESIGN SCORE (max of 5 points)		

3. Wetland Retrofits		
Design Factors	***X***	***Points***
Pond-Wetland or Multiple Cell Design		+ 2
Exceeds target WQv by more than 50%		+ 2
Complex wetland microtopography		+ 2
Exceeds target WQv by more than 25%		+ 1
Flow path greater than 1.5 to 1		+ 1
Wooded wetland design		+ 1
Off-line design		+ 1
No forebay or pretreatment features		- 1
Wetland intersects with groundwater		- 1
Flow path is less than 1:1		- 1
No wetland planting plan specified		- 2
Wetland SA to CDA ratio is less than 1.5%		- 2
Does not provide full WQv volume		- 2
NET DESIGN SCORE (max of 5 points)		

4. Bioretention Retrofits		
Design Factors	***X***	***Points***
Exceeds target WQv by more than 50%		+ 3
Exceeds target WQv by more than 25%		+ 2
Tested filter media soil P Index less than 30 (phosphorus only)		+ 3
Filter bed deeper than 30 inches		+ 1
Two cell design with pretreatment		+ 1
Permeable soils; no underdrain needed		+ 2
Upflow pipe on underdrain		+1
Impermeable soils; underdrain needed		- 1
Filter bed less than 18 inches deep		- 1
Single cell design		- 1
Bioretention cell is less than 5% of CDA		-1
Does not provide full water quality storage volume		- 2
Filter media not tested for P Index (phosphorus only)		- 3
NET DESIGN SCORE (max of 5 points)		
NET PHOSPHORUS SCORE (max of 5 points)		

5. Filtering Retrofits		
Design Factors	***X***	***Points***
Exceeds target WQv by more than 50%		+ 3
Exceeds target WQv by more than 25%		+ 2
Site is a severe or confirmed hotspot		+ 2
Organic media used within filter bed (all pollutants except N/P)		+ 2
Two cells with at least 25% WQv allocated to pretreatment		+ 1
Filter bed SA is at least 2.5% of CDA		+ 1
Filter bed exposed to sunlight		+ 1
Off-line design w/ storm bypass		+ 1
Dry pretreatment		- 1
On-line design, w/o storm bypass		- 1
Underground design (except MCTT)		- 1
Filter design is hard to access for maintenance		- 2
Does not provide full WQv volume		- 3
NET DESIGN SCORE (max of 5 points)		

6. Infiltration Retrofits		
Design Factors	**X**	**Points**
Exceeds target WQv by more than 50%		+ 3
Exceeds target WQv by more than 25%		+ 2
Tested infiltration rates between 1.0 and 4.0 in/hr		+ 2
At least two forms of pretreatment prior to infiltration		+ 2
CDA is nearly 100% impervious		+ 1
Off-line design w/ cleanout pipe		+ 1
Underdrain utilized		- 1
Filter fabric used on trench bottom		- 1
CDA more than 1.0 acre		- 1
Soil infiltration rates < 1.0 in/hr or > 4.0 in/hr		- 2
Pervious areas or construction clearing in CDA		- 2
Does not provide full WQv volume		- 3
NET DESIGN SCORE (max of 5 points)		

7. Swale Retrofits		
Design Factors	***X***	***Points***
Exceeds target WQv by more than 50%		+ 3
Dry or wet swale design		+ 2
Exceeds target WQv by more than 25%		+ 2
Longitudinal swale slope between 0.5 to 2.0%		+ 1
Velocity within swale < 1 fps during WQ storm		+ 1
Measured soil infiltration rates exceed 1.0 in/hr		+ 1
Multiple cells with pretreatment		+ 1
Off-line design w/ storm bypass		+ 1
Longitudinal swale slope < 0.5% or > 2%		- 1
Measured soil infiltration rates less than 1.0 in/hr		- 1
Swale sideslopes more than 5:1 h:v		- 1
Swale intersects groundwater (except wet swale)		- 1
No pretreatment to the swale or channel		- 1
Swales conveys stormflows up to 10 year storm		- 2
Does not provide full WQv volume		- 2
Grass channel		- 3
NET DESIGN SCORE (max of 5 points)		

Appendix C: Deriving the Channel Protection Storage Volume

Appendix C: Deriving the Channel Protection Storage Volume

Channel protection can help mitigate the impacts of development on streams by preventing an increased frequency of channel-forming events. The most commonly used channel protection method provides 24 hours of extended detention of the runoff generated by the 1-year, 24-hour storm. This method stores and gradually releases runoff so that critical erosive velocities in downstream channels are not exceeded. This appendix presents a technique that can be used to estimate the channel protection storage volume for an individual stormwater retrofit.

I. Storage Volume Estimation

The method used to estimate the channel protection volume was first proposed by Harrington (1987) and uses a modified version of the graphical peak discharge design procedure presented in Technical Reference 55 (TR-55) (NRCS, 1986). A seven-step method is presented to help designers compute several common hydrologic parameters needed to estimate the channel protection storage volume (Table C.1).

Step 1: Compute the 1-Year, 24-Hour Runoff Volume

The first step calculates the 1-year, 24-hour runoff volume using either the Curve Number (CN) Method presented in TR-55 or the Simple Method (Appendix B), although the two methods will yield different results.

Previous studies have found that the CN Method tends to underestimate the volume of runoff created by rainfall events of less than 2 inches (NYDEC, 2003) and that its accuracy may be limited when the runoff created by a storm is less than 0.5 inches (NRCS, 1986). The Simple Method also has its caveats (Appendix B). The designer may want to estimate the required channel protection volume using both methods and compare the results.

Step 2: Determine the Time of Concentration for the Subwatershed

The time of concentration (T_c) is the time that it takes for stormwater runoff to travel from the most hydraulically distant point in a subwatershed to the retrofit site. It is computed by delineating the stormwater flow path over pervious areas, open channels and storm drain pipes to get to the retrofit using standard velocity equations to compute the time it takes for stormwater runoff to travel the longest route. TR-55 presents more specific guidance on computing T_c.

Step 3: Compute the Initial Abstraction and Initial Abstraction Ratio

The initial abstraction (I_a) term represents all rainfall losses that occur before runoff begins. The losses include water retained in surface depressions, water intercepted by vegetation and water lost to evaporation and infiltration. I_a is highly variable but generally correlates with soil and land cover parameters and is directly related to the CN of the subwatershed (NRCS, 1986). If the CN Method was used to calculate the 1-year, 24-hour runoff volume (Step 1), the value of CN is already known and the value of I_a can

be obtained from Table C.2 or can be calculated using the following equation:

$I_a = 200/CN - 2$

Where:
I_a = Initial abstraction (inches)
CN = Subwatershed curve number (dimensionless)

If the 1-year, 24-hour runoff volume was calculated using the Simple Method, the value of CN can be back calculated using the following relationship between the runoff volume, curve number and precipitation depth (NYDEC, 2003):

$CN = 1000/[10 + 5P + 10Q - 10(Q^2 + 1.25QP)^{1/2}]$

Where:
P = Rainfall resulting from the 1-year, 24-hour storm event (inches)
Q = Runoff volume resulting from the 1-year, 24-hour storm event (inches)

The value of I_a can then be obtained from Table C.2 or by using the equation provided above. Once I_a is computed, the initial abstraction ratio (I_a/P) can be computed simply by dividing the initial abstraction by the rainfall depth. This ratio represents the fraction of the rainfall that is retained in surface depressions, intercepted by vegetation or lost to evaporation and infiltration.

Step 4: Compute the Uncontrolled Peak Discharge

The next step computes the uncontrolled peak discharge from the subwatershed (NRCS, 1986). This requires the determination of the unit peak discharge factor (q_u). This value can readily be determined using the values of T_c and I_a/P and knowledge of the rainfall distribution (Type I, IA, II, III) within the subwatershed (Figure C.1). With this information, the proper value of q_u can be selected from Figure C.2, C.3, C.4, or C.5.

Table C.1: Process for Estimating Channel Protection Volume

Step No.	Task
1	Compute the 1-Year, 24-Hour Runoff Volume
2	Determine the Time of Concentration for the Subwatershed
3	Compute the Initial Abstraction and Initial Abstraction Ratio
4	Compute the Uncontrolled Peak Discharge (Inflow)
5	Find the Ratio of the Uncontrolled Peak Discharge to the Controlled Peak Discharge
6	Calculate the Ratio of Storage Volume to Runoff Volume
7	Determine the Extended Detention Storage Volume

Curve number	I_a (in)	Curve number	I_a (in)
40	3.000	70	0.857
41	2.878	71	0.817
42	2.762	72	0.778
43	2.651	73	0.740
44	2.545	74	0.703
45	2.444	75	0.667
46	2.348	76	0.632
47	2.255	77	0.597
48	2.167	78	0.564
49	2.082	79	0.532
50	2.000	80	0.500
51	1.922	81	0.469
52	1.846	82	0.439
53	1.774	83	0.410
54	1.704	84	0.381
55	1.636	85	0.353
56	1.571	86	0.326
57	1.509	87	0.299
58	1.448	88	0.273
59	1.390	89	0.247
60	1.333	90	0.222
61	1.279	91	0.198
62	1.226	92	0.174
63	1.175	93	0.151
64	1.125	94	0.128
65	1.077	95	0.105
66	1.030	96	0.083
67	0.985	97	0.062
68	0.941	98	0.041
69	0.899		

Table C.2: The Relationship Between CN and I_a
Source: NRCS, 1986

Figure C.1: NRCS Rainfall Distribution Boundaries

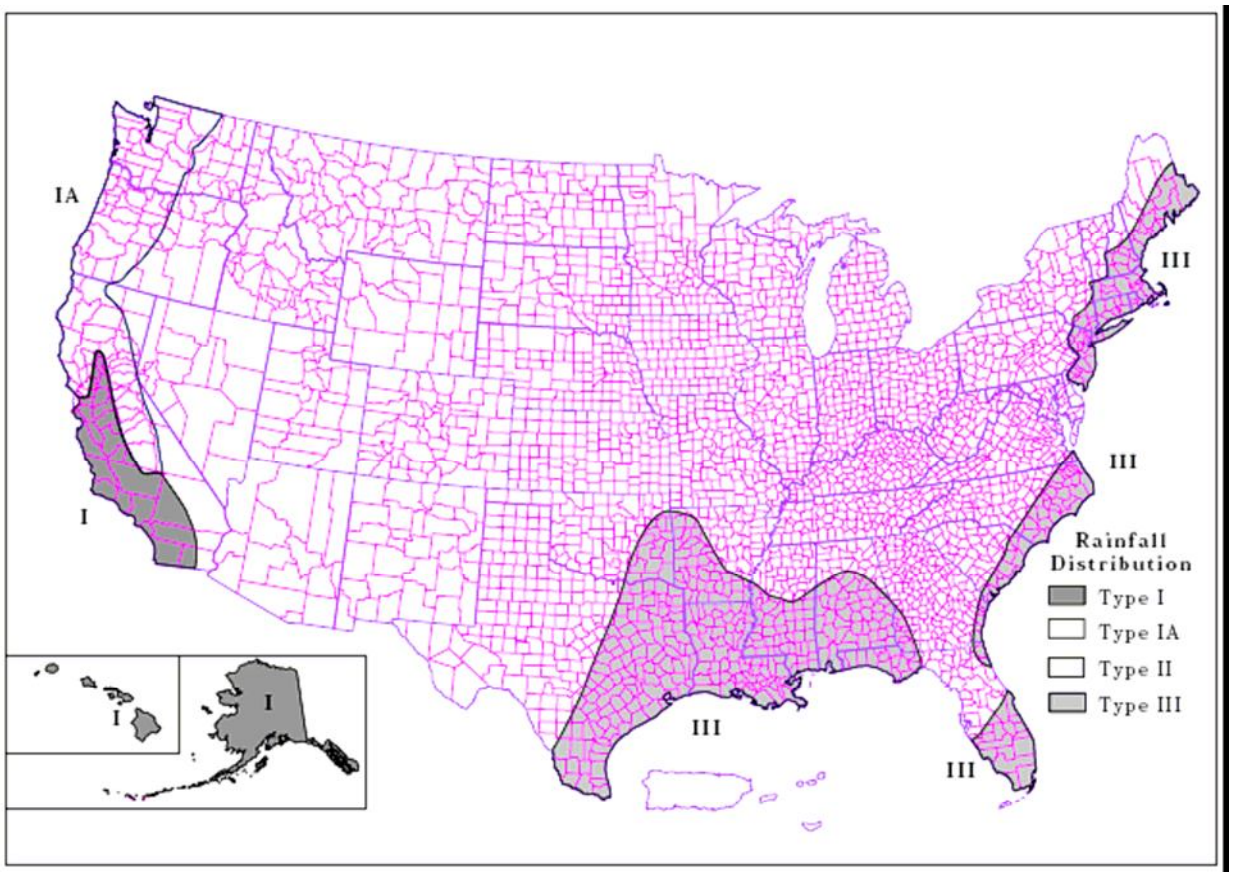

Source: NRCS, 1986

Figure C.2: Unit Peak Discharge for NRCS (SCS) Type I Rainfall Distribution

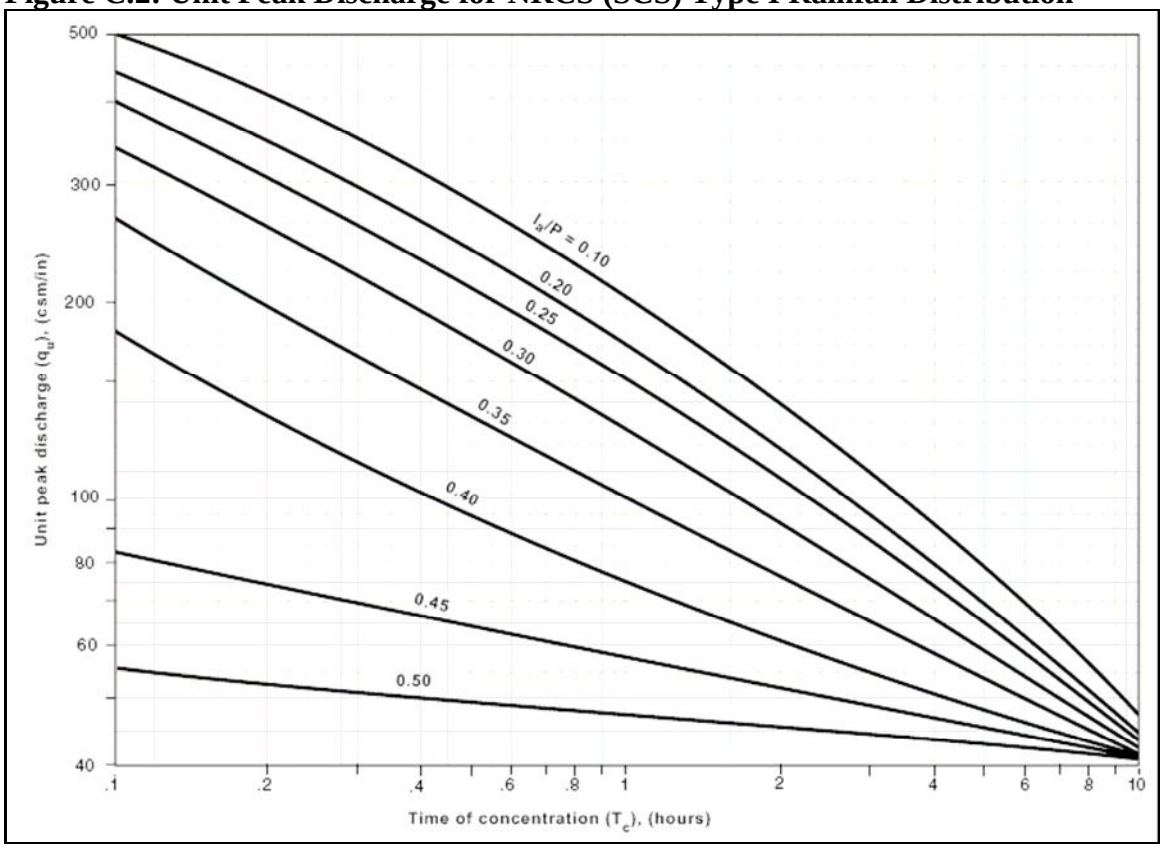

Source: NRCS, 1986

Figure C.3: Unit Peak Discharge for NRCS (SCS) Type IA Rainfall Distribution

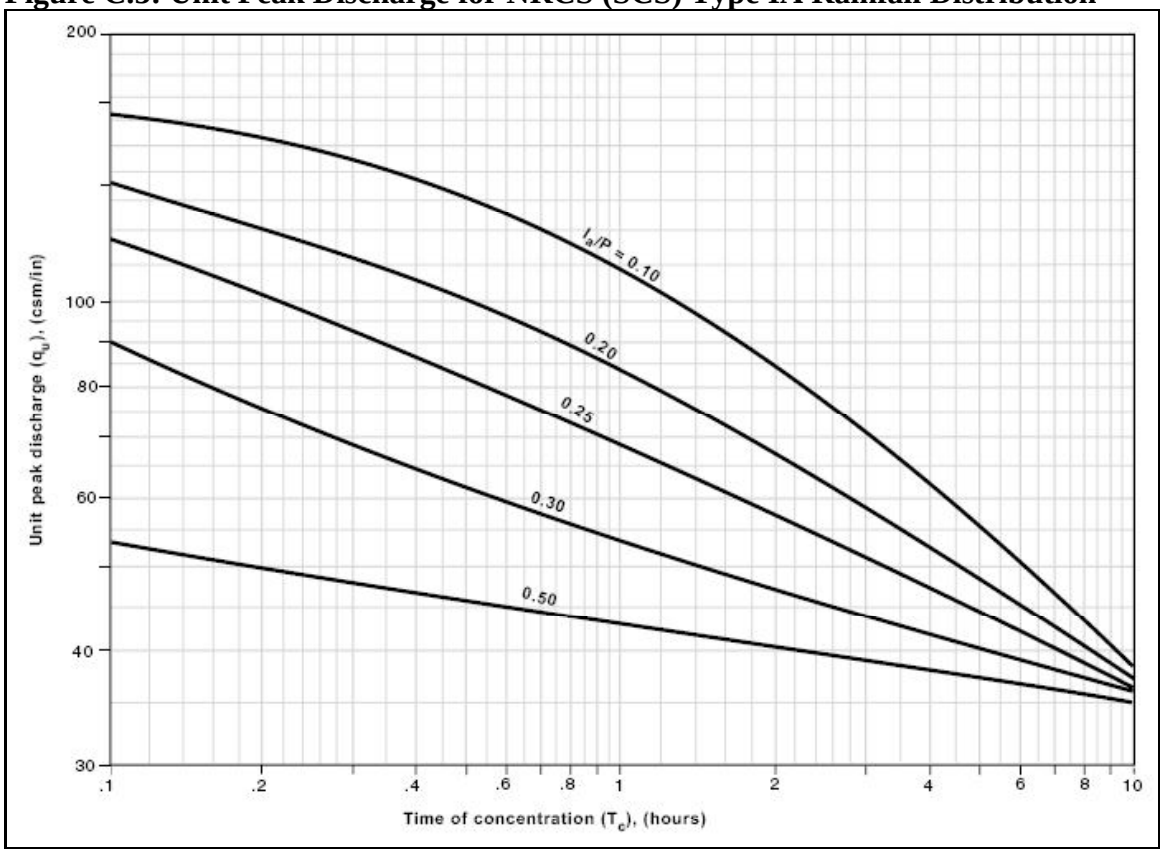

Source: NRCS, 1986

Figure C.4: Unit Peak Discharge for NRCS (SCS) Type II Rainfall Distribution

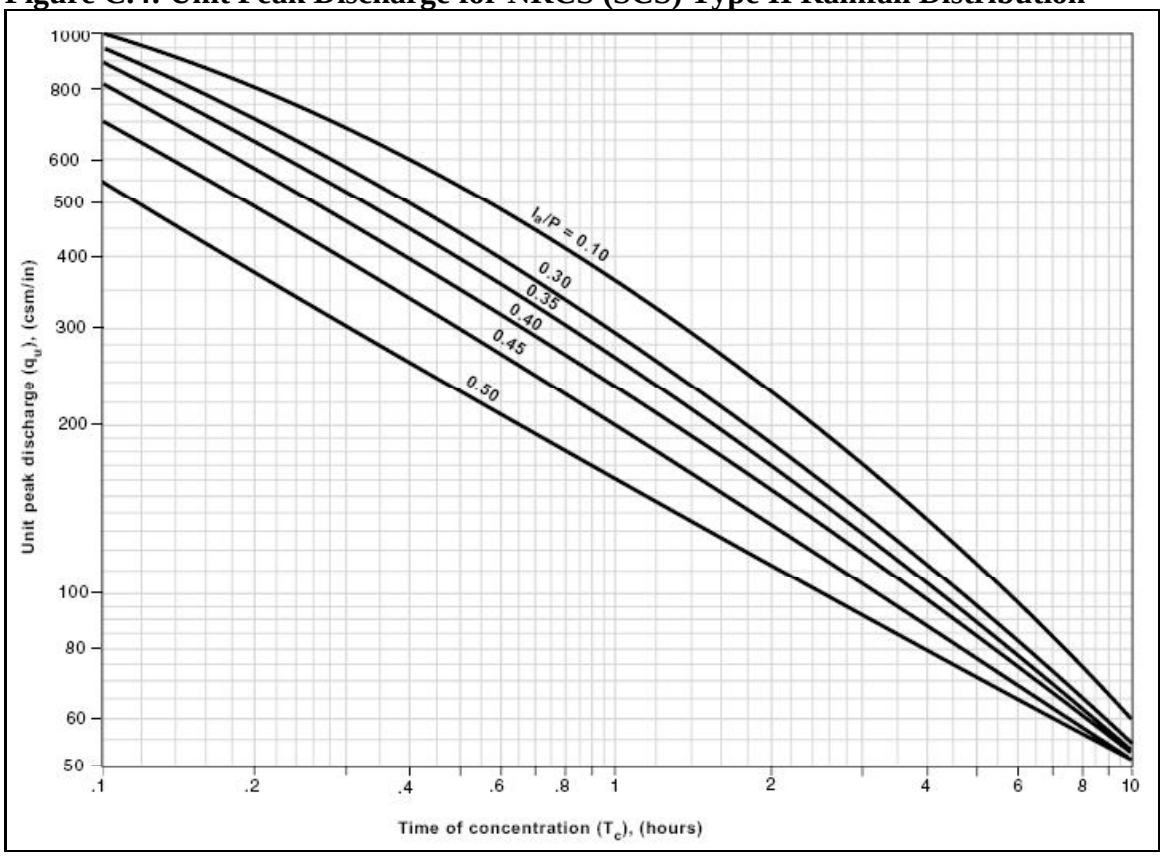

Source: NRCS, 1986

Figure C.5: Unit Peak Discharge for NRCS (SCS) Type III Rainfall Distribution

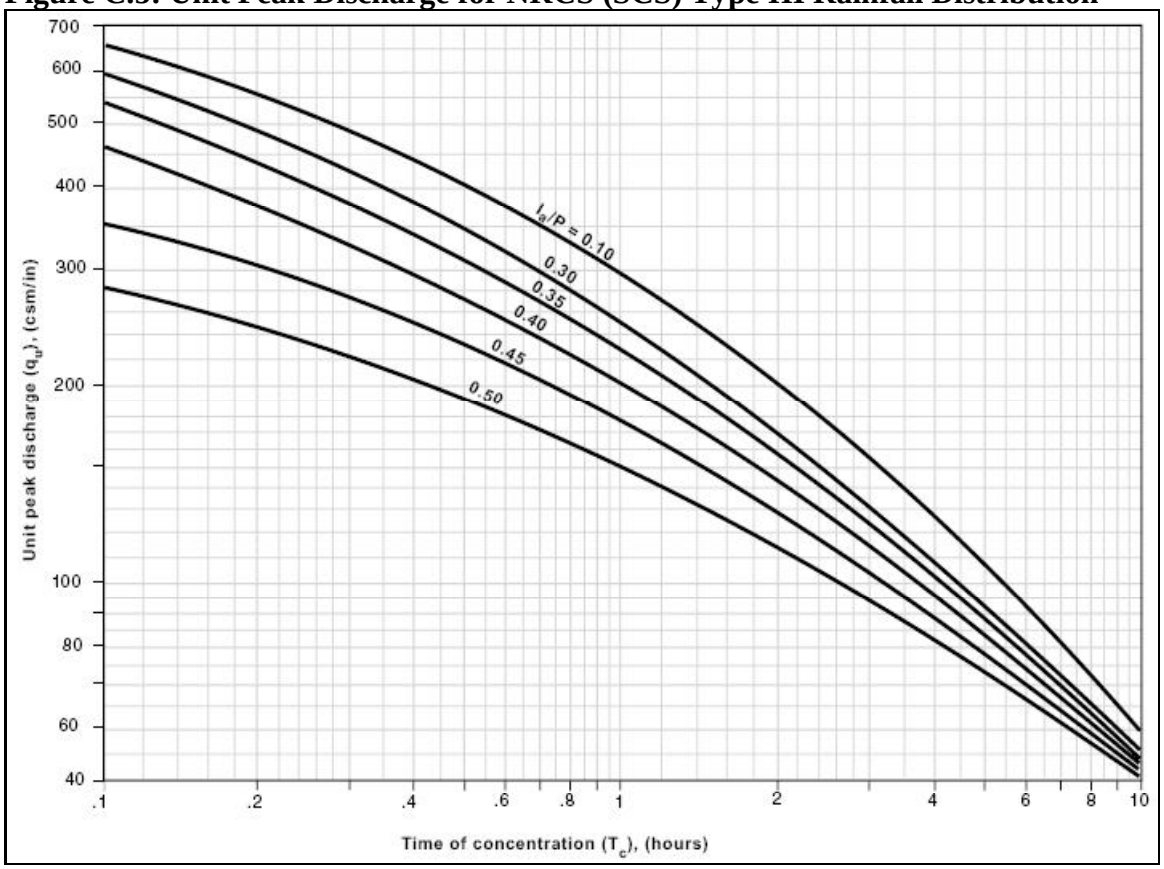

Source: NRCS, 1986

If the computed initial abstraction ratio (I_a/P) is outside the range of values provided in Figures C.2 - C.5, then the appropriate boundary value should be used. Linear interpolation can be used to estimate the unit peak discharge when the value of I_a/P falls between the values provided in the figures (NRCS, 1986).

Using the value of the unit peak discharge (q_u), the uncontrolled peak discharge (q_i) resulting from the 1-year, 24-hour storm event can be estimated using the following equation:

$$q_i = (q_u)(A)(Q)$$

Where:
q_i = Uncontrolled peak discharge (cfs)
q_u = Unit peak discharge (csm/in)
Q = Runoff volume resulting from the 1-year, 24-hour storm event (inches)
A = Area of the subwatershed (sq. miles)

<u>Step 5: Find the Ratio of the Uncontrolled Peak Discharge to the Controlled Peak Discharge</u>

The next step involves determining the ratio of the uncontrolled peak discharge to the controlled peak discharge (q_o/q_i). Once the unit peak discharge (q_u) and required extended detention time (T) (e.g. typically 24 hours) are known, Figure C.6 can be used to determine the value of q_o/q_i.

Figure C.6: Calculating the Ratio of the Uncontrolled Peak Discharge to the Controlled Peak Discharge

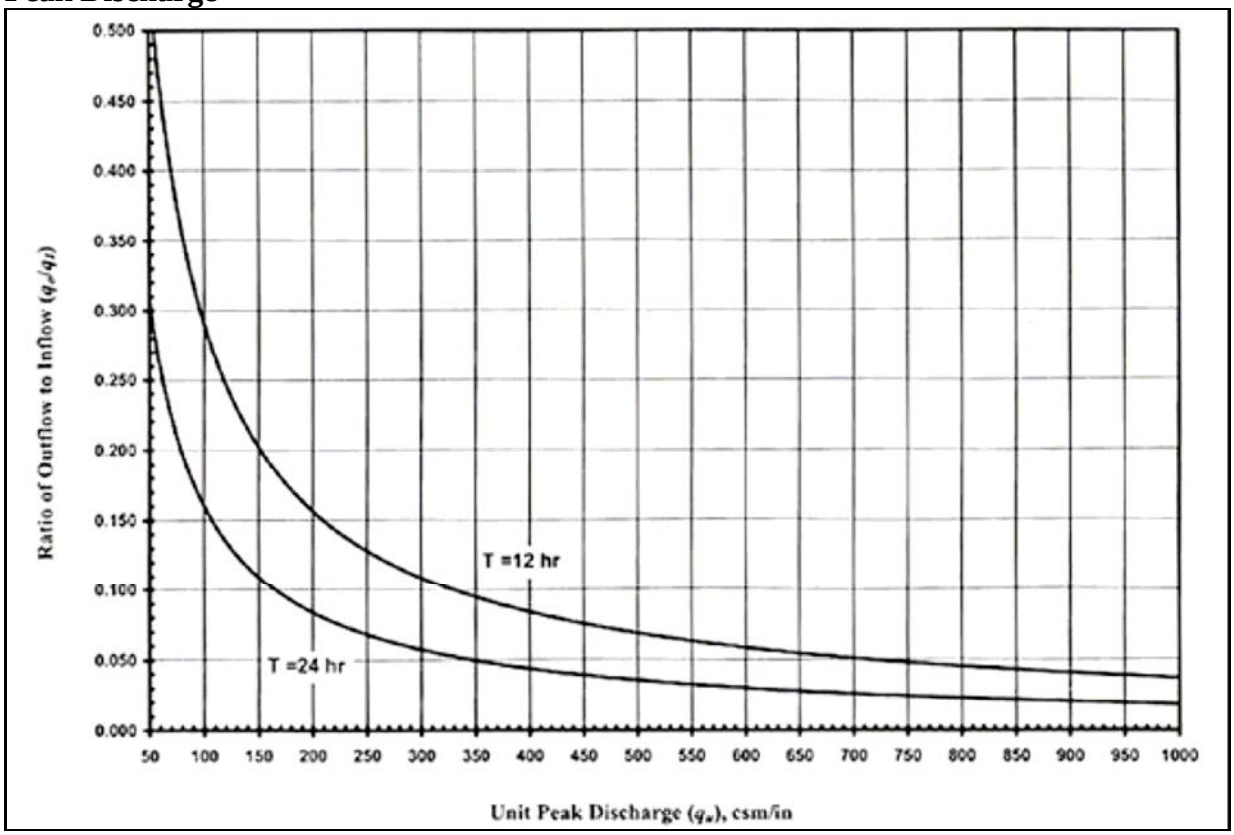

Source: MSSC, 2005

If the retrofit discharges to a cold water trout stream, it may be wise to limit the extended detention time to a maximum of 12 hours to reduce the stream warming effect.

Step 6: Calculate the Ratio of Storage Volume to Runoff Volume

The next step calculates the ratio of storage volume to runoff volume (V_s/V_r). Using the value of q_o/q_i obtained from Figure C.6 and the appropriate rainfall distribution (Type I, IA, II, III), the value of V_s/V_r can be obtained from Figure C.7.

The ratio of storage volume to runoff volume (V_s/V_r), can also be calculated numerically for a Type II or Type III rainfall distribution:

$$V_s/V_r = 0.683 - (1.43)(q_o/q_i) + (1.64)(q_o/q_i)^2 - (0.804)(q_o/q_i)^3$$

Where:
V_s = Required storage volume (acre-feet)
V_r = Runoff volume (acre-feet)
q_o = Controlled peak discharge/peak outflow discharge (cfs)
q_i = Uncontrolled peak discharge/peak inflow discharge (cfs)

Step 7: Determine the Extended Detention Storage Volume

The final step in the process is to determine the required extended detention storage volume. Using the value of V_s/V_r obtained from Figure C.7 (or the equation provided in Step 6), the required extended detention volume can be calculated using the following equation:

$$V_s = (V_s/V_r)(V_r)$$

Where:
V_s = Required storage volume (acre-feet)
V_r = Runoff volume (acre-feet)

Figure C.7: Calculating the Ratio of Storage Volume to Runoff Volume

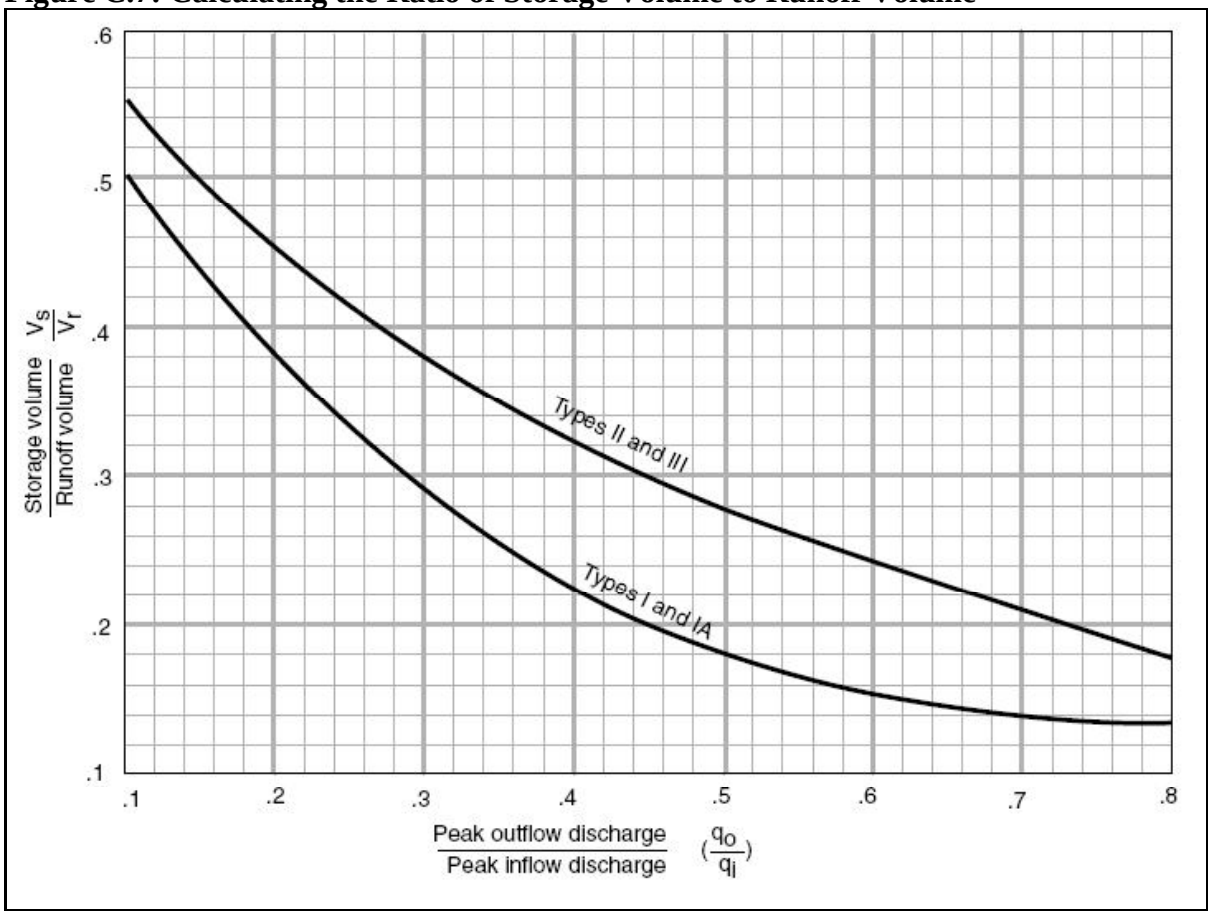

Source: NRCS, 1986

II. Estimated Channel Protection Volumes for Select U.S. Cities

Table C.3 provides an estimate of the channel protection volume needed for various levels of watershed impervious cover in select U.S. cities. A short-cut design rule is that the storage capacity needed to provide channel protection is about 60% of the runoff volume generated by the 1-year, 24-hour storm. This rule was used to derive the estimates. Designers can quickly refer to this table to initially estimate the target channel protection storage volume needed at a retrofit site.

Table C.3: Estimated CPv for Select U.S. Cities (cubic feet/acre)

City	1-Yr, 24-Hr Rainfall (in.)	Watershed Imperviousness (%)			
		10%	30%	60%	90%
		CPv (cf per acre)[1]			
Atlanta, GA	3.6	1,098	2,509	4,626	6,743
Knoxville, TN	2.5	762	1,742	3,213	4,683
New York City, NY	2.7	823	1,882	3,470	5,057
Greensboro, NC	2.7	823	1,882	3,470	5,057
Boston, MA	2.6	793	1,812	3,341	4,870
Baltimore, MD	2.6	793	1,812	3,341	4,870
Buffalo, NY	2.0	610	1,394	2,570	3,746
Washington, DC	2.6	793	1,812	3,341	4,870
Columbus, OH	2.2	671	1,533	2,827	4,121
Kansas City, MO	3.2	976	2,230	4,112	5,994
Seattle, WA	1.6	488	1,115	2,056	2,997
Burlington, VT	1.7	518	1,185	2,185	3,184
Dallas, TX	3.2	976	2,230	4,112	5,994
Austin, TX	3.2	976	2,230	4,112	5,994
Minneapolis, MN	2.4	732	1,673	3,084	4,495
Coeur D'Alene, ID	1.1	335	767	1,414	2,060
Salt Lake City, UT	1.1	335	767	1,414	2,060
Denver, CO	1.4	427	976	1,799	2,622
Phoenix, AZ	1.1	335	767	1,414	2,060
Las Vegas, NV	0.8	244	558	1,028	1,498

Appendix D: Retrofit Pollutant Removal Rates

Appendix D: Retrofit Pollutant Removal Rates

I. Basic Approach

This appendix documents how the pollutant removal rates for the stormwater treatment options presented in Chapter 3 were derived. The basic approach used to derive the pollutant removal rates was to update the National Pollutant Removal Performance Database (Winer, 2000) with new performance studies published in the last five years. The updated database was then statistically analyzed to derive new median and quartile values for each major group of stormwater treatment practices. The low end and high end are the 25th and 75th quartiles, respectively. Also, removal rates were rounded to the nearest 5 % for ease of use.

Where data gaps remained, engineering judgment was used to derive pollutant removal rates as described in Section II. These removal rates are indicated by **bold type** in the ensuing tables and designers should regard them as a provisional estimate until additional pollutant removal performance data becomes available. The notes section of the tables can provide more information on these derived rates.

II. Documentation of Pollutant Removal Rates

Recurring data gaps existed for organic carbon, hydrocarbons, chlorides, trash/debris and, for some practices, bacteria. The particular assumptions to derive removal rates for these pollutants are summarized below.

- *Organic Carbon* – Organic carbon is used to describe all total organic carbon, BOD or COD removal data contained in the original database (Winer, 2000). Very little new monitoring data was available, so the medians and quartiles were re-computed from the 2000 database.

- *Hydrocarbons* - Previous studies have found that the ability of stormwater treatment practices to remove petroleum hydrocarbons is closely related to their ability to remove suspended solids (Winer, 2000). This is due to the fact that hydrocarbons quickly adsorb to sediment particles and organic matter suspended in stormwater runoff (Schueler and Shepp, 1993). Consequently, hydrocarbon removal was assumed to be generally comparable to total suspended solids removal.

- *Chlorides* - Because chloride is extremely soluble, it is very difficult to remove from stormwater runoff. A review of 10 performance monitoring studies in cold climate regions failed to find any instance of positive removal rates for chlorides for any stormwater treatment practice. Indeed, many practices actually had negative removal rates. It was therefore assumed that chloride removal rates would be zero for all stormwater treatment options.

- *Trash/Debris* – No performance monitoring data were available to define removal rates for trash and debris. It was assumed that the pollutant removal mechanisms for trash and debris are similar to those used to remove total suspended solids (e.g. gravitational settling, screening). One key difference is that some materials float on the

surface, although most would still be trapped in the stormwater practice unless there was a major overflow. It was therefore assumed that trash and debris removal rates would be equal or slightly greater than the suspended solids removal rate for most stormwater practices.

Table D.1: Range of Reported Removal Rates for Dry Extended Detention Ponds			
Pollutant	**Low End**	**Median**	**High End**
Total Suspended Solids	20	50	70
Total Phosphorus	15	20	25
Soluble Phosphorus	-10	-5	10
Total Nitrogen	5	25	30
Organic Carbon	15	25	35
Total Zinc	0	30	60
Total Copper	20	30	40
Bacteria	**25**	**35**	**50**
Hydrocarbons	**40**	**70**	**80**
Chloride	**0**	**0**	**0**
Trash/Debris	**65**	**80**	**85**
Notes: Ten monitoring studies evaluated the performance of dry ED ponds for most parameters. Only two monitoring studies were available on **bacteria removal rates** for dry extended detention ponds, so engineering judgment was needed to establish the final removal rates. The primary mechanisms that facilitate bacteria removal are exposure to UV light and gravitational settling (Schueler, 1999). These removal mechanisms have been documented for wet ponds, which have been more extensively monitored for bacteria removal in wet ponds. Since stormwater runoff is not retained within dry ED ponds for as long as wet ponds, settling times and exposure to UV light are reduced. Dry ED ponds also have a greater risk of sediment resuspension than wet ponds, which can reintroduce previously removed bacteria back into the water column. It was therefore assumed that bacteria removal rates for dry ED ponds were approximately half of those measured for wet ponds.			

Table D.2: Range of Reported Removal Rates for Wet Ponds			
Pollutant	**Low End**	**Median**	**High End**
Total Suspended Solids	60	80	90
Total Phosphorus	40	50	75
Soluble Phosphorus	40	65	75
Total Nitrogen	15	30	40
Organic Carbon	25	45	65
Total Zinc	40	65	70
Total Copper	45	60	75
Bacteria	50	70	95
Hydrocarbons	**60**	**80**	**90**
Chloride	0	0	0
Trash/Debris	**75**	**90**	**95**
Note: 46 wet ponds have been monitored over the past two decades so the removal rate range shown above should be reasonably accurate. **Hydrocarbon** and **trash/debris** removal rates should be considered provisional			

Table D.3: Range of Reported Removal Rates for Stormwater Wetlands			
Pollutant	**Low End**	**Median**	**High End**
Total Suspended Solids	45	70	85
Total Phosphorus	15	50	75
Soluble Phosphorus	5	25	55
Total Nitrogen	0	25	55
Organic Carbon	0	20	45
Total Zinc	30	40	70
Total Copper	20	50	65
Bacteria	**40**	**60**	**85**
Hydrocarbons	**50**	**75**	**90**
Chloride	0	0	0
Trash/Debris	**75**	**90**	**95**
Notes: 40 monitoring studies were available to define rates for total suspended solids, total phosphorus, soluble phosphorus, total nitrogen, organic carbon, total zinc and total copper for constructed wetlands. Only three studies measured **bacteria removal** by constructed wetlands. Research profiled in Strecker et al. (2004) indicated bacterial removal rates for constructed wetlands is generally positive, but typically lower than wet ponds. It was therefore assumed that bacteria removal rates would be at least 10% lower than in wet ponds.			

Table D.4: Range of Reported Removal Rates for Bioretention Areas			
Pollutant	**Low End**	**Median**	**High End**
Total Suspended Solids	**15**	**60**	**75**
Total Phosphorus	-75	5	30
Soluble Phosphorus	-10	5	50
Total Nitrogen	40	45	55
Organic Carbon	**40**	**55**	**70**
Total Zinc	40	80	95
Total Copper	40	80	95
Bacteria	**25**	**40**	**70**
Hydrocarbons	**80**	**90**	**95**
Chloride	0	0	0
Trash/Debris	**80**	**90**	**95**
Notes: Ten new bioretention monitoring studies have been released in the last few years that meet the quality control criteria to be included in the updated database so it is now possible to define removal rates for total phosphorus, soluble phosphorus, total nitrogen, total zinc and total copper. Surprisingly, there were only four studies to define the **total suspended solids removal rate**. Similar pollutant removal mechanisms operate in both bioretention and filtering practices (sedimentation, filtration). The median total suspended solids removal rate for filtering practices is similar to the high end rate for bioretention, which suggests that bioretention rates can be expected to go up as more performance data becomes available. No **bacteria removal rates** were available in the literature as of 2006. Initial research reported by Hunt and his colleagues in 2007 suggest that bacteria removal rates were high. Therefore, it was once again assumed that bioretention would function in the same manner as filtering practices and have similar removal rates. The **phosphorus removal rates** reported for bioretention are clearly bi-modal. Sites where the soil media had high phosphorus content tended to leach phosphorus and experience negative removal rates. Sites where soils with a low P-index volume consistently performed at the upper end of the phosphorus removal range. Again, as more performance data become available and soil media testing becomes standard, the range of rates for bioretention is expected to shift.			

Table D.5: Range of Reported Removal Rates for Stormwater Filters			
Pollutant	**Low End**	**Median**	**High End**
Total Suspended Solids	80	85	90
Total Phosphorus	40	60	65
Soluble Phosphorus	-10	5	65
Total Nitrogen	30	30	50
Organic Carbon	40	55	70
Total Zinc	70	90	90
Total Copper	35	40	70
Bacteria	25	40	70
Hydrocarbons	**80**	**85**	**95**
Chloride	**0**	**0**	**0**
Trash/Debris	**85**	**90**	**95**
Note: Nearly 20 studies have evaluated filtering practices, so reliable removal rates are reported for total suspended solids, total phosphorus, soluble phosphorus, total nitrogen, total zinc, total copper and bacteria. It should be noted that while total nitrogen removal is positive, most filters leak nitrate-nitrogen. Also, performance of vertical sand filters and the MCTT were excluded from the statistical analysis.			

Table D.6: Range of Reported Removal Rates for Infiltration Practices			
Pollutant	**Low End**	**Median**	**High End**
Total Suspended Solids	**60**	**90**	**95**
Total Phosphorus	50	65	95
Soluble Phosphorus	**55**	**85**	**95**
Total Nitrogen	0	40	65
Organic Carbon	80	90	95
Total Zinc	65	65	85
Total Copper	**60**	**85**	**90**
Bacteria	**25**	**40**	**70**
Hydrocarbons	**60**	**90**	**95**
Chloride	**0**	**0**	**0**
Trash/Debris	**85**	**90**	**95**
Notes: Performance monitoring data for infiltration practices continue to be limited although the number of studies had doubled since 2000 (N=12). Total phosphorus, total nitrogen and total zinc all meet the minimum five-study test to be included for statistical analysis. Only three studies were available to characterize **total suspended solids, soluble phosphorus and total copper removal rates**. Recent research tends to confirm the range in removal rates (UNHSC, 2005). No data was found for **hydrocarbon, chloride and trash/debris** removal, so these were estimated using the general removal assumptions described earlier. **Bacteria removal rates** were also lacking, so it was once again assumed that they would be similar to those reported for filtering practices.			

Table D.7: Range of Reported Removal Rates for Swales			
Pollutant	**Low End**	**Median**	**High End**
Total Suspended Solids	70	80	90
Total Phosphorus	-15	25	45
Soluble Phosphorus	-95	-40	25
Total Nitrogen	40	55	75
Organic Carbon	55	70	85
Total Zinc	60	70	80
Total Copper	45	65	80
Bacteria	**- 65**	**-25**	**25**
Hydrocarbons	**70**	**80**	**90**
Chloride	0	0	0
Trash/Debris	**0**	**0**	**50**
Notes: 17 studies were available from the database to establish removal rates for total suspended solids, total phosphorus, soluble phosphorus, total nitrogen, total zinc and total copper. Only four studies were available for bacteria removal and all were negative. However, a positive 25% rate was established for the high end, since pollutant removal mechanisms in dry swales should have some capability to remove bacteria in the soil. Several studies monitored chloride and found only negative removal. No removal data was available for trash/debris, although it was presumed to be low due to washout of trash during high flows. A 50% removal rate was established for the high end for swale designs that contain treatment cells with actual trapping capability.			

Appendix E: Derivation of Unit Costs for Stormwater Retrofits and New Stormwater Treatment Construction

Appendix E: Derivation of Unit Costs for Stormwater Retrofits and New Stormwater Treatment Construction

I. Basic Approach, Findings and Caveats

A. Basic Cost Approach

The cost analysis involved a review of existing cost studies for new stormwater treatment options including studies by Wossink and Hunt (2003), Brown and Schueler (1997), Hathaway and Hunt (2006), WDNR (2003), LGPC (2003), Chicago DEP (2003), Liptan and Strecker (2003) and WSSI (2006). In addition, Hoyt (2007) performed an analysis of actual retrofit construction costs for nearly 100 projects around the country with the following sample size: new storage retrofits (N= 16), pond retrofits (N=31), on-site bioretention retrofits (N =18) and other retrofits (N = 29).

The basic approach was as follows:

- All construction costs were indexed and updated to 2006 dollars using the Engineering News Record Construction Cost Index (RS Means, 2006)
- All studies that utilized cost equations were solved for common retrofit boundary conditions to create a cost range (e.g., drainage area and impervious cover). For example, the range in pond costs was bounded at the high end (10 acres CDA, 15% IC) and the low end (250 acres CDA and 65% IC)
- Retrofit costs were expressed on a common basis ($/cubic foot treated or $/impervious acre treated)
- Total costs were calculated as the base construction cost multiplied by the design/engineering (D&E) rate. Both factors differed between new BMP and retrofit construction
- While a median cost is given for each new stormwater practice or retrofit type, cots are best expressed as a range. In most cases, the range was defined as the 25 to 75% quartiles of the known costs.
- When multiple cost estimates differed for the same retrofit practice, original studies were analyzed for cost-specific factors to explain the difference in terms of design or labor factors that might develop more predictive cost categories.
- Some engineering judgment was needed to classify costs such as the differential costs between new stormwater and retrofit construction.

B. Findings

- Retrofit costs are extremely variable depending on site conditions and retrofit design complexity. In many cases, construction costs were an order of magnitude different for the same volume of stormwater treated (Table E.1).
- Retrofit base construction costs generally exceeded the cost of new stormwater practices by a factor of 1.5 to 6.
- Construction costs for storage retrofits are generally lower than on-site retrofits based on the cost per impervious acre treated. The most influential retrofit cost

factor is the total acreage of impervious cover treated by a retrofit. Unit costs decline as acreage treated increases. By contrast, smaller on-site retrofits that treat less than a ½ acre of impervious cover tend to be two orders of magnitude more expensive per treated area than storage retrofit practices.

- Design and engineering (D&E) costs for storage retrofits exceed those for new stormwater practices when their much higher base retrofit construction costs are factored in.
- The D&E estimate for pond construction derived by Brown and Schueler (1997) of 32% was used to define costs for project management, design, permitting, landscaping and erosion and sediment control
- A 32% D&E rate also applies to on-site retrofits, based on Hoyt's 2007 review of the D&E costs for 17 projects.
- The components of D&E costs differ between storage retrofits (where permitting, and engineering studies dominate) than on-site retrofits (where design and project management dominates).
- A 40% D&E rate should be used for any retrofit requiring major environmental permits.
- The D&E rate differs based on retrofit location. For example, a 5% value was assigned for little retrofits, rain barrels and small rain gardens

Table E.1: Retrofit Construction Costs
2006 $ to Treat an Impervious Acre

Retrofit Type	Low End [1]	Median	High End
Pond Retrofit	$ 3,600	$ 11,100	$ 37,100
New Storage Retrofit	$ 9,000	$ 19,400	$ 32,200
Urban On-site Retrofit [2]	$ 58,000	$ 88,000	$ 150,000

[1] Low end is the 25% quartile value, high end is the 75th quartile value
[2] Mean contributing drainage area to practice = 0.58 acres

Table E.2: Base Construction Costs for New Stormwater Practices BMPs
2006 $ per impervious acre treated

Stormwater Practice	Low End	Median	High End	Source:
Constructed Wetlands [1]	$ 2,000	$ 2,900	$ 9,600	Cost Equation
Extended Detention [1]	2,200	3,800	7,500	Cost Equation
Wet Ponds [1]	3,100	8,350	28,750	Cost Equation
Water Quality Swales [2]	10,900	18,150	36,300	Derived
Bioretention	19,900	25,400	41,750	Cost Equation
Infiltration [3]	19,900	25,400	41,750	Derived
Residential Rooftop	10,900	27,200	49,000	Derived
Filtering Practices	18,150	58,100	79.900	Cost Equation
Non-Residential Roof	21,800	90,750	1,100,000	Derived

[1] based on typical range of CDA and IC noted in the basic approach section
[2] Derived from a cost per square foot
[3] Assumed to be comparable to bioretention costs
Please check documentation notes for all practices later in Part II of this Appendix

Base retrofit costs can be compared to the costs for constructing new stormwater practices shown in Table E.2. The cost ranges shown for new stormwater practices should not be used to estimate retrofit costs unless the designer is confident that all the site conditions outlined in Table E.3 can be met. Few proposed retrofit sites will meet these conditions.

Table E.4 compares the range in unit treatment costs for a large number of retrofit techniques while Chapter 2 offers more detailed cost data for each retrofit location in a subwatershed.

Table E.3: Guidance on when new STO cost equations can be used

- Abundant surface land is present on the site to provide flexibility in retrofit layout and design
- Site has adequate head and has no major utilities to work around
- Site topography is such that a neutral earthwork balance can be achieved (i.e., no off-site hauling)
- No flow splitters, riser modifications or other special plumbing is needed to make the site work
- No significant environmental permits are required
- No major landscaping or planting plan is needed in the design

Table E.4 Range of Retrofit Costs (2006 $ per cubic foot of runoff treated)

Retrofit Technique	Median Cost	Range
Pond Retrofits	$ 3.00	$ 1.00 to 10.00
Rain Gardens	$ 4.00	$ 3.00 to 5.00
New Storage Retrofits	$ 5.00	$ 2.50 to 9.00
Larger Bioretention Retrofits	$ 10.50	$ 7.50 to 17.25
Water Quality Swale Retrofit	$ 12.50	$ 7.00 to 22.00
Cisterns	$ 15.00	$ 6.00 to 25.00
French Drain/Dry Well	$ 12.00	$ 10.50 to 13.50
Infiltration Retrofits	$ 15.00	$ 10.00 to 23.00
Rain Barrels	$ 25.00	$ 12.50 to 40.00
Structural Sand Filter	$ 20.00	$ 16.00 to 22.00
Impervious Cover Conversion	$ 20.00	$ 18.50 to 21.50
Stormwater Planter	$ 27.00	$ 18.00 to 36.00
Small Bioretention Retrofits	$ 30.00	$ 25.00 to 40.00
Underground Sand Filter	$ 65.00	$ 28.00 to 75.00
Stormwater Tree Pits	$ 70.00	$ 58.00 to 83.00
Permeable Pavers	$ 120.00	$ 96.00 to 144.00
Extensive Green Rooftops	$ 225.00	$ 144.00 to 300.00
Intensive Green Rooftops	$ 360.00	$ 300.00 to 420.00

Note: Costs shown are base construction costs and do not include additional D&E costs, which can range from 5 to 40%

C. Caveats

The cost analysis described herein is subject to a number of important caveats that should be fully understood before using it to estimate retrofit project costs.

- Construction costs vary regionally based on labor rates, construction materials and design standards. The new construction cost data were largely drawn from North Carolina and Maryland studies, while retrofit cost data were derived from a larger national cross-section of projects (VA, NY, DE, CA, TX, OR, MD, OR, VA).

- Most on-site retrofits included in the national cost database were experimental designs or demonstration projects that had high initial construction costs. It is expected that unit retrofit costs will stay the same or even decline in future years as designers gain more experience and utilize more cost-effective and standardized construction techniques for these practices.

- All construction costs shown here exclude land acquisition costs. If land must be acquired, retrofit costs increase sharply, and some costly retrofit options, such as underground treatment, become more cost-effective.

- Construction costs do not include the costs needed to find the retrofit site (i.e., costs to perform a retrofit inventory, develop a concept design, assess project feasibility or rank priority projects in a subwatershed plan).

- Limited data were available to derive costs for several stormwater treatment options including infiltration and water quality swales, and some on-site retrofit techniques (e.g., expanded tree pits). These estimates should be viewed with caution until more actual retrofit cost data is generated.

- The base construction cost does not include costs for retrofit design and engineering (D&E) that is estimated by multiplying base construction cost of storage retrofits by a fixed percentage ranging from 5 to 40%. For on-site retrofits, the D&E factor ranges from 5 to 32%.

- Retrofit costs can be extremely variable, and actual costs for individual retrofit projects can significantly exceed the range shown, depending on site conditions. Designers should carefully evaluate the retrofit construction inflators/deflators shown in Chapter 2 and adjust their cost estimates accordingly.

- The construction cost for several on-site retrofits such as permeable pavers and green rooftops do not reflect the incremental cost difference of the surface they substitute or replace (e.g., regular asphalt vs. permeable pavers; conventional rooftop vs. green rooftop). If the surface needs replacing, actual retrofit costs should be expressed as the incremental cost difference from the conventional surface and the new retrofit.

- Reported costs for several on-site retrofits such as bioretention, rain gardens, and rain barrels vary greatly depending on whether it is assumed they will be designed and installed by volunteers or by paid contractors. Even when on-site retrofits are installed by volunteers, localities may still need to

incur a retrofit delivery cost to make them happen.

- The water quality sizing assumption for this retrofit cost analysis was treatment of one inch of runoff per impervious acre acre (or 3630 cubic feet of storage per impervious acre). If local water quality sizing target criteria depart from this assumption, the cost data should be adjusted accordingly.

II. Documentation of Unit Cost Data

This section outlines the assumptions and methods used to derive unit costs for new stormwater practices and retrofit practices.

A. ED Ponds

New Construction: The Brown and Schueler (1997) ED pond cost equation was updated to 2006 dollars using the ENR Construction Cost Index, which yielded the following equation:

$CC = (11.54)(V_s^{0.780})$

Where
V_s = storage volume in cubic feet

The equation was then solved for a common set of retrofit boundary conditions to create a range of expected construction costs:

Low end: 250 acre contributing drainage area (CDA) and 65% impervious cover (IC)
Average: 50 acre CDA and 35% IC
High end: 10 acre CDA and 15% IC

The base construction costs for each boundary condition were then converted into costs per impervious acre treated.

Retrofit Construction: The new storage retrofit database compiled by Hoyt (2007) contained numerous retrofits that used ED in combination with other stormwater practices to achieve full retrofit treatment. When these results are compared to the costs for new ED pond construction, it is evident that retrofits are about five times more expensive (median: $19,440 per impervious acre treated vs. $3,800). The median retrofit cost for new storage retrofits in Table E.1 should be used if the proposed ED retrofit is combined with wetland and/or wet pond treatment. The lower end cost of $ 9,000 is more appropriate for standalone ED retrofits. The new ED pond cost equation can be used if the retrofit satisfies the construction conditions outlined in Table E.3.

B. Wet Pond

New Construction: The same basic methods were used to update the three new wet pond construction costs from Brown and Schueler (1997) and Wossink and Hunt (2003). The updated 2006 equations are as follows:

Wet extended detention ponds
$CC = (12.02)(V_s^{0.750})$
Wet ponds
$CC = (277.89)(V_s^{0.553})$
Wet ponds:
$CC = (17{,}333)(A^{0.672})$

where A = contributing drainage area (acres) and only applies to CDA from 1 to 67 acres

The three equations were solved for the same retrofit boundary conditions established for ED ponds to define a low, middle and high-end range for expected construction costs. The results from all three equations were averaged, although the low end of the W&H equation was omitted because it was outside of the data range of its sample ponds. Unit construction costs for

each boundary condition were then converted into cost per impervious acre treated.

Retrofit Construction: The new storage retrofit database compiled by Hoyt (2007) contained numerous retrofits that relied on wet ponds for water quality treatment. When these costs are compared to the costs for new wet pond construction, it is evident that retrofits are about 2.3 times more expensive than new stormwater wetland construction (median: $19,440 vs. $8,350). This difference is reasonable given the more complicated construction conditions expected at wet pond retrofit sites. The median retrofit cost shown in Table E.1 is recommended for planning purposes, subject to the construction cost inflators/deflators outlined in Chapter 2. In rare cases, the new wet pond cost equations can be used if the retrofit site satisfies the new development construction conditions outlined in Table E.3.

C. Constructed Wetlands

New Construction: The same basic methods were used to update the two wetland construction costs derived by Brown and Schueler (1997) and Wossink and Hunt (2003) into 2006 dollars. The adjusted equations are as follows:

All ponds and wetlands

$CC = (29.43)(V_s^{0.701})$

Stormwater wetlands

$CC = (4{,}800)(A^{0.484})$

Note: Equation applies to 4 – 200 acre CDA

The equations were solved for the previously stated retrofit boundary conditions to create a range of expected construction costs, although the cost estimates generated between the two equations were not always in close agreement. For example, the low-end wetland cost estimate predicted by the Wossink and Hunt equation was omitted from the analysis because it is outside of the range of their wetland sample population. Some engineering judgment was needed to reconcile the low-end, middle and high-end unit costs for constructed wetlands.

Retrofit Construction: The new storage retrofit database compiled by Hoyt (2007) contained numerous retrofits that combined constructed wetlands with ED and/or wet ponds to achieve treatment. When these results are compared to the costs for new constructed wetland construction, retrofits appear to be nearly 7 times more expensive (median: $19,440 vs. $2,900). At first glance, this discrepancy is difficult to explain, but involves the inherent difference between new and retrofit construction of stormwater wetlands. The cost for new constructed wetlands is comparatively low since their shallow design requires much less excavation (which is normally the greatest component of base construction cost). Designers essentially rely on a greater site footprint to save excavation costs, which is seldom available in a retrofitting situation. Very few retrofits in the Hoyt (2007) database were solely constructed wetlands; most devoted considerable storage to extended detention and wet pond treatment in order to squeeze the wetland into a tight retrofit site.

Consequently, the median new storage retrofit unit cost in Table E.1 is reasonable to use if constructed wetlands are designed with ED or wet ponds cells. Designers may wish to adjust this cost higher or lower depending of the site-specific construction cost inflators/deflators outlined in Chapter 2. If it is an ideal site, and corresponds to the new development construction conditions

outlined in Table E.3, the most appropriate new constructed wetland cost equation can be used as an alternate.

D. Bioretention

New Construction: Several equations were updated to estimate new bioretention costs on projects greater than one acre in contributing drainage area (Brown and Schueler, 1997 and Wossink and Hunt 2003). Adjusted to 2006 dollars, the two equations are:

$CC = (8.02)(WQ_v^{0.990})$
$CC = (12{,}664)(A^{1.088})$ (*clay soils)*

These equations apply to more engineered bioretention areas and typically include underdrains, soil media and some type of pretreatment cell. The Wossink and Hunt equation for bioretention in sandy soils (where underdrains are not needed and less soil amendment is required) were not used, since this is not a common condition for retrofits on disturbed urban soils. The equations were solved for several hypothetical retrofit situations to establish expected boundary conditions as follows:

1.0 acre CDA and 100% IC
1.5 acre CDA and 65% IC
3.0 acre CDA and 35% IC

This approach helped define a low-end, middle and high-end unit costs for bioretention. Some engineering judgment was needed since the two equations were not always in agreement. For example, the low-end prediction from the Wossink and Hunt equation appeared unrealistically low and the middle value of ($5.50/cubic foot) was used to tie down the low end unit cost for new bioretention construction instead. The resulting cost estimates were then compared against the unit costs for rain gardens reported by Hathaway and Hunt (2006) and were found to be in general agreement.

Retrofit Construction: The cost of bioretention retrofits varies greatly depending on the contributing drainage area, design objective, installer and site conditions at the proposed retrofit site. Therefore, a four-tiered approach was used to define retrofit costs:

1. *Small highly urban retrofits*: The Hoyt (2007) database contained numerous bioretention retrofits built on highly urban uses with less than a half acre of CDA. The median cost for these bioretention retrofits was 3.5 times greater than the cost for a new bioretention area ($88,000 vs. $25,500 per impervious acre treated). The higher cost is due to need for demolition, extensive landscaping, full media replacement, underdrains and new connections to existing storm drain system. In addition, these retrofits are all professionally installed. Consequently, an average cost range of $25 to $40 per cubic foot treated is recommended for bioretention retrofits with less than 0.5 acre CDA. The higher end of the range applies when bioretention retrofits are designed as a landscape feature (i.e., special stone, intensive plant materials and special grading/berms).

2. *Rain gardens*: Numerous researchers have reported a much lower unit cost ($3 to $5 per cubic foot) to construct rain gardens (Hathaway and Hunt, 2006, WDNR (2003) and WSSI (2006). The term “rain gardens” is used here to define shallow bioretention areas in relatively permeable soils that lack underdrains and are installed with volunteer labor. This situation may occur

for homeowner installation of rain gardens and some demonstration retrofits.

3. *Typical bioretention retrofits*: Most bioretention retrofits fall between these two extremes, but are still likely to exceed the costs for new bioretention areas. Bioretention retrofits typically require more pretreatment, re-grading, new inlets and intensive landscaping than their new development counterparts. Not much data, however, were available to define this cost difference. Based on engineering judgment, a multiplier of 1.5 was applied to the new bioretention unit cost data to reflect the expected costs for typical bioretention retrofits ($10.50 per cubic foot treated, range of $7.50 to $17.75). Designers should adjust the project estimate to reflect the site-specific construction cost inflators/deflators described in Chapter 3.

4. *Ideal bioretention retrofits*. Some proposed sites are a natural for bioretention retrofit (e.g., abundant treatment area located in a depression, use of simple curb cuts to direct runoff into the retrofit, sandy soils, a simple planting plan etc.). Retrofit sites that satisfy the new development site conditions in Table E.3 may use unit costs for new bioretention construction (median $7.00 range of $5.50 to 10.50 per cubic foot treated)

E. Filtering Practices

New Construction: The costs for new stormwater filters depend on the complexity of their design, so a tiered cost estimation approach was followed. Sand filters were classified into three categories, as follows:

1. Surface sand filter (no concrete poured and no major structural elements)
2. Structural sand filter (perimeter or surface filter w/ two cells with major concrete/structural elements or special media)
3. Underground sand filter (deep excavation, concrete vault construction and special treatment media)

The Brown and Schueler (1997) cost equation was updated to 2006 dollars to define costs for surface sand filters, whereas the Wossink and Hunt (2003) equation was relied on to define costs for structural sand filters:

$CC = (59{,}678)(A^{0.882})$
Note: Applies to CDA of 0.5 to 9 acres

The cost equations were solved the equation for typical retrofit boundary conditions, as follows:

1.0 acre CDA and 100% IC
1.5 acre CDA and 65% IC
3.0 acre CDA and 35% IC

Based on these boundary conditions, expected low-end, middle and high-end values were determined for surface and structural sand filters. Some engineering judgment was used to adjust the high end predictions of the Wossink and Hunt equation downward, based on cross-checking with earlier cost estimates reported by Schueler (2000a).

Two sources were used to derive unit construction costs for underground sand filters (Schueler, 2000a) and Hoyt's 2007 review of nine underground and multi-chamber treatment train retrofit projects. The costs were quite variable, but a

projected cost range of $28 to $75 covered

Retrofit Construction – Given limited cost data and the similarity between new and retrofit filter costs, the three tier approach for estimating filtering practice costs was not adjusted to account for retrofitting. It was also reasoned was that most sand filters for new development are built at tight and constrained sites that are comparable to most retrofit situations.

F. Infiltration Practices

New Construction - No new construction cost data was discovered in the literature to estimate the unit costs to construct new infiltration practices. Given the inherent similarity in the construction process between bioretention and infiltration, it was therefore assumed that infiltration construction costs would be equivalent for new bioretention areas (see Table E.2).

Retrofit Construction – Very little infiltration retrofit cost data has been reported, presumably because of poor urban soil conditions have limited their use. It was assumed that infiltration retrofit costs would be twice that of new bioretention areas to account for expanded soil testing, pretreatment cells, erosion and sediment control and landscaping.

H. Water Quality Swales

New Construction – Several assumptions and methods were needed to derive unit construction costs for new water quality swales, which are frequently reported on a linear foot (Claytor, 2003) or a square foot basis (Hathaway and Hunt (2006). Most estimates are for grass swales that use checkdams to get surface storage. No data were available for dry swales which are similar in construction to bioretention areas most of the projects.
(e.g., underdrains and full media replacement). It was assumed that this class of water quality swales would be equivalent to the high end of new bioretention areas reported in Table E.2

The unit costs for water quality swales reported by Claytor (2003) were updated to 2006 dollars, and were converted to a per cubic foot basis using the following common retrofit channel conditions:

- 4 foot bottom width, 6 inch average ponding depth, 3:1 side slopes ($8.20/cubic foot)
- 8 foot bottom width, 6 inch average ponding depth, 3:1 side slopes ($4.75/cubic foot)
- 12 foot bottom width, 6 inch average ponding depth, 3:1 side slopes ($3.50/cubic foot)

Consequently, the low end for new water quality swale costs was established using the Claytor approach, and the high end using "running" bioretention.

Retrofit Construction- Swale retrofit costs were assumed to be twice that of new water quality swale construction due to the need for greater re-grading, creation of multiple cells, vegetation establishment, soil amendments, and work within tight easements.

I. Other On-Site Retrofit Techniques

The last group of retrofit cost data is the data for individual on-site practices. Cost data for these practices were derived from recent cost studies. Cost data were generally converted to a per cubic foot basis using unit conversions and assumptions about typical treatment areas. The particular methods used to derive the cost data for each of the

individual on-site practices are summarized below.

1. Stormwater Planters

Cost data from Hoyt (2007) was used to develop the unit costs for stormwater planters.

- Range: $83,500 to $104,500 per impervious acre treated

A unit conversion factor of 3630 CF was used to convert the impervious acre treated data to a per cubic foot basis:

- Range: $23.00/CF to $29.00/CF

The median cost was set at $26.00/CF and a cost range was established assuming that the low end and high end costs were 30% lower and higher than the median cost. The resulting range was $18.00/CF to $34.00/CF.

2. Cisterns

Cost data from Hoyt (2007) and Hathaway and Hunt (2006) were used to develop the unit costs for cisterns.

- Range: $20,000/IC to $80,000/IC
- Range: $1.00/gal to $3.00/gal

Unit conversions were used to convert the cost data to a per cubic foot basis:

- Range: $5.50/CF to $22.00/CF
- Range: $7.50/CF to $22.00/CF

Based on the results, a median cost was established at $15.00/CF (range:$6.00/CF to $22.00/CF).

3. Green Roofs

Updated cost data from Hoyt (2007), Chicago (2003), Portland BES (2006a) and WSSI (2006) were used to develop the unit costs for green roofs.

Extensive Green Roofs

- Range: $405,500 /IC to $770,500/IC (Hoyt, 2007)
- Range: $9.50/SF to $14.00/SF (Chicago, 2003)
- Range: $10.00/SF to $15.00/SF (Portland BES, 2006a)

Intensive Green Roofs

- Range: $18.00/SF to $30.00/SF (Chicago, 2003)
- $32.00/SF (WSSI, 2006)

Unit conversions were used to convert the cost data to a per cubic foot basis.

Extensive Green Roofs

- Range: $110/CF to $215/CF (Hoyt, 2007)
- Range: $115/CF to $170/CF (Chicago, 2003)
- Range: $120/CF to $180/CF (Portland BES, 2006a)

Intensive Green Roofs

- Range: $215/CF to $360/CF (Chicago, 2003)
- $385/CF (WSSI, 2006)

Based on the results, the median and ranges for extensive and intensive green roofs were established.

Extensive Green Roofs

- Range: $110/CF to $225/CF
- Median: $170/CF

Intensive Green Roofs

- Range: $225/CF to $400/CF
- Median: $310/CF

4. Permeable Pavers

Hathaway and Hunt (2006) re ported a $10/SF unit cost for permeable pavers.

Unit conversions, based on treating one inch of runoff from one impervious acre (e.g. 3,630 CF), were used to convert the cost data to a per cubic foot basis.

- $120/CF

The range of costs was established by assuming that the low end and high end costs are 30% lower and higher, respectively, than the median cost. The resulting cost range was $80/CF to $160/CF.

5. Rain Barrels

Cost data from Hathaway and Hunt (2006) and Portland BES (2006b) were used to develop the unit costs for rain barrels.

- Range: $50 to $300 per 55 gallon rain barrel (Portland BES, 2006b)
- $320 per 55 gallon rain barrel (Hathaway & Hunt, 2006)

Unit conversions were used to convert the cost data to a per cubic foot basis.

- Range: $7.50/CF to $41.00/CF (Portland BES, 2006b)
- $43.50/CF (Hathaway & Hunt, 2006)

Based on the results, the median and range were set at $25.00/CF and $7.50/CF to $40.00/CF, respectively.

6. Rain Gardens

Cost data from Hathaway and Hunt (2006) and WDNR (2003) were used to develop the unit costs for rain gardens.

- Range: $3.00/SF to $5.00/SF (Hathaway & Hunt, 2006)
- Range (homeowner installation): $3.00/SF to $5.00/SF (WDNR, 2003)
- Range (professional installation): $12.00/SF to $15.00/SF (WDNR, 2003)

The costs were converted to a cubic foot basis assuming the runoff from one inch of rainfall from one impervious acre (3,630 CF) and assuming a 12 inch ponding depth within the rain gardens.

Based on the results, three categories of rain garden installation were defined. These included volunteer installation, professional installation with standard landscaping and professional installation with deluxe landscaping:

Volunteer Installation
It was assumed that the cost data presented by Hathaway and Hunt (2006) represented the construction cost for rain gardens installed by volunteers. Therefore, the median and range were set at $4.00/CF and $3.00/CF to $5.00/CF, respectively, for rain gardens installed by volunteers.

Professional Installation with Standard Landscaping
We assumed that the construction cost for professionally installed rain gardens with standard landscaping was somewhere between the other two types of installations (e.g. volunteer installation and professional

installation with deluxe landscaping). The median and range were set at $7.50/CF and $5.00/CF to $10.00/CF, respectively.

This cost data matches well with the cost data presented for the "ideal bioretention retrofit" scenario. The two applications are very similar (e.g. professional installation, practice located in depressional area, simple conveyance to practice, sandy soils with no need for underdrain, simple planting plan), so the construction cost of the two practices should be similar.

Professional Installation with Deluxe Landscaping
It was assumed that the cost data presented by WDNR (2003) represented the construction cost for professionally installed rain gardens with deluxe landscaping (e.g. decorative stone, intensive landscaping). Therefore, the median and range were set at $12.50/CF and $10.00/CF to $15.00/CF, respectively.

7. French Drains/Dry Wells

Cost data from LGPC (2003) was used to develop the unit costs for french drains and dry wells.

- Range: $15/LF to $17/LF

In order to convert the cost data to a per cubic foot basis, the length of a french drain needed to treat one inch of runoff from one impervious acre was calculated. It was assumed that the french drain would be 2 feet deep and 2 feet wide (e.g. the dimensions of a typical french drain) and that the gravel used to fill the french drain would have a void ratio of 0.35. Based on these assumptions, 2,595 linear feet of french drain would be needed to treat 1 acre of impervious cover (e.g. [43,560 SF ∗ 1 IN] ÷ [12 IN/FT ∗ 2 FT * 0.35] ÷ 2 FT = 2,595 FT).

- Range: $10.50/CF to $12.50/CF

Based on the results, the range was set at $10.50/CF to $12.50/CF. The average unit cost (e.g. $11.50/CF) was set as the median.

8. Impervious Cover Conversion

Cost data from RS Means (2006) were used to develop the unit costs for impervious cover conversion.

- Asphalt Removal: $40,000/AC
- Concrete Removal: $55,000/AC
- Site Restoration: $26,150/AC

Site restoration includes soil preparation, fine grading, seeding and erosion control (Table 1).

A unit conversion, based on treating one inch of runoff from one impervious acre (e.g. 3,630 CF), was used to convert the cost data to a per cubic foot basis.

- Asphalt Removal: $11.00/CF
- Concrete Removal: $15.00/CF
- Site Restoration: $7.00/CF

The range was established by assuming that the costs for asphalt and concrete removal represent the low end and high end costs, respectively, for impervious cover removal. The range was therefore set at $18.00/CF to $22.00/CF. The average unit cost (e.g. $20.00/CF) was set as the median cost.

Table 1: Site Restoration for Impervious Cover Conversion		
Description	**Unit Cost**	**Unit**
Soil preparation (till topsoil)	$0.05	SF
Fine grading	$0.25	SF
Seeding (prairie/meadow mix)	$0.05	SF
Erosion control blanket	$0.25	SF
Total cost	$0.60	SF
Source: RS Means, 2006		

9. Filter Strips

Cost data from RS Means (2006) were used to develop the unit costs for filter strips.

- Site Restoration: $0.70/SF
- Level Spreader: $4.00/LF

Site restoration includes brush clearing and removal, soil preparation, fine grading, seeding and erosion control (Table 2).

A unit conversion based on treating one inch of runoff from one impervious acre (e.g. 3,630 CF) was used to convert the square foot filter strip cost data to a per cubic foot basis. To convert the unit cost for the level spreader, it was assumed that the overland flow path in the filter strip's contributing drainage area would be 75 feet long (the use of a longer overland flow path would not ensure that sheet flow is provided to the filter strip). Based on this assumption, 580 linear feet of filter strip and level spreader would be needed to treat 1 acre of impervious surface (e.g. 43,560 SF ÷ 75 FT = 580 FT).

- Level Spreader: $2,320/IC
- Level Spreader: $0.60/CF

To convert the unit cost for site restoration, it was assumed that the minimum filter strip width would be 25 feet and the maximum filter strip width would be 75 feet. Based on these assumptions, a minimum of 14,500 square feet and a maximum of 43,500 square feet would be need to treat 1 acre of impervious cover (e.g. 580 FT ∗ 25 FT = 14,500 SF and 580 FT ∗ 75 FT = 43,500 SF)

- Site Restoration: $10,000/IC to $30,500/IC
- Site Restoration: $3.00/CF to $8.50/CF

Based on the results, the range was set at $3.50/CF to $8.50/CF. The average unit cost ($6.00/CF) was set as the median.

10. Soil Compost Amendment

Cost data provided by Schueler (2000b), updated to 2006 dollars, was used to develop the unit costs for soil compost amendments.

- Range: $0.27/SF to $0.98/SF

Unit conversions were used to convert the cost data to a per cubic foot basis.

- Range: $3.20/CF to $11.80/SF

Based on the results, the median and range were set at $7.50/CF and $3.20/CF to $11.80/CF, respectively.

11. Street Bioretention Areas

The cost data compiled by Hoyt (2007) includes data from a number of small bioretention retrofits built in highly urbanized areas with less than 0.5 acres of contributing drainage area. The construction of these retrofits requires professional installation and demolition, soil replacement, underdrains, connections to the existing storm drain system and extensive landscaping.

The construction of street bioretention areas requires equally careful construction. Therefore, the construction cost of street bioretention areas was assumed to be the same as that of small, highly urban bioretention retrofits. The median and range were set at $30.00/CF and $25.00/CF to $40.00/CF, respectively. The higher end of the range should be used when the bioretention area is designed as a landscape feature (e.g., decorative stone, intensive landscaping)

Table E.2: Site Restoration for Filter Strips

Description	Unit Cost	Unit
Site preparation (brush clearing and removal)	$0.10	SF
Soil preparation (till topsoil)	$0.05	SF
Fine grading	$0.25	SF
Seeding (prairie/meadow mix)	$0.05	SF
Erosion control blanket	$0.25	SF
Total cost	$0.70	SF
Level spreader (based on 1 CF stone/LF)	$4.00	LF
Source: RS Means, 2006		

Appendix F: Rooftop Retrofit Design Sheets

RR-1	Rooftop Retrofit Design Sheets **STORMWATER PLANTERS**	

Stormwater or foundation planters are an on-site retrofit practice that can treat rooftop runoff. They consist of confined planters that store and/or infiltrate runoff through a soil bed to reduce runoff volumes and pollutant loads (Figure 1). Two major design variations exist based on the condition of the underlying soil. The *infiltration planter* is designed to allow runoff to first filter through the planter soil and then infiltrate down through native soils. The *filter* or *flow-through planter box* has compacted bottom soils or an impervious liner that prevents infiltration. When it overflows, water surcharges from the bottom of the planter after it filters through the soil through a perforated underdrain and discharges to the storm drain system. Both planter designs are sized to temporarily store runoff in a reservoir above the planter soil.

Stormwater planters combine an aesthetic landscaping feature with a functional form of stormwater treatment. Stormwater planters generally receive runoff from adjacent rooftop downspouts. As runoff passes through the planter, pollutants are captured on soils. Stormwater planters are landscaped with plants that are tolerant to both periods of drought and inundation.

Stormwater planters are useful in treating rooftop runoff in highly urban areas, such as a central business district. They can also be used to establish a pervious area within the hardscape of a plaza, courtyard, riverfront, or streetscape. While they treat a very small drainage area, they can be incorporated into municipal or corporate demonstration projects. Since each planter treats runoff from a few hundred to a few thousand square feet of contributing rooftop (plus the additional area of the planter bed itself), it takes quite a few planters to provide meaningful stormwater treatment in a subwatershed. On the other hand, planters are one of the few on-site or storage retrofit options available to treat ultra-urban sites.

The two primary factors to assess when considering stormwater planter retrofits are the contributing roof area to each roof leader, and how and where the excess runoff will be discharged from the planter. A planter designed to encourage infiltration should have adequate waterproofing and dewatering components to prevent foundation seepage.

Design

Two basic design variations for stormwater planters are the infiltration planter and the filter planter.

An **infiltration planter** filters rooftop runoff through planter soils followed by infiltration

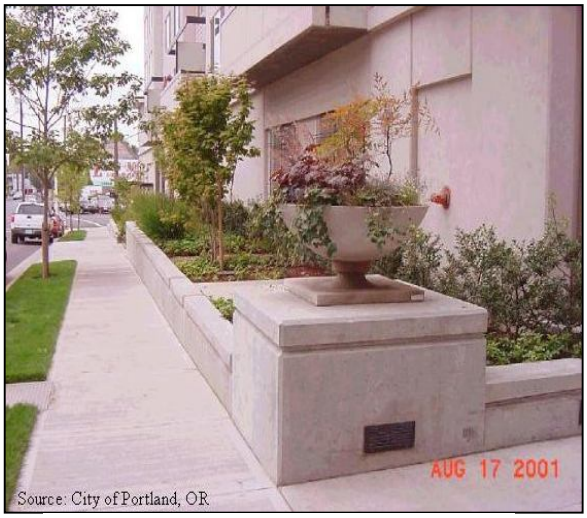

Figure 1: Portland Stormwater Planter

into soils below the planter (Figure 2). The recommended minimum width is 30 inches; length and shape can be decided by architectural considerations. The planter should be sized to temporarily store at least one-half inch of runoff from the contributing rooftop area in a reservoir above the planter bed. Infiltration planters should be placed at least ten feet away from a building to prevent possible flooding or basement seepage damage.

A **filter planter** has an impervious liner on the bottom of the planter. The minimum planter width is 18 inches with the shape and length governed by architectural considerations. Runoff is temporarily stored in a reservoir located above the planter bed. Overflow pipes are installed to discharge runoff when maximum ponding depths are exceeded to avoid water spilling over the side of the planter (Figure 3). Since a filter planter is self-contained and does not infiltrate into the ground, it can be installed right next to a building.

All planters should be placed at grade level or above ground, and sized to allow captured runoff to drain out within four hours after a storm event. Plant materials should be capable of withstanding moist and seasonally dry conditions. Planting media should have an infiltration rate of at least two inches per hour. The sand and gravel on the bottom of the planter should have a minimum infiltration rate of five inches per hour. The planter can be constructed of stone, concrete, brick, wood or other durable material. If treated wood is used, care should be taken so that trace metals and creosote do not leach out of the planter. Supplemental irrigation may be necessary in some regions to ensure plant survival during dry weather.

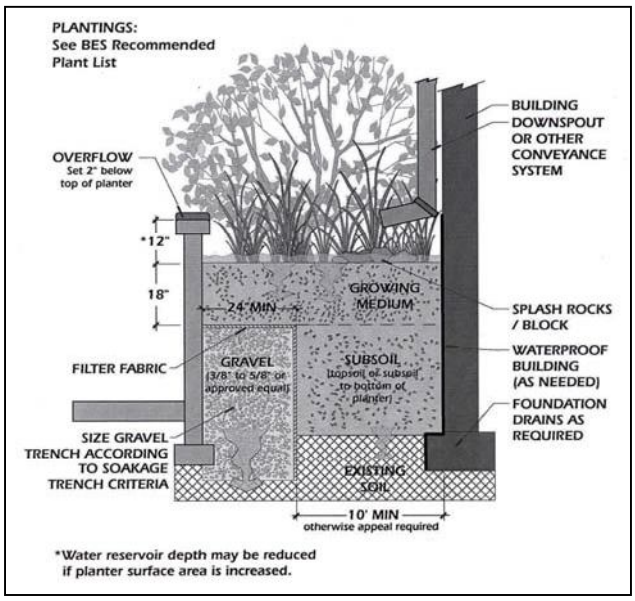

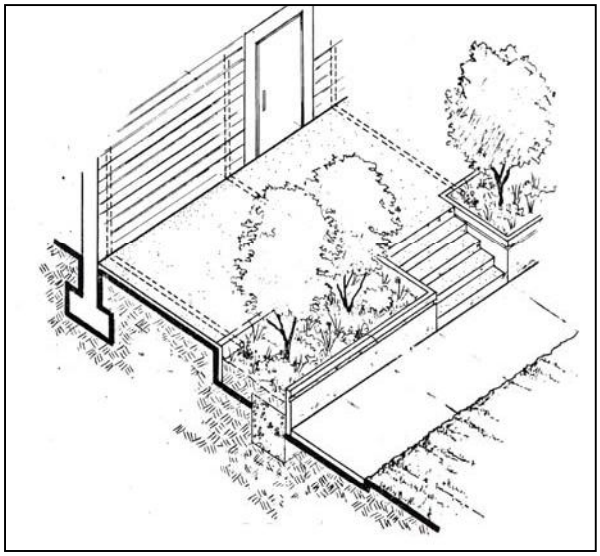

Figure 2: Infiltration Planter Schematic (left) and Infiltration Planter Box (right)
Source: Portland Stormwater Manual, 2002

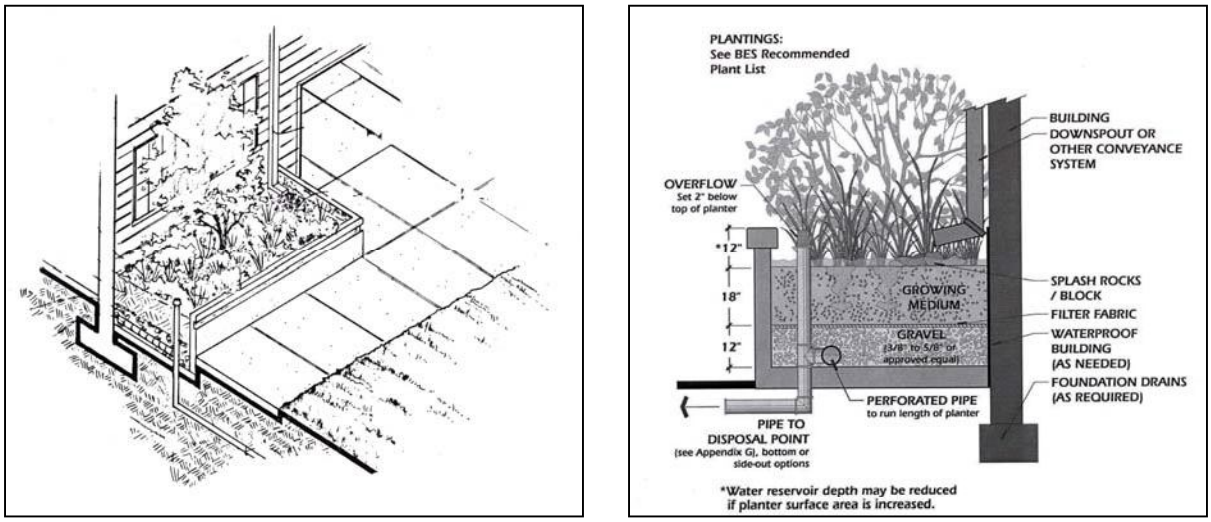

Figure 3: Finished Flow-Through Stormwater Planter (left) and Schematic (right)

Construction - It is advisable to use a single contractor throughout the construction and landscaping maintenance. Contractors should understand the purpose of stormwater planters including appropriate sizing, filtering media, setbacks from current utilities and buildings and care and maintenance of planted material.

Maintenance - Maintenance for stormwater planters involves routine landscaping, checking the integrity of the planter structure, and removal of organic matter. Planter container and overflow pipes should be inspected annually to ensure continued efficiency. Particular care should be taken to ensure that desired infiltration rates are being maintained through the planter soil and subsoils.

Cost – The median cost to construct stormwater planters is estimated to be $27.00 per cubic foot of runoff treated (ranging from $18.00 to $36.00)

Further Resources

City of Portland. 2004. *Stormwater Management Manual – Revised*. http://www.portlandonline.com/bes/index.cfm?c=35122&

Low Impact Development (LID) Center www.lowimpactdevelopment.org/

New York State. *New York State Stormwater Management Design Manual: Stormwater Planters.* *http://www.rpi.edu/~kilduff/Stormwater/planters1.pdf*

RR-2	Rooftop Retrofit Design Sheets **CISTERNS**	

Cisterns capture and reuse rooftop runoff from non-residential sites in a subwatershed. They consist of devices that retain runoff storage volume in aboveground or underground storage tanks (Figure 1). Runoff collected in the tank can be used for outdoor watering, gray water needs or in some cases, even drinking water supply. Stored rainwater provides an opportunity to conserve water and reduce water utility bills. Cisterns are generally much larger than rain barrels and typically have a capacity of more than 10,000 gallons. Since outdoor residential irrigation can account for up to 40% of domestic water consumption in the hot summer months, cisterns can conserve water and reduce the demand on the municipal water system (LID Center, 2003).Cisterns are not yet widely used in most regions of the country but can be incorporated into high-density green buildings.

Feasibility

Cisterns are an effective on-site retrofit option for treating rooftop runoff from selected commercial, industrial, institutional and municipal sites. In many cases, cisterns are a component of "green buildings," such as those certified by LEED. They are particularly useful on sites that are nearly completely built out, and simply represent an aboveground or underground storage alternative.
When assessing a potential cistern retrofit site, designers need to consider the total contributing roof area, as well as the existing "plumbing" system that moves water off of the roof. The capacity required in the cistern can be quickly estimated by a simple storage rule: storage of one inch of runoff from a thousand square feet of roof translates to 83 cubic feet of cistern capacity. The next critical factor is the how the cistern will be de-watered in between storms (i.e., pumped to the storm drain system during dry weather, used for supplemental irrigation, or pumped indoors for gray water plumbing). The last design factor to consider is whether the building owner is capable of operating the cistern.

Local rainfall data should be thoroughly analyzed before sizing cisterns. A monthly rain and snowfall budget may be needed to accurately size a cistern for a site. If freezing conditions are expected in the winter months, cisterns may need to be located below the frost line or inside the building.

Lack of space and the presence of surrounding trees can constrain the use of cisterns. Space problems can be overcome if the cistern is located on the roof or underground. Overhead trees can be a source of falling leaves that can clog the holding tank, or attract rodents and birds whose droppings can contaminate the tank. Cisterns should be located away from trees or other overhead vegetation. If the cistern will be used for gray water or potable water use, designers should also consult the local water authority to see what permits are needed.

Figure 1a: Wooden Cisterns at the Chesapeake Bay Foundation Headquarters

Figure 1b: Large Building Cistern System, Austin, TX

Implementation

Design - Most cisterns are prefabricated units that are sized to meet the required needs of the roof. Typical materials used to construct cisterns are wood, metal and reinforced concrete with a watertight compound. All materials should be sealed using a water safe, non-toxic substance. The cistern should also be equipped with a manhole opening to permit access for cleaning, inspection, and maintenance.

Construction - It is advisable to have an experienced contractor that is familiar with cistern sizing, installation materials, and proper site placement.

Maintenance - Maintenance requirements for cisterns are relatively low if they are only intended to provide supplemental irrigation water. Cisterns designed for drinking water supply have much higher maintenance requirements, such as frequent water quality testing and inspection of filtering systems. Cisterns, along with all their accessories should undergo regular inspections at least twice a year.

Cost - The cost of cisterns varies depending on their construction material and whether they are located above or below ground. The reported cost is $15,000 per cubic foot of runoff treated, with a range of $6,000 to $25,000.

Further Resources

Low Impact Development (LID) Center. *Rain barrels and Cisterns.* http://www.lid-stormwater.net/raincist/raincist_home.htm

Chesapeake Bay Foundation (CBF). 2003. *Phillip Merrill Environmental Center* http://www.cbf.org/site/PageServer?pagename=about_merrillcenter_water_main

University of Florida. Cisterns to Collect Non-Potable Water for Domestic Use. http://edis.ifas.ufl.edu/BODY_AE029

RR-3	Rooftop Retrofit Design Sheets **GREEN ROOFTOPS**	

Description

Green rooftops are used to store and treat rooftop runoff. Also known as a "living roof" or "eco-roof," they consist of a layer of vegetation and soil installed on top of a conventional roof (Figure 1). A green rooftop can be installed on small garages and larger industrial, commercial and municipal buildings. Green rooftops can be designed as extensive or intensive systems. Extensive systems have a thin layer of soil and a cover of grass or moss, while intensive systems have a thicker soil layer, may contain shrubs, trees and other vegetation, and are designed as a landscape amenity.

Green rooftops can be applied to both new and existing roofs, and can be installed on flat roofs or even roofs with slopes up to 30% provided special strapping and erosion control devices are used (Peck and Kuhn, 2003).

Reduction of runoff volume from green roofs is greater in areas where total annual rainfall is low because a greater percentage of rainfall is lost to evapotranspiration (Stephens, et al, 2002). Green roofs retain from 15 to 90% of rainfall, with reports of 65 to 100% in summer and 10 to 40% in winter (Liptan and Strecker, 2003; Roofscapes, Inc., 2003). Green roofs are most effective in reducing runoff volume for land uses with high percentages of rooftop coverage such as commercial, industrial and multifamily housing (Stephens, *et al*, 2002).

Green roofs also provide owners with many additional benefits, including insulation, energy savings, aesthetic value, wildlife habitat, and improved air quality. Some studies have also found that green roofs can extend the life of a conventional roof by up to 20 years.

Feasibility

Green rooftops are a useful on-site retrofit option for new municipal construction, commercial, multi-family, or institutional buildings. In many cases, green rooftops are a component of "green buildings," such as those specified by LEED. They are particularly useful on sites that are nearly completely built out. Other good opportunities to retrofit rooftops are conventional rooftops that have reached the end of their design life and need replacement. Incremental replacement of conventional rooftops with green rooftops can be an effective, long-range (e.g., 20 + years) strategy to incrementally control runoff in ultra-urban subwatersheds.

Figure 1: Green Rooftop on Chicago's City Hall
Source: Roofscapes Inc. www.roofmeadow.com

Many building owners are hesitant to make the conversion to green roofs, given the higher initial capital cost (despite the long term energy savings). Therefore municipalities need to develop an effective delivery mechanism in the form of credits or subsidies or even modify their current building codes to permit green rooftops.

Regional and Climatic Considerations - Plant selection for green rooftops is an integral design consideration, which is governed by local climate and design objectives (Figure 2). A qualified botanist or landscape architect should be consulted when choosing plant material. For extensive systems, plant material should be confined to hardier, indigenous varieties of grass and *sedum*. Root size and depth should also be considered to ensure that the plant will stabilize the shallow soil media. Plant choices can be much more diverse for intensive systems.

The location of the building plays an important role in the design process. The height of the roof, its exposure to wind, snow loading, orientation to the sun, and shading by surrounding buildings all have an impact on the selection of appropriate plant species.

Site Constraints and Permits - The key factors to consider when investigating a rooftop retrofit includes its area, age, and accessibility, structural capacity, and commitment of ownership.

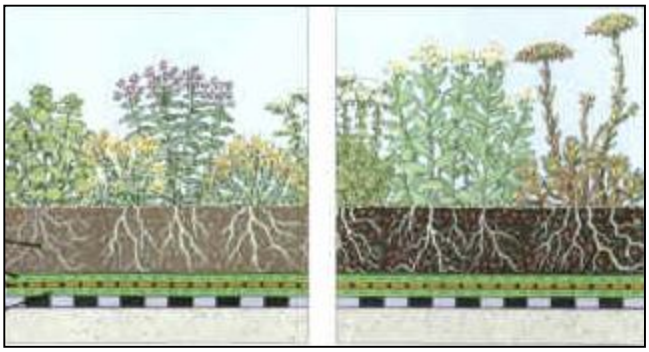

Figure 2: Extensive Cross-Section
Source: Unterlage, 1997

Structural Capacity of the Roof: A key constraint is whether the existing roof can support the additional weight of soil and plants. A licensed structural engineer or architect should conduct a structural analysis to determine the type of green roof system and any needed structural reinforcement.

Access to the Roof: Safe access must be available for workers and materials during both construction and maintenance.

Local Building Codes: Building codes often differ in each municipality, and local planning and zoning authorities should be consulted to obtain proper permits.

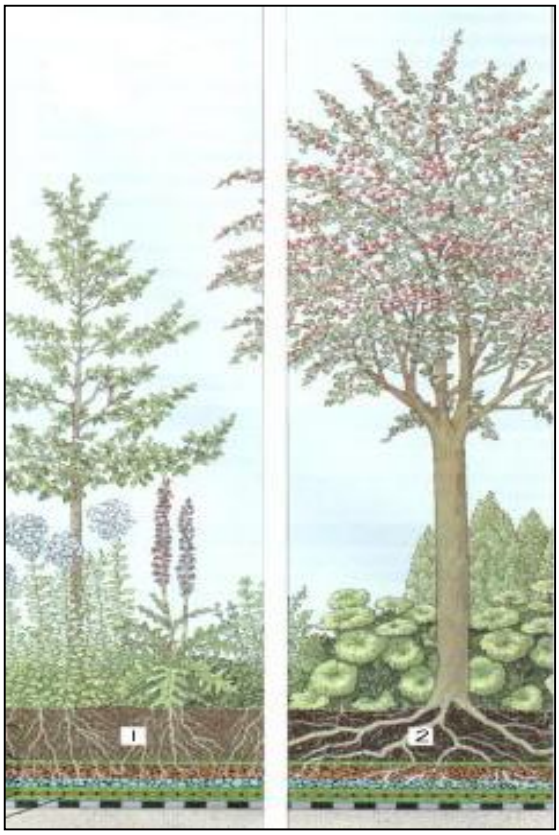

Figure 3: Cross-section of Intensive Green Roof
Source: Unterlage, 1997

Implementation

Each green rooftop is unique, given the purpose of the building, its architecture and the preferences of the builder and end user. Several common features should be kept in mind during green rooftop design, construction and maintenance.

Design – The two design options are the extensive and intensive systems, which vary in cost, depth of growing medium and choice of plants. **Extensive systems** are characterized by low weight, lower capital cost, minimal plant diversity, and reduced maintenance requirements (Figure 2). The growing medium is usually a mixture of sand, gravel, crushed brick, peat, or organic matter combined with soil. The soil media ranges between two and six inches in depth and increases the roof load by 16 to 35 pounds per square foot when fully saturated. Generally, extensive systems can be retrofit on most existing roofs without costly structural reinforcement. Since the growing medium is shallow and the microclimate is harsh, plant species should be low and hardy, which typically involves alpine or arid species, such as *sedum.*

Intensive systems have a deeper soil layer and a corresponding greater weight (Figure 3). Intensive systems have higher construction costs, greater plant diversity, and more expensive landscaping and maintenance needs. In many cases, intensive roofs are accessible to the public and are incorporated into the building as an interactive architectural feature (Figure 4). The growing medium is often soil based and ranges in depth from eight to 24 inches, with a saturated roof loading of between 60 and 200 pounds per square foot. Designers can use a diverse range of trees, shrubs and groundcover because the deeper growing medium allows longer root systems. This allows the designer to develop a more complex ecosystem. Maintenance requirements, however, are more costly and continuous, compared to extensive systems. In some cases, supplemental irrigation systems may be needed. Both a structural engineer and an experienced installer are recommended for intensive systems.

Designers should indicate how they will handle excess runoff that cannot be absorbed by the green rooftop, which is normally drained using downspouts. Most retrofits should be able to use the existing rooftop drainage system with only minor modifications.

Construction – An experienced installer should be used to avoid conflicts and maintain accountability. The green roof should be constructed in sections for easier inspection and maintenance access to the membrane and roof drains.

Maintenance - A green roof should be inspected after construction for plant establishment, leaks and other functional or structural concerns. Maintenance may include watering, fertilizing and weeding, which are greatest in the first two years as plants become established. The use of native vegetation is recommended to reduce plant maintenance. Irrigation and fertilization is only required during the first year before plants are established. After the first year, maintenance consists of two visits a year for weeding of invasive species, and membrane inspections .

Figure 4: Benches and pathways can be incorporated into green roofs

Cost – The estimated cost for extensive green rooftops is $225.00 per cubic foot treated (ranging from $144 to $300). Intensive green rooftops are even more expensive with a median of $360.00 per cubic foot treated (ranging from $300 to $420). While green rooftops are more expensive than other retrofit options, their lifecycle costs may be comparable to traditional roofs, when energy savings and roof longevity are factored in. Operation and maintenance costs are $0.09 to $0.23 per square foot per year (Stephens, *et al*., 2002). Design costs typically run 5-10% of the total project cost and administration and site review costs are 2.5 - 5% of the total project cost (Peck and Kuhn, 2003).

Further Resources

City of Chicago. Rooftop Gardens and Green Roofs. http://egov.cityofchicago.org/city/webportal/portalDeptCategoryAction.do?deptCategoryOID=-536889314&contentType=COC_EDITORIAL&topChannelName=Dept&entityName=Environment&deptMainCategoryOID=-536887205

TectaGreen, Tecta America Corp. *Green Roof Systems*. http://www.greenroof.com/greenroofsys.shtml

Peck, S. and M. Kuhn. *Design Guidelines for Green Roofs.* http://www.aaa.ab.ca/pages/members/documents/GreenRoofs_000.pdf

Roofscapes, Inc. *Green Technology for the Urban Environment.* www.roofmeadow.com

Greenroofs.com. http://www.greenroofs.com

Minnesota Urban Small Sites BMP Manual: Stormwater Best Management Practices for Cold Climates. http://www.metrocouncil.org/environment/Watershed/bmp/manual.htm

Maryland Department of the Environment. Green Roof - Fact Sheet. http://www.mde.state.md.us/assets/document/sedimentStormwater/SWM_greenroof.pdf

RR-4	Rooftop Retrofit Design Sheets **RAIN BARRELS**	

Description

Rain barrels are used to capture, store and reuse residential rooftop runoff. They consist of a simple stormwater collection device that stores rainwater from individual rooftop downspouts. Stored water can be used as a source of outdoor water for car washing or lawn or garden watering. The rooftop runoff stored in a rain barrel would normally flow onto a paved surface and eventually into a storm drain. Rain barrels typically have a capacity of 50 to 100 gallons of water (Figure 1).

Rain barrels can be applied to new and existing residential developments. They are most applicable for single family residential and townhouse uses. Rain barrels can have benefits on both a site level and subwatershed wide basis. Rain barrels promote water conservation, reduce water demand, and lower irrigation costs and demand (a rain barrel can save homeowners about 1,300 gallons of water during the peak summer months). Rain barrels are inexpensive and easy to build and install and create stronger watershed awareness.

Feasibility

Rain barrels are a common on-site retrofit practice to treat rooftop runoff from individual homes. Because each rain barrel retrofit treats such a small area, dozens or hundreds are needed to make a measurable difference at the subwatershed level. Consequently, widespread homeowner implementation of rain barrels requires targeted education, technical assistance and financial subsidies.

The potential to retrofit with rain barrels is normally evaluated as part of the neighborhood source assessment of the USSR. The most important factor is the proportion of existing homes that are directly connected to the storm drain system. In general, neighborhoods with residential lot sizes as small as 4000 square feet can be effectively retrofit with rain barrels (Figure 2). Negative neighborhood factors include the presence of basements, limited space for barrel de-watering, and lack of active homeowner association.

Regional and Climatic Considerations - Several issues pertaining to water quality, climate, and algae and mosquito control

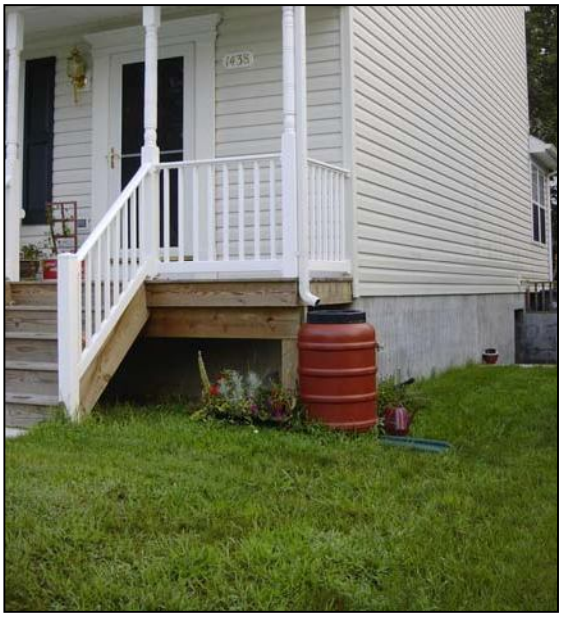

Figure 1: Installed Rain Barrel

should be taken into account in design. Water quality is usually not a major issue unless the stored water will be used for drinking water, which is not recommended without additional filtering and treatment. Rooftop runoff contains trace metals, such as zinc, copper and lead. The presence of these metals, however, should not adversely affect the use of rooftop runoff for supplemental lawn and garden irrigation.

Rain barrels require modification in regions with cold winters. Rain barrels do not function if temperatures regularly reach the freezing mark during winter months. Consequently, rain barrels should be drained and disconnected during winter months to ensure that frozen water does not damage the rain barrel, to back up into downspouts or overflow into a building foundation. Alternatively, rain barrels can be installed inside a building or garage.

Figure 2: Rain barrel installed on a balcony due to space constraints on a small lot.

It is important to reduce the amount of organic matter entering the barrel to prevent algae from growing in a rain barrel. This can be a problem for rain barrels serving a downspout whose gutters fill with leaves and other debris.

Since rain barrels have standing water, there is some risk that they may become mosquito-breeding sites. Simple solutions to reduce mosquito breeding include routine emptying of the barrel on a five day cycle to interfere with breeding time required by mosquitoes or screening the rainwater inlet so mosquitoes cannot enter the rain barrel (USWG, 2003).

Site Constraints and Permits - Rain barrels may not be appropriate in high-density urban settings where there is little or no green space to irrigate using the collected water. Similarly, neighborhoods where homes are close together may not have adequate surface area to safely discharge rain barrel overflow. Lastly, installation of rain barrels in neighborhoods where downspouts are already disconnected provides little or no retrofit benefit.

Implementation

Design - Rain barrels are much easier to design compared to other on-site retrofit practices. Still, the rain barrel should always incorporate the same basic design elements of any good stormwater practice, such as pretreatment (clean gutters), adequate storage capacity, and safe conveyance of flooding with rain barrel overflows).

Construction - Rain barrels can be purchased or custom made from large plastic drums (typically 55-gallon drums). They are relatively easy to construct using a few basic components available from hardware stores. Installation of a typical rain barrel involves disconnecting individual downspouts and redirecting it into the top of the rain barrel.

Rain barrels have an overflow pipe that redirects the rainwater back into the downspout or onto the lawn or other pervious surface when the rain barrel is full. Other rain barrel components may include spigots, connector barrels, mosquito proofing, and even water filters (CWP, 2003).

Maintenance – The maintenance required for rain barrels involves regular dewatering of the barrel to preserve capacity for the next storm event. Roof gutters should be inspected to ensure that leaves and organic matter are not entering the downspout to the rain barrel. In addition, the rain barrel, gutters, and downspouts need to be checked for leaks or obstructions. Lastly, the overflow pipe should be checked to ensure that overflow is draining in a non-erosive manner

Cost - Although costs vary across manufacturers, the average cost of a single rain barrel ranges from about $50 to $300, with an average of about $150 The cost per cubic foot treated is about $25 per cubic foot treated (ranging from $7 to $40) Costs can be reduced if volunteers or watershed groups perform the instillation. Consult Profile Sheet 0S-10 for some helpful resources on rain barrel delivery.

Further Resources

The following internet resources are recommended for a detailed description on how to build and install a rain barrel.

How to Build and Install a Rain Barrel
http://www.cwp.org/Community_Watersheds/brochure.pdf

Rain Barrels for Dummies: Unofficial Guidance for Backyard Retrofitters.
http://www.cwp.org/Community_Watersheds/Rain_Barrel.htm

King County, WA. Rain Barrel Information and Sources for the Pacific Northwest.
http://dnr.metrokc.gov/wlr/PI/rainbarrels.htm

Low Impact Development Center (LID). Rain Barrels and Cisterns.
http://www.lid-stormwater.net/raincist/raincist_maintain.htm

Maryland Green Building Program: Building a Simple Rain Barrel.
http://www.dnr.state.md.us/ed/rainbarrel.html

City of Bremerton. Rain Barrel Program: A Modern Spin On An Old Idea.
http://www.cityofbremerton.com/content/sw_makeyourownrainbarrel.html

Portland, OR Downspout Disconnection Program
http://www.portlandonline.com/bes/index.cfm?c=43081

RR-5	Rooftop Retrofit Design Sheets **RAIN GARDENS**	

Rain gardens capture, filter and infiltrate residential rooftop runoff, and consist of small, landscaped depressions that are usually 6 to 18 inches deep. A sand/soil mixture below the depression is planted with native shrubs, grasses or flowering plants (Figure 1). Rooftop runoff is detained in the depression for no more than a day until it either infiltrates or evapotranspires. Rain gardens can replenish groundwater, reduce stormwater volumes, and remove pollutants. A rain garden allows at least 30% more water to infiltrate into the ground compared to a conventional lawn (UWEO, 2002).

Rain gardens can be applied to existing single-family homes within targeted neighborhoods. Rain gardens have many benefits including increased watershed awareness and personal stewardship, improved neighborhood appearance, and creation of habitat for birds and butterflies. Rain gardens must be properly maintained; otherwise they may create basement flooding and standing water, and become an eyesore. For this reason, implementation of rain gardens requires a dedicated homeowner and community buy-in.

Feasibility

Rain gardens are essentially a non-engineered form of bioretention that treats rooftop runoff from individual roof leader. (see Profile Sheet ST-4). Because each rain garden treats a rather small area, dozens or hundreds are needed to make a measurable difference at the subwatershed level. Consequently, widespread homeowner implementation of rain gardens requires targeted education, technical assistance and financial subsidies.

The potential to retrofit rain gardens is normally evaluated as part of the neighborhood source assessment of the USSR. The most

Figure 1: Rain Garden

important factor is the proportion of existing homes that are directly connected to storm drain system. In general, neighborhoods with large residential lot sizes are most suitable (1/4 acre lots and larger). Negative neighborhood factors include the presence of basements, compacted soils, and poor neighborhood awareness. Positive factors are large rooftop areas that are directly connected to the storm drain system, lots with extensive tree canopy and good neighborhood housekeeping.

Regional and Climatic Considerations - One common misperception associated with rain gardens is that they provide a breeding ground for mosquitoes. Mosquitoes need three to seven days to breed, and standing water in the rain garden should last for only a few hours after most storms USWG, 2003).

Plant selection is also an important element of a successful rain garden. Considerations should include drought-tolerant plants that will not require much watering, but can withstand wet soils for up to 24 hours. Plant selection also depends on the amount of sun the garden receives. Xeriscaping (the practice of landscaping to conserve water) is recommended in arid climates (Figure 2). For a listing of the native plants in your region, visit: http://plants.usda.gov/ (USDA NRCS). This database allows the user to search for plants by name (common or scientific) or by state or county.

Site Constraints and Permits - The site constraints for rain gardens include soils and proximity to the house. The garden should be located a minimum of 10 feet away from the house to prevent basement seepage. Rain gardens work best in areas with well-drained soils. However, performance can be enhanced in poorly draining soils by providing an underdrain system or soil amendments.

Implementation

Design - The surface area of a rain garden should be between 20% and 30% of the roof area it drains to it to ensure it can temporarily hold water from a 1-inch rainstorm. Further guidance on sizing a rain garden is provided in Table 1.

To ensure that the water flows from the impervious surface to the garden, maintain at least a 1% slope from the lawn down to the rain garden (a shallow swale can be used). A downspout extension can be used to direct rooftop flow into the garden.

Construction - Construction of rain gardens is simple but requires physical labor to dig the garden, prepare the soil, and plant desired species. Select plants that have a well-established root system and plant them approximately one foot apart (UWEO, 2002). More information on how to install rain gardens can be found online in the Further Resources section.

Figure 2: Xeriscaped Garden

Table 1: Rain Garden Sizing Example
30' x 30' house footprint
¼ of this area drains to one downspout
15' x 15' = 225 sf
20% of 225sf = 45sf
30% of 225sf = 67.5 sf
The rain garden area should be between 45 and 67.5 square feet, depending on the soil type (use 20% for sandier soils in Soil Group A)

Maintenance - Maintenance of rain gardens is essential to ensure public acceptance and proper performance, and reduce nuisance problems. Typical maintenance includes periodic watering and weeding. The use of native plants can significantly reduce overall yard maintenance needs since they require less mowing, watering and fertilizer than conventional lawns.

Cost - The cost to construct a rain garden includes labor for construction and design, plants, and soil mixture. Design and construction costs can vary widely depending on the complexity of the project. Rain gardens typically cost about $4.00 per cubic foot of runoff treated (ranging from $3 to $5). Do-it-yourselfers can create beautiful rain gardens for a fraction of this cost.

Further Resources

Center for Watershed Protection *How to Install a Rain Garden.* http://www.cwp.org/Community_Watersheds/brochure.pdf

UWEO (University of Wisconsin Extension Office). Rain Gardens: http://clean-water.uwex.edu/pubs/pdf/home.gardens.pdf

Bannerman, R. and E. Considine. 2003. Rain Gardens: A how-to manual for homeowners http://www.dnr.state.wi.us/org/water/wm/dsfm/shore/documents/rgmanual.pdf

Center for Watershed Protection . *Rain Garden Applications and Simple Calculations.* http://www.cwp.org/Community_Watersheds/Rain_Garden.htm

Friends of Bassett Creek. 2000. *Rain Gardens: Gardening with Water Quality in Mind.* http://www.mninter.net/~stack/bassett/gardens.html.

Minneapolis, MN Neighborhood Rain Gardens http://www.fultonneighborhood.org/lfrwm.htm

Portland, OR Downspout Disconnection Program http://www.portlandonline.com/bes/index.cfm?c=43081

Rain Gardens for Stormwater Bioretention and Ecological Restoration.. http://www.nwf.org/campusecology/files/reillyprop.pdf

"Plotting to Infiltrate? Try Rain Gardens." *Yard and Garden Line News* 3(6). http://www.extension.umn.edu/yardandgarden/YGLNews/YGLN-May0101.html

West Michigan Environmental Action Council and the City of Grand Rapids RainGardens.org. http://www.raingardens.org

RR-6	Rooftop Retrofit Design Sheets
	FRENCH DRAINS and DRY WELLS

French drains and dry wells are an on-site retrofit practice that can capture and infiltrate residential rooftop runoff. Runoff from rooftop leaders is directed to the trench via a downspout or swale, is temporarily stored in the voids of the stone-filled trench, and ultimately percolates into the ground. The terms *french drain* and *dry well* are often used interchangeably since they perform the same function, however, their design and application differ slightly. A french drain is a shallow underground trench with a perforated pipes running along the bottom (Figure 1). A typical dry well is a deeper and shorter excavated trench with perforated pipes that run both vertically and horizontally through the stone (Figure 2).

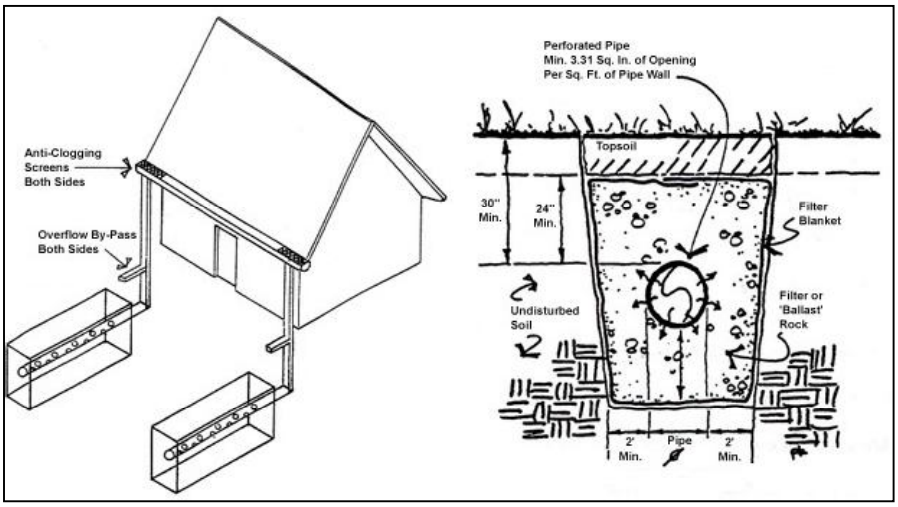

Figure 1: Schematic of French Drain

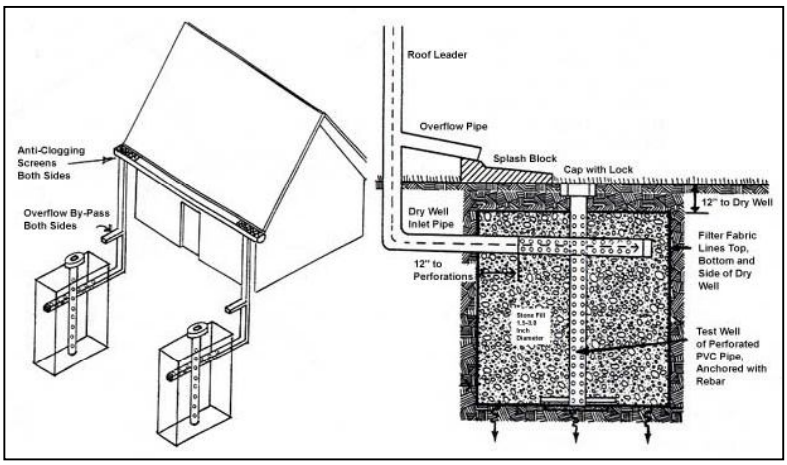

Figure 2: Schematic of Dry Well

French drains are almost exclusively used for residential sites, whereas dry wells can be used at both residential and commercial sites. Each practice serves a small drainage area, such as a single rooftop or roof leader. While not much space is needed to install these practices, very high-density neighborhoods will have limited opportunities.

Feasibility

Because each french drain/dry well treats a rather small area, dozens or hundreds are needed to make a measurable difference at the subwatershed level. Consequently, widespread homeowner implementation of these practices requires targeted technical assistance and financial subsidies.

The potential to retrofit with french drains/drywells is normally evaluated as part of the Neighborhood Source Assessment of the USSR The most important factor is the proportion of existing homes that are directly connected to the storm drain system. In general, neighborhoods with large residential lot sizes are most suitable (1/4 acre lots and larger). Negative neighborhood factors include the presence of basements, compacted soils, and poor neighborhood awareness or involvement. Positive factors are large rooftop areas that are directly connected to the storm drain system, lots with extensive tree canopy, and neighborhoods known for good housekeeping and active involvement.

Regional and Climatic Considerations - Dry wells and french drains do not function during winter months in colder climates unless the trench extends below the frost line. Also, dry wells are not feasible in regions with high water tables.

Site Constraints and Permits - The three main site constraints pertaining to french drains and dry wells are soils, hydrology and slope (LGPC, 2003). The soils must be permeable enough to ensure adequate infiltration within 48 hours. An infiltration rate of at least 0.5 inches per hour is recommended for underlying soils. To limit the risk of groundwater contamination, the bottom of these devices should be located at least three feet above the seasonally high water table or bedrock layer. Steep slopes and fill soils should also be avoided. These practices should be located on the down slope side of buildings and extend at least ten feet from building foundations to prevent potential seepage into basements (ARC, 2001).

Implementation

Design - Several design features can make french drains and dry wells more effective. First, it is important to provide pretreatment to reduce the high rate of clogging typically associated with these practices. While pretreatment options are limited, a screen placed on top of rooftop gutters can help to filter out materials such as leaves and other debris (LGPC, 2003). Guidance for sizing a french drain is provided in Table 1.

The design should provide some type of runoff bypass to direct large storm flows away from the house. The bypass is often an aboveground opening of the downspout as shown in Figures 1 and 2.

Table 1: French Drain Sizing Example
French Drain Surface Area = $\frac{(DA)(P)}{12(D)(V)}$
30' x 30' house footprint ¼ of this area drains to downspout Rainfall Depth (P) = 1" Drainage Area (DA) = 15'x 15' = 225ft^2 Depth of Proposed Trench (D) = 2ft Voids Ratio for Gravel (V) = 0.35 $\frac{(225)(1)}{12(2)(0.35)}$ = 26.8 ft^2 Trench dimensions: 13' length; 2' wide; 2' deep
Notes: Depth (D) can vary depending on site constraints Rainfall Depth (P) can vary; should reflect retrofit water quality target volume or local water quality criteria

Construction - Dry wells generally require more construction effort than other on-site practices due to the deeper excavation required. These practices require relatively simple materials, such as perforated pipe, stone (two to four inches in diameter) and filter fabric. Basic construction involves digging a slightly sloped trench (to carry the water away from the house), lining the sides of the trench with the filter fabric, laying the perforated pipe, and then backfilling the trench with gravel or stone.

Maintenance - Because these practices are out of sight, maintenance tends to be neglected. Regular maintenance consists of a cleaning out leaves and debris caught in the gutter screen and periodic replacement of the reservoir with clean rock. Inspection of the observation well should be done annually to ensure that the stone fill is level to the ground surface and that the filter fabric has not become clogged with material (ADEQ, 2000).

Cost – The unit cost to install these practices is about $12.00 per cubic foot treated (ranging from $10.50 to $13.50).

Further Resources

Guidance for Design, Installation, and Operation and Maintenance of Dry Wells. Phoenix, AZ. http://www.azdeq.gov/environ/water/permits/download/dwguid.pdf

Stormwater Management Guide for Minor Projects. http://www.lgpc.state.ny.us/pdf/strmguid.htm

Development Planning for Stormwater Management: A Manual for the Standard Urban Stormwater Mitigation Plan. http://www.ladpw.org/wmd/NPDES/table_contents.cfm

New York State Stormwater Management Design Manual. http://www.dec.ny.gov/chemical/29072.html

New Jersey Stormwater Best Management Practices Manual. *Standard for Dry Wells*. http://www.njstormwater.org/tier_A/pdf/NJ_SWBMP_9.3%20print.pdf

Houston Landscape Images: Drainage System Components. http://www.houstonlandscape.com/Drain_Systems.htm

Grounds Magazine. *How to Install a French Drain* http://www.grounds-mag.com/mag/grounds_maintenance_install_french_drain/

RR-7	Rooftop Retrofit Design Sheets **PERMEABLE PAVERS**	

Permeable pavers treat or reduce parking lot runoff using a porous or semi-porous material on driveways, access roads, parking lots and walkways. Permeable pavers can also allow for surface storage or infiltration of runoff, which can reduce stormwater flows compared to traditional surfaces like concrete or asphalt pavement.

The basic design presented here is for permeable pavers, which consist of a permeable asphalt or concrete surface that allows stormwater to quickly infiltrate into soils or a shallow underground stone reservoir (Figure 1). Runoff then percolates into the soil, where it recharges groundwater and traps stormwater pollutants. Other materials include grass paving blocks, interlocking concrete modules and brick pavers to provide some infiltration and detention of runoff.

Feasibility

Permeable pavers can be used as a retrofit to treat runoff from parking lots or adjacent rooftops. Good opportunities can be found in spillover parking areas, schools, municipal facilities and urban hardscapes (see Profile Sheet OS-12). Other opportunities include redevelopment of commercial sites, especially when parking lots are renovated or expanded.

It is extremely important to confirm that local soils can support adequate infiltration, since past grading, filling, disturbance and compaction can greatly alter their original infiltration qualities. The greatest opportunity to retrofit infiltration exists for sensitive or impacted subwatersheds, where some of the original soil structure may still exist. By contrast, most of the soils in subwatersheds are not likely to be suitable for infiltration. Some regions of the country still have highly permeable soils, which do allow for widespread use of permeable pavers (e.g., glacial tills, sand).

When evaluating a proposed permeable paver retrofit, designers should assess the same constraints for infiltration practices (see Profile Sheet ST-6d in Appendix I). Additional factors to consider include traffic volume and the intended use and ownership of the surface. Permeable pavers are much more versatile, because they do rely less on soil infiltration as compared to surface storage to provide runoff treatment.

Regional and Climate Concerns - Permeable pavers can be applied in most regions of the country, but needs to be adapted to meet the unique challenges of cold climates. Permeable pavers should not be used when sand or other

Figure 1: Permeable Pavement

materials are applied for winter traction since they quickly clog the pavers. Similarly, care should be taken when applying salt to permeable pavers, since chlorides can migrate into the groundwater. Permeable pavers have been successfully used in cold climate in Norway where design features were incorporated to reduce frost heave. Further, some experience suggests that snow melts faster on a porous surface because of rapid drainage below the snow surfaces.

Site Constraints and Permits – Permeable pavers has the same site constraints of any infiltration practice and should meet the following criteria:

- Soils need to have an infiltration rate between one-half and three inches per hour
- The bottom of the stone reservoir should be completely flat so that infiltrated runoff will be able to infiltrate through the entire surface
- Permeable pavers should be located at least three feet above the seasonally high groundwater table, and at least 100 feet away from drinking water wells
- Permeable pavers should not be used to treat stormwater hotspot areas due to the potential for groundwater contamination

Implementation

Design - Pretreatment, treatment, conveyance, and maintenance reduction should be considered in all permeable pavers retrofits.

In most permeable pavers designs, the pavers itself acts as pretreatment to the stone reservoir below. Because the surface serves this purpose, frequent maintenance of the pavers surface is critical to prevent clogging. Another pretreatment element is a fine gravel layer above the coarse gravel treatment reservoir. The effectiveness of both of these pretreatment measures can be inconsistent, which is one reason frequent vacuum sweeping is needed to keep the surface clean.

One design option intended as a backup water removal mechanism within a permeable pavers system is an "overflow edge." An “overflow-edge” is a trench surrounding the edge of a permeable pavers area. The trench connects to the stone reservoir below the surface of the pavers. Although this feature does not in itself reduce maintenance requirements, it acts as a backup in case the surface clogs. If the surface clogs, stormwater will flow over the surface and into the trench, where some infiltration and treatment will occur. The stone reservoir below the pavers should be composed of layers of small stone and be sized for the WQv storm event.

Variations to the reservoir design include the use of perforated corrugated metal piping, plastic arch pipe, and plastic lattice blocks. Water is conveyed through the stone reservoir from the surface of the pavers, then infiltrates into the underlying soil at the bottom of this stone reservoir. A layer of sand or choker stone should be placed below the stone reservoir to prevent preferential flow paths and to maintain a flat bottom.

Designs should include methods to convey larger storms to the storm drain system. One option is to set storm drain inlets slightly above the surface elevation of the pavers. This allows for temporary ponding above the surface if the surface clogs, but bypasses larger flows that are too large to be treated by the system.

Variations in the design of permeable pavers can address treatment of offsite sources. In one design variation, the stone reservoir below the filter can also treat runoff from other sources such as rooftop runoff. In this design, pipes are connected to the stone reservoir to

direct flow throughout the bottom of the storage reservoir.

Construction - Installation of permeable pavers is a specialized project and should involve experienced contractors. It is also important to ensure that the drainage area is fully stabilized prior to construction to slightly prevent sediment from clogging the pavers.

Maintenance - Permeable pavers requires slightly more maintenance than traditional pavement in order to ensure continued porosity of the surface. Owners should understand that using a sealer or repaving permeable pavers is not a viable option. Areas contributing to the permeable pavers site need to be mowed and bare areas should be seeded. The surface should be vacuumed three to four times each year to remove sediment and debris.

A carefully worded maintenance agreement is essential to provide specific guidance for the parking lot. The agreement should clearly specify how to conduct routine maintenance tasks, and repave the surface when the pavers reaches the end of their design life. Ideally, signs should be posted on the site identifying permeable paver areas to increase public awareness.

Inspections of permeable pavers should include inspection of surface for spalling or deterioration and testing to ensure that water is draining between storms. Adequate drawdown should occur within 24 to 48 hours.

Cost - Permeable pavers are more expensive than traditional asphalt or concrete pavement. While traditional pavement is approximately $.50 to $1.00 per square foot, permeable pavers can range from $2 to $3 per square foot, depending on the design. The cost per cubic foot of runoff treated is about $120.00 (ranging from $96.00 to $144.00). However, if the cost estimates were to include the savings due to a reduced need for storm drains and land consumption for stormwater treatment, the cost differential for permeable pavers drops sharply.

Further Resources

BioPaver.
http://www.biopaver.com/problems.html

Concrete Network. *Permeable/Porous Pavers.*
http://www.concretenetwork.com/concrete/porous_concrete_pavers/

Green Builder. A Source Book for Green and Sustainable Building: Pervious Paving Materials.
http://www.greenbuilder.com/sourcebook/PerviousMaterials.html

Pavers Search. *Paver Products and Resources for Homeowners and Professionals.*
http://www.paversearch.com/permeable-pavers-menu.htm

Puget Sound Online. *Natural Approaches to Stormwater Management: Permeable Pavement.*
http://www.psat.wa.gov/Publications/LID_studies/permeable_pavement.htm

Appendix G: Example Concept Design

R-9 Stormwater Planter at St. Martin Church

Location

The sidewalk on Fayette Street adjacent to St. Martin Church at the intersection of Fulton and Fayette Streets.

Site Description

The downspouts on the Fayette Street side of St. Martin Church discharge to a trench drain, which then discharges directly to the street (Figures 1 and 2).

Proposed Practice

The proposed practice for this site is an aboveground, flow-through stormwater planter that will capture and treat rooftop runoff.

Stormwater planters are small landscaped stormwater treatment practices that use soil filtration to reduce stormwater quantity and improve water quality, similar to rain gardens and green roofs. Flow-through planters are contained planters with an underdrain system that conveys filtered stormwater to the storm drain system (Figure 3)

Visual Glossary Reference

- #3. Planter boxes

Drainage Area

- The northern portion of the roof drains to the downspout where the stormwater planter will be located. The drainage area to this downspout is approximately 2,500 ft^2.

Figure 1: Downspout from St. Martin Church on Fayette.

Figure 2: Sidewalk along Fayette where stormwater planter will be located.

An aerial view of the estimated drainage area is attached.

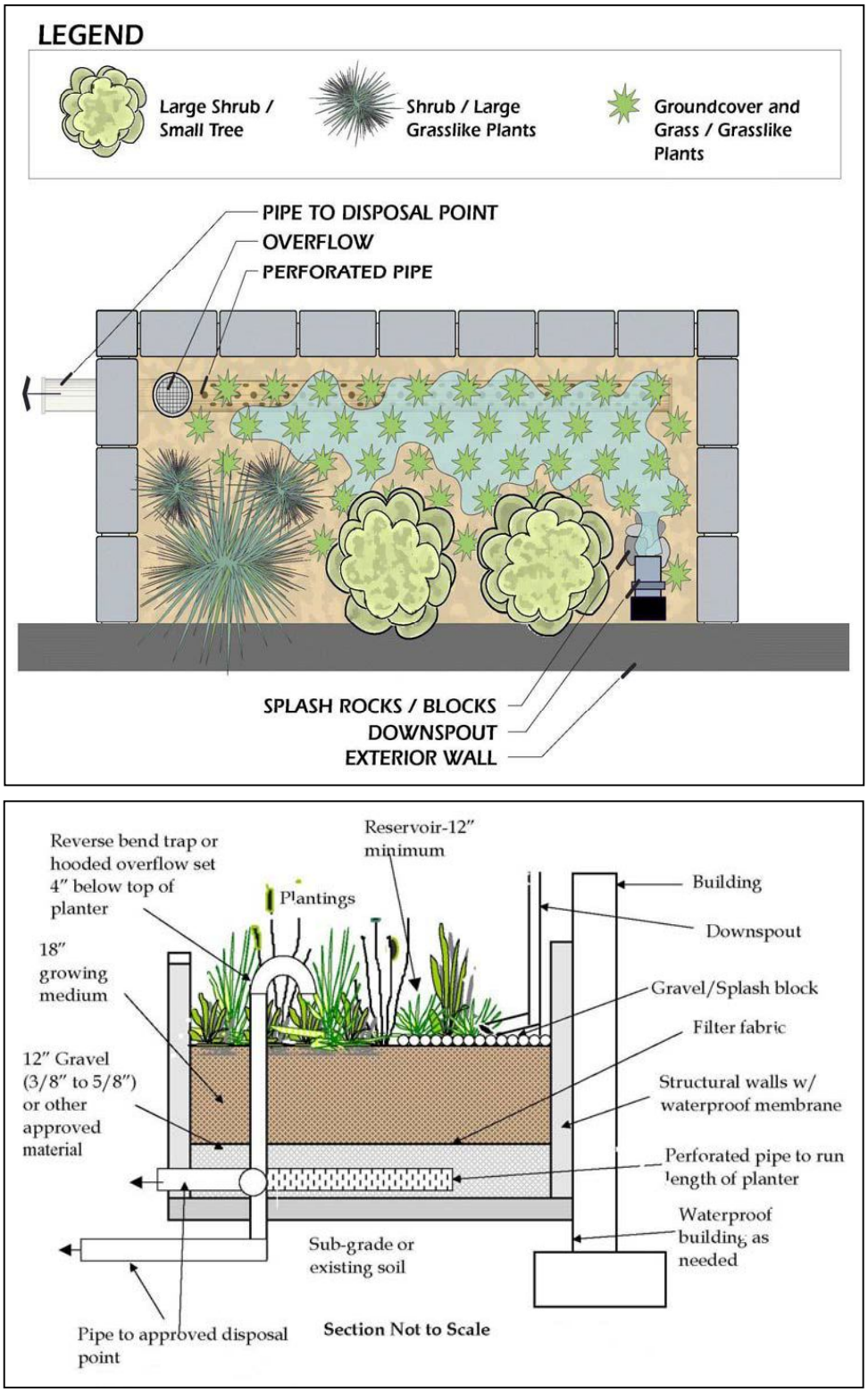

Figure 3: Plan view (top) and cross section view (bottom) of a flow-through stormwater planter (Source: Portland, OR, 2004).

Sizing Computations

- Stormwater runoff volume treated = 0.25 in, or ≈ 50 ft^3
- Target surface area of the stormwater planter = 67.5 ft^2
- Proposed dimensions of the planter = 9 ft by 7.5 ft
- Minimum soil depth = 1.5 ft
- Average ponding depth = 0.5 ft
- Maximum ponding depth = 1.0 ft
- Filter time ≈ 4 hours

Detailed sizing computations are attached.

Features

The stormwater planter will be placed on the sidewalk adjacent to the north side of the church on Fayette Street (Figure 4). Specific design notes follow:

- The planter will be an aboveground system – excavation will not be necessary.
- The downspout will be shortened and directed into the top of the planter. To prevent erosion, splash rocks should be placed below the downspout.
- The planter has been designed to pond water for 4 hours, with a maximum ponding depth of 12 inches. The dimensions of the proposed planter are 9 feet (along building) by 7.5 feet.
- The planting medium depth will be 18 inches. The gravel drainage layer will have a depth of 12 inches. Filter fabric will separate the planting medium from the gravel drainage layer, and should extend upwards along the walls of the planter to the top of the planting medium.
- A 4-inch vertical hooded PVC pipe will serve as an overflow control to redirect high flows out of the planter to the existing trench drain. This will require that a hole be "punched through" the pavement covering the trench drain to allow for insertion of the overflow pipe. The invert of the pipe's "hood" should be set 4 inches below the top of the planter.
- A 4-inch perforated PVC pipe in the drainage layer will direct treated runoff to the existing trench drain. This perforated PVC pipe should be connected to the vertical PVC overflow pipe. The over end of the perforated PVC pipe should be capped.
- Native plant species that are adaptable to the wet/dry conditions that will be present need to be selected.

A plan view and a cross section view of the proposed stormwater planter are attached.

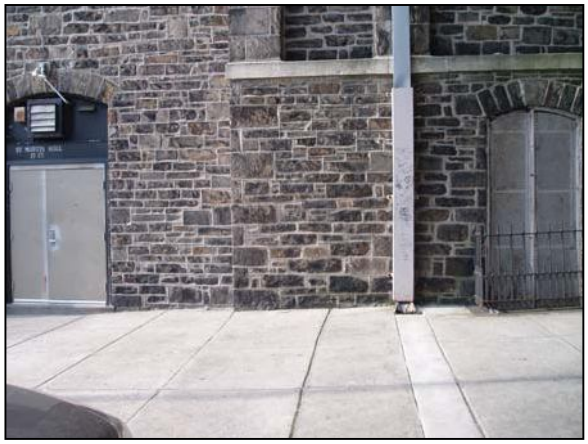

Figure 4: Proposed location of the stormwater planter, along the building between the window and corner (to the right of the door).

Construction Sequence

- Cut the downspout so that the end can be placed over the stormwater planter. Use a downspout elbow to direct the end of the downspout into the stormwater planter.

- Construct planter with the interior dimensions shown on the attached drawings. Drill hole through bottom of planter and sidewalk to allow for insertion of overflow control pipe.
- Assemble the vertical hooded PVC overflow pipe. Drill holes in the PVC pipe that will serve as the underdrain. Attached the perforated underdrain pipe to the overflow pipe. Set in the planter.
- Place 12 inches of 3/8" to 5/8" washed gravel in the bottom of the planter.
- Lay filter fabric across the top of the gravel drainage layer. The filter fabric should extend upwards along the walls of the planter to the top of the planting medium.
- Fill the planter with 18 inches of planting media. Slight overfilling is recommended to account for settlement.
- Presoak the planting media prior to planting vegetation to allow for settlement.
- Excavate or fill to achieve proper design elevation, leaving space for the upper layer of mulch that will bring the surface to final elevation (approx. 12 inches below the top of the planter).
- Place several 2" to 4" splash stones under the downspout.
- Plant vegetation and mulch.

Materials Specifications

Planter box:

- The planter box should be constructed with the interior dimensions shown on the attached drawings. The surface dimensions of the planting bed should be 9.0 ft by 7.5 ft.
- Materials suitable for planter wall construction include stone, concrete, brick, clay, plastic, wood, or other durable material.
- Treated wood may leach toxic chemicals and contaminate stormwater, and should not be used.
- A pre-manufactured container, such as a concrete vault, may be suitable for this practice.
- If using wood or some other permeable materials, the walls and bottom of the planter box should be lined with an impermeable membrane.

Downspout elbow:

- One downspout elbow

Splash rocks:

- Several 2" to 4" diameter rocks.

Planting medium:

- Approx. 101 $ft^3 \approx 3.8\ yd^3$ of well-blended, homogenous mixture of 50-60% construction sand; 20-30% top soil; and 20-30% organic leaf compost. This mixture should be a uniform mix, free of stones, stumps, etc.
    - Sand – clean construction sand, free of deleterious materials. AASHTO M-6 or ASTM C-33 with grain size of 0.02" – 0.04".
    - Top soil – sandy loam, loamy sand, or loam texture per USDA textural triangle with less than 5% clay content.
    - Organic leaf compost – aged leaf mulch.

Filter fabric:
- Approx. 117 ft^2 of filter fabric.
- This filter fabric should meet a minimum permittivity rate of 75 gal/min/ft^2.

Gravel:
- Approx. 67.5 $ft^3 \approx 2.5\ yd^3$ of 3/8" to 5/8"washed gravel

Underdrain and overflow drain system:
- Approx. 11 feet of 4" PVC schedule 40 pipe.
- One 4" PVC schedule 40 hood or trap (two 90° elbow PVC socket fittings may be used instead).
- One 4" PVC schedule 40 cap socket fitting.
- The perforated underdrain may be connected to the vertical overflow drain using a Schedule 40 Tee PVC Socket Fitting
- The perforated underdrain pipe may be created by drilling holes in 4" PVC Schedule 40 pipe. The holes should be 1/4" in diameter, 6" center to center, along three longitudinal rows.

Planting Considerations

- Vegetation selected for the stormwater planter should be relatively self-sustaining and adaptable.
- Native plant species are recommended, and fertilizer and pesticide use should be avoided whenever possible.
- Vegetation should be able to withstand extended dry and wet periods. Vegetation may be in standing water for up to four hours.
- Tree planting is discouraged in the planter due to the depth of planting medium (18").

A sample of appropriate plant materials is attached (MDE, 2000).

Maintenance Considerations

- Following completion, the stormwater planter should be inspected after each storm event greater than 0.5 inches, and at least twice in the first six months. Subsequently, inspections should be conducted annually and after storm events equal to or greater than the 1-year storm event.
- Routine maintenance activities include pruning and replacing dead or dying vegetation, plant thinning, and erosion repair.

Specific inspection and maintenance considerations include:

- Downspout: Debris shall be removed routinely (e.g., no less than every 6 months) and upon discovery. Damaged pipe shall be repaired upon discovery.
- Splash Blocks: Should be replaced if necessary.
- Planter: Water should drain from reservoir within 3-4 hours of storm event. Sources of clogging shall be identified and corrected. Topsoil may need to be amended with sand or replaced all together.

- Planting medium: Excavation and replacement of the soil and gravel layer may be necessary to correct low infiltration rates. Sediment accumulation should be hand removed with minimum damage to vegetation. Sediment should be removed if it is more than 4 inches thick or so thick as to damage or kill vegetation. Litter and debris shall be removed routinely (e.g., no less than quarterly) and upon discovery.
- Planter: Any structural deficiencies in the planter including rot, cracks, and failure should be repaired.
- Overflow Pipe: Damaged pipe shall be repaired or replaced upon discovery.
- Vegetation: Should be healthy and dense enough to provide filtering while protecting underlying soils from erosion. Mulch shall be replenished at least annually. Vegetation that limits access or interferes with planter operation should be pruned or removed. Fallen leaves and debris from deciduous plant foliage should be raked and removed.

R-9 Stormwater Planter at St. Martin Church

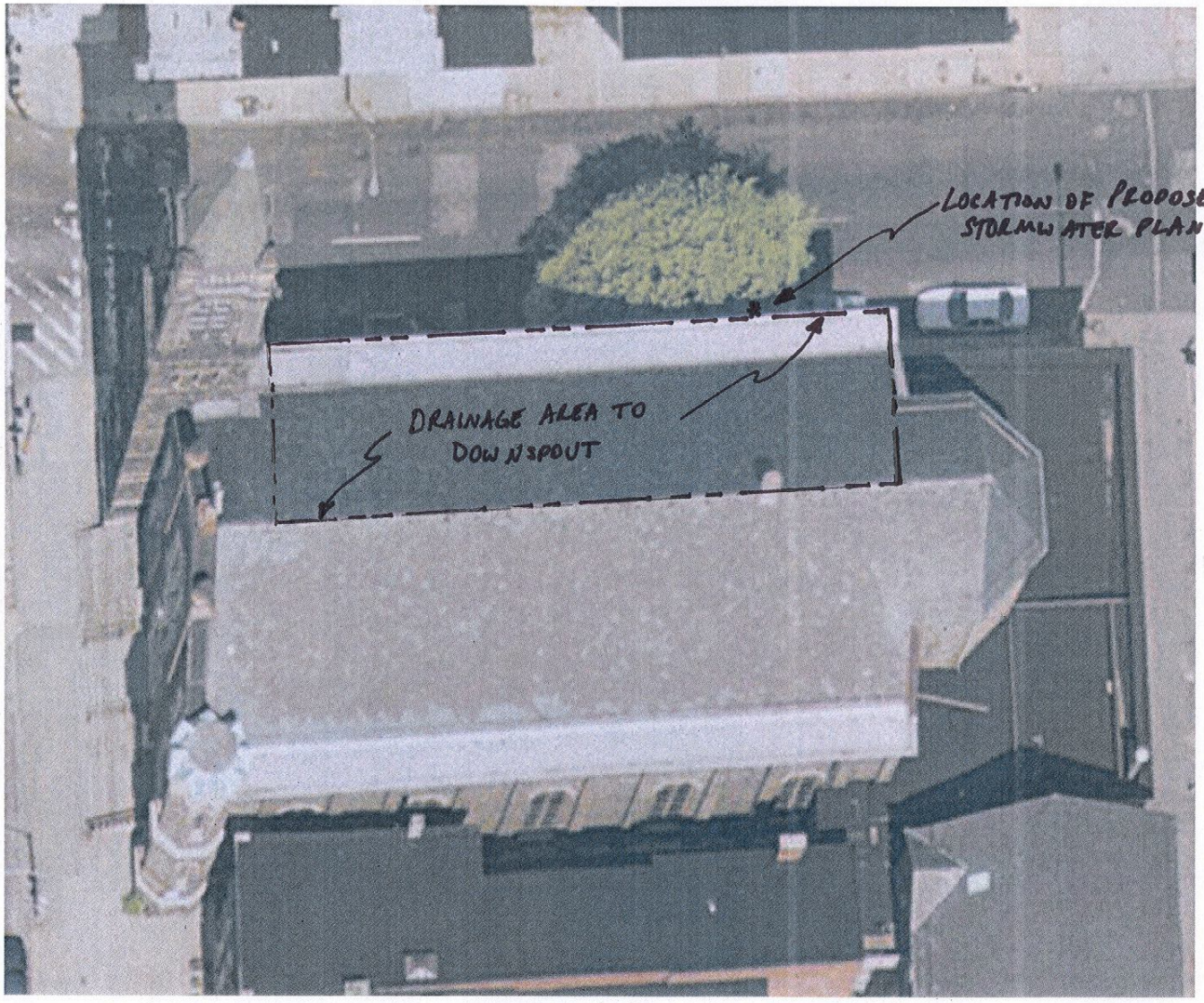

N

25 0 25 50 Feet

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R-9 SW Planter @ St. Martin Church

Drainage Area

$\approx 100\,ft \times 25\,ft = 2500\,ft^2$

↳ treats north half of roof

Sizing Computations

* WQ_v per MD Manual

$$WQ_v = \frac{(P)(R_v)(A)}{12}$$

where $P = 1.0''$

$R_v = 0.05 + 0.009(I)$

$= 0.05 + 0.009(100) = 0.95$

$A = 2{,}500\,ft^2$

$$WQ_v = \frac{(1\,in)(0.95)(2500\,ft^2)}{12} = 198\,ft^3 = \underline{200\,ft^3}$$

* Required Surface Area

$$A_f = \frac{(WQ_v)(d_f)}{(k)(h_f + d_f)(t_f)}$$

where $WQ_v = 200\,ft^3$

d_f = depth of soil = 1.5 ft

k = hydraulic conductivity = 2 in/hr = 4 ft/day

h_f = avg height of water = 6 in = 0.5 ft

t_f = filter time = 4 hrs = 0.17 days

$$A_f = \frac{(200\,ft^3)(1.5\,ft)}{(4\,ft/day)(0.5\,ft + 1.5\,ft)(0.17\,days)}$$

$$= 220\,ft^2$$

$\therefore$ min surface area = $220\,ft^2$

min soil depth = 1.5 ft

* Available Area = $(9.0\,ft) \times (7.5\,ft) = 67.5\,ft^2$

→ try $P = 0.25$

$$WQ_v = \frac{(0.25\,in)(0.95)(2500\,ft^2)}{12} = 49.5\,ft^3$$

→ revised A_f

$$A_f = \frac{(49.5\,ft^3)(1.5\,ft)}{(4\,ft/day)(0.5\,ft + 1.5\,ft)(0.17\,days)}$$

$$= 54.6\,ft^2$$

→ depth of rainfall treated ≈ 0.25

$\therefore$ target surface area = $67.5\,ft^2$

min soil depth = 1.5 ft

→ planter dimensions = 9 ft × 7.5 ft

R-9 STORMWATER PLANTER PLAN VIEW

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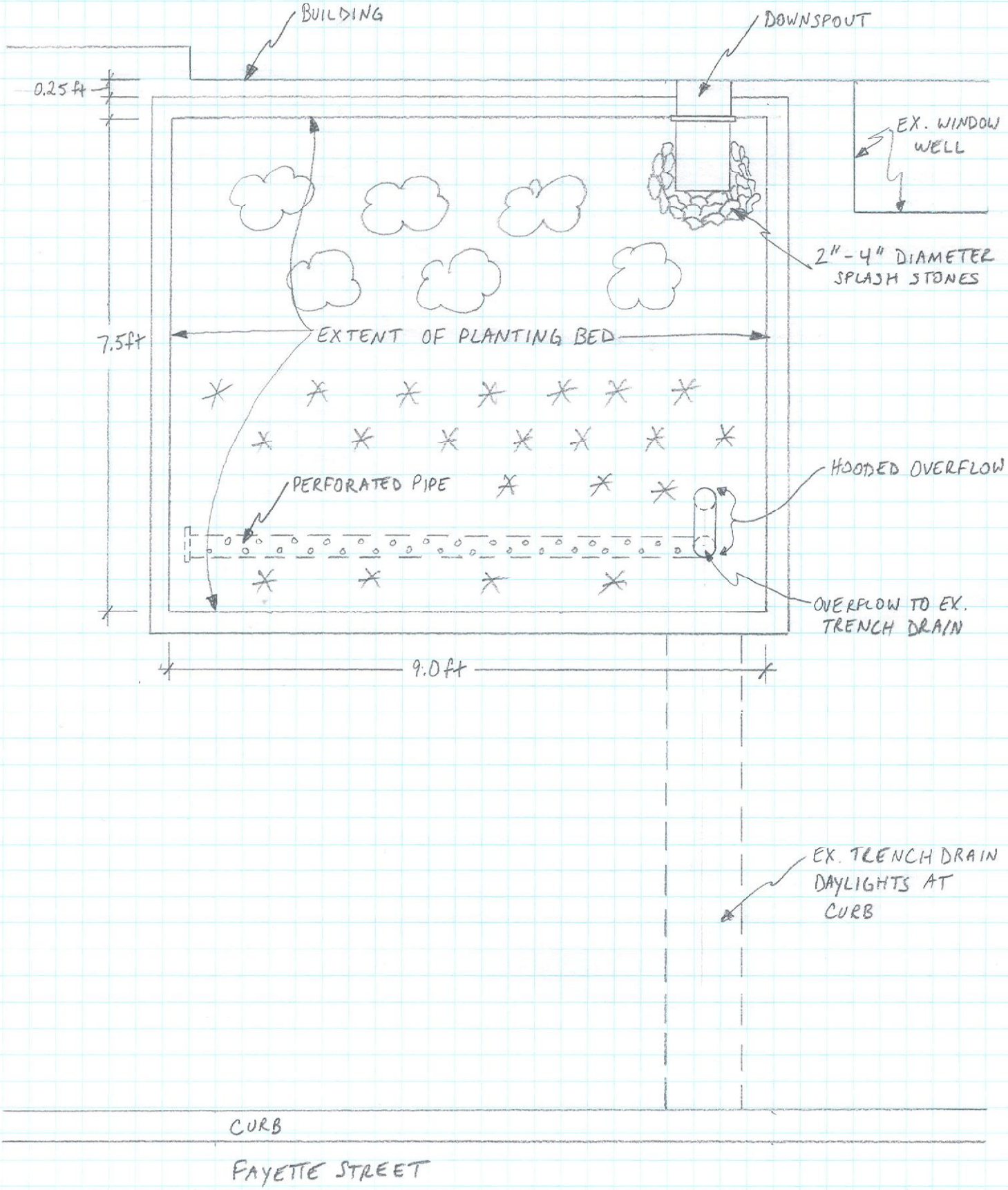

1" = 2'

R-9 STORMWATER PLANTER CROSS SECTION

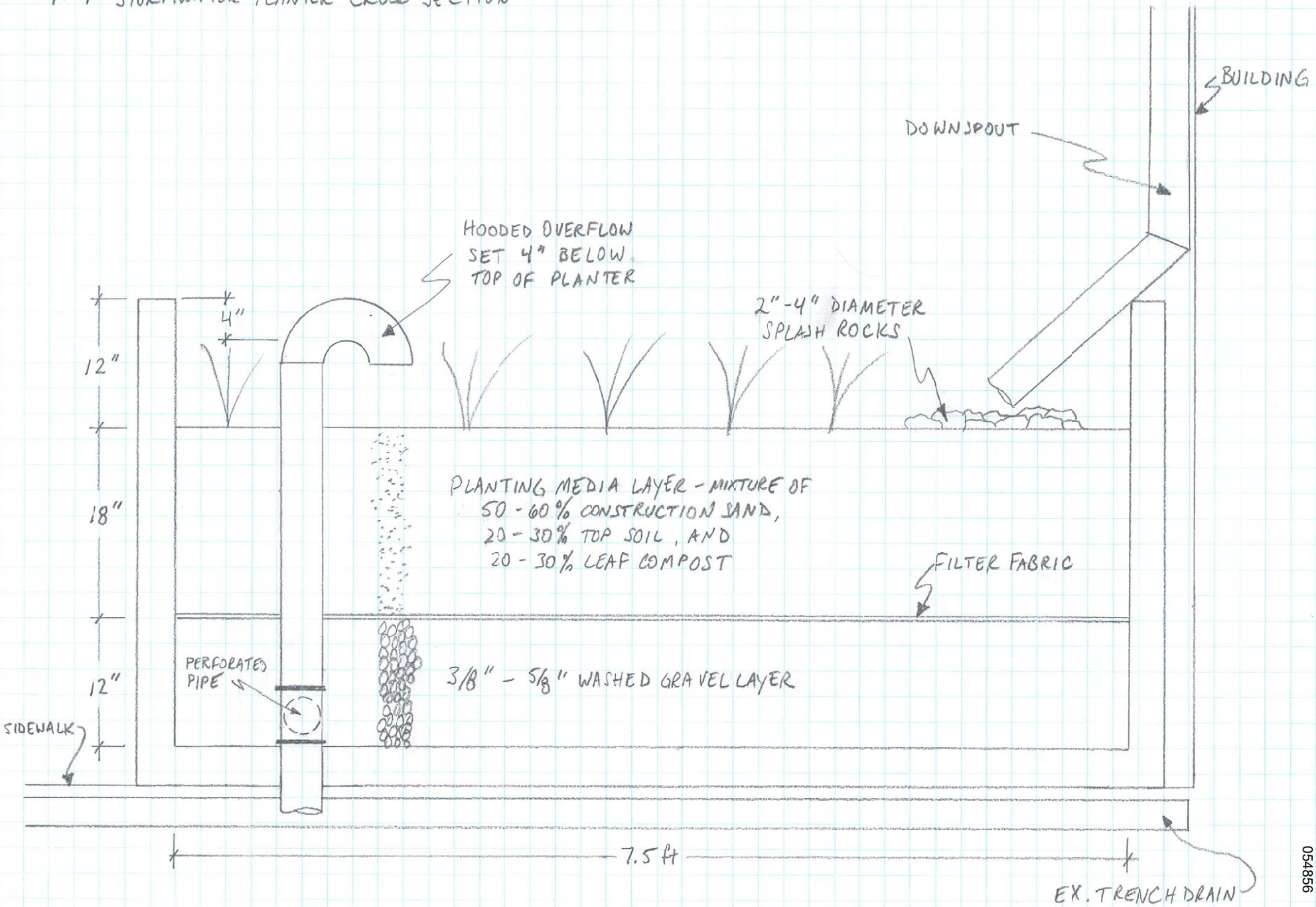

1" = 1'

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Table A.4 Commonly Used Species for Bioretention Areas

Trees	Shrubs	Herbaceous Species
Acer rubrum Red Maple	*Aesculus pariviflora* Bottlebrush Buckeye	*Andropogon virginicus* Broomsedge
Betula nigra River Birch	*Cephalanthus occidentalis* Buttonbush	*Eupatorium perpurea* Joe Pye Weed
Juniperus virginiana Eastern Red Cedar	*Hamemelis virginiana* Witch Hazel	*Scirpus pungens* Three Square Bulrush
Chionanthus virginicus Fringe-tree	*Vaccinium corymbosum* Highbush Blueberry	*Iris versicolor* Blue Flag
Nyssa sylvatica Black Gum	*Ilex glabra* Inkberry	*Lobelia cardinalis* Cardinal Flower
Diospyros virginiana Persimmon	*Ilex verticillata* Winterberry	*Panicum virgatum* Switchgrass
Platanus occidentalis Sycamore	*Viburnum dentatum* Arrowwood	*Dichanthelium scoparium* Broom Panic Grass
Quercus palustris Pin Oak	*Lindera benzoin* Spicebush	*Rudbeckia laciniata* Tall Coneflower
Quercus phellos Willow Oak	*Myrica pennsylvanica* Bayberry	*Scirpus cyperinus* Woolgrass
Salix nigra Black willow		*Vernonia noveboracensis* New York Ironweed

Note 1: For more options on plant selection for bioretention, consult Bioretention Manual (ETAB, 1993) or the Design of Stormwater Filtering Systems (Claytor and Schueler, 1997).

Appendix H: Infiltration Testing Procedures

Appendix H: Infiltration Testing Procedures

If a retrofit site appears to have soils that will permit the infiltration of stormwater runoff, the use of an infiltration retrofit may be possible. On-site testing should be conducted to establish the infiltration capacity of the native soils and determine the feasibility of the infiltration retrofit.

This appendix presents a basic infiltration testing procedure that can be used determine soil infiltration rates at a retrofit site.

I. Test Pit/Boring Procedures

1. 1 test pit or standard soil boring should be provided for every 200 square feet of proposed infiltration or bioretention facility.

2. The location of each test pit or standard soil boring should correspond to the location of the proposed facility.

3. Excavate each test pit or dig each standard soil boring to a depth at least 2 feet below the bottom of the proposed facility.

4. If the groundwater table is located within three feet of the bottom of the proposed facility, determine the depth to the groundwater table immediately upon excavation and again 24 hours after excavation.

5. Conduct Standard Penetration Testing (SPT) every 2 feet to a depth that is 2 feet below the bottom of the proposed facility.

6. Determine the USDA or Unified Soil Classification system textures at the bottom of the proposed facility and at a depth that is 2 feet below the bottom of the proposed facility. All soil horizons should be classified and described.

7. If bedrock is located within two feet of the bottom of the proposed facility, determine the depth to the bedrock layer.

8. Test pit/soil boring stakes should be left in the field to identify where soil investigations were performed.

II. Infiltration Testing Procedures

1. 1 infiltration test should be provided for every 200 square feet of proposed infiltration or bioretention facility.

2. The location of each infiltration test should correspond to the location of the proposed facility.

3. Install a test casing (e.g., rigid, 4 to 6 inch diameter pipe) to a depth 24 inches below the bottom of the proposed infiltration or bioretention facility.

4. Remove all loose material from sides the test casing and any smeared soil surfaces from the bottom of the test

casing to provide a natural soil interface into which water may percolate. If desired, a 2-inch layer of coarse sand or fine gravel may be placed at the bottom of the test casing to prevent clogging and scouring of the underlying soils. Fill test casing with clean water to a depth of 24 inches and allow underlying soils to pre-soak for 24 hours.

5. 24 hours later, refill the test casing with another 24 inches of clean water and measure the drop in water level within the test casing after one hour. Repeat the procedure three additional times by filling the test casing with clean water and measuring the drop in water level after one hour. A total of four observations will be completed. The infiltration rate of the underlying soils may either be reported as the average of all four observations or the value of the last observation. The infiltration rate should be reported in inches per hour.

6. Infiltration testing can be performed within an open test pit or a standard soil boring.

7. After infiltration testing is completed, the test casing should be removed and the test pit or soil boring backfilled and restored.

Appendix I: Retrofit Design Sheets

ST-1d	Retrofit Design Sheets	
	EXTENDED DETENTION	

Typical Constraints

Some common constraints for retrofitting extended detention ponds include:

Space Required: A typical ED pond requires a footprint of 1 to 3% of its contributing drainage area, depending on depth of the pond (the deeper the pond, the smaller footprint needed).

Available Head: Bottom elevations for ED retrofits are typically determined by the existing elevation of the downstream conveyance system (e.g., a stream, channel or pipe). Backwater in the upstream conveyance system can also constrain the head available at the retrofit site. Typically, a minimum of about six to 10 feet of head is needed to construct an ED retrofit.

Contributing Drainage Area: A minimum contributing drainage area is recommended for each ED design variant. For micropool ED ponds, a minimum of 10 acres is suggested in humid regions to sustain a permanent micropool to prevent clogging. A minimum of 25 acres is recommended in humid regions to maintain constant water elevations in wet ED ponds and ED wetlands. The minimum drainage area may increase in arid or semi-arid climates. A water balance should be conducted if the designer needs to maintain a constant pool elevation. ED may still work on drainage areas less than 10 acres, but designers should be aware that these “pocket” ponds will have very small orifices that will be prone to clogging, experience fluctuating water levels, and generate future maintenance problems.

Minimum Setbacks: Local ordinances and design criteria should be consulted to determine minimum setbacks to property lines, structures, and wells. Generally, ED retrofits should be setback at least 10 feet from property lines, 25 feet from building foundations, 50 feet from septic system fields, and 100 feet from private wells.

Utilities: Site designers should check to see if any utilities cross the proposed retrofit site. ED retrofits should not submerge existing sewer manholes as this can lead to infiltration/inflow problems and make maintenance access more difficult. Dry utilities such as underground electric or cable should never be inundated.

Depth to Water Table: The depth to the groundwater table is typically not a major concern for ED retrofits. In fact, intercepting a high water table can sustain a shallow pool or pocket wetland within the retrofit. Designers should keep in mind that groundwater inputs may reduce retrofit pollutant removal capability and could sharply increase excavation costs.

Depth to Bedrock: If bedrock layers are discovered near the surface of the proposed retrofit, it may be too difficult or expensive to excavate the storage needed for ED retrofits.

Special Community and Environmental Considerations about ED Retrofits

ED retrofits can create several community and environmental concerns to anticipate during design:

Aesthetics: ED retrofits tend to accumulate sediment and trash, especially if they are undersized. Many residents perceive dry ED ponds as being unsightly and creating nuisance conditions. Fluctuating water levels in ED retrofits also create a tough landscaping environment. In general, designers should avoid retrofit designs that rely solely on dry ED.

Existing Wetlands: ED retrofits should not be constructed within existing natural wetlands nor should they inundate or otherwise change the hydroperiod of existing wetlands.

Existing Forests: Clearing of mature trees should be avoided during retrofit layout. Designers should be aware that even modest changes in inundation frequency can kill upstream trees (Wright *et al.*, 2007).

Stream Warming Risk: ED ponds have less risk of stream warming than other pond options, but can warm streams if their low flow channel is not shaded. If the retrofit discharges to temperature-sensitive waters, the pond should be forested and have a maximum detention time of 12 hours or less to minimize potential stream warming.

Safety Risk: Dry ED ponds are generally considered to be safer than other pond options since they have few deep pools. Steep side-slopes and unfenced headwalls, however, can still create some safety risks.

Mosquito Risk: The fluctuating water levels within dry ED ponds have potential to create conditions that lead to mosquito breeding. Mosquitoes tend to be more prevalent in irregularly flooded ponds than in ponds with a permanent pool (Santana *et al*., 1994). Designers can minimize the risk by combining ED with a wet pond or wetland.

ED Retrofit Design Issues

ED retrofits are normally squeezed into very tight sites, so designers are always tempted to eliminate standard design features to maximize storage. However, designers should think twice before dropping the following critical design features:

Low Flow Orifice: Unless the drainage area to an ED retrofit is unusually large, the diameter of the ED orifice will be less than six inches in diameter. Small diameter pipes are prone to chronic clogging by organic debris and sediment. Retrofit designers should always look at upstream conditions to assess the potential for higher sediment and woody debris loads. The risk of clogging in such small openings can be reduced by:

- Sticking to a minimum orifice diameter of three inches or greater, even if this means walking away from the proposed retrofit site.
- Protecting the ED low flow orifice by installing a reverse-sloped pipe that extends to mid-depth of the permanent pool or micropool.
- Providing an over-sized forebay to trap sediment, trash and debris before it reaches the ED low flow orifice.
- Installing a trash rack to screen the low flow orifice.

Maximum Vertical Depth of ED: Designers often seek to maximize the depth of ED retrofits to treat a greater volume of runoff within a smaller footprint. Increasing the vertical fluctuation or "bounce" within an ED retrofit, however, can reduce pollutant removal, promote invasive species and create a difficult landscaping environment. In the context of retrofitting, the vertical elevation of ED storage should not extend more than 5 feet above the normal water surface elevation. The bounce effect is not as critical for channel protection or flood control storm events. These storms can exceed the 5 foot vertical limit if they are managed by a multi-stage outlet structure.

ED Retrofit Pond Maintenance Issues

Several maintenance issues can be addressed during retrofit design and future maintenance operations:

Clogging: Retrofits are prone to higher clogging risk at the ED low flow orifice and any upstream flow splitters. These aspects of retrofit plumbing should be inspected at least twice a year after initial construction. Designers should provide easy access to both the micropool and the pond drain to allow maintenance crews to dewater the retrofit.

Sediment Removal: Good maintenance access is also needed to allow crews to remove accumulated sediments. Designers should check to see whether sediments can be spoiled on-site or must be hauled away. The frequency of sediment removal should be increased if:

- A micropool is used within the ED retrofit
- The retrofit is undersized relative to the target WQv
- Significant development activity or winter road sanding is projected to occur in the retrofit's contributing drainage area

Vegetation Management: The constantly changing hydrologic regime of ED retrofits makes it hard to mow or manage vegetative growth. The bottom of dry ED retrofits often become soggy, and water-loving trees such as willows may take over. Retrofit designers should carefully evaluate how vegetation will be cost-effectively managed in the future. Landscape architects can prepare a planting plan that allows the retrofit to mature into a native forest in the right places yet keeps mowable turf along the embankment and all access areas. The wooded wetland concept proposed by Cappiella *et al*., (2005) may be a good option for many ED retrofits.

Trash Removal: Trash, debris and litter tend to accumulate in the forebay, micropool and on the bottom of ED ponds. The maintenance plan should schedule cleanups at least once a year.

A retrofit maintenance plan should be created to address each of the items listed above. The maintenance plan should identify the responsible party and contain a legally enforceable agreement that specifies maintenance duties and schedules.

Adaptation ED for Special Climates and Terrain

Cold Climates: Winter conditions can cause freezing problems within inlets, flow splitters, and ED outlet pipes due to ice formation. Designers can minimize these problems by:

- Not submerging inlet pipes

- Increasing the slope of inlet pipes by a minimum of 1% to discourage standing water and potential ice formation in upstream pipes
- Placing all pipes below the frost line to prevent frost heave and pipe freezing
- Designing low flow orifices to withdraw at least six inches below the typical ice layer
- Placing trash racks at a shallow angle to prevent ice formation

Sand loadings to ED retrofits may increase due to winter road maintenance. Consequently, designers may want to over-size forebays and/or micropools to account for the higher sedimentation rate. ED retrofits can also be designed to operate in a seasonal mode that provides additional WQv storage to treat snowmelt runoff (MSSC, 2005; Caraco *et al.*, 1997).

Arid regions: Water rights can be significant issue when it comes to capturing and detaining stormwater runoff in Western states. Also, ED retrofits in arid regions are subject to high sediment loads and may lack vigorous vegetative cover unless they receive supplemental irrigation (Caraco, 2000). The higher evaporation rates and limited inflows of arid regions always make it hard to sustain a permanent pool in the micropool and/or forebay. Designers may want to compute a water balance to determine if pools can be sustained, or if supplemental irrigation will be needed to maintain vegetative cover.

Karst Terrain: Geotechnical investigations are recommended when ED retrofit ponds are situated in active karst areas to minimize the risk of groundwater contamination and avoid sinkhole formation. An impermeable liner and a minimum three foot vertical separation distance from the underlying rock layer is recommended.

Costs to Install ED Retrofits

Extended detention ranks among the least expensive stormwater options, particularly when free storage can be obtained at pond and crossing retrofit sites (SR-1 and SR-2). The cost to install dry ED ponds at new development sites can be determined from the cost equations of Brown and Schueler (1997). The equations (updated to 2006 dollars) predict the base construction cost of new ED construction based on the storage volume of the pond, including excavation, control structures, and appurtenances:

$$BCC = (10.97)(V_s^{0.780})$$

Vs = Total storage volume (ft^3)
BCC = Base construction cost (2006 dollars)

The median cost to construct a new ED pond is about $3,800 per impervious acre treated (range: $2,200 to $7,500). Please note that ED retrofit construction costs are generally at least three times greater (see Chapter 2 and Appendix E).

Design Resources

Several state stormwater manuals provide extensive guidance on ED pond design:

Georgia Stormwater Management Manual
http://www.georgiastormwater.com

Minnesota Stormwater Management Manual
http://www.pca.state.mn.us/water/stormwater/stormwater-manual.html

Vermont Stormwater Management Manual
http://www.anr.state.vt.us/dec/waterq/cfm/ref/Ref_Stormwater.cfm

ST-2d	Retrofit Design Sheets **WET PONDS**	

Typical Constraints

Some common constraints hinder the use of wet pond retrofits in developed watersheds:

Space Required: The proposed surface area for a wet pond retrofit should be at least 1 to 3 % of its contributing drainage area, depending on the pond's depth.

Contributing Drainage Area: A minimum contributing drainage area of 10 to 25 acres is recommended for wet pond retrofits to maintain constant water elevations, although these can vary by design type and climatic region. Smaller drainage areas may be treated if the retrofit will intercept the groundwater table (but this may reduce pollutant removal and increase excavation costs). Wet ponds can still work on drainage areas less than 10 acres, but designers should be aware that these "pocket" ponds will be prone to clogging, experience fluctuating water levels, and generate more nuisance conditions. A water balance should be conducted if the designer needs to maintain constant pool elevations.

Utilities: Most utilities do not permit existing underground pipes or dry utilities to be submerged as a result of retrofit construction. It may be possible to submerge water or sewer lines if manholes are raised above the maximum water surface elevation of the pond and if the pipes were originally constructed in a watertight manner.

Excavation: Wet ponds normally entail several feet of excavation. Retrofit designers need to understand the quality of subsoils in terms of their suitability for embankment fill, potential excavation problems and whether they need to be hauled off-site.

Available Head: The depth of a wet pond retrofit is usually determined by the head available on the site. The bottom elevation is normally set by the existing downstream conveyance system to which the retrofit discharges (e.g., a stream, channel or pipe). While it is possible to excavate a pool below the outlet invert, this resulting dead storage may not mix well with the rest of the pond, thereby reducing performance and creating nuisance problems. Typically, a minimum of six to eight feet of head are needed to construct a wet pond retrofit.

Minimum Setbacks: Local ordinances and design criteria should be consulted to determine minimum setbacks to property lines, structures, and wells. As a general rule, wet pond retrofits should be setback at least 10 feet from property lines, 25 feet from building foundations, 50 feet from septic system fields, and 100 feet from private wells.

Depth to Water Table: The depth to the water table can be a design concern for wet pond retrofits. If the water table is close to the surface, it may make excavation difficult and expensive. Groundwater inputs can also reduce the pollutant removal rates. On the other hand, a high groundwater table can help provide a constant pool elevation to maintain a pocket pond when the contributing drainage area is small.

Depth to Bedrock: If bedrock layers occur near the surface of a proposed retrofit, it may be too expensive to blast the site to get enough storage volume.

Community and Environmental Considerations for Wet Pond Retrofits

Wet ponds are readily accepted by communities if they are properly designed and maintained. Pond retrofits, however, can generate several community and environmental concerns:

Aesthetic Issues: Many residents feel that wet ponds are an attractive landscape feature, promote a greater sense of community and are an attractive habitat for fish and wildlife. Designers should note that these benefits are often diminished if retrofits are under-sized or have small contributing drainage areas.

Existing Wetlands: A wet pond retrofit should not be constructed within an existing natural wetland. Any discharges from the retrofit into an existing natural wetland should be minimized to prevent changes to its hydroperiod.

Existing Forests: Construction of wet pond retrofits may involve major clearing of existing forest cover. Designers can expect a great deal of neighborhood opposition if they do not make a concerted effort to save mature trees during retrofit design and layout.

Stream Warming Risk: Wet ponds can warm streams by two to 10 degrees Fahrenheit, although this may not be a major problem for degraded urban streams (Galli, 1990). To minimize stream warming, wet pond retrofits should be shaded and provide shorter ED detention times (e.g., 12 hours vs. 24).

Safety Risk: Pond safety is an important community concern, as young children have perished by drowning in wet ponds after falling through the ice. Gentle side slopes and safety benches should be provided to avoid potentially dangerous drop-offs, especially when retrofits are located near residential areas. Residents may request fences around the pond or its outfalls in some retrofit situations.

Mosquito Risk: Mosquitoes are not a major problem for larger wet ponds (Santana *et al*., 1994; Ladd and Frankenburg, 2003). However, fluctuating water levels in smaller or under-sized wet ponds could pose some risk for mosquito breeding. Mosquito problems can be minimized through simple design features and maintenance operations described in Chapter 4 and MSSC (2005).

Geese and Waterfowl: Wet ponds with extensive turf and shallow shorelines can attract nuisance populations of resident geese and other waterfowl whose droppings can reduce pond nutrient and bacteria removal. Several design and landscaping features can make a pond retrofit much less attractive to geese (see Schueler, 1992).

Wet Pond Retrofit Design Issues

Wet pond retrofits are often squeezed into very tight sites, so designers can be tempted to eliminate standard design features in order to obtain maximum pool storage. It is generally advisable to sacrifice some storage volume in order to incorporate design features critical to retrofit performance, function and longevity. The following design features should be included in wet pond retrofits:

Pretreatment: Sediment forebays located at major inlets help extend the longevity of wet pond retrofits. Each forebay should be sized

to have about 10% of the total retrofit storage volume and have easy access for sediment cleanouts.

Long Flow Path: Retrofits should have an irregular shape and a long flow path from inlet to outlet to increase residence time and pond performance (ideally 2:1). Internal berms can be used to extend flow paths and create multiple pond cells.

Safety/Access Bench: Retrofits should include a flat bench just outside of the perimeter of the permanent pool to allow for maintenance access and reduce safety risks. The bench can be variable in width (10 to 15 feet).

Aquatic Bench: Aquatic benches are shallow areas just inside the perimeter of the normal pool that promote growth of aquatic and wetland plants. The bench also serves as a safety feature, reduces shoreline erosion and conceals floatable trash. In retrofit situations, the aquatic bench can vary in width from three to 10 feet.

Avoid Deep Pools: Designers often seek to maximize the depth of a wet pond retrofit to store a greater runoff volume within a smaller footprint. Pool depths greater than eight feet, however, should be avoided in most retrofit situations. Deep ponds can cause seasonal pond stratification that release pollutants stored in bottom sediments back into the water column (and have a much greater safety risk).

Wet Pond Retrofit Maintenance Issues

Wet ponds normally have less routine maintenance requirements than other stormwater treatment options. The frequency of maintenance operations may need to be scaled up if retrofits are undersized or have a small contributing drainage area. Designers should consult CWP (2004b) for more information on wet pond maintenance problems and solutions. Several maintenance issues can be addressed during retrofit design and future maintenance operations:

Maintenance Access: Good maintenance access should always be provided to the sediment forebay, access bench, riser and outlet structure so crews can more easily perform maintenance tasks. The riser structure should be placed within the embankment.

Sediment Removal: Sediments excavated from wet ponds are not normally classified as toxic or hazardous material, and can be safely disposed by either land application or land filling. Sediment testing may be needed prior to sediment disposal if the retrofit serves a hotspot land use.

Clogging: There is always some risk that the low flow orifice or upstream flow splitter may clog. These aspects of retrofit hydraulics should be inspected frequently after construction. The retrofit should have a pond drain so crews can de-water the pond to relieve clogging and remove sediments.

Vegetation Management: The maintenance plan should clearly outline how vegetation in the pond and its buffer will be managed or harvested in the future. Methods to establish desired aquatic plants and control invasive plant species should be outlined. Annual mowing of the pond buffer is only required along maintenance rights-of-way and the embankment. The remaining buffer can be managed as a meadow (mowing every other year) or as forest.

Trash Removal: The maintenance plan should schedule a shoreline cleanup at least once a year to remove trash and floatables.

Adapting Wet Ponds for Special Climates and Terrain

Cold climates: The performance of wet pond retrofits in cold climates can be enhanced when designers:

- Treat larger runoff volumes in the spring by adopting seasonal operation of the permanent pool (see MSSC, 2005)
- Plant salt-tolerant vegetation in pond benches
- Do not submerge inlet pipes and provide a minimum 1% pipe slope to discourage ice formation
- Locate low flow orifices so they withdraw at least 6 inches below the typical ice layer
- Angle trash racks to prevent ice formation
- Oversize riser and weir structures to avoid ice formation and freezing pipe
- Increase forebay size if road sanding is prevalent in the contributing drainage area

Arid Climates: Wet pond retrofits require special design in regions with low annual rainfall or high evapotranspiration. Ponds are generally not a preferred option if the permanent pool cannot be maintained without supplemental irrigation. Some tips for designing wet ponds in arid climates include the following:

- Pond vegetation flourishes when temperatures are warm and the growing season is long or year-round, which can result in prolific growth of algae, wetland plants, shrubs and trees (Figure 1). Regular mowing or even plant harvesting should be considered to keep vegetative growth in check.
- Designers should always check to make sure there is an adequate water balance to support a permanent pool throughout the year- otherwise the potential of algal blooms, odors and other nuisances can increase sharply. When in doubt, install a clay or synthetic liner to prevent water loss via infiltration.
- Arid regions generate higher sediment loads, so designers should consider adding extra sediment trapping capability in retrofit forebays (Caraco, 2000).

Karst Terrain: Deep pools increase the risk of sinkhole formation and groundwater contamination in regions with active karst. Designers should always conduct geotechnical investigations to assess this risk. Pond retrofits in karst areas should include impermeable liners and maintain at least three feet of vertical separation from the underlying rock layer.

Wet Pond Installation Costs

Wet ponds are more expensive on a unit area basis than constructed wetlands and ED ponds, primarily due to the need for deeper excavation and safety features such as side-slope control and benches (Wossink and Hunt, 2003). Several cost equations (updated to 2006 dollars) can predict the

Figure 1: Warm temperatures have led to algal blooms in this wet pond.

base construction cost of new wet ponds, given their proposed storage volume or drainage area treated.

Wet Extended Detention Ponds (Brown and Schueler, 1997)
BCC = $(10.97)(V_s^{0.750})$

Wet Ponds (Brown and Schueler, 1997)
BCC = $(263.99)(V_s^{0.553})$

Wet Ponds (Wossink and Hunt, 2003)
BCC = $(17{,}333)(A^{0.672})$

Vs = Total storage volume (ft^3)
A = area treated (acres)
BCC = Base construction cost (2006 dollars)

Solving these equations for a range of common pond sizes yields a median construction cost for a new wet pond of $ 8,350 per impervious acre treated (range: $ 3,100 to $28,750). Please note that the wet pond retrofit construction costs are typically 1.5 to 2 times higher than new pond construction (see Chapter 2 and Appendix E).

Wet Pond Design Resources

Many existing state and local stormwater manuals provide extensive guidance on wet pond design:

Vermont Stormwater Management Manual
http://www.anr.state.vt.us/dec/waterq/cfm/ref/Ref_Stormwater.cfm

Minnesota Stormwater Management Manual
http://www.pca.state.mn.us/water/stormwater/stormwater-manual.html

Austin, TX Drainage Criteria Manual
http://www.cityofaustin.org/watershed/publications.htm

New York State Stormwater Management Design Manual
http://www.dec.state.ny.us/website/dow/toolbox/swmanual/index.html

Maryland Stormwater Design Manual
http://www.mde.state.md.us/Programs/WaterPrograms/SedimentandStormwater/stormwater_design/index.asp

ST-3d	Retrofit Design Sheets **CONSTRUCTED WETLANDS**	

Typical Constraints

Constructed wetlands are subject to several constraints when it comes to retrofitting:

Contributing Drainage Area: The contributing drainage area must be large enough to sustain a permanent water level within a stormwater wetland. A minimum of 25 acres of drainage area is typically needed to maintain constant water elevations in humid regions, although the precise area varies based on local hydrology. The minimum drainage area can be relaxed if the bottom of the retrofit intercepts the groundwater table or if designers are willing to accept periodic wetland drawdown. Designers should note that these "pocket" wetlands will have lower pollutant removal, higher excavation costs, and a greater risk of invasive plant colonization.

Space Requirements: Wetland retrofits require a footprint ranging between 3 and 5% of the contributing drainage area, depending on the average depth of the wetland and the extent of its deep pool features.

Available Head: The depth of a wetland retrofit is usually constrained by the head available on the site. The bottom elevation is fixed by the elevation of the existing downstream conveyance system to which the retrofit will ultimately discharge. Head requirements for constructed wetlands are typically less than wet ponds because of their shallow nature - a minimum of two to four feet of head is usually needed.

Minimum Setbacks: Local ordinances and design criteria should be consulted to determine minimum setbacks to property lines, structures, utilities, and wells. As a general rule, wetland retrofits should be setback at least 10 feet from property lines, 25 feet from building foundations, 50 feet from septic system fields and 100 feet from private wells.

Depth to Water Table: The depth to the groundwater table is not a major constraint for constructed wetlands as a high water table can maintain wetland conditions within the retrofit. Designers should keep in mind that high groundwater inputs may reduce pollutant removal rates and increase excavation costs.

Community and Environmental Considerations for Constructed Wetlands

Constructed wetlands can generate several community and environmental concerns:

Aesthetics: Wetland retrofits can create wildlife habitat and become an attractive community feature. Designers should carefully think through how the wetland community will evolve over time, as the future plant community seldom resembles the one initially planted. Constructed wetlands require continual vegetative management to maintain desired wetland species, control woody growth and prevent invasive plants from taking over.

Existing Wetlands: It can be tempting to construct a stormwater wetland within an existing natural wetland, but this should

never be done unless it is part of a broader effort to restore a degraded urban wetland approved by the local or state wetland review authority. Designers should investigate the wetland status of adjacent areas to determine if the discharge from the constructed wetland will change the hydroperiod of a downstream natural wetland (see Cappiella et al., 2006b, for guidance on minimizing stormwater discharges to existing wetlands).

Regulatory Status: Constructed wetlands built for the express purpose of stormwater treatment are not considered jurisdictional wetlands in most regions of the country, but designers should check with their wetland permit authority to ensure this is the case.

Existing Forests: Given the large footprint of constructed wetlands, there is a strong chance that construction may cause extensive tree clearing. Designers should preserve mature trees during retrofit layout, and may want to use a wooded wetland concept to create a forested wetland community (see Cappiella *et al*., 2006b).

Stream Warming Risk: Constructed wetlands have a moderate risk of stream warming. If the retrofit discharges to temperature-sensitive waters, designers should consider the wooded wetland design, and any ED storage should be released in less than 12 hours.

Safety Risk: Constructed wetlands are safer than other pond options, although forebays and micropools should be designed with benches to reduce safety risks.

Mosquito Risk: Mosquito control can be a concern for stormwater wetlands if they are under-sized or have a small contributing drainage area. Few mosquito problems are reported for well designed, properly-sized and frequently maintained constructed wetlands (Santana *et al*., 1994) but no design can eliminate them completely. Simple precautions can be taken to minimize mosquito breeding habitat within a wetland retrofit, such as constant inflows, benches that create habitat for natural predators, and constant pool elevations (see Walton 2003 and MSSC, 2005).

Design Issues for Constructed Wetland Retrofits

Several elements should be considered when designing constructed wetland retrofits:

Sediment Forebays: Forebays should be located at all major inlets to trap sediment and preserve the capacity of the main wetland treatment cell. A major inlet is defined as serving at least 10% of the retrofit is contributing drainage area. The forebay should be at least four feet deep, contain about 15% of the total retrofit WQv, and have a variable width aquatic bench.

Constructed Wetland Layout: The layout of the stormwater wetland affects its pollutant removal capability and plant diversity. Performance is enhanced when the wetland has multiple cells, longer flowpaths, and a high surface area to volume ratio. Whenever possible, constructed wetlands should be irregularly shaped with a long, sinuous flow path.

Microtopography: Retrofits should have variable microtopography - a mix of shallow, intermediate, and deep areas that promote dense and diverse vegetative cover.

Planting Strategy: Wetland retrofits should outline a realistic, long-term planting strategy to establish and maintain desired wetland vegetation. The plan should indicate how wetland plants will be established

within each pondscaping zone (e.g., wetland plants, seed-mixes, volunteer colonization, and tree and shrub stock) and whether soil amendments are needed to get plants started. The future species trajectory of wetland retrofits is hard to predict, so several different strategies should be considered. Several excellent resources on wetland planting strategies are available (Schueler, 1992; and Shaw and Schmidt, 2003).

Wooded Wetland vs. Emergent Wetland Model: The traditional model for constructed wetlands has been a shallow emergent marsh. In many parts of the country, however, forested wetlands are the most common natural wetland community. In these regions, it may be desirable to design the wetland as a wooded wetland to more closely match local wetland types and reduce future wetland management problems (Cappiella et al., 2006a).

Maintenance Access: Good maintenance access should always be provided to the forebay so that crews can remove sediments and preserve wetland treatment capacity. More frequent sediment removal will be needed if the retrofit is undersized or has a small contributing drainage area.

Maintenance Issues for Constructed Wetland Retrofits

Several maintenance issues can be addressed during the design of constructed wetland retrofits:

Sediment Removal: Frequent sediment removal from the forebay is essential to maintain the function and performance of a constructed wetland. Maintenance plans should schedule cleanouts every five years or so, or when inspections indicate that 50% of the forebay capacity has been lost. Designers should also check to see whether removed sediments can be spoiled on-site or must be hauled away. Sediments excavated from constructed wetlands are not usually considered toxic or hazardous, and can be safely disposed by either land application or land filling.

Clogging: There is always some risk that the low flow orifice and any upstream flow splitters may clog. Clogging can quickly change design water elevations for the wetland and possibly kill wetland vegetation. The inlet and outlet structures to the wetland should be inspected frequently to discover any clogging problems.

Vegetation Management: Managing wetland vegetation is an important ongoing maintenance task. Designers should expect significant changes in wetland species composition over time. Invasive plants should be dealt with as soon as they colonize the wetland. Vegetation may need to be periodically harvested if the retrofit becomes overgrown. Construction contracts should include a care and replacement warranty extending at least two growing seasons after initial planting to selectively replant portions of the wetland that fail to take.

Trash Removal: Cleanups should be scheduled at least once a year to remove trash and debris from the retrofit.

Adapting Constructed Wetlands for Special Climates and Terrain

Cold Climates: Wetland performance decreases when snowmelt runoff delivers high pollutant loads. Shallow constructed wetlands can freeze in the winter, which allows runoff to flow over the ice layer and exit without treatment. Inlet and outlet structures close to the surface may also freeze, further diminishing wetland performance. Several design tips can

improve wintertime performance for wetland retrofits (see Profile Sheets ST-1d and ST-2d).

Salt loadings are higher in cold climates due to winter road maintenance. High chloride inputs have a detrimental effect on native wetland vegetation, and can shift the wetland to more salt-tolerant species such as cattails (Wright *et al*., 2007). Designers should choose salt-tolerant species when crafting their planting plan and consider reducing salt application in the contributing drainage area to the retrofit.

Arid Climates: Constructed wetlands are hard to establish in regions with low annual rainfall and high evapotranspiration rates. These climates make it difficult to maintain a constant pool water elevation throughout the growing season. Designers should always check to make sure there is an adequate water balance to support a wetland throughout the year - otherwise the potential of algal blooms, odors and other nuisances will increase sharply. When in doubt, install clay or synthetic liners to prevent water loss via infiltration. Wetland vegetation flourishes when temperatures are warm and the growing season is long or year-round. Regular mowing or even harvesting should be considered to keep vegetative growth in check.

Karst Terrain: Even shallow pools in active karst terrain can increase the risk of sinkhole formation and groundwater contamination. Designers should always conduct geotechnical investigations in karst terrain to assess this risk. If in doubt, designers should employ an impermeable liner and maintain at least three feet of vertical separation from the underlying karst layer.

Constructed Wetland Installation Costs

Constructed wetlands are less expensive on a unit area basis than wet ponds and extended detention ponds since they require less excavation and need fewer safety features (Wossink & Hunt, 2003). On the other hand, some constructed wetlands have a larger surface footprint. These construction cost savings may disappear if land must be acquired to install the retrofit.

Wossink and Hunt (2003) developed an equation to predict the cost of new wetland construction based on the acreage of the contributing drainage area treated (updated to 2006 dollars):

$$BCC = (4{,}465)(A^{0.484})$$

Where:
A = Size of contributing drainage area (acres)
BCC = Base construction cost (2006 dollars)

Brown and Schueler (1997) devised a similar equation for new wetland and pond construction based on storage volume needed that yields slightly higher costs:

$$BCC = (27.95)(V_s^{0.701})$$

Where:
V_s = Total storage volume (ft^3)
BCC = Base construction cost (2006 dollars)

Based on typical wetland sizes, the equations yield a median construction cost of $2,900 per impervious acre treated (range: $2,000 to $9,600). Few retrofit sites will meet the criteria for use of these equations. Under most retrofit conditions, wetland retrofit construction costs will be 3 to 4 times greater than new wetland construction (see Chapter 2 and Appendix E).

Constructed Wetland Design Resources

Vermont Stormwater Management Manual
http://www.anr.state.vt.us/dec/waterq/cfm/ref/Ref_Stormwater.cfm

Connecticut 2004 Stormwater Management Manual
http://dep.state.ct.us/wtr/stormwater/strmwtrman.htm#download

Stormwater Management Manual for Western Washington
http://www.ecy.wa.gov/programs/wq/stormwater/manual.html

Minnesota Stormwater Manual
http://www.pca.state.mn.us/water/stormwater/stormwater-manual.html

ST-4d	Retrofit Design Sheets **BIORETENTION**	

Typical Constraints

Bioretention can be applied in most soils or topography since runoff percolates through an engineered soil bed and is returned to the stormwater system. Key constraints when retrofitting with bioretention include:

Available Space: Not every open area will be a good candidate for bioretention. To start with, designers should look for open areas that are at least five to 10% of the contributing drainage area and are free of underground utilities.

Site Topography: Bioretention is best applied when contributing slopes are more than 1% and less than 5%. Ideally, the proposed treatment area will be located in depression to minimize excavation costs.

Available Head: Bioretention retrofits are fundamentally constrained by the invert elevation of the existing conveyance system they discharge to. These elevations generally establish the bottom elevation needed to tie the underdrain from the bioretention area into the storm drain system. In general, four to five feet of elevation above this invert is needed to drive stormwater through a proposed bioretention area. Less head is needed if underlying soils are permeable enough to dispense with the underdrain.

Water Table: Bioretention should always be separated from the water table to ensure groundwater does not intersect with the filter bed. Mixing can lead to possible groundwater contamination or practice failure. A separation distance of 3 feet is recommended between the bottom of the filter bed and the seasonally high water table.

Overhead Wires: Designers should also check whether future tree growth in the bioretention area will interfere with existing overhead utility lines.

Soils: Soil conditions do not constrain the use of bioretention although they determine whether an underdrain is needed. Impermeable soils in Hydrologic Soil Group C or D usually require an underdrain, whereas A or B soils often do not. Designers should verify soil permeability when designing a bioretention retrofit, using the on-site soil investigation methods presented in Appendix H.

Community and Environmental Considerations for Bioretention Retrofits

Bioretention is a popular practice, since it can meet local landscaping requirements and improve site appearance. The only major drawbacks relate to who will handle future landscape maintenance and whether landowners will modify or replace the bioretention area in the future. If bioretention areas will be installed on private lots, homeowners need to be educated on their routine maintenance tasks and fully understand their intended stormwater function.

Design Issues for Bioretention

Several issues should be considered when designing bioretention retrofits:

Pretreatment: Pretreatment can prevent premature clogging and prolong the effective function of bioretention retrofits. Several pretreatment measures can be used, including directing runoff over a grass filter strip, adding a three to six inch drop or installing a pea gravel diaphragm that spreads flow evenly and drops out larger sediment particles. A two-cell design is recommended when bioretention is used as a storage retrofit or for larger on-site applications. The first cell is a sediment forebay that pretreats runoff and traps sediment before discharge into the main bioretention cell.

Landscaping is critical to the function and appearance of bioretention areas. Where possible, a combination of native trees, shrubs, and herbaceous plant species are preferred. Plants should be able to tolerate both wet and dry conditions. Most upland vegetation does not do well in the deepest center areas that are more frequently inundated. “Wet footed” plants, such as wetland forbs, should be planted near the center, whereas upland species are better for the edges of the bioretention area. Regional lists of plant species suitable for bioretention areas can be found at the end of this profile sheet.

Type of media: The choice of filter media is important to provide adequate drainage, support plant growth and optimize pollutant removal within the filter bed. Early design guidance recommended a mix of 50-60% sand, 20-30% topsoil and 20-30% organic leaf compost. The topsoil component should consist of loamy sand, sandy loam, or loam with a clay content no greater than 5%. Hunt and Lord (2006a) has recently advocated a bioretention soil mix with a greater proportion of sand (85-88% sand; 8-12% fines; and 3-5% organic matter) as a more effective choice for pollutant removal. They also strongly recommend that topsoil be tested to ensure that it has a low phosphorus index value to prevent phosphorus leaching. If nitrogen removal is the goal, it may be advisable to increase the percentage of soil fines.

Designers should also ensure that the media is well mixed and homogeneous. The media should have an infiltration rate of 1.0 to 2.0 inches per hour as recent research indicates that pollutant removal is optimized in this range.

Depth of Media: Early bioretention design guidance recommended a minimum filter bed depth of 4 feet. However, the filter bed may be reduced in depth to 1.5 to 2.5 feet in certain retrofit applications, particularly when available head is limited. Research has shown that good pollutant removal can still be achieved in filter beds as shallow as 1.5 feet, with the possible exception of nitrogen (Davis, 2005, and Hunt *et al.*, 2006). It is doubtful that filter beds less than 1.5 feet deep can provide reliable pollutant removal efficiency over the long run. Designers should also remember that filter beds need to be at least 4 feet deep to provide enough soil volume for the root structure of mature trees (i.e., use turf, perennials or shrubs instead of trees for shallower filter beds).

Underdrain: In many bioretention retrofits, filtered runoff will be collected by a perforated underdrain and conveyed to the storm drain system. If the site has permeable soils, however, the underdrain can be reduced or eliminated altogether. The need for an underdrain depends on the

permeability of the underlying soils, which have often been previously altered or compacted in many retrofit situations. Soil permeability rates should always be verified when designing a bioretention retrofit (see Appendix H). If an underdrain is required at a bioretention retrofit, it should have a minimum diameter of 6 inches and be placed in a foot deep gravel bed.

Overflow: Designers should always incorporate an overflow structure to safely bypass larger storms around the bioretention retrofit. The invert of the overflow should be placed at the maximum water surface elevation of the bioretention area, which is typically 6 to 12 inches above the surface of the filter bed.

Surface Cover: A three-inch layer of hardwood mulch on the surface of the filter bed enhances plant survival, suppresses weed growth, and pretreats runoff before it reaches the filter bed. Shredded hardwood bark mulch makes a very good surface cover, as it retains a significant amount of nitrogen and typically will not float away. On the other hand, hardwood mulch needs to be replaced every few years, may not be durable or attractive enough for certain retrofit situations, and may not be available in some regions of the country. In these situations, designers may wish to consider alternative covers such as turf, river stone, gravel or pumice stone.

Contributing Drainage Area: Designers should always verify that the actual contributing area and inlet elevations are accurately determined at the retrofit site. Designers should walk the site during a rainstorm to look at actual flowpaths to the proposed treatment area, and confirm these boundaries using fine resolution topographic surveys.

Bioretention Maintenance Issues

Bioretention requires seasonal landscaping maintenance to establish and maintain vigorous plant cover:

Vegetation Management: Vegetation management is an important to sustain the pollutant removal and landscaping benefits of the bioretention area. The construction contract should include a care and replacement warranty to ensure vegetation gets properly established and survives during the first growing season after construction.

Surface Cover/Filter Bed: The surface of the filter bed can become clogged with fine sediments over time. Core aeration or deep tilling may relieve the problem. The surface cover layer will need to be removed and replaced every two or three years. The inlets and pretreatment measures for the bioretention retrofit also need frequent inspections to ensure they are working properly and to remove deposited sediments.

Training Landscape Contractors: Maintenance can be performed by landscaping contractors who are already providing similar landscaping services on the property, but they will need training on bioretention maintenance tasks.

Adapting Bioretention for Special Climates and Terrain

Bioretention areas can be applied almost everywhere, with the proper design modifications:

Arid Climates: Bioretention areas should be landscaped with drought-tolerant plant species. A xeriscaping approach is preferred since supplemental irrigation makes little sense in arid and semi-arid climates. It may

also be advisable to switch from mulch to a more durable surface cover such as riverstone or pumice. The planting plan may also have fewer trees and plants to minimize the need for supplemental irrigation. Designers should recognize that longer growing seasons increase both the frequency and cost of landscape maintenance.

Cold Climates: Bioretention areas can be used for snow storage as long as an overflow is provided and they are planted with salt-tolerant, non-woody plant species (for a species list, consult MSSC, 2005). While several studies have shown that bioretention operates effectively in winter conditions, it is a good idea to extend the filter bed and underdrain pipe below the frost line and/or oversize the underdrain by one pipe size to reduce the freezing potential.

Karst Terrain: Bioretention should utilize impermeable liners and underdrains when located in an active karst area. A geotechnical investigation may be needed to confirm that three feet of vertical separation exists from the underlying rock layer.

Bioretention Installation Costs

The cost to construct bioretention areas are extremely variable, and are strongly influenced by the area treated, the depth of filter bed, the presence or absence of an underdrain and whether it is professionally designed, installed or landscaped. Wossink and Hunt (2003) report that bioretention has the lowest construction costs of all new stormwater treatment options serving smaller drainage areas from 1 to 5 acres. On the other hand, the unit costs to retrofit bioretention in highly urban settings may be 10 to 20 times higher (See Appendix E). The long-term maintenance costs for bioretention areas are not expected to be very different from normal landscaping maintenance costs.

Brown and Schueler (1997) developed equations to predict the base construction cost of bioretention as a function of the water quality volume provided. When these equations are adjusted to 2006 dollars, they yield:

$$BCC = (7.62)(WQ_v^{0.990})$$

Where:
WQ_v = Water quality volume (ft^3)
BCC = Base construction cost (2006 dollars)

More recently, Wossink and Hunt (2003) developed equations to predict the cost of new bioretention construction as a function of their contributing drainage area. This equation yields lower cost estimates compared to the Brown equation:

$$BCC = (11{,}781)(A^{1.088})$$

Where:
A = Size of contributing drainage area (acres)
BCC = Base construction cost (2006 dollars)

Using these equations, it is possible to establish median bioretention costs of $25,400 per impervious acre treated (range: $19,900 to $41,750). Construction cost drops sharply when site soils are permeable enough to dispense with an underdrain (although this is not a common retrofit situation).

Bioretention Design Resources

Several state and local stormwater manuals provide useful bioretention design guidance:

Prince George's Co., MD Bioretention Manual
http://www.goprincegeorgescounty.com/Government/AgencyIndex/DER/ESD/Bioretention/bioretention.asp?nivel=foldmenu(7)

Lake Co., OH Bioretention Guidance Manual
http://www2.lakecountyohio.org/smd/Forms.htm

Low Impact Development Technical Guidance Manual for Puget Sound, WA
http://www.psat.wa.gov/Publications/LID_tech_manual05/lid_index.htm

Wisconsin Stormwater Management Technical Standards
http://www.dnr.state.wi.us/org/water/wm/nps/stormwater/techstds.htm#Post

Maryland Stormwater Design Manual
http://www.mde.state.md.us/Programs/WaterPrograms/SedimentandStormwater/stormwater_design/index.asp

ST-5d	Retrofit Design Sheets **FILTRATION**	

Typical Constraints

Stormwater filters can be applied in most regions of the country and most types of urban land. It is important to note that stormwater filters are not always cost-effective to retrofit on a widespread basis, given their high unit cost and small area served. Design constraints for filter retrofits include:

Available Head: The principal retrofit constraint for stormwater filters is available head which is defined as the vertical distance between the top elevation of the filter and the bottom elevation of the existing storm drain system that accepts its runoff. Designers can quickly estimate available head at a proposed retrofit site by locating the closest stormwater inlet or manhole. The difference in elevation between the surface and the invert elevation of the underground storm drain pipe gives a rough approximation of the available head. The head required for stormwater filters ranges from two to ten feet, depending on the design variant. Thus, it is difficult to employ filters in extremely flat terrain since they require gravity flow through the filter. The one exception is the perimeter sand filter, which can be applied at sites with as little as two feet of head.

Contributing Drainage Area: Sand filters are best applied on small sites that are as close to 100% impervious as possible. A maximum contributing drainage area of five acres is recommended for surface sand filters, and a maximum contributing drainage area of two acres is recommended for perimeter or underground filters (Claytor and Schueler, 1996). Filters have been used on larger drainage areas in the past, but they tend to experience greater clogging problems.

Space Required: The amount of space required for a filter retrofit depends on the design variant selected. Both sand and organic surface filters typically consume about 2 to 3% of the contributing drainage area, while perimeter sand filters typically consume less than 1%. Underground stormwater filters generally consume no surface land except manholes needed for maintenance access.

Community and Environmental Concerns for Filter Retrofits

Stormwater filters have a few community and environmental concerns:

Aesthetics: The main drawback with stormwater filters is their appearance - many are imposing concrete boxes that tend to accumulate a lot of trash and debris. Retrofit designers should try to soften up the appearance of surface filters and make sure they are routinely maintained.

Mosquito Breeding: There is a risk that underground and perimeter filters may create potential habitat for mosquito breeding. If this is a concern, designers

should keep standing water in sedimentation chambers to a minimum.

Groundwater: Filters are recommended when groundwater protection is an issue since they do not normally interact with groundwater and therefore have less potential to contaminate it.

Design Issues for Filter Retrofit Applications

Several unique design issues are involved with filter retrofits, as follows:

Pretreatment: Adequate pretreatment is needed to prevent premature filter clogging and ensure retrofit longevity. Either wet or dry pretreatment chambers can be used to capture and remove coarse sediment particles before they reach the filter bed. Designers should allocate at least 25% of the total WQv to pretreatment. Additional pretreatment measures may include a grass filter strip installed prior to the filter and regular sweeping of the street or parking lot. If a proprietary filter is used, designers should check to see whether the device has adequate pretreatment volume. The sedimentation chamber should be designed to allow maintenance crews to get vactor trucks close to the retrofit for cleanouts.

Type of Media: The normal filter media consists of clean, washed concrete sand with individual grains between 0.02 and 0.04 inches in diameter. Alternatively, organic media can be used, such as a peat/sand mixture or a leaf compost mixture. The decision to use organic media in a stormwater filter depends on which stormwater pollutants are targeted for removal. Organic media may enhance pollutant removal performance with respect to metals and hydrocarbons (Claytor & Schueler, 1996). Recent research, however, has shown that organic media can actually leach soluble nitrate and phosphorus, suggesting it is a poor choice when nutrients are the pollutant of concern.

Type of Filter: The choice of which sand design filter design to apply depends on available space and head, and the desired level of pollutant removal. In ultra-urban situations where surface space is at a premium, underground sand filters are often the only design that can be used. Surface and perimeter filters are often a more economical choice when adequate surface area is available.

Depth of Media: The depth of the filter media plays a role in how quickly stormwater moves through the filter bed and how well it removes pollutants. Recent design guidance recommends that a minimum filter bed depth ranging from 18 and 24 inches.

Impervious Drainage Area: In retrofit situations, the contributing drainage area should be as close to 100% impervious as possible in order to reduce the risk that eroded sediments will clog the filter.

Overflow: Most filtering practices are designed as off-line systems so that all flows enter the filter, but larger flows overflow to an outlet chamber, and are not treated. Exceptions include the perimeter filter and most underground filters. Runoff from larger storm events should be bypassed using an overflow structure or a flow splitter. Claytor and Schueler (1996) and ARC (2001) provide design guidance for flow splitters for filtering practices.

Drawdown: Stormwater filters should be designed to drain or dewater within 48 hours after a storm event to reduce the potential for nuisance conditions.

Maintenance Issues for Filter Retrofits

Several maintenance issues can addressed during retrofit design to reduce future maintenance operations, including:

Access: Good maintenance access is needed to allow crews to perform regular inspections and maintenance activities. Stormwater filters should be clearly visible at the retrofit site so inspectors and maintenance crews can easily find them. Adequate signs or markings should be provided at manhole access points for underground filters.

Confined Space Issues: Underground filters are often classified as an underground confined space. Consequently, special OSHA rules and training are needed to protect the workers that access them. These procedures often involve training on confined space entry, venting and the use of gas probes.

Sediment/Filter Bed Removal: Sediments will need to be regularly removed from the pretreatment chamber every three to five years. The filter bed media may also need to be replaced on the same schedule.

Site Inspections: Regular site inspections are critical to schedule sediment removal operations, replace filter media and relieve any surface clogging. Frequent inspections are especially needed for underground and perimeter filter retrofits since they are out of sight and can be easily forgotten.

Sediment Testing: Designers should check to see whether the filter is treating runoff from a hotspot site. If so, crews may need to test sediments before disposing of trapped sediments or filter bed media. Sediment testing is not needed if the filter does not receive runoff from a designated stormwater hotspot.

Adapting Filters for Special Climates and Terrain

Stormwater filters can be successfully employed when certain design modifications are made:

Cold Climates: Surface or perimeter filters may not always be effective during the winter months. The main problem is ice that forms over and within the filter bed. Ice formation may briefly cause nuisance flooding if the filter bed is still frozen when spring melt occurs. To avoid these problems, filters should be inspected before the onset of winter (prior to the first freeze) to dewater wet chambers and scarify the filter surface. Other measures to improve winter performance include:

- Placing a weir placed between the pretreatment chamber and filter bed to reduce ice formation as a more effective substitute than a traditional standpipe orifice.
- Extending the filter bed below the frost line to prevent freezing within the filter bed
- Oversizing the underdrain to encourage more rapid drainage to minimize freezing of the filter bed
- Expanding the sediment chamber to account for road sanding. Pretreatment chambers should be sized for up to 40% of the WQv

Arid Climates: Designers may want to increase storage in the pretreatment chamber to handle higher sediment loads expected in arid climates. Dry sedimentation chambers should be sized up to 40% of the WQv. Wet pretreatment is seldom feasible in arid climates.

Karst Terrain: Stormwater filters are a good option in active karst areas since they are not connected to groundwater and therefore minimize the risk of sinkhole formation and groundwater contamination.

Installation Costs for Filtering Practices

Stormwater filters have one of the highest unit construction costs of any stormwater treatment option treating small drainage areas. The cost to construct a stormwater filter depends on the region and design variant used (Table 1). For surface sand filters, Brown and Schueler (1997) reported construction costs ranging between about $3.00 and $8.00 per cubic foot of water quality volume treated (2006 dollars). Wossink and Hunt (2003) developed a cost prediction equation for stormwater filter construction based on drainage area treated. The updated equation is:

$$BCC = (55{,}515)(A^{0.882})$$

Where:
A = Size of contributing drainage area (acres)
BCC = Base construction cost (2006 dollars)

While underground and perimeter sand filters are the most expensive filtering practice, they consume minimal surface land, making them a cost-effective practice in ultra-urban areas where land prices are at a premium.

Design Resources

Several existing stormwater manuals provide useful guidance on stormwater filter design:

District of Columbia Stormwater Management Guidebook
http://dchealth.dc.gov/DOH/site/default.asp?dohNav=|33110|

The Minnesota Stormwater Manual
http://www.pca.state.mn.us/water/stormwater/stormwater-manual.html

Maryland Stormwater Design Manual
http://www.mde.state.md.us/Programs/WaterPrograms/SedimentandStormwater/stormwater_design/index.asp

Design of Stormwater Filtering Systems. Center for Watershed Protection
http://www.cwp.org/PublicationStore/special.htm

Georgia Stormwater Management Manual
http://www.georgiastormwater.com

Design Variant	Median Cost Per Impervious Acre Treated	Range in Cost
Simple Surface Filter	$ 18,150	$ 10,900 to $29,000
Structural Sand Filter	$ 72,000	$ 58,100 to $79,900
Underground Sand Filter	$ 234,000	$ 100,800 to $ 270,000
See Appendix E: Simple surface filter lacks structural elements and reinforced concrete		

ST-6d	Retrofit Design Sheets **INFILTRATION**	

Typical Constraints

Numerous constraints need to be assessed to ensure infiltration is feasible at a proposed retrofit site, including:

Soils: Soil permeability is the single biggest factor when evaluating infiltration retrofits. A minimum infiltration rate of at least 0.5 inches/hour is needed to make the retrofit work. Several studies have shown that ultimate infiltration rates decline by as much as 50% from initial rates, so designers should be very conservative and not force infiltration on questionable soils. On-site infiltration investigations should always be conducted to establish the actual infiltration capacity of underlying soils using methods presented in Appendix H.

Avoid Stormwater Hotspots: Never infiltrate runoff from a hotspot operation. Make sure to conduct a HSI on all operations in the contributing area to determine the potential risk of groundwater contamination. If a site is classified as a stormwater hotspot, then runoff must be fully treated by another practice prior to infiltration.

Contributing Drainage Area: Infiltration retrofits are best applied to small contributing drainage areas that are as close to 100% impervious as possible. If the contributing contains any pervious area, it must be properly stabilized with dense vegetation, both during and after construction, to prevent eroded sediments from prematurely clogging the facility. Additionally, the maximum contributing drainage area to an infiltration trench should be limited to one acre or less. The maximum contributing drainage area to underground infiltration systems should be limited to five acres or less. Infiltration practices serving larger drainage areas tend to experience more chronic clogging problems.

Space Required: The typical footprint of an infiltration retrofit ranges from 5 to 10% of its contributing drainage area, but varies depending on its depth, storage void, space, and infiltration rate.

Minimum Setbacks: As a general rule, infiltration retrofits should be setback at least 10 feet from property lines, 25 feet from building foundations, 100 feet from septic system fields, 100 feet from private wells, 100 feet from surface waters, 400 feet from surface drinking water sources and 1,200 feet from public water supply wells.

Depth to Water Table/Bedrock: Infiltration retrofits should be separated at least three feet from the water table to ensure groundwater never intersects with the floor of the infiltration practice, which could cause groundwater contamination or practice failure. A three foot separation distance should be maintained between the bottom of the infiltration retrofit and any confining bedrock layer.

Community and Environmental Considerations for Infiltration Retrofits

Several community and environmental concerns can arise when infiltration retrofits are proposed:

Nuisance Conditions: Poorly designed infiltration retrofits can create potential nuisance problems such as basement flooding, poor yard drainage and standing water. In most cases, these problems can be minimized through adequate setbacks, on-site soil testing and pretreatment.

Mosquito Risk: Infiltration retrofits can potentially create mosquito breeding conditions if they clog and have standing water for extended periods.

Groundwater Protection: Communities that rely on groundwater for drinking water are often concerned about potential stormwater contamination. Designers should investigate the prevailing land use in the contributing drainage area. Runoff from potential stormwater hotspots should never be infiltrated. For residential and institutional land uses, infiltration is desirable since it replenishes groundwater supplies. Infiltration retrofits in these areas should have over-sized and redundant pretreatment to reduce the risk that stormwater pollutants or spills will reach groundwater.

Groundwater Injection Permits: Groundwater injection permits may be required in some areas of the country. Designers should investigate whether or not a proposed infiltration retrofit is subject to a state or local groundwater injection permit.

Design Issues for Infiltration Retrofit Applications

The design of infiltration retrofits should be more conservative than the design of new infiltration practices to promote longevity. A series of design elements can minimize the risk of practice failure:

Pretreatment is essential to extend the longevity of infiltration retrofits. Designers should include at least two pretreatment measures in every retrofit, such as grass swales, filter strips, sump pits, sediment forebays or plunge pools.

Off-line Design: Infiltration retrofits should be designed off-line so they only receive the target WQv and bypass larger storm flows. A flow splitter or overflow structure can be used for this purpose; design guidance for small flow splitters can be found in Claytor and Schueler (1996) and ARC (2001).

Small Contributing Drainage Areas: The contributing drainage area to each infiltration retrofit should be less than one acre, and be distributed in multiple locations around the site. Ideally, the contributing drainage area should be entirely impervious to preclude the possibility that eroded sediments from pervious areas will clog the retrofit. Designers should also try to keep the depth of the infiltration retrofit to less than four to six feet.

Rapid Drawdown: When possible, infiltration retrofits should be sized so that the target WQv rapidly infiltrates within 24 to 36 hours (rather than the standard 48 hour drawdown limit for new practices). This design approach provides a factor of safety to prevent nuisance ponding conditions.

Conservative Infiltration Rates. Underlying soils should have a minimum infiltration rate of at least 0.5 inches per hour. Several test pits are needed to measure the infiltration rates across a proposed retrofit site. Appendix H provides guidance on performing infiltration testing. However, infiltration rates of 1.0 to 2.0 inches per hour are ideal. Designers may wish to cut measured infiltration rates in half to approximate the long term infiltration rate.

No Filter Fabric on Bottom: The use of geotextile filter fabric along the bottom of infiltration retrofits should be avoided. Experience has shown that filter fabric is prone to clogging, and that a layer of coarse washed stone (choker stone) is a more effective substitute.

Observation Wells: One or more observation wells should be installed within infiltration retrofits so that drawdown rate can be measured after storm events. Observation wells typically consist of perforated PVC pipes that are four to six inches in diameter and extend from the surface to the bottom of the infiltration retrofit.

Maintenance Issues with Infiltration Retrofits

Historically, infiltration practices have had a high failure rate compared to other stormwater treatment options (Galli, 1992). A conservative retrofit design approach should greatly reduce the risk of initial retrofit failure (Figure 1). Even so, the future performance of infiltration requires a strong commitment to regular inspection and maintenance. Designers should only choose infiltration when they are confident that the landowner or municipal agency will be a responsible maintainer in the future. The maintainer should be expected to handle the following ongoing tasks:

Figure 1: Failed Infiltration Trench

Site Inspections: Regular site inspections are critical to the performance and longevity of infiltration retrofits. The drawdown rate of the retrofit should be measured at the observation wells at least twice a year. It is recommended that infiltration rates be checked in observation wells three days following a storm event greater than one half inch in depth. If standing water is still observed in the well after three days, this is a clear sign that that clogging has become a problem. Additionally, pretreatment devices and flow diversion structures should be checked for sediment buildup and structural damage.

Sediment Removal/Trench Reconstruction: Sediment will need to be regularly removed from pretreatment facilities. If major clogging occurs, the practice may need to be reconstructed. Good maintenance access is needed to allow crews and heavy equipment to perform maintenance tasks.

A maintenance plan should be created that identifies the party responsible for maintenance and specifies ongoing maintenance tasks over a prescribed schedule.

Adapting Infiltration for Special Climates and Terrain

Although infiltration practices have been successfully employed in both cold and arid climates, several design modifications are needed to ensure they function properly:

Cold Climates: Infiltration retrofits are generally not feasible in extremely cold climates experiencing permafrost, but they can be designed to withstand more moderate winter conditions. The main problem is ice forming in the voids or the subsoils below which may briefly cause nuisance flooding when spring melt occurs. These problems can be avoided if the bottom of the retrofit extends below the frost line.

If the retrofit treats roadside runoff, it may be desirable to divert flow in the winter to prevent movement of chlorides into groundwater and prevent clogging by road sand. Alternatively, pretreatment measures can be oversized to account for the additional sediment load caused by road sanding (up to 40% of the WQv). Care should be taken to ensure that infiltration retrofits are setback at least 25 feet from roadways to prevent potential frost heaving of road pavements.

Arid Climates: The key concern in arid and semi-arid watersheds is the greater risk of potential clogging due to higher sediment loads. Consequently, over-sized pretreatment should be strongly emphasized, and the contributing drainage area should be kept as close to 100% impervious as possible.

Karst Terrain: Infiltration retrofits should not be used in active karst regions unless geotechnical investigations have eliminated concerns about sinkhole formation and groundwater contamination.

Installation Costs for Infiltration Retrofits

Very little construction cost information about infiltration practices is available. Because their construction methods are similar, the cost for infiltration practices are assumed to be comparable to bioretention areas (Appendix E). Consequently, the cost to construct infiltration practices at new development sites is estimated to be $25,400 per impervious acre treated (range: $19,900 to $41,750). Few retrofit sites will meet new development conditions; however, most retrofits will cost 1.5 to 2.0 times more than new infiltration practices.

Infiltration Design Resources

Several recent stormwater manuals present updated design criteria for infiltration practices:

New Jersey Stormwater Best Management Practices Manual
http://www.nj.gov/dep/watershedmgt/bmpmanualfeb2004.htm

Pennsylvania Draft Stormwater Best Management Practices Manual
http://www.dep.state.pa.us/dep/subject/advcoun/Stormwater/stormwatercomm.htm

Green Technology: The Delaware Urban Runoff Management Approach
http://www.dnrec.state.de.us/DNREC2000/Divisions/Soil/Stormwater/New/GT_Stds%20&%20Specs_06-05.pdf

New York State Stormwater Management Design Manual
http://www.dec.state.ny.us/website/dow/toolbox/swmanual/index.html

ST-7d	Retrofit Design Sheets	
	SWALES	

Typical Constraints

Constraints to consider when evaluating a potential swale retrofit include:

Contributing Drainage Area: The maximum contributing drainage area to a swale retrofit should be five acres and preferably less.

Space Required: Swale retrofits usually consume about five to 15% of their contributing drainage area.

Site Topography: Site topography constrains swale retrofits; some gradient is needed to provide water quality treatment but not so much that treatment is impeded. Swales generally work best on sites with relatively flat slopes (e.g., less than 5% slope for grass channels and 2% for wet and dry swales). Steeper slopes create rapid runoff velocities that can cause erosion and do not allow enough contact time for infiltration or filtering. Swales perform poorly in extremely flat terrain because they lack enough grade to create storage cells, and lack head to drive the system.

Available Head: A minimum amount of head is needed to implement each swale retrofit. Dry swales typically require three to five feet of head since they require a filter bed and underdrain. Wet swales require about two feet of head, whereas grass swales need only a foot. Designers should measure gradient in the field to ensure enough head exists to drive the swale retrofit.

Hydraulic Capacity of Existing Open Channel: Most open channels were originally sized with enough capacity to convey runoff from the ten-year storm, and be non-erosive during the two-year design storm event. In many cases, the open channel may be under-capacity due to upstream development or past sedimentation. The capacity of the existing open channel should be verified during the retrofit project investigation. Field observations that may indicate an existing channel is undersized channel include excessive erosion of the channel side slopes, poor vegetative stabilization and overbank debris.

Width of Existing Right of Way or Easement: Designers should investigate whether the existing right of way or stormwater easement is wide enough to accommodate retrofit construction and maintenance access. In most cases, the existing channel will need to be widened or flows split into adjacent off-channel treatment cells.

Depth to Water Table: Designers should separate the bottom of the swale from the groundwater by at least two feet for dry swales and grass channels. It is permissible to intersect the water table for wet swales, since the pool enhances water quality treatment.

*Soils: S*oil permeability influences which swale design variant will work best in the existing channel. Designers should note that past construction and compaction may have severely reduced the permeability of the

original swale soils. Several on-site tests should be conducted at the proposed retrofit to measure actual soil infiltration retrofit rates (see Appendix H). In general, grass swales are restricted to soils in Hydrologic Soil Groups A or B. Dry swales also work well on these soils, but can be applied to more impermeable C or D soils if an underdrain is used. Wet swales work best on more impermeable C or D soils.

Utilities: Many utilities run along or underneath open channels, so designers should always check for utility lines or crossings at each swale retrofit site. The presence of dry or wet utilities usually renders a swale retrofit infeasible.

Community and Environmental Considerations for Swale Retrofits

Swale retrofits are normally accepted by communities if they are properly designed and maintained, but require approval by multiple landowners to secure additional right of way. The main concerns of adjacent residents are perceptions that swale retrofits will create nuisance conditions or will be hard to maintain. Common concerns include the continued ability to mow grass, landscape preferences, weeds, standing water, and mosquitoes. For these reasons, wet swales are not recommended in residential settings - the shallow, standing water in the swale is often viewed as a potential nuisance by homeowners. Dry swales are a much better alternative.

Key Design Issues for Swale Retrofits

Several design elements can ensure the swale retrofit performs effectively over the long run:

Pretreatment: Adequate pretreatment is needed to trap sediments before they reach the main treatment cell of the swale retrofit. A small sediment forebay located at the upstream end of the swale often works best. A pea gravel flow spreader along the top of each bank can pretreat lateral runoff from the road shoulder to the swale.

Swale Dimensions: Swales should have a bottom width ranging from two to eight feet to ensure an adequate surface area exists along the bottom of the swale for filtering. If a swale will be wider than eight feet, designers should incorporate berms, check dams, level spreaders or multi-level cross sections to prevent braiding and erosion within the swale bottom. Swale retrofits should be designed with a parabolic or trapezoidal cross section and have side slopes no steeper than 3:1 (h:v). Designers should seek side slopes much less than 3:1 to promote more treatment of lateral sheet flow, if space is available.

Ponding Depth: Drop structures or check dams can be used to create ponding cells along the length of the swale. The maximum ponding depth in a swale should not exceed 18 inches at the most downstream point. The average ponding depth throughout the swale should be 12 inches.

Drawdown: Dry swale retrofits should be designed so that the desired WQv is completely filtered within six hours or less. This drawdown time can be achieved by using a sandy soil mix or an underdrain along the bottom of the swale. No minimum drawdown time is required for wet swale retrofits.

Swale Media: Dry swales require replacement of native soils with a prepared soil media. The soil media provides adequate drainage, supports plant growth and facilitates pollutant removal within the dry swale. The soil media should have an infiltration rate of at least one foot per day

and be comprised of a mix of native soil, sand and organic compost similar to bioretention design recommendations presented in ST-4. At least 18 inches of soil media should be mixed into the swale bottom.

Underdrain: Underdrains are provided in dry swale retrofits to ensure they drain properly after storms. The underdrain should have a minimum diameter of 6 inches and be encased in a foot deep gravel bed. Underdrains are not needed in wet swales or grass channels.

Swale Maintenance Requirements

Swale maintenance often fits within normal turf management operations that are already being performed. Swale retrofits are often located near landowners that have real or perceived concerns on how the swale may affect their front yards and property value. Therefore, designers should consider how to:

- Minimize standing water
- Minimize interference of check dams with regular mowing
- Manage vegetative growth in the future
- Educate residents on how to properly maintain the swale over time

Regular inspections should be conducted on the swale retrofit to schedule maintenance operations such as sediment removal, spot revegetation and inlet stabilization. Maintenance crews may need to be educated on the purpose and maintenance needs of swale retrofits installed along streets or highway right-of-way.

Adapting Swales for Special Climates and Terrain

Swale retrofits can be applied in most climates and terrain with some design modifications:

Cold Climates: Swales can store snow and treat snowmelt runoff. If roadway salt is applied, swales should be planted with salt-tolerant and non-woody plant species. Consult the Minnesota Stormwater Manual for a list of salt-tolerant grass species (MSSC, 2005). The dry swale underdrain pipe should extend below the frost line and be oversized by one pipe size to reduce the chances of freeze-up.

Arid Climates: It is extremely hard to maintain a wet swale retrofit in arid and semi-arid climates. Swales should be planted with drought-tolerant vegetation and the planting plan should specify fewer broad-leaved plants to minimize the need for supplemental irrigation. A xeriscaping approach is preferred for any swale in arid or semi-arid regions since irrigation makes little sense and is expensive in these regions.

Karst Terrain: Swale retrofits should utilize impermeable liners and underdrains to prevent sinkhole formation in active karst areas.

Swale Installation Costs

Only limited cost data has been published on swale construction costs. Equations to estimate swale costs for new construction are outlined in Appendix E. The projected cost for swales at new development sites is estimated to be $18,150 per impervious acre treated (range: $10,900 to $36,300). Few retrofit sites will meet the construction conditions for new development sites; most swale retrofits will cost about twice as much, particularly if they involve off-channel treatment.

Swale Design Tools

New York State Stormwater Management Design Manual
http://www.dec.state.ny.us/website/dow/toolbox/swmanual/index.html

Vermont Stormwater Management Manual
http://www.anr.state.vt.us/dec/waterq/cfm/ref/Ref_Stormwater.cfm

Stormwater Management Manual for Western Washington
http://www.ecy.wa.gov/programs/wq/stormwater/manual.html#How_to_Find_the_Stormwater_Manual_on_the

CNMI and Guam Stormwater Management Manual
http://www.guamepa.govguam.net/programs/water/index.html

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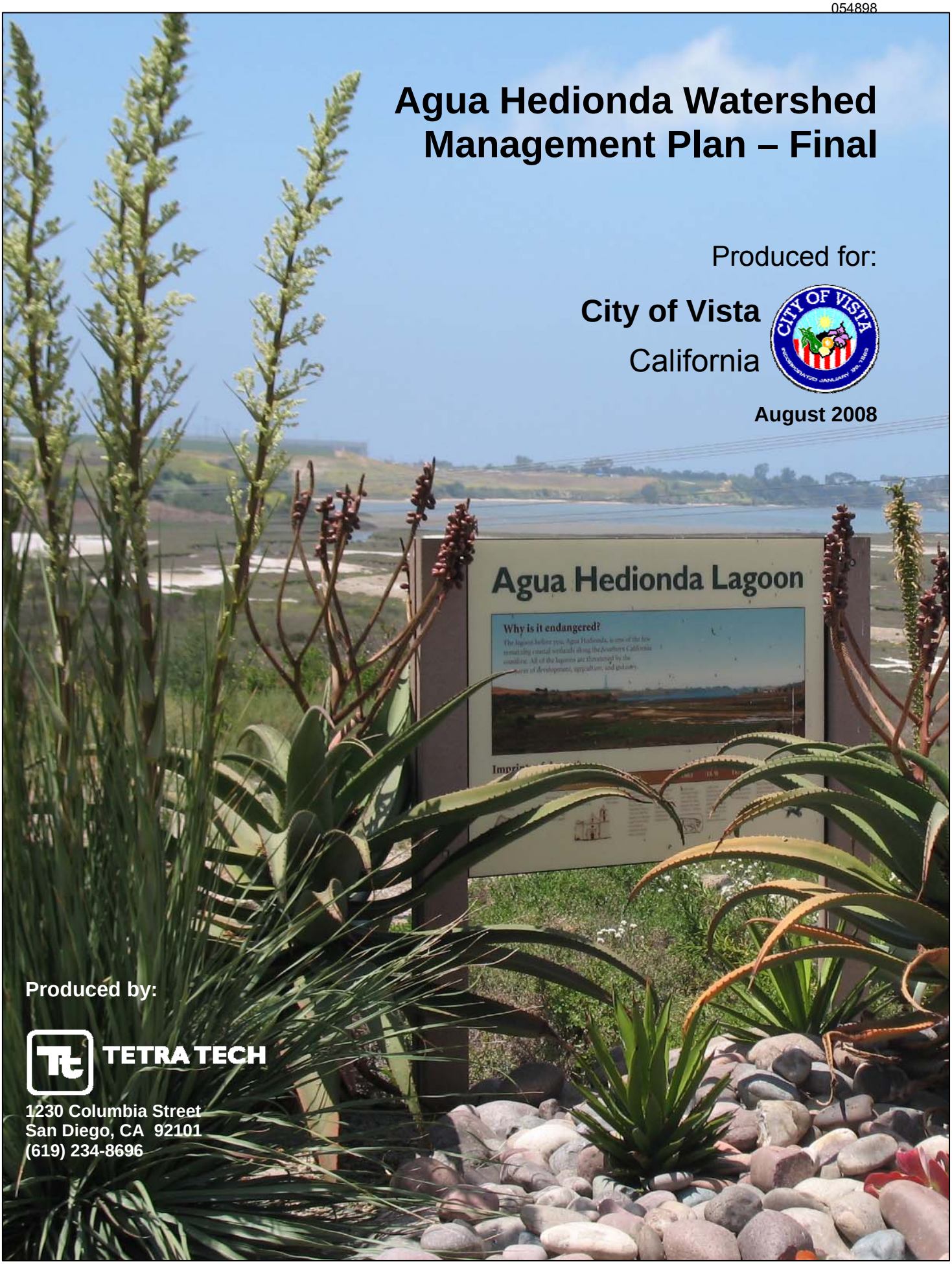

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Acronyms

ACOE – Army Corps of Engineers

BIA – Building Industry Association

BMP – Best Management Practice

CDFG – California Department of Fish and Game

CEQA – California Environmental Quality Act

CRAM – California Rapid Assessment Method

DEM – Digital Elevation Model

DWR – California Department of Water Resources

EDD – Extended Dry Detention

EMCs – event mean concentrations

HMPs – Habitat Management Plans

IRWMP – Integrated Regional Water Management Plan

LID – Low Impact Development

LSPC – Loading Simulation Program C++

JURMPs – Jurisdictional Urban Runoff Management Programs

MLPA – 1999 Marine Life Protection Act

MM – Management Measures

MP – Management Practices

MPA – Marine Protected Area

NEPA – National Environmental Policy Act

NGOs – Non-governmental Organizations

PAMA – Pre-approved Mitigation Areas

RWQCB – San Diego Regional Water Quality Board

SANDAG – San Diego Area Council of Governments

SDG&E – San Diego Gas & Electric

SELC – San Elijo Lagoon Conservancy

SET – Site Evaluation Tool

SSO – Sanitary Sewer Overflows

TAC – Technical Advisory Committee

TMDL – Total Maximum Daily Loads

TSS – Total Suspended Solids

USEPA – U.S. Environmental Protection Agency

WDRs – Waste Discharge Requirements

WMP – Watershed Management Plan

WPG – Watershed Planning Group

Agua Hedionda WMP Executive Summary

Where is the Agua Hedionda watershed?

The Agua Hedionda watershed is located in southern California, about 35 miles north of downtown San Diego. The watershed drains 31 square miles of land and includes portions of the cities of Carlsbad, Vista, Oceanside, and San Marcos, and the unincorporated County of San Diego. The watershed contains approximately 37 linear miles of streams most of which are still natural or earthen bottomed channels. The watershed terminates at the Agua Hedionda Lagoon, an important cultural, economic and environmental resource that provides critical habitat for migratory and resident birds and fish. The lagoon serves as nursery habitat for commercially and recreationally significant coastal and resident species.

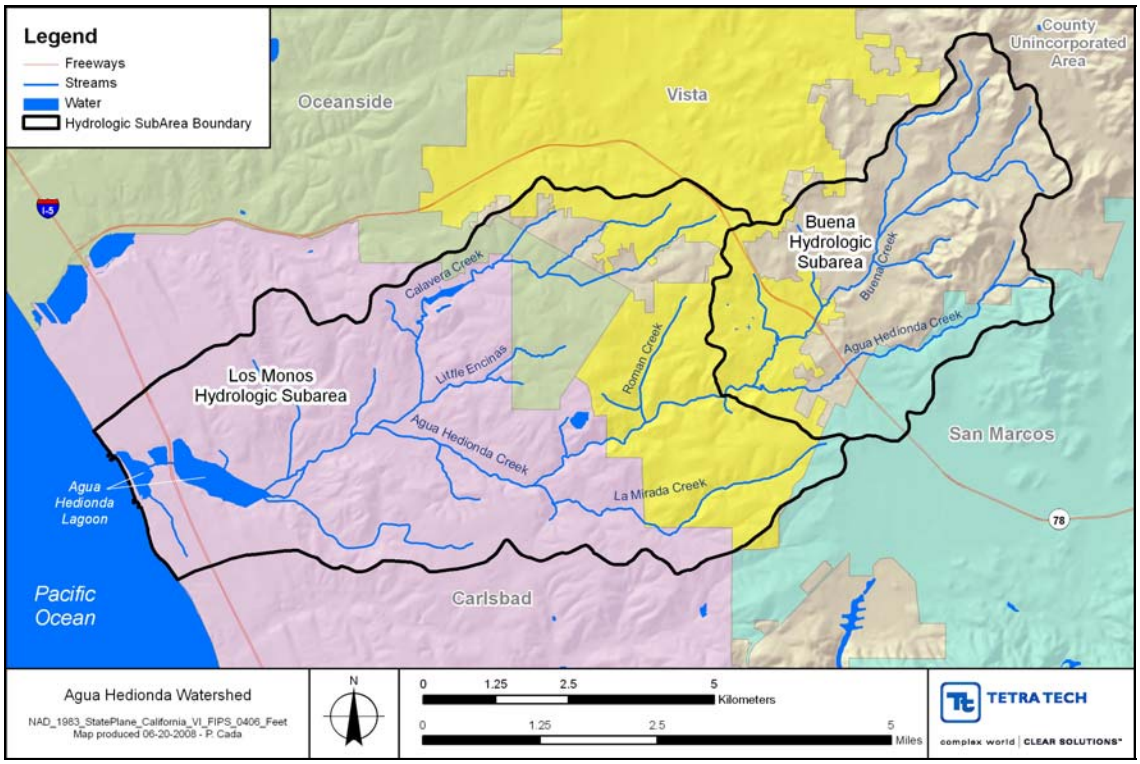

Why does the Agua Hedionda watershed need a management plan?

Signs of degradation are evident throughout the watershed, and significant loss of natural habitat across all ecosystems has occurred. In addition, large areas with high quality habitat in the upper watershed are planned for development. To address these and other concerns, the local stakeholders have prepared this Watershed Management Plan (WMP) to "Preserve, restore and enhance the watershed's natural functions and features." They recognize that a healthy watershed is one that provides wildlife habitat, clean water, scenic beauty, and other benefits.

What are the priority issues in the watershed?

A number of priority issues emerged from the assessment of watershed conditions and trends, including:

- Urban land use has increased over time in the watershed, replacing agriculture and natural open space. Future development is expected to cause additional impacts to water quality and stream stability.
- The San Diego Regional Water Quality Board (RWQCB) has listed Agua Hedionda Creek, Buena Creek, and Agua Hedionda Lagoon as impaired and not supporting designated beneficial uses under the Clean Water Act Section 303(d).
- Stream channel modification, from a natural to impacted state, has been observed throughout the watershed. Typical impacts include habitat degradation and channel and bank erosion (see photo to the right).
- The majority of wetland and riparian habitat in the watershed has either been cleared or developed. The largest expanses of unprotected habitat, both riparian and upland, exist in the upper watershed, while the largest protected areas occur in the lower watershed.
- Predicted climate change may present a challenge to planning long-term management in the Agua Hedionda watershed. Shifts in weather patterns may increase sediment loading, channel erosion, and other stressors that already have an impact on watershed functions. Climate change may also endanger existing habitat and could present increased hazards to both human and animal life in the watershed.

Fallen Trees Due to Bank Erosion in the Creeks

What is the Agua Hedionda Watershed Management Plan?

The Agua Hedionda WMP provides a comprehensive, scientifically-based plan for preserving, restoring, and enhancing watershed functions and minimizing future degradation. The WMP assesses past, present, and future watershed conditions and identifies management needs throughout the watershed, considering the complex relationships among different watershed processes. As the watershed faces additional stress from development, the WMP provides a foundation for successfully addressing both past degradation and future stresses, and as further watershed-related regulations are adopted, the WMP guides decision makers towards the most beneficial management practices for a healthy watershed.

The stakeholders developed the following goals that formed the basis for the plan:

1. Design land use and infrastructure so as to minimize impacts on the watershed.
2. Protect, restore and enhance habitat in the watershed.
3. Restore watershed functions, including hydrology, water quality, and habitat, using a balanced approach that minimizes negative impacts.
4. Support compliance with regional, state, and federal regulatory requirements.
5. Increase awareness and stewardship within the watershed, including encouraging policymakers to develop policies that support a healthy watershed.

What does the plan recommend?

The WMP recommends management actions to address priority issues, build upon current management efforts, and resolve existing management gaps. These actions are prioritized based on how well each opportunity will contribute to the WMP goals and objectives. Watershed model results, Geographic Information Systems (GIS) analysis, and field observation were among the tools used to prioritize the most promising opportunities. The types of management actions are summarized below.

- **New Development Site Management:** New development has a significant potential to exacerbate existing watershed impacts, or even create new ones in relatively unimpacted streams. Development can increase pollutant loading rates in runoff, and can also increase the frequency and duration of erosive flows in stream channels. Appropriate site management can partially or even fully mitigate development impacts, depending to a large degree on how aggressively they are implemented. The WMP recommends implementing watershed-specific low impact development (LID) techniques for stormwater management, including reduction of impervious surface, stream buffer policies, and the use of structural stormwater management practices (extended detention facilities, grass swales, and permeable pavement).

- **Preservation and Riparian Buffer and Wetlands Restoration:** Land acquisition and preservation prevents remaining natural areas from being developed or disturbed; this type of management also maintains the existing quality of the natural areas through stewardship activities, such as invasive species control. Riparian buffer restoration creates native riparian vegetation along streams. Wetlands restoration reestablishes wetland hydrology and vegetation where historic wetlands have been impacted or destroyed. Specifically, the WMP recommends the following high priority actions:

Unprotected Natural Habitat in Upper Watershed

  - Land acquisition and preservation opportunities including 387 acres in total.
  - 27 buffer restoration opportunities ranging from about 0.2 to 29 acres and including 129 acres in total.
  - 12 top ranking wetland restoration opportunities ranging from about 0.2 to 21 acres and including 47 acres in total.

  These opportunities include stakeholder recommended opportunities that provide a strong link to the WPG's goals and objectives. These and many additional recommended opportunities are provided to decision makers as part of the Management Opportunity Database, a spreadsheet tool detailing the characteristics of all opportunities considered.

- **Stream Restoration:** Stream restoration involves restoring the shape and function of a stream. The WMP recommendations, in particular, focus on installing grade control structures within a stream channel to achieve equilibrium between sediment inflow and transport capacity. The WMP recommends 11 stream restoration reaches covering nearly 30,000 feet of stream.

- **Stormwater BMP Retrofit Projects:** The WMP recommends portions of the watershed where retrofits of stormwater best management practices (BMPs) can reduce impacts from development.

BMP retrofits recommended include extended detention facilities, grass swales, and other structural BMPs that are appropriate for the watershed. Six demonstration BMP retrofits are identified that can support the above stream restoration opportunities.

- **Monitoring:** Once WMP implementation has begun, a coordinated monitoring program is recommended for water quality, land use change and treatment, restoration, and retrofits. Specific tracking indicators identified by the WPG can be integrated with existing monitoring requirements under programs such as the MS4 permit and the MHCP and MSCP programs.
- **Citizen Stewardship/Public Outreach:** The WMP recommends a comprehensive watershed implementation and stewardship effort led by a collaborative watershed council. Recommended outreach efforts include education for local boards, educational materials, technical and policy-oriented workshops and programs, and management partnerships.
- **Funding and Sustained Support:** Securing and maintaining stable and diverse funding for the WMP will be an important, ongoing effort. The WMP discusses options for funding and sustained support that are most applicable to the watershed.
- **Focus Areas:** Three areas in the watershed are highlighted in the plan where management opportunities can be implemented together to achieve cumulative and potentially greater watershed benefits.

How will the plan be implemented?

Implementation of the WMP will depend on all stakeholders taking an active role, though the roles will vary greatly by action. The WMP outlines the primary roles and responsibilities of stakeholders in carrying out the recommended actions. Implementation timelines and milestones are designated, potential funding sources are listed, and costs are estimated. Detailed lists of implementation actions are provided to facilitate leadership and coordination among stakeholders. It is highly recommended that one of the first steps toward implementation is the development of a formal Watershed Council consisting of members of the local jurisdictions with land use authority. One key aspect of implementation will be collaboration with regional management efforts and agencies. Many local and regional plans are identified in the WMP that relate closely to the Agua Hedionda WMP.

Watershed management is ongoing work that must respond and adapt to changing conditions. The WMP recommends several procedures or actions that enable this adaptive approach: long-term monitoring, management indicators for plan performance evaluation, and a Watershed Council that can make plan updates.

What are the benefits of plan implementation?

The recommended management opportunities will provide a number of benefits to the watershed. By addressing the goals and objectives of the plan, these opportunities will work toward preserving, restoring, and enhancing the Agua Hedionda watershed's natural functions and features. The WMP describes the specific benefits of all management types and provides quantitative estimates of benefits for low impact development, preservation, and BMP retrofits.

New development and redevelopment site management will provide reductions in future pollutant loading and hydrology impacts. Watershed modeling indicates that if certain land conversion (e.g., from agricultural to LID development) is realized, basic low impact development (LID) techniques and certain BMPs are implemented for future development and redevelopment, and land preservation is achieved, communities in the watershed should be able to "hold the line" on pollutant loading and peak discharge. Implementing enhanced LID techniques would achieve even greater cumulative benefits in the watershed.

Land acquisition and preservation can have a significant impact on localized stream water quality, streambank stability, and habitat diversity. In tandem with the other WMP actions, preservation can also help restore water quality and hydrology functions on a watershed scale.

Riparian buffer restoration is an important tool in the protection and restoration of watershed functions. A stable, vegetated streambank is a crucial component of stream channel protection and sediment reduction. Without vegetation along a stream, streambanks can slough off and may become more susceptible to failure during high flow events. Riparian buffers also serve as filters for sediment and other pollutants such as nutrients in runoff from adjacent land.

The benefits of wetland restoration include flow control, nutrient cycling, and habitat diversity. Wetland restoration actions can also strengthen other WMP actions, such as buffer restoration, stream restoration, and land preservation.

The retrofit BMPs will provide pollutant load and runoff reductions for their receiving watersheds. Furthermore, the BMPs will reduce storm event peak flow and runoff volume, an important component of mitigating risk of geomorphic change in streams receiving the runoff.

It is important to note that the recommended actions work together to achieve greater functional uplift for the watershed. In fact, the recommendations are designed to leverage actions and maximize overall preservation and restoration benefits for the Agua Hedionda watershed. Citizen outreach and education will support the above benefits, and funding, sustained support, and monitoring will be essential for realizing the multiple benefits and creating a healthy watershed that provides habitat, water cleansing and aesthetic benefits that can be managed to promote quality local communities.

(Photo courtesy of William Kloetzer)

Implementation of the Agua Hedionda WMP is critical to creating a healthy watershed that provides habitat, water cleansing and aesthetic benefits for local communities.

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1 Introduction

The Agua Hedionda Watershed Management Plan (WMP) provides a comprehensive, scientifically-based plan for preserving, restoring, and enhancing the Agua Hedionda watershed's natural functions and features. The WMP assesses past, present, and future watershed conditions and identifies management needs throughout the watershed, considering the complex relationships among different watershed processes. Governments, organizations, citizens, and other interested stakeholders were involved throughout the planning process to ensure that the WMP reflects local management needs and priorities. As the watershed faces additional stress from development, the WMP will provide a foundation for successfully addressing both past and future degradation. As further watershed-related regulations are adopted, the WMP can be used to guide decision makers towards the most beneficial management practices for the watershed.

The Agua Hedionda watershed is located in southern California, about 35 miles north of downtown San Diego. The watershed drains about 30 square miles of land and includes portions of four municipalities – Carlsbad, Vista, Oceanside, and San Marcos – as well as area in the unincorporated portions of the County of San Diego. The Agua Hedionda Creek headwaters begin in the San Marcos Mountains in west central San Diego county. Agua Hedionda Creek flows into the Agua Hedionda Lagoon, which discharges into the Pacific Ocean. While a few natural and agricultural areas remain, urban development characterizes much of the watershed.

Prior to the inception of this plan, the Agua Hedionda watershed had experienced significant signs of degradation. Fallen trees in stream channels were among the most evident signs that rapid urban growth was severely impacting stream channel stability. Monitoring indicated that water quality in the streams had significantly degraded. To address these and other concerns, the City of Vista, in cooperation with the Carlsbad Watershed Network, received a grant from the State Water Resources Control Board to develop a plan to manage and restore the watershed. The purpose of the Agua Hedionda Watershed Management Plan (WMP) is to provide a comprehensive plan to restore watershed functions and minimize future degradation.

The Agua Hedionda WMP was developed using a multifaceted approach, which integrated stakeholder involvement, science, engineering, and feasibility evaluation. Goals, management objectives, indicators, and benchmarks were used in the assessment of conditions and evaluation of management strategies and opportunities; these accountability methods can also be used to evaluate success of the Plan. Development of this plan included several types of public participation. A watershed coordinator was hired to coordinate the public outreach. The Watershed Planning Group (WPG) – with representatives from local and state governments, federal agencies, environmental organizations, and local citizens – was formed to provide input and make recommendations throughout development of the management plan. The Technical Advisory Committee (TAC) helped establish assumptions for future land use conditions, comment on draft findings, screen candidate Best Management Practices (BMPs) and Low Impact Development (LID) scenarios to evaluate in more detail, and provide input on candidate sites for stream restoration, BMP retrofits, and land acquisition. Outreach meetings were held with local governments, and project reports were posted on a project website to provide wider public access to materials. Public comments were received on the draft plan, and responses to these comments are documented in Appendix K.

Early in the process, Tetra Tech worked with the WPG to develop the following goals for the plan:

1. Design land use and infrastructure so as to minimize impacts on the watershed.
2. Protect, restore and enhance habitat in the watershed.

3. Restore watershed functions, including hydrology, water quality, and habitat, using a balanced approach that minimizes negative impacts.
4. Support compliance with regional, state, and federal regulatory requirements.
5. Increase awareness and stewardship within the watershed, including encouraging policy makers to develop policies that support a healthy watershed.

Following the WPG's initial meetings, Tetra Tech conducted field reconnaissance, stream characterization, geomorphic analysis, data analysis, and watershed modeling to assess the current and future conditions in the watershed. Preliminary indicators were selected to measure the achievement of the goals and objectives. Then, the WPG finalized its goals, objectives, and indicators, and Tetra Tech used these indicators to identify management opportunities that would best achieve the WPG's goals and objectives. Tetra Tech produced the following reports that document these assessments in detail:

- Water Quality Analysis and Recommendations Report (Tetra Tech, 2007)
- Watershed Acquisition and Restoration Opportunity Report (Tetra Tech, 2008a)
- Watershed Modeling and Geomorphic Analysis Report (Tetra Tech, 2008b)
- Bioengineering Management and Implementation Report (Tetra Tech, 2008c)

These reports are available from the WMP website (http://www.carlsbadwatershednetwork.org/AH-WMP.html) or through the City of Vista.

Rather than duplicate this documentation, the WMP draws upon the conclusions of these reports to recommend an approach for addressing priority watershed issues and achieving the WPG's goals. The Management Opportunity Database, a spreadsheet tool that contains information for all parcel or site-based opportunities, will be provided to decision makers.

The recommendations of the Agua Hedionda WMP represent a geographically focused, comprehensive watershed planning effort. The plan considers existing and future resource conditions, key watershed processes, and priority watershed issues. Current regulations and other policies are evaluated as potential building blocks for the plan recommendations. The goals and objectives developed by stakeholders in the WPG form the foundation for the identification of management opportunities. The plan presents management measures for achieving and sustaining measurable water quality improvements and recommends focus areas where opportunities will complement each other and lead to greater improvement in watershed functions. Finally, strategies are provided to help facilitate implementation of plan recommendations which include implementation responsibilities and timelines.

2 Watershed Characteristics

2.1 Location and Population

The Agua Hedionda watershed is located in San Diego County and within the Carlsbad Hydrologic Unit. It is approximately 20,175 acres (31.5 mi^2) and is divided into two subareas: the Buena hydrologic subarea (904.32) in the upper watershed and Los Monos hydrologic subarea (904.31) in the lower watershed (Figure 2-1). The watershed includes portions of four municipalities, Carlsbad, Vista, Oceanside, and San Marcos, as well as area in the unincorporated portions of the County of San Diego. These different jurisdictions are estimated to have a total population of about 65,000 people living in the watershed (CWN, 2008).

The watershed contains approximately 37 linear miles of stream including Agua Hedionda, Roman, Little Encinas, La Mirada, Calavera, and Buena creeks and several unnamed tributaries. It also includes three significant standing bodies of water: the Agua Hedionda Lagoon, Lake Calavera, and Maerkle Reservoir (a covered water storage facility). Major transportation corridors include Interstate 5, State Route 78, the Pacific Coast Highway, and the Santa Fe Railroad.

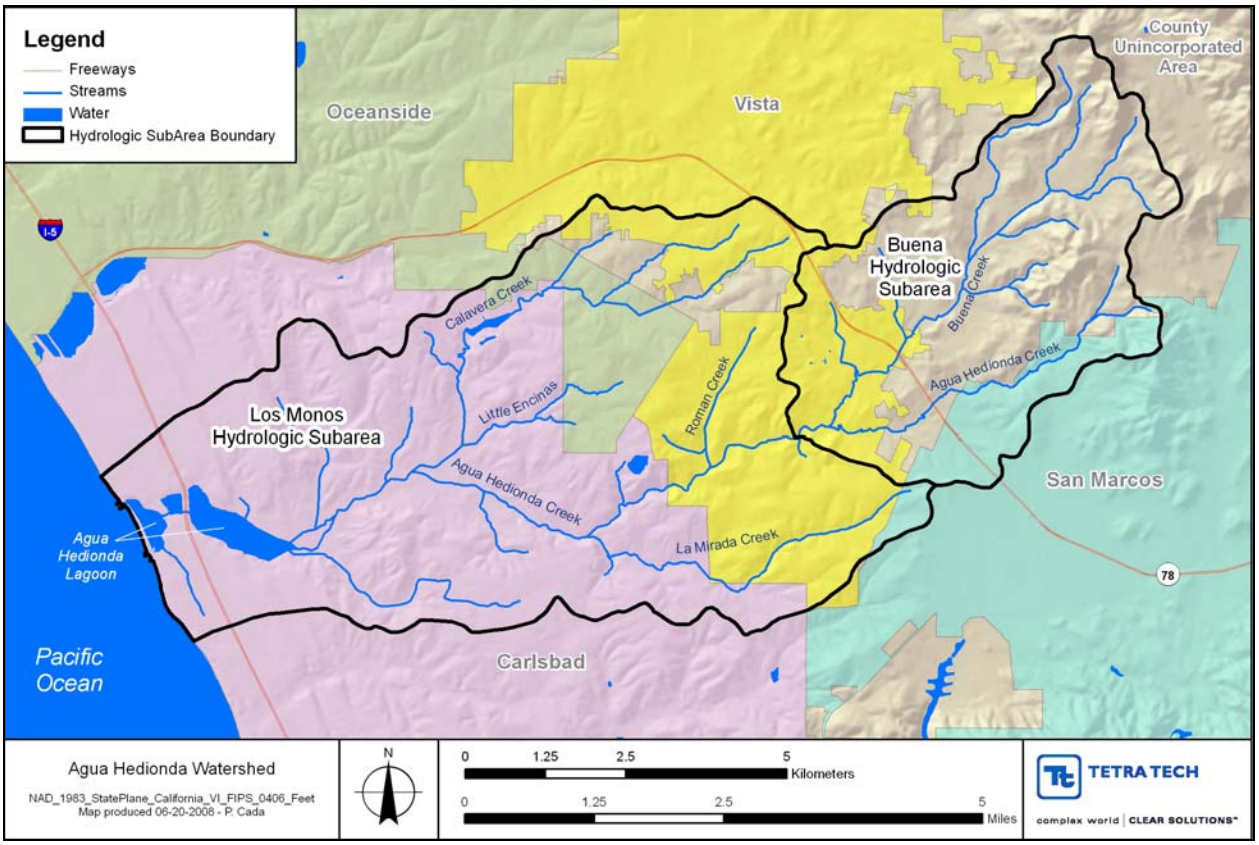

Figure 2-1. Agua Hedionda Watershed

2.2 Subwatersheds

The Agua Hedionda watershed was divided into smaller units, or subwatersheds, to provide a common basis for assessment and management recommendations. The subwatershed delineation for Agua

Hedionda is derived from a 10-meter resolution digital elevation model (DEM) from the National Elevation Dataset. Boundaries were modified using the municipal storm sewer networks, 2-foot contour topography layers, and aerial images. Accordingly, 29 subwatersheds (not including the "beach" watershed, model ID 999) were delineated with an average size of 1.1 mi^2 covering a total area of 31 mi^2 (Figure 2-1).

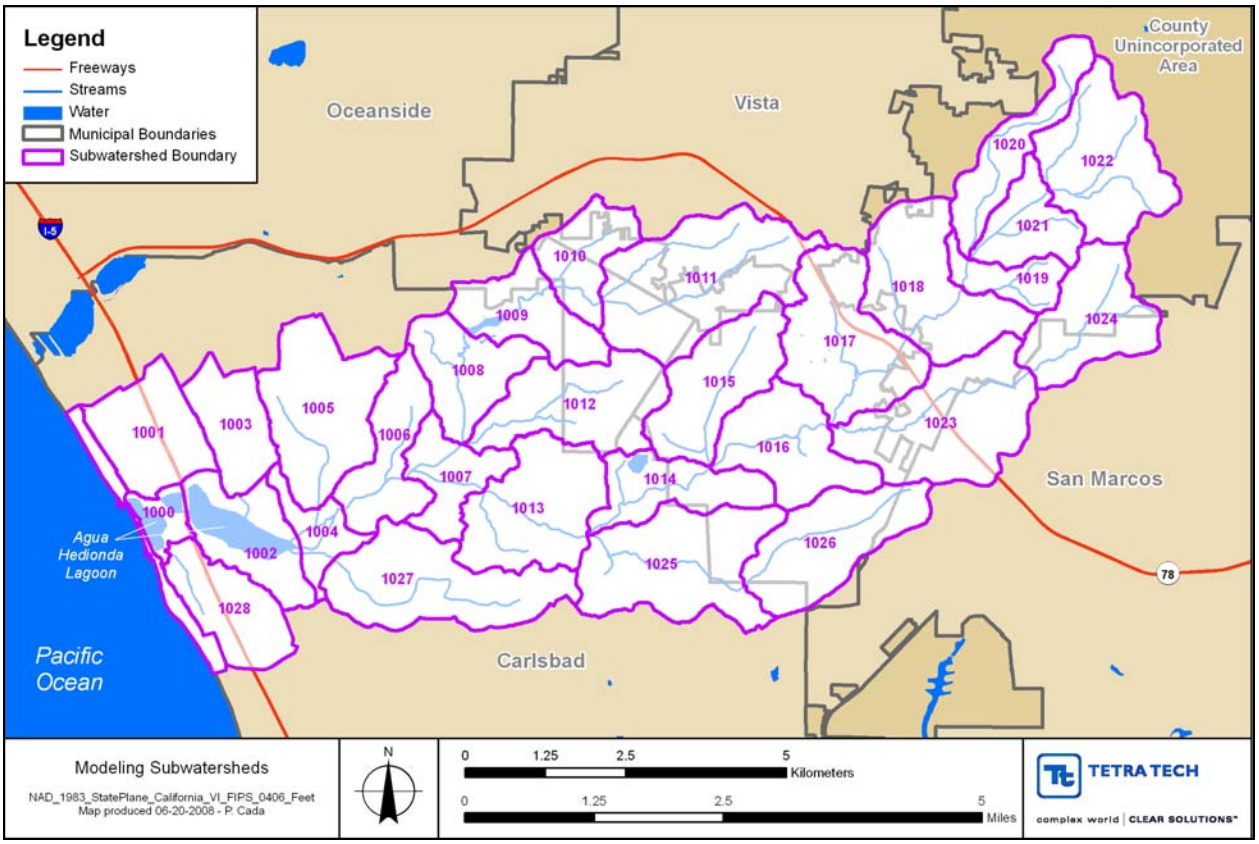

Figure 2-2. Map of Agua Hedionda Model Subwatersheds

2.3 LAND USE AND LAND COVER (EXISTING AND FUTURE)

2.3.1 Land Use

Land use can be a major force behind watershed health and degradation. In most cases, land development will increase the volume, frequency and magnitude of runoff within the watershed thus leading to increased pollutant loads and physical impacts to stream channels. Therefore, consideration of existing and future land use patterns within the watershed is an integral part of a watershed management plan.

Current (defined as year 2007) and planned land use (defined as year 2030) information was obtained from the San Diego Area Council of Governments (SANDAG). SANDAG has updated the land use layers continuously since 2000 using aerial photography, the County Assessor Master Property Records file, and other ancillary information. The planned land use data were derived from the Series 11 Regional Growth Forecast using each municipality's master development plans. Since each jurisdiction has its own individualized way of categorizing its future land use designations, an aggregate planned land use code was devised.

Both SANDAG GIS coverages (both current and planned land use) were modified using GIS parcel data to allow for a finer resolution of residential categories based on lot size. Additionally, future land use was modified based on feedback from municipalities on expected changes in under and undeveloped land uses from the existing (2007) condition. SANDAG classifications were grouped into a smaller number of categories for subsequent modeling applications (Tetra Tech, 2008b).

In 2007, residential areas covered nearly as much area in the watershed (34 percent) as the categories of agriculture and open spaces (38 percent) combined (Table 2-1). By this time residential developments had spread into the central and upper watershed, bringing human influences into closer contact with streams and displacing agriculture and open spaces (Figure 2-3). In fact, agricultural lands had already decreased 55 percent since 1986 levels (Tetra Tech, 2007). Most of the areas categorized as "transitional" before 2007 had been developed into residential and industrial spaces.

As noted in the 2030 Regional Growth Forecast for the San Diego Region (SANDAG, 2005), the watershed is intended to become primarily residential (46 percent total, with 32 percent as Very Low-, Low-, Medium-Density Residential and Single Family Multiple Units, and 14 percent considered Multiple Family/High Density Residential), warehouse, industrial and transportation (22 percent), and open space (19 percent) (Table 2-1). Nearly all current agricultural land is planned for development, while it is projected that open space will be reduced 33 percent from 2007 levels (Figure 2-4). Although the land use plans have provided for open space buffers along many of the streams in the lower portion of the watershed, the vast majority of the upper watershed shows development adjacent to stream corridors.

Table 2-1. Percent of Watershed for Each Land Use Class in 2007 and 2030

LULC Description	Area – 2007 (%)	Area – 2030 (%)
Agriculture	8%	0%
Heavy Commercial	1%	3%
High Density Residential (≤ 0.25 ac)	8%	8%
Low Density Residential (0.5 – 1 ac)	6%	10%
Lt. Commercial/Office/Institutional	4%	5%
Medium Density Residential (0.25 – 0.5 ac)	5%	12%
Multi-Family Residential	4%	6%
Open Space	29%	19%
Open/Recreation	1%	2%
Parks/Recreation	2%	2%
Single Family Multiple Units	2%	2%
Transitional	0%	0%
Very Low Density Residential (> 1 ac)	9%	8%
Warehouse/Industrial/Transportation	20%	22%
Water	2%	2%

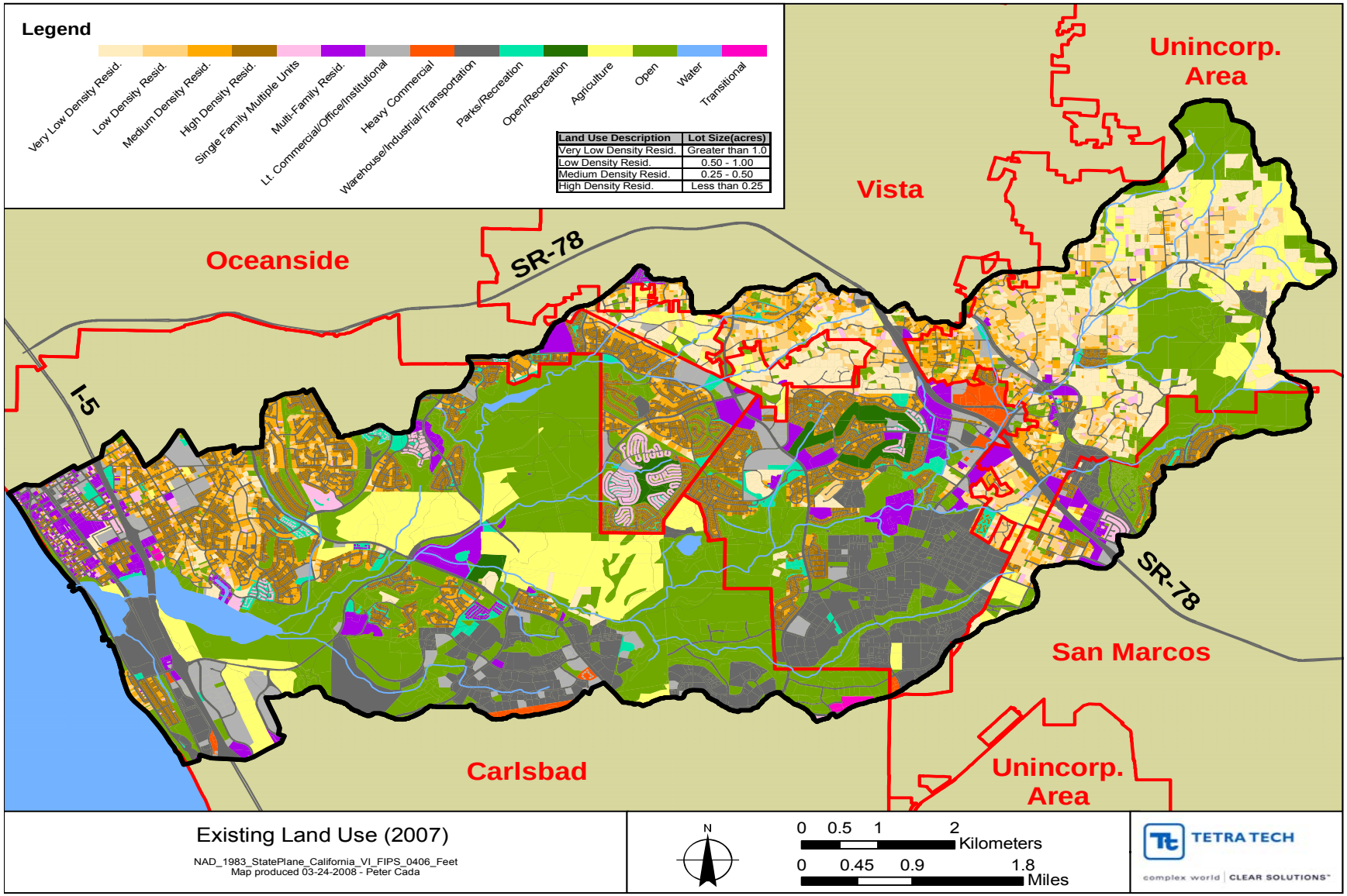

Figure 2-3. Existing (2007) Land Use in the Agua Hedionda Watershed

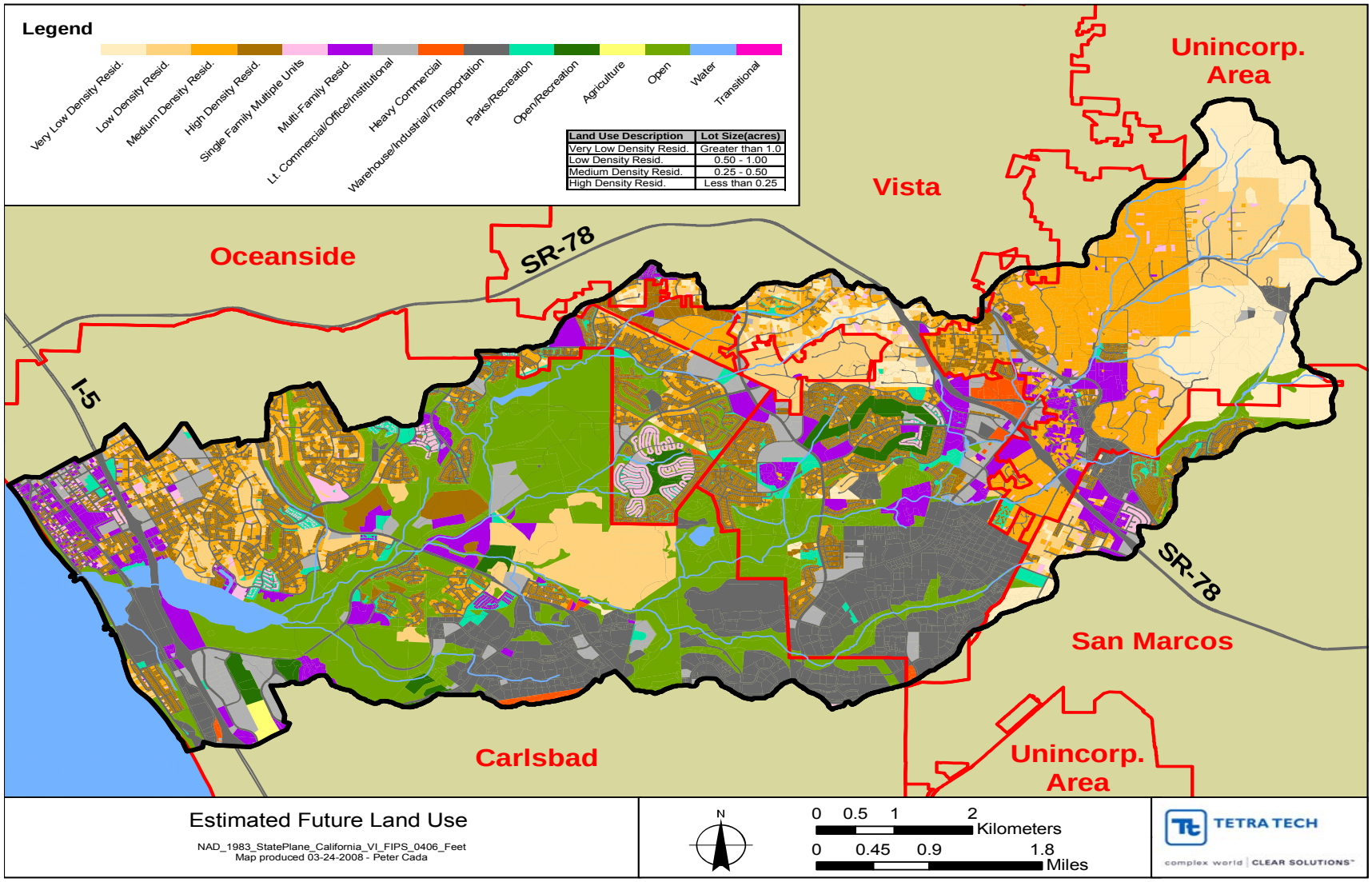

Figure 2-4. Estimated Future (2030) Land Use in the Agua Hedionda Watershed

2.3.2 Impervious Surfaces

Urbanization has profound influences on watershed health. As land is converted to rooftops, roads, and parking lots, impervious surface area increases leading to increased storm runoff while less surface water is able to infiltrate. These increases in impervious surface lead to greater volume, frequency and magnitude of runoff within the watershed. The Center for Watershed Protection Impervious Cover Model (CWP, 2007a) indicates that certain zones of stream quality exist, most notably at about 10 percent impervious cover, where sensitive stream elements (e.g., sensitive aquatic species, excellent habitat structure, and excellent water quality) begin to become lost from the system. A second threshold appears to exist at around 25 to 30 percent impervious cover, where most indicators of stream quality consistently shift to a poor condition (e.g., diminished aquatic diversity, water quality, and habitat scores). However, these categories are based heavily upon mid-Atlantic and Puget Sound research and may be less applicable to Southern California watersheds.

The 2001 National Land Cover Data (30-meter resolution) was used to assess trends in imperviousness throughout the watershed. The watershed upstream of the lagoon has an average imperviousness of about 29 percent (32 percent if measuring from the lagoon outlet).[1] The upper portion of the watershed generally has a lower percentage of impervious surfaces than the lower watershed. Pockets of low imperviousness are present in the central watershed, especially along the lower portion of Calavera Creek (see Subwatershed #1008 in Figure 2-5). The intensely developed areas just to the north and south of the Agua Hedionda lagoon (Subwatersheds #1001 and #1028) have percentages well above 50 percent (Figure 2-5).

It is important to note that conditions within a stream segment are influenced by the entire upstream contributing area. The stress on any particular reach is a result of cumulative imperviousness and associated runoff upstream of that reach. In headwater subwatersheds, imperviousness may not impact the headwater reaches as severely as downstream subwatersheds that have higher cumulative imperviousness. On the other hand, subwatersheds that have relatively low imperviousness within the immediate subwatershed area may experience severe impacts from upstream subwatersheds with high cumulative imperviousness.

[1] In the main stem of Agua Hedionda Creek in particular, NLCD impervious data is based on reflectance. In Southern California, it appears to count beaches and other sandy areas as impervious surfaces (which they are not). Undeveloped areas also have dispersed, bare rock. This is naturally disconnected land and should not be considered impervious. Therefore, this data may overestimate imperviousness in some parts of the watershed, particularly in less developed portions.

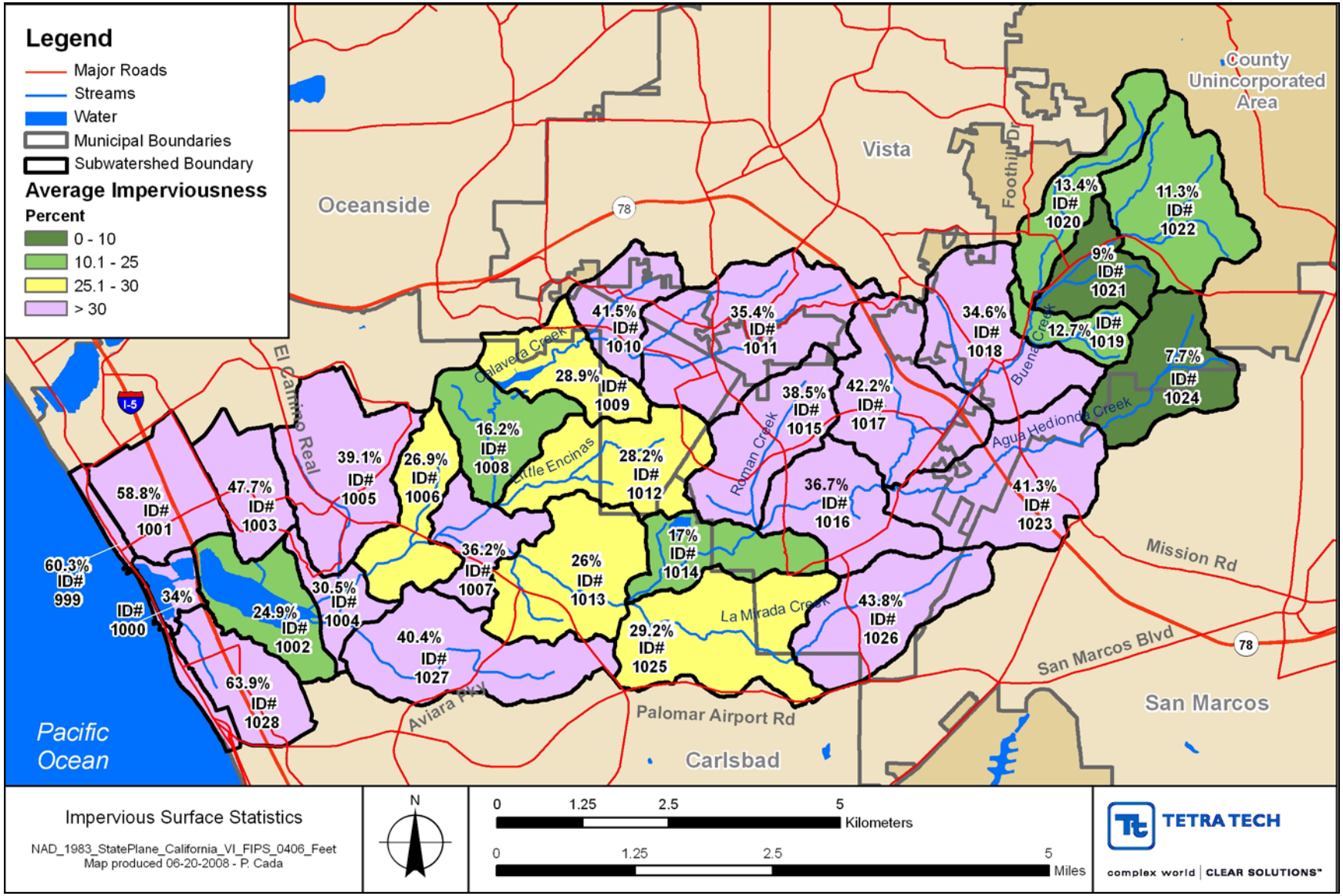

Figure 2-5. Percent Impervious Surface Cover for Each Subwatershed

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3 Assessment and Planning Approach

3.1 MISSION, GOALS, AND OBJECTIVES

To develop the Agua Hedionda WMP, Tetra Tech worked with the City of Vista using a multifaceted approach, which integrated stakeholder involvement, science, engineering, and feasibility evaluations. Development of this plan included several types of public participation:

- Watershed Planning Group (WPG) – This group was formed to provide input and make recommendations throughout development of the management plan. Membership is comprised of 50 citizens and representative groups or organizations in the watershed that have a stake or interest in the Watershed Management Plan. Ten meetings were held to develop goals and objectives, review and comment on draft findings, and to develop recommendations for the plan. In addition, members of the group were trained and participated in the watershed field reconnaissance and characterization.
- Technical Advisory Committee (TAC) – This group was comprised of local government technical advisors from planning and engineering departments (Table A-2). The group helped establish assumptions for future land use conditions, comment on draft findings, screen candidate BMPs and LID scenarios to evaluate in more detail, and provide input on candidate sites for stream restoration, BMP retrofits, and land acquisition.
- Watershed Coordinator – The watershed coordinator solicited, assembled and managed the project stakeholders to maximize their input to the WMP development. This important role maintained the continuity and focus of the various stakeholders, the project team and the funding agency.
- Outreach meetings – Meetings were held with local jurisdictions, agencies, and stakeholders, including the Cities of Carlsbad and Vista Engineering and Planning Departments, County of San Diego Department of Land Use Planning, California Department of Fish and Game, the US Fish and Wildlife Service, California Coastal Commission, California State Lands Commission, Carlsbad Watershed Network, Agua Hedionda Lagoon Foundation, Poseidon Resources, and Cabrillo Power II.
- Web Distribution – Project information and reports were posted on a project website to provide wider public access to materials produced by the process. (http://www.carlsbadwatershednetwork.org/AH-WMP.html)

At its initial meeting, the WPG discussed issues that the plan should address and drafted preliminary Mission, Goals and Objectives. The discussion included which beneficial watershed uses were important to protect and restore. After Tetra Tech reviewed existing studies and water quality data and evaluated the future conditions highlighted in Section 2, the Goals and Objectives were refined by the WPG. The Goals and Objectives (Table 3-1) are a critical part of the watershed management plan providing the basis for determining what issues need to be managed and how they should be addressed.

Table 3-1. Mission, Goals, and Objectives

Mission Statement
Preserve, restore and enhance the watershed's natural functions and features.
Goals and Objectives
1. Design land use and infrastructure so as to minimize impacts on the watershed.
a) Design and construct infrastructure projects (e.g., sewer lines) in a manner that minimizes impacts on watershed functions (i.e., water quality, habitat, and hydrology).
b) Design and construct new developments, recreation areas, etc., in a manner that minimizes impacts on watershed functions, including minimizing impervious areas.
2. Protect, restore and enhance habitat in the watershed.
a) Protect and expand undeveloped natural areas to protect habitat.
b) Protect, enhance, and restore terrestrial habitat, especially existing vegetation in riparian areas.
c) Provide riparian habitat to improve and maintain wildlife habitat.
d) Provide natural area connectivity to improve and maintain wildlife habitat.
e) Maintain stable streambanks and riparian areas to protect instream aquatic habitat and mature trees.
f) Maintain and protect instream habitat to support native aquatic biology.
g) Maintain and protect lagoon habitat.
3. Restore watershed functions, including hydrology, water quality, and habitat, using a balanced approach that minimizes negative impacts.
a) Restore and protect beneficial watershed functions and uses including
▪ Wildlife habitat
▪ Recreation
▪ Protection from flood damage
b) Design and construct restoration projects to minimize impacts to
▪ Streambanks
▪ Riparian areas
▪ Wildlife habitat areas
4. Support compliance with regional, state, and federal regulatory requirements. (While there are many regulatory requirements, several compliance issues are key to addressing existing impacts and mitigating impacts from future development, as follows.)
a) The San Diego Regional Water Quality Control Board has listed Aqua Hedionda Creek, Buena Creek, and Agua Hedionda Lagoon as impaired and not supporting designated beneficial uses under the Clean Water Act Section 303(d). Future compliance includes
▪ Meeting water quality standards for Total Dissolved Solids, Manganese, Selenium, and Sulfates for Aqua Hedionda Creek;
▪ Meeting water quality standards for DDT, Nitrate-Nitrite, and phosphate for Buena Creek.
▪ Meeting water quality standards for sediment and bacteria in Agua Hedionda lagoon.

b)	The San Diego Regional Water Quality Control Board and local governments in the watershed have stormwater management requirements for controlling sedimentation and erosion during construction. Future compliance will require adequate inspection and enforcement.
c)	The San Diego Regional Water Quality Control Board and local governments in the watershed have LID and stormwater management requirements to control post-construction runoff from new development. Compliance will require plan review, site inspection, and long-term BMP inspection and maintenance to ensure BMP requirements are being met.
d)	Reduce non-compliance events for water quality objectives and sedimentation and erosion control.
5. *Increase awareness and stewardship within the watershed, including encouraging policymakers to develop policies that support a healthy watershed.* This includes minimizing impervious area and providing for stream buffers.	
a)	Form collaborative Agua Hedionda Watershed Council to sustain long-term watershed management.
	▪ Determine the most appropriate organization and venue for Council.
	▪ Hire part- or full-time Watershed Coordinator.
	▪ Gain support from local political and business leaders.
	▪ Obtain long-term governance and funding for Watershed Coordinator and Council support.
b)	Support adoption and implementation of the Watershed Management Plan as well as ordinances, regulations, policies, and procedures by local jurisdictions, agencies, and environmental conservation organizations.
c)	Disseminate information to local governments to support scientifically based, sound decision-making.
d)	Develop a consistent and comprehensive message for watershed health and actions citizens can take. Distribute through website, water bills, press releases, brochures, and presentations.
e)	Encourage Low Impact Development (LID) at the new development, redevelopment and individual homeowner and project level.
f)	Reward good stewardship though an awards program that recognizes project sponsors who implement programs that preserve and enhance watershed health.
g)	Develop partnerships with business, residents, NGOs, Cities, the County, Agencies, schools and private entities throughout the watershed to leverage opportunities for watershed stewardship.

3.2 ESTABLISHING INDICATORS AND ASSESSMENT TOOLS

Indicators are measurable or predictable quantities that can be used to assess the current health of the watershed and to track progress toward meeting watershed goals and objectives. Indicators can be linked to the natural resource or to program actions. Example natural resource indicators for the objectives listed above are benthic community, channel morphology, and riparian habitat (e.g., as defined by percent undisturbed forest within the 100-year floodplain). Example programmatic tracking indicators include the number of local governments adopting the WMP or the number of presentations made to local governments on WMP findings. Often, there are multiple indicators associated with a given objective. Since it is important to evaluate existing conditions as well as predict future conditions, some selected indicators reflect parameters that can be or have been observed in the field (called observed indicators). Other selected indicators reflect parameters that can be used in modeling to compare current and future

conditions (called predictive indicators), while other indicators are used to track progress in meeting goals and objectives during plan implementation (called tracking indicators). Indicators were established so that appropriate tools and methods could be selected to support detailed watershed assessment and planning. To be capable of evaluating how indicators respond to different management actions, Tetra Tech developed several assessment tools, including a watershed model, a site-evaluation model, and GIS analysis. Table 3-2, Table 3-3, and Table 3-4 summarize the indicators selected, how they are linked to the management objectives, and the assessment tools used.

Table 3-2. Infrastructure/Development Management Indicators

Indicator	Linked to Objectives	Assessment Tools/Methods
Water Quality (Modeling of Future Conditions): Relative nutrient, upland sediment, and bacteria loading	1a, 1b	Watershed Model
Water Quality (Observed/measured): Instream – Copper, Turbidity, Total Dissolved Solids, Total Suspended Solids, Total Phosphorus, Total Nitrogen, Enterococcus, Fecal Coliform, Pesticides: DDT, diazinon, chlorphyrifos Lagoon – Total Suspended Solids, Turbidity, Total Phosphorus, Total Nitrogen, Enterococcus, and Fecal Coliform	1a, 1b	N/A (This is a future tracking indicator for use during plan implementation.)
Aquatic Habitat (IBI ratings, benthic bioclass, aquatic habitat index)	1a, 1b	Data Analysis
Existing native riparian habitat extent and connectivity (percent land cover)	1a, 1b	GIS Analysis
Stream stability	1a, 1b	Field Reconnaissance Watershed Model
Frequency, magnitude, and duration of extreme high flows	1a, 1b	Watershed Model
Flood elevation	1a, 1b	N/A (This is a future tracking indicator for use during plan implementation.)
Constraints to restoration (qualitative)	1a	Field Reconnaissance GIS Analysis
Planned road/bridge/culvert construction projects	1a	N/A (This is a future tracking indicator for use during plan implementation.)
Planned utility expansion	1a	N/A (This is a future tracking indicator for use during plan implementation.)
Percent imperviousness	1b	GIS Analysis Watershed Model

Indicator	Linked to Objectives	Assessment Tools/Methods
Percent of development with LID controls	1b	N/A (This is a future tracking indicator for use during plan implementation.)
Percent of development controlled by BMPs	1b	N/A (This is a future tracking indicator for use during plan implementation.)

Table 3-3. Habitat Management Indicators

Indicator	Linked to Objectives	Assessment Tools/Methods
Percent of the watershed in natural area 2007 Percent change in watershed natural area: Tracking indicator for plan implementation.	All	GIS Analysis
Existing terrestrial habitat extent and connectivity (percent land cover)	All	GIS Analysis
Invasive species extent and status of treatment	2a through 2d	GIS Analysis
Existing riparian habitat extent and connectivity (percent land cover within 100-year floodplain)	2b, 2c, 2e	GIS Analysis
MSCP and MHCP priority communities extent	All	GIS Analysis
Location of priority tree species (i.e., 100-year oaks) along streams	2e	GIS Analysis
Stream stability	2e	Field Reconnaissance Watershed Model
Frequency, magnitude, and duration of extreme high flows	2e, 2f	Watershed Model
Aquatic Habitat 2007 Aquatic Habitat Future – Tracking for plan implementation	2e, 2f	Field Reconnaissance
Aquatic Biodiversity 2007 Aquatic Biodiversity Future – Tracking for plan implementation	2f	GIS Analysis Data Analysis
Lagoon Habitat Quality 2007 Lagoon Habitat Quality – Tracking for plan implementation	2g	GIS Analysis Data Analysis
Unprotected terrestrial habitat extent and connectivity (percent land cover)	All	GIS Analysis

Indicator	Linked to Objectives	Assessment Tools/Methods
Unprotected riparian habitat extent and connectivity (percent land cover within 100-year floodplain)	All	GIS Analysis
MSCP and MHCP priority communities extent on unprotected land or near unprotected land	All	GIS Analysis

Table 3-4. Restoration Management Indicators

Indicator	Linked to Objectives	Assessment Tools/Methods
Goal #2 Habitat Indicators	3a, 3b	GIS Analysis
Existing recreation areas, including trails and natural areas (location, use, potential future impacts)	3a	N/A (This is a future tracking indicator for use during plan implementation.)
Degree of flood control within reach	3a	N/A (This is a future tracking indicator for use during plan implementation.)

These indicators and assessment tools were used to evaluate existing conditions, predevelopment conditions, future conditions, and Low Impact Development and BMP implementation.

Table 3-5. Stewardship Programmatic Indicators

Indicator	Linked to Objectives	Assessment Tools/Methods
Formation of Agua Hedionda Watershed Council	5a	N/A (This is a future tracking indicator for use during plan implementation.)
Securing funds for and contracting with a Watershed Coordinator	5a	N/A (This is a future tracking indicator for use during plan implementation.)
Number of jurisdictions, agencies and local NGOs to adopt, accept or formally recognize WMP as a decision making tool	5b	N/A (This is a future tracking indicator for use during plan implementation.)
Number of presentations to local government departments and councils or boards regarding WMP findings	5c	N/A (This is a future tracking indicator for use during plan implementation.)
Development of consistent and comprehensive message for watershed health	5d	N/A (This is a future tracking indicator for use during plan implementation.)
Number of website postings, mailers, bill inserts, press releases or brochures distributed	5d	N/A (This is a future tracking indicator for use during plan implementation.)
Number of LID workshops for new development, redevelopment and individual homeowners	5e	N/A (This is a future tracking indicator for use during plan implementation.)
Number of Watershed Steward Awards given to local businesses for implementing pollution reducing practices	5f	N/A (This is a future tracking indicator for use during plan implementation.)
Number of partnerships throughout the watershed that are leveraged to expand stewardship efforts or messages	5g	N/A (This is a future tracking indicator for use during plan implementation.)

3.3 OTHER EVALUATION CRITERIA

An effective watershed management plan requires not only sound scientific and engineering analysis; it also requires cost and feasibility analysis. Therefore, in evaluating different management options, additional evaluation criteria were used such as:

- Meets multiple objectives
- Relative cost

- Stakeholder support
- Site feasibility (e.g., site access, utility constraints, etc.)
- Political feasibility
- Administrative feasibility

These criteria are discussed in more detail in Section 6.

4 Existing and Future Watershed Conditions

4.1 WATER QUALITY CONDITIONS AND TRENDS

4.1.1 Agua Hedionda Water Quality Analysis

The San Diego Regional Water Quality Board (RWQCB) has listed Agua Hedionda Creek, Buena Creek, and Agua Hedionda Lagoon as impaired and not supporting designated beneficial uses under the Clean Water Act Section 303(d). Portions of the Agua Hedionda Creek are impaired for total dissolved solids (TDS), manganese, selenium, and sulfates. Buena Creek is listed for DDT, nitrate-nitrite, and phosphate. The lagoon is listed as impaired from excess sediment and bacteria. Though several of the impairments are attributed to unknown sources, the bacterial and sediment-related impairments have been attributed to urban runoff and other nonpoint sources. Sediment nonpoint sources may include natural background sources (i.e., sparse chaparral type cover on undeveloped land), channel erosion, and stormwater runoff from construction, post-construction, and agricultural sites. Bacteria nonpoint sources may include natural background sources (i.e., wildlife), residential irrigation runoff, septic systems, sanitary sewers, transient encampments, and pet waste. Monitoring is underway to collect sufficient data to develop Total Maximum Daily Loads (TMDLs)[1] for these waterbodies under a separate project.

A general watershed characterization and review of existing data was conducted using available regional and local datasets and previous assessment reports (Tetra Tech, 2007). The review described both spatial and temporal trends in the watershed to evaluate current water quality conditions and provide recommendations to best meet existing and future regulatory, planning and monitoring needs.

The data review suggested that sediment (TSS and turbidity) and bacteria (coliforms and enterococcus) are the greatest threats to watershed function in the Agua Hedionda watershed. Concentrations of these constituents exceed water quality objectives the majority of the time. Moreover, reports of significant upward trends in TSS, turbidity, and fecal coliform at the wet weather monitoring station (where El Camino Real crosses Agua Hedionda Creek) suggest the problem is getting worse (Weston, 2007a). Turbidity was higher in the receiving water samples, an expected pattern based on the storm-driven nature of this parameter. Impairment from indicator bacteria such as fecal coliform is, however, both a dry and wet weather problem in the watershed.

While the lack of wet weather monitoring sites inhibits the evaluation of spatial patterns, samples collected as part of the dry weather monitoring (storm drains and instream) show particularly high bacteria levels in La Mirada Creek, which drains commercial development, as well as Calavera Creek upstream of Lake Calavera. High salinity (a parameter closely related to TDS) is also found along Calavera Creek in areas draining residential development, suggesting a human source, although groundwater is likely the chief contributor to TDS levels throughout the watershed. Composition of TDS has not been analyzed in these samples. However, it is not unusual for coastal streams in southern California to exhibit elevated TDS due to mineral soils and geology.

While nitrogen does not appear to be a significant threat in most of the watershed, the impairment of Buena Creek combined with the significant upward trend of nitrate (Weston, 2007a) suggest that it could

[1] A TMDL or Total Maximum Daily Load is a calculation of the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards, and an allocation of that amount to the pollutant's sources.

become a problem in the future. Phosphorus levels in the watershed are a concern as well: concentrations exceed the Basin Plan WQO and Buena Creek is 303(d)-listed for phosphate. Some potential sources of nutrients throughout the watershed include fertilized lawns, fertilized agricultural fields, and atmospheric deposition. Irrigation return flow during dry weather can transport significant amounts of nutrients, particularly nitrogen, to receiving waters via subsurface flow. During wet weather events, build up of nitrogen and phosphorus on impervious surfaces from atmospheric deposition and other urban activities is available for surface runoff.

There is some evidence to suggest that pesticides are a threat in the watershed; however, toxicity tests have not borne out a persistent impact on the biological community. In addition, Weston (2007a) observed that the number of pesticide exceedances has decreased since 2002. There is also little indication that metals present a significant problem for aquatic life in the watershed based on an evaluation of metals toxicity.

Given the lack of evidence for widespread and severe toxicity in the watershed, the poor biological community as seen in biotic integrity indices can likely be attributed to habitat degradation from scour during storms and sediment transport from both upland and instream sources.

4.1.2 Watershed Scenario Modeling

To support the development of the WMP, a watershed model using the Loading Simulation Program C++ (LSPC) was developed to provide an evaluation of the differences between past and future pollutant loading conditions relative to existing watershed conditions, and supply additional insights into the potential hydromodification impacts on the physical integrity of stream channels and habitat. LSPC is a continuous watershed model supported by U.S. Environmental Protection Agency (USEPA) and has been used widely throughout Southern California. The watershed model describes hydrology and pollutant loading of Total Nitrogen (TN), Total Phosphorus (TP), sediment, and bacteria (fecal coliform). The model application is documented in Tetra Tech (2008b).

Evaluation of the following indicators under WMP goals 1 and 2 is supported by the modeling analysis: water quality in terms of relative nutrient, upland sediment, and bacteria loading; stream stability; frequency, magnitude, and duration of extreme high stream flows; and percent imperviousness. Analysis of past, present, and future scenarios is used to guide identification of current areas of degradation and contributors to impairment as well as potential threats from future development.

Four scenarios were modeled to evaluate past (predevelopment scenario), present (existing scenario) and future (future scenario) conditions in the Agua Hedionda watershed.

1. The **Predevelopment Scenario** models all developed land as open space.
2. The **Existing Scenario** is based on 2007 land use (as of approximately January 1) and contains a representation of BMP treatment for development that has occurred since 2001, as well as a small amount of treatment that occurred before that time.
3. The **Future Scenario with the Future BMP treatment**. This is based on assumptions about planned development through 2030 overlaid with current stormwater control requirements. The Future with BMPs Scenario also contains nearly 1,000 acres of redevelopment and associated new treatment planned for by the City of Vista.
4. The **Future Scenario without the BMP treatment**.

Pollutant loading to the lagoon is a concern due to its impaired status for bacteria and sediment. While this analysis did not provide the EPA-required TMDL (this will occur later in time under another effort), it can provide a relative understanding of current and future conditions. In the analysis, the Future

Scenario with Future BMPs results in loading slightly lower pollutant loads than under the Existing Condition, a desirable result (Table 4-1).

Future development with BMPs as represented in the model is predicted to result in an overall decrease in sediment, bacteria, and nutrient loading to the lagoon due to three factors: (1) preservation of open space, (2) the conversion of agricultural land to residential and non-residential development that is treated by stormwater BMPs, and (3) the redevelopment with associated stormwater BMP treatment of significant portions of the watershed. The modeling results were sensitive to these changes. In particular, if the planned redevelopment does not occur as represented in the model scenarios (e.g., without treatment as required by the Order R9-2007-001), the watershed could be at greater risk of degradation. Further, since the assimilative capacity of the lagoon has not been determined to date, additional reductions beyond those predicted by this watershed model in the future scenario could be needed.

Table 4-1. Percent Change in Average Annual Loading Relative to the Existing Scenario

Pollutant	Predevelopment	Existing	Future w/o BMPs	Future w/ BMPs
TN	-63%	0%	9%	-6%
TP	-86%	0%	12%	-5%
Fecal	-93%	0%	13%	-12%
Sediment	-11%	0%	7%	-7%

Trends in pollutant loading in the future throughout the watershed are also driven by development of agricultural land and redevelopment. Decreases in loading seen here tend to mask any increases that are derived from the development of open space even though one-third of open space is planned for development. Overall increases in pollutant loading (at least >1 percent) occur in only a few subwatersheds. Most of the area-averaged increases in loading are predicted to occur in the uppermost portion of the watershed; however it is important to note that the upper subwatersheds have a much lower existing level of loading compared to other subwatersheds.

The modeling results were used to select key areas or priority subwatersheds where watershed management and improvement projects can be focused. Eight subwatersheds were selected in the following manner (Figure 4-1). First, subwatersheds that ranked in the highest quartile within each of the selected metrics were selected. Metrics considered were existing unit area loading of fecal coliform, sediment, TN and TP from the watershed model as well as the hydrologic metric, difference between existing and predevelopment T_{Qmean}. The T_{Qmean} metric is the proportion of time that stream flow is above the annual daily-averaged mean level; the difference between the predevelopment and existing scenario values provides an indicator of the impact of urbanization on the flow regime or channel hydromodification. Subwatersheds that occurred in the top quartile of three or more of the selected metrics were considered high priority for management opportunities, most importantly BMP retrofits.

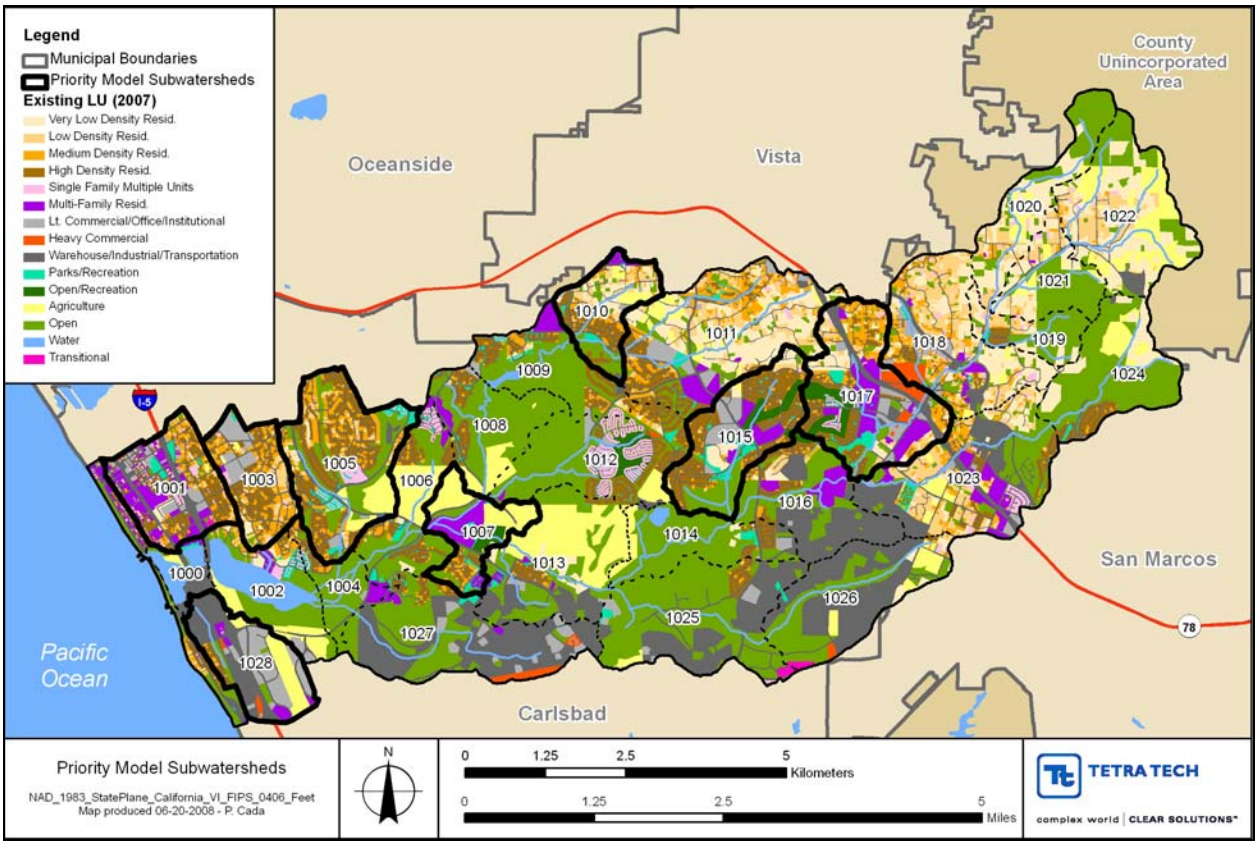

Figure 4-1. Priority Subwatersheds with Highest Existing Runoff Volume and Pollutant Loading

4.2 GEOMORPHOLOGY CONDITIONS AND TRENDS

Geomorphology refers to the study of landforms and the processes that shape them and is particularly relevant to stream functions within the context of a watershed assessment. A geomorphic analysis of stream channels in the Agua Hedionda watershed was conducted to evaluate how geomorphic processes have influenced the existing channels, and to investigate the need for and appropriateness of stream restoration measures. The analysis of the geomorphic condition included two primary components: 1) observations made during a field assessment, and 2) a review of historic data including aerial photography and topographic maps. An evaluation of simulated hydrology from the watershed model supplemented these analyses.

Based on the field assessment, the existing geomorphic condition of stream channels in the Agua Hedionda watershed spans the full range of possible conditions or stages of channel alteration. Some reaches do not exhibit instability (e.g., the upper reach of La Mirada Creek and the upper reach of Little Encinas Creek). Other reaches are typical of incising and widening reaches, including the upper reach of two headwater tributaries to Buena Creek, the central portion of Agua Hedionda Creek (shown in Figure 4-2) and the upper reach of Calavera Creek. Some reaches appear to have naturally reached a state of post-disturbance equilibrium (e.g., the upper reach of Agua Hedionda Creek).

Figure 4-2. An Incised and Widening (with recent slumping) Reach of Agua Hedionda Creek

The review of historic data utilized a series of historical aerial photographs for the years 1939, 1963, 1990, and 2002. The available aerial photographs represent conditions that range from relatively sparse development to current levels of development. The historic context provided through the aerial photograph review allows for preliminary assessments of morphologic change due to natural variability versus impacts due to human influence.

In conjunction, the field assessment and aerial photograph analyses revealed that the stability of the channel has been negatively impacted over time at many locations throughout the stream system. The results suggest that channel modification due to past watershed development has occurred in many parts of the watershed. These impacts are most significant over a reach of upper Calavera Creek and much of the lower reaches of Agua Hedionda Creek (Figure 4-3). Other impacted reaches were noted but were not as significant. A combination of stabilization, restoration, and stormwater retrofit practices is needed to address these existing impacts. Planned new development has the potential to further degrade stream channels in the Agua Hedionda watershed, although the impacts can be mitigated to a large extent by existing BMP requirements that address peak flows from future development. The need for additional protection measures should be explored during the development of the San Diego Region Hydromodification Plan; this plan is currently being developed and will include more protective measures than stormwater controls that are currently in place (see Appendix A for more details).

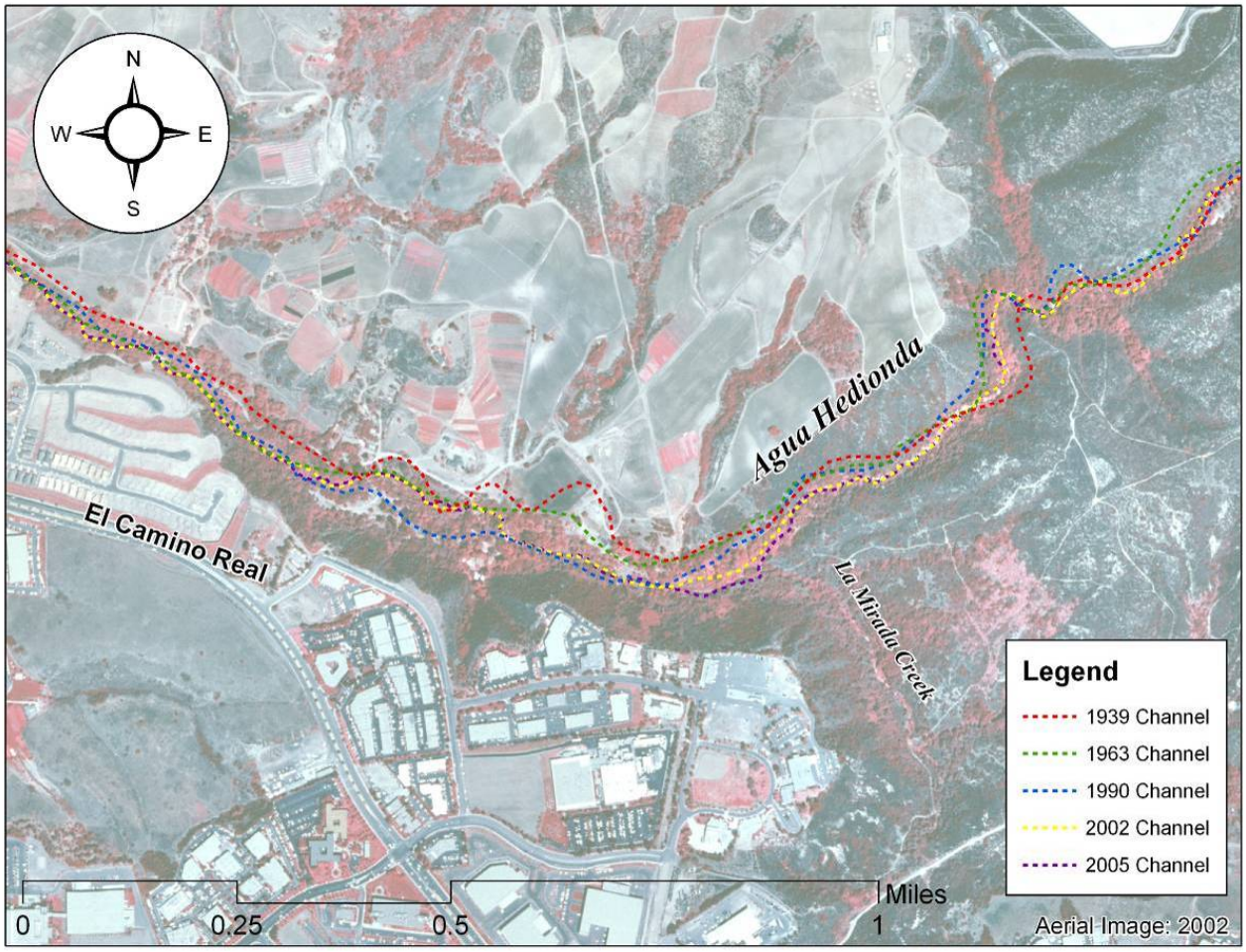

Figure 4-3. Channel Analysis in Lower Agua Hedionda Creek

4.2.1 Comparison with Hydrologic Modeling Results

Hydromodification is a concern in many Southern California watersheds. Hydromodification is the alteration of the natural flow of water through a landscape, and typically takes the form of stream channel modification or channelization. Hydrographs, plots illustrating the magnitude of stream flow during a storm event, were created based on simulation results from the watershed model. These hydrographs provided insight into the potential impact that changes in the rates and volumes of streamflow can have on stream channels. Peak flows under the Future BMP Scenario were reduced to or below Existing levels in nearly every case. However, a focus on the tails of the storm events revealed persistence over time of higher flows in the Future BMPs Scenario. Though its effect in the Agua Hedionda watershed is unclear, this increase in the duration of elevated flows has been associated with a potential for additional stream channel impacts. Studies have indicated that controlling only the peak flow may not be fully protective of stream channels due to an increase in the duration of erosive bankfull and sub-bankfull events (Brown and Caraco, 2001). Attempts to mitigate the problem have often incorporated extended detention and slow release of a channel protection volume. This issue should be explored further during the development of the Hydromodification Plan for the county.

To compare modeling results with the geomorphic analysis, a hydrologic metric, T_{Qmean}, was developed for the predevelopment and existing scenario using the GeoTools package (Raff et al., 2007). The subwatersheds with the least percentage change would be expected to have the least impact on channel

morphology. The geomorphic analysis identified the Upper Agua Hedionda Creek and most of the mainstem of Buena Creek as exhibiting little channel movement over time. These areas correspond well to the subwatersheds with the least change in T_{Qmean} (i.e., the light orange and yellow shaded areas in the upper portion of the watershed shown in Figure 4-4). The impacted reaches on the upper Calavera Creek noted in the geomorphic analysis correspond to subwatersheds with large changes in the metric (c.f. subwatersheds 1011 and 1010 in Figure 4-4). La Mirada Creek is aggrading (accumulating sediment) based on the site evaluation corresponding to a moderate T_{Qmean} difference in the upper drainage area.

Areas where the two lines of evidence, the geomorphic analysis and the model, do not converge are at Little Encinas Creek and Roman Creek. The expected geomorphic impact to Roman Creek based on the difference in T_{Qmean} is not realized, apparently due to the presence of large rock contributing to stability. Field characterization near the outlet of Roman Creek showed a channel that may have been impacted in the past but was equilibrating to watershed conditions.

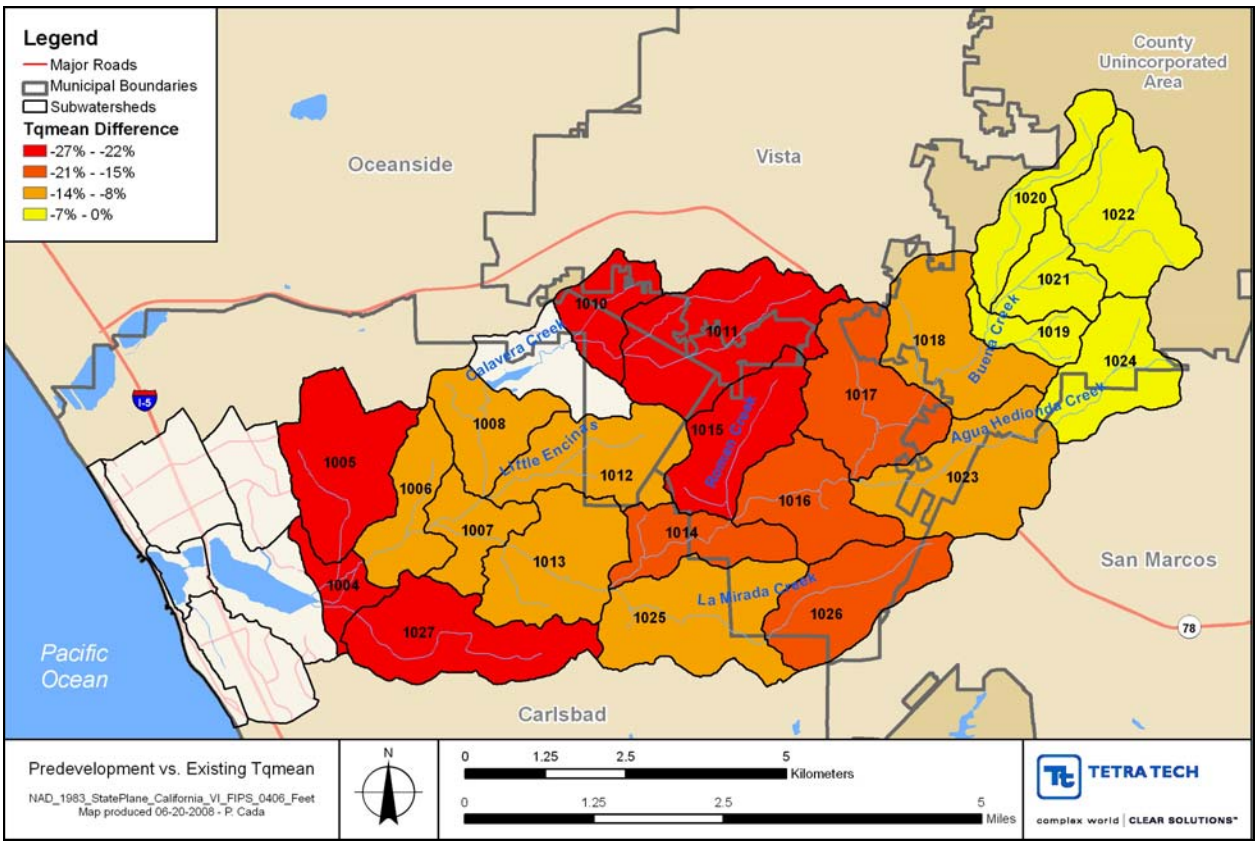

Figure 4-4. Changes in Hydrologic Metric (T_{Qmean}) from Predevelopment to Existing

4.3 CLIMATE CONDITIONS AND TRENDS

Hydrologic conditions in the region, within California, and in the Colorado River basin will likely be altered as a result of global climate change (based on conditions observed over the past century). According to a recent California Department of Water Resources (DWR) report:

> "Climate change may seriously affect the State's water resources. Temperature increases could affect water demand and aquatic ecosystems. Changes in the timing and amount of

precipitation and runoff could occur. Sea level rise could adversely affect the Sacramento-San Joaquin River Delta and coastal areas of the State."

Potential effects of climate change on California's water resources and expected consequences include:

- Reduction of the State's average annual snowpack
- Changes in the timing, intensity, location, amount, and variability of precipitation
- Long-term changes in watershed vegetation and increased incidence of wildfires
- Sea level rise
- Increased water temperatures
- Changes in urban and agricultural water demand (DWR, 2006)

These consequences could have a significant impact on the Agua Hedionda watershed. More intense coastal storms could magnify the hydromodification effects in the channels causing additional erosion and sedimentation. Rising sea level would inundate existing lagoon saltwater marshes. If preserved land is present along the margins of the lagoon, raising sea level could represent a shift of habitat into these margins; however, if additional land is not preserved, the rise may result in a permanent loss of salt marsh habitat. The watershed beaches may also shrink because of rising seas and increased erosion from more intense winter storms. Currently, many beaches are protected from erosion through manmade sand replenishment (or "nourishment") programs, which bring in sand from outside sources to replace the diminishing supply of natural sand (CCCC, 2006).

4.4 HABITAT CONDITIONS AND TRENDS

The Agua Hedionda watershed has experienced an extensive loss of habitat throughout its terrestrial, wetland, and aquatic ecosystems. When vegetation cover was mapped in 1995, about 27 percent of the watershed remained in natural, relatively undisturbed areas. This natural vegetation has decreased since 1995 to about 22 percent of the watershed, and without further habitat protection or restoration, natural area in the watershed is likely to decrease to 12 percent at build-out based on the extent of currently protected natural vegetation in the watershed.[1] The following sections describe the general habitat conditions in the watershed and provide information on lagoon habitat, plant communities, and sensitive species. This information provides the baseline for evaluating management opportunities that can restore, preserve, and enhance habitat for plant and animal species in the watershed.

4.4.1 General Habitat Conditions

This section provides an overview of general habitat conditions in the watershed, and addresses four major habitats: riparian, wetland, aquatic, and upland. Existing habitat connectivity within the watershed is also discussed. All forms of habitat in the watershed not only provide wildlife habitat but also provide watershed and water quality functions that contribute to the overall health of the Agua Hedionda watershed.

A detailed, comprehensive inventory of vegetation communities in the region was last conducted in 1995 by the San Diego Area Council of Governments (SANDAG). Figure 4-5 displays the distribution of major vegetation classifications within the watershed (SANDAG, 1995). Although most of the watershed

[1] Local and regional governments are currently preparing habitat management plans that may protect additional land once enacted.

is classified as non-native vegetation, unvegetated land, or developed land, significant areas of scrub/chaparral and herbaceous communities are present (Table 4-2).

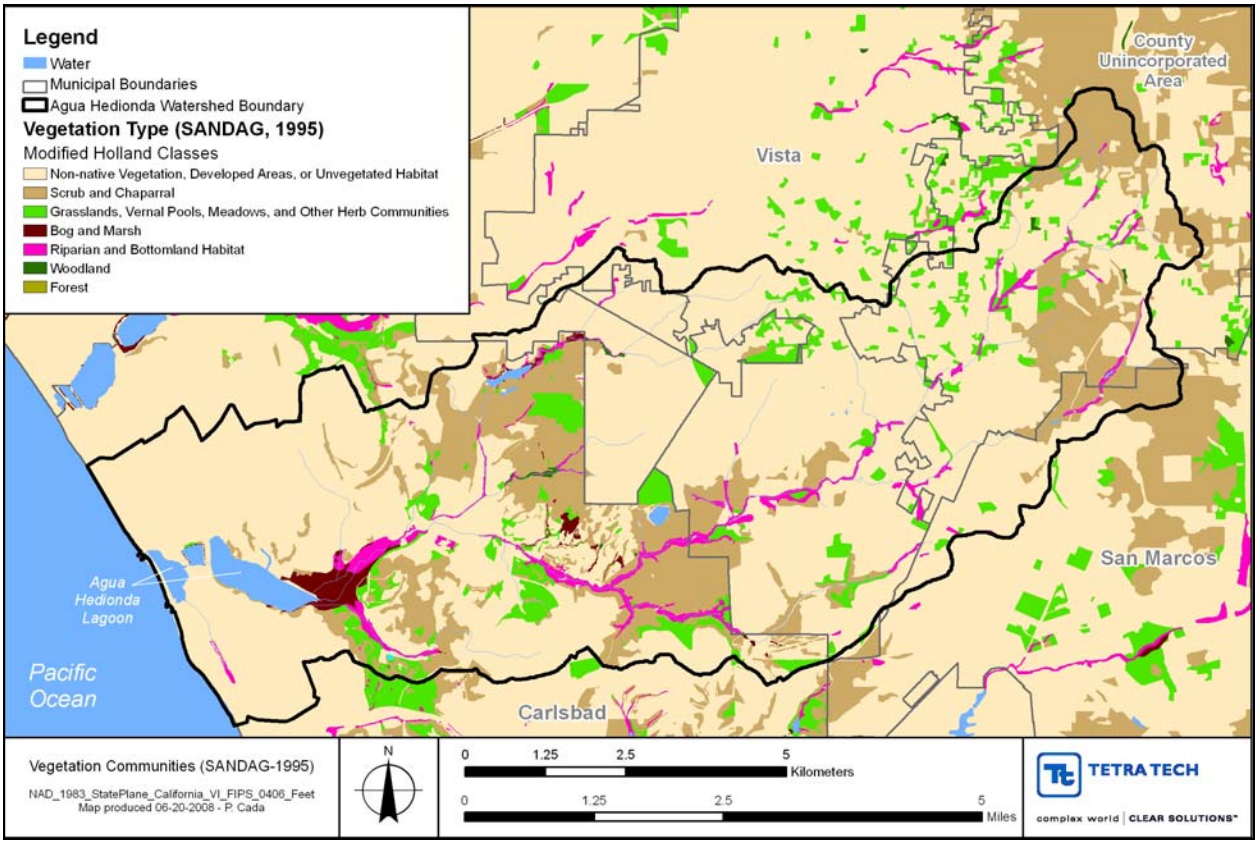

Figure 4-5. Vegetation Communities Available in the Watershed

Table 4-2. Vegetation Community Types in Agua Hedionda Watershed

Vegetation Community	Acreage
Non-native Vegetation, Developed Areas, or Unvegetated Habitat	14,100
Scrub and Chaparral	3,800
Grasslands, Meadows, and Other Herb Communities	1,200
Riparian and Bottomland Habitat	500
Estuarine	300
Bog and Marsh	200
Disturbed Wetland	53
Woodland	26
Forest	0.1

Many of the natural vegetation communities are fragmented due to roads, agriculture, and residential and commercial development. As natural vegetation communities are divided into smaller and smaller parcels, native plant and animal species may be threatened due to reduced mobility. Meanwhile, invasive species often thrive in fragmented habitats (discussed in more detail in Section 4.4.1.2).

Riparian habitat (also known as riparian, or stream, buffer) exists between stream channels and upland areas and provides important benefits for the protection and restoration of watershed functions. This land provides habitat, protects streambanks from erosion, and acts as a filter for many pollutants from adjacent uplands. By approximating the historic extent of riparian vegetation, Tetra Tech estimated that 60 percent of riparian vegetation has been lost. Land along stream channels in Figure 4-5 with little or no natural vegetation indicates areas where a major loss of riparian habitat has occurred. Loss of riparian habitat has occurred throughout the watershed, but this loss is most evident along Buena and Agua Hedionda creeks in the central and upper portions of the watershed and along the upper reaches of Calavera Creek.

Wetland habitat may overlap with riparian habitat and generally includes seasonally or intermittently flooded areas that provide a transitional habitat area between open water and dry land. Wetland habitat in general supports a high degree of biodiversity. Some wildlife species depend on wetlands as their exclusive habitat, while others that live in upland areas still depend on wetlands for essential resources, including food and water. In addition to wildlife functions, wetland habitat provides functions important to water quality, including nutrient cycling and sediment trapping.

The loss of wetland habitat has been particularly significant within the watershed. California has lost more than 90 percent of its historic wetlands and has experienced a much greater loss than the national average of 50 percent (State Coastal Conservancy, 1989). Agua Hedionda watershed exemplifies this loss. Using hydric soils data and the National Wetlands Inventory, Tetra Tech estimated that the watershed has experienced an 82 percent loss in wetland habitat. Historically, most of the wetlands likely occurred in the lower, more coastal portion of the watershed. Much of this land is either highly developed or disturbed by agriculture, leaving little coastal wetland habitat remaining except for the lagoon. Vernal pools were likely to exist historically in the watershed, but neither Tetra Tech's research nor stakeholder knowledge has indicated that any vernal pools remain.[1] The locations of existing wetlands can be seen in Figure 4-5 within the bog and marsh and riparian and bottomland habitat vegetation classes. The disturbed wetland class indicates locations of wetlands that may still exist, but vegetation has been disturbed or removed.

Considering these wetland losses, the Agua Hedionda Lagoon is an important habitat resource for the watershed. The primary wildlife habitat provided by the lagoon is open water. In addition to the open water areas, eelgrass beds provide habitat for fish and crabs, and mudflats provide feeding areas for migrant birds. The marsh areas, although limited, provide additional habitat diversity for a variety of species (State Coastal Conservancy, 1989). (See Section 4.4.1.1 for more details.)

Upstream of the lagoon, watershed impacts, including development, have degraded or destroyed aquatic habitat within stream channels. Biological monitoring data indicates that benthic macroinvertebrate biodiversity is relatively poor at select sample locations in the watershed, as reported in Tetra Tech (2007). During October 2007 field reconnaissance, Tetra Tech evaluated aquatic habitat qualitatively throughout the watershed and found a range of aquatic habitat quality, including some potentially high quality sites. Benthic macroinvertebrate sampling at additional locations may reveal higher diversity in locations with higher quality habitat, but these results are difficult to project based on the intermittent nature of the streams and the high sediment load throughout the watershed.

[1] A vernal pool is a shallow, intermittently flooded wetland that is typically dry during the summer and fall (Mitch and Gosselink, 2000).

The diverse habitats within Agua Hedionda watershed support species sensitive to further habitat degradation, including those listed on state and federal endangered and threatened species lists. Table 4-3 lists the endangered and threatened species, designated at the state and federal levels, that are likely to occur within the watershed or have occurred in the past. At the federal level, a species is designated as "endangered" if it is in danger of extinction within most or all of its range, and a species is designated "threatened" if it is likely to become an endangered species in the future. The state listing generally corresponds with this definition, but some species may not match the federal listing if they are considered more or less rare within state boundaries.

All listed species except for two are presumed to occur in the watershed (noted as "presumed extant" in the table). The tidewater goby (*Eucyclogobius newberryi*) no longer occurs in the Agua Hedionda Lagoon and is thought to no longer occur in the watershed (noted as "possibly extirpated" in the table; see table footnote). The California least tern (*Sternula antillarum browni*) has been observed in the vicinity of the lagoon but is not believed to nest within the watershed due to absence of foraging habitat (MEC, 1995) and is designated in the table as "extirpated" (see table footnote).

Table 4-3. Federal and State Endangered and Threatened Species Identified within the Agua Hedionda Watershed (CNDDB, 2008)

Scientific Name	Common Name	Presence[1]	Federal Listing	State Listing
Acanthomintha ilicifolia	San Diego thorn-mint	Presumed Extant	Threatened	Endangered
Arctostaphylos glandulosa ssp. crassifolia	Del Mar manzanita	Presumed Extant	Endangered	None
Brodiaea filifolia	thread-leaved brodiaea	Presumed Extant	Threatened	Endangered
Charadrius alexandrinus nivosus	western snowy plover	Presumed Extant	Threatened	None
Eryngium aristulatum var. parishii	San Diego button-celery	Presumed Extant	Endangered	Endangered
Eucyclogobius newberryi	tidewater goby	Possibly Extirpated[2]	Endangered	None
Navarretia fossalis	Moran's navarretia	Presumed Extant	Threatened	None
Passerculus sandwichensis beldingi	Belding's savannah sparrow	Presumed Extant	None	Endangered
Polioptila californica californica	coastal California gnatcatcher	Presumed Extant	Threatened	None
Rallus longirostris levipes	light-footed clapper rail	Presumed Extant	Endangered	Endangered
Sternula antillarum browni	California least tern	Extirpated	Endangered	Endangered
Vireo bellii pusillus	least Bell's vireo	Presumed Extant	Endangered	Endangered

[1] "Presumed Extant" means that a species is likely to occur in the watershed; "Possibly Extirpated" means that a species has been observed in the past but may not occur, at present, within the watershed; "Extirpated" means that a species has been observed in the past but is unlikely to occur, at present, within the watershed.

[2] The tidewater goby no longer occurs in the Agua Hedionda Lagoon.

Due to the extensive loss of habitat across all ecosystems, existing upland habitat is important to consider because it maintains existing biodiversity and protects water quality, particularly for highly erodible upland areas. In the lower portion of the watershed, most of the remaining upland natural vegetation has been preserved, but in the upper portion of the watershed, large tracts of upland habitat remain unprotected.

Another major habitat impact has been the loss of connectivity between the upper and lower portions of the watershed. Since this loss is due to development, no feasible opportunity exists to restore this habitat connectivity. Despite this loss, significant tracts of natural wildlife habitat still exist both in the lower and upper portions of the watershed, and a combination of preservation and restoration could be successful at maintaining and enhancing the current habitat connectivity.

4.4.1.1 Agua Hedionda Lagoon

Agua Hedionda means "stinking water" in Spanish; named presumably because of the odor of the stagnant water (MEC, 1995). Agua Hedionda is a salt marsh slough which was dredged to its current configuration in 1954 by San Diego Gas & Electric (SDG&E) to provide cooling water for the Encina Power Plant. Prior to dredging, the estuary was a slough that was only occasionally open to the ocean. The lagoon covers approximately 230 acres and is made up of three basins separated by the Railroad (built in the late 1800s), the Pacific Coast Highway, locally re-named as Carlsbad Boulevard (1910), and Interstate 5 (1967). The three lagoon basins include the 66-acre outer basin (westernmost basin), the 27-acre middle basin, and the 140-acre inner basin (AHLF, 1991). The lagoon is connected to the ocean by an inlet bordered by two rock jetties at the northern end of the outer basin. The lagoon is 0.5 mile wide at its widest point and extends 1.7 miles inland from the coast to the mouth of Agua Hedionda Creek.

Figure 4-6. View of Agua Hedionda Lagoon

The original dredge depth of the lagoon was approximately 8 ft mean sea level; however, it is believed to be shallower now due to sediment discharged from Agua Hedionda Creek and sand entering the lagoon through the jetties. The outer basin is dredged every one to three years to remove sediment (mostly sand entering from the ocean through the jetties) to maintain adequate water storage and related tidal prism for drawing sea water for the once-through cooling system that cools the Cabrillo Power Plant on the southwest edge of the lagoon. The inner basin was re-dredged once in 1998 through 1999. The margins of the lagoon vary significantly from gentle to steep slopes along the northern and southern shores, to nearly flat salt marsh expanses along the eastern shoreline neat the mouth of Agua Hedionda Creek. Eelgrass is found in all three lagoon basins primarily in the shallower depths which provide a valuable habitat for benthic organisms that are fed upon by birds and fishes (MEC, 1995).

The lagoon empties into the Pacific Ocean within the Southern California Bight. Longshore currents, driven by winds and ocean swells, generally move water and sand in a southerly direction along the coast. The shoreline adjacent to the lagoon is gently sloping and sandy bottomed with occasional kelp beds. The beaches outside of the lagoon are in the City of Carlsbad and are a popular destination for locals and tourists alike for swimming, surfing, fishing, diving, jogging and relaxing. Beneficial Uses of Agua Hedionda Lagoon include:

- Industrial Service Supply (IND)
- Contact Water Recreation (REC-1)
- Non-contact Water Recreation (REC-2)
- Commercial and Sport Fishing (COMM)
- Preservation of Biological Habitats of Special Significance (BIOL)
- Estuarine Habitat (EST)
- Wildlife Habitat (WILD)
- Rare, Threatened, or Endangered Species (RARE)
- Marine Habitat (MAR)
- Aquaculture (AQUA)
- Migration of Aquatic Organisms Spawning, Reproduction, and/or Early Development (SPWN)
- Shellfish Harvesting (SHELL)

The RWQCB has determined that the Aqua Hedionda Lagoon does not meet certain water quality objectives for indicator bacteria and sedimentation/siltation (SDRWQCB, 2007). The RWQCB is in the process of developing Total Maximum Daily Loads (TMDLs) for Agua Hedionda Creek and Agua Hedionda Lagoon.

The lagoon contains four primary habitat categories: subtidal, flats, marsh and upland. These habitats support a large number and variety of species, some of which are threatened or endangered. The lagoon is an important habitat for coastal marine and resident fish, particularly as nursery habitat for commercially and recreationally important coastal species such as California halibut and diamond turbot. The most abundant fish are silversides (topsmelt and juvenile atherinids) and gobies. Gobies consist of five species, but the most common are arrow and yellowfin. The lagoon also supports a variety of benthic invertebrates, including cockles, mussels, bubble snails, mud dwelling snails, amphipod crustaceans, isopod crustaceans, mysids and shrimp. Following is a list of the special status bird species identified in and around the lagoon (MEC, 1995):

- California Brown Pelican – federally endangered
- California Least Tern – federally endangered
- Western Snowy Plover – federally endangered
- Belding's Savannah Sparrow – State of California endangered

The majority of the lagoon is currently owned by Cabrillo Power II and supports a thriving marine ecosystem. It is home to the Hubbs-SeaWorld fish hatchery and white sea bass research facility, the Carlsbad Aquafarm (commercial mussel farm), YMCA Camp and the Agua Hedionda Lagoon Foundation's Discovery Center. Surrounding the lagoon are agricultural fields to the south and residential development to the north. The eastern shore of the lagoon is the California Department of Fish & Game Agua Hedionda Lagoon Ecological Reserve. The lagoon extension of the reserve is designated by the California legislature, through the 1999 Marine Life Protection Act (MLPA), as a Marine Protected Area (MPA), known as the Agua Hedionda Lagoon State Marine Reserve. The purpose of designating a MPA is to protect marine ecosystems, diminish the impacts from human activities that are altering and degrading our coastal and marine environment, and improve recreational and education opportunities offered by these special areas. There are three types of MLPAs: state marine reserve, state marine park, and state marine conservation area, each with different rules about what activities can or cannot be done within them. In general, marine reserves do not allow any type of extractive activities (including fishing or kelp harvesting), with the exception of scientific collecting under a permit, marine parks do not allow any commercial extraction, and marine conservation areas do not allow some combination of commercial and/or recreational extraction.

Lagoon Restoration Efforts

As a baseline for evaluating future management actions, recent lagoon restoration efforts will be important to consider. Significant impacts to the lagoon have been caused by excessive sediment loading and invasive aquatic plant infestation. Past restoration efforts have focused on mitigating these impacts and enhancing both the natural function and industrial uses of the lagoon. The most recent restoration efforts have been successful at restoring lagoon habitat and mitigating for sediment and invasive species impacts.

Since the Cabrillo Power Plant uses the lagoon for cooling water and dredges the outer lagoon about every two years, the Agua Hedionda Lagoon is one of the few lagoons in the area to receive continuous tidal flushing because it is regularly dredged and has jetties (State Coastal Conservancy, 1989). Tidal flushing helps to maintain low concentrations of pollutants within the lagoon and reduce eutrophication (Howes et al., 1991). The entire lagoon was completely dredged during 1998 through 1999, which significantly increased tidal flushing. Following the dredging, eelgrass beds were restored to provide enhanced marine nursery areas (San Diego Wetlands, 2008).

The most recent restoration project successfully removed an infestation of *Caulerpa taxifolia*, an invasive seaweed. This invasive species was discovered in the lagoon in June 2000. Treatment occurred between June 2000 and September 2001, and following treatment, surveys were conducted four times per year. The last patch of *Caulerpa taxifolia* was eradicated in September 2002. Surveys were conducted twice per year from summer 2003 through December 2005, and no additional patches were discovered (SCCAT, 2008). The removal of this invasive species has protected and enhanced the eel grass beds within the lagoon, which are an important habitat for fish and other aquatic species. If left uncontrolled, *Caulerpa taxifolia* could be a major threat to California marine and tidal ecosystems. In the Mediterranean Sea, where similar climatic conditions exist, the seaweed covers 30,000 acres of sea floor and has destroyed natural aquatic communities, displaced native plants and animals, and decreased overall biodiversity. The Mediterranean infestation has also caused economic damage to fishing, tourism, boating, and other recreational industries (SCCAT, 2008). Protection from further infestations will be an important management activity for the lagoon.

Sediment loading to the lagoon has caused impacts to lagoon habitat in the past, but dredging the inner lagoon on a regular basis could be cost prohibitive. Considering the success of recent restoration efforts, the most promising restoration opportunity for lagoon habitat is likely to be the control of upstream sediment loading which will involve stormwater BMP retrofits and stream restoration measures. If a dredging project occurs in the future, upstream sediment management will help protect the benefits of that dredging project as well. Land acquisition and buffer restoration adjacent to and near the lagoon would enhance the diversity and health of the lagoon habitat and the wildlife communities supported by the lagoon.

4.4.1.2 Invasive Plant Species

Invasive plant species, both aquatic and terrestrial, threaten habitat quality throughout the Agua Hedionda watershed. Populations of invasive plant species can dominate a plant community by out-competing native species, increasing soil erosion, and altering fire regimes, nutrient cycling, and hydrology. Invasive species data were collected by the San Elijo Lagoon Conservancy (SELC) as part of their recent study of restoration of riparian/wetlands habitat in the Carlsbad Hydrologic Unit (SELC, 2007). The sites were identified through GIS and through local knowledge of infestations. Some invasive species occurrences in the watershed may not be included in this dataset.

SELC found pampas grass (*Cortaderia selloana*) and giant reed (*Arundo donax*) to be the most dominant invasive species within the Agua Hedionda watershed (Table 4-4; Figure 4-7). However, the presence of periwinkle (*Vinca major*), salt cedar (*Tamarix sp.*), castor bean (*Ricinus communis*), artichoke thistle (*Cynara cardunculus)*, palms (*Washingtonia robusta* or *Phoenix canariensis)*, and pepperweed (*Lepidium latifolium)* are also a concern.

Table 4-4. Acreage of Invasive Plant Species Present in the Agua Hedionda Watershed (SELC)

Common Name	Scientific Name	Acreage
Pampas grass	*Cortaderia selloana*	98.4
Giant reed	*Arundo donax*	22.9
Periwinkle	*Vinca major*	6.9
Salt cedar	*Tamarix sp.*	4.4
Castor bean	*Ricinus communi*	4.3
Artichoke thistle	*Cynara cardunculus*	3.6
Palms	*Washingtonia robusta* or *Phoenix canariensis*	2.7
Pepperweed	*Lepidium latifolium*	0.01
Total		**143.2**

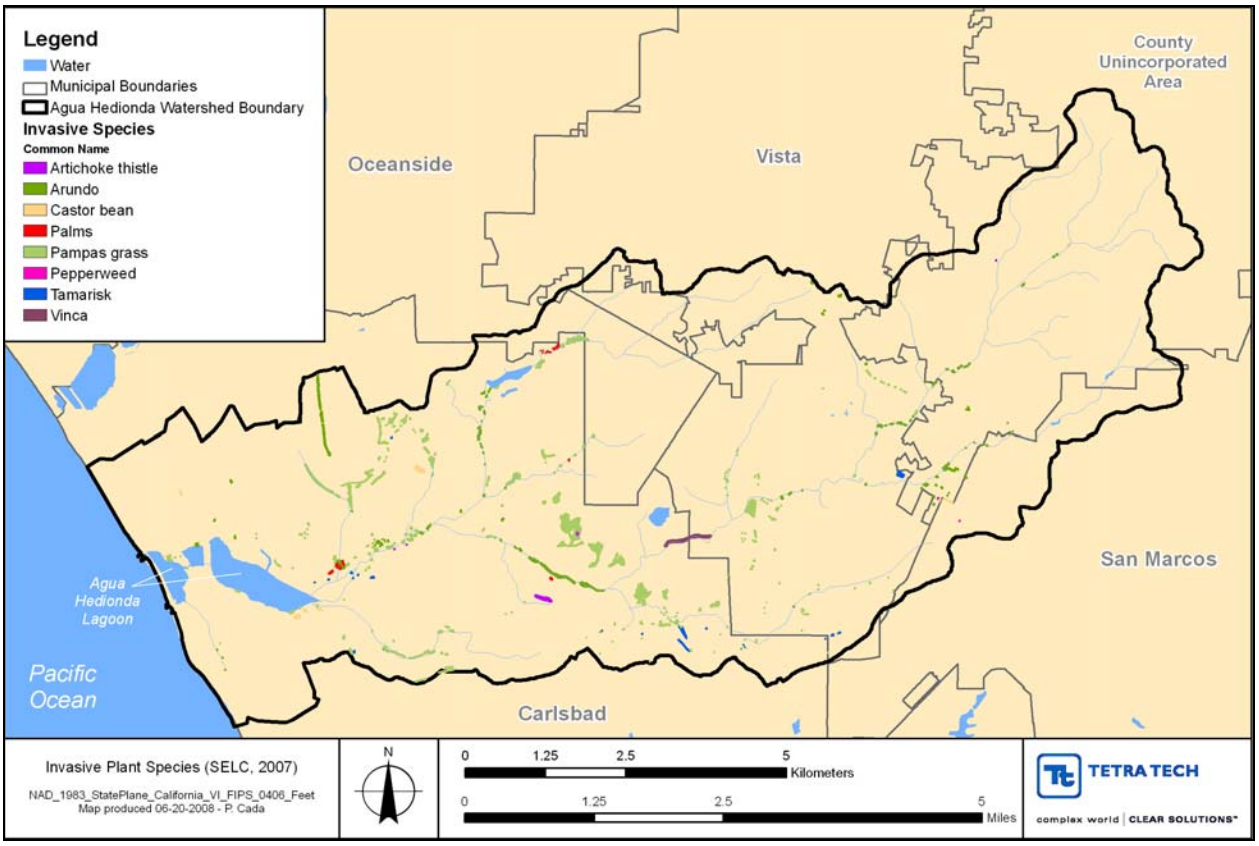

Figure 4-7. Invasive Plant Species Present in the Watershed

4.5 CULTURAL RESOURCES

Native Americans have inhabited the Agua Hedionda watershed for approximately 9,000 years and many archeological sites have been discovered in the watershed (Howes et al., 1991). The first known inhabitants were the hunter-gatherer groups known today as the Kumeyaay people. Around 1,000 B.C., the Luiseno people began to inhabit the watershed, either replacing or co-existing with the Kumeyaay people. The Luiseno people made salt and gathered shellfish for food, tools, and jewelry. The native people lived off the abundant sea life and fertile land along the coast of northern San Diego County for many centuries. The Luiseno culture changed rapidly with the arrival the Spanish expedition of Don Gaspar de Portola and Father Juan Crespi, and the Mission San Luis Rey was established in 1798 (Howes et al., 1991; AHLF, 2008).

There are many Luiseno people living today who are active in the Agua Hedionda watershed preserving their history, cultural and way of life. These local descendants are known as members of the San Luis Rey Band of Mission Indians. Native American artifacts are commonly unearthed during construction projects and protection of these cultural resources is a key consideration during development of the Agua Hedionda Watershed (Howes et al., 1991; AHLF, 2008).

4.6 PRIORITY WATERSHED ISSUES

A number of priority watershed issues emerged from the assessment of watershed conditions and trends within the Agua Hedionda watershed. Urban land use has increased over time in the watershed, replacing agriculture and natural open space. Although much of the watershed is already developed, future

development is expected to cause additional impacts to water quality and stream stability. Development regulations are estimated to reduce future impacts if fully enforced. However, additional management is needed to successfully improve and restore watershed functions. The watershed could be at greater risk of degradation if planned redevelopment does not occur as represented in model scenarios (e.g., without treatment as required by the 2007 Order).

Sediment and bacteria were found to be particular pollutants of concern. Sediment nonpoint sources include natural background sources, channel erosion, and stormwater runoff from construction, post-construction, and agricultural sites. Bacteria nonpoint sources include natural background sources, irrigation runoff, septic systems, sanitary sewers, transient encampments, and pet waste. Sediment and bacteria concentrations in Agua Hedionda Creek appear to be increasing and may indicate increased threats to water quality and aquatic communities under future conditions. Irrigation practices are believed to alter natural hydrology and increase nutrient and bacteria loading during extended dry periods. Waterbody impairments, as listed in Section 4.1.1, indicate portions of the watershed where particular pollutants have degraded watershed functions. Impaired waterbodies include Agua Hedionda Creek, Buena Creek, and Agua Hedionda Lagoon.

Stream channel modification, from a natural to impacted state, has been observed throughout the watershed. Typical impacts include habitat degradation and channel and bank erosion. These impacts are most significant along the upper reaches of Calavera Creek and much of the lower reaches of Agua Hedionda Creek. Although current regulatory efforts are expected to reduce impacts from future development, future development is expected to have some effect. If current impacts are not addressed, future development could lead to greater channel instability and increased erosion. Control of peak flow may not be sufficient to protect stream stability and channel protection volume requirements may be warranted. Current impacts will need to be addressed as well, especially reaches identified as highly unstable.

The watershed has experienced significant loss of natural habitat across all ecosystems. The majority of wetland and riparian habitat in the watershed has either been cleared or developed, and these losses are most evident in coastal areas, upper Calavera Creek, and along Buena and Agua Hedionda creeks in the central and upper watershed. The largest areas of unprotected habitat, both riparian and upland, exist in the upper watershed, while the largest protected areas occur in the lower watershed. Current habitat planning efforts may protect additional land, but without additional preservation efforts, future development could reduce natural habitat to 13 percent of the watershed.

Predicted climate change may present a challenge to planning long-term management in the Agua Hedionda watershed. Extreme shifts in weather patterns may increase sediment loading, channel erosion, and other stressors that already have an impact on watershed functions. Climate change may also endanger existing habitat and could present increased hazards to both human and animal life in the watershed.

Due to the large number of priority issues within the watershed, successful management will require attention to how different pollutant sources and stressors interact in the watershed and how different management techniques can be brought together to address these multiple issues. A review of current regulations and policies can help to further differentiate priorities by indicating where policies will address priority issues and where additional management is needed.

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5 Management Building Blocks and Gaps

Section 4 considered existing and future conditions within the watershed and identified the priority issues for management. Toward addressing these issues, an evaluation of current regulations was used to determine if additional policies or regulations would contribute to the goals of this WMP. Appendix A summarizes the current regulations and policies that are relevant to the WMP goals, including water quality standards, stormwater management requirements, riparian buffer requirements, floodplain management requirements, and habitat management plans.

Management building blocks are regulations or policies that are currently addressing a priority watershed issue and whose benefits can be augmented by additional management. Management gaps occur where a policy does not address a particular priority issue or objective in the watershed. Identifying building blocks and gaps in management can lead to the selection of priority management needs, like habitat restoration, within the watershed. In this section, key management building blocks are discussed and management needs are identified.

5.1 Key Watershed Management Building Blocks

The review of current regulations and other policies within the Agua Hedionda watershed revealed a number of management building blocks for the WMP. Efforts to improve watershed functions within the watershed have been ongoing for at least two decades. Local governments began managing stormwater in the 1990s, and stormwater management requirements for private development began with the 2001 Order. More recent efforts, like the 2007 Order and the ongoing habitat management planning, continue to reduce impacts to watershed functions. The Agua Hedionda WMP considers the current management framework and how implementation of the plan can work alongside these efforts to achieve the plan's goals and objectives. This section highlights current watershed management efforts that can be augmented by the WMP and management gaps not currently addressed by existing policies.

303(d) List and TMDLs

Section 4.1 lists the impaired waters within the watershed. Waterbodies are placed on the California 303(d) list if the water quality objectives are not met, indicating that the existing and potential beneficial uses of these waterbodies are impaired. The RWQCB will be developing Total Maximum Daily Loads (TMDLs) for these impairments. The water quality assessment in Section 4.1 indicated that sediment and bacteria loading are particular pollutants of concern for the watershed. The listing of Agua Hedionda Lagoon for sedimentation/siltation and bacteria will help support management efforts to reduce these pollutants in the future. The listing of Buena Creek for nitrate, nitrite, and phosphorus will also help support management efforts to reduce nutrient loading to Buena Creek, an issue highlighted in the water quality assessment. However, completion of these TMDLs, except for the lagoon, is not expected until 2019, and implementation of management as a result of each TMDL is uncertain. Except for the lagoon impairment, it does not appear that other impairments in the watershed will be addressed within the next 10 years. Although the lagoon TMDL monitoring is moving forward, completion of the TMDL Implementation Plan is not anticipated for a few years.

IRWMP

The Integrated Regional Water Management Plan (IRWMP) is a regional water resource management effort that represents concurrent efforts aimed at securing long-term water supply reliability by first recognizing the inter-connectivity of water supplies and the environment and then pursuing projects yielding multiple benefits for water supplies, water quality, and natural resources. Although the schedule plan updates vary, the project lists are usually updated every few years, and the plan is likely to be updated every five years (Rob Hutsel, San Diego River Park Foundation, personal communication to

Heather Fisher, June 2008). Opportunities identified through IRWMP planning efforts that remain unfunded could be investigated for implementation by local jurisdictions and organizations. Likewise, opportunities identified through this WMP could be implemented that augment efforts under the IRWMP. Agua Hedionda watershed management efforts should include tracking where IRWMP implementation occurs in the watershed. Public review periods for future IRWMPs can be used to support a greater focus within the Agua Hedionda watershed if past IRWMPs have overlooked important opportunities that relate to regional water resource priorities.

RWQCB 2007 Order

The 2007 Order is a major management building block for this WMP. The requirements of the 2007 Order that particularly relate to the WMP's goals and objectives are: 1) Low Impact Development, 2) Hydromodification Plans, 3) Sediment and Erosion Control and 4) Watershed Urban Runoff Management. The degree of successful implementation and enforcement of these requirements will determine their effectiveness on improving watershed functions within the Agua Hedionda watershed.

Stormwater best management practices are currently selected based on a qualitative assessment of pollutant removal efficiency (high, medium, or low removal efficiency; see Appendix A for more details). Without quantitative pollution reduction targets (e.g., 87 percent removal rather than "high efficiency"), it will be difficult for jurisdictions to ensure that stormwater management is fully addressing pollutants of concern and protecting water quality from further impairment. Quantitative reduction targets or requirements would need to be implemented in a way that is both consistent from development project to project, and relatively easy to implement and enforce. Simple, cost-effective modeling tools (i.e., spreadsheet-based tools) could be utilized that predict development site pollutant loading, helping jurisdictions enforce stormwater regulations. The modeling tools would measure the pollutant removal efficiency of stormwater BMPs and predict the pollutant loading rate for a development site, based on local or regional data. Developers could enter their site data into the model to test performance and make necessary changes to the site, and development review staff could compare model output to loading targets and determine if a development meets the stormwater requirements.

The 2007 Order Low Impact Development requirements for priority developments have the potential to provide a substantial reduction in impervious surface and promotion of infiltration within the watershed. However, local enforcement will determine how effectively these requirements are implemented. Development plan review staff will need to be knowledgeable of LID techniques and be able to identify where LID implementation is lacking in development plans. The extent to which specific LID BMPs are required will also affect the effectiveness of the 2007 Order. For example, the BMP "minimize disturbance to natural drainages" would ideally be interpreted as using natural drainage paths within the site's stormwater management system. If this requirement is not strictly enforced, it could be interpreted more broadly to mean minimizing direct impacts to stream channels without attention to drainage paths throughout a development site. The effectiveness of the 2007 Order will depend on each jurisdiction's interpretation of the requirements. Guidance provided as part of this WMP can provide insight into more specific and effective requirements for the use of LID in the watershed. Since local jurisdictions will be working on their specific interpretation within the next two years, this WMP can provide timely support and guidance to those jurisdictions.

The permanent hydromodification requirements, projected to be in place by 2009, will help protect streams from increased channel erosion and instability. These requirements will address impacts from future new development and redevelopment. Although these requirements will help minimize future impacts, development approved prior to 2009 will not be obligated to comply with these requirements. This gap in management could lead to increased impacts in the short-term. Current and future regulations will be addressing peak flows, but it is possible that channel protection volume requirements will be needed to protect streams from further degradation. Since a large portion of the watershed is already developed, additional management in already developed areas will be needed to thoroughly address

current levels of bank erosion and instability, especially in areas that are not likely to redevelop. Stream channels impacted by past development will require measures to restore natural channel morphology and bank stability.

Although regional sediment and erosion control (S&E) requirements have not changed significantly between the 2001 and 2007 Orders, the local jurisdictions could take advantage of this ordinance change to strengthen S&E enforcement. Tetra Tech was unable to determine the extent that sediment loading from new construction was contributing to sediment within streams. However, upland sediment loading is expected to have an impact. If jurisdictions review how effective their current requirements are and assess compliance, they may determine that stricter requirements or enforcement would lead to sediment reduction benefits.

The 2007 Order also requires that the jurisdictions within the Carlsbad Watershed collaborate in the development and implementation of a watershed-based program that addresses urban runoff quality. They are required to identify high priority pollutants and their sources and develop collective watershed strategy to abate the sources and reduce the discharge of pollutants causing the high priority water quality problems of the watershed (it should be noted that for the 2007 Order the watershed is defined at the Carlsbad Hydrologic Unit and the Agua Hedionda Watershed Is a sub-watershed). The Carlsbad WURMP Co-Permittees are also required to measure the effectiveness of their program which can be leveraged with the monitoring recommendations of this WMP. The WURMP requirement of the 2007 Order is a strong building block for the WMP.

Riparian Buffer Protection

The cities of Carlsbad and Vista and the County of San Diego have buffer regulations in place that will provide some riparian habitat protection for future new development and redevelopment. Increased riparian area protection would provide additional habitat and water quality benefits. All jurisdictions in the watershed address riparian buffer protection to some degree in their stormwater management regulations, but additional protection measures could be warranted. As discussed in Section 4.4, the majority of riparian habitat has already been impacted. Restoration of riparian habitat would be needed to fully address habitat and water quality needs within the watershed.

Floodplain Management

Local floodplain management ordinances currently provide prevention of flood hazards and some degree of flood retention by prohibiting most structures within the floodplain. Past development has likely impacted much of the watershed's natural flood retention and control functions. Both the regulatory review and habitat assessment results suggest a need for natural floodplain restoration within the watershed.

Habitat Management

Current habitat management planning efforts, both regional and local, provide a comprehensive and effective means for protecting critical habitat for sensitive species. The MHCP subregional Plan and the Carlsbad Habitat Management Plan (HMP) are protecting critical habitat in the lower portion of the watershed. MHCP sub area plans for Vista, San Marcos, and Oceanside are expected to protect additional critical habitat once finalized, and the North County MSCP is expected to protect critical habitat in the remainder of the watershed. Across the watershed, these planning efforts will provide an important building block for watershed management. However, these efforts focus on habitat and not specifically on protecting land for multiple purposes, like downstream water quality and channel protection. Additional habitat management will likely be needed that addresses all priority issues within the Agua Hedionda watershed while building upon current habitat protection efforts. Habitat management should include both preserving additional natural areas and stewardship of preserved areas. Once the HMPs are finalized, WMP implementation should focus on protecting and managing habitat and sensitive species that are not addressed by these HMPs.

Water Conservation

In June 2008, Governor Arnold Schwarzenegger formally declared that drought conditions exist in California and called for a number of steps to address drought conditions throughout the state. The declaration calls for increased water conservation by local governments and water agencies as part of a suite of proposed measures (Steinhauer, 2008). As a result of increased water conservation, water use for irrigation may decrease in the future.

Appendix A includes a summary of the State of California's model water conservation ordinance, which is currently under development. This ordinance, once in place, is expected to fill an important management gap within the watershed. The watershed assessment revealed that nutrient loading during extended dry periods in Buena Creek is likely caused, in part, by irrigation of lawns and landscaping. Improved water conservation will help address this loading and return stream hydrology to a more natural cycle. Implementation of the model water conservation requirements will likely require stakeholder support and outreach to fully achieve the benefits of the stricter requirements.

Ongoing Infrastructure Improvements

Local jurisdictions have recently developed sewer master plans and storm drain master plans, and these plans are resulting in ongoing and upcoming infrastructure improvements. Since sewer pipes are often in the creek, sewer pipe removal, relocation, or replacement may coincide with preservation or restoration opportunities and could augment these management efforts. Jurisdictions will also be required to mitigate impacts from infrastructure projects which may provide further opportunities for preservation and restoration within the watershed.

Current Non-Regulatory Management Efforts

Non-governmental organizations have been working in the watershed to manage and improve watershed functions. One example of these efforts is the removal of the invasive aquatic plant *Caulerpa* from Agua Hedionda Lagoon, which was a joint effort between the Agua Hedionda Lagoon Foundation and Southern California Caulerpa Action Team, described in Section 4.4.1.1. The major NGOs working in the watershed are:

- Agua Hedionda Lagoon Foundation
- Preserve Calavera
- Friends of Hedionda Creek
- Carlsbad Watershed Network

Management efforts within the watershed are not limited to the scope of the above groups. San Elijo Lagoon Conservancy (SELC) has also been active in the watershed through monitoring and invasive species management efforts. The San Diego Coastkeeper is an organization that trains stream monitors, collects monitoring data, and participates in watershed management efforts, and Surfrider is involved with key watershed issues in the region. Additional groups are expected to be interested in continuing and building upon their past management efforts in the watershed.

Although many groups are active in the watershed, the watershed does not have an overarching organization that coordinates all watershed management efforts. A watershed-wide coordinating organization, either through a local government or NGO, will be needed to successfully implement this plan.

5.2 BASELINE CONDITIONS: GAP ASSESSMENT

Baseline conditions are those conditions within a watershed that are occurring or will occur in the future without further efforts to improve watershed functions. The baseline conditions assessment evaluates the existing and future conditions in the watershed without further action in relation to the WPG goals and objectives. The relationship among priority watershed issues, management building blocks, and management gaps is considered as well. Through this assessment, types of management are identified that will be necessary to achieve the WPG goals and objectives.

Goal 1. Design land use so as to minimize impacts on the watershed.

a. Design and construct infrastructure projects (e.g., sewer lines) in a manner that minimizes impacts on watershed functions (i.e., water quality, habitat, and hydrology).

b. Design and construct new developments, recreation areas, etc., in a manner that minimizes impacts on watershed functions, including minimizing impervious areas.

The baseline existing and future conditions relating to this goal and associated objectives center around existing and future land use/land cover in the watershed. The land use assessment under Section 2.3 shows that a majority of the watershed is currently developed, and that medium to high density land[1] will increase from 44 percent of the watershed in 2007 to 58 percent of the watershed in 2030. Increases will occur across all medium to high density land uses, both commercial and residential, but the greatest increase is projected in medium density residential, which is likely to increase from 5 to 12 percent of the watershed. Since most of this increased density will occur in the upper watershed, the impact there will be more significant. The average imperviousness of the watershed was estimated to be greater than 30 percent and is projected to increase with increases in development.

Past development and increases in impervious surface have contributed to the high pollutant concentrations and water quality impairments noted in the water quality assessment (Section 4.1.1). In addition to these impacts, the geomorphic analysis found that past development and infrastructure has likely contributed to channel instability at many locations throughout the stream system. These impacts appear to be caused, in part, by unnaturally high flows during storm events. Increases in developed land, particularly imperviousness, are expected to further negative impacts to streams.

The modeling assessment, described in Section 4.1, found that recently enacted regulations, particularly the 2007 Order, will help to mitigate impacts from future development. However, the model results were sensitive to the following changes:

- Preservation of open space
- The conversion of agricultural land to residential and non-residential development that is treated by stormwater BMPs
- The redevelopment with associated stormwater BMP treatment of significant portions of the watershed

In particular, if the planned redevelopment does not occur as represented in the model scenarios (e.g., without treatment as required by the 2007 Order), the watershed could be at greater risk of degradation. Further, since the assimilative capacity of the lagoon has not been determined to date, additional reductions beyond those predicted by the watershed model in the future scenario could be needed.

[1] Medium to high density land use includes all developed land uses except for parks/recreation, low density residential, and very low density residential.

The majority of riparian habitat in the watershed has either been cleared or developed. This loss of vegetated areas along streams has likely contributed to bank erosion and channel instability. Lack of riparian buffers has also contributed to increased sediment and other pollutant loading to streams. Most flooding occurs in riparian areas, and therefore flooding hazards are most likely to occur in areas where riparian habitat has been cleared and developed. Riparian habitat within 50 feet of streams will be protected in most portions of the watershed within the cities of Carlsbad and Vista and the County of San Diego in the future. Disturbance of additional riparian vegetation, outside of the currently protected 50 foot buffers, may cause additional watershed impacts, and the past impacts to riparian habitat will continue to contribute to watershed impacts if this habitat is not restored.

These results suggest that without further action, new development and infrastructure projects are likely to cause increased watershed degradation. To assist in achieving Goal #1 and the associated objectives, the Agua Hedionda WMP provides the following:

- Recommendations for minimizing impacts from new development/redevelopment (Section 6.1)
- Identification of high quality areas for preservation that could be severely impacted by development (Section 6.2)

In concert with these strategies, infrastructure design to minimize watershed impacts should be encouraged through policies and oversight by watershed jurisdictions and other stakeholders.

Goal 2. Protect, restore and enhance habitat in the watershed.

a) Protect and expand undeveloped natural areas to protect habitat

b) Protect, enhance, and restore terrestrial habitat, especially existing vegetation in riparian areas

c) Provide riparian habitat to improve and maintain wildlife habitat

d) Provide natural area connectivity to improve and maintain wildlife habitat

e) Maintain stable streambanks and riparian areas to protect instream aquatic habitat and mature trees

f) Maintain and protect instream habitat to support native aquatic biology

g) Maintain and protect lagoon habitat

The baseline existing and future conditions relating to this goal and associated objectives include the existing and expected future conditions of the major habitat types in the watershed: upland, riparian, lagoon, and other wetland habitats. As established in previous sections, the watershed has experienced extensive loss of habitat across all habitat types. Additional habitat, especially in the upper portion of the watershed remains unprotected and threatened by future development. Mature trees along streambanks are threatened by undercutting; some mature riparian trees have already been lost, and additional losses are likely to occur if current hydromodification and channel stability trends continue.

Recent lagoon restoration efforts have helped improve wetland habitat conditions, but excessive sediment loading to the lagoon is likely to continue if upstream sediment sources are not addressed. Historic loss of coastal habitat will also not be addressed without additional management.

To address these issues and help to achieve Goal #2 and the associated objectives, the Agua Hedionda WMP identifies the following opportunities:

- Land acquisition opportunities for habitat preservation
- Riparian buffer restoration opportunities
- Wetlands restoration opportunities
- Stream restoration opportunities

The indicators identified under Goal #2 were used to evaluate and prioritize these opportunities. This identification and prioritization are described in more detail in Sections 6.2 and 6.3.

Goal 3. Restore watershed functions, including hydrology, water quality, and habitat, using a balanced approach that minimizes negative impacts.

a) Restore and protect beneficial watershed functions and uses including:
   - Wildlife habitat
   - Recreation
   - Protection from flood damage

b) Design and construct restoration projects to minimize impacts to:
   - Streambanks
   - Riparian areas
   - Wildlife habitat areas

Since this goal encompasses all watershed functions, the baseline existing and future conditions relating to this goal would include all priority issues discussed in Section 4.5:

- Sediment and bacteria were found to be particular pollutants of concern
- Impaired waterbodies include Agua Hedionda Creek, Buena Creek, and Agua Hedionda Lagoon
- Stream channel modification, from a natural to impacted state, has been observed throughout the watershed
- The watershed has experienced significant loss of natural habitat across all ecosystems
- Climate change presents a challenge to planning long-term management in the Agua Hedionda watershed

To achieve Goal #3 and its associated objectives, successful management will require attention to how different pollutant sources and stressors interact in the watershed and how different management techniques can be brought together to address these multiple issues. In addition to the management techniques identified for Goals #1 and #2, the stormwater best management practice (BMP) retrofits will provide opportunities to reduce pollutant loading and control stormwater flows from past development that otherwise lacks stormwater management.

To minimize potentially negative impacts from management opportunities, the potential for one type of management to benefit or hinder another type of management will need to be considered. The plan provides recommended focus areas in which the complementary benefits of different management opportunities are considered. The focus area assessment identifies portions of the watershed where management is likely to successfully address the multiple priories under this goal, including recreational areas, flood control, water quality, and habitat. The focus areas are described in Section 6.8.

Goal 4. Support compliance with regional, state, and federal regulatory requirements.

a) The RWQCB has listed Aqua Hedionda Creek, Buena Creek, and Agua Hedionda Lagoon as impaired and not supporting designated beneficial uses under the Clean Water Act Section 303(d). Future compliance includes:
   - Meeting water quality standards for Total Dissolved Solids, manganese, selenium, and sulfates for Aqua Hedionda Creek
   - Meeting water quality standards for DDT, nitrate-nitrite, and phosphate for Buena Creek

- Meeting water quality standards for sediment and bacteria in the Lagoon

b) The RWQCBand local governments in the watershed have stormwater management requirements for controlling sedimentation and erosion during construction.

- Track compliance with BMP requirements

c) The RWQCB and local governments in the watershed have LID and stormwater management requirements to control post-construction runoff from new development. Compliance will require plan review, site inspection, and long-term BMP inspection and maintenance to ensure BMP requirements are being met**.**

d) Reduce non-compliance events for water quality objectives and sedimentation and erosion control

The following management gaps illustrate the baseline conditions relating to this goal and associated objectives:

- Planned efforts to address water quality impairments within the next decade except for the lagoon impairment, which is currently being addressed through the development of a TMDL
- Hydromodification requirements in association with the required Hydromodification Plans (HMPs) are under development but are net yet in place
- Numeric pollution reduction targets for stormwater management
- Specific requirements and implementation/enforcement methods for 2007 Order LID requirements
- Methods to reduce upland sediment loading from construction sites beyond current regulations and enforcement

The first management gap indicates that although the lagoon TMDL is currently being developed, water quality standards for impaired streams within the watershed are not likely to be met within the next decade without additional watershed management. All management techniques recommended by this plan would contribute toward meeting water quality standards, and plan implementation may prevent other waterbodies from being listed as impaired. The selection of focus areas in Section 6.8 considers how management techniques can be implemented to address impairments within the watershed.

The remaining three management gaps indicate that local jurisdictions are working toward meeting the 2007 Order and may need support, through this watershed plan, to fully comply with the intent of the regulations. This plan provides recommendations for effectively applying LID approaches within the watershed (Section 6.1) and for conducting citizen education and outreach to help encourage compliance with regulations (Section 6.6).

Goal 5. Increase awareness and stewardship within the watershed, including encouraging policymakers to develop policies that support a healthy watershed. This includes minimizing impervious area and providing for stream buffers.

a) Form collaborative Agua Hedionda Watershed Council to sustain long-term watershed management.

b) Support adoption and implementation of the Watershed Management Plan as well as ordinances, regulations, policies, and procedures by local jurisdictions, agencies, and environmental conservation organizations.

c) Disseminate information to local governments to support scientifically based, sound decision-making.

d) Develop a consistent and comprehensive message for watershed health and actions citizens can take. Distribute through website, water bills, press releases, brochures, and presentations.

e) Encourage Low Impact Development (LID) at the new development, redevelopment and individual homeowner and project level.

f) Reward good stewardship though an awards program that recognizes project sponsors that implement programs that preserve and enhance watershed health.

g) Develop partnerships with business, residents, NGOs, Cities, the County, Agencies, schools and private entities throughout the watershed to leverage opportunities for watershed stewardship.

Stewardship management gaps include:

- An overarching environmental protection group is missing in the watershed.
- Collaboration between local jurisdictions, agencies and local environmental organizations.
- Political support for the watershed management process.
- Watershed-specific educational message to educate decision makers, stakeholders and the public.

Citizens and environmental groups are currently active in the watershed and current educational programs promote awareness of watershed issues. However, the WPG has indicated that more outreach is needed to policymakers to encourage additional management, particularly to minimize impervious area and preserve and restore riparian habitat. This plan provides recommendations for organizing a comprehensive watershed implementation and stewardship effort that would be led by a collaborative watershed council. Recommended outreach efforts include education for local boards, educational materials, technical and policy-oriented workshops and programs, and management partnerships. These recommendations are discussed in Section 6.6.

5.3 SUMMARY OF MANAGEMENT GAPS AND NEEDS

Several management gaps emerged from the above evaluation of current regulations and key management building blocks and gaps. Management opportunities can be identified that address these management gaps and build upon past and current management efforts. The following major management gaps were identified through the above evaluation:

- Planned efforts to address water quality impairments, except for the lagoon impairment, within the next decade.
- Specific requirements and implementation/enforcement methods for the 2007 Order LID requirements.
- Lack of quantitative measures and assessment methods (involving simple, cost-effective spreadsheet-based modeling tools) for management practice performance to meet stormwater management requirements for pollutant reduction.
- Hydromodification management in developed areas not slated for redevelopment and restoration of stream channels impacted by past development.
- Methods to reduce upland sediment loading from construction sites beyond current regulations and enforcement.
- Restoration of existing impacts, including loss of riparian habitat (including matures trees and other natural vegetation along streambanks), wetland habitat, and aquatic habitat.
- Natural floodplain restoration.

- Land protection that addresses all priority issues in the watershed, including water quality, channel stability, and habitat.
- An overarching watershed organization that coordinates all watershed management efforts.

Opportunities to track other efforts and provide outreach and support were also identified; these opportunities are addressed as part of this plan, but the above management gaps represent where this WMP is likely to provide the most benefit while building upon past management efforts. For each gap, this plan provides opportunities to protect and restore watershed functions. Cooperation among jurisdictions, NGOs, and people who live and work in the watershed will be needed to fully address the above management gaps.

6 Recommended Watershed Management Opportunities

This section presents the management opportunities identified to achieve the WPG's goals and objectives. These opportunities were selected to address priority issues discussed in Section 4, build upon current management efforts, and resolve the management gaps outlined in Section 5. This section is organized by the following management types (Sections 6.1 through 6.7):

- New Development Site Management
- Preservation and Riparian Buffer and Wetlands Restoration
- Stream Restoration
- Stormwater BMP Retrofit Projects
- Development of quantitative methods for assessing management practice performance for meeting pollutant reduction targets
- Citizen Stewardship/Public Outreach
- Funding and Sustained Support

After each of these management types are introduced, Section 6.8 describes how Tetra Tech selected focus areas where different management types would complement each other and, if implemented in concert, provide greater watershed benefits.

At the end of each section, key implementation actions are listed for the opportunities. It is important to note that restoration and BMP retrofit projects may require the following permits:

- Coastal Development Permit for construction within the Coastal Zone
- Section 404 Permit from the U.S. Army Corps of Engineers construction impacting to jurisdictional waters of the U.S.
- 401 Water Quality Certification from the RWQCB for conditions placed in the Section 404 Permit to protect water quality
- Streambed Alteration Agreement from California Department of Fish and Game due to impacts to jurisdictional wetlands and streambeds
- Local Development Permits (i.e., grading, building or other construction related permits)

Proposed watershed management projects may also require an evaluation under the California Environmental Quality Act (CEQA), which requires state and local agencies to evaluate the environmental impacts of their actions. It a project involves the use of federal funds, an evaluation under the National Environmental Policy Act (NEPA) may also be required.

6.1 New Development Site Management

New development has a significant potential to exacerbate existing watershed impacts, or even create new ones in relatively unimpacted streams. Development can increase pollutant loading rates in runoff, and can also increase the frequency and duration of erosive flows in stream channels. Appropriate site management can partially or even fully mitigate development impacts, depending to a large degree on how aggressively they are implemented. Site management measures can meet several of the WPG's goals

and objectives, including #1b (design and construct new developments, recreation areas, etc., in a manner that minimizes impacts on watershed functions, including minimizing impervious areas) and all of objectives under Goal #4 (support compliance with regional, state, and federal regulatory requirements). Measures can also support Goal #2 (protect, restore, and enhance habitat in the watershed) depending on whether riparian area and habitat protection are included in site management.

Many of the following sections focus on specific opportunities identified through watershed-wide surveys. New development/redevelopment site management, on the other hand, is an ongoing process related to current or potential future regulations, and the interpretation and enforcement of those regulations. Two aspects of site management are discussed:

1. Irrigation requirements (for reducing irrigation return flow)
2. Site stormwater management

Irrigation Return Flow

Irrigation return flow is likely an important component of nutrient impacts to the watershed and lagoon. Under natural conditions, many Agua Hedionda creeks would be dry much of the time, but low flows persist throughout the year. Irrigation in developed areas of the watershed exceeds the capacity of the soil and vegetation to evaporate and transpire the applied water, so excess irrigation water flows through shallow groundwater to adjacent streams. Low flow monitoring data (e.g., Buena Creek) show highly elevated concentrations of both total phosphorus and total nitrogen, and is correlated with developed areas of the watershed. Lawn and landscaping fertilization is likely an important nutrient source in shallow groundwater. Reducing irrigation return flow impacts has two separate components – reducing nutrient loads at the source, and reducing return flow itself.

Several tools can be employed to reducing fertilizer use at both new and existing development sites, including:

- Homeowner education about the impacts of over-fertilization
- Encourage or require soil testing to determine proper fertilization rates
- Certification and training of lawn and landscaping care companies to require application of fertilizer at appropriate rates, and prevent misapplication to impervious surfaces

Irrigation cannot be eliminated from the developed landscape of the Agua Hedionda watershed; it is essentially required by California law (Public Resources Code 4291) for fire protection around building structures. A 100-foot “minimum defensible space” must be maintained around housing structures, including a 30-foot perimeter “Home Defense Zone” which must have few trees and vegetation with high moisture content. However, this does not imply overwatering; in fact, the County of San Diego Department of Planning and Land Use recommends using drought tolerant plant species and providing irrigation only when necessary (San Diego County, 2008).

If irrigation meets but does not exceed demand, then irrigation return flow can be greatly reduced or even eliminated. However, low water rates provide little incentive to conserve water, and irrigation water use comprises about 50 to 70 percent of total water use (Carlos Michelon, San Diego County Water Authority, personal communication, March 4, 2008). California Assembly Bill 325, the Model Local Water Efficient Landscape Ordinance, went into effect in 1993 and specifies restrictions on irrigation throughout California; however, adherence to these restrictions appears to be limited. Rulemaking is currently underway to strengthen the 1992 requirements by 2010.

Irrigation return flow can be reduced, and perhaps nearly eliminated by implementing the following measures:

- Stronger enforcement of the Model Local Water Efficient Landscape Ordinance in its current form, and adopting and enforcing the pending update
- Property owner education about the impacts of irrigation return flow
- Pilot programs to test innovative technologies for sensing irrigation demand and reducing water use
- Explore the possibility of cost-sharing for technologies that reduce water use

Stormwater Management

Providing adequate sediment and erosion control practices during site construction is a critical part of site management for protecting water resources. While active construction sites are usually developed and stabilized within a relatively short time period, the construction phase of a project has an especially high risk for impacting water resources. Soil erosion rates from uncontrolled construction sites can be extremely high, especially if gullies or washouts develop. Fortunately, the managing authorities in the Agua Hedionda watershed already have strong and well-developed sediment and erosion control programs (David Hauser, City of Carlsbad, personal communication, October 2007). These programs should continue to be supported and maintained to ensure compliance with requirements, thus reducing the risk of construction phase impacts to water quality. See Appendix A for more information about sediment and erosion control regulations.

Post-construction stormwater runoff can be managed in many ways, and the combination of site design and BMP selection can lead to a plan that minimizes stormwater impacts to water resources. This section provides an exploration of projected benefits of two different stormwater management scenarios – one based on basic adoption of LID practices as specified by the 2007 Order (called "*Basic LID*"), and another based on a higher level of LID implementation (called "*Enhanced LID*"). The degree to which LID practices will be required in the future depends on many factors. There is currently some uncertainty in the Agua Hedionda watershed about future requirements – implementation of pending TMDLs may include a stormwater management component, with recommendation for specific BMPs to optimize reductions for target pollutants. Communities may elect to implement LID to varying degrees. The modeled LID scenarios should not be interpreted as extremes in design, nor should the results be seen as absolute. Many other scenarios with varying degrees of LID implementation could be conceived, and pollutant removal performance is based on central tendencies from monitoring studies, but inherently contains some uncertainty. The scenarios also use generic site assumptions, but in reality each site is unique and presents its own opportunities for adoption of LID practices.

Assumptions for each of the two scenarios were developed for the following representative land uses:

- Medium Density Residential
- Multi-family Residential
- Commercial
- Industrial/Warehouse

The selection of treatment practices was influenced by the following factors:

- Existing post-construction stormwater management requirements
- Constraints related to the physical environment of the watershed that limit the use of certain practices
- For each type of site modeled, treatment practice feasibility with respect to site layout and economic considerations

Each of these is discussed, followed by a summary of the LID scenario analysis. The following information used for treatment practice selection has application to stormwater management and LID in a broader sense, and forms the basis for many of the recommendations in the Prioritization section. Details of the analysis are presented in Appendix J, including site specific assumptions, BMP performance assumptions, and the modeling framework used for the analysis.

Post-construction Stormwater Management Requirements

Regulations are the primary driver for shaping site stormwater management, and well constructed requirements can be used to implement watershed-wide goals. The 2007 Order stipulates that local governments must encourage the use of LID in new development and redevelopment projects. The County of San Diego has developed a Low Impact Development Handbook to provide guidance during this initial phase of LID implementation. The Manual states that there is "a lack of research and pilot projects in an arid environment." With the few LID examples in the region, there is a lack of project information or lessons learned.

At a minimum, developers must meet the existing design criteria from the 2001 Order, which include:

- Volume-control based BMPs that provide treatment to the volume of runoff produced from a 24-hour 85th percentile storm event
- Flow-control based BMPs that provide treatment for a specified flow rate based on a set rainfall intensity (either fixed or dependent on the local 85th percentile storm)

Additional peak flow requirements are specified by the 2007 Order (matching pre-development peak flows up to the 10-year 24-hour storm event). All site designs under both scenarios are assumed to meet the requirements of both the 2001 and 2007 Orders as stated above. However, the extent of required future LID adoption is unknown, so the two LID scenarios vary in the assumed level of LID adoption.

Environmental Constraints

Rainfall. The Agua Hedionda watershed gets approximately 10 to 13 inches of rainfall per year. Many of the streams in the watershed are dry except during the large, infrequent rain events (or their baseflow is maintained artificially by irrigation return flow). Techniques that require substantial water input to maintain a permanent pool (e.g., wet ponds and wetlands) are not likely to be seen as sustainable by some stakeholders, and have another risk – if water rates increase, or if the pool is maintained by irrigation return flow that dwindles under irrigation use restrictions, the pools could dry up and become a sediment and pollutant source. Other techniques developed for more humid environments (e.g., bioretention) may not perform as expected without permanent irrigation. Note that the arid environmental constraint affects not only new development projects, but also redevelopment and retrofit projects.

Fire. As noted in the discussion regarding irrigation return flow, there are state fire safety rules that limit the type and density of vegetation within 100 feet of building structures. These regulations may potentially affect the feasibility of some practices that rely on vegetation for treatment; especially those that work best when distributed throughout a site. When selecting plants for BMPs, developers may need to strike a balance between appropriate hydrologic requirements and fire resistance. Note that this constraint affects not only new development projects, but also redevelopment and retrofit projects.

Slope. The steep slopes present in much of the watershed pose a challenge to minimizing the use of fill material (because fill is often used in construction to maximize buildable area). Fill slopes are designed specifically to minimize infiltration of water into the fill and drain runoff off the land surface. As a result, the engineered compacted soil is not conducive to infiltrating excess runoff on steep slopes. Tetra Tech analyzed the developable land in the Agua Hedionda Watershed per designated future land use, and determined that slope is not a major constraint for new development requiring stormwater management. Figure 6-1 depicts the areas projected to develop in the watershed in green, orange, and pink. Green indicates areas with slope less than 15 percent, orange is used for slopes 15 percent to 25 percent, and red

is for slopes greater than 25 percent. As the figure demonstrates, almost all of the developable land has a slope of less than 15 percent. The only exception is an area in the far eastern part of the watershed, which is anticipated to develop as Very Low Density Residential (cross-hatched area) and would not be considered a priority project under the 2001 and 2007 Orders. However, slope is an important consideration at individual sites, and may limit the choice of management practices.

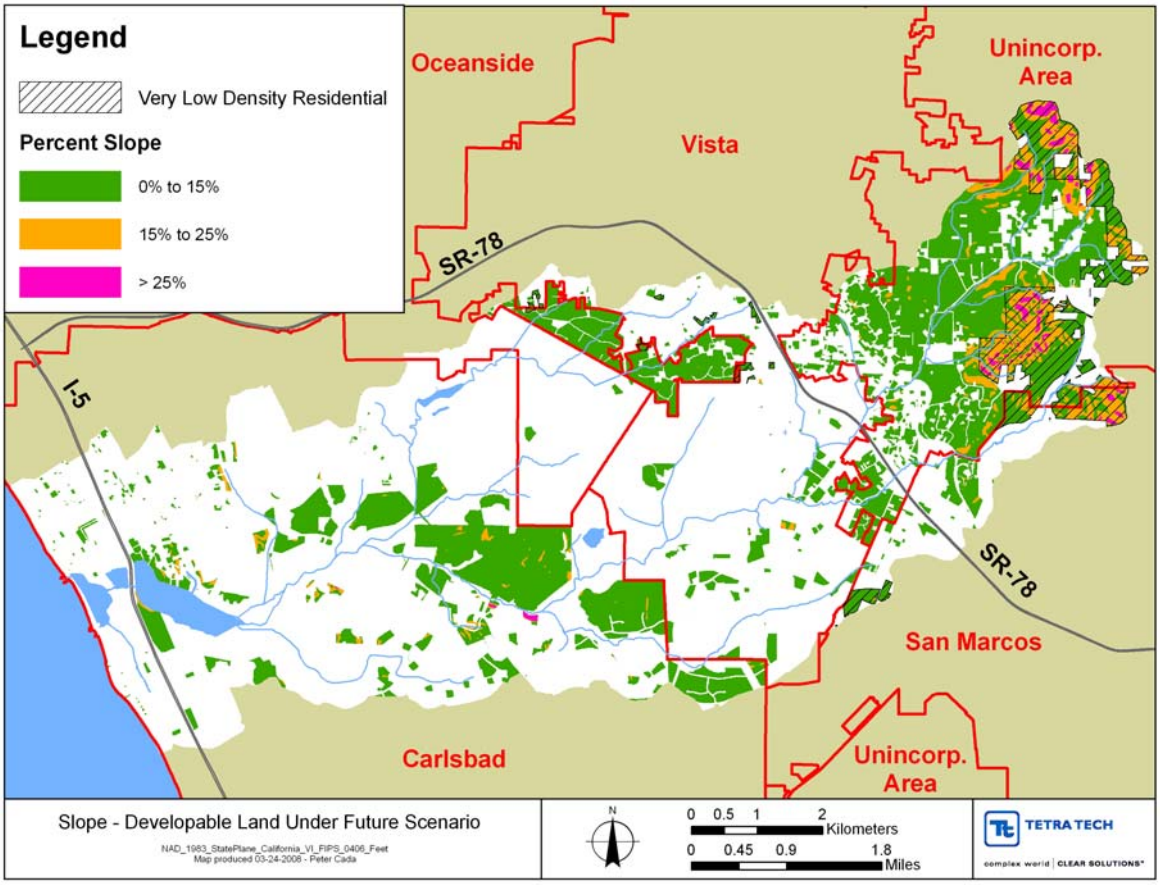

Figure 6-1. Slope Class for Developable Land

Soil Infiltration Rate. Many LID practices rely on infiltration of stormwater runoff, a treatment method that is highly effective for pollutant treatment and volume reduction. Infiltration trenches and infiltration basins rely on good underlying soil infiltration rates, while treatment by bioretention and porous pavement technologies is improved when infiltration is supported. However, soils with low or very low infiltration rates may slow percolation of stored runoff to the point of being ineffective. For example, in the Piedmont region of the Southeastern U.S. where heavy clay soils dominate, an underdrain system is specified for bioretention (North Carolina Division of Water Quality, 2007). On the other hand, many areas in Seattle, WA with mapped soils showing low infiltration rates were found to support higher rates than expected, and BMPs placed at these sites completely drain and infiltrate runoff within 72 hours (Tracy Tackett, Seattle Public Utilities, personal communication, June 22, 2008). Tetra Tech analyzed the developable land in the Agua Hedionda Watershed per designated future land use, and determined that soil infiltration rates are a major constraint for using LID for new development requiring stormwater management. As seen in Figure 6-2, most of the developable area has a soil hydrologic group of D (shown in red), which has very low infiltration rates. Most of the remaining developable land has group

C soils (shown in orange), which have low infiltration rates. A very small portion of developable land has B soils (shown in yellow), which have moderate infiltration rates. The ubiquitous presence of soils with low or very low infiltration rates in areas projected for future development may eliminate altogether the LID practices that rely exclusively on infiltration, and increase the cost of other practices (such as bioretention and larger porous pavement installations) where an underdrain system may need to be installed and connected to a storm drainage system.

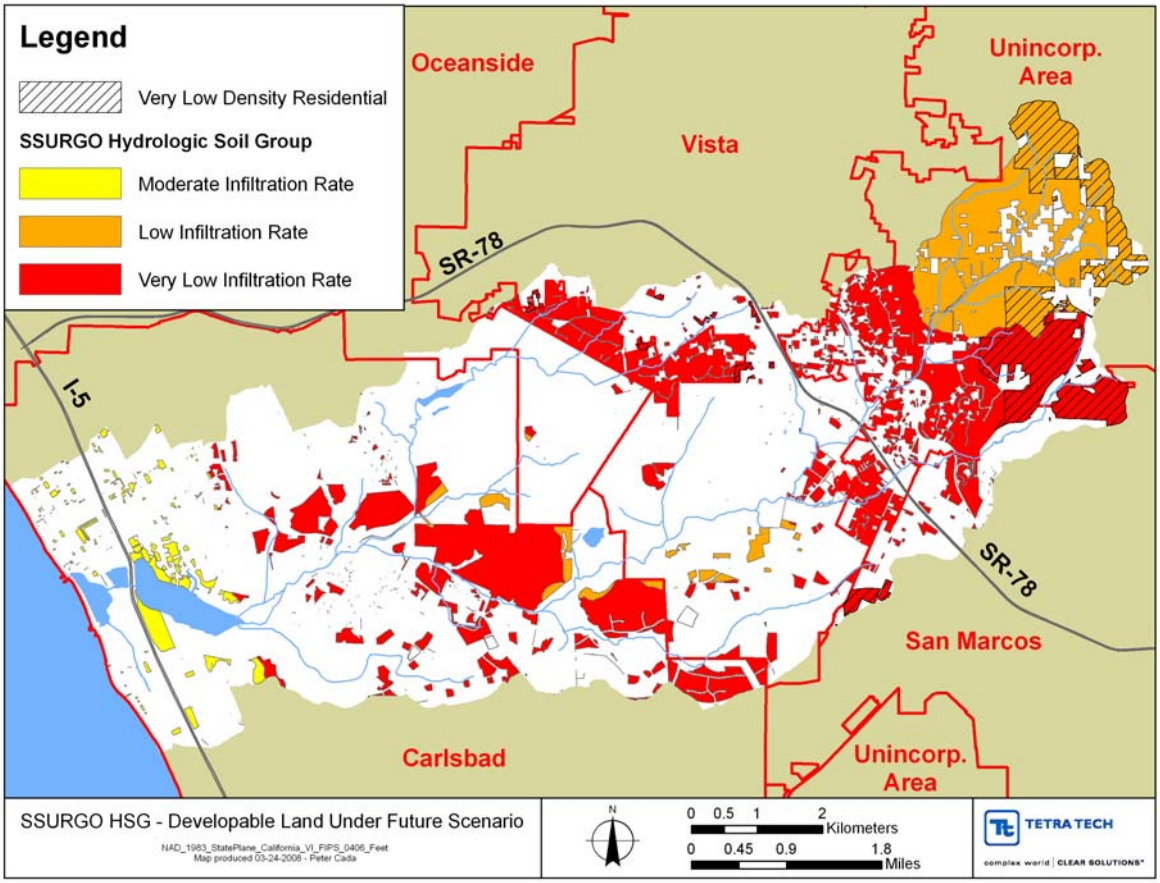

Figure 6-2. Soil Hydrologic Group for Developable Land

Site Specific Practice Feasibility

Site land use and layout of buildings, sidewalks, and driving surfaces has a strong influence on what practices can be incorporated. If a site has a high percentage of impervious area, there is limited pervious area for most structural BMPs. The distribution of the impervious area is also an important factor; if the impervious area is concentrated, it will be more difficult to use dispersed LID BMPs that treat runoff nearer the source; by the same token, it may be easier to route runoff to well-placed BMPs.

As discussed previously, an analysis of two stormwater management scenarios (*Basic LID* and *Enhanced LID*) was performed for four representative land uses to explore potential benefits to water resource protection. The land use categories and impervious area assumptions are shown in Table 6-1. The analysis is presented in detail in Appendix J.

Table 6-1. LID Scenario Land Use Categories

Land Use	Percent Impervious Area	Comments
Medium Density Residential	33%	Single family homes
Multi-family Residential	65%	Mix of large buildings, roads/parking areas, and pervious surfaces distributed throughout the site
Commercial	85%	Small strip shopping center
Industrial/Warehouse	72%	Industrial facility in center of site, surrounding by access roads and parking areas

The *Basic LID* scenario is based on the combined use of vegetated swales (or bioswales) for water quality treatment of part of the site, and an extended dry detention basin treating all of the site, providing both hydrologic control for the 2001/2007 Order requirements, as well as water quality treatment benefits. The site assumptions and configurations are identical to those used in the Agua Hedionda Watershed Modeling and Geomorphic Analysis Report (Tetra Tech, 2008b) for the same land uses. The *Enhanced LID* scenario begins with the *Basic LID* scenario assumptions, but assumes a higher level of treatment, balancing feasibility and cost considerations. For instance, bioretention is not used due to the uncertainty regarding proper vegetation and potential increased cost if an underdrain system is required. Porous pavement was included but not used extensively, again due to uncertainty about infiltration. Large cisterns for irrigation water were included for the Multi-family and Commercial classes, where the combination of large roof surface area and centralized irrigation systems are assumed to make the practice more cost effective. Some of the scenarios assume impervious area reductions as well. The following specific changes implemented in the *Enhanced LID* scenario include:

- Medium Density Residential – a cluster design is used, grouping the housing units closer together on smaller lots, and leaving one-third of the site as undeveloped open space. Impervious area is reduced by decreasing driveway length, sidewalk use, and overall road footprint.
- Multifamily Residential – Impervious area is reduced somewhat by more efficient layout. Porous pavement is used for all sidewalks. The swales treat a greater proportion of the site. Large cisterns capture roof runoff, and reuse the water for irrigation.
- Commercial – Porous pavement is used for large fraction of the parking area. Large cisterns capture roof runoff, and reuse the water for irrigation.
- Industrial – The most challenging site, with layout constraints and little economic incentive for cisterns for irrigation. Porous pavement parking spaces is assumed (a small fraction of the total paved surface), and the swales treat a greater proportion of the site.

Further details regarding site layout assumptions and BMP treatment are discussed in Appendix J. The results of the analysis estimate that implementation of *Basic LID* treatment practices would reduce sediment loads by about 60 – 70 percent, and fecal coliform loads by almost 90 percent. Total nitrogen and total phosphorus removal would be considerably less, ranging from 35 – 45 percent and 25 to 30 percent, respectively. The *Enhanced LID* techniques improve sediment removal to some degree for most of the develop classes, but nitrogen and phosphorus removal are improved considerably. Multi-family Residential and Commercial land uses under *Enhanced LID* provide additional storm event peak flow and duration reductions due to the use of large cisterns, and are likely to reduce risk of downstream channel erosion over the *Basic LID* design. More results are shown the LID Implementation Benefits section (7.4.1) and in Appendix J.

The following actions provide support and guidance for successfully implementing the recommendations in this section as well as management gaps and needs identified elsewhere in this report. Most of these items are related to interpreting and enforcing the 2007 Order.

- Revision of local codes to incorporate recommended *Basic LID* techniques.
- Application of *Basic LID* techniques include reducing and disconnecting impervious area; extended dry detention; swales or bioretention; and stream buffers (included in the 2007 Order).
- Tracking compliance with stormwater management and LID.
- Review of the site plan and engineering plans for compliance with LID requirements (included in 2007 Order).
- Development of quantitative methods (involving simple, cost-effective spreadsheet-based modeling tools) for assessing management practice performance for meeting pollutant reduction targets.
- Implementation of the *Enhanced LID* techniques following the adoption of new hydrology and/or new water quality requirements.
- Additional revision of local codes, as needed, to meet future, more stringent requirements.
- Feasibility studies for cisterns, porous pavement, and bioretention without irrigation. If soil infiltration rates are found to be higher than expected and support bioretention and porous pavement without underdrain systems, then feasibility studies should be expanded to include infiltration basins on sites with lower slopes and low risk for grade failure.
- To address irrigation return flow, stronger enforcement of the Model Local Water Efficient Landscape Ordinance in its current form, and adopting and enforcing the pending update.
- Programs to support reduced use of irrigation for developed sites, including property owner education, pilot programs to test innovative technologies for use reduction, and cost-sharing for technologies that reduce water use.
- As discussed in the Agua Hedionda Modeling and Hydromodification Report (Tetra Tech, 2008b), current BMP requirements, including those specified under the 2007Order, may not be sufficient to protect from hydromodification of downstream channels. The need for additional protection measures should be explored during the development of the San Diego Regional Hydromodification Plan.

Implementation strategies to accomplish most of these actions are described in more detail in Section 7.

6.2 Land Acquisition, Riparian Buffer Restoration, and Wetlands Restoration

The Agua Hedionda Watershed Management Plan provides an opportunity to identify 1) remaining high quality habitat and 2) opportunities to restore lost habitat. Land acquisition prevents remaining natural areas from being developed or disturbed; this type of management also maintains the existing quality of the natural areas through stewardship activities, such as invasive species control and enforcement of restrictions on public use. Riparian buffer restoration seeks to remove invasive species and revegetate native riparian vegetation along streams and other waterbodies. Wetlands restoration reestablishes wetland hydrology and vegetation on land where historic wetlands have been impacted or destroyed. Some overlap occurs between these practices and stream restoration, but generally stream restoration

focuses more on restoring the shape and function of a stream through instream controls, recontouring, and other engineering practices.

The preservation and restoration opportunities were evaluated based on screening criteria that measure how well the opportunities meet the goals and objectives of the WMP. These opportunities particularly address Goal #2 while also addressing water quality concerns relating to Goal #3. Indicators identified to measure achievement of these goals were used when selecting and evaluating these opportunities. The opportunities considered for land acquisition, buffer restoration, and wetlands restoration are collectively referred to hereafter as "AqRest" opportunities.

6.2.1 Screening Criteria

The screening criteria used for the AqRest opportunities identify conditions in the watershed where management would be most successful at achieving the WPG's habitat objectives under Goal #2 and water quality objectives under Goal #3. Table 6-2 lists the screening criteria developed for the purpose of selecting and prioritizing AqRest opportunities and illustrates which criteria were used for each type of opportunity. Several of the screening criteria are used to prioritize more than one opportunity. In the Agua Hedionda Watershed Acquisition and Restoration Report (Tetra Tech, 2008a), details are provided on how screening criteria and associated data were used to evaluate each type of opportunity.

The data and screening criteria were used to calculate metrics to measure achievement of the WPG's objectives. A metric is defined, for the purposes of this evaluation, as a measurement that can be used to identify and prioritize management opportunities according to the goals and objectives. Metric methods can vary in complexity, from the count of species observations per subwatershed to a set of rules involving treatment status and distance from invasive species infestations.

The metrics were used to develop a scoring system that prioritized management opportunities. A separate scoring system was developed for each type of management. The scoring systems were linked in some cases, where a metric calculated for one type of management helped better prioritize another type of management. For example, the priority subwatershed metric developed for the land acquisition prioritization was also applied to the buffer and wetlands restoration prioritization to identify restoration opportunities that provided connectivity to existing habitat. Following Tetra Tech (2008a), the WPG provided comments on the screening criteria and the updates were made to the prioritization and scoring methods, as detailed in Appendix B. Screening criteria added following these comments are noted in Table 6-2.

Table 6-2. Initial Screening Criteria Selected to Evaluate Land Acquisition, Buffer Restoration, and Wetlands Restoration Opportunities

Screening Criteria / Data	Land Acquisition	Buffer Restoration	Wetlands Restoration
SC-1 Natural Area	✓		
SC-2 Protected Natural Areas	✓		
SC-3 Unprotected Natural Areas	✓		
SC-4 Existing Terrestrial Habitat	✓		
SC-5 Invasive Species Extent and Status of Treatment	✓		
SC-6 Riparian Habitat (Existing and Estimated Historic Extent)	✓		
SC-7 Priority Subwatersheds	✓	✓	✓
SC-8 Restoration Reaches	✓	✓	
SC-9 MSCP/MHCP Species	✓		
SC-10 Aquatic Habitat	✓		
SC-11 Wetland Function using California Rapid Assessment Method	✓		✓
SC-12 Lagoon Subwatersheds	✓		
SC-13 Erosion Hazard Index	✓		
SC-14 Riparian Buffer or Wetland Restoration Opportunity		✓	✓
SC-15 Riparian Restoration Opportunity		✓	
SC-16 Wetlands Restoration Opportunity			✓
SC-17 Mature Riparian Trees		✓	✓[1]
SC-18 Sewer Constraints		✓	✓
SC-19 Road and Bridge Constraints		✓	✓
SC-20 Priority and Linkage Subwatersheds		✓	✓
SC-21 Coastal Subwatersheds			✓
SC-22 Stakeholder Priority	✓[1]		✓
SC-23 Total Opportunity Area	✓[1]		

[1] These screening criteria were added following stakeholder comments on Tetra Tech (2008a).

As a parallel effort to identify AqRest opportunities, Tetra Tech asked WPG members, resource agencies, conservation organizations, and other stakeholders to recommend locations in the watersheds for land acquisition and preservation as well as wetlands restoration. Under the stakeholder priority screening criteria, the stakeholder recommended opportunities that contained natural area or wetlands restoration opportunity were given a higher score under either the land acquisition or wetlands restoration prioritization. For a subset of these opportunities, stakeholders provided information on the location, amenities, and status of management, which is provided in the Management Opportunity Database (a spreadsheet tool that will be given to decision makers with the WMP).

6.2.2 Prioritization

6.2.2.1 Land Acquisition for Preservation

Parcels with unprotected natural area were considered opportunities for land acquisition and habitat preservation within the watershed. Prioritization focused on evaluating both the quality of the parcel identified for preservation and the quality of the surrounding habitat. The methods used to score and rank the parcels identified for preservation are described in Tetra Tech (2008a). As indicated above, these scoring methods were updated based on WPG comments. Detailed scoring results are provided in the opportunity database provided with this plan.

Figure 6-3. View into the headwater area of the Buena Creek watershed as seen from Hardell Lane. (Photo courtesy of M. Ashford, Ashford Engineering, Inc.)

Table 6-3 lists the 25 top ranking land acquisition and preservation opportunities based on the revised scoring methods. Planning-level, conceptual costs are provided based on methods outlined in Tetra Tech (2008a). These costs include the cost to preserve the land from further development (acquisition cost) and the cost to manage the land in perpetuity (endowment cost). Long-term management needs may include invasive species control, fire prevention, removal of diseased trees, enforcement of restrictions on public use, and other maintenance activities.

Figure 6-4. Existing Natural Riparian Habitat – Agua Hedionda Creek (Reach 17)

The 25 top ranking land acquisition and preservation opportunities range from about 2 to 50 acres and include 387 acres in total. The cost of purchasing and maintaining all top ranking parcels is estimated to range from $38 to $95 million for fee simple acquisition. This cost may be reduced through purchase of conservation easements, bargain sales, etc. The total cost per acre is estimated to range from $45,000 to $280,000. The variation in cost per acquisition is due to the differences in value between riparian, upland, and coastal areas. Riparian areas are typically undevelopable and therefore less expensive to acquire than upland areas; land in coastal areas tends to be more expensive than land in more inland areas. Since these estimates are planning-level, conceptual costs, they should not be used for funding allocation in a capital budget plan but can be used to estimate costs for a grant application.

Many other high quality land acquisition opportunities exist throughout the watershed; however, for practical purposes of preparation of this watershed-wide plan, and for comprehensive budgeting purposes, only the top 25 are highlighted that meet the broader watershed objectives. Throughout the watershed, several properties exist that would provide benefits for habitat protection, wildlife movement, and endangered species support. As the stakeholders move forward, these properties can be added to the acquisition list as appropriate. Specific opportunities to consider include LA-21, LA-29, LA-31, LA-34,

LA-39, LA-64, LA-68, LA-87, LA-92, LA-108, LA-111, LA-114, LA-123, LA-129, LA-133, LA-135, LA-140, LA-168, LA-201, LA-208, LA-219, LA-286, LA-292, LA-345, LA-375, LA-532, LA-543, LA-559, and LA-637.

The following actions will be required to successfully implement the recommended land acquisition and preservation opportunities:

- Field evaluation
- Identify project proponent (site-by-site)[1]
- Landowner outreach
- Coordination with cultural resources priorities
- Secure funding sources
- Identify/secure stewardship organizations
- Develop stewardship plan
- Purchase Property
- Annual acquisition/restoration workshop
- Update/maintain prioritization tool

Implementation strategies to accomplish these actions are described in more detail in Section 7 and Appendix H.

[1] Note: Project proponent is one or more entities that wishes to acquire the project site. The proponent may be a local government or other agency, an NGO, and/or a private sector entity that has mitigation needs.

Table 6-3. Land Acquisition and Preservation Top Ranking Opportunities and Conceptual Cost Estimates

WMP ID	Acres of Undisturbed Natural Area	Land Acquisition Cost		Endowment Cost		Total Cost		Total Cost Per Acre	
		Low	High	Low	High	Low	High	Low	High
LA-01	8.5	$616,000	$1,479,000	$85,000	$254,000	$701,000	$1,733,000	$83,000	$204,000
LA-02	15.7	$986,000	$2,310,000	$157,000	$470,000	$1,143,000	$2,780,000	$73,000	$178,000
LA-03	6.1	$391,000	$919,000	$61,000	$182,000	$452,000	$1,101,000	$74,000	$181,000
LA-04	7.6	$455,000	$1,058,000	$76,000	$227,000	$531,000	$1,285,000	$70,000	$170,000
LA-05	5.4	$404,000	$974,000	$54,000	$161,000	$458,000	$1,135,000	$86,000	$212,000
LA-06	11.8	$759,000	$1,786,000	$118,000	$353,000	$877,000	$2,139,000	$75,000	$182,000
LA-07	39.0	$2,986,000	$7,219,000	$390,000	$1,169,000	$3,376,000	$8,388,000	$87,000	$215,000
LA-08	2.3	$82,000	$163,000	$23,000	$69,000	$105,000	$232,000	$45,000	$100,000
LA-10	6.4	$620,000	$1,544,000	$64,000	$191,000	$684,000	$1,735,000	$107,000	$272,000
LA-11	49.4	$4,827,000	$12,037,000	$494,000	$1,482,000	$5,321,000	$13,519,000	$108,000	$274,000
LA-12	38.6	$2,880,000	$6,936,000	$386,000	$1,159,000	$3,266,000	$8,095,000	$85,000	$210,000
LA-18	7.6	$496,000	$1,170,000	$76,000	$227,000	$572,000	$1,397,000	$76,000	$185,000
LA-35	38.3	$3,517,000	$8,708,000	$383,000	$1,149,000	$3,900,000	$9,857,000	$102,000	$257,000
LA-41	2.8	$277,000	$693,000	$28,000	$83,000	$305,000	$776,000	$110,000	$280,000
LA-42	18.5	$1,850,000	$4,625,000	$185,000	$555,000	$2,035,000	$5,180,000	$110,000	$280,000
LA-43	29.4	$2,937,000	$7,343,000	$294,000	$881,000	$3,231,000	$8,224,000	$110,000	$280,000
LA-44	18.7	$1,868,000	$4,670,000	$187,000	$560,000	$2,055,000	$5,230,000	$110,000	$280,000
LA-46	8.2	$823,000	$2,058,000	$82,000	$247,000	$905,000	$2,305,000	$110,000	$280,000
LA-48	3.2	$318,000	$795,000	$32,000	$95,000	$350,000	$890,000	$110,000	$280,000

WMP ID	Acres of Undisturbed Natural Area	Land Acquisition Cost		Endowment Cost		Total Cost		Total Cost Per Acre	
		Low	High	Low	High	Low	High	Low	High
LA-50	2.0	$200,000	$500,000	$20,000	$60,000	$220,000	$560,000	$110,000	$280,000
LA-52	37.7	$3,772,000	$9,430,000	$377,000	$1,132,000	$4,149,000	$10,562,000	$110,000	$280,000
LA-53	16.8	$1,683,000	$4,208,000	$168,000	$505,000	$1,851,000	$4,713,000	$110,000	$280,000
LA-55	2.0	$196,000	$490,000	$20,000	$59,000	$216,000	$549,000	$110,000	$280,000
LA-57	4.0	$398,000	$995,000	$40,000	$119,000	$438,000	$1,114,000	$110,000	$280,000
LA-58	6.5	$654,000	$1,635,000	$65,000	$196,000	$719,000	$1,831,000	$110,000	$280,000

6.2.2.2 Buffer Restoration

Riparian habitat exists between stream channels and upland areas and typically intersects with the floodplain. Riparian buffer restoration involves restoring natural vegetation where riparian habitat has been previously impacted or destroyed. Riparian buffer restoration will provide an important management strategy, particularly when coupled with preservation, bioengineering, and BMP retrofit opportunities. Much of the riparian vegetation in the watershed has been disturbed; however a significant area of land exists where it can be restored.

Riparian buffer restoration management measures, as considered in this management plan, would include restoration (i.e., planting) of riparian vegetation. Appropriate plant communities will need to be selected, and a planting plan should be developed for each site that identifies planting zones based on hydrology, soils, slopes and other factors) for the selected plant communities. Construction activities will involve invasive plant removal, grading, soil conditioning, planting, and soil stabilization. Maintenance and monitoring will be required to ensure success of the restoration. Section 6.3 recommends stream restoration opportunities that use additional measures to restore stream functionality.

It will be important to prioritize riparian buffer restoration where it will provide the greatest benefits for wildlife populations and water quality. One of the WPG's objectives is to enhance and restore riparian habitat. Restoration near or adjacent to existing habitat will directly address this objective because the existing habitat quality will be enhanced by connectivity to the restored areas. When implemented upstream of stream restoration projects, riparian buffer restoration will help protect existing and restored aquatic habitat downstream. Buffer restoration can also enhance efforts to protect mature trees in riparian corridors and will help to establish a new generation of Coast Live Oak and other priority riparian species. Riparian buffers will also provide erosion control and some removal of stormwater pollutants.

To identify areas where riparian habitat could be restored, Tetra Tech estimated the historic and current extent of riparian habitat. This area was estimated using the 100-year floodplain, vegetation cover GIS data, and aerial photographs. The estimated extent of riparian habitat, existing and historic, was termed the targeted buffer area and is shown in Figure 6-5. Undeveloped parcels without natural vegetation were identified as opportunities for riparian habitat restoration.

Figure 6-5 displays the locations of the buffer restoration opportunities and groups the opportunities into three priority levels based on the updated scoring. Table 6-4 lists the 27 top ranking buffer restoration opportunities based on the revised scoring methods; these opportunities are displayed as the high priority level in Figure 6-5. The methods used to score and rank the opportunities are described in Tetra Tech Figure 6-5 (2008a). As indicated above, these scoring methods were updated based on WPG comments. Detailed scoring results are provided in the opportunity database provided with this plan.

Planning-level, conceptual costs in Table 6-4 are based on methods outlined in Tetra Tech (2008a). These costs include preserving the land from further development (acquisition cost), restoring riparian vegetation, and managing the land in perpetuity (endowment cost). Long-term management needs may include invasive species control, fire prevention, removal of diseased trees, enforcement of restrictions on public use, and other maintenance activities. Since these estimates are planning-level, conceptual costs, they should not be used for funding allocation in a capital budget plan but can be used to estimate costs for a grant application.

The 27 top ranking buffer restoration opportunities range from about 0.2 to 29 acres and include 129 acres in total. The estimated cost of purchasing through fee simple acquisition, restoring, and maintaining all top ranking parcels is estimated to range from $10 to $19 million. This cost may be reduced through purchase of conservation easements, bargain sales, etc. The total cost per acre is estimated to range from $42,000 to $160,000 per acre. The variation in cost per acquisition is due to the differences in value between public versus private ownership. Riparian areas are typically undevelopable and therefore less

expensive to acquire than upland areas. Some parcels are owned by public entities and, therefore, acquisition costs for these parcels were assumed to be zero.

The following actions will be required to successfully implement the recommended buffer restoration opportunities:

- Project proponent[1] identification (site-by-site basis)
- Field evaluation
- Landowner outreach
- Contact ACOE and other permitting agencies
- Coordinate with trails and infrastructure
- Coordination with cultural resources priorities
- Preliminary design and cost estimate
- Secure needed permits
- Secure funding
- Secure stewardship organizations
- Final planning and design
- Develop stewardship plan
- Implement Projects
- Annual acquisition/restoration workshop
- Updating/maintaining prioritization tool

Implementation strategies to accomplish these actions are described in more detail in Section 7 and Appendix H.

[1] Project proponent is one or more entities that wish to conduct stream buffer or wetland restoration on the project site. The proponent may be a local government or other agency, an NGO and/or a private sector entity that has mitigation needs.

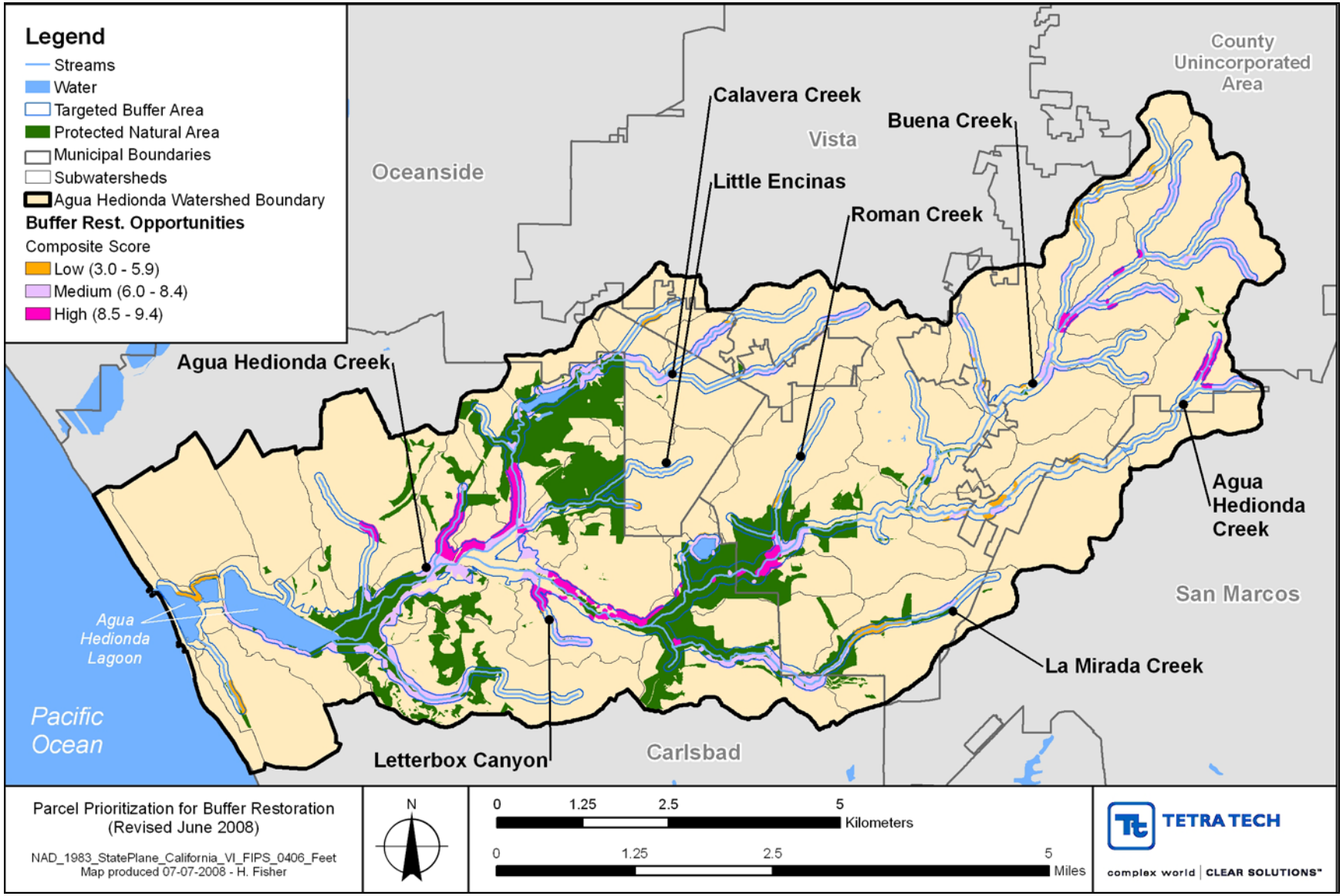

Figure 6-5. Buffer Restoration Opportunities

Table 6-4. Buffer Restoration Top Ranking Opportunities and Conceptual Cost Estimates

WMP ID	Acres of Restoration Opportunity	Land Acquisition Cost		Restoration Cost		Endowment Cost		Total Cost	
		Low	High	Low	High	Low	High	Low	High
BR-01	11.0	$384,000	$769,000	$329,000	$549,000	$132,000	$329,000	$845,000	$1,647,000
BR-02	4.3	$0	$0	$129,000	$214,000	$51,000	$129,000	$180,000	$343,000
BR-03	1.9	$66,000	$132,000	$57,000	$94,000	$23,000	$57,000	$146,000	$283,000
BR-04	1.6	$56,000	$112,000	$48,000	$80,000	$19,000	$48,000	$123,000	$240,000
BR-05	1.0	$34,000	$67,000	$29,000	$48,000	$12,000	$29,000	$75,000	$144,000
BR-06	0.8	$29,000	$59,000	$25,000	$42,000	$10,000	$25,000	$64,000	$126,000
BR-07	0.7	$24,000	$48,000	$20,000	$34,000	$8,000	$20,000	$52,000	$102,000
BR-08	4.1	$143,000	$287,000	$123,000	$205,000	$49,000	$123,000	$315,000	$615,000
BR-10	1.3	$45,000	$90,000	$38,000	$64,000	$15,000	$38,000	$98,000	$192,000
BR-11	1.2	$41,000	$83,000	$36,000	$59,000	$14,000	$36,000	$91,000	$178,000
BR-12	1.1	$39,000	$77,000	$33,000	$55,000	$13,000	$33,000	$85,000	$165,000
BR-13	1.1	$37,000	$75,000	$32,000	$53,000	$13,000	$32,000	$82,000	$160,000
BR-14	0.8	$28,000	$56,000	$24,000	$40,000	$10,000	$24,000	$62,000	$120,000
BR-16	0.2	$0	$0	$7,000	$12,000	$3,000	$7,000	$10,000	$19,000
BR-19	1.2	$41,000	$82,000	$35,000	$59,000	$14,000	$35,000	$90,000	$176,000
BR-21	0.8	$0	$0	$25,000	$42,000	$10,000	$25,000	$35,000	$67,000
BR-22	0.8	$28,000	$55,000	$24,000	$39,000	$9,000	$24,000	$61,000	$118,000
BR-26	21.2	$742,000	$1,484,000	$636,000	$1,060,000	$254,000	$636,000	$1,632,000	$3,180,000
BR-28	3.1	$110,000	$220,000	$94,000	$157,000	$38,000	$94,000	$242,000	$471,000

WMP ID	Acres of Restoration Opportunity	Land Acquisition Cost		Restoration Cost		Endowment Cost		Total Cost	
		Low	High	Low	High	Low	High	Low	High
BR-30	1.2	$40,000	$81,000	$35,000	$58,000	$14,000	$35,000	$89,000	$174,000
BR-31	0.4	$15,000	$30,000	$13,000	$21,000	$5,000	$13,000	$33,000	$64,000
BR-36	29.2	$1,021,000	$2,042,000	$875,000	$1,459,000	$350,000	$875,000	$2,246,000	$4,376,000
BR-37	12.4	$432,000	$865,000	$371,000	$618,000	$148,000	$371,000	$951,000	$1,854,000
BR-38	11.0	$384,000	$768,000	$329,000	$549,000	$132,000	$329,000	$845,000	$1,646,000
BR-39	8.6	$299,000	$599,000	$257,000	$428,000	$103,000	$257,000	$659,000	$1,284,000
BR-40	7.2	$253,000	$506,000	$217,000	$361,000	$87,000	$217,000	$557,000	$1,084,000
BR-46	0.9	$31,000	$63,000	$27,000	$45,000	$11,000	$27,000	$69,000	$135,000

6.2.2.3 Wetlands Restoration

As discussed in Section 4.4, the Agua Hedionda watershed has most likely lost the majority of its historical wetland habitat. Wetlands restoration would seek to restore some of this lost habitat while enhancing the connectivity of overall habitat in the watershed. Beyond habitat, wetlands restoration would also restore the water quality functions of wetlands, including flood control, sediment trapping, and nutrient attenuation.

The types of wetlands restoration measures will vary depending on site-specific characteristics, however, they will typically involve grading and excavation to restore wetland hydrology, invasive species removal, and revegetation. Once properties are identified for landowner outreach and implementation, the opportunities will need to be evaluated in the field and conceptual wetlands restoration designs would need to be developed for each opportunity. Appropriate plant communities will need to be selected, and a planting plan should be developed for each site that identifies planting zones based on hydrology, soils, slopes and other factors) for the selected plant communities. Construction activities will involve invasive plant removal, grading and excavation, soil conditioning, planting, and soil stabilization. Maintenance and monitoring will be required to ensure success of the restoration.

Tetra Tech spoke with a number of mitigation bank managers during the development of the WMP, and those managers generally indicated that wetlands restoration opportunities are difficult to find in the San Diego area, and that coastal wetlands restoration opportunities tend to be both difficult to find and expensive. To ensure that remaining opportunities are captured within the Agua Hedionda WMP, Tetra Tech developed comprehensive geographic information system (GIS) screening methods that identified undeveloped land where wetland vegetation has been cleared or where wetland hydrology has been altered or destroyed. Tetra Tech also documented stakeholder recommendations for wetland restoration opportunities to supplement the opportunities identified through the GIS analysis.

Figure 6-6 displays the locations of the wetlands restoration opportunities and groups the opportunities into three priority levels based on the updated scoring. Table 6-5 lists the 12 top ranking wetlands restoration opportunities based on the revised scoring methods; these opportunities are displayed as the high priority level in Figure 6-6. The methods used to score and rank the opportunities are described in Tetra Tech (2008a). As indicated above, these scoring methods were updated based on WPG comments. Detailed scoring results are provided in the opportunity database provided with this plan.

Planning-level, conceptual costs in Table 6-5 are based on methods outlined in Tetra Tech (2008a). These costs include preserving the land from further development (acquisition cost), restoring wetland vegetation and hydrology, and managing the land in perpetuity (endowment cost). Long-term management needs may include invasive species control, fire prevention, removal diseased trees, enforcement of restrictions on public use, and other maintenance activities. Since these estimates are planning-level, conceptual costs, they should not be used for funding allocation in a capital budget plan but can be used to estimate costs for a grant application.

The 12 top ranking wetland restoration opportunities range from about 0.2 to 21 acres and include 47 acres in total. The estimated cost of purchasing through fee simple acquisition, restoring, and maintaining all top ranking parcels is estimated to range from $3 to $10 million. This cost may be reduced through purchase of conservation easements, bargain sales, etc. The total cost per acre is estimated to range from $42,000 to $250,000 per acre. The variation in cost per acquisition is due to public versus private ownership. Some parcels are owned by public entities and, therefore, acquisition costs for these parcels were assumed to be zero. None of the wetlands restoration opportunities were in coastal subwatersheds and, therefore, higher coastal property values were not considered.

Two promising wetlands restoration opportunities were added to the stakeholder recommended list after the above analysis. These opportunities are both on California Department of Fish and Game (CDFG)

managed ecological reserve lands. They are tidally influenced but function relatively poorly due to a number of factors, principally elevation and drainage. The creation of greater tidal channels and vegetated marshlands in the present salt panne habitat areas is recommended to provide greater larval fish production at Agua Hedionda Lagoon. It should be noted that some of the higher flats are used by nesting birds and thus some consideration should be given to how restoration can provide a net benefit instead of replacing one resource or habitat with another (Keith Merkle, Merkle & Associates, personal communication to Meleah Ashford, July 2008). The Management Opportunity Database provides more details on these and other stakeholder recommended wetlands restoration opportunities.

The following actions will be required to successfully implement the recommended wetlands restoration opportunities:

- Project proponent[1] identification (site by site basis)
- Field evaluation
- Landowner outreach
- Contact ACOE and other permitting agencies
- Coordinate with trails and infrastructure
- Coordination with cultural resources priorities
- Preliminary design and cost estimate
- Secure needed permits
- Securing funding
- Secure stewardship organizations
- Final planning and design
- Develop stewardship plan
- Implement Projects
- Annual acquisition/restoration workshop
- Updating/maintaining prioritization tool

Implementation strategies to accomplish these actions are described in more detail in Section 7 and Appendix H.

[1] Project proponent is one or more entities that wish to conduct stream buffer or wetland restoration on the project site. The proponent may be a local government or other agency, an NGO and/or a private sector entity that has mitigation needs.

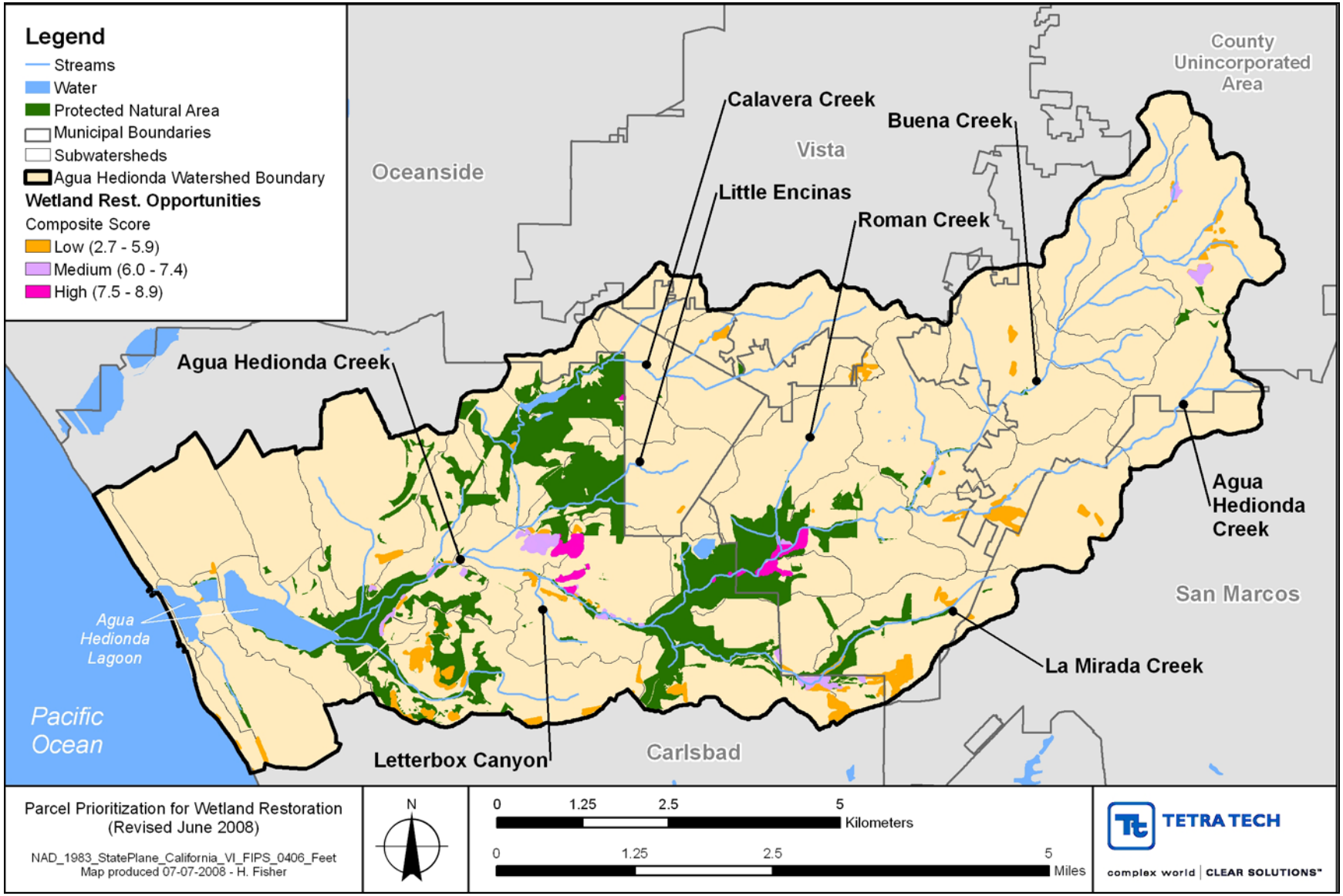

Figure 6-6. Wetlands Restoration Opportunities

Table 6-5. Wetlands Restoration Top Ranking Opportunities and Conceptual Cost Estimates

WMP ID	Acres of Restoration Opportunity	Land Acquisition Cost		Restoration Cost		Endowment Cost		Total Cost	
		Low	High	Low	High	Low	High	Low	High
WR-01	6.1	$213,000	$426,000	$183,000	$761,000	$73,000	$183,000	$469,000	$1,370,000
WR-02	3.6	$0	$0	$108,000	$448,000	$43,000	$108,000	$151,000	$556,000
WR-04	0.4	$16,000	$31,000	$13,000	$56,000	$5,000	$13,000	$34,000	$100,000
WR-05	0.9	$33,000	$66,000	$28,000	$118,000	$11,000	$28,000	$72,000	$212,000
WR-07	0.2	$0	$0	$7,000	$30,000	$3,000	$7,000	$10,000	$37,000
WR-08	4.3	$0	$0	$130,000	$543,000	$52,000	$130,000	$182,000	$673,000
WR-09	3.3	$0	$0	$100,000	$417,000	$40,000	$100,000	$140,000	$517,000
WR-10	3.0	$0	$0	$90,000	$377,000	$36,000	$90,000	$126,000	$467,000
WR-11	0.2	$7,000	$13,000	$6,000	$24,000	$2,000	$6,000	$15,000	$43,000
WR-13	20.5	$716,000	$1,433,000	$614,000	$2,558,000	$246,000	$614,000	$1,576,000	$4,605,000
WR-14	4.2	$146,000	$292,000	$125,000	$522,000	$50,000	$125,000	$321,000	$939,000
WR-16	0.4	$0	$0	$12,000	$51,000	$5,000	$12,000	$17,000	$63,000

6.3 STREAM RESTORATION

The stream restoration opportunities identified for the Agua Hedionda WMP support the WPG's Goal #2 – to protect, restore and enhance habitat in the watershed. The main focus of the stream restoration projects is objective 2e – maintain stable streambanks and riparian areas to protect instream aquatic habitat and priority tree species. The stream restoration projects also address objective 2b – protect, enhance, and restore terrestrial habitat, especially existing vegetation in riparian areas by providing a stable environment (i.e., stable streambanks). The stream restoration projects indirectly meet objective 2g – maintain and protect lagoon habitat by limiting the delivery of excess sediment that is a result of mass wasting of unstable streambanks.

Stream restoration opportunities focus on in-stream measures that meet these goals and objectives. Stream restoration, as recommended in this WMP, involves installing grade control structures within a stream channel to achieve an equilibrium between sediment inflow and transport capacity of the stream. Components of grade control structures include loose rock structures, channel lining, and more rigid structures. Loose rock structures are recommended for stream stabilization to mimic the appearance of natural stream beds. The traditional rock grade control structures would be low profile (approximately two feet in height) and can be used to create riffles along the stream. It may be necessary to add fill to the channel bed to begin to rebuild the bed elevation to an equilibrium state. Completely soft bank stabilization measures are not recommended because the highly erosive forces evident in the watershed would likely undermine these measures. Additional information on grade control structures is provided in Tetra Tech (2008c).

6.3.1 Screening Criteria

Based on the geomorphic analysis in Tetra Tech (2008b), the most significant stream concern is the widespread channel erosion. As discussed in 4.2, some channel banks have experienced significant bank erosion while other locations have been limited to undercutting at the toe of the bank. Numerous locations have experienced channel incision (lowering of the channel invert). However, some amount of erosion in the channel can be seen in most reaches of the stream systems throughout the watershed.

Stream restoration opportunities were identified based on the following investigations:

- Field reconnaissance
- Stakeholder recommended opportunities
- Review of historic aerial photographs

These investigations were part of the geomorphic analysis described in Section 4.2. The opportunities were selected where evidence of significant channel erosion and instability was found and where restoration was likely to have the greatest success at restoring functionality. Once opportunities were identified, additional field reconnaissance was conducted to determine the specific restoration needs of the stream reaches. Conceptual plans for each stream reach were developed that describe the measures necessary to address channel erosion and instability.

At this level of conceptual design, Tetra Tech made the assumption that changes to the channel slope would be adequate to achieve equilibrium conditions to restore stream functions. It is important to note that additional hydrologic, hydraulic, and sediment transport modeling will be required to move to detailed project design, and this modeling may show that channel modifications, such as channel widening, may be also be necessary to achieve an equilibrium condition.

6.3.2 Prioritization

The evidence of channel erosion and instability was used to identify restoration opportunities that would have the greatest likelihood of success for reducing channel erosion in the watershed. All of the stream restoration projects identified herein are considered high priority projects. The WPG reviewed the opportunities and concluded that all opportunities should be prioritized equally for implementation. They represent those projects where the more significant stability issues are present as well as those that have gained local interest. The location of the identified stream restoration opportunities is illustrated in Figure 6-7. The opportunities area is described in more detail in Tetra Tech (2008c) and 10 percent conceptual plans are provided in Appendix C.

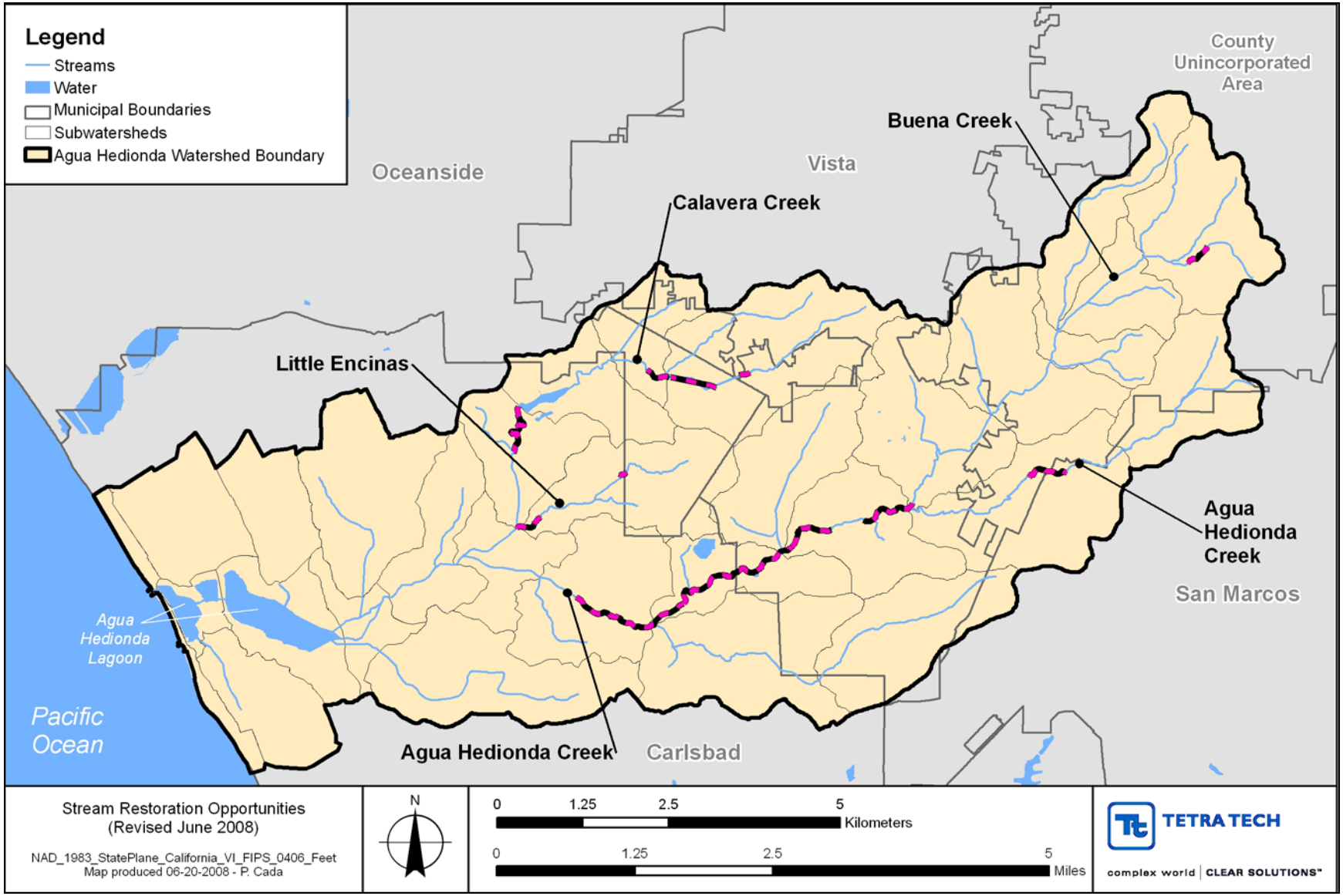

Figure 6-7. Stream Restoration Opportunities

No further prioritization of opportunities is provided; however it is understood that the various agencies and organizations will be interested in pursuing projects that have different elements and support different issues. Below is a description of the five critical factors that were identified and evaluated for each project followed by Table 6-6 which identifies whether each factor applies to an individual project.

- **WMP Goals**
  - Specific objectives for which the project was evaluated include:
    - (1) Objective 2b: Protect, enhance, and restore terrestrial habitat, especially existing vegetation in riparian areas
    - (2) Objective 2e: Maintain stable streambanks and riparian areas to protect instream aquatic habitat and priority tree species.
- **Location**
  - Is the project located in the lower portions of the watershed? It is likely that projects located in the lower watershed can have a greater impact on sediment trapping and prevent that sediment from reaching the lagoon.
- **Public Ownership**
  - Is the property identified for the project in public ownership?
- **Critical Timing**
  - Does the channel exhibit concerns or issues that appear to require more immediate attention? The following critical timing issues have been identified:
    - SR-02 – imminent failure of concrete grade control structure
    - SR-06 – channel is completely blocked with debris at one location
    - SR-07 – development is imminent; property currently available
    - SR-11 – parking lot damage has occurred and will likely continue
- **Multiple Benefits**
  - Can multiple benefits be integrated with the project? The following multiple benefits have been identified:
    - SR-01 – provide flooding relief
    - SR-02 – coordinate with planned sewer line upgrades
    - SR-05 – restoration of significant watershed function prior to planned development

Based on the strong evaluation of project SR-02 and identification of a project proponent (the City of Vista), this project was targeted for further development. For this project, Tetra Tech conducted additional data collection and design to support development of 10 percent conceptual plans. This information is provided in Appendix D.

Table 6-6. Summary of Stream Restoration Opportunities

WMP_ID	Subwatershed Model ID(s)	Length (feet)	Obj 2b: Protect Existing Riparian Veg.	Obj 2e: Maintain Stable Streambanks	Located in Lower Watershed	Public Ownership	Critical Timing	Multiple Benefits	Associated Demonstration BMP (see Section 6.4)
SR-1	1023, 1017, 1016	2,949	x	x				x	
SR-2	1016	2,525	x	x		x	x	x	SW-1
SR-3	1014, 1015, 1016	7,120	x	x	x	x			
SR-4	1013, 1014, 1025	6,272	x	x	x	x			SW-2, SW-3, SW-4
SR-5	1013	600			x			x	SW-2, SW-3, SW-4
SR-6	1022	1,329		x			x		
SR-7	1011	516		x			x	x	
SR-8	1011	2,237		x					
SR-9	1008, 1010, 1011	4,503	x	x	x	x			
SR-10	1012	430	x	x		x			SW-5
SR-11	1007, 1008, 1012	1,454		x	x		x		
SR-12	1023	2,200	x	x					

Planning-level, conceptual costs were estimated for the stream restoration opportunities (Table 6-7). The conceptual cost estimates include mobilization, construction (grading, materials, etc.), construction contingencies, design, and permitting costs. Additional analysis, modeling and design work will be required to support the restoration opportunities and to develop detailed cost estimates. The following estimates are for a conceptual level of planning and are more appropriate for identifying the relative cost of opportunities among the various sites. These cost estimates should not be used for funding allocation in a capital budget plan but can be used to estimate costs for a grant application. More details on the assumptions used can be found in Tetra Tech (2008c).

Table 6-7. Stream Restoration Opportunity Conceptual Cost Estimates

Site	Total Cost
Site SR-1	$813,194
Site SR-2	$750,000
Site SR-3	$1,422,500
Site SR-4	$1,272,500
Site SR-5	$1,247,917
Site SR-6	$521,510
Site SR-7	$1,355,208
Site SR-8	$624,500
Site SR-9	$952,000
Site SR-10	$428,000
Site SR-11	$618,750
Site SR-12	$575,000

The following actions will be required to successfully implement the recommended stream restoration opportunities:

- Landowner outreach
- Project proponent identification (site-by-site basis)[1]
- Contact ACOE and other permitting agencies
- Coordinate with trails and infrastructure
- Coordinate with cultural resources priorities
- Preliminary design and cost estimate
- Secure needed permits

[1] Project proponent is one or more entities that wish to conduct stream restoration on the project site. The proponent may be a local government or other agency, an NGO and/or a private sector entity that has mitigation needs.

- Secure funding sources
- Secure stewardship organization
- Final planning and design
- Develop stewardship plan
- Implement projects
- Annual acquisition/restoration workshop
- Update prioritization tool; coordinate with sewer and storm drain infrastructure programs

Implementation strategies to accomplish these actions are described in more detail in Section 7 and Appendix H.

6.4 STORMWATER BMP RETROFIT PROJECTS

Most of the land that was developed within the Agua Hedionda watershed prior to the year 2001 was not treated for stormwater runoff. Without stormwater controls, the increased runoff can erode stream channels, increase pollutant loadings, cause downstream flooding, and decrease groundwater recharge.

With Order 2001-01, the RWQCB began requiring widespread treatment of stormwater with BMPs to meet MS4 permit requirements. The MS4 co-permittees within Agua Hedionda watershed are the County of San Diego and the cities of Carlsbad, Vista, Oceanside, and San Marcos. The Order applies to "priority projects", which includes essentially all projects in the Agua Hedionda watershed except for those at the lowest densities. An estimated 70 percent of the development that occurred between the 2001 Order and the year 2007 received some level of stormwater treatment. Areas not receiving treatment were either not considered priority projects or received relatively ineffective treatments (e.g., drain inserts used alone). The RWQCB subsequently updated the permit with additional treatment requirements (e.g., peak flow control and LID) in January 2007 by issuing Final Order No. R9-2007-0001 (2007 Order). The vast majority of new development now requires treatment of stormwater according to the 2001 and 2007 Orders. Stormwater retrofit projects are meant to address areas that currently are not treated as a result of the 2001 or 2007 Order.

Stormwater BMP retrofit opportunities identified for Agua Hedionda WMP support goal #2, to protect, restore and enhance habitat in the watershed, and goal #3, to restore watershed functions, including hydrology, water quality, and habitat, using a balanced approach that minimizes negative impacts. The stormwater retrofit opportunities address both hydromodification impacts and water quality degradation. The process for screening potential BMP retrofit sites and the resulting opportunities are described in the following sections.

6.4.1 Screening Criteria

To address untreated development and restore water quality within the watershed, it is recommended that a program of installing stormwater BMP retrofits be initiated. There are more than 6,000 acres of untreated development within the watershed excluding roads, parks, and very low and low density residential development. Given limited resources to install BMPs to address all of the untreated development within the watershed, a screening process was employed to identify retrofit locations that maximize effectiveness and feasibility. The screening process was implemented on two fronts. First, publically-owned sites were selected within the priority subwatersheds, those with the highest existing runoff and pollutant loading, identified in Section 2. Second, sites adjacent to the identified stream restoration reaches were selected.

There are nearly 3,000 acres of untreated parcels in the priority model subwatersheds first presented in Section 4.1.2. Since it is unlikely that BMPs can be installed to treat all of these parcels in the near term, publically-owned parcels within these subwatersheds have been identified as highest priority parcels for BMP placement (Figure 6-8). There are about 347 acres in 56 parcels of publically owned land within these subwatersheds (Table 6-8). Approximately half are city-owned while the remaining are owned by school districts, water districts, and the State of California. Given the costs of land acquisition, these parcels represent some of the most feasible potential sites to construct BMP retrofits.

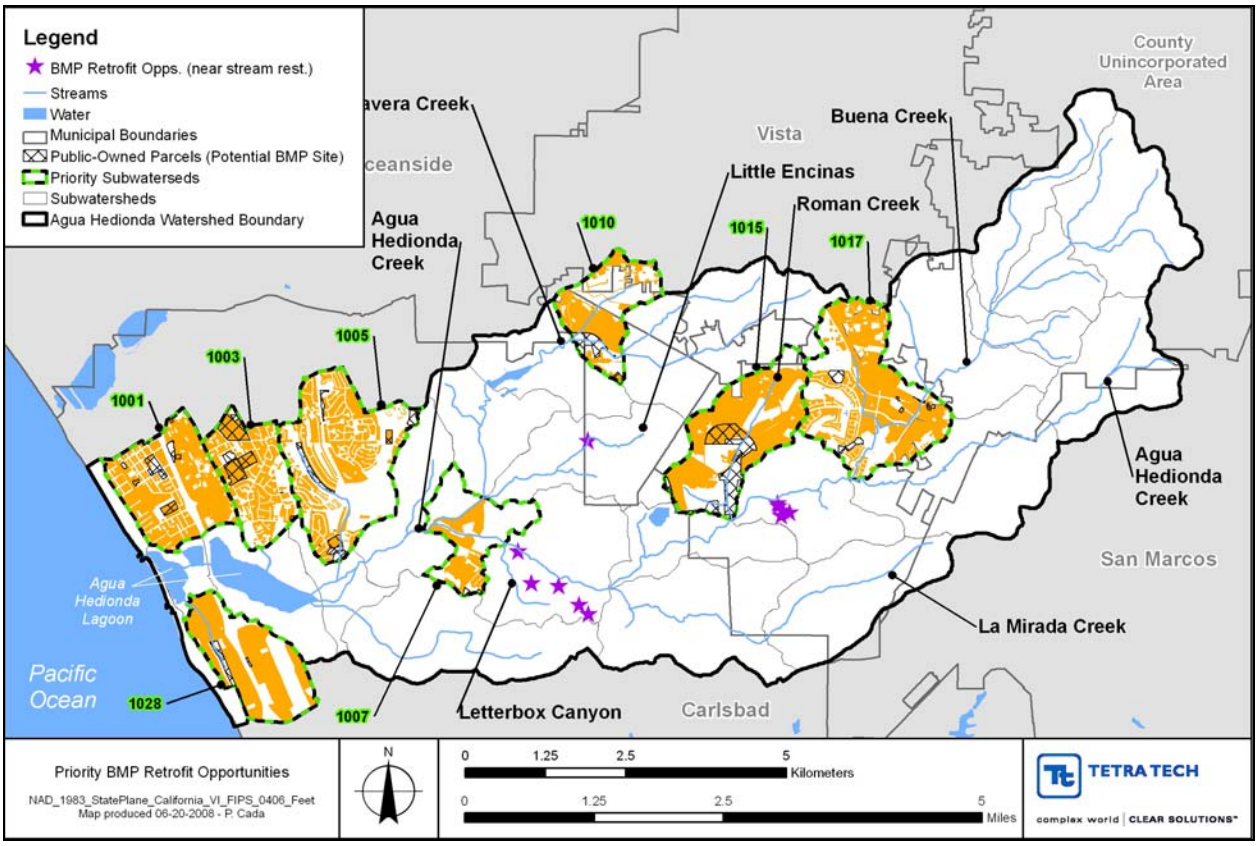

Figure 6-8. Priority BMP Retrofit Opportunities (untreated areas in priority subwatersheds are shaded orange/yellow)

Table 6-8. Public-Owned Parcels Located within Priority Subwatersheds

Owner	Number of Parcels	Total Parcel Area (ac)	Subwatershed Model ID(s)
Carlsbad Municipal Water District	2	55.9	1005, 1006, 1012, 1014, 1015
Carlsbad Unified School District	18	86.4	1001, 1003, 1005
City of Carlsbad	40	253.8	1001, 1003-1010, 1013, 1027, 1028
City of Carlsbad Redevelopment Agency	3	4.8	1001
City of Oceanside	3	27.1	1009-1011
City of Vista	23	109.9	1015-1017
Regents of the University of California	5	76.6	1014-1015
State of California	3	93.3	999, 1002, 1004, 1005, 1028
Vista Irrigation District	3	2.3	1010, 1015-1017
Vista Unified School District	1	34.6	1015

Stormwater retrofit opportunities have also been identified along reaches where stream restoration projects have been prioritized (Figure 6-8). Site maps for each site are provided in Appendix D. Supplementing the stream restoration project with stormwater retrofits will increase the benefits of the project and provide additional hydraulic stability.

The BMPs chosen for retrofits near stream restoration sites include extended dry detention (typically at the outlets of the drainage areas), rainwater capture cisterns, permeable pavement, and vegetated swales (used as either bioswales along road sides or as recessed medians). Appendix E illustrates the recommended locations of these BMPs. Table 6-9 provides details regarding the drainage areas and BMPs selected for each retrofit site. Note that the cumulative percentage of area treated by BMPs exceeds 100 percent for two of the retrofit sites. This occurs because some of the BMPs in those cases treat only a portion of the drainage area, while the extended dry detention ponds treat the entire drainage area. This BMP "treatment train" is common practice where land area limits the use of larger, centralized structures and when more stringent water quality goals are to be met. BMPs in series can provide additional stormwater treatment benefits.

SW-4 was split into two subwatersheds – the larger residential area treated by the extended dry detention, and the median swale to the south of the residential area. The drainage areas are not actually connected, so they were evaluated separately.

Table 6-9. Drainage Area and BMP Retrofit Descriptions

Retrofit Site	Total Drainage Area (ac)	Estimated Percent Impervious	Percent of DA Treated By BMP			
			Extended Dry Detention	Cistern	Vegetated Swale	Permeable Pavement
SW-1	45.0	75%	100%	7.9%		1.8%
SW-2	31.6	72%		5.6%	3.3%	
SW-3	27.7	70%	100%			
SW-4a	30.3	38%	100%		18.5%	
SW-4b	6.9	82%			100%	
SW-5	2.4	85%			100%	

Potential BMP retrofit opportunities have been provided and may form the basis of a targeted program to addressed untreated development in the watershed. For the targeted subwatersheds shown in Figure 6-6, additional upland assessment and site selection will be necessary using publically-owned land as a first cut of potential BMP placement sites. Once sites are selected, additional prioritization is conducted, and funding sources are identified, additional data collection will be needed to support detailed cost estimates, design, permitting and construction. The retrofit sites located outside of the priority subwatersheds, but adjacent to the stream restoration sites, may also be considered for implementation. Though concept designs have been provided as an example of what might be installed on the sites, additional site data would need to be collected to support more detailed design and cost estimation.

Steps included in the implementation process for BMP retrofits include:

- Landowner outreach
- Preliminary design and cost estimation
- Permitting
- Identify and secure funding
- Final planning, design and costs
- Project construction.

6.5 MONITORING

Once WMP implementation has begun, a coordinated monitoring program for water quality, land use change and treatment, restoration, and retrofits should be initiated. Specific tracking indicators identified by the WPG can be integrated with existing monitoring requirements under programs such as the MS4 permit and the MHCP and MSCP programs. Periodically, implementation activities should be reviewed along with water quality monitoring results to provide an understanding of the progress being achieved in managing and restoring the Agua Hedionda watershed. As new information is gathered and effectiveness is assessed, planned implementation actions may need to be modified under a process of adaptive management.

In addition to ambient water quality monitoring through the watershed, land treatment tracking and restoration monitoring are additional components needed as part of WMP implementation. Tracking is

recommended for future land use change and any associated BMP treatment. As noted in Section 3, additional WMP tracking indicators include percent of development with LID controls and percent of development with BMPs. This can be coordinated with SUSMP annual reports, SANDAG land use data updates, and other tracking requirements.

6.5.1 Monitoring Indicators

The WPG has selected multiple water quality indicators for future tracking in the watershed (Table 6-10). Indicators include sediment, nutrients, bacteria, metals and pesticides for tributaries to the Agua Hedionda Lagoon. Lagoon indicators include TSS, turbidity, TP, TN, enterococcus, and fecal coliform. The parameters chosen represent those tied to existing impairments and other constituents that are considered elevated and warrant future tracking. Though not specifically identified as a tracking indicator by the WPG, bioassessment will be important to track for restoration of aquatic habitat and biological communities. The basis for parameter selection is discussed further below.

Table 6-10. Monitoring Indicators for the Agua Hedionda Watershed

Indicator	Variables	Linked to Goal #1 Objectives
Observed Water Quality	Tributaries - Copper, Turbidity, Total Dissolved Solids, Total Suspended Solids, Total Phosphorus, Total Nitrogen, Enterococcus, Fecal Coliform, DDT, diazinon; chlorphyrifos Lagoon - Total Suspended Solids, Turbidity, Total Phosphorus, Total Nitrogen, Enterococcus, and Fecal Coliform	1a, 1b
Aquatic Habitat	IBI ratings, benthic bioclass, aquatic habitat index	1a, 1b
Wetland Habitat	CRAM Ratings	1a, 1b

6.5.2 Existing Monitoring in the Watershed

Monitoring has been conducted by multiple organizations in the Agua Hedionda watershed. Each has their own objectives. The Co-permittees have monitoring requirements for their Municipal NPDES Permit which has the following goals:

1. Assess compliance with 2007 Order
2. Measure and improve the effectiveness of the Co-permittees' urban runoff management programs
3. Assess the chemical, physical, and biological impacts to receiving waters resulting from urban runoff discharges
4. Characterize urban runoff discharges
5. Identify sources of specific pollutants
6. Prioritize drainage and sub-drainage areas that need management actions
7. Detect and eliminate illicit discharges and illicit connections to the MS4
8. Assess the overall health of receiving waters

Monitoring to comply with RWQCB Investigation Order No. R9-2006-076 (lagoon monitoring) to support source assessments and linkage analyses for TMDL development for sediment (TSS and turbidity) and bacterial constituents is ongoing and described further below. Other organizations have

supplemented this monitoring including the San Elijo Lagoon Conservancy, the Watershed Stewards Training for Citizens Monitoring, the Agua Hedionda Lagoon Foundation, and the Carlsbad Watershed Network (described further in Tetra Tech, 2007).

6.5.2.1 Receiving Waters and Urban Runoff Monitoring Program

Regular monitoring is required as part of the Receiving Waters Monitoring Program and Urban Runoff Monitoring program described in the 2007 Order. Receiving waters monitoring is required at a mass loading station, a temporary watershed assessment station, two bioassessment stations, in the lagoon, and at selected coastal storm drains. The mass loading station is monitored twice during wet weather events and twice during dry weather flow events during each year of required monitoring on Agua Hedionda Creek at El Camino Real. The SELC supplements this with continuous flow monitoring.

In Agua Hedionda, mass loading monitoring is required in permit years 1, 2, and 4. Additional monitoring occurs as a temporary watershed assessment station monitoring in years 1 and 4. Bioassessment monitoring is required in year 1 and 4 at two sites. Lagoon monitoring of chemistry, toxicity, and benthic infauna is also required in either year 2 as part of the special program (Bight 2008) or in all of the other four permit years.

In addition to toxicity tests, the parameters listed in Table 6-11 are required to be collected at the mass loading and temporary watershed assessment stations.

Table 6-11. Parameters Collected at the Mass Loading Station (based on 2007 Order)

Physical Parameters, Nutrients, Hydrocarbons	Pesticides	Metals (Total and Dissolved)	Bacteria
TDS	Diazinon	Antimony	Total Coliform
TSS	Chlorpyrifos	Arsenic	Fecal Coliform
Turbidity	Ambition	Cadmium	Enterococcus
Total Hardness		Chromium	
pH		Copper	
Specific Conductance		Lead	
Temperature		Nickel	
Dissolved Phosphorus		Selenium	
Nitrite and Nitrate		Zinc	
TKN			
Ammonia			
BOD (5-day)			
COD			
TOC and DOC			
MBAS			
Oil and Grease			

Urban runoff monitoring has several additional monitoring components including MS4 outfalls, source identification, and dry weather monitoring. Dry weather samples have been collected at 10 instream stations and in over 50 storm drains in the Agua Hedionda watershed (these programs are currently being revised based on requirements of the 2007 Order). Co-permittees are also required to utilize monitoring data and analysis from the Receiving Waters Monitoring Program to assess the effectiveness of their programs.

6.5.2.2 TMDL Monitoring

The RWQCB issued Investigation Order No. R9-2006-076 to the dischargers to the creeks and lagoons in San Diego County that are 303(d) listed for sediment, nutrients, TDS and bacteria. The Order requires collection of data for the development of TMDLs under the Clean Water Act. The purpose of the monitoring is to address the principal data needs required to develop watershed loading and lagoon water quality models for the parameters of interest in the lagoons to develop TMDLs (City of Encinitas, 2007).

The monitoring plan for Agua Hedionda Lagoon includes: (1) continuous monitoring of hydrodynamic and certain water quality parameters (salinity, temperature, flow or water level, and turbidity[1]), (2) wet weather monitoring, and (3) dry weather monitoring. Monitoring of hydrology and core chemical parameters (salinity, temperature, turbidity, and water-level and flow) will be measured via data sondes at

[1] At the mass emission station, turbidity is only collected during the dry weather index periods.

the mass emission site, within each segment, and at the ocean outlet. Storm event sampling is planned for the ocean outlet at Pacific Coast Highway Bridge, at the lagoon outlet at I-5, at the tributary, the main lagoon segment, and the mass loading station (Figure 6-9). Sediment sampling following the storm event is also planned for the main lagoon segment. Storm events with rainfall ranging from 0.2 inch to 1 inch or greater will be targeted. Dry weather monitoring consists of storm drains, each mass emission site, ocean inlet, and within lagoon sampling sites during key "index" periods. Sampling is expected to be completed in the fall of 2008.

Pollutagraph sampling at the mass emission tributary site will occur during two storm events with eight samples taken throughout the pollutagraph per storm. Five samples will be collected per storm for bacteria analysis. Parameters include flow, TSS, TDS, sediment particle size distribution, and bacteria (fecal coliform, total coliform, and enterococcus).

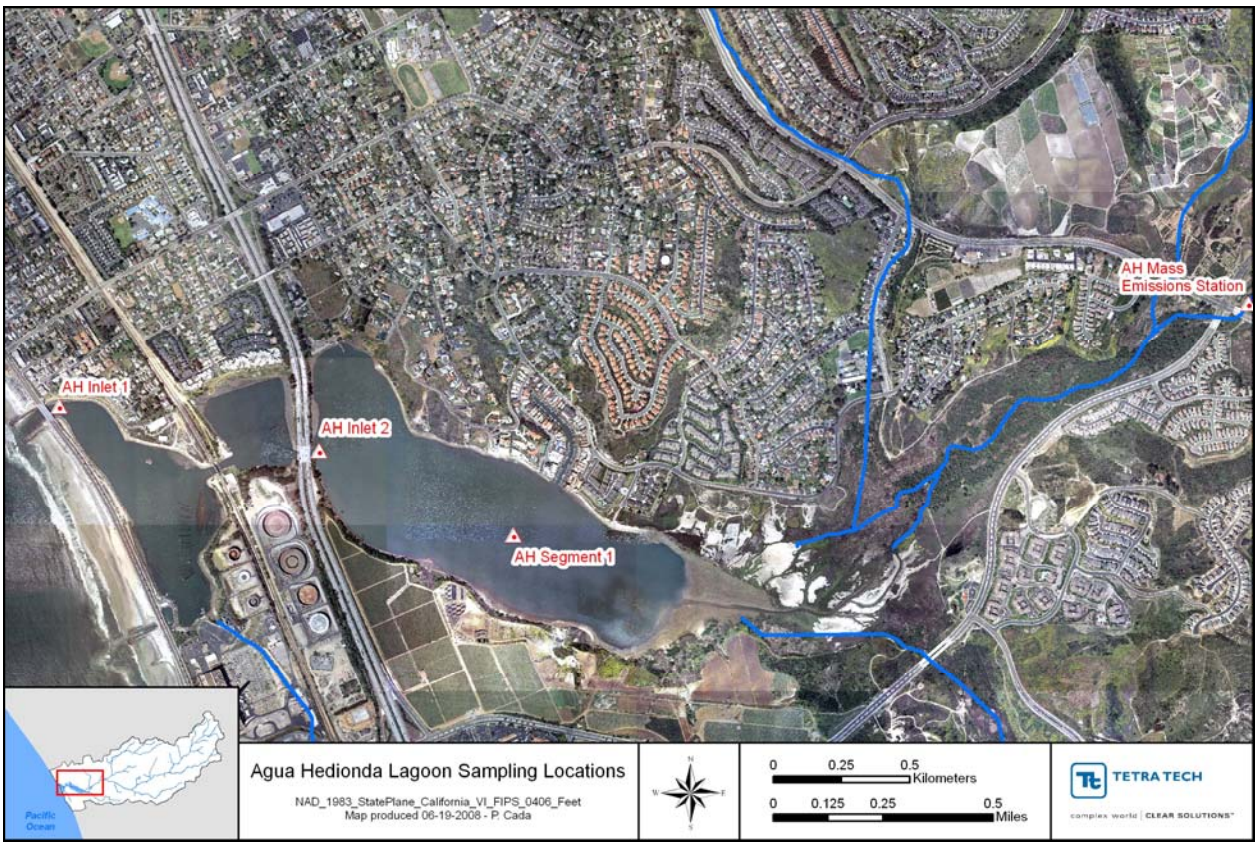

Figure 6-9. Map of TMDL Monitoring Sites

6.5.2.3 CRAM Monitoring

The California Rapid Assessment Method (CRAM) is a technique for monitoring wetlands. It can be used for monitoring efforts within a watershed context to assess cumulative impacts, assist with locating the best sites for restoration, and reporting on restoration project success. It also has the potential to be an excellent tool to standardize the reporting of site impacts and compensatory mitigation under the 401/404 programs, and perhaps for TMDL purposes. In the Fall of 2007, 23 CRAM assessment were performed throughout the watershed. These assessments were utilized to develop the recommendations in this WMP. Future CRAM monitoring can fill in gaps spatially through the watershed and over time to monitor improvements or degradation at specific sites.

6.5.3 Future WMP Monitoring Recommendations

All of the WMP indicators listed in Table 6-10 are collected at the mass loading station on Agua Hedionda Creek (at El Camino Real) and in the lagoon, with a few exceptions. Total phosphorus and DDT are not included in the list of parameters for the mass loading station sampling under the MS4 permit. Since DDT is persistent in the environment and no existing sources are expected, limited monitoring in Buena Creek (e.g., twice a year) of this parameter is likely sufficient. Dissolved phosphorus rather than total phosphorus is collected under the existing permit requirements. The addition of total phosphorus at the mass loading station should be considered given the present uncertainty in the linkage and response of lagoon algal communities.

The specific parameters required for the lagoon monitoring were not identified in the 2007 Order. Nutrients are not being collected as part of the TMDL monitoring since the lagoon is not impaired for nutrients. Both nutrients and bacteria should be monitored in the lagoon on an annual basis. Lagoon sampling should be conducted at the mid-channel station shown in Figure 6-9.

Wet weather monitoring extended to additional sites within the watershed would provide a better understanding of pollutant sources, areas requiring treatment, and watershed improvements. Additional wet weather sites to consider that augment existing wet weather monitoring and provide additional spatial understanding of storm-driven loading include:

1) Buena Creek near Dry Weather Station AH-13 (Figure 6-10)
2) Stormwater Outfalls not currently monitored in Subwatersheds 1001, 1003, and 1005
3) La Mirada Creek near Dry Weather Station AH-59 (Figure 6-10)
4) Calavera Creek at Lake Boulevard and Waverly Road

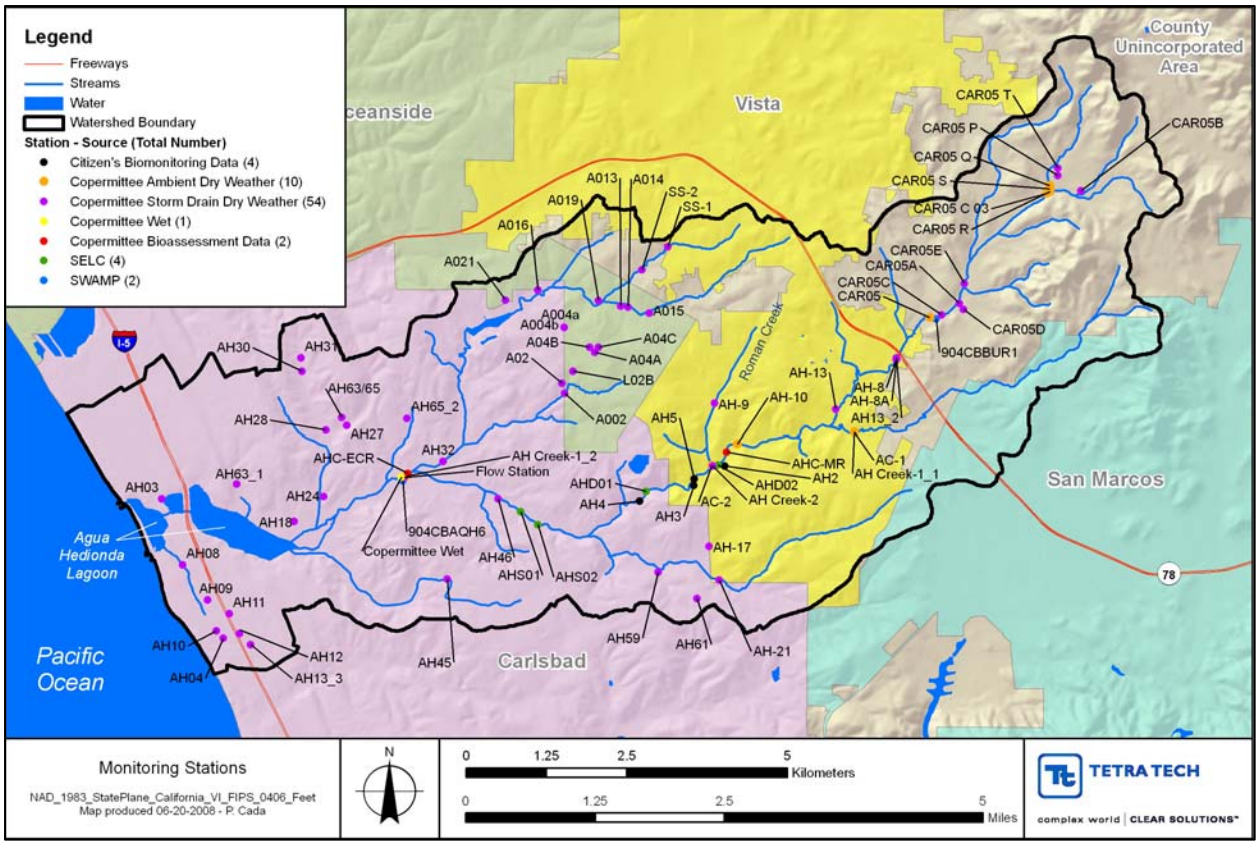

Figure 6-10. Monitoring Stations in the Agua Hedionda Watershed

Progress in meeting the TMDL objectives and to address the remaining impairments will require monitoring in the future in the lagoon and its tributaries. This monitoring plan will likely not be developed until after the TMDL is developed. The implementation monitoring should be coordinated with monitoring needed to support the goals and objectives of this WMP.

Bioassessment monitoring, including aquatic habitat, could be improved by adding other sites beyond the two required under the permit. Habitat was an important component of the goals and objectives of the WMP. As such, additional sites are warranted. In addition to AHC-ECR and AH-MR, recommended sites include AHS02 and a representative site on Buena Creek, to be determined during plan implementation.

Based on strong interest expressed by the WPG, we recommend that California Rapid Assessment Method (CRAM) data be periodically collected and assessed for wetland areas of the watershed. Monitoring results from CRAM assessments should be compared to results reported in Tetra Tech (2007) to assess improvement or degradation in wetland functions.

In addition to the ambient monitoring needs described in the preceding sections, pre- and post-construction monitoring of any projects implemented in association with the WMP should be conducted as resources allow. This would include stream restoration and BMP retrofit projects. Such monitoring can demonstrate real benefits of these practices and provide programmatic feedback for reporting the MS4 permit.

The following actions will be required to successfully implement the recommended monitoring:

- Long term stream and lagoon monitoring program (supplementing current monitoring by Co-permittees)

- Collect and assess physical, chemical, and biological data from multiple programs
- Periodically report on monitoring results
- Long-term wetlands monitoring (CRAM)
- Inspections and maintenance of sanitary sewer systems
- Check lines for leaks, illicit connections, and overflows (included in the CA Sanitary Sewer Overflows Waste Discharge Requirements (SSO WDRs))
- Monitor effectiveness/efficacy of BMP demonstration projects
- Inspections and maintenance of storm drainage systems
- Increase efforts to clear and maintain storm drains and drainageways to remove deposited materials. (Included in "Regional Channel Maintenance" program.) Note: Any disturbance to natural channels should be minimized.
- Construction site inspection and enforcement action
- Conduct onsite inspections and take enforcement actions, as needed, during construction (included in the 2007 Order)
- Stormwater BMP inspection and enforcement
- Staff inspect onsite stormwater management systems and take enforcement action, as needed, on failing systems (included in the 2007 Order)
- Track key Watershed Management Plan Indicators.

Implementation strategies to accomplish these actions are described in more detail in Section 7 and Appendix H.

6.6 CITIZEN STEWARDSHIP/PUBLIC OUTREACH

6.6.1 Collaborative Watershed Council

Stewardship and management of the Agua Hedionda watershed depends on the collective efforts of citizens, businesses, non-governmental organizations (NGOs) and governmental agencies. A Watershed Council is recommended as a way to establish and support a strong partnership among those organizations which have significant authority or resources for managing the watershed. It is also intended to ensure meaningful public participation in the decision-making. A Watershed Coordinator should be hired to staff the Council.

Watershed management should be adaptive—a living process that responds to changing conditions, needs, and information. Instituting a Watershed Council establishes an approach that can adapt to changing needs and will allow current and future issues to be addressed in ways that are both environmentally sound and fiscally responsible. It is an approach in which all stakeholders pool and coordinate their technical and financial resources to achieve the watershed management goals.

This Plan recommends that the Council include multiple coordinating forums to support stakeholder involvement, providing an opportunity for everyone to participate to the level they want to contribute and providing a known place to "plug in."

Watershed Council. This group should comprise lead staff and officials from partners that have significant authority and/or resources to manage the Agua Hedionda watershed. The purpose of the

Council is to coordinate on policy, funding, and resource allocation issues, to provide sustained leadership, to ensure that the partnership is strong, and that the management plan is updated as needed.

It is highly recommended that one elected official from each local government jurisdiction be appointed to the Council. This is vital for successful implementation because of their power to direct staff, approve budgets and/or sponsor grant efforts for management measures. In addition, this group of stakeholders is responsible for the infrastructure in the watershed and represents the regulated community, generally held responsible for compliance with water quality regulations, including future TMDL implementation.

Technical Advisory Committee. This Committee should include staff representatives from governmental agencies and select non-governmental organizations with expertise on water resource and land planning issues in the watershed. The purpose of the Committee is to help carry out the activities of the Watershed Management Plan and to report recommendations to the Council.

Watershed Partners. This group is comprised of interested citizens, NGOs, local land owners, media and businesses. It also includes responsible parties that are regulated by other agencies, such as the local Co-permittees who are responsible for NPDES Permit and TMDL compliance. The Watershed Partners would have a key role in implementing the WMP. It is envisioned that the Watershed Planning Group members, responsible for guiding the development of the WMP, would participate in this group.

Funding Committee. The purpose of the Funding Committee is to provide and seek funding opportunities to finance implementation of the WMP. The Funding Committee would include local governments, state and federal agencies, and private foundations, developers or corporations. These stakeholders can provide direct funding, grants and loans. The partners need to be informed continuously about the cost of implementing the WMP projects and the benefits provided to the community. The funding partners on the Committee would make recommendations to the Council on funding opportunities and priorities.

As a first step for the Council, it is recommended that a grant be secured to hire a Watershed Coordinator who would support the work of the Council. In the future, the work and staff of the Council could be funded through Council partners, grants, reallocation of local government fees, etc.

6.6.2 Education of Local Boards to Gain Support for Watershed Management

Because it is recommended that the local boards (City Council, City Planning Commissions, Agency Boards, and County Supervisors) provide primary support and possible funding for the WMP projects, their support is critical. The Watershed Council should meet with these boards during their regularly scheduled meetings on an annual basis to update them on the needs, benefits and progress of the WMP implementation. Table 6-12 provides a guideline for the content and goals of these meetings.

Table 6-12. Content and Goals for Educating Local Boards

Meeting Number	Content	Goal
1	Introduction of the WMP, goals & objectives, summary of recommendations, and plans for implementation. This should include how the WMP meets current board goals and relates to the board's existing programs.	Adoption of the WMP Support for the WMP Participation of Board Member/s on Watershed Council and direction for staff participation Commitment to include WMP explicitly in future board goals
2	Overview of the WMP (refresher), summary of actions to date, identification of barriers to implementation, request for assistance to overcome barriers (if appropriate), and request for continued support.	Continued support for the WMP Understanding of how the WMP helps meet general board goals Commitment to include the WMP explicitly in future board goals
Annually	Same as #2. Present new finding and information about watershed conditions and management opportunities.	Same as #2. Help adapt the Watershed Plan as needed.

6.6.3 Development of Citizen Education Materials

Education of the general public is an important first step in order to effect changes in habits that impact the watershed. It is important to educate the public about the direct benefit of a healthy watershed to their quality of life. The public must understand what a healthy watershed looks like and how they can contribute to positive watershed health. Educational material should include messages that support the many overlapping programs that work to improve the watershed; for example, habitat protection and management (MHCP/MSCP), water quality (stormwater NPDES Permit), water conservation (State Model Water Conservation Ordinance), reduction of impervious surfaces (Stormwater NPDES Permit LID and Hydromodification). These materials should strive to be distributed in English and Spanish. Educational materials can include:

- Brochures
- Agency bill inserts (brief flyers in water bills)
- Write-ups in local city, agency, NGO and appropriate groups' newsletters and websites. Specifically these would include:
  - Local jurisdiction – Cities of Carlsbad, Oceanside, San Marcos, and Vista, the County of San Diego
  - Local Water Agencies – Carlsbad Municipal Water District, City of Oceanside Water Utilities Department, Vallecitos Water District, Vista Irrigation District
  - Local Sewer Agencies – the Buena Sanitation District (Vista), City of Carlsbad, City of Oceanside Water Utilities Department, City of Vista Sanitation District, and Vallecitos Water District
  - Local NGOs – Agua Hedionda Lagoon Foundation, Preserve Calavera, Friends of Hedionda Creek, Carlsbad Watershed Network

- Appropriate Groups – local Homeowner Associations, Chambers of Commerce, primary businesses (Poseidon, Cabrillo Power Plant, YMCA, Hubbs SeaWorld, etc.)

- Press releases to local media, including the *North County Times*, *Union Tribune* (North County section and Spanish edition, *Enlace*), and *Coast News*
- Training for watershed monitoring

6.6.4 LID Workshops and Training

Low Impact Development has been identified in the WMP as a strong tool to mitigate impacts from future development and support non-degradation of water quality and watershed health. To promote LID use in its most optimal form for the watershed, LID workshops and training sessions are recommended. The purpose of these workshops and training sessions is to increase implementation of the most effective LID techniques throughout the watershed. Workshops should be held for jurisdictional staff, private sector developers and engineers, and the interested general public. There are good opportunities to collaborate on the workshops with other organizations, including local jurisdictions, San Diego Coastkeeper and the Building Industry Association (BIA). The workshops should include general LID education, however they should focus on local knowledge obtained from the modeling effort in this WMP (see Section 6.1 and Appendix J). It is recommended that workshops and training for municipal staff be performed by other professionals or professional organizations. Education for engineers and developers might best be received from professionals within local jurisdictions who will be approving developer plans, whereas workshops for the general public could be conducted by local jurisdictions and by NGOs.

6.6.5 Annual Awards Program

An annual awards program is recommended to encourage and recognize local efforts toward watershed protection. This program should be coordinated through the Watershed Council. To be transparent and objective, the program should have specific objectives, guidelines, nomination criteria and prioritization processes. It is recommended that these guidelines be formally drawn up and voted on by the Watershed Council and posted on the webpage. Awards should be considered for individuals, public officials, developers, businesses, and NGOs. Presentation of the awards should include a press release to maximize publicity and the educational value of the event.

6.6.6 Annual Progress Workshops

A number of watershed actions are being recommended that will involve numerous agencies and groups. To keep track of "who's doing what" in the watershed and progress made on WMP implementation, it is recommended that Watershed Partners have annual progress workshops. This would also be a forum to share lessons learned on LID techniques, successful BMP retrofits, etc. These workshops could be held in conjunction with the annual acquisition/restoration workshop.

6.6.7 Management Partnerships

Many partnership opportunities exist within the watershed to leverage programs towards project implementation. These partnerships should not be underestimated as a means to implement the WMP. A partial list of key opportunities is presented in Table 6-13.

Table 6-13. WMP Partnership Opportunities

Partnership Organization	Potential Partnering Opportunity	Potential Project for Opportunity
Local, State & Federal Agencies	Funding	Land acquisition, restoration projects
Carlsbad Watershed Co-permittees	Collaboration	Educational materials, workshops, meetings
Utility Agencies	Collaboration, Matching Funds	Restoration for infrastructure construction and maintenance, educational material development and distribution
Private Developers	Funding, Matching Funds	Acquisition and/or restoration as mitigation for development
NGOs	Collaboration	Educational material and events, project prioritization, awards program
Businesses	Collaboration	Educational material distribution, awards program, workshops

6.6.8 Data/Information Management Via Website

Information sharing is important to maximize collaboration and keep stakeholders informed. As data is collected in the watershed by various stakeholders, it is helpful to integrate that data and use it for decision making, whether it be for management measure selections, effectiveness evaluations, or project prioritization. It is recommended that a website be the best avenue for information sharing. The website should maintain program information including an overview of the WMP, announcements, events calendar, meeting archives, educational material ongoing projects, and links to other related programs. It should be maintained on a regular basis which will include staff time to prepare updates and funding to support website hosting.

Implementation strategies to accomplish citizen stewardship/public outreach actions are described in more detail in Section 7 and Appendix H.

6.7 FUNDING AND SUSTAINED SUPPORT

Securing and maintaining stable and diverse funding for WMP will be challenging and an ongoing action. A wide range of funding options is available for watershed actions and having a variety funding sources will help avoid interruptions in implementation and reliance on a single entity for support (EPA, 2005). This section discusses a variety of funding options most applicable to the watershed; other means do exist for funding and sustaining support for watershed management, and those options should be explored as well.

6.7.1 Grant Programs

The California voters have been generous in past ten years supporting a range of water related bond programs. In addition, there is wide support for community-based watershed restoration programs. Water quality related actions that are well supported include stormwater quality best management practices (BMPs) and low impact development (LID). Many of these programs are oriented towards "brick and mortar" implementation; therefore having a Plan with specific projects identified sets the Agua Hedionda WMP up well for implementation.

A wide range of grant programs are available so that it is important to match the appropriate project with the grant program. Some of the primary grant programs that are appropriate for the Agua Hedionda management measures include small grant programs for education and outreach programs and development and support of the Watershed Council and Watershed Coordinator, and larger grant programs for implementation projects, such as acquisition and restoration. Appendix H provides a list of several current grant programs, who administers the grant, the type of projects eligible for the project and the range of available funds for each grant.

Almost all grants require some amount of matching funds be contributed by the recipient of the funds. Grant match provides granting organizations the assurance that the grant recipient is dedicated to the project and willing to put in their own effort or finances. Matching funds are generally in the range of 10 to 20 percent. In rare cases no matching funds are required and in some grant programs up to 50 to 75 percent matching is required. Matching funds generally are in the form of in-kind labor, up-front funding of project design or environmental clearance, or pre-project monitoring used to define the project need. Many funding agencies have restrictions regarding where the matching funds can be derived, for instance grants from the State generally disallow matching funds to be derived from other State funds or programs.

Once the project has been aligned to a grant program, the grant scope must be outlined. Often grant programs require a two-step process where a conceptual scope is submitted and if approved the grant applicant will be asked back for a full proposal that is more detailed. The level of detail of the scope depends on the grant requirements; however, it is always helpful to have the project well scoped out prior to any grant application so that the technical feasibility, project budget and schedule are well understood. The projects outlined in this WMP are generally in a conceptual stage and require additional effort to develop the scope and budget for a grant application. During the scoping process project partners should be identified who will provide support for the project either financially or technically.

In the Agua Hedionda watershed there are many ongoing projects that can also be leveraged as matching funds for the recommended management measures. These include partnering with ongoing educational programs by the various NGOs in the watershed, jurisdictions (particularly the Carlsbad Watershed Urban Runoff Management Program), and private organizations who perform environmental education to support their business. Another source of matching funds that is promising in the Agua Hedionda Watershed is partnering with other implementation projects performed by jurisdictions, agencies or private ventures. In the near future it is likely that the jurisdictions within the watershed will be implementing projects associated with improvements and maintenance to their sewer, water and storm drain infrastructure. These projects may be implemented in conjunction with watershed projects for matching funds or the implementation of the infrastructure project may require mitigation that can be used to leverage a larger grant project. In addition, local development projects will be required to mitigate impacts. All of these types of projects create opportunities for partnerships on large mitigation projects and for matching funds.

It is important to contact appropriate agencies as early as possible to gain support for the project. The implementation projects recommended in this WMP will require agency environmental clearance that in some cases may require substantial effort. Agencies are generally willing to meet with project proponents to discuss their projects and provide assistance and direction regarding the approval process. The various agencies and environmental clearances that are likely to be required for project implementation are discussed in Appendix A, Summary of Key Federal, State, and Local Regulations Applicable to the Watershed. In most cases, the projects support the goals of the agencies so that they can be helpful partners. Grant agencies look favorably on the involvement of a variety of agencies because it shows a higher level of support and more likely rate of project success.

Finally, preparing the grant application can require a significant effort. to make the application as competitive as possible, it is important to know the project and applicant eligibility requirements, project types to be funded and program goals. The applicant should discuss the project with the granting agency

in advance to better understand the funding probability of each project. Often the granting agency will have a public meeting to discuss the grant program well in advance of sending out a request for proposals. Many grant programs will have a list serve that can be joined to receive automated information about upcoming programs.

6.7.2 Coordination with Agencies

Several agencies have ongoing programs that could fund projects within the watershed. Often agencies are interested in land acquisition to develop preserves or protect natural habitat. State and federal funds or programs are established for preservation efforts, particularly where there are endangered species, or sensitive habitat. The State of California Wildlife Conservation Board Grant program funds restoration and enhancement of wildlife habitat, development of public access facilities for wildlife oriented uses and protection of habitat through fee acquisitions and conservation easements. The Partners for Fish and Wildlife Program provides technical support and funding for on-the-ground wetland restoration projects on private land. The National Fish and Wildlife Foundation also provide grants for projects that sustain, restore and enhance the nation's fish, wildlife, plants, and their habitats through their Keystone Initiative Grants and Special Grant Programs.

The State and federal wildlife agencies also sign off on mitigation plans and often a project has a need to mitigate offsite which requires an acquisition or restoration project. Caltrans also is involved in acquisition and restoration projects for road project mitigation and is another potential partner. The regional planning agency, San Diego Association of Governments (SANDAG), will soon be allocating acquisition funds from the 1/2 cent Transnet sales tax measure. In addition, there may be opportunities with local jurisdictions to coordinate on projects related to their MHCP/MSCP efforts or as mitigation for development projects. Universities may also be interested in developing or expanding preservation or restoration programs.

It is recommended that these agencies be contacted on a regular basis to discuss the WMP recommended projects and request that they consider the project lists when developing their agency goals and priorities. These agencies can also be helpful in identifying funding opportunities that may arise that are appropriate for the WMP projects. Another important aspect of coordinating with agencies is to keep them informed of locally available projects that can be used for mitigation and stress the need to implement local projects to offset local impacts.

6.7.3 Mitigation Programs

As development within the watershed grows and infrastructure projects (freeways, roads, pipelines, etc.) are planned there will need to mitigate their impacts. Most of the acquisition and restoration projects outlined in the WMP are suitable projects for mitigation. Furthermore, since most agencies request that mitigation be implemented near to the area of the impact and prefer areas where a detailed analysis and comprehensive process has been conducted for mitigation site identification, mitigation compensation is a good option for funding implementation of the projects recommended herein.

The challenge is matching mitigation needs to projects. Mitigation requirements are generally required at a specific size, and only in rare cases will that size match directly with a project outlined in this WMP. However, with some creativity this can be overcome. Options include developing mitigation banks, pre-approved mitigation areas (PAMA), or an in-lieu fee program. These programs are designed to pool resources from a range of mitigation requirements to create a larger project that is more likely to have a greater benefit to the watershed. These programs are a tremendous benefit to project proponents in need of mitigation and can result in significantly more benefit to the watershed then a group of smaller mitigation projects scattered throughout the watershed. The other benefit to this approach is collectively obtaining permits for the mitigation and long-term management of the final project. Mitigation Banks can

be established by a city, county or land management organization who will perform the upfront project design and permitting and then sell-off credits or acres to project proponents in need of mitigation. One example in the watershed is the 180-acre Carlsbad Highlands Mitigation Bank created by the which is now sold out and the property is being managed by CDFG as part of the Carlsbad Highlands Ecological Reserve (TAIC, 2008).

6.7.4 Watershed Council Support

Having a long-term organization such as a Watershed Council to oversee and sustain the implementation of the WMP will be one of the keys to its success. Keys to the success for the Watershed Council is having a Watershed Coordinator who will manage and support the organization, coordinate activities and obtain sustained funding for management implementation.

Funding and hiring a Watershed Coordinator in the near term (i.e., six months) is essential. The WMP, which has well documented watershed needs and recommendations, provides a strong basis and momentum for establishing a Watershed Coordinator position and establishing a Watershed Council. This momentum should be capitalized on quickly.

Funding for a Watershed Coordinator can be obtained from a variety of sources. Agencies, such as the Department of Conservation, are recognizing the importance of Watershed Councils and Watershed Coordinators and have a grant program established solely for that purpose. Other grant agencies are also recognizing this need and are open to funding such a position either outright or as a part of a larger project. Again, with some creativity, the watershed coordinator position can be funded from a variety of sources; however, a more sustained form of funding is desirable in order to maintain a long-term connection to the watershed and the programs outlined herein.

More diverse forms of support include additional types of grants, local agencies and/or jurisdictions, NGOs and the business community. For example, each project that is funded in the watershed can also have a component included in the scope to support the Watershed Council and Watershed Coordinator. Most grants from the State of California require that public meeting be held and technical advisory committees or watershed planning groups be established to oversee the project. This can be used as an opportunity to support the Watershed Coordinator. Appendix H provides a list of funding opportunities in the form of grants to support a watershed coordinator. Because of their role in overseeing development, local jurisdictions will be key participants in the Watershed Council. As such, they could also be considered as potential funding sources for the Watershed Coordinator and Watershed Council.

6.7.5 Implementation

The following actions will be required to successfully implement the efforts described above:

- Grant Programs
  - Identify target grant programs
  - Match projects to grant programs
  - Scope projects, identify partnerships and matching funds
  - Contact appropriate agencies and discuss projects
  - Prepare grant applications
- Coordination with Agencies
  - Identify target agencies and funding opportunities through agency programs
  - Meet quarterly with appropriate agencies to discuss priorities and opportunities

  - Coordinate with Universities
- Mitigation Programs
  - Meet with jurisdictions and agencies to discuss mitigation banks and in-lieu fee programs[1]
  - Align projects with mitigation banks and in-lieu fee programs
  - Obtain agency support for mitigation banks and in-lieu fee programs
  - Outreach to development community
- Watershed Council Support (Watershed Coordinator Support)
  - Prepare scope for watershed and staffing needs ($)
  - Obtain local support from agencies, jurisdictions, NGOs and the business community
  - Identify grant/funding opportunities and pursue with grant proposals
  - Redirection of City fees

Implementation strategies to accomplish key actions are described in more detail in Section 7.

6.8 RECOMMENDED FOCUS AREAS FOR MANAGEMENT

The selection of individual opportunities in the previous sections was based on a watershed-wide review of management needs and opportunities. Each priority opportunity represents a location where a significant management need exists. Several of the stream restoration opportunities address bank undercutting that is endangering mature riparian trees. The top ranking land acquisition opportunities represent parcels where large tracts of undisturbed natural area are unprotected and where new development would have the greatest impact on water quality and habitat relative to other unprotected parcels. Drawing from individual priorities, the combined benefits of multiple management types was considered in selecting the focus areas. Although some individual prioritizations considered the relationship among types of opportunities (e.g., the restoration opportunity metric for the acquisition and restoration opportunities), the purpose of the focus areas was to select several comprehensive suites of opportunities that would be implemented in concert to achieve a greater functional benefit.

Tetra Tech based the selection of focus areas on the location of management opportunities, the WPG's goals and objectives, and general trends in modeling and monitoring data. Each focus area represents a portion of the watershed where a significant management need exists and where a number of opportunities would complement each other. The portions of the watershed not selected as focus areas contained fewer complementary management opportunities and/or presented constraints to management. Most notably, Tetra Tech considered the Calavera Creek drainage area as a potential focus area but concluded that the stream conditions should be evaluated after the Lake Calavera dam is repaired[2] and before a comprehensive restoration effort is planned within this drainage. In addition to this factor, the upper portion of the Calavera Creek drainage area did not present as many complementary management opportunities as the selected focus areas. In general, the selected focus areas presented more promising habitat preservation and restoration opportunities than other portions of the watershed.

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[1] Development of a mitigation bank or in-lieu fee program requires careful planning and close coordination between project proponents, local jurisdictions, and the wildlife agencies to meet the specific conditions of mitigation.

[2] The dam is expected to be repaired and site construction completed soon after the WMP is finalized.

The selection of focus areas does not imply that management should only be focused in these selected areas. Tetra Tech recommends that funding be focused in these portions of the watershed in the near term, and that management opportunities within the focus areas should be implemented in concert where possible. The priority lists and decision-making tools provided with the plan may lead implementers to select promising management opportunities outside the focus areas because an opportunity presents itself. With sufficient funding and other support, it may be possible to implement the focus area management at the same time as other priority management actions throughout the watershed.

Where possible, upstream management within focus areas should be accomplished first. During implementation, trade-offs will need to be considered between readily available opportunities and those that provide the greatest functional benefit. For example, several extended dry detention (EDD) opportunities may exist that, if implemented, would protect a stream restoration opportunity from damage during storm events. The stream restoration opportunity may have funding available first, while EDD facilities are still in the conceptual design phase and are several years away from funding. Implementers will need to consider the risk of implementing the stream restoration site prior to the upstream protection versus the delayed benefits if the restoration is postponed. In this situation, implementers may decide to construct the stream restoration first if there is a low risk of damage, and then construct the EDD facilities as soon as possible following the restoration.

Tetra Tech recommends three focus areas for watershed management:

- Headwaters Focus Area: The headwaters of Agua Hedionda and Buena creeks, including subwatersheds 1019, 1020, 1021, 1022, and 1024.
- Mainstem Focus Area: The mainstem of Agua Hedionda Creek along SR-02, SR-03 and SR-04 and land draining to the creek that has a significant impact on this reach, including subwatersheds 1013, 1014, 1015, 1016, and 1017.
- Lagoon Focus Area: Agua Hedionda Lagoon and subwatersheds draining directly to the lagoon, including 1000, 1002, and 1004 as well as land within adjacent subwatersheds directly impacting the lagoon.

The focus areas directly address the WPG's goals and objectives. They most strongly address Goals #2 and #3 by representing where the greatest improvement in habitat and water quality can be achieved. The focus areas also address Goal #1 by identifying management opportunities that would help protect downstream efforts and ensure management success overall. Efforts through goals #4 (regulatory compliance support) and #5 (outreach, education, and stewardship) can also be achieved by concentrating management in the focus areas. Emphasis on regulatory compliance and citizen outreach with these focus areas will help ensure that the greatest functional benefits are achieved. The following bulleted lists provide the rationale for selecting these focus areas, and specific management opportunities are recommended within each focus area.

Headwaters Focus Area

Location: The headwaters of Agua Hedionda and Buena Creeks, including subwatersheds 1019, 1020, 1021, 1022, and 1024 (Figure 6-11).

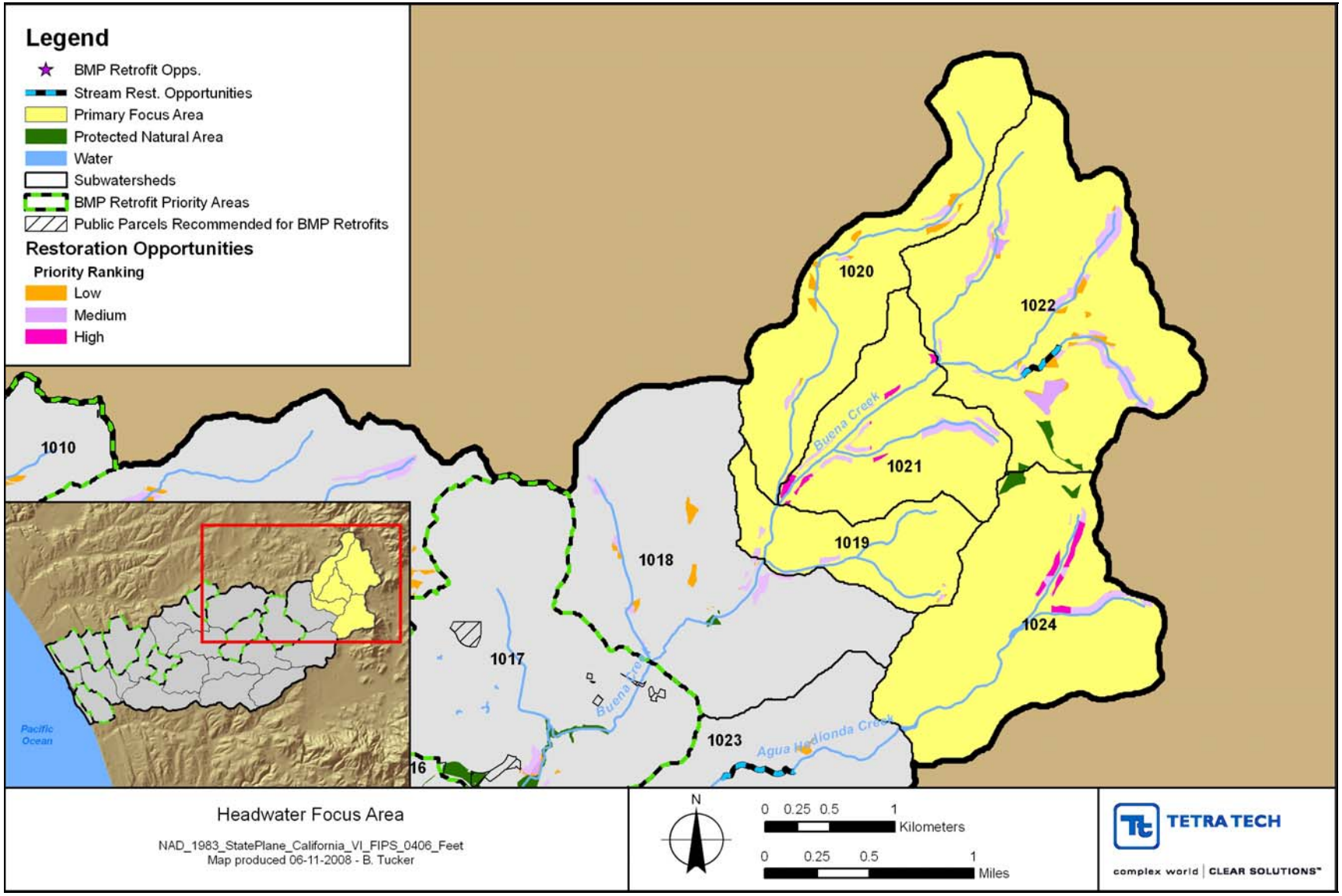

Figure 6-11. Headwaters Focus Area (This focus area contains a large area of land acquisition opportunity that is not shown due to the sensitive nature of these opportunities.)

Rationale for Selection:

- Is the least developed portion of the watershed and contains large opportunities for land preservation (acquisition)
- Has high potential for future development
- Has high potential for future pollutant loading and stream erosion risk
- Buena Creek Headwaters experiences high nitrate loading during extended dry periods. A potential source may be nutrient-laden irrigation return flow from lawns.
- Agua Hedionda Headwaters have been designated as a stakeholder priority for land acquisition and preservation and contain the majority of high priority land acquisition opportunities based on the WMP's overall prioritization criteria.
- Buena Creek Headwaters contain a large number of medium priority acquisition opportunities based on the WMP's overall prioritization criteria.

Complementary Management Actions:

- New Development Site Management: General attention to compliance with new standards and application of innovative practices, including LID, and consideration of enhanced management. Recommend that jurisdictions focus on minimizing nutrient load from new lawns and other landscaping.
- Preservation:
  - Primary focus on preserving top ranking, high priority opportunities: LA-01, LA-02, LA-03, LA-04, LA-06, LA-07, LA-01, LA-11, LA-12, LA-18, LA-35, LA-41, LA-42, LA-43, LA-44, LA-46, LA-48, LA-50, LA-52, LA-53, LA-55, LA-57, and LA-58.
  - Secondary focus on preserving large tracts and remaining riparian areas among the medium priority opportunities, including any stakeholder priorities that are not listed above.
- Buffer Restoration:
  - Primary focus on restoring top ranking, high priority opportunities: BR-03, BR-04, BR-05, BR-06, BR07, BR-08, BR-10, BR-11, BR-12, BR-13, BR-14, and BR-22.
  - Secondary focus on restoring medium priority opportunities. No stakeholder priorities have been identified, but stakeholder input should be considered when selecting projects for implementation.
- Wetlands Restoration: Wetlands restoration opportunities are limited in this focus area to medium and low priority opportunities.
  - Primary focus on the highest scoring opportunities: WR-62, WR-64, WR-65, and WR-66.
  - No secondary focus due to limited opportunity.
- Stream Restoration: Primary focus on SR-06 on Buena Creek.
- BMP Retrofits: BMP retrofits should not be a primary focus, but may be a secondary focus where opportunities are available for EDD and downspout disconnection.
- Monitoring:
  - Pre- and post-construction monitoring of stream restoration sites.
  - Land treatment tracking for new development.

- Citizen Stewardship:
  - Outreach to landowners throughout focus area on the benefits of controlling invasive species and maintaining natural vegetation on their property.
  - Promotion of enhanced new development site management among stormwater regulators and developers.

Mainstem Focus Area

Location: The mainstem of Agua Hedionda Creek along SR-02, SR-03 and SR-04 and land draining to the creek that has a significant impact on this reach, including subwatersheds 1013, 1014, 1015, 1016, and 1017 (Figure 6-12).

Rationale for Selection:

- Contains the largest, contiguous stream restoration need and opportunity within the watershed, which addresses endangered mature trees and channel erosion.
- Includes two subwatersheds targeted for BMP retrofits due to high pollutant loading and a large number of untreated parcels. The loading from these subwatersheds is expected to have an influence on water quality within the stream restoration opportunities and contribute to hydraulic stability.
- Stream, buffer, and wetlands restoration opportunities are adjacent to protected natural areas and public recreational areas.
- Has high potential for complementary habitat restoration, preservation, and flood retention opportunities.

Complementary Management Actions:

- New Development Site Management: General attention to compliance with new standards and application of innovative practices, including LID, and consideration of enhanced management. Recommend that jurisdictions focus on addressing hydromodification to protect channel stability. Most of the focus area is developed, but some potential for future development exists.
- Preservation: Land acquisition opportunities are limited in this focus area to medium and low priority opportunities.
  - Primary focus on preserving riparian portions of medium priority land acquisition opportunities to maintain habitat contiguity and protection of restored channels, including the highest scoring opportunities (including LA-08, LA-20, LA-05) and the nearest opportunities upstream from SR-02 (including LA-126 and LA-348).
  - Secondary focus on preserving stakeholder priorities not listed above and additional upland areas.
- Buffer Restoration:
  - Primary focus on restoring top ranking, high priority opportunities: BR-01, BR-02, BR-16, BR-19, BR-21, BR-30, BR-31, BR-38, BR-39, BR-40, and BR-46. Some overlap occurs with wetlands restoration opportunities.
  - Secondary focus on restoring medium priority opportunities. No stakeholder priorities have been identified, but stakeholder input should be considered when selecting projects for implementation.

- Wetlands Restoration:
  - Primary focus on the top ranking, high priority opportunities that are contiguous and present a significant flood retention opportunity: WR-01, WR-02, WR-04, WR-05, WR-08, WR-09, WR-10, WR-11, and WR-20.
  - Secondary focus on other top ranking, high priority opportunities: WR-07, WR-13, WR-14, and WR-19.
- Stream Restoration:
  - Primary focus on opportunities SR-02, SR-03, and SR-04.
  - Secondary focus on opportunity SR-01.
- BMP Retrofits:
  - Primary focus on EDD upstream of SR-03 and SR-04. For maximum benefit, EDD retrofits should be implemented throughout the focus area in a decentralized manner so that flow control mimics natural hydrology. SW-01 BMPs are provided as example opportunities that would complement stream restoration.
  - For subwatersheds 1015 and 1017, primary focus on retrofits that reduce pollutant loading.
- Monitoring:
  - Pre- and post-construction monitoring of restoration and retrofit sites.
  - Land treatment tracking for new development.
- Citizen Stewardship: Include outreach to property owners along creek regarding maintenance of riparian habitat, control of invasive species, minimization of erosion, and other practices. Small, low-scoring acquisition and restoration opportunities can be used to target outreach.

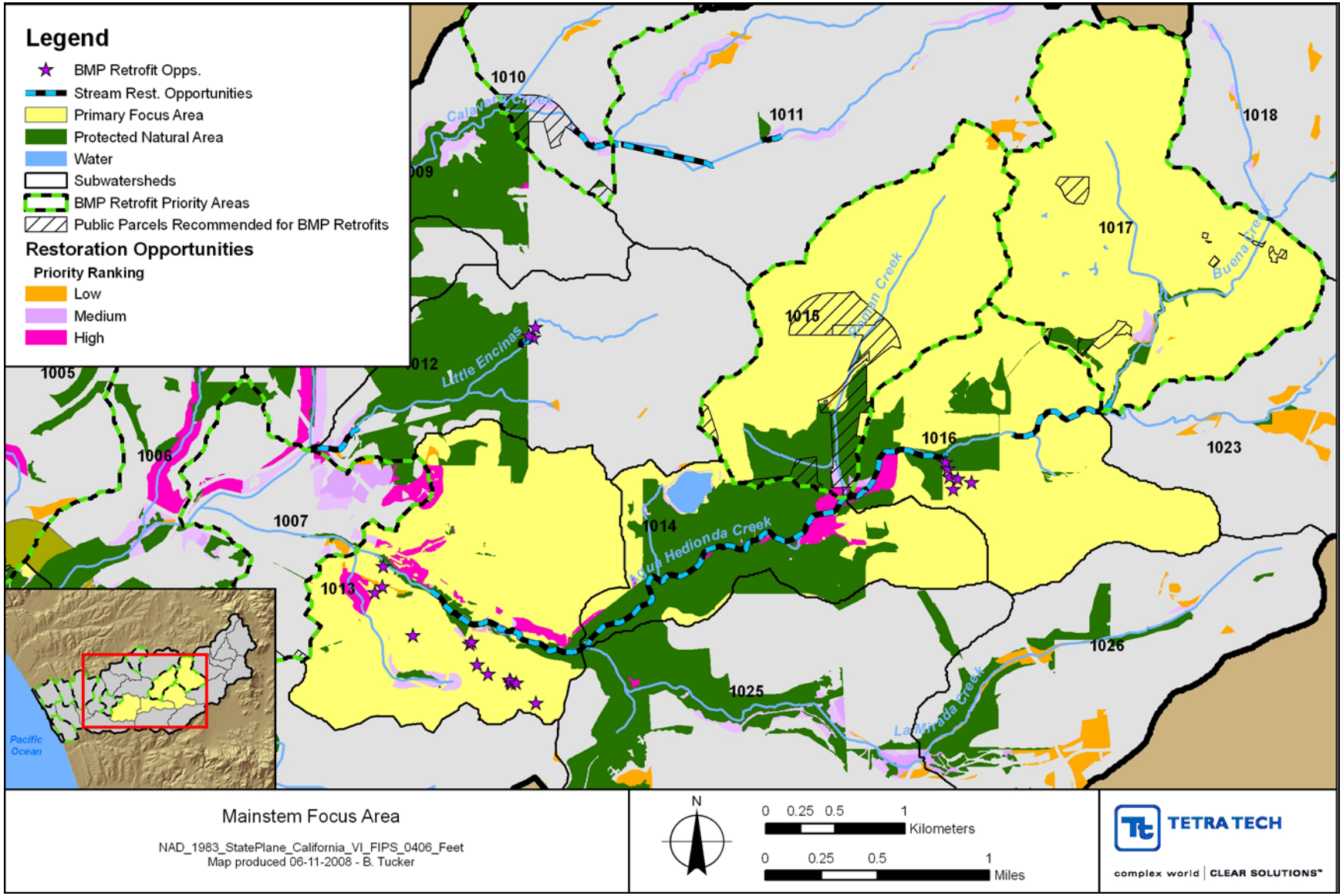

Figure 6-12. Mainstem Focus Area (Land acquisition opportunities are not shown.)

Lagoon Focus Area

Location: Agua Hedionda Lagoon and subwatersheds draining directly to the lagoon, including 1000, 1002, and 1004, as well as land within adjacent subwatersheds directly impacting the lagoon (Figure 6-13).

Rationale for Selection:

- Represents a large portion of the remaining wetland habitat in the watershed.
- Lagoon habitat is listed as a priority under WPG goals and objectives.
- Includes subwatersheds targeted for BMP retrofits due to high pollutant loading and large number of untreated parcels. The loading from these subwatersheds is expected to have an influence on water quality within the lagoon.

Complementary Management Actions:

- New Development Site Management: General attention to compliance with new standards and application of innovative practices, including LID, and consideration of enhanced management. Recommend that jurisdictions focus on minimizing pollutant loading and encouraging developers to incorporate wildlife habitat into development designs. Most of the focus area is developed, but some potential for future development exists.
- Preservation: Land acquisition opportunities are limited in this focus area to medium and low priority opportunities.
    - Primary focus on preserving high scoring, medium-priority opportunities: LA-70, LA-135, LA-137, LA-138, LA-139, LA-140, and LA-208.
    - Secondary focus on preserving additional medium priority opportunities.
- Buffer Restoration: Buffer restoration opportunities are limited in this focus area to medium and low priority opportunities.
    - Primary focus on restoring high scoring, medium-priority opportunities: BR-125, BR-92, BR-89, BR-215, and BR-168.
    - Secondary focus on restoring remaining riparian areas among the medium and low priority opportunities and additional buffer restoration opportunities identified by stakeholders.
- Wetlands Restoration: Wetlands restoration opportunities are limited in this focus area to medium and low priority opportunities.
    - Primary focus on the highest scoring opportunities: WR-62, WR-64, WR-65, and WR-66.
    - No secondary focus due to limited opportunity.
- Stream Restoration: Not applicable.
- BMP Retrofits: Focus subwatersheds #1001, #1003, and #1005. Infiltration BMPs, such as bioretention, and porous pavement should be investigated since soils may be suitable for these practices.
    - Monitoring: Pre- and post-construction monitoring of restoration and retrofit sites.
    - Land treatment tracking for new development.
- Citizen Stewardship: Focus on developing management partnerships among stakeholders and organizations with mitigation needs. Continue and enhance current education efforts on lagoon water quality and habitat.

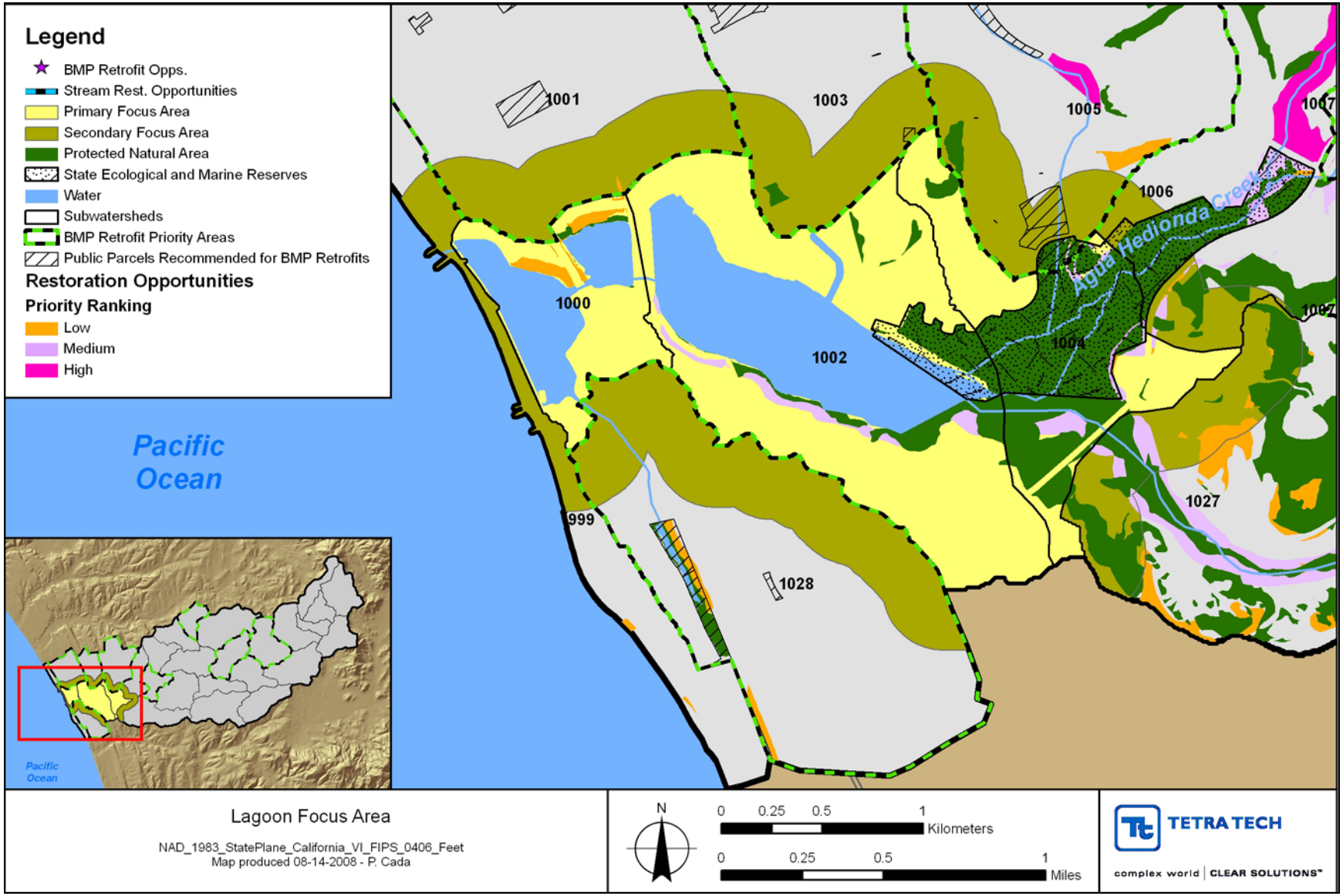

Figure 6-13. Lagoon Focus Area (Land acquisition opportunities are not shown.)

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7 Implementation

7.1 PRIMARY ROLES AND RESPONSIBILITIES IN CARRYING OUT THE ACTIONS

Implementation of the WMP will depend on all stakeholders taking an active role, though the roles will vary greatly by action. Some actions will be implemented jointly by various stakeholders; some actions will be led by NGOs; other actions, because of differing land use authority and permitting requirements, will be implemented separately by local jurisdictions to address specific conditions in specific areas of the watershed; other actions will be led by private or public sector partners needing mitigation opportunities.

The timing of actions, even certainty about their timing, will also vary greatly: some actions are currently ongoing, others have target dates that are time certain, while other actions have a high degree of uncertainty regarding time of implementation.

All implementation actions will be carried out as funds are available. Excepts where actions are noted to be part of ongoing permit or regulatory requirements, the actions recommended are considered to be voluntary, i.e., not conducted through a regulatory program. Many of the actions will, however, help the region achieve multiple goals and regulatory requirements, as outlined in Section 7.6 below.

As discussed in Section 6, two key actions which can greatly enhance implementation of this Plan and long-term watershed management are the hiring of a part-time watershed coordinator and the formation of a watershed council. Of the action items listed below, these are the highest priority for short-term implementation (within 6 to 12 months).

The sections below briefly discuss all of the recommended implementation actions that were introduced in Section 6, and present the recommended roles and responsibilities by each management plan component:

- New development site management
- Preservation
- Riparian buffer, wetland, and stream restoration
- BMP stormwater retrofit
- Monitoring and enforcement
- Citizen stewardship/citizen outreach
- Funding and sustained support

Appendix H provides summary opportunities by type and jurisdiction, a list of recommendations, key groups responsible for implementing each action, and potential funding sources.

7.1.1 New Development Site Management Actions

Leadership Role – Local Jurisdictions

High Priority Action A. Revision of local codes to incorporate recommended *Basic LID* techniques.

Pursuant to the 2007 Order, local government Co-permittees in the region are required to incorporate LID requirements and standards into their local codes and ordinances by March 2010. Tetra Tech screened which LID techniques may be most effective to use in the Agua Hedionda watershed to meet the current

water quality and quantity requirements and the WMP goals and objectives. It is recommended that local governments in the watershed incorporate the following specific *Basic LID* techniques into their local LID standards and codes as preferred for development applications: reducing and disconnecting impervious area; extended dry detention; swales or bioretention; and stream buffers. General guidelines for establishing stream buffers in new development and redevelopment are provided in Appendix L.

Action B. Tracking compliance with stormwater management and LID.

Pursuant both to LID ordinance revisions enacted by local governments in March 2008 and future revisions to be enacted in March 2010, local planning and engineering staff should review the site plan and engineering plans for compliance with stormwater treatment and LID requirements. Two of the Watershed Management Indicators are percent of future development using the *Basic LID* techniques recommended in Action A and percent of future development using BMPs. Therefore the watershed coordinator should work with the local jurisdictions to track this indicator every 2 to 3 years.

If the planned redevelopment does not occur as represented in the model scenarios (e.g., without treatment as required by the 2007 Order), the watershed could be at greater risk of degradation. Given this risk, the coordinator should track the extent of redevelopment in the watershed and how it is treated. If significantly less redevelopment occurs, additional BMP retrofits to untreated development should be considered.

Responsible Groups: Local planning and engineering department, Watershed Coordinator.

Action C. Implementation of the *Enhanced LID* techniques as new hydrology and/or new water quality requirements are adopted.

The RWQCB is currently drafting a sediment and a bacteria Total Maximum Daily Load (TMDL) for the Agua Hedionda Lagoon and Co-permittees will be soon required to adopt Hydromodification requirements in accordance to the 2007 Order. If, as a result, new water quality and or hydrology requirements are adopted in the future covering the Agua Hedionda watershed, it is recommended that Co-permittees consider adding *Enhanced LID* requirements to their local codes and ordinances. Based on a screening of the LID techniques that are likely to be most effective in the Agua Hedionda watershed, the enhanced requirements would include stronger efforts to reduce impervious area and disconnect impervious areas; use of porous pavement in select areas of the site, and use of rainwater capture cisterns. This would be in addition to the "*Basic LID* techniques" listed above.

Responsible Groups: Local planning and engineering departments.

Action D. Feasibility study for cisterns, porous pavement, and bioretention without irrigation.

Local engineering departments should jointly seek funding or sponsorship of pilot studies for appropriate design and use of porous pavement and appropriate plantings for bioretention cells without irrigation. In addition studies should be undertaken to evaluate the cost effectiveness of using cisterns in the watershed. The local jurisdictions should also oversee the pilot studies and share results. These studies could be funded as pilot studies through upcoming grant opportunities, as partnership projects with local water authorities, or as demonstration projects sponsored by product vendors.

Responsible Groups: Local engineering departments.

7.1.2 Preservation Actions

Leadership Role – Project Proponent and Watershed Coordinator/Watershed Council

High Priority Action A. Field evaluation.

Conduct a site visit of each of the 25 priority preservation sites to determine if the site has been disturbed and to confirm that the site still exhibits characteristics that made it a priority preservation site. Use checklist drawn from prioritization report. If possible, organize a field evaluation (1 or 2 days) event with watershed partners. Alternatively, the Project Proponent, once identified, could do the field evaluation.

Responsible Groups: NGOs, CA Fish and game, US Fish and Wildlife, local jurisdictions, project proponent.

High Priority Action B. Identify project proponent (site-by-site).

The Project Proponent is one or more entities that wish to acquire the project site. The proponent may be a local government or other agency, an NGO and/or a private sector entity that has mitigation needs.

Responsible Groups: Watershed Coordinator, local jurisdictions, NGOs

High Priority Action C. Landowner outreach.

Develop landowner outreach materials that convey a unified message about the area of interest, the parcel's importance in protecting the streams and lagoon, potential benefits to the landowner of selling and/or donating the property or conservation easements, etc. Develop outreach strategy (coordinating with watershed partners) so that each landowner is contacted by the appropriate person. Verify that landowner information developed as part of WMP information is up-to-date.

Responsible Groups: NGOs for private property, local jurisdictions for public property.

Action D. Coordination with cultural resources priorities.

There are confidential databases of cultural resource sites in the watershed. If one or more of the preservation sites also coincides with a cultural resource site, it could raise the priority of the site and increase the potential funders for acquisition.

Responsible Groups: NGOs and Project Proponent

Action E. Secure funding sources.

Responsible Groups: Project Proponent, Watershed Coordinator/Watershed Council, NGOs, CA Fish and Game, US Fish and Wildlife, ACOE, local jurisdictions

Action F. Identify/secure stewardship organizations and develop stewardship plan.

An organization must be identified to provide long-term stewardship of the site, which includes but is not limited to fire prevention, invasive species control, and replanting. The Stewardship organization should develop a stewardship plan and ensure that funding is provided to implement it.

Responsible Groups: Project Proponent and stewardship organization.

Action G. Purchase property.

Purchase could include fee simple acquisition, purchase of conservation easements, donation of land, and/or bargain sale.

Responsible Groups: Project Proponents, NGOs, CA Fish and Game, US Fish and Wildlife, ACOE, local jurisdictions

Action H. Annual acquisition/restoration workshop.

Each year watershed partners should meet to discuss which lands have been acquired and restored in the previous 12 months, new sites that have been identified that should be considered for acquisition or restoration, new acquisition and restoration initiatives, priority sites that have been developed and therefore need to be removed from consideration, proposals to revise the criteria and weighting for prioritizing sites, new potential funding sources, etc. The new Watershed Coordinator and Watershed Council should organize and host the event.

Responsible Groups: Watershed Coordinator/Watershed Council, NGOs, CA Fish and Game, US Fish and Wildlife, ACOE, local jurisdictions

Action I. Update/maintain prioritization tool.

The WMP prioritization tool should be updated annually based on information from the annual acquisition/restoration workshop.

Responsible Group: Watershed Coordinator

7.1.3 Riparian Buffer, Wetland and Stream Restoration

Leadership Role – Project Proponent

Note: The New Development Site Management actions include preservation of stream buffers in future development applications in the watershed. This is separate from the recommended riparian buffer restoration projects (see New Development Site Management High Priority Action A).

High Priority Action A. Identify project proponent (site-by-site).

The Project Proponent is one or more entities that wish to acquire the project site. The proponent may be a local government or other agency, an NGO and/or a private sector entity that has mitigation needs.

Responsible Groups: Watershed Coordinator, local jurisdictions, NGOs

High Priority Action B. Field evaluation.

Conduct a site visit to confirm the site has not been disturbed and to confirm that the site meets criteria which made it a priority buffer, wetland, or stream restoration site. Use checklist from WMP prioritization report.

Responsible Group: Project proponent.

High Priority Action C. Landowner outreach.

Verify that landowner information developed as part of WMP information is up-to-date. Develop outreach materials regarding the importance of the site, generally what is being proposed, the environmental benefits of the project, and the potential tax benefits to the property owners.

Responsible Group: Project proponent, NGOs

Action D. Contact ACOE and other permitting agencies.

Have pre-design meeting with the ACOE, CA Fish and Game, local engineering departments, and other potential permitting agencies to determine which types of permits will be needed for the project site.

Responsible Group: Project Proponent

Action E. Coordinate with local trails and infrastructure plans.

Determine if the site is part of a local water, sewer, road, or other infrastructure plan or a trails plan that would either nullify restoration of the site or would complement restoration of the site.

Responsible Group: Project Proponent

Action F. Coordination with cultural resources priorities.

There are confidential databases of cultural resource sites in the watershed. If one or more of the restoration sites also coincides with a cultural resource site, it could raise the priority of the site and increase the potential funders for restoration. Alternatively, a cultural resource site may nullify disturbance of the site for restoration.

Responsible Groups: Project Proponent and NGOs

Action G. Develop design and cost estimates.

Planning-level, conceptual costs were estimated and presented in the WMP for the buffer, wetland and stream restoration opportunities however, additional analysis, modeling and design work will be required to support the restoration opportunities and to develop detailed cost estimates for funding allocation.

Responsible Groups: Project Proponent

Action H. Secure needed permits.

Depending on the nature of the proposed activities projects, agency permits may be required, including Coastal Development Permit for construction within the Coastal Zone, Section 404 Permit from the U.S. Army Corps of Engineers construction impacting to jurisdictional waters of the U.S., 401 Water Quality Certification from the RWQCB for conditions placed in the Section 404 Permit to protect water quality, Streambed Alteration Agreement from California Department of Fish and Game due to impacts to jurisdictional wetlands and streambeds, and Local Development Permits (i.e., grading, building or other construction related permits). Section 7 consultation under the Endangered Species Act may be required if a Corps 404 permit is needed, particularly in the case where a project will be in critical habitat or where endangered species are located. Proposed watershed management projects may also require an evaluation under the California Environmental Quality Act (CEQA), which requires state and local agencies to evaluate the environmental impacts of their actions. If a project involves the use of federal funds, an evaluation under the National Environmental Policy Act (NEPA) may also be required.

Responsible Groups: Project Proponent

Action I. Secure funding sources.

A variety of funding options may be used to support restoration projects depending on the type of project and how it matches up with funding sources.

Responsible Groups: Project Proponent, Watershed Coordinator/Watershed Council, NGOs, CA Fish and Game, US Fish and Wildlife, ACOE, local jurisdictions

Action J. Identify/secure stewardship organizations and develop stewardship plan.

An organization must be identified to provide long-term stewardship of the site, which includes but is not limited to fire prevention, invasive species control, and replanting. The Stewardship organization should develop a stewardship plan and ensure that funding is provided to implement it.

Responsible Groups: Project Proponent and stewardship organization.

Action K. Implement projects.

Responsible Groups: Project Proponents

Action L. Annual acquisition/restoration workshop.

Each year watershed partners should meet to discuss which lands have been acquired and restored in the previous 12 months, new sites that have been identified that should be considered for acquisition or restoration, new acquisition and restoration initiatives, priority sites that have been developed and need to be removed from consideration, proposals to revise the criteria and weighting for prioritizing sites, new potential funding sources, etc. The new Watershed Coordinator and Watershed Council should organize and host the event.

Responsible Groups: Watershed Coordinator/Watershed Council, NGOs, CA Fish and Game, US Fish and Wildlife, ACOE, local jurisdictions

Action M. Update/maintain prioritization tool.

The WMP prioritization tool should be updated annually based on information from the annual acquisition/restoration workshop.

Responsible Group: Watershed Coordinator

7.1.4 Stormwater BMP Retrofit

Leadership Role – Local Jurisdictions

Action A. Site selection and feasibility (untreated areas).

The WMP identified areas that have the highest pollutant loading and stormwater volume impacts and that also were developed before stormwater BMPs were required. These "untreated" areas need to be surveyed to identify promising sites for BMP retrofits and to screen for project feasibility on the highest ranking sites. As redevelopment is monitored over time, untreated areas slated for redevelopment should be considered for BMP retrofits if redevelopment trends change and the land is likely to remain untreated. Each local government engineering department in the watershed should conduct individual surveys for untreated areas within their jurisdiction.

Responsible Group: Local engineering departments

Action B. Collection of additional site data.

The WMP identified five potential demonstration sites that may complement the proposed stream restoration projects. Additional data need to be collected to assist in BMP selection, sizing, and location.

Responsible Group: Local engineering departments (individual surveys for untreated areas within their jurisdiction)

Action C. Landowner outreach.

Verify that landowner information developed as part of WMP information is up-to-date. Develop outreach materials regarding the importance of the site, generally what is being proposed, the environmental benefits of the project, flood reduction benefits to the property owner, and the potential fee waivers or other incentives for the property owners.

Responsible Group: Local engineering departments

Action D. Preliminary design and cost estimate.

Based on final selection of BMPs for the site, develop preliminary design and cost estimates.

Responsible Group: Local engineering departments

Action E. Secure needed permits.

It is anticipated that BMP retrofits on the demonstration sites and in the untreated areas will be on sites that have been highly disturbed in the past and therefore would not require the types of permits required for restoration projects. However, some permits may be required, depending on the BMP selected and the site location.

Responsible Group: Local engineering departments

Action F. Secure funding sources.

A variety of funding options may be used to support restoration projects depending on the type of project and how it matches up with funding sources.

Responsible Groups: Project Proponent, Watershed Council, NGOs, CA Fish and Game, US Fish and Wildlife, ACOE, local jurisdictions

Action G. Implement projects.

Responsible Group: Local engineering departments

Action H. Monitor effectiveness/efficacy of demonstration projects.

Given that the use of LID techniques is relatively new in the San Diego region, there is a need to monitor the effectiveness of these techniques in managing stormwater peak volume and pollutant loading. This monitoring should include measuring inflow and outflow of the BMPs as well as downstream conditions.

Responsible Groups: Local engineering departments and universities

7.1.5 Monitoring and Enforcement

Leadership Role – Local Jurisdictions and NGOs

Action A. Long term stream and lagoon monitoring program.

Collect and assess physical, chemical, and biological data for streams in the watershed and the lagoon through a long-term monitoring program. This monitoring is to supplement current monitoring by Co-permittees (see recommendations in Section 6.5). Periodically report on monitoring results using baseline water quality data from the WMP and water quality goals as benchmarks for comparison.

Responsible Groups: Co-permittees, NGOs, universities

Action B. Long-term wetlands monitoring (CRAM).

Periodically collect and assess CRAM data for wetland areas of the watershed. As a part of the WMP, the Southern California Coastal Water Research Project (SCCWRP) conducted a one-day CRAM training event which was well attended by NGOs, agencies and local jurisdictions. A partnership with SCCWRP, through a local NGO or university would be a good partnership to implement this action long-term. It is important that the data be fully analyzed and made available to stakeholders at a central location such as the Agua Hedionda Lagoon Discovery Center. Periodically report on monitoring results using CRAM monitoring results from the WMP as a benchmark for comparison.

Responsible Group: NGOs

Action C. Inspections and maintenance of sanitary sewer systems.

Check lines for leaks, illicit connections, and overflows. Inspect sewage conveyance systems (pipes, pump stations, manholes) to ensure proper functioning. This ongoing work is included in the new Sanitary Sewer Order (State Waste Discharge Requirements (WDR) Order 2006-0003-DWQ)

Responsible Group: Local wastewater/sewer departments

Action D. Monitoring effectiveness/efficacy of BMP demonstration projects.

Given that the use of LID techniques is relatively new in the San Diego region, there is a need to monitor the effectiveness of these techniques in managing stormwater peak volume and pollutant loading. This monitoring should include measuring inflow and outflow of the BMPs as well as downstream conditions. Universities would be appropriate potential partners in this effort.

Responsible Groups: Local engineering departments and universities

Action E. Inspections and maintenance of storm drainage systems.

Increase efforts to clear and maintain storm drains and drainageways to remove deposited materials. For storm drain pipes, cleaning is especially needed with pipes too flat to be self-cleansing. Clearing of drainageways should involve routine inspection of drainage channels and creeks. This ongoing work is also included in "Regional Channel Maintenance" program. The Regional Channel Maintenance Workgroup has developed a guide for maintenance activities which should facilitate this recommended action.

Responsible Groups: Local jurisdictions

Action F. Construction site inspection and enforcement action.

During construction, conduct onsite inspections and take enforcement actions, as needed. This ongoing work is also included in the 2007 Order.

Responsible Groups: Local jurisdictions

Action G. Stormwater BMP inspection and enforcement.

Regularly inspect stormwater controls to certify their proper functioning and to require repair of failing systems. This action is also included in the 2007 Order.

Responsible Groups: Local jurisdictions

Action H. Tracking key watershed management plan indicators.

In order to measure the effectiveness of the WMP and the actions taken in meeting the goals and objectives, it is important to track the WMP key indicators over time. These indicators include, but are not

limited to, stream water quality, riparian habitat extent, percent change in the watershed's natural area, location of mature tree species, percent imperviousness, percent of new development implementing LID, etc. Tracking of key WMP indicators will require ongoing support, commitment and funding. Many of the indicators to be tracked will require analysis using GIS tools and modeling. Although some of the indicators can be tracked by NGOs, complete implementation will best be performed by the Watershed Coordinator or hiring a consultant through the Watershed Council or NGOs. If implementation of the WMP becomes an integral part of local jurisdictions' WURMP and TMDL implementation programs this action could fall under their assessment purview.

Responsible Groups: Watershed Coordinator/Watershed Council, NGOs, local jurisdictions

7.1.6 Citizen Stewardship/Public Outreach

Leadership Role – Watershed Coordinator/Watershed Council, Local Jurisdictions

High Priority Action A. Collaborative Agua Hedionda Watershed Council.

This includes creation of a permanent watershed council supported by a part-time watershed coordinator. It is recommended that each local government have an elected official as representative on the board of the Watershed Council. In addition to local jurisdictions, the watershed council will be stronger if it contains members from agencies with authority in the watershed (wildlife agencies, US Army Corps of Engineers, RWQCB, sewer agencies and water districts, etc.). To be most effective, the Watershed Council should be formalized with an agreement in the form of a Memorandum of Understanding, Joint Powers Agreement or Memorandum of Agreement between local jurisdictions. The Council may also wish to form as a non-profit organization. It is also recommended that the Council have several stakeholder committees: watershed partners, technical advisory committee, and funding committee.

Responsible Group (for forming Council): local jurisdictions

Action B. Reporting to local governments and local boards.

The Watershed Council should meet with these boards during their regularly scheduled meetings on an annual basis to update them on the needs, benefits and progress of the WMP implementation.

Responsible Group: Watershed Coordinator/Watershed Council

Action C. Distribution of educational materials.

Educational materials can include brochures, agency bill inserts (brief flyers in water bills), press releases, presentations to schools and civic groups.

Responsible Groups: Watershed Coordinator/Watershed Council, local jurisdictions, NGOs

High Priority Action D. LID workshops and training.

The workshops should include general LID education, however they should focus on local knowledge obtained from the modeling effort in this WMP (see Section 6.1 and Appendix J). It is recommended that workshops and training for municipal staff is performed by other professionals or professional organizations.

Responsible Groups: Local jurisdictions, NGO

Action E. Annual awards program.

An annual awards program is recommended to encourage and recognize local efforts towards watershed protection. Awards should be considered for individuals, Public Officials, developers, businesses, or NGOs.

Responsible Group: Watershed Coordinator/Watershed Council

Action F. Annual progress workshop.

This workshop would allow watershed partners to discuss progress made in implementing the WMP and new initiatives for the coming year.

Responsible Groups: Watershed Council, NGOs, local jurisdictions

Action G. Management partnerships.

Establish partnerships within the watershed to leverage programs towards project implementation.

Responsible Groups: Watershed Coordinator/Watershed Council, Local jurisdictions, University, Private mitigation proponents (Developers, Poseidon, Caltrans, Cabrillo, Power Plants), US Fish and Wildlife, CA Fish and Game, SANDAG, etc.

Action H. Aqua Hedionda Website.

The website should maintain program information including an overview of the WMP, announcements, events calendar, meeting archives, educational material ongoing projects, and links to other related programs. It should be maintained on a regular basis which will include staff time to prepare updates and funding to support website hosting.

Responsible Group: Watershed Coordinator/Watershed Council

7.1.7 Funding and Sustained Support

Leadership Role – Watershed Coordinator and Local Jurisdictions

High Priority Action A. Grant Programs.

Successfully tapping into grant programs will involve identifying target grant programs, matching projects to grant programs, identifying partnerships and matching funds, contacting appropriate agencies, and preparing grant applications. A wide range of potential funding options are discussed in Section 6.7. The responsibility for obtaining grant funding falls with the Watershed Coordinator, local jurisdictions and NGOs as grant applicant and project sponsors.

Responsible Groups: Watershed Coordinator, local jurisdictions, NGOs

High Priority Action B. Coordination with agencies.

Identify target agencies and funding opportunities through agency programs. Meet quarterly with appropriate agencies to discuss priorities and opportunities.

Responsible Groups: Watershed Coordinator, local jurisdictions, NGOs

High Priority Action C. Mitigation programs.

Identifying win-win opportunities for addressing mitigation needs and implementing preservation/restoration projects requires aligning projects with mitigation banks and in-lieu fee

programs; obtaining agency support for mitigation banks and in-lieu fee programs; and conducting outreach to the development community, public and private sector entities in need of mitigation credits.

Responsible Groups: Watershed Coordinator, local jurisdictions, NGOs

High Priority Action D. Watershed Council Support (Watershed Coordinator Support).

The Watershed Council and Watershed Coordinator will require startup and ongoing funding support. Key steps to securing this support include preparing a scope for the watershed council and staffing needs ($); obtaining local support from agencies, jurisdictions, NGOs and the business community; identifying grant/funding opportunities and pursue with grant proposals; explore redirection of City fees.

Responsible Groups: startup – local jurisdictions and NGOs; ongoing support – Watershed Coordinator, local jurisdictions, NGOs, other watershed partners

7.2 TIMELINES AND MILESTONES

Clearly some recommended actions take priority, either because they are most essential to preservation and restoration of the Agua Hedionda Watershed, or because they are required before other actions can move forward, or both. A number of the recommended actions are ongoing, particularly the monitoring and enforcement activities. Appendix H, Implementation Actions, provides proposed timelines for each of the recommended WMP actions, noting where timelines of certain actions are yet to be determined.

Below are the proposed timelines for High Priority Actions.

- Hire part-time Watershed Coordinator – September 2008-March 2009
- Establish Watershed Council – September 2008-September 2009
- Conduct field evaluation of priority preservation sites – August 2008-February 2009.
- Identify project proponents for preservation and restoration projects – TBD (potentially concerted effort could begin after hiring watershed coordinator)
- Conduct field evaluation/verification for the restoration sites– TBD dependant on indentifying project proponents
- Conduct landowner outreach for preservation and restoration projects – TBD dependant on indentifying project proponents
- Host annual preservation/restoration workshop – August 2009 (and annually thereafter)
- Conduct LID workshops and training – TBD (dependent on local jurisdiction resources and grants)
- Revise local codes to include *Basic LID* techniques and standards – March 2010
- Track key watershed indicators – 2011-2012 (every 3 - 5 years thereafter)
- Secure Funding –TBD (potentially concerted effort could begin after hiring watershed coordinator)

Ongoing programs that affect Agua Hedionda watershed planning and funding efforts also have key milestones that should be tracked over the next several years. These program milestones include:

- Requirements for Sanitary Sewer Order (State Waste Discharge Requirements (WDR) Order 2006-0003-DWQ) for Wastewater Collection Agencies
- Water Conservation Ordinance adoption by local jurisdictions

- MSCP and MHCP (including subarea and local plans) implementation (County and cities)
- Lagoon TMDL
- Reissuance of San Diego County Municipal Stormwater Permit (2007 Order)
- IRWMP Update – Prop 84 Planning Grant
- Stormwater Grants
- Flood Control Grants

7.3 ESTIMATED COSTS AND FUNDING

Estimated Cost and Funding

Implementation of the WMP will require funding and sustained support. Estimated cost for some of the key WMP components are summarized below. The cost of the citizen stewardship actions is yet to be determined. These costs are also summarized in Appendix H by type of opportunity and jurisdiction in which the opportunity is located.

New Development Site Management

Local governments' revision of codes and ordinances to incorporate the use of LID is an existing requirement, not an added cost to local jurisdictions and the development community of the WMP. Studies have shown that use of LID can in some cases reduce overall development costs, depending on the site design. These reductions are often found in reduced paving costs (due to narrower streets, shorter driveways, etc.), reduced infrastructure costs (e.g., using swales in place of curb and gutter), and reduced grading costs. Cost saving site designs are more often achieved in rural and suburban development rather than highly urbanized developments.

Preservation

25 properties

387 acres to preserve

$38 to $95 million in total acquisition costs (fee simple acquisition)

Cost per acre: $45,000 to $280,000 per acre

Potential Funding Sources: Mitigation Banks and In-lieu program; Project Mitigation Needs (developers, Caltrans, etc.); Grants – SWRCB (Prop 84), DWR (Prop 84 and 1e), San Diego County IRWM (Prop 84), EPA 319(h), CA Ocean Protection Council, Wetland Recovery, State Tribal and local Government (EPA); MHCP and MSCP implementation, U.S. Fish & Wildlife, California Department of Fish & Game

Riparian Buffer Restoration

27 properties

129 acres to restore

$10 to $19 million in total acquisition and restoration costs

Total cost per acre: $42,000 to $160,000 per acre

Potential Funding Sources: Mitigation Banks and In-lieu programs

Project Mitigation Needs (developers, Caltrans, SANDAG Transnet, etc.); Grants –SWRCB (Prop 84), DWR (Prop 84 and 1e), San Diego County IRWM (Prop 84), EPA 319(h), CA Ocean Protection Council, Wetland Recovery, State Tribal and local Government (EPA)

Wetland Restoration

12 properties

47 acres to restore

$2 to $10 million in total acquisition and restoration costs

Total cost per acre: $42,000 to $250,000 per acre

Potential Funding Sources: Mitigation Banks and In-lieu programs

Project Mitigation Needs (developers, Caltrans, SANDAG Transnet, etc.); Grants – SWRCB (Prop 84), DWR (Prop 84 and 1e), San Diego County IRWM (Prop 84), EPA 319(h), CA Ocean Protection Council, Southern California Wetland Recovery Project, State Tribal and local Government (EPA)

Stream Restoration

12 reaches to restore

32,000 feet, or 6 miles to restore

$10 to $11 million in restoration costs

Potential Funding Sources: Mitigation Banks and In-lieu programs

Project Mitigation Needs (developers, local jurisdictions' CIP project, Caltrans, SANDAG Transnet, etc.); Grants (SWRCB (Prop 84), DWR (Prop 84 and 1e), San Diego County IRWM (Prop 84), EPA 319(h), CA Ocean Protection Council, Wetland Recovery, State Tribal and local Government (EPA)

BMP Retrofit Demonstration Projects

Six BMP retrofit sites were identified. Some sites included multiple BMPs on the conceptual design.

Table 7-1 provides conceptual level unit costs associated with each BMP:

Table 7-1. Stormwater Retrofit Costs

BMP	Unit Price
Bioretention	$6.00/cf
Bioswales	$1.00/cf
Cisterns	$7.5K/1,800 gallons
Depressed medians	$1.00/cf
Grading	$2/cy
Media filter	$4.5/cfs -$3k/catch basin
Pervious paving	$10 - $15/sf
Trees	$3.50/sf
Shrubs	$1.75/sf
Trash Traps	$350/opening

Potential Funding Sources: Local jurisdictions, vendors; Grants (EPA 319)

Monitoring and Enforcement

Many of the monitoring and enforcement actions fall within current local government responsibilities and do not pose additional management cost, e.g. inspections/maintenance of sanitary sewer systems; inspections/maintenance of storm drainage systems; construction site inspection, stormwater BMP Inspection, and Co-permittee stream and lagoon monitoring. The cost of the enhanced monitoring, of continued CRAM monitoring, and of tracking watershed indicators has not been determined.

Potential Funding Sources: Local jurisdictions; Grants

Citizen Stewardship

Cost to be determined

Potential Funding Sources: SWRCB (Prop 84); DWR (Prop 84 and 1e); San Diego County IRWM (Prop 84); EPA 319(h); CA Ocean Protection Council; Southern California Wetland Recovery Project, State Tribal and local Government (EPA)

Funding and Sustained Support

$10,000 grant for forming Watershed Council (one time cost)

$100,000 annually for watershed coordinator (preliminary estimate including salary, fringe, and overhead)

Potential Funding Sources: Grants: Southern California Wetland Recovery Project, Department of Conservation; Local jurisdictions; Local businesses, Private Foundations

7.4 ESTIMATED IMPACTS AND BENEFITS

Below we present how each of the key actions contribute to preservation, restoration and enhancement of the watershed, where possible using results of the watershed and site scale modeling of the Agua Hedionda watershed as well as accepted literature values. The information can be used to help educate citizens, businesses, and elected officials about the benefits of the actions recommended and used in grant applications to support implementation efforts.

While the benefits are discussed individually, it is important to note that the recommended actions work together to achieve greater functional uplift for the watershed. In fact, the Focus Areas are designed to leverage actions and maximize overall preservation and restoration benefits for the Agua Hedionda watershed.

7.4.1 LID Implementation Benefits

LID Implementation Benefits

When looking at cumulative pollutant loading and peak volume near the mouth of the watershed, the watershed modeling indicates that if certain land conversion (e.g., from agricultural to LID development) is realized, *Basic LID* techniques are implemented for future development and redevelopment, and land preservation is achieved, communities in the watershed should be able to "hold the line" on pollutant loading and peak discharge. Implementing *Enhanced LID* techniques would achieve even greater cumulative benefits in the watershed.

What are the LID benefits on a site scale? Table 7-2 through Table 7-5 show the results of the site pollutant loading analysis/modeling of different types of development in the Agua Hedionda watershed. The percentages reflect the reduction in load from an untreated site with default percent impervious area assumptions. The *Basic LID* implementation scenario assumes adoption of practices meeting the 2007

order, with minimal incorporation of additional LID. The *Enhanced LID* implementation scenario assumes the development site not only meets the 2007 order requirements, but additional LID measures have been incorporated with some consideration for economic feasibility. The *Enhanced LID* scenarios are just an example of what might be achieved; other configurations are possible, and may be influenced by changes to regulations resulting from pending TMDL and hydrology implementation requirements. Details about the scenarios are discussed in Section 6.1 and Appendix J.

It is estimated that implementation of *Basic LID* techniques for new development would achieve 60 percent to 70 percent reduction in sediment load and an 88 percent reduction in fecal coliform load, which are key problem parameters for the watershed and lagoon. It is expected to also achieve a 35 to 45 percent reduction in Total Nitrogen and a 25 to 30 percent reduction in Total Phosphorus. Implementation of the *Enhanced LID* techniques are predicted to provide substantially greater reductions in Total Nitrogen and Total Phosphorus, especially for multi-family, commercial, and industrial development (e.g., approximately 50 to 65 percent reduction in Total Nitrogen compared with the 35 to 45 percent reduction under the *Basic LID* approach).

Table 7-2. Medium Density Residential LID Benefits

Medium Density Residential	Percent Reduction of Load	
	Basic LID	***Enhanced LID***
Total Nitrogen	45%	58%
Total Phosphorus	30%	45%
Sediment	70%	71%
Fecal Coliform	88%	91%

Table 7-3. Multifamily Residential LID Benefits

Multifamily Residential	Percent Reduction of Load	
	Basic LID	***Enhanced LID***
Total Nitrogen	35%	65%
Total Phosphorus	25%	60%
Sediment	59%	68%
Fecal Coliform	88%	93%

Table 7-4. Commercial Development LID Benefits

Commercial	Percent Reduction of Load	
	Basic LID	***Enhanced LID***
Total Nitrogen	37%	58%
Total Phosphorus	26%	54%
Sediment	62%	67%
Fecal Coliform	88%	98%

Table 7-5. Industrial Development LID Benefits

Industrial	Percent Reduction of Load	
	Basic LID	***Enhanced LID***
Total Nitrogen	37%	48%
Total Phosphorus	26%	32%
Sediment	61%	74%
Fecal Coliform	88%	88%

The previous tables demonstrate the potential benefits of using stormwater management and LID techniques to reduce pollutant load washoff from stable, developed sites. However, an additional impact from development is the increase in peak flow and runoff volume resulting of conversion of natural land cover to developed pervious and impervious surfaces. What results is an increased risk of channel erosion, from both higher peaks and longer durations of flow. Figure 7-1 compares design storm event hydrographs for the Basic versus *Enhanced LID* scenarios for multifamily development. As seen in the *Basic LID* hydrographs on the left, the extended dry detention basin designed under the 2007 order requirements reduces the peak flow to values lower than existing conditions (assumed to be undeveloped land) for all three design storms. However, for the 5- and 10-year events there is a period of time when the post-with-BMPs flow exceeds existing conditions, resulting in a longer duration of potentially erosive conditions in the receiving stream. The *Enhanced LID* scenario incorporates large cisterns (with assumed water reuse) that provide additional runoff storage, and greatly reduce flow during the most potentially erosive portion of the post-with-BMPs hydrograph, nearly matching the existing hydrograph. LID techniques can not only improve pollutant removal, but also reduce total runoff volume and change storm event hydrologic response to more closely mimic natural conditions. Hydrographs for Medium Density Residential, Commercial, and Industrial development are provided in Appendix J.

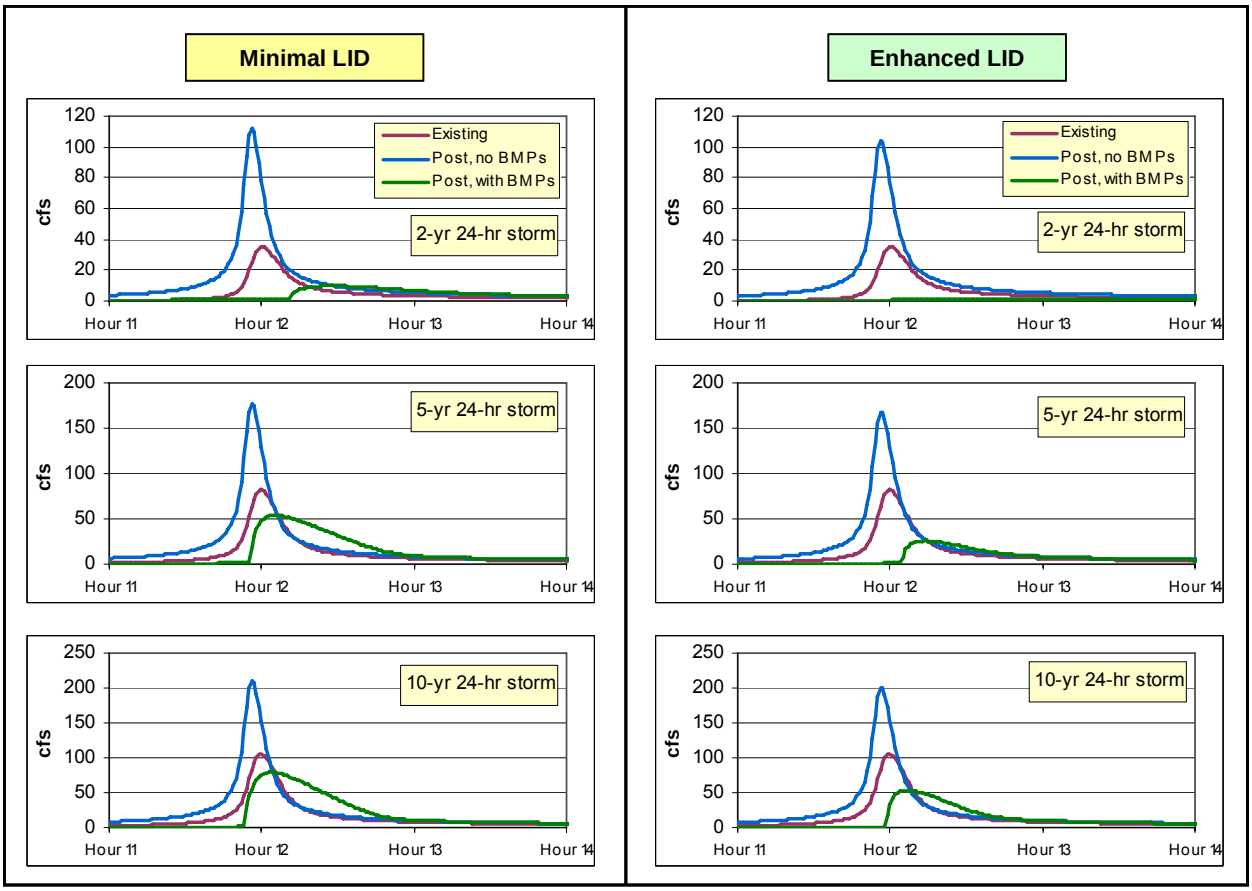

Figure 7-1. Projected Hydrographs for *Basic LID* and *Enhanced LID* Scenarios for Multifamily Development

7.4.2 Preservation Benefits

In the Agua Hedionda watershed, land preservation directly supports the WPG goal "preserve habitat in the watershed" (Goal #2). It also supports the goals to restore watershed functions (Goal #3), and to support compliance with regulatory requirements (Goal #4).

While the habitat benefits of land preservation are difficult to quantify, the watershed modeling results do shed light on the benefits of pollution and runoff prevention. For example, if the zoning for a particular parcel allows medium density residential development, then developing the land would generate double stormwater runoff and double the total phosphorus per acre runoff than preserving the land in open space (see Table 7-6). If zoning allows high density residential, it would generate approximately 6 times the stormwater runoff and 20 times the total phosphorus as preserving it in open space. The table shows that preservation of land can significantly reduce fecal coliform, total nitrogen, total phosphorus, and surface runoff volume on a site basis.

Table 7-6 suggests that sediment loading, in some cases, can be lower or similar when developed compared to when preserved. First, the watershed land in its natural state has erosive soils and high sediment loading. When an area develops, it has more impervious area and less natural area that can erode. However, it is important to note that the figures shown in Table 7-6 do not include the sediment impacts due to greater impervious area and associated stormwater volume (i.e., hydromodification and stream bank erosion). Therefore, overall sediment reduction benefits can be better understood by comparing both the sediment loading and surface runoff columns to open space conditions.

For each parcel targeted for acquisition, pollutant loading and runoff prevention can be estimated by matching the current zoning of the property to the appropriate land use category in Table 7-6. Multiply the acres by the loading and runoff factors (e.g., TP lb/ac/yr) for both the zoned land use and the preserve open space. The difference between the two will yield the loading/runoff reduction benefit.

Preservation of the priority parcels can have a significant impact on localized stream water quality, streambank stability, and habitat diversity. In tandem with the other WMP actions, preservation can also help restore water quality and hydrology functions on a watershed scale.

Table 7-6. Open Space Preservation Benefits

Land Use	Fecal Coliform #/ac/yr	TN lb/ac/yr	TP lb/ac/yr	Sediment ton/ac/yr	Surface Runoff in/yr
Preserved Open Space	1.60E+09	1.34	0.05	0.64	1.23
Medium Density Residential	2.22E+10	1.55	0.12	0.52	2.48
Low Density Residential	2.42E+10	1.81	0.14	0.76	2.94
Very Low Density Residential	2.43E+10	2.12	0.14	1.24	3.54
Lt. Commercial/Office/Institutional	4.14E+09	4.67	0.43	0.60	4.98
Warehouse/Industrial/Transportation	5.00E+09	4.75	0.50	0.49	5.86
Multi-Family Residential	9.37E+10	7.30	0.91	0.42	6.04
High Density Residential	1.10E+11	7.96	1.02	0.82	6.86
Heavy Commercial	7.32E+09	6.59	0.73	0.60	8.46
Loading rates based on average annual model simulation of future land use scenario. It includes BMP treatment for applicable land uses.					

7.4.3 Riparian Buffers Restoration Benefits

Stream buffers are an important tool in the protection and restoration of watershed functions. A stable, vegetated streambank is a crucial component of stream channel protection and sediment reduction. Without vegetation along a stream, streambanks can slough off and may become more susceptible to failure during high flow events. Riparian buffers also serve as filters for sediment and other pollutants such as nutrients in runoff from adjacent land.

Buffers with widths of approximately 50 to 100 feet (or greater) can provide water quality functions, stabilize the streambank, and protect aquatic habitat (Wenger, 1999). The benefits for stream stability are difficult to quantify. However, the filtering and denitrification effects of riparian buffers and filter strips have been studied extensively. General estimates of effectiveness at reducing pollutants in runoff from adjacent land are as follows: 70 to > 90 percent reduction in TSS, 50 to 90 percent reduction in TP, and 50 to >90 percent of TN (Unsicker et al., 1984, Wenger et at., 1999, CASQA BMP Manual). The effectiveness varies based on width, vegetation type, subsurface flow paths (particularly for N), and position in the landscape.

7.4.4 Wetland Restoration Benefits

The benefits of wetland restoration include flow control, nutrient cycling, and habitat diversity. These wetland benefits, however, are difficult to model and quantify. In the Agua Hedionda watershed, wetland restoration supports several of the WPG goals, including restoring and enhancing habitat in the watershed

(Goal #2), restore watershed functions (Goal #3), and supporting compliance with regulatory requirements (Goal #4). Wetland restoration actions can also strengthen other WMP actions, such as buffer restoration, stream restoration, and land preservation.

7.4.5 Stream Restoration Benefits

Instream sedimentation combined with contribution from upload sources is one of the primary concerns in the Agua Hedionda watershed. Sediment from instream sources contributes to impairment in the lagoon as well as degradation of aquatic habitat and associated biological communities in Agua Hedionda Creek and its tributaries. The purpose of the proposed stream restoration projects described in Section 6.3 is to stabilize stream channels in order reduce sediment generated by eroding streambanks and incising channels. The specific benefits of these projects are difficult to quantify based on information gathered to date. Nonetheless, reducing instream sources of sediment is expected to improve water quality, enhance aquatic habitat, stabilize morphologic instabilities, decrease sediment loading to the lagoon, and ultimately improve the diversity and abundance of aquatic communities in both the lagoon and its tributaries.

7.4.6 BMP Retrofit Benefits

Table 7-7 show the results of the site pollutant loading analysis/modeling of the conceptual designs of different types of BMP retrofit demonstration sites, located near proposed stream restoration sites, in terms of percent reduction of annual flow volume and pollutant loading. This information allows for comparison between sites and provides a general indication of the overall performance of retrofit benefits throughout the watershed. The performance of SW-1 is dominated by the extended dry detention basin that treats the entire drainage area, but the cistern does contribute to the reductions, especially for runoff volume. The performance for SW-2 is less than the other sites for TSS and nutrients, which is not surprising since the BMPs treat less than 10 percent of the total drainage area. SW-3 and SW-4a have similar performance in terms of percent removal, and reflects the similarity of treatment between the sites. SW-4b and SW-5 are also very similar; both represent drainage areas for median swales treating adjacent road area.

Table 7-7. Percent Annual Pollutant Load Reductions for Each Retrofit Site

Retrofit Site	Flow Volume (in/yr)	TSS (tons/yr)	TN (lb/yr)	TP (lb/yr)	Fecal Coliform (# x 10^9/yr)
SW-1	13.6%	51.0%	30.5%	27.2%	89.7%
SW-2	6.2%	6.0%	7.8%	6.7%	6.1%
SW-3	5.0%	49.0%	23.7%	20.2%	87.9%
SW-4a	5.0%	49.0%	23.7%	20.7%	88.0%
SW-4b	13.0%	81.0%	55.1%	23.6%	0.0%
SW-5	13.1%	81.0%	55.6%	25.0%	0.0%

The analysis demonstrates that the retrofit BMPs provide pollutant load and runoff reductions for their receiving watersheds. Furthermore, the BMPs reduce storm event peak flow and runoff volume, an important component of mitigating risk of geomorphic change in streams receiving the runoff. Note that the drainage area delineations and impervious area estimates used in the analysis above should not be used for engineering design.

7.5 ADAPTIVE APPROACH

Watershed management is ongoing work that must respond and adapt to changing conditions. The WMP recommends several procedures or actions that enable this adaptive approach: long-term monitoring; management indicators for plan performance evaluation; and a Watershed Council that can make plan updates.

Monitoring

This WMP recommends that local jurisdictions continue to collect and analyze chemical, physical, and biological data for both the streams and the lagoon, and that NGOs continue the CRAM monitoring of wetland areas in the watershed. Enhanced monitoring is recommended in some locations, particularly wet weather monitoring and bioassessments. Analysis of this monitoring will help determine if water quality objectives are being met and will help track progress from baseline (2007) conditions. Monitoring can also help determine if and where problem sources exists.

Watershed Indicators

The Watershed Council should work with partners to analyze results of the monitoring data as well as other important tracking indicators: percent riparian habitat, percent impervious area, percent of new development using LID. These watershed indicators should be used for evaluating plan performance. Results should be incorporated into the Council's and local government's decision-making process for adapting the management plan.

Watershed Council

The Watershed Council will provide a mechanism for routine watershed management plan updates. It is recommended that the Council revisit the Plan every 5 to 10 years, considering recommendations on Plan revisions from the Watershed Partners Committee and Technical Advisory Committee.

7.6 HOW THE PLAN SUPPORTS REGIONAL REQUIREMENTS AND INITIATIVES

Many regional plans exist that relate closely to the Agua Hedionda WMP. Many of them were consulted when developing the goals and objectives for this WMP and the recommendations considered these programs as collaborative opportunities. The discussion below shows the various programs that affect watershed management in the region and how this plan is consistent with and integrates with them.

7.6.1 Local Urban Runoff Management Programs

7.6.1.1 Jurisdictional Urban Runoff Management Program (JURMPS)

RWQCB Order No. R9-2007-0001 (NPDES Permit No. CAS0108758), *Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego County, the San Diego Unified Port District, and the San Diego County Regional Airport Authority* (2007 Order), describes requirements for the control of pollutant discharges from municipal storm sewer systems (MS4s) within San Diego County. The provisions of the 2007 Order require the development and implementation of comprehensive Jurisdictional Urban Runoff Management Programs (JURMPs).

The JURMP outlines actions that will be taken to control and reduce pollutants within the jurisdiction. Most of the recommendations within this WMP support the objectives of the JURMPs, but likely the most applicable are the recommended Citizen Stewardship/Public Outreach and the Stormwater BMP Retrofit actions.

Also as a part of the JURMP are the SUSMP and Hydromodification requirements. The recommended new development site management actions support the SUSMP and Hydromodification requirements by outlining techniques that are most effective for this specific watershed at accomplishing the goals of the WMP and of these two programs.

7.6.1.2 Carlsbad Watershed Urban Runoff Management Program (WURMP)

The 2007 Order also requires that the Co-permittees within the Carlsbad Watershed collaborate in the development and implementation of a watershed-based program that addresses urban runoff quality. The rationale for this need is simple: urban runoff does not follow jurisdictional boundaries and often travels through many jurisdictions while flowing to receiving waters. Therefore, the actions of multiple municipalities within a watershed can have a cumulative impact upon shared receiving waters. The mechanism that the 2007 Order uses to require watershed collaboration is the development of the Watershed Urban Runoff Management Plan (WURMP). The goal of the Carlsbad WURMP is to reduce the discharges of pollutants from the municipal separate storm sewer system (MS4) to the maximum extent practicable (MEP) and prevent urban runoff discharges from the MS4 from causing or contributing to a violation of water quality standards. (CWURMP 2008).

The Agua Hedionda Watershed is within the Carlsbad Hydrologic Unit, which is designated a watershed by the RWQCB for the purposed of the 2007 Order. In reality there are unique six watersheds within the Carlsbad Hydrologic Unit. The Agua Hedionda WMP supports the goals and objectives of the Carlsbad WURMP and its implementation can satisfy many of the requirements of the WURMP. Specifically the Agua Hedionda WMP supports:

- Activity ID# CHU-WQA11: Land Acquisitions – This activity consists of supporting the implementation the northern subarea plan. While this plan has yet to be approved by the County of San Diego, lands have been and will continue to be acquired from willing sellers. As discussed below, the MSCP has identified target preservation areas in the upper watershed.
- Activity ID #: CHU-WQEA1: Residential Irrigation Runoff Reduction Education – This activity will focus on education of area residents related to water quality impacts of irrigation runoff.
- Activity ID #: CHU-WQEA4: LID and Watershed Planning for Community Planning and Sponsor Groups – This activity involves educating local planning and sponsor groups throughout the unincorporated County on low impact development (LID) and watershed planning principles, practices, and requirements.
- Proposed Public Participation Activities – The Carlsbad Watershed Co-permittees are responsible for implementing a watershed-specific public participation mechanism within the watershed. The mechanism encourages participation from other organizations within the watershed (such as other agencies, private companies, environmental groups, etc.)

7.6.2 MHCP/MSCP and Open Space Plans (Some Jurisdictions)

The Multiple Habitat Conservation Program (MHCP) and Multiple Species Conservation Program (MSCP) are comprehensive conservation planning processes that address the needs of multiple plant and animal species in San Diego County. The MHCP goal is to conserve approximately 19,000 acres of habitat and to contribute to the habitat preserve system for the protection of more than 80 rare, threatened, or endangered species (SANDAG). Within the Agua Hedionda Watershed, the MHCP covers the jurisdiction of Carlsbad, Vista, Oceanside and San Marcos. The acquisition priorities developed in this WMP considered the MHCP as an indicator so that the areas identified herein overlap partially or fully with the MHCP priorities.

The goal of the MSCP is to ensure the long-term survival of sensitive plant and animal species, protect the natural vegetation found throughout San Diego County, and provide for economic development of the region through the development of large-scale open-space preserves created through acquisition of land (County of San Diego). One technique used in the MSCP is the designation of pre-approved mitigation areas (PAMAs), which are areas identified with high biological value in which conservation will be encouraged. PAMAs are proposed for the North County MSCP Subarea and are defined as habitat areas that the Wildlife Agencies have pre-approved as meeting the criteria for the reduced mitigation requirements as specified in the County's MSCP Plan. Early drafts of the North County MCSP Subarea Plan identify a PAMA in the upper watershed which overlaps partially or fully the acquisition recommendations of this WMP.

Local jurisdictions within the watershed have developed or will be developing local plans as part of the MHCP and MSCP. The Carlsbad Habitat Management Plan (HMP) is already in place, and the Oceanside HMP is near completion. More details on the MHCP/MSCP and related plans are provided in Appendix A.

7.6.3 Carlsbad Watershed Management Plan

The Carlsbad Watershed Management Plan includes five Plan Goals and twelve Plan Objectives that were used as a foundation for developing the goals and objectives for this plan. Thus, this plan supports all of the goals and objectives of the Carlsbad Watershed Management Plan; however, it specifically helps meet *Action No. 3 Plan at the Watershed Level, but Analyze and Implement at the Sub-watershed Level* (note that the reference to the watershed level in this context includes all of the Carlsbad Hydrologic Unit).

7.6.4 San Diego County IRWMP

The Goals and objectives for the San Diego Integrated Water Management Plan (SDIRWMP) were also used to develop the goals and objectives for this WMP. The specific goal that the Agua Hedionda WMP supports is *Goal No. 3 Protect and Enhance Water Quality.* The specific objectives that are supported by this plan include:

- Objective C - Further the scientific and technical foundation of water management,
- Objective F - Reduce the negative effects on waterways and watershed health caused by hydromodification and flooding,
- Objective G - Effectively reduce sources of pollutants and environmental stressors, and
- Objective H - Protect, restore, and maintain habitat and open space

Also the following Water Management Strategies from the SDIRWMP are employed in the Agua Hedionda WMP:

- Ecosystem restoration
- Ecosystem preservation
- Environmental and habitat protection and improvement
- Wetlands enhancement and creation
- Pollution prevention
- Water quality protection and improvement
- Urban runoff management

- Watershed management and planning
- Stakeholder/Community Involvement
- Enhance scientific and technical knowledge

7.6.5 RWQCB Basin Plan, WMI, SWRCB NPS Strategic Plan, California Ocean Plan

7.6.5.1 Watershed Management Initiative (WMI)

The SWRCB and RWQCBs have developed a special initiative called the "Watershed Management Initiative" to address issues related to watershed management, describe current regional efforts, and establish an action plan to implement watershed management plans statewide. The two goals of the WMI are to "*preserve, enhance, and restore water resources while balancing economic and environmental impacts,"* and *"promote cooperative relationships and to improve support for the regulated community and the public."* The stakeholder-driven development process used to develop the WMP and the development of recommendations to preserve, enhance and restore the watershed supports the goals of the WMI. This WMP supports and was driven by the RWQCB watershed management approach's seven guiding principles: geographic focus, comprehensive perspective, partnerships with stakeholders, coordinated priority setting, best use of resources, improved decision making and improved efficiency.

7.6.5.2 RWQCB's Basin Plan

The RWQCB's Basin Plan is designed to preserve and enhance water quality and protect the beneficial uses of all regional waters. It designates existing and potential beneficial uses of groundwater and surface waters in the Region and establishes groundwater and surface water quality objectives to protect the designated beneficial uses. Several water bodies in the watershed do not meet the Basin Plan objectives and are considered impaired. This WMP supports the Basin Plan as it aims to reduce pollutants in the watershed, thereby enhancing water quality and protecting the watershed's many beneficial uses.

7.6.5.3 SWRCB NPS Strategic Plan

The State Water Resources Control Board implements a Non-point Source (NPS) Pollution Program. The NPS Pollution Plan goals include:

- Track, monitor, assess, and report NPS Program activities
- Target NPS Program activities
- Coordinate with public and private partners in all aspects of the NPS Program
- Implement Management Measures (MM) and Management Practices (MP)

The 2003-2008 NPS Five-Year Implementation Plan objectives include:

- Promote the implementation of MMs and related practices by all levels of water quality managers (federal, State, watershed groups and other stakeholders)
- Preserve water quality in waterbodies that are currently meeting California water quality standards and protect them from future degradation for impacts of nonpoint source pollution
- Promote the implementation of MMs and use of MPs for the NPS components of TMDLs or in CWA section 303(d) listed water bodies in order to improve water quality

- Promote better leverage of inter-agency and private entity resources for NPS Programs

The project meets the NPS Control Plan goals on a watershed level by implementing management measures (MMs) to reduce and prevent NPS pollution from entering receiving waters. The WMP recommends utilization of MMs from the Urban Category, Forestry Category, Hydromodification Category, and Wetlands, Riparian Areas and Vegetated Treatment Systems Category of the State Water Resources Control Board State of California NPS Five-Year Implementation Plan (July 2003 through June 2008). Recommendations for monitoring and tracking programs are integrated into the plan to measure the effectiveness of the management measures and the overall plan implementation. The collaborative effort between local government, agency, academic and NGOs provides an interdisciplinary approach to the WMP. Implementation of the Plan can also be used to also address TMDLs for the lagoon and creeks.

7.6.6 Agency Plans

7.6.6.1 California Department of Fish and Game

The mission of the Department of Fish and Game (DFG) is to manage California's diverse fish, wildlife, and plant resources, and the habitats upon which they depend, for their ecological values and for their use and enjoyment by the public. DFG's Strategic Plan is organized into four key themes; 1) Public Service, Outreach and Education, 3) Cooperative Approaches to Resource Stewardship and Use, 3) Manage Wildlife from a Broad Habitat Perspective, and 4) Organizational Vitality. This WMP supports the first three themes by establishing a forum for collaboration and stewardship, and presenting recommendations that look at cumulative effects and a broad-based, ecosystem-wide approach to habitat preservation.

DFG owns and maintains the Agua Hedionda Lagoon Ecological Reserve along Agua Hedionda Creek between the mouth and El Camino Real. Recommendations in the WMP include Stormwater Retrofit sites that would protect the Reserve, and preservation and restoration opportunities that would enhance and expand the open space around the Reserve. DFG also has designated a part of the lagoon as a marine protected area. The Agua Hedionda Lagoon State Marine Reserve is adjacent to and waterside of the Reserve and is a "no take" zone for fishing other than for restricted management purposes. The WMP recommends projects that will reduce sediment from entering the lagoon that could impact the Marine Reserve.

7.6.6.2 Southern California Wetland Recovery Project

The Southern California Wetlands Recovery Project (SCWRP) is a partnership of 18 state and federal agencies working cooperatively with local government, business, and non-profit organizations to acquire, restore, and enhance coastal wetlands in Southern California. The goal of SCWRP is to accelerate the pace, extent, and effectiveness of coastal wetlands restoration. The SCWRP's six regional goals are:

- Preserve and restore coastal wetland ecosystems.
- Preserve and restore stream corridors and wetland ecosystems in coastal watersheds.
- Recover native habitat and species diversity.
- Integrate wetlands recovery with other public objectives.
- Promote education and compatible access related to coastal wetlands and watersheds.
- Advance the science of wetlands restoration and management in Southern California.

SCWRP develops a Work Plan on a biannual basis that identifies priorities for Southern California wetlands restoration and enhancement. The Agua Hedionda WMP supports the goals of the SCWRP and

specifically multiple projects for acquisition and restoration recommended in this WMP support the Work Plan Tier I and II project priority list for the Stream Corridors/Riparian Areas.

7.6.6.3 SANDAG

SANDAG's TransNet Environmental Mitigation Program coordinates with local jurisdictions, wildlife agencies, the building industry, and stakeholders to acquire open space for mitigation and to provide funding for management and monitoring. The Agua Hedionda WMP identifies acquisition and restoration priorities through a comprehensive watershed approach that can be used to implement the TransNet Environmental Mitigation Program.

It will be important in coming years to maintaining connections with these regional agencies to continually show how the WMP support regional requirements and initiatives, both to build support for the plan and to build win-win partnerships for project implementation.

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Preface

Stormwater runoff from the built environment remains one of the great challenges of modern water pollution control, as this source of contamination is a principal contributor to water quality impairment of waterbodies nationwide. In addition to entrainment of chemical and microbial contaminants as stormwater runs over roads, rooftops, and compacted land, stormwater discharge poses a physical hazard to aquatic habitats and stream function, owing to the increase in water velocity and volume that inevitably result on a watershed scale as many individually managed sources are combined. Given the shift of the world's population to urban settings, and that this trend is expected to be accompanied by continued wholesale landscape alteration to accommodate population increases, the magnitude of the stormwater problem is only expected to grow.

In recognition of the need for improved control measures, in 1987 the U.S. Congress mandated the U.S. Environmental Protection Agency (EPA), under amendments to the Clean Water Act, to control certain stormwater discharges under the National Pollutant Discharge Elimination System. In response to this federal legislation, a permitting program was put in place by EPA as the Phase I (1990) and Phase II (1999) stormwater regulations, which together set forth requirements for municipal separate storm sewer systems and industrial activities including construction. The result of the regulatory program has been identification of hundreds of thousands of sources needing to be permitted, which has put a strain on EPA and state administrative systems for implementation and management. At the same time, achievement of water quality improvement as a result of the permit requirements has remained an elusive goal.

To address the seeming intractability of this problem, the EPA requested that the National Research Council (NRC) review its current permitting program for stormwater discharge under the Clean Water Act and provide suggestions for improvement. The broad goals of the study were to better understand the links between stormwater pollutant discharges and ambient water quality, to assess the state of the science of stormwater management, and to make associated policy recommendations. More specifically, the study was asked to:

(1) Clarify the mechanisms by which pollutants in stormwater discharges affect ambient water quality criteria and define the elements of a "protocol" to link pollutants in stormwater discharges to ambient water quality criteria.

(2) Consider how useful monitoring is for both determining the potential of a discharge to contribute to a water quality standards violation and for determining the adequacy of stormwater pollution prevention plans. What specific parameters should be monitored and when and where? What effluent

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limits and benchmarks are needed to ensure that the discharge does not cause or contribute to a water quality standards violation?

(3) Assess and evaluate the relationship between different levels of stormwater pollution prevention plan implementation and in-stream water quality, considering a broad suite of best management practices (BMPs).

(4) Make recommendations for how to best stipulate provisions in stormwater permits to ensure that discharges will not cause or contribute to exceedances of water quality standards. This should be done in the context of general permits. As a part of this task, the committee will consider currently available information on permit and program compliance.

(5) Assess the design of the stormwater permitting program implemented under the Clean Water Act.

There are a number of related topics that one might expect to find in this report that are excluded, because EPA requested that the study be limited to problems addressed by the agency's stormwater regulatory program. Specifically, nonpoint source pollution from agricultural runoff, septic systems, combined sewer overflows, sanitary sewer overflows, and concentrated animal feeding operations are not addressed in this report. In addition, alteration of the urban base-flow hydrograph from a number of causes that are not directly related to storm events (e.g., interbasin transfers of water, leakage from water supply pipes, lawn irrigation, and groundwater withdrawals) is a topic outside the scope of the report and therefore not included in any depth.

In developing this report, the committee benefited greatly from the advice and input of EPA representatives, including Jenny Molloy, Linda Boornazian, and Mike Borst; representatives from the City of Austin; representatives from King County, Washington, and the City of Seattle; and representatives from the Irvine Ranch Water District. The committee heard presentations by many of these individuals in addition to Chris Crockett, City of Philadelphia Water Department; Pete LaFlamme and Mary Borg, Vermont Department of Environmental Conservation; Michael Barrett, University of Texas at Austin; Roger Glick, City of Austin; Michael Piehler, UNC Institute of Marine Sciences, Keith Stolzenbach, UCLA; Steve Burges, University of Washington; Wayne Huber, Oregon State University; Don Theiler, King County; Charlie Logue, Clean Water Services, Hillsboro, Oregon; Don Duke, Florida Gulf Coast University; Mike Stenstrom, UCLA; Gary Wolff, California Water Board; Paula Daniels, City of Los Angeles Public Works; Mark Gold, Heal the Bay; Geoff Brosseau, California Stormwater Quality Association; Steve Weisberg, Southern California Coastal Water Research Project; Chris Crompton, Southern California Stormwater Monitoring Coalition; David Beckman, NRDC; and Eric Strecker, Geosyntec. We also thank all those stakeholders who took time to

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share with us their perspectives and wisdom about the various issues affecting stormwater.

The committee was fortunate to have taken several field trips in conjunction with committee meetings. The following individuals are thanked for their participation in organizing and guiding these trips: Austin (Kathy Shay, Mike Kelly, Matt Hollon, Pat Hartigan, Mateo Scoggins, David Johns, and Nancy McClintock); Seattle (Darla Inglis, Chris May, Dan Powers, Scott Bawden, Nat Scholz, John Incardona, Kate McNeil, Bob Duffner, and Curt Crawford); and Los Angeles (Peter Postlmayr, Matthew Keces, Alan Bay, and Sat Tamaribuchi).

Completion of this report would not have been possible without the Herculean efforts of project study director Laura Ehlers. Her powers to organize, probe, synthesize, and keep the committee on track with completing its task were simply remarkable. Meeting logistics and travel arrangements were ably assisted by Ellen De Guzman and Jeanne Aquilino.

This report has been reviewed in draft form by individuals chosen for their diverse perspectives and technical expertise, in accordance with procedures approved by the NRC's Report Review Committee. The purpose of this independent review is to provide candid and critical comments that will assist the institution in making its published report as sound as possible and to ensure that the report meets institutional standards for objectivity, evidence, and responsiveness to the study charge. The review comments and draft manuscript remain confidential to protect the integrity of the deliberative process. We wish to thank the following individuals for their review of this report: Michael Barrett, University of Texas; Bruce Ferguson, University of Georgia; James Heaney, University of Florida; Daniel Medina, CH2MHILL; Margaret Palmer, University of Maryland Chesapeake Biological Laboratory; Kenneth Potter, University of Wisconsin; Joan Rose, Michigan State University; Eric Strecker, Geosyntec; and Bruce Wilson, Minnesota Pollution Control Agency.

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Claire Welty,
Committee Chair

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Summary

Urbanization is the changing of land use from forest or agricultural uses to suburban and urban areas. This conversion is proceeding in the United States at an unprecedented pace, and the majority of the country's population now lives in suburban and urban areas. The creation of impervious surfaces that accompanies urbanization profoundly affects how water moves both above and below ground during and following storm events, the quality of that stormwater, and the ultimate condition of nearby rivers, lakes, and estuaries.

The National Pollutant Discharge Elimination System (NPDES) program under the Clean Water Act (CWA) is the primary federal vehicle to regulate the quality of the nation's waterbodies. This program was initially developed to reduce pollutants from industrial process wastewater and municipal sewage discharges. These point sources were known to be responsible for poor, often drastically degraded conditions in receiving waterbodies. They were easily regulated because they emanated from identifiable locations, such as pipe outfalls. To address the role of stormwater in causing or contributing to water quality impairments, in 1987 Congress wrote Section 402(p) of the CWA, bringing stormwater control into the NPDES program, and in 1990 the U.S. Environmental Protection Agency (EPA) issued the Phase I Stormwater Rules. These rules require NPDES permits for operators of municipal separate storm sewer systems (MS4s) serving populations over 100,000 and for runoff associated with industry, including construction sites five acres and larger. In 1999 EPA issued the Phase II Stormwater Rule to expand the requirements to small MS4s and construction sites between one and five acres in size.

With the addition of these regulated entities, the overall NPDES program has grown by almost an order of magnitude. EPA estimates that the total number of permittees under the stormwater program at any time exceeds half a million. For comparison, there are fewer than 100,000 non-stormwater (meaning wastewater) permittees covered by the NPDES program. To manage the large number of permittees, the stormwater program relies heavily on the use of general permits to control industrial, construction, and Phase II MS4 discharges. These are usually statewide, one-size-fits-all permits in which general provisions are stipulated.

To comply with the CWA regulations, industrial and construction permittees must create and implement a stormwater pollution prevention plan, and MS4 permittees must implement a stormwater management plan. These plans document the stormwater control measures (SCMs) (sometimes known as best management practices or BMPs) that will be used to prevent stormwater emanating from these sources from degrading nearby waterbodies. These SCMs range from structural methods such as detention ponds and bioswales to nonstructural methods such as designing new development to reduce the percentage of impervious surfaces.

A number of problems with the stormwater program as it is currently implemented have been recognized. First, there is limited information available on

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the effectiveness and longevity of many SCMs, thereby contributing to uncertainty in their performance. Second, the requirements for monitoring vary depending on the regulating entity and the type of activity. For example, a subset of industrial facilities must conduct "benchmark monitoring" and the results often exceed the values established by EPA or the states, but it is unclear whether these exceedances provide useful indicators of potential water quality problems. Finally, state and local stormwater programs are plagued by a lack of resources to review stormwater pollution prevention plans and conduct regular compliance inspections. For all these reasons, the stormwater program has suffered from poor accountability and uncertain effectiveness at improving the quality of the nation's waters.

In light of these challenges, EPA requested the advice of the National Research Council's Water Science and Technology Board on the federal stormwater program, considering all entities regulated under the program (i.e., municipal, industrial, and construction). The following statement of task guided the work of the committee:

(1) Clarify the mechanisms by which pollutants in stormwater discharges affect ambient water quality criteria and define the elements of a "protocol" to link pollutants in stormwater discharges to ambient water quality criteria.

(2) Consider how useful monitoring is for both determining the potential of a discharge to contribute to a water quality standards violation and for determining the adequacy of stormwater pollution prevention plans. What specific parameters should be monitored and when and where? What effluent limits and benchmarks are needed to ensure that the discharge does not cause or contribute to a water quality standards violation?

(3) Assess and evaluate the relationship between different levels of stormwater pollution prevention plan implementation and in-stream water quality, considering a broad suite of SCMs.

(4) Make recommendations for how to best stipulate provisions in stormwater permits to ensure that discharges will not cause or contribute to exceedances of water quality standards. This should be done in the context of general permits. As a part of this task, the committee will consider currently available information on permit and program compliance.

(5) Assess the design of the stormwater permitting program implemented under the CWA.

Chapter 2 of this report presents the regulatory history of stormwater control in the United States, focusing on relevant portions of the CWA and the federal and state regulations that have been created to implement the Act. Chapter 3 reviews the scientific aspects of stormwater, including sources of pollutants in stormwater, how stormwater moves across the land surface, and its impacts on receiving waters. Chapter 4 evaluates the current industrial and MS4 monitoring requirements, and it considers the multitude of models available for linking stormwater discharges to ambient water quality. Chapter 5 considers the vast

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suite of both structural and nonstructural measures designed to control stormwater and reduce its pollutant loading to waterbodies. In Chapter 6, the limitations and possibilities associated with a new regulatory approach are explored, as are those of a more traditional but enhanced scheme. This new approach, which rests on the broad foundation of correlative studies demonstrating the effects of urbanization on aquatic ecosystems, would reduce the impact of stormwater on receiving waters beyond any efforts currently in widespread practice.

THE CHALLENGE OF REGULATING STORMWATER

Although stormwater has been long recognized as contributing to water quality impairment, the creation of federal regulations to deal with stormwater quality has occurred only in the last 20 years. Because this longstanding environmental problem is being addressed so late in the development and management of urban areas, the laws that mandate better stormwater control are generally incomplete and are often in conflict with state and local rules that have primarily stressed the flood control aspects of stormwater management (i.e., moving water away from structures and cities as fast as possible). Many prior investigators have observed that stormwater discharges would ideally be regulated through direct controls on land use, strict limits on both the quantity and quality of stormwater runoff into surface waters, and rigorous monitoring of adjacent waterbodies to ensure that they are not degraded by stormwater discharges. Future land-use development would be controlled to minimize stormwater discharges, and impervious cover and volumetric restrictions would serve as proxies for stormwater loading from many of these developments. Products that contribute pollutants through stormwater—like de-icing materials, fertilizers, and vehicular exhaust—would be regulated at a national level to ensure that the most environmentally benign materials are used.

Presently, however, the regulation of stormwater is hampered by its association with a statute that focuses primarily on specific pollutants and ignores the volume of discharges. Also, most stormwater discharges are regulated on an individualized basis without accounting for the cumulative contributions from multiple sources in the same watershed. Perhaps most problematic is that the requirements governing stormwater dischargers leave a great deal of discretion to the dischargers themselves in developing stormwater pollution prevention plans and self-monitoring to ensure compliance. These problems are exacerbated by the fact that the dual responsibilities of land-use planning and stormwater management within local governments are frequently decoupled.

EPA's current approach to regulating stormwater is unlikely to produce an accurate or complete picture of the extent of the problem, nor is it likely to adequately control stormwater's contribution to waterbody impairment. The lack of rigorous end-of-pipe monitoring, coupled with EPA's failure to use flow or alternative measures for regulating stormwater, make it

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difficult for EPA to develop enforceable requirements for stormwater dischargers. Instead, the stormwater permits leave a great deal of discretion to the regulated community to set their own standards and to self-monitor. Current statistics on the states' implementation of the stormwater program, discharger compliance with stormwater requirements, and the ability of states and EPA to incorporate stormwater permits with Total Maximum Daily Loads are uniformly discouraging. Radical changes to the current regulatory program (see Chapter 6) appear necessary to provide meaningful regulation of stormwater dischargers in the future.

Flow and related parameters like impervious cover should be considered for use as proxies for stormwater pollutant loading. These analogs for the traditional focus on the "discharge" of "pollutants" have great potential as a federal stormwater management tool because they provide specific and measurable targets, while at the same time they focus regulators on water degradation resulting from the increased volume as well as increased pollutant loadings in stormwater runoff. Without these more easily measured parameters for evaluating the contribution of various stormwater sources, regulators will continue to struggle with enormously expensive and potentially technically impossible attempts to determine the pollutant loading from individual dischargers or will rely too heavily on unaudited and largely ineffective self-reporting, self-policing, and paperwork enforcement.

EPA should engage in much more vigilant regulatory oversight in the national licensing of products that contribute significantly to stormwater pollution. De-icing chemicals, materials used in brake linings, motor fuels, asphalt sealants, fertilizers, and a variety of other products should be examined for their potential contamination of stormwater. Currently, EPA does not apparently utilize its existing licensing authority to regulate these products in a way that minimizes their contribution to stormwater contamination. States can also enact restrictions on or tax the application of pesticides or other particularly toxic products. Even local efforts could ultimately help motivate broader scale, federal restrictions on particular products.

The federal government should provide more financial support to state and local efforts to regulate stormwater. State and local governments do not have adequate financial support to implement the stormwater program in a rigorous way. At the very least, Congress should provide states with financial support for engaging in more meaningful regulation of stormwater discharges. EPA should also reassess its allocation of funds within the NPDES program. The agency has traditionally directed funds to focus on the reissuance of NPDES wastewater permits, while the present need is to advance the NPDES stormwater program because NPDES stormwater permittees outnumber wastewater permittees more than five fold, and the contribution of diffuse sources of pollution to degradation of the nation's waterbodies continues to increase.

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EFFECTS OF URBANIZATION ON WATERSHEDS

Urbanization causes change to natural systems that tends to occur in the following sequence. First, land use and land cover are altered as vegetation and topsoil are removed to make way for agriculture, or subsequently buildings, roads, and other urban infrastructure. These changes, and the introduction of a constructed drainage network, alter the hydrology of the local area, such that receiving waters in the affected watershed experience radically different flow regimes than prior to urbanization. Nearly all of the associated problems result from one underlying cause: loss of the water-retaining and evapotranspirating functions of the soil and vegetation in the urban landscape. In an undeveloped area, rainfall typically infiltrates into the ground surface or is evapotranspirated by vegetation. In the urban landscape, these processes of evapotranspiration and water retention in the soil are diminished, such that stormwater flows rapidly across the land surface and arrives at the stream channel in short, concentrated bursts of high discharge. This transformation of the hydrologic regime is a wholesale reorganization of the processes of runoff generation, and it occurs throughout the developed landscape. When combined with the introduction of pollutant sources that accompany urbanization (such as lawns, motor vehicles, domesticated animals, and industries), these changes in hydrology have led to water quality and habitat degradation in virtually all urban streams.

The current state of the science has documented the characteristics of stormwater runoff, including its quantity and quality from many different land covers, as well as the characteristics of dry weather runoff. In addition, many correlative studies show how parameters co-vary in important but complex and poorly understood ways (e.g., changes in macroinvertebrate or fish communities associated with watershed road density or the percentage of impervious cover). Nonetheless, efforts to create mechanistic links between population growth, land-use change, hydrologic alteration, geomorphic adjustments, chemical contamination in stormwater, disrupted energy flows and biotic interactions, and changes in ecological communities are still in development. Despite this assessment, there are a number of overarching truths that remain poorly integrated into stormwater management decision-making, although they have been robustly characterized for more than a decade and have a strong scientific basis that reaches even farther back through the history of published investigations.

There is a direct relationship between land cover and the biological condition of downstream receiving waters. The possibility for the highest levels of aquatic biological condition exists only with very light urban transformation of the landscape. Conversely, the lowest levels of biological condition are inevitable with extensive urban transformation of the landscape, commonly seen after conversion of about one-third to one-half of a contributing watershed into impervious area. Although not every degraded waterbody is a product of intense urban development, all highly urban watersheds produce severely degraded receiving waters.

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The protection of aquatic life in urban streams requires an approach that incorporates all stressors. Urban Stream Syndrome reflects a multitude of effects caused by altered hydrology in urban streams, altered habitat, and polluted runoff. Focusing on only one of these factors is not an effective management strategy. For example, even without noticeably elevated pollutant concentrations in receiving waters, alterations in their hydrologic regimes are associated with impaired biological condition. More comprehensive biological monitoring of waterbodies will be critical to better understanding the cumulative impacts of urbanization on stream condition.

The full distribution and sequence of flows (i.e., the flow regime) should be taken into consideration when assessing the impacts of stormwater on streams. Permanently increased stormwater volume is only one aspect of an urban-altered storm hydrograph. It contributes to high in-stream velocities, which in turn increase streambank erosion and accompanying sediment pollution of surface water. Other hydrologic changes, however, include changes in the sequence and frequency of high flows, the rate of rise and fall of the hydrograph, and the season of the year in which high flows can occur. These all can affect both the physical and biological conditions of streams, lakes, and wetlands. Thus, effective hydrologic mitigation for urban development cannot just aim to reduce post-development peak flows to predevelopment peak flows.

Roads and parking lots can be the most significant type of land cover with respect to stormwater. They constitute as much as 70 percent of total impervious cover in ultra-urban landscapes, and as much as 80 percent of the directly connected impervious cover. Roads tend to capture and export more stormwater pollutants than other land covers in these highly impervious areas, especially in regions of the country having mostly small rainfall events. As rainfall amounts become larger, pervious areas in most residential land uses become more significant sources of runoff, sediment, nutrients, and landscaping chemicals. In all cases, directly connected impervious surfaces (roads, parking lots, and roofs that are directly connected to the drainage system) produce the first runoff observed at a storm-drain inlet and outfall because their travel times are the quickest.

MONITORING AND MODELING

The stormwater monitoring requirements under the EPA Stormwater Program are variable and generally sparse, which has led to considerable skepticism about their usefulness. This report considers the amount and value of the data collected over the years by municipalities (which are substantial on a nationwide basis) and by industries, and it makes suggestions for improvement. The MS4 and particularly the industrial stormwater monitoring programs suffer from a paucity of data, from inconsistent sampling techniques, and from requirements

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that are difficult to relate to the compliance of individual dischargers. For these reasons, conclusions about stormwater management are usually made with incomplete information. Stormwater management would benefit most substantially from a well-balanced monitoring program that encompasses chemical, biological, and physical parameters from outfalls to receiving waters.

Many processes connect sources of pollution to an effect observed in a downstream receiving water—processes that can be represented in watershed models, which are the key to linking stormwater dischargers to impaired receiving waters. The report explores the current capability of models to make such links, including simple models and more involved mechanistic models. At the present time, stormwater modeling has not evolved enough to consistently say whether a particular discharger can be linked to a specific waterbody impairment. Some quantitative predictions can be made, particularly those that are based on well-supported causal relationships of a variable that responds to changes in a relatively simple driver (e.g., modeling how a runoff hydrograph or pollutant loading change in response to increased impervious land cover). However, in almost all cases, the uncertainty in the modeling and the data (including its general unavailability), the scale of the problems, and the presence of multiple stressors in a watershed make it difficult to assign to any given source a specific contribution to water quality impairment.

Because of a 10-year effort to collect and analyze monitoring data from MS4s nationwide, the quality of stormwater from urbanized areas is well characterized. These results come from many thousands of storm events, systematically compiled and widely accessible; they form a robust dataset of utility to theoreticians and practitioners alike. These data make it possible to accurately estimate stormwater pollutant concentrations from various land uses. Additional data are available from other stormwater permit holders that were not originally included in the database and from ongoing projects, and these should be acquired to augment the database and improve its value in stormwater management decision-making.

Industry should monitor the quality of stormwater discharges from certain critical industrial sectors in a more sophisticated manner, so that permitting authorities can better establish benchmarks and technology-based effluent guidelines. Many of the benchmark monitoring requirements and effluent guidelines for certain industrial subsectors are based on inaccurate and old information. Furthermore, there has been no nationwide compilation and analysis of industrial benchmark data, as has occurred for MS4 monitoring data, to better understand typical stormwater concentrations of pollutants from various industries.

Continuous, flow-weighted sampling methods should replace the traditional collection of stormwater data using grab samples. Data obtained from too few grab samples are highly variable, particularly for industrial monitoring

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programs, and subject to greater uncertainly because of experimenter error and poor data-collection practices. In order to use stormwater data for decision making in a scientifically defensible fashion, grab sampling should be abandoned as a credible stormwater sampling approach for virtually all applications. It should be replaced by more accurate and frequent continuous sampling methods that are flow weighted. Flow-weighted composite monitoring should continue for the duration of the rain event. Emerging sensor systems that provide high temporal resolution and real-time estimates for specific pollutants should be further investigated, with the aim of providing lower costs and more extensive monitoring systems to sample both streamflow and constituent loads.

Watershed models are useful tools for predicting downstream impacts from urbanization and designing mitigation to reduce those impacts, but they are incomplete in scope and do not offer definitive causal links between polluted discharges and downstream degradation. Every model simulates only a subset of the multiple interconnections between physical, chemical, and biological processes found in any watershed, and they all use a grossly simplified representation of the true spatial and temporal variability of a watershed. To speak of a "comprehensive watershed model" is thus an oxymoron, because the science of stormwater is not sufficiently far advanced to determine causality between all sources, resulting stressors, and their physical, chemical, and biological responses. Thus, it is not yet possible to create a protocol that mechanistically links stormwater dischargers to the quality of receiving waters. The utility of models with more modest goals, however, can still be high—as long as the questions being addressed by the model are in fact relevant and important to the functioning of the watershed to which that model is being applied, and sufficient data are available to calibrate the model for the processes included therein.

STORMWATER MANAGEMENT APPROACHES

A fundamental component of EPA's stormwater program is the creation of stormwater pollution prevention plans that document the SCMs that will be used to prevent the permittee's stormwater discharges from degrading local waterbodies. Thus, a consideration of these measures—their effectiveness in meeting different goals, their cost, and how they are coordinated with one another—is central to any evaluation of the stormwater program. The statement of task asks for an evaluation of the relationship between different levels of stormwater pollution prevention plan implementation and in-stream water quality. Although the state of knowledge has yet to reveal the mechanistic links that would allow for a full assessment of that relationship, enough is known to design systems of SCMs, on a site-scale or local watershed scale, that can substantially reduce the effects of urbanization.

The characteristics, applicability, goals, effectiveness, and cost of nearly 20 different broad categories of SCMs to treat the quality and quantity of stormwa-

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ter runoff are discussed in Chapter 5, organized as they might be applied from the rooftop to the stream. SCMs, when designed, constructed, and maintained correctly, have demonstrated the ability to reduce runoff volume and peak flows and to remove pollutants. A multitude of case studies illustrates the use of SCMs in specific settings and demonstrates that a particular SCM can have a measurable positive effect on water quality or a biological metric. However, the implementation of SCMs at the watershed scale has been too inconsistent and too recent to be able to definitively link their performance to the prolonged sustainment—at the watershed level—of receiving water quality, in-stream habitat, or stream geomorphology.

Individual controls on stormwater discharges are inadequate as the sole solution to stormwater in urban watersheds. SCM implementation needs to be designed as a system, integrating structural and nonstructural SCMs and incorporating watershed goals, site characteristics, development land use, construction erosion and sedimentation controls, aesthetics, monitoring, and maintenance. Stormwater cannot be adequately managed on a piecemeal basis due to the complexity of both the hydrologic and pollutant processes and their effect on habitat and stream quality. Past practices of designing detention basins on a site-by-site basis have been ineffective at protecting water quality in receiving waters and only partially effective in meeting flood control requirements.

Nonstructural SCMs such as product substitution, better site design, downspout disconnection, conservation of natural areas, and watershed and land-use planning can dramatically reduce the volume of runoff and pollutant load from a new development. Such SCMs should be considered first before structural practices. For example, lead concentrations in stormwater have been reduced by at least a factor of 4 after the removal of lead from gasoline. Not creating impervious surfaces or removing a contaminant from the runoff stream simplifies and reduces the reliance on structural SCMs.

SCMs that harvest, infiltrate, and evapotranspirate stormwater are critical to reducing the volume and pollutant loading of small storms. Urban municipal separate stormwater conveyance systems have been designed for flood control to protect life and property from extreme rainfall events, but they have generally failed to address the more frequent rain events (<2.5 cm) that are key to recharge and baseflow in most areas. These small storms may only generate runoff from paved areas and transport the “first flush” of contaminants. SCMs designed to remove this class of storms from surface runoff (runoff-volume-reduction SCMs—rainwater harvesting, vegetated, and subsurface) can also help address larger watershed flooding issues.

Performance characteristics are starting to be established for most structural and some nonstructural SCMs, but additional research is needed on the relevant hydrologic and water quality processes within SCMs across

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different climates and soil conditions. Typical data such as long-term load reduction efficiencies and pollutant effluent concentrations can be found in the International Stormwater BMP Database. However, understanding the processes involved in each SCM is in its infancy, making modeling of these SCMs difficult. Seasonal differences, the time between storms, and other factors all affect pollutant loadings emanating from SCMs. Research is needed that moves away from the use of percent removal and toward better simulation of SCM performance. Research is particularly important for nonstructural SCMs, which in many cases are more effective, have longer life spans, and require less maintenance than structural SCMs. EPA should be a leader in SCM research, both directly by improving its internal modeling efforts and by funding state efforts to monitor and report back on the success of SCMs in the field.

The retrofitting of urban areas presents both unique opportunities and challenges. Promoting growth in these areas is desirable because it takes pressure off the suburban fringes, thereby preventing sprawl, and it minimizes the creation of new impervious surfaces. However, it is more complex than Greenfields development because of the need to upgrade existing infrastructure, the limited availability and affordability of land, and the complications caused by rezoning. These sites may be contaminated, requiring cleanup before redevelopment can occur. Both innovative zoning and development incentives, along with the careful selection SCMs, are needed to achieve fair and effective storm-water management in these areas. For example, incentive or performance zoning could be used to allow for greater densities on a site, freeing other portions of the site for SCMs. Publicly owned, consolidated SCMs should be strongly considered as there may be insufficient land to have small, on-site systems. The performance and maintenance of the former can be overseen more effectively by a local government entity. The types of SCMs that are used in consolidated facilities—particularly detention basins, wet/dry ponds, and stormwater wetlands—perform multiple functions, such as prevention of streambank erosion, flood control, and large-scale habitat provision.

INNOVATIVE STORMWATER MANAGEMENT AND REGULATORY PERMITTING

There are numerous innovative regulatory strategies that could be used to improve the EPA's stormwater program. The course of action most likely to check and reverse degradation of the nation's aquatic resources would be to **base all stormwater and other wastewater discharge permits on watershed boundaries instead of political boundaries.** Watershed-based permitting is the regulated allowance of discharges of water and wastes borne by those discharges to waters of the United States, with due consideration of: (1) the implications of those discharges for preservation or improvement of prevailing ecological conditions in the watershed's aquatic systems, (2) cooperation among political ju-

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risdictions sharing a watershed, and (3) coordinated regulation and management of all discharges having the potential to modify the hydrology and water quality of the watershed's receiving waters.

Responsibility and authority for implementation of watershed-based permits would be centralized with a municipal lead permittee working in partnership with other municipalities in the watershed as co-permittees. Permitting authorities (designated states or, otherwise, EPA) would adopt a minimum goal in every watershed to avoid any further loss or degradation of designated beneficial uses in the watershed's component waterbodies and additional goals in some cases aimed at recovering lost beneficial uses. Permittees, with support by the states or EPA, would then move to comprehensive impact source analysis as a foundation for targeting solutions. The most effective solutions are expected to lie in isolating, to the extent possible, receiving waterbodies from exposure to those impact sources. In particular, low-impact design methods, termed Aquatic Resources Conservation Design in this report, should be employed to the fullest extent feasible and backed by conventional SCMs when necessary.

The approach gives municipal co-permittees more responsibility, with commensurately greater authority and funding, to manage all of the sources discharging, directly or through municipally owned conveyances, to the waterbodies comprising the watershed. This report also outlines a new monitoring program structured to assess progress toward meeting objectives and the overlying goals, diagnosing reasons for any lack of progress, and determining compliance by dischargers. The proposal further includes market-based trading of credits among dischargers to achieve overall compliance in the most efficient manner and adaptive management to determine additional actions if monitoring demonstrates failure to achieve objectives.

As a first step to taking the proposed program nationwide, a pilot program is recommended that will allow EPA to work through some of the more predictable impediments to watershed-based permitting, such as the inevitable limits of an urban municipality's authority within a larger watershed.

Short of adopting watershed-based permitting, other smaller-scale changes to the EPA stormwater program are possible. These recommendations do not preclude watershed-based permitting at some future date, and indeed they lay the groundwork in the near term for an eventual shift to watershed-based permitting.

Integration of the three permitting types is necessary, such that construction and industrial sites come under the jurisdiction of their associated municipalities. Federal and state NPDES permitting authorities do not presently have, and can never reasonably expect to have, sufficient personnel to inspect and enforce stormwater regulations on more than 100,000 discrete point source facilities discharging stormwater. A better structure would be one where the NPDES permitting authority empowers the MS4 permittees to act as the first tier of entities exercising control on stormwater discharges to the MS4 to protect

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water quality. The National Pretreatment Program, EPA's successful treatment program for municipal and industrial wastewater sources, could serve as a model for integration.

To improve the industrial, construction, and MS4 permitting programs in their current configuration, EPA should (1) issue guidance for MS4, industrial, and construction permittees on what constitutes a design storm for water quality purposes; (2) issue guidance for MS4 permittees on methods to identify high-risk industrial facilities for program prioritization such as inspections; (3) support the compilation and collection of quality industrial stormwater effluent data and SCM effluent quality data in a national database; and (4) develop numerical expressions of the MS4 standard of "maximum extent practicable." Each of these issues is discussed in greater detail in Chapter 6.

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Watershed-based permitting will require additional resources and regulatory program support. Such an approach shifts more attention to ambient outcomes as well as expanded permitting coverage. Additional resources for program implementation could come from shifting existing programmatic resources. For example, some state permitting resources may be shifted away from existing point source programs toward stormwater permitting. Strategic planning and prioritization could shift the distribution of federal and state grant and loan programs to encourage and support more watershed-based stormwater permitting programs. However, securing new levels of public funds will likely be required. All levels of government must recognize that additional resources may be required from citizens and businesses (in the form of taxes, fees, etc.) in order to operate a more comprehensive and effective stormwater permitting program.

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1
Introduction

URBANIZATION AND ITS IMPACTS

The influence of humans on the physical and biological systems of the Earth's surface is not a recent manifestation of modern societies; instead, it is ubiquitous throughout our history. As human populations have grown, so has their footprint, such that between 30 and 50 percent of the Earth's surface has now been transformed (Vitousek et al., 1997). Most of this land area is not covered with pavement; indeed, less than 10 percent of this transformed surface is truly "urban" (Grübler, 1994). However, urbanization causes extensive changes to the land surface beyond its immediate borders, particularly in ostensibly rural regions, through alterations by agriculture and forestry that support the urban population (Lambin et al., 2001). Within the immediate boundaries of cities and suburbs, the changes to natural conditions and processes wrought by urbanization are among the most radical of any human activity.

In the United States, population is growing at an annual rate of 0.9 percent (U.S. Census Bureau, *http://www.census.gov/compendia/statab/2007edition.html*); the majority of the population of the United States now lives in suburban and urban areas (Figure 1-1). Because the area appropriated for urban land uses is growing even faster, these patterns of growth all but guarantee that the influences of urban land uses will continue to expand over time. Cities and suburbia obviously provide the homes and livelihood for most of the nation's population. But, as this report makes clear, these benefits have been accompanied by significant environmental change. Urbanization of the landscape profoundly affects how water moves both above and below ground during and following storm events; the quality of that stormwater (defined in Box 1-1); and the ultimate condition of nearby rivers, lakes, and estuaries. Unlike agriculture, which can display significant interchange with forest cover over time scales of a century (e.g., Hart, 1968), there is no indication that once-urbanized land ever returns to a less intensive state. Urban land, however, does continue to change over time; by one estimate, 42 percent of land currently considered "urban" in the United States will be redeveloped by 2030 (Brookings Institute, 2004). In their words, "nearly half of what will be the built environment in 2030 doesn't even exist yet" (p. vi). This truth belies the common belief that efforts to improve management of stormwater are doomed to irrelevancy because so much of the landscape is already built. Opportunities for improvement have indeed been lost, but many more still await an improved management approach.

Measures of urbanization are varied, and the disparate methods of quantifying the presence and influence of human activity tend to confound analyses of environmental effects. Population density is a direct metric of human presence, but it is not the most relevant measure of the influence of those people on their surrounding landscape. Expressions of the built environment, most commonly

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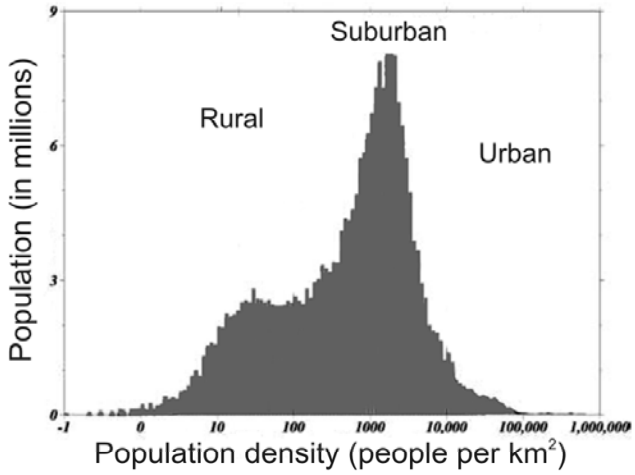

FIGURE 1-1 Histogram of population for the United States, based on 2000 census data. The median population density is about 1,000 people/km^2. SOURCE: Modified from Pozzi and Small (2005), who place the rural–suburban boundary at 100 people/km^2. Reprinted, with permission, from ASPRS (2005). Copyright 2005 by the American Society for Photogrammetry and Remote Sensing.

BOX 1-1
What Is "Stormwater"?

"Stormwater" is a term that is used widely in both scientific literature and regulatory documents. It is also used frequently throughout this report. Although all of these usages share much in common, there are important differences that benefit from an explicit discussion.

Most broadly, stormwater runoff is the water associated with a rain or snow storm that can be measured in a downstream river, stream, ditch, gutter, or pipe shortly after the precipitation has reached the ground. What constitutes "shortly" depends on the size of the watershed and the efficiency of the drainage system, and a number of techniques exist to precisely separate stormwater runoff from its more languid counterpart, "baseflow." For small and highly urban watersheds, the interval between rainfall and measured stormwater discharges may be only a few minutes. For watersheds of many tens or hundreds of square miles, the lag between these two components of storm response may be hours or even a day.

From a regulatory perspective, stormwater must pass through some sort of engineered conveyance, be it a gutter, a pipe, or a concrete canal. If it simply runs over the ground surface, or soaks into the soil and soon reemerges as seeps into a nearby stream, it may be water generated by the storm but it is not regulated stormwater.

This report emphasizes the first, more hydrologically oriented definition. However, attention is focused mainly on that component of stormwater that emanates from those parts of a landscape that have been affected in some fashion by human activities ("urban stormwater"). Mostly this includes water that flows over the ground surface and is subsequently collected by natural channels or artificial conveyance systems, but it can also include water that has infiltrated into the ground but nonetheless reaches a stream channel relatively rapidly and that contributes to the increased stream discharge that commonly accompanies almost any rainfall event in a human-disturbed watershed.

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road density or pavement coverage as a percentage of gross land area, are more likely to determine stormwater runoff-related consequences. An inverse metric, the percentage of mature vegetation or forest across a landscape, expresses the magnitude of related, but not identical, impacts to downstream systems. Alternatively, these measures of land cover can be replaced by measures of land use, wherein the types of human activity (e.g., residential, industrial, commercial) are used as proxies for the suite of hydrologic, chemical, and biological changes imposed on the surrounding landscape.

All of these metrics of urbanization are strongly correlated, although none can directly substitute for another. They also are measured differently, which renders one or another more suitable for a given application. Land use is a common measure in the realm of urban planning, wherein current and future conditions for a city or an entire region are characterized using equivalent categories across parcels, blocks, or broad regions. Road density can be reliably and rapidly measured, either manually or in a Geographic Information System environment, and it commonly displays a very good correlation with other measures of human activity. "Land cover," however, and particularly the percentage of impervious cover, is the metric most commonly used in studying the effects of urban development on stormwater, because it clearly expresses the hydrologic influence and watershed scale of urbanization. Box 1-2 describes the ways in which the percent of impervious cover in a watershed is measured.

There is no universally accepted terminology to describe land-cover or land-use conditions along the rural-to-urban gradient. Pozzi and Small (2005), for example, identified "rural," "suburban," and "urban" land uses on the basis of population density and vegetation cover, but they did not observe abrupt transitions that suggested natural boundaries (see Figure 1-1). In contrast, the Center for Watershed Protection (2005) defined the same terms but used impervious area percentage as the criterion, with such labels as "rural" (0 to 10 percent imperviousness), "suburban" (10 to 25 percent imperviousness), "urban" (25 to 60 percent imperviousness) and "ultra-urban" (greater than 60 percent imperviousness).

Beyond the problems posed by precise yet inconsistent definitions for commonly used words, none of the boundaries specified by these definitions are reflected in either hydrologic or ecosystem responses. Hydrologic response is strongly dependent on both land cover and drainage connectivity (e.g., Leopold, 1968); ecological responses in urbanizing watersheds do not show marked thresholds along an urban gradient (e.g., Figure 1-2) and they are dependent on not only the sheer magnitude of urban development but also the spatial configuration of that development across the watershed (Alberti et al., 2006). This report, therefore, uses such terms as "urban" and "suburban" under their common usage, without implying or advocating for a more precise (but ultimately limited and discipline-specific) definition.

Changing land cover and land use influence the physical, chemical, and biological conditions of downstream waterways. The specific mechanisms by which this influence occurs vary from place to place, and even a cursory review

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BOX 1-2
Measures of Impervious Cover

The percentage of impervious surface or cover in a landscape is the most frequently used measure of urbanization. Yet this parameter has its limitations, in part because it has not been consistently used or defined. Most significant is the distinction between ***total*** impervious area (TIA) and ***effective*** impervious area (EIA). TIA is the "intuitive" definition of imperviousness: that fraction of the watershed covered by constructed, non-infiltrating surfaces such as concrete, asphalt, and buildings. Hydrologically, however, this definition is incomplete for two reasons. First, it ignores nominally "pervious" surfaces that are sufficiently compacted or otherwise so low in permeability that the rate of runoff from them is similar or indistinguishable from pavement. For example, Burges and others (1998) found that the impervious unit-area runoff was only 20 percent greater than that from pervious areas—primarily thin sodded lawns over glacial till—in a western Washington residential subdivision. Clearly, this hydrologic contribution cannot be ignored entirely.

The second limitation of TIA is that it includes some paved surfaces that may contribute nothing to the stormwater-runoff response of the downstream channel. A gazebo in the middle of parkland, for example, probably will impose no hydrologic changes into the catchment except for a very localized elevation of soil moisture at the edge of its roof. Less obvious, but still relevant, would be the different downstream consequences of rooftops that drain alternatively into a piped storm-drain system with direct discharge into a natural stream or onto splash blocks that disperse the runoff onto the garden or lawn at each corner of the building. This metric therefore cannot recognize any stormwater mitigation that may result from alternative runoff-management strategies, for example, pervious pavements or rainwater harvesting.

The first of these TIA limitations, the production of significant runoff from nominally pervious surfaces, is typically ignored in the characterization of urban development. The reason for such an approach lies in the difficulty in identifying such areas and estimating their contribution, and because of the credible belief that the degree to which pervious areas shed water as overland flow should be related, albeit imperfectly, with the amount of *impervious* area: where construction and development are more intense and cover progressively greater fractions of the

of the literature demonstrates that many different factors can be important, such as changes to flow regime, physical and chemical constituents in the water column, or the physical form of the stream channel itself (Paul and Meyer, 2001). Not all of these changes are present in any given system—lakes, wetlands, and streams can be altered by human activity in many different ways, each unique to the activity and the setting in which it occurs. Nonetheless, direct influences of land-use change on freshwater systems commonly include the following (Naiman and Turner, 2000):

- Altering the composition and structure of the natural flora and fauna,
- Changing disturbance regimes,
- Fragmenting the land into smaller and more diverse parcels, and
- Changing the juxtaposition between parcel types.

Historically, human-induced alteration was not universally seen as a problem. In particular, dams and other stream-channel "improvements" were a

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watershed, it is more likely that the intervening green spaces have been stripped and compacted during construction and only imperfectly rehabilitated for their hydrologic functions during subsequent "landscaping."

The second of these TIA limitations, inclusion of non-contributing impervious areas, is formally addressed through the concept of EIA, defined as the impervious surfaces with direct hydraulic connection to the downstream drainage (or stream) system. Thus, any part of the TIA that drains onto pervious (i.e., "green") ground is excluded from the measurement of EIA. This parameter, at least conceptually, captures the hydrologic significance of imperviousness. EIA is the parameter normally used to characterize urban development in hydrologic models.

The direct measurement of EIA is complicated. Studies designed specifically to quantify this parameter must make direct, independent measurements of both TIA and EIA (Alley and Veenhuis, 1983; Laenen, 1983; Prysch and Ebbert, 1986). The results can then be generalized either as a correlation between the two parameters or as a "typical" value for a given land use. Sutherland (1995) developed an equation that describes the relationship between EIA and TIA. Its general form is:

$$EIA = A\,(TIA)^{B}$$

where *A* and *B* are a unique combination of numbers that satisfy the following criteria:

TIA = 1 then EIA = 0%
TIA = 100 then EIA = 100%

A commonly used version of this equation ($EIA = 0.15\ TIA^{1.41}$) was based on samples from highly urbanized land uses in Denver, Colorado (Alley and Veenhuis, 1983; Gregory et al., 2005). These results, however, are almost certainly region- and even neighborhood-specific, and, although highly relevant to watershed studies, they can be quite laborious to develop.

common activity of municipal and federal engineering works of the mid-20th century (Williams and Wolman, 1984). "Flood control" implied a betterment of conditions, at least for streamside residents (Chang, 1992). And fisheries "enhancements," commonly reflected by massive infrastructure for hatcheries or artificial spawning channels, were once seen as unequivocal benefits for fish populations (White, 1996; Levin et al., 2001).

By almost any currently applied metric, however, the net result of human alteration of the landscape to date has resulted in a degradation of the conditions in downstream watercourses. Many prior researchers, particularly when considering ecological conditions and metrics, have recognized a crude but monotonically declining relationship between human-induced landscape alteration and downstream conditions (e.g., Figure 1-2; Horner et al., 1997; Davies and Jackson, 2006). These include metrics of physical stream-channel conditions (e.g., Bledsoe and Watson, 2001), chemical constituents (e.g., Figure 1-3; House et al., 1993), and biological communities (e.g., Figure 1-4; Steedman, 1988; Wang et al., 1997).

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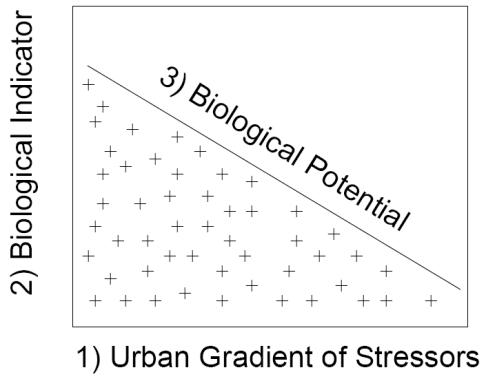

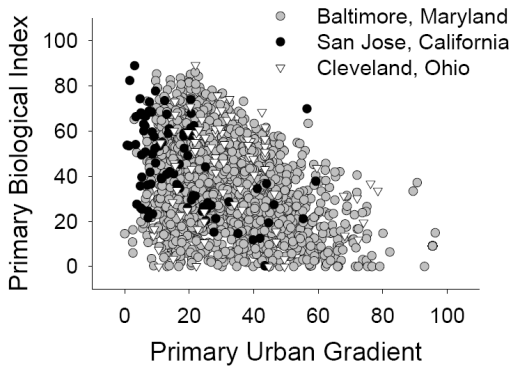

FIGURE 1-2 Conceptual model (top) and actual response (bottom) of a biological system's response to stress. The "Urban Gradient of Stressors" might be a single metric of urbanization, such as percent watershed impervious or road density; the "Biological Indicator" may be single-metric or multi-metric measures of the level of disturbance in an aquatic community. The right-declining line traces the limits of a "factor-ceiling distribution" (Thomson et al., 1986), wherein individual sites (i.e., data points) have a wide range of potential values for a given position along the urban gradient but are not observed above a maximum possible limit of the biological index. The bottom graph illustrates actual biological responses, using a biotic index developed to show responses to urban impacts plotted against a standardized urban gradient comprising urban land use, road density, and population. SOURCE: Top figure reprinted, with permission, from Davies and Jackson (2006). Copyright by the Ecological Society of America. Bottom figure reprinted, with permission, from Barbour et al. (2006). Copyright by the Water Environment Research Foundation.

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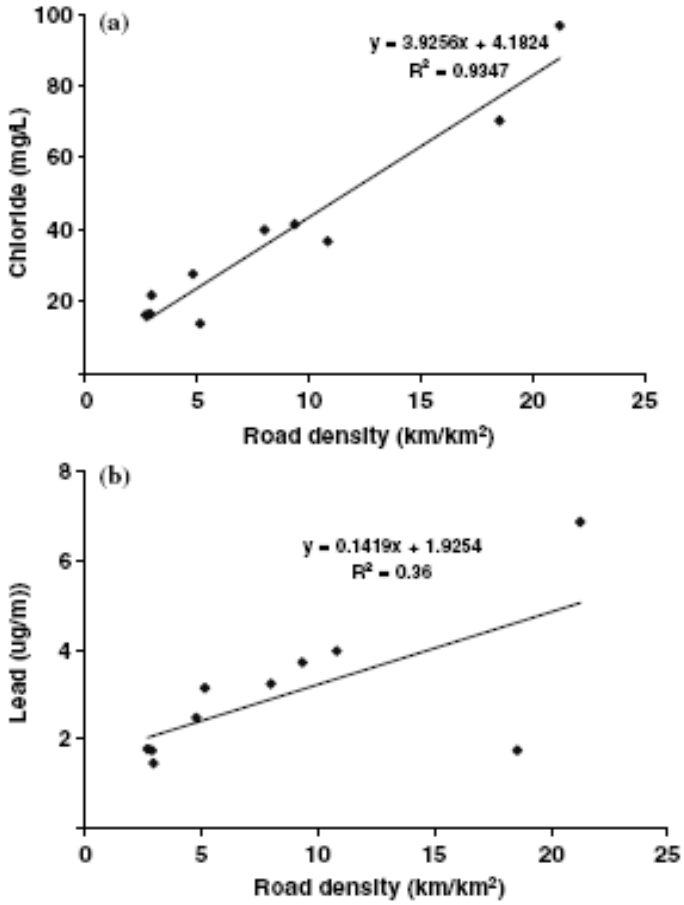

FIGURE 1-3 Example relationships between road density (a surrogate measure of urban development) and common water quality constituents. Direct causality is not necessarily implied by such relationships, but the monotonic increase in concentrations with increasing "urbanization," however measured, is near-universal. SOURCE: Reprinted, with permission, from Chang and Carlson (2005). Copyright 2005 by Springer.

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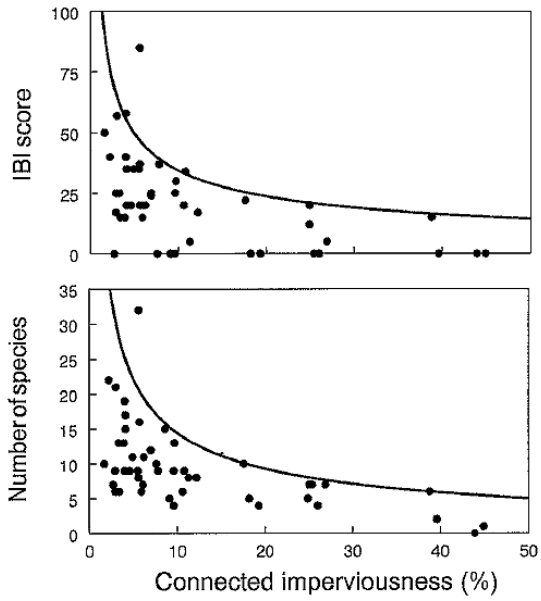

FIGURE 1-4 Plots of Effective Impervious Area (EIA, or "connected imperviousness") against metrics of biologic response in fish populations. SOURCE: Reprinted, with permission, from Wang et al. (2001). Copyright 2001 by Springer.

The association between watercourse degradation and landscape alteration in general, and urban development in particular, seems inexorable. The scientific and regulatory challenge of the last three decades has been to decouple this relationship, in some cases to reverse its trend and in others to manage where these impacts are to occur.

WHAT'S WRONG WITH THE NATION'S WATERS?

Since passage of the Water Quality Act of 1948 and the Clean Water Act (CWA) of 1972, 1977, and 1987, water quality in the United States has measurably improved in the major streams and rivers and in the Great Lakes. However, substantial challenges and problems remain. Major reporting efforts that have examined state and national indicators of condition, such as CWA 305(b) reports (EPA, 2002) and the Heinz State of the Nation's Ecosystem report (Heinz Center, 2002), or environmental monitoring that was designed to provide statistically valid estimates of condition (e.g., National Wadeable Stream Assessment; EPA, 2006), have confirmed widespread impairments related to diffuse sources of pollution and stressors.

The National Water Quality Inventory (derived from Section 305b of the CWA) compiles data in relation to use designations and water quality standards.

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As discussed in greater detail in Chapter 2, such standards include both (1) a description of the use that a waterbody is supposed to achieve (such as a source of drinking water or a cold water fishery) and (2) narrative or numeric criteria for physical, chemical, and biological parameters that allow the designated use to be achieved. As of 2002, 45 percent of assessed streams and rivers, 47 percent of assessed lakes, 32 percent of assessed estuarine areas, 17 percent of assessed shoreline miles, 87 percent of near-coastal ocean areas, 51 percent of assessed wetlands, 91 percent of assessed Great Lakes shoreline miles, and 99 percent of assessed Great Lakes open water areas were not meeting water quality standards set by the states (2002 EPA Report to Congress).[1]

The U.S. Environmental Protection Agency (EPA) has also embarked on a five-year statistically valid survey of the nation's waters (http://www.epa.gov/owow/monitoring/guide.pdf). To date, two waterbody types—coastal areas and wadeable streams—have been assessed. The most recent data indicate that 42 percent of wadeable streams are in poor biological condition and 25 percent are in fair condition (EPA, 2006). The overall condition of the nation's estuaries is generally fair, with Puerto Rico and Northeast Coast regions rated poor, the Gulf Coast and West Coast regions rated fair, and the Southeast Coast region rated good to fair (EPA, 2007). These condition ratings for the National Estuary Program are based on a water quality index, a sediment quality index, a benthic index, and a fish tissue contaminants index.

The impairment of waterbodies is manifested in a multitude of ways. Indeed, EPA's primary process for reporting waterbody condition (Section 303(d) of the CWA—see Chapter 2) identifies over 200 distinct types of impairments. As shown in Table 1-1, these have been categorized into 15 broad categories, encompassing about 94 percent of all impairments. 59,515 waterbodies fall into one of the top 15 categories, while the total reported number of waterbodies impaired from all causes is 63,599 (which is an underestimate of the actual total because not all waterbodies are assessed). Mercury, microbial pathogens, sediments, other metals, and nutrients are the major pollutants associated with impaired waterbodies nationwide. These constituents have direct impacts on aquatic ecosystems and public health, which form the basis of the water quality standards set for these compounds. Sediments can harm fish and macroinvertebrate communities by introducing sorbed contaminants, decreasing available light in streams, and smothering fish eggs. Microbial pathogens can cause disease to humans via both ingestion and dermal contact and are frequently cited as the cause of beach closures and other recreational water hazards in lakes and estuaries. Nutrient over-enrichment can promote a cascade of events in waterbodies from algal blooms to decreases in dissolved oxygen and associated fish kills. Metals like mercury, pesticides, and other organic compounds that enter

[1] EPA does not yet have the 2004 assessment findings compiled in a consistent format from all the states. EPA is also working on processing the states 2006 Integrated Reports as the 303(d) portions are approved and the states submit their final assessment findings. Susan Holdsworth, EPA, personal communication, September 2007.

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waterways can be taken up by fish species, accumulating in their tissues and presenting a health risk to organisms (including humans) that consume the fish.

However, Table 1-1 can be misleading if it implies that degraded *water quality* is the primary metric of impairment. In fact, many of the nation's streams, lakes, and estuaries also suffer from fundamental changes in their flow regime and energy inputs, alteration of aquatic habitats, and resulting disruption of biotic interactions that are not easily measured via pollutant concentrations. Such waters may not be listed on State 303(d) lists because of the absence of a corresponding water quality standard that would directly indicate such conditions (like a biocriterion). Figure 1-5A, B, and C show examples of such impacted waterbodies.

TABLE 1-1 Top 15 Categories of Impairment Requiring CWA Section 303(d) Action

Cause of Impairment	Number of Waterbodies	Percent of the Total
Mercury	8,555	14%
Pathogens	8,526	14%
Sediment	6,689	11%
Metals (other than mercury)	6,389	11%
Nutrients	5,654	10%
Oxygen depletion	4,568	8%
pH	3,389	6%
Cause unknown - biological integrity	2,866	5%
Temperature	2,854	5%
Habitat alteration	2,220	4%
PCBs	2,081	3%
Turbidity	2,050	3%
Cause unknown	1,356	2%
Pesticides	1,322	2%
Salinity/TDS/chlorides	996	2%

Note: "Waterbodies" refers to individual river segments, lakes, and reservoirs. A single waterbody can have multiple impairments. Because most waters are not assessed, however, there is no estimate of the number of unimpaired waters in the United States. SOURCE: EPA, National Section 303(d) List Fact Sheet (http://iaspub.epa.gov/waters/national_rept.control). The data are based on three-fourths of states reporting from 2004 lists, with the remaining from earlier lists and one state from a 2006 list.

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FIGURE 1-5A Headwater tributary in Philadelphia suffering from Urban Stream Syndrome. SOURCE: Courtesy of Chris Crockett, Philadelphia Water Department.

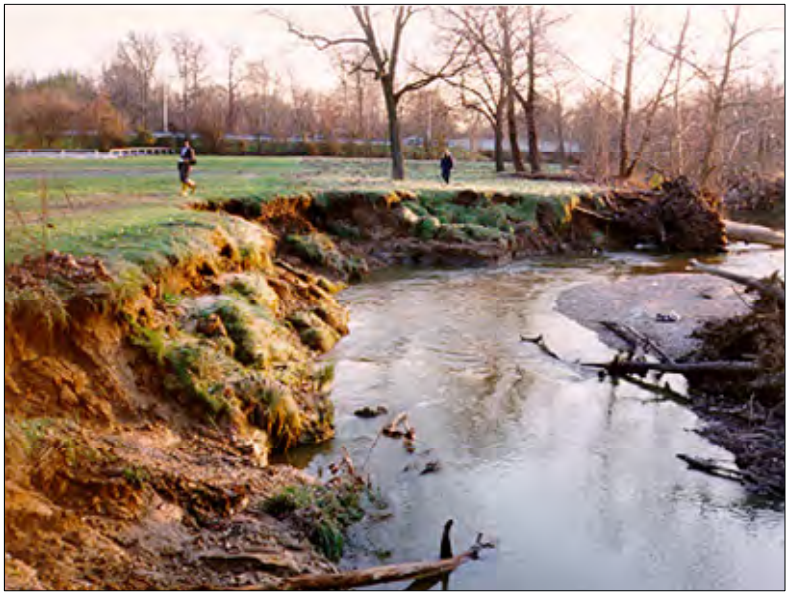

FIGURE 1-5B A destabilized stream in Vermont. SOURCE: Courtesy of Pete LaFlamme, Vermont Department of Environmental Conservation.

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FIGURE 1-5C An urban stream, the Lower Oso Creek in Orange County, California, following a storm event. Oso Creek was formerly an ephemeral stream, but heavy development in the contributing watershed has created perennial flow—stormwater flow during wet weather and minor wastewater discharges and authorized non-stormwater discharges such as landscape irrigation runoff during dry weather. Courtesy of Eric Stein, Southern California Coastal Research Water Project.

Over the years, the greatest successes in improving the nation's waters have been in abating the often severe impairments caused by municipal and industrial point source discharges. The pollutant load reductions required of these facilities have been driven by the National Pollutant Discharge Elimination System (NPDES) permit requirements of the CWA (see Chapter 2). Although the majority of these sources are now controlled, further declines in water quality remain likely if the land-use changes that typify more diffuse sources of pollution are not addressed (Palmer and Allan, 2006). These include land-disturbing agricultural, silvicultural, urban, industrial, and construction activities from which hard-to-monitor pollutants emerge during wet-weather events. Pollution from these landscapes has been almost universally acknowledged as the most pressing challenge to the restoration of waterbodies and aquatic ecosystems nationwide. All population and development forecasts indicate a continued worsening of the environmental conditions caused by diffuse sources of pollution under the nation's current growth and land-use trajectories.

Recognition of urban stormwater's role in the degradation of the nation's waters is but the latest stage in the history of this byproduct of the human envi-

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ronment. Runoff conveyance systems have been part of cities for centuries, but they reflected only the desire to remove water from roads and walkways as rapidly and efficiently as possible. In some arid environments, rainwater has always been collected for irrigation or drinking; elsewhere it has been treated as an unmetered, and largely benign, waste product of cities. Minimal (unengineered) ditches or pipes drained developed areas to the nearest natural watercourse. Where more convenient, stormwater shared conveyance with wastewater, eliminating the cost of a separate pipe system but commonly resulting in sewage overflows during rainstorms. Recognition of downstream flooding that commonly resulted from upstream development led to construction of stormwater storage ponds or vaults in many municipalities in the 1960s, but their performance has typically fallen far short of design objectives (Booth and Jackson, 1997; Maxted and Shaver, 1999; Nehrke and Roesner, 2004). Water-quality treatment has been a relatively recent addition to the management of stormwater, and although a significant fraction of pollutants can be removed through such efforts (e.g., Strecker et al., 2004; see http://www.bmpdatabase.org), the constituents remaining even in "treated" stormwater represent a substantial, but largely unappreciated, impact to downstream watercourses.

Of the waterbodies that have been assessed in the United States, impairments from urban runoff are responsible for about 38,114 miles of impaired rivers and streams, 948,420 acres of impaired lakes, 2,742 square miles of impaired bays and estuaries, and 79,582 acres of impaired wetlands (2002 305(b) report). These numbers must be considered an underestimate, since the urban runoff category does not include stormwater discharges from municipal separate storm sewer systems (MS4s) and permitted industries, including construction. Urban stormwater is listed as the "primary" source of impairment for 13 percent of all rivers, 18 percent of all lakes, and 32 percent of all estuaries (2000 305(b) report). Although these numbers may seem low, urban areas cover just 3 percent of the land mass of the United States (Loveland and Auch, 2004), and so their influence is disproportionately large. Indeed, developed and developing areas that are a primary focus of stormwater regulations contain some of the most degraded waters in the country. For example, in Ohio few sites with greater than 27 percent imperviousness can meet interim CWA goals in nearby waterbodies, and biological degradation is observed with much less urban development (Miltner et al., 2004). Numerous authors have found similar patterns (see Meyer et al., 2005).

Although no water quality inventory data have been made available from the EPA since 2002, the dimensions of the stormwater problem can be further gleaned from several past regional and national water quality inventories. Many of these assessments are somewhat dated and are subject to the normal data and assessment limitations of national assessment methods, but they indicate that stormwater runoff has a deleterious impact on nearly all of the nation's waters. For example:

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- Harvesting of shellfish is prohibited, restricted, or conditional in nearly 40 percent of all shellfish beds nationally due to high bacterial levels, and urban runoff and failing septic systems are cited as the prime causes. Reopening of shellfish beds due to improved wastewater treatment has been more than offset by bed closures due to rapid coastal development (NOAA, 1992; EPA, 1998).

- In 2006 there were over 15,000 beach closings or swimming advisories due to bacterial levels exceeding health and safety standards, with polluted runoff and stormwater cited as the cause of the impairment 40 percent of the time (NRDC, 2007).

- Pesticides were detected in 97 percent of urban stream water samples across the United States, and exceeded human health and aquatic life benchmarks 6.7 and 83 percent of the time, respectively (USGS, 2006). In 94 percent of fish tissues sampled in urban areas nationwide, organochlorine compounds were detected.

- Urban development was responsible for almost 39 percent of freshwater wetland loss (88,960 acres) nationally between 1998 and 2004 (Dahl, 2006), and the direct impact of stormwater runoff in degrading wetland quality is predicted to affect an even greater acreage (Wright et al., 2006).

- Eastern brook trout are present in intact populations in only 5 percent of more than 12,000 subwatersheds in their historical range in eastern North America, and urbanization is cited as a primary threat in 25 percent of the remaining subwatersheds with reduced populations (Trout Unlimited, 2006).

- Increased flooding is common throughout urban and suburban areas, sometimes as a consequence of improperly sited development (Figure 1-6A) but more commonly as a result of increasing discharges over time resulting from progressive urbanization farther upstream (Figure 1-6B). According to FEMA (undated), property damage from all types of flooding, from flash floods to large river floods, averages $2 billion a year.

- The chemical effects of stormwater runoff are pervasive and severe throughout the nation's urban waterways, and they can extend far downstream of the urban source. Stormwater discharges from urban areas to marine and estuarine waters cause greater water column toxicity than similar discharges from less urban areas (Bay et al., 2003).

- A variety of studies have shown that stormwater runoff is a vector of pathogens with potential human health implications in both freshwater (Calderon et al., 1991) and marine waters (Dwight et al., 2004; Colford et al., 2007).

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A

B

FIGURE 1-6 (A) New residential construction in the path of episodic stream discharge (Issaquah, Washington); (B) recent flooding of an 18th-century tavern in Collegeville, Pennsylvania following a storm event in an upstream developing watershed. SOURCES: Top, Derek Booth, Stillwater Sciences, Inc., and bottom, Robert Traver, Villanova University.

WHY IS IT SO HARD TO REDUCE THE IMPACTS OF STORMWATER?

"Urban stormwater" is the runoff from a landscape that has been affected in some fashion by human activities, during and immediately after rain. Most visibly, it is the water flow over the ground surface, which is collected by natural channels and artificial conveyance systems (pipes, gutters, and ditches) and ultimately routed to a stream, river, lake, wetland, or ocean. It also includes water that has percolated into the ground but nonetheless reaches a stream channel relatively rapidly (typically within a day or so of the rainfall), contributing to the high discharge in a stream that commonly accompanies rainfall. The subsurface

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flow paths that contribute to this stormflow response are typically quite shallow, in the upper layers of the soil, and are sometimes termed "interflow." They stand in contrast to deeper groundwater paths, where water moves at much lower velocities by longer paths and so reaches the stream slowly, over periods of days, weeks, or months. This deeper flow sustains streamflow during rainless periods and is usually called baseflow, as distinct from "stormwater." A formal distinction between these types of runoff is sometimes needed for certain computational procedures, but for most purposes a qualitative understanding is sufficient.

These runoff paths can be identified in virtually all modified landscapes, such as agriculture, forestry, and mining. However, this report focuses on those settings with the particular combination of activities that constitute "urbanization," by which we mean to include the commonly understood conversion (whether incremental or total) of a vegetated landscape to one with roads, houses, and other structures.

Although the role of urban stormwater in degrading the nation's waters has been recognized for decades (e.g., Klein, 1979), reducing that role has been notoriously difficult. This difficulty arises from three basic attributes of what is commonly termed "stormwater":

1. It is produced from literally everywhere in a *developed* landscape;
2. Its production and delivery are episodic, and these fluctuations are difficult to attenuate; and
3. It accumulates and transports much of the collective waste of the urban environment.

Wherever grasslands and forest are replaced by urban development in general, and impervious surfaces in particular, the movement of water across the landscape is radically altered (see Figure 1-7). Nearly all of the associated problems result from one underlying cause: loss of the water-retaining function of the soil and vegetation in the urban landscape. In an undeveloped, vegetated landscape, soil structure and hydrologic behavior are strongly influenced by biological activities that increase soil porosity (the ratio of void space to total soil volume) and the number and size of macropores, and thus the storage and conductivity of water as it moves through the soil. Leaf litter on the soil surface dissipates raindrop energy; the soil's organic content reduces detachment of small soil particles and maintains high surface infiltration rates. As a consequence, rainfall typically infiltrates into the ground surface or is evapotranspired by vegetation, except during particularly intense rainfall events (Dunne and Leopold, 1978).

In the urban landscape, these processes of evapotranspiration and water retention in the soil may be lost for the simple reason that the loose upper layers of the soil and vegetation are gone—stripped away to provide a better foundation for roads and buildings. Even if the soil still exists, it no longer functions if precipitation is denied access because of paving or rooftops. In either case, a stormwater

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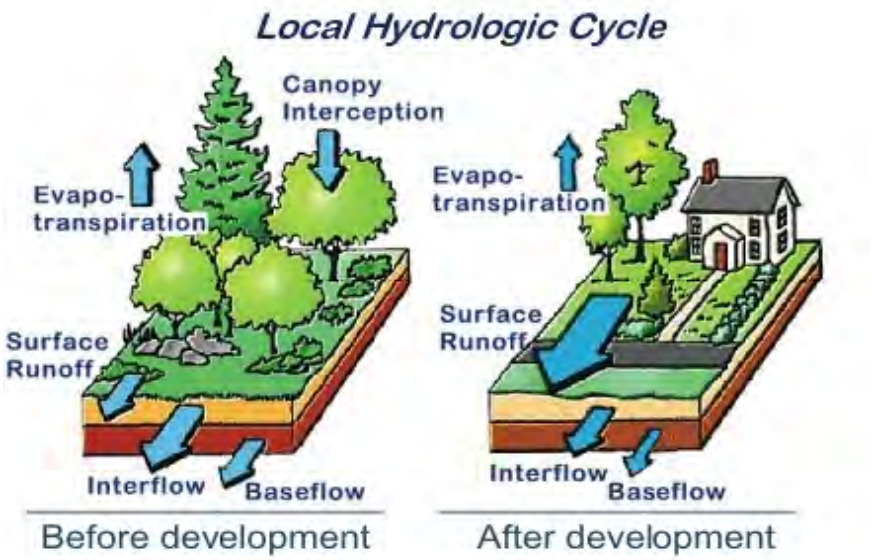

FIGURE 1-7 Schematic of the hydrologic pathways in humid-region watersheds, before and after urban development. The sizes of the arrows suggest relative magnitudes of the different elements of the hydrologic cycle, but conditions can vary greatly between individual catchments and only the increase in surface runoff in the post-development condition is ubiquitous. SOURCE: Adapted from Schueler (1987) and Maryland Department of the Environment; http://www.mde.state.md.us/Programs/WaterPrograms.

runoff reservoir of tremendous volume is removed from the stormwater runoff system; water that may have lingered in this reservoir for a few days or many weeks, or been returned directly to the atmosphere by evaporation or transpiration by plants, now flows rapidly across the land surface and arrives at the stream channel in short, concentrated bursts of high discharge.

This transformation of the hydrologic regime from one where subsurface flow once dominated to one where overland flow now dominates is not simply a readjustment of runoff flow paths, and it does not just result in a modest increase in flow volumes. It is a wholesale reorganization of the processes of runoff generation, and it occurs throughout the developed landscape. As such, it can affect every aspect of that runoff (Leopold, 1968)—not only its rate of production, its volume, and its chemistry, but also what it indirectly affects farther downstream (Walsh et al., 2005a). This includes erosion of mobile channel boundaries, mobilization of once-static channel elements (e.g., large logs), scavenging of contaminants from the surface of the urban landscape, and efficient transfer of heat from warmed surfaces to receiving waterbodies. These changes have commonly inspired human reactions—typically with narrow objectives but carrying additional, far-ranging consequences—such as the piping of once-exposed channels, bank armoring, and construction of large open-water detention ponds (e.g., Lieb and Carline, 2000).

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This change in runoff regime is also commonly accompanied by certain land-use activities that have the potential to generate particularly harmful or toxic discharges, notably those commercial activities that are the particular focus of the industrial NPDES permits. These include manufacturing facilities, transport of freight or passengers, salvage yards, and a more generally defined category of "sites where industrial materials, equipment, or activities are exposed to stormwater" (e.g., EPA, 1992).

Other human actions are associated with urban landscapes that do not affect stormwater directly, but which can further amplify the negative consequences of altered flow. These actions include clearing of riparian vegetation around streams and wetlands, introduction of atmospheric pollutants that are subsequently deposited, inadvertent release of exotic chemicals into the environment, and channel crossings by roads and utilities. Each of these additional actions further degrades downstream waterbodies and increases the challenge of finding effective methods to reverse these changes (Boulton, 1999). There is little doubt as to why the problem of urban stormwater has not yet been "solved"—because every functional element of an aquatic ecosystem is affected. Urban stormwater has resulted in such widespread impacts, both physical and biological, in aquatic systems across the world that this phenomenon has been termed the "Urban Stream Syndrome" (see Figure 1-5; Walsh et al., 2005b).

Of the many possible ways to consider these conditions, Karr (1991) has recommended a simple yet comprehensive grouping of the major stressors arising from urbanization that influence aquatic assemblages (Figure 1-8). These include chemical pollutants (water quality and toxicity); changes to flow magnitude, frequency, and seasonality of various discharges; the physical aspects of stream, lake, or wetland habitats; the energy dynamics of food webs, sunlight, and temperature; and biotic interactions between native and exotic species. Stormwater and stormwater-related impacts encompass all of these categories, some directly (e.g., water chemistry) and some indirectly (e.g., habitat, energy dynamics). Because of the wide-ranging effects of stormwater, programs to abate stormwater impacts on aquatic systems must deal with a broad range of impairments far beyond any single altered feature, whether traditional water-chemistry parameters or flow rates and volumes.

The broad spatial scale of where and how these impacts are generated suggests that solutions, if effective, should be executed at an equivalent scale. Although the "problem" of stormwater runoff is manifested most directly as an altered hydrograph or elevated concentrations of pollutants, it is ultimately an expression of land-use change at a landscape scale. Symptomatic solutions, applied only at the end of a stormwater collection pipe, are not likely to prove fully effective because they are not functioning at the scale of the original disturbance (Kloss and Calarusse, 2006).

The landscape-scale generation of stormwater has a number of consequences for any attempt to reduce its effects on receiving waters, as described below.

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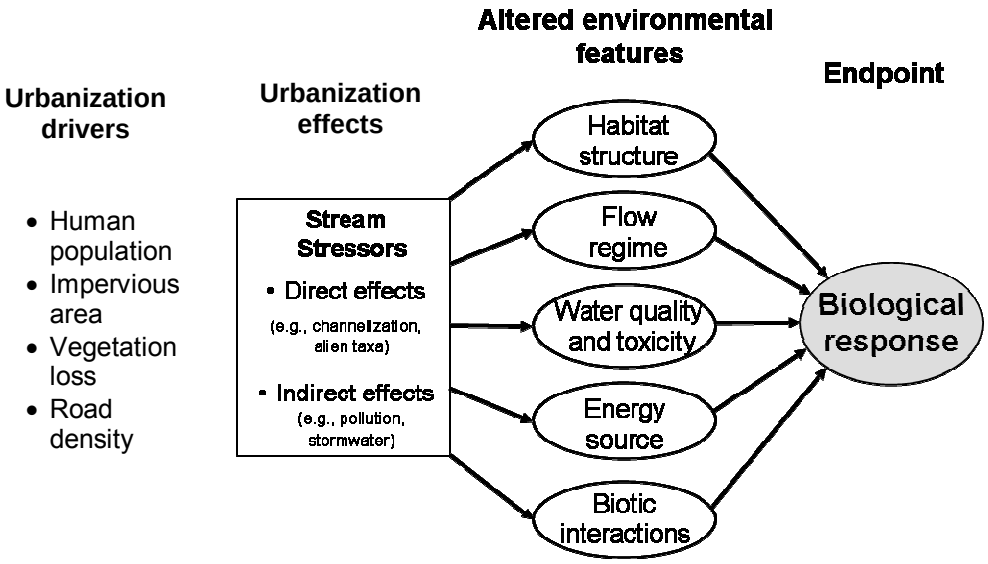

FIGURE 1-8 Five features that are affected by urban development and, in turn, affect biological conditions in urban streams. SOURCES: Modified from Karr (1991), Karr and Yoder (2004), and Booth (2005). Reprinted, with permission, from Karr (1991). Copyright 2001 by Ecological Society of America. Reprinted, with permission, from Karr and Yoder (2004). Copyright 2004 by American Society of Civil Engineers. Reprinted, with permission, from Booth (2005). Copyright 2005 by the North American Benthological Society.

Sources and Volumes

The "source" of stormwater runoff is dispersed, making collection and centralized treatment challenging. To the extent that collection is successful, however, the flip side of this condition—very large volumes—becomes manifest. Either an extensive infrastructure brings stormwater to centralized facilities, whose operation and maintenance may be relatively straightforward (e.g., Anderson et al., 2002) but of modest effectiveness, or stormwater remains dispersed for management, treatment, or both across the landscape (e.g., Konrad and Burges, 2001; Holman-Dodds et al., 2003; Puget Sound Action Team, 2005; Walsh et al., 2005a; Bloom, 2006; van Roon, 2007), better mimicking the natural processes of runoff generation but requiring a potentially unlimited number of "facilities" that may have their own particular needs for space, cost, and maintenance.

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Treatment Challenges

Regardless of the scale at which treatment is attempted, technological difficulties are significant because of the variety of "pollutants" that must be addressed. These include physical objects, from large debris to microscopic particles; chemical constituents, both dissolved and immiscible; and less easily categorized properties such as temperature. Wastewater treatment plants manage a similarly broad range of pollutants, but stormwater flows have highly unsteady inflows and, when present, typically much greater volumes to treat.

Industrial sources of stormwater pose a particularly challenging problem because potential generators of polluted or toxic runoff are widespread and are regulated under NPDES permitting by their *activities*, not by the specific category of industrial activity under which they fall. This complicates any systematic effort to identify those entities that should be regulated (Duke et al., 1999). Even for the limited number of regulated generators, pollution prevention measures are of uncertain effectiveness.

Soil erosion from construction sites is another pollution source that has proven difficult to effectively control. Although most bare sites are relatively small and only short-lived, at any given time there can be many sites under construction, each of which can deliver sediment loads to downstream waterbodies at rates that exceed background levels by many orders of magnitude (e.g., Wolman and Schick, 1967). Relatively effective approaches and technologies exist to dramatically reduce the magnitude of these sediment discharges (e.g., Raskin et al., 2005), but they depend on conscientious installation and regular maintenance. Enforcement of such requirements, normally a low-priority activity of local departments of building or public works, is commonly lacking.

Another difference between the stormwater and wastewater streams is that stormwater treatment must address not only "pollutants" but also physically and ecologically deleterious changes in flow rate and total runoff volume. Treating these changes constitutes a particularly difficult task for two reasons. First, there is simply more runoff, as a rule, and so replicating the predevelopment hydrograph is not an option—the increased volume of runoff guarantees that some discharges, some of the time, must be allowed to increase. Second, there is little agreement on what constitutes "adequate" or "effective" treatment for the various attributes of flow. Even the most basic metrics, such as the magnitude of peak flow, can require extensive infrastructure to achieve (e.g., Booth and Jackson, 1997); other flow metrics that correlate more directly with undesired effects on physical and biological systems can require even greater efforts to match. In many cases, the urban-induced transformation of the flow regime makes true "mitigation" virtually impossible.

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Widespread Cause and Effects

The spatial scale of stormwater generation and its impacts is wide-ranging. "Generators" are literally landscape-wide, and impacts can occur at every location in the path followed by urban runoff, from source to receiving waterbody (Hamilton et al., 2004). There are few ways to demonstrate causal connections between distributed landscape sources and cumulative downstream effects (Allan, 2004), and so site-specific mitigation typically provides little lasting improvement in the watershed as a whole (Maxted and Shaver, 1997).

Stormwater Measurements

The desired attributes of stormwater runoff are normally expressed through a combination of physical and chemical parameters. These parameters are commonly presumed to have direct correlation to attributes of human or ecological concern, such as the condition of human or fish communities, or the stability of a stream channel, even though these parameters do not directly measure those effects. The most commonly measured physical parameters are hydrologic and simply measure the rate of flow past a specified location. Both the absolute, instantaneous magnitude of that flow rate (i.e., the discharge) and the variations in that rate over multiple time scales (i.e., how rapidly the discharge varies over an hour, a day, a season, etc.) can be captured by analysis of a continuous time series of a flow. Obviously, however, a nearly unlimited number of possible metrics, capturing a multitude of temporal scales, could be defined (Poff et al., 1997, 2006; Cassin et al., 2004; Konrad et al., 2005; Roy et al., 2005; Chang, 2007). Commonly only a single parameter—the peak storm discharge for a given return period (Hollis, 1975)—has been emphasized in the past. Mitigation of urban-induced flow increases have followed this narrow approach, typically by endeavoring to reduce peak discharge by use of detention ponds but leaving the underlying increase in runoff volumes—and the associated augmentation of both frequency and duration of high discharges—untouched. This partly explains why evaluation of downstream conditions commonly document little improvement resulting from traditional flow-mitigation measures (e.g., Maxted and Shaver, 1997; Roesner et al., 2001; May and Horner, 2002).

Other physical parameters, less commonly measured or articulated, can also express the conditions of downstream watercourses. Measures of size or complexity, particularly for stream channels, are particularly responsive to the changes in flow regime and discharge. Booth (1990) suggested that discriminating between *channel expansion*, the proportional increase in channel cross-sectional area with increasing discharge, and *channel incision*, the catastrophic vertical downcutting that sometimes accompanies urban-induced flow increases, captures important end-members of the physical response to hydrologic change. The former (proportional expansion) is more thoroughly documented (Hammer, 1972; Hollis and Luckett, 1976; Morisawa and LaFlure, 1982; Neller, 1988;

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Whitlow and Gregory, 1989; Booth and Jackson, 1997; Moscrip and Montgomery, 1997; Booth and Henshaw, 2001); the latter (catastrophic incision) is more difficult to quantify but has been recognized in both urban and agricultural settings (e.g., Simon, 1989). Both types of changes result not only in a larger channel but also in substantial simplification and loss of features normally associated with high-quality habitat for fish and other in-stream biota. The sediment released by these "growing channels" also can be the largest component of the overall sediment load delivered to downstream waterbodies (Trimble, 1997; Nelson and Booth, 2002).

Chemical parameters (or, historically, "water-quality parameters"; see Dinius, 1987; Gergel et al., 2002) cover a host of naturally and anthropogenically occurring constituents in water. In flowing water these are normally expressed as instantaneous measurements of concentration. In waterbodies with long residence times, such as lakes, these may be expressed as either concentrations or as loads (total accumulated amounts, or total amounts integrated over an extended time interval). The CWA defined a list of priority pollutants, of which a subset is regularly measured in many urban streams (e.g., Field and Pitt, 1990). Parameters that are not measured may or may not be present, but without assessment they are rarely recognized for their potential (or actual) contribution to waterbody impairment.

Other attributes of stormwater do not fit as neatly into the categories of water quantity or water quality. Temperature is commonly measured and is normally treated as a water quality parameter, although it is obviously not a chemical property of the water (LeBlanc et al., 1997; Wang et al., 2003). Similarly, direct or indirect measures of suspended matter in the water column (e.g., concentration of total suspended solids, or secchi disk depths in a lake) are primarily physical parameters but are normally included in water quality metrics. Flow velocity is rarely measured in either context, even though it too correlates directly to stream-channel conditions. Even more direct expressions of a flow's ability to transport sediment or other debris, such as shear stress or unit stream power, are rarely reported and virtually never regulated.

***

Urban runoff degrades aquatic systems in multiple ways, which confounds our attempts to define causality or to demonstrate clear linkages between mitigation and ecosystem improvement. It is generally recognized from the conceptual models that seek to describe this system that no single element holds the key to ecosystem condition. All elements must be functional, and yet every element can be affected by urban runoff in different ways. These impacts occur at virtually all spatial scales, from the site-specific to the landscape; this breadth and diversity challenges our efforts to find effective solutions.

This complexity and the continued growth of the built environment also present fundamental social choices and management challenges. Stormwater control measures entail substantial costs for their long-term maintenance, moni-

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toring to determine their performance, and enforcement of their use—all of which must be weighed against their (sometimes unproven) benefits. Furthermore, the overarching importance of impervious surfaces inextricably links stormwater management to land-use decisions and policy. For example, where a reversal of the effects of urbanization cannot be realized, more intensive land-use development in certain areas may be a paradoxically appropriate response to reduce the overall impacts of stormwater. That is, increasing population density and impervious cover in designated urban areas may reduce the creation of impervious surface and the associated ecological impacts in areas that will remain undeveloped as a result. In these highly urban areas (with very high percentages of impervious surface), aquatic conditions in local streams will be irreversibly changed and the Urban Stream Syndrome may be unavoidable to some extent. Where these impacts occur and what effort and cost will be used to avoid these impacts are both fundamental issues confronting the nation as it attempts to address stormwater.

IMPETUS FOR THE STUDY AND REPORT ROADMAP

In 1972 Congress amended the Federal Water Pollution Control Act (subsequently referred to as the Clean Water Act) to require control of discharges of pollutants to waters of the United States from point sources. Initial efforts to improve water quality using NPDES permits focused primarily on reducing pollutants from industrial process wastewater and municipal sewage discharges. These point source discharges were clearly and easily shown to be responsible for poor, often drastically degraded conditions in receiving waterbodies because they tended to emanate from identifiable and easily monitored locations, such as pipe outfalls.

As pollution control measures for industrial process wastewater and municipal sewage were implemented and refined during the 1970s and 1980s, more diffuse sources of water pollution have become the predominant causes of water quality impairment, including stormwater runoff. To address the role of stormwater in causing water quality impairments, Congress included Section 402(p) in the CWA; this section established a comprehensive, two-phase approach to stormwater control using the NPDES program. In 1990 EPA issued the Phase I Stormwater Rule (55 Fed. Reg. 47990; November 16, 1990) requiring NPDES permits for operators of municipal separate storm sewer systems (MS4s) serving populations over 100,000 and for runoff associated with industrial activity, including runoff from construction sites five acres and larger. In 1999 EPA issued the Phase II Stormwater Rule (64 Fed. Reg. 68722; December 8, 1999), which expanded the requirements to small MS4s in urban areas and to construction sites between one and five acres in size.

Since EPA's stormwater program came into being, several problems inherent in its design and implementation have become apparent. As discussed in more detail in Chapter 2, problems stem to a large extent from the diffuse nature

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of stormwater discharges combined with a regulatory process that was created for point sources (the NPDES permitting approach). These problems are compounded by the shear number of entities requiring oversight. Although exact numbers are not available, EPA estimates that the number of regulated MS4s is about 7,000, including 1,000 Phase I municipalities and 6,000 from Phase II. The number of industrial permittees is thought to be around 100,000. Each year, the construction permit covers around 200,000 permittees each for both Phase I (five acres or greater) and Phase II (one to five acres) projects. Thus, the total number of permittees under the stormwater program at any time numbers greater than half a million. There are fewer than 100,000 non-stormwater (meaning wastewater) permittees covered by the NPDES program, such that stormwater permittees account for approximately 80 percent of NPDES-regulated entities. To manage this large number of permittees, the stormwater program relies heavily on the use of general permits to control industrial, construction, and Phase II MS4 discharges, which are usually statewide, one-size-fits-all permits in which general provisions are stipulated.

An example of the burden felt by a single state is provided by Michigan (David Drullinger, Michigan Department of Environmental Quality Water Bureau, personal communication, September 2007). The Phase I Stormwater regulations that became effective in 1990 regulate 3,400 industrial sites, 765 construction sites per year, and five large cities in Michigan. The Phase II regulations, effective since 1999, have extended the requirements to 7,000 construction sites per year and 550 new jurisdictions, which are comprised of about 350 "primary jurisdictions" (cities, villages, and townships) and 200 "nested jurisdictions" (county drains, road agencies, and public schools). Often, only a handful of state employees are allocated to administer the entire program (see the survey in Appendix C).

In order to comply with the CWA regulations, permittees must fulfill a number of requirements, including the creation and implementation of a stormwater pollution prevention plan, and in some cases, monitoring of stormwater discharges. Stormwater pollution prevention plans document the stormwater control measures (SCMs; sometimes known as best management practices or BMPs) that will be used to prevent or slow stormwater from quickly reaching nearby waterbodies and degrading their quality. These include structural methods such as detention ponds and nonstructural methods such as designing new development to reduce the percentage of impervious surfaces. Unfortunately, data on the degree of pollutant reduction that can be assigned to a particular SCM are only now becoming available (see Chapter 5).

Other sources of variability in EPA's stormwater program are that (1) there are three permit types (municipal, industrial, and construction), (2) some states and local governments have assumed primacy for the program from EPA while others have not, and state effluent limits or benchmarks for stormwater discharges may differ from the federal requirements, and (3) whether there are monitoring requirements varies depending on the regulating entity and the type of activity. For industrial stormwater there are 29 sectors of industrial activity

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covered by the general permit, each of which is characterized by a different suite of possible contaminants and SCMs.

Because of the industry-, site-, and community-specific nature of stormwater pollution prevention plans, and because of the lack of resources of most NPDES permitting authorities to review these plans and conduct regular compliance inspections, water quality-related accountability in the stormwater program is poor. Monitoring data are minimal for most permittees, despite the fact that they are often the only indicators of whether an adequate stormwater program is being implemented. At the present time, available monitoring data indicate that many industrial facilities routinely exceed "benchmark values" established by EPA or the states, although it is not clear whether these exceedances provide useful indicators of stormwater pollution prevention plan inadequacies or potential water quality problems. These uncertainties have led to mounting and contradictory pressure from permittees to eliminate monitoring requirements entirely as well as from those hoping for greater monitoring requirements to better understand the true nature of stormwater discharges and their impact.

To improve the accountability of it Stormwater Program, EPA requested advice on stormwater issues from the National Research Council's (NRC's) Water Science and Technology Board as the next round of general permits is being prepared. Although the drivers for this study have been in the industrial stormwater arena, this study considered all entities regulated under the NPDES program (municipal, industrial, and construction). The following statement of task guided the work of the committee:

(1) Clarify the mechanisms by which pollutants in stormwater discharges affect ambient water quality criteria and define the elements of a "protocol" to link pollutants in stormwater discharges to ambient water quality criteria.

(2) Consider how useful monitoring is for both determining the potential of a discharge to contribute to a water quality standards violation and for determining the adequacy of stormwater pollution prevention plans. What specific parameters should be monitored and when and where? What effluent limits and benchmarks are needed to ensure that the discharge does not cause or contribute to a water quality standards violation?

(3) Assess and evaluate the relationship between different levels of stormwater pollution prevention plan implementation and in-stream water quality, considering a broad suite of SCMs.

(4) Make recommendations for how to best stipulate provisions in stormwater permits to ensure that discharges will not cause or contribute to exceedances of water quality standards. This should be done in the context of general permits. As a part of this task, the committee will consider currently available information on permit and program compliance.

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(5) Assess the design of the stormwater permitting program implemented under the CWA.

The report is intended to inform decision makers within EPA, affected industries, public stormwater utilities, other government agencies and the private sector about potential options for managing stormwater.

EPA requested that the study be limited to those issues that fall under the agency's current regulatory scheme for stormwater, which excludes nonpoint sources of pollution such as agricultural runoff and septic systems. Thus, these sources are not extensively covered in this report. The reader is referred to NRC (2000, 2005) for more detailed information on the contribution of agricultural runoff and septic systems to waterbody impairment and on innovative technologies for treating these sources. Also at the request of EPA, concentrated animal feeding operations and combined sewer overflows were not a primary focus. However, the committee felt that in order to be most useful it should opine on certain critical effects of regulated stormwater beyond the delivery of traditional pollutants. Thus, changes in stream flow, streambank erosion, and habitat alterations caused by stormwater are considered, despite the relative inattention given to them in current regulations.

Chapter 2 presents the regulatory history of stormwater control in the United States, focusing on relevant portions of the CWA and the regulations that have been created to implement the Act. Federal, state, and local programs for or affecting stormwater management are described and critiqued. Chapter 3 deals with the first item in the statement of task. It reviews the scientific aspects of stormwater, including sources of pollutants in stormwater, how stormwater moves across the land surface, and its impacts on receiving waters. It reflects the best of currently available science, and addresses biological endpoints that go far beyond ambient water quality criteria. Methods for monitoring and modeling stormwater (the subject of the second item in the statement of task) are described in Chapter 4. The material evaluates the usefulness of current benchmark and MS4 monitoring requirements, and suggestions for improvement are made. The latter half of the chapter considers the multitude of models available for linking stormwater discharges to ambient water quality. This analysis makes it clear that stormwater pollution cannot yet be treated as a deterministic system (in which the contribution of individual dischargers to a waterbody impairment can be identified) without significantly greater investment in model development. Addressing primarily the third item in the statement of task, Chapter 5 considers the vast suite of both structural and nonstructural measures designed to control stormwater and reduce its pollutant loading to waterbodies. It also takes on relevant larger-scale concepts, such as the benefit of stormwater management within a watershed framework. In Chapter 6, the limitations and possibilities associated with a new regulatory approach are explored, as are those of an enhanced but more traditional scheme. Numerous suggestions for improving the stormwater permitting process for municipalities, industrial sites, and con-

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struction are made. Along with Chapter 2, this chapter addresses the final two items in the committee's statement of task.

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2
The Challenge of Regulating Stormwater

Although stormwater has long been regarded as a major culprit in urban flooding, only in the past 30 years have policymakers appreciated the significant role stormwater plays in the impairment of urban watersheds. This recent rise to fame has led to a cacophony of federal, state, and local regulations to deal with stormwater, including the federal Clean Water Act (CWA) implemented by the U.S. Environmental Protection Agency (EPA). Perhaps because this longstanding environmental problem is being addressed so late in the development and management of urban watersheds, the laws that mandate better stormwater control are generally incomplete and were often passed for other purposes, like industrial waste control.

This chapter discusses the regulatory programs that govern stormwater, particularly the federal program, explaining how these programs manage stormwater only impartially and often inadequately. While progress has been made in the regulation of urban stormwater—from the initial emphasis on simply moving it away from structures and cities as fast as possible to its role in degrading neighboring waterbodies—a significant number of gaps remain in the existing system. Chapter 6 returns to these gaps and considers the ways that at least some of them may be addressed.

FEDERAL REGULATORY FRAMEWORK FOR STORMWATER

The Clean Water Act

The CWA is a comprehensive piece of U.S. legislation that has a goal of restoring and maintaining the chemical, physical, and biological integrity of the nation's waters. Its long-term goal is the elimination of polluted discharges to surface waters (originally by 1985), although much of its current effort focuses on the interim goal of attaining swimmable and fishable waters. Initially enacted as the Federal Water Pollution Control Act in 1948, it was revised by amendments in 1972 that gave it a stronger regulatory, water chemistry-focused basis to deal with acute industrial and municipal effluents that existed in the 1970s. Amendments in 1987 broadened its focus to deal with more diffuse sources of impairments, including stormwater. Improved monitoring over the past two decades has documented that although discharges have not been eliminated, there has been a widespread lessening of the effects of direct municipal and industrial wastewater discharges.

A timeline of federal regulatory events over the past 125 years relevant to stormwater, which includes regulatory precursors to the 1972 CWA, is shown in Table 2-1. The table reveals that while there was a flourish of regulatory activity related to stormwater during the mid-1980s to 1990s, there has been much less regulatory activity since that time.

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TABLE 2-1 Legal and Regulatory Milestones for the Stormwater Program

1886	**Rivers and Harbors Act.** A navigation-oriented statute that was used in the 1960s and 1970s to challenge unpermitted pollutant discharges from industry.
1948 *1952* *1955*	**Federal Water Pollution Control Act.** Provided matching funds for wastewater treatment facilities, grants for state water pollution control programs, and limited federal authority to act against interstate pollution.
1965	**Water Quality Act.** Required states to adopt water quality standards for interstate waters subject to federal approval. It also required states to adopt state implementation plans, although failure to do so would not result in a federally implemented plan. As a result, enforceable requirements against polluting industries, even in interstate waters, was limited.
1972	**Federal Water Pollution Control Act.** First rigorous national law prohibiting the discharge of pollutants into surface waters without a permit. • Goal is to restore and maintain health of U.S. waters • Protection of aquatic life and human contact recreation by 1983 • Eliminate discharge of pollutants by 1985 • Wastewater treatment plant financing
	Clean Water Act Section 303(d) • Contains a water quality-based strategy for waters that remain polluted after the implementation of technology-based standards. • Requires states to identify waters that remain polluted, to determine the total maximum daily loads that would reverse the impairments, and then to allocate loads to sources. If states do not perform these actions, EPA must.
	Clean Water Act Section 208 • Designated and funded the development of regional water quality management plans to assess regional water quality, propose stream standards, identify water quality problem areas, and identify wastewater treatment plan long-term needs. These plans also include policy statements which provide a common consistent basis for decision making.
1977 *1981*	**Clean Water Act Sections 301 and 402** • Control release of toxic pollutants to U.S. waters • Technology treatment standards for conventional pollutants and priority toxic pollutants. • Recognition of technology limitations for some processes.
1977	*NRDC vs. Costle.* Required EPA to include stormwater discharges in the National Pollution Discharge Elimination System (NPDES) program.
1987	**Clean Water Act Amended Sections 301 and 402** • Control toxic pollutants discharged to U.S. waters. • Manage urban stormwater pollution. • Numerical criteria for all toxic pollutants. • Integrated control strategies for impaired waters. • Stormwater permit programs for urban areas and industry. • Stronger enforcement penalties. • Anti-backsliding provisions.

Table continues next page

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TABLE 2-1 continued

1990	**EPA's Phase I Stormwater Permit Rules are Promulgated** • Application and permit requirements for large and medium municipalities • Application and permit requirements for light and heavy industrial facilities based on Standard Industrial Classification (SIC) Codes, and construction activity ≥ 5 acres
1999	**EPA's Phase II Stormwater Permit Rules are Promulgated** • Permit requirements for census-defined urbanized areas • Permit requirements for construction sites 1 to 5 acres
1997-2001	**Total Maximum Daily Load (TMDL) Program Litigation** • Courts order EPA to establish TMDLs in a number of states if the states fail to do so. The TMDLs assign Waste Load Allocations for stormwater discharges which must be incorporated as effluent limitations in stormwater permits.
2006-2008	**Section 323 of the Energy Policy Act of 2005** • EPA promulgates rule (2006) to exempt stormwater discharges from oil and gas exploration, production, processing, treatment operations, or transmission facilities from NPDES stormwater permit program. • In 2008, courts order EPA to reverse the rule which exempted certain activities in the oil and gas exploration industry from storm water regulations. In *Natural Resources Defense Council vs. EPA* (9th Cir. 2008), the court held that it was "arbitrary and capricious" to exempt from the Clean Water Act stormwater discharges containing sediment contamination that contribute to a violation of water quality standards.
2007	**Energy Independence and Security Act of 2007** • Requires all federal development and redevelopment projects with a footprint above 5,000 square feet to achieve predevelopment hydrology to the "maximum extent technically feasible."

The Basic NPDES Program: Regulating Pollutant Discharges

The centerpiece of the CWA is its mandate "that all *discharges* into the nation's waters are unlawful, unless specifically authorized by a permit" [42 U.S.C. §1342(a)]. Discharges do not include all types of pollutant flows, however. Instead, "discharges" are defined more narrowly as "point sources" of pollution, which in turn include only sources that flow through a discrete conveyance, like a pipe or ditch, into a lake or stream [33 U.S.C. §§ 1362(12) and (14)]. Much of the focus of the CWA program, then, is on limiting pollutants emanating from these discrete, point sources directly into waters of the United States. Authority to control nonpoint sources of pollution, like agricultural runoff (even when drained via pipes or ditches), is generally left to the states with more limited federal oversight and direction.

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All point sources of pollutants are required to obtain a National Pollutant Discharge Elimination System (NPDES) permit and ensure that their pollutant discharges do not exceed specified effluent standards. Congress also commanded that rather than tie effluent standards to the needs of the receiving waterbody—an exercise that was far too scientifically uncertain and time-consuming—the effluent standards should first be based on the best available pollution technology or the equivalent. In response to a very ambitious mandate, EPA has promulgated very specific, quantitative discharge limits for the wastewater produced by over 30 industrial categories of sources based on what the best pollution control technology could accomplish, and it requires at least secondary treatment for the effluent produced by most sewage treatment plants. Under the terms of their permits, these large sources are also required to self-monitor their effluent at regular intervals and submit compliance reports to state or federal regulators.

EPA quickly realized after passage of the CWA in 1972 that if it were required to develop pollution limits for all point sources, it would need to regulate hundreds of thousands and perhaps even millions of small stormwater ditches and thousands of small municipal stormwater outfalls, all of which met the technical definition of "point source". It attempted to exempt all these sources, only to have the D.C. Circuit Court read the CWA to permit no exemptions [*NRDC vs. Costle*, 568 F.2d 1369 (D.C. Cir. 1977)]. In response, EPA developed a "general" permit system (an "umbrella" permit that covers multiple permittees) for smaller outfalls of municipal stormwater and similar sources, but it generally did not require these sources to meet effluent limitations or monitor their effluent.

It should be noted that, while the purpose of the CWA is to ensure protection of the physical, biological, and chemical integrity of the nation's waters, the enforceable reach of the Act extends only to the discharges of "pollutants" into waters of the United States [33 U.S.C. § 1311(a); cf. PUD No. 1 of Jefferson County v. Washington Department of Ecology, 511 U.S. 700 (1994) (providing states with broad authority under section 401 of the CWA to protect designated uses, not simply limit the discharge of pollutants)]. Even though "pollutant" is defined broadly in the Act to include virtually every imaginable substance added to surface waters, including heat, it has not traditionally been read to include water volume [33 U.S.C. § 1362(6)]. Thus, the focus of the CWA with respect to its application to stormwater has traditionally been on the water quality of stormwater and not on its quantity, timing, or other hydrologic properties. Nonetheless, because the statutory definition of "pollutant" includes "industrial, municipal, and agricultural waste discharged into water," using transient and substantial increases in flow in urban watersheds as a proxy for pollutant loading seems a reasonable interpretation of the statute. EPA Regions 1 and 3 have considered flow control as a particularly effective way to track sediment loading, and they have used flow in TMDLs as a surrogate for pollutant loading (EPA Region 3, 2003). State trial courts have thus far ruled that municipal separate storm sewer system (MS4) permits issued under delegated federal authority can

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impose restrictions on flow where changes in flow impair the beneficial uses of surface waters (Beckman, 2007). EPA should consider more formally clarifying that significant, transient increases in flow in urban watersheds serve as a legally valid proxy for the loading of pollutants. This clarification will allow regulators to address the problems of stormwater in more diverse ways that include attention to water volume as well as to the concentration of individual pollutants.

Stormwater Discharge Program

By 1987, Congress became concerned about the significant role that stormwater played in contributing to water pollution, and it commanded EPA to regulate a number of enumerated stormwater discharges more rigorously. Specifically, Section 402(p), introduced in the 1987 Amendments to the CWA, directs EPA to regulate some of the largest stormwater discharges—those that occur at industrial facilities and municipal storm sewers from larger cities and other significant sources (like large construction sites)—by requiring permits and promulgating discharge standards that require the equivalent of the best available technology [42 U.S.C. § 1342(p)(3)]. Effectively, then, Congress grafted larger stormwater discharges onto the existing NPDES program that was governing discharges from manufacturing and sewage treatment plants.

Upon passage of Section 402(p), EPA divided the promulgation of its stormwater program into two phases that encompass increasingly smaller discharges. The first phase, finalized in 1990, regulates stormwater discharges from ten types of industrial operations (this includes the entire manufacturing sector), construction occurring on five or more acres, and medium or large storm sewers in areas that serve 100,000 or more people [40 C.F.R. § 122.26(a)(3) (1990); 40 C.F.R. § 122.26 (b)(14) (1990)]. The second phase, finalized in 1995, includes smaller municipal storm sewer systems and smaller construction sites (down to one acre) [60 Fed. Reg. 40,230 (Aug. 7, 1995) (codified at 40 C.F.R. Parts 122, 124 (1995)]. If these covered sources fail to apply for a permit, they are in violation of the CWA.

Because stormwater is more variable and site specific with regard to its quality and quantity than wastewater, EPA found it necessary to diverge in two important ways from the existing NPDES program governing discharges from industries and sewage treatment plants. First, stormwater discharge limits are not federally specified in advance as they are with discharges from manufacturing plants. Even though Congress directed EPA to require stormwater sources to install the equivalent of the best available technology or "best management practices," EPA concluded that the choice of these best management practices (referred to in this report as stormwater control measures or SCMs) would need to be source specific. As a result, although EPA provides constraints on the choices available, it generally leaves stormwater sources with responsibility for

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developing a stormwater pollution prevention plan and the state with the authority to approve, amend, or reject these plans (EPA, 2006, p. 15).

Second, because of the great variability in the nature of stormwater flow, some sources are not required to monitor the pollutants in their stormwater discharges. Even when monitoring is required, there is generally a great deal of flexibility for regulated parties to self-monitor as compared with the monitoring requirements applied to industrial waste effluent (not stormwater from industries). More specifically, for a small subset of stormwater sources such as Phase I MS4s, some monitoring of effluent during a select number of storms at a select number of outfalls is required (EPA, 1996a, p. VIII-1). A slightly larger number of identified stormwater dischargers, primarily industrial, are only required to collect grab samples four times during the year and visually sample and report on them (so-called benchmark monitoring). The remaining stormwater sources are not required to monitor their effluent at all (EPA, 1996a). States and localities may still demand more stringent controls and rigorous stormwater monitoring, particularly in areas undergoing a Total Maximum Daily Load (TMDL) assessment, as discussed below. Yet, even for degraded waters subject to TMDLs, any added monitoring that might be required will be limited only to the pollutants that cause the degraded condition [40 C.F.R. §§ 420.32-420.36 (2004)].

Water Quality Management

Since technology-based regulatory requirements imposed on both stormwater and more traditional types of discharges are not tied to the conditions of the receiving water—that is, they require sources only to do their technological best to eliminate pollution—basic federal effluent limits are not always adequate to protect water quality. In response to this gap in protection, Congress has developed a number of programs to ensure that waters are not degraded below minimal federal and state goals [e.g., 33 U.S.C. §§ 1288, 1313(e), 1329, 1314(l)]. Among these, the TMDL program involves the most rigorous effort to control both point and nonpoint sources to ensure that water quality goals are met [33 U.S.C. § 1313(d)].

Under the TMDL program, states are required to list waterbodies not meeting water quality standards and to determine, for each degraded waterbody, the "total maximum daily load" of the problematic pollutant that can be allowed without violating the applicable water quality standard. The state then determines what types of additional pollutant loading reductions are needed, considering not only point sources but also nonpoint sources. It then promulgates controls on these sources to ensure further reductions to achieve applicable water quality goals.

The TMDL process has four separate components. The first two components are already required of the states through other sections of the CWA: (1) identify beneficial uses for all waters in the state and (2) set water quality stan-

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dards that correlate with these various uses. The TMDL program adds two components by requiring that states then (3) identify segments where water quality goals have not been met for one or more pollutants and (4) develop a plan that will ensure added reductions are made by point and/or nonpoint sources to meet water quality goals in the future. Each of these is discussed below.

Beneficial Uses. States are required to conduct the equivalent of "zoning" by identifying, for each water segment in the state, a beneficial use, which consists of ensuring that the waters are fit for either recreation, drinking water, aquatic life, or agricultural, industrial, and other purposes [33 U.S.C. § 1313(c)(2)(A)]. All states have derived "narrative definitions" to define the beneficial uses of waterbodies that are components of all water quality standard programs. Many of these narrative criteria are conceptual in nature and tend to define general aspects of the beneficial uses. For categories such as *aquatic life uses*, most states have a single metric for differentiating uses by type of stream (e.g., coldwater vs. warmwater fisheries). In general, the desired biological characteristics of the waterbody are not well defined in the description of the beneficial use. Some states, such as Ohio, have added important details to their beneficial uses by developing tiered aquatic life uses that recognize a strong gradient of anthropogenic background disturbance that controls whether a waterbody can attain a certain water quality and biological functioning (see Box 2-1; Yoder and Rankin, 1998). Any aquatic life use tier less stringent than the CWA interim goal of "swimmable–fishable" requires a Use Attainability Analysis to support a finding that restoration is not currently feasible and recovery is not likely in a reasonable period of time. This analysis and proposed designation must undergo public comment and review and are always considered temporary in nature. More importantly, typically one or more tiers above the operative interim goal of "swimmable–fishable" are provided. This method typically will protect the highest attainable uses in a state more effectively than having only single uses.

The concept of tiered beneficial uses and use attainability is especially important with regard to urban stormwater because of the potential irreversibility of anthropogenic development and the substantial costs that might be incurred in attempting to repair degraded urban watersheds to "swimmable–fishable" or higher status. Indeed, it is important to consider what public benefits and costs might occur for different designated uses. For example, large public benefits (in terms of aesthetics and safety) might be gained from initial improvements in an urban stream (e.g., restoring base flow) that achieve modest aquatic use and protect secondary human contact. However, achieving designated uses associated with primary human contact or exceptional aquatic habitat may be much more costly, such that the perceived incremental public gains may be much lower than the costs that must be expended to achieve that more ambitious designation.

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BOX 2-1
Ohio's Tiered Aquatic Life Uses

"Designated" or "beneficial" uses for waterbodies are an important aspect of the CWA because they are the explicit water quality goals or endpoints set for each water or class of waters. Ohio was one of the first states to implement tiered aquatic life uses (TALUs) in 1978 as part of its water quality standards (WQS). Most states have a single aquatic life use for a class of waters based on narrative biological criteria (e.g., warmwater or cold-water fisheries) although many states now collect data that would allow identification of multiple tiers of condition. EPA has recognized the management advantages inherent to tiered aquatic life uses and has developed a technical document on how to develop the scientific basis that would allow States to implement tiered uses (EPA, 2005a; Davies and Jackson, 2006).

Ohio's TALUs reflect the mosaic of natural features across Ohio and over 200 years of human changes to the natural landscape. Widespread information on Ohio's natural history (e.g., Trautman's 1957 *Fishes of Ohio*) provided strong evidence that the potential fauna of streams was not uniform, but varied geographically. Based on this knowledge, Ohio developed a more protective aquatic life use tier to protect streams of high biological diversity that harbored unique assemblages of rare or sensitive aquatic species (e.g., fish, mussels, invertebrates). In its WQS in 1978, Ohio established a narrative Exceptional Warmwater Habitat (EWH) aquatic life use to supplement its more widespread general or "Warmwater Habitat" aquatic life use (WWH) (Yoder and Rankin, 1995).

The CWA permits states to assign aquatic life uses that do not meet the baseline swimmable-fishable goals of the CWA under specific circumstances after conducting a Use Attainability Analysis (UAA), which documents that higher CWA aquatic life use goals (e.g., WWH and EWH in Ohio) are not feasibly attainable. These alternate aquatic life uses are always considered temporary in case land use changes or technology changes to make restoration feasible. The accrual of more than ten years of biological assessment data by the late 1980s and extensive habitat and stressor data provided a key link between the stressors that limited attainment of a higher aquatic life use in certain areas and reaches of Ohio streams. This assessment formed the basis for several "modified" (physical) warmwater uses for Ohio waters and a "limited" use (limited resource water, LRW) for mostly small ephemeral or highly artificial waters (Yoder and Rankin, 1995). Table 2-2 summarizes the biological and physical characteristics of Ohio TALUs and the management consequences of these uses. Channelization typically maintained by county or municipal drainage and flood control efforts, particularly where such changes have been extensive, are the predominant cause of Modified and Limited aquatic life uses. Extensive channel modification in urban watersheds has led to some modified warmwater habitat (MWH) and LRW uses in urban areas. There has been discussion of developing specific "urban" aquatic life uses; however the complexity of multiple stressors and the need to find a clear link between the sources limiting aquatic life and feasible remediation is just now being addressed in urban settings (Barbour et al., 2006).

The TALUs in Ohio (EWH→LRW) reflect a gradient of landscape and direct physical changes, largely related to changes to instream habitat and associated hydrological features. Aquatic life uses and the classification strata based on ecoregion and stream size (headwater, wadeable, and boatable streams) provide the template for the biocriteria expectations for Ohio streams (see Box 2-2). Identification of the appropriate tiers for streams and UAA are a routine part of watershed monitoring in Ohio and are based on biological, habitat, and other supporting data. Any recommendations for changes in aquatic life uses are subject to public comment when the Ohio WQS are changed.

Ohio's water quality standards contain specific listings by stream or stream reach with notations about the appropriate aquatic life use as well as other applicable uses (e.g., recreation). Much of the impact of tiered uses on regulated entities or watershed management

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TABLE 2-2 Key features associated with tiered aquatic life uses in the Ohio WQS. SOURCE: EPA (2005a), Appendix B.

Aquatic Life Use	Key Attributes	Why a Waterbody Would Be Designated	Practical Impacts (compared to a baseline of WWH)
Warmwater Habitat (WWH)	Balanced assemblages of fish/invertebrates comparable to least impacted *regional* reference condition	Either supports biota consistent with numeric biocriteria for that ecoregion **or** exhibits the habitat potential to support recovery of the aquatic fauna	Baseline regulatory requirements consistent with the CWA "fishable" and "protection & propagation" goals; criteria consistent with U.S. EPA guidance with State/regional modifications as appropriate
Exceptional Warmwater Habitat (EWH)	Unique and/or diverse assemblages; comparable to upper quartile of *statewide* reference condition	Attainment of the EWH biocriteria demonstrated by both organism groups	More stringent criteria for D.O., temperature, ammonia, and nutrient targets; more stringent restrictions on dissolved metals translators; restrictions on nationwide dredge & fill permits; may result in more stringent wastewater treatment requirements
Coldwater Habitat (CWH)	Sustained presence of Salmonid or non-salmonid coldwater aquatic organisms; bonafide trout fishery	Bioassessment reveals coldwater species as defined by Ohio EPA (1987); put-and-take trout fishery managed by Ohio DNR	Same as above except that common metals criteria are more stringent; may result in more stringent wastewater treatment requirements
Modified Warmwater Habitat (MWH)	Warmwater assemblage dominated by species tolerant of low D.O., excessive nutrients, siltation, and/or habitat modifications	Impairment of the WWH biocriteria; existence and/or maintenance of hydrological modifications that cannot be reversed or abated to attain the WWH biocriteria; a use attainability analysis is required	Less stringent criteria for D.O., ammonia, and nutrient targets; less restrictive applications of dissolved metals translators; Nationwide permits apply without restrictions or exception; may result in less restrictive wastewater treatment requirements
Limited Resource Waters (LRW)	Highly degraded assemblages dominated exclusively by tolerant species; *should not* reflect acutely toxic conditions	Extensive physical and hydrological modifications that cannot be reversed and which preclude attainment of higher uses; a use attainability analysis is required	Chemical criteria are based on the prevention of acutely lethal conditions; may result in less restrictive wastewater treatment requirements

efforts arises from the tiered chemical and stressor criteria associated with each TALU. Criteria for compounds such as ammonia and dissolved oxygen vary with aquatic life use (see Table 2-2). Furthermore, application of management actions in Ohio, ranging from assigning antidegradation tiers, awarding funding for wastewater infrastructure and other projects, to issuing CWA Section 401/404 permits, are influence by the TALU and the biological assemblages present.

Ohio has been expanding its use of tiered uses by proposing tiered uses for wetlands (*http://www.epa.state.oh.us/dsw/rules/draft_1-53_feb06.pdf*) and developing new aquatic life uses for very small (primary headwater, PHW) streams. Both of these water types have a strong intersection with urban construction and stormwater practices. In Ohio this is especially so because the proposed mitigation standards for steams and wetlands are linked to TALUs (Ohio EPA, 2007).

Davies and Jackson (2006) present a good summary of the Maine rationale for TALUs: "(1) identifying and preserving the highest quality resources, (2) more accurately depicting existing conditions, (3) setting realistic and attainable management goals, (4) preserving incremental improvements, and (5) triggering management action when conditions decline" (Davies et al., 1999). Appendices A and B of EPA (2005a) provide more detailed information about the TALUs in Maine and Ohio, respectively.

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Water Quality Criteria. Once a state has created a list of beneficial uses for its waters, water quality criteria are then determined that correspond with these uses. These criteria can target chemical, biological, or physical parameters, and they can be either numeric or narrative.

In response to the acute chemical water pollution that existed when the CWA was written, the primary focus of water quality criteria was the control of toxic and conventional pollutants from wastewater treatment plants. EPA developed water quality criteria for a wide range of conventional pollutants and began working on criteria for a list of priority pollutants. These were generally in the form of numeric criteria that are then used by states to set their standards for the range of waterbody types that exist in that state. While states do not have to adopt EPA water quality criteria, they must have a scientific basis for setting their own criteria. In practice, however, states have promulgated numerical water quality standards that can vary by as much as 1,000-fold for the same contaminant but are still considered justified by the available science [e.g., the water quality criteria for dioxin—*Natural Resources Defense Council, Inc. vs. EPA*, 16 F.3d 1395, 1398, 1403-05 (4th Cir. 1993)].

The gradual abatement of point source impairments and increased focus on ambient monitoring and nonpoint source pollutants has led to a gradual, albeit inconsistent, shift by states toward (1) biological and intensive watershed monitoring and (2) consideration of stressors that are not typical point source pollutants including nutrients, bedded sediments, and habitat loss. For these parameters, many states have developed narrative criteria (e.g., "nutrients levels that will not result in noxious algal populations"), but these can be subjective and hard to enforce.

The use of biological criteria (biocriteria) has gained in popularity because traditional water quality monitoring is now perceived as insufficient to answer questions about the wide range of impairments caused by activities other than wastewater point sources, including stormwater (GAO, 2000). As described in Box 2-2, Ohio has defined biocriteria in its water quality standards based on multimetric indices from reference sites that quantify the baseline expectations for each tier of aquatic life use.

Antidegradation. The antidegradation provision of the water quality standards deals with waters that already achieve or exceed baseline water quality criteria for a given designated use. Antidegradation provisions must be considered before any regulated activity can be authorized that may result in a lowering of water quality which includes biological criteria. These provisions protect the existing beneficial uses of a water and only allow a lowering of water quality (but never lower than the baseline criteria associated with the beneficial use) where necessary to support important social and economic development. It essentially asks the question: is the discharge or activity necessary? States with refined designated uses and biological criteria have used these programs to their advantage to craft scientifically sound, protective, yet flexible antidegradation rules (see Ohio and Maine). Antidegradation is not a replacement for tiered

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BOX 2-2
Ohio's Biocriteria

After it implemented tiered aquatic life uses in 1978, Ohio developed numeric biocriteria in 1990 (Ohio WQS; Ohio Administrative Code 3745-1) as part of its WQS. Since designated uses were formulated and described in ecological terms, Ohio felt that it was natural that the criteria should be assessed on an ecological basis (Yoder, 1978). Subsequent to the establishment of the EWH tier in its WQS, Ohio expanded its biological monitoring efforts to include both macroinvertebrates and fish (Yoder and Rankin, 1995) and established consistent and robust monitoring methodologies that have been maintained to the present. This core of consistently collected data has allowed the application of analytical tools, including multimetric indices such as the Index of Biotic Integrity (IBI), the Invertebrate Community Index (ICI), and other multivariate tools. The development of aquatic ecoregions (Omernik, 1987, 1995; Gallant et al., 1989), a practical definition of biological integrity (Karr and Dudley, 1981), multimetric assessment tools (Karr, 1981; Karr et al., 1986), and reference site concepts (Hughes et al., 1986) provided the basis for developing Ohio's ecoregion-based numeric criteria.

Successful application of biocriteria in Ohio was dependent on the ability to accurately classify aquatic ecosystem changes based on primarily natural abiotic features of the environment. Ohio's reference sites, on which the biocriteria are based, reflect spatial differences that were partially explained by aquatic ecoregions and stream size. Biological indices were calibrated and stratified on this basis to arrive at biological criteria that present minimally acceptable baseline ecological index scores (e.g., IBI, ICI). Ohio biocriteria stratified by ecoregion aquatic life use and stream size are depicted in Figure 2-1.

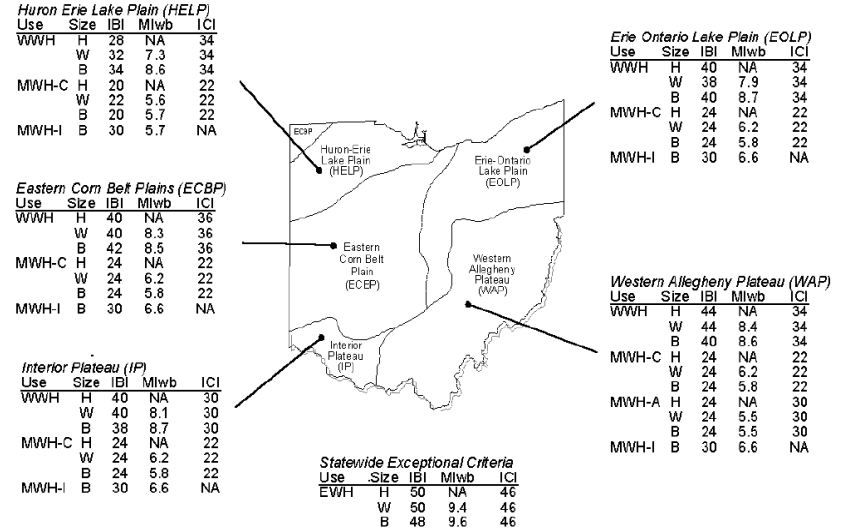

Huron Erie Lake Plain (HELP)

Use	Size	IBI	MIwb	ICI
WWH	H	28	NA	34
	W	32	7.3	34
	B	34	8.6	34
MWH-C	H	20	NA	22
	W	22	5.6	22
	B	20	5.7	22
MWH-I	B	30	5.7	NA

Eastern Corn Belt Plains (ECBP)

Use	Size	IBI	MIwb	ICI
WWH	H	40	NA	36
	W	40	8.3	36
	B	42	8.5	36
MWH-C	H	24	NA	22
	W	24	6.2	22
	B	24	5.8	22
MWH-I	B	30	6.6	NA

Interior Plateau (IP)

Use	Size	IBI	MIwb	ICI
WWH	H	40	NA	30
	W	40	8.1	30
	B	38	8.7	30
MWH-C	H	24	NA	22
	W	24	6.2	22
	B	24	5.8	22
MWH-I	B	30	6.6	NA

Erie Ontario Lake Plain (EOLP)

Use	Size	IBI	MIwb	ICI
WWH	H	40	NA	34
	W	38	7.9	34
	B	40	8.7	34
MWH-C	H	24	NA	22
	W	24	6.2	22
	B	24	5.8	22
MWH-I	B	30	6.6	NA

Western Allegheny Plateau (WAP)

Use	Size	IBI	MIwb	ICI
WWH	H	44	NA	34
	W	44	8.4	34
	B	40	8.6	34
MWH-C	H	24	NA	22
	W	24	6.2	22
	B	24	5.8	22
MWH-A	H	24	NA	30
	W	24	5.5	30
	B	24	5.5	30
MWH-I	B	30	6.6	NA

Statewide Exceptional Criteria

Use	Size	IBI	MIwb	ICI
EWH	H	50	NA	46
	W	50	9.4	46
	B	48	9.6	46

FIGURE 2-1 Numeric biological criteria adopted by Ohio EPA in 1990, using three biological indices [IBI, ICI, and the Modified Index of well-being (MIwb), which is used to assessed fish assemblages] and showing stratification by stream size, ecoregion, and designated use (warmwater habitat, WWH; modified warmwater habitat-channelized, MWH-C; modified warmwater habitat-impounded, MWH-I; and exceptional warmwater habitat, EWH). SOURCE: EPA (2006, Appendix B). The basis for the Ohio biocriteria and sampling methods is found in Ohio EPA (1987, 1989a,b), DeShon (1995), and Yoder and Rankin (1995).

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uses, which provide a permanent floor against lowering water quality protection. Tiered beneficial uses and refined antidegradation rules can have substantial influence on stormwater programs because they influence the goals and levels of protection assigned to each waterbody.

Monitoring Programs to Identify Degraded Segments. Monitoring strategies by the states generally follow the regulatory efforts of EPA and seek to identify those waterbodies where water quality standards are not being met. Much of the initial ambient monitoring (i.e., monitoring of receiving waterbodies) was chemical based and focused on documenting changes in pollutant concentrations and exceedances of water quality criteria. Biological monitoring techniques have a long history of use as indicators of water quality impacts. However, it was not until such tools became more widespread—initially in states like Maine, North Carolina, and Ohio—that the extent of stormwater and other stressor effects on waterbodies became better understood. The biological response to common nonpoint stressors has driven the consideration of new water quality criteria (e.g., for nutrients, bedded sediments) that were not major considerations under an effluent-dominated paradigm of water management.

In parallel with the increase in biocriteria has been the development of biological monitoring to measure beneficial use attainment. Integrated biological surveys have revealed impairments of waterbodies that go beyond those caused by typical point sources (EPA, 1996b; Barbour et al., 1999a). The substantial increase in biological assemblage monitoring during the 1980s was enhanced by the development of more standard methods (Davis, 1995; Barbour et al., 1999a,b; Klemm et al., 2003) along with conceptual advances in the development of assessment tools (Karr, 1981; Karr and Chu, 1999). Development of improved classification tools (e.g., ecoregions, stream types), the reference site concept (Stoddard et al., 2006), and analytical approaches including multivariate (e.g., discriminant analysis) and multimetric indices such as IBI and ICI (see Box 2-3; Karr et al., 1986; DeShon, 1995) resulted in biological criteria being developed for several states. Biological monitoring approaches are becoming a widespread tool for assessing attainment of aquatic life use designation goals inherent to state water quality standards. Development of biocriteria represents a maturation of the use of biological data and provides institutional advantages for states in addressing pollutants without numeric criteria (e.g., nutrients) and non-chemical stressors such as habitat (Yoder and Rankin, 1998).

Setting Loads and Restricting Loading. Section 303d of the CWA requires that states compare existing water quality data with water quality standards set by the states, territories, and tribes. For those waters found to be in violation of their water quality standards, Section 303d requires that the state develop a TMDL. Currently, approximately 20,000 of monitored U.S. waters are in non-attainment of water quality standards, as evidenced by not meeting at least one specific narrative or numeric physical, chemical, or biological criterion, and thus require the development of a TMDL.

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BOX 2-3
Commonly Used Biological Assessment Indices

Much of the initial work using biological data to assess the effects of pollution on inland streams and rivers was a response to Chicago's routing of sewage effluents into the Illinois River in the late 1800s. Early research focused on the use of indicator species, singly or in aggregate, and how they changed along gradients of effluent concentrations (Davis, 1990, 1995). In the 1950s Ruth Patrick used biological data to assess rivers by observing longitudinal changes in taxonomic groups, and later in the 1950s and 1960s "diversity indices" (e.g., Shannon-Wiener index, Shannon and Weaver, 1949) were used to assess aquatic communities (Washington, 1984; Davis 1990, 1995). These indices were various mathematical constructs that measured attributes such as richness and evenness of species abundance in samples and are still widely used today in ecological studies. Similarity indices are another approach that is used to compare biological assemblages between sites. There are a wide multitude of such indices (e.g., Bray-Curtis, Jaccard) and all use various mathematical constructs to examine species in common and absent between samples.

Biotic indices are generally of more recent origin (1970s to the present). Hilsenhoff (1987, 1988) assigned organic pollution tolerances to macroinvertebrate taxa and then combined these ratings in a biotic index that is still widely used for macroinvertebrates. Karr (1981) developed the Index of Biotic Integrity (IBI), a "multimetric" index that is composed of a series of 12 metrics of a Midwest stream fish community. This approach has been widely adopted and adapted to many types of waterbodies (streams, lakes, rivers, estuaries, wetlands, the Great Lakes, etc.) and organism groups and is probably the most widely used biotic index approach in the United States. Examples include the periphyton IBI (PIBI; Hill et al., 2000) for algal communities, the Invertebrate Community Index (ICI; DeShon, 1995) and benthic IBI (B-IBI, Kerans and Karr, 1994) for macroinvertebrates, a benthic IBI for estuaries (B-IBI; Weisberg et al., 1997), and a vegetative IBI for wetlands (VIBI-E; Mack, 2007).

Various multivariate statistical approaches have also been used to assess aquatic assemblages, often concurrently with multimetric indices. Maine, for example, uses a discriminant analysis that assesses stream stations by comparison to reference sites (Davies and Tsomides, 1997). Predictive modeling approaches, incorporating both biotic and environmental variables, have been widely used in Great Britain and Europe (River Invertebrate Prediction and Classification System, RIVPACS; Wright et al., 1993), Australia (AUSRIVAS; Simpson and Norris, 2000), and more recently in the United States by Hawkins et al. (2000).

All of these approaches now have a wide scientific literature supporting their use and application. EPA (2002a) reports that most states have a biomonitoring program with at least one organism group to assess key waters in their states, although the level of implementation and sophistication varies by state. For example, only four states have numeric biocriteria in their state water quality standards, although 11 more are developing such biocriteria based on one or more of the above monitoring approaches (EPA, 2002a). The key to implementation of any of these approaches is to set appropriate goals for waters that can be accurately measured and then to use this type of information to identify limiting stressors (e.g., EPA Stressor Identification Process; EPA, 2000a).

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The TMDL process includes an enforceable pollution control plan for degraded waters based on a quantification of the loading of pollutants and an understanding of problem sources within the watershed [33 U.S.C. § 1313(d)(1)(C)]. Both point and nonpoint sources of the problematic pollutants, including runoff from agriculture, are typically considered and their contributions to the problem are assessed. A plan is then developed that may require these sources to reduce their loading to a level (the TMDL) that ensures that the water will ultimately meet its designated use. Most of the TMDL requirements have been developed through regulation. Additional effluent limits for point sources discharging into segments subject to TMDLs are incorporated into the NPDES permit.

Total Maximum Daily Load Program and Stormwater

The new emphasis on TMDLs and the revelation that impacts are primarily from diffuse sources has increased the attention given to stormwater. If a TMDL assigns waste load allocations to stormwater discharges, these must be incorporated as effluent limitations into stormwater permits. In addition, the TMDL program provides a new opportunity for states to regulate stormwater sources more vigorously. In degraded waterbodies, effluent reductions for point sources are not limited by what is economically feasible but instead include requirements that will ensure that the continued degradation of the receiving water is abated. If a permitted stormwater source is contributing pollutants to a degraded waterbody and the state believes that further reductions in pollution from that source are needed, then more stringent discharge limitations are required. For example, in *City of Arcadia vs. State Water Resources Control Board* [135 Cal. App. 4th 1392 (Ca. Ct. App. 2006)], the court held in part that California's zero trash requirements for municipal storm drains, resulting from state TMDLs, were not inconsistent with TMDL requirements or the CWA. Thus, the maximum-extent-practicable standard for MS4s, as well as other technology-based requirements for other stormwater permittees, are a floor, not a ceiling, for permit requirements when receiving waters are impaired (Beckman, 2007). Finally, since the TMDL program expects the states to regulate any source—point or nonpoint—that it considers problematic, any source of stormwater is fair game, regardless of whether it is listed in Section 402p, and regardless of whether it is a "point source." Nonpoint source runoff from agricultural and silvicultural operations is in fact a common target for TMDL-driven restrictions [see, e.g., *Pronsolino vs. Nastri*, 291 F.3d 1123, 1130 (9th Cir. 2002), upholding restrictions on nonpoint sources, such as logging, compelled by State's TMDLs)].

Despite the potential for positive interaction between stormwater regulation and the TMDL program, there appears to be little activity occurring at the stormwater–TMDL interface. This is partly because the TMDL program itself has been slow in developing. In 2000, the National Wildlife Federation applied 36 criteria to the 50 states' water quality programs and concluded that 75 per-

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cent of the states had failed to develop meaningful TMDL programs (National Wildlife Federation, 2000, pp. 1–2). The General Accounting Office (GAO, 1989) identified the lack of implementation of TMDLs as a major impediment to attaining the goals of the CWA, which led to a spate of lawsuits filed by environmental groups to reverse this pattern. The result was numerous settlements with ambitious deadlines for issuing TMDLs.

Commentators blame the delays in these TMDL programs on inadequate ambient monitoring data and on the technical and political challenges of causally linking individual sources to problems of impairment. In a 2001 report, for example, the National Research Council (NRC) noted that unjustified and poorly supported water quality standards, a lack of monitoring, uncertainty in the relevant models, and a failure to use biocriteria to assess beneficial uses directly all contributed to the delays in states' abilities to bring their waters into attainment through the TMDL program (NRC, 2001). Each of these facets is not only technically complicated but also expensive. The cost of undertaking a rigorous TMDL program in a single state has been estimated to be about $4 billion per state, assuming that each state has 100 watersheds in need of TMDLs (Houck, 1999, p. 10476).

As a result, the technical demands of the TMDL program make for a particularly bad fit with the technical impediments already present in monitoring and managing stormwater. As mentioned earlier, the pollutant loadings in stormwater effluent vary dramatically over time and stormwater is notoriously difficult to monitor for pollutants. It is thus difficult to understand how much of a pollutant a stormwater point source contributes to a degraded waterbody, much less determine how best to reduce that loading so that the waterbody will meet its TMDL. As long as the focus in these TMDLs remains on pollutants rather than flow (a point raised earlier that will be considered again), the technical challenges of incorporating stormwater sources in a water quality-based regulatory program are substantial. Without considerable resources for modeling and monitoring, the regulator has insufficient tools to link stormwater contributions to water quality impairments.

These substantial challenges in linking stormwater sources back to TMDLs are reflected by the limited number of reports and guidance documents on the subject. In one recent report, for example, EPA provides 17 case studies in which states and EPA regions incorporated stormwater control measures into TMDL plans, but it is not at all clear from this report that these efforts are widespread or indicative of greater statewide activity (EPA, 2007a). Indeed, it almost appears that these case studies represent the universe of efforts to link TMDLs and stormwater management together. The committee's statement of task also appears to underscore, albeit implicitly, EPA's difficulty in making scientific connections between the TMDL and stormwater programs. This challenge is returned to in Chapter 6, which suggests some ways that the two can be joined together more creatively.

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Other Statutory Authorities that Control Stormwater

Although the CWA is by far the most direct statutory authority regulating stormwater discharges, there are other federal regulatory authorities that could lead to added regulation of at least some stormwater sources of pollution.

Critical Resources

If there is evidence that stormwater flows or pollutants are adversely impacting either endangered species habitat or sensitive drinking water sources, federal law may impose more stringent regulatory restrictions on these activities. Under the Endangered Species Act, stormwater that jeopardizes the continued existence of endangered species may need to be reduced to the point that it no longer threatens the endangered or threatened populations in measurable ways, especially if the stormwater discharge results from the activity of a federal agency [16 U.S.C. §§ 1536(a), 1538(a)].

Under the Safe Drinking Water Act, a surface water supply of drinking water must conduct periodic "sanitary surveys" to ensure the quality of the supply (see 40 C.F.R. § 142.16). During the course of these surveys, significant stormwater contributions to pollution may be discovered that are out of compliance or not regulated under the Clean Water Act because they are outside of an MS4 area. Such a discovery could lead to more rigorous regulation of stormwater discharges. For a groundwater source that supplies 50 percent or more of the drinking water for an area and for which there is no reasonably available alternative source, the aquifer can be designated as a "Sole Source Aquifer" and receive greater protection under the Safe Drinking Water Act [42 U.S.C. § 300(h)-3(e)]. Stormwater sources that result from federally funded projects are also more closely monitored to ensure they do not cause significant contamination to these sole source aquifers.

Some particularly sensitive water supplies are covered by both programs. The Edwards Aquifer underlying parts of Austin and San Antonio, Texas, for example, is identified as a "Sole Source Aquifer." There are also several endangered species of fish and salamander in that same area. As a result, both the Safe Drinking Water Act and the Endangered Species Act demand more rigorous stormwater management programs to protect this delicate watershed.

Stormwater is also regulated indirectly by floodplain control requirements promulgated by the Federal Emergency Management Agency (FEMA). In order for a community to participate in the FEMA National Flood Insurance Program, it must fulfill a number of requirements, including ensuring that projects will not increase flood heights, including flood levels adjacent to the project site [see, e.g., 44 C.F.R. § 60.3(d)].

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Contaminated Sites

Continuous discharges of contaminated stormwater and other urban pollutants (particularly through combined sewer overflows) have led to highly contaminated submerged sediments in many urban bays and rivers throughout the United States. In several cases where the sediment contamination was perceived as presenting a risk to human health or has led to substantial natural resource damages, claims have been filed under the federal hazardous waste cleanup statute commonly known as Superfund (42 U.S.C. § 9601 et seq.). This liability under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) technically applies to any area—whether submerged or not—as long as there is a "release or a threat of release of a hazardous substance" and the hazardous substances have accumulated in such a way as to lead to the "incurrence of response [cleanup] costs" or to "natural resource damages" [42 U.S.C. §9607(a)]. Although only a few municipalities and sewer systems have been sued, Superfund liability is theoretically of concern for possibly a much larger number of cities or even industries whose stormwater contains hazardous substances and when at least some of the discharges were either in violation of a permit or unpermitted. The National Oceanic and Atmospheric Administration brought suit against the City of Seattle and the Municipality of Metropolitan Seattle alleging natural resource damages to Elliott Bay resulting from pollution in stormwater and combined sewer overflows; the case was settled in 1991 (*United States vs. City of Seattle*, No. C90-395WD, *http://www.gc.noaa.gov/natural-office1.html*). While some of the elements for liability remain unresolved by the courts, such as whether some or all of the discharges are exempted under the "federally permitted release" defense of CERCLA [42 U.S.C. § 9601(10)(H)], which exempts surface water discharges that are covered by a general or NPDES permit from liability, the prospect of potential liability is still present.

Diversion of Stormwater Underground or into Wetlands

In some areas, stormwater is eliminated by discharging it into wetlands. If done through pipes or other types of point sources, these activities require a permit under the CWA. Localities or other sources that attempt to dispense with their stormwater discharges in this fashion must thus first acquire an NPDES permit.

Even without a direct discharge into wetlands, stormwater can indirectly enter wetland systems and substantially impair their functioning. In a review of more than 50 studies, the Center for Watershed Protection found that increased urbanization and development increased the amount of stormwater to wetlands, which in turn "led to increased ponding, greater water level fluctuation and/or hydrologic drought in urban wetlands" (Wright et al., 2006). They found that, in

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some cases, the ability of the wetlands to naturally remove pollutants became overwhelmed by pollutant loadings from stormwater.

An even more common method of controlling stormwater is to discharge it underground. Technically, these subsurface discharges of stormwater, including dry wells, bored wells, and infiltration galleries, are considered by EPA to be infiltration or "Class V" wells, which require a permit under the CWA as long as they are in proximity to an underground source of drinking water (40 C.F.R. Parts 144, 146). While EPA's definition excludes surface impoundments and excavated trenches lined with stone (provided they do not include subsurface fluid distribution systems or amount to "improved sinkholes" that involve the man-made modification of a naturally occurring karst depression for the purpose of stormwater control), most other types of subsurface drainage systems are covered regardless of the volume discharged (40 C.F.R. § 144.81(4)).

Given EPA's recent description of SCMs considered to be Class V injection wells (EPA, 2008), most SCMs that rely on infiltration are exempted. For example, if an infiltration trench is wider than it is deep, it is exempted from the Class V well regulations. Residential septic systems are also exempted [see 40 C.F.R. §§ 144.1(g)(1)(ii) and (2)(iii)]. However, those that involve deeper dry wells or infiltration galleries appear to require Class V well permits under the Safe Drinking Water Act. Because the use of these SCMs is likely to involve expensive compliance requirements, dischargers may steer away from them.

Air Contaminants

Air pollutants from vehicular exhaust and industrial sources that precipitate on roads and parking lots can also be collected in stormwater and increase pollutant loading (see Chapter 3 discussion of atmospheric deposition). While the Clean Air Act regulates these sources of air contamination, it does not eliminate them. Stormwater that is contaminated with air pollutants may consist of both "legal" releases of air pollutants, as well as "illegal" releases emitted in violation of a permit, although the distinction between the two groups of pollutants is effectively impossible to make in practice.

Pesticides and Other Chemical Products Applied to Land and Road Surfaces

EPA regulates the licensing of pesticides as well as chemicals and chemical mixtures, although its actual authority to take action, such as restricting product use or requiring labeling, varies according to the statute and whether the product is new or existing. Although EPA technically is allowed to consider the extent to which a chemical is accumulating in stormwater in determining whether additional restrictions of the chemical are needed, EPA is not aware of any instances in its Toxic Substances Control Act (TSCA) chemical regulatory decision-

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making in which it actually used this authority to advance water quality protection (Jenny Molloy, EPA, personal communication, March 13, 2008).

In its pesticide registration program, EPA does routinely consider a pesticide's potential for adverse aquatic effects from stormwater runoff in determining whether the pesticide constitutes an unreasonable risk (Bill Jordan, EPA, personal communication, March 14, 2008). EPA has imposed use restrictions on a number of individual pesticides, such as prohibiting aerial applications, requiring buffer strips, or reducing application amounts. Presumably states and localities are tasked with primary enforcement responsibility for most of these use restrictions. EPA has also required a surface water monitoring program as a condition of the re-registration for atrazine and continues to evaluate available surface water and groundwater data to assess pesticide risks (Bill Jordan, EPA, personal communication, March 14, 2008).

EPA STORMWATER PROGRAM

Stormwater is defined in federal regulations as "storm water runoff, snow melt runoff, and surface runoff and drainage" [40 CFR §122.26(b)(13)]. EPA intended that the term describe runoff from precipitation-related events and not include any type of non-stormwater discharge (55 Fed. Reg. 47995). A brief discussion of the evolution of the EPA's stormwater program is followed by an explanation of the permitting mechanisms and the various ways in which the program has been implemented by the states. As shown in Figure 2-2, the entire NPDES program has grown by almost an order of magnitude over the past 35 years in terms of the number of regulated entities, which explains the reliance of the program on general rather than individual permits. Both phases of the stormwater program have brought a large number of new entities under regulation.

Historical Background

States like Florida, Washington, Maryland, Wisconsin, and Vermont and some local municipalities such as Austin, Texas, Portland, Oregon, and Bellevue, Washington, preceded the EPA in implementing programs to mitigate the adverse impacts of stormwater quality and quantity on surface waters. The State of Florida, after a period of experimentation in the late 1970s, adopted a rule that required a state permit for all new stormwater discharges and for modifications to existing discharges if flows or pollutants increased (Florida Administrative Code, Chapter 17-25, 1982). The City of Bellevue, WA, established a municipal utility in 1974 to manage stormwater for water quality, hydrologic balance, and flood management purposes using an interconnected system of natural areas and existing drainage features.

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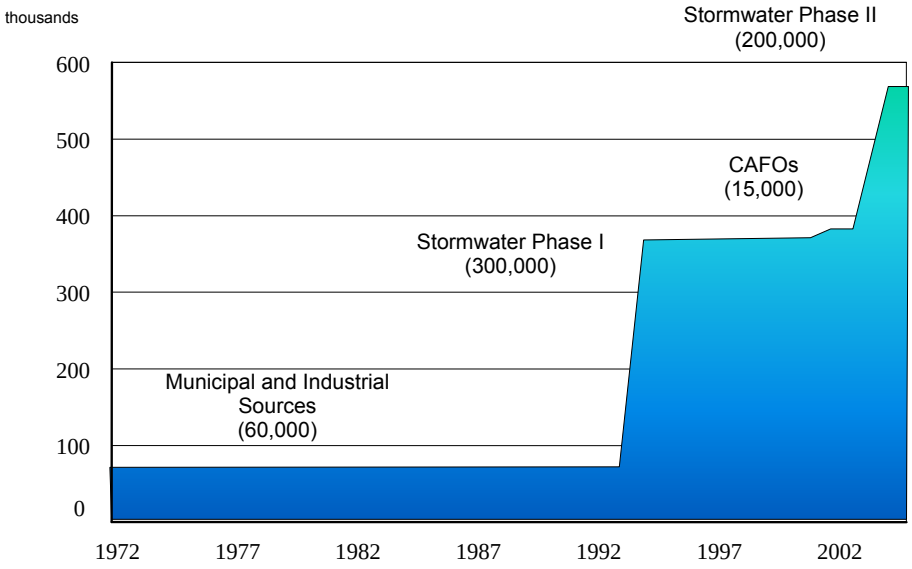

FIGURE 2-2 The number of permittees under the NPDES program of the Clean Water Act from 1972 to the present. Note that concentrated Animal Feeding Operations (CAFOs) are not considered in this report. SOURCE: Courtesy of Linda Boornazian, EPA.

EPA first considered regulating stormwater in 1973. At that time, it exempted from NPDES permit coverage conveyances carrying stormwater runoff not contaminated by industrial or commercial activity, unless the discharge was determined by the Administrator to be a significant contributor of pollutants to surface waters (38 Fed. Reg. 13530, May 22, 1973). EPA reasoned that while these stormwater conveyances were point sources, they were not suitable for end-of-pipe, technology-based controls because of the intermittent, variable, and less predictable nature of stormwater discharges. Stormwater pollution would be better managed at the local agency level through nonpoint source controls such as practices that prevent pollutants from entering the runoff. Further, EPA justified its decision by noting that the enormous numbers of individual permits that the Agency would have to issue would be administratively burdensome and divert resources from addressing industrial process wastewater and municipal sewage discharges, which presented more identifiable problems.

The Natural Resources Defense Council (NRDC) successfully challenged the EPA's selective exemption of stormwater point sources from the NPDES regulatory permitting scheme in federal court [*NRDC vs. Train*, 396 F.Supp. 1393 (D.D.C. 1975), *aff'd NRDC vs. Costle* 568 F.2d. 1369 (D.C. Cir. 1977)]. The court ruled that EPA did not have the authority to exempt point source discharges from the NPDES permit program, but recognized the Agency's discretion to use reasonable procedures to manage the administrative burden and to

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define what constitutes a stormwater point source. Consequently, EPA issued a rule establishing a comprehensive permit program for all stormwater discharges (except rural runoff) including municipal separate storm sewer systems (MS4s), which were to be issued "general" or area permits after a period of study (41 Fed. Reg. 11307, March 18, 1976). Individual permits were required for stormwater discharges from industrial or commercial activity, or where the stormwater discharge was designated by the permitting authority to be a significant contributor of pollutants. Comprehensive revisions to the NPDES regulations were published next, retaining the broad definition of stormwater discharges subject to the NPDES permit program and requiring permit application requirements similar to those for industrial wastewater discharges, including testing for an extended list of pollutants (44 Fed. Reg. 32854, June 7, 1979; 45 Fed. Reg. 33290, May 19, 1980).

The new NPDES regulations resulted in lawsuits filed in federal courts by a number of major trade associations, member companies, and environmental groups challenging several aspects of the NPDES program, including the stormwater provisions. The cases were consolidated in the D.C. Circuit Court of Appeals, and EPA reached a settlement with the industry petitioners on July 7, 1982, agreeing to propose changes to the stormwater regulations to balance environmental concerns with the practical limitations of issuing individual NPDES permits and limited resources. The Agency significantly narrowed the definition of stormwater point sources to conveyances contaminated by process wastes, raw materials, toxics, hazardous pollutants, or oil and grease, and it reduced application requirements by dividing stormwater discharges into two groups based on their potential for significant pollution problems (47 Fed. Reg. 52073, November 18, 1982). EPA issued a final rule retaining the broad coverage of stormwater point sources, and a two-tiered classification to administratively regulate these stormwater discharges (49 Fed. Reg. 37998, September 26, 1984).

The rule generated considerably controversy; trade associations and industry contended that application deadlines would be impossible to meet and that the sampling requirements were excessive, while the environmental community expressed a concern that additional changes or delays would exacerbate the Agency's failure to regulate sources of stormwater pollution. On the basis of the post-promulgation comments received, EPA determined that it was necessary to obtain additional data on stormwater discharges to assess their significance, and it conducted meetings with industry groups, who indicated an interest in providing representative data on the quality of stormwater discharges of their membership. The Agency determined that the submission of representative data was the most practical and efficient means of determining appropriate permit terms and conditions, as well as priorities for the multitude of stormwater point source discharges that needed to be permitted (50 Fed. Reg. 32548, August 12, 1985).

In the mean time, the U.S. House of Representatives and the Senate both passed bills to amend the CWA in mid-1985. The separate bills were reconciled in Conference Committee, and on February 4, 1987, Congress passed the Water

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Quality Act (WQA), which specifically addressed stormwater discharges. The WQA added Section 402(p) to the CWA, which requires stormwater permits to be issued prior to October 1992 for (i) municipal stormwater discharges from large and medium municipalities based on the 1990 census; (ii) discharges associated with industrial activity; and (iii) a stormwater discharge that the Administrator determines contributes to the violation of a water quality standard or is a significant contributor of pollutants to waters of the United States. MS4s were required to reduce pollutants in stormwater discharges to the "maximum extent practicable" (MEP). Industrial and construction stormwater discharges must meet the best conventional technology (BCT) standard for conventional pollutants and the best available technology economically achievable (BAT) standard for toxic pollutants. EPA and the NPDES-delegated states were given the flexibility to issue municipal stormwater permits on a system-wide or jurisdiction-wide basis. In addition, the WQA amended Section 402(l)(2) of the CWA to not require a permit for stormwater discharges from mining and oil and gas operations if the stormwater discharge is not contaminated by contact, and it amended Section 502(14) of the CWA to exclude agricultural stormwater discharges from the definition of point source.

These regulations had been informed by the National Urban Runoff Program, conducted from 1978 to 1983 to characterize the water quality of stormwater runoff from light industrial, commercial, and residential areas (Athayde et al., 1983). The majority of samples collected were analyzed for eight conventional pollutants and three heavy metals, and a subset was analyzed for 120 priority pollutants. The study indicated that on an annual loading basis, some of the conventional pollutants were greater than the pollutant loadings resulting from municipal wastewater treatment plants. In addition, the study found that a significant number of samples exceeded EPA's water quality criteria for freshwater.

The Federal Highway Administration conducted studies over a ten-year period ending in 1990 to characterize the water quality of stormwater runoff from roadways (Driscoll et al., 1990). A total of 993 individual stormwater events at 31 highway sites in 11 states were monitored for eight conventional pollutants and three heavy metals. In addition, a subset of samples was analyzed for certain other conventional pollutant parameters. The studies found that urban highways had significantly higher pollutant concentrations and loads than non-urban highway sites. Also, sites in relatively dry semi-arid regions had higher concentrations of many pollutants than sites in humid regions.

Final Stormwater Regulations

EPA issued final regulations in 1990 establishing a process for stormwater permit application, the required components of municipal stormwater management plans, and a permitting strategy for stormwater discharges associated with industrial activities (55 Fed. Reg. 222, 47992, November 16, 1990). Stormwater

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discharges associated with industrial activity that discharge to MS4s were required to obtain separate individual or general NPDES permits. Nevertheless, EPA recognized that medium and large MS4s had a significant role to play in source identification and the development of pollution controls for industry, and thus municipalities were obligated to require the implementation of controls under local government authority for stormwater discharges associated with industrial activity in their stormwater management program. The final regulations also established minimum sampling requirements during permit application for medium and large MS4s (serving a population based on the 1990 census of 100,000 to 250,000, and 250,000 or more, respectively). MS4s were required to submit a two-part application over two years with the first part describing the existing program and resources and the second part providing representative stormwater quality discharge data and a description of a proposed stormwater management program, after which individual MS4 NPDES permits would be issued for medium and large MS4s.

In addition, the regulations identified ten industry groups and construction activity disturbing land area five acres or greater as being subject to stormwater NPDES permits. These industries were classified as either heavy industry or light industry where industrial activities are exposed to stormwater, based on the Office of Management and Budget Standard Industrial Classifications (SIC). The main industrial sectors subject to the stormwater program are shown in Table 2-3 and include 11 regulatory categories: (i) facilities with effluent limitations, (ii) manufacturing, (iii) mineral, metal, oil and gas, (iv) hazardous waste treatment, storage, or disposal facilities, (v) landfills, (vi) recycling facilities, (vii) steam electric plants, (viii) transportation facilities, (ix) treatment works, (x) construction activity, and (xi) light industrial activity.

The second phase of final stormwater regulations promulgated on December 8, 1999 (64 Fed. Reg. 68722) required small MS4s to obtain permit coverage for stormwater discharges no later than March 10, 2003. A small MS4 is defined as an MS4 not already covered by an MS4 permit as a medium or large MS4, or is located in “urbanized areas” as defined by the Bureau of the Census (unless waived by the NPDES permitting authority), or is designated by the NPDES permitting authority on a case-by-case basis if situated outside of urbanized areas. Further, the regulations lowered the construction activities regulatory threshold for permit coverage for stormwater discharges from five acres to one acre.

To give an idea of the administrative burden associated with the stormwater program and the different types of permits, Table 2-4 shows the number of regulated entities in the Los Angeles region that fall under either individual or general permit categories. Industrial and construction greatly outweigh municipal permittees, and stormwater permittees are vastly more numerous that traditional wastewater permittees.

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TABLE 2-3 Sectors of Industrial Activity Covered by the EPA Stormwater Program

Category (see page 69)	**Sector**	**SIC Major Group**	**Activity Represented**
(i)	A	24	Timber products
(ii)	B	26	Paper and allied products
(ii)	C	28 and 39	Chemical and allied products
(i), (ii)	D	29	Asphalt paving and roofing materials and lubricants
(i) (ii)	E	32	Glass, clay, cement, concrete, and gypsum products
(i) (iii)	F	33	Primary metals
(i), (iii)	G	10	Metal mining (ore mining and dressing)
(i), (iii)	H	12	Coal mines and coal mining-related facilities
(i), (iii)	I	13	Oil and gas refining
(i), (iii)	J	14	Mineral mining and dressing
(iv)	K	HZ	Hazardous waste, treatment, storage, and disposal
(v)	L	LF	Landfills, land application sites, and open dumps
(vi)	M	50	Automobile salvage yards
(vii)	N	50	Scrap recycling facilities
(vii)	O	SE	Steam electric generating facilities
(viii)	P	40, 41, 42, 43, 51	Land transportation and warehousing
(viii)	Q	44	Water transportation
(viii)	R	37	Ship and boat building or repairing yards
(viii)	S	45	Air transportation
(ix)	T	TW	Treatment works
(xi)	U	20, 21	Food and kindred products
(xi)	V	22, 23, 31	Textile mills, apparel, and other fabric product manufacturing, leather and leather products
(xi)	W	24, 25	Furniture and fixtures
(xi)	X	27	Printing and publishing
(xi)	Y	30, 39, 34	Rubber, miscellaneous plastic products, and miscel-laneous manufacturing industries
(xi)	AB	35, 37	Transportation equipment, industrial or commercial machinery
(xi)	AC	35, 36, 38	Electronic, electrical, photographic, and optical goods
(x)			Construction activity
	AD		Non-classified facilities designated by Administrator under 40 CFR §122.26(g)(1)(l)

SOURCE: 65 Fed. Reg. 64804, October 30, 2000.

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TABLE 2-4 Number of NPDES Wastewater and Stormwater Entities Regulated by the CalEPA, Los Angeles Regional Water Board, as of May 2007

Waste Type	Individual Permittees	General Permittees
Wastewater and Non-stormwater Industry	103	574
Combined Wastewater and Stormwater	23	0
Stormwater (pre-1990)	45	0
Industrial Stormwater (post-1990)	0	2990
Construction Stormwater (post-1990)	0	2551
Municipal Stormwater (post-1990)	100	0
Total	271	6215

Municipal Permits

States with delegated NPDES permit authority (all except Alaska, Arizona, Idaho, Massachusetts, New Hampshire, and New Mexico) issued the first large and medium MS4 permits beginning in 1990, some of which are presently in their fourth permit term. These MS4 permits require large and medium municipalities to implement programmatic control measures (the six minimum measures) in the areas of (1) public education and outreach, (2) public participation and involvement, (3) illicit discharge detection and elimination, (4) construction site runoff control, (5) post-construction runoff control, and (6) pollution prevention and good housekeeping—all to reduce the discharge of pollutants in stormwater to the *maximum extent practicable*. Efforts to meet the six minimum measures are documented in a stormwater management plan. Non-stormwater discharges to the MS4 are prohibited unless separately permitted under the NPDES, except for certain authorized non-stormwater discharges, such as landscape irrigation runoff, which are deemed innocuous nuisance flows and not a source of pollutants. MS4 permits generally require analytic monitoring of pollutants in stormwater discharges for all Phase I medium and large MS4s from a subset of their outfalls that are 36 inches or greater in diameter or drain 50 acres or more. These data, at the discretion of the permitting authority, may be compared with water quality standards and considered (by default) to be effluent limitations, which refer to any restriction, including schedules of compliance, established by a state or the Administrator pursuant to CWA Section 304(b) on quantities, rates, and concentrations of chemical, physical, biological, and other constituents discharged from point sources into navigable waters, the waters of the contiguous zone, or the ocean (40 CFR §401.11). A future exceedance of an effluent limitation constitutes a permit violation. However, permitting authorities have so far not taken this approach to interpreting MS4 stormwater discharge data.

The Phase I stormwater regulations require medium and large MS4s to inspect "high-risk" industrial facilities and construction sites within their jurisdictions. Certain industrial facilities and construction sites of a minimum acreage are also subject to separate EPA/state permitting under the industrial and con-

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struction general permits (see below). While EPA envisioned a partnership with municipalities on these inspections in its Phase I Rule Making, it provided no federal funding to build these partnerships. Both industry and municipalities have argued that the dual inspection responsibilities are duplicative and redundant. Municipalities have further contended that the inspection of Phase I industrial facilities and construction sites are solely an EPA/state obligation, although state and federal courts have ruled otherwise. In the committee's experience, many MS4s do not oversee or regulate industries within their boundaries.

As part of the Phase II program, small MS4s are covered under general permits and are required to implement a stormwater management program to meet the six minimum measures mentioned above. Unlike with Phase I, Phase II MS4 stormwater discharge monitoring was made discretionary, and inspection of industrial facilities within the boundary of a Phase II MS4 is not required.

Industrial Permits

EPA issued the first nationwide multi-sector industrial stormwater general permit (MSGP) on September 29, 1995 (60 Fed. Reg. 50804), which was reissued on October 30, 2000 (65 Fed. Reg. 64746). A proposed new MSGP was released for public comment in 2005 (EPA, 2005b). The proposed MSGP requires that industrial facility operators prepare a stormwater pollution prevention plan (similar to an MS4's stormwater management plan) that documents the SCMs that will be implemented to reduce pollutants in stormwater discharges. They must achieve technology-based requirements using BAT or BCT or water quality-based effluent limits, which is the same requirement as for process wastewater permits.

All industrial sectors covered under the MSGP must conduct visual monitoring four times a year. The visual monitoring is performed by collecting a grab sample within the first hour of stormwater discharge and observing its characteristics qualitatively. A subset of MSGP industrial categories is required to perform analytical monitoring for benchmark pollutant parameters four times in Year 2 of permit coverage and again in Year 4 if benchmarks were exceeded in Year 2. The benchmark pollutant parameters, listed in Table 2-5, were selected based on the sampling data included with group permit applications submitted after the EPA issued its stormwater regulations in 1990. To comply with the benchmark monitoring requirements, a grab sample must be collected within the first hour of stormwater discharge after a rainfall event of 0.1 inch or greater and with an interceding dry period of at least 72 hours. A benchmark exceedance is not a permit violation, but rather is meant to trigger the facility operator to investigate SCMs and make necessary improvements.

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TABLE 2-5 Industry Sectors and Sub-Sectors Subject to Benchmark Monitoring

MSGP Sector	**Industry Sub-sector**	**Required Parameters for Benchmark Monitoring**
C	Industry organic chemicals Plastics, synthetic resins, etc. Soaps, detergents, cosmetics, perfumes Agricultural chemicals	Al, Fe, nitrate and nitrite N Zn Zn, nitrate and nitrite N Pb, Fe, Zn, P, nitrate and nitrite N
D	Asphalt paving and roofing materials	TSS
E	Clay products Concrete products	Al TSS and Fe
F	Steel works, blast furnaces, rolling and finishing mills Iron and steel foundries Non-ferrous rolling and drawing Non-ferrous foundries (casting)	Al, Zn Al, Cu, Fe, Zn, TSS Cu, Zn Cu, Zn
G	Copper ore mining and dressing	COD, TSS, nitrate and nitrite N
H	Coal mines and coal mining related facilities	TSS
J	Dimension stone, crushed stone, and non-metallic minerals (except fuels) Sand and gravel mining	TSS, Al, Fe Nitrate and nitrite N, TSS
K	Hazardous waste treatment, storage, or disposal	NH_3, Mg, COD, Ar, Cd, CN, Pb, Hg, Se, Ag
L	Landfills, land application sites, and open dumps	Fe, TSS
M	Automobile salvage yards	TSS, Al, Fe, Pb
N	Scrap recycling	Cu, Al, Fe, Pb, Zn, TSS, COD
O	Steam electric generating facilities	Fe
Q	Water transportation facilities	Al, Fe, Pb, Zn
S	Airports with deicing activities	BOD, COD, NH_3, pH
U	Grain mill products Fats and oils	TSS BOD, COD, nitrate and nitrite N, TSS
Y	Rubber products	Zn
AA	Fabricated metal products except coating Fabricated metal coating and engraving	Fe, Al, Zn, nitrate and nitrite N Zn, nitrate and nitrite N

NOTE: BOD, biological oxygen demand; COD, chemical oxygen demand; TSS, total suspended solids.
SOURCE: 65 Fed. Reg. 64817, October 30, 2000.

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EPA had already established technology-based effluent limitations for stormwater discharges for eight subcategories of industrial discharges prior to 1987, namely, for cement manufacturing, feedlots, fertilizer manufacturing, petroleum refining, phosphate manufacturing, steam electric, coal mining, and ore mining and dressing (see Table 2-6). Most of these facilities were covered under individual permits prior to 1987 and are generally required to stay covered under individual stormwater permits. Facilities in these sub-categories that had not been issued a stormwater discharge permit prior to 1992 are allowed to be covered under the MSGP, but they still have analytical monitoring requirements that must be compared to effluent limitation guidelines. An exceedance of the effluent limitation constitutes a permit violation.

TABLE 2-6 Select Stormwater Effluent Limitation Guidelines for Illustrative Purposes

Discharges	**Design Storm**	**Pollutant Parameters**	**Effluent Limitations (max per day)**
Phosphate Fertilizer Manufacturing Runoff (40 C.F.R. 418)	Not specified	Total P Fluoride	105 mg/L 75 mg/L
Petroleum Refining (40 C.F.R. 419)	Not specified	O&G TOC BOD5 COD Phenols Cr Hex Cr pH	15 mg/L 110 mg/L 48 kg/1000 m^3 flow 360 mg/1000 m^3 flow 0.35 mg/1000 m^3 flow 0.73 mg/1000 m^3 flow 0.062 mg/1000 m^3 flow 6–9
Asphalt Paving and Roofing Emulsion Products Runoff (40 C.F.R. 443)	Not specified	TSS O&G pH	0.023 kg/m^3 0.015 kg/m^3 6.0–9.0
Cement Manufacturing Material Storage Piles Runoff (40 C.F.R. 411)	10 yr, 24 hour	TSS pH	50 mg/L 6.0–9.0
Coal Mining (40 C.F.R. 434 Subpart B)	1 yr, 24 hour	Fe Mn TSS pH	7.0 mg/L 4 mg/L 70 mg/L 6.0–9.0
Steam Electric Power Generating (40 C.F.R. 423)	10 yr, 24 hour	TSS pH PCBs	50 mg/L 6.0–9.0 No discharge

NOTE: BOD5, biological oxygen demand; COD, chemical oxygen demand; O&G, oil and grease; PCBs, polychlorinated biphenyls; TOC, total organic carbon; TSS, total suspended solids. SOURCE: 40 C.F.R.

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At the issuance of the Final Storm Water Rule in 1990, EPA envisioned the use of a mix of general permits and individual permits to better manage the administrative burden associated with permitting thousands of industrial stormwater point sources. In its original permitting strategy for industrial stormwater discharges, EPA articulated a four-tier strategy with the nationwide general permits: Tier 1 was baseline permitting, Tier 2 would incorporate watershed permits, Tier 3 would be industry category-specific permitting, and Tier 4 would encompass facility-specific individual permits. In reality, individual permits, which would allow for the crafting of permit conditions to be better structured to the specific industrial facility based on its higher potential risk to water quality, and could include adequate monitoring for purposes of compliance and enforcement, have been sparsely used. Similarly, neither the watershed permitting strategy nor the industry category-specific permitting strategy has found favor in the absence of better federal guidance and funding.

Industrial stormwater general permits are issued by the State NPDES Permitting Authority in NPDES-delegated states, and may be in the form a single statewide permit covering thousands of industrial permittees or sector-specific stormwater general permits covering less than a hundred facilities. EPA Regions issue the MSGP in states without NPDES-delegated authority and for facilities on Native Indian and Tribal Lands. EPA's nationwide 2000 MSGP presently covers 4,102 facilities.

Construction Permits

EPA issued the first nationwide construction stormwater general permit (CGP) in February 1998 (63 Fed. Reg. 7858). The permits are valid for five-year terms. The most recent CGP was issued in 2005 (68 Fed. Reg. 39087), and the EPA in 2008 administratively continued the CGP until the end of 2009, when it is expected to have developed effluent guidelines for construction activity (73 Fed. Reg. 40338). The EPA is presently under court order to develop effluent limitation guidelines for stormwater discharges from the construction and land development industry. The construction general permit requires the implementation of stormwater pollution prevention plans to prevent erosion, control sediment in stormwater discharges, and manage construction waste materials. Operators of the construction activity are required to perform visual inspections regularly, but no sampling of stormwater discharge during rainfall events is required. As with the industrial and municipal permittees, an exceedance of an effluent limitation incorporated in a permit would be a violation of the CWA and is subject to penalties.

EPA's CGP covers construction activity in areas where EPA is the permitting authority, including Indian lands, Puerto Rico, the District of Columbia, Massachusetts, New Hampshire, New Mexico, Idaho, Arizona, and Alaska. All other states have been delegated the authority to issue NPDES permits, and

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these states issue CGPs based on the EPA model but with subtle variations. For example the California and Georgia CGPs include monitoring requirements for construction sites discharging to sediment-impaired waterbodies. Wisconsin requires weekly inspections and an inspection within 24 hours of a rain event of 0.5 inches or greater. Georgia imposes discharge limits of an increase of no more than 10 Nephelometric Turbidity Units (NTU) above background in trout streams and no more than 25 NTU above background in other types of streams.

Permit Creation, Administration, and Requirements

For individual permits, the entity seeking coverage submits an application and one permit is issued. The conditions of the permit are based on an analysis of information provided in a rather lengthy permit application by the facility operator about the facility and the discharge. Generally, it takes six to 18 months for the permittee to compile the application information and for the permitting authority to finalize the permit. Individual permits are common for medium and large MS4s (Phase I), small MS4s in a few states (Phase II), and a few industrial activities.

General permits, on the other hand, are issued by the permitting authority, and interested parties then submit an Notice of Intent (NOI) to be covered. This mechanism is used where large numbers of dischargers require permit coverage, such as construction activities, most industrial activities, and most small MS4s (Phase II). The permit must identify the area of coverage, the sources covered, and the process for obtaining coverage. Once the permit is issued, a permittee may submit a NOI and receive coverage either immediately or within a very short time frame (e.g., 30 days).

All permits contain “effluent limitations” or “effluent guidelines,” adherence to which is required of the permittee. However, the terms (which are synonymous) are agonizingly broad and encompass (1) meeting numeric pollutant limits in the discharge, (2) using certain SCMs, and (3) meeting certain design or performance standards. Effluent limitations may be expressed as SCMs when numeric limits are infeasible or for stormwater discharges where monitoring data are insufficient to carry out the purposes and intent of the CWA [122.44(k)]. If EPA has promulgated numerical “effluent guidelines” for existing and new stormwater sources under CWA Sections 301, 304, or 306, then the permits must incorporate the “effluent guidelines” as permit limits.

Effluent limitations can be either technology-based or water quality-based requirements. Technology-based requirements establish pollutant limits for discharges on what the best pollution control technology installed for that industry would normally accomplish. Water-quality based requirements, by contrast, look to the receiving waters to determine the level of pollution reduction needed for individual sources. There are national technology-based standards available for many categories of point sources, including many industrial sectors and municipal wastewater treatment plants. In the absence of national standards, tech-

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nology-based requirements are developed on a case-by-case basis using best professional judgment. In general, BAT is the standard for toxic and non-conventional pollutants, while BCT is the standard for conventional pollutants. Water quality-based effluent limitations are required where technology-based limits are found to be insufficient to achieve applicable water quality standards, including restoring impaired waters, preventing impairments, and protecting high-quality waters. Limitations must control all pollutants or pollutant parameters that are or may be discharged at a level which will *cause, have reasonable potential to cause, or contribute to* an excursion above any applicable water quality standard. To distinguish between technology-based and water quality-based effluent limits, consider that a permittee is required to meet a numeric pollutant limit in their stormwater discharge. A technology-based limit would be based on studies of effluent concentrations coming from that technology, while a water quality-based limit would be based on some assessment of the impact of the discharge on a nearby receiving water (with the applicable water quality standard being the most conservative choice).

EPA is presently writing stormwater "effluent guidelines" for airport de-icing operations and construction/development activity, with an estimated final action date of December 2009.

Permits Prior to 1990

A limited number of individual stormwater permits (perhaps in the low thousands) were first issued prior to 1990, the period before EPA promulgated regulations specific to stormwater discharges, and before EPA first received the authority to issue general NPDES permits. These individual NPDES permits for industrial stormwater discharges, like traditional individual wastewater NPDES permits, incorporate numerical effluent limits and they impose discharge monitoring requirements to demonstrate compliance. These facilities were selected for permitting before 1990, presumably because of the risk they presented to causing or contributing to the exceedance of water quality standards.

Do Permittees Have to Meet Water Quality Standards in their Effluent?

It is unclear as to whether municipal, industrial, and construction stormwater discharges must meet water quality standards. Furthermore, even if such discharges were required to meet water quality standards, the absence of monitoring found within the permits means that enforcement of the requirement would be difficult at best. Nonetheless, some sources suggest that, with the exception of Phase II MS4 discharges, EPA's intent is that stormwater discharges comply with water quality standards, especially where a TMDL is in place.

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First, the EPA Office of General Counsel issued a memorandum in 1991 stating that municipal stormwater permits must require that MS4s reduce stormwater pollutant discharges to the maximum extent practicable and must also comply with water quality standards. Recognizing the complexity of stormwater, EPA's 1996 Interim Permitting Approach for Water Quality-Based Effluent Limitations in Storm Water Permits (61 Fed. Reg. 43761) stated that stormwater permits should use SCMs in first-term stormwater permits and expanded or better-tailored SCMs in subsequent term permits to provide for the attainment of water quality standards. However, where adequate information existed to develop more specific conditions or limitations to meet water quality standards, these conditions or limitations are to be incorporated into stormwater permits as necessary and appropriate.

As permitting authorities began to develop TMDL waste load allocations to address impaired receiving waters, and waste load allocations were assigned to stormwater discharges, EPA issued a TMDL Stormwater Policy. It stated that stormwater permits must include permit conditions consistent with the assumptions and requirements of available waste load allocations (EPA, 2002b). Since waste load allocations derive directly from water quality standards, this could be interpreted as saying that stormwater discharges must meet water quality standards. However, EPA expected that most water quality-based effluent limitations for NPDES-regulated stormwater discharges that implement TMDL waste load allocations would be expressed as SCMs, and that numeric limits would be used only in rare instances. This is understandable, given that storm events are dynamic and variable and it would be expensive to monitor all storm events and discharge points, particularly for MS4s, to demonstrate compliance with a waste load allocation expressed as a numeric effluent limitation. Effluent limitations expressed as SCMs appear to be the best interim approach to demonstrate compliance with TMDLs, provided that these SCMs are reasonably expected to satisfy the waste load allocation in the TMDL. As part of the TMDL, the NPDES permit must also specify the monitoring necessary to determine compliance with effluent limitations. Where effluent limits are specified as SCMs, the permit should specify the monitoring necessary to assess if the load reductions expected from SCM implementation are achieved (e.g., SCM performance data).

Implementation of the Stormwater Program by States and Municipalities

NPDES-delegated states and Indian Tribes generally utilize the CGP and the MSGP as model templates for adopting their respective general permits to regulate stormwater discharges associated with industrial activity, including construction, within their jurisdictions. Nevertheless, some variations exist. For example, the California CGP requires sampling of stormwater at construction sites that discharge to surface waters that are listed as being impaired for sediment. Connecticut's MSGP regulates stormwater discharges associated with

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commercial activity, in addition to industrial activity. With respect to the municipal permits, the variability with which the stormwater program is implemented reflects the flexibility inherent in the MEP standard. In the absence of a definite description of MEP or nationwide effluent guidelines issued by EPA, states and municipalities have not been very rigorous in determining what constitutes an adequate level of compliance. This self-defined compliance threshold has been translated into a wide range of efforts at program implementation.

A number of MS4 programs have been leaders in some areas of program implementation. For example, Prince George's County, Maryland, was a pioneer in implementing low impact development (LID) techniques. Notable efforts have been made by states and municipalities in the Pacific Northwest, such as Oregon and Washington. California and Florida also are in the forefront of implementing comprehensive and progressive stormwater programs.

Greater implementation is evident in states that had state stormwater regulations in place prior to the advent of the national stormwater program (GAO, 2007). Some states issued early MS4 permits (e.g., California, Florida, Washington, and Wisconsin) prior to the promulgation of the national stormwater program, while a number of MS4s (e.g., Austin, Texas,; Santa Monica, California; and Bellevue, Washington) were already implementing comprehensive stormwater management programs. In addition, some MS4s conducted individual stormwater management activities, such as street-sweeping, household hazardous waste collection, construction site plan review, and inspections, prior to the national stormwater program. These areas are more likely than areas without a stormwater program that predated the EPA program to be successfully meeting the requirements of the current program.

One of the obvious differences is the level of interest and effort exercised by coastal communities or communities in close proximity to a water resource that have immediate access to the beneficial uses of those resources but also have an immediate view of the impacts of polluted runoff. That interest may contrast with the less active posture of upstream or further inland communities that may not be as sensitive and willing to implement more stringent stormwater programs. A recent report has found that programs with more specific permit requirements generally result in more comprehensive and progressive stormwater management programs (TetraTech, 2006a). The report concluded that permittees should be required to develop measurable goals based on the desired outcomes of the stormwater program. Furthermore, additional stormwater permit requirements can be expected as more TMDLs are developed and wasteload allocations must be translated into permit conditions.

GAO Report on Current Status of Implementation

In 2007, the GAO issued a report to determine the impact of EPA's Stormwater Program on communities (GAO, 2007). Some of the relevant findings are

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that urban stormwater runoff continues to be a major contributor to the nation's degraded waters and that stormwater program implementation has been slow for both Phase I and Phase II communities, with almost 11 percent of all communities not yet permitted as of fall 2006. Litigation, among other reasons, delayed the issuance of some permits for years after the application deadlines. As a result, almost all Phase II and some Phase I communities are still in the early stages of program implementation although deadlines for permit applications were years ago—16 years for Phase I and six years for Phase II. EPA has acknowledged that it does not currently have a system in place to measure the success of the Phase I program on a national scale (EPA, 2000b). Therefore, it is reasonable to conclude that the level of implementation of the stormwater program ranges widely, from municipalities having completed a third-term permit (such as Los Angeles County MS4 permit) to municipalities not yet covered by a Phase II MS4 permit.

The GAO report also indicates that communities' inconsistent reporting of activities makes it difficult to evaluate program implementation nationwide. Based on the report's findings it seems that little auditing activity has been performed to gauge the status of implementation and effectiveness in achieving water quality improvements. Most often cited is the effort by EPA's Region 9 and the State of California auditors that recently discovered, among other things, that some MS4s (1) had not developed stormwater management plans, (2) were not properly performing an adequate number of inspections to enforce their stormwater ordinances, and (3) were lax in implementing SCMs at publicly owned construction sites. They also found that some MS4s were not adequately controlling stormwater runoff at municipally owned and operated facilities, such as maintenance yards. In response to these findings, EPA issued in January 2007 an MS4 Program Evaluation Guidance document (EPA, 2007b).

In the absence of a nationwide perspective of the implementation of the stormwater program, it is hard to make a determination about the program's success. There are communities and states that seem to have made great strides in implementing progressive stormwater programs, but it also seems that overall many programs are still in the early stages of implementation, while a number of communities are still waiting to obtain coverage under the MS4 permits. In addition, it appears that there is no national uniform system of tracking success or cost data. All these unknowns make it very difficult to formulate any definite statements about how successful the implementation of the program is on a national perspective.

Committee Survey

In order to get a better understanding of how the stormwater program is implemented by the states, during 2007 the committee conducted two surveys asking states about their monitoring requirements, compliance determination, and other facts for each program (municipal, industrial, and construction). For the

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larger survey, 18 states representing all ten EPA regions responded to the survey. Both surveys and all responses are found in Appendix C.

As expected, the responding states reported that Phase I MS4s are required to sample their stormwater discharges for pollutants, although the frequency of sampling and the number of pollutants being sampled tended to vary. No state reported requiring Phase II MS4s to sample stormwater discharges. Monitoring requirements for industrial stormwater varied by state from none in Minnesota, Nebraska, and Maine to benchmark monitoring required under the MSGP in Virginia, New York, and Wyoming. California, Connecticut, and Washington require all industrial facilities to monitor for select chemical pollutants. Connecticut, additionally, requires sampling for aquatic toxicity. Most of the responding states do not require construction sites to do much more than visual monitoring periodically and after rain events. Georgia and Washington require construction sites to monitor for parameters such as turbidity and pH. California and Oregon require sampling when the discharge is to a waterbody impaired by sediment.

As mentioned previously, Phase I MS4s (but not Phase II MS4s) are required to address industrial dischargers within their boundaries. There was considerable variability regarding the survey questions of whether MS4s can conduct inspections of industrial facilities and what industries are considered high risk. In all of the responding states except Virginia, the responders think that MS4s have the authority to inspect industries within their boundaries, although the extent to which this is done is not clear and, in the committee's experience, is quite rare. Many of the responding states have not identified "high-risk" facilities and targeted them for compliance scrutiny, although certain categories were felt to be problematic by the state employee responding to the survey, such as metal foundries, auto salvage yards, metal recyclers, cement plants, and saw mills. In California and Washington, however, some of the Phase I MS4 permits have identified high-risk facilities for the municipal permittee to inspect.

Georgia, Maine, Minnesota, Nevada, New York, Vermont, and Washington have State Guidance Manuals for MS4 implementation, while in California a coalition of municipalities and the California Department of Transportation have developed MS4 guidance manuals. The rest of the responding states rely on general guidance provided by the EPA. State guidance manuals for the implementation of the industrial stormwater program were less common than guidance manuals for construction activity, with only California and Washington having such guidance manuals. In contrast, except for Nebraska and Oklahoma, statewide guidance manuals for erosion and sediment control were available. This may have resulted from the fact that many states had laws in place that required erosion and sediment control practices during land development, timber harvesting, and agricultural farming that predated the EPA stormwater regulations.

In an attempt to determine the level of oversight that a state provides for industrial and construction operations, the survey asked whether and to whom

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stormwater pollution prevention plans (SWPPPs) are submitted. Most of the responding states require the stormwater pollution prevention plans that industrial facilities prepare to be retained at the facility and produced when requested by the state. Only Oregon, Vermont, Washington, and Hawaii required industrial SWPPPs to be submitted to the state when seeking coverage under the MSGP. The practice for the submittal of construction SWPPPs was similar, except that some states required that SWPPPs for large construction projects be submitted to the state.

Compliance with the MS4 permit in the responding States is mainly determined through the evaluation of annual reports and program audits, although no indication was given of the frequency of audits. Regulators in Maine have monthly meetings with municipalities. The responding states evaluate compliance with the MSGP by reviewing annual monitoring reports and conducting inspections of industrial facilities. Connecticut characterized its industrial inspections as "regular," Maine inspects industrial facilities twice per five-year permit cycle, while Vermont performs visual inspections four times a year. No other responding states specified the frequency of inspections. Inspections and reviews of the SWPPPs constitute the main ways for responding states to determine the compliance of sites and facilities covered under the CGP.

With respect to the extent of actual compliance, few states have such information, partly because it has not routinely been collected and analyzed. West Virginia has found that, of the 871 permitted industrial facilities in the state, 576 were delinquent in submitting the results of their benchmark monitoring. Several case studies of compliance rates for municipal, industrial, and construction sites in Southern California are presented in Box 2-4. The data suggest that compliance in all three groups is poor, particularly for industrial sites. This may be partly explained by the preponderance of small businesses covered by the MSGP, whose operators may have financial difficulty in committing funds to SCMs, or lack a recognition and knowledge of the stormwater program and its requirements.

Another aspect of compliance is the extent to which industrial facilities have identified themselves and applied for coverage under the state MSGP. Six states responded to the committee's survey about that topic; only two of the six (California and Vermont) have made efforts to determine the numbers of non-filers of an NOI to be covered by the MSGP. In both cases, the efforts, which involved mailings, telephone calls, and file review, found that the number of non-filing facilities that should be subject to the MSGP was substantial (see Box 2-5 for California's data). Duke and Augustenborg (2006) studied this level of compliance (whether industries are filing an NOI for permit coverage) and found incomplete compliance that is variable among states and urbanized areas. Texas and Oklahoma had higher levels of permit coverage than California or Florida.

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BOX 2-4
Compliance with Stormwater Permits in Southern California

Construction General Permits

In order to determine the compliance of construction sites with the general stormwater permit, data were collected and analyzed from three sources: (1) an audit performed in June 2004 of the development construction program of five cities that are permittees in the Los Angeles County MS4 permit (about 44 sites), (2) an audit performed in February 2002 of the development construction program (among others) of five Ventura County MS4 permittees (about 32 sites), and (3) a review and inspection of 24 large construction sites (50 acres or greater of disturbed land). These sites accounted for about 5 percent of all construction sites in the region at the time, and they represent both small and large construction sites. The most common violations on construction sites were paper violations, such as incomplete SWPPPs and a lack of record keeping. Forty (40) percent of the sites had some type of paper deficiency. A close second is the absence of erosion and/or sediment control, observed on 30 percent of the sites. SOURCE: TetraTech (2002, 2006b,c).

Industrial Multi-Sector General Permit

For industrial sites, information was obtained from the following sources: (1) a review of SCM inspections performed in February 2005 which consisted of 38 sites in the transportation sector; (2) a review of inspections and non-filer identification information in the plastics sector performed in 2007, which consisted of about 100 permitted sites among a large number of non-filer sites; and (3) a review of 13 area airport inspections and 55 port tenant inspections at the ports of Los Angeles and Long Beach. The sites are about 6 percent of the total number of permittees covered by California's MSGP and represent some of the major regulated industrial sectors. The most common violations observed at industrial sites were the lack of implementation of SCMs such as overhead cover, secondary containment and/or spill control. Sixty (60) percent of the sites had poor housekeeping problems. This was followed by incomplete stormwater pollution prevention plans (40 percent). (SOURCE: E. Solomon, California EPA, Los Angeles Regional Water Board, personal communication, 2008).

In another study, the California Water Boards with the assistance of an EPA contractor conducted inspections of 1,848 industrial stormwater permittees (21 percent of permitted facilities) between 2001 and 2005 (TetraTech, 2006d). Seventy-one (71) percent of the industrial facilities inspected were not in compliance with the MSGP and 18 percent were identified as a threat to water quality. Fifty-six (56) percent of facilities that collected one or more water quality samples reported an exceedance of a benchmark. Facility follow-up inspections indicated that field presence of the California Water Boards inspectors improved facility compliance with the MSGP.

Municipal Permits

An audit similar to the TetraTech study described above was conducted for 84 Phase I and Phase II MS4s in California during the same period (TetraTech, 2006e). The audits found that municipal maintenance facilities were often deficient in implementing SCMs, MS4 permittees did not obtain adequate legal authority to implement the program, they were not inspecting industrial facilities and construction sites or were inspecting them inadequately, and they were unable to evaluate program effectiveness in improving water quality. Overall, the audits found that programs with more specific permit requirements

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BOX 2-4 Continued

generally resulted in more comprehensive and progressive stormwater management programs. For example, the Los Angeles or San Diego MS4 permits enumerate in detail the permit tasks such as the frequency of inspection, the types of facilities, and the SCMs to be inspected that permittees must perform in implementing their stormwater program. The auditors concluded that the specificity of the provisions enabled the permitting authorities to enforce the MS4 permits and improve the quality of MS4 discharges.

Compliance with Industrial Permits within MS4s

The EPA and the California EPA Los Angeles Regional Water Board conducted a limited audit of the inspection program requirements of the Los Angeles County MS4 Permit and the City of Long Beach MS4 Permit in conjunction with industrial facilities covered under the MSGP within the Ports of Los Angeles and Long Beach (EPA, 2007c). The Port of Long Beach is covered under a single NOI for its 53 tenant facilities that discharge stormwater associated with industrial activity, while 137 industrial facilities within the Port of Los Angeles file independent NOIs. At the Port of Los Angeles, of the 23 facilities that were inspected, 30 percent were judged to pose a significant threat to water quality, 43 percent were determined to have some violations with regard to implementation of SCMs or paperwork requirements, and 26 percent appeared to be in compliance with the MSGP. At the Port of Long Beach, of the 21 tenant facilities that were inspected, 14 percent were judged to pose a significant threat to water quality, 52 percent were determined to have some deficiencies with regard to implementation of SCMs or paperwork requirements, and 33 percent appeared to be in full compliance with general permit requirements. The Port of Long Beach had a more comprehensive stormwater monitoring program which indicated that several pollutant parameters were above EPA benchmark values. Communication between the MS4 departments and the ports in both programs appeared deficient. The EPA issued 20 compliance orders for violations of the MSGP, but it did not pursue any action against the MS4s overseeing the industries because it was outside the scope of the EPA audit.

LOCAL CODES AND ORDINANCES THAT AFFECT STORMWATER MANAGEMENT

Zoning and building standards, codes, and ordinances have been the basis for city building in the United States for almost a century. They define how to build to protect the health, safety, and welfare of the public, and to establish a predictable, although often lengthy and cumbersome, process for ensuring that built improvements become a well-integrated part of the larger urban environment. Review processes can be as simple as a walk-through in a local building department for a minor house remodeling project. In other cases, extended rezoning processes for larger projects can require several years of planning; multiple public meetings; multiple reviews by city, state, and federal agencies; and specialized studies to determine impacts on the natural environment and water, sewer, and transportation systems.

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BOX 2-5
Searching for Non-Filers Under the Industrial MSGP in Southern California

The California Water Boards conducted an industrial non-filer identification study between 1995 and 1998 (CA SWB, 1999). The study had three components: (1) to develop a mechanism to identify facilities subject to the industrial stormwater general permit that had not filed an NOI, which involved a comparison of commercially available and agency databases with that maintained by the California Water Boards; (2) to communicate with operators of these facilities to inform them of their responsibility to comply, which was done using post-mail, telephone calls, and filed verification; and (3) to refer responses to the communication efforts to the Water Boards for any appropriate follow-up.

About 9 percent of the potential non-filers submitted an NOI after the initial mail contact. About 52 percent of facilities indicated that they were exempt. About 37 percent failed to respond and 16 percent of mailed packages were returned unopened. A follow-up on facilities that claimed they were exempt indicated that 16 percent of them indeed needed to comply. Similarly 33 percent of facilities that failed to respond were determined as needing to file NOIs. The study suggested that only half of facilities considered heavy industrial had filed NOIs through the first five years of the program (Duke and Shaver, 1999).

The California EPA Los Angeles Regional Water Board and the City of Los Angeles conducted a study in the City of Los Angeles between January 1998 and June 2000 to identify non-filers and evaluate compliance by door-to-door visits in industrially zoned areas of the city (Swamikannu et al., 2001). The field investigations covered industrial zones totaling about 4.2 square miles, or about 22 percent of the area in the City of Los Angeles zoned for industrial land use. A total of 1,103 of suspected non-filer facilities were subject to detailed on-site facility investigation. Ninety-three (93) were determined to have already have submitted NOIs, and 436 were determined not to be subject to the industrial stormwater general permit. The site visits identified 223 potential non-filers, or industrial facilities where site-visit evidence suggested the facilities probably needed to comply with relevant regulations but that had not filed NOIs or recognized their duty to comply at the time of the visit. Of the facilities identified as potential non-filers, 202 were identified during detailed on-site investigations, or 18 percent of facilities inspected with that methodology; and 21 were identified during the less-detailed non-filer assessment visits, or 6 percent of the 379 facilities inspected with that methodology. In total, 295 of the 1,103 facilities visited under the project (about 27 percent) were known or suspected to be required to file NOIs under the permit, including 93 facilities that had previously filed NOIs and 202 facilities identified as probably required to file NOIs based on visual evidence of industrial activities exposed to stormwater. Thus, prior to the project, only 31 percent of all facilities in the project area needing to comply had submitted an NOI.

There is an overlapping and conflicting maze of codes, regulations, ordinances, and standards that have a profound influence on the ability to implement stormwater control measures, although they can be loosely categorized into three areas. Land-use zoning is the first type of control. Zoning, which was developed in response to unsanitary and unhealthy living conditions in 19th-century cities, prescribes permitted land uses, building heights, setbacks, and the arrangement of different types of land uses on a given site. Zoning often requires improvements that enhance the aesthetic and functional qualities of communities. For example, ordinances prescribing landscaping, minimum parking requirements, paving types, and related requirements have been developed to

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improve the livability of cities. These ordinances have a significant impact on both how stormwater affects waterbodies and on attempts to mitigate its impacts.

The second category involves the design and construction of buildings. National and international building codes and standards, such as the International Building Code, and Uniform Plumbing, Electrical, and Fire Codes, for example, allow local governments to establish minimum requirements for building construction. Because these controls primarily affect building construction, they have less effect on stormwater discharges than zoning.

The third category includes engineering and infrastructure standards and practices that govern the design and maintenance of the public realm—streets, roads, utilities rights-of-way, and urban waterways. Roadway design standards and emergency access requirements have resulted in contemporary cities that are 30 percent or more pavement, just to accommodate the movement and storage of vehicles in the public right-of-way. The standards for the construction of deep utilities—water and sewer lines that are typically located underneath streets—are often the reason that streets are wider than necessary to safely carry traffic.

Over time, these codes, standards, and practices have become more complex, and they may no longer support the latest innovations in planning practices. The past 10 to 20 years have seen a number of innovations in zoning and related building standards. Mixed-use, mixed-density communities that incorporate traditional patterns of community development (often described as "New Urbanism"), low impact development (LID), and transit-oriented development are examples of building patterns that challenge traditional zoning and city design standards. With the exception of LID, proposed new patterns of development and regulations connected with their implementation rarely incorporate specific guidelines for innovations in stormwater management, other than to have general references to environmental responsibility, ecological restoration, and natural area protection.

The following sections describe in more detail the codes, ordinances, and standards that affect stormwater and our ability to control it, and alternative approaches to developing new standards and practices that support and encourage effective stormwater management.

Zoning

The primary, traditional purpose of zoning has been to segregate land uses thought to be incompatible. In practice, zoning is used as a permitting system to prevent new development from harming existing residents or businesses. Zoning is commonly controlled by local governments such as counties or cities, though the specifics of the zoning regime are determined primarily by state planning laws (see Box 2-6 for a discussion of land use acts in Oregon and Washington).

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BOX 2-6
Growth Management in the Pacific Northwest

In Oregon, the 1973 Legislative Assembly enacted the Oregon Land Use Act, which recognized that the uncoordinated use of lands threatens orderly development of the environment, the health, safety, order, convenience, prosperity and welfare of the people of Oregon. The state required all of Oregon's 214 cities and 36 counties to adopt comprehensive plans and land-use regulations. It specified planning concerns that had to be addressed, set statewide standards that local plans and ordinances had to meet, and established a review process to ensure that those standards were met. Aims of the program are to conserve farm land, forest land, coastal resources, and other important natural resources; encourage-efficient development; coordinate the planning activities of local governments and state and federal agencies; enhance the state's economy; and reduce the public costs that result from poorly planned development. Setting urban growth boundaries is a major mechanism for implementing the act.

The Washington State Legislature followed in 1990 with the Growth Management Act (GMA), adopted on grounds similar to Oregon's act. The GMA requires state and local governments to manage Washington's growth by identifying and protecting critical areas and natural resource lands, designating urban growth areas, preparing comprehensive plans, and implementing them through capital investments and development regulations. Similar again to Oregon, rather than centralize planning and decision-making at the state level, the GMA established state goals, set deadlines for compliance, offered direction on how to prepare local comprehensive plans and regulations, and set forth requirements for early and continuous public participation. Urban growth areas (UGAs) are those areas, designated by counties pursuant to the GMA, "within which urban growth shall be encouraged and outside of which growth can occur only if it is not urban in nature." Within these UGAs, growth is encouraged and supported with adequate facilities. Areas outside of the UGAs are reserved for primarily rural and resource uses. Urban growth areas are to be based on population forecasts made by counties, which are required to have a 20-year supply of land for future residential development inside the boundary—a time frame also pertaining in the Oregon system. In both states urban growth boundaries are reconsidered and sometimes adjusted to meet this criterion.

It is important to note that the growth management efforts in the two states have no direct relationship to stormwater management. Rather, the laws control development density, which has implications for how stormwater should be managed (see discussion in Chapter 5). The local jurisdictions in Washington have reacted in different ways to link growth management and stormwater management. For example, the King County, Washington, stormwater code requires drainage review to evaluate and deal with stormwater impacts for development that adds 2,000 square feet or more of impervious surface or clears more than 7,000 square feet. For rural residential lots outside the UGA, the impervious threshold is reduced to 500 square feet.

Sources:
http://bluebook.state.or.us/state/executive/Land_Conservation/land_conservation_history.htm
http://www.oregonmetro.gov/index.cfm/go/by.web/id=277
http://www.gmhb.wa.gov/gma/ and *http://www.mrsc.org/Subjects/Planning/compfaqs.aspx*

Zoning involves regulation of the kinds of activities that will be acceptable on particular lots (such as open space, residential, agricultural, commercial or industrial), the densities at which those activities can be performed (from low-density housing such as single-family homes to high-density housing such as high-rise apartment buildings), the height of buildings, the amount of space

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structures may occupy, the location of a building on the lot (setbacks), the proportions of the types of space on a lot (for example, how much landscaped space and how much paved space), and how much parking must be provided. Thus, zoning can have a significant impact on the amount of impervious area in a development and on what constitutes allowable stormwater management.

As an example, local parking ordinances are often found within zoning that govern the size, number, and surface material of parking spaces, as well as the overall geometry of the parking lot as a whole. The parking demand requirements are tied to particular land uses and zoning categories, and can create needless impervious cover. Most local parking codes are overly generous and have few, if any, provisions to treat stormwater at the source (Wells, 1995). For example, in a co-housing project under construction in Fresno, California, current city codes require 27-foot-long parking spaces. The developer, in an effort to reduce construction costs, requested that the length of spaces be reduced to 24 feet. The city agreed to the smaller spaces if the developer would sign an indemnity clause guaranteeing that the local government would not be sued in case of an accident (Wenz, 2008).

Similarly, landscaping ordinances apply to certain commercial and institutional zoning categories and specify that a fixed percentage of site area be devoted to landscaping, screening, or similar setbacks. These codes may require as much as 5 to 10 percent of the site area to be landscaped, but seldom reference opportunities to capture and store runoff at the source, despite the fact that the area devoted to landscaping is often large enough to meet some or all of their stormwater treatment needs.

Zoning codes have evolved over the years as urban planning theory has changed, legal constraints have fluctuated, and political priorities have shifted. The various approaches to zoning can be divided into four broad categories: Euclidean, performance, planned unit development, and form-based.

Euclidean Zoning

Named for the type of zoning code adopted in the town of Euclid, Ohio, Euclidean zoning codes are by far the most prevalent in the United States, used extensively in small towns and large cities alike. Euclidean zoning is characterized by the segregation of land uses into specified geographic districts and dimensional standards stipulating limitations on the magnitude of development activity that is allowed to take place on lots within each type of district. Typical land-use districts in Euclidean zoning are residential (single- or multi-family), commercial, and industrial. Uses within each district are usually heavily prescribed to exclude other types of uses (for example, residential districts typically disallow commercial or industrial uses). Some “accessory” or “conditional” uses may be allowed in order to accommodate the needs of the primary uses. Dimensional standards apply to any structures built on lots within each zoning district and typically take the form of setbacks, height limits,

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minimum lot sizes, lot coverage limits, and other limitations on the building envelope.

Although traditional Euclidean zoning does not include any significant requirements for stormwater drainage, there is no reason that it could not. Modern Euclidean ordinances include a broad list of "development standards" that address topics like signage, lighting, steep slopes, and other topics, and that list could be expanded to included stormwater standards for private development.

Euclidean zoning is used almost universally across the country (with rare exceptions) because of its relative effectiveness, ease of implementation (one set of explicit, prescriptive rules), long-established legal precedent, and familiarity to planners and design professionals. However, Euclidean zoning has received heavy criticism for its unnecessary separation of land uses, its lack of flexibility, and its institutionalization of now-outdated planning theory. . In response, variances and other methods have been used to modify Euclidean zoning so that it is better adapted to localized conditions and existing patterns of development. The sections below briefly describe a range of innovations in local zoning regulations that have potential for incorporating stormwater controls into existing regulations.

Incentive Zoning. Incentive zoning systems are typically an add-on to Euclidean zoning systems. First implemented in Chicago and New York City in 1961, incentive zoning is intended to provide a reward-based system to encourage development that meets established urban development goals. Typically, a base level of prescriptive limitations on development will be established and an extensive list of incentive criteria with an associated reward scale will be established for developers to adopt at their discretion. Common examples include floor-area-ratio bonuses for affordable housing provided on-site and height-limit bonuses for the inclusion of public amenities on-site.

With incentive zoning, developers are awarded additional development capacity in exchange for a public benefit, such as a provision for low- or moderate-income housing, or an amenity, such as additional open space. Incentive zoning is often used in more highly urbanized areas. Consideration for water quality treatment and innovative SCMs fits well within the incentive zoning model. For example, redevelopment sites in urbanized areas are often required to incorporate stormwater control measures into developments to minimize impacts on aging, undersized stormwater systems in that area, and to meet new water quality requirements. An incentive could be to allow greater building height, and therefore higher density, than under existing zoning, freeing up land area for SCMs that could also serve as a passive park area. Another example would be to allow a higher density on the site and to require not an on-site system but a cash payment to the governing entity to provide for consolidated stormwater management and treatment. Off-site consolidated systems, discussed more extensively in Chapter 5, may require creation of a localized main-

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tenance district or an increase in stormwater maintenance fees to offset long-term maintenance costs.

Incentive zoning could be used to preserve natural areas or stream corridors as part of a watershed enhancement strategy. For example, transferrable development rights (TDR) could be used in the context of the urban or semi-urban interface with rural lands. Many of the formal TDR programs in Colorado (such as Fruita/Mesa County and Aspen/Pitkin) involve cities or counties seeking to preserve sensitive areas in the county, or outlying areas of the city, including the floodplain, in exchange for urban-level density on a more appropriate site (David D. Smith, Garfield & Hecht P.C., personal communication, 2008).

Incentive zoning allows for a high degree of flexibility, but it can be complex to administer. The more a proposed development takes advantage of incentive criteria, the more closely it has to be reviewed on a discretionary basis. The initial creation of the incentive structure can also be challenging and often requires extensive ongoing revision to maintain balance between incentive magnitude and value given to developers.

Performance Zoning

Performance zoning uses performance-based or goal-oriented criteria to establish review parameters for proposed development projects in any area of a municipality. At its heart, performance zoning deemphasizes the specific land uses, minimum setbacks, and maximum heights applicable to a development site and instead requires that the development meet certain performance standards (usually related to noise, glare, traffic generation, or visibility). Performance zoning sometimes utilizes a "points-based" system whereby a property developer can apply credits toward meeting established zoning goals through selecting from a menu of compliance options (some examples include mitigation of environmental impacts, providing public amenities, and building affordable housing units). Additional discretionary criteria may also be established as part of the review process.

The appeal of performance zoning lies in its high level of flexibility, rationality, transparency, and accountability. Because performance zoning is grounded in specific and in many cases quantifiable goals, it better accommodates market principles and private property rights with environmental protection. However, performance zoning can be extremely difficult to implement and can require a high level of discretionary activity on the part of the supervising authority. City staff must often be trained to use specialized equipment to measure the performance of the development, and sometimes those impacts cannot be measured until the building is completed and the activity operating, by which time it may be difficult and expensive to modify a building that turns out not to meet the required performance standards. Because stormwater performance is measurable (especially the amounts of water retained/detained and rates and amounts of water discharge), stormwater

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regulations could be integrated into a performance zoning system. As with other topics, however, it might be time-consuming or require special equipment to measure compliance (particularly before the building is built).

Planned Unit Development (Including Cluster Development and Conservation Design)

A planned unit development (PUD) is generally a large area of land under unified control that is planned and developed as a whole through a single development operation or series of development phases, in accord with a master plan. In California, these are known as Specific Plans. More specialized forms of PUDs include clustered subdivisions where density limitations apply to the development site as a whole but provide flexibility in the lot size, setback, and other standards that apply to individual house lots. These PUDs provide considerable flexibility in locating building sites and associated roads and utilities, allowing them to be concentrated in parts of the site, with the remaining land use for agriculture, recreation, preservation of sensitive areas, or other open-space purposes.

PUDs are typically, although not exclusively, found in new development areas and have significant open space and park areas that are often 25 percent or more of the total land area. This large amount of open space provides considerable opportunity for the use of consolidated, multifunctional stormwater controls.

Form-Based Zoning

Form-based zoning relies on rules applied to development sites according to both prescriptive and potentially discretionary criteria. These criteria are typically dependent on lot size, location, proximity, and other various site- and use-specific characteristics. Form-based codes offer considerably more flexibility in building uses than do Euclidean codes, but, as they are comparatively new, may be more challenging to create. When form-based codes do not contain appropriate illustrations and diagrams, they are criticized as being difficult to interpret.

One example of a recently adopted code with form-based features is the Land Development Code adopted by Louisville, Kentucky, in 2003. This zoning code creates “form districts” for Louisville Metro. Each form district intends to recognize that some areas of the city are more suburban in nature, while others are more urban. Building setbacks, heights, and design features vary according to the form district. As an example, in a “traditional neighborhood” form district, a maximum setback might be 15 feet from the property line, while in a suburban “neighborhood” there may be no maximum

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setback. Narrower setbacks allow increased density, requiring less land area for the same number of housing units and resulting in a smaller development footprint.

In rural and suburban areas, form-based codes can often reinforce the "open" character of development by preserving open site areas, which could be used for on-site stormwater management. In denser, urban areas, however, some form-based ordinances favor shorter, more pedestrian-scale buildings that cover more of the site than taller buildings of the same square footage, on the basis that keeping activity closer to the ground and enclosing street frontages results in a better pedestrian environment and urban form. One result of this preference is that there may be less of the site left potentially available for on-site stormwater detention or infiltration. Integrating stormwater management considerations into form-based codes may require a cash payment system where the developer contributes to financing of a district or regional stormwater treatment facility because on-site solutions are not available.

Building Codes

Building codes define minimum standards for the construction of virtually all types and scales of structures. With a few exceptions, building codes have limited direct impact on stormwater management. The main example is where structural and geotechnical design standards, which stem from the need to protect buildings and infrastructure from water damage, discourage or prohibit the potential infiltration of water adjacent to building foundations. Such standards can make it difficult to use landscape-based SCMs, such as porous pavement, bioinfiltration, and extended detention. There is a need to examine and redefine structural and geotechnical "standards of care" that ensure the structural integrity of buildings and other infrastructure like buried utilities, in order for landscaped areas adjacent to structures to be utilized more effectively for SCMs. For example, a developer building a mixed-use, medium-density infill development in Denver intended to incorporate innovative approaches to stormwater management by infiltrating stormwater in a number of areas around the site. The standard of care for the geotechnical design of building foundations typically requires that positive drainage be maintained a minimum of 5 feet from the building edge. The geotechnical engineer required, when informed that water might be infiltrated in the area of the building and without further study, that the minimum distance to an infiltration area must be at least to 20 feet from the building, greatly limiting the potential for using the building landscape areas as SCMs. The City of Los Angeles is in the process of updating its Building Code, but it is not clear if it will be sufficiently comprehensive to address the use of some LID practices, such as on-site infiltration. The 2002 Building Code now in effect is written to require the builder to convey water away from the building using concrete or some other "non-erosive device."

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Engineering and Infrastructure Standards and Practices

Engineering standards and practices for public rights-of-way complement building and zoning codes which control development on private property. Engineering standards and practices typically describe requirements for public utilities such as stormwater and wastewater, roadways, and related basic services. For example, there are standards for parking and roadway design that typically describe the specific type of roadway and parking surfacing requirements. Regulations and standards often require minimum gradients for surface drainage, site grading, and drainage pipe size, all of which play an important role in how stormwater is transported. There are also often landscape planting requirements, including the requirement to mound landscape areas to screen cars, which can preclude the opportunity to incorporate SCMs into landscape areas.

Unless right-of-way improvements are constructed as part of the subdivision process by private developers, improvements in the right-of-way are typically provided for by city government and public agencies. Because engineering standards are often based on decades of refinement and have evolved regionally and nationally, they are difficult to change. For example, street widths are determined more by the ability to maneuver emergency equipment and to accommodate water and sewer easements than the need for adequate lane widths for vehicles. Street lane-width requirements might be as narrow as 11 feet for each travel lane, resulting in a street width of 22 to 24 feet. This could accommodate emergency vehicle access, which typically can require a minimum of 20 feet of unobstructed street. However, because most streets also include potable water distribution lines and easement requirements for the lines, which are a minimum of 30 feet in width, this results in a minimum roadway width of 30 feet.

Local drainage codes govern the disposal of stormwater and essentially dictate the nature and capacity of the stormwater infrastructure from the roof to the floodplain. Like many codes, they were developed over time to address problems such as basement flooding, nuisance drainage problems, maintenance of floodplain boundaries, and protection of infrastructure such as bridges and sewers from storm damage. Local drainage codes, many of which predate the EPA's stormwater program, often involve peak discharge control requirements for a series of design storm events ranging from the 2-year storm up to the 100-year event. Traditional drainage codes can often conflict with effective approaches to reducing runoff volume or removing pollutants from stormwater. Examples of such codes include requirements for positive drainage, directly connected roof leaders, curbs and gutters, lined channels, storm-drain inlets, and large-diameter storm-drain pipes discharging to a downstream detention or flood control basins.

Often, standards have been tested through legal precedent, and case law has developed around certain standards of care, which can further deter innovation. Changes in design standards could result in unknown legal exposure and liabil-

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ity. Specific types of equipment, maintenance protocols and procedures, and extensive training further discourage changes in established standards and procedures.

Innovations in Codes and Regulations to Promote Better Stormwater Management

A number of innovations have been developed in the previously described zoning, building codes, and infrastructure and engineering standards that make them more amenable to stormwater management. These are described in detail below.

Separate Ordinances for New and Infill Development

Redevelopment of existing urban areas is almost universally more difficult and expensive than Greenfield development because of the deconstruction costs of the former, higher costs of designing around existing infrastructure, upgrading existing infrastructure, and higher costs and risks associated with assuming liability of pre-existing problems (contamination, etc). Redevelopment often occurs in areas of medium to high levels of impervious surface (e.g., downtown areas). Such severely space-limited areas with high land costs drive up stormwater management costs. Consequently, holding developers of such areas to the same stormwater standard as for Greenfield developments creates a financial disincentive for redevelopment. Without careful application, stormwater requirements may discourage needed redevelopment in existing urban areas. This would be unfortunate because redevelopment can take pressure off of the development of lands at the urban fringe, it can accommodate growth without introducing new impervious surfaces, and it can bring improvements in stormwater management to areas that had previously had none.

Stormwater planning can include the development of separate ordinances for infill and new developments. Wisconsin has administrative rules that establish specific requirements for stormwater management based on whether the site is new development, redevelopment, or infill. Requirements for new development include reducing total suspended solids (TSS) by 80 percent, maintaining the pre-development peak discharge for the 2-year, 24-hour storm, infiltrating 90 percent of the pre-development infiltration volume for residential areas, and infiltrating 60 percent of the pre-development infiltration volume for non-residential areas. Redevelopment varies from new development only in that the TSS requirement is less at 40 percent reduction. Requirements for existing developed areas in incorporated cities, villages, and towns do not include peak flow reduction or infiltration performance standards, but the municipalities must achieve a 40 percent reduction in their TSS load by 2013. Other requirements unique to developed areas include public education activities, proper application

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of nutrients on municipality property, and elimination of illicit discharges (*www.dnr.state.wi.us/org/water/wm/nps/stormwater/post-constr/*). Chapter 5 makes recommendations for the specific types of SCMs that should be used for new, low-density residential development as opposed to redevelopment of existing urban and industrial areas.

Integrated Stormwater Management and Growth Policies

In the city of San Jose, California, an approach was taken to link water quality and development policies that emphasized higher density in-fill development and performance-based approaches to achieving water quality goals. The city's approach encourages stormwater practices such as minimizing impervious surface and incorporating swales as the preferred means of conveyance and treatment. In urbanized areas, the policy then goes on to define criteria to determine the practicability of meeting numeric sizing requirements for stormwater control measures, and identifies Equivalent Alternative Compliance Measures for cases where on-site controls are impractical. Equivalent Measures can include regional stormwater treatment and other specific projects that "count" as SCMs, including certain affordable and senior housing projects, significant redevelopment within the urban core, and Brownfield projects. This is similar to in lieu fee programs that are sometimes implemented by municipalities to provide additional regulated parties with compliance options (see discussion in Chapter 6).

This approach is a breakthrough in terms of measuring environmental performance, which is now focused only on what happens within the boundaries of a site for a project. This myopic view tends to allow many environmentally unfriendly projects that encourage sprawl and expand the city's boundaries to qualify as "low impact," while more intense projects on a small footprint appear to have a much higher impact because they cover so much of the site. San Jose brought several other layers of review, including location in the watershed (close to other uses or not) as a means of estimating performance. A PowerPoint presentation describing their approach in greater detail is linked here (*http://www.cmcgc.com/media/handouts/260126/THR-PDF/040-Ketchum.PDF*, Lisa Nisenson, Nisenson Consulting, LLC, personal communication, May 8, 2007).

Unified Development Codes

A unified development code (UDC) consolidates development-related regulations into a single code that represents a more consistent, logical, integrated, and efficient means of controlling development. UDCs integrate zoning and subdivision regulations, simplifying development controls that are often con-

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flicting, confusing, and that require multiple layers of review and administration. UDC development standards may include circulation standards that address how vehicles and pedestrians move, including provision for adequate emergency access. Utility standards are described for water distribution and sewage collection, and necessary utility easements are prescribed. Because of the integrated nature of the code, efficiencies in requirements for right-of-way can reduce street widths or the reduction in setbacks, for example, resulting in more compact development.

Design Review Incentives to Speed Permitting

A number of incentives have been put in place to promote innovative stormwater control measures in cities such as Portland and Chicago, where environmental concerns have been identified as a key goal for development and redevelopment. Practices such as the waiver or reduction of development fees, preferential treatment and review and approval of innovative plans, reduction in stormwater fees, and related incentives encourage the use of innovative stormwater practices. In Chicago, the Green Permit Program initiated in April 2005 has proven attractive to many developers as it speeds up the permitting process. Under the Green Permit Program, a green building adviser reviews design plans under an aggressive schedule long before a permit application is submitted. There is one point of contact with intimate knowledge about the project to help speed up the permit process. Projects going through the Green Permit Program receive benefits based on their "level of green." Tier I commercial projects are designed to be Leadership in Energy and Environmental Design (LEED) certified (see Box 2-7). Tier II projects must obtain LEED silver rating. At this level, outside consultant review fees, which range from $5,000 to $50,000, are waived. Tier III projects must earn LEED gold. The goal for a Tier III project is to issue a permit in three weeks for a small project such as a 12-unit condo building. Thus, there is both time and money saved. Private developers are interested in the time savings because they can pay less interest on their construction loans by completing the building faster. By the end of 2005, 19 green permits were issued. The program's director estimated that about 50 would be issued in 2006, which exceeds the city's goal of 40.

In Portland, Oregon, the city's Green Building Program is considering instituting a new High-Performance Green Building Policy. Along with goals for reducing global warming pollution, it proposes (1) waiving development fees if goals are exceeded by specified percentages and (2) eligibility for cash rewards and qualification for state and federal financial incentives and tax credits if even higher goals are achieved. Developers can earn credits by incorporating enhanced stormwater management and water conservation features into their projects, including the use of green roofs (Wenz, 2008).

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BOX 2-7
Innovative Building Codes

An increased interest in energy conservation and more environmentally friendly building practices in general has led to various methods by which buildings can be evaluated for environmentally friendly construction, in addition to conventional code compliance. The most popular system in the United States is the Leadership in Energy and Environmental Design (LEED) system developed in 2000.

The LEED Green Building Rating System is a voluntary, consensus-based national rating system for developing high-performance, sustainable buildings. LEED addresses all building types and emphasizes state-of-the-art strategies in five areas: sustainable site development, water savings, energy efficiency, materials and resources selection, and indoor environmental quality. The U.S. Green Building Council is a 501(c)(3) nonprofit organization that certifies sustainable businesses, homes, hospitals, schools, and neighborhoods.

The LEED system encourages progressive stormwater management practices as part of its rating system. The LEED system has identified specific criteria, with points assigned to each of the criteria, to assess the success of stormwater strategies. Generally, the criteria are based on LID principles and practices and relate directly to the *Better Site Design Handbook* of the Center for Watershed Protection (CWP, 1998). The system identifies eight categories by which building sites and site-planning practices are evaluated. Of the 69 points possible to achieve the highest LEED rating, 16 points are directly related to innovative site design and stormwater management practices. Six of the eight criteria describing sound site-planning practices relate directly to good stormwater practices, including the following:

- Erosion and sediment control;
- Site selection to protect farmland, wetlands, and watercourses;
- Site design to encourage denser infill development to protect Greenfield sites;
- Limitations on site disturbance;
- Specific requirements for the management of stormwater rate and quantity; and
- Specific requirements for the treatment of stormwater for TSS and phosphorous removal.

The LEED rating system has been criticized because it focuses on individual buildings in building sites. A new category, LEED neighborhood development, was developed in response to consider the interrelationship of buildings and building sites and connections to existing urban infrastructure. The category is currently in pilot testing. Evaluation criteria related directly to stormwater include:

- All requirements of the original site design criteria,
- A reduced requirement for parking based on access to transit and reduced auto use, and
- Site planning that emphasizes compact development.

There are parallel challenges in the realm of community development and city building that tend to discourage innovative stormwater management policies and practices. Building codes and zoning have evolved to reflect the complex relationship of legal, political, and social processes and frequently do not promote or allow the most innovative stormwater management. Engineering standards and practices that guide the development of roads and utilities present equal and possibly greater challenges, in that legal and technical precedents and

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large investments in public equipment and infrastructure present even more intractable reasons to resist change.

The difficulty of implementing stormwater control measures cannot be attributed to an individual code, standard, or regulation. It is important to unravel the complexities of codes, regulations, ordinances, and standards and practices that discourage innovative stormwater management and target the particular element (or multiple elements) that is a barrier to innovation. Elements that are barriers might not have been considered previously. For example, roadway design is controlled more by access for emergency equipment and utilities rights-of-way than by the need for wide travel lanes; it is the fire marshal and the water department that should be the focus of attention, rather than the transportation engineer.

LIMITATIONS OF THE FEDERAL STORMWATER PROGRAM

The regulation of stormwater discharges seems an inevitable next step to the CWA's objective of "restoring the nation's waters," and EPA's stormwater program is still evolving. Yet, in its current configuration EPA's approach seems inadequate to overcome the unique challenges of stormwater and therefore runs the risk of only being partly effective in meeting its goals. A number of regulatory, institutional, and societal obstacles continue to hamper stormwater management in the United States, as described below.

The Poor Fit Between the Clean Water Act's Regulatory Approach and the Realities of Stormwater Management

Controlling stormwater discharges with the CWA introduces a number of obstacles to effective stormwater regulation. Unlike traditional industrial effluent, stormwater introduces not only contaminants but also surges in volume that degrade receiving waterbodies; yet the statute appears focused primarily on the "discharge" of "pollutants." Moreover, unlike traditional effluent streams from manufacturing processes, the pollutant loadings in stormwater vary substantially over time, making effluent monitoring and the development of enforceable control requirements considerably more challenging. Traditional use of end-of-pipe control technologies and automated effluent monitors used for industrial effluent do not work for the episodic and variable loading of pollutants in stormwater unless they account for these eccentricities by adjustments such as flow-weighted measurements. Finally, at the root of the stormwater problem is increasingly intensive land use. Yet the CWA contains little authority for regulators to directly limit land development, even though the discharges that result from these developments increase stormwater loading at a predictably rapid pace. The CWA thus expects regulators to reduce stormwater loadings, but gives them incomplete tools for effectuating this goal.

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A more straightforward way to regulate stormwater contributions to water-body impairment would be to use flow or a surrogate, like impervious cover, as a measure of stormwater loading (such as in the Barberry Creek TMDL [Maine DEP, 2003, pp. 16–20] or the Eagle Brook TMDL [Connecticut DEP, 2007, pp. 8–10]). Flow from individual stormwater sources is easier to monitor, model, and even approximate as compared to calculating the loadings of individual contaminants in stormwater effluent. Efforts to reduce stormwater flow will automatically achieve reductions in pollutant loading. Moreover, flow is itself responsible for additional erosion and sedimentation that adversely impacts surface water quality. Flow provides an inexpensive, convenient, and realistic means of tracking stormwater contributions to surface waters. Congress itself recently underscored the usefulness of flow as a measure for aquatic impairments by requiring that all future developments involving a federal facility with a footprint larger than 5,000 square feet ensure that the development achieves predevelopment hydrology to the maximum extent technically feasible "with regard to the temperature, rate, volume, and duration of flow" (Energy Independence and Security Act of 2007, § 438). Several EPA regions have also used flow in modeling stormwater inputs for TMDL purposes (EPA, 2007a, Potash Brook TMDL, pp. 12–13).

Permitting and Enforcement

For industrial wastewater discharged directly from industrial operations (rather than indirectly through stormwater), the CWA requirements are relatively straightforward. In these traditional cases, EPA essentially identifies an average manufacturer within a category of industry, like iron and steel manufacturers engaged in coke-making, and then quantifies the pollutant concentrations that would result in the effluent if the industry installed the best available pollution control technology. EPA promulgates these effluent standards as national, mandatory limits (e.g., see Table 2-7).

TABLE 2-7 Effluent Limits for Best Available Technology Requirements for By-product Coke-making in Iron and Steel Manufacturing

Regulated Parameter	Maximum Daily[1]	Maximum Monthly Average[1]
Ammonia-N	0.00293	0.00202
Benzo(a)pyrene	0.0000110	0.00000612
Cyanide	0.00297	0.00208
Naphthalene	0.0000111	0.00000616
Phenols (4AAP)	0.0000381	0.000238

[1]pounds per thousand pound of product.
SOURCE: 40 C.F.R. § 420.13(a).

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By contrast, the uncertainties and variability surrounding both the nature of the stormwater discharges and the capabilities of various pollution controls for any given industrial site, construction site, or municipal storm sewer make it much more difficult to set precise numeric limits in advance for stormwater sources. The quantity and quality of stormwater are quite variable over time and vary substantially from one property to another. Natural causes of variation in the pollutant loads in stormwater runoff include the topography of a site, the soil conditions, and of course, the nature of storm flows in intensity, frequency, and volume. In addition, the manner in which the facility stores and uses materials, the amount of impervious cover, and sometimes even what materials the facility uses can vary and affect pollutant loads in runoff from one site to another. Together, these sources of variability, particularly the natural features, make it much more difficult to identify or predict a meaningful "average" pollutant load of stormwater runoff from a facility. As a result, EPA generally leaves it to the regulated facilities, with limited oversight from regulators, to identify the appropriate SCMs for a site. Unfortunately, this deferential approach makes the permit requirements vulnerable to significant ambiguities and difficult to enforce, as discussed below for each permit type.

Municipal Stormwater Permits. MS4 permits are difficult to enforce because the permit requirements have not yet been translated into standardized procedures to establish end-of-pipe numerical effluent limits for MS4 stormwater discharges. CWA Section 402(p) requires that pollutants in stormwater discharges from the MS4 be reduced to the maximum extent practicable and comply with water quality standards (when so required by the permitting authority). However, neither EPA nor NPDES-delegated states have yet expressed these criteria for compliance in numerical form.

The EPA has not yet defined MEP in an objective manner that could lead to convergence of MS4 programs to reduce stormwater pollution. Thus, at present MS4 permittees have no more guidance on the level of effort expected other than what is stated in the CWA:

> [S]hall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practice, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants. [CWA Section 402(p)(3)(B)(iii)]

A legal opinion issued by the California Water Board's Office of Chief Counsel in 1993 stated that MEP would be met if MS4 permittees implemented technically feasible SCMs, considering costs, public acceptance, effectiveness, and regulatory compliance (Memorandum from Elizabeth Miller Jennings, Office of Chief Counsel, to Archie Matthews, Division of Water Quality, California Water Board, February 11, 1993). In its promulgation of the Phase II Rule in 1999, the EPA described MEP as a flexible site-specific standard, stating that:

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> The pollutant reductions that represent MEP may be different for each [MS4 Permittee] given the unique local hydrological and geological concerns that may exist and the differing possible pollutant control strategies. (64 Fed. Reg. 68722, 68754)

As matters stand today, MS4 programs are free to choose from the EPA's menu of SCMs, with MEP being left to the discretionary judgment of the implementing municipality. Similarly, there are no clear criteria to be met for industrial facilities that discharge to MS4s in order for the MS4s to comply with MEP. The lack of federal guidance for MS4s is understandable. A stormwater expert panel convened by the California EPA State Water Board in 2006 (CA SWB, 2006) concluded that it was not yet feasible to establish strictly enforceable end-of-pipe numeric effluent limits for MS4 discharges. The principal reasons cited were (1) the lack of a design storm (because in any year there are few storms sufficiently large in volume and/or intensity to exceed the design volume capacity or flow rates of most treatment SCMs) and (2) the high variability of stormwater quality influenced by factors such as antecedent dry periods, extent of connected impervious area, geographic location, and land use.

Industrial and Construction Stormwater Permits. The industrial and construction stormwater programs suffer from the same kind of deficiencies as the municipal stormwater program. These stormwater discharges are not bound by the MEP criterion, but they are required to comply with either technology-based or, less often, water quality-based effluent limitations. In selecting SCMs to comply with these limitations, the industrial discharger or construction operator similarly selects from a menu of options devised by the EPA or, in some cases, the states or localities for their particular facility (EPA, 2006, p. 15). For example, the regulated party will generally identify structural SCMs, such as fences and impoundments that minimize runoff, and describe how they will be installed. The SWPPP must also include nonstructural SCMs, like good housekeeping practices, that require the discharger to minimize the opportunity for pollutants to be exposed to stormwater. The SWPPP and the accompanying SCMs constitute the compliance requirements for the stormwater discharger and are essentially analogous to the numeric effluent limits listed for industrial effluents in the Code of Federal Regulations.

This set of requirements leaves considerable discretion to regulated parties in several important ways. First, the regulations require the discharger to evaluate the site for problematic pollutants; but where the regulated party does not have specific knowledge or data, they need only offer "estimates" and "predictions" of the types of pollutants that might be present at the site (EPA, 1996a, pp. IV-3, V-3). With the exception of visible features, the deferential site investigation requirements allow regulated parties to describe site conditions in ways that may effectively escape accountability unless there is a vigorous regulatory presence.

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Second, dischargers enjoy considerable discretion in drafting the SWPPP (EPA, 1996a, p. IV-3). Despite EPA's instructions to consider a laundry list of considerations that will help the facility settle on the most effective plan (EPA, 2006, p. 20), rational operators may take advantage of the wiggle room and develop ambiguous requirements that leave them with considerable discretion in determining whether they are in compliance (EPA, 2006, pp. 15, 20, 132). Indeed, the federal regulations do little to prevent regulated parties from devising requirements that maximize their discretion. Instead, EPA describes many of the permit requirements in general terms. For example, in its industrial stormwater permit program the EPA commands the regulated party to "implement any additional SCMs that are economically reasonable and appropriate in light of current industry practice, and are necessary to eliminate or reduce pollutants in . . . stormwater discharges" (EPA, 2006, p. 23).

EPA's program provides few rewards or incentives for dischargers to go beyond the federal minimum and embrace rigorous or innovative SCMs. In fact, if the regulated party invests resources to measure pollutant loads on their property, they are creating a paper trail that puts them at risk of greater regulation. Under the EPA's regulations, a regulated party "must provide a summary of existing stormwater discharge sampling data previously taken at [its] facility," but if there are no data or sampling efforts, then the facility is off the hook (EPA, 2006, p. 20). Quantitative measures can thus be incriminating, particularly in a regulatory setting where the regulator is willing to settle for estimates.

Dilemma of Self-Monitoring

Unlike the wastewater program where there are relatively rigid self-monitoring requirements for the end-of-pipe effluent, self-monitoring is much more difficult to prescribe for stormwater discharges, which are variable over time and space. [For example, *compare* 33 U.S.C. § 1342(a)(2)-(b)(2) (2000) (outlining requirements for compliance under NPDES) *with* EPA, 2006, p. 26 (outlining requirements for self-compliance under EPA regulations.)] EPA's middle ground, in response to these challenges, requires self-monitoring of select chemicals in stormwater for only a subset of regulated parties—Phase I MS4 permittees and a limited number of industrial facilities (see Table 2-8, EPA, 2006, pp. 93-94). Yet even for these more rigid monitoring requirements, the discharger enjoys some discretion in sampling. The EPA's sampling guidelines do prescribe regular intervals for sampling but ultimately must defer to the discharger insofar as requiring only that the samples should be taken within 30 minutes after the storm begins, and only if it is the first storm in three days (EPA, 2006, p. 33).

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TABLE 2-8 Effluent Monitoring Requirements for Various Dischargers of Stormwater

Source Category	Type of Effluent Monitoring Required by EPA
Phase I MS4	Municipality must develop a monitoring plan that provides for representative data collection. This requires the municipality, at the very least, to select at least 5 to 10 of its most representative outfalls for regular sampling and sample for selected conventional pollutants and heavy metals in its effluent.
Phase II MS4	None
Small subset of highest risk industries, like hazardous waste landfills	Must conduct compliance monitoring as specified in effluent guidelines and ensure compliance with these effluent limits. Must also conduct visual monitoring and benchmark monitoring.
Larger subset of higher risk industrial dischargers	Benchmark monitoring: Must conduct analytic monitoring to determine whether effluent exceeds numeric benchmark values; compliance with the numeric values is not required, however. Must also conduct visual monitoring.
Remaining set of industry except construction	Visual monitoring: Must take four grab samples of stormwater effluent each year during first 30 minutes of a storm event and inspect the sample visually for contamination.
Construction (larger than 5 acres)	Visual monitoring: Must take four grab samples of stormwater effluent each year during first 30 minutes of a storm event and inspect the sample visually for contamination.
Construction (between 1 and 5 acres)	Visual monitoring: Must take four grab samples of stormwater effluent each year during first 30 minutes of a storm event and inspect the sample visually for contamination.

Note: State regulators can and sometimes do require more—see Appendix C.

Moreover, while the monitoring itself is mandatory, the legal consequences of an exceedance of a numerical limit vary and may be quite limited. For a small number of identified industries, exceedances of effluent limits established by EPA are considered permit violations (65 Fed. Reg. 64766). For the other high-risk industries subject to benchmark monitoring requirements (see Table 2-5), the analytical limits do not lead to violations per se, but only serve to "flag" the discharger that it should consider amending its SWPPP to address the problematic pollutant (EPA, 2006, pp. 10, 30, 34). Although municipalities are required to do more extensive sampling of stormwater runoff and enjoy less sampling discretion, even municipalities are allowed to select what they believe are their most representative outfalls for purposes of monitoring pollutant loads (EPA, 1996a. p. VIII-1).

A large subset of dischargers—the remaining industrial dischargers and construction sites—are subject to much more limited monitoring requirements. They are not required to sample contaminant levels, but instead are required only to conduct a visual inspection of a grab sample of their stormwater runoff on a quarterly basis and describe the visual appearance of the sample in a document that is kept on file at the site (EPA, 2006, p. 28). Certainly a visual sample is better than nothing, but the requirement allows the discharger not only some discretion in determining how and when to take the sample (explained below), but also discretion in how to describe the sample.

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A final set of regulated parties, the Phase II MS4s, are not required to perform any quantitative monitoring of runoff to test the effectiveness of SCMs (EPA, 1996a, p. 3).

Making matters worse, in some states there appear to be limited regulatory resources to verify compliance with many of these permit requirements. Thus, even though monitoring plans are subject to review and approval by permitting agencies, there may be insufficient resources to support this level of oversight. As shown in Appendix C, the total number of staff associated with state stormwater programs is usually just a handful, except in cases of larger states (California and Georgia) or those where there is a longer history of stormwater management (Washington and Minnesota). In its survey of state stormwater programs, the committee asked states how they tracked sources' compliance with the stormwater permits. For the 18 states responding to the questionnaire, review of (1) monitoring data, (2) annual reports, and (3) SWPPP as well as onsite inspections were the primary mechanisms. However, several states indicated that they conduct an inspection only after receiving complaints. West Virginia tracked whether industrial facilities submitted their required samples and followed up with a letter if they failed to comply, but in 2006 it found that over 65 percent of the dischargers were delinquent in their sampling. Although the states were not asked in the survey to estimate the overall compliance rate, Ohio admitted that at least for construction, "the general sense is that no site is 100 percent in compliance with the Construction General Permit" (see Appendix C).

Even where considerable regulatory resources are dedicated to ensuring that dischargers are in compliance, it is not clear how well regulators can independently assess compliance with the permit requirements. For example, some of the permits will require "good housekeeping" practices that should take place daily at the facility. Whether or how well these practices are followed cannot be assessed during a single inspection. While a particularly non-compliant facility might be apparent from a brief visual inspection, a facility that is mildly sloppy, or at least has periods during which it is not careful, can escape detection on one of these pre-announced audits. Facilities also know best the pollutants they generate and how or whether those pollutants might make contact with stormwater. Inspectors might be able to notice some of these problems, but because they do not have the same level of information about the operations of the facility, they can be expected to miss some problems.

Identifying Potentially Regulatable Parties

Evidence suggests that a sizable percentage of industrial and construction stormwater dischargers are also failing to self-identify themselves to regulators, and hence these unreported dischargers remain both unpermitted and unregulated (GAO, 2005; Duke and Augustenborg, 2006). In contrast to industrial pipes that carry wastes from factories out to receiving waters, the physical pres-

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ence of stormwater dischargers may be less visible or obvious. Thus, particularly for some industries and construction, if a stormwater discharger does not apply for a permit, the probability of detecting it is quite low.

In Maine, less than 20 percent of the stormwater dischargers that fall within the regulatory jurisdiction of the federal stormwater program actually applied for permits before 2005—more than a decade after the federal regulations were promulgated (Richardson, 2005). Yet there is no record of enforcement action taken by Maine against the unpermitted dischargers during that interim period. Indeed, in the one enforcement action brought by citizens in Maine for an unpermitted discharge, the discharger claimed ignorance of the stormwater program. In Washington, the State Department of Ecology speculates that between 10 and 25 percent of all businesses that should be covered by the federal stormwater permit program are actually permitted (McClure, 2004). In a four-state study, Duke and Augustenborg (2006) found a higher percentage of stormwater dischargers—between 50 and 80 percent—had applied for permits by 2004, but they concluded that this was still "highly incomplete" compliance for an established permit program.

In 2007, the committee sent a short survey to each state stormwater program inquiring as to whether and how they tracked non-filing stormwater dischargers, but only six states replied to the questions and only two of the six states had any methods for tracking non-filers or conducting outreach to encourage all covered parties to apply for permits (see Appendix C). While the low response rate cannot be read to mean that the states do not take the stormwater program seriously, the responses that were received lend some support to the possibility that there is substantial noncompliance at the filing stage.

In response to this problem of unpermitted discharges, the EPA appears to be targeting enforcement against stormwater dischargers that do not have permits. In several cases, the EPA pursued regulated industries that failed to apply for stormwater permits (EPA Region 9, 2005; Kaufman et al., 2005). The EPA has also brought enforcement actions against at least three construction companies for failing to apply for a stormwater permit for their construction runoff (EPA Region 1, 2004). Such enforcement actions help to make the stormwater program more visible and give the appearance of a higher probability of enforcement associated with non-compliance. Nevertheless, the non-intuitive features of needing a permit to discharge stormwater, coupled with a rational perception of a low probability of being caught, likely encourage some dischargers to fail to enter the regulatory system.

Absence of Regulatory Prioritization

Many states have been overwhelmed with the sheer numbers of permittees, particularly industry and construction sites, and lack a prioritization strategy to identify high-risk sources in particular need of rigorous and enforceable permit

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conditions. For example, in California major facilities like the Los Angeles International Airport and the Los Angeles and Long Beach ports are covered under California's MSGP along with a half-acre metal plating facility in El Segundo—all subject to the same level of compliance scrutiny even after nearly two decades of implementation! Similarly, a multiphase, 20-year, thousand-acre residential development such as Newhall Land Development in North Los Angeles County is covered by the same California CGP as a one-acre residential home construction project in West Los Angeles, and subject to the same level of compliance scrutiny. The lack of an EPA strategy to identify and address high-risk industrial facilities and construction sites (i.e., those that pose the greatest risk of discharging polluted stormwater) remains an enormous deficiency. Phase I MS4s, for example, are left to their own devices to determine how to identify the most significant contributors to their stormwater systems (Duke, 2007).

Limited Public Participation

Public participation is more limited in the stormwater program in comparison to the wastewater permit program, providing less citizen-based oversight over stormwater discharges. Typically, during the issuance of an individual NPDES permit (for either wastewater or stormwater) the public has a chance to comment and review the draft permit requirements that are specifically prescribed for a certain site and discharge. While the same is true about the public participation during the adoption of a general stormwater permit, those general permits contain only the framework of the requirements and the menu of conditions, but do not prescribe specific requirements. Instead, it is up to the permittee to tailor the compliance to the specific conditions of the site in the form of a SWPPP. However, at this phase neither the public nor the regulators have access to the site-specific plan developed by the permittee to comply with the obligations of the permit. In the case of general permits, then, the discharger has enormous flexibility in designing its compliance activities.

Citizens also encounter difficulties in enforcing stormwater permit requirements. Citizens have managed to sue facilities for unpermitted stormwater discharges: this is a straightforward process because citizens need only verify that the facility should be covered and lacks a permit (Richardson, 2005). Overseeing facility compliance with stormwater permit requirements is a different story, however, and citizens are stymied at this stage of ensuring facility compliance. Citizens can access a facility's SWPPP, but only if they request the plan from the facility in writing (EPA, 2006, p. 25). Moreover, the facility is given the authority to make a determination—apparently without regulator oversight—of whether the plan contains confidential business information and thus cannot be disclosed to citizens (EPA, 2006, p. 26). But, even if the facility sends the plan to the citizens, it will be nearly impossible for them to independently assess whether the facility is in compliance unless the citizens station telescopes,

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conduct air surveillance of the site, or are allowed to access the facility's records of its own self-inspections. Moreover, to the extent that the stormwater outfalls are on the facility's property, citizens might not be able to conduct their own sampling without trespassing.

Not surprisingly, significant progress has nevertheless been made in reducing stormwater pollution when stormwater becomes a visible public issue. This increased visibility is often accomplished with the help of local environmental advocacy groups who call attention to the endangered species, tourism, or drinking water supplies that are jeopardized by stormwater contamination. Box 2-8 describes two cases of active public participation in the management of stormwater.

BOX 2-8
Citizen Involvement/Education in Stormwater Regulations

The federal Clean Water Act, under Section 505, authorizes citizen groups to bring an action in U.S. or state courts if the EPA or a state fails to enforce water quality regulations. Unsurprisingly, the few areas nationally where stormwater quality has become a visible public issue and significant progress has been made in reducing stormwater pollution have prominent local environmental advocacy groups actively involved.

Heal the Bay, Santa Monica, California. In Southern California, Santa Monica-based Heal the Bay has utilized research, education, community action, public advocacy, and political activism to improve the quality of stormwater discharges from MS4s in Southern California. Heal the Bay operates an aquarium to educate the public, conducts stream teams to survey local streams, posts a beach report card on the web to inform swimmers on beach quality, appears before the California Water Boards to comment on NPDES stormwater permits, and works with lawmakers to sponsor legislative bills that protect water quality.

In 1998, the organization helped co-author legislation to notify the public when shoreline water samples show that water may be unsafe for swimming. California regulations (AB411) require local health agencies (county or city) to monitor water quality at beaches that are adjacent to a flowing storm drain and have 50,000 visitors annually (from April 1 to October 31). At a minimum, these beaches are tested on a weekly basis for three specific bacteria indicators: total coliform, fecal coliform, and *enterococcus*. Local health officials are required to post or close the beach, with warning signs, if state standards for bacterial indicators are exceeded. The monitoring data collected are available to the public.

In order to better inform and engage the public, Heal the Bay has followed up with a web-based Weekly Beach Report Card (*http://healthebay.org/brc/statemap.asp*) and the release of an Annual California Beach Report Card assigning an "A" to "F" letter grade to more than 500 beaches throughout the state based on their levels of bacterial pollution. Heal the Bay's Annual Beach Report Card is a comprehensive evaluation of California coastal water quality based on daily and weekly samples gathered at beaches from Humboldt County to the Mexican border. A poor grade means beachgoers face a higher risk of contracting illnesses such as stomach flu, ear infections, upper respiratory infections, and skin rashes than swimmers at cleaner beaches.

Heal the Bay was instrumental in passing Proposition O in the City of Los Angeles which sets aside half a billion dollars to improve the quality of stormwater discharges. In the 2007 term of the California Legislature, the organization has sponsored five legislative bills to address marine debris, including plastic litter transported in stormwater runoff, that

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Box 2-8 Continued

foul global surface waters (*Currents*, Vol. 21, No. 2, p.8, 2007). Heal the Bay also coordinates its actions and partners with other regional and national environmental organizations, such as the WaterKeepers and the NRDC, in advancing water quality protection nationally.

Save Our Springs, Austin, Texas. Citizen groups have played a very influential role in the development of a rigorous stormwater control program in the City of Austin, Texas. Catalyzed in 1990 by a proposal for extensive development that threatened the fragile Barton Springs area, a citizens group named Save Our Springs Legal Defense Fund (later renamed Save our Springs Alliance) formed to oppose the development. It orchestrated an infamous all-night council meeting, with 800 citizens registering in opposition to the proposed development and ultimately led to the City Council's rejection of the 4,000-acre proposal and the formulation of a "no degradation" policy for the Barton Creek watershed. The nonprofit later sponsored the Save Our Springs Ordinance, a citizen initiative supported by 30,000 signatures, which passed by a 2 to 1 margin in 1992 to further strengthen protection of the area. The Save Our Springs Ordinance limits impervious cover in the Barton Springs watershed to a maximum of between 15 and 25 percent, depending on the location of the development in relation to the recharge and contributing zones. The ordinance also mandates that stormwater runoff be as clean after development as before. The ordinance was subject to a number of legal challenges, all of which were successfully defended by the nonprofit in a string of court battles.

Since its initial formation in 1990, the Save Our Springs Alliance has continued to serve a vital role in educating the community about watershed protection and organizing citizens to oppose development that threatens Barton Springs. The organization has also been instrumental in working with a variety of government and nonprofit organizations to set aside large areas of parkland and open spaces within the watershed. Other citizen groups, like the Save Barton Creek Association, also play a very active, complementary role to the Save Our Springs Alliance in protecting the watershed. These other nonprofits are sometimes allied and sometimes diverge to take more moderate stances to development proposals. The resulting constellation of citizen groups, citizen outreach, and community participation is very high in the Austin area and has unquestionably led to a much more informed citizenry and a more rigorous watershed protection program than would exist without such grassroots leadership.

Accounting for Future Land Use

One of the challenges of managing stormwater from urban watersheds thus involves anticipating and channeling future urban growth. Currently, the CWA does little to anticipate and control for future sources of stormwater pollution in urban watersheds. Permits are issued individually on a technology-based basis, allowing for uncontrolled cumulative increases in pollutant and volume loads over time as individual sources grow in number. The TMDL process in theory requires states to account for future growth by requiring a "margin of safety" in loading projections. However, it is not clear how frequently future growth is included in individual TMDLs or how vigorous the growth calculations are (for example, see EPA [2007a, pp. 12, 37], mentioning considerations of future land use as a consideration in stormwater related TMDLs for only a few—Potash Brook and the lower Cuyahoga River—of the 17 TMDLs described in the report). In any event, as already noted a TMDL is generally triggered only after

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waters have been impaired, which does nothing to anticipate and channel land development before waters become degraded.

The fact that stormwater regulation and land-use regulation are largely decoupled in the federal regulatory system is understandable given the CWA's industrial and municipal wastewater focus and concerns about federalism, but this limited approach is not a credible approach to stormwater management in the future. Federal incentives must be developed to encourage states and municipalities to channel growth in a way that acknowledges, estimates, and minimizes stormwater problems.

Picking up the Slack at the Municipal and State Level

Because it involves land use, any stormwater discharge program strikes at a target that is traditionally within the province of state and even more likely local government regulation. Indeed, it is possible that part of the reason for the EPA's loosely structured permit program is its concern about intruding on the province of state and local governments, particularly given their superior expertise in regulating land-use practices through zoning, codes, and ordinances.

In theory, it is perfectly plausible that some state and local governments will step into the void and overcome some of the problems that afflict the federal stormwater discharge program. If local or state governments required mandatory monitoring or more rigorous and less ambiguous SCMs, they would make considerable progress in developing a more successful stormwater control program. In fact, some states and localities have instituted programs that take these steps. For example, Oregon has established its own benchmarks based on industrial stormwater monitoring data, and it uses the benchmark exceedances to deny industries coverage under Oregon's MSGP. In such cases, the facility operator must file for an individual stormwater discharge NPDES permit. Some municipalities are also engaging in these problems, such as the City of Austin and its ban on coal tar sealants.

Despite these bursts of activity, most state and local governments have not taken the initiative to fill the gaps in the EPA's federal program (see Tucker [2005] for some exceptions). Because they involve some expense, stormwater discharge requirements can increase resident taxes, anger businesses, and strain already busy regulatory staff. Moreover, if the benefits of stormwater controls are not going to materialize in waters close to or of value to the community instituting the controls, then the costs of the program from the locality's standpoint are likely to outweigh its benefits. Federal financial support for state and local stormwater programs is very limited (see section below). Until serious resources are allocated to match the seriousness and complexity of the problem and the magnitude of the caseload, it seems unlikely that states and local communities will step in to fill the gaps in EPA's program. These impediments help explain why there appear to be so many stormwater sources out of compliance

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with the stormwater discharge permit program as discussed above, at least in the few states that have gone on record.

Funding Constraints

Without a doubt, the biggest challenge for states, regions, and municipalities is having adequate fiscal resources dedicated to implement the stormwater program. Box 2-9 highlights the costs of the program for the State of Wisconsin, which has been traditionally strong in stormwater management. Phase I regulations require that a brief description of the annual proposed budget for the following year be included in each annual report, but this requirement has been dispensed with entirely for Phase II.

Ever since the promulgation of the stormwater amendments to the CWA and the issuance of the stormwater regulations, the discharger community pointed out that this statutory requirement had the flavor of an unfunded mandate. Unlike the initial CWA that provided significant funding for research, design, and construction of wastewater treatment plants, the stormwater amendments did not provide any funding to support the implementation of the requirements by the municipal operators. The lack of a meaningful level of investment in addressing the more complex and technologically challenging problem of cleaning up stormwater has left states and municipalities in the difficult position of scrambling for financial support in an era of multiple infrastructure funding challenges.

While a number of communities have passed stormwater fees linked to water quality as described below, a significant number of communities still do not have that financial resource. Municipalities that have not formed utility districts or imposed user fees have had to rely on general funds, where stormwater permit compliance must compete with public safety, fire protection, and public libraries. This circumstance explains why elected local government officials have been reluctant to embrace the stormwater program. Stormwater quality management is often not regarded as a municipal service, unlike flood control or wastewater conveyance and treatment. A concerted effort will need to be made by all stakeholders to make the practical and legal case that stormwater quality management is truly another municipal service like trash collection, wastewater treatment, flood control, etc. Even in states that do collect fees to finance stormwater permit programs, the programs appear underfunded relative to other types of water pollution initiatives. Table 2-10 shows the water quality budget of the California EPA, Los Angeles Regional Water Board. The amount of money per regulated entity (see Table 2-4) dedicated to the stormwater program pales in comparison to the wastewater portion of the NPDES program, and it has

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BOX 2-9
Preliminary Cost Estimates for Complying with Stormwater Discharge Permits in Wisconsin

The Wisconsin Department of Natural Resources (WDNR) was delegated authority under the CWA to administer the stormwater permit program under Chapter NR 216. There are 75 municipalities regulated under individual MS4 permits and 141 MS4s regulated under a general permit for a total of 216 municipalities with stormwater discharge permits.

As part of the "pollution prevention" minimum measure the municipalities are required to achieve compliance with the developed urban area performance standards in Chapter NR 151.13. By March 10, 2008, municipalities subject to a municipal stormwater permit under NR 216 must reduce their annual TSS loads by 20 percent. These same permitted municipalities are required to achieve an annual TSS load reduction of 40 percent by March 10, 2013. The reduction in TSS is compared to no controls, and any existing SCMs will be given credit toward achieving the 20 or 40 percent. As part of their compliance with NR151.13 developed area performance standards, the municipalities are preparing stormwater plans describing how they will achieve the 20 and 40 percent TSS reduction. They are required to use an urban runoff model, such as WinSLAMM or P8, to do the pollutant load analysis.

As the permitted municipalities comply with the six minimum control measures and submit the stormwater plans for their developed area urban areas, the WDNR is learning how much it is going to cost to achieve the requirements in the stormwater discharge permits. Some cities have already been submitting annual reports that include the cost of the six minimum measures. Nine of the permitted municipalities in the southeast part of Wisconsin have been submitting their annual reports for at least four years. The average population of these nine communities is 17,700 with a range of about 6,000 to 65,000. The average cost of the six minimum measures in 2007 for the nine municipalities is $162,900 with a range of $11,600 to $479,000. These costs have not changed significantly from year to year. The average per capita cost is $9 with a range of $1 to $16 per person. Street cleaning and catch basin cleaning (Figures 2-3 and 2-4) cost are included in the cost for the pollution prevention measure, and most of the cities were probably incurring costs for these two activities before the issuing of the permit. On average the street cleaning and catch basin cleaning represent about 40 percent of the annual cost for the six minimum measures. These two activities will help the cities achieve the 20 and 40 percent TSS performance standards for developed urban areas.

Information is available on the preliminary cost of achieving the 40 percent TSS performance standard for selected cities in Wisconsin. The costs were prepared for 15 municipalities by Earth Tech Inc. in Madison, Wisconsin. Areas of the municipality developed after October 2004 are not included in the TSS load analysis. At this point in the preparation of the stormwater plans the costs are just capital cost estimates done at the planning level (Table 2-9). Because the municipalities receive credit for their existing practices, these capital costs represent the additional practices needed to achieve the annual 40 percent TSS reduction. The costs per capita appear to decline for cities with a population over 50,000. All of the costs in Table 2-9 will increase when other costs, such as maintenance and land cost, are included.

For most of the 15 municipalities, the capital costs are for retrofitting dry ponds with permanent pools, installing new wet detention ponds, and improved street cleaning capabilities. Because of their lower cost, the regional type practices have received more attention in the stormwater plans than the source area practices, such as proprietary devices and biofilters. Municipalities with a higher percentage of newer areas will usually have lower cost because the newer developments tend to have stormwater control measures designed to achieve a high level of TSS control, such as wet detention ponds. Older parts of a municipality are usually limited to practices with a lower TSS reduction, such as street cleaning and catch basin cleaning. Of course, retrofitting older areas with higher efficiency practices is expensive,

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BOX 2-9 Continued

and the cost can go higher than expected when unexpected site limitations occur, such as the presence of underground utilities.

Over the next five years all of the 15 municipalities must budget the costs in Table 2-9. It is not clear yet how much of a burden these costs represent to the taxpayers in each municipality. All the permits will be reviewed for compliance with the performance standards in 2013.

TABLE 2-9 Planning-Level Capital Cost Estimate to Meet 40 Percent TSS Reduction

Population	Number of Cities	Average Cost ($)	Minimum Cost ($)	Maximum Cost ($)	Avg. Cost per Capita per Year over 5 Years ($)
5,000 to 10,000	5	1,380,000	425,000	2,800,000	34
10,000 to 50,000	6	4,600,00	2,700,00	9,200,000	35
50,000 to 100,000	4	9,200,000	7,000,000	12,500,000	26

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FIGURE 2-3 Catch basin cleaning. SOURCE: Robert Pitt, University of Alabama.

FIGURE 2-4 Street cleaning. SOURCE: Courtesy of the U.S. Geological Survey.

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TABLE 2-10 Comparison of Fiscal Year (FY) 02–03 Budget with FY 06–07 Budget for Water Quality Programs at the California EPA, Los Angeles Regional Water Board

Program	Funding Source	2002–2003	2006–2007
NPDES[1]	Federal	$2.8 million	$2.6 million
Stormwater	State	$2.3 million	$2.1 million
TMDLs	Federal	$1.47 million	$1.38 million
Spills, Leaks, Investigation Cleanup	State	$1.32 million	$2.87 million
Underground Storage Tanks	State	$2.78 million	$2.74 million
Non-Chapter 15 (Septics)	State	$0.93 million	$0.93 million
Water Quality Planning	Federal	$0.2 million	$0.21 million
Well Investigation	State	$1.36 million	$0.36 million
Water Quality Certification	Federal	$0.2 million	$0.23 million
Total		$17.1 million	$15.82 million

[1]The NPDES row is entirely wastewater funding, as there is no federal money for implementing the stormwater program. Note that the stormwater program in the table is entirely state funded.

declined over time. Furthermore, of the more than $5 billion dollars in low-interest loans provided in 2006 for investments in water quality improvements, 96 percent of that total funding went to wastewater treatment (EPA, 2007d).

There are a number of potential methods that agencies can use to collect stormwater quality management fees, as described more extensively in Chapter 5. A number of states now levy permit fees, with some permits costing in excess of $10,000, to help defray the costs of implementation and enforcement of their stormwater programs. The State of Colorado, for example, has developed an elaborate fee structure for separate types of general permits for industry and construction, as well as MS4s (see *http://www.cdphe.state.co.us/wq/permitsunit/stormwater/StormwaterFees.pdf*). The ability of a state agency to collect fees generally must first be authorized by the state legislatures (see, e.g., Revised Code of Washington 90.48.465, providing the state agency with the authority to "collect expenses for issuing and administering each class of permits"). The lack of state legislative authorization may limit some state agencies from creating such programs on their own. In fact, in those states where fees cannot be levied against permittees, the stormwater programs appear to be both underfinanced and understaffed. Some municipalities have even experienced political backlash because of the absence of a strong state or federal program requiring them to engage in rigorous stormwater management (see Box 2-10).

Stormwater Management Expertise

Historically, engineering curriculum dealt with stormwater management by focusing on the flood control aspects, with little attention given to the water quality aspects. Thus, there has been a significant gap in knowledge and a lack

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BOX 2-10
A City's Ability to Pay for Stormwater, Water, and Sewage Utility Fees

With the implementation of the stormwater permit program of the CWA, stormwater utilities are becoming more common as a way to jointly address regional stormwater quality and drainage issues. One such program is the Jefferson County, Alabama, Storm Water Management Authority (SWMA), formed in 1997 under state legislation that enables local governments to pool their resources in a regional stormwater authority to meet regulations required by the CWA. Jefferson County, the City of Birmingham, and 22 other regional municipalities in Jefferson, part of Shelby and part of St. Clair counties, Alabama, were required to comply with CWA regulations. The act gave the stormwater program the ability to develop a funding mechanism for the program and to form a Public Corporation.

Over the years, SWMA has been responsible for many activities. One of their first goals was to develop a comprehensive GIS database to map outfalls, land uses, stormwater practices, and many other features that were required as part of the permit program. Another major activity conducted by SWMA was the collection of water samples from about 150 sites in the authority's jurisdiction, both during wet and dry weather. SWMA also inspects approximately 4,000 outfalls during dry weather to check for inappropriate connections to the storm drainage system. SWMA coordinates public volunteer efforts with local environmental groups, including the Alabama Water Watch, the Alabama River Alliance, the Black Warrior Riverkeeper, and the Cahaba River Society. SWMA also inspects businesses and industries (including construction sites) within their jurisdictions that are not permitted by the Alabama Department of Environmental Management (ADEM). SWMA does not enforce rules or issue fines, although it can report violators to the state. In its most famous case, it reported McWane Inc. for pollution that led to investigations by the state and the federal government, and ultimately a trial and criminal convictions.

The Birmingham News (Bouma, 2007) reported that from 1997 to 2005, SWMA's responsibilities under the CWA increased substantially, although their fees did not rise. In late 2005, SWMA proposed that member cities increase their stormwater charges from $5 a year to $12 a year per household for residences and from $15 to $36 per year for businesses. At that point, the Business Alliance for Responsible Development (BARD), a group of large businesses, utilities, mining interests, developers and landowners, began to argue that the group was financially irresponsible, and its attorneys convinced member cities that they could save money by withdrawing from SWMA. Even though SWMA withdrew its fee increase request, many local municipalities have pulled out of SWMA, significantly reducing the agency's budget and ability to conduct comprehensive monitoring and reporting. BARD claims the pollution control programs of the ADEM are sufficient. In their countersuit, several environmental groups maintain that ADEM has failed to adequately protect the state's waters because the agency is underfunded, understaffed, and ineffective at enforcement. Much of the Cahaba and Black Warrior River systems within Jefferson County have such poor water quality that they frequently violate water quality standards (*http://www.southernenvironment.org*). SWMA has been significantly impaired in its ability to monitor and report water quality violations with the withdrawal of many of its original member municipalities and the associated reduced budget.

At the same time, the sewer bill for a family of four in the region is expected to be about $63 per month in 2008. Domestic water rates have also increased, up to about $32 per month (*The Birmingham News*, Barnett Wright, December 30, 2007). Domestic water rates have increased in recent years in attempts to upgrade infrastructure in response to widespread and long-lasting droughts and to cover rising fuel costs. It is ironic that stormwater management agency fees are very small compared to these other urban water agency fees per household by orders of magnitude. The $12 per year stormwater fee was used to justify the dismantling of an agency that was doing its job and identifying CWA violators. In order to bring some reasonableness to the stormwater management situation and expected fees, it may be possible for the EPA to re-examine its guidelines of 2 percent of the household income for sewer fees to reflect other components of the urban water system, and to ensure adequate enforcement of existing regulations, especially by underfunded state environmental agencies.

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of qualified personnel. In areas where SCMs are just beginning to be introduced, many municipalities, industrial operators, and construction site operators are not prepared to address water quality issues; the problem is especially difficult for smaller municipalities and operators. The profession and academia are moving to correct this shortfall. Professional associations such as the Water Environment Federation (WEF) and the American Society for Civil Engineers (ASCE) are co-authoring an update of the WEF/ASCE Manual of Practice "Design of Urban Runoff Controls" that integrates quality and quantity, after years of issuing separate manuals of design and operation for the water quality and water quantity elements of stormwater management.

The split between water quantity and quality is evident in municipal efforts that have focused primarily on flood control issues and design of appropriate appurtenances tailored for this purpose. As discussed earlier, most municipal codes specify practices to collect and move water away as fast as possible from urbanized areas. Very little focus has been put on practices to mitigate the quality of the stormwater runoff. This is especially true in urbanized areas with separate municipal storm sewer systems. Even the designation "sewer" is borrowed from the sanitary sewer conveyance system terminology. In arid or semi-arid areas, these flood control systems have been maximally engineered such that river beds have become concrete channels. A typical example is the Los Angeles River, which most of the year resembles an empty freeway. This analysis does not intend to minimize the engineering feat of designing a robust and reliable flood control system. For example, during the unusually wet 2005 season in Southern California, the Los Angeles area did not have any major flooding incidents. However, based on recent studies (Stein and Ackerman, 2007) up to 80 percent of the annual metals loading from six watersheds in the Los Angeles area was transported by stormwater events.

Because of the historical lack of focus on stormwater quality, municipal departments in general are not designed to address the issue of pollution in urban runoff. Just recently and due to the stormwater regulations, cities have been adding personnel and creating new sections to deal with the issue. However, because of the complexities of the task, many duties are spread among various municipal departments, and more often than not coordination is still lacking. Perhaps most problematic is the fact that the local governmental entities in charge of stormwater management are often different from those that oversee land-use planning and regulation. This disconnect between land-use planning and stormwater management is especially true for large cities. It is not unusual for program responsibilities to be compartmentalized, with industrial aspects of the program handled by one group, construction by another, and planning and public education by other distinct units. Smaller cities may have one person handling all aspects of the program assisted by a consulting firm. While coordination may be ensured, the task can be overwhelming for a single staff person.

Beyond water quality issues, training to better understand the importance of volume control and the role of LID has not yet reached many practitioners.

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Many established practices and industry standards in the fields of civil, geotechnical, and structural engineering were developed prior to the introduction of the current group of SCMs and can unnecessarily limit their use. Indeed, certain SCMs such as porous landscape detention, extended detention, and vegetated swales require special knowledge about soils and appropriate plant communities to ensure their longevity and ease of maintenance.

Supplementing the Clean Water Act with Other Federal Authorities that Can Control Stormwater Pollutants at the Source

EPA does have other supplemental authorities that are capable of making significant progress in reducing or even eliminating some of the problematic stormwater pollutants at the national level. Under both the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) and the TSCA, for example, EPA could restrict some of the most problematic pollutants at their source by requiring labels that alert consumers to the deleterious water quality impacts caused by widely marketed chemical products, restricting their use, or even banning them. This source-based regulation bypasses the need of individual dischargers or governments to be concerned with reducing the individual contaminants in stormwater.

The City of Austin's encounter with coal tar-based asphalt sealants provides an illustration of the types of products contributing toxins to stormwater discharges that could be far better controlled at the production or marketing stage. Through detective work, the City of Austin learned that coal tar-based asphalt sealants leach high levels of polycyclic aromatic hydrocarbons (PAHs) into surface waters (Mahler et al., 2005; Van Metre et al., 2006). The city discovered this because the PAHs were found in sediments in Barton Springs, which were in turn leading to the decline of the endangered Barton Creek salamander (Richardson, 2006). By tracing upstream, the city was able to find the culprit—a parking lot at the top of the hill that was recently sealed with coal tar sealant and produced very high PAH readings. Further tests revealed that coal tar sealants typically leach very high levels of PAHs, but other types of asphalt sealants that are not created from coal tar are much less toxic to the environment and are no more expensive than the coal tar-based sealants (City of Austin, 2004). As a result of its findings, the City of Austin banned the use of coal tar-based asphalt sealants. Several retailers, including Lowes and Home Depot followed the city's lead and refused to carry coal tar sealants. Dane County in the State of Wisconsin has now also banned coal tar sealants[1].

[1] See, e.g., Coal Tar-based pavement sealants studied, Science Daily, February 12, 2007, available at *http://www.sciencedaily.com/upi/index.php?feed=Science&article=UPI-1-20070212-10255500-bc-us-sealants.xml*; Matthew DeFour, Dane County bans Sealants with Coal Tar, Wisconsin State Journal, April 6, 2007, available at *http://www.madison.com/wsj/home/local/index.php?ntid=128156&ntpid=5.*

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For reasons that appear to inure to the perceived impotency of TSCA and the enormous burdens of restricting chemicals under that statute, EPA declined to take regulatory action under TSCA against coal tar sealants (Letter from Brent Fewell, Acting Assisting Administrator, U.S. EPA, to Senator Jeffords, October 16, 2006, p. 3). Yet, it had authority to consider whether this particular chemical mixture presents an "unreasonable risk" to health and the environment, particularly in comparison to a substitute product that is available at the same or even lower price [15 U.S.C. § 2605(a); *Corrosion Proof Fittings vs. EPA*, 947 F.2d 1201 (5th Cir. 1991)]. Indeed, if EPA had undertaken such an assessment, it might have even discovered that the coal tar sealants are not as inferior as Austin and others have concluded; alternatively it could reveal that these sealants do present an "unreasonable risk" since there are substantial risks from the sealant without corresponding benefits, given the availability of a less risky substitute.

A similar situation holds for other ubiquitous stormwater pollutants, such as the zinc in tires, roof shingles, and downspouts; the copper in brake pads; heavy metals in fertilizers; creosote- and chromated copper arsenate (CCA)-treated wood; and de-icers, including road salt. Each of these sources may be contributing toxins to stormwater in environmentally damaging amounts, and each of these products might have less deleterious and equally cost-effective substitutes available, yet EPA and other federal agencies seem not to be undertaking any analysis of these possibilities. The EPA's phase-out of lead in gasoline in the 1970s, which led to measurable declines in the concentrations of lead in stormwater by the mid-1980s (see Figure 2-5), may provide a model of the type of gradual regulatory ban EPA could use to reduce contaminants in products that are non-essential.

Some states are taking more aggressive forms of product regulation. For example, in the mid-1990s, numerous scientific studies conducted in California by stormwater programs, wastewater treatment plants, the University of California, California Water Boards, the U.S. Geological Survey, and EPA showed widespread toxicity in local creeks, stormwater runoff, and wastewater treatment plant effluent from pesticide residues, particularly diazinon and chlopyrifos (which are commonly used organophosphate pesticides available in hundreds of consumer products) (Kuivila and Foe, 1995; MacCoy et al., 1995). As a result, the California Water Boards and EPA listed many waters in urban areas of California as being impaired in accordance with CWA Section 303(d). Many cities and counties were required to implement expensive programs to control the pollution under the MS4 NPDES permits to restore the designated beneficial uses of pesticide-impaired waters. Figure 2-6 shows the results of one such action—a ban on diazinon.

In sum, even though there are a number of sources of pollutants—from roof tiles to asphalt sealants to de-icers to brake linings—that could be regulated more restrictively at the product and market stage, EPA currently provides little meaningful regulatory oversight of these sources with regard to their contri-

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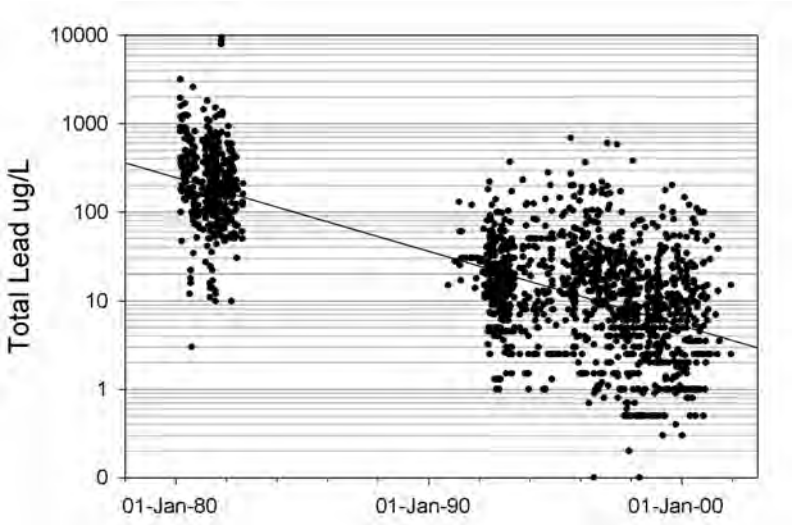

FIGURE 2-5 Trend of lead concentrations in stormwater in EPA rain zone 2 from 1980 to 2001. Although the range of lead concentrations for any narrow range of years is quite large, there is a significant and obvious trend in concentration for these 20 years. SOURCE: National Stormwater Quality Database (version 3).

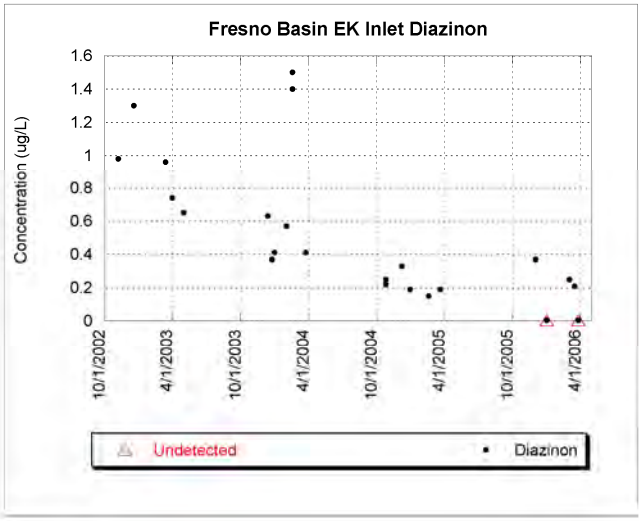

FIGURE 2-6 Trend of the organophosphate pesticide diazinon in MS4 discharges that flow into a stormwater basin in Fresno County, California, following a ban on the pesticide. The figure shows the significant drop in the diazinon concentration in just four years to levels where it is no longer toxic to freshwater aquatic life. EPA prohibited the retail sale of diazinon for crack and crevice and virtually all indoor uses after December 31, 2002, and non-agriculture outdoor use was phased out by December 31, 2004. Restricted use for agricultural purposes is still allowed. SOURCE: Reprinted, with permission, from Brosseau (2007). Copyright 2006 by Fresno Metropolitan Flood Control District.

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bution to stormwater pollution. The EPA's authority to prioritize and target products that increase pollutants in runoff, both for added testing and regulation, seems clear from the broad language of TSCA [15 U.S.C. § 2605(a)]. The underutilization of this national authority to regulate environmentally deleterious stormwater pollutants thus seems to be a remediable shortcoming of EPA's current stormwater regulatory program.

CONCLUSIONS AND RECOMMENDATIONS

In an ideal world, stormwater discharges would be regulated through direct controls on land use, strict limits on both the quantity and quality of stormwater runoff into surface waters, and rigorous monitoring of adjacent waterbodies to ensure that they are not degraded by stormwater discharges. Future land-use development would be controlled to prevent increases in stormwater discharges from predevelopment conditions, and impervious cover and volumetric restrictions would serve as a reliable proxy for stormwater loading from many of these developments. Large construction and industrial areas with significant amounts of impervious cover would face strict regulatory standards and monitoring requirements for their stormwater discharges. Products and other sources that contribute significant pollutants through stormwater—like de-icing materials, urban fertilizers and pesticides, and vehicular exhaust—would be regulated at a national level to ensure that the most environmentally benign materials are used when they are likely to end up in surface waters.

In the United States, the regulation of stormwater looks quite different from this idealized vision. Since the primary federal statute—the CWA—is concerned with limiting pollutants into surface waters, the volume of discharges are secondary and are generally not regulated at all. Moreover, given the CWA's focus on regulating pollutants, there are few if any incentives to anticipate or limit intensive future land uses that generate large quantities of stormwater. Most stormwater discharges are regulated instead on an individualized basis with the demand that existing point sources of stormwater pollutants implement SCMs, without accounting for the cumulative contributions of multiple sources in the same watershed. Moreover, since individual stormwater discharges vary with terrain, rainfall, and use of the land, the restrictions governing regulated parties are generally site-specific, leaving a great deal of discretion to the dischargers themselves in developing SWPPPs and self-monitoring to ensure compliance. While states and local governments are free to pick up the large slack left by the federal program, there are effectively no resources and very limited infrastructure with which to address the technical and costly challenges faced by the control of stormwater. These problems are exacerbated by the fact that land use and stormwater management responsibilities within local governments are frequently decoupled. The following conclusions and recommendations are made.

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EPA's current approach to regulating stormwater is unlikely to produce an accurate or complete picture of the extent of the problem, nor is it likely to adequately control stormwater's contribution to waterbody impairment. The lack of rigorous end-of-pipe monitoring, coupled with EPA's failure to use flow or alternative measures for regulating stormwater, make it difficult for EPA to develop enforceable requirements for stormwater dischargers. Instead, under EPA's program, the stormwater permits leave a great deal of discretion to the regulated community to set their own standards and self-monitor.

Implementation of the federal program has also been incomplete. Current statistics on the states' implementation of the stormwater program, discharger compliance with stormwater requirements, and the ability of states and EPA to incorporate stormwater permits with TMDLs are uniformly discouraging. Radical changes to the current regulatory program (see Chapter 6) appear necessary to provide meaningful regulation of stormwater dischargers in the future.

Future land development and its potential increases in stormwater must be considered and addressed in a stormwater regulatory program. The NPDES permit program governing stormwater discharges does not provide for explicit consideration of future land use. Although the TMDL program expects states to account for future growth in calculating loadings, even these more limited requirements for degraded waters may not always be implemented in a rigorous way. In the future, EPA stormwater programs should include more direct and explicit consideration of future land developments. For example, stormwater permit programs could be predicated on rigorous projections of future growth and changes in impervious cover within an MS4. Regulators could also be encouraged to use incentives to lessen the impact of land development (e.g., by reducing needless impervious cover within future developments).

Flow and related parameters like impervious cover should be considered for use as proxies for stormwater pollutant loading. These analogs for the traditional focus on the "discharge" of "pollutants" have great potential as a federal stormwater management tool because they provide specific and measurable targets, while at the same time they focus regulators on water degradation resulting from the increased volume as well as increased pollutant loadings in stormwater runoff. Without these more easily measured parameters for evaluating the contribution of various stormwater sources, regulators will continue to struggle with enormously expensive and potentially technically impossible attempts to determine the pollutant loading from individual dischargers or will rely too heavily on unaudited and largely ineffective self-reporting, self-policing, and paperwork enforcement.

Local building and zoning codes, and engineering standards and practices that guide the development of roads and utilities, frequently do not promote or allow the most innovative stormwater management. Fortu-

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nately, a variety of regulatory innovations—from more flexible and thoughtful zoning to using design review incentives to guide building codes to having separate ordinances for new versus infill development can be used to encourage more effective stormwater management. These are particularly important to promoting redevelopment in existing urban areas, which reduces the creation of new impervious areas and takes pressure off of the development of lands at the urban fringe (i.e., reduces sprawl).

EPA should provide more robust regulatory guidelines for state and local government efforts to regulate stormwater discharges. There are a number of ambiguities in the current federal stormwater program that complicate the ability of state and local governments to rigorously implement the program. EPA should issue clarifying guidance on several key areas. Among the areas most in need of additional federal direction are the identification of industrial dischargers that constitute the highest risk with regard to stormwater pollution and the types of permit requirements that should apply to these high-risk sources. EPA should also issue more detailed guidance on how state and local governments might prioritize monitoring and enforcement of the numerous and diverse stormwater sources within their purview. Finally, EPA should issue guidance on how stormwater permits could be drafted to produce more easily enforced requirements that enable oversight and enforcement not only by government officials, but also by citizens. Further detail is found in Chapter 6.

EPA should engage in much more vigilant regulatory oversight in the national licensing of products that contribute significantly to stormwater pollution. De-icing chemicals, materials used in brake linings, motor fuels, asphalt sealants, fertilizers, and a variety of other products should be examined for their potential contamination of stormwater. Currently, EPA does not apparently utilize its existing licensing authority to regulate these products in a way that minimizes their contribution to stormwater contamination. States can also enact restrictions on or tax the application of pesticides or even ban particular pesticides or other particularly toxic products. Austin, for example, has banned the use of coal-tar sealants within city boundaries. States and localities have also experimented with alternatives to road salt that are less environmentally toxic. These local efforts are important and could ultimately help motivate broader scale, federal restrictions on particular products.

The federal government should provide more financial support to state and local efforts to regulate stormwater. State and local governments do not have adequate financial support to implement the stormwater program in a rigorous way. At the very least, Congress should provide states with financial support for engaging in more meaningful regulation of stormwater discharges. EPA should also reassess its allocation of funds within the NPDES program. The agency has traditionally directed funds to focus on the reissuance of NPDES

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wastewater permits, while the present need is to advance the NPDES stormwater program because NPDES stormwater permittees outnumber wastewater permittees more than five fold, and the contribution of diffuse sources of pollution to degradation of the nation's waterbodies continues to increase.

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3
Hydrologic, Geomorphic, and Biological Effects of Urbanization on Watersheds

A watershed is defined as the contributing drainage area connected to an outlet or waterbody of interest, for example a stream or river reach, lake, reservoir, or estuary. Watershed structure and composition include both naturally formed and constructed drainage networks, and both undisturbed areas and human dominated landscape elements. Therefore, the watershed is a natural geographic unit to address the cumulative impacts of urban stormwater. Urbanization has affected change to natural systems that tends to occur in the following sequence. First, land use and land cover are altered as vegetation and topsoil are removed to make way for agriculture or subsequently buildings, roads, and other urban infrastructure. These changes, and the introduction of a built drainage network, alter the hydrology of the local area, such that receiving waters in the affected watershed can experience radically different flow regimes than they did prior to urbanization. This altered hydrology, when combined with the introduction of pollutant sources that accompany urbanization (such as people, domesticated animals, industries, etc.), has led to water quality degradation of many urban streams.

This chapter first discusses the typical land-use and land-cover composition of urbanized watersheds. This is followed by a description of changes to the hydrologic and geomorphic framework of the watershed that result from urbanization, including altered runoff, streamflow mass transport, and stream-channel stability. The chapter then discusses the characteristics of stormwater runoff, including its quantity and quality from different land covers, as well as the characteristics of dry weather runoff. Finally, the effects of urbanization on aquatic ecosystems and human health are explored.

LAND-USE CHANGES

Land use has been described as the human modification of the natural environment into the built environment, such as fields, pastures, and settlements. Important characteristics of different land uses are the modified surface characteristics of the land and the activities that take place within that land use. From a stormwater viewpoint, land uses are usually differentiated by building density and comprised of residential, commercial, industrial, institutional, recreational, and open-space land uses, among others. Each of these land uses usually has distinct activities taking place within it that affect runoff quality. In addition, each land use is comprised of various amounts of surface land cover, such as roofs, roads, parking areas, and landscaped areas. The amount and type of each cover also affect the quality and quantity of runoff from urban areas. Changes in land use and in the land covers within the land uses associated with develop-

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ment and redevelopment are therefore important considerations when studying local receiving water problems, the sources of these problems within the watershed, and the stormwater control opportunities.

Land-Use Definitions

Although there can be many classifications of residential land use, a crude and common categorization is to differentiate by density. High-density residential land use refers to urban single-family housing at a density of greater than 6 units per acre, including the house, driveway, yards, sidewalks, and streets. Medium density is between 2 and 6 units per acre, while low density refers to areas where the density is 0.7 to 2 units per acre. Another significant residential land use is multiple-family housing for three or more families and from one to three stories in height. These units may be adjoined up-and-down, side-by-side, or front-and-rear.

There are a variety of commercial land uses common in the United States. The strip commercial area includes those buildings for which the primary function is the sale of goods or services. This category includes some institutional lands found in commercial strips, such as post offices, court houses, and fire and police stations. This category does not include warehouses or buildings used for the manufacture of goods. Shopping centers are another common commercial area and have the unique distinction that the related parking lot that surrounds the buildings is at least 2.5 times the area of the building roof area. Office parks are a land use on which non-retail business takes place. The buildings are usually multi-storied and surrounded by larger areas of lawn and other landscaping. Finally, downtown central business districts are highly impervious areas of commercial and institutional land use.

Industrial areas can be differentiated by the intensity of the industry. For example, “manufacturing industrial” is a land use that encompasses those buildings and premises that are devoted to the manufacture of products, with many of the operations conducted outside, such as power plants, steel mills, and cement plants. Institutional areas include a variety of buildings, for example schools, churches, and hospitals and other medical facilities that provide patient overnight care.

Roads constitute a very important land use in terms of pollutant contributions. The “freeway” land use includes limited-access highways and the interchange areas, including any vegetated rights-of-ways. Finally, there are a variety of open-space categories, such as cemeteries, parks, and undeveloped land. Parks include outdoor recreational areas such as municipal playgrounds, botanical gardens, arboretums, golf courses, and natural areas. Undeveloped lands are private or publicly owned with no structures and have a complete vegetative cover. This includes vacant lots, transformer stations, radio and TV transmission areas, water towers, and railroad rights-of-way.

The preceding land-use descriptions are the traditional categories that make

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up the vast majority of the land in U.S. cities. However, there are emerging categories of land use, such as those espoused under the term New Urbanism, which combine several area types (such as commercial and high-density residential areas). Although land use can be broadly and generally categorized, local variations can be extremely important such that locally available land-use data and definitions should always be used. For example, local planning agencies typically do not separate the medium-density residential areas into subcategories. However, this may be necessary to represent different development trends that have occurred with time, and to represent newly emerging types of land uses for an area. Box 3-1 discusses the subtle influence that tree canopy could have on the residential land-use classification.

Trends in Urbanization

Researchers at Columbia University (de Sherbinin, 2002) state that 83 percent of the Earth's land surface has been affected by human settlements and activities, with the urbanized areas comprising about 4 percent of the total land use of the world. Urban areas are expanding world-wide, especially in developing countries. The United Nations Population Division estimates suggest that the

BOX 3-1
The Role of Tree Cover in Residential Land Use

Figure 3-1 shows two medium-density residential neighborhoods, one older and one newer. Tree canopy is obviously different in each case, and it may have an effect on seasonal organic debris in an area and possibly on nutrient loads (although nutrient discharges appear to be more related to homeowner fertilizer applications). Increased tree canopy cover also has a theoretical benefit in reducing runoff quantities due to increased interception losses. In both cases, however, monitoring data to quantify these benefits are sparse. Xiao (1998) examined the effect urban tree cover had on the rainfall volume striking the ground in Sacramento, California. The results indicated that the type of tree or type of canopy cover affected the amount of rainfall reduction measured during a rain event, such that large broad-leafed evergreens and conifers reduced the rainfall that reached the ground by 36 percent, while medium-sized conifers and deciduous trees reduced the rainfall by 18 percent. Cochran (2008) compared the volume and intensity of rain that reached the ground in an open area (no canopy cover) versus two areas with intact canopy covers in Shelby County, Alabama, over a year. The sites were sufficiently close to each other to assume that the rainfall characteristics were the same in terms of the intensity and the variation of intensity and volume during the storm. Rainfall "throughfall" was reduced by about 13.5 percent during the spring and summer months when heavily wooded cover existed. The rainfall characteristics at the leafless tree sites (winter deciduous trees) were not significantly different from the parking lot control sites. In many locations around the county, very high winds are associated with severe storms, significantly decreasing the interception losses. Of course, mature trees are known to provide other benefits in urban areas, including shading to counteract stormwater temperature increases and massive root systems that help restore beneficial soil structure conditions. Additional research is needed to quantify the benefits of urban trees through a comprehensive monitoring program.

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BOX 3-1 Continued

FIGURE 3-1 Two medium-density residential areas (no alleys); the area below is older. SOURCE: Robert Pitt, University of Alabama.

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world's population will become mostly urbanized by 2010, whereas only 37 percent of the world's population was urbanized in 1970. De Sherbinin (2002) concludes that although the extent of urban areas is not large when compared with other land uses (such as agriculture or forestry) their environmental impact is significant. Population densities in the cities are large, and their political, cultural, and economic influence is great. Most industrial activity is also located near cities. The influence of urban areas extends beyond their boundaries due to the need for large amounts of land for food and energy production, to generate raw materials for industry, for building water supplies, for obtaining other resources such as construction materials, and for recreational areas. One study estimated that the cities of Baltic Europe require from 500 to more than 1,000 times the urbanized land area (in the form of forests, agricultural, marine, and wetland areas) to supply their resources and to provide for waste disposal (de Sherbinin, 2002).

Currently, considerable effort is being spent investigating land-use changes world-wide and in the United States in support of global climate change research. The U.S. Geological Survey (USGS, 1999) has prepared many research reports describing these changes; Figure 3-2 shows the results for one study in the Chicago and Milwaukee areas, and Figure 3-3 shows the results for a study in the Chesapeake Bay area. These maps graphically show the dramatic rate of change in land use in these areas. The very large growth in urban areas during the 20 years between 1975 and 1995 is especially astonishing. By 1995, Milwaukee and Chicago's urbanized areas more than doubled in size from prior years. Even more rapid growth has occurred in the Washington, D.C.–Baltimore area.

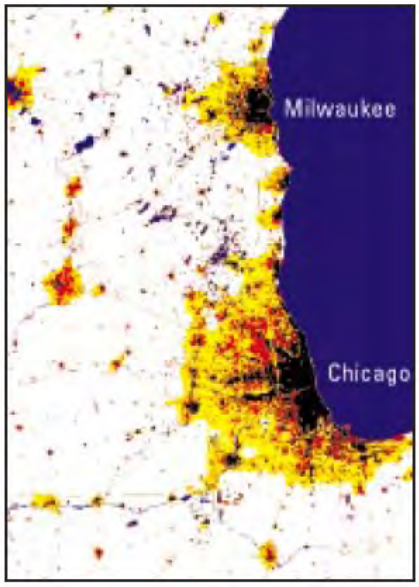

FIGURE 3-2 The extent of urban land in Chicago and Milwaukee in 1955 (black), 1975 (medium gray), and 1995 (light gray). SOURCE: USGS (1999).

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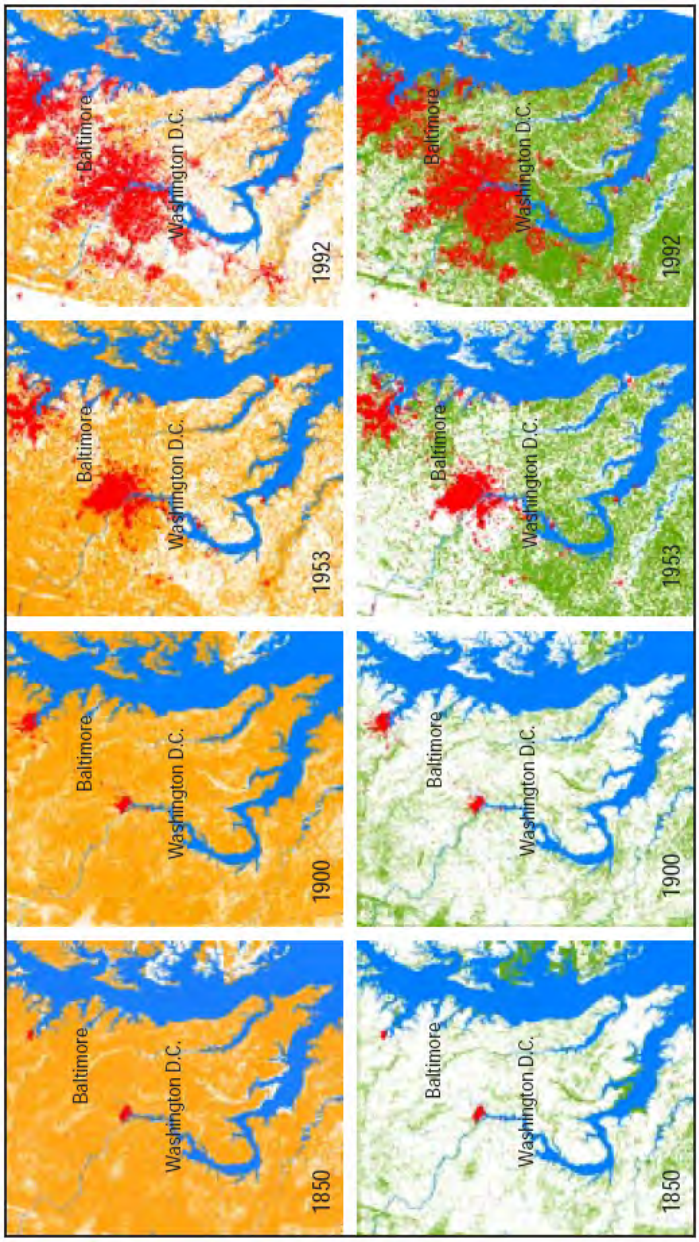

FIGURE 3-3 This series of maps compares changes in urban, agricultural, and forested lands in the Patuxent River watershed over the past 140 years. The top series shows the extent of urban areas (black) along with agriculture (gray), which was at its peak in the mid- to late 1800s. The bottom series show that urban (black) and forested land (gray) have increased since 1900. SOURCE: USGS (1999).

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Many different metrics can be used to measure the rate of urbanization in the United States, including the number of housing starts and permits and the level of new U.S. development. The latter is tracked by the U.S. Department of Agriculture's (USDA) National Resources Inventory (USDA, 2000). The inventory, conducted every five years, covers all non-federal lands in the United States, which is 75 percent of the U.S. total land area. The inventory uses land-use information from about 800,000 statistically selected locations. From 1992 to 1997, about 2.2 million acres per year were converted from non-developed to developed status. According to the USDA (2000), the per capita developed land use (acres per person, a classical measure of urban sprawl) has increased in the United States between the years of 1982 and 1997 from about 0.43 to about 0.49 acres per person. The smallest amount of developed land used per person was for New York and Hawaii (0.15 acres), while the largest land consumption rate was for North Dakota, at about 10 times greater. Surprisingly, Los Angeles is the densest urban area in the country at 0.11 acres per person. The amount of urban sprawl is also directly proportionate to the population growth. According to Beck et al. (2003):

> In the 16 cities that grew in population by 10 percent or less between 1970 and 1990 (but whose population did not decline), developed area expanded 38 percent—more than in cities that declined in population but considerably less than in the cities where population increased more dramatically. Cities that grew in population by between 10 and 30 percent sprawled 54 percent on average. Cities that grew between 31 and 50 percent sprawled 72 percent on average. Cities that grew in population by more than 50 percent sprawled on average 112 percent. These findings confirm the common sense, but often unacknowledged proposition, that there is a strong positive relationship between sprawl and population growth.

In most areas, the per capita use of developed land has increased, along with the population growth. However, even some cities that had no population growth or had negative growth, such as Detroit, still had large amounts of sprawl (increased amounts of developed land used per person), but usually much less than cities that had large population growth. Los Angeles actually had an 8 percent decreased rate of land consumption per resident during this period, but the city still experienced tremendous growth in land area due to its very large population growth. The additional 3.1 million residents in the Los Angeles area during this time resulted in the development of almost an additional 400 square miles.

Land-Cover Characteristics in Urban Areas

As an area urbanizes, the land cover changes from pre-existing rural sur-

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faces, such as agricultural fields or forests, to a combination of different surface types. In municipal areas, land cover can be separated into various common categories—pictured and described in Box 3-2—that include roofs, roads, parking areas, storage areas, other paved areas, and landscaped or undeveloped areas.

Most attention is given to impervious cover, which can be easily quantified for different types of land development. Given the many types of land cover described in Box 3-2, impervious cover is composed of two principal components: building rooftops and the transportation system (roads, driveways, and parking lots). Compacted soils and unpaved parking areas and driveways also have "impervious" characteristics in that they severely hinder the infiltration of water, although they are not composed of pavement or roofing material. In terms of total impervious area, the transportation component often exceeds the rooftop component (Schueler, 1994). For example, in Olympia, Washington, where 11 residential multifamily and commercial areas were analyzed in detail, the areas associated with transportation-related uses comprised 63 to 70 percent of the total impervious cover (Wells, 1995). A significant portion of these impervious areas—mainly parking lots, driveways, and road shoulders—experience only minimal traffic activity. Most retail parking lots are sized to accommodate peak parking usage, which occurs only occasionally during the peak holiday shopping season, leaving most of the area unused for a majority of the time. On the other hand, many business and school parking areas are used to their full capacity nearly every work day and during the school year. Other differences at parking areas relate to the turnover of parking during the day. Parked vehicles in business and school lots are mostly stationary throughout the work and school hours. The lighter traffic in these areas results in less vehicle-associated pollutant deposition and less surface wear in comparison to the greater parking turnover and larger traffic volumes in retail areas (Brattebo and Booth, 2003).

As described in Box 1-1, impervious cover is broken down into two main categories: directly connected impervious areas (or effective impervious area) and non-directly connected (disconnected) impervious areas (Sutherland, 2000; Gregory et al., 2005) (although it is recognized that these two states are end-members of a range of conditions). Directly connected impervious area includes impervious surfaces which drain directly to the sealed drainage system without flowing appreciable distances over pervious surfaces (usually a flow length of less than 5 to 20 feet over pervious surfaces, depending on soil and slope characteristics and the amount of runoff). Those areas are the most important component of stormwater runoff quantity and quality problems. Approximately 80 percent of directly connected impervious areas are associated with vehicle use such as streets, driveways, and parking (Heaney, 2000).

Values of imperviousness can vary significantly according to the method used to estimate the impervious cover. In a detailed analysis of urban imperviousness in Boulder, Colorado, Lee and Heaney (2003) found that hydrologic modeling of the study area resulted in large variations (265 percent difference)

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BOX 3-2
Land Cover in Urban Areas

For any given land use, there is a range of land covers that are typical. Common land covers are described below, along with some indication of their contribution to stormwater runoff and their pollutant-generating ability.

Roofs. These are usually either flat or pitched, as both have significantly different runoff responses. Flat roofs can have about 5 to 10 mm of detention storage while pitched roofs have very little detention storage. Roofing materials are also usually quite different for these types of roofs, further affecting runoff quality. In addition, roof flashing and roof gutters may be major sources of heavy metals if made of galvanized metal or copper. Directly connected roofs have their roof drains efficiently connected to the drainage system, such as direct connections to the storm drainage itself or draining to driveways that lead to the drainage system. These directly connected roofs have much more of their runoff waters reaching the receiving waters than do partially connected roofs, which drain to pervious areas.

A directly connected roof drain

A disconnected roof drain (drains to pervious area)

Parking Areas. These can be asphalt or concrete paved (impervious surface) or unpaved (traditionally considered a pervious surface) and are either directly connected or drain to adjacent pervious areas. Areas that have rapid turnover of parked cars throughout the day likely have greater levels of contamination due to the frequent starting of the vehicles, an expected major source of pavement pollutants. Unpaved parking areas actually should be considered impervious surfaces, as the compacted surface does not allow any infiltration of runoff. Besides automobile activity in the parking areas, other associated activities contribute to contamination. For example, parked cars in disrepair awaiting service can contribute to parking area runoff contamination. In addition, maintenance of the pavement surface, such as coal-tar seal coating, can be significant sources of polycyclic aromatic hydrocarbons (PAHs) to the runoff.

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BOX 3-2 Continued

Paved parking area with frequent automobile movement

Contamination of paved parking areas due to commercial activities

Storage Areas. These can also be paved, unpaved, directly connected, or drained to pervious areas. As with parking areas, unpaved storage areas should not be considered pervious surfaces because the compacted material effectively hinders infiltration. Detention storage runoff losses from unpaved storage areas can be significant. In storage areas (especially in commercial and industrial land uses), activities in the area can have significant effects on runoff quality.

Contaminated paved storage area at vehicle junk yard

Heavy equipment storage area on concrete surface

Streets. Streets in municipal areas are usually paved and directly connected to the storm drainage system. In municipal areas, streets constitute a significant percentage of all impervious surfaces and runoff flows. Features that affect the quality of runoff from streets include the varying amounts of traffic on different roads and the amount and type of roadside vegetation. Large seasonal phosphorus loads can occur from residential roads in heavily wooded areas, for example.

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Wide arterial street with little roadside vegetation (left) and narrow residential street with substantial vegetation (top, right)

Other Paved Areas. Other paved areas in municipal regions include driveways, playgrounds, and sidewalks. Depending on their slopes and local grading, these areas may drain directly to the drainage system or to adjacent pervious areas. In most cases, the runoff from these areas contributes little to the overall runoff for an area, and the runoff quality is of relatively better quality than from the other "hard" surfaces.

Landscaped and Turf Areas. Although these are some of the only true pervious surfaces in municipal areas, disturbed urban soils can be severely compacted, with much more reduced infiltration rates than are assumed for undisturbed regional soils. Besides the usually greater than expected quantities of runoff of pervious surfaces in urban areas, they can also contribute high concentrations of various pollutants. In areas with high rain intensities, erosion of sediment can be high from pervious areas, resulting in much higher concentrations of total suspended solids (TSS) than from paved areas. Also, landscaping chemicals, including fertilizers and pesticides, can be transported from landscaped urban areas. Undeveloped woods in urban areas can have close to natural runoff conditions, but many parks and other open-space areas usually have degraded runoff compared to natural conditions. Turf grass has unique characteristics compared to other landscaped areas in that the soil structure is usually more severely degraded compared to natural conditions. The normally shallower root systems are not as effective in restoring compacted soils and they can remain compacted due to some activities (pathways, parked cars, playing fields, etc.) that do not occur on areas planted with shrubs and trees.

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BOX 3-2 Continued

Soil erosion from turf areas with fine-grained soils during periods of high rain intensities

Undeveloped Areas. Undeveloped areas in otherwise urban locations differ from natural areas. In many situations, they can be previously disturbed (cleared and graded) areas that have not been sold or developed. They may be overgrown with various local vegetation types that thrive in disturbed locations. In other situations, undeveloped areas may be small segments of natural areas that have not been disturbed or revegetated. In this case, their stormwater characteristics may approach natural conditions but still be degraded due to adjacent activities and atmospheric deposition.

SOURCE: Pitt and Voorhees (1995, 2002). Photographs courtesy of Robert Pitt, University of Alabama.

in the calculations of peak discharge when impervious surface areas were determined using different methods. They concluded that the main focus should be on effective impervious area (EIA) when examining the effects of urbanization on stormwater quantity and quality.

Runoff from disconnected impervious areas can be spread over pervious surfaces as sheet flow and given the opportunity to infiltrate before reaching the drainage system. Therefore, there can be a substantial reduction in the runoff volume and a delay in the remaining runoff entering the storm drainage collection system, depending on the soil infiltration rate, the depth of the flow, and the

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available flow length. Examples of disconnected impervious surfaces are rooftops that discharge into lawns, streets with swales, and parking lots with runoff directed to adjacent open space or swales. From a hydrologic point of view, road-related imperviousness usually exerts a larger impact than rooftop-related imperviousness, because roadways are usually directly connected whereas roofs can be disconnected (Schueler, 1994).

Methods for Determining Land Use and Land Cover

Historically, land-use and land-cover information was acquired by a combination of field measurements and aerial photographic analyses—methods that required intensive interpretation and cross validation to guarantee that the analyst's interpretations were reliable (Goetz et al., 2003). Figure 3-4 is an example of a high-resolution panchromatic aerial photograph that was taken from an airplane in Toronto and used for measurements of urban surfaces (Pitt and McLean, 1986). Most recently, satellite images have become available at high spatial resolution for many areas (<1 to 5 m resolution) and have the advantage of digital multi-spectral information more complete than even that provided by digital orthophotographs. Minnesota has one of the longest records (over 20 years) of continuously recorded statistics on land cover and impervious surfaces derived from satellite images—information which has been incorporated into the

FIGURE 3-4 Example of a high-resolution panchromatic aerial photograph of an industrial area used for measurements of urban surfaces. SOURCE: Pitt and McLean (1986).

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Minnesota Statewide Conservation and Preservation Plan. Some of the remaining problems to be overcome with satellite imagery include difficulties in obtaining consistent sequential acquisition dates, intensive computer processing time requirements, and large computer storage space requirements to store massive amounts of image information.

The recommended approach for conducting a survey of land uses and development characteristics (land cover and activities) for an area is to use both aerial photography and site surveys. Aerial photography has improved greatly in recent years, but it is still not suitable for obtaining all the information needed for developing a comprehensive stormwater management plan. Initially, aerial photos should be used to identify the locations and extents of the various land uses in the study area. Neighborhoods representing homogenous land uses should then be identified for site surveys. Usually, about 10 to 15 neighborhoods for each land use are sufficient for a community being studied (Burton and Pitt, 2002). After the field surveys are conducted, the aerials are again used to measure the actual areas associated with land surface cover. This information can be used with field survey data to separate the surfaces into the appropriate categories for analyses and modeling.

Box 3-3 presents a detailed study of land cover for several land uses in the southern United States using satellite imagery and ground surveys (Bochis, 2007; Bochis et al., 2008). The results presented here have been found to be broadly similar to other areas studied in the United States, although few studies have been as detailed, and there are likely to be regional differences.

The general conclusion of many land-use and land-cover studies is that in urban areas, the amount of impervious surfaces has increased since the early years of the 20th century because of the tendency toward increased automobile use and bigger houses, which is associated with an increase in the facilities necessary to accommodate them (wider streets, more parking lots, and garages). As shown in later sections of this report, the construction of impervious surfaces leads to multiple impacts on stream systems. Therefore, future development plans and water resource protection programs should consider reducing impervious cover in the potential expansion of communities. Wells (1995), Booth (2000), Stone (2004), and Gregory et al. (2005) show that reducing the size and dimensions of residential parcels, promoting cluster developments (clustered medium-density residential areas in conjunction with open space, instead of large tracts of low-density areas), building taller buildings, reducing the residential street width (local access streets), narrowing the width and/or building one-side sidewalks, reducing the size of paved parking areas to reflect the average parking needs instead of peak needs, and using permeable pavement for intermittent/overflow parking can reduce the traditional impervious cover in communities by 10 to 50 percent. Many of these benefits can also be met by paying better attention to how the pavement and roof areas are connected to the drainage system. Impervious surfaces that are “disconnected” by allowing their drainage water to flow to adjacent landscaped areas can result in reduced runoff quantities.

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BOX 3-3
Land Use and Land Cover for the Little Shades Creek Watershed

Data collected by Bochis-Micu and Pitt (2005) and Bochis (2007) for the Little Shades Creek watershed near Birmingham, Alabama, were acquired using IKONOS satellite imagery (provided by the Jefferson County Storm Water Management Authority) as an alternative to classical aerial photography to map the characteristics of the land uses in the monitored watershed areas, supplemented with verified ground truth surveys. IKONOS is the first commercially owned satellite that provides 1-m-resolution panchromatic image data and 4-m multi-spectral imagery (Goetz et al., 2003).

This project was conducted to evaluate the effects of variable site conditions associated with each land-use category. About 12 homogeneous neighborhoods were investigated in each of the 16 major land uses in this 2,500-hectare watershed. Detailed land-cover measurements were made using a variety of techniques, as listed above, including field surveys for small details that were not visible with remote sensing tools (such as roof drain connectiveness, pavement texture, and landscaping maintenance practices). Each of these individual neighborhoods was individually modeled to investigate the resultant variability in runoff volume and pollutant discharges. These were statistically evaluated to determine if the land-use categories properly stratified these data by explaining significant fractions of the variability. Bochis-Micu and Pitt (2005) and Bochis (2007) concluded that land-use categories were an appropriate surrogate that can be used to describe the observed combinations of land surfaces. However, proper stormwater modeling should examine the specific land surfaces in each land-use category in order to better understand the likely sources of the pollutants and the effectiveness of candidate stormwater control measures (SCMs).

This watershed has an overall impervious cover of about 35 percent, of which about 25 percent is directly connected to the drainage system. Table 3-1 shows the average land covers for each of the surveyed land uses, along with the major source areas in each of the directly connected and disconnected impervious and pervious surface categories. The impervious covers include streets, driveways, parking, playgrounds, roofs, walkways, and storage areas. The directly connected areas are indicated as “connected” or “draining to impervious” and do not include the pervious area or the impervious areas that drain to pervious areas. As expected, the land uses with the least impervious cover are open space (vacant land, cemeteries, golf courses) and low-density residential, and the land uses with the largest impervious covers are commercial areas, followed by industrial areas. For a typical high-density residential land use in this region (having 15 or more units per hectare), the major land cover was found to be landscaped areas, subdivided into front- and backyard categories, while 25 percent of this land-use area is covered by impervious surfaces broken down into three major subcategories: roofs, streets, and driveways. The subareas making up each land use show expected trends, with roofs and streets being the predominant directly connected impervious covers in residential areas, and parking and storage areas also being important in commercial and industrial areas.

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BOX 3-3 Continued

TABLE 3-1 Little Shades Creek Watershed Land Cover Information (percent and the predominant land cover)

Land Use	Directly Connected Impervious Cover (%)	Disconnected Impervious Cover (%)	Pervious Cover (%)
High-Density Residential	14 (streets and roof)	10 (roofs)	76 (front and rear landscaping)
Medium-Density Residential (<1960 to 1980)	11 (streets and roofs)	8 (roofs)	81 (front and rear landscaping)
Medium-Density Residential (>1980)	14 (streets and roofs)	5 (roofs)	80 (front and rear landscaping)
Low-Density Residential	6 (streets)	4 (roofs)	89 (front and rear landscaping)
Apartments	21 (streets and parking)	22 (roofs)	58 (front and rear landscaping)
Multiple Families	28 (roofs, parking , and streets)	7 (roofs)	65 (front and rear landscaping)
Offices	59 (parking, streets, and roofs)	3 (parking)	39 (front and rear landscaping)
Shopping Centers	64 (parking, roofs, and streets)	4 (roofs)	31 (front landscaping)
Schools	16 (roofs and parking)	20 (playground)	64 (front and rear landscaping, large turf)
Churches	53 (parking and streets)	7 (parking)	40 (front landscaping)
Industrial	39 (storage, parking, and streets)	18 (storage and roofs)	44 (front and rear landscaping)
Parks	32 (streets and parking)	33 (playground)	34 (large turf and undeveloped)
Cemeteries	7 (streets)	15 (parking)	78 (large turf)
Golf Courses	2 (streets)	4 (roofs)	95 (large turf)
Vacant	5 (streets)	1 (driveways)	94 (undeveloped and large turf)

SOURCE: Bochis-Micu and Pitt (2005) and Bochis (2007). Reprinted, with permission, from Bochis (2007). Copyright 2007 by Celina Bochis.

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HYDROLOGIC AND GEOMORPHIC CHANGES

The watershed provides an organizing framework for the management of stormwater because it determines the natural patterns of water flow as well as the constituent sediment, nutrient, and pollutant loads. In undeveloped watersheds, hillslope hydrologic flow-path systems co-evolve with microclimate, soils, and vegetation to form topographic patterns within which ecosystems are spatially arranged and adjusted to the long-term patterns of water, energy, and nutrient availability. The landforms that comprise the watershed include the network patterns of streams, rivers, and their associated riparian zones and floodplains, as well as component freshwater lakes, reservoirs, wetlands, and estuaries.

This section starts with a discussion of precipitation measurement and characteristics before turning to the typical changes in hydrology and geomorphology of the watershed brought on by urbanization. In both the terrestrial and aquatic phases, retention and residence time of sediment and solutes decreases with increasing flow volume and velocity. This results in relatively high retention and low export of water and nutrients in undeveloped watersheds compared to decreasing retention and greater pollutant export in disturbed or developed systems.

The Storm in Stormwater

The magnitude and frequency of stormwater discharges are not just determined by rainfall. Instead, they are the combined product of storm and interstorm characteristics, land use, the natural and built drainage system, and any stormwater control measures (SCMs) that have been implemented. The total volume and peak discharge of runoff, as well as the mobilization and transport of pollutants, are dependent on all aspects of the storm magnitude, catchment antecedent moisture conditions, and the interstorm period. Therefore, information on the frequency distribution of storm events and properties is an important aspect of understanding the distribution of pollutant concentrations and loads in stormwater discharges. In northern climates, runoff production from precipitation can be significantly delayed by the accumulation, ripening, and melt of snowpacks, such that much of the annual load of certain pollutants may be mobilized in peak flow from snowmelt events. Therefore, measurement of precipitation and potential accumulation in both liquid and solid form is critical for stormwater assessment.

Precipitation Measurements

Any given storm is characterized by the storm's total rainfall (depth), its duration, and the average and peak intensity. A *storm hyetograph* depicts meas-

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ured precipitation depth (or intensity) at a precipitation gauge as a function of time; an example is shown in Figure 3-5. This figure illustrates the typical high degree of variability of precipitation over the total duration of a storm. In this example, the total storm depth is 50.9 mm, the duration is 19 hours, and the peak intensity is 0.56 mm/minute (peak depth of 2.79 mm divided by the measurement increment of 5 minutes). The average intensity is 0.045 mm/minute, quite a bit lower than the peak intensity, since the storm duration is punctuated by periods of low and no measurable precipitation.

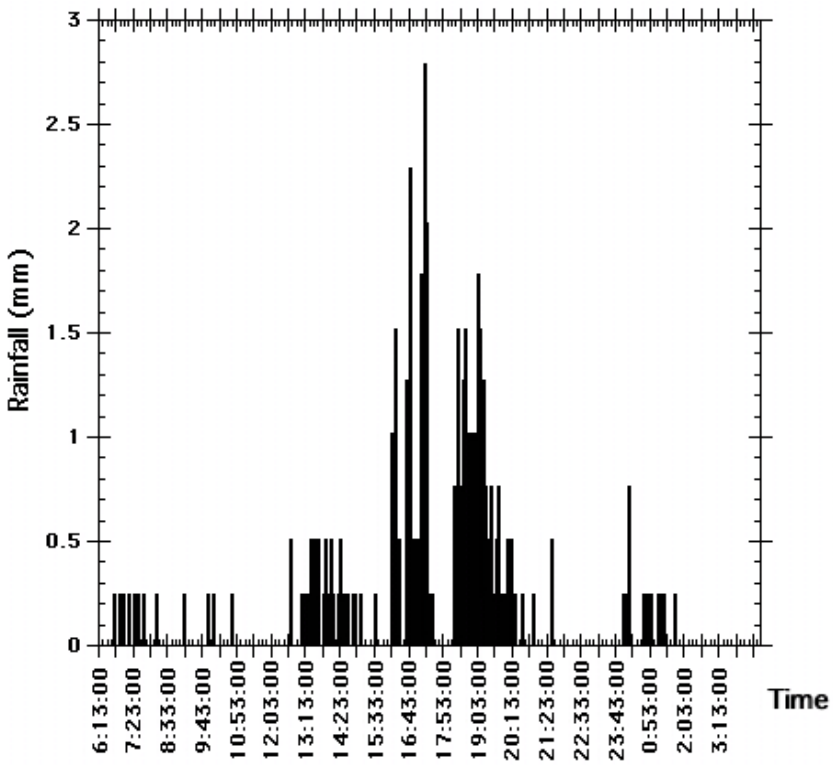

FIGURE 3-5 Example of a storm hyetograph at location RG2, September 20–21, 2001, Valley Creek watershed, Chester County, Pennsylvania. The time increment of measurement is 5 minutes, while the entire duration of this storm is about 16 hours.

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In addition to measurements of individual storm events, precipitation data are routinely collected for longer time periods and compiled and analyzed annually when trying to understand local rainfall patterns and their impact on baseflow, water quality, and infrastructure design. Figure 3-6 shows the rainfall during 2007 at both humid (Baltimore) and arid (Phoenix) locations. Especially apparent in the Baltimore data is the fact that the majority of storm events are less than 20 mm in depth.

Several networks of precipitation gauges are available in the United States; gauge data are available online from the National Climatic Data Center (NCDC) (*http://ncdc.nws.noaa.gov*). High-resolution precipitation data (i.e., with measurement intervals of an hour or less) are typically not recorded except at primary weather service meteorological stations, while daily precipitation records are more extensively collected and available through the Cooperative Weather Observer Program (*http://www.nws.noaa.gov/om/coop/*). This distinction is important to stormwater managers because most stormwater applications require short-duration measurements or model results (minutes to hours). Fortunately, a combination of precipitation gauges and precipitation radar estimates are available to estimate precipitation depth and duration, as well as additional methods to estimate snowfall and snowpack water equivalent depth and conditions. (A thorough description of precipitation measurement by radar is given by Krajewski and Smith [2001]). While most of the conterminous United States is covered by NEXRAD radar for estimation of high-temporal-resolution precipitation at current resolutions of ~4 km, the radar backscatter information requires calibration and correction with precipitation gauge data, and satellite estimates

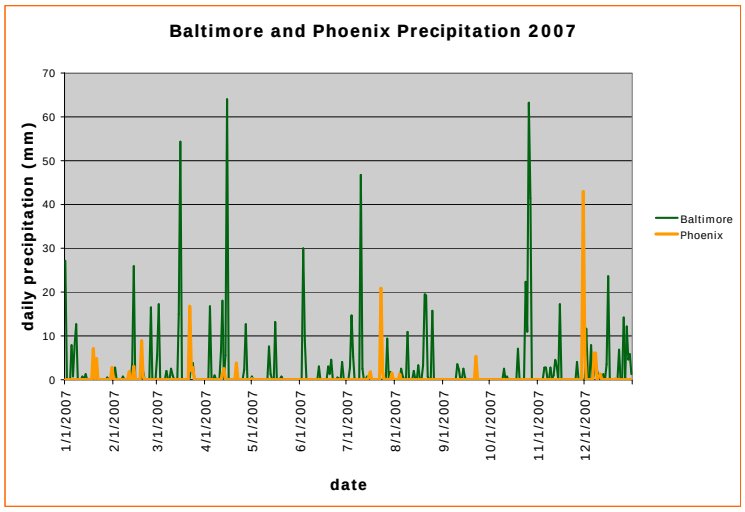

FIGURE 3-6 Daily precipitation totals for the Baltimore-Washington and Phoenix airports for 2007. SOURCE: Data from the National Weather Service.

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of precipitation are generally not sufficiently reliable for stormwater applications. It goes without saying that the measurement, quality assurance, and maintenance of long-term precipitation records are both vital and nontrivial to stormwater management.

Precipitation Statistics

The basic characterization of precipitation is by depth-duration-frequency curves, which describe the return period, recurrence interval, and exceedance probability (terms all denoting frequency) of different precipitation intensities (depths) over different durations. The methodology for determining the curves is described in Box 3-4. Precipitation durations of interest in stormwater management range from a few minutes (important for determining peak discharge from small urban drainage areas) to a year (where the interest is in the total annual volume of runoff production). As an example, one might be interested in the return period of the 1-inch, 1-hour event, or the 1-inch, 24-hour event; the latter would have a much shorter return period, because accumulating an inch of rain over a day is much more common than accumulating the same amount over just an hour.

BOX 3-4
Determining Depth-Duration-Frequency Curves

Depth-duration-frequency curves are developed from precipitation records using either annual maximum data series or annual exceedance data series. Annual maximum data series are calculated by extracting the annual maximum precipitation depths of a chosen duration from a record. In cases where there are only a few years of data available (less than 20 to 25 years), then an annual exceedance series (a type of "partial duration series") for each storm duration can be calculated, where N largest values from N years are chosen. An annual maximum series excludes other extreme values of record that may occur in the same year. For example, the second highest value on record at an observing station may occur in the same year as the highest value on record but will not be included in the annual maximum series. The design precipitation depths determined from the annual exceedance series can be adjusted to match those derived from an annual maximum series using empirical factors (Chow et al., 1988; NOAA Atlas data series, see *http://www.weather.gov/oh/hdsc/currentpf.htm*, e.g., Bonnin et al., 2006). Hydrologic frequency analysis is then applied the data series to determine desired return periods by fitting a probability distribution to the data to determine the return periods[1] of interest. The process is repeated for other chosen storm durations.

[1]Analysis of annual maximum series produces estimates of the average period between years when a particular value is exceeded ("average recurrence interval"). Analysis of partial duration (annual exceedance) series gives the average period between cases of a particular magnitude ("annual exceedance probability"). The two results are numerically similar at rarer average recurrence intervals but differ at shorter average recurrence intervals (below about 20 years). NOAA (e.g., Bonnin et al., 2006) notes that the use of the terminology "average recurrence interval" and "annual exceedance probability" typically reflects the analysis of the two different series, but that sometimes the term "average recurrence interval" is used as a general term for ease of reference.

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The National Weather Service has developed an online utility to estimate the return period for a range of depth–duration events for any place in the conterminous United States (*http://hdsc.nws.noaa.gov/hdsc/pfds/*). Figures 3-7 and 3-8 show examples of precipitation depth-duration-frequency curves for a humid location (Baltimore, Maryland) and an arid site (Phoenix, Arizona). As an illustration of the climatic influence on the depth-duration-frequency curves, the 2-year, 1-hour storm is associated with a depth of 1.2 inches of precipitation in Baltimore, whereas this same recurrence interval and duration are associated with a depth of only 0.6 inch of precipitation in Phoenix. Durations from 5 minutes to one day are shown because this is the range typically used in the design of stormwater management facilities. The shorter durations provide expected magnitude and frequency for brief but significant precipitation intensity peaks that can mobilize and transport large amounts of pollutants and erode soil, and they are used in high-resolution stormwater models. More commonly, however, stormwater regulations are written for 24-hour durations at 2-, 10-, 25-, 50-, or 100-year recurrence intervals.

Because storm magnitudes and frequencies vary by climatic region, it is reasonable to expect them to change during recurring climate events (e.g., El Niño) or over the long term by climate change. Alteration in convective precipitation by major urban centers has been documented for some time (Huff and Changnon, 1973). Some evidence exists that precipitation regimes are shifting systematically toward an increase in more intense rainfall events, which is consistent with modeled projections of global climate change increases in hydrologic extremes. Kunkel et al. (1999) analyzed precipitation data from 1,295 weather stations from 1931 to 1996 across the contiguous United States and found that storms with extreme levels of precipitation have increased in frequency. The analysis considered short-duration events (1, 3, and 7 days) of 1-year and 5-year return intervals. A linear trend analysis using Kendall's slope estimator statistic indicated that the overall trend in 7-day, 1-yr events for the conterminous United States is upward at a rate of about 3 percent per decade for 1931 to 1996; the upward trend in 7-day, 5-year events is about 4 percent per decade. These two time series are shown in Figure 3-9. An increased frequency of intense precipitation events will shift depth-frequency-duration curves for a given location, with a given return period being associated with a more intense event. Alternatively, the return period for a given intensity (or depth) of an event will be reduced if the event is occurring more frequently. In light of climate change, depth-duration-frequency curves will need to be updated regularly in order to ensure that stormwater management facilities are not underdesigned for an increasing intensity of precipitation. Additional implications of climate change for stormwater management are discussed in Box 3-5.

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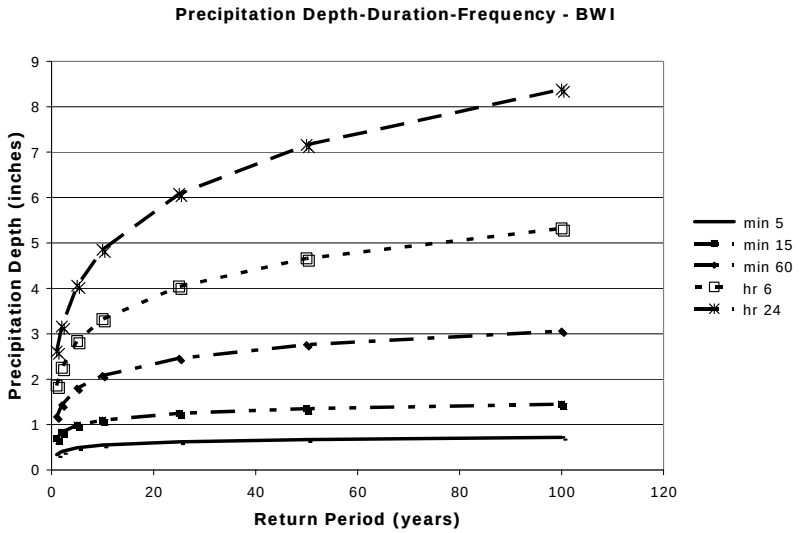

FIGURE 3-7 Depth-duration-frequency curves for Baltimore, Maryland. SOURCE: Data from the National Weather Service.

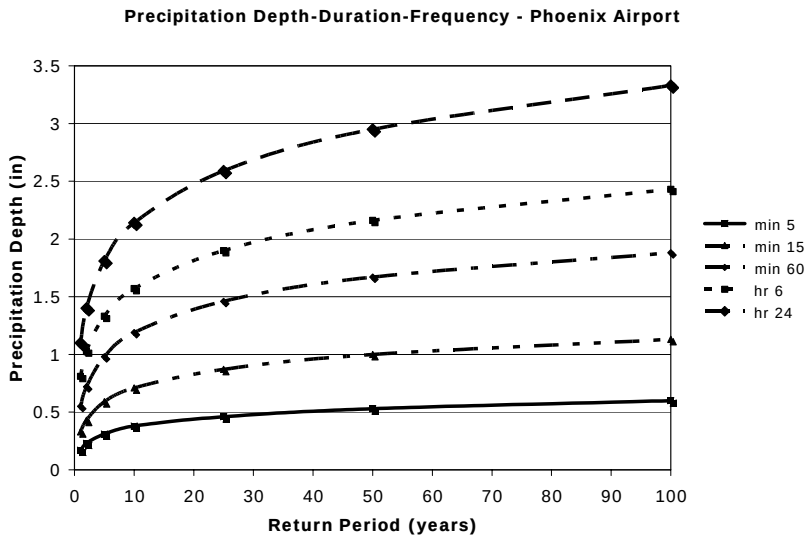

FIGURE 3-8 Depth-duration-frequency curves for Phoenix, Arizona. SOURCE: Data from the National Weather Service.

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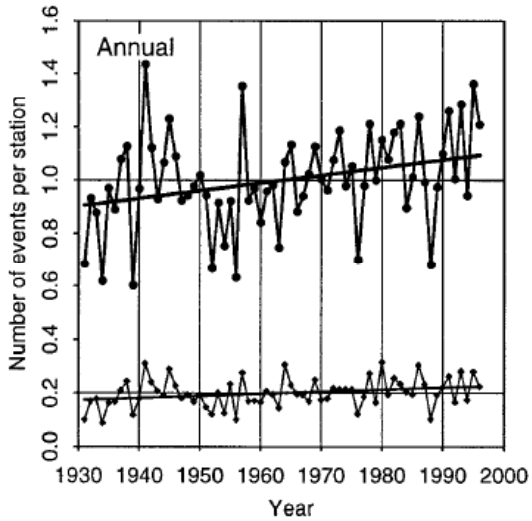

FIGURE 3-9 Nationally averaged annual U.S. time series of the number of precipitation events of 7-day duration exceeding 1-year (dots) and 5-year (diamonds) recurrence intervals. SOURCE: Reprinted, with permission, from Kunkel et al. (1999). Copyright 1999 by American Meteorological Society.

BOX 3-5
Climate Change and Stormwater Management

An ongoing report series issued by the U.S. Climate Change Science Program and the Subcommittee on Global Change Research summarizes the evidence for climate change to date and expected impacts of climate change, including impacts on the water resources sector (*http://www.climatescience.gov/*). According to the Intergovernmental Panel on Climate Change (IPCC 2007), annual precipitation will likely increase in the northeastern United States and will likely decrease in the southwestern United States over the next 100 years. In the western United States, precipitation increases are projected during the winter, whereas decreases are projected for the summer. As temperatures warm, precipitation will increasingly fall as rain rather than snow, and snow season length and snow depth are very likely to decrease in most of the country. More extreme precipitation events are also projected, which, when coupled with an anticipated increase in rain-on-snow events, would contribute to more severe flooding due to increases in extreme stormwater runoff.

The predictions for increases in the intensity and frequency of extreme events have significant implications for future stormwater management. First, many of the design standards currently in use will need to be revised, since they are based on historical data. For example, depth-duration-frequency curves used for design storm data will need to be updated, because the magnitude of the design storms will change. Even with revised design standards, in light of future uncertainty, new SCMs will need to be designed conservatively to allow for additional storage that will be required for regions with predicted trends in increased precipitation. In addition, existing SCM designs based on old standards may prove to be undersized in the future. Implementation of a monitoring program to check existing SCM inflows against original design inflows may be prudent to aid in judging whether retrofit of existing facilities or additional stormwater infrastructure is needed.

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Design Storms

Given that only daily precipitation records are widely available, but short-duration data are required for stormwater analysis and prediction, *design storms* have been developed for the different regions of the United States by different state and federal resource agencies. A *design storm* is a specified temporal pattern of rainfall at a location, created using an overall storm duration and frequency relevant to the design problem at hand. Examples of design storms include the 24-hour, 100-year event for flood control and the 24-hour, 2-year event for channel protection. The magnitude of the design storm can be derived from data at a single gauge, or from synthesized regional data published by state or federal agencies. The simplest form of a design storm is a triangular hyetograph where the base is the duration and the height is adjusted so that the area under the curve equals the total precipitation. In instances where the hyetograph is to be used to estimate sequences of shorter duration intensities (i.e., minutes to a few hours) within larger duration events, depth-duration-frequency curve data can be used to synthesize a design storm hyetograph (see Chow et al., 1988). An example design storm for the 100-year storm event for St. Louis based on NOAA Atlas 14 depth-duration-frequency data is shown in Figure 3-10.

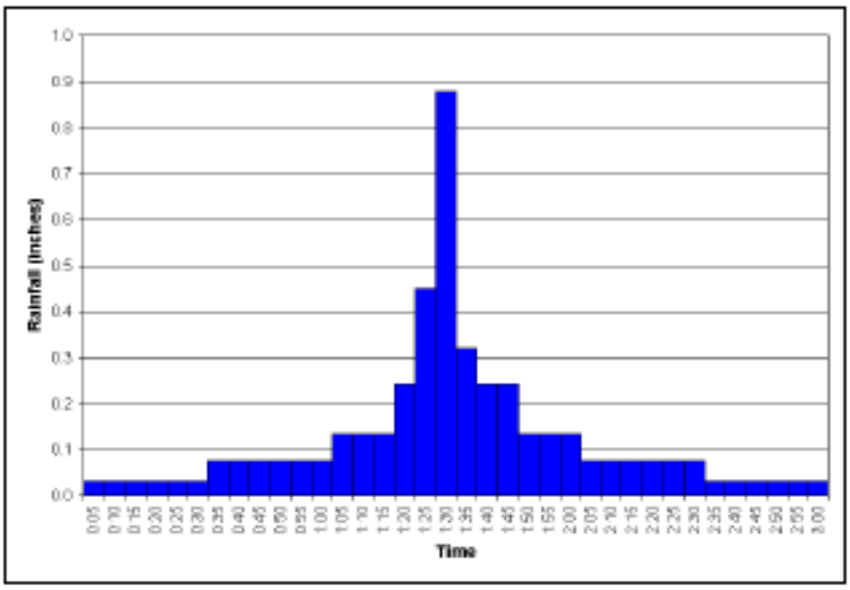

FIGURE 3-10 Hundred-year design storm for St. Louis based on NOAA Atlas 14 data. SOURCE: Hoblit et al. (2004) based on data from Bonnin et al. (2003).

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Conversion of Precipitation to Runoff

Dynamics of Watershed Flowpaths

Precipitation falling on the land surface is subject to evaporative loss to the atmosphere by vegetation canopy and leaf litter interception, evaporation directly from standing water on the surface and upper soil layers or impervious surfaces, and later transpiration through root uptake by vascular plants. Snowpack is also subject to sublimation (conversion of snow or ice directly to vapor), which results in the loss of a portion of the snow prior to melt. The rate of evaporative loss depends on local weather conditions (temperature, humidity, wind speed, solar radiation) and the rate and duration of precipitation. Precipitation (or snowmelt) in excess of interception and potential evaporative loss rates is then partitioned into infiltration and direct runoff.[1]

There is a gradation of flowpaths transporting water, sediment, and solutes through a watershed, ranging from rapid surface flowpaths through generally slower subsurface flowpaths. Residence times generally increase from surface to subsurface flowpaths, with rapid surface flow providing the major contribution to flood flow while subsurface flowpaths contribute to longer-term patterns of surface wetness. Watershed characteristics that influence the relative dominance of surface versus subsurface flowpaths include infiltration capacity as affected by land cover, soil properties, and macropores; subsurface structure or soil horizons with varying conductivity; antecedent soil moisture and groundwater levels; and the precipitation duration and intensity for a particular storm.

The distribution and activity of flowpaths result in changing patterns of soil moisture and groundwater depth, which result in patterns of soil properties, vegetation, and microbial communities. These ecosystem patterns, in turn, can have strong influences on the hydraulics of flow and biogeochemical transformations within the flowpaths, with important implications for sources, sinks, and transport of solutes and sediment in the watershed. Riparian areas, wetlands, and the benthos of streams and waterbodies are nodes of interaction between surface and groundwater flowpaths, yielding reactive environments in which "hot spots" of biogeochemical transformation develop (McClain et al., 2003). Thus, any alteration of surface and subsurface hydrologic flowpaths, for

[1] The term *runoff* is often used in two senses. For a given precipitation event, direct *storm runoff* refers to the rainfall (minus losses) that is shed by the landscape to a receiving waterbody. In an area of 100 percent imperviousness, the runoff nearly equals the rainfall (especially for larger storms). Over greater time and space scales, *surface water runoff* refers to streamflow passing through the outlet of a catchment, including base flow from groundwater that has entered the stream channel. The raw units of runoff in either case are volume per time, but the volumetric flowrate (discharge) is often divided by contributing area to express runoff in units of depth per time. In this way, unit runoff rates from various-sized watersheds can be compared to account for differences other than the contributing area.

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example due to urbanization, not only alters the properties of soil and vegetation canopy but also reforms the ecosystem distribution of biogeochemical transformations.

Runoff Measurements

Surface water runoff for a given area is measured by dividing the discharge at a given point in the stream channel by the contributing watershed area. The basic variables describing channel hydraulics include width, mean depth, slope, roughness, and velocity. Channel discharge is the product of width, depth, and velocity and is typically estimated by either directly measuring each of these three components, or by development of a rating curve of measured discharge as a function of water depth, or stage relative to a datum, of the channel that is more easily estimated by a staff gauge or pressure transducer. The establishment of a gauging station to measure discharge typically requires a stable cross section so that stage can be uniquely related to discharge. Maintenance of reliable, long-term gauge sites is expensive and requires periodic remeasurement to update rating curves, as well as to remove temporary obstructions that may raise stage relative to unobstructed conditions.

Most stream gauging in the United States is carried out by the USGS, and can be found on-line at *http://waterdata.usgs.gov/nwis*. Recent reviews of standard methods of stream gauging and the status of the USGS stream gauging network are given by the USGS (1998) and the National Research Council (NRC, 2004). A major concern is the overall decline in the number of active gauges, particularly long-term gauges, as well as the representativeness of the stream gauge network relative to the needs of stormwater permitting. For example, restored streams typically lack any gauged streamflow or water quality information prior to or following restoration. This makes it very difficult to assess both the potential for successful restoration and whether project goals are met.

Support of existing and development of new gauges is often in collaboration through a co-funding mechanism with other agencies. Municipal co-funding for stations in support of National Pollutant Discharge Elimination System (NPDES) permitting is common and has tended to shift the concentration of active gauges toward more urban areas. Note that the USGS river monitoring system was originally designed for resource inventory, and therefore did not originally sample many headwater streams, particularly intermittent and ephemeral channels that are typically most proximal to stormwater discharges. While this is beginning to change with municipal co-funding, headwater streams are still underrepresented in the National Water Information System relative to their ecological significance.

Reliable records for stream discharge are vital because the frequency distribution and temporal trends of flows must be known to evaluate long-term loading to waterbodies. Magnitude and frequency analysis of sediment and other

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stream constituent loads consists of a transport equation as a function of discharge, integrated over the discharge frequency distribution (e.g., Wolman and Miller, 1960). Different constituent loads have different forms of dependency on discharge, but are often nonlinear such that long-term or expected loads cannot be simply evaluated from mean flow conditions. Similar to precipitation, discharge levels often follow an Extreme Value distribution, dependent on climate, land use, and hydrogeology, but which is typically dampened compared to precipitation due to the memory effects of subsurface storage and flows (e.g., Winter, 2007).

Impacts of Urbanization on Runoff

Shift from Infiltration and Evapotranspiration to Surface Runoff

Replacement of vegetation with impervious or hardened surfaces affects the hydrologic budget—the quantity of water moving through each component of the hydrologic cycle—in a number of predictable ways. As the percent of the landscape that is paved over or compacted is increased, the land area available for infiltration of precipitation is reduced, and the amount of stormwater available for direct surface runoff becomes greater, leading to increased frequency and severity of flooding. Reduced infiltration of precipitation leads to reduced recharge of the groundwater reservoir; absent new sources of recharge, this can lead to reduction in base flow of streams (e.g., Simmons and Reynolds, 1982; Rose and Peters, 2001). Vegetation removal also results in a lower amount of evapotranspiration compared to undeveloped land. This can have particularly profound hydrologic effects in those regions of the country where a significant percent of precipitation is evapotranspirated, such as the arid Southwest (Ng and Miller, 1980). Figure 3-11 illustrates the changes to these components of the hydrologic budget as the percent of impervious area is increased.

It should be noted that the conversion in hydrology from infiltrated water to surface runoff following urbanization is not entirely straightforward in all cases. Leaking pressurized water supply pipes and sanitary sewers, subsurface discharge of septic system effluent (Burns et al., 2005), infiltration of stormwater from unlined detention ponds, and lawn irrigation can offset reduced infiltration of precipitation, such that stream baseflow levels may actually be increased, especially during low base flow months, when such effects would be most pronounced (Konrad and Booth, 2005; Meyer, 2005). Cracks in sealed surfaces can also provide concentrated points of infiltration (Sharp et al., 2006).

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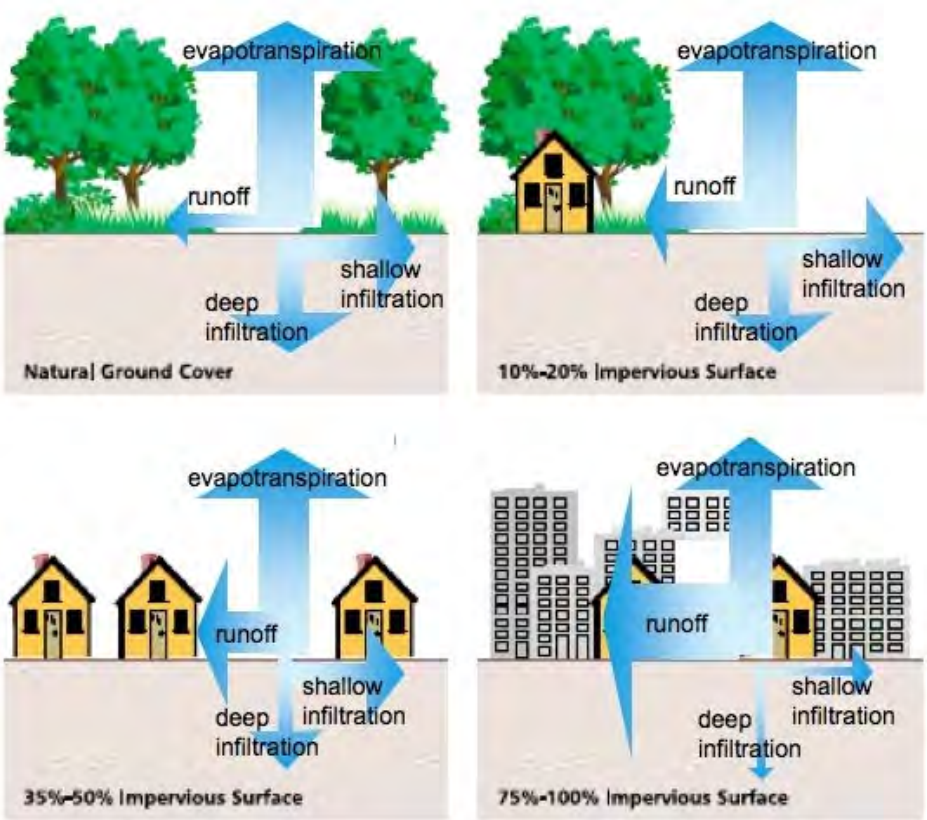

FIGURE 3-11 As land cover changes from vegetated and undeveloped (upper left) to developed with increased connected impervious surfaces (lower right), the partitioning of precipitation into other components of the hydrologic cycle is shifted. Evapotranspiration and shallow and deep infiltration are reduced, and surface runoff is increased. SOURCE: Adapted from the Federal Interagency Stream Restoration Working Group (FISRWG, 2000).

Relationship Between Imperviousness, Drainage Density, and Runoff

Excess runoff due to urbanization is a direct reflection of the land uses onto which the precipitation falls, as well as the presence of drainage systems that receive stormwater from many separate source areas before it enters receiving waters. Thus, a functional way of partitioning urban areas is by the nature of the impervious cover and by its connection to the drainage system, underlying the differentiation of total impervious area and effective impervious area discussed in Box 1-2.

As examples of how runoff changes with urbanization, Figure 3-12 shows

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daily stream flow values for a low-density suburban catchment and a high-density urban catchment in the Baltimore, Maryland area. The low-density site (Figure 3-12A) shows a strong seasonal signal and a marked decline in flow during an extreme drought in 2002. In contrast, the more densely urbanized catchment (Figure 3-12B) shows a much greater variability in flow that is dominated by impervious surface runoff, and a dampened response to the drought because natural groundwater flow is a much smaller component of the total discharge.

The percentage of time a discharge level is equaled or exceeded is displayed by flow duration curves, which show the cumulative frequency distributions of flows for a given duration. Examples for three catchments in the Baltimore area are given in Figure 3-13, showing the tendency for urban areas to produce high flows with much longer aggregate durations.

As another example of how runoff changes with imperviousness, a locally calibrated version of WinSLAMM was used to investigate the relationships between watershed and runoff characteristics for 125 individual neighborhoods in

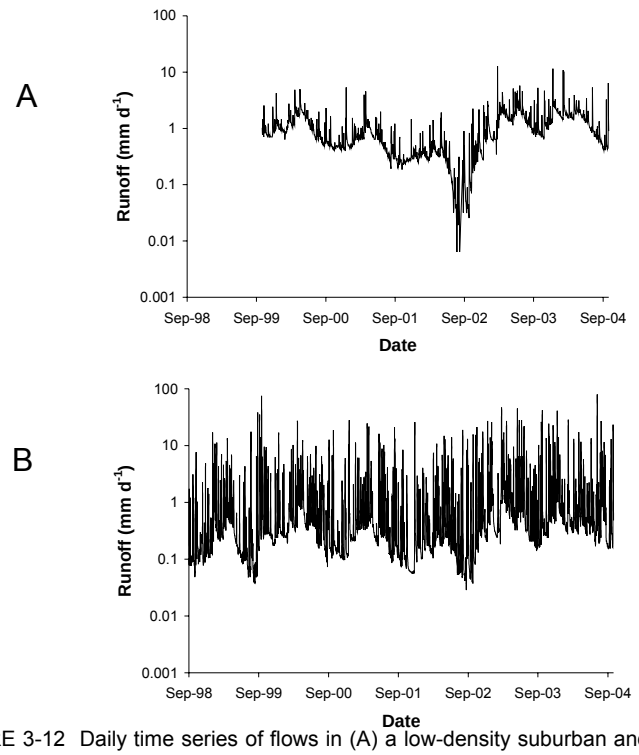

FIGURE 3-12 Daily time series of flows in (A) a low-density suburban and forested catchment (Baisman Run, *http://waterdata.usgs.gov/md/nwis/uv/?site_no=01583580*) and (B) a catchment dominated by medium- to high-density residential and commercial land uses (Dead Run, *http://waterdata.usgs.gov/md/nwis/uv/?site_no=01589330*). Both lie within the Piedmont physiographic province.

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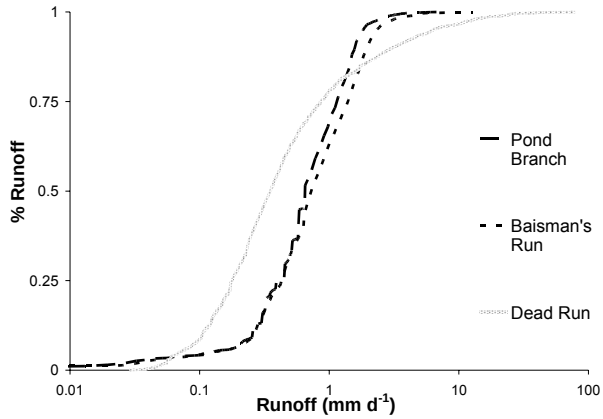

FIGURE 3-13 Flow duration curves for three watersheds with distinct land use in the Baltimore, Maryland area. Pond branch is a forested reference site, Baisman's Run is ex-urban, and Dead Run is urban. Urban areas have flashier runoff with greater frequency of low and high extreme flows.

Jefferson County, Alabama (Bochis-Micu and Pitt, 2005). Figure 3-14 shows the relationships between the directly connected impervious area values and the calculated volumetric runoff coefficient (R_v, which is the volumetric fraction of the rainfall that occurs as runoff), based on 43 years of local rain data. As expected, there is a strong relationship between these parameters for both sandy and clayey soil conditions. It is interesting to note that the R_v values are relatively constant until values of directly connected impervious cover of 10 to 15 percent are reached (at R_v values of about 0.07 for sandy soil areas and 0.16 for clayey soil areas)—the point where receiving water degradation typically has been observed to start (as discussed later in the chapter). The 25 to 30 percent directly connected impervious levels (where significant degradation is usually observed) is associated with R_v values of about 0.14 for sandy soil areas and 0.25 for clayey soil areas; this is where the curves start to greatly increase in slope.

Relationship Between Runoff and Rainfall Conditions

The runoff that results from various land uses also varies depending on rainfall conditions. For small rain depths, almost all the runoff originates solely from directly connected impervious areas, as disconnected areas have most of their flows infiltrated (Pitt, 1987). For larger storms, both directly connected

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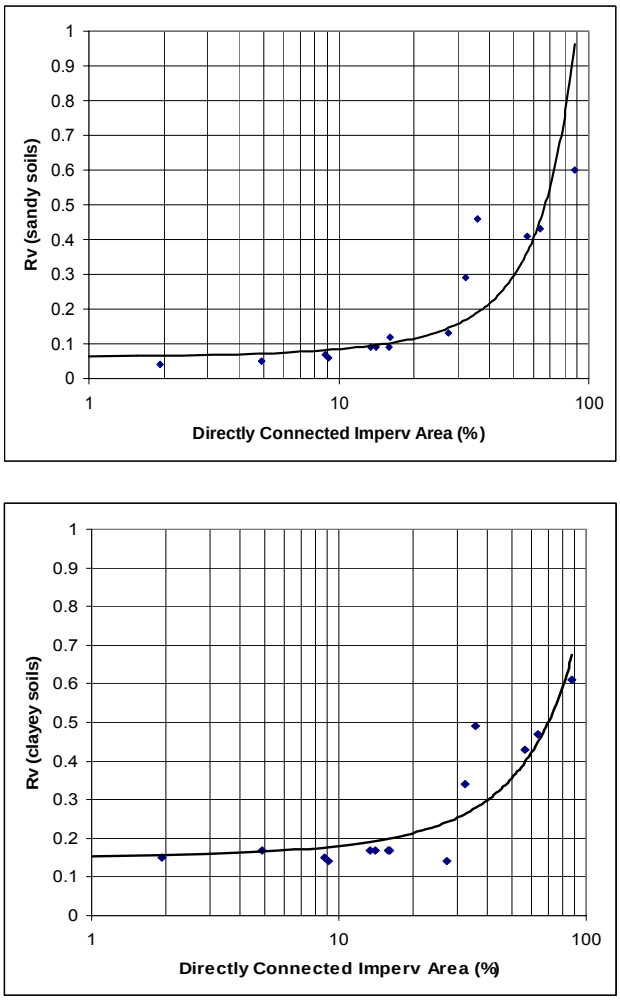

FIGURE 3-14 Relationships between the directly connected impervious area (%) and the calculated volumetric runoff coefficients (R_v) for sandy soil (top) and clayey soil (bottom). SOURCE: Reprinted, with permission, from Bochis-Micu and Pitt (2005). Copyright 2005 by Water Environment Federation, Alexandria, Virginia.

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and disconnected impervious areas contribute runoff to the stormwater management system. For example, Figure 3-15 (created using WinSLAMM; Pitt and Voorhees, 1995) shows the relative runoff contributions for a large commercial/mall area in Hoover, Alabama, for different rains (Bochis, 2007). In this example, about 80 percent of the runoff originates from the parking areas for the smallest runoff-producing rains. This contribution decreases to about 55 percent at rain depths of about 0.5 inch (13 mm). This decrease in the importance of parking areas as a source of runoff volume is associated with an increase in runoff contributions from streets and directly connected roofs. In many areas, pervious areas are not hydrologically active until the rain depths are relatively large and are not significant runoff contributors until the rainfall exceeds about 25 mm for many land uses and soil conditions. However, compacted urban soils can greatly increase the flow contributions from pervious areas during smaller rains. Burges and others (1998), for example, found that more than 60 percent of the storm runoff in a suburban development in western Washington State originated from nominally "green" parts of the landscape, primarily lawns.

A further example illustrating the relationship between rainfall and runoff is given for Milwaukee, summarized in Box 3-6. The two curves of Figure 3-16 show a relationship between rainfall and runoff that is typical of urban areas. Very small storms (< 0.05 inch) produce no measurable runoff, owing to removal by interception storage and evaporation. Storms that deposit up to one inch of rainfall constitute about 90 percent of the storm events in this region, but these events produced only about 50 percent of the runoff. Very large events (greater than 3 inches of precipitation) are rare and destructive, accounting for only a few percent of the annual rainfall events.

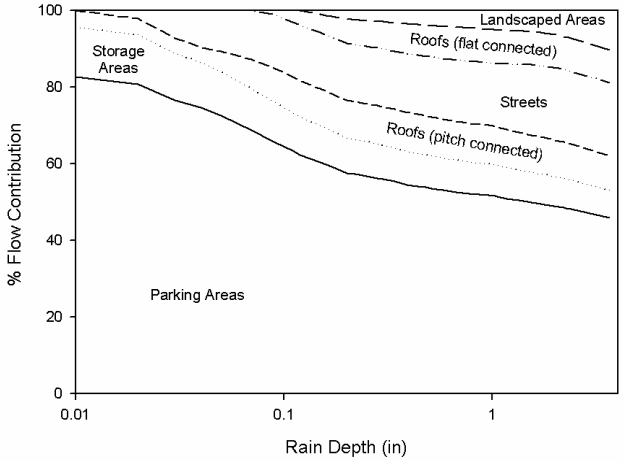

FIGURE 3-15 Surfaces contributing to runoff for a commercial/mall area. SOURCE: Reprinted, with permission, from Bochis (2007). Copyright 2007 by Celina Bochis.

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BOX 3-6
Example Rainfall and Runoff Distributions

Figure 3-16 is an example of rainfall and runoff observed at Milwaukee, Wisconsin (Bannerman et al., 1983), as monitored during the Nationwide Urban Runoff Program (NURP) (EPA, 1983). This observed distribution is interesting because of the unusually large rains that occurred twice during the monitoring program. These two major rains would be in the category of design storms for conventional drainage systems. These plots indicate that these very large events, in the year they occurred, caused a measureable fraction of the annual pollutant loads and runoff volume discharges, but smaller events were responsible for the vast majority of the discharges. In typical years, when these rare design events do not occur, their pro-rated contributions would be even smaller.

More than half of the runoff from this typical medium-density residential area was associated with rain events that were smaller than 0.75 inch. Two large storms (about 3 and 5 inches in depth), which are included in the figure, distort this figure because, on average, the Milwaukee area only expects one 3.5-inch storm about every five years, and 5-inch storms even less frequently. If these large rains did not occur, such as for most years, then the significance of the smaller rains would be even greater. The figure also shows the accumulated mass discharges of different pollutants (suspended solids, chemical oxygen demand [COD], phosphates, and lead) monitored during the Milwaukee NURP project. When these figures are compared, it is seen that the runoff and pollutant mass discharge distributions are very similar and that variations in the runoff volume are much more important than variations in pollutant concentrations (the mass divided by the runoff volume) for determining pollutant mass discharges.

These rainfall and runoff distributions for Milwaukee can thus be divided into four regions:

- **Less than 0.5 inch.** These rains account for most of the events, but little of the runoff volume, and they are therefore easiest to control. They produce much less pollutant mass discharge and probably have less receiving water effects than other rains. However, the runoff pollutant concentrations likely exceed regulatory standards for several categories of critical pollutants (bacteria and some total recoverable heavy metals). They also cause large numbers of overflow events in uncontrolled combined sewers. These rains are very common, occurring once or twice a week (accounting for about 60 percent of the total rainfall events and about 45 percent of the total runoff-generating events), but they only account for about 20 percent of the

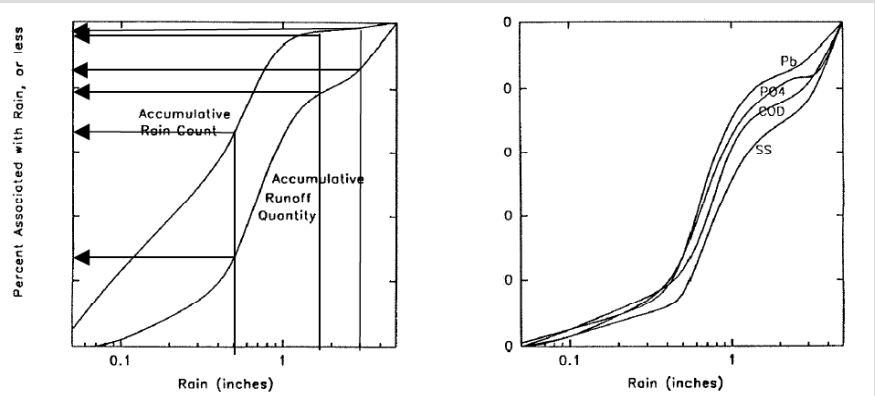

FIGURE 3-16 Milwaukee rainfall and runoff probability distributions, and pollutant mass discharge probability distributions (1981 to 1983). Rain count refers to the number of rain events. SOURCE: Data from Bannerman et al. (1983).

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BOX 3-6 Continued

annual runoff and pollutant discharges. Rains less than about 0.05 inch did not produce noticeable runoff.

- **0.5 to 1.5 inches**. These rains account for the majority of the runoff volume (about 50 percent of the annual volume for this Milwaukee example) and produce moderate to high flows. They account for about 35 percent of the annual rain events, and about 20 percent of the annual runoff events, by number. These rains occur on average about every two weeks from spring to fall and subject the receiving waters to frequent high pollutant loads and moderate to high flows.

- **1.5 to 3 inches**. These rains produce the most damaging flows from a habitat destruction standpoint and occur every several months (at least once or twice a year). These recurring high flows, which were historically associated with much less frequent rains, establish the energy gradient of the stream and cause unstable streambanks. Only about 2 percent of the rains are in this category, but they are responsible for about 10 percent of the annual runoff and pollutant discharges.

- Greater than **3 inches.** The rains in this category are included in design storms used for traditional drainage systems in Milwaukee, depending on the times of concentration and rain intensities. These rains occur only rarely (once every several years to once every several decades, or less frequently) and produce extremely large flows that greatly exceed the capacities of the storm drainage systems, causing extensive flooding. The monitoring period during the Milwaukee NURP was unusual in that two of these events occurred. Less than 2 percent of the rains were in this category (typically <<1 percent would be in this category), and they produced about 15 percent of the annual runoff quantity and pollutant discharges. However, when they do occur, substantial property and receiving water damage results (mostly associated with habitat destruction, sediment scouring, and the flushing of organisms great distances downstream and out of the system). The receiving water can conceivably recover naturally to pre-storm conditions within a few years. These storms, while very destructive, are sufficiently rare that the resulting environmental problems do not justify the massive controls that would be necessary to decrease their environmental effects.

Alteration of the Drainage Network

As shown in Figure 3-17, urbanization disrupts natural systems in ways that further complicate the hydrologic budget, beyond the imperviousness effects on runoff discussed earlier. As an area is urbanized, lower-order stream channels are typically re-routed or encased in pipes and paved over, resulting in a highly altered drainage pattern. The buried stream system is augmented by an extensive system of storm drains and pipes, providing enhanced drainage density (total lengths of pipes and channels divided by drainage area) compared to the natural system. Figure 3-18 shows how the drainage density of Baltimore today compares to the natural watershed before the modern stormwater system was fully developed. The artificial drainage system occupies a greater percentage of the landscape compared to natural conditions, permanently altering the terrestrial component of the hydrologic cycle.

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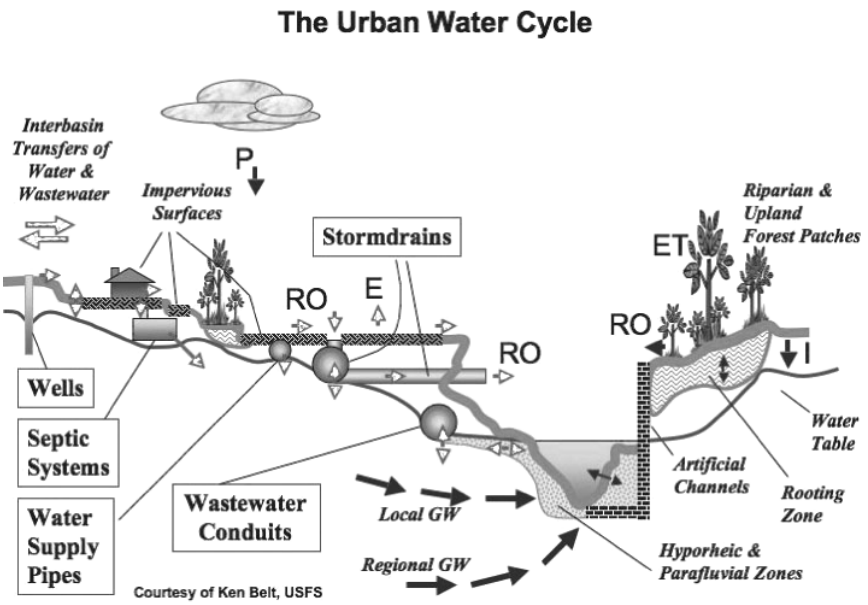

FIGURE 3-17 Alteration of the natural hydrologic cycle by the presence of piped systems. Black arrows represent the natural system; outlined arrows indicate short-circuiting due to piped systems. Note that several elements of the water cycle shown in this diagram are not considered in this report, such as septic systems, interbasin transfers of water and wastewater, and the influence of groundwater withdrawals. SOURCE: Courtesy of Kenneth Belt, USDA Forest Service, Baltimore, Maryland.

Flowpaths are altered in other ways by urban infrastructure. Buried stormwater and sewer pipes can act as infiltration galleries for groundwater, causing shortened groundwater flowpaths between groundwater reservoirs and stream systems. Natural surface water pathways are often interrupted or reversed, as shown by the blue lines in Figure 3-19 for a drainage system in Baltimore. Understanding how the system operates as a whole can often require knowledge of the history of construction conditions and field verification of the actual flow paths.

Large-scale infrastructure such as dams, ponds, and bridges can also have a major impact on stormwater flows. Figure 3-20 illustrates the interruption of the drainage network by bridges and culverts, even in places where there have been attempts to keep excessive development out of the riparian corridor. Simulations and post-flood mapping in areas around Baltimore have shown that bridge abutments such as those shown in Figure 3-20 can slow down channel floodwaters during storms. This is because water backs up behind bridges constructed

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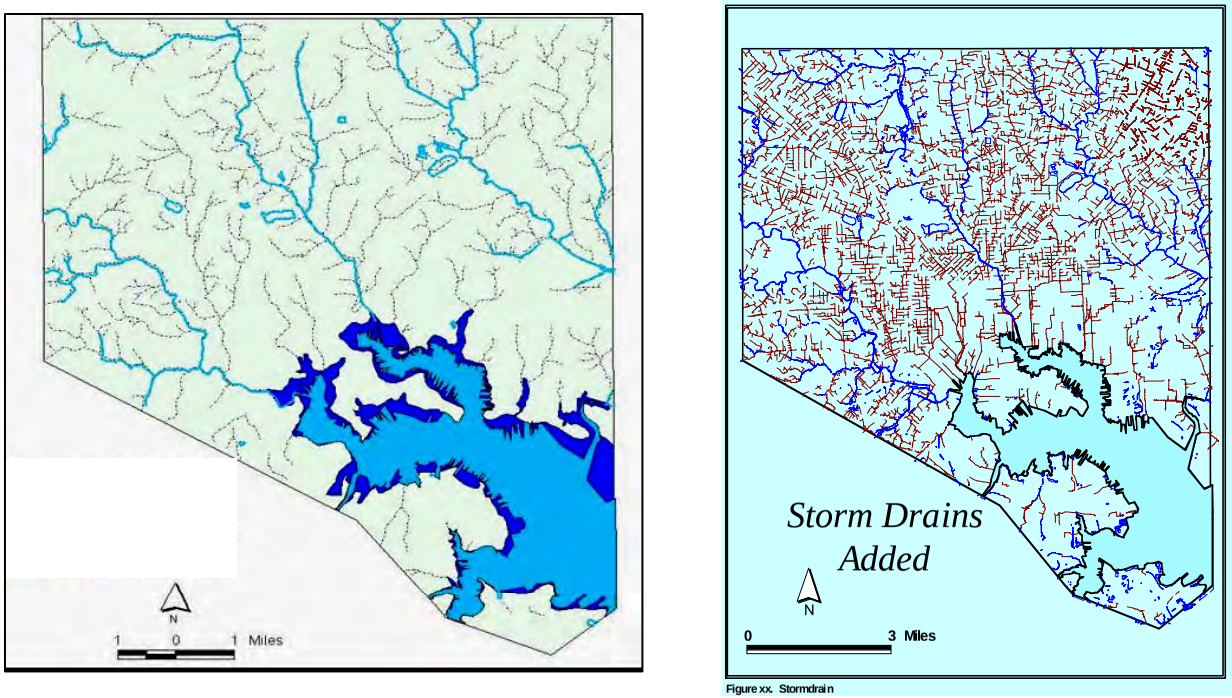

FIGURE 3-18 Baltimore City before and after development of its stormwater system. The left-hand panel shows first- and second-order streams lost to development. The right-hand panel shows the increase in drainage density resulting from construction of the modern storm-drain network. SOURCE: Courtesy of William Stack, Baltimore Department of Public Works.

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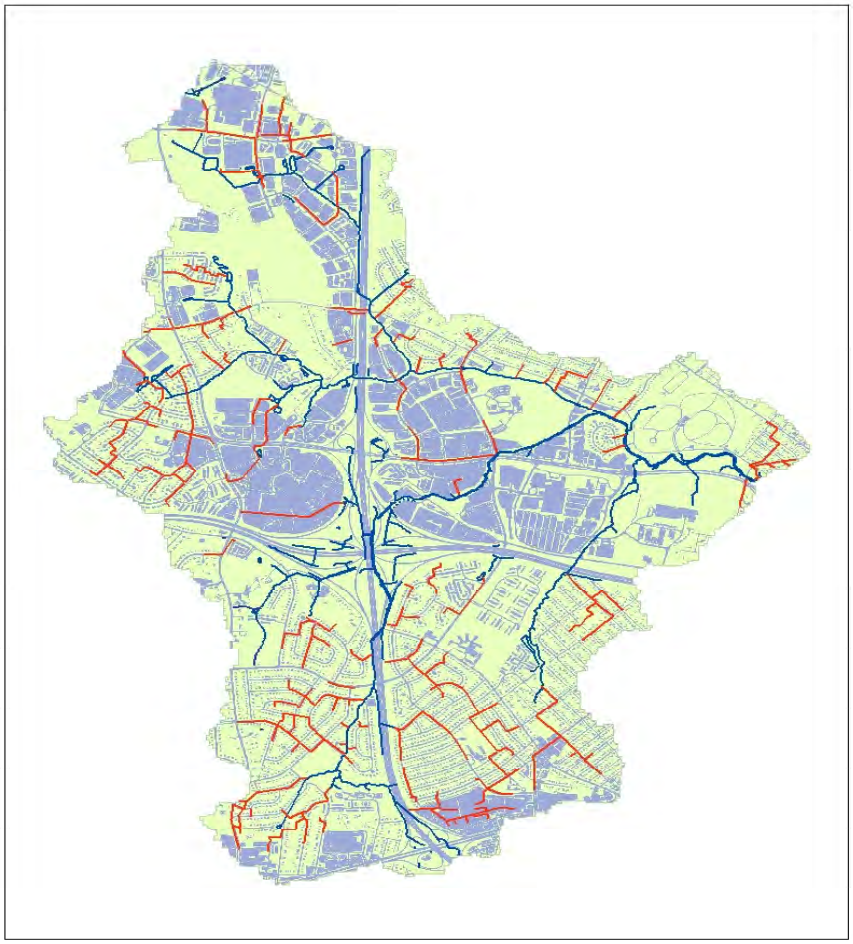

FIGURE 3-19 Dead Run drainage system, Baltimore, Maryland. Black lines indicate surface (daylighted) drainage; dark grey indicates the subsurface storm-drain system. The surface drainage system is highly disconnected. From the coverage it is difficult to impossible to discern the flow direction of some of the surface drainage components. SOURCE: Reprinted, with permission, from Meierdierks et al. (2004). Copyright 2004 by the American Geophysical Union.

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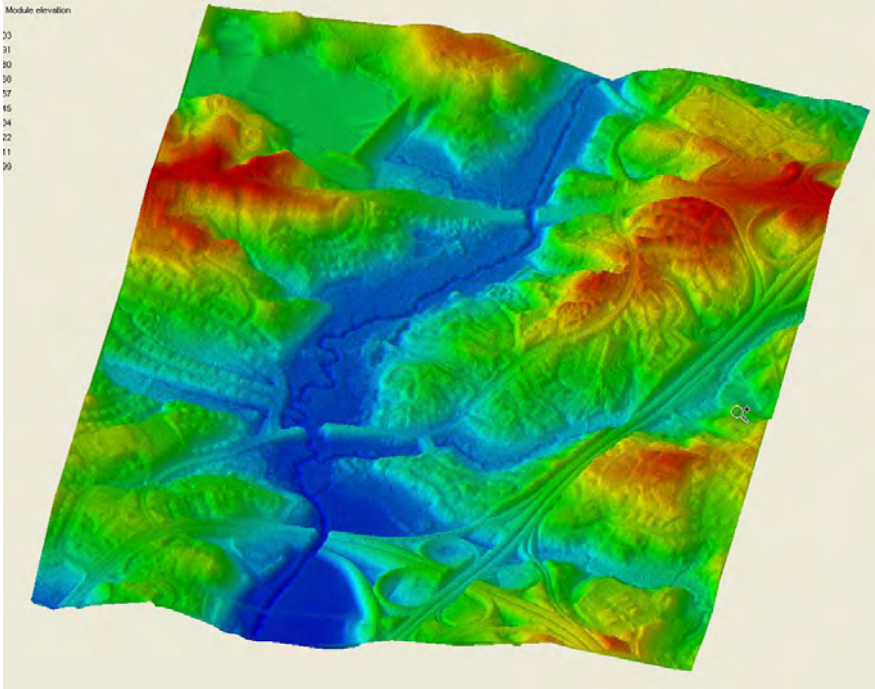

FIGURE 3-20 Shaded-relief lidar image of a portion of the Middle Patuxent River valley in Howard County, Maryland, showing the pervasive interruption of the drainage network by bridges and culverts, even in places where there is an attempt to keep excessive development out of the riparian corridor. SOURCE: Reprinted, with permission, from Miller, University of Maryland, Baltimore County. Copyright 2006 by Andrew J. Miller.

across the floodplain and spreads out over land surfaces and then flows back into channels as floodwaters subside. Although reducing the severity of downstream flooding, this phenomenon also interrupts the transport of sediment, leading to local zones of both enhanced deposition and downstream scour.

Alteration of Travel Times

The combination of impervious surface and altered drainage density provides significantly more rapid hydraulic pathways for stormwater to enter the nearest receiving waterbody compared to a natural landscape. This is illustrated quantitatively by Figure 3-21, which shows that the lag time—the difference in time between the center of mass of precipitation and the center of mass of the storm response hydrograph—is reduced for an urbanized landscape compared to a natural one.

The increase in surface runoff volumes and reduction in lag times between

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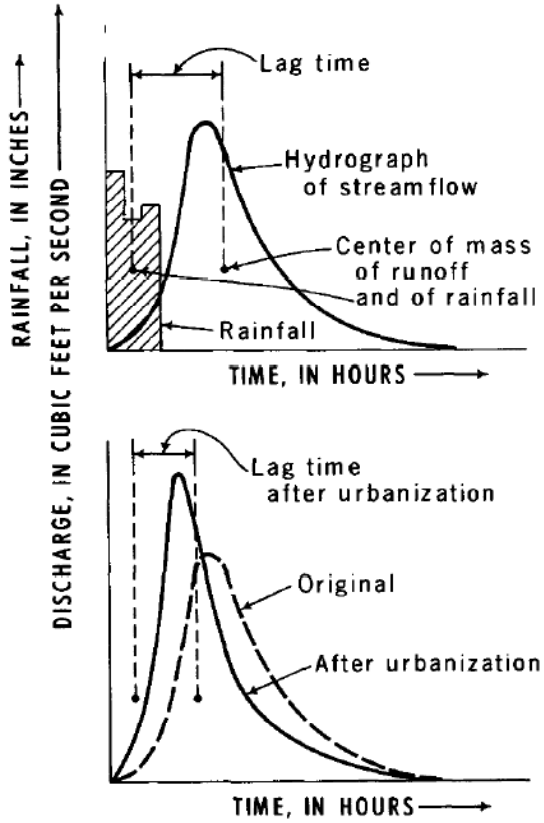

FIGURE 3-21 Illustration of the effect of urbanization on storm hydrograph lag time, the difference in time between the center of mass of rainfall and runoff response before and after urbanization. SOURCE: Leopold (1968).

precipitation and a waterbody's response give rise to greater velocities and volumetric discharges in receiving waters. Storm hydrographs in a developed setting peak earlier and higher than they do in undeveloped landscapes. This altered flow regime is of concern to property owners because upstream development can increase the probability of a flood-prone property being inundated. Properties in the floodplain and near stream channels are particularly susceptible to flooding from upstream development. Such increased flood risk is accompanied by associated potential property damages and costs of replacement or repair.

Various descriptors can be used to quantify the effects of urbanization on streamflow including flood frequency, flow duration, mean annual flood, discharge at bankfull stage, and frequency of bankfull stage. The "classic" view of

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urban-induced changes to runoff was presented by Leopold (1968), who provided several quantitative descriptors of the effects of urbanization on the mean annual flood. For example, Figure 3-22 shows the ratio of discharge before and after urbanization for the mean annual flood for a 1-square-mile area as a function of percentage of impervious area and percentage area served by a storm-drain system. This shows that for unsewered areas, increases from 0 to 100 percent impervious area will increase the peak discharge by a factor of 2.5. However, for 100 percent sewered areas, the ratio of peak discharges ranges from 1.7 to 8 for 0 to 100 percent impervious area. Clearly both impervious surfaces and the presence of a storm-drain system combine to increase discharge rates in receiving waters. Combining this information with regional flood frequency data, a discharge–frequency relationship can be developed that shows the expected discharge and recurrence interval for varying degrees of storm-drain coverage and impervious area coverage. An example is shown in Figure 3-23, using data from the Brandywine Creek watershed in Pennsylvania (Leopold, 1968). Bankfull flow for undeveloped conditions in general has a recurrence interval of about 1.5 years (which, in the particular case of the Brandywine, was 67 cubic feet per second); with 40 percent of the watershed area paved, this discharge would occur about three times as often.

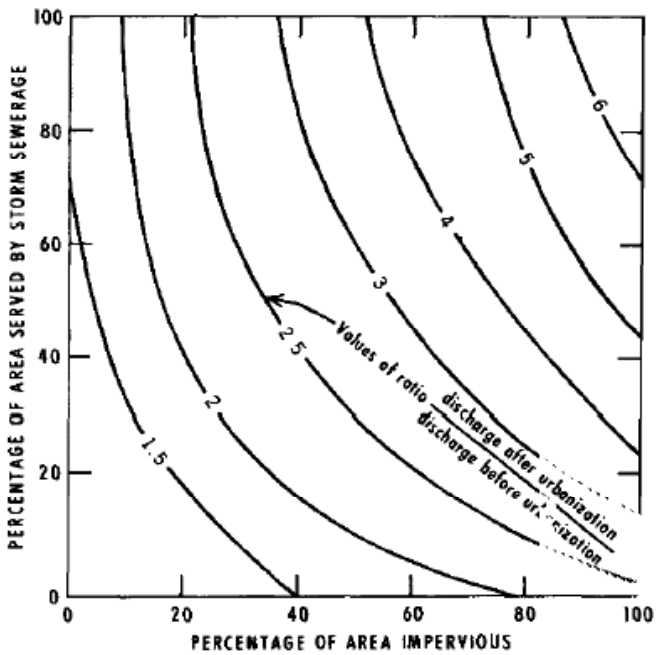

FIGURE 3-22 Ratio of peak discharge after urbanization to peak discharge before urbanization for the mean annual flood for a 1-square-mile drainage area, as a function of percent impervious surface and percent area drained by storm sewers. SOURCE: Leopold (1968).

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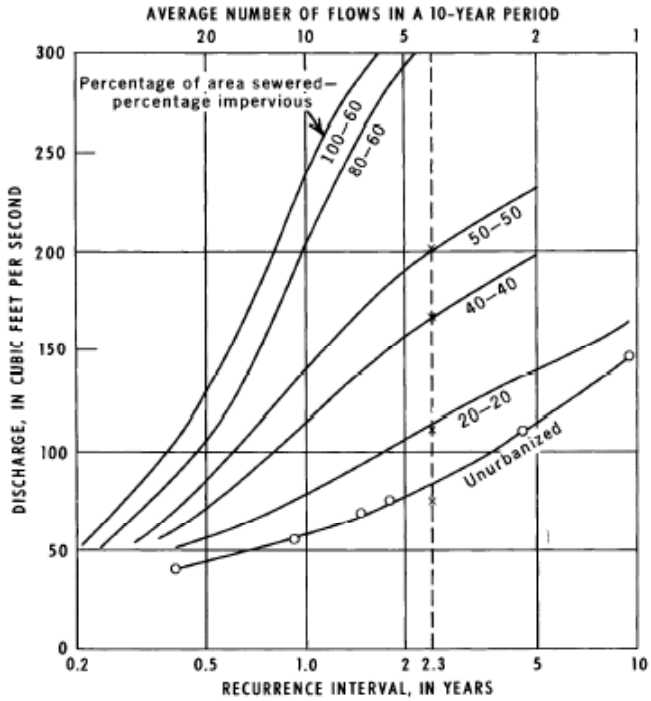

FIGURE 3-23 Flood frequency curves as a function of percent impervious area and percent of area serviced by storm sewers. The unurbanized data are from Brandywine Creek, Pennsylvania. SOURCE: Leopold (1968).

Over the past four decades since this first quantitative characterization of urban hydrology, a much greater variety of hydrologic changes resulting from urbanization has been recognized. Increases in peak discharge are certainly among those changes, and they will always gather attention because of their direct impact on human infrastructure and potential for more frequent and more severe flooding. The extended duration of flood flows, however, also affects natural channels because of the potential increase in erosion. Ecological effects of urban-altered flow regimes are even more diverse, because changes in the sequence and frequency of high flows, the rate of rise and fall of the hydrograph, and even the season of the year in which high flows can occur all have significant ecological effects and can be dramatically altered by watershed urbanization (e.g., Rose and Peters, 2001; Konrad et al., 2005; Roy et al., 2005; Poff et al., 2006).

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The overarching conclusion of many studies is that the impact of urbanization on the hydrologic cycle is dramatic. Increased impervious area and drainage connectedness decreases stormwater travel times, increases flow rates and volumes, and increases the erosive potential of streams. The flooding caused by increased flows can be life-threatening and damaging to property. As described below, changes to the hydrologic flow regime also can have deleterious effects on the geomorphic form of stream channels and the stability of aquatic ecosystems. Although these impacts are commonly ignored in efforts to improve "water quality," they are inextricably linked to measured changes in water chemistry and must be part of any attempt to recover beneficial uses that have been lost to upstream urbanization.

Geomorphology

Watershed geomorphology is determined by the arrangement, interactions, and characteristics of component landforms, which include the stream-channel network, the interlocking network of ridges and drainage divides, and the set of hillslopes between the channel (or floodplain) and ridge. The stream and ridge systems define complementary networks, with the ridge (or drainage divide) network separating the drainage areas contributing to each reach in the stream network. At the hillslope scale, the ridges provide upper boundaries of all surface flowpaths which converge into the complementary stream reaches. A rich literature describes the topology and geometry of stream and ridge networks (e.g., Horton, 1945; Strahler, 1957, 1964; Shreve, 1966, 1967, 1969; Smart, 1968; Abrahams, 1984; Rodriguez-Iturbe et al., 1992).

Besides stream channels, a variety of other water features and landforms make up a watershed. Fresh waterbodies (ponds, lakes, and reservoirs) are typically embedded within the stream network, while wetlands may be either embedded within the stream network or separated and upslope from the channels. Estuaries represent the interface of the stream network with the open ocean. Additional fluvial and colluvial landforms include alluvial fans, landslide features, and a set of smaller features within or near the channels and floodplains including bar deposits, levees, and terraces. Each of these landforms are developed and maintained by the fluvial and gravitational transport and deposition of sediment, and are therefore potentially sensitive to disruption or alteration of flowpaths, hydrologic flow regimes, and sediment supply.

Stream Network Form and Ordering Methods

Most watersheds are fully convergent, with tributary streams combining to form progressively larger channels downstream. The manner is which streams from different source areas join to produce mainstreams strongly influences the propagation of stormwater discharge and pollutant concentrations, and the con-

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sequent level of ecological impairment in the aquatic ecosystem.

Methods for indexing the topologic position of individual reaches within the drainage network have been introduced by Horton (1945), Strahler (1957), Shreve (1966, 1967) and others. All stream topologic systems are dependent on the identification of first-order streams—the most upstream element of the network—and their lengths and drainage areas. Unfortunately, no universal standards exist to define where the stream head is located, or whether perennial, intermittent, and ephemeral channels should be considered in this determination. While this may seem like a trivial process, the identification and delineation of these sources effectively determines what lengths and sections of channels are defined to be *waterbodies* and, thus, the classification of all downstream waterbodies.

Nadeau and Rains (2007) have recently reviewed stream-channel delineation in the United States using standardized maps and hydrographic datasets to better relate climate to the extent of perennial, intermittent, and ephemeral channel types. Because this may influence the set of stream channels that are regulated by the Clean Water Act (CWA), it is the subject of current legal arguments in courts up to and including the Supreme Court (e.g., *Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers*, 531 U.S. 159 [2001], *John A. Rapanos et al. vs. United States* [U.S., No. 04-1034, 2005]). In addition to the stream-channel network, additional features (discussed below) that are embedded in or isolated from the delineated stream network (lakes, ponds, and wetlands) are subject to regulation under the CWA based on their proximity or interaction with the defined stream and river network. Therefore, definition of the extent and degree of connectivity of the nation's stream network, with an emphasis on the headwater region, is a critical determinant of the set of waterbodies that are regulated for stormwater permitting (Nadeau and Rains, 2007).

Stream Reach Geomorphology

Within the channel network, stream reaches typically follow a regular pattern of changes in downstream channel form. Hydraulic geometry equations, first introduced by Leopold and Maddock (1953), describe the gross geomorphic adjustment of the channel (in terms of average channel depth and width) to the flow regime and sometimes the sediment supply. Within this general pattern of larger flows producing larger channels, variations in channel form are evident, particularly the continuum among straight, meandering, or braided patterns. These forms are dependent on the spatial and temporal patterns of discharge, sediment supply, transport capacity, and roughness elements.

Most natural channels have high width-to-depth ratios and complexity of channel form compared with engineered channels. Meanders are ubiquitous self-forming features in channels, created as accelerated flow around the outside of the meander entrains and transports more sediment, producing greater flow depths and eroding the bank, while decelerated flow on the inside of the mean-

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der results in deposition and the formation of lower water depth and bank gradients. These channels typically show small-scale alternation between larger cross sections with lower velocities and defining pools, and smaller cross sections with higher velocity flow in riffles. Braided streams form repeated subdivision and reconvergence of the channel in multiple threads, with reduced specific discharge compared to a single channel. Natural obstructions including woody debris, boulders, and other large (relative to channel dimensions) features all contribute to hydraulic and habitat heterogeneity. The complexity of these channel patterns contributes to hydraulic roughness, further dissipating stream energy by increasing the effective wetted perimeter of the channel through a valley and deflecting flow between banks.

Embedded Standing Waterbodies

Standing waterbodies include natural, constructed, or modified ponds and lakes and are characterized by low or near-zero lateral velocity. They can be thought of as extensions of pools within the drainage network, although there is no clear threshold at which a pool can be defined as a pond or lake. When they are embedded within the channel network, they are characterized with much greater cross-sectional area (width x depth), lower surface water slopes (approaching flat), and lower velocities than a stream reach of similar length. Therefore, standing waterbodies function as depositional zones, have higher residence times, and provide significant storage of water, sediment, nutrients, and other pollutants within the stream network.

Riparian Zone

The riparian area is a transitional zone between the active channel and the uplands, and between surface water and groundwater. The area typically has shallower groundwater levels and higher soil moisture than the surrounding uplands, and it may support wetlands or other vegetation communities that require higher soil moisture. Riparian zones provide important ecosystem functions and services, such as reducing peak flood flows, transforming bioavailable nutrients into organic matter, and providing critical habitat.

In humid landscapes, a functioning riparian area commonly is an area where shallow groundwater forms discharge seeps, either directly to the surface and then to the stream channel or through subsurface flowpaths to the stream channel. The potential for high moisture and organic material content provides an environment conducive to anaerobic microbial activity, which can provide effective sinks for inorganic nitrogen by denitrification, reducing nitrate loading to the stream channel. However, the width of the effective riparian zone depends on local topographic gradients, hydrogeology, and the channel geomorphology (Lowrance et al., 1997). In steeply incised channels and valleys, or areas with

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deeper flowpaths, the riparian zone may be narrow and relatively well drained.

Under more arid conditions with lower groundwater levels, riparian areas may be the only areas within the watershed with sufficient moisture levels to support significant vegetation canopy cover, even though saturation conditions may occur only infrequently. Subsurface flowpaths may be oriented most commonly from the channel to the bed and banks, forming the major source of recharge to this zone from periodic flooding. In monsoonal climates in the U.S. southwest, runoff generated in mountainous areas or from storm activity may recharge riparian aquifers well downstream from the storm or snowmelt activity. Channelization that reduces this channel-to-riparian recharge may significantly impair riparian and floodplain ecosystems that provide critical habitat and other ecosystem services (NRC, 2002).

Floodplains

The presence and distribution of alluvial depositional zones, including floodplains, is dependent on the distribution and balance of upstream sediment sources and sediment transport capacity, the temporal and spatial variability of discharge, and any geological structural controls on valley gradient. Lateral migration of streams contributes to the development of floodplains as the outer bank of the migrating channel erodes sediment and deposition occurs on the opposite bank. This leads to channels that are closely coupled to their floodplains, with frequent overbank flow and deposition, backwater deposits, wetlands, abandoned channels, and other floodplain features. During major events, overbank flooding and deposition adds sediment, nutrients, and contaminants to the floodplain surface, and may significantly rework preexisting deposits and drainage patterns. Constructional landforms typical of urbanized watersheds, such as levees, tend to disconnect streams from their floodplains.

Changes in Geomorphology from Urbanization

Changes to channel morphology are among the most common and readily visible effects of urban development on natural stream systems (Booth and Henshaw, 2001). The actions of deforestation, channelization, and paving of the uplands can produce tremendous changes in the delivery of water and sediment into the channel network. In channel reaches that are alluvial, the responses are commonly rapid and often dramatic. Channels widen and deepen, and in some cases may incise many meters below the original level of their beds. Alternatively, channels may fill with sediment derived from farther upstream to produce a braided form where a single-thread channel previously existed.

The clearest single determinant of urban channel change is the alteration of the hydrologic response of an urban watershed, notably the increase in streamflow discharges. Increases in runoff mobilize sediment both on the land surface

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and within the stream channel. Because transport capacity increases nonlinearly with flow velocity (Vogel et al., 2003), much greater transport will occur in higher flow events. However, the low frequency of these events may result in decreasing cumulative sediment transport during the highest flows, as described by standard magnitude and frequency analysis (Wolman and Miller, 1960), such that the maximum time-integrated sediment transport occurs at moderate flows (e.g., bankfull stage in streams in the eastern United States).

If the increase in sediment transport caused by the shift in the runoff regime is not matched by the sediment supply, channel bed entrenchment and bank erosion and collapse lead to a deeper, wider channel form. Increases in channel dimensions caused by increased discharges have been observed in numerous studies, including Hammer (1972), Hollis and Luckett (1976), Morisawa and LaFlure (1982), Neller (1988), Whitlow and Gregory (1989), Moscrip and Montgomery (1997), and Booth and Jackson (1997). MacRae (1997), reporting on other studies, found that channel cross-sectional areas began to enlarge after about 20 to 25 percent of the watershed was developed, commonly corresponding to about 5 percent impervious cover. When the watersheds were completely developed, the channel enlargements were about 5 to 7 times the original cross-sectional areas. Channel widening can occur for several decades before a new equilibrium is established between the new cross-section and the new discharges.

Construction results in a large—but normally temporary—increase in sediment load to aquatic systems (e.g., Wolman and Schick, 1967). Indeed, erosion and sediment transport rates can reach up to more than 200 Mg/ha/yr on construction sites, which is well in excess of typical rates from agricultural land (e.g., Wolman and Schick, 1967; Dunne and Leopold, 1978); rates from undisturbed and well-vegetated catchments are negligible (e.g., <<1 Mg/ha/yr). The increased sediment loads from construction exert an opposing tendency to channel erosion and probably explain much of the channel narrowing or shallowing that is sometimes reported (e.g., Leopold, 1973; Nanson and Young, 1981; Ebisemiju, 1989; Odemerho, 1992).

Additional sediment is commonly introduced into the channel network by the erosion of the streambank and bed itself. Indeed, this source can become the largest single fraction of the sediment load in an urbanizing watershed (Trimble, 1997). For example, Nelson and Booth (2002) reported on sediment sources in the Issaquah Creek watershed, an urbanizing, mixed-use watershed in the Pacific Northwest. Human activity in the watershed, particularly urban development, has caused an increase of nearly 50 percent in the annual sediment yield, now estimated to be 44 tons/km^2/yr^1. The main sources of sediment in the watershed are landslides (50 percent), channel-bank erosion (20 percent), and stormwater discharges (15 percent).

The higher flow volumes and peak discharge caused by urbanization also tend to preferentially remove fine-grained sediment, leaving a lag of coarser bed material (armoring) or removing alluvial material entirely and eroding into the geologic substrate (Figure 3-24). The geomorphic outcome of these changes is a

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FIGURE 3-24 Example of an urban stream that has eroded entirely through its alluvium to expose the underlying consolidated geologic stratum below (Thornton Creek, Seattle, Washington). SOURCE: Derek Booth, Stillwater Sciences, Inc.

mix of erosional enlargement of some stream reaches, significant sedimentation in others, and potential head-ward downcutting of tributaries as discharge levels from small catchments increase. The collective effects of these processes have been described by Walsh et al. (2005) as "Urban Stream Syndrome," which includes not only the visible alteration of the physical form of the channel but also the consequent deterioration of stream biogeochemical function and aquatic trophic structures.

Other changes also accompany these geomorphic changes. Episodic inundation of the floodplain during floods may be reduced in magnitude and frequency, depending on the increases in peak flow relative to the deepening and resultant increase in flow capacity of the channel. Where deeply entrenched, this channel morphology will lower the groundwater level adjacent to the channel. The effectiveness of riparian areas in filtering or removing solutes is thus reduced because subsurface water may reach the channel only by flowpaths now well below the organic-rich upper soil horizons. Removal of fine-grained stream-bottom sediment, or erosion down to bedrock, may substantially lower the exchange of stream water with the surrounding groundwater of the hyporheic zone.

In addition to these indirect effects on the physical form of the stream channel, urbanization also commonly modifies streams directly to improve drainage, applying channel straightening and lining to reduce friction, increase flow capacity, and stabilize channel position (Figure 3-25). The enlarged and often

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FIGURE 3-25 Example of a channelized urban stream for maximized flood conveyance and geomorphic stability (Los Angeles River, California). SOURCE: Robert Pitt, University of Alabama.

lined and straightened stream-channel cross section reduces the complexity of the bed and the contact between the stream and floodplain, and increases transport efficiency of sediment and solutes to receiving waterbodies. Enhanced sedimentation of receiving waterbodies, in turn, reduces water clarity, decreases depth, and buries the benthic environment.

POLLUTANT LOADING IN STORMWATER

Hydrologic flowpaths influence the production of particulate and dissolved substances on the land surface during storms, as well as their delivery to the stream-channel network. Natural watersheds typically develop a sequence of ecosystem types along hydrologic flowpaths that utilize available limiting resources, thereby reducing their export farther downslope or downstream, such that in-stream concentrations of these nutrients are low. As a watershed shifts from having mostly natural pervious surfaces to having heavily disturbed soils, new impervious surfaces, and activities characteristic of urbanization, the runoff quality shifts from relatively lower to higher concentrations of pollutants. Anthropogenic activities that can increase runoff pollutant concentrations in urban watersheds include application of chemicals for fertilization and pest control; leaching and corrosion of pollutants from exposed materials; exhaust emissions,

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leaks from, and wear of vehicles; atmospheric deposition of pollutants; and inappropriate discharges of wastes.

Most lands in the United States that have been developed were originally grasslands, prairies, or forest. About 40 percent of today's developed land went through an agricultural phase (cropland or pastureland) before becoming urbanized, while more than half of today's developed land area has been a direct conversion of natural covers (USDA, 2000). Agricultural land can produce stormwater runoff with high pollutant concentrations via soil erosion, the introduction of chemicals (fertilizers, pesticides, and herbicides), animal operations that are major sources of bacteria in runoff, and forestry operations. Indeed, urban stormwater may actually have slightly lower pollutant concentrations than other nonpoint sources of pollution, especially for sediment and nutrients. The key difference is that urban watersheds produce a much larger annual volume of runoff waters, such that the mass of pollutants discharged is often greater following urbanization. Some of the complex land-use–pollutant loading relationships are evident in Box 3-7, which shows the measured annual mass loads of nitrogen and phosphorus in four small watersheds of different land use monitored as part of the Baltimore Long-Term Ecological Research program. Depending on the nutrient and the year, the agricultural and urban watersheds had a higher nutrient export rate than the forested subwatershed.

Table 3-3 summarizes the comparative importance of urban land-use types in generating pollutants of concerns that can impact receiving waters (Burton and Pitt, 2002). This summary is highly qualitative and may vary depending on the site-specific conditions, regional climate, activities being conducted in each land use, and development characteristics. It should be noted that the rankings in Table 3-3 are relative to one another and classified on a per-unit-area basis. Furthermore, this table shows the parameters for each land-use category, such that the effects for a community at large would be dependent on the areas of each land use shown. Thus, although residential land use is shown to be a relatively smaller source of many pollutants, it is the largest fraction of land use in most communities, typically making it the largest stormwater source on a mass pollutant discharge basis. Similarly, freeway, industrial, and commercial areas can be very significant sources of many stormwater problems, and their discharge significance is usually much greater than their land area indicates. Construction sites are usually the overwhelming source of sediment in urban areas, even though they make up very small areas of most communities. A later table (Table 3-4) presents observed stormwater discharge concentrations for selected constituents for different land uses.

The following section describes stormwater characteristics associated with urbanized conditions. At any given time, parts of an urban area will be under construction, which is the source of large sediment losses, flow path disruptions, increased runoff quantities, and some chemical contamination. Depending on the time frame of development, increased stormwater pollutant discharges associated with construction activities may last for several years until land covers are stabilized. After construction has been completed, the characteristics of urban

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BOX 3-7
Comparison of Nitrogen and Phosphorus Export from Watersheds with Different Land Uses

Land use is a significant influence on nutrient export as controlled by impervious area, sanitary infrastructure, fertilizer application, and other determinants of input, retention, and stormwater transport. Tables 3-2A and 3-2B compare dissolved nitrate, total nitrogen, phosphate, and total phosphorus loads exported from forest catchments with catchments in different developed land uses studied by the Baltimore Ecosystem Study (Groffman et al., 2004). Loads were computed with the Fluxmaster system (Schwarz et al., 2006) from weekly samples taken at outlet gauges. In these sites in Baltimore County, the forested catchment, Pond Branch, has nitrogen loads one to two orders of magnitude lower than the developed catchments. Baisman Run, with one-third of the catchment in low-density, septic-served suburban land use, has nitrogen export exceeding Dead Run, an older, dense urban catchment. In this case, nutrient load does not follow the direct variation of impervious area because of the switch to septic systems and greater fertilizer use in lower density areas. However, Figure 3-26 shows that as impervious area increases, a much greater proportion of the total nitrogen load is discharged in less frequent, higher runoff events (Shields et al., 2008), reducing the potential to decrease loads by on-site SCMs. Total phosphorus loads were similarly as low (0.05–0.6 kg P/ha/yr) as nitrogen in the Pond Branch catchment (forest) over the 2000–2004 time period, and one to two orders of magnitude lower compared to agricultural and residential catchments.

It should be noted that specific areal loading rates, even in undeveloped catchments, can vary significantly depending on rates of atmospheric deposition, disturbance, and climate conditions. The hydrologic connectivity of nonpoint pollutant source areas to receiving waterbodies is also a critical control on loading in developed catchments (Nadeau and Rains, 2007) and is dependent on both properties of the pollutant as well as the catchment hydrology. For example, total nitrogen was high in both the agricultural and low-density suburban sites. Total phosphorus, on the other hand, was high in the Baltimore Ecosystem Study agricultural catchment, but close to the concentration of the forest site in the low-density suburban site serviced by septic systems. This is because septic systems tend to retain phosphorus, while septic wastewater nitrogen is typically nitrified in the unsaturated zone below a spreading field and efficiently transported in the groundwater to nearby streams.

TABLE 3-2A Dissolved Nitrate and Total Nitrogen Export Rates from Forest and Developed Land-Use Catchments in the Baltimore Ecosystem Study

Catchment	Land Use	Nitrate (kg N/ha/yr)			Total N (kg N/ha/yr)		
		2000	2001	2002	2000	2001	2002
Pond Branch	Forest	0.11	0.08	0.04	0.47	0.37	0.17
McDonogh	Agriculture	17.6	12.9	4.3	20.5	14.5	4.5
Baisman Run	Mixed Forest and Suburban	7.2	3.8	1.5	8.2	4.2	1.7
Dead Run	Urban	3.0	2.9	2.9	5.6	5.3	4.2

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TABLE 3-2B Dissolved Phosphate and Total Phosphorus Export Rates from Forest and Developed Land-Use Catchments in the Baltimore Ecosystem Study

Catchment	**Land Use**	**Phosphate (kg P/ha/yr)**			**Total P (kg P/ha/yr)**		
		2000	2001	2002	2000	2001	2002
Pond Branch	Forest	0.009	0.007	0.003	0.02	0.014	0.006
McDonogh	Agriculture	0.12	0.080	0.022	0.22	0.14	0.043
Baisman Run	Mixed Forest and Suburban	0.009	0.005	0.002	0.02	0.011	0.004
Dead Run	Urban	0.039	0.037	0.03	0.10	0.10	0.08

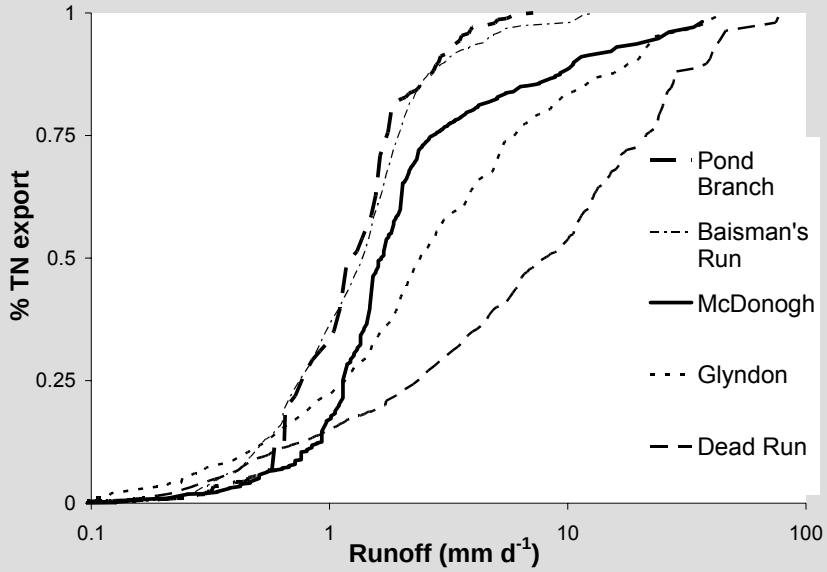

FIGURE 3-26 Cumulative transport of total nitrogen at increasing flow levels from catchments in Baltimore City and County including dominantly forest (Pond Branch), low-density development on septic systems and forest (Baisman Run), agricultural (McDonogh), medium-density suburban development on separate sewers (Glyndon), and higher-density residential, commercial, and highway land cover (Dead Run). SOURCE: Reprinted, with permission, from Shields et al. (2008). Copyright 2008 by the American Geophysical Union.

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TABLE 3-3 Relative Sources of Parameters of Concern for Different Land Uses in Urban Areas

Problem Parameter	Residential	Commercial	Industrial	Freeway	Construction
High flow rates (energy)	Low	High	Moderate	High	Moderate
Large runoff volumes	Low	High	Moderate	High	Moderate
Debris (floatables and gross solids)	High	High	Low	Moderate	High
Sediment	Low	Moderate	Low	Low	Very high
Inappropriate discharges (mostly sewage and cleaning wastes)	Moderate	High	Moderate	Low	Low
Microorganisms	High	Moderate	Moderate	Low	Low
Toxicants (heavy metals/organics)	Low	Moderate	High	High	Moderate
Nutrients (eutrophication)	Moderate	Moderate	Low	Low	Moderate
Organic debris (SOD and DO)	High	Low	Low	Low	Moderate
Heat (elevated water temperature)	Moderate	High	Moderate	High	Low

NOTE: SOD, sediment oxygen demand; DO, dissolved oxygen.
SOURCE: Summarized from Burton and Pitt (2002), Pitt et al. (2008), and CWP and Pitt (2008).

runoff are controlled largely by the increase in volume and the washoff of pollutants from impervious surfaces. Stormwater in this phase is associated with increases in discharges of most pollutants, but with less sediment washoff than from construction and likely less sediment and nutrient discharges compared to any pre-urbanization agricultural operations (although increased channel erosion may increase the mass of sediment delivered in this phase; Pitt et al., 2007). A third significant urban land use is industrial activity. As described later, industrial site stormwater discharges are highly variable, but often greater than other land uses.

Construction Site Erosion Characteristics

Problems associated with construction site runoff have been known for many years. More than 25 years ago, Willett (1980) estimated that approximately 5 billion tons of sediment reached U.S. surface waters annually, of which 30 percent was generated by natural processes and 70 percent by human activities. Half of this 70 percent was attributed to eroding croplands. Although construction occurred on only about 0.007 percent of U.S. land in the 1970s, it ac-

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counted for approximately 10 percent of the sediment load to all U.S. surface waters and equaled the combined sediment contributions of forestry, mining, industrial, and commercial land uses (Willett, 1980).

Construction accounts for a much greater proportion of the sediment load in urban areas than it does in the nation as a whole. This is because construction sites have extremely high erosion rates and because urban construction sites are efficiently drained by stormwater drainage systems installed early during the construction activities. Construction site erosion losses vary greatly throughout the nation, depending on local rain, soil, topographic, and management conditions. As an example, the Birmingham, Alabama, area may have some of the highest erosion rates in the United States because of its combination of very high-energy rains, moderately to severely erosive soils, and steep slopes (Pitt et al., 2007). The typically high erosion rates mean that even a small construction project may have a significant detrimental effect on local waterbodies.

Extensive evaluations of urban construction site runoff problems have been conducted in Wisconsin for many years. Data from the highly urbanized Menomonee River watershed in southeastern Wisconsin indicate that construction sites have much greater potentials for generating sediment and phosphorus than do other land uses (Chesters et al., 1979). For example, construction sites can generate approximately 8 times more sediment and 18 times more phosphorus than industrial sites (the land use that contributes the second highest amount of these pollutants) and 25 times more sediment and phosphorus than row crops. In fact, construction sites contributed more sediment and phosphorus to the Menomonee River than any other land use, although in 1979, construction comprised only 3.3 percent of the watershed's total land area. During this early study, construction sites were found to contribute about 50 percent of the suspended sediment and total phosphorus loading at the river mouth (Novotny and Chesters, 1981).

Similar conclusions were reported by the Southeastern Wisconsin Regional Planning Commission (SEWRPC) in a 1978 modeling study of the relative pollutant contributions of 17 categories of point and nonpoint pollution sources to 14 watersheds in the southeast Wisconsin regional planning area (SEWRPC, 1978). This study revealed construction as the first or second largest contributor of sediment and phosphorus in 12 of the 14 watersheds. Although construction occupied only 2 percent of the region's total land area in 1978, it contributed approximately 36 percent of the sediment and 28 percent of the total phosphorus load to inland waters, making construction the region's second largest source of these two pollutants. The largest source of sediment was estimated to be cropland; livestock operations were estimated to be the largest source of phosphorus. By comparison, cropland comprised 72 percent of the region's land area and contributed about 45 percent of the sediment and only 11 percent of the phosphorus to regional watersheds. When looking at the Milwaukee River watershed as a whole, construction is a major sediment contributor, even though the amount of land under active construction is very low. Construction areas were estimated to contribute about 53 percent of the total sediment discharged by the

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Milwaukee River in 1985 (total sediment load of 12,500 lb/yr), while croplands contributed 25 percent, streambank erosion contributed 13 percent, and urban runoff contributed 8 percent.

Line and White (2007) recently investigated runoff characteristics from two similar drainage areas in the Piedmont region of North Carolina. One of the drainage areas was being developed as part of a large residential subdivision during the course of the study, while the other remained forested or in agricultural fields. Runoff volume was 68 percent greater for the developing compared with the undeveloped area, and baseflow as a percentage of overall discharge was approximately zero compared with 25 percent for the undeveloped area. Overall annual export of sediment was 95 percent greater for the developing area, while export of nitrogen and phosphorus forms was 66 to 88 percent greater for the developing area.

The biological stream impact of construction site runoff can be severe. For example, Hunt and Grow (2001) describe a field study conducted to determine the impact to a stream from a poorly controlled construction site, with impact being measured via fish electroshocking and using the Qualitative Habitat Evaluation Index. The 33-acre construction site consisted of severely eroded silt and clay loam subsoil and was located within the Turkey Creek drainage, Scioto County, Ohio. The number of fish species declined (from 26 to 19) and the number of fish found decreased (from 525 to 230) when comparing upstream unimpacted reaches to areas below the heavily eroding site. The Index of Biotic Integrity and the Modified Index of Well-Being, common fisheries indexes for stream quality, were reduced from 46 to 32 and 8.3 to 6.3, respectively. Upstream of the area of impact, Turkey Creek had the highest water quality designation available, but fell to the lowest water quality designation in the area of the construction activity. Water quality sampling conducted at upstream and downstream sites verified that the decline in fish diversity was not due to chemical affects alone.

Municipal Stormwater Characteristics

The suite of stormwater pollutants generated by municipal areas is expected to be much more diverse than construction sites because of the greater variety of land uses and pollutant source areas found within a typical city. Many studies have investigated stormwater quality, with the U.S. Environmental Protection Agency's (EPA's) NURP (EPA, 1983) being the best known and earliest effort to collect and summarize these data. Unfortunately, NURP was limited in that it did not represent all areas of the United States or all important land uses. More recently, the National Stormwater Quality Database (NSQD) (CWP and Pitt, 2008; Pitt et al., 2008 for version 3) has been compiling data from the EPA's NPDES stormwater permit program for larger Phase I municipal separate storm sewer system (MS4) communities. As a condition of their Phase I permits, municipalities were required to establish a monitoring program to characterize their local stormwater quality for their most important land uses discharging to the

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MS4. Although only a few samples from a few locations were required to be monitored each year in each community, the many years of sampling and large number of communities has produced a database containing runoff quality information for nearly 8,000 individual storm events over a wide range of urban land uses. The NSQD makes it possible to statistically compare runoff from different land uses for different areas of the country.

A number of land uses are represented in MS4 permits and also the database, including industrial stormwater discharges to an MS4. However, there is no separate compilation of quantitative mass emissions from specific industrial stormwater sources that may have been collected under industrial permit monitoring efforts. The observations in the NSQD were all obtained at outfall locations and do not include snowmelt or construction erosion sources. The most recent version of the NSQD contains stormwater data from about one-fourth of the total number of communities that participated in the Phase I NPDES stormwater permit monitoring activities. The database is located at *http://unix.eng.ua.edu/~rpitt/Research/ms4/mainms4.shtml*.

Table 3-4 is a summary of *some* of the stormwater data included in NSQD version 3, while Figure 3-27 shows selected plots of these data. The table describes the total number of observations, the percentage of observations above the detection limits, the median, and coefficients of variation for a few of the major constituents for residential, commercial, industrial, institutional, freeway, and open-space land-use categories, although relatively few data are available for institutional and open-space areas. It should be noted that even if there are significant differences in the median concentrations by the land uses, the range of the concentrations within single land uses can still be quite large. Furthermore, plots like Figure 3-27 do not capture the large variability in data points observed at an individual site.

There are many factors that can be considered when examining the quality of stormwater, including land use, geographical region, and season. The following is a narrative summary of the entire database and may not reflect information in Table 3-4 and Figure 3-29, which show only subsets of the data. First, statistical analyses of variance on the NSQD found significant differences among land-use categories for all of the conventional constituents, except for dissolved oxygen. (Turbidity, total solids, total coliforms, and total *E. coli* did not have enough samples in each group to evaluate land-use differences.) Freeway sites were found to be significant sources of several pollutants. For example, the highest TSS, COD, and oil and grease concentrations (but not necessarily the highest *median* concentrations) were reported for freeways. The median ammonia concentration in freeway stormwater is almost three times the median concentration observed in residential and open-space land uses, while freeways have the lowest orthophosphate and nitrite–nitrate concentrations—half of the concentration levels that were observed in industrial land uses.

In almost all cases the median metal concentrations at the industrial areas were about three times the median concentrations observed in open-space and residential areas. The highest lead and zinc concentrations (but not necessarily

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TABLE 3-4 Summary of Selected Stormwater Quality Data Included in NSQD, Version 3.0

	TSS (mg/L)	COD (mg/L)	Fecal Colif. (mpn/100 mL)	Nitrogen, Total Kjeldahl (mg/L)	Phosphorus, Total (mg/L)	Cu, Total (µg/L)	Pb, Total (µg/L)	Zn, Total (µg/L)
All Areas Combined (8,139)								
Coefficient of variation (COV)	2.2	1.1	5.0	1.2	2.8	2.1	2.0	3.3
Median	62.0	53.0	4300	1.3	0.2	15.0	14.0	90.0
Number of samples	6780	5070	2154	6156	7425	5165	4694	6184
% samples above detection	99	99	91	97	97	88	78	98
All Residential Areas Combined (2,586)								
COV	2.0	1.0	5.7	1.2	1.6	1.9	2.1	3.3
Median	59.0	50.0	4200	1.2	0.3	12.0	6.0	70.0
Number of samples	2167	1473	505	2026	2286	1640	1279	1912
% samples above detection	99	99	89	98	98	88	77	97
All Commercial Areas Combined (916)								
COV	1.7	1.0	3.0	0.9	1.2	1.4	1.7	1.4
Median	55.0	63.0	3000	1.3	0.2	17.9	15.0	110.0
Number of samples	843	640	270	726	920	753	605	839
% samples above detection	97	98	89	98	95	85	79	99
All Industrial Areas Combined (719)								
COV	1.7	1.3	6.1	1.1	1.4	2.1	2.0	1.7
Median	73.0	59.0	2850	1.4	0.2	19.0	20.0	156.2
Number of samples	594	474	317	560	605	536	550	596
% samples above detection	98	98	94	97	95	86	76	99

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All Freeway Areas Combined (680)								
COV	2.6	1.0	2.7	1.2	5.2	2.2	1.1	1.4
Median	53.0	64.0	2000	1.7	0.3	17.8	49.0	100.0
Number of samples	360	439	67	430	585	340	355	587
% samples above detection	100	100	100	99	99	99	99	99
All Institutional Areas Combined (24)								
COV	1.1	1.0	0.4	0.6	0.9	0.6	1.0	0.9
Median	18.0	37.5	3400	1.1	0.2	21.5	8.6	198.0
Number of samples	23	22	3	22	23	21	21	22
% samples above detection	96	91	100	91	96	57	86	100
All Open -Space Areas Combined (79)								
COV	1.8	0.6	1.2	1.2	1.5	0.4	0.9	0.8
Median	10.5	21.3	2300	0.4	0.0	9.0	48.0	57.0
Number of samples	72	12	7	50	77	15	10	16
% samples above detection	97	83	100	96	97	47	20	50

NOTE: The complete database is located at: http://unix.eng.ua.edu/~rpitt/Research/ms4/mainms4.shtml. SOURCE: National Stormwater Quality Database.

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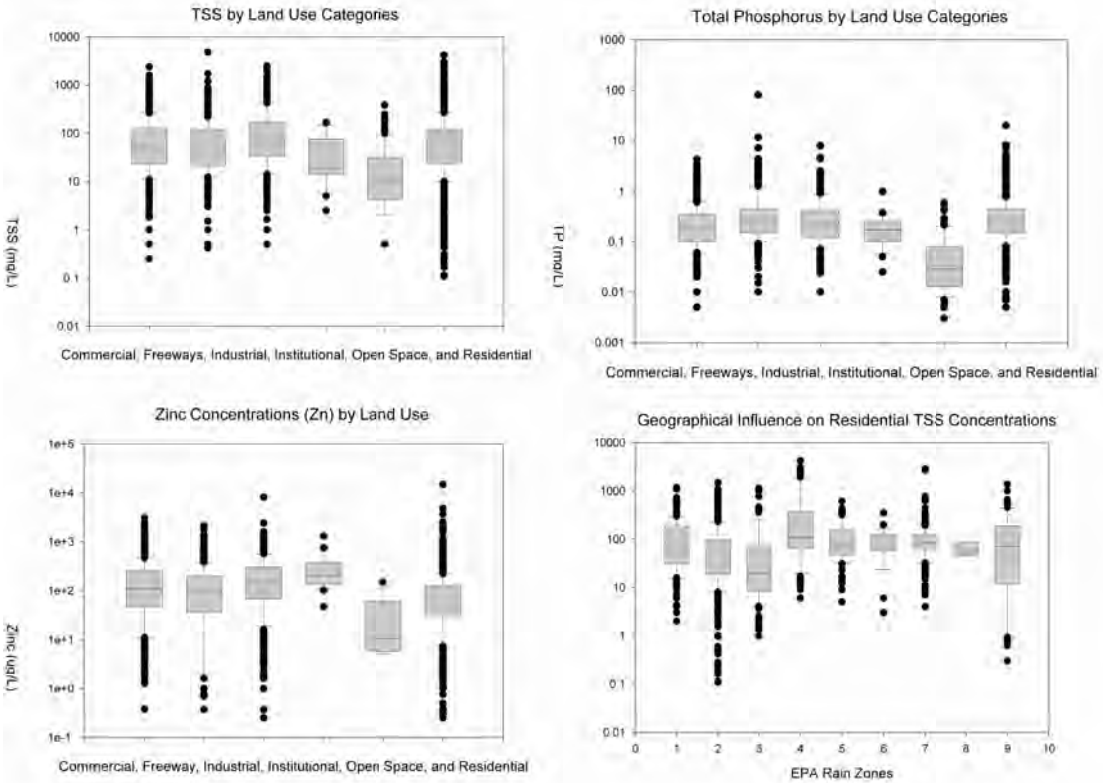

FIGURE 3-27 Grouped box and whisker plots of data from the NSQD. The median values are indicated with the horizontal line in the center of the box, while the ends of the box represent the 25th and 75th percentile values. The whickers extend to the 5th and 95th percentile values, and values outside of these extremes are indicated with separate dots. These groups were statistically analyzed and were found to have at least one group that is significantly different from the other groups. The ranges of the values in each group are large, but a very large number of data points is available for each group. The grouping of the data into these categories helps explain much of the total variability observed, and the large number of samples in each category allows suitable statistical tests to be made. Many detailed analyses are presented at the NSQD website (Maestre and Pitt, 2005).

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the highest *median* concentrations) were found in industrial land uses. Lower concentrations of TDS, five-day biological oxygen demand (BOD_5), and fecal coliforms were observed in industrial land-use areas. By contrast, the highest concentrations of dissolved and total phosphorus were associated with residential land uses. Fecal coliform concentrations are also relatively high for residential and mixed residential land uses. Open-space land-use areas show consistently low concentrations for the constituents examined. There was no significant difference noted for total nitrogen among any of the land uses monitored.

In terms of regional differences, significantly higher concentrations of TSS, BOD_5, COD, total phosphorus, total copper, and total zinc were observed in arid and semi-arid regions compared to more humid regions. In contrast, fecal coliforms and total dissolved solids were found to be higher in the upper Midwest. More detailed discussions of land use and regional differences in stormwater quality can be found in Maestre et al. (2004) and Maestre and Pitt (2005, 2006). In addition to the information presented above, numerous researchers have conducted source area monitoring to characterize sheet flows originating from urban surfaces (such as roofs, parking lots, streets, landscaped areas, storage areas, and loading docks). The reader is referred to Pitt et al. (2005a,b,c) for much of this information.

Industrial Stormwater Characteristics

The NSQD, described earlier, has shown that industrial-area stormwater has higher concentrations of most pollutants compared to other land uses, although the variability is high. MS4 monitoring activities are usually conducted at outfalls of drainage systems containing many individual industrial activities, so discharge characteristics for specific industrial types are rarely available. This discussion provides some additional information concerning industrial stormwater beyond that included in the previous discussion of municipal stormwater. In general, there is a profound lack of data on industrial stormwater compared to municipal stormwater, and a correspondingly greater uncertainty about industrial stormwater characteristics.

The first comprehensive monitoring of an industrial area that included stormwater, dry weather base flows, and snowmelt runoff was conducted in selected Humber River catchments in Ontario (Pitt and McLean, 1986). Table 3-5 shows the annual mass discharges from the monitored industrial area in North York, along with ratios of these annual discharges compared to discharges from a mixed commercial and residential area in Etobicoke. The mass discharges of heavy metals, total phosphorus, and COD from industrial stormwater are three to six times that of the mixed residential and commercial areas.

Hotspots of contamination on industrial sites are a specific concern. Stormwater runoff from “hotspots” may contain loadings of hydrocarbons, trace metals, nutrients, pathogens and/or other toxicants that are greater than the loadings of “normal” runoff. Examples of these hotspots include airport de-icing

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TABLE 3-5 Annual Storm Drainage Mass Discharges from Toronto-Area Industrial Land Use

Measured Parameter	Units	Annual Mass Discharges from Industrial Drainage Area	Stormwater Annual Discharge Ratio (Industrial Compared to Residential and Commercial Mixed Area)
Runoff volume	m^3/hr/yr	6,580	1.6
total solids	kg/ha/yr	6,190	2.8
total phosphorus	kg/ha/yr	4,320	4.5
TKN	g/ha/yr	16,500	1.2
COD	kg/ha/yr	662	3.3
Cu	g/ha/yr	416	4.0
Pb	g/ha/yr	595	4.2
Zn	g/ha/yr	1,700	5.8

SOURCE: Pitt and McLean (1986).

facilities, auto recyclers/junkyards, commercial garden nurseries, parking lots, vehicle fueling and maintenance stations, bus or truck (fleet) storage areas, industrial rooftops, marinas, outdoor transfer facilities, public works storage areas, and vehicle and equipment washing/steam cleaning facilities (Bannerman et al., 1993; Pitt et al., 1995; Claytor and Schueler, 1996).

The elevated concentrations and mass discharges found in stormwater at industrial sites are associated with both the activities that occur and the materials used in industrial areas, as discussed in the sections that follow.

Effects of Roofing Materials on Stormwater Quality

The extensive rooftops of industrial areas can be a significant pollutant source area. A summary of the literature on roof-top runoff quality, including both roof surfaces and underlying materials used as subbases (such as treated wood), is presented in Table 3-6. Good (1993) found that dissolved metals' concentrations and toxicity remained high in roof runoff samples, especially from rusty galvanized metal roofs during both first flush and several hours after a rain has started, indicating that metal leaching continued throughout the events and for many years. During pilot-scale tests of roof panels exposed to rains over a two-year period, Clark et al. (2008) found that copper roof runoff concentrations for newly treated wood panels exceeded 5 mg/L (a very high value compared to median NSQD stormwater concentrations of about 10 to 40 µg/L for different land uses) for the first nine months of exposure. These results indicated that copper continued to be released from these wood products at levels high enough to exceed aquatic life criteria for long periods after installation, and were not simply due to excess surface coating washing off in the first few storms after installation.

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TABLE 3-6 Roof Runoff Analysis—A Literature Summary

Roof Type	Location	Water Quality Parameter								Reference
		Cu (µg/L)	Zn (µg/L)	Pb (µg/L)	Cd (µg/L)	As (µg/L)	pH	NH_4^+ (mg/L)	NO_3^- (mg/L)	
Polyester Tile Flat gravel	Duebendorf, Switzerland	6817 1905 140	2076 360 36	510 172 22	3.1 2.1 0.2					Boller (1997)
Plywood w/ roof paper/tar Rusty galvanized metal Old metal w/Al paint Flat tar surface w/fibrous reflective Al paint New anodized Al	Washington	$166^T/128^D$ $20^T/2^D$ $11^T/7^D$ $25^T/14^D$ $16^T/7^D$	$877^T/909^D$ $12200^T/11900^D$ $1980^T/1610^D$ $297^T/257^D$ $101^T/82^D$	$11^T/<5^D$ $302^T/35^D$ $10^T/<5^D$ $10^T/5^D$ $15^T/<5^D$			4.3 5.9 4.8 4.1 5.9			Good (1993)
Zinc-galvanized Fe	Dunedin City, New Zealand	560 µg/g	5901 µg/g	670 µg/g						Brown & Peake (2006)
Fe-Zn sheets Concrete slate tiles Asbestos cement sheets Aluminum sheets	Ile-Ife, Nigeria						6.77 7.45 7.09 6.68	0.06 0.05 0.06 0.05	1.52 3.34 2.26 6.18	Adeniyi and Olabanji (2005)
Cu panels	Munich, Germany	200–11100					6.7–7.0			Athanasiadis et al. (2006)
Galvanized metals (primarily Galvalume®)	Seattle, WA	10–1400	420–14700	ND						Tobiason (2004)
CCA wood Untreated wood	Florida					1200–1800 2–3				Khan et al. (2006)

Note: D, dissolved; T, total; ND, not detected.
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Traditional unpainted or uncoated hot-dip galvanized steel roof surfaces can also produce very high zinc concentrations. For example, pilot-scale tests by Clark et al. (2008) indicated that zinc roof runoff concentrations were 5 to 30 mg/L throughout the first two years of monitoring of a traditional galvanized metal panel. These are very high values compared to median stormwater values reported in the NSQD of 60 to 300 µg/L for different land uses. Factory-painted aluminum–zinc alloy panels had runoff zinc levels less than 250 µg/L, which were closer to the reported NSQD median values. The authors concluded that traditional galvanized metal roofing contributed the greatest concentrations of many metals and nutrients. In addition, they found that pressure-treated and waterproofed wood contributed substantial copper loads. The potential for nutrient release exists in many of the materials tested (possibly as a result of phosphate washes and binders used in the material's preparation or due to natural degradation).

Other researchers have investigated the effects of industrial rooftop runoff on receiving waters and biota. Bailey et al. (1999) investigated the toxicity to juvenile rainbow trout of runoff from British Columbia sawmills and found that much of the toxicity may have been a result of divalent cations on the industrial site, especially zinc from galvanized roofs.

Effects of Pavement and Pavement Maintenance on Stormwater Quality

Pavement surfaces can also have a strong influence on stormwater runoff quality. For example, concrete is often mixed with industrial waste sludges as a way of disposing of the wastes. However, this can lead to stormwater discharges high in toxic compounds, either due to the additives themselves or due to the mobilization of compounds via the additives. Salaita and Tate (1998) showed that high levels of aluminum, iron, calcium, magnesium, silicon, and sodium were seen in the cement-waste samples. A variety of sands, including waste sands, have been suggested as potential additives to cement and for use as fill in roadway construction. Wiebusch et al. (1998) tested brick sands and found that the higher the concentration of alkaline and alkaline earth metals in the samples, the more easily the heavy metals were released. Pitt et al. (1995) also found that concrete yard runoff had the highest toxicity (using Microtox screening methods) observed from many source areas, likely due to the elevated pH (about 11) from the lime dust washing off from the site.

The components of asphalt have been investigated by Rogge et al. (1997), who found that the majority of the elutable organic mass that could be identified consisted of *n*-alkanes (73 percent), carboxylic acids such as *n*-alkanoic acids (17 percent), and benzoic acids. PAHs and thiaarenes were 7.9 percent of the identifiable mass. In addition, heterocyclic aromatic hydrocarbons containing sulfur (S-PAH), such as dibenzothiophene, were identified at concentration lev-

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els similar to that of phenanthrene. S-PAHs are potentially mutagenic (similar to other PAHs), but due to their slightly increased polarity, they are more soluble in water and more prone to aquatic bioaccumulation.

In addition to the bitumens and asphalts, other compounds are added to paving (and asphaltic roofing) materials. Chemical modifiers are used both to increase the temperature range at which asphalts can be used and to prevent stripping of the asphalt from the binder. A variety of fillers may also be used in asphalt pavement mixtures. The long-term environmental effects of these chemicals in asphalts are unknown. Reclaimed asphalt pavements have also been proposed for use as fill materials for roadways. Brantley and Townsend (1999) performed a series of leaching tests and analyzed the leachate for a variety of organics and heavy metals. Only lead from asphalt pavements reclaimed from older roadways was found to be elevated in the leachate.

Stormwater quality from asphalt-paved surfaces seems to vary with time. Fish kills have been reported when rains occur shortly after asphalt has been installed in parking areas near ponds or streams (Anonymous, 2000; Perez-Rivas, 2000; Kline, 2002). It is expected that these effects are associated with losses of the more volatile and toxic hydrocarbons that are present on new surfaces. It is likely that the concentrations of these materials in runoff decrease as the pavement ages. Toxicity tests conducted on pavements several years old have not indicated any significant detrimental effects, except for those associated with activities conducted on the surface (such as maintenance and storage of heavy equipment; Pitt et al., 1995, 1999). However, pavement maintenance used to "renew" the asphalt surfaces has been shown to cause significant problems, which are summarized below.

A significant source of PAHs in the Austin, Texas, area (and likely elsewhere) has been identified as coal-tar sealants commonly used to "restore" asphalt parking lots and storage areas. Mahler et al. (2005) found that small particles of sealcoat that flake off due to abrasion by vehicle tires have PAH concentrations about 65 times higher than for particles washed off parking lots that are not seal coated. Unsealed parking lots receive PAHs from the same urban sources as do sealed parking lots (e.g., tire particles, leaking motor oil, vehicle exhaust, and atmospheric fallout), and yet the average yield of PAHs from the sealed parking lots was found to be 50 times greater than that from the control lots. The authors concluded that sealed parking lots could be the dominant source of PAHs in watersheds that have seal-coated surfaces, such as many industrial, commercial, and residential areas. Consequently, the City of Austin has restricted the use of parking lot coal-tar sealants, as have several Wisconsin communities.

Stored Materials Exposed to Rain

Although roofing and pavement materials make up a large fraction of the total surface covers and can have significant effects on stormwater quality, leaching of rain through stored materials may also be a significant pollutant

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source at industrial sites. Exposed metals in scrap yards can result in very high concentrations of heavy metals. For example, Table 3-7 summarizes data from three metals recycling facilities/scrap yards in Wisconsin and shows the large fraction of metals that are either dissolved in the runoff or associated with very fine particulate matter. For most of these metals, their greatest abundance is associated with the small particles (<20 μm in diameter), and relatively little is associated with the filterable fraction. These metals concentrations (especially zinc, copper, and lead) are also very high compared to that of most outfall industrial stormwater.

OTHER SOURCES OF URBAN RUNOFF DISCHARGES

Wet weather stormwater discharges from separate storm sewer outfalls are not the only discharges entering receiving waters from these systems. Dry weather flows, snowmelt, and atmospheric deposition all contribute to the pollutant loading of urban areas to receiving waters, and for some compounds may be the largest contributor. Many structural SCMs, especially those that rely on sedimentation or filtration, have been designed to function primarily with stormwater and are not nearly as effective for dry weather discharges, snowmelt, or atmospheric deposition because these nontraditional sources vary considerably in key characteristics, such as the flow rate and volume to be treated, sediment concentrsations and particle size distribution, major competing ions, association of pollutants with particulates of different sizes, and temperature. Information on the treatability of stormwater vs. snowmelt and other nontraditional sources of urban runoff can be found in Pitt and McLean (1986), Pitt et al. (1995), Johnson et al. (2003), and Morquecho (2005).

TABLE 3-7 Metal Concentration Ranges Observed in Scrapyard Runoff

Particle Size	Iron (mg/L)	Aluminum (mg/L)	Zinc (mg/L)
Total	20 – 810	15 – 70	1.6 – 8
< 63 μm diameter	22 – 767	15 – 58	1.5 – 7.6
< 38 μm diameter	21 – 705	15 – 58	1.4 – 7.4
< 20 μm diameter	15 – 534	12 – 50	1.1 – 7.2
< 0.45 μm diameter (filterable fraction)	0.1 – 38	0.1 – 5	0.1 – 6.7
	Copper (mg/L)	**Lead (mg/L)**	**Chromium (mg/L)**
Total	1.1 – 3.8	0.6 – 1.7	0.1 – 1.9
< 63 μm diameter	1.1 – 3.6	0.1 – 1.6	0.1 – 1.6
< 38 μm diameter	1.1 – 3.3	0.1 – 1.6	0.1 – 1.4
< 20 μm diameter	1.0 – 2.8	0.1 – 1.6	0.1 – 1.2
< 0.45 μm diameter (filterable fraction)	0.1 – 0.3	0.1 – 0.3	0.1 – 0.3

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Dry Weather Flows

At many stormwater outfalls, discharges occur during dry weather. These may be associated with discharges from leaking sanitary sewer and drinking water distribution systems, industrial wastewaters, irrigation return flows, or natural spring water entering the system (Figures 3-28 to 3-33). Possibly 25 percent of all separate stormwater outfalls have water flowing in them during dry weather, and as much as 10 percent are grossly contaminated with raw sewage, industrial wastewaters, and so forth (Pitt et al., 1993). These flow contributions can be significant on an annual mass basis, even though the flow rates are relatively small, because they have long duration. This is particularly true in arid areas, where dry weather discharges can occur daily. For example, despite the fact that rain is scarce from May to September in Southern California, an estimated 40 to 90 million liters of discharge flow per day into Santa Monica Bay through approximately 70 stormwater outlets that empty onto or across beaches (LAC DPW, 1985; SMBRP, 1994), such that the contribution of dry weather flow to the total volume of runoff into the bay is about 30 percent (NRC, 1984). Furthermore, in the nearby Ballona Creek watershed, dry weather discharges of trace metals were found to comprise from 8 to 42 percent of the total annual loading (McPherson et al., 2002). Stein and Tiefenthaler (2003) further found that the highest loadings of metals and bacteria in this watershed discharging during dry weather can be attributed to a few specific stormwater drains.

In many cases, stormwater managers tend to overlook the contribution of dry weather discharges, although the EPA's NPDES Stormwater Permit program requires municipalities to conduct stormwater outfall surveys to identify, and then correct, inappropriate discharges into separate storm sewer systems. The role of inappropriate discharges in the NPDES Stormwater Permit program, the developed and tested program to identify and quantify their discharges, and an extensive review of these programs throughout the United States can be found in the recently updated report prepared for the EPA (CWP and Pitt, 2004).

FIGURE 3-28 Washing of vehicle engine and allowing runoff to enter storm drainage system. SOURCE: Robert Pitt, University of Alabama.

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FIGURE 3-29 Contamination of storm drainage with inappropriate disposal of oil. SOURCE: Courtesy of the Center for Watershed Protection.

FIGURE 3-30 Dry weather flows from Toronto industrial area outfall. SOURCE: Pitt and McLean (1986).

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FIGURE 3-31 Sewage from clogged system overflowing into storm drainage system. SOURCE: Robert Pitt, University of Alabama.

FIGURE 3-32 Failing sanitary sewer, causing upwelling of sewage through soil, and draining to gutter and then to storm drainage system. SOURCE: Robert Pitt, University of Alabama.

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FIGURE 3-33 Dye tests to confirm improper sanitary sewage connection to storm drainage system. SOURCE: Robert Pitt, University of Alabama.

Snowmelt

In northern areas, snowmelt runoff can be a significant contributor to the annual discharges from urban areas through the storm drainage system (see Figure 3-34). In locations having long and harsh winters, with little snowmelt until the spring, pollutants can accumulate and be trapped in the snowpack all winter until the major thaw when the contaminants are transported in short-duration events to the outfalls (Jokela, 1990). The sources of the contaminants accumulating in snowpack depend on the location, but they usually include emissions from nearby motor vehicles and heating equipment and industrial activity in the neighborhood. Dry deposition of sulfur dioxide from industrial and power plant smokestacks affects snow packs over a wider area and has frequently been studied because of its role in the acid deposition process (Cadle, 1991). Pollutants are also directly deposited on the snowpack. The sources of directly deposited pollutants include debris from deteriorated roadways, vehicles depositing petroleum products and metals, and roadway maintenance crews applying salt and anti-skid grit (Oberts, 1994). Urban snowmelt, like rain runoff, washes some material off streets, roofs, parking and industrial storage lots, and drainage gutters. However, snowmelt runoff usually has much less energy than striking rain and heavy flowing stormwater. Novotny et al. (1986) found that urban soil ero-

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sion is reduced or eliminated during winter snow-cover conditions. However, erosion of bare ground at construction sites in the spring due to snowmelt can still be very high (Figure 3-35).

FIGURE 3-34 Snowmelt photos. SOURCE: Roger Bannerman, Wisconsin Department of Natural Resources.

FIGURE 3-35 Construction site in early spring after snowmelt showing extensive sediment transport. SOURCE: Roger Bannerman, Wisconsin Department of Natural Resources.

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Sources of Contaminants in Snowmelt

Several mechanisms can bring about contamination of snow and snowmelt waters. Initially, air pollutants can be incorporated into snowflakes as they form and fall to the ground. After it falls to the ground and accumulates, the snow can become further contaminated by dry atmospheric deposition, deposition of nearby lost fugitive dust materials (usually blown onto snow packs near roads by passing vehicles), and wash off of particulates from the exposed ground surfaces as it melts and flows to the drainage system.

Snowflakes can remove particulates and gases from the air by in-cloud or below-cloud capture. In-cloud capture of pollutants can occur during snowflake formation as super-cooled cloud water condenses on particles and aerosols that act as cloud condensation nuclei. This is known as nucleation scavenging and is a major pathway for air pollution to be incorporated into snow. Particles and gases may also be scavenged as snowflakes fall to the ground. Gases can also be absorbed as snow falls. Snowflakes are more effective below-cloud scavengers than raindrops because they are bigger and fall slower. Barrie (1991) reports that large snowflakes capture particles in the 0.2- to 0.4-μm-diameter range, not by impaction but by filtering the air that moves through the snow flakes as they fall to the ground.

Most of the contamination of snow in urban areas likely occurs after it lands on the ground. Table 3-8 shows the flow-weighted mean concentrations of pollutants found in undisturbed falling snow compared to snow found in urban snow cover (Bennett et al., 1981). Pitt and McLean (1986) also measured snowpack contamination as a function of distance from a heavily traveled road passing through a park. The contaminants in the snow were at much greater concentrations near the road (the major source of blown contamination on the snow) than farther away. (The pollutant levels in the fresh fallen snow are generally a small fraction of the levels in the snow collected from urban study areas.) Pierstorff and Bishop (1980) also analyzed freshly fallen snow and compared the quality to snow stored at a snow dump site. They concluded that "pollutant levels at the dump site are the result of environmental input occurring after the snow falls." Some pollutants in snowmelt have almost no atmospheric

TABLE 3-8 Comparison of Flow-Weighted Pollutant Concentration Means of Snow Samples from Boulder, Colorado

	Fresh Fallen	High Density Land Use	Low Density Land Use
COD	10	402	54
TS	86	2000	165
SS	16	545	4.5
TKN	0.19	2.69	2
NO_3	0.15	0	0
P	—	0.66	0.017
Pb	—	0.95	—

Note: The units are mg/L. SOURCE: Reprinted, with permission, from Bennett et al. (1981). Copyright 1981 by Water Pollution Control Federation.

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sources. For example, Oliver et al. (1974) found negligible amounts of chlorides in samples of snow from rooftops, indicating that the high chloride level found in the snowmelt runoff water comes almost entirely from surface sources (i.e., road salting). Similar roadside snowpack observations along city park roads by Pitt and McLean (1986) also indicated the strong association of road salt with snowpack chloride levels.

Runoff and Pollutant Loading from Snowmelt

Snowmelt events can exhibit a first flush, in which there are higher concentrations of contaminants at the beginning compared to the total event averaged concentration. The enrichment of the first portion of a snowmelt event by soluble pollutants may be due to snowpack density changes, where water percolation and melt/freeze events that occur in the snowpack cause soluble pollutants to be flushed from throughout the snowpack to concentrate at the bottom of the pack (Colbeck, 1981). This concentrated layer leaves the snowpack as a highly concentrated pulse, as snow melts from the bottom due to warmth from the ground (Oberts, 1994).

When it rains on snow, heavy pollutant loads can be produced because both soluble and particulate pollutants are melted from the snowpack simultaneously. Also, the large volume of melt plus rain can wash off pollutants that have accumulated on various surfaces such as roads, parking lots, roofs, and saturated soil surfaces. The intensity of runoff from a rain-on-snow event can be greater than a summer thunderstorm because the ground is saturated or frozen and the rapidly melting snowpack provides added runoff volume (Oberts, 1994).

Figure 3-36 compares the runoff volumes associated with snowmelts alone to those associated with snowmelts mixed with rain from monitoring at an industrial area in Toronto (Pitt and McLean, 1986). Rain with snowmelt contributes over 80 percent of the total cold-weather event runoff volume.

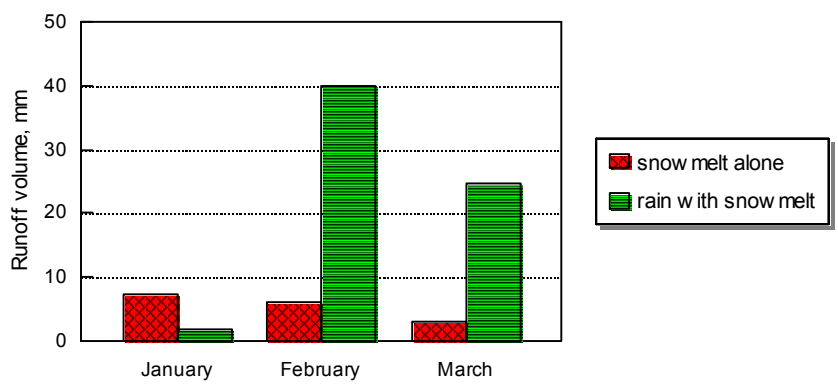

FIGURE 3-36 Runoff volumes for snowmelt events alone and when rain falls on melting snow packs (Toronto industrial area). SOURCE: Pitt and McLean (1986).

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Whether pollutant loadings are higher or lower for snowmelt than for rainfall depends on the particular pollutant and its seasonal prevalence in the environment. For example, the high concentrations of dissolved solids found in snowmelt are usually caused by high chloride concentrations that stem from the amount of de-icing salt used. Figure 3-37 is a plot of the chloride concentrations in the influent to the Monroe Street detention pond in Madison, Wisconsin. Chloride levels are negligible in the non-winter months but increase dramatically when road salting begins in the fall, and remain high through the snow melting period, even extending another month or so after the snowpack in the area has melted. Bennett et al. (1981) found that suspended solids and COD loadings for snowmelt runoff were about one-half of those for rainfall. Nutrients were much lower for snowmelt, while the loadings for lead were about the same for both forms of precipitation. Oberts (1994) reports that much of the annual pollutant yields from event flows in Minneapolis is accounted for by end-of-winter major melts. End-of-winter melts yielded 8 to 20 percent of the total phosphorous and total lead annual load in Minnesota. Small midwinter melts accounted for less than 5 percent of the total loads. Box 3-8 shows mass pollutant discharges for a study site in Toronto and emphasizes the significance of snowmelt discharges on the total annual storm drainage discharges.

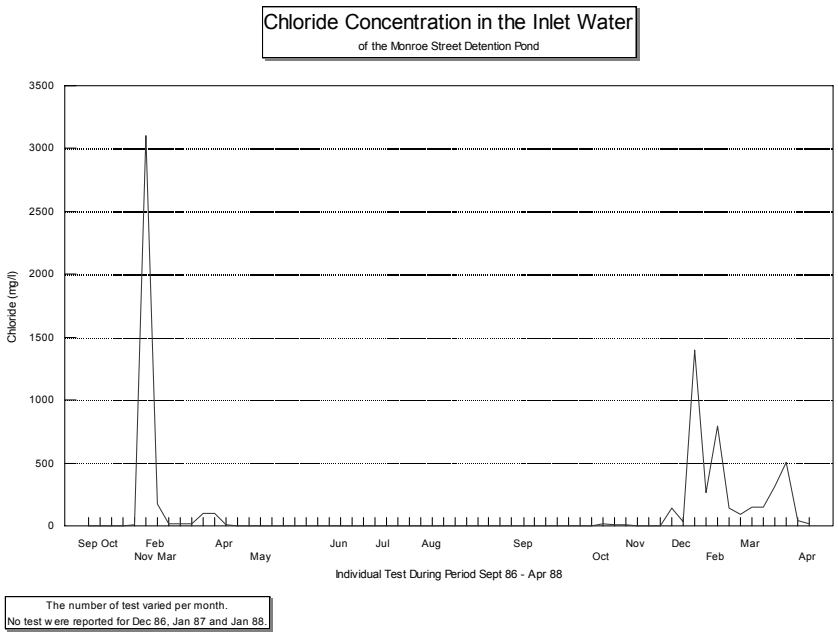

FIGURE 3-37 Monroe Street detention pond chloride concentration of influent (1986–1988). SOURCE: House et al. (1993).

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BOX 3-8
The Contribution of Dry Weather Discharges and Snowmelt to Overall Runoff in Toronto, Ontario

An extensive analysis of all types of stormwater flow—for both dry and wet weather—was conducted in Toronto in the mid-1980s (Pitt and McLean, 1986). The Toronto Area Watershed Management Strategy study included comprehensive monitoring in a residential/commercial area and an industrial area for summer stormwater, warm season dry weather flows, snowmelt, and cold season dry weather flows. In addition to the outfall monitoring, detailed source area sheet flow monitoring was also conducted during rain and snowmelt events to determine the relative magnitude of pollutant sources. Particulate accumulation and wash-off tests were also conducted for a variety of streets in order to better determine their role in contaminant contributions.

Tables 3-9 and 3-10 summarize Toronto residential/commercial and industrial urban runoff median concentrations during both warm and cold weather, respectively. These tables show the relative volumes and concentrations of wet weather and dry weather flows coming from the different land uses. The bacteria densities during cold weather are substantially less than during warm weather, but are still relatively high; similar findings were noted during the NURP studies (EPA, 1983). However, chloride concentrations and dissolved solids are much higher during cold weather. Early spring stormwater events also contain high dissolved solids concentrations. Cold weather runoff accounted for more than half of the heavy metal discharges in the residential/commercial area, while warm weather discharges of zinc were much greater than the cold weather discharges for the industrial area. Warm weather flows were also the predominant sources of phosphorus for the industrial area.

One of the interesting observations is that, at these monitoring locations, warm weather stormwater runoff only contributed about 20 to 30 percent of the total annual flows being discharged from the separate stormwater outfalls. The magnitudes of the base flows were especially surprising, as these monitoring locations were research sites to investigate stormwater processes and were carefully investigated to ensure that they did not have significant inappropriate discharges before they were selected for the monitoring programs.

In comparing runoff from the industrial and residential catchments, Pitt and McLean (1986) observed that concentrations of most constituents in runoff from the industrial watershed were typically greater than the concentrations of the same constituents in the residential runoff. The only constituents with a unit-area yield that were lower in the industrial area were chlorides and total dissolved solids, which was attributed to the use of road deicing salts in residential areas. Annual yields of several constituents (total solids, total dissolved solids, chlorides, ammonia nitrogen, and phenolics) were dominated by cold weather flows, irrespective of the land use.

A comparison of the Toronto sheet flow data from the different land-use areas indicated that the highest concentrations of lead and zinc were found in samples collected from paved areas and roads during both rain runoff and snowmelt (Pitt and McLean, 1986). Fecal coliform values were significantly higher on sidewalks and on, or near, roads during snowmelt sampling, likely because these areas are where dogs would be walked in winter conditions. In warm weather, dog walking would be less concentrated into these areas. The concentrations for total solids from grass or bare open areas were reduced dramatically during snowmelt compared to rain runoff, an indication of the reduced erosion and the

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BOX 3-8 Continued

poor delivery of particulate pollutants during snowmelt periods. Cold weather sheet flow median concentrations of particulate solids for the grass and open areas (80 mg/L) were much less than the TSS concentrations observed during warm weather runoff (250 mg/L) for these same areas. Snowmelt total solids concentrations also increased in areas located near roads due to the influence of road salting on dissolved solids concentrations. In the residential areas, streets were the most significant source of snowmelt solids, while yards and open areas were the major sources of nutrients. Parking and storage areas contrib-

TABLE 3-9 Median Pollutant Concentrations Observed at Toronto Outfalls during Warm Weather[1]

	Baseflow		Stormwater	
Measured Parameter	*Residential*	*Industrial*	*Residential*	*Industrial*
Stormwater volume (m^3/ha/season)	—	—	950	1500
Baseflow volume (m^3/ha/season)	1700	2100	—	—
Total residue	979	554	256	371
Total dissolved solids	973	454	230	208
Suspended solids	<5	43	22	117
Chlorides	281	78	34	17
Total phosphorus	0.09	0.73	0.28	0.75
Phosphates	<0.06	0.12	0.02	0.16
Total Kjeldahl nitrogen (organic N plus NH_3)	0.9	2.4	2.5	2.0
Ammonia nitrogen	<0.1	<0.1	<0.1	<0.1
Chemical oxygen demand	22	108	55	106
Fecal coliform bacteria (#/100 mL)	33,000	7,000	40,000	49,000
Fecal strep. bacteria (#/100 mL)	2,300	8,800	20,000	39,000
Pseudomonas aeruginosa bacteria (#/100 mL)	2,900	2,380	2,700	11,000
Cadmium	<0.01	<0.01	<0.01	<0.01
Chromium	<0.06	0.42	<0.06	0.32
Copper	0.02	0.05	0.03	0.06
Lead	<0.04	<0.04	<0.06	0.08
Zinc	0.04	0.18	0.06	0.19
Phenolics (μg/L)	<1.5	2.0	1.2	5.1
α-BHC (ng/L)	17	<1	1	3.5
γ-BHC (lindane) (ng/L)	5	<2	<1	<1
Chlordane (ng/L)	4	<2	<2	<2
Dieldrin (ng/L)	4	<5	<2	<2
Pentachlorophenol (ng/L)	280	50	70	705

[1]Values are in mg/L unless otherwise indicated. Warm weather samples were obtained during the late spring, summer, and early fall months when the air temperatures were above freezing and no snow was present.
SOURCE: Pitt and McLean (1986).

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uted the most snowmelt pollutants in the industrial area. An analysis of snow samples taken along a transect of a snowpack adjacent to an industrial road showed that the pollutant levels decreased as a function of distance from the roadway. At distances greater than 3 to 5 meters from the edge of the snowpack, the concentrations were relatively constant. Novotny et al. (1986) sampled along a transect of a snowpack by a freeway in Milwaukee. They also found that the concentration of constituents decreased as the distance from the road increased. Most of the measured constituents, including total solids and lead, were at or near background levels at 30 meters or more from the road.

TABLE 3-10 Median Pollutant Concentrations Observed at Toronto Outfalls during Cold Weather[1]

Measured Parameter	Baseflow		Snowmelt	
	Residential	*Industrial*	*Residential*	*Industrial*
Stormwater volume (m^3/ha/season)	—	—	1800	830
Base flow volume (m^3/ha/season)	1100	660	—	—
Total residue	2230	1080	1580	1340
Total dissolved solids	2210	1020	1530	1240
Suspended solids	21	50	30	95
Chlorides	1080	470	660	620
Total phosphorus	0.18	0.34	0.23	0.50
Phosphates	<0.05	<0.02	<0.06	0.14
Total Kjeldahl nitrogen (organic N plus NH_3)	1.4	2.0	1.7	2.5
Ammonia nitrogen	<0.1	<0.1	0.2	0.4
Chemical oxygen demand	48	68	40	94
Fecal coliform bacteria (#/100 mL)	9800	400	2320	300
Fecal strep bacteria (#/100 mL)	1400	2400	1900	2500
Pseudomonas aeruginosa bacteria (#/100 mL)	85	55	20	30
Cadmium	<0.01	<0.01	<0.01	0.01
Chromium	<0.01	0.24	<0.01	0.35
Copper	0.02	0.04	0.04	0.07
Lead	<0.06	<0.04	0.09	0.08
Zinc	0.07	0.15	0.12	0.31
Phenolics (mg/L)	2.0	7.3	2.5	15
α-BHC (ng/L)	NA	3	4	5
γ-BHC (lindane) (ng/L)	NA	NA	2	1
Chlordane (ng/L)	NA	NA	11	2
Dieldrin (ng/L)	NA	NA	2	NA
Pentachlorophenol (ng/L)	NA	NA	NA	40

[1]Values are in mg/L unless otherwise indicated. Cold weather samples were obtained during the winter months when the air temperatures were commonly below freezing. Snowmelt samples were obtained during snowmelt episodes and when rain fell on snow.
NA, not analyzed
SOURCE: Pitt and McLean (1986).

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Atmospheric Deposition

The atmosphere contains a diverse array of contaminants, including metals (e.g., copper, chromium, lead, mercury, zinc), nutrients (nitrogen, phosphorus), and organic compounds (e.g., PAHs, polychlorinated biphenyls, pesticides). These contaminants are introduced to the atmosphere by a variety of sources, including local point sources (e.g., power plant stacks) and mobile sources (e.g., motor vehicles), local fugitive emissions (e.g., street dust and wind-eroded materials), and transport from non-local areas. These emissions, composed of gases, small particles (aerosols), and larger particles, become entrained in the atmosphere and subject to a complex series of physical and chemical reactions (Schueler, 1983).

Atmospheric contaminants are deposited on land and water in two ways—termed wet deposition and dry deposition. Wet deposition (or wetfall) involves the sorption and condensation of pollutants to water drops and snowflakes followed by deposition with precipitation. This mechanism dominates the deposition of gases and aerosol particles. Dry deposition (or dryfall) is the direct transfer of contaminants to land or water by gravity (particles) or by diffusion (vapor and particles). Dry deposition occurs when atmospheric turbulence is not sufficient to counteract the tendency of particles to fall out at a rate governed, but not exclusively determined, by gravity (Schueler, 1983).

As atmospheric contaminants deposit, they can exert an influence on stormwater in several ways. Contaminants deposited by wetfall are directly conveyed to stormwater while those in dryfall can be washed off the land surface. For both processes, the atmospheric load of contaminants is strongly influenced by-characteristics such as the amount of impervious surface, the magnitude and proximity of emission sources, wind speed and direction, and precipitation magnitude and frequency (Schueler, 1983). Deposition rates can depend on the type of contaminant and can be site-specific. The relationships between atmospheric deposition and stormwater quality are, however, not well understood and difficult to determine. Following are a few illustrative examples.

Southern California

Several studies have addressed atmospheric deposition in Southern California (e.g., Lu et al., 2003; Harris and Davidson, 2005; Stolzenbach et al., 2007). Stolzenbach et al. and Lu et al. conclude the following *for this region:*

- the major source of contaminants to the atmosphere in this region is associated with resuspended dust, primarily from roads,
- contaminants in resuspended dust may reflect historical as well as current sources and distant as well as local sources,
- atmospheric loadings to the receiving water are primarily the result of chronic daily dry deposition of large particles greater than 10 µm in size on the

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watershed rather than directly on a waterbody,

- significant spatial variability occurs in trace metal mass loadings and deposition fluxes, particularly along transportation corridors along the coast and the mountain slopes of the airshed,
- significant diurnal and seasonal variations occur in the deposition of trace metals, and
- atmospheric deposition of metals is a significant component of contaminant loading to waterbodies in the region relative to other point and nonpoint sources.

Harris and Davidson (2005) have reported that traditional sources of lead to the south coast air basin of California accounted for less than 15 percent of the lead exiting the basin each year. They resolve this difference by considering that lead particles deposited during the years of leaded gasoline use are resuspended as airborne lead at this time, some decades after their original deposition. This result indicates that lead levels in the soil will remain elevated for decades and that resuspension of this lead will remain a major source of atmospheric lead well into the future.

Sabin et al. (2005) assessed the contribution of trace metals (chromium, copper, lead, nickel, and zinc) from atmospheric deposition to stormwater runoff in a small impervious urban catchment in the Los Angeles area. Dry deposition contributed 90 percent or more of the total deposition inside the catchment, indicating the dominance of dry deposition in semi-arid regions such as Los Angeles. Deposition potentially accounted for from 57 to 90 percent of the total trace metals in stormwater in the study area, demonstrating that atmospheric deposition can be an important source of trace metals in stormwater near urban centers.

San Francisco

Dissolved copper is toxic to phytoplankton, the base of the aquatic food chain. Copper and other metals are released in small quantities when drivers depress their brakes. The Brake Pad Partnership (*http://www.suscon.org/brakepad/index/asp*) has conducted studies to determine how much copper is released as wear debris, and how it travels through the air and streets to surface waters. A comprehensive and complex model of copper loads to and of transport and reactions in San Francisco Bay was developed (Yee and Franz, 2005). Objectives were to provide daily loadings of flow, TSS, and copper to the bay and to estimate the relative contribution of brake pad wear debris to copper in the bay. The modeling results (Rosselot, 2006a) indicated that an estimated 47,000 kg of copper was released to the atmosphere in the Bay Area in 2003. Of this amount, 17,000 kg Cu/yr was dry-deposited in subwatersheds; 3,200 kg Cu/yr was wet-deposited in subwatersheds; 1,200 kg Cu/yr was dry-deposited directly to bay waters; and 1,300 kg Cu/yr was wet-deposited directly to bay waters. The remaining 24,000 kg Cu/yr remained airborne until it left the Bay

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Area. The contribution of copper from brake pads to the bay is estimated to range from 10 to 35 percent of the total copper input, with the best estimate being 23 percent (Rosselot, 2006a,b).

Washington, D.C., Metropolitan Area

Schueler (1983) investigated the atmospheric deposition of several contaminants in Washington, D.C., and its surrounding areas in the early 1980s. The contaminants assessed included trace metals (cadmium, copper, iron, lead, nickel, and zinc), nutrients (nitrogen and phosphorus), solids, and organics as measured collectively by BOD and COD. Dryfall solids loading increased progressively from rural to urban sites. A similar trend was observed for total phosphorus, total nitrogen, and trace metal dry deposition rates. Wet deposition rates exhibited few consistent regional patterns.

The relative importance of wet and dry deposition varied considerably with each contaminant and each site. For example, most of the nitrogen was supplied by wet deposition while most of the phosphorus was delivered via dry deposition. If a contaminant is deposited primarily by wet deposition, it is likely that a major fraction of it will be rapidly entrained in urban runoff.

Atmospheric sources were estimated to contribute from 70 to 95 percent of the total nitrogen load to urban runoff and 20 to 35 percent of the total phosphorus load. Overall, atmospheric deposition appeared to be a moderate source of pollutants in urban runoff. However, with the exception of nitrogen, atmospheric deposition was not the major source.

Average annual atmospheric deposition rates suggested a general trend toward greater deposition rates from rural to suburban to urban sites. This pattern was most pronounced for dry deposition. Wet deposition was the most important deposition mechanism for total nitrogen, nitrate, organic nitrogen, COD, copper, and zinc. Dry deposition was most important for most soil-related constituents, such as total solids, iron, lead, total phosphorus, and orthophosphate.

Measurements of rainfall pH showed median values between 4.0 and 4.1 at all stations and during all seasons. Increased mobilization of trace metals from urban surfaces caused by acid rain was noted at several monitoring sites.

***

Relationships between atmospheric deposition rates and the quality of urban stormwater are complex and cannot be generalized regionally or temporally. Site-specific measurements or reliable estimates of (1) contaminant sources, (2) atmospheric particle size and contaminant concentrations, (3) deposition rates and mechanisms, (4) land surface characteristics, (5) local and regional hydrology and meteorology, and (6) contaminant concentrations in stormwater are needed to assess management decisions to improve stormwater quality. Transportation is a major source of metals (lead in gasoline, zinc in tires, copper in

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brake pads). The results of the modeling of copper in San Francisco and its watershed demonstrate the feasibility of modeling the impact of a source, in this case copper input by atmospheric deposition, on water quality in a receiving waterbody.

BIOLOGICAL RESPONSES TO URBANIZATION

As discussed in Chapter 1, the biological integrity of aquatic ecosystems is influenced by five major categories of environmental stressors: (1) chemical, (2) hydrologic, (3) physical (e.g., habitat), (4) biological (e.g., disease, alien species), and (5) energy-related factors (e.g., nutrient dynamics). Recent studies on biological assemblages in urban or urbanizing waters have begun to examine how stormwater stressors limit biological potential along various urban gradients (Horner et al., 2003; Carter and Fend, 2005; Meador et al., 2005; Barbour et al., 2008; Purcell et al., 2009). Advances in biological monitoring and assessment over the past two decades have enabled much of this research. Today, many states and tribes use biological data to directly measure their aquatic life beneficial uses and have developed numeric biocriteria that are institutionalized in their water quality standards. Most of these approaches compare biology and stressors to suites of reference sites (Hughes, 1995; Stoddard et al., 2006), which can vary from near-pristine areas to agricultural landscapes. While this section focuses on streams because of the wealth of data, similar work is being performed on other waterbody types such as wetlands (Mack and Micacchion, 2007) and estuaries, both of which are susceptible to stormwater pollutants such as metals because of their depositional nature (Morrisey et al., 2000).

Aquatic life beneficial uses are based on achieving aquatic *potential* given feasible restorative actions. Because such potential may vary substantially across a region depending on land use and other factors, some states have adopted tiered aquatic life uses (see Box 2-1). The potential of many urban streams is likely to be something less than "biological integrity" (the ultimate goal of the CWA) or even "fishable–swimmable" goals, which are the interim goals of the CWA. Indeed, there is a near-universal, negative association between biological assemblages in streams and increasing urbanization, to the extent that it has been termed the "Urban Stream Syndrome" (Walsh et al., 2005). Recent investigations that have quantified the responses of macroinvertebrates and other biological assemblages along multiple measures of urban/stormwater stressors have discussed how best to set aquatic life goals for urban streams (Booth and Jackson, 1997; Bernhardt and Palmer, 2007). One of the most important contributions to this debate has been the development of the Biological Condition Gradient (BCG) concept by EPA. The BCG is an attempt to anchor and standardize interpretations of biological conditions and to unify biological monitoring results across the United States in order to advance the use of tiered aquatic life beneficial uses. This section summarizes the characteristic biological responses to urban gradients, within the framework of the BCG, and it re-

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views evidence of biological responses within the aforementioned five major categories of environmental stressors.

Biological Condition Gradient

The BCG framework is an ecological model of how structural and functional components of biological assemblages change along gradients of increasing stressors of many kinds (Davies and Jackson, 2006). Ecological systems have some common general attributes related to their structure and function that form the basis for how biological organisms respond to stressors in the environment. Over the past 20 years, development of biological indicators nationwide has taken advantage of these repeatable biological responses to stress; however, state benchmarks often have varied substantially, even between adjacent states. To gain consistency, the EPA convened a national workgroup of EPA Regions, States, and Tribes to develop the BCG—a standardized, nationally applicable model that defines important attributes of biological assemblages and describes how these attributes change along a gradient of increasing stress from pristine environments to severely impaired conditions (Figure 3-38; Davies and Jackson, 2006). The goals of this work were to improve national consistency in the rating and application of biological assessment tools for all types of waterbodies and to provide a baseline for the development of tiered aquatic life uses.

To date, the BCG has been applied to assemblages including aquatic macroinvertebrates, fish, Unionid mussels, and algae in streams, but it could be applied to any organism group in any type of waterbody. The BCG is derived by applying a suite of ten ecological attributes that allows biological condition to be interpreted independently of assessment method (Table 3-11; Davies and Jackson, 2006). The first five attributes focus on taxa sensitivity, an important component of tools such as multimetric indices (e.g., the Index of Biotic Integrity [IBI], the Invertebrate Community Index [ICI]; see Box 2-3) used in the United States and Europe. Many indicator taxa have been widely studied, and, for groups such as fish, historical data often exist. Most states have established lists of tolerant and intolerant species as part of their use of biological indices (Simon and Lyons, 1995). The relatively large literature on species population and distribution changes in response to stressors and landscape condition offers insight into the mechanisms for population shifts, some of which are summarized in this section.

The first two attributes of the BCG relate to those streams that are closest to natural or pristine, with most taxa "as naturally occur." Attribute 1 and 2 taxa are the most sensitive species that typically disappear with even minor stress. Table 3-12 lists some example attribute 1 taxa for four different regions of the United States. Attribute 3 reflects more ubiquitous, but still sensitive, species that can provide information as human influence on the landscape becomes more obvious, but is not yet severe. Attributes 5 and 6 are taxa that increase in abundance and distribution with increasing stress. The organism condition at-

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The Biological Condition Gradient: Biological Response to Increasing Levels of Stress

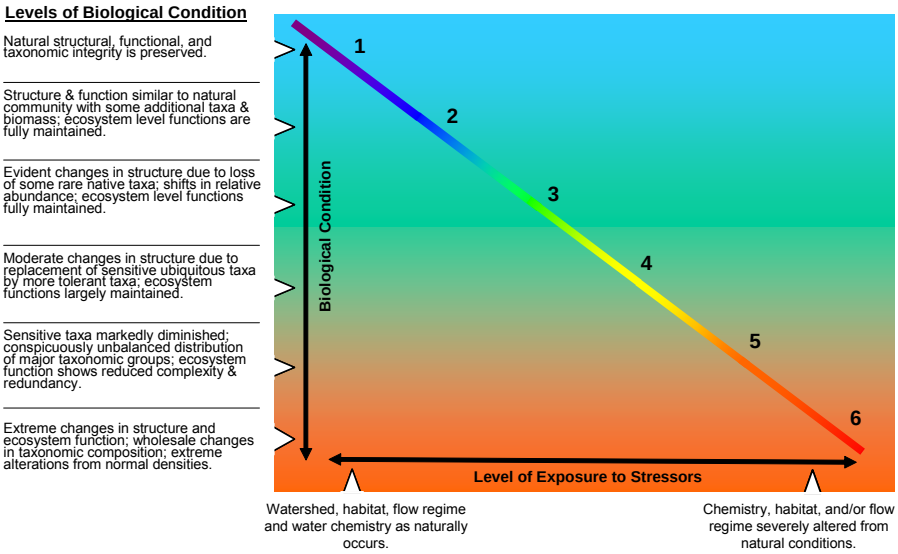

FIGURE 3-38 The Biological Condition Gradient (BCG) and summaries of biological condition along tiers of this gradient. SOURCE: Modified from Davies and Jackson (2006) by EPA.

TABLE 3-11 Ecological attributes that comprise the basis for the BCG

1.	Historically documented, sensitive, long-lived or regionally endemic taxa
2.	Sensitive-rare taxa
3.	Sensitive-ubiquitous taxa
4.	Taxa of intermediate tolerance
5.	Tolerant taxa
6.	Non-native or introduced taxa
7.	Organism condition
8.	Ecosystem functions
9.	Spatial and temporal extent of detrimental effects
10.	Ecosystem connectance

SOURCE: EPA (2005).

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TABLE 3-12 Example of Taxa that *Might Serve* as Attribute 1: "Historically Documented, Sensitive, Long-Lived, Regionally Endemic Taxa for Streams in Four Regions of the United States"

State and Taxon	Taxa Representative of Attribute I
Maine	
Mollusks	brook floater (*Alasmodonta varicosa*), triangle floater (*Alasmodonta undulata*), yellow lampmussel (*Lampsilis cariosa*)
Fishes	brook stickleback (*Culaea inconstans*), swamp darter (*Etheostoma fusiforme*)
Washington	
Fishes	steelhead (*Oncorhynchus mykiss*)
Amphibians	spotted frog (*Rana pretiosa*)
Arizona	
Mollusks	spring snails (*Pyrgulopsis* spp.)
Fishes	Gila trout (*Oncorhynchus gilae*), Apache trout (*Oncorhynchus apache*), cutthroat trout (endemic strains) (*Oncorhynchus clarki*)
Amphibians	Chihuahua leopard frog (*Rana chiricahuensis*)
Kansas	
Mollusks†	hickorynut (*Obovaria olivaria*), black sandshell (*Ligumia recta*), ponderous campeloma (*Campeloma crassulum*)
Fishes	Arkansas River shiner (*Notropis girardi*), Topeka shiner (*Notropis topeka*), Arkansas darter (*Etheostoma cragini*), Neosho madtom (*Noturus placidus*), flathead chub (*Platygobio gracilisa*)
Other invertebrates	ringed crayfish (*Orconectes neglectus neglectus*), Plains sand-burrowing mayfly (*Homoeoneuria ammophila*)
Amphibians	Plains spadefood toad (*Spea bombifrans*), Great Plains toad (*Bugo cognatus*), Great Plains narrowmouth toad (*Gastrophryne olivaceae*), Plains leopard frog (*Rana blairi*)

†Although not truly endemic to the central plains, these regionally extirpated mollusks were widely distributed in eastern Kansas prior to the onset of intensive agriculture.
SOURCE: Table 7 from Davies and Jackson (2006). Reprinted, with permission, from Davies and Jackson (2006). Copyright 2006 by Ecological Society of America.

tribute (7) includes the presence of anomalies (e.g., tumors, lesions, eroded fins, etc.) or the presence of large or long-lived individuals in a population. Most natural streams typically have few or incidental rates of "anomalies" associated with disease and stress. Natural waterbodies typically also have the entire range of life stages present, as would be expected. However, as stress is increased, larger individuals may disappear or emigrate, or reproductive failure may occur. Ecosystem function (attribute 8) is very difficult to measure directly (Davies and Jackson, 2006). However, certain functions can be inferred from structural measures common to various multimetric indices, examples of which are listed in Table 3-13. The last two attributes (9 and 10) may be of particular importance with regard to stormwater and urban impacts. Cumulative impacts are a characteristic of urbanization, and biological organisms typically integrate the effects of many small insults to the landscape. Additionally, most natural systems often have strong "connectance," such that aquatic life often has stages that rely on migrating across multiple types or sizes of waterbodies. Urbanized streams can decrease connectance by creating migration blocks, including vertical barriers at road crossings and small dams (Warren and Pardew, 1998).

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TABLE 3-13 Function Ecological Attributes or Process Rates and Their Structural Indicators

Biotic Level and Function or Process	**Structural Indicator**
Individual level	
Fecundity	Maximum individual size, number of eggs
Growth and metabolism	Length/mass (condition)
Morbidity	Percentage anomalies
Population Level	
Growth and fecundity	Density
Mortality	Size- or age-class distribution
Production	Biomass, standing crop, catch per unit effort
Sustainability	Size- or age-class distribution
Migration, reproduction	Presence or absence, density
Community or assemblage level	
Production/respiration ratio, autotrophy vs heterotrophy	Trophic guilds, indicator species
Primary production	Biomass, ash-free dry mass
Ecosystem level	
Connectivity	Degree of aquatic and riparian fragmentation longitudinally, vertically, and horizontally; presence or absence of diadromous and potadromous species

SOURCE: Table 4 from Davies and Jackson (2006). Reprinted, with permission, from Davies and Jackson (2006). Copyright 2006 by Ecological Society of America.

Construction of a BCG creates a conceptual framework for developing stressor–response gradients for particular urban areas. The initial work done to develop the BCG derived a series of six tiers to describe a gradient of biological condition that is anchored in pristine conditions ("as naturally occurs") and that extends to severely degraded conditions (see Figure 3-38). Exercises done by the national work group to derive such a gradient for macroinvertebrates in wadeable streams showed strong consistency in assigning tiers to datasets using the descriptions of taxa for each attribute along these gradients (Davies and Jackson, 2006). Substantial data already exist to populate many of the attributes of the BCG and to provide mechanistic underpinning for the expected directions of change.

The BCG is not a replacement for assessment tools such as the IBI or multivariate predictive models (e.g., RIVPACS approach), but rather a conceptual overlay for characterizing the anchor point-of-reference conditions and a consistent way to communicate biological condition along gradients of stress. As such, it has strong application to understanding stormwater impacts and to communicating where a goal is located along the gradient of biological condition. While most urban goals may be distant from "pristine" or "natural," the BCG process can dispel misconceptions that alternate urban goals are "dead streams" or unsafe in some manner.

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Factors Limiting Aquatic Assemblages in Urban Waters

A slew of recent investigations have quantified the responses of macroinvertebrates and other biological assemblages to multiple measures of urbanization and to stormwater in particular. One important conclusion of some of this work is that declines in the highest biological condition start with low levels of anthropogenic change (e.g., 5 to 25 percent impervious surface); higher levels of urbanization severely alter aquatic conditions (Horner et al., 2003). This has important consequences for protecting sites with the highest biological integrity, as they may be among the most vulnerable. The non-threshold nature of this aquatic response and the typical wedge-shaped response to multiple stressors by aquatic assemblages are discussed in Box 3-9.

BOX 3-9
Non-threshold Nature of the Decline of Biological Assemblages Along Urban Stressor Gradients

Several recent surveys have demonstrated that biological assemblages begin to decline in condition with even low levels of urban disturbance as measured by various gradients of urbanization (e.g., May, 1996; Horner et al., 1997; May et al., 1997; Horner et al., 2003; Moore and Palmer, 2005; Barbour et al., 2008). This box summarizes the work of Horner et al. (2003) in small streams in three regions: Montgomery County, Maryland; Austin, Texas; and the Puget Sound area of Washington. Geographic Information System (GIS) analyses using information such as land use, total impervious area, and riparian land use were used to develop multi-metric Watershed Condition Indices (WCIs) for each region. These in turn were related to fish and macroinvertebrate indices, e.g., benthic IBIs, (B-IBI, all three regions), a fish IBI (F-IBI for Maryland) and an index that was the ratio of the sensitive coho salmon to the more tolerant cutthroat trout in collections for the Puget Sound lowland area.

In each of these areas, no or extremely low urban development, substantial forest cover, and minimal disturbance of riparian zones characterized sites with the highest biological scores, but these conditions did not guarantee high scores because other impacts could limit biology even with these “natural” characteristics. In all three regions, high urbanization and loss of natural cover always led to biological degradation (Figures 3-39 and 3-40). The results of this study were similar to other recent studies such as Barbour et al. (2008) that identify a “wedge-shaped” relationship or a “polygonal” relationship (Carter and Fend, 2005) between urban gradients and biological condition. These types of relationships have also been termed “factor-ceiling” relationships (Thomson et al., 1996). The outer surface of these wedges or polygons reflects where the urban gradients limit biological assemblages, such that points below this surface typically represent sites affected by other stressors (e.g., combined sewer overflows, discharges, etc.). In all of these studies it is easier to predict loss of biological conditions as the urban gradients (e.g., WCI) worsen than it is to ensure high biological integrity at low proportions of urban stress (because some other stressor may still limit aquatic condition).

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BOX 3-9 Continued

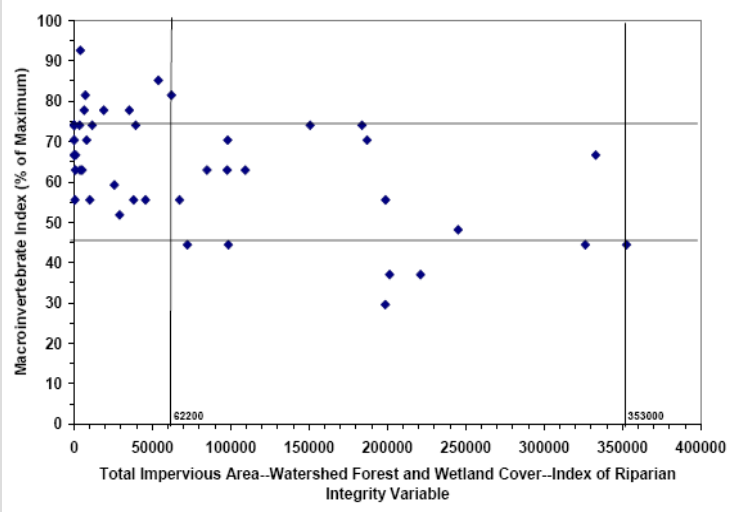

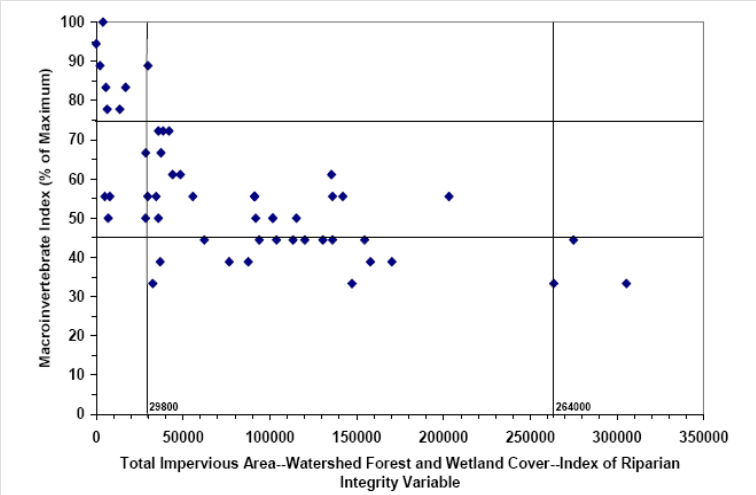

FIGURE 3-39 Plots of a measure of urbanization (TIA + Wetland & Forest Cover + IRI) versus B-IBIs for Austin, Texas (top), and Montgomery County, Maryland (bottom). SOURCE: Horner et al. (2003).

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BOX 3-9 Continued

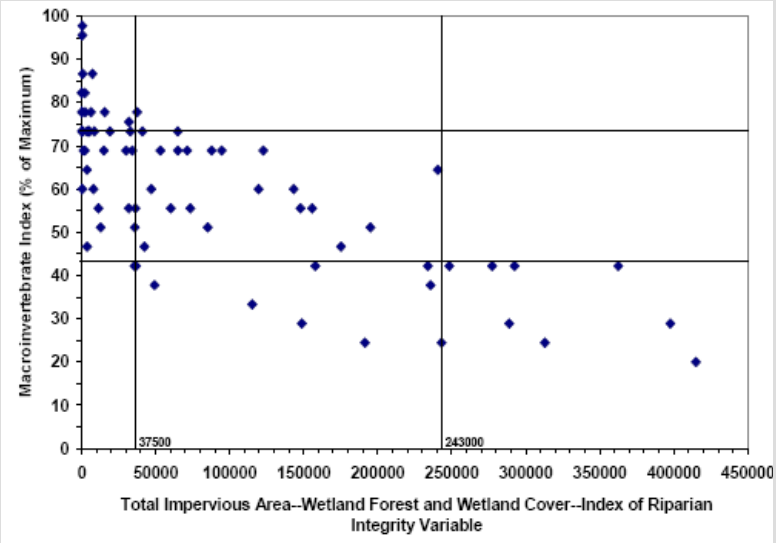

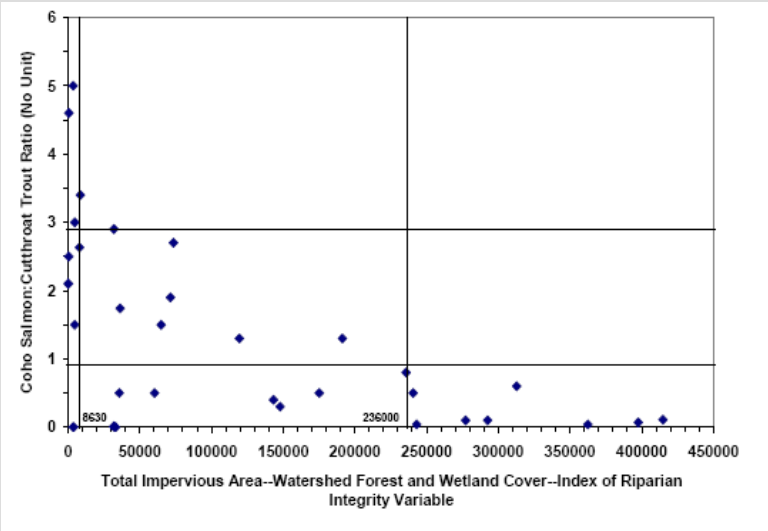

FIGURE 3-40 Plots of a measure of urbanization (TIA + Wetland & Forest Cover + IRI) versus B-IBIs for Puget Sound (top) and versus the ratio of coho salmon to cutthroat trout for Puget Sound (bottom). SOURCE: Horner et al. (2003).

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BOX 3-9 Continued

Horner et al. (2003) also focused on whether structural SCMs could moderate the effects of urbanization on biological assemblages. They made detailed observations of two subbasins in the Puget Sound lowland area, one with a greater degree of stormwater management than the other (although neither had what would be considered comprehensive stormwater management with a focus on water quality issues). As shown in Figure 3-41, at the highest levels of urbanization (triangles), the subbasin with the more extensive use of structural SCMs did have better biological conditions. There was less evidence of biological benefit in the watershed that used SCMs but it had only moderate urbanization and more natural land cover (squares and diamonds). There were no circumstances where high biological condition was observed along with the use of SCMs because high biological condition only occurred where little human alteration was present, and thus SCMs were not used.

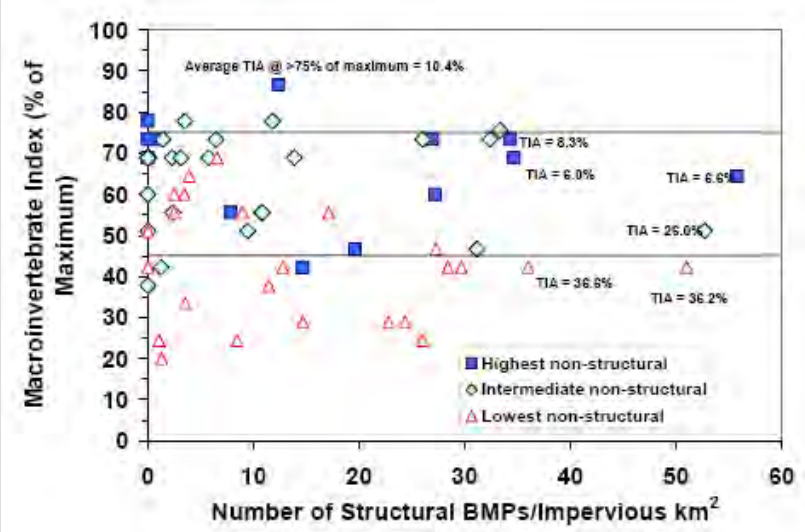

FIGURE 3-41 Macroinvertebrate community index versus structural SCM density with the highest, intermediate, and lowest one-third of natural watershed and riparian cover. The upper and lower horizontal lines represent indices considered to define relatively high and low levels of biological integrity, respectively. SOURCE: Horner et al. (2003).

The sections that follow review the evidence underlying biological responses to each of the major categories of stressors: chemical, hydrologic, physical habitat, biological, and energy-related factors. As will be evident in some of the examples, the stressors themselves can interact (e.g., flow can influence habitat, habitat can influence energy processing, etc.), which increases the complexity of understanding how stormwater affects aquatic ecosystems.

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Biological Responses to Toxic Pollutants

The chemical constituents of natural streams vary widely with climatic region, stream size, soil types, and geological setting. Most small natural streams, outside of unique areas wth naturally occurring toxicants, have very low levels of chemicals considered to be toxicants and have relatively low levels of dissolved and particulate materials in general. This applies to chemicals in the water column and in sediments. Increasing amounts of impervious surface in the watershed typically increase the concentrations of many chemical parameters in runoff derived from urban surfaces (e.g., Porcella and Sorenson, 1980; Sprague et al., 2007).

Stormwater concentrations of these pollutants can be variable and sometimes extreme or "toxic" depending on the timing of flows (e.g., first flush), although concentrations at base flows may not routinely exceed water quality benchmarks (Sprague et al., 2007). Historical deposition of toxics in sediments can also be responsible for extremely high pollutant concentrations within waterbodies, even though the stormwater discharges may no longer be active. These situations have been termed "legacy pollution" and are most commonly associated with urban centers that have a history of industrial production.

Natural constituents such as dissolved materials (e.g., chlorides), particulate material (e.g., fine sediments), nutrients (e.g., phosphorus and nitrogen compounds), as well as a myriad of man-made parameters such as heavy metals and organic chemicals (e.g., hydrocarbons, pesticides and herbicides) have been documented to be increased and at times pervasive in stormwater (Heany and Huber, 1984; Paul and Meyer, 2001; Roy et al., 2003; Gilliom et al., 2006) although specific patterns of concentrations can vary with region and ecological setting (Sprague et al., 2007). Water chemistry impacts can also arise from a complex array of permitted discharges, storm sewer discharges, and combined sewer overflows that are treated to certain limits but at times fail to remove all constituents from flows, especially when associated with storm events (Paul and Meyer, 2001).

Streams in urban settings can have increases in toxicant levels compared to background concentrations. In many instances these cases have been associated with loss of aquatic species and impairment of aquatic life goals (EPA, 2002), which are usually explained in terms of typical lethal responses. The complexity of urban systems with regard to pathways, magnitude, duration, and timing of toxicity as well as possible synergistic or antagonistic effects of mixtures of pollutants argues for a broad approach to characterizing effects including not only toxicity testing, but also novel approaches and direct monitoring of biological assemblages (Burton et al., 1999). What is problematic from a traditional management perspective is that aquatic communities may decline before exceedances of water quality criteria are evident (May et al., 1997; Horner et al., 2003).

The first three BCG attributes focus on populations of species of high to very high sensitivity, most of which are uncommon or absent in waters with any

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substantial level of urbanization. Multi-metric indices such as IBI, which reflect loss of these species, decline at least linearly with increasing urbanization (e.g., Miltner et al., 2004; Meador et al., 2005; Walters et al., 2005). Although toxicity to compounds varies with species, many species of federal and state endangered and threatened aquatic species are more sensitive than "commonly" used test species (Dwyer et al., 2005), such that the loss of aquatic species when toxicant levels exceed criteria are readily explained.

The mechanisms of species population declines in response to chemical contaminants are likely complex and not just limited to direct lethality of the pollutant. Indeed, initial chemical changes may have no "toxic" effects, but rather could change competitive and trophic dynamics by changing primary production and energy dynamics in streams. For example, exposures to aromatic and chlorinated organic compounds from sediments derived from urban areas have been found to increase the susceptibility of salmonids to the bacterial pathogen *Vibrio anguillarum* (Arkoosh et al., 2001). Recent work has found that salmonids show substantial behavioral changes from olfactory degradation related to copper at concentrations as low as 2 μg/L, well below copper water quality criteria and above levels measured in most stormwater-affected streams (Hecht et al., 2007; Sandahl et al., 2007). Salmonid and other fish depend extensively on olfactory cues for feeding, emigration, responding to prey and predators, social and spawning interactions, and other behaviors, such that loss or diminution of such cues may have population-level effects on these species (Sandahl et al., 2007). Copper has been shown to cause olfactory effects on other species (Beyers et al., 2001) and to impair the sensory ability of the fish lateral line (Hernandez et al., 2006), which is nearly ubiquitous in fishes and important for most freshwater species in feeding, schooling, spawning, and other behaviors.

Whole effluent toxicity testing or sediment toxicity testing may misclassify the effects of runoff and effluents in urban settings (Burton et al., 1999). Short-term toxicity tests of stormwater often result in no identified toxicity. However, longer studies (e.g., 30 days) have shown increasing toxicity with time (Masterson and Bannerman, 1994; Ramcheck and Crunkilton, 1995). This suggests that the mechanism of toxicity could be through an ingestion pathway, for example, rather than gill uptake. Metals are often in high concentrations where fine sediments accumulate, and their legacy can extend past the time period of active discharge. Metal concentrations in urban stream sediments have been associated with high rates of fish and invertebrate anomalies such as tumors, lesions, and deformities (Burton, 1992; Ingersoll et al., 1997; Smith et al., 2003).

Biological Responses to Non-Toxicant Chemicals

Non-toxic chemical compounds that occur in stormwater such as nutrients, dissolved oxygen (DO), pH, and dissolved solids as well as physical factors such as temperature can have impacts on aquatic life. The effects of some of these

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compounds (e.g., DO, pH) have been well documented from other impacts (e.g., wastewater, mining), such that nearly all states have developed water quality criteria for these parameters. For example, nutrient enrichment in stormwater runoff has been associated with declines of biological condition in streams (Miltner and Rankin, 1998). Chloride, sulfate, and other dissolved ions that are often elevated in urban areas can have effects on osmoregulation of aquatic organisms and have been associated with loss of species sensitive to dissolved materials such as mayflies (Kennedy et al., 2004). The concentrations of these compounds can vary regionally (Sprague et al., 2007) and with the degree of urbanization.

Water quality criteria for temperature were spurred by the need for thermal permits for industrial and power plant cooling water discharges. There is a very large literature on the importance of water temperature to aquatic organisms; preference, avoidance, and lethal temperature ranges have been derived for many aquatic species (e.g., Brungs and Jones, 1977; Coutant, 1977; Eaton et al., 1995). In addition, temperature is one of the key classification strata for aquatic life, in that streams are routinely classified as cold water, cool water, or warm water based on the geographic and natural settings of waters. The removal of catchment and riparian vegetation and the general increase in surface runoff from impervious, man-made, and heat-capturing surfaces has been associated with increasing water temperatures in urban waterbodies (Wang and Kanehl, 2003; Nelson and Palmer, 2007). A number of researchers have created models to predict in-stream temperatures based on urban characteristics (Krause et al., 2004; Herb et al., 2008).

Hydrologic Influences on Aquatic Life

The importance of "natural" flow regimes on aquatic life has been well documented (Poff et al., 1997; Richter et al., 1997a, 2003). As watersheds urbanize, flow regimes change from little runoff to over 40 to 90 percent of the rainfall becoming surface runoff (Roesner and Bledsoe, 2003). Flow regimes in urban streams typically are very "flashy," with higher and more frequent peak events, compared to undisturbed systems (Poff et al., 1997; Baker et al., 2004) and well as reduced base flows and more frequent desiccation (Bernhardt and Palmer, 2007). Richter et al. (1996) proposed a series of indicators that could be used to measure hydrologic disturbance, many of which have been used in the recent studies identifying the hydrologic effects of stormwater on aquatic biota (Barbour et al., 2008). Pomeroy et al. (2008) did an extensive review of which flow characteristics appear to have the greatest influence on biological metrics and biological integrity. No single measure of flow was found to be significant in all studies; however, important attributes included flow variability and flashiness, flood frequency, flow volume, flow variability, flow timing, and flow duration.

There are a number of mechanisms that may be responsible for the influ-

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ence of flow characteristics on aquatic assemblages. Aquatic species vary dramatically in their swimming performance and behaviors, and species are generally adapted to undisturbed flow regimes in an area. Many low- to moderate-gradient small streams in the United States, for example, have strong connections with their flood-prone areas and often possess habitat features that insulate poor swimming species from episodic natural high flows. Undercut banks, rootwads, oxbows, and backwater habitats all can act as refugia from high flows. Some aquatic species are more or less mobile within the sediments, like certain macroinvertebrates (meiofauna or hyporheos) and fish species such as sculpins and madtoms. Secondary impacts from hydrologic changes such as bank erosion and aggradation of fines can render substrates embedded and prohibit organisms, particularly the meiofauna, from moving vertically within the bottom substrates (Schmid-Araya, 2000). Substrate fining has been documented to occur with increasing urbanization, especially in the early stages of development, which can embed spawning habitats and eliminate or reduce spawning success of fish such as salmonids and minnows (Waters, 1995).

Flood flows can cause mortality in the absence of urbanization. For example, flood flows in streams under natural conditions have been documented as a cause of substantial mortality in young or larval fish such as smallmouth bass (Funk and Fleener, 1974; Lorantas and Kristine, 2004). Increased flashiness from urbanization is likely to exacerbate this effect. Thus, increases in the frequency of peak flows during spring will increase the probability of spawning failure, such that sensitive species may eventually be locally extirpated. In urban areas, culverts and other flow obstructions can create conditions that may preclude re-colonization of upstream reaches because weak-swimming fishes cannot move past flow constrictions or leap past vertical drops caused by artificial structures.

Hydrologic simplification and stream straightening that occur in urban streams, often as a result of increased peak flows or as a local management response, typically remove habitat used as temporary refuges from high flows, such as backwater areas, undercut banks, and rootwads. There is a large literature relating populations of fish and macroinvertebrates to various habitat features of streams, rivers, and wetlands. The first two attributes of the BCG identify taxa that are historically documented, sensitive, long-lived, or regionally endemic taxa or sensitive-rare taxa. Many of these taxa are endangered because of large-scale changes in flow-influenced habitats; that is, threats of extinction often center on habitat degradation that influence spawning, feeding, or other aspects of a species life history (Rieman et al., 1993). In contrast, many of the fish and macroinvertebrate taxa that compose regional lists of tolerant taxa are tolerant to habitat changes related to flow disturbance as well as chemical parameters. Understanding the life history attributes of certain species and how they may change with multiple stressors (Power, 1997) is an important tool for understanding complex responses of aquatic ecosystems to urban stressors.

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Geomorphic and Habitat Influences on Aquatic Life

In natural waters, geomorphic factors and climate, modified by vegetation and land use, constrain the types of physical habitat features likely to occur in streams (Webster and D'Angelo, 1997). For example, very-low-gradient streams may have few riffles and be dominated by woody debris and bank cover, whereas higher gradient waters may have more habitat types formed by rapidly flowing waters (riffles, runs). Aquatic life in streams is influenced directly by the habitat features that are present, such as substrate types, in-stream structures, bank structure, and flow types (e.g., deep-fast vs. shallow-slow).

As discussed previously, human alteration of landscapes, encroachment on riparian areas, and direct channel modifications (e.g., channelization) that acompany urbanization have often resulted in unstable channels, with negative consequences for aquatic habitat. As urbanization has increased, channel density has declined because streams have been piped, dewatered, and straightened (Meyer and Wallace, 2001; Paul and Meyer, 2001). Changes in the magnitude, relative proportions, and timing of sediment and water delivery have resulted in loss of aquatic life and habitat via a wide range of mechanisms, including changes in channel bed materials, increased suspended sediment loads, loss of riparian habitat due to bank erosion, and changes in the variability of flow and sediment transport characteristics relative to aquatic life cycles (Roesner and Bledsoe, 2003). There are still significant gaps in knowledge about how stormwater stressors can affect stream habitat, especially as one moves from the reach scale to the watershed scale. Understanding the stage and trajectory of channel evolution is critical to understanding channel recovery and expected habitat conditions or in choosing effective restoration options (Simon et al., 2007).

Across much of the United States, stream habitats have been altered to the imperilment of aquatic species (Williams et al., 1989; Richter et al., 1997b; Strayer et al., 2004). A study of rapidly urbanizing streams in central Ohio identified the loss of highly and moderately sensitive species as a key factor the decline in the IBI in these streams (Miltner et al., 2004). These streams had historical fish collections when they were primarily influenced by agricultural land use; sampling after the onset of suburban development documented the loss of many of these species attributable to land-use changes and habitat degradation along these urban streams. Along the BCGs that have been developed for streams, most of the species in attributes 1–3 are specialists requiring very specific habitats for spawning, feeding, and refuge. Habitat alteration, either direct or indirect, creates harsh environments that tend to favor tolerant taxa, which would otherwise be in low abundance. Often these tolerant species are characterized by high reproductive potential, generalist feeding behaviors, tolerance to chemical stressors such as low DO, and pioneering strategies that allow rapid recolonization following acute stressful events.

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Altered Energy Pathways in Urban Streams

The pathways of energy flow in streams are an important determinant of aquatic species distributions. In most natural temperate streams, headwaters transform and export energy from stream side vegetation and adjacent land uses into aquatic biomass. The types, amount, and timing of delivery of water, organic material, and debris have important consequences for conditions downstream (Dolloff and Webster, 2000). The energy-transforming aspect of stream ecosystems is difficult to capture directly, so most measures are surrogates, such as the trophic characteristics of assemblages and chemical and physical characteristics consistent with natural energy processes.

An increasingly urban landscape can have a complex array of effects on energy dynamics in streams (Allan, 2004). Loss of riparian areas and changes in riparian vegetation can reduce the supply and quality of coarse organic matter that forms the base of aquatic food webs in most small streams. The reduction in the amount of organic matter with riparian loss is obvious; however, changing species of vegetation (e.g., invasion or planting of exotic species) can affect the quality of organic matter and influence higher trophic levels because, for example, exotic species may have different nutrient values (e.g., C/N ratios, trace chemicals) or process nutrients at a different rate (Royer et al., 1999). Furthermore, native invertebrate taxa may not be adapted to utilize the exotic material (Miller and Boulton, 2005). For example, changes in leaf species in a stream may alter the macroinvertebrate community by favoring species that feed on fast-decaying versus slow-decaying leaves (Smock and MacGregor, 1988; Cummins et al., 1989; Gregory et al., 1991).

Other recent work is examining ways that changes in geomorphology with increasing urbanization can influence trophic structure in streams (Doyle, 2006). Groffman et al. (2005) examined nitrogen processing in stream geomorphic structures such as bars, riffles, and debris dams in suburban and forested areas. Although suburban areas had high rates of production in organic-rich debris dams and gravel bars, higher storm flow effects in urban streams may make these features less stable and able to be maintained (Groffman et al., 2005). Changes in habitat and riparian vegetation may greatly alter trophic patterns of energy transport. For example, local nutrient enrichments combined with reduced riparian vegetation can result in nuisance algal growths in waterbodies that are evidence of simpler energy pathways. Corresponding effects are further water chemistry changes from algal decomposition (e.g.., low DO) or very high algal activity (e.g., high pH) (Ehlinger et al., 2004).

The complexity of energy flow through simple ecosystems is illustrated in Figure 3-42, a “simplified” food web of a headwater stream published by Meyer (1994). The forms in which nutrients are delivered to streams may be more important than actual concentrations as well as the availability of carbon sources essential for nutrient transformation. The nutrient components that form the base of the food web in Figure 3-42 are the FPOM and CPOM boxes. In many natural streams, woody and leafy debris are the most common form of nutrient

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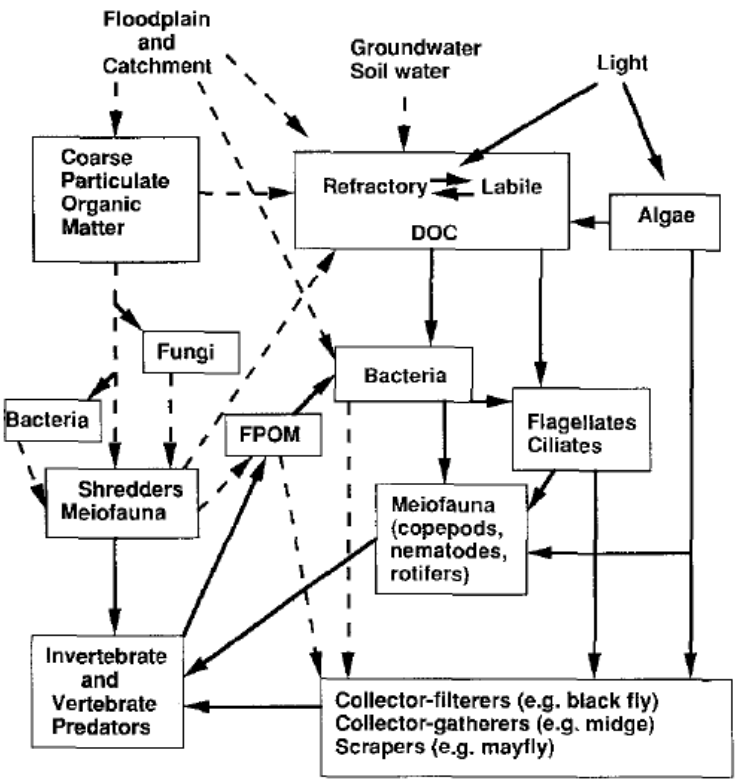

FIGURE 3-42 Simplified diagram of a lotic food web showing sources and major pathways of organic carbon. Dotted lines indicate flows that are a part of the microbial loop in flowing water but not in planktonic systems. SOURCE: Reprinted, with permission, from Meyer (1994). Copyright 1994 by Springer.

input, and changes to urban landscapes often change this to dissolved and finer forms. Urbanization can also reduce the retention of organic debris of streams (Groffman et al., 2005) and the timing of nutrient delivery. Timing can be of crucial importance since species spawning and growth periods may be specifically timed to take advantage of available nutrients.

As important as energy and nutrient dynamics are to stream function, many of the stream characteristics that determine effective energy flow are not typically considered when characterizing stormwater impacts. The best chance for considering these variables and maximizing ecosystem function is through inte-

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grated, biologically based monitoring programs that include urban areas (Barbour et al., 2008) and stressor identification procedures (EPA, 2000) to isolate likely causes of impact and to inform the choices of SCMs.

Biological Interactions in Urban Streams

Streams in urbanized environments often are characterized by fewer native and more alien species than natural streams (DeVivo, 1996; Meador et al., 2005). The influence of exotic species is not always predictable and may be most severe in lentic environments (e.g., wetlands, estuaries) and in riparian zones where various exotic aquatic plants can greatly alter natural systems in both structure and function (Hood and Naiman, 2000). Riley et al. (2005) foundthat the presence of alien aquatic amphibians was positively related to degree of urbanization, as was the absence of certain native amphibian species. In a review of possible reasons for this observation, he suggested that altered flow regimes were responsible. In the arid California streams they studied, flow became more constant with urbanization (i.e., natural streams were generally ephemeral), which allowed invasion by exotic species that can prey on, compete with, or hybridize with native species (Riley et al., 2005). The alteration of stream habitat that accompanies urbanization can also lead to predation by domestic cats and dogs or collection by humans, especially where species (e.g., California newts) are large and conspicuous (Riley et al., 2005).

The effects of specific exotic species on aquatic systems has been observed to vary geographically, although recent work has found correlations between total invasion rate and the number of high-impact exotic species (Ricciardi and Kipp, 2008). This suggests that overall efforts to reduce the importation or spread of all alien species should be helpful.

The Role of Biological Monitoring

The preceding sections illustrate the importance of biological data to understanding the complexities associated with urban and stormwater impacts to waterbodies. Although categories of urban stressors have been discussed individually, these stressors routinely, if not universally, co-occur in urban waterbodies. Their cumulative impacts are best measured with biological tools because the biota integrate the influence of all of these stressors.

Many programmatic aspects of the CWA arose as a response to rather obvious impacts of chemical pollutants that were occurring in surface waters during this time. The initial focus of water quality standards was on developing chemical criteria that could serve as engineering endpoints for waste treatment systems (e.g., NPDES permits). Rather general aquatic life goals for streams and rivers that were suitable for the initial focus of the CWA are now considered insufficient to deal with the complex suite of stressors limiting aquatic systems.

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To that end, refined aquatic life goals and improved biological monitoring are essential for effective water quality management, including stormwater issues (NRC, 2001). Practical biological and physical monitoring tools have even been developed for very small headwater streams (Ohio EPA, 2002; Fritz et al., 2006), which are particularly affected by stormwater because of their prevalence (greater than 95 percent of channels), their relatively high surface-to-volume ratio, their role in nutrient and material processing, and their vulnerability to direct modification such as channelization and piping (Meyer and Wallace, 2001).

Surrogate indicators of stormwater impacts to aquatic life (such as TSS concentrations) have been widely used because direct biological measures were poorly developed and these surrogates were assumed to be important to pollutant delivery to urban streams. However, biological assessment has rapidly advanced in many states and can be readily applied or if needed modified to be sensitive to stormwater stressors (Barbour et al., 2008). As Karr and Chu (1999) warned, the management of complex systems requires measures that integrate multiple factors. Stormwater permitting is no different, and care must be taken to ensure that permitting and regulatory actions retain ecological relevance. Surrogate measures have an essential role in the assessment of individual SCMs; however, this needs to be kept in context with the entire suite of stressors likely to be important to the aquatic life goals in streams.

Stormwater management programs should not necessarily bear the burden of biological monitoring; rather, well-conceived biological monitoring should be the prevue of state and local government agencies (as discussed more extensively in Chapter 6). Refined aquatic life goals developed for all waters, including urban waters, measured with appropriate biological measures, should be the final endpoint for management. The collection of biological data needs to be closely integrated across multiple disciplines in order to be effective. Pomeroy et al. (2008) describe a multidisciplinary approach to study the effects of stormwater in urban settings, and Scholz and Booth (2001) also propose a monitoring approach for urban watersheds. Such efforts are not necessarily easy, and many institutions find pitfalls when trying to integrate scientific information across disciplines (Benda et al., 2002).

EPA water programs, such as the Total Maximum Daily Load (TMDL) program, have been criticized for having too narrow a focus on a limited number of traditional pollutants to the exclusion of important stressors such as hydrology, habitat alteration, and invasive taxa (Karr and Yoder, 2004)—all serious problems associated with stormwater and urbanization. The science has advanced significantly over the past decade so that biological assessment should be an essential tool for identifying stormwater impacts and informing the choice of SCMs in a region or watershed. Although biological responses to stressors in the ambient environment are by their nature correlative exercises, ecological epidemiology principles or "stressor identification" methods can identify likely causative agents of impairment with relatively high certainty in many instances (Suter, 1993, 2006; EPA, 2000). Coupled with other ambient and source moni-

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toring information, biological information can form the basis for an effective stormwater program. As an example, Box 3-10 introduces the Impervious Cover Model (ICM), which was developed using correlative information on the association between impervious cover and biological metrics. The crux of the ICM is that stormwater management is tailored along a readily measureable gradient (impervious cover) that integrates multiple individual stressor categories that would otherwise be overlooked in the traditional pollutant-based approach to stormwater management. Even the form of the ICM (as conceptualized in Figure 3-43) matches that outlined for the BCG (Figure 3-38). Use of the ICM to improve the MS4 stormwater program is discussed in Chapter 6.

Human Health Impacts

Despite the unequivocal evidence of ecosystem consequences resulting from urban stormwater, a formal risk analysis of the human health effects associated with stormwater runoff is not yet possible. This is because (1) many of the most important waterborne pathogens have not been quantified in stormwater, (2) enumeration methods reported in the current literature are disparate and do not account for particle-bound pathogens, and (3) sampling times during storms have not been standardized nor are known to have occurred during periods of human exposure. Individual studies have investigated the runoff impacts on public health in freshwater (Calderon et al., 1991) and marine waters (Haile et al., 1999; Dwight et al,. 2004; Colford et al., 2007). Although these studies provide ample evidence that stormwater runoff can serve as a vector of pathogens with potential health implications (for example, Ahn et al., 2005, found that fecal indicator bacteria concentrations could exceed California ocean bathing water standards by up to 500 percent in surf zones receiving stormwater runoff), it is difficult to draw conclusive inferences about the specific human health impacts from microbial contamination of stormwater. Calderon et al. (1991) concluded that the currently recommended bacterial indicators are ineffective for predicting potential health effects associated with water contaminated by nonpoint sources of fecal pollution. Furthermore, in a study conducted in Mission Bay, California, which analyzed bacterial indicators using traditional and nontraditional methods (chromogenic substrate and quantitative polymerase chain reaction), as well as a novel bacterial indicator and viruses, traditional fecal indicators were not associated with identified human health risks such as diarrhea and skin rash (Colford et al., 2007).

The Santa Monica Bay study (Haile et al., 1999) indicated that the risks of several health outcomes were higher for people who swam at storm-drain locations compared to those who swam farther from the drain. However, the list of health outcomes that were more statistically significant (fever, chills, ear discharge, cough and phlegm, and significant respiratory) did not include highly

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BOX 3-10
The Impervious Cover Model: An Emerging Framework for Urban Stormwater Management

The Impervious Cover Model (ICM) is a management tool that is useful for diagnosing the severity of future stream problems in a subwatershed. The ICM defines four categories of urban streams based on how much impervious cover exists in their subwatershed: *high-quality streams*, *impacted streams, non-supporting streams,* and *urban drainage*. The ICM is then used to develop specific quantitative or narrative predictions for stream indicators within each stream category (see Figure 3-43). These predictions define the severity of current stream impacts and the prospects for their future restoration. Predictions are made for five kinds of urban stream impacts: changes in stream hydrology, alteration of the stream corridor, stream habitat degradation, declining water quality, and loss of aquatic diversity.

The general predictions of the ICM are as follows. Stream segments with less than 10 percent impervious cover (IC) in their contributing drainage area continue to function as **Sensitive Streams**, and are generally able to retain their hydrologic function and support good-to-excellent aquatic diversity. Stream segments that have 10 to 25 percent IC in their contributing drainage area behave as **Impacted Streams** and show clear signs of declining stream health. Most indicators of stream health will fall in the fair range, although some segments may range from fair to good as riparian cover improves. The decline in stream quality is greatest toward the higher end of the IC range. Stream segments that range between 25 and 60 percent subwatershed impervious cover are classified as **Non-Supporting Streams** (i.e., no longer supporting their designated uses in terms of hydrology, channel stability habitat, water quality, or biological diversity). These stream segments become so degraded that any future stream restoration or riparian cover improvements are insufficient to fully recover stream function and diversity (i.e., the streams are so dominated by subwatershed IC that they cannot attain predevelopment conditions). Stream segments whose subwatersheds exceed 60 percent IC are physically altered so that they merely function as a conduit for flood waters. These streams are classified as **Urban Drainage** and consistently have poor water quality, highly unstable channels, and very poor habitat and biodiversity scores. In many cases, these urban stream segments are eliminated altogether by earthworks and/or storm-drain enclosure. Table 3-14 shows in greater detail how stream corridor indicators respond to greater subwatershed impervious cover.

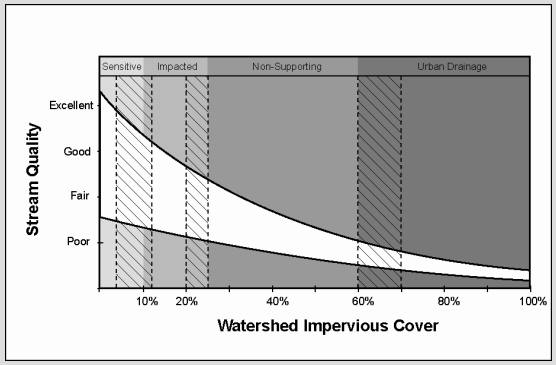

FIGURE 3-43 Changes in Stream Quality with Percent Impervious Cover in the Contributing Watershed. SOURCE: Chesapeake Stormwater Network (2008). Reprinted, with permission, from Chesapeake Stormwater Network (2008). Copyright 2008 by Chesapeake Stormwater Network.

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TABLE 3-14 General ICM Predictions Based on Urban Subwatershed Classification (CWP, 2004):

Prediction	Impacted (IC 11 to 25%) [8]	Non-supporting (IC 26 to 60%)	Urban Drainage (IC > 60%)
Runoff as a Fraction of Annual Rainfall [1]	10 to 20%	25 to 60%	60 to 90%
Frequency of Bankfull Flow per Year [2]	1.5 to 3 per year	3 to 7 per year	7 to 10 per year
Fraction of Original Stream Network Remaining	60 to 90%	25 to 60%	10 to 30%
Fraction of Riparian Forest Buffer Intact	50 to 70%	30 to 60%	Less than 30%
Crossings per Stream Mile	1 to 2	2 to 10	None left
Ultimate Channel Enlargement Ration [3]	1.5 to 2.5 larger	2.5 to 6 times larger	6 to 12 times larger
Typical Stream Habitat Score	Fair, but variable	Consistently poor	Poor, often absent
Increased Stream Warming [4]	2 to 4 °F	4 to 8 °F	8+ °F
Annual Nutrient Load [5]	1 to 2 times higher	2 to 4 times higher	4 to 6 times higher
Wet Weather Violations of Bacteria Standards	Frequent	Continuous	Ubiquitous
Fish Advisories	Rare	Potential risk of accumulation	Should be presumed
Aquatic Insect Diversity [6]	Fair to good	Fair	Very poor
Fish Diversity [7]	Fair to good	Poor	Very poor

[1] Based on annual storm runoff coefficient; ranges from 2 to 5% for undeveloped streams.
[2] Predevelopment bankfull flood frequency is about 0.5 per year, or about one bankfull flood every two years.
[3] Ultimate stream-channel cross-section compared to typical predevelopment channel cross section.
[4] Typical increase in mean summer stream temperature in degrees Fahrenheit, compared with shaded rural stream.
[5] Annual unit-area stormwater phosphorus and/or nitrogen load produced from a rural subwatershed.
[6] As measured by benthic index of biotic integrity. Scores for rural streams range from good to very good.
[7] As measured by fish index of biotic integrity. Scores for rural streams range from good to very good.
[8] IC is not the strongest indicator of stream health below 10% IC, so the sensitive streams category is omitted from this table.
SOURCE: Adapted from Schueler (2004).

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BOX 3-10 Continued

Scientific Support for the ICM

The ICM predicts that hydrological, habitat, water quality, and biotic indicators of stream health first begin to decline sharply at around 10 percent total IC in smaller catchments (Schueler, 1994). The ICM has since been extensively tested in ecoregions around the United States and elsewhere, with more than 200 different studies confirming the basic model for single stream indicators or groups of stream indicators (CWP, 2003; Schueler, 2004). Several recent research studies have reinforced the ICM as it is applied to first- to third-order streams (Coles et al., 2004; Horner et al., 2004; Deacon et al., 2005; Fitzpatrick et al., 2005; King et al., 2005; McBride and Booth, 2005; Cianfrina et al., 2006; Urban et al., 2006; Schueler et al., 2008).

Researchers have focused their efforts to define the specific thresholds where urban stream degradation first begins. There is robust debate as to whether there is a sharp initial threshold or merely a continuum of degradation as IC increases, although the latter is more favored. There is much less debate, however, about the dominant role of IC in defining the hydrologic, habitat, water quality, and biodiversity expectations for streams with higher levels of IC (15 to 60 percent).

Caveats to the ICM

The ICM is a powerful predictor of urban stream quality when used appropriately. The first caveat is that subwatershed IC is defined as total impervious area (TIA) and not effective impervious area (EIA). Second, the ICM should be restricted to first- to third-order alluvial streams with moderate gradient and no major point sources of pollutant discharge. The ICM is most useful in projecting the behavior of numerous stream health indicators, and it is not intended to be accurate for every individual stream indicator. In addition, management practices in the contributing catchment or subwatershed must not be poor (e.g., no deforestation, acid mine drainage, intensive row crops, etc.); just because a subwatershed has less than 10 percent IC does not automatically mean that it will have good or excellent stream quality if past catchment management practices were poor.

ICM predictions are general and may not apply to every stream within the proposed classifications. Urban streams are notoriously variable, and factors such as gradient, stream order, stream type, age of subwatershed development, and past land use can and will make some streams depart from these predictions. Indeed, these “outlier” streams are extremely interesting from the standpoint of restoration. In general, subwatershed IC causes a continuous but variable decline in most stream corridor indicators. Consequently, the severity of individual indicator impacts tends to be greater at the upper end of the IC range for each stream category.

Effects of Catchment Treatment on the ICM

Most studies that investigated the ICM were done in communities with some degree of catchment treatment (e.g., stormwater management or stream buffers). Detecting the effect of catchment treatment on the ICM involves a very complex and difficult paired watershed design. Very few catchments meet the criteria for either full treatment or the lack of it,

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no two catchments are ever really identical, and individual catchments exhibit great variability from year to year. Not surprisingly, the first generation of research studies has produced ambiguous results. For example, seven research studies showed that ponds and wetlands are unable to prevent the degradation of aquatic life in downstream channels associated with higher levels of IC (Galli, 1990; Jones et al., 1996; Horner and May, 1999; Maxted, 1999; MNCPPC, 2000; Horner et al., 2001; Stribling et al., 2001). The primary reasons cited are stream warming (amplified by ponds), changes in organic matter processing, the increased runoff volumes delivered to downstream channels, and habitat degradation caused by channel enlargement.

Riparian forest cover is defined as canopy cover within 100 meters of the stream, and is measured as the percentage of the upstream network in this condition. Numerous researchers have evaluated the relative impact of riparian forest cover and IC on stream geomorphology, aquatic insects, fish assemblages, and various indices of biotic integrity. As a group, the studies suggest that indicator values for urban streams improve when riparian forest cover is retained over at least 50 to 75 percent of the length of the upstream network (Booth et al., 2002; Morley and Karr, 2002; Wang et al., 2003; Allan, 2004; Sweeney et al., 2004; Moore and Palmer, 2005; Cianfrina et al., 2006; Urban et al., 2006).

Application of the ICM to other Receiving Waters

Recent research has focused on the potential value of the ICM in predicting the future quality of receiving waters such as tidal coves, lakes, wetlands and small estuaries. The primary work on small estuaries by Holland et al. (2004) [references cited in CWP (2003), Lerberg et al. (2000)] indicates that adverse changes in physical, sediment, and water quality variables can be detected at 10 to 20 percent subwatershed IC, with a clear biological response observed in the range of 20 to 30 percent IC. The primary physical changes involve greater salinity fluctuations, greater sedimentation, and greater pollutant contamination of sediments. The biological response includes declines in diversity of benthic macroinvertebrates, shrimp, and finfish.

More recent work by King et al. (2005) reported a biological response for coastal plain streams at around 21 to 32 percent urban development (which is usually about twice as high as IC). The thresholds for important water quality indicators such as bacterial exceedances in shellfish beds and beaches appears to begin at about 10 percent subwatershed IC, with chronic violations observed at 20 percent IC (Mallin et al., 2001). Algal blooms and anoxia resulting from nutrient enrichment by stormwater runoff also are routinely noted at 10 to 20 percent subwatershed IC (Mallin et al., 2004).

The primary conclusion to be drawn from the existing science is that the ICM does apply to tidal coves and streams, but that the impervious levels associated with particular biological responses appear to be higher (20 to 30 percent IC for significant declines) than for freshwater streams, presumably due to their greater tidal mixing and inputs from nearshore ecosystems. The ICM may also apply to lakes (CWP, 2003) and freshwater wetlands (Wright et al., 2007) under carefully defined conditions. The initial conclusion is that the application of the ICM shows promise under special conditions, but more controlled research is needed to determine if IC (or other watershed metrics) is useful in forecasting receiving water quality conditions.

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BOX 3-10 Continued

Utility of the ICM in Urban Stream Classification and Watershed Management

The ICM is best used as an urban stream classification tool to set reasonable expectations for the range of likely stream quality indicators (e.g., physical, hydrologic, water quality, habitat, and biological diversity) over broad ranges of subwatershed IC. In particular, it helps define general thresholds where water quality standards or biological narrative conditions cannot be consistently met during wet weather conditions (see Table 6-2). These predictions help stormwater managers and regulators to devise appropriate and geographically explicit stormwater management and subwatershed restoration strategies for their catchments as part of MS4 permit compliance. More specifically, assuming that local monitoring data are available to confirm the general predictions of the ICM, it enables managers to manage stormwater within the context of current and future watershed conditions.

credible gastrointestinal illness, which is curious because the vast majority of epidemiological studies worldwide suggests a causal dose-related relationship between gastrointestinal symptoms and recreational water quality measured by bacterial indicator counts (Pruss, 1998). Dwight et al. (2004) found that surfers in an urban environment reported more symptoms than their rural counterparts; however, water quality was not specifically evaluated in that study.

To better assess the relationship between swimming in waters contaminated by stormwater, which have not been influenced by human sewage, and the risk of related illness, the California Water Boards and the City of Dana Point have initiated an epidemiological study. This study will be conducted at Doheny Beach, Orange County, California, which is a beach known to have high fecal indicator bacteria concentrations with no known human source. The project will examine new techniques for measuring traditional fecal indicator bacteria, new species of bacteria, and viruses to determine whether they yield a better relationship to human health outcomes than the indicators presently used in California. The study is expected to be completed in 2010. In addition, the State of California is researching new methods for rapid detection of beach bacterial indicators and ways to bring these methods into regular use by the environmental monitoring and public health communities to better protect human health.

CONCLUSIONS AND RECOMMENDATIONS

The present state of the science of stormwater reflects both the strengths and weaknesses of historic, monodisciplinary investigations. Each of the component disciplines—hydrology, geomorphology, aquatic chemistry, ecology, land use, and population dynamics—have well-tested theoretical foundations and useful predictive models. In particular, there are many correlative studies showing how parameters co-vary in important but complex and poorly understood ways (e.g., changes in fish community associated with watershed road

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density or the percentage of IC). Nonetheless, efforts to create mechanistic links between population growth, land-use change, hydrologic alteration, geomorphic adjustments, chemical contamination in stormwater, disrupted energy flows, and biotic interactions, to changes in ecological communities are still in development. Despite this assessment, there are a number of overarching truths that remain poorly integrated into stormwater management decision making, although they have been robustly characterized and have a strong scientific basis. These are expanded upon below.

There is a direct relationship between land cover and the biological condition of downstream receiving waters. The possibility for the highest levels of aquatic biological condition exists only with very light urban transformation of the landscape. Even then, alterations to biological communities have been documented at such low levels of imperviousness, typically associated with roads and the clearing of native vegetation, that there has been no real "urban development" at all. Conversely, the lowest levels of biological condition are inevitable with extensive urban transformation of the landscape, commonly seen after conversion of about one-third to one-half of a contributing watershed into impervious area. Although not every degraded waterbody is a product of intense urban development, all highly urban watersheds produce severely degraded receiving waters. Because of the close and, to date, inexorable linkage between land cover and the health of downstream waters, stormwater management is an unavoidable offshoot of watershed-based land-use planning (or, more commonly, its absence).

The protection of aquatic life in urban streams requires an approach that incorporates all stressors. Urban Stream Syndrome reflects a multitude of effects caused by altered hydrology in urban streams, altered habitat, and polluted runoff. Focusing on only one of these factors is not an effective management strategy. For example, even without noticeably elevated pollutant concentrations in receiving waters, alterations in their hydrologic regimes are associated with impaired biological condition. Achieving the articulated goals for stormwater management under the CWA will require a balanced approach that incorporates hydrology, water quality, and habitat considerations.

The full distribution and sequence of flows (i.e., the flow regime) should be taken into consideration when assessing the impacts of stormwater on streams. Permanently increased stormwater volume is only one aspect of an urban-altered storm hydrograph. It contributes to high in-stream velocities, which in turn increase streambank erosion and accompanying sediment pollution of surface water. Other hydrologic changes, however, include changes in the sequence and frequency of high flows, the rate of rise and fall of the hydrograph, and the season of the year in which high flows can occur. These all can affect both the physical and biological conditions of streams, lakes, and wetlands. Thus, effective hydrologic mitigation for urban development cannot just

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aim to reduce post-development peak flows to predevelopment peak flows.

A single design storm cannot adequately capture the variability of rain and how that translates into runoff or pollutant loadings, and thus is not suitable for addressing the multiple objectives of stormwater management. Of particular importance to the types of problems associated with urbanization is the size of rain events. The largest and most infrequent rains cause near-bank-full conditions and may be most responsible for habitat destruction; these are the traditional "design storms" used to design safe drainage systems. However, moderate-sized rains are more likely to be associated with most of the annual mass discharges of stormwater pollutants, and these can be very important to the eutrophication of lakes and nearshore waters. Water quality standards for bacterial indicators and total recoverable heavy metals are exceeded for almost *every* rain in urban areas. Therefore, the whole distribution of storm size needs to be evaluated for most urban receiving waters because many of these problems co-exist.

Roads and parking lots can be the most significant type of land cover with respect to stormwater. They constitute as much as 70 percent of total impervious cover in ultra-urban landscapes, and as much as 80 percent of the directly connected impervious cover. Roads tend to capture and export more stormwater pollutants than other land covers in these highly impervious areas because of their close proximity to the variety of pollutants associated with automobiles. This is especially true in areas of the country having mostly small rainfall events (as in the Pacific Northwest). As rainfall amounts become larger, pervious areas in most residential land uses become more significant sources of runoff, sediment, nutrients, and landscaping chemicals. In all cases, directly connected impervious surfaces (roads, parking lots, and roofs that are directly connected to the drainage system) produce the first runoff observed at a storm-drain inlet and outfall because their travel times are the quickest.

Generally, the quality of stormwater from urbanized areas is well characterized, with the common pollutants being sediment, metals, bacteria, nutrients, pesticides, trash, and polycyclic aromatic hydrocarbons. These results come from many thousands of storm events from across the nation, systematically compiled and widely accessible; they form a robust data set of utility to theoreticians and practitioners alike. These data make it possible to accurately estimate pollutant concentrations, which have been shown to vary by land cover and by region across the country. However, characterization data are relatively sparse for individual industrial operations, which makes these sources less amenable to generalized approaches based on reliable assumptions of pollutant types and loads. In addition, industrial operations vary greatly from site to site, such that it may be necessary to separate them into different categories in order to better understand industrial stormwater quality.

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Nontraditional sources of stormwater pollution must be taken into consideration when assessing the overall impact of urbanization on receiving waterbodies. These nontraditional sources include atmospheric deposition, snowmelt, and dry weather discharges, which can constitute a significant portion of annual pollutant loadings from storm systems in urban areas (such as metals in Los Angeles). For example, atmospheric deposition of metals is a very significant component of contaminant loading to waterbodies in the Los Angeles region relative to other point and nonpoint sources. Similarly, much of the sediment found in receiving waters following watershed urbanization can come from streambank erosion as opposed to being contributed by polluted stormwater.

Biological monitoring of waterbodies is critical to better understanding the cumulative impacts of urbanization on stream condition. Over 25 years ago, individual states developed the concept of regional reference sites and developed multi-metric indices to identify and characterize degraded aquatic assemblages in urban streams. Biological assessments respond to the range of non-chemical stressors identified as being important in urban waterways including habitat degradation, hydrological alterations, and sediment and siltation impacts, as well as to the influence of nutrients and other chemical stressors where chemical criteria do not exist or where their effects are difficult to measure directly (e.g., episodic stressors). The increase in biological monitoring has also helped to frame issues related to exotic species, which are locally of critical importance but completely unrecognized by traditional physical monitoring programs.

Epidemiological studies on the human health risks of swimming in freshwater and marine waters contaminated by urban stormwater discharges in temperate and warm climates are needed. Unlike with aquatic organisms, there is little information on the health risks of urban stormwater to humans. Standardized watershed assessment methods to identify the sources of human pathogens and indicator organisms in receiving waters need to be developed, especially for those waters with a contact-recreation use designation that have had multiple exceedances of pathogen or indicator criteria in a relatively short period of time. Given their difficulty and expense, epidemiological studies should be undertaken only after careful characterization of water quality and stormwater flows in the study area.

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4
Monitoring and Modeling

As part of its statement of task, the committee was asked to consider several aspects of stormwater monitoring, including how useful the activity is, what should be monitored and when and where, and how benchmarks should be established. As noted in Chapter 2, the stormwater monitoring requirements under the U.S. Environmental Protection Agency (EPA) stormwater program are variable and generally sparse, which has led to considerable skepticism about their usefulness. This chapter first considers the value of the data collected over the years by municipalities and makes suggestions for improvement. It then does the same for industrial stormwater monitoring, which has lagged behind the municipal separate storm sewer system (MS4) program both in requirements and implementation.

It should be noted upfront that this chapter does not discuss the fine details of MS4 and industrial monitoring that pertain to regulatory compliance—questions such as should the average end of pipe concentrations meet water quality standards, how many exceedances should be allowed per year, or should effluent concentrations be compared to acute or chronic criteria. Individual benchmarks and effluent limits for specific chemicals emanating from specific industries are not provided. The current state of MS4 and industrial stormwater monitoring and the paucity of high quality data are such that it is premature and in many cases impossible to make such determinations. Rather, the chapter suggests both *how* to monitor an individual industry and *how* to determine benchmarks and effluent limits for industrial categories. It suggests how monitoring requirements should be tailored to accommodate the risk level of an individual industrial discharger. Finally, it makes numerous technical suggestions for improving the monitoring of MS4s, building on the data already submitted and analyzed as part of the National Stormwater Quality Database. Policy recommendations about the monitoring of both industries and MS4s are found in Chapter 6.

This chapter's emphasis on monitoring of stormwater should not be interpreted as a disinterest in other types of monitoring, such as biomonitoring of receiving waters, precipitation measurements, or determination of land cover. Indeed, these latter activities are extremely important (they are introduced in the preceding chapter) and they underpin the new permitting program proposed in Chapter 6 (especially biological monitoring). Stormwater management would benefit most substantially from a well-balanced monitoring program that encompasses chemical, biological, and physical parameters from outfalls to receiving waters. Currently, however, decisions about stormwater management are usually made with incomplete information; for example, there are continued recommendations by many that street cleaning will solve a municipality's problems, even when the municipality does not have any information on the sources of the material being removed.

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A second charge to the committee was to define the elements of a "protocol" to link pollutants in stormwater discharges to ambient water quality criteria. As described in Chapter 3, many processes connect sources of pollution to an effect observed in a downstream receiving water. More and more, these processes can be represented in watershed models, which are the key to linking stormwater sources to effects observed in receiving waters. The latter half of the chapter explores the current capability of models to make such links, including simple models, statistical and conceptual models, and more involved mechanistic models. At the present time, associating a single discharger with degraded in-stream conditions is generally not possible because of the state of both modeling and monitoring of stormwater.

MONITORING OF MS4s

EPA's regulations for stormwater monitoring of MS4s is very limited, in that only the application requirements are stated [see 40 CFR § 122.26(d)]. The regulations require the MS4 program to identify five to ten stormwater discharge outfalls and to collect representative stormwater data for conventional and priority toxic pollutants from three representative storm events using both grab and composite sampling methods. Each sampled storm event must have a rainfall of at least 0.1 inch, must be preceded by at least 72 hours of a dry period, and the rain event must be within 50 percent of the average or median of the per storm volume and duration for the region. While the measurement of flow is not specifically required, an MS4 must make estimates of the event mean concentrations (EMCs) for pollutants discharged from all outfalls to surface waters, and in order to determine EMCs, flow needs to be measured or calculated.

Other than these requirements, the exact type of MS4 monitoring that is to be conducted during the permit term is left to the discretion of the permitting authority. EPA has not issued any guidance on what would be considered an adequate MS4 monitoring program for permitting authorities to evaluate compliance. Some guidance for MS4 monitoring based on desired management questions has been developed locally (for example, see the SCCWRP Technical Report No. 419, SMC 2004, Model Monitoring Program for MS4s in Southern California).

In the absence of national guidance from EPA, the MS4 monitoring programs for Phase I MS4s vary widely in structure and objectives, and Phase II MS4 programs largely do not perform any monitoring at all. The types of monitoring typically contained in Phase I MS4 permits include the (1) wet weather outfall screening and monitoring to characterize stormwater flows, (2) dry weather outfall screening and monitoring under illicit discharge detection and elimination programs, (3) biological monitoring to determine storm water impacts, (4) ambient water quality monitoring to characterize water quality conditions, and (5) stormwater control measure (SCM) effectiveness monitoring.

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The Nationwide Stormwater Quality Database

Stormwater monitoring data collected by a portion of Phase I MS4s has been evaluated for years by the University of Alabama and the Center for Watershed Protection and compiled in a database called the Nationwide Stormwater Quality Database (NSQD). These data were collected in order to describe the characteristics of stormwater on a national level, to provide guidance for future sampling needs, and to enhance local stormwater management activities in areas with limited data. The MS4 monitoring data collected over the past ten years from more than 200 municipalities throughout the country have great potential in characterizing the quality of stormwater runoff and comparing it against historical benchmarks. Version 3 of the NSQD is available online at: http://unix.eng.ua.edu/~rpitt/Research/ms4/mainms4.shtml. It contains data from more than 8,500 events and 100 municipalities throughout the country. About 5,800 events are associated with homogeneous land uses, while the remainder are for mixed land uses.

The general approach to data collection was to contact EPA regional offices to obtain state contacts for the MS4 data, then the individual municipalities with Phase I permits were targeted for data collection. Selected outfall data from the International BMP Database were also included in NSQD version 3, eliminating any source area and any treated stormwater samples. Some of the older National Urban Runoff Program (NURP) (EPA, 1983) data were also included in the NSQD, along with some data from specialized U.S. Geological Survey (USGS) stormwater monitoring activities in order to better represent nationwide conditions and additional land uses. Because there were multiple sources of information, quality assurance and quality control reviews were very important to verify the correctness of data added to the database, and to ensure that no duplicate entries were added.

The NSQD includes sampling location information such as city, state, land use, drainage area, and EPA Rain Zone, as well as date, season, and rain depth. The constituents commonly measured for in stormwater include total suspended solids (TSS), 5-day biological oxygen demand (BOD_5), chemical oxygen demand (COD), total phosphorus (TP), total Kjeldahl nitrogen (TKN), nitrite plus nitrate (NO_2+NO_3), total copper (Cu), total lead (Pb), and total zinc (Zn). Less information is available for many other constituents (including filterable heavy metals and bacteria). Figure 4-1 is a map showing the EPA Rain Zones in the United States, along with the locations of the communities contributing to the NSQD, version 3. Table 4-1 shows the number of samples for each land use and for each Rain Zone. This table does not show the number of mixed land-use site samples. Rain Zones 8 and 9 have very few samples, and institutional and open-space areas are poorly represented. However, residential, commercial, industrial, and freeway data are plentiful, except for the few Rain Zones noted above.

Land use has an important impact on the quality of stormwater. For example, the concentrations of heavy metals are higher for industrial land-use areas

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TABLE 4-1 Number of Samples per Land Use and EPA Rain Zone

Single Land Use	1	2	3	4	5	6	7	8	9	Total
Commercial	234	484	131	66	42	37	64	0	22	1080
Freeways	0	241	14	0	262	189	28	0	0	734
Industrial	100	327	90	51	83	74	146	0	22	893
Institutional	9	46	0	0	0	0	0	0	0	55
Open Space	68	37	0	18	0	2	0	0	0	125
Residential	294	1470	290	122	105	32	532	7	81	2933
Total	705	2605	525	257	492	334	770	7	125	5820

Note: there are no mixed-use sites in this table. SOURCE: National Stormwater Quality Database.

due to manufacturing processes and other activities that generate these materials. Fecal coliform concentrations are relatively high for residential and mixed residential land uses, and nitrate concentrations are higher for the freeway land use. Open-space land-use areas show consistently low concentrations for the constituents examined. Seasons could also be a factor in the variation of nutrient concentrations in stormwater due to seasonal uses of fertilizers and leaf drop occurring during the fall season. Most studies also report lower bacteria concentrations in the winter than in the summer. Lead concentrations in stormwater have also significantly decreased since the elimination of lead in gasoline (see Figure 2-6). Most of the statistical tests used are multivariate statistical evaluations that compare different constituent concentrations with land use and geographical location. More detailed discussions of the earlier NSQD results are found in various references, including Maestre et al. (2004, 2005) and Pitt et al. (2003, 2004).

How to use the NSQD to Calculate Representative EMC Values

EMC values were initially used during the NURP to describe typical concentrations of pollutants in stormwater for different monitoring locations and land uses. An EMC is intended to represent the average concentration for a single monitored event, usually based on flow-weighted composite sampling. It can also be calculated from discrete samples taken during an event if flow data are also available. Many individual subsamples should be taken throughout most of the event to calculate the EMC for that event. Being an overall average value, an EMC does not represent possible extremes that may occur during an event.

The NSQD includes individual EMC values from about 8,500 separate events. Stormwater managers typically want a representative single value for a land use for their area. As such, they typically evaluate a series of individual

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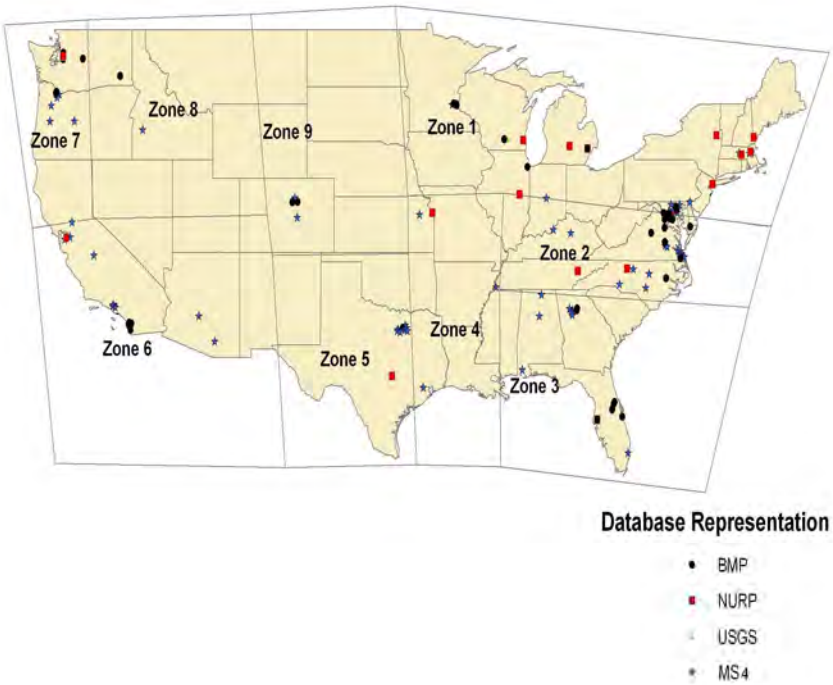

FIGURE 4-1 Sampling Locations for Data Contained in the National Stormwater Quality Database, version 3.

storm EMC values for conditions similar to those representing their site of concern. With the NSQD in a spreadsheet form, it is relatively simple to extract suitable events representing the desired conditions. However, the individual EMC values will likely have a large variability. Maestre and Pitt (2006) reviewed the NSQD data to better explain the variability according to different site and sampling conditions (land use, geographical location, season, rain depth, amount of impervious area, sampling methods, antecedent dry period, etc.). The most common significant factor was land use, with some geographical and fewer seasonal effects observed. As with the original NURP data, EMCs in the NSQD are usually expressed using medians and coefficients of variation to reflect uncertainty, assuming lognormal distributions of the EMC values. Figure 4-2 shows several lognormal probability plots for a few constituents from the NSQD. Probability plots shown as straight lines indicate that the concentrations can be represented by lognormal distributions (see Box 4-1).

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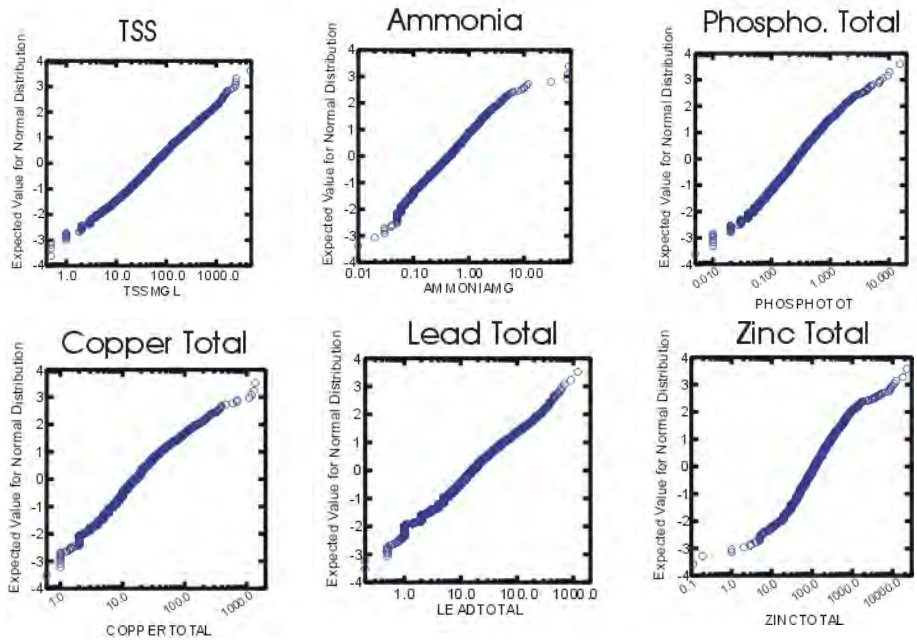

FIGURE 4-2 Lognormal probability plots of stormwater quality data for selected constituents (pooled data from NSQD version 1.1).

Fitting a known distribution is important as it helps indicate the proper statistical tests that may be conducted. Using the *median* EMC value in load calculations, without considering the data variability, will result in smaller mass loads compared to actual monitored conditions. This is due to the medians underrepresenting the larger concentrations that are expected to occur. The use of *average* EMC values will represent the larger values better, although they will still not represent the variability likely to exist. If all of the variability cannot be further explained adequately (such as being affected by rain depth), which would be highly unlikely, then a set of random calculations (such as that obtained using Monte Carlo procedures) reflecting the described probability distribution of the constituents would be the best method to use when calculating loads.

Municipal Monitoring Issues

As described in Chapter 2, typical MS4 monitoring requirements involve sampling during several events per year at the most common land uses in the area. Obviously, a few samples will not result in very useful data due to

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BOX 4-1
Probability Distributions of Stormwater Data

The coefficient of variation (COV) values for many constituents in the NSQD range from unusually low values of about 0.1 (for pH) to highs between 1 and 2. One objective of a data analysis procedure is to categorize the data into separate stratifications, each having small variations in the observed concentrations. The only stratification usually applied is for land use. However, further analyses indicated many differences by geographical area and some differences by season. When separated into appropriate stratifications, the COV values are reduced, ranging between about 0.5 to 1.0. With a reasonable confidence of 95 percent (α= 0.05) and power of 80 percent (β= 0.20), and a suitable allowable error goal of 25 percent, the number of samples needed to characterize these conditions would therefore range from about 25 to 50 (Burton and Pitt, 2002). In a continuing monitoring program (such as the Phase I stormwater National Pollutant Discharge Elimination System [NPDES] permit monitoring effort) characterization data will improve over time as more samples are obtained, even with only a few samples collected each year from each site.

Stormwater managers have generally accepted the assumption of lognormality of stormwater constituent concentrations between the 5th and 95th percentiles. Based on this assumption, it is common to use the log-transformed EMC values to evaluate differences between land-use categories and other characteristics. Statistical inference methods, such as estimation and tests of hypothesis, and analysis of variance, require statistical information about the distribution of the EMC values to evaluate these differences. The use of the log-transformed data usually includes the location and scale parameter, but a lower-bound parameter is usually neglected.

Maestre et al. (2005) conducted statistical tests using NSQD data to evaluate the lognormality assumptions of selected common constituents. It was found in almost all cases that the log-transformed data followed a straight line between the 5th and 95th percentile, as illustrated in Figure 4-3 for total dissolved solids (TDS) in residential areas.

For many statistical tests focusing on the central tendency (such as for determining the concentrations that are to be used for mass balance calculations), this may be a suitable fit. As an example, the model WinSLAMM (Pitt, 1986; Pitt and Voorhees, 1995) uses a Monte Carlo component to describe the likely variability of stormwater source flow pollutant concentrations using either lognormal or normal probability distributions for each constituent. However, if the most extreme values are of importance, such as when dealing with the influence of many non-detectable values on the predicted concentrations, or determining the frequency of observations exceeding a numerical standard, a better description of the extreme values may be important.

The NSQD contains many factors for each sampled event that likely affect the observed concentrations. These include such factors as seasons, geographical zones, and rain intensities. These factors may affect the shape of the probability distribution. The only way to evaluate the required number of samples in each category is by using the power of the test, where power is the probability that the test statistic will lead to a rejection of the null hypothesis (Gibbons and Chakraborti, 2003).

In the NSQD, most of the data were from residential land uses. The Kolmogorov-Smirnov test was used to indicate if the cumulative empirical probability distribution of the residential stormwater constituents can be adequately represented with a lognormal distribution. The number of collected samples was sufficient to detect if the empirical distribu-

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BOX 4-1 Continued

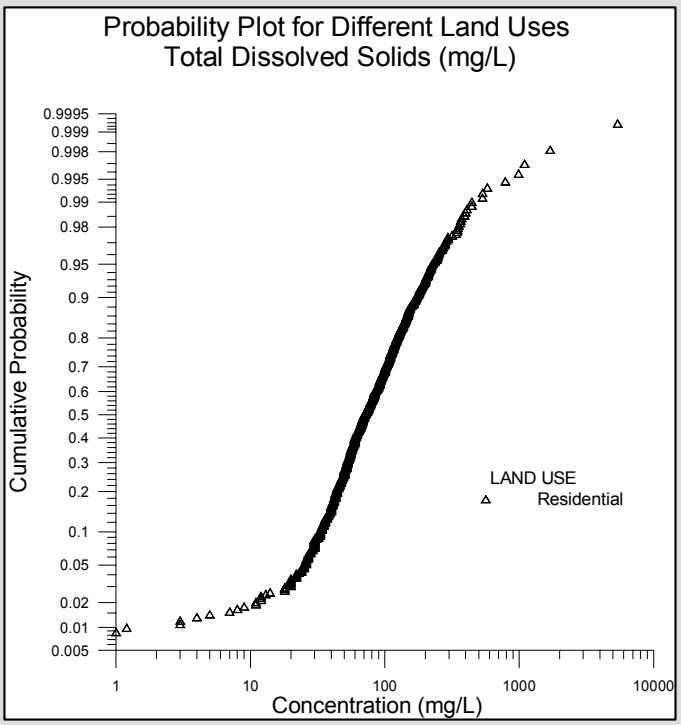

FIGURE 4-3 Probability plot of total dissolved solids in residential land uses (NSQD version 1.1 data).

tion was located inside an interval of width 0.1 above and below the estimated cumulative probability distribution. If the interval was reduced to 0.05, the power varies between 40 and 65 percent. Another factor that must be considered is the importance of relatively small errors in the selected distribution and the problems of false-negative determinations. It may not be practical to collect as many data observations as needed when the distributions are close. Therefore, it is important to understand what types of further statistical and analysis problems may be caused by having fewer samples than optimal. For example, Figure 4-4 (total phosphorus in residential areas) shows that most of the data fall along the straight line (indicating a lognormal fit), with fewer than 10 observations (out of 933) in the tails being outside of the obvious path of the line, or a false-negative rate of about 0.01 (1 percent).

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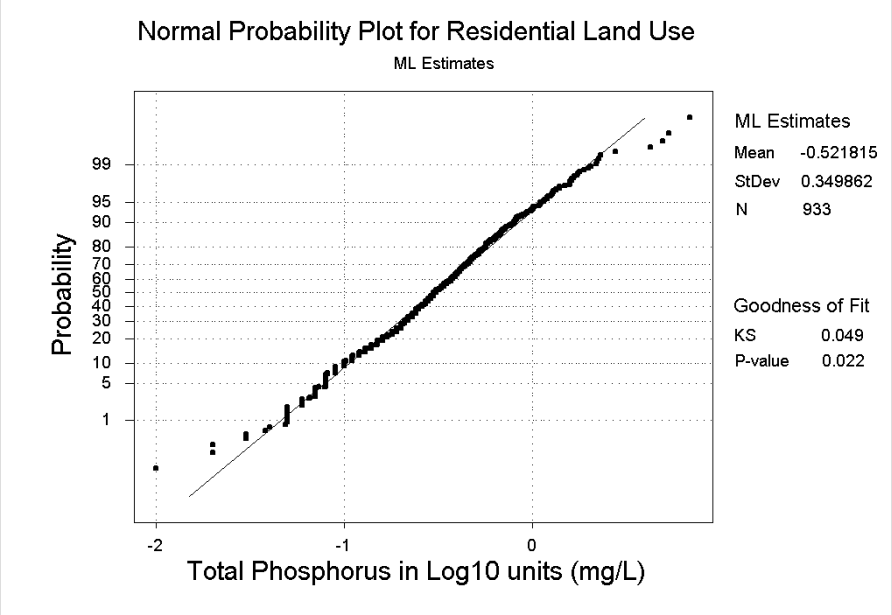

FIGURE 4-4 Normality test for total phosphorus in residential land uses using the NSQD.

Further analyses to compare the constituent concentration distributions to other common probability distributions (normal, lognormal, gamma, and exponential) were also conducted for all land uses by Maestre et al. (2004). Most of the stormwater constituents can be assumed to follow a lognormal distribution with little error. The use of a third parameter in the estimated lognormal distribution may be needed, depending on the number of samples. When the number of samples is large per category (approximately more than 400 samples) the maximum likelihood and the two-parameter lognormal distribution better fit the empirical distribution. For large sample sizes, the L-moments method usually unacceptably truncates the distribution in the lower tail. However, when the sample size is more moderate per category (approximately between 100 and 400 samples), the three-parameter lognormal method, estimated by L-moments, better fits the empirical distribution. When the sample size is small (less than 100 samples, as is common for most stormwater programs), the use of the third parameter does not improve the fit with the empirical distribution and the common two-parameter lognormal distribution produces a better fit than the other two methods. The use of the lognormal distribution also has an advantage over the other distribution types because it can be easily transformed to a normal distribution and the data can then be correctly examined using a wide variety of statistical tests.

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the variability of stormwater characteristics. However, during the period of a five-year permit with three samples per year, about 15 events would be sampled for each land use. While still insufficient for many analyses, this number of data points likely allows the confidence limits to be reasonably calculated for the average conditions. When many sites of the same land use are monitored for a region, substantial data may be collected during a permit cycle. This was the premise of the NSQD where MS4 data were collected for many locations throughout the country. These data were evaluated and various findings made. The following comments are partially based on these analyses, along with additional data sources.

Sampling Technique and Compositing

There are a variety of methods for collecting and compositing stormwater samples that can result in different values for the EMC. The first distinction is the mode of sample collection, either as grab samples or automatic sampling. Obviously, grab sampling is limited by the speed and accuracy of the individuals doing the sampling, and it is personnel intensive. It is for this reason that about 80 percent of the NSQD samples are collected using automatic samplers. Manual sampling has been observed to result in slightly lower TSS concentrations compared to automatic sampling procedures. This may occur, for example, if the manual sampling team arrives after the start of runoff and therefore misses an elevated first flush (if it exists for the site), resulting in reduced EMCs.

A second important concept is how and whether the samples are combined following collection. With *time-based discrete sampling*, **s**amplers (people or machines) are programmed to take an aliquot after a set period of time (usually in the range of every 15 minutes) and each aliquot is put into a separate bottle (usually 1 liter). Each bottle is processed separately, so this method can have high laboratory costs. This is the only method, however, that will characterize the changes in pollutant concentrations during the event. *Time-based composite sampling* refers to samplers being programmed to take an aliquot after a set period of time (as short as every 3 minutes), but then the aliquots are combined into one container prior to analysis (compositing). All parts of the event receive equal weight with this method, but the large number of aliquots can produce a reasonably accurate composite concentration. Finally, *flow-weighted composite sampling* refers to samplers being programmed to collect an aliquot (usually 1 liter) for a set volume of discharge. Thus, more samples are collected during the peak of the hydrograph than toward the trailing edge of the hydrograph. All of the aliquots are composited into one container, so the concentration for the event is weighted by flow.

Most communities calculate their EMC values using flow-weighted composite sample analyses for more accurate mass discharge estimates compared to time-based compositing. This is especially important for areas with a first flush of very short duration, because time-composited samples may overly emphasize

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these higher flows. An automatic sampler with flow-weighted samples, in conjunction with a bed-load sampler, is likely the most accurate sampling method, but only if the sampler can obtain a representative sample at the location (such as sampling at a cascading location, or using an automated depth-integrated sampler) (Clark et al., 2008).

Time- and flow-weighted composite options have been evaluated in residential, commercial, and industrial land uses in EPA Rain Zone 2 and in industrial land uses in EPA Rain Zone 3 for the NSQD data. No significant differences were observed for BOD_5 concentrations using either of the compositing schemes for any of the four categories. TSS and total lead median concentrations in EPA Rain Zone 2 were two to five times higher in concentration when time-based compositing was used instead of flow-based compositing. Nutrients in EPA Rain Zone 2 collected in residential, commercial, and industrial areas showed no significant differences using either compositing method. The only exceptions were for ammonia in residential and commercial land-use areas and total phosphorus in residential areas where time-based composite samples had higher concentrations. Metals were higher when time-based compositing was used in residential and commercial land-use areas. No differences were observed in industrial land-use areas, except for lead. Again, in most cases, mass discharges are of the most importance in order to show compliance with TMDL requirements. Flow-weighted sampling is the most accurate method to obtain these values (assuming sufficient numbers of subsamples are obtained). However, if receiving water effects are associated with short-duration high concentrations, then discrete samples need to be collected and analyzed, with no compositing of the samples during the event. Of course, this is vastly more costly and fewer events are usually monitored if discrete sampling is conducted.

Numbers of Data Observations Needed

The biggest issue associated with most monitoring programs is the number of data points needed. In many cases, insufficient data are collected to address the objectives of the monitoring program with a reasonable amount of confidence and power. Burton and Pitt (2002) present much guidance in determining the amount of data that should be collected. A basic equation that can be used to estimate the number of samples to characterize a set of conditions is as follows:

$$n = [COV(Z_{1-\alpha} + Z_{1-\beta})/(error)]^2$$

where:

n = number of samples needed.

α = false-positive rate ($1-\alpha$ is the degree of confidence; a value of α of 0.05 is usually considered statistically significant, corresponding to a $1-\alpha$ degree

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of confidence of 0.95, or 95%).

β = false-negative rate ($1-\beta$ is the power; if used, a value of β of 0.2 is common, but it is frequently and improperly ignored, corresponding to a β of 0.5).

$Z_{1-\alpha}$ = Z score (associated with area under a normal curve) corresponding to $1-\alpha$; if α is 0.05 (95% degree of confidence), then the corresponding $Z_{1-\alpha}$ score is 1.645 (from standard statistical tables).

$Z_{1-\beta}$ = Z score corresponding to $1-\beta$ value; if β is 0.2 (power of 80%), then the corresponding $Z_{1-\beta}$ score is 0.85 (from standard statistical tables); however, if power is ignored and β is 0.5, then the corresponding $Z_{1-\beta}$ score is 0.

error = allowable error, as a fraction of the true value of the mean.

COV = coefficient of variation (sometimes noted as CV), the standard deviation divided by the mean (dataset assumed to be normally distributed).

Figures 4-5 and 4-6 can be used to estimate the sampling effort, based on the expected variability of the constituent being monitored, the allowable error in the calculated mean value, and the associated confidence and power. Figure 4-5 can be used for a single sampling point that is being monitored for basic characterization information, while Figure 4-6 is used for paired sampling when two locations are being compared. Confidence and power are needed to control the likelihood of false negatives and false positives. The sample needs increase dramatically as the difference between datasets becomes small when comparing two conditions with a paired analysis, as shown in Figure 4-6 (above and below an outfall, influent vs. effluent, etc.). Typically, being able to detect a difference of at least about 25 percent (requiring about 50 sample pairs with typical sample variabilities) is a reasonable objective for most stormwater projects. This is especially important when monitoring programs attempt to distinguish test and control conditions associated with SCMs. It is easy to confirm significant differences between influent and effluent conditions at wet detention ponds, as they have relatively high removal rates. Less effective controls are much more difficult to verify, as the sampling program requirements become very expensive.

First-Flush Effects

First flush refers to an assumed elevated load of pollutants discharged in the beginning of a runoff event. The first-flush effect has been observed more often in small catchments than in large catchments (Thompson et al., 1995, cited by WEF and ASCE, 1998). Indeed, in large catchments (>162 ha, 400 acres), the

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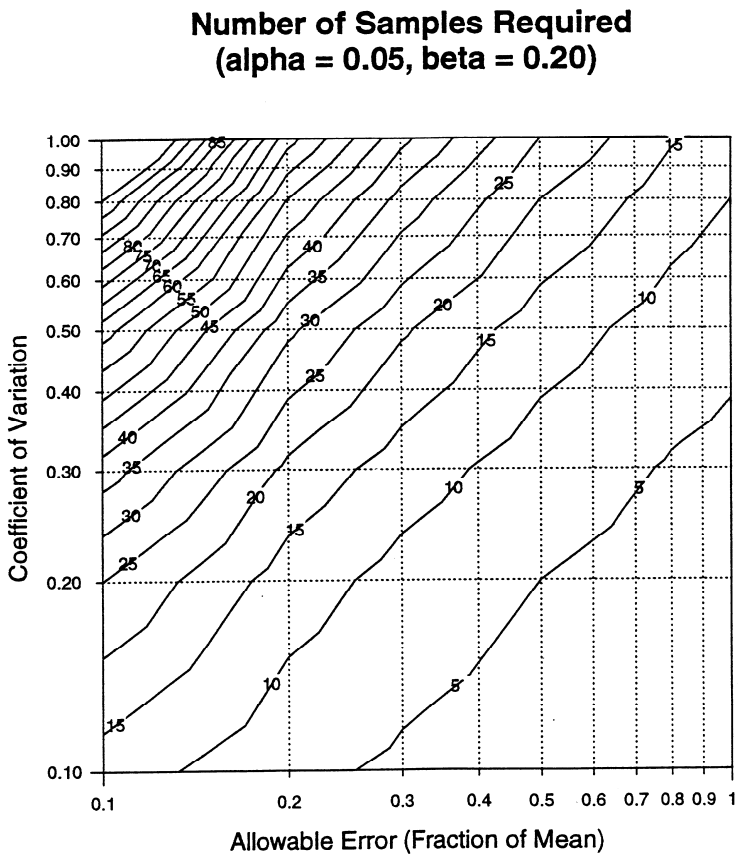

FIGURE 4-5 Number of samples to characterize median (power of 80% and confidence of 95%). SOURCE: Reprinted, with permission from, Burton and Pitt (2002). Copyright 2002 by CRC Press.

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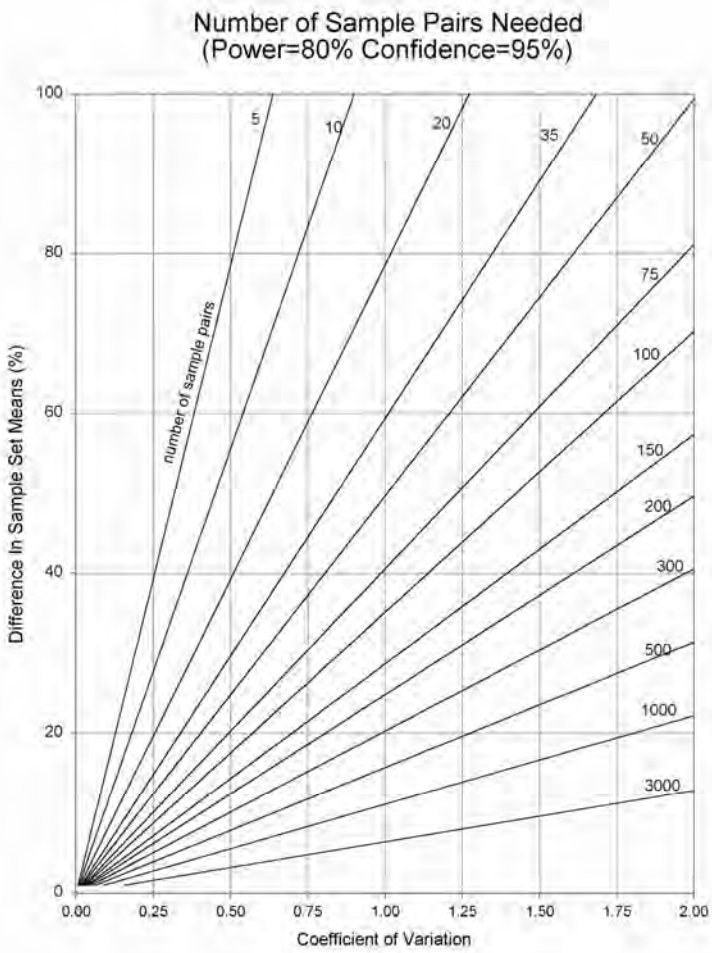

FIGURE 4-6 Number of paired samples needed to distinguish between two sets of observations (power 80% and confidence of 95%). SOURCE: Reprinted, with permission from, Burton and Pitt (2002). Copyright 2002 by CRC Press.

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highest concentrations are usually observed at the times of flow peak (Brown et al., 1995; Soeur et al., 1995). Adams and Papa (2000) and Deletic (1998) both concluded that the presence of a first flush depends on numerous site and rainfall characteristics.

Figure 4-7 is a plot of monitoring data from the Villanova first-flush study (Batroney, 2008) showing the flows, rainfall, TSS concentration, TDS concentration, and TDS and TSS event mean concentrations for the inflow to an infiltration trench. Because of the first-flush effect, a grab sample early in the storm would have over-predicted the TSS event mean concentration of the site, and a later sample would have under-predicted this same value, although for TDS the results would have been similar.

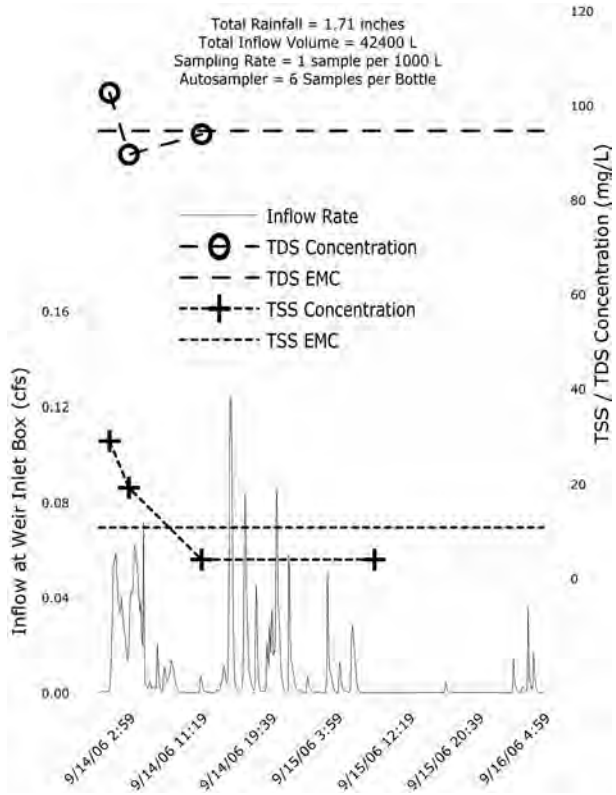

FIGURE 4-7 Villanova first-flush study showing pollutant concentration as a function of inflow rainfall volume. This study collected runoff leaving the top floor of a parking garage. Samples were taken of the runoff in one-quarter-inch increments, up to an inch of rain, and then every inch thereafter. The plot of TSS concentration versus rainfall increment shows a strong first flush for this storm, while the TDS concentration does not. SOURCE: Reprinted, with permission, Batroney (2008). Copyright 2008 by T. Thomas Batroney.

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Figure 4-8 shows data for a short-duration, high-intensity rain in Tuscaloosa, Alabama, that had rain intensities as great a 6 inches per hour for a 10-minute period. The drainage area was a 0.4-ha paved parking lot with some landscaping along the edges. The turbidity plot shows a strong first flush for this event, and the particle size distributions indicate larger particles at the beginning of the event, then becoming smaller as the event progresses, and then larger near the end. Most of the other pollutants analyzed had similar first-flush patterns like the turbidity, with the notable exception of bacteria. Both *E. coli* and enterococci concentrations started off moderately low, but then increased substantially near the end of the rain. Several rains have been monitored at this site so far, and most show a similar pattern with decreasing turbidity and increasing bacteria as the rain continues.

Sample collection conducted for some of the NPDES MS4 Phase I permits required both a grab and a composite sample for each event. A grab sample was to be taken during the first 30 minutes of discharge to capture the first flush, and a flow-weighted composite sample was to be taken for the entire time of discharge (every 15 to 20 minutes for at least three hours or until the event ended). Maestre et al. (2004) examined about 400 paired sets of 30-minute and 3-hour samples from the NSQD, as shown in Table 4-2. Generally, a statistically significant first flush is associated with a median concentration ratio of about 1.4 or greater (the exceptions are where the number of samples in a specific category is much smaller). The largest ratios observed were about 2.5, indicating that for these conditions the first 30-minute flush sample concentrations are about 2.5 times greater than the composite sample concentrations. More of the larger ratios are found for the commercial and institutional land-use categories, where larger paved areas are likely to be found. The smallest ratios are associated with the residential, industrial, and open-space land uses—locations where there may be larger areas of unpaved surfaces.

The data in Table 4-2 were from North Carolina (76.2 percent), Alabama (3.1 percent), Kentucky (13.9 percent), and Kansas (6.7 percent) because most other states' stormwater permits did not require this sampling strategy. The NSQD investigation of first-flush conditions for these data locations indicated that a first-flush effect was not present for all the land-use categories and certainly not for all constituents. Commercial and residential areas were more likely to show this phenomenon, especially if the peak rainfall occurred near the beginning of the event. It is expected that this effect will more likely occur in a watershed with a high level of imperviousness, but even so, the data indicated first flushes for less than 50 percent of the samples for the most impervious areas. This reduced frequency of observed first flushes in areas most likely to have first flushes is probably associated with the varying rain conditions during the different events, including composite samples that did not represent the complete runoff duration.

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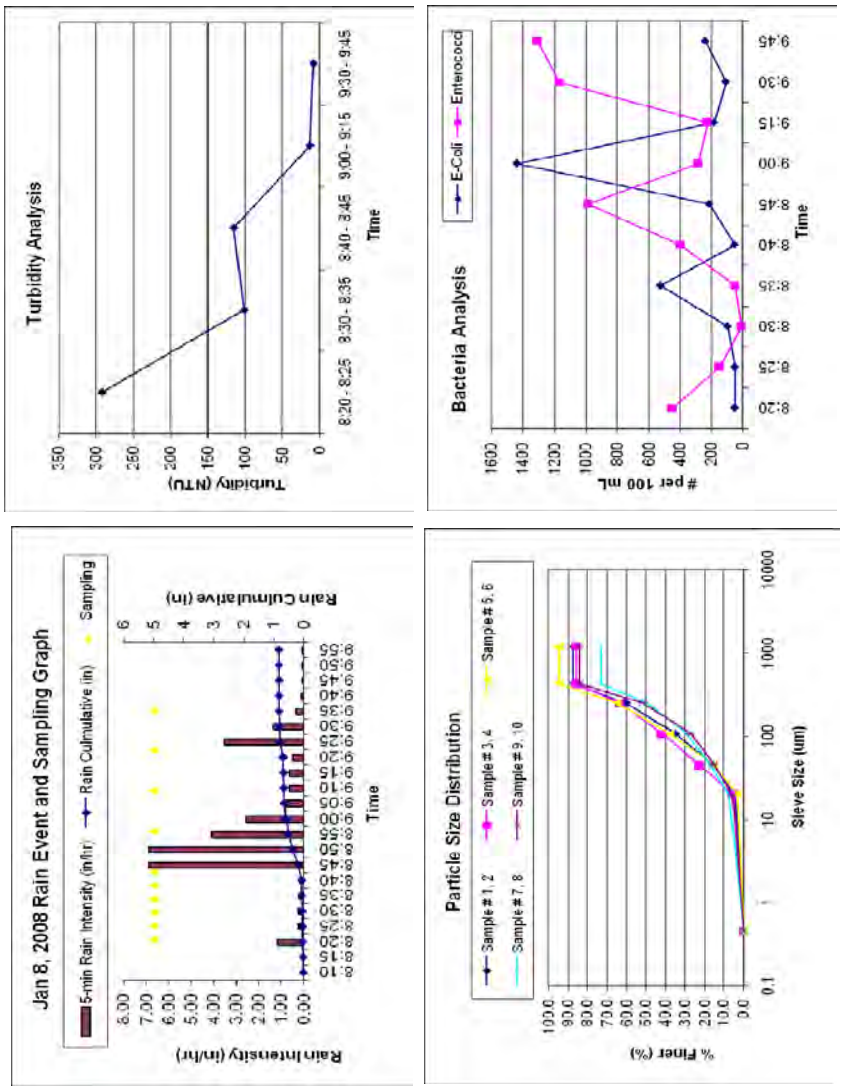

FIGURE 4-8 Pollutant variations during rain period (0.4-ha drainage area, mostly paved parking with small fringe turf area, Tuscaloosa, Alabama). SOURCE: Robert Pitt, University of Alabama.

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TABLE 4-2 Significant First Flush Ratios (First Flush to Composite Median Concentration)

Parameter	Commercial				Industrial				Institutional			
	n	sc	R	ratio	n	sc	R	ratio	n	sc	R	ratio
Turbidity, NTU	11	11	=	1.32			X				X	
COD, mg/L	91	91	≠	2.29	84	84	≠	1.43	18	18	≠	2.73
TSS, mg/L	90	90	≠	1.85	83	83	=	0.97	18	18	≠	2.12
Fecal coliform, col/100mL	12	12	=	0.87			X				X	
TKN, mg/L	93	86	≠	1.71	77	76	≠	1.35			X	
Phosphorus total, mg/L	89	77	≠	1.44	84	71	=	1.42	17	17	=	1.24
Copper, total, µg/L	92	82	≠	1.62	84	76	≠	1.24	18	7	=	0.94
Lead, total, µg/L	89	83	≠	1.65	84	71	≠	1.41	18	13	≠	2.28
Zinc, total, µg/L	90	90	≠	1.93	83	83	≠	1.54	18	18	≠	2.48

Parameter	Open Space				Residential				All Combined			
	n	sc	R	ratio	n	sc	R	ratio	n	sc	R	ratio
Turbidity, NTU			X		12	12	=	1.24	26	26	=	1.26
COD, mg/L	28	28	=	0.67	140	140	≠	1.63	363	363	≠	1.71
TSS, mg/L	32	32	=	0.95	144	144	≠	1.84	372	372	≠	1.60
Fecal coliform, col/100mL			X		10	9	=	0.98	22	21	=	1.21
TKN, mg/L	32	14	=	1.28	131	123	≠	1.65	335	301	≠	1.60
Phosphorus, total, mg/L	32	20	=	1.05	140	128	≠	1.46	363	313	≠	1.45
Copper, total, µg/L	30	22	=	0.78	144	108	≠	1.33	368	295	≠	1.33
Lead, total, µg/L	31	16	=	0.90	140	93	≠	1.48	364	278	≠	1.50
Zinc, total, µg/L	21	21	=	1.25	136	136	≠	1.58	350	350	≠	1.59

Note: n, number of total possible events; sc, number of selected events with detected values; R, result; X, not enough data; =, not enough evidence to conclude that median values are different; ≠, median values are different. "Ratio" is the ratio of the first flush to the full-period sample concentrations.
SOURCE: NSQD, as reported by Maestre et al. (2004).

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Groups of constituents showed different behaviors for different land uses. All the heavy metals evaluated showed higher concentrations at the beginning of the event in the commercial land-use category. Similarly, all the nutrients showed higher initial concentrations in residential land-use areas, except for total nitrogen and orthophosphorus. This phenomenon was not found in the bacterial analyses. None of the land uses showed a higher population of bacteria at the beginning of the event.

The general conclusion from these data is that, in areas having low and generally even-intensity rains, first-flush observations are more common, especially in small and mostly paved areas. As an area increases in size, multiple routing pathways tend to blend the water, and runoff from the more distant locations reaches the outfall later in the event. SCMs located at outfalls in areas having low levels of impervious cover should be selected and sized to treat the complete event, if possible. Preferential treatment of first flushes may only be justified for small impervious areas, but even then, care needs to be taken to prevent undersizing and missing substantial fractions of the event.

Seasonal first flushes refer to larger portions of the annual runoff and pollutant discharges occurring during a short rain season. Seasonal first flushes may be observed in more arid locations where seasonal rainfalls are predominant. As an example, central and southern California can have dry conditions for extended periods, with the initial rains of the season occurring in the late fall. These rains can be quite large and, since they occur after prolonged dry periods, may carry substantial portions of the annual stormwater pollutant load. This is especially pronounced if later winter rains are more mild in intensity and frequent. For these areas, certain types of seasonally applied SCMs may be effective. As an example, extensive street, channel, and inlet cleaning in the late summer and early fall could be used to remove large quantities of debris and leaves from the streets before the first heavy rains occur. Other seasonal maintenance operations benefiting stormwater quality should also be scheduled before these initial rains.

Rain Depth Effects

An issue related to first flushes pertains to the effects of rain depth on stormwater quality. The NSQD contains much rainfall data along with runoff data for most areas of the country. Figure 4-9 contains scatter plots showing concentrations plotted against rain depth for some NSQD data. Although many might assume a correlation between concentrations and rain depth, in fact there are no obvious trends of concentration associated with rain depth. Rainfall energy determines erosion and wash-off of particulates, but sufficient runoff volume is needed to carry the particulate pollutants to the outfalls. Different travel times from different locations in the drainage areas results in these materials arriving at different times, plus periods of high rainfall intensity (that increase pollutant wash-off and movement) occur randomly throughout the storm. The

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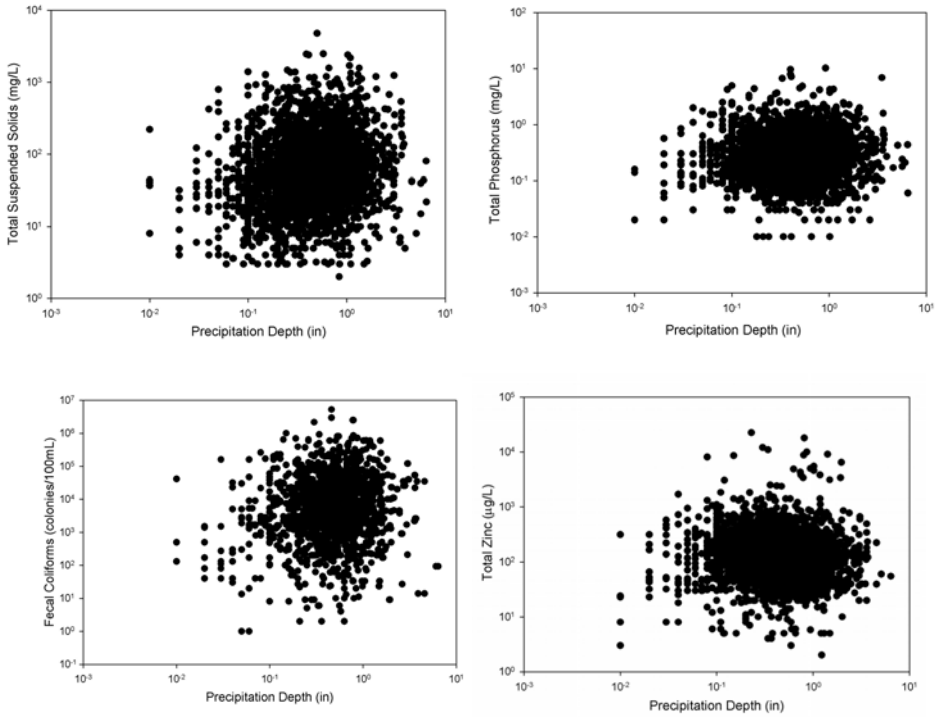

FIGURE 4-9 Examples of scatter plots by precipitation depth. SOURCE: NSQD.

resulting outfall stormwater concentration patterns for a large area having various surfaces is therefore complex and rain depth is just one of the factors involved.

Reported Monitoring Problems

A number of monitoring problems were described in the local Phase I community MS4 annual monitoring reports that were summarized as part of assembling the NSQD. About 58 percent of the communities described monitoring problems. Problems were mostly associated with obtaining reliable data for the targeted events. These problems increased costs because equipment failures had to be corrected and sampling excursions had to be rescheduled. One of the basic sampling requirements was to collect three samples every year for each

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of the land-use stations. These samples were to be collected at least one month apart during storm events having at least 0.1-inch rains, and with at least 72 hours from the previous 0.1-inch storm event. It was also required (when feasible) that the variance in the duration of the event and the total rainfall not exceed the median rainfall for the area. About 47 percent of the communities reported problems meeting these requirements. In many areas of the country, it was difficult to have three storm events per year with these characteristics. Furthermore, the complete range of site conditions needs to be represented in the data-collection effort; focusing only on a narrow range of conditions limits the representativeness of the data.

The second most frequent problem, reported by 26 percent of the communities, concerned backwater tidal influences during sampling, or that the outfall became submerged during the event. In other cases, it was observed that there was flow under the pipe (flowing outside of the pipe, in the backfill material, likely groundwater), or sometimes there was no flow at all. These circumstances all caused contamination of the collected samples, which had to be discarded, and prevented accurate flow monitoring. Greater care is obviously needed when locating sampling locations to eliminate these problems.

About 12 percent of the communities described errors related to malfunctions of the sampling equipment. When reported, the equipment failures were due to incompatibility between the software and the equipment, clogging of the rain gauges, and obstruction in the sampling or bubbler lines. Memory losses in the equipment recording data were also periodically reported. Other reported problems were associated with lighting, false starts of the automatic sampler before the runoff started, and operator error due to misinterpretation of the equipment configuration manual.

The reported problems suggest that the following changes should be made. First, the rain gauges need to be placed close to the monitored watersheds. Large watersheds cannot be represented with a single rain gauge at the monitoring station. In all cases, a standard rain gauge needs to supplement a tipping bucket rain gauge, and at least three rain gauges should be used in the research watersheds. Second, flow-monitoring instrumentation also needs to be used at all water quality monitoring stations. The lack of flow data greatly hinders the value of the chemical data. Third, monitoring needs to cover the complete storm duration. Automatic samplers need to be properly programmed and maintained to handle very short to very long events. It is unlikely that manual samplers were able to initiate sampling near the beginning of the events, unless they were deployed in anticipation of an event later in the day. A more cost-effective and reliable option would be to have semi-permanent monitoring stations at the various locations with sampling equipment installed in anticipation of a monitored event. Most monitoring agencies operated three to five land-use stations at one time. This number of samplers, and flow equipment, could have been deployed in anticipation of an acceptable event and would not need to be continuously installed in the field at all sampling locations.

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Non-Detected Analyses

Left-censored data involve observations that are reported as below the limits of detection, whereas right-censored data involve above-range observations. Unfortunately, many important stormwater measurements (such as for filtered heavy metals) have large fractions of undetected values. These incomplete data greatly hinder many statistical tests. To estimate the problems associated with censored values, it is important to identify the probability distributions of the data in the dataset and the level of censoring. As discussed previously, most of the constituents in the NSQD follow a lognormal distribution. When the frequencies of the censored observations were lower than 5 percent, the means, standard deviations, and COVs were almost identical to the values obtained when the censored observations were replaced by half of the detection limit. As the percentage of nondetected values increases, replacing the censored observation by half of the detection limit instead of estimating them using Cohen's maximum likelihood method produced lower means and larger standard deviations. Replacing the censored observations by half of the detection limit is not recommended for levels of censoring larger than 15 percent. Because the Cohen method uses the detected observations to estimate the nondetected values, it is not very accurate, and therefore not recommended, when the percentage of censored observations is larger than 40 percent (Burton and Pitt, 2002). In this case, summaries should only be presented for the detected observations, with clear notations stating the level of nondetected observations.

The best method to eliminate problems associated with left-censored data is to use an appropriate analytical method. By keeping the nondetectable level below 5 percent, there are many fewer statistical analysis problems and the value of the datasets can be fully realized. Table 4-3 summarizes the recommended minimum detection limits for various stormwater constituents to obtain manageable nondetection frequencies (< 5 percent), based on the NSQD data observations. Some of the open-space stormwater measurements (lead, and oil and grease, for example) would likely have greater than 5 percent nondetections, even with the detection limits shown. The detection limits for filtered heavy metals should also be substantially less than shown on this table.

Seasonal Effects

Another factor that some believe may affect stormwater quality is the season when the sample was obtained. If the few samples collected for a single site were all collected in the same season, the results may not be representative of the whole year. The NPDES sampling protocols were designed to minimize this effect by requiring the three samples per year to be separated by at least one month. The few samples still could be collected within a single season, but not within the same week. Seasonal variations for residential fecal coliform data are shown in Figure 4-10 for NSQD data for all residential areas. These data were

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TABLE 4-3 Suggested Analytical Detection Limits for Stormwater Monitoring Programs to Obtain Less Than 5 Percent Nondetections

Parameter	Residential, Commercial, Industrial, Freeway		Open Space	
Conductivity	20	µS/cm	20	µS/cm
Hardness	10	mg/L	10	mg/L
Oil and grease	0.5	mg/L	0.5	mg/L
TDS	10	mg/L	10	mg/L
TSS	5	mg/L	1	mg/L
BOD_5	2	mg/L	1	mg/L
COD	10	mg/L	5	mg/L
Ammonia	0.05	mg/L	0.01	mg/L
$NO_2 + NO_3$	0.1	mg/L	0.05	mg/L
TKN	0.2	mg/L	0.2	mg/L
Dissolved P	0.02	mg/L	0.01	mg/L
Total P	0.05	mg/L	0.02	mg/L
Total Cu	2	µg/L	2	µg/L
Total Pb	3	µg/L (residential µg/L)	1	µg/L
Total Ni	2	µg/L	1	µg/L
Total Zn	20	µg/L (residential 10 µg/L)	5	µg/L

SOURCE: Maestre and Pitt (2005).

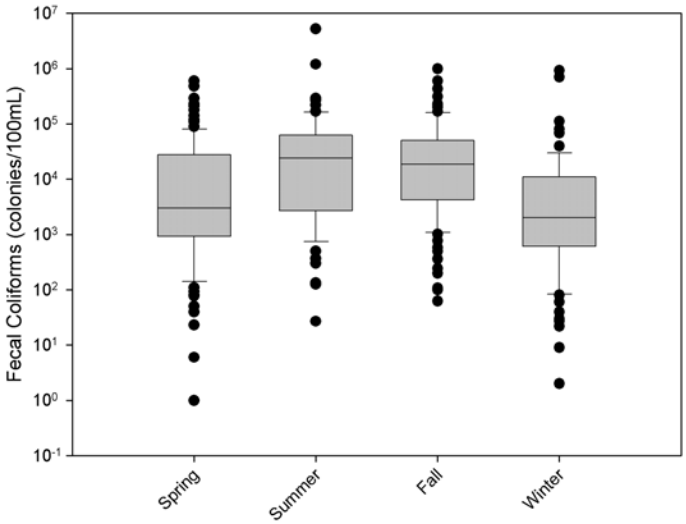

FIGURE 4-10 Fecal coliform concentrations in stormwater by season. SOURCE: NSQD.

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the only significant differences in concentration by season for any constituent measured. The bacteria levels are lowest during the winter season and highest during the summer and fall (a similar conclusion was obtained during the NURP data evaluations).

Recommendations for MS4 Monitoring Activities

The NSQD is an important tool for the analysis of stormwater discharges at outfalls. About a fourth of the total existing information from the NPDES Phase I program is included in the database. Most of the statistical analyses in this research were performed for residential, commercial, and industrial land uses in EPA Rain Zone 2 (the area of emphasis according to the terms of the EPA-funded research). Many more data are available from other stormwater permit holders that are not included in this database. Acquiring these additional data for inclusion in the NSQD is a recommended and cost-effective activity and should be accomplished as additional data are also being obtained from ongoing monitoring projects.

The use of automatic samplers, coupled with bed-load samplers, is preferred over manual sampling procedures. In addition, flow monitoring and on-site rainfall monitoring need to be included as part of all stormwater characterization monitoring. The additional information associated with flow and rainfall data will greatly enhance the usefulness of the much more expensive water quality monitoring. Flow monitoring must also be correctly conducted, with adequate verification and correct base-flow subtraction methods applied. A related issue frequently mentioned by the monitoring agencies is the lack of on-site precipitation information for many of the sites. Using regional rainfall data from locations distant from the monitoring location is likely to be a major source of error when rainfall factors are being investigated.

Many of the stormwater permits only required monitoring during the first three hours of the rain event. This may have influenced the EMCs if the rain event continued much beyond this time. Flow-weighted composite monitoring should continue for the complete rain duration. Monitoring only three events per year from each monitoring location requires many years before statistically adequate numbers of observations are obtained. In addition, it is much more difficult to ensure that such a small fraction of the total number of annual events is representative. Also, there is minimal value in obtaining continued data from an area after sufficient information is obtained. It is recommended that a more concentrated monitoring program be conducted for a two- or three-year period, with a total of about 30 events monitored for each site, covering a wide range of rain conditions. Periodic checks can be made in future years, such as repeating concentrated monitoring every 10 years or so (and for only 15 events during the follow-up surveys).

Finally, better watershed area descriptions, especially accurate drainage-area delineations, are needed for all monitored sites. While the data contained in

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the NSQD are extremely useful, future monitoring information obtained as part of the stormwater permit program would be greatly enhanced with these additional considerations.

MONITORING OF INDUSTRIES INCLUDING CONSTRUCTION

The various industrial stormwater monitoring requirements of the EPA Stormwater Program have come under considerable scrutiny since the program's inception. Input to the committee at its first meeting conveyed the strong sense that monitoring as it is being done is nearly useless, is burdensome, and produces data that are not being utilized. The requirements consist of the following. All industrial sectors covered under the Multi-Sector General Permit (MSGP) must conduct visual monitoring four times a year. This visual monitoring is performed by collecting a grab sample within the first hour of stormwater discharge and observing its characteristics qualitatively (except for construction activities—see below). A subset of MSGP industries are required to perform analytical monitoring for benchmark pollutant parameters (see Table 2-5) four times in year 2 of permit coverage and again in year 4 if benchmarks are exceeded in year 2. A benchmark sample is collected as a grab sample within the first hour of stormwater discharge after a rainfall event of 0.1 inch or greater and with an interceding dry period of at least 72 hours. An even smaller subset of MSGP industries that are subject to numerical effluent guidelines under 40 C.F.R. must, in addition, collect grab samples of their stormwater discharge after every discharge event and analyze it for specific pollutant parameters as specified in the effluent guidelines (see Table 2-6). There is no monitoring requirement for stormwater discharges from construction activity in the Construction General Permit. There is only an elective requirement that the construction site be visually inspected within 24 hours after the end of a storm event that is 0.5 inch or greater, if inspections are not performed weekly.

EPA selected the benchmark analytical parameters for industry subsectors to monitor using data submitted by industrial groups in 1993 as part of their group applications. The industrial groups were required to sample a minimum of 10 percent of facilities within an industry group for pH, TSS, BOD_5, oil and grease, COD, TKN, nitrate plus nitrite nitrogen, and total phosphorous. Each sampling facility within a group collected a minimum of one grab sample within the first 30 minutes of discharge and one flow-weighted composite sample. Other nonconventional pollutants such as fecal coliform bacteria, iron, and cobalt were analyzed only if the industry group expected it to be present. Similarly, toxic pollutants such as lead, copper, and zinc were not sampled but rather self-identified only if expected to be present in the stormwater discharge. As a result of the self-directed nature of these exercises, the data submitted with the group applications were often incomplete, inconsistent, and not representative of the potential risk posed by the stormwater discharge to human health and aquatic

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life. EPA has not conducted or funded independent investigations and has relied solely on the data submitted by industry groups to determine which pollutant parameters are appropriate for the analytical monitoring of an industry subsector. Thus, there are glaring deficiencies; for example, the only benchmark parameter for asphalt paving and roofing materials is TSS, even though current science shows that the most harmful pollutants in stormwater discharges from the asphalt manufacturing industry are polycyclic aromatic hydrocarbons (compare Table 2-5 with Mahler et al., 2005).

Aside from the suitability of benchmark parameters is the fact the too few samples are collected to sufficiently characterize the variability of pollutant concentrations associated with industrial facilities within a sector. This is discussed in detail in Box 4-2, which describes one of the few efforts to collect and analyze data from the benchmark monitoring of industries done in Southern California. EPA has not requested a nationwide effort to compile these data, as was done for the MS4 program, although this could potentially lead to average effluent concentrations by industrial sector that could be used for a variety of purposes, including more considerate regulations. Finally, the compliance monitoring that is presently being conducted under the MSGP is of limited usefulness because it is being done to comply with effluent guidelines that have not been updated to reflect the best available technology relevant to pollutants of most concern. All of these factors have led to an industrial stormwater monitoring program that is not very useful for the purposes of reducing stormwater pollution from industries or informing operators on which harmful pollutants to expect from their sites.

Industrial-Area Monitoring Issues

Monitoring at industrial sites has some unique issues that must be overcome. The most important aspect for any monitoring program is understanding and specifying the objectives of the monitoring program and developing and following a detained experimental design to allow these objectives to be met. The following discussion is organized around the reasons why monitoring at industrial sites may be conducted.

Regional Monitoring of Many Facilities

An important monitoring objective would be regional monitoring to calibrate and verify stormwater quality models, to randomly verify compliance at facilities not normally requiring monitoring, and to establish benchmarks for compliance. As shown in Box 4-2, haphazard monitoring throughout an area would require a very large effort, and would still likely result in large errors in the expected data. It is recommended that a regional stormwater authority coordinate regional monitoring as part of the MS4 monitoring requirements, possibly

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BOX 4-2
The Plight of Industrial Stormwater Data

Unlike the data collected by municipalities and stored in the NSQD, the benchmark monitoring data collected by permitted industries are not compiled or analyzed on a national basis. However, there has been at least one attempt to compile these data on a more local basis. California required that industrial facilities submit their benchmark monitoring data over a nine-year period, and it was subsequently analyzed by Michael Stenstrom and colleagues at UCLA (Stenstrom and Lee, 2005; Lee et al., 2007). The collected data were for such parameters as pH, turbidity, specific conductance, oil and grease (or total organic carbon), and several metals. There are more than 6,000 industries covered under the California general permit, each of which was to have collected two grab samples per year for a limited number of parameters. Whether these data were collected each year and for each industry was highly variable.

The analysis of the data from Los Angeles and Ventura counties revealed that stormwater monitoring data are not similar to the types of data that the environmental engineering field is used to collecting, in particular wastewater data. Indeed, as shown in Figure 4-11, stormwater data are many orders of magnitude more variable than drinking water and wastewater data. The coefficients of variation for municipal and industrial stormwater were almost two orders of magnitude higher than for drinking water and wastewater, with the industrial stormwater data being particularly variable. This variability comes from various sources, including intrinsic variability given the episodic nature of storm events, analytical methods that are more variable when applied to stormwater, and sampling technique problems and error.

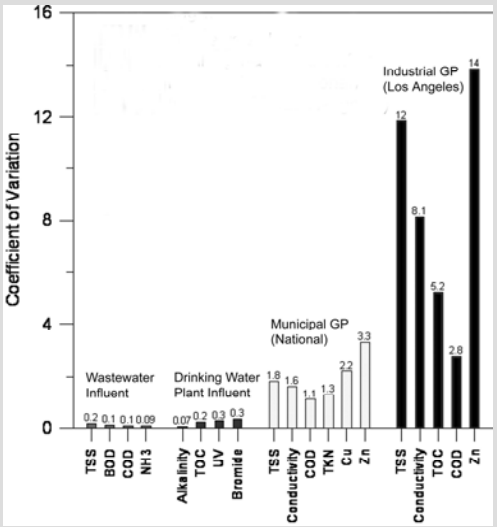

FIGURE 4-11 A comparison of data from four sources: wastewater influent, drinking water plant effluent, municipal stormwater, and industrial stormwater. SOURCE: Reprinted, with permission, from Stenstrom (2007). Copyright 2007 by Michael K. Stenstrom.

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BOX 4-2 Continued

This enormous variability means that it is extremely difficult to make meaningful statements. For example, it was impossible, using different analyses, to correlate certain chemical pollutants with certain industries. Furthermore, although the data revealed that there are exceedances of benchmark values for certain parameters (Al, Cu, Fe, Pb, and Zn in particular), the data are not of sufficient quantity or quality to identify problem polluters. Finally, there were also large numbers of outliers (that is, samples whose concentrations were well above the 75th percentile range).

Because of these large coefficients of variation, greater numbers of samples are needed to be able to say there is a significant difference between samples. As shown in Figure 4-12 using COD and a 50 percent difference in means as an example, one would need six data points to tell the difference between two wastewater influents, 80 data points if one had municipal stormwater data, and around 1,000 data points for industrial stormwater. These numbers obviously eclipse what is required under all states' MSGPs.

For drinking water treatment, monitoring is done to ensure the quality of the product, while for wastewater, there is a permit that requires the plant to meet a specific quality of water. Unlike these other areas of water resources, there are few incentives that might compel an industry to increase its frequency of stormwater monitoring. As a result, industries are less invested in the process and rarely have the expertise needed to carry out self-monitoring.

Permitted industries are not required to sample flow. However, Stenstrom and colleagues used Los Angeles rainfall data (see Figure 4-13) as a surrogate for flow and demonstrated that there is a seasonal first-flush phenomenon occurring in early fall. That is, samples taken after a prolonged dry spell will have higher pollutant concentrations. There are always high concentrations of contaminants during the first rainfall because contaminants have had time to accumulate since the previous rainfall. This is important because EPA asks the industrial permittees to collect data from the first rainfall, such that they may end up overestimating the mass emissions for the year. Furthermore, it shows that numeric limits for grab samples would be risky because the measured data are highly affected by the timing of the storm.

The controversy about numeric limits for industrial stormwater dischargers has existed for more than ten years in California. A recent expert panel concluded that in some cases, numeric limits are appropriate (for construction, but not for municipalities). Stenstrom's recommendations are that industrial monitoring should be either ended or upgraded (for competent industries). If upgraded, it should include more types of monitored parameters, a sampling method with a lower coefficient of variation, real-time monitoring as opposed to grab samples, more quality assurance/quality control, and web-based reporting. A fee-based program with a subset of randomly selected industries may be better than requiring every industry to sample. Stenstrom and Lee (2005) suggest who might do this monitoring if the industry does not have the necessary trained personnel. There is concern that the California water boards are too understaffed to administer such programs and respond to high emitters.

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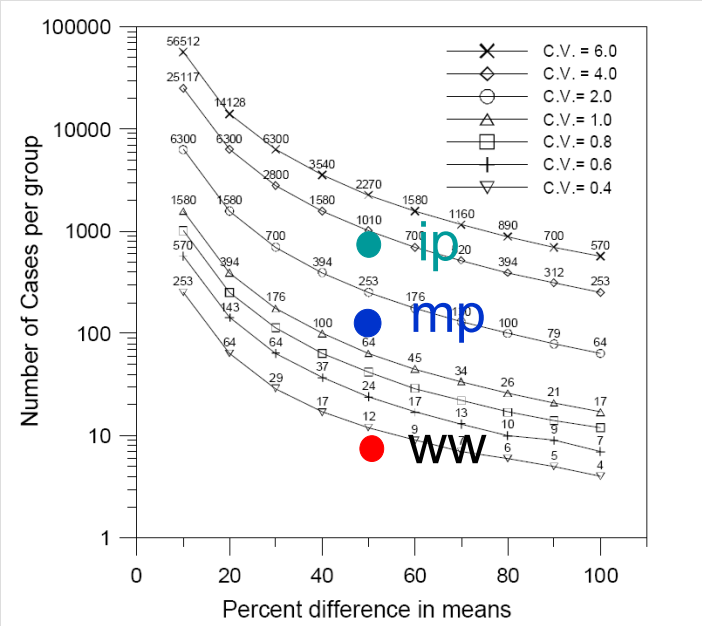

FIGURE 4-12 Number of cases needed to detect a certain percentage difference in the means, using COD as an example. SOURCE: Reprinted, with permission, from Stenstrom (2007). Copyright 2007 by Michael K. Stenstrom.

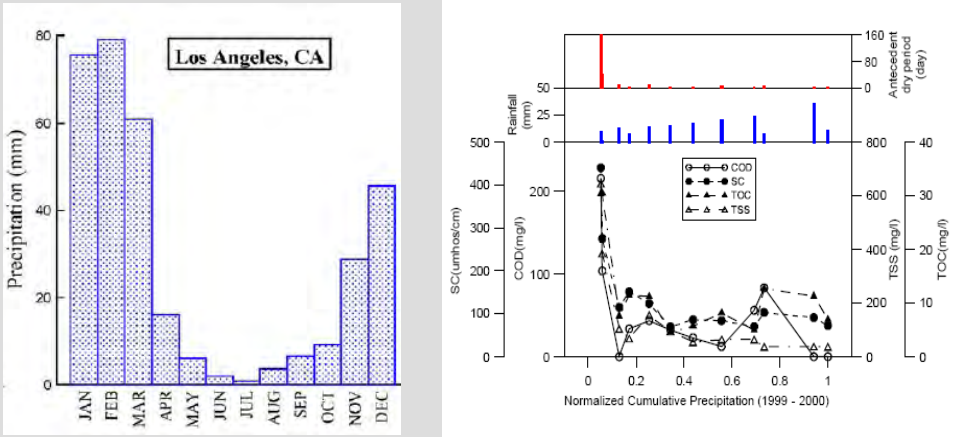

FIGURE 4-13 Annual precipitation in Los Angeles (left) and seasonal first flushes of various contaminants (right). SOURCE: Reprinted, with permission, from Stenstrom (2007). Copyright 2007 by Michael K. Stenstrom.

SOURCES: Stenstrom and Lee (2005), Lee et al. (2007), Stenstrom (2007).

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even at the state level covering several Phase I municipalities. A coordinated effort would be most cost-effective with the results compiled for a specific objective. The general steps in this effort would include the following.

(1) Compiling available regional stormwater quality data and comparing the available data to the needs (such as calibration of a regional model; verifying compliance of facilities not requiring monitoring; and establishing regional benchmarks). This may include expanding the NSQD for the region to include all of the collected data, plus examination of data collected as part of other specialized monitoring activities. These objectives will result in different data needs, so it is critical that the uses of the data are identified before sampling plans are established.

(2) Identifying monitoring opportunities as part of other on-going activities that can be expanded to also meet data gaps for these specific objectives. It is important to understand the time frame for the monitoring and ensure that it will meet the needs. As an example, current NPDES stormwater monitoring only requires a few events to be sampled per year at a facility. It may take many years before sufficient data are obtained unless the monitoring effort is accelerated.

(3) Preparing an experimental design that identifies the magnitude of the needed data, considering the allowable errors in the results, and carrying out the sampling program. Different types of data may have varying data quality objectives, depending on their use. It may be possible to truncate some of the monitoring when a sufficient understanding is obtained.

A regionally calibrated and verified model can be used to review development plans and proposed SCMs for new facilities. When suitably integrated with receiving-water modeling tools, a stormwater model can also be used to develop discharge objectives and numeric discharge limits that are expected to meet regulatory requirements. Eventually, it may be possible to couple watershed stormwater models with regional receiving water assessments and beneficial use studies. Haphazard monitoring of a few events each year will be very difficult to correlate with regional receiving water objectives, while a calibrated and verified watershed model, along with receiving water assessments, will result in a much more useful tool and understanding of the local problems.

Regional monitoring can also be targeted to categories of industries that were previously determined to be of low priority. This monitoring activity would randomly target a specific number of these facilities for monitoring to verify the assumption that they are of low priority and are still carrying out the minimum management practices. This activity would also quantify the discharges from these facilities and the performance of the minimum controls. If the discharges are excessive when compared to the initial assumptions, or the management practices being used are not adequate, then corrective actions would be instigated. A single category of specific industries could be selected for any one year, and a team from the regional stormwater management author-

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ity could randomly select and monitor a subset of these facilities. An efficient experimental design would need to be developed based on expected conditions, but it is expected that from 10 to 15 such facilities would be monitored for at least a year in a large metropolitan area that has a Phase I stormwater permit, or even state-wide.

Regional monitoring is also necessary to more accurately establish benchmarks for numeric permits. Geographical location, along with land use, is normally an important factor affecting stormwater quality. Receiving water impacts and desired beneficial uses also vary greatly for different locations. It is therefore obvious that compliance benchmarks also be established that consider these regional differences. This could be a single statewide effort if the state agency has the permit authority and if the state has minimal receiving water and stormwater variations. However, in most cases, significant variations occur throughout the state and separate monitoring activities would be needed for each region. In the simplest case, probability distributions of stormwater discharge quality can be developed for different discharge categories and the benchmarks would be associated with a specific probability value. In some cases, an overall distribution may be appropriate, and only the sites having concentrations greater than the benchmark value would need to have additional treatment. In all cases, a basic level of stormwater management should be expected for all sites, but the benchmark values would identify sites where additional controls are necessary. The random monitoring of sites not requiring extensive monitoring could be used to identify and adjust the basic levels of control needed for all categories of stormwater dischargers.

Identification of Critical Source Areas Associated with Specific Industrial Operations

The objective of this monitoring activity would be to identify and characterize critical source areas for specific industries of concern. If critical source areas can be identified, targeted control or treatment can be much more effective than relying only on outfall monitoring. Many of the treatment strategies for industrial sites involve pollution prevention, ranging from covering material or product storage areas to coating galvanized metal. Other treatment strategies involve the use of highly effective treatment devices targeting a small area, such as filters used to treat zinc in roof runoff or lamella plate separators for pretreatment of storage yard runoff before wet pond treatment. Knowledge of the characteristics of the runoff from the different areas at a facility is needed in order to select and design the appropriate treatment methods.

Box 4-3 is a case study of one such group monitoring effort—for a segment of the telecommunications industry targeting a specific maintenance practice. Instead of having each telecommunication company throughout the country conduct a detailed monitoring program for individual stormwater permits associated with maintenance efforts, many of the companies joined together under an

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BOX 4-3
Monitoring to Support a General Stormwater Group Permit Application for the Telecommunications Industry

This monitoring program was conducted to support a group permit application for the telecommunications industry, specifically to cover maintenance operations associated with pumping water out of communications manholes that is then discharged into the storm drainage system. Under federal and state environmental statues, the generator (owner or operator) is responsible for determining if the discharged water needs treatment. The work performed under this project covered characterization, prevention, and treatment methods of water found in manholes.

The objective of this project was to develop a test method to quickly evaluate water in manholes and then to recommend on-site treatment and preventative methods. To meet the telecommunication industry needs, the evaluating tests of water found in manholes need to be simple, quick, inexpensive, field applicable, and accurate indicators of contaminated conditions. The on-site treatment methods must be cost-effective and quickly reduce the concentrations of the contaminant of concern to acceptable levels before the water from manholes is discharged, to result in a safe environment for workers.

A sampling effort was conducted by Pitt et al. (1998) to characterize the quality of the water and sediment found in manholes. More than 700 water samples and 300 sediment samples were analyzed over a three-year period, representing major land-use, age, season, and geographical factors from throughout the United States. The samples were analyzed for a wide range of common and toxic constituents. The statistical procedures identified specific relationships between these main factor categories and other manhole characteristics. Part of the project was to evaluate many field analytical methods. Finally, research was also conducted to examine possible water treatment methods for water being pumped from telecommunication manholes.

Summary of Sampling Effort and Strategy

The objective of the monitoring program was to characterize telecommunication manhole water and sediment. Important variables affecting the quality of these materials were also determined. A stratified random sampling design was followed, with the data organized in a full 2^4 factorial design, with repeated sampling of the same manholes for each season. The goal for the minimum number of samples per strata was ten. This sampling effort enabled the determination of errors associated with the results, which was expected to be less than 25 percent. In addition, this level of effort enabled comparison tests to be made outside of the factorial design. Table 4-4 lists the constituents that were evaluated for each of the sample types.

The immense amount of data collected during this project and the adherence to the original experimental design enabled a comprehensive statistical evaluation of the data. Several steps in data analysis were performed, including:

- exploratory data analyses (mainly probability plots and grouped box plots),
- simple correlation analyses (mainly Pearson correlation matrices and associated scatter plots),
- complex correlation analyses (mainly cluster and principal component analyses, plus Kurskal-Wallis comparison tests), and

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• model building (based on complete 2^4 factorial analyses of the most important factors).

The toxicity screening tests (using the Azur Microtox® method) conducted on both unfiltered and filtered water samples from telecommunication manholes indicated a wide range of toxicity, with no obvious trends for season, land use, or age. About 60 percent of the samples were not considered toxic (less than an I25 light reduction of 20 percent, the light reduction associated with phosphorescent bacteria after a 25-minute exposure to undiluted samples), about 20 percent were considered moderately toxic, while about 10 percent were considered toxic (light reductions of greater than 40 percent), and 10 percent were considered highly toxic (light reductions of greater than 60 percent). Surprisingly, samples from residential areas generally had greater toxicities than samples from commercial and industrial areas. Samples from newer areas were also more toxic than those from older areas. Further statistical tests of the data indicated that the high toxicity levels were likely associated with periodic high concentrations of salt (in areas using de-icing salt), heavy metals (especially filterable zinc, with high values found in most areas), and pesticides (associated with newer residential areas).

TABLE 4-4 Constituents Examined in Water and Sediment from Telecommunication Manholes

Constituent	Unfiltered Water	Filtered Water	Sediment
Solids, volatile solids, COD, Cu, Pb, and Zn	X	X	X
Turbidity, color, and toxicity (Microtox screening method)	X	X	
pH, conductivity, hardness, phosphate, nitrate, ammonia, boron, fluoride, potassium, and detergents	X		
Odor, color, and texture			X
E. coli, enterococci, particle size, and chromium	Selected		
Metal scan (ICP)			Selected
PAHs, phenols (GC/MSD), and pesticides	X	Selected	Selected

SOURCE: Modified from Pitt et al. (1998).

Concentrations of copper, lead, and zinc were evaluated in almost all of the water samples, and some filtered samples were also analyzed for chromium. From 470 to 548 samples (75 to 100 percent of all unfiltered samples analyzed) had detectable concentrations of these metals. Filterable lead concentrations in the water were as high as 160 μg/L, while total lead concentrations were as high as 810 μg/L. Zinc values in filtered and unfiltered samples were as high as about 3,500 μg/L. Some of the copper concentrations were also high in both filtered and unfiltered samples (as high as 1,400 μg/L). Chromium concentrations as high as 45 μg/L were also detected.

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BOX 4-3 Continued

About 300 sediment samples were analyzed and reviewed for heavy metals. An ICP/MS was used to obtain a broad range of metals with good detection limits. The following list shows the median observed concentrations for some of the constituents found in the sediments (expressed as milligrams of the constituent per kilogram of dry sediment):

Aluminum	14,000 mg/kg
COD	85,000 mg/kg
Chromium	<10 mg/kg
Copper	100 mg/kg
Lead	200 mg/kg
Strontium	35 mg/kg
Zinc	1,330 mg/kg

Geographical area had the largest effect on the data observations, while land use, season, and age influenced many fewer parameters. The most obvious relationship was found for high dissolved solids and conductivity associated with winter samples from snowmelt areas. The high winter concentrations slowly decreased with time, with the lowest concentrations noted in the fall. Another important observation was the common association between zinc and toxicity. Residential-area samples generally had larger zinc concentrations than the samples from commercial and industrial areas. Samples from the newest areas also had higher zinc concentrations compared to samples from older areas. No overall patterns were observed for zinc concentrations in sediment samples obtained from manholes. Other constituents (especially nutrients and pesticides) were also found to have higher concentrations in water collected from manholes in newer residential areas. Very few organic toxicants were found in the water samples, but sediment sample organic toxicant concentrations appeared to be well correlated to sediment texture and color. About 10 to 25 percent of the sediment samples had relatively large concentrations of organics. Bacteria analyses indicated some relatively high bacteria counts in a small percentage of the samples. Bacteria were found in lower amounts during sampling periods that were extremely hot or extremely cold. Pacific Northwest samples also had the lowest bacteria counts.

The data were used to develop and test predictive equations based on site conditions. These models were shown to be valid for most of the data, but the highest concentrations were not well predicted. Therefore, special comparisons of many site conditions were made for the manholes having water with the highest concentrations of critical constituents for comparison to the other locations. It was interesting to note that about half of the problem manholes were repeated samples from the same sites (after complete pumping), but at different seasons, indicating continuous problems and not discrete incidents. In addition, the problem manholes were found for all areas of the country and for most rain conditions. Water clarity and color, along with sediment texture, were found to be significant factors associated with the high concentrations of other constituents, while land use was also noted as a significant factor. These factors can be used to help identify problem manholes, but the rates of false positives and false negatives were found to be high. Therefore, these screening criteria can be used to identify more likely problematic manholes, but other methods (such as confirmation chemical analyses) are also needed to identify those that could not be identified using these simpler methods.

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BOX 4-3 Continued

The field analytical test methods worked reasonably well, but had much higher detection limits than advertised, limiting their usefulness. Due to the complexity and time needs for many of these on-site analyses, it is usually more effective to analyze samples at a central facility. For scheduled maintenance operations, a crew could arrive at the site before the maintenance time to collect samples and have them analyzed before the maintenance crew arrives. For emergency repairs, it is possible to pump the collected water into a tank truck for later analyses, treatment, and disposal.

The treatment scenario developed and tested is relatively rapid and cheap and can be used for all operations, irrespective of screening analyses. Chemical addition (using ferric chloride) to the standing water in the manhole was found to reduce problematic levels of almost all constituents to low levels. Slow pumping from the water surface over about a 15- to 30-minute period, with the discharged water then treated in 20-μm cartridge filters, allows the manhole to be entered and the repairs made relatively rapidly, with the water safely discharged. The remaining several inches of water in the bottom of the manhole, along with the sediment, can be removed at a later time for proper disposal.

SOURCE: Pitt et al. (1998).

industrial trade group to coordinate the monitoring and to apply for a group permit. This was a significant effort that was conducted over several years and involved the participation of many regional facilities throughout the nation. This coordinated effort spread the cost over these different participants, and also allowed significant amounts of data to be collected, control practices to be evaluated, and the development of screening methods that allow emergency maintenance operations of the telecommunication system to proceed in a timely manner. The experimental design of this monitoring program allowed an efficient examination of factors affecting stormwater discharges from these operations. This enabled the efficient implementation of effective control programs that targeted specific site and operational characteristics. Although the total cost for this monitoring program was high, it was much less costly than if each individual company had conducted their own monitoring. In addition, this group effort resulted in much more useful information for the industry as a whole.

Outfall Monitoring at a Single Industrial Facility for Permit Compliance and to Demonstrate Effectiveness of Control Practices

Sampling at an individual facility results in outfall data that can be compared to pre-control conditions and numeric standards. There are many guidance documents and reports available describing how to monitor stormwater at an outfall. Two comprehensive sources that describe stormwater monitoring procedures include the handbook written by Burton and Pitt (2002) and a recent guidance report prepared by Shaver et al. (2007). There are a number of basic

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components that need to be included for an outfall characterization monitoring effort, many which have been described in this report. These include the following:

- rainfall monitoring in the drainage area (rate and depth, at least at two locations).
- flow monitoring at the outfall (calibrated with known flow or using dye dilution methods).
- flow-weighted composite sampler, with sampler modified to accommodate a wide range of rain events.
- recommended use of water quality sonde to obtain high-resolution and continuous measurements of such parameters as turbidity, conductivity, pH, oxidation reduction potential, dissolved oxygen (DO), and temperature.
- preparation of adequate experimental design that quantifies the needed sampling effort to meet the data quality objectives (adequate numbers of samples in all rain categories and seasons).
- selection of constituents that meet monitoring objectives. In addition, the analytical methods must be appropriately selected to minimize "nondetected" values.
- monitoring station maintenance must also be conducted appropriately to ensure reliable sample collection. Sampling plan must also consider sample retrieval, sample preparation and processing, and delivery to the analytical laboratory to meet quality control requirements.

Burton and Pitt (2002) describe these monitoring components in detail, along with many other monitoring elements of potential interest (e.g., receiving water biological, physical, and chemical monitoring, including sediment and habitat studies), and include many case studies addressing these components, along with basic statistical analyses and interpretation of the collected data. Box 4-4 provides a detailed example of industrial stormwater monitoring at individual sites in Wisconsin.

In general, monitoring of industries should be tailored to their stormwater pollution potential, considering receiving water uses and problems. There are a number of site survey methods that have been developed to rank industry by risk that mostly rely on visual inspections and information readily available from regional agencies. The Center for Watershed Protection developed a hot-spot investigation procedure that is included in the Urban Subwatershed Restoration Manual No. 11 (Wright et al., 2005). This site survey reconnaissance method ranks each site according to its likely stormwater pollutant discharge potential. A detailed field sheet is used when surveying each site to assist with the visual inspections. Cross and Duke (2008) developed a methodology, described in greater detail in Chapter 6, to visually assess industrial facilities based on the level of activities exposed to stormwater. They devised four categories—Category A, no activities exposed to stormwater; Category B, low intensity; Category C, medium intensity; and Category D, high intensity—and tested this

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BOX 4-4
Wisconsin's Monitoring of Industrial Stormwater

The State of Wisconsin also uses a site assessment method to rank industrial operations into three tiers, mostly based on their standard industrial codes. This system groups facilities by industry and how likely they are to contaminate stormwater. The general permits differ in monitoring requirements, inspection frequency, plan development requirements, and the annual permit fee. The Tier 1 general permit covers the facilities that are considered "heavy" industries, such as paper manufacturing, chemical manufacturing, petroleum refining, ship building/repair, and bulk storage of coal, minerals, and ores. The monitoring required of these facilities is presented in this box. The Tier 2 general permit covers facilities that are considered "light" industries and includes such sites as furniture manufacturing, printing, warehousing, and textiles. Facilities with no discharge of contaminated stormwater are in the Tier 3 category and include sites that have no outdoor storage of materials or waste products.

In accordance with the Wisconsin MSGP, Tier 1 industries are required to perform an annual chemical stormwater sampling at each outfall for those residual pollutants listed in the industry's stormwater pollution prevention plan. The one runoff event selected for sampling must occur between March and November and the rainfall depth must be at least 0.1 inch. At least 72 hours must separate the sampled event and the previous rainfall of 0.1 inch. The concentration of the pollutant must represent a composite of at least three grab samples collected in the first 30 minutes of the runoff event. There is concern about the value of collecting so few samples from just one storm each year.

To evaluate how well this sampling protocol characterizes pollutant concentrations in industrial runoff, the Wisconsin Department of Natural Resources partnered with the USGS to collect stormwater samples from three Tier 2 industrial sites (Roa-Espinosa and Bannerman, 1994). Seven runoff events were monitored at each site, and the samples were collected using five different sampling methods, including (1) flow-weighted composites, (2) time-based discrete samples, (3) time-based composites, (4) a composite of discrete samples from first 30 minutes, and (5) time-based composite sheet flow samples. The first three methods have been described previously. For the composite of discrete samples from the first 30 minutes, the sampler is programmed to take an aliquot after a set period of time (usually every 5 minutes) and the aliquots are combined into one container. The sampler stops collecting samples after 30 minutes. For many sites the samples are collected manually, so there is a high probability the sample does not represent the first 30 minutes of the event. For the time-based composite sheet flow samples, a sheet flow sampler is programmed to take an aliquot of sheet flow after a set period of time (usually about every 5 to 15 minutes). All the aliquots are deposited in one bottle beneath the surface of the ground. All of the parts of the hydrograph receive equal weight in the final concentration, but the larger number of aliquots makes for a reasonably accurate composite concentration. This method is unique in that it can be placed near the source of concern. Automatic samplers were used for the first four methods, while sheet flow samplers designed by the USGS were used for the fifth method (Bannerman et al., 1993). Samples were collected during the entire event. All the automatic samplers had to be installed at a location with concentrated flow, such as an outfall pipe, while the sheet flow samplers could be installed in the pavement near a potential source, such as a material storage area.

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BOX 4-4 Continued

The time-based discrete, time-based composite, first-30-minute composite, and sheet flow samples were analyzed for COD, total recoverable copper, total recoverable lead, total recoverable zinc, TSS, total solids, and hardness. In addition to these constituents, the flow-weighted composite samples were analyzed for antimony, arsenic, beryllium, chromium, ammonia-N, nitrate plus nitrite, TKN, and TP. All the analysis was done at the State Laboratory of Hygiene in Madison, Wisconsin, and the data are stored in the USGS's QWDATA database.

The number of samples collected during a runoff event varied greatly among the five types of sampling. By design, the median number of samples collected for the first 30 minutes was three. Limits on the funds available for laboratory cost limited the time-based discrete sampling to about six per storm. Since they are not restricted by laboratory cost, the composites can be based on more sub-samples during a storm. Thus, the median numbers of sub-samples collected for the flow-weighted composite and time-based composite were 13 and 24, respectively. The time-based composite sheet flow sample could not document the number of samples it collected, but it was set to collect a sample every few minutes.

To judge the accuracy of the sampling methods, one method had to be selected as the most representative of the concentration and load affecting the receiving water. Because a relatively large number of samples are collected and the timing of the sampling is weighted by volume, the flow-weighted composite concentrations were used as the best representation of the quality of the industrial runoff. Concentrations in water samples collected by the time-based composite method compared very well to those collected by the flow-weighted composite method, especially if the time-based composite resulted in 20 sub-samples or more. This was not true for the discrete sampling method, because many fewer sub-samples were used to represent changes across the hydrograph. The time-based composite sheet flow sampler produced concentrations slightly higher than the time-based composite samplers collecting water in the concentrated flow. Concentrations from the sheet flow sampler are probably not diluted by other source areas such as the roof.

Concentrations of total recoverable zinc and TSS collected in the first 30 minutes of the event were usually two to three times higher than the flow-weighted composite samples. For many of the events, the highest concentration of these constituents occurred in the first 10 minutes of the event. Although the concentrations might be higher in the first part of the event, the earlier parts of the event might only represent one third or less of the total runoff volume. Thus, using the concentrations from the first 30 minutes of the event could greatly overestimate the constituent load from the site.

Along with accuracy, the selection of an appropriate sampling method must consider cost and the criteria for installing the sampling equipment. To measure flow, the site must have a location where the flow is concentrated, such as a pipe or well-defined channel, and the runoff is just coming from the site. Out of 474 sites evaluated for this project, only 14 met the criteria for an accurate flow measurement. A few more sites might be suitable for using an automatic sampler without flow measurements, but the number of sites would still be limited. Sheet flow samplers can be used on most sites, since they are simply installed in the pavement near the source of concern.

For each sampling method, approximate costs were determined including equipment, installation of equipment, and the analysis of one sample (Table 4-5). Collecting the samples and processing the data should also be included, but they were not because this cost is highly variable. Flow-weighted composite and time-based discrete sampling had the highest cost. Flow measurements made the composite sampling more expensive, while the laboratory cost of analyzing six discrete samples increased the cost of the time-based

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TABLE 4-5 Cost of Using Different Sampling Methods in 1993 Dollars

Method	Estimated Cost for Equipment, Installation, and Analysis of One Sample
Flow-weighted composite	$16,052
Time-based discrete	$22,682
Time-based composite	$5,920
First-30-minutes (automatic sampler)	$6,000
First-30-minutes (grab sample)	$1,800[1]
Time-based composite sheet flow sampler	$2,889

[1]Cost of laboratory analysis only. SOURCE: Reprinted, with permission, from Roa-Espinosa and Bannerman (1994). Copyright 1994 by the American Society of Civil Engineers.

discrete method. It should be noted that hand grab samples could be used to collect the discrete samples in the first 30 minutes at lower cost, although this depends strongly on the skill of the person collecting the sample. The sheet flow sampler could be the most cost effective approach to sampling an industrial site.

A determination must be made of how many runoff events should be sampled in order to accurately characterize a site's water quality. As shown in Table 4-6, representing a site with the results from one storm can be very misleading. Concentrations in Table 4-6 were collected by the flow-weighted composite method. The geometric means of EMCs from five or more events were very different than the lowest or highest concentration observed for the set of storms. The chances of observing an extreme value by sampling just one event is increased by selecting a sampling method designed to collect a limited number of sub-samples, such as the first-30-minutes method. Too few storms were monitored in this project to properly evaluate the variability in the EMCs, but sufficient changes occur between the zinc and TSS geometric means in Table 4-6 to suggest that a compliance monitoring schedule should include a minimum of five events be sampled each year.

To overcome the high COV observed for municipal stormwater data collected in Wisconsin, EMCs should be determined for about 40 events (Selbig and Bannerman, 2007; Horwatich et al., 2008). The 40 event mean concentrations would probably represent the long-range distribution of rainfall depths, and there would be sufficient data available to perform some trend analysis, such as evaluating the benefits of an SCM implemented at an industrial site. Monitoring 40 events each year, however, would be too costly for an annual compliance monitoring schedule for each industrial site.

Results from this project indicate that the stormwater monitoring required at industrial sites cannot adequately characterize the quality of runoff from an industrial site. Only collecting samples from the first 30 minutes of a storm is probably an overestimate of the concentration, and a load calculated from this concentration would exaggerate the impact of the site on the receiving waters. Time- and flow-based composite sampling would be much better methods for monitoring a site if there are locations to operate an automatic sampler. For sites without such a location, the time-based composite sheet flow sampler offers the best results at the least cost. Given all the variability in concentrations between runoff events, the annual monitoring schedule for any site should include sampling multiple storms.

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BOX 4-4 Continued

TABLE 4-6 Effects of Including a Different Number of Events in the Geometric Mean Calculation for Zinc and TSS[a]

Number of Events	Total Recoverable Zinc	Total Suspended Solids
	AC Rochester	
1 (Lowest Concentration)	57	8
1 (Highest Concentration)	150	84
3	76	24
5	91	36
	PPG Industries	
1 (Lowest Concentration)	140	32
1 (Highest Concentration)	330	49
3	153	57
6	186	53
	Warman International	
1 (Lowest Concentration)	68	17
1 (Highest Concentration)	140	56
3	67	15
5	81	26
7	74	19

[a]Samples were collected using the flow-weighted composite method. SOURCE: Reprinted, with permission, from Roa-Espinosa and Bannerman (1994). Copyright 1994 by the American Society of Civil Engineers.

scheme by examining many southern Florida industrial facilities. About 25 percent of the facilities surveyed that were officially included in the stormwater permit program had no stormwater exposure (Category A), but very few had submitted the necessary application to qualify for an exception under the "no exposure" rule. Slightly more than half of the of the surveyed facilities were included in the "no exposure" and "low exposure" categories, obviously deserving less attention compared to the higher impact categories.

Recommendations for Industrial Stormwater Monitoring

Suitable industrial monitoring programs can be implemented for different categories of industrial activities. The following is one such suggestion, based on the likely risks associated with stormwater discharges from each type of facility.

No Exposure to Industrial Activities and Other Low-Risk Industrial Operations

For sites having limited stormwater exposure to industrial operations, such as no outdoor storage of materials or waste products, basic monitoring would

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not normally be conducted. However, roof runoff (especially if galvanized metals are used) and large parking areas need to be addressed under basic stormwater regulations dealing with these common sources of contaminants and the large amounts of runoff that may be produced. Simple SCM guidance manuals can be used to select and size any needed controls for these sites, based on the areas of concern at the facility. For these facilities, simple visual inspections with no monitoring requirements may be appropriate to ensure compliance with the basic stormwater regulations. A regionally calibrated stormwater quality model can be used to evaluate these basic stormwater conditions and to calculate the expected benefits of control measures. Periodic random monitoring of sites in this category should be conducted to verify the small magnitude of discharges from these sites and the performance of SCMs.

Medium-Risk Industrial Operations

For "medium-intensity" industry facilities, site inspections and modeling should be supplemented with suitable outfall monitoring to ensure compliance. As noted in Box 4-2, there can be a tremendous amount of variability in industrial runoff characteristics. However, the dataset described in that example was a compilation of data from many different types of facilities, with no separation by industrial type. Even different facilities in a single industrial group may have highly variable runoff characteristics. However, a single facility has much less variability, and reasonable monitoring strategies can be developed for compliance purposes. As noted in Box 4-4, about 40 samples were expected to be needed for each site in that example. With typical permit periods of five years, this would require that less than ten samples per year (more than the three samples per year currently obtained at many locations) be collected in order to determine the EMC for the site for comparison to allowable discharge conditions. Obviously, the actual number of samples needed is dependent on the variability of the runoff characteristics and the allowable error, as described elsewhere. After about 10 to 15 storms have been monitored for a site, it would be possible to better estimate the total number of samples actually needed based on the data quality objectives. If the monitoring during the permit period indicated excessive stormwater discharges, then the SCMs are obviously not adequate and would need improvement. The permit for the next five-year period could then be modified to reflect the need for more stringent controls, and suitable fines accessed if the facility was not in compliance. It is recommended that absolute compliance not be expected in the industrial permits, but that appropriate benchmarks be established that allow a small fraction of the monitored events to exceed the goals. This is similar to discharge permit requirements for combined sewers, and for air quality regulations, where a certain number of excessive periods are allowed per year.

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High-Risk Industrial Facilities

For "high-risk" industrial sites of the most critical nature, especially if noncompliance may cause significant human and environmental health problems, visual inspections and site modeling should be used in conjunction with monitoring of each event during the permit period. Because of the potential danger associated with noncompliance, the most stringent and robust controls would be required, and frequent monitoring would be needed to ensure compliance. If noncompliance was noted, immediate action would be needed to improve the discharge conditions. This is similar to industrial and municipal NPDES monitoring requirements for point sources.

MODELING TO LINKING SOURCES OF POLLUTION TO EFFECTS IN RECEIVING WATERS

Stormwater permitting is designed to regulate dischargers, develop information, and reduce the level of stormwater pollutants and impact on receiving waterbodies. An important assumption is that the level of understanding of the stormwater system, through a combination of monitoring and modeling, is sufficient to associate stormwater discharges with receiving waterbody impacts. Impairment of waterbodies can occur for a variety of physical, chemical, and biological reasons, often with a complex combination of causes. The ambient water quality of a receiving waterbody, which may result in a determination of impairment, is itself a function of the total mass loading of pollutant; dilution with stream discharge or standing waterbody volume; the capacity of the aquatic ecosystem to assimilate, transform, or disperse the pollutant; and transport out of the waterbody. In addition to the chemical and physical attributes of the water, impairment may also be characterized by degraded biologic structure or geomorphic form of the waterbody (e.g., channel incision in urban areas). Interactions between multiple pollutant loadings, long turnover and residence times, saturation effects, and cascading feedbacks with biological communities complicate the apparent response of waterbodies to pollutant discharge. This is particularly important when considering cumulative watershed effects, in which interactions between stressors and long-term alteration of watershed conditions may contribute to threshold responses of a waterbody to continued loading or alteration. Under these conditions, simple "loading-response" relations are often elusive and require consideration of historical and local watershed conditions.

As an example, pollutant loading at high stream flow or into strong tidally flushed systems may be advected downstream or into the coastal ocean without building up significant concentrations, while pollutant loading at low flow may not be effectively transported and dispersed and may build up to harmful concentrations. In the former case the pollutant may be rapidly transported out of the local waterbody, but may impact a more distant, downstream system. In addition, certain pollutants, such as inorganic nitrogen, may be discharged into

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surface waters and subsequently transformed and removed from the water column into vegetation or outgassed (e.g., volatilized or denitrified) into the atmosphere under certain ecosystem conditions. Sediment and other pollutants may be stored for long time periods in alluvial or lacustrine deposits, and then remobilized long after the initial loading into a stream reach or standing waterbody in response to extreme climate events, land-use change, reservoir management, or even reductions in the pollutant concentrations in the water column. Consequently, long lags may exist between the actual discharge of the sediment (and any pollutants adsorbed or otherwise stored within the deposits) and their contribution to waterbody impairment. Therefore, understanding the fate of pollutants, particularly nonconservative forms, may require consideration of the full ecosystem cycling and transport of the material over long time periods.

Impairment of waterbodies can be assessed on the basis of biological indicators, as discussed in Chapter 2. As organisms and communities respond to multiple stressors, it is not always clear what the direct or indirect effects of any specific pollutant discharge is, or how that may be exacerbated by correlated or interacting activity in the watershed. The association of specific types of impairment with surrounding land use implicitly accounts for these interactions but does not provide a mechanistic understanding of the linkage sufficient to specify effective remedial activity. However, much progress has been made in determining toxic effects of certain contaminants on different aquatic species assemblages (see, e.g., Shaver et al., 2007) and on quantifying impacts of land use on flow duration curves, EMCs, and loading rates for a number of pollutants (Maestre and Pitt, 2005). For the latter effort, it has been shown that there is large variability within land-use categories, both as a function of specific SCMs and of innate differences due to historical legacies, climate, and hydrogeology.

A protocol linking pollutants in stormwater discharges to ambient water quality criteria should be based on conservation of mass, in which the major inputs, outputs, transformations, and stores of the pollutant can be quantified. Indeed, these are the components of hydrologic and watershed models used to simulate the fate and transport of stormwater and its pollutants. SCMs that improve ambient water quality criteria are designed to act on one or more of these mass balance terms. A number of these measures act to reduce the magnitude of a stormwater source (e.g., porous pavement), while others are designed to absorb or dissipate a pollutant within a hydrologic flowpath downstream from a source (e.g., rain garden, detention pond, stream restoration). The latter requires some consideration of the flowpath from the source to the receiving waterbody. Therefore, determining the major sources, sinks, and transformations of the pollutant should be the first step in this procedure. For a number of pollutants there may be very few potential sources, while for others there may be multiple significant sources. The spatial diversity of these sources and sinks may also range from uniform distribution to “hot spot” patterns that are difficult to detect and quantify. Many stormwater models work effectively with sources, but are not structured to follow the transport or transformation of pollutants from source to waterbody along hydrologic flowpaths.

Figure 4-14 shows the drainage area of Jordan Lake, an important regional

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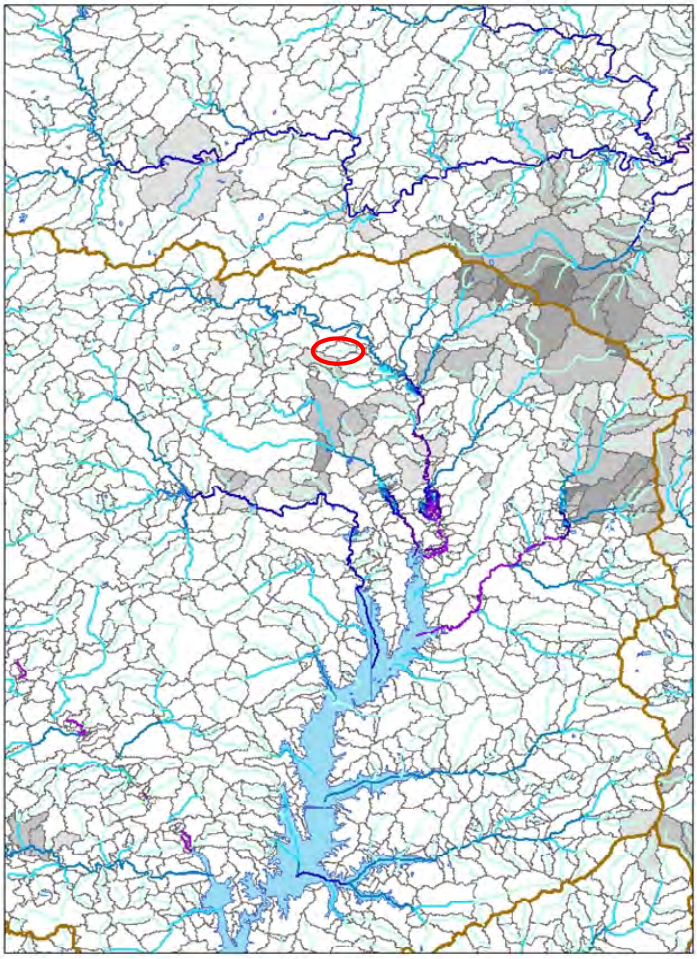

FIGURE 4-14 The drainage area to Jordan Lake, a major drinking water reservoir in the Triangle area of North Carolina, is under nutrient-sensitive rules, requiring reductions in total nitrogen and phosphorus. Drainage flowlines and catchment areas are from NHDplus, and are shaded according to their percentage of industrial and commercial land cover from the NLCD. The area outlined in black is a small urban catchment, detailed in Figure 4-15, and comprised of a wooded central region, surrounded by residential and institutional land use. SOURCE: Data from the NHD^{+}.

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drinking water source in the Triangle area of North Carolina. Catchment areas are shaded to relate the percentage of industrial and commercial land cover, according to the National Land Cover Database (NLCD). Figure 4-15 shows a small tributary within the Jordan Lake watershed in Chapel Hill (outlined in Figure 4-14) with a high-resolution image of all impervious surfaces overlain on the topographically defined surface flowpath network. Each of the distributed sources of stormwater is routed through a flowpath consisting of other pervious and impervious segments, within which additions, abstractions, and transformations of water and pollutants occur depending on weather, hydrologic, and ecosystem conditions. The cumulative delivery and impact of all stormwater sources include the transformations occurring along the flowpaths, which could include specific SCMs such as detention or infiltration facilities or simply infiltration or transformations in riparian areas or low-order streams. The riparian area may be bypassed depending on stormwater concentration or piping, and it may have various levels of effectiveness on reducing pollutants depending on geomorphic, ecosystem, and hydrologic conditions. The ability of a stormwater model to capture these types of effects is a key property influencing its ability to associate a stormwater source with a waterbody outcome.

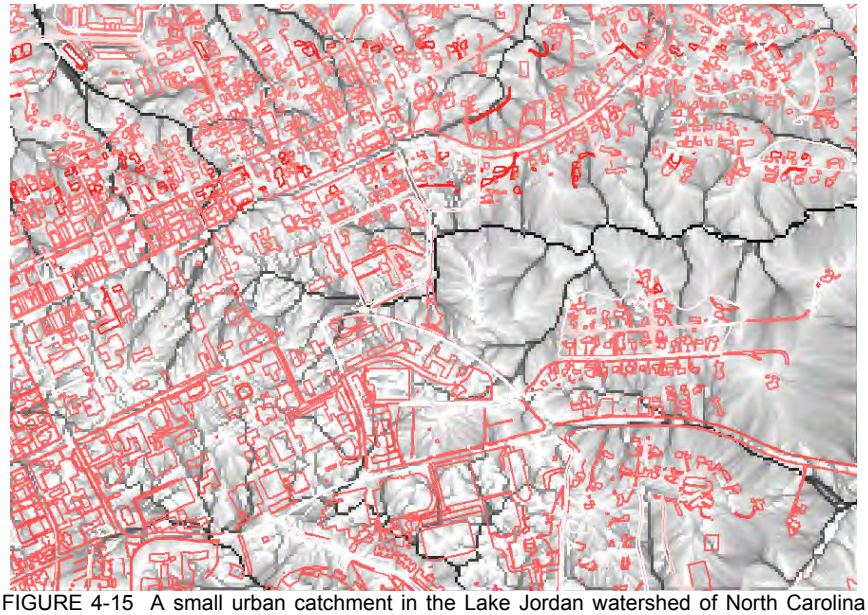

FIGURE 4-15 A small urban catchment in the Lake Jordan watershed of North Carolina with distributed sources of impervious surface (buildings and roads) stormwater arranged within the full surface drainage flowpath system. Stormwater from each source is routed down surface and subsurface flowpaths to the nearest tributary and out the drainage network, with additions and abstractions of water and pollutants along each flowpath segment. SOURCE: Data from the NHD^{+}.

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This section discusses the fundamentals of stormwater modeling and the capabilities of commonly used models. Much of this information is captured in a summary table at the end of the section (Table 4-7). The models included are the following:

- The Rational Method, or $Q = C*I*A$, where Q is the peak discharge for small urban catchments, A is the catchment area, I is the rainfall intensity, and C is a rainfall-runoff coefficient.
- The Simple Method, which classifies stormwater generation and impact regimes by the percent impervious cover
- TR-20 and TR-55
- The Generalized Watershed Loading Function (GWLF)
- Program for Predicting Polluting Particle Passage through Pits, Puddles, and Ponds (P8)
- Model for Urban Stormwater Improvement Conceptualization (MUSIC)
- Stormwater Management Model (SWMM)
- Source Loading and Management Model (WinSLAMM)
- Soil and Water Assessment Tool (SWAT)
- Hydrologic Simulation Program–Fortran (HSPF)
- Western Washington Hydrologic Model
- Chesapeake Bay Watershed Model (CBWM)

Fundamentals of Stormwater Models

Stormwater models are designed to evaluate the impacts of a stormwater discharge on a receiving waterbody. In order to do this, the model must have the capability of describing the nature of the source term (volumes, constituents), transport and transformation to the receiving waterbody, and physical, chemical, and biological interaction with the receiving water body and ecosystem. No model can mechanistically reproduce all of these interactions because of current limitations in available data, incomplete understanding of all processes, and large uncertainties in model and data components. Computer resources, while rapidly advancing, still limit the complexity of certain applications, especially as spatial data become increasingly available and it is tempting to model at ever-increasing resolution and comprehensiveness. Therefore, models must make a set of simplifying assumptions, emphasizing more reliable and available data, while attempting to retain critical processes, feedbacks, and interactions. Models are typically developed for a variety of applications, ranging from hydraulic design for small urban catchments to urban and rural pollutant loading at a range of watershed scales.

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An evaluation of the current state of stormwater modeling should say much about our ability to link pollutant sources with effects in receiving waters. Both stormwater models and models supporting the evaluation of SCM design and effectiveness are based on simulating a mass budget of water and specific pollutants. The detail of mass flux, transformation, and storage terms vary depending on the scale and purpose of the application, level of knowledge regarding the primary processes, and available data. In many cases, mechanisms of transformation may be either poorly understood or may be dependent on detailed interactions. As an example, nitrogen-cycle transformations are sensitive to very short temporal and spatial conditions, termed "hot spots" and "hot moments" relative to hydrologic flowpaths and moisture conditions (McClain et al., 2003).

Stormwater runoff production and routing are common components of these models. All models include an approach to estimate the production of stormwater runoff from one or more zones in the watershed, although runoff routing from the location(s) of runoff production to a point or waterbody is not always included explicitly. Major divisions between approaches are found in the representation of the watershed "geography" in terms of patterns and heterogeneity, and in runoff production and routing. Some stormwater models do not consider the effects of routing from a runoff source to a local waterbody directly, but may attempt to reproduce net impacts at larger scales through the use of unit hydrograph theory to estimate peak flows, and delivery ratios or stormwater control efficiency factors to estimate export to a waterbody.

There are a number of different approaches and paradigms used in stormwater models that include varying degrees of watershed physical, biological, and chemical process detail, as well as spatial and temporal resolution and the representation of uncertainty in model estimates. A number of researchers have written about the nature of watershed models (e.g., Beven, 2001; Pitt and Vorhees, 2002). At present, many hydrologic and stormwater models have become so complex, with multiple choices for different components, that standard descriptions apply only to specific components of the models. The following discussion is generalized; most models fit the descriptions only to certain degrees or only under specific conditions in which they are operated.

Lumped Versus Distributed Approaches

Central to the design of watershed models is the concept of a "control volume," which is a unit within which material and energy contents and balances are defined, with boundaries across which material and energy transport occurs. Control volumes can range from multiple subsurface layers and vegetation canopy layers bounded in three dimensions to a full watershed. Lumped models ignore or average spatial heterogeneity and patterns of watershed conditions, representing all control volumes, and the stores, sources, and sinks of water and pollutants in a vertically linked set of conceptual components, such as surface interception, unsaturated and saturated subsurface zones, and a single stream or

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river reach. For example, SWAT or HSPF are conceptually lumped at the scale of subwatersheds (e.g., the level of geography in Figure 4-14) and do not show any spatial patterns at higher resolutions (e.g., Figure 4-15) than these units. While multiple land-use/soil combinations may be represented, these models do not represent the connectivity of the land segments (e.g., which land segments drain into which land segments) and assume all unique land segment types drain directly to a stream.

Distributed models include some scheme to represent spatial heterogeneity of the watershed environment pertinent to stormwater generation, including land cover, soils, topography, meteorological inputs, and stream reach properties distributed through a set of linked control volumes. Control volumes representing land elements, including vertically linked surface and subsurface stores, are connected by a representation of water and pollutant lateral routing through a network of flowpaths that may be predefined or set by the dynamics of surface, soil, and saturated zone water storage. The land elements may be grid cells in a regular lattice, or irregular elements (e.g., triangles) with the pattern adapted to variations in land surface characteristics or hydraulic gradients.

A number of models are intermediate between lumped and distributed, with approaches such as lumping at the subwatershed scale, incorporating statistical distributions of land element types within subwatersheds but without explicit pattern representation, or lumping some variables and processes (such as groundwater storage and flux), while including distributed representation of topography and land cover. Thus, within the model SLAMM (Pitt and Vorhees, 2002), the catchment is described in sufficient detail to summarize the breakdown of different drainage sequences. As an example, roof area will be broken down to the proportion that drains to pervious areas and to directly connected impervious areas. An important distinction is that there is no routing of the output of one land element into another, such that there is no drainage sequence that may significantly modify the stormwater runoff from its source to the stream. Implicitly, all land elements drain directly into a stream, although a loss rate or delivery ratio can be specified.

The choice of a more lumped or distributed model is often dependent on available data and overall complexity of the model. Simpler, lumped models may be preferred in the absence of sufficient data to effectively parameterize a distributed approach, or for simplicity and computational speed. However, fully lumped models may be limited in their ability to represent spatial dependency, such as the development and dynamics of riparian zones, or the effects of SCM patterns and placement. As there is typically an irreducible level of spatial heterogeneity in land surface characteristics down to very small levels below the resolution of individual flow elements, we note that all models lump at some scale (Beven, 2000).

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Mechanistic Versus Conceptual Process Representation

Mechanistic, or process-based, approaches attempt to reproduce key stormwater transport and transformation processes with more physically, chemically, or biologically based detail, while conceptual models represent fluxes between stores and transformations with aggregate, simplified mathematical forms. No operational models are built purely from first principles, so the distinction between mechanistic and conceptual process basis is one of degree.

The level of sampling necessary to support detailed mechanistic models, as well as remaining uncertainty in physicochemical processes active in heterogeneous environments typically limits the application of first-principle methods. The development or application of more mechanistic approaches is currently limited by available measurements, which require both time and resources to adequately carry out. Unfortunately, modeling and monitoring have often been mutually exclusive in terms of budgets, although it is necessary for both to be carefully planned and integrated. A new generation of sensors and a more rigorous and formal sampling protocol for existing methods will be necessary to advance beyond the current practice.

At present, most operational hydrologic and transport models are based on a strong set of simplifying assumptions regarding active processes and/or the spatial variation of sources, sinks, and stores in the watershed. Runoff production can be computed by a range of more mechanistic to more conceptual or empirical methods. More mechanistic methods include estimation of infiltration capacities based on soil hydraulic properties and moisture conditions, excess runoff production, and hydraulic routing over land surfaces into and through a stream-channel network. More conceptual approaches use a National Resources Conservation Service (NRCS) curve number approach (see Box 4-5) and unit hydrograph methods to estimate runoff volume and time of concentration. Pollutant concentrations or loads are often estimated on the basis of look-up tables using land use or land cover. Land use- or land cover-specific EMC or unit area loading for pollutants can be developed directly from monitoring data or from local, regional, or national databases. The NSQD statistically summarizes the results of a large number of stormwater monitoring projects (as discussed previously in this chapter). The effects of SCM performance (typically percent removal) can be estimated from similar databases (e.g., www.bmpdatabase.org). A set of models, such as SWAT, incorporate fairly detailed descriptions of nutrient cycling as an alternative to using EMC, requiring more detailed inputs of soil, crop, and management information. Unfortunately, the detailed biogeochemistry of this and similar models is typically not matched by the hydrology, which remains lumped at individual Hydrologic Response Unit (HRU) levels using NRCS curve number methods, although options exist to incorporate more mechanistic infiltration excess runoff.

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BOX 4-5
NRCS Technical Release 55

NRCS methods to estimate runoff volumes and flows have been popular since the early 1950s (Rallison, 1980). Fundamentally they can be broken into the separation of runoff from the rainfall volume (Curve Number Method), the pattern of runoff over time (dimensionless unit hydrograph), and their application within computer simulation models. In the late 1970s these components were packaged together in a desktop hydrology method known as Technical Release 55 (TR-55). TR-55 became the primary model used by the majority of stormwater designers, and there is considerable confusion over the terms used to describe what aspects of the NRCS methods are in use.

The NRCS Curve Number Method was first derived in the 1950s for prediction of runoff from ungauged agricultural areas. It relates two summation ratios, that of runoff to rainfall and that of moisture retained to maximum potential retention. Two statistically based relations were developed to drive the ratio, the first of which is based on a "curve number" which depicts the soil type, land cover, and initial moisture content. The second or initial abstraction is defined as the volume of losses that occur prior to the initiation of runoff, and is also related to the curve number. Data were used to derive curve numbers for each soil type and cover as shown in Figure 4-16 (Rallison, 1980).

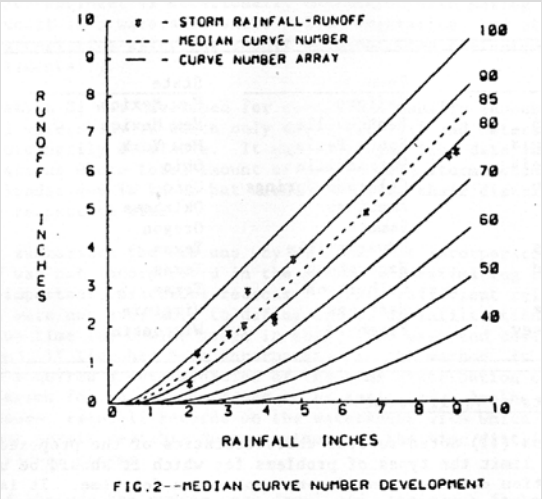

FIGURE 4-16 Development of curve number from collected data. SOURCE: Reprinted, with permission, from Rallison (1980). Copyright 1980 by the American Society of Civil Engineers.

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The Curve Number method is a very practical method that gives "average" runoff results from a watershed and is used in many models (WIN TR-55, TR-20, SWMM, GWLF, HEC-HMS, etc.). Caution has to be exercised when using it for smaller urbanizing storm events. For example, past practice was to average curve numbers for developments for pavement and grass based on percent imperviousness. While this works well for large storms, for smaller storms it gives erroneous answers through violation of the initial abstraction relationship. Current state manuals (MDE, 2000; PaDEP, 2006) do not allow paved- and unpaved-area curve numbers to be averaged. When applied to continuous simulation models (such as in SWMM or GWLF), it requires an additional method to recover the capacity to remove runoff because the soil capacity to infiltrate water is restored over time.

The NRCS Dimensionless Unit Hydrograph has also evolved over many years and simply creates a temporal pattern from the runoff generated from the curve number method. This transformation is based upon the time of concentration, defined as the length of time the water takes to travel from the top to the bottom of the watershed. The dimensionless curve ensures that conservation of mass is maintained. The main purpose of this method is to estimate how long it takes the runoff generated by the curve number to run off the land and produce discharge at the watershed outlet.

The NRCS curve number and dimensionless unit hydrograph were first incorporated in the Soil Conservation Service (SCS) TR-20 hydrologic computer model developed in the 1960s. As most stormwater professionals did not have access to mainframes, SCS put together TR-55, which created a hand or calculator method to apply the curve number and dimensionless unit hydrograph. In order to create this hand method, many runs were generated using TR-20 to develop patterns for different times of concentration. The difficulty with using the original TR-55 in the modern era is that the simplifications to the hydrograph development do not allow the benefits of SCMs to be easily accounted for.

The use of the term TR-55 has been equated with the curve number method; this has created confusion, especially when it is included in municipal code. Further clouding the issue, there are two types of TR-55 computer models available. One is based on the original, outdated, simplified hand method, and the other (Win TR-55) returns to the more appropriate application of the curve number and dimensionless hydrograph methods. In either case, the focus of these models is on single event hydrology and cannot easily incorporate or demonstrate the benefits of the wide range of structural and nonstructural SCMs. Note that the curve number and dimensionless unit hydrograph methods are incorporated in many continuous flow models, including SWMM and GWLF, as the basis of runoff generation and runoff timing.

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Deterministic Versus Stochastic Methods

Deterministic models are fully determined by their equation sets, initial and boundary conditions, and forcing meteorology. There are no components that include random variation. In a stochastic model, at least one parameter or variable is drawn from a probability distribution function such that the same model set-up (initial and boundary conditions, meteorology, parameter sets) will have randomly varying results. The advantage of the latter approach is the ability to generate statistical variability of outcomes, reflecting uncertainty in parameters, processes, or any other component. In fact, any deterministic model can be operated in a stochastic manner by sampling parameter values from specified probability distributions.

It is recognized that information on the probability distribution of input parameters may be scarce. For situations with limited information on parameter values, one option is to assume a uniform distribution that brackets a range of values of the parameter reported in the literature. This would at least be a start in considering the impacts of the variability of model inputs on outputs. A thorough discussion on methods for incorporating uncertainty analysis into model evaluation is provided in Chapter 14 of Ramaswami et al. (2005). It should be noted that the ability to generate probability distribution information on stormwater outcomes requires a potentially large number of model runs, which may be difficult for detailed mechanistic and distributed models that have large computational loads.

Continuous Versus Event-Based Approaches

Another division between modeling approaches is the time domain of the simulation. Event-based models limit simulation time domains to a storm event, covering the time of rainfall and runoff generation and routing. Initial conditions need to be estimated on the basis of antecedent moisture or precipitation conditions. For catchments in which runoff is dominated by impervious surfaces, this is a reasonable approach. In landscapes dominated by variable source area runoff dynamics in which runoff is generated from areas that actively expand and contract on the basis of soil moisture conditions, a fuller accounting of the soil moisture budget is required. Furthermore, event-based modeling is inappropriate for water quality purposes because it will not reproduce the full distribution of receiving water problems. Continuous models include simulation of a full time domain composed of storm and inter-storm periods, thus tracking soil moisture budgets up to and including storm events.

Outfall Models

After beneficial use impairments are recognized, cause-and-effect relation-

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ships need to be established and restorative discharge goals need to be developed. Models are commonly used to calculate the expected discharges for different outfalls affecting the receiving water in a community. All of the models shown in Table 4-7 can calculate outfall discharge quantities, although some may only give expected average annual discharge. Models calculate these discharges using a variety of processes, but all use an urban hydrology component to determine the runoff quantity and various methods to calculate the quality of the runoff. The runoff quantity is multiplied by the pollutant concentration in the outfall to obtain the mass discharges of the different pollutants. The outfall mass discharge from the various outfalls in the area can then be compared to identify the most significant outfalls that should be targeted for control.

The most common hydrology "engines" in simple stormwater models are the NRCS curve number method or a simple volumetric runoff coefficient—R_v, the ratio of runoff to rainfall—for either single rainfall events or the total annual rainfall depth. Runoff quality in the simple models is usually calculated based on published EMCs for similar land uses in the same geographical area. More complex models may use build-up and wash-off of pollutants from impervious surfaces in a time series or they may derive pollutant concentrations from more detailed biogeochemical cycling mechanisms, including atmospheric deposition and other inputs (e.g., fertilizer). Some models use a combination of these processes depending on the area considered, and others offer choices to the model user. Again, these processes all need local calibration and verification to reduce the likely uncertainty associated with the resultant calculated discharge conditions.

Source Area

When the outfalls are ranked according to their discharges of the pollutants of importance, further detailed modeling can be conducted to identify sources of the significant pollutants within the outfall drainage area. Lumped parameter models cannot be used, as the model parameters vary within the drainage area according to the different source areas. Distributed area models can be used to calculate contributions from different source areas within the watershed area. This information can then be used to rank the land uses and source area contributions. In-stream responses can be calculated if the land-area models are linked to appropriate receiving-water models.

Need for Coupling Models

As urban areas become increasingly extensive and heterogeneous, including a gradient of dense urban to forest and agricultural areas, linkage and coupling of models to develop feedback and interactions (e.g., impacts of urban runoff hydraulics with stream scour and sedimentation, mixed with agricultural nutrient

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and sediment production on receiving waterbodies) is a critical area that requires more development. In general, stormwater models were designed to track and predict discharges from sources by surface water flowpaths into receiving waterbodies, such that infiltration was considered to be a loss (or retention) of water and its constituents. To fully evaluate catchment-scale impacts of urbanization on receiving waterbodies, the infiltration term needs to be considered a source term for the groundwater, and a groundwater component or model needs to be coupled to complete the surface–subsurface hydrologic interactions and loadings to the waterbody.

Finally, each of the models may or may not incorporate explicit consideration of SCM performance based on design, implementation and location within the catchment. As discussed in the next chapter, SCM models can range from simple efficiency factors (0–1 multipliers on source discharge) to more detailed treatment of physical, chemical, and biological transport and transformations.

Linking to Receiving-Water Models

Specific problems for urban receiving waters need to be identified through comprehensive field monitoring and modeling. Monitoring can identify current problems and may identify the stressors of importance (see Burton and Pitt [2002] for tools to evaluate receiving water impairments). However, monitoring cannot predict conditions that do not yet exist and for other periods of time that are not represented at the time of monitoring. Modeling is therefore needed to gain a more comprehensive understanding of the problem. In small-scale totally urbanized systems, less complex receiving-water models are needed. However, as the watershed becomes more complex and larger with multiple land uses, the receiving-water models also need to become more complex. Complex receiving-water models need to include transport and transformations of the pollutants of concern, for example. Examples of models shown on the comparison table that include receiving-water processes are MUSIC and HSPF. Other models (such as WinSLAMM) provide direct data links to external receiving-water models. Calibration and verification of important receiving-water processes that are to be implemented in a model can be very expensive and time consuming, and still result in substantial uncertainty.

Model Calibration and Verification

Calibration is the process where model parameters are adjusted to minimize the difference between model output and field measurements, with an aim of keeping model parameters within a range of values reported in the literature. Model *verification*, similar to model validation, is used to mean comparison between calibrated model results using part of a data set as input and results from application of the calibrated model using a second (independent) part of

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the data set as input. Oreskes et al. (1994) present the viewpoint that no model can really be verified; at best, verification should be taken to mean that a model is consistent with a physical system under a given set of comparison data. This is not synonymous with saying that the model can reliably represent the real system under any set of conditions. In general, the water quantity aspects of stormwater modeling are easier to calibrate and verify than the water quality aspects, in part because there are more water quantity data available and because chemical transformations are more complex to simulate. A thorough discussion of the broad topic of model evaluation is provided by several excellent texts on this subject, including Schnoor (1996) and Ramaswami et al. (2005).

Models in Practice Today

Table 4-7 presents a set of models used for stormwater evaluation that range in complexity from first-generation stormwater models making use of simple empirical land cover/runoff and loading relations to more detailed and information-demanding models. The columns in Table 4-7 provide an abbreviated description of some of the attributes of these models—common usage, typical application scales, the degree of model complexity, some data requirements (for the hydrologic component), whether the model addresses groundwater, and whether the model has the ability to simulate SCMs. Models capable of simulating a water quality component require EMC data, with some models also having a simple build-up/wash-off approach to water quality simulation (e.g., SWMM, WinSLAMM, and MUSIC) and others simulating more complex geochemistry (e.g., SWAT and HSPF). The set of columns in Table 4-7 is not meant to be exhaustive in describing the models, which is why websites are provided for comprehensive model descriptions and data requirements.

In addition to the models listed in Table 4-7, a representative set of emerging research models that are not specifically designed for stormwater, but may offer some advantages for specific uses, are also described below. In general, it is important that models that integrate hydrologic, hydraulic, meteorologic, water quality, and biologic processes maintain balance in their treatment of process details. Both model design and data collection should proceed in concert and should be geared toward evaluating and diagnosing the consistency of model or coupled model predictions and the uncertainty attached to each component and the integrated modeling system. The models should be used in a manner that produces both best estimates of stormwater discharge impacts on receiving waterbodies, as well as the level of uncertainty in the predictions.

The Rational Method is a highly simplified model widely used to estimate peak flows for in sizing storm sewer pipes and other low level drainage pathways. The method assumes a constant rainfall rate (intensity), such that the runoff rate will increase until the time at which all of the drainage area contributes to flow at its outlet (termed the *time of concentration*). The product of the drainage area and rainfall intensity is considered to be the input flow rate to the

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drainage area under consideration; the ratio of the input flow rate to an outflow discharge rate is termed the runoff coefficient. Runoff coefficients for a variety of land surface types and slopes have been compiled in standard tables (see e.g., Chow et al., 1988). The outflow is determined by multiplying inflow (rainfall intensity times drainage area) by the runoff coefficient for the land-surface type. As pointed out by Chow et al. (1988), this method is often criticized owing to its simplified approach, so its use is limited to stormwater inlet and piping designs.

The Simple Method estimates stormwater pollutant loads for urban areas, and it is most valuable for assessing and comparing the relative stormwater pollutant load changes of different land use and stormwater management scenarios. It requires a modest amount of information, including the subwatershed drainage area and impervious cover, stormwater pollutant concentrations (as defined by the EMC), and annual precipitation. The subwatershed can be broken up into specific land uses, such that annual pollutant loads are calculated for each type of land use. Stormwater pollutant concentrations are usually estimated from local or regional data, or from national data sources. The Simple Method estimates pollutant loads for chemical constituents as a product of annual runoff volume and pollutant concentration, as $L = 0.226\ R \times C \times A$, where L = annual load (lbs), R = annual runoff (inches), C = pollutant concentration (mg/l), and A = area (acres).

Of slightly increased complexity are those models initially developed decades ago by the Soil Conservation Service, now the NRCS of the U.S. Department of Agriculture (USDA). NRCS Technical Releases (TR) 20 and 55 are widely used in many municipalities, despite the availability of more rigorous, updated stormwater models. Box 4-5 provides an overview of the NRCS TR-55 assumptions and approaches.

A number of watershed models that are used for stormwater assessment are lumped, conceptual forms, with varying levels of process simplification and spatial patterns aggregated at the subwatershed level, with aspatial statistical distribution of land types as described above. The GWLF model (Haith and Shoemaker, 1987) is an example of this type of approach, using simple land use-based EMC with NRCS curve number estimates of runoff within a watershed context. GWLF is a continuous model with simplified upper- and lower-zone subsurface water stores, and a simple linear aquifer to deliver groundwater flow. EMCs are assigned or calibrated for subsurface and surface flow delivery, while sediment erosion and delivery are computed with the use of the Universal Soil Loss Equation and delivery coefficients. The methods are easily linked to a Geographical Information System (GIS), which provides land-use composition at the subwatershed level and develops estimates of runoff and loading that are typically used to estimate annual loading. AVGWLF links GWLF with ArcView and is used as a planning- or screening-level tool. A recent example of AVGWLF for nutrient loading linked to a simple stream network nutrient decay model for the development of a TMDL for a North Carolina water supply area is given in Box 4-6.

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BOX 4-6
The B. Everett Jordan Lake GWLF Watershed Model Development

Jordan Lake is a regionally important water supply reservoir at the base of the 1,686-square-mile Haw watershed in North Carolina (see Figure 4-17). It is considered a nutrient-sensitive waterbody. Officials are now in the process of implementing watershed goals to reduce nitrogen and phosphorus, with the reduction goals differentiated by geographic location within the basin. In support of the development of these rules as part of a TMDL effort, the North Carolina Division of Water Quality commissioned a water quality modeling study (Tetra Tech, 2003). The modeling effort was needed to support the evaluation of nutrient reduction strategies in different parts of the watershed relative to Jordan Lake, which requires both a model of nutrient loading, as well as river transport and transformation. Given data and resource restrictions, a more detailed model was not considered feasible. As GWLF does not support nutrient transformations in the stream network, the model was used in conjunction with a method to decay nutrient source loading by river transport distance to the lake. A spreadsheet model was designed to take as input GWLF estimates of seasonal loads for 14-digit hydrologic unit code (HUC) subbasins of the Haw, and to reduce the loads by river miles between the subwatershed and Jordan Lake. The GWLF loading model was calibrated to observations in small subwatersheds within the Haw using HRUs developed from soil and NLCD land classes, updated with additional information from county GIS parcel databases and the 2000 Census. This information was used to estimate subwatershed impervious surface cover, fertilizer inputs, runoff curve numbers, soil water capacity, and vegetation cover to adjust evapotranspiration rates. Wastewater disposal (sewer or septic) was estimated on the basis of urban service boundaries. GWLF was used to provide loading estimates, using limited information on soil and groundwater nutrient concentrations, and calibrated delivery ratios. In-stream loss was based on a first-order exponential decay function of river travel time to Jordan Lake, with the decay coefficient generated by estimates of residence time in the river network, and upstream/downstream nutrient loads following non-linear regression methods used in SPARROW (Alexander et al., 2000). Further adjustments based on impoundment trapping of sediment and associated nutrient loads were carried out for larger reservoirs in the Haw. The results provided estimates of both loading and transport efficiency to Jordan Lake, with estimates of relative effectiveness of sectoral loading reductions in different parts of the watershed.

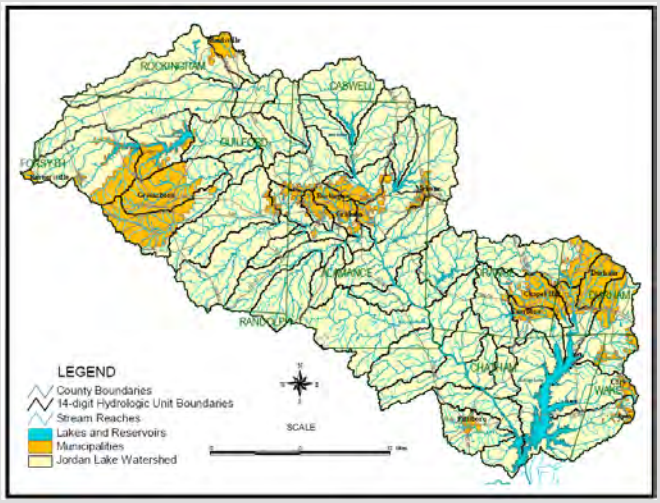

FIGURE 4-17 14 digit HUCs draining to Jordan Lake in the Haw River watershed of North Carolina. SOURCE: Tetra Tech (2003).

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P8 (Program for Predicting Polluting Particle Passage through Pits, Puddles, and Ponds) is a curve number-based model for predicting the generation and transport of stormwater runoff pollutants in urban watersheds, originally developed to help design and evaluate nutrient control in wet detention ponds (Palmstrom and Walker, 1990; http://wwwalker.net/p8/). Continuous water-balance and mass-balance calculations are performed and consist of the following elements: watersheds, devices, particle classes, and water quality components. Continuous simulations use hourly rainfall and daily air temperature time series. The model was initially calibrated to predict runoff quality typical of that measured under NURP (EPA, 1983). SCMs in P8 include detention ponds (wet, dry, extended), infiltration basins, swales, and buffer strips. Groundwater and baseflows are also included in the model using linear reservoir processes.

MUSIC is a part of the Catchment Modelling Toolkit (www.toolkit.net.au) developed by the Cooperative Research Center for Catchment Hydrology in Australia (Wong et al., 2001). The model concentrates on the quality and quantity of urban stormwater, including detailed accounting of multiple SCMs acting within a treatment train and life-cycle costing. It employs a simplified rainfall–runoff model (Chiew and McMahon, 1997) based on impervious area and two moisture stores (shallow and deep). TSS, total nitrogen, and total phosphorus are based on EMCs, sampled from lognormal distributions. The model does not contain detailed hydraulics required for routing or sizing of SCMs, and it is designed as a planning tool.

EPA's SWMM has the capability of simulating water quantity and quality for a single storm event or for continuous runoff. The model is commonly used to design and evaluate storm, sanitary, and combined sewer systems. SWMM accounts for hydrologic processes that produce runoff from urban areas, including time-varying rainfall, evaporation, snow accumulation and melting, depression storage, infiltration into soil, percolation to groundwater, interflow between groundwater and the drainage system, and nonlinear reservoir routing of overland flow. Spatial variability is modeled by dividing a study area into a collection of smaller, homogeneous subcatchment areas, each containing its own fraction of pervious and impervious sub-areas. Overland flow can be routed between sub-areas, between subcatchments, or between entry points of a drainage system. SWMM can also be used to estimate the production of pollutant loads associated with runoff for a number of user-defined water quality constituents. Transport processes include dry-weather pollutant buildup over different land uses, pollutant wash-off from specific land uses, direct contribution of rainfall deposition, and the action of such SCMs as street cleaning, source control, and treatment in storage units, among others.

Watershed models such as SWAT (Arnold et al., 1998) or HSPF (Bicknell et al., 1997, 2005) have components based on similar land-use runoff and loading factors, but also incorporate options to utilize detailed descriptions of interception, infiltration, runoff, routing, and biogeochemical transformations. Both models are based on hydrologic models that were developed prior to the availability of detailed digital spatial information on watershed form and use concep-

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tual control volumes that are not spatially linked. HRUs are based on land use, soils, and vegetation (and crop) type, among other characteristics, and are considered uniformly distributed through a subbasin. Within each HRU, simplified representations of soil upper and lower zones, or unsaturated and saturated components, are vertically integrated with a conceptual groundwater storage-release component. There is no land surface routing and all runoff from a land element is considered to reach the river reach, with some delivery ratio if appropriate for sediment and other constituents. Like GWLF, the models are typically not designed to estimate loadings from individual dischargers, but are used to help guide and develop TMDL for watersheds. SWAT and HSPF are integrated within the EPA BASINS system (http://www.epa.gov/waterscience/basins) with GIS tools designed to use available spatial data to set up and parameterize simulations for watersheds within the United States. Examples of combining one of these models, typically designed for larger-scale applications (such as the area shown in Figure 4-14) with more site-specific models such as SLAMM or SWMM, are given in Box 4-7.

BOX 4-7
Using SWAT and WinSLAMM to Predict Phosphorus Loads in the Rock River Basin, Wisconsin

Wisconsin Administrative Code NR 217 states that wastewater treatment facilities in Wisconsin must achieve an effluent concentration of 1 mg/L for phosphorus. Alternative limits are allowed if it can be demonstrated that achieving the 1 mg/L limit will not "result in an environmentally significant improvement in water quality" (NR 217.04(2)(b)1). In response to NR 217, a group of municipal wastewater treatment facilities formed the Rock River Partnership (RRP) to assess water quality management issues (Kirsch, 2000). The RRP and the Wisconsin Department of Natural Resources funded a study to seek water quality solutions across all media, and not just pursue additional reductions from point sources. A significant portion of the study required a modeling effort to determine the magnitude of various nutrient sources and determine potential reductions through the implementation of global SCMs.

The Rock River Basin covers approximately 9,530 square kilometers and lies within the glaciated portion of south central and eastern Wisconsin (Figure 4-18). The Rock River and its numerous tributaries thread their way through this landscape that spreads over 10 counties inhabited by more than 750,000 residents. There are 40 permitted municipalities in the watershed, representing 4 percent of the land area, and they are served by 57 sewage treatment plants. Urban centers include Madison, Janesville, and Beloit as well as smaller cities such as Waupun, Watertown, Oconomowoc, Jefferson, and Beaver Dam. Although the basin is experiencing rapid growth, it is still largely rural in character with agriculture using nearly 75 percent of the land area. Crops range from continuous corn and corn–soybean rotations in the south to a mix of dairy, feeder operations, and cash cropping in the north. The basin enjoys a healthy economy with a good balance of agricultural, industrial, and service businesses.

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BOX 4-7 Continued

The focus of the modeling was to construct an intermediate-level macroscale model to better quantify phosphorus loads from point and nonpoint sources throughout the basin. The three goals of the modeling effort were to (1) estimate the average annual phosphorus load, (2) estimate the relative contribution of phosphorus loads from both nonpoint (urban and agricultural) and point sources, and (3) estimate changes in average annual phosphorus loads from the application of global SCMs and point source controls.

SWAT was selected for the agricultural analysis and WinSLAMM was selected to develop phosphorus loads for the urban areas. WinSLAMM was selected to make estimates of stormwater loads, because it is already calibrated in Wisconsin for stormwater volumes and pollutant concentrations. Outputs of phosphorus loads from WinSLAMM were used as input to SWAT. One output of SWAT was a total nonpoint phosphorus load based on agricultural loads calculated in SWAT and stormwater loads estimated by WinSLAMM.

SWAT was calibrated with data from 23 USGS gauging stations in the Rock River Basin. Hydrology was balanced first on a yearly basis looking at average annual totals, then monthly to verify snowfall and snowmelt routines, and then daily. Daily calibration was conducted to check crop growth, evapotranspiration, and daily peak flows. Crop yields predicted by SWAT were calibrated to those published in the USDA Agricultural Statistics.

Under current land-use and management conditions, the model predicted an average annual load of approximately 1,680,000 pounds of total phosphorus for the basin with 41 percent from point sources and 59 percent from nonpoint sources. Less than 10 percent of the annual phosphorus load is generated by the urban areas in the watershed. Evaluation of various SCM scenarios shows that with implementation of NR 217 (applicable point source effluent at 1 mg/L) and improvement in tillage practices and nutrient management practices, total phosphorus can be reduced across the basin by approximately 40 percent. It is important to note that the nonpoint management practices that were analyzed were limited to two options: modifications in tillage practices, and adoption of recommended nutrient application rates. No other management practices (i.e., urban controls, riparian buffer strips, etc.) were simulated. Urban controls were not included because the urban areas contributed a relatively small percentage of the total phosphorus load. Thus, loadings depicted by SWAT under these management scenarios do not necessarily represent the lowest attainable loads. Results suggest that a combination of point and nonpoint controls will be required to attain significant phosphorus reductions.

The CBWM is a detailed watershed model that is extended from HSPF as a base, but includes additional components to incorporate stormwater controls at the land segment level. HSPF is operated for a number of subbasins, and each subbasin model includes different land segments based on land cover and soil units as aspatial, lumped distribution functions, but also includes representation of SCMs and (large) stream routing. Model implementation at the scale of the full Chesapeake Bay watershed requires fairly coarse-grained land partitioning. A threshold of 100 cfs mean annual flow is used to represent streams and rivers, and the one-to-one mapping of land segment to river reach produces large, heterogeneous land segments as the basic runoff-producing zones. SCMs are implemented either at the field or runoff production unit as distinct land segment types in terms of management or land cover, or as “edge-of-field” reductions of runoff or pollutant loads. The latter are assigned as static efficiency factors irrespective of flow conditions or season, with all SCMs within a land segment integrated into a single weighted efficiency value.

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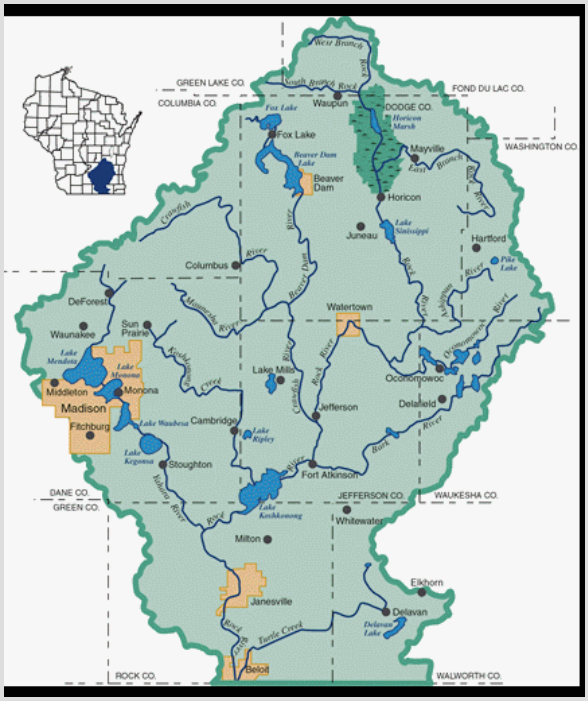

FIGURE 4-18 Rock River Basin, Wisconsin. SOURCE: Reprinted, with permission, from Kirsch (2000). Copyright 2000 by American Society for Biological and Agricultural Engineers.

SLAMM is designed for complex, urban catchments and is used as a planning tool to assess both stormwater and pollutant runoff production and the capability of specific stormwater control strategies to reduce stormwater discharges from urban sources. It is specifically designed to capture the most significant distributed and sequential drainage effects of variable source areas in urban catchments (Pitt and Vorhees, 2002) and is based on detailed descriptions of the catchment composition, including both type and relative position (drainage sequence) of land elements. The model is dependent on high-resolution classification or description of the catchment that has become increasingly available in urban areas over the past two decades, and comprehensive field assessment of runoff and pollutant loading from different urban land elements. SLAMM uses continuous simulation for some aspects, such as the build up of street pollutant loads between storms, while using event-based simulation for runoff. The description of build-up and wash-off is a critical component in urban stormwater models applied to areas with substantial impervious surfaces and is a good example of the need to match detailed and rigorous field sampling in

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order to adequately describe and represent dominant processes. Details of measurement and model representation for build-up and wash-off of contaminants are given in Box 4-8.

Potential New Applications of Coupled Distributed Models

The advent of high-resolution digital topographic and land-cover data over the past two decades has fueled a significant shift in runoff modeling towards "spatially explicit" simulations that distinguish and connect runoff producing elements in a detailed flow routing network. While models developed prior to the availability of high-resolution data or based on older paradigms developed in the absence of this information required spatial and conceptual lumping of control volumes, more recently developed distributed models may contain control volumes linked in multiple vertical layers (soil and aquifer elements) and laterally from a drainage divide to the stream, including stream-channel and riparian segments. A set of models has been developed and applied to stormwater generation using this paradigm that can be applied at the scale of residential neighborhoods, resolving land cover and topography at the parcel level. These models also vary in terms of their emphasis, with some models better representing coupled surface water–groundwater interactions, water, carbon and nutrient cycling, or land–atmosphere interactions. Boyer et al. (2006) have recently reviewed a set of hydrologic and ecosystem models in terms of their ability to simulate sources, transport, and transformation of nitrogen within terrestrial and aquatic ecosystems. Data and information requirements are typically high, and the level of process specificity may outstrip the available information necessary to parameterize the integrated models. However, an emphasis is placed on providing mechanistic linkage and feedbacks between important surface, subsurface, atmospheric, and ecosystem components. Examples of these models include the Distributed Hydrology Soil Vegetation model (DHSVM, Wigmosta et al., 1994); the Regional Hydro-Ecologic Simulation System (RHESSys, Band et al., 1993; Tague and Band, 2004); ParFlow-Common Land Model (CLM, Maxwell and Miller, 2007); the Penn State Integrated Hydrologic Model (PIHM, Qu and Duffy, 2007); the Soil Moisture Distribution and Routing (SMDR) model (Easton et al., 2007); and that of Xiao et al. (2007).

One advantage of integrating surface and subsurface flow systems within any of these model structures is the ability to incorporate different SCMs by specifying characteristics of specific locations within the flow element networks linked to the subsurface drainage. Examples can include alteration of surface detention storage and release curves to simulate detention ponds, or soil depth, texture, vegetation, and drainage release for rainfall gardens. The advantage of this approach is the tight coupling of these SCM features with the connected surface and subsurface drainage systems, allowing the direct incorporation of the SCM as sink or source terms within the flowpath network. Burgess et al. (1998) effectively demonstrated that suburban lawns can become the major

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BOX 4-8
Build-up and Wash-off of Contaminants from Impervious Surfaces

The accumulation and wash-off of street particulates have been studied for many years (Sartor and Boyd, 1972; Pitt, 1979, 1985, 1987) and are important considerations in many stormwater models, such as SWMM, HSPF, and SLAMM, that require information pertaining to the movement of pollutants over land surfaces. Accumulation rates are usually obtained through trial and error during calibration, with little, if any, actual direct measurements. Furthermore, those direct measurements that have been made are often misapplied in modeling applications, resulting in unreasonable model predictions.

Historically, streets have been considered the most important directly connected impervious surface. Therefore, much early research was directed toward measuring the processes on these surfaces. Although it was eventually realized that other surfaces can also be significant pollutant sources (see Pitt et al., 2005a,b for reviews), additional research to study accumulation and wash-off for these other areas has not been conducted, such that the following discussion is focused on street dirt accumulation and wash-off.

Accumulation of Particulates on Street Surfaces

The permanent storage component of street surface particulates is a function of street texture and condition and is the quantity of street dust and dirt that cannot be removed naturally by rain or wind, or by street cleaning equipment. It is literally trapped in the texture of the street. The street dirt loading at any time is this initial permanent loading plus the accumulation amount corresponding to the exposure period, minus the resuspended material removal by wind and traffic-induced turbulence.

One of the first research studies to attempt to measure street dirt accumulation was conducted by Sartor and Boyd (1972). Field investigations were conducted between 1969 and 1971 in several cities throughout the United States and in residential, commercial, and industrial land-use areas. Figure 4-19 is a plot of the 26 test area measurements collected from different cities, but separated by the three land uses. The data are the accumulated solids loading plotted against the number of days since the street had been cleaned by the municipal street cleaning operation or a “significant” rain. There is a large amount of variability. The street cleaning and this rain were both assumed to remove all of the street dirt; hence, the curves were all forced through zero loading at zero days.

A more thorough study was conducted in San Jose, California by Pitt (1979), during which the measured street dirt loading for a smooth street was also found to be a function of time. As shown in Figure 4-20, both accumulation rates and increases in particle size of the street dirt increase as time between street cleaning lengthens. However, it is also evident that there is a substantial residual loading on the streets immediately after the street cleaning, which differs substantially from the assumption of Sartor and Boyd that rains reduce street dirt to zero.

The San Jose study also investigated the role of different street textures, which resulted in very different street dirt loadings. Although the accumulation and deposition rates are quite similar, the initial loading values (the permanent storage values) are very different, with greater amounts of street dirt trapped by the coarser (oil and screens) pavement. Street cleaning and rains are not able to remove this residual material. The early, uncorrected Sartor and Boyd accumulation rates that ignored the initial loading values were almost ten times the corrected values that had reasonable “initial loads.”

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BOX 4-8 Continued

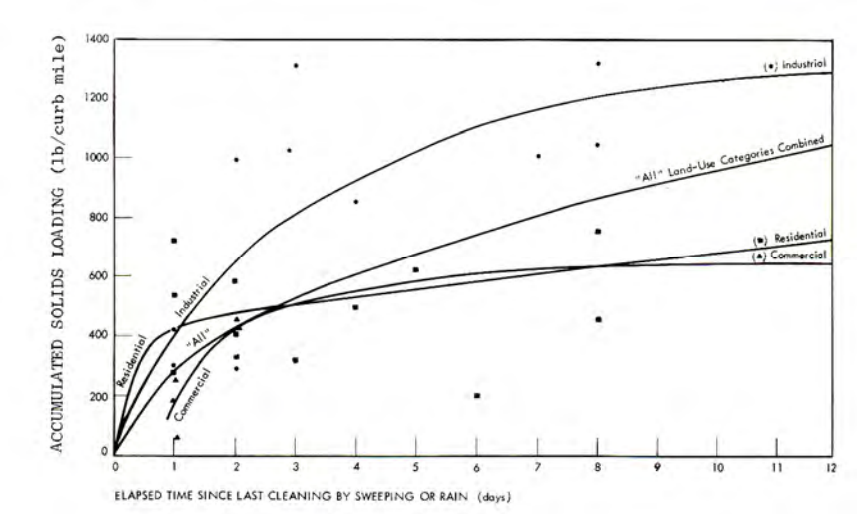

FIGURE 4-19 Accumulation curves developed during early street cleaning research. SOURCE: Sartor and Boyd (1972).

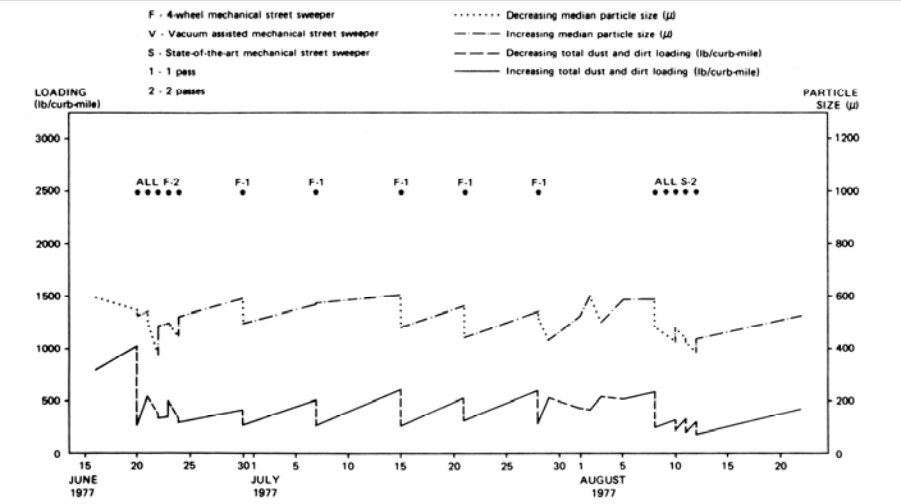

FIGURE 4-20 Street dirt accumulation and particle size changes on good asphalt streets in San Jose, California. SOURCE: Pitt (1979).

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Finally, it was found that, at very long accumulation periods relative to the rain frequency, the wind losses (fugitive dust) may approximate the deposition rate, resulting in very little increases in loading. In Bellevue, Washington, with inter-event rain periods averaging about three days, steady loadings were observed after about one week (Pitt, 1985). However, in Castro Valley, California, the rain inter-event periods were much longer (ranging from about 20 to 100 days), and steady loadings were never observed (Pitt and Shawley, 1982).

Taking many studies into account (Sartor and Boyd 1972—corrected; Pitt, 1979, 1983, 1985; Pitt and Shawley, 1982; Pitt and Sutherland, 1982; Pitt and McLean, 1986), the most important factors affecting the initial loading and maximum loading values have been found to be street texture and street condition, and not land use. When data from many locations are studied, it is apparent that smooth streets have substantially less loadings at any accumulation period compared to rough streets for the same land use. Very long accumulation periods relative to the rain frequency result in high street dirt loadings. However, during these conditions the wind losses of street dirt (as fugitive dust) may approximate the deposition rate, resulting in relatively constant street dirt loadings.

Wash-off of Street Surface Pollutants

Wash-off of particulates from impervious surfaces is dependent on the available supply of particulates on the surface that can be removed by rains, the rain energy available to loosen the material, and the capacity of the runoff to transport the loosened material. Observations of particulate wash-off during controlled tests have resulted in empirical wash-off models. The earliest controlled street dirt wash-off experiments were conducted by Sartor and Boyd (1972) to estimate the percentage of the available particulates on the streets that would wash off during rains of different magnitudes. Sartor and Boyd fitted their data to an exponential curve, as shown in Figure 4-21 (accumulative wash-off curves for several particle sizes). The empirical equation that they developed, $N = N_o\, e^{-kR}$, is only sensitive to the total rain depth up to the time of interest and the initial street dirt loading.

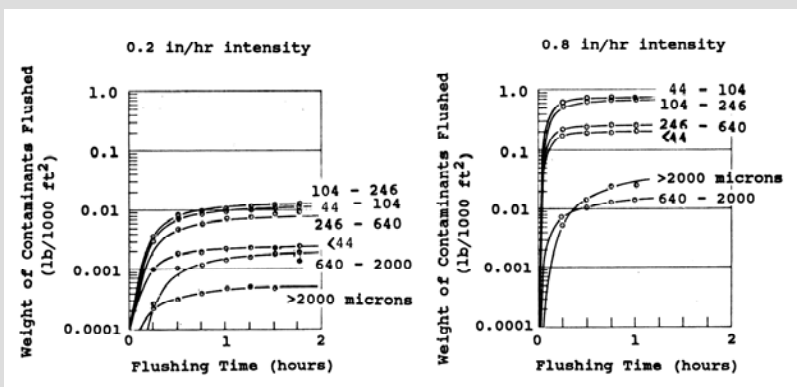

FIGURE 4-21 Street dirt wash-off during high-intensity rain tests. SOURCE: Sartor and Boyd (1972).

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BOX 4-8 Continued

There are several problems with this approach. First, these figures did not show the total street dirt loading that was present before the wash-off tests. Most modelers have assumed that the asymptotic maximum shown was the total "before-rain" street dirt loading; that is, the N_o factor has been assumed to be the total initial street loading, when in fact it is only the portion of the total street load available for wash-off (the maximum asymptotic wash-off load observed during the wash-off tests). The actual total street dirt loadings were several times greater than the maximum wash-off amounts observed. STORM and SWMM now use an availability factor (*A*) for particulate residue as a calibration procedure in order to reduce the wash-off quantity for different rain intensities (Novotny and Chesters, 1981). Second, the proportionality constant, *k*, was found by Sartor and Boyd to be slightly dependent on street texture and condition, but was independent of rain intensity and particle size. The value of this constant is usually taken as 0.18/mm, assuming that 90 percent of the particulates will be washed from a paved surface in one hour during a 13 mm/h rain. However, Alley (1981) fitted this model to watershed outfall runoff data and found that the constant varied for different storms and pollutants for a single study area. Novotny examined "before" and "after" rain-event street particulate loading data using the Milwaukee NURP stormwater data (Bannerman et al., 1983) and found almost a three-fold difference between the proportionality constant value for fine (<45 μm) and medium-sized particles (100 to 250 μm). Jewell et al. (1980) also found large variations in outfall "fitted" values for different rains compared to the typical default value. They stressed the need to have local calibration data before using the exponential wash-off equation, as the default values can be very misleading. The exponential wash-off equation for impervious areas is justified, but wash-off coefficients for each pollutant would improve its accuracy. The current SWMM5 version discourages the use of accumulation and wash-off functions due to lack of data, and the misinterpretation of available data.

It turns out that particle dislodgement and transport characteristics at impervious areas can be directly measured using relatively simple wash-off tests. The Bellevue, Washington, urban runoff project (Pitt, 1985) included about 50 pairs of street dirt loading observations close to the beginnings and ends of rains to determine the differences in loadings that may have been caused by the rains. The observations were affected by rains falling directly on the streets, along with flows and particulates originating from non-street areas. When all the data were considered together, the net loading difference was about 10 to 13 g/curb-m removed, which amounted to a street dirt load reduction of about 15 percent. Large reductions in street dirt loadings for the small particles were observed during these Bellevue rains. Most of the weight of solid material in the runoff was concentrated in fine particle sizes (<63 μm). Very few wash-off particles greater than 1,000 μm were found; in fact, street dirt loadings increased for the largest sizes, presumably due to settled erosion materials. Urban runoff outfall particle size analyses in Bellevue (Pitt, 1985) resulted in a median particle size of about 50 μm; similar results were obtained in the Milwaukee NURP study (Bannerman et al., 1983). The results make sense because the rain energy needed to remove larger particles is much greater than for small particles.

In order to clarify street dirt wash-off, Pitt (1987) conducted numerous controlled wash-off tests on city streets in Toronto. The experimental factors examined included rain intensity, street texture, and street dirt loading. The differences between available and total street dirt loads were also related to the experimental factors. The runoff flow quantities were also carefully monitored to determine the magnitude of initial and total rain water losses on impervious surfaces. The test setup was designed and tested to best represent actual rainfall conditions, such as rain intensities (3 mm/h) and peak rain intensities (12 mm/h). The kinetic energies of the "rains" during these tests were therefore comparable to actual rains under investigation. Figure 4-22 shows the asymptotic wash-off values observed in the tests, along with the measured total street dirt loadings. The maximum asymptotic values are the "available" street dirt loadings (N_o). As can be seen, the measured

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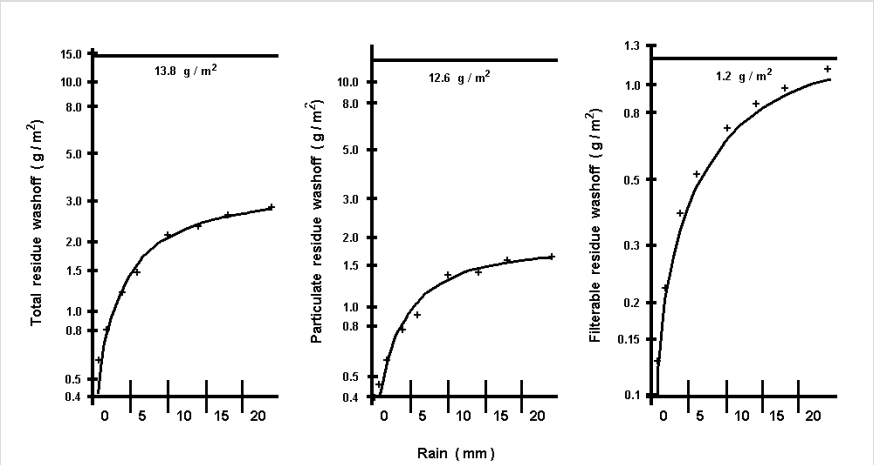

FIGURE 4-22 Wash-off plots for high rain intensity, dirty street, and smooth street test, showing the total street dirt loading. SOURCE: Pitt (1987).

total loadings are several times larger than these "available" loading values. For example, the asymptotic available total solids value for the high-intensity rain–dirty street–smooth street test was about 3 g/m^2 while the total load on the street for this test was about 14 g/m^2, or about five times the available load. The differences between available and total loadings for the other tests were even greater, with the total loads typically about ten times greater than the available loads. The total loading and available loading values for dissolved solids were quite close, indicating almost complete wash-off of the very small particles.

The availability factor (the ratio of the available loading, N_0, to the total loading) depended on the rain intensity and the street roughness, such that wash-off was more efficient for the higher rain energy and smoother pavement tests. The worst case was for a low rain intensity and rough street, where only about 4.5 percent of the street dirt would be washed from the pavement. In contrast, the high rain intensities on the smooth streets were more than four times more efficient in removing street dirt (20 percent removal).

A final important consideration in calculating wash-off of street dirt during rains is the carrying capacity of the flowing water to transport sediment. If the calculated wash-off is greater than the carrying capacity (such as would occur for relatively heavy street dirt loads and low to moderate rain intensities), then the carrying capacity is limiting. For high rain intensities, the carrying capacity is likely sufficient to transport most or all of the wash-off material. Figure 4-23 shows the maximum wash-off amounts (g/m^2) for the different tests conducted on smooth streets plotted against the rain intensity (mm/h) used for the tests (data from Sartor and Boyd, 1972, and Pitt, 1987). Wash-off limitations for rough streets would be more restrictive.

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BOX 4-8 Continued

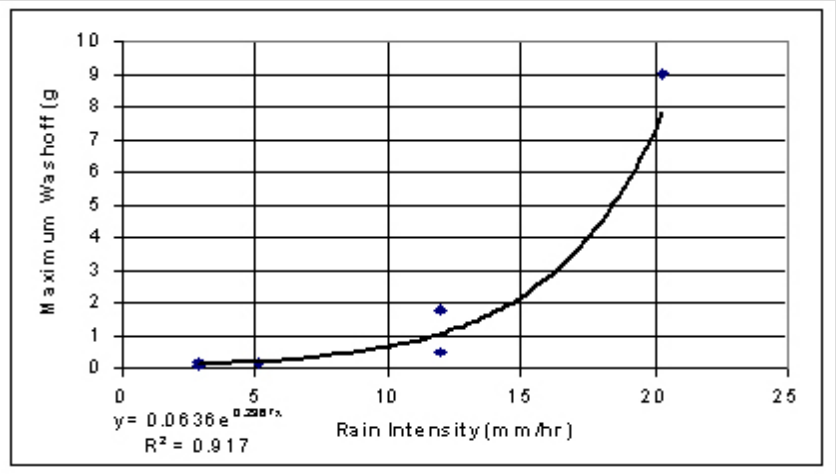

FIGURE 4-23 Maximum wash-off capacity for smooth streets (based on measurements of Sartor and Boyd, 1972; Pitt, 1987). If the predicted wash-off, using the previous "standard" wash-off equations, is smaller than the values shown in this figure, then those values can be used directly. However, if the predicted wash-off is greater than the values shown in this figure, then the values in the figure should be used.

Accumulation and Wash-off Summary

This discussion summarized street particulate wash-off observations obtained during special wash-off tests, along with associated street dirt accumulation measurements. The objectives of these tests were to identify the significant rain and street factors affecting particulate wash-off and to develop appropriate wash-off models. The controlled wash-off experiments identified important relationships between "available" and "total" particulate loadings and the significant effects of the test variables on the wash-off model parameters. Past modeling efforts have typically ignored or misused this relationship to inaccurately predict the importance of street particulate wash-off. The available loadings were almost completely washed off streets during rains of about 25 mm (as previously assumed). However, the fraction of the total loading that was available was at most only 20 percent of the total loading, and averaged only 10 percent, with resultant actual wash-offs of only about 9 percent of the total loadings.

In many model applications, total initial loading values (as usually measured during field studies) are used in conjunction with model parameters as the available loadings, resulting in predicted wash-off values that are many times larger than observed. This has the effect of incorrectly assuming greater pollutant contributions originating from streets and less from other areas during rains. This in turn results in inaccurate estimates of the effectiveness of different source area urban runoff controls. Although streets can be important sources of runoff and stormwater pollutants, their significance varies greatly depending on the land use and rainfall pattern. They are much more important sources in areas having relatively mild rains (e.g., the Pacific Northwest), where contaminants from other potential sources are not effectively transported to the storm drainage system.

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source of stormwater in seasonally wet conditions (Seattle), while Cuo et al. (2008) have explored the modification of DHSVM to include detention SCMs. Xiao et al. (2007) explicitly integrated and evaluated parcel scale SCM design and efficiency into their model. Wang et al. (2008) integrated a canopy interception model with a semi-distributed subsurface moisture scheme (TOPMODEL) to evaluate the effectiveness of urban tree canopy interception on stormwater production, utilizing a detailed spatial dataset of urban tree cover. Band et al. (2001) and Law (2003) coupled a water-, carbon-, and nitrogen-cycling model to a distributed water routing system modified from DHSVM to simulate nitrogen cycling and export in a high-spatial-resolution representation of forested and suburban catchments. While these models have the potential to directly link stormwater generation with specific dischargers, the challenge of scaling to larger watersheds remains. SMDR (Easton et al., 2007) has recently been used to integrate rural and urban stormwater production, including dissolved phosphorus source and transport in New York State.

Alternatives to mass budget-based models include fully statistical approaches such as simple regressions based on watershed land use and population (e.g., Boyer et al., 2002); nonlinear regression using detailed watershed spatial data and observed loads to estimate retention parameters and loading of nutrients, sediment, and other pollutants (e.g., Smith et al., 1997; Brakebill and Preston, 1999; Schwarz et al., 2006); and Bayesian chain models (e.g., Reckhow and Chapra, 1999; Borsuk et al., 2001). These models have the advantage of being data-based, and therefore capable of assimilating observations as they become available to update water quality probabilities, but also lack a process basis that might support management intervention. A major debate exists within the literature as to the relative advantages of detailed process-based models that may not have inadequate information for parameterization, and the more empirical, data-based approaches.

Limitations in Extending Stormwater Models to Biological Impacts

The mass budget approach may be successful in developing the physical and chemical characteristics of the receiving waterbody in terms of the flow (or stage) duration curve, the distribution of concentrations over time, and the integrated pollutant storage and flux (load) terms. However, the biological status of the waterbody requires a link between the physical and chemical conditions, primary productivity, and trophic system interactions. Progressing from aquatic ecosystem productivity to trophic systems includes increasingly complex ecological processes such as competition, herbivory, predation, and migration. To date, mechanistic linkage between flow path hydraulics, biogeochemistry, and the ecological structure of the aquatic environment has not been developed. Instead, habitat suitability for different communities is identified through empirical sampling and analysis, with the implicit assumption that, as relative

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TABLE 4-7 Example Mathematical Models That Have Been or Can Be Used in Stormwater Modeling

Model	Common Use	Typical Scale	Complexity	Data Requirements	Ground-water	SCM	Reference
Rational Method	Urban hydraulic design—peak flow	Small	Simple	Land cover, rainfall intensity, T_c	None	None	Standard hydrology text
Simple Method	Urban annual runoff, loads	Small to medium	Simple	Impervious surface cover, land use, annual rainfall	None	None	http://www.stormwatercenter.net/monitoring%20and%20assessment/simple%20meth/simple.htm
TR-20 TR-55	Rural/urban runoff production for simple stormwater models, hydraulic design	Small to medium	Simple to medium	Land use, soil texture, T_c	None	Pond sizing for hydraulic benefits and others through CN modification	http://www.wsi.nrcs.usda.gov/products/W2Q/H&H/Tools_Models
GWLF	Rural/urban runoff, pollutant loading	Medium to watershed	Simple to medium	Land use, soil texture, precipitation time series	Simple linear reservoir	Runoff reduction with CN modification	Haith and Shoemaker (1987) http://www.avgwlf.psu.edu/overview.htm
P8	Urban runoff, pollutant loading	Small to large	Simple to medium	Land use, soil texture, precipitation time series, SCM type and sizing	Simple linear reservoir	Runoff reduction with CN modification, ponds (evaluation and sizing), infiltration, street cleaning	Palmstrom and Walker (1990) http://www.wwwalker.net/p8/
MUSIC	Urban runoff, pollutant loading, hydraulic design, simple receiving water	Small to large	Medium to complex	Land use, soil texture, precipitation/PET? time series, drainage system details, SCM type and sizing	Simple linear reservoir	Comprehensive evaluation of SCM systems	Wong (2000) (proprietary) http://www.toolkit.net.au/cgi-bin/WebObjects/toolkit.woa/wa/productDetails?productID=1000000

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SWMM	Urban runoff, pollutant loading, hydraulic design	Small to large	Medium to complex	Land use, soil texture, meteorological time series, drainage system details, SCM type and sizing	Simple linear reservoir?	Infiltration practices, ponds, street cleaning	http://www.epa.gov/ednnrmrl/models/swmm
PCSWMM	Same as above	Same as above	Same as above	Same as above	Same as above	Enhanced SCM compared to SWMM	(proprietary) http://www.computationalhydraulics.com/Software/PCSWMM.NET
WinSLAMM	Urban runoff, pollutant loads	Small to large	Intermediate	Land cover, land use, development characteristics, soil texture, compaction, rainfall event time series, monthly PET, monthly water evaporation, SCM type and sizing	Mounding under infiltration controls	Comprehensive evaluation of SCM systems	(proprietary) http://www.winslamm.com/prod01.htm
SWAT	Rural runoff, loading	Medium to watershed	Intermediate	Land cover/land use, soil texture, precipitation, temperature, humidity, solar radiation time or PET series	Simple subbasin reservoir	Impoundments, agricultural conservation practices, nutrient management, buffers	http://www.epa.gov/waterscience/BASINS/bsnsdocs.html#swat
HSPF	Comprehensive watershed evaluation, receiving water dynamics	Medium to watershed	Complex	Land cover/land use, soil texture, precipitation, temperature, humidity, solar radiation or PET time series	Subbasin reservoir	Infiltration, ponds	Bicknell et al. (2005) http://www.epa.gov/ceampubl/swater/hspf/index.htm http://www.epa.gov/waterscience/BASINS/bsnsdocs.html#hspf
WWHM	HSPF engine with regional modifications,	Puget Sound	Complex	Same as above	Same as above	Enhanced infiltration, ponds (from HSPF)	http://www.ecy.wa.gov/programs/wg/stormwater/wwhm_training/index.html.
CBWM	HSPF engine with regional modifications,	Chesapeake Bay Watershed	Complex	Same as above	Same as above	Enhanced infiltration, ponds (from HSPF)	http://www.chesapeakebay.net/phase5.htm

Note: CN, curve number

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habitat suitability changes, transitions will occur between species or assemblages. These methods may work well at the base of the trophic system (algae, phytoplankton) and for specific conditions such as DO limitations on fish communities, but the impacts of low to moderate concentrations of pollutants on aquatic ecosystems may still be poorly understood. A critical assumption in these and similar models (e.g., ecological community change resulting from physical changes to the watershed or climate) is the substitution of space for time. More detailed understanding of the mechanisms leading to a shift in ecological communities and interactions with the physical environment is necessary to develop models of transient change, stability of the shifts, and feedback to the biophysical environment.

Given these limitations, it should be noted that statistical databases on species tolerance to a range of aquatic conditions have been compiled that will allow the development of habitat suitability mapping as a mechanism for (1) targeting ecosystem restoration, (2) determining vulnerable sites (for use in application of the Endangered Species Act), and (3) assessing aquatic ecosystem impairment and "best use" relative to reference sites.

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Stormwater models have been developed to meet a range of objectives, including small-scale hydraulic design (e.g., siting and sizing a detention pond), estimation of potential contributions of stormwater pollutants from different land covers and locations using empirically generated EMC, and large watershed hydrology and gross pollutant loading. The ability to associate a given discharger with a particular waterbody impairment is limited by the scale and complexity of watersheds (i.e., there maybe multiple discharge interactions); by the ability of a model to accurately reproduce the distribution function of discharge events and their cumulative impacts (as opposed to focusing only on design storms of specific return periods); and by the availability of monitoring data of sufficient number and design to characterize basic processes (e.g., build-up/wash-off), to parameterize the models, and to validate model predictions.

In smaller urban catchments with few dominant dischargers and significant impervious area, current modeling capabilities may be sufficient to associate the cumulative impact of discharge to waterbody impairment. However, many impaired waterbodies have larger, more heterogeneous stormwater sources, with impacts that are complex functions of current and past conditions. The level of sampling that would be necessary to support linked model calibration and verification using current measurement technologies is both time-consuming and expensive. In order to develop a more consistent capability to support stormwater permitting needs, there should be increased investment in improving model paradigms, especially the practice and methods of model linkage as described above, and in stormwater monitoring. The latter may require investment in a new generation of sensors that can sample at temporal resolutions that can adjust to characterize low flow and the dynamics of storm flow, but are sufficiently

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inexpensive and autonomous to be deployed in multiple locations from distributed sources to receiving waterbodies of interest. Finally, as urban areas extend to encompass progressively lower-density development, the interactions of surface water and groundwater become more critical to the cumulative impact of stormwater on impaired waterbodies.

EPA needs to ensure continuous support and development of their water quality models and spatial data infrastructure. Beyond this, a set of distributed watershed models has been developed that can resolve the location and position of parcels within hydrologic flow fields; these are being modified for use as urban stormwater models. These models avoid the pitfalls of lumping, but they require much greater volumes of spatial data, provided by current remote sensing technology (e.g., lidar, airborne digital optical and infrared sensors) as well as the emerging set of in-stream sensor systems. While these methods are not yet operational or widespread, they should be further investigated and tested for their capabilities to support stormwater management.

CONCLUSIONS AND RECOMMENDATIONS

This chapter addresses what might be the two weakest areas of the stormwater program—monitoring and modeling of stormwater. The MS4 and particularly the industrial stormwater monitoring programs suffer from (1) a paucity of data, (2) inconsistent sampling techniques, (3) a lack of analyses of available data and guidance on how permittees should be using the data to improve stormwater management decisions, and (4) requirements that are difficult to relate to the compliance of individual dischargers. The current state of stormwater modeling is similarly limited. Stormwater modeling has not evolved enough to consistently say whether a particular discharger can be linked to a specific waterbody impairment, although there are many correlative studies showing how parameters co-vary in important but complex and poorly understood ways (see Chapter 3). Some quantitative predictions can be made, particularly those that are based on well-supported causal relationships of a variable that responds to changes in a relatively simple driver (e.g., modeling how a runoff hydrograph or pollutant loading change in response to increased impervious land cover). However, in almost all cases, the uncertainty in the modeling and the data, the scale of the problems, and the presence of multiple stressors in a watershed make it difficult to assign to any given source a specific contribution to water quality impairment. More detailed conclusions and recommendations about monitoring and modeling are given below.

Because of a ten-year effort to collect and analyze monitoring data from MS4s nationwide, the quality of stormwater from urbanized areas is well characterized. These results come from many thousands of storm events, systematically compiled and widely accessible; they form a robust dataset of utility to theoreticians and practitioners alike. These data make it possible to

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accurately estimate the EMC of many pollutants. Additional data are available from other stormwater permit holders that were not originally included in the database and from ongoing projects, and these should be acquired to augment the database and improve its value in stormwater management decision-making.

Industry should monitor the quality of stormwater discharges from certain critical industrial sectors in a more sophisticated manner, so that permitting authorities can better establish benchmarks and technology-based effluent guidelines. Many of the benchmark monitoring requirements and effluent guidelines for certain industrial subsectors are based on inaccurate and old information. Furthermore, there has been no nationwide compilation and analysis of industrial benchmark data, as has occurred for MS4 monitoring data, to better understand typical stormwater concentrations of pollutants from various industries. The absence of accurate benchmarks and effluent guidelines for critical industrial sectors discharging stormwater may explain the lack of enforcement by permitting authorities, as compared to the vigorous enforcement within the wastewater discharge program.

Industrial monitoring should be targeted to those sites having the greatest risk associated with their stormwater discharges. Many industrial sites have no or limited exposure to runoff and should not be required to undertake extensive monitoring. Visual inspections should be made, and basic controls should be implemented at these areas. Medium-risk industrial sites should conduct monitoring so that a sufficient number of storms are measured over the life of the permit for comparison to regional benchmarks. Again, visual inspections and basic controls are needed for these sites, along with specialized controls to minimize discharges of the critical pollutants. Stormwater from high-risk industrial sites needs to be continuously monitored, similar to current point source monitoring practices. The use of a regionally calibrated stormwater model and random monitoring of the lower-risk areas will likely require additional monitoring.

Continuous, flow-weighted sampling methods should replace the traditional collection of stormwater data using grab samples. Data obtained from too few grab samples are highly variable, particularly for industrial monitoring programs, and subject to greater uncertainly because of experimenter error and poor data-collection practices. In order to use stormwater data for decision making in a scientifically defensible fashion, grab sampling should be abandoned as a credible stormwater sampling approach for virtually all applications. It should be replaced by more accurate and frequent continuous sampling methods that are flow weighted. Flow-weighted composite monitoring should continue for the duration of the rain event. Emerging sensor systems that provide high temporal resolution and real-time estimates for specific pollutants should be further investigated, with the aim of providing lower costs and more extensive monitoring systems to sample both streamflow and constituent loads.

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Flow monitoring and on-site rainfall monitoring need to be included as part of stormwater characterization monitoring. The additional information associated with flow and rainfall data greatly enhance the usefulness of the much more expensive water quality monitoring. Flow monitoring should also be correctly conducted, with adequate verification and correct base-flow subtraction methods applied. Using regional rainfall data from locations distant from the monitoring location is likely to be a major source of error when rainfall factors are being investigated. The measurement, quality assurance, and maintenance of long-term precipitation records are both vital and nontrivial to stormwater management.

Whether a first flush of contaminants occurs at the start of a rainfall event depends on the intensity of rainfall, the land use, and the specific pollutant. First flushes are more common for smaller sites with greater imperviousness and thus tend to be associated with more intense land uses such as commercial areas. Even though a site may have a first flush of a constituent of concern, it is still important that any SCM be designed to treat as much of the runoff from the site as possible. In many situations, elevated discharges may occur later in an event associated with delayed periods of peak rainfall intensity.

Stormwater runoff in arid and semi-arid climates demonstrates a seasonal first-flush effect (i.e., the dirtiest storms are the first storms of the season). In these cases, it is important that SCMs are able to adequately handle these flows. As an example, early spring rains mixed with snowmelt may occur during periods when wet detention ponds are still frozen, hindering their performance. The first fall rains in the southwestern regions of the United States may occur after extended periods of dry weather. Some SCMs, such as street cleaning targeting leaf removal, may be more effective before these rains than at other times of the year.

Watershed models are useful tools for predicting downstream impacts from urbanization and designing mitigation to reduce those impacts, but they are incomplete in scope and typically do not offer definitive causal links between polluted discharges and downstream degradation. Every model simulates only a subset of the multiple interconnections between physical, chemical, and biological processes found in any watershed, and they all use a grossly simplified representation of the true spatial and temporal variability of a watershed. To speak of a "comprehensive watershed model" is thus an oxymoron, because the science of stormwater is not sufficiently far advanced to determine causality between all sources, resulting stressors, and their physical, chemical, and biological responses. Thus, it is not yet possible to create a protocol that mechanistically links stormwater dischargers to the quality of receiving waters. The utility of models with more modest goals, however, can still be high—as long as the questions being addressed by the model are in fact relevant and important to the functioning of the watershed to which that model is being applied, and sufficient data are available to calibrate the model for the processes

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included therein.

EPA needs to ensure that the modeling and monitoring capabilities of the nation are continued and enhanced to avoid losing momentum in understanding and eliminating stormwater pollutant discharges. There is a need to extend, develop, and support current modeling capabilities, emphasizing (1) the impacts of flow energy, sediment transport, contaminated sediment, and acute and chronic toxicity on biological systems in receiving waterbodies; (2) more mechanistic representation (physical, chemical, biological) of SCMs; and (3) coupling between a set of functionally specific models to promote the linkage of source, transport and transformation, and receiving water impacts of stormwater discharges. Stormwater models have typically not incorporated interactions with groundwater and have treated infiltration and recharge of groundwater as a loss term with minimal consideration of groundwater contamination or transport to receiving waterbodies. Emerging distributed modeling paradigms that simulate interactions of surface and subsurface flowpaths provide promising tools that should be further developed and tested for applications in stormwater analysis.

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5
Stormwater Management Approaches

A fundamental component of the U.S. Environmental Protection Agency's (EPA) Stormwater Program, for municipalities as well as industries and construction, is the creation of stormwater pollution prevention plans. These plans invariably document the stormwater control measures that will be used to prevent the permittee's stormwater discharges from degrading local waterbodies. Thus, a consideration of these measures—their effectiveness in meeting different goals, their cost, and how they are coordinated with one another—is central to any evaluation of the Stormwater Program. This report uses the term stormwater control measure (SCM) instead of the term best management practice (BMP) because the latter is poorly defined and not specific to the field of stormwater.

The committee's statement of task asks for an evaluation of the relationship between different levels of stormwater pollution prevention plan implementation and in-stream water quality. As discussed in the last two chapters, the state of the science has yet to reveal the mechanistic links that would allow for a full assessment of that relationship. However, enough is known to design systems of SCMs, on a site scale or local watershed scale, to lessen many of the effects of urbanization. Also, for many regulated entities the current approach to stormwater management consists of choosing one or more SCMs from a preapproved list. Both of these facts argue for the more comprehensive discussion of SCMs found in this chapter, including information on their characteristics, applicability, goals, effectiveness, and cost. In addition, a multitude of case studies illustrate the use of SCMs in specific settings and demonstrate that a particular SCM can have a measurable positive effect on water quality or a biological metric. The discussion of SCMs is organized along the gradient from the rooftop to the stream. Thus, pollutant and runoff prevention are discussed first, followed by runoff reduction and finally pollutant reduction.

HISTORICAL PERSPECTIVE ON STORMWATER CONTROL MEASURES

Over the centuries, SCMs have met different needs for cities around the world. Cities in the Mesopotamian Empire during the second millennium BC had practices for flood control, to convey waste, and to store rain water for household and irrigation uses (Manor, 1966) (see Figure 5-1). Today, SCMs are considered a vital part of managing flooding and drainage problems in a city. What is relatively new is an emphasis on using the practices to remove pollutants from stormwater and selecting practices capable of providing groundwater recharge. These recent expectations for SCMs are not readily accepted and re-

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quire an increased commitment to the proper design and maintenance of the practices.

With the help of a method for estimating peak flows (the Rational Method, see Chapter 4), the modern urban drainage system came into being soon after World War II. This generally consisted of a system of catch basins and pipes to prevent flooding and drainage problems by efficiently delivering runoff water to the nearest waterbody. However, it was soon realized that delivering the water too quickly caused severe downstream flooding and bank erosion in the receiving water. To prevent bank erosion and provide more space for flood waters, some stream channels were enlarged and lined with concrete (see Figure 5-2). But while hardening and enlarging natural channels is a cost-effective solution to erosion and flooding, the modified channel increases downstream peak flows and it does not provide habitat to support a healthy aquatic ecosystem.

FIGURE 5-1 Cistern tank, Kamiros, Rhodes (ancient Greece, 7th century BC). SOURCE: Robert Pitt, University of Alabama.

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FIGURE 5-2 Concrete channel in Lincoln Creek, Milwaukee, Wisconsin. SOURCE: Roger Bannerman, Wisconsin Department of Natural Resources.

Some way was needed to control the quantity of water reaching the end of pipes during a runoff event, and on-site detention (Figure 5-3) became the standard for accomplishing this. Ordinances started appearing in the early 1970s, requiring developers to reduce the peaks of different size storms, such as the 10-year, 24-hour storm. The ordinances were usually intended to prevent future problems with peak flows by requiring the installation of flow control structures, such as detention basins, in new developments. Detention basins can control peak flows directly below the point of discharge and at the property boundary. However, when designed on a site-by-site basis without taking other basins into account, they can lead to downstream flooding problems because volume is not reduced (McCuen, 1979; Ferguson, 1991; Traver and Chadderton, 1992; EPA, 2005d). In addition, out of concerns for clogging, openings in the outlet structure of most basins are generally too large to hold back flows from smaller, more frequent storms. Furthermore, low-flow channels have been constructed or the basins have been graded to move the runoff through the structure without delay to prevent wet areas and to make it easier to mow and maintain the detention basin.

Because of the limitations of on-site detention, infiltration of urban runoff to control its volume has become a recent goal of stormwater management. Without stormwater infiltration, municipalities in wetter regions of the country can expect drops in local groundwater levels, declining stream base flows (Wang et al., 2003a), and flows diminished or stopped altogether from springs feeding wetlands and lakes (Leopold, 1968; Ferguson, 1994).

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FIGURE 5-3 On-site detention. SOURCE: Tom Schueler, Chesapeake Stormwater Network, Inc.

The need to provide volume control marked the beginning of low-impact development (LID) and conservation design (Arendt, 1996; Prince George's County, 2000), which were founded on the seminal work of landscape architect Ian McHarg and associates decades earlier (McHarg and Sutton, 1975; McHarg and Steiner, 1998). The goal of LID is to allow for development of a site while maintaining as much of its natural hydrology as possible, such as infiltration, frequency and volume of discharges, and groundwater recharge. This is accomplished with infiltration practices, functional grading, open channels, disconnection of impervious areas, and the use of fewer impervious surfaces. Much of the LID focus is to manage the stormwater as close as possible to its source—that is, on each individual lot rather than conveying the runoff to a larger regional SCM. Individual practices include rain gardens (see Figure 5-4), disconnected roof drains, porous pavement, narrower streets, and grass swales. In some cases, LID site plans still have to include a method for passing the larger storms safely, such as a regional infiltration or detention basin or by increasing the capacity of grass swales.

Infiltration has been practiced in a few scattered locations for a long time. For example, on Long Island, New York, infiltration basins were built starting in 1930 to reduce the need for a storm sewer system and to recharge the aquifer, which was the only source of drinking water (Ferguson, 1998). The Cities of Fresno, California, and El Paso, Texas, which faced rapidly dropping groundwater tables, began comprehensive infiltration efforts in the 1960s and 1970s. In the 1980s Maryland took the lead on the east coast by creating an ambitious

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FIGURE 5-4 Rain Garden in Madison, Wisconsin. SOURCE: Roger Bannerman, Wisconsin Department of Natural Resources.

statewide infiltration program. The number of states embracing elements of LID, especially infiltration, has increased during the 1990s and into the new century and includes California, Florida, Minnesota, New Jersey, Vermont, Washington, and Wisconsin.

Evidence gathered in the 1970s and 1980s suggested that pollutants be added to the list of things needing control in stormwater (EPA, 1983). Damages caused by elevated flows, such as stream habitat destruction and floods, were relatively easy to document with something as simple as photographs. Documentation of elevated concentrations of conventional pollutants and potentially toxic pollutants, however, required intensive collection of water quality samples during runoff events. Samples collected from storm sewer pipes and urban streams in the Menomonee River watershed in the late 1970s clearly showed the concentrations of many pollutants, such as heavy metals and sediment, were elevated in urban runoff (Bannerman et al., 1979). Levels of heavy metals were especially high in industrial-site runoff, and construction-site erosion was calculated to be a large source of sediment in the watershed. This study was followed by the National Urban Runoff Program, which added more evidence about the high levels of some pollutants found in urban runoff (Athayde et al., 1983; Bannerman et al., 1983).

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With new development rapidly adding to the environmental impacts of existing urban areas, the need to develop good stormwater management programs is more urgent than ever. For a variety of reasons, the greatest potential for stormwater management to reduce the footprint of urbanization is in the suburbs. These areas are experiencing the fastest rates of growth, they are more amenable to stormwater management because buildings and infrastructure are not yet in place, and costs for stormwater management can be borne by the developer rather than by taxpayers. Indeed, most structural SCMs are applied to new development rather than existing urban areas. Many of the most innovative stormwater programs around the country are found in the suburbs of large cities such as Seattle, Austin, and Washington, D.C. When stormwater management in ultra-urban areas is required, it entails the retrofitting of detention basins and other flow control structures or the introduction of innovative below-ground structures characterized by greater technical constraints and higher costs, most of which are charged to local taxpayers.

Current-day SCMs represent a radical departure from past practices, which focused on dealing with extreme flood events via large detention basins designed to reduce peak flows at the downstream property line. As defined in this chapter, SCMs now include practices intended to meet broad watershed goals of protecting the biology and geomorphology of receiving waters in addition to flood peak protection. The term encompasses such diverse actions as using more conventional practices like basins and wetland to installing stream buffers, reducing impervious surfaces, and educating the public.

REVIEW OF STORMWATER CONTROL MEASURES

Stormwater control measures refer to what is defined by EPA (1999) as "a technique, measure, or structural control that is used for a given set of conditions to manage the quantity and improve the quality of stormwater runoff in the most cost-effective manner." SCMs are designed to mitigate the changes to both the quantity and quality of stormwater runoff that are caused by urbanization. Some SCMs are engineered or constructed facilities, such as a stormwater wetland or infiltration basin, that reduce pollutant loading and modify volumes and flow. Other SCMs are preventative, including such activities as education and better site design to limit the generation of stormwater runoff or pollutants.

Stormwater Management Goals

It is impossible to discuss SCMs without first considering the goals that they are expected to meet. A broadly stated goal for stormwater management is to reduce pollutant loads to waterbodies and maintain, as much as possible, the natural hydrology of a watershed. On a practical level, these goals must be made specific to the region of concern and embedded in the strategy for that

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region. Depending on the designated uses of the receiving waters, climate, geomorphology, and historical development, a given area may be more or less sensitive to both pollutants and hydrologic modifications. For example, goals for groundwater recharge might be higher in an area with sandy soils as compared to one with mostly clayey soils; watersheds in the coastal zone may not require hydrologic controls. Ideally, the goals of stormwater management should be linked to the water quality standards for a given state's receiving waters. However, because of the substantial knowledge gap about the effect of a particular stormwater discharge on a particular receiving water (see Chapter 3 conclusions), surrogate goals are often used by state stormwater programs in lieu of water quality standards. Examples include credit systems, mandating the use of specific SCMs, or achieving stormwater volume reduction. Credit systems might be used for practices that are known to be productive but are difficult to quantify, such as planting trees. Specific SCMs might be assumed to remove a percent of pollutants, for example 85 percent removal of total suspended solids (TSS) within a stormwater wetland. Reducing the volume of runoff from impervious surfaces (e.g., using an infiltration device) might be assumed to capture the first flush of pollutants during a storm event. Before discussing specific state goals, it is worth understanding the broader context in which goals are set.

Trade-offs Between Stormwater Control Goals and Costs

The potentially substantial costs of implementing SCMs raise a number of fundamental social choices concerning land-use decisions, designated uses, and priority setting for urban waters. To illustrate some of these choices, consider a hypothetical urban watershed with three possible land-cover scenarios: 25, 50, and 75 percent impervious surface. A number of different beneficial uses could be selected for the streams in this watershed. At a minimum, the goal may be to establish low-level standards to protect public health and safety. To achieve this, sufficient and appropriate SCMs might be applied to protect residents from flooding and achieve water quality conditions consistent with secondary human contact. Alternatively, the designated use could be to achieve the physical, chemical, and/or biological conditions sufficient to provide exceptional aquatic habitat (e.g., a high-quality recreational fishery). The physical, biological, and chemical conditions supportive of this use might be similar to a reference stream located in a much less disturbed watershed. Achieving this particular designated use would require substantially greater resources and effort than achieving a secondary human contact use. Intermediate designated uses could also be imagined, including improving ambient water quality conditions that would make the water safe for full-body emersion (primary human contact) or habitat conditions for more tolerant aquatic species.

Figure 5-5 sketches what the marginal (incremental) SCM costs (opportunity costs) might be to achieve different designated uses given different amounts of impervious surface in the watershed. The horizontal axis orders potential

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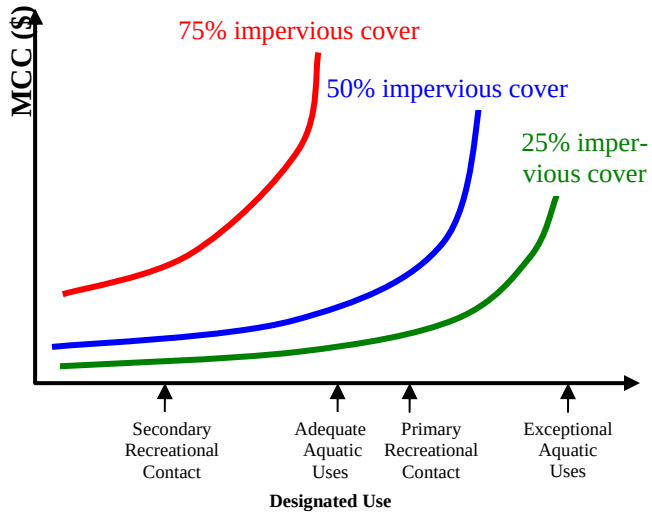

FIGURE 5-5 Cost of achieving designated uses in a hypothetical urban watershed. MCC is the marginal control cost, which represents the incremental costs to achieve successive expansion of designated uses through SCMs. The curves are constructed on the assumption that the lowest cost combination of SCMs would be implemented at each point on the curve.

designated uses in terms of least difficult to most difficult to achieve. The three conceptual curves represent the SCM costs under three different impervious surface scenarios. The relative positions of the cost curves indicate that achieving any specific designated use will be more costly in situations with a higher percentage of the watershed in impervious cover. All cost curves are upward sloping, reflecting the fact that incremental improvements in designated uses will be increasingly costly to achieve. The cost curves are purely conceptual, but nonetheless might reasonably reflect the relative costs and direction of change associated with achieving specific designated uses in different watershed conditions.

The locations of the cost curves suggest that in certain circumstances not all designated uses can be achieved or can be achieved only at an extremely high cost. For example, the attainment of exceptional aquatic uses may be unachievable in areas with 50 percent impervious surface even with maximum application of SCMs. In this illustration, the cost of achieving even secondary human contact use is high for areas with 75 percent impervious surfaces. In such highly urbanized settings, achievement of only adequate levels of aquatic uses could be exceedingly high and strain the limits of what is technically achievable. Finally, the existing and likely expected future land-use conditions have significant im-

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plications for what is achievable and at what cost. Clearly land-use decisions have an impact on the cost and whether a use can be achieved, and thus they need to be included in the decision process. The trade-off between costs and achieving specific designated uses can change substantially given different development patterns.

The purpose of Figure 5-5 is not to identify the precise location of the cost curves or to identify thresholds for achieving specific designated uses. Rather, these concepts are used to illustrate some fundamental trade-offs that confront public and private investment and regulatory decisions concerning stormwater management. The general relationships shown in Figure 5-5 suggest the need for establishing priorities for investments in stormwater management and controls, and connecting land usage and watershed goals. Setting overly ambitious or costly goals for urban streams may result in the perverse consequence of causing more waters to fail to meet designated uses. For example, consider efforts to secure ambitious designated uses in highly developed areas or in an area slated for future high-density development. Regulatory requirements and investments to limit stormwater quantity and quality through open-space requirements, areas set aside for infiltration and water detention, and strict application of maximum extent practicable controls have the effect of both increasing development costs and diminishing land available for residential and commercial properties. Policies designed to achieve exceedingly costly or infeasible designated uses in urban or urbanizing areas could have the net consequence of shifting development (and associated impervious surface) out into neighboring areas and watersheds. The end result might be minimal improvements in "within-watershed" ambient conditions but a decrease in designated uses (more impairments) elsewhere. In such a case, it might be sound water quality policy to accept higher levels of impervious surface in targeted locations, more stormwater-related impacts, and less ambitious designated uses in urban watersheds in order to preserve and protect designated uses in other watersheds.

Setting unrealistic or unachievable water quality objectives in urban areas can also pose political risks for stormwater management. The cost and difficulty of achieving ambitious water quality standards for urban stream goals may be understood by program managers but pursued nonetheless in efforts to demonstrate public commitment to achieving high-quality urban waters. Yet, promising what cannot be realistically achieved may act to undermine public support for urban stormwater programs. Increasing costs without significant observable improvements in ambient water conditions or achievement of water quality standards could ultimately reduce public commitment to the program. Thus, there are risks of "setting the bar" too high, or not coordinating land use and designated stream uses.

The cost of setting the bar too low can also be significant. Stormwater requirements that result in ineffective stormwater management will not achieve or maintain the desired water uses and can result in impairments. Loss of property, degraded waters, and failed infrastructure are tangible costs to the public (Johnston et al., 2006). Streambank rehabilitation costs can be severe, and loss of con-

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fidence in the ability to meet stormwater goals can result.

The above should not be construed as an argument for or against devoting resources to SCMs; rather, such decisions should be made with an open and transparent acknowledgment and understanding of the costs and consequences involved in those decisions.

Common State Stormwater Goals

Most states do not and have never had an overriding water quality objective in their stormwater program, but rather have used engineering criteria for SCM performance to guide stormwater management. These criteria can be loosely categorized as:

- Erosion and sedimentation control,
- Recharge/base flow,
- Water quality,
- Channel protection, and
- Flooding events.

The SCMs used to address these goals work by minimizing or eliminating increases in stormwater runoff volume, peak flows, and/or the pollutant load carried by stormwater.

The criteria chosen by any given state usually integrate state, federal, and regional laws and regulations. Areas of differing climates may emphasize one goal over another, and the levels of control may vary drastically. Contrast a desert region where rainwater harvesting is extremely important versus a coastal region subject to hurricanes. Some areas like Seattle have frequent smaller volume rainfalls—the direct opposite of Austin, Texas—such that small volume controls would be much more effective in Seattle than Austin. Regional geology (karst) or the presence of Brownfields may affect the chosen criteria as well.

The committee's survey of State Stormwater Programs (Appendix C) reflects a wide variation in program goals as reflected in the criteria found in their SCM manuals. Some states have no specific criteria because they do not produce SCM manuals, while others have manuals that address every category of criteria from flooding events to groundwater recharge. Some states rely upon EPA or other states' or transportation agencies' manuals. In general, soil and erosion control criteria are the most common and often exist in the absence of any other state criteria. This wide variation reflects the difficulties that states face in keeping up with rapidly changing information about SCM design and performance.

The criteria are ordered below (after the section on erosion and sediment control) according to the size of the storm they address, from smallest to most extreme. The criteria can be expressed in a variety of ways, from a simple requirement to control a certain volume of rainfall or runoff (expressed as a depth)

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to the size of a design storm to more esoteric requirements, such as limiting the time that flow can be above a certain threshold. The volumes of rainfall or runoff are based on statistics of a region's daily rainfall, and they approximate one another as the percentage of impervious cover increases. Design storms for larger events that address channel protection and flooding are usually based on extreme event statistics and tend to represent a temporal pattern of rainfall over a set period, usually a day. Finally, it should be noted that the categories are not mutually exclusive; for example, recharge of groundwater may enhance water quality via pollutant removal during the infiltration process.

Erosion and Sedimentation Control. This criterion refers to the prevention of erosion and sedimentation of sites during construction and is focused at the site level. Criteria usually include a barrier plan to prevent sedimentation from leaving the site (e.g., silt fences), practices to minimize the potential erosion (phased construction), and facilities to capture and remove sediment from the runoff (detention). Because these measures are considered temporary, smaller extreme events are designated as the design storm than what typically would be used if flood control were the goal.

Recharge/Base Flow. This criterion is focused on sustaining the preconstruction hydrology of a site as it relates to base flow and recharge of groundwater supplies. It may also include consideration of water usage of the property owners and return through septic tanks and tile fields. The criterion, expressed as a volume requirement, is usually to capture around 0.5 to 1.0 inch of runoff from impervious surfaces depending on the climate and soil type of the region. (For this range of rainfall, very little runoff occurs from grass or forested areas, which is why runoff from impervious surfaces is used as the criterion.)

Water Quality. Criteria for water quality are the most widespread, and are usually crafted as specific percent removal for pollutants in stormwater discharge. Generally, a water quality criterion is based on a set volume of stormwater being treated by the SCM. The size of the storm can run from the first inch of rainfall off impervious surfaces to the runoff from the one-year, 24-hour extreme storm event. It should be noted that the term "water quality" covers a wide range of groundwater and surface water pollutants, including water temperature and emerging contaminants.

Many of the water quality criteria are surrogates for more meaningful parameters that are difficult to quantify or cannot be quantified, or they reflect situations where the science is not developed enough to set more explicit goals. For example, the Wisconsin state requirement of an 80 percent reduction in TSS in stormwater discharge does not apply to receiving waters themselves. However, it presumes that there will be some water quality benefits in receiving waters; that is, phosphorus and fecal coliform might be captured by the TSS requirement. Similarly water quality criteria may be expressed as credits for good practices, such as using LID, street sweeping, or stream buffers.

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Channel Protection. This criterion refers to protecting channels from accelerated erosion during storm events due to the increased runoff. It is tied to either the presumed "channel-forming event"—what geomorphologists once believed was the storm size that created the channel due to erosion and deposition—or to the minimum flow that accomplishes any degree of sediment transport. It is generally defined as somewhere between the one- and five-year, 24-hour storm event or a discharge level typically exceeded once to several times per year. Some states require a reduction in runoff volume for these events to match preconstruction levels. Others may require that the average annual duration of flows that are large enough to erode the streambank be held the same on an annual basis under pre- and postdevelopment conditions.

It is not uncommon to find states where a channel protection goal will be written poorly, such that it does not actually prevent channel widening. For example, MacRae (1997) presented a review of the common "zero runoff increase" discharge criterion, which is commonly met by using ponds designed to detain the two-year, 24-hour storm. MacRae showed that stream bed and bank erosion occur during much lower events, namely mid-depth flows that generally occur more than once a year, not just during bank-full conditions (approximated by the two-year event). This finding is entirely consistent with the well-established geomorphological literature (e.g., Pickup and Warner, 1976; Andrews, 1984; Carling, 1988; Sidle, 1988). During monitoring near Toronto, MacRae found that the duration of the geomorphically significant predevelopment mid-bankfull flows increased by more than four-fold after 34 percent of the basin had been urbanized. The channel had responded by increasing in cross-sectional area by as much as three times in some areas, and was still expanding.

Flooding Events. This criterion addresses public safety and the protection of property and is applicable to storm events that exceed the channel capacity. The 10- through the 100-year storm is generally used as the standard. Volume-reduction SCMs can aid or meet this criterion depending on the density of development, but usually assistance is needed in the form of detention SCMs. In some areas, it may be necessary to reduce the peak flow to below preconstruction levels in order to avoid the combined effects of increased volume, altered timing, and a changed hydrograph. It should be noted that some states do not consider the larger storms (100-year) to be a stormwater issue and have separate flood control requirements.

Each state develops a framework of goals, and the corresponding SCMs used to meet them, which will depend on the scale and focus of the stormwater management strategy. A few states have opted to express stormwater goals within the context of watershed plans for regions of the state. However, the setting of goals on a watershed basis is time-consuming and requires study of the watersheds in question. The more common approach has been to set generic or minimal controls for a region that are not based on a watershed plan. This has been done in Maryland, Wisconsin (see Box 5-1), and Pennsylvania (see Box 5-2). This strategy has the advantage of more rapid implementation of

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BOX 5-1
Wisconsin Statewide Goal of TSS Reduction for Stormwater Management

To measure the success of stormwater management, Wisconsin has statewide goals for sediment and flow (Wisconsin DNR, 2002). A lot is known about the impacts of sediment on receiving waters, and any reduction is thought to be beneficial. Flow can be a good indicator of other factors; for example, reducing peak flows will prevent bank erosion.

Developing areas in Wisconsin are required to reduce the annual TSS load by 80 percent compared to no controls (Wisconsin DNR, 2002). Two flow-rated requirements for developing areas are in the administrative rules. One is that the site must maintain the peak flow for the two-year, 24-hour rainfall event. Second, the annual infiltration volume for postdevelopment must be within 90 percent of the predevelopment volumes for residential land uses; the number for non-residential is 60 percent. Both of these flow control goals are thought to also have water quality benefits.

The goal for existing urban areas is an annual reduction in TSS loads. Municipalities must reduce their annual TSS loads by 20 percent, compared to no controls, by 2008. This number is increased to 40 percent by 2013. All of these goals were partially selected to be reasonable based on cost and technical feasibility.

BOX 5-2
Volume-Based Stormwater Goals in Pennsylvania

Pennsylvania has developed a stormwater *Best Management Practices* manual to support the Commonwealth's Storm Water Management Act. This manual and an accompanying sample ordinance advocates two methods for stormwater control based on volume, termed Control Guidance (CG) 1 and 2. The first (CG-1) requires that the runoff volume be maintained at the two-year, 24-hour storm level (which corresponds to approximately 3.5 inches of rainfall in this region) through infiltration, evapotranspiration, or reuse. This criterion addresses recharge/base flow, water quality, and channel protection, as well as helping to meet flooding requirements.

The second method (CG-2) requires capture and removal of the first inch of runoff from paved areas, with infiltration strongly recommended to address recharge and water quality issues. Additionally, to meet channel protection criteria, the second inch is required to be held for 24 hours, which should reduce the channel-forming flows. (This is an unusual criterion in that it is expressed as what an SCM can accomplish, not as the flow that the channel can handle.) Peak flows for larger events are required to be at preconstruction levels or less if the need is established by a watershed plan. These criteria are the starting point for watershed or regional plans, to reduce the effort of plan development. Some credits are available for tree planting, and other nonstructural practices are advocated for dissolved solids mitigation. See http://www.dep.state.pa.us/dep/deputate/watermgt/wc/subjects/stormwatermanagement/default.htm.

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some SCMs because watershed management plans are not required. In order to be applicable to all watersheds in the state, the goals must target common pollutants or flow modification factors where the processes are well known. It must also be possible for these goals to be stated in National Pollutant Discharge Elimination System (NPDES) permits. Many states have selected TSS reduction, volume reduction, and peak flow control as generic goals. A generic goal is not usually based on potentially toxic pollutants, such as heavy metals, due to the complexity of their interaction in the environment, the dependence on the existing baseline conditions, and the need for more understanding on what are acceptable levels. The difficulty with the generic approach is that specific watershed issues are not addressed, and the beneficial uses of waters are not guaranteed.

One potential drawback of a strategy based on a generic goal coupled to the permit process is that the implementation of the goal is usually on a site-by-site basis, especially for developing areas. Generic goals may be appropriate for certain ubiquitous watershed processes and are clearly better than having no goals at all. However, they do not incorporate the effects of differences in past development and any unique watershed characteristics; they should be considered just a good starting point for setting watershed-based goals.

Role of SCMs in Achieving Stormwater Management Goals

One important fundamental change in SCM design philosophy has come about because of the recent understanding of the roles of smaller storms and of impervious surfaces. This is demonstrated by Box 3-4, which shows that for the Milwaukee area more than 50 percent of the rainfall by volume occurs in storms that have a depth of less then 0.75 inch. If extreme events are the only design criteria for SCMs, the vast majority of the annual rainfall will go untreated or uncontrolled, as it is smaller than the minimum extreme event. This relationship is not the same in all regions. For example, in Austin, Texas, the total yearly rainfall is smaller than in Milwaukee, but a large part of the volume occurs during larger storm events, with long dry periods in between.

The upshot is that the design strategy for stormwater management, including drainage systems and SCMs, should take a region's rainfall and associated runoff conditions into account. For example, an SCM chosen to capture the majority of the suspended solids, recharge the baseflow, reduce streambank erosion, and reduce downstream flooding in Pennsylvania or Seattle (which have moderate and regular rainfall) would likely not be as effective in Texas, where storms are infrequent and larger. In some areas, a reduction in runoff volume may not be sufficient to control streambank erosion and flooding, such that a second SCM like an extended detention stormwater wetland may be needed to meet management goals.

Finally, as discussed in greater detail in a subsequent section, SCMs are most effective from the perspective of both efficiency and cost when stormwater

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management is incorporated in the early planning stages of a community. Retrofitting existing development with SCMs is much more technically difficult and costly because the space may not be available, other infrastructure is already installed, or utilities may interfere. Furthermore, if the property is on private land or dedicated as an easement to a homeowners association, there may be regulatory limitations to what can be done. Because of these barriers, retrofitting existing urban areas often depends on engineered or manufactured SCMs, which are more expensive in both construction and operation.

Stormwater Control Measures

SCMs reduce or mitigate the generation of stormwater runoff and associated pollutants. These practices include both "structural" or engineered devices as well as more "nonstructural measures" such as land-use planning, site design, land conservation, education, and stewardship practices. Structural practices may be defined as any facility constructed to mitigate the adverse impacts of stormwater and urban runoff pollution. Nonstructural practices, which tend to be longer-term and lower-maintenance solutions, can greatly reduce the need for or increase the effectiveness of structural SCMs. For example, product substitution and land-use planning may be key to the successful implementation of an infiltration SCM. Preserving wooded areas and reducing street widths can allow the size of detention basins in the area to be reduced.

Table 5-1 presents the expansive list of SCMs that are described in this chapter. For most of the SCMs, each listed item represents a class of related practices, with individual methods discussed in greater detail later in the chapter. There are nearly 20 different broad categories of SCMs that can be applied, often in combination, to treat the quality and quantity of stormwater runoff. A primary difference among the SCMs relates to which stage of the development cycle they are applied, where in the watershed they are installed, and who is responsible for implementing them.

The development cycle extends from broad planning and zoning to site design, construction, occupancy, retrofitting, and redevelopment. As can be seen, SCMs are applied throughout the entire cycle. The scale at which the SCM is applied also varies considerably. While many SCMs are installed at individual sites as part of development or redevelopment applications, many are also applied at the scale of the stream corridor or the watershed or to existing municipal stormwater infrastructure. The final column in Table 5-1 suggests who would implement the SCM. In general, the responsibility for implementing SCMs primarily resides with developers and local stormwater agencies, but planning agencies, landowners, existing industry, regulatory agencies, and municipal separate storm sewer system (MS4) permittees can also be responsible for implementing many key SCMs.

In Table 5-1, the SCMs are ordered in such a way as to mimic natural systems as rain travels from the roof to the stream through combined application of

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TABLE 5-1 Summary of Stormwater Control Measures—When, Where, and Who

Stormwater Control Measure	When	Where	Who
Product Substitution	Continuous	National, state, regional	Regulatory agencies
Watershed and Land-Use Planning	Planning stage	Watershed	Local planning agencies
Conservation of Natural Areas	Site and watershed planning stage	Site, watershed	Developer, local planning agency
Impervious Cover Minimization	Site planning stage	Site	Developer, local review authority
Earthwork Minimization	Grading plan	Site	Developer, local review authority
Erosion and Sediment Control	Construction	Site	Developer, local review authority
Reforestation and Soil Conservation	Site planning and construction	Site	Developer, local review authority
Pollution Prevention SCMs for Stormwater Hotspots	Post-construction or retrofit	Site	Operators and local and state permitting agencies
Runoff Volume Reduction—Rainwater harvesting	Post-construction or retrofit	Rooftop	Developer, local planning agency and review authority
Runoff Volume Reduction—Vegetated	Post-construction or retrofit	Site	Developer, local planning agency and review authority
Runoff Volume Reduction—Subsurface	Post-construction or retrofit	Site	Developer, local planning agency and review authority
Peak Reduction and Runoff Treatment	Post-construction or retrofit	Site	Developer, local planning agency and review authority
Runoff Treatment	Post-construction or retrofit	Site	Developer, local planning agency and review authority
Aquatic Buffers and Managed Floodplains	Planning, construction and post-construction	Stream corridor	Developer, local planning agency and review authority, landowners
Stream Rehabilitation	Postdevelopment	Stream corridor	Local planning agency and review authority

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TABLE 5-1 Continued

Stormwater Control Measure	When	Where	Who
Municipal Housekeeping	Postdevelopment	Streets and stormwater infrastructure	MS4 Permittee
Illicit Discharge Detection and Elimination	Postdevelopment	Stormwater infrastructure	MS4 Permittee
Stormwater Education	Postdevelopment	Stormwater infrastructure	MS4 Permittee
Residential Stewardship	Postdevelopment	Stormwater infrastructure	MS4 Permittee

Note: Nonstructural SCMs are in italics.

a series of practices throughout the entire development site. This order is upheld throughout the chapter, with the implication that no SCM should be chosen without first considering those that precede it on the list.

Given that there are 20 different SCM groups and a much larger number of individual design variations or practices within each group, it is difficult to authoritatively define the specific performance or effectiveness of SCMs. In addition, our understanding of their performance is rapidly changing to reflect new research, testing, field experience, and maintenance history. The translation of these new data into design and implementation guidance is accelerating as well. What is possible is to describe their basic hydrologic and water quality objectives and make a general comparative assessment of what is known about their design, performance, and maintenance as of mid-2008. This broad technology assessment is provided in Table 5-2, which reflects the committee's collective understanding about the SCMs from three broad perspectives:

- Is widely accepted design or implementation guidance available for the SCM and has it been widely disseminated to the user community?
- Have enough research studies been published to accurately characterize the expected hydrologic or pollutant removal performance of the SCM in most regions of the country?
- Is there enough experience with the SCM to adequately define the type and scope of maintenance needed to ensure its longevity over several decades?

Affirmative answers to these three questions are needed to be able to reliably quantify or model the ability of the SCM, which is an important element in defining whether the SCM can be linked to improvements in receiving water quality. As will be discussed in subsequent sections of this chapter, there are many SCMs for which there is only a limited understanding, particularly those that are nonstructural in nature.

The columns in Table 5-2 summarize several important factors about each SCM, including the ability of the SCM to meet hydrologic control objectives

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and water quality objectives, the availability of design guidance, the availability of performance studies, and whether there are maintenance protocols. The hydrologic control objectives range from complete prevention of stormwater flow to reduction in runoff volume and reduction in peak flows. The column on water quality objectives describes whether the SCM can prevent the generation of, or remove, contaminants of concern in stormwater.

The availability of design guidance tends to be greatest for the structural practices. Some but not all nonstructural practices are of recent origin, and communities lack available design guidance to include them as an integral element of local stormwater solutions. Where design guidance is available, it may not yet have been disseminated to the full population of Phase II MS4 communities.

TABLE 5-2 Current Understanding of Stormwater Control Measure Capabilities

SCM	Hydrologic Control Objectives	Water Quality Objectives	Available Design Guidance	Performance Studies Available	Defined Maintenance Protocols
Product Substitution	NA	Prevention	NA	Limited	NA
Watershed and Land-Use Planning	All objectives	Prevention	Available	Limited	Yes
Conservation of Natural Areas	Prevention	Prevention	Available	None	Yes
Impervious Cover Minimization	Prevention and reduction	Prevention	Available	Limited	No
Earthwork Minimization	Prevention	Prevention	Emerging	Limited	Yes
Erosion and Sediment Control	Prevention and reduction	Prevention and removal	Available	Limited	Yes
Reforestation and Soil Conservation	Prevention and reduction	Prevention and removal	Emerging	None	No
Pollution Prevention SCMs for Hotspots	NA	Prevention	Emerging	Very few	No
Runoff Volume Reduction—Rainwater harvesting	Reduction	NA	Emerging	Limited	Yes
Runoff Volume Reduction—Vegetated (Green Roofs, Bioretention, Bioinfiltration, Bioswales)	Reduction and some peak attenuation	Removal	Available	Limited	Emerging
Runoff Volume Reduction—Subsurface (Infiltration Trenches, Pervious Pavements)	Reduction and some peak attenuation	Removal	Available	Limited	Yes

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TABLE 5-2 Continued

SCM	Hydrologic Control Objectives	Water Quality Objectives	Available Design Guidance	Performance Studies Available	Defined Maintenance Protocols
Peak Reduction and Runoff Treatment (Stormwater Wetlands, Dry/Wet Ponds)	Peak attenuation	Removal	Available	Adequate	Yes
Runoff Treatment (Sand Filters, Manufactured Devices)	None	Removal	Emerging	Adequate—sand filters Limited—manufactured devices	Yes
Aquatic Buffers and Managed Floodplains	NA	Prevention and removal	Available	Very few	Emerging
Stream Rehabilitation	NA	Prevention and removal	Emerging	Limited	Unknown
Municipal Housekeeping (Street Sweeping/ Storm-Drain Cleanouts)	NA	Removal	Emerging	Limited	Emerging
Illicit Discharge Detection/ Elimination	NA	Prevention and removal	Available	Very few	No
Stormwater Education	Prevention	Prevention	Available	Very few	Emerging
Residential Stewardship	Prevention	Prevention	Emerging	Very few	No

Note: Nonstructural SCMs are in italics.

Key:		
Hydrologic Objective	Water Quality Objective	Available Design Guidance?
Prevention: Prevents generation of runoff **Reduction:** Reduces volume of runoff **Treatment:** Delays runoff delivery only **Peak Attenuation**: Reduction of peak flows through detention	**Prevention**: Prevents generation, accumulation, or wash-off of pollutants and/or reduces runoff volume **Removal:** Reduces pollutant concentrations in runoff by physical, chemical, or biological means	**Available:** Basic design or implementation guidance is available in most areas of the country are readily available **Emerging:** Design guidance is still under development, is missing in many parts of the country, or requires more performance data
Performance Data Available?	Defined Maintenance Protocol?	Notes:
Very Few: Handful of studies, not enough data to generalize about SCM performance **Limited:** Numerous studies have been done, but results are variable or inconsistent **Adequate**: Enough studies have been done to adequately define performance	**No:** Extremely limited understanding of procedures to maintain SCM in the future **Emerging:** Still learning about how to maintain the SCM **Yes**: Solid understanding of maintenance for future SCM needs	**NA:** Not applicable for the SCM

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The column on the availability of performance data is divided into those SCMs where enough studies have been done to adequately define performance, those SCMs where limited work has been done and the results are variable, and those SCMs where only a handful of studies are available. A large and growing number of performance studies are available that report the efficiencies of structural SCMs in reducing flows and pollutant loading (Strecker et al., 2004; ASCE, 2007; Schueler et al., 2007; Selbig and Bannerman, 2008). Many of these are compiled in the Center for Watershed Protection's National Pollutant Removal Performance Database for Stormwater Treatment Practices (http://www.cwp.org/Resource_Library/Center_Docs/SW/bmpwriteup_092007_v3.pdf), in the International Stormwater BMP Database (http://www.bmp-database.org/Docs/Performance%20Summary%20June%202008.pdf), and by the Water Environment Research Foundation (WERF, 2008). In cases where there is incomplete understanding of their performance, often information can be gleaned from other fields including agronomy, forestry, petroleum exploration, and sanitary engineering. Current research suggests that it is not a question if whether structural SCMs "work" but more of a question of to what degree and with what longevity (Heasom et al., 2006; Davis et al., 2008; Emerson and Traver, 2008). There is considerably less known about the performance of nonstructural practices for stormwater treatment, partly because their application has been uneven around the country and it remains fairly low in comparison to structural stormwater practices.

Finally, defined maintenance protocols for SCMs can be nonexistent, emerging, or fully available. SCMs differ widely in the extent to which they can be considered permanent solutions. For those SCMs that work on the individual site scale on private property, such as rain gardens, local stormwater managers may be reluctant to adopt such practices due to concerns about their ability to enforce private landowners to conduct maintenance over time. Similarly, those SCMs that involve local government decisions (such as education, residential stewardship practices, zoning, or street sweeping) may be less attractive because governments are likely to change over time.

The following sections contain more detailed information about the individual SCMs listed in Tables 5-1 and 5-2, including the operating unit processes, the pollutants treated, the typical performance for both runoff and pollutant reduction, the strengths and weaknesses, maintenance and inspection requirements, and the largest sources of variability and uncertainty.

Product Substitution

Product substitution refers to the classic pollution prevention approach of reducing the emissions of pollutants available for future wash-off into stormwater runoff. The most notable example is the introduction of unleaded gasoline, which resulted in an order-of-magnitude reduction of lead levels in stormwater runoff in a decade (Pitt et al., 2004a,b). Similar reductions are expected with the

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phase-out of methyl tert-butyl ether (MTBE) additives in gasoline. Other examples of product substitution are the ban on coal-tar sealants during parking lot renovation that has reduced PAH runoff (Van Metre et al., 2006), phosphorus-free fertilizers that have measurably reduced phosphorus runoff to Minnesota lakes (Barten and Johnson, 2007), the painting of galvanized metal surfaces, and alternative rooftop surfaces (Clark et al., 2005). Given the importance of coal power plant emissions in the atmospheric deposition of nitrogen and mercury, it is possible that future emissions reductions for such plants may result in lower stormwater runoff concentrations for these two pollutants.

The level of control afforded by product substitution is quite high if major reductions in emissions or deposition can be achieved. The difficulty is that these reductions require action in another environmental regulatory arena, such as air quality, hazardous waste, or pesticide regulations, which may not see stormwater quality as a core part of their mission.

Watershed and Land-Use Planning

Communities can address stormwater problems by making land-use decisions that change the location or quantity of impervious cover created by new development. This can be accomplished through zoning, watershed plans, comprehensive land-use plans, or Smart Growth incentives.

The unit process that is managed is the amount of impervious cover, which is strongly related to various residential and commercial zoning categories (Cappiella and Brown, 2000). Numerous techniques exist to forecast future watershed impervious cover and its probable impact on the quality of aquatic resources (see the discussion of the Impervious Cover Model in Chapter 3; CWP, 1998a; MD DNR, 2005). Using these techniques and simple or complex simulation models, planners can estimate stormwater flows and pollutant loads through the watershed planning process and alter the location or intensity of development to reduce them.

The level of control that can be achieved by watershed and land-use planning is theoretically high, but relatively few communities have aggressively exercised it. The most common application of downzoning has been applied to watersheds that drain to drinking water reservoirs (Kitchell, 2002). The strength of this practice is that it has the potential to directly address the underlying causes of the stormwater problem rather than just treating its numerous symptoms. The weakness is that local decisions on zoning and Smart Growth are reversible and often driven by other community concerns such as economic development, adequate infrastructure, and transportation. In addition, powerful consumer and market forces often have promoted low-density sprawl development. Communities that use watershed-based zoning often require a compelling local environmental goal, since state and federal regulatory authorities have traditionally been extremely reluctant to interfere with the local land-use and zoning powers.

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Conservation of Natural Areas

Natural-area conservation protects natural features and environmental resources that help maintain the predevelopment hydrology of a site by reducing runoff, promoting infiltration, and preventing soil erosion. Natural areas are protected by a permanent conservation easement prescribing allowable uses and activities on the parcel and preventing future development. Examples include any areas of undisturbed vegetation preserved at the development site, including forests, wetlands, native grasslands, floodplains and riparian areas, zero-order stream channels, spring and seeps, ridge tops or steep slopes, and stream, wetland, or shoreline buffers. In general, conservation should maximize contiguous area and avoid habitat fragmentation.

While natural areas are conserved at many development sites, most of these requirements are prompted by other local, state, and federal habitat protections, and are not explicitly designed or intended to provide runoff reduction and stormwater treatment. To date, there are virtually no data to quantify the runoff reduction and/or pollutant removal capability of specific types of natural area conservation, or the ability to explicitly link them to site design.

Impervious Cover Reduction

A variety of practices, some of which fall under the broader term "better site design," can be used to minimize the creation of new impervious cover and disconnect or make more permeable the hard surfaces that are needed (Nichols et al., 1997; Richman, 1997; CWP, 1998a). A list of some common impervious cover reduction practices for both residential and commercial areas is provided below.

<u>Elements of Better Site Design: Single-Family Residential</u>

- Maximum residential street width
- Maximum street right-of-way width
- Swales and other stormwater practices can be located within the right-of-way
- Maximum cul-de-sac radius with a bioretention island in the center
- Alternative turnaround options such as hammerheads are acceptable if they reduce impervious cover
- Narrow sidewalks on one side of the street (or move pedestrian pathways away from the street entirely)
- Disconnect rooftops from the storm-drain systems
- Minimize driveway length and width and utilize permeable surfaces
- Allow for cluster or open-space designs that reduce lot size or setbacks in exchange for conservation of natural areas
- Permeable pavement in parking areas, driveways, sidewalks, walkways, and patios

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Elements of Better Site Design: Multi-Family Residential and Commercial

- Design buildings and parking to have multiple levels
- Store rooftop runoff in green roofs, foundation planters, bioretention areas, or cisterns
- Reduce parking lot size by reducing parking demand ratios and stall dimensions
- Use landscaping areas, tree pits, and planters for stormwater treatment
- Use permeable pavement over parking areas, plazas, and courtyards

CWP (1998a) recommends minimum or maximum geometric dimensions for subdivisions, individual lots, streets, sidewalks, cul-de-sacs, and parking lots that minimize the generation of needless impervious cover, based on a national roundtable of fire safety, planning, transportation and zoning experts. Specific changes in local development codes can be made using these criteria, but it is often important to engage as many municipal agencies that are involved in development as possible in order to gain consensus on code changes.

At the present time, there is little research available to define the runoff reduction benefits of these practices. However, modeling studies consistently show a 10 to 45 percent reduction in runoff compared to conventional development (CWP, 1998b,c, 2002). Several monitoring studies have documented a major reduction in stormwater runoff from development sites that employ various forms of impervious cover reduction and LID in the United States and Australia (Coombes et al., 2000; Philips et al., 2003; Cheng et al., 2005) compared to those that do not.

Unfortunately, better site design has been slowly adopted by local planners, developers, designers, and public works officials. For example, although the project pictured in Figure 5-6 has been very successful in terms of controlling stormwater, the better-site-design principles used have not been widely adopted in the Seattle area. Existing local development codes may discourage or even prohibit the application of environmental site design practices, and many engineers and plan reviewers are hesitant to embrace them. Impervious cover reduction must be incorporated at the earliest stage of site layout and design to be effective, but outdated development codes in many communities can greatly restrict the scope of impervious cover reduction (see Chapter 2). Finally, the performance and longevity of impervious cover reduction are dependent on the infiltration capability of local soils, the intensity of development, and the future management actions of landowners.

Earthwork Minimization

This source control measure seeks to limit the degree of clearing and grading on a development site in order to prevent soil compaction, conserve soils, prevent erosion from steep slopes, and protect zero-order streams. This is accomplished by (1) identifying key soils, drainage features, and slopes to protect

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FIGURE 5-6 110th Street, Seattle, part of the Natural Drainage Systems Project. This location exhibits several elements of impervious cover reduction. In particular, vegetated swales were installed and curbs and gutters removed. There are sidewalks on only one side of the street, and they are separated from the road by the swales. The residences' rooftops have been disconnected from the storm-drain systems and are redirected into the swales. SOURCE: Seattle Public Utilities.

and then (2) establishing a limit of disturbance where construction equipment is excluded. This element is an important, but often under-utilized component of local erosion and sediment control plans.

Numerous researchers have documented the impact of mass grading, clearing, and the passage of construction equipment on the compaction of soils, as measured by increase in bulk density, declines in soil permeability, and increases in the runoff coefficient (Lichter and Lindsey, 1994; Legg et al., 1996; Schueler, 2001a,b; Gregory et al., 2006). Another goal of earthwork minimization is to protect zero-order streams, which are channels with defined banks that emanate from a hollow or ravine with convergent contour lines (Gomi et al., 2002). They represent the uppermost definable channels that possess temporary or intermittent flow. Functioning zero-order channels provide major watershed functions, including groundwater recharge and discharge (Schollen et al., 2006; Winter, 2007), important nutrient storage and transformation functions (Bernot and Dodds, 2005; Groffman et al., 2005), storage and retention of eroded hillslope sediments (Meyers, 2003), and delivery of leaf inputs and large woody debris. Compared to high-order network streams, zero-order streams are disproportionately disturbed by mass grading, enclosure, or channelization (Gomi et al., 2002; Meyer, 2003).

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The practice of earthwork minimization is not widely applied across the country. This is partly due to the limited performance data available to quantify its benefits, and the absence of local or national design guidance or performance benchmarks for the practice.

Erosion and Sediment Control

Erosion and sediment control predates much of the NPDES stormwater permitting program. It consists of the temporary installation and operation of a series of structural and nonstructural practices throughout the entire construction process to minimize soil erosion and prevent off-site delivery of sediment. Because construction is expected to last for a finite and short period of time, the design standards are usually smaller and thus riskier (25-year versus the 100-year storm). By phasing construction, thereby limiting the exposure of bare earth at any one time, the risk to the environment is reduced significantly.

The basic practices include clearing limits, dikes, berms, temporary buffers, protection of drainage-ways, soil stabilization through hydroseeding or mulching, perimeter controls, and various types of sediment traps and basins. All plans have some component that requires filtration of runoff crossing construction areas to prevent sediment from leaving the site. This usually requires a sediment collection system including, but not limited to, conventional settling ponds and advanced sediment collection devices such as polymer-assisted sedimentation and advanced sand filtration. Silt fences are commonly specified to filter distributed flows, and they require maintenance and replacement after storms as shown in Figure 5-7. Filter systems are added to inlets until the streets are paved and the surrounding area has a cover of vegetation (Figure 5-8). Sedimentation basins (Figure 5-9) are constructed to filter out sediments through rock filters, or are equipped with floating skimmers or chemical treatment to settle out pollutants. Other common erosion and sediment control measures include temporary seeding and rock or rigged entrances to construction sites to remove dirt from vehicle tires (see Figure 5-10).

Control of the runoff's erosive potential is a critical element. Most erosion and sediment control manuals provide design guidance on the capacity and ability of swales to handle runoff without eroding, on the design of flow paths to transport runoff at non-erosive velocities, and on the dissipation of energy at pipe outlets. Examples include rock energy dissipaters, level spreaders (see Figure 5-11), and other devices.

Box 5-3 provides a comprehensive list of recommended construction SCMs. The reader is directed to reviews by Brown and Caraco (1997) and Shaver et al. (2007) for more information. Although erosion and sediment control practices are temporary, they require constant operation and maintenance during the complicated sequence of construction and after major storm events. It is exceptionally important to ensure that practices are frequently inspected and repaired and that sediments are cleaned out. Erosion and sediment control are

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FIGURE 5-7 A functioning silt fence (top) and an improperly maintained silt fence (bottom). SOURCES: Top, EPA NPDES Menu of BMPs (available at http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=factsheet_results&view=specific&bmp=56) and, bottom, Robert Traver, Villanova University.

FIGURE 5-8 Sediment filter left in place after construction. SOURCE: Robert Traver, Villanova University.

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FIGURE 5-9 Sediment basin. SOURCE: EPA NPDES Menu of BMPs (available at http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=factsheet_results&vew=specific&bmp=56).

FIGURE 5-10 Rumble strips to remove dirt from vehicle tires. SOURCE: Laura Ehlers, National Research Council.

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FIGURE 5-11 Level spreader. SOURCE: Robert Traver, Villanova University.

BOX 5-3
Recommended Construction Stormwater Control Measures

1. As the top priority, emphasize construction management SCMs as follows:
   - Maintain existing vegetation cover, if it exists, as long as possible.
   - Perform ground-disturbing work in the season with smaller risk of erosion, and work off disturbed ground in the higher risk season.
   - Limit ground disturbance to the amount that can be effectively controlled in the event of rain.
   - Use natural depressions and planning excavation to drain runoff internally and isolate areas of potential sediment and other pollutant generation from draining off the site, so long as safe in large storms.
   - Schedule and coordinate rough grading, finish grading, and erosion control application to be completed in the shortest possible time overall and with the shortest possible lag between these work activities.

2. Stabilize with cover appropriate to site conditions, season, and future work plans. For example:
   - Rapidly stabilize disturbed areas that could drain off the site, and that will not be worked again, with permanent vegetation supplemented with highly effective temporary erosion controls until achievement of at least 90 percent vegetative soil cover.
   - Rapidly stabilize disturbed areas that could drain off the site, and that will not be worked again for more than three days, with highly effective temporary erosion controls.
   - If at least 0.1 inch of rain is predicted with a probability of 40 percent or more, before rain falls stabilize or isolate disturbed areas that could drain off the site, and that are being actively worked or will be within three days, with measures that will prevent or minimize transport of sediment off the property.

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BOX 5-3 Continued

3. As backup for cases where all of the above measures are used to the maximum extent possible but sediments still could be released from the site, consider the need for sediment collection systems including, but not limited to, conventional settling ponds and advanced sediment collection devices such as polymer-assisted sedimentation and advanced sand filtration.

4. Specify emergency stabilization and/or runoff collection (e.g., using temporary depressions) procedures for areas of active work when rain is forecast.

5. If runoff can enter storm drains, use a perimeter control strategy as backup where some soil exposure will still occur, even with the best possible erosion control (above measures) or when there is discharge to a sensitive waterbody.

6. Specify flow control SCMs to prevent or minimize to the extent possible:
- Flow of relatively clean off-site water over bare soil or potentially contaminated areas;
- Flow of relatively clean intercepted groundwater over bare soil or potentially contaminated areas;
- High velocities of flow over relatively steep and/or long slopes, in excess of what erosion control coverings can withstand; and
- Erosion of channels by concentrated flows, by using channel lining, velocity control, or both.

7. Specify stabilization of construction entrance and exit areas, provision of a nearby tire and chassis wash for dirty vehicles leaving the site with a wash water sediment trap, and a sweeping plan.

8. Specify construction road stabilization.

9. Specify wind erosion control.

10. Prevent contact between rainfall or runoff and potentially polluting construction materials, processes, wastes, and vehicle and equipment fluids by such measures as enclosures, covers, and containments, as well as berming to direct runoff.

widely applied in many communities, and most states have some level of design guidance or standards and specifications. Nonetheless, few communities have quantified the effectiveness of a series of construction SCMs applied to an individual site, nor have they clearly defined performance benchmarks for individual practices or their collective effect at the site. In general, there has been little monitoring in the past few decades to characterize the performance of construction SCMs, although a few notable studies have been recently published (e.g., Line and White, 2007). Box 5-4 describes the effectiveness of filter fences and filter fences plus grass buffers to reduce sediment loadings from construction activities and the resulting biological impacts.

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BOX 5-4
Receiving Water Impacts Associated with Construction Site Discharges

The following is a summary of a recent research project that investigated in-stream biological conditions downstream of construction sites having varying levels of erosion controls (none, the use of filter fences, and filter fences plus grass buffers) for comparison. The project title is *Studies to Evaluate the Effectiveness of Current BMPs in Controlling Stormwater Discharges from Small Construction Sites* and was conducted for the Alabama Water Resources Research Institute, Project 2001AL4121B, by Drs. Robert Angus, Ken Marion, and Melinda Lalor of the University of Alabama at Birmingham. The initial phase of the project, described below, was completed in 2002 (Angus et al., 2002). While this case study is felt to be representative of many sites across the United States, there are other examples of where silt fences have been observed to be more effective (e.g., Barrett et al., 1998).

Methods

This study was conducted in the upper Cahaba River watershed in north central Alabama, near Birmingham. The study areas had the following characteristics. (1) Topography and soil types representative of the upland physiographic regions in the Southeast (i.e., southern Appalachian and foothill areas); thus, findings from this study should be relevant to a large portion of the Southeast. (2) The rainfall amounts and intensities in this region are representative of many areas of the Southeast and (3) the expanding suburbs of the Birmingham metropolitan area are rapidly encroaching upon the upper Cahaba River and its tributaries. Stormwater runoff samples were manually collected from sheet flows above silt fences, and from points below the fence within the vegetated buffer. Water was sampled during "intense" (≥1 inch/hour) rain events. The runoff samples were analyzed for turbidity, particle size distribution (using a Coulter Counter Multi-Sizer IIe), and total solids (dissolved solids plus suspended/non-filterable solids). Sampling was only carried out on sites with properly installed and well-maintained silt fences, located immediately upgrade from areas with good vegetative cover.

Six tributary or upper mainstream sites were studied to investigate the effects of sedimentation from construction sites on both habitat quality and the biological "health" of the aquatic ecosystem (using benthic macroinvertebrates and fish). EPA's Revision to Rapid Bioassessment Protocols for Use in Streams and Rivers was used to assess the habitat quality at the study sites. Each site was assessed in the spring to evaluate immediate effects of the sediment, and again during the following late summer or early fall to evaluate delayed effects.

Results

Effectiveness of Silt Fences. Silt fences were found to be better than no control measures at all, but not substantially. The mean counts of small particles (<5 μm) below the silt fences were about 50 percent less than that from areas with no erosion control measures, even though the fences appeared to be properly installed and in good order. However, the variabilities were large and the difference between the means was not statistically significant. For every variable measured, the mean values of samples taken below silt fences were significantly higher ($p < 0.001$) than samples collected from undisturbed vegetated control sites collected nearby and at the same time. These data therefore indicate that silt fences are only marginally effective at reducing soil particulates in runoff water.

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Effectiveness of Filter Fences with Vegetated Buffers. Runoff samples were also collected immediately below filter fences, and below filter fences after flow over buffers having 5, 10, and 15 feet of dense (intact) vegetation. Mean total solids in samples collected below silt fences and a 15-foot-wide vegetated buffer zone were about 20 percent lower, on average, than those samples collected only below the silt fence. The installation of filter fences above an intact, good vegetated buffer removes sediment from construction site runoff more effectively than with the use of filter fences alone.

Biological Metrics Sensitive to Sedimentation Effects (Fish). Analysis of the fish biota indicates that various metrics used to evaluate the biological integrity of the fish community also are affected by highly sedimented streams. As shown in Figure 5-12, the overall composition of the population, as quantified by the Index of Biotic Integrity (IBI) is lower; the proportion and biomass of darters, a disturbance-sensitive group, is lower; the proportion and biomass of sunfish is higher; the Shannon-Weiner diversity index is lower; and the number of disturbance-tolerant species is higher as mean sediment depth increases.

Benthic Macroinvertebrates. A number of stream benthic macroinvertebrate community characteristics were also found to be sensitive to sedimentation. Metrics based on these characteristics differ greatly between sediment-impacted and control sites (Figure 5-13). Some of the metrics that appear to reflect sediment-associated stresses include the Hilsenhoff Biotic Index (HBI), a variation of the EPT index (percent EPT minus Baetis), and the Sorensen Index of Similarity to a reference site. The HBI is a weighted mean tolerance value; high HBI values indicate sites dominated by disturbance-tolerant macroinvertebrate taxa. The EPT% index is the percent of the collection represented by organisms in the generally disturbance-sensitive orders *Ephemeroptera, Plecoptera,* and *Trichoptera*. Specimens of the genus *Baetis* were not included in the index as they are relatively disturbance-tolerant. The HBI and the EPT indices also show positive correlations to several other measures of disturbance, such as percent of the watershed altered by development.

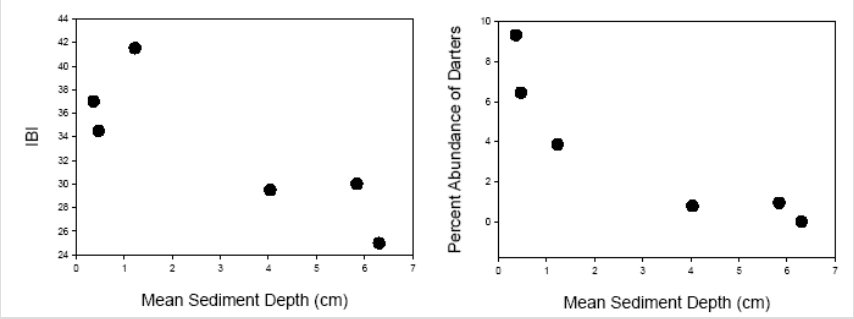

FIGURE 5-12 Association between two fish metrics and amount of stream sediment. NOTE: The IBI is based on numerous characteristics of the fish population. The percent relative abundance of darters is the percentage of darters to all the fish collected at a site. SOURCE: Angus et al. (2002).

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BOX 5-4 Continued

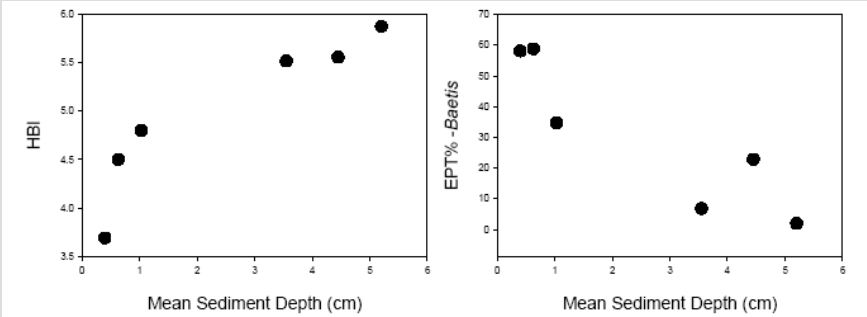

FIGURE 5-13 Associations between two macroinvertebrate metrics and the amount of stream sediment. SOURCE: Angus et al. (2002).

Reforestation and Soil Compost Amendments

This set of practices seeks to improve the quality of native vegetation and soils present at the site. Depending on the ecoregion, this may involve forest, prairie, or chapparal plantings, tilling, and amending compacted soils to improve their hydrologic properties.

The goal is to maintain as much predevelopment hydrologic function at a development site as possible by retaining canopy interception, duff/soil layer interception, evapotranspiration, and surface infiltration. The basic methods to implement this practice are described in Cappiella et al. (2006), Pitt et al. (2005), Chollak and Rosenfeld (1998), and Balusek (2003).

At this time, there are few monitoring data to assess the degree to which land reforestation or soil amendments can improve the quality of stormwater runoff at a particular development site, apart from the presumptive watershed research that has shown that forests with undisturbed soils have very low rates of surface runoff and extremely low levels of pollutants in runoff (Singer and Rust, 1975; Johnson et al., 2000; Chang, 2006). More data are needed on the hydrologic properties of urban forests and soils whose ecological functions are stressed or degraded by the urbanization process (Pouyat et al., 1995, 2007).

Pollution Prevention SCMs for Stormwater Hotspots

Certain classes of municipal and industrial operations are required to maintain a series of pollution prevention practices to prevent or minimize contact of pollutants with rainfall and runoff. Pollution prevention practices involve a wide range of operational practices at a site related to vehicle repairs, fueling, washing and storage, loading and unloading areas, outdoor storage of materials, spill prevention and response, building repair and maintenance, landscape and

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turf management, and other activities that can introduce pollutants into the stormwater system (CWP, 2005). Training of personnel at the affected area is needed to ensure that industrial and municipal managers and employees understand and implement the correct stormwater pollution prevention practices needed for their site or operation.

Examples of municipal operations that may need pollution prevention plans include public works yards, landfills, wastewater treatment plants, recycling and solid waste transfer stations, maintenance depots, school bus and fleet storage and maintenance areas, public golf courses, and ongoing highway maintenance operations. The major industrial categories that require stormwater pollution prevention plans were described in Table 2-3. Both industrial and municipal operations must develop a detailed stormwater pollution prevention plan, train employees, and submit reports to regulators. Compliance has been a significant issue with this program in the past, particularly for small businesses (Duke and Augustenberg, 2006; Cross and Duke, 2008) Recently filed investigations of stormwater hotspots indicate many of these operations are not fully implementing their stormwater pollution prevention plans, and a recent GAO report (2007) indicates that state inspections and enforcement actions are extremely rare.

The goal of pollution prevention is to prevent contact of rainfall or stormwater runoff with pollutants, and it is an important element of the post-construction stormwater plan. However, with the exception of a few industries such as auto salvage yards (Swamikannu, 1994), basic research is lacking on how much greater event mean concentrations are at municipal and industrial stormwater hotspots compared to other urban land uses. In addition, little is presently known about whether aggressive implementation of stormwater pollution prevention plans actually can reduce stormwater pollutant concentrations at hot spots.

Runoff Volume Reduction—Rainwater Harvesting

A primary goal of stormwater management is to reduce the volume of runoff from impervious surfaces. There are several classes of SCMs that can achieve this goal, including rainwater harvesting systems, vegetated SCMs that evapotranspirate part of the volume, and infiltration SCMs. For all of these measures, the amount of runoff volume to be captured depends on watershed goals, site conditions including climate, upstream nonstructural practices employed, and whether the chosen SCM is the sole management measure or part of a treatment train. Generally, runoff-volume-reduction SCMs are designed to handle at least the first flush from impervious surfaces (1 inch of rainfall). In Pennsylvania, control of the 24-hour, two-year storm volume (about 8 cm) is considered the standard necessary to protect stream-channel geomorphology, while base flow recharge and the first flush can be addressed by capturing a much smaller volume of rain (1–3 cm). Where both goals must be met, the designer is permitted to either oversize the volume reduction device to control the

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larger volume, or build a smaller device and use it in series with an extended detention basin to protect the stream geomorphology (PaDEP, 2006). Some designers have reported that in areas with medium to lower percentage impervious surfaces they are able to control up to the 100-year storm by enlarging runoff-volume-reduction SCMs and using the entire site. In retrofit situations, capture amounts as small as 1 cm are a distinct improvement. It should be noted that there are important, although indirect, water quality benefits of all runoff-volume-reduction SCMs—(1) the reduction in runoff will reduce streambank erosion downstream and the concomitant increases in sediment load, and (2) volume reductions lead to pollutant load reductions, even if pollutant concentrations in stormwater are not decreased.

Rainwater harvesting systems refer to use of captured runoff from roof tops in rain barrels, tanks, or cisterns (Figures 5-14 and 5-15). This SCM treats runoff as a resource and is one of the few SCMs that can provide a tangible economic benefit through the reduction of treated water usage. Rainwater harvesting systems have substantial potential as retrofits via the use of rain barrels or cisterns that can replace lawn or garden sprinkling systems. Use of this SCM to provide gray water within buildings (e.g., for toilet flushing) is considerably more complicated due to the need to construct new plumbing and obtain the necessary permits.

FIGURE 5-14 Rainwater harvesting tanks at a Starbucks in Austin, Texas. SOURCE: Laura Ehlers, National Research Council.

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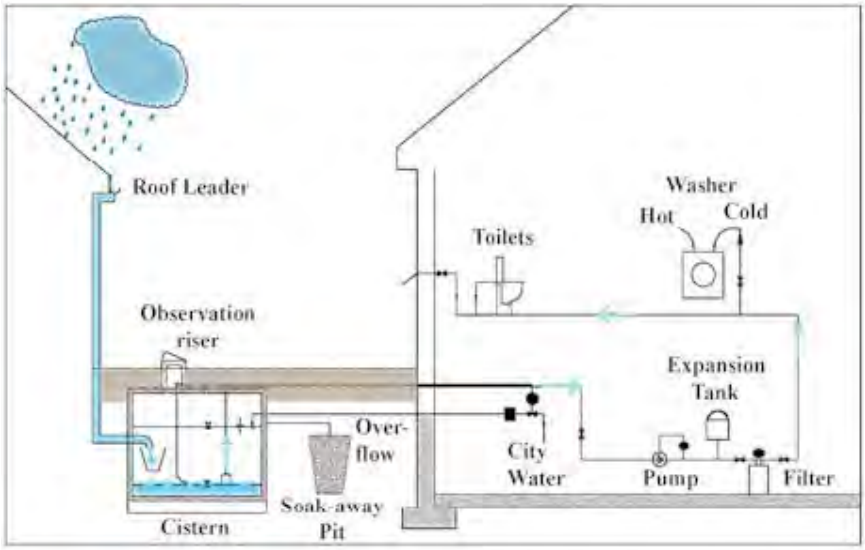

FIGURE 5-15 A Schematic of rainwater harvesting. SOURCE: PaDEP (2006).

The greatest challenge with these systems is the need to use the stored water and avoid full tanks, since these cannot be responsive in the event of a storm. That is, these SCMs are effective only if the captured runoff can be regularly used for some grey water usage, like car washing, toilet flushing, or irrigation systems (golf courses, landscaping, nurseries). In some areas it might be possible to use the water for drinking, showering, or washing, but treatment to potable water quality would be required. Sizing of the required storage is dependent on the climate patterns, the amount of impervious cover, and the frequency of water use. Areas with frequent rainfall events require less storage as long as the water is used regularly, while areas with cold weather will not be able to utilize the systems for irrigation in the winter and thus require larger storage.

One substantial advantage of these systems is their ability to reduce water costs for the user and the ability to share needs. An example of this interaction is the Pelican Hill development in Irvine, California, where excess runoff from the streets and houses is collected in enormous cisterns and used for watering of a nearby golf course. Furthermore, compared to other SCMs, the construction of rainwater harvesting facilities provide a long-term benefit with minimal maintenance cost, although they do require an upfront investment for piping and storage tanks.

Coombes et al. (2000) found that rainwater harvesting achieved a 60 to 90 percent reduction in runoff volume; in general, few studies have been conducted to determine the performance of these SCMs. It should be noted that rainwater harvesting systems do collect airborne deposition and acid rain.

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Runoff Volume Reduction—Vegetated

A large and very promising class of SCMs includes those that use infiltration and evapotranspiration via vegetation to reduce the volume of runoff. These SCMs also directly address water quality of both surface water and groundwater by reducing streambank erosion, capturing suspended solids, and removing other pollutants from stormwater during filtration through the soil (although the extent to which pollutants are removed depends on the specific pollutant and the local soil chemistry). Depending on their design, these SCMs can also reduce peak flows and recharge groundwater (if they infiltrate). These SCMs can often be added as retrofits to developed areas by installing them into existing lawns, rights of way, or traffic islands. They can add beauty and property value.

Flow volume is addressed by this SCM group by first capturing runoff, creating a temporary holding area, and then removing the stored volume through infiltration and evapotranspiration. Examples include bioswales, bioretention, rain gardens, green roofs, and bioinfiltration. Swales refer to grassy areas on the side of the road that convey drainage. These were first designed to move runoff away from paved areas, but can now be designed to achieve a certain contact time with runoff so as to promote infiltration and pollutant removal (see Figure 5-16). Bioretention generally refers to a constructed sand filter with soil and vegetation growing on top to which stormwater runoff from impervious surfaces is directed (Figure 5-17). The original rain garden or bioretention facilities were constructed with a fabric at the bottom of the prepared soil to prevent infiltration and instead had a low-level outflow at the bottom. Green roofs (Figure 5-18) are very similar to bioretention SCMs. They tend to be populated with a light expanded shale-type soil and succulent plants chosen to survive wet and dry periods. Finally, bioinfiltration is similar to bioretention but is better engineered to achieve greater infiltration (Figure 5-19). All of these devices are usually at the upper end of a treatment train and designed for smaller storms, which minimizes their footprint and allows for incorporation within existing infrastructure (such as traffic control devices and median strips). This allows for distributed treatment of the smaller volumes and distributed volume reduction.

These SCMs work by capturing water in a vegetated area, which then infiltrates into the soil below. They are primarily designed to use plant material and soil to evapotranspirate the runoff over several days. A shallow depth of ponding is required, since the inflows may exceed the possible infiltration ability of the native soil. This ponding is maintained above an engineered sandy soil mixture and is a surface-controlled process (Hillel, 1998). Early in the storm, the soil moisture potential creates a suction process that helps draw water into the SCM. This then changes to a steady rate that is "practically equal to the saturated hydraulic conductivity" of the subsurface (Hillel, 1998). The hydrologic design goal should be to maximize the volume of water that can be held in the soil, which necessitates consideration of the soil hydraulic conductivity (which varies with temperature), climate, depth to groundwater, and time to drain.

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FIGURE 5-16 Vegetated swale. SOURCE: PaDEP (2006).

FIGURE 5-17 Bioretention during a storm event at the University of Maryland. SOURCE: Reprinted, with permission, from Davis et al. (2008). Copyright 2008 by the American Society of Civil Engineers.

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FIGURE 5-18 City Hall in the center of Chicago's downtown was retrofitted with a green roof to reduce the heat island effect, remove airborne pollutants, and attenuate stormwater flows as a demonstration of innovative stormwater management in an ultra-urban setting. SOURCE: Courtesy of the Conservation Design Forum.

FIGURE 5-19 Retrofit bioinfiltration at Villanova University immediately following a storm event. SOURCE: Robert Traver, Villanova University.

Usually these devices are designed to empty between 24 and 72 hours after a storm event. In some cases (usually bioretention), these SCMs have an underdrain.

The choice of vegetation is an important part of the design of these SCMs. Many sites where infiltration is desirable have highly sandy soils, and the vegetation has to be able to endure both wet and dry periods. Long root growths are desired to promote infiltration (Barr Engineering Co., 2001), and plants that attract birds can reduce the insect population. Bioretention cells may be wet for

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longer periods than bioinfiltration sites, requiring different plants. Denser plantings or "thorns" may be needed to avoid the destruction caused by humans and animals taking shortcuts through the beds.

The pollutant removal mechanism operating for volume-reduction SCMs are different for each pollutant type, soil type, and volume-reduction mechanism. For bioretention and SCMs using infiltration, the sedimentation and filtration of suspended solids in the top layers of the soil are extremely efficient. Several studies have shown that the upper layers of the soil capture metals, particulate nutrients, and carbon (Pitt, 1996; Deschesne et al., 2005; Davis et al., 2008). The removal of dissolved nutrients from stormwater is not as straightforward. While ammonia is caught by the top organic layer, nitrate is mobile in the soil column. Some bioretention systems have been built to hold water in the soil for longer periods in order to create anaerobic conditions that would promote denitrification (Hunt and Lord, 2006a). Phosphorus removal is related to the amount of phosphorus in the original soil. Some studies have shown that bioretention cells built with agricultural soils increased the amount of phosphorus released. Chlorides pass through the system unchecked (Ermilio and Traver, 2006), while oils and greases are easily removed by the organic layer. Hunt et al. (2008) have reported in studies in North Carolina that the drying cycle appears to kill off bacteria. Temperature is not usually a concern as most storms do not overflow these devices. Green roofs collect airborne deposition and acid rain and may export nutrients when they overflow. However, this must be tempered by the fact that in larger storms, most natural lands would produce nutrients.

A group of new research studies from North America and Australia have demonstrated the value of many of these runoff-volume-reduction practices to replicate predevelopment hydrology at the site. The results from 10 recent studies are given in Table 5-3, which shows the runoff reduction capability of bioretention. As can be seen, the reduction in runoff volume achieved by these practices is impressive—ranging from 20 to 99 percent with a median reduction of about 75 percent. Box 5-5 discusses the excellent performance of the bioswales installed during Seattle's natural drainage systems project (see also Horner et al., 2003; Jefferies, 2004; Stagge, 2006). Bioinfiltration has been less studied, but one field study concluded that close to 30 percent of the storm volume was able to be removed by bioinfiltration (Sharkey, 2006). A very recent case study of bioinfiltration is provided in Box 5-6, which demonstrates that the capture of small storms through these SCMs is extremely effective in areas where the majority of the rainfall falls in smaller storms.

The strengths of vegetated runoff-volume-reduction SCMs include the flexibility to utilize the drainage system as part of the treatment train. For example, bioswales can replace drainage pipes, green roofs can be installed on buildings, and bioretention can replace parking borders (Figure 5-27), thereby reducing the footprint of the stormwater system. Also, through the use of swales and reducing pipes and inlets, costs can be offset. Vegetated systems are more tolerant of the TSS collected, and their growth cycle maintains pathways for

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TABLE 5-3 Volumetric Runoff Reduction Achieved by Bioretention

Bioretention Design	Location	Runoff Reduction	Reference
Infiltration	CT	99%	Dietz and Clausen (2006)
	PA	86%	Ermilio and Traver (2006)
	FL	98%	Rushton (2002)
	AUS	73%	Lloyd et al. (2002)
Underdrain	ONT	40%	Van Seters et al. (2006)
	Model	30%	Perez-Perdini et al. (2005)
	NC	40 to 60%	Smith and Hunt (2007)
	NC	20 to 29%	Sharkey (2006)
	NC	52 to 56%	Hunt et al. (2008)
	MD	52 to 65%	Davis et al. (2008)

BOX 5-5
Bioswale Case Study 110th Street Cascade, Seattle, Washington

A recent example of the ability of SCMs to accomplish a variety of goals was illustrated for water quality swales in Seattle, Washington. As part of its Natural Drainage Systems Project, the City of Seattle retrofitted several blocks of an urban residential neighborhood with curbside vegetated swales. On NW 110th Street, the two-block-long system was developed as a cascade, due to the steep slope (6 percent). Twelve stepped, in-series biofilters were installed between properties and the road, each of which contains a storage area and an overflow weir. During rain events, the cells were designed to fill before emptying into the cell downstream. The soils in the bottom of each cell were over one foot thick and consisted of river rocks overlain by a swale mix. Native plants were chosen to vegetate the sides of the swale.

Extensive flow and water quality sampling occurred during 2003–2006 at the inflow and outflow of the biofilters as well as at references points elsewhere in the neighborhood that are not served by the new SCMs. Perhaps the most profound observation was that almost 50 percent of all rainfall flowing into the cascade was infiltrated, resulting in a corresponding reduction in runoff. Indeed, the cascade discharged measurable flow only during 49 of 235 storm events during the period. Depending on preceding conditions, the cascade was able to retain all of the flow for storms up to 1 inch in magnitude. In addition to the reduction in runoff affected by the swales, they also achieved significant peak flow reduction, as shown in Figure 5-20. Many peak flow rates were entirely dampened, even those where the inflow peak rate was as high as 0.7 cfs.

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BOX 5-5 Continued

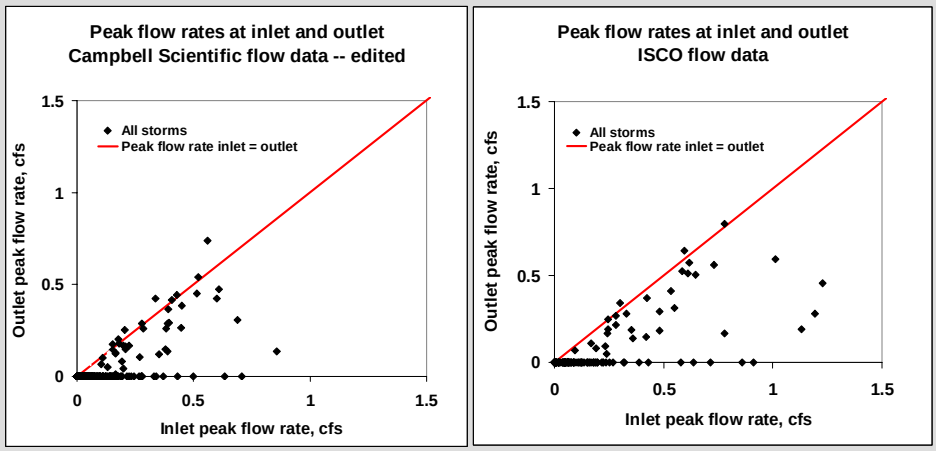

FIGURE 5-20 Peak flow rates at the inlet and outlet of the cascade, as measured by two different devices: Campbell Scientific (left) and ISCO (right). SOURCE: Horner and Chapman (2007).

Water quality data were also extremely encouraging, as shown in Table 5-4. For total suspended solids, influent concentration of 94 mg/L decreased to 29 mg/L at the outlet of the cascade. Similar percent removals were observed for total copper, total phosphorus, total zinc, and total lead (see Table 5-4). Soluble phosphorus concentrations tended to increase from the inflow of the cascade to the outflow.

TABLE 5-4 Typical Outflow Quality from the 110th Street Cascade.

Pollutant	Range (mg/L)
Total Suspended Solids	10–40
Total Nitrogen	0.6–1.4
Total Phosphorus	0.09–0.23
Soluble Reactive Phosphorus	0.02–0.05
Total Copper	0.004–0.008
Dissolved Copper	0.002–0.005
Total Zinc	0.04–0.11
Dissolved Zinc	0.02–0.06
Total Lead	0.002–0.007
Dissolved Lead	<0.001
Motor Oil	0.11–0.33

SOURCE: Horner and Chapman (2007).

Taking both measured concentrations and volume reduction into account, the cascade reduced the mass loadings for the contaminants by 60 percent to greater than 90 percent. As shown in Table 5-5, pollutants associated with sediments were reduced to the greatest extent, while dissolved pollutants were less readily removed.

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BOX 5-5 Continued

TABLE 5-5 Pollutant Mass Loading Reductions at 110th Street Cascade.

Pollutant	Percent Reduction (90% Confidence Interval)
Total Suspended Solids	84 (72–92)
Total Nitrogen	63 (53–74)
Total Phosphorus	63 (49–74)
Total Copper	83 (77–88)
Dissolved Copper	67 (50–78)
Total Zinc	76 (46–85)
Dissolved Zinc	55 (21–70)
Total Lead	90 (84–94)
Motor Oil	92 (86–97)

SOURCE: Horner and Chapman (2007).

This level of performance was compared to other parts of the neighborhood treated with conventional ditch and pipe systems. The concentrations of almost all pollutants at the outlet of the 100th Cascade was significantly lower than a corresponding outlet at 120th Street. Furthermore, the ability of this SCM to attenuate peak flows and reduce runoff was remarkable.

BOX 5-6
SCM Evaluation Through Monitoring: Villanova Bioinfiltration SCM

The Bioinfiltration Traffic Island located on the campus of Villanova University in Southeastern Pennsylvania is part of the Villanova Urban Stormwater Partnership (VUSP) BMP Demonstration Park (see Figure 5-21). Originally funded through the Pennsylvania Growing Greener Program, and now through the State's 319 nonpoint source monitoring program, the site has been monitored continuously since soon after it was constructed in 2001. This monitoring has lead to a wealth of information about the performance and monitoring needs of infiltration SCMs.

FIGURE 5-21 Villanova Bioinfiltration Traffic Island SCM. SOURCE: Reprinted, with permission, from VUSP. Copyright by Villanova Urban Stormwater Partnership.

The SCM is a retrofit of an existing curb-enclosed traffic island in the parking lot of a university dormitory complex. The original grass area was dug out to approximately six feet. The soil removed during the excavation was then mixed with sand onsite to create a 50 percent sand–soil mixture. This soil mixture was then placed back into the excavation to

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BOX 5-6 Continued

a depth of approximately four feet, leaving a surface depression that is an average of two feet deep. Care was taken during construction to prevent any compaction of either the soil mixture or the undisturbed soil below. Placement of the mixed soil is shown in Figure 5-22.

FIGURE 5-22 Placement of the mixed soil in the basin. Notice the construction equipment being kept away from the basin to avoid potential compaction of the sub-base. SOURCE: Reprinted, with permission, from VUSP. Copyright by Villanova Urban Stormwater Partnership.

During construction two curb cuts were created to direct runoff into the SCM. Creation of one of the cuts entailed filling and paving over an existing stormwater inlet to redirect the runoff that previously entered the stormwater drainage system of the parking lot. Another existing inlet was used to collect and redirect runoff into the SCM. Plants were chosen based on their ability to thrive in both extreme wet and dry conditions; the species chosen are commonly found on sand dunes where similar wet/dry conditions may exist.

The contributing watershed is approximately 50,000 square feet and is 52 percent impervious surfaces. The design goal of the SCM was for it to temporarily store the first inch of runoff. The one-inch capture depth is based on an analysis of local historical rainfall data showing that capture of the first inch of each storm would account for approximately 96 percent of the annual rainfall. This capture depth would therefore also account for the majority of the annual pollutant load coming from the drainage area.

Continuous monitoring over multiple years has increased our understanding of how this type of structure operates and its benefits. For example, Heasom et al. (2006) was able to produce a continuous hydrologic flow model of the site based on season. Figure 5-23 shows the variability of the infiltration rate on a seasonal basis, and the relationship between infiltration and temperature (Emerson and Traver, 2008). This work has also shown no statistical change in performance over the five-year monitoring period.

When examining the yearly performance of the site from a surface water standpoint, it is easily shown that on a regular basis approximately 50 to 60 percent of the runoff that reaches the site is removed from the surface waters, and 80 to 85 percent of the rainfall is infiltrated (Figure 5-24).

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BOX 5-6 Continued

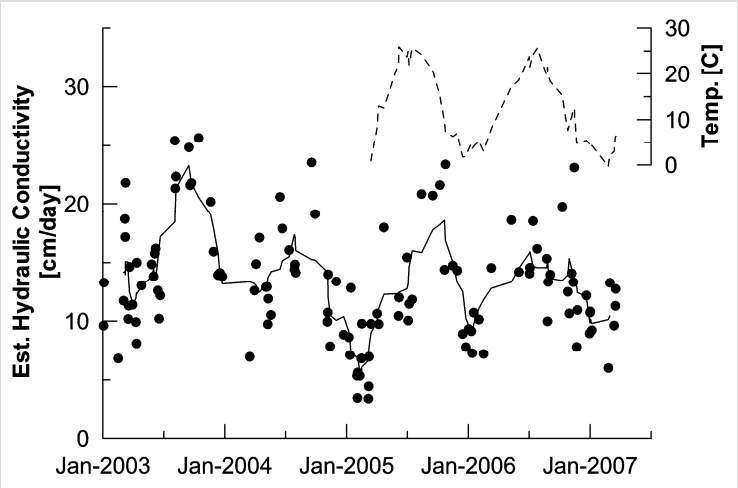

FIGURE 5-23 Seasonal Infiltration Rate. SOURCE: Reprinted, with permission, from Emerson and Traver (2008). Copyright 2008 by Journal of Irrigation and Drainage Engineering.

The performance of the SCM during individual storm events was examined in 2005. Out of 77 rainfall events, overflow was recorded for only seven events. Generally overflow did not occur for rainfalls less than 1.95 inches except for one occasion. As the bowl volume is much less than this value, substantial infiltration must be occurring during the storm event. When one extreme 6-inch storm was recorded (Figure 5-25), it was surprising to note that infiltration occurred all during the storm event, as did some unexpected peak flow reduction. What is even more impressive is to examine the reduction in the duration of flows, which is directly related to downstream channel erosion (Figure 5-26). Clearly the bioinfiltration SCM exceeded its design goals.

Research on this site is currently examining water quality benefits and groundwater interactions. When evaluating the pollutant removal of bioinfiltration, it is critical to consider flow volumes and pollutant levels together. For example, during many of the overflow events, there were higher nutrient levels leaving the SCM than entering due to the plants contained within the SCM. However, when the runoff volume reduction is considered, the total nitrogen and phosphorus removed from the influent is impressive (Davis et al., 2008). Water quality studies of the infiltrated water are still incomplete but generally show some conversion of nitrate to nitrite, and high chlorides from snow melt chemicals moving through the system. Nutrient levels are relatively low in the samples at the 8-foot depth.

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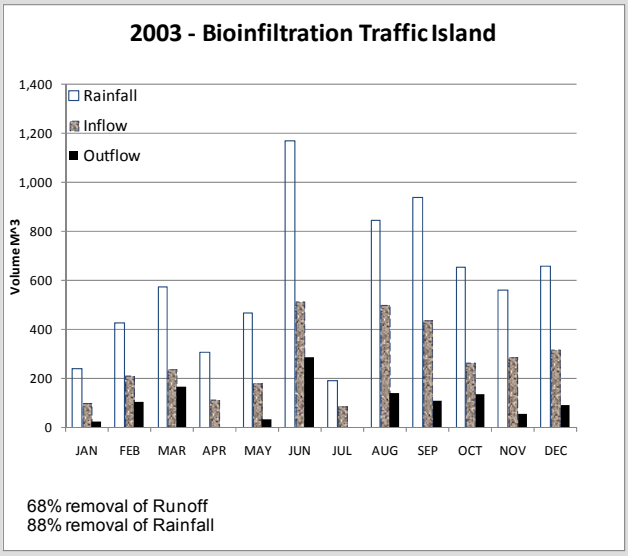

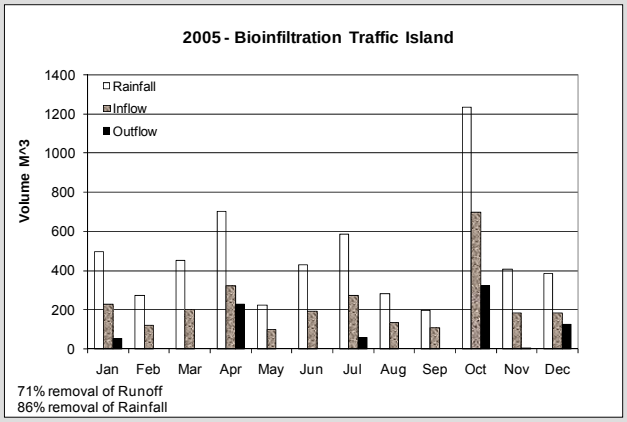

FIGURE 5-24 2003 Performance and 2005 Performance. SOURCE: Reprinted, with permission, from VUSP. Copyright by Villanova Urban Stormwater Partnership.

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BOX 5-6 Continued

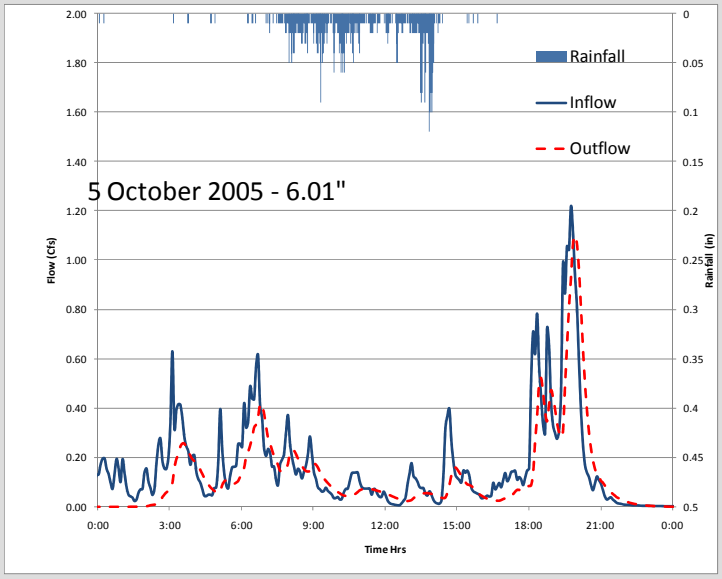

FIGURE 5-25 October 2005 extreme storm event. SOURCE: Reprinted, with permission, from VUSP. Copyright by Villanova Urban Stormwater Partnership.

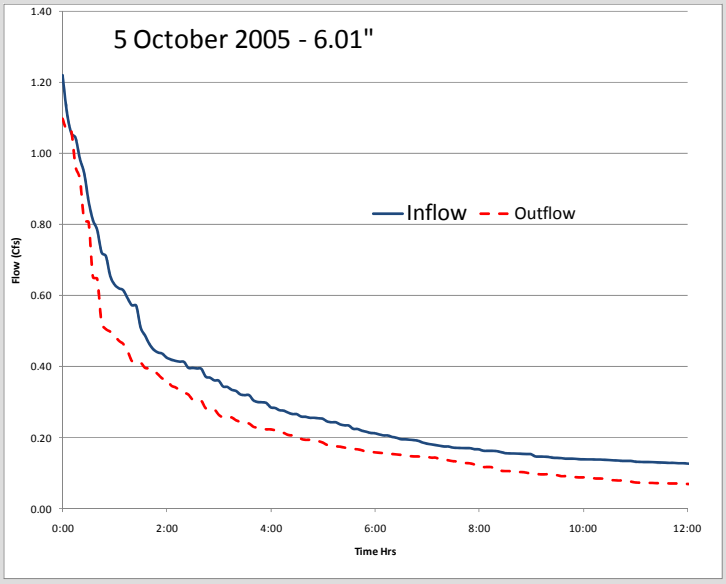

FIGURE 5-26 Flow duration curves, October 2005. SOURCE: Reprinted, with permission, from VUSP. Copyright by Villanova Urban Stormwater Partnership.

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FIGURE 5-27 North Carolina Retrofit Bioretention SCMs. SOURCE: Robert Traver, Villanova University.

infiltration and prevents clogging. Freeze–thaw cycles also contribute to pathway maintenance. The aesthetic appeal of vegetated SCMs is also a significant strength.

Weaknesses include the dependence of these SCMs on native soil infiltration and the need to understand groundwater levels and karst geology, particularly for those SCMs designed to infiltrate. For bioinfiltration and bioretention, most failures occur early on and are caused by sedimentation and construction errors that reduce infiltration capacity, such as stripping off the topsoil and compacting the subsurface. Once a good grass cover is established in the contributing area, the danger of sedimentation is reduced. Nonetheless, the need to prevent sediment from overwhelming these structures is critical. The longevity of these SCMs and their vulnerability to toxic spills are a concern (Emerson and Traver, 2008), as is their failure to reduce chlorides. Finally, in areas where the land use is a hot spot, or where the SCM could potentially contaminate the groundwater supply, bioretention, non-infiltrating bioswales, and green roofs may be more suitable than infiltration SCMs.

The role of infiltration SCMs in promoting groundwater recharge deserves additional consideration. Although this is a benefit of infiltration SCMs in regions where groundwater levels are dropping, it may be undesirable in a few limited scenarios. For example, in the arid southwest contributions to base flow from irrigation have turned some dry ephemeral stream systems into perennial streams that support the growth of dense vegetation, which may be less desirable habitat for certain riparian species (like the Arroyo toad in Southern California). Infiltration SCMs could contribute to changing the flow regime in cases such as these. In most urban areas, there is so much impervious cover that it would be

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difficult to "overinfiltrate." Nonetheless, the use of infiltration SCMs will change local subsurface hydrology, and the ramifications of this—good and bad—should be considered prior to their installation.

Maintenance of vegetated runoff-volume-reduction SCMs is relatively simple. A visit after a rainstorm to check for plant health, to check sediment buildup, and to see if the water is ponded can answer many questions. Maintenance includes trash pickup and seasonal removal of dead grasses and weeds. Sediment removal from pretreatment devices is required. Depending on the pollutant concentrations in the influent, the upper layer of organic matter may need to be removed infrequently to maintain infiltration and to prevent metal and nutrient buildup.

At the site level, the chief factors that lead to uncertainty are the infiltration performance of the soil, particular for the limiting subsoil layer, and how to predict the extent of pollutant removal. Traditional percolation tests are not effective to estimate the infiltration performance; rather, testing hydraulic conductivity is required. Furthermore, the infiltration rate varies depending on temperature and season (Emerson and Traver, 2008). Basing measurements on percent removal of pollutants is extremely misleading, since every site and storm generates different levels of pollutants. The extent of pollutant removal depends on land use, time between storms, seasons, and so forth. These factors should be part of the design philosophy for the site. Finally, it should also be pointed out that climate is a factor determining the effectiveness of some of these SCMs. For example, green roofs are more likely to succeed in areas having smaller, more frequent storms (like the Pacific Northwest) compared to areas subjected to less frequent, more intense storms (like Texas).

Runoff Volume Reduction—Subsurface

Infiltration is the primary runoff-volume-reduction mechanism for subsurface SCMs, such that much of the previous discussion is relevant here. Thus, like vegetated SCMs, these SCMs provide benefits for groundwater recharge, water quality, stream channel protection, peak flow reduction, capture of the suspended solids load, and filtration through the soil (Ferguson, 2002). Because these systems can be built in conjunction with paved surfaces (i.e., they are often buried under parking lots), the amount of water captured, and thus stream protection, may be higher than for vegetated systems. They also have lower land requirements than vegetated systems, which can be an enormous advantage when using these SCMs during retrofitting, as long as the soil is conducive to infiltration.

Similar to vegetated SCMs, this SCM group works primarily by first capturing runoff and then removing the stored volume through infiltration. The temporary holding area is made either of stone or using manufactured vaults. Examples include pervious pavement, infiltration trenches, and seepage pits (see Figures 5-28, 5-29, 5-30, 5-31, and 5-32). As with vegetated SCMs, a shallow

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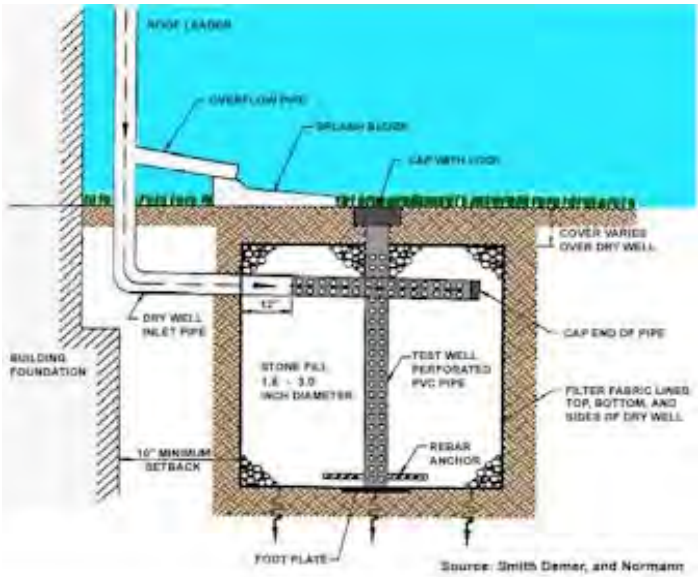

FIGURE 5-28 Schematic of a seepage pit. SOURCE: PaDEP (2006).

FIGURE 5-29 Porous asphalt. SOURCE: PaDEP (2006).

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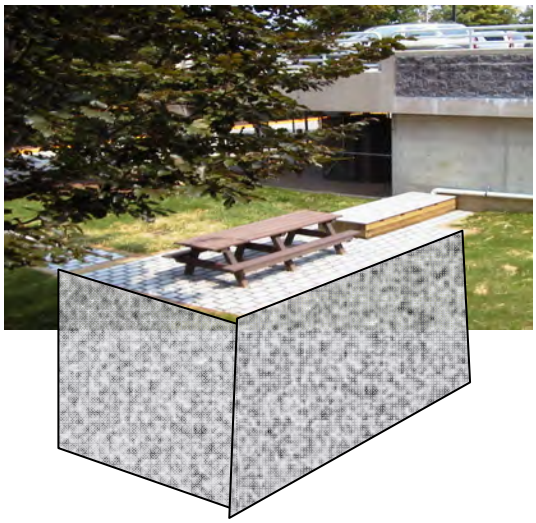

FIGURE 5-30 A retrofitted infiltration trench at Villanova University. SOURCE: Reprinted, with permission, from VUSP. Copyright by VUSP.

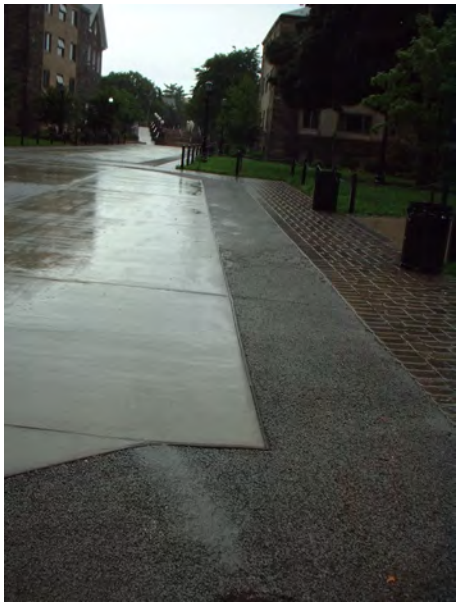

FIGURE 5-31 Pervious concrete at Villanova University. SOURCE: Reprinted, with permission from Villanova University. Copyright by VUSP.

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FIGURE 5-32 A small office building conversion at the edge of downtown Denver included the replacement of a portion of the site's parking with modular block porous pavement underlain by an 18-inch layer of crushed rock. Rainfall on the porous pavement and roof runoff for most storm events are contained in the reservoir created by the crushed rock. The pavement infiltrates runoff from most storm events for one-third of the impervious area on the half-acre site. SOURCE: Courtesy of Wenk Associates.

depth of ponding is required, since the inflows may exceed the possible infiltration ability of the native soil. In this case, the ponding is maintained within a rock bed under a porous pavement or in an infiltration trench. These devices are usually designed to empty between 24 and 72 hours after the storm event.

The infiltration processes operating for these subsurface SCMs are similar to those for the vegetated devices previously discussed. Thus, much like for

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vegetated systems, the level of control achieved depends on the infiltration ability of the native soils, the percent of impervious surface area in the contributing watershed, land use contributing to the pollutant loadings, and climate. A large number of recent studies have found that permeable pavement can reduce runoff volume by anywhere from 50 percent (Rushton, 2002; Jefferies, 2004; Bean et al., 2007) to as much as 95 percent or greater (van Seters et al., 2006; Kwiatkowski et al., 2007). Box 5-7 describes the success of a recent retrofitting of asphalt with pervious pavement at Villanova University.

The strengths of subsurface runoff-volume-reduction SCMs are similar to those of their vegetated counterparts. Additional attributes include their ability to be installed under parking areas and to manage larger volumes of rainfall. These SCMs typically have few problems with safety or vector-borne diseases because of their subsurface location and storage capacity, and they can be very aesthetically pleasing. The potential of permeable pavement could be particularly far-reaching if one considers the amount of impervious surface in urban areas that is comprised of roads, driveways, and parking lots.

The weaknesses of these SCMs are also similar to those of vegetated systems, including their dependence on native soil infiltration and the need to understand groundwater levels and karst geology. Simply estimating the soil hydraulic conductivity can have an error rate of an order of magnitude. Specifically for subsurface systems that use geotextiles (not permeable pavement), there is a danger of TSS being compressed against the bottom of the geotextile, preventing infiltration. There are no freeze–thaw cycles or vegetated processes that can reopen pathways, so the control of TSS is even more critical to their life span. In most cases (permeable pavement is an exception), pretreatment is required, except for the cleanest of sources (like a slate roof). Typically, manufactured devices, sediment forebays, or grass strips are part of the design of subsurface SCMs to capture the larger sediment particles.

The maintenance of subsurface runoff-volume-reduction SCMs is relatively simple but critical. If inspection wells are installed, a visit after a rainstorm will check that the volume is captured, and later that it has infiltrated. Porous surfaces should undergo periodic vacuum street sweeping when a sediment source is present. Pretreatment devices require sediment removal. The difficulty with this class of SCMs is that, if a toxic spill occurs or maintenance is not proactive, there are no easy corrective measures other than replacement.

Low-Impact Development. LID refers primarily to the use of small, engineered, on-site stormwater practices to treat the quality and quantity of runoff at its source. It is discussed here because the SCMs that are thought of as LID—particularly vegetated swales, green roofs, permeable pavement, and rain gardens—are all runoff-volume-reduction SCMs. They are designed to capture the first portion of a rainfall event and to treat the runoff from a few hundred square meters of impervious cover.

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BOX 5-7
Evaluation Through Monitoring: Villanova Pervious Concrete SCM

Villanova University's Stormwater Research and Demonstration Park is home to a pervious concrete infiltration site (Figure 5-33). The site, formerly a standard asphalt paved area, is located between two dormitories. The area was reconstructed in the summer of 2002 and outfitted with three infiltration beds overlain with pervious concrete. Usage of the site consists primarily of pedestrian traffic with some light automobile traffic. The pervious concrete site is designed to infiltrate small-volume storms (1 to 2 inches). Roof top runoff is directly piped to the rock bed under the concrete. For these smaller events, there is essentially no runoff from the site.

FIGURE 5-33 Villanova University pervious concrete retrofit site. SOURCE: Reprinted, with permission, from VUSP. Copyright by VUSP.

The pervious concrete is outlined with decorative pavers that divide the pervious concrete into three separate sections as seen in Figure 5-33. Underneath these three sections are individual storage beds. Since the site lies on a significant slope it was necessary to create earthen dams that isolate each storage area. At the top of each dam there is an overflow pipe which connects the storage area with the next one downstream. The final storage bed has an overflow that connects to the existing storm sewer. The beds are approximately 4 feet deep and are filled with stone, producing about 40 percent void space within the beds. A geotextile pervious liner was laid down to separate the storage beds from the undisturbed soil below (Figure 5-34). The primary idea was to avoid any upward migration of the in-situ soil, which could possibly reduce the capacity of the beds over time.

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BOX 5-7 Continued

FIGURE 5-34 Infiltration bed under construction. Pervious concrete has functionality and workability similar to that of regular concrete. However, the pervious concrete mix lacks the sand and other fine particles found in regular concrete. This creates a significant amount of void space which allows water to flow relatively unobstructed through the concrete. This site was the first attempt at creating a pervious concrete SCM in the area, and there were construction and material problems. Since that time the industry has matured, and a second site on campus constructed in 2007 has not had any significant difficulties. SOURCE: Reprinted, with permission, from VUSP. Copyright by VUSP.

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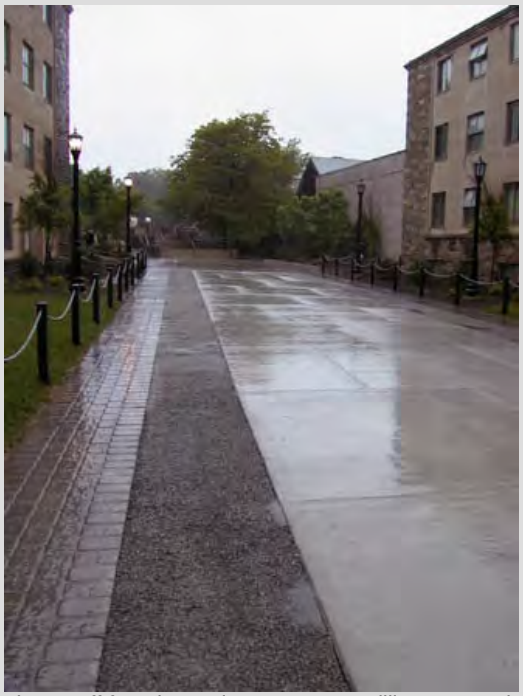

Note the runoff from impervious concrete spilling over to the pervious concrete. SOURCE: Robert Traver, Villanova University

Continuous monitoring of the site over a number of years has considerably increased our understanding of infiltration. Similar to the bioinfiltration site (Box 5-6), the infiltration rate of permeable concrete does vary as a function of temperature (Braga et al., 2007; Emerson and Traver, 2008), and the SCM volume reduction is impressive. As shown in Figure 5-35, over 95 percent of the yearly rainfall was infiltrated with minimal overflow. Besides hydrologic plots, water quality plots also show the benefits of permeable concrete (Kwiatkowski et al., 2007). Because over 95 percent of the runoff is infiltrated, well over 95 percent of the pollutant mass is also removed. Figure 5-36 shows the level of copper extracted from lysimeters buried under the rock bed and surrounding grass. The plot is arranged in quartiles, with readings in milligrams per liter. Lysimeter samples from under the surrounding grass and one foot and four feet under the infiltration bed all report almost no copper, compared to samples taken from the port in the rock bed and from the gutters draining the roof tops.

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BOX 5-7 Continued

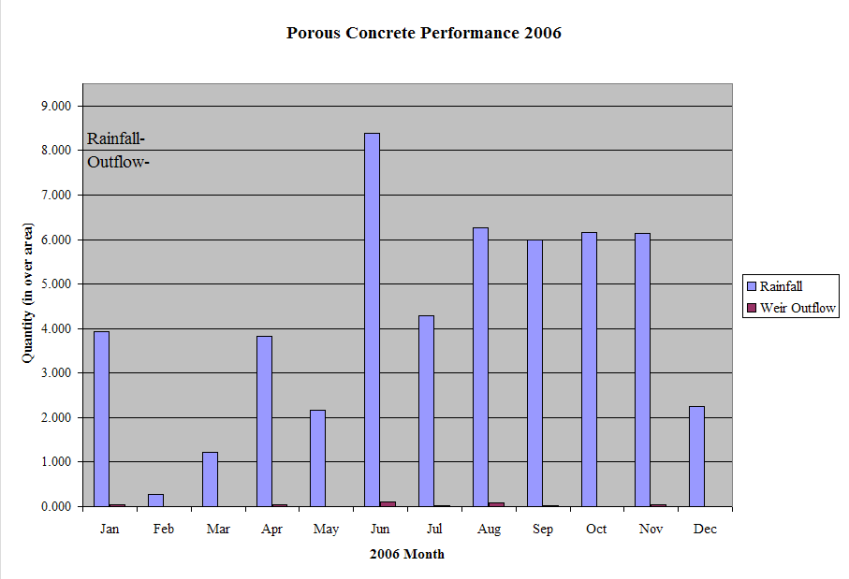

FIGURE 5-35 Rainfall and corresponding outflow from the weir of the SCM. SOURCE: Reprinted, with permission, from VUSP. Copyright by VUSP.

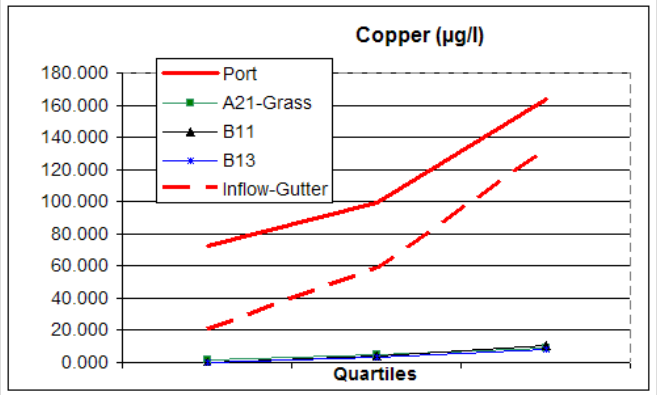

FIGURE 5-36 Copper measured at various locations. The three quartiles correspond to the 25th, 50th, and 75th percentile value of all data collected. A21 is a lysimeter location under the surrounding grass, while B11 and B13 refer to locations that are one foot and four feet under the infiltration bed, respectively. SOURCE: Reprinted, with permission, from VUSP. Copyright by VUSP.

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As discussed earlier, several studies have measured the runoff volume reduction of individual LID practices. Fewer studies are available on whether multiple LID practices, when used together, have a cumulative benefit at the neighborhood or catchment scale. Four monitoring studies have clearly documented a major reduction in runoff from developments that employ LID and Better Site Design (see Box 5-8) compared to those that do not. In addition, six studies have documented the runoff reduction benefits of LID at the catchment or watershed scale using a modeling approach (Alexander and Heaney, 2002; Stephens et al., 2002; Holman-Dodds et al., 2003; Coombes, 2004; Hardy et al., 2004; Huber et al., 2006).

Peak Flow Reduction and Runoff Treatment

After efforts are made to prevent the generation of pollutants and to reduce the volume of runoff that reaches stormwater systems, stormwater management focuses on the reduction of peak flows and associated treatment of polluted runoff. The main class of SCMs used to accomplish this is extended detention basins, versions of which have dominated stormwater management for decades. These include a wide variety of ponds and wetlands, including wet ponds (also known as retention basins), dry extended detention ponds (as known as detention basins), and constructed wetlands. By holding a volume of stormwater runoff for an extended period of time, extended detention SCMs can achieve both water quality improvement and reduced peak flows. Generally the goal is to hold the flows for 24 hours at a minimum to maximize the opportunity of settling, adsorption, and transformation of pollutants (based on past pollutant removal studies) (Rea and Traver, 2005). For smaller storm events (one- to two-year storms), this added holding time also greatly reduces the outflows from the SCM to a level that the stream channel can handle. Most wet ponds and stormwater wetlands can hold a “water quality” volume, such that the flows leaving in smaller storms have been held and “treated” for multiple days. Extended detention dry ponds greatly reduce the outflow peaks to achieve the required residence times.

Usually extended detention devices are lower in the treatment train of SCMs, if not at the end. This is both due to their function (they are designed for larger events) and because the required water sources and less permeable soils needed for these SCMs are more likely to be found at the lower areas of the site. Some opportunities exist to naturalize dry ponds or to retrofit wet ponds into stormwater wetlands but it depends on their site configuration and hydrology. Stormwater wetlands are shown in Figures 5-40 and 5-41. A wet pond and a dry extended detention basin are shown in Figures 5-42 and 5-43.

Simple ponds are little more than a hole in the ground, in which stormwater is piped in and out. Dry ponds are meant to be dry between storms, whereas wet ponds have a permanent pool throughout the year. Detention basins reduce peak flows by restricting the outflows and creating a storage area. Depending on the

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BOX 5-8
Jordan Cove—An LID Watershed Project

LID refers to the use of a system of small, on-site SCMs to counteract increases in flow and pollution following development and to control smaller runoff events. Although some studies are available that measure the runoff volume reduction of individual LID practices, fewer studies are available on whether multiple LID practices, when used together, have a cumulative benefit at the neighborhood or catchment scale. Of those listed in Table 5-6, Jordan Cove is the most extensively studied, as it was monitored for ten years as part of a paired watershed study that included a site with no SCMs and a site with traditional (detention) SCMs. The watersheds were monitored during calibration, construction, and post-construction periods. The project consisted of 12 lots, and the SCMs used were bioretention, porous pavements, no-mow areas, and education for the homeowners (Figure 5-37).

TABLE 5-6 Review of Recent LID Monitoring Research on a Catchment Scale

Location	Practices	Runoff Reduction
Jordan Cove, USA Dietz and Clausen (2008)	Permeable pavers, bioretention, grass swales, education	84%
Somerset Heights, USA Cheng et al. (2005)	Grass swale, bioretention, and roof-top disconnection	45%
Figtree Place, Australia Coombes et al. (2000)	Rain tanks, infiltration trenches, swales	100%

FIGURE 5-37 Jordan Cove LID subdivision. SOURCE: Reprinted, with permission, from Clausen (2007). Copyright 2007 by John Clausen.

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Figure 5-38 (right panel) displays the hydrograph from a post-construction storm comparing the LID, traditional, and control watersheds. Note that the traditional watershed shows the delay and peak reduction from the detention basins, while the LID watershed has almost no runoff. The LID watershed was found to reduce runoff volume by 74 percent by increasing infiltration over preconstruction levels.

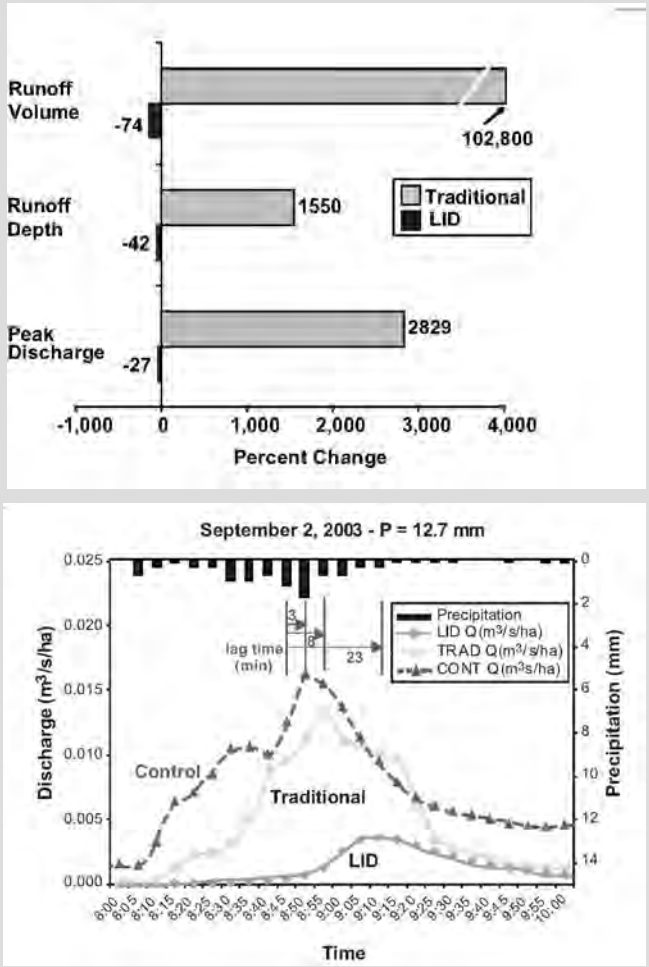

FIGURE 5-38. Significant changes in runoff volume (m^3/week), runoff depth (cm/week) and peak discharge (m^3/sec/week) after construction was completed (top panel). Hydrograph of all three subdivisions in the project, showing the larger volume and rate of runoff from the traditional and control subdivisions, as compared to the LID (bottom panel). SOURCE: Reprinted, with permission, from Clausen (2007). Copyright 2007 by John Clausen.

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BOX 5-8 Continued

Comparisons of nutrient and metal concentrations and total export in the surface water shows the value of the LID approach as well as the significance of the reduction in runoff volume. Figure 5-39 shows the changes in pollutant concentration and mass export before and after construction for the traditional and LID subdivisions. Note that concentrations of TSS and nutrients are increased in the LID subdivision (left-hand panel); this is because swales and natural systems are used in place of piping as a "green" drainage system and because only larger storms leave the site. The right-hand panel shows how the large reduction in runoff achieved through infiltration can dramatically reduce the net export of pollutants from the LID watershed.

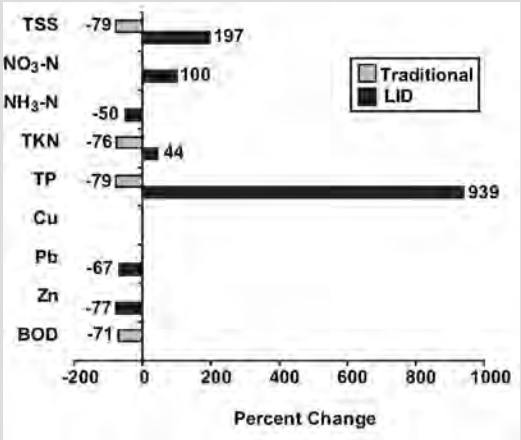

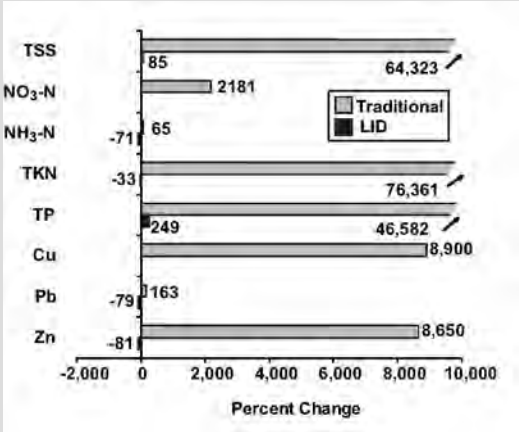

FIGURE 5-39 Significant changes in pollutant concentration, after construction was completed (top). Units are mg/L for NO_3-N, NH_3-N, TKN, TP, and BOD, and µg/L for Cu, Pb, and Zn. Significant changes in mass export (kg/ha/year) after construction was completed (bottom). SOURCE: Reprinted, with permission, from Clausen (2007). Copyright 2007 by John Clausen.

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FIGURE 5-40 Constructed wetland. SOURCE: PaDEP (2006).

FIGURE 5-41 Retrofitted stormwater wetland at Villanova University. SOURCE: Reprinted, with permission, from VUSP. Copyright by VUSP.

FIGURE 5-42 Wet pond. SOURCE: PaDEP (2006).

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FIGURE 5-43 Dry extended detention pond. SOURCE: PaDEP (2006).

detention time, outflows can be reduced to levels that do not accelerate erosion, that protect the stream channel, and that reduce flooding.

The flow normally enters the structure through a sediment forebay (Figure 5-44), which is included to capture incoming sediment, remove the larger particles through settling, and allow for easier maintenance. Then a meandering path or cell structure is built to "extend" and slow down the flows. The main basin is a large storage area (sometimes over the meandering flow paths). Finally, the runoff exits through an outflow control structure built to retard flow.

Wet ponds, stormwater wetlands, and (to a lesser extent) dry extended detention ponds provide treatment. The first step in treatment is the settling of larger particles in the sediment forebay. Next, for wet ponds a permanent pool of water is maintained so that, for smaller storms, the new flows push out a volume that has had a chance to interact with vegetation and be "treated." This volume is equivalent to an inch of rain over the impervious surfaces in the drainage area. Thus, what exits the SCM during smaller storm events is baseflow contributions and runoff that entered during previous events. For dry extended detention ponds, there is no permanent pool and the outlet is instead greatly restricted. For all of these devices, vegetation is considered crucial to pollutant removal. Indeed, wet ponds are designed with an aquatic bench around the edges to promote contact with plants. The vegetation aids in reduction of flow velocities, provides growth surfaces for microbes, takes up pollutants, and provides filtering (Braskerud, 2001).

The ability of detention structures to achieve a certain level of control is size related—that is, the more peak flow reduction or pollutant removal required, the more volume and surface area are needed in the basin. Because it is not simply the peak flows that are important, but also the duration of the flows that cause damage to the stream channels (McCuen, 1979; Loucks et al., 2005),

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FIGURE 5-44 Villanova University sediment forebay. SOURCE: Reprinted, with permission, from VUSP. Copyright by VUSP.

some detention basins are currently sized and installed in series with runoff-volume-reduction SCMs.

The strength of extended detention devices is the opportunity to create habitats or picturesque settings during stormwater management. The weaknesses of these measures include large land requirements, chloride buildup, possible temperature effects, and the creation of habitat for undesirable species in urban areas. There is a perception that these devices promote mosquitoes, but that has not been found to be a problem when a healthy biological habitat is created (Greenway et al., 2003). Another drawback of this class of SCMs is that they often have limited treatment capacity, in that they can reduce pollutants in stormwater only to a certain level. These so-called irreducible effluent concentrations have been documented mainly for ponds and stormwater wetlands, as well as sand filters and grass channels (Schueler, 1998). Finally, it should be noted that either a larger watershed (10–25 acres; CWP, 2004) or a continuous water source is needed to sustain wet ponds and stormwater wetlands.

Maintenance requirements for extended detention basins and wetlands include the removal of built-up sediment from the sediment forebay, harvesting of grasses to remove accumulated nutrients, and repair of berms and structures after storm events. Inspection items relate to the maintenance of the berm and sediment forebay.

While the basic hydrologic function of extended detention devices is well known, their performance on a watershed basis is not. Because they do not significantly reduce runoff volume and are designed on a site-by-site basis using synthetic storm patterns, their exclusive use as a flood reduction strategy at the

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watershed scale is uncertain (McCuen, 1979; Traver and Chadderton, 1992). Much of this variability is reduced when they are coupled with volume reduction SCMs at the watershed level. Pollutant removal is effected by climate, short-circuiting, and by the schedule of sediment removal and plant harvesting. Extreme events can resuspend captured sediments, thus reintroducing them into the environment. Although there is debate, it seems likely that plants will need to be harvested to accomplish nutrient removal (Reed et al., 1998).

Runoff Treatment

As mentioned above, many SCMs associated with runoff volume reduction and extended detention provide a water quality benefit. There are also some SCMs that focus primarily on water quality with little peak flow or volume effect. Designed for smaller storms, these are usually based on filtration, hydrodynamic separation, or small-scale bioretention systems that drain to a subsequent receiving water or other device. Thus, often these SCMs are used in conjunction with other devices in a treatment train or as retrofits under parking lots. They can be very effective as pretreatment devices when used “higher up” in the watershed than infiltration structures. Finally, in some cases these SCMs are specifically designed to reduce peak flows in addition to providing water quality benefits by introducing elements that make them similar to detention basins; this is particularly the case for sand filters.

The sand filter is relied on as a treatment technology in many regions, particular those where stream geomorphology is less of a concern and thus peak flow control and runoff volume reduction are not the primary goals. These devices can be effective at removing suspended sediments and can extend the longevity and performance of runoff-volume-reduction SCMs. They are also one of the few urban retrofits available, due to the ability to implement them within traditional culvert systems. Figures 5-45 and 5-46 show designs for the Austin sand filter and the Delaware sand filter.

Filters use sand, peat, or compost to remove particulates, similar to the processes used in drinking water plants. Sand filters primarily remove suspended solids and ammonia nitrogen. Biological material such as peat or compost provides adsorption of contaminants such as dissolved metals, hydrocarbons, and other organic chemicals. Hydrodynamic devices use rotational forces to separate the solids from the flow, allowing the solids to settle out of the flow stream. There is a recent class of bioretention-like manufactured devices that combine inlets with planters. In these systems, small volumes are directed to a soil planter area, with larger flows bypassing and continuing down the storm sewer system. In any event, for manufactured items the user needs to look to the manufacturer’s published and reviewed data to understand how the device should be applied.

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FIGURE 5-45 Austin sand filter. SOURCE: Robert Traver, Villanova University.

FIGURE 5-46 Delaware sand filter. SOURCE: Tom Schueler, Chesapeake Stormwater Network.

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The level of control that can be achieved with these SCMs depends entirely on sizing of the device based on the incoming flow and pollutant loads. Each unit has a certified removal rate depending on inflow to the SCM. Also all units have a maximum volume or rate of flow they can treat, such that higher flows are bypassed with no treatment. Thus, the user has to determine what size unit is needed and the number to use based on the area's hydrologic cycle and what criteria are to be met.

With the exception of some types of sand filters, the strengths of water quality SCMs are that they can be placed within existing infrastructure or under parking lots, and thus do not take up land that may be used for other purposes. They make excellent choices for retrofit situations. For filters, there is a wealth of experience from the water treatment community on their operations. For all manufactured devices there are several testing protocols that have been set up to validate the performance of the manufactured devices (the sufficiency of which is discussed in Box 5-9). Weaknesses of these devices include their cost and maintenance requirements. Regular maintenance and inspection at a high level are required to remove captured pollutants, to replace mulch, or to rake and remove the surface layer to prevent clogging. In some cases specialized equipment (vacuum trucks) is required to remove built-up sediment. Although the underground placement of these devices has many benefits, it makes it easy to neglect their maintenance because there are no signs of reduced performance on the surface. Because these devices are manufactured, the unit construction cost is usually higher than for other SCMs. Finally, the numerous testing protocols are confusing and prevent more widespread applications.

The chief uncertainty with these SCMs is due to the lack of certification of some manufactured devices. There is also concern about which pollutants are removed by which class of device. For example, hydrodynamic devices and sand filters do not address dissolved nutrients, and in some cases convert suspended pollutants to their dissolved form. Both issues are related to the false perception that a single SCM must be found that will comprehensively treat stormwater. Such pressures often put vendors in a position of trying to certify that their devices can remove all pollutants. Most often, these devices can serve effectively as part of a treatment train, and should be valued for their incremental contributions to water quality treatment. For example, a filter that removes sediment upstream of a bioinfiltration SCM can greatly prolong the life of the infiltration device.

Aquatic Buffers and Managed Floodplains

Aquatic buffers, sometimes also known as stream buffers or riparian buffers, involve reserving a vegetated zone adjacent to streams, shorelines, or wetlands as part of development regulations or as an ordinance. In most regions of the country, the buffer is managed as forest, although in arid or semi-arid

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BOX 5-9
Insufficient Testing of Proprietary Stormwater Control Measures

Manufacturers of proprietary SCMs offer a service that can save municipalities time and money. Time is saved by the ability of the manufactures to quickly select a model matching the needs of the site. A city can minimize the cost of buying the product by requiring the different manufacturers to submit bids for the site. All the benefits of the service will have no meaning, however, if the cities cannot trust the performance claims of the different products. Because the United States does not have, at this time, a national program to verify the performance of proprietary SCMs, interested municipalities face a high amount of uncertainty when they select a product. Money could be wasted on products that might have the lowest bid, but do not achieve the water quality goals of the city or state.

The EPA's Environmental Technology Verification (ETV) program was created to facilitate the deployment of innovative or improved environmental technologies through performance verification and dissemination of information. The Wet Weather Flow Technologies Pilot was established as part of the ETV program to verify commercially available technologies used in the abatement and control of urban stormwater runoff, combined sewer overflows, and sanitary sewer overflows. Ten proprietary SCMs were tested under the ETV program (see Figure 5-47), and the results of the monitoring are available on the National Sanitation Foundation International website. Unfortunately, the funding for the ETV program was discontinued before all the stormwater products could be tested. Without a national testing program some states have taken a more regional approach to verifying the performance of proprietary practices, while most states do not have any type of verification or approval program.

The Washington Department of Ecology has supported a testing protocol called Technology Assessment Protocol–Ecology that describes a process for evaluating and reporting on the performance and appropriate uses of emerging SCMs. California, Massachusetts, Maryland, New Jersey, Pennsylvania, and Virginia have sponsored a testing program called Technology Acceptance and Reciprocity Partnership (TARP), and a number of products are being tested in the field. The State of Wisconsin has prepared a draft technical standard (1006) describing methods for predicting the site-specific reduction efficiency of proprietary sedimentation devices. To meet the criteria in the standard the manufacturers can either use a model to predict the performance of the practice or complete a laboratory protocol designed to develop efficiency curves for each product. Although none of these state or federal verification efforts have produced enough information to sufficiently reduce the uncertainty in selection and sizing of proprietary SCMs, many proprietary practices are being installed around the country, because of the perceived advantage of the service being provided by the manufacturers and the sometimes overly optimistic performance claims.

All those involved in stormwater management, including the manufacturers, will have a much better chance of implementing a cost-effective stormwater program in their cities if the barriers to a national testing program for proprietary SCMs are eliminated. Two of the barriers to the ETV program were high cost and the transferability of the results. Also, the ETV testing did not produce results that could be used in developing efficiency curves for the product. A new national testing program could reduce the cost by using laboratory testing instead of field testing. Each manufacturer would only have to do one series of tests in the lab and the results would be applicable to the entire country. The laboratory

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BOX 5-9 Continued

protocol in the Wisconsin Technical Standard 1006 provides a good example of what should be included to evaluate each practice over a range of particle sizes and flows. These types of laboratory data could also be used to produce efficiency curves for each practice. It would be relatively easy for state and local agencies to review the benefits of each installation if the efficiency curves were incorporated into urban runoff models, such as WinSLAMM or P8.

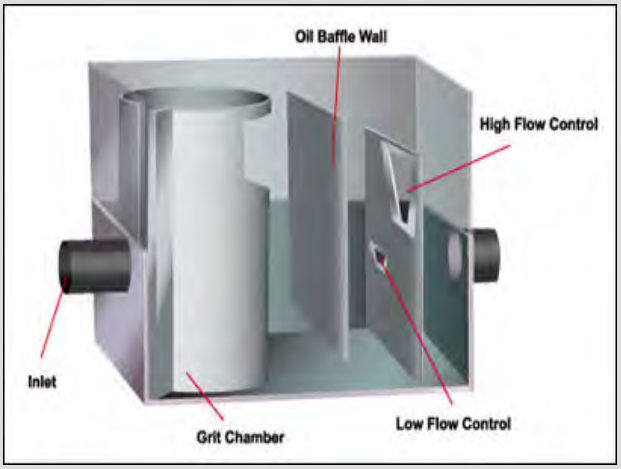

Stormwater 360 Hydrodynamic Separator. SOURCE: EPA (2005c).

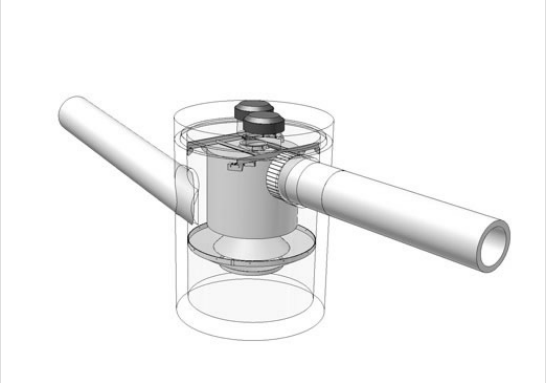

Downstream Defender. SOURCE: Available online at http://epa.gov/Region1/assistance/ ceitts/stormwater/techs/downstreamdefender.html

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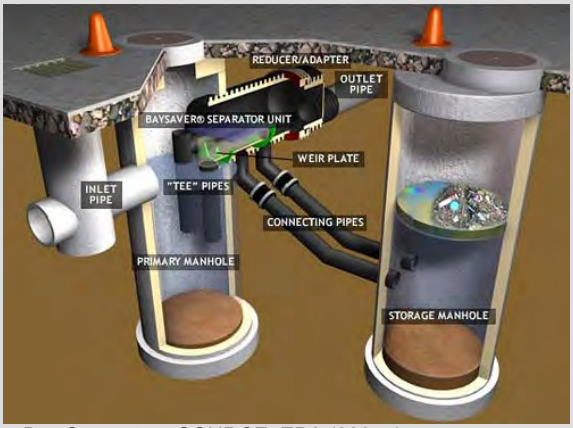

Bay Seperator. SOURCE: EPA (2005a).

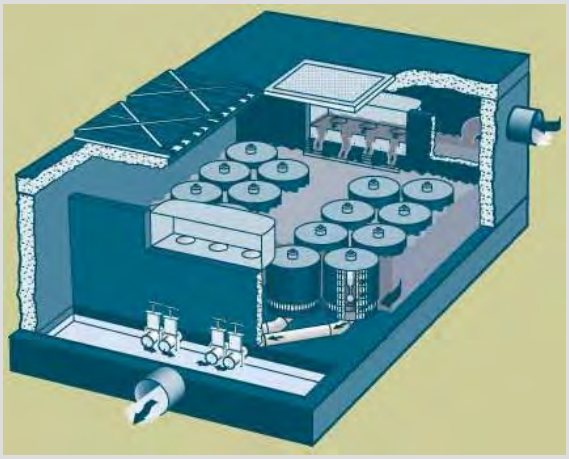

Stormfilter. SOURCE: EPA (2005b).

FIGURE 5-47 Proprietary Manufactured Devices tested by the ETV Program.

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regions it may be managed as prairie, chapparal, or other cover. When properly designed, buffers can both reduce runoff volumes and provide water quality treatment to stormwater.

The performance of urban stream buffers cannot be predicted from studies of buffers installed to remove sediment and nutrients from agricultural areas (Lowrance and Sheridan, 2005). Agricultural buffers have been reported to have high sediment and nutrient removal because they intercept sheet flow or shallow groundwater flow in the riparian zone. By contrast, urban stream buffers often receive concentrated surface runoff or may even have a storm-drain pipe that short-circuits the buffer and directly discharges into the stream. Consequently, the pollutant removal capability of urban stream buffers is limited, unless they are specifically designed to distribute and treat stormwater runoff (NRC, 2000). This involves the use of level spreaders, grass filters, and berms to transform concentrated flows into sheet flow (Hathaway and Hunt, 2006). Such designed urban stream buffers have been applied widely in the Neuse River basin to reduce urban stormwater nutrient inputs to this nitrogen-sensitive waterbody.

The primary benefit of buffers is to help maintain aquatic biodiversity within the stream. Numerous researchers have evaluated the relative impact of riparian forest cover and impervious cover on stream geomorphology, aquatic insects, fish assemblages, and various indexes of biotic integrity. As a group, the studies suggest that indicator values for urban stream health increase when riparian forest cover is retained over at least 50 to 75 percent of the length of the upstream network (Goetz et al., 2003; Wang et al., 2003b; McBride and Booth, 2005; Moore and Palmer, 2005). The width of the buffer is also important for enhancing its stream protection benefits, and it ranges from 25 to 200 feet depending on stream order, protection objectives, and community ordinances. At the present time, there are no data to support an optimum width for water quality purposes. The beneficial impact of riparian forest cover is less detectable when watershed impervious cover exceeds 15 percent, at which point degradation by stormwater runoff overwhelms the benefits of the riparian forest (Roy et al., 2005, 2006; Walsh et al., 2007).

Maintenance, inspection, and compliance for buffers can be a problem. In most communities, urban stream buffers are simply a line on a map and are not managed in any significant way after construction is over. As such, urban stream buffers are prone to residential encroachment and clearing, and to colonization by invasive plants. Another important practice is to protect, preserve, or otherwise manage the ultimate 100-year floodplain so that vulnerable property and infrastructure are not damaged during extreme floods. Federal Emergency Management Agency (FEMA), state, and local requirements often restrict or control development on land within the floodway or floodplain. In larger streams, the floodway and aquatic buffer can be integrated together to achieve multiple social objectives.

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Stream Rehabilitation

While not traditionally considered an SCM, certain stream rehabilitation practices or approaches can be effective at recreating stream physical habitat and ecosystem function lost during urbanization. When combined with effective SCMs in upland areas, stream rehabilitation practices can be an important component of a larger strategy to address stormwater. From the standpoint of mitigating stormwater impacts, four types of urban stream rehabilitation are common:

- Practices that stabilize streambanks and/or prevent channel incision/enlargement can reduce downstream delivery of sediments and attached nutrients (see Figure 5-48). Although the magnitude of sediment delivery from urban-induced stream-channel enlargement is well documented, there are very few published data to quantify the potential reduction in sediment or nutrients from subsequent channel stabilization.

- Streams can be hydrologically reconnected to their floodplains by building up the profile of incised urban streams using grade controls so that the channel and floodplain interact to a greater degree. Urban stream reaches that have been so rehabilitated have increased nutrient uptake and processing rates, and in particular increased denitrification rates, compared to degraded urban streams prior to treatment (Bukavecas, 2007; Kaushal et al., 2008). This suggests that urban stream rehabilitation may be one of many elements that can be considered to help decrease loads in nutrient-sensitive watersheds.

- Practices that enhance in-stream habitat for aquatic life can improve the expected level of stream biodiversity. However, Konrad (2003) notes that improvement of biological diversity of urban streams should still be considered an experiment, since it is not always clear what hydrologic, water quality, or habitat stressors are limiting. Larson et al. (2001) found that physical habitat improvements can result in no biological improvement at all. In addition, many of the biological processes in urban stream ecosystems remain poorly understood, such as carbon processing and nutrient uptake.

- Some stream rehabilitation practices can indirectly increase stream biodiversity (such as riparian reforestation, which could reduce stream temperatures, and the removal of barriers to fish migration).

It should be noted that the majority of urban stream rehabilitation projects undertaken in the United States are designed for purposes other than mitigating the impacts of stormwater or enhancing stream biodiversity or ecosystem function (Bernhardt et al., 2005). Most stream rehabilitation projects have a much narrower design focus, and are intended to protect threatened infrastructure,

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FIGURE 5-48 Three photographs illustrate stream rehabilitation in Denver. The top picture is a creek that has eroded in its bed due to urbanization. The middle picture shows a portion of the stabilized creek immediately after construction. Check structures, which keep the creek from cutting its bed, are visible in the middle distance. The bottom image shows the creek just upstream of one of the check structures two years after stabilization. The thickets of willows established themselves naturally. The only revegetation performed was to seed the area for erosion control. SOURCE: Courtesy of Wenk Associates.

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naturalize the stream corridor, achieve a stable channel, or maintain local bank stability (Schueler and Brown, 2004). Improvements in either biological health or the quality of stormwater runoff have rarely been documented.

Unique design models and methods are required for urban streams, compared to their natural or rural counterparts, given the profound changes in hydrologic and sediment regime and stream–floodplain interaction that they experience (Konrad, 2003). While a great deal of design guidance on urban stream rehabilitation has been released in recent years (FISRWG, 2000; Doll and Jennings, 2003; Schueler and Brown, 2004), most of the available guidance has not yet been tailored to produce specific outcomes for stormwater mitigation, such as reduced sediment delivery, increased nutrient processing, or enhanced stream biodiversity. Indeed, several researchers have noted that many urban stream rehabilitation projects fail to achieve even their narrow design objectives, for a wide range of reasons (Bernhardt and Palmer, 2007; Sudduth et al., 2007). This is not surprising given that urban stream rehabilitation is relatively new and rarely addresses the full range of in-stream alteration generated by watershed-scale changes. This shortfall suggests that much more research and testing are needed to ensure urban stream habilitation can meet its promise as an emerging SCM.

Municipal Housekeeping (Street Sweeping and Storm-Drain Cleanouts)

Phase II NPDES stormwater permits specifically require municipal good housekeeping as one of the six minimum management measures for MS4s. Although EPA has not presented definitive guidance on what constitutes "good housekeeping", CWP (2008) outlines ten municipal operations where housekeeping actions can improve the quality of stormwater, including the following:

- municipal hotspot facility management,
- municipal construction project management,
- road maintenance,
- street sweeping,
- storm-drain maintenance,
- stormwater hotline response,
- landscape and park maintenance ,
- SCM maintenance, and
- employee training.

The overarching theme is that good housekeeping practices at municipal operations provide source treatment of pollutants before they enter the storm-drain system. The most frequently applied practices are street sweeping (Figure 5-49) and sediment cleanouts of sumps and storm-drain inlets. Most communities

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FIGURE 5-49 Vacuum street sweeper at Villanova University. SOURCE: Robert Traver, Villanova University.

conduct both operations at some frequency for safety and aesthetic reasons, although not specifically for the sake of improving stormwater quality (Law et al., 2008).

Numerous performance monitoring studies have been conducted to evaluate the effect of street sweeping on the concentration of stormwater pollutants in downstream storm-drain pipes (see Pitt, 1979; Bender and Terstriep, 1994; Brinkman and Tobin, 2001; Zarrielo et al., 2002; Chang et al., 2005; USGS, 2005; Law et al., 2008). The basic finding is that regular street sweeping has a low or limited impact on stormwater quality, depending on street conditions, sweeping frequency, sweeper technology, operator training, and on-street parking. Sweeping will always have a limited removal capability because rainfall events frequently wash off pollutants before the sweeper passes through, and only some surfaces are accessible to the sweeper, thus excluding sidewalk, driveways, and landscaped areas. Frequent sweeping (i.e., weekly or monthly) has a moderate capability to remove sediment, trash and debris, coarse solids, and organic matter.

Fewer studies have been conducted on the pollutant removal capability of frequent sediment cleanout of storm-drain inlets, most in regions with arid climates (Lager et al., 1977; Mineart and Singh, 1994; Morgan et al., 2005). These studies have shown some moderate pollutant removal if cleanouts are done on a monthly or quarterly basis. Most communities, however, report that they clean out storm drains on an annual basis or in response to problems or drainage complaints (Law, 2006).

Frequent sweeping and cleanouts conducted on the dirtiest streets and storm

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drains appear to be the most effective way to include these operations in the stormwater treatment train. However, given the uncertainty associated with the expected pollutant removal for these practices, street sweeping and storm-drain cleanout cannot be relied on as the sole SCMs for an urban area.

Illicit Discharge Detection and Elimination

MS4 communities must develop a program to detect and eliminate illicit discharges to their storm-drain system as a stormwater NPDES permit condition. Illicit discharges can involve illegal cross-connections of sewage or washwater into the storm-drain system or various intermittent or transitory discharges due to spills, leaks, dumping, or other activities that introduce pollutants into the storm-drain system during dry weather. National guidance on the methods to find and fix illicit discharges was developed by Brown et al. (2004). Local illicit discharge detection and elimination (IDDE) programs represent an ongoing and perpetual effort to monitor the network of pipes and ditches to prevent pollution discharges.

The water quality significance of illicit discharges has been difficult to define since they occur episodically in different parts of a municipal storm drain system. Field experience in conducting outfall surveys does indicate that illicit discharges may be present at 2 to 5 percent of all outfalls at any given time. Given that pollutants are being introduced into the receiving water during dry weather, illicit discharges may have an amplified effect on water quality and biological diversity.

Many communities indicate that they employ a citizen hotline to report illicit discharges and other water quality problems (Brown et al., 2004), which sharply increases the number of illicit discharge problems observed.

Stormwater Education

Like IDDE, stormwater education is one of the six minimum management measures that MS4 communities must address in their stormwater NPDES permits. Stormwater education involves municipal efforts to make sure individuals understand how their daily actions can positively or negatively influence water quality and work to change specific behaviors linked to specific pollutants of concern (Schueler, 2001c). Targeted behaviors include lawn fertilization, littering, car fluid recycling, car washing, pesticide use, septic system maintenance, and pet waste pickup. Communities may utilize a wide variety of messages to make the public aware of the behavior and more desirable alternatives through radio, television, newspaper ads, flyers, workshops, or door-to-door outreach. Several communities have performed before-and-after surveys to assess both the penetration rate for these campaigns and their ability to induce changes in actual behaviors. Significant changes in behaviors have been recorded (see Schueler,

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2002), although few studies are available to link specific stormwater quality improvements to the educational campaigns (but see Turner, 2005; CASQA, 2007).

Residential Stewardship

This SCM involves municipal programs to enhance residential stewardship to improve stormwater quality. Residents can undertake a wide range of activities and practices that can reduce the volume or quality of runoff produced on their property or in their neighborhood as a whole. This may include installing rain barrels or rain gardens, planting trees, xeriscaping, downspout disconnection, storm-drain marking, household hazardous waste pickups, and yard waste composting (CWP, 2005). This expands on stormwater education in that a municipality provides a convenient delivery service to enable residents to engage in positive watershed behavior. The effectiveness of residential stewardship is enhanced when carrots are provided to encourage the desired behavior, such as subsidies, recognition, discounts, and technical assistance (CWP, 2005). Consequently, communities need to develop a targeted program to educate residents and help them engage in the desired behavior.

SCM Performance Monitoring and Modeling

Stormwater is characterized by widely fluctuating flows. In addition, inflow pollutant concentrations vary over the course of a storm and can be a function of time since the last storm, watershed, size and intensity of rainfall, season, amount of imperviousness, pollutant of interest, and so forth. This variability of the inflow to SCMs along with the very nature of SCMs makes performance monitoring a complex task. Most SCMs are built to manage stormwater, not to enable flow and water quality monitoring. Furthermore, they are incorporated into the collection system and spread throughout developments. Measurement of multiple inflows, outflows, evapotranspiration, and infiltration are simply not feasible for most sites. Many factors, such as temperature and climate, play a role in how well SCMs function. Infiltration rates can vary by an order of magnitude as a function of temperature (Braga et al., 2007; Emerson and Traver, 2008), such that a reading in late summer might be twice that of a winter reading. Determining performance can be further complicated because, e.g., at the start of a storm a detention basin could still be partially full from a previous storm, and removal rates for wetlands are a function of the growing season, not to mention snowmelt events.

Monitoring of SCMs is usually performed for one of two purposes: functionality or more intensive performance monitoring. Monitoring of functionality is primarily to establish that the SCM is functioning as designed. Performance monitoring is focused on determining what level of performance is achieved by

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the SCM.

Functionality Monitoring

Functionality monitoring, in a broad sense, involves checking to see whether the SCM is functioning and screening it for potential problems. Both the federal and several state industrial and construction stormwater general permits have standard requirements for visual inspections following a major storm event. Visual observations of an SCM by themselves do not provide information on runoff reduction or pollutant removal, but rather only that the device is functioning as designed. Adding some grab samples for laboratory analysis can act as a screening tool to determine if a more complex analysis is required.

The first step of functionality monitoring for any SCM is to examine the physical condition of the device (piping, pervious surfaces, outlet structure, etc.). Visual inspection of sediments, eroded berms, clogged outlets, and other problems are good indications of the SCM's functionality (see Figure 5-50). For infiltration devices, visiting after a storm event will show whether or not the device is functioning. A simple staff gauge (Figure 5-51) or a stilling well in pervious pavement can be used to measure the amount of water-level change over several days to estimate infiltration rates. Minnesota suggests the use of fire equipment or hydrants to fill infiltration sites with a set volume of water to measure the rate of infiltration. For sites that are designed to capture a set volume, for example a green roof, a visit could be coordinated with a rainfall event of the appropriate size to determine whether there is overflow during the event. If so, then clearly further investigation is required.

FIGURE 5-50 Rusted outlet structure. SOURCE: Reprinted, with permission, from Emerson. Copyright by Clay Emerson.

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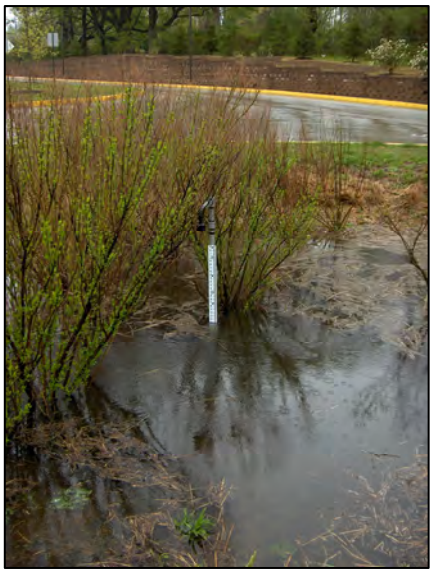

FIGURE 5-51 Staff gauge attached to ultrasonic sensor after a storm. SOURCE: Reprinted, with permission, from VUSP. Copyright by VUSP.

For extended detention and stormwater wetlands, the depth of water during an event is an indicator of how well the SCM is functioning. Usually high-water marks are easy to determine due to debris or mud marks on the banks or the structures. If the size of the storm event is known, the depths can be compared to what was expected for the structure. Other indicators of problems would include erosion downstream of the SCM, algal blooms, invasive species, poor water clarity, and odor.

For water quality and manufactured devices, visual inspections after a storm event can determine whether the SCM is functioning properly. Standing water over a sand or other media filter 48 hours after a storm is a sign of problems. Odor and lack of flow clarity could be a sign of filter breakthrough or other problems. For manufactured devices, literature about the device should specify inspection and maintenance procedures.

Monitoring of nonstructural SCMs is almost exclusively limited to visual observation due to the difficulty in applying numerical value to their benefits. Visual inspection can identify eroded stream buffers, additional paved areas, or denuded conservation areas (see Figure 5-52).

Performance Monitoring

Performance monitoring is an extremely intensive effort to determine the performance of an SCM over either an individual storm event or over a series of

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FIGURE 5-52 Wooded conservation area stripped of trees. Note pile of sawdust. SOURCE: Robert Traver, Villanova University.

storms. It requires integration of flow and water quality data creating both a hydrograph and a polutograph for a storm event as shown in Figure 5-53. The creation of these graphs requires continuous monitoring of the hydrology of the site and multiple water quality samples of the SCM inflow and outflow, the vadose zone, and groundwater. Event mean concentrations can then be determined from these data. There should be clear criteria for the number and type of storms to be sampled and for the conditions preceding a storm. For example, for most SCMs it would be improper to sample a second storm event in series, as the inflow may be free of pollutants and the soil moisture filled, resulting in a poor or negative performance. (Extended detention basins are an exception because the outflow during a storm event may include inflows from previous events.) The size of the sampled storm is also important. If the water quality goal is focused on smaller events, the 100-year storm would not give a proper picture of the performance because the occurrence is so rare that it is not a water quality priority.

For runoff-volume-reduction SCMs, performance monitoring can be extremely difficult because these systems are spread over the project site. The monitoring program must consider multiple-size storms because these SCMs are designed to remove perhaps the first inch of runoff. Therefore, for storms of less than an inch, there is no surface water release, so the treatment is 100

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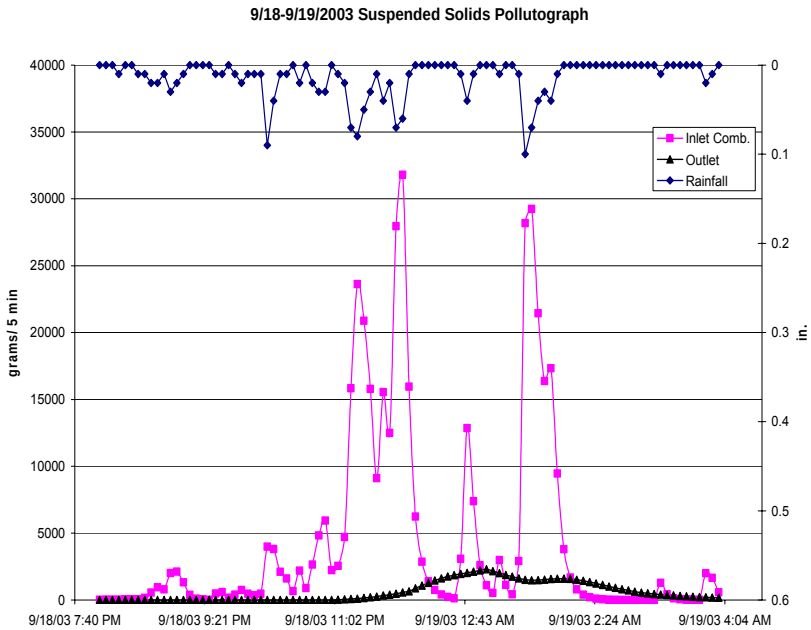

FIGURE 5-53 Example polutograph that displays inflow and outflow TSS during a storm event from the Villanova wetland stormwater SCM. SOURCE: Reprinted, with permission, Rea and Traver (2005). Copyright 2005 by the American Society of Civil Engineers.

percent effective for surface discharges. During larger events, a bioretention SCM or green roof may export pollutants. When viewed over the entire spectrum of storms, these devices are an outstanding success; however, this may not be evident during a hurricane.

Through the use of manufactured weirs (Figure 5-54), it is possible to develop flow-depth criteria based on hydraulic principles for surface flows entering or leaving the SCM. Where this is not practical, various manufacturers have Doppler velocity sensors that, combined with geometry and depth, provide a reasonable continuous record of flow. Measurement of depth within a device can be accomplished through use of pressure transducers, bubblers, float gauges, and ultrasonic sensors. Other common measures would include rainfall and temperature. One advantage of these data recording systems is that they can be connected to water quality probes and automated samplers to provide a flow-weighted sample of the event for subsequent laboratory analysis. Field calibration and monitoring of these systems is required.

Groundwater sampling for infiltration SCMs is a challenge. Although the rate of change in water depth can indicate volume moving into the soil mantle, it is difficult to establish whether this flow is evapotranspirated or ends up as baseflow or deep groundwater input. Sampling in the vadose zone can be established

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FIGURE 5-54 Weir flow used to measure flow rate. SOURCE: Robert Traver, Villanova University.

through the use of lysimeters that, through a vacuum, draw out water from the soil matrix. Soil moisture probes can give a rough estimation of the soil moisture content, and weighing lysimeters can establish evapotranspiration rates. Finally groundwater wells can be used to establish the effect of the SCM on the groundwater depth and quality during and after storm events.

Performance monitoring of extended detention SCMs is difficult because the inflows and outflows are variable and may extend over multiple days. Hydrologic monitoring can be accomplished using weirs (Figure 5-54), flow meters, and level detectors. The new generation of temperature, dissolved oxygen, and conductivity probes allows for automated monitoring. (It should be noted that in many cases the conductivity probes are observing chlorides, which are not generally removed by SCMs.) In many cases monitoring of the downstream stream-channel geomorphology and stream habitat may be more useful than performance monitoring when assessing the effect of the SCM.

The performance monitoring of treatment devices is straightforward and involves determining the pollutant mass inflows and outflows. Performance monitoring of manufactured SCMs has been established through several protocols. An example is TARP, used by multiple states (*http://www.dep.state.pa.us/dep/deputate/pollprev/techservices/tarp/).* This requires the manufacturer to test their units according to a set protocol of lab or field experiments to set performance criteria. Several TARP member and other states have published revised

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protocols for their use. These and other similar criteria are evolving and the subject of considerable effort by industry organizations that include the American Society of Civil Engineers.

Finally, much needs to be done to determine the performance of nonstructural SCMs, for which little to no monitoring data are available (see Table 5-2). Currently most practitioners expand upon current hydrologic modeling techniques to simulate these techniques. For example, disconnection of impervious surfaces is often modeled by adding the runoff from the roof or parking area as distributed "rainfall" on the pervious area. Experiments and long-term monitoring are needed for these SCMs.

More information on SCM monitoring is available through the International Stormwater BMP Database (*http://www.bmpdatabase.org*).

Modeling of SCM performance

Modeling of SCMs is required to understand their individual performance and their effect on the overall watershed. The dispersed nature of their implementation, the wide variety of possible SCM types and goals, and the wide range of rainfall events they are designed for makes modeling of SCMs extremely challenging. For example, to model multiple SCMs on a single site may require simulation of many hydrologic and environmental processes for each SCM in series. Modeling these effects over large watersheds by simulating each SCM is not only impractical, but the noise in the modeling may make the simulation results suspect. Thus, it is critical to understand the model's purpose, limitations, and applicability.

As discussed in Chapter 4, one approach to simulating SCM performance is through mathematical representation of the unit processes. The large volumes of data needed for process-based models generally restrict their use to smaller-scale modeling. For flow this would start with the hydrograph entering the SCM and include infiltration, evapotranspiration, routing through the system, or whatever flow paths were applicable. The environmental processes that would need to be represented could include settling, adsorption, biological transformation, and soil physics. Currently there are no environmental process models that work across the range of SCMs. Rather, the state of art is to use general removal efficiencies from publications such as the International Stormwater BMP Database (http://www.bmpdatabase.org) and the Center for Watershed Protection's National Pollutant Removal Database (CWP, 2000b, 2007b). Unfortunately, this approach has many limitations. The percent removal used on a site and storm basis does not include storm intensity, period between the storms, land use, temperature, management practices, whether other SCMs are upstream, and so forth. It also should be noted that percent removals are a surface water statistic and do not address groundwater issues or include any biogeochemistry.

Mechanistic simulation of the hydrologic processes within an SCM is much advanced compared to environmental simulation, but from a modeling scale it is

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still evolving. Indeed, models such as the Prince George's County Decision Support System are greatly improved in that the hydrologic simulation of the SCM includes infiltration, but they still do not incorporate the more rigorous soil physics and groundwater interactions. Some models, such as the Stormwater Management Model (SWMM), have the capability to incorporate mechanistic descriptions of the hydrologic processes occurring inside an SCM.

At larger scales, simulation of SCMs is done primarily using lumped models that do not explicitly represent the unit processes but rather the overall effects. For example, the goal may be to model the removal of 2 cm of rainfall from every storm from bioinfiltration SCMs. Thus, all that would be needed is how many SCMs are present and their configuration and what their capabilities are within your watershed. What is critical for these models is to represent the interrelated processes correctly and to include seasonal effects. Again, the pollutant removal capability of the SCM is represented with removal efficiencies derived from publications.

Regardless of the scale of the model, or the extent to which it is mechanistic or not, nonstructural SCMs are a challenge. Limiting impervious surface or maintenance of forest cover have been modeled because they can be represented as the maintenance of certain land uses. However, aquatic buffers, disconnected impervious surfaces, stormwater education, municipal housekeeping, and most other nonstructural SCMs are problematic. Another challenge from a watershed perspective is determining what volume of pollutants comes from streambank erosion during elevated flows versus from nonpoint source pollution. Most hydrologic models do not include or represent in-stream processes.

In order to move forward with modeling of SCMs, it will be necessary to better understand the unit processes of the different SCMs, and how they differ for hydrology versus transformations. Research is needed to gather performance numbers for the nonstructural SCMs. Until such information is available, it will be virtually impossible to predict that an individual SCM can accomplish a certain level of treatment and thus prevent a nearby receiving water from violating its water quality standard.

DESIGNING SYSTEMS OF STORMWATER CONTROL MEASURES ON A WATERSHED SCALE

Most communities have traditionally relied on stormwater management approaches that result in the design and installation of SCMs on a site-by-site basis. This has created a large number of individual stormwater systems and SCMs that are widely distributed and have become a substantial part of the contemporary urban and suburban landscape. Typically, traditional stormwater infrastructure was designed on a subdivision basis to reduce peak storm flow rates to predevelopment levels for large flood events (> 10-year return period). The problem with the traditional approach is that (1) the majority of storms throughout the year are small and therefore pass through the detention facilities

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uncontrolled, (2) the criterion of reducing storm flow does not address the need for reducing total storm volume, and (3) the facilities are not designed to work as a system on a watershed scale. In many cases, the site-by-site approach has exacerbated downstream flooding and channel erosion problems as a watershed is gradually built out. For example, McCuen (1979) and Emerson et al. (2005) showed that an unplanned system of site-based SCMs can actually increase flooding on a watershed scale owing to the effect of many facilities discharging into a receiving waterbody in an uncoordinated fashion—causing the very flooding problem the individual basins were built to solve.

With the relatively recent recognition of unacceptable downstream impacts and the regulation of urban stormwater quality has come a rethinking of the design of traditional stormwater systems. It is becoming rapidly understood that stormwater management should occur on a watershed scale to prevent flow control problems from occurring or reducing the chances that they might become worse. In this context, the "watershed scale" refers to the small local watershed to which the individual site drains (i.e., a few square miles within a single municipality). Together, the developer, designer, plan reviewer, owners, and the municipality jointly install and operate a linked and shared system of distributed practices across multiple sites that achieve small watershed objectives. Many metropolitan areas around the country have institutions, such as the Southeast Wisconsin Regional Planning Commission and the Milwaukee Metropolitan Sewage District, that are doing stormwater master planning to reduce flooding, bank erosion, and water quality problems on a watershed scale.

Designing stormwater management on a watershed scale creates the opportunity to evaluate a system of SCMs and maximize overall effectiveness based on multiple criteria, such as the incremental costs to development beyond traditional stormwater infrastructure, the limitations imposed on land area required for site planning, the effectiveness at improving water quality or attenuating discharges, and aesthetics. Because the benefits that accrue with improved water quality are generally not realized by those entities required to implement SCMs, greater value must be created beyond the functional aspects of the facility if there is to be wide acceptance of SCMs as part of the urban landscape. Stormwater systems designed on a watershed basis are more likely to be seen as a multi-functional resource that can contribute to the overall quality of the urban environment. Potential even exists to make the stormwater system a primary component of the civic framework of the community—elements of the public realm that serve to enhance a community's quality of life like public spaces and parks. For example, in central Minneapolis, redevelopment of a 100-acre area called Heritage Park as a mixed-density residential neighborhood was organized around two parks linked by a parkway that served dual functions of recreation and stormwater management.

Key elements of the watershed approach to designing systems of SCMs are discussed in detail below. They include the following:

1. Forecasting the current and future development types.

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2. Forecasting the scale of current and future development.
3. Choosing among on-site, distributed SCMs and larger, consolidated SCMs.
4. Defining stressors of concern.
5. Determining goals for the receiving water.
6. Noting the physical constraints.
7. Developing SCM guidance and performance criteria for the local watershed.
8. Establishing a trading system.
9. Ensuring the safe performance of the drainage network, streams, and floodplains.
10. Establishing community objectives for the publically owned elements of stormwater infrastructure.
11. Establishing a maintenance plan.

Forecasting the Current and Future Development Types

Forecasting the type of current and future development within the local watershed will guide or shape how individual practices and SCMs are generally assembled at each individual site. The development types that are generally thought of include Greenfield development (small and large scales), redevelopment within established communities and on Brownfield sites, and retrofitting of existing urban areas. These development types range roughly from lower density to higher density impervious cover. Box 5-10 explains how the type of development can dictate stormwater management, discussing two main categories—*Greenfield* development and *redevelopment* of existing areas. The former refers to development that changes pristine or agricultural land to urban or suburban land uses, frequently low-density residential housing. Redevelopment refers to changing from an existing urban land use to another, usually of higher density, such as from single-family housing to multi-family housing. Finally, *retrofitting* as used in this report is not a development type but rather the upgrading of stormwater management within an existing land use to meet higher standards.

Table 5-7 shows which SCMs are best suited for Greenfield development (particularly low-density residential), redevelopment of urban areas, and intense industrial redevelopment. The last category is broken out because the suite of SCMs needed is substantially different than for urban redevelopment. Each type of development has a different footprint, impervious cover, open space, land cost, and existing stormwater infrastructure. Consequently, SCMs that are ideally suited for one type of development may be impractical or infeasible for another. One of the main points to be made is that there are more options during Greenfield development than during redevelopment because of existing infrastructure, limited land area, and higher costs in the latter case.

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BOX 5-10
Development Types and their Relationship to the Stormwater System

Development falls into two basic types. Greenfield development requires new infrastructure designed according to contemporary design standards for roads, utilities, and related infrastructure. Redevelopment refers to developed areas undergoing land-use change. In contrast to Greenfields, infrastructure in previously developed areas is often in poor condition, was not built to current design standards, and is inadequate for the new land uses proposed. The stormwater management scenarios common to these types of development are described below.

Greenfield Development

At the largest scale, Greenfield development refers to planned communities at the developing edge of metropolitan areas. Communities of this type often vary from several hundred acres to very large projects that encompassed tens of thousands of acres requiring buildout over decades. They often include the trunk or primary stormwater system as well as open stream and river corridors. The most progressive communities of this type incorporate a significant portion of the area to stormwater systems that exist as surface elements. Such stormwater system elements are typically at the subwatershed scale and provide for consolidated conveyance, detention, and water quality treatment. These elements of the infrastructure can be multi-functional in nature, providing for wildlife habitat, trail corridors, and open-space amenities.

Greenfield development can also occur on a small scale—neighborhoods or individual sites within newly developing areas that are served by the secondary public and tertiary stormwater systems. This smaller-scale, incremental expansion of existing urban patterns is a more typical way for cities to grow. A more limited range of SCMs are available on smaller projects of this type, including LID practices.

Redevelopment of Existing Areas

Redevelopment within established communities is typically at the scale of individual sites and occasionally the scale of a small district. The area is usually served by private, on-site systems that convey larger storm events into preexisting stormwater systems that were developed decades ago, either in historic city centers or in “first ring,” post-World War II suburbs adjacent to historic city centers. Redevelopment in these areas is typically much denser than the original use. The resulting increase in impervious area, and typically the inadequacy of existing stormwater infrastructure serving the site often results in significant development costs for on-site detention and water quality treatment. Elaborate vaults or related structures, or land area that could be utilized for development, must often be committed to on-site stormwater management to comply with current stormwater regulations.

Brownfields are redevelopments of industrial and often contaminated property at the scale of an individual site, neighborhood, or district. Secondary public systems and private stormwater systems on individual sites typically serve these areas. In many cases, especially in outdated industrial areas, little or no stormwater infrastructure exists, or it is so inadequate as to require replacement. Water quality treatment on contaminated sites may also be necessary. For these reasons, stormwater management in such developments presents special challenges. As an example, the most common methods of remediation of contaminated sites involve capping of contaminated soils or treatment of contaminants in situ, especially where removal of contaminated soils from a site is cost prohibitive. Given that contaminants are still often in place on redeveloped Brownfield sites and must not be disturbed, certain SCMs such as infiltration of stormwater into site soils, or excavation for stormwater piping and other utilities, present special challenges.

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TABLE 5-7 Applicability of Stormwater Control Measures by Type of Development

Stormwater Control Measure	Low-Density Greenfield Residential	Urban Redevelopment	Intense Industrial Redevelopment
Product Substitution	○	●	●
Watershed and Land-Use Planning	■	■	○
Conservation of Natural Areas	■	♦	○
Impervious Cover Minimization	■	♦	♦
Earthwork Minimization	■	♦	♦
Erosion and Sediment Control	■	■	■
Reforestation and Soil Conservation	■	●	●
Pollution Prevention SCMs	♦	●	■
Runoff Volume Reduction—Rainwater Harvesting	■	■	●
Runoff Reduction—Vegetated	■	○	●
Runoff Reduction—Subsurface	■	○	♦
Peak Reduction and Runoff Treatment	■	♦	○
Runoff Treatment	●	●	■
Aquatic Buffers and Managed Floodplains	●	♦	○
Stream Rehabilitation	○	♦	♦
Municipal Housekeeping	○	○	NA
IDDE	○	○	○
Stormwater Education	●	●	●
Residential Stewardship	■	●	NA

NOTE: ■, always; ●, often; ○, sometimes; ♦, rarely; NA, not applicable.

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Forecasting the Scale of Current and Future Development

The choice of what SCMs to use depends on the area that needs to be serviced. It turns out that some SCMs work best over a few acres, whereas others require several dozen acres or more; some are highly effective only for the smallest sites, while others work best at the stream corridor or subwatershed level. Table 5-1 includes a column that is related the scale at which individual SCMs can be applied ("where" column). The SCMs mainly applied at the site scale include runoff volume reduction—rainwater harvesting, runoff treatment like filtering, and pollution prevention SCMs for hotspots. As one goes up in scale, SCMs like runoff volume reduction—vegetated and subsurface, earthwork minimization, and erosion and sediment control take on more of a role. At the largest scales, watershed and land-use planning, conservation of natural areas, reforestation and soil conservation, peak flow reduction, buffers and managed floodplains, stream rehabilitation, municipal housekeeping, IDDE, stormwater education, and residential stewardship play a more important role. Some SCMs are useful at all scales, such as product substitution and impervious cover minimization.

Choosing Among On-Site, Distributed SCMs and Larger, Consolidated SCMs

There are distinct advantages and disadvantages to consider when choosing to use a system of larger, consolidated SCMs versus smaller-scale, on-site SCMs that go beyond their ability to achieve water quality or urban stream health. Smaller, on-site facilities that serve to meet the requirements for residential, commercial, and office developments tend to be privately owned. Typically, flows are directed to porous landscape detention areas or similar SCMs, such that volume and pollutants in stormwater are removed at or near their source. Quite often, these SCMs are relegated to the perimeter project, incorporated into detention ponds, or, at best, developed as landscape infiltration and parking islands and buffers. On-site infiltration of frequent storm events can also reduce the erosive impacts of stormwater volumes on downstream receiving waters. Maintenance is performed by the individual landowner, which is both an advantage because the responsibility and costs for cleanup of pollutants generated by individual properties are equitably distributed, and a disadvantage because ongoing maintenance incurs a significant expense on the part of individual property owners and enforcement of properties not in compliance with required maintenance is difficult. On the negative side, individual SCMs often require additional land, which increases development costs and can encourage sprawl. Monitoring of thousands of SCMs in perpetuity in a typical city creates a significant ongoing public expense, and special training and staffing may be required to maintain SCM effectiveness (especially for subgrade or in-building vaults used in ultra-urban environments). Finally, given that as much as 30 per-

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cent of the urban landscape is comprised of public streets and rights-of-way, there are limited opportunities to treat runoff from streets through individual on-site private SCMs. (Notable exceptions are subsurface runoff-volume-reduction SCMs like permeable pavement that require no additional land and promote full development density within a given land parcel because they use the soil areas below roads and the development site for infiltration.)

In contrast, publicly owned, consolidated SCMs are usually constructed as part of larger Greenfield and infill development projects in areas where there is little or no existing infrastructure. This type of facility—usually an infiltration basin, detention basin, wet/dry pond, or stormwater wetland—tends to be significantly larger, serving multiple individual properties. Ownership is usually by the municipality, but may be a privately managed, quasi-public special district. There must be adequate land available to accommodate the facility and a means of up-front financing to construct the facility. An equitable means of allocating costs for ongoing maintenance must also be identified. However, the advantage of these facilities is that consolidation requires less overall land area, and treatment of public streets and rights-of-way can be addressed. Monitoring and maintenance are typically the responsibility of one organization, allowing for effective ongoing operations to maintain the original function of the facility. If that entity is public, this ensures that the facility will be maintained in perpetuity, allowing for the potential to permanently reduce stormwater volumes and for reduction in the size of downstream stormwater infrastructure. Because consolidated facilities are typically larger than on-site SCMs, mechanized maintenance equipment allows for greater efficiency and lower costs. Finally, consolidated SCMs have great potential for multifunctional uses because wildlife habitat, recreational, and open-space amenities can be integrated to their design. Box 5-11 describes sites of various scales where either consolidated or distributed SCMs were chosen.

Defining Stressors of Concern

The primary pollutants or stressors of concern (and the primary source areas or stormwater hotspots within the watershed likely to produce them) should be carefully defined for the watershed. Although this community decision is made only infrequently, it is critical to ensuring that SCMs are designed to prevent or reduce the maximum load of the pollutants of greatest concern. This choice may be guided by regional water quality priorities (such as nutrient reduction in the Chesapeake Bay or Neuse River watersheds) or may be an outgrowth of the total maximum daily load process where there is known water quality impairment or a listed pollutant. The choice of a pollutant of concern is paramount, since individual SCMs have been shown to have highly variable capabilities to prevent or reduce specific pollutants (see WERF, 2006; ASCE, 2007; CWP, 2007b). In some cases, the capability of SCMs to reduce a specific pollutant may be uncertain or unknown.

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BOX 5-11
Examples of Communities Using Consolidated versus Distributed SCMs

Stapleton Airport New Community

This is a mixed-use, mixed-density New Urbanist community that has been under development for the past 15 years on the 4,500-acre former Stapleton Airport site in central Denver. As shown in Figures 5-55 and 5-56, the stormwater system emphasizes surface conveyance and treatment on individual sites, as well as in consolidated regional facilities.

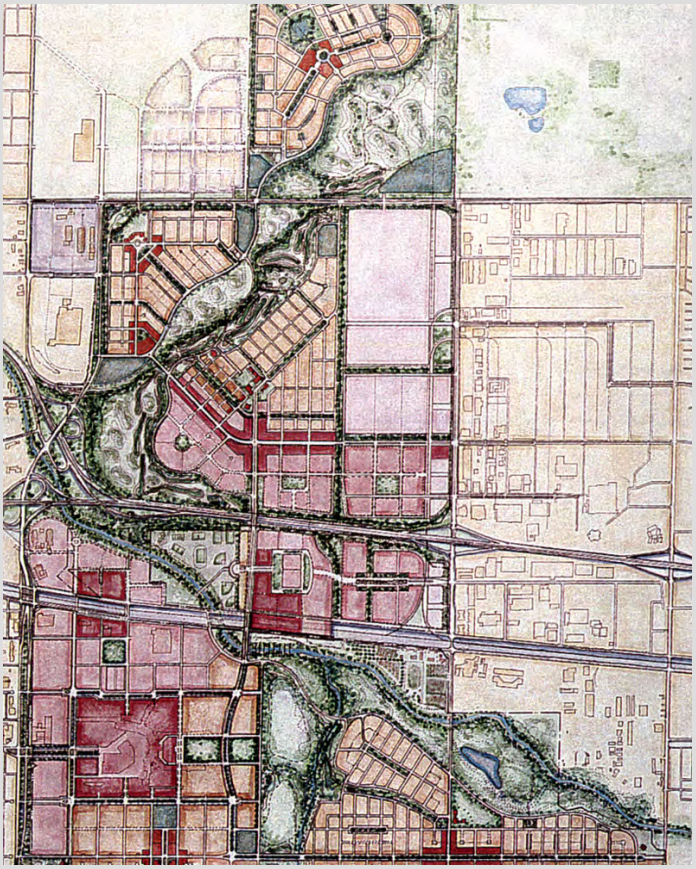

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FIGURE 5-55 The community plan, shown on the left, is organized around two day lighted creeks, formerly buried under airport runways, and a series of secondary conveyances which provide recreational open space within neighborhoods. The image above illustrates one of the multi-functional creek corridors. Consolidated stormwater treatment areas and surface conveyances define more traditional park recreation and play areas. SOURCE: Courtesy of the Stapleton Redevelopment Foundation.

FIGURE 5-56 A consolidated treatment area adjacent to one of several neighborhoods that have been constructed as part of the project's build-out. SOURCE: Courtesy of Wenk Associates.

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BOX 5-11 Continued

Heritage Park Neighborhood Redevelopment

A failed public housing project adjacent to downtown Minneapolis, Minnesota, has been replaced by a mixed-density residential neighborhood. Over 1,200 rental, affordable, and market-rate single- and multi-family housing units have been provided in the 100-acre project area. The neighborhood is organized around two neighborhood parks and a parkway that serve dual functions as neighborhood recreation space and as surface stormwater conveyance and a consolidated treatment system (see Figure 5-57). Water quality treatment is being provided for a combined area of over 660 acres that includes the 100-acre project area and over 500 acres of adjacent neighborhoods. Existing stormwater pipes have been routed through treatment areas with treatment levels ranging from 50 to 85 percent TSS removal, depending on the available land area.

FIGURE 5-57 View of a sediment trap and porous landscape detention area in the central parkway spine of Heritage Park. The sediment trap in the center left of the photo was designed for ease of maintenance access by city crews with standard city maintenance equipment. SOURCE: Courtesy of the SRF Consulting Group, Inc.

The High Point Neighborhood

This Seattle project is the largest example of the city's Natural Drainage Systems Project and it illustrates the incorporation of individual SCMs into street rights-of-way as well as a consolidated facility. The on-site, distributed SCMs in this 600-acre neighborhood are swales, permeable pavement, and disconnected downspouts. A large detention pond services the entire region that is much smaller than it would have been had the other SCMs not been built. Both types of SCMs are shown in Figure 5-58.

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FIGURE 5-58 Natural drainage system methods have been applied to a 34-block, 1,600-unit mixed-income housing redevelopment project called High Point. Shown on top, vegetated swales, porous concrete sidewalks, and frontyard rain gardens convey and treat stormwater on-site. Below is the detention pond for the development. SOURCE: top, William Wenk, Wenk Associates, and bottom, Laura Ehlers, National Research Council.

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BOX 5-11 Continued

Pottsdammer Platz

This project, in the heart of Berlin, Germany, illustrates the potential for stormwater treatment in the densest urban environments by incorporating treatment into building systems and architectural pools that are the centerpiece of a series of urban plazas. As shown in Figure 5-59, on-site, individual SCMs are used to collect stormwater and use it for sanitary purposes.

FIGURE 5-59 As shown to the left and below, stormwater is collected and stored on-site in a series of vaults. Water is circulated through a series of biofiltration areas and used for toilets and other mechanical systems in the building complex. Large storms overflow into an adjacent canal. SOURCE: Reprinted, with permission, from Herbert Dreiseitl, Dieter Grau (2001). Copyright 2001 by Birkhäuser Publishing Ltd.

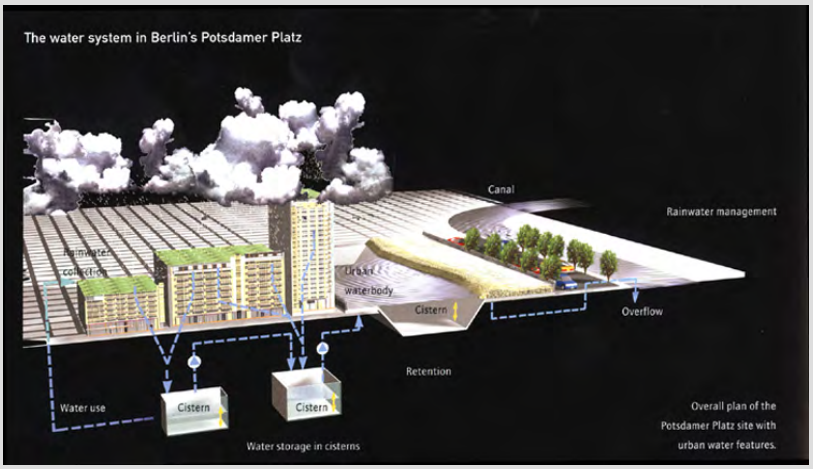

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Menomonee Valley Redevelopment, Wisconsin

The 140-acre redevelopment of abandoned railyards illustrates how a Brownfield site within an existing floodplain can be redeveloped using both on-site and consolidated treatment. As shown in Figure 5-60, consolidated treatment is incorporated into park areas which provide recreation for adjacent neighborhoods and serve as a centerpiece for a developing light industrial area that provides jobs to surrounding neighborhoods. Treatment on individual privately owned parcels is limited to the removal of larger sediments and debris only, making more land available for development. The volume of water that, by regulation, must be captured and treated on individual sites is conveyed through a conventional subsurface system for treatment in park areas.

FIGURE 5-60 Illustrations show consolidated treatment areas in proposed parks. The top image illustrates the fair weather condition, the center image the water quality capture volume, and the bottom image the 100-year storm event. Construction was completed in spring 2007. SOURCE: Courtesy of Wenk Associates.

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Determining Goals for the Receiving Waters

It is important to set biological and public health goals for the receiving water that are achievable given the ultimate impervious cover intended for the local watershed (see the Impervious Cover Model in Box 3-10). If the receiving water is too sensitive to meet these goals, one should consider adjustments to zoning and development codes to reduce the amount of impervious cover. The biological goals may involve a keystone species, such as salmon or trout, a desired state of biological integrity in a stream, or a maximum level of eutrophication in a lake. In other communities, stormwater goals may be driven by the need to protect a sole-source drinking water supply (e.g., New York watersheds) or to maintain water contact recreation at a beach, lake, or river. Once again, the watershed goals that are selected have a strong influence on the assembly of SCMs needed to meet them, since individual SCMs vary greatly in their ability to achieve different biological or public health outcomes.

Noting the Physical Constraints

The specific physical constraints of the watershed terrain and the development pattern will influence the selection and assembly of SCMs. The application of SCMs must be customized in every watershed to reflect its unique terrain, such as karst, high water tables, low or high slopes, freeze–thaw depth, soil types, and underlying geology. Each SCM has different restrictions or constraints associated with these terrain factors. Consequently, the SCM prescription changes as one moves from one physiographic region to another (e.g., the flat coastal plain, the rolling Piedmont, the ridge and valley, and mountainous headwaters).

Developing SCM Guidance and Performance Criteria for the Local Watershed

Based on the foregoing factors, the community should establish specific sizing, selection, and design requirements for SCMs. These SCM performance criteria may be established in a local, regional, or state stormwater design manual, or by reference in a local watershed plan. The Minnesota Stormwater Steering Committee (MSSC, 2005) provides a good example of how SCM guidance can be customized to protect specific types of receiving waters (e.g., high-quality lakes, trout streams, drinking water reservoirs, and impaired waters). In general, the watershed- or receiving water-based criteria are more specific and detailed than would be found in a regional or statewide stormwater manual. For example, the local stormwater guidance criteria may be more prescriptive with respect to runoff reduction and SCM sizing requirements, outline a preferred sequence for SCMs, and indicate where SCMs should (or should not) be located

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in the watershed. Like the identification of stressors or pollutants of concerns, this step is rarely taken under current paradigms of stormwater management.

Establishing a Trading System

A stormwater trading or offset system is critical to situations when on-site SCMs are not feasible or desirable in the watershed. Communities may choose to establish some kind of stormwater trading or mitigation system in the event that full compliance is not possible due to physical constraints or because it is more cost effective or equitable to achieve pollutant reduction elsewhere in the local watershed. The most common example is providing an offset fee based on the cost to remove an equivalent amount of pollutants (such as phosphorus in the Maryland Critical Area—MD DNR, 2003). This kind of trading can provide for greater cost equity between low-cost Greenfield sites and higher-cost ultra-urban sites.

Ensuring the Safe and Effective Performance of the Drainage Network, Streams, and Floodplains

The urban water system is not solely designed to manage the quality of runoff. It also must be capable of safely handling flooding from extreme storms to protect life and property. Consequently, communities need to ensure that their stormwater infrastructure can prevent increased flooding caused by development (and possibly exacerbated future climate change). In addition, many SCMs must be designed to safely pass extreme storms when they do occur. This usually requires a watershed approach to stormwater management to ensure that quality and quantity control are integrated together, with an emphasis on the connection and effective use of conveyance channels, streams, riparian buffers, and floodplains.

Establishing Community Objectives for the Publicly Owned Elements of Stormwater Infrastructure

The stormwater infrastructure in a community normally occupies a considerable surface area of the landscape once all the SCMs, drainage easements, buffers, and floodplains are added together. Consequently, communities may require that individual SCM elements are designed to achieve multiple objectives, such as landscaping, parks, recreation, greenways, trails, habitat, sustainability, and other community amenities (as discussed extensively above). In other cases, communities may want to ensure that SCMs do not cause safety or vector problems and that they look attractive. The best way to maximize community benefits is to provide clear guidance in local SCM criteria at the site

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level and to ensure that local watershed plans provide an overall context for their implementation.

Establishing an Inspection and Maintenance Plan

The long-term performance of any SCM is fundamentally linked to the frequency of inspections and maintenance. As a result, NPDES stormwater permit conditions for industrial, construction, and municipal permittees specify that pollution prevention, construction, and post-construction SCMs be adequately maintained. MS4 communities are also required under NPDES stormwater permits to track, inspect, and ensure the maintenance of the collective system of SCMs and stormwater infrastructure within their jurisdiction. In larger communities, this can involve hundreds or even thousands of individual SCMs located on either public or private property. In these situations, communities need to devise a workable model that will be used to operate, inspect, and maintain the stormwater infrastructure across their local watershed. Communities have the lead responsibility in their MS4 permits to assure that SCMs are maintained properly to ensure their continued function and performance over time. They can elect to assign the responsibility to the public sector, the private sector (e.g., property owners and homeowners association), or a hybrid of the two, but under their MS4 permits they have ultimate responsibility to ensure that SCM maintenance actually occurs. This entails assigning legal and financial responsibilities to the owners of each SCM element in the watershed, as well as maintaining a tracking and enforcement system to ensure compliance.

Summary

Taking all of the elements above into consideration, the emerging goal of stormwater management is to mimic, as much as possible, the hydrological and water quality processes of natural systems as rain travels from the roof to the stream through combined application of a series of practices throughout the entire development site and extending to the stream corridor. The series of SCMs incrementally reduces the volume of stormwater on its way to the stream, thereby reducing the amount of conventional stormwater infrastructure required.

There is no single SCM prescription that can be applied to each kind of development; rather, a combination of interacting practices must be used for full and effective treatment. For a low-density residential Greenfield setting, a combination of SCMs that might be implemented is illustrated in Table 5-8. There are many successful examples of SCMs in this context and at different scales. By contrast, Tables 5-9 and 5-10 outline how the general “roof-to-stream” stormwater approach is adapted for intense industrial operations and urban redevelopment sites, respectively. As can be seen, these development situations require a differ combination of SCMs and practices to address the unique design

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TABLE 5-8 From the Roof to the Stream: SCMs in a Residential Greenfield

SCM	What it Is	What it Replaces	How it Works
Land-Use Planning	Early site assessment	Doing SWM design after site layout	Map and plan submitted at earliest stage of development review showing environmental, drainage, and soil features
Conservation of Natural Areas	Maximize forest canopy	Mass clearing	Preservation of priority forests and reforestation of turf areas to intercept rainfall
Earthwork Minimization	Conserve soils and contours	Mass grading and soil compaction	Construction practices to conserve soil structure and only disturb a small site footprint
Impervious Cover Minimization	Better site design	Large streets, lots and cul-de-sacs	Narrower streets, permeable driveways, clustering lots, and other actions to reduce site IC
Runoff Volume Reduction—Rainwater Harvesting	Utilize rooftop runoff	Direct connected roof leaders	A series of practices to capture, disconnect, store, infiltrate, or harvest rooftop runoff
Runoff Volume Reduction—Vegetated	Frontyard bioretention	Positive drainage from roof to road	Grading frontyard to treat roof, lawn, and driveway runoff using shallow bioretention
	Dry swales	Curb/gutter and storm drain pipes	Shallow, well-drained bioretention swales located in the street right-of-way
Peak Reduction and Runoff Treatment	Linear wetlands	Large detention ponds	Long, multi-cell, forested wetlands located in the stormwater conveyance system
Aquatic Buffers and Managed Floodplains	Stream buffer management	Unmanaged stream buffers	Active reforestation of buffers and restoration of degraded streams

Note: SCMs are applied in a series, although all of the above may not be needed at a given residential site. This “roof-to-stream” approach works best for low- to medium-density residential development.

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TABLE 5-9 From the Roof to the Outfall: SCMs in an Industrial Context

SCM Category	What it Is	What it Replaces	How it Works
Pollution Prevention	Drainage mapping	No map	Analysis of the locations and connections of the stormwater and wastewater infrastructure from the site
	Hotspot site Investigation	Visual inspection	Systematic assessment of runoff problems and pollution prevention opportunities at the site
	Rooftop management	Uncontrolled rooftop runoff	Use of alternative roof surfaces or coatings to reduce metal runoff, and disconnection of roof runoff for stormwater treatment
	Exterior maintenance practices	Routine plant maintenance	Special practices to reduce discharges during painting, powerwashing, cleaning, sealcoating and sandplasting
	Extending roofs for no exposure	Exposed hotspot operations	Extending covers over susceptible loading/unloading, fueling, outdoor storage, and waste management operations
	Vehicular pollution prevention	Uncontrolled vehicle operations	Pollution prevention practices applied to vehicle repair, washing, fueling, and parking operations
	Outdoor pollution prevention practices	Outdoor materials storage	Prevent rainwater from contact with potential pollutants by covering, secondary containment, or diversion from storm-drain system
	Waste management practices	Exposed dumpster or waste streams	Improved dumpster location, management, and treatment to prevent contact with rainwater or runoff
	Spill control plan and response	No plan	Develop and test response to spills to the storm-drain system, train employees, and have spill control kits available on-site
	Greenscaping	Routine landscape and turf maintenance	Reduce use of pesticides, fertilization, and irrigation in pervious areas, and conversion of turf to forest
	Employee stewardship	Lack of stormwater awareness	Regular ongoing training of employees on stormwater problems and pollution prevention practices
	Site housekeeping and stormwater maintenance	Dirty site and unmaintained infrastructure	Regular sweeping, storm-drain cleanouts, litter pickup, and maintenance of stormwater infrastructure
Runoff Treatment	Stormwater retrofitting	No stormwater treatment	Filtering retrofits to remove pollutants from most severe hotspot areas
IDDE	Outfall analysis	No monitoring	Monitoring of outfall quality to measure effectiveness

Note: While many SCMs are used at each individual industrial site, the exact combination depends on the specific configuration, operations, and footprint of each site.

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TABLE 5-10 From the Roof to the Street: SCMs in a Redevelopment Context

SCM Category	What it Is	What it Replaces	How it Works
Impervious Cover Minimization	Site design to prevent pollution	Conventional site design	Designing redevelopment footprint to restore natural area remnants, minimize needless impervious cover, and reduce hotspot potential
Runoff Volume Reduction—Rainwater Harvesting and Vegetated	Treatment on the roof	Traditional rooftops	Use of green rooftops to reduce runoff generated from roof surfaces
	Rooftop runoff treatment	Directly connected roof leaders	Use of rain tanks, cisterns, and rooftop disconnection to capture, store, and treat runoff
	Runoff treatment in landscaping	Traditional landscaping	Use of foundation planters and bioretention areas to treat runoff from parking lots and rooftops
Soil Conservation and Reforestation	Runoff reduction in pervious areas	Impervious or compacted soils	Reducing runoff from compacted soils through tilling and compost amendments, and in some cases, removal of unneeded impervious cover
	Increase urban tree canopy	Turf or landscaping	Providing adequate rooting volume to develop mature tree canopy to intercept rainfall
Runoff Reduction—Subsurface	Increase permeability of impervious cover	Hard asphalt or concrete	Use of permeable pavers, porous concrete, and similar products to decrease runoff generation from parking lots and other hard surfaces.
Runoff Reduction—Vegetated	Runoff treatment in the street	Sidewalks, curb and gutter, and storm drains	Use of expanded tree pits, dry swales and street bioretention cells to further treat runoff in the street or its right-of-way
Runoff Treatment	Underground treatment	Catch basins and storm-drain pipes	Use of underground sand filters and other practices to treat hotspot runoff quality at the site
Municipal Housekeeping	Street cleaning	Unswept streets	Targeted street cleaning on priority streets to remove trash and gross solids
Watershed Planning	Off-site stormwater treatment or mitigation	On-site waivers	Stormwater retrofits or restoration projects elsewhere in the watershed to compensate for stormwater requirements that cannot be met on-site

Note: SCMs are applied in a series, although all of the above may not be needed at a given redevelopment site.

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challenges of dense urban environments. The tables are meant to be illustrative of certain situations; other scenarios, such as commercial development, would likely require additional tables.

In summary, a watershed approach for organizing site-based stormwater decisions is generally superior to making site-based decisions in isolation. Communities that adopt the preceding watershed elements not only can maximize the performance of the entire system of SCMs to meet local watershed objectives, but also can maximize other urban functions, reduce total costs, and reduce future maintenance burdens.

COST, FINANCE OPTIONS, AND INCENTIVES

Municipal Stormwater Financing

To be financially sustainable, stormwater programs must develop a stable long-term funding source. The activities common to most municipal stormwater programs (such as education, development design review, inspection, and enforcement) are funded through general tax revenues, most commonly property taxes and sales taxes (NAFSMA, 2006), which is problematic for several reasons. First, stormwater management financed through general tax receipts does not link or attempt to link financial obligation with services received. The absence of such links can reduce the ability of a municipality to adequately plan and meet basic stormwater management obligations. Second, when funded through general tax revenues, stormwater programs must compete with other municipal programs and funding obligations. Finally, in programs funded by general tax revenue, responsibilities for stormwater management tend to be distributed into the work responsibilities of existing and multiple departments (e.g., public works, planning, etc.). One recent survey conducted in the Charles River watershed in Massachusetts found that three-quarters of local stormwater management programs did not have staff dedicated exclusively for stormwater management (Charles River Watershed Association, 2007).

Increasingly, many municipalities are establishing stormwater utilities to manage stormwater (Kaspersen, 2000). Most stormwater utilities are created as a separate organizational entity with a dedicated, self-sustaining source of funding. The typical stormwater utility generates the large majority of revenue through user fees (Florida Stormwater Association, 2003; Black and Veatch, 2005; NAFSMA, 2006). User fees are established and set so as to have a close nexus to the cost of providing the service and, thus, are most commonly based on the amount of impervious surface, frequently measured in terms of equivalent residential unit. For example, an average single-family residence may create 3,000 square feet of impervious surface (roof and driveway area). A per-unit charge is then assigned to this "equivalent runoff unit." To simplify program

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administration, utilities typically assign a flat rate for residential properties (customer class average) (NAFSMA, 2006). Nonresidential properties are then charged individually based on the total amount of impervious surface (square feet or equivalent runoff units) of the parcel. Fees are sometimes also based on gross area (total area of a parcel) or some combination of gross area and a development intensity measure (Duncan, 2004; NAFSMA, 2006).

Municipalities have the legal authority to create stormwater utilities in most states (Lehner et al., 1999). In addition to creating the utility, a municipality will generally establish the utility rate structure in a separate ordinance. Separating the ordinances allows the municipality flexibility to change the rate structure without revising the ordinance governing the entire utility (Lehner et al., 1999). While municipalities generally have the authority to collect fees, some states have legal restrictions on the ability of local governments to levy taxes (Lehner et al., 1999; NAFSMA, 2006). The legal distinction between a tax and a fee is the most common legal challenge to a stormwater utility. For example, stormwater fees have been subject to litigation in at least 17 states (NAFSMA, 2006). To avoid legal challenges, care must be taken to meet a number of legal tests that distinguish a fee for a specific service and a general tax.

Stormwater utilities typically bill monthly, and fees range widely. A recent survey of U.S. stormwater utilities reported that fees for residential households range from $1 to $14 per month, but a typical residential household rate is in the range of $3 to $6 (Black and Veatch, 2005). Despite the dedicated funding source, the majority of stormwater utilities responding to a recent survey (55 percent) indicated that current funding levels were either inadequate or just adequate to meet their most urgent needs (Black and Veatch, 2005).

Both municipal and state programs can finance administrative programming costs through stormwater permitting fees. Municipal stormwater programs can use separate fees to finance inspection activities. For instance, inspection fees can be charged to cover the costs of ensuring that SCMs are adequately planned, installed, or maintained (Debo and Reese, 2003). Stormwater management programs can also ensure adequate funding for installation and maintenance of SCMs by requiring responsible parties to post financial assurances. Performance bonds, letters of credit, and cash escrow are all examples of financial assurances that require up-front financial payments to ensure that longer-term actions or activities are successfully carried out. North Carolina's model stormwater ordinance recommends that the amount of a maintenance performance security (bond, cash escrow, etc.) be based on the present value of an annuity based on both inspection costs and operation and maintenance costs (Whisnant, 2007).

In addition to fees or taxes, exactions such as impact fees can also be used as a way to finance municipal stormwater infrastructure investments (Debo and Reese, 2003). An impact fee is a one-time charge levied on new development. The fee is based on the costs to finance the infrastructure needed to service the new development. The ability to levy impact fees varies between states. Municipalities that use impact fees are also required to show a close nexus between the size of the fee and the level of benefits provided by the fee; a failure to do so

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exposes local government to law suits (Keller, 2003). Compared to other funding sources, impact fees also exhibit greater variability in revenue flows because the amount of funds collected is dependent on development growth.

Bonds and grants can supplement the funding sources identified above. Bonds and loans tend to smooth payments over time for large up-front stormwater investments. For example, state and federal loan programs (state revolving funds) provide long-term, low-interest loans to local governments or capital investments (Keller, 2003). In addition, grant opportunities are sometimes available from state and federal sources to help pay for specific elements of local stormwater management programs.

Municipalities require funds to meet federal and state stormwater requirements. Understanding of the municipal costs incurred by implementing stormwater regulations under the Phase I and II stormwater rules, however, is incomplete (GAO, 2007). Of the six minimum measures of a municipal stormwater program (public education, public involvement, illicit discharge detection and elimination, construction site runoff control, post-construction stormwater management, and pollution prevention/good housekeeping—see Chapter 2), a recent study of six California municipalities found that pollution prevention activities (primarily street sweeping) accounted for over 60 percent of all municipal stormwater management costs in these communities (Currier et al., 2005). Annual per-household costs ranged from $18 to $46.

Stormwater Cost Review

Conceptually, the costs of providing SCMs are all opportunity costs (EPA, 2000). Opportunity costs are the value of alternatives (next best) given up by society to achieve a particular outcome. In the case of stormwater control, opportunity costs include direct costs necessary to control and treat runoff such as capital and construction costs and the present value of annual operation and maintenance costs. Initial installation costs should also include the value of foregone opportunities on the land used for stormwater control, typically measured as land acquisition (land price).

Costs also include public and private resources incurred in the administration of the stormwater management program. Private-sector costs might include time and administrative costs associated with permitting programs. Public costs include agency monitoring and enforcement costs.

Opportunity costs also include other values that might be given up as a consequence of stormwater management. For example, the creation of a wet pond in a residential area might be opposed because of perceived safety, aesthetic, or nuisance concerns (undesirable insect or animal species). In this case, the diminished satisfaction of nearby property owners is an opportunity cost associated with the wet pond. On the other hand, if SCMs are considered a neighborhood amenity (e.g., a constructed wetland in a park setting), opportunity costs may decrease. In addition, costs of a given practice may be reduced by reducing

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costs elsewhere. For example, increasing on-site infiltration rates can reduce off-site storage costs by reducing the volume and slowing the release of runoff.

In general the cost of SCMs is incompletely understood and significant gaps exist in the literature. More systematic research has been conducted on the cost of conventional stormwater SCMs (wet ponds, detention basins, etc.), with less research applied to more recent, smaller-scale, on-site infiltration practices. Cost research is challenging given that stormwater treatment exhibits considerable site-specific variation resulting from different soil, topography, climatic conditions, local economic conditions, and regulatory requirements (Lambe et al., 2005).

The literature on stormwater costs tend to be oriented around construction costs of particular types of SCMs (Wiegand et al., 1986; SWRPC, 1991; Brown and Schueler, 1997; Heaney et al., 2002; Sample et al., 2003; Wossink and Hunt, 2003; Caltrans, 2004; Narayanan and Pitt, 2006; DeWoody, 2007). In many of these studies, construction cost functions are estimated statistically based on a sample of recently installed SCMs and the observed total construction costs. Observed costs are then related statistically to characteristics that influence cost such as practice size. Other studies estimate costs by identifying the individual components of a construction project (pipes, excavation, materials, labor, etc.), estimating unit costs of each component, and then summing all project components. These studies generally find that construction costs decrease on a per-unit basis as the overall size (expressed in volume or drainage area) of the SCM increases (Lambe et al., 2005). These within-practice economies of scale are found across certain SCMs including wet ponds, detention ponds, and constructed wetlands. Several empirical studies, however, failed to find evidence of economies of scale for bioretention practices (Brown and Schueler, 1997; Wossink and Hunt, 2003).

Increasing attention has been paid to small-scale practices, including efforts to increase infiltration and retain water through such means as green roofs, permeable pavements, rain barrels, and rain gardens (under the label of LID). The costs of these practices are less well studied compared to the other stormwater practices identified above. In general, per-unit construction and design costs exceed larger-scale SCMs (Low Impact Development Center, 2007). Higher construction costs, however, may be offset to various degrees by reducing the investments in stormwater conveyance and storage infrastructure (i.e., less storage volume is needed) (CWP, 1998a, 2000a; Low Impact Development Center, 2007). Others have suggested that per-unit costs to reduce runoff may be less for these small-scale distributed practices because of higher infiltration rates and retention rates (MacMullan and Reich, 2007).

Compared to construction costs, less is known about the operation and maintenance costs of SCMs (Wossink and Hunt, 2003; Lambe et al., 2005; MacMullan and Reich, 2007). Most stormwater practices are not maintenance free and can create financial and long-term management obligations for responsible parties (Hager, 2003). Cost-estimation programs and procedures have been developed to estimate operation and maintenance costs as well as construction

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costs (SWRPC, 1991; Lambe et al., 2005; Narayanan and Pitt, 2006), but examination of observed maintenance costs is less common. Based on estimates from Wossink and Hunt (2003), the total present value of maintenance costs over 20 years can range from 15 to 70 percent of total capital construction costs for wet ponds and constructed wetlands and appear generally consistent with percentages reported in EPA (1999). Operation and maintenance costs were also reported to be a substantial percentage of construction costs of infiltration pits and bioretention areas in Southern California (DeWoody, 2007). Others estimate that over the life of many SCMs, maintenance costs may equal construction costs (CWP, 2000a). In general, maintenance costs tend to decrease as a percentage of total SCM cost as the total size of the SCM increases (Wossink and Hunt, 2003).

Very few quantifiable estimates are available for public and private regulatory compliance costs. Compliance costs could include both initial permitting costs (labor and time delays) of gaining regulatory approval for a particular stormwater design to post-construction compliance costs (administration, inspection monitoring, and enforcement). Compliance monitoring is a particular concern if a stormwater management program relies on widespread use of small-scale distributed on-site practices (Hager, 2003). Unlike larger-scale or regional stormwater facilities that might be located on public lands or on private lands with an active stormwater management plan, a multitude of smaller SCMs would increase monitoring and inspection times by increasing the number of SCMs. Furthermore, municipal governments may be reluctant to undertake enforcement actions against citizens with SCMs located on private land.

Land costs tend to be site specific and exhibit a great deal of spatial variation. Some types of SCMs, such as constructed wetlands, are more land intensive than others. In highly urban areas, land costs may be the single biggest cost outlay of land-intensive SCMs (Wossink and Hunt, 2003).

In general, cost analyses generally find that the cost to treat a given acreage or volume of water is less for regional SCMs than for smaller-scale SCMs (Brown and Schueler, 1997; EPA, 1999; Wossink and Hunt, 2003). For example, considering maintenance, capital construction, and land costs, recent estimates for North Carolina indicate that annual costs for wet ponds and constructed wetlands range between $100 and $3,000 per treated acre (typically less than $1,000). Per-acre annual costs for bioretention and sand filters typically ranged between $300 and $3,500, and between $4,500 and 8,500, respectively. However, if SCMs face space constraints, bioretention areas can become more cost effective. Furthermore, other classes of small, on-site practices, such as grass swales and filter strips, can sometimes be implemented for relatively low cost.

There are exceptions to the general conclusion that larger-scale stormwater practices tend to be less costly on a per-unit basis than more numerous and distributed on-site practices. For instance, in Sun Valley, California, a recent study indicates that installing small distributed practices (infiltration practices, porous pavement, rain gardens) was more cost effective than centralized approaches for

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a retrofit program (Cutter et al., 2008). In this particular setting, the difference tended to revolve around the high land costs in the urbanized setting. Small-scale practices can be placed on low-valued land or integrated into existing landscaping, reducing land costs. Centralized stormwater facilities require substantial purchases of high-priced urban properties. Similarly, small distributed practices (porous pavement, green roofs, rain gardens, and constructed wetlands) can also provide a more cost-effective approach to reducing combined sewer overflow (CSO) discharges in a highly urban setting than large structural CSO controls (storage tanks) (Montalto et al., 2007).

SCMs are now a part of most development processes and consequently will increase the cost of the development. Randolph et al. (2006) report on the cost of complying with stormwater and sediment and erosion control regulations for six developments in the Washington, D.C., metropolitan area. These costs include primarily stormwater facility construction and land costs. The findings from these case studies indicate that stormwater and erosion and sediment control comprised about 60 percent of all environmental-related compliance costs for the residential developments studied and added about $5,000 to the average price of a home. Nationwide, stormwater and erosion and sediment controls are estimated to add $1,500 to $9,000 to the cost of a new residential dwelling unit (Randolph et al., 2006).

As a means to control targeted chemical constituents, SCMs may be an expensive control option relative to other control alternatives. For example, nutrients from anthropocentric sources are an increasing water quality concern for many fresh and marine waters. Some states (e.g., Virginia, Maryland, and North Carolina) require stormwater programs to achieve specific nutrient (nitrogen or phosphorus) stormwater standards. The construction, maintenance, and land costs of reducing nitrogen discharge from residential developments using bioretention areas, wet ponds, constructed wetlands, or sand filters range from $60 to $2,500 per pound (Aultman, 2007). These control costs can be an order of magnitude higher than nitrogen control costs from point sources or agricultural nonpoint sources. The high per-pound removal costs are due in part to the relatively low mass load of nutrients carried in stormwater runoff. These estimates, however, assume that all costs are allocated exclusively to nitrogen removal. The high per-pound removal costs from the control of single pollutants highlight the importance of achieving ancillary and offsetting benefits associated with stormwater control (e.g., removal of other pollutants of concern, stream-channel protection from volume reduction, and enhancement of neighborhood amenities).

It should also be noted that installing SCMs in an existing built environment tends to be significantly more expensive than new construction. Construction costs for retrofitted extended detention ponds, wet ponds, and constructed wetlands were estimated to be two to seven times more costly than new SCMs (Schueler et al., 2007). Retrofit costs can be higher for a variety of reasons, including the need to upgrade existing infrastructure (culverts, drainage channels, etc.) to meet contemporary engineering and regulatory requirements. Retrofitting a single existing residential city block in Seattle with a new stormwater

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drainage system that included reduced street widths, biofiltration practices, and enhanced vegetation cost an estimated $850,000 (see Box 5-5; Seattle Public Utilities, 2007). Estimates suggested that the costs might have been even higher using more conventional stormwater piping/drainage systems (Chris May, personal communication, August 2007; EPA, 2007).

As discussed earlier in the chapter, stormwater runoff can be reduced and managed through better site design to reduce impervious cover. Low- to medium-density developments can reduce impervious cover through cluster development patterns that preserve open space and reduce lot sizes. Impervious surfaces and infiltration rates could be altered by any number of site-design characteristics such as reduction in street widths, reduction in the number of cul-de-sacs, and different setback requirements (CWP, 2000a). Finally, impervious surface per capita could be substantially reduced by increasing the population per dwelling unit.

Quantifying the cost of many of these design features is more challenging, and the literature is much less developed or conclusive than the literature on conventional SCM costs. Many design features described above (clustering, reduced setbacks, narrower streets, less curb and gutter) can significantly lower construction and infrastructure costs (CWP, 2001; EPA, 2007). Such features may reduce the capital cost of subdivision development by 10 to 33 percent (CWP, 2000a).

On the other hand, the evidence is unclear whether consumers are willing to pay for these design features. If consumers prefer features typically associated with conventional developments (large suburban lot, for example), then some aspects of alternative development designs/patterns could impose an opportunity cost on builders and buyers alike in the form of reduced housing value. For example, most statistical studies in the U.S. housing market find that consumers prefer homes with larger lots and are willing to pay premiums for homes located on cul-de-sacs, presumably for privacy and safety reasons (Dubin, 1998; Fina and Shabman, 1999; Song and Knapp, 2003). These effects, however, might be partly or completely offset by the higher value consumers might place on the proximity of open space to their homes (Palmquist, 1980; Cheshire and Sheppard, 1995; Qiu et al., 2006). Anecdotal evidence indicates that residents feel that Seattle's Street Edge Alternative program (the natural drainage system retrofit program that combines swales, bioretention and reduced impervious surfaces) increased their property values (City of Seattle, undated). Studies that have attempted to assess the net change in costs are limited, but some evidence suggests that the amenity values of lower-impact designs may match or outweigh the disamentities (Song and Knapp, 2003).

Incentives for Stormwater Management

The dominant policy approach to controlling effluent discharge under the Clean Water Act is through the application of technology-based effluent stan-

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dards or the requirements to install particular technologies or practices. Some note that this general policy approach may not provide the regulated community with (1) incentives to invest in pollution prevention activities beyond what is required in the standard or with (2) sufficient opportunities or flexibility to lower overall compliance costs (Parikh et al., 2005).

A loosely grouped set of policies, called here "incentive-based,"[1] aim to create financial incentives to manage effluent or volume discharge. Such policies tend to be classified into two groups: price- and quantity-based mechanisms (Stavins, 2000; Parikh et al., 2005). Price-based mechanisms are created when government creates a charge (tax, fee, etc.) or subsidy (payment) on an outcome that government wants to either discourage or encourage. Ideally, the price would be placed on a target outcome (effluents discharged, volume of water released, etc.) and not on the means to achieve that outcome end (such as a tax or subsidy to adopt specific technologies or practices).[2] Quantity-based policies require government to establish some binding limit or cap on an outcome (e.g., mass load of effluent, volume of runoff, etc.) for an identified group of dischargers, but then allow the regulated parties to "trade" responsibilities for meeting that limit or cap. The opportunity to trade creates the financial incentive. The trading concept is discussed in greater detail in Chapter 6, while this section focuses on price-based incentives.

Some stormwater utilities offer reductions in stormwater fees to landowners who voluntarily undertake activities to reduce runoff from their parcels (Doll and Lindsey, 1999; Keller, 2003). The reduction in tax obligations, called credits, can be interpreted as a financial subsidy or payment for implementing onsite runoff controls. Credit payments are typically made based on the volume of water detained. For example, as part of Portland, Oregon's Clean River Rewards program, residents and commercial property owners can reduce their stormwater utility fee by as much as 35 percent by reducing stormwater runoff from existing developed properties (Portland Bureau of Environmental Services, 2008a). Residential and commercial property owners are given a number of ways to reduce runoff to receive this financial benefit. In addition, Portland has a downspout disconnection program that aims to reduce discharge into CSOs in targeted areas in the city. Property owners may be reimbursed up to $53 per eligible downspout (Portland Bureau of Environmental Services, 2008b).

Alternatively, stormwater utilities could (where allowed) also use fee revenue to provide private incentives for stormwater control through a competitive

[1] These policies are sometimes called "market-based" policies, but that term will not be used here because many of the incentive-based policies discussed fail to contain features characteristic of a market system.

[2] The literature on what level to set the price (tax or subsidy) is vast, complex, and controversial. Parikh et al. (2005) seem to wander into this debate (perhaps unwittingly) by making a distinction between taxes based on some optimality rule (marginal damage costs equal to marginal control costs) and those based on some other sort of decision rule. Without getting into the specifics of this debate here, this discussion will simply assert more generally that price-based incentive policies structure taxes and subsidies to induce desirable behavioral change (rather than simply to raise revenue).

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bidding process. Such a bidding process ("reverse auction") would request proposals for stormwater reduction projects and fund projects that reduce volume at the least cost. Proposed investments that can meet the program objectives at the lowest per unit cost would receive payments. Such a program creates private incentives to search for low-cost stormwater investments by creating a price for runoff volume reduction. The bidding program could also be used to identify cost-effective stormwater investments in areas targeted for enhanced levels of restoration. A bidding program has been proposed as a way to lower overall costs of a stormwater program in Southern California (Cutter et al., 2008). Revenue to fund such a competitive bid program could come from a variety of sources including stormwater utility fees or fees paid into an in lieu fee program.

Finally, impact fees on new developments can be structured in a way to create incentives to reduce stormwater runoff volumes. Charges based on runoff volume (or a surrogate measure like impervious surface) can provide an incentive for developers to reduce the volume of new runoff created.

CHALLENGES TO IMPLEMENTATION OF WATERSHED-BASED MANAGEMENT AND STORMWATER CONTROL MEASURES

The implementation of SCMs has seen variable success. Environmental awareness, threats to potable water sources or to habitat for threatened and endangered species, problems with combined sewer overflows, and other environmental factors have caused cities such as Portland, Oregon; Seattle, Washington; Chicago, Illinois; and Austin, Texas to aggressively pursue widespread implementation of a broad range of SCMs. In contrast, other cities have been slow to implement recommended practices, for many reasons. This is particularly true for nonstructural SCMs, despite their popularity among planners and regulators for the past two decades. A host of real and perceived concerns about individual nonstructural SCMs are often raised regarding development costs, market acceptance, fire safety, emergency access, traffic and parking congestion, basement seepage, pedestrian safety, backyard flooding, nuisance conditions, maintenance, and winter snow removal operations. While most of these concerns are unfounded, they contribute to a culture of inertia when it comes to code change (CWP, 1998a, 2000a). As a result, some nonstructural SCMs are discouraged or even prohibited by local development codes. Very few communities make the consideration of nonstructural practices a required element of stormwater plan review, nor do they require that they be considered early in the site layout and design process when their effectiveness would be maximized. Finally, many engineers and planners feel they can fully comply with existing stormwater criteria without resorting to nonstructural SCMs.

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Cost Issues

There are numerous cost issues that have proven to be significant barriers to the use of innovative SCMs. Special construction techniques required for the proper design and function of SCMs, specially formulated manufactured soils, expensive subsurface vaults, and increased land area requirements as a result of increased stormwater storage requirements can significantly increase site development costs. For smaller projects in highly urbanized areas where land costs are high, there can be a disproportionately large expense to comply with stormwater regulations, causing developers to seek, and often receive, exemption from requirements.

Sediment removal and related maintenance activities required to ensure the proper ongoing functioning of SCMs are activities that are not a part of normal building maintenance. Data on maintenance costs of SCMs on privately owned facilities are limited, and management companies responsible for commercial and office building maintenance have yet to provide SCM maintenance as part of their services.

Additional costs are incurred when development review periods by public agencies get extended because of an increased level of design review required to evaluate the compliance of SCMs with city ordinances. Additional review increases development costs and extends the design process. Even with specialized training for city staff to evaluate SCM submittals, deviation from the most basic type of SCM design seems to require extended review and documentation.

Cost concerns are partly responsible for the markedly slow implementation of the stormwater program. The federal deadlines for permit coverage have long passed; in fact more than 14 years have lapsed for medium and large municipalities. A good part of the delay can be explained by the resistance of states and local governments to the unknown cost burden. Cities contend that the permit requirements are unreasonable, expensive, and unrealistic to achieve. Many local government officials view some permit provisions such as LID or better site design as intrusion into the land-use authority of local governments.

As discussed in Chapter 2, the U.S. Congress provided no start-up or upgrade financial assistance, unlike what it did for municipally owned and operated wastewater treatment plants after the promulgation of the NPDES permit program under the Clean Water Act in 1972. Local governments have been reluctant to tax residents or create stormwater utilities. States like California and Michigan even have laws that require voter approval in order for local governments to assess new fees. Thus, to implement the NPDES stormwater program, states have had to largely rely on stormwater permit fees collected to support a skeletal to modest staff for program oversight. In Denver, and presumably in other cities, there is no reduction in stormwater fees when impervious area is reduced because of construction of on-site SCMs. This amounts to a disincentive to do the “right thing.” Meanwhile, the overall federal budget for the NPDES program, including stormwater, has been declining.

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Long-Term Maintenance of Stormwater Control Measures

One of the weakest parts of most stormwater management programs is the lack of information about, and funding to support, the long-term maintenance of SCMs. If SCMs are not inspected and maintained on a regular basis, the stormwater management program is likely to fail. This also negatively impacts the design process—if there is no inspection program oand no accountability for maintenance, the designer has no incentive to build better, more maintenance-friendly SCMs. Finally, without an accurate assessment of the maintenance needs of an SCM, land owners and other responsible parties cannot anticipate their total costs over the lifetime of the device.

Almost all SCMs require active long-term maintenance in order to continue to provide volume and water quality benefits (Hoyt and Brown, 2005; Hunt and Lord, 2006b). Furthermore, a typical municipality may contain hundreds or thousands of individual SCMs within its jurisdiction. Thus, the long-term obligations for maintenance are considerable. For example, the annual maintenance cost of 100 medium-sized wet ponds (one-half acre to 2 acres) is estimated to be a quarter of a million dollars (Hunt and Lord, 2006c). Currently, the majority of municipal stormwater programs do not have adequate plans or resources in place for the long-term maintenance of SCMs (GAO, 2007).

A number of issues confront the long-term maintenance of SCMs. First, legal and financial responsibility for maintenance must be assigned. Historically stormwater ownership and responsibility have been poorly defined and implemented (Reese and Presler, 2005). If a party is an industrial facility that is required to obtain a permit, then responsibility for maintaining SCMs rests with the permittee. Other instances are more ambiguous. For residential developments, the responsibility for long-term maintenance could be assigned to the developer (e.g., establishing long-term financial accounts for maintenance), individual landowners, homeowners associations, or the municipality itself. Some cities, like Austin and Seattle, assume responsibility for long-term maintenance of SCMs in residential areas. Concerns over assigning responsibility to individual residential landowners or homeowners associations include insufficient technical and financial resources to conduct consistent maintenance and a lack of inspection to require maintenance. A recent survey of municipal stormwater programs found that less than one-third perform regular maintenance on stormwater detention ponds or water quality SCMs in general residential areas (Reese and Presler, 2005). To ensure that adequate maintenance will occur, municipalities can require performance securities (performance bonds, escrow accounts, letter of credit, etc.) that ensure adequate funds are available for maintenance and repair in the event of failure to maintain the SCM by the responsible party.

An effective maintenance program also requires a system to inventory and track SCMs, inspection/monitoring, and enforcement against noncompliance. The large number of SCMs to track and manage creates management challenges. Municipal stormwater programs must administer their regulatory programs, perform inspection and enforcement activities, and maintain SCMs in public

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lands/rights-of-way and sometimes in residential areas. Municipal programs often do not have adequate staff to ensure that these maintenance responsibilities are adequately carried out. The lack of adequate staff for inspection and an inadequate system for prioritizing inspections have been repeatedly pointed out (Duke and Beswick, 1997; Duke, 2007; GAO, 2007).

Tracking and monitoring costs may also create disincentives for municipalities to adopt smaller-scale SCMs. Residential-scale rain gardens, porous driveways, rain barrels, and grass swales all have the potential to increase the cost and complexity of compliance monitoring because of the multitude of small infiltration devices that are located on private property as opposed to having fewer SCMs located in public rights-of-way or public lands. Small-scale distributed SCMs located on private property raise concerns of municipal willingness to inspect and enforce against noncompliance. Indeed, some municipalities have banned innovative SCMs like pervious pavement because the municipalities have no means to ensure their maintenance and continued operation.

Finally, there is concern that there is inadequate funding to maintain the growing number of SCMs on the landscape. The long-term funding obligation for maintenance has been difficult to assess (GAO, 2007), partly because many stormwater programs frequently do not have adequate accounting practices to define capital value and depreciation, maintenance, operation, or management programs (Reese and Presler, 2005). The problem is compounded because the long-term maintenance cost associated with various types of SCMs is not well understood. Additional research and information are needed on the costs of maintaining the performance of SCMs as experienced in the field (rather than ex ante estimates based on design plans). Research into long-term maintenance costs should include not only routine operation and maintenance costs but also costs for inspection and enforcement and remediation costs associated with SCM performance failures. Such research is critical to understanding the long-term cost obligation that is being assumed by municipal stormwater programs that are responsible for managing a growing number of SCMs.

At the present time, the maintenance schedule for many of the proprietary and non-proprietary SCMs is poorly defined. It will vary with the type of drainage area and the activities that are occurring within it and with the efficiency of the SCM. (For example, the city of Austin, Texas, has determined that the average lifespan of their sand filters ranges from 5 to 15 years, but can be as little as one year if there is construction in the drainage area.) In order to establish a maintenance schedule, an assessment protocol needs to be adopted by municipalities. The protocol, which is specific to the type of SCM, could consist of the following: each year municipalities would be required to collect data from a subset of their SCMs on public and private property, and then over a period of years these data could be used to determine maintenance schedules, predict performance based on age and sediment loading, and identify failed systems. A measurement of the depth of deposited sediment might be the only test needed for settling devices, such as hydrodynamic devices and wet detention ponds. Two levels of analysis could be performed for infiltration devices—one based

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on simple visual observations and the other using an instrument to check infiltration rates. These assessment methods for infiltration devices have been tested at the University of Minnesota (Gulliver and Anderson, 2007). Without an assessment protocol for SCMs, the chances for poor maintenance and outright failure are greatly increased, it is difficult if not impossible to determine the actual performance of an SCM, and there will be insufficient data to reduce the uncertainty in future SCM design.

Lack of Design Guidance on Important SCMs and Lack of Training

Progress in implementing SCMs is often handicapped by the lack of local or national design guidance on important SCMs, and by the lack of training among the many players in the land development community (planners, designers, plan reviewers, public works staff, regulators, and contractors) on how to properly implement them on the ground. For example, design guidance is lacking or just emerging for many of the non-traditional SCMs, such as conservation of natural areas, earthwork minimization, product substitution, reforestation, soil restoration, impervious cover reduction, municipal housekeeping, stormwater education, and residential stewardship. Some LID techniques are better covered, such as the standards for pervious concrete from the American Concrete Institute and the National Ready Mixed Concrete Association. Design guidance for traditional SCMs such as erosion and sediment control may exist but is often incomplete, outdated, or lacking key implementation details to ensure proper on-the-ground implementation. In other cases, design guidance is available, but has not been disseminated to the full population of Phase II MS4 communities. For example, in an unpublished survey of state manuals used to develop national post-construction stormwater guidance, Hirschman and Kosco (2008) found that less than 25 percent provided sizing criteria, detailed engineering design specifications, or maintenance criteria. Nationwide guidance on SCM design and implementation may not be advisable or applicable to all physiographic, climatic, and ecoregions of the country. Rather, EPA and the states should encourage the development of regional design guidance that can be readily adapted and adopted by municipal and industrial permittees. Improvement of SCM design guidance should incorporate more direct consideration of the parameters of concern, how they move across the landscape, and the issues in receiving waters—a strategy both espoused in this report (page 351) and in recent publications on this topic (Strecker et al., 2005, 2007).

The second key issue relates to how to train and possibly certify the hundreds of thousands of individuals that are responsible for land development and stormwater infrastructure at the local and state level. New stormwater methods and practices cannot be effectively implemented until local planners, engineers, and landscape architects fully understand them and are confident on how to apply them to real-world sites. Currently, stormwater design is not a major com-

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ponent of the already crowded curriculum of undergraduate or graduate planning engineering or landscape architecture programs. Most stormwater professionals acquire their skills on the job. Given the rapid development of new stormwater technologies, there is a critical need for implementation of regional or statewide training programs to ensure that stormwater professionals are equipped with the latest knowledge and skills. The training programs should ultimately lead to formal certification for stormwater designers, inspectors, and plan reviewers.

Different Standards in Different Jurisdictions That Are Within the Same Watershed

Governmental and watershed boundaries rarely coincide, with the result that most watersheds are made up of many municipal bodies regulating stormwater management. Unfortunately in most cases there is no overarching stormwater regulatory structure that is based upon a watershed analysis. This can result in many unfortunate conflicts, where approval of a stormwater facility does not affect the community issuing the permit. It is often said that the most effective stormwater management for an area high in the watershed is to speed the water downstream, thus saving the upstream community but severely damaging the downstream rivers. While this may be an exaggeration, the problems downstream are less of a concern to the upper watershed communities, and downstream communities may not be able to solve their water issues without help from the upstream communities.

Often neighboring communities' plans or the methods or data used do not coincide. For example, often out-of-date rainfall distributions, methods, or standards are required in the code that do not apply to the newer focus on smaller storms and volume reduction. If methods that include Modified Rational or TR-55 are used, it is difficult if not impossible to show the benefits in peak flow reduction gained through volume reduction devices. Also, some municipalities may require curb and piping and not allow swales, impending the implementation of a cost-effective design. Finally, it is difficult to observe a measureable impact of SCMs when they are guided by a patchwork of regulations. One community may require removal of the first inch of runoff, and another may require the reduction of the 25-year, post-construction peak to the 10-year pre-construction level.

Water Rights that Conflict with Stormwater Management

In the West, water is considered real property, governed by state law and regional water compacts. Landowners in urban areas rarely own surface water rights and are typically prohibited from "beneficial use" of that water, which affects how SCMs are chosen. For example, current practices in Colorado typically allow stormwater to be infiltrated within a short period of time on-site

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without violation of water laws. However, storage of and/or pumping this water for broader distribution is considered to be a beneficial use and is therefore prohibited. Moreover, as discussed in Chapter 2, SCMs that manage stormwater by driving the water underground with a bored, drilled, or driven shaft or a hole dug deeper than its widest surface dimension are typically considered to be "injection wells," requiring a federal permit and regular monitoring under the Safe Drinking Water Act.

Some states prohibit infiltration because of concerns over long-term groundwater pollution. In California, which does not have a uniform policy for groundwater management and groundwater rights, authority over groundwater quality management falls to several regional and local agencies. For example, the Upper Los Angeles River Area (ULARA) has a court-appointed Watermaster to manage the complex appropriation of its groundwater to user cities and agencies. The ULARA has clashed with the City of Los Angeles regarding rights to all of the water that normally recharges the Los Angeles River via runoff from precipitation. In 2000, the ULARA Watermaster expressed a concern with certain permit provisions of the Los Angeles County MS4 Permit for New Development/ Redevelopment that promoted infiltration, stating that the MS4 permit interfered with the adjudicated right of the City of Los Angeles to manage groundwater.

Urban Development and Sprawl

The continued expansion of urban areas is inevitable given population increases worldwide and the transition from agricultural to industrial economies. Given that urbanization of almost any magnitude—even less than 10 percent impervious area—has been demonstrated to have an impact on in-stream water quality, a central question to be addressed is how water quality can be maintained as cities grow, without having negative impacts on social and economic systems. Ideally, SCMs would perform their water quality function, contribute to the livability of cities, and enhance their economic and social potentials.

Low-density, auto-oriented urban development, commonly known as sprawl, has been the predominant pattern of development in the United States, and increasingly worldwide, since World War II. It has been widely criticized for its inefficient use of land, its high use of natural resources, and its high energy costs—all of which are associated with the required auto-oriented travel. Additionally, ongoing economic costs related to the provision of widely dispersed services and social impacts of a breakdown in community life have been identified (Bruegmann, 2005). Sprawl and the impacts on in-stream water quality that result from urbanization have been an inevitable consequence of improved economic conditions. In the United States, sprawl constitutes the vast majority of development occurring today because a majority of the population is attracted to the benefits of a suburban lifestyle, government has subsidized roads and highways at the expense of public transit, and local zoning often limits de-

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velopment density.

There has been a great deal of innovation in city planning and design in the past decade that encourages greater density and a return to urban living. New types of zoning, New Urbanism, Smart Growth, and related innovations in urban planning and design have been developed in parallel with environmental regulations at local to national levels (see Chapter 2). They acknowledge the importance of protecting natural resources to maintain quality of life and have established water quality as an important consideration in city building.

It is not clear that current stormwater regulations can be effectively implemented over the broad range of development patterns that characterize contemporary cities or if they inadvertently favor one type of development over another. For example, on-site SMCs are often recommended as the preferred means of stormwater management, although they tend to encourage lower-density development patterns. And while they are easily implemented and regulated given the incremental, site-by-site development that is typical of most urban growth, monitoring and maintenance can be expensive and difficult for both the individual property owner and the regulating authority. In highly urbanized areas, they are often relegated to subsurface systems that are expensive and that, to be effective, require high levels of maintenance.

In newly developing areas, cluster development should be encouraged whenever possible, according to the Smart Growth principles of narrower streets, reduced setbacks, and related approaches to reduce the amount of impervious area required and land consumed. Furthermore, an interconnected series of on-site and consolidated SCMs can reduce subsurface stormwater piping requirements. Most planned communities have dedicated park and open-space areas that can constitute 25 percent or more of a development's total land area, making it feasible to easily accommodate consolidated SCMs (typically 8 to 10 percent of impervious area) within multi-functional open space and park lands. Cost efficiencies such as a 30 percent reduction in infrastructure costs (Duaney Plater-Zyberk & Company, 2006) can be realized through Smart Growth development techniques. Clustered housing surrounded by open space, laced with trails, has appreciated in value at a higher rate than conventionally designed subdivisions (Crompton, 2007).

In order to encourage infill or redevelopment over sprawl patterns of development, innovative zoning and other practices will be needed to prevent stormwater management from becoming onerous. For example, incentive zoning or performance zoning could be used to allow for greater densities on a site, freeing other portions of the site for SCMs. Innovations in governance and finance can also be used to incorporate consolidated SCMs into urban environments. For example, the City of Denver, in updating its Comprehensive Plan, designated certain underdeveloped corridors and districts in the city as "areas of change" where it hoped to encourage large-scale infill redevelopment. Given the scale of redevelopment, it would be feasible to establish special maintenance districts, allowing the development of consolidated SCMs that have multiple functions. To fund land purchase and facility design and construction, cash in lieu of pay-

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ments could be made.

Safety and Aesthetic Concerns

Vector-borne diseases, especially West Nile virus, are a concern when SCMs such as extended detention basins, constructed wetlands, and rain barrels are proposed. Furthermore, other SCMs that are poorly designed, improperly constructed, or inadequately maintained may retain water and provide an ideal breeding ground for mosquitoes, increasing the potential for disease transmission to humans and wildlife. Kwan et al. (2005) found that water-retaining SCMs increase the availability of breeding habitats for disease vectors and provide opportunistic species an extended breeding season. State Health Departments generally recommend that SCMs be designed to drain fully in 72 hours, which is the minimum time required for a mosquito to complete its life cycle under optimum conditions. In SCMs where there is permanent standing water, such as stormwater wetlands, there is the possibility of introducing biota that might prey on mosquitoes. Municipalities may have to consider the added cost of vector control and public health when implementing stormwater quality management programs.

With larger consolidated and regional extended detention facilities, concerns about the safety of children who may be attracted to such SCMs and ensuing liability must be considered. These SCMs need to be fenced off or otherwise designed appropriately to reduce the risk of drowning.

One aspect of stormwater management that is infrequently considered is the aesthetic appeal, or lack thereof, of SCMs. The visual qualities of SCMs are important because they are a growing part of the urban landscape setting. Although it can be assumed that landscapes that are carefully tended are often preferred over other types of landscapes, it depends substantially on one's point of view. For example, an engineer may consider a particular SCM that is functioning as expected to be beautiful in the sense that its engineering function has been realized, even though there is sediment buildup, algae, or other products of a properly functioning SCM visible. Similarly, a biologist or ecologist evaluating an ecologically healthy SCM in an urban context might find it to be beautiful because of its biological or ecological diversity, whereas another individual who evaluates the same SCM finds it to be "weedy." SCMs can be viewed as a means of restoring a degraded landscape to a state that might have existed before urban development. The desire to "return to nature" is a seductive idea that suggests naturalistic SCMs that may have very little to do with an original landscape, given the dramatic changes in hydrology that are inevitable with urban streams. Each of these widely varied views of SCMs may be appropriate depending on the context and the viewer.

A goal of stormwater management should be to make SCMs desirable and attractive to a broader audience, thereby increasing their potential for long-term effectiveness. For example, the Portland convention center rain gardens demon-

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strate how native and non-native wetland plantings can be carefully composed as a landscape composition and also provide for stormwater treatment. If context and aesthetics of a chosen SCM are poorly matched, there is a high probability that the SCM will be eliminated or its function compromised because of modifications that make its landscape qualities more appropriate for its context.

CONCLUSIONS AND RECOMMENDATIONS

SCMs, when designed, constructed, and maintained correctly, have demonstrated the ability to reduce runoff volume and peak flows and to remove pollutants. However, in very few cases has the performance of SCMs been mechanistically linked to the guaranteed sustainment at the watershed level of receiving water quality, in-stream habitat, or stream geomorphology. Many studies demonstrate that degradation in rivers is directly related to impervious surfaces in the contributing watershed, and it is clear that SCMs, particularly combinations of SMCs, can reduce the runoff volume, erosive flows, and pollutant loadings coming from such surfaces. However, none of these measures perfectly mimic natural conditions, such that the accumulation of these SCMs in a watershed may not protect the most sensitive beneficial aquatic life uses in a state. Furthermore, the implementation of SCMs at the watershed scale has been too inconsistent and too recent to observe an actual cause-and-effect relationship between SCMs and receiving waters. The following specific conclusions and recommendations about stormwater control measures are made.

Individual controls on stormwater discharges are inadequate as the sole solution to stormwater in urban watersheds. SCM implementation needs to be designed as a system, integrating structural and nonstructural SCMs and incorporating watershed goals, site characteristics, development land use, construction erosion and sedimentation controls, aesthetics, monitoring, and maintenance. Stormwater cannot be adequately managed on a piecemeal basis due to the complexity of both the hydrologic and pollutant processes and their effect on habitat and stream quality. Past practices of designing detention basins on a site-by-site basis have been ineffective at protecting water quality in receiving waters and only partially effective in meeting flood control requirements.

Nonstructural SCMs such as product substitution, better site design, downspout disconnection, conservation of natural areas, and watershed and land-use planning can dramatically reduce the volume of runoff and pollutant load from a new development. Such SCMs should be considered first before structural practices. For example, lead concentrations in stormwater have been reduced by at least a factor of 4 after the removal of lead from gasoline. Not creating impervious surfaces or removing a contaminant from the runoff stream simplifies and reduces the reliance on structural SCMs.

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SCMs that harvest, infiltrate, and evapotranspirate stormwater are critical to reducing the volume and pollutant loading of small storms. Urban municipal separate stormwater conveyance systems have been designed for flood control to protect life and property from extreme rainfall events, but they have generally failed to address the more frequent rain events (<2.5 cm) that are key to recharge and baseflow in most areas. These small storms may only generate runoff from paved areas and transport the "first flush" of contaminants. SCMs designed to remove this class of storms from surface runoff (runoff-volume-reduction SCMs—rainwater harvesting, vegetated, and subsurface) can also address larger watershed flooding issues.

Performance characteristics are starting to be established for most structural and some nonstructural SCMs, but additional research is needed on the relevant hydrologic and water quality processes within SCMs across different climates and soil conditions. Typical data such as long-term load reduction efficiencies and pollutant effluent concentrations can be found in the International Stormwater BMP Database. However, understanding the processes involved in each SCM is in its infancy, making modeling of these SCMs difficult. Seasonal differences, the time between storms, and other factors all affect pollutant loadings emanating from SCMs. Research is needed that moves away from the use of percent removal and toward better simulation of SCM performance. Hydrologic models of SCMs that incorporate soil physics (moisture, wetting fronts) and groundwater processes are only now becoming available. Research is particularly important for nonstructural SCMs, which in many cases are more effective, have longer life spans, and require less maintenance than structural SCMs. EPA should be a leader in SCM research, both directly by improving its internal modeling efforts and by funding state efforts to monitor and report back on the success of SCMs in the field.

Research is needed to determine the effectiveness of suites of SCMs at the watershed scale. In parallel with learning more about how to quantify the unit processes of both structural and nonstructural practices, research is needed to develop surrogates or guidelines for modeling SCMs in lumped watershed models. Design formulas and criteria for the most commonly used SCMs, such as wet ponds and grass swales, are based on extensive laboratory and/or field testing. There are limited data for other SCMs, such as bioretention and proprietary filters. Whereas it is important to continue to do rigorous evaluations of individual SCMs, there is also a role for more simple methods to gain an approximate idea about how SCMs are performing. The scale factor is a problem for watershed managers and modelers, and there is a need to provide guidance on how to simulate a watershed of SCMs, without modeling thousands of individual sites.

Improved guidance for the design and selection of SMCs is needed to improve their implementation. Progress in implementing SCMs is often

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handicapped by the lack of design guidance, particularly for many of the non-traditional SCMs. Existing design guidance is often incomplete, outdated, or lacking key details to ensure proper on-the-ground implementation. In other cases, SCM design guidance has not been disseminated to the full population of MS4 communities. Nationwide guidance on SCM design and implementation may not be advisable or applicable to all physiographic, climatic, and ecoregions of the country. Rather, EPA and the states should encourage the development of regional design guidance that can be readily adapted and adopted by municipal and industrial permittees. As our understanding of the relevant hydrologic, environmental, and biological processes increases, SCM design guidance should be improved to incorporate more direct consideration of the parameters of concern, how they move across the landscape, and the issues in receiving waters.

The retrofitting of urban areas presents both unique opportunities and challenges. Promoting growth in these areas is desirable because it takes pressure off the suburban fringes, thereby preventing sprawl, and it minimizes the creation of new impervious surfaces. However, it is more complex than Greenfields development because of the need to upgrade existing infrastructure, the limited availability and affordability of land, and the complications caused by rezoning. These sites may be contaminated, requiring cleanup before redevelopment can occur. Both innovative zoning and development incentives, along with the selection of SCMs that work well in the urban setting, are needed to achieve fair and effective stormwater management in these areas. For example, incentive or performance zoning could be used to allow for greater densities on a site, freeing other portions of the site for SCMs. Publicly owned, consolidated SCMs should be strongly considered as there may be insufficient land to have small, on-site systems. The performance and maintenance of the former can be overseen more effectively by a local government entity. The types of SCMs that are used in consolidated facilities—particularly detention basins, wet/dry ponds, and stormwater wetlands—perform multiple functions, such as prevention of streambank erosion, flood control, and large-scale habitat provision.

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6
Innovative Stormwater Management and Regulatory Permitting

There are numerous innovative regulatory strategies that could be used to improve EPA's stormwater program. This chapter first outlines a substantial departure from the status quo, namely, basing all stormwater and other wastewater discharge permits on watershed boundaries instead of political boundaries. Watershed-based permitting is not a new concept, but it has been attempted in only a few communities. Development of the new permitting paradigm is followed by more modest and easily implemented recommendations for improving the stormwater program, from a new plan for monitoring industrial sites to encouraging greater use of quantitative measures of the maximum extent practicable requirement. The recommendations in the latter half of the chapter do not preclude adoption of watershed-based permitting at some future date, and indeed they lay the groundwork in the near term for an eventual shift to watershed-based permitting.

WATERSHED PERMITTING FRAMEWORK FOR MANAGING STORMWATER

At its initial meeting in January 2007, the committee heard opinions that collectively pointed in a new direction for managing and regulating stormwater that would differ from the end-of-pipe approach traditionally applied by regulatory agencies under the National Pollutant Discharge Elimination System (NPDES) permits and be based instead on a watershed framework. Indeed, the U.S. Environmental Protection Agency (EPA) has already given substantial thought to watershed permitting and issued a Watershed-Based NPDES Permitting Policy Statement (EPA, 2003a) that defined watershed-based permitting as an approach that produces NPDES permits that are issued to point sources on a geographic or watershed basis. It went on to declare that, "The utility of this tool relies heavily on a detailed, integrated, and inclusive watershed planning process. Watershed planning includes monitoring and assessment activities that generate the data necessary for clear watershed goals to be established and permits to be designed to specifically address the goals."

In the statement, EPA listed a number of important benefits of watershed permitting:

- More environmentally effective results;
- Ability to emphasize measuring the effectiveness of targeted actions on improvements in water quality;

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- Greater opportunities for trading and other market-based approaches;
- Reduced cost of improving the quality of the nation's waters;
- More effective implementation of watershed plans, including total maximum daily loads (TMDLs); and
- Other ancillary benefits beyond those that have been achieved under the Clean Water Act (e.g., integrating CWA and Safe Drinking Water Act [SDWA] programs).

Subsequent to the policy statement, EPA published two guidance documents that lay out a general process for a designated state that wishes to set up any type of permit or permits under CWA auspices on a watershed basis (EPA, 2003b, 2007a). It also outlined a number of case studies illustrating various kinds of permits that contain some watershed-based elements. Box 6-1 describes in greater detail the more recent report (EPA, 2007a) and its 11 "options" for watershed-based permitting. Unfortunately, the EPA guidance is lacking in its description of what constitutes watershed-based permitting, who would be covered under such a permit, and how it would replace the current program for municipalities and industries discharging stormwater under an individual or general NPDES permit. Few examples are given, some of which are not even watershed-based, with most of the examples involving grouping municipal wastewater treatment works under a single permit with no reference to stormwater. Most of the 11 options are removed from the fundamental concept of watershed-based permitting. Finally, the guidance fails to elaborate on the policy statement goal to make water quality standards watershed-based. The committee concluded that, although the EPA documents lay some groundwork for watershed-based permitting—especially the ideas of integrated municipal permits, water quality trading, and monitoring consortia—the sum total of EPA's analysis does not define a framework for moving toward true watershed-based permitting. The guidance attends to few of the details associated with such a program and it has made no attempt to envision how such a system could be extended to the states and the municipal and industrial stormwater permittees. This chapter attempts to overcome these shortcomings by presenting a more comprehensive description of watershed-based permitting for stormwater dischargers.

The approach proposed in this chapter fits within the general framework outlined by EPA but goes much further. First, it is intended to replace the present structure, instead of being an adjunct to it, and to be uniformly applied nationwide. The proposal adopts the goal orientation of the policy statement and then extends it to root watershed management and permitting in comprehensive objectives representing the ability of waters to actually support designated beneficial uses. The proposal builds primarily around the integrated municipal permit concept in the policy statement and technical guidance. Like EPA's outline, the committee emphasizes measuring the effectiveness of actions in bringing improvements, but goes on from there to recommend a set of monitoring activi-

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BOX 6-1
EPA's Current Guidance on Watershed-Based Permitting

Rather than explicitly define watershed based permitting, the EPA's recent guidance (EPA, 2007a) groups a large number of activities as having elements of watershed-based permitting, and defines how each might be utilized by a community. They are

- NPDES permitting development on a watershed basis,
- Water quality trading,
- Wet weather integration,
- Indicator development for watershed-based stormwater management,
- TMDL development and implementation,
- Monitoring consortium,
- Permit synchronization,
- Statewide rotating basin planning,
- State-approved watershed management plan development,
- Section 319 planning, and
- Source water protection planning.

Taking these topics in order, the first option is generally similar to that in EPA (2003a,b), but with some more detail on possible permitting forms. "Coordinated individual permits" implies that individual permits would be made similar and set with respect to one another and to a holistic watershed goal. The nature of such permits is not fully described, and there are no examples given. An "integrated municipal permit," also presented in the earlier policy statement, would place the disparate individual NPDES permits in a municipality (e.g., wastewater plants, combined sewer overflows, municipal separate storm sewer systems [MS4s]) under one permit. However, such a permit is not necessarily watershed-based. Finally, the "multi-source permit" could go in numerous directions, none of which are described in detail. In one concept, all current individual permittees who discharge a common pollutant into a watershed would come under one new individual permit that regulates that pollutant, while keeping the existing individual permits intact for other purposes. The Neuse River Consortium is given as an example. Alternatively, a multi-source permit could cover all dischargers of a particular type now falling under one individual permit that regulates all of their pollutants (no examples are given). In yet another application, this permit could be a general permit, and it would be identical to the existing general permits, except that it would be organized along watershed boundaries. As above, it could be refined on the basis of pollutant or discharger type.

The other ten options are more distant from the fundamental concept of watershed-based permitting. The water quality trading description is minimal, though it does mention a new EPA document that gives guidance to permittees for trading. Wet weather integration, the third topic, can mean any number of things, from creating a single permit to cover all discharges of pollutants during wet weather in a municipality, as described above for "coordinated individual permits," to just having all the managers of the systems get together and strategize. Although a stated goal is to reduce the amount of water in the sewer system after a storm, this integration is not particularly well defined in the document, nor is it well differentiated from other activities that would normally occur under an MS4 permit.

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BOX 6-1 Continued

Indicator development for watershed-based stormwater management refers to identifying indicators that are better than one or a few pollutants at characterizing the degree of impairment wrought by stormwater. Stormwater runoff volume is one indicator being developed by Vermont, and percent impervious surface is another. As discussed in Chapter 2, some states have long used biological indicators that integrate the effects of many pollutants as well as physical stresses such as elevated flow velocities. Indicators can be used as TMDL targets or as goals in NPDES permits. Identifying and adopting indicators is, essentially, a prerequisite to implementing some of the other options listed above.

Regarding the next topic on the list, the option of TMDL development is obvious, since the TMDL program is by definition watershed based. If it can be made the highest priority, and if stormwater is a contributor, then the implementation plan can be an excellent way to combat stormwater pollution on a watershed basis. Reducing the contribution of the pollutant from a stormwater source can involve water quality trading, better enforcement of existing permits, or creating new watershed-based permits. Hence, again, there is considerable overlap with the previously discussed options.

Developing a monitoring consortium is an option that works when sufficient data are not available to do much else. The concept mainly refers to monitoring of ambient waters. The activity is shared among partners (e.g., all wastewater plants in a region), with the goal of collecting and analyzing enough data to improve management decisions on a watershed basis, instead of for a single plant.

The following topic, permit synchronization, refers to having all permits within a watershed expire and be renewed simultaneously. This approach could be helpful for streamlining administrative, monitoring, and management tasks associated with maintaining the permits. Some states have operated in this way, whereas others have decided not to. It is one way to coordinate permits in cases where other types of watershed-based permitting would not work. Similarly, the statewide rotating basin approach, used by many states, relies on a five-year cycle. The state is divided into major watersheds, and each watershed is in a different stage of the cycle every year. It is a way to distribute the workload such that there is never a year when, for example, every watershed would require monitoring. Since it is a statewide program, how it relates to a watershed-based permitting situation is not at all clear.

ties designed to support active adaptive management to achieve objectives, aswell as to assess compliance. Credit trading, indicator development, the rotating basin approach, and monitoring should be part of management and permitting programs within watersheds, and ideas are advanced to develop these and other elements.

In addition to building on the work of EPA, the proposed approach tackles many of the impediments to effective watershed management identified in the National Research Council (NRC) treatise on watershed management (NRC, 1999). That report noted that watershed approaches are easiest to implement at the local level; thus, the approach developed in this chapter is a bottom-up process in which programmatic responsibility lies mainly with municipalities. Because the natural boundaries of watersheds rarely coincide with political jurisdictions, watersheds as geographic areas are less useful for political, institutional, and funding purposes, such that initiatives and organizations directed at watershed management should be flexible. The proposed approach recognizes this reality and makes numerous suggestions for pilot testing, funding, and institutional arrangements that will facilitate success. Finally, NRC (1999) notes the

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With regard to the next topic, there has been a great deal of watershed planning around the nation and tremendous variety in form and comprehensiveness. Plans generally contain some information on the state of the watershed, goals for the watershed, and activities to meet those goals. Development of such plans in areas that do not have them could facilitate watershed-based permitting by providing much needed information about conditions, sources of pollutants, and methods to reduce pollution. According to EPA, a watershed plan may or may not indicate the need for watershed-based permitting.

The Section 319 Program refers to voluntary efforts to reduce pollution from nonpoint sources. The program in and of itself is not relevant to NPDES permits, since it deals strictly with activities that are not regulated. However, these activities could be traded with more traditional stormwater practices as part of a watershed-based effort to reduce overall pollution reaching waterbodies. Many watershed plans must consider guidance for the 319 program in order to get funding for their management activities.

If the watershed in question contains a drinking water source (either surface water or groundwater), then a good source water protection plan can have a significant impact on NPDES permitting in a watershed. Information collected during the assessment phase of source water protection could be used to help inform watershed-based permitting. Also, NPDES permits could be rewritten taking into account the proximity of discharges to source water intakes.

Following its coverage of the 11 options, EPA (2007a) gives a hypothetical example of picking six of the options to develop permitting for a watershed. It discusses how the options might be prioritized, but in a very qualitative manner, according to considerations such as availability of funding and personnel, stakeholder desires, environmental impacts, and sequencing of events. Chapter 1 of the report ends with a list of performance goals that might apply to the 11 options.

Chapter 2 further explains the multi-source watershed-based permit, discussing, for example, who would be covered by it, who would administer it, and how credit trading fits in. The chapter has a lot of practical, although quite intuitive, information about how to write such a permit. Much of the decision making is left to the permit writer. There are discussions of effluent limitations, monitoring requirements, reporting and record keeping, special conditions, and public notice. Chapter 3 follows by presenting case studies, although fewer than appeared in 2003 and not all truly watershed based.

need to "develop practical procedures for considering risk and uncertainty in real world decision-making in order to advance watershed management." The proposed revised monitoring system presented later in this chapter is designed to provide information in the face of ongoing uncertainty, i.e., adaptive management in a permitting context.

Watershed Management and Permitting Issues

There are many implications of redirecting the stormwater management and regulatory system from a site-by-site, SCM-by-SCM approach to an emphasis on attainment of beneficial uses throughout a watershed. Most fundamentally, the program's focus would shift to a primary concentration on broad goals in terms of, for example, achieving a targeted condition in a biological indicator associated with aquatic ecosystem beneficial uses or no net increase in elevated

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flow duration. Application of site-specific stormwater control measures (SCMs) would no longer constitute presumptive evidence of permit compliance, as is often the case in permits now, although it would still be an essential means to meeting goals. Achieving those goals, however, would form the compliance criteria.

In recognition of the demonstrated negative effects of watershed hydrologic modification on the attainment of beneficial uses, the proposal steps beyond the generally prevailing practice by embracing water quantity as a concern along with water quality. The inclusion of hydrology is consistent with the CWA on several grounds. First, elevated runoff peak flow rates and volumes increase erosive shear stress on stream beds and banks and directly contribute particulate pollutants to the flow (such as suspended and settleable solids, as well as nutrients and other contaminants bound to the soil material). Conversely, reduced dry-weather flows often occur in urban streams as a result of lost groundwater recharge and tend to concentrate pollutants and, hence, worsen their biological effects. Moreover, pollutant mass loading is the product of concentration and flow volume, and thus increased wet-weather surface runoff directly augments the cumulative burden on receiving waters. Finally, regulatory precedent for incorporating hydrology exists, as demonstrated by Vermont's stormwater program (LaFlamme, 2007).

At this time, stormwater management and regulation are divorced from the management and regulation of municipal and industrial wastewater. A true watershed-based approach would incorporate the full range of municipal and industrial sources, including (1) public streets and highways; (2) municipal stormwater drainage systems; (3) municipal separate and combined wastewater collection, conveyance, and treatment systems; (4) industrial stormwater and process wastewater discharges; (5) private residential and commercial property; and (6) construction sites. These many sources represent an array of uncoordinated permits under the current system and a strong challenge to developing a watershed-based approach. As pointed out in Chapter 2, multi-source considerations are an implicit facet of TMDL assessments, wherein states must consider both point and nonpoint sources. EPA (2003b) identified, among other possible permit types, an Integrated Municipal NPDES Permit, which would bundle all requirements for a municipality (e.g., stormwater, combined sewer overflows, biosolids, pretreatment) into a single permit. The Tualatin River watershed in Oregon has faced this challenge, at least in part, through an innovative watershed permit that combines both wastewater treatment and stormwater, brings in management of agricultural contributions to thermal pollution, and allows for pollutant trading among sources (see Box 6-2). It appears that the various participating parties did not use their energies in trying to allocate blame but instead determined the most effective and efficient ways of improving conditions. For example, the municipal permittees willingly offered incentives to agricultural landowners to plant riparian shade trees as an alternative to more expensive means of reducing stream temperatures under their direct control. Indeed, with agriculture not being regulated by the Clean Water Act, watershed permitting

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BOX 6-2
Watershed-Based Permitting in Oregon

Clean Water Services is a wastewater and stormwater utility that covers a special service district of 12 cities and unincorporated areas in urban Washington County, Oregon. It was originally chartered in the 1970s as the Unified Sewerage Agency to consolidate the management of 26 "package" wastewater treatment facilities. Its responsibilities expanded to stormwater management in the early 1990s and it now serves nearly 500,000 customers. There are four wastewater treatment plants (WWTPs) in the district, with a dry weather capacity of 71 million gallons per day (MGD). During low-flow months, the discharge from these plants can account for 50 percent of the water in the Tualatin River. The district also own rights to one-quarter of the stored water in Hagg Lake. The land use in the watershed is about one-third urban, one-third agriculture, and one-third forest.

In 2001, the region was faced with TMDLs on the Tualatin River or its tributaries for total phosphorus, ammonia, temperature, bacteria, and dissolved oxygen. By 2002, the area was also dealing with four expired NPDES permits and one expired MS4 permit (all of which had been administratively extended), approval of a second TMDL, and an Endangered Species Act (ESA) listing. The region decided that it wanted to try to integrate all of these programs using a watershed-based regulatory framework. This would include a TMDL implementation mechanism, an ESA response plan, and integrated water resources management (meaning that water quantity, water quality, and habitat considerations would be made at the same time). Prior to integration, water quality was covered by the TMDL and NPDES programs, but these programs did not cover water quantity and habitat issues. The ESA listing addressed the habitat issues, but it was done totally independently of the TMDLs and NPDES permits.

Thus, the region applied for an integrated municipal NPDES permit that bundles all NPDES permit requirements for a municipality into a single permit, including publicly owned treatment works (POTWs), pretreatment, stormwater, sanitary sewer overflows, and biosolids. Initially, it encompassed the four WWTP permits, the one MS4 permit, and the industrial and construction stormwater permits. The hope was that this would streamline multiple permits and capture administrative and programmatic efficiencies; provide a mechanism for implementing more cost-effective technologies and management practices including water quality credit trading; integrate watershed management across federal statutes such as the CWA, SDWA, and ESA; and encourage early and meaningful collaboration and cooperation among key stakeholders.

This case study was successful because a single entity—Clean Water Services—was already in charge of what would have otherwise been a group of individual permittees. Furthermore, all the NPDES permits had expired and the TMDL had just been issued, providing a window of opportunity. The state regulatory agency was very willing, and EPA provided a $75,000 grant. Finally, there was a robust water quality database and modeling performed for the area because of the previous TMDL work. The watershed-based permit, the first in the nation, was issued February 26, 2004. Among its unique elements are an intergovernmental agreement companion document signed by the Oregon Department of Environmental Quality (DEQ), water quality credit trading, and consolidation of reporting requirements. The water quality trading is one of the most interesting elements, and several variations have been attempted. Biological oxygen demand (BOD) and NH_3 have been traded both intra-facility and inter-facility.

The temperature TMDL on the Tualatin River is a particularly interesting example of trading because it helped to bring agriculture into the process, where it would otherwise not have been involved. Along the length of the river, there are portions that exceed the temperature standard. A TMDL allocation was calculated that would lower temperatures by the

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BOX 6-2 Continued

same amount everywhere, such that there would be no point along the river that would be in exceedance. Options for reducing temperature include reducing the influent wastewater temperature (which is hard to do), reducing the total WWTP discharge to the Tualatin River (which is not practical), mechanically cooling or refrigerating WWTP discharge (which would require more energy), or trading the heat load via flow augmentation and increased shading (which is what was attempted).

Clean Water Services choose to utilize a market-based, watershed approach to meet the Tualatin temperature TMDL. It was market-based because it had financial incentives for certain groups to participate, it was cost-effective, and it provided ancillary ecosystem services. It was a watershed-based approach because it capitalized on the total assimilative capacity of the basin. What was done was to (1) provide cooling and in-stream flow augmentation by releasing water from Hagg Lake Reservoir, and (2) trade riparian stream surface shading improvement credits. They also reused WWTP effluent in lieu of irrigation withdrawals. For the riparian shading, they developed an "enhanced" CREP program to increase the financial incentives to rural landowners (with Clean Water Services paying the difference over existing federal and state programs). Clean Water Services also made incentive payments to the Soil and Water Conservation District to hire people to act as agents of Clean Water Services. Oregon DEQ's Shadalator model was used to quantify thermal credits for riparian planting projects, which required that information be collected at 100-foot increments along the stream on elevation, aspect, wetted width, Nordfjord-Sogn Detachment Zone, channel incision, and plant type and planting corridor width. To summarize, over the five-year term of the permit, Clean Water Services will release 30 cfs/d of stored water from Hagg Lake each July and August and shade roughly 35 miles of tributary riparian area (they have already planted 34 miles of riparian buffer). This plan involved an element of risk taking, since the actions of unregulated parties (such as farmers) have suddenly become the responsibility of Clean Water Services.

and initiatives of this type represent the best, and perhaps only, mechanism for ameliorating negative effects of agricultural runoff that, left unattended, would undo gains in managing urban runoff. The Neuse River case study, discussed later in this chapter, is another example of bringing agricultural contributions to aquatic degradation under control, along with urban sources, through a watershed-based approach.

Significant disadvantages of the current system of separate permits for municipal, construction, and industrial activities are (1) the permits attack the problem on a piecemeal basis, (2) they are hard to coordinate because they expire at different times, (3) they are not designed to allow for long-term operation of SCMs, and (4) they do not cover all discharges. A solution to these problems would be to integrate all discharge permitting under municipal authority, as is proposed here. The lead permittee and co-permittees would bear ultimate responsibility for meeting watershed goals and would regulate all public and private discharges within their jurisdictions to attain them. Municipalities are the natural focus for this role because they are the center of land-use decisions throughout the nation.

Municipalities must be provided with substantially greater resources than they have now to take on this increased responsibility. Beyond funding, regula-

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tory responsibilities must be realigned to some degree. The norm now is for states to administer industrial permits directly and generally attend to all aspects of permit management. However, states, more often than not, are unable because of resource limitations to give permittees much attention in the form of inspection and feedback to ensure compliance. At the same time, some states, explicitly or implicitly, expect municipal permittees to set up programs to meet water quality standards in the waters to which all land uses under their jurisdictions discharge.[1] It only makes sense in this situation to have designated states (or EPA for the others) specify criteria for industrial and construction permits but revise regulations to empower and support municipal co-permittees in compliance-related activities. This paradigm is not unprecedented in environmental permitting, as under the Clean Air Act, states develop state implementation plans for implementation by local entities. For this new arrangement to work, states would have to be comfortable that municipalities could handle the responsibility and be able to exercise the added authority granted. The committee's opinion is that municipalities generally do have the capability, working together as co-permittees with a large-jurisdiction lead permittee and with guidance and support from states.

It bears noting at the outset that the proposed new program would not reduce the present system's reliance on general permits. Whereas a general permit now can be issued to a group of municipalities having differing circumstances, under the new system a permit could just as well be formulated in the same way for a group of varying watersheds. General industrial and construction permits would be just as prevalent too.

Toward Watershed-Based Permitting

Watershed-based permitting is taken in this report to mean regulated allowance of discharges of water and wastes borne by those discharges to waters of the United States, with due consideration of (1) the implications of those discharges for preservation or improvement of prevailing ecological conditions in the watershed's aquatic systems, (2) cooperation among political jurisdictions sharing a watershed, and (3) coordinated regulation and management of all discharges having the potential to modify the hydrology and water quality of the watershed's receiving waters.

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[1] For example, the second Draft Ventura County [California] Municipal Separate Storm Sewer System Permit states (under Findings D. Permit Coverage), "Provisions of this Order apply to the urbanized areas of the municipalities, areas undergoing urbanization and areas which the Regional Water Board Executive Officer determines are discharging storm water that causes or contributes to a violation of a water quality standard … ." The permit further states (under Part 2—Receiving Water Limitations), "1. Discharges from the MS4 that cause or contribute to a violation of water quality standards are prohibited. … 3. … This Order shall be implemented to achieve compliance with receiving water limitations. If exceedence(s) of water quality objectives or water quality standards persist … the Permittee shall assure compliance with discharge prohibitions and receiving water limitations … ."

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Determining Watershed Scale for Permitting

A fundamental question that must be answered at the outset of any move to watershed permitting is, What is a watershed? Hydrologically, a watershed is the rain catchment area draining to a point of interest. Hence, the question comes down to, Where should the point of interest be located to define watersheds for permitting purposes? If placed close to the initial sources of surface runoff (e.g., on each first-order stream just above its confluence with another first-order stream), attention would be very specifically directed. However, there would be little flexibility to devise solutions for the greatest good. For example, trading of the commodities runoff quantity and quality would be very restricted. If on the other hand the point of interest is placed far downstream, thus defining a very large watershed, a welter of issues, and probably also of involved jurisdictions, would overly confuse the management and regulatory task.

The U.S. Geological Survey (USGS) delineates watersheds in the United States using a nationwide system based on surface hydrologic features. This system divides the country into 21 regions, 222 subregions, 352 accounting units, and 2,262 cataloging units. These hydrologic units are arranged within each other, from the smallest (cataloging units) to the largest (regions). USGS identifies each hydrologic unit by a unique hydrologic unit code (HUC) consisting of 2 to 16 digits based on the four levels of classification in the hydrologic unit system. Watersheds thus delineated are typically of the order a few square kilometers in area. This system is now being linked to the National Hydrography Dataset (NHD) and the National Land Cover Dataset to produce NHDPlus, an integrated suite of application-ready geospatial datasets.

The USGS system provides a starting point. Ultimately, though, what constitutes a watershed will best be answered with reference to specific biogeophysical conditions and problems and by personnel at relatively close hand (i.e., state or regional oversight agency staff). A general guideline might be the catchment area of a waterbody influenced by a set of similar subwatersheds. Similar subbasins would presumably be amenable to similar solutions and trading off reduced efforts in some places for compensating additional efforts elsewhere, as well as to analysis and monitoring on a representative basis, instead of exhaustively throughout. Often, a watershed defined in this way would flow into another watershed and influence it. Thus, there would have to be coordination among managers and regulators of interacting watersheds. It would be common for several watersheds ranging from relatively small to large in scale to be nested. Each would have its management team, and a committee drawn from those teams should be formed to coordinate goals and actions.

A prerequisite to moving toward watershed permitting, then, is for states or regions within states to delineate watersheds. California took this step early in the NPDES stormwater permitting process and offers a model in this respect, as well as in encompassing all jurisdictions coordinated by a lead permittee. First, the state organized its California EPA regional water boards on a watershed ba-

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sis. Furthermore, since 1992 it has been common in California to establish one jurisdiction as the lead permittee (e.g., Los Angeles County in the Los Angeles region, Orange County in the Santa Ana Region, and San Diego County in the San Diego Region) and all of the politically separate cities as co-permittees. The lead permittee has typically been the jurisdiction most widely distributed geographically in the region and large enough to develop compliance mechanisms and coordinate their implementation among all participants. Box 6-3 describes the approach taken to delineating management units within the Chesapeake Bay watershed, which comprises parts of Pennsylvania, Maryland, Virginia, and the District of Columbia. The case study illustrates well the approach advocated here of focusing on the outcome in the receiving water and considering all aspects of land and water resources management that determine that outcome.

Steps Toward Watershed-Based Permitting

Once a watershed is defined, a further question arises regarding how much and what part of its territory to cover formally under permit conditions. Under the present system substantial development occurring outside Phase I or Phase II municipal jurisdictions is escaping coverage. Failing to control relatively high levels of development both outside a permitted jurisdiction and upstream of more lightly developed areas within a permitted area is particularly contrary to the watershed approach. Areas having a more urban than rural character are already essentially treated as urban in water supply and sewer planning, and the same should occur in the area of stormwater management. Accordingly, the permit should extend to any area in the watershed, even if outside Phase I or II jurisdictions, zoned or otherwise projected for development at an urban scale (e.g., more than one dwelling per acre). States do have authority under the CWA to designate any area for Phase II coverage based on projected growth or the presence of impact sources. They should be required to do so for nationwide uniformity and best protection of water resources.

It is essential to clarify that watershed-based permitting as formulated in this chapter differs sharply from what has been termed watershed (or basin) planning. According to EPA, watershed planning "identifies broad goals and objectives, describes environmental problems, outlines specific alternatives for restoration and protection, and documents where, how, and by whom these action alternatives will be evaluated, selected, and implemented" (*http://www.epa.gov/watertrain/planning/planning7.htm*). Drawing up such a plan is a time-consuming process, which has often become an end in itself, instead of a means to an end. Completing a full watershed plan, as usually construed, should not be a prerequisite to watershed-based permitting. Rather, the anticipated process would spring much more from comprehensive, advanced scientific and technical analysis of the water resources to be managed and their contributing catchment areas than from a planning framework.

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BOX 6-3
Watershed Delineation for the Chesapeake Bay

The "Tributary Strategy Team" approach of the Chesapeake Bay Watershed provides a specific example of a watershed-scale approach to implementation of water quality control measures. Some background on this longstanding program is first provided, before turning to how watersheds were delineated. In 1983, the states of Virginia, Maryland, and Pennsylvania; the District of Columbia; and EPA signed an agreement to form the Chesapeake Bay Program with a goal to restore and protect the bay, which was suffering from nutrient overenrichment, severely reduced submerged aquatic vegetation, and contamination by toxics. In 1987 the program established a target of a 40 percent reduction in the amount of nutrients entering the Bay by 2000. In 1992 the bay program partners agreed to continue the 40 percent reduction goal beyond 2000 by allocating nutrient reduction targets to the bay's tributaries. In Chesapeake 2000, the most recent version of the Chesapeake Bay agreement, the nutrient reduction goals were reaffirmed, and an additional goal of sediment reduction was established. New York, Delaware, and West Virginia, locations of the bay's headwaters, also became involved in nutrient and sediment reduction. Cap load allocations for nutrients (nitrogen and phosphorus) and sediment to be reached by 2010 were agreed upon by the states. The states began developing 36 voluntary watershed-based tributary strategies to meet the state cap load allocations covering the entire 64,000-square-mile Chesapeake Bay watershed.

Watershed-based tributary strategies are developed in cooperation with local watershed stakeholders. For rural areas, where stakeholders include farmers, nutrient strategies include promotion of management practices such as maintaining cover crops on recently harvested cropland to reduce soil erosion, reduction in nitrogen applications, conservation tillage, and establishment of riparian buffers. For urban-area stakeholders such as homeowners and municipalities, tributary strategies include practices such as enhanced nutrient removal at WWTPs, low-impact development (LID) practices, erosion and sediment control practices, and septic system upgrades.

The first cut at delineating the watershed, which was based on hydrography and topography, defined the eight major areas draining to the Chesapeake Bay: six major basins (Susquehanna, Potomac, York, James, Rappahannock, and Patuxent) plus smaller areas not draining to a major river on the Eastern and Western Shores of the bay in Maryland. These subdivisions are disparate with respect to size (the Susquehanna can engulf almost the entire other seven), but direct drainage to the bay was the criterion at this level.

The next cut was made at state borders. For example, the Susquehanna traverses three states and was subdivided at the New York–Pennsylvania and Pennsylvania–Maryland political boundaries. Further cuts were subsequently made within some states. The criteria for these cuts varied from state to state, but generally involved a combination of smaller political jurisdictions (e.g., county, township), subwatershed basin borders, and other local considerations, such as local interest and investment (e.g., watershed associations).

The resulting delineations are highly variable in size but apparently satisfactory to the local parties who decided on the areas. They represent individual "tributary strategy areas" but are also nested within the larger eight designations and involve interjurisdictional and interstate coordination where a subbasin is divided by a political boundary. Although the example of the Chesapeake Bay is at a very large scale, the principles of watershed delineation it illuminates apply at all scales.

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Effective watershed-based permitting as outlined in this report is composed of:

- Centralizing responsibility and authority for implementation with a municipal lead permittee working in partnership with other municipalities in the watershed as co-permittees;
- Adopting a minimum goal in every watershed to avoid any further loss or degradation of designated beneficial uses within the watershed's component waterbodies;
- Assessing waterbodies that are not providing designated beneficial uses in order to set goals aimed at recovering these uses;
- Defining careful, complete, and clear specific objectives to be achieved through management and permitting;
- Comprehensive impact source analysis as a foundation for targeting solutions;
- Determining the most effective ways to isolate, to the extent possible, receiving waterbodies from exposure to those impact sources;
- Developing and appropriately allocating funding sources to enable the lead permittee and partners to implement effectively;
- Developing a monitoring program composed of direct measures to assess compliance and progress toward achieving objectives and diagnosing reasons for the ability or failure to meet objectives, in support of active adaptive management; and
- Developing a market system of trading credits as a tool available to municipal co-permittees to achieve watershed objectives, even if solutions cannot be uniformly applied.

The system proposed herein is a significant departure from the road traveled in the 20 years since CWA amendments began to bring stormwater under direct regulation. This reorganization is necessary because of the failure of the present system to achieve widespread and relatively uniform compliance (see Chapter 2) and, ultimately, to protect the nation's water resources from degradation by municipal, industrial, and construction runoff. The workload associated with adopting this approach will be considerable and will take some time to complete. The structure of the new program should be fully in place within five years, which is considered to be a reasonable period to complete the work. It could be fully implemented throughout the nation within ten years. However, interim measures toward its fulfillment should occur sooner, within one to two years. Such measures should be applied to each land-use and impact-source category (i.e., existing residential and commercial development, existing industry, new development, redevelopment, construction sites). For example, measures such as an effective impervious area limit or a requirement to maintain predevelopment recharge to the subsurface zone could make early progress in man-

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aging new development, and lead toward the ultimate, objective-based management and permitting strategy for that category. Advanced source control performance standards would be appropriate interim measures for existing development.

One innovative approach to watershed-based management that can ease the burden of the proposed new system is the rotating basin approach. As described by EPA (2007a), this option entails delineating state watershed boundaries and grouping the watersheds into basin management units, usually by the state water pollution control agency. Next, states implement a watershed management process on a rotating schedule, which is usually composed of five activities: (1) data collection and monitoring, (2) assessment, (3) strategy development, (4) basin plan review, and (5) implementation. Over time, different waterbodies are intensively studied as part of the rotation. Data collected can be used to support a number of different reporting and planning requirements, including a finding of attainment of water quality standards, a determination of impairment, or possible delisting if the waterbody is found not to be impaired. Florida offers a good example of the rotating basin approach. The Florida Department of Environmental Protection has defined five levels of intensity, or phases, each taking about one year to complete, and it has divided the state into 30 areas based on HUCs. At any one time six areas are in each phase before rotating to a subsequent phase. This division of effort would help alleviate the burden of moving to a new system of watershed-based permitting by programming the work over a period of years. It could certainly be organized on a priority basis, in which the watersheds of greatest interest for whatever reason (e.g., having the highest resource values, being most subject to new impacts) would get attention first.

An Objective-Based Framework

The proposed framework for watershed-based management and regulation of stormwater relies on broad goals to retain and recover aquatic resource beneficial uses, backed by specific objectives (e.g., water quality criteria) that must be achieved if the goals are to be fulfilled. Meeting the objectives and overarching goals is intended to become the basis for determining permit compliance, instead of the current reliance on implementation of SCMs as presumptive evidence of compliance.

The broad goals of retaining and recovering beneficial uses are entirely consistent with the antidegradation clause of the CWA. Antidegradation means that the current level of water quality shall be maintained and protected, unless waters exceed levels necessary for maintaining their beneficial uses *and* the state finds that allowing lower water quality is necessary to accommodate important economic or social development. In accordance with the antidegradation clause, a major pillar of the proposed concept is the goal of preventing degradation from the existing state of biological health, whatever it may be, to a lower state. Thus, fully and nearly pristine watersheds are to remain so and, at a minimum,

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partially or highly impaired ones are to suffer no further impairment. Beyond this minimum, impaired waters should be assessed to determine if feasible actions can be taken to recover lost designated beneficial uses or at least improve degraded uses.

As discussed in Chapter 2, beneficial uses relate to the social and ecological services offered, or intended to be offered, by waterbodies. For example, California has 20 categories of beneficial uses embracing water supply for various domestic, agricultural, and industrial purposes; provision of public recreation; and support of aquatic life and terrestrial wildlife (CalEPA, Central Coast Regional Water Board Basin Plan). That beneficial uses are usually assigned at the state level by waterbody classes or specific waterbodies would not change under the proposed permitting program revision. Most waters have several beneficial uses encompassing some water supply and ecological functions and, perhaps, some form of recreation. Unlike most current stormwater programs where attainment of beneficial uses is only implicit, these goals would become explicit in the altered system and officially promulgated by the authority operating the permit program (a designated state, in most cases, or EPA). The permitting authority would then partner with municipal permittees to determine the conditions that must be brought to bear to attain beneficial uses, set objectives or criteria to establish those conditions, and follow through with the tasks to accomplish objectives.

The proposed framework's reliance on achieving objectives that reflect the cumulative aquatic resource effects of contributing watershed conditions suggests the following related concepts:

- In whatever manner watershed boundaries are set, the full extent of the watershed from headwaters onward should be considered in defining objectives. This is important even where watershed scale and boundaries are based on local and/or regional hydrogeomorphic circumstances and their associated management and regulatory needs. Watersheds can and often will be defined and nested at different scales (e.g., streams tributary to a lake, a river flowing into an estuary or marine bay).

- The scale of objectives must be consistent with the scale and recognized beneficial uses of the watershed(s) in question; for example, sustaining salmonid fish spawning could be the basis for a stream objective, while retaining an oligotrophic state could be the essential objective for a lake to which the stream is tributary.

- Whenever beneficial uses pertain to living organisms (aquatic life or humans), representing the vast majority of all cases, objectives should be largely in biological terms. That is not to say that supplementary objectives cannot be stated otherwise (e.g., in terms of flow characteristics, chemical water quality constituents, or habitat attributes), but the ultimate direct thrust of the program

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should be toward the biota.

- Objectives must be carefully chosen to represent attributes of importance from a resource standpoint, limited in number for feasibility of tracking achievement, and defined in a way that achievement can be measured. For example, nitrogen is generally the nutrient limiting algal growth in saline systems and in excess it stimulates growth that can reduce dissolve oxygen, killing fish and other aerobic organisms. In this case the most productive objectives would probably target reduction of nitrogen concentration and mass flux and maintenance of dissolved oxygen. For waterbodies designated for contact recreation, fecal coliform indicators (although not directly pathogenic when waterborne) have proven to be an effective means of assessing condition and should continue to form the basis for objectives to protect contact recreation until research produces superior measures. If drinking water supply is a designated beneficial use of a lake, it will better serve that function in a lower than a higher state of eutrophication, which can be managed, according to a long limnological research record, by restricting water column chlorophyll *a* as an objective. Where the beneficial use is fish protection and propagation, biological criteria might include (1) maintenance of a specific population size of a resident fish species when that species' population can be assayed conveniently; (2) maintenance of a numerical index (e.g., benthic index of biotic integrity) when a fish species of ultimate interest cannot be assessed so conveniently but is known or reasonably hypothesized to be associated with the index; or (3) a related parameter, such as eelgrass beds, which are important fish nursery areas in estuarine waters, such that areal coverage by these beds would be an appropriate objective to track over time. An intermittent waterbody could have biological criteria related to, for example, fish migration or amphibian reproduction.

- The achievement of objectives, or lack thereof, is the basis for follow-up and prescription of remedies in an active adaptive management mode; that is, falling short of objectives would trigger a search for reasons throughout the watershed, followed by identification of actions necessary and sufficient to remedy the shortfall, assessment of their ability to reach objectives, and the cost of doing so. In the course of this assessment it may be concluded that the objective itself is faulty and should be restated, replaced, or discarded.

Basing the watershed framework principally on biological objectives grows out of the CWA's fundamental charge to protect the biological (as well as physical and chemical) integrity of the nation's waters. The tie between specific physical and chemical conditions and the sustenance of aquatic biological communities is not well established through an extensive, well-verified body of research. Moreover, living organisms consuming or living in water are subject to a vast multitude of simultaneous physical and chemical agents having the potential to harm them individually and interactively. There are no realistic prospects

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for research to determine the levels of these numerous agents that must be maintained to support beneficial uses. Therefore, their integrative effects must be determined using measures of biological populations or communities of interest.

By and large, state water quality standards as now promulgated would not serve the proposed objective-based system well. They are usually not phrased in biological terms or with respect to hydrologic variables now known to have instrumental negative effects on aquatic organisms, but instead mostly as concentrations of selected chemical elements or compounds. However, there is no prohibition of biological or hydrologic standards in the law. The recommended emphasis is consistent with and informed by the tiered aquatic life uses system applied by some states and illustrated for Ohio in Box 2-1. The use of such systems must expand greatly to support the recommended framework. An opportunity to do so exists through the triennial review already required for each state's water quality standards.

Certain special considerations affect the development and use of objectives as the device to carry forward watershed-based stormwater management and regulation. First, other elements of the CWA beyond the stormwater program and other laws may very well be involved in a watershed (see Chapter 2). Municipal and industrial wastewater discharges will often be contributors along with stormwater. Aquatic organisms may be listed as threatened or endangered under the federal ESA or state authority. Both objectives and the management and regulatory program designed to achieve objectives should reflect any such circumstances.

Instituting the proposed permitting program will require converting the TMDL program to one more suitable for its purposes and structure. The TMDL program is watershed based and hence offers some precedent and experience applicable to the new system. However, for the most part, it has operated only on waters declared to be impaired for specific pollutants, and it relies on management of specific physical and chemical water quality variables. Furthermore, in its current mode it takes no account of potential future impact sources. The TMDL program should be replaced with one adapted to the objective-based framework proposed here. This new program should apply to all waters assigned objectives, "impaired" or not, and formulate limits in whatever terms are best to achieve objectives. Hence, although the program would expand in coverage area, the efficient tailoring of objectives directly to beneficial uses could compensate for the expansion by targeting fewer variables. Finally, the new program should look to the future as well as the present by encompassing the anticipated impacts of prospective landscape changes.

The nature of a program to replace TMDLs can be glimpsed from a few attempts to move in the anticipated direction even under the existing structure. For example, Connecticut collected data directly linking impervious cover to poor stream health in Eagleville Brook (Connecticut Department of Environmental Protection, 2007). The stream's TMDL was developed using watershed impervious cover as a surrogate parameter for a mix of pollutants conveyed by stormwater. The intention is to reduce effective imperviousness by disconnect-

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ing impervious areas, installing unspecified SCMs, minimizing additional disturbance, and enhancing in-stream and riparian habitat. Flow was used as a surrogate for stormwater pollution in the Potash Brook, Vermont TMDL (Vermont DEC, 2006). In this waterbody, the impairment was based on biological indices that were then related to a hydrologic condition believed to be necessary to achieve the Vermont criteria for aquatic life. The TMDL will be implemented via the use of runoff-volume-reduction SCMs throughout the watershed.

Impact Sources

The CWA provides for regulating, as specific land-use types, only designated industrial categories, with construction sites disturbing one acre or more considered to be one of those categories. Otherwise, it gives authority to regulate municipal jurisdictions operating separate storm sewer systems. Generally speaking, these jurisdictions encompass, in addition to the industrial categories, the full range of urban land-use types, such as single- and multiple-family residential, various kinds and scales of commercial activity, institutional, and parks and other open space. All of these land uses and the activities conducted on them are, to one degree or another, sources of the agents that physically and chemically modify aquatic systems to the detriment of their biological health. Hence, most of the impact sources to which these aquatic systems are subject are not directly regulated under CWA authority as are industrial sources, but instead are indirectly regulated through the municipal program. Also, as already discussed, the situation is further complicated by the presence of municipal and industrial wastewater sources along with landscape sources contributing flow and pollutants to receiving waters via stormwater discharges.

The watershed-based framework envisioned here relies on municipalities led by a principal permittee. Thus, a fundamental task that municipal permittees charged with operating under a watershed-based permit must do is to find industries and construction sites in the watershed that have not filed for permit coverage and bring them under regulation. Furthermore, municipal co-permittees, with leadership by a watershed lead permittee, must classify industries and construction sites within their borders according to risk and accordingly prioritize them for inspection and monitoring (methods for doing this are discussed later in the chapter). Municipal permittees must have better tools than they have had in the past to assess the various impact sources and formulate strategies to manage them that have a reasonably high probability of fulfilling objectives. The present state of practice and research findings offers some directions for choosing or more completely developing these tools. However, by no means are all the necessary elements available, and substantial new basic and applied research must be performed.

From the literature come several possibilities to improve source analysis in the complex urban environment. Some examples of apparent promise, drawn from Clark et al. (2006) include the following:

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- Nirel and Revaclier (1999) used the ratio of dissolved rubidium (Rb) to strontium (Sr) to identify and quantify the impact of sewage effluents on river quality in Switzerland. Rubidium was present in larger quantities than strontium in feces and urine, making the ratio of these two elements an effective tracer that does not vary with river flow for a given water quality condition. Using the ratio alone produced the same conclusions regarding impact as measuring a host of physicochemical water quality variables. The researchers estimated that the Rb:Sr ratio must be lower than 0.007 if biological diversity is to be maintained, which could be the basis of an objective to manage river water quality. Although this case pertains to municipal wastewater and the technique works best in waters with a naturally low Rb:Sr ratio (e.g., calcareous regions), it success points out a potential avenue of research to simplify stormwater management on the basis of quantitative objectives related to biological integrity.

- Cosgrove (2002) described the approach used in New Jersey to characterize the relative contribution of point and nonpoint sources of pollutants in the Raritan River Basin. Twenty-one surface water sampling locations within the watershed were monitored four to five times per year from 1991 to 1997. These data were evaluated by comparing the median concentration at each sampling location with land-use statistics. Cumulative probability curves were also developed for each pollutant to demonstrate the probability that the concentration at a given location would be below a certain level (e.g., a stream standard). These probability curves were useful in determining the risk that a given location would violate a particular standard. The concentration data, coupled with continuous flow monitoring records, were utilized to determine the total load for each constituent. Regression analysis was used to develop a relationship between the total in-stream loads and flow. Such an analysis provided an indication of municipal or industrial discharge versus diffuse-source-dominated locations. Pollutant loads could then be converted to yield (load per unit area) to normalize the results for comparison from one station to another. The "screening level" methodology uses only existing data and, not requiring advanced modeling techniques, can be used to understand where to focus more rigorous modeling techniques.

- Maimone (2002) presented the overall approach that was used to screen and evaluate potential pollutant sources within the Schuylkill River watershed as part of the Schuylkill River Source Water Assessment Partnership. The partnership performed source water assessments of 42 public water supply intakes for the Pennsylvania Department of Environmental Protection. The watershed encompasses over 1,900 square miles with more than 3,000 potential point sources of contamination. In addition, runoff from diverse land uses such as urban and agriculture had to be characterized using the Stormwater Management Model. For all 42 surface water intakes, potential point sources were identified using existing databases. The list was first passed through a series of Geographic In-

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formation System-based "screening" sieves to limit the sources to only those considered to be high priority (including proximity and travel time from source to intake). Ten categories were identified that cover the range of the most important contaminants that might be found within the watershed, and a representative or surrogate chemical was identified whose properties were used to stand in for the category. Beyond the geographic screening, a more sophisticated screening was needed to limit the number of sites, using a decision support computer software program called EVAMIX. The greatest benefit of EVAMIX, compared to other software, is that it allows mixed criteria evaluation, qualitative and quantitative, to be considered concurrently. EVAMIX produced source rankings representing an organized and consistent use of both the objective data and the subjective priorities of decision makers.

- Hetling et al. (2003) investigated the effect of water quality management efforts on wastewater discharges to the Hudson River (from Troy, New York to the New York City Harbor) from 1900 to 2000. The paper demonstrated a methodology for estimating historic loadings where data are not available. Under these circumstances, estimated historic sewered and treated populations and per capita values were used to calculate wastewater flow and loadings for 5-day biochemical oxygen demand (BOD_5), total suspended solids (TSS), total nitrogen, and total phosphorus. The analysis showed that dispersed landscape sources have become the most significant contributors of the first two contaminants to the river, while municipal wastewater plants remain the largest sources of nutrients. The methodology presented in this paper could be used by co-permittees to estimate present-day sources of various types and contribute to moving toward a comprehensive permit incorporating multiple sources.

- Zeng and Rasmussen (2005) used multivariate statistics to characterize water quality in a lake and its tributaries. Tributary water was composed of three components. Factor analysis demonstrated that stormwater runoff was the predominant cause of elevation of a group of water quality variables in a factor including TSS, the measurement of which is a convenient surrogate for all variables in the factor. Similarly, municipal and industrial discharges could be characterized by total dissolved solids, and groundwater by alkalinity plus soluble reactive phosphorus. These sources can thus be distinguished through measurement of just four common water quality variables. Reducing the number of analytes reduces laboratory costs and allows resources to be freed up for other purposes. Cluster analyses performed on the data indicated that further savings could be realized by sampling just one among several stations in a cluster and sampling at just one point in time over a period of relatively stable water quality (e.g., a relatively dry period).

A key research need associated with applying the proposed framework is assessment of these and other mechanisms for sorting out the contributions of

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the variety of impact sources in the urban environment. Leading this effort would be a natural role for EPA.

Impact Reduction Strategies

The philosophical basis for impact reduction under a modified permitting system centered on a lead municipal permittee and associated co-permittees is to avoid, as far as possible, exposing receiving waters to impact sources or to otherwise minimize that exposure. The concept embraces both water quantity and quality impact sources and specifically raises the former category to the same level of scrutiny as traditionally applied to water quality sources. Furthermore, the endpoints upon which success and compliance would be judged are directly related to achievement of beneficial uses. This approach to impact reduction, where the direct focus is on reducing the loss of aquatic ecosystem functioning supportive of beneficial uses, fundamentally contrasts with the currently prevailing system. What are primary concerns in the existing system (e.g., discharge concentrations of certain chemical and physical substances, technological strategies from a menu of practices) are still prospectively important, but only as a means toward realizing functional objectives, not as endpoints themselves. To be sure, attaining beneficial uses will require wise choices among tools to decrease discharges and contaminant emissions. However, the ultimate proof will always be in biological outcomes.

As made clear in Chapters 3 and 4, linkages among myriad stressing agents, impact receptors, and specific mitigating abilities of technological fixes are poorly understood and not easily understandable. The proposed new paradigm acknowledges that the linkages are not established among the voluminous elements in an exceptionally complex system ranging from impact sources, through environmental transport and fate mechanisms, to ecosystem health. However, it is intuitively and theoretically clear that minimizing the generation of impacts in the first place and slowing their progression into aquatic environments can break the chain of landscape alteration that leads to increased runoff and pollutant production, modifies aquatic habitat, and ultimately causes deterioration of the biological community. Landscapes can be managed in a preventive, integrated fashion that deals with the many undifferentiated agents of impact and avoids, or at least reduces, the damage. Although the application of these theories may not automatically and quickly stem biological losses, the powerful mechanism of adaptive management, if correctly applied, can be used to make course corrections toward meeting the defined objectives.

An earlier National Research Council (NRC) committee examined the scientific basis of EPA's TMDL program and recommended "adaptive implementation" (AI) to water quality standards (NRC, 2001a). That committee drew AI directly from the concept of adaptive management for decision making under uncertainty, introduced by Holling and Chambers (1973) and Holling (1978) and described it as an iterative process in which TMDL objectives and the imple-

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mentation plans to meet those objectives are regularly reassessed during the ongoing implementation of controls. Shabman et al. (2007) and Freedman et al. (2008) subsequently extended and refined the applicability of AI for promoting water quality improvement both within and outside of the TMDL program. In that broader context, AI fits well with the framework put forward here. Indeed, the proposed revised monitoring system presented later in this chapter is designed to provide information to support adaptive management in a permitting context.

The Stages of Urbanization and Their Effects on Strategy

In waterbodies that are not in attainment of designated uses, it is likely that the physical stresses and pollutants responsible for the loss of beneficial uses will have to be decreased, especially as human occupancy of watersheds increases. Reducing stresses, in turn, entails mitigative management actions at every life stage of urban development: (1) during construction when disturbing soils and introducing other contaminants associated with building; (2) after new developments on Greenfields are established and through all the years of their existence; (3) when any already developed property is redeveloped; and (4) through retrofitting static existing development. Most management heretofore has concentrated on the first two of those life stages.

The proposed approach recognizes three broad stages of urban development requiring different strategies: new development, redevelopment, and existing development. *New development* means building on land either never before covered with human structures or in prior agricultural or silvicultural use relatively lightly developed with structures and pavements (i.e., Greenfields development). *Redevelopment* refers to fully or partially rebuilding on a site already in urban land use; there are significant opportunities for bringing protective measures to these areas where none previously existed. The term *existing development* means built urban land not changing through redevelopment; retrofitting these areas will require that permittees operate creatively.

What is meant by redevelopment requires some elaboration. Regulations already in force typically provide some threshold above which stormwater management requirements are specified for the redeveloped site. For example, the third Draft Ventura County Municipal Separate Storm Sewer System Permit defines "significant redevelopment" as land-disturbing activity that results in the creation or addition or replacement of 5,000 square feet or more of impervious surface area on an already developed site. The permit goes on to state that where redevelopment results in an alteration to more than 50 percent of the impervious surfaces of a previously existing development, and the existing development was not subject to postdevelopment stormwater quality control requirements, the entire site becomes subject to application of the same controls required for new development. Where the alteration affects 50 percent or less of the impervious surfaces, only the modified portion is subject to these controls.

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All urban areas are redeveloped at some rate, generally slowly (e.g., roughly one or at most a few percent *per annum*) but still providing an opportunity to ameliorate aquatic resource problems over time. Extending stormwater requirements to redeveloping property also gradually "levels the playing field" with new developments subject to the requirements. As pointed out in Chapter 2, some jurisdictions offer exemptions from stormwater management requirements to stimulate desired economic activities or realize social benefits. Such exemptions should be considered very carefully with respect to firm criteria designed to weigh the relative socioeconomic and environmental benefits, to prevent abuses, to gauge just how instrumental the exemption is to gaining the socioeconomic benefits, and to compensate through a trading mechanism as necessary to achieve set aquatic resource objectives.

It is important to mention that not only residential and commercial properties are redeveloped, but also streets and highways are periodically rebuilt. Highways have been documented to have stormwater runoff higher than other urban land uses in the concentrations and mass loadings of solids, metals, and some forms of nutrients (Burton and Pitt, 2002; Pitt et al., 2004; Shaver et al., 2007). Redevelopment of transportation corridors must be taken as an opportunity to install SCMs effective in reducing these pollutants.

Opportunities to apply SCMs are obviously greatest at the new development stage, somewhat less but still present in redevelopment, but most limited when land use is not changing (i.e., existing development). Still, it is extremely important to utilize all readily available opportunities and develop others in static urban areas, because compromised beneficial uses are a function of the development in place, not what has yet to occur. Often, possibly even most of the time, to meet watershed objectives it will be necessary to retrofit a substantial amount of the existing development with SCMs. To further progress in this overlooked but crucial area, the Center for Watershed Protection issued a practical Urban Stormwater Retrofit Practices manual (Schueler et al., 2007).

Practices for Impact Reduction

As described in Chapter 5, in the past 15 to 20 years stormwater management has passed through several stages. First, it was thought that the key to success was to match postdevelopment with predevelopment peak flow rates, while also reducing a few common pollutants (usually TSS) by a set percentage. Finding this to require large ponds but still not forestalling impacts, stormwater managers next deduced that runoff volumes and high discharge durations would also have to decrease. Almost simultaneously, although not necessarily in concert, the idea of LID arose to offer a way to achieve actual avoidance or at least minimization of discharge quantity and pollutant increases reaching far above predevelopment levels. For purposes of this discussion, the SCMs associated with LID along with others are named Aquatic Resources Conservation Design (ARCD). First, this term signifies that the principles and many of the methods

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apply not only to building on previously undeveloped sites, but also to redeveloping and retrofitting existing development. Second, incorporating aquatic resources conservation in the title is a direct reminder of the central reason for improving stormwater regulation and management. ARCD goes beyond LID to encompass many of the SCMs discussed in Chapter 5, in particular those that decrease surface runoff peak flow rates, volumes, and elevated flow durations caused by urbanization, and those that avoid or at least minimize the introduction of pollutants to any surface runoff produced. This concentration reduction, together with runoff volume decrease, cuts the cumulative mass loadings (mass per unit time) of pollutants entering receiving waters over time. The SCM categories from Table 5-1 that qualify as ARCD include:

- Product Substitution,
- Watershed and Land-Use Planning,
- Conservation of Natural Areas,
- Impervious Cover Minimization,
- Earthwork Minimization,
- Reforestation and Soil Conservation,
- Runoff Volume Reduction—Rainwater Harvesting, Vegetated, and Subsurface,
- Aquatic Buffers and Managed Floodplains, and
- Illicit Discharge Detection and Elimination.

The menu of ARCD practices begins with conserving, as much as possible, existing trees, other vegetation, and soils, as well as natural drainage features (e.g., depressions, dispersed sheet flows, swales). Clustering development to affect less land is a fundamental practice advancing this goal. Conserving natural features would further entail performing construction in such a way that vegetation and soils are not needlessly disturbed and soils are not compacted by heavy equipment. Using less of polluting materials, isolating contaminating materials and activities from contacting rainfall or runoff, and reducing the introduction of irrigation and other non-stormwater flows into storm drain systems are essential. Many ARCD practices fall into the category of minimizing impervious areas through decreasing building footprints and restricting the widths of streets and other pavements to the minimums necessary. Water can be harvested from impervious surfaces, especially roofs, and put to use for irrigation and gray water system supply. Harvesting is feasible at the small scale using rain barrels and at larger scales using larger collection cisterns and piping systems. Relatively low traffic areas can be constructed with permeable surfaces such as porous asphalt, open-graded Portland cement concrete, coarse granular materials, concrete or plastic unit pavers, or plastic grid systems. Another important category of ARCD practices involves draining runoff from roofs and pavements onto pervious areas, where all or much can infiltrate or evaporate in many situations.

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If these practices are used, but excess runoff still discharges from a site, ARCD offers an array of techniques to reduce the quantity through infiltration and evapotranspiration and improve the quality of any remaining runoff. These practices include (1) bioretention cells, which provide short-term ponded and soil storage until all or much of the water goes into the deeper soil or the atmosphere; (2) swales, in which water flows at some depth and velocity; (3) filter strips, broad surfaces receiving sheet flows; (4) infiltration trenches, where temporary storage is in below-ground gravel or rock media; and (5) vegetated ("green") roofs, which offer energy as well stormwater management benefits. Natural soils sometimes do not provide sufficient short-term storage and hydraulic conductivity for effective surface runoff reduction because of their composition but, unless they are very coarse sands or fine clays, can usually be amended with organic compost to serve well.

ARCD practices should be selected and applied as close to sources as possible to stem runoff and pollutant production near the point of potential generation. However, these practices must also work well together and, in many cases, must be supplemented with strategies operating farther downstream. For example, the City of Seattle, in its "natural drainage system" retrofit initiative, built serial bioretention cells flanking relatively flat streets that subsequently drain to "cascades" of vegetated stepped pools created by weirs, along more sloping streets. The upstream components are highly effective in attenuating most or even all runoff. Flowing at higher velocities, the cascades do not perform at such a high level, although under favorable conditions they can still infiltrate or evapotranspire the majority of the incoming runoff (Horner et al., 2001, 2002, 2004; Chapman, 2006; Horner and Chapman, 2007). Their role is to reduce runoff from sources not served by bioretention systems as well as capture pollutants through mechanisms mediated by the vegetation and soils. The success of Seattle's natural drainage systems demonstrates that well-designed SCMs can mimic natural landscapes hydrologically, and thereby avoid raising discharge quantities above predevelopment levels.

In some situations ARCD practices will not be feasible, at least not entirely, and the SCMs conventionally used now and in the recent past (e.g., retention/detention basins, biofiltration without soil enhancement, and sand filters) should be integrated into the overall system to realize the highest management potential.

The proposed watershed-based program emphasizing ARCD practices would convey significant benefits beyond greatly improved stormwater management. ARCD techniques overall would advance water conservation, and infiltrative practices would increase recharge of the groundwater resource. ARCD practices can be made attractive and thereby improve neighborhood aesthetics and property values. Retention of more natural vegetation would both save wildlife habitat and provide recreational opportunities. Municipalities could use the program in their general urban improvement initiatives, giving incentives to property owners to contribute to goals in that area while also complying with their stormwater permit.

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Municipal Permittee Roles in Implementing Strategies

Municipal permittees sharing a watershed will have key roles in promoting ARCD under the proposed new system. First, the lead permittee and its partners would be called upon to perform detailed scientifically and technically based watershed analysis as the program's foundation. The City of San Diego (2007) offers a model by which permittees could operate with its Strategic Plan for Watershed Activity Implementation. The plan consists of:

- Activity location prioritization—locations prioritized for action based on pollutant loading potential;
- Implementation strategy and activity prioritization—tiered approach identifying activities directed at meeting watershed goals over a five-year period;
- Potential watershed activities—general list of activities required and potentially required to meet goals as guidance for planning and budgeting;
- Watershed activity maps—specified locations for activities; and
- Framework for assessment monitoring—a plan for development of the monitoring and reporting program.

Municipal permittees would be required under general state regulations to make ARCD techniques top priorities for implementation in approving new developments and redevelopments, to be used unless they are formally and convincingly demonstrated to be infeasible. In that situation permit approval would still require full water quantity and quality management using conventional practices. Beyond regulation, municipalities would be called upon to give private property owners attractive incentives to select ARCD methods and support to implement them. Furthermore, they should supplement on-site ARCD installations with municipally created, more centralized facilities in subwatersheds.

Other municipal roles in the proposed program revolve around the prominence of soil infiltration as a mechanism in ARCD. Successful use of infiltration requires achieving soil hydraulic conductivity sufficient to drain the runoff collector quickly enough to provide capacity for subsequent storms and avoid nuisance conditions, while not so rapid that contaminants would reach groundwater. One important task for municipal co-permittees will be defining watershed soils and hydrogeological conditions to permit proper siting and design of infiltrative facilities. A great deal of soils information already exists in any community but must be assembled and interpreted to assist stormwater managers. U.S. Department of Agriculture soil surveys, while a start, are often insufficiently site-specific to characterize the subsurface accurately at a point on the landscape. More localized data available to municipalities come from years of recorded well logs, soil borings, and percolation test results. Municipalities should tap these records to define, to their best ability, soil types, hydraulic conductivities, and seasonal groundwater positions. Although abundant and valu-

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able, these data are unlikely to be sufficient to define subsurface attributes across a watershed. Thus, municipalities should collect additional data (soil borings, soils analyses, and percolation tests) to obtain a good level of assurance of the prospects for infiltrative ARCD.

Part of the task for municipalities will be overcoming opposition to infiltration if it is unjustified. Some opponents discourage infiltration based on coarse soil survey data that may not apply at all at a locality, or they fail to take into account that the well-established ARCD practice of soil amendment, generally with organic compost, can improve the characteristics of somewhat marginal soils sufficiently to function well during infiltration. While such amendment cannot increase hydraulic conductivity sufficiently in restrictive clay soils, the technique has proven to effectuate substantial infiltration and attendant reduction in runoff volumes and peak flow rates in Seattle's natural drainage systems, discussed above. These systems lie on variable soils, including formations categorized by the Natural Resources Conservation Service (2007) as being in hydrologic group C. This group generally has somewhat restricted saturated hydraulic conductivity in the least transmissive layer between the surface and 50 centimeters (20 inches) of between 1.0 micrometers per second (0.14 inches per hour) and 10.0 micrometers per second (1.42 inches per hour). Furthermore, additional runoff reduction often occurs through evapotranspiration, which is enhanced by the vegetation in ARCD systems.

Another objection sometimes raised to infiltrating stormwater is its perceived potential to compromise groundwater quality. Whether or not that potential is very great depends upon a number of variables: rate of infiltration, ability of the soil type to extract and retain contaminants, distance of travel to groundwater, and any contaminated layers through which the water passes. It is unlikely that urban stormwater, with its prevailing pollutant concentrations, will threaten groundwater if it travels at a moderate rate, through soils of medium or fine textures without contaminant deposits, to groundwater at least several meters below the surface. To ensure that groundwater is not compromised when surface water is routed through infiltrative practices, municipalities must establish where appropriate conditions do and do not exist and spot infiltration opportunities accordingly. Records of past waste disposal, leaks, and spills must be consulted to clean up or stay away from contaminated zones. There are alternatives even if documented soils or groundwater limitations rule out infiltrative practices. Much can be accomplished to reduce the quantities of contaminated urban runoff discharged to receiving waters through impervious surface reduction, water harvesting, and green roofs.

One additional problem to infiltrating stormwater runoff exists in some relatively dry areas and must be countered by municipalities. Overirrigation of lawns and landscape plantings has already increased infiltration well over the predevelopment amount and raised groundwater tables, sometimes to problematic levels. This unnecessary use of irrigation not only wastes potable water, often scarce in such areas, but reduces capacity to infiltrate stormwater without further water table rise. Municipalities should set up effective programs to con-

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serve water and simultaneously increase stormwater infiltration capacity.

A final element of an integrated management and permitting program under municipal control is use of capacity in the sanitary sewer and municipal wastewater treatment systems to treat some stormwater. This initiative must be pursued very carefully. One reason for care is that municipal treatment works have historically been overburdened with stormwater flows in combined sewers and have not yet broken free of that burden through sewer separation programs. A second reason is that municipal sewage treatment plants are generally designed to remove particulates and decompose organic wastes and not to capture the array of pollutants in stormwater, many dissolved or associated with the finest and most difficult to capture particles. Toxic contaminants can damage microbes and upset biological treatment plants. Nonetheless, capacity exists in many WWTPs to treat stormwater. The delivery of pollutants the plant was not designed to handle can be managed by pretreatment requirements, applied to industrial stormwater dischargers particularly. Dry weather flows, consisting mostly of excess irrigation runoff, can be diverted to treatment plants to prevent at least some of the nutrient and pesticide contamination that otherwise would flow to receiving waters. Additional capacity to treat stormwater can be gained by repairing defective municipal wastewater pipes that allow groundwater entry.

Special Considerations for Construction and Industrial Land Uses

All of the principles discussed above apply to industrial and construction sites as well: minimize the quantity of surface runoff and pollutants generated in the first place, or act to minimize what is exported off the site. Unfortunately, construction site stormwater now is managed all too often using sediment barriers (e.g., silt fences and gravel bags) and sedimentation ponds, none of which are very effective in preventing sediment transport. Much better procedures would involve improved construction site planning and management, backed up by effective erosion controls, preventing soil loss in the first place, which might be thought of as ARCD for the construction phase of development. Just as ARCD for the finished site would seek to avoid discharge volume and pollutant mass loading increase above predevelopment levels, the goal of improved construction would be to avoid or severely limit the release of eroded sediments and other pollutants from the construction site. Chapter 5 discusses construction-phase stormwater management in more detail.

Other industrial sites are faced with some additional challenges. First, industrial sites usually have less landscaping potentially available for land-based treatments. Their discharges are often more contaminated and carry greater risk to groundwater. On the other hand, industrial operations are amenable to a variety of source control options that can completely break the contact between pollutants and rainfall and runoff. Moving operations indoors or roofing outdoor material handling and processing areas can transform a high-risk situation to a

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no-risk one. It is recommended that industrial permits strongly emphasize source control (e.g., pollution prevention) as the first priority and the remaining ARCD measures as secondary options (as outlined in Table 5-9). Together these measures would attempt to avoid, or minimize to the extent possible, any discharge of stormwater that has contacted industrial sources.

It is likely that the remaining discharges that emanate from an industrial site will often require treatment and, if relatively highly contaminated, very efficient treatment to meet watershed objectives. Some industrial stormwater runoff carries pollutant concentrations that are orders of magnitude higher than now prevailing water quality standards. In these cases meeting watershed objectives may require providing active treatment, which refers to applying specifically engineered physicochemical mechanisms to reduce pollutant concentrations to reliably low levels (as opposed to the passive forms of treatment usually given stormwater, such as ponds, biofiltration, and sand filters). Examples now in the early stages of application to stormwater include chemical coagulation and precipitation, ion exchange, electrocoagulation, and filtration enhanced in various ways. These practices are undeniably more expensive than source controls and other ARCD options and traditional passive treatments. If they must be used at all, it is to the advantage of all parties that costs be lowered by decreasing contaminated waste stream throughput rates to the absolute minimum.

Administrative and Funding Arrangements

A number of practical, logistical considerations pertain to converting to the permitting and regulatory system discussed above. These considerations include:

- What design and performance standards should be placed on the management systems?
- What administrative vehicles offer the best prospects for success?
- What funding arrangements are necessary to support the revised permitting and management system?

Design and Performance Standards

It has already been asserted under the discussion of objectives above that ultimate performance standards should be based on results in the aquatic systems under protection. The report further advocates promulgating these standards primarily in terms of biological health (for protection of human health, aquatic life, or both), supplemented by measures of conditions well known to influence biological health quite directly, such as hydrologic variables. It was further proposed that active adaptive management be applied in relation to the degree of

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achievement of water resource objectives. However, it would not be wise to standardize entirely on this level and leave all questions of the means to the end to individual permittees. Certain design-level standards would also be appropriate. An example is provided by the recently issued draft municipal permit for Ventura County, California. In that permit, application of low-impact methods to new development and redevelopment is specified to hold the effective impervious area to 5 percent of the total contributing catchment. While technical experts may disagree on the precise number, the point is that adopting such a standard gives a straightforward design requirement on an evidentiary basis. Results in the receiving waters would still be tracked and used in active adaptive management if necessary, but effective application of the design standard would provide some level of initial assurance that the aquatic health standards can be met.

Forging Institutional Partnerships

At the heart of the proposal for a new system of regulating discharges to the nation's waters is issuing permits to groups of municipalities in a watershed operating as co-permittees under a lead permittee. Furthermore, the proposal envisions these municipal permittees assuming responsibility for and implementing the permits for all public and private dischargers in their jurisdictions. These admittedly sweeping changes in the way waters have been managed almost everywhere in the nation raise serious issues of acquiescence to the new arrangements, compatibility, and devising a sufficient and stable funding base. This section draws from the small number of examples where arrangements like those proposed here have been attempted.

The Los Angeles County Municipal Storm Water Permit offers a case study in how to aggregate municipalities in a co-permittee system while still allowing prospective members latitude should they perceive their own interests to deviate, even considering the advantages of group action. The permit, first issued in 1990, presently covers five watersheds and 86 municipal permittees. During the process of reissuing the 1996 permit, the City of Long Beach challenged the provisions of the Los Angeles County MS4 permit. The city was given the option of applying for its own individual permit, which it did. Long Beach was issued its own individual MS4 permit in 1999 with provisions similar to the Los Angeles County MS4 permit. As another example, a small coastal municipality (Hermosa Beach) covered by the Los Angeles County Municipal Storm Water Permit investigated the possibility of withdrawing from the county permit in 2000 to be reclassified as a Phase II municipality. Just as with Long Beach, Hermosa Beach was given the option of applying for an individual permit as a Phase I MS4, but in the end Hermosa Beach elected to remain within the areawide permit. Although this report strongly encourages cooperative participation of municipalities as co-permittees, it does not mandate it. Rather, the flexibility illustrated above should be retained in the proposed new permitting pro-

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gram. What matters for compliance with the CWA is that a municipality manage discharges in a manner at least equivalent to other permittees in the watershed.

Stephenson and Shabman (2005) gave thought to the dilemma of entities who may not naturally work well together being asked to cooperatively solve a problem that all have had a share in creating. They argued that new organizational forms that consolidate multiple regulated entities under a single organizational umbrella could be used to coordinate and manage jointly the collective obligations of a group of regulated parties at lower costs to members. Private and public regulated entities alike could benefit from participation in these new organizations. Such cooperative organizations could offer participating parties financial incentives and decision-making flexibility through credit trading programs.

Two larger-scale compliance associations exist in the Neuse and Tar-Pamlico river basins in North Carolina (Stephenson and Shabman, 2005). In both programs the state was concerned about nutrient enrichment of estuary waters and imposed an aggregate cap on industrial and municipal wastewater dischargers equivalent to a 30 percent reduction in nitrogen loads. In both programs, the state granted individual point source dischargers a choice: (1) accept new requirements to control nitrogen through individual NPDES permits or (2) form and join a discharger association. The rigidities associated with individual NPDES permits provided enough incentive for most point source dischargers to opt for the second choice. Compliance associations were then created and issued permits.

The Neuse River rules cover nonpoint agricultural sources as well as point discharges. Counties are responsible for reducing nutrient loads, and farmers must either join county associations that apply different strategies or individually contribute to meeting objectives by setting aside 50- to 100-foot buffers along all streams.

North Carolina requires compliance associations to meet a single mass load cap. In the Tar-Pamlico case, the legal requirement to meet the cap was established by an enforceable contractual agreement signed by the association and the state. In the Neuse program, a single "group compliance permit" was issued to the association. Both legal mechanisms established financial penalties for the two associations if aggregate discharges of the group exceed the association cap. A key advantage of the association is similar to that of a formal effluent trading program—granting dischargers flexibility to decide how best to meet the aggregate load cap. To date, the associations have managed to keep nitrogen loads considerably below their respective caps. Compliance costs have also fallen below original projections. Further, there is some evidence that the association concept is producing incentives for strong cooperative behavior that did not exist prior to implementation.

The case studies presented here illustrate ways in which both public and private entities subject to regulation can exercise options for operating autonomously should they not wish to incorporate with a group, while still contributing

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to the achievement of watershed objectives. The case studies suggest that most dischargers conclude in the end that group membership offers considerable advantages.

Funding Considerations

The existing stormwater permit program is characterized, in most of the nation, by municipal Phase I and now Phase II permittees operating mostly alone. In contrast the new system envisions coalitions of permittees that share a watershed operating in concert, under the coordination and leadership of a principal permittee. The present structure tends to bring about duplication in effort and staff, whereas cooperation should stimulate efficiencies that could defray at least part or even much of the extra local costs associated with new responsibilities for municipal permittees.

As explored in the preceding section, municipalities may not necessarily wish to join in co-permittee arrangements; and mechanisms are proposed to allow them to operate individually, as long as watershed objectives are met. However, the state could encourage participation through financial inducements, for example, by estimating the resources needed to meet the requirements of each watershed permit and pointing out to permittees how shared resources can save each contributor money. The state should also set preferences and better terms for grants in the favor of municipalities who join together.

To the questions of administrative vehicles and funding arrangements, stormwater utilities are the preferred mechanism, and regulations should support creating stormwater utilities. It should be added that, with watershed-based permitting as proposed here, utilities should also be regionalized on a watershed basis. A utility draws funds from the entities served in direct relation to the cost of providing the services, here management of the quantity and quality of stormwater discharged to natural waterbodies. These funds must be dedicated to that purpose and that purpose only, and cannot be redirected to general agency coffers or for any unrelated use.

Not only are more funds from more reliable sources needed, but monies should be redirected in ways differing from their allocation under the current system. It was proposed earlier that a lead municipal permittee, working with other municipal co-permittees, be given responsibility for coordinating permitting and management of municipal, industrial, and construction stormwater permits, and even permits involving other sources, such as industrial process and municipal wastewaters. Those entities would hence be doing work now devolving to individual private developers and industrial plants and other public authorities. They would need to attract the revenue from those other bodies in proportion to the added work taken on. A utility structure would provide a well-tested means of carrying out this reallocation.

Stormwater utility fees are generally assessed according to a simple formula, such as a flat rate for all single-unit dwellings and in proportion to imper-

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vious area for commercial property. Some municipalities have investigated charging more directly according to the estimated quantity and quality of stormwater discharged into the public drainage system. Municipal permittees may choose to formulate such a system, but the development process itself is not a trivial task and, being based on general (and usually quite simple) hydrologic and water quality models, can generate considerable arguments from rate payers. Going through this process is probably not necessary or even advisable for most municipal permittees, who will have many new functions should the proposed system be adopted. Instead, they should concentrate on implementing a fee structure based on a simple formula like the one above and then capture additional revenues for special functions that they will take over from industrial and construction permittees.

As discussed previously, in the proposed program municipal co-permittees, with leadership by a watershed lead permittee, will be asked to classify industries and construction sites within their borders according to risk and accordingly prioritize them for inspection and monitoring. It is proposed in the section on Measures of Achievement, below, that inspection include reviewing and approving industrial and construction site stormwater pollution prevention plans (SWPPPs). While many municipalities now inspect construction sites for stormwater compliance and some inspect industries, this work will increase significantly in the new system, and SWPPP review and approval will be a completely new element. Moreover, municipalities would perform some industrial monitoring now conducted by the industries themselves and may monitor high-risk construction sites. These special functions would require different institutional arrangements and substantial new revenue that could not be fairly charged to all rate payers. There are several possible sources for these funds. One way would be to increase industrial and construction permit fees and direct large proportions to municipalities to support inspection and monitoring. The permitting authority (designated state or EPA) would still hold ultimate authority, and municipalities could refer industrial and construction permittees found during inspection to be out of compliance to the permitting authority for enforcement. Another means would be to form consortia of industries of similar type and assess fees directly applicable to inspection and monitoring. For example, scrapyards under the jurisdiction of the California EPA Los Angeles Regional Water Board formed a monitoring consortium under which sample collection by a qualified contractor rotates among the members, with funding by all. While the members operate this system, it could be adapted to operation by municipal co-permittees.

A second-level funding concern is, once revenues are generated, how should they be put to use? It is very important that funds largely be devoted directly to the tasks at hand regarding the achievement of objectives instead of into excessive administrative and bureaucratic structure. These tasks are scientific and technical and are highly oriented toward what is actually going on in the drainage systems and their receiving waters. Thus, the majority of funds should be directed to making scientific and technical judgments based on obser-

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vations and monitoring results obtained in the field (see the discussion below).

Measures of Achievement

Critique of the Current Monitoring System

No area exemplifies the differences between the present and proposed new stormwater permitting and monitoring systems more than the measures used to gauge achievement. The current monitoring system is characterized by scattered and uncoordinated measurements of discharges from Phase I MS4s and some industries, and some visual observations of construction sites. The system proposed to take its place would emphasize monitoring of receiving water biological conditions as a data source for prescribing management adaptations to meet specified biological objectives. The discussion here first critiques the prevailing system to construct part of the rationale for changing it. It then proceeds to outline a recommended monitoring structure to replace it.

To expand very briefly on the point that the present system is scattered and uncoordinated, monitoring under all three stormwater permits is according to minimum requirements not founded in any particular objective or question. It therefore produces data that cannot be applied to any question that may be of importance to guide management programs, and it is entirely unrelated to the effects being produced in the receiving waters. Phase I municipal permit holders are generally required to monitor some storms at some discharges for no stated purposes but to report periodically to the permitting agency (Phase II municipalities have no monitoring requirements, although they may represent the major or even only impact sources in a given watershed). The usual model for industries across the nation is to collect a few discharge grab samples a year and send the results to the permitting authority, plus occasionally to make observations for obvious signs of pollution (e.g., oil sheen, odor). Construction site monitoring is less standardized and often involves no water quality monitoring at all. Again, no permittee under any of the three programs is obligated according to national standards to check the effects of its discharges on receiving waters. Since the individual effects of any discharger are often not distinguishable from any other, the scattershot system would usually not be able to discern responsibility for negative effects in the receiving water ecosystem.

Input to the committee conveyed the strong sense that monitoring as it is being done is nearly useless, burdensome, and producing data that are not being utilized. For example, the City of Philadelphia conducts substantial amounts of wet weather monitoring, which is very expensive, but it can barely monitor for TSS in many of its heavily impacted streams (Crockett, 2007). The resources to monitor for the more exotic pollutants do not exist. Smaller municipal permittees without the resources and sophistication of a big-city program have difficulty performing even the most basic monitoring. City water managers believe

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that the traditional stormwater program places too much emphasis on monitoring of individual chemicals rather than looking at ecological results (Crockett, 2007).

Industry representatives have also described several problems they see in industrial stormwater monitoring as it is performed now (Bromberg, 2007; Longsworth, 2007; Smith, 2007). One concerns the high degree of variability, from the methods used to what is actually measured (Stenstrom and Lee, 2005; Lee et al., 2007). Opponents have been quite critical of the benchmarks to which industrial monitoring data are compared, believing that the benchmarks have no basis in direct measurements associating stormwater with impacts. Some have suggested replacing monitoring with an annual stormwater documentation report to the permitting authority. It seems that industry personnel disrespect the current monitoring framework for some good reasons and feel it conveys a burden for little purpose. There was some implication that industry would be receptive to measures offering more meaningful information in place of poorly conceived monitoring requirements (Bromberg, 2007; Longsworth, 2007; Smith, 2007).

Proposed Revised Monitoring System

A structure in several tiers is proposed as a monitoring system to serve the watershed-based permitting and management framework.

Progress Evaluation Tier. This tier would represent the ultimate basis for judgment on whether the objectives adopted for the watershed are being met. Because these objectives would mainly be expressed in terms related to direct support of beneficial uses, so too would monitoring in the Progress Evaluation Tier principally emphasize direct measurements of ecological health. The preferred model for this evaluation would be the paired watershed approach, which is based on the classic method of scientific experimentation and was developed for water resource management investigations by EPA (Clausen and Spooner, 1993). Ideally, conditions in the waterbody under evaluation would be compared to conditions in the same waterbody before imposition of a permit and management scheme (before versus after comparison), as well as to conditions in a similar waterbody not subject to human-induced changes (affected system versus reference system comparison). At least one of these comparisons must be made if both cannot. If the objectives involve improving conditions, and not just avoiding more degradation, the reference should represent that state to which the objective points.

This function has traditionally been the province of the permitting authority (i.e., the designated state or EPA). In the new program, the function is assigned to municipal permittees, guided by the lead permittee, to conduct or contract, but with a substantial contribution by the permitting authority in the form of material support and guidance. The primary vehicle envisioned to perform the pro-

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gress assessment is a well-qualified monitoring consortium serving the watershed, and perhaps other watersheds in the vicinity. Case studies below present examples of successful joint ventures in monitoring that can serve as models. The proposal is based on the belief that monitoring should be more manageable and effective at the watershed compared to the state level and, furthermore, that utilizing a consortium approach should make it feasible for a coalition of municipal co-permittee partners to commission monitoring.

Findings of objective shortfall would trigger development of active adaptive management strategies. Generally, an assessment should be conducted to determine what additional measures should be put in place in regulating new development and redevelopment, as well as increasing coverage of existing developments with retrofits.

Diagnostic Tier. The second tier would be designed to provide the municipal permittees with the necessary information to formulate active adaptive management strategies, and they would be responsible for this second tier as well as the first. The Diagnostic Tier would be composed of assessment of information from the Compliance Reporting Tier, plus some specific field monitoring to determine the main reasons for ability or failure to meet objectives. Some highly directed monitoring of receiving water conditions could determine the need to improve management of water quantity, water quality, or both. A tool like the Vermont flow-duration curves is an example of a potentially useful device for diagnostic purposes. To allow the use of such a tool, it is important that continuous flow recorders be installed on key streams in the watershed. The techniques described in the Impact Sources section above, once they are further developed, would also be useful in Diagnostic Tier monitoring.

An important dimension of this tier would be prioritized inspection and monitoring of potentially high-risk industrial and construction sites. In addition, data submitted by the industrial and construction permittees according to the Compliance Reporting Tier would assist in targeting dischargers to bring about the necessary improvements in water quantity and/or quality management.

Compliance Reporting Tier. It is proposed that the first step in compliance reporting be submission of SWPPPs by all construction and industrial permittees (plus municipal corporation yards as an industrial-like activity) to the jurisdictional municipal permittee for review and approval. It is further proposed that the industrial permittees and municipal corporation yards be relieved of sample collection, *if* they develop SWPPPs making maximum possible use of ARCD practices, supplemented by active treatment as necessary, and the municipal permittee approves the SWPPP. Construction sites would be given a similar sampling dispensation if they develop an approved SWPPP along the lines of Box 5-3.

Otherwise, the permittees would be required to perform scientifically valid sampling and analysis and report results to the watershed co-permittees. This more comprehensive and meaningful monitoring would increase the burden al-

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ready felt by permittees and create a strong incentive to apply excellent SCMs. This burden could be relieved to a degree through participation with other similar dischargers in the watershed in a monitoring coalition. As an example, in North Carolina coalitions of wastewater dischargers are working with the state Division of Water Quality (DWQ) to create and manage coalition-led watershed monitoring programs that operate in conjunction with DWQ's ambient chemistry and biological programs (Atkins et al., 2007). Lee et al. (2007), after an assessment of industrial stormwater and other monitoring data, concluded that selecting a subset of permittees from each monitored category would yield better results at lower overall cost compared to monitoring at every location. This strategy would permit the use of more advanced sampling techniques, such as flow-weighted composite samplers instead of grab sampling, to estimate representative loads from each category with improved accuracy and reduced variability.

All permittees would still make observations of the SCMs and discharges and keep records. The final proposed step in compliance reporting is an annual report covering observations, SCM operation and maintenance, SWPPP modifications, and monitoring results (if any), to be sworn as to correctness, notarized, and submitted to the lead municipal permittee. The Massachusetts Environmental Results Program (April and Greiner, 2000) offers a possible model for compliance reporting and verification. This program uses annual self-certification to shift the compliance assurance burden onto facilities. Senior-level company officials certify annually that they are, and will continue to be, in compliance with all applicable air, water, and hazardous waste management performance standards. The state regulatory agency reviews the certifications, conducts both random and targeted inspections, and performs enforcement when necessary.

Research Tier. The final tier would be outside the permit system and exist to develop broad mechanistic understanding of stormwater impacts and SCM functioning important to assist permittees in reaching their objectives. EPA and state agencies designated to operate the permit system would have charge of this tier. These agencies would develop projects and contract with universities and other qualified research organizations on a competitive basis to carry out the research.

Instructive Case Studies for the Proposed Revised Monitoring System

Many municipalities, even large ones, would be challenged and burdened by taking on comprehensive watershed monitoring. The Southern California Coastal Water Research Project Authority (SCCWRP, http://www.sccwrp.org) offers an excellent model of how co-permittees in a watershed or an even broader area could organize to diffuse these challenges and burdens. SCCWRP

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is a joint-powers agency, one that is formed when several government bodies have a common mission that can be better addressed by pooling resources and knowledge. In SCCWRP's case, the common mission is to gather the necessary scientific information so that member agencies can effectively and cost-efficiently protect the Southern California marine environment. Key goals adopted by SCCWRP are defining the mechanisms by which aquatic biota are potentially affected by anthropogenic inputs and fostering communication among scientists and managers. Comprised of a multidisciplinary staff, SCCWRP encompasses units specializing in analytical chemistry, benthic ecology, fish biology, watershed conditions, toxicology, and emerging research.

SCCWRP's current mission stems from the results of a 1990 NRC review of marine environmental monitoring programs in the Southern California Bight (NRC, 1990). It was determined that although $17 million was being spent annually on marine monitoring, it was not possible to provide an integrated assessment of the status of the Southern California coastal marine environment. Most monitoring was associated with NPDES permit requirements and directed toward addressing questions about site-specific discharge sources. As a result, most monitoring in the bight was restricted to an area covering less than 5 percent of the bight's overall watershed, making it difficult to draw conclusions about the system as a whole. The limited spatial extent of monitoring was also found to limit the quality of local-scale assessments, since the boundaries of most monitoring programs did not match the spatial and temporal boundaries of the important physical and biological processes in the bight.

NRC (1990) further found that there was a lack of coordination among existing programs, with substantial differences in the parameters measured among programs, preventing integration of data. Even when the same parameters were examined, they were often measured with different methodologies or with different (or unknown) levels of quality assurance. Moreover, the NRC found that even when the same parameters were measured in the same way, substantial differences in data storage systems among monitoring programs limited access to the data for more comprehensive assessment. To avoid repetition of these shortcomings, the SCCWRP example should be given very thorough consideration as a template for the Progress Evaluation, Diagnostic, and Research Tiers in the proposed revised monitoring program.

The San Gabriel River Regional Monitoring Program (SGRRMP, *http://www.lasgrwc.org/SGRRMP.html*) is a watershed-scale counterpart to the larger-scale regional monitoring efforts in Southern California. The SGRRMP incorporates local and site-specific issues within a broader watershed-scale perspective. The program exists to improve overall monitoring cost effectiveness, reduce redundancies within and between existing monitoring programs, target monitoring efforts to contaminants of concern, and adjust monitoring locations and sampling frequencies to better respond to management priorities in the San Gabriel River watershed. Five core questions provide the structure for the regional program:

- What is the environmental health of streams in the overall watershed?

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- Are the conditions at areas of unique importance getting better or worse?
- Are receiving waters near discharges meeting water quality objectives?
- Are local fish safe to eat?
- Is body-contact recreation safe?

The workgroup convened to establish the program recommended monitoring designs to answer the core questions effectively and efficiently. The resulting program is a multilevel monitoring framework that combines probabilistic and targeted sampling for water quality, toxicity, and bioassessment and habitat condition.

The City of Austin, Texas, has more than 20 years of stormwater monitoring experience and offers additional guidance on designing and implementing watershed monitoring programs (City of Austin, 2006). Austin performs detailed periodic synoptic sampling in the watersheds it manages to track trends in stormwater quantity and quality. The city uses the results to evaluate the impacts of land development on stormwater quantity and pollution, establishing statistical relationships between measures of these conditions and the amount of impervious cover. Trend assessment over time leads to recommended changes to the City of Austin Environmental Criteria Manual as needed.

Creating Flexibility and Incentives Within a Watershed Approach

A watershed-based permitting approach to stormwater management focuses attention on watershed objectives and endpoints. To be able to achieve these goals, observable performance measures beyond the success of an individual SCM need to be identified that are consistent and necessary to meet designated uses. These might include watershed-level numeric limits on the amount of a particular pollutant allowed to enter a waterbody (e.g., pounds of phosphorus) or various measures of allowable volume of discharge. A watershed focus shifts attention away from specific SCM performance and site-specific technological requirements to achieving a larger watershed goal. As a consequence, there is considerable management flexibility in deciding how these goals will be achieved. Indeed, this flexibility was cited by the NRC (1999) as a prerequisite to successful watershed management.

One way of exercising this flexibility is to create an “incentive-based” or “market-based” approach to choose how watershed goals are met. It is recognized throughout the environmental management field that entities subject to regulation do not necessarily have equal opportunities and qualifications to comply sufficiently to sustain resources. To compensate for this, the market-based approach allows individual discretion to select how effluent (or runoff volume) will be controlled (choice of technology, processes, or practices) and where they will be controlled (on site or off site). That is, any discharger legiti-

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mately unable to meet discharge quantity and quality allocations would be able to finance offsets elsewhere to achieve the watershed goals. An important element and challenge is to couple this decision-making flexibility with personal (typically financial) incentives so that people willingly make choices supportive of the watershed objectives. Broadly stated, the idea is to create financial reasons and decision-making opportunities to lower compliance costs and create or implement new effluent/volume control options (Shabman and Stephenson, 2007).

Because incentive-based policies require a shift in emphasis from technologies and practices to outcomes (e.g., volume or quantity of effluents), the municipal manager would not be responsible for deciding what SCM will be implemented in specific areas or hand picking specific practices to promote. Rather the stormwater program manager's responsibilities shift to establishing watershed goals, developing metrics to measure outcomes and performance, and performing necessary inspection and enforcement activities.

Effluent trading, sometimes called "water-quality trading," is one type of incentive-based policy. In an ideal form, effluent trading requires government to establish a binding aggregate limit or cap on an outcome (e.g., mass load of effluent, volume of runoff) for an identified group of dischargers. The cap or aggregate allowable discharge is set to support and achieve a socially determined environmental goal. Because it is fixed, the cap provides the public assurances that environmental objectives will be achieved in the face of a growing and changing economy. The total allowable discharge is then divided into discrete and transferable units, called allowances, and either distributed or auctioned to existing dischargers. All dischargers must own sufficient allowances to cover their discharges. For instance, any new or expanding source must first purchase allowances (and hence effluent or volume reductions) from another source before legally discharging. The requirement to hold allowances on the condition to discharge and the positive allowance price creates financial incentives for pollution prevention. Dischargers holding allowances rather than reducing discharge face forgone revenues that could have been achieved from the sale of allowances. Conversely, expanding dischargers have incentives to invest in pollution prevention in order to avoid the cost of purchasing additional allowances.

In the context of the revised permit system advocated here, achievement of objectives (generally of a biological nature) will require some combination of strategies such as no net increases in hydrologic parameters (e.g., peak flow rates, durations, volumes), water pollutants, forest cover loss, and effective impervious area. If one entity is unable to contribute adequately to meeting its share of compliance, then it must obtain the necessary credit by buying it from another similar entity that is able to contribute more than its designated share. Ideally, all sources of a waterbody's problems, not only stormwater, would come under the trading system.

Implementing the market system requires development of a resource-based currency, a nontrivial exercise but one for which models are available in other

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fields, especially air emissions. For example, emission trading has been a critical element of the nation's strategy to limit sulfur dioxide and nitrogen oxide emissions (Ellerman et al., 2000). Carbon trading is a cornerstone policy in the European Union effort to limit greenhouse gas emissions. The EPA promotes the use of trading to help achieve the goals of the CWA and has issued several policy statements and recently published guidance on how trading programs can be grafted within existing NPDES permitting programs (EPA, 2003a, 2007b).

However, compared to the air program, experience and success with trading in the water program have been limited (Shabman et al., 2002). Furthermore, programs labeled trading have been implemented in a multitude of ways in the nation's water quality program (Woodward et al., 2002; Stephenson et al., 2005; Shabman and Stephenson, 2007). In many instances, trading programs are case-specific and isolated "trades" that do not fundamentally change the choice and incentives facing dischargers in a conventional permitting system. The extent to which trading policies can be effectively employed on a watershed scale is limited not only by the physical differences between air and water mediums, but also by the unique legal structure of the CWA (Stephenson et al., 1999). For example, the CWA is oriented around imposing technology-based performance requirements on specific subset of discharge sources. Individual NPDES permits require sources to achieve these agency-identified levels of performance and may specify how performance is achieved. The statute also places limits and disincentives on the degree to which permit agencies can deviate from these limits (e.g., "antibacksliding").

Thus, the focus of the NPDES permitting system has been on individual source control and technologies, unlike the air program, which has a stronger statutory orientation around achieving broader air quality goals (ambient air quality standards). The orientation of the NPDES program limits the flexibility and incentives for regulated parties that might make market-oriented trading possible. It turns out that some of the more successful applications of trading in the water program have occurred because of permitting innovations that effectively avoid some of these rigidities (see discussion of North Carolina point source control program on the Neuse River, above).

Trading programs of various types have been proposed or suggested for stormwater (Thurston et al., 2003; Parikh et al., 2006). Although conceptual models of a comprehensive trading program based on the total volume of allowable water to be discharged have been proposed, no working examples have yet to be implemented. More limited versions of trading programs, however, have been developed. These programs provide compliance flexibility for new sources of stormwater runoff. In some locations, new developments face a requirement to provide a specific level of volume or effluent control from the parcel to be developed. The regulated entity is typically obligated to meet this requirement with the applications of on-site SCMs. Trading programs create opportunities for regulated entities to meet their regulatory requirement off site (off the parcel to be developed), called here an offset. In some trading programs, the off-site controls can be accomplished by the creation of an in lieu fee program. Such

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programs typically occur for dischargers that are not required to hold or obtain individual NPDES permits.

In lieu fee programs offer some opportunity for regulated parties to make a financial payment (fee) to a local government entity in lieu of implementing on-site controls. The fees are collected and used to implement stormwater controls in other areas of the watershed. Controlling runoff at a regional level rather than through the construction of many small on-site controls may be more cost-effective given the economies of scale associated with some SCMs (see Chapter 5 pages 362–363). The option for off-site controls also allows the stormwater program to direct investments in stormwater control to specifically targeted areas of the watershed.

Examples of in lieu fee programs include Santa Monica, California, the Neuse River Basin in North Carolina, and Williamsburg, Virginia. Santa Monica's program requires new and redevelopment projects to treat a specific volume of runoff. The program first requires the regulated entity to take all feasible steps to meet the requirement through the implementation of on-site infiltration practices. If the regulated party can demonstrate why it is economically and physically infeasible to install any type of infiltration or treatment SCM, the regulated party can pay a fee based on the volume of water that needs to be controlled (the total mitigation volume is the volume that would have been attenuated via an SCM). The fee set by Santa Monica is $18/gallon of total required mitigation volume. The $18 reflects the cost of constructing an SCM and maintaining it over 40 years (DeWoody, 2007). Presumably these fees are used to construct infiltration measures elsewhere.

The Neuse River Program requires all new land development to meet a nitrogen export standard of 3.6 pounds per acre per year (North Carolina Division of Water Quality, 1999). The water quality goal for the Neuse basin is to reduce mass nitrogen loads by 30 percent in order to improve water quality in the estuary. The export standard was set to achieve a 30 percent reduction from the average nitrogen load from lands prior to development. Developers have the option to meet this export standard either through the application of on-site SCMs or by paying a fee into a state-administered Riparian Buffer Restoration Fund (see 15A North Carolina Administrative Code 02B .0240), which would be used to reduce nitrogen loads elsewhere in the basin. Developer discretion, however, is not unlimited. Under no circumstances may developers discharge more than an estimated 6.0 pounds per acre per year from a residential site.

The Williamsburg program has an in lieu fee program for total phosphorus loads created by new development (Frie et al., 1996; Stephenson et al., 1998). For every new development, the increase in total phosphorus load from stormwater runoff from impervious surfaces is estimated. Developers have the choice to meet the phosphorus load reduction requirement through the application of on-site controls or by paying a fee to the city. The fee is set at $5,000/lb of phosphorus, with the fees earmarked to the construction of regional stormwater facilities or for the preservation of open space within the city. The presence of a fee option could also provide incentives for developers to implement source

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reduction practices.

The above programs differ in some important ways. For example, the Santa Monica program requires regulated entities to undergo a "sequencing" process that places regulatory preference on on-site controls before being able to use the fee option. The Williamsburg program allows regulated entities the option to select between constructing on-site controls and paying the fee without a regulatory preference for on-site controls. Sequencing rules tend to limit control options and thus the cost-effectiveness of these types of programs.

In lieu fee programs are distinguished from other offset programs in that it is the responsibility of the local government (or more generally, any designated fee service provider such as a nongovernmental organization) to provide the off-site SCMs. In lieu fee programs, common in the U.S. wetlands program, face a number of implementation and design challenges (Shabman and Scodari, 2004). For example, enforcement sometimes becomes a concern because the local stormwater management agency responsible for constructing and maintaining the SCMs is also responsible for monitoring and enforcement. These dual responsibilities create potential conflicts of interest; if an off-site mitigation project fails, there maybe no apparent overseeing agency to enforce corrective actions. The lack of transparency in accounting to determine whether the offset projects provide enough compensation is also sometimes a challenge. Finally, the ability to fully offset the volume of effluent discharge from a new development is contingent on collecting enough revenue from the fee to pay for the construction and maintenance of offsite SCMs. The delay between impacts and compensation and lack of full public cost accounting complicate the challenges of setting an appropriate fee.

Ensuring that in lieu fee programs provide the necessary mitigation could be accomplished in a number of ways. For example, an oversight agency may be designated to establish tracking and reporting requirements and monitor in lieu fee program performance. Or, the potential conflicts of interest inherent in the lieu fee program design could be avoided by separating the provision of the off-site mitigation service from the monitoring and enforcement. It is possible to imagine that the private sector, rather than an in lieu fee administrator, could provide off-site stormwater reduction services to those subject to the stormwater control requirements. In this case, the private sector would provide stormwater detention/retention services above and beyond what is required by law. These private service providers would receive stormwater runoff credits for these investments ("above baseline") that could be sold to developers who might wish to meet their control obligations in ways other than on-site controls. In essence, the role of searching, designing, and constructing offsite SCMs would be transferred to the private-sector stormwater credit providers. The local stormwater managers, however, would retain full authority to monitor, verify, and enforce to ensure that these offsets are successfully implemented.

The flexibility provided by in lieu fee and trading programs requires that pollutant loads or runoff volume created at one site be reduced at another site. Thus, a design issue confronting these types of programs is the consideration of

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the spatial extent in which offsetting activities can occur. The extent of the spatial range of offsetting activities in turn will depend partly on the nature and type of service being offset. For example, in the Neuse example nitrogen is a regional, basinwide concern with minimal localized effects. In such cases, the offsetting activities might be allowed basinwide (after adjusting for nitrogen attenuation through the basin). In other situations where localized concerns maybe a greater concern (say from localized flooding), the flexibility offered by such programs may be more limited. However, such spatial flexibility might also be a way to implement and achieve watershed planning objectives. For example, development may be encouraged in high-impact areas, and offsetting fees could be used to protect and enhance water quality objectives in other areas.

This last point deserves further explanation. Although this chapter advocates that biological conditions in waterbodies should be maintained or improved, there are many urban areas where local waterbodies cannot achieve the same designated uses as less developed areas. If a goal-setting entity chose to do so, beneficial uses for waters in these areas could be set at levels that acknowledge this highly altered condition, such that these streams would not be expected to achieve the same biological condition as streams outside the urban core (see Chapter 5 pages 364-366). This might be done to encourage development in high impact areas; San Jose, CA, provides an example (see Chapter 2). In that city's stormwater program, in urban areas where on-site control is either technically impossible (due to soil or space constraints) or prohibitively costly, the developers can meet the post-construction treatment standard by providing volume control either through participation in a regional stormwater project or by providing equivalent projects off site (e.g., stream restoration).

It is also possible to design a stormwater offset program that allows the different functions of stormwater management to be separated to achieve watershed objectives. For example, management of peak flow serves mostly to prevent localized flooding while more stringent volume control maybe required to protect stream channels and aquatic life. Control of peak flow might be required on site or within a narrow geographic region. In areas targeted for development, however, the volume control needed for channel protection might be transferred off site and into areas where watershed planning has identified the need for higher levels of stream channel protection or enhancement (more stringent water quality standards). A similar watershed approach based on functional assessment was recommended for wetland compensation (NRC, 2001b).

Regulatory and Legal Implications of Proposed Watershed-Based Permitting Framework for Managing Stormwater

EPA, the states, and municipal permittees would all have tasks to perform to transform the framework set forth in this report to a fully developed and functioning program. These efforts would be rewarded with a program that is rooted

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in science, transparent in its aims, fairer for all than the current program, and better for the aquatic environment. This section of the report outlines the tasks necessary to carry the proposal forward to full development.

EPA should seek significant congressional funding to support the states and municipalities in undertaking this new program, in the nature of the support distributed to upgrade municipal WWTPs after the 1972 passage of the Federal Water Pollution Control Act. Beyond financial support, EPA's tasks emphasize broad policy formulation, regulatory modifications and adaptations necessary to initiate the new program, and guidance to the states and permittees. The principal adaptation needed in the regulatory arena involves converting the current TMDL program to a form suitable for the new system. Guidance would be needed in a number of crucial areas, and it is EPA's natural role to develop it.

States (or EPA for states without delegated authority) would have broad responsibilities to translate policies and federal regulations into their own regulatory and management systems. A key task in this regard would be to recast water quality standards into objectives most directly supporting sustenance and improvement of beneficial uses. States already have considerable background for performing this task through their present definitions of beneficial uses, the Section 303(d) process for assessing waterbody compliance with water quality standards, and the triennial review of those standards. However, the added prominence of biological aspects of beneficial uses and associated objectives will require additional analysis. Other prominent state tasks will involve defining the watersheds subject to permits, forming bodies of co-permittees associated with the watersheds, and appointing the lead permittee. Many other state tasks entail cooperative work with the permittees to support and assist them in funding and conducting their activities.

Many aspects of the municipal permittees' roles in implementing strategies were explored above in a section titled accordingly. That section especially focused on activities to advance the use of ARCD methods. More broadly, the permittees will be coordinators of all permits pertaining to the watershed's aquatic resources, collectively pointed toward meeting objectives that the permittees adopt under state oversight. Other categories of tasks assigned to the municipalities under the proposed system include monitoring, in the contexts of both inspections and sampling performed through a consortium, and enforcement actions and program adaptations to promote progress toward achieving objectives. Box 6-4 provides a listing of anticipated tasks for the municipal permittees as well as the states and EPA.

A Pilot Program as a Stepping Stone

The shift of responsibility for stormwater regulation to municipalities under the watershed-based approach may lead to some surprises in implementation and enforcement. Primarily because of this, EPA is well advised to institute a pilot

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BOX 6-4
Government Agencies Roles during the Operation of a Watershed-Based Permitting System

EPA

1. Petition Congress for significant funding support for states and municipal permittees, and develop a program of fairly distributing funds based on environmental and financial needs at the watershed level.
2. Initiate regulatory modifications and clarifications necessary to establish the system.
3. Set policies for watershed permitting based on this report's recommendations.
4. Adapt TMDL program for use in the new program.
5. Produce guidance to assist the states and municipal permittees in the areas of:
   a. Developing a rotating basin approach;
   b. Developing an integrated municipal NPDES permit incorporating the full range of sources;
   c. Developing stormwater utilities and other funding mechanisms;
   d. Using impact source analysis (e.g., using reasonable potential analysis and new research results, industrial and construction site risk assessment);
   e. Using ARCD techniques for new development, redevelopment, and retrofitting;
   f. Developing monitoring consortia;
   g. Developing a credit trading system;
   h. Developing an active adaptive management program

Designated States (or EPA otherwise)

1. Define watersheds for which permits will be issued and set up a rotating basin approach to govern watershed analysis in support of subsequent steps.
2. Formulate and formally adopt goals relative to avoiding any further loss or degradation of designated beneficial uses in each watershed's component waterbodies and recovering lost beneficial uses.
3. Use the results of the existing Section 303(d) process and supplementary work to assess the extent of designated beneficial use achievement in each watershed and set goals for protection and recovery.
4. Match municipal permittees to watersheds and designate a lead permittee for each watershed.
5. Estimate resource needs to fulfill permit requirements in each watershed.
6. Develop a grant program, drawing on EPA and state funds, to support municipal permittees, with incentives for joining co-permittee associations.
7. Identify areas outside the jurisdictions of permitted municipalities that should be brought into the program because of projected development or the existence of problem sources that would compromise the protection and recovery of beneficial uses.
8. Use the triennial review process to modify water quality standards to the objective basis, emphasizing biological outcomes recommended in this report.
9. Revise the TMDL program in accord with the needs of the new program.
10. Set requirements for credit trading systems.
11. Set up an integrated municipal NPDES permit incorporating the full range of sources.
12. Work with municipal permittees to establish specific objectives as the basis for progress assessment.
13. Work with municipalities to develop adaptive management programs responding to progress assessment results.

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14. Write municipal permits incorporating the above elements.
15. Write industrial and construction general or individual permits incorporating the recommendations in this report.
16. Allocate a substantial portion of industrial and construction permit fees to municipal permittees to oversee those sectors.
17. Set requirements for municipalities and private properties to opt out of the defined program without compromising the achievement of objectives.
18. Provide consultation, support, and guidance (adapted from EPA materials or originally produced) to municipal permittees in the areas of:
    a. Developing stormwater utilities and other funding mechanisms;
    b. Using impact source analysis (e.g., industrial and construction site risk assessment);
    c. Using ARCD techniques for new development, redevelopment, and retrofitting;
    d. Developing monitoring consortia;
    e. Developing a credit trading system
19. Perform enforcement actions on non-complying dischargers referred by municipal permittees.
20. Assess performance of municipal permittees and specify corrections, rewards, and penalties accordingly.

Municipal Co-permittees (led by Lead Permittee)

1. Adopt specific objectives as the basis for program progress assessment.
2. Convert ordinances and regulations as needed to implement the modified program.
3. Supplement and reorganize staffing to emphasize progress and compliance assessment as the principal functions of the program.
4. Perform or contract detailed scientifically and technically based watershed analysis as a foundation for permit compliance.
5. Assemble existing data on soils and hydrogeologic properties and supplement with additional data collection as necessary to assess infiltration prospects across the municipality.
6. Create incentives for private property owners to maximize the use of ARCD methods in new development and redevelopment.
7. Build subwatershed-scale, publicly owned ARCD works to supplement on-site management measures and as retrofits.
8. Develop capacity for stormwater management in municipal WWTPs by reducing groundwater inflows to sanitary sewer lines.
9. In areas experiencing excessive infiltration and groundwater table rise resulting from non-stormwater flows, develop capacity for stormwater management through infiltration by formulating water conservation programs.
10. Identify industries and construction sites that are required to apply for permits but have not done so and compel their filing.
11. Establish or enhance existing programs to inspect and oversee industries and construction sites; report non-complying dischargers to the state for enforcement actions.
12. Set up or join a monitoring consortium structured to implement the progress evaluation and diagnostic tiers of the proposed monitoring program.
13. Annually report monitoring results to the permitting authority; submit a comprehensive progress assessment triennially.

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program that provides some experience in municipality-based stormwater regulation before instituting a nationwide program. This pilot program will also allow EPA to work through more predictable impediments to this watershed-based approach. The most obvious impediment arises from the inevitable limits of an urban municipality's responsibility within a larger watershed: substantial growth and accompanying stormwater loading may occur on the outside periphery of a municipality's designated boundaries. If an urban authority lacks legal authority over this future growth, and if this growth contributes significantly to water quality degradation, then a considerable share of the urban stormwater problem could remain poorly addressed. A pilot program should help identify the extent of this jurisdictional slippage and help identify ways to overcome it. Second, it is possible that some municipalities will balk at the added responsibility involved with the watershed-based approach, even with adequate funding. Unless the objective performance standards are rigid, the monitoring requirements substantial, and the rewards for compliance compelling for municipalities that meet the standards, it is quite possible that noncompliance or bare minimal compliance will be the norm. A pilot program provides a less politically charged atmosphere to experiment with the benefits of watershed-based regulation at the local level and to generate local government support for the approach. Finally, because the watershed-based approach necessitates legislative amendments to the CWA, instituting a pilot program in the interim—both to improve the design of a watershed-based program as well as to generate enthusiasm for it—seems a sensible course.

The pilot program should target those local governments that are most eager to redress water quality degradation in their watersheds, but feel stymied by what they perceive as inadequate legal authority and flexibility to make the necessary improvements. Willing municipalities or regional governments would thus opt-in to the program. The pilot program entices these more progressive municipalities to participate by allowing them to serve as the lead authority and providing them with much greater flexibility to determine how to meet their performance-based water quality goals with fewer legal constraints.

Under the pilot program, a municipal government or similar legal authority would apply to EPA or a delegated state to be designated as the lead agency for that portion of the watershed within its legal jurisdiction. In the application itself the municipality would establish—using modeling and ambient data—how it plans at a general level to maintain or exceed its water quality goals (objective performance standards). These goals must be at or above the state water quality goals, or if they are different (i.e., use biological criteria when the state adopts chemical criteria), the municipality must demonstrate how its performance standards will attain the equivalent of the state water quality goals at the downstream edge of the municipality's border. The municipality would also be required to provide assurance of sufficient infrastructure and funding to allow it to develop a water quality plan, implement that plan, issue permits, and enforce the requirements within its boundaries. Finally, municipal plans, once finalized, would need to meet minimum federal procedural requirements. For example,

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the plans must be transparent and provide opportunities for public comment; they must be enforceable; and they must establish monitoring programs that will track whether they in fact meet the objective performance standards. If a municipality fails to meet any of its performance standards by the requisite deadline, the state and EPA would have the option of revoking the municipality's program, and reinstituting federal requirements. Ideally, federal guidance would also be available to municipalities to provide direction on how they might institute a watershed-based plan within their boundaries, while still reserving considerable flexibility to allow them to develop creative and progressive stormwater solutions. For example, municipalities would be encouraged to form stormwater utilities that are financed from point and even nonpoint sources that assist them in establishing rigorous permitting and enforcement of their water quality plan.

Municipalities that voluntarily take on this role as lead authority will be rewarded with few legal constraints on how they meet their performance-based objectives. NPDES permits for major sources will still be required and must meet federal minima (technology-based controls) to avoid possible hot spots surrounding large dischargers, and states would remain listed as the lead permittee for these permits, but the lead municipality or other regional government would be able to propose new, more stringent limits that are presumptively favored in revised NPDES permits. Stormwater permits would also be mandatory, but their substantive requirements would be left wholly within the discretion of the lead municipality. Finally, states and municipalities would *not* be required to comply with all of the federal regulations governing TMDLs (they would make a basic load calculation for pollutants contributing to degraded conditions, 33 U.S.C. § 1313(d), but would not be required to do more). Instead, the watershed-based program would be considered the functional equivalent of TMDLs for at least the municipality's portion of the watershed since the program ensures that water quality objectives are met. Municipalities could even be allowed to set interim goals over a period of a decade or more so that TMDLs need not be achieved in a single permit cycle.

Other than federal minimum standards for major NPDES sources, municipalities would have primary if not exclusive authority to decide what types of sources (including nonpoint) require permits, whether certain land uses might be taxed for stormwater management fees, and whether and how to create trading programs among the contributors to water quality impairments within their watershed. Municipalities would also have legal authority to petition EPA to restrict upstream sources that contribute significantly to water quality degradation in ways that make it difficult for them to reach their goals. Upstream governments or sources could be subject to more rigorous federal or state TMDLs and could be vulnerable to tort and related claims from downstream municipalities.

This added flexibility and authority for municipalities to control water quality problems within their legal jurisdiction—coupled with objective performance standards—should lead to more creative approaches to stormwater management that create significant benefits to the municipality (i.e., more green-space buffers along waterways for recreation) and stronger planning and taxation of new de-

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velopments that otherwise might be uncontrolled. Municipal green space, parks, and a variety of other public goods that both reduce stormwater and enhance the public enjoyment of the surface waters could result from allowing a municipality the freedom to determine how best to regulate sources within its local boundaries. For example, rather than automatically allowing federally approved SCMs that have little aesthetic or recreational qualities, alternative approaches to SCMs that retain their effectiveness but provide other qualities (particularly qualities that draw the public outdoors for recreation or relaxation) are more likely to be encouraged or even required by a municipality that serves as lead over implementation of its water quality program.

Although a national watershed-based approach to stormwater regulation is likely to require legislative amendments, the pilot program may not necessitate additional legislative authorization. It is possible that through regulation, EPA may be able to develop "in lieu of" or "functional equivalent" requirements that allow a rigorous watershed plan to substitute for the bare federal requirements governing stormwater regulation, general permits, and TMDL planning laid out in the CWA. This type of intricate legal analysis, however, is beyond the scope of this document.

Final Thoughts

The watershed-based stormwater permitting program outlined above is ultimately essential if the nation is to be successful in arresting aquatic resource depletion stemming from sources dispersed across the landscape. EPA is called upon to adopt the framework now and set in motion a process to move it toward implementation over the next five to, at most, ten years. This chapter deals with some but not the entire realm of political, legal, regulatory, and logistical issues raised by converting to a fundamentally different system of management and permitting. Ideas are contributed regarding piloting and transitioning toward the new program, altering institutional arrangements to accommodate it, and incentives for effective participation. For watershed-based permitting to take hold, specific actions will have to be undertaken by EPA, state permitting authorities, and municipal permittees during the adoption and transition process.

The proposed program could be implemented by EPA in a number of ways, ranging from making it mandatory without any exception in all states and jurisdictions to leaving it entirely voluntary. The committee recommends neither extreme and believes the best course would be: (1) pilot test and refine the program as described in the report section titled "A Pilot Program as a Stepping Stone;" (2) make the refined program the default to be followed by all designated states (and EPA in others) and all municipal, industrial, and construction permittees, unless a state permitting authority convincingly demonstrates to EPA's satisfaction than an alternative approach will accomplish the program's overall goal of retaining and recovering aquatic resource beneficial uses; (3) develop very significant incentives for states and permittees to participate; and

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(4) require objective demonstration by any state opting for an alternative that it is broadly achieving the goal to at least the same extent as states within the program, with appropriate sanctions for noncompliance.

ENHANCEMENT OF EXISTING PERMITTING BASIS

The current federal stormwater regulatory framework has been in place since 1990, and the point source NPDES program under which it is being implemented has existed since 1972. The U.S. Congress deliberately acted in 1987 to amend the federal CWA with the goal of addressing stormwater pollution because it had been identified as a leading cause of surface water impairments, and regulations were inadequate to address it effectively. The total rethinking of the current framework of regulating stormwater pollution described above may require changes in statute and take a long time to implement. Thus, in addition to the longer-term approach that integrates a watershed-wide planning and permitting strategy into the program, several near-term solutions are also offered, with the objective of improving the current regulatory implementation and which at most might require changes in regulation.

Problems Complying with Both Municipal and General Industrial Permits

The NPDES permitting authority issues (1) separate individual permits or general permits to impose discharge requirements on small, medium, and large MS4s; (2) general permits that require construction activity operators who discharge stormwater to waters of the United States, including those who discharge via MS4s, to implement SCMs; and (3) general permits for operators of stormwater discharges associated with industrial activity who discharge to waters of the United States, including those who discharge via MS4s, to implement SCMs. The MS4 operators in turn are also required under the terms of their MS4 permits to require industries and construction site operators who discharge stormwater via the MS4 to implement controls to reduce pollutants in stormwater discharges to the maximum extent practicable, including those covered under the permitting authority's NPDES general permits. This dual-coverage scheme appears intended to recognize the separation of governmental authorities. Unfortunately, in practice it is duplicative, inefficient, and ineffective in controlling stormwater pollution that enters the MS4 from diffuse and dispersed sources. Particularly in the area of monitoring of water quality, the dual approach seems to have resulted in a lack of prioritization of high-risk industrial sources and the purposeless collection of industrial stormwater monitoring data or the poor use of it to strategically reduce the discharge of stormwater pollutants to the MS4.

The preference of EPA to use general NPDES permits to alleviate the administrative burden associated with permitting more than a 100,000 point

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sources discharging stormwater is understandable. It would have been prudent to have some form of prioritization to select some subset of the whole as high-risk or have a strategy for identifying a subset for individual NPDES permits to better achieve the objective of ensuring compliance with water quality standards on the basis of potential risk. As discussed in Chapter 2, there are no federal guidelines for prioritization (determining what industries are high-risk for stormwater discharges), and the state permitting authorities have largely not prioritized because of the overwhelming burden of administering a very expansive stormwater permitting program.

In the existing permitting scheme, the MS4 operator cannot be faulted for having a reasonable expectation that the permitting authority's general NPDES permits that regulate industrial activities and construction that discharge to the MS4 would require, at a minimum, a sufficient level of identification and implementation of SCMs to facilitate the MS4 operator's compliance with the MS4 permit. However, such controls are not identified by the NPDES permitting authority and rather are left to the choice of the industrial facility and construction site operators. Furthermore, the NPDES permitting authority imposes weak to no discharge sampling requirements on industrial facility and construction activity operators, which greatly impairs the MS4's ability to determine and control the worst regulated stormwater discharges to the MS4. Similarly, the NPDES permitting authority's general permit for construction activity encourages construction facility operators to consider post-construction stormwater controls, but it does not require them, even though the MS4 permit's programmatic measures mandate new development planning and post-construction controls as essential elements of the MS4 program. The lack of integration among stormwater permits and the absence of objective measures of compliance that are quantifiable is a glaring shortcoming in current stormwater permits and renders them difficult to enforce for water quality protection.

The California EPA State Water Board asked an expert panel to evaluate the extent of implementation success of the stormwater program in California and the feasibility of numeric effluent limits in stormwater permits. In its report (CA SWB, 2006), the panel concluded that the flexible approach of allowing a permittee to self-select SCMs for the purpose of controlling stormwater pollution was largely ineffective. The reasons stated were: (1) the SCMs were selected without proper consideration of design, performance, hydraulics, and function; (2) the MS4 permittees were not accountable for the performance of the SCMs; (3) the industrial and construction permittees were not responsible for the performance of the SCMs; and (4) the SCMs were seldom maintained properly except for aesthetic purposes. In other words, the flexibility provided by self-determination, self-evaluation, and self-reporting did not assure that SCMs were being implemented to effectively reduce stormwater pollutants to the MEP. Rather, the flexibility resulted in a lack of coordination of purpose and accountability between the MS4 permittees who owned or operate the MS4 and the industry and construction permittees who discharge to the MS4. Although typically enforcement by the permitting authority would have restored the integrity

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of the stormwater program, that remedy is likely to be ineffective here because the choice of SCMs is left too much to discretion and there are no quantifiable performance or design criteria for water quality purposes.

Integration and Dissemination of Authority

This section offers a near-term alternative solution to the problem cited above that utilizes the existing framework of the NPDES stormwater program. The strategy builds on the authority of MS4s over industry and construction sites to implement an integrated permitting scheme to reduce stormwater pollution into the waters of the United States. Unlike the first section of this chapter, it does not take a watershed approach to protecting water quality, even though the municipal stormwater programs may be more cost-effective if implemented on a watershed scale. It also addresses a significant shortcoming of the current scheme, that is, failure to recognize the enormous staff resources that it would take at the federal and state level for successful implementation in the absence of the leadership of local governments. Further, federal and state NPDES permitting authorities do not presently have, and can never reasonably expect to have, sufficient personnel under the principles of democratic governance, such as in the United States, to inspect and enforce stormwater regulations on more than 100,000 discrete point source facilities discharging stormwater. A better structure would be one where the NPDES permitting authority empowers the MS4 permittees, who are local governments working for the public good, to act as the first tier of entities exercising control on stormwater discharges to the MS4 to protect water quality—an approach here called "integration."

The central concept of integration is to give the MS4s controlling jurisdiction and responsibility over discharges from construction and industry to the MS4 in addition to their responsibility to implement the programmatic minimum measures identified in regulation. This approach would be similar to the current NPDES permitting scheme for publicly owned WWTPs, where a WWTP operator controls the quality of wastewater inputs (industrial waste streams) to make sure that the total output will not exceed water quality standards (see Box 6-5 on the National Pretreatment Program). The WWTP operators establish additional criteria such as local limits, require discharge monitoring of industrial wastes, and conduct inspections to make sure industrial discharges implement adequate wastewater treatment technologies, so that treated effluent from the wastewater treatment can comply with water quality standards to protect receiving waters. The same could be done for stormwater, except here the WWTP is replaced by the MS4, and the other inputs in this case are all industrial and construction discharges of stormwater into the MS4. The criteria by which the outputs of the industries are judged could be either water quality- or technology-based criteria. This arrangement puts the burden on the MS4 to identify high-risk industries because the MS4 is now responsible for the overall output (which could be, for example, the concentration of pollutants in stormwater monitored during

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BOX 6-5
National Pretreatment Program

EPA's NPDES Permitting Program requires that all point source discharges to waters of the United States (i.e., "direct discharges") must be permitted. To address "indirect discharges" from industries to Publicly Owned Treatment Works (POTWs), EPA, through CWA authorities, established the National Pretreatment Program as a component of the NPDES Permitting Program. The National Pretreatment Program requires industrial and commercial dischargers to treat or control pollutants in their wastewater prior to discharge to POTWs.

In 1986, more than one-third of all toxic pollutants entered the nation's waters from POTWs through industrial discharges to public sewers. Certain industrial discharges, such as slug loads, can interfere with the operation of POTWs, leading to the discharge of untreated or inadequately treated wastewater into rivers, lakes, etc. Some pollutants are not compatible with biological wastewater treatment at POTWs and may pass through the treatment plant untreated. This "pass through" of pollutants impacts the surrounding environment, occasionally causing fish kills or other detrimental alterations of the receiving waters. Even when POTWs have the capability to remove toxic pollutants from wastewater, these toxics can end up in the POTW's sewage sludge, which in many places is land-applied to food crops, parks, or golf courses as fertilizer or soil conditioner.

The National Pretreatment Program is unique in that the general pretreatment regulations require all large POTWs (i.e., those designed to treat flows of more than 5 MGD) and smaller POTWs with significant industrial discharges to establish local pretreatment programs. These local programs must enforce all national pretreatment standards (effluent limitations) and requirements, in addition to any more stringent local requirements necessary to protect site-specific conditions at the POTW. More than 1,500 POTWs have developed and are implementing local pretreatment programs designed to control discharges from approximately 30,000 significant industrial users.

EPA has supported the pretreatment program through development of more than 30 manuals that provide guidance to EPA, states, POTWs, and industry on various pretreatment program requirements and policy determinations. Through this guidance, the pretreatment program has maintained national consistency in interpretation of the regulations.

The general pretreatment regulations establish responsibilities of federal, state, and local government, industry, and the public to implement pretreatment standards to control pollutants that pass through or interfere with POTW treatment processes or that may contaminate sewage sludge. The general pretreatment regulations apply to all non-domestic sources that introduce pollutants into a POTW. These sources of "indirect discharge" are more commonly referred to as industrial users (IUs). Since IUs can be as simple as an unmanned coin-operated car wash to as complex as an automobile manufacturing plant or a synthetic organic chemical producer, EPA developed four criteria that define a significant industrial user (SIU). Many of the general pretreatment regulations apply to SIUs as opposed to IUs, based on the fact that control of SIUs should provide adequate protection of the POTW.

Unlike other environmental programs that rely on federal or state governments to implement and enforce specific requirements, the Pretreatment Program places the majority of the responsibility on local municipalities**.** Specifically, Section 403.8(a) of the general pretreatment regulations states that any POTW (or combination of treatment plants operated by the same authority) with a total design flow greater than 5 million MGD and smaller POTWs with SIUs must establish a local pretreatment program. As of early 1998, 1,578 POTWs were required to have local programs. Although this represents only about 15 percent of the total treatment plants nationwide, these POTWs account for more than 80 percent (i.e., approximately 30 billion gallons a day) of the national wastewater flow.

Consistent with Section 403.8(f), POTW pretreatment programs must contain the six minimum elements described below (EPA, 1999):

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1. Legal Authority

The POTW must operate pursuant to legal authority enforceable in federal, state, or local courts, which authorizes or enables the POTW to apply and enforce any pretreatment regulations developed pursuant to the CWA. At a minimum, the legal authority must enable the POTW to:

i. deny or condition discharges to the POTW,
ii. require compliance with pretreatment standards and requirements,
iii. control IU discharges through permits, orders, or similar means,
iv. require IU compliance schedules when necessary to meet applicable pretreatment standards and/or requirements and the submission of reports to demonstrate compliance,
v. inspect and monitor IUs,
vi. obtain remedies for IU noncompliance, and
vii. comply with confidentiality requirements.

2. Procedures

The POTW must develop and implement procedures to ensure compliance with pretreatment requirements, including:

i. identify and locate IUs subject to the pretreatment program,
ii. identify the character and volume of pollutants contributed by such users,
iii. notify users of applicable pretreatment standards and requirements,
iv. receive and analyze reports from IUs,
v. sample and analyze IU discharges and evaluate the need for IU slug control plans,
vi. investigate instances of noncompliance, and
vii. comply with public participation requirements.

3. Funding

The POTW must have sufficient resources and qualified personnel to carry out the authorities and procedures specified in its approved pretreatment programs.

4. Local Limits

The POTW must develop local limits or document why those limits are not necessary.

5. Enforcement Response Plan (ERP)

The POTW must develop and implement an ERP that contains detailed procedures indicating how the POTW will investigate and respond to instances of IU noncompliance.

6. List of SIUs

The POTW must prepare, update, and submit to the approval authority a list of all significant industrial users (SIUs).

In addition to the six specific elements, pretreatment program submissions must include:

- A statement from the city solicitor (or the like) declaring the POTW has adequate authority to carry out program requirements;
- Copies of statutes, ordinances, regulations, agreements, or other authorities the POTW relies upon to administer the pretreatment program, including a statement reflecting the endorsement or approval of the bodies responsible for supervising and/or funding the program;

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BOX 6-5 Continued

- A brief description and organizational chart of the organization administering the program; and
- A description of funding levels and manpower available to implement the program.

The objectives of the National Pretreatment Program are achieved by applying and enforcing three types of discharge standards: (1) prohibited discharge standards, (2) categorical standards, and (3) local limits.

Prohibited Discharge Standards

All IUs, whether or not subject to any other national, state, or local pretreatment requirements, are subject to the general and specific prohibitions identified in 40 C.F.R. §§403.5(a) and (b), respectively. General prohibitions forbid the discharge of any pollutant(s) to a POTW that cause pass-through or interference. These prohibited discharge standards are intended to provide general protection for POTWs. Examples of these include prohibitions on discharges of pollutants that can create fire or explosion hazards, cause corrosive structural damage, obstruct flow within the POTW, and interfere with the POTW's biological treatment activity. However, their lack of specific pollutant limitations creates the need for additional controls, namely categorical pretreatment standards and local limits.

Categorical Standards

Categorical pretreatment standards (i.e., categorical standards) are national, uniform, technology-based standards that apply to discharges to POTWs from specific industrial categories (i.e., indirect dischargers) and limit the discharge of specific pollutants. Categorical pretreatment standards for both existing and new sources are promulgated by EPA pursuant to Section 307(b) and (c) of the CWA. Limitations developed for indirect discharges are designed to prevent the discharge of pollutants that could pass through, interfere with, or otherwise be incompatible with POTW operations. The categorical pretreatment standards can be concentration based or mass based. For example, the pretreatment standard for the electrical and electronic component manufacturing industry (40 C.F.R. Part 469, Subparts A-D) are concentration-based daily maximum and monthly average limits that vary by subpart and pollutant parameter.

Local Limits

Prohibited discharge standards are designed to protect against pass-through and interference generally. Categorical pretreatment standards, on the other hand, are designed to ensure that IUs implement technology-based controls to limit the discharge of pollutants. Local limits, however, address the specific needs and concerns of a POTW and its receiving waters. Federal regulations at 40 CFR §§403.8(f)(4) and 122.21(j)(4) require control authorities to evaluate the need for local limits and, if necessary, implement and enforce specific limits as part of pretreatment program activities. Local limits are developed for pollutants (e.g., metals, cyanide, BOD_5, TSS, oil and grease, organics) that may cause interference, pass-through, sludge contamination, and/or worker health and safety problems if discharged in excess of the receiving POTW treatment plant's capabilities and/or receiving water quality standards.

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events). If put in this position, municipalities will make intelligent choices and adopt effective strategies to identify which industries and sources to focus upon. Each of these issues is discussed in greater detail below.

Determination of High-Risk Dischargers

At present, the federal stormwater regulations do not specifically identify which sources would be considered high risk given the common pollutants in MS4 stormwater discharges. With the exception of the category of municipal landfills and hazardous waste treatment, storage, and disposal facilities, it does not even state that the other nine categories of industry singled out in the regulations for permitting under the multi-sector industrial stormwater general permit (MSGP) are really high risk. The devolution of this responsibility to the municipality is sensible because the municipality, as the land-use authority, already conducts development review and issues industrial conditional-use permits. The permitting authority would still be responsible for inspecting high-risk state, federal, and other facilities over which the MS4 permittee has no jurisdiction. In addition, the permitting authority would inspect municipal facilities such as airports, ports, landfills, and waste storage facilities to avoid the situation of self-inspection. Methods for ranking industries according to risk are discussed in a subsequent section.

It is likely that some of the designated high-risk facilities would be better regulated by individual stormwater NPDES permits. In particular, good candidates for individual NPDES permits include international ports, airports, and multiphase construction land developments, which are similar (in the potential risk they pose to water quality) to traditional major wastewater facilities such as petroleum refineries and large POTWs.

SCM Design Parameters, Numerical SCM Performance Criteria, and Monitoring

For the integration approach to work, the permitting authority and the MS4 permittee must better delineate SCM design parameters, numerical performance criteria, and default SCMs based on best available technology or water quality standards for the discharge of industrial and construction stormwater. Both the ASCE International Storm Water Database (which is now called the WERF International Storm Water Database because it is maintained by the Water Environment Research Foundation) and the National Stormwater Quality Database (NSQD), which were developed with EPA funding, are comprehensive datasets that can be used to develop numeric technology-based effluent criteria or limits for industrial and construction stormwater discharges. The MS4 can then determine the compliance of industry and construction activity with its requirements by using either some numeric criteria or a suite of SCMs that have been

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presumptively determined as capable of achieving the performance criteria. The EPA MSGP includes a general list of sector-specific SCMs, but these presently have no performance criteria associated with them. It is important that the EPA continue to support both the WERF and the NSQD databases as the repositories of SCM performance and MS4 monitoring data, so that MS4s can use them to establish local limits and update the performance criteria periodically to fully effectuate the iterative approach to ensuring that MS4 discharges eventually will meet water quality standards.

The proposed integration scheme will also facilitate the MS4 permittee's implementation of a purpose-oriented stormwater monitoring program directed toward identifying problematic industrial or construction stormwater discharges or high-risk industrial facility sectors. The current benchmark monitoring conducted by MSGP facilities would be eliminated. Instead, MSGP facilities would have the option of performing scientifically valid stormwater discharge sampling to demonstrate their compliance with performance criteria or to participate in an MS4-led monitoring program by paying in lieu fees to support the cost of the purpose-oriented MS4 monitoring program. The net effect of this alternative is to pool the resources to come up with an optimal sampling strategy to replace what is now a stormwater monitoring strategy that is haphazard and not useful.

MS4 Responsibilities

Under integration, the MS4 permittee would be primarily responsible for the quality of stormwater discharges that exit the MS4 to the waters of the United States. The MS4 permittee would not be responsible for stormwater discharges from federal and state facilities or for facilities that have been issued an individual NPDES permit for stormwater discharges. The MS4 permittee would be responsible for implementing the six minimum program measures, assisting in the oversight and inspection of facilities covered under the MSGP and the construction general permit (CGP), and implementing a strategic water quality monitoring program to identify and control pollutant discharges from high-risk sites. The permitting authority would share any fees collected under the MSGP and CGP with the MS4, and facilities covered by them would have the option to opt-out of self-monitoring and contribute equivalent funds to an MS4-led monitoring program. Similarly, the permitting authority would be expected to support research and special studies that address issues of regional or national significance through partnerships with the MS4 permittees.

Some MS4s may balk at taking on more responsibility for the control of stormwater pollution, as required for integration to succeed. However, there are already several case examples that exist. The State of Oregon requires facilities that discharge industrial stormwater to file a Notice of Intent (NOI) for coverage under the MSGP with both the state and the local MS4 (Campbell, 2007). The state has an agreement with the local MS4s for the inspection of the facilities covered under the MSGP and the sharing of NOI fees. The State of Tennessee

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has a statewide pilot program to partner with local MS4s for the inspection of construction sites that are covered under the CGP.

Analogy to the WWTP Pretreatment Program

It is certainly true that the MS4s are a more challenging point source to regulate for the discharge of pollutants than WWTPs. WWTPs have fewer outfalls discharging to waters of the United States than MS4s, and inputs into them are through discrete rather than diffuse sources as in the case of MS4s. It is thus expected to be more difficult to identify problem stormwater sources and to hold them accountable for discharges in excess of standards. This problem is not insurmountable, however. Watershed and land-use hydrologic models can be developed and refined by strategic sampling of pollutant sources for use by MS4 permittees and regulatory agencies. If EPA and state permitting authorities establish measurable outcomes as expected endpoints of progress, MS4 permittees will make intelligent choices about which measures to implement in order to meet these endpoints. In large part, the lack of progress nationally towards controlling pollutants in stormwater discharges from the MS4s has been due to the absence of national SCM design standards, MS4 discharge performance criteria, and stormwater effluent guidelines. Presently, the MS4 permittees as owners and operators of the MS4 affirmatively approve connections to the conveyance system for rainfall runoff. Historically the issuance of the MS4 connection permit has been based on the sizing of the pipes for the conveyance of flood waters. There are few barriers to including water quality considerations in reauthorizing these connections and adding new ones.

Note that EPA did initially consider using the WWTP pretreatment approach for stormwater discharges by requiring MS4 permittees to be primarily responsible for discharges of stormwater associated with industrial activity through the MS4 (53 Fed. Reg. 49428; December 7, 1988). However, EPA deviated from this approach in issuing its Final Storm Water Rule (55 Fed. Reg. 48006; November 16, 1990). In the absence of regulations that specifically confer authority on MS4 permittees to establish local limits for stormwater discharges to the MS4 from industry and businesses, the EPA should promulgate specific SCMs and performance guidelines with rigorous requirements for self-monitoring and compliance in order to support the integrated framework for controlling stormwater pollution from MS4s.

Potential Legal Barriers

A revised stormwater program that requires MS4s to play a more significant role in enforcement and oversight and that provides greater specificity in permit requirements is not only contemplated, but arguably demanded by Congress in the CWA. Specifically, Congress directs that MS4 permits be conditioned on

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the requirement that the MS4s "shall require controls to reduce the discharge of pollutants to the maximum extent practicable" 42 U.S.C. § 1342(p)(3)(B)(iii). EPA has already conditioned Phase I MS4 permits on the requirement that the municipality establish that it has the legal authority to inspect discharges into the system and take regulatory and enforcement action against excessive or violating sources [40 C.F.R. § 122.26(d)(2)(i)]. Nevertheless, to ensure that MS4s play an even more active role, EPA should include several additional requirements in its implementing regulations. In addition to promulgating more detailed and specific SCM requirements as discussed above, EPA should also require that the Phase I MS4s establish that they possess sufficient funding and staff to effectuate their responsibilities [see, e.g., 40 C.F.R. § 403.8(f)(2) and (3) requiring this showing for the POTW program]. Like the POTW program, states should also be authorized as MS4 permittees when the local governments are unable or unwilling to carry out their mandatory stormwater permit responsibilities [see, e.g., 40 C.F.R. § 403.10(e) providing this authority for the POTW program].

Industrial Program

The industrial stormwater permit program presently incorporates a menu of SCMs that are to be selected by the facility operator, a rudimentary monitoring program that includes visual observations, some water quality sampling for selected parameters for certain types of industries subject to numerical effluent limitations (see Table 2-6) or a set of pollutant-level benchmarks that are to be used as a measure to appropriately revise the SWPPP (see Table 2-5), and annual reporting. Neither SCM performance criteria nor the characteristics of a design storm for water quality purposes have been established. Given the broad discretion that facility operators enjoy as a result, it has been difficult to gauge compliance with the MSGP and initiate enforcement for non-compliance even though industrial stormwater discharges are required to meet effluent limitations (technology- or water quality-based) that reflect water quality standards (Duke and Beswick, 1997; Duke and Augustenborg, 2006; Wagner, 2006). Several ideas to address some of the shortcomings in the implementation of the permitting program for industrial stormwater discharges are offered as *additions* to the concept of MS4 regulatory integration discussed previously. They would substantively improve the current industrial stormwater permitting program even if the integration recommendations were not acted upon.

Criteria for a Water Quality Design Storm and Subsequent SCM Selection

To improve the quality of stormwater discharges from industry, provide for better accountability, and advance the objectives of the CWA, it is important

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first to identify the criteria for a water quality design storm as opposed to one for flood control design, where the objective is to protect human life and real property. It is important that the permitting authority designate the basis for the determination of the water quality design storm, and explicitly state that it would form the criteria for evaluation of compliance with technology-based standards or water quality-based standards. This is essential because the engineering design decisions that determine how much stormwater is to be treated to remove toxic pollutants that pose a risk to human health or aquatic life is more a policy matter than a scientific one (Schiff et al., 2007). While modeling exercises using continuous simulation methods in theory could be performed for every project or subwatershed or region to support planning decisions on how much stormwater needs to be treated for optimum water quality benefits, such a detailed analysis will be too cumbersome and cost-prohibitive for routine planning and implementation purposes. Thus it is recommended that the EPA establish guidelines for the selection of water quality design storms for controlling pollution from MS4 and industrial stormwater discharges. This would not be a new practice for EPA because the agency has previously established design storms for certain industrial sectors when promulgating effluent guidelines (Table 2-6). Conceivably, unlike the technology limiting design storms that are set on rainfall recurrence intervals, the design storm to protect surface water quality and beneficial uses could be different for different eco-regions of the United States.

The water quality design storm, which may be expressed as total rainfall depth, runoff volume, or rainfall intensity, incorporates the concept that extreme rainfall events are rare, and that a few times each year the runoff volume or flow rate from a storm will exceed the design volume or rate capacity of an SCM. Therefore, for the purpose of best available technology and cost-effectiveness, industrial facility operators should not be held accountable for pollutant removal from storms beyond the size for which an SCM is designed.

For MS4 operators, the concept of designing MS4s for both flood control conveyance (capital flood design) and for water quality protection (water quality design) involves a fundamental shift. Whereas flood control engineers design conveyance systems with return frequencies of two years (streets), ten years (detention basins), 50 years, and 100 years (channels), the water quality design storm event is for a return frequency of six months to a year. The water quality design implicitly focuses on treating the first flush of runoff, which contains the highest load and concentration of pollutants and which occurs in the first half to one inch of runoff. In contrast, flood control designs are built to convey tens of inches of runoff.

In addition to issuing the guidelines to support the setting of stormwater criteria for water quality design, it is important that the EPA establish SCM performance criteria based on best technologies and identify the "presumptive technologies" that have been demonstrated to achieve the performance criteria. The water quality design storm and the best available technologies with their associated criteria can then form a basis for technology-based effluent limitations to be included in industrial stormwater permits. If the facility operator elects the iden-

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tified presumptive technology, then compliance monitoring requirements can be scaled down to a minimum to ensure that the treatment systems are being properly maintained. On the other hand, if the operator elects to go with a suite of alternative SCMs, then the monitoring requirements sufficient to demonstrate that the suite of alternative SCMs are in fact achieving the effluent quality of the selected technology can be prescribed. In such a scheme, visual monitoring will serve to ensure that the treatment systems are being properly maintained, and compliance can be reported using the same procedures as required presently for the industrial wastewater permits.

How to Identify a High-Risk Industry

Both the watershed-based permitting approach described previously in this chapter and the integration approach call for municipal permittees, as part of their responsibilities, to identify high-risk industrial stormwater dischargers. This involves identifying the potential sources of concern, evaluating the extent of their potential impacts, and then prioritizing them for attention—a classic risk assessment. Municipalities would generally not be able to give equal and full attention to all sources, nor should they. Unfortunately, what constitutes high risk or any level of risk for industries covered by NPDES stormwater permits has not been defined by EPA, although the states have developed various interpretations (see Appendix C).

Two methodologies for identifying industrial and commercial facilities that are considered high-risk for discharging pollutants in stormwater are presented below. Box 6-6 describes the "intensity of industrial activity" method devised for the City of Jacksonville (Duke, 2007). This method uses telephone queries and a point scale system to visually score each facility based on the intensity of the industrial activities exposed to stormwater, and groups the results into categories A, B, C, or D in increasing order of intensity (Cross and Duke, 2008). The categories are designed to distinguish high-risk facilities from low-risk facilities, and not to make fine distinctions among facilities with similar characteristics. This typology is sufficient to distinguish facilities with little or no potential for discharging pollutants associated with stormwater from facilities that might discharge those pollutants. More than half of the facilities that were subject to Florida's MSGP were determined to be low-risk (Cross and Duke, 2008).

Box 6-7 outlines an empirical methodology used by the County of Los Angeles to rank the risk of industrial facilities for stormwater pollution on the basis of pollution potential P. The pollution potential P was computed as a product of the number of on-site sources, percent imperviousness, pollutant toxicity, degree of exposure, and the number of facilities (Los Angeles County, 2001). Based on this ranking scheme, five top high-risk industries were selected: (1) automobile dismantlers, (2) automobile repair, (3) metal fabrication, (4) motor freight, and (5) automobile dealers. Stormwater discharges from six facilities in each category were characterized over a two-year period, and the effectiveness of SCMs

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BOX 6-6
Risk Assessment for Industrial Dischargers of Stormwater

The City of Jacksonville has had very good success in determining what industries pose the highest stormwater risks by starting with businesses having the Standard Industrial Classification (SIC) codes designated for permit coverage but using multiple lists of potential sources and cross checking them to target inspections and other interventions where they will have the best effect. Other clues to sources of interest include other environmental permits (e.g., wastewater NPDES permits, permits for discharge to sanitary sewer), tax records, records of fire code inspections, building permit filings, planning agency proceedings, contacts with business associations, marketing information put out by companies, Resource Conservation and Recovery Act hazardous waste reports, and telephone and field surveys.

Duke (2007) proposed a 0- to 8-point scoring scheme (shown below) to rate the intensity of industrial activities exposed to stormwater. The system is based on the relative amount of exposure to precipitation and runoff by industrial materials, processes, wastes, and vehicles. Once municipalities gather the data and then classify their industries accordingly, they would have a very useful tool to program inspections and monitoring emphasizing the industries most risking their success in achieving established objectives. A similar system could and should be developed for construction sites.

<u>0 points</u>
- Small bulk waste, e.g., covered dumpster: area <100 m^2
- Hazardous waste: containers not exposed to precipitation

<u>1 point</u>
- Outdoor vehicle use: 1-2 vehicles, outdoors occasionally/never, not used in precipitation
- Vehicle washing outdoors, 1-2 vehicles, rarely or occasionally done

<u>2 points</u>
- Outdoor vehicles, e.g., forklifts: 1-2, outdoors occasionally/never, used in precipitation
- Outdoor vehicles, e.g., forklifts: 1-2, outdoors every day, not used in precipitation
- Outdoor vehicles, e.g., forklifts: 3-4, outdoors occasionally/never, not used in precipitation
- Vehicle maintenance or re-fueling, 1-2 vehicles, rarely or occasionally done, outside
- Vehicle washing outdoors, 1-2 vehicles, regularly done
- Vehicles washing outdoors, 3 vehicles, rarely or occasionally done

<u>4 points</u>
- Storage of materials or products: area < 100m^2 and/or < five 55-gallon drums
- Fixed outdoor equipment: 1-2 small or large item(s)
- Outdoor vehicles, e.g., forklifts: 1-2, outdoors every day, used in precipitation
- Outdoor vehicles, e.g., forklifts: 3-4, outdoors occasionally/never, used in precipitation
- Outdoor vehicles, e.g., forklifts: 3-4, outdoors every day, not used in precipitation
- Uncovered shipping/receiving area: 1-2 docks
- Vehicle maintenance or re-fueling outdoors, 1-2 vehicles, regularly done
- Vehicle maintenance or re-fueling outdoors, vehicles, rarely or occasionally done
- Plant yard, rail lines, access roads: 1,000 ft^2
- Small process equipment, e.g., compressors, generators: exposed to precipitation

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BOX 6-6 Continued

6 points
- Outdoor vehicles, e.g., forklifts: 3-4, outdoors every day, used in precipitation
- Outdoor vehicles, e.g., forklifts: > 5 or heavy, outdoors occasionally, used in precipitation
- Outdoor vehicles, e.g., forklifts: > 5 or heavy, outdoors every day, not used in precipitation
- Vehicle maintenance or re-fueling outdoors, 3 vehicles, regularly done
- Plant yard, rail lines, access roads: 1,000 ft^2

8 points
- Storage of materials or products: area 100^2 and/or five 55-gallon drums
- Boneyard of scrap, disused equipment, similar
- Hazardous waste: containers exposed to precipitation
- Fixed outdoor equipment: small or 2 large items
- Outdoor vehicles, e.g., forklifts: > 5 or heavy, outdoors every day, used in precipitation
- Uncovered shipping/receiving area: 3 docks
- Plant yard, rail lines, access roads: 5,000 ft^2
- Manufacturing activities, e.g., cutting, painting, coating materials: exposed to precipitation

SOURCE: Duke (2007).

was assessed at a subset of them. However, the monitoring was minimal, and so much of the prioritization was based on best professional judgment about pollutant discharges.

Industrial Stormwater Discharge Monitoring

Monitoring data from Phase I MS4s have been compiled in the NSQD for several years, making possible a number of important findings about the quality of municipal stormwater (see Chapter 3). Although industry that occurs within MS4s is technically included in the NSQD, the data are lumped together and not sector specific. There is no comparable, reliable source of data specifically on industrial discharges, even though EPA requires benchmark monitoring for MSGP industrial permittees. The intent was that industrial facility operators would use benchmark exceedances as action levels to improve SCMs, but this self-directed approach has been largely a failure. Many industrial facilities reported repeated exceedances of benchmark values without action, and others have failed to report any monitoring data at all. In addition, the representativeness of single grab samples taken to characterize the discharge and less-than-rigorous sample collection and quality assurance procedures have resulted in monitoring data that are not very useful. One of the only analyses of benchmark monitoring data ever done evaluated California's program between 1992 and 2001 (see Box 4-2; Stenstrom and Lee, 2005; Lee et al., 2007). The study showed no relationship between facility type and stormwater discharge quality. The cited reasons for the poor relationship included variability in sampling parameters, sampling time, and sampling strategy—that is, poor data.

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BOX 6-7
Los Angeles County Critical Facilities Monitoring Data

One of the few sources of data on industrial stormwater discharges comes from the County of Los Angeles. A stepwise process was used to identify the highest-risk industrial/commercial facilities, which were then monitored to measure the quality of their stormwater discharges and to evaluate the effectiveness of SCMs. The initial list of candidate facilities was identified from their relative numbers and the extent of their outdoor activities. This list was then refined using an empirical equation for pollutant potential P:

$$P = Q \times R \times T \times E \times N$$

where

Loading (Q) is the number of sources at a site and the likelihood of release;
Imperviousness (R) of a site is the percent of paved area;
Pollutant toxicity (T) denotes the number of toxic pollutants and the inherent toxicity of the mix;
An exposure factor (E) signifies if activities are exposed to rainfall; and
The Number (N) represents the total number of sites in the county.

Each variable was assigned a qualitative number from 1 to 10, with 10 representing the worst condition.

Based on this equation, five top "critical source" industries were determined: (1) automobile dismantlers; (2) automobile repair; (3) metal fabrication; (4) motor freight; and (5) automobile dealers. Six facilities from each of these categories were monitored during five storms a year for two years. The stormwater discharge samples were analyzed for general conventional pollutants, heavy metals, bacteria, and semi-volatile organic compounds. Half of the facilities were then fitted with SCMs, which were monitored to evaluate their effectiveness.

The highest median values were observed for total zinc (approx. 450 µg/L), dissolved zinc (approx. 360 µg/L), total copper (approx. 240 µg/L), and dissolved copper (approx. 110 µg/L) in stormwater discharges from fabricated metal sites. However, levels for total and dissolved zinc did not appear to be significantly different among the industry types. SCMs in the form of good housekeeping and spill containment measures were installed at half of the sites. For total and dissolved zinc, the median concentration lowered or stayed nearly the same with the implementation of SCMs at the auto dismantling, auto repair, and fabricated metals industries (i.e., in none of the circumstances was the difference significant). For total and dissolved copper, however, where the fabricated metal industry had displayed the highest median concentrations, levels were significantly reduced with the implementation of SCMs. The auto dismantling and auto repair businesses showed no significant differences in copper after the implementation of SCMs.

SOURCE: Los Angeles County (2001).

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In the past, it has been proposed to EPA that it fund a project that would systematically collect the benchmark monitoring data across the nation, as has been done for MS4s, but these suggestions have been rejected. To get better data from specific industrial sectors, it is recommended that a small subset of industrial users and sectors be selected for composite sampling in a program directed by the MS4. Alternatively, making a trained team responsible for monitoring of small-business industrial dischargers would reduce, if not eliminate, current problems with quality assurance.

Monitoring of industrial stormwater discharges could be streamlined by considering the adoption of a Reasonable Potential Analysis (RPA), which is already part of the existing practice in developing limits for NPDES wastewater permits (EPA, 1991). The RPA is a procedure that uses statistical distribution assumptions in association with a limited number of wastewater discharge quality measurements to determine the likelihood that a receiving water quality standard would be violated, which assists the permitting authority in determining what permit limitations should be set to protect receiving water quality. The effluent data from any treatment system may be described using standard descriptive statistics such as the mean concentration and the coefficient of variation. Using a statistical distribution such as the lognormal, an entire distribution of values can be projected from limited data; limits on pollutant concentrations in discharge can then be set at a specified probability of occurrence so that the receiving water is protected. An RPA for stormwater pollutants may be particularly relevant in developing performance criteria for SCMs for facilities discharging stormwater within the integrated framework of MS4 permitting. Also, MS4 permittees could use the method to reduce the number of pollutants that high-risk industries would be required to monitor in order to demonstrate to the municipality that they are not the source of pollutants in MS4 discharges that are impairing surface waters.

Construction Program

The recommendations for stormwater discharges associated with construction activity are very similar to those offered for stormwater discharges associated with industrial activity. The integration with the MS4 program is less of a challenge because municipalities have always had primacy on land development planning and construction activity. Most municipalities have had requirements for soil erosion and sediment control plans on construction sites that precede the federal stormwater regulations. EPA regulations already allow permitting authorities to approve Phase I and Phase II MS4 permittee oversight of CGP construction sites under the qualifying local program provision (40 C.F.R. 122.44(s)) (Grumbles, 2006). The weakness in the implementation of this provision currently is the absence of rigorous SCM performance criteria guidelines for MS4s permittees to meet in order to be deemed as qualifying.

The construction stormwater general permit program requires the develop-

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ment and implementation of an SWPPP. The SWPPP, which must be prepared before construction begins, focuses on two major requirements: (1) describing the site adequately and identifying the sources of pollution to stormwater discharges associated with construction activity on site and (2) identifying and implementing appropriate measures to reduce pollutants in stormwater discharges to ensure compliance with the terms and conditions of this permit. The SWPPP must describe the sequence of major stormwater control activities and the kinds of SCMs that will be in place, and it must identify interim and permanent stabilization practices, including a schedule of their implementation. There is an expectation that the construction site operator will use good site planning, preserve mature vegetation, and properly stage major earth-disturbing activities to avoid sediment loss and prevent erosion. Post-construction stormwater controls need to be considered, but are not required. Construction site operators are required to visually inspect the construction site weekly and perform a walk through before predicted storm events. No annual reports are required, but records must be kept for a period of three years after permit coverage has been terminated. There are no SCM performance criteria, other than a suggestion that most SCMs should be able to achieve 80 percent TSS removal. As with industry, it is difficult to gauge compliance with the CGP except when inadequate SCMs result in a massive discharge of sediment from a construction site.

The pollutant parameters that are of concern in stormwater discharges from construction activity are TSS, settleable solids, turbidity, and nutrients from erosion; pH from concrete and stucco; and a wide range of metallic and organic pollutants from construction materials, processes, wastes, and vehicles and other motorized equipment. The permitting authority, in addition to guidelines for the water quality design storm, must establish SCM performance criteria for stormwater discharges associated with construction activity. The construction site operator should be given the option of implementing SCMs that are the presumptive technology, or equivalent SCMs that can achieve the performance criteria. For example, the recommended SCMs in Box 5-3 could serve as the presumptive construction SCMs on a typical construction site that is less than 50 acres in size. If the operator elects to go with a suite of alternative SCMs, then adequate monitoring must be performed to demonstrate that the alternative SCMs are in fact achieving the performance criteria. In addition, the CGP presently does not mandate or require that post-construction SCMs be integrated with the MS4 permittee requirements under its New Development/Redevelopment Program requirements. The proper planning for and implementation of SCMs that will help mitigate stormwater pollution from planned future use of the site will be critical to protecting water quality. Thus the post-construction requirements of the CGP should be strengthened and better integrated with the new development/redevelopment requirements of the MS4 permits.

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Municipal Program

Several key enhancements to the MS4 permitting program are needed to ensure that resources are targeted to achieve the greatest on-the-ground implementation of SCMs to make incremental progress in meeting water quality standards. Six specific issues are discussed below; their implementation will require greater collaboration and flexibility among regulators and permitted parties. These recommendations are suggested for communities that are not ready for the integrated watershed approach proposed in the prior section, and represent a bridge toward building internal capacity to implement them.

Numeric Expression of "Maximum Extent Practicable"

The ambiguity of the term "maximum extent practicable" (MEP) has been a major impediment to achieving meaningful water quality results in the MS4 program. The EPA should develop numerical expressions of MEP in the next round of permit renewals that can be measured and tracked. A national numeric benchmark should be avoided; states should focus on regional benchmarks that are tied to their water quality problems. Four examples of methods to define MEP in a numeric manner are provided below: the first three are applied at a regional or state level, whereas the last (impervious cover-based TMDLs) offers more flexibility to be applied at individual sites.

Establish Municipal Action Levels. This approach relies on the use of a national database of stormwater runoff quality to establish reasonable expectations for outfall monitoring in highly developed watersheds. The NSQD (Pitt et al., 2004) allows users to statistically establish action levels based on regional or national event mean concentrations developed for pollutants of concern. The action level would be set to define unacceptable levels of stormwater quality (e.g., two standard deviations from the median statistic, for simplicity). Municipalities would then routinely monitor runoff quality from major outfalls. Where an MS4 outfall to surface waters consistently exceeds the action level, municipalities would need to demonstrate that they have been implementing the stormwater program measures to reduce the discharge of pollutants to the maximum extent practicable. The MS4 permittees can demonstrate the rigor of their efforts by documenting the level of implementation through measures of program effectiveness, failure of which will lead to an inference of noncompliance and potential enforcement by the permitting authority.

Site-Based Runoff and/or Pollutant Load Limits. This approach is primarily used for watersheds that are experiencing rapid development; it establishes numeric targets or performance standards for pollutant or runoff reduction that must be met on individual development sites. The numeric targets may involve specific pollutant load limits or runoff reduction volumes. For example,

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Virginia DCR (2007) and Hirschman et al. (2008) established a statewide computational method to ensure that SCMs are sized, designed, and sequenced to comply with specific nutrient-based load and runoff reduction limits. The nutrient load limits of 0.28 lb/acre/yr for total phosphorus and 2.68 lb/acre/yr for total nitrogen were computed using the Chesapeake Bay Model for Virginia tributaries to the bay. The design process also requires the computation of runoff reduction volumes achieved to promote the use of nonstructural SCMs. The basic concept is that new development on non-urban land must not exceed the average annual nutrient load and runoff volume for non-urban land using effective SCMs in the watershed. This blended site-based runoff and load limit approach has been advocated by the Office of Inspector General (2007) and Schueler (2008a) and is under active consideration by several other Chesapeake Bay states.

Wenger et al. (2008) reports on a no-net-hydrologic-increase strategy to protect endangered fish species in the northern Georgia Piedmont that sets specific on-site runoff reduction requirements for a range of land uses and design storm events. A similar approach has been incorporated into the recently enacted Energy Independence and Security Act of 2007 that contains provisions that require that the "sponsor of any development or redevelopment project involving a Federal facility with a footprint that exceeds 5,000 square feet shall use site planning, design, construction, and maintenance strategies for the property to maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow."

The challenge of defining MEP as a runoff reduction or pollutant load limit is that considerable scientific and engineering analysis is needed to establish the performance standards, evaluate SCM capability to meet them, and devise a workable computational approach that links them together at both the site and watershed levels. In addition, care must be taken to define an appropriate baseline to represent predevelopment conditions that does not unduly penalize redevelopment projects or make it impossible to comply with limits at new development sites after maximum effort to apply multiple SCMs is made.

Turbidity Limits for Construction Sites. Numeric enforcement criteria can be used to define what constitutes an egregious water quality violation at construction sites and provide a technical criterion to measure the effectiveness of erosion and sediment control practices. Currently, most states and localities do not specify either numeric enforcement criteria or a monitoring requirement within their CGP (see the survey data contained in Appendix C).

A maximum turbidity limit would establish definitive criteria as to what constitutes a direct sediment control violation and trigger an assessment for remediation and prevention actions. For example, local erosion and sediment control ordinances could establish a numeric turbidity limit of 75 Nephelometric Turbidity Units (NTU) as an instantaneous maximum for rainfall events less than an inch (or a 25 NTU monthly average) and would prohibit visible sedi-

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ment in water discharged from upland construction sites. While the exact turbidity limit would need to be derived on a regional basis to reflect geology, soils, and receiving water sensitivity, research conducted in the Puget Sound of Washington indicates that turbidity limits in the 25 to 75 NTU can be consistently achieved at most highway construction sites using current erosion and sediment control technology that is properly maintained (Horner et al., 1990). If turbidity limits are exceeded, a detailed assessment of site conditions and follow-up remediation actions would be required. If turbidity limits continue to be exceeded, penalties and enforcement actions would be imposed. Enforcement of turbidity limits could be performed either by state, local, or third party erosion and sediment control inspectors, or—under appropriate protocols, training, and documentation—by citizens or watershed groups.

Impervious Cover Limits and IC-based TMDLs. MS4s that discharge into TMDL watersheds also require more quantitative expression of how MEP will be defined to reduce pollutant loads to meet water quality standards. Maine, Vermont, and Connecticut have recently issued TMDLs that are based on impervious cover rather than individual pollutants of concern (Bellucci, 2007). In such a TMDL, impervious cover is used as a surrogate for increased runoff and pollutant loads as a way to simplify the urban TMDL implementation process. Impervious cover-based TMDLs have been issued for small subwatersheds that have biological stream impairments associated with stormwater runoff but no specific pollutant listed as causing the impairment (in most cases, these subwatersheds are classified as impacted according to the Impervious Cover Model [ICM]—see Box 3-10). A specific subwatershed threshold is set for effective impervious cover, which means impervious cover reductions are required through removal of impervious cover, greater stormwater treatment for new development, offsets through stormwater retrofits, or other means.

Traditional pollutant-based TMDLs would continue to be appropriate for "non-supporting" and "urban drainage" subwatersheds, although they could be modified to focus compliance monitoring on priority urban source areas or subwatersheds that produce the greatest pollutant loads. Although EPA (2002) indicates that this analysis does not extend to demonstrating that changes will occur in receiving waters, it does outline a rigorous process for evaluating pollutant discharges and SCM performance. More recent EPA guidance (2007c) recommends that MS4s conduct a four-step analysis, which is distilled to its essence below:

Step 1: Estimate loads for pollutant of concern for the watershed.

Step 2: Provide a specific list of SCMs that will be applied in the listed watershed.

Step 3: Estimate the pollutant removal capability of the individual SCMs applied.

Step 4: Compute aggregate watershed pollutant reduction achieved by the MS4.

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Although this is not a particularly new interpretation of addressing stormwater loads in watersheds listed as impaired and/or having written TMDLs, it is exceptionally uncommon for individual MS4s to document the link between their stormwater discharges and water quality standard exceedances, as modified by the system of SCMs that they used to reduce these pollutants. As of 2007, EPA could only document 17 TMDLs that addressed stormwater discharges using this sequential analysis. EPA and states need to provide more specific guidance for MS4s to comply with TMDLs in their permit applications and annual reports.

Focus MS4 Permit Implementation at the Subwatershed Level

Chapter 5 noted the importance of the watershed context for making better local stormwater decisions. This context can be formally incorporated into local MS4 permits by focusing implementation on a subwatershed basis, using the ICM, as described in Box 3-10 and outlined in Table 6-1. When urban streams are classified by the ICM, this basic subwatershed planning process can be used to establish realistic water quality and biodiversity goals for individual classes of subwatersheds, as shown in Table 6-2. As can be seen, goals for water and habitat quality become less stringent as impervious cover increases within the subwatershed. This subwatershed approach provides stormwater managers with more specific, measurable, and attainable implementation strategies than the one-size-fits-all approach that is still enshrined in current wet-weather management regulations.

Some examples of how to customize stormwater strategies for different subwatersheds are described in Table 6-3. This approach enables MS4s to utilize the full range of watershed planning, engineering, economic, and regulatory tools that can manage the intensity, location, and impact of impervious cover on receiving waters. In addition, the application of multiple tools in a given subwatershed class helps provide the maximum level of protection or restoration for an individual subwatershed when impervious cover is forecast to increase due to future growth and development. The conceptual management approach shown in Table 6-3 is meant to show how urban stream classification can be used to guide stormwater decisions on a subwatershed basis. The first column of the table lists some key stormwater management issues that lend themselves to a subwatershed approach and are explained in greater detail below.

Linkage with Local Land-Use Planning and Zoning. Given the critical relation between land use and the generation of stormwater, communities should ensure that their planning tools (e.g., comprehensive plans, zoning, and watershed planning) are appropriately aligned with the intended management classification for each subwatershed. For example, it is reasonable to encourage redevelopment, infill, and other forms of development intensification within non-

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TABLE 6-1 Components of Subwatershed-Based Stormwater Management

1. Define interim water quality and stormwater goals (i.e., pollutants of concern, biodiversity targets) and the primary stormwater source areas and hotspots that cause them.

2. Delineate subwatersheds within community boundaries.

3. Measure current and future impervious cover within individual subwatersheds.

4. Establish the initial subwatershed management classification using the ICM.

5. Undertake field monitoring to confirm or modify individual subwatershed classifications.

6. Develop specific stormwater strategies within each subwatershed classification that will guide or shape how individual practices and SCMs are generally assembled at each individual site.

7. Undertakes restoration investigations to verify restoration potential in priority subwatersheds.

8. Agree on the specific implementation measures that will be completed within the permit cycle. Evaluate the extent to which each of the six minimum management practices can be applied in each subwatershed to meet municipal objectives.

9. Agree on the maintenance model that will be used to operate or maintain the stormwater infrastructure, assign legal and financial responsibilities to the owners of each element of the system, and develop a tracking and enforcement system to ensure compliance.

10. Define the trading or offset system that will be used to achieve objectives elsewhere in the local watershed objectives in the event that full compliance cannot be achieved due to physical constraints (e.g., indexed fee-in-lieu to finance municipal retrofits).

11. Establish sentinel monitoring stations in subwatersheds to measure progress towards goals.

12. Revise subwatershed management plans in the subsequent NPDES permitting cycle based on monitoring data.

supporting or urban drainage subwatersheds, whereas down-zoning, site-based IC caps, and other density-limiting planning measures are best applied to sensitive subwatersheds.

Stormwater Treatment and Runoff Reduction MEP. Subwatershed classification allows managers to define achievable numerical benchmarks to define treatment in terms of the maximum extent practicable. Thus, a greater level of treatment is required for less-developed subwatersheds and a reduced level of treatment is applied for more intensely developed subwatersheds. This is most frequently expressed in terms of a rainfall depth associated with a given design storm. Designers are required to treat and/or reduce runoff for all storm events up to the designated storm event. This flexibility recognizes the greater difficulty and cost involved in providing the same level of treatment in an in-

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TABLE 6-2 Expectations for Different Urban Subwatershed Classes

Lightly Impacted Subwater-sheds (1 to 5% IC)	• Consistently attain scores for specific indicators for hydrology, biodiversity, and geomorphology that are comparable to streams whose entire subwatersheds are fully protected in a natural state (e.g., national parks). Should provide for healthy reproduction of trout, salmon, or other keystone fish species.
Moderately Impacted Subwater-sheds (6 to 10% IC)	• Consistently attain scores for specific stream indicators that are comparable to the highest 10 percent of streams in a population of rural watersheds in order to maintain or restore ecological structure, function, and diversity of the streams. The "good to excellent" indicator scores for this category of subwatersheds will be the benchmark against which the relative quality of more developed subwatersheds will be measured.
Heavily Impacted Sub-watersheds (11 to 25% IC)	• Consistently attain good stream quality indicator scores to ensure enough stream function to adequately protect downstream receiving waters from degradation. • Function is defined in terms of flood storage, in-stream nutrient processing, biological corridors, stable stream channels, and other factors.
Non-Supporting Subwater-sheds (26 to 60% IC)	• Consistently attain "fair to good" stream quality indicator scores. • Meet bacteria standards during dry weather and trash limits during wet weather. • Maintain existing stream corridor to allow for safe passage of fish and floodwaters.
Urban Drain-age Subwater-sheds (61 to 100% IC)	• Maintain "good" water quality conditions in downstream receiving waters. • Consistently attain "fair" water quality scores during wet weather and "good" water scores during dry weather. • Provide clean "plumbing" in upland land uses such that discharges of sewage and toxics do not occur.

Note: the objectives presume some portion of the subwatershed has already been developed, thereby limiting attainment of objectives. If a subwatershed is not yet developed, managers should shift expectations up one category (e.g., urban drainage should behave like non-supporting). Also, the specific ranges of IC that define each management category should always be derived from local or regional monitoring data. Note that the ranges in IC shown to define a subwatershed management category are illustrative and will vary regionally.

tensely developed subwatershed, as well as the fact that less treatment is needed to maintain stream condition in a highly urban subwatershed.

The other key element of defining MEP is to specify how much of the treatment volume must be achieved through runoff reduction. The runoff reduction volume has emerged as the primary performance benchmark to maintain predevelopment runoff conditions at a site after it is developed. In its simplest terms, this means achieving the same predevelopment runoff coefficient for each storm up to a defined storm event through a combination of canopy interception, soil infiltration, evaporation, rainfall harvesting, engineered infiltration, extended filtration, or evapotranspiration (Schueler, 2008b). Once again, the physical feasibility and need to provide treatment through runoff reduction becomes progressively harder as subwatershed impervious cover increases.

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TABLE 6-3 Examples of Customizing Stormwater Strategies on a Subwatershed Basis

Stormwater Management Issue	Lightly Impacted Subwatershed (1 to 5% IC)	Moderately Impacted Subwatershed (6 to 10% IC)	Impacted (IC 11 to 25%)	Non-Supporting (IC 26 to 60%)	Urban Drainage (61% + IC)
Linkage with Local Land-Use Planning and Zoning	Utilize extensive land conservation and acquisition to preserve natural land cover	Implement site-based or watershed-based IC caps and maximize conservation of natural areas	Reduce the IC created for each zoning category by changing local codes and ordinances	Encourage redevelopment, development intensification and mass transit to decrease per-capita IC utilization in the urban landscape. Develop watershed restoration plans to maintain or enhance existing aquatic resources.	
Site-based Stormwater Reduction and Treatment Limits	Allow no net increase in runoff volume, velocity and duration up to the five-year design storm	Treat runoff from two-year design storm, using SCMs to achieve 100% runoff reduction		Treat runoff from the one-year design storm, using SCMs to achieve at least 75% runoff reduction	
Site-Based IC Fees	None	Establish Excess IC fee for projects that exceed IC for zoning category		Allow IC mitigation fee	
Subwatershed Trading	Receiving Area for Conservation Easements	Receiving Area for Restoration Projects and/or Retrofit		Receiving or Sending Area for Retrofit	Sending Area for Restoration Projects
Stormwater Monitoring Approach	Measure in-stream metrics of biotic integrity		Track subwatershed IC and measure SCM performance	Check outfalls and measure SCM performance	Check stormwater quality against municipal actions levels at outfalls
TMDL Approach	Protect using antidegradation provisions of the CWA	Use IC-based TMDLs that use flow or IC as a surrogate for traditional pollutants		Use pollutant TMDLs to identify problem subwatersheds	Use pollutant TMDLs to identify priority source areas
Dry Weather Water Quality	Perform in-stream grab sampling of water quality at sentinel stations	Check for failing septic systems	Screen outfalls for illicit discharges	Perform dry weather sampling in streams and outfall screening	Perform dry weather sampling in receiving waters
Addressing Existing Development	Protect or conserve natural areas, enhance riparian cover, assess road crossings, and ensure farm, forest, and pasture best practices are used		Perform stream repairs, riparian reforestation, and residential stewardship	Perform storage retrofits and stream repairs	Use pollution source controls and municipal housekeeping

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Site-Based IC Fees. Several economic strategies can be used to promote equity and efficiency when it comes to managing stormwater in different kinds of subwatersheds. In lower-density subwatersheds, an excess impervious cover fee can be charged to individual sites that exceed a maximum threshold for impervious cover for their zoning category. Similarly, an impervious cover mitigation fee can be levied at individual development sites in more intensely developed subwatersheds when on-site compliance is not possible or it is more cost-effective to provide an equivalent amount of treatment elsewhere in the watershed. The type of fee and the frequency that is used is expected to be closely related to the subwatershed classification.

Subwatershed Trading. The degree of impervious cover in a subwatershed also has a strong influence on the feasibility, cost, and appropriateness of restoration projects. Consequently, any revenues collected from various site IC fees can be traded among subwatersheds to arrive at the least-cost, effective solutions. In general, the most intensely developed subwatersheds are sending areas and the more lightly developed subwatersheds are used as receiving areas for such projects.

Stormwater Monitoring Approach. Subwatershed classification can also be used to define the type and objectives for stormwater monitoring to track compliance over time. For example, in sensitive subwatersheds, it may be advisable to routinely measure in-stream metrics of biological integrity to ensure stream quality is being maintained or enhanced. As impervious cover increases, stormwater managers may want to shift toward tracking of subwatershed impervious cover and actual performance monitoring of select SCMs to establish their effectiveness (e.g., impacted subwatersheds). At even higher levels of impervious cover, streams are transformed into urban drainage, and monitoring becomes more focused on identifying individual stormwater outfalls with the worst quality during storm conditions.

TMDL Approach. Subwatershed classification may also serve as a useful tool to decide how to apply TMDLs to impaired waters, or how to ensure that healthy waters are not degraded by future land development. For example, most lightly developed subwatersheds will seldom be subject to a TMDL, or if so, urban stormwater is often only a minor component in the final waste load allocation. Antidegradation provisions of the CWA are often the best means to protect the quality of these healthy waters before they are degraded by future land development. By contrast, impaired watersheds appear to be the best candidates to apply impervious cover-based TMDLs, as described earlier in this section. As subwatershed impervious cover increases, more traditional pollutant-based TMDLs are warranted, with a focus on problem subwatersheds for non-supporting streams and priority source areas for urban drainage.

Dry Weather Water Quality. The type, severity, and sources of illicit dis-

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charges often differ among different subwatershed classifications, which can have a strong influence on the kind of dry weather detective work needed to isolate them. For example, in lightly developed subwatersheds, failing septic systems are often the most illicit discharges, which prompts assessments at the lot or ditch level. The storm-drain network and potential discharge source areas becomes progressively more complex as subwatershed impervious cover increases. Consequently, illicit-discharge assessments shift toward outfall screening, catchment analysis, and individual source analysis.

Addressing Existing Development. The need for, type of, and feasibility for restoration efforts shift as subwatershed impervious cover increases. In general, lightly developed watersheds have the greatest land area available for retrofits and restoration projects in the stream corridor. Consequently, unique restoration strategies are developed for different subwatershed classifications (Schueler, 2004).

Require More Quantitative Evaluation of MS4 Programs

The next round of permit renewals should contain explicit conditions to define and measure outcomes from the six minimum management measures that constitute a Phase II MS4 program. Measurable program evaluation is critical to develop, implement, and adapt effective local stormwater programs, and has been consistently requested in permits and application guidance. To date, however, only a small fraction of MS4 communities have provided measurable outcomes with regard to aggregate pollutant reduction achieved by their municipal stormwater programs.

CASQA (2007) defines a six-level pyramid to assess program effectiveness, beginning with documenting activities, raising awareness, changing behaviors, reducing loads from sources, improving runoff quality, and ultimately leading to protection of receiving water quality (see Figure 6-1).

At the current time, most MS4s are struggling simply to organize or document their program activities (i.e., the first level), and few have moved up the pyramid to provide a quantitative link between program activities and water quality improvements. The framework and methods to evaluate program effectiveness for each of the six minimum management measures has been outlined by CASQA (2007). Regulators are encouraged to work with permitted municipalities to define increasingly more specific quantitative measures of program performance in each succeeding permit cycle.

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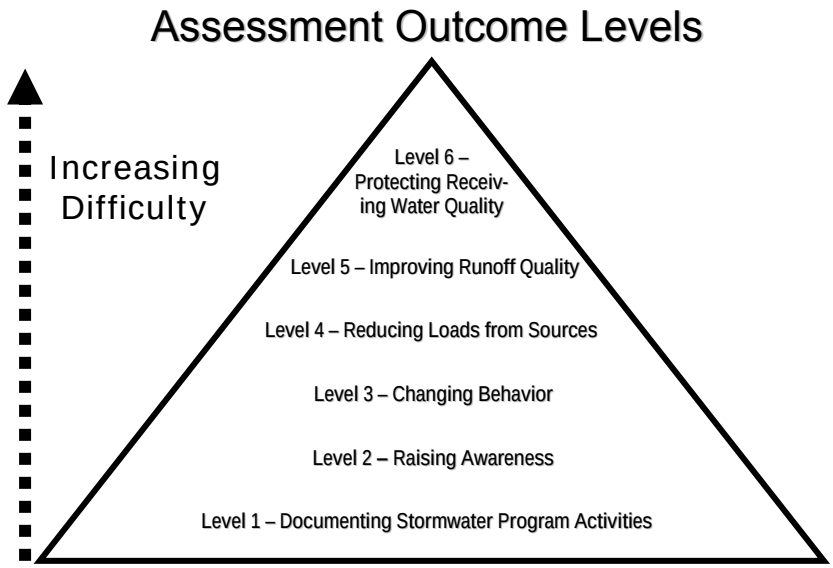

FIGURE 6-1 Pyramid of Assessment Outcome Levels for an MS4. SOURCE: CASQA (2007).

Shift Monitoring Requirements to Measure the Performance of Stormwater Control Measures

The lack of monitoring requirements in the Phase II stormwater program makes it virtually impossible to measure or track actual pollutant load or runoff volume reductions achieved. While the existing Phase I outfall monitoring requirements have improved our understanding of urban stormwater runoff quality, they are also insufficient to link program effort to receiving water quality. It is recommended that both Phase I and II MS4s shift to a more collaborative monitoring effort to link management efforts to receiving water quality, as described below:

- If a review of past Phase 1 MS4s stormwater outfall monitoring indicates no violations of the Municipal Action Limits, then their current outfall monitoring efforts can be replaced by pooled annual financial contributions to a regional stormwater monitoring collaborative or authority to conduct basic research on the performance and longevity of range of SCMs employed in the community.

- If some subwatersheds exceed Municipal Action Levels, outfall monitoring should be continued at these locations, as well as additional source area sampling in the problem subwatershed to define the sources of the stormwater

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pollutant of concern.

- Phase II MS4s should be encouraged to make incremental financial contributions to a state or regional stormwater monitoring research collaborative to conduct basic research on SCM performance and longevity. Although the committee knows of no examples where this has been accomplished, this pooling of financial resources by multiple MS4s should produce more useful scientific data to support municipal programs than could be produced by individual MS4s alone. Phase II communities that do not participate in the research collaborative would be required to perform their own outfall and/or SCM performance monitoring, at the discretion of the state or federal permitting authority.

- All MS4s should be required to indicate in their annual reports and permit renewal applications how they incorporated research findings into their existing stormwater programs, ordinances, and design manuals.

CONCLUSIONS AND RECOMMENDATIONS

The watershed-based permitting program outlined in the first part of this chapter is ultimately essential if the nation is to be successful in arresting aquatic resource depletion stemming from sources dispersed across the landscape. Smaller-scale changes to the EPA stormwater program are also possible. These include integration of industrial and construction permittees into municipal permits ("integration"), as well as a number of individual changes to the current industrial, construction, and municipal programs.

Improvements to the stormwater permitting program can be made in a tiered manner. Thus, individual recommendations specific to advancing one part of the municipal, industrial, or construction stormwater programs could be implemented immediately and with limited additional funds. "Integration" will need additional funding to provide incentives and to establish partnerships between municipal permittees and their associated industries. Finally, the watershed-based permitting approach will likely take up to ten years to implement. The following conclusions and recommendations about these options are made:

The greatest improvement to the EPA's Stormwater Program would be to convert the current piecemeal system into a watershed-based permitting system. The proposed system would encompass coordinated regulation and management of all discharges (wastewater, stormwater, and other diffuse sources), existing and anticipated from future growth, having the potential to modify the hydrology and water quality of the watershed's receiving waters.

The committee proposes centralizing responsibility and authority for implementation of watershed-based permits with a municipal lead permittee working in partnership with other municipalities in the watershed as co-permittees,

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with enhanced authority and funding commensurate with increased responsibility. Permitting authorities would adopt a minimum goal in every watershed to avoid any further loss or degradation of designated beneficial uses in the watershed's component waterbodies and additional goals in some cases aimed at recovering lost beneficial uses. The framework envisions the permitting authorities and municipal co-permittees working cooperatively to define careful, complete, and clear specific objectives aimed at meeting goals.

Permittees, with support from the permitting authority, would then move to comprehensive scientific and technically based watershed analysis as a foundation for targeting solutions. The most effective solutions are expected to lie in isolating, to the extent possible, receiving waterbodies from exposure to those impact sources. In particular, low-impact design methods, termed Aquatic Resources Conservation Design in this report, should be employed to the full extent feasible and backed by conventional SCMs when necessary. This report also outlines a monitoring program structured to assess progress toward meeting objectives and the overlying goals, diagnosing reasons for any lack of progress, and determining compliance by dischargers. The new concept further includes market-based trading of credits among dischargers to achieve overall compliance in the most efficient manner and adaptive management to program additional actions if monitoring demonstrates failure to achieve objectives.

Integration of the three permitting types, such that construction and industrial sites come under the jurisdiction of their associated municipalities, would greatly improve many deficient aspects of the stormwater program. Federal and state NPDES permitting authorities do not presently have, and can never reasonably expect to have, sufficient personnel to inspect and enforce stormwater regulations on more than 100,000 discrete point source facilities discharging stormwater. A better structure would be one where the NPDES permitting authority empowers the MS4 permittees to act as the first tier of entities exercising control on stormwater discharges to the MS4 to protect water quality. The National Pretreatment Program, EPA's successful treatment program for municipal and industrial wastewater sources, could serve as a model for integration.

Short of adopting watershed-based permitting or integration, a variety of other smaller-scale changes to the EPA stormwater program could be made now, as outlined below.

EPA should issue guidance for MS4, MSGP, and CGP permittees on what constitutes a design storm for water quality purposes. Precipitation events occur across a spectrum from small, more frequent storms to larger and more extreme storms, with the latter being a more typical focus of guidance manuals to date. Permittees need guidance from regional EPA offices on what water quality considerations to design SCMs for beyond issues such as safety of human life and property. In creating the guidance there should be a good faith

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effort to integrate water quality requirements with existing stormwater quantity requirements.

EPA should issue guidance for MS4 permittees on methods to identify high-risk industrial facilities for program prioritization such as inspections. Two visual methods for establishing rankings that have been field tested are provided in the chapter. Some of these high-risk industrial facilities and construction sites may be better covered by individual NPDES stormwater permits rather than the MSGP or the CGP, and if so would fall directly under the permitting authority and not be part of MS4 integration.

EPA should support the compilation and collection of quality *industrial* stormwater effluent data and SCM effluent quality data in a national database. This database can then serve as a source for the agency to develop technology-based effluent guidelines for stormwater discharges from industrial sectors and high-risk facilities.

EPA should develop numerical expressions to represent the MS4 standard of Maximum Extent Practicable. This could involve establishing municipal action levels based on expected outfall pollutant concentrations from the National Stormwater Quality Database, developing site-based runoff and pollutant load limits, and setting turbidity limits for construction sites. Such numerical expressions would create improved accountability, bring about consistency, and result in implementation actions that will lead to measurable reductions in stormwater pollutants in MS4 discharges.

Communities should use an urban stream classification system, such as a regionally adapted version of the Impervious Cover Model, to establish realistic water quality and biodiversity goals for individual classes of subwatersheds. The goals for water and habitat quality should become less stringent as impervious cover increases within the subwatershed. This should not become an excuse to work less diligently to improve the most degraded waterways—only to recognize that equivalent, or even greater, efforts to improve water quality conditions will achieve progressively less ambitious results in more highly urbanized watersheds. This approach would provide stormwater managers with more specific, measurable, and attainable implementation strategies than the one-size-fits-all approach that is promoted in current wet weather management regulations.

Better monitoring of MS4s to determine outcomes is needed. Only a small fraction of MS4 communities have provided measurable outcomes with regard to aggregate flow and pollutant reduction achieved by their municipal stormwater programs. A framework and methods to evaluate program effectiveness for each of the six minimum management measures have been outlined by CASQA (2007) and should be adopted. In addition, the lack of monitoring

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requirements in the Phase II stormwater program makes it virtually impossible to measure or track actual pollutant load or runoff volume reductions achieved. It is recommended that both Phase I and II MS4s shift to a more collaborative monitoring paradigm to link management efforts to receiving water quality.

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Watershed-based permitting will require additional resources and regulatory program support. Such an approach shifts more attention to ambient outcomes as well as expanded permitting coverage. Additional resources for program implementation could come from shifting existing programmatic resources. For example, some state permitting resources may be shifted away from existing point source programs toward stormwater permitting. Strategic planning and prioritization could shift the distribution of federal and state grant and loan programs to encourage and support more watershed-based stormwater permitting programs. However, securing new levels of public funds will likely be required. All levels of government must recognize that additional resources may be required from citizens and businesses (in the form of taxes, fees, etc.) in order to operate a more comprehensive and effective stormwater permitting program.

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Appendixes

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Appendix A
Acronyms

BAC	best attainable conditions
BAT	best available technology
BCG	Biological Condition Gradient
BCT	best control technology
BOD	biochemical oxygen demand
CAFO	concentrated animal feeding operation
CBWM	Chesapeake Bay Watershed Model
CCI	Census of Construction Industries
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CGP	Construction General Permit
CN	Curve Number
COD	chemical oxygen demand
COV	coefficient of variability
CWA	Clean Water Act
DHSVM	Distributed Hydrology, Soil, and Vegetation Model
EIA	effective impervious area
EMC	event mean concentration
ERP	Enforcement Response Plan
ETV	Environmental Technology Verification Program
EWH	exceptional warmwater habitat
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
GIS	Geographic Information System
GWLF	General Watershed Loading Function
HRU	Hydrologic Response Unit
HSPF	Hydrologic Simulation Program–Fortran
HUC	hydrologic unit code
ICM	Impervious Cover Model
KCRTS	King County Runoff Time Series
LDC	least disturbed conditions
LEED	Leadership in Energy and Environmental Design
LID	low-impact development
MDC	minimally disturbed conditions
MEP	maximum extent practicable
MGD	million gallons per day
MSGP	multi-sector industrial stormwater general permit
MTBE	methyl tert-butyl ether
NCSI	Normalized Channel Stabilization Index
NOI	Notice of Intent

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NPDES	National Pollutant Discharge Elimination System
NRDC	Natural Resources Defense Council
NRI	National Resource Inventory
NSQD	National Stormwater Quality Database
NTU	Nephelometric Turbidity Unit
NURP	National Urban Runoff Program
PAH	polycyclic aromatic hydrocarbons
PCB	polychlorinated biphenyl
POTW	publicly owned treatment works
PUD	planned unit development
RCRA	Resource Conservation and Recovery Act
RPA	Reasonable Potential Analysis
SBUH	Santa Barbara Unit Hydrograph
SCCWRP	Southern California Coastal Water Research Project Authority
SCM	stormwater control measure
SIC	Standard Industrial Classification
SLAMM	Source Loading and Management Model
SMDR	Soil Moisture Distributed and Routing
SWAT	Soil and Water Assessment Tool
SWMM	Stormwater Management Model
SWPPP	stormwater pollution prevention plan
TALU	tiered aquatic life use
TARP	Technology Acceptance and Reciprocity Partnership
TIA	total impervious area
TKN	total Kjedahl nitrogen
TMDL	total maximum daily load
TND	traditional neighborhood development
TOD	transit-oriented development
TSCA	Toxic Substances Control Act
TSS	total suspended solids
UAA	Use Attainability Analysis
UDC	unified development code
ULARA	Upper Los Angeles River Area
USLE	Universal Soil Loss Equation
WERF	Water Environment Research Foundation
WQA	Water Quality Act
WQS	water quality standard
WWH	warmwater habitat
WWHM	Western Washington Hydrologic Model
WWTP	wastewater treatment plant

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Appendix B
Glossary

Antidegradation: Policies which ensure protection of water quality from a particular waterbody where the water quality exceeds levels necessary to protect fish and wildlife propagation and recreation on and in the water. This also includes special protection of waters designated as outstanding natural resource waters. Antidegradation plans are adopted by each state to minimize adverse effects on water.

Best Management Practice (BMP): Physical, structural, and/or managerial practices that, when used singly or in combination, reduce the downstream quality and quantity impacts of stormwater. The term is synonymous with Stormwater Control Measure (SCM).

Biofiltration: The simultaneous process of filtration, infiltration, adsorption, and biological uptake of pollutants in stormwater that takes place when runoff flows over and through vegetated areas.

Bioinfiltration: A particular SCM that is like bioretention but has more infiltration, and thus would be categorized as an infiltration process.

Bioretention: A stormwater management practice that utilizes shallow storage, landscaping, and soils to control and treat urban stormwater runoff by collecting it in shallow depressions before filtering through a fabricated planting soil media. This SCM is often categorized under "filtration" although it has additional functions.

Buffer: The zone contiguous with a sensitive area that is required for the continued maintenance, function, and structural stability of the sensitive area. The critical functions of a riparian buffer (those associated with an aquatic system) include shading, input of organic debris and coarse sediments, uptake of nutrients, stabilization of banks, interception of fine sediments, overflow during high-water events, protection from disturbance by humans and domestic animals, maintenance of wildlife habitat, and room for variation of aquatic system boundaries over time due to hydrologic or climatic effects. The critical functions of terrestrial buffers include protection of slope stability, attenuation of surface water flows from stormwater runoff and precipitation, and erosion control.

> **Stream buffers** are zones of variable width that are located along both sides of a stream and are designed to provide a protective natural area along a stream corridor.

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Combined Sewer Overflow (CSO): A discharge of untreated wastewater from a combined sewer system at a point prior to the headworks of a publicly owned treatment works. CSOs generally occur during wet weather (rainfall or snowmelt). During periods of wet weather, these systems become overloaded, bypass treatment works, and discharge directly to receiving waters.

Combined Sewer System: A wastewater collection system that conveys sanitary wastewaters (domestic, commercial, and industrial wastewaters) and stormwater through a single pipe to a publicly owned treatment works for treatment prior to discharge to surface waters.

Constructed Wetland: A wetland that is created on a site that previously was not a wetland. This wetland is designed specifically to remove pollutants from stormwater runoff.

Created Wetland: A wetland that is created on a site that previously was not a wetland. This wetland is created to replace wetlands that were unavoidably destroyed during design and construction of a project. This wetland cannot be used for treatment of stormwater runoff.

Detention: The temporary storage of stormwater runoff in an SCM with the goals of controlling peak discharge rates and providing gravity settling of pollutants.

Detention Facility/Structure: An above- or below-ground facility, such as a pond or tank, that temporarily stores stormwater runoff and subsequently releases it at a slower rate than it is collected by the drainage facility system. There is little or no infiltration of stored stormwater, and the facility is designed to not create a permanent pool of water.

Drainage: Refers to the collection, conveyance, containment, and/or discharge of surface and stormwater runoff.

Drainage Area: That area contributing runoff to a single point measured in a horizontal plane, which is enclosed by a ridge line.

Drainage Basin: A geographic and hydrologic subunit of a watershed.

Dry Pond: A facility that provides stormwater quantity control by containing excess runoff in a detention basin, then releasing the runoff at allowable levels. Synonymous with detention basin, it is intended to be dry between storms.

Effluent Limitation: Any restriction imposed by the EPA director on quantities, discharge rates, and concentrations of pollutants that are discharged from

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point sources into waters of the United States, the waters of the contiguous zone, or the ocean.

Effluent Limitation Guidelines: A regulation published by the EPA Administrator under Section 304(b) of the Clean Water Act that establishes national technology-based effluent requirements for a specific industrial category.

Exfiltration: The downward movement of water through the soil; the downward flow of runoff from the bottom of an infiltration SCM into the soil.

Extended Detention: A stormwater design feature that provides for the gradual release of a volume of water in order to increase settling of pollutants and protect downstream channels from frequent storm events. When combined with a pond, the settling time is increased by 24 hours.

Filter Strip: A strip of permanent vegetation above ponds, diversions, and other structures to retard the flow of runoff, causing deposition of transported material and thereby reducing sedimentation. As an SCM, it refers to riparian buffers, which run adjacent to waterbodies and intercept overland flow and shallow subsurface flow (both of which are usually sheet flow rather than a distinct influent pipe). The term is borrowed from the agricultural world.

Flood Frequency: The frequency with which the flood of interest may be expected to occur at a site in any average interval of years. Frequency analysis defines the n-year flood as being the flood that will, over a long period, be equaled or exceeded on the average once every n years.

Frequency of Storm (Design Storm Frequency): The anticipated period in years that will elapse, based on average probability of storms in the design region, before a storm of a given intensity and/or total volume will recur; thus, a 10-year storm can be expected to occur on the average once every 10 years. Sewers designed to handle flows which occur under such storm conditions would be expected to be surcharged by any storms of greater amount or intensity.

General Permit: A single permit issued to a large number of dischargers of pollutants in stormwater. General permits are issued by the permitting authority, and interested parties then submit a Notice of Intent (NOI) to be covered. The permit must identify the area of coverage, the sources covered, and the process for obtaining coverage. Once the permit is issued, a permittee may submit an NOI and receive coverage within a very short time frame.

Grab Sample: A sample which is taken from a stream on a one-time basis without consideration of the flow rate of the stream and without consideration of time.

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Hotspot: An area where land use or activities generate highly contaminated runoff, with concentrations of pollutants in excess of those typically found in stormwater.

Hydrograph: A graph of runoff rate, inflow rate, or discharge rate, past a specific point as a function of time.

Hydroperiod: A seasonal occurrence of flooding and/or soil saturation; it encompasses depth, frequency, duration, and seasonal pattern of inundation.

Hyetograph: A graph of measured precipitation depth (or intensity) at a precipitation gauge as a function of time.

Impervious Surface or Impervious Cover: A hard surface area which either prevents or retards the entry of water into the soil. Common impervious surfaces include roof tops, walkways, patios, driveways, parking lots or storage areas, concrete or asphalt paving, gravel roads, packed earthen materials, and oiled surfaces.

Infiltration: The downward movement of water from the surface to the subsoil.

Infiltration Facility: A drainage facility designed to use the hydrologic process of runoff soaking into the ground, commonly referred to as percolation, to dispose of stormwater.

Infiltration Pond: A facility that provides stormwater quantity control by containing excess runoff in a detention facility, then percolating that runoff into the surrounding soil.

Level Spreader: A temporary SCM used to spread stormwater runoff uniformly over the ground surface as sheet flow. The purpose of level spreaders is to prevent concentrated, erosive flows from occurring. Levels spreaders will commonly be used at the upstream end of wider biofilters to ensure sheet flow into the biofilter.

Municipal Separate Storm Sewer System: A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains) owned by a state, city, town, or other public body that is designed or used for collecting or conveying stormwater, which is not a combined sewer and which is not part of a publicly owned treatment works.

National Pollutant Discharge Elimination System: A provision of the Clean Water Act that prohibits the discharge of pollutants into waters of the United States unless a special permit is issued by EPA, a state, or, where delegated, a

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tribal government on an Indian reservation. The permit applies to point sources of pollutants to ensure that their pollutant discharges do not exceed specified effluent standards. The effluent standards in most permits are based on the best available pollution technology or the equivalent.

Nonpoint Source: Diffuse pollution source, but with a regulatory connotation; a source without a single point of origin or not introduced into a receiving stream from a specific outlet. The pollutants are generally carried off the land by stormwater. Some common nonpoint sources are agriculture, forestry, mining, dams, channels, land disposal, and saltwater intrusion.

Nonstructural SCM: Stormwater control measure that uses natural measures to reduce pollution levels, does not require extensive construction efforts, and/or promotes pollutant reduction by eliminating the pollutant source.

Peak Discharge Rate: The maximum instantaneous rate of flow during a storm, usually in reference to a specific design storm event.

Point Source: Any discernible, confined, and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fixture, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel, or other floating craft from which pollutants are or may be discharged.

Pollutant: A contaminant in a concentration or amount that adversely alters the physical, chemical, or biological properties of the natural environment. Dredged soil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials (except those regulated under the Atomic Energy Act of 1954, as amended), heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water (EPA, 2008).

Polutograph: A graph of pollutant loading rate (mass per unit time) as a function of time.

Predevelopment Conditions: Those conditions that existed at a site just prior to the development in question, which are not necessarily pristine conditions.

Pretreatment: The removal of material such as gross solids, grot, grease, and scum from flows prior to physical, biological, and chemical treatment processes to improve treatability. The reduction of the amount of pollutants, the elimination of pollutants, or the alteration of the nature of pollutant properties in wastewater prior to or in lieu of discharging or otherwise introducing such pollutants into a publicly owned treatment works [40 C.F.R. § 403.3(q)]. Pretreatment may include screening, grit removal, stormwater, and oil separators. With re-

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spect to stormwater, it refers to techniques employed in stormwater SCMs to help trap coarse materials and other pollutants before they enter the SCM.

Recharge: The flow of groundwater from the infiltration of stormwater runoff.

Recharge Volume: The portion of the water quality volume used to maintain groundwater recharge rates at development sites.

Retention: The process of collecting and holding stormwater runoff with no surface outflow. Also, the amount of precipitation on a drainage area that does not escape as runoff. It is the difference between total precipitation and total runoff.

Retention/Detention Facility: A type of drainage facility designed either to hold water for a considerable length of time and then release it by evaporation, plant transpiration, and/or infiltration into the ground, or to hold stormwater runoff for a short period of time and then release it to the stormwater management system.

Runoff: The term is often used in two senses. For a given precipitation event, direct *storm runoff* refers to the rainfall (minus losses) that is shed by the landscape to a receiving waterbody. In an area of 100 percent imperviousness, the runoff equals the rainfall. Over greater time and space scales, *surface water runoff* refers to streamflow passing through the outlet of a watershed, including base flow from groundwater that has entered the stream channel.

Soil Stabilization: The use of measures such as rock lining, vegetation, or other engineering structure to prevent the movement of soil when loads are applied to the soil.

Source Control: A type of SCM that is intended to prevent pollutants from entering stormwater. A few examples of source control are erosion control practices, maintenance of stormwater facilities, constructing roofs over storage and working areas, and directing wash water and similar discharges to the sanitary sewer or a dead end sump.

Stormwater: That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, channels, or pipes into a defined surface water channel or a constructed infiltration facility. According to 40 C.F.R. § 122.26(b)(13), this includes stormwater runoff, snow melt runoff, and surface runoff and drainage.

Stormwater Control Measure (SCM): Physical, structural, and/or managerial measures that, when used singly or in combination, reduce the downstream quality and quantity impacts of stormwater. Also, a permit condition used in place

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of or in conjunction with effluent limitations to prevent or control the discharge of pollutants. This may include a schedule of activities, prohibition of practices, maintenance procedures, or other management practices. SCMs may include, but are not limited to, treatment requirements; operating procedures; practices to control plant site runoff, spillage, leaks, sludge, or waste disposal; or drainage from raw material storage.

Stormwater Drainage System: Constructed and natural features which function together as a system to collect, convey, channel, hold, inhibit, retain, detain, infiltrate, divert, treat, or filter stormwater.

Stormwater Facility: A constructed component of a stormwater drainage system, designed or constructed to perform a particular function or multiple functions. Stormwater facilities include, but are not limited to, pipes, swales, ditches, culverts, street gutters, detention basins, retention basins, constructed wetlands, infiltration devices, catch basins, oil/water separators, sediment basins, and modular pavement.

Structural SCMs: Devices which are constructed to provide temporary storage and treatment of stormwater runoff.

Swale: A shallow drainage conveyance with relatively gentle side slopes, generally with flow depths of less than one foot.

> **Biofilter (**same as a **Biofiltration Swale):** A sloped, vegetated channel or ditch that provides both conveyance and water quality treatment to stormwater runoff. It does not provide stormwater quantity control but can convey runoff to SCMs designed for that purpose.
>
> **Dry Swale**: An open drainage channel explicitly designed to detain and promote the filtration of stormwater runoff through an underlying fabricated soil media. It has an underdrain.
>
> **Wet Swale:** An open drainage channel or depression, explicitly designed to retain water or intercept groundwater for water quality treatment.

Technology-Based Effluent Limit: A permit limit for a pollutant that is based on the capability of a treatment method to reduce the pollutant to a certain concentration.

Time of Concentration: The time period necessary for surface runoff to reach the outlet of a subbasin from the hydraulically most remote point in the tributary drainage area.

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Total Maximum Daily Load (TMDL): The amount, or load, of a specific pollutant that a waterbody can assimilate and still meet the water quality standard for its designated use. For impaired waters the TMDL reduces the overall load by allocating the load among current pollutant loads (from point and nonpoint sources), background or natural loads, a margin of safety, and sometimes an allocation for future growth.

Volumetric Runoff Coefficient (R_v): The value that is applied to a given rainfall volume to yield a corresponding runoff volume based on the percent impervious cover in a drainage basin.

Water Quality-Based Effluent Limit (WQBEL): A value determined by selecting the most stringent of the effluent limits calculated using all applicable water quality criteria (e.g., aquatic life, human health, and wildlife) for a specific point source to a specific receiving water for a given pollutant.

Water Quality SCM: An SCM specifically designed for pollutant removal.

Water Quantity SCM: An SCM specifically designed to reduce the peak rate of stormwater runoff.

Water Quality Volume (W_{qv}): The volume needed to capture and treat 90 percent of the average annual stormwater runoff volume equal to 1 inch times the volumetric runoff coefficient (R_v) times the site area.

Wetlands: Those areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. This includes wetlands created, restored, or enhanced as part of a mitigation procedure. This does not include constructed wetlands or the following surface waters of the state intentionally constructed from sites that are not wetlands: irrigation and drainage ditches, grass-lined swales, canals, agricultural detention facilities, farm ponds, and landscape amenities.

Wet Pond: A facility that treats stormwater for water quality by utilizing a permanent pool of water to remove conventional pollutants from runoff through sedimentation, biological uptake, and plant filtration. Synonymous with a retention basin.

SOURCES: Most of the definitions are from EPA (2003), "BMP Design Considerations," 600/R-03/103, or EPA (2008), "Handbook for Developing Watershed Plans to Restore and Protect Our Waters," EPA 841-B-08-002.

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Appendix C
Summary of Responses from State Stormwater Coordinators

On February 21, 2007, on behalf of the committee, Jenny Molloy of EPA's Office of Wastewater Management sent the following questions to a group of state stormwater program managers and received six responses (found in Tables C-1 and C-2).

1. For industrial and/or construction: do you have information on non-filers, i.e., folks who should have submitted NOIs, but did not? If so, how old are these data, and how do they compare to overall numbers of those with permit coverage? How did you find and/or estimate the number of non-filers?

2. Also for industrial and/or construction: do you have information on compliance rates? Yes, this is a really broad question, but something along the lines of: based on inspections (or monitoring data, or whatever metric you use), have you made any determinations on numbers of facilities out of compliance, or alternatively, in compliance? If so, define what you mean by compliance (paper violations, SWPPP/BMP inadequacies, water quality standards violations, etc.).

TABLE C-1 Nonfilers

State	Information on Industrial Non-Filers	Estimate Percent Non-Filers as of Total	Basis of Estimate	Period of Estimate	Comment
CA	Yes	50 percent of heavy industry statewide 69 percent Of industry within City of Los Angeles	Study—CA Water Board, 1999; Duke and Shaver, 1999. Study—Swamikannu et al., 2001	1995–1998 1998–2000	
MN	No				Study in progress
OH	No				Plan outreach to business
OR	No				Do not compile data
VT	Yes	88–90 percent of industry	Mass mailing	2006	No response from 2,400 of 3,000 mailings
WI	No				

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TABLE C-2 Compliance

State	Information on Compliance Rates	Estimate of Covered Facilities Non-Compliant	Basis of Estimate	Period of Estimate	Comment
CA	Yes (Construction)	40 percent deficient in paperwork; 30 percent with inadequate E&S controls	MS4 construction audit in Los Angeles and Ventura counties, and large CGP construction sites	2002, 2004, and 2005	Prioritized large CGP sites for inspection
	Yes (Industrial)	60 percent poor housekeeping practices; 40 percent incomplete SWPPPs	Transportation sector, plastics manufacturing inspections in Los Angeles County	2005 and 2007	
NH	No				Inspect in response to complaints
OH	No				Inspect construction sites as a priority
OR	No				Do not compile data
VT	No				Plan to inspect for compliance
WV	Yes (Industrial)	66 percent failed to submit report	Monitoring report submittal tracking	2007	Mailed deficiency notices
WI	Yes (Construction)	38 percent with minor and 43 percent with major violations	A subsample of 1 percent of CGP sites	2007	Perform inspections annually; no central database tracking

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In September 2007, the NRC Committee on Reducing Stormwater Discharge Contributions to Water Pollution sent the following survey to 50 state stormwater program managers. Responses were received from 18 states, including at least one from every EPA region. The blank survey is shown below, and Tables C-3 through C-9 contain the states' responses.

The NRC committee members will greatly appreciate receiving the following information from State Stormwater Coordinators. Please complete both sides of this form and return to Xavier Swamikannu, CalEPA, Los Angeles Regional Water Board, xswamikannu@waterboards.ca.gov or Fax: (213) 576-6625.

State:
Name of information provider:

Please summarize your State's Stormwater Permit Program

	Municipal Permit	Industrial General Permit	Construction General Permit
What are the monitoring requirements?			
How is compliance demonstrated (monitoring or other activity)?			
To whom is the SWPPP submitted?			
Can an MS4 perform an inspection of an industry within its boundary?			
What industries are considered "high-risk"?			
Do BMP manuals exist for implementation guidance?			
No. of dedicated staff or FTEs			

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Does your State Storm Water BMP Manual contain the following, and what are they?

WQ sizing criteria	
Recharge criteria	
Channel protection criteria	
Overbank flood criteria	
Extreme flows	
Acceptable BMP list	
Detailed engineering specs for BMPs	
Soil and erosion control requirements (unless this is left to the local government)	

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TABLE C-3 Monitoring Requirements

State	Municipal	Industrial	Construction
Alabama	Monitoring requirements are specific to the Phase I MS4. MS4 Phase II permit does not require monitoring.	Monitoring is specific to the General Permit type and associated discharge. Alabama has 18 NPDES Industrial Stormwater General Permits. http://www.adem.state.al.us/genpermits.htm	Monitoring is required under specific conditions, but in general compliance with the permit does not require monitoring. ADEM Admin. Code Chapter 335-6-12 is attached.
California	Monitoring requirements are specific to the Phase 1 MS4 permits. MS4 Phase II permit monitoring is discretionary.	2 wet weather sampling events per year – 4 basic parameters and other pollutants known to be on site. Quarterly visual monitoring.	Visual monitoring before, during, and after rain events. Analytical monitoring for discharges to sediment-impaired waterbodies.
Connecticut	Sample six outfalls once a year. Twelve chemical parameters.	Sample all outfalls once a year. Ten chemical parameters plus aquatic toxicity.	None, yet. Soon to modify permit to sample for turbidity.
Georgia	Dry weather outfall screening.	Standard monitoring from the EPA MSGP. Additional monitoring for the pollutant of concern for industries that may be causing or contributing to stream impairment.	Monitoring is required for a qualifying rain event (0.5 inch) once after clearing and grubbing, and once after mass grading.
Hawaii	Visual and water chemistry sampling.	Visual and water chemistry sampling.	Visual
Maine	None	No benchmark monitoring, only effluent limitations. Additional monitoring upon request based on discharges, complaints, audits, or inspections	None
Minnesota	The Phase I MS4 permits for Minneapolis and St. Paul require monitoring. MS4 Phase II permit does not require monitoring.	The current state MSGP does not have monitoring requirements. The proposed next term draft permit would require at least 4 stormwater monitoring events per year.	The current state CGP does not require monitoring. The proposed next term draft permit is not expected to include monitoring.

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TABLE C-3 Continued

State	Municipal	Industrial	Construction
Nebraska	Stormwater monitoring required on different use sites. BMP monitoring.	None. Monitoring can be required by the director through permit.	None. Monitoring can be required by the director through permit.
Nevada	Required for storm events that produce runoff.	None	None
New York	Ad hoc	Similar to monitoring in the EPA MSGP.	None. Self-inspection.
Ohio	Phase I MS4 permits require some chemical and biological monitoring. Phase II MS4 permit does not require mandatory monitoring, although recommended as part of IDDE program.	Similar to monitoring in the EPA MSGP, except annually. No priority chemical monitoring required.	For the state CGP, no chemical monitoring. For special watershed CGPs associated with TMDLs, TSS monitoring required.
Oklahoma	Phase 1 MS4s permits require dry weather monitoring, floatables monitoring, and watershed characterization monitoring, including biological assessments.	Quarterly visual monitoring and annual analytical monitoring.	None
Oregon	Monitoring requirements are specific to the Phase I MS4. The Phase II MS4 permit does not require monitoring, though some permittees do monitor on their own accord. The average frequency is 2-4 times a year.	Industrial facilities required to sample their stormwater discharge 4 times per year. Also required to conduct visual monitoring of their discharge on a monthly basis when discharge is present. Mining sites in addition are subject to the same requirements as in the state CGP since sediment is the main pollutant of concern.	None. However, permittees discharging stormwater to waters listed specifically for turbidity/sedimentation on the most recent 303(d) list or that have a TMDL for turbidity/sedimentation have the option of either monitoring for turbidity or implementing additional BMPs.

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State	Municipal	Industrial	Construction
Vermont	None other than the development of an IDDE program and follow-up until elimination occurs	Benchmark monitoring for individual sectors, quarterly for the first year. Visual inspection 4 times per year. Effluent limitations (if applicable) once per year.	None at present. Turbidity monitoring for moderate-risk projects included in draft CGP.
Virginia	Monitoring requirements are specific to the Phase I MS4 permit. The Phase II MS4 permit does not require monitoring.	Benchmark and effluent limitation (the same as EPA's 2000 MSGP), except we only require one sample per year for benchmark samples.	None
Washington	Monitoring requirements are specific to the Phase I MS4, *Outfall conveyance system monitoring*. Selected outfalls for representative land uses are monitored intensively for a wide range of chemical constituents including toxicity. *BMP effectiveness monitoring*. Selected stormwater BMPs are monitored to determine performance and how effective the designs are. The Phase II MS4 permit does not require monitoring, except as required under the IDDE program or for a TMDL.	Industry required to sample for turbidity, pH, zinc, and petroleum oil and grease. If exceeds zinc benchmark, then also need to monitor for total copper, total lead, and hardness. There are additional monitoring requirements for different industry categories. For discharges to impaired 303(d) waters monitor required for the pollutants for which the waterbody is impaired.	All state CGP sites are required to do weekly monitoring for turbidity and pH. If benchmark exceeded, specific actions/responses are triggered. For sites which discharge to waters impaired by phosphorous, turbidity, fine sediments, or high pH, monitoring required for these parameters additionally.
West Virginia	NA	Benchmark monitoring. Sector specific.	None
Wyoming	None	Benchmark monitoring for timber, metal mining, concrete and gypsum, junkyards and recycling. Effluent limitation monitoring for coal piles, concrete manufacture, and asphalt emulsion.	None

NOTE: NA, not answered

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TABLE C-4 How is Compliance Demonstrated?

State	Municipal	Industrial	Construction
Alabama	MS4 Phase I – monitoring and BMPs MS4 Phase II – BMPs	Monitoring reporting and BMP implementation	Inspections. Monitoring; SWPPP implementation during inspection; aerial reconnaissance
California	Annual and monitoring reporting. MS4 audits and inspections.	Annual and monitoring reporting. Inspections.	Annual certifications. Inspections
Connecticut	Annual and monitoring reporting.	Annual and monitoring reporting. Inspections.	Inspections. SWPPP review and implementation for large projects.
Georgia	Annual and monitoring reporting.	Annual and monitoring reporting.	Reporting.
Hawaii	Annual and Monitoring reporting. Inspections.	Annual and monitoring reporting. Inspections.	Inspections. Reporting.
Maine	Annual reporting and municipal audits.	Inspections and audits, at least two per 5-year permit term.	NA
Minnesota		Annual reporting and inspections.	
Nebraska	MS4 audits and annual reporting.	Inspections and SWPPP implementation.	Inspections and SWPPP implementation—complaint only.
Nevada	Annual reporting, MS4 audits, inspections.	Annual reporting, inspections	Inspections.
New York	Annual reporting and MS4 audits.	Annual and monitoring reporting. Inspections.	Inspections and SWPPP implementation.
Ohio	Annual reporting.	SWPPP implementation.	SWPPP implementation.
Oklahoma	Annual reporting. MS4 audits and compliance schedules.	Annual and monitoring reporting. Inspections.	SWPPP implementation and inspections based on complaints received.

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State	Municipal	Industrial	Construction
Oregon	Annual and monitoring reporting.	Annual and monitoring reporting. Action Plan approval.	Inspections and SWPPP implementation.
Vermont	Annual reporting and MS4 audits.	Monitoring reporting.	Inspections, recordkeeping.
Virginia	Registration statement BMP implementation.	Monitoring reporting and inspections.	Inspections. SWPPP and E&S plan implementation.
Washington	Implementation of prescriptive stormwater management program.	Monitoring reporting and inspections.	Inspections and monitoring reporting.
West Virginia	NA	SWPPP implementation and monitoring reporting.	Inspections. SWPPP implementation.
Wyoming	Periodic MS4 audits.	Inspections, monitoring reporting.	Inspections.

NOTE: NA, not answered.

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TABLE C-5 To Whom Is the SWPPP Submitted?

State	Municipal	Industrial	Construction
Alabama	MS4 Phase I – Storm Water Management Program (SWMP) sent to state. Should be available for review at the time of inspection. (SWPPP information should also be provided to the department.) MS4 Phase 2 – SWMP submitted with the Notice of Intent (NOI).	No submittal to state. The SWPPP must be kept on site and made available for review at the time of inspection.	No submittal to state. The SWPPP must be kept on site and made available for review at the time of inspection. SWPPP required to be submitted under certain circumstance during registration and re-registration.
California	MS4 Phase 1 – SWMP incorporated as prescriptive requirements in the permit. MS4 Phase 2 – SWMP submitted to state with NOI	No submittal to state. The SWPPP must be kept on site and made available for review at the time of inspection.	No submittal to state. The SWPPP must be kept on site and made available for review at the time of inspection.
Connecticut	NA	The SWPPP is submitted to the state only if requested.	The SWPPP is submitted to the state only if requested.
Georgia	The SWMP is submitted to the state.	The SWPPP is submitted to the state only if requested. Otherwise it is kept on-site.	The E&S Control Plan equivalent to the SWPPP is submitted to the Local Issuing Authority. It is also submitted to the state if the project disturbs more than 50 ac, or if there is no LIA.
Hawaii	NA	The SWMP is submitted to the state.	The SWMP is submitted to the state.
Maine	NA	The SWPPP is submitted to the state only if requested.	The E&S Control Plan equivalent to the SWPPP is submitted to the state for review.

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State	Municipal	Industrial	Construction
Minnesota	Phase 1 MS4 - The SWMP is submitted to the state for review and public notice.	The SWPPP is not required to be submitted to the state.	The SWPPP must be must be submitted to the state for review for projects disturbing 50 acres or more, and has a discharge point within 2,000 feet of an impaired or special water listed in the state CGP. A SWPPP must also be submitted for projects proposing to use alternative method(s) for the permanent stormwater management system.
Nebraska	NA	The SWPPP is submitted to the state only if requested.	The SWPPP is submitted to the MS4 permittee and to the state when requested.
Nevada	NA	No submittal to state. The SWPPP must be kept on site.	No submittal to state. The SWPPP must be kept on site.
New York	NA	Some SWPPPs submitted to state (very few).	About 1/6 SWPPPs submitted to state.
Ohio	NA	The SWPPP is submitted to the MS4 permittee and to the state when requested.	The SWPPP is submitted to the state.
Oregon	NA	The SWPPP is submitted to the state on first application and when renewing coverage under the state MSGP.	The SWPPP is submitted to the state on first application and when renewing coverage under the state CGP. Projects that are greater than 5 acres are subject to public notice and comment.

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TABLE C-5 Continued

State	Municipal	Industrial	Construction
Vermont	NA	A copy of the SWPPP is submitted to the state, and the original kept on site.	The E&S Control Plan is submitted to the state. Low-risk projects have a standard assigned E&S Control Plan – "Low Risk Handbook".
Virginia	NA	No submittal to the state. The SWPPP must be kept on-site.	No submittal to the state. The SWPPP must be kept on-site.
Washington	NA	The SWPPP is submitted to the state upon first application only. Otherwise, the SWPPP must be kept on site and must be made available to the state, the MS4 permittee, or the public upon request.	The SWPPP is not submitted to the state. The SWPPP must be kept on site and must be made available to the state, the MS4 permittee or the public upon request.
West Virginia	NA	The SWPPP is submitted to the state upon first application only.	The SWPPP is submitted to the state.
Wyoming	NA	The SWPPP is submitted to the state for facilities >50 ac. Class 1 waters not eligible for coverage under the state MSGP.	The SWPPP is submitted to the state for projects >100 ac or on Class 1 waters.

NOTE: NA, not applicable.

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TABLE C-6 Can an MS4 Inspect Industries Within Its Boundary?

Alabama	Yes, if adequate legal authority exists.
California	Yes. Local agencies inspection to ensure compliance with local stormwater or municipal ordinance.
Connecticut	Yes. Nothing specific. State MSGP requires industries to comply with the stormwater management program of the MS4 in which they are located.
Georgia	Yes
Hawaii	Yes
Maine	Yes
Minnesota	Yes. Capability to do this varies with the MS4.
Nebraska	Yes. Phase 1 MS4s only.
Nevada	Yes
New York	Yes. MS4s can inspect for illicit discharge detection and elimination. Industries can be inspected under local authority, but local inspections are infrequently conducted.
Ohio	Yes. Phase I MS4s can check for MSGP coverage and that a SWPPP exists in conjunction with pretreatment inspections.
Oklahoma	Yes
Oregon	Yes, under various authorities. Pretreatment, industrial stormwater, construction stormwater, etc.
Vermont	Yes. The MS4 can request an inspection but can be denied access.
Virginia	No. No state statute for private property access to inspect for stormwater management. Some do use Fire Marshall's authority through the fire code.
Washington	Yes
West Virginia	NA
Wyoming	Yes. If the MS4 has authority.

NOTE: NA, not answered.

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TABLE C-7 What Industries Are Considered High Risk?

Alabama	Metal foundries.
California	None specified in the state MSGP. Some MS4 permits may specify high-risk industries. Construction activity discharging to sediment-impaired waterbodies are identified as high risk in the state CGP.
Connecticut	None specified in the state MSGP.
Georgia	None specified in the state MSGP. Facilities that may be causing or contributing to stream impairment are high risk.
Hawaii	None specified in the state MSGP
Maine	Auto salvage, scrap metal recycling, boatyards and marinas, concrete and asphalt, batch plants, vehicle maintenance facilities.
Minnesota	None specified in the state MSGP. Heavy industries are considered higher risk.
Nebraska	Ethanol, scrap metal recycling.
Nevada	Waste oil recyclers, auto salvage, aggregate mines, cement plants.
New York	Auto salvage, scrap recycling.
Ohio	None specified in the state MSGP. Individual stormwater permits required for some airports, landfills, sand and gravel operations, and bulk terminals.
Oklahoma	None specified in the state MSGP.
Oregon	None specified in the state MSGP.
Vermont	None specified in the state MSGP. Gravel pits, salvage yards, scrap recycling facilities are considered high risk.
Virginia	None specified in the state MSGP.
Washington	MS4 permit identifies a list of industries and land uses that the permittee must inspect (See Permit appendix 8).
West Virginia	None specified in the state MSGP. Mills and auto salvage yards are considered high risk.
Wyoming	None specified in the state MSGP. Case by case based on proximity to high class waters and industry type.

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TABLE C-8 Do State BMP Manuals Exist for Implementation Guidance?

State	Municipal	Industrial	Construction
Alabama	No. Use EPA materials.	No. Use EPA Materials.	Yes. State E&S Manual. http://swcc.state.al.us/erosion_handbook.htm
California	Yes. CASQA and Caltrans manuals. Not officially adopted.	Yes. CASQA and Caltrans manuals. Not officially adopted	Yes. CASQA and Caltrans manuals. Not officially adopted.
Connecticut	No	No. An SWPPP guidance document is available online.	Yes. E&S Guidelines (2002) and CT Stormwater Quality Manual (2004).
Hawaii	No. Use EPA materials.	No. Use EPA materials.	No. Use EPA materials.
Georgia	Yes. Georgia Stormwater Management Manual.	No. Use EPA materials.	Yes. Manual for Erosion and Sediment Control in Georgia.
Maine	Yes	Yes	Yes
Minnesota	Yes. The Minnesota Stormwater Manual at: http://www.pca.state.mn.us/water/stormwater/stormwater-manual.html Stormwater BMPs – Protecting Water Quality in Urban Areas at: http://www.pca.state.mn.us/water/pubs/sw-bmpmanual.html	No. Plan to develop one.	Yes. Fact sheets and guidance at: http://www.pca.state.mn.us/water/stormwater/stormwater-ms4.html#bmp
Nebraska	No	No	No
Nevada	Yes	Yes	Yes
New York	Yes	Yes. A few state materials.	Yes

continued next page

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TABLE C-8 Continued

State	Municipal	Industrial	Construction
Ohio	No. Use EPA materials.	No. Use EPA materials.	Yes. http://www.dnr.state.oh.us/water/rainwater/default/tabid/9186/Default.aspx
Oklahoma	No. Use EPA materials.	No. Use EPA materials.	No. Use EPA materials.
Oregon	No	No. Have BMP technical assistance guidance documents.	Yes. Use of Oregon BMP manual is optional.
Vermont	Yes	No	Yes. Standards for designers, a field guide for contractors (2006), and the Low Risk Handbook.
Virginia	Yes. E&S control and stormwater handbooks.	No	Yes. E&S control and stormwater handbooks.
Washington	Yes. Stormwater Management Manual for Western Washington (2005) and Stormwater Management Manual for Eastern Washington (2004)	Yes. http://www.ecy.wa.gov/programs/wq/stormwater/manual.html	Yes. http://www.ecy.wa.gov/programs/wq/stormwater/eastern_manual/index.html
West Virginia	No	No	Yes
Wyoming	No	No. Refer to manuals from other states.	No. Refer to manuals from other states.

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TABLE C-9 Full-Time Staff Dedicated to the Stormwater Program

State	Municipal	Industrial	Construction	Total Statewide
Alabama	1.5	7	25–30	33.5–38.5
California				89
Connecticut				5
Georgia	4.5	2.5	46	53
Hawaii	0.5	1	2	3.5
Maine	0.7	2.5	NA	
Minnesota		4.3	14	36
Nebraska				3
Nevada	1	1.5	3	5.5
New York	7	1	11	19
Ohio				18
Oklahoma				7
Oregon	1	4–5 (shared with construction)	4–5 (shared with industrial)	5–6
Vermont	0.5	2	5	7.5
Virginia	3	8 (shared with other programs)	10	13
Washington	10	17	16	43
West Virginia	NA	1	5	
Wyoming				4

NOTE: NA, not answered.

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Appendix D
Biographical Information for the Committee on Reducing Stormwater Discharge Contributions to Water Pollution

Claire Welty, *Chair*, is the Director of the Center for Urban Environmental Research and Education and Professor of Civil and Environmental Engineering at University of Maryland, Baltimore County (UMBC). Dr. Welty's work has primarily focused on transport processes in aquifers; her current research interest is in watershed-scale urban hydrology, particularly in urban groundwater. Prior to her appointment at UMBC, Dr. Welty was a faculty member at Drexel University for 15 years, where she taught hydrology and also served as Associate Director of the School of Environmental Science, Engineering, and Policy. Dr. Welty is the chair of the National Research Council's (NRC's) Water Science and Technology Board and has previously served on three NRC study committees. She is the Chair-Elect of the Consortium of Universities for the Advancement of Hydrologic Science Inc. Dr. Welty received a B.A. in environmental sciences from the University of Virginia, an M.S. in environmental engineering from the George Washington University, and a Ph.D. in civil and environmental engineering from the Massachusetts Institute of Technology.

Roger T. Bannerman has been an environmental specialist for the Wisconsin Department of Natural Resources for over 30 years. For most of that time he has directed research projects investigating urban runoff. Topics addressed by his studies over the years include the quality of urban streams, identification of problem pollutants in stormwater, toxicity of stormwater pollutants, effectiveness of different stormwater control practices, sources of stormwater pollutants, selection of cost-effective control practices, and benefits of low-impact development. He has applied these results to management plans developed for most urban areas in Wisconsin. This includes the calibration of the urban runoff model called the Source Loading and Management Model. The results of his research projects have been used to develop Wisconsin's new administrative rules that regulate stormwater management. Mr. Bannerman received his B.S. in chemistry from Humboldt State College and an M.S. from the University of Wisconsin in water chemistry.

Derek B. Booth has joint positions as Senior Geologist at Stillwater Sciences, Inc., and Adjunct Professor at the University of Washington where he is senior editor of the international journal *Quaternary Research* and holds faculty appointments in Civil Engineering and Earth & Space Sciences. Prior to this, he was director of the Center for Urban Water Resources Management (and its suc-

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cessor, the Center for Water and Watershed Studies) at the university. He maintains active research into the causes of stream-channel degradation, the effectiveness of stormwater mitigation strategies, and the physical effects of urban development on aquatic systems, with over a dozen publications and a wide range of national and international invited presentations on the topic. Dr. Booth received a B.A. in literature from Hampshire College, a B.A. in geology from the University of California at Berkeley, an M.S. in geology from Stanford University, and a Ph.D. in geological sciences from the University of Washington.

Richard R. Horner is a professor in the Department of Civil and Environment Engineering at the University of Washington, with adjunct appointments in Landscape Architecture and in the College of Forest Resources' Center for Urban Horticulture. He received his Ph.D. from the University of Washington's Department of Civil and Environmental Engineering and previous engineering degrees from the University of Pennsylvania. Dr. Horner splits his time between university research and private practice. In both cases his work concerns how human occupancy of and activities on the landscape affect natural waters, and how negative effects can be reduced. He has been involved in two extended research projects concerning the ecological response of freshwater resources to urban conditions and the urbanization process. The first studied the effect of human activities on freshwater wetlands of the Puget Sound lowlands and led to a comprehensive set of management guidelines to reduce negative effects. A ten-year study involved the analogous investigation of human effects on Puget Sounds' salmon spawning and rearing streams. In addition, he has broad experience in all aspects of stormwater management, having helped design many stormwater programs in Washington, California, and British Columbia. He previously served on the NRC's Committee on the Comparative Costs of Rock Salt and Calcium Magnesium Acetate for Highway Deicing.

Charles R. O'Melia (NAE) is the Abel Wolman Professor of Environmental Engineering and Chair of the Geography and Environmental Engineering Department at the Johns Hopkins University, where he has served on the faculty for over 25 years. Dr. O'Melia's research areas include aquatic chemistry, environmental colloid chemistry, water and wastewater treatment, modeling of natural surface and subsurface waters, and the behavior of colloidal particles. He has served on the advisory board and review committees for the environmental engineering departments of multiple universities. He has served in a range of advising roles to professional societies including the American Water Works Association and Research Foundation, the Water Pollution Control Federation, the American Chemical Society, and the International Water Supply Association. He has served on several NRC committees, including chairing the Steering Committee, Symposium on Science and Regulation, and the Committee on Watershed Management for New York City. He was also a member of the

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NRC Water Science and Technology Board and the Board on Environmental Studies and Toxicology. Dr. O'Melia earned a Ph.D. in Sanitary Engineering from the University of Michigan. In 1989, Dr. O'Melia was elected to the National Academy of Engineering for significant contributions to the theories of coagulation, flocculation, and filtration leading to improved water-treatment practices throughout the world.

Robert E. Pitt is the Cudworth Professor of Urban Water Systems in the Department of Civil, Construction, and Environmental Engineering at the University of Alabama (UA). He is also Director of the UA interdisciplinary Environmental Institute. Dr. Pitt's research concerns the effects, sources, and control of urban runoff, which has resulted in numerous development management plans, stormwater ordinances, and design manuals. Dr. Pitt has also developed and tested procedures to recognize and reduce inappropriate discharges of wastewaters to separate storm drainages. He has investigated the sources and control of stormwater toxicants and examined stormwater effects on groundwater. He has also carried out a number of receiving water impact studies associated with stormwater. These studies have included a variety of field monitoring activities, including water and sediment quality, fish and benthos taxonomic composition, and laboratory toxicity tests. His current research includes developing a nationwide database of national stormwater permit information and conducting comprehensive evaluations of these data. Dr. Pitt received a B.S. in engineering science from Humboldt State University, an M.S. in civil engineering from San Jose State University, and a Ph.D. in civil and environmental engineering from the University of Wisconsin.

Edward T. Rankin is an Environmental Management Associate with Ohio University at the Institute for Local Government Administration and Rural Development (ILGARD) which is the Voinovich School of Leadership and Public Affairs located in Athens, Ohio. He had previously been a Senior Research Associate in the Center for Applied Bioassessment and Biocriteria within the Midwest Biodiversity Institute (MBI). Prior to 2002, he was an aquatic ecologist with Ohio EPA for almost 18 years. Mr. Rankin's research centers around the effects of stormwater and other urban stressors on aquatic life, development and application of stream habitat assessment methodologies, development and application of biological criteria and biological-based chemical criteria for aquatic life, and improving the accuracy of total maximum daily loads for nutrients and sediment. He is particularly interested in the application of research to management of aquatic life issues and has extensive experience with the development of tiered aquatic life uses and use attainability analyses in streams. Mr. Rankin received his B.S. in biology from St. Bonaventure University and his M.S. in zoology from The Ohio State University.

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Thomas R. Schueler founded the Center for Watershed Protection in 1992 as a nonprofit organization dedicated to protecting our nation's streams, lakes and wetlands through improved land management. In 2007, he launched the Chesapeake Stormwater Network, whose mission is to improve on-the-ground implementation of more sustainable stormwater management and environmental site design practices in each of 1,300 communities and seven states in the Chesapeake Bay Watershed. He has conducted extensive research on the pollutant removal performance, cost, and longevity of stormwater control measures, and he has developed guidance for both Phase I and Phase II communities to meet minimum management measures to comply with municipal stormwater permits, including development of a national stormwater monitoring database and national guidance on illicit discharge detection and elimination. Mr. Schueler has written several widely referenced manuals that describe how to apply the tools of watershed protection and restoration, and he is working on a wide range of research projects and watershed applications across the United States. Prior to founding the Center, he worked for ten years at the Metropolitan Washington Council of Governments, where he led the Anacostia Watershed Restoration Team, one of first efforts to comprehensively restore an urban watershed. He received his B.S. in environmental science from the George Washington University.

Kurt Stephenson is an associate professor of Environmental and Natural Resource Economics in the Department of Agricultural and Applied Economics at the Virginia Polytechnic Institute and State University. His professional objective is to better integrate economic perspectives and analysis into decision making related to water resource issues. Particular emphasis is placed on the application of economic analysis to interdisciplinary research of policy issues. The design and implementation of market-based policies to secure environmental objectives is a primary area of study within this context. He is currently involved in determining effective strategies for reducing nutrient loads in the Opequon Watershed in Virginia and West Virginia, including evaluating the cost effectiveness and feasibility of using urban nonpoint source controls (including stormwater management) as an offset to growth in point source loads. He is a member of the Virginia Department of Environmental Quality's Nutrient Trading Technical Advisory Committee and the Academic Advisory Committee. Dr. Stephenson received his B.S. in economics from Radford University, his M.S. in agricultural economics from Virginia Tech, and his Ph.D. in economics from the University of Nebraska.

Xavier Swamikannu is Chief of the Stormwater Permitting Program for the Los Angeles Regional Water Board and the California EPA, where he has worked for nearly 20 years. He has extensive experience with the implementation of municipal and industrial stormwater programs in Southern California, including the evaluation of pollutant discharges, determining the effectiveness of stormwater control measures in treating stormwater runoff,

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developing performance criteria and better understanding of their costs. He has participated on EPA's General Permits and Total Maximum Daily Load Work Groups and he has served on many state and regional technical advisory committees concerned with stormwater regulations. He was recognized by the California Water Boards in 2007 for his national leadership in the stormwater program, and by the California State Senate for his service on the technical advisory committee of the Santa Monica Bay Restoration Commission. Dr. Swamikannu received his B.S. in natural and chemical sciences from St. Joseph's College in Bangalore, India, his M.S. in environmental sciences from Texas Christian University, and his Ph.D. in environmental science and engineering from the University of California, Los Angeles.

Robert G. Traver is a professor of Civil and Environmental Engineering at Villanova University and the Director of the Villanova Urban Stormwater Partnership. He conducts research on topics that include modeling of stream hydraulics, urban hydrology, water quality, and measures to mitigate stormwater effects of urbanization. Most recently he has created a Stormwater Best Management Practice Demonstration and Research Park on the Villanova Campus. Dr. Traver is also involved with the implementation of stormwater policy. He has participated in a team study to review the effects of Pennsylvania's water regulation from a watershed sustainability viewpoint, acted as a reviewer for Pennsylvania's 1995 Best Management Practice Handbook, and has served as Chair for the 1998, 1999, 2001, 2003, and 2005 Pennsylvania Stormwater Management Symposiums held at Villanova. More recently he was selected to serve on the American Society of Civil Engineers' External Review Panel of the Corps investigation of Hurricane Katrina. Dr. Traver is a retired LTC in the Army Reserves and a veteran of Operation Desert Storm. He received his B.S. in civil engineering from the Virginia Military Institute, his M.S. in civil engineering from Villanova, and his Ph.D. in civil engineering from Pennsylvania State University.

Wendy E. Wagner is the Joe A. Worsham Centennial Professor at the University of Texas School of Law. Before joining the UT faculty, she was a professor at Case Western Reserve University School of Law and a visiting professor at Columbia Law School and the Vanderbilt School of Law. Wagner's research focuses on the interface between science and environmental law, and her articles have appeared in numerous journals, including the Columbia, Cornell, Duke, Georgetown, Illinois, Texas, Wisconsin, and Yale Law Reviews. She has published on the practical problems with EPA's current approach to stormwater regulation. She has also written several articles on the challenges of regulating media like stormwater, on restoring polluted waters with public values, on the legal aspects of the regulatory use of environmental modeling, and on technology-based standards. Ms. Wagner received a master's degree in environmental studies from the Yale School of Forestry and

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Environmental Studies and a law degree from Yale Law School. She clerked for the Honorable Judge Albert Engel, Chief Judge of the U.S. Court of Appeals for the 6th Circuit.

William E. Wenk is founder and president of Wenk Associates, Inc., a Denver-based landscape architectural firm. He is also an Adjunct Associate Professor of Landscape Architecture at the University of Colorado in Denver. For over 20 years, he has been influential in the restoration and redevelopment of urban river and stream corridors, the transformation of derelict urban land, and the design of public parks and open spaces. Mr. Wenk was the Principal Urban Designer for the Menomonee River Valley Redevelopment, an award-winning "green infrastructure" redevelopment in Milwaukee that integrated a network of parks and open spaces through stormwater infrastructure, regional and local trails, and a restored river corridor into a proposed 130-acre mixed-use and light industrial development. Other projects of his include the Prairie Trail Community Master Plan in Ankeny, Iowa (a surface stormwater system designed to provide flood control and water quality for a new 1000-acre mixed-use community), and the Stapleton Airport Parks and Open Space Redevelopment (a surface stormwater drainage design for the 4,500-acre redevelopment), as well as the Stapleton Water Quality Guidelines book to guide planners and developers on how to integrate stormwater best management practices into redevelopment. Mr. Wenk received a B.S.L.A. and M.L.A. from Michigan State University and the University of Oregon, respectively.

Laura J. Ehlers is a senior staff officer for the Water Science and Technology Board of the National Research Council. Since joining the NRC in 1997, she has served as the study director for eleven committees, including the Committee to Review the New York City Watershed Management Strategy, the Committee on Bioavailability of Contaminants in Soils and Sediment, the Committee on Assessment of Water Resources Research, and the Committee on Public Water Supply Distribution Systems: Assessing and Reducing Risks. Ehlers has periodically consulted for EPA's Office of Research Development regarding their water quality research programs. She received her B.S. from the California Institute of Technology, majoring in biology and engineering and applied science. She earned both an M.S.E. and a Ph.D. in environmental engineering at the Johns Hopkins University. Her dissertation, entitled RP4 Plasmid Transfer among Strains of *Pseudomonas* in a Biofilm, was awarded the 1998 Parsons Engineering/Association of Environmental Engineering Professors award for best doctoral thesis.

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Low Impact Development Manual for Southern California:

Technical Guidance and Site Planning Strategies

Prepared for

the Southern California Stormwater Monitoring Coalition

in cooperation with the State Water Resources Control Board

By

The Low Impact Development Center Inc

April 2010

Prepared for the Southern California Stormwater Monitoring Coalition, in cooperation with the State Water Resources Control Board, by the Low Impact Development Center, Inc.

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Executive Summary

Southern California is facing increased demands from urbanization, which can create adverse impacts to water quality and quantity. Urban areas can discharge polluted runoff and degrade alluvial channels. Two-thirds of urban streams have excessive nutrient pollution, and fecal coliform bacteria in these streams commonly exceed standards for water recreation (USGS, 2008). Water pollution not only impacts the beneficial uses of our receiving waters (e.g. aquatic life, recreation), but also represents a significant cost to cities as they strive to comply with increasingly stringent state and federal water quality regulations. The Southern California region, under the jurisdiction of three California Regional Water Quality Control Boards (RWQCBs), is faced with rapid population growth and continuous budget constraints. The region will meet the challenge of improving receiving water quality by incorporating low impact development (LID) stormwater techniques.

Stormwater is increasingly being managed through the strategies and principles of Low Impact Development, which is defined as an ecosystem-based approach to designing a built environment that remains a functioning part of an ecosystem rather than existing apart from it. It is an innovative approach to urban stormwater management that does not rely solely on conventional end-of-pipe structural methods; rather, it strategically integrates stormwater controls into the urban landscape. Targeted watershed goals and objectives can be addressed through the use of structural and non-structural LID techniques in order to reduce the discharge of pollutants and the effects of changes to runoff patterns caused by land use modifications (hydromodification).

Land developments in Southern California that drain to the Pacific coast and to inland waters and reservoirs have generated significant increases in stormwater runoff volume, which in turn has contributed to the discharge of pollutants into receiving waters, degraded aquatic habitat, impacted recreational use of these waters, and interfered with their use as water supply (California Department of Water Resources, 2009). LID for new development may only reduce the rate of increase of water quality degradation. Incorporating LID in redevelopment, where feasible, can replicate and enhance a site's hydrologic function, though it should be noted that creating a built environment that is a functioning part of an ecosystem in developed areas where water quality is already degraded may take extensive redevelopment and long periods of time, perhaps 50 to 100 years, before any benefits to water quality may be observed.

The purpose of this LID Manual is to serve as a resource that can be used to guide communities in the development of design, construction, and maintenance standards and specifications, as well as codes and ordinances, which can support their water quality management and regulatory compliance programs. It is intended to complement evolving local stormwater management requirements driven by the adoption of new municipal separate storm sewer system (MS4) permits under the Clean Water Act. New MS4 permits are increasingly requiring the adoption of LID techniques to minimize increases in runoff volume and peak discharge rates resulting from land development. Local permits are discussed in Appendix B.

Hydromodification has been identified as a leading source of water quality impairment in the United States (EPA, 2004). Hydrologic modifications change a site's runoff and transport characteristics, diminishing infiltration, interception, and evapotranspiration, thereby altering the distribution and flow of water across a site. LID is a design strategy that utilizes decentralized, small-scale source control structural and/or non-structural stormwater practices to meet certain technical requirements of federal, state, and local government stormwater management regulations, as well as natural resource protection and restoration goals. This approach can be used as an alternative or enhancement for conventional end-of-pipe stormwater pond technology. This alternative tool is important because it has the potential to lessen the energy impacts of large concentrated volumes of runoff from conventional end-of-pipe approaches on receiving waters and to reduce the development footprint and long-term maintenance considerations for end-of-pipe facilities. LID has also been used to meet targeted regulatory and resource protection objectives. LID addresses hydromodification through the use of "customized" small-scale source controls that allow the designer to select BMPs that best meet the watershed goals and

objectives. This approach also allows for the creation of treatment trains, which use a system of different techniques to provide multiple opportunities to reduce pollutant loads.

How to Use This Manual

This manual provides site planning and design guidance, but given the varying site conditions and regulations throughout the region it is not practical to provide suggestions and guidance for every possible situation. The recommendations in this manual are not intended to supersede any local regulations. The manual consists of concepts and techniques presented in a format that will facilitate dialogue between developers, engineers, and local governments to encourage adaptation and integration of these strategies and techniques into local regulatory and watershed protection programs.

In summary, this is a manual of practice for LID that provides:

- Details on how to use LID Principles and LID Best Management Practices (BMPs) to reduce the impacts of land development or re-development on water resources at the project level.
- Guidance for municipalities, land use planners, land developers, consultants, design professionals who prepare stormwater engineering plans and specifications, and others in private industry and public service.
- A site planning and design reference that will facilitate the implementation of LID for projects in Southern California. It is designed to complement the Stormwater BMP Manual(s) that have been developed and are maintained by the California Stormwater Quality Association (CASQA).
- A tool that can be applied at the site level for the development of integrated water and stormwater management regulatory compliance and resource protection programs.

The Manual is structured as follows:

Executive Summary
Provides an overview of the Manual's structure and objectives.

Section 1: The Impacts of Development and How LID Can Help
Describes how LID can be used to address major water quality and regional environmental challenges.

Section 2: The LID Site Design Process

- **Step 1: Assess Site**
  Outlines the data to be collected prior to site design and directs the user to data resources.
- **Step 2: Define Goals**
  Describes how LID fits into the regulatory environment and how it can be used in green building.
- **Step 3: Implement LID Principles**
  Presents site planning strategies to minimize the generation of stormwater runoff.
- **Step 4: Use LID BMPs to Mitigate Impacts**
  Discusses the selection and application of LID BMPs mitigate unavoidable stormwater runoff.
- **Step 5: Evaluate Design**
  Identifies methods for assessing the successful application of LID to a given site. Discusses the use of a number of modeling methods to evaluate LID designs.

Section 3: Case Studies
Presents case studies showing how LID is applied in various contexts.

Appendix A: Lists of Plants Suitable for LID in Southern California
Provides lists of plants suitable for general landscaping, bioretention, and green roofs in Southern California.

Appendix B: California Planning and Regulatory Framework for LID
Discusses how LID fits into California's regulatory environment.

Appendix C: LID, LEED, and the Sustainable Sites Initiative
Details how LID can be used to achieve LEED or Sustainable Sites Initiative Certification.

Section 1: The Impacts of Development and How LID Can Help

There are many potential benefits associated with the use of Low Impact Development (LID) practices. In addition to stormwater management, LID implementation can result in environmental, economic, and community benefits.

Potential Environmental Benefits

- Improved water quality
- Maintenance of predevelopment runoff volume
- Maintenance of predevelopment runoff discharge rate
- Groundwater recharge
- Terrestrial and aquatic habitat preservation
- Reduced potable water and energy demand
- Improved air quality
- Carbon sequestration
- Recycling and beneficial reuse
- Reduction in urban heat island effect

Potential Economic Benefits

- Reduced construction and maintenance costs (see SPU Cost-Benefit Analysis in *References and Resources* below)
- Improved marketability
- Energy cost reduction and water conservation

Potential Community Benefits

- Improved aesthetic value
- Provides “green job” opportunities
- Educational opportunities
- Health benefits

The primary factor to be considered when evaluating how to reduce and mitigate the impacts of stormwater is the pattern of rainfall in the watershed. The Southern California region experiences strong seasonal rainfall variation, with the wet season typically extending from October through April and virtually no rain from May through October. The region’s diverse topography results in a high degree of regional variation in total rainfall and storm size and annual rainfall totals can vary greatly from year to year. These variations will affect the feasibility, effectiveness and as a result the selection of various LID practices.

In addition to evaluating local climatic conditions in LID selection and sizing for stormwater benefits, it is necessary to understand the local hydrologic cycle in order to maintain or mimic the natural hydrologic function of a site.

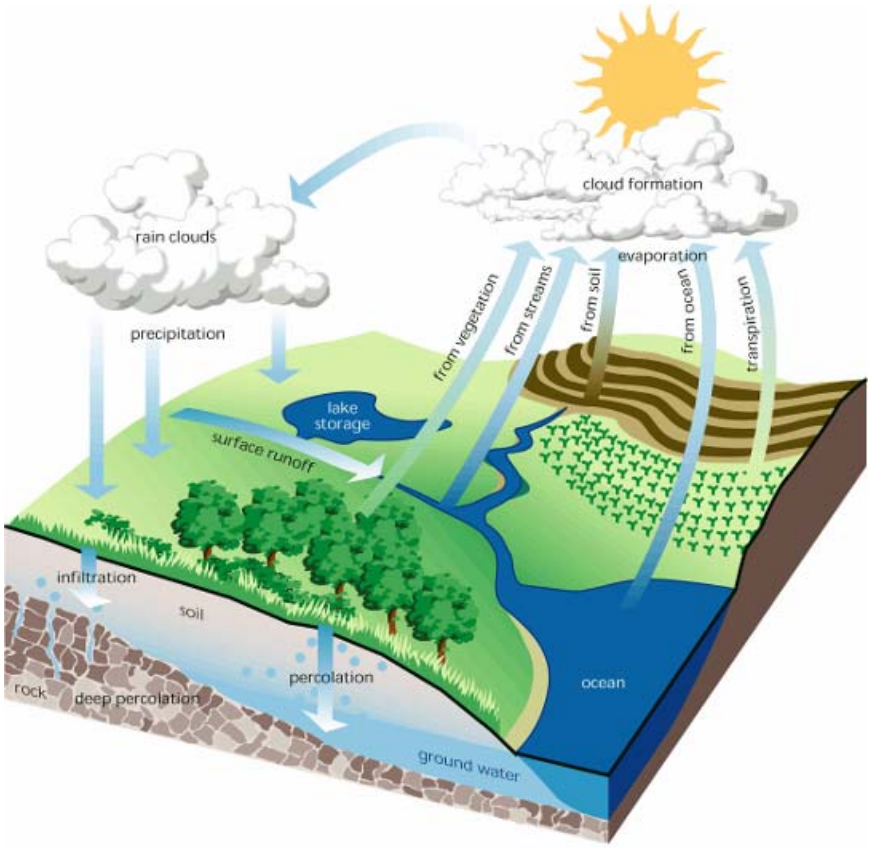

Figure 1. The Hydrologic Cycle.
Source: FISRG, 1998

Water cycles in the various regions of Southern California behave differently based on the amount of precipitation received. For example, in the northern part of Southern California, Pasadena receives 20 inches per year, while San Diego in the southwest receives just 10 inches. Los Angeles falls in the middle, averaging 15 inches per year. The low rainfall and high population of Southern California have lead to increasing concern over water importation. This, in turn, has led to efforts to manage groundwater resources and promote groundwater recharge (EMWD, 2005; OCWD, 2004).

Land development adds impervious surfaces such as rooftops, roads, and parking lots to the natural environment. As a result, the quantity and velocity of runoff increases, the amount of water that infiltrates to groundwater decreases, and pollutants deposited on the impervious surfaces are washed into stormwater conveyance systems and water bodies.

Typical alterations due to development may include:

- Increased imperviousness
- Increased runoff volume
- Reduced infiltration/groundwater recharge
- Introduction of new pollutants into watershed
- Increased pollutant concentrations
- Modifications to streams and channel banks

As a result of expansive development, the current hydrologic cycle in Southern California bears little resemblance to the natural system of a century ago. For example, in the 1920's approximately 95 percent of rainfall in Los Angeles was either infiltrated or evaporated, but that has dropped to approximately 50 percent as result of urban development (Green, 2007).

The primary goal of Low Impact Development is to preserve a site's predevelopment hydrology. The effects of changes to runoff patterns caused by land use modifications, or hydromodification, can be reduced by addressing targeted watershed goals and objectives through the use of structural and non-structural techniques that store, infiltrate, evaporate, and detain runoff. Achieving site design goals often requires consideration of the larger, less-frequent storm events that play a significant role in hydromodification, in addition to the small, frequent storms that are largely responsible for deteriorating water quality. Land use modifications may impact every aspect of site development and affect the hydrologic response of the site.

Figure 2 illustrates effects of development on the natural hydrologic cycle. The hydrologic response of a site is affected by every aspect of site development. Connected impervious areas and soil compaction characteristic of developed sites can cause runoff to be generated from even small amounts of rainfall. This results in an increase in volume and velocity of runoff, thereby increasing generation of sediment and suspended solids resulting from bank erosion.

Both LID and conventional stormwater management techniques attempt to control rates of runoff using accepted methods of hydrologic and hydraulic analysis, but conventional approaches typically include only the hydrologic components of precipitation, runoff conveyance and storage capacity. LID site design recognizes the significance of other components of the hydrologic cycle as well. How these other hydrologic components are taken into account will depend on the data available and purpose of the design. One LID design objective, for example, may be to preserve sediment load for a given site. There are many site design techniques that allow the site planner/engineer to create stormwater control mechanisms that function in a manner similar to that of natural control mechanisms. If LID techniques can be used for a particular site, the net result will be to more closely mimic the watershed's natural hydrologic functions or the water balance between runoff, infiltration, storage, groundwater recharge, and evapotranspiration. With the LID approach, receiving waters may experience fewer negative impacts in the volume, frequency, and quality of runoff, so as to maintain base flows and more closely approximate predevelopment runoff conditions.

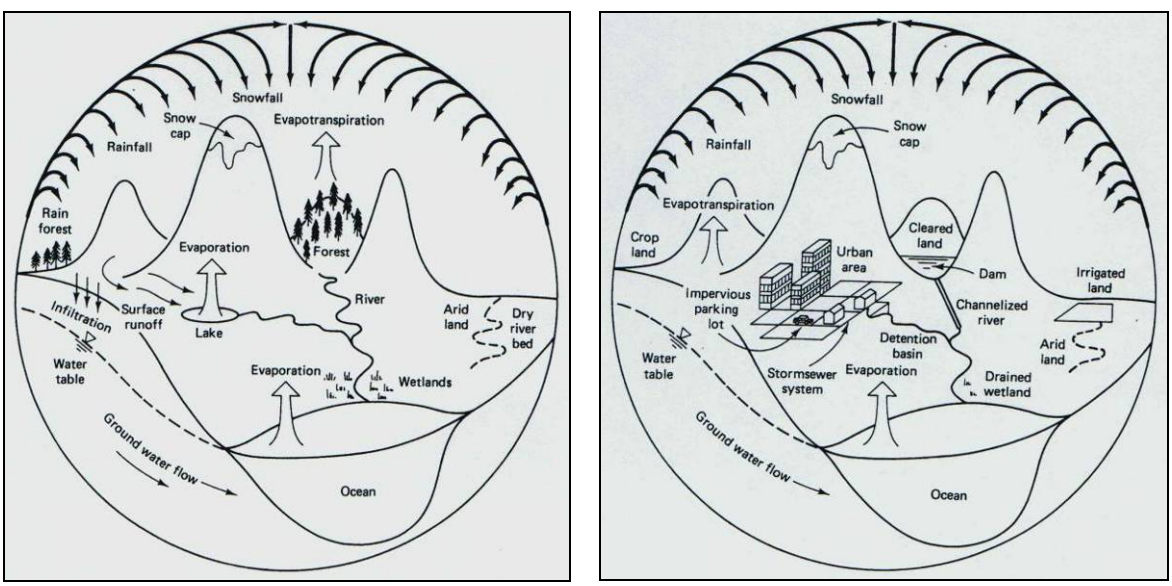

Figure 2. Natural Hydrologic Cycle (left); Hydrologic Cycle of a Developed Environment (right).
Source: McCuen, 1998

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Section 2: The LID Site Design Process

This manual establishes a framework for the LID site design process that informs all stages of planning and design. LID is not intended to be implemented as an afterthought, with a few BMPs placed on an otherwise conventionally designed site; proper implementation of LID techniques involves specialized site planning methods which are intended to be integrated into the overall site design. On a Low Impact Development project, consideration of natural resources such as soils, vegetation, and flow paths will influence the placement of buildings and paved surfaces, and as such LID needs to be considered at the earliest planning stages of a project.

A common misstep of developers and engineers is to wait until the final stages of development planning and design to attempt to incorporate LID, which often ends up requiring the loss of planned building space - or a costly re-design of the site. When LID is considered from the beginning, many designs can adequately meet the requirements for a project without significant loss of building space.

The process of planning a Low Impact Development project begins with a comprehensive understanding of the unique features of the site to be developed, which will guide the development of goals for minimizing the impact of the project. Next, a set of LID principles are included in the site planning process, to guide the creation of a site plan that works with the site's natural features and minimizes the generation of runoff. Once a sound site plan has been created, selected LID BMPs are included to capture and treat runoff where they are needed. The site plan is then evaluated to ensure that the stated goals have been met.

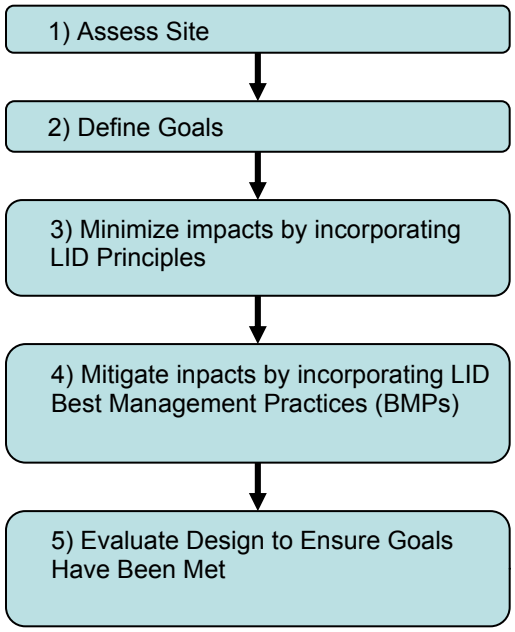

Figure 3. The LID Site Design Process.
Source: The Low Impact Development Center, Inc.

It is important to note that while the LID Site Design Process is presented in a linear fashion, in practice, steps three through five are an iterative process, where structural and non-structural design elements are added and adjusted in response to the modeling results until the project goals are met.

This design process is intended to be adaptable to a wide range of sites, economic constraints, and regulatory requirements, including those associated with new development, redevelopment, and retrofits, which may be subject to a variety of water quality, water quantity, and other requirements. These factors drive the site design, and guide the selection of the most appropriate practices and BMPs for the site.

The LID Site Design Process can be expected to require the balancing and rebalancing of a myriad of requirements placed on today's development projects in addition to those for water quality and water quantity, from the Americans with Disabilities Act requirements to xeriscaping requirements. Through the LID Site Design Process, the project professional must search for a balance that meets all requirements within the project budget.

The economics of LID are influenced by many factors, and the costs to implement LID will likely be a key factor in the level of LID implementation. New development projects are expected to provide the most economical opportunities for LID implementation. In new development, LID can be integrated into a project from its initiation when there are usually fewer project constraints and where LID features may be used in lieu of conventional, non LID features, potentially at savings to the project. Redevelopment and retrofit projects are expected to present more constraints to LID implementation, and these constraints are expected to make LID implementation on these types of projects more costly than in new development.

The economics of LID implementation warrants evaluation on both a capital and lifecycle basis. The capital cost analysis should include not only the cost to implement LID features, but also the potential savings in other features resulting from LID implementation. For example, a pervious paver parking lot may cost more to implement than a conventional asphalt concrete parking lot, but these costs may be offset by a reduction in storm drain costs or treatment control BMP costs made possible by the runoff reduction provided by the LID BMP. The lifecycle cost analysis should include not only the operation and maintenance costs, but also the potential savings in energy use and replacement costs. In the previous example, a pervious paver parking lot may have a life two the three times the life of an asphalt concrete parking lot, resulting in replacement savings. Perhaps the most complicated economic factor associated with LID is appropriately valuing the potential increase in marketability and desirability of LID projects.

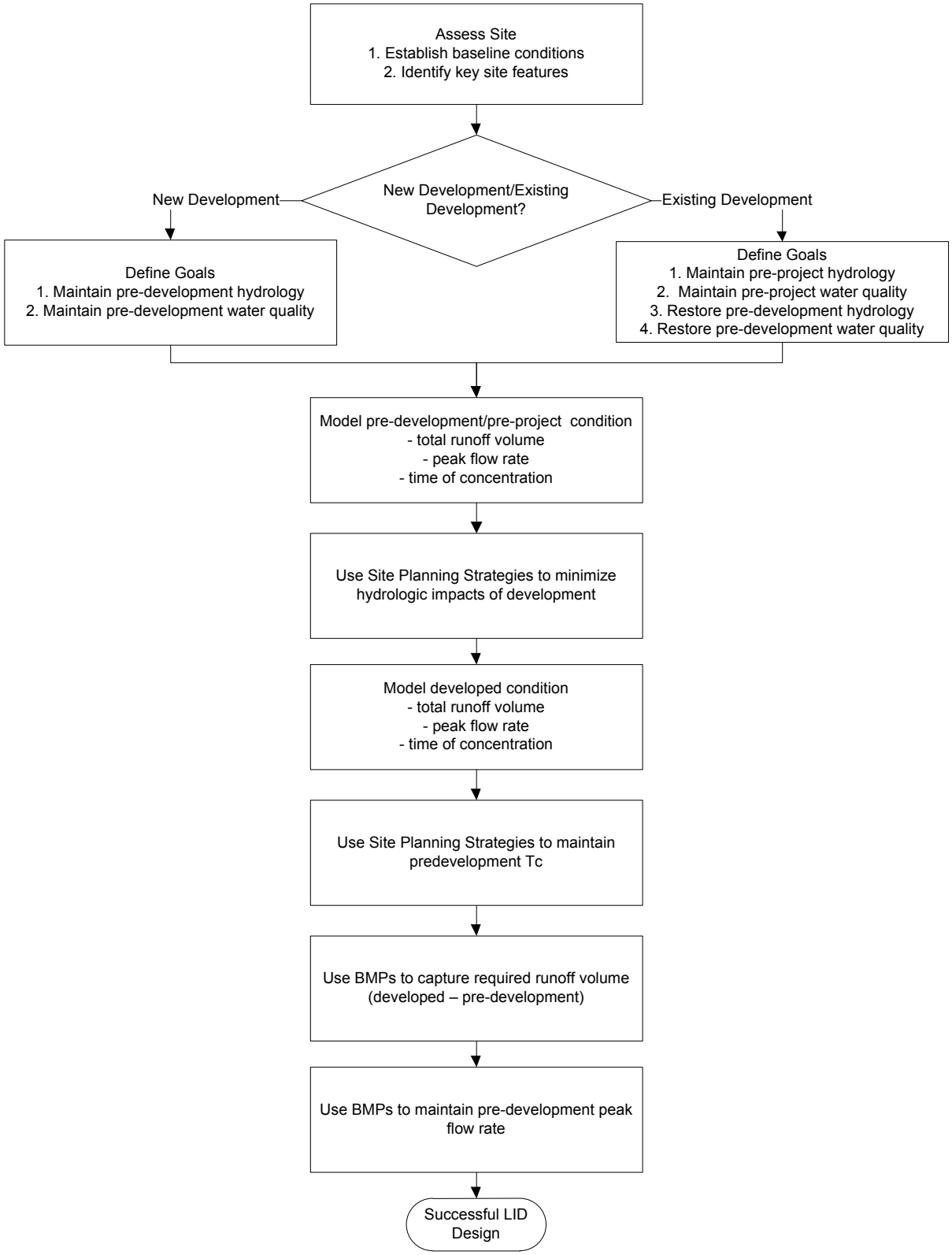

Figure 4. Use of the LID Site Design Process to Maintain or Restore Hydrologic Function.
Source: The Low Impact Development Center, Inc.

Integration with MS4 Permit Requirements
LID principles have been incorporated into local MS4 permits. The exact structure of these requirements varies by municipality, therefore, an effort has been made to present a design method that is sufficiently general to conform to a variety of local requirements. Discussion of specific local permitting issues is included in Appendix B.

Step 1: Conduct Site Assessment

A comprehensive site assessment is a fundamental starting point in the development of an LID site design. The site assessment will be a compilation of data from a variety of sources. These sources range from on-site visual inspection to professional surveys and geotechnical reports. The most important component of the site assessment process is the evaluation of the existing soils and drainage on-site and how they relate to the selection of specific LID practices.

The United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Web Soil Survey (WSS) is a common starting reference for the preliminary investigation of site suitability for LID. Soil Surveys include a plethora of planning level information for a site, from soil types to hydrologic soils groups. This resource can be used to develop a preliminary understanding of how LID would be best applied to the site. After the preliminary assessment of site soils has suggested the general site layout, then a site-specific geotechnical evaluation of soils is warranted. By conducting a geotechnical evaluation of site soils early in the LID Design Process, decisions regarding specific LID measures can be made with a higher degree of certainty, potentially reducing the number of iterations required to integrate LID into the site design.

The objective of the site assessment is a detailed site map, showing all of the data collected. This map will guide the selection and placement of site development (roads, parking lots and structures), structural, and non-structural BMPs.

The following list represents the foundation data for a comprehensive site assessment:

- Hydrology
- Topography
- Soils
- Geology
- Vegetation
- Eco-region
- Sensitive and Restricted Areas
- Existing Development
- Contamination
- Geological Considerations

Table 1 outlines each of the site assessment elements, what specific data should be collected and sources for the data of interest. Additional detail can be found in the sub-sections that follow.

Depending on the complexity of the site, a team of specialists may be required in order to conduct a thorough site assessment. These professionals may include: geotechnical engineers, surveyors, soil scientists, and restoration ecologists.

Table 1. Necessary Data Collection for Site Assessment.

Factor	Data of Interest	Data Sources	Development Stage
Hydrology	• Streams and receiving waters • Floodplains • Flow paths • Upslope drainage • Connection to existing drainage	• GIS maps • Professional property survey • National Atlas • FEMA Map Service Center	• Hydrology Study (usually prior to CEQA)
Topography	• 1' contours • Elevations of existing curbs and gutters	• Professional property survey • GIS maps • As-built drawings	• Phase One site assessment (usually part of due diligence)
Soils & Geological Considerations	• Hydrologic Soils Group • Soil texture • Impermeable or restrictive layers • Depth to bedrock • Depth to groundwater • Infiltration rate • Landslide potential	• NRCS soil maps • Professional soil testing • Assessment by geotechnical engineer	• Phase One site assessment • Geotechnical Report (usually prior to CEQA and included in CEQA document; often part of WQMP but best done earlier)
Vegetation	• Existing cover • Existing plant communities • Well-established trees	• GIS maps • Professional site survey	• Biological report (almost always done before CEQA and included in the circulated CEQA document)
Ecoregion	• Ecoregion	• USDA Forest Service • US EPA	• Biological reports
Sensitive and Restricted Areas	• Wetlands • Streamside Management Areas • Watercourse and Lake Protection Zones • Floodplains • Established trees • Intact forest • Habitat for threatened or endangered species • Easements • Underground storage tanks • Underground utilities	• Local County/City • California EPA • Deed search • Site survey	• Biological report • Jurisdictional delineation (almost always done before CEQA document prepared) • Special surveys (vireo, fairy shrimp, etc.) almost always done before CEQA document is prepared • Phase One
Existing Development	• Buildings • Paved areas • Landscaped areas • Utilities	• As-built site plans • Site Survey	• Many venues for gathering this information
Contamination	• Brownfield designation • Abandoned landfills • Groundwater contamination	• Local County/City • US EPA • California EPA • California Department of Toxic Substances Control	• Phase One

Source: The Low Impact Development Center, Inc.

LID Site Assessment – *Existing Hydrology*

One of the key pieces of the site assessment will be to map the site's existing hydrology. The map should include:

- Onsite streams and other water bodies
- Existing flow paths
- Floodplains
- Depth to groundwater
- Connections to and routing of existing storm drain systems
- Receiving waters
- Upslope drainage

Much of this information may be available from city and county municipal agencies. Where such data is not available, the site will need to be mapped by a qualified professional.

Existing flow paths and upslope drainage concerns can be assessed by examining topographic maps of the site.

Information on depth to groundwater can be found in the Natural Resources Conservation Service (NRCS) Web Soil Survey.

One of the best ways to get a sense of how water moves on the site is to visit during a heavy rain, taking note of where the water flows.

Additionally, the site should be placed in the context of the larger watershed. Identify any special concerns in the watershed. Find out whether the receiving waters are listed as impaired under section 303(d) of the Clean Water Act. The list is maintained by the State Water Resources Control Board (http://www.waterboards.ca.gov/water_issues/programs/tmdl/docs/303dlists2006/epa/state_usepa_combined.pdf). If the receiving water is listed, the development may be subject to additional regulatory requirements.

References and Resources

Cal-Atlas: http://atlas.ca.gov

USDA NRCS Web Soil Survey: http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm

USGS National Water Information Service: http://water.usgs.gov/nwis

LID Site Assessment – *Topography*

The topography of the site defines both the location and capacity requirements for potential LID implementations. The topography of upstream and downstream sites should also be considered with respect to any potential contribution to the total runoff generated during a storm event.

To design effective LID into new or existing sites requires a careful analysis of the topography and how and where stormwater runoff will concentrate and flow. Visiting the site during a storm event can provide an enormous amount of information regarding areas of concentration and flow. In the event preliminary data cannot be found, a topographic survey should be ordered prior to proceeding with the design phase of the project.

To be able to perform a detailed topographic site analysis, the following information must be acquired and evaluated:

- A detailed site topographic map showing the smallest contour interval possible; a contour map showing the contours at a 1-foot interval is preferred. For initial planning and scoping purposes, additional intervals can be interpolated from maps with larger intervals if necessary. If possible, try to obtain as-built drawings that may exist from previous construction.
- The location and elevation of existing drainage or stormwater structures, including the elevation of the rim of the structure where stormwater enters and the inverts of drainage pipes entering or exiting the structure.
- Elevation of all curbs and gutters on the site. The drawing should show top of curb and bottom of curb elevations. High and low points of walkways, driveways, and parking areas should also be noted.
- Location of drainage swales on the site. Indicate the flow direction in the channel for reference.

Check with the property owner for as-built drawings that might be available.

The local county GIS office may have a topography layer available that could provide working information, but keep in mind this data is typically not survey-quality data and should only be used for preliminary evaluation of the contributing watershed for your site LID BMPs.

USGS 1:24,000 Quad maps can be used to calculate the contributing watershed on larger sites.

References and Resources

USGS Topographic Maps: http://topomaps.usgs.gov/

LID Site Assessment – *Soils and Geology*

As many LID BMPs are designed to infiltrate runoff, understanding the site's soil type, characteristics, and profile will help focus efforts on measures that are most appropriate for managing stormwater on the site. This section describes considerations for assessing the site's soils that will help inform the placement of buildings and paved areas, and suggest the most suitable BMPs and where they would be best placed.

Failure to understand the characteristics and capabilities of the specific site soils results in poorly functioning LID designs. Proper understanding of the analysis and application of soil type and its capacity to infiltrate stormwater and mitigate non-point pollutants is imperative to the success of any LID implementation.

The following is a summary of soil considerations that should be assessed for the site. Additional information on each of these is provided below:

- Initial Soils Assessment
    - Hydrologic Soils Group

- On-Site Soils Assessment
    - Measured infiltration rates
    - Trench / Boring Logs
    - Depth to or presence of limiting soil types, i.e. expansive soils, caliche, fragipan, corrosive soils
- Geologic Assessment
    - Depth to bedrock
    - Depth to water table
    - Susceptibility to landslides

Initial Soils Assessment

Information regarding a site's hydrologic soils group can generally be gathered from available regional soils studies and may **only** be used as a preliminary source for soil characterization and early planning. When this information is used to estimate infiltration rates or BMP sizes, a safety factor of 10 is appropriately applied – and can usually be reduced once in situ testing has been completed. Site specific soil testing, by a qualified civil or geotechnical engineer, is essential before preliminary and final design and implementation of LID projects in order to confirm soil properties including infiltration capacity and should be done as early in the design process as possible.

The Natural Resources Conservation Service (NRCS) has compiled soils data on the U.S. Department of Agriculture (USDA) website. The online soil survey is called the Web Soil Survey (WSS) and can be viewed at the following URL: http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm.

In the event the WSS is unable to provide a soil map for the site of interest, which is often the case in areas of urban development, soil maps may be available from state or municipal government agencies. The local NRCS office may have access to published printed soil survey data which has not yet been posted online.

Soil series are assigned a Hydrologic Soil Group (HSG) rating, A through D, which describes the physical drainage and textural properties of each soil type and is useful for stormwater, wastewater, and other applications. This HSG rating is usually based on a range of permeability, as well as certain physical constraints such as soil texture, depth to bedrock, and seasonal high water table (SHWT). Soil types assigned an HSG Group A classification are very well drained and highly permeable (sand, loamy sand, sandy loam); Group D soils (clay loam, silty clay loam, sandy clay, silty clay, clay) are poorly drained and often situated in a valley bottom or floodplain. HSG-rated B and C soils offer good (B; silt loam, loam) to fair (C; sandy clay loam) drainage characteristics (USDA-SCS, 1986). The heavier D soils have little if any infiltration potential during rainfall events and produce much greater surface runoff in response to rainfall. Many soils in Southern California are classified with a HSG rating of C or D, which are usually not especially conducive to and will limit applicability of infiltration practices. In fact, data for the six counties covered by Regional Boards 4, 8, and 9 indicates that 3 percent of the soils are classified as A, 17 percent of soils are classified as B, 30 percent as C, 33 percent as D, and 16 percent as Urban Soils. It should be noted that the permeability ranges listed for the HSG ratings are based on the minimum rate of infiltration obtained for bare soil after prolonged wetting (USDA-SCS, 1986). A vegetative cover can increase these rates 3 to 7 times (Lindsey et. al., 1992).

These NRCS soil maps can be used to identify areas with potentially high infiltration rates (HSG Group A and B), which are potential areas for locating infiltration-based BMPs. Where possible, buildings and paved surfaces should be sited on less permeable soils.

Although initial soils information may be estimated using regional soils studies (typically using web-based or GIS data), in most cases this will not be an adequate replacement for on-site analysis. Additionally, it is important to adequately understand and characterize the infiltration capacity of the entire soil profile, as deeper soils may be more limiting to infiltration than surface soils.

On-Site Soils Assessment

Infiltration Testing

Infiltration tests should be performed in areas where infiltration-based BMPs are proposed and typically a minimum infiltration rate of 0.5 inch per hour is required. A variety of field testing techniques can be used to determine infiltration rate, including basin flooding, sprinkler infiltrometers, cylinder or double-ring infiltrometers, and lysimeters. Appropriate techniques should be selected based on the method of stormwater application being considered and may be subject to local guidance. Basin flooding and cylinder infiltrometer tests are preferred for the design of stormwater retention facilities (US EPA, 1998). The standard US Public Health Service percolation test used to design septic drain fields is not recommended.

Trench / Boring Logs
Once potential building and BMP locations have been identified, a qualified soil scientist or geotechnical engineer should dig test pits to gather more detailed information on the soils present at these locations. Test pits are required to confirm the types of soils present onsite, and will uncover the presence of soil layers that may impede infiltration, such as caliche or fragipan. Test pits will also determine the depth to bedrock and will help to establish the high groundwater elevation.

In developed sites being evaluated for redevelopment or retrofits, soil bulk density should be measured in a number of areas to determine the level of soil compaction, which can dramatically impede the movement of water into the soil.

Other Limiting Factors
Many of the soils in Southern California contain fairly shallow, moderately cemented restrictive layers of lithic or paralithic bedrock. These restrictive layers will limit the applicability of infiltration designs. Another likely challenge to infiltration is a type of soil known as caliche, which is found in many areas of the region. Caliche is a layer of soil in which the soil particles have been cemented together by lime (calcium carbonate, $CaCO_3$). It is usually found as a light-colored layer in the soil or as white or cream-colored concretions (lumps) mixed with the soil. Layers will vary in thickness from a few inches to several feet, and there may be more than one caliche layer in the soil.

Caliche is also problematic for vegetation in at least three ways. First, the caliche layer can be so tight that roots cannot penetrate through it. The result is that plants have only the soil above the caliche to use as a source of nutrients and water and normal root development is restricted. Second, the same conditions that restrict root penetration also reduce water movement. Water applied to the soil cannot easily move through the profile if a restrictive caliche layer is present. The restricted water penetration can contribute to problems arising from inadequate root aeration and can lead to accumulations of salt in the soil surface. Both problems, lack of aeration and salt accumulation, reduce the vigor of growing plants. Third, the pH and free calcium carbonate in a caliche soil are often high enough to cause iron to become unavailable for plants. The symptoms of iron deficiency are a yellowing of the youngest plant leaves while the veins in the leaves remain green. Iron deficiencies are further aggravated by the water saturation of the soil.

In some cases, near-surface caliche layers can be broken apart through mechanical means during site grading. This is typically accomplished by deep ripping, a process that involves using a bulldozer to drag a long tine through the soil on a checkerboard pattern. This process may remove the water penetration restriction, but may not mitigate the other challenges associated with caliche soils.

Many areas in Southern California have soils that are corrosive to metals and concrete. These soils are characterized by: high moisture content, high dissolved salts, and high acidity. Caltrans has established the following criteria for corrosive soils (Caltrans, 2003):

- Chloride concentration ≥ 500 ppm,
- Sulfate concentration ≥ 2,000 ppm, or
- pH ≤ 5.5

If one or more of these conditions is met, the site may require corrosion mitigation prior to the installation of any underground BMPs.

Pollutant Removal

Unpaved surfaces provide both infiltration and pollutant removal functions. Soils have a high capacity to remove soluble and insoluble pollutants from stormwater. Many factors influence a soil's pollutant removal capacity. Fully understanding soil pollutant removal involves a detailed understanding of hydrology, soils physics and chemistry, aquatic chemistry, biology, and botany. Factors that influence pollutant removal include the quality of the infiltrating water, and soil characteristics such as age, pH, mineral content, organic matter content, oxidation-reduction potential (redox), as well as the soil flora and fauna at the surface and in the subsurface.

Soil provides the medium for decomposition of organic material that is deposited on the land surface. Soil is the habitat for a vast spectrum of micro- and macro-organisms that form a natural recycling system. The rhizosphere (the rooting zone) includes roots, viruses, bacteria, fungi, algae, protozoa, mites, nematodes, worms, ants, maggots, other insects and insect larvae (grubs), earthworms and rodents. Processed nutrients in the rhizosphere are in turn used by the vegetative systems that develop on the soil mantle. When precipitation is infiltrated, pollutants from surface activities move into this soil treatment system, which effectively and efficiently breaks down most non-point source pollutants (biologically), removes them from the stormwater by cation exchange (chemically), and/or physically filters them through soil particles.

One important measure of chemical pollutant removal potential is cation exchange capacity (CEC), which describes the soil's ability to adsorb positively charged ions. A soil's CEC is a function of its clay and organic contents. Soils with a CEC of at least 10 milliequivalents per 100 grams are very efficient as a treatment medium, and offer the best opportunity to reduce or completely remove most common stormwater pollutants, such as phosphorus, metals and hydrocarbons. Non-point source pollutants that are solutes, such as nitrate, are the exception. Nitrates typically move with the infiltrating rainfall and do not undergo significant reduction or transformation, unless an anaerobic environment with the right class of microorganisms is encountered.

Phosphorus is a key pollutant of concern in many watersheds. Soils can act as either a source or a sink for certain forms of phosphorus, depending on their innate phosphorus content, measured by the P-index (Hunt et al, 2006). This can be of particular concern when soil is used as a pollutant filter, such as in bioretention. Use of high P-index soils in bioretention can lead to the bioretention cell exporting rather than removing certain forms of phosphorus. Table 2 summarizes the ideal soil properties for infiltration and pollutant removal. It is important to note that LID principles can be adapted to any site soil conditions. This table is intended only to facilitate the identification of areas where infiltration BMPs would be best suited, and to flag any special soil conditions that may need to be considered.

Table 2. Ideal Soil Properties for Infiltration and Pollutant Removal.

Property	Ideal range for infiltration/ pollutant removal
USDA textural classification	Sand, loamy sand, sandy loam, or loam
HSG	A or B
Infiltration rate	0.5 in/hr
CEC	> 10 milli-equivalents/100 grams
Organic Content	1.5 – 10%
P-index	< 25
pH	5.5-7.5
Depth to impermeable layers	> 5 feet
Depth to groundwater	> 10 feet

Source: The Low Impact Development Center, Inc.

Geologic Assessment

The primary geologic factors that influence selection and placement of LID BMPs are the depth to bedrock and the water table, and susceptibility to landslides. The depths to bedrock and the water table can be easily obtained as part of the site soils assessment described above.

Landslides
Southern California's physiography makes certain areas prone to landslides. Landsliding is a form of mass wasting, or gravity-caused erosion, and is a natural process which occurs readily in certain earth materials. The action of landsliding is heavily influenced by the saturation of soil and rock masses and is, to the dismay of thousands of its residents, a natural process on California's hill slopes.

LID design in areas prone to landslides, especially those that utilize infiltration, should be given careful consideration and should be subject to review by a licensed civil or geotechnical engineer. Since soil saturation is a primary cause of landslides, infiltration should be limited in areas of high landslide risk. Local construction best practices should also be considered when implementing LID in an area that is subject to landslides.

References and Resources

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USGS Education – California: Geography, Geology, Hazards, and Natural History Information http://education.usgs.gov/california/resources.html

USGS - Geologic Information for Southern California http://scamp.wr.usgs.gov/

USGS - Landslide Hazards Program http://landslides.usgs.gov/

USGS - Landslide Types and Processes http://pubs.usgs.gov/fs/2004/3072/fs-2004-3072.html

USGS - National Geologic Map Database http://ngmdb.usgs.gov/

USGS - National Landslide Overview Map of the United States
http://landslides.usgs.gov/learning/nationalmap/

LID Site Assessment – *Vegetation*

Knowledge of the plant communities occurring onsite is a factor in developing a site design that is well-integrated into the natural environment. Although development pressures have removed or strongly modified much of the natural vegetation in the area, ongoing development, redevelopment, and restoration efforts may present opportunities to protect and/or recapture some of the region's native plant communities.

When a site is disturbed by either natural events or human intervention, invasive species have the opportunity to gain a toe hold and dominate indigenous plant communities. Invasive species are plants that have been recently introduced and have the ability to thrive beyond their range of natural dispersal. Typically invasive species are characterized as adaptable, aggressive and have a high reproductive capability. These characteristics allow them to monopolize the limited resources available after a site disturbance has occurred and to outcompete native plant species. It is critical to identify these invaders during site assessment and, as part of the plant community restoration plan, to minimize the introduction and establishment of invasive plants into the landscape. Where a site is completely dominated by invasives, it may be possible to restore native vegetation into the planned landscaping. A qualified restoration ecologist should be consulted to create an appropriate restoration plan.

Southern California's natural vegetation reflects the region's climate and diverse topography and soils. The structure and function of the area's natural plant communities are strongly influenced by drought, seasonal flooding, elevation, slope and aspect, geological variation, fire history, and unique occurrence of the Santa Ana winds. The vegetation exhibits high levels of species diversity and endemism, and provides habitat for a great range of animals.

A site assessment should include a survey of existing vegetation onsite, identifying:

- Existing or historical plant communities
- Existing invasive species
- The presence/location(s) of dense/native plant cover
- The presence/location(s) of well-established trees

The following points briefly summarize important characteristics of several major plant communities in Southern California to help in identifying native plant cover versus invasive species. (Bornstein et al, 2005; Lenz and Dourley, 1981; Las Pilitas Nursery):

- Coastal Scrub:
    - primarily small to medium shrubs, subshrubs, or succulents
    - some species produce large green leaves with winter rains and small grayish leaves in summer; other species are drought-deciduous
    - annual precipitation is generally 10-20 inches
    - relatively narrow temperature range
    - plants can be somewhat sparsely distributed in the landscape
    - tend to be found in flat to moderately-sloped areas; slopes may be rocky
    - shallow to moderate soil depth

Figure 5. Coastal Scrub.
Source: © Marc Hoshovsky, California Department of Fish and Game

- Chaparral:
    - most extensive type of vegetation in California
    - primarily medium to large shrubs with thick, small, evergreen leaves; also contains fire-adapted annuals
    - can form dense thickets
    - many types of chaparral are recognized, depending on dominant species and combinations of species; this variation reflects different elevations, moisture levels, and soil types
    - annual precipitation is generally 12-35 inches, occurring in infrequent, heavy events
    - found on hills and lower mountain slopes in areas with generally mild winters; often on steep slopes that are very hot in summer
    - fairly drought-tolerant and adapted to fire; many shrub species can sprout from stumps following fire
    - shallow, usually well-drained, rocky soils

Figure 6. Chaparral.
Source: California Chaparral Institute

- Grassland:
    - comprises bunchgrasses, sedges, and annual and perennial wildflowers
    - merges with chaparral or oak woodland at higher elevations
    - annual precipitation is generally 6-20 inches
    - soils range from: deep alluvial fan and floodplain, to moderately deep upland with high organic matter, to low terrace land soils having moderately dense subsoils, to poorly drained valley basin soils
    - no longer abundant (largely replaced by agricultural land uses)
    - invasive exotic grasses and other herbs have impaired some remaining California grassland

Figure 7. Grassland.
Source: I. Anderson Center for Biological Diversity

- Coastal Oak Woodland:
    - discontinuous overstory of Coast Live Oak, other oak trees, or California Walnut
    - canopy coverage can vary, with a mix of shrubs and grasses occurring in the understory
    - annual precipitation is generally 15-25 inches with substantial runoff
    - soils are generally deep terrace land or upland soils

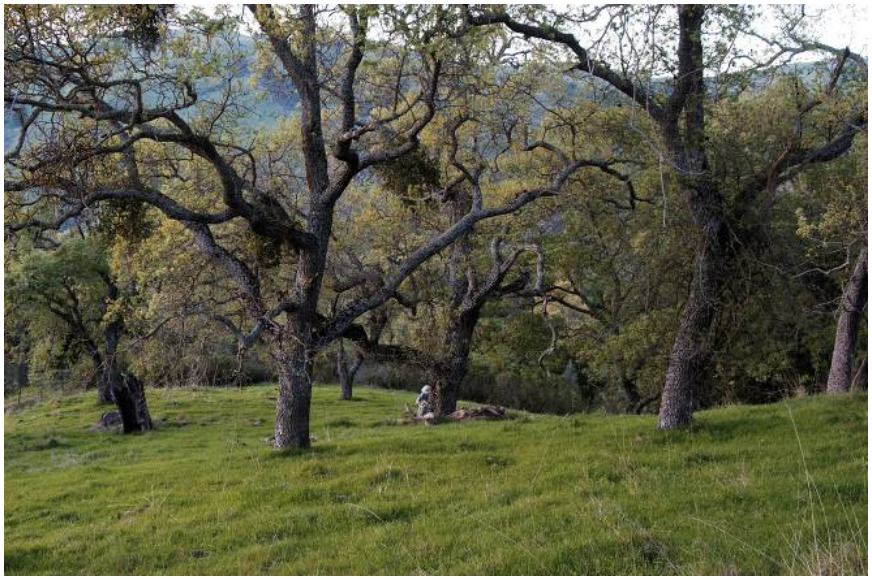

Figure 8. Oak Woodland.
Source: Daniel Griffin, University of Arkansas Tree-Ring Laboratory

- Riparian Woodland:
    - species composition varies with elevation
    - soils vary, depending on composition of materials deposited along waterways
    - plants generally require year-round presence of nearby surface water

Figure 9. Riparian Woodland.
Source: V.L. Holland, Ph.D.; Biological Sciences Department, California Polytechnic State University

- Pinyon-Juniper Woodland:
    - consists of juniper on shallower slopes and pinyon pine on higher and steeper slopes in mountain regions
    - plant community may have a variety of other trees, shrubs, and succulents
    - annual precipitation is generally 10-30 inches

Figure 10. Pinyon-Juniper Woodland.
Source: Joel Michaelsen; Department of Geology, UC Santa Barbara

- Pine Forest:
    - lower montane coniferous forest, with a great number of potential species (canopy and understory)
    - elevation generally ranges from 5,000 to 8,000 feet
    - annual precipitation is generally 25-80 inches (much of it falls as snow)
    - deep upland soils with moderate to high acidity

Figure 11. Pine Forest.
Source: Joel Michaelsen; Department of Geology, UC Santa Barbara

- Creosote Bush Scrub:
    - open, sparse desert community dominated by Creosote bush and prickly pear cactus
    - elevation generally less than 3,500 feet
    - annual precipitation is generally 5-10 inches
    - alkaline soils

Figure 12. Creosote Bush Scrub.
Source: Carrie Tai

- Joshua Tree Woodland:
    - desert community dominated by Joshua trees, shrubs and wildflowers
    - elevation generally ranges from 2,500 to 5,000 feet
    - annual precipitation is generally 5-10 inches
    - neutral soils

Figure 13. Joshua Tree Woodland.
Source: Carrie Tai

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LID Site Assessment – *Ecoregion*

Ecoregions and Native Plant Communities

Landscaping within a Low Impact Development project can be modeled on native plant communities found within an area's ecoregion. According to the World Wildlife Fund, an ecoregion is a "large area of land or water that contains a geographically distinct assemblage of natural communities that:

- share a large majority of their species and ecological dynamics;
- share similar environmental conditions, and;
- interact ecologically in ways that are critical for their long-term persistence."

Ecoregions can be described at a variety of spatial scales and further delineated into different subregions, such as provinces and sections. Two ecological subregions occur within the jurisdictions of Regional Water Quality Control Boards 4, 8 and 9, and have direct significance to this manual (USDA-FS, 1997):

1. Southern California Coast
2. Southern California Mountains and Valleys

In addition to the above subregions, large portions of Los Angeles, San Bernardino, Riverside, and San Diego Counties fall within three other ecoregions to the east:

1. Mohave Desert
2. Sonoran Desert
3. Colorado Desert

The ecoregions for the three RWQCB Regions in the project area are very broadly outlined; they can be further subdivided into sections and subsections within the hierarchical framework of ecoregions. Individual subsections have characteristic topography, soils, climate, and associated vegetation types. These features are summarized in Table 3 and Table 4 for the subsections that occur in the project area. Understanding the unique elements in a specific ecoregion the BMP is located in will inform the choices of plant materials incorporated into the BMP. This consideration will enhance the survival and sustainability of the selected plant material as well as provide habitat and cover for native wildlife.

Table 3. Climate and Vegetation of the Southern California Coast Ecoregion.

Subsection	Mean Annual Temp. & Precip.	Surface Water	Predominant Vegetation	Less Common Vegetation
Santa Ynez – Sulphur Mountains	45° - 60° F 18-30 in	Rapid runoff; all but larger streams dry in summer; no natural lakes	Coastal Oak Woodland; Montane Hardwood Forest; Chamise Chaparral; Mixed Chaparral	Coastal Scrub; Duneland; Grassland
Oxnard Plain – Santa Paula Valley	56° - 60° F 12-18 in with summer fog	Santa Clara River is perennial, Calleguas Creek is year-round; no natural lakes	Coastal Scrub	Saline Emergent Wetland; Grassland; Coastal Oak Woodland; Valley Foothill Riparian Woodland
Simi Valley – Santa Susana Mountains	52° - 62° F 16-20 in	Rapid runoff; streams dry in summer; no natural lakes	Coastal Scrub; Chamise Chaparral; Coast Oak Woodland	Valley Oak Woodland; Montane Hardwood Forest; Grassland; Valley Foothill Riparian Woodland; Montane Riparian Forest
Santa Monica Mountains	54° - 62° F 15-25 in	Rapid runoff; streams dry in summer; no natural lakes	Coastal Scrub; Chamise Chaparral; Mixed Chaparral	Coast Oak Woodland; Grassland; Valley Foothill Riparian Woodland; Montane Riparian Forest; Valley Oak Woodland
Los Angeles Plain	58° - 64° F 12-20 in with summer fog	Most streams dry in summer; no natural lakes	Coastal Scrub	Coast Oak Woodland; Chamise Chaparral; Mixed Chaparral; Valley Foothill Riparian Woodland; Saline Emergent Wetland; Duneland; Grassland
Coastal Hills	56° - 62° F 12-16 in with summer fog	Rapid runoff; mix of perennial and summer-dry streams; no natural lakes; some reservoirs	Coastal Scrub; Coast Oak Woodland	Chamise Chaparral; Mixed Chaparral; Valley Foothill Riparian Woodland; Grassland
Coastal Terrace	58° - 62° F 10-12 in with summer fog	Rapid runoff except for terraces with vernal pools; mix of perennial and summer-dry streams; no natural lakes	Coastal Scrub; Chamise Chaparral	Coast Oak Woodland; Saline Emergent Wetland; Torrey Pine Stands; Vernal Pools; Duneland; Grassland; Mixed Chaparral; Valley Foothill Riparian Woodland

Sources: USDA-FS, 1997, and CA-DFG, 2009

Table 4. Climate and Vegetation of the Southern CA Mountains and Valleys Ecoregion.

Subsection	Mean Annual Temp. & Precip.	Surface Water	Predominant Vegetation	Less Common Vegetation
San Raphael – Topatopa Mountains	45° - 60° F 18-30 in	Rapid runoff; rain except at higher elevations; all but larger & high-elevation streams dry in summer; no natural lakes	Chamise Chaparral; Mixed Chaparral	Coastal Oak Woodland; Coastal Scrub; Montane Hardwood Conifer Forest; Montane Hardwood Forest; Jeffrey Pine Forest; White Fir Forest; Grassland; Wet Meadow
Northern Transverse Ranges	40° - 54° F 12-30 in	Rapid runoff; rain except at higher elevations; all but larger & high-elevation streams dry in summer; no natural lakes	Juniper Woodland; Jeffrey Pine Forest; Montane Hardwood Conifer Forest; Chamise Chaparral; Mixed Chaparral;	Coastal Scrub; Montane Hardwood Forest; Pinyon-Juniper Woodland; Montane Chaparral; Subalpine Conifer Forest; White Fir Forest; Grassland; Wet Meadow
Sierra Pelona – Mint Canyon	45° - 60° F 12-20 in	Rapid runoff; rain except at higher elevations; all but larger streams dry in summer; sag ponds along San Andreas Fault	Chamise Chaparral; Mixed Chaparral; Coastal Oak Woodland	Coastal Scrub; Montane Hardwood Conifer Forest; Montane Hardwood Forest; Jeffrey Pine Forest; Juniper Woodland; Montane Chaparral; Grassland; Wet Meadow;
San Gabriel Mountains	45° - 60° F 20-30 in	Rapid runoff; rain except at higher elevations; all but larger streams dry in summer; sag ponds along San Andreas Fault	Chamise Chaparral; Mixed Chaparral	Jeffrey Pine Forest; Juniper Woodland; Montane Hardwood Conifer Forest; Montane Hardwood Forest; Grassland; Montane Chaparral; Coastal Oak Woodland; Pinyon-Juniper Woodland; Wet Meadow
Upper San Gabriel Mountains	40° - 50° F 30-40 in	Rapid runoff; rain except at higher elevations; all but larger streams dry in summer; no natural lakes	Jeffrey Pine Forest	Lodgepole Pine Forest; Subalpine Conifer Forest; Montane Chaparral; Montane Hardwood Conifer Forest; Montane Hardwood Forest; Coastal Oak Woodland; Juniper Woodland; Wet Meadow
Santa Ana Mountains	45° - 62° F 15-25 in	Rapid runoff; rain except at higher elevations; all but larger streams dry in summer; no natural lakes (but some drainage to Lake Elsinore)	Coastal Oak Woodland; Chamise Chaparral; Mixed Chaparral	Montane Hardwood Conifer Forest; Montane Hardwood Forest; Coastal Scrub; Jeffrey Pine Forest; Montane Chaparral; Grassland; Vernal Pools

Sources: USDA-FS, 1997, and CA-DFG, 2009

Table 4 (cont.): Climate and Vegetation of the Southern CA Mountains and Valleys Ecoregion.

Subsection	Mean Annual Temp. & Precip.	Surface Water	Predominant Vegetation	Less Common Vegetation
San Gorgonio Mountains	45° - 60° F 20-30 in	Rapid runoff; rain except at higher elevations; all but larger streams dry in summer; no natural lakes	Chamise Chaparral; Mixed Chaparral; Jeffrey Pine Forest	Subalpine Conifer Forest; Montane Chaparral; Juniper Woodland; Montane Hardwood Conifer Forest; Montane Hardwood Forest; Coastal Oak Woodland; Pinyon-Juniper Woodland; Coastal Scrub; Grassland
Upper San Gorgonio Mountains	40° - 50° F 30-40 in	Rapid runoff; much precipitation is snow; all but larger streams dry in summer; previously natural lakes replaced by reservoirs	Jeffrey Pine Forest	Mixed Chaparral; Subalpine Conifer Forest; Lodgepole Pine Forest; Juniper Woodland; Montane Hardwood Conifer Forest; Montane Hardwood Forest; Montane Chaparral; White Fir Forest; Pinyon-Juniper Woodland; Wet Meadow; Alpine Meadow
Fontana – Calimesa Terraces	62° - 64° F 20-20 in	Rapid runoff (even from alluvial fans); all but larger streams dry in summer; Santa Ana River flows year-round; no natural lakes	Coastal Scrub; Grassland	Mixed Chaparral; Juniper Woodland; Valley Foothill Riparian Woodland
Perris Valley and Hills	58° - 64° F 10-16 in	Rapid runoff (except from floodplains and lake basins); all but larger streams dry in summer; sag ponds along Elsinore Fault Zone; reservoirs	Coastal Scrub; Grassland	Coastal Oak Woodland; Chamise Chaparral; Mixed Chaparral; Juniper Woodland; Vernal Pools
San Jacinto Foothills – Cahuilla Mountains	50° - 60° F 10-20 in	Rapid runoff (except from alluvial plains); all but larger streams dry in summer; no natural lakes	Coastal Oak Woodland; Coastal Scrub	Chamise Chaparral; Montane Hardwood Conifer Forest; Montane Hardwood Forest; Mixed Chaparral; Montane Chaparral; Juniper Woodland; Jeffrey Pine Forest; Pinyon-Juniper Woodland; Grassland
San Jacinto Mountains	40° - 58° F 16-30 in	Rapid runoff (except from alluvial plains); rain except at higher elevations; all but larger streams dry in summer; no natural lakes	Jeffrey Pine Forest; Lodgepole Pine Forest; Mixed Chaparral	Coastal Oak Woodland; Juniper Woodland; Pinyon-Juniper Woodland; Montane Hardwood Conifer Forest; Montane Hardwood Forest; Montane Chaparral; Chamise Chaparral; Subalpine Conifer Forest; White Fir Forest; Wet Meadow; Grassland

Sources: USDA-FS, 1997, and CA-DFG, 2009

Table 4 (cont.): Climate and Vegetation of the Southern California Mountains and Valleys Ecoregion.

Subsection	Mean Annual Temp. & Precip.	Surface Water	Predominant Vegetation	Less Common Vegetation
Western Granitic Foothills	55° - 62° F 14-20 in	Rapid runoff; all but larger streams dry in summer; no natural lakes	Coastal Oak Woodland; Chamise Chaparral; Mixed Chaparral; Coastal Scrub	Montane Hardwood Conifer Forest; Montane Hardwood Forest; Montane Chaparral; Grassland; stands of Tecate cypress
Palomar – Cuyamaca Peak	50° - 58° F 18-40 in	Rapid runoff; all but larger streams dry in summer; sag ponds along Elsinore Fault Zone; level of Lake Henshaw (natural) has been raised artificially; reservoirs	Chamise Chaparral; Mixed Chaparral	Coastal Oak Woodland; Grassland; Jeffrey Pine Forest; Montane Hardwood Conifer Forest; Subalpine Conifer Forest; White Fir Forest; Montane Chaparral; Coastal Scrub; stands of Cuyamaca cypress and Tecate cypress

Sources: USDA-FS, 1997, and CA-DFG, 2009

References and Resources

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LID Site Assessment – *Sensitive and Restricted Areas*

Mapping of all sensitive and restricted areas on the site is required as part of the site planning and layout. Conservation easements that have been dedicated on the site will require special attention since these areas may fall under the control of regulatory agencies, such as the United States Army Corps of Engineers (USACE) or the State Department of Fish and Game (DFG).

Work that would affect the natural function of areas of environmental interest is often regulated by Federal or State agencies and must be identified and delineated. Additionally, several jurisdictions in Southern California have completed Multiple Species Habitat Conservation Plans, which identify key species and their associated habitats and may set requirements for conservation or mitigation.

Other types of easements and rights of way should also be identified prior to the selection of LID practices. Access easements can be established for sub-grade, on-grade and aerial utilities, and will dictate specific limitations to potential locations of LID BMPs.

Required Information

The following sensitive and restricted areas should be identified and delineated on the project site plan:

- Wetlands
  - http://www.ceres.ca.gov/wetlands/
- Streamside Management Areas / Watercourse and Lake Protection Zones
  - http://www.swrcb.ca.gov/water_issues/programs/nps/encyclopedia/2b_sma.shtml
- Floodplains
  - http://www.fema.gov/plan/prevent/fhm/dfm_dfhm.shtm
  - http://www.water.ca.gov/floodmgmt/lrafmo/fmb/fes/
  - Contact appropriate local agency for additional flood hazard areas
- Habitat for threatened or endangered species
  - Local MSHCP
  - http://www.dfg.ca.gov/habcon/
- Environmental easements on the property such as woodland, wetland, farmland, scenic areas, historic areas, wild and scenic rivers and other undisturbed natural areas that have been recorded as perpetual conservation easements in the property deed
- Location of buried storage tanks and utilities
  - As-built plans
  - Utility companies

References and Resources

California Watershed Assessment Manual http://www.cwam.ucdavis.edu/

Orange County Watersheds http://www.ocwatersheds.com/

Regional Water Quality Control Board Region 4 – Los Angeles
http://www.waterboards.ca.gov/losangeles/

Regional Water Quality Control Board Region 7 – Colorado http://www.waterboards.ca.gov/coloradoriver/

Regional Water Quality Control Board Region 8 – Santa Ana http://www.waterboards.ca.gov/santaana/

Regional Water Quality Control Board Region 9 – San Diego http://www.waterboards.ca.gov/sandiego/

San Diego County Multiple Species Habitat Conservation Program
http://www.sandiego.gov/planning/mscp/

State of California Conservation Easements Registry http://easements.resources.ca.gov/

Western Riverside County Regional Conservation Authority Multiple Species Habitat Conservation Plan
http://www.wrc-rca.org/library.asp

LID Site Assessment – *Existing Development*

On sites which are being redeveloped or retrofit with LID, it will be necessary to obtain detailed maps of the existing development on the site. Typical site surveys that are used in the design of the project will inherently contain most of the required information, and any non-standard information can be easily gathered by the surveyor. The existing topography (as described in the sections above) should also be included in the maps of the existing development. As-built site plans can also be obtained when available, but it should be noted that as-built drawings should be field-checked to ensure that they accurately reflect

the site as it currently exists. The information listed below will be used to select possible locations for LID BMPs on the site and can identify opportunities for reduction of impervious surfaces.

The following features should be identified and delineated on the project site plan:

- Buildings and foundations
- Parking areas, including the number and layout of parking spaces
- Driveways
- Vehicular access roads
- Paved sidewalks and paths
- Turf
- Landscaped areas
- Underground utilities, such as electric, gas, water, sewer, stormwater, telephone and cable TV
- Underground storage tanks

LID Site Assessment – *Contamination*

Potential soil and groundwater contamination should be considered on all redevelopment sites. Sites with existing soil contamination are called brownfields. Identified brownfields and former agricultural sites are managed by the USEPA, Cal/EPA, and the CA Department of Toxic Substances Control. Each of these agencies maintains lists of known brownfields. For preliminary investigation, the following websites can provide information on known brownfield sites:

- EPA Brownfield Website: http://www.epa.gov/brownfields
- CA Department of Toxic Substances Control links:
    - http://www.dtsc.ca.gov/SiteCleanup/Brownfields/,
    - http://www.dtsc.ca.gov/SiteCleanup/Cortese_List.cfm
- Cal/EPA link: http://www.calepa.ca.gov/brownfields/

Site contamination can be an issue in the redevelopment of urban, industrial and agricultural sites. Urban soils may be contaminated with lead deposited by vehicle exhaust or deteriorating paint. Industrial sites may be contaminated with a variety of chemicals, and may have been subject to intentional or unintentional dumping, resulting in soil or groundwater contamination. Former agricultural sites may be contaminated with pesticides or other chemicals, or may have high concentrations of mineral salts or nutrients. All redevelopment sites must be investigated for underground storage tanks, abandoned landfills, or other sources of groundwater contamination.

Brownfields require an approach to LID that is somewhat different from the common emphasis on infiltration, which could mobilize pollutants in the soil, contaminating groundwater. Rather, the emphasis on brownfield sites should be on minimizing the generation of runoff via source control, detention of runoff to reduce peak flows, and the treatment of runoff prior to discharge. Keep in mind that contaminated soil is often capped prior to redevelopment, creating a high degree of site impermeability, which can be expected to generate a large volume of runoff.

Use of planning strategies and BMPs that prevent the generation of stormwater can be especially beneficial on sites with contaminated soils, as they reduce the volume of stormwater that must be stored and treated. Where applicable and feasible, green roofs, which retain rooftop rainfall, can greatly reduce runoff volume, as can capture and reuse strategies that do not involve contact with the soil. Maximizing vegetative cover will reduce runoff volumes, promote evapotranspiration, prevent erosion of contaminated soil during storm events, and may provide pollutant removal via phytoremediation. Locating buildings and other paved surfaces on contamination hotspots will help to prevent infiltration through those areas.

BMPs commonly used for infiltration, such as bioretention or permeable pavements, should be lined with clean soil or an impermeable barrier, and equipped with underdrains to discharge treated stormwater into

the storm sewer. This will allow the use of these BMPs to store and treat stormwater runoff, but prevent contact between stormwater and the contaminated soil.

References and Resources

City of Emeryville, CA. *Stormwater Guidelines for Green, Dense Redevelopment*. http://www.epa.gov/smartgrowth/pdf/Stormwater_Guidelines.pdf

US EPA. 2008. *Case Studies for Stormwater Management on Compacted, Contaminated Soils in Dense Urban Areas*. http://www.epa.gov/nps/lid/

US EPA. 2008. *Design Principles for Stormwater Management on Compacted, Contaminated Soils in Dense Urban Areas*. http://www.epa.gov/nps/lid/

Step 2. Define Goals

LID can address both regulatory requirements and broader issues of environmental stewardship. Once you have a clear understanding of the site conditions and constraints, you can clearly define the project's goals for incorporating LID techniques. These goals may be imposed by local, state, or federal regulations, or may be the result of a desire to handle the site's stormwater in an environmentally responsible manner. A well-defined set of goals will inform the site design and selection of BMPs for the project.

Regulatory Goals

Regulatory requirements governing stormwater management often include minimum requirements for implementation of LID. Since these requirements vary depending on the local NPDES permit, the first step in defining a project's goals should be to evaluate the local regulatory requirements for the project.

Common Regulatory Requirements

- Water Quality Requirements, e.g.:
    - Treat the 85th percentile runoff volume
    - Treat the runoff flow rate generated by a rainfall intensity of 0.2 in/hr

- Hydromodification Requirements, e.g.:
    - Reduce/Match peak runoff discharge rate
    - Hydrograph matching
    - Flow duration control

LID to Help Meet Water Quality Requirements

Incorporation of LID Principles (described in Step 3) into a project will help reduce the runoff volume and peak rate, which will reduce treatment requirements. LID BMPs (described in Step 4) can be selected, sized and implemented to treat polluted runoff.

LID to help meet Hydromodification Requirements

Incorporation of LID Principles (described in Step 3) into a project will help reduce the runoff volume and peak rate, which will reduce the capture volume required for hydromodification mitigation. LID BMPs can then be implemented to address the remaining hydromodification requirements. Where LID infiltration or capture/reuse BMPs are feasible, they will most effectively meet hydromodification requirements as they remove runoff from the system. LID filtration BMPs can also be used to address hydromodification, but the design approaches provided in Step 4 herein may need to be modified to limit outflow from the BMP to meet the regulatory requirements.

LID vs Flood Control

The primary purpose of Low Impact Development is to preserve a site's predevelopment hydrology. Achieving this goal often requires consideration of the larger, less-frequent storm events that play a significant role in hydromodification, in addition to the small, frequent storms that are largely responsible for water quality. It is important to note that under predevelopment conditions, site runoff will occur during large storms. This runoff plays an important role in the geomorphology of receiving waters, reshaping channels and supplying sediment and nutrients. LID is not intended to interfere with these large, channel forming events; rather it is intended to prevent degradation due to excessive discharge of highly polluted runoff from small, frequent storms.

Many communities have long had specific requirements for flood control. Flood control and stormwater management requirements may be set forth by different municipal departments or even different agencies, but nonetheless, these requirements often have similarities that can simultaneously be addressed by applying the LID techniques. Similarly, agencies may have landscaping requirements or green space preservation requirements that can be related to Low Impact Development.

Environmental Stewardship

In addition to meeting the minimum regulatory requirements, implementing LID measures as described in this manual promotes Environmental Stewardship, which can add to the desirability / marketability of a project.

Benefits of Environmental Stewardship through LID

- Achieve LEED certification (details are included in Appendix C)
- Achieve Sustainable Sites Initiative certification (details are included in Appendix C)
- Maintain or restore water balance
- Protect habitat
- Preserve or create green space
- Harvest rainwater for reuse

How Much is Enough?

The goal evaluation process will define the level of LID implementation required for most projects. Due to the variables associated with the factors that define LID goals for a project, it is not possible for this manual to provide a single answer regarding the required extent of LID implementation. Furthermore, what may be considered an acceptable level of LID implementation in one area may be quite different acceptable levels in other areas.

Once the goals for LID implementation are determined for a project, the level can be compared to the following metrics.

Table 5. Levels of LID, Water Quality Treatment, and Hydrologic Control.

Level of Low Impact Development	Evaluation Metrics to be Achieved by Project	Notes
"Limited" Impact Development	Water Quality Treatment • 85th percentile average annual runoff captured and treated before release	Caution required. New runoff may create hydrologic conditions of concern.
"Limited" Impact Development	Hydrologic Control • Post development hydrograph significantly altered from predevelopment hydrograph through retention.	Caution required. Runoff reduction may create hydrologic conditions of concern by starving downstream waters of low flows. The reduction or elimination of low flows may have restorative benefits to downstream waters where prior developments have altered predevelopment hydrology.
Low Impact Development	Water Quality Treatment • 85th percentile average annual runoff captured and treated before release Hydrologic Control • Mimics predevelopment runoff volume for regionally appropriate events (e.g., 1yr, 2yr, 5yr, and 10yr, 24hr storm events)	Elevated peak flows may create hydrologic conditions of concern.
Low Impact Development	Water Quality Treatment • 85th percentile average annual runoff captured and treated before release Hydrologic Control • Mimics predevelopment runoff volume <u>and peak flows</u> for regionally appropriate events (e.g., 1yr, 2yr, 5yr, and 10yr, 24hr storm events)	Maintenance or restoration of predevelopment runoff hydrograph prevents downstream degradation.

Source: The Low Impact Development Center, Inc.

Step 3: Implementing LID Principles

Introduction

Once the site assessment has been performed and goals for implementing LID on the project have been defined, specific LID strategies can be selected and implemented to address the potential impacts of development discussed in Section 1 of this manual.

LID strategies can be broadly divided into two types:

- **LID Principles** that **minimize** the causes (or drivers) of project impacts, and
- **LID BMPs** that help **mitigate** unavoidable impacts.

Incorporating LID Principles at the beginning of the development planning process is the most cost effective way to implement LID successfully. When properly done, such measures can greatly reduce the extent of impacts that must be mitigated with BMPs. As such, a project proponent should exhaust all available and applicable measures to minimize impacts, before moving on to mitigating the remaining impacts.

It is important to note that LID Principles apply to each of the phases of a project, including: planning, design, construction and occupation.

Table 6. Examples of LID Principles and Where Within a Project Lifecycle They Can Be Implemented.

Phase	LID Principles (minimization)	LID Principles/ BMPs (mitigation)
Planning	• Preserve natural infiltration capacity • Preserve existing drainage patterns • Protect existing vegetation and sensitive areas	N/A
Design	• Minimize impervious area • Disconnect impervious areas	• Infiltration BMPs • Capture/Reuse BMPs • Filtration BMPs
Construction	• Minimize construction footprint • Minimize unnecessary compaction • Minimize removal of native vegetation and trees	• Revegetate disturbed areas
Occupation	• Implement source control BMPs	• Maintain BMPs appropriately

Source: The Low Impact Development Center, Inc.

Step 3 in this manual provides examples of LID Principles and how they can be incorporated into a project. The use of these strategies will help to maximize the effectiveness of the LID implementation, further improving and integrating stormwater management into the site. An LID project should attempt to incorporate each of these strategies to the extent appropriate, however the unique combination of features of the project site, as determined by the site assessment, will help inform the selection process. Creating a site plan that works with the site's natural features will generate a more hydrologically functional site and result in a site design that more closely mimics its predevelopment hydrograph, which in turn will help reduce the requirement for mitigation measures.

The simplest way to maintain the predevelopment hydrologic function of a site is to minimize the development footprint, preserving existing topography and drainage patterns. However, many development projects involve complete landform manipulation, where the entire site is cleared and graded. On such sites, where such grading is unavoidable, predevelopment hydrologic function can be reproduced with a proper mix of design strategies, especially minimizing impervious area, and the use of supplemental BMPs to store and treat excess runoff.

Maximize Natural Infiltration Capacity

A key component of LID is taking advantage of a site's natural infiltration and storage capacity. This will limit the amount of runoff generated, and therefore the need for mitigation BMPs. The site soils/geology assessment described previously in this manual will help to define areas with high potential for infiltration and surface storage.

These areas are typically characterized by:

- Hydrologic Soil Group A or B soils
- Mild slopes or depressions
- Historically undeveloped areas

Table 7. Available Techniques to Preserve Natural Infiltration Capacity.

Phase	Available Techniques
Planning	• Avoid placing buildings or other impervious surfaces on highly permeable areas. • Cluster buildings and other impervious areas onto the least permeable soils.
Design	• Where paving of permeable soils cannot be avoided, loss of infiltration capacity can be minimized by using permeable paving materials.
Construction	• Minimize construction footprint • Minimize unnecessary compaction
Occupancy	N/A

Source: The Low Impact Development Center, Inc.

Promoting infiltration in close proximity to buildings, paved structures, or steep slopes has the potential to create geotechnical hazards, such as slope destabilization or premature failure of structures. A geotechnical engineer should always be consulted when designing infiltration-based BMPs to ensure that site conditions are suitable and any potential concerns have been addressed.

Preserve Existing Drainage Patterns and Time of Concentration

Integrating existing drainage patterns into the site plan will help maintain a site's predevelopment hydrologic function. Preserving existing drainage paths and depressions will help maintain the time of concentration and infiltration rates of runoff, decreasing peak flows. The best way to define existing drainage patterns is to visit the site during a rain event and to directly observe runoff flowing over the site. If this is impossible, drainage patterns can be inferred from topographic data, though it should be noted that depression micro-storage features are often not accurately mapped in topographic surveys. Analysis of the existing site drainage patterns during the site assessment phase of the project can help to identify the best locations for buildings, roadways, and stormwater BMPs.

Minimize site grading that eliminates small depressions, which can provide storage of small storm volumes. Where possible, add additional depression "micro" storage throughout the site's landscaping. Mild gradients can be used to extend the time of concentration, which reduces peak flows and increases the potential for additional infiltration. While of course risk of serious flooding must be minimized, the persistence of temporary "puddles" during storms is beneficial to infiltration. If a site is visited during dry weather, these areas can sometimes be identified by looking for surficial dried clay deposits.

Table 8. Available Techniques to Help Preserve Existing Drainage Patterns and Increase the Time of Concentration.

Phase	Available Techniques
Planning	• Avoid channelization of natural streams • Establish set-backs and buffer areas from natural streams. • Where natural streams will be converted to engineered streams, provide sinuosity to increase the time of concentration. • Minimize mass grading of project site to avoid elimination of small depressions, which can provide storage of small storm volumes.
Design	• Avoid channelization of natural streams. • When designing channels, use mild slopes and increase channel roughness to extend time of concentration • When possible, use pervious channel linings to maximize opportunity for infiltration.
Construction	• Minimize construction footprint
Occupancy	N/A

Source: The Low Impact Development Center, Inc.

Protect Existing Vegetation and Sensitive Areas

A thorough site assessment will identify any areas containing dense vegetation or well-established trees. When planning the site, avoid disturbing these areas. Soils with thick, undisturbed vegetation have a much higher capacity to store and infiltrate runoff than do disturbed soils. Reestablishment of a mature vegetative community can take decades. Sensitive areas, such as wetlands, streams, floodplains, or intact forest, should also be avoided. Development in these areas is often restricted by federal, state and local laws.

Vegetative cover can also provide additional volume storage of rainfall by retaining water on the surfaces of leaves, branches, and trunks of trees during and after storm events. This capacity is rarely considered, but on sites with a dense tree canopy it can provide additional volume mitigation.

Table 9. Available Techniques to Protect Existing Vegetation and Sensitive Areas.

Phase	Available Techniques
Planning	• Establish set-backs and buffer zones surrounding sensitive areas • Incorporate established trees into site layout
Design	• Design site to deter human activity within sensitive areas (i.e. fences, signs, etc)
Construction	• Provide and maintain highly visible flagging and/or fencing around sensitive areas or vegetation that is to be protected.
Occupancy	• Establish use/access restrictions to sensitive areas

Source: The Low Impact Development Center, Inc.

Minimize Impervious Area

One of the principal causes of environmental impacts due to development is the creation of impervious surfaces. Impervious cover can be minimized through identification of the smallest possible land area that can be practically impacted or disturbed during site development. Below is a partial list of techniques that can reduce the amount of impervious area that will be created as part of a project. It is important to note that local laws and ordinances may dictate minimum requirements for road widths or building setbacks that cannot be reduced due to public health and safety concerns. In certain situations, it may be possible to achieve changes to codes and ordinances. Additional information can be found in the EPA Green Infrastructure Municipal Handbook, which is accessible online at: http://cfpub.epa.gov/npdes/greeninfrastructure/munichandbook.cfm.

Table 10. Available Techniques to Minimize Impervious Surfaces.

Phase	Available Techniques
Planning	• Build vertically rather than horizontally - add floors to minimize building footprint. • Cluster development to reduce requirements for roads and preserve green space. • Minimize lot setbacks (which in turn minimize driveway lengths) • Reduce road widths to minimum necessary for emergency vehicles
Design	• Install sidewalks on only one side of private roadways • Use alternative materials such as permeable paving blocks or porous pavements on driveways, sidewalks, parking areas, etc. • Create smaller parking spaces intended for compact cars.
Construction	• Minimize unnecessary compaction. The infiltrative capacity of soils can be greatly reduced when they are compacted, often to the point that they perform similarly to impervious surfaces. Work with a geotechnical engineer to determine the minimum level of compaction necessary to provide structural stability.
Occupancy	N/A

Source: The Low Impact Development Center, Inc.

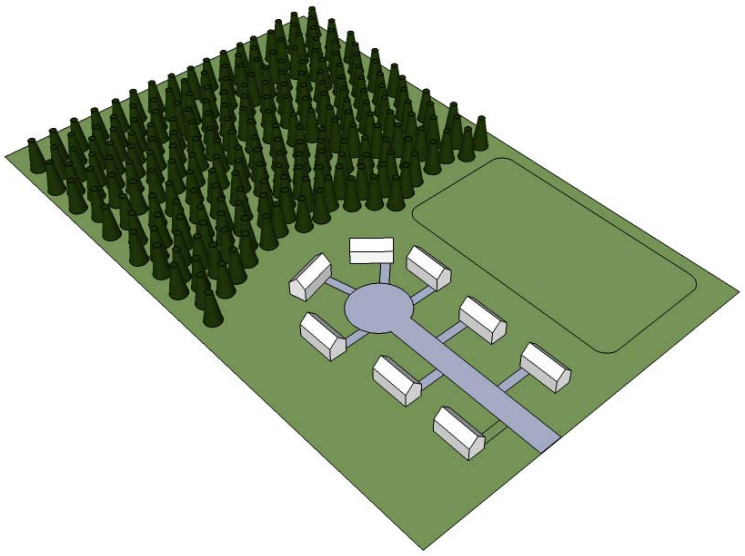

Figure 14. Residential development, showing housing clustered in one part of the site, preserving forest cover and creating space for a playing field (e.g. soccer, football, or other recreational area).
Source: The Low Impact Development Center, Inc.

Disconnect Impervious Areas

Runoff from 'connected' impervious surfaces commonly flows directly to a stormwater collection system with no opportunity for infiltration into the soil. For example, roofs and sidewalks commonly drain onto parking lots, and the runoff is conveyed by the curb and gutter to the nearest storm inlet. Runoff from numerous impervious drainage areas may converge, combining their volumes, peak runoff rates, and pollutant loads. Disconnecting impervious areas from conventional stormwater conveyance systems allows runoff to be collected and managed at the source or redirected onto pervious surfaces such as vegetated areas. This reduces the amount of directly connected impervious area (DCIA), and will reduce the peak discharge rate by increasing the time of concentration (T_c), maximize the opportunity for infiltration by reducing the velocity of flows and providing for greater contact time with the soil, and maximize the opportunity for evapotranspiration during transport.

Disconnection practices may be applied in almost any location, but impervious surfaces must discharge into a suitable receiving area for the practices to be effective. Information gathered during the site assessment will help inform the determination of appropriate receiving areas. Typical receiving areas for disconnected impervious runoff include landscaped areas and/or other LID Mitigation BMPs (i.e. filter strips or bioretention). Runoff must not flow toward building foundations or be redirected onto adjacent private properties. Setbacks from buildings or other structures may be required to ensure soil stability, particularly for practices that are designed to concentrate and infiltrate runoff. Consult with the project geotechnical engineer to identify areas where infiltration can be accommodated.

Discharge areas must be located down gradient from runoff discharges. In a residential setting, this could mean that roof runoff discharges to either the front yard or the back yard, depending on the site configuration. As compared to conventional development, some potential techniques for redirecting flows to vegetated areas may require local design standards to be revisited.

Table 11. Available Techniques to Disconnect Impervious Areas.

Phase	Available Techniques
Planning	• Plan site layout and mass grading to allow for runoff to be directed into distributed permeable areas such as turf, recreational areas, medians, parking islands, planter boxes, etc. • Avoid channelization of natural on-site streams
Design	• Provide permeable areas within medians and parkways that are designed to accept runoff from adjacent areas (i.e. via curb cuts). • Construct roof downspouts to drain to pervious areas such as planter boxes or adjacent landscaping. • Use permeable paving materials such as paving blocks or porous pavements on driveways, sidewalks, parking areas, etc.
Construction	N/A
Occupancy	N/A

Source: The Low Impact Development Center, Inc.

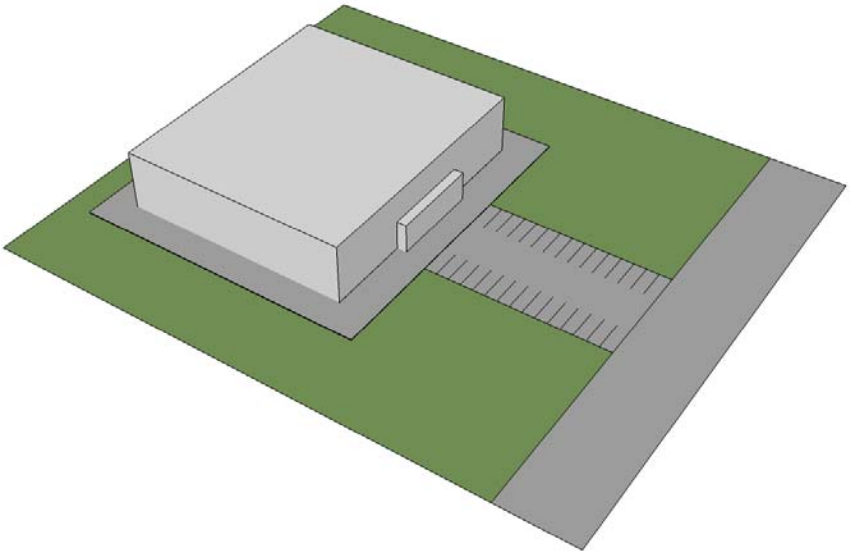

Figure 15. Commercial site showing directly connected impervious areas. The roof drains to the sidewalk, which drains to the parking lot, and then directly onto the street.
Source: The Low Impact Development Center, Inc.

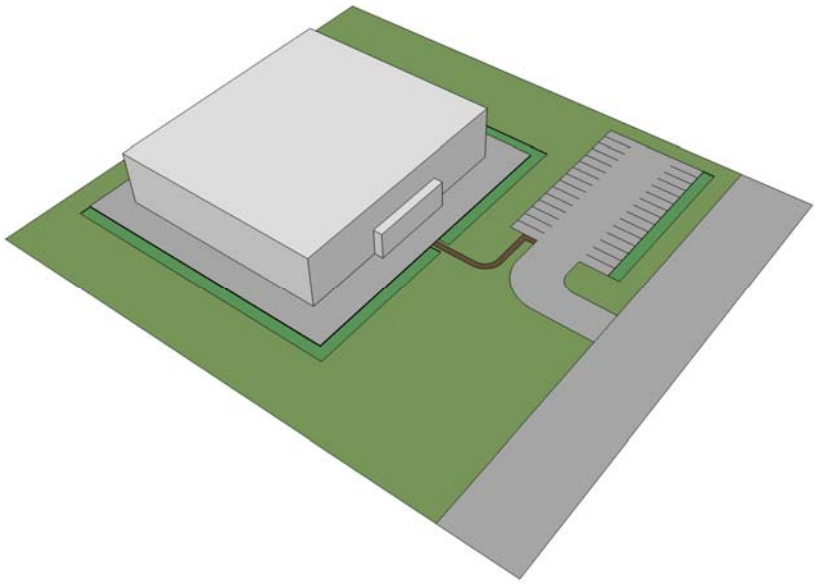

Figure 16. Commercial area in which impervious surfaces have been disconnected. Runoff from the roof and sidewalk are captured by bioretention cells. Sidewalks are separated from the parking lot by a large vegetated area. The parking lot drains to a bioretention cell rather than directly to the street.
Source: The Low Impact Development Center, Inc.

Minimize Construction Footprint

Minimizing the amount of site clearing and grading can dramatically reduce the overall hydrologic impacts of site development. This applies primarily to new construction but the principles can be adapted to retrofit and infill projects as well.

Soil compaction resulting from the movement of heavy construction equipment can reduce soil infiltration rates by 70-99 percent (Gregory et al, 2006). Even low levels of compaction caused by light construction equipment can significantly reduce infiltration rates. In addition, compaction can destroy the complex network of biota in the soil profile that support the soil's ability to capture and mitigate pollutants. Soil compaction severely limits the establishment of healthy root systems of plants that may be used to revegetate the area. For these reasons, it is very important to avoid unnecessary damage to soils during the construction process. The use of clearly defined protection areas will help to preserve the existing capacity of the site to store, treat and infiltrate stormwater runoff.

Site designers should work with civil and geotechnical engineers to determine which areas must be graded and compacted to provide soil stability, and which areas may be left undisturbed.

Table 12. Available Techniques to Minimize the Construction Footprint.

Phase	Available Techniques
Planning	• Many of the planning techniques identified in the above sections will help minimize the construction footprint.
Design	N/A
Construction	• Minimize the size of construction easements. • Locate material storage areas and stockpiles within the development envelope. • Limit ground disturbance outside of areas that require grading. • Identify and clearly delineate access routes for the movement of heavy equipment. • Establish and delineate vegetation and soil protection areas.
Occupancy	N/A

Source: The Low Impact Development Center, Inc.

Establish Vegetation and Soil Protection Areas
Vegetative protection areas (e.g. stream, river, lake and other watercourse buffers, vegetation protection areas, existing trees) should be clearly delineated with highly visible fencing materials to prevent incursion of equipment or the stockpiling of materials during construction. Tree trunks should be sheathed during construction to prevent or minimize damage to the bark.

Use of Mulch and Load Distributing Matting
Mulch blankets can be used to protect soil from compaction during construction. The use of timbers or other types of load distributing materials can also be used to limit the effect of heavy equipment movement on the site.

Pre / Post Construction Soil and Plant Treatments
Consideration should be given to pre-construction treatment of the soil to mitigate the stresses on existing shrubs and trees. This can include soil aeration and specific fertilization protocols that would encourage plant vitality. A local restoration ecologist should be engaged well in advance of the start of construction to develop a plan based on specific site conditions since some of these practices are carried out prior to construction.

Inspection Guidelines and Procedures
Management of soil, water, and vegetation protection measures during the construction process will only be effective if it is carefully implemented and meticulously policed during all phases of construction. Even if overlooked for a single day, significant damage can be done. The cost of damage remediation will be far greater than the cost of avoiding it. Areas intended for infiltration should be treated especially carefully. Avoid the use of heavy machinery or discharge of sediment-laden runoff in these areas.

Techniques implemented on the construction site to minimize the construction footprint should be included in the project documentation and contractors working on the project should review and agree to comply with them while working on the jobsite. Construction site inspections should include inspection of such protocols to ensure they are maintained throughout construction.

Revegetate Disturbed Areas

Introduction

Maximizing plant cover protects the soil and improves ability of the site to retain stormwater, minimize runoff, and help to prevent erosion. Plants have multiple impacts on downstream water quality. First, the presence of a plant canopy (plus associated leaf litter and other organic matter that accumulates below the plants) can intercept rainfall, which reduces the erosive potential of precipitation. With less eroded material going to receiving waters, turbidity, chemical pollution, and sedimentation are reduced. Second, a healthy plant and soil community can help to trap and remediate chemical pollutants and filter particulate matter as water percolates into the soil. This occurs through the physical action of water movement through the soil, as well as through biological activity by plants and the soil microbial community that is supported by plants. Third, thick vegetative cover can maintain and even improve soil infiltration rates.

When revegetating areas that will not be landscaped as part of the project, preference should be given to native vegetation, which is uniquely suited to the local soils and climate. However, consideration of the location of the plants in the landscape with regards to wildfire safety can sometimes make the use of native species unsuitable. Information about typical native species occurring in common local vegetative communities can be found in LID Site Assessment – Vegetation section of this manual. Additional information can be found by contacting local Master Gardeners or seeking the advice of local plant nurseries, which will have specific knowledge of plants suitable for your particular application. The Las Pilitas Nursery in Santa Margarita has compiled a detailed database of California native plants which is accessible online at: http://www.laspilitas.com/comhabit/california_communities.html. The website can be used to aid in determining the correct plant communities by searching by either ZIP code or town. In cases where use of native vegetation is impractical or impossible, use of non-natives adapted to similar climate regimes, such as the Mediterranean, may be appropriate. Appendix A can help with selection of plant species suitable for Southern California. This strategy will maximize the successful establishment of plantings, and minimize the need for supplemental irrigation.

Soil Stockpiling and Site Generated Organics

The regeneration of disturbed topsoil can take years under optimal conditions, and sometimes can take many decades (Brady and Weil, 2002). Proper stockpiling, storage, and reapplication of disturbed topsoil can greatly accelerate this process. Improper soil storage and restoration can significantly decrease the biological activity of the soil, decrease the successful establishment of plantings, and increase the ability of undesirable invasive species to dominate the disturbed landscape.

Soil stockpiling and the use of in situ grubbed plant material and duff as mulch or soil amendments should be encouraged. This will reduce the need for importation of top soil to improve soil quality, and will encourage reestablishment of soil flora and fauna after site disturbance. Successful soil stockpiling and reuse begins in the early stages of project planning.

The use of topsoil harvested from the local site can improve the productivity and rate of re-vegetation of a disturbed site. In addition to stockpiled soil, vegetative material grubbed from the site and free of invasive species can be tilled back into the soil to increase organic content.

Restoration of disturbed areas using native soils which have been properly stockpiled during the construction phase of the project is the preferred method of post construction soil restoration. Proper assessment of the site during the pre-construction phase of the project is critical to maintaining soil quality, both structural and biological, during the period the soil is stockpiled. Determination of the volume of soil to be stockpiled and designating an area large enough on site to accommodate the stockpiled soil should be considered early in project design.

Consideration must be given to maintenance of the flora and fauna present in the stockpiled soil in addition to its physical condition. Improper storage such as soil that is too wet or stockpiled to deeply, can render what were active biological soil communities sterile. This will severely impact the ability of the soil to support a healthy plant community. If necessary, a local soil scientist familiar with regional soils can provide testing services to evaluate soil condition prior to and after construction and recommend appropriate remediation steps to restore the soil's predevelopment ability to infiltrate stormwater runoff and support a healthy plant community.

Additional information about the impact of soil stockpiling can be found in the following document which was prepared for the District 11 office of the California Department of Transportation.

Restoration in the California Desert - http://www.sci.sdsu.edu/SERG/techniques/topsoil.html

Firescaping

Fire is a part of the ecosystems of Southern California. Over the years, wildfires have repeatedly destroyed homes and caused loss of life. In response to this natural phenomenon, extensive research has been done and, in the interest of public safety, guidelines have been codified into law. When considering any planting or re-vegetation plan consideration must be given to minimizing the risks of fire with proper plant selection and maintenance. Keep in mind that all plants are flammable given the right conditions; selection and maintenance of plants to mitigate flammability go hand in hand. A plant with a low flammability rating which is allowed to accumulate dead wood or excessive levels of duff in and around the plant will elevate the risk of flammability significantly.

California law (Public Resources Code 4291) requires a minimum 100-foot space around homes on level ground to protect the structure and provide a safe area for firefighters. If a home is located on a slope, additional distance is required and plant spacing, selection, and design must be modified to maintain proper fire safety margins.

A four zone system has been developed to create a maximum buffer around structures located in high risk wildfire zones. Each zone has very specific landscaping and management requirements to minimize flammability of the landscape.

The four zones are broken down as follows:

Zone One – The garden or clean and green zone
Zone Two – The greenbelt or reduced fuel zone
Zone Three – The transition zone
Zone Four – Native or Natural Zone / Open Space

The landscape plant selection and design for any bioretention or re-vegetation project should be compliant with the requirements of the specific zone in which it will be located. For assistance in determining the correct zone plant selection and spacing, contact your local fire department or insurance company for assistance. Additional resources are provided below for specific information about successful firescaping plant selection and design requirements.

Additional Information

California Department of Forestry and Fire Protection (CAL FIRE) - http://www.fire.ca.gov

California Master Gardeners - http://camastergardeners.ucdavis.edu

Center for Fire Research - http://firecenter.berkeley.edu

University of California Agriculture and Natural Resources SAFE Landscapes - http://groups.ucanr.org/SAFE/

Xeriscape Landscaping

As water use, the frequency of drought, and the impact of organic waste generated from landscape management increase in California, methods to deal with these problems have been developed. The concept of xeriscape was originally developed by the Denver Water Department in 1978. The word was coined by combining the Greek word *xeros* ("dry") with landscape. Since 1978, the xeriscape has become a widely-accepted alternative to traditional landscape design in dry areas.

Xeriscape landscaping is a landscape design and plant selection scheme that is used to minimize required resources and waste generated from a landscape. Defined as “quality landscaping that conserves water and protects the environment” the principles of xeriscape should be employed in any project that creates or restores the landscape. Consulting local resources, such as your local county extension agent, Master Gardeners, Landscape Architects, or local garden centers and nurseries, will help to select plant material suitable for a specific geographic location.

Xeriscape landscaping is based on seven principles:

- Planning and design
- Soil analysis
- Appropriate plant selection
- Practical turf areas
- Efficient irrigation
- Use of mulches
- Appropriate maintenance

Xeriscape landscaping has many benefits which include:

- Reduced water use
- Decreased energy use
- Reduced heating and cooling costs resulting from optimal placement of trees and plants
- Minimal runoff from both stormwater and irrigation resulting in reduction of sediment, fertilizer and pesticide transport
- Reduction in yard waste that would normally be landfilled
- Creation of habitat for wildlife
- Lower labor and maintenance costs
- Extended life of existing water resources infrastructure.

A xeriscape-type landscape can reduce outdoor water consumption by as much as 50 percent without sacrificing the quality and beauty of your home environment. It is also an environmentally sound landscape, requiring less fertilizer and fewer chemicals. Xeriscape-type landscape is low maintenance, saving time, effort and money.

The Water Conservation in Landscaping Act of 2006 requires local agencies to adopt landscape water conservation ordinances. Agencies can either adopt the Department of Water Resources' Model Water Efficient Landscape Ordinance, or create their own ordinances, which must be at least as effective. The model ordinance is available at: http://www.water.ca.gov/wateruseefficiency/landscapeordinance/.

Additional Information

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Planning / Inspection Guidelines

The quality and size of plant material should be clearly defined in the landscaping and re-vegetation plans and the establishment period for the re-vegetation and landscaping should be clearly identified, including any specific establishment guidelines. While native plants are typically the lowest maintenance option for re-vegetation and landscaping any post-installation maintenance required will be dictated by the characteristics of the selected plant community.

Implement Source Control Measures

The discharge of many common stormwater pollutants from a project site can be greatly minimized by practicing vigilant source control. The most common stormwater pollutant impairments in Southern California fall into ten categories:

- Suspended solids
- Oxygen demanding substances
- Nitrogen compounds
- Phosphorus
- Microbial pathogens
- Heavy metals
- Oil and grease
- Toxic organic compounds (e.g. pesticides)
- Trash

Table 13 provides additional details on the sources of these pollutants/indicators.

Table 13. Pollutants in Stormwater.

Pollutant	Origin	Discharge Source(s)	Location
Suspended Solids	• Small particles of clay, silt, sand, other soil materials, small particles of vegetation, and bacteria	Soil erosion Motor vehicles Building materials	Deposited on impervious surfaces
Oxygen demanding substances	• Natural origin • Excess biodegradable materials or waste discharge	Excess organic waste products such as lawn clippings and leaves	Landscaped areas
Nitrogen compounds	• Excess residential, agricultural, and commercial fertilizer use • Animal wastes • Plant decay • Atmospheric deposition	Turf grass Non native ornamental landscapes	Highly managed landscapes in both residential and commercial developments
Phosphorus	• Excess fertilizer use • Decaying vegetation, such as lawn clippings and leaves • Present in animal waste	Maintained commercial and residential landscapes Golf courses	Highly managed landscapes in both residential and commercial developments
Microbial pathogens	• Present in animal waste	Runoff from areas where waste has been deposited	Landscaped and natural areas Trails and walkways
Heavy metals	• Released in vehicle emissions • Released by tire wear • Break pads • Leach from asphalt shingles	Motor vehicles Asphalt shingles	Driveways, roadways, highways, parking and storage lots Roofs
Oils and Grease	• Leaks or spills from motor vehicles	Motor vehicles	Driveways, roadways, highways, parking and storage lots
Toxic organic compounds	• Pesticides	Pesticides used for commercial, agricultural and residential applications	Runoff from treated landscapes and agricultural areas
	• Polycyclic aromatic hydrocarbons (PAHs)	Motor vehicle fuel leakage and spillage Asphalt pavement Asphalt roof runoff	Roads and parking lots Runoff from buildings with asphalt roofing materials (shingles, membrane and other types of roofs)
	• Solvents	Industrial, commercial and residential cleaners, degreasers and lubricants	
Trash	Non-biodegradable plastics and coated paper products. Depending on storm intensity, a large variety of debris that would be classified as trash can be mobilized.	Human activities	Parking lots and roadways Sidewalks Parks and recreation areas

Source: Davis and McCuen, 2005

Suspended Solids (TSS)

The largest source of suspended solids is soil erosion. Protecting and revegetating soil is the best practice for reducing TSS. Implementation of industry standard erosion and sediment control measures during construction is a very effective method to control the transport of TSS on- and off-site during and after the construction process. Innovative Erosion and Sedimentation (E&S) practices, such as compost socks and compost berms, have become widely accepted as effective TSS control practices.

Proper site design, incorporating maximum vegetative cover and the appropriate use of mulching to minimize exposed soil, dramatically reduces the levels of TSS generated during and after construction. Pretreating for TSS prior to runoff entering other BMPs will significantly extend the functional lifespan of the BMP.

Oxygen demanding substances

High levels of organic material in runoff increase the population of aerobic microorganisms, resulting in reduced dissolved oxygen content. Typical levels of biodegradable organic compounds do not contribute a major oxygen demand in runoff. Properly disposing of organic materials can help minimize the creation of oxygen demanding substances.

Nitrogen compounds / Phosphorus

High levels of nutrients, such as nitrogen and phosphorus, in runoff contribute to eutrophication in receiving waters. Although runoff from agricultural fields and feed lots is a major source of these pollutants, urban areas with improperly managed landscapes can also be substantial sources. The nutrient content in runoff can be reduced at the source by limiting application of fertilizers to landscaped areas to the minimum necessary. Measures that lower nutrient runoff potential by limiting fertilizer application and reducing the requirement for supplemental application include the use of conservation design principles, the reduction of high maintenance turf grass, and integration of native plants into the landscape.

Microbial pathogens

The primary source of microbial pathogens is feces from wild and domestic animals. Domestic animal feces should be managed with a combination of public awareness and municipal regulation requiring owners to remove waste left by their pets. At moderate levels, microbial pathogens can be mitigated by naturally occurring biota found in bioretention cell soils.

Heavy metals, oil, and grease

Automobiles, trucks, and buses are the primary source of heavy metals, oils, and grease found in urban settings. Source control for automotive sources includes fixing leaks, performing maintenance in covered/appropriate areas, and washing vehicles in the grass.

Toxic organic compounds

Toxic organic compounds are found in pesticides used on high maintenance landscapes. The proper selection, application, and timing of application of pesticides can be the most effective way to control the source of pesticide toxicity. In the event levels of these pollutants are found that exceed EPA standards, appropriate local or state agencies should be contacted. If the source of the pollutants can be identified, it should be remediated by trained personnel.

Trash/floatables

Trash is found anywhere there is a human presence. Providing trash cans with lids at convenient locations and installing educational signs can help to prevent trash and floatables from entering the

system. Conventional stormwater conveyance infrastructure can be retrofitted with devices to intercept trash and floatables at multiple locations within a drainage area. This reduces the maintenance required by concentrating the trash in fewer locations on the site, where it can be removed during scheduled maintenance of the facility.

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Step 4: Use LID BMPs to Mitigate Impacts

For many projects, it will not be possible to completely meet the minimum goals for the project with LID Principles alone. In such cases, LID BMPs can be implemented to mitigate remaining project impacts. It should be noted that although such LID BMPs may be necessary to meet the goals, the vigilant implementation of LID Principles can significantly reduce the required size of such mitigation BMPs.

This chapter provides descriptions, basic design guidance, and selection criteria for the most commonly used LID BMPs. Detailed information on the five primary BMPs used in LID (Bioretention, Capture/Reuse, Permeable Pavement, Vegetated Roofs, and Soil Amendments) is provided. Other BMPs are described briefly, and links are provided to more detailed sources of information.

The LID BMPs discussed in this manual can be divided into two broad types based on how they function. LID BMPs are either retention BMPs or non-retention BMPs; with the first comprised of BMPs that retain runoff onsite either via infiltration, evapotranspiration, or capture and use, and the latter being comprised of BMPs that filter or treat runoff and allow it to discharge offsite. Depending on any site constraints identified in the LID Site Assessment (Section 1 in this Manual), many LID BMPs can be configured to function as either type. Below is a summary list of various common types of BMPs.

Table 14. BMP Functions of the LID BMPs Discussed in this Manual.

BMP	Capture and Reuse	Infiltration	Filtration
Bioretention (infiltration design)		✓	✓
Bioretention (filtration design)			✓
Porous Pavement (infiltration design)		✓	✓
Porous Pavement (filtration design)			✓
Capture/Reuse	✓		✓*
Vegetated Roofs			✓
Soil Amendments		✓	✓
Downspout Disconnection		✓	✓
Filter Strips			✓
Vegetated Swales			✓
Infiltration (Retention) Basins		✓	✓
Infiltration Trenches		✓	✓
Dry Wells		✓	✓
Dry Ponds (Extended Detention Basins)			✓
Constructed Wetlands			✓
Wet Ponds			✓
Media Filters / Filter Basins			✓
Proprietary Devices			✓
* depends on design			
Many filtration BMPs can result in substantial runoff reduction via infiltration or evapotranspiration.			

Source: The Low Impact Development Center, Inc.

The selection of an appropriate set of BMPs for a given site should be based on the project goals and site capabilities and constraints. Several factors must be taken into account:

- LID goals (peak flow reduction, storage volume needed, pollutant removal)
- Site configuration (e.g. space available)
- Site constraints (e.g. slopes, depth to groundwater)
- Operation and maintenance requirements
- Cost

The following tables can be used to compare BMPs.

Table 15. BMP Performance – Hydrologic Impacts.

BMP	Volume Reduction	Peak Flow Reduction	Groundwater Recharge
Bioretention (infiltration design)	●	●	●
Bioretention (filtration design)	○	●	○
Porous Pavement (infiltration design)	●	●	●
Porous Pavement (filtration design)	○	●	○
Capture/Reuse	⦿	○	○
Vegetated Roofs	○	●	○
Soil Amendments	⦿	⦿	⦿
Downspout Disconnection	⦿	⦿	⦿
Filter Strips	⦿	○	⦿
Vegetated Swales	⦿	○	⦿
Infiltration (Retention) Basins	●	●	●
Infiltration Trenches	⦿	○	⦿
Dry Wells	⦿	○	⦿
Dry Ponds (Extended Detention Basins)	○	●	○
Constructed Wetlands	⦿*	●	○
Wet Ponds	⦿*	●	○
Media Filters / Filter Basins	○	⦿	○
Proprietary Devices	○	○	○

Key: ● High effectiveness ⦿ Medium effectiveness ○Low effectiveness

Rankings are qualitative.

- "High effectiveness" means that one of the BMP's primary functions is to meet the objective.
- "Medium effectiveness" means that a BMP can partially meet the objective but should be used in conjunction with other source controls.
- "Low effectiveness" means that the BMP provides minimal benefit to the objective and another BMP should be used if that objective is important.

* Wetlands and wet ponds constructed on soils with high permeability are difficult to keep saturated during Southern California's extended dry season. For this reason, they are rarely used, and only on highly impermeable soils.

Source: Adapted from WERF, 2006.

Table 16. Environmental Benefits of BMPs.

BMP	Runoff Quality Enhancement	Water Conservation (Recharge/Reuse)	Heat Island Reduction	Energy Conservation	Air Pollution Reduction	Habitat
Bioretention	✓	✓	✓		✓	✓
Permeable Pavement	✓	✓				
Capture/Reuse	✓	✓				
Vegetated Roofs	✓		✓	✓	✓	✓
Soil Amendments	✓	✓				✓
Downspout Disconnection		✓				
Filter Strips	✓	✓	✓			
Vegetated Swales	✓	✓	✓		✓	
Infiltration (Retention) Basins	✓	✓				
Infiltration Trenches	✓	✓				
Dry Wells	✓	✓				
Dry Ponds (Detention Basins)	✓					
Constructed Wetlands	✓		✓		✓	✓
Wet Ponds	✓					✓
Media Filters/Filter Basins	✓					
Proprietary Devices	✓					

Source: Adapted from WERF, 2006.

Table 17. BMP Performance – Influent/Effluent Water Quality.

BMP	Sediment (mg/L)	Nitrogen (mg/L)	Phosphorus (mg/L)	Metals – Zn (µg/L)	Oil and Grease (mg/L)	Bacteria (#/100mL)	Temp	Notes
Bioretention without underdrain	0	0	0	0	0	0	Excellent	Infiltration practices are assumed to have zero discharge
Bioretention with underdrain	34/15.5*	1.68/1.14†	0.61/0.16*	107/46*	30.8/2.5‡	641.5/86.5§	Moderate**	
Permeable Pavement without underdrain	0	0	0	0	0	0	Excellent	Infiltration practices are assumed to have zero discharge
Permeable Pavement with underdrain	xx/17.0††	xx/1.23††	xx/0.09††	xx/17††	xx/0.018‡‡	No data	Moderate	
Capture and Reuse	0	0	0	0	0	0	Excellent	Infiltration practices are assumed to have zero discharge
Vegetated Roofs	No data	1.3/1.63***	0.012/0.057***	No data	N/A	xx/22§	Moderate	
Downspout Disconnection	0	0	0	0	0	0	Excellent	Infiltration practices are assumed to have zero discharge
Soil Amendments	0	0	0	0	0	0	Excellent	Infiltration practices are assumed to have zero discharge
Vegetated Filter Strips	114/27.6§§	1.12/0.66‡‡	0.38/0.86§§	355/79§§	No data	No data	Low	
Vegetated Swales	114/58.9§§	No data	0.38/0.62§§	355/96§§	No data	13,492/5,947§	Low	
Infiltration Basins	0	0	0	0	0	0	Excellent	Infiltration practices are assumed to have zero discharge
Infiltration Trenches	0	0	0	0	0	0	Excellent	Infiltration practices are assumed to have zero discharge

Source: Data assembled by the Low Impact Development Center, Inc.

Table 17 (Cont.): BMP Performance – Influent/Effluent Water Quality.

BMP	Sediment (mg/L)	Nitrogen (mg/L)	Phosphorus (mg/L)	Metals – Zn (µg/L)	Oil and Grease (mg/L)	Bacteria (#/100mL)	Temp	Notes
Dry Wells	0	0	0	0	0	0	Excellent	Infiltration practices are assumed to have zero discharge
Dry Ponds	114/46.6[§§]	0.96/0.98[‡‡]	0.38/0.28[§§]	355/136[§§]	2.72/2.54[‡‡]	2,218/1,741[§]	Poor	
Constructed Wetlands	37.8/17.8[††]	2.12/1.15[††]	0.27/0.14[††]	47/31[††]	No data	2,097/257[§]	Poor[**]	
Wet Ponds	114/11.8[§§]	2.29/1.46[‡‡]	0.38/0.54[§§]	355/37[§§]	0.82/0.88[‡‡]	2,693/446.4[§]	Poor[**]	
Media Filters / Filter Basins	114/11.3[§§]	No data	0.38/0.25[§§]	355/36[§§]	No data	1,820/541.3[§]	Poor	Includes Austin sand filter, Delaware sand filter, Multi-chambered treatment trains
Proprietary Devices	varies	varies	varies	varies	varies	varies	Poor	Performance is device-specific

Key: [*]Davis, 2007 [§]Clary et al, 2008 [†]Hunt et al, 2008 [‡]Hong et al, 2006 [***]Teemusk and Mander, 2007
[**]Jones and Hunt, 2008 [§§]Caltrans, 2004 [††]Geosyntec, 2008 [‡‡]International Stormwater BMP Database, 2009

Source: Data assembled by the Low Impact Development Center, Inc.

Table 18. BMP Site Suitability Criteria.

BMP	Soil HSG				Depth to groundwater		Depth to impermeable layer/bedrock		Slope			High Landslide Risk	Soil Contamination
	A	B	C	D	< 10'	> 10'	<5'	>5'	0-5%	5-15%	> 15%		
Bioretention	✓	✓				✓		✓	✓	✓if terraced			
Bioretention with underdrain			✓	✓	✓	✓	✓	✓	✓	✓ if terraced		✓	✓ with liner
Permeable Pavement	✓	✓				✓		✓	✓				
Permeable Pavement with underdrain			✓	✓	✓	✓	✓	✓	✓			✓	✓with liner
Capture/Reuse	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Vegetated Roofs	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Soil Amendments	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Downspout Disconnection	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Filter Strips	✓	✓	✓	✓		✓		✓	✓				
Vegetated Swales	✓	✓	✓	✓		✓		✓	✓	✓			
Infiltration (Retention) Basins	✓	✓	✓			✓		✓	✓				
Infiltration trenches	✓	✓	✓			✓		✓	✓				
Dry wells	✓	✓	✓			✓		✓	✓				
Dry ponds (detention basins)	✓	✓	✓			✓		✓	✓				✓ with liner
Constructed Wetlands		✓	✓	✓	✓	✓	✓	✓	✓				✓ with liner
Wet ponds		✓	✓	✓	✓	✓	✓	✓	✓	✓			✓ with liner
Media filters / Filter Basins	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Proprietary Devices	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Source: The Low Impact Development Center, Inc.

Table 18 (Cont.): BMP Site Suitability Criteria.

BMP	Available space			Maintenance		
	Low	Med	High	Low	Med	High
Bioretention		✓		✓	✓	
Bioretention with underdrain		✓		✓	✓	
Permeable Pavement	✓				✓	✓
Permeable Pavement with underdrain	✓				✓	✓
Capture/Reuse	✓			✓		
Vegetated Roofs	✓				✓	
Soil Amendments	✓	✓	✓	✓		
Downspout Disconnection		✓	✓	✓		
Filter Strips		✓			✓	
Vegetated Swales		✓		✓	✓	
Infiltration (Retention) Basins		✓			✓	✓
Infiltration trenches	✓			✓		
Dry wells	✓			✓		
Dry ponds (detention basins)			✓		✓	
Constructed Wetlands			✓		✓	✓
Wet ponds			✓		✓	
Media filters / Filter Basins	✓				✓	
Proprietary Devices	✓					✓

Source: The Low Impact Development Center, Inc.

Table 19. Maintenance Considerations for LID BMPs.

Source Control	Level of Effort	Frequency
Bioretention	**Minimal to Moderate:** Vegetation management required; occasional removal of captured debris	Semi-annual vegetation management, inspection
Permeable Pavement	**Moderate:** Rejuvenation may be needed (vacuum sweeper/power washing); vegetation management; pavement may have to be completely changed	Semi-annual vacuuming, inspection
Capture/Reuse	**Low:** No vegetation management; no removal of captured pollutants	Weekly emptying between storm events Semi-annual inspection
Vegetated Roofs	**Moderate:** Vegetation management	Semi-annual inspection Vegetation management
Soil Amendments	**Minimal:** No vegetation management; no removal of captured pollutants	Annual inspection
Downspout Disconnection	**Minimal:** No vegetation management; no removal of captured pollutants	Annual inspection
Filter Strips	**Low to Moderate:** Management of vegetation; occasional removal of captured pollutants	Weekly mowing Semi-annual inspection
Vegetated Swales	**Low to Moderate:** Minimal removal of captured pollutants; vegetation management	Weekly mowing Semi-annual inspection
Infiltration Basins	**Moderate to High:** Rejuvenation may be needed (scarifying surface/raking); possible removal of vegetation; removal of captured materials	Semi-annual inspection
Infiltration Trenches	**Low:** Removal of captured debris; periodic inspection	Semi-annual inspection
Dry Wells	**Low:** Removal of captured debris; periodic inspection	Semi-annual inspection
Dry Ponds	**Moderate:** Removal of captured debris; vegetation management; periodic inspection	Weekly mowing Semi-annual inspection Sediment removal every 5-25 years
Constructed Wetlands	**High:** Management of vegetation; removal of floating debris and trash; sediment and vegetation removal; maintain water level during dry periods	Semi-annual inspection Vegetation management
Wet Ponds	**Moderate:** Removal of captured debris; vegetation management; mosquito control	Semi-annual inspection, debris removal, Annual vegetation harvesting
Media Filters	**Moderate:** Inspection and removal of captured debris; sediment removal.	Quarterly inspection, debris removal
Proprietary Devices	**Moderate:** Inspection and removal of captured debris; sediment removal.	Quarterly inspection, debris removal

Source: Adapted from WERF, 2006

Infiltration Feasibility

In many jurisdictions, infiltration-based BMPs are given preference over capture- or filtration-based BMPs. The feasibility of using infiltration is determined primarily by the nature of the soils and topography at the site. The following checklist can be used for a preliminary assessment of the feasibility of using infiltration-based BMPs on a site; however, a geotechnical engineer should be consulted anytime infiltration is being considered. In areas where infiltration-based BMPs are planned, appropriate infiltration and percolation tests must be performed to verify soil and subsoil infiltration and percolation rates.

Table 20. Site Factors Influencing the Feasibility of Infiltration.

Site Factor	Acceptable Range
Hydrologic Soil Group	A or B
Soil infiltration rate	At least 0.5 in/hr
Slope	Less than 5% Note: terraced bioretention designs can accommodate slopes up to 15%
Depth to bedrock or impermeable layers	Varies based on site conditions
Depth to seasonal high water table	At least 10 feet
Setback from buildings with basements	At least 50 feet*
Setback from buildings without basements	At least 5 feet*
Landslide risk	Low
Soil contamination	None

* Infiltration designs can be used adjacent to structures if an impermeable membrane is used to protect the structure and if otherwise compatible with engineering specifications. All distances noted are subject to the geotechnical engineer's review and approval based on specific site conditions.

Source: The Low Impact Development Center, Inc.

Cost

In 2009, the Water Environment Research Foundation (WERF) published the second version of its BMP and LID Whole Life Cost Models. The spreadsheet tools are intended to guide the determination of capital and maintenance costs for nine selected stormwater management practices that include:

1. Extended detention basins;
2. Retention ponds;
3. Swales;
4. Permeable pavement;
5. Green roofs;
6. Large commercial cisterns;
7. Residential rain gardens;
8. Curb-contained bioretention; and
9. In-curb planter vaults.

By inputting basic values such as drainage area, treatment volume, construction materials, and maintenance frequencies, the models will estimate BMP project costs.

Literature reviews and costing methods used by queried U.S. stormwater agencies were used to develop the models. The models can provide planning-level estimates of costs or site-specific costs depending upon the level of information that the user can provide. Each of the models contains default cost values from project research. Adding a few inputs (e.g., drainage area, rainfall, and treatment volume) will provide planning level capital, maintenance, and whole life costs. The model uses default assumptions, design equations, and unit costs derived from manufacturers, RS Means 100, or reported costs from stormwater agencies. Using the models in this manner provides general cost estimates as the cost factors are based on national averages and do not take into account regional or site specific design factors. The models do note that regional cost data were not normalized to national cost data and data from multiple locations were averaged to determine the model default values.

The models can also provide site-specific cost estimates as nearly every cost component of each model can be customized, allowing inputs that reflect geographic influences and individual site conditions. The models can also be used to provide varying degrees of specificity as each cost component can be provided by the user or a combination of default values and user provided values can be used.

The models and User Guide are available for free at WERF web site: http://www.werf.org/AM/Template.cfm?Section=Search_Publications&TEMPLATE=/CM/ContentDisplay.cfm&CONTENTID=10836.

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Bioretention

Bioretention cells are small-scale, vegetated, shallow depressions that address pollutants contained in stormwater runoff by filtration through an engineered soil medium. Biological and chemical reactions in the soil matrix and root zone remove pollutants, and runoff volume is reduced through plant uptake and infiltration into the underlying subsoil. Where infiltration is impossible, bioretention cells are fitted with underdrains to discharge treated stormwater into the storm drainage system. Properly constructed bioretention cells replicate the hydraulic function of an undisturbed upland ecosystem. By intercepting, detaining, and infiltrating runoff, bioretention cells reduce the volume of stormwater flows and reduce on-site erosion. They may be designed on-line or off-line from the primary stormwater conveyance system.

Bioretention can be designed as an integrated landscape feature that improves water quality while reducing runoff quantity. Bioretention offers considerable flexibility in terms of how it can be integrated into a site, and can complement other structural management systems, such as porous pavement parking lots and infiltration trenches, as well as non-structural stormwater BMPs.

Bioretention vegetation serves to improve water quality and reduce runoff quantity. The plants absorb some pollutants, while microbes associated with the plant roots and soil degrade pollutants. In addition to filtering pollutants, the soil medium allows storage and, where feasible, infiltration of stormwater runoff, providing volume control. Soil media serve as a bonding surface for nutrients to enhance pollutant removal. Additional treatment capacity is provided by a surface mulch layer, which traps sediments that can carry high pollutant loads. The most successful bioretention cells mimic nature by employing a rich diversity of locally-adapted plant types and species, which provides them with good tolerance of pests, diseases, and other environmental stressors.

Figure 17. Bioretention Cell in Parking Lot, Caltrans District 11 Headquarters, San Diego, CA.
Source: Wallace Roberts & Todd, Inc.

Cost

Bioretention cells often replace areas that would have been landscaped and maintenance-intensive, so the net cost can be less than the conventional alternatives. In addition, the use of bioretention can decrease the cost for stormwater conveyance systems on a site. Bioretention cells cost approximately $3-4 per square foot for simple residential designs, and $10-40 per square foot for commercial installations (LIDC, 2007).

Benefits

- Reduced runoff volume
- Reduced peak discharge rate
- Reduced TSS
- Reduced pollutant loading
- Reduced runoff temperature
- Groundwater recharge (if soils are sufficiently permeable and no underdrain is placed underneath)
- Habitat creation
- Enhanced site aesthetics
- Reduced heat island effect

Limitations

- Terraced designs must be used on steep slopes
- Infiltration design requires sufficiently permeable soils, depth to groundwater and depth to impermeable layers
- Infiltration design should be located at least 100 feet from drinking water wells
- Maximum tributary area should be less than 5 acres
- Requires regular trash removal and maintenance of vegetation
- May require irrigation during dry periods

Potential LEED Credits:

Primary: Sustainable Sites – Credit 6 “Stormwater Management” (1-2 Points)
Other: Sustainable Sites – Credit 7 “Landscape & Exterior Design to Reduce Heat Islands” (1-2 Points)
Water Efficiency – Credit 1 “Water Efficient Landscaping” (1-2 Points)
Innovation & Design Process (1-4 Points)

Water Supply Impacts

Water supply impacts vary, and are associated with water needed for initial plant establishment and subsequent maintenance. Water will likely be needed for maintenance irrigation, unless the species chosen are adapted to the site’s precipitation, soils, and microclimate, and have adequate conditions to survive and grow without supplemental irrigation. In these cases, the long-term supply impact is essentially neutral. For a retrofit project in which an existing “conventionally” landscaped area (e.g., turf or higher water-use plants) is replaced with bioretention, the water supply impact should be positive (i.e., less water is needed) compared to the existing developed condition. Detailed guidance on the irrigation needs of landscape plantings has been published by the California Department of Water Resources (UCCE and CDWR, 2000).

Applications

Bioretention can take many forms, from the simple residential “rain garden”, to the “planter box” complete with underdrain and engineered filtering media. Bioretention is appropriate for use in commercial, institutional, residential, industrial, and transportation applications. The common forms of bioretention and potential applications are provided below.

Potential Applications

Residential	YES
Commercial	YES
High-density	LIMITED
Industrial	YES
Recreational/Institutional	YES
Highway/Road	YES
Parking Lots	YES

Residential

Residential settings often provide favorable conditions in which to incorporate bioretention. Bioretention cells can be installed in lawn areas or locations that would otherwise have been landscaped. Roof drainage, driveway, street/sidewalk and yard drainage can be treated with bioretention. A range of treatment train options are available in residential applications. Downspouts, for instance, can deliver stormwater directly to the surface of a bioretention cell or a grass yard, or a vegetated channel can be used as pretreatment for bioretention cell influent.

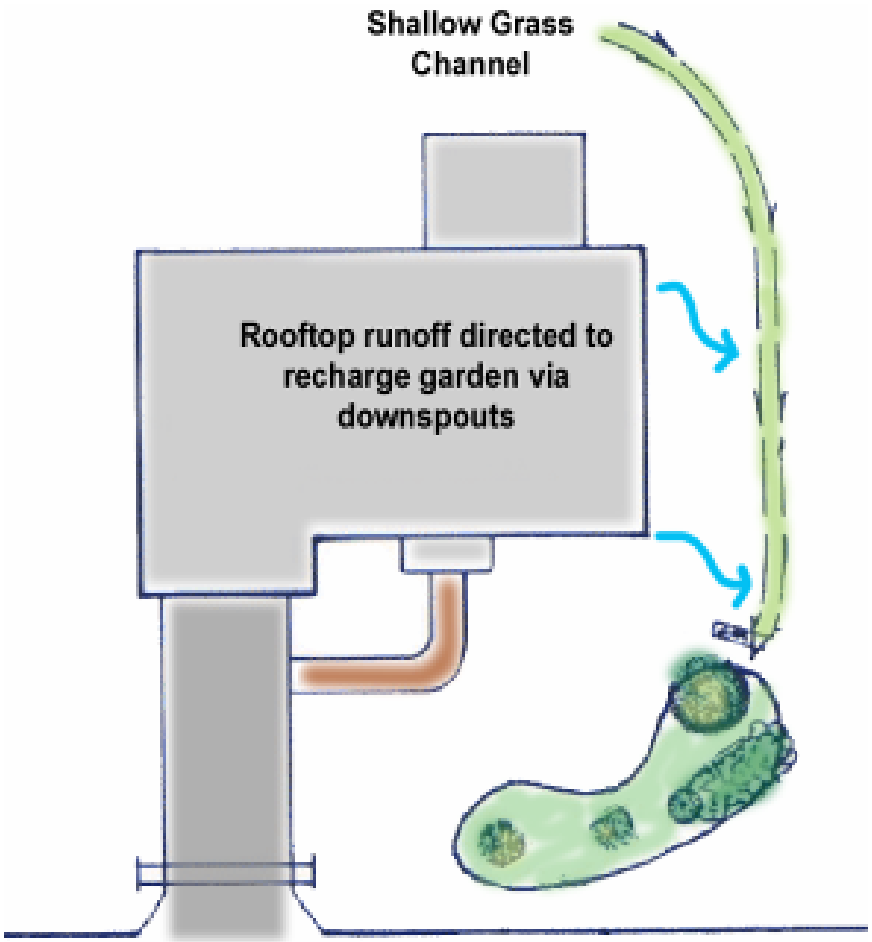

Figure 18. Single-Family Residential Lot Drainage Schematic.
Source: Claytor and Schueler, 1995, with modifications by Cahill Associates

Figure 19. Roof leader draining to bioretention cell.
Source: Wild Ones Natural Landscapers, Ltd., Applewood, MI.

Planter Box

In urban settings, bioretention can be incorporated into planter boxes. As part of a disconnection strategy, roof downspouts may be directed to vegetated planter boxes to store and filter stormwater. Planter boxes offer “green space” in tightly confined urban areas that provide a soil/plant mixture suitable for stormwater capture and treatment.

Planter boxes are most commonly used in urban areas adjacent to buildings and along sidewalks. Locations close to roof downspouts are preferable when used a part of a disconnection program. Planter boxes may be constructed of any durable material. When built adjacent to buildings as a receptacle for downspout runoff, they are often constructed of the same material as the building. Otherwise they may be constructed of concrete to blend in with the sidewalk or metal when they are stand-alone units. Planter boxes constructed adjacent to buildings should be fitted with waterproofing membranes on the building side to prevent seepage of captured water into the building.

Figure 20. Planter box capturing roof runoff.
Source: The Low Impact Development Center, Inc.

Commercial - Parking Lot Landscaped Filter Basin (LFB)
Stormwater management and green space areas are limited in parking areas. In these situations, bioretention can create functional areas out of existing landscaping. Bioretention can be retrofit into existing parking lot islands, or designed into parking lot medians and perimeters.

Figure 21. Parking Lot Bioswale, Oxnard, CA.
Source: Ed Gripp

- *Curbless Parking Lot Bioretention*
  A bioretention cell can be located adjacent to a parking area with wheel stops rather than curbs, allowing stormwater to flow as a distributed “sheet” of water over the parking lot edge and directly into the cell. Shallow grades must direct runoff at reasonable velocities.

- *Curbed Parking Lot Bioretention*
  Runoff can be directed along a parking lot island by using a curb and gutter. Once runoff reaches a low point along the curb perimeter, water enters the bioretention cell through a curb cut. If the runoff volume exceeds the ponding depth available, water will overflow the bioretention cell and enter a standard inlet.

Roadway
Bioretention cells can be used alongside roadways. Runoff is conveyed along the concrete curb until it reaches the end of the gutter, where it spills into the vegetated area. A schematic of this type of arrangement is shown below.

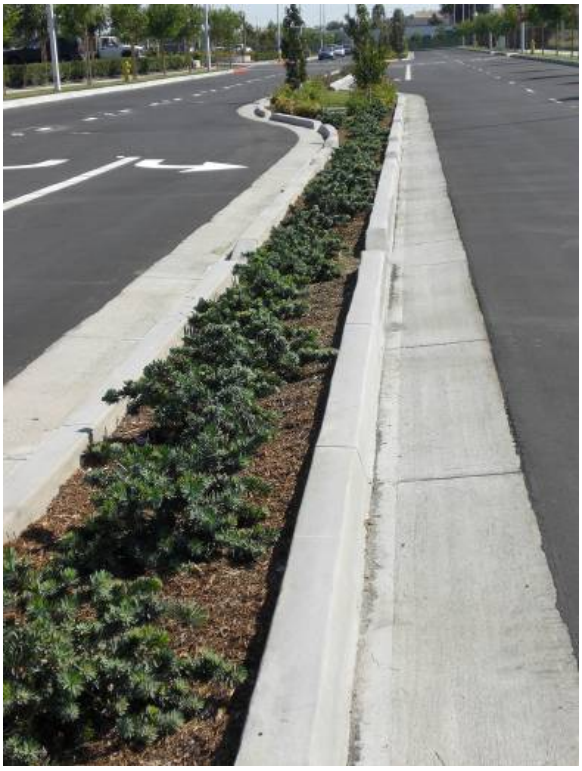

Figure 22. Linear Bioretention, Downey, CA.
Source: Bill DePoto

Dry Swales
In addition to the common “cell” design, bioretention can be incorporated into vegetated swales. Such structures can be used to provide infiltration and water quality treatment while conveying larger flows to supplemental storage BMPs.

Figure 23. Bioretention cell for street/yard drainage, Los Angeles, CA.
Source: Bill DePoto

Site Factors

- Depth to water table: Ten (10)- foot minimum for infiltration (Regional Boards and local agencies may have differing requirements.)
- Depth to bedrock: Varies with site conditions (Regional Boards and local agencies may have specific requirements.)
- Soil permeability: soils are typically required to have a minimum of 0.5 inches per hour for infiltration
- Feasibility on steeper slopes: medium

When working in areas with steeper slopes (up to 15 percent), it is critical to first verify that these BMPs are feasible. A geotechnical engineer should be consulted to evaluate the suitability of installing a bioretention cell on or near a steep slope, to identify the risk of creating an unstable condition; underdrains may be required for slope applications. When they do occur on slopes, bioretention cells should be terraced laterally along slope contours to minimize earthwork and provide level areas for infiltration.

Percolation tests should be performed by a qualified professional to verify soil permeability in the locations where bioretention cells are planned. If soils are found to have percolation rates less than 0.5 in/hour, bioretention cells should be fitted with underdrains and treated as filtration rather than infiltration practices.

Many local jurisdictions are developing standard specifications for the location, sizing, configuration, and/or maintenance of LID BMPs and such requirements where they exist should be used. Where local specifications for bioretention do not exist, the following guidelines can be used.

Building Setbacks

- Buildings with basements: 50 feet, down-gradient from foundation
- Buildings without basements: 5 feet

Planter box bioretention facilities can be placed adjacent to buildings if they are fit with waterproofing membranes adjacent to the building wall.

Pedestrian Traffic

Pedestrian traffic across bioretention cells causes compaction, decreasing the infiltration rate of the soil. Walking across bioretention cells should be discouraged by providing alternative pathways and by planting densely.

Pretreatment (may be necessary to help prevent clogging)

Pretreatment consists of sediment removal through a vegetated buffer strip, cleanout, stabilized inlet, water quality inlet, or sediment trap prior to runoff entry into the bioretention cell. Pretreatment of runoff should be provided wherever excessive sediment is likely to enter the bioretention cell and cause concern for decreased functionality of the BMP. Rooftop runoff may need little or no pretreatment.

Flow Entrance

Options:

- Water may enter via an inlet (e.g., flared end section) or trench drain
- Sheet flow into the facility over grassed areas or level spreader
- Curb cuts with grading for sheet flow entrance
- Roof leaders with direct surface connection

Entering velocities must be non-erosive where concentrated runoff enters the bioretention cell – use inlet energy dissipaters such as rocks or splash blocks.

Figure 24. Bioretention cell for street/yard drainage, Downey, CA.
Source: Bill DePoto

Figure 25. Curb cut directing water from the street into a bioswale.
Source: Haan-Fawn Chau

Ponding Area
For most areas, maximum 3:1 side slopes or flatter are recommended to enhance safety and buffer the erosive force of incoming runoff. In planter boxes or other areas where vertical walls are necessary, use energy dissipators to control erosion.

Surface ponding depth is generally 6 to 12 inches. Drawdown times vary by jurisdiction, but are generally in the range of 24-72 hours to minimize vector issues and prevent depletion of oxygen in the soil.

Bioretention Soil Medium/Volume Storage Bed
Bioretention soil medium (BSM) depth should be between 24 and 36 inches where only herbaceous plant species will be utilized. If trees and woody shrubs will be used, soil media depth may need to be increased, depending on plant species (especially in poorly drained sites). Provided they meet drainage criteria, native soils can be used as part of the soil medium.

The BSM is generally composed of: 50 percent sand, 30 percent topsoil, and 20 percent organic material by volume (LIDC, 2003). The formula can be varied to some extent, but major changes may impact both hydraulic and pollutant removal performance and should be studied carefully. Engineered soil media meeting the specification described in Table 21 can be expected to have infiltration rates ranging from 25 – 130 in/hr (Hsieh and Davis, 2005).

Table 21. Bioretention Soil Medium (BSM) Specification.

Component	Properties
Sand	Conforms to ASTM C33 Fine Aggregate
Organic Material	Compost or shredded hardwood mulch
Topsoil	
• Sand (2.0 – 0.050 mm)	50 – 85% by weight
• Silt (0.050 – 0.002 mm)	0 – 50% by weight
• Clay (less than 0.002 mm)	10 – 20% by weight[1]
• Organic Matter	1.5 – 10% by weight
• pH	5.5 – 7.5 (NOTE: pH can be corrected with soil amendments if outside acceptable range)
• Magnesium	Minimum 32 ppm (NOTE: magnesium sulfate can be added to increase Mg)
• Phosphorus (Phosphate - P_2O_5)	Not to exceed 69 ppm P-index should be less than 25
• Potassium (K_2O)	Minimum 78 ppm (NOTE: potash can be added to increase K)
• Soluble Salts	Not to exceed 500 ppm

Source: The Low Impact Development Center, Inc., 2003

Surface Mulch or Organic Layer

- Acts as a filter for pollutants in runoff
- Protects underlying soil from drying and eroding
- Reduces likelihood of weed establishment
- Provides a medium for biological growth, decomposition of organic material, and adsorption and bonding of heavy metals

Two to three inches of shredded hardwood mulch (aged at least 6 months to 1 year), leaf compost, or other comparable product should be uniformly applied immediately after planting to prevent erosion, enhance metal removal, and aid plant establishment. Wood chips should be avoided as they tend to float during inundation periods.

Mulch or compost should not exceed 3 inches in depth so as not to restrict oxygen flow, and should not be placed directly against the stems or trunks of plants.

Plants

Proper plant selection is essential for bioretention areas to be effective. Typically, generalist plant species native to the area are best suited to the variable environmental conditions encountered in a bioretention cell, as they need to withstand a wide range of soil and moisture regimes. See the plant list in Appendix A for recommended species based on ecoregion. When designing the planting, it is important that plant species are located according to their tolerance of inundation and prolonged soil saturation; less tolerant species should be located at the higher elevations. It should be noted, however, that bioretention cells drain rapidly, and therefore do not develop anoxic soil conditions. Trees, shrubs, and herbaceous

[1] If the proposed topsoil is known to contain expansive clays, clay content should not exceed 10% by weight.

perennials may be used in a bioretention cell. They should be selected with other functions in mind (e.g., shade, screening versus clear views, color, etc.), in addition to suitability for bioretention and to the ecoregion. For bioretention cells that will have an underdrain, it is also important to select species that do not have invasive roots, which have a tendency to clog perforated drainage pipes. A landscape architect can help with plant selection and bioretention cell design.

Verify that candidate plants can tolerate snowmelt chemicals, if applicable (at high elevations).

In most cases, seed is not the preferred method for plant establishment in a bioretention cell. The fluctuating water levels make it difficult for the seed to readily establish, and the random nature of seeding may result in an undesirable plant layout for some situations. Instead, it is strongly recommended that containerized live plants be utilized: plugs or 1-gallon for herbaceous plants, 1- to 5-gallon for shrubs, and 5-gallon to 24-inch box for trees. Plant spacing depends on mature plant size and desired density of plant cover.

Plant species composition generally depends on how often water is expected to pond in the bioretention cell. For Southern California, species will likely need to be drought-tolerant plants that can handle occasional inundation during the rainy season.

Underdrain

In areas with HSG group A or B soils, bioretention cells may often be constructed without underdrains in order to maximize infiltration. In areas with less-permeable (typically HSG Group C or D soils), underdrains may be required to ensure adequate drainage. Underdrains are typically constructed of a 6” diameter perforated pipe connecting to an existing stormwater conveyance structure or outlet. Underdrains should be surrounded by at least a six inch layer of ASTM No. 57 aggregate.

Enhanced Nitrogen Removal

The underdrain can be placed several inches above the bottom of the bioretention cell, creating an extended detention zone that will provide an opportunity for enhanced nitrogen removal by denitrification (Hsieh et al, 2007).

Overflow

Provide for the direct discharge of excess runoff during large storm events when the subsurface and surface storage capacity is exceeded.

Examples of outlet controls include domed risers, inlet structures, weirs, and similar devices.

Figure 26. Positive Overflow Device: Domed Riser.
Source: Macomb County Michigan Public Works Office

Figure 27. Inlet Structure, Downey, CA.
Source: Bill DePoto

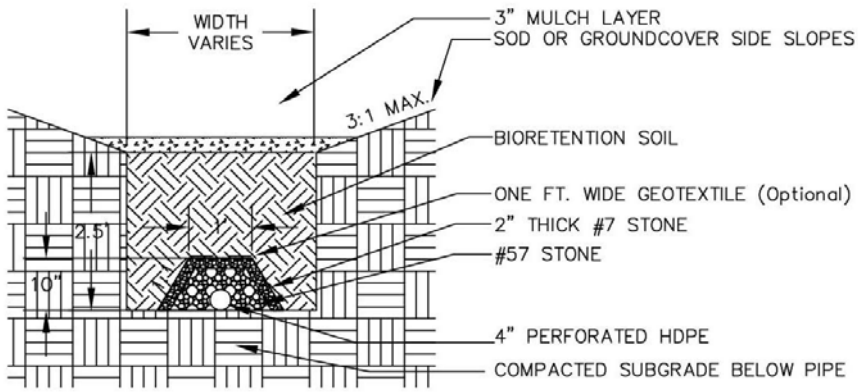

Figure 28. Detailed cross-section of a bioretention cell.
Source: LID Center

Sizing criteria for systems without underdrain
Surface area depends on storage volume requirements and permeability of the BSM and underlying native soil. Runoff volume is based on local regulatory requirements, such as a specific design storm (e.g. 2-year, 24-hour) or total runoff (85th percentile), and is calculated using one of the methods described in Step 5 of this manual, or by the method specified by local regulations. The total storage volume of a bioretention cell, V_{BMP}, accounts for both surface ponding and the available pore space within the soil medium.

Maximum Total Depth
The maximum total depth of the bioretention cell (ponding depth, BSM depth and gravel storage depth) is limited by the infiltration rate of the surrounding soil. This depth can be calculated using the following formula (RCFC & WCD, 2006):

$$D_m(in) = \frac{t(hr) \times I(in/hr)}{s}$$

where I = site infiltration rate (in/hr)
s = safety factor, and
t = drawdown time (usually 48-72 hours).

The safety factor, s, accounts for uncertainty in the true site infiltration rate. If the infiltration rate is not based on onsite testing, use s = 10, for planning purposes only. Before finalizing design, conduct in situ double-ring infiltrometer tests to establish true infiltration rates, and use pits or borings to examine subsoils for restrictive layers. Then, a safety factor not less than s = 3 is to be applied.

This total depth can then be divided among the surface ponding depth and subsurface BSM depth:

$$D_m = D_p + D_b$$

where D_p = ponding depth, and
D_b = BSM depth.

Surface Area
The size of the bioretention cell is determined by calculating the area necessary to store the design volume at the maximum depth, taking into account the available storage volume within the BSM. The area of the bioretention cell can be calculated using the following formula, assuming that the bioretention cell is constructed with a level surface:

$$A\ (ft^2) = \frac{V_{BMP}(ft^3) \times 12(in/ft)}{D_p(in) + D_b(in) \times R_b}$$

where A = BMP surface area (ft^2)
V_{BMP} = BMP design volume (ft^3), and
R_b = BSM void ratio (usually about 0.3).

The total surface area needed may be divided into multiple cells. This configuration, for example, may be useful to collect runoff from both the front and back of a building.

Sizing criteria for systems with underdrain
In poor soils or other locations where infiltration is not feasible, bioretention cells are constructed with underdrains, and therefore serve as detention rather than retention systems. Where underdrains are used, maximum depth is not limited by the infiltration rate of the surrounding soil. The depth of the bioretention cell may be determined based on other design considerations, such as necessary storage volume, plant rooting depth, and pollutant removal performance. Typical values are given below:

Ponding depth	6 inches
BSM depth	24-36 inches

The total storage volume, V_{BMP}, accounts for both surface ponding and the available pore space within the soil medium. The total area required can then be calculated using the above equation for surface area.

Construction Guidance

The following is a typical construction sequence. However, alterations will be necessary depending on design variations.

1. Install temporary sediment control BMPs as required by permitting authority.
2. Complete site grading, minimizing compaction as much as possible. If applicable, construct curb cuts or other inflow entrance, but provide protection so that drainage is prohibited from entering the construction area. Construct pretreatment devices (filter strips, swales, etc.) if applicable.
3. Stabilize grading, except within the bioretention area.
4. Excavate bioretention cell to proposed invert depth and scarify the existing soil surfaces. Do not compact soils.
5. Install perforated underdrain if applicable. The underdrain system shall be placed on a 3-ft wide bed of No. 57 aggregate, covered with 6 inches of No. 57 aggregate and topped with 2 inches of No. 7 aggregate.
6. Backfill bioretention cell with Bioretention Soil Medium (BSM) in 12-inch layers. Each layer should be compacted by saturating the bioretention cell.
7. Install automatic irrigation system if applicable.
8. Allow the BSM to settle for 24 hours.
9. Complete final grading to achieve proposed design elevations, leaving space for upper layer of compost or mulch as specified on plans.
10. Plant vegetation according to planting plan.
11. Apply mulch layer.
12. Install erosion protection at surface flow entrances where necessary.
13. Perform infiltration testing to verify system performance.

Figure 29. Newly Planted Bioretention Cell in El Monte, CA.
Source: Bill DePoto

Maintenance Considerations

Properly designed and installed bioretention cells require some regular maintenance, most frequently during the first year or two of establishment.

Bioretention cells will require supplemental irrigation during the first 2-3 years after planting. Drought-tolerant species may need little additional water after this period, except during prolonged drought, when supplemental irrigation may become necessary for plant survival. Verify that the maintenance plan includes a watering schedule for the establishment period and in times of extreme drought after plants have been established.

While vegetation is being established, remove weeds by hand (weeding frequency should decrease over time, as plants grow).

Although plants may need occasional pruning or trimming, bioretention cells should generally not be mowed on a regular basis. Trim vegetation as necessary to maintain healthy plant growth. In some instances, where it is desired to maintain fast-growing, annual herbaceous plant cover, annual mowing may be appropriate.

Replace dead plants. If a particular species proves to be prone to mortality, it may need to be replaced with a different species that is more likely to succeed on this particular site.

Mulch should be re-applied when erosion is evident. In areas expected to have low metal loads in the runoff, mulch as needed to maintain a 2-3 inch depth. In areas with relatively high metal loads, replace mulch once per year.

Bioretention cells should be inspected at least two times per year for sediment buildup, trash removal, erosion, and to evaluate the health of the vegetation. If sediment buildup reaches 25 percent of the ponding depth, it should be removed, taking care to minimize soil disturbance. If erosion is noticed within the bioretention cell, additional soil stabilization measures should be applied. If vegetation appears to be in poor health with no obvious cause, a landscape specialist should be consulted.

An important concern for bioretention applications is their long-term protection and maintenance, especially if undertaken in multiple (adjacent) residential lots where individual homeowners provide

maintenance. In such situations, it is important to provide management guarantees that ensure their long-term functionality (e.g., deed restrictions, covenants, and maintenance agreements).

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Wild Ones Natural Landscapers. http://www.for-wild.org/

Pervious Pavement

Pervious pavement consists of a permeable surface course underlain by a storage reservoir consisting of a uniformly graded aggregate bed or premanufactured structural stormwater units. An optional filter layer with subdrains may be incorporated for installations on soils that do not support infiltration. The surface course may consist of pervious bituminous asphalt, pervious concrete, various types of permeable pavers, reinforced turf or gravel, or clear binder pavements.

Variations

1. Pervious Bituminous Pavement
2. Pervious Concrete
3. Permeable Pavers
4. Reinforced Turf/Gravel
5. "Clear" Binder Pavements

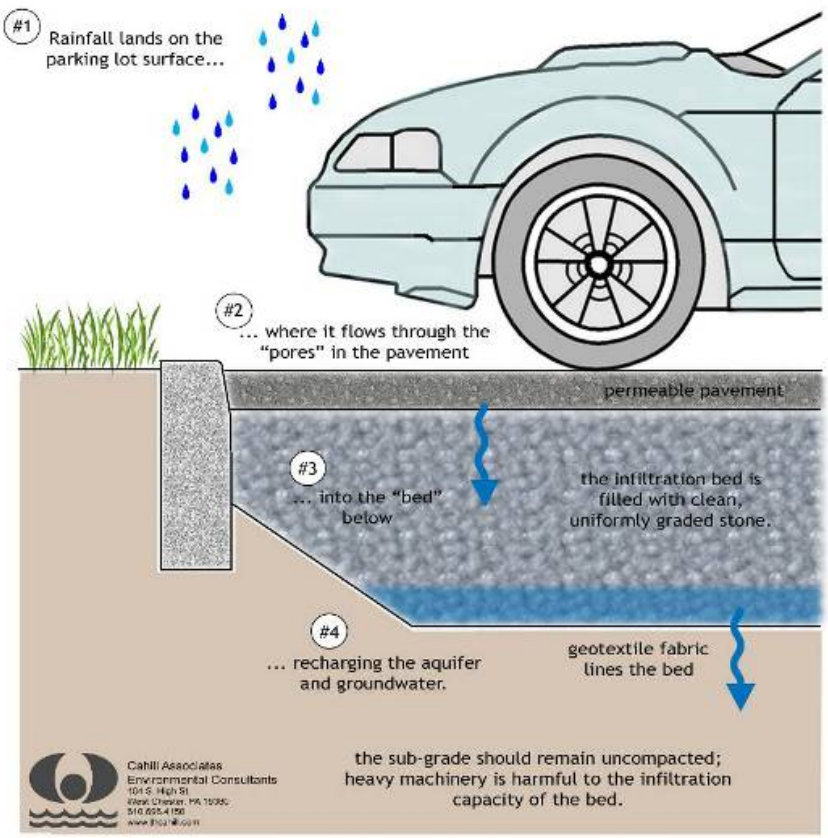

Figure 30. Cross-section showing design components of a permeable pavement with subsurface infiltration bed. Where infiltration is infeasible, underdrains can be fitted into the subsurface bed.
Source: Cahill Associates

Benefits

- Reduced runoff volume
- Reduced peak discharge rate
- Reduced TSS
- Reduced pollutant loading
- Reduced runoff temperature

- Groundwater recharge (if soils are sufficiently permeable and no underdrain is placed underneath)
- Reduced heat island effect
- Dual purpose

Limitations

- Should not be used to capture runoff from unpaved areas without pretreatment, such as a vegetated filter strip
- Should not be used in areas with high danger of pollutant spills
- Not suitable for high traffic areas
- Requires regular maintenance
- Not suitable for slopes greater than 3 percent

Water Quality

Pervious pavement systems are effective in reducing such pollutants as total suspended solids, metals, and oil and grease. The pervious pavement surface, the (optional) filter layer, and the underlying soils below the infiltration bed filter particulate pollutants. Pervious pavement systems will provide limited treatment of dissolved pollutants, such as nitrates.

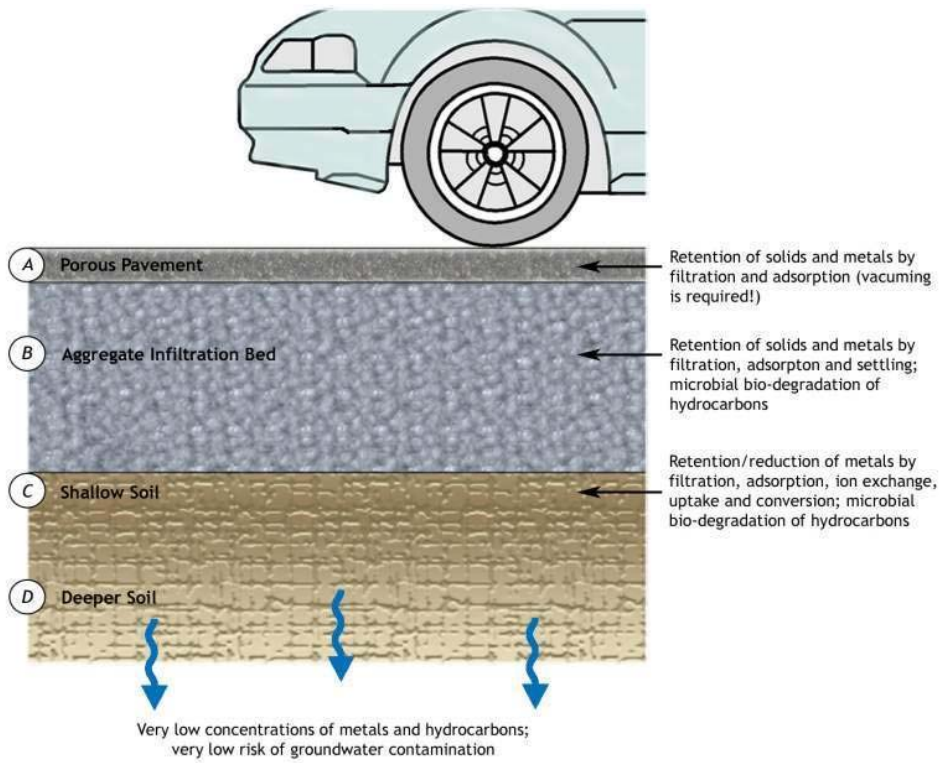

Figure 31. Water quality benefits of pervious pavement with subsurface infiltration.
Source: Cahill Associates

Table 22. Water Quality Benefits of Pervious Pavement With a Subsurface Infiltration Bed.

System Component	Mechanism(s)	Contaminants Retained/Reduced	References
Porous Pavement	Filtration and Adsorption	Total Suspended Solids (TSS), Heavy Metals, Hydrocarbons, COD, and De-icing Salt (less required, more retained) (Note: maintenance by vacuuming is required)	Ferguson, 2005; Legret and Colandini, 1999; Pagotto et al., 2000; UNHSC, 2007
Infiltration Bed or filter layer	Filtration, Adsorption, Settling, Microbial Bio-Degradation	TSS, Metals, and Hydrocarbons, plus Total Organic Carbon, COD, Nitrogen	Balades et al, 1992 & 1995; Diniz and Espey, 1979; Legret and Colandini, ,1999; Newman et al, 2002; Pratt et al, 1999; Swisher, 2002; Thelen and Howe, 1978
Shallow Soil	Filtration, Adsorption, Ion Exchange, Microbial Bio-Degradation, Conversion, and Uptake (only with high plant activity)	Metals and Hydrocarbons, including PAHs	Barraud et al, 1999; Dierkes and Geiger, 1999; Legret et all 1999; Swisher, 2002
Deeper Soil	Filtration, Adsorption, Ion Exchange, Conversion, and Uptake (only with high plant activity)	Metals and Hydrocarbons, plus Organics and Bacteria; Very Low Risk of Groundwater Contamination	Barraud et al, 1999; Boving et al, 2006; Dierkes, 1998; Dierkes and Geiger, 1999; Mikkelsen, 1997; Pitt et al, 1994; Roseen et al, 2006

Source: Cahill Associates

Peak Flow Rate Mitigation

Properly designed pervious pavement systems provide effective management of peak flow rates due to the provided storage reservoir.

Potential LEED Credits:

Primary: Sustainable Sites – Credit 6 “Stormwater Management” (1-2 Points)
Other: Innovation & Design Process (1-4 Points)

Cost

The majority of added cost of a pervious pavement/infiltration system lies in the underlying stone bed and optional filter layer, which is generally deeper than a conventional bed and lined with non-woven geotextile. However, for new construction projects, this additional cost can be partially offset by the significant reduction in the required drainage infrastructure (i.e. inlets and pipes). Pervious pavement areas with subsurface infiltration beds can reduce or eliminate the need (and associated costs, space, etc.) for large detention basins. When these factors are considered, pervious pavement with infiltration has proven itself less expensive than the impervious pavement with associated traditional stormwater management. Recent installations have averaged between $2,000 and $2,500 per parking space, for the pavement and stormwater management systems.

- Pervious asphalt, with additives, is generally 10 to 20 percent higher in cost than standard asphalt on a unit area basis. Unit costs for pervious asphalt (w/o infiltration bed) range from about $1.75/SF to $3.50/SF.

- Pervious concrete, as a material, is generally more expensive than asphalt and requires more labor and experience for installation due to specific material constraints. Unit costs for 6-inch thick pervious concrete (w/o infiltration bed) section are typically between $6-7/SF.

- Permeable pavers vary in cost depending on type and manufacturer.

NOTE: The data provided is based on average market costs. For greater accuracy a site and market specific cost estimate should be developed.

Table 23 and Table 24 summarize the costs associated with Phases I and II, respectively, of a pervious pavement demonstration project completed in 2005 at the San Diego County Operations Center in Kearny Mesa. Phase I included pervious asphalt, concrete, and pavers, while Phase II included only pervious asphalt (different mixes than in Phase I) and concrete.

Table 23. San Diego COC Phase I – Pervious Pavement Costs.

Pavement Replacement Square Foot Costs 2005						
	Demolition & Excavation	**Installation of Sub Base**	**Pavement Costs**	**Square Foot Costs***	**Annual Est. Square Foot Maintenance Costs**	**Comments**
Porous Asphalt	$ 2.75	$ 1.88	$ 1.87	$ 6.50	$ 0.04	18" – Excavation/Backfill 3" – Porous Asphalt
Standard Asphalt	$ 2.13	$ 1.04	$ 1.32	$ 4.49	$ 0.06	6" – Excavation/Backfill 6" – Asphalt
Porous Concrete	$3.19	$ 1.88	$ 6.34	$ 11.41	$ 0.02	18" – Excavation/Backfill 5-1/2" – Pervious Concrete
Standard Concrete	$ 1.51	$ -----	$ 3.42	$ 4.93	$ 0.01	No new base material 6" – Reinforced Concrete
Porous Pavers	$ 2.75	$ 1.88	$ 9.63	$ 14.26	TBD	18" – Excavation/Backfill 3" – Paver
*Square foot cost are based on actual cost received by the County of San Diego						

Source: Cahill Associates

Table 24. San Diego COC Phase II – Pervious Pavement Costs.

Pavement Replacement Square Foot Costs 2007						
	Demolition & Excavation	**Installation of Sub Base**	**Pavement Costs**	**Square Foot Costs***	**Annual Est. Square Foot Maintenance Costs**	**Comments**
Porous Asphalt	$ 3.39	$ 3.40	$ 2.01	$ 8.80	$ 0.04	18-30" – Excavation/Backfill 3" – Porous Asphalt
Standard Asphalt	$ 2.13	$ 1.04	$ 1.32	$ 4.49	$ 0.06	6" – Excavation/Backfill 6" – Asphalt
Porous Concrete	$3.64	$ 3.40	$ 7.10	$ 14.14	$ 0.02	18-30" – Excavation/Backfill 5-1/2" – Pervious Concrete
Standard Concrete	$ 1.51	$ -----	$ 3.42	$ 4.93	$ 0.01	No new base material 6" – Reinforced Concrete
*Square foot cost are based on actual cost received by the County of San Diego						

Source: Cahill Associates

Applications

Pervious pavement is well-suited for parking lots, walking paths, sidewalks, playgrounds, plazas, tennis courts, and other similar uses. Pervious pavement can be used in driveways if the homeowner is aware of the stormwater functions of the pavement and willing to maintain it. Pervious pavement can be used in low-traffic roadways, but should not be used on roadways carrying more than 25,000 vehicles per day. The thickness of the pervious pavement system works to distribute traffic loads, and can decrease the need for compaction of the subsoil. Pervious pavement can also be layered on top of impermeable asphalt, where it can help to quickly remove water falling on the pavement surface, reducing splash and spray from vehicles. This reduces the amount of pollutants washed from vehicles, limiting water quality degradation. In areas where fire lanes are required to be impermeable, the impermeable surface should be sloped toward the pervious pavement. The reservoir layer should extend beneath the entire pavement surface.

Pervious pavements can be used in residential, commercial, institutional, and industrial applications in both urban and suburban environments. Pervious pavements have been widely applied in retrofit situations as existing standard pavements are replaced. Pervious pavements should not be used in industrial and commercial applications where pavement areas are used for material storage or the potential for surface clogging is high due to high traffic of construction vehicles.

Potential Applications

Residential	YES
Commercial	YES
High-Density	YES
Industrial	LIMITED
Recreational/Institutional	YES
Highway/Road	LIMITED

Parking Areas

Figure 32. Parking Lot, City of Downey, CA.
Source: California Watershed Engineering

Figure 33. Pervious Paver Parking Stalls, Redlands, CA.
Source: Jeff Endicott

Figure 34. Pervious Paver Driveway, Chino, CA.
Source: Jeff Endicott

Pervious Pavement Walkways

Pervious pavement, both as asphalt and concrete, can also be used in walkways and sidewalks. These installations typically consist of a shallow (8 in. minimum) aggregate trench that is sloped to follow the surface slope of the path. In the case of steeper surface slopes, the aggregate infiltration trench may be "terraced" into level reaches in order to maximize its infiltration capacity, at the expense of additional aggregate.

Figure 35. Pervious Concrete Sidewalk, Santa Monica, CA.
Source: Bill DePoto

Playgrounds / Basketball / Tennis

Figure 36. Pervious asphalt basketball court at 2nd Ward Neighborhood Park in Upper Darby, PA.
Source: Cahill Associates

Streets and Alleys

Figure 37. Pervious asphalt street in residential neighborhood in Portland Oregon.
Source: Cahill Associates

Figure 38. Pervious paver parking edge in residential neighborhood in Portland Oregon.
Source: Cahill Associates

Figure 39. Porous friction course over traditional asphalt.
Source: Caltrans

Variations

Pervious Bituminous Asphalt

Pervious bituminous asphalt pavement was first studied in the early 1970's by the Franklin Institute in Philadelphia and consists of standard bituminous asphalt in which the fines have been screened and reduced, allowing water to pass through small voids. Pervious asphalt is placed directly on the stone bed in a single 3 ½ to 4-inch lift that is lightly rolled to a finish depth of 2 ½ to 3-inches.

Because pervious asphalt is standard asphalt with reduced fines, it is similar in appearance to standard asphalt. Recent research in open-graded mixes for highway applications has led to additional improvements in pervious asphalt through the use of additives and higher-grade binders. Pervious asphalt is suitable for use in any climate where standard asphalt is appropriate.

Figure 40. Pervious asphalt parking lot at Flinn Springs County Park in El Cajon, CA.
Source: Cahill Associates

Figure 41. Close-up showing pervious asphalt pavement atop a stone infiltration/storage bed at the San Diego County Operations Center in Kearny Mesa, CA.
Source: Cahill Associates

Pervious Concrete
Pervious Portland Cement Concrete, or pervious concrete, was developed by the Florida Concrete Association and has seen the most widespread application in Florida and other southern areas. Like pervious asphalt, pervious concrete is produced by substantially reducing the number of fines in the mix in order to establish voids for drainage. Like other types of pervious pavements, pervious concrete should always be underlain by a stone bed designed for stormwater management and should never be placed directly onto a soil bed.

While pervious asphalt is very similar in appearance to standard asphalt, pervious concrete has a coarser appearance than its conventional counterpart and a clean-swept finish can not be achieved. Care must be taken during placement to avoid over-working the surface and creating an impervious layer. Pervious concrete has been proven to be an effective stormwater management BMP. Another potential advantage of pervious concrete is the option of introducing color to the mix. The industry now offers a variety of hues and tints that can allow a pervious concrete installation to better integrate with its adjacent landscape. Additional information pertaining to pervious concrete, including specifications, is available from the Florida Concrete Association and the National Ready Mix Association (see References).

Figure 42. Pervious concrete in Cerritos, CA.
Source: Bill DePoto

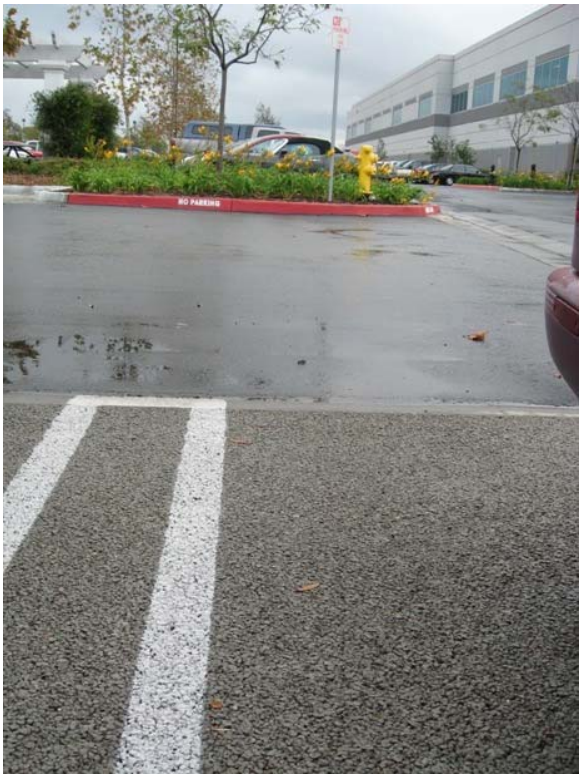

Figure 43. Pervious concrete parking areas, Haas Automation, Inc., Oxnard, CA.
Source: Lorraine Rubin

Permeable Pavers

Permeable pavers consist of interlocking units (often concrete) that provide some portion of surface area that may be filled with a pervious material such as gravel. These units are often very attractive and are especially well suited to plazas, patios, small parking areas, etc. There are also products available that provide a fully permeable surface through the use of plastic rings/grids filled with gravel. A number of manufactured products are available, including (but not limited to): Aqua Bric (Orco Block); Turfstone; UNI Eco-stone; EP Henry ECO I Paver; Checkerblock; Netlon Gravel Pavement Systems; Permapave. Permeable pavers vary greatly in their design and resulting open area. Some designs offer relatively little open surface area where infiltration can take place. Table 25 lists the open area percentage of several commonly used paver products. Please note that this list is not exhaustive; there are many other paver products on the market.

Designers are encouraged to obtain paving system permeability data from the manufacturer of the paving stone being specified. The rates for clean systems (freshly installed) are expected to be quite high, and should be de-rated by applying a safety factor during design.

When used in parking lots or other applications involving pedestrians, ADA access standards must be considered. Options include selecting an ADA compliant block system, or paving ADA access areas with compliant, alternative surfaces such as AC or concrete.

Table 25. Open Area Percentage of Several Commonly Used Paver Products.

Paver Product	Open Area Percentage
Turfstone™	41
Checker Block®	75
Netpave® 50	85
UNI Eco-stone®	12
Acker-Stone Aqua-Via	9.3
Permapave	Varies (depends on size of stone used as aggregate)
ORCO Aqua Brick® Paving Stones	10.6
Angelus SF Rima™ Paving Stones	10

Source: The Low Impact Development Center, Inc.

Figure 44. Turfstone™ Pavers.
Source: Interlocking Paving Systems, Inc.

Figure 45. Turfstone™ Driveway.
Source: Nicolock

Figure 46. Checker Block® Shoulder.
Source: Nicolock

Figure 47. NetPave® 50.
Source: Rehbein Solutions, Inc.

Figure 48. Permapave.
Source: Permapave USA

Figure 49. Uni Eco-stone® Pavers.
Source: Interlocking Paving Systems, Inc.

Figure 50. Acker-Stone Aqua-Via.
Source: Acker-Stone Industries

Figure 51. Aqua Bric® Type 4 (ADA Compliant).
Source: ORCO Block Co., Inc., Photography by RA Hanson

Figure 52. SF Rima™ Paving Stones at the Persico Commercial Center in the City of Downey, CA.
Source: Angelus Paving Stones

As products are always being developed, the designer is encouraged to evaluate the benefits of various products with respect to the specific application. Many paver manufacturers recommend compaction of the soil and do not include a drainage/storage area, and therefore, they do not provide optimal stormwater management benefits. A system with a compacted sub-grade will not provide significant infiltration. In LID applications, pavers are used with gravel beds or uncompacted subgrades. The entire system (paver, the joint fill, and subgrade) should be tested to provide reasonable estimates of performance.

Reinforced Turf

Reinforced Turf consists of interlocking structural units that contain voids or areas for turf grass growth and are suitable for traffic loads and parking. Reinforced turf units may consist of concrete or plastic and are underlain by a stone and/or sand drainage system for stormwater management.

Reinforced Turf is excellent for applications such as fire access roads (where permitted), overflow parking, and occasional use parking (such as at religious facilities and athletic facilities). Reinforced Turf is also an excellent application to reduce the required standard pavement width of paths and driveways that must occasionally provide for emergency vehicle access.

While both plastic and concrete units perform well for stormwater management and traffic needs, plastic units tend to provide better turf establishment and longevity, largely because the plastic will not absorb water and diminish soil moisture conditions. A number of manufactured products are available, including (but not limited to): Grasspave; Geoblock; Grassy Pave; Geoweb; Netlon Turf Pavement Systems. The designer is encouraged to evaluate and select a product suitable to the project.

Figure 53. Reinforced turf used as overflow parking area.
Source: Cahill Associates

Other
Other proprietary products are now available which are similar to pervious asphalt and concrete, but which utilize clear binders so that the beauty of the natural stone is visible, creating an aesthetically pleasing look. Some of these products are not suitable for vehicular traffic, and the material strength varies by product. The use of clear binder allows the designer the versatility of utilizing different colored aggregates to suit the application and appearance desired. Typical applications include: tree pits, walkways, plazas, and playgrounds. A number of products are available on the market today, including (but not limited to): Addapave TP, and Flexipave.

Design Guidance

A pervious pavement system consists of a pervious surface course underlain by a storage reservoir placed upon uncompacted subgrade to facilitate stormwater infiltration or upon a filter layer with subdrains. The storage reservoir consists of a stone bed of uniformly graded and clean-washed coarse aggregate, typically 1-1/2 to 2-1/2 inches in size. The pervious pavement may consist of pervious bituminous asphalt, pervious concrete, pervious pavers, or other types of pervious structural materials. A layer of nonwoven geotextile filter fabric can be used to separate the aggregate from the underlying soil, preventing the migration of fines into the bed. The porous pavement surface should be level if possible, and should not have a slope greater than 3 percent. Bed bottoms should always be level and uncompacted to allow for even and distributed stormwater infiltration. On sloped sites, beds should be constructed using a terraced design, as shown in Figure 54. Many designs incorporate a river stone/rock edge treatment or inlets which are directly tied to the bed so that the stormwater system will continue to function even if the performance of the pervious pavement surface is compromised.

Pervious pavements are adaptable to various soil conditions. In sites with less permeable soils, pervious pavement systems can be fitted with underdrains to discharge stored runoff into the storm drainage system. In sites where soils are contaminated or with high groundwater tables, the storage reservoir can be lined to prevent exfiltration entirely.

When properly designed, pervious pavement systems provide effective management of stormwater volume and peak flow rates. The storage reservoir below the pavement surface can be sized to manage both direct runoff and runoff generated by adjacent areas, such as rooftops. Because the stone bed provides storage, outlet structures can be designed to manage peak flow rates with the use of weir and orifice controls.

Many local jurisdictions are developing standard specifications for the location, sizing, configuration, and/or maintenance of LID BMPs and such requirements where they exist should be used. Where local specifications for pervious pavements do not exist, the following guidelines can be used.

Figure 54. Design subsurface infiltration beds to "step" down a slope, maintaining level bed bottoms and earthen berms between beds.
Source: Andropogon Associates

Site Factors

1. Water Table Separation: Ten (10) feet (Regional Boards and local agencies may have differing requirements.) Installations at sites with higher water tables may be lined to prevent exfiltration.
2. Bedrock Separation: Varies with site conditions (Regional Boards and local agencies may have specific requirements.)
3. Soil Permeability: Permeability of at least 0.5 in/hr is required for infiltration. Installations in less permeable soils can be fitted with underdrains.
4. Feasibility on Steep Slopes: Low**

** Infiltration beds may be placed on a mild slope (<3%) however subsurface layers should have level bottoms and be terraced along slopes.

The overall site shall be evaluated for potential pervious pavement/ infiltration areas early in the design process, as effective pervious pavement design requires consideration of grading.

Infiltration areas should be located within the immediate project area in order to control runoff at its source. Expected use and traffic demands shall also be considered in pervious pavement placement. An impervious water stop should be placed along infiltration bed edges where pervious pavement meets standard impervious pavements.

Percolation tests should be performed by a qualified professional to verify soil permeability in the locations where previous pavements are planned. If soils are found to have percolation rates less than 0.5 in/hour, pervious pavements should be fitted with underdrains and treated as filtration rather than infiltration practices. If pervious pavements are planned in close proximity to buildings or other structures, a geotechnical engineer should be consulted to evaluate the risk of creating unstable soil conditions. A thorough analysis of the soil profile and potential barriers to infiltration must be performed prior to implementing pervious pavements.

Sediment Control

Control of sediment is critical. Rigorous installation and maintenance of erosion and sediment control measures is required to prevent sediment deposition on the pavement surface or within the stone bed. The edges of the nonwoven geotextile lining may be folded over the edge of the pavement until the site is stabilized. The designer should carefully consider the site placement of pervious pavement to reduce the likelihood of sediment deposition. Surface sediment should be removed by a vacuum sweeper and should not be power-washed into the underlying bed.

Infiltration Bed

The underlying infiltration bed is comprised of clean, uniformly-graded aggregate with approximately 40 percent void space. AASHTO No.57 gravel is often used. Depending on local aggregate availability, both larger and smaller size aggregate have been used. The critical requirements are that the aggregate be uniformly-graded, clean-washed, and contain a significant void content. The depth of the bed is a function of stormwater storage requirements, site grading, and anticipated loading (in the case of pervious asphalt, see Table 26 and Table 27). Infiltration beds are typically sized to mitigate the increased runoff volume from the more frequent, small storm events.

If designed to infiltrate, the bed bottom should be compacted only to the extent necessary to provide structural stability at the direction of the geotechnical engineer. The stone bed is placed in lifts and lightly rolled according to the specifications. The thickness of the pavement system acts to distribute the traffic load, compensating for the lack of compaction of the subsoil (Ferguson, 2005).

Bed bottoms must be level or nearly level. Sloping bed bottoms will lead to areas of ponding and reduced stormwater distribution within the bed.

Table 26. Minimum Pervious Asphalt Pavement Thickness Required to Bear Structural Load on Poor Subgrade with CBR 2.

Traffic Category	Average ESAL per Day	Porous Asphalt Surface Course Thickness (in)	Aggregate Base Course Thickness (in)	Total Thickness (in)
Light (parking lots, residential streets)	1 10	4 4	6 12	10 16
Medium light (city business streets)	20 50	4.5 5	13 14	17.5 19
Heavy (highways)	1000 5000	6 7	20 22	26 29
CBR is California Bearing Ratio; ESAL is Equivalent Single Axle Load = 18,000 pounds				

Source: Ferguson, 2005

Table 27. Minimum Total Pervious Asphalt Pavement Thickness (aggregate base course + pervious asphalt surface course). Required to Bear Structural Load on Various Subgrades.

Traffic Load	Minimum Total Pavement Thickness (inches)		
	Subgrade CBR 6 to 9	Subgrade CBR 10 to 14	Subgrade CBR 15 or more
Light (ESAL 5 or less per day)	9	7	5
Medium light (1,000 vpd max., ESAL 6 to 20 per day)	11	8	6
Medium (3,000 vpd max., ESAL 21 to 75 per day)	12	9	7
vpd is vehicles per day; ESAL is 18,000 pounds			

Source: Ferguson, 2005

While most pervious pavement installations are underlain by an aggregate bed, alternative subsurface storage products may also be employed. These include a variety of proprietary, interlocking plastic units that contain much greater storage capacity than aggregate.

In areas with poorly-draining soils, infiltration beds below pervious pavement may be designed to slowly discharge to adjacent wetlands or bioretention areas. In this way, a pervious pavement installation may act as an alternative form of capture and reuse for landscape irrigation. Only in extreme cases (i.e. industrial sites with contaminated soils) will the aggregate bed need to be lined to prevent infiltration.

Figure 55. Pervious concrete parking lot with river stone edge treatment at Flinn Springs County Park, El Cajon, CA.
Source: Cahill Associates

Overflows
All systems should be designed with an overflow system. The specific design of these structures may vary, depending on factors such as rate and storage requirements, but it always must include positive overflow from the system.

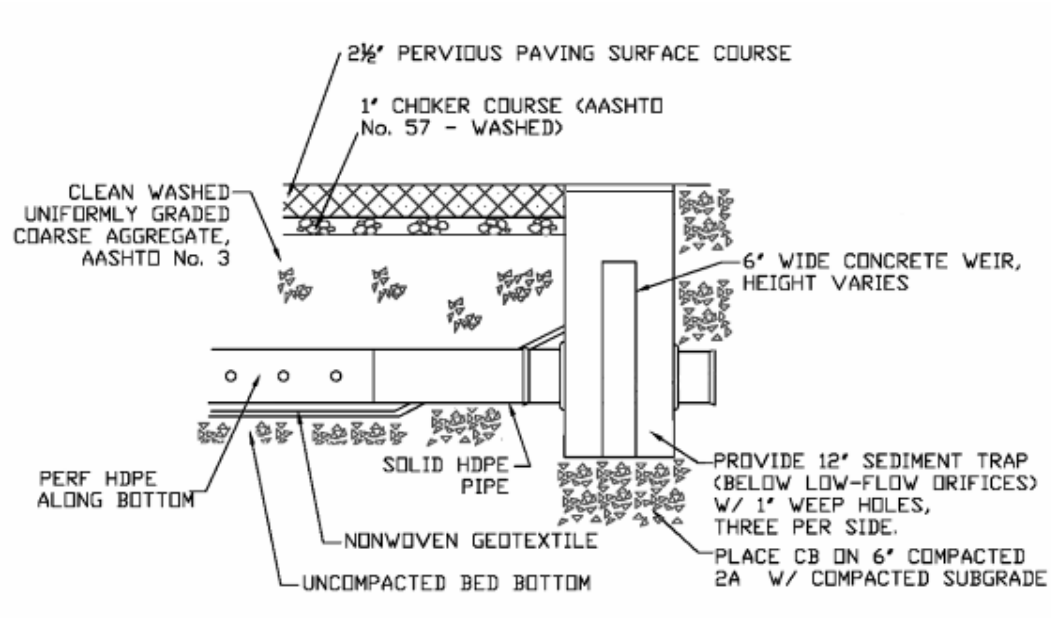

Figure 56. Example detail of an overflow device from a pervious asphalt system.
Source: Cahill Associates

Sizing Criteria
Surface area depends on storage volume requirements and permeability of the underlying native soil. Runoff volume is based on local regulatory requirements, such as a specific design storm (e.g. 2-year, 24-hour) or total runoff (85th percentile).

The permeable pavement area necessary to capture the design volume (V_{BMP}) is determined by calculating the area necessary to store the design volume at the maximum depth (b_{TH}), taking into account the available storage area within the gravel pore space. The depth of the gravel storage reservoir should not exceed 12 inches for either the infiltration or filtration designs (Riverside County, 2010). The area can be calculated using the following formula:

$$A(ft^2) = \frac{V_{BMP}(ft^3)}{b_{TH}(in) \times R_g / 12(in/ft)}$$

where A = BMP surface area (ft^2)
V_{BMP} = BMP design volume (ft^3)
b_{TH} = reservoir depth (in), and
R_g = gravel void ratio (usually 0.4).

This calculation assumes a level pavement surface. The storage volume for a sloped surface would be significantly reduced.

Construction Guidance

Pervious pavement is most susceptible to failure difficulties during construction, and therefore it is important that the construction be undertaken in such as way as to prevent:

- Unnecessary compaction of underlying soil

- Contamination of stone bed with sediment and fines
- Tracking of sediment onto pavement
- Drainage of sediment laden waters onto pervious surface or into constructed bed

Staging, construction practices, and erosion and sediment control must be taken into consideration when using pervious pavements.

1. Due to the nature of construction sites, pervious pavement and other infiltration measures should be installed toward the end of the construction period, if possible. Infiltration beds under pervious pavement may be used as temporary sediment basins or traps provided that they are not excavated to within 12 inches of the designated bed bottom elevation. Once the site is stabilized and sediment storage is no longer required, the bed is excavated to its final grade and the pervious pavement system is installed.

2. If designed to infiltrate, the existing subgrade under the bed areas should be compacted to the minimum extent necessary, as determined by geotechnical analysis.

3. Where erosion of subgrade has caused accumulation of fine materials and/or surface ponding, this material shall be removed with light equipment and the underlying soils scarified to a minimum depth of 6 inches with a York rake (or equivalent) and light tractor. Fine grading shall be done by hand. Bed bottoms must be level grade.

Earthen berms (if used) between infiltration beds shall be left in place during excavation. These berms do not require compaction if proven stable during construction.

Figure 57. Earthen berms separate terraced infiltration beds.
Source: Cahill Associates

Geotextile and bed aggregate shall be placed immediately after approval of subgrade preparation. Geotextile is to be placed in accordance with manufacturer's standards and recommendations. Adjacent strips of geotextile shall overlap a minimum of 18 inches. It shall also be secured at least 4 feet outside of the bed in order to prevent runoff or sediment from entering the storage bed. This edge strip shall remain in place until all bare soils contiguous to beds have been stabilized and vegetated. Once the site is fully stabilized, excess geotextile along bed edges can be cut back to the bed edge.

Clean (washed) uniformly-graded aggregate is placed in the bed in 8-inch lifts. Each layer shall be lightly compacted, with the construction equipment kept off the bed bottom as much as possible.

Once bed aggregate is installed to the desired grade, a +/- 1 inch layer of choker base course (AASHTO #57, or equivalent) aggregate shall be installed uniformly over the surface in order to provide an even surface for paving.

Figure 58. Open-graded, clean, coarse aggregate for infiltration beds.
Source: Cahill Associates

Install pervious pavement. Pervious concrete should be installed by an NRMCA Certified Installer (http://www.nrmca.org/certifications/pervious/). Permeable paver installers are certified by the Interlocking Concrete Pavement Institute (http://www.icpi.org/). After final pervious asphalt or concrete installation, no vehicular traffic of any kind shall be permitted on the pavement surface until cooling and hardening or curing has taken place, and in no case within the first 72 hours.

The full permeability of the pavement surface shall be tested by application of clean water over the surface, using a hose or other distribution devise. Applied water shall infiltrate directly without puddle formation or surface runoff.

Figure 59. Water on Porous Asphalt.
Source: Fishbeck, Thompson, Carr & Huber, Inc.

Maintenance Considerations

- Prevent Clogging of Pavement Surface with Sediment
  - Vacuum pavement twice per year
  - Maintain planted areas adjacent to pavement
  - Immediately clean soil deposited on pavement
  - Do not allow construction staging, soil/mulch storage, etc. on unprotected pavement surface
  - Clean inlets draining to the subsurface bed twice per year

- Repairs
  - Surface should never be seal-coated
  - Inspect for pavement rutting/raveling on an annual basis (some minor ruts may occur in the pervious pavement from stationary wheel rotation)
  - Damaged areas less than 50 square feet can be patched with pervious or standard pavement
  - Larger areas should be patched with an approved pervious pavement

Properly installed and maintained pervious pavement has a lifespan comparable to impervious pavement types, and existing systems that are more than twenty years in age continue to function (Adams, 2003). Because water drains through the surface course and into the subsurface bed, freeze-thaw cycles do not tend to adversely affect pervious pavement.

The primary goal of pervious pavement maintenance is to prevent the pavement surface and/or underlying infiltration bed from becoming clogged with fine sediments. To keep the system clean throughout the year and prolong its lifespan, the pavement surface should be vacuumed twice per year with a commercial cleaning unit. Inlet structures within or draining to the infiltration beds should also be cleaned out on a biannual basis.

Planted areas adjacent to pervious pavement should be well maintained to prevent soil washout onto the pavement. If washout does occur it should be cleaned off the pavement immediately to prevent further clogging of the pores. Furthermore, if bare spots or eroded areas are observed within the planted areas,

they should be replanted and/or stabilized at once. Planted areas should be inspected on a semi-annual basis. Trash and other litter that is observed during these inspections should be removed.

Superficial dirt does not necessarily clog the pavement voids. However, dirt that is ground in repeatedly by tires can lead to clogging. Therefore, vehicles should be discouraged from tracking or spilling excessive dirt onto the pavement. Furthermore, construction vehicles and hazardous materials carriers should be prohibited from entering a pervious pavement lot. Descriptive signage is recommended to maintain institutional memory of pervious pavement.

The use of pervious pavement must be carefully considered in areas where the pavement may be seal coated or paved over due to lack of awareness, such as individual home driveways. In those situations, a system that is not easily altered by the property owner may be more appropriate. Educational signage at pervious pavement installations may guarantee its prolonged use.

Vacuuming

Pervious pavement should be cleaned with a vacuum sweeper two times per year. Acceptable types of vacuum sweepers include the Elgin Whirlwind and the Allianz Model 650. Though much less effective than “pure” vacuum sweepers, regenerative air sweepers, such as the Tymco Model 210, Schwarze 348, Victory, and others, are sometimes used. These units contain a blower system that generates a high velocity air column, which forces the air against the pavement at an angle, creating a 'peeling’ or 'knifing' effect. The high volume air blast loosens the debris from the pavement surface, then transports it across the width of the sweeping head and lifts it into the containment hopper via a suction tube. Thus, sediment and debris are loosened from the pavement and sucked into the unit. (Note: simple broom sweepers are not recommended for pervious pavement maintenance.)

If the pavement surface has become significantly clogged such that routine vacuum sweeping does not restore permeability, then a more intensive level of treatment may be required. Recent studies have proven the usefulness of washing pervious pavements with clean, low pressure water, followed by immediate vacuuming. Combinations of washing and vacuuming techniques have proved effective in cleaning both organic clogging as well as sandy clogging. Research in Florida found that a “power head cone nozzle” that “concentrated the water in a narrowly rotating cone” worked best. (Note: if the pressure of the washing nozzle is too great, contaminants may be driven further into the pervious surface.) Maintenance crews are encouraged to determine the most effective strategy of cleaning their pervious pavement installations.

For smaller installations, such as sidewalks, plazas, or small parking lots, “walk behind” vacuum units may prove most effective. Though these units can be loud and somewhat deleterious to the operator due to the lack of dust suppression, they are also relatively easy to operate and inexpensive. Examples of acceptable “walk behind” units include the Billy Goat models, the 5700 industrial-strength Scrubber by Tennant, and the sidewalk class vacuum sweepers made by Nilfisk, Advance, and Hako. If “walk behind” units are used, it is recommended that the scrub pressure be kept relatively low. The dirtiest areas may need to be power washed after scrubbing to get out the dirt that has been deeply ground in.

Restoration / Repairs

Because pervious pavement drains rapidly, potholes are extremely unlikely to occur, though settling might occur if a soft spot in the subgrade is not removed during construction. For damaged areas of less than 50 square feet, a declivity could be patched by any means suitable with standard pavement, with the loss of porosity of that area being insignificant. The declivity can also be filled with pervious mix or paver units. If an area greater than 50 SF is in need of repair, approval of patch type must be sought from either the engineer or owner. Under no circumstance is the pavement surface to ever be seal-coated. Required repair of drainage structures should be done promptly to ensure continued proper functioning of the system.

With minimal maintenance, pervious pavement can function effectively for well over 20 years. However, in the event that maintenance of the pervious pavement is neglected and it becomes clogged over time, the owner should vacuum the lot until permeability is restored. (If the permeability of the lot cannot be

restored, the pavement should be removed and replaced with a new pervious mix or pervious units.) Recent research has shown that one of the most effective ways of restoring pervious pavement is applying a pressurized dose of a non-toxic detergent cleaning solution, allowing adequate soak time, and then vacuuming with a high performance unit. Once again, it is important to note that high pressure washing may drive contaminants further into the pervious surface and even into the underlying aggregate. It is therefore recommended that, prior to vacuum sweeping, a low performance pressure washer is used to get the solution to break the surface tension and reach into the pores.

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Capture and Reuse

Capture/Reuse, commonly referred to as rainwater harvesting, is a centuries old practice of collecting rainwater that has recently gained prominence as a stormwater management practice. Capture/reuse systems collect and store rainwater from impervious surfaces for later use. The collected rainwater is ideal for non-potable applications, such as landscape irrigation, toilet flushing, and vehicle washing. Capture/reuse is a multi-benefit practice because it reduces stormwater discharge volumes while simultaneously reducing the demand for potable water.

Rooftop runoff, because it often contains lower pollutant loads than surface runoff and provides accessible locations for collection, is the stormwater most often collected in capture/reuse systems. Roof downspouts are redirected to collection containers such as rain barrels, which typically range from 55 to 120 gallons, or cisterns, which can be several hundred to several thousand gallons. Rain barrels are typically installed at outdoor residential locations; cisterns can be installed in residential and nonresidential locations, either indoors or out, and above or below grade.

Capture/reuse serves to reduce the quantity of stormwater runoff by removing a volume of stormwater equal to the capacity of the collection tank. Capture/reuse can also be used as part of a treatment train by directing the overflow to a bioretention system to provide additional volume reduction and water quality treatment in instances where the quantity of runoff from a storm event exceeds the volume of the collection tank. When treatment such as filtration or disinfection is provided on capture/reuse systems it is intended to protect the collection tanks from fouling and/or to improve the quality of water for reuse applications.

Figure 60. Outdoor Cistern with Overflow Directed to Pervious Area.
Source: SEMCOG

Figure 61. Cisterns used for irrigation.
Source: Sunset Publishing Corporation

Cost

A typical commercial 55 gallon rain barrel can retail for about $80 to $120. Additional costs are incurred for the hardware necessary to attach the barrel to the drainage system. Do-it-yourself kits may cost under $30. Cistern system prices vary by size and location of installation. Cisterns for residential applications may range in size from 100 gallons to 10,000 gallons. A cistern is expected to have a lifespan of 20-50 years, depending on site specifics and materials used. Cisterns can be prefabricated plastic, concrete or metal, or they can be cast-in-place concrete. In general, storage tanks can be expected to cost about one dollar per gallon of storage.

Benefits

- Reduced runoff volume
- Reduced peak discharge rate
- Reduced TSS
- Reduced pollutant loading
- Reduced potable water demand

Limitations

- Treats only rooftop runoff
- Must be monitored regularly to ensure that there is adequate storage capacity
- Regulatory obstacles may limit reuse opportunities
- If not installed correctly, may provide habitat for mosquitoes

Potential LEED Credits:

Primary: Sustainable Sites – Credit 6 “Stormwater Management” (1-2 Points)
Other: Water Efficiency – Credit 1 “Water Efficient Landscaping” (1 Point)
Water Efficiency – Credit 2 “Innovative Wastewater Technologies” (1 Point)
Water Efficiency – Credit 3 “Water Use Reduction” (1-2 Points)
Innovation & Design Process (1-4 Points)

Water Supply Impacts

Per capita domestic indoor water use is 70 gallons per day (gpd); however, outdoor irrigation, especially in dry climates, can increase per capita usage to 165 gpd, meaning that outdoor irrigation can account for nearly 60 percent of demand. Similarly, other non-potable uses comprise a large percentage of water demand. Domestic toilet flushing accounts for 11 percent of water demand. In office buildings, toilet flushing accounts for 25 percent of demand, while cooling systems account for 23 percent. Non-potable uses consume a significant percentage of water from municipal systems. Capture/reuse offers the opportunity to reduce the demand on the potable water supply by offering an alternative source of water. Using capture/reuse as a stormwater management technique provides the opportunity to have a positive impact on water supply by matching the quality of the water supplied to the quality required for a given demand. Due to the limited and variable rainfall, and extended dry seasons in many areas of the semi-arid southern California region, the benefits of integrating rainfall collection systems into domestic use systems must be weighed against the cost of implementing such systems. Constructing separate rainwater harvesting systems to be used solely for irrigation may be more practical economically.

Applications

Capture/reuse can be used in many applications from residential rain barrels to large-scale cisterns. Capture/reuse is appropriate for use in residential, commercial, high-density, institutional, residential, and industrial applications. The common forms of capture/reuse applications are provided below.

Potential Applications	
Residential	YES
Commercial	YES
High-density	YES
Industrial	YES
Recreational/Institutional	YES
Highway/Road	NO

Residential
Rain barrels are most commonly used in residential settings. Simple diversions of roof downspouts to rain barrels allow roof runoff to be redirected away from sewers. The collected rainwater is most often used for outdoor water uses such as landscape irrigation or vehicle washing. A 55 gallon barrel will be filled by 0.5 inches of net runoff from 176 square feet of rooftop. Rain barrels are generally not fitted with water pumps; therefore discharge areas must be located down gradient from the rain barrel. This may limit the potential for a homeowner to use captured runoff for irrigation of landscaped areas that are upslope from the roof discharge point. Flow can be improved by raising the rain barrel on blocks.

It is important to note that atmospheric deposition is a significant source of pollution in runoff (Sabin et al, 2005). Captured roof runoff should never be used for potable uses, and should not be used to irrigate vegetable gardens unless it is pretreated by filtration or settling.

Figure 62. Residential rain barrel in Los Angeles.
Source: LA Rainwater Harvesting Program

Figure 63. Large-scale residential system in Los Angeles, CA.
Source: Tree People

Commercial

Capture/reuse systems for commercial settings can vary in size and may consist of cisterns with several thousand gallons of storage capacity. Because non-potable uses can constitute up to 85 percent of water demand in commercial buildings, commercial applications offer a large potential to use harvested rainwater for uses such as irrigation, toilet flushing, and cooling system makeup.

Figure 64. Large cistern for vegetated roof plaza maintenance.
Source: Cahill Associates

Figure 65. Six (6) 1,000 gallon cisterns at U.S EPA headquarters provide water for irrigation
Source: U.S. EPA

Storage Beneath Structure

Stormwater can be stored under hardscaped elements (such as paths and walkways) through the use of structural plastic storage units, such as RainTank, or other alternative manufactured storage products, and can supplement onsite irrigation needs. Designing a capture-reuse system in which runoff is stored under a hardscaped structure is best used in institutional or commercial settings. This type of subsurface storage is larger and more elaborate, typically requiring pumps to connect to the irrigation system.

Figure 66. Rainstore™ unit beneath brick pavers on a vegetated rooftop plaza.
Source: Cahill Associates

Figure 67. Rainstore™ units used as the storage element underneath a brick pathway atop a vegetated rooftop plaza.
Source: Cahill Associates

Design Guidance

Site Factors

- Water Table / Bedrock Separation: N/A
- Soil Permeability: N/A
- Feasibility on steeper slopes: N/A

Sizing

The sizing of capture/reuse systems is dependent upon the volume of water available for capture, comprised of the total area of the collection surface and rainfall; the associated demand for the harvested rainwater; and the space available for tank installation. In many instances the size of the collection container is a pre-determined design variable. For instance, rain barrels typically are available within a limited range of sizes; similarly, available lot or building space may determine the allowable dimensions of a cistern and thus the provided storage volume.

An analysis of precipitation and demand is required when trying to optimize the sizing of cisterns. Historical monthly or daily rainfall records should be examined to determine the amount, frequency, and seasonal variation of rainfall. Several years of data should be included to account for dry and wet years. Additionally, in Southern California it is often suggested to oversize the storage system to maximize the volume of rain captured during the rainy season. This allows some carryover in order to make water available in the dry season when little, if any, rainwater would be collected. The volume of water that can be collected from a given rain event can be calculated as:

V (gal) = Area of Collection Surface (ft^2) x Rainfall (in) / 12 in/ft x 0.8 (Capture Efficiency) x 7.48 gal/ft^3

Where captured rainwater can be practicably integrated into the sites water use supply, the specific potential end uses for the water need to be determined to provide an estimate of the daily or monthly water demands. For instance, toilet and urinal flushing impart a consistent daily demand on a water system while outdoor irrigation may be somewhat more episodic. The determined end uses will provide the daily drawdown rate. Comparing the drawdown rate to the predicted fill rate will determine proper cistern capacity. National averages for per capita residential water demand are provided below.

Table 28. Typical Domestic Daily per Capita Water Use.

Use	Gallons per Capita	% of Daily Total
Potable indoor uses		
• Showers	11.6	7.0%
• Dishwashers	1.0	0.6%
• Baths	1.2	0.8%
• Faucets	10.9	6.6%
• Other uses, leaks	11.1	6.7%
Subtotal	**35.8**	**21.7%**
Non-potable indoor uses		
• Clothes washers	15.0	9.1%
• Toilets	18.5	11.2%
Subtotal	**33.5**	**20.3%**
Outdoor uses	**95.7**	**58.0%**

Source: AWWARF, 1999

Water Quality Treatment

Efficient operation and the intended end uses will determine the level of treatment needed in a capture/reuse system. Other than simple screening, water collected in rain barrels and used for residential irrigation does not typically require treatment. Little human health risk is presented when harvested rainwater is used for other non-potable uses (e.g., water closets, urinals, hose bibbs), though such usage requires the installation of a dual plumbing system to keep potable water separated from harvested water. In these situations, screening and filtration to prevent particles and debris from traveling through the collection and plumbing system is typically sufficient. When harvested water is used for higher end contact uses, additional filtration and disinfection is required. As an example, typical water quality criteria for various end uses from the Texas Rainwater Harvesting Manual are provided in the table below. Detailed specifications and design guidance can be found through the American Rainwater Catchment Systems Association (http://www.arcsa.org).

Table 29. Minimum Water Quality Guidelines and Treatment Options for Stormwater Reuse.

Use	Minimum Water Quality Guidelines	Suggested Treatment Options
Potable indoor uses	• Total coliforms – 0 • Fecal coliforms – 0 • Protozoan cysts – 0 • Viruses – 0 • Turbidity < 1 NTU	• Pre-filtration – first flush diverter • Cartridge filtration – 3 micron sediment filter followed by 3 micron activated carbon filter • Disinfection – chlorine residual of 0.2 ppm or UV disinfection
Non-potable indoor uses	• Total coliforms < 500 cfu per 100 mL • Fecal coliforms < 100 cfu per 100 mL	• Pre-filtration – first flush diverter • Cartridge filtration – 5 micron sediment filter • Disinfection – chlorination with household bleach or UV disinfection
Outdoor uses	N/A	• Pre-filtration – first flush diverter
*cfu – colony forming units *NTU – nephelometric turbidity units		

Source: The Low Impact Development Center, Inc.

The harvesting system must not be connected to the potable water supply system at any time. High levels of caution are needed to ensure the integrity of the separation between the potable system and the harvesting system.

System Design

All components of a capture/reuse system should be designed to minimize the introduction of pollutants and to provide treatment sufficient for the intended end uses.

Tank, Collection, and Distribution

When rainwater is collected from rooftops, gutters should be equipped with leaf screens with openings no larger than 1/2 inch across their entire length, including the downspout opening. The screens prevent debris from clogging the collection system and/or fouling the harvested water. For internal downspouts, the downspout opening should be screened. A first flush diverter may be used to allow the initial portion of runoff to bypass the collection tank. If additional primary filtration is desired, roof washers may also be used. Roof washers can act as first flush diverters and also contain filter media (e.g., sand, gravel, filter fabric) to provide removal of particulates that have passed through the leaf screens.

Rain barrels and cisterns should be constructed of materials rated for potable water use. Outdoor tanks should be constructed of opaque materials or otherwise shaded or buried to protect the harvested

rainwater from direct sunlight. Tank overflows should be directed away from structures and to pervious areas to allow for infiltration whenever possible. Outdoor tanks should also contain adequate screening at each opening to prevent insects from entering the tank. Rain barrels and cisterns temporarily store stormwater and when properly designed and maintained there is less potential for breeding of mosquitoes and other pests than with conventional BMPs.

For non-potable indoor uses (where local codes and ordinances allow), additional treatment can be provided following the collection tank, even though it may not be necessary for public health reasons. Additional cartridge filtration can be provided to prevent suspended particles from entering pipes.

Separate piping without direct connection to potable water piping should be provided for capture/reuse systems. Dedicated piping should be color coded and labeled as harvested rainwater, not for consumption. Faucets supplied with non-potable rainwater should contain signage identifying the water source as non-potable and not for consumption.

Cross-contamination
When make-up water is required to be provided to the capture/reuse system from the municipal system, steps should be taken to prevent cross-contamination. Cross-contamination measures for capture/reuse systems will be similar to those for reclaimed and greywater systems. The make-up supply to the cistern is the point of greatest risk for cross-contamination of the potable supply. A backflow prevention assembly on the potable water supply line, an air gap, or both must be provided to prevent collected rainwater from entering the potable supply. Contact local water system authorities to determine specific requirements. The designated dual piping system is also part of the cross-contamination prevention measures.

Construction

Cisterns are typically prefabricated, made of plastic, metal, or concrete. They can also be cast-in-place. A variety of containers are used for rain barrels. Positive outlet for overflow should be provided a few inches from the top of collection tank and should be sized to safely discharge excess volume when the tank is full. When cisterns are installed below grade, observation risers should rise at least 6 inches above grade.

Maintenance

When cisterns are used for non-potable indoor uses, a municipal inspection should occur during installation. Annual municipal inspections of the backflow prevention systems are also recommended. For a property owner, the operation and maintenance of a rainwater harvesting system is similar to a private well. Annual water quality testing is recommended when captured rainwater is provided for indoor uses. Regular inspection and replacement of treatment system components such as filters or UV lights is also recommended.

Maintenance Schedules:

Rain Barrel Maintenance
- Inspect rain barrels four times per year, and after major storm events.
- Remove debris from screens as needed.
- Replace screens, spigots, downspouts, and leaders as needed.

Cistern Maintenance
- Flush cisterns annually to remove sediment.
- For buried structures, vacuum removal of sediment is required.
- Brush the inside surfaces and thoroughly disinfect twice per year.

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Green Roofs

Green roofs are vegetated roof systems that filter, absorb, and retain or detain the rain that falls upon them. Green roofs are comprised of a layer of soil media planted with vegetation. Extensive green roofs, defined as those systems 2 to 6 inches in thickness, are the design most often used for stormwater management. Other structural components are incorporated into green roof systems including waterproofing, synthetic insulation, and fabrics.

Intensive green roofs are less commonly used as a dedicated stormwater management practice. The soil media is greater than 6 inches thick and they can be comprised of a wide arrange of vegetation including shrubs and trees.

Rain that falls onto green roofs is returned to the atmosphere either by evaporation or transpiration by plants, which remove the water from the soil media. When the soil media becomes saturated, the excess water percolates through to the drainage layer and is discharged through the roof downspouts. Green roofs can provide high rates of rainfall retention and decrease the peak flow rate because of the temporary soil storage that occurs during discharge events.

Figure 68. Demonstration vegetated roof project at EuroAmerican Growers in Bonsall, CA.
Source: Technical Advisory Committee

Cost

The cost for green roofs will be influenced by the depth of the soil media, the number and type of additional structural components in the design, the vegetation selected, and the need for structural roof modifications. While green roofs have typically been one of the more costly LID practices, costs have continued to decrease with increasing rates of adoption. In addition, the use of green roofs can decrease the cost for stormwater conveyance systems on a site and increase the cooling efficiency of the building. Green roofs cost approximately $5 to $10 per square foot for new roof construction, but can cost up to $25 per square foot for retrofits.

Benefits

- Reduced runoff volume
- Reduced peak discharge rate
- Reduced TSS
- Reduced pollutant loading
- Reduced runoff temperature
- Habitat creation
- Enhanced site aesthetics
- Reduced building energy use

Limitations

- Captures and treats only rooftop runoff
- Not suitable for steep roofs (> 30 degrees)
- Heavier than conventional roofs, may require additional support
- Require occasional vegetation management, and may require supplemental irrigation during droughts

Potential LEED Credits:

Primary: Sustainable Sites – Credit 6 “Stormwater Management” (1 Point)
Other: Sustainable Sites – Credit 7 “Landscape & Exterior Design to Reduce Heat Islands” (1 Point)

Water Supply Impacts

Impacts vary, and are associated with water needed for initial plant establishment and subsequent maintenance, but in general should be minor. When needed, subsurface irrigation should be used to minimize evaporative losses. Detailed guidance on the irrigation needs of landscape plantings has been published by the California Department of Water Resources (UCCE and CDWR, 2000).

Applications

Green roofs have a wide variety of applications for a number of land uses but are most common in urban/high-density, institutional, commercial, and industrial applications. Potential applications are provided below.

Potential Applications	
Residential	YES
Commercial	YES
High-density	YES
Industrial	YES
Recreational/Institutional	YES
Highway/Road	NO

Figure 69. Vista Hermosa Park Ranger Station, Los Angeles.
Source: Greenroofs.com

Figure 70. Premier Automotive Headquarters, Irvine.
Source: Roofscapes, Inc.

Design Guidance

Site Factors

- Water Table / Bedrock Separation: N/A
- Soil Permeability: N/A
- Feasibility on steeper slopes: N/A

Green roofs are most often applied to buildings with flat roofs, but roofs with slopes up to 30° can be accommodated with the use of mesh, stabilization panels, or battens. Slopes greater than 30° may also be accommodated with specialized designs. Green roofs will not cover the entire roof area because of the need to reserve space for heating ventilation and air condition (HVAC) systems and areas for roof access and maintenance. Typically 50 to 80 percent of the total roof area will be covered by the green roof.

The load carrying capacity of the roof will also influence the suitability of a green roof. The wet weight of the green roof measures the fully saturated vegetation, soil media, and membrane layers. Extensive green roof wet weight is approximately 6 to 7 pounds per square foot per inch of depth. Green roofs typically incorporate very drought-tolerant plants and utilize coarse engineered media with high permeability. A typical profile would include the following layers:

- Vegetation layer
- Engineered growth media
- Separation geotextile
- Semi-rigid plastic geocomposite drain or mat (typical mats are made from non-biodegradable fabric or plastic foam)
- Root barrier (optional)
- Waterproofing membrane

A waterproof membrane is needed to prevent water migration from the green roof to the structural roof. An optional root barrier may also be installed to prevent root damage of the waterproof membrane. Insulation, if included in the roof covering system, may be installed either above or below the primary waterproofing membrane.

Plant Selection

Plants should be selected which will create a healthy, drought-tolerant roof cover. In general, selected plants should be:

- Native or adapted species tolerant of extreme climate conditions (e.g., heat, drought, wind);
- Low-growing, with a range of growth forms (e.g., spreading evergreen shrubs or subshrubs, succulents, perennials, self-seeding annuals);
- Possessive of a shallow root system without the chance of developing a deep taproot; and
- Long lived or self-propagating, with low maintenance and fertilizer needs.

A variety of species and growth forms may be considered for a single roof project to ensure survival and plant growth. In addition, because many perennials and annuals are dormant during part or all of the rainy season, evergreen and cool-season plants should be included to help with rainfall interception and evapotranspiration during the seasons when rains typically occur.

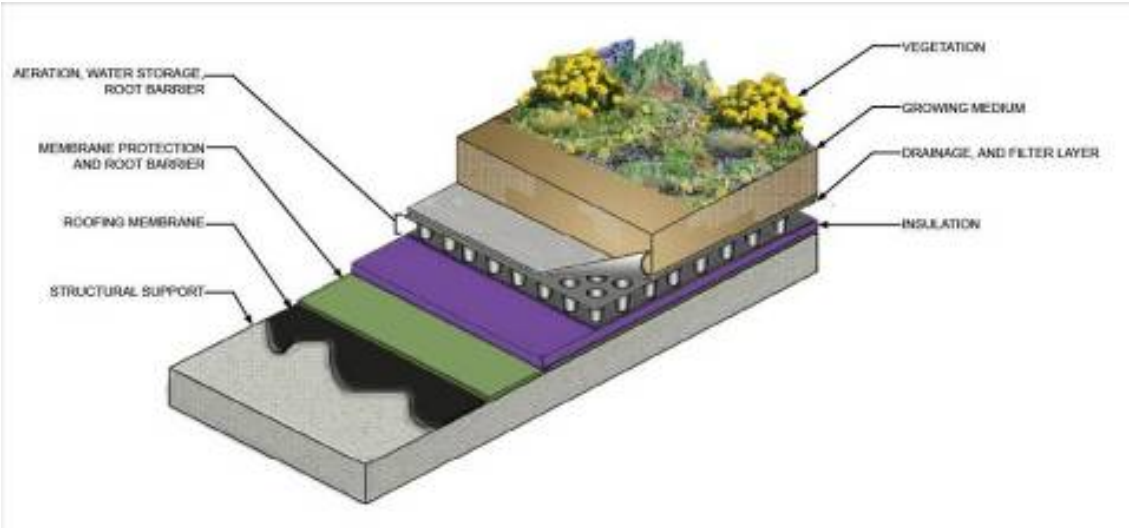

Figure 71. Green Roof Schematic.
Source: Cahill Associates

Construction Guidance

The following is a typical construction sequence. However, alterations will be necessary depending on design variations.

1. Install waterproof membrane and visually inspect. The waterproofing should be tested for water tightness by the roofing applicator.
2. Install slope stabilization measures for pitched roofs.
3. If the waterproofing materials are not root-fast, install a root-barrier layer.
4. Lay out key drainage components, including drain access chambers, internal drainage conduit, confinement border units, and isolation frames (for rooftop utilities, hatches, and penetrations).
5. Install walkways and paths (for maintenance or projects with public access).
6. Install the drainage layer. Depending on the variation type, this could be a geocomposite drain, mat, or drainage media.
7. Cover the drainage layer with the separation fabric (in some assemblies, the separation fabric is pre-bonded to a synthetic drainage layer).
8. Install sub surface irrigation capillary matting and supply lines according to design.
9. Install the growth media layer on top of the capillary matting using crane lifted supersacks.
10. Install the plant layer from cuttings, plugs, seed, or pre-grown mats, according to spacing or seeding rate specified by green roof designer.
11. Provide protection (e.g., UV-degradable erosion control netting) from wind disruptions as warranted by the project conditions and plant establishment method.
12. Overhead irrigation should be provided during the plant establishment for a period determined by the green roof designer until plants are fully established.

Maintenance Considerations

The maintenance schedule should include the following activities.

1. In the arid southwest, regular to periodic irrigation will likely be required.
2. During the plant establishment period, weeding, fertilization (if needed), and infill planting is recommended every three to four months. Thereafter, only two visits per year for inspection and light weeding should be required.
3. Drainage outlets should be inspected periodically to verify that they drain freely and are not clogged with debris.

4. The waterproof membrane should be inspected periodically for drainage or leaks. It is also possible to include a leak detection system in the green roof design.

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BMP Factsheets

The following factsheets cover several additional BMPs that are commonly used in LID designs. These BMPs are in widespread use, and many local sources of design guidance already exist. Therefore, the factsheets provide a brief description of the practice, its benefits and limitations, and links to more detailed information.

Downspout Disconnection

Downspout disconnection refers to the redirection of stormwater from an existing downspout to a vegetated area (e.g. a swale or planter box) or a collection system (e.g. a rain barrel or cistern). The collected water can be used for onsite landscaping. Downspout disconnections are typically used in residential, commercial, and industrial applications.

Water quality benefits are gained from disconnection practices because a percentage of the overall stormwater volume infiltrates into pervious areas or is lost through evapotranspiration. Disconnection practices decrease the total volume of stormwater discharged to receiving water bodies. Therefore, the reduction in pollutant and nutrient loading attributed to disconnection is dependent upon the reduction in stormwater volume. In addition, the impact of disconnection on stormwater volume and peak discharge is dependent upon the area to which the stormwater is directed.

Figure 72. Downspout disconnection into vegetated area.
Source: Prince George's County, MD Department of Environmental Resources

Benefits

- Reduced peak discharge rate
- Reduced runoff volume
- Reduced TSS
- Reduced pollutant loading
- Reduced runoff temperature

Limitations

- Runoff must not flow toward building foundations or onto adjacent private property.
- Discharge areas must be large enough to infiltrate runoff (typically 10 percent of contributing roof area)

Potential LEED Credits:

Primary: Sustainable Sites – Credit 6 "Stormwater Management" (1-2 Points)
Other: Water Efficiency – Credit 1 "Water Efficient Landscaping" (1-2 Points)
Innovation & Design Process (1-4 Points)

Design Guidance

Direct downspout disconnections away from buildings. Ensure that the ground slopes away from the discharge point. Use spashblocks, rocks, or flagstones at the end of downspouts to direct runoff and control erosion. As a rule of thumb, the discharge area should be 10 percent of the roof area draining to the downspout (Portland BES, 2010). For low permeability soils (HSG C and D), a greater discharge area may be required. In large storm events, discharge areas may be subjected to high flows, and potentially to temporary submergence. Select landscape materials that are not easily eroded or transported. Preference should be given to rock or stone groundcovers over wood mulch.

Links to Detailed Information

California Stormwater Quality Association. 2003. *Roof Runoff Controls, SD-11*. California Stormwater BMP Handbook New Development and Redevelopment. http://www.cabmphandbooks.com/Documents/Development/SD-11.pdf

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Water Environment Federation. Accessed January 2010. *Stop Sewer Backups and Disconnect Downspouts*. http://www.wef.org/PublicInformation/page.aspx?id=696

Soil Amendments

The ability of existing soils to absorb, infiltrate and remove pollutants from stormwater can be improved by the application of soil amendments. These include compost, as well as other soil conditioners and fertilizers as appropriate for specific site conditions. Soil amendments can change the physical, chemical and biological characteristics of the soil, restoring degraded soils and improving naturally poor soils. Soil amendments reduce bulk density and increase cation exchange capacity, enhancing the soil's ability to hold water, increasing infiltration rates, and improving nutrient retention and pollutant removal.

Figure 73. Soil Amending Process.
Source: U.S. EPA

Cost
Costs associated with soil amending include the amendments themselves and their application. These costs are generally on the order of $1-3 per square foot.

Benefits
- Reduced runoff volume
- Reduced peak discharge rate
- Groundwater recharge
- Reduced TSS
- Reduced pollutant loading
- Habitat creation
- Enhanced site aesthetics

Limitations
- Not recommended for slopes steeper than 3:1

Potential LEED Credits:
Primary: N/A
Other: Innovation & Design Process (1-4 Points)

Water Supply Impacts

Soil amendments increase the ability of the soil to hold water, and therefore may decrease the need for irrigation during dry periods.

Design Guidelines

Amendments can be applied by topdressing or tilling into the upper soil layers. The most appropriate amendments and application rates are determined through soil testing.

Maintenance

Soil should be planted and mulched after installation. No part of the site should have bare soil exposed. Compaction of amended soils should be avoided.

Amended soils should be inspected annually for signs of compaction, waterlogging, loss of vegetated cover, or erosion. Routine infiltration testing can be used to pinpoint potential problem areas. In areas where remediation is needed, soil samples may help to diagnose specific deficiencies in the soil. Corrective actions include application of additional amendments and mechanical aeration.

Links to Detailed Information

County of San Diego. 2007. *Low Impact Development Handbook.*
http://www.sdcounty.ca.gov/dplu/docs/LID-Handbook.pdf

Inland Empire Regional Composting Authority. *General Landscaping Information*.
http://www.ierca.org/docs/GeneralLandscape.pdf

Low Impact Development Center, Inc. *Soil Amendments*.
http://www.lid-stormwater.net/soilamend_home.htm

University of California Cooperative Extension (UCCE) and California Department of Water Resources (CDWR). 2000. *A Guide to Estimating Irrigation Water Needs of Landscape Plantings in California*. Sacramento, CA: California Department of Water Resources.

Vegetated Filter Strips

Filter strips are bands of dense, permanent vegetation with a uniform slope designed to provide water quality treatment for an adjacent runoff source (i.e., impervious area) by allowing pollutant filtering and settling and stormwater infiltration. They are also commonly used as pretreatment for other BMPs.

Figure 74. Filter strip used as pretreatment for highway runoff.
Source: RBF Consulting

Benefits

- Reduced peak discharge rate
- Reduced TSS
- Reduced pollutant loading
- Enhanced site aesthetics
- Reduced phosphorus (high efficiency)
- Reduced metals (medium efficiency)

Limitations

- Must be sited adjacent to imperviousness surfaces
- Requires regular inspection and maintenance to maintain sheet flow
- Relatively large footprint, may not be suitable for highly urban areas
- Must be used in conjunction with additional BMPs to provide volume storage and peak flow reduction.

Potential LEED Credits:

Primary: Sustainable Sites – Credit 6 “Stormwater Management” (1-2 Points)
Other: Sustainable Sites – Credit 7 “Landscape & Exterior Design to Reduce Heat Islands” (1-2 Points)
Water Efficiency – Credit 1 “Water Efficient Landscaping” (1-2 Points)
Innovation & Design Process (1-4 Points)

Links to Detailed Information

California Department of Transportation. 2008. *Caltrans Treatment BMP Technology Report*. April 2008, CTSW-RT-08-167.02.02.
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California Stormwater Quality Association (CASQA). 2003. *California Stormwater BMP Handbook – New Development and Redevelopment*. BMP Factsheet TC-31: Vegetated Buffer Strip. http://www.cabmphandbooks.com/Documents/Development/TC-31.pdf

County of Los Angeles Department of Public Works. 2009. *Stormwater Best Management Practice Design and Maintenance Manual*. http://dpw.lacounty.gov/DES/design_manuals/StormwaterBMPDesignandMaintenance.pdf

County of San Diego. 2007. *Low Impact Development Handbook.* http://www.sdcounty.ca.gov/dplu/docs/LID-Handbook.pdf

Vegetated Swales

Vegetated swales are broad, shallow channels designed to convey and either filter or infiltrate stormwater runoff. The swales are vegetated along the bottom and sides of the channel and are used to reduce stormwater volume through infiltration, improve water quality through infiltration and vegetative filtering, and reduce runoff velocity by increasing flow path lengths and channel roughness.

Figure 75. A vegetated swale with curb cuts in Playa Vista, California.
Source: Keith Linker

Figure 76. A vegetated swale with curb cuts in El Monte, California.
Source: Bill DePoto

Benefits

- Reduced stormwater volume
- Reduced peak discharge rate
- Reduced TSS
- Reduced pollutant loading
- Enhanced site aesthetics
- Reduced phosphorus (moderate efficiency)
- Reduced metals (moderate efficiency)
- Increases time of concentration, T_c

Limitations

- Not applicable for steep slopes
- Requires regular vegetation maintenance and trash removal
- Not suitable for areas with highly erodible soils
- Should not be located under trees which may drop leaves or needles, impeding flow
- Must be used in conjunction with additional BMPs to provide volume storage and peak flow reduction.

Potential LEED Credits:

Primary: Sustainable Sites – Credit 6 "Stormwater Management" (1-2 Points)

Other: Sustainable Sites – Credit 7 "Landscape & Exterior Design to Reduce Heat Islands" (1-2 Points)
Water Efficiency – Credit 1 "Water Efficient Landscaping" (1-2 Points)
Innovation & Design Process (1-4 Points)

Links to Detailed Information

California Department of Transportation. 2008. *Caltrans Treatment BMP Technology Report*. April 2008, CTSW-RT-08-167.02.02.
http://www.dot.ca.gov/hq/env/stormwater/annual_report/2008/annual_report_06-07/attachments/Treatment_BMP_Technology_Rprt.pdf

California Stormwater Quality Association (CASQA). 2003. *California Stormwater BMP Handbook – New Development and Redevelopment*. BMP Factsheet TC-30: Vegetated Swale.
http://www.cabmphandbooks.com/Documents/Development/TC-30.pdf

County of Los Angeles Department of Public Works. 2009. *Stormwater Best Management Practice Design and Maintenance Manual*.
http://dpw.lacounty.gov/DES/design_manuals/StormwaterBMPDesignandMaintenance.pdf

County of San Diego. 2007. *Low Impact Development Handbook.*
http://www.sdcounty.ca.gov/dplu/docs/LID-Handbook.pdf

Infiltration Basins

Infiltration basins are shallow impoundments designed to collect and infiltrate stormwater. Collected stormwater temporarily ponds on the surface of the basin, then infiltrates. Pollutant removal is accomplished by natural mechanisms within the soil including filtration, absorption and adsorption, and chemical and biological uptake. Siting is constrained by available land and the infiltration capacity of the soils.

Figure 77. Infiltration Basin.
Source: March Joint Powers Authority

Benefits

- Reduced stormwater volume
- Reduced peak discharge rate
- Reduced TSS
- Reduced pollutant loading
- Increased groundwater recharge

Limitations

- Requires large pervious area
- Not suitable on fill sites or steep slopes
- Risk of groundwater contamination in very coarse soils
- High potential for clogging; functioning is difficult to restore
- Requires regular maintenance

Potential LEED Credits:

Primary: Sustainable Sites – Credit 6 “Stormwater Management” (1-2 Points)
Other: Innovation & Design Process (1-4 Points)

Links to Detailed Information

California Stormwater Quality Association (CASQA). 2003. *California Stormwater BMP Handbook – New Development and Redevelopment*. BMP Factsheet TC-11: Infiltration Basin.
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http://www.sdcounty.ca.gov/dplu/docs/LID-Handbook.pdf

Infiltration Trenches

Infiltration trenches are narrow trenches that have been back-filled with stone. They collect runoff during a storm event, store it in the void spaces in the stone, and release it into the soil by infiltration. Pretreatment, often with filter strips, is required to prevent sediment buildup and ensure effective infiltration. Infiltration trenches can drain areas up to 10 acres. They are not recommended downstream of erodible areas, on steep slopes, or in areas where pollutant spills are likely. Infiltration trenches must be set back 10 feet from the seasonal high groundwater table, 5 feet from any impermeable soil layers or bedrock, and out of tree drip lines. Infiltration trenches can be prone to clogging with sediment and require pretreatment as well as regular observation and maintenance to ensure proper functioning.

Figure 78. Infiltration Trench.
Source: RBF Consulting

Benefits

- Reduced stormwater volume
- Reduced peak discharge rate
- Reduced TSS
- Reduced pollutant loading
- Increased groundwater recharge

Limitations

- The longitudinal slope of the trench should not exceed 3 percent
- High potential for clogging; functioning is difficult to restore
- Risk of groundwater contamination in very coarse soils
- Requires regular maintenance
- Low removal of dissolved pollutants
- Some configurations may meet the definition of EPA Class V injection wells, and must be registered with EPA Region 9. Regulations vary by jurisdiction. Details are available at: http://www.epa.gov/region09/water/groundwater/uic-classv.html

Potential LEED Credits:

Primary: Sustainable Sites – Credit 6 “Stormwater Management” (1-2 Points)
Other: Innovation & Design Process (1-4 Points)

Links to Detailed Information

California Stormwater Quality Association (CASQA). 2003. *California Stormwater BMP Handbook – New Development and Redevelopment*. BMP Factsheet TC-10: Infiltration Trench.
http://www.cabmphandbooks.com/Documents/Development/TC-10.pdf

County of Los Angeles Department of Public Works. 2009. *Stormwater Best Management Practice Design and Maintenance Manual*.
http://dpw.lacounty.gov/DES/design_manuals/StormwaterBMPDesignandMaintenance.pdf

County of San Diego. 2007. *Low Impact Development Handbook.*
http://www.sdcounty.ca.gov/dplu/docs/LID-Handbook.pdf

Dry Wells

A dry well is an underground storage facility used to capture and infiltrate runoff from downspouts or small impervious areas. Dry wells can be used on steep slopes, where many other BMPs cannot, provided the slope is stable and not subject to landslide risk. They have a very small footprint, and can be used in tight spaces. Dry wells are typically used in residential or other small-scale applications.

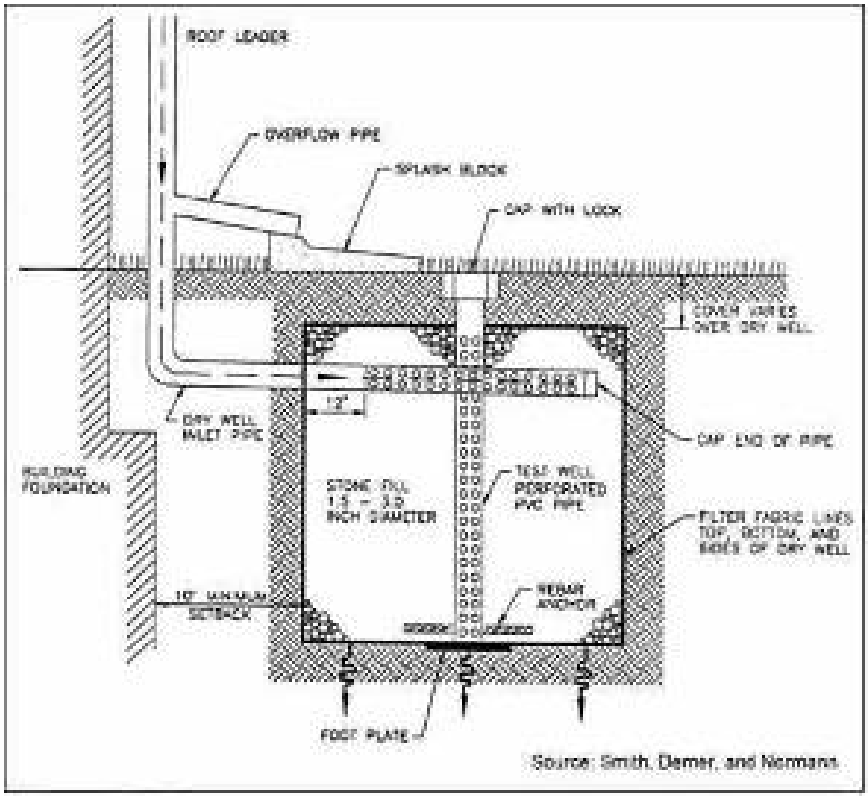

Figure 79. Schematic of a dry well.
Source: Stormwater Management for Maine, 1995. (UFC Manual).

Benefits

- Reduced peak discharge rate
- Reduced runoff volume
- Reduced TSS
- Reduced pollutant loading
- Reduced runoff temperature

Limitations

- Requires HSG Group A or B soils
- Not suitable for high sediment loads
- Dry wells meet the definition of EPA Class V wells, and must be registered with EPA Region 9. Regulations vary by jurisdiction. Details are available at: http://www.epa.gov/region09/water/groundwater/uic-classv.html

Potential LEED Credits:

Primary: Sustainable Sites – Credit 6 "Stormwater Management" (1-2 Points)
Other: Innovation & Design Process (1-4 Points)

Links to Detailed Information

County of San Diego. 2007. *Low Impact Development Handbook.*
http://www.sdcounty.ca.gov/dplu/docs/LID-Handbook.pdf

U.S. Department of Defense. 2004. *Unified Facilities Criteria (UFC) Low Impact Development Manual*. UFC 3-210-10. http://www.lowimpactdevelopment.org/lid%20articles/ufc_3_210_10.pdf

U.S. Environmental Protection Agency. *Underground Injection Control for Region 9 Class V Wells.*
http://www.epa.gov/region09/water/groundwater/uic-classv.html

Dry Ponds

Dry ponds, also known as extended detention basins, are designed to collect and detain a water quality volume of stormwater for a set period of time, normally 24 to 72 hours, before discharging the runoff. Dry ponds do not maintain a permanent pool, emptying completely between rain events. Water quality improvements are gained from sedimentation and peak flow attenuation.

Figure 80. Dry pond.
Source: RBF Consulting

Benefits

- Reduced TSS
- Reduced pollutant loading

Limitations

- Requires tributary area greater than 5 acres
- Outlets of detention systems may clog easily if not properly designed and maintained
- Requires large dedicated area
- Low ability to reduce runoff volume

Potential LEED Credits:

Primary: Sustainable Sites – Credit 6 "Stormwater Management" (1-2 Points)
Other: N/A

Links to Detailed Information

California Stormwater Quality Association (CASQA). 2003. *California Stormwater BMP Handbook – New Development and Redevelopment*. BMP Factsheet TC-22: Extended Detention Basin.
http://www.cabmphandbooks.com/Documents/Development/TC-22.pdf

County of Los Angeles Department of Public Works. 2009. *Stormwater Best Management Practice Design and Maintenance Manual*.
http://dpw.lacounty.gov/DES/design_manuals/StormwaterBMPDesignandMaintenance.pdf

County of San Diego. 2007. *Low Impact Development Handbook.*
http://www.sdcounty.ca.gov/dplu/docs/LID-Handbook.pdf

Constructed Wetlands

Constructed wetlands are shallow, engineered vegetated systems designed to provide stormwater detention and pollutant removal. Natural wetlands SHOULD NOT be used to treat stormwater.

Figure 81. Dominguez Gap Wetlands, LA County.
Source: Raphael D. Mazor, Southern California Coastal Water Research Project

Benefits

- Reduced peak discharge rate
- Reduced TSS
- Reduced pollutant loading
- Reduced runoff temperature
- Habitat creation
- Enhanced site aesthetics

Limitations

- Requires year-round base flow
- Requires large footprint
- Not suitable for steep slopes
- Requires careful design, maintenance and monitoring to prevent vector infestation
- Safety concerns where there is public access
- Dense plantings may restrict access for maintenance

Links to Detailed Information

California Stormwater Quality Association (CASQA). 2003. *California Stormwater BMP Handbook – New Development and Redevelopment*. BMP Factsheet TC-21: Constructed Wetlands.
http://www.cabmphandbooks.com/Documents/Development/TC-21.pdf

County of Los Angeles Department of Public Works. 2009. *Stormwater Best Management Practice Design and Maintenance Manual*.
http://dpw.lacounty.gov/DES/design_manuals/StormwaterBMPDesignandMaintenance.pdf

USEPA - Guiding Principles for Constructed Wetlands
http://www.epa.gov/owow/wetlands/pdf/constructed.pdf

Media Filters

A media filter is a flow-through system designed to improve water quality from impervious drainage areas by slowly filtering runoff through a media such as sand. It consists of one or more sedimentation and filtration chambers or areas to treat runoff. Pollutant removal in media filters occurs primarily through straining and sedimentation. Treated effluent is collected by underdrain piping and discharged. Surface and underground media filters function similarly.

Types of non-vegetated Media Filters

- Bed Filters – Includes conventional Delaware and Austin sand filter designs as well as horizontal flow bed filters.
- Modular Cartridge based filters – Typically proprietary and available in a range of configurations including radial flow, upward flow and fluidized bed filters with customizable media.
- Powered filtration systems – Utilize a range of media and are often designed as parallel systems with backwash capabilities.
- Catch Basin inserts – Typically designed with shallow media beds (<2”) very high hydraulic loading rates (> 10 gpm/ft^2) and very low contact time (<5 sec) at design flow rates.

Figure 82. Surface media filter.
Source: Portland BES

Benefits

- Most media filters can be located below ground and can support H20 loading. Therefore they require no dedicated site area.
- No potable water demand
- Pollutant sequestration. Pollutants are stored out of contact with the public, wildlife, groundwater, soil or vegetation.
- Spill protection
- Filter media can be customized to target specific pollutants of concern

- Modular, standardized design can reduce construction errors

Limitations

- Very low runoff volume reduction capability
- Low ability to remove dissolved pollutants
- May require confined space entry for maintenance
- May require cooperation with vendor for replacement media or cartridges
- Maintenance of underground filters is easily neglected, and can lead to system failure
- Designs that maintain permanent standing water may create vector concerns

Potential LEED Credits:

Primary: Sustainable Sites – Credit 6 "Stormwater Management" (1-2 Points)
Other: N/A

Application

Where landscape based BMPs are infeasible, especially on retrofit projects due to space limitations or pre-existing structures and grading, filtration can be provided in a modular, non-vegetated format to provide important pollutant reduction benefits.

Filter Performance and Design

The performance of any media filter is governed primarily by four factors:

- Hydraulic Loading Rate – The application rate of untreated water to the surface of the filter media usually expressed as a flow rate per filter surface area. i.e. gpm/ft^2
- Filter Media Gradation – A finer media gradation reduces hydraulic conductivity and increases the capture efficiency for fine particulate pollutants. Finer media also has a greater surface area which increases sorption rates for chemically active media. A more homogenous media gradation increases voids volume in a media bed. Finer media is more susceptible to surface clogging.
- Residence Time - Residence time is a function of media gradation, hydraulic loading rate and the media bed depth and configuration. A longer residence time generally improves pollutant removal performance.
- Media Chemical properties – Filter media can be inert (i.e. perlite) or can be selected to target specific pollutants of concern (i.e. activated carbon for trace organics). Chemically active options may be organic, mineral or synthetic or a combination of types. Media should be selected with consideration of the type and load of pollutants requiring removal.

Given the tremendous variability and the proprietary nature of many media filter designs, observed media filter performance varies widely. Sand filters following CASQA handbook guidance are generally accepted as effective stand-alone treatment systems for most common stormwater pollutants. At least three peer reviewed field monitoring protocols have been developed for the express purpose of identifying those stormwater treatment system designs that demonstrate comparable performance and that operational feasibility. Initial laboratory or bench scale performance evaluation is useful for refining filter design and operation characteristics, but in-field performance verification following one of the following protocols is essential. Media filter designs that have been accepted by the following programs may be considered for use where bioretention facilities are infeasible.

- Sacramento Stormwater Quality Partnership – "Investigation of Structural Control Measures for New Development"
- Washington State Department of Ecology – "Technology Assessment Protocol – Ecology" (TAPE), General Use Level Designation
- Technology Assessment Reciprocity Partnership (TARP) – "Protocol for Stormwater Best Management Practice Demonstrations", Final Certification

Links to Detailed Information

Caltrans, 2004. BMP Retrofit Pilot Program – Final Report. Report ID: CTSW - RT - 01 – 050. California Department of Transportation, Sacramento, CA.
http://www.dot.ca.gov/hq/env/stormwater/special/newsetup/_pdfs/new_technology/CTSW-RT-01-050.pdf

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California Stormwater Quality Association (CASQA). 2003. *California Stormwater BMP Handbook – New Development and Redevelopment*. BMP Factsheet TC-40: Media Filter.
http://www.cabmphandbooks.com/Documents/Development/TC-40.pdf

Sacramento Stormwater Management Program. 1999. *Investigation of Structural Control Measures for New Development.*
http://www.sacstormwater.org/ConstructionandNewDevelopment/Manuals/SCM/SCMReport.pdf

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http://www.mass.gov/dep/water/laws/swprotoc.pdf

Washington State Department of Ecology. 2008. *Guidance for Evaluating Emerging Stormwater Treatment Technologies: Technology Assessment Protocol – Ecology (TAPE).*
http://www.ecy.wa.gov/biblio/0210037.html

Proprietary Devices

Proprietary devices include water quality inlets, catch basin controls or stand-alone vaults that prevent sediment, oils, floatable trash, and debris from being transmitted through the collection system. Proprietary devices may be used with other BMPs as part of a stormwater treatment train. However, these controls are generally considered pretreatment devices, as they typically provide limited treatment when compared to other BMPs, and often do not provide detention or retention of stormwater runoff.

Figure 83. Catch basin insert.
Source: REM Inc.

Benefits

- Remove trash, debris, sediment, and/or oils
- Good retrofit capability

Limitations

- Provide limited water quality treatment
- Do not attenuate peak flows or volume
- Some devices permit permanent pools of standing water, which can provide a breeding area for mosquitoes
- Maintenance of underground devices is easily neglected, and can lead to system failure

Potential LEED Credits:

Primary: Sustainable Sites – Credit 6 “Stormwater Management” (1-2 Points)
Other: N/A

Links to Detailed Information

California Stormwater Quality Association (CASQA). 2003. *California Stormwater BMP Handbook – New Development and Redevelopment*. BMP Factsheet TC-50: Water Quality Inlet.
http://www.cabmphandbooks.com/Documents/Development/TC-50.pdf

California Stormwater Quality Association (CASQA). 2003. *California Stormwater BMP Handbook – New Development and Redevelopment*. BMP Factsheet MP-50: Wet Vault.
http://www.cabmphandbooks.com/Documents/Development/MP-50.pdf

Sacramento Stormwater Management Program. 1999. *Investigation of Structural Control Measures for New Development.*
http://www.sacstormwater.org/ConstructionandNewDevelopment/Manuals/SCM/SCMReport.pdf

Step 5: Evaluate Design

A successful LID design must meet the goals that have been laid out at the beginning of the design process. Assessment of the level to which these goals have been met has both quantitative and qualitative elements.

LID centers on the goal of mimicking the predevelopment hydrology of a site, including volume, flow, and time of concentration of the runoff hydrograph. A successful LID design will have the following attributes:

- Runoff should be captured and treated where it is generated. Therefore, every impervious surface should be associated with a dedicated BMP or set of BMPs to capture and treat the runoff from that surface.
- No runoff should be discharged untreated, with the exception of excess runoff from events greater than the 85th percentile storm event.
- Excess stormwater relative to predevelopment conditions should be captured and held onsite to the maximum extent practicable. The exact level of capture that is warranted will depend on the site's predevelopment hydrology, and the level of infiltration that can be achieved will depend on the site's soils.
- Predevelopment peak discharge rates should be maintained.
- The predevelopment time of concentration should be maintained. Flow paths should be as long as possible, flow surfaces should be roughened. This will prevent increases in the peak flow rate.
- Environmentally sensitive site features should be preserved.
- A designer should try to optimize the siting of buildings and paved areas in places that will have minimal impact on the site's hydrology. The design should avoid developing the most permeable soils, instead taking advantage of these areas for infiltration.

LID Hydrologic Analysis

The purpose of this section is to provide technical guidance on the estimation and control of stormwater runoff quality and quantity. A general overview of hydrograph methods used for designing BMPs, and a description of some of the more common computerized modeling methods and analysis is provided.

When assessing the structural BMPs that can be used to meet stormwater control objectives for a new or redevelopment project, the stormwater designer will need to adequately simulate various stormwater runoff scenarios. The hydrologic analysis includes estimating design storm characteristics (e.g., frequency, intensity, duration, and quality of runoff) with and without stormwater BMP controls. The type of calculations and models utilized in the hydrologic analyses is integral to appropriately simulating the pre- and post- design conditions and determining whether a successful design has been developed.

Background on Modeling LID

Stormwater modeling has its origin in the design of flood control facilities, which focused on protection of public property and safety. Changes in stormwater management, primarily related to environmental objectives, have necessitated that models be expanded to include a broader array of modeling capabilities. Additionally, conventional modeling focuses on the large storm events, whereas environmental objectives are often focused on the smaller events, which have the greatest influence on pollutant transport and channel geomorphology.

With the increasing use of LID as a stormwater mitigation approach, the peak flow rate and volume runoff benefits of LID need to be adequately accounted for in the selected modeling approach. There are multiple models that are capable of simulating stormwater runoff characteristics.

Commonly Used Models for LID Design

- California Stormwater BMP Handbook Approach
- Rational Method
- TR-20/TR-55
- HEC-1
- HSPF
- SWMM
- SLAMM

There have been many methodologies developed to estimate the total runoff volume, the peak flow rate of runoff, and the runoff hydrograph from land surfaces under a variety of conditions. This section describes some of the methods that are most commonly used for stormwater design. When selecting a modeling approach, match the tool to the scope, complexity, and size of the project while considering the conditions of the receiving waters and runoff conveyance system.

California Stormwater BMP Handbook Approach

Source: California Stormwater Quality Association

Storm Simulation Type: Continuous

Stormwater Analysis Capability: Volume, Flow

Description: The California Stormwater BMP Handbook Approach is based on an application of the STORM model, developed by the U.S. Army Corps of Engineers, to California. Both volume-based and flow-based BMP sizing curves are provided for representative areas throughout the state, and require only the calculation of a composite runoff coefficient for the proposed site.

Typical Use: Primarily used for site-scale sizing of water quality BMPs.

Advantages: This approach is easy to apply, and does not require the use of sophisticated models. Calculations are based on commonly available project information. The approach is often approved for use in California NPDES permits.

References:

California Stormwater Quality Association (CASQA). 2003. *California Stormwater BMP Handbook – New Development and Redevelopment*. Section 5, Treatment Control BMPs. http://www.cabmphandbooks.com/Documents/Development/Section_5.pdf

The Rational Method

Source: Kuichling, 1889

Storm Simulation Type: Single event

Storm Analysis Capability: Flow

Description: The rational formula calculates the peak flow rate as a function of the rainfall intensity (for a specific design return period and time of concentration (T_c)), the watershed area, and the runoff coefficient.

Typical Use: Estimating peak runoff rates from relatively small (200 acre) developed drainage areas. The Rational Method is commonly used to estimate runoff rates from large storm events for the design of conventional stormwater infrastructure (e.g., pipes) for flood management.

Advantages: Simple calculations that do not require intensive labor or software. Input values are readily available and can be adjusted to improve estimates.

Disadvantages: While the calculations are simple, peak runoff rate estimates are highly sensitive to estimates of the T_c. Additionally, the Rational Method is unable to accommodate for storage in the drainage area.

Recommendation: Can be used to size BMPs for water quality improvement. Manipulation of runoff coefficients can be conducted to simulate storage and infiltration processes, but considerable error may be introduced.

References:

CASQA, 2003. *California Stormwater BMP Handbook for New Development and Redevelopment*. Available online: http://www.cabmphandbooks.com/

Kuichling, E., 1889. *The Relation Between Rainfall and the Discharge of Sewers in Populous Districts*¸ Transactions ASCE 20(402):1-60.

TR-55 / TR-20

Source: The U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS)

Storm Simulation Type: Single event

Description: "Technical Release 55 (TR-55) presents simplified procedures to calculate storm runoff volume, peak rate of discharge, hydrographs, and storage volumes required for floodwater reservoirs. These procedures are applicable to small watersheds, especially urbanizing watersheds, in the United States." (NRCS, 1986) TR-55 uses the runoff curve number method and unit hydrographs to convert rainfall into runoff estimates.

Typical Use: Used for both watershed/basin planning as well as project scale calculations.

Advantages: The advantage of applying TR-55 and TR-20 is the convenience of tables and input parameters included for a wide range of soil and land use conditions. TR-55 is the most widely used approach to hydrology.

Disadvantages: While simple to use, runoff estimates are highly sensitive to estimates of the Tc and curve numbers.

Recommendation: Can be effectively used to model LID BMPs for single event storms. User must be aware of uncertainty related to input parameters.

References:
NRCS, 1986. *Urban Hydrology for Small Watersheds*. Washington, DC: USDA.

NRCS – WinTR-55 Computer Model
http://www.wsi.nrcs.usda.gov/products/W2Q/H&H/Tools_Models/WinTR55.html

HEC-1

Source: U.S. Army Corps of Engineers, Hydrologic Engineering Center (HEC)

Storm Simulation Type: Single event

Stormwater Analysis Capability: Flow

Description: HEC-1 is designed to simulate the surface runoff response of a drainage basin to precipitation by representing the basin as an interconnected system of hydrologic and hydraulic components. Each component provides simulation of a rainfall-runoff process. The result of the modeling process is the computation of streamflow hydrographs at desired locations in the river basin.

Typical Use: Primarily used to design conventional detention basins for flood control.

Advantages: The ability to simulate system routing and storage provides some improvement over use of the Rational Method.

Disadvantages: May be complex for most users without appreciable benefit over TR-55, which is easier to use.

Recommendation: Can be used to simulate LID BMPs, but TR-55 would be a better option.

References:
USACE, HEC-1 Flood Hydrograph Package
http://www.hec.usace.army.mil/software/legacysoftware/hec1/hec1.htm

HSPF- Hydrologic Simulation Program – FORTRAN

Source: U.S. Environmental Protection Agency

Storm Simulation Type: Continuous simulation

Stormwater Analysis Capability: Water Quality and Flow

Description: The HSPF model simulates of water quantity and quality runoff from mixed land use watersheds. Using continuous simulation of rainfall-runoff processes, the model generates hydrographs, runoff flow rates, sediment yield, and pollutant washoff and transport. HSPF includes consideration of infiltration, subsurface water balance, interflow, and base flow.

Typical Use: Traditional use for conventional flood control and water quality treatment. Increasingly, models based on HSPF are being utilized to estimate emerging stormwater management practices such as LID.

Advantages: Models most processes that would concern LID BMP design. Capable of simulating a wider range of hydrologic responses through continuous simulation.

Disadvantages: HSPF is a complex model and requires a user familiar with the software. Also requires significant input data.

Recommendation: If the model is available and calibrated to the local conditions, then HSPF or an HSPF-based model would be appropriate. The LID designer should consider whether a simpler model (e.g., TR-55) would be sufficient.

References:
USEPA – Exposure Assessment Models: HSPF http://www.epa.gov/ceampubl/swater/hspf/

Storm Water Management Model (SWMM)

Source: U.S. Environmental Protection Agency

Storm Simulation Type: Single event and continuous simulations

Stormwater Analysis Capability: Water quality and flow

Description: SWMM is an urban stormwater model developed and maintained by the EPA. SWMM is applied to stormwater simulations including urban runoff, flood routing, and flooding analysis. The model provides continuous simulation of rainfall-runoff processes (peak flow, rate, duration) and associated pollutant washoff and transport. SWMM also includes flow routing capabilities for open channels and piped systems.

Typical Use: Predominantly used to design conventional stormwater facilities for flood control and conveyance. Used both at watershed- and parcel- level analysis. Some users have modified SWMM to better simulate LID practices and processes.

Advantages: SWMM provides ability to simulate water quality and flow, routing, and storage functions. Accounts for rainfall patterns and characteristics through continuous simulations. Can be modified to better meet user needs.

Disadvantages: Requires significant data input and user familiarity. Increase in variables, while providing an opportunity for more accurate simulations, can also create increased error due to the need to estimate multiple parameters.

Recommendation: Can be effectively used to model LID BMPs but user should determine whether a simpler method would be satisfactory.

References:
USEPA – Ecosystems Research Division: Stormwater Management Model (SWMM)
http://www.epa.gov/athens/wwqtsc/html/swmm.html

SLAMM (Source Loading and Management Model)

Source: PV & Associates

Storm Simulation Type: Continuous

Stormwater Analysis Capability: Water Quality

Description: SLAMM was developed to better understand the relationships between sources of runoff pollutants and runoff quality. It has been continually expanded and includes a variety of water quality control practices (infiltration, detention ponds, porous pavement, street cleaning, catch basin cleaning, and grass swales).

Typical Use: SLAMM is mostly used as a planning tool, to better understand sources of urban runoff pollutants and their control. Special emphasis has been placed on small storms, where most pollutant transport occurs.

Advantages: One of its most important features is its ability to consider many stormwater controls (affecting source areas, drainage systems, and outfalls) together, for a long series of rains. SLAMM can be effectively used in conjunction with drainage design models to incorporate the mutual benefits of water quality controls on drainage design.

Disadvantages: As a water quality model, SLAMM cannot predict stormwater runoff characteristics associated with LID.

Recommendation: Can be used if coupled with an appropriate runoff model.

References:
WinSLAMM - http://www.winslamm.com/default.html

Selecting the Appropriate Model to Evaluate Your LID Design

All of the models described in the preceding section can be utilized for evaluation of LID design. The appropriate computational methods depend on the type of information required and the size of the drainage area to be analyzed. In selecting the appropriate procedure, consider the scope and complexity of the problem, the available data, and the acceptable level of error. Consider the stormwater runoff objective (e.g., volume, peak rate, flow frequency/duration, water quality), then select the appropriate model.

Single Event versus Continuous Simulation Model

A continuous simulation model has considerable advantages over the single event-based methods. A continuous simulation model is capable of simulating a wider range of hydrologic responses than the single event models. Single event models cannot take into account storm events that may occur just before or just after the single event (the design storm) that is under consideration. Event- based modeling has a place, however, especially in the design of small projects (typically less than 200 acres), where resources are limited.

Continuous runoff models are able to simulate a continuous long term record of runoff and soil moisture conditions. Finally, single event models do not allow for estimation and analyses of flow durations, which may be necessary to determine acceptable discharges to streams.

Table 30 further describes the differences between these models.

Table 30. Commonly Used Models for LID Design.

	CA BMP Handbook	Rational Method	TR-55/TR-20	HEC-1	HSPF	SWMM	SLAMM
Simulation Type	Continuous	Single event	Single event	Single event	Continuous	Single Event/ Continuous	Continuous
Runoff Volume	Yes	No	Yes	Yes	Yes	Yes	No
Peak Discharge	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Water Quality	No	No	No	No	Yes	Yes	Yes
Flow Routing	No	No	Yes	Yes	Yes	Yes	Yes
Storm Events	Small	Large	All	Large	All	All	Small
Overall Complexity	Low	Low	Moderate	Moderate	High	High	High
Appropriateness for LID	Moderate	Moderate	High	Moderate	High	High	High

Source: The Low Impact Development Center, Inc.

Section 3: Case Studies

Case Study 1: Commercial Retrofit

Retrofit existing commercial site with green roofs, permeable pavement, and bioretention.

Location: San Diego
Total Site Area: 2.81 acres

Existing Conditions
Total impervious area: 1.65 ac

- buildings: 0.39 ac
- parking: 0.99 ac
- walkways: 0.26 ac

Landscaped areas (turf): 1.16 ac

Existing soils: Gravel pit, Hydrologic Soil Group A, Infiltration rate: 13 in/hr, based on NRCS Web Soil Survey (http://websoilsurvey.nrcs.usda.gov). Soil profiles and infiltration rates should be measured in the field prior to finalization of design.

Weighted runoff coefficient: 0.54
Composite curve number: 78

Predevelopment Conditions
Land cover: California sagebrush
Curve number: 35

Analysis
Using the California Stormwater BMP Handbook approach, the required storage volume for 85 percent capture would be 3,979 cubic feet.

Using the TR-55 approach, the required storage volume to restore predevelopment hydrologic performance for the 10-year, 24 hour storm would be 11,224 cubic feet.

Suggested BMPs:

1. Retrofit existing buildings with extensive green roofs. Cover 75 percent of each roof's surface, leaving room for HVAC and other equipment. This would reduce the site composite curve number to 69, and reduce the required storage volume to 5,153 cubic feet.
2. The remaining impervious area can be treated by incorporating 6,800 square feet of permeable pavement into existing parking areas. The permeable pavement would be underlain by a 1-foot-deep gravel storage bed. This is well below the 5.2-foot maximum storage depth to ensure drainage within 48 hours on this soil, providing 2,736 cubic feet of storage.

Landscaped areas cannot be drained to permeable pavement. Runoff from these areas can be captured by surrounding existing drains with small bioretention cells. Assuming a typical 1.4-foot depth of storage, based on 6 inch ponding depth and 2.5 foot media depth, 1,940 square feet of bioretention would provide an additional 2716 cubic feet of storage.

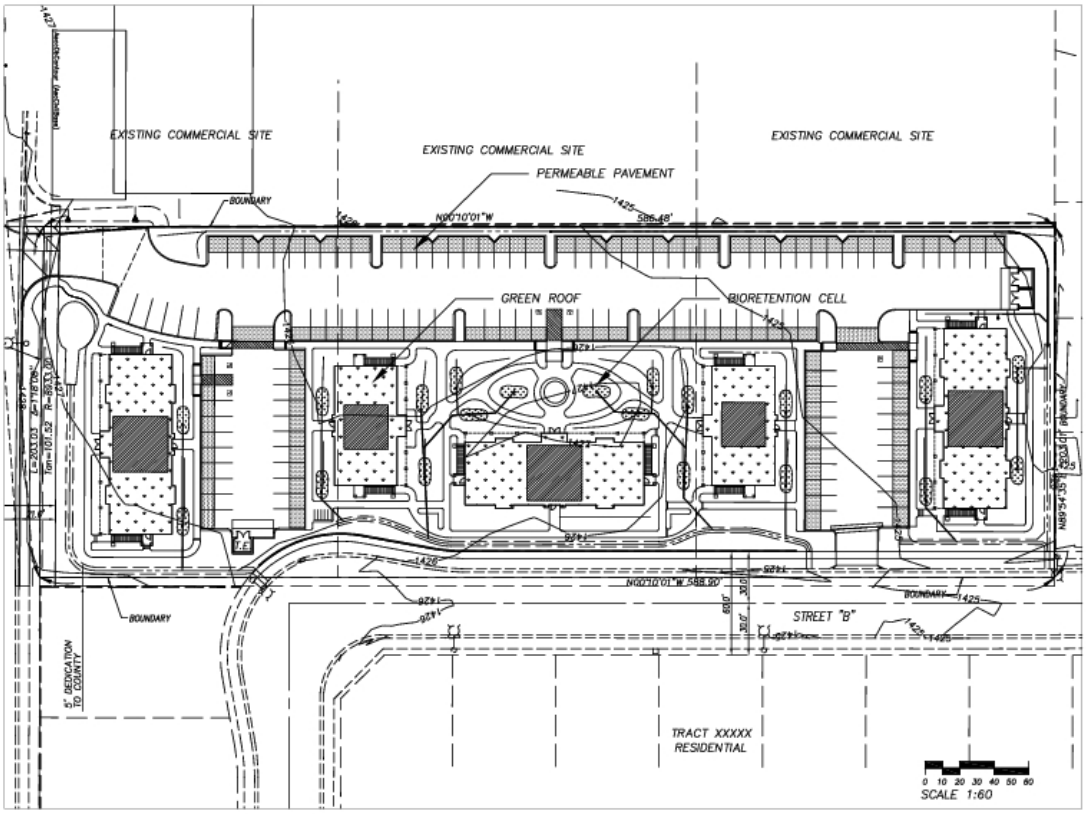

Figure 84. Retrofit of an existing commercial site.
Source: The Low Impact Development Center, Inc.

Case Study 2: Residential Retrofit

Retrofit existing residential development with permeable pavement, bioretention, and rain barrels.

Location: Ventura
Total site area: 14.7 acres

Existing Conditions
Total impervious area: 6.9 ac

- houses: 1.3 ac
- driveways: 1.1 ac
- sidewalks: 1.0 ac
- roads: 3.0 ac

Landscaped areas (turf): 7.7 ac

Existing soils: Mocho loam and Pico sandy loam, Hydrologic Soil Group B, average infiltration rate: 2.6 in/hr, based on NRCS Web Soil Survey (http://websoilsurvey.nrcs.usda.gov). Soil profiles and infiltration rates should be measured in the field prior to finalization of design.

Weighted runoff coefficient: 0.49
Composite curve number:

Predevelopment Conditions
Land cover: California sagebrush
Curve number: 35

Analysis
Using the California Stormwater BMP Handbook Approach, the required storage volume for 85 percent capture would be 39,949 cubic feet.

Using the TR-55 approach, the required storage volume to restore predevelopment hydrologic performance for the 10-year, 24 hour storm would be 127,304 cubic feet.

Suggested BMPs:

1. Replace existing sidewalks with permeable pavement, underlain by a 2-foot gravel storage layer. This would provide 55,187 cubic feet of storage.
2. Retrofit each of the 57 houses in the development with two 55-gallon rain barrels. This would provide a total of 834 cubic feet of storage over the entire development.
3. Build two bioretention cells on each of the 57 lots, totaling 580 square feet per lot, assuming a 6-inch ponding depth, and 30-inch media depth. This would provide a total of 45,493 cubic feet of storage over the entire development.
4. Convert existing swale to bioretention, 10,206 square feet, assuming a 6-inch ponding depth, and a 30-inch media depth. This would provide the remaining 14,033 cubic feet of storage.

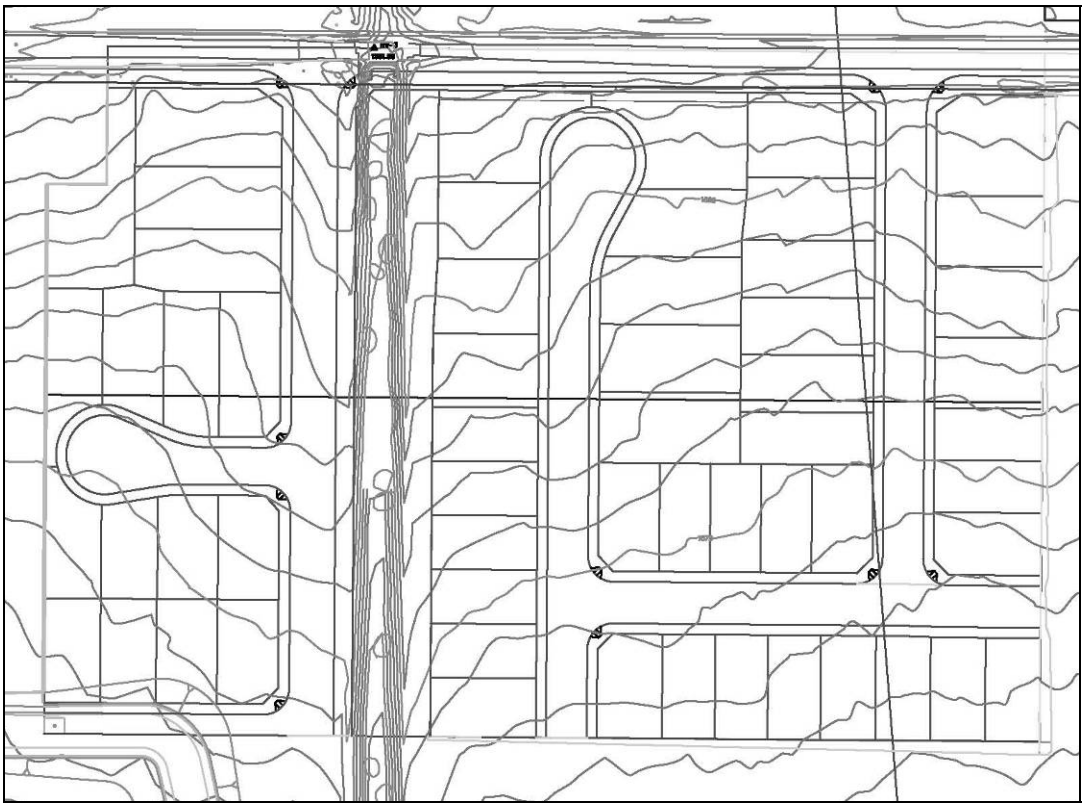

Figure 85. Existing residential subdivision.
Source: The Low Impact Development Center, Inc.

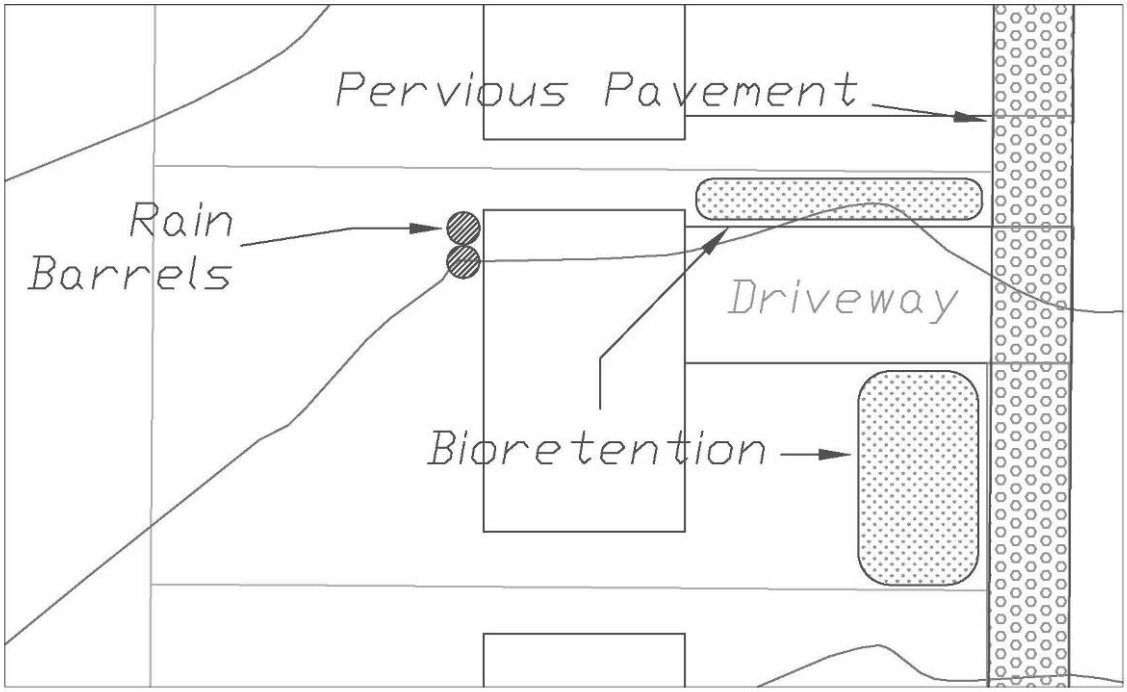

Figure 86. LID retrofits to an existing residential lot.
These retrofits are to be applied to each lot in the subdivision.
Source: The Low Impact Development Center, Inc.

Case Study 3: Commercial Design

Retrofit an existing commercial warehouse with green roof, permeable pavement, and bioretention, and reduce the impact of a planned expansion.

Location: Riverside
Total site area: 52.9 acres

Existing Conditions
Total impervious area: 21.6 ac

- Existing building: 11.8 ac
- Existing parking: 9.8 ac

Undeveloped area: 31.3 ac

Existing Hydrology: Existing ephemeral stream running through site. Depth to groundwater: high (> 2m). Site is within a braided channel and floods frequently.

Topography: Site has a steady, 2-5 percent slope running northwest to southeast. Stream runs transverse to the slope in the eastern half of the site.

Existing soils: Soboba stony loamy sand, psamments, and fluvents, Hydrologic Soil Group A, average infiltration rate: 16 in/hr. Soil is very coarse, but frequently floods. No restrictive layers. Soils data is based on NRCS Web Soil Survey (http://websoilsurvey.nrcs.usda.gov). Soil profiles and infiltration rates should be measured in the field prior to finalization of design.

Existing vegetation: California sagebrush

Ecoregion: Los Angeles Plain

Sensitive and restricted areas: There is a stream running through the site, blocking the natural area for the addition.

Existing development: existing building (513,361 sf), two parking areas (55,606 sf in front, 360,644 sf loading area behind building)

Contamination: no known contamination issues

Landslide Potential: low

Proposed Addition
Warehouse addition: 146,711 sf
Parking lot: 50,687 sf
Loading area: parking for 210 tractor trailers

Design Approach
Design addition using LID Site Design Strategies to minimize hydrologic disturbance.

- Maximize Natural Infiltration Capacity
- Preserve Existing Drainage Patterns
- Protect Existing Vegetation and Sensitive Areas

Avoid development within riparian corridor. Place new building and parking areas to the east of the stream, with a bridge connecting the two areas.

- Minimize Impervious Area

Reduce the size of the tractor trailer parking area by creating a two-story parking structure.

- Disconnect Impervious Areas and Downspouts

Separate front parking area from building. Isolate roof runoff from loading area.

Weighted runoff coefficient: 0.52
Composite curve number, developed site: 75
Composite curve number, predevelopment (before ALL development): 35

Analysis
Using the California Stormwater BMP Handbook Approach, the required storage volume for 85 percent capture would be 67,153 cubic feet.

Using the TR-55 approach, the required storage volume to restore predevelopment hydrologic performance for the 10-year, 24 hour storm would be 193,785 cubic feet.

Suggested BMPs:
1. Retrofit existing building with extensive green roof. Cover 75 percent of roof's surface, leaving room for HVAC and other equipment. This would reduce the site composite curve number to 69, and reduce the required storage volume to 84,421 cubic feet.
2. Harvest rainwater from the roof of the new building, stored in cisterns under the building. This would provide 38,023 cubic feet of storage.
3. Install pervious pavement with 6-inch gravel storage layer in front parking lots. This would provide 21,572 cubic feet of storage.
4. Surround perimeter of existing and proposed loading areas with bioretention:
    a. 10 feet x 1,350 ft, 6 inch ponding depth, 30-inch media for existing loading area – 18,562 cubic feet.
    b. 10 feet x 743 ft, 6 inch ponding depth, 30-inch media for proposed loading area/ truck parking – 10,220 cubic feet.

Bioretention has an excellent capacity to trap and remove any oil, grease or other pollutants resulting from high truck traffic in these areas.

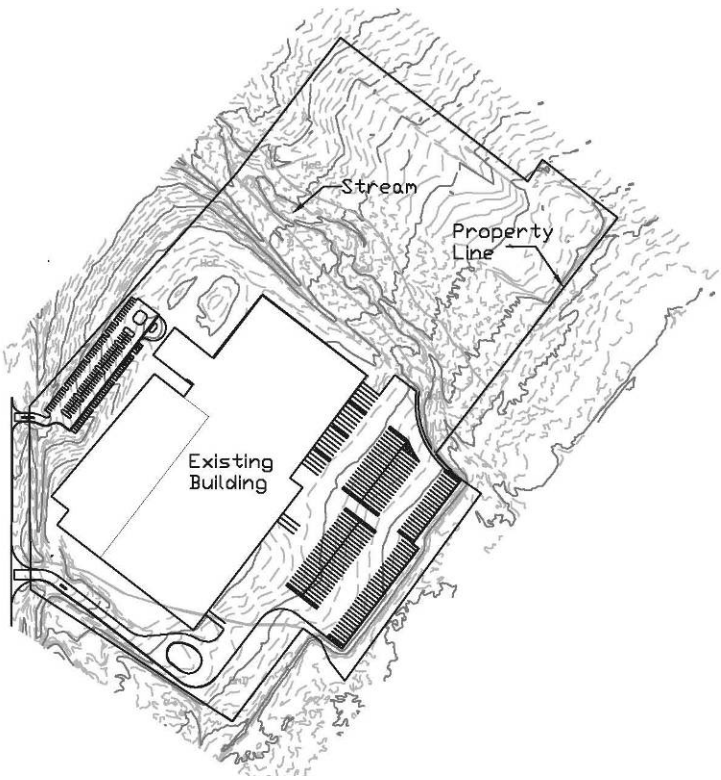

Figure 87. Existing commercial development.
Source: The Low Impact Development Center, Inc.

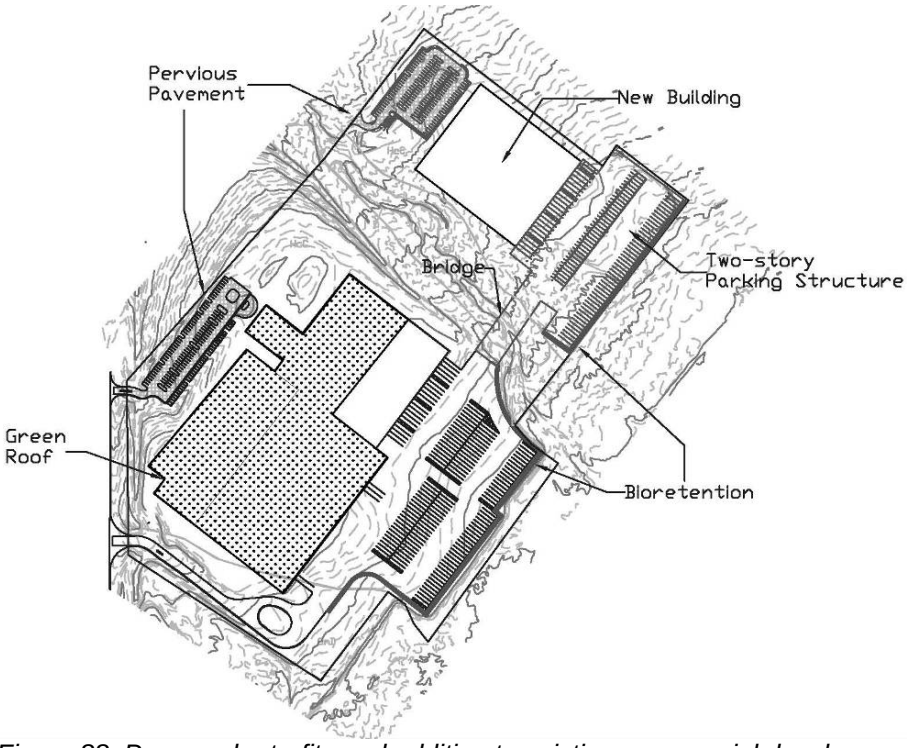

Figure 88. Proposed retrofits and addition to existing commercial development.
Source: The Low Impact Development Center, Inc.

Case Study 4: Residential Development

Design a 118-lot residential subdivision on an undeveloped parcel.

Location: Riverside
Total site area: 44.4 acres

Existing Conditions

Existing Hydrology: No waterbodies are present onsite. Depth to groundwater: high (> 2m).

Topography: Site is sloped from west to east. The northwestern quadrant slopes steeply to the south and east (5-8 percent slopes). A smaller hill is present in the southeast corner, sloping north and west. The low area between these hills slopes gently from west to east, with a slope of 1-2 percent.

Existing soils:

- 60% Cortina gravelly coarse sandy loam, 2-5% slopes, HSG A
- 34% Arbuckle gravelly loam, 8-15% slopes, HSG B
- 3% Ysidora gravelly very fine sandy loam, 8-25% slopes, eroded, HSG C

No restrictive layers. Soils data is based on NRCS Web Soil Survey (http://websoilsurvey.nrcs.usda.gov). Soil profiles and infiltration rates should be measured in the field prior to finalization of design.

Existing vegetation: California sagebrush

Ecoregion: Los Angeles Plain

Sensitive and restricted areas: The slope on the northwestern side of the site is fairly steep, with poorly draining, eroded soils, and should therefore be avoided.

Existing development: none

Contamination: no known contamination issues

Landslide Potential: low

Proposed Development

Design Approach
Design subdivision using LID Site Design Strategies to minimize hydrologic disturbance.

- Maximize Natural Infiltration Capacity

- Preserve Existing Drainage Patterns

Development is focused on level ground to avoid disturbance of natural drainage patterns

- Protect Existing Vegetation and Sensitive Areas

Avoid developing on steep, eroded slopes

- Minimize Impervious Area

The subdivision is designed with small lots concentrated on one part of the site. Lots are centered around a large communal park to provide recreational opportunities. Minimal road widths are used (40 feet, including sidewalks on one side).

- Disconnect Impervious Areas and Downspouts

Roof downspouts are connected to rain barrels. Driveways use permeable pavement to avoid discharge onto roads. Sidewalks are fitted with permeable pavement to capture street runoff.

Weighted runoff coefficient:
Composite curve number, predevelopment: 36
Composite curve number, developed site: 51

Analysis
Using the California Stormwater BMP Handbook approach, the required storage volume for 85 percent capture would be 59,653 cubic feet.

Using the TR-55 approach, the required storage volume to restore predevelopment hydrologic performance for the 10-year, 24 hour storm would be 21,121 cubic feet.

Suggested BMPs:

1. Install one 55-gallon rain barrel at each of the 115 houses in the development. This would provide a total of 841 cubic feet of storage.
2. Install pervious pavement with 1-foot gravel storage layer in driveways. This would provide a total of 11,500 cubic feet of storage over the entire development.
3. Install pervious pavement with 1-foot gravel storage layer on sidewalks. This would provide 11,193 cubic feet of storage.

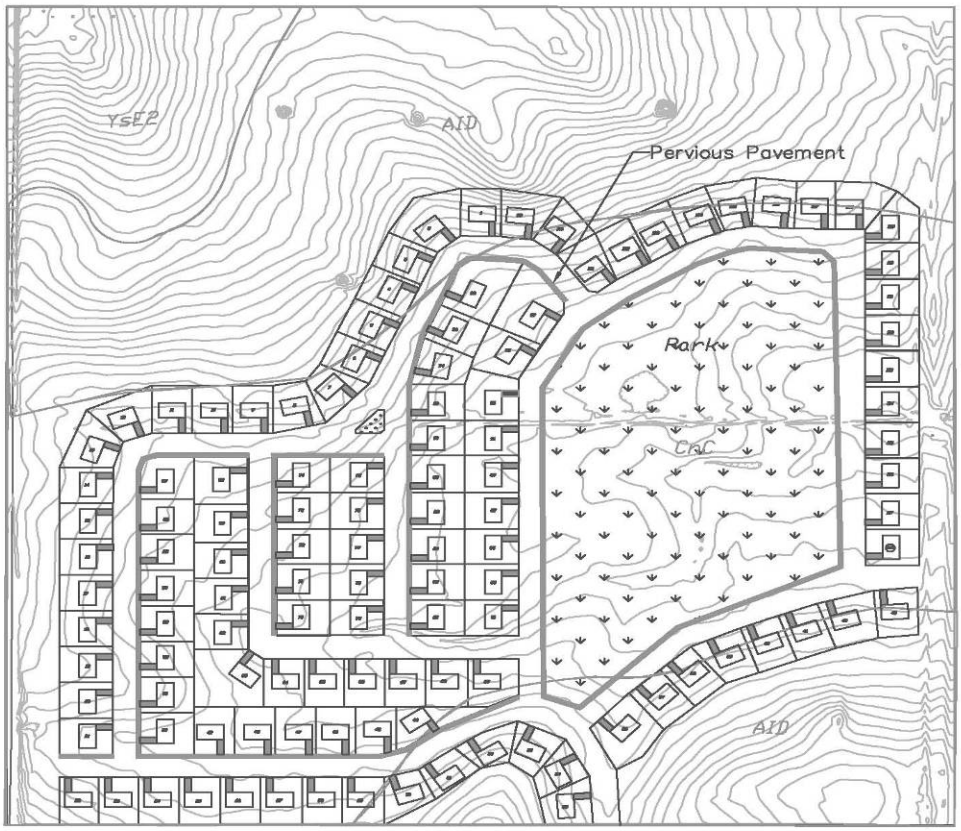

Figure 89. Residential subdivision design.
Source: The Low Impact Development Center, Inc.

Appendix A: Lists of Plants Suitable for Southern California

The plant lists included in this manual are intended to serve as a general guide for identifying plants likely to be suitable for use in LID. The lists a and associated references are not exhaustive, and are not a substitute for the planting recommendations of a qualified landscape professional with knowledge of LID and following a site and design specific evaluation.

Table 31. Master Plant List.

Master Plant List				**Region[2]**				**Light Level[4]**			**Moisture[5]**				**Uses**		
Latin Name[1]	**Common Name**	**Form**	**Sunset Zone**	**Coastal**	**Intermediate**	**Inland**	**Native Community[3]**	**H**	**M**	**L**	**VL**	**L**	**M**	**H**	**General**	**Bioretention**	**Roof**
Acalypha californica	California Copperleaf	evergreen shrub		✓	✓	✓	chaparral, scrub	✓	✓		✓✓				✓		
*Achillea millefoilum **	Yarrow	herbaceous perennial	1-24	✓	✓	✓	Many	✓	✓	✓	✓✓	✓	✓	✓	✓	✓	✓
Adenostoma fasciculatum 'Nicolas'	Prostrate Chamise	groundcover	14-16, 18-24	✓	✓	✓	Chaparral	✓	✓	✓	✓✓			✓	✓		✓
Aesculus californica	California Buckeye	deciduous tree	4-10,12,14-24	✓	✓	✓	Woodland	✓	✓	✓	✓✓			✓	✓		✓
Agave deserti	Desert Century Plant	succulent	12-24	✓	✓	✓	Scrub	✓		✓	✓✓			✓	✓		✓
Agave shawii	Shaw's Century Plant	succulent		✓	✓		css	✓		✓	✓✓			✓	✓		✓
Ambrosia chamissonis	Sand Bur	sprawling perennial		✓			dunes	✓			✓✓						✓
Ambrosia pumila	San Diego Ambrosia	groundcover		✓	✓		dunes	✓	✓		✓✓	✓					✓
Amorpha fruticosa	False Indigobush	Deciduous shrub		✓	✓	✓	riparian	✓	✓	✓	✓		✓	✓	✓	✓	✓
Antigonon leptopus	San Miguel Coral Vine	climbing vine	12, 13, 18-24	✓	✓		chaparral, scrub	✓	✓			✓	✓				✓
Arbutus menziesii	Madrone	broadleaf evergreen tree	15-17, 19-24	✓	✓	✓	woodland, forest	✓	✓	✓	✓	✓	✓	✓	✓		✓
Arctostaphylos catalinae	Catalina Manzanita	broadleaf evergreen tree/shrub		✓	✓	✓	chaparral	✓	✓	✓	✓✓			✓	✓		✓
Arctostaphylos densiflora 'Howard McMinn'	McMinn Manzanita	broadleaf evergreen shrub	7-9, 14-21	✓	✓	✓	chaparral	✓	✓	✓	✓✓			✓	✓		✓
Arctostaphylos edmundsii 'Carmel Sur'	Carmel Sur Manzanita	groundcover	6-9, 14-24	✓	✓	✓	ocean bluffs	✓	✓	✓	✓	✓		✓	✓		✓
Arctostaphylos glauca	Bigberry Manzanita	broadleaf evergreen shrub		✓	✓	✓	chaparral	✓	✓	✓	✓✓			✓	✓		✓

Master Plant List (Cont.)				Region[2]				Light Level[4]			Moisture[5]				Uses		
Latin Name[1]	Common Name	Form	Sunset Zone	Coastal	Intermediate	Inland	Native Community[3]	H	M	L	VL	L	M	H	General	Bioretention	Roof
Arctostaphylos 'Lester Rowntree'	Lester Rowntree Manzanita	broadleaf evergreen tree/shrub		✓	✓		chaparral	✓	✓		✓	✓			✓		
Arctostaphylos 'Pacific Mist'	Pacific Mist Manzanita	groundcover	7-9, 14-24	✓	✓		chaparral	✓	✓		✓	✓			✓		
Arctostaphylos uva-ursi 'Point Reyes'	Point Reyes Bearberry	groundcover	1-9, 14-24	✓		✓	woodland	✓	✓	✓	✓				✓		
Aristida purpurea	Purple Three-Awn	bunchgrass		✓	✓	✓	css, chaparral	✓	✓		✓✓				✓	✓	✓
Artemisia californica	California Sagebrush	evergreen subshrub	1-24	✓	✓		css, chaparral	✓	✓		✓✓				✓		✓
Artemisia californica 'Canyon Gray'	Canyon Gray Sagebrush	groundcover	1-24	✓	✓		css, chaparral	✓	✓		✓				✓		
Artemisia ludoviciana	Silver Wormwood	creeping perennial				✓	scrub	✓			✓				✓		✓
Artemisia pycnocephala	Beach Sagewort	herbaceous perennial	1-24	✓		✓	css, dune	✓	✓		✓	✓					✓
Atriplex lentiformis ssp. Breweri	Quail Bush	everg. or decid. shrub	1-24	✓	✓	✓	scrub	✓			✓✓				✓		
Baileya multiradiata	Desert Marigold	perennial	7-14, 18, 19		✓	✓	scrub, grassland	✓			✓✓	✓					✓
Baccharis pilularis 'Pigeon Point' or 'Twin Peaks'	Dwarf Coyote Bush	groundcover	1-3, 7-23	✓	✓	✓	css, chaparral	✓	✓		✓	✓			✓	✓	✓
Baileya multiradiata	Desert Marigold	perennial	7-14, 18, 19		✓	✓	scrub, grassland	✓			✓✓	✓					✓
Baccharis pilularis 'Pigeon Point' or 'Twin Peaks'	Dwarf Coyote Bush	groundcover	1-3, 7-23	✓	✓	✓	css, chaparral	✓	✓		✓	✓			✓	✓	✓
Baccharis pilularis ssp. consanguinea	Coyote Bush	woody perennial	5-11, 14-24	✓	✓		css, chaparral	✓	✓		✓✓				✓		
Bouteloua curtipendula	Side-oats Grama	bunchgrass		✓	✓	✓	scrub, woodland	✓			✓	✓			✓		✓
Brahea armata	Blue Hesper Palm	palm tree	10, 12-17, 19-24	✓	✓	✓	scrub	✓			✓	✓			✓		
Brahea edulis	Guadalupe Palm	palm tree	12-24	✓	✓		woodland	✓	✓		✓	✓			✓		
Calycanthus occidentalis	Spice Bush	decid shrub	4-9, 14-24	✓	✓	✓	woodland, forest	✓	✓			✓	✓		✓	✓	
Calystegia macrostegia 'Anacapa Pink'	Island Morning-glory	evergreen vine		✓	✓		css, chaparral	✓	✓			✓			✓		

Master Plant List (Cont.)				Region[2]				Light Level[4]			Moisture[5]				Uses		
Latin Name[1]	Common Name	Form	Sunset Zone	Coastal	Intermediate	Inland	Native Community[3]	H	M	L	VL	L	M	H	General	Bioretention	Roof
Calocedrus decurrens	Incense Cedar	evergreen tree	2-12, 14-24	✓	✓	✓	forest	✓	✓		✓	✓			✓		
Camissonia (Oenothera) cheiranthifolia *	Beach Evening Primrose	herbaceous perennial		✓			beach/dune	✓	✓		✓✓	✓			✓		✓
Carex pansa	California Meadow Sedge	creeping perennial		✓		✓	bluffs, strand	✓	✓	✓			✓	✓	✓	✓	
Carex praegracilis	California Field Sedge	creeping perennial		✓	✓	✓	riparian	✓	✓	✓			✓	✓		✓	
Ceanothus arboreus	Island Ceanothus	broadleaf evergreen tree/shrub		✓	✓		css, chaparral	✓			✓	✓			✓		
Ceanothus crassifolius	Hoaryleaf Ceanothus	broadleaf evergreen shrub		✓	✓		chaparral	✓			✓✓				✓		
Ceanothus greggii ssp. Perplexans	Cupleaf Lilac	broadleaf evergreen shrub			✓	✓	chaparral	✓			✓✓				✓		
Ceonothus griseus 'Santa Ana'	Santa Ana Ceonothus	evergreen shrub		✓			chaparral	✓	✓			✓	✓		✓	✓	
Ceanothus griseus horizontalis 'Yankee Point'	Carmel Creeper	groundcover	5-9, 14-17, 19-24	✓	✓		css, forest	✓	✓		✓	✓			✓		
Ceanothus hearstiorum	Heart Ceanothus	groundcover		✓			css, forest	✓	✓		✓	✓			✓		
Ceanothus impressus	Santa Barbara Ceanothus	evergreen shrub		✓			chaparral	✓	✓		✓✓				✓		
Ceanothus maritimus	Maritime Ceanothus	groundcover		✓			css	✓	✓		✓	✓			✓		
Ceanothus megacarpus	Big Pod Ceanothus	evergreen shrub		✓	✓		css, chaparral	✓			✓✓				✓		
Ceonothus verrucosus	Wartystem Ceonothus	evergreen shrub		✓	✓		css, chaparral	✓			✓✓				✓		
Ceanothus 'Anchor Bay'	Anchor Bay Ceanothus	groundcover		✓	✓		css, forest	✓	✓			✓	✓		✓	✓	
Ceanothus 'Concha'	Concha Ceanothus	evergreen shrub		✓	✓		chaparral	✓			✓	✓			✓		
Calystegia macrostegia 'Anacapa Pink'	Island Morning-glory	evergreen vine		✓	✓		css, chaparral	✓	✓			✓			✓		

Master Plant List (Cont.)				Region[2]				Light Level[4]			Moisture[5]				Uses		
Latin Name[1]	Common Name	Form	Sunset Zone	Coastal	Intermediate	Inland	Native Community[3]	H	M	L	VL	L	M	H	General	Bioretention	Roof
Ceanothus 'Ray Hartman'	Ray Hartman Ceanothus	evergreen shrub	5-9, 14-24	✓	✓		css, chaparral	✓			✓	✓			✓		
Cercidium floridum	Blue Palo Verde	deciduous tree	10-14, 18-20	✓	✓	✓	scrub	✓			✓✓				✓		
Cercis occidentalis	Western Redbud	deciduous shrub/tree	2-24	✓	✓	✓	chaparral, woodland	✓	✓		✓	✓			✓		
Cercocarpus betuloides	Western Mountain Mahogany	evergreen shrub/tree	6-24	✓	✓	✓	chaparral, woodland	✓			✓✓				✓		
Chilopsis linearis	Desert Willow	deciduous tree/shrub	7-14, 18-23	✓	✓	✓	riparian, scrub	✓			✓	✓	✓		✓	✓	
Cneoridium dumosum	Bushrue	evergreen shrub		✓	✓	✓	css, chaparral	✓	✓		✓✓				✓		
Cupressus forbesii	Tecate Cypress	evergreen conifer	8-14, 18-20	✓	✓	✓	chaparral, forest	✓			✓				✓		
Ceanothus hearstiorum	Heart Ceanothus	groundcover		✓			css, forest	✓	✓		✓	✓			✓		
Ceanothus impressus	Santa Barbara Ceanothus	evergreen shrub		✓			chaparral	✓	✓		✓✓				✓		
Ceanothus maritimus	Maritime Ceanothus	groundcover		✓			css	✓	✓		✓	✓			✓		
Ceanothus megacarpus	Big Pod Ceanothus	evergreen shrub		✓	✓		css, chaparral	✓			✓✓				✓		
Ceonothus verrucosus	Wartystem Ceonothus	evergreen shrub		✓	✓		css, chaparral	✓			✓✓				✓		
Ceanothus 'Anchor Bay'	Anchor Bay Ceanothus	groundcover		✓	✓		css, forest	✓	✓			✓	✓		✓	✓	
Ceanothus 'Concha'	Concha Ceanothus	evergreen shrub		✓	✓		chaparral	✓			✓	✓			✓		
Ceanothus 'Ray Hartman'	Ray Hartman Ceanothus	evergreen shrub	5-9, 14-24	✓	✓		css, chaparral	✓			✓	✓			✓		
Cercidium floridum	Blue Palo Verde	deciduous tree	10-14, 18-20	✓	✓	✓	scrub	✓			✓✓				✓		
Cercis occidentalis	Western Redbud	deciduous shrub/tree	2-24	✓	✓	✓	chaparral, woodland	✓	✓		✓	✓			✓		
Cercocarpus betuloides	Western Mountain Mahogany	evergreen shrub/tree	6-24	✓	✓	✓	chaparral, woodland	✓			✓✓				✓		

Master Plant List (Cont.)				Region[2]				Light Level[4]			Moisture[5]				Uses		
Latin Name[1]	Common Name	Form	Sunset Zone	Coastal	Intermediate	Inland	Native Community[3]	H	M	L	VL	L	M	H	General	Bioretention	Roof
Chilopsis linearis	Desert Willow	deciduous tree/shrub	7-14, 18-23	✓	✓	✓	riparian, scrub	✓			✓	✓	✓		✓	✓	
Cneoridium dumosum	Bushrue	evergreen shrub		✓	✓	✓	css, chaparral	✓	✓		✓✓				✓		
Cupressus forbesii	Tecate Cypress	evergreen conifer	8-14, 18-20	✓	✓	✓	chaparral, forest	✓			✓				✓		
Dendromecon harfordii	Channel Island Bush Poppy	evergreen shrub	7-9, 14-24	✓	✓		chaparral	✓			✓✓				✓		
Dendromecon rigida	Bush Poppy	evergreen shrub	4-12, 14-24		✓	✓	chaparral	✓			✓✓				✓		
Deschampsia caespitosa *	Tufted Hairgrass	perennial bunchgrass	1-24	✓	✓	✓	woodland, forest	✓	✓	✓	✓	✓	✓		✓	✓	
Dichelostemma capitatum	Wild Hyacinth	Bulb	1-24	✓		✓	many	✓			✓✓				✓		✓
Distichlis spicata	Salt Grass	creeping perennial		✓		✓	beach/dune; marsh	✓	✓			✓	✓	✓	✓	✓	
Dudleya hassei	Catalina Live-forever	Succulent		✓		✓	css	✓	✓	✓	✓✓				✓		✓
Dudleya pulverulenta	Chalk Dudleya	Succulent		✓	✓	✓	css, chaparral	✓	✓		✓✓				✓		✓
Eleocharis montevidensis	Spike Rush	grass-like perennial		✓	✓	✓	many	✓	✓	✓				✓		✓	
Encelia californica	Coast Sunflower	evergreen subshrub		✓	✓		css, chaparral	✓	✓		✓✓				✓		
Encelia farinose	Incienso	evergreen subshrub		✓	✓	✓	chaparral, scrub	✓			✓✓				✓		
Epilobium californicum	California Fuchsia	herb perennial		✓	✓	✓	many	✓	✓		✓✓				✓		✓
Epilobium canum	Hoary California Fuchsia	herb perennial		✓	✓	✓	css, chaparral	✓	✓		✓✓				✓		✓
Eriogonum arborescens	Santa Cruz Island Buckwheat	evergreen shrub	14-24	✓	✓		css, chaparral	✓	✓		✓	✓			✓		
Eriogonum crocatum	Saffron Buckwheat	evergreen subshrub/herb perennial	12-24	✓	✓		css	✓			✓✓				✓		✓
Eriogonum fasciculatum	California Buckwheat	woody perennial	8, 9, 12-24	✓	✓	✓	many	✓	✓		✓✓				✓		

Master Plant List (Cont.)				Region[2]				Light Level[4]			Moisture[5]				Uses		
Latin Name[1]	Common Name	Form	Sunset Zone	Coastal	Intermediate	Inland	Native Community[3]	H	M	L	VL	L	M	H	General	Bioretention	Roof
Eriogonum fasciculatum 'Dana Point'	Dana Point Buckwheat	groundcover	8, 9, 12-24	✓	✓		css	✓	✓		✓✓				✓		
Eriogonum grande var. rubescens	Red Buckwheat	evergreen subshrub	14-24	✓			beach/dune; css	✓	✓		✓	✓			✓		
Eriogonum parvifolium	Coastal Buckwheat	evergreen subshrub		✓			beach/dune; css	✓	✓		✓✓				✓		
Eriophyllum confertiflorum	Golden Yarrow	herbaceous subshrub		✓	✓		many	✓	✓			✓	✓		✓		✓
Eschscholzia californica	California Poppy	annual	1-24	✓	✓	✓	scrub	✓			✓✓				✓		✓
Euphorbia misera	Cliff Spurge	shrub		✓		✓	scrub	✓			✓						✓
Fallugia paradoxa	Apache Plume	semi-decid shrub	2-23	✓	✓	✓	scrub, woodland	✓			✓✓				✓		
Fragaria californica *	Woodland Strawberry	groundcover		✓	✓	✓	chap, forest		✓	✓		✓	✓		✓		
Fraxinus dipetala	California Ash	deciduous tree	7-24	✓	✓	✓	chap., woodland	✓	✓		✓✓	✓			✓		
Fremontodendron californicum	California Flannelbush; Fremontia	evergreen shrub	7-24	✓	✓	✓	chaparral, forest	✓			✓✓				✓		
Galvezia speciosa	Island Bush Snapdragon	evergreen shrub	14-24	✓	✓		css	✓	✓			✓			✓		
Grindelia stricta	Gum Plant	evergreen herb. perenn.		✓	✓		css, chap, beach	✓	✓		✓	✓			✓		
Helianthemum scoparium	Sun Rose	herbaceous subshrub		✓	✓	✓	css, forest	✓	✓		✓✓				✓		✓
Heteromeles arbutifolia	Toyon	broadleaf evergreen tree/shrub	5-9, 14-24	✓	✓	✓	chaparral	✓	✓		✓✓				✓		
Huechera maxima	Island Alum Root	evergreen perennial		✓		✓	css, chaparral		✓	✓	✓	✓			✓	✓	
Hyptis emoryi	Desert Lavender	semi-ever shrub		✓	✓	✓	scrub	✓	✓		✓✓				✓		
Iris douglasiana *	Douglas Iris	herbaceous perennial	4-9, 14-24	✓	✓	✓	grassland, forest	✓	✓	✓	✓	✓			✓	✓	

Master Plant List (Cont.)				Region[2]				Light Level[4]			Moisture[5]				Uses		
Latin Name[1]	Common Name	Form	Sunset Zone	Coastal	Intermediate	Inland	Native Community[3]	H	M	L	VL	L	M	H	General	Bioretention	Roof
Isocoma menziesii var. menziesii	Menzies' Goldenbush	evergreen subshrub		✓			css, beach/dune	✓	✓		✓✓				✓		✓
Iva hayesiana	Hayes Iva	evergreen shrub		✓	✓	✓	css, marsh	✓	✓		✓✓				✓	✓	✓
Juncus patens	California Gray Rush	perennial rush	8-24	✓	✓	✓	riparian	✓	✓	✓	✓✓	✓	✓	✓	✓	✓	
Keckiella antirrhinoides	Yellow Bush Penstemon	semi-evergreen shrub		✓	✓	✓	chaparral	✓	✓		✓✓				✓		
Lasthenia californica	California Goldfields	annual		✓	✓		css, woodland	✓	✓		✓✓	✓			✓		✓
Lepechinia fragrans	Fragrant Pitcher Sage	semi-evergreen shrub		✓	✓		chaparral	✓	✓		✓	✓			✓		
Leymus condensatus 'Canyon Prince'	Canyon Prince Wild Rye	bunchgrass		✓	✓	✓	css, chaparral, woodland	✓	✓		✓	✓			✓	✓	
Leymus triticoides 'Grey Dawn' *	Grey Dawn Creeping Wild Rye	creeping perennial grass		✓	✓	✓	css, chaparral, woodland	✓	✓	✓	✓	✓	✓			✓	
Linum lewisii *	Blue Flax	herbaceous perennial		✓	✓	✓	many	✓	✓	✓	✓	✓	✓	✓	✓		
Lonicera subspicata	Chaparral Honeysuckle	deciduous vine/shrub		✓	✓		chaparral	✓	✓		✓✓				✓		
Lotus scoparius	Deerweed	herbaceous perennial		✓	✓		chaparral	✓	✓		✓✓				✓		
Lyonothamnus floribundus ssp. Asplenifolius	Fern-leaved Catalina Ironwood	broadleaf evergreen tree	15-17, 19-24	✓	✓		chap., woodland	✓			✓✓				✓		
Mahonia nevinii	Nevin's Barberry	evergreen shrub	8-24	✓	✓	✓	css, chaparral	✓			✓✓	✓			✓	✓	
Malacothamnus fasciculatus	Chaparral Mallow	evergreen shrub		✓	✓		css, chaparral	✓			✓✓				✓		
Malosma laurina (Rhus laurina)	Laurel Sumac	evergreen shrub		✓	✓		css, chaparral	✓			✓✓				✓		
Mimulus cardinalis	Scarlet Monkeyflower	herbaceous perennial	4-24	✓	✓	✓	riparian	✓	✓	✓			✓	✓		✓	
Mirabilis californica	Wishbone Bush	perennial		✓		✓	chap., grassland	✓			✓	✓			✓		✓
Muhlenbergia rigens *	Deergrass	bunchgrass	4-24	✓	✓	✓	many	✓	✓		✓✓				✓	✓	

Master Plant List (Cont.)				Region[2]				Light Level[4]			Moisture[5]				Uses		
Latin Name[1]	Common Name	Form	Sunset Zone	Coastal	Intermediate	Inland	Native Community[3]	H	M	L	VL	L	M	H	General	Bioretention	Roof
Myrica californica	Pacific Wax Myrtle	broadleaf evergreen tree/shrub		✓	✓		css, chaparral	✓	✓			✓	✓		✓	✓	
Nasella pulchra *	Purple Needlegrass	bunchgrass		✓	✓	✓	css, chaparral, woodland	✓	✓		✓✓				✓		✓
Opuntia littoralis	Coastal Prickly Pear	low-growing cactus		✓	✓		css, chaparral	✓			✓✓				✓		✓
Ornithostaphylos oppositifolia	Baja Bird Bush	evergreen shrub		✓	✓	✓	chaparral	✓	✓		✓✓				✓		
Pinus coulteri	Coulter Pine	evergreen tree		✓	✓	✓	woodland, forest	✓			✓				✓		
Pinus sabiniana	Foothill Pine	evergreen conifer		✓	✓	✓	woodland	✓			✓✓				✓		
Pinus torreyana	Torrey Pine	evergreen conifer		✓	✓		woodland	✓			✓✓				✓		
Platanus racemosa	California Sycamore	deciduous tree	4-24	✓	✓		riparian	✓			✓✓	✓	✓		✓	✓	
Polypodium californicum	California Polypody	summer-dormant fern		✓	✓	✓	css, chaparral, woodland		✓	✓			✓	✓		✓	
Populus fremontii	Fremont Cottonwood	deciduous tree	7-24	✓	✓	✓	riparian	✓			✓	✓	✓		✓		
Prunus ilicifolia ssp. Ilicifolia	Hollyleaf Cherry	broadleaf evergreen tree/shrub	7-9, 12-24	✓	✓	✓	chap, woodland	✓	✓		✓✓				✓		
Quercus agrifolia	Coast Live Oak	broadleaf evergreen tree	7-9, 14-24	✓	✓		chap, woodland	✓			✓✓				✓		
Quercus chrysolepis	Canyon Live Oak	broadleaf evergreen tree	3-11, 14-24	✓	✓	✓	woodland	✓	✓		✓	✓			✓		
Quercus engelmannii	Engelmann Oak	broadleaf evergreen tree	7-9, 14-21	✓	✓		grassland, woodland	✓			✓✓				✓		
Quercus kelloggii	Black Oak	deciduous tree	5-9, 14-21	✓	✓	✓	woodland, forest	✓			✓	✓			✓		
Quercus lobata	Valley Oak	deciduous tree	4-9, 12-24	✓	✓	✓	grassland, woodland	✓			✓	✓			✓		
Rhamnus californica	Coffeeberry	evergreen shrub	4-9, 14-24	✓	✓		chap, woodland	✓	✓		✓	✓			✓		

Master Plant List (Cont.)				Region[2]				Light Level[4]			Moisture[5]				Uses		
Latin Name[1]	Common Name	Form	Sunset Zone	Coastal	Intermediate	Inland	Native Community[3]	H	M	L	VL	L	M	H	General	Bioretention	Roof
Rhamnus californica 'Eve Case'	Coffeeberry	evergreen shrub	4-24	✓	✓		chap, woodland	✓	✓		✓	✓			✓		
Rhamnus crocea	Redberry	evergreen shrub	14-21	✓	✓		css, chaparral	✓	✓		✓✓				✓		
Rhamnus ilicifolia	Hollyleaf Redberry	evergreen shrub	7-16, 18-21	✓	✓	✓	chaparral, woodland, forest	✓	✓		✓✓				✓		
Rhus integrifolia	Lemonadeberry	evergreen shrub	8, 9, 14-17, 19-24	✓	✓		css, chaparral	✓	✓		✓✓				✓		
Rhus ovata	Sugar Bush	evergreen shrub	9-12, 14-24	✓	✓	✓	css, chaparral	✓	✓		✓✓				✓		
Ribes aureum var. gracillimum	Golden Currant	semi-deciduous shrub	1-24		✓	✓	chap., woodland	✓	✓		✓✓	✓			✓		
Ribes malvaceum 'Dancing Tassels'	Dancing Tassels Currant	deciduous shrub	6-9, 14-21	✓	✓	✓	chap., woodland	✓	✓	✓	✓	✓			✓		
Ribes speciosum	Fuchsia Flowering Gooseberry	deciduous shrub	8, 9, 14-24	✓	✓	✓	chap., woodland		✓	✓		✓	✓		✓	✓	
Ribes viburnifolium	Catalina Perfume	evergreen shrub	8, 9, 14-24	✓	✓	✓	css	✓	✓	✓	✓✓	✓			✓	✓	
Romneya coulteri	Matilija Poppy	clumping semi-evergreen perennial	4-12, 14-24	✓	✓		css, chaparral	✓	✓		✓				✓		
Romneya trichocalyx	Hairy Matilija Poppy	clumping semi-evergreen perennial		✓	✓	✓	css, chaparral	✓			✓✓				✓		
Rosa californica	California Wild Rose	semi-deciduous shrub		✓	✓	✓	riparian, woodland	✓	✓	✓		✓	✓		✓	✓	
Salix lucida ssp. Lasiandra	Lance-leaf Willow	deciduous tree		✓	✓	✓	many	✓	✓				✓	✓		✓	
Salvia apiana	White Sage	evergreen shrub		✓	✓		css, chaparral	✓			✓✓				✓		
Salvia cedrosensis	Cedros Island Sage	perennial		✓			scrub	✓	✓		✓✓				✓		✓
Salvia clevelandii	Cleveland Sage	evergreen shrub	8, 9, 12-24	✓	✓		css, chaparral	✓	✓		✓✓				✓		
Salvia greggii	Autumn Sage	woody perennial	8-24		✓	✓	grassland, woodland	✓	✓		✓✓	✓			✓		✓

Master Plant List (Cont.)				Region[2]				Light Level[4]			Moisture[5]				Uses		
Latin Name[1]	Common Name	Form	Sunset Zone	Coastal	Intermediate	Inland	Native Community[3]	H	M	L	VL	L	M	H	General	Bioretention	Roof
Sporobolus airoides	Alkali dropseed	perennial bunchgrass	1-24	✓	✓	✓	many	✓			✓	✓	✓		✓	✓	
Symphoricarpos mollis	Creeping Snowberry	groundcover	4-24	✓	✓		chap., woodland		✓	✓	✓	✓			✓		
Trichostema lanatum	Woolly Blue Curls	evergreen shrub	14-24	✓	✓		chaparral	✓			✓✓				✓		
Umbellularia californica	California Bay Laurel	broadleaf evergreen tree	4-10, 12-24	✓	✓	✓	woodland, forest	✓	✓		✓✓	✓			✓	✓	
Venegasia carpesioides	Canyon Sunflower	semi-evergreen subshrub		✓	✓	✓	css, chaparral, woodland	✓	✓	✓		✓	✓	✓	✓	✓	
Washingtonia filifera	California Fan Palm	palm tree	8-24		✓	✓	desert oasis	✓	✓				✓		✓		
Yucca schidigera	Mohave Yucca	succulent	10-24	✓	✓	✓	scrub	✓			✓✓				✓		
Yucca whipplei	Our Lord's Candle	succulent	2-24	✓	✓	✓	css, chap., scrub	✓	✓		✓✓				✓		

[1] References: *California Native Plants for the Garden*. Carol Bornstein, David Fross, & Bart O'Brien. Cachuma Press (2005). *California Native Trees & Shrubs*. Lee W. Lenz & John Dourley. Rancho Santa Ana Botanic Garden (1981). *Plants of El Camino Real*. Tree of Life Nursery (2004). *Western Garden Book*. Kathleen Norris Brenzel, ed. Sunset Publishing (2007).

[2] Indicates region that species may be grown in, based on horticultural references. Verify the cold-hardiness of desired species, especially for higher elevations. Coastal region includes Sunset *Western Garden Book* zones 22 and 24; Intermediate region includes Sunset zones 3, 20, 21, and 23; Inland region includes Sunset zones 2, 18, and 19.

[3] Note that some native plants may not be permitted in certain fire fuel management areas, or are only permitted under specific planting and management conditions. Consult with appropriate county fire authority as to the applicability of a proposed plant species list.

[4] H = high (full sun); M = medium (partial shade); L = low (full shade)

[5] Refers to summer water needed after establishment. VL = very low (summer water every 4 weeks; two check marks indicates that species may acclimate to seasonal rainfall, especially if planted in its native region and conditions); L = low (summer water every 4 weeks); M = medium (summer water every 2-3 weeks); H = high (summer water every week; some species may require constant moisture)

* Can be used in a native meadow planting as a lawn substitute, for example: *Achillea millefolium, Camissonia cheiranthifolia, Deschampsia caespitosa, Fragaria californica, Iris douglasiana, Leymus triticoides 'Gray Dawn', Linum Lewisii, Muhlenbergia rigens, Nasella pulchra, Salvia sonomensis, Sisyrhynchium bellum*

** Several Sedum species may be used for vegetated roofs, including: *S. clavatum, S. hakonense, S. lineare, S. nussbaumerianum, S. repestre, S. spathulifolium*

Table 32. General Plant List.

General Plant List				Region[2]				Light Level[4]			Moisture[5]				Uses		
Latin Name[1]	Common Name	Form	Sunset Zone	Coastal	Intermediate	Inland	Native Community[3]	H	M	L	VL	L	M	H	General	Bioretention	Roof
Trees																	
Aesculus californica	California Buckeye	deciduous tree	4-10, 12, 14-24	✓	✓	✓	woodland	✓	✓		✓✓				✓		
Arbutus menziesii	Madrone	broadleaf evergreen tree	15-17, 19-24	✓	✓		woodland, forest	✓	✓			✓	✓		✓		
Arctostaphylos catalinae	Catalina Manzanita	broadleaf evergreen tree/shrub		✓	✓		chaparral	✓	✓		✓✓				✓		
Arctostaphylos 'Lester Rowntree'	Lester Rowntree Manzanita	broadleaf evergreen tree/shrub		✓	✓		chaparral	✓	✓		✓	✓			✓		
Brahea armata	Blue Hesper Palm	palm tree	10, 12-17, 19-24	✓	✓	✓	scrub	✓			✓	✓			✓		
Brahea edulis	Guadalupe Palm	palm tree	12-24	✓	✓		woodland	✓	✓		✓	✓			✓		
Calocedrus decurrens	Incense Cedar	evergreen tree	2-12, 14-24	✓	✓	✓	forest	✓	✓		✓	✓			✓		
Ceanothus arboreus	Island Ceanothus	broadleaf evergreen tree/shrub		✓	✓		css, chaparral	✓			✓	✓			✓		
Cercidium floridum	Blue Palo Verde	deciduous tree	10-14, 18-20	✓	✓	✓	scrub	✓			✓✓				✓		
Chilopsis linearis	Desert Willow	deciduous tree/shrub	7-14, 18-23	✓	✓	✓	riparian, scrub	✓			✓	✓	✓		✓		
Cupressus forbesii	Tecate Cypress	evergreen conifer	8-14, 18-20	✓	✓	✓	chaparral, forest	✓			✓				✓		
Fraxinus dipetala	California Ash	deciduous tree	7-24	✓	✓	✓	chap., woodland	✓	✓		✓✓	✓			✓		
Lyonothamnus floribundus ssp. asplenifolius	Fern-leaved Catalina Ironwood	broadleaf evergreen tree	15-17, 19-24	✓	✓		chap., woodland	✓			✓✓				✓		
Myrica californica	Pacific Wax Myrtle	broadleaf evergreen tree/shrub	4-9, 14-24	✓	✓		css, chaparral	✓	✓			✓	✓		✓		
Pinus coulteri	Coulter Pine	evergreen tree		✓	✓	✓	woodland, forest	✓			✓				✓		
Pinus sabiniana	Foothill Pine	evergreen conifer		✓	✓	✓	woodland	✓			✓✓				✓		

General Plant List (Cont.)				Region[2]				Light Level[4]			Moisture[5]				Uses		
Latin Name[1]	Common Name	Form	Sunset Zone	Coastal	Intermediate	Inland	Native Community[3]	H	M	L	VL	L	M	H	General	Bioretention	Roof
Pinus torreyana	Torrey Pine	evergreen conifer		✓	✓		woodland	✓			✓✓				✓		
Platanus racemosa	California Sycamore	deciduous tree	4-24	✓	✓		riparian	✓			✓✓	✓	✓		✓		
Populus fremontii	Fremont Cottonwood	deciduous tree	7-24	✓	✓	✓	riparian	✓			✓	✓	✓		✓		
Quercus agrifolia	Coast Live Oak	broadleaf evergreen tree	7-9, 14-24	✓	✓		chap., woodland	✓			✓✓				✓		
Quercus chrysolepis	Canyon Live Oak	broadleaf evergreen tree	3-11, 14-24	✓	✓	✓	woodland	✓	✓		✓	✓			✓		
Quercus engelmannii	Engelmann Oak	broadleaf evergreen tree	7-9, 12-24	✓	✓		grassland, woodland	✓			✓✓				✓		
Quercus kelloggii	Black Oak	deciduous tree	5-9, 14-21	✓	✓	✓	woodland, forest	✓			✓	✓			✓		
Quercus lobata	Valley Oak	deciduous tree	4-9, 12-24	✓	✓	✓	grassland, woodland	✓			✓	✓			✓		
Umbellularia californica	California Bay Laurel	broadleaf evergreen tree	4-10, 12-24	✓	✓	✓	woodland, forest	✓	✓		✓✓	✓			✓		
Washingtonia filifera	California Fan Palm	palm tree	8-24		✓	✓	desert oasis	✓	✓				✓		✓		
Shrubs																	
Acalypha californica	California Copperleaf	evergreen shrub		✓	✓	✓	chaparral, scrub	✓	✓		✓✓				✓		
Arctostaphylos densiflora 'Howard McMinn'	McMinn Manzanita	broadleaf evergreen shrub	7-9, 14-21	✓	✓		chaparral	✓	✓		✓✓				✓		
Arctostaphylos glauca	Bigberry Manzanita	broadleaf evergreen shrub		✓	✓	✓	chaparral	✓	✓		✓✓				✓		
Arctostaphylos manzanita	Common Manzanita	evergreen shrub		✓	✓	✓	chaparral, forest, woodland	✓	✓		✓✓				✓		
Arctostaphylos otayensis	Otay Manzanita	evergreen shrub		✓	✓	✓	chaparral	✓	✓		✓✓				✓		
Arctostaphylos refugioensis	Refugio Manzanita	evergreen shrub		✓	✓		chaparral	✓	✓		✓				✓		
Artemisia californica	California Sagebrush	evergreen subshrub	1-24	✓	✓		css, chaparral	✓	✓		✓✓				✓		
Atriplex lentiformis ssp. Breweri	Quail Bush	evergreen or deciduous shrub	7-14, 18, 19	✓	✓	✓	scrub	✓			✓✓				✓		
Calycanthus occidentalis	Spice Bush	deciduous shrub	4-9, 14-24	✓	✓	✓	woodland, forest	✓	✓			✓	✓		✓		

General Plant List (Cont.)				Region[2]				Light Level[4]			Moisture[5]				Uses		
Latin Name[1]	Common Name	Form	Sunset Zone	Coastal	Intermediate	Inland	Native Community[3]	H	M	L	VL	L	M	H	General	Bioretention	Roof
Ceanothus crassifolius	Hoaryleaf Ceanothus	broadleaf evergreen shrub		✓	✓		chaparral	✓			✓✓				✓		
Ceanothus greggii ssp. Perplexans	Cupleaf Lilac	broadleaf evergreen shrub			✓	✓	chaparral	✓			✓✓				✓		
Ceonothus griseus 'Santa Ana'	Santa Ana Ceonothus	evergreen shrub		✓			chaparral	✓	✓			✓	✓		✓		
Ceanothus impressus	Santa Barbara Ceanothus	evergreen shrub		✓			chaparral	✓	✓		✓✓				✓		
Ceanothus megacarpus	Big Pod Ceanothus	evergreen shrub		✓	✓		css, chaparral	✓			✓✓				✓		
Ceonothus verrucosus	Wartystem Ceonothus	evergreen shrub		✓	✓		css, chaparral	✓			✓✓				✓		
Ceanothus 'Concha'	Concha Ceanothus	evergreen shrub		✓	✓		chaparral	✓			✓	✓			✓		
Ceanothus 'Ray Hartman'	Ray Hartman Ceanothus	evergreen shrub	5-9, 14-24	✓	✓		css, chaparral	✓			✓	✓			✓		
Cercis occidentalis	Western Redbud	deciduous shrub/tree	2-24	✓	✓	✓	chaparral, woodland	✓	✓		✓	✓			✓		
Cercocarpus betuloides	Western Mountain Mahogany	evergreen shrub/tree	6-24	✓	✓	✓	chap., woodland	✓			✓✓				✓		
Cneoridium dumosum	Bushrue	evergreen shrub		✓	✓	✓	css, chaparral	✓	✓		✓✓				✓		
Dendromecon harfordii	Channel Island Bush Poppy	evergreen shrub	7-9, 14-24	✓	✓		chaparral	✓			✓✓				✓		
Dendromecon rigida	Bush Poppy	evergreen shrub	4-12, 14-24		✓	✓	chaparral	✓			✓✓				✓		
Encelia californica	Coast Sunflower	evergreen subshrub		✓	✓		css, chaparral	✓	✓		✓✓				✓		
Encelia farinose	Incienso	evergreen subshrub		✓	✓	✓	chap, scrub	✓			✓✓				✓		
Eriogonum arborescens	Santa Cruz Island Buckwheat	evergreen shrub	14-24	✓	✓		css, chaparral	✓	✓		✓	✓			✓		
Eriogonum fasciculatum	California Buckwheat	woody perennial	8, 9, 12-24	✓		✓	many	✓	✓		✓✓				✓		
Eriogonum grande var. rubescens	Red Buckwheat	evergreen subshrub	14-24	✓			beach/dune, css	✓	✓		✓	✓			✓		
Eriogonum parvifolium	Coastal Buckwheat	evergreen subshrub		✓			beach/dune, css	✓	✓		✓✓				✓		
Fallugia paradoxa	Apache Plume	semi-deciduous shrub	2-23	✓	✓	✓	scrub, woodland	✓			✓✓				✓		

General Plant List (Cont.)				Region[2]				Light Level[4]			Moisture[5]				Uses		
Latin Name[1]	Common Name	Form	Sunset Zone	Coastal	Intermediate	Inland	Native Community[3]	H	M	L	VL	L	M	H	General	Bioretention	Roof
Fremontodendron californicum	California Flannelbush	evergreen shrub	7-24	✓	✓	✓	chap, forest	✓			✓✓				✓		
Galvezia speciosa	Island Bush Snapdragon	evergreen shrub	14-24	✓	✓		css	✓	✓			✓			✓		
Heteromeles arbutifolia	Toyon	broadleaf evergreen tree/shrub	5-9, 14-24	✓	✓	✓	chaparral	✓	✓		✓✓				✓		
Hyptis emoryi	Desert Lavender	semi-evergreen shrub		✓	✓	✓	scrub	✓	✓		✓✓				✓		
Isocoma menziesii var. menziesii	Menzies' Goldenbush	evergreen subshrub		✓			css, beach/dune	✓	✓		✓✓				✓		
Iva hayesiana	Hayes Iva	evergreen shrub	10-13	✓	✓	✓	css, marsh	✓	✓		✓✓				✓		
Justicia californica	Chuparosa	semi-deciduous shrub		✓	✓	✓	scrub	✓	✓		✓	✓	✓		✓		
Keckiella antirrhinoides	Yellow Bush Penstemon	semi-evergreen shrub		✓	✓	✓	chaparral	✓	✓		✓✓				✓		
Lepechinia fragrans	Fragrant Pitcher Sage	semi-evergreen shrub		✓	✓		chaparral	✓	✓		✓	✓			✓		
Mahonia nevinii	Nevin's Barberry	evergreen shrub	8-24	✓	✓	✓	css, chaparral	✓			✓✓	✓			✓		
Malacothamnus fasciculatus	Chaparral Mallow	evergreen shrub		✓	✓		css, chaparral	✓			✓✓				✓		
Malosma laurina (Rhus laurina)	Laurel Sumac	evergreen shrub		✓	✓		css, chaparral	✓			✓✓				✓		
Ornithostaphylos oppositifolia	Baja Bird Bush	evergreen shrub		✓	✓	✓	chaparral	✓	✓		✓✓				✓		
Prunus ilicifolia ssp. Ilicifolia	Hollyleaf Cherry	broadleaf evergreen tree/shrub	7-9, 12-24	✓	✓	✓	chap., woodland	✓	✓		✓✓				✓		
Rhamnus californica	Coffeeberry	evergreen shrub	4-9, 14-24	✓	✓		chap., woodland	✓	✓		✓	✓			✓		
Rhamnus californica 'Eve Case'	Coffeeberry	evergreen shrub	4-24	✓	✓		chap., woodland	✓	✓		✓	✓			✓		
Rhamnus crocea	Redberry	evergreen shrub	14-21	✓	✓		css, chaparral	✓	✓		✓✓				✓		
Rhamnus ilicifolia	Hollyleaf Redberry	evergreen shrub	7-16, 18-21	✓	✓	✓	chaparral, woodland, forest	✓	✓		✓✓				✓		
Rhus integrifolia	Lemonadeberry	evergreen shrub	8, 9, 14-17, 19-24	✓	✓		css, chaparral	✓	✓		✓✓				✓		

General Plant List (Cont.)				Region[2]				Light Level[4]			Moisture[5]				Uses		
Latin Name[1]	Common Name	Form	Sunset Zone	Coastal	Intermediate	Inland	Native Community[3]	H	M	L	VL	L	M	H	General	Bioretention	Roof
Rhus ovata	Sugar Bush	evergreen shrub	9-12, 14-24	✓	✓	✓	css, chaparral	✓	✓		✓✓				✓		
Ribes aureum var. gracillimum	Golden Currant	semi-deciduous shrub	1-24		✓	✓	chap., woodland	✓	✓		✓✓	✓			✓		
Ribes malvaceum 'Dancing Tassels'	Dancing Tassels Currant	deciduous shrub	6-9, 14-21	✓	✓	✓	chap., woodland	✓	✓	✓	✓	✓			✓		
Ribes speciosum	Fuchsia Flowering Gooseberry	deciduous shrub	8,9, 14-24	✓	✓	✓	chap., woodland		✓	✓		✓	✓		✓		
Ribes viburnifolium	Catalina Perfume	evergreen shrub	8,9, 14-24	✓	✓	✓	css	✓	✓	✓	✓✓	✓			✓		
Rosa californica	California Wild Rose	semi-deciduous shrub		✓	✓	✓	riparian, woodland	✓	✓	✓		✓	✓		✓		
Salvia apiana	White Sage	evergreen shrub		✓	✓		css, chaparral	✓			✓✓				✓		
Salvia clevelandii	Cleveland Sage	evergreen shrub	8,9, 12-24	✓	✓		css, chaparral	✓	✓		✓✓				✓		
Salvia leucophylla	Purple Sage	semi-evergreen shrub	8, 9, 14-17	✓	✓		css, chap	✓			✓✓	✓			✓		
Salvia mellifera 'Tera Seca'	Tera Seca Sage	semi-evergreen subshrub		✓	✓		css, chaparral	✓	✓		✓	✓			✓		
Sambucus mexicana	Mexican Elderberry	deciduous shrub/tree	1-24	✓	✓	✓	css, chaparral, woodland	✓	✓				✓	✓	✓		
Simmondsia chinensis	Jojoba	evergreen shrub	7-24	✓	✓	✓	scrub	✓			✓✓				✓		
Trichostema lanatum	Woolly Blue Curls	evergreen shrub	14-24	✓	✓		chaparral	✓			✓✓				✓		
Groundcovers, Vines, Succulents, Perennials, Annuals																	
*Achillea millefoilum **	Yarrow	herbaceous perennial	1-24	✓	✓	✓	many	✓	✓	✓	✓✓	✓	✓	✓	✓		
Adenostoma fasciculatum 'Nicolas'	Prostrate Chamise	groundcover	14-16, 18-24	✓	✓		chaparral	✓	✓		✓✓				✓		
Agave deserti	Desert Century Plant	succulent	12-24	✓	✓	✓	scrub	✓			✓✓				✓		
Agave shawii	Shaw's Century Plant	succulent		✓	✓		css	✓			✓✓				✓		
Arctostaphylos edmundsii 'Carmel Sur'	Carmel Sur Manzanita	groundcover	6-9, 14-24	✓	✓		ocean bluffs	✓	✓			✓			✓		
Arctostaphylos hookeri 'Monterey Carpet'	Monterey Carpet Manzanita	groundcover		✓	✓		woodland		✓		✓	✓			✓		

General Plant List (Cont.)				Region[2]				Light Level[4]			Moisture[5]				Uses		
Latin Name[1]	Common Name	Form	Sunset Zone	Coastal	Intermediate	Inland	Native Community[3]	H	M	L	VL	L	M	H	General	Bioretention	Roof
Arctostaphylos uva-ursi 'Point Reyes'	Point Reyes Bearberry	groundcover	1-9, 14-24	✓		✓	woodland	✓	✓	✓	✓				✓		
Arctostaphylos 'Pacific Mist'	Pacific Mist Manzanita	groundcover	7-9, 14-24	✓	✓		chaparral	✓	✓		✓	✓			✓		
Aristolochia californica	California Dutchman's Pipe	deciduous vine		✓	✓	✓	woodland		✓	✓	✓	✓	✓		✓		
Artemisia californica 'Canyon Gray'	Canyon Gray Sagebrush	groundcover	1-24	✓	✓		css, chaparral	✓	✓		✓				✓		
Artemisia ludoviciana	Silver Wormwood	creeping perennial	1-24			✓	scrub	✓			✓				✓		
Baccharis pilularis 'Pigeon Point' or 'Twin Peaks'	Dwarf Coyote Bush	groundcover	5-11, 14-24	✓	✓	✓	css, chaparral	✓	✓		✓	✓			✓		
Baccharis pilularis ssp. consanguinea	Coyote Bush	woody perennial	5-11, 14-24	✓	✓		css, chaparral	✓	✓		✓✓				✓		
Baccharis 'Centennial'	Centennial Desert Broom	groundcover	10-13		✓	✓	scrub	✓	✓		✓✓				✓		
Calystegia macrostegia 'Anacapa Pink'	Island Morning-glory	evergreen vine		✓	✓		css, chaparral	✓	✓			✓			✓		
*Camissonia (Oenothera) cheiranthifolia **	Beach Evening Primrose	herbaceous perennial		✓			beach/dune	✓	✓		✓✓	✓			✓		
Ceanothus griseus horizontalis 'Yankee Point'	Carmel Creeper	groundcover	5-9,14-17, 19-24	✓	✓		css, forest	✓	✓		✓	✓			✓		
Ceanothus hearstiorum	Heart Ceanothus	groundcover		✓			css, forest	✓	✓		✓	✓			✓		
Ceanothus maritimus	Maritime Ceanothus	groundcover		✓			css	✓	✓		✓	✓			✓		
Ceanothus 'Anchor Bay'	Anchor Bay Ceanothus	groundcover		✓	✓		css, forest	✓	✓			✓	✓		✓		
Dichelostemma capitatum	Wild Hyacinth	bulb	1-24	✓		✓	many	✓			✓✓				✓		
Distichlis spicata	Salt Grass	creeping perennial		✓		✓	beach/dune, marsh	✓	✓			✓	✓	✓	✓		
Dudleya hassei	Catalina Live-forever	succulent		✓		✓	css	✓	✓	✓	✓✓				✓		
Dudleya pulverulenta	Chalk Dudleya	succulent		✓	✓	✓	css, chaparral	✓	✓		✓✓				✓		
Epilobium californicum	California Fuchsia	herbaceous perennial		✓	✓	✓	many	✓	✓		✓✓				✓		
Epilobium canum	Hoary California Fuchsia	herbaceous perennial		✓	✓	✓	css, chaparral	✓	✓		✓✓				✓		

General Plant List (Cont.)				Region[2]				Light Level[4]			Moisture[5]				Uses		
Latin Name[1]	Common Name	Form	Sunset Zone	Coastal	Intermediate	Inland	Native Community[3]	H	M	L	VL	L	M	H	General	Bioretention	Roof
Eriogonum crocatum	Saffron Buckwheat	evergreen subshrub/ herbaceous perennial	12-24	✓	✓		css	✓			✓✓				✓		
Eriogonum fasciculatum 'Dana Point'	Dana Point Buckwheat	groundcover	8, 9, 12-24	✓	✓		css	✓	✓		✓✓				✓		
Eriophyllum confertiflorum	Golden Yarrow	herbaceous subshrub		✓	✓		many	✓	✓			✓	✓		✓		
Eschscholzia californica	California Poppy	annual	1-24	✓	✓	✓	scrub	✓			✓✓				✓		
*Fragaria californica **	Woodland Strawberry	groundcover		✓	✓	✓	chaparral, forest		✓	✓		✓	✓		✓		
Grindelia stricta	Gum Plant	evergr. herb. perennial		✓	✓		css, chap, beach	✓	✓		✓	✓			✓		
Helianthemum scoparium	Sun Rose	herbaceous subshrub		✓	✓	✓	css, forest	✓	✓		✓✓				✓		
Huechera maxima	Island Alum Root	evergreen perennial		✓		✓	css, chaparral		✓	✓	✓	✓			✓		
*Iris douglasiana **	Douglas Iris	herbaceous perennial	4-9, 14-24	✓	✓	✓	grassland, forest	✓	✓	✓	✓	✓			✓		
Lasthenia californica	California Goldfields	annual		✓	✓		css, woodland	✓	✓		✓✓	✓			✓		
*Linum lewisii **	Blue Flax	herbaceous perennial		✓	✓	✓	many	✓	✓	✓	✓	✓	✓	✓	✓		
Lonicera subspicata	Chaparral Honeysuckle	deciduous vine/shrub		✓	✓		chaparral	✓	✓		✓✓				✓		
Lotus scoparius	Deerweed	herbaceous perennial		✓	✓		chaparral	✓	✓		✓✓				✓		
Mirabilis californica	Wishbone Bush	perennial		✓		✓	chap, grassland	✓			✓	✓			✓		
Opuntia littoralis	Coastal Prickly Pear	low-growing cactus		✓	✓		css, chaparral	✓			✓✓				✓		
Romneya coulteri	Matilija Poppy	clumping semi-everg perennial	4-12, 14-24	✓	✓		css, chaparral	✓	✓		✓				✓		
Romneya trichocalyx	Hairy Matilija Poppy	clumping semi-everg perennial		✓	✓	✓	css, chaparral	✓			✓✓				✓		
Salvia cedrosensis	Cedros Island Sage	perennial		✓			scrub	✓	✓		✓✓				✓		

General Plant List (Cont.)				Region[2]				Light Level[4]			Moisture[5]				Uses		
Latin Name[1]	Common Name	Form	Sunset Zone	Coastal	Intermediate	Inland	Native Community[3]	H	M	L	VL	L	M	H	General	Bioretention	Roof
Salvia greggii	Autumn Sage	woody perennial	8-24		✓	✓	grassland, woodland	✓	✓		✓✓	✓			✓		
Salvia sonomensis *	Creeping Sage	perennial	7-9, 14-24	✓	✓	✓	chap., woodland	✓	✓		✓				✓		
Salvia spathacea	Hummingbird Sage	perennial		✓	✓		many		✓	✓	✓✓				✓		
Satureja douglasii	Yerba Buena	evergr. herb. perennial	4-9, 14-24	✓	✓		chap., woodland		✓	✓	✓	✓	✓		✓		
Sisyrhynchium bellum *	Blue-eyed Grass	perennial	4-24	✓	✓	✓	many	✓	✓		✓✓				✓		
Sphaeralcea ambigua	Desert Mallow	woody perennial			✓	✓	scrub	✓	✓		✓				✓		
Symphoricarpos mollis	Creeping Snowberry	groundcover	4-24	✓	✓		chap, woodland		✓	✓	✓	✓			✓		
Venegasia carpesioides	Canyon Sunflower	semi-evergreen subshrub		✓	✓	✓	css, chap, woodland	✓	✓	✓		✓	✓	✓	✓		
Yucca schidigera	Mohave Yucca	succulent	10-24	✓	✓	✓	scrub	✓			✓✓				✓		
Yucca whipplei	Our Lord's Candle	succulent	2-24	✓	✓	✓	css, chap, scrub	✓	✓		✓✓				✓		
Grasses and Grass-like Plants															✓		
Aristida purpurea	Purple Three-Awn	bunchgrass		✓	✓	✓	css, chaparral	✓	✓		✓✓				✓		
Bouteloua curtipendula	Side-oats Grama	bunchgrass		✓	✓	✓	scrub, woodland	✓			✓	✓			✓		
Carex pansa	California Meadow Sedge	creeping perennial		✓		✓	bluffs, strand	✓	✓	✓			✓	✓	✓		
Deschampsia caespitosa *	Tufted Hairgrass	perennial bunchgrass	1-24	✓	✓	✓	woodland, forest	✓	✓	✓	✓	✓	✓		✓		
Juncus patens	California Gray Rush	perennial rush	8-24	✓	✓	✓	riparian	✓	✓	✓	✓✓	✓	✓	✓	✓		
Leymus condensatus 'Canyon Prince'	Canyon Prince Wild Rye	bunchgrass		✓	✓	✓	css, chap, woodland	✓	✓		✓	✓			✓		
Muhlenbergia rigens *	Deergrass	bunchgrass	4-24	✓	✓	✓	many	✓	✓		✓✓				✓		
Nasella pulchra *	Purple Needlegrass	bunchgrass		✓	✓	✓	css, chap, woodland	✓	✓		✓✓				✓		
Sporobolus airoides	Alkali dropseed	perennial bunchgrass	1-24	✓	✓	✓	many	✓			✓	✓	✓		✓		

General Plant List (Cont.)	

[1] References: *California Native Plants for the Garden*. Carol Bornstein, David Fross, & Bart O'Brien. Cachuma Press (2005). *California Native Trees & Shrubs*. Lee W. Lenz & John Dourley. Rancho Santa Ana Botanic Garden (1981). *Plants of El Camino Real*. Tree of Life Nursery (2004). *Western Garden Book*. Kathleen Norris Brenzel, ed. Sunset Publishing (2007).
[2] Indicates region that species may be grown in, based on horticultural references. Verify the cold-hardiness of desired species, especially for higher elevations. Coastal region includes Sunset *Western Garden Book* zones 22 and 24; Intermediate region includes Sunset zones 3, 20, 21, and 23; Inland region includes Sunset zones 2, 18, and 19.
[3] Note that some native plants may not be permitted in certain fire fuel management areas, or are only permitted under specific planting and management conditions. Consult with appropriate county fire authority as to the applicability of a proposed plant species list.
[4] H = high (full sun); M = medium (partial shade); L = low (full shade)
[5] Refers to summer water needed after establishment. VL = very low (summer water every 4 weeks; two check marks indicates that species may acclimate to seasonal rainfall, especially if planted in its native region and conditions); L = low (summer water every 4 weeks); M = medium (summer water every 2-3 weeks); H = high (summer water every week; some species may require constant moisture)
* Can be used in a native meadow planting as a lawn substitute, for example: *Achillea millefolium, Camissonia cheiranthifolia, Deschampsia caespitosa, Fragaria californica, Iris douglasiana, Leymus triticoides 'Gray Dawn', Linum Lewisii, Muhlenbergia rigens, Nasella pulchra, Salvia sonomensis, Sisyrhynchium bellum*

Table 33. Bioretention Plant List.

Bioretention Plant List				**Region[2]**				**Light Level[4]**			**Moisture[5]**				**Uses**		
Latin Name[1]	**Common Name**	**Form**	**Sunset Zone**	**Coastal**	**Intermediate**	**Inland**	**Native Community[3]**	**H**	**M**	**L**	**VL**	**L**	**M**	**H**	**General**	**Bioretention**	**Roof**
Trees																	
Chilopsis linearis	Desert Willow	deciduous tree/shrub	7-14, 18-23	✓	✓	✓	riparian, scrub	✓			✓	✓	✓			✓	
Myrica californica	Pacific Wax Myrtle	broadleaf evergreen tree/shrub	4-9, 14-24	✓	✓		css, chaparral	✓	✓			✓	✓			✓	
Platanus racemosa	California Sycamore	deciduous tree	4-24	✓	✓		riparian	✓			✓✓	✓	✓			✓	
Salix lucida ssp. lasiandra	Lance-leaf Willow	deciduous tree		✓	✓	✓	many	✓	✓				✓	✓		✓	
Umbellularia californica	California Bay Laurel	broadleaf evergreen tree	4-10, 12-24	✓	✓	✓	woodland, forest	✓	✓		✓✓	✓				✓	
Shrubs																	
Amorpha fruticosa	False Indigobush	deciduous shrub		✓	✓	✓	riparian	✓	✓	✓			✓	✓		✓	
Calycanthus occidentalis	Spice Bush	deciduous shrub	4-9, 14-24	✓	✓	✓	woodland, forest	✓	✓			✓	✓			✓	
Ceonothus griseus 'Santa Ana'	Santa Ana Ceonothus	evergreen shrub		✓			chaparral	✓	✓			✓	✓			✓	
Iva hayesiana	Hayes Iva	evergreen shrub		✓	✓	✓	css, marsh	✓	✓		✓✓					✓	
Justicia californica	Chuparosa	semi-decid shrub	10-13	✓	✓	✓	scrub	✓	✓		✓	✓	✓			✓	
Mahonia nevinii	Nevin's Barberry	evergreen shrub	8-24	✓	✓	✓	css, chaparral	✓			✓✓	✓				✓	
Ribes speciosum	Fuchsia Flowering Gooseberry	deciduous shrub	8, 9, 14-24	✓	✓	✓	chap., woodland		✓	✓		✓	✓			✓	
Ribes viburnifolium	Catalina Perfume	evergreen shrub	8, 9, 14-24	✓	✓	✓	css	✓	✓	✓	✓✓	✓				✓	
Rosa californica	California Wild Rose	semi-deciduous shrub		✓	✓	✓	riparian, woodland	✓	✓	✓		✓	✓			✓	
Sambucus mexicana	Mexican Elderberry	deciduous shrub/tree	1-24	✓	✓	✓	css, chaparral, woodland	✓	✓				✓	✓		✓	

Bioretention Plant List (Cont.)				Region[2]				Light Level[4]			Moisture[5]				Uses		
Latin Name[1]	Common Name	Form	Sunset Zone	Coastal	Intermediate	Inland	Native Community[3]	H	M	L	VL	L	M	H	General	Bioretention	Roof
Groundcovers, Vines, Succulents, Perennials, Annuals																	
Achillea millefoilum	Yarrow	herbaceous perennial	1-24	✓	✓	✓	riparian	✓	✓	✓			✓			✓	
Artemisia douglasiana	Mugwort	herbaceous perennial		✓	✓	✓	css, chaparral	✓	✓		✓	✓				✓	
Baccharis pilularis 'Pigeon Point' or 'Twin Peaks'	Dwarf Coyote Bush	groundcover	5-11, 14-24	✓	✓		css, forest	✓	✓			✓	✓			✓	
Ceanothus 'Anchor Bay'	Anchor Bay Ceanothus	groundcover														✓	
Huechera maxima	Island Alum Root	evergreen perennial		✓		✓	css, chaparral		✓	✓	✓	✓				✓	
Iris douglasiana	Douglas Iris	herbaceous perennial	4-9, 14-24	✓	✓	✓	grassland, forest	✓	✓	✓	✓	✓				✓	
Mimulus cardinalis	Scarlet Monkeyflower	herbaceous perennial	4-24	✓	✓	✓	riparian	✓	✓	✓			✓	✓		✓	
Polypodium californicum	California Polypody	summer-dormant fern		✓	✓	✓	css, chaparral, woodland		✓	✓			✓	✓		✓	
Satureja douglasii	Yerba Buena	evergr. herb. perennial	4-9, 14-24	✓	✓		chap., woodland		✓	✓	✓	✓	✓			✓	
Venegasia carpesioides	Canyon Sunflower	semi-evergreen subshrub		✓	✓	✓	css, chaparral, woodland	✓	✓	✓		✓	✓	✓		✓	
Grasses and Grass-like Plants																	
Aristida purpurea	Purple Three-Awn	bunchgrass		✓	✓	✓	css, chaparral	✓	✓		✓✓					✓	
Carex pansa	California Meadow Sedge	creeping perennial		✓		✓	bluffs, strand	✓	✓	✓			✓	✓		✓	
Carex praegracilis	California Field Sedge	creeping perennial		✓	✓	✓	riparian	✓	✓	✓			✓	✓		✓	
Deschampsia caespitosa	Tufted Hairgrass	perennial bunchgrass	1-24	✓	✓	✓	woodland, forest	✓	✓	✓	✓	✓	✓			✓	
Distichlis spicata	Salt Grass	creeping perennial		✓		✓	beach/dune, marsh	✓	✓			✓	✓	✓		✓	
Eleocharis montevidensis	Spike Rush	grass-like perennial		✓	✓	✓	many	✓	✓	✓				✓		✓	

Bioretention Plant List (Cont.)				Region[2]				Light Level[4]			Moisture[5]				Uses		
Latin Name[1]	Common Name	Form	Sunset Zone	Coastal	Intermediate	Inland	Native Community[3]	H	M	L	VL	L	M	H	General	Bioretention	Roof
Juncus patens	California Gray Rush	perennial rush	8-24	✓	✓	✓	riparian	✓	✓	✓	✓✓	✓	✓	✓		✓	
Leymus condensatus 'Canyon Prince'	Canyon Prince Wild Rye	bunchgrass		✓	✓	✓	css, chaparral, woodland	✓	✓		✓	✓				✓	
Leymus triticoides 'Grey Dawn'	Grey Dawn Creeping Wild Rye	creeping perennial grass		✓	✓	✓	css, chaparral, woodland	✓	✓	✓	✓	✓	✓			✓	
Muhlenbergia rigens *	Deergrass	bunchgrass	4-24	✓	✓	✓	many	✓	✓		✓✓					✓	
Scirpus cenuus	Low Bulrush	grass-like perennial		✓	✓		marsh	✓	✓	✓			✓	✓		✓	
Sporobolus airoides	Alkali dropseed	perennial bunchgrass	1-24	✓	✓	✓	many	✓			✓	✓	✓			✓	

[1] References: *California Native Plants for the Garden*. Carol Bornstein, David Fross, & Bart O'Brien. Cachuma Press (2005). *California Native Trees & Shrubs*. Lee W. Lenz & John Dourley. Rancho Santa Ana Botanic Garden (1981). *Plants of El Camino Real*. Tree of Life Nursery (2004). *Western Garden Book*. Kathleen Norris Brenzel, ed. Sunset Publishing (2007).
[2] Indicates region that species may be grown in, based on horticultural references. Verify the cold-hardiness of desired species, especially for higher elevations. Coastal region includes Sunset *Western Garden Book* zones 22 and 24; Intermediate region includes Sunset zones 3, 20, 21, and 23; Inland region includes Sunset zones 2, 18, and 19.
[3] Note that some native plants may not be permitted in certain fire fuel management areas, or are only permitted under specific planting and management conditions. Consult with appropriate county fire authority as to the applicability of a proposed plant species list.
[4] H = high (full sun); M = medium (partial shade); L = low (full shade)
[5] Refers to summer water needed after establishment. VL = very low (summer water every 4 weeks; two check marks indicates that species may acclimate to seasonal rainfall, especially if planted in its native region and conditions); L = low (summer water every 4 weeks); M = medium (summer water every 2-3 weeks); H = high (summer water every week; some species may require constant moisture)

Table 34. Vegetated Roof Plant List.

Vegetated Roof Plant List				**Region[2]**				**Light Level[4]**			**Moisture[5]**				**Uses**		
Latin Name[1]	**Common Name**	**Form**	**Sunset Zone**	**Coastal**	**Intermediate**	**Inland**	**Native Community[3]**	**H**	**M**	**L**	**VL**	**L**	**M**	**H**	**General**	**Bioretention**	**Roof**
Shrubs																	
Euphorbia misera	Cliff Spurge	shrub		✓		✓	scrub	✓			✓						
Iva hayesiana	Hayes Iva	evergreen shrub		✓	✓	✓	css, marsh	✓	✓		✓✓						
Groundcovers, Vines, Succulents, Perennials, Annuals																	
Achillea millefoilum	Yarrow	herbaceous perennial	1-24	✓	✓	✓	many	✓	✓	✓	✓✓	✓	✓	✓			
Adenostoma fasciculatum 'Nicolas'	Prostrate Chamise	groundcover	4-16, 18-24	✓	✓		chaparral	✓	✓		✓✓						
Ambrosia chamissonis	Sand Bur	sprawling perennial		✓			dunes	✓			✓✓						
Ambrosia pumila	San Diego Ambrosia	groundcover		✓	✓		dunes	✓	✓		✓✓	✓					
Antigonon leptopus	San Miguel Coral Vine	climbing vine	12, 13, 18-24	✓	✓		chap, scrub	✓	✓			✓	✓				
Artemisia californica	California Sagebrush	evergreen subshrub	1-24	✓	✓		css, chaparral	✓	✓		✓✓						
Artemisia ludoviciana	Silver Wormwood	creeping perennial	1-24			✓	scrub	✓			✓						
Artemisia pycnocephala	Beach Sagewort	herbaceous perennial	1-24	✓		✓	css, dune	✓	✓		✓	✓					
Baileya multiradiata	Desert Marigold	perennial			✓	✓	scrub, grassland	✓			✓✓	✓					
Baccharis pilularis 'Pigeon Point' or 'Twin Peaks'	Dwarf Coyote Bush	groundcover	5-11, 14-24	✓	✓	✓	css, chaparral	✓	✓		✓	✓					
Camissonia (Oenothera) cheiranthifolia	Beach Evening Primrose	herbaceous perennial		✓			beach/dune	✓	✓		✓✓	✓					
Dichelostemma capitatum	Wild Hyacinth	bulb		✓		✓	many	✓			✓✓						
Dudleya hassei	Catalina Live-forever	succulent		✓		✓	css	✓	✓	✓	✓✓						
Dudleya pulverulenta	Chalk Dudleya	succulent		✓	✓	✓	css, chaparral	✓	✓		✓✓						
Epilobium californicum	California Fuchsia	herbaceous perennial		✓	✓	✓	many	✓	✓		✓✓						

Vegetated Roof Plant List (Cont.)				Region[2]				Light Level[4]			Moisture[5]				Uses		
Latin Name[1]	Common Name	Form	Sunset Zone	Coastal	Intermediate	Inland	Native Community[3]	H	M	L	VL	L	M	H	General	Bioretention	Roof
Epilobium canum	Hoary California Fuchsia	herbaceous perennial		✓	✓	✓	css, chaparral	✓	✓		✓✓						
Eriogonum crocatum	Saffron Buckwheat	evergreen subshrub/ herbaceous perennial	12-24	✓	✓		css	✓			✓✓						
Eriophyllum confertiflorum	Golden Yarrow	herbaceous subshrub		✓	✓		many	✓	✓			✓	✓				
Eschscholzia californica	California Poppy	annual	1-24	✓	✓	✓	scrub	✓			✓✓						
Helianthemum scoparium	Sun Rose	herbaceous subshrub		✓	✓	✓	css, forest	✓	✓		✓✓						
Isocoma menziesii var. menziesii	Menzies' Goldenbush	evergreen subshrub		✓			css, beach/dune	✓	✓		✓✓						
Lasthenia californica	California Goldfields	annual		✓	✓		css, woodland	✓	✓		✓✓	✓					
Mirabilis californica	Wishbone Bush	perennial		✓		✓	chap., grassland	✓			✓	✓					
Opuntia littoralis	Coastal Prickly Pear	low-growing cactus		✓	✓		css, chaparral	✓			✓✓						
Salvia cedrosensis	Cedros Island Sage	perennial		✓			scrub	✓	✓		✓✓						
Salvia greggii	Autumn Sage	woody perennial	8-24		✓	✓	grassland, woodland	✓	✓		✓✓	✓					
Salvia mellifera 'Tera Seca'	Tera Seca Sage	semi-evergreen subshrub		✓	✓		css, chaparral	✓	✓		✓	✓					
Salvia sonomensis	Creeping Sage	perennial	7-9, 14-24	✓	✓	✓	chap., woodland	✓	✓		✓						
Sedum sp. **	Sedum	succulent		✓	✓	✓		✓			✓✓	✓					
Sisyrhynchium bellum	Blue-eyed Grass	perennial	4-24	✓	✓	✓	many	✓	✓		✓✓						
Sphaeralcea ambigua	Desert Mallow	woody perennial			✓	✓	scrub	✓	✓		✓						
Grasses and Grass-like Plants																	
Aristida purpurea	Purple Three-Awn	bunchgrass		✓	✓	✓	css, chaparral	✓	✓		✓✓						
Bouteloua curtipendula	Side-oats Grama	bunchgrass		✓	✓	✓	scrub, woodland	✓			✓	✓					

Vegetated Roof Plant List (Cont.)				Region[2]				Light Level[4]			Moisture[5]				Uses		
Latin Name[1]	Common Name	Form	Sunset Zone	Coastal	Intermediate	Inland	Native Community[3]	H	M	L	VL	L	M	H	General	Bioretention	Roof
Nasella pulchra	Purple Needlegrass	bunchgrass		✓	✓	✓	css, chap, woodland	✓	✓		✓✓						

[1] References: *California Native Plants for the Garden*. Carol Bornstein, David Fross, & Bart O'Brien. Cachuma Press (2005). *California Native Trees & Shrubs*. Lee W. Lenz & John Dourley. Rancho Santa Ana Botanic Garden (1981). *Plants of El Camino Real*. Tree of Life Nursery (2004). *Western Garden Book*. Kathleen Norris Brenzel, ed. Sunset Publishing (2007).
[2] Indicates region that species may be grown in, based on horticultural references. Verify the cold-hardiness of desired species, especially for higher elevations. Coastal region includes Sunset *Western Garden Book* zones 22 and 24; Intermediate region includes Sunset zones 3, 20, 21, and 23; Inland region includes Sunset zones 2, 18, and 19.
[3] Note that some native plants may not be permitted in certain fire fuel management areas, or are only permitted under specific planting and management conditions. Consult with appropriate county fire authority as to the applicability of a proposed plant species list.
[4] H = high (full sun); M = medium (partial shade); L = low (full shade)
[5] Refers to summer water needed after establishment. VL = very low (summer water every 4 weeks; two check marks indicates that species may acclimate to seasonal rainfall, especially if planted in its native region and conditions); L = low (summer water every 4 weeks); M = medium (summer water every 2-3 weeks); H = high (summer water every week; some species may require constant moisture)
[**] Several Sedum species may be used for vegetated roofs, including: *S. clavatum, S. hakonense, S. lineare, S. nussbaumerianum, S. repestre, S. spathulifolium*

Appendix B: California Planning and Regulatory Framework for LID

Introduction

Low Impact Development is a relatively new practice in California. As such, LID is still being integrated into the California planning process. Very few general plans have water or water resources elements, and even fewer specifically address LID and hydromodification. Since the general plan is the foundation of the California planning process, and LID is not well addressed in general plans, LID is also inconsistently addressed in subsequent steps in the planning process.

When LID is addressed in the planning process, it is frequently incorporated at the site planning stage, which is too late in the process to make the kinds of impacts that are possible.

Currently, the State Water Resources Control Boards and California Regional Water Quality Control Boards are driving the use of LID measures in new development. The US Environmental Protection Agency, which has published several documents on both low impact development and smart growth as stormwater best management practices, also encourages LID.

NOTE: The following information is current as of the publishing of this document. Please contact the appropriate regulatory agency for the most up-to-date information.

LID in NPDES Stormwater Permits

Municipal Permits

Since the adoption of the San Diego County Municipal Separate Storm Sewer Systems (MS4) Permit in 2007, municipal permits within the region have contained specific LID and hydromodification requirements. The LID terminology is new, but the underpinnings of LID in MS4 permits in Southern California have existed for some time. The major emphasis of the LID requirements in municipal permits is on reduction of impervious area in order to facilitate infiltration and reduce urban runoff. New MS4 permits include LID requirements that apply to specified categories of new development and redevelopment projects. The Permittees are tasked with the responsibility of developing design and maintenance criteria and establishing minimum standards for the use of LID practices. They are also required to develop manuals or technical guidance for municipal employees and private sector practitioners involved with the implementation of LID practices.

San Diego County MS4 Permit

San Diego County's current MS4 Permit was adopted in 2007 (RWQCB Order No. R9-2007-01, NPDES Permit No. CAS0108758). The permit was the first in the region to contain specific LID requirements. Priority Development Projects are required, where feasible, to:

a) Conserve natural areas, including existing trees, other vegetation, and soils.
b) Construct streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided that public safety and a walkable environment for pedestrians are not compromised.
c) Minimize the impervious footprint of the project.
d) Minimize soil compaction.
e) Minimize disturbances to natural drainages (e.g., natural swales, topographic depressions, etc.)
f) Minimize directly connected impervious areas and promote infiltration.

g) Drain a portion of impervious areas (rooftops, parking lots, sidewalks, walkways, patios, etc) into pervious areas prior to discharge, where feasible.
h) Properly design and construct the pervious areas to effectively receive and infiltrate or treat runoff from impervious areas, taking into consideration the pervious areas' soil conditions, slope, and other pertinent factors.
i) Construct a portion of walkways, trails, overflow parking lots, alleys, or other low-traffic areas with permeable surfaces, such as pervious concrete, porous asphalt, unit pavers, and granular materials, where site and soil conditions permit.

In addition, Priority Development Projects are required to maintain predevelopment flow rates and durations for a range of storms designated by the County.

Orange County MS4 Permits

Orange County has two separate NPDES Permits, which are administered by the Santa Ana and San Diego Regional Water Quality Control Boards. The current Santa Ana Region Permit was renewed in 2009 (RWQCB Order No. R8-2009-0030, NPDES Permit No. CAS618030). The San Diego Region Permit was also renewed in 2009 (RWQCB Order No. R9-2009-002, NPDES Permit No. CAS0108740).

Santa Ana Region: The permit requires priority development projects to ascertain the impact of the development on the site's hydrologic regime, and attempt to maintain or replicate the pre-development hydrologic regime through the use of design techniques that create a functionally equivalent post-development hydrologic regime. This is accomplished through site preservation techniques and the use of integrated and distributed micro-scale storm water infiltration, retention, detention, evapotranspiration, filtration and treatment systems as close as feasible to the source of runoff. LID site design principles must be followed to reduce runoff to a level consistent with the maximum extent practicable (MEP) standard. Priority development projects are required to infiltrate, harvest and re-use, evapotranspire, or bio-treat the 85th percentile storm event. Biotreatment systems may only be used if infiltration, evapotranspiration, and reuse are infeasible.

The Permittees are required to minimize the short and long-term impacts on receiving water quality from new developments and significant re-developments, including submittal of a Water Quality Management Plan (WQMP), emphasizing implementation of LID principles and addressing hydrologic conditions of concern, prior to issuance of any grading or building permits or recordation of any subdivision maps. The WQMPs are required to include BMPs for source control, pollution prevention, site design, LID implementation and structural treatment control BMPs.

San Diego Region: The permit requires the following LID BMPs to be implemented at all Development Projects where applicable and feasible:

a) Conserve natural areas, including existing trees, other vegetation, and soils.
b) Construct streets, sidewalks, or parking lot aisles to the minimum widths necessary, provided that public safety is not compromised.
c) Minimize the impervious footprint of the project.
d) Minimize soil compaction to landscaped areas.
e) Minimize disturbances to natural drainages (e.g., natural swales, topographic depressions, etc.)
f) Disconnect impervious surfaces through distributed pervious areas.

Priority Development Projects are required to implement LID BMPs which will collectively minimize directly connected impervious areas, limit loss of existing infiltration capacity, and protect areas that provide important water quality benefits necessary to maintain riparian and aquatic biota, and/or are particularly susceptible to erosion and sediment loss.

The following LID BMPs must be implemented at all Priority Development Projects where technically feasible as required below:

(i) Maintain or restore natural storage reservoirs and drainage corridors (including depressions, areas of permeable soils, swales, and ephemeral and intermittent streams.

(ii) Projects with landscaped or other pervious areas must, where feasible, drain runoff from impervious areas (rooftops, parking lots, sidewalks, walkways, patios, etc) into pervious areas prior to discharge to the MS4. The amount of runoff from impervious areas that is to drain to pervious areas shall not exceed the total capacity of the project's pervious areas to infiltrate or treat runoff, taking into consideration the pervious areas' geologic and soil conditions, slope, and other pertinent factors.

(iii) Projects with landscaped or other pervious areas must, where feasible, properly design and construct the pervious areas to effectively receive and infiltrate or treat runoff from impervious areas, prior to discharge to the MS4. Soil compaction for these areas shall be minimized. The amount of the impervious areas that are to drain to pervious areas must be based upon the total size, soil conditions, slope, and other pertinent factors.

(iv) Projects with low traffic areas and appropriate soil conditions must construct walkways, trails, overflow parking lots, alleys, or other low-traffic areas with permeable surfaces, such as pervious concrete, porous asphalt, unit pavers, and granular materials.

LID BMPs are required to capture and retain the volume of runoff produced from a 24-hour 85th percentile storm event, if technically feasible. LID biofiltration BMPs may be used to treat any volume that cannot be retained onsite. Conventional BMPs may only be used if LID BMPs are infeasible.

The Hydromodification Management Plan (HMP) shall be incorporated into the local Sewer System Management Plan (SSMP) and implemented by each Co-permittee so that estimated post-project runoff discharge rates and durations shall not exceed pre-development discharge rates and durations. Where the proposed project is located on an already developed site, the pre-project discharge rate and duration shall be that of the pre-developed, naturally occurring condition.

Riverside County MS4 Permit

The current Riverside County MS4 Permit was adopted in 2010 (RWQCB Order No. R8-2010-0033, NPDES Permit No. CAS618033). Priority development projects are required to infiltrate, harvest and use, evapotranspire, or bio-treat the 85th percentile storm event. Preference is given to retention through infiltration, harvest and use, and/or evapotranspiration. If these techniques cannot feasibly treat the entire design storm volume, then bio-treatment BMPs can be used. The permit requires new development and redevelopment projects disturbing more than one acre to maintain pre-development site hydrology (including runoff volume, velocity, duration, time of concentration) to the maximum extent practicable for the 2-year return frequency storm.

San Bernardino County MS4 Permit

The current San Bernardino County MS4 Permit was adopted in 2010 (RWQCB Order No. R8-2010-0036, NPDES Permit No. CAS618036). Priority development projects are required to infiltrate, harvest and use, evapotranspire, or bio-treat the 85th percentile storm event. Preference is given to retention through infiltration, harvest and use, and/or evapotranspiration. If these techniques cannot feasibly treat the entire design storm volume, then bio-treatment BMPs can be used. The permit requires new development and redevelopment projects disturbing more than one acre to maintain pre-development site hydrology (including runoff volume, velocity, duration, time of concentration) to the maximum extent practicable for the 2-year return frequency storm.

Ventura County MS4 Permit

Ventura County's current MS4 Permit was adopted in 2000, and is currently under revision (RWQCB Order No. R4-2009-0057, NPDES Permit No. CAS004002). The proposed permit establishes a 5 percent limit on effective impervious area (EIA) for new development and redevelopment, and requires that the design storm runoff volume from 95 percent of the impervious area be retained by infiltration, evapotranspiration, or reuse. EIA is the portion of surface area that is hydrologically connected via sheet flow over a hardened conveyance or impervious surface without intervening medium to mitigate stormwater from the design storm. On infill projects where 5 percent is not technically feasible, the project must reduce percent EIA to as close to 5 percent as feasible and no more than 30 percent of the total project area. The EIA difference may be made up through off-site mitigation. Off-site mitigation is required for the volume of stormwater from the design storm that that cannot be retained on-site within the 5 percent EIA limitations. Any design storm volume runoff from the impervious area of the site needs to be treated for stormwater quality.

Treatment BMPs must be selected in the following order of preference: Infiltration BMPs, BMPs that store and reuse stormwater, BMPs that incorporate vegetation and integrate multiple uses, BMPs that percolate runoff through engineered soils and allow it to slowly discharge downstream, and proprietary treatment control BMPs that are based on LID. Bioretention with an underdrain (biotreatment) is considered a treatment BMP and can be used only after the design storm volume has been retained and the water used on site.

A Technical Guidance Manual (TGM) was developed in 2002 for the previous permit to explain how to design and implement a variety of specific LID and Best Management Practices (BMPs) for the treatment of storm water utilizing source control, site design and structural treatment control. The 2002 TGM will be updated for the new permit requirements to provide cost effective strategies to successfully meet the latest storm water quality improvement goals. The new TGM will also provide alternative compliance measures where LID is infeasible or limited.

Los Angeles County MS4 Permit

Los Angeles County's current MS4 Permit was issued in 2001 and amended in 2006, 2007, and 2009 (RWQCB Order No. R4-2001-182, NPDES Permit No. CAS004001). A new permit is currently under development. There are no specific LID requirements in the current permit. The current LA County MS4 Permit requires that post-construction treatment control BMPs incorporate, at a minimum, one of the following design standards:

1. Volumetric Treatment Control BMP (Any of the four methods would be acceptable)
    a. 85th percentile 24-hour runoff event, or
    b. Volume of runoff produced from a 0.75 inch storm event, or
    c. Volume of annual runoff based on unit basin storage to achieve 80 percent volume treatment, or
    d. Volume of runoff from a historical-record based reference 24-hour rainfall for treatment that achieves the same reduction in pollutant loads achieved by the 85th percentile 24-hour runoff event.
2. Flow Based Treatment Control BMP (Any of the three methods would be acceptable)
    a. Flow of runoff produced from a rain event equal to at least 0.2 inches per hour intensity, or
    b. The flow of runoff produced from a rain event equal to at least two times the 85th percentile hourly rainfall intensity for Los Angeles County, or
    c. The flow from runoff produced from a rain event that will result in treatment of the same portion of runoff as treated using volumetric standards above.

The current Los Angeles County MS4 Permit does not require any LID measures. However, the Los Angeles County Department of Public Works proactively developed an LID manual for both private and public projects. As of January 2009, such projects within unincorporated LA County

are required to implement LID measures (County of Los Angeles, 2009). The LID manual requires infiltration of ΔV, the increase of the runoff volume at parcel level (if possible). If parcel level LID is not possible, then the developer can apply for a regional LID solution. Currently, Los Angeles County is developing another LID Manual for infrastructure projects such as highways and drainage projects.

Phase II Municipal Permits

The SWRCB adopted a statewide General Phase II MS4 Permit in April 2003 (SWRCB Order No. 2003-0005-DWQ). The general permit covers small MS4s that are not directly regulated by the Phase I permits. Phase II communities are required to develop stormwater management programs that reduce the discharge of pollutants to the maximum extent practicable (MEP) and protect water quality. The Permittees are required to address stormwater runoff from new development and redevelopment projects that disturb more than one acre by developing and implementing control strategies, which can include a combination of structural and non-structural BMPs.

General Construction Permits

As of July 2010, all discharges related to construction activity will be required to obtain coverage under the statewide Construction General Permit (SWRCB Order No. 2009-0009-DWQ). The new permit establishes statewide post-construction runoff standards and requires the maintenance of a site's predevelopment hydrology in order to control hydromodification.

The regulatory approach of the permit is one of effluent limitation and hydrograph control. The pre-development site hydrology must be evaluated and approximated using structural and non-structural controls so that there is no increase in the volume of runoff that leaves the site and no decrease in the time of concentration.

Incorporating LID into the Planning Process

Incorporating LID into General Plans

Although California has a variety of regional plans, including Regional Blueprints adopted by Councils of Governments, the cornerstone of the California planning process is the general plan. According to Thomas Kent, in his text The Urban General Plan (1964), a general plan is "the official statement of a municipal legislative body which sets forth its major policies concerning desirable future physical development." The general plan process is defined by Government Code Sections 65000-66037, which delegate most local land use decisions to individual cities and counties across the state. Each county and incorporated city is required to adopt "a comprehensive long term general plan for physical development."

General plans include development goals and policies and lay the foundation for land use decisions made by planning commissions, city councils, or boards of supervisors. General plans must contain text sections and maps or diagrams illustrating the general distribution of land uses, circulation systems, open space, environmental hazard areas, and other policy statements that can be illustrated. The Government Code specifies that general plans must contain seven mandatory elements or components: circulation, conservation, housing, land use, noise, open-space, and safety. Local governments may also voluntarily adopt other elements addressing topics of local interest. Cities and counties could adopt an optional water element in their general plans, but few have done so. Instead, water has most often been partially addressed in either the mandatory conservation element or in optional natural resources or public facilities elements. Water is frequently addressed only in terms of water supply and/or water conservation.

Possible Approaches to Incorporate LID into General Plans

There are several viable methods of incorporating LID into general plans. One approach would involve amending existing general plan elements to incorporate LID principles, goals, and policies. Since water is most often addressed in the required conservation element, appropriate principles, goals, and policies could be added to this element. In a January 2008, report prepared for the Ocean Protection Council, entitled **"State and Local Policies Encouraging or Requiring Low Impact Development in California,"** The report recommends that a state LID statute should provide language for incorporating low impact development into the mandatory land use and conservation elements of general plans. In addition, since the land use element is the focus of local land use decisions, language on low impact development should also be added to the element. When water is addressed in another element, such as an optional natural resources or water element, LID language should be added to that element.

A second approach would be to develop a new water element. Not many such optional elements have been adopted in California; however, the 2003 edition of the State of California General Plan Guidelines contains a detailed discussion of optional water elements. OPR stated,

> *"Given the importance of water to the state's future, a community would be well served to create a separate water element, in conjunction with the appropriate water supply and resource agencies, in which each aspect of the hydrologic cycle is integrated into a single chapter of the general plan. With recent law that requires land use decisions to be linked to water availability, a water element takes on increased importance."*

An optional element, such as a water element, can be amended at any time, which is important since LID is an evolving practice. To assist local governments in developing water elements, the Local Government Commission included a model water element as appendix to its July 2006 publication, *The Ahwahnee Water Principles, A Blueprint for Regional Sustainability*.

The model water element proposed by the Local Government Commission (LGC) includes sample policies grouped into three sections: 1) Watershed protection and management; 2) Protecting and improving water quality; and 3) Managing supply and demand of water resources. The model element was designed to provide a policy framework to address the links between water and land use. It builds upon the Ahwahnee Water Principles.

Addressing LID through Specific Plans

A specific plan is a flexible tool for systematically implementing general plans. Specific plans must be consistent with Section 65450-65457 of the Government Code. These provisions require that specific plans be consistent with the general plans of the jurisdictions that adopt them. The range of issues addressed and the area covered by specific plans is left to the discretion of the decision-making body of the city or county adopting the plan. Once a specific plan is adopted, all zoning regulations, all public works projects, and all subsequent subdivision and development must be consistent with the specific plan.

Section 65451 of the Government Code specifies the structure of a specific plan. The information that is to be presented by text and diagram includes the distribution, location and extent of land uses within the area covered by the plan. Specific plans also include:

> *"(2) The proposed distribution, location, and extent and intensity of major components of public and private transportation, sewage, water, drainage, solid waste disposal, energy, and other essential facilities proposed to be located*

> *within the area covered by the plan and needed to support the land uses described in the plan.*

In addition, the specific plans contain:

> *"(3) The Standards and criteria by which development will proceed, and standards for the conservation, development, and utilization of natural resources, where applicable," and*
>
> *"(4) A program of implementation measures including regulations, programs, public works projects, and financing measures necessary to carry out paragraphs (1), (2), and (3).*

Since specific plans are flexible and scalable by design, they can be used in different ways to implement LID. If adopted by resolution, a specific plan is a policy document. If adopted by ordinance, a specific plan would be a regulatory document. An overlay specific plan could be adopted either by resolution or ordinance to address only the LID issue. Alternatively, a specific plan could be adopted to address the comprehensive development or redevelopment of a defined area and include LID requirements among the standards and implementation measures applicable to the area.

An example specific plan is being prepared for a portion of the City of San Bernardino as part of the Inland Empire Sustainable Watershed Program (IESWP), a Proposition 50 grant project funded through the CalFed Watershed Program of the California Department of Water Resources. This project, **"The Model Specific Plan for Watershed Sustainability"** was designed to "develop a guide for how urban planners can use land use design to create LID-friendly specific plans that implement LID at a community scale. This approach leverages the efficiency and opportunity of scale to streamline the MS4 storm water runoff permit compliance process.

The IESWP is a capacity building program to increase participation in watershed planning and management in the upper Santa Ana River watershed. It targets land use planners and decision-makers, the development community, and residents by providing products, resources, and forums that encourage the incorporation of watershed and low impact development approaches into the planning and development process.

Addressing LID through Conditions of Approval

One method of addressing LID as early as possible in the planning process and of tracking implementation of LID practices would be to develop and apply both standard and non-standard conditions of approval. Most jurisdictions apply conditions of approval to the approval of development projects. These conditions often relate to a broad range of topics, including grading, drainage, landscaping, and water quality. Conditions of approval normally state what is to be done, who is to do it, when it is to be done, and who is responsible for determining compliance. Conditions are applied to discretionary planning permits and subdivision maps at different levels in the approval process and may be repeated at subsequent levels of approval when they would be informative to applicants or municipal staff.

Many jurisdictions have developed water quality conditions of approval. Such conditions often relate to pollution prevention during construction and planning for the installation of post-construction structural and non-structural water quality control measures.

New conditions of approval requiring consideration of, and planning for, implementation of low impact development measures could be added to the lists of conditions of approval. LID conditions of approval should be applied as early as possible in the project approval process and

repeated at subsequent levels of approval to ensure compliance, timely implementation, and long-term maintenance.

LID and Municipal Codes and Ordinances

LID and Municipal Codes

Municipal codes can relate to low impact development in several ways. Cities and counties can adopt separate LID ordinances to require the use of LID principles in development projects and provide standards for the use of LID. An LID ordinance can specify when LID implementation plans are due and can specify compliance with criteria and standards in a manual or guidance document that can be updated as new information becomes available and as experience with implementation and maintenance of LID measures is gained.

Municipal codes may contain barriers to LID implementation. The magnitude of the barriers in existing ordinances will vary with the purpose of implementing LID measures. If the primary purpose for implementing LID measures is to reduce runoff to improve water quality or to improve flood control, the barrier in existing ordinances may be less difficult to overcome than if the purpose is to achieve a broad watershed protection and enhancement goal.

Many types of codes and ordinances can influence the implementation of LID. Different codes may impact LID differently at different scales. At the site scale, building codes, landscape codes, parking codes, and zoning ordinances can influence site coverage, building dimension, parking requirements and landscaping. Parking codes have received special attention because vehicle parking is a major component of the built environment. These issues are discussed in detail in the January 2008 Tetra Tech analysis of **"State and Local Policies Encouraging or Requiring Low Impact Development in California**" and in an analysis of watershed-based planning strategies completed for Ventura County by the Local Government Commission.

New Ordinances to Facilitate LID

One direct way to use city and county codes to facilitate LID is to adopt specific LID ordinances to require the use of LID principles in development projects. This approach has been followed by the County of Los Angeles, which added a chapter to the Title 12 Environmental Protection of the Los Angeles County Code. This chapter is entitled Low Impact Development (LID) Standards; its stated purpose is to require the use of LID principles in development projects. The chapter states, *"LID builds on conventional design strategies by utilizing every softscape and hardscape surface in the development to perform a beneficial hydrologic function by retaining, detaining, storing, changing the timing of, or filtering stormwater and urban runoff."* The ordinance requires that comprehensive LID plans that demonstrate compliance with an LID Standards Manual be submitted for review and approval by the Department of Public Works. It also specifies that urban and stormwater runoff quantity and quality control standards will be established in the LID Standards Manual that is to be updated and maintained by the Department of Public Works. For subdivisions, the LID plans must be approved prior to tentative map approval. For all other development, an LID plan must be approved prior to issuance of a grading permit or, where a grading permit is not required, prior to issuance of a building permit.

The Subdivision and Planning Zoning Titles of the Los Angeles County Code were amended to add reference to the Low Impact Development Title. In addition, the County adopted ordinances for green building and drought-tolerant landscaping. All three ordinances apply to all administrative and all discretionary projects.

Changes to Los Angeles Municipal Code

The City of Los Angeles amended Chapter VI Article 4.4 Section 64.72 of the Los Angeles Municipal Code in January 2010 to incorporate LID. The code was amended to "expand the applicability of the existing Standard Urban Stormwater Mitigation Plan (SUSMP) requirements by providing stormwater and rainwater LID strategies for planning, and construction of development and redevelopment projects that require building permits" (LA DPW, 2010).

The City's LID ordinance requires that stormwater runoff from development and redevelopment projects be managed to the maximum extent feasible through onsite infiltration, evapotranspiration, capture and reuse, and biofiltration or bioretention BMPs.

Including LID in Stormwater Ordinances

County of Contra Costa

LID can be included in new stormwater management ordinances or amended into existing ordinances. One example of this is the model developed by the Contra Costa County Clean Water Program (CCCCWP) for adoption by its member municipalities. This ordinance was adopted individually by the County of Contra Costa and the 19 cities and towns in the County after the San Francisco Bay Regional Water Quality Control Board added provision C.3 to the County's 1999 area-wide municipal NPDES permit in 2003. This provision is similar to the SUSMP provisions in other MS4 permits. The permittees began to implement provision C.3 in 2005.

This ordinance is a comprehensive stormwater management and discharge control ordinance. It incorporates LID by requiring that:

> *"Every application for a development project, including but not limited to a rezoning, tentative map, parcel map, conditional use permit, variance, site development permit, design review, or building permit that is subject to the development runoff requirements in the City's NPDES permit shall be accompanied by a stormwater control plan that meets the criteria in the most recent version of the Contra Costa Clean Water Program Stormwater C.3. Guidebook."*

The Guidebook contains step-by-step guidance for preparing the required Stormwater Control Plans. It also includes design procedures and calculation procedures, as well as guidance for the operation and maintenance of stormwater facilities.

Originally, the Stormwater Control Plan requirement applied, with some exceptions, to all developments that created one acre or more of impervious surface, including street and road projects and projects on previously developed sites that result in the addition or replacement of a combined total of one acre or more of impervious surface. Effective August 15, 2006, it applies, again with some exceptions, to all projects that create 10,000 square feet or more of impervious surface.

The Contra Costa County Clean Water Program created an LID approach to implementing the Regional Water Board's requirements for applicable new developments to:

- Design the site to minimize imperviousness, detain runoff, and infiltrate runoff where feasible;
- Cover or control sources of stormwater pollutants;
- Treat runoff prior to discharge from the site;

- Ensure runoff does not exceed pre-project peaks and durations; and
- Maintain treatment and flow-control facilities.

Removing Barriers to LID in Current Codes

Removing barriers to LID in existing codes, including zoning codes, is likely to be a time consuming process and vary from jurisdiction to jurisdiction. Perceived barriers to implementation of LID measures are often the result of the needs and experience of multiple departments within a municipality. These departments have promoted standards to facilitate achieving a variety of goals and responsibilities. Not all perceived barriers will need to be removed from existing codes. It may be easier, at least initially, to use overlay zones or specific plans to facilitate implementation of LID practices in both new development and redevelopment projects. As more experience is gained with implementation of LID, standards could be modified in consultation with the departments that promoted the standards that are perceived by stormwater managers to be barriers to LID.

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Appendix C: LID, LEED, and the Sustainable Sites Initiative

LID practices can not only accomplish stormwater management goals but can also aid in obtaining LEED (Leadership in Energy and Environmental Design) certification. There are currently nine LEED Green Building Rating Systems, all of which are voluntary, consensus-based, and market-driven (U.S. Green Building Council, 2009). The systems are categorized by development type, and internally divided into credit categories. The credit name, number, and LEED point-worth are provided, as well as the credit's intent, requirements, options, and in some cases, potential strategies. A minimum of 40 points are needed for LEED certification. Two rating systems most relevant to LID are for new construction and neighborhood development.

The LEED for New Construction Rating System is designed to guide high-performance commercial and institutional projects, including office buildings, high-rise residential buildings, government buildings, recreational facilities, manufacturing plants, and laboratories of all sizes (U.S. Green Building, 2009). The intent is to promote healthful, durable, affordable, and environmentally sound practices in building design and construction (U.S. Green Building Council, 2009). Credit categories relating to LID include: Sustainable Sites, Water Efficiency, and Materials and Resources. Table C-1 provides examples of LEED credits that LID can be used to address.

Table 35. LEED for New Construction Credit Options.

Category	Credit Number	Credit Name	Points Possible	Possible LID BMP
Sustainable Sites	5.1	Site Development, Protect or Restore Habitat	1	Appropriate native plant selection, protect sensitive areas
	5.2	Site Development, Maximize Open Space	1	Minimize construction footprint
	6.1	Stormwater Design, Quantity Control	1	Multiple LID BMPs
	6.2	Stormwater Design, Quality Control	1	Multiple LID BMPs
	7.1	Heat Island Effect, Non-roof	1	Shade from trees, light colored pervious paving
	7.2	Heat Island Effect, Roof	1	Vegetated roof
Water Efficiency	1.1	Water Efficient Landscaping, Reduce by 50%	2	Rain barrels, cisterns, select appropriate plant species
	1.2	Water Efficient Landscaping, No Potable Use or No Irrigation	4	Soil amendments, capture/reuse
	2.1	Innovative Wastewater Technologies, Reduce potable by 50%	2	Capture/reuse
	3.1	Water Use Reduction, 30% Reduction	2	Capture/reuse
	3.2	Water Use Reduction, 35% Reduction	3	Capture/reuse
	3.3	Water Use Reduction, 40% Reduction	4	Capture/reuse
	3.1	Material Reuse, 5%	1	Multiple LID BMPs
Materials & Resources	3.2	Material Reuse, 10%	1	Multiple LID BMPs
	4.1	Recycled Content, 10%	1	Multiple LID BMPs
	4.2	Recycled Content, 20%	1	Multiple LID BMPs
	5.1	Regional Materials, 10%	1	Multiple LID BMPs
	5.2	Regional Materials, 20%	1	Multiple LID BMPs
		Total Possible Points:	**22**	

Source: The Low Impact Development Center, Inc.

The LEED for Neighborhood Development Rating System integrates the principles of smart growth, urbanism, and green building to bring buildings together into a neighborhood, and relate the neighborhood to its larger region and landscape (Congress of New Urbanism et al, 2009). These standards have been assembled through collaboration among the Congress of New Urbanism, the U. S. Green Building Council, and the Natural Resources Defense Council. The partnership created the rating system to encourage developers to revitalize existing urban areas, reduce land consumption, reduce automobile dependence, promote pedestrian activity, improve

air quality, decrease polluted stormwater runoff, and build more livable, sustainable, communities for people of all income levels (Congress of New Urbanism et al, 2009). Credit categories relating to LID include: Smart Location & Linkage and Green Construction & Technology. The table below provides examples of LEED credits that LID can be used to address.

Table 36. LEED for Neighborhood Development Credit Options.

Category	Credit Number	Credit Name	Points Possible	Possible LID BMP/Strategy
Smart Location & Linkage	8.1	Steep Slope Protection	1	Vegetated swales, native plants
	9.1	Site Design for Habitat or Wetland Conservation	1	Native plants, infiltration basins, dry ponds, constructed wetlands
	10.1	Restoration of Habitat or Wetlands	1	Restore vegetation
	11.1	Conservation Management of Habitat or Wetlands	1	Preserve existing vegetation and sensitive areas
Neighbor-hood Patter & Design	1.1	Compact Development	1-7	Minimize impervious areas
	6.1	Reduced Parking Footprint	2	Decrease size of parking spaces, pervious pavement
	7.1	Walkable Streets	4-8	Planting trees, curb bump-outs
	12.1	Access to Open Spaces	1	Minimize impervious areas
	13.1	Access to Active Spaces	1	Minimize impervious areas
	15.1	Community Outreach and Involvement	1	Informative signs on public LID structures, meetings

Source: The Low Impact Development Center, Inc.

Table C-2 (Cont.): LEED for Neighborhood Development Credit Options.

Category	Credit Number	Credit Name	Points Possible	Possible LID BMP/Strategy
Green Construction & Technology	1.1	LEED Certified Green Buildings	1-3	Green roofs, cisterns, landscaping
	2.1	Energy Efficiency in Buildings	1-3	Green roofs, cisterns, landscaping
	3.1	Reduced Water Use	1-3	Cisterns, rain barrels
	6.1	Minimize Site Disturbance Through Site Design	1	Native vegetation preservation
	7.1	Minimize Site Disturbance Through Site Design	1	Minimizing construction footprint
	9.1	Stormwater Management	1-5	Vegetated swales
	10.1	Heat Island Reduction, Non-Roof	1	Shade from native trees, light colored pervious paving
	10.2	Heat island Reduction, Roof	1	Vegetated roof
		Total Possible Points:	**40**	

Source: The Low Impact Development Center, Inc.

The above tables display just some of the options for achieving LEED credit points through LID. There are many other points available under these systems as well as through the other seven rating systems that may be applicable to a given project. Some credit categories have prerequisites that must be met before credit certification can be achieved. The U.S. Green Building Council provides information about all of the LEED rating systems, listing all prerequisites, possible credits, and points.

The Green Building Certification Institute administers LEED certification for all commercial and industrial projects. The certification process begins with a determination of whether LEED is right for a project. The project must then be registered, signifying intent to develop a building which meets LEED certification requirements. Resources will be provided at this time that will assist with the application for certification. Application preparation will require a specific set of documents, depending on the desired credit or certification. Once all materials are assembled, the designated LEED Project Administrator is eligible to submit the application online.

Sustainable Sites Initiative

The Sustainable Sites Initiative, a partnership of the American Society of Landscape Architects, the Lady Bird Johnson Wildflower Center, and the United States Botanic Garden, has established Sustainable Sites Initiative Guidelines to certify sustainable landscapes. The Guidelines are modeled after the LEED program, and offer certification based on the use of prerequisites and credits for specific sustainable design practices. The Initiative is currently in its pilot phase. Ratings are based on a 250 point system. Projects can be awarded one to five stars, based on the number of credits earned. A minimum of 100 credits must be earned in order to be awarded one star. In addition to earning credits, projects must follow several prerequisites in order to qualify as sustainable sites. Up to 127 of these credits can be earned by following the LID Site Design Process described in this manual.

Table 37. Sustainable Sites Initiative Prerequisite and Credit Options.

Category	Credit Number	Credit Name	Points Possible	Possible LID BMP/Strategy
Site Selection	Prerequisite 1.2	Protect floodplain functions		Protect sensitive areas
	Prerequisite 1.3	Preserve wetlands		Protect sensitive areas
	Prerequisite 1.4	Preserve threatened or endangered species and their habitats		Protect sensitive areas
	Credit 1.5	Select brownfields or greyfields for redevelopment	5-10	LID can be used on these sites
	Credit 1.6	Select sites within existing communities	6	LID can be used for redevelopment
	Credit 1.7	Select sites that encourage non-motorized transportation and use of public transit	5	LID can be used for redevelopment
Pre-Design Assessment and Planning	Prerequisite 2.1	Conduct a pre-design site assessment and explore opportunities for site sustainability		LID site assessment process
	Prerequisite 2.2	Use an integrated site development process		LID site planning strategies
Site Design – Water	Prerequisite 3.1	Reduce potable water use for landscape irrigation by 50 percent from established baseline		Plant adapted vegetation Capture/reuse
	Credit 3.2	Reduce potable water use for landscape irrigation by 75 percent or more from established baseline	2-5	Plant adapted vegetation Capture/reuse
	Credit 3.3	Protect and restore riparian, wetland, and shoreline buffers	3-8	Protect sensitive areas
	Credit 3.5	Manage stormwater on site	5-10	Multiple LID BMPs
	Credit 3.6	Protect and enhance on-site water resources and receiving water quality	3-9	Multiple LID BMPs
	Credit 3.7	Design rainwater/stormwater features to provide a landscape amenity	1-3	Multiple LID BMPs
	Credit 3.8	Maintain water features to conserve water and other resources	1-4	Multiple LID BMPs

Source: The Low Impact Development Center, Inc.

Table C-3 (Cont.): Sustainable Sites Initiative Prerequisite and Credit Options.

Category	Credit Number	Credit Name	Points Possible	Possible LID BMP/Strategy
Site Design – Soil and Vegetation	Prerequisite 4.2	Use appropriate, non-invasive plants		Revegetate disturbed areas
	Prerequisite 4.3	Create a soil management plan		Amend soils
	Credit 4.4	Minimize soil disturbance in design and construction	6	Minimize impervious areas Minimize construction footprint
	Credit 4.5	Preserve all vegetation designated as special status	5	Protect existing vegetation
	Credit 4.6	Preserve or restore appropriate plant biomass on site	3-8	Protect existing vegetation Revegetate disturbed areas
	Credit 4.7	Use native plants	1-4	Revegetate disturbed areas
Site Design – Soil and Vegetation	Credit 4.8	Preserve plant communities native to the ecoregion	2-6	Protect existing vegetation
	Credit 4.9	Restore plant communities native to the ecoregion	1-5	Revegetate disturbed areas
	Credit 4.10	Use vegetation to minimize building heating requirements	2-4	Vegetated roofs
	Credit 4.11	Use vegetation to minimize building cooling requirements	2-5	Vegetated roofs
	Credit 4.12	Reduce urban heat island effects	3-5	Minimize impervious areas Vegetated roofs Light-colored pervious pavement

Source: The Low Impact Development Center, Inc.

Table C-3 (Cont.): Sustainable Sites Initiative Prerequisite and Credit Options.

Category	Credit Number	Credit Name	Points Possible	Possible LID BMP/Strategy
Site Design – Materials Selection	Credit 5.2	Maintain on-site structures, hardscape, and landscape amenities	1-4	Minimize impervious areas
Site Design – Human Health and Well-Being	Credit 6.7	Provide views of vegetation and quiet outdoor spaces for mental restoration	3-4	Multiple LID BMPs
	Credit 6.8	Provide outdoor spaces for social interaction	3	Vegetated roofs
Monitoring and Innovation	Credit 9.2	Innovation in site design	8	LID Site Design Process
		Total Possible Points:	**127**	

Source: The Low Impact Development Center, Inc.

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Monitoring Urban Pesticide Runoff in California 2008 - 2009

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ABSTRACT

To determine the prevalent pesticides in urban surface waters in California, the California Department of Pesticide Regulation (CDPR) initiated a statewide urban surface water monitoring program in 2008. Water and sediment samples were collected at 25 sites in the Sacramento (SAC), San Francisco Bay (SFB), greater Los Angeles (Orange County), and San Diego (SD) areas. Samples were collected at stormdrain outflows and at receiving waters during rainy and during dryflow conditions. Water samples were analyzed for 63 pesticides or degradates. Sediment samples were only collected during dryflow and analyzed for pyrethroids and chlorpyrifos. In water samples, 18 insecticides and 12 herbicides or their degradates were detected above their reporting limits. Multiple detections were common; 50% of the samples had three or more pesticides and 25% had six or more pesticides. OC and SAC had the highest detection frequencies and SD had the fewest. The most frequently detected insecticides in water were bifenthrin, fipronil, fipronil sulfone, carbaryl, desulfinyl fipronil, and malathion. Chlorpyrifos and diazinon were detected, albeit infrequently, despite drastic reductions in urban use. Fipronil, fipronil sulfone, desulfinyl fipronil, and carbaryl were more frequently detected in OC than in other areas of the study. Other pyrethroids were infrequently detected in water samples but common contaminants of sediments. Half of the sediments contained five or more pyrethroids. The most common pyrethroids in sediments were bifenthrin, cyfluthrin, permethrin, deltamethrin, λ-cyhalothrin, and cypermethrin. Herbicides were detected at slightly higher frequencies than insecticides; the most frequently detected herbicides were 2,4-D, triclopyr, dicamba, diuron, MCPA, and pendimethalin. Except for bifenthrin, pesticides occurred with equal frequency in stormdrain outflows and in receiving waters. Bifenthrin was more frequently detected in stormdrain outflows than in receiving waters. Rain increased pesticide runoff for all of the pesticides but fipronil (and degradates). Fipronil appeared to have a continuous load dependent on use rather than rainfall. Detection of the herbicides diuron and pendimethalin also correlated with use but these herbicides are routinely applied during the rainy season when pesticide detections are generally highest. Bifenthrin, fipronil, and diuron were detected in water samples at concentrations that potentially could be toxic to aquatic organisms.

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I. INTRODUCTION

Annual California urban pesticide use is on the order of millions of kg of active ingredient (ai). Urban pesticide use includes structural pest control, landscape maintenance, rights-of-way and public health pest protection applications, as well as applications to commercial, institutional, and industrials areas, and residential home-and-garden applications. The California Department of Pesticide Regulation (CDPR) compiles pesticide use records for urban pesticide applications made by licensed applicators. Annually, professional applicators apply over 4 million kg ai of pesticides for urban (non-agriculture) pest control (CDPR 2010). However, urban pesticide use by individual homeowners is not reported, so that total urban use in California is greater than this reported use. Especially in dense urbanized areas, high homeowner pesticide use is anticipated. For example, a recent survey of four large home improvement stores in northern and southern California showed that 190 pesticide products, containing 79 different ai's, were being sold for outdoor use (Osienski et al. 2010). Other surveys have also shown that large numbers of pesticides are being sold in retail stores. Moran's (2005) survey indicated that more than 320 pesticide products containing 99 different ai's were being sold in the San Francisco Bay Area. Another survey in Sacramento, Stockton, and the San Francisco Bay area revealed 542 different products containing 112 different ai's were available for sale (Flint 2003). Efforts have been made to estimate this non-reported urban pesticide use in California by comparing CDPR's Pesticide Use Report (PUR) and sales database, but a recent analysis by Zhang and Spurlock (2010) demonstrated the high degree of uncertainty in those estimates. However, it has been estimated that non-agricultural pesticide uses account for approximately 20-25% of all total pesticide use in the United States; most of these uses are in urban areas (Aspelin and Grube 1999; Kiely et al. 2004). In 2009, excluding adjuvants, the total reported pesticide use in California was over 68 million kg ai (CDPR 2010). Thus, these data show that large amounts of pesticides are applied in California urban areas, although the exact amounts are unknown.

Due to the high volume of urban pesticide use and perhaps lack of consumer awareness, urban pesticide runoff may exceed agricultural runoff (Wittmer et al. 2011). Pesticide runoff into urban creeks and rivers can occur via stormdrains during dryflow or with stormwater runoff leading to concentrations that may be toxic to aquatic organisms (Hoffman et al. 2000; Revitt et al. 2001; Schiff and Sutula 2004; Budd et al. 2007; Sprague and Nowell 2008; Weston et al. 2009; Oki and Haver, 2009). Many urban use pesticides have been detected at concentrations that are sufficient to cause toxicity in laboratory bioassays (Werner, et al., 2000; Schiff et al. 2002; Hunt, et al., 2003; Holmes et al. 2008; Mize et al. 2008; Lao et al. 2010; Weston and Lydy 2010). In addition, numerous urban creeks are listed on the 2006 Federal Clean Water Act Section 303(d) list due to the presence of organophosphorus (OP) pesticides that often originated in urban runoff (Cal/EPA 2009). Most of these listings are due to the presence of chlorpyrifos or diazinon. Chlorpyrifos and diazinon have been banned from most urban (residential) uses due to unfavorable human health and ecological risks. However, some urban uses of these two OP insecticides are still allowed so that their presence in urban waterways is still possible. For instance, chlorpyrifos is allowed for sale in indoor ant and roach baits in child resistant packaging, as a fogger adult mosquitocide (when applied by a public

agency), and for use in golf course turf applications at reduced rates (US EPA 2010a). Currently in California, both chlorpyrifos and diazinon are used in urban areas for structural pest control, rights-of-way applications, and for landscape maintenance when applied by a licensed professional applicator. However, the overall urban use in California is less than 1% of the total usage prior to initiating the residential ban in 2000 (CDPR 2010).

Recent monitoring in California shows that urban waterways are frequently contaminated with pyrethroids, the OPs diazinon and chlorpyrifos, and fipronil (Oki and Haver, 2009; Weston et al. 2009; Weston and Lydy 2010; Lao et al. 2010). There is little or no published monitoring data for many other urban use pesticides in California, especially herbicides. Herbicides are often acutely toxic to algae, although the environmental impacts of herbicides on aquatic systems is not well understood (Jassby et al. 2003; Miller et al. 2005; Sommer et al. 2007). In addition, there are synergistic interactions between different pesticides to aquatic invertebrates (Lydy and Belden 2006). Additional monitoring of urban waterways is therefore needed in order to assess the potential impacts of urban pesticide use on urban surface waters. A consistent statewide monitoring program will provide useful data on the environmental fate of urban use pesticides and aid in the development and implementation of management measures. In 2008, CDPR initiated a statewide urban monitoring project to address the problems of pesticides in urban waterways. Specific objectives of this study were fourfold: 1) determine what pesticides, at what concentrations, are present in urban runoff; 2) evaluate the magnitude of measured concentrations relative to water quality or aquatic toxicity benchmarks; 3) assess the effect of waterbody type (e.g., stormwater drain vs. creek); and 4) assess the effect of season (dryflow vs. rainstorm).

II. MATERIALS AND METHODS

Study Area. Monitoring was conducted in four large metropolitan areas in northern and southern California. Twenty-five sites were sampled in total; four in the Sacramento area, seven in each of the San Francisco Bay, the greater Los Angeles, and San Diego areas (Figure 1). Water and sediment samples were collected from either stormdrain outflows or from downstream receiving waters (Figure 2); generally for each of the four main sampling areas, there were two or three stormdrain outflows for each receiving water site. Receiving waters comprised of: Pleasant Grove Creek (Sacramento [SAC] area), Grayson and Koopman/Martin Canyon Creeks (San Francisco Bay [SFB] area), and Wood Canyon and Salt Creeks (greater Los Angeles area, in Orange County [OC]), Lindo Lake (inflow), and the San Diego River (San Diego [SD] area). Two storm drain outflow sites at the San Diego River sites only contained water during rain events. Detailed information about the sampling sites can be found in Appendix I, Table A1.

Field Sampling. This study was initiated in April 2008 and ended at the end of the August 2009. In northern California, four dryflow and four rainstorm sampling events were completed. However, due to limited rainfall in southern California, we were only

able to sample one rain event during both the 2008 and 2009 water years[1]. To make up for the lack of rain sampling, we completed five dryflow sampling events. Pyrethroid monitoring was added about 10 months after this study was initiated, with sampling beginning in February 2009. Because of the limited rain in southern California, no pyrethroids were collected during rain events. We use the term dryflow for our base stream flow in urban surface waters as these waters likely never experience true baseflow, the condition where only groundwater contributes to surface water flow. Urban surface waters are augmented with water from other sources, as irrigation, washing of cars, etc. (Sprague and Nowell 2007). We will refer to dryflow conditions when surface waters receive no input from rain storms; usually in California from late April or early May through September or October.

Sediment samples were collected for pyrethroid and chlorpyrifos analysis. The collection of sediment sample timings differed somewhat from the water sample sampling. For pyrethroid analysis, sediments were collected twice during the study. In northern California, sediments were collected near the end of the rainy season and once in the summer. In southern California, sediments were collected in the late spring after the termination of the rainy season. Sediments were collected both from stormdrain outflows and, when feasible to do so, receiving waters. Sediments for chlorpyrifos analysis were only collected once, in the spring of 2009.

Water samples from receiving waters were collected from stream banks close to midstream as feasible directly into 1-L glass amber bottles using an extendable pole and sealed with Teflon®-lined lids. Stormdrain outflows, generally with less flow, were collected by hand directly into 1-L amber bottles. However, dependent on flow and water depth, occasionally water samples from stormdrain outflows were collected into a stainless steel container and aliquots were poured into 1-L glass bottles. During the rainstorm event in OC, storm samples were collected as a composite sample with a Hach-Sigma 900 Max automated sampler and split into 1-L amber bottles for transport. Sediment (up to a 2 cm depth) were collected using a stainless steel trowel or shovel, composited in a stainless steel container, and individual samples were placed into clear glass Mason® jars for later chemical analysis. Sediments could not be collected at all sites. Immediately after sampling, water and sediment samples were stored on wet ice for transport. Upon arrival at the laboratory, water samples were refrigerated (4°C) whereas sediments samples were frozen (–20°C) until chemical analysis.

Total Suspended Solids and Total Organic Carbon. We analyzed total suspended solids (TSS) in water samples and total organic carbon (TOC) in both water and sediment samples. TSS was analyzed following US EPA method 160.2 (US EPA, 1971). Briefly, waters samples were filtered under vacuum through a Buchner funnel lined with a glass fiber filter, dried overnight at 103-105°C, and weighed. TOC was analyzed using a TOC-V CSH/CNS analyzer (Shimadzu Corporation, Kyoto, Japan).

[1]A water year is from October of one year through September of the next; e.g., water year 2009 is from October 2008 through September 2009.

Field Measurements. Water physiochemical properties (dissolved oxygen [DO], electrical conductivity [EC], pH, turbidity, and temperature) were measured *in situ*. Measurements were taken with a YSI 6920 V2 meter (YSI Incorporated, Yellow Springs, OH). The meter was calibrated prior to field use (Doo and Lee 2008).

To get an estimate over overall pesticide load, flow data measurements were collected using a Global Flow Probe Flow Meter (Global Water, Gold River, CA). Flow could not be taken at all sites at all sampling dates, due to low or no flow or, in some cases, due to rapid flow in larger creeks. In specific cases, flow was estimated using the float method (timing the movement of an object on the surface) or by measuring volume over time (Appendix I).

Analytical Chemistry. We analyzed for a total of 63 different pesticides, or pesticide degradates, in this study. Most of the analysis were from the following pesticide groups: pyrethroids, carbamates, OP, fipronil (FP) and FP degradates, synthetic auxin herbicides, triazines/triazinones/uracils/ureas (photosynthesis inhibitor herbicides [PI]), and dinitroaniline herbicides (Table 1). Although some of the pesticides included in the chemical analysis are not urban use pesticides, they were analyzed and reported by the laboratory from the same analytical method.

We report the results as: 1) nd, not detected, concentrations below the minimum detection limit; 2) tr, trace detection, where in the chemist's best professional judgment the analyte does exist between the reporting limit and the minimum detection limit; 3) a numerical concentration in ng L^{-1} (pyrethroid water samples), µg L^{-1} (all other water samples), or ng g^{-1} (dry weight; sediment samples).

QA/QC for Water and Sediment Samples. Quality control for this study followed the CDPR SOP guidelines on Chemistry Laboratory Quality Control (Segawa, 1995). Quality control consisted of blind spikes, laboratory matrix spikes, method blanks, field duplicates, and field blanks. Propazine was also used as a surrogate spike in the PI analytical screen. Fifteen percent of the field samples were field duplicates, field blanks, or blind spikes.

Statistics. Statistical analyses was conducted using the non-parametric Mann-Whitley mean comparison test, significance at the 0.05 level, with Minitab® Statistical Software (Release 15). Regression analysis was also determined using Minitab®, significance also at the 0.05 level.

III. RESULTS AND DISCUSSION

Pesticides detected in surface waters

Of the 63 pesticides or analytes in the chemical analysis, we detected 30 different pesticides (including degradates) above their analytical reporting limit (18 insecticides and 12 herbicides). Many pesticides in the analyses were not urban use pesticides and

detections were not expected; nonetheless, 77% of the sampling sites contained at least one pesticide. Of the detected pesticides, OC and SAC had the highest detection frequency (24 and 20%, respectively), then SFB (14%) with SD having the fewest (4.5%). Frequently, more than one pesticide was detected in a water sample, which significantly differed among the four different study regions. OC had significantly higher median number of pesticides per water sample (6) than did SAC (4), which was significantly higher than SFB (2), which was significantly higher than SD (0; p=0.000-0.135, Figure 3). OC residents tend to have slightly more pest problems than residents in northern California which may warrant more pesticide applications (Flint 2003). Our data would suggest higher use than the other areas of the study. SD may also have higher levels of pesticides in surface water; for example, the San Diego Storm Water Department (2010) has recently reported high levels of pyrethroids in this area. And, although we report fewer pesticides found at one time in urban streams than in a 10 year review by Gilliom et al. (2006), different analyses, sampling regimes, or differences in pesticide use (e.g., much reduced urban use of diazinon or chlorpyrifos) may account for the differences.

The most frequently detected insecticides in surface waters were, in decreasing order, bifenthrin, fipronil (FP), FP sulfone, carbaryl, desulfinyl FP, malathion, and permethrin (Figure 4). Bifenthrin was the most frequently detected insecticide and second most detected pesticide in the study, with a 56% detection frequency. The high detection frequency was attributed to the high number of detections in SAC and SFB during rain runoff. For example, in northern California, bifenthrin dryflow detection frequency was 27% but increased to 97% during rainstorm events. We had similar dryflow detections of bifenthrin in southern California (29%) but because bifenthrin was added later in the study, there is no rainstorm sampling of bifenthrin in this part of the state. Because rainfall greatly enhances bifenthrin detections, additional sampling during rainstorm events in southern California is needed to determine the full contamination of bifenthrin in the urban runoff.

Other pyrethroids were detected in waters samples, albeit infrequently. The detection frequency of other pyrethroids in water samples: permethrin (both cis and trans isomers) 9.7%; cypermethrin 4.2%; esfenvalerate/fenvalerate, cyfluthrin, and λ-cyhalothrin, 1.4%. All pyrethroids were detected above their analytical reporting limit.

Fipronil and degradates were frequently detected. This group had a higher percentage of trace detections than detections above their analytical reporting limit. Fipronil had a 30% detection frequency; if trace detections are included, detection frequency increased to 73%. This was also observed for the five degradates (percentage of detections above reporting limit, detections including trace detections):

- FP sulfone (27%; 77%);
- Desulfinyl FP (17%; 79%);
- FP amide (4.5%; 64%);
- Desulfinyl FP amide (3%; 42%);
- FP sulfide (0.6%; 54%).

Fipronil, FP sulfone, and desulfinyl FP had higher detection frequencies in OC than in other areas of California (Figure 5).

Carbaryl was the fourth most frequently detected insecticide in surface waters (18% detection frequency, with trace detections, 28%). Carbaryl was also more frequently detected in OC than in other areas of the state (Figure 5). Three OPs were detected. Malathion was most frequently detected of these, with a 14% detection frequency (with trace detections, 25%). Diazinon and chlorpyrifos were also infrequently detected, with a 6.5% and 4.5% detection frequency, respectively. The reduced urban detections of diazinon and chlorpyrifos over past sampling (Gilliom 2006) are likely due to the drastic reduction of these insecticides in urban areas (US EPA 2010a, 2010b). The only other insecticide detected in the study was oxamyl (a carbamate), detected once in a water sample from southern California.

The most frequently detected herbicides were 2,4-D, triclopyr, dicamba, diuron, MCPA, and pendimethalin (Figure 6). 2,4-D was the most frequently detected pesticide in this study and as a group, the synthetic auxin herbicides (2,4-D, triclopyr, dicamba, and MCPA) were frequently detected in all areas but SDR. MCPA was also rarely detected in OC. For urban use, these four herbicides have similar uses and application timings. Frequency of detection ranged from 23% (MCPA) to 65% (2,4-D); detection frequency increased from 30% - 72% if trace detections are considered. Diuron was also frequently detected (30% detection frequency; with trace detections, 57%).

The dinitroaniline herbicides pendimethalin, oryzalin, and prodiamine were also detected, albeit less frequently than the synthetic auxins and diuron. Their detection frequency ranged from 8% - 20% and if trace detections are considered, detection frequency increased to 21% - 37% (Figure 6). Of these, pendimethalin had much higher detection frequency in SAC (54% detection frequency) than in other areas (SFB was second highest, with 19% detection frequency). Prodiamine was only detected in northern California. Simazine, prometuron, and oxyfluorfen were detected less than 5% of the time.

Pesticides detected in sediments

We did not detect chlorpyrifos in any sediment samples, but pyrethroids were abundant. All of the sediments contained at least one pyrethroid, over half contained at least five pyrethroids (median), and up to eight different pyrethroids were detected in one sediment sample (Figure 7, A). Bifenthrin was the most frequently detected pyrethroid; it was detected in all but two sediment samples. Sediment also commonly contained cyfluthrin, permethrin (both cis and trans isomers), deltamethrin λ-cyhalothrin, and cypermethrin; in addition esfenvalerate/fenvalerate and resmethrin were detected (Figure 7, B).

Appendix I contains the complete analytical results (for both water and sediment) for the study (Tables A2-A10).

The effect of waterbody type (storm drain vs. creek receiving water) on pesticide detections in urban surface waters.

There were little differences between detection frequencies between storm drain outflows and receiving waters, with most pesticides having less than 10% difference between these two different water bodies (Figure 8). Bifenthrin was the main exception. Bifenthrin had a 64% detection frequency in stormdrain outflows but only a 36% detection frequency in receiving waters. Except for bifenthrin and pendimethalin, there were less than 10% differences between detections in receiving waters and stormdrain outflows. For most pesticides, sampling at stormdrain outflows gives a good representation of urban runoff and is often easier and safer to sample than from larger receiving waters. Other pyrethroids may behave like bifenthrin, but we did not have sufficient detections in water to make this determination.

In addition, there were no significant differences in the median number of pesticides detected per sample between stormdrain outflows and receiving waters (median 3.0 and 2.5, respectively; p=0.584).

The effect of season (dryflow vs. rainstorm) on pesticide detections in urban surface waters.

Generally, we detected more pesticides during rainstorms than during dryflow sampling. Fipronil (and degradates) were a main contradiction; these were detected frequently during both dryflow and rainstorm events (Figure 9). This was biased by detections from OC, where dryflow sampling had high detections of fipronil (71% detection frequency) and its degradates (up to 77% detection frequency). Although first flush detections (first rainstorm of the water year) gave the highest detection frequencies in northern California and in San Diego, this was not true in Orange County. Detections of fipronil (and degradates) during the first flush in Orange County had similar detection frequencies as several of the dryflow sampling events. However, regardless of rain or dryflow sampling, detections from northern California correlated well with PUR use (r^2=75%; p=0.006) but detections from southern California did not (r^2=28%; p=0.08). The poor correlation in southern California was likely due to few detections with low to moderate use in San Diego and to high detections in Orange County with moderate use. Although fipronil runoff can be influenced by rainfall, it also behaves as other urban use pesticides that show a continuous load independent of rain events (Wittmer et al. 2011). The use of pesticides that have a continuous load into urban surface waters may be a concern. To prevent runoff, overall use would need to decrease, not just use during the rainy season. As fipronil use increases, runoff into urban surface waters will likely increase, regardless of season.

All other detected pesticides had detection frequencies between 18-69% higher during rainstorm sampling than during dryflow sampling. Bifenthrin was most frequently detected pesticide during rainstorms. Although bifenthrin has higher reported use during dry weather than during the rainy season (CDPR 2010)[2], detections were higher during

[2]Although we cannot account for homeowner use, this use likely follows application timings made by professional applicators.

rainstorm sampling. Bifenthrin had a 97% detection frequency during rain sampling compared to a 28% detection frequency during dryflow. Rain runoff may be initially driving bifenthrin into the water via sediment and organic carbon and keeping it suspended. Bifenthrin is known to be tightly bound to sediment and organic carbon. During rainstorm sampling events, the median concentrations of TSS, TOC, and turbidity were significantly higher than these parameters taken during dryflow sampling (p=0.0000-0.0035).

Herbicides were more frequently detected during rain sampling than during dryflow sampling. We had detection frequencies between 26-46% higher during rain sampling (Figure 9). In California, many herbicides are applied during the rainy season for residual weed control and would be less effective applied at other times of the year. Applications during the rainy season increase runoff into surface waters. Two of the herbicides we frequently detected, diuron and pendimethalin, had their highest use and detections during the rainy season (Figure 10). As use decreased in the spring through summer, the number of detections also decreased. Both diuron and pendimethalin had a good correlation between use and detections (r^2=85%, p=0.001 and r^2=94%, p=0.01, respectively). Synthetic auxin herbicides also had higher detections frequencies when sampled during rainstorm events than during dryflow. Synthetic auxins are used late in the rainy season (March – May) to control flushes of germinated weeds but they also have use in the summer months. Although our detections frequencies are higher during rain runoff, we also detected synthetic auxins in dryflow sampling. We did not have a good correlation between reported use and detections, possibly due to unreported homeowner use or to the persistence of some of these herbicides when applied in the late summer (Figure 10; August, September) and then are detected in some of the first rainfalls of the season (October, November).

Differences between the number of pesticides per sample during dryflow and rainstorm sampling give additional evidence that pesticides tend to runoff into urban surface waters when it rains. The median number of pesticides detected per sample during a rainstorm event was significantly greater than samples collected during dryflow (median 7.0 and 1.0, respectively; p=0.000).

Comparison of Pesticide Concentrations to Aquatic Toxicity Benchmarks

Established aquatic toxicity benchmarks can be used to interpret monitoring data and prioritize sites and pesticides for further investigation (US EPA 2010c). For this analysis, we used acute benchmarks available from US EPA OPP. But for pyrethroids we used established *H. azteca* LC_{50}s (where available) due to the sensitivity of this organism to pyrethroids (Anderson et al. 2006, Weston and Jackson 2009). In water samples, we detected eleven pesticides above their benchmarks or LC_{50}s (Table 2). In all, 76% of the sampling sites had at least one pesticide above its benchmark/LC_{50}. This value comparable to the 83% value for urban streams as stated by Gilliom et al. (2006) during a 10 year review (1992-2001) of USGS data. Any differences are likely due to changes in urban insecticide use that has occurred (decreased chlorpyrifos and diazinon use offset with increased pyrethroid use), as well as different sampling sites and monitoring regimes. Of OPs, we only detected chlorpyrifos twice above its benchmark value and malathion once, all in northern California. Pyrethroids (mostly bifenthrin), fipronil, and

diuron were the only other pesticides detected at concentrations above their toxicity benchmarks. None of the other pesticides were detected above their benchmarks.

Pyrethroids were frequently detected above their LC_{50}s and this group of pesticides had the highest percentage of detections with the potential to be toxic to sensitive aquatic organisms. Pyrethroids are highly hydrophobic and associate with the dissolved organic carbon and suspended sediment in water samples which may limit their bioavailability. Taking these factors into consideration with the equation by Spurlock et al. (2005) and using the K_{oc} value of 240000 (NPIC 2011), the bioavailability of bifenthrin ranged between 14% - 58% of the total concentrations. With these values, we would expect that approximately 20% of the bifenthrin detections would be toxic to *H. azteca*. However, K_{oc} values are highly variable. For bifenthrin, Laskowski (2002) lists a range of K_{oc} values from 116000 – 888000 ml g^{-1}. Based on this range of uncertainty in K_{oc}, the estimated fraction of bifenthrin detections with bioavailable concentrations sufficiently high to cause toxicity to *H. azteca* ranged between 3% and 30%. We cannot know precisely what the overall toxic potential for bifenthrin was in the urban waterways where we sampled. However, it is likely that some of the bifenthrin would have been available for uptake and toxicity to sensitive aquatic species in these waterways.

Although infrequently detected, cyfluthrin, cypermethrin, λ-cyhalothrin, and esfenvalerate were all detected above their respective benchmarks/LC_{50}s. Half of all the permethrin detections were also above its benchmark (Table 2, estimated bioavailability)

Fipronil had the second highest number of detections above its US EPA toxicity benchmark, with 20 detections (13% of all fipronil detections). Most of these detections above the benchmark (80%) were from OC, mostly during dryflow sampling. The fipronil degradates FP sulfone (MB46136) and FP sulfide (MB45950) are more toxic than fipronil itself (FAN 2010) even though fipronil has a lower benchmark. Using EPA benchmark values, Mize (et al. 2008) estimated LC_{50} values for the sulfone and sulfide degradates to be 0.06 and 0.22 µg L^{-1}, respectively, for sensitive species. Using these LC_{50}s, FP sulfone was detected 36 times (23% of FP sulfone total detections, mostly in OC) over its LC_{50}. Likely FP sulfone has the potential to contribute to toxicity in these waters. No other fipronil degradates were detected above benchmarks (we could not find any toxicity values for desulfinyl FP or desulfinyl FP amide). This data also indicates that most of the potential toxicity of fipronil was in OC.

Diuron was the only herbicide that was detected above its US EPA benchmark for non-vascular plants. Eight water samples (5% of total) contained concentrations above its benchmark; all were detected in northern California, mostly during rainstorm sampling. In past work, the potential importance of diuron toxicity to the overall food chain has been overshadowed by pesticides that cause toxicity to aquatic invertebrates (Munn et al. 2006, Sprague and Nowell 2008). The ecological importance of diuron toxicity to phytoplankton is not well understood (Jassby et al. 2003, Miller et al. 2005, Sommer et al. 2007).

In pesticide risk assessment, toxicity is usually based on exposure to one stressor or contaminate. However, it is more common for aquatic organisms to be exposed to multiple stressor or contaminants, often in complex mixtures of herbicides and insecticides. For example, our results show that 50% of the water from one site contained 3 or more pesticides, 25% of the sites contained six or more pesticides, and 15% of the sites contained eight or more pesticides. Other work has shown similar results (Gilliom 2006). The accumulated number of pesticides found at one time likely has a negative effect on overall stream health. Generally, pesticides within the same pesticide class (with a common mode of action) are likely to have an additive effect whereas pesticides from different chemistry classes are likely to have more varied effects, such as synergism or antagonism (Lydy and Belden 2006). However, little is known about interactions among multiple pesticides on the toxicity to aquatic organisms as all chemical combinations (pairs, triplets, etc.) are impossible to investigate (Lydy and Belden 2006). These combinations, in addition to other chemical contaminants (e.g., metals and salts) and physical stressors (as dissolved oxygen concentrations, temperature, and habitat degradation) likely interact to degrade natural habitats. Our work suggests that multiple pesticide stressors are common occurrences in urban surface waters and that toxicity tests should investigate these interactions.

Water Quality

Water temperature, pH, EC, turbidity, DO, TSS, and TOC were measured in this study. DO, pH, and EC have specific water quality objectives and generally were within water quality objectives. DO exceeded water quality objectives 20% of the time but pH and EC only exceeded the objectives 2% and 9% of the time, respectively. Median concentrations of turbidity (3.1 NTU), TSS, and TOC were low (6.6 and 7.8 ppm, respectively). There were little differences in water quality between stormdrain outflows and receiving waters but there were some water quality differences between northern and southern California, and between dryflow and rain runoff. All of the water quality parameters can be found in the Appendix I, Tables A11 - A15.

Quality Control

Quality control was acceptable for the study. Ninety-eight percent of all matrix and propazine spikes were recovered within acceptable levels and there were no detections in the lab blanks. Appendix II has more detailed information about quality control.

IV. CONCLUSIONS

The main conclusions from the study are listed below.

1. Urban water bodies contain numerous pesticides at any given time. We detected 30 different pesticides and degradates. The main insecticides detected in water samples were bifenthrin, fipronil, fipronil sulfone, carbaryl, desulfinyl fipronil, and malathion. The main herbicides detected were 2,4-D, triclopyr, dicamba, diuron, MCPA, and pendimethalin.

2. Urban surface waters often contain more than one pesticide. Fifty percent of the sampled waters had three or more pesticides and 25% of the sampled waters had six or more pesticides.
3. Fipronil, fipronil sulfone, desulfinyl fipronil, and carbaryl occur at higher frequencies in Orange County (greater Los Angeles area) than in other areas of California.
4. San Diego area had fewer pesticide detections than did other areas of the study.
5. Diazinon and chlorpyrifos are still detected in urban waters, albeit infrequently.
6. Pyrethroids are found in urban surface waters. Bifenthrin is the main pyrethroid (56% detection frequency) followed by permethrin (10% detection frequency). In urban surface waters, only about one-third of the pyrethroid concentration is bioavailable to aquatic organisms.
7. Sediments contain numerous pyrethroids and pyrethroids are more likely to occur in sediments than in water. Bifenthrin was most frequently detected (95% detection frequency), but cyfluthrin, cypermethrin, deltamethrin λ-cyhalothrin, and permethrin were common contaminants of urban sediments (32%-78% detection frequency).
8. Rainstorms drive most pesticides into urban surface waters. Bifenthrin, diuron, MCPA, 2,4-D, malathion, dicamba, triclopyr, pendimethalin, and carbaryl are more frequently found during rain runoff than during dryflow sampling.
9. Fipronil (and degradates) can be found frequently in urban surface waters during dryflow. Although rain may increase runoff, it is not needed to transport fipronil into urban surface waters.
10. Pesticides are detected in storm drain outflows and receiving waters with about equal frequency, except for bifenthrin (and perhaps other pyrethroids). Bifenthrin is more commonly found in stormdrain outflows than in receiving waters.
11. Bifenthrin, fipronil, and diuron are detected in water at concentrations that potentially could be toxic to aquatic life. Other pyrethroids are infrequently detected but at concentrations that potentially could be toxic to aquatic organisms. Fipronil sulfone may also have toxicological concerns.

From this work, we can make recommendation for future research:

1. Southern California, and especially the Orange County area, had high detections of insecticides. Other high urban use insecticides (i.e., imidacloprid) should be monitored to determine the extent of total insecticide runoff. We also had little storm runoff data for bifenthrin in Southern California; additional monitoring of bifenthrin during rainstorm events is warranted. Bioavailable concentrations of bifenthrin need to be estimated in monitoring studies.
2. Determine if other high urban use pesticides, like the fungicide chlorothalonil, are common contaminants of urban surface waters.
3. More work in the San Diego area is warranted to determine if the low level of detections are typical to this area. Future studies in the San Diego area should look at additional neighborhoods and creek sites to determine the extent of pesticide runoff.
4. Additional monitoring of fipronil during dryflow is warranted to determine if runoff is related to use rather than rainfall. Sampling should occur monthly, at the end of the month, to correspond with PUR monthly use summaries.
5. Determine if diuron and pendimethalin detections during rainy season occur only during rain runoff or if they are common in the rainy season when it is not raining.

6. Conduct toxicity testing with two-way and three-way mixtures of pesticides commonly found in urban waters. Tests should include algae and aquatic invertebrates common to California.

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Table 1. Pesticides analyzed by the California Department of Food and Agriculture in water or sediment, with their method detection and reporting limits, and holding times. Specific methods can be found at http://www.cdpr.ca.gov/docs/emon/pubs/em_methd_main.htm.

Analyte Group (method)		Method Detection Limit (µg L^{-1})	Reporting Limit (µg L^{-1})	Holding time (days)
Carbamate Insecticides (HPLC; method EMON-SM 11.3)				
Analytes: aldicarb, aldicarb sufoxide, aldicarb sulfone, methomyl, carbofuran, 3-OH carbofuran, carbaryl, oxamyl, methiocarb		0.01 – 0.02	0.05	28 (acidified)
Fipronil Insecticides (GC/MSD in SIM mode; method EMON-SM 05-013)				
Analytes: fipronil (FP), desulfinyl FP, desulfinyl FP amide, FP sulfide, FP sulfone, FP amide		0.003 – 0.005	0.05	14
Organophosphorus Insecticides in Water (method EMON-SM 46-0)				
Analytes by GC/FPD: azinphos methyl, dichlorvos, dimethoate, disulfoton, ethoprop, fenamiphos, fonofos, malathion, methidathion, methyl parathion, phorate, profenofos, tribufos (plant growth regulator - defoliant)		0.008 – 0.0142	0.03 – 0.05	7
Analytes by GC/MS: chlorpyrifos, diazinon		0.0008 – 0.0012	0.01	7
Pyrethroid Insecticides (GC-ECD; water method, EMON-SM 05-003; sediment method EMON-SM 52.9)				
Analytes: bifenthrin, cyfluthrin, cypermethrin, deltamethrin/tralomethrin, esfenvalerate/fenvalerate, fenpropathrin, λ-cyhalothrin, permethrin (cis, trans), resmethrin	Water	0.001 – 0.008	0.005 – 0.015	4
	Sediment (µg kg^{-1})	0.107 – 0.183	1.0	183
Triazine/Triazinone/Uracil/Urea Herbicides (LC/MC/MC; method EMON-SM 62.9)				
Analytes: atrazine, ACET (deisopropyl atrazine), bromacil, DACT (diamino chlorotriazine), DEA (deethyl atrazine), diuron, hexazinone, metribuzin, prometon, prometryn, simazine and norflurazon (a phytoene desaturase inhibitor)		0.01 – 0.04	0.05	14

Table 1 continued.

Synthetic Auxin Herbicides (GC/MS; method EMON-SM 05-012)			
Analytes: 2,4-D, dicamba, MCPA, triclopyr	0.064	0.1	12
Dinitroaniline Herbicides (GC/TQMS or LCQ; method EMON-SM 05-006)			
Analytes: benfluralin, ethalfluralin, oryzalin, pendimethalin, prodiamine, trifluralin, oxyfluorfen (diphenyl ether herbicide)	0.0048 – 0.015	0.05	14

Table 2. Detection frequencies (above reporting limits) of pesticides detected above US EPA benchmark or commonly accepted LC_{50} values in water samples (N = 155; pyrethroids, N = 72).

Pesticide	Benchmark ($\mu g\ L^{-1}$)[A]	Detection Frequency (DF)	
		DF for the Study	DF greater than benchmark or LC_{50}
Diuron	2.4	30%	5%
Fipronil (FP)	0.11	30%	13%
FP sulfone	0.36	27%	0.6%
Chlorpyrifos	0.05	4.5%	1.3%
Malathion	0.3	14%	0.6%
	Benchmark or LC_{50} ($ng\ L^{-1}$)		--Pyrethroid DF above estimated bioavailable concentration[E]--
Bifenthrin[B]	7.7	56%	20%
Permethrin[A,C]	10	11.1%	5.6%
Cyfluthrin[B]	2.3	1.4%	1.4%
λ-Cyhalothrin[A]	3.5	1.4%	1.4%
Cypermethrin[B]	2.3	4.2%	4.2%
Esfenvalerate[A, D]	25	1.4%	1.4%

[A] Lowest acute fish or invertebrate benchmark (US EPA 2010c)
[B] *Hyalella azteca* LC_{50} (Weston and Jackson 2009)
[C] Both cis and trans isomers
[D] Analysis does not differentiate between esfenvalerate and fenvalerate
[E] Using equation from Spurlock et al. (2005) and K_{oc} values from PPDB (2011) and NPIC (2011).

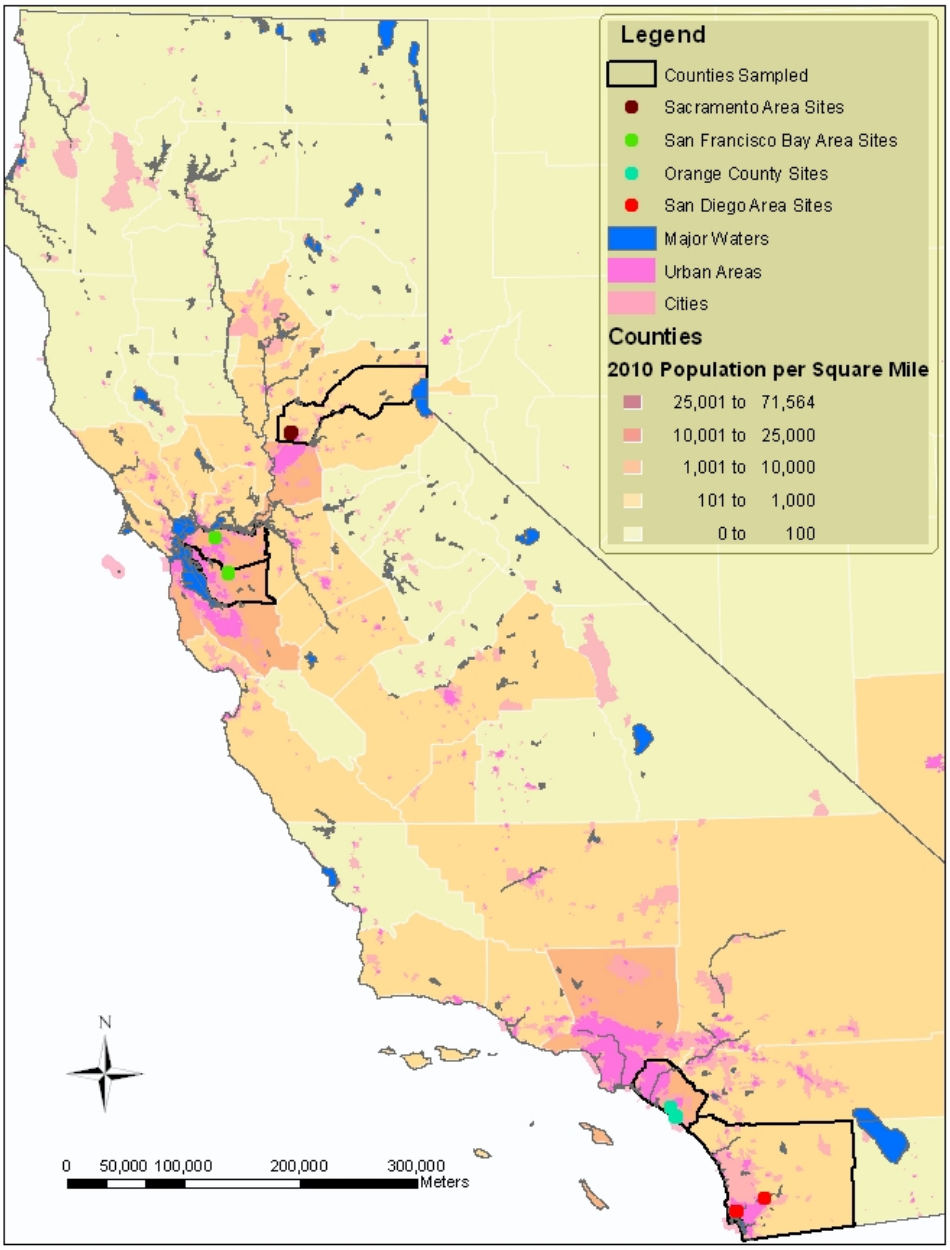

Figure 1. Sampling sites for CDPR's urban monitoring project in the Sacramento, San Francisco Bay, greater Los Angeles (Orange County), and San Diego areas, California.

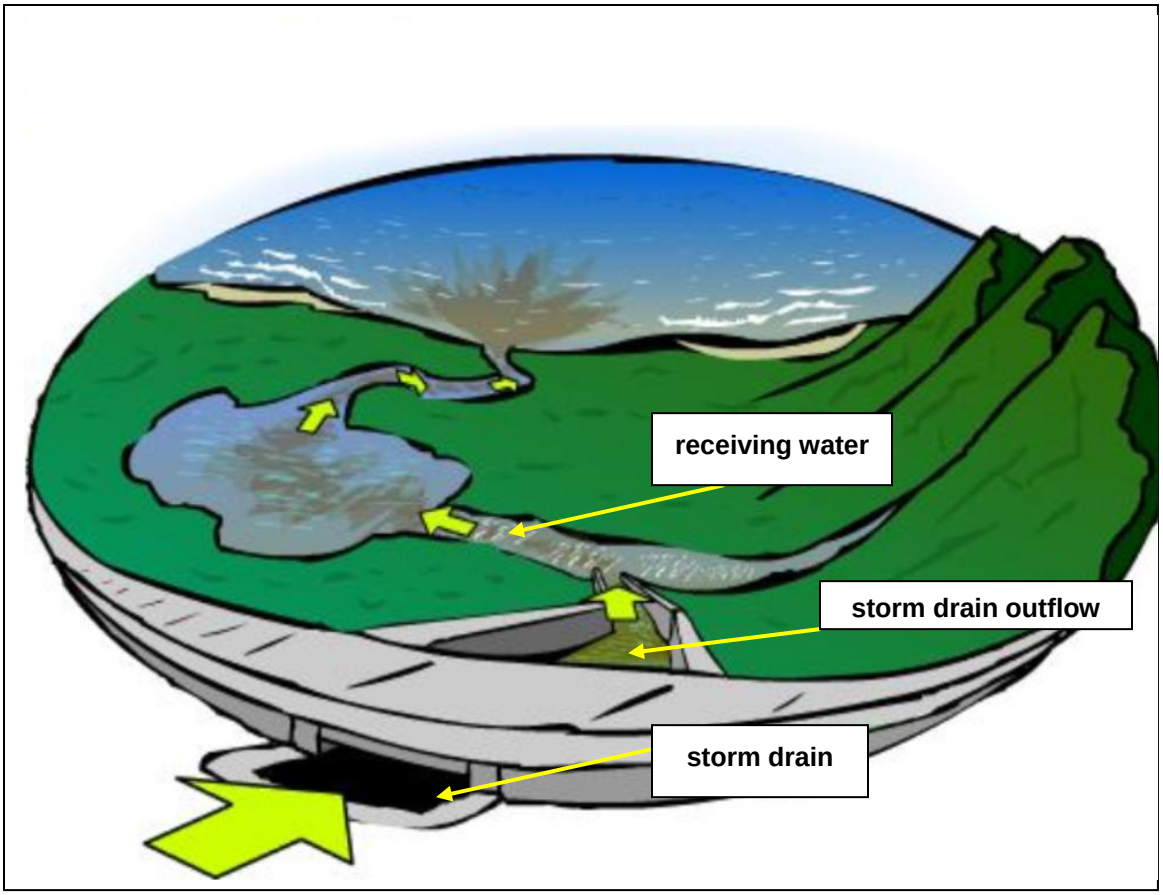

Figure 2. Cartoon depicting a storm drain outflow and receiving water (*from* http://www.stormwater.co.trumbull.oh.us/).

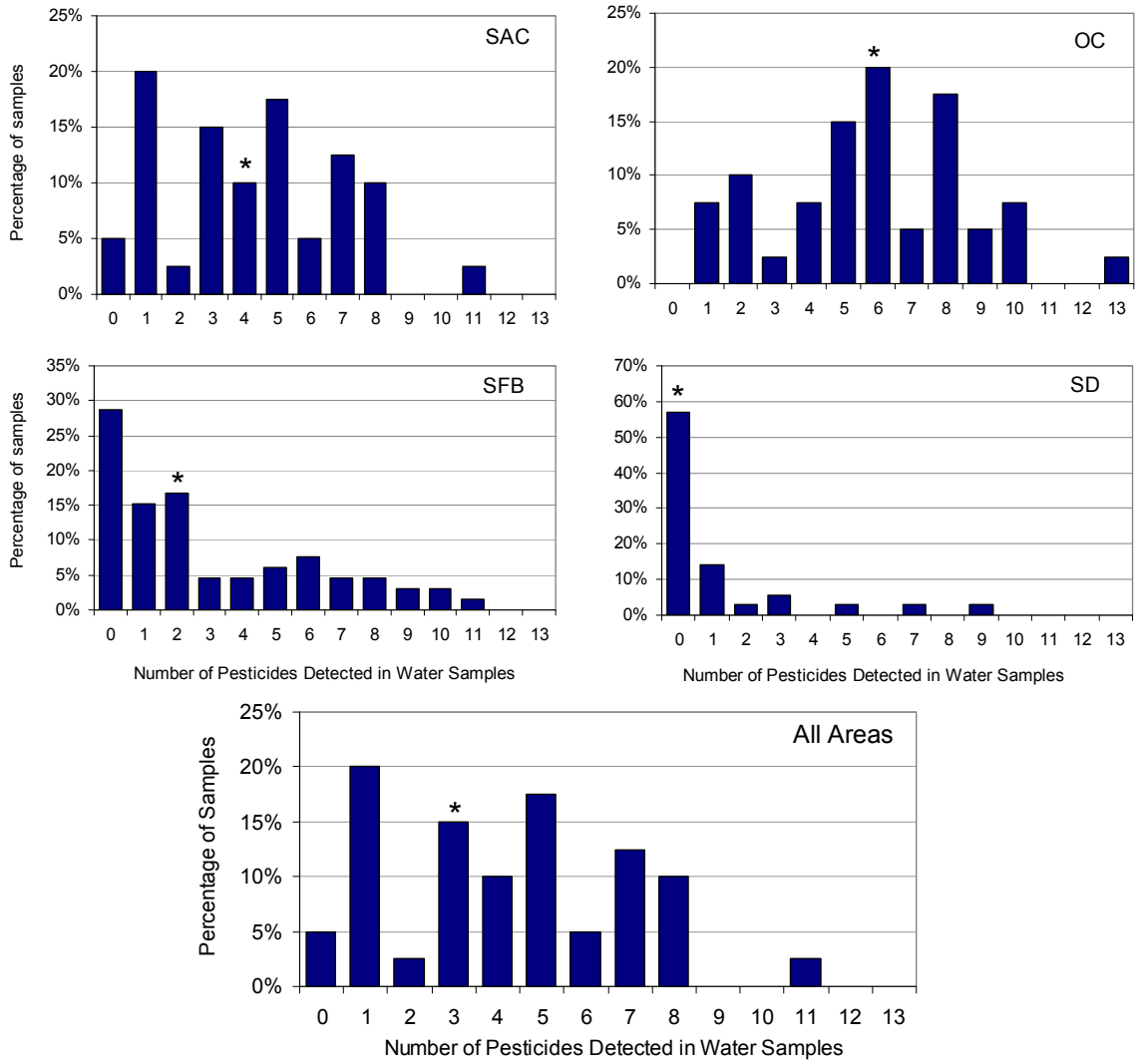

Figure 3. Number of pesticides detected in water samples collected from urban creeks and storm drain outflows in the four different sampling areas of California (Sacramento [SAC], San Francisco Bay [SFB], greater Los Angeles [OC], and San Diego [SD] areas of California, USA) and in samples combined from all four sampling areas. All detections were above the analytical reporting limit; * indicates the median number of pesticides detected per water sample.

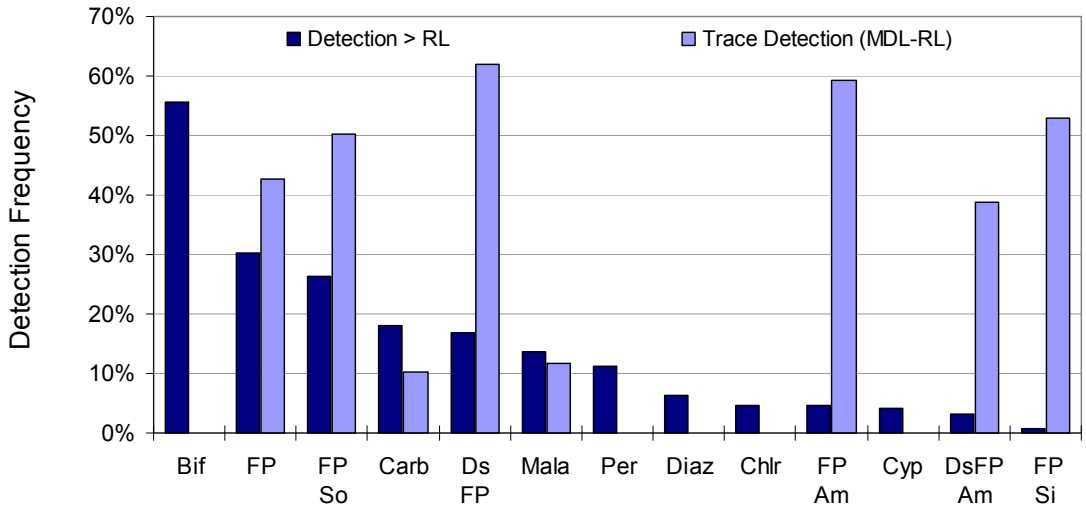

Figure 4. Detection frequency of insecticides from all sampling areas of California between April 2008 and August 2009. Bif, bifenthrin; FP, fipronil; FP So, FP sulfone; Carb, carbaryl; Ds FP, desulfinyl FP; Mal, malathion; Per, cis and trans-permethrin; Diaz, diazinon; Chlr, chlorpyrifos; FP Am, FP amide; Cyp, cypermethrin; Ds FP Am, DSFP amide; FP Si, FP sulfide. There was also one detection each of cyfluthrin, λ-cyhalothrin, esfenvalerate/fenvalerate, and oxamyl. RL, reporting limit; MDL, minimum detection limit.

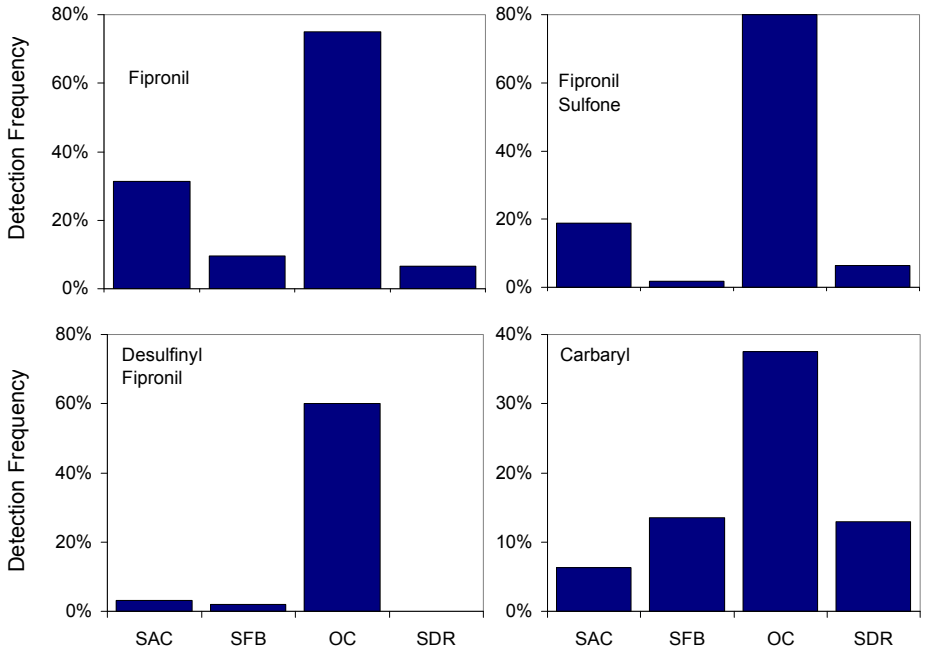

Figure 5. Detection frequency of fipronil, fipronil sulfone, desulfinyl fipronil, and carbaryl in the four different sampling areas of California (Sacramento [SAC], San Francisco Bay [SFB], greater Los Angeles [OC], and San Diego [SD] areas of California, USA). All detections were above the analytical reporting limit.

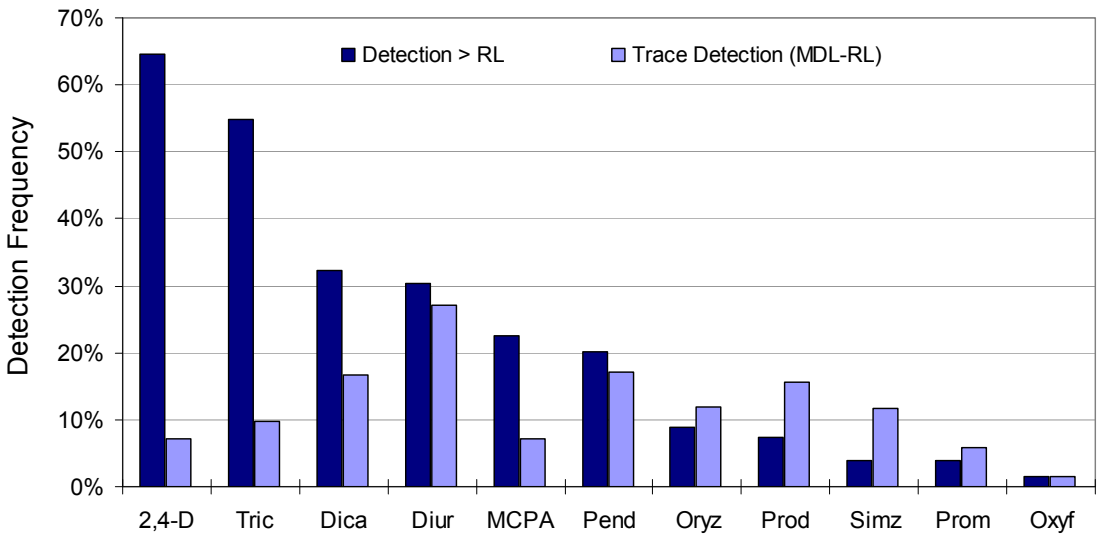

Figure 6**.** Detection frequency of herbicides from all sampling areas of California between April 2008 and August 2009. Tric, triclopyr; Dica, dicamba; Diur, diuron; Pend, pendimethalin; Oryz, oryzalin; Prod, prodiamine; Simz, simazine; Prom, prometon; Oxyf, oxyfluorfen. There was also one detection of ACET (deisopropyl atrazine), one trace detection of bromacil, and one trace detection of trifluralin. RL, reporting limit; MDL, minimum detection limit.

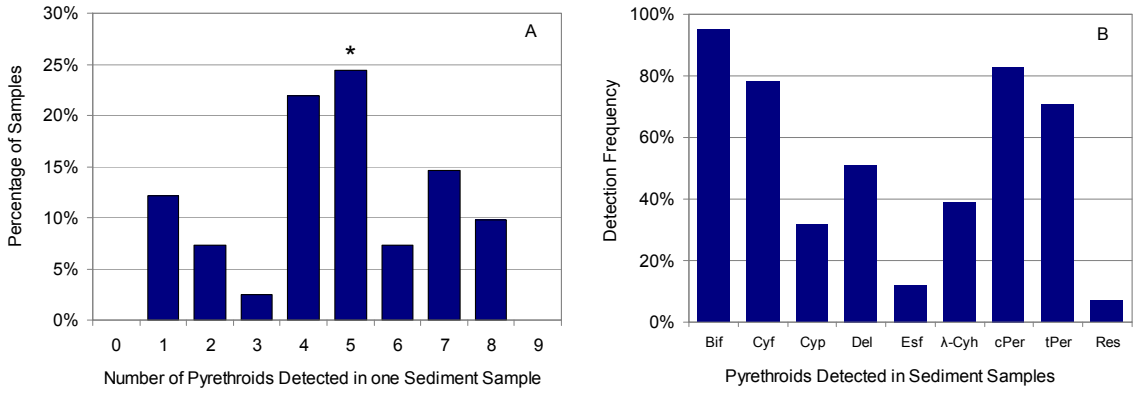

Figure 7. Detections of pyrethroids in sediments from all sampling areas of California. A, percentage of pyrethroid detections per sample (* indicates the median number of pyrethroids detected). B, detection frequency of pyrethroids in sediment samples (Bif, bifenthrin; Cyf, cyfluthrin; Cyp, cypermethrin; Del, deltamethrin; Esf, fenvalerate/esfenvalerate; λ-Cyh, λ-cyhalothrin; cPer, tPer, cis- and trans- permethrin; Res, resmethrin).

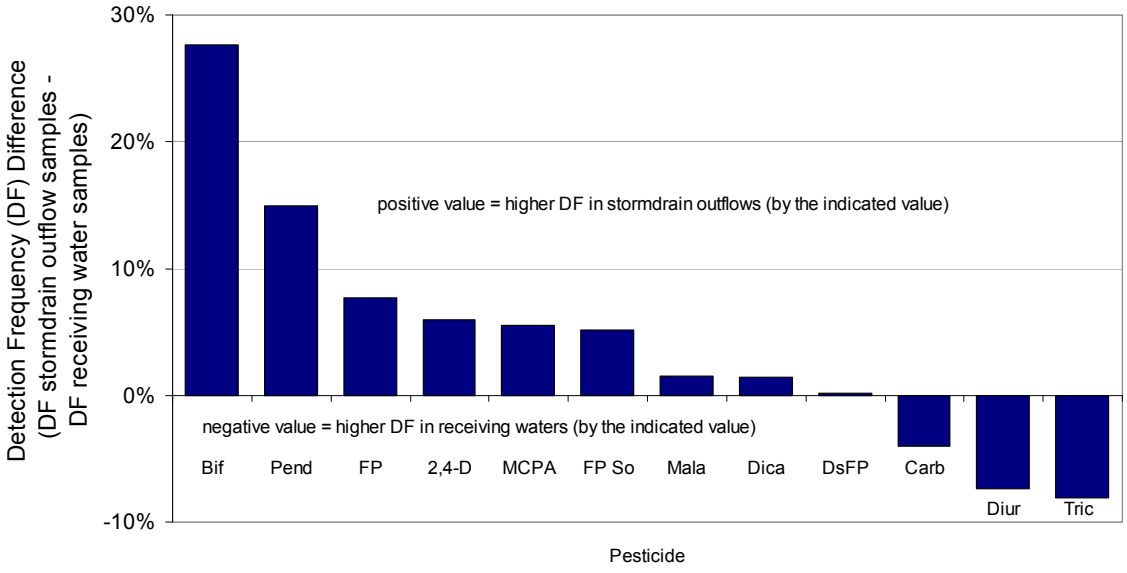

Figure 8. The influence of waterbody on frequency of pesticide detections. Detection Frequency (DF) differences were determined by subtracting the detection frequency of stormdrain outflow samples from the detection frequency of receiving water (DF receiving water – DF stormdrain outflow). Thus, a positive value on the y-axis (Detection Frequency Difference) indicates higher detection frequency in stormdrain outflows and a negative value indicates a higher detection frequency in receiving waters. Bif, bifenthrin; Pend, pendimethalin; FP, fipronil; FPSo, FP sulfone; Mala, malathion; Dica, dicamba; DsFP, desulfinyl FP; Carb, carbaryl; Diur, diuron; Tric, triclopyr. Only pesticides or degradates detected with a greater than 10% detection frequency during the entire study are included in the figure.

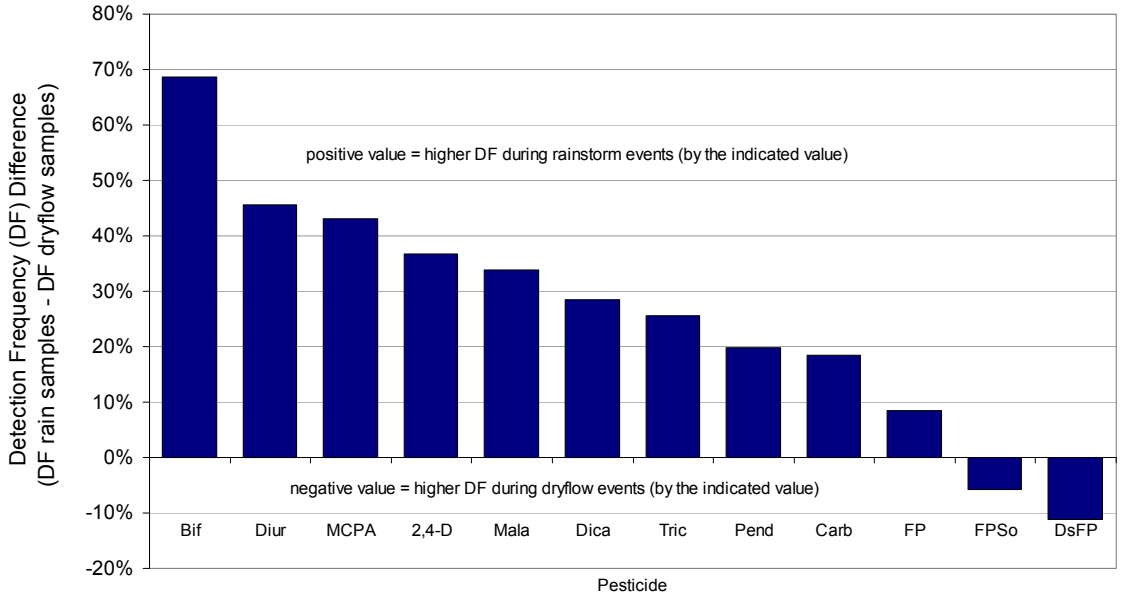

Figure 9. The influence of rain on frequency of pesticide detections. Detection Frequency (DF) differences were determined by subtracting the detection frequency of dryflow samples from the detection frequency of rainstorm samples (DF rainstorm – DF dryflow). Thus, a positive value on the y-axis (Detection Frequency Difference) indicates higher detection frequency during rainstorm sampling (by the indicated value) and a negative value indicates a higher detection frequency during dryflow sampling). Bif, bifenthrin; Diur, diuron; Mala, malathion; Dica, dicamba; Tric, triclopyr; Pend, pendimethalin; Carb; carbaryl; FP, fipronil; FPSo, FP sulfone; DsFP, desulfinyl FP. Only pesticides or degradates detected with a greater than 10% detection frequency during the entire study are included in the figure.

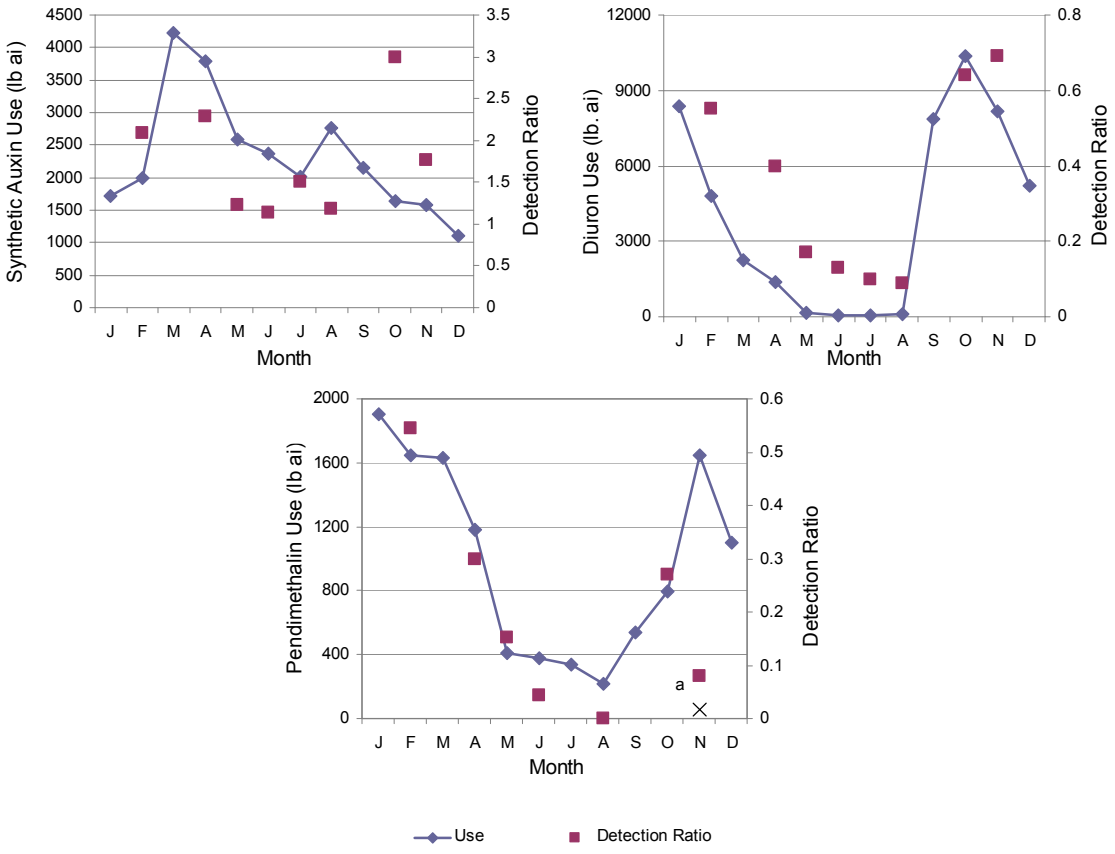

Figure 10. PUR reported use of diuron, pendimethalin, and synthetic auxin herbicides (2,4-D, dicamba, MCPA, and triclopyr) and their detection ratios. The detection ratio is the number of detections (greater than the reporting limit) per number of sampling events for that particular month. A detection frequency of 1.0 indicates that one pesticide was detected at one site. PUR use data was an average of 2008 – 2009 for the counties sampled, except: point a (pendimethalin), sampled only in southern California, x indicates actual use for the collected samples and this data was used in the correlation.

VI. APPENDIX I. DATA

Appendix I contains data for the urban study, April 2008 – August 2009. Abbreviations commonly used in the Appendix tables:

Abbreviation	Definition
FP	fipronil
mv	missing value, not data available or site not sampled
nd	not detected
ppm	parts per million (mg L^{-1})
RW	receiving water
StDr	storm drain outflow
tr	trace detection (below the reporting limit but above the minimum detection limit).

Table A1. Characteristics of the sampling sites in Study 249.

Watershed	Site Location	Site ID	Site Type	Urban Land Use	Approx-imate Area (Acres)	Approximate Residence Number	Datum: WGS84 (Decimal degrees)		City	County
							Longitude	Latitude		
Grayson Creek	Shadowood Park between Chilpancingo Parkway and 2nd Avenue South	GRY010	Storm Drain	Mixed residential and commercial	320	600	37.97967	-122.06878	Martinez/ Pleasant Hill	Contra Costa
Grayson Creek	Blackwood Ave. and 2nd Ave South	GRY020	Storm Drain	Mixed residential and commercial	670	1200	37.98097	-122.06929	Martinez/ Pleasant Hill	Contra Costa
Grayson Creek	Grayson Creek at Center Avenue	GRY030	Receiving Water	Mixed residential and commercial			37.983549	-122.0685	Martinez/ Pleasant Hill	Contra Costa
Martin Canyon/ Koopman Canyon Creek	Donohue Drive at Fire Station	MCC010	Storm Drain	Mostly residential	500	1300	37.70922	-121.93335	Dublin	Alameda
Martin Canyon/ Koopman Canyon Creek	End of Millbrook Avenue	MCC020	Storm Drain	Mostly residential	225	650	37.71668	-121.93524	Dublin	Alameda
Martin Canyon/ Koopman Canyon Creek	Dublin Blvd by Safeway and I-680	MCC030	Storm Drain	Mixed residential and commercial	290	450	37.70686	-121.92711	Dublin	Alameda
Martin Canyon/ Koopman Canyon Creek	Dublin Blvd by Safeway and I-680	MCC040	Receiving Water	Mixed residential and commercial			37.706412	-121.92669	Dublin	Alameda
Pleasant Grove Creek	Dr. Paul J. Dugan Park on Diamond Woods Circle	PGC010	Storm Drain	Mostly residential	50	250	38.80477	-121.32733	Roseville	Placer

Table A1 continued.

Watershed	Site Location	Site ID	Site Type	Urban Land Use	Approx-imate Area (Acres)	Approximate Residence Number	Datum: WGS84 (Decimal degrees)		City	County
Pleasant Grove Creek	Opal and Parkside Way, righthand side of stream	PGC020	Storm Drain	Mostly residential	150	450	38.80232	-121.33855	Roseville	Placer
Pleasant Grove Creek	At Crocker Ranch Road	PGC030	Storm Drain	Mostly residential	85	300	38.79908	-121.34698	Roseville	Placer
Pleasant Grove Creek	At Veteran's Memorial Park	PGC040	Receiving Water	Mostly residential			38.79857	-121.34802	Roseville	Placer
Salt Creek	South neighborhood (contributing)	SC 1	Storm Drain	Mostly residential	96	460	33.50908	-117.6907	Laguna Nigel	Orange
Salt Creek	North neighborhood (contributing)	SC 3	Storm Drain	Mostly residential	120	245	33.51197	-117.6971	Laguna Nigel	Orange
Salt Creek	Below Niguel Road bridge	SC 5	Receiving Water	Mostly residential			33.50547	-117.709	Laguna Nigel	Orange
Wood Canyon	Above constructed wetland	WC 1	Storm Drain	Mostly residential	NA[1]	NA	33.58247	-117.7453	Aliso Viejo	Orange
Wood Canyon	Below constructed wetland	WC 2	Storm Drain	Mostly residential	194	283	33.58155	-117.7457	Aliso Viejo	Orange
Wood Canyon	South neighborhood (contributing)	WC 3	Storm Drain	Mostly residential	66	307	33.58158	-117.7457	Aliso Viejo	Orange
Wood Canyon	Receiving water below storm drains	AV01	Receiving Water	Mostly residential			33.58131	-117.74585	Aliso Viejo	Orange
San Diego River	At Fashion Valley Road	SDR101	Receiving Water	Mixed residential and commercial			32.76436	-117.1701	San Diego	San Diego
San Diego River	Above Fashion Valley Road	SDR102	Storm Drain	Mixed residential and commercial	NA	NA	32.76528	-117.16914	San Diego	San Diego
San Diego River	At Camino de la Reina	SDR103	Storm Drain	Commercial	NA	NA	32.76568	-117.16511	San Diego	San Diego
San Diego River	Camino de la Reina & Camino Del Arroyo	SDR104	Storm Drain	Mixed residential and commercial	NA	NA	32.76679	-117.15823	San Diego	San Diego

Table A1 continued.

Watershed	Site Location	Site ID	Site Type	Urban Land Use	Approx-imate Area (Acres)	Approximate Residence Number	Datum: WGS84 (Decimal degrees)		City	County
Lindo Lake	At Lindo Lake	SDR151	Storm Drain	Mostly residential	NA	NA	32.85731	-116.9128	Lakeside	San Diego
Lindo Lake	At Lindo Lake	SDR156	Storm Drain	Mostly residential	NA	NA	32.85724	-116.91274	Lakeside	San Diego
Lindo Lake	At Lindo Lake	SDR158	Receiving Water	Mostly residential			32.85715	-116.91314	Lakeside	San Diego

[1]Data not available

Table A2. Detections of insecticides in water samples from Sacramento area sampling sites. Concentrations are in µg L^{-1} unless specified.

Sample Date	Site ID	Waterbody	Sampling Event	Carbaryl	Desulfinyl fipronil	Desulfinyl FP amide	Fipronil	Fipronil amide	Fipronil sulfide	Fipronil sulfone	Chlorpyrifos	Malathion	Bifenthrin (ng L^{-1})	Cyfluthrin (ng L^{-1})	Cypermethrin (ng L^{-1})	Permethrin cis (ng L^{-1})	Permethrin trans (ng L^{-1})
4/21/2008	PGC010	StDr	Dryflow	nd	tr	nd	tr	nd	nd	tr	nd	nd	mv	mv	mv	mv	mv
4/21/2008	PGC020	StDr	Dryflow	0.065	tr	nd	tr	nd	nd	tr	nd	tr	mv	mv	mv	mv	mv
4/21/2008	PGC030	StDr	Dryflow	nd	0.054	tr	0.064	tr	tr	0.118	nd	nd	mv	mv	mv	mv	mv
4/21/2008	PGC040	RW	Dryflow	nd	tr	tr	tr	tr	tr	0.078	nd	nd	mv	mv	mv	mv	mv
6/23/2008	PGC010	StDr	Dryflow	nd	tr	tr	tr	tr	tr	tr	nd	nd	mv	mv	mv	mv	mv
6/23/2008	PGC020	StDr	Dryflow	tr	tr	tr	0.164	tr	tr	tr	nd	nd	mv	mv	mv	mv	mv
6/23/2008	PGC030	StDr	Dryflow	nd	tr	nd	tr	nd	nd	tr	nd	nd	mv	mv	mv	mv	mv
6/23/2008	PGC040	RW	Dryflow	nd	tr	nd	tr	nd	nd	tr	nd	nd	mv	mv	mv	mv	mv
8/4/2008	PGC010	StDr	Dryflow	nd	tr	tr	tr	tr	tr	0.064	nd	nd	mv	mv	mv	mv	mv
8/4/2008	PGC020	StDr	Dryflow	nd	tr	tr	tr	tr	tr	tr	nd	nd	mv	mv	mv	mv	mv
8/4/2008	PGC030	StDr	Dryflow	nd	tr	tr	0.066	tr	tr	tr	nd	nd	mv	mv	mv	mv	mv
8/4/2008	PGC040	RW	Dryflow	nd	tr	tr	0.061	tr	tr	tr	nd	nd	mv	mv	mv	mv	mv
11/1/2008	PGC010	StDr	Rain	tr	tr	tr	0.107	tr	tr	0.059	nd	tr	mv	mv	mv	mv	mv
11/1/2008	PGC020	StDr	Rain	0.129	tr	tr	0.146	tr	tr	0.064	nd	0.357	mv	mv	mv	mv	mv
11/1/2008	PGC030	StDr	Rain	nd	tr	tr	0.064	tr	tr	tr	nd	tr	mv	mv	mv	mv	mv
11/1/2008	PGC040	RW	Rain	tr	tr	nd	tr	tr	tr	tr	nd	tr	mv	mv	mv	mv	mv
2/13/2009	PGC010	StDr	Rain	nd	tr	tr	0.057	tr	tr	tr	nd	tr	203	nd	18.9	nd	nd

Table A2 continued.

Sample Date	Site ID	Waterbody	Sampling Event	Carbaryl	Desulfinyl fipronil	Desulfinyl FP amide	Fipronil	Fipronil amide	Fipronil sulfide	Fipronil sulfone	Chlorpyrifos	Malathion	Bifenthrin (ng L^{-1})	Cyfluthrin (ng L^{-1})	Cypermethrin (ng L^{-1})	Permethrin cis (ng L^{-1})	Permethrin trans (ng L^{-1})
2/13/2009	PGC020	StDr	Rain	nd	tr	tr	0.118	tr	tr	0.058	nd	0.040	48.5	nd	nd	nd	nd
2/13/2009	PGC030	StDr	Rain	nd	tr	tr	0.067	tr	nd	tr	nd	nd	43.6	nd	nd	nd	nd
2/13/2009	PGC040	RW	Rain	nd	tr	nd	tr	nd	nd	tr	nd	nd	17	nd	nd	nd	nd
4/7/2009	PGC010	StDr	Rain	nd	tr	nd	tr	nd	nd	tr	nd	0.048	98.5	nd	nd	nd	nd
4/7/2009	PGC020	StDr	Rain	nd	tr	nd	tr	nd	nd	tr	nd	0.121	19.2	nd	nd	nd	nd
4/7/2009	PGC030	StDr	Rain	nd	tr	nd	tr	tr	nd	tr	nd	nd	46.7	nd	nd	nd	nd
4/7/2009	PGC040	RW	Rain	nd	tr	nd	tr	tr	nd	tr	nd	nd	7.74	nd	nd	nd	nd
4/13/2009	PGC010	StDr	Dryflow	mv	mv	mv	mv	mv	mv	mv	mv	mv	25.7	nd	nd	nd	nd
4/13/2009	PGC020	StDr	Dryflow	mv	mv	mv	mv	mv	mv	mv	mv	mv	8.58	nd	nd	nd	nd
4/13/2009	PGC030	StDr	Dryflow	mv	mv	mv	mv	mv	mv	mv	mv	mv	20.8	18.9	nd	28.5	25.4
4/13/2009	PGC040	RW	Dryflow	mv	mv	mv	mv	mv	mv	mv	mv	mv	nd	nd	nd	nd	nd
5/1/2009	PGC010	StDr	Rain	tr	tr	nd	tr	nd	nd	tr	nd	0.068	20.3	nd	15.1	nd	nd
5/1/2009	PGC020	StDr	Rain	nd	tr	nd	tr	nd	nd	tr	nd	0.064	14.5	nd	nd	nd	nd
5/1/2009	PGC030	StDr	Rain	nd	tr	nd	tr	tr	nd	tr	0.012	0.192	20.1	nd	nd	nd	nd
5/1/2009	PGC040	RW	Rain	tr	tr	nd	tr	nd	nd	tr	nd	0.040	8.87	nd	nd	nd	nd
8/27/2009	GRY010	StDr	Dryflow	nd	nd	nd	nd	tr	tr	tr	nd	nd	nd	nd	nd	nd	nd
8/27/2009	GRY020	StDr	Dryflow	nd	nd	nd	nd	nd	tr	nd	nd	nd	nd	nd	nd	nd	nd
8/27/2009	GRY030	RW	Dryflow	nd	tr	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
8/27/2009	MCC010	StDr	Dryflow	nd	nd	nd	nd	tr	nd	nd	nd	nd	nd	nd	nd	nd	nd
8/27/2009	MCC020	StDr	Dryflow	nd	nd	nd	nd	nd	nd	tr	nd	nd	nd	nd	nd	nd	nd
8/27/2009	MCC030	StDr	Dryflow	nd	nd	nd	nd	tr	nd	nd	nd	nd	nd	nd	nd	nd	nd
8/27/2009	MCC040	RW	Dryflow	nd	nd	nd	nd	tr	nd	nd	nd	nd	nd	nd	nd	nd	nd

Table A3. Detections of insecticides in water samples from San Francisco Bay area sampling sites. Concentrations are in µg L^{-1} unless specified.

Sample Date	Site ID	Waterbody	Sampling Event	Carbaryl	Desulfinyl fipronil	Desulfinyl FP amide	Fipronil	Fipronil amide	Fipronil sulfide	Fipronil sulfone	Chlorpyrifos	Diazinon	Malathion	Bifenthrin (ng L^{-1})	Cypermethrin (ng L^{-1})	Permethrin cis (ng L^{-1})	Permethrin trans (ng L^{-1})
4/22/2008	GRY010	StDr	Dryflow	nd	nd	nd	tr	tr	tr	tr	nd	nd	nd	mv	mv	mv	mv
4/22/2008	GRY020	StDr	Dryflow	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	mv	mv	mv	mv
4/22/2008	GRY030	RW	Dryflow	nd	tr	nd	nd	nd	nd	nd	nd	nd	nd	mv	mv	mv	mv
4/22/2008	MCC010	StDr	Dryflow	nd	nd	nd	nd	tr	nd	nd	nd	nd	nd	mv	mv	mv	mv
4/22/2008	MCC020	StDr	Dryflow	nd	nd	nd	nd	nd	nd	tr	nd	nd	nd	mv	mv	mv	mv
4/22/2008	MCC030	StDr	Dryflow	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	mv	mv	mv	mv
4/22/2008	MCC040	RW	Dryflow	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	mv	mv	mv	mv
6/24/2008	GRY010	StDr	Dryflow	tr	nd	nd	tr	nd	tr	nd	nd	nd	nd	mv	mv	mv	mv
6/24/2008	GRY020	StDr	Dryflow	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	mv	mv	mv	mv
6/24/2008	GRY030	RW	Dryflow	nd	nd	nd	tr	nd	nd	nd	nd	nd	nd	mv	mv	mv	mv
6/24/2008	MCC010	StDr	Dryflow	nd	nd	nd	nd	tr	nd	nd	nd	nd	nd	mv	mv	mv	mv
6/24/2008	MCC020	StDr	Dryflow	nd	tr	nd	nd	nd	nd	nd	nd	nd	nd	mv	mv	mv	mv
6/24/2008	MCC030	StDr	Dryflow	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	mv	mv	mv	mv
6/24/2008	MCC040	RW	Dryflow	nd	nd	nd	nd	tr	nd	nd	nd	nd	nd	mv	mv	mv	mv
8/6/2008	GRY010	StDr	Dryflow	nd	tr	nd	tr	tr	tr	tr	nd	nd	nd	mv	mv	mv	mv
8/6/2008	GRY020	StDr	Dryflow	nd	tr	nd	tr	tr	tr	tr	nd	nd	nd	mv	mv	mv	mv
8/6/2008	GRY030	RW	Dryflow	nd	tr	nd	tr	tr	tr	tr	nd	nd	nd	mv	mv	mv	mv
8/5/2008	MCC010	StDr	Dryflow	nd	tr	tr	tr	tr	tr	tr	nd	nd	nd	mv	mv	mv	mv
8/5/2008	MCC020	StDr	Dryflow	nd	tr	tr	tr	tr	tr	tr	nd	nd	nd	mv	mv	mv	mv
8/5/2008	MCC030	StDr	Dryflow	nd	tr	tr	tr	tr	tr	tr	nd	nd	nd	mv	mv	mv	mv
8/5/2008	MCC040	RW	Dryflow	nd	tr	nd	tr	tr	tr	tr	nd	nd	nd	mv	mv	mv	mv
11/1/2008	GRY010	StDr	Rain	nd	tr	nd	0.061	tr	tr	tr	nd	nd	nd	mv	mv	mv	mv
11/1/2008	GRY020	StDr	Rain	0.294	0.059	nd	0.458	tr	tr	0.085	nd	nd	nd	mv	mv	mv	mv
11/1/2008	GRY030	RW	Rain	0.28	tr	nd	tr	tr	tr	tr	nd	nd	nd	mv	mv	mv	mv
11/1/2008	MCC010	StDr	Rain	nd	tr	nd	0.05	tr	tr	tr	nd	nd	0.075	mv	mv	mv	mv
11/1/2008	MCC020	StDr	Rain	nd	tr	nd	tr	tr	tr	tr	nd	nd	tr	mv	mv	mv	mv
11/1/2008	MCC030	StDr	Rain	tr	tr	nd	0.078	tr	tr	tr	nd	nd	tr	mv	mv	mv	mv
11/1/2008	MCC040	RW	Rain	nd	tr	nd	tr	tr	tr	tr	nd	nd	nd	mv	mv	mv	mv
2/15/2009	GRY010	StDr	Rain	nd	tr	nd	tr	tr	tr	tr	0.0104	nd	nd	16.2	nd	nd	nd
2/15/2009	GRY020	StDr	Rain	nd	tr	nd	tr	tr	tr	tr	nd	0.0547	nd	32.6	nd	nd	15.5
2/15/2009	GRY030	RW	Rain	nd	tr	nd	tr	tr	nd	tr	0.0228	0.0388	nd	23.4	nd	nd	nd
2/15/2009	MCC010	StDr	Rain	nd	tr	nd	tr	tr	nd	tr	0.014	0.0414	nd	19.7	nd	nd	nd

Table A3 continued.

Sample Date	Site ID	Waterbody	Sampling Event	Carbaryl	Desulfinyl fipronil	Desulfinyl FP amide	Fipronil	Fipronil amide	Fipronil sulfide	Fipronil sulfone	Chlorpyrifos	Diazinon	Malathion	Bifenthrin (ng L^{-1})	Cypermethrin (ng L^{-1})	Permethrin cis (ng L^{-1})	Permethrin trans (ng L^{-1})
2/15/2009	MCC020	StDr	Rain	nd	tr	tr	tr	tr	nd	tr	0.0229	0.0432	nd	13.7	nd	nd	nd
2/15/2009	MCC030	StDr	Rain	nd	tr	nd	tr	nd	nd	tr	0.0539	0.0458	nd	27.2	nd	16.1	23.9
2/15/2009	MCC040	RW	Rain	nd	tr	nd	tr	nd	nd	tr	0.0507	nd	nd	27.2	nd	16.1	23.9
4/7/2009	GRY010	StDr	Rain	nd	tr	nd	tr	tr	nd	tr	nd	nd	0.079	8.02	nd	nd	nd
4/7/2009	GRY020	StDr	Rain	nd	tr	nd	tr	tr	nd	tr	nd	nd	0.06	6.6	nd	nd	nd
4/7/2009	GRY030	RW	Rain	0.094	tr	nd	tr	tr	nd	tr	nd	nd	0.055	20	nd	nd	nd
4/14/2009	GRY010	StDr	Dryflow	mv	mv	mv	mv	mv	mv	mv	mv	mv	mv	nd	nd	nd	nd
4/14/2009	GRY020	StDr	Dryflow	mv	mv	mv	mv	mv	mv	mv	mv	mv	mv	nd	nd	nd	nd
4/14/2009	GRY030	RW	Dryflow	mv	mv	mv	mv	mv	mv	mv	mv	mv	mv	nd	nd	nd	nd
4/14/2009	MCC010	StDr	Dryflow	mv	mv	mv	mv	mv	mv	mv	mv	mv	mv	nd	nd	nd	nd
4/14/2009	MCC020	StDr	Dryflow	mv	mv	mv	mv	mv	mv	mv	mv	mv	mv	nd	nd	nd	nd
4/14/2009	MCC030	StDr	Dryflow	mv	mv	mv	mv	mv	mv	mv	mv	mv	mv	nd	nd	nd	nd
4/14/2009	MCC040	RW	Dryflow	mv	mv	mv	mv	mv	mv	mv	mv	mv	mv	nd	nd	nd	nd
5/1/2009	GRY010	StDr	Rain	tr	tr	nd	0.067	tr	tr	tr	nd	nd	nd	nd	nd	nd	nd
5/1/2009	GRY020	StDr	Rain	0.069	tr	nd	tr	tr	tr	tr	nd	nd	nd	9.2	nd	nd	nd
5/1/2009	GRY030	RW	Rain	0.187	tr	nd	tr	nd	nd	tr	nd	nd	tr	8.4	nd	nd	nd
5/1/2009	MCC010	StDr	Rain	tr	tr	nd	tr	nd	nd	tr	nd	nd	tr	5.89	nd	nd	nd
5/1/2009	MCC020	StDr	Rain	tr	tr	nd	tr	nd	nd	tr	nd	nd	nd	13.9	nd	nd	nd
5/1/2009	MCC030	StDr	Rain	0.119	tr	nd	tr	nd	nd	tr	nd	nd	nd	5.47	nd	nd	nd
5/1/2009	MCC040	RW	Rain	0.369	tr	nd	tr	nd	nd	tr	nd	nd	tr	5.25	nd	nd	nd
8/27/2009	GRY010	StDr	Dryflow	nd	nd	nd	nd	tr	tr	tr	nd	nd	nd	nd	nd	nd	nd
8/27/2009	GRY020	StDr	Dryflow	nd	nd	nd	nd	nd	tr	nd	nd	nd	nd	nd	nd	nd	nd
8/27/2009	GRY030	RW	Dryflow	nd	tr	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
8/27/2009	MCC010	StDr	Dryflow	nd	nd	nd	nd	tr	nd	nd	nd	nd	nd	nd	nd	nd	nd
8/27/2009	MCC020	StDr	Dryflow	nd	nd	nd	nd	nd	nd	tr	nd	nd	nd	nd	nd	nd	nd
8/27/2009	MCC030	StDr	Dryflow	nd	nd	nd	nd	tr	nd	nd	nd	nd	nd	nd	nd	nd	nd
8/27/2009	MCC040	RW	Dryflow	nd	nd	nd	nd	tr	nd	nd	nd	0.0105	nd	nd	nd	nd	nd

Table A4. Detections of insecticides in water samples from Orange County area sampling sites. Concentrations are in µg L^{-1} unless specified.

Sample Date	Site ID	Waterbody	Sampling Event	Carbaryl	Oxamyl	Desulfinyl fipronil	Desulfinyl FP amide	Fipronil	Fipronil amide	Fipronil sulfide	Fipronil sulfone	Diazinon	Malathion	Bifenthrin (ng L^{-1})	Fenvalerate/ esfenvalerate (ng L^{-1})	Lambda-cyhalothrin (ng L^{-1})	Permethrin cis (ng L^{-1})	Permethrin trans (ng L^{-1})
4/8/2008	AV01	RW	Dryflow	0.159	nd	0.060	tr	0.232	tr	tr	0.107	nd	nd	mv	mv	mv	mv	mv
4/8/2008	SC1	StDr	Dryflow	0.078	nd	tr	tr	tr	tr	tr	0.051	nd	nd	mv	mv	mv	mv	mv
4/8/2008	SC3	StDr	Dryflow	tr	0.112	tr	tr	tr	tr	tr	0.068	nd	nd	mv	mv	mv	mv	mv
4/8/2008	SC5	RW	Dryflow	nd	nd	tr	tr	0.052	tr	tr	0.060	nd	nd	mv	mv	mv	mv	mv
4/8/2008	WC1	StDr	Dryflow	nd	nd	tr	tr	tr	tr	tr	tr	nd	nd	mv	mv	mv	mv	mv
4/8/2008	WC2	StDr	Dryflow	0.197	nd	tr	tr	0.140	tr	tr	0.092	nd	nd	mv	mv	mv	mv	mv
4/8/2008	WC3	StDr	Dryflow	nd	nd	0.118	0.072	0.359	0.145	tr	0.187	nd	nd	mv	mv	mv	mv	mv
5/13/2008	AV01	RW	Dryflow	0.091	nd	0.053	tr	0.099	tr	tr	0.064	nd	nd	mv	mv	mv	mv	mv
5/13/2008	SC1	StDr	Dryflow	nd	nd	tr	tr	tr	tr	tr	tr	nd	tr	mv	mv	mv	mv	mv
5/13/2008	SC3	StDr	Dryflow	nd	nd	0.126	tr	0.391	tr	tr	0.110	nd	tr	mv	mv	mv	mv	mv
5/13/2008	SC5	RW	Dryflow	tr	nd	tr	tr	tr	tr	tr	tr	nd	nd	mv	mv	mv	mv	mv
5/13/2008	WC1	StDr	Dryflow	0.682	nd	tr	tr	tr	tr	tr	0.053	nd	nd	mv	mv	mv	mv	mv
5/13/2008	WC2	StDr	Dryflow	0.086	nd	0.056	tr	0.106	tr	tr	0.066	nd	nd	mv	mv	mv	mv	mv
5/13/2008	WC3	StDr	Dryflow	0.130	nd	0.056	0.062	0.094	0.101	tr	0.104	nd	0.057	mv	mv	mv	mv	mv
6/13/2008	SC1	StDr	Dryflow	0.108	nd	tr	tr	0.076	0.051	tr	0.070	nd	tr	mv	mv	mv	mv	mv
6/13/2008	SC3	StDr	Dryflow	nd	nd	0.167	tr	0.175	nd	tr	0.140	nd	nd	mv	mv	mv	mv	mv
6/13/2008	SC5	RW	Dryflow	nd	nd	tr	tr	0.062	tr	tr	0.056	nd	0.232	mv	mv	mv	mv	mv
6/14/2008	AV01	RW	Dryflow	0.111	nd	0.061	tr	0.063	tr	tr	0.082	nd	nd	mv	mv	mv	mv	mv
6/14/2008	WC1	StDr	Dryflow	nd	nd	0.111	tr	0.179	tr	tr	0.080	nd	tr	mv	mv	mv	mv	mv
6/14/2008	WC2	StDr	Dryflow	0.161	nd	tr	tr	0.059	tr	tr	0.060	nd	nd	mv	mv	mv	mv	mv
6/14/2008	WC3	StDr	Dryflow	nd	nd	0.093	0.078	0.064	0.113	tr	0.171	nd	nd	mv	mv	mv	mv	mv
11/26/2008	AV01	RW	Rain	0.109	nd	0.085	0.058	0.164	0.088	tr	0.141	nd	tr	mv	mv	mv	mv	mv
11/26/2008	SC1	StDr	Rain	0.088	nd	tr	tr	0.103	tr	tr	0.076	nd	0.109	mv	mv	mv	mv	mv
11/26/2008	SC3	StDr	Rain	0.057	nd	0.050	tr	0.148	tr	tr	0.061	nd	0.168	mv	mv	mv	mv	mv
11/26/2008	SC5	RW	Rain	0.129	nd	0.059	tr	0.120	tr	tr	0.077	0.064	0.119	mv	mv	mv	mv	mv
11/26/2008	WC2	StDr	Rain	tr	nd	tr	tr	0.076	tr	tr	0.091	nd	tr	mv	mv	mv	mv	mv
11/26/2008	WC3	StDr	Rain	0.180	nd	0.093	tr	0.196	0.064	tr	0.160	nd	nd	mv	mv	mv	mv	mv
5/5/2009	AV01	RW	Dryflow	nd	nd	0.053	tr	0.072	tr	tr	tr	nd	nd	nd	nd	nd	nd	nd
5/5/2009	SC1	StDr	Dryflow	nd	nd	0.069	tr	0.085	tr	tr	0.064	nd	nd	nd	nd	nd	nd	nd
5/5/2009	SC3	StDr	Dryflow	nd	nd	0.129	tr	0.099	tr	tr	0.077	nd	nd	26.4	27.8	17.9	25.9	37.7
5/5/2009	SC5	RW	Dryflow	tr	nd	tr	tr	tr	tr	tr	tr	nd	tr	nd	nd	nd	nd	nd
5/5/2009	WC1	StDr	Dryflow	nd	nd	tr	tr	tr	tr	tr	tr	nd	nd	12.3	nd	nd	nd	nd
5/5/2009	WC2	StDr	Dryflow	nd	nd	0.051	tr	tr	tr	tr	tr	nd	nd	nd	nd	nd	nd	nd

Table A4 continued.

Sample Date	Site ID	Waterbody	Sampling Event	Carbaryl	Oxamyl	Desulfinyl fipronil	Desulfinyl FP amide	Fipronil	Fipronil amide	Fipronil sulfide	Fipronil sulfone	Diazinon	Malathion	Bifenthrin (ng L^{-1})	Fenvalerate/ esfenvalerate (ng L^{-1})	Lambda-cyhalothrin (ng L^{-1})	Permethrin cis (ng L^{-1})	Permethrin trans (ng L^{-1})
5/5/2009	WC3	StDr	Dryflow	nd	nd	0.061	tr	0.464	tr	tr	0.069	0.015	nd	5.18	nd	nd	nd	nd
8/1/2009	SC1	StDr	Dryflow	nd	nd	tr	tr	tr	tr	tr	tr	nd	nd	nd	nd	nd	nd	nd
8/1/2009	SC3	StDr	Dryflow	nd	nd	0.144	0.063	0.518	tr	tr	0.244	0.029	tr	23.7	nd	nd	21.7	25.9
8/1/2009	SC5	RW	Dryflow	nd	nd	0.064	tr	0.132	tr	tr	0.072	nd	nd	nd	nd	nd	nd	nd
8/1/2009	WC2	StDr	Dryflow	tr	nd	0.061	tr	0.126	tr	tr	0.07	nd	nd	nd	nd	nd	nd	nd
8/1/2009	WC3	StDr	Dryflow	nd	nd	0.102	tr	2.11	0.094	0.057	0.546	nd	nd	11.7	nd	nd	15.5	nd

Table A5. Detections of insecticides in water samples from San Diego area sampling sites. Concentrations are in µg L^{-1}.

Sample Date	Site ID	Waterbody	Sampling Event	Carbaryl	Desulfinyl fipronil	Desulfinyl fipronil amide	Fipronil	Fipronil amide	Fipronil sulfide	Fipronil sulfone	Diazinon	Malathion
4/7/2008	SDR101	RW	Dryflow	nd	nd	nd	nd	nd	nd	nd	nd	nd
4/7/2008	SDR102	StDr	Dryflow	0.05	nd	nd	nd	nd	nd	nd	nd	nd
4/7/2008	SDR151	StDr	Dryflow	nd	nd	nd	nd	nd	nd	nd	nd	nd
4/7/2008	SDR156	StDr	Dryflow	nd	nd	nd	nd	nd	nd	nd	nd	nd
4/7/2008	SDR158	RW	Dryflow	nd	nd	nd	nd	nd	nd	nd	nd	nd
5/12/2008	SDR101	RW	Dryflow	nd	tr	nd	nd	nd	nd	tr	nd	nd
5/12/2008	SDR102	StDr	Dryflow	nd	nd	nd	nd	nd	nd	nd	nd	nd
5/12/2008	SDR151	StDr	Dryflow	nd	nd	nd	nd	nd	nd	nd	nd	nd
5/12/2008	SDR156	StDr	Dryflow	nd	nd	nd	nd	nd	nd	nd	nd	nd
5/12/2008	SDR158	RW	Dryflow	nd	nd	nd	nd	nd	nd	nd	nd	nd
5/12/2008	SDR159C	StDr	Dryflow	nd	nd	nd	nd	nd	nd	nd	nd	nd
6/12/2008	SDR151	StDr	Dryflow	nd	nd	nd	nd	nd	nd	nd	nd	nd
6/12/2008	SDR156	StDr	Dryflow	nd	tr	nd	nd	nd	nd	nd	nd	nd
6/12/2008	SDR158	RW	Dryflow	nd	nd	nd	nd	nd	nd	nd	nd	nd
6/13/2008	SDR101	RW	Dryflow	nd	tr	nd	nd	nd	nd	tr	nd	nd
6/13/2008	SDR102	StDr	Dryflow	nd	nd	nd	nd	nd	nd	nd	nd	nd
11/26/2008	SDR101	RW	Rain	tr	tr	tr	tr	tr	nd	tr	nd	0.058
11/26/2008	SDR102	StDr	Rain	nd	tr	nd	tr	tr	nd	tr	nd	nd
11/26/2008	SDR103	StDr	Rain	nd	tr	nd	nd	nd	nd	nd	nd	nd
11/26/2008	SDR104	StDr	Rain	nd	tr	tr	tr	tr	nd	tr	nd	nd
11/26/2008	SDR151	StDr	Rain	0.066	tr	tr	0.053	tr	tr	0.071	nd	0.157
11/26/2008	SDR156	StDr	Rain	0.055	tr	tr	tr	tr	tr	tr	nd	0.248
11/26/2008	SDR158	RW	Rain	0.066	tr	tr	0.058	tr	tr	0.079	nd	0.154
5/6/2009	SDR101	RW	Dryflow	nd	tr	nd	nd	nd	nd	tr	0.0146	nd
5/6/2009	SDR102	StDr	Dryflow	nd	nd	nd	nd	nd	nd	nd	nd	nd
5/6/2009	SDR156	StDr	Dryflow	nd	tr	nd	nd	tr	nd	tr	nd	nd
5/6/2009	SDR158	RW	Dryflow	nd	tr	nd	nd	nd	nd	tr	nd	nd
8/1/2009	SDR101	RW	Dryflow	nd	tr	nd	nd	nd	nd	nd	nd	nd
8/1/2009	SDR102	StDr	Dryflow	nd	nd	nd	nd	nd	nd	nd	nd	nd
8/1/2009	SDR156	StDr	Dryflow	nd	tr	nd	tr	nd	nd	tr	nd	nd
8/1/2009	SDR158	RW	Dryflow	nd	tr	nd	nd	nd	nd	nd	nd	nd

Table A6. Detections of herbicides in water samples from Sacramento area sampling sites. Concentrations are in µg L^{-1}.

Sample Date	Site ID	Waterbody	Sampling Event	2,4-D	Dicamba	Diuron	MCPA	Oryzalin	Oxyfluorfen	Pendimethalin	Prodiamine	Prometon	Triclopyr
4/21/2008	PGC010	StDr	Dryflow	1.29	0.25	nd	tr	nd	nd	0.232	0.053	nd	nd
4/21/2008	PGC020	StDr	Dryflow	2.51	0.73	tr	0.101	nd	nd	0.067	nd	nd	nd
4/21/2008	PGC030	StDr	Dryflow	2.4	tr	nd	nd	nd	nd	0.396	tr	nd	0.324
4/21/2008	PGC040	RW	Dryflow	0.48	0.071	nd	tr	nd	nd	tr	nd	tr	0.1
5/27/2008	PGC010	StDr	Dryflow	11.475	0.296	nd	0.059	nd	nd	0.051	tr	0.234	nd
5/27/2008	PGC020	StDr	Dryflow	8.22	3.07	tr	13.59	nd	nd	0.07	tr	nd	1.484
5/27/2008	PGC030	StDr	Dryflow	1.494	tr	nd	nd	nd	nd	0.05	tr	nd	0.286
5/27/2008	PGC040	RW	Dryflow	0.747	0.069	nd	nd	nd	nd	nd	nd	tr	0.275
6/23/2008	PGC010	StDr	Dryflow	0.3	tr	nd	nd	nd	nd	tr	tr	tr	nd
6/23/2008	PGC020	StDr	Dryflow	3.622	0.114	nd	nd	nd	nd	nd	tr	nd	nd
6/23/2008	PGC030	StDr	Dryflow	0.079	nd	nd	nd	nd	nd	0.349	nd	nd	nd
6/23/2008	PGC040	RW	Dryflow	1.228	nd	nd	nd	nd	nd	nd	nd	nd	tr
11/1/2008	PGC010	StDr	Rain	0.209	0.186	tr	0.061	nd	nd	tr	tr	1.6	tr
11/1/2008	PGC020	StDr	Rain	0.697	0.069	tr	tr	tr	nd	nd	tr	tr	0.061
11/1/2008	PGC030	StDr	Rain	0.221	0.058	nd	tr	nd	nd	nd	0.085	nd	0.242
11/1/2008	PGC040	RW	Rain	0.214	tr	tr	0.086	nd	nd	nd	nd	nd	0.233
2/13/2009	PGC010	StDr	Rain	3.51	tr	0.214	tr	tr	nd	0.051	0.06	nd	tr
2/13/2009	PGC020	StDr	Rain	2.01	0.401	tr	1.05	1.04	nd	0.094	0.096	nd	0.415
2/13/2009	PGC030	StDr	Rain	0.147	0.096	tr	0.175	0.151	nd	tr	0.062	nd	nd
2/13/2009	PGC040	RW	Rain	tr	nd	0.429	nd	0.194	nd	tr	tr	nd	nd
4/7/2009	PGC010	StDr	Rain	10.4	0.947	tr	3.3	tr	nd	0.163	nd	nd	0.838
4/7/2009	PGC020	StDr	Rain	1.27	0.135	17.6	0.268	tr	nd	0.161	tr	nd	0.106
4/7/2009	PGC030	StDr	Rain	3.46	0.189	0.134	nd	tr	nd	0.096	tr	nd	tr
4/7/2009	PGC040	RW	Rain	1.02	0.085	6.76	0.141	tr	nd	tr	nd	nd	tr
5/1/2009	PGC010	StDr	Rain	0.429	0.079	nd	0.082	nd	nd	0.067	nd	0.268	nd
5/1/2009	PGC020	StDr	Rain	0.37	0.167	0.921	0.103	tr	nd	0.064	nd	nd	0.084
5/1/2009	PGC030	StDr	Rain	0.196	0.355	tr	0.44	tr	nd	0.084	nd	nd	0.137

Table A6 continued.

Sample Date	Site ID	Waterbody	Sampling Event	2,4-D	Dicamba	Diuron	MCPA	Oryzalin	Oxyfluorfen	Pendimethalin	Prodiamine	Prometon	Triclopyr
5/1/2009	PGC040	RW	Rain	0.479	0.114	0.135	0.266	tr	tr	nd	nd	nd	0.085
8/28/2009	PGC010	StDr	Dryflow	0.164	0.118	nd	nd	mv	mv	mv	mv	nd	nd
8/28/2009	PGC020	StDr	Dryflow	0.127	0.075	tr	nd	mv	mv	mv	mv	nd	0.136
8/28/2009	PGC030	StDr	Dryflow	0.162	0.07	nd	nd	mv	mv	mv	mv	nd	nd
8/28/2009	PGC040	RW	Dryflow	nd	0.543	nd	nd	mv	mv	mv	mv	nd	nd

Table A7. Detections of herbicides in water samples from San Francisco Bay area sampling sites. Concentrations are in µg L^{-1}.

Sample Date	Site ID	Waterbody	Sampling Event	2,4-D	ACET	Dicamba	Diuron	MCPA	Oryzalin	Oxyfluorfen	Pendimethalin	Prodiamine	Prometon	Triclopyr
4/22/2008	GRY010	StDr	Dryflow	nd	nd	nd	tr	nd	nd	nd	tr	nd	nd	tr
4/22/2008	GRY020	StDr	Dryflow	nd	nd	nd	0.11	nd	nd	nd	nd	nd	nd	0.126
4/22/2008	GRY030	RW	Dryflow	0.163	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.35
4/22/2008	MCC010	StDr	Dryflow	0.905	nd	tr	0.088	nd	nd	nd	nd	nd	nd	0.06
4/22/2008	MCC020	StDr	Dryflow	0.101	nd	nd	0.477	nd	nd	nd	nd	nd	nd	nd
4/22/2008	MCC030	StDr	Dryflow	nd	nd	nd	tr	nd	nd	nd	nd	nd	nd	nd
4/22/2008	MCC040	RW	Dryflow	10.1	nd	0.544	1.7	nd	nd	nd	nd	nd	nd	nd
5/28/2008	GRY010	StDr	Dryflow	0.069	nd	nd	tr	nd	nd	nd	nd	nd	nd	0.119
5/28/2008	GRY020	StDr	Dryflow	0.069	nd	nd	tr	nd	nd	nd	nd	nd	nd	0.119
5/28/2008	GRY030	RW	Dryflow	0.073	nd	tr	nd	tr	nd	nd	nd	nd	nd	1.075
5/28/2008	MCC010	StDr	Dryflow	0.052	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
5/28/2008	MCC020	StDr	Dryflow	0.047	nd	nd	0.072	nd	nd	nd	nd	nd	nd	tr
5/28/2008	MCC030	StDr	Dryflow	tr	nd	nd	tr	0.063	nd	nd	nd	nd	nd	tr
5/28/2008	MCC040	RW	Dryflow	nd	nd	nd	3	0.071	nd	nd	nd	nd	nd	tr
6/24/2008	GRY010	StDr	Dryflow	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	tr
6/24/2008	GRY020	StDr	Dryflow	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.124
6/24/2008	GRY030	RW	Dryflow	0.284	nd	nd	tr	nd	nd	nd	nd	nd	nd	0.325
6/24/2008	MCC010	StDr	Dryflow	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
6/24/2008	MCC020	StDr	Dryflow	0.142	nd	tr	0.148	nd	nd	nd	nd	nd	nd	nd

Table A7 continued.

Sample Date	Site ID	Waterbody	Sampling Event	2,4-D	ACET	Dicamba	Diuron	MCPA	Oryzalin	Oxyfluorfen	Pendimethalin	Prodiamine	Prometon	Triclopyr
6/24/2008	MCC030	StDr	Dryflow	tr	nd	nd	0.233	nd	nd	nd	nd	nd	nd	nd
6/24/2008	MCC040	RW	Dryflow	tr	nd	nd	2.68	tr	nd	nd	nd	nd	nd	nd
11/1/2008	GRY010	StDr	Rain	0.093	nd	nd	0.391	nd	nd	nd	0.115	tr	nd	0.255
11/1/2008	GRY020	StDr	Rain	0.209	nd	0.096	0.414	0.207	nd	nd	0.05	tr	nd	0.228
11/1/2008	GRY030	RW	Rain	0.408	nd	0.064	0.169	0.127	0.116	nd	0.057	tr	nd	6.746
11/1/2008	MCC010	StDr	Rain	0.186	nd	tr	0.054	0.157	0.077	nd	nd	nd	nd	0.115
11/1/2008	MCC020	StDr	Rain	0.613	nd	tr	3.9	0.088	nd	nd	nd	tr	0.133	tr
11/1/2008	MCC030	StDr	Rain	0.103	nd	nd	0.306	0.098	tr	nd	tr	nd	1.6	0.173
11/1/2008	MCC040	RW	Rain	0.173	nd	tr	6.82	0.151	nd	0.07	tr	nd	nd	0.12
2/15/2009	GRY010	StDr	Rain	tr	nd	nd	tr	nd	tr	nd	tr	0.09	nd	nd
2/15/2009	GRY020	StDr	Rain	tr	nd	nd	0.445	nd	tr	nd	1.02	0.061	nd	nd
2/15/2009	GRY030	RW	Rain	0.118	nd	tr	0.26	tr	0.096	nd	0.073	0.142	nd	0.347
2/15/2009	MCC010	StDr	Rain	1.107	nd	tr	tr	0.167	0.129	nd	nd	nd	nd	0.2
2/15/2009	MCC020	StDr	Rain	0.461	nd	0.111	0.209	0.052	tr	nd	nd	nd	nd	0.076
2/15/2009	MCC030	StDr	Rain	0.121	nd	tr	tr	0.082	0.11	nd	0.604	nd	nd	0.137
2/15/2009	MCC040	RW	Rain	0.28	nd	tr	0.709	0.077	nd	nd	0.651	nd	nd	0.11
4/7/2009	GRY010	StDr	Rain	0.102	nd	0.054	nd	nd	0.06	nd	nd	tr	nd	0.322
4/7/2009	GRY020	StDr	Rain	0.251	nd	0.065	0.162	nd	nd	0.052	nd	0.052	nd	0.073
4/7/2009	GRY030	RW	Rain	0.423	nd	0.102	0.104	0.143	0.41	nd	0.675	0.056	tr	0.254
5/1/2009	GRY010	StDr	Rain	0.094	0.086	tr	nd	nd	nd	nd	nd	nd	nd	0.099
5/1/2009	GRY020	StDr	Rain	0.439	nd	0.101	tr	0.275	nd	nd	tr	nd	nd	0.153
5/1/2009	GRY030	RW	Rain	0.131	nd	tr	tr	nd	nd	nd	tr	tr	nd	0.179
5/1/2009	MCC010	StDr	Rain	0.339	nd	0.063	tr	0.079	tr	nd	nd	nd	tr	0.205
5/1/2009	MCC020	StDr	Rain	0.524	nd	0.05	27.6	0.212	nd	nd	nd	nd	nd	0.254
5/1/2009	MCC030	StDr	Rain	0.141	nd	tr	0.377	nd	nd	nd	tr	nd	nd	0.08
5/1/2009	MCC040	RW	Rain	0.275	nd	0.055	10.9	0.122	tr	nd	tr	nd	nd	0.207
8/27/2009	GRY010	StDr	Dryflow	nd	nd	nd	nd	nd	mv	mv	mv	mv	nd	0.054
8/27/2009	GRY020	StDr	Dryflow	tr	nd	nd	nd	nd	mv	mv	mv	mv	nd	0.172
8/27/2009	GRY030	RW	Dryflow	nd	nd	nd	nd	nd	mv	mv	mv	mv	nd	0.096
8/27/2009	MCC010	StDr	Dryflow	nd	nd	nd	nd	nd	mv	mv	mv	mv	nd	0.053
8/27/2009	MCC020	StDr	Dryflow	0.075	nd	nd	nd	nd	mv	mv	mv	mv	nd	nd
8/27/2009	MCC030	StDr	Dryflow	nd	nd	nd	nd	nd	mv	mv	mv	mv	nd	nd
8/27/2009	MCC040	RW	Dryflow	nd	nd	nd	1.49	nd	mv	mv	mv	mv	nd	nd

Table A8. Detections of herbicides in water samples from Orange County sampling sites. Concentrations are in µg L^{-1}.

Sample Date	Site ID	Waterbody	Sampling Event	2,4-D	Dicamba	Diuron	MCPA	Oxyfluorfen	Pendimethalin	Prodiamine	Prometon	Simazine	Triclopyr
4/8/2008	AV01	RW	Dryflow	0.39	nd	0.054	nd	nd	tr	nd	nd	0.058	0.11
4/8/2008	SC1	StDr	Dryflow	0.052	nd	tr	nd	nd	nd	nd	nd	0.057	0.11
4/8/2008	SC3	StDr	Dryflow	0.144	0.06	0.099	nd	tr	0.138	nd	nd	0.095	0.143
4/8/2008	SC5	RW	Dryflow	0.151	nd	tr	nd	nd	nd	tr	nd	0.06	0.387
4/8/2008	WC1	StDr	Dryflow	0.096	nd	tr	nd	nd	tr	nd	nd	tr	nd
4/8/2008	WC2	StDr	Dryflow	0.573	nd	0.051	nd	nd	tr	nd	nd	tr	0.149
4/8/2008	WC3	StDr	Dryflow	0.136	nd	tr	nd	nd	0.077	nd	nd	tr	0.115
5/13/2008	AV01	RW	Dryflow	nd	0.056	tr	nd	nd	tr	nd	nd	tr	0.138
5/13/2008	SC1	StDr	Dryflow	nd	tr	tr	nd	nd	nd	nd	nd	tr	0.462
5/13/2008	SC3	StDr	Dryflow	nd	tr	0.05	nd	nd	tr	nd	nd	tr	0.509
5/13/2008	SC5	RW	Dryflow	nd	0.117	nd	nd	nd	nd	nd	tr	tr	0.23
5/13/2008	WC1	StDr	Dryflow	nd	nd	tr	nd	nd	tr	nd	nd	tr	tr
5/13/2008	WC2	StDr	Dryflow	nd	nd	tr	nd	nd	nd	nd	nd	tr	0.073
5/13/2008	WC3	StDr	Dryflow	nd	nd	tr	nd	nd	nd	nd	nd	tr	0.061
6/13/2008	SC1	StDr	Dryflow	0.256	nd	tr	nd	nd	nd	nd	nd	tr	0.626
6/13/2008	SC3	StDr	Dryflow	0.058	nd	nd	nd	nd	nd	nd	nd	nd	nd
6/13/2008	SC5	RW	Dryflow	0.1	0.062	nd	nd	nd	nd	nd	nd	tr	0.152
6/14/2008	AV01	RW	Dryflow	0.152	nd	tr	nd	nd	nd	nd	nd	tr	0.265
6/14/2008	WC1	StDr	Dryflow	0.711	0.169	tr	0.482	nd	nd	nd	nd	tr	0.21
6/14/2008	WC2	StDr	Dryflow	0.276	tr	tr	nd	nd	nd	nd	nd	tr	0.208
6/14/2008	WC3	StDr	Dryflow	0.409	0.17	tr	nd	nd	nd	nd	nd	tr	0.297
11/26/2008	AV01	RW	Rain	0.1657	0.054	0.22	nd	nd	nd	nd	nd	nd	0.13
11/26/2008	SC1	StDr	Rain	0.547	tr	0.271	nd	nd	nd	tr	nd	nd	0.152
11/26/2008	SC3	StDr	Rain	0.111	nd	0.132	nd	nd	0.215	nd	nd	nd	0.299
11/26/2008	SC5	RW	Rain	0.204	nd	0.228	tr	nd	nd	nd	nd	nd	0.103
11/26/2008	WC2	StDr	Rain	1.571	0.369	tr	tr	nd	nd	nd	nd	nd	0.127
11/26/2008	WC3	StDr	Rain	0.191	tr	0.273	nd	nd	tr	nd	nd	nd	0.088
5/5/2009	AV01	RW	Dryflow	0.182	nd	nd	nd	nd	tr	nd	nd	nd	0.125
5/5/2009	SC1	StDr	Dryflow	0.57	0.314	nd	nd	nd	nd	tr	nd	nd	0.056
5/5/2009	SC3	StDr	Dryflow	0.969	nd	nd	nd	nd	nd	nd	nd	nd	0.086
5/5/2009	SC5	RW	Dryflow	0.406	tr	nd	nd	nd	nd	tr	nd	nd	0.073
5/5/2009	WC1	StDr	Dryflow	tr	nd	tr	nd	nd	nd	nd	nd	nd	tr
5/5/2009	WC2	StDr	Dryflow	0.351	nd	tr	nd	nd	tr	nd	nd	nd	0.287

Table A8 continued.

Sample Date	Site ID	Waterbody	Sampling Event	2,4-D	Dicamba	Diuron	MCPA	Oxyfluorfen	Pendimethalin	Prodiamine	Prometon	Simazine	Triclopyr
5/5/2009	WC3	StDr	Dryflow	0.196	nd	nd	nd	nd	0.292	nd	nd	nd	0.215
8/1/2009	AV01	RW	Dryflow	0.324	0.088	tr	nd	mv	mv	mv	nd	nd	0.074
8/1/2009	SC1	StDr	Dryflow	0.065	tr	nd	0.238	mv	mv	mv	nd	nd	tr
8/1/2009	SC3	StDr	Dryflow	1.454	0.517	nd	0.424	mv	mv	mv	nd	nd	0.086
8/1/2009	SC5	RW	Dryflow	tr	tr	nd	tr	mv	mv	mv	nd	nd	0.164
8/1/2009	WC2	StDr	Dryflow	0.745	0.150	0.063	nd	mv	mv	mv	nd	nd	tr
8/1/2009	WC3	StDr	Dryflow	0.330	0.193	tr	nd	mv	mv	mv	nd	nd	1.329

Table A9. Detections of herbicides in water samples from San Diego Sampling sites. Concentrations are in µg L^{-1}.

Sample Date	Site ID	Waterbody	Sampling Event	2,4-D	Bromacil	Dicamba	Diuron	MCPA	Oryzalin	Prodiamine	Prometon	Simazine	Triclopyr	Trifluralin
4/7/2008	SDR101	RW	Dryflow	0.052	nd	nd	nd	nd	nd	nd	tr	0.13	0.051	nd
4/7/2008	SDR102	StDr	Dryflow	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
4/7/2008	SDR151	StDr	Dryflow	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
4/7/2008	SDR156	StDr	Dryflow	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	tr
4/7/2008	SDR158	RW	Dryflow	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
5/12/2008	SDR101	RW	Dryflow	nd	nd	nd	nd	nd	nd	nd	nd	tr	nd	nd
5/12/2008	SDR102	StDr	Dryflow	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
5/12/2008	SDR151	StDr	Dryflow	nd	nd	nd	nd	nd	nd	nd	nd	tr	nd	nd
5/12/2008	SDR156	StDr	Dryflow	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
5/12/2008	SDR158	RW	Dryflow	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
5/12/2008	SDR159C	StDr	Dryflow	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
6/12/2008	SDR151	StDr	Dryflow	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
6/12/2008	SDR156	StDr	Dryflow	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
6/12/2008	SDR158	RW	Dryflow	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd

Table A9 continued.

Sample Date	Site ID	Waterbody	Sampling Event	2,4-D	Bromacil	Dicamba	Diuron	MCPA	Oryzalin	Prodiamine	Prometon	Simazine	Triclopyr	Trifluralin
6/13/2008	SDR101	RW	Dryflow	tr	nd	nd	nd	nd	nd	nd	nd	0.057	nd	nd
6/13/2008	SDR102	StDr	Dryflow	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
11/26/2008	SDR101	RW	Rain	0.085	tr	nd	tr	nd	0.383	nd	1.34	nd	0.114	nd
11/26/2008	SDR102	StDr	Rain	nd	nd	nd	2.03	nd	nd	nd	nd	nd	nd	nd
11/26/2008	SDR103	StDr	Rain	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
11/26/2008	SDR104	StDr	Rain	tr	nd	nd	0.059	nd	0.208	nd	nd	nd	nd	nd
11/26/2008	SDR151	StDr	Rain	0.261	nd	0.053	0.234	0.11	nd	nd	nd	nd	0.059	nd
11/26/2008	SDR156	StDr	Rain	0.132	nd	nd	nd	nd	nd	nd	tr	nd	nd	nd
11/26/2008	SDR158	RW	Rain	0.339	nd	0.07	0.238	nd	tr	nd	nd	nd	nd	nd
5/6/2009	SDR101	RW	Dryflow	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
5/6/2009	SDR102	StDr	Dryflow	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
5/6/2009	SDR156	StDr	Dryflow	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
5/6/2009	SDR158	RW	Dryflow	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
8/1/2009	SDR101	RW	Dryflow	nd	nd	nd	nd	nd	mv	mv	nd	nd	nd	mv
8/1/2009	SDR102	StDr	Dryflow	nd	nd	nd	nd	nd	mv	mv	nd	nd	nd	mv
8/1/2009	SDR156	StDr	Dryflow	nd	nd	nd	nd	nd	mv	mv	nd	nd	nd	mv
8/1/2009	SDR158	RW	Dryflow	nd	nd	nd	nd	nd	mv	mv	nd	nd	nd	mv

Table A10. Detections of pyrethroids in sediments (units, µg kg^{-1} dry wt.). All sediments were collected during dryflow.

Site ID	Area	Waterbody	Sample Date	Bifenthrin	Cyfluthrin	Cypermethrin	Deltamethrin	Fenvalerate/ esfenvalerate	Lambda-cyhalothrin	Permethrin cis	Permethrin trans	Resmethrin	Fenopropathrin
PGC010	SAC	StDr	8/4/2008	438.4	75.2	45.3	13.2	nd	8.1	89.2	38.4	nd	nd
PGC020	SAC	StDr	8/4/2008	196.2	13.2	6.7	2.8	nd	2.6	16.7	10.7	nd	nd
PGC020	SAC	StDr	8/4/2008	101.1	28.6	10.2	nd	nd	6.9	66.9	45.2	nd	nd
PGC020	SAC	StDr	8/4/2008	605.6	14.7	19.7	nd	nd	nd	22.6	12.2	nd	nd
PGC030	SAC	StDr	8/4/2008	63.5	9.8	4.6	2.1	nd	2.0	45.0	24.0	nd	nd
PGC010	SAC	StDr	4/13/2009	679.8	148.6	53.6	20.3	nd	14.8	113.1	52.8	nd	nd
PGC010	SAC	StDr	4/13/2009	41.5	5.5	nd	2.0	nd	nd	3.4	nd	nd	nd
PGC020	SAC	StDr	4/13/2009	61.4	4.4	nd	nd	nd	nd	7.4	2.9	nd	nd
PGC020	SAC	StDr	4/13/2009	323.5	83.7	22.7	7.5	4.9	4.1	40.7	35.6	nd	nd
PGC020	SAC	StDr	4/13/2009	267.9	49.6	22.6	14.0	nd	5.8	58.2	35.5	24.0	nd
PGC030	SAC	StDr	4/13/2009	24.0	2.9	nd	nd	nd	nd	5.2	3.1	nd	nd
MCC010	SFB	StDr	8/5/2008	37.5	23.4	nd	7.2	nd	nd	5.0	4.1	nd	nd
MCC020	SFB	StDr	8/5/2008	0.1	18.9	nd	nd	nd	nd	nd	nd	nd	nd
MCC030	SFB	StDr	8/5/2008	25.5	19.6	nd	5.2	nd	nd	3.8	nd	nd	nd
GRY010	SFB	StDr	8/6/2008	7.8	nd	nd	nd	nd	nd	nd	nd	nd	nd
GRY020	SFB	StDr	8/6/2008	13.1	2.9	nd	1.8	nd	nd	4.6	1.8	nd	nd
GRY030	SFB	RW	8/6/2008	8.9	1.9	nd	nd	nd	nd	2.2	nd	nd	nd
GRY030	SFB	RW	8/6/2008	9.3	nd	nd	nd	nd	nd	2.8	nd	nd	nd
GRY020	SFB	StDr	4/14/2009	17.9	2.1	nd	nd	nd	nd	3.3	2.2	nd	nd
GRY030	SFB	RW	4/14/2009	26.8	7.1	nd	2.3	nd	nd	7.0	5.2	nd	nd
GRY030	SFB	RW	4/14/2009	23.0	5.8	nd	nd	nd	nd	5.7	5.2	nd	nd
MCC010	SFB	StDr	4/14/2009	11.9	4.3	nd	nd	nd	1.5	4.3	4.1	nd	nd
SC1	OC	StDr	6/13/2008	45.0	14.1	nd	2.2	nd	nd	23.5	21.5	nd	nd
SC3	OC	StDr	6/13/2008	39.7	38.2	nd	26.8	nd	4.6	45.3	46.5	nd	nd
SC5	OC	RW	6/13/2008	25.2	7.0	nd	4.7	nd	1.9	11.5	8.6	nd	nd
AV01	OC	RW	6/14/2008	236.5	44.6	nd	12.3	9.4	21.6	45.7	27.5	nd	nd
WC1	OC	StDr	6/14/2008	323.7	89.3	18.2	15.7	4.0	31.9	149.0	206.7	nd	nd
WC2	OC	StDr	6/14/2008	141.0	39.0	nd	6.9	6.6	31.0	62.6	67.0	nd	nd
WC3	OC	StDr	6/14/2008	207.6	67.2	22.0	50.7	20.3	30.1	171.0	207.6	nd	nd
SC1	OC	StDr	5/5/2009	14.2	3.7	nd	5.8	nd	nd	16.4	19.5	nd	nd
SC3	OC	StDr	5/5/2009	nd	nd	nd	2.7	nd	7.5	6.8	15.6	nd	nd
SC5	OC	RW	5/5/2009	nd	nd	nd	nd	nd	3.1	2.2	2.7	8.3	nd
SDR151	SD	StDr	6/12/2008	3.3	nd	1.9	nd	nd	nd	nd	nd	nd	nd

Table A10 continued.

Site ID	Area	Waterbody	Sample Date	Bifenthrin	Cyfluthrin	Cypermethrin	Deltamethrin	Fenvalerate/ esfenvalerate	Lambda-cyhalothrin	Permethrin cis	Permethrin trans	Resmethrin	Fenopropathrin
SDR158	SD	RW	6/12/2008	1.3	nd	nd	nd	nd	nd	nd	nd	nd	nd
SDR101	SD	RW	6/13/2008	0.1	nd	nd	nd	nd	nd	nd	nd	nd	nd
SDR102	SD	StDr	6/13/2008	0.1	2.0	nd	nd	nd	nd	1.7	1.6	nd	nd
SDR101	SD	RW	5/6/2009	3.8	nd	nd	nd	nd	nd	nd	nd	nd	nd
SDR101	SD	RW	5/6/2009	4.6	nd	nd	nd	nd	nd	nd	nd	nd	nd
SDR102	SD	StDr	5/6/2009	3.2	3.1	nd	nd	nd	nd	6.5	8.4	5.0	nd
SDR156	SD	StDr	5/6/2009	8.3	4.2	7.9	nd	nd	nd	3.2	2.9	nd	nd
SDR158	SD	RW	5/6/2009	10.7	6.0	4.0	1.8	nd	nd	2.1	nd	nd	nd

Table A11. Summary of the water quality parameters for the entire study.

	pH	EC (mS cm^{-1})	DO (mg L^{-1})	Temper-ature (°C)	Turbidity (NTU)	TSS (mg L^{-1})	TOC (mg L^{-1})
Median	7.6	1.0	8.4	16.9	3.1	7.2	7.8
Range	6.1 – 8.6	0.06 – 4.47	1.5 – 18.3	6.9 – 25.9	0 – 236.6	0 – 844.3	1.2 – 106.4
Criteria for water quality[1]	6.5 – 8.5	> 3.0 (severe)	< 5.0	15.6 – 23.9 (seasonal), or not 2.8°C above natural levels	> 1 NTU or 20% based on natural levels[2]	Shall not cause a nuisance or adversely affect beneficial uses.	--
Percent outside criteria	2%	9%	20%	--	Background natural levels unknown	unknown	

[1]Criteria from Central Valley Regional Water Quality Board, Water Quality Control Plan for the Sacramento and San Joaquin River Basins, http://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/; The San Diego Regional Water Quality Board, San Diego Region Basin Plan, http://www.waterboards.ca.gov/sandiego/water_issues/programs/basin_plan/; San Francisco Bay Area Regional Water Quality Control Board, basin plan, http://www.swrcb.ca.gov/rwqcb2/basin_planning.shtml

[2]Determined based on medians of sampling sites. If NTUs medians were between 1 – 5, and increase of 1 NTU over the median was an exceedance. If the medians were between 5 – 50 NTUs, an increase of 20% or more was an exceedance. Most exceedances (70%) were during rainstorm sampling and in stormdrain outflows (67%).

Water Quality Parameters by Category

There generally were little differences in water quality parameters between stormdrain outfalls and receiving waters. However, storm drain outflows had significantly higher DO and lower conductivity (EC) than receiving waters (p=0.0031-0.0163; Table A11). Rainfall was the biggest factor influencing differences between these water quality parameters. With dryflow conditions EC and temperature values were significantly higher than those observed with rainstorm events (p=0.000), whereas during rain events, DO, turbidity, TSS, and TOC were significantly higher than during dryflow (p=0.000-0.0035; Table A12). Between areas of the state, northern California had significantly higher DO (p=0.000) whereas southern California had significantly higher conductivity and temperature (p=0.000; Table A13). These may be rainfall effects.

Table A12.Water quality median concentrations between stormdrain outflows and receiving waters.

	pH	EC (mS cm^{-1})	DO (mg L^{-1})	Temper-ature (°C)	Turbidity (NTU)	TSS (mg L^{-1})	TOC (mg L^{-1})
Stormdrain outflows	7.63	0.82	8.4	17.2	2.6	7.1	7.3
Receiving waters	7.67	1.43	6.9	18.0	3.9	6.1	8.8
Significant p values	n.s.	0.0031	0.0163	n.s.	n.s.	n.s.	n.s.

Table A13. Water quality median concentrations between dryflow and rainstorm sampling.

	pH	EC (mS cm^{-1})	DO (mg L^{-1})	Temper-ature (°C)	Turbidity (NTU)	TSS (mg L^{-1})	TOC (mg L^{-1})
Dryflow	7.69	1.46	7.3	18.6	1.1	4.4	6.9
Rainstorm	7.62	0.29	9.0	15.8	17.4	31.1	9.5
Significant p values.	n.s.	0.000	0.000	0.000	0.000	0.000	0.0035

Table A14. Water quality median concentrations between northern and southern California.

	pH	EC (mS cm^{-1})	DO (mg L^{-1})	Temper-ature (°C)	Turbidity (NTU)	TSS (mg L^{-1})	TOC (mg L^{-1})
Northern California	7.7	0.37	8.7	16.7	2.9	7.1	6.9
Southern California	7.56	1.73	7.1	18.6	2.7	6.1	9.1
Significant p values	n.s.	0.000	0.000	0.000	n.s.	n.s.	n.s.

Table A15. Water quality parameters at the individual sampling sites of the urban study.

Region	Area	Sample Date	Site ID	Water Body	Sample Event	Flow (cfs)[1]	pH	EC (mS cm^{-1})	DO (mg L^{-1})	Temp (°C)	Turb (NTU)	TSS (ppm)	TOC (ppm)
NoCal	SAC	21-Apr-08	PGC010	StDr	Dryflow	nf	7.29	0.167	5.88	13.34	3.8	4.41	10.32
NoCal	SAC	21-Apr-08	PGC020	StDr	Dryflow	0.23	7.04	0.217	5.43	11.03	3.4	30.87	7.724
NoCal	SAC	21-Apr-08	PGC030	StDr	Dryflow	fl	7.66	0.143	9.28	15.17	2.5	4.37	9.432
NoCal	SAC	21-Apr-08	PGC040	RW	Dryflow	fl	7.75	0.487	7.75	13.58	mv	1.95	6.875
NoCal	SAC	27-May-08	PGC010	StDr	Dryflow	nf	7.35	0.183	8.33	17.66	13.2	5.73	11.29
NoCal	SAC	27-May-08	PGC020	StDr	Dryflow	nf	7.06	0.193	4.45	16.15	4.9	4.95	10.81
NoCal	SAC	27-May-08	PGC030	StDr	Dryflow	0.015	7.75	0.198	8.43	19.01	4.2	6.44	13.42
NoCal	SAC	27-May-08	PGC040	RW	Dryflow	nf	7.74	0.508	5.8	17.45	0.9	2.50	11.31
NoCal	SAC	23-Jun-08	PGC010	StDr	Dryflow	nf	7.11	0.215	4.3	21.89	2.5	4.21	11.65
NoCal	SAC	23-Jun-08	PGC020	StDr	Dryflow	0.05	6.82	0.176	3.2	20.78	0.1	2.93	10.47
NoCal	SAC	23-Jun-08	PGC030	StDr	Dryflow	0.035	7.5	0.144	7.52	23.65	1.3	2.63	8.931
NoCal	SAC	23-Jun-08	PGC040	RW	Dryflow	nf	7.57	0.369	4.24	22.78	1	3.23	8.983
NoCal	SAC	04-Aug-08	PGC010	StDr	Dryflow	nf	7.24	0.182	4.96	22.4	0	11.83	12.29
NoCal	SAC	04-Aug-08	PGC020	StDr	Dryflow	0.13	6.77	0.316	4.87	19.81	mv	2.26	9.34
NoCal	SAC	04-Aug-08	PGC030	StDr	Dryflow	0.0142	7.64	0.181	7.37	24.47	88.3	6.59	10.97
NoCal	SAC	04-Aug-08	PGC040	RW	Dryflow	nf	7.22	0.338	3.53	21.24	2.4	5.84	8.788
NoCal	SAC	01-Nov-08	PGC010	StDr	Rain	fl	7.22	0.198	9.06	16.64	6.7	8.47	10.73
NoCal	SAC	01-Nov-08	PGC020	StDr	Rain	2.22	7.59	0.15	8.13	16.68	4.5	7.53	7.919
NoCal	SAC	01-Nov-08	PGC030	StDr	Rain	1.28	7.7	0.135	9.47	17.31	9	7.14	7.967
NoCal	SAC	01-Nov-08	PGC040	RW	Rain	fl	7.52	0.313	6.47	15.88	18	66.36	12.1
NoCal	SAC	13-Feb-09	PGC010	StDr	Rain	2.49	7.62	0.113	11.26	6.94	12.2	13.88	13.95
NoCal	SAC	13-Feb-09	PGC020	StDr	Rain	4.99	7.57	0.204	11.02	7.47	24	mv	15.67
NoCal	SAC	13-Feb-09	PGC030	StDr	Rain	4.66	7.73	0.277	11.93	8.5	27	15.48	15.8
NoCal	SAC	13-Feb-09	PGC040	RW	Rain	135.98	7.68	0.174	10.57	7.8	45.4	81.14	mv
NoCal	SAC	07-Apr-09	PGC010	StDr	Rain	fl	7.4	0.129	8.5	13.47	6.5	4.88	6.759
NoCal	SAC	07-Apr-09	PGC020	StDr	Rain	fl	7.35	0.96	9.3	13.57	8.7	9.87	6.06
NoCal	SAC	07-Apr-09	PGC030	StDr	Rain	fl	7.67	0.105	9.91	14.23	mv	2.00	6.109
NoCal	SAC	07-Apr-09	PGC040	RW	Rain	fl	7.76	0.385	8.02	14	16.5	20.00	6.339
NoCal	SAC	13-Apr-09	PGC010	StDr	Dryflow	nf	6.99	0.184	1.5	14.23	2.2	1.12	8.749
NoCal	SAC	13-Apr-09	PGC020	StDr	Dryflow	nf	6.78	0.352	2.1	13.8	2	1.75	9.4495
NoCal	SAC	13-Apr-09	PGC030	StDr	Dryflow	fl	7.48	0.173	7.4	16.66	87.4	13.75	18.61
NoCal	SAC	13-Apr-09	PGC040	RW	Dryflow	fl	7.1	0.22	2.43	14.85	3.1	5.50	6.112
NoCal	SAC	01-May-09	PGC010	StDr	Rain	1.4	7.67	0.076	8.79	18.04	3.9	6.14	3.119
NoCal	SAC	01-May-09	PGC020	StDr	Rain	1.25	7.47	0.078	8.62	17.68	8.6	11.96	4.266
NoCal	SAC	01-May-09	PGC030	StDr	Rain	fl	7.38	0.063	9.57	16.8	5.8	14.46	4.122
NoCal	SAC	01-May-09	PGC040	RW	Rain	fl	7.89	0.267	8.72	16.56	7.2	12.24	6.084
NoCal	SAC	28-Aug-09	ANT001	StDr	Dryflow	0.02	7.99	0.493	7.24	24.46	2.8	2.62	20.45

Table A15 continued.

Region	Area	Sample Date	Site ID	Water Body	Sample Event	Flow (cfs)[1]	pH	EC (mS cm^{-1})	DO (mg L^{-1})	Temp (°C)	Turb (NTU)	TSS (ppm)	TOC (ppm)
NoCal	SAC	28-Aug-09	FOL001	StDr	Dryflow	0.02	6.61	0.201	6.69	21.46	0.3	0.71	5.698
NoCal	SAC	28-Aug-09	FOL002	StDr	Dryflow	fl	8.03	0.28	8.19	20.55	0	28.48	1.77
NoCal	SAC	28-Aug-09	NAT001	StDr	Dryflow	fl	mv	mv	mv	mv	mv	2.12	5.38
NoCal	SAC	28-Aug-09	PGC010	StDr	Dryflow	nf	6.96	0.206	2.11	23.37	2.4	6.07	9.713
NoCal	SAC	28-Aug-09	PGC020	StDr	Dryflow	0.01	6.74	0.153	1.17	21.1	0	5.20	10.14
NoCal	SAC	28-Aug-09	PGC030	StDr	Dryflow	fl	7.59	0.193	6.95	25.28	0.1	2.81	7.49
NoCal	SAC	28-Aug-09	PGC040	RW	Dryflow	nf	7.18	0.348	3.65	20.88	4	7.91	9.87
NoCal	SFB	22-Apr-08	GRY010	StDr	Dryflow	0.44	8.04	2.22	9.58	13.11	8.7	3.24	4.85
NoCal	SFB	22-Apr-08	GRY020	StDr	Dryflow	0.33	8.12	1.883	10.59	14.02	0.6	0.57	4.24
NoCal	SFB	22-Apr-08	GRY030	RW	Dryflow	5.53	8.36	1.581	14.77	17.12	1.1	2.80	4.295
NoCal	SFB	22-Apr-08	MCC010	StDr	Dryflow	0.41	8.25	1.822	12.6	15.86	1.1	9.90	3.288
NoCal	SFB	22-Apr-08	MCC020	StDr	Dryflow	fl	8.17	1.84	10.4	11	0.3	7.18	106.4
NoCal	SFB	22-Apr-08	MCC030	StDr	Dryflow	0.33	8.24	1.087	9.75	15.68	0.2	0.00	1.358
NoCal	SFB	22-Apr-08	MCC040	RW	Dryflow	fl	7.82	1.641	8.53	12.88	0.1	0.00	3.292
NoCal	SFB	28-May-08	GRY010	StDr	Dryflow	0.05	7.97	1.861	8.62	15.72	0.9	6.02	4.795
NoCal	SFB	28-May-08	GRY020	StDr	Dryflow	0.024	8.1	1.577	10.34	16.95	0.7	2.79	3.982
NoCal	SFB	28-May-08	GRY030	RW	Dryflow	2.02	8.3	1.497	12.8	20.51	1.7	5.51	4.348
NoCal	SFB	28-May-08	MCC010	StDr	Dryflow	0.28	8.15	1.853	9.77	16.87	0.5	12.08	3.307
NoCal	SFB	28-May-08	MCC020	StDr	Dryflow	0.29	8.21	1.484	9.57	14.25	0	0.74	6.571
NoCal	SFB	28-May-08	MCC030	StDr	Dryflow	0.27	8.16	1.077	8.89	17.61	0	4.98	2.466
NoCal	SFB	28-May-08	MCC040	RW	Dryflow	0.73	7.95	1.598	9.3	15.84	0	1.32	3.218
NoCal	SFB	24-Jun-08	GRY010	StDr	Dryflow	fl	8.18	1.296	7.5	18.77	2.4	19.52	4.843
NoCal	SFB	24-Jun-08	GRY020	StDr	Dryflow	0.01	8.18	2.01	12.14	18.78	0	3.06	3.745
NoCal	SFB	24-Jun-08	GRY030	RW	Dryflow	0.90	8.58	1.092	18.29	25.91	8.9	15.08	5.381
NoCal	SFB	24-Jun-08	MCC010	StDr	Dryflow	0.04	8.13	1.975	9.92	17.95	0	2.30	3.189
NoCal	SFB	24-Jun-08	MCC020	StDr	Dryflow	fl	8.26	1.591	9.23	15.92	0	0.67	5.83
NoCal	SFB	24-Jun-08	MCC030	StDr	Dryflow	1.23	7.85	1.147	5.83	19.08	0	mv	7.921
NoCal	SFB	24-Jun-08	MCC040	RW	Dryflow	2.18	7.72	1.648	4.69	18.22	0	mv	15.79
NoCal	SFB	05-Aug-08	MCC010	StDr	Dryflow	0.14	8.05	0.193	8.42	18.12	0	0.94	3.024
NoCal	SFB	05-Aug-08	MCC020	StDr	Dryflow	fl	8.34	1.564	8.27	16.93	2.2	12.90	6.985
NoCal	SFB	05-Aug-08	MCC030	StDr	Dryflow	0.1	8.17	0.82	7.68	19.93	0	16.79	9.464
NoCal	SFB	05-Aug-08	MCC040	RW	Dryflow	fl	7.66	1.644	3.71	19.63	9.7	2.28	5.015
NoCal	SFB	06-Aug-08	GRY010	StDr	Dryflow	0.0188	7.78	0.928	7.93	17.26	2.6	7.65	4.565
NoCal	SFB	06-Aug-08	GRY020	StDr	Dryflow	0.059	8.11	1.75	9.64	19.71	0.3	6.66	3.77
NoCal	SFB	06-Aug-08	GRY030	RW	Dryflow	5.15	8.17	0.699	7.45	20.38	3.9	8.79	3.826
NoCal	SFB	01-Nov-08	GRY010	StDr	Rain	7.00	7.17	0.306	8.86	16.99	177.2	844.31	12.48
NoCal	SFB	01-Nov-08	GRY020	StDr	Rain	0.42	7.42	0.383	9.21	17.4	97	470.73	15.01

Table A15 continued.

Region	Area	Sample Date	Site ID	Water Body	Sample Event	Flow (cfs)[1]	pH	EC (mS cm^{-1})	DO (mg L^{-1})	Temp (°C)	Turb (NTU)	TSS (ppm)	TOC (ppm)
NoCal	SFB	01-Nov-08	GRY030	RW	Rain	fl	7.76	0.282	5.94	17.18	201.6	647.93	13.5
NoCal	SFB	01-Nov-08	MCC010	StDr	Rain	3.60	7.84	0.328	9.03	18.08	16.8	67.63	11.245
NoCal	SFB	01-Nov-08	MCC020	StDr	Rain	4.00	7.74	0.737	8.46	12.73	165.3	31.09	10.76
NoCal	SFB	01-Nov-08	MCC030	StDr	Rain	39.00	7.37	0.076	9.37	17.37	24.5	59.50	5.546
NoCal	SFB	01-Nov-08	MCC040	RW	Rain	81.00	7.59	0.186	8.66	18.61	56.7	282.61	9.503
NoCal	SFB	15-Feb-09	GRY010	StDr	Rain	18.60	7.73	0.41	11.06	9.46	79.2	187.93	8.006
NoCal	SFB	15-Feb-09	GRY020	StDr	Rain	5.73	7.67	0.279	11.2	9.38	55.8	150.87	3.714
NoCal	SFB	15-Feb-09	GRY030	RW	Rain	fl	7.68	0.193	10.54	9.96	52	111.13	4.58
NoCal	SFB	15-Feb-09	MCC010	StDr	Rain	6.46	8.04	0.434	11.36	11.41	4.1	7.00	4.817
NoCal	SFB	15-Feb-09	MCC020	StDr	Rain	2.80	8.1	0.539	10.84	10.57	2.9	7.50	5.004
NoCal	SFB	15-Feb-09	MCC030	StDr	Rain	7.32	7.52	0.141	10.31	12.21	21.1	19.70	4.819
NoCal	SFB	15-Feb-09	MCC040	RW	Rain	91.80	7.8	0.286	10.79	11.72	21.8	40.69	3.983
NoCal	SFB	07-Apr-09	GRY010	StDr	Rain	3.28	7.35	0.651	9.43	12.13	34.8	103.95	9.59
NoCal	SFB	07-Apr-09	GRY020	StDr	Rain	0.64	7.86	1.151	9.41	14.14	16.5	29.10	8.704
NoCal	SFB	07-Apr-09	GRY030	RW	Rain	52.50	7.55	0.399	8.41	13.39	101.9	115.50	9.607
NoCal	SFB	14-Apr-09	GRY010	StDr	Dryflow	0.07	8.04	2.277	9.15	12.11	0.7	3.12	5.717
NoCal	SFB	14-Apr-09	GRY020	StDr	Dryflow	0.07	8.06	1.44	10.38	14.33	2.6	26.52	4.556
NoCal	SFB	14-Apr-09	GRY030	RW	Dryflow	1.29	8.18	1.779	9.66	16.85	0	3.84	4.412
NoCal	SFB	14-Apr-09	MCC010	StDr	Dryflow	0.30	8.32	1.952	12.03	12.73	0	25.25	2.511
NoCal	SFB	14-Apr-09	MCC020	StDr	Dryflow	0.00	8.28	1.298	10.21	11.85	0	1.61	6.922
NoCal	SFB	14-Apr-09	MCC020[1]	StDr	Dryflow	0.16	mv	mv	mv	mv	mv	12176.4[2]	259[2]
NoCal	SFB	14-Apr-09	MCC030	StDr	Dryflow	0.16	7.98	1.1	9.53	15.65	0	0.81	1.155
NoCal	SFB	14-Apr-09	MCC040	RW	Dryflow	0.164	7.88	1.685	9.78	13.25	0	0.10	2.684
NoCal	SFB	01-May-09	GRY010	StDr	Rain	9.00	7.62	1.09	8.39	15.75	31.8	43.59	12.27
NoCal	SFB	01-May-09	GRY020	StDr	Rain	1.66	7.6	0.364	9.3	16.64	13.1	11.90	9.507
NoCal	SFB	01-May-09	GRY030	RW	Rain	Fl	7.61	0.451	6.92	16.39	32.2	61.29	16.37
NoCal	SFB	01-May-09	MCC010	StDr	Rain	3.59	7.8	0.539	9	15.83	122.3	3.82	12.4
NoCal	SFB	01-May-09	MCC020	StDr	Rain	1.24	7.88	0.178	8.98	15.79	10.3	8.59	9.889
NoCal	SFB	01-May-09	MCC030	StDr	Rain	0.837	7.42	0.15	9.06	16.47	7.5	9.26	9.56
NoCal	SFB	01-May-09	MCC040	RW	Rain	Fl	7.68	0.212	9.41	15.89	6.6	11.31	9.067
NoCal	SFB	27-Aug-09	MCC010	StDr	Dryflow	0.08	8.21	2.07	9.65	18.01	0	1.31	6.161
NoCal	SFB	27-Aug-09	MCC020	StDr	Dryflow	fl	8.32	1.104	8.07	17.7	0	1.31	11.24
NoCal	SFB	27-Aug-09	MCC030	StDr	Dryflow	0.03	8.14	0.889	8.45	20	2.7	7.94	2.028
NoCal	SFB	27-Aug-09	MCC040	RW	Dryflow	nf	7.52	1.668	2.28	18.74	0.7	4.70	95.11
NoCal	SFB	27-Aug-09	GRY010	StDr	Dryflow	fl	7.34	0.8	1.33	16.77	3.9	12.94	6.757
NoCal	SFB	27-Aug-09	GRY020	StDr	Dryflow	fl	8.22	1.825	8.58	18.5	0	0.40	5.01
NoCal	SFB	27-Aug-09	GRY030	RW	Dryflow	0.96	8.26	1.025	12.26	24.44	7.5	7.58	6.021

[2] Values for TOC and TSS are high because this sample was mostly sediment, unlike the preceding sample from the same site.

Table A15 continued.

Region	Area	Sample Date	Site ID	Water Body	Sample Event	Flow (cfs)[1]	pH	EC (mS cm^{-1})	DO (mg L^{-1})	Temp (°C)	Turb (NTU)	TSS (ppm)	TOC (ppm)
SoCal	OC	08-Apr-08	SC1	StDr	Dryflow	0.02	7.53	4.289	7.72	14.46	3.2	5.19	8.963
SoCal	OC	08-Apr-08	SC3	StDr	Dryflow	0.05	8.2	1.527	9.58	16.43	6.8	17.18	15.55
SoCal	OC	08-Apr-08	SC5	RW	Dryflow	0.52	7.7	3.193	10.38	14.92	1.4	6.55	10.42
SoCal	OC	08-Apr-08	WC1	StDr	Dryflow	0.06	8.3	1.059	10	16.16	1.4	0.00	2.327
SoCal	OC	08-Apr-08	WC2	StDr	Dryflow	0.09	7.59	1.238	5.57	15.39	0	20.80	5.01
SoCal	OC	08-Apr-08	WC3	StDr	Dryflow	0.01	8.17	2.703	8.68	16.13	0.7	2.06	9.575
SoCal	OC	08-Apr-08	AV01	RW	Dryflow	0.12	7.94	1.28	9.09	16.54	4.3	7.60	5.414
SoCal	OC	13-May-08	SC1	StDr	Dryflow	nf	7.57	3.095	7.07	15.75	4.3	16.07	10.74
SoCal	OC	13-May-08	SC3	StDr	Dryflow	fl	8.53	1.793	7.6	17.6	mv	4.45	9.297
SoCal	OC	13-May-08	SC5	RW	Dryflow	1.46	7.82	4.287	9.53	16.07	0	8.25	9.302
SoCal	OC	13-May-08	WC1	StDr	Dryflow	0.12	8.28	1.039	8.66	17.65	0	0.51	3.588
SoCal	OC	13-May-08	WC2	StDr	Dryflow	0.32	7.58	1.244	4.91	17.86	0	0.40	5.412
SoCal	OC	13-May-08	WC3	StDr	Dryflow	fl	8.11	3.741	7.88	17.86	0.4	22.75	11.72
SoCal	OC	13-May-08	AV01	RW	Dryflow	3.20	7.68	1.638	5.76	17.86	2.4	9.62	7.806
SoCal	OC	13-Jun-08	SC1	StDr	Dryflow	fl	7.4	4.107	5.81	19.29	0.4	8.01	Mv
SoCal	OC	13-Jun-08	SC3	StDr	Dryflow	fl	8.14	2.315	8.18	22.42	3.1	12.75	33.33
SoCal	OC	13-Jun-08	SC5	RW	Dryflow	0.42	7.9	3.844	mv	19.85	0	3.77	10.85
SoCal	OC	14-Jun-08	WC1	StDr	Dryflow	0.10	8.13	0.907	mv	19.4	0	1.26	5.134
SoCal	OC	14-Jun-08	WC2	StDr	Dryflow	0.17	7.33	1.253	mv	17.27	0	1.05	6.443
SoCal	OC	14-Jun-08	WC3	StDr	Dryflow	0.05	8.01	1.529	8.55	19.04	0.4	17.89	10.08
SoCal	OC	14-Jun-08	AV01	RW	Dryflow	0.24	7.49	1.378	5.1	17.51	3.5	4.76	7.509
SoCal	OC	26-Nov-08	SC1	StDr	Rain	fl	6.08	0.646	7.87	15.46	mv	mv	mv
SoCal	OC	26-Nov-08	SC3	StDr	Rain	fl	6.63	0.305	8.31	15.82	mv	295.83	12.69
SoCal	OC	26-Nov-08	SC5	RW	Rain	fl	6.47	0.594	8.84	14.72	mv	211.25	9.343
SoCal	OC	26-Nov-08	WC2	StDr	Rain	fl	7.43	1.072	9.34	15.58	mv	24.29	6.213
SoCal	OC	26-Nov-08	WC3	StDr	Rain	fl	7.63	0.569	8.18	14.43	mv	116.02	7.416
SoCal	OC	26-Nov-08	AV01	RW	Rain	fl	7.41	1.379	7.44	15.23	mv	79.80	10.56
SoCal	OC	05-May-09	SC1	StDr	Dryflow	fl	6.98	4.472	6.45	20.55	mv	31.68	14.16
SoCal	OC	05-May-09	SC3	StDr	Dryflow	fl	7.6	1.658	7.61	21.14	mv	230.75	17.88
SoCal	OC	05-May-09	SC5	RW	Dryflow	fl	7.26	3.341	7.43	18.24	mv	2.53	10.68
SoCal	OC	05-May-09	WC1	StDr	Dryflow	nf	6.67	1.836	5.15	20.3	mv	434.44	5.696
SoCal	OC	05-May-09	WC2	StDr	Dryflow	fl	6.98	1.197	4.39	18.98	mv	0.00	4.392
SoCal	OC	05-May-09	WC3	StDr	Dryflow	fl	7.03	2.968	5.53	18.25	mv	4.95	12.315
SoCal	OC	05-May-09	AV01	RW	Dryflow	fl	6.82	1.362	5.24	18.94	mv	0.75	4.953
SoCal	OC	01-Aug-09	AV01	RW	Dryflow	fl	7.63	0.99	6.61	22.87	5	0.74	7.184
SoCal	OC	01-Aug-09	WC2	StDr	Dryflow	mv	mv	mv	mv	mv	mv	0.00	7.194
SoCal	OC	01-Aug-09	WC3	StDr	Dryflow	mv	mv	mv	mv	mv	mv	12.12	17.73

Table A15 continued.

Region	Area	Sample Date	Site ID	Water Body	Sample Event	Flow (cfs)[1]	pH	EC (mS cm^{-1})	DO (mg L^{-1})	Temp (°C)	Turb (NTU)	TSS (ppm)	TOC (ppm)
SoCal	OC	01-Aug-09	SC1	StDr	Dryflow	nf	mv	mv	mv	mv	mv	15.23	13.15
SoCal	OC	01-Aug-09	SC3	StDr	Dryflow	mv	mv	mv	mv	mv	mv	2.83	26.27
SoCal	OC	01-Aug-09	SC5	RW	Dryflow	fl	7.33	2.494	3.67	21.19	3.3	0.47	14.13
SoCal	SD	07-Apr-08	SDR101	RW	Dryflow	2.2	7.7	2.565	6.79	19.1	2.6	0.00	70.21
SoCal	SD	07-Apr-08	SDR102	StDr	Dryflow	0.06	7.44	3.176	7.17	20.59	11.5	26.91	3.611
SoCal	SD	07-Apr-08	SDR151	StDr	Dryflow	0.28	7.36	2.59	4.62	21.17	0	0.00	1.545
SoCal	SD	07-Apr-08	SDR156	StDr	Dryflow	0.01	8.13	0.993	9.04	17.08	0	0.00	1.553
SoCal	SD	07-Apr-08	SDR158	RW	Dryflow	nf	7.35	2.566	4.51	20.15	14.5	4.20	77.69
SoCal	SD	12-May-08	SDR101	RW	Dryflow	17.21	7.81	3.025	5.46	20.45	0.2	1.26	7.956
SoCal	SD	12-May-08	SDR102	StDr	Dryflow	fl	7.41	3.462	6.85	20.73	12.2	4.13	3.457
SoCal	SD	12-May-08	SDR151	StDr	Dryflow	0.5806	7.31	2.587	3.62	21.45	0	0.00	1.392
SoCal	SD	12-May-08	SDR156	StDr	Dryflow	fl	8.04	0.974	7.7	17.98	0	2.30	3.383
SoCal	SD	12-May-08	SDR158	RW	Dryflow	fl	7.41	2.559	4.59	20.73	8.1	7.25	1.565
SoCal	SD	12-May-08	SDR159C	StDr	Dryflow	0.43	7.36	2.595	4.6	21.36	0	0.00	1.493
SoCal	SD	12-Jun-08	SDR151	StDr	Dryflow	0.0668	7.22	2.578	3.62	21.61	0	0.00	1.284
SoCal	SD	12-Jun-08	SDR156	StDr	Dryflow	fl	7.78	0.678	mv	19.55	7.6	0.00	2.463
SoCal	SD	12-Jun-08	SDR158	RW	Dryflow	nf	7.21	2.547	5.05	21.39	4.8	6.41	1.689
SoCal	SD	13-Jun-08	SDR101	RW	Dryflow	1.07	7.55	3.015	2.32	22.64	0	1.33	9.852
SoCal	SD	13-Jun-08	SDR102	StDr	Dryflow	fl	7.38	3.237	6.2	20.97	9.9	21.10	4.142
SoCal	SD	26-Nov-08	SDR101	RW	Rain	67.50	7.71	1.489	7.1	16.88	37.7	98.20	10.8
SoCal	SD	26-Nov-08	SDR102	StDr	Rain	1.80	7.4	1.132	8.07	17.99	7.4	10.53	6.131
SoCal	SD	26-Nov-08	SDR103	StDr	Rain	0.03	8.15	0.195	8.75	17.22	0	4.25	16.25
SoCal	SD	26-Nov-08	SDR104	StDr	Rain	2.00	7.62	0.148	4.37	16.59	13.5	43.38	10.18
SoCal	SD	26-Nov-08	SDR151	StDr	Rain	nf	7.92	0.264	8.79	16.62	218	218.83	14.5
SoCal	SD	26-Nov-08	SDR156	StDr	Rain	fl	7.48	0.14	8.26	17.1	13.6	41.31	20.66
SoCal	SD	26-Nov-08	SDR158	RW	Rain	fl	7.4	0.29	8.37	16.32	236.6	213.67	14.19
SoCal	SD	06-May-09	SDR101	RW	Dryflow	3.22	7.6	2.947	3.68	21.88	0	6.12	8.313
SoCal	SD	06-May-09	SDR102	StDr	Dryflow	1.77	7.31	3.462	7.16	21.12	10.4	9.28	3.735
SoCal	SD	06-May-09	SDR156	StDr	Dryflow	0.01	8.13	0.977	8.82	18.24	0	43.51	1.745
SoCal	SD	06-May-09	SDR158	RW	Dryflow	nf	7.39	1.898	2.9	21.38	14.4	31.50	9.094
SoCal	SD	01-Aug-09	SDR101	RW	Dryflow	1.13	7.57	4.074	0.94	23.31	2	4.55	20.58
SoCal	SD	01-Aug-09	SDR102	StDr	Dryflow	0.13	7.48	3.588	6.75	22.37	12	4.61	9.694
SoCal	SD	01-Aug-09	SDR156	StDr	Dryflow	nf	8.17	0.815	7.01	22.36	94.2	1456.69	5.689
SoCal	SD	01-Aug-09	SDR158	RW	Dryflow	nf	7.32	2.637	0.88	23.22	8.2	3.91	10.52

[1]fl, the water in the waterbody was flowing but flow could not be taken; nf, the water in the waterbody was not flowing.

VII. APPENDIX II. QUALITY CONTROL

1. Holding times. Holding times are the length of time from when the sample is collected to when it is extracted prior to analysis, and vary for the different analyte screens (Table 1). All analyses met there holding times, except for two synthetic auxin analyses. The holding times for two of these batches failed by one and two days. Due to a lab error, another batch was not extracted until 50 days after sampling. Conducting a lab duplicate analysis confirmed that exceeding the holding time did not affect the degradation of these samples.

2. Lab Blanks. There were no detections in any of the lab blanks.

3. Matrix and propazine surrogate spikes. With analytical batch, control water or sediment is spiked with known concentrations of the pesticides in that particular analytical screen. For the study there were 698 matrix spikes; 98% of these were recovered within acceptable limits. All 194 propazine surrogates (a triazine surrogate) were recovered with laboratory acceptable limits, as were all of the sediment matrix spikes.

4. Blind spikes, Field Blanks, and Field Duplicates. About 15% of the samples were blind spikes, field blanks, or field duplicates. Twenty-seven analytes in 15 blind spikes were all recovered within acceptable limits. However, in one analysis, fipronil was detected as a trace detection for fipronil, without fipronil added to the sample.

There were no detections in any of the 37 field blanks. Of 90 field duplicate analyses (water samples), 96% had good reproducibility (less than 25% difference) between the original field sample and the field duplicate. Sediment samples had more variation, with only 80% of the samples having good reproducibility. The sediment matrix may be interfering with the analysis and causing some variation in the data.

055929

Amended

Green City Clean Waters

The City of Philadelphia's Program for Combined Sewer Overflow Control

Program Summary

Amended by the Philadelphia Water Department
June 1, 2011

The creation and implementation of our *Green City, Clean Waters* vision is made possible as a result of the contributions of our partner City agencies and departments that provided, and continue to share their expertise, guidance and support toward the realization of this plan.

Streets Department

Mayor's Office of Sustainability

Philadelphia Parks & Recreation

Planning Commission

Office of Housing and Community Development

Housing Authority

School District

Parking Authority

Redevelopment Authority

Licenses and Inspections

Zoning Commission

Commerce Department

Philadelphia Industrial Development Corporation

Health Department

PWD also recognizes the invaluable contributions of our watershed partnerships, special service districts and other non-governmental organizations in making this vision a reality.

The Philadelphia Water Department is pleased to announce the approval by the Commonwealth of Pennsylvania of our *Green City, Clean Waters* plan as amended through negotiations with the Pennsylvania Department of Environmental Protection (PA DEP) since its submission in September, 2009. This program represents the City of Philadelphia's commitment towards meeting our regulatory obligations while helping to revitalize our City. Our Combined Sewer Overflow (CSO) Long Term Control Plan Update (LTCPU) submitted in September, 2009 explains how this vision and the commitment to its implementation grew out of our history, built on our extensive watershed analysis and planning, and is continually informed by local and national policy trends. The full LTCPU document is available online for download at www.philly-watersheds.org/ltcpu/.

Through evaluation of a number of alternative implementation approaches, we determined that a green stormwater infrastructure-based approach would provide maximum return in environmental, economic, and social benefits within the most efficient timeframe, making it the best approach for the City of Philadelphia.

The *Green City, Clean Waters* Program has been amended as follows:

- Program commitment: $1.2B net present value (represents $2.4B capital construction plus operating and maintenance costs, in terms of actual future expenditures) for addressing water quality goals as set both by the Pennsylvania and the National CSO Control Policies. These projects will be implemented over a 25-year period, with metrics and milestones developed to measure progress along the way.
- The stream restoration program included in the original LTCPU has been removed from the Program's CSO compliance goals. However, the City intends to continue its stream restoration and wetland creation efforts and is committed to spending $125M net present value ($260M future expenditures) toward achieving the goal of restoring the biological resources of the City's streams.
- The City's plan is based on a Presumption Approach, as described in the National CSO Policy, to approach the water quality requirements of the Clean Water Act (CWA) and the Pennsylvania Clean Streams Law as follows: The City will construct and place into operation the controls described as the selected alternative in the amended LTCPU to achieve the elimination of the mass of the pollutants that otherwise would be removed by the capture of 85% by volume of the combined sewage collected in the Combined Sewer System (CSS) during precipitation events on a system-wide annual average basis.

Over the next five years, the Philadelphia Water Department will lay the foundation for achieving the Green City, Clean Waters vision over the full 25 year implementation period of this plan and beyond. The cost and affordability of those programs and the additional value they will leverage were analyzed and vetted extensively. The desire to ensure our watersheds are healthy while building a competitive, sustainable future for Philadelphia is shared by other City agencies, partner organizations, and residents, who have expressed enthusiastic support for achieving our vision of *Green City, Clean Waters*.

Introduction

The Philadelphia Water Department (PWD) developed a robust plan for supporting an effort that will resonate with the values and hopes of Philadelphia's neighborhoods and provide a clear pathway to a sustainable and resilient future, while strengthening the utility, broadening its mission and complying with environmental laws and regulations.

Nationwide, water utilities find themselves under increasing pressure as they confront a new set of complex environmental, demographic and financial challenges while also trying to meet expanded customer expectations for a safe and affordable water supply; the collection and high level treatment of wastewater and stormwater; flood protection; and clean, attractive, fishable, swimmable rivers and streams. Unfortunately this dilemma comes at a time when the City is grappling with some very real problems of population and financial decline.

Also significant are our new challenges to water quality and quantity, aging infrastructure, and the impacts of climate change on human health and our ecosystems. While changing demographics and conservation have resulted in an infrastructure system that has, in some places, provided capacity that exceeds overall needs, new regulations, energy, climatic and environmental issues will require significant new investments. Meeting these challenges requires either a significant new investment in infrastructure, or a paradigm shift in our approach to urban water resources.

During the past decade, PWD has created, tested and implemented new integrated strategies that promote the economic and social growth of the City and that meet the environmental, ecological and business missions of the utility. As the City agency charged with ensuring optimal compliance with the Federal Clean Water Act, PWD developed an infrastructure management program intended to protect and enhance our region's waterways by managing stormwater runoff to significantly reduce our reliance on construction of additional underground infrastructure. In effect, we plan to invest in green stormwater infrastructure solutions to reseed what are currently our impervious watershed hardscapes.

055932

Our Heritage

Over three hundred years ago, William Penn created the "Greene Country Towne" vision for his beloved Philadelphia. As the City grew, it became a hub of politics, technology and business. In keeping with this innovative approach to promoting healthy communities, Philadelphia was the first city in America to supply its citizens with drinking water (1801) and, in 1855 began purchasing land along the Schuylkill River to protect the water supply, creating several thousand acres of buffer known as Fairmount Park, now the world's largest urban park.

It is with great pride that we embrace our forefather's appreciation of the vital connection between a green city and clean water. Today, the Philadelphia Water Department (PWD) has a unique opportunity to address modern challenges to managing our water resources and infrastructure in an innovative way. By transforming Philadelphia into a 21st Century Sustainable City, we can move toward a realization of Penn's vision for a vibrant, healthy and green city.

What Are Combined and Separate Sewer Systems?

The City of Philadelphia has one of the first sewer systems in the country, with portions dating back to the second half of the 19th century. Much of that original infrastructure is still operational today. PWD's significant commitment to continuously inspect and maintain the 3,000 mile system of pipes, manholes, storm drains, and control chambers will sustain the use by City residents for years to come.

The City of Philadelphia's sewer system is comprised of both combined and separate sewer systems. A combined sewer system (CSS) is simply a single sewer system that carries both sewage and stormwater in one pipe, to a water pollution control plant for treatment before being released to a waterway. During moderate to heavy rainfall events, the system will reach capacity, overflow, and discharge a mixture of sewage and stormwater directly to our streams and rivers from the 164 permitted Combined Sewer Overflow (CSO) outfalls within the City. Forty-eight percent of the City of Philadelphia, or about 64 square miles, is within the combined sewer system drainage areas. Four watersheds, generally comprised of the older areas of the City of Philadelphia, receive CSO discharges.

The remainder of the City of Philadelphia's sewer system is drained by what is called a separate sewer system. A separate sewer system collects stormwater in a storm sewer pipe and discharges it directly to a waterway, while the sanitary sewage collected from homes, businesses, and industry is collected in a sanitary sewer pipe and taken to the water pollution control plant for treatment before being released to the waterways.

Watersheds Receiving CSO Discharges	mi^2 drained within Phila.	served by CSS (approx)
Tookany/Tacony-Frankford Creek	19	80%
Cobbs Creek	6	80%
Delaware River	40	71%
Schuylkill River	36	40%

This amounts to 64 square miles of Combined Sewer Service drainage area for potential implementation.

Combined Sewer System

Our Vision

The *Green City, Clean Waters* program is the realization of PWD's land-water-infrastructure philosophy. We have put less emphasis on the use of traditional infrastructure as it is cost prohibitive while also missing the restoration mark, instead pledging our valuable investments toward greening the City as a means to provide specific benefits to the residents of the City of Philadelphia while meeting ecological restoration goals.

Our vision is to unite the City of Philadelphia with its water environment, creating a green legacy for future generations while incorporating a balance between ecology, economics, and equity.

We will integrate CSO and water resources management into the socioeconomic fabric of the City by creating amenities for the people who live and work here.

PWD's *Green City, Clean Waters* program integrates management of Philadelphia's watersheds into a larger context. It is designed to provide many benefits beyond the reduction of combined sewer overflows, so that every dollar spent provides a maximum return in benefits to the public and the environment.

Our Vision Includes

- Large-scale implementation of green stormwater infrastructure to manage runoff at the source on public land and reduce demands on sewer infrastructure
- Requirements and incentives for green stormwater infrastructure to manage runoff at the source on private land and reduce demands on sewer infrastructure
- A large-scale street tree program to improve appearance and manage stormwater at the source on City streets
- Increased access to and improved recreational opportunities along green and attractive stream corridors and waterfronts
- Preserved open space utilized to manage stormwater at the source
- Converted vacant and abandoned lands to open space and responsible redevelopment
- Restored streams with physical habitat enhancements that support healthy aquatic communities
- Additional infrastructure-based controls when necessary to meet appropriate water quality standards.

Our Commitment

More than
$356 million
in commitments
already in place

$2.4 billion
invested by PWD
by 25-year mark

More than
$3 billion
full investment
in plan through
the addition
of leveraged
activities

We have heard a theme echoed in civic and public forums, in our watershed partnerships, and throughout Philadelphia's neighborhoods. People want to see more "green" in their communities, and they are ready to commit both time and effort to make it happen.

Our pledge is to put mechanisms in place over the coming years to equip the City to function as a "Green Machine." Long into the future, even beyond the limited timeframe of our 25-year planning horizon. Every time land is touched by development or redevelopment (for streets, homes, business, industry and so on), the principles of sustainability and stormwater management will be incorporated into the design and engineering of the development.

Our strategy is to focus on improving the water resources and revitalizing the City of Philadelphia. Commitments made in this plan will lay the foundation for a sustainable Philadelphia by greening our neighborhoods, restoring our waterfronts, improving our outdoor recreation spaces, and enhancing our quality of life. With the assistance of many public and private partners, we envision greening at least one third of the existing impervious cover in our Combined Sewer System drainage areas over the next two and a half decades, transforming them into "Greened Acres" that will filter or store the first inch of rainwater runoff each time it rains.

At the close of this 25 year implementation period, PWD will have invested approximately $2.4 billion ($1.2 billion in 2009 dollars) to initiate the largest green stormwater infrastructure program ever envisioned in this country, providing for the elimination of the mass of the pollutants that otherwise would be removed by the capture of 85% by volume of the combined sewage collected in the Combined Sewer System (CSS) during precipitation events on a system-wide annual average basis.

This *Green City, Clean Waters* commitment is made in addition to numerous CSO-related PWD program elements already in place, including:

- Approximately $200 million spent toward PWD's 1997 LTCP commitments (including Nine Minimum Controls, capital projects, and watershed planning)
- Approximately $2 million committed annually to reviewing private sector development plans for compliance with PWD's Stormwater Regulations
- Approximately $125 million committed to stream restoration in the Cobbs and Tookany/ Tacony-Frankford (TTF) watersheds—as outlined in the Integrated Watershed Management Plan (IWMP) commitments
- Approximately $56 million committed to relining streamside interceptor pipes in the Cobbs and Tookany/ Tacony-Frankford (TTF) watersheds—as outlined in the Integrated Watershed Management Plan (IWMP) commitments
- Approximately $2 million committed annually to Public Outreach and Education (including support of the Fairmount Waterworks Interpretive Center, and Philadelphia Parks & Recreation Environmental Stewardship and Education Division.)

Through these and other leveraged activities by our many stakeholders and partners, we anticipate that the full investment in Philadelphia's *Green City, Clean Waters* programs will reach well over $3 billion.

It is important that we reduce sewage overflows to our waterways in order to provide our citizens with destinations to play, fish, relax, and reconnect with nature. Our waterways are—and should be—protected and preserved to remain sources of beauty and life. Even after the close of this 25-year implementation period, the practices put in place will continue to produce Greened Acres, achieving additional cumulative reductions in combined sewer overflows to our rivers and streams. We pledge to continue this reduction.

Reducing sewage overflow to our waterways in order to provide our citizens with destinations to play, fish, relax, and reconnect with nature is the foundation of our environmental ethic.

Altogether, the following principles will help us enjoy clean, safe and accessible streams and rivers.

Basic Principles Underlying the City's *Green City, Clean Waters* Approach

- Utilizing rainwater as a resource by recycling, re-using, and recharging long neglected groundwater aquifers rather than piping it away from our communities into our already stressed tributaries
- Maintaining and upgrading one of the nation's oldest water infrastructure systems
- Collaborating to revitalize our City with an emphasis on sustainability
- Energizing our citizens, partnerships, public and regulatory partners to adopt and join us in this watershed-based strategy

This plan commits the City to reducing significantly the negative impacts of stormwater on the effectiveness of our sewer collection system. Our strategy is to reduce the stormwater burdening our sewers, changing the way that our landscape interacts with stormwater by enhancing our city's impervious cover with natural features. PWD will measure progress through Greened Acres that capture and manage the first inch of stormwater.

"Philadelphia has proposed *Green City, Clean Waters*, a novel initiative that will invest $2 billion over the next 25 years to green our city's stormwater infrastructure and recreate the natural processes that keep storm water out of our systems," said Mayor Michael A. Nutter. "Currently under consideration by the U.S. EPA and approved by the Pennsylvania Department of Environmental Protection, this plan will make our city greener, healthier and more liveable."

Mayor Michael Nutter
City of Philadelphia

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What is a "Greened Acre"?

An important performance goal used throughout this document is the achievement of a Greened Acre. Each Greened Acre represents an acre of impervious cover within the combined sewer service area that has at least the first inch of runoff managed by stormwater infrastructure. This includes the area of the stormwater management feature itself and the area that drains to it. One acre receives one million gallons of rainfall each year. Today, if the land is impervious, it all runs off into the sewer and becomes polluted. A Greened Acre will stop 80–90% of this pollution from occurring.

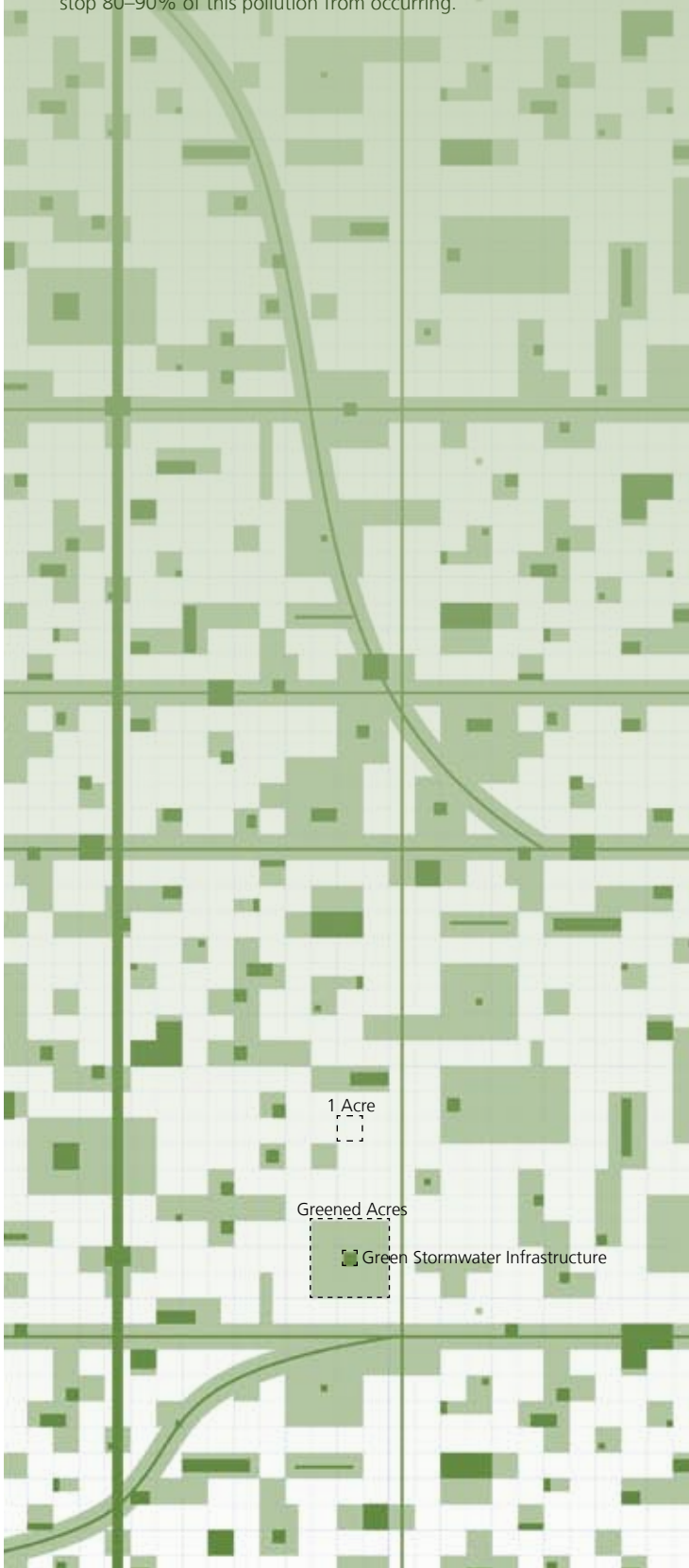

Development of the Long Term Control Plan Update

What Do the Clean Water Act and Combined Sewer Overflow Policy Require Us to Do?

- Meet water quality standard goals by substantially reducing combined sewer overflows
- Restore our waterways to enable aquatic life to thrive
- Commit PWD funding but remain affordable to our customers
- Outline our strategy of innovative and effective technologies and policies

What We've Been Doing

Since 1997, PWD has been committed to gaining a better understanding of how our sewer collection system functions every time it rains, including when the system fills to capacity, when and where overflows occur and in what volumes, as well as where and how more capacity could be added to meet our water quality standard goals.

We have also been studying our rivers and streams from a watershed wide perspective as Philadelphia occupies the downstream portions of our watersheds. For this reason, our watershed management plans are developed with our upstream suburban neighbors in Delaware, Montgomery and Bucks counties. Without their cooperation and commitment to take similar protection measures, the efficacy of our efforts would be limited. The following is a summary of our activities over the past 14 years:

- Developing Integrated Watershed Management Plans
- Conducting watershed-wide chemical and biological assessments to thoroughly understand the condition of our waterways, the diversity and health of our water ecosystems, and the physical condition of our waterways
- Implementing demonstration projects for stream renewal and stormwater management
- Modeling and characterizing the performance of our sewer collection system
- Constructing additional sewer storage capacity
- Implementing new regulations to manage stormwater for development
- Sponsoring regional, watershed-based stormwater management planning
- Transitioning to a parcel based stormwater fee

The culmination of this work has led PWD to make this commitment to the Pennsylvania Department of Environmental Protection (PADEP) and United States Environmental Protection Agency (USEPA), and more importantly, to our citizens.

Watershed Planning Approach

PWD developed our concept of regional watershed management planning after recognizing that, as the downstream most entity in each of the watersheds draining to the City of Philadelphia, the necessary long-term sustainable improvements to water quality and habitat within each waterway could not be achieved without watershed-wide stakeholder and agency support.

Watershed management fosters the coordinated implementation of programs, addresses and manages stormwater, looks to control sources of pollution, reduces polluted runoff, and promotes managed growth in the City and surrounding areas, while protecting the region's drinking water supplies, fishing and other recreational activities, and preserving sensitive natural resources such as parks and streams.

Water Quality Summary

Major issues in each of the four watersheds are summarized in the following table. Limited public awareness and sense of stewardship, and water quality impairment during dry and wet weather were identified in each of the four watersheds as major concerns. Common types of impairment include high levels of fecal coliform, elevated water temperatures, large day and night time variations in dissolved oxygen, and dissolved oxygen levels below minimum standards. During dry weather, potential sewage flows in separate sewer service areas were a concern in all watersheds. Another common dry weather concern was the presence of litter and unsightly streams, which discouraged recreational use.

In the Tookany/Tacony-Frankford and Cobbs Creek Watersheds, degraded aquatic and riparian habitats, and limited diversity of fish and other aquatic life were cited as ecosystem concerns. In those watersheds, bank and streambed erosion threatened the functions of nearby utilities and CSOs impacted both water quality and stream channels. In the Schuylkill and Delaware Watersheds, major concerns included the lack of recreational opportunities and public access to the riverfront, and the presence of PCBs which necessitated fish advisories.

Our watershed problems do not begin or end at the outfall.

Through the watershed-based planning process, PWD commits to addressing a multitude of overlapping regulatory requirements, including EPA's Combined Sewer Overflow (CSO) Control Policy, Phase I and Phase II Stormwater Regulations, PA Act 167 Stormwater Management, Total Maximum Daily Load allocations, PA Act 537 Sewage Facilities Planning, the Clean Streams Law, and Safe Drinking Water Act based drinking water source protection programs. The planning process must also fit within a host of non-regulatory planning processes and initiatives, including existing municipal and conservation planning efforts (e.g. River Conservation Plans, Open Space Plans, municipal comprehensive plans) and stakeholder goals. Implementation of this LTCPU commitment is just one part of PWD's larger, watershed-based commitment.

		Watersheds in the Combined Sewer Area			
		Tookany/Tacony-Frankford Creek	Cobbs Creek	Delaware River	Schuylkill River
Dry Weather Water Quality, Aesthetics and Recreation	Water quality concerns (including bacteria and dissolved oxygen)	●	●	●	●
	Potential sewage flows in separate sewered areas	●	●	●	●
	Litter and unsightly streams that discourage recreational use	●	●	○	○
	Safety concerns along streams and stream corridors	●	●	○	○
Watershed Stewardship	Limited public awareness and sense of stewardship	●	●	●	●
	Recreational opportunities and public access below potential	●	●	●	●
Healthy Living Resources	Degraded aquatic and riparian habitats	●	●	○	○
	Limited diversity of fish and other aquatic life	●	●	○	○
	Channelized stream sections	●	○	○	○
	Loss of wetlands	●	●	●	●
	Utility infrastructure threatened by bank and streambed erosion	●	●	○	○
Wet Weather Water Quality and Quantity	Water quality concerns (including bacteria and dissolved oxygen)	●	●	●	●
	CSO and stormwater impacts on stream channels	●	●	○	○
	Total Maximum Daily Load and fish advisories established for PCBs	○	○	●	●
	Little volume control and treatment of stormwater flows in separate sewered areas	●	●	○	○

This watershed planning approach recognizes that there is a direct connection between all neighborhoods in Philadelphia, whether adjacent to or miles from the City's rivers and creeks, and their watersheds. Household wastewater, roof runoff, road and sidewalk runoff, and parking lot runoff all end up in the sewers and ultimately in our waterways. Stormwater management in neighborhoods near and far from the waterways is essential. By managing stormwater at its source, it is possible to reduce the amount of stormwater that ends up in our rivers and creeks, simultaneously improving the quality of our neighborhoods and our waterways.

PWD is committed to developing watershed-based plans for each of the five major tributary streams that drain through the City of Philadelphia, including the Cobbs, Tookany/Tacony-Frankford, Wissahickon, Pennypack and Poquessing. Recently, PWD further committed to developing watershed-based plans for the City of Philadelphia

A **typical** urban watershed has negative effects on its creeks:

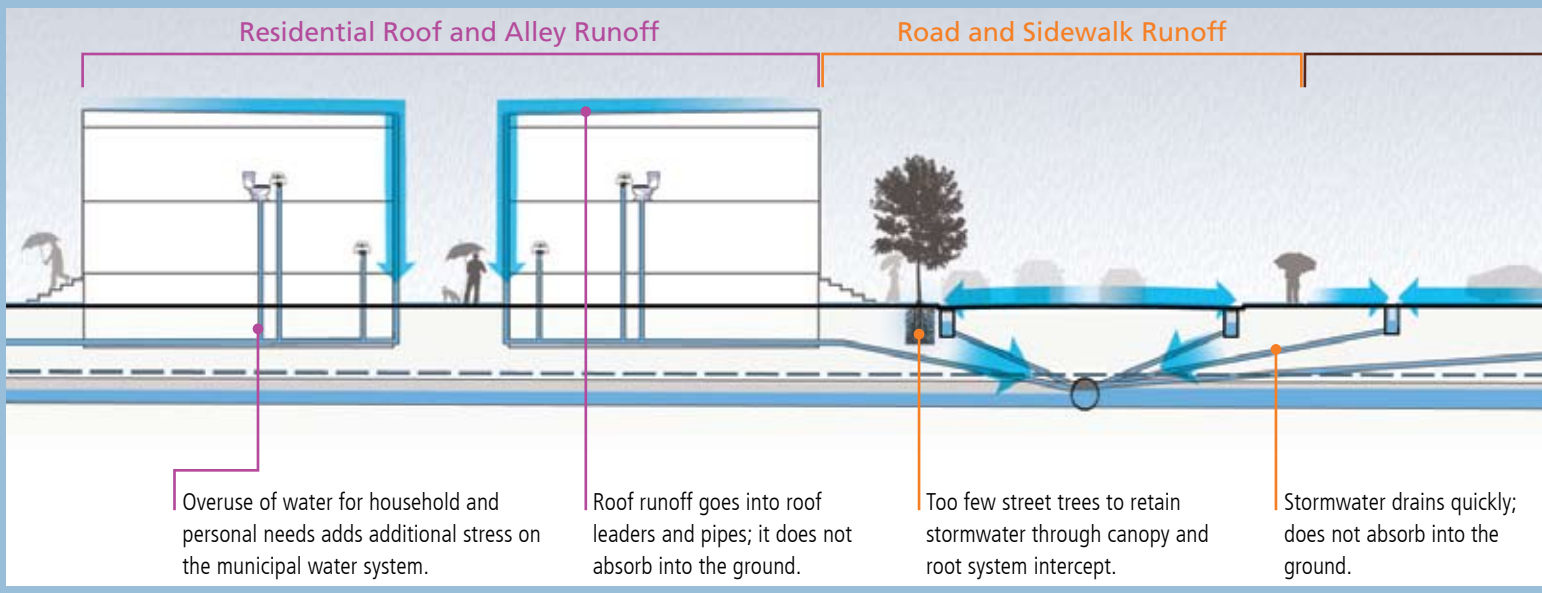

A more **sustainable** approach to stormwater will positively affect the watershed:

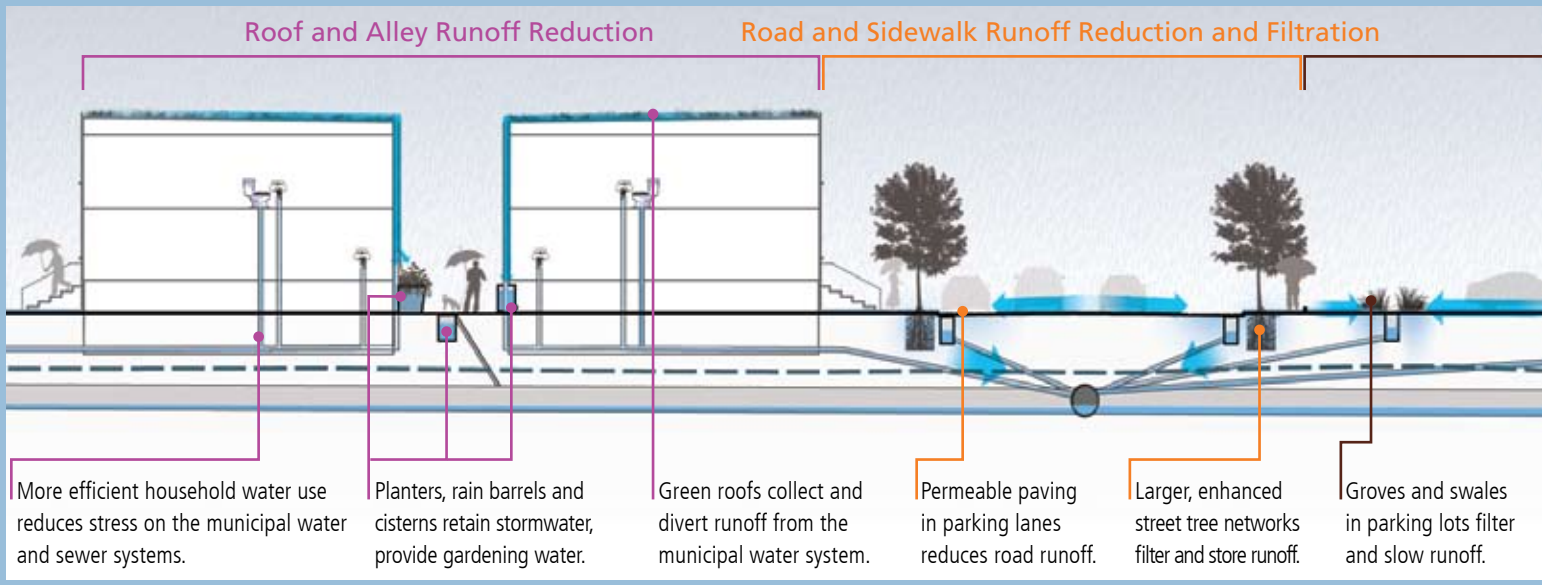

portions of the Schuylkill and Delaware River systems. To date, integrated watershed management plans has been completed for the Cobbs and Tookany/Tacony-Frankford Watersheds.

PWD's watershed-based planning process is based on a carefully crafted approach to meeting the challenges of watershed management in an urban setting. The primary intent of the planning process is to improve the environmental health and safe enjoyment of the watershed

"Philadelphia has shown a long-term commitment to the concepts of preservation and restoration applied on a watershed scale. Although these are not new ideas, they have the feeling of something innovative, because they are winning more and more interest around the country as the best way to a sustainable water future."

David Burke, Pennsylvania Department of Environmental Protection

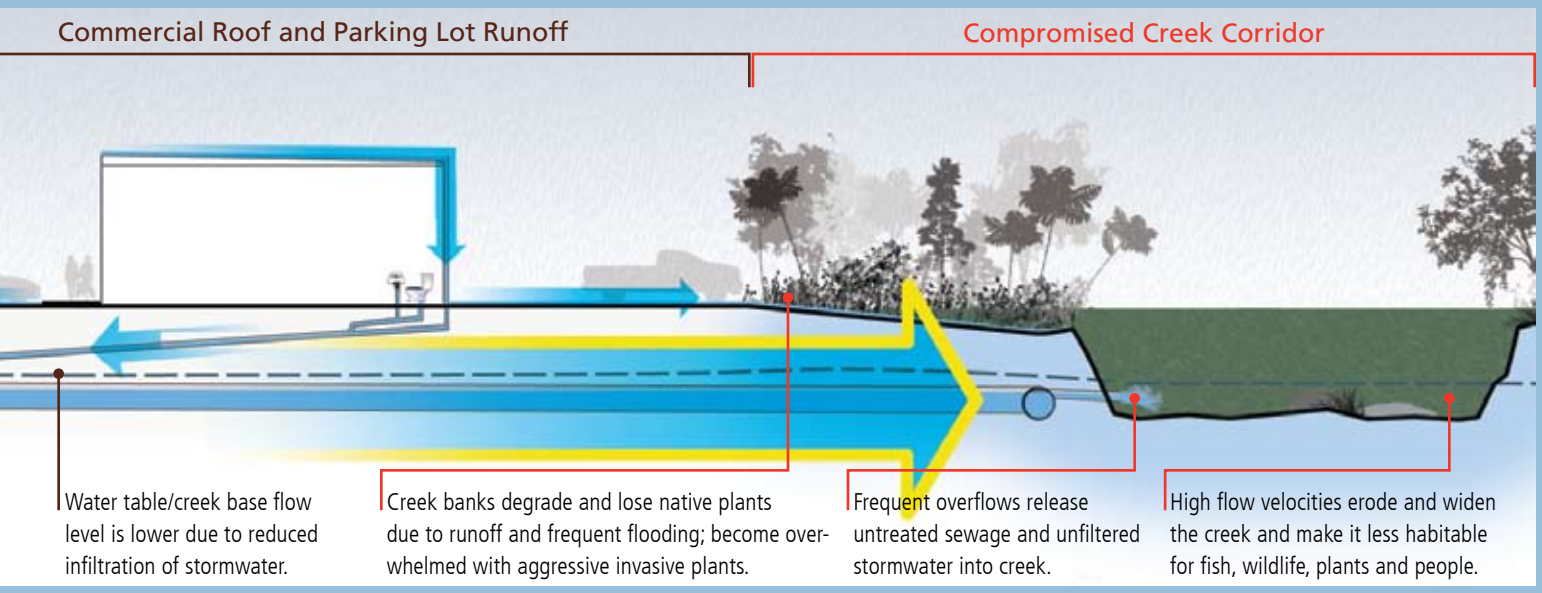

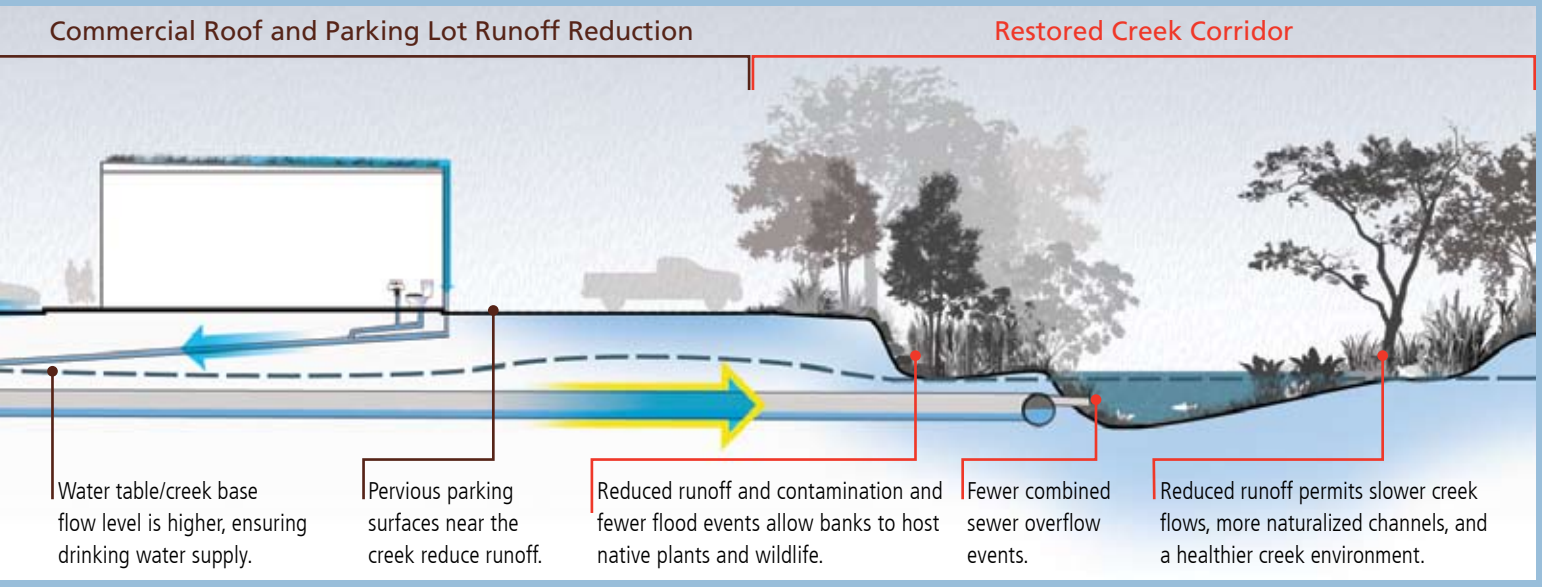

on a region-wide scale by sharing resources and through cooperation among residents and other stakeholders. PWD offers the residents and stakeholders a number of resources, as this multifaceted planning approach requires a tremendous amount of coordination, characterization and planning, which the watershed stakeholders build on through the watershed-based planning process.

PWD's watershed plans are built upon a solid, scientific foundation composed of water quality monitoring (including both wet and dry weather samples), benthic invertebrate (bug) and fish bioassessments, physical stream surveys (fluvial geomorphology as well as streamside infrastructure) and hydraulic and hydrologic computer modeling of stormwater flows and pollutant loading. Based on these extensive physical, chemical and biological assessments, the plans explore the nature, causes, and severity of water quality impairments in the watershed and

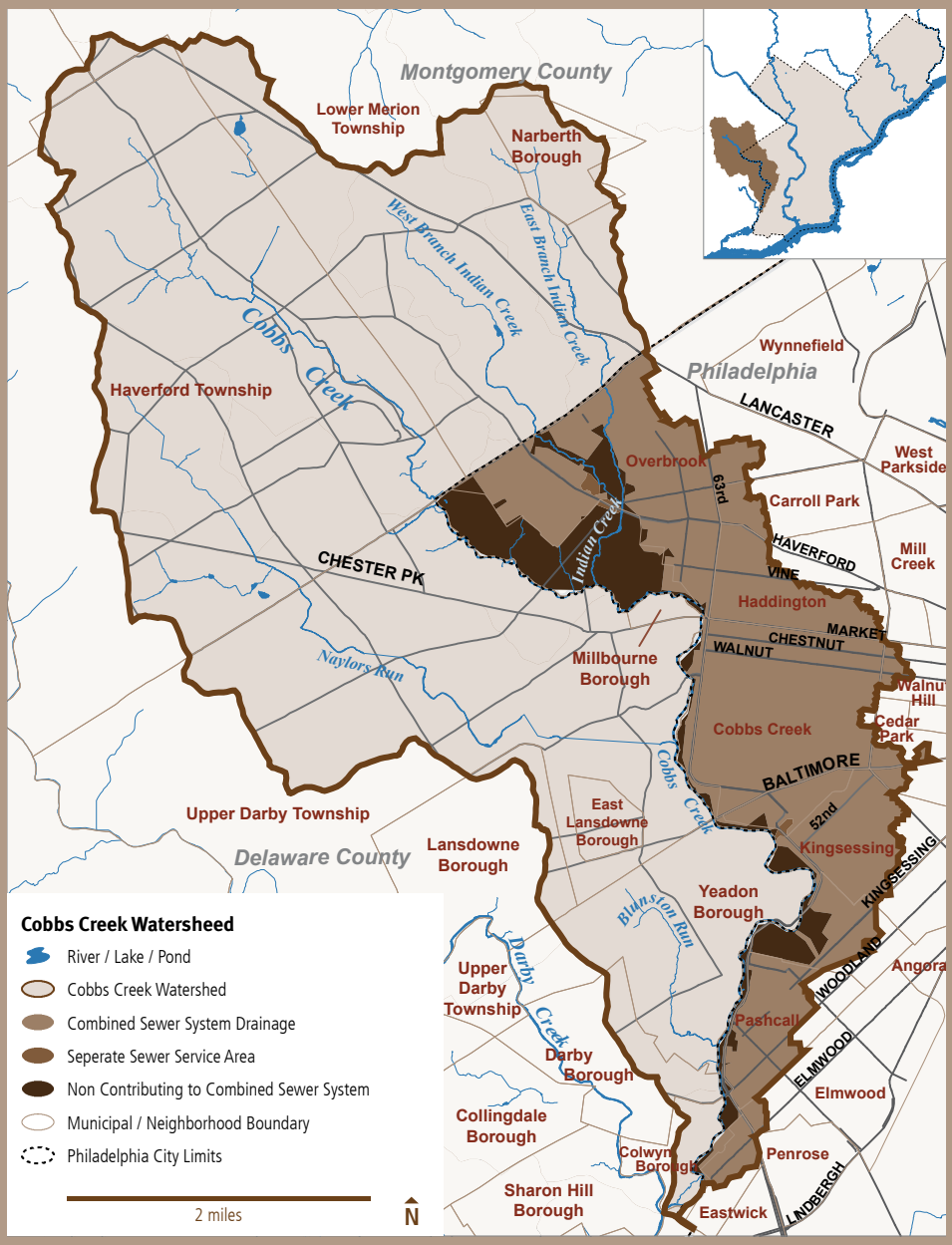

Cobbs Creek Watershed

Integrated Watershed Management Plan

In 1999, the PWD formed its first watershed partnership, the Darby-Cobbs Watershed Partnership in an effort to connect residents, businesses, and government as neighbors and stewards of the watershed. Since then, the Partnership has been active in developing a vision for the watershed and guiding and supporting subsequent planning activities within the watershed. The Partnership functions as a consortium of proactive environmental groups, community groups, government agencies, businesses, residents and other stakeholders who have an interest in improving the Darby-Cobbs Watershed.

The mission of the Darby-Cobbs Watershed Partnership is to improve the environmental health and safe enjoyment of the Darby-Cobbs Watershed by sharing resources through cooperation of the residents and other stakeholders in the Watershed. The goals of the initiative are to protect, enhance, and restore the beneficial uses of the Darby-Cobbs waterways and riparian areas.

Implementation Commitment to Date: The Cobbs Creek Integrated Watershed Management Plan (CCIWMP), completed in 2004 included a long term commitment to implementation measures to address dry and wet weather water quality goals, and stream and habitat restoration goals. The first 5-year implementation plan for the CCIWMP (2006–2011) included a commitment from PWD of roughly $16 million.

PWD and a number of the Darby-Cobbs Watershed Partners have successfully secured funding for and implemented multiple demonstration projects within the watershed. These projects stretch from the headwaters in Delaware and Montgomery Counties through the City of Philadelphia. The watershed partnership has worked over the years to understand where the information gaps exist within the community so that they could target demonstration projects that would not only achieve water quality and habitat related benefits, but also spread these demonstration projects geographically such that they would reach a diversity of community audiences educating residents about their various benefits.

A snapshot of projects implemented and/or underway within the Darby-Cobbs Watershed in 2008

opportunities for improvement.

PWD's watershed-based plans present logical and affordable pathways to restore and protect the beneficial and designated uses of these urban waterways.

Through an integrated approach to watershed management, PWD has reached across municipal boundaries and closely listened to its ratepayers. The wishes of our watershed partners are clear—they unanimously desire communities where there is opportunity for fishing, hiking and birding in a safe park—along a clean creek—surrounded by a healthy stream buffer which can protect rich and diverse aquatic life in their streams. These are the tenets that watershed partners believe will result in watersheds that attain water quality and water quantity improvements, a healthier natural environment and a better quality of life for the people who live, work and play in the watersheds.

Below: Two examples of completed Integrated Watershed Management Plans

Tookany/Tacony-Frankford Creek Watershed

Integrated Watershed Management Plan

PWD initiated the second watershed-based plan development process in the Tookany/Tacony-Frankford (TTF) Watershed in 2000. The TTF Watershed drains 29 square miles in Philadelphia and Montgomery Counties. The City of Philadelphia occupies almost 52% of the watershed drainage. The creek is referred to as the Tookany Creek until it enters Philadelphia at Cheltenham Avenue; then as the Tacony Creek from the Montgomery County border until the confluence with the historic Wingohocking Creek in Juniata Park; and finally the section of stream from Juniata Park to the Delaware River is referred to as the Frankford Creek. This planning endeavor in the TTF Watershed took roughly 4 years to move from watershed characterization to plan completion.

In 2005, under PWD's leadership, the Tookany/Tacony-Frankford Watershed Partnership transformed from a loose partnership into a formally incorporated independent non-profit organization, composed of environmental professionals, community groups, government entities, and other watershed stakeholders. The Partnership has embarked on implementing the Tookany/Tacony-Frankford Integrated Watershed Management Plan (TTFIWMP) and is active in advancing a wide range of initiatives for the good of the watershed.

Implementation Commitment to Date: The TTFIWMP, completed in 2005, included a long term commitment to implementation measures to address dry and wet weather water quality goals, and stream and habitat restoration goals. The first 5-year implementation plan for the TTFIWMP (2006-2011) included a commitment from PWD of roughly $18 million.

Not only has this watershed partnership celebrated the success of transitioning from a loosely affiliated informal partnership structure to an independent nonprofit organization with the mission of implementing the recommendations of the IWMP, but in its first few years of existing as a non-profit, this organization has secured funding for and implemented a number of demonstration projects throughout the watershed area. On an annual basis, PWD works with the Watershed Partnership to feature a number of on-the-ground accomplishments from the previous year and shares them with our watershed stakeholders in celebration of all we have achieved.

A snapshot of projects implemented and/or underway within the Tookany/Tacony-Frankford Watershed in 2008

Planning Goals from the Integrated Watershed Management Plan

Over the past twelve years, the watershed-based goal-setting process initiated through IWMP development has taught PWD that our watershed stakeholders generally consider all watershed management goals of almost equal importance; there is no goal of clear "higher rank" than others. The *Green City, Clean Waters* program aligns with this equal prioritization by addressing all aspects of watershed management instead of focusing solely on selected in-stream water quality parameters.

Source: Data based on the goal-setting process for the development of the Cobbs Creek Integrated Watershed Management Plan, 2003

Watershed Goals as Prescribed by Watershed Partners

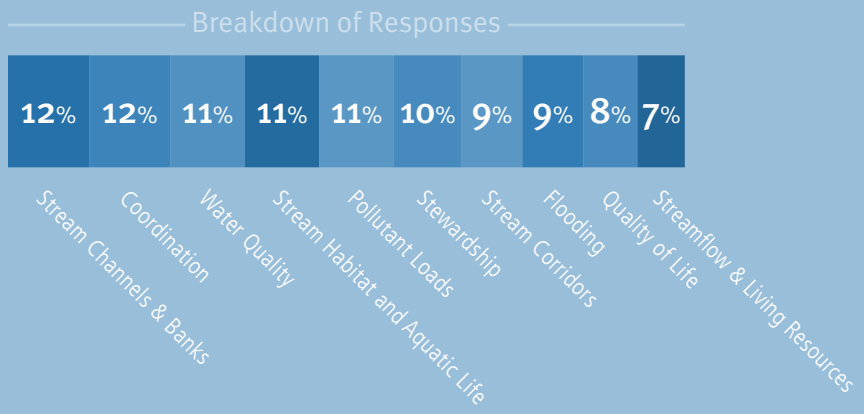

It is our goal to accomplish as many environmental improvements as possible, as quickly as feasible. We see the greatest immediate benefit to the public coming from an aggressive implementation of all the targets.

Environmental Targets

In an ideal world, flowing streams and rivers would remain in harmony with the surrounding environment. Banks would remain stable with lush, vegetative protection. Fish and benthic invertebrates (bugs) would thrive within their in-stream habitat. The floodplains surrounding the streams would be accessible, and within them one would find a mix of wetlands and mature forest cover.

Unfortunately, for the urban waterways of the Philadelphia area, streams have fallen victim to years of the effects of urbanization. As population and development have increased within and surrounding Philadelphia, so has impervious cover. This has resulted in a significant increase in stormwater runoff to be managed by existing infrastructure, ultimately making its way to these urban streams. This increase has created a "flashy" flow regime in these urban streams, meaning that they go from very low streamflows during dry weather to extremely high flows during rain events. This effect has devastated the stream systems, causing erosion and scouring of streambanks such that habitat has been all but destroyed for benthic invertebrate and fish populations.

Development of watershed planning goals through the stakeholder-led integrated watershed management planning process resulted in the establishment of three implementation targets for watershed improvement and restoration, based on consideration of ecology and human health. Targets help us to break the overwhelming end goal of "significantly improving watershed conditions" into three distinct measurable pieces on which we can consistently assess our performance during the implementation period.

Improvement of Stream Quality, Aesthetics and Recreation During "Dry" Weather: Our focus is on achieving water quality standards in the stream during dry weather periods, which is when we believe that our stakeholders are most likely to be recreating streamside. In a given year, dry weather conditions are observed close to 65% of the time. Achievement of this target would involve the elimination of dry weather discharges to the stream from outfalls, removal of trash and litter from the waterway, improvement of public access to the waterways, as well as enhancement of streamside recreational opportunities including streamside trails and open space.

Preservation and Enhancement of Healthy Living Resources: Part of what makes a stream so valuable is its healthy aquatic environment which results in diverse benthic invertebrate (bug) and fish populations. Implementation projects to achieve this lofty target are aimed not only at restoration of habitat, but also at measures to provide the opportunity for these organisms to seek refuge and avoid the high velocities of streamflow during storms. Achievement of this target will increase the population, health, and diversity of our benthic invertebrate and fish species within the stream.

Improvement of Wet Weather Water Quality and Quantity: During rainstorms a great deal of stormwater is piped to our streams—resulting in abrupt changes in water quantity and quality. Through the use of Green Stormwater Infrastructure tools, we seek to reduce the impact of these abrupt changes by managing stormwater where it hits the ground, thereby reducing the amount of stormwater that reaches the waterways.

Green Stormwater Infrastructure

The use of sustainable and natural design, called green stormwater infrastructure, will bring about the renewal and expansion of the urban form. This approach has been shown to be the most environmentally beneficial and economically favorable way to remediate the effect of more than 200 years of urbanization on the City's waterways.

By investing in green stormwater infrastructure and other innovative, cost-saving strategies to manage stormwater, we are not only ensuring the rebirth of our ecological resources but are also striving to provide a host of other environmental, social and economic benefits that will catalyze our success in achieving the sought after reality of the "Greenest City in America."

Acknowledging the symbiotic relationship between land use and water resources, our definition of green stormwater infrastructure includes a range of soil-water-plant systems that intercept stormwater, infiltrate a portion of it into the ground, evaporate a portion of it into the air, and in some cases release a portion of it slowly back into the sewer system.

Green stormwater infrastructure examples include bioretention planters in sidewalks and parking lots, green roofs, and roof leaders that run off into lawns and rain gardens. These vegetated features manage rain where it hits the ground similar to the way a natural system such as a forest or a meadow would handle the rain runoff. We sincerely believe in the efficacy of using nature's own designs in which rainwater is an essential component for a thriving ecosystem. When rainwater is removed from a natural system, it is only a matter of time before the ecosystem fails. The reduction of baseflow in urban streams is the unintended consequence of traditional infrastructure that pipes rainwater away from where it hits the ground before it has a chance to infiltrate.

Green stormwater infrastructure also involves the restoration of physical habitats in stream channels, along stream corridors, and on riverfronts. Restoration of stream habitats and riverfronts can also be combined with commitments to improve public access and amenities along the stream corridors. Public stewardship can only be guaranteed when the public is given the opportunity to see, touch and experience the streams healed by our efforts. These practices are critical to PWD's larger restoration vision; without them, the ecosystem damage resulting from two centuries of urbanization will not be reversed.

As green stormwater infrastructure becomes the standard practice, we will systematically reduce the amount of stormwater runoff from the City's built environment every time we renew the urban landscape and streetscapes. When we complete a public land transformation, the new green stormwater infrastructure will manage the first inch of rainfall which would normally flow along its street gutters and into its storm drains. We now look at our City's streets with an eye that seeks opportunities to peel back the existing concrete and asphalt and replace it with a new landscape, rich with vegetation that welcomes the rain—storing, draining and cleaning it. Our focus is on creating new standards of sustainable urban design that will guide the development and redevelopment of American cities in the 21st century.

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Integrating with Local and National Policy

The *Green City, Clean Waters* program is designed so that every dollar spent provides a maximum return in benefits to the public and the environment.

In a hallmark challenge to make Philadelphia "The Greenest City in America," Mayor Michael Nutter has committed to reducing the City's exposure to rising energy prices, to limiting the City's environmental footprint, and repositioning the workforce and economic development strategies to leverage an enormous competitive advantage in the emerging green economy. He created the new cabinet-level Office of Sustainability and a Sustainability Advisory Board representing public, private, and nonprofit interests from across the metropolitan area. In April 2009, the City launched "Greenworks," an innovative action plan focusing on Energy, Environment, Equity, Economy, and engagement with ambitious targets to be addressed within the next five years.

PWD's *Green City, Clean Waters* plan integrates management of Philadelphia's watersheds into this larger context. It is designed to provide many benefits beyond the reduction of combined sewer overflows, so that every dollar spent provides a maximum return in benefits to the public and the environment. Philadelphia's *Green City, Clean Waters* plan is a unique and fresh approach that supports numerous EPA initiatives at a time when our nation's cities need 21st Century solutions to aging infrastructure problems. EPA Administrator Lisa Jackson identified five priorities for the Administration, including:

1. Protecting America's water;*
2. Improving air quality;*
3. Reducing greenhouse gas emissions;*
4. Cleaning up hazardous-waste sites; and
5. Managing chemical risks.

PWD's *Green City, Clean Waters* program will directly address three of these five priorities (Denoted with an asterisk).

The City of Philadelphia's *Green City, Clean Waters* plan has been prepared in light of the recent green stormwater infrastructure guidance and policy documents developed by the United States Environmental Protection Agency (EPA). The EPA signed the "Green Stormwater Infrastructure Statement of Intent" in April 2007 and followed with the production of two memos, including "Using Green Stormwater Infrastructure to Protect Water Quality in Stormwater, CSO, Nonpoint Source and other Water Programs" and "Use of Green Stormwater Infrastructure in Permits and Enforcement." These EPA memos strongly support the use of green stormwater infrastructure approaches in lieu of traditional infrastructure when possible by encouraging state and federal policies to integrate green stormwater infrastructure into permitting and enforcement activities.

In March 2009, Administrator Jackson charged the EPA Office of Water with leading a new Urban Waters Initiative. The focus of this program will be to promote stewardship of urban waterways in the communities that surround them, especially in areas not historically targeted by environmental outreach. The goals of the Urban Waters Initiative are 1) to achieve water quality goals for fishable/ swimmable/drinkable rivers,2) to improve public health and the environment and quality of life, and 3) sustain community improvements over multiple generations. This initiative will help restore urban waterways in Environmental Justice communities. The *Green City, Clean Waters* Program embodies the intent of this Urban Waters Initiative. PWD will follow this initiative as it develops and will seek opportunities for partnership synergies.

Also, the EPA has recently joined forces with the US Department of Housing and Urban Development and the Department of Transportation through an Interagency Partnership for Sustainable Communities, focusing national attention to improve access to affordable housing, more transportation options, and lower transportation costs while protecting the environment in communities nationwide. Philadelphia's unique approach to meeting CSO requirements helps promote the goal of livable communities by investing in healthy, safe and walkable neighborhoods and coordinates all levels of policy to support our existing communities. This is yet another initiative that would dovetail with the *Green City, Clean Waters* program, presenting opportunities to partner and where possible, leverage funding such that both agencies are able to stretch their limited capital further and are able to get more out of each investment.

LTCPU Implementation Alternatives Evaluated

In order to compare the costs and benefits for multiple implementation approaches, we performed a comprehensive alternatives analysis on a number of implementation approaches (summarized below). Each infrastructure alternative was analyzed in detail for each watershed. Green Stormwater Infrastructure with Targeted Traditional Infrastructure was clearly the best alternative for several reasons. First, this alternative reduced combined sewer overflow in a cost-effective manner. Second, it meets the broader goals of PWD's Integrated Watershed Management approach while maximizing environmental, social, and economic benefits. Third, this alternative is the only one that meets all watershed goals without causing severe economic hardship for PWD's ratepayers. Finally, public feedback has expressed a clear and unambiguous preference for an alternative focused on green stormwater infrastructure.

					Economic Benefits				Social Benefits			Environmental Benefits	
	Affordable	Scalable	Meets Combined Sewer Overflow Policy Goals	Meets Watershed-based Planning Goals	Creates Jobs; Reduces Social Cost of Poverty	Enhances Recreation	Improves Community Quality of Life	Reduces Effects of Excessive Heat	Restores Ecosystems	Improves Air Quality	Saves Energy and Offsets Climate Change	Public Support	Benefits Accrual Method
Complete Sewer Separation • construct new sanitary sewer infrastructure • convert existing combined sewers to a municipal separate storm sewer system (MS4) • separate combined sanitary and storm laterals on private property • reconnect private properties to new system • reconstruct streets and sidewalks to their existing conditions	○	○	●	◐	○	○	○	○	○	○	○	○	at completion
Large-scale Storage (Tunnels) • construct traditional tunnel storage to temporarily store combined sewage • dewater stored sewage when capacity at water pollution control plants is available	○	○	●	◐	○	○	○	○	○	○	○	○	at completion
Plant Expansion, Satellite Treatment • construct decentralized satellite treatment facilities • construct new consolidation sewers to convey waste water to new satellite facilities	◐	◐	●	◐	○	○	○	○	○	○	○	○	at completion
Green Stormwater Infrastructure with Increased Transmission and Treatment • implement large-scale application of green stormwater infrastructure • construct new interceptors to increase capacity • increase wet weather wastewater treatment capacity	◐	◐	●	●	◐	●	◐	◐	●	◐	◐	◐	immediate incremental
Green Stormwater Infrastructure with Targeted Traditional Infrastructure • implement intensive large-scale application of green stormwater infrastructure • increase wet weather wastewater treatment capacity in targeted locations	●	●	●	●	●	●	●	●	●	●	●	●	immediate incremental

Why This Approach is Best for the City of Philadelphia

PWD considered it critical to embed the CSO program in the larger context of the various economic, social, and environmental challenges.

Multiple alternatives for meeting program objectives were developed and initially compared for their effectiveness and efficiencies in reducing combined sewer overflows. In selecting the best alternative for meeting the City's obligations for controlling CSO events, PWD considered it critical to embed the CSO program in the larger context of the various economic, social, and environmental challenges. These challenges require that government agencies break out of their traditional roles of providing narrowly defined services and seek to work together toward larger goals. PWD's LTCPU rightly focuses on significantly reducing CSOs, thereby making Philadelphia's creeks and rivers cleaner and healthier. But as the single largest investment in the City's environment over the next 25 years, it presents a unique opportunity to be much more than just a water quality improvement program and reverse the decline in the physical infrastructure in the City. It must be designed to provide additional benefits beyond the reduction of CSOs, so that every investment made provides a maximum return in benefits to the City.

After more than two years of significant engineering and economic analyses, the "Green Stormwater Infrastructure with Targeted Traditional Infrastructure" alternative was shown to be the most attractive alternative due to the many environmental, social, and economic benefits that can be realized, its ability to improve all four watersheds and remain within affordability guidelines, and the fact that benefits begin accruing immediately—thereby producing benefits for City residents long before the traditional infrastructure approach would. Because the alternative is implemented gradually, it is also adaptable to changing conditions and uncertainty. By comparison, due to limited financial capability, PWD could only afford a partial tunnel solution, meaning that only one watershed would benefit from this traditional infrastructure program within the 25-year implementation horizon. Instead, we chose a green and decentralized program that is adaptable over the 25-year implementation program and produces benefits throughout the combined sewer system drainage area.

Conceptual Comparison of CSO Capture Over Time for Alternatives Evaluated by the City of Philadelphia

In terms of percent capture as the performance standard, both immediate and continuous progress is made with the Green Stormwater Infrastructure with Targeted Traditional Infrastructure alternative, resulting in significant increase in capture after 25 years as opposed to a Centralized Storage alternative— which would not achieve any benefits until the end of the implementation cycle.

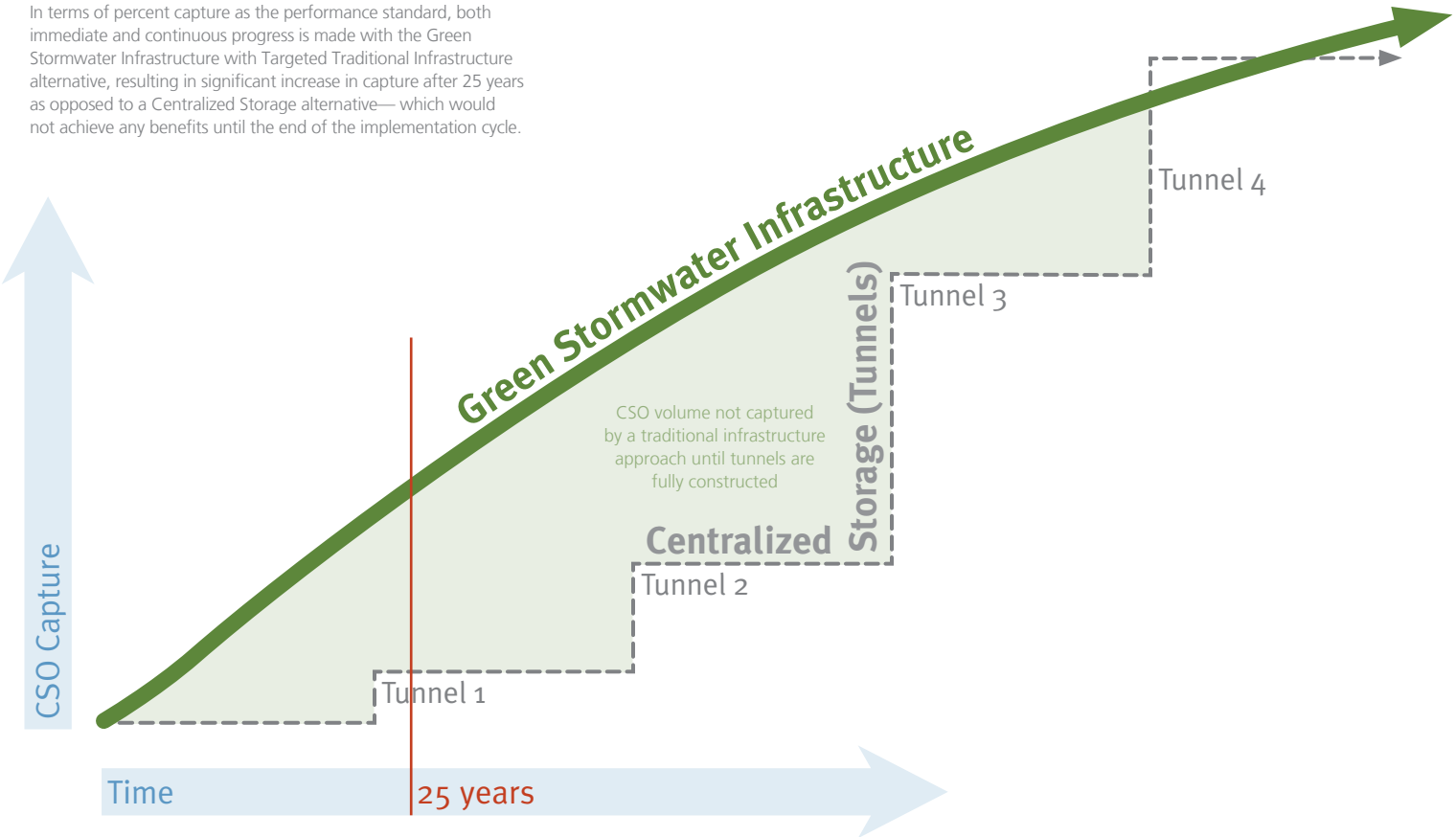

An important advantage of *Green City, Clean Waters* is that it lays the groundwork for the revitalization of our City in areas of public health, recreation, housing and neighborhood values. Philadelphia is the first city to fully adopt this approach for a CSO regulatory compliance program, which accumulates multiple social benefits in addition to complying with the City's Clean Water Act responsibilities.

To fully understand these benefits, PWD has undertaken a Triple Bottom Line analysis of the environmental, social, and economic benefits of the program. This triple bottom line accounting means expanding the traditional financial reporting framework to take into account ecological and social performance so that the total benefits can be evaluated against the financial investment. Triple Bottom Line accounting attempts to describe the social and environmental impact of PWD's infrastructure investment such that they can account for not only the water quality benefit that the infrastructure would produce, but also the additional environmental and societal benefits generated by the various alternatives evaluated.

Although some of these environmental, social, and health benefits can be extremely difficult to quantify, PWD felt it was important to analyze these "triple bottom line" benefits in an attempt to compare the green approach with other traditional infrastructure alternatives. Understanding the full societal costs and benefits is important in justifying the program with the ratepayers, who will ultimately pay for this initiative. With the help of leading environmental economists, PWD compared the alternatives to help quantify the social benefits. After 45 years, the *Green City, Clean Waters* program will have generated more than one dollar in benefits for every dollar invested by PWD, representing a net gain in value to the city.

"The Mayor's commitment to making Philadelphia the greenest city in America is well served by this innovative program that encourages water infrastructure to be spent in a sustainable fashion. This groundbreaking $2 billion plan will produce financial, environmental and social benefits over the next 25 years. I believe it will become the national model for stormwater management."

Rina Cutler, Deputy Mayor of Transportation and Utilities, City of Philadelphia

"Philadelphia is setting a national model for smarter, greener ways to clean up troubled rivers, lakes and beaches. Green infrastructure is often the best and most cost-effective way to tackle water pollution. The city is pioneering a broad investment in measures that not only deliver cleaner water, but dramatically improve the overall health and quality of life for its residents at the same time. The rest of the country would be wise to take notice."

Lawrence Levine
Natural Resources Defense Council
Senior Water Attorney

After 45 years, the *Green City, Clean Waters* program will generate more value in benefits than the cost of the program to the City.

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Triple Bottom Line Benefits

Economic Benefits

Green Stormwater Infrastructure Jobs Reduce the Social Cost of Poverty. Governments at all levels incur significant costs in coping with poverty, and Philadelphia is no exception. Green stormwater infrastructure creates jobs which require no prior experience and are suitable for individuals who might be otherwise unemployed and living in poverty. These new jobs create a benefit to society in reduced poverty-related costs, in addition to the wages paid to the individual workers. The stabilizing and transforming effects of green stormwater infrastructure in neighborhoods further reinforce and support the benefits of providing employment to a population that is outside the labor force. Green stormwater infrastructure is not by itself the solution to poverty, but could serve as a valuable tool in poverty reduction.

Annually, about 250 people employed in Green Jobs.

Social Benefits

Increase of up to 10% more recreational and stream-related visits to Fairmount Park.

Green Stormwater Infrastructure Enhances Recreation. Throughout the Fairmount Park system, residents enjoy recreation along Philadelphia's stream corridors and waterfronts, but some areas do not live up to their full potential. Improved access, appearance, and opportunities in these areas will make them more desirable destinations for the public. Recreation also will be more desirable along newly greened neighborhood streets and public places. Today, many Philadelphians enjoy recreation along our stream corridors and waterfronts such as the Forbidden Drive along the Wissahickon Creek and The Schuylkill River Trail. *Green City, Clean Waters* will improve aquatic habitat and accessibility to the Tacony Creek and the Cobbs Creek to enhance their appeal as passive recreational locations as well.

Increase of up to $390 million in property value of homes near parks and green areas over the next 45 years.

Green Stormwater Infrastructure Improves Community Quality of Life. Trees and parks are an important part of the recipe that together can transform an urban neighborhood into an inviting, exciting place to live, work and play. Residents clearly recognize and value this quality of life benefit of urban vegetation. One way to estimate a value is to study property values in areas that are close to parks and greenery. In Philadelphia, green stormwater infrastructure is expected to raise property values by approximately 2–5%.

Reduction of up to 140 fatalities caused by excessive heat over the next 45 years.

Green Stormwater Infrastructure Reduces Effects of Excessive Heat. Heat waves are a fixture of summers in Philadelphia, including some severe enough to result in over 100 premature deaths (Summer of 1993). These events may be more frequent and severe in the future due to climate change. Green stormwater infrastructure (trees, green roofs, and bioretention sidewalks) reduces the severity of extreme heat events in three ways—by creating shade, by reducing the amount of heat absorbing pavement and rooftops, and by emitting water vapor—all of which cool hot air. This cooling effect will be sufficient to actually reduce heat stress-related fatalities in the City during extreme heat wave events.

055949

Environmental Benefits

Green Stormwater Infrastructure Improves Air Quality. Like many major cities in the United States, EPA currently classifies the Philadelphia metropolitan area as exceeding federal air quality standards for both ozone (smog) and fine particles (soot). Known health impacts of these air pollutants include premature death, hospitalization for respiratory diseases, heart attacks, and lost work and school days. Green stormwater infrastructure will improve Philadelphia's air quality in two ways—by reducing emissions of pollutants (such as SO_2) and by removing ozone and particulates from the air. Reductions in energy and vehicle use will reduce emissions of pollutants. Once in the air, some ozone is taken into the leaves of trees as they "breathe." Leaves also trap additional fine particulates, which then wash off in the rain or fall with the autumn leaf drop.

Air quality benefits from fully-grown trees will on average lead to (each year):

Up to 1-2 avoided premature deaths
Up to 20 avoided asthma attacks
Up to 250 fewer missed days of work or school

Green Stormwater Infrastructure Saves Energy and Offsets Climate Change. Green stormwater infrastructure reduces energy use, fuel use, and carbon emissions in two ways. First, the cooling effects of trees and plants shade and insulate buildings from wide temperature swings, decreasing the energy needed for heating and cooling. Second, rain is managed where it falls in systems of soil and plants, reducing the energy needed for traditional systems to store, pipe, and treat it. Growing trees also act as carbon "sinks," absorbing carbon dioxide from the air and incorporating it into their branches and trunks.

Up to 1.5 billion lbs of carbon dioxide emissions avoided or absorbed. This is equivalent to removing close to 3,400 vehicles from the roadways each year.

Green Stormwater Infrastructure Restores Ecosystems. Green stormwater infrastructure improves ecosystems in two ways. First, by allowing rain to soak into the ground and return slowly to streams, thereby restoring a water cycle more similar to a natural watershed. This provides a natural water quality filter and limits erosion of stream channels caused by high flows, both of which benefit aquatic species. Second, PWD's green stormwater infrastructure approach includes physical restoration of stream channels and streamside lands, including wetlands, to restore habitat needed for healthy ecosystems.

Up to $8.5 million in water quality and habitat improvements over the next 40 years including:

Up to 45 acres of wetland restored
Up to 148 acres of wetlands created
7.7 mi of stream restored in the Cobbs Creek Watershed
3.4 mi of stream restored in the Tookany/Tacony-Frankford Watershed

Before and after a stream restoration of exposed interceptor pipe along Marshall Road in the Cobbs Creek Watershed.

A vision of Cobbs Creek looking toward Woodland Avenue Dam illustrating habitat restoration and recreation enhancements.

The *Green City, Clean Waters* Approach

PWD's $2.4 billion investment over the next 25 years will not only make our waterways cherished and thriving destinations, but will also leverage our capital investment in a way that provides multiple additional community benefits that further Mayor Nutter's Greenworks Plan and supports the vision of numerous civic and community partners for a truly sustainable city. PWD will invest $1.67 billion in Green Stormwater Infrastructure projects throughout the city, and $345 million in upgrades to the treatment plant capacity to handle additional stormwater flows. The remaining $420 million represents a "flexible spending category", and could be spent on additional Green Stormwater Infrastructure or targeted gray infrastructure, whichever proves more efficient as the program evolves.

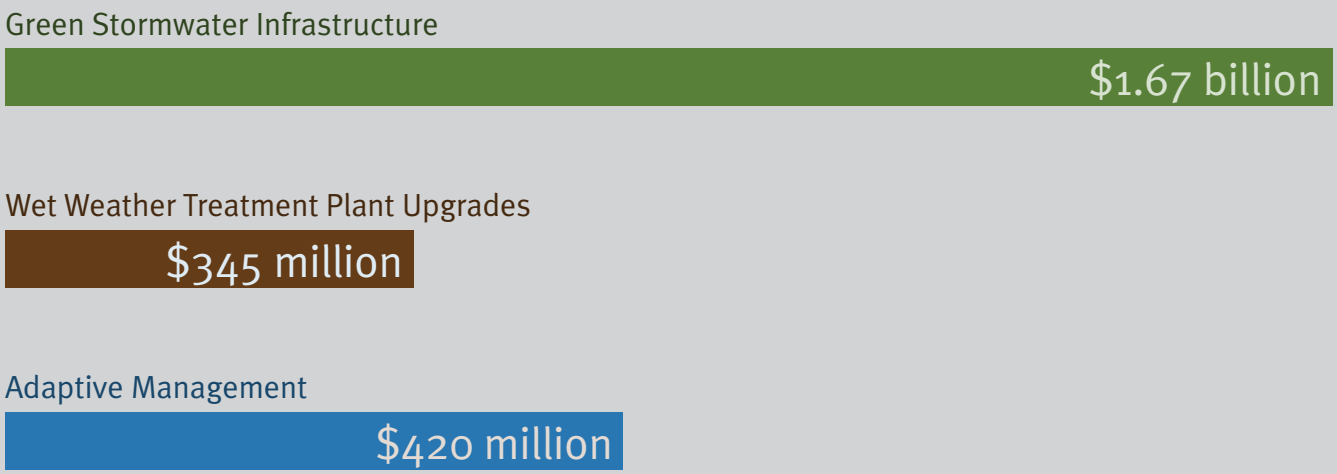

Green Stormwater Infrastructure

Breakdown of Impervious Cover within the Combined Sewer System Drainage by PWD's Green Programs

Green Streets 38%

Green Schools 2%

Green Public Facilities 3%

Green Parking 5%

Green Open Space 10%

Green Industry, Business, Commerce, and Institutions 16%

Green Alleys, Driveways, and Walkways 6%

Green Homes 20%

PWD has analyzed the impervious cover associated with various land use categories and grouped percentages under their green program headings.

*Please note that the "Streets" category does not include streets adjacent to public open space; these streets are included in the impervious surface percentage associated with "Public Open Space"

PWD's Green Stormwater Infrastructure Commitment

This commitment sets in motion a plan for converting more than one-third of the impervious cover within the combined sewer drainage area to Greened Acres. PWD has developed a number of "Green Programs," each with a number of associated implementation tools—including policy changes, regulatory tools, funding commitments and incentives through which the transformation from impervious acre to Greened Acres will occur.

Key to the success of PWD's strategy is that immense opportunity exists for implementation on publicly-owned land, such as City-owned properties, streets and rights-of-way, which constitute 45% of the impervious land area of the City. With that in mind, the initial approach to achieving management of impervious cover is to focus efforts on publicly owned impervious cover and the larger, more commercial properties, and to use programs addressing impervious cover on smaller private properties to increase the level of control as needed. Over the course of the implementation horizon, additional programmatic elements will be explored and developed.

An important performance metric used throughout this document is the achievement of a Greened Acre. This Greened Acre includes the area of the stormwater management feature itself and the area that drains to it (or the stormwater feature's own "little" watershed).

Each Greened Acre will manage the first inch of runoff from one impervious acre of the combined sewer service area. One acre receives about 1 million gallons of rain each year. Today, if the land is impervious, it all runs off into the sewer and becomes polluted. A Greened Acre will stop 80–90% of this pollution from occurring.

We have some clear ideas and have implemented many of the solutions through a variety of demonstration projects with the assistance of our partners, although deciding the precise application will be an evolving process. What is truly exciting about this plan is that it has the power to change forever the way our City renews its streets and neighborhoods. Many of these green technologies have been proven successful, but are untried on such a city-wide scale. Our plan contains built-in "milestones" that allow us to measure our progress with each element every five years and adapt as necessary. Because of the numerous possible tools available for greening acres, the plan is by its very nature adaptive.

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Green Stormwater Infrastructure Tools

The Green Programs described on the following pages will each utilize a unique mix of green stormwater infrastructure tools. The majority of these examples have been implemented locally, demonstrating the use of green infrastructure in Philadelphia. The additional examples are located in Portland, Oregon, as noted.

Plants and Stormwater Management

Trees, shrubs, and flowers help manage rain, or stormwater, through catching rain drops on their leaves and branches before the stormwater becomes runoff, as it hits the ground. The stormwater collected on these surfaces can easily evaporate into the air. Additionally, plants help manage stormwater runoff not only by allowing water to infiltrate into the soil, but also by a process called evapotranspiration, in which water is taken up by plant roots and transpired through their leaves. Plants and soil also help in filtering stormwater runoff.

Stormwater Tree Trench

A stormwater tree trench is a system of trees that is connected by an underground infiltration structure. On the surface, a stormwater tree trench looks like a series of street tree pits. However, under the sidewalk, an engineered system manages the incoming runoff. This system is composed of a trench dug along the sidewalk, lined with a permeable geotextile fabric, filled with stone or gravel, and topped off with soil and trees. Stormwater runoff flows through a special inlet (storm drain), leading to the stormwater tree trench. The runoff is stored in the empty spaces between the stones, watering the trees and slowly infiltrating through the bottom. If the capacity of this system is exceeded, stormwater runoff can bypass it entirely and flow into an existing street inlet.

West Mill Creek, Philadelphia, PA

Downspout Planter

A downspout planter is a struct
stormwater from roof gutters to
by the plants. Downspout plant
vegetation and are connected t
water flow in. They filter pollut
soil and flowsfilter sediment an
down through the planter. They
which do not infiltrate runoff in
rely on evapotranspiration and
stormwater. Excess water can o
spout connection. Downspout p
many sizes and shapes, and wit
concrete, brick, plastic lumber o

Philadelphia Water Department

Green Roof

A green roof is a roof or section of roof that is vegetated. A green roof system is composed of multiple layers including waterproofing, a drainage layer, an engineered planting media, and specially selected plants. Green roofs can be installed on many types of roofs, from small slanting roofs to large commercial flat roofs. Two basic types of green roofs have been developed, extensive and intensive. An extensive green roof system is a thin, (usually less than 6 inches), lighter-weight system planted predominantly with drought-tolerant succulent plants and grasses. An intensive green roof is a deeper, heavier system designed to sustain more complex landscapes. A green roof is effective in reducing the volume and velocity of stormwater runoff from roofs by temporarily storing stormwater, slowing excess stormwater release into the combined sewer system, and promoting evapotranspiration.

PECO Building, Philadelphia, PA

Rain Barrel

A rain barrel or cistern is a structure that collects and stores stormwater runoff from rooftops. The collected rain water can be used for irrigation to water lawns, gardens, window boxes or street trees. By temporarily holding the stormwater runoff during a rain event, more capacity can be added to the city's sewer system. However, rain barrels and cisterns only serve an effective stormwater control function if the stored water is used or emptied between most storms so that there is free storage volume for the next storm. Rain barrels are designed to overflow into the sewer system through the existing downspout connection in large storm events. Although these systems only store a small volume of stormwater, collectively, they can be effective at preventing large volumes of runoff from entering the sewer system

Philadelphia, PA

Pervious Paving

Pervious pavement is a special
that allows water to infiltrate
prevents it from becoming run
structural support of conventio
of a porous surface and an un
stone reservoir provides tempo
infiltrates into the soil. There
porous surfaces including pervi
and interlocking pavers. Inter
slightly different way than pe
Rather than allowing the wa
paving, pavers are spaced ap
between the pavers that allow

Mill Creek Basketball Court, Phil

ure that is designed to allow
flow through and be used
ers are filled with gravel, soil,
the roof downspout to let
nts as water infiltrates the
d are typically waterproofed,
are frequently closed systems
to the ground, rather, they
short-term storage to manage
verflow into the existing down-
lanters can be constructed in
h various materials, including
r wood.

Facility, Philadelphia, PA

Bump-out

A stormwater bump-out is a vegetated curb extension that protrudes into the street either mid-block or at an intersection, creating a new curb some distance from the existing curb. A bump-out is composed of a layer of stone that is topped with soil and plants. An inlet or curb-cut directs runoff into the bump-out structure where it can be stored, infiltrated, and taken up by the plants (evapotranspiration). Excess runoff is permitted to leave the system and flow to an existing inlet. The vegetation of the bump-out will be short enough to allow for open site lines of traffic. Aside from managing stormwater, bump-outs also help with traffic calming, and when located at crosswalks, they provide a pedestrian safety benefit by reducing the street crossing distance.

NE Siskiyou Street, Portland, OR

Stormwater Planter

A stormwater planter is a specialized planter installed into the sidewalk area that is designed to manage street and sidewalk runoff. It is normally rectangular, with four concrete sides providing structure and curbs for the planter. The planter is lined with a permeable fabric, filled with gravel or stone, and topped off with soil, plants, and, sometimes, trees. The top of the soil in the planter is lower in elevation than the sidewalk, allowing for runoff to flow into the planter through an inlet at street level. These planters manage stormwater by providing storage, infiltration, and evapotranspiration of run-off. Excess runoff is directed into an overflow pipe connected to the existing combined sewer pipe.

Columbus Square, Philadelphia, PA

ly designed pavement system
through the pavement and
off. This system provides the
onal pavement, but is made up
derground stone reservoir. The
orary storage before the water
are many different types of
ous asphalt, pervious concrete,
locking pavers function in a
ervious concrete and asphalt.
cer to penetrate through the
part with gravel or grass in
s for infiltration.

adelphia, PA

Rain Garden

A rain garden is a garden designed to collect runoff from impervious surfaces such as roofs, walkways, and parking lots, allowing water to infiltrate into the ground. The garden is typically moderately depressed (lower than the surrounding ground level), with the bottom layer filled with stone, so runoff can collect and pond within it. The site is graded appropriately to cause stormwater to flow into the rain garden area from the nearby impervious area. The water ponds on the surface, is used by the vegetation in evapotranspiration, and infiltrates into the subsurface stone storage and soil. Rain gardens can be connected to sewer systems through an overflow structure, but usually they are sized to infiltrate the collected stormwater runoff within 72 hours. Flexible and easy to incorporate into landscaped areas, rain gardens are suitable for many types and sizes of development and retrofits. Rain gardens are effective at removing pollutants and reducing stormwater runoff volume.

Wissahickon Charter School, Philadelphia, PA

Stormwater Wetland

A stormwater wetland is a man-made shallow marsh system that is engineered to serve as both a temporary storage location as well as a natural filter for stormwater runoff. Each wetland is composed of various depths of storage areas, including surface, shallow, and deep areas, and a complex mix of wetland-appropriate landscaping. Stormwater wetlands are one of the best stormwater management tools for pollutant removal and can provide considerable aesthetic and wildlife benefits.

Saylor Grove, Philadelphia, PA

Above: Street runoff is captured at this rain garden at 47th St. and Gray's Ferry Ave. in the Combined Sewer Area within the Schuylkill River Watershed.

Above: The West Mill Creek Green Streets demonstration project in the Schuylkill Watershed includes a tree trench, permeable pavers and modified street inlets to divert stormwater into a subsurface infiltration bed.

Green Streets

Streets and sidewalks are by far the largest single category of public impervious cover, accounting for roughly 38% of the impervious cover within the combined sewer service area. (Note: impervious cover associated with streets in front of parks was not included in this percentage; these streets are included in the "Green Public Open Space" program). A green street acts as a natural stormwater management system, capturing rain or melting snow (runoff), allowing it to soak into soil, filtering it and at the same time, reducing the amount of stormwater that would otherwise make its way into Philadelphia's combined sewer pipes.

PWD's Green Streets designs will provide stormwater management functions while still maintaining the primary function of the street for vehicles and pedestrians. These Greened Acres will provide additional societal benefits on our streets, such as shading, cooling, traffic calming, and visual enhancement.

Some of the green stormwater infrastructure tools in our green streets tool box include street trees and the "pit" they are planted in, sidewalk trenches and planters, sidewalk bump-outs and bulb-outs (sidewalk extensions), and porous pavement. Street tree pits and trenches capture the flow of stormwater from the street and sidewalk and allow it to soak into the soil to water the trees. They provide shade, improve air quality, absorb noise and beautify the neighborhoods.

Through the use of sidewalk planters, stormwater runoff from the street and sidewalk is directed to the planter through a curb opening, allowing stormwater to be absorbed by the plant and soil materials. Sidewalk planters help protect our waterways by filtering and reducing stormwater runoff.

The use of porous pavement allows the stormwater runoff to soak right through our sidewalks, while providing the same structural support as traditional pavement. This is a tool that at the surface might not look "green," but still provides stormwater management benefits.

PWD is working to align its green stormwater infrastructure practices with street greening programs associated with Greenwork's ambitious greening goals. Coordination of PWD's program with other city programs will encourage maximum effectiveness. Ultimately, the Green Streets program should result in setting a "green standard" for streets within the City. Partners include PennDOT and the City of Philadelphia Streets Department as well as special service districts to help with maintenance.

Since implementation of the *Green City, Clean Waters* program will depend highly on green streets, PWD has already started collaborating with the Streets Department and other utilities so that all projects will become streamlined and coordinated. PWD will design tree trenches and bumpouts to streets already slated for improvements. When both utility and road work can be done on each street at the same time, it lessens the project costs and the inconvenience to residents.

Additionally, Philadelphia Parks & Recreation already has an extensive street tree program. PWD will build on a successful history of working together with the park system by designing street tree trenches to be installed as street trees are installed or replaced. Not only will these trenches increase the life expectancy of the trees, they will capture even more urban runoff in the underground drainage system. The same efficiencies can be realized by installing curbside green stormwater infrastructure such as bump-outs when the City replaces or installs Americans with Disabilities Act mandated ramps on the sidewalks.

PWD has begun to prepare standard designs, and is working on appropriate regulations and incentives to retrofit streets whenever the opportunity arises. Thus, simple green designs (e.g. street trees) will be available for use where possible when streets are affected by:

- PWD infrastructure repair/replacement
- PWD storm flood relief related construction
- Cable/Gas/Phone infrastructure repair/replacement
- Routine repaving by either the Philadelphia Streets Department or PennDOT

Green Schools

Schools make up 2% of all impervious cover in the combined sewer drainage area but are highly visible, thereby offering excellent opportunities to educate the local community on green stormwater infrastructure. An array of stormwater measures can be implemented on school properties, such as rain gardens, green roofs, porous pavement, trees, rain barrels and cisterns. For example, porous pavement and trees on both parking and recreational facilities on school campuses can transform what are now heat-trapping asphalt surfaces into more welcoming, cooler, green havens.

Right: Harmony Garden enhances the school yard and curriculum at Wissahickon Charter School. Green stormwater infrastructure features here include rain gardens, pervious pavers and a subsurface infiltration system.

Green Public Facilities

Public parcels make up 3% of impervious cover in the combined sewer drainage area. The value in retrofitting them with green stormwater infrastructure is primarily to lead by example. This cannot be underestimated, both for establishing the credibility of the program in the eyes of the public, and to demonstrate the effectiveness of the measures to still skeptical individuals within the development community. PWD is leading this initiative by evaluating opportunities for the greening of its own facilities. Additionally, PWD encourages the installation of green streets surrounding major public facilities to maximize the potential stormwater management benefits.

Left: Green roof being planted on the Free Library of Philadelphia in the Schuylkill Watershed.

Green Parking

Parking lots, at 5% of the impervious cover, present a great opportunity to reduce stormwater runoff. Parking lots have a significant visual impact on the City, and green parking lots can contribute to the overall improvement in the appearance of the City's commercial and business districts. A variety of stormwater measures can be used to renovate parking lots, including vegetative strips, infiltration beds (which temporarily store runoff and clean it), trees, porous pavement, sand filters, and even green roofs on parking garages.

City-owned parking facilities will be targeted as a demonstration of the City's commitment to green stormwater infrastructure. Additionally, the incentives provided by PWD's Parcel Based Billing Initiative, which resulted in a reallocation of stormwater fees should make retrofits aimed at reducing stormwater fees more attractive such that private parking lots might begin to seek opportunities for retrofit. The City may also consider an ordinance to mandate a green buffer around all parking facilities that also function as a stormwater infiltration measure.

Above: A vegetated swale collects and infiltrates stormwater from an employee parking lot at the Philadelphia International Airport in the Schuylkill Watershed.

Above: The stormwater demonstration project at Cliveden Park captures runoff from adjacent streets and uses the park's natural topography to detain and infiltrate stormwater in the Tookany/Tacony Frankford Watershed.

Green Public Open Space

Public Open Space with the inclusion of streets adjacent to parks makes up about 10% of the City's impervious cover. Impervious cover associated with the park lands itself is quite low, but PWD sees opportunities for utilizing the streets surrounding these parcels to route and manage stormwater from the surrounding areas where this can be done without adversely impacting the quality of the public land itself.

Recreational centers are important community focal points in Philadelphia, many of which are in need of restoration and upgrades. PWD will continue to identify opportunities to implement green stormwater infrastructure on these large parcels while enhancing community amenities.

Green Industry/Business/Commerce/Institutions

The combined Green Industry, Business, Commerce, and Institutions program makes up about 16% of the City's impervious cover. Philadelphia's industrial, business, commerce, and institutional properties hold significant opportunities for green stormwater infrastructure implementation. Generally, because implementation of this program is within the control of private entities, PWD will undertake a supporting role in seeing it developed programmatically. Many industries, businesses and commercial buildings would be expected to face upgrades and renovations within the 25-year time frame, making a high rate of compliance with stormwater regulations a reasonable expectation. Also, one clear incentive for private entities to consider installation of green stormwater infrastructure will be PWD's new Parcel Based Billing Initiative, which ties impervious cover to the stormwater fee. PWD anticipates that this will result in many existing large private, non-residential entities retrofitting their properties with stormwater management infrastructure in order to receive a credit in the stormwater portion of their bill.

A program to target properties and buildings owned by churches, hospitals, universities, and sports stadiums presents another highly visible opportunity for green stormwater infrastructure. Much like large commercial or industrial properties, this program will rely on compliance with the City's Stormwater Regulations for new facilities as well as the incentive for retrofit of existing facilities provided by the Parcel Based Billing Initiative. In addition, many major universities have embarked on ambitious sustainability initiatives. Where possible, PWD will seek to partner with these entities in order to produce synergies and stretch limited dollars. This may present opportunities to work with each university to separate all stormwater from the sewer system for onsite, green solutions.

Other opportunities might include greening the large areas of impervious cover associated with the sports stadium complexes and the Convention Center, which attract millions of visitors each year. When certain large facilities are renovated or constructed anew, complete separation of the facility's sanitary and storm sewers might be possible, would ideally be combined with green measures.

Green Alleys/Driveways/Walkways

Philadelphia has many smaller alleys located behind houses and commercial buildings that are currently impervious and drain to the storm and combined sewers via stormwater inlets. Though this program only makes up about 6% of all impervious cover in the City, it may offer relatively inexpensive solutions for infiltration or collection of roof runoff. These often underutilized areas present an opportunity to either use the alleys for infiltration, or to convey stormwater to green stormwater infrastructure located at the end of an alley. In addition to the alleys, there are often walkways providing access to backyards of homes, and driveways for single family homes and row houses that present other opportunities for onsite stormwater controls.

Green Homes

Residential roofs make up 20% of all impervious cover in the City. The key to success for this program may lie in the simplicity of smaller scale stormwater management solutions on homeowner's properties.

Homeowners can carry out these solutions themselves and achieve benefits at a minimal cost. Projects, such as the use of rain barrels, have already proven popular in pilot programs, and if implemented on a larger scale, can ultimately affect a significantly larger amount of impervious cover. Additionally, more ambitious (and somewhat more costly) measures should also be considered, including the installation of a green roof or capturing stormwater in larger cisterns for reuse.

Public education is a key to increasing participation in residential stormwater measures such as:

- Installing rain barrels to collect roof runoff
- Disconnecting downspouts to direct runoff to pervious areas (rain garden) or small drywells
- Using site slopes to direct stormwater runoff to rain gardens

Below: Rain barrel collecting porch roof runoff, installed in front of a Philadelphia rowhome in the Schuylkill Watershed.

Stream Corridor Restoration and Preservation

Restoration and Preservation of riverfronts, stream habitats and corridors can be combined with efforts to improve public access and amenities along the water corridors. Implicit in this effort are aspirations to re-connect Philadelphians with our extensive river network. As noted previously, at EPA's direction, the stream restoration program included in the original LTCPU was removed from the Program's CSO compliance goals. However, the City intends to continue its stream restoration and wetland creation efforts and is committed to spending $125M toward achieving the goal of restoring the biological resources of the City's streams. This includes a commitment to restoration of 7.7 miles of the stream corridor along the Cobbs Creek and 3.4 miles of stream corridor along the Tacony Creek. Where applicable, wetland preservation, enhancement and creation within these corridors will offer additional benefits, including mitigation of adverse impacts of stormwater runoff and increases in the ecological connectivity within the region.

PWD will seek to identify locations where CSO outfalls may be consolidated or extended in order to enhance recreational opportunities

In another innovative initiative, PWD is currently assembling a Watershed Project Registry to identify and study areas for future stream restoration, wetland creation, wetland enhancement (including invasive plant management), tidal wetland creation/restoration, stream daylighting and preservation projects. In conjunction with another initiative, a proposed In-lieu Fee Program to channel wetland mitigation efforts of the public and private sector towards stream restoration, these efforts will help to leverage PWD funds with developer mitigation funds to ensure a steady progression towards the greater goal of making Philadelphia one of the greenest cities in the country as well as realizing the full ecological potential of the Fairmount Park system, which could one day serve as the model for urban forestry and river management.

Restoration and Preservation Opportunities in Philadelphia Watersheds

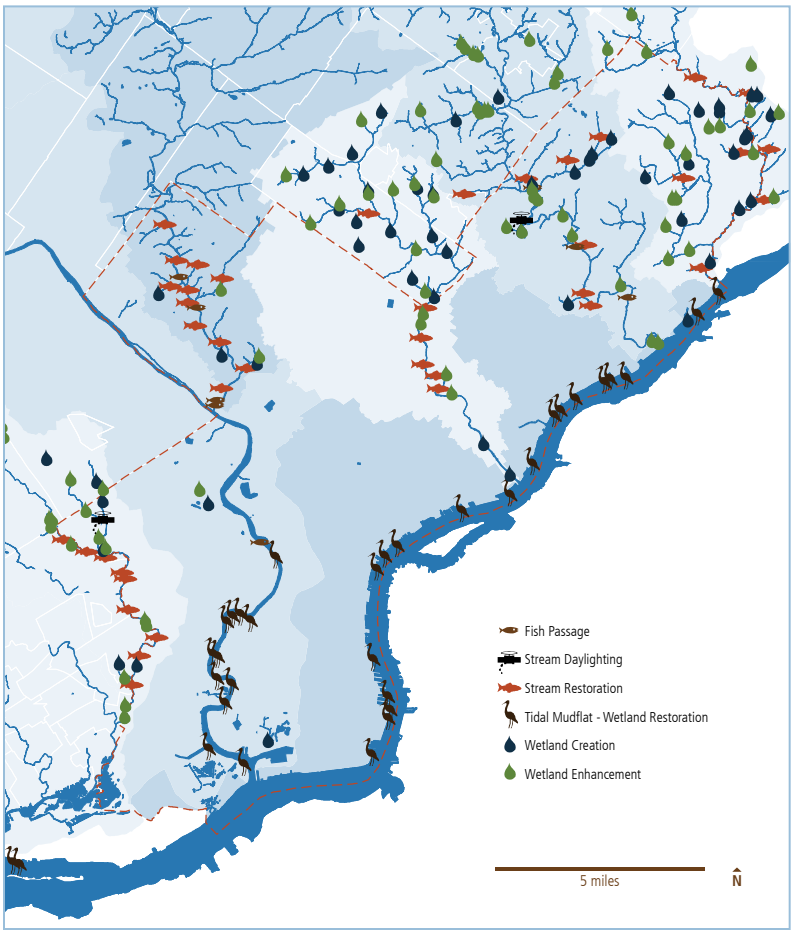

Wet Weather Treatment Plant Upgrades

The *Green City, Clean Waters* program includes some traditional infrastructure to maximize the combined sewer overflow reduction benefits of the program. The expansion of wet weather treatment capacity at all three of PWD's existing water pollution control plants includes the following commitments:

- Expansion of the Northeast Water Pollution Control Plant to include a 215 million gallon/day secondary treatment bypass.
- Expansion of the Southwest Water Pollution Control Plant to include a 60 million gallon/day increase in secondary treatment capacity.
- Expansion of the Southeast Water Pollution Control Plant to include a 50 million gallon/day increase in the secondary treatment capacity through process and hydraulic improvements.

These plant expansions will allow PWD to better utilize the existing sewer infrastructure to capture and treat sewage.

These are complex projects that PWD has spent several years evaluating through the use of hydraulic and hydrologic computer modeling and facilities planning. Thus far PWD has obtained preliminary designs for these upgrades, but will work over the coming years to develop the necessary final designs, including detailed surveying and geotechnical investigations in order to move forward with construction of these upgrades.

Below: Image of PWD's Southwest Water Pollution Control Plant

Our Next Five Years

The first five years of the implementation commitment are the most critical for establishing the framework of the program, building the momentum to engage other City agencies to participate in developing a new set of everyday standards for managing stormwater. This represents a transformative moment for the City.

PWD's strategy for these first five years will be detailed in the Implementation and Adaptive Management Plan (IAMP). The IAMP will describe the City's plans for implementing the various components of the program, including both green stormwater infrastructure and traditional infrastructure. It will lay out the approach for tracking and reporting progress toward meeting our compliance goals, as well as outlining the City's proposal for evaluating progress at the five-year benchmarks and making decisions about adapting the program as necessary to achieve our goals.

The IAMP will describe some of the ways in which City codes, ordinances, policies, and interagency procedures have been, or will need to be, modified to optimize the implementation of the *Green City, Clean Waters* program. It also will address coordination with other City agencies and other stakeholder partners to leverage opportunities for getting the most benefit from our investment. The implementation plan will identify potential conflicts that may emerge among federal, state and local funding requirements, and the implementation goals of the program. It will include recommendations for ways to overcome potential legal issues, ownership and liability concerns, and public and private boundary issues.

In the coming years, PWD will implement a program to address wet weather inflow and infiltration in the City's separate sewer areas and will complete a sanitary sewer evaluation survey to better explore the potential for further remedial controls on sanitary sewer infiltration and inflow to reduce CSOs. Based on the results of that survey, the City will initiate a strategy to implement measures identified as having a significant potential to reduce CSO discharges.

Within the first five years of the *Green City, Clean Waters* program, PWD will implement "Early Action Areas (EAAs)." These are areas where we will seek to implement green stormwater infrastructure in a clustered or relatively concentrated area. These EAAs will help to create small "districts" throughout the city that will provide a glimpse into what a future "green city" will look like.

In addition to the IAMP, PWD will develop a Comprehensive Monitoring Plan to describe the City's plans for performing monitoring of natural and engineered systems that are associated with the CSO Program and a First Edition Green Infrastructure Maintenance Manual to ensure that green stormwater infrastructure is properly maintained. The Manual is intended for use by City agencies, and any other entity responsible for performing the maintenance of green stormwater infrastructure.

Lastly, within this initial 5 years of the implementation period, PWD also must study the risks associated with recreational use of the City's waterways as they relate to CSO discharges. The City must not only evaluate currently utilized recreational locations, but also areas likely to become recreational locations in the future as the riverfronts are redeveloped and public access is improved. Related to this investigation, PWD may initiate a Water Quality Standards Attainment Review, but will do this in a way that respects the public's very basic desire for attractive streams.

PWD believes that groundwork laid by this first five years will put the structure in place to support development of our "green machine." As we develop additional tools over the coming years, this machine will continue to gain momentum.

"Instead of investing in one project that treats one concern, green infrastructure allows us to protect the health of our waters, save money and make our communities more attractive places to buy homes and build businesses."
"We want to use the win-win strategies we see here [Big Green Block, Philadelphia] and other projects throughout the city to make every community healthier, more prosperous and more sustainable."

Lisa Jackson, U.S. Environmental Protection Agency Administrator

Greened Acres

Greened Acres is a metric that accounts for the conversion of a highly impervious urban landscape through the implementation of projects that reduce stormwater runoff. A Greened Acre is described as an acre of impervious cover reconfigured to utilize green stormwater infrastructure to manage the first inch of stormwater runoff from that acre.

A Greened Acre is an expression of the volume of stormwater managed by green stormwater infrastructure, based on the design for the project, and is conditional on the proper operation and maintenance of the project. One Greened Acre is equivalent to 1 inch of managed stormwater from 1 acre of drainage area, or 27,158 gallons of managed stormwater.

These volumes will be tracked as Greened Acres (GA) using the equation:

$$GA = IC \times Wd$$

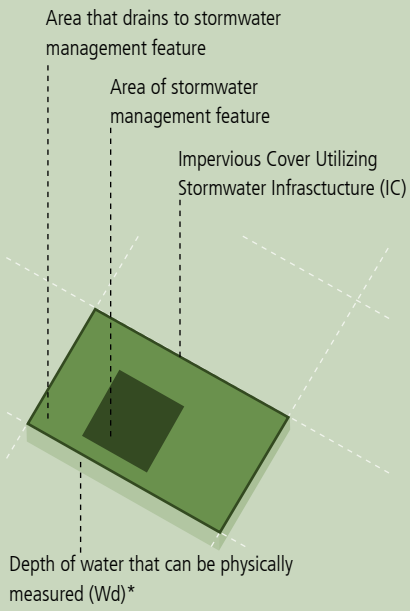

* Green stormwater infrastructure designs will be aimed at controlling at least 1 inch of runoff, and up to 1.5 inches of runoff, unless otherwise deemed feasible by engineering design.

Cost and Affordability

PWD has become a national leader in its quest to demonstrate how to protect and restore stream water quality without the expenditure of billions of dollars on new pipes, tunnels and treatment systems.

To meet the requirements of the National Combined Sewer Overflow Policy, PWD is taking an approach that relies heavily on stormwater source-control measures and green stormwater infrastructure. Indeed, PWD has become a national leader in its quest to demonstrate how to protect and restore stream water quality without the expenditure of billions of dollars on new pipes, tunnels and treatment systems. Philadelphia is partnering with other urban centers, national environmental organizations' and the EPA, to recognize the value of urban infrastructure renewal and expansion using the more sustainable approach that focuses on the use of green stormwater infrastructure. This approach has been shown to be the most environmentally and economically favorable way to remediate the effects of urbanization on the City's waterways and help make the City of Philadelphia the Greenest City in America.

PWD currently spends upwards of $150 million each year renewing and upgrading its existing facilities. In addition to these recurring costs, Philadelphia anticipates spending additional funds over the coming years to meet evolving drinking water quality and stormwater management goals under the Safe Drinking Water Act and Clean Water Act. In the current economic climate, securing capital funding for our existing, on-going programs, much less new initiatives, is a challenge. That is why, when money is available, it is ever more critical to ensure that every dollar is leveraged to address the myriad of issues facing our water utility.

A financial capability assessment for the City of Philadelphia's LTCPU was prepared using criteria suggested by the EPA. The EPA's approach calls for an evaluation of costs of the proposed improvements against Philadelphia citizens' median household income. In general, wastewater and stormwater control costs that exceed 1.5%-to-2% of the median household income become an unacceptable cost burden to ratepayers. The estimated cost to implement the Long Term Control Plan Update will approach $2.4 billion by the end of the twenty-five year implementation period. Based on this estimate and implementation schedule, the affordability assessment determined that the LTCPU would result in a cost to City of Philadelphia residents above the upper limit of EPA's median household income affordability criteria.

PWD is ready to invest $2.4 billion over the next 25 years ($1.2 billion in 2009 dollars) to not only make our waterways cherished and thriving destinations, but also to use our citizen investment in a way that provides multiple additional community benefits that further Mayor Nutter's Greenworks Plan and supports the vision of numerous civic and community partners for a truly sustainable city.

"The Philadelphia Water Department's *Green City, Clean Waters* initiative is a terrific way to clean up our environment and grow the economy. It is an outside-the-box, innovative, cost-effective, and green solution to the problem of sewer overflows that will improve our rivers, make our water safer, and make Philadelphia a more vibrant place to live, work, and play."

Brian Glass, Senior Attorney for Citizens for Pennsylvania's Future (PennFuture)

Leveraging Opportunities

Because of the preliminary policy structures put in place over the past 12 years since the original LTCP was adopted by the City of Philadelphia, PWD is able to leverage a great deal of funding toward their Clean Water Act commitments. These are structures that PWD instituted and programmatically supports, but for which the majority of Greened Acres will not be paid for by PWD's rate payers.

The first and most significant source of leveraged funding comes from the development community. Because of the City's updated stormwater regulations adopted in January, 2006, every development/redevelopment project initiated within the City limits with an area of disturbance greater than 15,000 square feet must manage the first inch of runoff from the site—which is the same measure that PWD is utilizing for our Greened Acres concept. With a city-wide redevelopment rate of up to 1% annually, PWD estimates that more than $1 billion (present value) will be applied toward the City's greening goals in the coming 25 years.

Another policy-related tool that will help to achieve additional Greened Acres city-wide is the Parcel Based Billing Initiative, which will be phased in over the coming years. This initiative will impact some customers much more than others—at times causing the monthly water bill to increase fourfold or more. PWD has been targeting heavily impacted customers with a program aimed at evaluating them for potential achievement of "stormwater credits" resulting from retrofits on the property to manage the first inch of runoff. This program involves the offer of free design assistance and site evaluation by a PWD contractor in order to identify potential stormwater management opportunities that might exist on the site—and to perform a cost-benefit analysis in order to help the property owner to weigh the cost of the retrofit against the annual savings on the water bill. PWD believes that the Parcel Based Billing Initiative will result in many of these large parcels being retrofitted to manage the first inch of runoff—producing additional Greened Acres.

Vacant land presents a unique opportunity for stormwater management. There are over 40,000 vacant parcels of land in the City. These present an opportunity for green redevelopment. In addition, there are many areas of the City ready for redevelopment, including areas of abandoned or substandard housing, abandoned industrial areas, or outdated commercial facilities. High priced and ever scarcer energy is changing the way Americans live, making older urban centers more and more attractive places to live and work. With a rate of redevelopment in the City that is expected to impact up to 1% of the City's impervious cover each year, vacant lands will likely become targeted focal points for redevelopment. Ensuring that all redevelopment projects contribute to a greener city will be critical to meeting ambitious green stormwater infrastructure goals.

Over the past 5 years, hundreds of millions of dollars have been awarded to fund green initiatives in the City of Philadelphia by organizations such as the William Penn Foundation as well as grant awards from Growing Greener (PA DEP and PA DCNR), the Army Corps of Engineers, and US EPA, among others. As the recipient of numerous grants and funding allocations aimed at establishing demonstration projects throughout the region, PWD has been leveraging funding toward the implementation of green stormwater infrastructure for a number of years. Through this work, PWD has developed strong working relationships with partner organizations doing similar work and when possible has worked with those organizations to stretch dollars even further. It is estimated that over the 25 year implementation period, close to $1 billion in additional funding will be contributed by these agencies for further implementation of green stormwater infrastructure.

Vacant Land Example

The above image shows a mixed industrial and residential section of a Philadelphia neighborhood with vacant properties highlighted in yellow. This neighborhood has an 11% vacancy rate. Due to the large number of vacant properties, this neighborhood has many opportunities for neighborhood revitalization, which can lead to an expansion of the PWD customer base. The vacant properties may also provide an opportunity for placement of green stormwater infrastructure.

Achieving The Vision Together

"*Green City, Clean Waters* will be transformative for Philadelphia. The 25 year plan will invest $2 billion in our infrastructure and communities, yielding tremendous benefits for our environment and water quality, while at the same time improving quality of life and stimulating economic development."

Katherine Gajewski
Director of Mayor's Office of Sustainability, City of Philadelphia

PWD plays a critical role in helping the City of Philadelphia achieve its goal to be the Greenest City in America. The City currently has the necessary building blocks for a greener future; it is a City of neighborhoods with walkable streets, a regional transit structure, a huge park system, already observed successes in revitalization of vacant lands and historically significant and ecologically valuable rivers. But we cannot implement this green stormwater infrastructure program in a vacuum. Given the number of events that are coming together at this pivotal time in the history of Philadelphia and this utility, we now need to accelerate the pace of change to cross traditional boundaries and envision a new relationship between the City, its government, water, the environment and its citizens.

These events include:

- The release of PWD's LTCPU
- City-wide stormwater regulations that redefine the way the City addresses stormwater
- The release of Greenworks Philadelphia with specific targets and goals for a Sustainable City through year 2015
- The release of the new Zoning Reform Commission Report and forthcoming Zoning Code
- The release of several significant new visioning and planning documents describing the revitalization and rebuilding of Philadelphia's riverfronts
- The interest of Mayor Nutter in seeing a new way for Government agencies to work in unison to solve common problems
- Implemented stormwater parcel-based billing that will encourage stormwater management on private properties.

Together these inter-related initiatives will help realize Philadelphia's ambitious green vision. The co-benefits of these programs—human health, aesthetics, ecological restoration, economic growth and a more vibrant City—are significant and real. It is time to accelerate the pace of change at the utility by creating interrelationships between our needs, actions and strategies and those of the City of Philadelphia.

Our challenge is to instill our programs and needs into design, construction, operation and maintenance of our City systems (transit, streets, universities, schools); the growth and nurturing of our natural systems (parks, rivers, streams, wetlands); and the protection of public health systems.

Our opportunity is to use controlled change through a slow evolution of our City to the 21st Century sustainable model described in Greenworks Philadelphia. By re-thinking how our systems work, their purpose and value to us, we can begin to integrate modifications in design of our capital facilities to meet multiple goals. By re-thinking the business of water, we can repurpose funds for water infrastructure, playgrounds, street reconstruction and transportation to leverage scarce capital dollars.

Although PWD has many green stormwater infrastructure projects already in the ground, we recognize that retrofitting a street or public facility is certainly more costly than building new infrastructure as a component of a complete renewal project. As it grows its green identity, Philadelphia will plant the seeds for a true city-wide partnership. Working together will result in an incredibly innovative, cost-effective and transformative incremental approach to how City departments revitalize neighborhoods to make them healthier and more sustainable places in our little corner of the biosphere.

PWD is laying the groundwork for partnerships with the Philadelphia Housing Authority, the Office of Housing and Commercial Development, the Streets Department, and private developers. At minimum, the current stormwater regulations ensure all new large development will move towards our goal of Greened Acres, but building partnerships will help us exceed minimal standards and look for cost-effective opportunities to maximize green elements. With each new development, the vision of how green it can be will keep growing. Assuming a redevelopment rate of .8 to 1% per year, an estimated 5,000 to 6,000 acres within the combined sewer system drainage will become greened during the 25 year program.

Another important partnership that will develop as a result of this program is between PWD, Philadelphia Industrial Development Corporation (PIDC), Department of Commerce and Special Service Districts such as Center City District. These partnerships will help transform the commercial corridors and business parks in the City. Adding stormwater management to the existing beautification projects will reduce overall maintenance costs and allow more restored corridors. The greener, safer corridors draw new customers and retailers, creating additional local and green jobs which in turn promote safety in the City.

The largest landowners in Philadelphia are often institutions of health, learning, and worship. These campuses such as hospitals, universities and churches have already been leading the field of environmental sustainability. Not only can they easily incorporate greening into their mission, they are often willing to go far beyond required stormwater management. This means a few property owners can transform the City in a big way.

These are just a few examples of the many exciting developments and synergistic relationships budding in Philadelphia. Our hope is that as the City grows its green identity, more residents may be drawn to Philadelphia. When the City flourishes, revenue increases, which supports more greening, which can increase property values, and enhances awareness of the benefits of green stormwater infrastructure, creating a positive feedback loop that helps the program thrive. The greening of Philadelphia benefits the environment as a whole.

The time is now. Never before have such opportunities aligned and a sustainable solution been so clear. The City of Philadelphia's *Green City, Clean Waters Plan* is the first of its kind, launching the transformation of Philadelphia as it leads the way for other urban areas to become 21st Century Sustainable Cities.

For more information and to stay involved with the developments of *Green City, Clean Waters*, visit our website, www.phillywatersheds.org, and our Facebook page, by searching for *Green City, Clean Waters*.

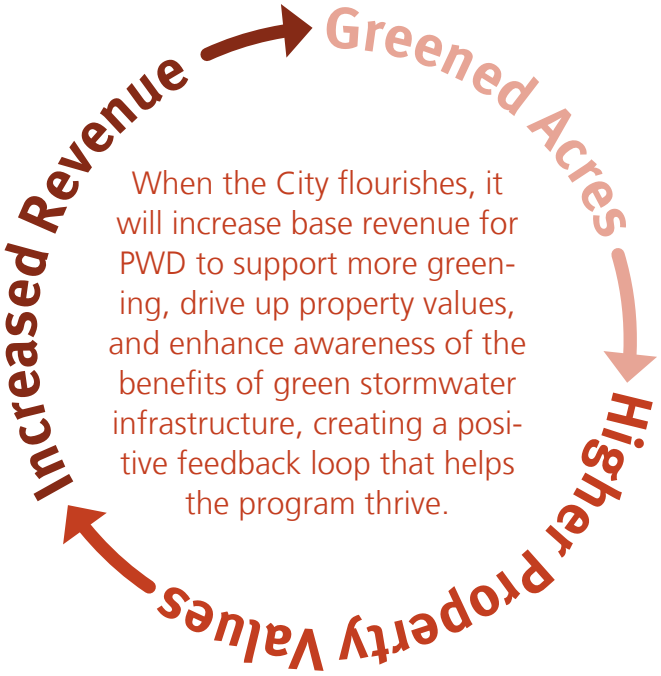

Overwhelming Public Support

Participants in the Philadelphia Water Department's *Green City, Clean Waters* public outreach program have expressed overwhelming support for green stormwater infrastructure as the preferred approach to reducing CSOs in Philadelphia. The thousands that have participated in meetings, events and other PWD activities to date have consistently expressed enthusiasm for the *Green City, Clean Waters* plan. Over ninety-two percent of the more than 700 "Green Neighborhoods through Green Streets" survey participants responded positively to the green stormwater infrastructure approach. All stakeholders, from suburban watershed partners to City residents living in the CSO drainage areas, desire a land-based approach that promotes multiple community benefits and creates truly sustainable watersheds and cleaner, safer and more accessible waterways.

Partnerships, Plans and Participation

Support for green stormwater infrastructure is echoed throughout all components of PWD's *Green City, Clean Waters* public participation program and confirms the wishes expressed over the past ten years by PWD's long-standing watershed partners during the integrated watershed management planning process.

PWD believes that a commitment to diverse watershed partners, including the residents of the City, is critical to the success of the *Green City, Clean Waters* plan. PWD has offered a variety of education and outreach programs over the past twelve years that target the residents in and outside of the City and that foster public awareness, which facilitates public involvement. Over the past few years alone, the Philadelphia Water Department has gone beyond the required public meetings and has created multiple innovative outreach programs, including the Cobbs Green Homes Demonstration program, the GreenTreks "*Green City, Clean Waters*" video series, a Green Streets Adoption program, a *Green City, Clean Waters* Curriculum for schools, a "*Green City, Clean Waters*" art exhibit by local environmental artist, Bill Kelly, in addition to a traveling *Green City, Clean Waters* informational exhibit among other programs. Furthermore, unprecedented partnerships with civic groups and local organizations city-wide led to the implementation of PWD's first phase of Greet Streets. The approximately 400 *Green City, Clean Waters* Facebook "Friends" regularly keep updated on new programs and events. The *Green City, Clean Waters* on-line blog (http://www.phillywatersheds.org/blog) provides information on the latest activities and events, such as accounts regarding PWD's first porous pavement street and PWD's first green roof bus shelter installation (only one in the country!).

The Demand

In recent months PWD has seen the desire for green stormwater infrastructure rapidly evolve into a demand by our residents. Through PWD's Model Neighborhoods initiative, PWD has received approximately 750 signatures between March and July of 2009, from residents petitioning for Green Streets. These residents wanted PWD to install green stormwater infrastructure on their block, in order to serve as a model green neighborhood. Today, PWD is working to meet the demand and working with civic groups throughout the city to go beyond the demand and to further our mission of spreading green stormwater infrastructure to meet all facets of communities – whether it is on a street, commerical property, schoolyard or park – and in every CSO impacted neighborhood in the city.

"Cities across the nation are now looking at Philadelphia as the preeminent model for managing stormwater through green infrastructure." "This approach will benefit Philadelphians by protecting their drinking water, making rivers and streams more attractive recreation amenities, and supporting economic growth."

Paul King
President & CEO
Pennsylvania Environmental Council

"As we evolve Philadelphia into America's most sustainable and green city, the opportunities ahead will be limited only by the confines of our imaginations and the extent of our determination."

Howard Neukrug
Philadelphia Water Commissioner

Demonstrating the Vision Throughout Philadelphia

Community Based Planning Initiatives

The Model Neighborhoods program was launched in January 2009, led by PWD and partners, to showcase green street stormwater infrastructure tools, such as stormwater tree trenches, stormwater planters and stormwater bump-outs, in addition to providing green stormwater infrastructure to residents. Model Neighborhoods were envisioned as communities in the City that would provide the Philadelphia Water Department and its partners with an early opportunity to demonstrate green stormwater infrastructure. Today, Green Streets projects are planned for neighborhoods all over the city, making practically all neighborhoods in the CSO communities "model neighborhoods"; as such PWD is now evolving our former model neighborhood program to a broader community based planning initiative program.

The communities participating in the former Model Neighborhoods initiative were selected due to their existing partnerships with the Philadelphia Water Department. These partnerships were formed as a result of flooding complaints and other water-related issues that PWD had addressed previously. The Philadelphia Water Department views every community in the combined sewered drainage areas of Philadelphia as potential model neighborhoods and hopes to implement green stormwater infrastructure in all communities throughout the City over the next twenty-five years.

Our early collaborations with neighborhoods throughout Philadelphia have informed us that the demand for green stormwater infrastructure is high and residents are enthusiastic to see green stormwater infrastructure on their streets immediately. In fact, the demand for implementation within the multiple neighborhoods has exceeded the Philadelphia Water Department's current capacity to implement them. This is a true testament to the overwhelmingly positive response the City has received from its citizens in support of green stormwater infrastructure. In addition to increasing the Philadelphia Water Department's capacity to implement green stormwater infrastructure throughout the City, a neighborhood outreach and planning protocol is being developed which we hope will be replicated throughout the City to educate more residents about the *Green City, Clean Waters* vision, to inform them of the challenges and opportunities that exist when planning for green stormwater infrastructure, and to engage them in identifying the best opportunities for green infrastructure within their neighborhoods. Ultimately, the goal is to partner with Philadelphians to identify the most strategic investments in green stormwater infrastructure that can meet PWD's goal of reducing combined sewer overflows while also creating tangible physical, social, economic, and environmental benefits within our neighborhoods.

Acknowledgements

We would like to thank the members of the *Green City, Clean Waters* Advisory Committee for their investment of time and energy during the initial demonstration phase as we worked through the planning process.

Active *Green City, Clean Waters* Advisory Committee Members

Community Legal Services, Inc.

Sierra Club

PennFuture/Next Great City

Delaware River City Corporation

Northern Liberties Neighbors Association

Washington West Civic Association

Passyunk Square Neighborhood Association

Passyunk West Civic Association

Pennsylvania Environmental Council

Tookany/Tacony-Frankford Watershed Partnership

Pennsylvania Department of Environmental Protection

Philadelphia Parks & Recreation

We would also like to thank the members of an independent team that reviewed the City of Philadelphia's Green City, Clean Waters plan. The Citizens for Pennsylvania's Future, the Natural Resources Defense Council, and Clean Water Action, managed a series of independent reviews of the plan. Dr. Robert Traver of Villanova University and Michele Adams from Meliora Design were retained to evaluate the expected performance of the LTCPU based on assessment of the models, the model inputs and results, and the implementation plan. Another review, conducted by John Frondorf of Becker and Frondorf, focused on the cost estimation methodology. David Russell of Russell Consulting reviewed the financial capability assessment.

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Ventura County Technical Guidance Manual for Stormwater Quality Control Measures

Manual Update 2011

Ventura Countywide Stormwater Quality Management Program

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July 13, 2011

Manual Updates: The 2011 TGM may be periodically updated to correct minor errors and unintentional omissions. Additionally, due to the evolving nature of stormwater quality management, the 2011 TGM may also be updated to incorporate new and innovative control measures. 2011 TGM users should ensure that they are referencing the most current edition by checking www.vcstormwater.org or contacting the local permitting agency.

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1 INTRODUCTION

This *Technical Guidance Manual for Stormwater Quality Measures* (2011 TGM) provides guidance for the implementation of stormwater management control measures in new development and redevelopment projects in the County of Ventura and the incorporated cities therein. These guidelines are intended to improve water quality and mitigate potential water quality impacts. These guidelines have been developed to meet the Planning and Land Development requirements contained in Part 4, Section E of the Los Angeles Regional Water Quality Control Board's (Regional Board) municipal separate storm sewer system (MS4) permit (Order R4-2010-0108) for new development and redevelopment projects.

The Planning and Land Development requirements are not implemented at the discretion of the local permitting agency; they are requirements in Order R4-2010-0108 that must be complied with. The 2011 TGM does not attempt to expand or circumvent these requirements, but rather it provides guidance on how to meet them.

When used in this Manual, the verb "shall" indicates a statement of required, mandatory, or specifically prohibited practice. Statements that are not mandatory, but are recommended practice in typical situations, with allowable deviations if engineering judgment or scientific study indicates them appropriate, are typically stated with the verb "should." In both cases specific options may be provided that are allowable modifications.

1.1 Goals

The 2011 TGM has been prepared by the Ventura Countywide Stormwater Quality Management Program to accomplish the following goals:

- Ensure that new development and redevelopment projects reduce urban runoff pollution to the "maximum extent practicable" (MEP);
- Ensure that the implementation of measures in the 2011 TGM are consistent with Regional Water Quality Control Board Order R4-2010-0108 and other state requirements;
- Provide guidance to developers, design engineers, agency engineers, and planners on the selection and implementation of appropriate stormwater management control measures; and
- Provide maintenance procedures to ensure that the selected stormwater management control measures will be properly maintained to provide effective, long-term pollution control.

1.2 Regulatory Background

In 1972, the Federal Water Pollution Control Act [later referred to as the Clean Water Act (CWA)] was amended to require National Pollutant Discharge Elimination System (NPDES) permits for the discharge of pollutants to waters of the United States from any point source. In 1987, the CWA was amended to require the United States Environmental Protection Agency (USEPA) to establish regulations permitting municipal and industrial stormwater discharges under the NPDES permit program. The USEPA published final regulations regarding stormwater discharges on November 16, 1990. The regulations require that MS4 discharges to surface waters be regulated by a NPDES permit.

The Ventura County Watershed Protection District, County of Ventura, and the cities of Camarillo, Fillmore, Moorpark, Ojai, Oxnard, Port Hueneme, San Buenaventura, Santa Paula, Simi Valley, and Thousand Oaks have joined together to form the Ventura Countywide Stormwater Quality Management Program (Program)and are named as co-permittees under a revised countywide municipal NPDES permit for stormwater discharges issued by the Regional Water Quality Control Board in 2010 (Order R4-2010-0108).

Prior to the issuance of Order R4-2010-0108, stormwater discharges from the Ventura County MS4 were covered under the countywide waste discharge requirements contained in three previous MS4 NPDES Permits (Order 09-0057, Order 00-108, and Order No. 94-082).

Under Order R4-2010-0108, the co-permittees are required to administer, implement, and enforce a Stormwater Quality Management Program (Program) to reduce pollutants in urban runoff to the MEP. The Program emphasizes all aspects of pollution control including, but not limited to, public awareness and participation, source control, regulatory restrictions, water quality monitoring, and treatment control.

For the Program to be successful, it is critical to control urban runoff pollution from new development and redevelopment projects during and after construction. Therefore, the co-permittees implemented the Planning and Land Development Program, one element within the Program, to specifically control post-construction urban runoff pollutants from new development and redevelopment projects. The goal of the Planning and Land Development Program is to minimize runoff pollution typically caused by land development and protect the beneficial uses of receiving waters by limiting effective impervious area (EIA) to no more than 5% of the project area and retaining stormwater on site. This goal can be achieved by employing a sensible combination of Site Design Principles and Techniques, Source Control Measures, Retention Best Management Practices (BMPs), Biofiltration BMPs, and Treatment Control Measures to the level required in Order R4-2010-0108.

“Site Design Principles and Techniques,” “Source Control Measures,” “Retention

BMPs," "Biofiltration BMPs," and "Treatment Control Measures," as used in the 2011 TGM refer to BMPs and features incorporated into the design of a new development or redevelopment project, which prevent and/or reduce pollutants in stormwater runoff from the project. These measures are described below:

1) ***Site Design Principles and Techniques*** are a stormwater management strategy that emphasizes conservation and use of existing site features to reduce the amount of runoff and pollutant loading that is generated from a project site.

2) ***Source Control Measures*** limit the exposure of materials and activities so that potential sources of pollutants are prevented from making contact with stormwater runoff.

3) ***Retention BMPs*** are stormwater BMPs that are designed to retain water onsite, and achieve a greater reduction in surface runoff from a project site than traditional stormwater Treatment Control Measures. The term "Retention BMPs" encompasses infiltration, rainwater harvesting[1], and evapotranspiration BMPs. Retention BMPs are preferred and shall be selected over biofiltration BMPs and Treatment Control Measures where technically feasible to do so.

4) ***Biofiltration BMPs*** are vegetated stormwater BMPs that remove pollutants by filtering stormwater through vegetation and soils.

5) ***Treatment Control Measures*** are engineered BMPs that provide a reduction of pollutant loads and concentrations in stormwater runoff.

Applicable projects (Section 1.4) must reduce Effective Impervious Area (EIA) to less than or equal to five percent (≤5%) of the total project area, unless infeasible. Impervious surfaces are rendered "ineffective" if the design storm volume is fully retained onsite using Retention BMPs. Biofiltration BMPs may be used to achieve the 5% EIA standard if Retention BMPs are technically infeasible (see Section 3.2).

The 2011 TGM contains guidance for the design and implementation of all of these types of stormwater management control measures for new development and redevelopment projects. In addition to the requirements of Order R4-2010-0108, owners and developers of some of the sites in the County may also be subject to the State of California's general permit for stormwater discharge from industrial activities (Industrial General Permit) and general permit for stormwater discharge from construction activities (Construction General Permit). The stormwater management control measures provided in the 2011 TGM may also assist the owner or developer in meeting the requirements of the State's construction and industrial permits. The stormwater management staffs of the governing co-permittee agencies are available to provide assistance regarding all of the State stormwater permit

[1] Rainwater harvesting is a BMP that stores and uses rainwater or stormwater runoff. This is consistent with the use of the term "reuse" contained in Order R4-2010-0108.

requirements.

1.3 Impacts of Land Development

The Cities and County of Ventura have separate stormwater and sanitary sewer conveyance systems. Land development typically creates an increase in impervious surfaces, which increases the amount of runoff and pollutants entering stormwater conveyance systems. Pollutants that enter the conveyance system in stormwater are typically transported directly to receiving waters (i.e. local channels, rivers, and the ocean), and are not treated in a wastewater treatment plant. Pollutants in untreated stormwater runoff from impervious surfaces that drains to streets and enters storm drains directly contribute to water pollution.

Typically, as stormwater runs over impervious surfaces (e.g., rooftops, roadways, and parking lots), it:

- Does not infiltrate or evapotranspire, which increases runoff volumes, velocities, and flow rates;
- Moves more quickly, which increases runoff velocities; and
- Entrains (i.e., accumulates) pollution and sediment, which increases nutrients, bacteria, and other pollutant concentrations in receiving waters (i.e., local channels, rivers, and the ocean).

The impacts of these alterations due to development may include:

- Increased concentrations of nutrients, toxic pollutants, and bacteria in surface receiving waters, including adjacent land and habitat (e.g., beaches) creeks, estuaries, and storm drain outlets.
- Increased flooding due to higher peak flow rates and runoff volumes produced by a storm.
- Decreased wet season groundwater recharge due to a decreased infiltration area.
- Increased dry season groundwater recharge due to outdoor irrigation with potable or reclaimed water.
- Introduction of baseflows in ephemeral streams due to surface discharge of dry weather urban runoff.
- Increased stream and channel bank instability and erosion due to increased runoff volumes, flow durations, and higher stream velocities (“hydromodification impacts”); and

- Increased stream temperature due to loss of riparian vegetation as well as runoff warmed by impervious surfaces, which decreases dissolved oxygen levels and makes streams inhospitable to some aquatic life requiring cooler temperatures for survival.

1.4 Stormwater Management Principles

Stormwater management principles such as Integrated Water Resource Management (IWRM) and Low Impact Development (LID) can be used to help mitigate the impacts of development. These principles are described below.

The emergence of LID falls under the umbrella of the over-arching concept of IWRM. IWRM is a process which promotes the coordinated development and management of water, land, and related resources. IWRM links traditional development topics such as land use, water supply, wastewater treatment/reclamation, flood control/drainage, water quality, and hydromodification management into a cohesive hydrologic system that recognizes their interdependencies and minimizes their potentially negative effects on the environment. An example of IWRM includes recharging groundwater with reclaimed wastewater to support the water supply. Another example is combining stormwater treatment, hydromodification control, and flood control in a single regional infiltration basin that recharges groundwater, incorporates recreation, and provides habitat. Another example is using Smart Growth principles to help reduce the environmental footprint while still accommodating growth.

Generally, the 2011 TGM advises to first design for the largest hydrologic controls (such as matching post development 100-year flows with pre-project 100-year flows for flood mitigation requirements), according to the appropriate City or County drainage requirements (not included in the 2011 TGM). Secondly, the 2011 TGM advises to check if flood mitigation will reduce or satisfy the stormwater management requirements (as set forth in the 2011 TGM). If it does not, then add more controls as necessary. Flood mitigation may provide the necessary sediment and pollution control, thereby reducing maintenance requirements for the stormwater management BMPs. A sequence of hydrologic controls should be considered, such as site design, flood drainage mitigation, and Retention BMPs. Biofiltration BMPs and Treatment Control Measures can be considered where the use of Retention BMPs is technically infeasible. Each of these controls will have an influence on stormwater runoff from the new development or redevelopment project.

Similar to Source Control Measures, which prevent pollutant sources from contacting stormwater runoff, Retention BMPs use techniques to infiltrate, store, use, and evaporate runoff onsite to mimic pre-development hydrology, to the extent feasible. The goal of LID is to increase groundwater recharge, enhance water quality, and prevent degradation of downstream natural drainage channels. This goal may be accomplished with creative site planning and with incorporation of localized, naturally functioning BMPs into the project. Implementation of Retention BMPs will

reduce the size of additional Hydromodification Control Measures that may be required for a new development or redevelopment project, and, in many circumstances, may be used to satisfy all stormwater management requirements.

1.5 Applicability

The following projects and associated triggers, contained in subpart 4.E.II of Order R4-2010-0108, are subject to the requirements and standards laid out in the 2011 TGM.

Note that some of the project triggers are based on *total altered surface area* and others on *impervious surface area*, which is an intentional requirement in the MS4 Permit.

New Development Projects

Development projects subject to conditioning and approval for the design and implementation of post-construction stormwater management control measures, prior to completion of the project(s), are:

1) All development projects equal to 1 acre or greater of disturbed area that adds more than 10,000 square feet of impervious surface area.

2) Industrial parks with 10,000 square feet or more of total altered surface area.

3) Commercial strip malls with 10,000 square feet or more of impervious surface area.

4) Retail gasoline outlets with 5,000 square feet or more of total altered surface area.

5) Restaurants (Standard Industrial Classification (SIC) of 5812) with 5,000 square feet or more of total altered surface area.

6) Parking lots with 5,000 square feet or more of impervious surface area, or with 25 or more parking spaces.

7) Streets, roads, highways, and freeway construction of 10,000 square feet or more of impervious surface area (see Section 2 for specific requirements).

8) Automotive service facilities (Standard Industrial Classification (SIC) of 5013, 5014, 5511, 5541, 7532-7534 and 7536-7539) of 5,000 square feet or more of total altered surface area.

9) Projects located in or directly adjacent to, or discharging directly to an Environmentally Sensitive Area (ESA), where the development will:

    a. Discharge stormwater runoff that is likely to impact a sensitive biological species or habitat; and

b. Create 2,500 square feet or more of impervious surface area.

10) Single-family hillside homes (see Section 2 for specific requirements).

Redevelopment Projects

Redevelopment projects subject to conditioning and approval for the design and implementation of post-construction stormwater management control measures, prior to completion of the project(s), are redevelopment projects in categories 1 through 10 above that meet the threshold identified below:

- Land-disturbing activity that results in the creation or addition or replacement of 5,000 square feet or more of impervious surface area on an already developed site.

Additionally:

1) Projects where redevelopment results in an alteration to more than fifty percent of impervious surfaces of a previously existing development, and the existing development was not subject to the post development stormwater quality control requirements of Board Order 00-108, shall mitigate the entire redevelopment project area.

2) Projects where redevelopment results in an alteration to more than fifty percent of impervious surfaces of a previously existing development, and the existing development was subject to the post development stormwater quality control requirements of Board Order 00-108, must mitigate only the altered portion of the redevelopment project area and not the entire project area.

3) Projects where redevelopment results in an alteration of less than fifty percent of impervious surfaces of a previously existing development must mitigate only the altered portion of the redevelopment project area and not the entire project area.

Land-disturbing activity that results in the creation or addition or replacement of less than 5,000 square feet of impervious surface area on an already developed site, or that results in a decrease in impervious area which was subject to the post-development stormwater quality control requirements of Board Order 00-108, is not subject to mitigation unless so directed by the local permitting agency.

Redevelopment does not include routine maintenance activities that are conducted to maintain the original line and grade, hydraulic capacity, or original purpose of the facility or emergency redevelopment activity required to protect public health and safety. Impervious surface replacement, such as the reconstruction of parking lots and roadways, that does not disturb additional area and maintains the original grade and alignment, is considered a routine maintenance activity. Agencies' flood control, drainage, and wet utilities projects that maintain original line and grade or hydraulic capacity are considered routine maintenance. Redevelopment also does not include the repaving of existing roads to maintain original line and grade.

Existing single-family dwelling and accessory structure projects are exempt from the redevelopment requirements unless the project creates, adds, or replaces 10,000 square feet of impervious surface area.

Effective Date

The new development and redevelopment requirements contained in Part 4, Section E of Board Order R4-2010-0108 (the "Order") shall become effective 90 calendar days after the Regional Water Quality Control Board Executive Officer approves the 2011 TGM (the "Effective Date"). After the Effective Date, all applicable projects, except those identified below, must comply with the new development and redevelopment requirements contained in Part 4, Section E of the Order.

The new development and redevelopment requirements contained in Part 4, Section E of the Order shall not apply to the projects described in paragraphs 1 through 5 below. Projects meeting the criteria listed in paragraphs 1 through 5 below shall instead continue to comply with the performance criteria set forth in the 2002 Technical Guidance Manual for Stormwater Quality Control Measures under Board Order 00-108:

1) Projects or phases of projects where the project's applications have been "deemed complete for processing" (or words of equivalent meaning), including projects with ministerial approval, by the applicable local permitting agency in accordance with the local permitting agency's applicable rules prior to the Effective Date; or

2) Projects that are the subject of an approved Development Agreement and/or an adopted Specific Plan; or an application for a Development Agreement and/or Specific Plan where the application for the Development Agreement and/or Specific Plan has been "deemed complete for processing" (or words of equivalent meaning), by the applicable local permitting agency in accordance with the local permitting agency's applicable rules, and thereafter during the term of such Development Agreement and/or Specific Plan unless earlier cancelled or terminated; or

3) All private projects in which, prior to the Effective Date, the private party has completed public improvements; commenced design, obtained financing, and/or participated in the financing of the public improvements; or which requires the private party to reimburse the local agency for public improvements upon the development of such private project; or

4) Local agency projects for which the governing body or their designee has approved initiation of the project design prior to the Effective Date; or

5) A Tentative Map or Vesting Tentative Map deemed complete or approved by the local permitting agency prior to the Effective Date, and subsequently a Revised Map is submitted, the project would be exempt from the 2011 TGM provisions if the revisions substantially conform to original map design, consistent with

Subdivision Map Act requirements. Changes must also comply with local and state law.

The intent of these guidelines is to ensure that projects for which the applications have been deemed "complete" or the applicants have worked with local permitting agency staff to develop a final, or substantially final, drainage concept and site layout that includes water quality treatment based upon the performance criteria set forth in the 2002 Technical Guidance Manual for Stormwater Quality Control Measures prior to the Effective Date, are not required to redesign their proposed projects for purposes of complying with the new development and redevelopment requirements contained in Part 4, Section E of Board Order R4-2010-0108.

In addition, any project, phase of a project, or individual lot within a larger previously-approved project, where the application for such project has been "deemed complete for processing" (or words of equivalent meaning) that does not have a final or substantially final drainage concept as determined by the local permitting agency or a site layout that includes water quality treatment must comply with the performance standards set forth in the 2011 TGM.

1.6 Organization of the 2011 TGM

The 2011 TGM is divided into seven sections and nine appendices:

Section 1	Introduction
Section 2	Stormwater Management Standards
Section 3	Site Assessment and BMP Selection
Section 4	Site Design Principles & Techniques
Section 5	Source Control Measures
Section 6	Retention BMPs, Biofiltration BMPs, and Treatment Control Measure Design
Section 7	Operation and Maintenance Planning
Appendix A	Glossary of Terms
Appendix B	Maps: Watersheds Delineation, Existing Urban Areas, Environmentally Sensitive Areas, and 85th Percentile Rainfall Depth
Appendix C	Site Soil Type and Infiltration Testing

Appendix D	BMP Performance Guidance
Appendix E	BMP Sizing Worksheets
Appendix F	Flow Splitter Design
Appendix G	Design Criteria Checklists for Stormwater Runoff BMPs
Appendix H	Stormwater Control Measure Access and Maintenance Agreements
Appendix I	Stormwater Control Measure Maintenance Plan Guidelines and Checklists

2 STORMWATER MANAGEMENT STANDARDS

2.1 Introduction

This section outlines the design process to comply with stormwater control requirements. A flowchart is presented in Figure 2-1 to illustrate a step-by-step process for incorporating these stormwater management control measures.

The selection of appropriate stormwater management control measures should be a collaborative effort between the project proponent and the local permitting agency staff. It is recommended that discussions between project planners, engineers, and local permitting agency staff regarding selection of stormwater management control measures occur very early in the design process.

2.2 Step 1: Determine Project Applicability

New development and redevelopment projects meeting the applicability criteria contained in Section 4.E.II of Order R4-2010-0108 [presented in Section 1.5 of the 2011 TGM] must include control measures specified in the 2011 TGM. These projects should be designed to meet the performance criteria described in the steps below.

Separate requirements exist for three types of projects:

- Projects located within a Redevelopment Project Area Master Plan (RPAMP);
- Single Family Hillside Homes; and
- Roadway Projects.

The requirements for these three project types are described in further detail in the substeps below. Projects that are not applicable are still subject to stormwater agency review, especially for flood drainage requirements. Stormwater management control measures may be required by the governing agency for inapplicable projects, depending on the potential discharge of pollutants in stormwater runoff, impairments in receiving water, or other special conditions that would require increased protection.

Step 1a: Determine RPAMP Eligibility

If a project is located within the boundary of a Redevelopment Project Area Master Plan (RPAMP), the stormwater management requirements in the RPAMP take precedence over the control measures and performance criteria specified in this 2011 TGM. A stormwater agency may apply to the Regional Water Quality Control Board for approval of a RPAMP in consideration of exceptional site constraints that inhibit site-by-site or project-by-project implementation of post-construction requirements.

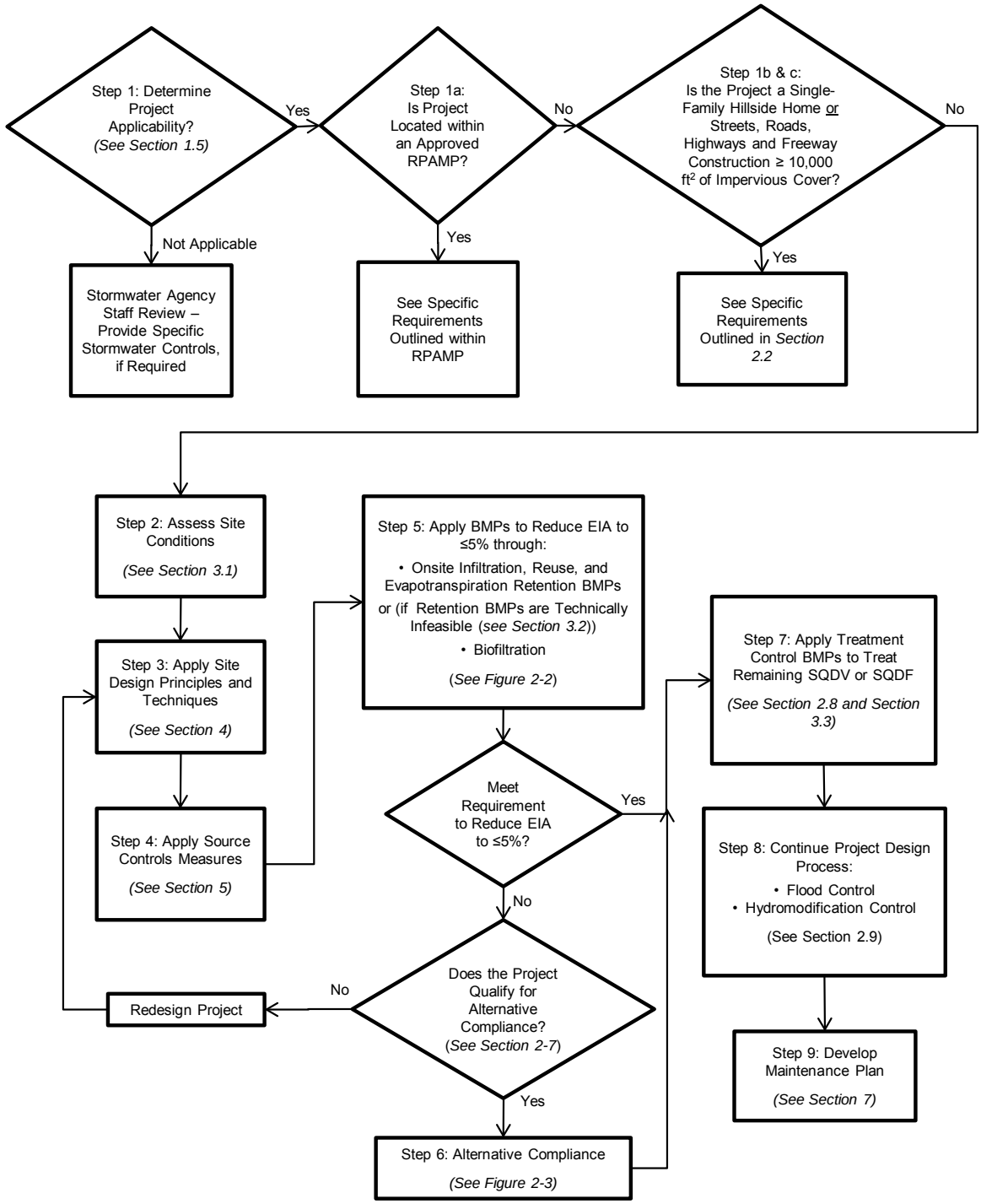

Figure 2-1: Stormwater Management Control Measures Design Decision Flowchart

Step 1b: Single-Family Hillside Homes

Single-family hillside home projects have specific requirements separate from other new development and redevelopment project categories. These requirements only apply to single-family hillside homes that disturb less than 1 acre and that add less than 10,000 square feet of impervious surface area. If the project is equal to 1 acre or greater of disturbed area that adds more than 10,000 square feet of impervious surface area, then project must comply with Steps 2 through 9.

According to Order R4-2010-0108, a hillside is defined as:

> "*Property located in an area with known erosive soil conditions, where the development will result in grading on any slope that is 20% or greater or an area designated by the Municipality under a General Plan or ordinance as a 'hillside area.'*"

The measures presented in this substep comprise the performance standard for single-family hillside home new development and redevelopment projects and apply to the entire lot (additional information on these measures may be found in Section 4 and Section 5).

Conserve Natural Areas

Each project site possesses unique topographic, hydrologic and vegetative features, some of which are more suitable for development than others. Locating development on the least sensitive portion of a site and conserving naturally vegetated areas can minimize environmental impacts in general and stormwater runoff impacts in particular.

The following measures are required and should be included in the lot layout, consistent with applicable General Plan and Local Area Plan policies and if appropriate and feasible with the given site conditions:

1) Concentrate or cluster improvements on the least-sensitive portions of the lot and leave the remaining land in a natural undisturbed state; at a minimum, sensitive portions of the lot should include areas covered under Clean Water Act Section 404 such as riparian areas and wetlands;

2) Limit clearing and grading of native vegetation on the lot to the minimum area needed to build the home, allow access, and provide fire protection; and

3) Maximize trees and other vegetation at the site by planting additional vegetation, clustering tree areas, and promoting the use of native and/or drought-tolerant plants.

Protect Slopes and Channels

Erosion of slopes and channels can be a major source of sediment and associated pollutants such as nutrients, if not properly protected and stabilized.

Slope Protection

Slope protection practices must conform to local permitting agency erosion and sediment control standards and design requirements. The post-construction design criteria described below are intended to enhance and be consistent with these local standards.

1) Slopes must be protected from erosion by safely conveying runoff from the tops of slopes.

2) Slopes must be vegetated by first considering the use of native or drought-tolerant species.

Channel Protection

The following measures should be implemented to provide erosion protection to unlined receiving streams on the lot. Activities and structures must conform to applicable permitting requirements, standards, and specifications of agencies with jurisdiction (i.e., U.S. Army Corps of Engineers, California Department of Fish and Game, or Regional Water Quality Control Board).

1) Use natural drainage systems to the maximum extent practicable, but minimize runoff discharge to the maximum extent practicable.

2) Stabilize permanent channel crossings.

3) Install energy dissipaters, such as rock riprap, at the outlets of storm drains, culverts, conduits or channels that discharge into unlined channels.

Provide Storm Drain System Stenciling and Signage

Storm drain message markers or placards are required at all storm drain inlets within the project boundary. The signs should be placed in clear sight facing anyone approaching the inlet from either side. All storm drain inlet locations must be identified on the development site map.

Some local agencies within the County have approved storm drain message placards for use. Consult local permitting agency stormwater staff to determine specific requirements for placard types and installation methods.

Divert Roof Runoff and Surface Flows to Vegetated Area(s) or Collection System(s), Unless the Diversion Would Result in Slope Instability

Diverted Roof Runoff
City of Santa Barbara

Disconnecting downspouts divert water from roof gutters to (1) vegetated pervious areas of the site in order to allow for infiltration, storage, evapotranspiration (i.e., evaporation and uptake of water by plants), and treatment, or (2) a rainwater collection system (e.g., a rain barrel or a cistern). Disconnected downspouts differ from conventional downspout systems that provide a direct connection of roof runoff to stormwater conveyance systems (storm drains), which quickly collect and convey stormwater away from the site. "Flow spreading" is a technique used to spread runoff from rooftops, sidewalks, patios, and driveways out over a vegetated pervious area, rather than concentrating and conveying the runoff directly to a stormwater conveyance system.

Dispersion methods include splash blocks, gravel-filled trenches, or other methods which serve to spread runoff over vegetated pervious areas. Sheet flow dispersion is the simplest method and can be used for any impervious or pervious surface that is graded so as to avoid concentrating flows. Because flows are already dispersed as they leave the surface, they only need to traverse through a narrow band of adjacent vegetation for the runoff to be effectively attenuated and treated.

The following requirements apply to runoff diversion:

- Vegetated flowpaths for the diverted flows should be at least 25 feet in length, measured from the diversion location to the downstream property line, structure, steep slope, stream, wetland, or impervious surface. The vegetated flowpath must be covered with well-established lawn or pasture, landscaping with well-established groundcover, or native vegetation with natural groundcover. The groundcover should be dense enough to help disperse and infiltrate flows and to prevent erosion.

- If the vegetated flowpath (measured as defined above) is less than 25 feet, a perforated stub-out connection may be used in lieu of downspout dispersion. A perforated stub-out connection is a length of perforated pipe within a gravel-filled trench that is placed between roof downspouts and a stub-out to the local drainage system. A perforated stub-out may also be used where implementation of downspout dispersion might cause erosion or flooding problems, either onsite or on adjacent lots. This provision might be

appropriate, for example, for lots where dispersed flows might pose a potential hazard for lower lying lots or adjacent offsite lots. Location of the connection should be selected to allow a maximum amount of runoff to infiltrate into the ground (ideally a dry location on the site that is relatively well drained). To facilitate maintenance, the perforated pipe portion of the system should not be located under impervious or heavily compacted (e.g., driveways and parking areas) surfaces. The use of a perforated stub-out in lieu of downspout dispersion may be determined by the Local permitting agency.

- In general, if the ground is sloped away from the foundation and there is adequate vegetation and area for effective dispersion, splash blocks will adequately disperse stormwater runoff. If the ground is fairly level, if the structure includes a basement, or if foundation drains are proposed, splash blocks with downspout extensions may be a better choice because the discharge point is moved away from the foundation. Downspout extensions may include piping to a splash block/discharge point a considerable distance from the downspout, as long as the runoff can travel through a well-vegetated area as described above.

- No erosion or flooding of downstream properties may result.

- Runoff discharged towards steep slopes or landslide hazard areas, including perforated stub-out connections, must be evaluated by a geotechnical engineer or qualified geologist. The discharge point may not be placed on or above slopes greater than 20% or above erosion hazard areas without evaluation by a geotechnical engineer or qualified geologist and jurisdiction approval.

- For sites with septic systems, the discharge point must be down gradient of the drainfield primary and reserve areas. This requirement can be waived by the jurisdiction's permit review staff if site topography clearly prohibits flows from intersecting with the drainfield.

Step 1c: Roadway Projects

Roadway projects have specific requirements separate from other new development and redevelopment project categories. The measures presented in this substep comprise the performance standard for street, roadway, highway, and freeway projects. Section 4.E.II of Order R4-2010-0108 requires street, roadway, highway, and freeway projects that construct 10,000 square feet or more of impervious surface area, to incorporate USEPA guidance regarding *Managing Wet Weather with Green Infrastructure: Green Streets* to the maximum extent practicable.

The following requirements apply to the impervious area within the right-of-way associated with public streets, roads, highways, and freeways projects and the streets

that are part of a larger private project. These requirements do not apply to routine maintenance activities that are conducted to maintain original line and grade, hydraulic capacity, original purpose of facility, or emergency redevelopment activity required to protect public health and safety. Impervious surface replacement, such as the reconstruction of parking lots and roadways, which does not disturb additional area and maintains the original grade and alignment, is considered a routine maintenance activity. Agencies' flood control, drainage, and wet utilities projects that maintain original line and grade or hydraulic capacity are considered routine maintenance. Also, the requirements do not apply to the repaving of existing roads to maintain original line and grade.

Minimum requirements for the impervious area within the right-of-way associated with streets, roads, highways, and freeways are as follows:

1) Provide Retention BMPs or Biofiltration BMPs sized to capture and treat the Stormwater Quality Design Volume (SQDV) or the Stormwater Quality design Flow (SQDF) (see Step 7 for guidance on calculating the SQDV and SQDF).

   Additional Treatment Control Measures may be integrated into roadway projects if they are used in a treatment train approach with Retention BMPs or Biofiltration BMPs to address the pollutants of concern (see Section 3.3).

2) Projects should apply the following measures to the maximum extent practicable and as specified in the local permitting agency's codes:

   - Minimize street width to the appropriate minimum width for maintaining traffic flow and public safety;
   - Use porous pavement or pavers for low traffic roadways, on-street parking, shoulders or sidewalks; and
   - Add tree canopy by planting or preserving trees and shrubs.

2.3 Step 2: Assess Site Conditions

The next step is to collect site information that is critical for the selection and implementation of Retention BMPs, Biofiltration BMPs, and Treatment Control Measures. The following information should be documented: topography, soil type and geology, groundwater, geotechnical considerations, offsite drainage, existing utilities, and Environmentally Sensitive Areas. In addition, soil and infiltration testing should be conducted. Detailed guidance on assessing site conditions can be found in Section 3.1.

2.4 Step 3: Apply Site Design Principles and Techniques

The third step is to apply Site Design Principles & Techniques (see Section 4). The implementation of LID requires an integrated approach to site design and

stormwater management. Traditional approaches to stormwater management planning within the site planning process are not likely to achieve the LID performance standard of the MS4 Permit. The use of the site planning techniques presented in Section 4 (Site Design Principles & Techniques) will help generate a more hydrologically functional site, maximize the effectiveness of Retention BMPs, and integrate stormwater management throughout the site.

The following criteria should be considered during the early site planning stages:

- Retention BMPs should be considered as early as possible in the site planning process. Hydrology should be a key principle that is integrated into the initial site assessment planning phases. Where flexibility exists, conceptual drainage plans should attempt to route water to areas suitable for Retention BMPs.

- A multidisciplinary approach at the initial phases of the project is recommended and should include planners, engineers, landscape architects, and architects.

- Individual Retention BMPs should be distributed throughout the project site as feasible and may influence the configuration of roads, buildings and other infrastructure.

- The project must demonstrate disconnection of impervious surface such that the 5% EIA requirement is achieved. If fully meeting the 5% EIA requirement using Retention BMPs is not technically feasible, the project must still utilize Retention BMPs to the maximum extent practicable.

- Flood and hydromodification control should be considered early in the design stages. Even sites with Retention BMPs will still have runoff that occurs during large storm events, but Retention facilities can have flood and hydromodification control benefits. It may be possible to simultaneously address flood and hydromodification control requirements through an integrated water resources management approach.

Perhaps the most important aspect of site planning is allowing sufficient space for Retention BMPs in areas that can physically accept runoff. A simple rule of thumb is to allow 3 to 10 percent of the tributary impervious area (depending on how well the soils drain and then allow for more area with less infiltrative soils) for infiltration BMPs and 3 to 5 percent for biofiltration in preliminary design to achieve the 5% Effective Impermeable Area (EIA) standard.

2.5 Step 4: Apply Source Control Measures

All applicable projects must implement applicable Source Control Measures. Source Control Measures are operational practices that reduce potential pollutants at the

source. They typically do not require maintenance or significant construction. Guidance on Source Control Measures can be found in Section 5.

2.6 Step 5: Apply BMPs to Reduce EIA to ≤5%

According to Order R4-2010-0108, Applicable projects must reduce Effective Impervious Area (EIA) to less than or equal to five percent (≤5%) of the total project area, unless infeasible. Impervious surfaces are rendered "ineffective" if the design storm volume is fully retained onsite using either infiltration, rainwater harvesting, and/or evapotranspiration Retention BMPs. Biofiltration BMPs may be used to achieve the 5% EIA standard if Retention BMPs are technically infeasible (see Section 3.2). This section and Figure 2-2 describe the process for reducing EIA to ≤5%. Refer to Section 2.7 if Retention BMPs and/or Biofiltration BMPs cannot feasibly be used to meet the 5% EIA standard (see Section 3.2).

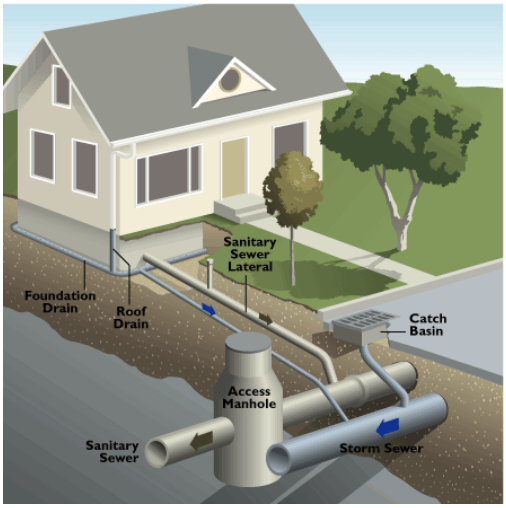

Effective Impervious Area
Victoria, BC Capital Regional District

Step 5a: Calculate Allowable EIA

EIA is defined as impervious area that is hydrologically connected via sheet flow over a hardened conveyance or impervious surface without any intervening medium to mitigate flow volume. Connected impervious areas efficiently transport runoff without allowing infiltration. Often in urban areas, runoff from connected impervious surfaces is immediately directed into a stormwater conveyance system where it is further connected and efficiently transported to an outfall (stormwater conveyance system outlet). For example, in this illustration, the rooftop is directly connected via a roof drain and underground solid drain pipe to the storm drain in the street (Note that the sanitary sewer is separate from the storm sewer). The roadway drains to the storm drain through the catch basin. The roof area and roadway area would be considered EIA.

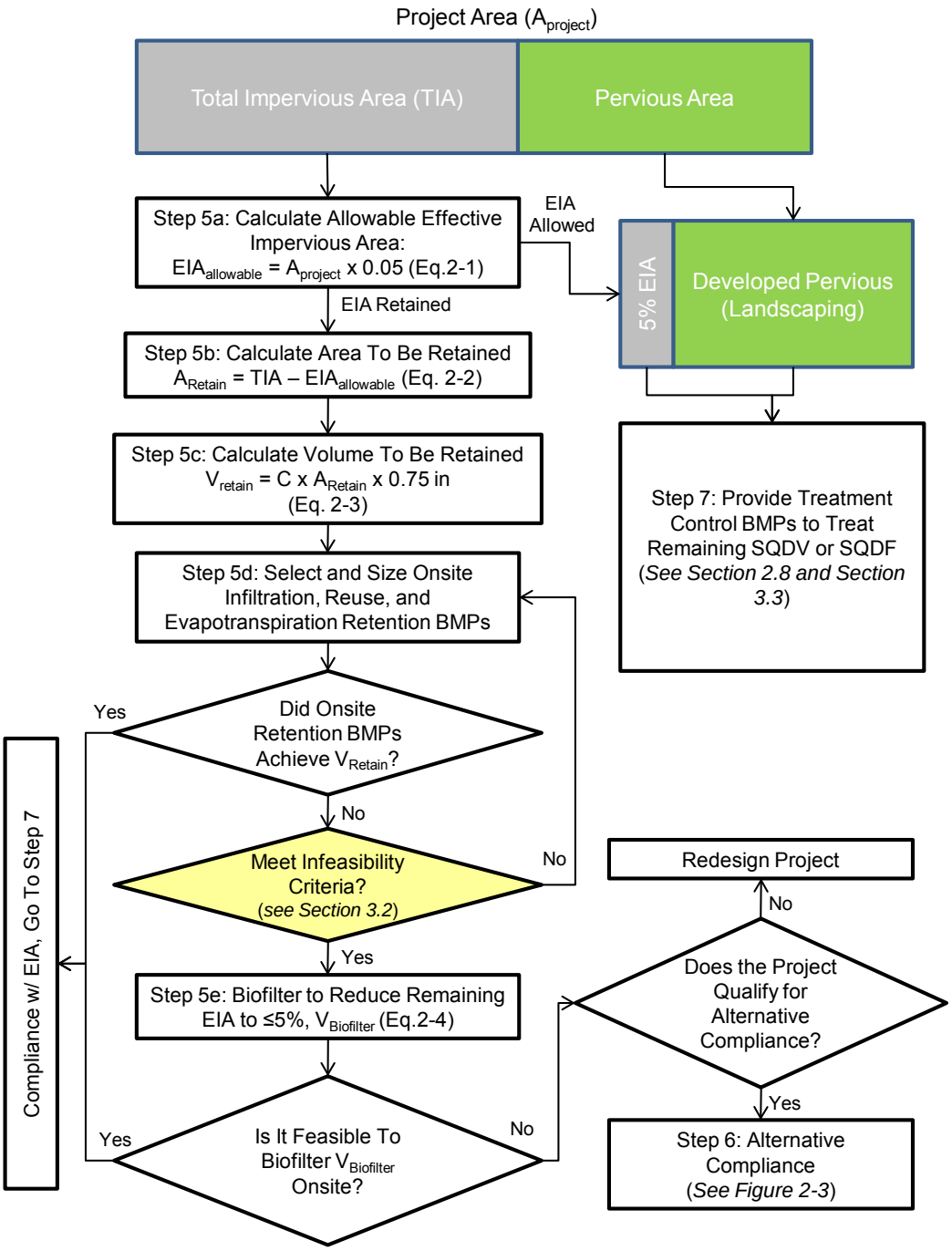

Figure 2-2: Apply BMPs to Reduce EIA to ≤5% Process Flow Chart

> "Impervious surface" is a man-made hard surface area which causes water to run off the surface in greater quantities or at an increased rate of flow from the flow present under natural conditions prior to development. Common impervious surfaces include, but are not limited to, rooftops, walkways, patios, driveways, parking lots or storage areas, concrete or asphalt paving, compacted gravel roads, packed earthen materials, and oiled, macadam or other surfaces which similarly impede the natural infiltration of stormwater. Open, uncovered retention/detention facilities and exposed bedrock shall not be considered as impervious surfaces for purposes of determining EIA retention volume.

The allowable EIA for a project site should be calculated as follows:

$$EIA_{allowable} = (A_{project})*(\%_{allowable}) \qquad \text{(Equation 2-1)}$$

Where:

$EIA_{allowable}$ = the maximum impervious area from which runoff can be treated and discharged offsite [and not retained onsite] (acres)

$A_{project}$ = the total project area (acres).

> "Total project area" (or "gross project area") for new development and redevelopment projects is defined as the disturbed, developed, and undisturbed portions within the project's property (or properties) boundary, at the project scale submitted for first approval. Areas proposed to be permanently dedicated for open space purposes as part of the project are explicitly included in the "total project area." Areas of land precluded from development through a restrictive covenant, conservation easement, or other recorded document for the permanent preservation of open space prior to project submittal shall not be included in the "total project area."

$\%_{allowable}$ = 5 percent

Step 5b: Calculate Impervious Area to be Retained

The impervious area from which runoff must be retained onsite is the total impervious area minus the $EIA_{allowable}$, which should be calculated as follows:

$$A_{Retain} = TIA - EIA_{allowable} = (IMP*A_{project}) - EIA_{allowable} \qquad \text{(Equation 2-2)}$$

Where:

A_{Retain} = the drainage area from which runoff must be retained (acres)

TIA = total impervious area (acres)

$EIA_{allowable}$	=	the maximum impervious area from which runoff can be treated and discharged offsite [and not retained onsite] (acres).
IMP	=	imperviousness of project area (%)/100
$A_{project}$	=	the total project area (acres)

Step 5c: Calculate the Volume to be Retained (SQDV)

All Retention BMPs used to render impervious surfaces "ineffective" should be properly sized to retain the volume of water that results from the water quality design storm. The design storm volume, referred to in the TGM as the Stormwater Quality Design Volume (SQDV) shall be calculated using the following four allowable methodologies:

1) The 85th percentile 24-hour runoff event determined as the maximized capture stormwater volume for the area using a 48 to 72-hour draw down time, from the formula recommended in Urban Runoff Quality Management, WEF Manual of Practice No. 23/ASCE Manual of Practice No. 87, (1998); or

2) The volume of annual runoff based on unit basin storage water quality volume to achieve 80 percent or more volume treatment; or

3) The volume of runoff produced from a 0.75 inch storm event; or

4) Eighty (80) percent of the average annual runoff volume using an appropriate public domain continuous flow model [such as Storm Water Management Model (SWMM) or Hydrologic Engineering Center – Hydrologic Simulation Program – Fortran (HEC-HSPF)], using the local rainfall record and relevant BMP sizing and design data.

Note: Examples used throughout the 2011 TGM use the 0.75 inch storm event (Methodology #3).

EXAMPLE 2-1: EIA CALCULATION

Given: 10 acre total project area, 55% impervious, 25% landscaped, 20% undisturbed, percent allowable EIA = 5%.

$EIA_{allowable} = 10 * 0.05 = 0.5$ acres

$A_{Retain} = (0.55*10) – 0.5 = 5.0$ acres

$A_{treatment} = (0.25*10) + 0.5 = 3.0$ acres

The maximum EIA allowed for the site is 0.5 acres, from which the generated runoff must be treated prior to discharge, in addition to the runoff from the 2.5 acres landscaped area, up to the design storm volume or flow rate. The runoff volume generated from the remaining 5 acre impervious area (A_{Retain}) must be retained onsite via infiltration, rainwater harvesting, and/or evapotranspiration Retention BMPs.

$A_{treatment}$ equals the EIA allowed for the site plus the landscaped area.

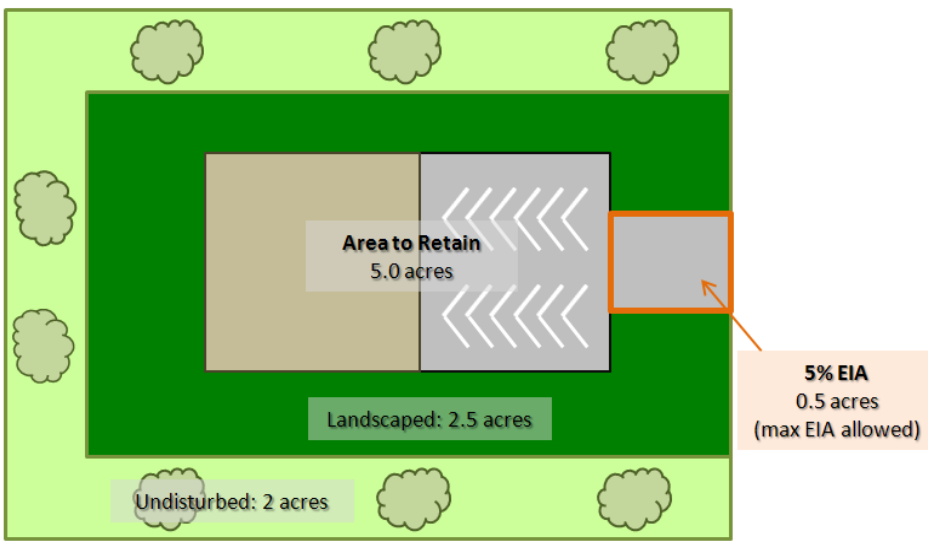

Note: graphic not to scale; for illustration purposes only

The runoff volume that is to be retained onsite should be calculated using Equation 2-3 below:

$$V_{Retain} = C*(0.75/12)*A_{retain} \qquad \text{(Equation 2-3)}$$

Where:

V_{Retain} = the stormwater quality design volume (SQDV) that must be retained onsite (ac-ft)

C	=	runoff coefficient (equals o.95 for impervious surfaces)
0.75	=	the design rainfall depth (in) [based on SQDV sizing method 3]
A_{Retain}	=	the drainage area from which runoff is retained (acres), calculated using Equation 2-2

EXAMPLE 2-2: RETENTION VOLUME CALCULATION

Given: A_{Retain} = 5.0 acres (from Example 2-1); runoff coefficient (C) = 0.95

$$V_{Retain} = 0.95*(0.75/12)*5.0 \text{ acres} = 0.3 \text{ acre-feet}$$

The project must retain at least 0.3 acre-feet of runoff from impervious surfaces using Retention BMPs.

Step 5d: Select and Size Onsite Retention BMPs to Achieve 5% EIA

The next step is to select and size Retention BMPs, based on the site assessment design, and constraints. Section 3-4 provides guidance on the selection of Retention BMPs. The project must demonstrate disconnection of impervious area such that the 5% EIA requirement is achieved.

Step 5e: Select and Size Biofiltration BMPs to Reduce EIA to ≤5%

Retention BMPs shall be used onsite to the maximum extent practicable. Pretreatment BMPs shall be provided for all infiltration BMPs and other Retention BMPs as needed (see Section 6.1).

New development and redevelopment projects that demonstrate technical infeasibility for reducing EIA to ≤5% using Retention BMPs are eligible to use Biofiltration BMPs to achieve the EIA performance standard.

The project applicant shall demonstrate technical infeasibility by submitting a site-specific analysis conducted and endorsed by a registered professional engineer, geologist, architect, and/or landscape architect. Section 3.2 discusses technical feasibility screening criteria. Projects that cannot demonstrate technical infeasibility shall meet the requirement to reduce EIA to ≤5% using Retention BMPs. Otherwise project applicants must examine other options for meeting the requirements, such as redesigning the site.

Volume-based biofiltration BMPs shall be sized to treat 1.5 times the volume not retained using Retention BMPs.

The onsite biofiltered volume ($V_{Biofilter}$), should be calculated as follows:

$$V_{Biofilter} = (V_{Retain} - V_{Achieved}) * 1.5 \qquad \text{(Equation 2-4)}$$

Where:

$V_{Biofilter}$	=	the volume that must be captured and treated in a Biofiltration BMP (ac-ft)
V_{Retain}	=	the stormwater quality design volume (SQDV) that must be retained (ac-ft) (established in Step 5c)
$V_{Achieved}$	=	the volume retained onsite using Retention BMPs (ac-ft)

EXAMPLE 2-3: BIOFILTRATION VOLUME CALCULATION

Given: V_{Retain} = 0.3 ac-ft (from Example 2-2); $V_{Achieved}$ = 0.25 ac-ft

$$V_{Biofilter} = (0.3 - 0.25) * 1.5 = 0.075 \text{ ac-ft}$$

If the project applicant has demonstrated technical infeasibility, the remaining EIA requirement may be met by biofiltering 1.5 times the remaining V_{Retain}. In this case, the Biofiltration BMP must be sized to treat 0.075 ac-ft.

If the project applicant has demonstrated technical infeasibility, the remaining EIA requirement may also be satisfied with flow-based Biofiltration BMPs. Flow-based Biofiltration BMPs shall be sized for the remaining drainage area from which runoff must be retained (A_{Retain}) using the methodology described in Section 2.8, Stormwater Quality Design Flow, with a rainfall intensity that varies with time of concentration for the catchment tributary to the flow-based Biofiltration BMP, according to Table 2-1.

Table 2-1: Flow-Based Biofiltration BMP Design Intensity for 150% Sizing

Time of Concentration, minutes	Design Intensity for 150% Sizing, in/hr
30	0.24
20	0.25
15	0.28
10	0.31
5	0.35

Time of concentration should be determined using the methodology provided in the Ventura County Hydrology Manual.

2.7 Step 6: Alternative Compliance

Certain new development and redevelopment project types are eligible for alternative compliance measures if onsite Retention BMPs and/or Biofiltration BMPs cannot feasibly be used to meet the 5% EIA standard (see Section 3.2). Such projects include:

1) Redevelopment projects (as defined in Section 1.5).

2) Infill projects. Infill projects meet the following conditions:

   a. The project is consistent with applicable general plan designation, and all applicable general plan policies, and applicable zoning designation and regulations;

   b. The proposed development occurs on a project site of no more than five acres substantially surrounded by urban uses;

   c. The project site has no value as habitat for endangered, rare, or threatened species;

   d. Approval of the project would not result in any significant effects relating to traffic, noise, air quality, or water quality; and

   e. The site can be adequately served by all required utilities and public services (modified from State Guidelines § 15332).

3) Smart Growth projects. Smart Growth projects are defined as new development and redevelopment projects that occur within existing urban areas[2] (see maps in Appendix B) designed to achieve the majority of the following principles[3]:

   a. Create a range of housing opportunities and choices;

   b. Create walkable neighborhoods;

   c. Mix land uses;

[2] Existing urban areas and corresponding maps in Appendix B are based on the cities' City Urban Restriction Boundaries (CURB) lines and in the case of the unincorporated County, the Existing Community designation. These boundaries are a growth management tool intended to channel growth and protect agricultural and open-space land. The 2011 TGM utilizes existing urban areas (as defined in Appendix B) to provide parameters around eligibility for alternative compliance in two areas: 1) Smart Growth and 2) low income housing projects.

[3] Adapted from the Smart Growth Network's Smart Growth Principles in cooperation with the U.S. Environmental Protection Agency.

d. Preserve open space, natural beauty, and critical areas;

   i. Farmland preservation may also be considered for projects occurring outside existing urban areas (as defined by the Appendix B maps).

e. Provide a variety of transportation choices;

   i. Includes transit oriented development (development located within an average 2,000 foot walk to a bus or train station).[4]

f. Strengthen and direct development towards existing communities (as defined by Appendix B maps); and

g. Take advantage of compact building design.

The City or County Planning Division in which a project is proposed will ultimately determine whether a project meets these Smart Growth criteria.

4) Pedestrian/bike trail projects:

   ✓ Located along side of a road and

   ✓ Where right-of-way width is inadequate for the implementation of Retention and/or Biofiltration BMPs.

5) Agency flood control, drainage, and wet utilities projects:

   ✓ Located within waterbody and is therefore not increasing functional impervious cover; or

   ✓ Located on top of a narrow flood control feature (such as a levee) and space is unavailable for the implementation of Retention and/or Biofiltration BMPs; or

   ✓ Where the integrity of the flood control feature (such as a dam or levee) may be compromised through Retention and/or Biofiltration BMPs (e.g., infiltration of stormwater is not appropriate in a levee).

6) Historical preservation projects:

   ✓ Where the extent of the designated preservation area restricts the amount of land available for the implementation of Retention BMPs.

[4] Calthorpe, P. (1993), "The next American metropolis: Ecology, community, and the American dream", New York: Princeton Architectural Press.

7) Low income housing projects that occur within existing urban areas (as defined by the maps provided in Appendix B):

   - ✓ Where density requirements restrict the amount of land available for the implementation of Retention BMPs and/or
   - ✓ Where project financing constraints restrict the amount of land available for the implementation of Retention BMPs.

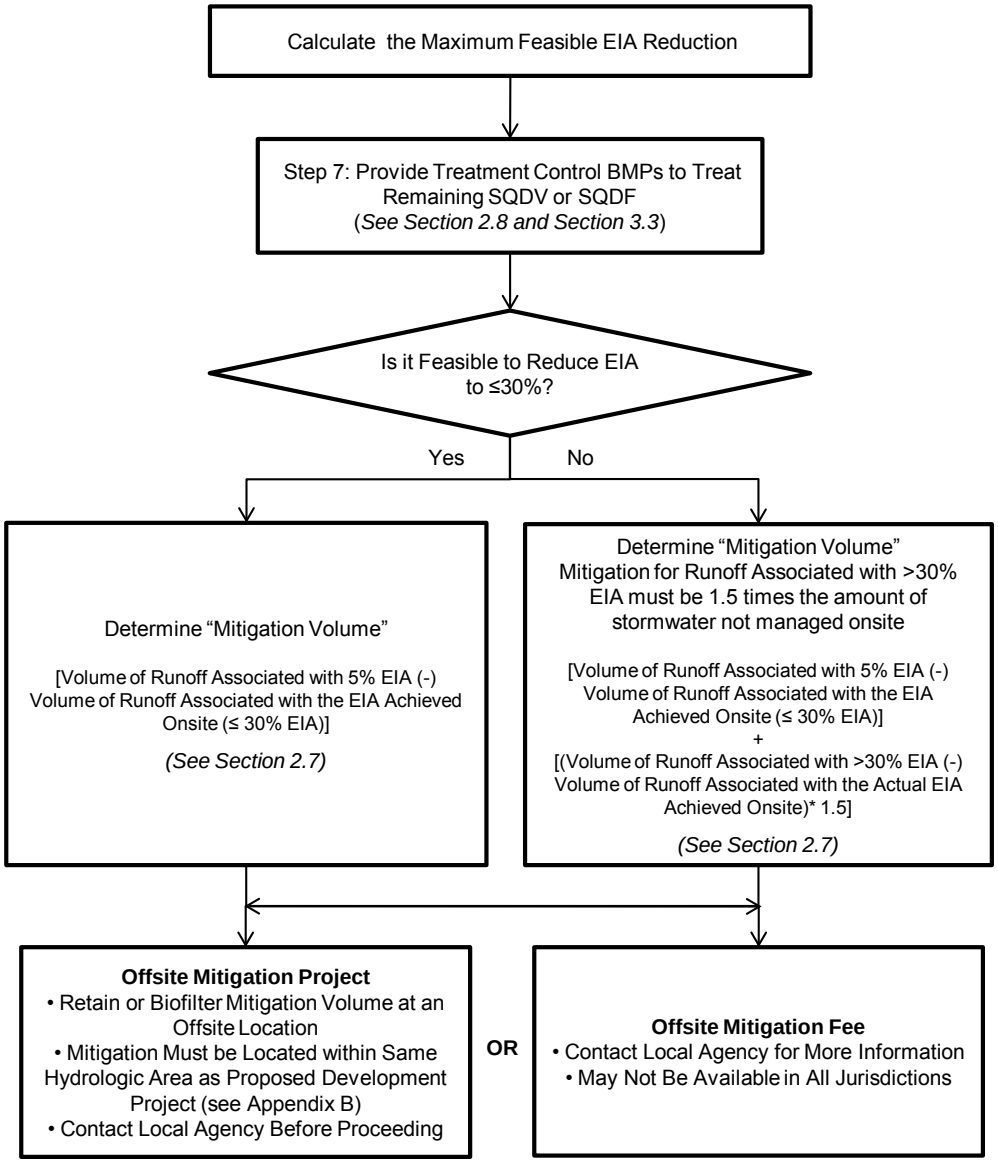

Figure 2-3: Alternative Stormwater Management Control Measures Compliance Decision Flow Chart

Projects in these categories must demonstrate that full compliance with the 5% EIA standard using Retention BMPs and Biofiltration BMPs is infeasible prior to moving to the alternative compliance flowchart (Figure 2-3) and selecting an offsite mitigation alternative. Section 3.2 provides infeasibility criteria.

Stormwater runoff from impervious surfaces and developed pervious surfaces that is not fully retained onsite (up to the SQDV) shall be mitigated using Treatment Control Measures [Chapter 6] selected per the BMP selection process outlined in Section 3.3, in addition to offsite alternative compliance measures.

Alternative compliance may be met through two options:

- Offsite mitigation project; or
- Offsite mitigation fee.

In either case, the Project applicant must contact the local approval agency before proceeding with Alternative Compliance.

Mitigation Volume

Projects requesting alternative compliance must demonstration that EIA has been reduced to the maximum extent practicable. Additionally, the SQDV or SQDF from all directly connected impervious area and the developed pervious project area must be captured and treated within the project site.

Alternative compliance options will be based on the "mitigation volume." The mitigation volume is the difference between the volume of runoff associated with 5% EIA and the volume of runoff associated with the actual EIA achieved onsite less than or equal to 30% (≤30%) EIA. The offsite mitigation requirement for EIA in excess of 30% (>30%) is 1.5 times the amount of stormwater not managed onsite.

Projects Feasible to Reduce EIA to ≤ 30%

1) Determine the volume of runoff that is retained and biofiltered onsite ($V_{Ret/Bio}$), using Equation 2-5 below:

$$V_{Ret/Bio} = (V_{Achieved} + (V_{Biofiltered}/1.5)) \qquad \text{(Equation 2-5)}$$

Where:

$V_{Ret/Bio}$ = the total volume of runoff retained and/or biofiltered onsite using Retention and Biofiltration BMPs

$V_{Achieved}$ = the runoff volume retained onsite using Retention BMPs as calculated in Equation 2-4

$V_{Biofiltered}$ = the runoff volume biofiltered onsite

2) Determine the Mitigation Volume ($V_{Mitigation}$), using Equation 2-6 below:

$$V_{Mitigation} = V_{Retain} - V_{Ret/Bio} \quad \text{(Equation 2-6)}$$

Where:

$V_{Mitigation}$ = the volume of runoff that must be mitigated offsite

V_{Retain} = the SQDV that must be retained onsite per the 5% EIA requirement calculated in Equation 2-3

$V_{Ret/Bio}$ = the total volume of runoff retained and/or biofiltered onsite using Retention and Biofiltration BMPs calculated in Equation 2-5

EXAMPLE 2-4: ≤30% EIA OFFSITE MITIGATION VOLUME CALCULATION

Given: V_{Retain} = 0.3 ac-ft (from Example 2-2); $V_{Retained}$ = 0.25 ac-ft; $V_{Biofiltered}$ = 0.06 ac-ft

1) Calculate volume of runoff retained and biofiltered onsite ($V_{Ret/Bio}$).

$V_{Ret/BioBio}$ = 0.25 + (0.06/1.5) = 0.29 ac-ft [See Equation 2-5]

2) Calculate Mitigation Volume: ($V_{Mitigation}$):

$V_{Mitigation}$ = 0.3– 0.29 = 0.01 acre-feet [See Equation 2-6]

The required offsite mitigation volume is 0.01 ac-ft.

In addition, the SQDV or SQDF from the EIA (0.5 acres) and the developed pervious area (10 acres *25% = 2.5 acres) must be captured and treated in an approved Treatment Control Measure.

SQDV (acre-feet) = C*(0.75/12)*3 acres

OR

SQDF (cfs) = C* 0.20 in/hr * 3 acres

Note: Per Order R4-2010-0108, several options exist to determine the SQDV and SQDF. Examples used throughout the 2011 TGM use the 0.75 inch storm event (SQDV Methodology #3) for the SQDV and 0.2 inches per hour intensity for the SQDF (SQDF Methodology #1). For these examples, the 10-acre project site is assumed to be in a location where the 85th percentile storm event is equal to 0.75 inches.

Projects with EIA > 30%

For the scenario where the effective impervious area of the project is greater than 30% due to infeasibility, the runoff volume associated with the effective impervious area up to 30% must be mitigated offsite at a one-to-one ratio and the runoff volume associated with the effective impervious area greater than 30% must be mitigated off-site at 1.5 times the volume.

1) Determine the area of the impervious portion of the drainage area from which runoff is retained or biofiltered at 30% EIA ($A_{30\%EIA}$), using Equation 2-7 below:

$$A_{30\%EIA} = (IMP*A_{project}) - (30\%*A_{project}) \quad \text{(Equation 2-7)}$$

Where:

$A_{30\%EIA}$	=	the impervious portion of the drainage area from which runoff would have been retained or biofiltered at 30% EIA (acres)
IMP	=	total imperviousness of project area (%)/100
$A_{project}$	=	the total project area (acres)

2) Determine the total volume that would have been retained or biofiltered onsite at 30% EIA ($V_{30\%EIA}$), using Equation 2-8 below:

$$V_{30\%EIA} = C*(0.75/12)*A_{30\%EIA} \qquad \text{(Equation 2-8)}$$

Where:

$V_{30\%EIA}$	=	the stormwater quality design volume (SQDV) retained or biofiltered at 30% EIA (note: for the purposes of this calculation, the biofiltered volume does not include the 1.5 multiplier)
C	=	runoff coefficient [equals o.95 for impervious surfaces]
0.75	=	the design rainfall depth (in) [based on SQDV sizing method 3]
$A_{30\%EIA}$	=	the impervious area from which runoff would have been retained or biofiltered at 30% EIA (acres) [See Equation 2-7]

3) Determine the impervious area from which runoff is actually retained ($A_{ActualEIA}$). This is the total amount of impervious area that drains to properly sized Retention or Biofiltration BMPs.

$$A_{ActualEIA} = (IMP*A_{project}) - (EIA\%*A_{project}) \qquad \text{(Equation 2-9)}$$

Where:

$A_{ActualEIA}$	=	the impervious portion of the drainage area from which runoff is retained or biofiltered using the actual EIA achieved on-site (acres)
IMP	=	total imperviousness of project area (%)/100
$A_{project}$	=	the total project area (acres)
EIA%	=	percent EIA actually achieved on-site

4) Determine the volume that is actually retained onsite ($V_{ActualEIA}$), using Equation 2-10 below:

$$V_{ActualEIA} = C*(0.75/12)*A_{AcutalEIA} \quad \text{(Equation 2-10)}$$

Where:

$V_{AcutalEIA}$	=	the stormwater quality design volume (SQDV) that is retained and/or biofiltered onsite C = runoff coefficient [equals o.95 for impervious surfaces]
0.75	=	the design rainfall depth (in) [based on SQDV sizing method 3]
$A_{ActualEIA}$	=	the area associated with the Actual EIA achieved onsite, (i.e., the area from which runoff is retained or biofiltered (acres) [See # 3 above]

Determine the Mitigation Volume for 30% EIA using Equation 2-11 below:

$$V_{Mitigation30\%} = V_{Retain} - V_{30\%EIA} \quad \text{(Equation 2-11)}$$

Where:

$V_{Mitigation30\%}$	=	the mitigation volume for Project site with 30% EIA
V_{Retain}	=	the SQDV that must be retained onsite per the 5% EIA requirement, calculated using Equation 2-3
$V_{30\%EIA}$	=	the runoff that would have been retained and/or biofiltered at 30% EIA (note: for the purposes of this calculation, the biofiltered volume does not include the 1.5 multiplier), calculated using Equation 2-8

Determine the Mitigation Volume for >30% (EIA $V_{Mitigation>30\%}$), using Equation 2-12 below:

$$V_{Mitigation>30\%} = (V_{30\%EIA} - V_{ActualEIA})*1.5 \quad \text{(Equation 2-12)}$$

Where:

$V_{Mitigation>30\%}$	=	the mitigation volume for >30% EIA
$V_{30\%EIA}$	=	the stormwater quality design volume (SQDV) retained or biofiltered at 30% EIA (note: for the

purposes of this calculation, the biofiltered volume does not include the 1.5 multiplier)

$V_{ActualEIA}$ = the stormwater quality design volume (SQDV) that is actually retained and/or biofiltered onsite, calculated using Equation 2-9

Determine the Total Mitigation Volume ($V_{MitigationTotal}$), using Equation 2-13 below:

$$V_{MitigationTotal} = V_{Mitigation>30\%} + V_{Mitigation30\%} \quad \text{(Equation 2-13)}$$

Where:

$V_{MitigationTotal}$ = the total mitigation volume for 30% EIA

$V_{Mitigation>30\%}$ = the mitigation volume for >30% EIA, calculated using Equation 2-11

$V_{Mitigation30\%}$ = the mitigation volume for 30% EIA calculated using Equation 2-10.

EXAMPLE 2-5: >30% EIA OFFSITE MITIGATION CALCULATION

Given: 40% EIA; 10 acre total project area, 55% impervious, 25% landscaped, 20% undisturbed; runoff coefficient (C) = 0.95; V_{Retain} = 0.3 ac-ft

1) Determine impervious area retained or biofiltered onsite at 30% EIA
   $A_{30\%EIA}$ = ((55/100)*10) – ((30/100)*10) = 2.5 acres [See Equation 2-7]

2) Determine the volume that is retained or biofiltered onsite at 30% EIA
   $V_{30\%EIA}$ = 0.95*(0.75/12)*2.5 = 0.15 ac-ft [See Equation 2-8]

3) Determine the impervious area from which runoff is actually retained
   $A_{ActualEIA}$ = ((55/100)*10) – ((40/100)*10) = 1.5 acres [See Equation 2-9]

4) Determine the volume that is actually retained or biofiltered onsite
   $V_{ActualEIA}$ = 0.95*(0.75/12)*1.5 = 0.09 ac-ft [See Equation 2-10]

5) Determine Mitigation Volume for 30% EIA
   $V_{Mitigation30\%}$ = 0.3 – 0.15 = 0.15 ac-ft [See Equation 2-11]

6) Determine Mitigation Volume for >30%
   $V_{Mitigation>30\%}$ = (0.15-0.09) *1.5 = 0.09 ac-ft [See Equation 2-12]

7) Determine the Total Mitigation Volume
   $V_{MitigationTotal}$ = 0.15 + 0.09 = 0.24 ac-ft [See Equation 2-13]

The required offsite mitigation volume is 0.24 ac-ft

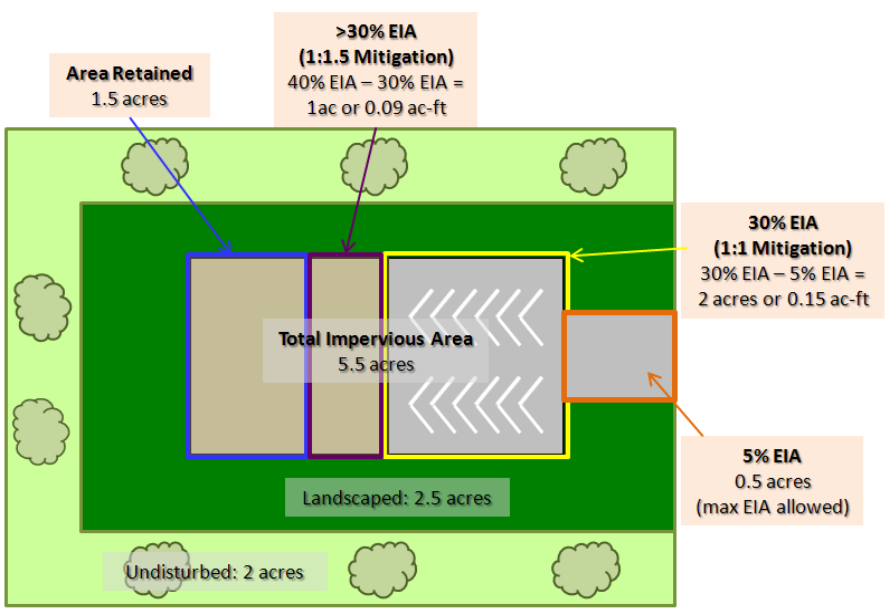

Selecting Offsite Mitigation Projects

Project applicants may identify offsite mitigation projects. Project applicants are responsible for completing offsite mitigation projects that will achieve equivalent volume and pollutant load reduction using Retention and/or Biofiltration BMPs sized for the mitigation volume. Offsite mitigation projects must adhere to the following criteria:

- Offsite mitigation projects must be located within the same hydrologic area (see map in Appendix B)
- Offsite mitigation projects must be completed as soon as possible and at the latest, within 4 years of the certificate of occupancy for the original project.

Examples of Offsite Mitigation Projects

Mitigation projects should target urbanized areas that were developed without stormwater mitigation. All projects must be approved by the local permitting agency and must adhere to the BMP Selection Criteria presented in Section 3.3 of the 2011 TGM. Potential project types may include:

- Convert a convex parking lot landscaped island into a depressed bioretention area designed to retain parking lot runoff.
- Convert a traditionally-paved parking lot into porous pavement.
- Modify an existing detention pond into a retention pond.
- Install bioretention in bump-outs, in parkways, or in roadway medians.
- Install bioretention in sidewalk areas to infiltrate roof, sidewalk, and/or roadway runoff. Sidewalks must be wide enough to permit foot traffic around bioretention area.
- Incorporate infiltration BMPs into landscaped areas that collect runoff from impervious surfaces.
- Regional BMPs.

Offsite Mitigation Fee

In some cases, Alternative Compliance may be achieved through an Offsite Mitigation Fee. A list of offsite mitigation projects available for funding will be identified by the Approval Agencies. Applicants should contact their local Approval Agency for more information. The Offsite Mitigation Fee may not be available in all jurisdictions.

2.8 Step 7: Apply Treatment Control Measures

Stormwater runoff from EIA and developed pervious surfaces shall be mitigated using Retention BMPs, Biofiltration BMPs, or Treatment Control Measures [Chapter 6] selected per the BMP selection process outlined in Section 3.3. Biofiltration BMPs and Treatment Control Measures may be sized to meet the Stormwater Quality Design Volume (SQDV) or the Stormwater Quality Design Flow (SQDF). Treatment Control Measures should be designed in adherence with the guidance provided in Section 6 of the 2011 TGM in order to assure a level of pollutant removal comparable to those listed in Attachment "C" of Order R4-2010-0108 (also provided in Appendix D.1).

Projects that are eligible for Offsite Mitigation must still provide treatment for all impervious surfaces and developed pervious areas using Treatment Control Measures sized to meet the SQDV or SQDF on site. Treatment Control Measures must be selected per the BMP selection process outlined in Section 3.3.

Stormwater Quality Design Volume (SQDV)

Volume-based Treatment Control Measures must be sized to capture and treat the runoff volume from the water quality design storm. The SQDV shall be calculated using the following four allowable methodologies:

1) The 85th percentile 24-hour runoff event determined as the maximized capture stormwater volume for the area using a 48 to 72-hour draw down time, from the formula recommended in Urban Runoff Quality Management, WEF Manual of Practice No. 23/ASCE Manual of Practice No. 87, (1998); or

2) The volume of annual runoff based on unit basin storage water quality volume to achieve 80 percent or more volume treatment; or

3) The volume of runoff produced from a 0.75 inch storm event; or

4) Eighty (80) percent of the average annual runoff volume using an appropriate public domain continuous flow model [such as Storm Water Management Model (SWMM) or Hydrologic Engineering Center – Hydrologic Simulation Program – Fortran (HEC-HSPF)], using the local rainfall record and relevant BMP sizing and design data.

The allowable design storm calculation methodology for Treatment Control Measures, per Order R4-2010-0108, is determined by the total project disturbed land area, as summarized in Table 2-2 below.

Table 2-2: Allowed Design Storm Methodology Based on Project Size

Project Size (Disturbed Land Area[1])	Allowed Design Storm Methodology
Less than 5 acres	(1), (2), (3), or (4)
5 acres - 50 acres	(1), (2), or (4)
More than 50 acres	(4)

[1] "Disturbed Area" means any area that is altered as a result of land disturbance, such as clearing, grading, grubbing, stockpiling or excavation.

Instructions for calculating the SQDV based on method (3), the volume of runoff produced from a 0.75 inch storm event, are provided below. Instructions for calculating the SQDV for methods (1), (2), and (4) are provided in Appendix E. Note that Biofiltration BMPs must be sized to treat 1.5 times the volume not retained using Retention BMPs as indicated in Step 5e.

Calculation Procedure

1) Determine the area from which runoff must be retained or captured and treated ($A_{project}$).

2) Determine the runoff coefficient (C), using Equation 2-13 below:

$$C = 0.95*imp + C_p\,(1\text{-}imp) \qquad \text{(Equation 2-13)}$$

Where:

C	=	runoff coefficient (equals o.95 for impervious surfaces)
imp	=	impervious fraction of watershed
C_p	=	pervious runoff coefficient, determined based on soil type using table below [see Ventura County Hydrology Manual (2006)]:

Table 2-3: Ventura Soil Type Pervious Runoff Coefficients

Ventura Soil Type (Soil Number)	C_p value
1	0.15
2	0.10
3	0.10
4	0.05
5	0.05
6	0
7	0

3) Determine the stormwater runoff design volume (SQDV), using Equation 2-14 below:

$$SQDV = C*(0.75/12)* A_{project} \qquad \text{(Equation 2-14)}$$

Where:

SQDV	=	the stormwater quality design volume (acre-feet)
C	=	runoff coefficient, calculated by Equation 2-13
0.75	=	the design rainfall depth (in) [based on sizing method (3)]Atrib
$A_{project}$	=	drainage area of the tributary catchment (acres)

Stormwater Quality Design Flow (SQDF)

For the purposes of the 2011 TGM, instructions for calculating the SQDF based on method (1), the flow of runoff produced from a rainfall event equal to at least 0.2 inches per hour intensity, are provided below. Instructions for calculating the SQDF for methods (2), and (3) are provided in Appendix E. Note that flow-based Biofiltration BMPs used to achieve 5% EIA must be sized per the design intensity specified in Table 2-1.

Calculation Procedure

1) Determine the drainage area from which the flow-based BMP will be receiving runoff ($A_{project}$).

2) Calculate the runoff coefficient (C), using Equation 2-13.

3) Calculate the SQDF using Equation 2-15 below:

$$SQDF = C*I*A_{project} \quad \text{(Equation 2-15)}$$

Where:

SQDF	=	flow in cubic feet per second (cfs)
C	=	runoff coefficient, calculated by Equation 2-13 above
I	=	average rainfall intensity (inches/hour) for a duration equal to the time of concentration of the watershed [equal to 0.2 in/hr for method (1); see also Table 2-1:]
$A_{project}$	=	drainage area of the tributary catchment (acres)

2.9 Step 8: Continue Project Design Process: Flood Control and Hydromodification Requirements

The project applicant should continue with the design process to address additional requirements including flood control and hydromodification control criteria.

Step 8a: Flood Control Requirements

Applicants shall comply with Ventura County and local approval agency regulations on floodplain and floodway management.

Step 8b: Hydromodification (Flow/Volume/Duration) Control Criteria

Projects meeting the applicability criteria contained in Section 4.E.II of Order R4-2010-0108 (presented in Section 1.5 of the 2011 TGM) are required to implement hydrologic control measures to prevent accelerated erosion and to protect stream habitat in downstream natural drainage systems. Natural drainage systems are defined as unlined or unimproved (not engineered) creeks, streams, rivers and their tributaries.

Exemptions

The following new development and redevelopment projects are exempt from the hydromodification control criteria:

1) Single-family structures, unless such projects disturb one acre or more of land or create, add, or replace 10,000 square feet or more of impervious surface area.

2) All projects that disturb less than one acre.

3) Projects that are replacement, maintenance, or repair of an Agency's existing flood control facility, storm drain, or transportation network.

4) Redevelopment projects in existing urban areas [see maps in Appendix B] that do not increase the effective impervious area or decrease the infiltration capacity of pervious areas compared to the pre-developed condition.

5) Projects that have any increased discharge directly or via a storm drain to a sump, lake, area under tidal influence, into a waterway that has a 100-year peak flow (Q100) of 25,000 cubic feet per second (cfs) or more, or other receiving water that is not susceptible to hydromodification impacts.

6) Projects that discharge directly or via a storm drain into concrete or improved (not natural) channels (e.g., rip rap, sackcrete, etc.), which, in turn, discharge into receiving water that is not susceptible to hydromodification impacts (as in #5 above).

Hydromodification Control Measures

The purpose of Hydromodification Control Measures is to minimize changes in post-development stormwater runoff discharge rates, velocities, and durations by maintaining within a certain tolerance, the project's pre-developed stormwater runoff flow rates and durations.

Hydromodification Control Measures may include onsite, subregional, or regional Hydromodification Control Measures, Retention BMPs, or stream restoration measures. Preference must be given to onsite Retention BMPs and Hydromodification Control Measures. In-stream restoration measures may not adversely affect the beneficial uses of natural drainage systems.

The Southern California Stormwater Monitoring Coalition (SMC) is developing a regional methodology to eliminate or mitigate the adverse impacts of hydromodification as a result of urbanization, including hydromodification assessment and management tools. The Program will develop and implement watershed-specific Hydromodification Control Plans (HCPs) after the completion of the SMC study. Until the completion of the HCPs, the Interim Hydromodification Control Criteria, described below, apply to applicable, non-exempt new development and redevelopment projects.

Interim Hydromodification Control Criteria

1) Projects disturbing less than 50 acres must comply with the Stormwater Management Standards contained in the 2011 TGM (i.e., a combination of Retention BMPs, Biofiltration BMPs, and/or Treatment Control Measures).

2) Projects disturbing 50 acres or greater must develop and implement a Hydromodification Analysis Study (HAS) that demonstrates that post development conditions are expected to approximate the pre-developed erosive

effect of sediment transporting flows in receiving waters. The HAS must lead to the incorporation of project design features intended to approximate, to the extent feasible, an Erosion Potential value of 1, or any alternative value that can be shown to be protective of the natural drainage systems from erosion, incision, and sedimentation that can occur as a result of flow increases from impervious surfaces and damage stream habitat in natural drainage systems. The methodology for calculating Erosion Potential is provided in Appendix E of Order R4-2010-0108. Project proponents must work with their local permitting authority to ensure that the HAS is correctly prepared.

2.10 Step 9: Develop Maintenance Plan

The Ventura Countywide Stormwater Quality Management Program (Program) requires the submittal of a Maintenance Plan and execution of a Maintenance Agreement with the owner/operator of any stormwater control that requires maintenance including Site Design Principles and Techniques (Section 4); Source Control Measures (Section 5; and Retention BMPs, Biofiltration BMPs, and Treatment Control Measures (Section 6). Maintenance Plans must include guidelines for how and when inspection and maintenance should occur for each control. Section 7 and Appendices H and I provide additional information and guidance on compliance with maintenance requirements.

3 SITE ASSESSMENT AND BMP SELECTION

3.1 Assessing Site Conditions and Other Constraints

Assessing a site's potential for implementation of Retention BMPs, Biofiltration BMPs, and Treatment Control Measures requires both the review of existing information and the collection of site-specific measurements. Available information regarding site layout and slope, soil type, geotechnical conditions, and local groundwater conditions should be reviewed as discussed below. In addition, soil and infiltration testing should be conducted to determine if stormwater infiltration is feasible and to determine the appropriate design infiltration rates for infiltration-based treatment BMPs.

Site Conditions

Topography

The site's topography should be assessed to evaluate surface drainage and topographic high and low points, as well as to identify the presence of steep slopes that qualify as Hillside Locations. All of these conditions have an impact on what type of Retention BMPs, Biofiltration BMPs, and Treatment Control Measures will be most beneficial for a given project site. Stormwater infiltration is more effective on level or gently sloping sites. Flows on slopes steeper than 15% may runoff as surface flows, rather than infiltrate into the ground. On hillsides, infiltrated runoff may daylight or resurface a short distance downslope, which could cause slope instability depending on the soil or geologic conditions. See the Geotechnical Considerations section below.

Soil Type and Geology

The site's soil types and geologic conditions should be determined to evaluate the site's ability to infiltrate stormwater and to identify suitable, as well as unsuitable, locations for infiltration-based BMPs (e.g., infiltration basins and trenches, bioretention without an underdrain, permeable pavement, and drywells). Using the Soil Survey completed by the Soil Conservation Service (SCS) (now identified as the Natural Resource Conservation Service [NRCS]) of the U. S. Department of Agriculture in April 1970, soils in Ventura County were grouped into seven hydrologically homogeneous families [see Ventura County Hydrology Manual (2006); also see Appendix B]. Two families were assigned to each of the NRCS Hydrologic Soil Groups A, B, and C; while only one family was considered appropriate for NRCS Hydrologic Soil Group D [for further information, see http://soils.usda.gov/]:

- Group A soils are typically sands, loamy sands, or sandy loams. Group A soils have low runoff potential and high infiltration rates even when thoroughly wetted. They consist chiefly of deep and well to excessively drained sands or

gravels and have a high rate of water transmission. Ventura County soil numbers 6 and 7 are Group A soils.

- Group B soils are typically silty loams or loams. They have a moderate infiltration rate when thoroughly wetted and consist chiefly of moderately deep to deep and moderately well to well drained soils with moderately fine to moderately coarse texture. Ventura County soil numbers 4 and 5 are Group B soils.

- Group C soils are typically sandy clay loams. They have low infiltration rates when thoroughly wetted, consist chiefly of soils with a layer that impedes downward movement of water, and/or have moderately fine to fine soil structure. Ventura County soil numbers 2 and 3 are Group C soils.

- Group D soils are typically clay loams, silty clay loams, sandy clays, silty clays, or clays. They have very low infiltration rates when thoroughly wetted and consist chiefly of clay soils with high swelling potential, permanent high water table, claypan or clay layer at or near the surface, and/or shallow soils over nearly impervious material. Ventura County soil number 1 is a Group D soil.

Infiltration-based BMPs should be feasible in areas mapped with Ventura County Soil Numbers 4 through 7. If site-specific data is available, then soils with infiltration rates of 0.5 in/hr or greater are considered feasible for infiltration. Infiltration-based BMPs should not be designed for sites mapped with Ventura County Soil Numbers 1 through 3 (unless site specific testing is performed and shows an infiltration rate greater than 0.5 in/hr) or with site-specific infiltration rates less than 0.5 in/hr.

Locations where soils are mapped with Ventura Hydrology Manual Soil Number 3, or where a site-specific analyses show that the soils have an infiltration rate of 0.3 to 0.5 inches per hour, and no other infiltration-related infeasibility criteria apply, shall use a Bioinfiltration BMP (or Rainwater Harvesting). Bioinfiltration is an adaption of the Bioretention with an Underdrain BMP in which the underdrain is raised above the gravel storage layer in order to promote infiltration but allow release of biotreated runoff to the storm drain when infiltration capacity is reached.

Early identification of soil types throughout the project footprint can reduce the number of test pit investigations and infiltration tests needed. Early identification reduces the number of potential test sites to locations with those that are most likely to be amenable to infiltration. Guidance for conducting test pit investigations and infiltration tests is provided in Appendix C.

Project applicants should review available geologic or geotechnical reports on local geology to identify relevant features such as depth to bedrock, rock type, lithology, faults, and hydrostratigraphic or confining units. These geologic investigations may also identify shallow water tables and past groundwater issues that are important for BMP design (see below).

Groundwater Considerations

Site groundwater conditions should be considered prior to Retention BMP, Biofiltration BMP, and Treatment Control Measure siting, selection, sizing, and design. The depth to groundwater beneath the project during the wet season may preclude infiltration, since five feet of separation to the seasonal high ground water level and mounded groundwater level is required. Depth to seasonal high groundwater level shall be estimated as the average of the annual minima (i.e., the shallowest recorded measurements in each water year, defined as October 1 through September 30) for all years on record. If groundwater level data are not available or not considered to be representative, seasonal high groundwater depth can be determined by redoximorphic analytical methods combined with temporary groundwater monitoring for November 1 through April 1 at the proposed project site.

In areas with known groundwater pollution, infiltration may need to be avoided, as it could contribute to the movement or dispersion of groundwater contamination. Areas with known groundwater impacts include sites listed by the Los Angeles Regional Water Quality Control Board's Leaking Underground Storage Tanks (LUST) program and Site Cleanup Program (SCP). The California State Water Resources Control Board maintains a database of registered contaminated sites through their 'Geotracker' Program. Registered contaminated sites can be identified in the project vicinity when the site address is typed into the "map cleanup sites" field.

Mobilization of groundwater contaminants may also be of concern where contamination from natural sources is prevalent (e.g., marine sediments, selenium rich groundwater, to the extent that data is available). Infiltration on sites with contaminated soils or groundwater that could be mobilized or exacerbated by infiltration is not allowed, unless a site-specific analysis determines the infiltration would be beneficial. A site-specific analysis may be conducted where groundwater pollutant mobilization is a concern to allow for infiltration-based BMPs.

Research conducted on the effects of stormwater infiltration on groundwater by Pitt et al. (1994) indicate that the potential for contamination due to infiltration is dependent on a number of factors, including the local hydrogeology and the chemical characteristics of the pollutants of concern. Chemical characteristics that influence the potential for groundwater impacts include high mobility (low absorption potential), high solubility fractions, and abundance of pollutants in urban runoff. As a class of constituents, trace metals tend to adsorb onto soil particles and are filtered out by the soils. This has been confirmed by extensive data collected beneath stormwater detention/retention ponds in Fresno (conducted as part of the Nationwide Urban Runoff Program (Brown & Caldwell, 1984)) that showed that trace metals tended to be adsorbed in the upper few feet in the bottom sediments. Bacteria are also filtered out by soils. More mobile and soluble pollutants, such as chloride and nitrate, have a greater potential for impacting groundwater.

Where soils have very high infiltration rates, groundwater quality may be impacted by infiltration BMPs. Prior to the use of infiltration basins and subsurface infiltration BMPs in areas with high infiltration rates, consult with the local

regulatory agencies to identify if unconfined aquifers are located beneath the project to determine the appropriateness of infiltration-based BMPs. In areas underlain by unconfined aquifers with designated beneficial groundwater uses (e.g. drinking water supply), the application of infiltration BMPs should be limited to those that provide significant pretreatment to ensure groundwater is protected from pollutants of concern.

Geotechnical Considerations

Water infiltration can cause geotechnical issues, including: (1) settlement through collapsible soil, (2) expansive soil movement, (3) slope instability, and (4) increased liquefaction hazard. Stormwater infiltration temporarily raises the groundwater level near the infiltration facility, such that the potential geotechnical conditions are likely to be of greatest significance near the infiltration area and decrease with distance. A geotechnical investigation should be performed for the infiltration facility to identify potential geotechnical issues and geological hazards that may result from infiltration.

In general, infiltration-based BMPs must be set back from building foundations or steep slopes. Increased water pressure in soil pores reduces soil strength. Decreased soil strength can make foundations more susceptible to settlement and slopes more susceptible to failure. Recommendations for each site should be determined by a licensed geotechnical engineer based on soils boring data, drainage patterns, and the current requirements for stormwater treatment. Implementing the geotechnical engineer's requirements is essential to prevent damage from increased subsurface water pressure on surrounding properties, public infrastructure, sloped banks, and even mudslides.

Collapsible Soil

Typically, collapsible soil is observed in sediments that are loosely deposited, separated by coatings or particles of clay or carbonate, and subject to saturation. Stormwater infiltration will result in a temporary rise in the groundwater elevation. This rise in groundwater could change the soil structure by dissolving or deteriorating the intergranular contacts between the sand particles, resulting in a sudden collapse, referred to as hydrocollapse. This collapse phenomenon generally occurs during the first saturation episode after deposition of the soil, and repeated cycles of saturation are not likely to result in additional collapse. It is important to evaluate the potential for hydrocollapse during the geotechnical investigation.

The magnitude of hydrocollapse is proportional to the thickness of the soil column where infiltration is occurring. In most instances, the magnitude of hydrocollapse will be small. Regardless, the geotechnical engineer should evaluate the potential effects of hydrocollapse from large infiltration facilities on nearby structures and roadways. Typically, a network of surface settlement monuments is installed around the infiltration site, along adjacent roadways, and in neighboring developments to evaluate if hydrocollapse has occurred. These monuments are typically monitored

prior to infiltrating stormwater, monthly during the first year of operation of the facility, then yearly thereafter for a period of approximately five years.

Expansive Soil

Expansive soil is generally defined as soil or rock material that has a potential for shrinking or swelling under changing moisture conditions. Expansive soils contain clay minerals that expand in volume when water is introduced and shrink when the water is removed or the material is dried. When expansive soil is present near the ground surface, a rise in groundwater from infiltration activities can introduce moisture and cause these soils to swell. Conversely, as the groundwater surface falls after infiltration, these soils will shrink in response to the loss of moisture in the soil structure. The effects of expansive soil movement (swelling and shrinking) will be greatest on near surface structures such as shallow foundations, roadways, and concrete walks. Basements or below-grade parking structures can also be affected as additional loads are applied to the basement walls from the large swelling pressures generated by soil expansion. A geotechnical investigation should identify if expandable materials are present near the proposed infiltration facility, and if they are, evaluate if the infiltration will result in wetting of these materials. See Appendix B, Map B-14 (expansive soil potential map).

Slopes

Slopes near the infiltration facility can be affected by the temporary rise in groundwater. The presence of a water surface near a slope can substantially reduce the stability of the slope from a dry condition. A groundwater mounding analysis should be performed to evaluate the rise in groundwater around the facility. If the computed rise in groundwater approaches nearby slopes, then a separate slope stability evaluation should be performed to evaluate the implications of the temporary groundwater surface. The geotechnical and groundwater mounding evaluations should identify the duration of the elevated groundwater and assign factors of safety consistent with the duration (e.g., temporary or long-term conditions).

Liquefaction

Seismically-induced soil liquefaction is a phenomenon in which saturated granular materials, typically possessing low to medium density, undergo matrix rearrangement, develop high pore water pressure, and lose shear strength due to cyclic ground motions induced by earthquakes. This rearrangement and strength loss is followed by a reduction in bulk volume. Manifestation of soil liquefaction can include loss of bearing capacity for foundations, surface settlements, and tilting in level ground. Soil liquefaction can also result in instabilities and lateral spreading in embankments and areas of sloping ground.

Saturation of the subsurface soils above the existing groundwater table may occur as a result of stormwater infiltration. A groundwater mounding analysis should also

evaluate the duration of mounding, as a lengthy duration or long-term rise in groundwater will need to be considered in the evaluation of liquefaction. If the granular soils are sufficiently dense, it is unlikely that liquefaction will be of concern, regardless of the groundwater mounding. If analyses indicate that the potential for liquefaction may be increased from stormwater infiltration, then the analyses will need to evaluate the liquefaction-induced settlement of structures, lateral spreading, and other surface manifestations. See Appendix B, Map B-14 (liquefaction potential map).

Managing Offsite Drainage

Locations and sources of offsite run-on onto the site should be identified early in the design process. Offsite drainage should be considered when determining appropriate BMPs so that drainage can be managed. Concentrated flows from offsite drainage may cause extensive erosion, if not properly conveyed through or around the project site or otherwise managed. By identifying the locations and sources of offsite drainage, the volume of water running onto the site may be estimated and factored into the siting and sizing of onsite BMPs. Vegetated swales or storm drains may be used to intercept, divert, and convey offsite drainage through or around a site to prevent flooding or erosion that might otherwise occur.

Existing Utilities

Existing utility lines that are onsite will limit the possible locations of certain BMPs. For example, infiltration BMPs should not be located near utility lines where the increased amount of water could damage the utilities. Stormwater should be directed away from existing underground utilities. Project designs that require the relocation of existing utilities should be avoided, if possible.

Environmentally Sensitive Areas

The presence of Environmentally Sensitive Areas (ESAs) may limit the siting of certain BMPs. ESA's are typically delineated by and fall under the regulatory oversight of state or federal agencies such as the U.S. Army Corp of Engineers (USACE), California Department of Fish and Game, U.S. Fish and Wildlife Service, or the California Environmental Protection Agency. BMPs should be selected and sited to avoid adversely affecting an ESA. The Ventura County ESA map (ESA as defined in Order R4-2010-0108) is provided in Appendix B or may be obtained from the local permitting authority.

3.2 Technical Feasibility Screening

To use biofiltration BMPs and alternative compliance measures, the project applicant should demonstrate that compliance with the requirement to reduce EIA to ≤5% using Retention BMPs is technically infeasible by submitting a site-specific hydrologic and/or design analysis conducted and endorsed by a registered professional engineer and/or geologist. Projects seeking to use alternative compliance measures must demonstrate EIA has been reduced to the maximum

extent practicable. Project applicants should contact their local Approval Agency to determine if additional infeasibility criteria apply. Technical infeasibility may result from conditions including the following:

1) Locations where seasonal high groundwater or mounded groundwater beneath an infiltration BMP is within 5 feet of the bottom of the infiltration BMP.

2) Locations on the project site where soils are mapped with Ventura Hydrology Manual Soil Numbers 1-2 or site-specific analyses show that the soils have an infiltration rate less than 0.3 inches per hour. Locations where soils are mapped with Ventura Hydrology Manual Soil Number 3, or where a site-specific analyses show that the soils have an infiltration rate of 0.3 to 0.5 inches per hour, and no other infiltration-related infeasibility criteria apply, shall use a Bioinfiltration BMP or Rainwater Harvesting (if feasible) to achieve the 5% EIA requirement.

3) Locations on the project site within 100 feet of a groundwater well used for drinking water, non-potable wells, drain fields, and springs; locations less than 50 feet away from slopes steeper than 15 percent or an alternative setback established by the geotechnical expert for the project; and locations less than eight feet from building foundations or an alternative setback established by the geotechnical expert for the project.

4) Locations where pollutant mobilization is a documented concern, unless a site-specific analysis determines that infiltration would not be detrimental. Portions of brownfield development sites may be eligible for alternative compliance where pollutant mobilization is a concern.

5) Locations with potential geotechnical hazards established by the geotechnical professional for the project.

6) Projects with high-risk areas such as service/gas stations, truck stops, and heavy industrial sites, unless a site-specific evaluation demonstrates that:

   - Treatment is provided to address pollutants of concern, and/or

   - High risks areas are isolated from stormwater runoff or infiltration areas with little chance of spill migration.

7) Locations where reduction of surface runoff may potentially impair beneficial uses of the receiving water as documented in a site-specific study (e.g., California Environmental Quality Act (CEQA) analysis) or watershed plan.

8) Location where an increase in infiltration over natural conditions could potentially cause impairments to downstream beneficial uses, such as change of seasonality of ephemeral washes, as confirmed through a site-specific study.

9) Green roofs are not required to be considered for all project locations and types; this evapotranspiration BMP is considered optional subject to the approval of the permitting authority.

10) Projects that do not provide sufficient demand for harvested stormwater such that the system provides 80% capture with a 72 hour drawdown time considering all "allowable and reliable demand."

    a. Allowable and reliable demand is defined as the rate of use of harvested water under average wet season conditions (November through March), from sources meeting the following criteria:

        - The use is permitted by building codes and health codes without requiring disinfection and fine filtration.

        - The use is reliable on a seasonal basis, such that the lowest weekly demand on an average annual basis is no less than 2/7th of the wet season average. *Intent: Under worst-case conditions, the demand should still be sufficient to use the entire tank volume within a week.*

        - Where a reliable use is present on the site that is not permitted by building codes and/or health codes, a variance has been sought to allow use without disinfection and fine filtration.

        - The use does not conflict with mandatory use of reclaimed water. It is assumed that uses do not conflict unless water balance calculations are provided to demonstrate the contrary.

        - The estimated use rates are consistent with requirements for low water use landscaping requirements under local and statewide ordinance (including California Assembly Bill 1881).

11) BMPs that are not allowable per current federal, state or local codes are considered infeasible. Local codes will be updated by mid-2012 as required in Order R4-2010-0108 (Provision III.D).

12) The following project types where the density and/or nature of the project would create significant difficulty for compliance with the requirement to reduce EIA to ≤5%:

    a. Redevelopment projects (as defined in Section1.5).

    b. Infill projects that meet the following conditions:

        i. The project is consistent with applicable general plan designation, and all applicable general plan policies, and applicable zoning designation and regulations;

ii. The proposed development occurs on a project site of no more than five acres substantially surrounded by urban uses;

iii. The project site has no value as habitat for endangered, rare, or threatened species;

iv. Approval of the project would not result in any significant effects relating to traffic, noise, air quality, or water quality; and

v. The site can be adequately served by all required utilities and public services (modified from State Guidelines § 15332).

c. Smart Growth projects, which are defined as new development and redevelopment projects that occur within existing urban areas (see maps in Appendix B) designed to achieve the majority of the following principles :

i. Create a range of housing opportunities and choices;

ii. Create walkable neighborhoods;

iii. Mix land uses;

iv. Preserve open space, natural beauty, and critical areas;

1. Farmland preservation may also be considered for projects occurring outside existing urban areas (as defined by the Appendix B maps).

v. Provide a variety of transportation choices;

vi. Includes transit oriented development (development located within an average 2,000 foot walk to a bus or train station).

vii. Strengthen and direct development towards existing communities (as defined by Appendix B maps); and

viii. Take advantage of compact building design.

The City or County Planning Division in which a project is proposed will ultimately determine whether a project meets these Smart Growth criteria.

13) Pedestrian/bike trail projects:

- ✓ Located along side of a road and
- ✓ Where right-of-way width is inadequate for the implementation of Retention and/or Biofiltration BMPs.

14) Agency flood control, drainage, and wet utilities projects:

- ✓ Located within waterbody and is therefore not increasing functional impervious cover; or
- ✓ Located on top of a narrow flood control feature (such as a levee) and space is unavailable for the implementation of Retention and/or Biofiltration BMPs; or
- ✓ Where the integrity of the flood control feature (such as a dam or levee) may be compromised through Retention and/or Biofiltration BMPs (e.g., infiltration of stormwater is not appropriate in a levee).

15) Historical preservation projects:

- ✓ Where the extent of the designated preservation area restricts the amount of land available for the implementation of Retention BMPs.

16) Low income housing projects that occur within existing urban areas (as defined by the maps provided in Appendix B):

- ✓ Where density requirements restrict the amount of land available for the implementation of Retention BMPs and/or
- ✓ Where project financing constraints restrict the amount of land available for the implementation of Retention BMPs.

Determining Maximum Volume Feasibly Infiltrated and/or Biofiltered

Site conditions and constraints may make it infeasible to fully retain stormwater to achieve ≤ 5% EIA using Retention BMPs. In such cases, stormwater runoff must be retained to the maximum extent practicable and then the remaining volume must be multiplied by 1.5 and biofiltered to the maximum extent practicable. If SQDV still remains, it may be addressed in an alternative compliance program. This section provides narrative and numeric criteria for determining the "maximized" volume for Infiltration BMPs and Biofiltration BMPs. The term "maximized" refers to the volume that is determined, on a case-by-case basis, to be consistent with the maximum extent practicable standard.

Criteria for Maximizing Infiltration Volume

Volume can be considered to be maximized in infiltration BMPs when all of the following conditions are met, or when adjustments to the site/BMP plan to meet any one of these criteria results in achievement of the ≤5% EIA performance standard:

1) BMPs are designed to the maximum depth allowed by design standards, but are not required to exceed the depth that infiltrates within 48 hours at the design percolation rate. *Explanation: Deeper BMPs provide more volume per footprint*

area, therefore it is more feasible to retain stormwater in deeper BMPs than shallower BMPs. However, because of the nature of sequential storms in Southern California, the volume provided in excess of that which drains within 48 hours provides significantly diminishing value.

2) All practicable methods are employed to enhance the design percolation rate, including:

   - Use of soil amendments to native soil below infiltration BMPs, and
   - Provision of pretreatment to reduce the allowable factor of safety, and
   - Additional site investigation to reduce uncertainty in infiltration rate and allow the use of a lower factor of safety.

3) Good site practices have been integrated to provide the maximum pervious area feasible for infiltration BMPs, and infiltration BMPs have been configured to make use of this area. Table 3-1 provides recommended percentages of a site, by project type, that should be feasible to dedicate to infiltration BMPs (where technically feasible) within pervious areas. If the project has not provided this portion of the project site for infiltration BMPs (where technically feasible), an attempt should be made to improve site design to provide more pervious area until it is either infeasible to provide more pervious area or EIA is reduced to ≤5%. The minimum percent of parking lot pavement area considered feasible to dedicate to permeable pavement (where technically feasible) is 20%; this does not apply to parking lots that anticipate heavy truck traffic such as truck stops and heavy industrial areas. The criteria provided in Table 3-1 are guidance; each project will be individually evaluated by the local permitting authority to determine if good site practices have been integrated into the project to provide the maximum pervious area feasible for siting infiltration BMPs.

Criteria for Maximizing Biofiltration Volume

Biofiltration BMPs can be used downstream of a Retention BMP that has been "maximized" (e.g., a planter box treating overflow from a cistern) or can be designed to provide both "maximized" retention and "maximized" biofiltration in the same BMP (e.g., a bioretention area with an underdrain, where retention volume is provided in a gravel layer or other subsurface reservoir below the underdrain).

Volume can be considered to be maximized in Biofiltration BMPs when all of the following conditions are met, or when adjustments to the site design and BMP plan to meet any one of these criteria results in achievement of the ≤5% EIA performance standard:

1) Drain time and/or treatment rate of the Biofiltration BMP is consistent with design guidance contained in Section 6 of the 2011 TGM.

2) Good site practices have been integrated to provide the maximum area feasible for Biofiltration BMPs, and BMPs have been configured to make use of this area. Table 3-1 provides recommended percentages of a site that are feasible to be dedicated to Biofiltration BMPs by project type. If the project has not provided these portions of the project site for siting Biofiltration BMPs, an attempt should be made to improve site design to provide more area until it is either infeasible to provide more area or EIA is reduced to ≤5%. The criteria provided in Table 3-1 are guidance; each project will be individually evaluated by the local permitting authority to determine if good site practices have been integrated into the project to provide the maximum pervious area feasible for siting Biofiltration BMPs.

If a Biofiltration BMP also includes a retention component (e.g., storage volume in a swale in amended soil below the surface discharge elevation or storage below the underdrain of a bioretention area), the maximized retention volume is determined as the volume of water that can be infiltrated or evapotranspired within 48 hours after the Biofiltration BMP has emptied. This criterion should be used to establish the depth of the retention layer (i.e., the depth of amended soil below the swale or the size of the storage below underdrains in the bioretention area).

Table 3-1: Recommended Criteria for Percent of Site Feasible to Dedicate to BMPs

Project Type		Percent of Site[1]
New Development	SF/MF Residential < 7 du/ac	10
	SF/MF Residential 7 – 18 du/ac	7
	SF/MF Residential > 18 du/ac	5
	Mixed Use, Commercial, Institutional/Industrial w/ FAR < 1.0	10
	Mixed Use, Commercial, Institutional/Industrial w/ FAR 1.0 – 2.0	7
	Mixed Use, Commercial, Institutional/Industrial w/ FAR > 2.0	5
	Podium (parking under > 75% of project)	3
	Projects with zoning allowing development to lot lines	2
	Transit Oriented Development	5
	Parking	5

Project Type		Percent of Site[1]
Redevelopment	SF/MF Residential < 7 du/ac	5
	SF/MF Residential 7 – 18 du/ac	4
	SF/MF Residential > 18 du/ac	3
	Mixed Use, Commercial, Institutional/Industrial w/ FAR < 1.0	5
	Mixed Use, Commercial, Institutional/Industrial w/ FAR 1.0 – 2.0	4
	Mixed Use, Commercial, Institutional/Industrial w/ FAR > 2.0	3
	Podium (parking under > 75% of project)	2
	Projects with zoning allowing development to lot lines	1
	Transit Oriented Development	3
	Projects in Historic Districts	3

Key: SF = Single Family, MF = Multi Family, du/ac = dwelling units per acre, FAR = Floor Area Ratio = ratio of gross floor area of building to gross lot area.

[1] If subsurface BMPs are used, dedicated area may have other surface land uses which do not structurally impact the subsurface BMP (see INF-6: Proprietary Infiltration).

3.3 Treatment Control Measure Selection Guidance

Treatment Control Measure selection criteria contained in Order R4-2010-0108 include the following:

- Treatment Control Measures shall be selected based on the primary class of pollutants likely to be discharged from the project (e.g., metals from an auto repair shop).
- For projects that discharge to an impaired waterbody and whose discharges contain the pollutant causing impairment, the project shall select Treatment Control Measures from the top three performing BMP categories, or alternative BMPs that are designed to meet or exceed the performance of the highest performing BMP, for the pollutant causing impairment.

Primary Class of Pollutants

Pollutants in stormwater runoff are typically related to land use activities, which means that the proposed project's site uses provide some indication of the pollutants that will be generated in the site's runoff. Table 3-2 identifies pollutants of concern based on typical land use activities that may be present on a project site.

Table 3-2: Land Uses and Associated Pollutants

Class of Pollutant	Potential Land Use and Activities Sources
Sediment (TSS and Turbidity)	Streets, driveways, roads, landscaped areas, construction activities, soil erosion (channels and slopes)
Nutrients	Landscape fertilizers, atmospheric deposition, automobile exhaust, soil erosion, animal waste, detergents
Metals/Metalloids	Automobiles, bridges, atmospheric deposition, industrial areas, soil erosion, metal surfaces, combustion processes
Pesticides	Landscaped areas, roadsides, utility right-of-ways
Organic Materials/ Oxygen Demanding Substances	Landscaped areas, animal wastes, industrial wastes
Oil and Grease/ Organics Associated with Petroleum	Roads, driveways, parking lots, vehicle maintenance areas, gas stations, automobile emissions, restaurants
Bacteria and Viruses	Lawns, roads, leaky sanitary sewer lines, sanitary sewer cross-connections, animal waste (domestic and wild), septic systems, homeless encampments, sediments/biofilms in stormwater conveyance system
Trash and Debris (Gross Solids and Floatables)	Commercial areas, roadways, schools, trash receptacles/storage/disposal

Adapted from US EPA, 1999 (Preliminary Data Summary of Urban Stormwater BMPs)

Impaired Waterbodies

When designated beneficial uses of a particular receiving water body are being compromised by water quality for a specific or multiple pollutants, Section 303(d) of the CWA requires identifying and listing that water body as “impaired”.

Table 3-3 below lists the categories of pollutants and specific pollutants that are included on the 2010 303(d) list for Ventura County. Project proponents should consult the most recent 303(d) list to identify whether the project’s receiving waterbody is listed as impaired. The most recent 303(d) list is located on the State Water Resources Control Board website (click on water issues/programs/water quality assessment).

Table 3-3: Ventura County 2010 303(d)-listed Water Quality Pollutants

Class of Pollutant	Specific Pollutants		
Sediment (TSS and Turbidity)	Sedimentation/Siltation		
Nutrients	Ammonia Nitrate and Nitrite Nitrate Nitrogen	Organic Enrichment/ Low Dissolved Oxygen	Algae Eutrophic
Metals/Metalloids	Boron Copper Copper, Dissolved	Lead Mercury Nickel	Selenium Zinc
Pesticides	ChemA (tissue) Chlordane Chlordane (tissue & sediment) Chlordane (tissue) Chlorpyrifos Chlorpyrifos (tissue) DDT DDT (sediment) DDT (tissue & sediment)	DDT (tissue) Diazinon Dieldrin Dieldrin (tissue) Organophosphorous Pesticides Toxaphene Toxaphene (tissue & sediment) Toxaphene (tissue)	
Trash and Debris (Gross Solids and Floatables)	Trash and Debris		
Other Organics	PCBs		
Bacteria and Viruses	Coliform Bacteria	Indicator Bacteria	
Salinity	Chloride		
Toxicity	Sediment Toxicity	Toxicity	
Miscellaneous	pH	Scum/Foam - unnatural	Sulfates

Once the classes of pollutants likely to be discharged from the project have been identified for projects that do not discharge to an impaired waterbody, any Treatment Control Measures listed in Table 3-4 that addresses the primary pollutant class may be selected. If more than one pollutant class is identified, then sediment shall be the primary pollutant class.

For projects that discharge to an impaired waterbody and whose discharges contain the pollutant causing impairment, the project shall select Treatment Control Measures from the top three BMPs listed for that class of pollutant in Table 3-4, or alternative BMPs that are designed to meet or exceed the performance of the highest performing Treatment Control Measure, for the pollutant causing impairment. Many receiving water impairments are due to legacy pollutants from past land use activities (e.g., DDT from historical farming or PCBs from historical industrial activities), where the primary sources are contaminated soils and sediment. For these pollutants, site clean-up, erosion and sediment controls during construction, slope

stabilization measures, and placement of impervious surfaces will address the legacy pollutants.

Table 3-4: Treatment Control Measures for Addressing Pollutants of Concern

Class of Pollutant	Recommended BMPs (in Order of Performance)
Sediment	1. Retention BMPs (Infiltration, Rainwater Harvesting, and Evapotranspiration BMPs) 2. Any of the following BMPs(equivalent performance): a. Biofiltration BMPs b. Wet Detention Basin c. Constructed Wetland d. Sand Filter/Cartridge Media Filter 3. Dry Extended Detention Basin
Metals / Metalloids	1. Retention BMPs (Infiltration, Rainwater Harvesting, and Evapotranspiration BMPs) 2. Any of the following BMPs (equivalent performance): a. Constructed Wetland b. Biofiltration BMPs c. Wet Detention Basin d. Sand Filter/Cartridge Media Filter 3. Dry Extended Detention Basin
Nutrients[1]	1. Retention BMPs (Infiltration, Rainwater Harvesting, and Evapotranspiration BMPs) 2. Any of the following BMPs (equivalent performance): a. Bioinfiltration b. Wet Detention Basin c. Constructed Wetland 3. Any of the following BMPs (equivalent performance): a. Biofiltration BMPs 4. Any of the following (equivalent performance): a. Sand Filter/Cartridge Media Filter b. Dry Extended Detention Basin
Pesticides[2]	1. Source controls, erosion controls 2. Retention BMPs (Infiltration, Rainwater Harvesting, and Evapotranspiration BMPs) 3. Any of the following BMPs (equivalent performance): a. Biofiltration BMPs b. Wet Detention Basin c. Constructed Wetland d. Sand Filter/Cartridge Media Filter 4. Dry Extended Detention Basin

Class of Pollutant	Recommended BMPs (in Order of Performance)
Pathogens	1. Retention BMPs (Infiltration, Rainwater Harvesting, and Evapotranspiration BMPs) 2. Any of the following BMPs (equivalent performance): a. Bioretention with Underdrain b. Wet Detention Basins c. Proprietary Biofiltration 3. Sand Filter/Cartridge Media Filter
Trash and Debris	1. Gross Solids Removal BMPs (should be combined with a Retention BMP, Biofiltration BMP, or Treatment Control Measure) 2. Any Retention BMP, Biofiltration BMP, or Treatment Control Measure designed to incorporate a trash capture device (e.g., a trash screen)

[1]Performance is based on removal of nitrogen compounds. For performance of BMPs in removing phosphorous, see sediment pollutant class as they are largely associated with particulates.
[2]Performance data is not available for this pollutant class, but as they are largely associated with particulates, BMP selection should be similar to the sediment pollutant class.

An analysis of Biofiltration BMP and Treatment Control Measure performance from the ASCE International Stormwater BMP Database [1999-2008] is provided in Appendix D. These performance data summaries are occasionally revised. Updated analyses of Biofiltration BMP and Treatment Control Measure performance may be found on the ASCE International Stormwater BMP Database website. The 2011 TGM assumes that BMPs adhering to the design guidance provided in Section 6 will have a level of pollutant removal performance comparable to those listed in Attachment C in Order R4-2010-0108 (also provided in Appendix D.1).

Proprietary BMPs should meet or exceed the performance standards listed in Attachment C in Order R4-2010-0108 and provided in Appendix D.

The data contained in the Stormwater BMP Database indicate that wet detention basins, constructed wetlands, sand filters, and biofilters are among the best performing BMPs for the typical pollutants of concern in urban runoff. This conclusion is consistent with the treatment processes typically provided by these BMP types (e.g., filtration, sedimentation, adsorption, and biological processes).

Wet detention basins (wetponds) and constructed wetlands are attractive solutions both from a treatment process and observed performance perspective. However, these systems require significant base flow to maintain their permanent pools and to avoid creating stagnant conditions and vector concerns. Therefore, these BMPs are often infeasible in locations where water conservation during dry weather is a significant concern. If a regional Treatment Control Measure is desired, infiltration basins and dry extended detention basins may be more feasible in Ventura County. However, these BMPs may need additional treatment train components (e.g., pre- or post-treatment) to adequately address the entire list of pollutants of concern and provide reliable and consistent performance, in addition to significant space

requirements. BMP designs for each pollutant category that incorporate dense vegetation and promote extended contact with or filtration through soils are encouraged, consistent with the BMP selection prioritization requirements in Order R4-2010-0108.

Consideration of Site-Specific Conditions

Ultimately, Retention BMPs, Biofiltration BMPs, and Treatment Control Measures have to be constructed at a physical location and site-specific conditions should be considered during the BMP selection process. Site constraints such as steep slopes, poor draining soils, high ground water tables, unstable or contaminated soils and several other factors can preclude the implementation of certain kinds of Retention BMPs, Biofiltration BMPs, and Treatment Control Measures or design options. Therefore, site-specific conditions must be considered when selecting specific BMPs or Treatment Control Measures to implement. Once candidate BMPs or Treatment Control Measures have been chosen, the selection process should consider the site assessment results for soil characteristics, slopes, groundwater proximity, etc. Table 3-5 below provides general guidance for designers regarding site limitations for the different Retention BMPs, Biofiltration BMPs, and Treatment Control Measures.

Table 3-6 below provides general guidance for designers regarding capital and operation costs for the different Retention BMPs, Biofiltration BMPs, and Treatment Control Measures. BMP costs can also be estimated using the Water Environment Research Foundation (WERF) BMP and LID Whole Life Cost Models. These models are set of spreadsheet tools that help users identify and combine capital costs and ongoing maintenance expenditures in order to estimate whole life costs for stormwater management. The models provide a framework for calculating capital and long-term maintenance costs of individual Retention BMPs, Biofiltration BMPs, and Treatment Control Measures. Models are included for retention ponds, extended detention basins, vegetated swales, permeable pavement, green roofs, large commercial cisterns, and bioretention. Online PDF of user's guide and spreadsheet tools are located here: http://www.werf.org/AM/Template.cfm?Section=Research_Profile&Template=/CustomSource/Research/PublicationProfile.cfm&id=SW2R08.

Table 3-5: BMP Site Suitability Considerations

Important Note to Users: This table should be used to provide general BMP comparisons only and should not replace an evaluation performed by a qualified water quality professional.

BMP	Site Suitability Considerations			
	Tributary Area (Acres) [1]	Site Slope (%)	Depth to Seasonally High or Mounded Groundwater (ft)	Soil Number
Infiltration BMPs: INF-1: Infiltration Basin INF-2: Infiltration Trench INF-3: Bioretention INF-4: Drywell INF-6: Proprietary Infiltration	< 5	< 7[2]	> 5	Not suitable in Soil Numbers 1, 2, and 3 unless percolation testing shows the infiltration rate is greater than 0.5 in/hr
INF-5: Permeable Pavement	< 5	< 5[2,5]	> 2 with underdrains; > 5 without underdrains	Underdrains should be provided for Soil Numbers 1, 2, and 3
ET-1: Green Roof	Equal to roof tributary area	N/A	N/A	N/A
BIO-1: Bioretention with Underdrain	< 5	< 15; planter boxes are generally more suitable for steep slopes[2,3]	> 2 with underdrains; > 5 without underdrains	Underdrains should be provided for Soil Numbers 1, 2, and 3
BIO-2: Planter Box	< 1	< 15[4]	> 2	Any
BIO-3: Vegetated Swale	< 5	< 10 site slope; 0.5 to 6 longitudinal slope of swale [2,3]	> 2 with underdrains; > 5 without underdrains	Any[3]

BMP	Site Suitability Considerations			
	Tributary Area (Acres) [1]	Site Slope (%)	Depth to Seasonally High or Mounded Groundwater (ft)	Soil Number
BIO-4: Vegetated Filter Strip	< 2	< 4 site slope; 2 to 6 longitudinal slope of strip[2]	> 2	Any
BIO-5: Proprietary Biotreatment Devices	The site suitability requirements for specific proprietary devices must be provided by the manufacturer and should be verified by independent sources or assessed by a qualified water quality professional.			
TCM-4: Sand Filter	< 10	< 15[4]	> 2	Any
TCM-5: Cartridge Media Filters	The site suitability requirements for specific proprietary devices must be provided by the manufacturer and should be verified by independent sources or assessed by a qualified water quality professional.			
PT-1: Hydrodynamic Devices	The site suitability requirements for specific proprietary devices must be provided by the manufacturer and should be verified by independent sources or assessed by a qualified water quality professional.			
PT-2: Catch Basin Inserts				

[1] Tributary area is the area of the site draining to the BMP. Tributary areas provided here should be used as a general guideline only. Tributary areas can be larger or smaller as appropriate.

[2] If site slope exceeds that specified or if the system is within 200 ft from the top of a hazardous slope or landslide area (on the uphill side), a geotechnical investigation analysis and report addressing slope stability shall be prepared by a licensed civil engineer. In addition, for swales, if the longitudinal slope exceeds 6%, check dams should be provided.

[3] If system is located within 50 feet of a sensitive steep slope (on the uphill side), within 10 feet from a structure, has a longitudinal slope less than 1.5% (swales), or has poorly drained soils (e.g., silts and clays), underdrains should be incorporated.

[4] If system is fully contained, includes an underdrain system, and overflows to a stormwater conveyance system, then slopes can exceed 15%.

[5] If a gravel base is used for storage of runoff: (1) slopes should be restricted to 0.5% (steeper grades reduce storage capacity) and (2) underdrains should be used if within 50 feet of a sensitive steep slope.

[6] Setbacks apply to systems without underdrains.

Table 3-6: BMP Cost Considerations

BMP Type	Relative Expense[4] (cost/ac-ft[1] or cost/cfs[2])	Construction Costs (per cubic feet)[3,4]	Typical Cost[3]		Annual Maintenance Cost (% of Construction)[3,4]	Notes
			($/BMP)	Application		
Infiltration Trench	Not included	$4- $50	$45,000	5-ac Commercial Site (65% Impervious)	5%-20%	
Infiltration Basin	$	$1.30 - $18	$15,000	5-ac Commercial Site (65% Impervious)	1% -10%	
Bioretention	Not included	$3- $5.30	$60,000	5-ac Commercial Site (65% Impervious)	5%- 7%	Cost of plants varies. Maintenance costs comparable to cost of typical landscaping.
Swale	$$	$0.25-$0.50	$3,500	5-ac Residential Site (35% Impervious)	5%- 7%	
Filter Strip	$$	$0.00- $1.30	$0- $9,000	5-ac Residential Site (35% Impervious)	$350/ acre/ year (about $0.01/square foot/ year)	
Extended Detention Basin	$$$	$0.50- $1.00	Not included		3 to 6%	Costs vary widely. One 0.3 ac-ft basin was recorded to have cost $160,000[5] $3,132 Annual maintenance costs for per Caltrans[5]
Wet Ponds	$$$	$0.50- $1.00	Not included		3 to 6%	$17,000 Annual maintenance costs for one Caltrans pond[5]
Constructed Wetland	$$$$	$0.60 – $1.25	$125,000	50-Acre Residential Site (35% Impervious)	2%	
Sand Filter	$$$$	$3 - $6	$35,000- $70,000	5-Acre Commercial Site (65% Impervious)		

[1] Volume based BMPs
[2] Flow based BMPs
[3] EPA, 1999. Preliminary Data Summary of Urban Storm Water Best Management Practices. Part D, Cost and Benefits Analysis. http://water.epa.gov/scitech/wastetech/guide/stormwater/index.cfm#report
[4] CASQA, 2003. New Development and Redevelopment Handbook
[5] Figures from Caltrans studies cited in CASQA BMP Handbook.

4 SITE DESIGN PRINCIPLES AND TECHNIQUES

4.1 Introduction

The primary objective of the Site Design Principles and Techniques is to reduce the hydrologic and water quality impacts associated with land development. The benefits derived from this approach include**:**

- Reduced size of downstream Treatment Control Measures and conveyance systems;
- Reduced pollutant loading to onsite Treatment Control Measures and receiving streams; and
- Reduced hydraulic impact on receiving streams.

Site Design Principles and Techniques include the following design features and considerations:

- Site planning;
- Protect and restore natural areas;
- Minimize land disturbance;
- Minimize impervious cover;
- Apply Low Impact Development best management practices (LID BMPs) at various scales: and
- Implement Integrated Water Resource Management Practices.

The Site Design Principles and Techniques described in this section are required to be considered for all new development and redevelopment projects subject to conditioning and approval for the design and implementation of post-construction stormwater management control measures (as defined in Section 1.5). They are not required if the project proponent demonstrates to the satisfaction of the City or County that the particular measures are not applicable to the proposed project, or the project site conditions make it infeasible to implement the site design control measure in question. The applicability of specific controls outlined within this section should be confirmed with the local government.

Detailed descriptions and design criteria for each of the Site Design Principles and Techniques are presented in the following section.

4.2 Site Planning

Purpose

LID requires a holistic approach to site design and stormwater management. As such, planners, developers, architects, and engineers should reconsider conventional approaches to stormwater management. The use of site planning techniques presented here will generate a more hydrologically functional site, help to maximize the effectiveness of Retention BMPs, and integrate stormwater management throughout the site.

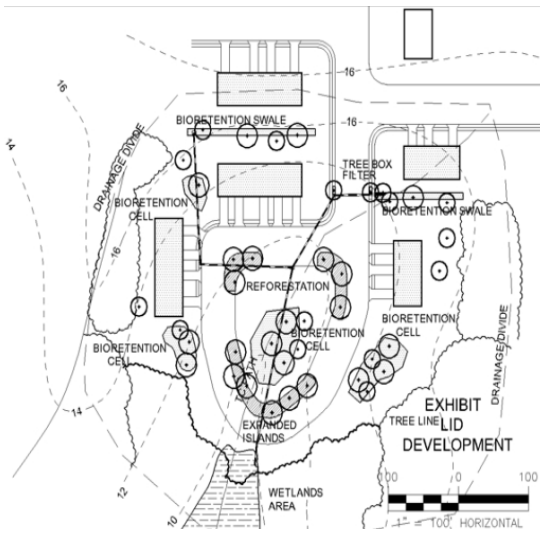

LID BMPs Integrated within Site Planning Process

Low Impact Development Center, Inc.

Design Criteria

The following criteria should be considered during the early site planning stages:

1) Retention BMPs should be considered as early as possible in the site planning process. Hydrology should be an organizing principle that is integrated into the initial site assessment planning phases.

2) Project applicants should anticipate and plan for the space requirements of Retention and Biofiltration BMPs. Table 4-1 provides general rules of thumb for BMP space requirements.

3) Site planning should use a multidisciplinary approach that includes planners, engineers, landscape architects, and architects at the initial phases of the project.

4) Individual Retention BMPs should be distributed throughout the project site and may influence the configuration of roads, buildings, and other infrastructure.

5) The project must demonstrate disconnection of impervious surface such that the 5% EIA requirement is achieved. If fully meeting the 5% EIA requirement using Retention BMPs is not technically feasible, the project must still utilize Retention BMPs to the maximum extent practicable.

6) Consider flood control early in the design stages. Even sites with Retention BMPs will still have runoff that occurs during large storm events. Look for opportunities to simultaneously address flood control requirements and the requirement to reduce EIA to ≤5% presented in Section 2.

7) Consider the use of alternative building materials instead of conventional materials for new construction and renovation. Several studies have indicated that metal used as roofing material, flashing, or gutters can leach metals into the environment. Avoid the use of roofing, gutters, and trim made of copper and galvanized (zinc) roofs, gutters, chain link fences and siding.

8) Consider 2010 Green Building Code requirements during the site planning stages.

Table 4-1: Rule of Thumb Space Requirements for BMPs[5]

BMP Type	% of Contributing Drainage Area
Infiltration	3 to 10
Rainwater Harvesting (Cistern)	0 to 10
Evapotranspiration (Green Roof)	1 to 1 ratio of impervious cover treated
Biofiltration	3 to 5
Dry Extended Detention Basin	1 to 3
Wet Detention Basin	1 to 3
Sand Filters	0 to 5
Cartridge Media Filter	0 to 5

[5] Modified from Schueler, T., D. Hirschman, M. Novotney, and J. Zielinski. 2007. Urban Stormwater Retrofit Practices. Manual 3 in the Urban Subwatershed Restoration Manual Series. Center for Watershed Protection. Ellicott City, MD.

4.3 Protect and Restore Natural Areas

Purpose

Each project site possesses unique topographic, hydrologic and vegetative features, some of which are more suitable for development than others. Sensitive areas that should be protected and/or restored include streams and their buffers, floodplains, wetlands, steep slopes, and high permeability soils. Additionally, slopes can be a major source of sediment and should be properly protected and stabilized.

Locating development on the least sensitive portion of a site and conserving naturally vegetated areas can minimize environmental impacts in general and stormwater runoff impacts in particular.

Stream Buffer

Larry Walker Associates

Design Criteria

If applicable and feasible for the given site conditions, the following site design features or elements are required and should be included in the project site layout, consistent with applicable General Plan and Local Area Plan policies:

1) Identify and cordon off streams and their buffers, floodplains, wetlands, and steep slopes.

2) Reserve areas with high permeability soils for either open space or Infiltration BMPs.

3) Incorporate existing trees into site layout.

4) Identify areas that may be restored or revegetated either during or post-construction.

5) Identify and avoid and/or stabilize areas susceptible to erosion and sediment loss.

6) Concentrate or cluster development on the least-sensitive portions of a site, while leaving the remaining land in a natural undisturbed state.

7) Slopes must be protected from erosion by safely conveying runoff from the tops of slopes.

   - Slopes should be vegetated by first considering use of native or drought-tolerant species.

- Slope protection practices must conform to local permitting agency erosion and sediment control standards and design standards. The design criteria described in this section are intended to enhance and be consistent with these local standards.

8) Limit clearing and grading of native vegetation at the project site to the minimum amount needed to build lots, allow access, and provide fire protection.

9) Maintain existing topography and existing drainage divides to encourage dispersed flow.

10) Maximize trees and other vegetation at each site by planting additional vegetation, clustering tree areas, and promoting the use of native and/or drought-tolerant plants.

11) Promote natural vegetation by using parking lot islands and other landscaped areas. Integrate vegetated BMPs within parking lot islands and landscaped areas.

4.4 Minimize Land Disturbance

Purpose

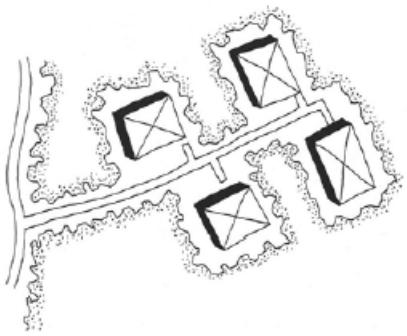

Minimized Clearing and Grading

Greenfield et al., 1991

This control works to protect water quality by preserving some of the natural hydrologic function of the site. By designing a site layout to preserve the natural hydrology and drainageways on the site, it reduces the need for grading the disturbance of vegetation and soils (GSMM, 2001). By siting buildings and impervious surfaces away from steep slopes, drainageways, and floodplains, it limits the amount of grading, clearing and distance and reduces the hydrologic impact. This site design principle has most applicability in greenfield settings, but opportunities may exist in redevelopment and infill projects.

Existing soils may contain organic material and soil biota that are ideal for storing and infiltrating stormwater. Clearing, grading, and heavy equipment can remove and compact existing soils and, therefore, limit their infiltrative capacity. The design criteria presented below are not intended to supersede compaction requirements associated with building codes.

Design Criteria

1) Delineate and flag the development envelope for the site. Delineating and flagging the development envelope includes a clear indication of the development envelope on the site plan and physical demarcation in the field which can be accomplished using temporary orange construction fencing or flagging. The development envelope can be established by identifying the minimum area needed to build lots; allow access and provide fire protection; and protect and buffer sensitive features such as streams, floodplains, steep slopes and wetlands. Concentrate buildings and paved areas on the least permeable soils, with the least intact habitats.

2) Plan clearing and grading to minimize the compaction of infiltrative soils.

3) Restrict equipment access and storage of construction equipment to the development envelope.

4) Restrict storage of construction equipment within the development envelope.

5) Avoid the removal of existing trees and valuable vegetation, as feasible.

6) Consider soil amendments to restore permeability and organic content especially for infill and redevelopment projects to avoid soil disturbance.

4.5 Minimize Impervious Cover

Purpose

The potential for the discharge of pollutants in stormwater runoff from a project site increases as the percentage of impervious area within the project site increases because impervious areas increase the volume and rate of runoff flow. Pollutants deposited on impervious areas tend to be easily mobilized and transported by surface water runoff. Minimizing impervious area through site design is an important means of minimizing stormwater pollutants of concern. In addition to the environmental and aesthetic benefits, a highly pervious site may allow reduction in the size of downstream conveyance and treatment systems, yielding savings in development costs. Reducing impervious area is the most cost effective way of minimizing the effective impervious area (EIA) requirement.

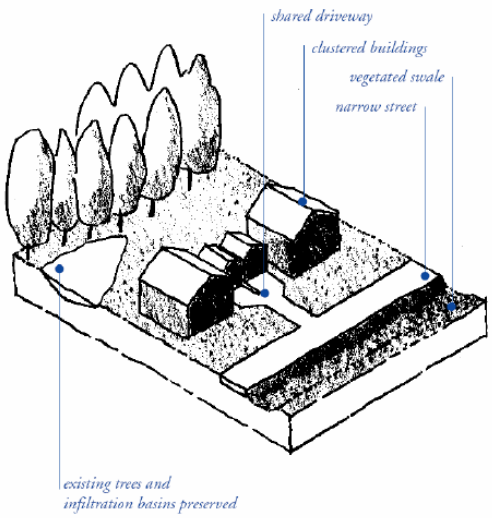

Impervious Cover Minimization

BASMAA, Start at the Source

Design Criteria

Local permitting agency building and fire codes and ordinances determine some aspects of site design. These design strategies are intended to enhance and be consistent with these local codes and ordinances. Minimizing impervious surfaces at every possible opportunity requires integration of many small strategies. Suggested strategies for minimizing impervious surfaces through site design include the following:

1) Use minimum allowable roadway cross sections, driveway lengths, and parking stall widths and lengths.

2) Minimize or eliminate the use of curbs and gutters, and maximize the use of Retention BMPs, where slope and density permit.

3) Use two-track/ribbon alleyways/driveways or shared driveways.

4) Include landscape islands in cul-de-sac streets. Consider alternatives to cul-de-sacs to increase connectivity.

5) Reduce the footprints of building and parking lots. Building footprints may be reduced by building taller.

6) Use permeable pavement to accommodate overflow parking (if overflow parking is needed).

7) Cluster buildings and paved areas to maximize pervious area.

8) Maximize tree preservation or tree planting.

9) Avoid compacting or paving over soils with high infiltration rates (see Minimize Land Disturbance).

10) Use pervious pavement materials where appropriate, such as modular paving blocks, turf blocks, porous concrete and asphalt, brick, and gravel or cobbles.

11) Use grass-lined channels or surface swales to convey runoff instead of paved gutters (see Vegetated Swale in Section 6).

12) Build more compactly in infill and redevelopment site to avoid disturbing natural and agricultural lands. Per capita impacts can be significantly reduced by building more compactly in infill and redevelopment areas.

4.6 Apply LID at Various Scales

Purpose

LID is a decentralized approach to stormwater management that works to mimic the natural hydrology of the site by retaining rainfall onsite. In order to realize the full benefits of water quality protection and runoff volume reduction, LID should be integrated and considered at the regional and watershed scale and the site scale.

Design Criteria

Regional/Watershed

1) Consider Density: Low density development has a greater water resource impact than compact growth on a watershed scale. Higher density development uses less land and produces less impervious cover per capita than low density development (USEPA, 2006). Developments should consider higher densities, but should still adhere to density levels as specified within local zoning requirements.

2) Identify and Preserve Contiguous Open Space: Large contiguous areas of open space can act as a flood control, have an ecological benefit, serve as a buffer for streams and rivers, and provide recreational opportunities (EPA, 2004). Applicants should look for opportunities to link open space preservation with regional open space preservation efforts (such as Save Open Space and Agricultural Resources).

3) Make use of Previously Developed Sites: Redevelopment of existing sites replace impervious cover with impervious cover, reduces the need for greenfield development, and makes use of existing infrastructure.

4) Locate Compact Development within Close Proximity to Mass Transit: This maximizes transportation choices, reduces the number of automobile trips, and lessens the water quality impacts associated with transportation and low-density sprawl.

Site

The following design criteria should be considered at the site level in addition to the principles and techniques discussed earlier in this section (e.g., Minimize Impervious Cover).

1) Maintain and Restore Natural Flowpaths for Runoff: Site buildings and impervious surfaces away from steep slopes, drainageways, and floodplains to reduce the amount of necessary clearing and grading and maintain the pre-development hydrology's time of concentration.

2) Maximize Use of Existing Impervious Cover: Assess and take advantage of opportunities to use existing impervious surfaces at the site level to reduce runoff at a watershed scale.

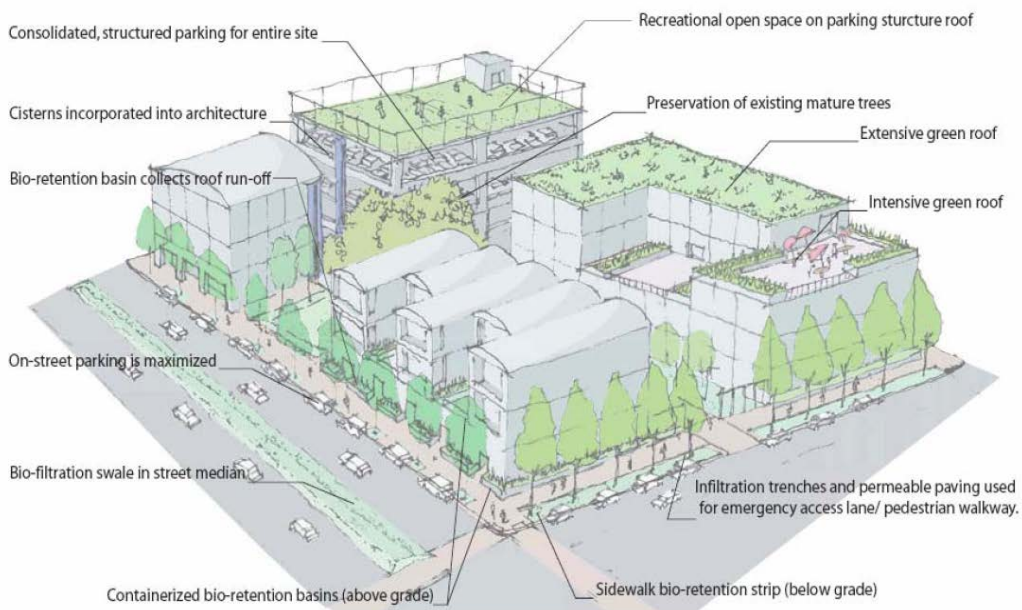

LID BMPs Considered at Various Scales

C. Anderson, Sustainable Urbanism

3) Design Public Spaces and Common Areas to Minimize Stormwater Runoff: Public spaces and common areas can serve as community gathering places but are often composed of impervious cover (e.g., courtyards primarily made up of concrete) (EPA, 2004). Design public spaces and common areas to accommodate both people and stormwater management.

4) Compact Project Design: Compact project design reduces the amount of impervious cover per capita, increases walkability, and decreases water quality impacts associated with transportation. Concentrating development on one portion of the site reduces the amount of lawn, provides more opportunities to preserve open space, and maintains and restores natural flow paths. Additionally, compact design can reduce street and driveway length and as a result, can help to reduce the imperviousness associated with development.

5) Encourage Use of Multiple Modes of Transportation: In addition to density and compact design, additional aspects of site design may encourage the use of multiple modes of transportation:

- Bicycle and pedestrian-friendly streets;
- Well connected sidewalks and streets; and
- Mixed uses that encourage walking.

4.7 Implement Integrated Water Resource Management Practices

Purpose

Integrated Water Resource Management (IWRM) is a process which promotes the coordinated development and management of water, land, and related resources. Order R4-2010-0108 promotes the use of IWRM to help guide the selection of BMPs that conserve water, recharge groundwater, provide recreational opportunities and serve as multiple purpose parks and preserve open space.

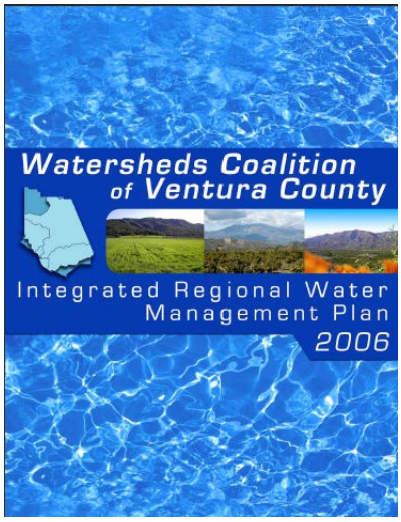

Integrated Regional Water Management Plan

Ventura County

Many of the concepts of IWRM are documented in the County's Integrated Regional Water Management Plan (IRWMP). The IRWMP is the product of an intensive stakeholder process and addresses multiple water resource management goals including improved water supply reliability, water recycling, water conservation, recreation and access, flood control, wetlands enhancement and creation, and environmental and habitat protection (Watershed Coalition of Ventura County, 2006).

Design Criteria

The goals of the 2011 TGM and the new development and redevelopment requirements contained within Order R4-2010-0108, complement the goals of the IRWMP. Development projects should strive to select BMPs that meet the following multiple objectives (Watershed Coalition of Ventura County, 2006):

1) Conserve and Augment Water Supplies: Identify and evaluate the opportunities to recharge groundwater and increase water use efficiency. This can be accomplished through infiltration of stormwater runoff and selection of drought-tolerant landscaping.

2) Protect People, Property and the Environment from Adverse Flooding Impacts: Identify opportunities to utilize BMPs that provide both water quality and water quantity benefits. Provide and maintain setbacks from streams and rivers.

3) Protect and Restore Habitat and Ecosystems in Watersheds: Implement the practices identified in Protect and Restore Natural Areas to integrate habitat and stormwater goals. Landscaping selection for stormwater management practices may also further encourage and attract wildlife.

4) Provide Water-related Recreational, Public Access and Educational Opportunities: Integrate recreation and stormwater management by creating multi-functional BMPs and designing courtyards and open spaces that accommodate both people and stormwater runoff. Consider providing educational signs for BMPs located in public spaces, where appropriate.

5 SOURCE CONTROL MEASURES

5.1 Introduction

Source Control Measures are low-technology practices designed to prevent pollutants from contacting stormwater runoff and prevent discharge of contaminated runoff to the storm drainage system. This section addresses site-specific, structural-type Source Control Measures consisting of specific design features or elements. Non-structural type Source Control Measures; such as good housekeeping and employee training, are not included in the 2011 TGM. The project applicant can consult the California Industrial Best Management Practice Manual for this type of practice (SWQTF, 1993). The governing stormwater agency may require additional Source Control Measures not included in the 2011 TGM for specific pollutants, activities, or land uses.

This section describes control measures for specific types of sites or activities that have been identified as potential significant sources of pollutants in stormwater. Each of the measures specified in this section should be implemented in conjunction with appropriate non-structural Source Control Measures to optimize pollution prevention.

The measures addressed in this section apply to both stormwater and non-stormwater discharges. Non-stormwater discharges are the discharge of any substance, such as process wastewater, to the storm drainage system or water body that is not composed entirely of stormwater. Stormwater that is mixed or commingled with other non-stormwater flows is considered non-stormwater. Discharges of stormwater and non-stormwater to the storm drainage system or a water body may be subject to local, state, or federal permitting prior to discharge. The appropriate agency should be contacted prior to any discharge. Discuss the matter with the stormwater staff if you are uncertain as to which agency should be contacted.

Some of the measures presented in this section require connection to the sanitary sewer system. It is prohibited to connect and discharge to the sanitary sewer system without prior approval or obtaining the required permits. Contact the stormwater staff of the governing agency about obtaining sanitary sewer permits within Ventura County. Discharges of certain types of flows to the sanitary sewer system may be cost prohibitive. The designer is urged to contact the appropriate agency prior to completing site and equipment design of the facility.

5.2 Description

Table 5-1 summarizes site-specific Source Control Measures and associated design features specified for various sites and activities. Fact Sheets are presented in this section for each source control measure. These sheets include design criteria

established by the Approval Agencies to ensure effective implementation of the required Source Control Measures:

Table 5-1: Summary of Site-Specific Source Control Measure Design Features

Site-Specific Source Control Measure [1]	DESIGN FEATURE OR ELEMENT						
	Signs, placards, stencils	Surfacing (compatible, impervious)	Covers, screens	Grading/berming to prevent run-on	Grading/berming to provide secondary containment	Sanitary sewer connection	Emergency Storm Drain Seal
Storm Drain Message and Signage (S-1)	X						
Outdoor Material Storage Area Design (S-2)		X	X	X	X		X
Outdoor Trash Storage and Waste Handling Area Design (S-3)		X	X	X		X	
Outdoor Loading/Unloading Dock Area Design (S-4)		X	X	X	X		
Outdoor Repair/Maintenance Bay Design (S-5)		X	X	X	X		X
Outdoor Vehicle/Equipment/ Accessory Washing Area Design (S-6)		X	X	X	X	X	X
Fueling Area Design (S-7)		X	X	X	X		X
Parking Lot Design [2]							

1 Refer to Fact Sheets in Section 6 for detailed information and design criteria and Appendix E for BMP sizing worksheets

2 Requirements for proper design of parking lots are covered by requirements for General Site Design Principles and Techniques (see Section 4) and Treatment Control Measures (see Section 6).

5.3 Site-Specific Source Control Measures

S-1: Storm Drain Message and Signage

Purpose

Waste materials dumped into storm drain inlets can have severe impacts on receiving and ground waters. Posting notices regarding discharge prohibitions at storm drain inlets can prevent waste dumping. This Fact Sheet contains details on the installation of storm drain messages at storm drain inlets located in new or redeveloped commercial, industrial, and residential sites.

Design Criteria

Storm drain messages have become a popular method of alerting the public to the effects of and the prohibitions against waste disposal into the storm drain system. The signs are typically stenciled or affixed near the storm drain inlet. The message simply informs the public that dumping of wastes into storm drain inlets is prohibited and/or the drain discharges to a receiving water.

Storm drain message markers or placards are required at all storm drain inlets within the boundary of the development project. The marker should be placed in clear sight facing anyone approaching the inlet from either side (see Figure 5-1). All storm drain inlet locations must be identified on the development site map.

Some local agencies within the County have approved storm drain message placards for use. Signs with language and/or graphical icons, which prohibit illegal dumping, should be posted at designated public access points along channels and streams within a project area. Consult local permitting agency stormwater staff to determine specific requirements for placard types and installation methods.

Maintenance Requirements

Legibility of markers and signs should be maintained. If required by the agency with jurisdiction over the project, the owner/operator or homeowner's association shall enter into a Maintenance Agreement with the agency or record a deed restriction upon the property title to maintain the legibility of placards and signs.

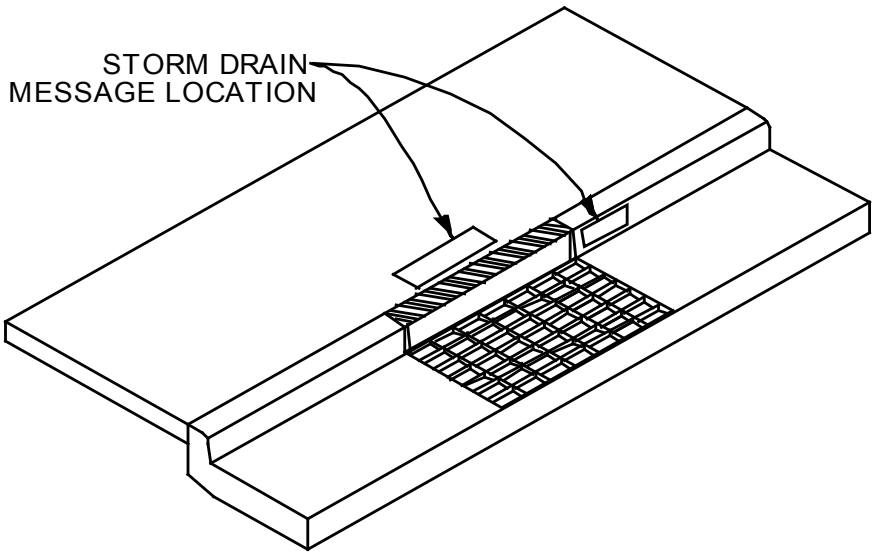

CURB TYPE INLET

NOTES:

1. **STORM DRAIN MESSAGE SHALL BE APPLIED IN SUCH A WAY AS TO PROVIDE A CLEAR, LEGIBLE IMAGE.**
2. **STORM DRAIN MESSAGE SHALL BE PERMANENTLY APPLIED DURING THE CONSTRUCTION OF THE CURB AND GUTTER USING A METHOD APPROVED BY THE LOCAL AGENCY.**

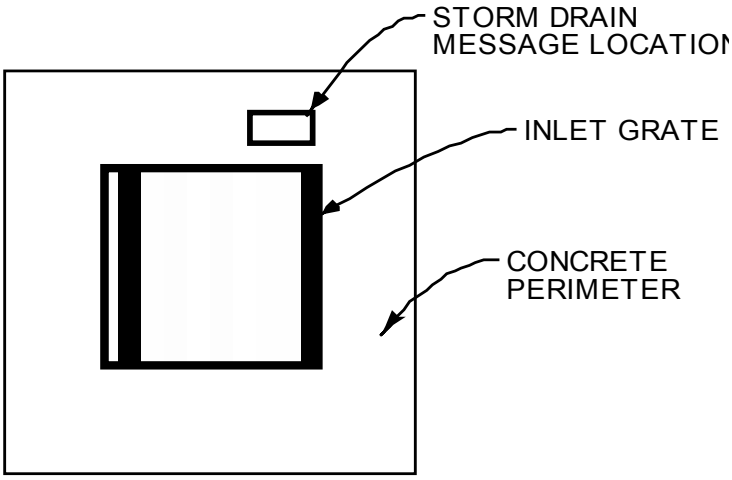

AREA TYPE INLET

Figure 5-1: Storm Drain Message Location

S-2: Outdoor Material Storage Area Design

Purpose

Materials that are stored outdoors could become sources of pollutants in stormwater runoff if not handled or stored properly. Materials could be in the form of raw products, by-products, finished products, and waste products. The type of pollutants associated with the materials will vary depending on the type of commercial or industrial activity.

Some materials are more of a concern than others. Toxic and hazardous materials must be prevented from coming in contact with stormwater. Non-toxic or non-hazardous materials do not have to be prevented from stormwater contact, but cannot be allowed to runoff with the stormwater. These materials may have toxic effects on receiving waters. Accumulated material on an impervious surface could result in significant debris and sediment being discharged with stormwater runoff causing a significant impact on the rivers or streams that receive the runoff.

Materials may be stored in a variety of ways, including bulk piles, containers, shelving, stacking, and tanks. Stormwater contamination may be prevented by eliminating the possibility of stormwater contact with the material storage areas either through diversion, cover, or capture of the stormwater. Control measures may also include minimizing the storage area. Control measures are site-specific and must meet local permitting agency requirements.

Design Criteria

Design requirements for material storage areas are governed by Building and Fire Codes and by current City or County ordinances and zoning requirements. Source Control Measures described in the Fact Sheet are intended to enhance and be consistent with these code and ordinance requirements. The following design features should be incorporated into the design of a material storage area when storing materials outside could contribute significant pollutants to the storm drain.

Table 5-2: Design Criteria for Outdoor Material Storage Area Design

Source Control Design Feature	Design Criteria
Surfacing	• Construct the storage area base with a material impervious to leaks and spills.
Covers	• Install a cover that extends beyond the storage area, or use a manufactured storage shed for small containers.
Grading/Containment	• Minimize the storage area. • Slope the storage area towards a dead-end sump to contain spills. • Grade or berm storage areas to prevent run-on from surrounding areas. • Direct runoff from downspouts/roofs away from storage areas.

Accumulated Stormwater and Non-stormwater

Stormwater and non-stormwater will accumulate in containment areas and sumps with impervious surfaces. Contaminated accumulated water must be disposed of in accordance with applicable laws and cannot be discharged directly to the storm drain or sanitary sewer system without the appropriate permit.

S-3: Outdoor Trash Storage Area Design

Purpose

Stormwater runoff from areas where trash is stored or disposed of can be polluted. In addition, loose trash and debris can be easily transported by water or wind into nearby storm drain inlets, channels, and/or creeks. Waste handling operations may be sources of stormwater pollution and include dumpsters, litter control, and waste piles. This fact sheet contains details on the specific measures required to prevent or reduce pollutants in stormwater runoff associated with trash storage and handling.

Design Criteria

Design requirements for waste handling areas are governed by Building and Fire Codes, and by current local permitting agency ordinances and zoning requirements. The design criteria described in the Fact Sheet are meant to enhance and be consistent with these code and ordinance requirements. Hazardous waste should be handled in accordance with legal requirements established in Title 22, California Code of Regulations.

Wastes from commercial and industrial sites are typically hauled by either public or commercial carriers that may have design or access requirements for waste storage areas. The design criteria listed below are recommendations and are not intended to be in conflict with requirements established by the waste hauler. The waste hauler

should be contacted prior to the design of your site trash collection area to obtain established and accepted guidelines for designing trash collection areas. Conflicts or issues should be discussed with the local permitting agency.

The following trash storage area design controls were developed to enhance the local permitting agency codes and ordinances and should be implemented depending on the type of waste and the type of containment.

Table 5-3: Design Criteria for Outdoor Trash Storage Areas

Source Control Design Feature	Design Criteria
Surfacing	• Construct the storage area base with a material impervious to leaks and spills.
Screens/Covers	• Install a screen or wall around trash storage area to prevent offsite transport of loose trash. • Use lined bins or dumpsters to reduce leaking of liquid wastes. • Use water-proof lids on bins/dumpsters or provide a roof to cover enclosure (local permitting agency discretion) to prevent rainfall from entering containers.
Grading/Contouring	• Berm or grade the waste handling area to prevent run-on of stormwater. • Do not locate storm drains in immediate vicinity of the trash storage area.
Signs	• Post signs on all dumpsters informing users that hazardous materials are not to be disposed of therein.

Maintenance Requirements

The owner/operator must maintain the integrity of structural elements that are subject to damage (e.g. screens, covers and signs). Maintenance Agreements between the local permitting agency and the owner/operator may be required. Some agencies will require maintenance deed restrictions to be recorded of the property title. If required by the local permitting agency, Maintenance Agreements or deed restrictions must be executed by the owner/operator before improvement plans are approved. Refer to Appendix G and H for further guidance regarding Maintenance Plan Agreements.

S-4: Outdoor Loading/Unloading Dock Area Design

Purpose

Materials spilled, leaked, or lost during loading or unloading may collect on impervious surfaces or in the soil and be carried away by runoff or when the area is cleaned. Rainfall may also wash pollutants from machinery used to load or unload materials. Depressed loading docks (truck wells) are contained areas that can accumulate stormwater runoff. Discharge of spills or contaminated stormwater to

the storm drain system is prohibited. This Fact Sheet contains details on specific measures recommended to prevent or reduce pollutants in stormwater runoff from outdoor loading or unloading areas.

Design Criteria

Design requirements for outdoor loading and unloading of materials are governed by Building and Fire Codes, and by current local permitting agency ordinances and zoning requirements. Source Control Measures described in this Fact Sheet are meant to enhance and be consistent with these code and ordinance requirements. Companies may have their own design or access requirements for loading docks. The design criteria listed below are not intended to be in conflict with requirements established by individual companies. Conflicts or issues should be discussed with the local permitting agency.

The following design criteria should be followed when developing construction plans for material loading and unloading areas:

Table 5-4: Design Criteria for Outdoor Loading/ Unloading Areas

Source Control Design Feature	Design Criteria
Surfacing	• Construct floor surfaces with materials that are compatible with materials being handled in the loading/unloading area.
Covers	• Cover loading/unloading areas to a distance of at least 3 feet beyond the loading dock or install a seal or door skirt to be used for all material transfers between the trailer and the building.
Grading/Contouring	• Grade or berm storage the areas to prevent run-on from surrounding areas. • Direct runoff from downspouts/roofs away from loading areas.
Emergency Storm Drain Seal	• Do not locate storm drains in the loading dock area. Direct connections to storm drains from depressed loading docks are prohibited. • Provide means, such as isolation valves, drain plugs, or drain covers, to prevent spills or contaminated stormwater from entering the storm drainage system.

Accumulated Stormwater and Non-stormwater

Stormwater and non-stormwater will accumulate in containment areas and sumps with impervious surfaces, such as depressed loading docks. Contaminated accumulated water must be disposed of in accordance with applicable laws and cannot be discharged directly to the storm drain or sanitary sewer system without the appropriate permit.

S-5: Outdoor Repair/Maintenance Bay Design

Purpose

Activities that can contaminate stormwater include engine repair, service, and parking (i.e. leaking engines or parts). Oil and grease, solvents, car battery acid, coolant and gasoline from the repair/maintenance bays can severely impact stormwater if allowed to come into contact with stormwater runoff. This Fact Sheet contains details on the specific measures required to prevent or reduce pollutants in stormwater runoff from vehicle and equipment maintenance and repair areas.

Design Criteria

Design requirements for vehicle maintenance and repair areas are governed by Building and Fire Codes, and by current local permitting agency ordinances, and zoning requirements. The design criteria described in this Fact Sheet are meant to enhance and be consistent with these code requirements.

The following design criteria are required for vehicle and equipment maintenance, and repair. All wash water, hazardous and toxic wastes must be prevented from entering the storm drainage system.

Source Control Design Feature	Design Criteria
Surfacing	• Construct the vehicle maintenance/repair floor area with Portland cement concrete.
Covers	• Cover or berm areas where vehicle parts with fluids are stored. • Cover or enclose all vehicle maintenance/repair areas.
Grading/ Contouring	• Berm or grade the maintenance/repair area to prevent run-on and runoff of stormwater or runoff of spills. • Direct runoff from downspouts/roofs away from maintenance/repair areas. • Grade the maintenance/repair area to drain to a dead-end sump for collection of all wash water, leaks and spills. Direct connection of maintenance/repair area to storm drain system is prohibited. • Do not locate storm drains in the immediate vicinity of the maintenance/repair area.
Emergency Storm Drain Seal	• Provide means, such as isolation valves, drain plugs, or drain covers, to prevent spills or contaminated stormwater from entering the storm drainage system.

Accumulated Stormwater and Non-stormwater

Stormwater and non-stormwater will accumulate in containment areas and sumps with impervious surfaces. Contaminated accumulated water must be disposed of in accordance with applicable laws and cannot be discharged directly to the storm drain or sanitary sewer system without the appropriate permit.

S-6: Outdoor Vehicle/Equipment/Accessory Washing Area Design

Purpose

Washing vehicles and equipment in areas where wash water flows onto the ground can pollute stormwater. Wash waters are not allowed in the storm drain system. They can contain high concentrations of oil and grease, solvents, phosphates and high suspended solids loads. Sources of washing contamination include outside vehicle/equipment cleaning or wash water discharge to the ground. This Fact Sheet contains details on the specific measures required to prevent or reduce pollutants in stormwater runoff from vehicle and equipment washing areas.

Design Criteria

Design requirements for vehicle maintenance and repair areas are governed by Building and Fire Codes, and by current local permitting agency ordinances, and zoning requirements. The design criteria described in this Fact Sheet are meant to enhance and be consistent with these code requirements.

The following design criteria are required for vehicle and equipment washing areas. All hazardous and toxic wastes must be prevented from entering the storm drain system.

Source Control Design Feature	Design Criteria
Surfacing	• Construct the vehicle/equipment wash area floors with Portland cement concrete.
Covers	• Provide a cover that extends over the entire wash area.
Grading/ Contouring	• Berm or grade the maintenance/repair area to prevent run-on and runoff of stormwater or runoff of spills. • Grade or berm the wash area to contain the wash water within the covered area and direct the wash water to treatment and recycle or pretreatment and proper connection to the sanitary sewer system. Obtain approval from the governing agency before discharging to the sanitary sewer. • Direct runoff from downspouts/roofs away from wash areas. • Do not locate storm drains in the immediate vicinity of the wash area.
Emergency Storm Drain Seal	• Provide means, such as isolation valves, drain plugs, or drain covers, to prevent spills or contaminated stormwater from entering the storm drainage system.

Accumulated Stormwater and Non-stormwater

Stormwater and non-stormwater will accumulate in containment areas and sumps with impervious surfaces. Contaminated accumulated water must be disposed of in accordance with applicable laws and cannot be discharged directly to the storm drain or sanitary sewer system without the appropriate permit.

S-7: Fueling Area Design

Purpose

Spills at vehicle and equipment fueling areas can be a significant source of pollution because fuels contain toxic materials and heavy metals that are not easily removed by stormwater treatment devices. When stormwater mixes with fuel spilled or leaked onto the ground, it becomes polluted by petroleum-based materials that are harmful to humans, fish, and wildlife. This could occur at large industrial sites or at small commercial sites such as gas stations and convenience stores. This Fact Sheet contains details on specific measures required to prevent or reduce pollutants in stormwater runoff from vehicle and equipment fueling areas, including retail gas stations.

Design Criteria

Design requirements for fueling areas are governed by Building and Fire Codes and by current local permitting agency ordinances and zoning requirements. The design requirements described in this Fact Sheet are meant to enhance and be consistent with these code and ordinance requirements.

Source Control Design Feature	Design Criteria
Surfacing	• Fuel dispensing areas must be paved with Portland cement concrete. The fuel dispensing area is defined as extending 6.5 feet from the corner of each fuel dispenser or the length at which the hose and nozzle assemble may be operated plus 1 foot, whichever is less. The paving around the fuel dispensing area may exceed the minimum dimensions of the "fuel dispensing area" stated above. • Use asphalt sealant to protect asphalt paved areas surrounding the fueling area.
Covers	• The fuel dispensing area must be covered [1], and the cover's minimum dimensions must be equal to or greater than the area within the grade break or the fuel dispensing area, as defined above. The cover must not drain onto the fuel dispensing area.
Grading/ Contouring	• The fuel dispensing area should have a 2% to 4% slope to prevent ponding and must be separated from the rest of the site by a grade break that prevents run-on of stormwater to the extent practicable. • Grade the fueling area to drain toward a dead-end sump. • Direct runoff from downspouts/roofs away from fueling areas. • Do not locate storm drains in the immediate vicinity of the fueling area.

Source Control Design Feature	Design Criteria
Emergency Storm Drain Seal	• Provide means, such as isolation valves, drain plugs, or drain covers, to prevent spills or contaminated stormwater from entering the storm drainage system.

1. If fueling large equipment or vehicles that would prohibit the use of covers or roofs, the fueling island should be designed to sufficiently accommodate the larger vehicles and equipment and to prevent run-on and runoff of stormwater. Grade to direct stormwater to a dead-end sump.

Accumulated Stormwater and Non-stormwater

Stormwater and non-stormwater will accumulate in containment areas and sumps with impervious surfaces. Contaminated accumulated water must be disposed of in accordance with applicable laws and cannot be discharged directly to the storm drain or sanitary sewer system without the appropriate permit.

S-8: Proof of Control Measure Maintenance

Purpose

Continued effectiveness of control measures specified in the 2011 TGM depends on diligent ongoing inspection and maintenance. To ensure that such maintenance is provided, the local permitting agency will require both a Maintenance Agreement and a Maintenance Plan from the owner/operator of stormwater control measures.

Maintenance Agreement

Onsite Treatment Control Measures are to be maintained by the owner/operator. Maintenance Agreements between the governing agency and the owner/operator may be required. A Maintenance Agreement with the governing agency must be executed by the owner/operator before occupancy of the project is approved. A sample Maintenance Agreement form is provided in Appendix H.

Maintenance Plan

A post-construction Maintenance Plan shall be prepared and made available at the governing agency's request. The Maintenance Plan should address items such as:

- Operation plan and schedule, including a site map;
- Maintenance and cleaning activities and schedule;
- Equipment and resource requirements necessary to operate and maintain facility; and
- Responsible party for operation and maintenance.

Additional guidelines for Maintenance Plans are provided in Appendix I.

6 STORMWATER BMP DESIGN

6.1 Introduction

Retention BMPs, Biofiltration BMPs, and Treatment Control Measures are required to augment Site Design Principles and Techniques and Source Control Measures to reduce pollution from stormwater discharges to the maximum extent practicable. Retention BMPs are engineered facilities that are designed to retain surface runoff on the project site. Biofiltration BMPs are vegetated stormwater BMPs that remove pollutants by filtering stormwater through vegetation and soils. Treatment Control Measures are engineered BMPs that provide a reduction of pollutant loads and concentrations in stormwater runoff. The type(s) of Retention BMPs and Biofiltration BMPs to be implemented depends on site suitability factors discussed in this chapter. The type of Treatment Control Measure(s) to be implemented at a site depends on a number of factors including: type of pollutants in the stormwater runoff, quantity of stormwater runoff to be treated, project site conditions, receiving water conditions, and state industrial permit requirements, where applicable. Land requirements and costs to design, construct, and maintain Treatment Control Measures vary by type.

Unlike flood control measures that are designed to handle peak flows, stormwater Retention BMPs, Biofiltration BMPs, and Treatment Control Measures are designed to retain or treat the more frequent, lower-flow storm events, or the first flush runoff from larger storm events (typically referred to as the first flush events). Small, frequent storm events represent most of the total average annual rainfall for the area. It's the volume from such small events, referred to as the Stormwater Quality Design Volume (SQDV), that is targeted for retention onsite in Retention BMPs. Biofiltration BMPs and Treatment Control Measures can be sized to capture either the SQDV or the Stormwater Quality Design Flow (SQDF). Calculation methods for the SQDV and the SQDF are presented in Section 2 and Appendix E.

6.2 General Considerations

Retention BMPs, Biofiltration BMPs, and Treatment Control Measures are designed to remove pollutants contained in stormwater runoff. The pollutants of concern, depending on the watershed, may include trash, debris, and sediment; metals such as copper, lead, and zinc; nutrients such as nitrogen and phosphorous; certain bacteria and viruses; mineral salts such as chloride; and organic chemicals such as petroleum hydrocarbons and pesticides. Pollutant removal methods include sedimentation/settling, filtration, plant uptake, ion exchange, adsorption, and microbially-mediated decomposition. Floatable pollutants such as oil, debris, and scum can be removed with separator structures. Retention BMPs, Biofiltration BMPs, and some Treatment Control Measures are also designed to reduce runoff volume, thereby reducing pollutant loading to receiving waters. Retention BMP,

Biofiltration BMPs, and Treatment Control Measure types and common terms used in stormwater treatment are discussed below.

Maintenance Responsibility

Unless otherwise agreed to by the governing stormwater agency, the landowner, site operator, or homeowner's association is responsible for the operation and maintenance of the Retention BMPs, Biofiltration BMPs, and Treatment Control Measures. Failure to properly operate and maintain the measures could result in reduced treatment of stormwater runoff or a concentrated loading of pollutants to the storm drain system. To protect against failure, a Maintenance Plan must be developed and implemented for all Retention BMPs, Biofiltration BMPs, and Treatment Control Measures. Guidelines for maintenance plans are provided in Appendix I of the 2011 TGM. The Plan must be made available at the agency's request. In addition, a maintenance agreement with the governing agency may be required. The example maintenance agreements are included in Appendix H.

In addition to maintenance, the governing agency may require water quality monitoring agreements for any of the Retention BMPs, Biofiltration BMPs, or Treatment Control Measures recommended in the 2011 TGM. Monitoring may be conducted by the site operator, the agency, or both. Monitoring may be required for a period of time to help the agency evaluate the effectiveness of Retention BMPs, Biofiltration BMPs, and Treatment Control Measures in reducing pollutants in stormwater runoff.

Pretreatment

Pretreatment must be provided for filtration and infiltration facilities and other facilities whose function could be adversely affected by sediment or other pollutants. Pretreatment may also be provided for water quality detention basins and other Treatment Control Measures to facilitate the routine removal of sediment, trash, and debris, and to increase the longevity of the downstream BMPs.

Pretreatment may be provided by presettling basins or forebays (small detention basins), vegetated swales, filter strips, and hydrodynamic separators. Source control activities, described in Chapter 5, minimize the introduction of pollutants into stormwater runoff and also help to protect filtration and infiltration facilities. Effort should be made early in the site planning stages to minimize runoff from impervious areas by grading toward landscaped areas, disconnecting downspouts, and using pervious conveyances prior to discharging to the storm drain system. These site design practices can reduce the size and maintenance burden of downstream, end-of-pipe BMPs.

Oil/Water Separation

Oil/water separators remove floating oil from the water surface. There are two general types of separators: American Petroleum Institute (API) separators and

coalescing plate (CP) separators. Both types use physical mechanisms to remove high concentrations of floating and dispersed oil. Oil/water separators are not suitable for the relatively low concentrations of petroleum hydrocarbons present in typical urban runoff, and should only be used in locations where higher concentrations of oil are expected to occur, such as retail fuel facilities, high volume roads, and petroleum-related industrial facilities. Oil/water separators must be located off-line from the primary conveyance system, as they function at low flow conditions and will wash out in high flow conditions. Other oil control devices/facilities that may be used for pretreatment of slightly elevated concentrations of oil (i.e., typical of high use commercial parking lots) include catch basin inserts, hydrodynamic devices, and linear sand filters. Oil control devices/facilities should always be placed upstream of other treatment facilities and as close to the oil source as possible.

Infiltration

Infiltration refers to the use of the filtration, adsorption, and biological decomposition properties of soils to remove pollutants prior to the intentional routing of runoff to the subsurface for groundwater recharge. Infiltration BMPs are a type of Retention BMP and include infiltration basins, infiltration trenches, bioretention without an underdrain, dry wells, permeable pavement, and proprietary infiltration devices. Infiltration can provide multiple benefits including pollutant removal, hydromodification control, groundwater recharge, and flood control. However, conditions that can limit the use of infiltration include soil properties and potential adverse impacts on groundwater quality. A geotechnical investigation must be conducted when evaluating infiltration to determine the suitability of the site soil in adequately addressing groundwater protection. This may include an in-situ percolation test, per the guidance provided in Appendix C, and the determination of minimum depth to groundwater. The minimum separation to seasonal high groundwater or estimated mounded groundwater is five feet. Depth to seasonal high groundwater level shall be estimated as the average of the annual minima (i.e., the shallowest recorded measurements in each water year, defined as October 1 through September 30) for all years on record. If groundwater level data are not available or not considered to be representative, seasonal high groundwater depth can be determined by redoximorphic analytical methods combined with temporary groundwater monitoring for November 1 through April 1 at the proposed project site.

Soils should have sufficient organic content and sorption capacity to remove certain pollutants, but must be coarse enough to infiltrate runoff in a reasonable amount of time (e.g., < 72 hours for above-ground ponded water to prevent vector breeding). Examples of suitable soils are silty and sandy loams. Coarser soils, such as gravelly sands, have limited organic content and high permeability and therefore present a potential risk to groundwater from certain pollutants, especially in areas of shallow groundwater. Prior to the use of infiltration BMPs, consult with the local permitting agency to identify if vulnerable unconfined aquifers are located beneath the project to determine the appropriateness of these BMPs. In an area identified as an unconfined

aquifer, the application of infiltration BMPs should include significant pretreatment to ensure groundwater is protected from pollutants of concern.

Infiltration BMPs should not be placed in high-risk areas such as at or near service/gas stations, truck stops, and heavy industrial sites due to the groundwater contamination risk. Infiltration BMPs may be placed in high-risk areas if a site-specific evaluation demonstrates that sufficient pretreatment is provided to address pollutants of concern, high risks areas are isolated from stormwater runoff, or infiltration areas have little chance of spill migration.

In addition, infiltration BMPs must be sited at least 50 feet away from slopes steeper than 15 percent or an alternative setback established by the geotechnical expert for the project. Adequate spacing (100 feet or more) must be provided between infiltration BMPs and potable wells, non-potable wells, drain fields, and springs. Infiltration BMPs must be setback from building foundations at least eight feet or have an alternative setback established by the geotechnical expert for the project.

Infiltration is not allowed at locations with contaminated soils or groundwater where the pollutants could be mobilized or exacerbated by infiltration, unless a site-specific analysis determines the infiltration would not be detrimental. A site-specific analysis shall be prepared where pollutant mobilization (e.g., naturally-derived groundwater pollutants) is a concern. Projects must consider the potential for mobilization of groundwater contamination from natural sources as a result of stormwater infiltration (e.g., marine sediments, selenium-rich groundwater) to the extent that data is available.

Incidental infiltration that occurs in other types of Biofiltration BMPs and Treatment Control Measures, such as dry extended detention basins, vegetation swales, filter strips, and bioretention areas with underdrains, pose little risk to groundwater quality as treatment is provided in the BMP prior to infiltration.

Biofiltration BMPs

Biofiltration BMPs use vegetation and soils or other filtration media for runoff treatment. As runoff passes through the vegetation and filtration media, the combined effects of filtration, adsorption, and biological uptake remove pollutants. In biofiltration BMPs, pore spaces and organic material in the soils help to retain water in the form of soil moisture and to promote the pollutant adsorption (e.g., dissolved metals and petroleum hydrocarbons) into the soil matrix. Plants use soil moisture, promote the drying of the soil through transpiration, and uptake pollutants in their roots and leaves. Plants with extensive root systems also help to maintain filtration rates. Vegetation also decreases the velocity of flow and allows for particulates to settle.

Treatment Control Measures

Filtration

Various media, such as sand, perlite, zeolite, compost, and activated carbon, can be used in filtration BMPs to effectively remove total suspended solids (TSS) and associated pollutants such as organics (hydrocarbons and pesticides) and particulate metals. Filtration systems can be configured in the form of horizontal beds, trenches, or lastly, cartridge systems in underground vaults or catch basins.

Wetpools

A wetpool is a permanent pool of water incorporated into a wetpond or stormwater wetland BMP. Wetpools provide runoff treatment by allowing settling of particulates (sedimentation) by biological uptake and by vegetative filtration (if vegetation is present). Wetpool BMPs may be single-purpose facilities, providing only runoff treatment, or they may also provide flow control by providing additional detention storage with the use of a multi-stage outlet structure. If combined with detention, the wetpool volume can often be stacked under the detention volume with little further loss of development area.

"On-line" and "Off-line" Facilities

The location and configuration of control facilities can vary depending on the desired function. For example, drop structures or grade control may be located in a drainage channel so as to stabilize a channel for hydromodification control purposes. Such facilities are referred to as "in-stream" controls. Retention BMPs, Biofiltration BMPs, and Treatment Control Measures may not be located in-stream. Retention BMPs, Biofiltration BMPs, and Treatment Control Measures cannot be located in Waters of the US, but rather must be located upland to retain or treat runoff prior to discharge into Waters of the US.

If a Retention BMP, Biofiltration BMP, or Treatment Control Measure facility is designed such that all the runoff passes through the facility, the facility is called an "on-line" system. However, care must be taken to limit the resuspension of previously captured pollutants or damage to BMP performance during high flows. If, on the other hand, the facility only receives flows less than or equal to the stormwater quality design flow (SQDF), the facility is called an "off-line" system. Off-line systems therefore require a flow splitter or equivalent device. Generally treatment performance is better for off-line facilities because a larger percentage of the runoff is treated. Figure 6-1 illustrates the difference between on-line, off-line, and in-stream controls.

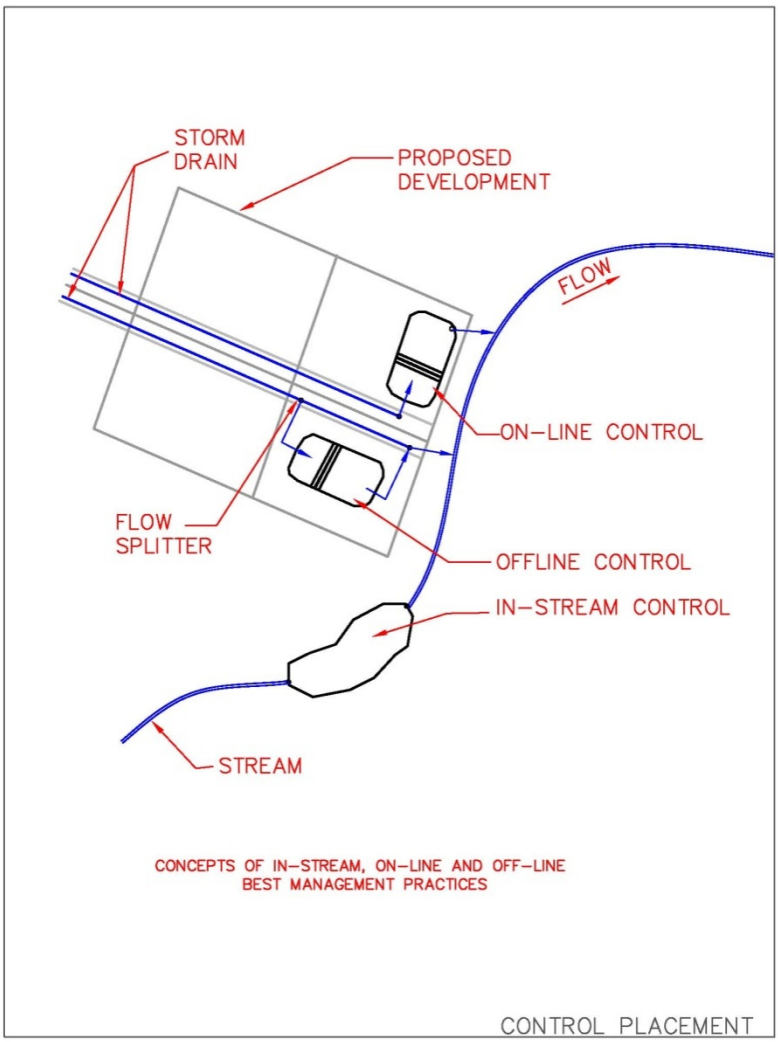

Figure 6-1: Differences between On-line, Off-line, and In-stream Control Measures

6.3 Retention BMP, Biofiltration BMP, and Treatment Control Measure Fact Sheets

This section provides fact sheets with recommended criteria for the design and implementation of Retention BMPs, Biofiltration BMPs, and Treatment Control Measures. The siting, design, and maintenance requirements in the fact sheets are intended to ensure optimal performance of the measures. Alternative designs may be approved by the local permitting authority based on site specific conditions if equivalent pollutant removal performance is provided.

The 2011 TGM also contains calculation worksheets to aid in the design of these BMPs in Appendix E. New BMPs that are equivalent to those included in the 2011 TGM are acceptable based on approval of the local permitting agency.

Fact sheets are provided for the Retention BMPs, Biofiltration BMPs, and Treatment Control Measures listed below:

Retention BMPs

Infiltration BMPs

INF-1: Infiltration Basin
INF-2: Infiltration Trench
INF-3: Bioretention
INF-4: Drywell
INF-5: Permeable Pavement
INF-6: Proprietary Infiltration

Rainwater Harvesting BMPs

RWH-1: Rainwater Harvesting

Evapotranspiration BMPs

ET-1: Green Roof
ET-2: Hydrologic Source Controls

Biofiltration BMPs

BIO-1: Bioretention with Underdrain
BIO-2: Planter Box
BIO-3: Vegetated Swale
BIO-4: Vegetated Filter Strip
BIO-5: Proprietary Biotreatment

Treatment Control Measures

TCM-1: Dry Extended Detention Basin
TCM-2: Wet Detention Basin
TCM-3: Constructed Wetland
TCM-4: Sand Filter (if vegetated, this is considered a Biofiltration BMP)
TCM-5: Cartridge Media Filter

Pretreatment/Gross Solids Removal BMPs

PT-1: Hydrodynamic Device
PT-2: Catch Basin Insert

INF-1: Infiltration Basin

An infiltration basin consists of an earthen basin constructed in naturally pervious soils (Type A or B soils) with a flat bottom and provided with an inlet structure to dissipate energy of incoming flow and an emergency spillway to control excess flows. An optional relief underdrain may be provided to drain the basin if standing water conditions occur. A forebay settling basin or separate Treatment Control Measure must be provided as pretreatment. An infiltration basin functions by retaining the SQDV in the basin and allowing the retained runoff to percolate into the underlying native soils over a specified period of time. The bottoms of infiltration basins are typically vegetated with dry-land grasses or irrigated turf grass. A typical layout of an infiltration basin system is shown in Figure 6-2.

Infiltration Basin in a Fresno, CA Park, Before and After a Rain Event

Photo Credit: Geosyntec Consultants

Application

- Mixed-use and commercial
- Roads and parking lots
- Parks and open spaces
- Single and multi-family residential
- Can integrate with parks

Routine Maintenance

- Removal trash, debris, and sediment at inlet and outlets
- Wet weather inspection to ensure drain time
- Remove weeds
- Inspect for mosquito breeding

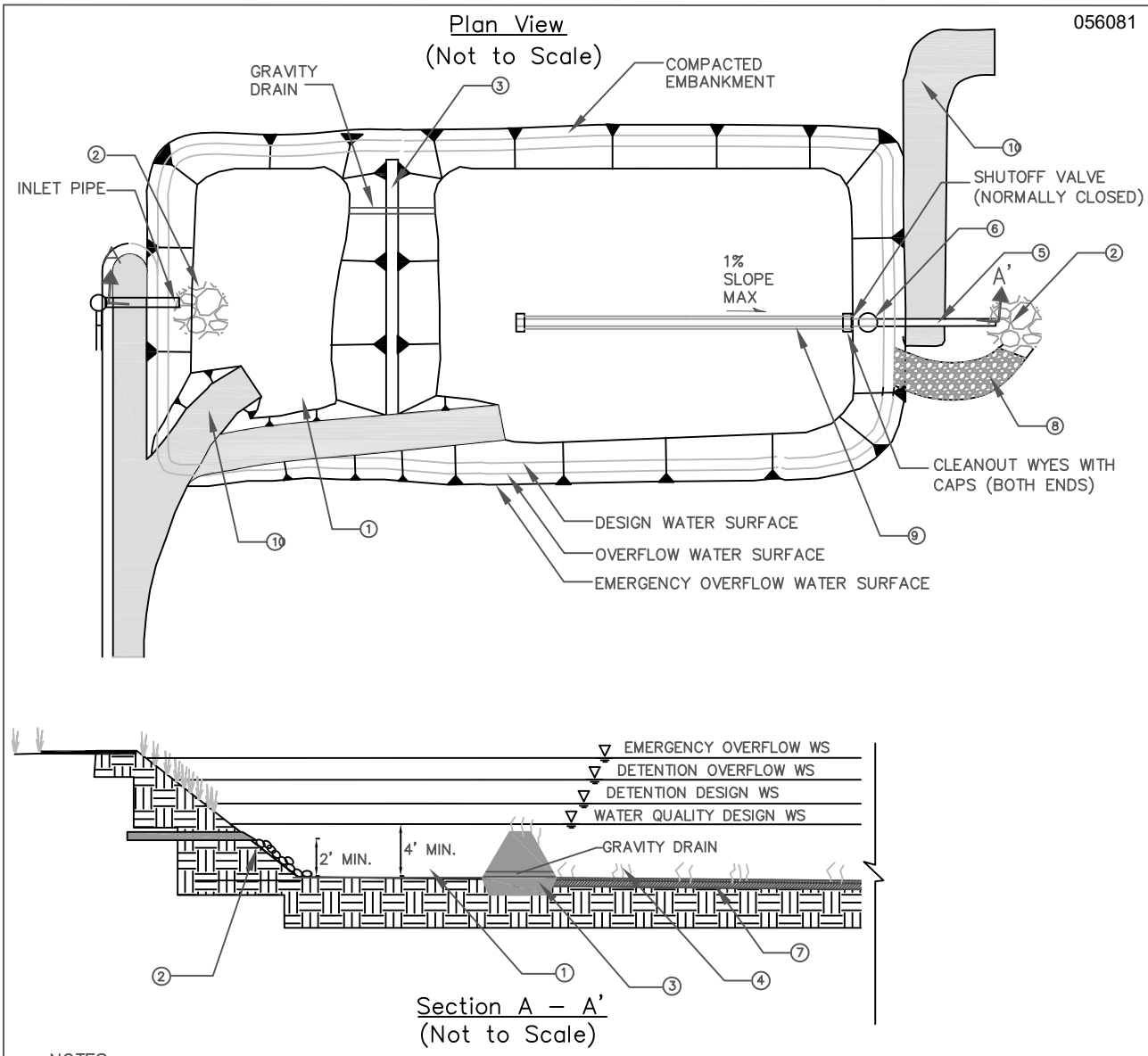

NOTES:

1. UPSTREAM PRETREATMENT SHALL BE PROVIDED. SEDIMENT FOREBAY WITH VOLUME EQUAL TO 25% OF TOTAL INFILTRATION BASIN VOLUME MAY BE USED IN LIEU OF UPSTREAM PRETREATMENT. DEPTH SHALL BE 4' MIN TO 8' MAX PLUS AN ADDITIONAL 1 FOOT MIN SEDIMENT STORAGE DEPTH.
2. RIP RAP APRON OR OTHER ENERGY DISSIPATION.
3. EXTEND EARTHEN BERM ACROSS ENTIRE WIDTH OF THE INFILTRATION BASIN.
4. INFILTRATION BASIN BOTTOM AND SIDE SLOPES SHALL BE PLANTED WITH DROUGHT TOLERANT VEGETATION. DEEP ROOTED VEGETATION PREFERRED FOR BASIN BOTTOM. NO TOPSOIL SHALL BE ADDED TO INFILTRATION BASIN BED.
5. SIZE OUTLET PIPE TO PASS 100–YEAR PEAK FLOW FOR ON–LINE INFILTRATION BASINS AND WATER QUALITY PEAK FLOW FOR OFF–LINE INFILTRATION BASINS.
6. WATER QUALITY OUTLET STRUCTURE. SEE FIGURE 7–2 AND FIGURE 7–3 FOR DETAILS.
7. OVER EXCAVATE BASIN BOTTOM 1 FOOT. RE–PLACE EXCAVATED MATERIAL UNIFORMLY WITHOUT COMPACTION. AMENDING EXCAVATED MATERIAL WITH 2" – 4" OF COARSE SAND IS RECOMMENDED FOR SOILS WITH BORDER LINE INFILTRATION CAPACITY.
8. INSTALL EMERGENCY OVERFLOW SPILLWAY AS NEEDED. SEE FIGURE 2–4 FOR DETAILS
9. INSTALL OPTIONAL 6" MINIMUM DIAMETER PERFORATED PIPE UNDERDRAIN. INSTALL AT 0.5% MINIMUM SLOPE.
10. MAINTENANCE RAMP SHOULD PROVIDE ACCESS TO BOTH THE FIRST CELL AND MAIN BASIN.

Geosyntec consultants

Figure 6-2: Infiltration Basin

Limitations

The following limitations should be considered before choosing to use an infiltration basin:

- Native soil infiltration rate - permeability of soils at the infiltration basin location must be at least 0.5 inches per hour.
- Depth to groundwater, bedrock, or low permeability soil layer – 5 feet vertical separation is required between the bottom of the infiltration basin and the seasonal high groundwater level or mounded groundwater level, bedrock, or other barrier to infiltration to ensure that the facility will completely drain between storms and that infiltrating water will receive adequate treatment though the soils before it reaches the groundwater.
- Slope stability - infiltration BMPs must be sited at least 50 feet away from slopes steeper than 15 percent or an alternative setback established by the geotechnical expert for the project.
- Setbacks - a minimum setback (100 feet or more) must be provided between infiltration BMPs and potable wells, non-potable wells, drain fields, and springs. Infiltration BMPs must be setback at least eight feet from building foundations or have an alternative setback established by the geotechnical expert for the project.
- Groundwater contamination - the application of infiltration BMPs should include significant pretreatment in an area identified as an unconfined aquifer to ensure groundwater is protected for pollutants of concern.
- Contaminated soils or groundwater plumes - infiltration BMPs are not allowed at locations with contaminated soils or groundwater, where the pollutants could be mobilized or exacerbated by infiltration, unless a site-specific analysis determines the infiltration would be beneficial.
- High pollutant land uses - infiltration BMPs should not be placed in high-risk areas such as at or near service/gas stations, truck stops, and heavy industrial sites due to the groundwater contamination risk unless a site-specific evaluation demonstrates that sufficient pretreatment is provided to address pollutants of concern, high risks areas are isolated from stormwater runoff, or infiltration areas have little chance of spill migration.
- High sediment loading rates – infiltration BMPs may clog quickly if sediment loads are high (e.g., unstabilized site) or if flows are not adequately pretreated.

Additional Control Functions

Infiltration basins can be designed for flow control by providing storage capacity in excess of that provided by infiltration and incorporating outlet controls. The additional storage and outlet structure should be provided per the requirements outlined in the Dry Extended Detention Basins section of the 2011 TGM. Note that the selected outlet structure should not be designed to drain the design volume intended for infiltration and should be similar to outlet structures that maintain a permanent pool (see Section 6.10.2 – Wet Retention Basins).

Multi-Use Opportunities

Infiltration basins may be integrated into the design of a park or playfield. Recreational multi-use facilities should be inspected after every storm and may require a greater maintenance frequency than dedicated infiltration basins to ensure aesthetics and public safety are not compromised. Any planned multi-use facility must obtain approval by the affected City and County departments.

Design Criteria

The main challenge associated with infiltration basins is preventing system clogging and subsequent infiltration inhibition. Infiltration basins should be designed according to the requirements listed in Table 6-1 and outlined in the section below. Detailed design procedures and an example are included in Appendix E.

Table 6-1: Infiltration Basin Design Criteria

Design Parameter	Unit	Design Criteria
Stormwater quality design volume (SQDV)	acre-feet	See Section 2.3 and Appendix E for calculating SQDV
Design drawdown time	hr	12 - 72 (See Appendix D, Section D.2)
Bottom basin Elevation	feet	5 feet above seasonally high groundwater table or mounded groundwater
Setbacks	feet	100 feet from wells, fields, and springs; 20 feet downslope of 100 feet upslope of foundations; Geotechnical expert should establish the setback requirement from building foundations that must be ≥ 8 ft.
Pretreatment	-	Sedimentation forebay or any Treatment Control Measure shall be provided as pretreatment for all tributary surfaces other than roofs.

Design Parameter	Unit	Design Criteria
Design percolation rate (P_{design})	in/hr	Measured percolation rate must be corrected based onsite suitability assessment and design related considerations described in this fact sheet.
Facility geometry	-	Forebay (if applicable): 25% of facility volume; flat bottom slope
Freeboard (minimum)	ft	1.0
Inlet/ Outlet erosion control	-	Energy dissipater to reduce velocity
Overflow device	-	Required if system is on-line

Geotechnical Considerations

An extensive geotechnical site investigation must be undertaken early in the site planning process to verify site suitability for the installation of infiltration facilities, due to the potential to contaminate groundwater, cause slope instability, impact surrounding structures, and have insufficient infiltration capacity.. Soil infiltration rates and the water table depth should be evaluated to ensure that conditions are satisfactory for proper operation of an infiltration facility. See Appendix C for guidance on infiltration testing.

The project designer must demonstrate through infiltration testing, soil logs, and the written opinion of a licensed civil engineer that sufficiently permeable soils exist onsite to allow the construction of a properly functioning infiltration facility.

1) Infiltration facilities require a minimum soil infiltration rate of 0.5 inches/hour. Pretreatment is required in all instances.

2) Groundwater separation must be at least 5 feet from the basin bottom to the measured Seasonal High Groundwater Elevation or estimated high groundwater mounding elevation. Groundwater levels measurements must be made during the time when water level is expected to be at a maximum (i.e., toward the end of the wet season).

3) Potential BMP sites with a slope greater than 25% (4:1) should be excluded. A geotechnical analysis and report addressing slope stability are required if located within 50 feet of slopes greater than 15%.

Soil Assessment and Site Geotechnical Investigation Reports

The soil assessment report should:

- State whether the site is suitable for the proposed infiltration basin;

- Recommend a design percolation rate (see "*Step 2: Determine The Design Percolation Rate*" below);
- Identify the seasonally high depth to groundwater table surface elevation;
- Provide a good understanding of how the stormwater runoff will move in the soil (horizontally or vertically) and if there are any geological conditions that could inhibit the movement of water; and
- If a geotechnical investigation and report are required, the report should:
  - Provide a written opinion by a professional civil engineer describing whether the infiltration basin will compromise slope stability; and
  - Identify potential impacts to nearby structural foundations.

Setbacks

1) Infiltration facilities shall be setback a minimum of 100 feet from proposed or existing potable wells, non-potable wells, septic drain fields, and springs.
2) Infiltration BMPs must be sited at least 50 feet away from slopes steeper than 15 percent or an alternative setback established by the geotechnical expert for the project.
3) The geotechnical expert shall establish the setback requirement from building foundations that must be ≥ 8 ft.

Pretreatment

Pretreatment is required for infiltration basins in order to reduce the sediment load entering the facility and maintain the infiltration rate of the facility. Pretreatment refers to design features that provide settling of large particles before runoff reaches a management practice; easing the long-term maintenance burden. Pretreatment is important for most all structural stormwater BMPs, but it is particularly important for infiltration BMPs. To ensure that pretreatment mechanisms are effective, designers should incorporate sediment reduction practices. Sediment reduction BMPs may include vegetated swales, vegetated filter strips, sedimentation basins or forebays, sedimentation manholes and hydrodynamic separation devices. The use of at least two pretreatment devices is highly recommended for infiltration basins.

For design specification of selected pretreatment devices, refer to:

- BIO-3: Vegetated swales
- BIO-4: Vegetated filter strips
- TCM-4: Sand filters

- TCM-5: Cartridge media filters
- PT-1: Hydrodynamic separation device

Sizing Criteria

As with sand filters, infiltration facilities can be sized using one of two methods: a simple sizing method or a routing modeling method. With either method the SQDV volume must be completely infiltrated within 12 to 72 hours (see Appendix D, Section D.2 for a discussion on drawdown time and BMP performance). The simple sizing procedures provided below can be used for either infiltration basins or infiltration trenches (see INF-2: Infiltration Trench). For the routing modeling method, refer to TCM-4 Sand Filters.

Step 1: Calculate the Design Volume

Infiltration facilities shall be sized to capture and infiltrate the SQDV volume (see Section 2 and Appendix E) with a 12 to 72 hour drawdown time (see Appendix D, Section D.2).

Step 2: Determine the Design Percolation Rate

The percolation rate will decline between maintenance cycles as the surface becomes occluded and particulates accumulate in the infiltrative layer. Monitoring of actual facility performance has shown that the full-scale infiltration rate is far lower than the rate measured by small-scale testing. It is important that adequate conservatism is incorporated in the selection of design percolation rates. For infiltration trenches, the design percolation rate discussed here is the percolation rate of the underlying soils and not the percolation rate of the filter media bed (refer to the "Geometry and Sizing" section of INF-2 for the recommended composition of the filter media bed for infiltration trenches).

Considerations for Design Percolation Rate Corrections

Suitability assessment related considerations include (Table 6-2):

- Soil assessment methods – the site assessment extent (e.g., number of borings, test pits, etc.) and the measurement method used to estimate the short-term infiltration rate.
- Predominant soil texture/percent fines – soil texture and the percent fines can greatly influence the potential for clogging.
- Site soil variability – site with spatially heterogeneous soils (vertically or horizontally), as determined from site investigations, are more difficult to estimate average properties resulting in a higher level of uncertainty associated with initial estimates.

- Depth to seasonal high groundwater/impervious layer – groundwater mounding may become an issue during excessively wet conditions where shallow aquifers or shallow clay lenses are present.

Table 6-2: Suitability Assessment Related Considerations for Infiltration Facility Safety Factors

Consideration	High Concern	Medium Concern	Low Concern
Assessment methods	Use of soil survey maps or simple texture analysis to estimate short-term infiltration rates	Direct measurement of ≥ 20 percent of infiltration area with localized infiltration measurement methods (e.g., infiltrometer)	Direct measurement of ≥ 50 percent of infiltration area with localized infiltration measurement methods or Use of extensive test pit infiltration measurement methods
Ventura Hydrology Manual soil number (measured infiltration rate)	3 (f = 0.5 – 0.64)	4 or 5 (f = 0.65 –0.91)	6 or 7 (f = 0.92 or higher)
Site soil variability	Highly variable soils indicated from site assessment or limited soil borings collected during site assessment	Soil borings/test pits indicate moderately homogeneous soils	Multiple soil borings/test pits indicate relatively homogeneous soils
Depth to groundwater/ impervious layer	<10 ft below facility bottom	10-30 ft below facility bottom	>30 below facility bottom

Localized infiltration testing refers to methods such as the double ring infiltrometer test (ASTM D3385-88), which measure infiltration rates over an area less than 10 sq-ft and do not attempt to account for soil heterogeneity. Extensive infiltration testing refers to methods that include excavating a significant portion of the proposed infiltration area, filling the excavation with water, and monitoring drawdown. In all cases, testing should be conducted in the area of the proposed BMP where, based on geotechnical data, soils appear least likely to support infiltration.

Design related considerations include (Table 6-3):

- Size of area tributary to facility – all things being equal, both physical and economic risk factors related to infiltration facilities increase with an increase in the tributary area served. Therefore facilities serving larger tributary areas should use more restrictive adjustment factors.

- Level of pretreatment/expected influent sediment loads – credit should be given for good pretreatment by allowing less restrictive factors to account for the reduced probability of clogging from high sediment loading. Also, facilities designed to capture runoff from relatively clean surfaces such as rooftops are likely to see low sediment loads and therefore should be allowed to apply less restrictive safety factors.

- Redundancy – facilities that consist of multiple subsystems operating in parallel such that parts of the system remains functional when other parts fail and/or bypass, should be rewarded for the built-in redundancy with less restrictive correction and safety factors. For example, if bypass flows would be at least partially treated by another BMP, the risk of discharging untreated runoff in the event of clogging the primary facility is reduced. A bioretention facility that overflows to a landscaped area is another example. Compaction during construction – proper construction oversight is needed during construction to ensure that the bottoms of infiltration facility are not overly compacted. Facilities that do not commit to proper construction practices and oversight should have to use more restrictive correction and safety factors.

Table 6-3: Design Related Considerations for Infiltration Facility Safety Factors

Consideration	High Concern	Medium Concern	Low Concern
Tributary area size	Greater than 10 acres.	Greater than 2 acres but less than 10 acres.	2 acres or less.
Level of pre-treatment/ expected influent sediment loads	Pre-treatment from gross solids removal devices only, such as hydrodynamic separators, racks and screens, AND tributary area includes landscaped areas, steep slopes, high traffic areas, or any other areas expected to produce high sediment, trash, or debris loads.	Good pre-treatment with BMPs that mitigate coarse sediments such as vegetated swales AND influent sediment loads from the tributary area are expected to be relatively low (e.g., low traffic, mild slopes, disconnected impervious areas, etc.).	Excellent pre-treatment with BMPs that mitigate fine sediments such as bioretention or media filtration OR sedimentation or facility only treats runoff from relatively clean surfaces, such as rooftops.
Redundancy of treatment	No redundancy in BMP treatment train.	Medium redundancy, other BMPs available in treatment train to maintain at least 50% of function of facility in event of failure.	High redundancy, multiple components capable of operating independently and in parallel, maintaining at least 90% of facility functionality in event of failure.
Compaction during construction	Construction of facility on a compacted site or elevated probability of unintended/ indirect compaction.	Medium probability of unintended/ indirect compaction.	Heavy equipment actively prohibited from infiltration areas during construction and low probability of unintended/ indirect compaction.

Adjust the measured short-term infiltration rate using a weighted average of several safety factors using the worksheet shown in Table 6-4 below. The design percolation rate would be determined as follows:

- For each consideration shown in Table 6-2 and Table 6-3 above, determine whether the consideration is a high, medium, or low concern.
- For all high concerns, assign a factor value of 3, for medium concerns, assign a factor value of 2, and for low concerns assign a factor value of 1.
- Multiply each of the factors by the corresponding weight to get a product.

- Sum the products within each factor category to obtain a safety factor for each.
- Multiply the two safety factors together to get the final combined safety factor. If the combined safety factor is less than 2, then use 2 as the safety factor.
- Divide the measured short-term infiltration rate by the combined safety factor to obtain the adjusted design percolation rate for use in sizing the infiltration facility.

Table 6-4: Infiltration Facility Safety Factor Determination Worksheet

Factor Category		Factor Description	Assigned Weight (w)	Factor Value (v)	Product (p) p = w x v
A	Suitability Assessment	Soil assessment methods	0.25		
		Predominant soil texture	0.25		
		Site soil variability	0.25		
		Depth to groundwater / impervious layer	0.25		
		Suitability Assessment Safety Factor, $S_A = \Sigma p$			
B	Design	Tributary area size	0.25		
		Level of pre-treatment/ expected sediment loads	0.25		
		Redundancy	0.25		
		Compaction during construction	0.25		
		Design Safety Factor, $S_B = \Sigma p$			
Combined Safety Factor = S_A x S_B					

Note: The minimum combined adjustment factor shall not be less than 2.0 and the maximum combined adjustment factor shall not exceed 9.

Step 3: Calculate the surface area

Determine the size of the required infiltrating surface by assuming the SQDV will fill the available ponding depth plus (for infiltration trenches) the void spaces based on the computed porosity of the filter media (normally about 32%).

1) Determine the maximum depth of runoff that can be infiltrated within the required drain time (d_{max}) as follows:

$$d_{\max} = \frac{P_{design}}{12} t \qquad \text{(Equation 6-1)}$$

Where:

d_{max}	=	the maximum depth of water that can be infiltrated within the required drain time (ft)
P_{design}	=	design percolation rate of underlying soils (in/hr)
t	=	required drain time (hrs)

2) Choose the ponding depth (d_p) and/or trench depth (d_t) such that:

$$d_{\max} \geq d_p \quad \text{For Infiltration Basins} \qquad \text{(Equation 6-2)}$$

$$d_{\max} \geq n_t d_t + d_p \quad \text{For Infiltration Trenches} \qquad \text{(Equation 6-3)}$$

Where:

d_{max}	=	the maximum depth of water that can be infiltrated within the required drain time (ft)
d_p	=	ponding depth (ft)
n_t	=	trench fill aggregate porosity (unitless)
d_t	=	depth of trench fill (ft)

3) Calculate infiltrating surface area (filter bottom area) required:

$$A = \frac{SQDV}{((TP_{design}/12) + d_p)} \quad \text{For Infiltration Basins} \qquad \text{(Equation 6-4)}$$

$$A = \frac{SQDV}{((TP_{design}/12) + n_t d_t + d_p)} \quad \text{For Infiltration Trenches} \qquad \text{(Equation 6-5)}$$

Where:

$SQDV$	=	stormwater quality design volume (ft^3)
n_t	=	trench fill aggregate porosity (unitless)
P_{design}	=	design percolation rate (in/hr)
d_p	=	ponding depth (ft)
d_t	=	depth of trench fill (ft)
T	=	fill time (time to fill to max ponding depth with water) (hrs) [use 2 hours for most designs]

Geometry and Sizing

1) Infiltration basins should be designed and constructed with the flattest bottom slope possible to promote uniform ponding and infiltration across the facility.

2) A sediment forebay is required unless adequate pretreatment is provided in a separate pretreatment unit (e.g., vegetated swale, filter strip, hydrodynamic device) to reduce sediment loads entering the infiltration basin. The sediment forebay, if present, should have a volume equal to 25% of the total infiltration basin volume.

3) The forebay should be designed with a minimum length to width ratio of 2:1 and should completely drain to the main basin through an 8-inch minimum low-flow outlet within 10 minutes.

4) All inlets should enter the sediment forebay. If there are multiple inlets, the length-to-width ratio should be based on the average flowpath length for all inlets.

5) Design embankments to conform to requirements of the State of California Division of Safety of Dams, if the basin dimensions cause it to fall under that agency's jurisdiction.

Drainage

1) The bottom of the infiltration bed should be native soil, over-excavated to at least one foot in depth, and replaced uniformly without compaction. Amending the excavated soil with 2-4 inches (~15-30%) of coarse sand is recommended.

2) The hydraulic conductivity of the subsurface layers should be sufficient to ensure a maximum 72-hr drawdown time. An observation well shall be incorporated to allow observation of drain time.

3) For infiltration basins, an underdrain should be installed within the bottom layer to provide drainage in case of standing water. The underdrain should be operated by opening a valve, which should be closed during normal operation. Cleanouts should be provided for the underdrain. See Sand Filter Section VEG-8 for specifications for underdrains.

Emergency Overflow

1) There should be an overflow route for stormwater flows that overtop the facility or in case the infiltration facility becomes clogged.

2) The overflow channel should be able to safely convey flows from the peak design storm to the downstream stormwater conveyance system or other acceptable discharge point.

3) Spillway and overflow structures should be designed in accordance with applicable standards of the Ventura County Flood Control District or local jurisdiction.

Vegetation

1) A thick mat of drought tolerant grass should be established on the basin floor and side-slopes following construction. Grasses can help prevent erosion and increase evapotranspiration and their roots discourage compaction helping to maintain the surface infiltration rates. Additionally, the active growing vegetation can help break up surface layers that accumulate fine particulates.

2) Grass may need to be irrigated during establishment.

3) For infiltration basins, landscaping of the area surrounding the basin should adhere to the following criteria so as not to hinder maintenance operations:

    a. No trees or shrubs may be planted within 10 feet of inlet or outlet pipes or manmade drainage structures such as spillways, flow spreaders, or earthen embankments. Species with roots that seek water, such as willow or poplar, should not be used within 50 feet of pipes.

    b. Prohibited non-native plant species will not be permitted. For more information on invasive weeds, including biology and control of listed weeds, look at the encycloweedia located at the California Department of Food and Agriculture website or the California Invasive Plant Council website at www.cal-ipc.org.

Maintenance Access

1) Maintenance access road(s) shall be provided to the drainage structures associated with the basin (e.g., inlet, emergency overflow, or bypass structures). Manhole and catch basin lids should be in or at the edge of the access road.

2) An access ramp to the basin bottom is required to facilitate the entry of sediment removal and vegetation maintenance equipment without compaction of the basin bottom and side slopes.

Construction Considerations

To preserve and avoid the loss of infiltration capacity, the following construction guidelines are specified:

1) The entire area draining to the facility should be stabilized before construction begins. If this is impossible, a diversion berm should be placed around the perimeter of the infiltration site to prevent sediment entrance during construction.

2) Infiltration basins should not be hydraulically connected to the stormwater conveyance system until all contributing tributary areas are stabilized as shown on the Contract Plans and to the satisfaction of the Engineer. Infiltration basins should not be used as sediment control facilities.

3) Compaction of the subgrade with heavy equipment should be minimized to the maximum extent possible. If the use of heavy equipment on the base of the facility cannot be avoided, the infiltrative capacity should be restored by tilling or aerating prior to placing the infiltrative bed.

4) The exposed soils should be inspected by a civil engineer after excavation to confirm that soil conditions are suitable.

Operations and Maintenance

Infiltration facility maintenance should include frequent inspections to ensure that surface ponding infiltrates into the subsurface completely within the design infiltration time after a storm (see Appendix I for an infiltration BMP inspection and maintenance checklist).

Maintenance and regular inspections are of primary importance if infiltration BMPs are to continue to function as originally designed. A specific maintenance plan shall be formulated specifically for each facility outlining the schedule and scope of maintenance operations, as well as the data handling and reporting requirements. The following are general maintenance requirements:

1) Regular inspection should determine if the pretreatment sediment removal BMPs require routine maintenance.

2) If water is noticed in the basin more than 72 hours after a major storm the infiltration facility may be clogged. Maintenance activities triggered by a potentially clogged facility include:

    a. Check for debris/sediment accumulation, rake surface, and remove sediment (if any) and evaluate potential sources of sediment and debris (e.g., embankment erosion, channel scour, overhanging trees, etc). If suspected upland sources are outside of the immediate jurisdiction, additional pretreatment operations (e.g., trash racks, vegetated swales, etc.) may be necessary.

    b. For basins, removal of the top layer of native soil may be required to restore infiltrative capacity.

    c. Any debris or algae growth located on top of the infiltration facility should be removed and disposed of properly.

    d. Facilities shall be inspected annually. Trash and debris should be removed as needed, but at least annually prior to the beginning of the wet season.

3) Site vegetation should be maintained as frequently as necessary to maintain the aesthetic appearance of the site, and as follows:

   a. Vegetation, large shrubs, or trees that limit access or interfere with basin operation should be pruned or removed.

   b. Slope areas that have become bare should be revegetated and eroded areas should be regraded prior to being revegetated.

   c. Grass should be mowed to 4" - 9" high and grass clippings should be removed.

   d. Fallen leaves and debris from deciduous plant foliage should be raked and removed.

   e. Invasive vegetation, such as Alligatorweed (Alternanthera philoxeroides), Halogeton (Halogeton glomeratus), Spotted Knapweed (Centaurea maculosa), Giant Reed (Arundo donax), Castor Bean (Ricinus communis), Perennial Pepperweed (Lepidium latifolium), and Yellow Starthistle (Centaurea solstitalis) should be removed and replaced with non-invasive species. Invasive species should never contribute more than 25% of the vegetated area. For more information on invasive weeds, including biology and control of listed weeds, look at the encycloweedia located at the California Department of Food and Agriculture website or the California Invasive Plant Council website at www.cal-ipc.org.

   f. Dead vegetation should be removed if it exceeds 10% of area coverage. Vegetation should be replaced immediately to maintain cover density and control erosion where soils are exposed.

4) For infiltration basins, sediment build-up exceeding 50% of the forebay capacity should be removed. Sediment from the remainder of the basin should be removed when 6 inches of sediment accumulates. Sediments should be tested for toxic substance accumulation in compliance with current disposal requirements if land uses in the catchment include commercial or industrial zones, or if visual or olfactory indications of pollution are noticed. If toxic substances are encountered at concentrations exceeding thresholds of Title 22, Section 66261 of the California Code of Regulations, the sediment should be disposed of in a hazardous waste landfill and the source of the contaminated sediments should be investigated and mitigated to the extent possible.

5) Following sediment removal activities, replanting and/or reseeding of vegetation may be required for reestablishment.

INF-2: Infiltration Trench

Infiltration trenches are long, narrow, gravel-filled trenches, often vegetated, that infiltrate stormwater runoff from small drainage areas. Infiltration trenches may include a shallow depression at the surface, but the majority of runoff is stored in the void space within the gravel and infiltrates through the sides and the bottom of the trench.

Rural Highway Infiltration Trench

http://stormwater.wordpress.com/2007/05/23/infiltration--trenches/

Application

- Open areas adjacent to parking lots, driveways, and buildings
- Roadway medians and shoulders

Routine Maintenance

- Removal trash, debris, and sediment at inlet and outlets
- Wet weather inspection to ensure drain time
- Remove weeds
- Inspect for mosquito breeding

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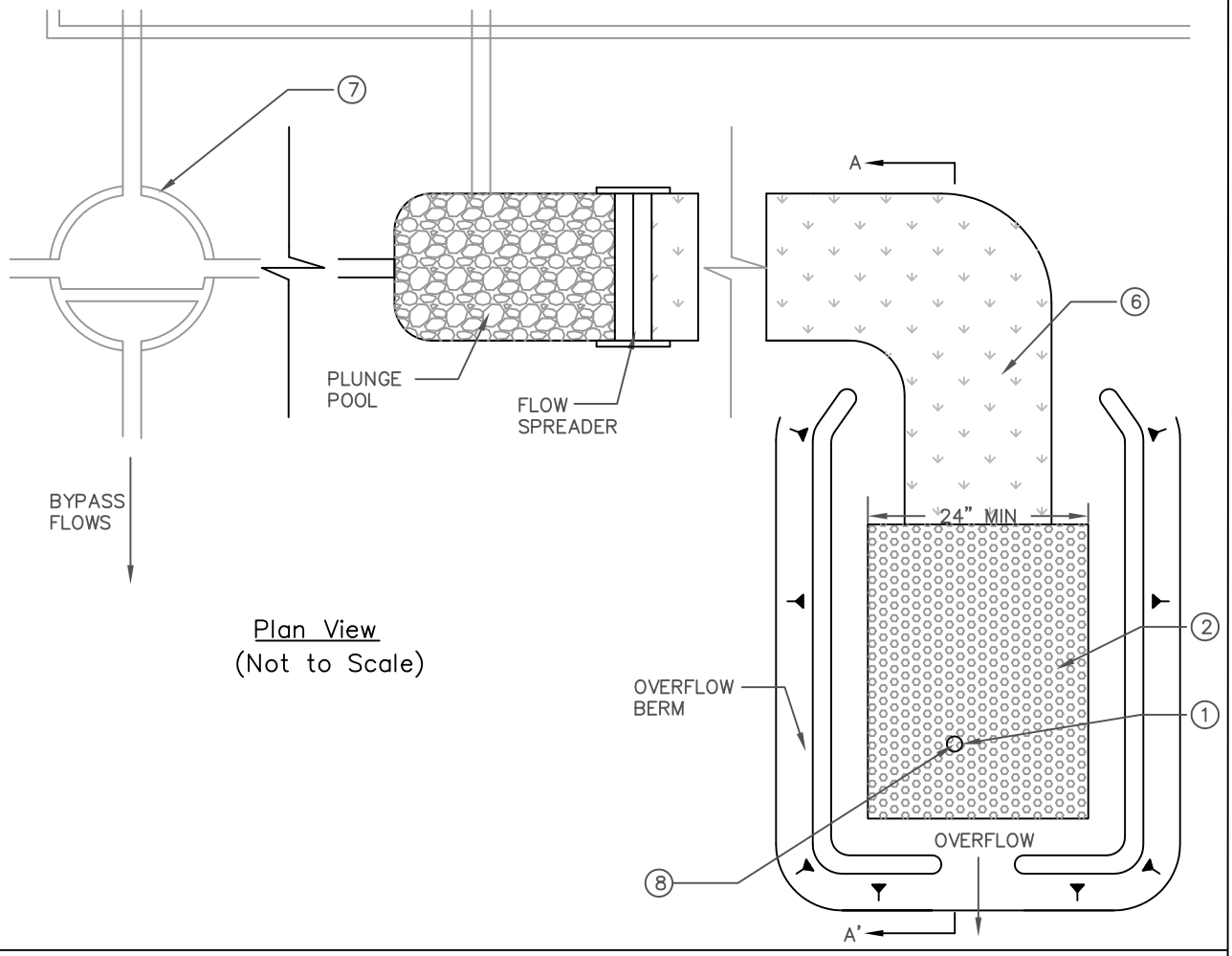

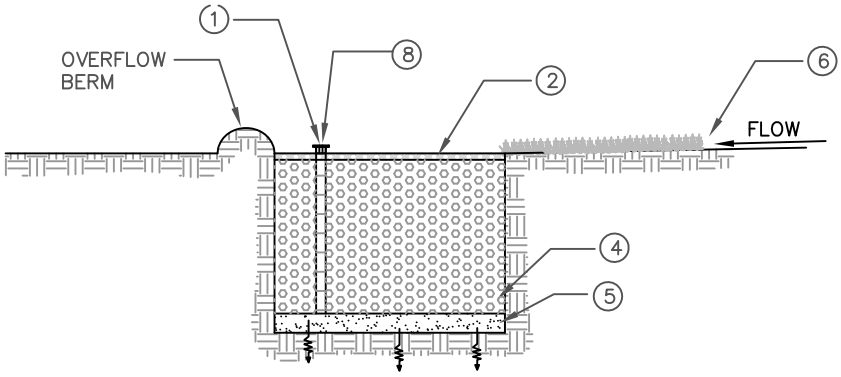

Section A – A'
(Not to Scale)

NOTES:

1. OBSERVATION WELL WITH LOCKABLE ABOVE-GROUND CAP.
2. 2" PEA GRAVEL FILTER LAYER.
3. MINIMUM 10' ABOVE SEASONAL HIGH GROUNDWATER TABLE AND 3' ABOVE BEDROCK.
4. 3' – 5' DEEP TRENCH FILLED WITH 2" – 6" DIAMETER CLEAN STONE WITH 30% – 40% VOIDS.
5. 6" DEEP SAND FILTER LAYER (OR FABRIC EQUIVALENT).
6. RUNOFF FILTERS THROUGH GRASS FILTER STRIP OR VEGETATED SWALE.
7. OPTIONAL FLOW CONTROL DEVICE FOR OFF-LINE CONFIGURATIONS.

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Figure 6-3: Infiltration Trench

Limitations

The following limitations should be considered before choosing to use an infiltration trench:

- Native soil infiltration rate – soil permeability at the infiltration trench location must be at least 0.5 inches per hour.
- Depth to groundwater, bedrock, or low permeability soil layer – 5 feet vertical separation is required between the bottom of the infiltration trench and the seasonal high groundwater level or mounded groundwater level, bedrock, or other barrier to infiltration to ensure that the facility will completely drain between storms and that infiltrating water will receive adequate treatment though the soils before it reaches the groundwater.
- Slope stability - infiltration BMPs must be sited at least 50 feet away from slopes steeper than 15 percent or an alternative setback established by the geotechnical expert for the project.
- Setbacks - a minimum setback (100 feet or more) must be provided between infiltration BMPs and potable wells, non-potable wells, drain fields and springs. Infiltration BMPs must be setback from building foundations at least eight feet or an alternative setback established by the geotechnical expert for the project.
- Groundwater contamination - the application of infiltration BMPs should include significant pretreatment in an area identified as an unconfined aquifer to ensure groundwater is protected for pollutants of concern.
    - Contaminated soils or groundwater plumes - infiltration BMPs are not allowed at locations with contaminated soils or groundwater where the pollutants could be mobilized or exacerbated by infiltration, unless a site-specific analysis determines that infiltration would be beneficial.
- High pollutant land uses - infiltration BMPs should not be placed in high-risk areas such as at or near service/gas stations, truck stops, and heavy industrial sites due to the groundwater contamination risk unless a site-specific evaluation demonstrates that sufficient pretreatment is provided to address pollutants of concern, high risks areas are isolated from stormwater runoff, or infiltration areas have little chance of spill migration.
- High sediment loading rates – infiltration BMPs may clog quickly if sediment loads are high (e.g., unstabilized site) or if flows are not adequately pretreated.

Design Criteria

The main challenge associated with infiltration trenches is preventing system clogging and subsequent infiltration inhibition. Infiltration trenches should be designed according to the requirements listed in Table 6-5 and outlined in the section below. BMP sizing worksheets are presented in Appendix E.

Table 6-5: Infiltration Trench Design Criteria

Design Parameter	Unit	Design Criteria
Stormwater quality design volume (SQDV)	acre-feet	See Section 2 and Appendix E for calculating SQDV.
Design drawdown time	hr	12 – 72, see Appendix D, Section D.2
Trench bottom elevation	feet	5 feet from seasonally high groundwater table
Setbacks	feet	100 feet from wells, fields, springs Geotechnical expert should establish the setback requirement from building foundations that must be ≥ 8 ft Do not locate under tree drip-lines
Pretreatment	-	BIO-3: Vegetated Swale, BIO-4: Filter Strip, proprietary device, or sedimentation forebay, for all surfaces other than roofs
Design percolation rate, (P_{design})	in/hr	Measured percolation rate must be corrected based onsite suitability assessment and design related considerations described in this fact sheet
Maximum depth of facility (d_{max})	feet	8.0; Defined by the design infiltration rate and the design drawdown time (includes ponding depth and depth of media)
Surface area of facility (A)	square feet	Based on depth of ponding (if applicable) and depth of trench media
Facility geometry	-	Minimum 24 inches wide and maximum 5 feet deep; max 3% bottom slope
Filter media diameter	inches	1 – 3 (gravel); prefabricated media may also be used
Trench lining material	-	Geotextile fabric
Overflow device	-	Required if system is on-line

Geotechnical Considerations

An extensive geotechnical site investigation must be undertaken early in the site planning process to verify site suitability for the installation of infiltration facilities due to the potential to contaminate groundwater, cause slope instability, impact surrounding structures, and have insufficient infiltration capacity. Soil infiltration rates and the water table depth should be evaluated to ensure that conditions are satisfactory for proper operation of an infiltration facility. See Appendix C for guidance on infiltration testing.

The project designer must demonstrate through infiltration testing, soil logs, and the written opinion of a licensed civil engineer that sufficiently permeable soils exist onsite to allow the construction of a properly functioning infiltration facility.

1) Infiltration facilities require a minimum soil infiltration rate of 0.5 inches/hour. If infiltration rates exceed 2.4 inches/hour, then the runoff should be fully treated in an upstream BMP prior to infiltration to protect groundwater quality. Pretreatment for coarse sediment removal is required in all instances.

2) Groundwater separation must be at least 5 feet from the trench bottom to the measured season high groundwater elevation or estimated high groundwater mounding elevation. Groundwater level measurements must be made during the time when water level is expected to be at a maximum (i.e., toward the end of the wet season).

3) Sites with a slope greater than 25% (4:1) should be excluded. A geotechnical analysis and report addressing slope stability are required if located on slopes greater than 15%.

Soil Assessment and Site Geotechnical Investigation Reports

The soil assessment report should:

- State whether the site is suitable for the proposed infiltration trench;
- Recommend a design infiltration rate (see the Step 2 of sizing methodology section, “Determine the design percolation rate,” in the Infiltration Basin fact sheet above);
- Identify the seasonally high depth to groundwater table surface elevation.
- Provide a good understanding of how the stormwater runoff will move in the soil (horizontally or vertically) and if there are any geological conditions that could inhibit the movement of water; and
- If a geotechnical investigation and report are required, the report should:
    - Provide a written opinion by a professional civil engineer describing whether the infiltration trench will compromise slope stability; and

- Identify potential impacts to nearby structural foundations.

Setbacks

1) Infiltration facilities shall be setback a minimum of 100 feet from proposed or existing potable wells, non-potable wells, septic drain fields, and springs.

2) Infiltration BMPs must be sited at least 50 feet away from slopes steeper than 15 percent or an alternative setback established by the geotechnical expert for the project.

3) Infiltration BMPs must be setback from building foundations at least eight feet or an alternative setback established by the geotechnical expert for the project.

Pretreatment

Pretreatment is required for infiltration trenches in order to reduce the sediment load entering the facility and maintain the infiltration rate of the facility. Pretreatment refers to design features that provide settling of large particles before runoff reaches a management practice; easing the long-term maintenance burden. Pretreatment is important for most all structural stormwater BMPs, but it is particularly important for infiltration BMPs. To ensure that pretreatment mechanisms are effective, designers should incorporate sediment reduction practices. Sediment reduction BMPs may include vegetated swales, vegetated filter strips, sedimentation basins or forebays, sedimentation manholes and hydrodynamic separation devices.

For design specification of selected pre-treatment devices, refer to:

- VEG-3: Vegetated swales
- VEG-4: Vegetated filter strips
- TCM-4: Sand filters
- TCM-5: Cartridge media filters
- PT-1: Hydrodynamic separation device

Sizing Criteria

See Sizing Criteria section in the INF-1: Infiltration Basin fact sheet.

Geometry and Sizing

1) Infiltration trenches should be at least 2 feet wide and 3 to 5 feet deep.

2) The longitudinal slope of the trench should not exceed 3%.

3) The filter bed media layers should have the following composition and thickness:

a. Top layer – If stormwater runoff enters the top of the trench via sheet flow at the ground surface, then the top 2 inches should be pea gravel with a thin 2 to 4 inch layer of pure sand and 2 inch layer of chocking stone (e.g., #8) to capture sediment before entering the trench. If stormwater runoff enters the trench from an underground pipe, pretreatment prior to entry into the trench is required.

b. Middle layer (3 to 5 feet of washed, 1.5 to 3 inch gravel). Void space should be in the range of 30 percent to 40 percent.

c. Bottom layer (6 inches of clean, washed sand to encourage drainage and prevent compaction of the native soil while the stone aggregate is added).

4) One or more observation wells should be installed, depending on trench length, to check for water level, drawdown time, and evidence of clogging. A typical observation well consists of a slotted PVC well screen, 4 to 6 inches in diameter, capped with a lockable, above-ground lid.

Drainage

1) The bottom of the infiltration bed must be native soil, over-excavated to at least one foot in depth and replaced uniformly without compaction. Amending the excavated soil with 2 to 4 inches (~15% to 30%) of coarse sand is recommended.

2) The hydraulic conductivity of the subsurface layers should be sufficient to ensure the design drawdown time. An observation well should be incorporated to allow observation of drain time.

Emergency Overflow

1) There must be an overflow route for stormwater flows that overtop the facility or in case the infiltration facility becomes clogged.

2) The overflow channel must be able to safely convey flows from the peak design storm to the downstream stormwater conveyance system or other acceptable discharge point.

Vegetation

1) Trees and other large vegetation should be planted away from trenches such that drip lines do not overhang infiltration beds.

Maintenance Access

1) The facility and outlet structures must all be safely accessible during wet and dry weather conditions.

2) An access road along the length of the trench is required, unless the trench is located along an existing road or parking lot that can be safely used for maintenance access.

3) If the infiltration trench becomes plugged and fails, then access is needed to excavate the facility to remove and replace the top layer or the filter bed media, as well as to increase all dimensions of the facility by 2 inches to provide a fresh surface for infiltration. To prevent damage and compaction, access must be able to accommodate a backhoe working at "arms length".

Construction Considerations

To preserve and avoid the loss of infiltration capacity, the following construction guidelines are specified:

1) The entire area draining to the facility must be stabilized before construction begins. If this is impossible, a diversion berm should be placed around the perimeter of the infiltration site to prevent sediment entering during construction.

2) Infiltration trenches should not be hydraulically connected to the stormwater conveyance system until all contributing tributary areas are stabilized as shown on the Contract Plans and to the satisfaction of the Engineer. Infiltration trenches should not be used as sediment control facilities.

3) Compaction of the subgrade with heavy equipment should be minimized to the maximum extent possible. If the use of heavy equipment on the base of the facility cannot be avoided, the infiltrative capacity should be restored by tilling or aerating prior to placing the infiltrative bed.

4) The exposed soils should be inspected by a civil engineer after excavation to confirm that soil conditions are suitable.

Operations and Maintenance

Infiltration facility maintenance should include frequent inspections to ensure that water infiltrates into the subsurface completely within the design drawdown time after a storm.

Maintenance and regular inspections are of primary importance if infiltration trenches are to continue to function as originally designed. A specific maintenance plan shall be developed specific to each facility outlining the schedule and scope of maintenance operations, as well as the documentation and reporting requirements. The following are general maintenance requirements:

1) Regular inspection should determine if the sediment pretreatment structures require preventative maintenance. Inspect a minimum of twice a year, before and after the rainy season, after large storms, or more frequently if needed.

2) If water is noticed in the observation well of the infiltration trench more than 72 hours after a major storm, the infiltration trench may be clogged. Maintenance activities triggered by a potentially clogged facility include:

a. For trenches, assess the condition of the top aggregate layer for sediment buildup and crusting. Remove top layer of pea gravel and replace. If slow draining conditions persist, entire trench may need to be excavated and replaced.

3) Any debris or algae growth located on top of the infiltration facility should be removed and disposed of properly.

4) Inspect a minimum of twice a year, before and after the rainy season, after large storms, or more frequently if needed.

5) Clean when loss of infiltrative capacity is observed. If drawdown time is observed to have increased significantly over the design drawdown time, removal of sediment may be necessary. This is an expensive maintenance activity and the need for it can be minimized through prevention of upstream erosion.

6) Mow as appropriate for vegetative cover species.

7) Monitor health of vegetation and replace as necessary.

8) Control mosquitoes as necessary.

9) Remove litter and debris from trench area as required.

INF-3: Bioretention

Bioretention stormwater treatment facilities are landscaped shallow depressions that capture and filter stormwater runoff. These facilities function as a soil and plant-based filtration device that removes pollutants through a variety of physical, biological, and chemical treatment processes. The facilities normally consist of a ponding area, mulch layer, planting soils, and plantings. An optional gravel layer can be added below the planting soil to provide additional storage volume for infiltration. As stormwater passes down through the planting soil, pollutants are filtered, adsorbed, and biodegraded by the soil and plants. For areas with low permeability native soils or steep slopes, see section INF-7: Bioinfiltration or BIO-1: Bioretention with Underdrain for relevant design specifications.

Bioretention in Parkway and parking lots

Photo Credits: Geosyntec Consultants

Application

- Commercial, residential, mixed use, institutional, and recreational uses
- Parking lot islands, traffic circles
- Road parkways & medians

Preventative Maintenance

- Repair small eroded areas
- Remove trash and debris and rake surface soils
- Remove accumulated fine sediments, dead leaves and trash
- Remove weeds and prune back excess plant growth
- Remove sediment and debris accumulation near inlet and outlet structures
- Periodically observe function under wet weather conditions

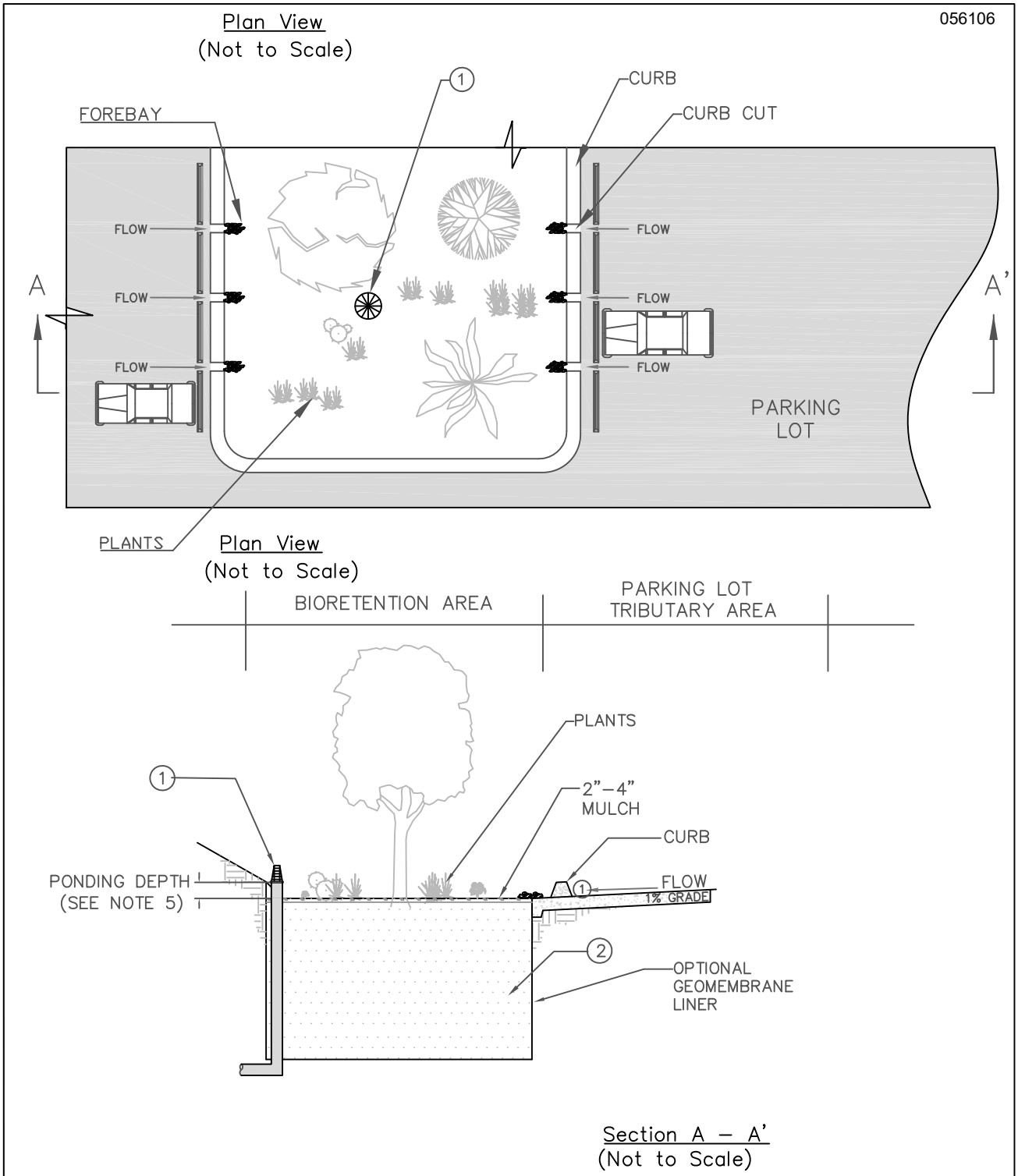

NOTES:

① OVERFLOW DEVICE: VERTICAL RISER OR EQUIVALENT.

② 2' MIN PLANTING MIX; 3' PREFERRED.

③ PONDING DEPTH 18" WITH FENCE; 6" WITHOUT FENCE.

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Figure 6-4: Bioretention

Limitations

The following limitations should be considered before choosing to use bioretention:

1) Native soil infiltration rate - soil permeability at the bioretention location must be at least 0.5 inches per hour.

2) Depth to groundwater, bedrock, or low permeability soil layer – 5 feet vertical separation is required between the bottom of the infiltration trench and the seasonal high groundwater level or mounded groundwater level, bedrock, or other barrier to infiltration to ensure that the facility will completely drain between storms and that infiltrating water will receive adequate treatment though the soils before it reaches the groundwater.

3) Slope stability - infiltration BMPs must be sited at least 50 feet away from slopes steeper than 15 percent or an alternative setback established by the geotechnical expert for the project.

4) Setbacks - a minimum setback (100 feet or more) must be provided between infiltration BMPs and potable wells, non-potable wells, drain fields, and springs. Infiltration BMPs must be setback from building foundations at least eight feet or have an alternative setback established by the geotechnical expert for the project.

5) Groundwater contamination - the application of infiltration BMPs should include significant pretreatment in an area identified as an unconfined aquifer to ensure groundwater is protected for pollutants of concern.

6) Contaminated soils or groundwater plumes - infiltration BMPs are not allowed at locations with contaminated soils or groundwater where the pollutants could be mobilized or exacerbated by infiltration, unless a site-specific analysis determines that infiltration would be beneficial.

7) High pollutant land uses - infiltration BMPs should not be placed in high-risk areas such as at or near service/gas stations, truck stops, and heavy industrial sites due to the groundwater contamination risk unless a site-specific evaluation demonstrates that sufficient pretreatment is provided to address pollutants of concern, high risks areas are isolated from stormwater runoff, or infiltration areas have little chance of spill migration.

8) High sediment loading rates – infiltration BMPs may clog quickly if sediment loads are high (e.g., unstabilized site) or if flows are not adequately pretreated.

9) Vertical relief and proximity to storm drain - site must have adequate relief between the land surface and storm drain to permit vertical percolation through the soil media and collection.

Design Criteria

Bioretention should be designed according to the requirements listed in Table 6-6 and outlined in the section below. BMP sizing worksheets are presented in Appendix E.

Table 6-6: Bioretention Design Criteria

Design Parameter	Unit	Design Criteria
Stormwater quality design volume (SQDV)	acre-feet	See Section 2 and Appendix E for calculating SQDV.
Forebay	-	Forebay should be provided for all tributary surfaces that contain landscaped areas. Forebays should be designed to prevent standing water during dry weather and should be planted with a plant palette that is tolerant of wet conditions.
Maximum drawdown time of water ponded on surface	hours	48
Maximum drawdown time of surface ponding plus subsurface pores	hours	96 (72 preferred)
Maximum ponding depth	inches	18
Minimum thickness of amended soil	feet	2 (3 preferred)
Minimum thickness of stabilized mulch	inches	2 to 3
Planting mix composition	-	60 to 80% fine sand, 20 to 40% compost
Overflow device	-	Required

Sizing Criteria

Bioretention facilities can be sized using one of two methods: a simple sizing method or a routing modeling method. With either method the SQDV volume must be completely infiltrated within 96 hours (including subsurface pore space), and surface ponding must be infiltrated within 48 hours. The simple sizing procedure is provided below. For the routing modeling method, refer to TCM-4 Sand Filters.

Step 1: Calculate the Design Volume

Bioretention facilities shall be sized to capture and infiltrate the SQDV volume (see Section 2.3 and Appendix E).

Step 2: Determine the Design Percolation Rate

The percolation rate through the BMP and to the subsurface will decline between maintenance cycles as the surface becomes occluded and particulates accumulate in the infiltration layer. Monitoring of actual facility performance has shown that the full-scale infiltration rate is far lower than the rate measured by small-scale testing. It is important that adequate conservatism is incorporated in the selection of design percolation rates. For bioretention facilities, the design percolation rate discussed here is the adjusted percolation rate of the underlying soils and not the percolation rate of the filter media bed.

Considerations for Design Percolation Rate Corrections

Suitability assessment-related considerations include (Table 6-7):

- Soil assessment methods – the site assessment extent (e.g., number of borings, test pits, etc.) and the measurement method used to estimate the short-term infiltration rate.
- Predominant soil texture/percent fines – soil texture and the percent of fines can greatly influence the potential for clogging.
- Site soil variability – site with spatially heterogeneous soils (vertically or horizontally) as determined from site investigations are more difficult to estimate average properties, resulting in a higher level of uncertainty associated with initial estimates.
- Depth to seasonal high groundwater/impervious layer – groundwater mounding may become an issue during excessively wet conditions where shallow aquifers or shallow clay lenses are present.

Localized infiltration testing refers to methods such as the double ring infiltrometer test (ASTM D3385-88), which measure infiltration rates over an area less than 10 sq-ft and do not attempt to account for soil heterogeneity. Extensive infiltration testing refers to methods that include excavating a significant portion of the proposed infiltration area, filling the excavation with water, and monitoring drawdown. In all cases, testing should be conducted in the area of the proposed BMP where, based on geotechnical data, soils appear least likely to support infiltration.

Table 6-7: Suitability Assessment Related Considerations for Infiltration Facility Safety Factors

Consideration	High Concern	Medium Concern	Low Concern
Assessment methods	Use of soil survey maps or simple texture analysis to estimate short-term infiltration rates	Direct measurement of ≥ 20 percent of infiltration area with localized infiltration measurement methods (e.g., infiltrometer)	Direct measurement of ≥ 50 percent of infiltration area with localized infiltration measurement methods or Use of extensive test pit infiltration measurement methods
Ventura Hydrology Manual soil number (measured infiltration rate)	3 (f = 0.5 – 0.64)	4 or 5 (f = 0.65 – 0.91)	6 or 7 (f = 0.92 or higher)
Site soil variability	Highly variable soils indicated from site assessment or limited soil borings collected during site assessment	Soil borings/test pits indicate moderately homogeneous soils	Multiple soil borings/test pits indicate relatively homogeneous soils
Depth to groundwater/ impervious layer	<10 ft below facility bottom	10-30 ft below facility bottom	>30 below facility bottom

Design related considerations include:

- Size of area tributary to facility – all things being equal, both physical and economic risk factors related to infiltration facilities increase with an increase in the tributary area served. Therefore facilities serving larger tributary areas should use more restrictive adjustment factors.

- Level of pretreatment/expected influent sediment loads – credit should be given for good pretreatment by allowing less restrictive factors to account for the reduced probability of clogging from high sediment loading. Also, facilities designed to capture runoff from relatively clean surfaces such as rooftops are likely to see low sediment loads and therefore should be allowed to apply less restrictive safety factors.

- Redundancy – facilities that consist of multiple subsystems operating in parallel such that parts of the system remain functional when other parts fail and/or bypass should be rewarded for the built-in redundancy with less restrictive

correction and safety factors. For example, if bypass flows would be at least partially treated in another BMP, the risk of discharging untreated runoff in the event of clogging the primary facility is reduced. A bioretention facility that overflows to a landscaped area is another example.

- Compaction during construction – proper construction oversight is needed during construction to ensure that the bottoms of bioretention facility are not overly compacted. Facilities that do not commit to proper construction practices and oversight should have to use more restrictive correction and safety factors.

Table 6-8: Design Related Considerations for Infiltration Facility Safety Factors

Consideration	High Concern	Medium Concern	Low Concern
Tributary area size	Greater than 10 acres.	Greater than 2 acres but less than 10 acres.	2 acres or less.
Level of pre-treatment/ expected influent sediment loads	Pre-treatment from gross solids removal devices only, such as hydrodynamic separators, racks and screens, AND tributary area includes landscaped areas, steep slopes, high traffic areas, or any other areas expected to produce high sediment, trash, or debris loads.	Good pre-treatment with BMPs that mitigate coarse sediments such as vegetated swales AND influent sediment loads from the tributary area are expected to be relatively low (e.g., low traffic, mild slopes, disconnected impervious areas, etc.).	Excellent pre-treatment with BMPs that mitigate fine sediments such as bioretention or media filtration OR sedimentation or facility only treats runoff from relatively clean surfaces, such as rooftops.
Redundancy of treatment	No redundancy in BMP treatment train.	Medium redundancy, other BMPs available in treatment train to maintain at least 50% of function of facility in event of failure.	High redundancy, multiple components capable of operating independently and in parallel, maintaining at least 90% of facility functionality in event of failure.
Compaction during construction	Construction of facility on a compacted site or elevated probability of unintended/ indirect compaction.	Medium probability of unintended/ indirect compaction.	Heavy equipment actively prohibited from infiltration areas during construction and low probability of unintended/ indirect compaction.

Adjust the measured short-term infiltration rate using a weighted average of several safety factors using the worksheet shown in Table 6-9 below. The design percolation rate would be determined as follows:

- For each consideration shown in Tables 6-7 and 6-8 above, determine whether the consideration is a high, medium, or low concern.
- For all high concerns assign a factor value of 3, for medium concerns assign a factor value of 2, and for low concerns assign a factor value of 1.
- Multiply each of the factors by the corresponding weight to get a product.
- Sum the products within each factor category to obtain a safety factor for each.
- Multiply the two safety factors together to get the final combined safety factor. If the combined safety factor is less than 2, then use 2 as the safety factor.
- Divide the measured short-term infiltration rate by the combined safety factor to obtain the adjusted design percolation rate for use in sizing the infiltration facility.

Table 6-9: Infiltration Facility Safety Factor Determination Worksheet

Factor Category		Factor Description	Assigned Weight (w)	Factor Value (v)	Product (p) p = w x v
A	Suitability Assessment	Soil assessment methods	0.25		
		Predominant soil texture	0.25		
		Site soil variability	0.25		
		Depth to groundwater / impervious layer	0.25		
		Suitability Assessment Safety Factor, $S_A = \Sigma p$			
B	Design	Tributary area size	0.25		
		Level of pre-treatment/ expected sediment loads	0.25		
		Redundancy	0.25		
		Compaction during construction	0.25		
		Design Safety Factor, $S_B = \Sigma p$			
		Combined Safety Factor = S_A x S_B			

Note: The minimum combined adjustment factor shall not be less than 2.0 and the maximum combined adjustment factor shall not exceed 9.

Step 3: Calculate the surface area

Determine the size of the required infiltrating surface by assuming the SQDV will fill the available ponding depth plus the void spaces in the media, based on the computed porosity of the filter media and optional aggregate layer.

1) Determine the maximum depth of surface ponding that can be infiltrated within the required surface drain time (48 hr), (d_{max}), as follows:

$$d_{\max} = \frac{P_{design} \times t_{ponding}}{12\frac{in}{ft}} \qquad \text{(Equation 6-6)}$$

Where:

$t_{ponding}$	=	required drain time of surface ponding (48 hrs)
P_{design}	=	design percolation rate of underlying soils (in/hr) (see Step 2, above)
d_{max}	=	the maximum depth of surface ponding water that can be infiltrated within the required drain time (ft), calculated using Equation 6-6

2) Choose surface ponding depth (d_p) such that:

$$d_p \le d_{\max} \qquad \text{(Equation 6-7)}$$

Where:

d_p	=	selected surface ponding depth (ft)
d_{max}	=	the maximum depth of water that can be infiltrated within the required drain time (ft)

Choose thickness(es) of amended media and optional gravel storage layer and calculate total effective storage depth of the bioretention area ($d_{effective}$), as follows:

$$d_{effective} \le (d_p + n^*_{media} l_{media} + n_{gravel} l_{gravel}) \qquad \text{(Equation 6-8)}$$

Where:

$d_{effective}$	=	total equivalent depth of water stored in bioretention area (ft), including surface ponding and volume available in pore spaces of media and gravel layers
d_p	=	surface ponding depth (ft), chosen using Equation 6-7
n^*_{media}	=	available porosity of amended soil media (ft/ft), approximately 0.25 ft/ft accounting for antecedent moisture conditions. This represents the volume of

available pore space as a fraction of the total soil volume; sometimes has units of (ft^3/ft^3) or described as a percentage.

l_{media} = thickness of amended soil media layer (ft), minimum 2 ft

n_{gravel} = porosity of optional gravel layer (ft/ft), approximately 0.40 ft/ft

l_{gravel} = thickness of optional gravel layer (ft)

3) Check that entire effective depth (surface plus subsurface storage), $d_{effective}$, infiltrates in no greater than 96 hours as follows:

$$t_{total} = \frac{d_{effective}}{P_{design}} \times 12 \frac{in}{ft} \leq 96\ hr \qquad \text{(Equation 6-9)}$$

Where:

$d_{effective}$ = total equivalent depth of water stored in bioretention area (ft), calculated using Equation 6-8

P_{design} = design percolation rate of underlying soils (in/hr) (see Step 2, above)

If $t_{total} > 96$ hrs, then reduce surface ponding depth and/or amended media thickness and/or gravel thickness and return to 1).

If $t_{total} \leq 96$ hrs, then proceed to 5).

4) Calculate required infiltrating surface area, (A_{req}):

$$A_{req} = \frac{SQDV}{d_{effective}} \qquad \text{(Equation 6-10)}$$

Where:

A_{req} = required infiltrating area (ft^2). Should be calculated at the contour corresponding to the mid ponding depth (i.e., $0.5 \times d_p$ from the bottom of the facility).

$SQDV$ = stormwater quality design volume (ft^3)

$d_{effective}$ = total equivalent depth of water stored in bioretention area (ft), calculated using Equation 6-8

5) Calculate total footprint required by including a buffer for side slopes and freeboard; A_{req} is calculated at the contour corresponding to the mid ponding depth (i.e., $0.5 \times d_p$ from the bottom of the facility).

Geometry

1) Bioretention areas shall be sized to capture and treat the stormwater quality design volume (See Section 2 and Appendix E for calculating SQDV) with an 18-inch maximum ponding depth. *The intention is that ponding depth be limited to a depth that will allow for a health vegetation layer.*

2) Minimum planting soil depth should be 2 feet, although 3 feet is preferred. *The intention is that the minimum planting soil depth should provide a beneficial root zone for the chosen plant palette and adequate water storage for the SQDV.*

3) A gravel storage layer below the bioretention soil media to promote infiltration into the native soil is optional.

4) Bioretention should be designed to drain below the planting soil in less than 48 hours and completely drain in less than 96 hours. *The intention is that soils must be allowed to dry out periodically in order to restore hydraulic capacity needed to receive flows from subsequent storms, maintain infiltration rates, maintain adequate soil oxygen levels for healthy soil biota and vegetation, and to provide proper soil conditions for biodegradation and retention of pollutants.*

Flow Entrance and Energy Dissipation

The following types of flow entrance can be used for bioretention cells:

1) Dispersed, low velocity flow across a landscape area. Dispersed flow may not be possible given space limitations or if the facility is controlling roadway or parking lot flows where curbs are mandatory.

2) Dispersed flow across pavement or gravel and past wheel stops for parking areas.

3) Curb cuts for roadside or parking lot areas: curb cuts should include rock or other erosion protection material in the channel entrance to dissipate energy. Flow entrance should drop 2 to 3 inches from curb line and it should provide a settling area and periodic sediment removal of coarse material before flow dissipates to the remainder of the cell.

4) Pipe flow entrance: Piped entrances, such as roof downspouts, should include rock, splash blocks, or other appropriate measures at the entrance to dissipate energy and disperse flows.

Woody plants (trees, shrubs, etc.) can restrict or concentrate flows and can be damaged by erosion around the root ball and should not be placed directly in the entrance flow path.

Overflow

An overflow device is required at the 18-inch ponding depth. The following, or equivalent should be provided:

1) A vertical PVC pipe (SDR 35) to act as an overflow riser.

2) The overflow riser(s) should be 6 inches or greater in diameter, so it can be cleaned without damage to the pipe.

The inlet to the riser should be at the ponding depth (18 inches for fenced bioretention areas and 6 inches for areas that are not fenced), and be capped with a spider cap to exclude floating mulch and debris. Spider caps should be screwed in or glued, i.e., not removable.

Hydraulic Restriction Layers

Infiltration pathways may need to be restricted due to the close proximity of roads, foundations, or other infrastructure. A geomembrane liner, or other equivalent water proofing, may be placed along the vertical walls to reduce lateral flows. This liner should have a minimum thickness of 30 mils.

Planting/Storage Media

1) The planting media placed in the cell should achieve a long-term, in-place infiltration rate of at least 1 inch per hour. Higher infiltration rates are permissible. If the design long-term, in-place infiltration rate of the soil exceeds 12 inches per hour, documentation should be provided to demonstrate that the media will adequately address pollutants of concern at a higher flowrate. Bioretention soil shall also support vigorous plant growth.

2) Planting media should consist of 60 to 80% fine sand and 20 to 40% compost.

3) Sand should be free of wood, waste, coating such as clay, stone dust, carbonate, etc., or any other deleterious material. All aggregate passing the No. 200 sieve size should be non-plastic. Sand for bioretention should be analyzed by an accredited lab using #200, #100, #40, #30, #16, #8, #4, and 3/8 sieves (ASTM D 422 or as approved by the local permitting authority) and meet the following gradation (Note: all sands complying with ASTM C33 for fine aggregate comply with the gradation requirements below):

Sieve Size (ASTM D422)	% Passing (by weight)	
	Minimum	Maximum
3/8 inch	100	100
#4	90	100
#8	70	100
#16	40	95
#30	15	70
#40	5	55
#100	0	15
#200	0	5

Note: the gradation of the sand component of the media is believed to be a major factor in the hydraulic conductivity of the media mix. If the desired hydraulic conductivity of the media cannot be achieved within the specified proportions of sand and compost (#2), then it may be necessary to utilize sand at the coarser end of the range specified in above ("minimum" column).

4) Compost should be a well decomposed, stable, weed free organic matter source derived from waste materials including yard debris, wood wastes, or other organic materials not including manure or biosolids meeting standards developed by the US Composting Council (USCC). The product shall be certified through the USCC Seal of Testing Assurance (STA) Program (a compost testing and information disclosure program). Compost quality should be verified via a lab analysis to be:

- Feedstock materials shall be specified and include one or more of the following: landscape/yard trimmings, grass clippings, food scraps, and agricultural crop residues.
- Organic matter: 35-75% dry weight basis.
- Carbon and Nitrogen Ratio: 15:1 < C:N < 25:1
- Maturity/Stability: shall have dark brown color and a soil-like odor. Compost exhibiting a sour or putrid smell, containing recognizable grass or leaves, or is hot (120 F) upon delivery or rewetting is not acceptable.
- Toxicity: any one of the following measures is sufficient to indicate non-toxicity:
  - NH4:NH3 < 3
  - Ammonium < 500 ppm, dry weight basis
  - Seed Germination > 80% of control
  - Plant trials > 80% of control

- Solvita® > 5 index value

- Nutrient content:
  - Total Nitrogen content 0.9% or above preferred
  - Total Boron should be <80 ppm, soluble boron < 2.5 ppm
- Salinity: < 6.0 mmhos/cm
- pH between 6.5 and 8 (may vary with plant palette)

Compost for bioretention should be analyzed by an accredited lab using #200, ¼ inch, ½ inch, and 1 inch sieves (ASTM D 422 or as approved by the local permitting authority) and meet the following gradation:

Sieve Size (ASTM D422)	% Passing (by weight)	
	Minimum	Maximum
1 inch	99	100
½ inch	90	100
¼ inch	40	90
#200	2	10

Tests should be sufficiently recent to represent the actual material that is anticipated to be delivered to the site. If processes or sources used by the supplier have changed significantly since the most recent testing, new tests should be requested.

Note: the gradation of compost used in bioretention media is believed to play an important role in the saturated hydraulic conductivity of the media. To achieve a higher saturated hydraulic conductivity, it may be necessary to utilize compost at the coarser end of this range ("minimum" column). The percent passing the #200 sieve (fines) is believed to be the most important factor in hydraulic conductivity.

In addition, a coarser compost mix provides more heterogeneity of the bioretention media, which is believed to be advantageous for more rapid development of soil structure needed to support health biological processes. This may be an advantage for plant establishment with lower nutrient and water input.

5) The bioretention area should be covered with 2 to 4 inches (average 3 inches) of mulch at the start and an additional placement of 1 to 2 inches of mulch should be added annually. *The intention is that to help sustain the nutrient levels, suppress weeds, retain moisture, and maintain infiltration capacity*.

Plants

1) Plant materials should be tolerant of summer drought, ponding fluctuations, and saturated soil conditions for 48 to 96 hours.

2) It is recommended that a minimum of three types of tree, shrubs, and/or herbaceous groundcover species be incorporated to protect against facility failure due to disease and insect infestations of a single species.

3) Native plant species and/or hardy cultivars that are not invasive and do not require chemical inputs should be used to the maximum extent practicable.

Operations and Maintenance

Bioretention areas require annual plant, soil, and mulch layer maintenance to ensure optimum infiltration, storage, and pollutant removal capabilities. In general, bioretention maintenance requirements are typical landscape care procedures and include:

1) Watering: Plants should be drought-tolerant. Watering may be required during prolonged dry periods after plants are established.

2) Erosion control: Inspect flow entrances, ponding area, and surface overflow areas periodically, and replace soil, plant material, and/or mulch layer in areas if erosion has occurred (see Appendix I for a bioretention inspection and maintenance checklist). Properly designed facilities with appropriate flow velocities should not have erosion problems, except perhaps in extreme events. If erosion problems occur, the following should be reassessed: (1) flow velocities and gradients within the cell, and (2) flow dissipation and erosion protection strategies in the pretreatment area and flow entrance. If sediment is deposited in the bioretention area, immediately determine the source within the contributing area, stabilize, and remove excess surface deposits.

3) Plant material: Depending on aesthetic requirements, occasional pruning and removing of dead plant material may be necessary. Replace all dead plants and if specific plants have a high mortality rate, assess the cause and, if necessary, replace with more appropriate species. Periodic weeding is necessary until plants are established. The weeding schedule should become less frequent if the appropriate plant species and planting density have been used and, as a result, undesirable plants excluded.

4) Nutrients and pesticides: The soil mix and plants should be selected for optimum fertility, plant establishment, and growth. Nutrient and pesticide inputs should not be required and may degrade the pollutant processing capability of the bioretention area, as well as contribute pollutant loads to receiving waters. By design, bioretention facilities are located in areas where phosphorous and nitrogen levels are often elevated and these should not be limiting nutrients. If in question, have soil analyzed for fertility.

5) Mulch: Replace mulch annually in bioretention facilities where heavy metal deposition is likely (e.g., contributing areas that include industrial and auto dealer/repair parking lots and roads). In residential lots or other areas where metal

deposition is not a concern, replace or add mulch as needed to maintain a 2 to 3 inch depth at least once every two years.

6) Soil: Soil mixes for bioretention facilities are designed to maintain long-term fertility and pollutant processing capability. Estimates from metal attenuation research suggest that metal accumulation should not present an environmental concern for at least 20 years in bioretention systems. Replacing mulch in bioretention facilities where heavy metal deposition is likely provides an additional level of protection for prolonged performance. If in question, have soil analyzed for fertility and pollutant levels.

INF-4: Drywell

A dry well is defined as a bored, drilled, or driven shaft or hole whose depth is greater than its width. A dry well is designed specifically for flood alleviation and stormwater disposal. Drywells are similar to infiltration trenches in their design and function, as they are designed to temporarily store and infiltrate runoff, primarily from rooftops or other impervious areas with low pollutant loading. A dry well may be either a small excavated pit filled with aggregate or a prefabricated storage chamber or pipe segment.

Dry wells can be used to reduce the increased volume of stormwater runoff caused by roofs of buildings. While generally not a significant source of runoff pollution, roofs are one of the most important sources of new or increased runoff volume from land development sites. Dry wells can also be used to indirectly enhance water quality by reducing the amount of SQDV to be treated by the other, downstream stormwater management facilities.

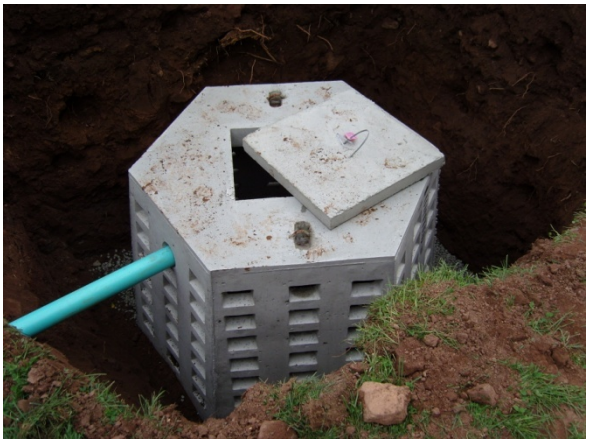

Drywell installation

Photo Credits: 1. K&A Enterprises; 2. Canale Landscaping

Application

- Infiltration of roof runoff

Preventative Maintenance

- Remove trash, debris, and sediment at inlet and outlets
- Wet weather inspection to ensure drain time
- Inspect for mosquito breeding

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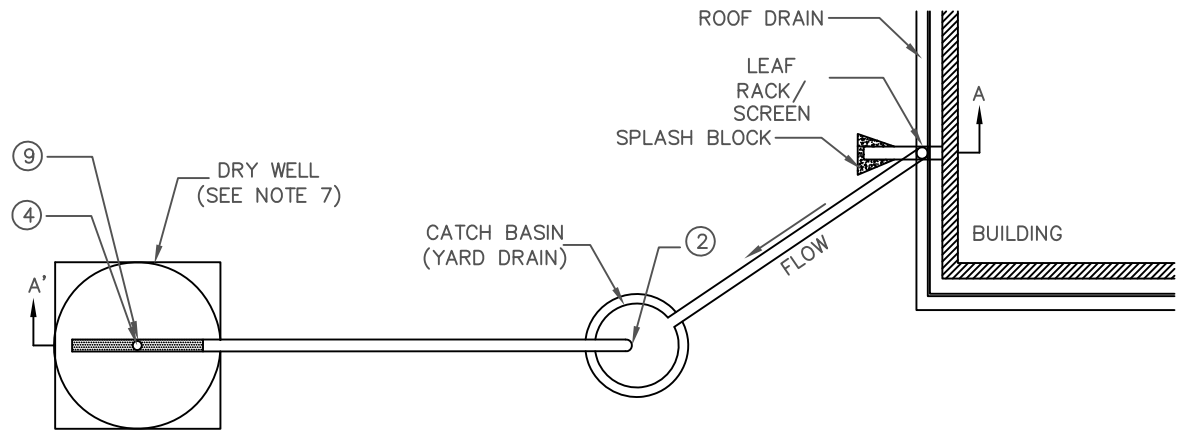

Plan View
(Not to Scale)

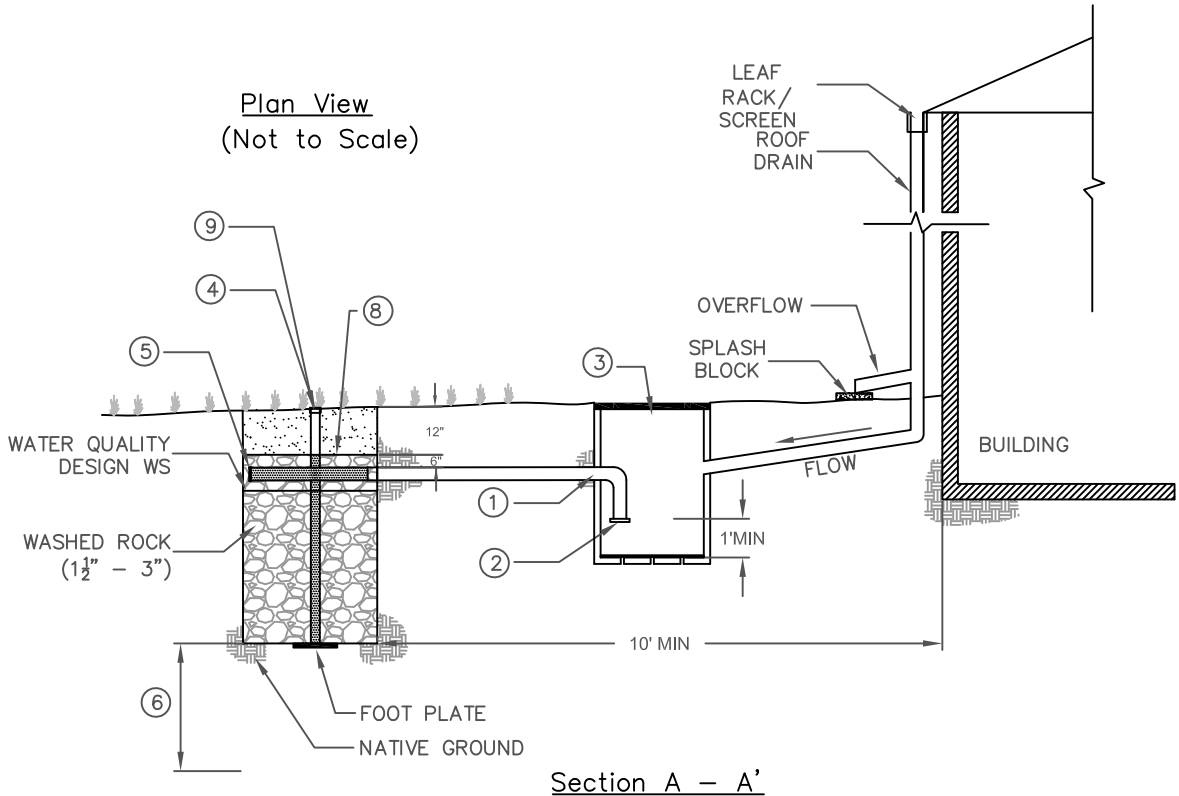

Section A – A'
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NOTES:

1. MINIMUM 4" – 6" DIAMETER PVC PIPE. INSTALL AT FLAT SLOPE.
2. INSTALL FINE MESH SCREEN AT INLET TO DRY WELL. SET INLET ELEVATION AT 1' MINIMUM ABOVE CATCH BASIN BOTTOM.
3. CATCH BASIN (YARD DRAIN) INSTALLED WITH A SOLID LID FLUSH WITH GROUND SURFACE.
4. 4–6" VERTICAL PERFORATED PVC INSPECTION WELL WITH SCREW LID (NUT DOWN) FLUSH WITH GROUND SURFACE.
5. CAP END OF 4–6" HORZONTAL PERFORATED PVC DISPERSION PIPE.
6. MINIMUM 10' ABOVE SEASONAL HIGH GROUNDWATER TABLE AND 3' ABOVE BEDROCK.
7. DRY WELL CONFIGURATION MAY VARY (E.G. PRE–FAB MAY BE CIRCULAR).
8. CHOKING STONE LAYER SHALL BE PLACED ON TOP OF THE DRY WELL TO SEPARATE IT FROM THE TOPSOIL AND PREVENT CLOGGING.

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Figure 6-5: Drywell

Limitations

The following limitations shall be considered before choosing to use a dry well:

- Native soil infiltration rate – soil permeability at the infiltration basin location must be at least 0.5 inches per hour.
- Depth to groundwater, bedrock, or low permeability soil layer – 5 feet vertical separation is required between the bottom of the infiltration basin and the seasonal high groundwater level or mounded groundwater level, bedrock, or other barrier to infiltration to ensure that the facility will completely drain between storms and that infiltrating water will receive adequate treatment though the soils before it reaches the groundwater.
- Slope stability - infiltration BMPs must be sited at least 50 feet away from slopes steeper than 15 percent or an alternative setback established by the geotechnical expert for the project.
- Setbacks - a minimum setback (100 feet or more) must be provided between infiltration BMPs and potable wells, non-potable wells, drain fields, and springs. Infiltration BMPs must be setback from building foundations at least eight feet or have an alternative setback established by the geotechnical expert for the project.
- Groundwater contamination - the application of infiltration BMPs should include significant pretreatment in an area identified as an unconfined aquifer, to ensure groundwater is protected from pollutants of concern.
- Contaminated soils or groundwater plumes - infiltration BMPs are not allowed at locations with contaminated soils or groundwater where the pollutants could be mobilized or exacerbated by infiltration, unless a site-specific analysis determines the infiltration would be beneficial.
- High pollutant land uses - infiltration BMPs should not be placed in high-risk areas such as at or near service/gas stations, truck stops, and heavy industrial sites due to groundwater contamination risk unless a site-specific evaluation demonstrates that sufficient pretreatment is provided to address pollutants of concern, high risks areas are isolated from stormwater runoff, or infiltration areas have little chance of spill migration.
- High sediment loading rates – infiltration BMPs may clog quickly if sediment loads are high (e.g., unstabilized site) or if flows are not adequately pretreated.
- Dry wells cannot receive untreated stormwater runoff, except rooftop runoff. Pretreatment of runoff from other surfaces is necessary to prevent premature failure that results from clogging with fine sediment, and to prevent potential groundwater contamination due to nutrients, salts, and hydrocarbons.

- Infiltration structures cannot be used to treat runoff from portions of the site that are not stabilized.
- Rehabilitation of failed dry wells requires complete reconstruction.

Design Criteria

The main challenge associated with drywells, as with infiltration trenches, is the prevention of system clogging and subsequent infiltration inhibition. Drywells should be designed according to the requirements listed in Table 6-10 and outlined in the section below. BMP sizing worksheets are presented in Appendix E.

Table 6-10: Infiltration BMP Design Criteria

Design Parameter	Unit	Design Criteria
Stormwater quality design volume (SQDV)	acre-feet	See Section 2 and Appendix E for calculating SQDV.
Design drawdown time	hour	12
Pretreatment	-	BIO-3: Vegetated Swale, BIO-4: Filter Strip, proprietary device, or equivalent.
Design percolation rate (k_{design})	in/hr	Shall be corrected for testing method, potential for clogging and compaction over time, and facility geometry.
Maximum depth of facility (d_{max})	feet	Defined by the design infiltration rate and the design drawdown time (includes depth of media).
Surface area of facility (A)	ft^2	Based on depth of dry well media.
Facility geometry	-	Geometry varies; max 10 feet deep; flat bottom slope.
Filter media diameter	inches	1.5 – 3 (gravel); prefabricated media may also be used
Overflow device	-	Required if system is on-line

Geotechnical Considerations

An extensive geotechnical site investigation must be undertaken early in the site planning process to verify site suitability for the installation of infiltration facilities, due to the potential to contaminate groundwater, cause slope instability, impact surrounding structures, and have insufficient infiltration capacity. Soil infiltration rates and the water table depth should be evaluated to ensure that conditions are satisfactory for proper operation of an infiltration facility. See Appendix C for guidance on infiltration testing.

The project designer must demonstrate through infiltration testing, soil logs, and the written opinion of a licensed civil engineer that sufficiently permeable soils exist on site to allow the construction of a properly functioning infiltration facility.

1) Infiltration facilities require a minimum soil infiltration rate of 0.5 inches/hour. If infiltration rates exceed 2.4 inches/hour, then the runoff should be fully-treated in an upstream BMP prior to infiltration to protect groundwater quality. Pretreatment for coarse sediment removal is required in all instances.

2) Groundwater separation must be at least 5 feet from the basin bottom to the measured season high groundwater elevation or estimated high groundwater mounding elevation. Measurements of groundwater levels must be made during the time when water level is expected to be at a maximum (i.e., toward the end of the wet season).

3) Sites with a slope greater than 25% (4:1) should be excluded. A geotechnical analysis and report addressing slope stability are required if located on slopes greater than 15%.

Soil Assessment and Site Geotechnical Investigation Reports

The soil assessment report should:

- State whether the site is suitable for the proposed drywell;
- Recommend a design infiltration rate (see the Step 2 of sizing methodology section, "Determine the design percolation rate," in the INF-1: Infiltration Basin fact sheet above);
- Identify the seasonal high depth to groundwater table surface elevation;
- Provide a good understanding of how the stormwater runoff will move in the soil (horizontally or vertically) and if there are any geological conditions that could inhibit the movement of water; and
- If a geotechnical investigation and report are required, the report should:
  - Provide a written opinion by a professional civil engineer describing whether the drywell will compromise slope stability; and
  - Identify potential impacts to nearby structural foundations.

Setbacks

1) Infiltration facilities shall be setback a minimum of 100 feet from proposed or existing potable wells, non-potable wells, septic drain fields, and springs.

2) Infiltration BMPs must be sited at least 50 feet away from slopes steeper than 15 percent or an alternative setback established by the geotechnical expert for the project.

3) Infiltration BMPs must be setback from building foundations at least eight feet or have an alternative setback established by the geotechnical expert for the project.

Pretreatment

- A removable filter with a screened bottom should be installed in the roof leader below the surcharge pipe in order to screen out leaves and other debris.

- Though roofs are generally not a significant source of runoff pollution, they can still be source of particulates and organic matter. Measures such as roof gutter guards, roof leader clean-out with sump, or an intermediate sump box can provide pretreatment for dry wells by minimizing the amount of sediment and other particulates that may enter it.

Sizing Criteria

See Sizing Criteria section in the INF-1: Infiltration Basin fact sheet.

Geometry and Sizing

1) Dry well configurations vary, but generally they have length and width dimensions closer to square than infiltration trenches. Pre-fabricated dry-wells are often circular. The surface area of the dry well must be large enough to infiltrate the storage volume in 12 hours based on the maximum depth allowable (d_{max}).

2) The filter bed media layers are the same as for infiltration trenches unless prefabricated dry wells and/or media are used. The porosity of gravel media systems is generally 30 to 40% and is 80 to 95% for prefabricated media systems.

3) If a dry well receives runoff from an underground pipe (i.e., runoff does not enter the top of the dry well from the ground surface), a fine mesh screen should be installed at the inlet. The inlet elevation should be 18 inches below the ground surface (i.e., below 12 inches of surface soil and 6 inches of dry well media).

4) An observation well should be installed to check for water levels, drawdown time, and evidence of clogging. A typical observation well consists of a slotted PVC well screen, 4 to 6 inches in diameter, capped with a lockable, above-ground lid.

Drainage

1) The bottom of infiltration bed must be native soil, over-excavated to at least one foot in depth and replaced uniformly without compaction. Amending the excavated soil with 2 to 4 inches (~15% to 30%) of coarse sand is recommended.

2) The hydraulic conductivity of the subsurface layers should be sufficient to ensure a maximum 12 hr drawdown time. An observation well should be incorporated to allow observation of drain time.

Emergency Overflow

1) There must be an overflow route for stormwater flows that overtop the facility or in case the infiltration facility becomes clogged.

2) The overflow channel must be able to safely convey flows from the peak design storm to the downstream stormwater conveyance system or other acceptable discharge point.

Vegetation

1) Drywells should be kept free of vegetation.

2) Trees and other large vegetation should be planted away from drywells such that drip lines do not overhang infiltration beds.

Maintenance Access

1) The facility and outlet structures must all be safely accessible during wet and dry weather conditions.

2) Maintenance access is required.

3) If the drywell becomes plugged and fails, then access is needed to excavate the facility to remove and replace the top layer and the filter bed media of the structure. To prevent damage and compaction, access must be able to accommodate a backhoe working at “arms length”.

Construction Considerations

To preserve and avoid the loss of infiltration capacity, the following construction guidelines should be specified:

1) The entire area draining to the facility must be stabilized before construction begins. If this is impossible, a diversion berm should be placed around the perimeter of the infiltration site to prevent sediment entering during construction.

2) Drywells should not be hydraulically connected to the stormwater conveyance system until all contributing tributary areas are stabilized as shown on the Contract Plans and to the satisfaction of the Engineer. Drywells should not be used as sediment control facilities.

3) Compaction of the subgrade with heavy equipment should be minimized to the maximum extent possible. If the use of heavy equipment on the base of the facility

cannot be avoided, the infiltration capacity should be restored by tilling or aerating prior to placing the infiltrative bed.

4) The exposed soils should be inspected by a civil engineer after excavation to confirm that soil conditions are suitable.

Operations and Maintenance

Drywell maintenance should be performed frequently to ensure that water infiltrates into the subsurface completely within the recommended infiltration time (or drain time if a drywell receives runoff from an underground pipe) of 72 hours or less after a storm.

Maintenance and regular inspections are important for the proper function of drywells. A specific maintenance plan shall be developed specifically for each facility outlining the schedule and scope of maintenance operations, documentation, and reporting requirements.

INF-5: Permeable Pavement

Permeable pavements contain small voids that allow water to pass through to a stone base. They come in a variety of forms; they may be a modular paving system (concrete pavers, grass-pave, or gravel-pave) or a poured-in-place solution (porous concrete or permeable asphalt). All permeable pavements with a stone reservoir base treat stormwater and remove sediments and metals to some degree. While conventional pavement result in increased rates and volumes of surface runoff, porous pavements when properly constructed and maintained, allow some of the stormwater to percolate through the pavement and enter the soil below. This facilitates groundwater recharge while providing the structural and functional features needed for the roadway, parking lot, or sidewalk. The paving surface, subgrade, and installation requirements of permeable pavements are more complex than those for conventional asphalt or concrete surfaces. For porous pavements to function properly over an expected life span of 15 to 20 years, they must be properly sited and carefully designed and installed, as well as periodically maintained. Failure to protect paved areas from construction-related sediment loads can result in their premature clogging and failure. Note that the 2011 TGM does not provide specific instructions on how to design and construct pavement.

Permeable pavement applications

Photo Credits: 1. Geosyntec Consultants; 2. EPA Stormwater Manaaement

Application

- Parking lots
- Driveways
- Sidewalks and walkways
- Outdoor athletic courts

Preventative Maintenance

- Trash removal
- Post-rain inspections
- Vacuum sweeping
- Vegetation inspection and removal

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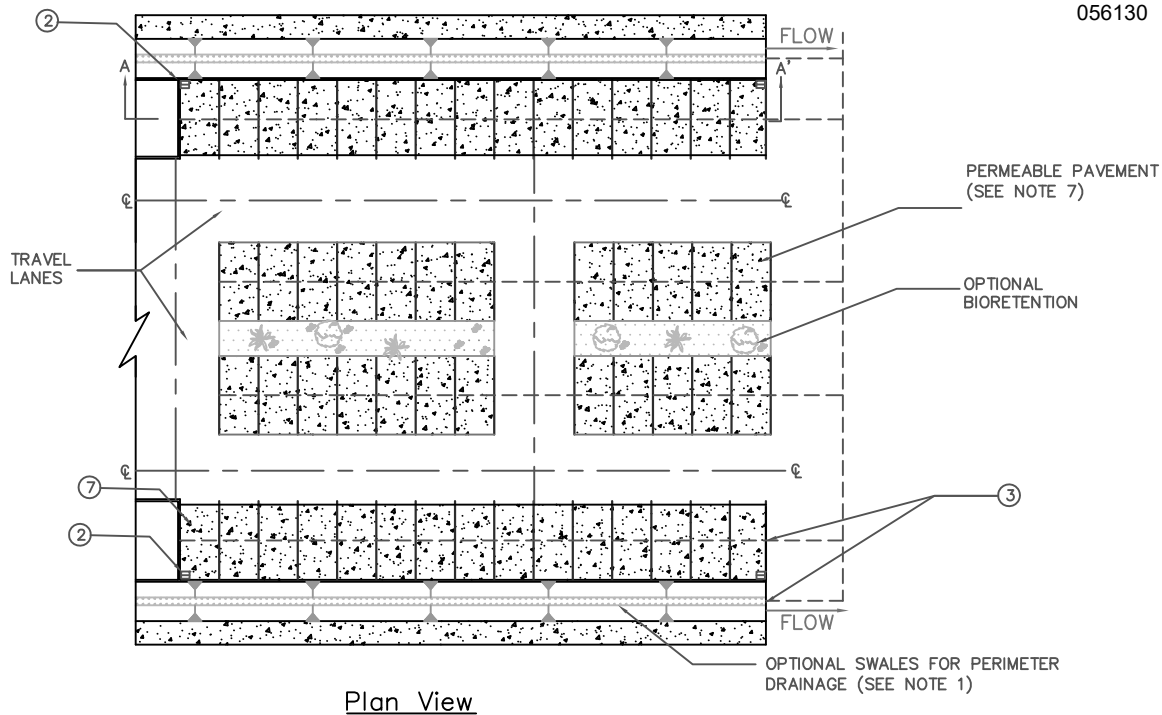

Plan View
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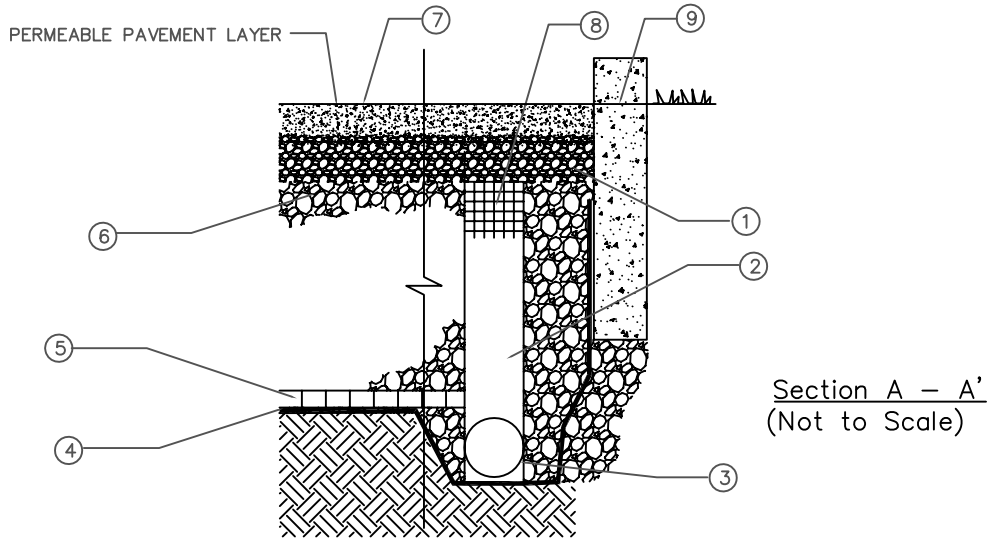

Section A – A'
(Not to Scale)

NOTES:

1. BEDDING COURSE SHALL BE 1½" TO 3" MIN THICKNESS (TYP NO. 8 AGGREGATE).
2. OPTIONAL OVERFLOW PIPE(S) SHALL BE PROVIDED IF OVERFLOWS ARE NOT MANAGED VIA PERIMETER DRAINAGE TO SWALES, BIORETENTION OR STORM WATER CONVEYANCE SYSTEM INLETS.
3. CONNECT OUTFALL PIPES TO DOWNSTREAM STORMWATER CONVEYANCE SYSTEM. OUTFALL PIPES SHALL BE SLOPED TOWARDS COLLECTION SYSTEM.
4. SOIL SUBGRADE SHALL HAVE ZERO SLOPE.
5. INSTALL GEOTEXTILE OR CHOKING LAYER ON BOTTOM & SIDES OF OPEN–GRADED BASE FOR FULL AND PARTIAL INFILTRATION, OR AN IMPERMEABLE LINER FOR NO INFILTRATION.
6. OPEN–GRADED BASE. THICKNESS AND GRADATION VARIES WITH DESIGN. TYP. NO. 57 AGGREGATE OR 4" THICK NO. 57 OVER NO. 2 STONE SUBASE. THICKNESS OF SUB–BASE VARIES WITH DESIGN.
7. PERMEABLE PAVEMENT INFILTRATIVE LAYER
8. OPTIONAL RIGID PLASTIC SCREEN FASTENED OVER OVERFLOW INLETS.
9. CURB/EDGE RESTRAINT WITH CUT–OUTS FOR OVERFLOW DRAINAGE TO PERIMETER BMPS, STORMWATER CONVEYANCE SYSTEM INLETS OR OPTIONAL OVERFLOW PIPES.
10. PARTIAL EXFILTRATION THROUGH THE SOIL. PERFORATED PIPES DRAIN EXCESS RUNOFF THAT CAN NOT BE ABSORBED BY SLOW–DRAINING SOIL.

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Figure 6-6: Permeable Pavement

Limitations

The following describes limitations for the use of permeable pavement.

- Native soil infiltration rate - permeability of soils at the BMP location must be at least 0.5 inches per hour.
- Depth to groundwater, bedrock, or low permeability soil layer – 5 feet vertical separation is required between the bottom of the infiltration trench and the seasonal high groundwater level or mounded groundwater level, bedrock, or other infiltration barrier to ensure that the facility will completely drain between storms and that infiltrating water will receive adequate treatment though the soils before it reaches the groundwater.
- Slope stability - infiltration BMPs must be sited at least 50 feet away from slopes steeper than 15 percent or an alternative setback established by the geotechnical expert for the project.
- Setbacks - a minimum setback (100 feet or more) must be provided between infiltration BMPs and potable wells, non-potable wells, drain fields, and springs. Infiltration BMPs must be setback from building foundations at least eight feet or an alternative setback established by the geotechnical expert for the project.
- Groundwater contamination - the application of infiltration BMPs should include significant pretreatment in an area identified as an unconfined aquifer, to ensure groundwater is protected for pollutants of concern.
- Contaminated soils or groundwater plumes - infiltration BMPs are not allowed at locations with contaminated soils or groundwater where the pollutants could be mobilized or exacerbated by infiltration, unless a site-specific analysis determines the infiltration would be beneficial.
- High pollutant land uses - infiltration BMPs should not be placed in high-risk areas such as at or near a service/gas stations, truck stops, and heavy industrial sites due to the groundwater contamination risk unless a site-specific evaluation demonstrates that sufficient pretreatment is provided to address pollutants of concern, high risks areas are isolated from stormwater runoff, or infiltration areas that have little chance of spill migration.
- High sediment loading rates – infiltration BMPs may clog quickly if sediment loads are high (e.g., unstabilized site) or if flows are not adequately pretreated.
- Permeable pavement cannot receive untreated stormwater runoff from other surfaces. Pretreatment of run-on from other surfaces is necessary to prevent premature failure that results from clogging with fine sediment.

- Permeable pavement cannot be used to treat runoff from portions of the site that are not stabilized.

Design Criteria

Permeable pavement should be designed according to the requirements listed in Table 6-11 and outlined in the section below.

Table 6-11: Permeable Pavements Design Criteria

Design Parameter	Unit	Design Criteria
Stormwater Quality Design Volume (SQDV)	acre-feet	See Section 2 and Appendix E for calculating SQDV.
Pretreatment	-	Runoff from pervious areas should be minimized but, if provided, BIO-3: Vegetated Swale or BIO-4: Filter Strip should be provided for all runoff from offsite sources that are not directly adjacent to the permeable pavement.
Drawdown time of gravel drainage layer	hrs	12 - 72
Porous Pavement Infill		ASTM C-33 sand or equivalent
Minimum depth to bedrock	ft	2 (without underdrains)
Minimum depth to seasonal high water table	ft	2 (with underdrains); 10 (without underdrains)
Infiltration rate of subsoil	in/hr	1.0 (minimum without an underdrain)
Overflow device	-	Required

Geotechnical Considerations

An extensive geotechnical site investigation must be undertaken early in the site planning process to verify site suitability for the installation of infiltration facilities, due to the potential to contaminate groundwater, cause slope instability, impact surrounding structures, and have insufficient infiltration capacity. Soil infiltration rates and the water table depth should be evaluated to ensure that conditions are satisfactory for proper operation of an infiltration facility. See Appendix C for guidance on infiltration testing.

The project designer must demonstrate through infiltration testing, soil logs, and the written opinion of a licensed civil engineer that sufficiently permeable soils exist onsite to allow the construction of a properly functioning infiltration facility.

1) Infiltration facilities require a minimum native soil infiltration rate of 0.5 inches/hour. If infiltration rates exceed 2.4 inches/hour, then the runoff should be fully treated in an upstream BMP prior to infiltration to protect groundwater quality.

Pretreatment for removing coarse sediment present in runoff from the tributary area is required in all instances.

2) Groundwater separation must be at least 5 feet from the basin bottom to the measured season high groundwater elevation or estimated high groundwater mounding elevation. Groundwater levels measurements must be made during the time when the water level is expected to be at a maximum (i.e., toward the end of the wet season).

3) Sites with a slope greater than 25% (4:1) should be excluded. A geotechnical analysis and report addressing slope stability are required if located on slopes greater than 15%.

Soil Assessment and Site Geotechnical Investigation Reports

The soil assessment report should:

- State whether the site is suitable for the proposed permeable pavement;
- Recommend a design infiltration rate (see the Step 2 of sizing methodology section, "Determine the design percolation rate," in the Infiltration Basin fact sheet above);
- Identify the seasonal high depth to groundwater table surface elevation;
- Provide a good understanding of how the stormwater runoff will move in the soil (horizontally or vertically) and if there are any geological conditions that could inhibit the movement of water; and
- If a geotechnical investigation and report are required, the report should:
  - Provide a written opinion by a professional civil engineer describing whether the infiltration trench will compromise slope stability; and
  - Identify potential impacts to nearby structural foundations.

Setbacks

1) Infiltration facilities shall be setback a minimum of 100 feet from proposed or existing potable wells, non-potable wells, septic drain fields, and springs.

2) Infiltration BMPs must be sited at least 50 feet away from slopes steeper than 15 percent or an alternative setback established by the geotechnical expert for the project.

3) Infiltration BMPs must be setback from building foundations at least eight feet or have an alternative setback established by the geotechnical expert for the project.

Pretreatment

1) Depending on how and where permeable pavements will be used, pretreatment of the runoff entering the permeable pavement may be necessary. This is particularly important when the permeable pavement will be accepting run-on from pervious areas or areas that are not completely stabilized. If this is the case, then the run-on should be treated prior to contacting the permeable pavement. Without adequate pretreatment, the life of the permeable pavement may be significantly decreased.

2) If sheet flow is conveyed to the permeable pavement over stabilized grassed areas, the site must be graded in such a way that minimizes erosive conditions.

Sizing Criteria

Permeable pavement must be designed to meet Ventura County codes and/or applicable local permitting authority codes. These sizing criteria are meant to provide guidance for runoff volume storage only.

Step 1: Calculate the Design Volume

Infiltration facilities shall be sized to capture and infiltrate the SQDV volume (see Section 2 and Appendix E) with a 12 to 72 hour drawdown time (see Appendix D, Section D.2).

Step 2: Determine the Design Percolation Rate

The percolation rate will decline between maintenance cycles as the surface becomes occluded and particulates accumulate in the infiltration layer. Monitoring of actual facility performance has shown that the full-scale infiltration rate is far lower than the rate measured by small-scale testing. It is important that adequate conservatism is incorporated in the selection of design percolation rates. For infiltration trenches, the design percolation rate discussed here is the percolation rate of the underlying soils and not the percolation rate of the filter media bed (refer to the "Geometry and Sizing" section of INF-2 for the recommended composition of the filter media bed for infiltration trenches).

Considerations for Design Percolation Rate Corrections

Suitability assessment related considerations include (Table 6-12):

- Soil assessment methods – the site assessment extent (e.g., number of borings, test pits, etc.) and the measurement method used to estimate the short-term infiltration rate.

- Predominant soil texture/percent fines – soil texture and the percent of fines can greatly influence the potential for clogging.

- Site soil variability – site with spatially heterogeneous soils (vertically or horizontally) as determined from site investigations are more difficult to estimate

average properties resulting in a higher level of uncertainty associated with initial estimates.

- Depth to seasonal high groundwater/impervious layer – groundwater mounding may become an issue during excessively wet conditions where shallow aquifers or shallow clay lenses are present.

Table 6-12: Suitability Assessment Related Considerations for Infiltration Facility Safety Factors

Consideration	High Concern	Medium Concern	Low Concern
Assessment methods	Use of soil survey maps or simple texture analysis to estimate short-term infiltration rates	Direct measurement of ≥ 20 percent of infiltration area with localized infiltration measurement methods (e.g., infiltrometer)	Direct measurement of ≥ 50 percent of infiltration area with localized infiltration measurement methods or Use of extensive test pit infiltration measurement methods
Ventura Hydrology Manual soil number (measured infiltration rate)	3 (f = 0.5 – 0.64)	4 or 5 (f = 0.65 – 0.91)	6 or 7 (f = 0.92 or higher)
Site soil variability	Highly variable soils indicated from site assessment or limited soil borings collected during site assessment	Soil borings/test pits indicate moderately homogeneous soils	Multiple soil borings/test pits indicate relatively homogeneous soils
Depth to groundwater/ impervious layer	<10 ft below facility bottom	10-30 ft below facility bottom	>30 below facility bottom

Localized infiltration testing refers to methods such as the double ring infiltrometer test (ASTM D3385-88) which measure infiltration rates over an area less than 10 sq-ft and do not attempt to account for soil heterogeneity. Extensive infiltration testing refers to methods that include excavating a significant portion of the proposed infiltration area, filling the excavation with water, and monitoring drawdown. In all cases, testing should be conducted in the area of the proposed BMP where, based on geotechnical data, soils appear least likely to support infiltration.

Design related considerations include (Table 6-13):

- Size of area tributary to facility – all things being equal, both physical and economic risk factors related to infiltration facilities increase with an increase in the tributary area served. Therefore facilities serving larger tributary areas should use more restrictive adjustment factors.

- Level of pretreatment/expected influent sediment loads – credit should be given for good pretreatment by allowing less restrictive factors to account for the reduced probability of clogging from high sediment loading. Also facilities designed to capture runoff from relatively clean surfaces such as rooftops are likely to see low sediment loads and therefore should be allowed to apply less restrictive safety factors.

- Redundancy – facilities that consist of multiple subsystems operating in parallel such that parts of the system remains functional when other parts fail and/or bypass should be rewarded for the built-in redundancy with less restrictive correction and safety factors. For example, if bypass flows would be at least partially treated in another BMP, the risk of discharging untreated runoff in the event of clogging the primary facility is reduced. A bioretention facility that overflows to a landscaped area is another example.

Compaction during construction – proper construction oversight is needed during construction to ensure that the bottom of the infiltration facility are not overly compacted. Facilities that do not commit to proper construction practices and oversight should have to use more restrictive correction and safety factors.

Table 6-13: Design Related Considerations for Infiltration Facility Safety Factors

Consideration	High Concern	Medium Concern	Low Concern
Tributary area size	Greater than 10 acres.	Greater than 2 acres but less than 10 acres.	2 acres or less.
Level of pre-treatment/ expected influent sediment loads	Pre-treatment from gross solids removal devices only, such as hydrodynamic separators, racks and screens AND tributary area includes landscaped areas, steep slopes, high traffic areas, or any other areas expected to produce high sediment, trash, or debris loads.	Good pre-treatment with BMPs that mitigate coarse sediments such as vegetated swales AND influent sediment loads from the tributary area are expected to be relatively low (e.g., low traffic, mild slopes, disconnected impervious areas, etc.).	Excellent pre-treatment with BMPs that mitigate fine sediments such as bioretention or media filtration OR sedimentation or facility only treats runoff from relatively clean surfaces, such as rooftops.
Redundancy of treatment	No redundancy in BMP treatment train.	Medium redundancy, other BMPs available in treatment train to maintain at least 50% of function of facility in event of failure.	High redundancy, multiple components capable of operating independently and in parallel, maintaining at least 90% of facility functionality in event of failure.
Compaction during construction	Construction of facility on a compacted site or elevated probability of unintended/ indirect compaction.	Medium probability of unintended/ indirect compaction.	Heavy equipment actively prohibited from infiltration areas during construction and low probability of unintended/ indirect compaction.

Adjust the measured short-term infiltration rate using a weighted average of several safety factors, using the worksheet shown in Table 6-14 below. The design percolation rate would be determined as follows:

- For each consideration shown in Table 6-12 and Table 6-13 above, determine whether the consideration is a high, medium, or low concern.
- For all high concerns assign a factor value of 3, for medium concerns assign a factor value of 2, and for low concerns assign a factor value of 1.
- Multiply each of the factors by the corresponding weight to get a product.

- Sum the products within each factor category to obtain a safety factor for each.
- Multiply the two safety factors together to get the final combined safety factor. If the combined safety factor is less than 2, then use 2 as the safety factor.
- Divide the measured short term infiltration rate by the combined safety factor to obtain the adjusted design percolation rate for use in sizing the infiltration facility.

Table 6-14: Infiltration Facility Safety Factor Determination Worksheet

Factor Category		Factor Description	Assigned Weight (w)	Factor Value (v)	Product (p) p = w x v
A	Suitability Assessment	Soil assessment methods	0.25		
		Predominant soil texture	0.25		
		Site soil variability	0.25		
		Depth to groundwater / impervious layer	0.25		
		Suitability Assessment Safety Factor, $S_A = \Sigma p$			
B	Design	Tributary area size	0.25		
		Level of pre-treatment/ expected sediment loads	0.25		
		Redundancy	0.25		
		Compaction during construction	0.25		
		Design Safety Factor, $S_B = \Sigma p$			
Combined Safety Factor = S_A x S_B					

Note: The minimum combined adjustment factor shall not be less than 2.0 and the maximum combined adjustment factor shall not exceed 9.

Step 3: Determine the Gravel Drainage Layer Depth

Permeable pavement (including the base layers) should be designed to drain in less than 72 hours. The basis for this is that soils must be allowed to dry out periodically in order to restore hydraulic capacity to receive flows from subsequent storms, maintain infiltration rates, maintain adequate sub soil oxygen levels for healthy soil biota, and to provide proper soil conditions for biodegradation and retention of pollutants.

1) Calculate the maximum depth of runoff (d_{max}) that can be infiltrated within the drawdown time:

$$d_{\max} = \frac{P_{design} \bullet t}{12} \qquad \text{(Equation 6-11)}$$

Where:

d_{max} = maximum depth that can be infiltrated (ft)

P_{design}	=	design percolation rate of underlying soils (in/hr) (see Step 2, above)
t	=	drawdown time (12-72 hours) (hr)

2) Select the gravel drainage layer depth, (l), such that:

$$d_{\max} \geq n \times l \qquad \text{(Equation 6-12)}$$

Where:

d_{max}	=	maximum depth that can be infiltrated (ft) (see 1) above)
n	=	gravel drainage layer porosity(unitless)(generally about 40% or 0.40 for gravel)
l	=	gravel drainage layer depth (ft)

Step 4: Determine infiltrating surface area

3) Calculate infiltrating surface area for permeable pavement (A):

$$A = \frac{SQDV}{\frac{TP_{design}}{12} + nl} \qquad \text{(Equation 6-13)}$$

Where:

P_{design}	=	design percolation rate of underlying soils (in/hr) (see Step 2, above)
n	=	gravel drainage layer porosity(unitless)[about 40% or 0.40 for gravel]
l	=	depth of gravel drainage layer (ft)
T	=	time to fill the gravel drainage layer with water (use 2 hours for most designs) (hr)

Geometry and Size

1) Permeable pavement shall be sized to capture and treat the stormwater quality design volume (SQDV).

2) Pavement design options include:

a. Full or partial infiltration – A design for full infiltration uses an open graded base for maximum infiltration and storage of stormwater. The water infiltrates directly into the base and through the soil. Pipes may provide drainage in overflow conditions. Partial infiltration does not rely completely on infiltration through the soil to dispose all of the captured runoff. Some of the water may infiltrate into the soil and the remainder drained by pipes.

b. No infiltration – No infiltration is desirable when the soil has low permeability and low strength, or there are other site limitations. An underdrain should be provided if the depth to bedrock is less than 2 feet or the depth to the water table is less than 10 feet. By storing water for a time in the base and then slowly releasing it through pipes, the design behaves like an underground detention pond. In other cases, the soil of the sub-base may be compacted and stabilized to render improved support for vehicular loads. This practice reduces infiltration into the soil to nearly zero. The "no infiltration" option requires the use of geotextile and bedding between the pavement and the open graded base.

3) If permeable pavement is located on a site with a slope greater than 2%, the permeable pavement area should be terraced to prevent lateral flow through the subsurface. Permeable pavement cannot be located on a site with a slope greater than 5%.

4) Porous pavement systems generally consist of at least four different layers of material:

a. The top or wearing layer consists of either asphalt or concrete with a greater than normal percentage of voids (typically 12 to 20 percent in the case of asphalt). The wearing layer may also be comprised of lattice-type pavers (either hollow concrete blocks or paving stones made from solid conventional concrete or stone), which are set in a bedding material (sand, pea-sized gravel or turf grass).

b. Below the wearing layer, a stone reservoir layer or a thick layer of aggregate (e.g., 2 inch stone) provides the bulk of the water storage capacity for a porous pavement system. In the pavement design, it is important to ensure that this reservoir layer retains its load bearing capacity under saturated conditions, because it may take several days for complete drainage to occur.

c. Typically, porous pavement designs include two (or more) transition layers that can be constructed from 1 to 2 inch diameter stone. One transition layer separates the top wearing layer from the underlying stone reservoir layer. Another transition layer is used to separate the stone reservoir from the undisturbed subgrade soil. Some designs also add a geotextile layer to this bottom layer or some combination of stones and geotextiles.

d. Porous asphalt pavement, for example, consists of open grade asphalt mixture ranging in depth from 2 to 4 inches with 16 percent voids. The thickness selected depends on bearing strength and pavement design requirements. This layer sits on a 2 to 4 inch transition layer located over a stone reservoir. The bottom layer completes the transition to the underlying undisturbed soil using a combination transition/filter fabric layer.

e. The depth of each layer should be determined by a licensed civil engineer based on analyses of the hydrology, hydraulics, and structural requirements of the site.

5) Modular paving stones are also used to create porous pavements. These pavements can be constructed in situ by pouring concrete into special frames or by using preformed blocks. The top layer of these porous pavements consists of conventional concrete, with the intervening void areas filled with either turf or sand. A transition or bedding layer is used to make the transition to the reservoir layer. These lattice-type pavers or hollow concrete blocks are often used in conjunction with turf grasses and are used in low-traffic parking lots, lanes, or driveways. Porous pavements using paving stones have similar construction, but can be designed to have a much higher load bearing capacity, and therefore have more widespread applicability. Construction guidelines and design specifications are available from the manufacturers of these products.

6) Permeable pavement (including the base layers) should be designed to drain in less than 72 hours. The basis for this is that soils must be allowed to dry out periodically in order to restore hydraulic capacity to receive flows from subsequent storms, maintain infiltration rates, maintain adequate subsoil oxygen levels for healthy soil biota, and to provide proper soil conditions for biodegradation and retention of pollutants.

7) The percolation rate will decline as the surface becomes occluded and particulates accumulate in the infiltration layer. It is important that adequate conservatism is incorporated in the selection of design percolation rates.

Overflow

An overflow mechanism is required. Two options are provided:

Option 1: Perimeter control

Flows in excess of the design capacity of the permeable pavement system will require an overflow system connected to a downstream conveyance or other stormwater runoff BMP. In addition, if the pavement becomes clogged and infiltration decreases to the point that there is ponding, runoff will migrate off of the pavement via overland flow instead of infiltrating into the subsurface gravel layer. There are several options for handling overflow using perimeter controls such as:

1) Perimeter vegetated swale.

2) Perimeter bioretention.

3) Storm drain inlets.

4) Rock filled trench that funnels flow around pavement and into the subsurface gravel layer.

Option 2: Overflow pipe(s)

1) A vertical pipe should be connected to the underdrain.

2) The diameter, location, and quantity may vary with design and should be determined by a licensed civil engineer.

3) The pipe should be located away from vehicular traffic.

4) The piping system may incorporate an observational and/or cleanout well.

5) The top of the overflow pipe should be covered with a screen fastened over the overflow inlet.

Construction Considerations

1) Permeable pavement should be laid close to level and the bottom of the base layers must be level to ensure uniform infiltration.

2) Permeable pavement surfaces should not be used to store site materials, unless the surface is well protected from accidental spillage or other contamination.

3) To prevent/minimize soil compaction in the area of the permeable pavement installation, use light equipment with tracks or oversized tires.

4) Divert stormwater from the area as needed (before and during installation).

5) The pavement should be the last installation done at a development site. Landscaping should be completed and adjacent areas stabilized, before pavement installation to minimize the risk of clogging.

6) Vehicular traffic should be prohibited for at least 2 days after installation.

Operations and Maintenance

Permeable pavement mainly requires vacuuming and management of adjacent areas to limit sediment contamination and prevent clogging by fine sediment particles. Therefore, little special training is needed for maintenance crews. The following maintenance concerns and maintenance activities shall be considered and provided:

1) Trash tends to accumulate in paved areas, particularly in parking lots and along roadways. The need for litter removal should be determined through periodic inspection.

2) Regularly (e.g., monthly for a few months after initial installation, then quarterly) inspect pavement for pools of standing water after rain events, this could indicate surface clogging.

3) Actively (3 to 4 times per year, or more frequently depending onsite conditions) vacuum sweep the pavement to reduce the risk of clogging by frequently removing fine sediments before they can clog the pavement and subsurface layers. This also helps to prolong the functional period of the pavement.

4) Inspect for vegetation growth on pavement and remove when present.

5) Inspect for missing sand/gravel in spaces between pavers and replace as needed.

6) Activities that lead to ruts or depressions on the surface should be prevented or the integrity of the pavement should be restored by patching or repaving. Examples are vehicle tracks and utility maintenance.

7) Spot clogging of porous concrete may be remedied by drilling 0.5 inch holes every few feet in the concrete.

8) Interlocking pavers that are damaged should be replaced.

9) Maintain landscaped areas and reseed bare areas.

INF-6: Proprietary Infiltration

A number of vendors offer proprietary infiltration products that allow for similar or enhanced rates of infiltration and subsurface storage while offering durable prefrabricated structures. There are many varieties of proprietary infiltration BMPs.

Proprietary Infiltration BMPs

Photo Credits: 1. & 2. Contech Stormwater Solutions, Inc.

Application

- Mixed-use and commercial
- Roads and parking lots
- Parks and open spaces
- Single and multi-family residential

Routine Maintenance

- Removal trash, debris, and sediment at inlet and outlets
- Wet weather inspection to ensure drain time
- Inspect for mosquito breeding

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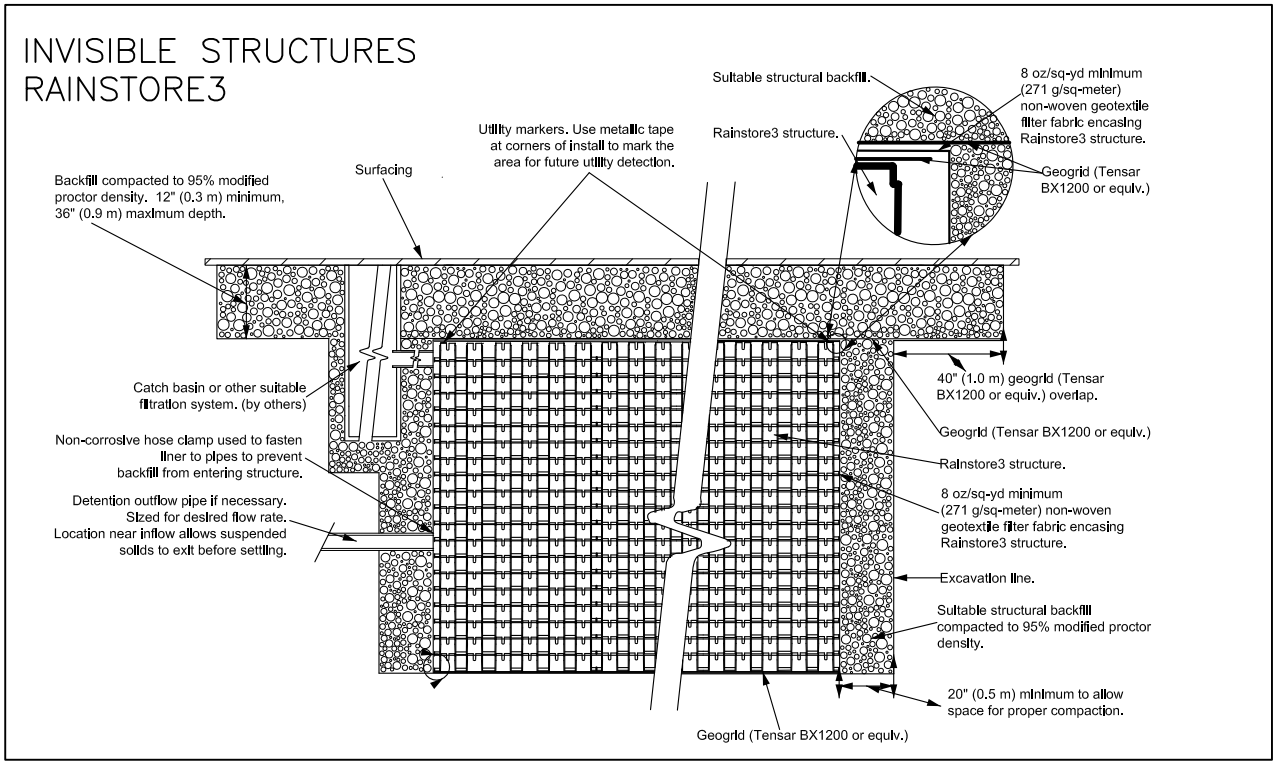

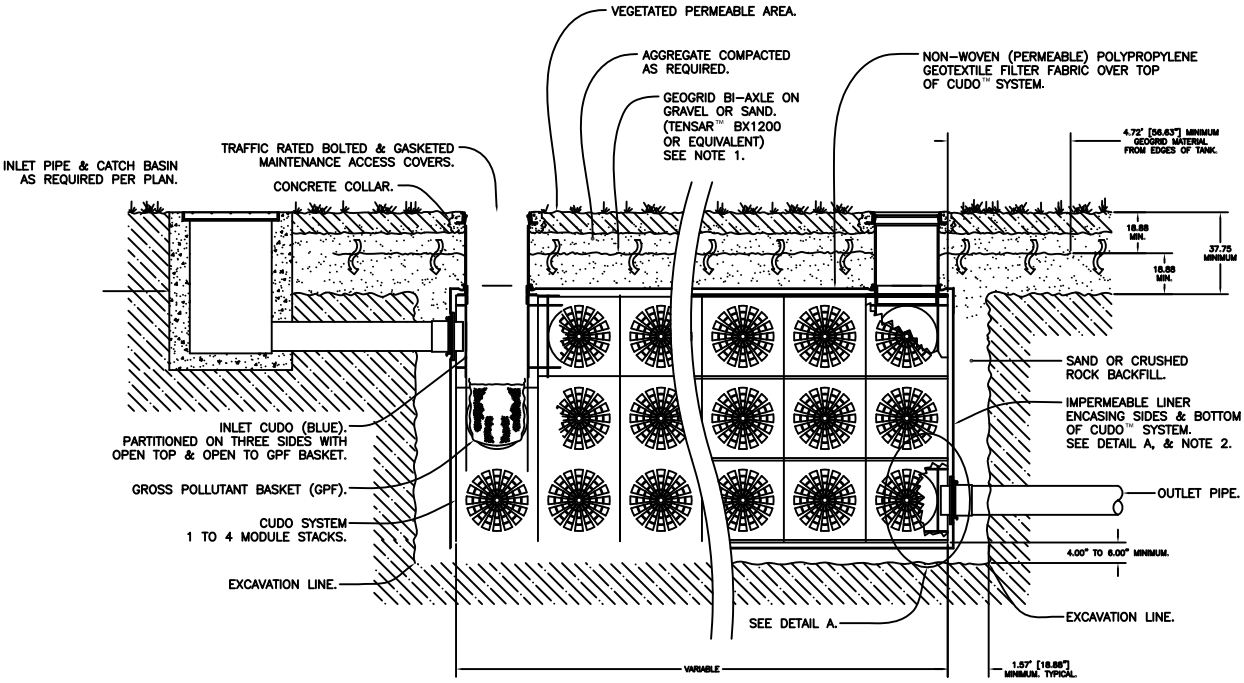

SECTION / CUTAWAY VIEW
SCALE: NONE

CUDO Stormwater Products, Inc.
P.O. Box 497 Occidental, CA 95465
Ph. (877) 876-3345 Fax (707) 876-3346

Geosyntec consultants

Figure 6-7: Proprietary Infiltration BMPs

Limitations

The following limitations shall be considered before choosing to use an infiltration BMP:

- Native soil infiltration rate - soil permeability of the infiltration basin location must be at least 0.5 inches per hour.
- Depth to groundwater, bedrock, or low permeability soil layer – 5 feet vertical separation is required between the bottom of the infiltration basin and the seasonal high groundwater level or mounded groundwater level, bedrock, or other barrier to infiltration to ensure that the facility will completely drain between storms and that infiltrating water will receive adequate treatment though the soils before it reaches the groundwater.
- Slope stability - infiltration BMPs must be sited at least 50 feet away from slopes steeper than 15 percent or an alternative setback established by the geotechnical expert for the project.
- Setbacks - a minimum setback (100 feet or more) must be provided between infiltration BMPs and potable wells, non-potable wells, drain fields and springs. Infiltration BMPs must be setback from building foundations at least eight feet or have an alternative setback established by the geotechnical expert for the project.
- Groundwater contamination - the application of infiltration BMPs should include significant pretreatment in an area identified as an unconfined aquifer, to ensure groundwater is protected for pollutants of concern.
- Contaminated soils or groundwater plumes - infiltration BMPs are not allowed at locations with contaminated soils or groundwater where the pollutants could be mobilized or exacerbated by infiltration, unless a site-specific analysis determines the infiltration would be beneficial.
- High pollutant land uses - infiltration BMPs should not be placed in high-risk areas such as at or near service/gas stations, truck stops, and heavy industrial sites due to the groundwater contamination risk unless a site-specific evaluation demonstrates that sufficient pretreatment is provided to address pollutants of concern, high risks areas are isolated from stormwater runoff, or infiltration areas have little chance of spill migration
- High sediment loading rates – infiltration BMPs may clog quickly if sediment loads are high (e.g., unstabilized site) or if flows are not adequately pretreated.

Table 6-15: Proprietary Infiltration Manufacturer Websites

Device	Manufacturer	Website
A-2000™	Contech® Construction Products Inc.	www.contech-cpi.com/stormwater/13
ChamberMaxx™	Contech® Construction Products Inc.	www.contech-cpi.com/stormwater/13
CON/SPAN Vaults™	Contech® Construction Products Inc.	www.contech-cpi.com/stormwater/13
CON/Storm™	Contech® Construction Products Inc.	www.contech-cpi.com/stormwater/13
Perforated Corrugated Metal Pipe (CMP)	Contech® Construction Products Inc.	www.contech-cpi.com/stormwater/13
Drywell StormFilter	Contech® Construction Products Inc.	www.contech-cpi.com/stormwater/13
CUDO® Water Storage System	KriStar Enterprises Inc.	www.kristar.com
D-Raintank® Matrix Tank Modules	Atlantis®	www.atlantis-america.com
EcoRain™ Modular Rain Tank	EcoRain Systems Inc.	www.ecorain.com
Landmax®	Hancor®	www.hancor.com
Landsaver™	Hancor®	www.hancor.com
Precast Concrete Dry Well	Jensen Precast®	www.jensenprecast.com
Rainstore[3]	Invisible Structures Inc.	www.invisiblestructures.com
StormChambers™	Hydrologic Solutions, Inc.	www.hydrologicsolutions.com
Stormtech® SC-740 and SC-310 Chambers	StormTech LLC	www.stormtech.com
StormTrap®	StormTrap	www.stormtrap.com
Triton Chambers™	Triton Stormwater Solutions	www.tritonsws.com

Geotechnical Considerations

An extensive geotechnical site investigation must be undertaken early in the site planning process to verify site suitability for the installation of infiltration facilities, due to the potential to contaminate groundwater, cause slope instability, impact surrounding structures, and have insufficient infiltration capacity. Soil infiltration rates and the water table depth should be evaluated to ensure that conditions are satisfactory for proper operation of an infiltration facility. See Appendix C for guidance on infiltration testing.

The project designer must demonstrate through infiltration testing, soil logs, and the written opinion of a licensed civil engineer that sufficiently permeable soils exist onsite to allow the construction of a properly functioning infiltration facility.

1) Infiltration facilities require a minimum soil infiltration rate of 0.5 inches/hour. If infiltration rates exceed 2.4 inches/hour such that pollutant removal may not be adequate to protect groundwater quality, then the runoff should be fully treated in an upstream BMP prior to infiltration to protect groundwater quality. Pretreatment for coarse sediment removal is required in all instances.

2) Groundwater separation must be at least 5 feet from the basin bottom to the measured season high groundwater elevation or estimated high groundwater mounding elevation. Measurements of groundwater levels must be made during the time when water level is expected to be at a maximum (i.e., toward the end of the wet season).

3) Sites with a slope greater than 25% (4:1) should be excluded. A geotechnical analysis and report addressing slope stability are required if located on slopes greater than 15%.

Soil Assessment and Site Geotechnical Investigation Reports

The soil assessment report should:

- State whether the site is suitable for the proposed proprietary infiltration BMP.;
- Recommend a design infiltration rate (see the Step 2 of sizing methodology section, "Determine the design percolation rate," in the Infiltration Basin fact sheet above);
- Identify the seasonal high depth to groundwater table surface elevation;
- Provide a good understanding of how the stormwater runoff will move in the soil (horizontally or vertically) and if there are any geological conditions that could inhibit the movement of water; and
- If a geotechnical investigation and report are required, the report should:
  - Provide a written opinion by a professional civil engineer describing whether the infiltration trench will compromise slope stability; and
  - Identify potential impacts to nearby structural foundations.

Setbacks

1) Infiltration facilities shall be setback a minimum of 100 feet from proposed or existing potable wells, non-potable wells, septic drain fields, and springs.

2) Infiltration BMPs must be sited at least 50 feet away from slopes steeper than 15 percent or an alternative setback established by the geotechnical expert for the project.

3) Infiltration BMPs must be setback from building foundations at least eight feet or have an alternative setback established by the geotechnical expert for the project.

Pretreatment

Pretreatment is required for proprietary infiltration BMPs in order to reduce the sediment load entering the facility and maintain the infiltration rate of the facility. Pretreatment refers to design features that provide settling of sediment particles before runoff reaches a management practice. This eases the long-term maintenance burden and likelihood of failure. Pretreatment is important for most stormwater treatment BMPs, but it is particularly important for infiltration BMPs. To ensure that pretreatment mechanisms are effective, designers should incorporate sediment reduction practices. Sediment reduction BMPs may include vegetated swales, vegetated filter strips, sedimentation basins, sedimentation manholes and hydrodynamic separation devices. The use of at least two pretreatment devices is highly recommended for infiltration BMPs.

Sizing

1) Proprietary infiltration BMPs shall be sized to capture and treat the stormwater quality design volume (SQDV). See Section 2 and Appendix E for calculating for further detail.

2) The percolation rate will decline as the surface becomes occluded and particulates accumulate in the infiltrative layer. It is important that adequate conservatism is incorporated in the selection of design percolation rates.

3) For the sizing guidelines, refer to the manufacturer's website.

Operations and Maintenance

See vendor's website for maintenance requirements.

INF-7: Bioinfiltration

Bioinfiltration facilities are designed for partial infiltration of runoff and partial biotreatment. These facilities are similar to bioretention devices with underdrains, but the underdrain is raised above the gravel sump to facilitate infiltration. These facilities can be used in areas where there are no hazards associated with infiltration, but infiltration of the full DCV may not be feasible due to low infiltration rates (Soil Type 3) or high depths of fill. These facilities may not result in retention of the DCV but they can be used to meet the MEP standards.

Bioretention in Parkway and parking lots

Photo Credits: Geosyntec Consultants

Application

- Commercial, residential, mixed use, institutional, and recreational uses
- Parking lot islands, traffic circles
- Road parkways & medians

Preventative Maintenance

- Repair small eroded areas
- Remove trash and debris and rake surface soils
- Remove accumulated fine sediments, dead leaves and trash
- Remove weeds and prune back excess plant growth
- Remove sediment and debris accumulation near inlet and outlet structures
- Periodically observe function under wet weather conditions

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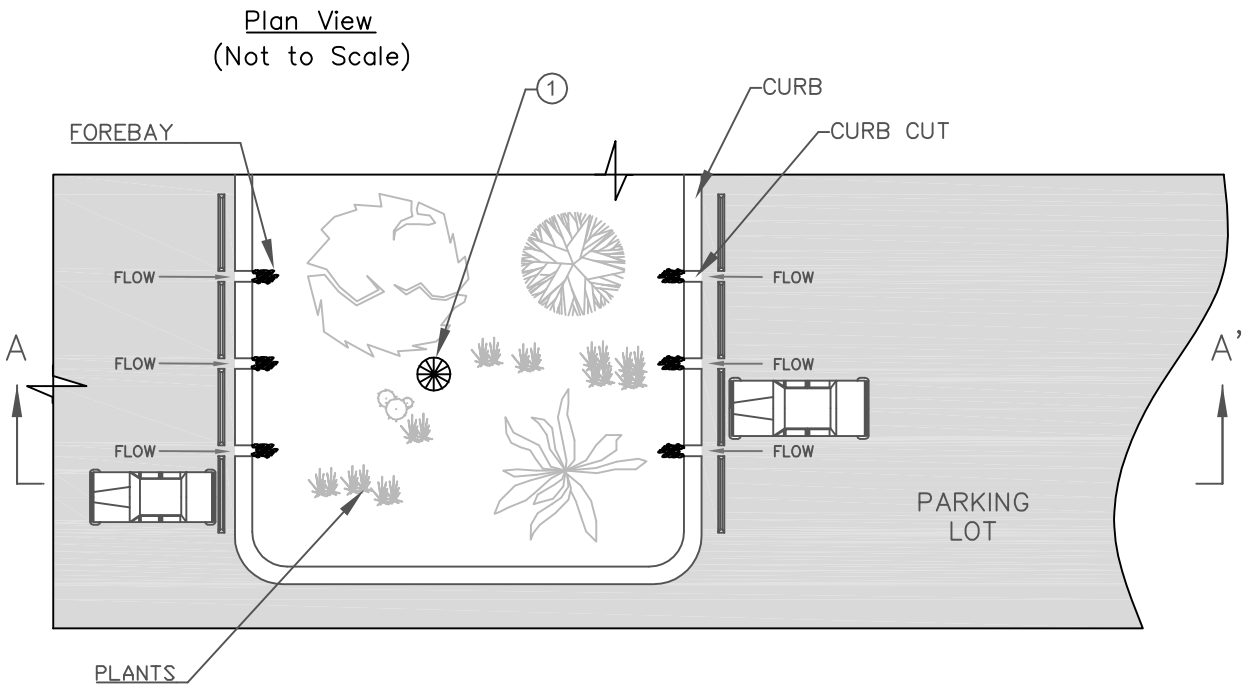

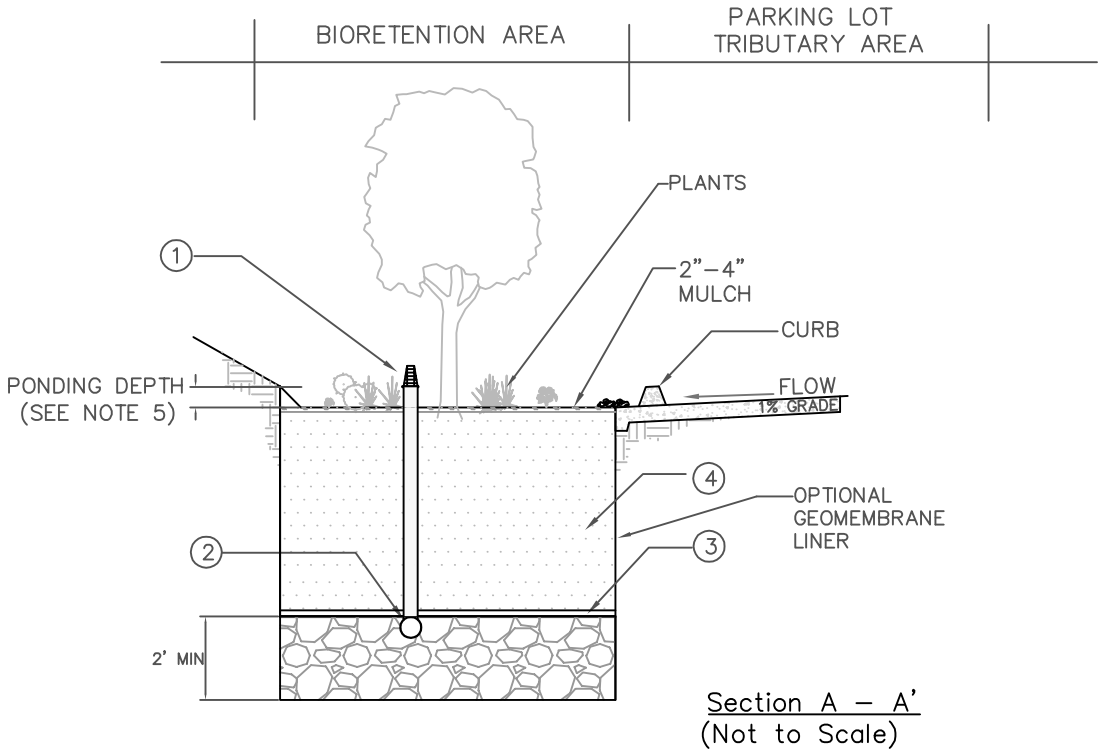

NOTES:

① OVERFLOW DEVICE: VERTICAL RISER OR EQUIVALENT.
② PERFORATED 6" MIN PVC PIPE UNDERDRAIN.
③ OPTIONAL CHOKING GRAVEL LAYER.
④ 2' MIN PLANTING MIX; 3' PREFERRED.
⑤ PONDING DEPTH 18" WITH FENCE; 6" WITHOUT FENCE.
⑥ 2' MIN GRAVEL LAYER DEPTH.

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Figure 6-8: Bioinfiltration

Limitations

The following limitations should be considered before choosing to use bioinfiltration:

1) Native soil infiltration rate - soil permeability at the bioinfiltration location must be no less than 0.3 inches per hour.

2) Depth to groundwater, bedrock, or low permeability soil layer – 5 feet vertical separation is required between the bottom of the infiltration trench and the seasonal high groundwater level or mounded groundwater level, bedrock, or other barrier to infiltration to ensure that the facility will completely drain between storms and that infiltrating water will receive adequate treatment though the soils before it reaches the groundwater.

3) Slope stability - infiltration BMPs must be sited at least 50 feet away from slopes steeper than 15 percent or an alternative setback established by the geotechnical expert for the project.

4) Setbacks - a minimum setback (100 feet or more) must be provided between infiltration BMPs and potable wells, non-potable wells, drain fields, and springs. Infiltration BMPs must be setback from building foundations at least eight feet or have an alternative setback established by the geotechnical expert for the project.

5) Groundwater contamination - the application of infiltration BMPs should include significant pretreatment in an area identified as an unconfined aquifer to ensure groundwater is protected for pollutants of concern.

6) Contaminated soils or groundwater plumes - infiltration BMPs are not allowed at locations with contaminated soils or groundwater where the pollutants could be mobilized or exacerbated by infiltration, unless a site-specific analysis determines that infiltration would be beneficial.

7) High pollutant land uses - infiltration BMPs should not be placed in high-risk areas such as at or near service/gas stations, truck stops, and heavy industrial sites due to the groundwater contamination risk unless a site-specific evaluation demonstrates that sufficient pretreatment is provided to address pollutants of concern, high risks areas are isolated from stormwater runoff, or infiltration areas have little chance of spill migration.

8) High sediment loading rates – infiltration BMPs may clog quickly if sediment loads are high (e.g., unstabilized site) or if flows are not adequately pretreated.

9) Vertical relief and proximity to storm drain - site must have adequate relief between the land surface and storm drain to permit vertical percolation through the soil media and collection.

Design Criteria

Bioinfiltration should be designed according to the requirements listed in Table 6-16 and outlined in the section below.

Table 6-16: Bioretention Design Criteria

Design Parameter	Unit	Design Criteria
Stormwater quality design volume (SQDV)	acre-feet	See Section 2 and Appendix E for calculating SQDV.
Forebay	-	Forebay should be provided for all tributary surfaces that contain landscaped areas. Forebays should be designed to prevent standing water during dry weather and should be planted with a plant palette that is tolerant of wet conditions.
Maximum drawdown time of water ponded on surface	hours	48
Maximum drawdown time of surface ponding plus subsurface pores	hours	96 (72 preferred)
Maximum ponding depth	inches	18
Minimum thickness of amended soil	feet	2 (3 preferred)
Minimum thickness of stabilized mulch	inches	2 to 4
Planting mix composition	-	60 to 80% fine sand, 20 to 40% compost
Underdrain sizing	-	Underdrain should be installed below the choking stone; 6 inch minimum diameter; 0.5% minimum slope; slotted, polyvinyl chloride (PVC) pipe (PVC SDR 35 or approved equivalent); spacing shall be determined to provide capacity for maximum rate filtered through amended media
Minimum thickness of gravel layer	feet	2
Overflow device	-	Required

Sizing Criteria

Bioinfiltration facilities can be sized using one of two methods: a simple sizing method or a routing modeling method. With either method the SQDV volume must be completely infiltrated within 96 hours (including subsurface pore space), and surface ponding must be infiltrated within 48 hours. The simple sizing procedure is provided below. For the routing modeling method, refer to TCM-4 Sand Filters.

Step 1: Calculate the Design Volume

Bioinfiltration facilities shall be sized to capture and partially infiltrate and partially biotreat the SQDV volume (see Section 2.3 and Appendix E).

Step 2: Determine the Design Percolation Rate

The percolation rate through the BMP and to the subsurface will decline between maintenance cycles as the surface becomes occluded and particulates accumulate in the infiltration layer. Monitoring of actual facility performance has shown that the full-scale infiltration rate is far lower than the rate measured by small-scale testing. It is important that adequate conservatism is incorporated in the selection of design percolation rates. For bioinfiltration facilities, the design percolation rate discussed here is the adjusted percolation rate of the underlying soils and not the percolation rate of the filter media bed. The measured short-term infiltration rate should be adjusted using a factor of safety of 2.0.

Step 3: Calculate the surface area

Determine the size of the required infiltrating surface by assuming the SQDV will fill the available ponding depth plus the void spaces in the media, based on the computed porosity of the filter media and optional aggregate layer.

1) Determine the maximum depth of surface ponding that can be infiltrated within the required surface drain time (48 hr), (d_{max}), as follows:

$$d_{\max} = \frac{P_{design} \times t_{ponding}}{12\frac{in}{ft}} \qquad \text{(Equation 6-14)}$$

Where:

$t_{ponding}$	=	required drain time of surface ponding (48 hrs)
P_{design}	=	design percolation rate of underlying soils (in/hr) (see Step 2, above)

d_{max}	=	the maximum depth of surface ponding water that can be infiltrated within the required drain time (ft), calculated using Equation 6-14

2) Choose surface ponding depth (d_p) such that:

$$d_p \leq d_{\max} \qquad \text{(Equation 6-15)}$$

Where:

d_p	=	selected surface ponding depth (ft)
d_{max}	=	the maximum depth of water that can be infiltrated within the required drain time (ft)

Choose thickness(es) of amended media and aggregate layer(s) and calculate total effective storage depth of the bioinfiltration area ($d_{effective}$), as follows:

$$d_{effective} \leq (d_p + n^*_{media} l_{media} + n_{gravel} l_{gravel}) \qquad \text{(Equation 6-16)}$$

Where:

$d_{effective}$	=	total equivalent depth of water stored in bioinfiltration area (ft), including surface ponding and volume available in pore spaces of media and gravel layers
d_p	=	surface ponding depth (ft), chosen using Equation 6=15
n^*_{media}	=	available porosity of amended soil media (ft/ft), approximately 0.25 ft/ft accounting for antecedent moisture conditions. This represents the volume of available pore space as a fraction of the total soil volume; sometimes has units of (ft^3/ft^3) or described as a percentage.
l_{media}	=	thickness of amended soil media layer (ft), minimum 2 ft
n_{gravel}	=	porosity of gravel layer (ft/ft), approximately 0.40 ft/ft
l_{gravel}	=	thickness of gravel layer (ft), minimum 2 ft

3) Check that entire effective depth (surface plus subsurface storage), $d_{effective}$, infiltrates in no greater than 96 hours as follows:

$$t_{total} = \frac{d_{effective}}{P_{design}} \times 12 \frac{in}{ft} \leq 96\ hr \qquad \text{(Equation 6-17)}$$

Where:

$d_{effective}$ = total equivalent depth of water stored in bioinfiltration area (ft), calculated using Equation 6-16

P_{design} = design percolation rate of underlying soils (in/hr) (see Step 2, above)

If $t_{total} > 96$ hrs, then reduce surface ponding depth and/or amended media thickness and/or gravel thickness and return to 1).

If $t_{total} \leq 96$ hrs, then proceed to 5).

4) Calculate required infiltrating surface area, (A_{req}):

$$A_{req} = \frac{SQDV}{d_{effective}} \qquad \text{(Equation 6-18)}$$

Where:

A_{req} = required infiltrating area (ft^2). Should be calculated at the contour corresponding to the mid ponding depth (i.e., $0.5 \times d_p$ from the bottom of the facility).

$SQDV$ = stormwater quality design volume (ft^3)

$d_{effective}$ = total equivalent depth of water stored in bioinfiltration area (ft), calculated using Equation 6-16

5) Calculate total footprint required by including a buffer for side slopes and freeboard; A_{req} is calculated at the contour corresponding to the mid ponding depth (i.e., $0.5 \times d_p$ from the bottom of the facility).

Geometry

1) Minimum planting soil depth should be 2 feet, although 3 feet is preferred.

   The intention is that the minimum planting soil depth should provide a beneficial root zone for the chosen plant palette and adequate water storage for the stormwater quality design volume. A deeper soil depth will provide a smaller surface area footprint.

2) Minimum gravel layer depth is 2 feet.

The intention is that the gravel sump provides partial retention of captured water.

3) Bioinfiltration should be designed to drain below the planting soil in less than 48 hours and completely drain from the gravel layer in 96 hours (both starting from the end of inflow).

   The intention is that soils must be allowed to dry out periodically in order to restore hydraulic capacity to receive flows from subsequent storms, maintain infiltration rates, maintain adequate soil oxygen levels for healthy soil biota and vegetation, and to provide proper soil conditions for biodegradation and retention of pollutants.

Flow Entrance and Energy Dissipation

The following types of flow entrance can be used for bioinfiltration cells:

1) Dispersed, low velocity flow across a landscape area. Dispersed flow may not be possible given space limitations or if the facility is controlling roadway or parking lot flows where curbs are mandatory.

2) Dispersed flow across pavement or gravel and past wheel stops for parking areas.

3) Curb cuts for roadside or parking lot areas: curb cuts should include rock or other erosion protection material in the channel entrance to dissipate energy. Flow entrance should drop 2 to 3 inches from curb line and it should provide a settling area and periodic sediment removal of coarse material before flow dissipates to the remainder of the cell.

4) Pipe flow entrance: Piped entrances, such as roof downspouts, should include rock, splash blocks, or other appropriate measures at the entrance to dissipate energy and disperse flows.

Woody plants (trees, shrubs, etc.) can restrict or concentrate flows and can be damaged by erosion around the root ball and should not be placed directly in the entrance flow path.

Underdrains

Underdrains should meet the following criteria:

1) 6-inch minimum diameter.

2) Underdrains should be made of slotted, polyvinyl chloride (PVC) pipe (PVC SDR 35 or approved equivalent). *The intention is that compared to round-hole perforated pipe, slotted underdrains provide greater intake capacity, clog resistant drainage, and reduced entrance velocity into the pipe, thereby reducing the chances of solids migration.*

3) Slotted pipe should have 2 to 4 rows of slots cut perpendicular to the axis of the pipe or at right angles to the pitch of corrugations. Slots should be 0.04 to 0.1 inches and should have a length of 1 to 1.25 inches. Slots should be longitudinally spaced such that the pipe has a minimum of one square inch of slot per lineal foot of pipe and should be placed with slots facing the bottom of the pipe.

4) Underdrains should be sloped at a minimum of 0.5%.

5) Rigid non-perforated observation pipes with a diameter equal to the underdrain diameter should be connected to the underdrain every 100 feet to provide a clean-out port as well as an observation well to monitor dewatering rates. The wells/cleanouts should be connected to the perforated underdrain with the appropriate manufactured connections. The wells/cleanouts should extend 6 inches above the top elevation of the bioinfiltration facility mulch, and should be capped with a lockable screw cap. The ends of the underdrain pipes not terminating in an observation well/cleanout should also be capped.

Gravel Layer

1) The following aggregate should be used for the gravel layer below the underdrain pipe. Place the underdrain below the choking stone, within the top 6 inches of the gravel layer.

Sieve size	Percent Passing
¾ inch	100
¼ inch	30-60
US No. 8	20-50
US No. 50	3-12
US No. 200	0-1

2) At the option of the designer/geotechnical engineer, a geotextile fabric may be placed between the planting media and the gravel layer. If a geotextile fabric is used, it should meet a minimum permittivity rate of 75 gal/min/ft^2, should not impede the infiltration rate of the soil medium, and should meet the following minimum materials requirements.

Geotextile Property	Value	Test Method
Trapezoidal Tear (lbs)	40 (min)	ASTM D4533
Permeability (cm/sec)	0.2 (min)	ASTM D4491
AOS (sieve size)	#60 - #70 (min)	ASTM D4751
Ultraviolet resistance	70% or greater	ASTM D4355

Preferably, aggregate (choking stone) should be used in place of filter fabric to reduce the potential for clogging. This aggregate layer should consist of 2 to 4 inches

of washed sand underlain with 2 inches of choking stone (Typically #8 or #89 washed).

3) Bioinfiltration facilities have the added benefit of enhanced nitrogen removal due to the elevated underdrain. This allows for a fluctuating anaerobic/aerobic zone below the drain pipe. *The intention is that denitrification within the anaerobic/anoxic zone is facilitated by microbes using forms of nitrogen (NO_2 and NO_3) instead of oxygen for respiration.*

4) The underdrain should drain freely to an acceptable discharge point. The underdrain can be connected to a downstream open conveyance (vegetated swale), to another bioinfiltration cell as part of a connected treatment system, to a storm drain, daylight to a vegetated dispersion area using an effective flow dispersion device, or to a storage facility for harvesting.

Overflow

An overflow device is required at the 18-inch ponding depth. The following, or equivalent should be provided:

1) A vertical PVC pipe (SDR 35) to act as an overflow riser.

2) The overflow riser(s) should be 6 inches or greater in diameter, so it can be cleaned without damage to the pipe.

The inlet to the riser should be at the ponding depth (18 inches for fenced bioinfiltration areas and 6 inches for areas that are not fenced), and be capped with a spider cap to exclude floating mulch and debris. Spider caps should be screwed in or glued, i.e., not removable.

Hydraulic Restriction Layers

Infiltration pathways may need to be restricted due to the close proximity of roads, foundations, or other infrastructure. A geomembrane liner, or other equivalent water proofing, may be placed along the vertical walls to reduce lateral flows. This liner should have a minimum thickness of 30 mils.

Planting/Storage Media

1) The planting media placed in the cell should achieve a long-term, in-place infiltration rate of at least 1 inch per hour. Higher infiltration rates are permissible. If the design long-term, in-place infiltration rate of the soil exceeds 12 inches per hour, documentation should be provided to demonstrate that the media will adequately address pollutants of concern at a higher flowrate. Bioinfiltration soil shall also support vigorous plant growth.

2) Planting media should consist of 60 to 80% fine sand and 20 to 40% compost.

3) Sand should be free of wood, waste, coating such as clay, stone dust, carbonate, etc., or any other deleterious material. All aggregate passing the No. 200 sieve size should be non-plastic. Sand for bioinfiltration should be analyzed by an accredited lab using #200, #100, #40, #30, #16, #8, #4, and 3/8 sieves (ASTM D 422 or as approved by the local permitting authority) and meet the following gradation (Note: all sands complying with ASTM C33 for fine aggregate comply with the gradation requirements below):

Sieve Size (ASTM D422)	% Passing (by weight)	
	Minimum	Maximum
3/8 inch	100	100
#4	90	100
#8	70	100
#16	40	95
#30	15	70
#40	5	55
#100	0	15
#200	0	5

Note: the gradation of the sand component of the media is believed to be a major factor in the hydraulic conductivity of the media mix. If the desired hydraulic conductivity of the media cannot be achieved within the specified proportions of sand and compost (#2), then it may be necessary to utilize sand at the coarser end of the range specified in above ("minimum" column).

4) Compost should be a well decomposed, stable, weed free organic matter source derived from waste materials including yard debris, wood wastes, or other organic materials not including manure or biosolids meeting standards developed by the US Composting Council (USCC). The product shall be certified through the USCC Seal of Testing Assurance (STA) Program (a compost testing and information disclosure program). Compost quality should be verified via a lab analysis to be:

- Feedstock materials shall be specified and include one or more of the following: landscape/yard trimmings, grass clippings, food scraps, and agricultural crop residues.
- Organic matter: 35-75% dry weight basis.
- Carbon and Nitrogen Ratio: 15:1 < C:N < 25:1
- Maturity/Stability: shall have dark brown color and a soil-like odor. Compost exhibiting a sour or putrid smell, containing recognizable grass or leaves, or is hot (120 F) upon delivery or rewetting is not acceptable.

- Toxicity: any one of the following measures is sufficient to indicate non-toxicity:
  - NH4:NH3 < 3
  - Ammonium < 500 ppm, dry weight basis
  - Seed Germination > 80% of control
  - Plant trials > 80% of control
  - e. Solvita® > 5 index value
- Nutrient content:
  - Total Nitrogen content 0.9% or above preferred
  - Total Boron should be <80 ppm, soluble boron < 2.5 ppm
- Salinity: < 6.0 mmhos/cm
- pH between 6.5 and 8 (may vary with plant palette)

Compost for bioinfiltration should be analyzed by an accredited lab using #200, ¼ inch, ½ inch, and 1 inch sieves (ASTM D 422 or as approved by the local permitting authority) and meet the following gradation:

Sieve Size (ASTM D422)	% Passing (by weight)	
	Minimum	Maximum
1 inch	99	100
½ inch	90	100
¼ inch	40	90
#200	2	10

Tests should be sufficiently recent to represent the actual material that is anticipated to be delivered to the site. If processes or sources used by the supplier have changed significantly since the most recent testing, new tests should be requested.

Note: the gradation of compost used in bioinfiltration media is believed to play an important role in the saturated hydraulic conductivity of the media. To achieve a higher saturated hydraulic conductivity, it may be necessary to utilize compost at the coarser end of this range ("minimum" column). The percent passing the #200 sieve (fines) is believed to be the most important factor in hydraulic conductivity.

In addition, a coarser compost mix provides more heterogeneity of the bioinfiltration media, which is believed to be advantageous for more rapid development of soil structure needed to support health biological processes. This may be an advantage for plant establishment with lower nutrient and water input.

5) The bioinfiltration area should be covered with 2 to 4 inches (average 3 inches) of mulch at the start and an additional placement of 1 to 2 inches of mulch should be added annually. *The intention is that to help sustain the nutrient levels, suppress weeds, retain moisture, and maintain infiltration capacity*.

Planting/Storage Media Design for Nutrient Sensitive Receiving Waters

1) Where the BMP discharges to receiving waters with nutrient impairments or nutrient TMDLs, the planting media placed in the cell should be designed with the specific goal of minimizing the potential for initial and long term leaching of nutrients from the media.

2) In general, the potential for leaching of nutrients can be minimized by:

    a. Utilizing stable, aged compost (as required of media mixes under all conditions).

    b. Utilizing other sources of organic matter, as appropriate, that are safe, non-toxic, and have lower potential for nutrient leaching than compost.

    c. Reducing the content of compost or other organic material in the media mix to the minimum amount necessary to support vigorous plant growth and healthy biological processes.

3) A landscape architect should be consulted to assist in the design of planting/storage media to balance the interests of plant establishment, water retention capacity (irrigation demand), and the potential for nutrient leaching. The following practices should be considered in developing the media mix design:

    a. The actual nutrient content and organic content of the selected compost source should be considered when specifying the proportions of compost and sand. The compost specification allows a range of organic content over approximately a factor of 2 and nutrient content may vary more widely. Therefore determining the actual organic content and nutrient content of the compost expected to be supplied is important in determining the proportion to be used for amendment.

    b. A commitment to periodic soil testing for nutrient content and a commitment to adaptive management of nutrient levels can help reduce the amount of organic amendment that must be provided initially. Generally, nutrients can be added planting areas through the addition of organic mulch, but cannot be removed.

    c. Plant palettes and the associated planting mix should be designed with native plants where possible. Native plants generally have a broader tolerance for nutrient content, and can be longer lived in leaner/lower nutrient soils. An additional benefit of lower nutrient levels is that native plants will generally have less competition from weeds.

d. Nutrients are better retained in soils with higher cation exchange capacity (CEC). CEC can be increased through selection of organic material with naturally high CEC, such as peat, and/or selection of inorganic material with high CEC such as some sands or engineered minerals (e.g., low P-index sands, zeolites, rhyolites, etc). Including higher CEC materials would tend to reduce the net leaching of nutrients.

e. Soil structure can be more important than nutrient content in plant survival and biologic health of the system. If a good soil structure can be created with very low amounts of compost, plants survivability should still be provided. Soil structure is loosely defined as the ability of the soil to conduct and store water and nutrients as well as the degree of aeration of the soil. While soil structure generally develops with time, planting/storage media can be designed to promote earlier development of soil structure. Soil structure is enhanced by the use of amendments with high hummus content (as found in well-aged organic material). In addition, soil structure can be enhanced through the use of compost/organic material with a distribution of particle sizes (i.e., a more heterogeneous mix). Finally, inorganic amendments such as polymer beads may be useful for promoting aeration and moisture retention associated with a good soil structure. An example of engineered soil to promote soil structure can be found here:

http://www.hort.cornell.edu/uhi/outreach/pdfs/custructuralsoilwebpdf.pdf

f. Younger plants are generally more tolerant of lower nutrient levels and tend to help develop soil structure as they grow. Starting plants from smaller transplants can help reduce the need for organic amendments and improve soil structure. The project should be able to accept a plant mortality rate that is somewhat higher than starting from larger plants and providing high organic content.

g. With these considerations, it is anticipated that less than 10 percent compost amendment could be used, while still balancing plant survivability and water retention.

Plants

1) Plant materials should be tolerant of summer drought, ponding fluctuations, and saturated soil conditions for 48 to 96 hours.

2) It is recommended that a minimum of three types of tree, shrubs, and/or herbaceous groundcover species be incorporated to protect against facility failure due to disease and insect infestations of a single species.

3) Native plant species and/or hardy cultivars that are not invasive and do not require chemical inputs should be used to the maximum extent practicable.

Operations and Maintenance

Bioinfiltration areas require annual plant, soil, and mulch layer maintenance to ensure optimum infiltration, storage, and pollutant removal capabilities. In general, bioinfiltration maintenance requirements are typical landscape care procedures and include:

1) Watering: Plants should be drought-tolerant. Watering may be required during prolonged dry periods after plants are established.

2) Erosion control: Inspect flow entrances, ponding area, and surface overflow areas periodically, and replace soil, plant material, and/or mulch layer in areas if erosion has occurred (see Appendix I for a bioinfiltration inspection and maintenance checklist). Properly designed facilities with appropriate flow velocities should not have erosion problems, except perhaps in extreme events. If erosion problems occur, the following should be reassessed: (1) flow velocities and gradients within the cell, and (2) flow dissipation and erosion protection strategies in the pretreatment area and flow entrance. If sediment is deposited in the bioinfiltration area, immediately determine the source within the contributing area, stabilize, and remove excess surface deposits.

3) Plant material: Depending on aesthetic requirements, occasional pruning and removing of dead plant material may be necessary. Replace all dead plants and if specific plants have a high mortality rate, assess the cause and, if necessary, replace with more appropriate species. Periodic weeding is necessary until plants are established. The weeding schedule should become less frequent if the appropriate plant species and planting density have been used and, as a result, undesirable plants excluded.

4) Nutrients and pesticides: The soil mix and plants should be selected for optimum fertility, plant establishment, and growth. Nutrient and pesticide inputs should not be required and may degrade the pollutant processing capability of the bioinfiltration area, as well as contribute pollutant loads to receiving waters. By design, bioinfiltration facilities are located in areas where phosphorous and nitrogen levels are often elevated and these should not be limiting nutrients. If in question, have soil analyzed for fertility.

5) Mulch: Replace mulch annually in bioinfiltration facilities where heavy metal deposition is likely (e.g., contributing areas that include industrial and auto dealer/repair parking lots and roads). In residential lots or other areas where metal deposition is not a concern, replace or add mulch as needed to maintain a 2 to 3 inch depth at least once every two years.

6) Soil: Soil mixes for bioinfiltration facilities are designed to maintain long-term fertility and pollutant processing capability. Estimates from metal attenuation research suggest that metal accumulation should not present an environmental

concern for at least 20 years in bioinfiltration systems. Replacing mulch in bioinfiltration facilities where heavy metal deposition is likely provides an additional level of protection for prolonged performance. If in question, have soil analyzed for fertility and pollutant levels.

RWH-1: Rainwater Harvesting

Rainwater harvesting BMPs capture and store stormwater runoff for later use. These BMPs are engineered to store a specified volume of water with no surface discharge until this volume is exceeded. Storage facilities that can be used to harvest rainwater include cisterns (above ground tanks), open storage reservoirs (e.g., ponds and lakes), and underground storage devices (tanks, vaults, pipes, arch spans, and proprietary storage systems). Uses of captured water may potentially include irrigation demand, indoor non-potable demand, industrial process water demand, or other demands. Rainwater harvesting systems typically include several components: (1) methods to divert runoff to the storage device, (2) an overflow for when the storage device is full, and (3) a distribution system to get the water to where it is intended to be used. Harvesting systems typically include pretreatment to remove large sediment and vegetative debris. Systems used for internal uses may require an additional level of treatment prior to use.

Cistern

Photo Credit: MetaEfficient

Application

- Any type of land use, provided adequate water demand

Preventative Maintenance

- Debris and sediment removal
- After-rain inspections

Limitations

Rainwater harvesting may be used to meet all of the 5% EIA requirement if reliable demand is available. Rainwater harvesting is not required to be used if the available demands do not meet the volume required for 80% capture using a 72 hour drawdown time.

Design Criteria

Specific considerations for cistern rainwater harvesting systems include:

- Cisterns should include screens on gutters and downspouts to remove vegetative debris and sediment from the runoff prior to entering the cistern.
- Above-ground cisterns should be secured in place.
- Above-ground cisterns should not be located on uneven or sloped surfaces; if installed on a sloped surface, the base where the cistern will be installed should be leveled and designed for the weight of the filled cistern prior to installation.
- Child-resistant covers and mosquito screens should be placed on all water entry holes.
- A first flush diverter may be installed so that initial runoff bypasses the cistern. Where a first flush diverter is used, the diverted flows must be directed to a pervious area so that no runoff is produced or another form of treatment must be provided for this flow.
- Above-ground cisterns should be installed in a location with easy access for maintenance or replacement.

Specific considerations for underground detention include:

- Access entry covers (36” diameter minimum) should be locking and within 50 feet of all areas of the detention tank.
- In cases where the detention facility provides sediment containment, the facility should be laid flat and there should be at least ½ foot of dead storage within the tank or vault.
- Outlet structures should be designed using the 100-year storm as overflow and should be easily accessible for maintenance activities.
- For detention facilities beneath roads and parking areas, structural requirements should meet H20 load requirements.
- In cases where groundwater may cause flotation, these forces should be counteracted with backfill, anchors, or other measures.

- Underground detention facilities should be installed on consolidated and stable native soil; if the facility is constructed in fill slopes, a geotechnical analysis should be performed to ensure stability.

General considerations include:

- In cases where there is non-potable indoor demand, proper pretreatment measures should be installed such as pre-filtration, cartridge filtration, and/or disinfection (which can also be provided between the cistern and point of use).
- Plumbing systems should be installed in accordance with the current California Building and Plumbing Codes (CBC – part of California Code of Regulations, Title 24).
- Underground detention facilities can be incorporated into a treatment train to provide initial or supplemental storage to other detention storage facilities and/or infiltration BMPs.
- Treatment of the captured rainwater (i.e. disinfection) may be required depending on the end use of the water.

Rainwater harvesting uses include:

- Harvested rainwater can be used for irrigation and other non-potable uses (if local, State, and Federal ordinances allow). The use of captured stormwater allows a reduced demand on the potable water supply. Cross-contamination should be prevented when make-up water is required for rainwater use demand by providing a backflow prevention system on the potable water supply line and/or an air gap.
- Irrigation Use
  - Subsurface (or drip) irrigation should not require disinfection pretreatment prior to use; other irrigation types, such as spray irrigation, may require additional pre-treatment prior to use
  - Selecting native and/or drought tolerant plants for landscaped area will reduce irrigation demand; however, they are still recommended for use.
- Domestic Use
  - Domestic uses may include toilet flushing and clothes washing (if local, State, and Federal ordinances allow).
  - Pretreatment requirements per local, State, or Federal codes and ordinances may apply.
- Other Non-Potable Uses

- Other potential non-potable uses may include vehicle/equipment washing, evaporative cooling, industrial processes, and dilution water for recycled water systems.

Sizing Criteria

The effectiveness of rainwater harvesting (RWH) systems is a function of tributary area, storage volume, demand patterns and magnitudes, and operational regime. If either of the latter two factors are too complex, simple design criteria metrics are not possible. The rainwater harvesting design criteria provided in this Fact Sheet are intended for the evaluation of systems that have relatively simple demand regimes and passive operation. If the answer to any of the following complexity screening questions is yes, a site-specific evaluation of rainwater harvesting effectiveness should be completed using a continuous simulation model with a long-term precipitation record.

Complexity Screening Questions:

- Does the proposed system have seasonally-varying demand other than irrigation?
- Will the system be operated by advanced control systems or otherwise actively controlled?
- Does the operational regime call for the system be shut down at any time during the rainy season?

Effectiveness of a harvesting system for retaining the SQDV depends on the cistern's effective storage capacity (i.e., the volume available for storage at the beginning of each event). Therefore, the required storage volume varies based on precipitation and demand. Using the following sizing charts, cisterns should be sized to achieve 80 percent capture efficiency. These nomographs are based on continuous simulation performed in EPA SWMM using precipitation and ET records representative of lowland regions (Oxnard Airport Precipitation Gauge, El Rio Spreading Grounds ET station) and mountainous regions (Ojai-Stewart Canyon Precipitation Gauge, Matilja ET Station) of the County.

Instructions for determining required cistern volume and demand are provided below:

Step 1: Determine Required Rainwater Harvesting Design Volume (RWHDV)

Note that a rainwater harvesting system sized for 80% capture runoff (as determined by continuous modeling), which can draw down in 72 hours is required to meet the 5% EIA standard. If the demand required to draw a tank sized for these parameters is not available, rainwater harvesting is not mandated for use. Partial capture of runoff is allowable if rainwater harvesting is desired for use. Sizing instructions for partial capture are included in Step 3.

1) Determine the design storm required for 80% capture with a 72 hour drawdown time by selecting the project region (lowland or mountainous), then determining where the 72 hour drawdown curve intersects the 80% capture line. Pivot down from this intersection to the x axis to read the design storm, d_{design}.

2) Determine the required rainwater harvesting system volume using the following equation:

$$RWHDV = C*(d_{design}/12)*A_{retain} \qquad \text{(Equation 6-19)}$$

Where:

RWHDV	=	rainwater harvesting design volume (acre-ft)
C	=	runoff coefficient, calculated using Appendix E and the site imperviousness
d_{design}	=	design storm required for 80% capture with a 72 hour drawdown time, estimated as described in 1) (inches)
A_{retain}	=	the drainage area from which runoff must be retained (acres)

Step 2: Determine the Required Daily Demand to Achieve 80% Capture

1) The required daily demand to achieve 80% capture of runoff can be calculated as follows:

$$Demand = [RWHDV/(72/24)] * (325{,}851) \qquad \text{(Equation 6-20)}$$

Where:

Demand	=	required project daily demand to draw down rainwater harvesting system sized for 80% capture in 72 hours (gallons)
RWHDV	=	rainwater harvesting design volume (acre-ft), from Step 1 above

If the project daily demand is less than the Demand calculated, the project is not required to utilize rainwater harvesting. If rainwater harvesting is desired for use for partial retention, if a longer drawdown time is desired, or if a predetermined daily demand is to be used, refer to Steps 3 and 4 below.

Step 3: Determine RWHDV for Partial Retention or a Longer Drawdown Time

1) Calculate RWHDV for selected combination of % capture and drawdown time using nomographs and the following equation:

$$RWHDV = C*(d_{design}/12)*A_{retain} \quad \text{(Equation 6-21)}$$

Where:

RWHDV	=	rainwater harvesting design volume (acre-ft)
C	=	runoff coefficient, calculated using Appendix E and the site imperviousness
d_{design}	=	design storm required for selected % capture and drawdown time (inches)
A_{retain}	=	the drainage area from which runoff must be retained (acres)

2) Determine the required daily demand for the selected capture efficiency and/or drawdown time:

$$Demand = [RWHDV/(t_{drawdown}/24)] * (325{,}851) \quad \text{(Equation 6-22)}$$

Where:

Demand	=	required project daily demand to draw down rainwater harvesting system sized for 80% capture in 72 hours (gallons)
RWHDV	=	rainwater harvesting design volume (acre-ft), from 1) above
$t_{drawdown}$	=	selected drawdown time (hours)

Step 4: Determine RWHDV for a Predetermined Daily Demand

1) Determine the daily demand requirement in acre-feet (1 acre-foot = 325,851 gallons).

2) Calculate the required RWHDV for the desired drawdown time using the following equation:

$$RWHDV = Demand *(t_{drawdown}/24) \quad \text{(Equation 6-23)}$$

Where:

Demand	=	required project daily demand (acre-feet)
RWHDV	=	rainwater harvesting design volume (acre-ft)
$t_{drawdown}$	=	selected drawdown time (hours)

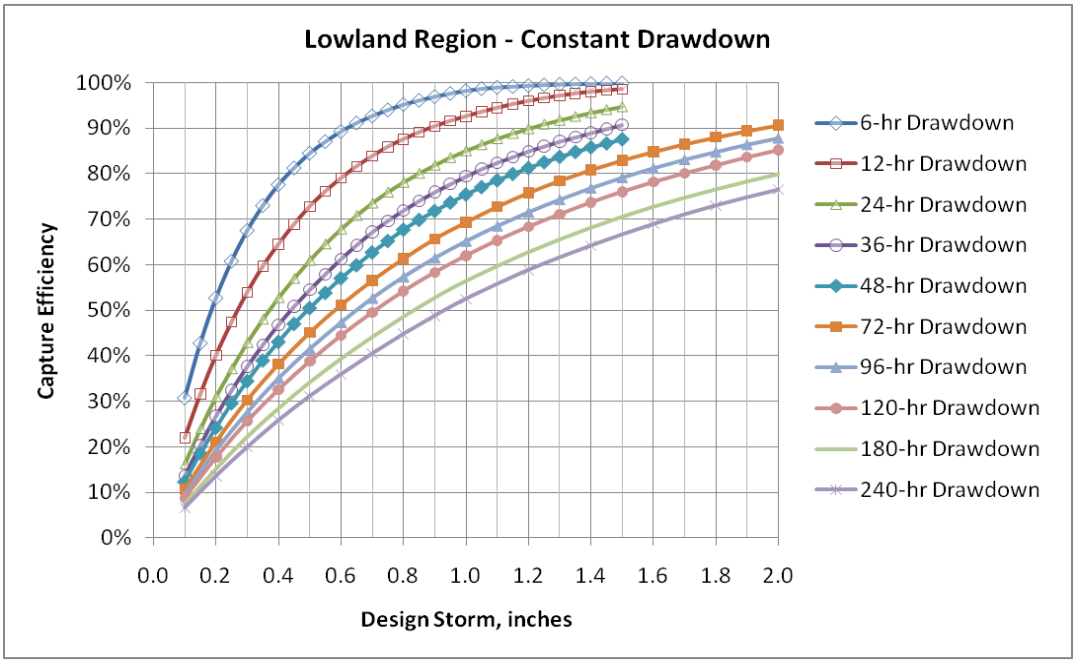
Lowland Region - Constant Drawdown
Capture Efficiency
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
Design Storm, inches
6-hr Drawdown
12-hr Drawdown
24-hr Drawdown
36-hr Drawdown
48-hr Drawdown
72-hr Drawdown
96-hr Drawdown
120-hr Drawdown
180-hr Drawdown
240-hr Drawdown

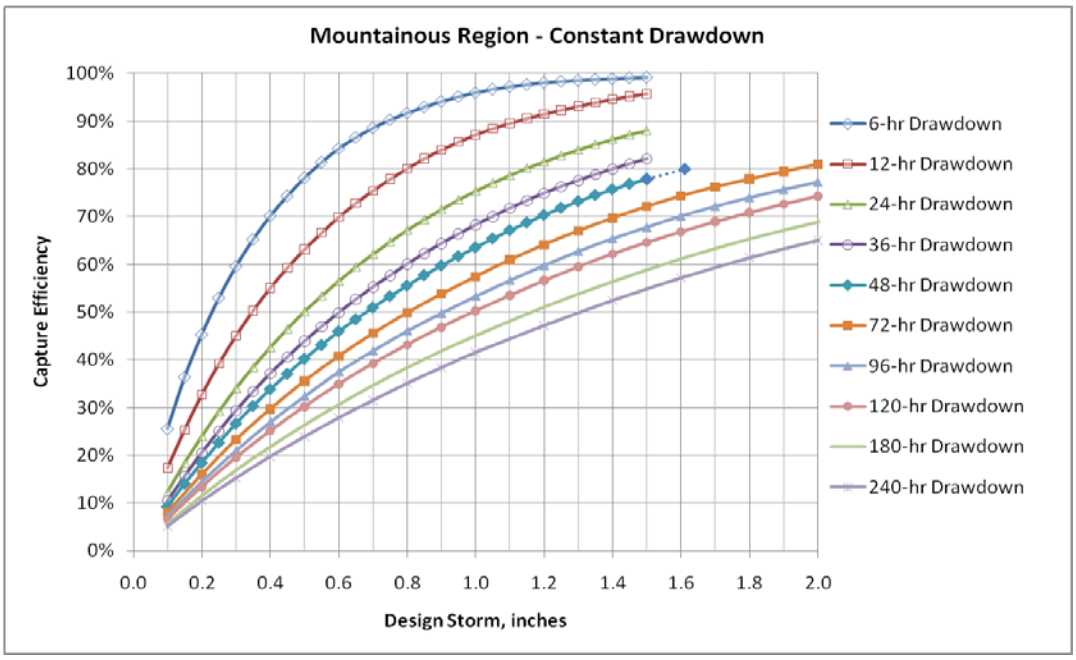
Mountainous Region - Constant Drawdown
Capture Efficiency
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
Design Storm, inches
6-hr Drawdown
12-hr Drawdown
24-hr Drawdown
36-hr Drawdown
48-hr Drawdown
72-hr Drawdown
96-hr Drawdown
120-hr Drawdown
180-hr Drawdown
240-hr Drawdown

Operations and Maintenance

1) Inspect storage facilities, associated pipes, and valve connections for leaks.

2) Clean gutters and filters of debris that has accumulated and is obstructing flow into the storage facility.

3) Clean and remove accumulated sediment annually.

4) Check cisterns for stability and anchor if necessary.

5) If the storage device is underground, ensure that a manhole is accessible, operational, and secure.

ET-1: Green Roof

Green roofs (also known as eco-roofs and vegetated roof covers) are roofing systems that layer a soil/vegetative cover over a waterproofing membrane. Green roofs rely on highly porous media and moisture retention layers to store intercepted precipitation and to support vegetation that can reduce the volume of stormwater runoff via evapotranspiration. There are two types of green roofing systems: extensive, which is a light-weight system; and intensive, which is a heavier system that allows for larger plants but requires additional structural support.

Green Roof Examples

Photo Credits:

1. Milwaukee Department of Environmental Sustainability;

2. Geosyntec Consultants

Application

- Building roofs
- Outdoor eating area roofs
- Parking structure or turnaround roofs

Preventative Maintenance

- Weeding and pruning
- Leaf and debris removal
- Regular membrane inspection
- Drain cleanout

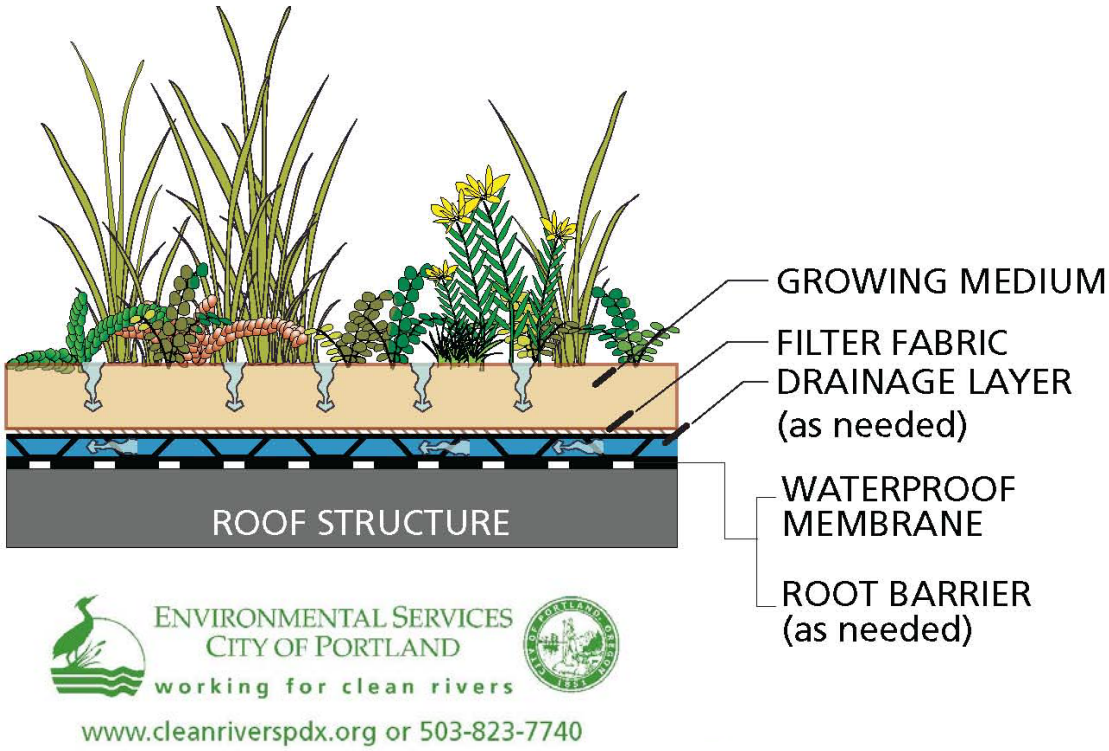

Exhibit A: Green Roof Schematic Courtesy of Portland, OR Environmental Services Department

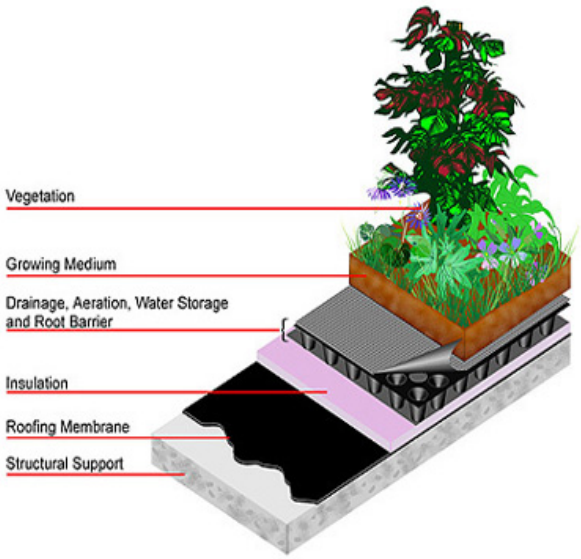

Exhibit B: Green Roof Schematic Courtesy of American Wick

Geosyntec consultants

Figure 6-9: Green Roofs

Limitations

The following describes additional site suitability recommendations and limitations for green roofs.

- Typically not used for steep roofs (>25%); and
- Structural roof support must be sufficient to support additional roof weight.

Design Criteria

Green roofs should be designed according to the requirements listed in Table 6-17 and outlined in the section below.

Table 6-17: Green Roof Design Criteria

Design Parameter	Unit	Design Criteria
Soil depth range	inch	2 – 6
Saturated soil weight	lbs. / sq. ft.	10 – 25
Maximum roof slope	%	25
Minimum roof slope	--	Flat
Vegetation type	--	Varies (see vegetation section below)
Vegetation height	--	Varies (see vegetation section below)

Sizing

Green roofs may provide quantifiable reduction in volume. However, they are not explicitly sized to meet the water quality treatment requirements. Rather, the volume reduction is accounted for implicitly in sizing calculations for the treatment BMPs for the remainder of the site by assuming that the roof area is pervious rather than impervious when calculating a runoff coefficient for the site.

Green Roof Components

Structural Support

The first requirement that must be met before installing a green roof is the structural support of the roof. The roof must be able to support the additional weight of the soil, water, and vegetation. A licensed structural engineer should be consulted to determine the proposed structural support during the design phase.

Waterproof Roofing Membrane

Waterproof roofing membrane is an integral part of a green roofing system. The waterproof membrane prevents the roof runoff from penetrating and damaging the roofing material. There are many materials available for this purpose and come in various forms (i.e., rolls, sheets, liquid) and exhibit different characteristics (e.g., flexibility, strength, etc.). Depending on the type of membrane chosen a root barrier may be required to prevent roots from compromising the integrity of the membrane.

Drainage Layer

Depending on the design of the roof, a drainage layer may be required to convey the excess runoff from of the roof. If a drainage layer is needed, there are numerous options including a gravel layer (which may require additional structural support), and many styles and types of plastic drainage layers.

Soil Considerations

The soil layer is an important factor in the construction and operation of green roofs. The soil layer must have excellent drainage, not be too heavy when saturated, and be adequately fertile as a growing medium for plants. Many companies sell their own proprietary soil mixes. However, a simple mix of ¼ topsoil, ¼ compost, and the remainder pumice perlite may be used for many applications. Other soil amendments may be substituted for the compost and the pumice perlite. The soil mix used should not contain any clay.

Vegetation

Green roofs must be vegetated in order to provide adequate treatment of runoff via filtration and evapotranspiration. Vegetation, when chosen and maintained appropriately, also improves the aesthetics of a site. Green roofs should be vegetated with a mix of erosion-resistant plant species that effectively bind the soil and can withstand the extreme environment of rooftops. A diverse selection of low growing plants that thrive under the specific site, climatic, and watering conditions should be identified. A mixture of drought-tolerant, self-sustaining (perennial or self-sowing without need for fertilizers, herbicides, and or pesticides) is most effective in the Ventura County region. Plants selected should also be low maintenance and able to withstand heat, cold, and high winds. Native or adapted sedum/succulent plants are preferred because they generally require less fertilizer, limited maintenance, and are more drought resistant than exotic plants. When appropriate, green roofs may be planted with larger plants. However, this depends on structural support and soil depth.

The following provides additional vegetation guidance for green roofs.

1) For extensive roofs, trees or shrubs may be used as long as the increased soil depth required may be supported.

2) Irrigation is required if the seed is planted in spring or summer. The use of a permanent smart (self-regulating) irrigation system or other watering system, may help provide maximal water quality performance. Drought-tolerant plants should be specified to minimize irrigation requirements. For projects seeking "High Performance Building" recognition, ASHRAE Standard 189.1 states that potable water cannot be used for irrigating green roofs after they are established.

3) Locate the green roof vegetation in an area without excessive shade to avoid poor vegetative growth. For moderately shaded areas, shade tolerant plants should be used.

4) A relevant plant list should be provided by a landscape professional and used as a guide to support project-specific planting recommendations, including recommendations on appropriate plants, fertilizer, mulching applications, and irrigation requirements (if any) to ensure healthy vegetation growth.

Drain

1) There must be a drain pipe (gutter) to convey runoff (both overflow and underdrain flow, if appropriate) safely from the roof to another basic or stormwater runoff BMP, a pervious area, or the stormwater conveyance system.

Construction Considerations

1) Building structure must be adequate to hold the additional weight of the soil, retained water, and plants.

2) Plants should be selected carefully to minimize maintenance and function properly.

Operations and Maintenance

1) During the establishment period, green roofs may need irrigation and occasional light fertilization until the plants have fully established themselves. Once healthy and fully established, properly selected climate-appropriate plants will no longer need irrigation except during extreme drought.

2) Weeding during the establishment period may be required to ensure proper establishment of the desired vegetation. Once established and assuming proper selection of vegetation, the vegetation should not require any preventative maintenance.

3) The roofing membrane should be inspected routinely, as it is a crucial element of the green roof. In addition, preventative inspection of the drainage paths is required to ensure that there are no clogs in the system. If a green roof is not properly draining, the moisture in the system may cause the roof to leak and/or the plants to drown or rot. Leaks in the roof may occur not only due to improper drainage, but also if the incorrect combination of waterproofing barrier, root barrier, and drainage systems

are selected. Leak inspections in the roofing system are advised, especially in locations prone to leaks, such as at all joints.

4) Inspect green roofs for erosion or damage to vegetation after every storm greater than 0.75 inches and at the end of the wet season to schedule summer maintenance and in the fall to ensure readiness for winter. Additional inspection after periods of heavy runoff is recommended. Green roofs should be checked for debris, litter, and signs of clogging.

5) Replanting and/or reseeding of vegetation may be required for reestablishment.

6) Vegetation should be healthy and dense enough to provide filtering while protecting underlying soils from erosion.

7) Fallen leaves and debris from deciduous plant foliage should be removed.

8) Invasive vegetation, such as Alligatorweed (*Alternanthera philoxeroides*), Halogeton (*Halogeton glomeratus*), Spotted Knapweed (*Centaurea maculosa*), Giant Reed (*Arundo donax*), Castor Bean (*Ricinus communis*), Perennial Pepperweed (*Lepidium latifolium*), and Yellow Starthistle (*Centaurea solstitalis*) should be removed and replaced with non-invasive species. For more information on invasive weeds, including biology and control of listed weeds, look at the encycloweedia located at the California Department of Food and Agriculture website or the California Invasive Plant Council website at www.cal-ipc.org.

9) Dead vegetation should be removed if greater than 10% of the area coverage. Vegetation should be replaced and established before the wet season to maintain cover density and control erosion where soils are exposed.

ET-2: Hydrologic Source Control BMPs

Hydrologic source control (HSC) BMPs are simple BMPs that are highly integrated with the site design to reduce runoff volume. The practices described in this fact sheet include impervious area dispersion, street trees, and rain barrels.

Application

- Building roofs
- Sidewalks and patios
- Landscaping hardscapes

Preventative Maintenance

- Weeding and pruning
- Leaf and debris removal

Hydrologic Source Control Examples

Photo Credits:

1. http://www.auburn.edu/projects/sustainability/website/newsletter/0910.php;

2. Geosyntec Consultants;

3. toronto.ca/environment/water.htm

Accounting for Hydrologic Source Controls in Hydrologic Calculations

The effects of HSC BMPs are accounted for in hydrologic calculations as an adjustment to the storm depth used in the SQDV calculations described in Section 2. Runoff volume calculations are performed exactly as described in Section 2, with the exception that the storm depth used in the calculation is adjusted prior to the calculation. Adjustments are based on the type and magnitude of HSC BMPs employed for the drainage area per guidance outlined in this Fact Sheet.

EXAMPLE 6.1: ACCOUNTING FOR HSCS IN HYDROLOGIC CALCULATIONS

Given:

- A drainage area consists of a 1 acre building roof surrounded by 0.25 acres of landscaping (80 percent composite imperviousness);
- The drainage from the roof is spread uniformly over the entire pervious area via splash pads and level spreaders;
- Soils are moderately well drained and have a shallow slope;
- For the purpose of this example, assume the hydrologic source control adjustment for this configuration of disconnected downspouts is 0.3 inches. For an actual project, hydrologic source control adjustment would be calculated based on instructions in this section; and
- The unadjusted design storm depth at the project site is 0.75 inches.

Result:

1) The designer uses 0.75 inches – 0.3 inches = 0.45 inches in the calculation of SQDV.

Impervious Area Dispersion

Impervious area dispersion refers to the practice of routing runoff from impervious areas, such as rooftops, walkways, and patios, onto the surface of adjacent pervious areas. Runoff is dispersed uniformly via splash block or dispersion trench and soaks into the ground as it moves slowly across the surface of the pervious area. Minor ponding may occur, but it is not the intent of this practice to actively promote localized on-lot infiltration, which should be designed as an infiltration BMP (see INF-1 through INF-6 above).

Design Considerations

1) Not likely to result in net increased infiltration over existing condition for previously pervious sites, but has potential to result in some geotechnical hazards associated with infiltration.

2) Significant pervious area should be available, at a ratio of at least 1 part pervious area capable of receiving flow to 5 parts impervious.

3) Pervious area receiving flow should have a slope ≤ 2 percent and path lengths of ≥ 10 feet per 1000 sf of impervious area.

4) Overflow from the pervious area up to the SQDV should be directed to a Retention BMP, Biofiltration BMP, or Treatment Control Measure. Larger flows should be directed to the storm drain system.

5) Soils in the pervious area should be preserved in their natural condition or improved with soil amendments (see Soil Amendments below).

6) Impervious area disconnection is an HSC that may be used as the first element in any treatment train.

7) The use of impervious area disconnection reduces the sizing requirement for downstream Retention BMPs, Biofiltration BMPs, and/or Treatment Control Measures.

Calculating HSC Retention Volume

1) The retention volume provided by downspout dispersion is a function of the ratio of impervious to pervious area.

2) Determine flow patterns in pervious area and estimate footprint of pervious area receiving dispersed flow. Calculate the ratio of pervious to impervious area.

3) Check soil conditions using the checklist below; amend if necessary.

4) Look up the storm retention depth (d_{HSC}), from the chart to the right.

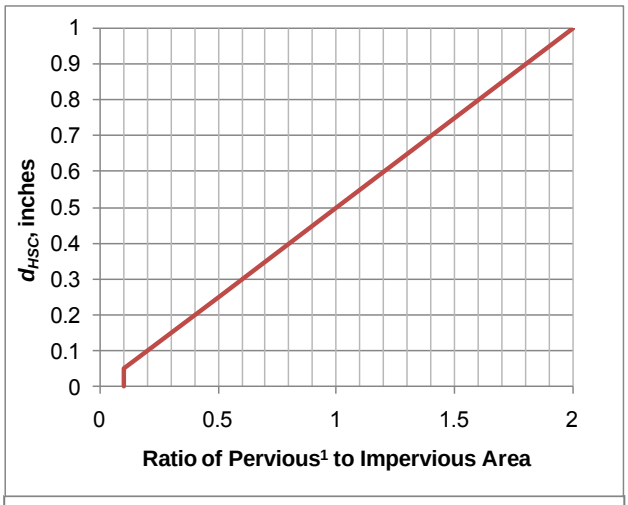

[1] Pervious area used in calculation should only include the pervious area receiving flow, not pervious area receiving only direct rainfall or upslope pervious drainage.

5) The max d_{HSC} is equal to the design storm depth for the project site.

Soil Condition Checklist

1) Soil should have a maximum slope of 2 percent.

2) Landscaping should be well-established.

3) Amended soils should consist of: 60 to 70% sand, 15 to 25% compost, 10 to 20% clean topsoil. The organic content of the soil mixture should be 8 to 12%; the pH range should be 5.5 to 7.5.

Additional References

- SMC LID Manual (pp 131): http://www.lowimpactdevelopment.org/guest75/pub/All_Projects/SoCal_LID_Manual/SoCalLID_Manual_FINAL_040910.pdf
- City of Portland Bureau of Environmental Services. 2010. How to manage stormwater – Disconnect Downspouts: http://www.portlandonline.com/bes/index.cfm?c=43081&a=177702
- Seattle Public Utility: http://www.cityofseattle.org/util/stellent/groups/public/@spu/@usm/documents/webcontent/spu01_006395.pdf
- Thurston County, Washington State (pp 10): http://www.co.thurston.wa.us/wwm/Engineering_Standards/Drainage_Manual/PDFs/DG-5%20Roof%20Runoff%20Control.pdf

Amended Soils

A soil amendment is any material added to the upper layer of soil especially in the vicinity of the root zone soil to improve its physical properties, such as the water retention, permeability, water infiltration, drainage, aeration and structure. The goal is to provide a better environment for roots. To do its work, an amendment should be thoroughly mixed into the soil. If it is merely buried, its effectiveness is reduced and it will interfere with water and air movement and root growth.

Amending a soil is different from mulching, although many mulches also are used as amendments. A mulch is left on the soil surface. Its purpose is to reduce evaporation and runoff, inhibit weed growth, and create an attractive appearance. Mulches also moderate soil temperature, helping to warm soils in the spring and cool them in the summer. Mulches may be incorporated into the soil as amendments after they have decomposed to the point that they no longer serve their purpose.

Organic amendments, such as compost, increase soil organic matter content and offer many benefits. Organic matter improves soil aeration, water infiltration, and both water- and nutrient-holding capacity. Many organic amendments contain plant nutrients and act as organic fertilizers. Organic matter also is an important energy source for bacteria, fungi and earthworms that live in the soil.

Design Considerations

1) Landscaped and other developed pervious areas can be amended to improve evapotranspiration and soil moisture storage capacity.

2) Landscape and other developed pervious areas can be amended to increase infiltration rates in cases where the limiting infiltration horizon exists near the surface of the soil column.

3) Soil amendments are common components of several Retention BMPs, Biofiltration BMPs, and Treatment Control Measures, including infiltration basins, bioretention, vegetated swales, filter strips, planter boxes, green roofs, dry extended detention basins, wet retention basins, and constructed treatment wetlands.

4) Compost, soil conditioners, and fertilizers should be rototilled into the native soil to a minimum depth of 6 inches; 12 inches preferred.

5) All soil amendments shall be free of sticks, glass, plastic, metal, debris larger than 1 inch, and other deleterious material.

6) Compost shall meet criteria listed in the guidelines for planting and storage media.

Calculating HSC Retention Volume

No retention credit is given for amended soils alone. Amended soils should be used to increase the retention volume of Retention BMPs, Biofiltration BMPs, and Treatment Control Measures.

Additional References

- San Diego County LID Handbook Appendix 4 (Factsheet 30): http://www.sdcounty.ca.gov/dplu/docs/LID-Appendices.pdf

- Colorado State University Extension website: http://www.ext.colostate.edu/pubs/garden/07235.html

Street Trees

By intercepting rainfall, trees can provide several aesthetic and stormwater benefits including peak flow control, increased infiltration and evapotranspiration, and runoff temperature reduction. The volume of precipitation intercepted by the canopy reduces the treatment volume required for downstream treatment BMPs. Shading reduces the heat island effect as well as the temperature of adjacent impervious surfaces over which stormwater flows, and thus reduces the heat transferred to the downstream waterbody. Tree roots also strengthen the soil structure and provide infiltrative pathways, simultaneously reducing erosion potential and enhancing infiltration.

Design Considerations

1) Street trees can be incorporated along sidewalks, streets, parking lots, or driveways.

2) Street trees can be used in combination with bioretention systems along medians or in traffic calming bays.

3) There should be sufficient space available to accommodate both the tree canopy and the root system.

4) The mature tree canopy, height, and root system should not interfere with subsurface utilities, overhead powerlines, buildings and foundations, or other existing or planned structures.

5) Depending on space constraints, a 20 to 30 foot canopy (at maturity) is recommended for stormwater mitigation.

6) Native, drought-tolerant species should be selected in order to minimize irrigation requirements and improve the long-term viability of the tree.

7) Trees should not impede pedestrian or vehicle sight lines.

8) Planting locations should receive adequate sunlight and wind protection. Other environmental factors should be considered prior to planting.

9) Soils should be preserved in their natural condition (if appropriate for planting) or restored via soil amendments. If necessary, a landscape architect should be consulted.

Calculating HSC Retention Volume

1) The retention volume provided by streets trees via canopy interception is dependent on the tree species, time of the year, and maturity.

2) To compute the retention credit, the expected impervious area covered by the full tree canopy after 4 years of growth should be computed (IA_{HSC}). The maximum retention depth credit for canopy interception (d_{HSC}) is 0.05 inches.

Additional References

- California Stormwater BMP Handbook: http://www.cabmphandbooks.com/Documents/Development/Section_3.pdf
- City of Los Angeles, Street Tree Division - Street Tree Selection Guide: http://bss.lacity.org/UrbanForestryDivision/StreetTreeSelectionGuide.htm
- Portland Stormwater Management Manual: http://www.portlandonline.com/bes/index.cfm?c=35122&a=55791
- San Diego County LID Handbook Fact Sheets: http://www.sdcounty.ca.gov/dplu/docs/LID-Appendices.pdf

Residential Rain Barrels

Rain barrels are above ground storage vessels that capture runoff from roof downspouts during rain events and detain that runoff for later use for irrigating landscaped areas.

Design Considerations

1) If detained water will be used for irrigation, sufficient vegetated areas and other impervious surfaces should be present in the drainage area.

2) Storage capacity and sufficient area for overflow dispersion should be accounted for.

3) Screens on gutters and downspouts to remove sediment and particles as the water enters the barrel or cistern should be provided.

4) Removable child-resistant covers and mosquito screening should be provided to prevent unwanted access.

5) Above-ground barrels should be secured in place.

6) Above-ground barrels should not be located on uneven or sloped surfaces. If installed on a sloped surface, the base where the rain barrel will be installed should be leveled prior to installation.

7) Overflow dispersion should occur greater than 5 feet from building foundations.

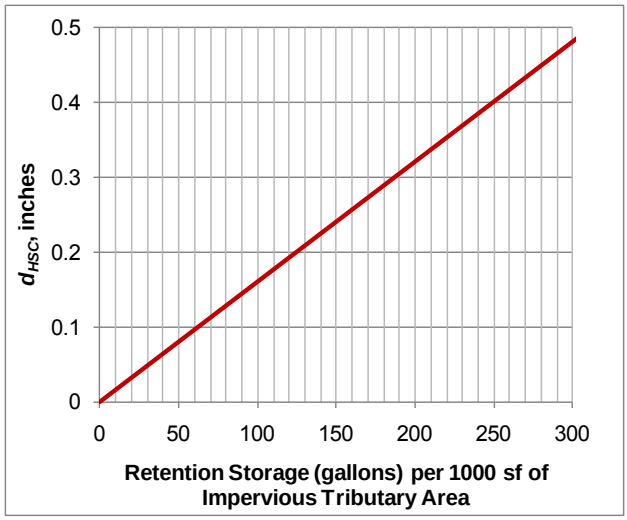

8) Dispersion should not cause geotechnical hazards related to slope stability.

9) Effective energy dissipation and uniform flow spreading methods should be employed to prevent erosion and facilitate dispersion.

10) Placement should allow easy access for regular maintenance.

Calculating HSC Retention Volume

1) The retention volume provided by rain barrels that are not actively managed can be computed as 50% of the total storage volume (e.g., 22.5 gallons for each 55 gallon barrel).

2) If the rain barrel is actively managed, then it should be treated as a cistern (see RWH-1).

3) Estimate the average retention volume per 1000 square feet impervious tributary area provided by rain barrels.

4) Look up the storm retention depth (d_{HSC}), from the chart to the right.

5) The max d_{HSC} is equal to the design storm depth for the project site.

Additional References

- Santa Barbara BMP Guidance Manual, Chapter 6: http://www.santabarbaraca.gov/NR/rdonlyres/91D1FA75-C185-491E-A882-49EE17789DF8/0/Manual_071008_Final.pdf
- County of Los Angeles LID Standards Manual: http://dpw.lacounty.gov/wmd/LA_County_LID_Manual.pdf
- SMC LID Manual (pp 114): http://www.lowimpactdevelopment.org/guest75/pub/All_Projects/SoCal_LID_Manual/SoCalLID_Manual_FINAL_040910.pdf
- San Diego County LID Handbook Appendix 4 (Factsheet 26): http://www.sdcounty.ca.gov/dplu/docs/LID-Appendices.pdf

BIO-1: Bioretention with Underdrain

Bioretention stormwater treatment facilities are landscaped shallow depressions that capture and filter stormwater runoff. These facilities function as a soil and plant based filtration device that removes pollutants through a variety of physical, biological, and chemical treatment processes. The facilities normally consist of a ponding area, mulch layer, planting soils, and plantings. As stormwater passes down through the planting soil, pollutants are filtered, adsorbed, and biodegraded by the soil and plants. Bioretention with an underdrain is a treatment control measures that can be used for areas with low permeability native soils or steep slopes. Bioretention may be designed without an underdrain to serve as a retention BMP in areas of high soil permeability (see INF-3 Bioretention) or partial retention/ partial biofiltration BMP (see INF-7: Bioinfiltration).

Bioretention in Parking Lots

Photo Credits: Geosyntec Consultants

Application

- Parking lots
- Roadway parkways and medians
- School entrances, courtyards, and walkways
- Playgrounds and sports fields

Preventative Maintenance

- Repair small eroded areas
- Remove trash and debris and rake surface soils
- Remove accumulated fine sediments, dead leaves, and trash
- Remove weeds and prune back excess plant growth
- Remove sediment and debris accumulation near inlet and outlet structures
- Periodically observe function under wet weather conditions

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Plan View
(Not to Scale)

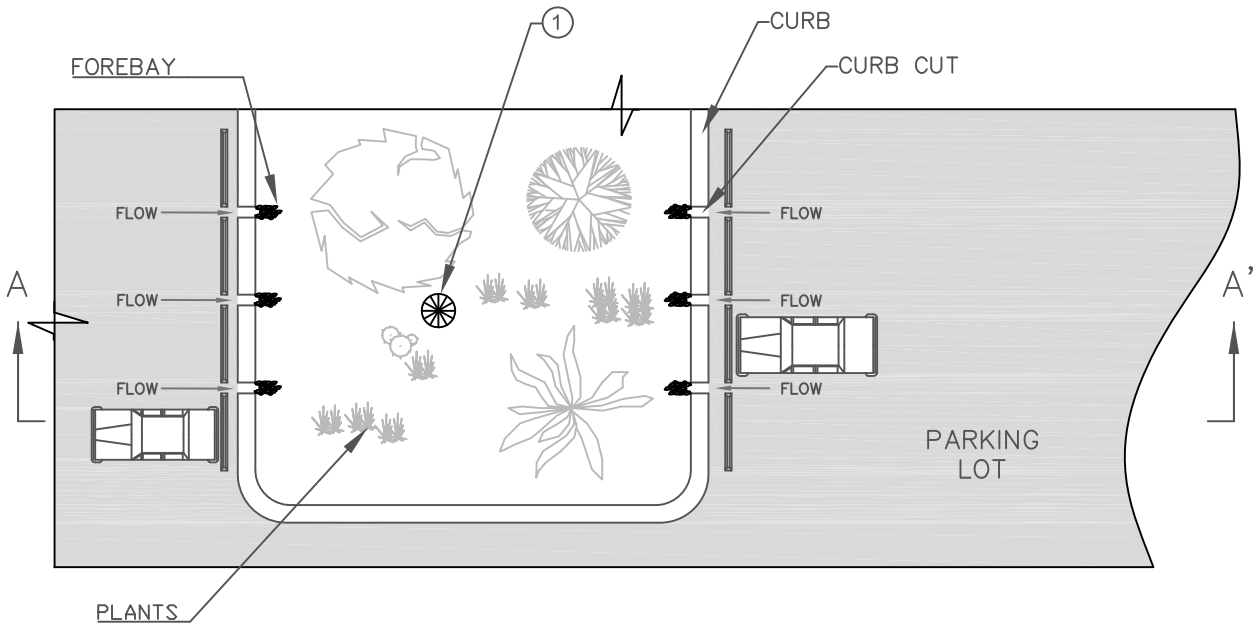

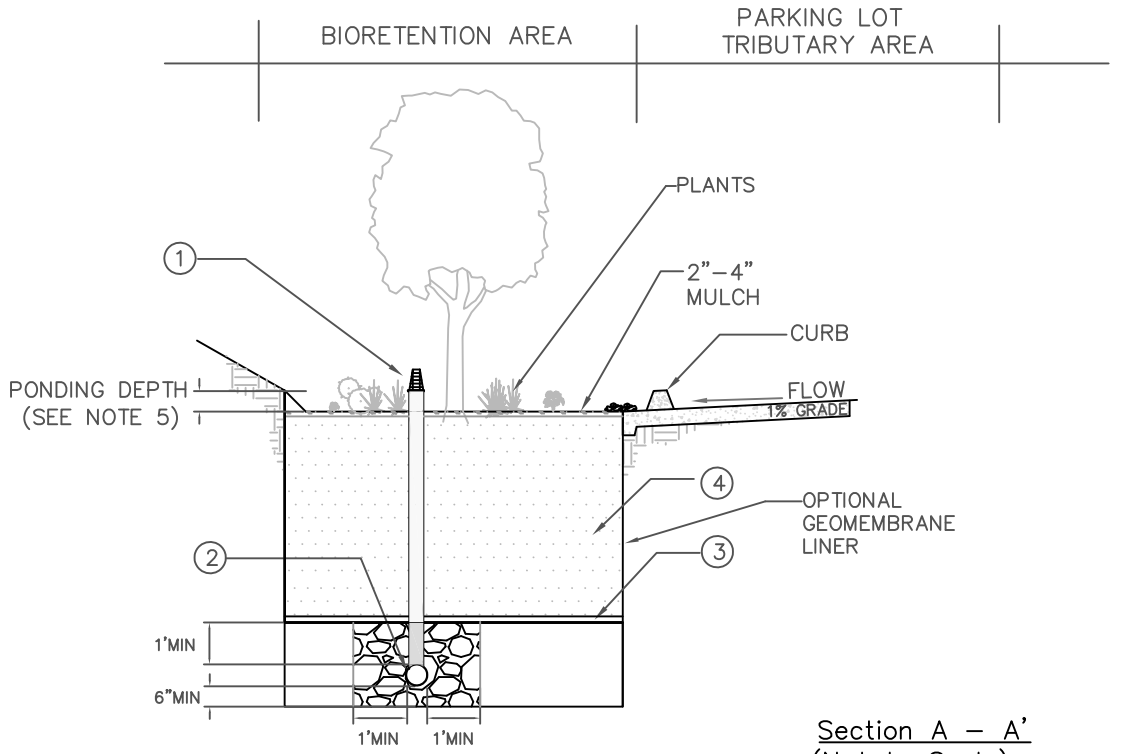

Section A – A'
(Not to Scale)

NOTES:

① OVERFLOW DEVICE: VERTICAL RISER OR EQUIVALENT.
② PERFORATED 6" MIN PVC PIPE UNDERDRAIN.
③ OPTIONAL CHOKING GRAVEL LAYER.
④ 2' MIN PLANTING MIX; 3' PREFERRED.
⑤ PONDING DEPTH 18" WITH FENCE; 6" WITHOUT FENCE.

Geosyntec consultants

Figure 6-10: Bioretention with Underdrain

Limitations

1) Vertical relief and proximity to storm drain - site must have adequate relief between land surface and storm drain to permit vertical percolation through the soil media and collection and conveyance in underdrain to storm drain system.

2) Depth to groundwater - shallow groundwater table may not permit complete drawdown between storms.

Design Criteria

Bioretention with an underdrain should be designed according to the requirements listed in Table 6-18 and outlined in the section below. BMP sizing worksheets are presented in Appendix E.

Table 6-18: Bioretention with an Underdrain Design Criteria

Design Parameter	Unit	Design Criteria
Stormwater quality design volume (SQDV)	acre-feet	See Section 2 and Appendix E for calculating SQDV.
Forebay	-	Forebay should be provided for all tributary surfaces that contain landscaped areas. Forebays should be designed to prevent standing water during dry weather and should be planted with a plant palette that is tolerant of wet conditions.
Maximum drawdown time of water ponded on surface	hours	72
Maximum drawdown time of surface ponding plus subsurface pores	hours	96 (72 preferred)
Maximum ponding depth	inches	18 inches
Minimum thickness of amended soils layer	feet	2 (3 preferred)
Minimum thickness of stabilized mulch	inches	2 to 4
Planting mix composition	-	60 to 80% fine sand, 20 to 40% compost
Underdrain sizing	-	6 inch minimum diameter; 0.5% minimum slope; slotted, polyvinyl chloride (PVC) pipe (PVC SDR 35 or approved equivalent); spacing shall be determined to provide

Design Parameter	Unit	Design Criteria
		capacity for maximum rate filtered through amended media
Gravel layer	-	A gravel bed should be provided around underdrain. Underdrain should have at least 1 foot of gravel installed to the sides and on top of the underdrain, and at least 0.5 feet of gravel installed below underdrain.
Overflow device	-	Required

Sizing Criteria

Bioretention facilities with underdrains shall be designed to capture and treat the SQDV. However because these systems commonly have a relatively high amended soil infiltration rate and shallow depth, these systems are typically capable of filtering a significant portion of the SQDV during a storm event. Therefore, a simplified routing approach is described in the following steps that accounts for the portion of the SQDV that is filtered during the storm event.

Step 1: Calculate the Design Volume

Bioretention facilities shall be sized to capture and biofilter the SQDV (see Section 2.3 and Appendix E).

Step 2: Determine the Design Percolation Rate

Sizing is based on the design saturated hydraulic conductivity (K_{sat}) of the amended soil layer. A target K_{sat} of 5 inches per hour is recommended for non-proprietary amended soil media. The media K_{sat} will decline between maintenance cycles as the surface becomes occluded and particulates accumulate in the amended soil layer. A factor of safety of 2.0 should be applied such that the resulting recommended design K_{sat} is 2.5 inches per hour. This value should be used for sizing unless sufficient rationale is provided to justify a higher design K_{sat}.

Step 3: Calculate the surface area

Determine the size of the required infiltrating surface by assuming the SQDV will fill the available ponding depth plus the void spaces in the media, based on the computed porosity of the filter media and aggregate layer.

1) Select a surface ponding depth (d_p) that satisfies geometric criteria and is congruent with the constraints of the site. Selecting a deeper ponding depth (18 inches maximum) generally yields a smaller footprint, however, it requires greater consideration for public safety, energy dissipation, and plant selection.

2) Compute time for selected ponding depth to filter through media:

$$t_{ponding} = \frac{d_p}{K_{design}} 12 \frac{in}{ft}$$ (Equation 6-24)

Where:

$t_{ponding}$	=	required drain time of surface ponding (≤ 72 hrs)
d_p	=	selected surface ponding water depth (ft)
K_{design}	=	media design saturated hydraulic conductivity (in/hr) (see Step 2, above)

If $t_{ponding}$ exceeds 72 hours, return to (1) and reduce surface ponding or increase media K_{design}. Otherwise, proceed to next step.

Note: In nearly all cases, $t_{ponding}$ will not approach 72 hours unless a low K_{design} is specified.

3) Compute depth of water that may be filtered during the design storm event as follows:

$$d_{filtered} = Minimum\left[\frac{K_{design} \times T_{routing}}{12 \, in/ft}, d_p\right]$$ (Equation 6-25)

Where:

$d_{filtered}$	=	depth of water that may be considered to be filtered during the design storm event (ft) for routing calculations; this value should not exceed the surface ponding depth (d_p)
K_{design}	=	design saturated hydraulic conductivity (in/hr) (see Step 2, above)
$T_{routing}$	=	storm duration that may be assumed for routing calculations; this should be assumed to be 3 hours unless rationale for an alternative assumption is provided
d_p	=	selected surface ponding water depth (ft)

The intention is that routing is important in the appropriate sizing of bioretention with underdrains. However, the depth of water considered to be filtered during the storm should be limited to the maximum ponding depth. This

results in designs that are robust to account for a variety of storm depths and durations. This limitation is for sizing calculations only. In reality, the depth that is filtered during a storm will vary based on storm depth, duration, and intensity. This TGM does not intend to limit the amount that may actually be filtered.

4) Calculate required infiltrating surface area (filter bottom area):

$$A_{req} = \frac{SQDV}{d_p + d_{filtered}} \qquad \text{(Equation 6-26)}$$

Where:

A_{req}	=	required infiltrating area (ft^2). Should be calculated at the contour corresponding to the mid ponding depth (i.e., $0.5 \times d_p$ from the bottom of the facility)
$SQDV$	=	stormwater quality design volume (ft^3)
d_p	=	selected surface ponding water depth (ft)
$d_{filtered}$	=	depth of water that can be considered to be filtered during the design storm event (ft) for routing calculations (See Equation 6-15)

5) Calculate total footprint required by including a buffer for side slopes and freeboard; A_{req} is calculated at the contour corresponding to the mid ponding depth (i.e., $0.5 \times d_p$ from the bottom of the facility).

Geometry

1) Minimum planting soil depth should be 2 feet, although 3 feet is preferred.

   The intention is that the minimum planting soil depth should provide a beneficial root zone for the chosen plant palette and adequate water storage for the stormwater quality design volume. A deeper soil depth will provide a smaller surface area footprint.

2) Bioretention should be designed to drain below the planting soil in less than 72 hours and completely drain from the underdrain in 96 hours (both starting from the end of inflow).

   The intention is that soils must be allowed to dry out periodically in order to restore hydraulic capacity to receive flows from subsequent storms, maintain infiltration rates, maintain adequate soil oxygen levels for healthy soil biota and vegetation, and to provide proper soil conditions for biodegradation and retention of pollutants.

Flow Entrance and Energy Dissipation

The following types of flow entrance can be used for bioretention cells:

1) Dispersed, low velocity flow across a landscape area. Dispersed flow may not be possible given space limitations or if the facility is controlling roadway or parking lot flows where curbs are mandatory.

2) Dispersed flow across pavement or gravel and past wheel stops for parking areas.

3) Curb cuts for roadside or parking lot areas: Curb cuts should include rock or other erosion protection material in the channel entrance to dissipate energy. Flow entrance should drop 2 to 3 inches from curb line and provide an area for settling and periodic removal of sediment and coarse material before flow dissipates to the remainder of the cell.

4) Pipe flow entrance: Piped entrances, such as roof downspouts, should include rock, splash blocks, or other appropriate measures at the entrance to dissipate energy and disperse flows.

5) Woody plants (trees, shrubs, etc.) can restrict or concentrate flows and can be damaged by erosion around the root ball and should not be placed directly in the entrance flow path.

Underdrains

Underdrains should meet the following criteria:

1) 6-inch minimum diameter.

2) Underdrains should be made of slotted, polyvinyl chloride (PVC) pipe (PVC SDR 35 or approved equivalent). *The intention is that compared to round-hole perforated pipe, slotted underdrains provide greater intake capacity, clog resistant drainage, and reduced entrance velocity into the pipe, thereby reducing the chances of solids migration.*

3) Slotted pipe should have 2 to 4 rows of slots cut perpendicular to the axis of the pipe or at right angles to the pitch of corrugations. Slots should be 0.04 to 0.1 inches and should have a length of 1 to 1.25 inches. Slots should be longitudinally spaced such that the pipe has a minimum of one square inch of slot per lineal foot of pipe and should be placed with slots facing the bottom of the pipe.

4) Underdrains should be sloped at a minimum of 0.5%.

5) Rigid non-perforated observation pipes with a diameter equal to the underdrain diameter should be connected to the underdrain every 100 feet to provide a clean-out port as well as an observation well to monitor dewatering rates. The wells/cleanouts should be connected to the perforated underdrain with the appropriate manufactured connections. The wells/cleanouts should extend 6 inches above the top

elevation of the bioretention facility mulch, and should be capped with a lockable screw cap. The ends of the underdrain pipes not terminating in an observation well/cleanout should also be capped.

6) The following aggregate should be used to provide a gravel blanket and bedding for the underdrain pipe. Place the underdrain on a bed of washed aggregate at a minimum thickness of 6 inches and cover it with the same aggregate to provide a 1 foot minimum depth around the top and sides of the slotted pipe.

Sieve size	Percent Passing
¾ inch	100
¼ inch	30-60
US No. 8	20-50
US No. 50	3-12
US No. 200	0-1

7) At the option of the designer/geotechnical engineer, a geotextile fabric may be placed between the planting media and the drain rock. If a geotextile fabric is used, it should meet a minimum permittivity rate of 75 gal/min/ft^2, should not impede the infiltration rate of the soil medium, and should meet the following minimum materials requirements.

Geotextile Property	Value	Test Method
Trapezoidal Tear (lbs)	40 (min)	ASTM D4533
Permeability (cm/sec)	0.2 (min)	ASTM D4491
AOS (sieve size)	#60 - #70 (min)	ASTM D4751
Ultraviolet resistance	70% or greater	ASTM D4355

Preferably, aggregate should be used in place of filter fabric to reduce the potential for clogging. This aggregate layer should consist of 2 to 4 inches of washed sand underlain with 2 inches of choking stone (Typically #8 or #89 washed).

8) For bioretention facilities enhanced to remove address nitrogen as the primary pollutant class, the underdrain should be elevated from the bottom of the bioretention facility by at least 6 inches within the gravel blanket to create a fluctuating anaerobic/aerobic zone below the drain pipe. *The intention is that denitrification within the anaerobic/anoxic zone is facilitated by microbes using forms of nitrogen (NO_2 and NO_3) instead of oxygen for respiration.*

An alternative enhanced nitrogen removal design is to include an internal water storage layer by adding a 90-degree elbow to the underdrain to raise the outlet. This design feature provides additional storage in the media. The bioretention facility must have at least 30 inches of planting media. The top of the elbow should be at

least 12 inches below the top of the planting media, and in poorly draining soils, should preferably be 18 to 24 inches below the top of the planting media. The top of the water storage layer should not be less than 12 inches from the bottom of the planting media layer. (For more information, see Urban Waterways publication).

9) The underdrain should drain freely to an acceptable discharge point. The underdrain can be connected to a downstream open conveyance (vegetated swale), to another bioretention cell as part of a connected treatment system, to a storm drain, daylight to a vegetated dispersion area using an effective flow dispersion device, or to a storage facility for rainwater harvesting.

Overflow

An overflow device is required at the maximum ponding depth. The following, or equivalent, should be provided:

1) A vertical PVC pipe (SDR 35) should be connected to the underdrain.

2) The overflow riser(s) should be 6 inches or greater in diameter, so it can be cleaned without damage to the pipe. The vertical pipe will provide access to cleaning the underdrains.

3) The inlet to the riser should be at the ponding depth (maximum 18 inches for fenced bioretention areas and 6 inches for areas that are not fenced), and be capped with a spider cap to exclude floating mulch and debris. Spider caps should be screwed in or glued (i.e., not removable).

Hydraulic Restriction Layers

Infiltration pathways may need to be restricted due to the close proximity of roads, foundations, or other infrastructure. A geomembrane liner, or other equivalent water proofing, may be placed along the vertical walls to reduce lateral flows. This liner should have a minimum thickness of 30 mils.

Planting/Storage Media

1) The planting media placed in the cell should achieve a long-term, in-place infiltration rate of at least 1 inch per hour. Higher infiltration rates are permissible. If the design long-term, in-place infiltration rate of the soil exceeds 12 inches per hour, documentation should be provided to demonstrate that the media will adequately address pollutants of concern at a higher flowrate. Bioretention soil shall also support vigorous plant growth.

2) Planting media should consist of 60 to 80% fine sand and 20 to 40% compost.

3) Sand should be free of wood, waste, coating such as clay, stone dust, carbonate, etc., or any other deleterious material. All aggregate passing the No. 200 sieve size should be non-plastic. Sand for bioretention should be analyzed by an accredited lab using

#200, #100, #40, #30, #16, #8, #4, and 3/8 sieves (ASTM D 422 or as approved by the local permitting authority) and meet the following gradation (Note: all sands complying with ASTM C33 for fine aggregate comply with the gradation requirements below):

Sieve Size (ASTM D422)	% Passing (by weight)	
	Minimum	Maximum
3/8 inch	100	100
#4	90	100
#8	70	100
#16	40	95
#30	15	70
#40	5	55
#100	0	15
#200	0	5

Note: the gradation of the sand component of the media is believed to be a major factor in the hydraulic conductivity of the media mix. If the desired hydraulic conductivity of the media cannot be achieved within the specified proportions of sand and compost (#2), then it may be necessary to utilize sand at the coarser end of the range specified in above ("minimum" column).

4) Compost should be a well decomposed, stable, weed free organic matter source derived from waste materials including yard debris, wood wastes, or other organic materials not including manure or biosolids meeting standards developed by the US Composting Council (USCC). The product shall be certified through the USCC Seal of Testing Assurance (STA) Program (a compost testing and information disclosure program). Compost quality should be verified via a lab analysis to be:

- Feedstock materials shall be specified and include one or more of the following: landscape/yard trimmings, grass clippings, food scraps, and agricultural crop residues.
- Organic matter: 35-75% dry weight basis.
- Carbon and Nitrogen Ratio: 15:1 < C:N < 25:1
- Maturity/Stability: shall have dark brown color and a soil-like odor. Compost exhibiting a sour or putrid smell, containing recognizable grass or leaves, or is hot (120 F) upon delivery or rewetting is not acceptable.
- Toxicity: any one of the following measures is sufficient to indicate non-toxicity:
  - NH4:NH3 < 3
  - Ammonium < 500 ppm, dry weight basis

  - Seed Germination > 80% of control
  - Plant trials > 80% of control
  - Solvita® > 5 index value
- Nutrient content:
  - Total Nitrogen content 0.9% or above preferred
  - Total Boron should be <80 ppm, soluble boron < 2.5 ppm
- Salinity: < 6.0 mmhos/cm
- pH between 6.5 and 8 (may vary with plant palette)

Compost for bioretention should be analyzed by an accredited lab using #200, ¼ inch, ½ inch, and 1 inch sieves (ASTM D 422 or as approved by the local permitting authority) and meet the following gradation:

Sieve Size (ASTM D422)	% Passing (by weight)	
	Minimum	Maximum
1 inch	99	100
½ inch	90	100
¼ inch	40	90
#200	2	10

Tests should be sufficiently recent to represent the actual material that is anticipated to be delivered to the site. If processes or sources used by the supplier have changed significantly since the most recent testing, new tests should be requested.

Note: the gradation of compost used in bioretention media is believed to play an important role in the saturated hydraulic conductivity of the media. To achieve a higher saturated hydraulic conductivity, it may be necessary to utilize compost at the coarser end of this range ("minimum" column). The percent passing the #200 sieve (fines) is believed to be the most important factor in hydraulic conductivity.

In addition, a coarser compost mix provides more heterogeneity of the bioretention media, which is believed to be advantageous for more rapid development of soil structure needed to support health biological processes. This may be an advantage for plant establishment with lower nutrient and water input.

5) The bioretention area should be covered with 2 to 4 inches (average 3 inches) of mulch at the start and an additional placement of 1 to 2 inches of mulch should be added annually. *The intention is that to help sustain the nutrient levels, suppress weeds, retain moisture, and maintain infiltration capacity*.

Plants

Plant materials should be tolerant of summer drought, ponding fluctuations, and saturated soil conditions for 48 to 96 hours.

It is recommended that a minimum of three types of tree, shrubs, and/or herbaceous groundcover species be incorporated to protect against facility failure due to disease and insect infestations of a single species.

Native plant species and/or hardy cultivars that are not invasive and do not require chemical inputs should be used to the maximum extent practicable.

Operations and Maintenance

Bioretention areas require annual plant, soil, and mulch layer maintenance to ensure optimum infiltration, storage, and pollutant removal capabilities. In general, bioretention maintenance requirements are typical landscape care procedures and include:

1) Watering: Plants should be selected to be drought-tolerant and not require watering after establishment (2 to 3 years). Watering may be required during prolonged dry periods after plants are established.

2) Erosion control: Inspect flow entrances, ponding area, and surface overflow areas periodically, and replace soil, plant material, and/or mulch layer in areas if erosion has occurred (see Appendix I for a bioretention inspection and maintenance checklist). Properly designed facilities with appropriate flow velocities should not have erosion problems except perhaps in extreme events. If erosion problems occur, the following should be reassessed: (1) flow velocities and gradients within the cell, and (2) flow dissipation and erosion protection strategies in the pretreatment area and flow entrance. If sediment is deposited in the bioretention area, immediately determine the source within the contributing area, stabilize, and remove excess surface deposits.

3) Plant material: Depending on aesthetic requirements, occasional pruning and removing of dead plant material may be necessary. Replace all dead plants and if specific plants have a high mortality rate, assess the cause and, if necessary, replace with more appropriate species. Periodic weeding is necessary until plants are established. The weeding schedule should become less frequent if the appropriate plant species and planting density have been used and, as a result, undesirable plants have been excluded.

4) Nutrient and pesticides: The soil mix and plants are selected for optimum fertility, plant establishment, and growth. Nutrient and pesticide inputs should not be required and may degrade the pollutant processing capability of the bioretention area, as well as contribute pollutant loads to receiving waters. By design, bioretention facilities are located in areas where phosphorous and nitrogen levels are often

elevated and these should not be limiting nutrients. If in question, have soil analyzed for fertility.

5) Mulch: Replace mulch annually in bioretention facilities where high trash, sediment load, and heavy metal deposition is likely (e.g., heavy metal contributing areas include industrial and auto dealer/repair parking lots and roads). In residential lots or other areas where metal deposition is not a concern, replace or add mulch as needed to maintain a 2 to 3 inch depth at least once every two years.

6) Soil: Soil mixes for bioretention facilities are designed to maintain long-term fertility and pollutant processing capability. Replacing mulch in bioretention facilities where high trash, sediment load, and heavy metal deposition are likely provides an additional level of protection for prolonged performance. Estimates from metal attenuation research suggest that metal accumulation should not present an environmental concern for at least 20 years in bioretention systems. However, the saturated hydraulic conductivity should be assessed at least annually to ensure that the design water quality event is being treated. If in question, have soil analyzed for fertility and pollutant levels.

BIO-2: Planter Box

Planter boxes are bioretention treatment control measures that are completely contained within an impermeable structure with an underdrain (they do not infiltrate). These facilities function as a soil and plant based filtration device that removes pollutants through a variety of physical, biological, and chemical treatment processes. The facilities normally consist of a ponding area, mulch layer, planting soils, plantings, and an underdrain within the planter box. As stormwater passes down through the planting soil, pollutants are filtered, adsorbed, and biodegraded by the soil and plants. Planter boxes are comprised of a variety of materials, usually chosen to be the same material as the adjacent building or sidewalk.

Planter boxes may be placed adjacent to or near buildings, other structures, or sidewalks. Planter boxes can be used directly adjacent to buildings beneath downspouts as long as the boxes are properly lined on the building side and the overflow outlet discharges away from the building to ensure water does not percolate into footings or foundations. They can also be placed further away from buildings by conveying roof runoff in shallow engineered open conveyances, shallow pipes, or other innovative drainage structures.

Planter boxes extending along a building wall

Photo Credit: Geosyntec Consultants

Application

- Areas adjacent to buildings and sidewalks
- Building entrances, courtyards, and walkways

Preventative Maintenance

- Repair small eroded areas
- Remove trash and debris and rake surface soils
- Remove accumulated fine sediments, dead leaves, and trash
- Remove weeds and prune back excess plant growth
- Remove sediment and debris accumulation near inlet and outlet structures

  Periodically observe function under wet weather conditions

056202

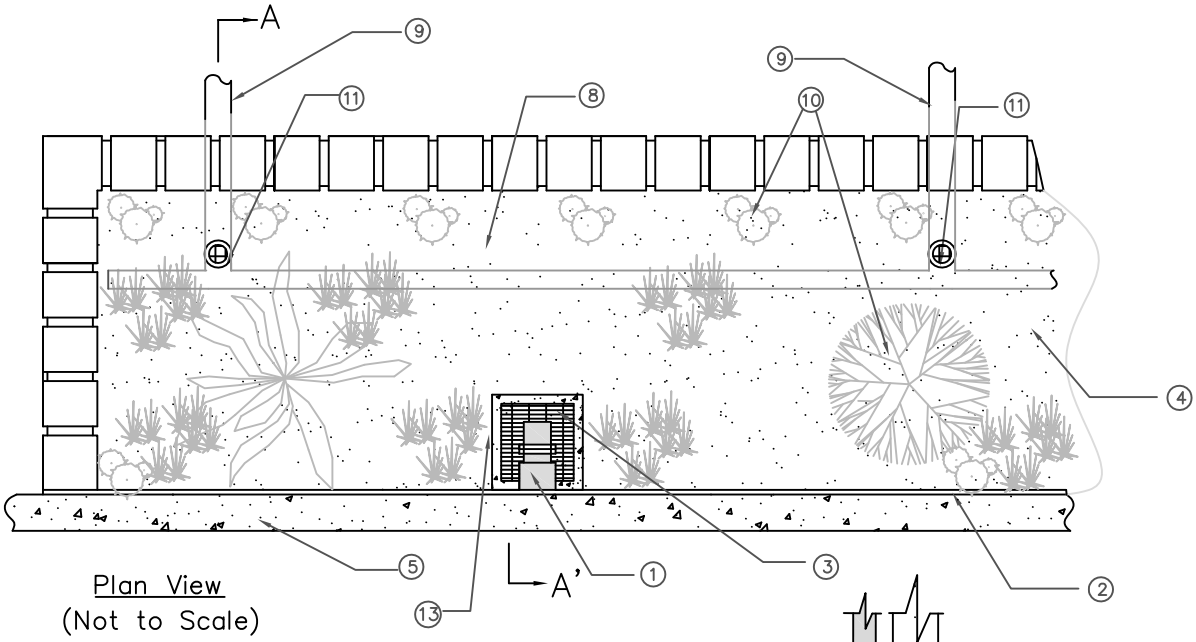

Plan View
(Not to Scale)

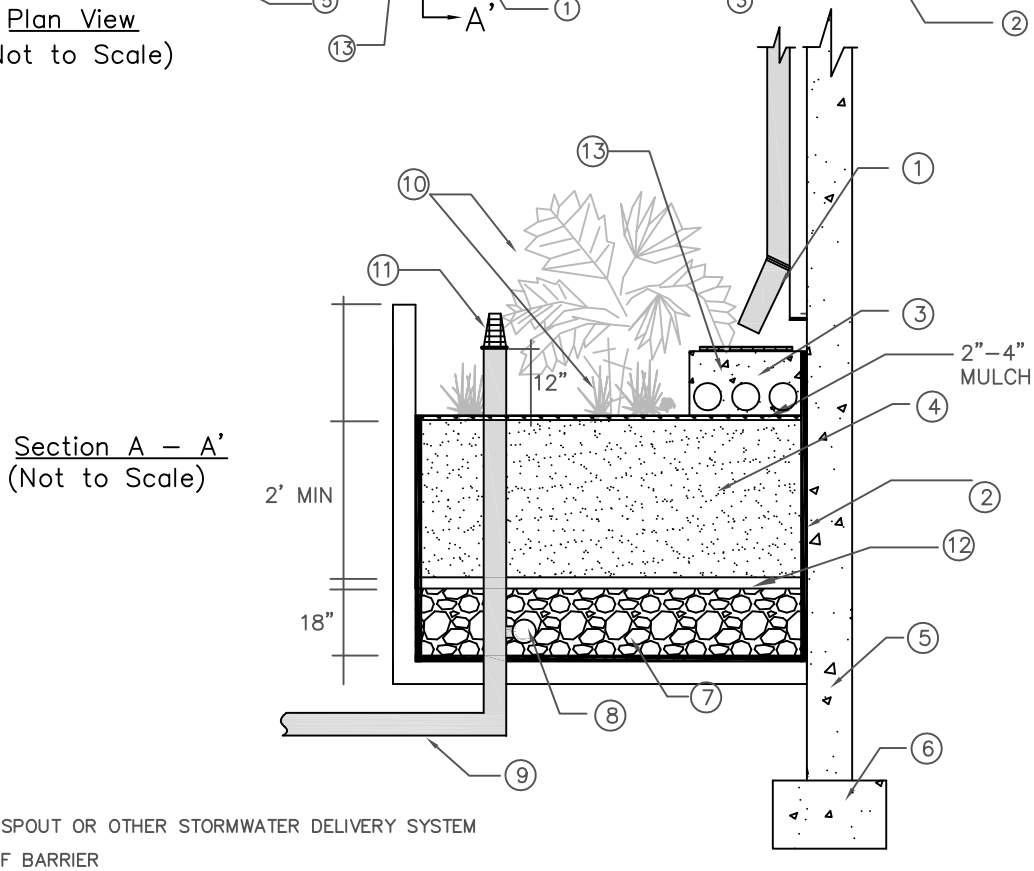

Section A – A'
(Not to Scale)

NOTES:

1. ROOF DOWNSPOUT OR OTHER STORMWATER DELIVERY SYSTEM
2. WATERPROOF BARRIER
3. SHALLOW ENERGY DISSIPATOR BASIN DISPERSES FLOW AT SOIL SURFACE
4. SOIL MIX (SEE PLANTING MEDIA SECTION)
5. BUILDING
6. FOUNDATION. INSTALL FOUNDATION DRAINS AS NEEDED
7. GRAVEL BEDDING (SEE UNDERDRAIN)
8. PERFORATED PIPE SHALL RUN ENTIRE LENGTH OF PLANTER
9. CONNECTION TO DOWNSTREAM CONVEYANCE SYSTEM
10. PLANTS
11. SET OVERFLOW 2" BELOW THE TOP OF THE PLANTER
12. OPTIONAL CHOKING GRAVEL LAYER

Geosyntec consultants

Figure 6-11: Planter Box

Limitations

The applicability of stormwater planter boxes is limited by the following site characteristics:

1) The tributary area (area draining to the planter box area) should be less than 15,000 ft^2.

2) Groundwater levels should be at least 2 ft lower than the bottom of the planter box.

3) Site must have adequate vertical relief between land surface and the stormwater conveyance system to permit connection of the underdrain to the stormwater conveyance system.

4) Planter boxes should not be located in areas with excessive shade to avoid poor vegetative growth. For moderately shaded areas, shade tolerant plants should be used.

Design Criteria

Planter boxes should be designed according to the requirements listed in Table 6-19 and outlined in the section below. BMP sizing worksheets are presented in Appendix E.

Table 6-19: Planter Box Design Criteria

Design Parameter	Unit	Design Criteria
Stormwater quality design volume (SQDV)	acre-feet	See Section 2 and Appendix E for calculating SQDV.
Drawdown time of planting soil	hours	12
Maximum ponding depth	inches	12
Minimum soil depth	feet	2; 3 preferred
Stabilized mulch depth	inches	2 to 3
Planting soil composition	-	60 to 70% sand, 30 to 40% compost
Underdrain	-	6 inch minimum diameter; 0.5% minimum slope; slotted, polyvinyl chloride (PVC) pipe (PVC SDR 35 or approved equivalent)
Overflow device	-	Required

Sizing Criteria

See Sizing Criteria section in the BIO-1: Bioretention with underdrains fact sheet.

Geometry and Size

1) Planter boxes areas should be sized to capture and treat the SQDV with a 12 inch maximum ponding depth. The mulch layer should be included as part of the ponding depth.

2) Minimum soil depth should be 2 feet, although 3 feet is preferred. *The intention is that a minimum soil depth should provide a beneficial root zone for the chosen plant palette and adequate water storage for the SQDV. A deeper planting soil depth will provide a smaller surface area footprint.*

3) Planter boxes should be designed to drain to below the planting soil depth in less than 48 hours. *The intention is that soils must be allowed to dry out periodically in order to restore hydraulic capacity to receive flows from subsequent storms, maintain infiltration rates, prevent long periods of saturation for plant health, maintain adequate soil oxygen levels for healthy soil biota and vegetation, reduce potential for vector breeding, and provide proper soil conditions for biodegradation and retention of pollutants.*

4) Any planter box shape configuration is possible as long as other design criteria are met.

5) The distance between the downspouts and the overflow outlet should be maximized. *The intention is to increase the opportunity for stormwater retention and filtration.*

6) Off-line configurations should be considered to minimize the possibility of scouring and resuspension of previously captured pollutants during large storms.

Structural Materials

1) Planter boxes should be constructed out of stone, concrete, brick, recycled plastic, or other permanent materials. Pressure-treated wood or other materials that may leach pollutants (e.g., arsenic, copper, zinc, etc.) should not be allowed.

2) The structure should be adequately sealed or a waterproof membrane installed to ensure water only exits the structure via the underdrain.

Flow Entrance and Energy Dissipation

The following types of flow entrance can be used for planter boxes:

1) Pipe flow entrance: Piped entrances, such as roof downspouts, should include rock, splash blocks, or other appropriate measures at the entrance to dissipate energy and disperse flows.

2) Woody plants (e.g., trees, shrubs, etc.) can restrict or concentrate flows and can be damaged by erosion around the root ball and should not be placed directly in the entrance flow path.

Underdrains

Underdrains are required and should meet the following criteria:

1) 6-inch minimum diameter.

2) Underdrains should be made of slotted, polyvinyl chloride (PVC) pipe (PVC SDR 35 or approved equivalent). *The intention is that in comparison to round-hole perforated pipe, slotted underdrains provide greater intake capacity, clog resistant drainage, and reduced entrance velocity into the pipe, thereby reducing the chances of solids migration.*

3) Slotted pipe should have 2 to 4 rows of slots cut perpendicular to the axis of the pipe or at right angles to the pitch of corrugations. Slots should be 0.04 to 0.1 inch and should have a length of 1 to 1.25 inches. Slots should be longitudinally spaced such that the pipe has a minimum of one square inch opening per lineal foot and should face down.

4) Underdrains should be sloped at a minimum of 0.5%.

5) Rigid non-perforated observation pipes with a diameter equal to the underdrain diameter should be connected to the underdrain every 100 feet to provide a clean-out port as well as an observation well to monitor dewatering rates. The wells/cleanouts should be connected to the perforated underdrain with the appropriate manufactured connections. The wells/cleanouts should extend 6 inches above the top elevation of the bioretention facility mulch, and should be capped with a lockable screw cap. The ends of underdrain pipes not terminating in an observation well/cleanout should also be capped.

6) The following aggregate should be used to provide a gravel blanket and bedding for the underdrain pipe. Place the underdrain on a bed of washed aggregate at a minimum thickness of 6 inches and cover it with the same aggregate to provide a 1 foot minimum depth around the top and sides of the slotted pipe.

Sieve size	Percent Passing
¾ inch	100
¼ inch	30-60
US No. 8	20-50
US No. 50	3-12
US No. 200	0-1

7) At the option of the designer/geotechnical engineer, a geotextile fabric may be placed between the planting media and the drain rock. If a geotextile fabric is used, it should

meet a minimum permittivity rate of 75 gal/min/ft^2, should not impede the infiltration rate of the soil medium, and should meet the following minimum materials requirements.

Geotextile Property	Value	Test Method
Trapezoidal Tear (lbs)	40 (min)	ASTM D4533
Permeability (cm/sec)	0.2 (min)	ASTM D4491
AOS (sieve size)	#60 - #70 (min)	ASTM D4751
Ultraviolet resistance	70% or greater	ASTM D4355

Preferably, aggregate should be used in place of filter fabric to reduce the potential for clogging. This aggregate layer should consist of 2 to 4 inches of washed sand underlain with 2 inches of choking stone (Typically #8 or #89 washed).

8) The underdrain should be elevated from the bottom of the bioretention facility by 6 inches within the gravel blanket to create a fluctuating anaerobic/aerobic zone below the drain pipe. *The intention is that denitrification within the anaerobic/anoxic zone is facilitated by microbes using forms of nitrogen (NO_2 and NO_3) instead of oxygen for respiration.*

9) The underdrain must drain freely to an acceptable discharge point. The underdrain can be connected to a downstream open conveyance (vegetated swale), to another bioretention cell as part of a connected treatment system, to a storm drain, daylight to a vegetated dispersion area using an effective flow dispersion device, or to a storage facility for rainwater harvesting.

Overflow

An overflow device is required to be set at 2 inches below the top of the planter and no more than 12 inches above the soil surface. The most common option is a vertical riser, described below.

Vertical riser

1) A vertical PVC pipe (SDR 35) should be connected to the underdrain.

2) The overflow riser(s) should be 6 inches or greater in diameter, so it can be cleaned without damage to the pipe. The vertical pipe will provide access to cleaning the underdrains.

3) The inlet to the riser should be a maximum of 12 inches above the planting soil, and be capped with a spider cap. Spider caps should be screwed in or glued (i.e., not removable).

Hydraulic Restriction Layers

A waterproof barrier should be provided to restrict moisture away from foundations. Geomembrane liners should have a minimum thickness of 30 mils. Equivalent waterproofing measures may be used.

Planting/Storage Media

1) The planting media placed in the cell should achieve a long-term, in-place infiltration rate of at least 1 inch per hour. Higher infiltration rates are permissible. If the design long-term, in-place infiltration rate of the soil exceeds 12 inches per hour, documentation should be provided to demonstrate that the media will adequately address pollutants of concern at a higher flowrate. Planter box soil shall also support vigorous plant growth.

2) Planting media should consist of 60 to 80% fine sand and 20 to 40% compost.

3) Sand should be free of wood, waste, coating such as clay, stone dust, carbonate, etc., or any other deleterious material. All aggregate passing the No. 200 sieve size should be non-plastic. Sand for the planter box should be analyzed by an accredited lab using #200, #100, #40, #30, #16, #8, #4, and 3/8 sieves (ASTM D 422 or as approved by the local permitting authority) and meet the following gradation (Note: all sands complying with ASTM C33 for fine aggregate comply with the gradation requirements below):

Sieve Size (ASTM D422)	% Passing (by weight)	
	Minimum	Maximum
3/8 inch	100	100
#4	90	100
#8	70	100
#16	40	95
#30	15	70
#40	5	55
#100	0	15
#200	0	5

Note: the gradation of the sand component of the media is believed to be a major factor in the hydraulic conductivity of the media mix. If the desired hydraulic conductivity of the media cannot be achieved within the specified proportions of sand and compost (#2), then it may be necessary to utilize sand at the coarser end of the range specified in above (“minimum” column).

4) Compost should be a well decomposed, stable, weed free organic matter source derived from waste materials including yard debris, wood wastes, or other organic materials not including manure or biosolids meeting standards developed by the US Composting Council (USCC). The product shall be certified through the USCC Seal

of Testing Assurance (STA) Program (a compost testing and information disclosure program). Compost quality should be verified via a lab analysis to be:

- Feedstock materials shall be specified and include one or more of the following: landscape/yard trimmings, grass clippings, food scraps, and agricultural crop residues.
- Organic matter: 35-75% dry weight basis.
- Carbon and Nitrogen Ratio: 15:1 < C:N < 25:1
- Maturity/Stability: shall have dark brown color and a soil-like odor. Compost exhibiting a sour or putrid smell, containing recognizable grass or leaves, or is hot (120 F) upon delivery or rewetting is not acceptable.
- Toxicity: any one of the following measures is sufficient to indicate non-toxicity:
    - NH4:NH3 < 3
    - Ammonium < 500 ppm, dry weight basis
    - Seed Germination > 80% of control
    - Plant trials > 80% of control
    - Solvita® > 5 index value
- Nutrient content:
    - Total Nitrogen content 0.9% or above preferred
    - Total Boron should be <80 ppm, soluble boron < 2.5 ppm
- Salinity: < 6.0 mmhos/cm
- pH between 6.5 and 8 (may vary with plant palette)

Compost for planter box should be analyzed by an accredited lab using #200, ¼ inch, ½ inch, and 1 inch sieves (ASTM D 422 or as approved by the local permitting authority) and meet the following gradation:

Sieve Size (ASTM D422)	% Passing (by weight)	
	Minimum	Maximum
1 inch	99	100
½ inch	90	100
¼ inch	40	90
#200	2	10

Tests should be sufficiently recent to represent the actual material that is anticipated to be delivered to the site. If processes or sources used by the supplier have changed significantly since the most recent testing, new tests should be requested.

Note: the gradation of compost used in planter box media is believed to play an important role in the saturated hydraulic conductivity of the media. To achieve a higher saturated hydraulic conductivity, it may be necessary to utilize compost at the coarser end of this range ("minimum" column). The percent passing the #200 sieve (fines) is believed to be the most important factor in hydraulic conductivity.

In addition, a coarser compost mix provides more heterogeneity of the planter box media, which is believed to be advantageous for more rapid development of soil structure needed to support health biological processes. This may be an advantage for plant establishment with lower nutrient and water input.

5) The planter box should be covered with 2 to 4 inches (average 3 inches) of mulch at the start and an additional placement of 1 to 2 inches of mulch should be added annually. *The intention is that to help sustain the nutrient levels, suppress weeds, retain moisture, and maintain infiltration capacity*.

Plants

1) Plant materials should be tolerant of summer drought, ponding fluctuations, and saturated soil conditions for 48 to 96 hours.

2) It is recommended that a minimum of three types of tree, shrubs, and/or herbaceous groundcover species be incorporated to protect against facility failure due to disease and insect infestations of a single species.

3) Native plant species and/or hardy cultivars that are not invasive and do not require chemical inputs should be used to the maximum extent practicable.

4) Plants should be selected carefully to minimize maintenance and function properly.

Operations and Maintenance

Planter boxes require annual plant, soil, and mulch layer maintenance to ensure optimum infiltration, storage, and pollutant removal capabilities. In general, planter box maintenance requirements are typical of landscape care procedures and include:

1) Watering: Plants should be selected to be drought-tolerant and do not require watering after establishment (2 to 3 years). Watering may be required during prolonged dry periods after plants are established.

2) Erosion control: Inspect flow entrances, ponding area, and surface overflow areas periodically, and replace soil, plant material, and/or mulch layer in areas if erosion has occurred (see Appendix I for an inspection and maintenance checklist). Properly designed facilities with appropriate flow velocities should not have erosion problems

except perhaps in extreme events. If erosion problems occur, the following should be reassessed: (1) flow velocities and gradients within the cell, and (2) flow dissipation and erosion protection strategies in the flow entrance. If sediment is deposited in the planter box, immediately determine the source within the contributing area, stabilize, and remove excess surface deposits.

3) Plant material: Depending on aesthetic requirements, occasional pruning and removing of dead plant material may be necessary. Replace all dead plants and if specific plants have a high mortality rate, assess the cause and, if necessary, replace with more appropriate species. Periodic weeding is necessary until plants are established. The weeding schedule should become less frequent if the appropriate plant species and planting density have been used and, as a result, undesirable plants have been excluded.

4) Nutrients and pesticides: The soil mix and plants are selected for optimum fertility, plant establishment, and growth. Nutrient and pesticide inputs should not be required and may degrade the pollutant processing capability of the planter box area, as well as contribute pollutant loads to receiving waters. By design, planter boxes are located in areas where phosphorous and nitrogen levels are often elevated and these should not be limiting nutrients. If in question, have soil analyzed for fertility.

5) Mulch: Replace mulch annually in planter boxes where high trash, sediment load, and heavy metal deposition is likely (e.g., heavy metal contributing areas include industrial, auto dealer/repair, parking lots, and roads). In residential lots or other areas where metal deposition is not a concern, replace or add mulch as needed to maintain a 2 to 3 inch depth at least once every two years.

6) Soil: Soil mixes for planter boxes are designed to maintain long-term fertility and pollutant processing capability. Replacing mulch in planter boxes where high trash, sediment load, and heavy metal deposition are likely provides an additional level of protection for prolonged performance. Estimates from metal attenuation research suggest that metal accumulation should not present an environmental concern for at least 20 years in planter boxes. However, the saturated hydraulic conductivity should be assessed at least annually to ensure that the design water quality event is being treated. If in question, have soil analyzed for fertility and pollutant levels.

BIO-3: Vegetated Swale

Vegetated swales are open, shallow channels with low-lying vegetation covering the side slopes and bottom that collect and slowly convey runoff to downstream discharge points. Vegetated swales provide pollutant removal through settling and filtration in the vegetation (usually grasses) lining the channels, provide the opportunity for stormwater volume reduction through infiltration and evapotranspiration, reduce the flow velocity, and conveying stormwater runoff. An effective vegetated swale achieves uniform sheet flow through a densely vegetated area for a period of several minutes. The vegetation in the swale can vary depending on its location and is the choice of the designer, depending on the design criteria outlined in this section.

Vegetated swale captures flow from a residential street

Photo Credit: Geosyntec Consultants

Application

- Open areas adjacent to parking lots
- Open spaces adjacent to athletic fields
- Roadway medians and shoulders

Preventative Maintenance

- Remove excess sediment, trash, and debris
- Clean and reset flow spreaders
- Mow regularly
- Remove sediment and debris build-up near inlets and outlets
- Repair minor erosion and scouring

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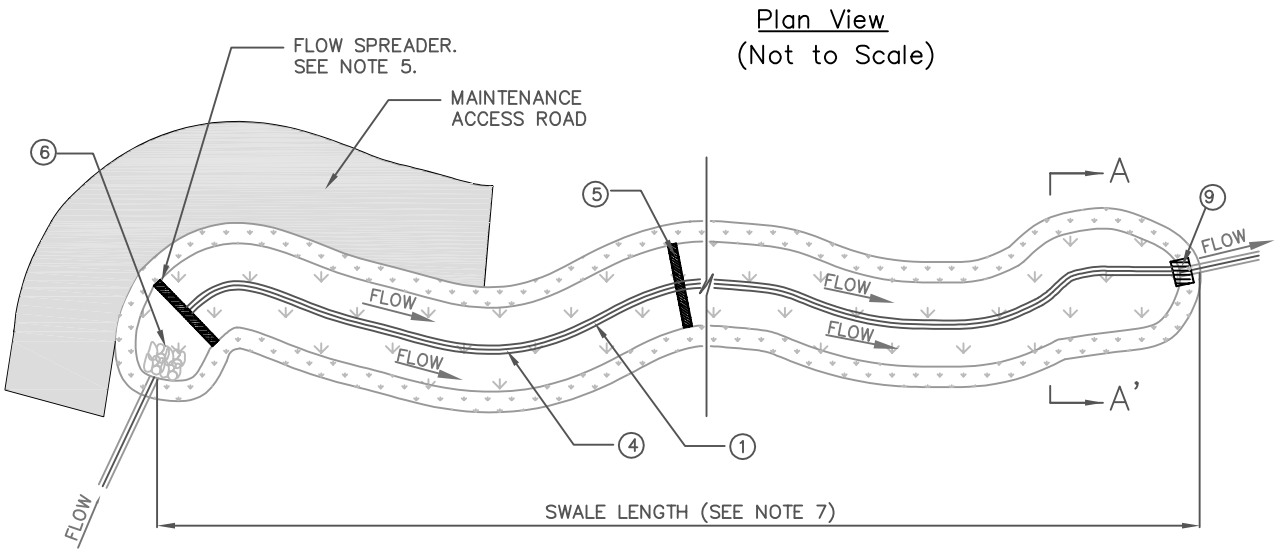

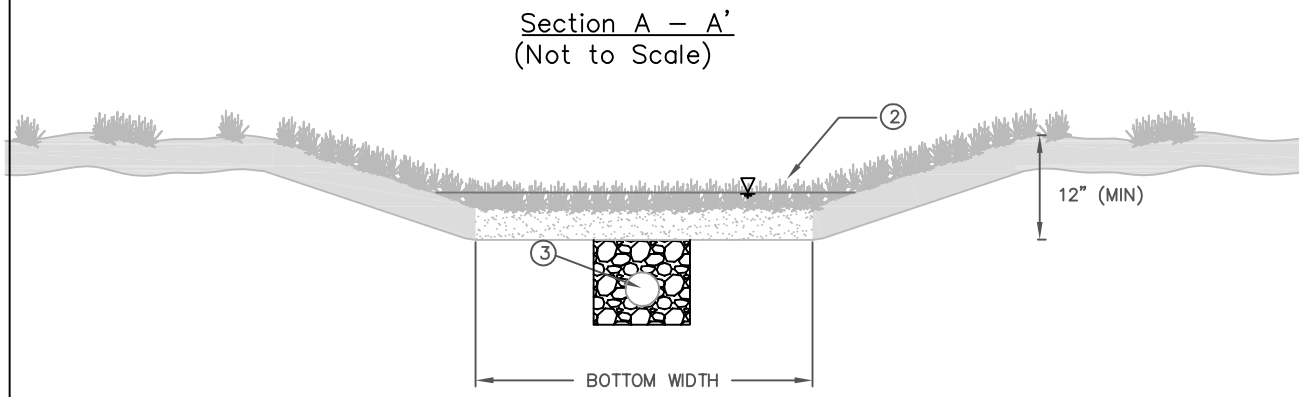

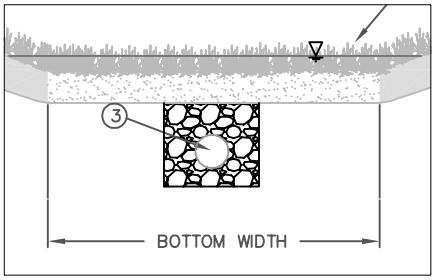

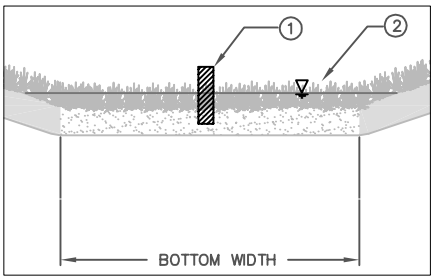

NOTES:

1. SWALE DIVIDER REQUIRED FOR BOTTOM WIDTHS > 10'. MINIMUM REQUIRED BOTTOM WIDTH IS 2' EXCLUDING WIDTH OF LOW FLOW CHANNEL. MAXIMUM BOTTOM WIDTH WITH DIVIDER IS 16'.
2. DEPTH OF FLOW FOR WATER QUALITY TREATMENT MUST NOT EXCEED TWO–THIRDS OF VEGETATION HEIGHT OR NOT GREATER THAN 2" FOR FREQUENTLY MOWED TURF.
3. IF AN UNDERDRAIN IS REQUIRED, IT MUST CONSIST OF AN AT LEAST 6" DIAMETER PERFORATED PIPE IN COARSE AGGREGATE BED CONNECTED TO STORM DRAIN. GRAVEL BED MUST EXTEND 6" BELOW AND 12" TO THE SIDE AND TOP OF THE PIPE.
4. IF NO UNDERDRAIN, LOW FLOW DRAIN SHALL EXTEND ENTIRE LENGTH OF SWALE AND SHALL HAVE A DEPTH OF 6" MINIMUM AND WIDTH NO MORE THAN 5% SWALE BOTTOM WIDTH. ANCHORED PLATE FLOW SPREADER IF USED, SHALL HAVE V–NOTCHES (MAX TOP WIDTH = 5% OF SWALE WIDTH) OR HOLES TO ALLOW PREFERENTIAL EXIT OF LOW FLOWS.
5. INSTALL CHECK DAMS OR GRADE CONTROL STRUCTURES FOR SLOPES > 2% AT 50' MAXIMUM SPACING TO ACHIEVE A MAXIMUM EFFECTIVE LONGITUDINAL SLOPE OF 2%. FLOW SPREADERS SHALL BE PROVIDED AT INLET AND AT THE BASE OF EACH CHECK DAM.
6. INSTALL ENERGY DISSIPATOR AT THE INLET OF VEGETATED SWALE.
7. SWALE LENGTH SHALL LENGTH REQUIRED TO PROVIDE 7 MINUTES RESIDENCE TIME.
8. INSTALL APPROPRIATE OUTLET STRUCTURE. ACCOMODATE LOW FLOW CHANNEL AND/OR UNDERDRAIN (IF PRESENT).
9. AMEND SOILS WITH 2" OF COMPOST TILLED INTO 6" OF NATIVE SOIL UNLESS NATIVE SOIL ORGANIC CONTENT > 10%.

Geosyntec consultants

Figure 6-12: Vegetated Swale

Limitations

1) Compatibility with flood control - swales should not interfere with flood control functions of existing conveyance and detention structures.

2) Vegetation - select vegetation appropriately based on irrigation requirements and exposure (shady versus sunny areas). A thick vegetative cover is needed for vegetated swales to function properly. Native and drought tolerant plants are recommended.

3) Drainage area - each vegetated swale can treat a relatively small drainage area. Large areas should be divided and treated using multiple swales.

Design Criteria

Vegetated swales should be designed according to the requirements listed in Table 6-20 and outlined in the section below. BMP sizing worksheets are presented in Appendix E.

Table 6-20: Vegetated Swale Filter Design Criteria

Design Parameter	Unit	Design Criteria
Stormwater quality design flow rate (SQDF)	cfs	See Section 2 and Appendix E for calculating SQDF.
Swale Geometry	-	Trapezoidal
Minimum bottom width	feet	2
Maximum bottom width	feet	10; if greater than 10 must use swale dividers; with dividers, max is 16
Minimum length	feet	sufficient length to provide minimum contact time
Minimum slope in flow direction	%	0.2 (provide underdrains for slopes less < 0.5%)
Maximum slope in flow direction	%	2.0 (provide grade-control checks for slopes > 2.0)
Maximum flow velocity	ft/sec	1.0 (water quality treatment); 3.0 (flood conveyance)
Maximum depth of flow for water quality treatment	inches	3 to 5 (1 inch below top of grass)
Minimum residence (contact) time	minutes	7 (provide sufficient length to yield minimum residence time)
Vegetation type	--	Varies (see vegetation section below); Native and drought tolerant plants are recommended
Vegetation height	inches	4 to 6 (trim or mow to maintain height)

Sizing Criteria

The flow capacity of a vegetated swale is a function of the longitudinal slope (parallel to flow), the resistance to flow (i.e. Manning's roughness), and the cross sectional area. The cross section is normally approximately trapezoidal and the area is a function of the bottom width and side slopes. The flow capacity of vegetated swales should be such that the SQDF will not exceed a flow depth of 2/3 the height of the vegetation within the swale or 4 inches at the SQDF. Once design criteria have been selected, the resulting flow depth for the SQDF is checked. If the depth restriction is exceeded, swale parameters (e.g. longitudinal slope, width) are adjusted to reduce the flow depth.

Procedures for sizing vegetated swales are summarized below. A vegetated swale sizing worksheet and example are also provided.

Step 1: Select design flows

The swale sizing is based on the SQDF (see Section 2 and Appendix E).

Step 2: Calculate swale bottom width

The swale bottom width (b) is calculated based on Manning's equation for open-channel flow. This equation can be used to calculate discharges (Q) as follows:

$$Q = \frac{1.49AR^{0.67}S^{0.5}}{n} \qquad \text{(Equation 6-27)}$$

Where:

Q	=	flow rate (cfs)
n	=	Manning's roughness coefficient (unitless)
A	=	cross-sectional area of flow (ft2)
R	=	hydraulic radius (ft) = area divided by wetted perimeter
S	=	longitudinal slope (ft/ft)

For shallow flow depths in swales, channel side slopes are ignored in the calculation of bottom width. Use the following equation (a simplified form of Manning's formula) to estimate the swale bottom width (b):

$$b = \frac{SQDF * n_{wq}}{1.49y^{0.67}s^{0.5}} \qquad \text{(Equation 6-28)}$$

Where:

b	=	bottom width of swale (ft)

$SQDF$	=	stormwater quality design flow (cfs)
n_{wq}	=	Manning's roughness coefficient for shallow flow conditions = 0.2 (unitless)
y	=	design flow depth (ft)
s	=	longitudinal slope (along direction of flow) (ft/ft)

Proceed to Step 3 if the bottom width is calculated to be between 2 and 10 feet. A minimum 2-foot bottom width is required. Therefore, if the calculated bottom width is less than 2 feet, increase the width to 2 feet and recalculate the design flow depth y using the Equation 6-18, where $SQDF$, n_{wq}, and s are the same values as used above, but b = 2 feet.

The maximum allowable bottom width is 10 feet. Therefore, if the calculated bottom width exceeds 10 feet, then one of the following steps is necessary to reduce the design bottom width:

1) Increase the longitudinal slope (s) to a maximum of 2 feet in 100 feet (0.02 feet per foot).

2) Increase the design flow depth (y) to a maximum of 4 inches.

3) Place a divider lengthwise along the swale bottom (Figure 6-11) at least three-quarters of the swale length (beginning at the inlet), without compromising the design flow depth and swale lateral slope requirements. The swale width can be increased to an absolute maximum of 16 feet if a divider is provided.

Step 3: Determine design flow velocity

To calculate the design flow velocity (V_{wq}) through the swale, use the flow continuity equation:

$$V_{wq} = SQDF/A_{wq} \qquad \text{(Equation 6-29)}$$

Where:

V_{wq}	=	design flow velocity (fps)
$SQDF$	=	stormwater quality design flow (cfs)
A_{wq}	=	$by + Zy^2$ = cross-sectional area (ft^2) of flow at design depth, where Z = side slope length per unit height (e.g., Z = 3 if side slopes are 3H:1V)

If the design flow velocity exceeds 1 foot per second, go back to Step 2 and modify one or more of the design parameters (longitudinal slope, bottom width, or flow depth) to

reduce the design flow velocity to 1 foot per second or less. If the design flow velocity is calculated to be less than 1 foot per second, proceed to Step 4. *Note: It is desirable to have the design velocity as low as possible, both to improve treatment effectiveness and to reduce swale length requirements.*

Step 4: Calculate swale length

Use the following equation to determine the necessary swale length (L) to achieve a hydraulic residence time of at least 7 minutes:

$$L = 60 t_{hr} V_{wq} \qquad \text{(Equation 6-30)}$$

Where:

L	=	minimum allowable swale length (ft)
t_{hr}	=	hydraulic residence time (min)
V_{wq}	=	design flow velocity (fps), calculated by Equation 6-19

If there is adequate space on the site to accommodate a larger swale, consider using a greater length to increase the hydraulic residence time and improve the swale's pollutant removal capability. If the calculated length is too long for the site, or if it would cause layout problems, such as encroachment into shaded areas, proceed to Step 5 to further modify the layout. If the swale length can be accommodated on the site (meandering may help), proceed to Step 6.

Step 5: Adjust swale layout to fit on site

If the swale length calculated in Step 4 is too long for the site, the length can be reduced (to a minimum of 100 feet) by increasing the bottom width up to a maximum of 16 feet, as long as the 10 minute retention time is retained. However, the length cannot be increased in order to reduce the bottom width because Manning's depth-velocity-flow rate relationships would not be preserved. If the bottom width is increased to greater than 10 feet, a low flow dividing berm is needed to split the swale cross section in half to prevent channelization.

Length can be adjusted by calculating the top area of the swale and providing an equivalent top area with the adjusted dimensions.

1) Calculate the swale treatment top area (A_{top}), based on the swale length calculated in Step 4:

$$A_{top} = (b_i + b_{slope}) L_i \qquad \text{(Equation 6-31)}$$

Where:

A_{top}	=	top area (ft^2) at the design treatment depth
b_i	=	bottom width (ft), calculated in Step 2 using Equation 6-18
b_{slope}	=	the additional top width (ft) above the side slope for the design water depth (for 3:1 side slopes and a 4-inch water depth, b_{slope} = 2 feet)
L_i	=	initial length (ft) calculated in Step 4 using Equation 6-30

2) Use the swale top area and a reduced swale length (L_f) to increase the bottom width, using the following equation:

$$L_f = A_{top} / (b_f + b_{slope}) \qquad \text{(Equation 6-32)}$$

Where:

L_f	=	reduced swale length (ft)
b_f	=	increased bottom width (ft)

3) Recalculate V_{wq} according to Step 3 using the revised cross-sectional area A_{wq} based on the increased bottom width (b_f). Revise the design as necessary if the design flow velocity exceeds 1 foot per second.

4) Recalculate to ensure that the 10 minute retention time is retained.

Step 6: Provide conveyance capacity for flows higher than SQDF

Vegetated swales may be designed as flow-through channels that convey flows higher than the SQDF, or they may be designed to incorporate a high-flow bypass upstream of the swale inlet. A high-flow bypass usually results in a smaller swale size. If a high-flow bypass is provided, this step is not needed. If no high-flow bypass is provided, proceed with the procedure below. A flow splitter structure design is described in Appendix F.

1) Check the swale size to determine whether the swale can convey the flood control design storm peak flow (Refer to Ventura County Hydrology Manual, revised 2006).

2) The peak flow velocity of the flood control design storm (see Ventura County Hydrology Manual revised 2006) should be less than 3.0 feet per second. If this velocity exceeds 3.0 feet per second, return to Step 2 and increase the bottom width or flatten the longitudinal slope as necessary to reduce the flood control design storm peak flow velocity to 3.0 feet per second or less. If the longitudinal slope is flattened, the swale bottom width must be recalculated (Step 2) and must meet all design criteria.

Geometry and Size

1) In general, a trapezoidal channel shape should be assumed for sizing calculations above, but a more naturalistic channel cross-section is preferred.

2) Swales designed for water quality treatment purposes only are usually fairly shallow, generally less than 1 ft. Therefore, a side slope of 2:1 (H:V) can be used and is acceptable.

3) Swales shall be greater than 100 feet in length. The vegetated swale can be shorter than 100 feet if it is used for pretreatment only (i.e., prior to infiltration). Length can be increased by meandering the swale.

4) The minimum swale bottom width shall be 2 feet to allow for ease of mowing.

5) The maximum swale bottom width shall be limited to 10 feet, unless a swale divider is provided, then the maximum bottom width can be a maximum of 16 feet wide. The swale width is calculated without the swale diving berm. *The intention is that experience shows that when the width exceeds about 10 feet, it is difficult to keep the water from concentrating in low flow channels. It is also difficult to construct the bottom level without sloping to one side. Vegetated swales are best constructed by leveling the bottom after excavating. A single-width pass with a front-end loader produces a better result than a multiple-width pass.*

6) Swales that are required to convey flood flow as well as the SQDF should be sized to convey the flood control design storm and include a provision of freeboard as required by the local approval authority.

7) Gradual meandering bends in the swale are desirable for aesthetic purposes and to promote slower flow.

Bottom Slope

1) The longitudinal slope (along the direction of flow) should be between 1% and 6%.

2) If longitudinal slopes are less than 1.5% and the soils are poorly drained (e.g., silts and clays), then underdrains should be provided. A soils report to verify soils properties should be provided for swales less than 1.5%.

3) If longitudinal slope exceeds 2%, check dams with vertical drops of 12 inches or less should be provided to achieve a bottom slope of 2% or less between the drop structures.

4) The lateral (horizontal) slope at the bottom of the swale should be zero (flat) to discourage channeling.

Water Depth and Dry Weather Flow Drain

1) Water depth should not exceed 4 inches (or 2/3 of the expected vegetation height), except for frequently mowed turf swales, in which the depth should not exceed 2 inches.

2) The swale length must provide a minimum hydraulic residence time of 7 minutes.

3) A low flow drain should be provided if the potential for dry weather flows exists. The low flow drain should extend the entire length of the swale. The drain should have a minimum depth of 6 inches, and a width no more than 5% of the calculated swale bottom width. The width of the drain should be in addition to the required bottom width. The flow spreader at the swale inlet should have v-notches (maximum top width = 5% of swale width) or holes to allow preferential exit of low flows into the drain, if applicable. If an underdrain or gravel drainage layer is installed as discussed below, the low flow drain should be omitted.

Swale Inflow and Design Capacity

1) Whenever possible, inflow should be directed towards the upstream end of the swale and should, at a minimum, occur evenly over the length of the swale. Swale inflow design should provide for positive drainage into the swale to function on the long-term with minimal maintenance.

2) On-line vegetated swales should be designed to convey flow rates up to the post-development peak stormwater runoff discharge rate (flow rate) for the 100-yr 24-hour storm event, with appropriate freeboard (see Ventura County Hydrology Manual, revised 2006).

3) Off-line vegetated swales should be designed to convey the flow-based SQDF by using a flow diversion structure (e.g., flow splitter) which diverts the SQDF to the off-line vegetated swale designed to handle SQDF. Freeboard for off-line swales is not required, but should be provided if space is available. Flow splitter design specifications are described in Appendix F.

Energy Dissipation

1) Vegetated swales may be designed either on-line or off-line. If the facility is on-line, velocities should be maintained below the maximum design flow velocity of 3 feet per second to prevent scour and resuspension of deposited sediments.

2) The maximum flow velocity under the stormwater quality design flow rate should not exceed 1.0 foot per second. *The intention is that this maximum SQDV promotes settling and keeps vegetation upright.*

3) This velocity limitation combined with a maximum depth of 4 inches and bottom width of 10 feet results in a recommended maximum flow capacity of about 3.3 cfs,

after accounting for the side slopes. The contributory drainage area to each swale is limited so as not to exceed this recommended maximum flow capacity.

4) The maximum flow velocity during the 100-yr 24-hr storm event should not exceed 3.0 foot per second. This can be accomplished by:

    a. Splitting roadside swales near high points in the road so that flows drain in opposite directions, mimicking flow patterns on the road surface.

    b. Limiting tributary areas to long swales by diverting flows throughout the length of the swale at regular intervals, to the downstream stormwater conveyance system.

5) A flow spreader (see "Flow Spreaders" below) should be used at the inlet so that the entrance velocity is quickly dissipated and the flow is uniformly distributed across the whole swale. Energy dissipation controls should be constructed of sound materials such as stones, concrete, or proprietary devices that are rated to withstand the energy of the influent flows.

6) If check dams are used to reduce the longitudinal slope, a flow spreader should be provided at the toe of each vertical drop, with specifications described below.

7) If flow is to be introduced through curb cuts, place pavement approximately one inch above the elevation of the vegetated areas. Curb cuts should be at least 12 inches wide to prevent clogging.

Flow Spreaders

1) An anchored plate flow spreader or similar device should be provided at the inlet to the swale. Equivalent methods for spreading flows evenly throughout the width of the swale are acceptable.

2) The top surface of the flow spreader plate should be level, projecting a minimum of 2 inches above the ground surface of the water quality facility, or v-notched with notches 6 to 10 inches on center and 1 to 4 inches deep (use shallower notches with closer spacing).

3) A flow spreader plate should extend horizontally beyond the bottom width of the facility to prevent water from eroding the side slope. The plate should have a row of horizontal perforations at its base to prevent ponding for long durations. The horizontal extent should be such that the bank is protected for all flows up to the 100-yr 24-hr storm event (on-line swales) or the maximum flow that will enter the water quality facility (off-line swales).

4) Flow spreader plates should be securely fixed in place.

5) Flow spreader plates may be made of either concrete, stainless steel, or other durable material.

6) Anchor posts should be 4-inch square concrete, tubular stainless steel, or other material resistant to decay.

Check Dams

If check dams are required, they can be designed using a number of different materials, including riprap, earthen berms, or removal stop logs. Where vegetated swales parallel urban streets, the check dam can double as a crossing walk so that pedestrians have a pathway from the parked car to the building.

Check dams must be placed as to achieve the desired slope (1 to 6%) at a maximum of 50 feet apart. Check dams should be no higher than 12 inches. If riprap is used, the material should consist of well-graded stone consisting of a mixture of rock sizes. The following is an example of an acceptable gradation:

Particle Size	% Passing
24 inch	100
15 inch	75
9 inch	50
4 inch	10

Underdrains

If underdrains (not to be confused with a dry weather flow drain) are required, then they should meet the following criteria:

1) Underdrains should be made of slotted, polyvinyl chloride (PVC) pipe (PVC SDR 35 or approved equivalent). *The intention is that in comparison to round-hole perforated pipe, slotted underdrains provide greater intake capacity, clog resistant drainage, and reduced entrance velocity into the pipe, thereby reducing the chances of solids migration.*

2) Slotted pipe should have 2 to 4 rows of slots cut perpendicular to the axis of the pipe or at right angles to the pitch of corrugations. Slots should be 0.04 to 0.1 inch and should have a length of 1 to 1.25 inches. Slots should be longitudinally spaced such that the pipe has a minimum of one square inch of opening per linear foot of pipe.

3) Underdrains should be sloped at a minimum of 0.5%.

4) The underdrain pipe should be 6 inches or greater in diameter, so it can be cleaned without damage to the pipe. Clean-out risers with diameters equal to the underdrain pipe should be placed at the terminal ends of the underdrain and can be incorporated into the flow spreader and outlet structure to minimize maintenance obstacles in the swale. Intermediate clean-out risers may also be placed in the check dams or grade control structures. The cleanout risers should be capped with a lockable screw cap.

5) The underdrain should be placed parallel to the swale bottom and backfilled and underbedded with six inches of drain rock. The following coarse aggregate should be used to provide a gravel blanket and bedding for the underdrain pipe to provide a 1 foot minimum depth around the top and sides of the slotted pipe.

Sieve size	Percent Passing
¾ inch	100
¼ inch	30-60
US No. 8	20-50
US No. 50	3-12
US No. 200	0-1

6) At the option of the designer/geotechnical engineer, the drain rock may be wrapped in a geotextile fabric meeting the following minimum materials requirements. If a geotextile fabric is used, it should pass 75 gal/min/ft^2, should not impede the infiltration rate of the soil medium, and should meet the following minimum materials requirements.

Geotextile Property	Value	Test Method
Trapezoidal Tear (lbs)	40 (min)	ASTM D4533
Permeability (cm/sec)	0.2 (min)	ASTM D4491
AOS (sieve size)	#60 - #70 (min)	ASTM D4751
Ultraviolet resistance	70% or greater	ASTM D4355

Preferably, aggregate should be used in place of geotextile fabric to reduce the potential for clogging. This aggregate layer should consist of 2 to 4 inches of washed sand underlain with 2 inches of choking stone (Typically #8 or #89 washed).

7) The underdrain should drain freely to an acceptable discharge point. The underdrain can be connected to a downstream open conveyance (vegetated swale), to another bioretention cell as part of a connected treatment system, daylight to a vegetated dispersion area using an effective flow dispersion device, stored for rainwater harvesting, or to a storm drain.

Gravel Drainage Layer

To increase volume reduction and if soil conditions allow (infiltration rate > 0.5 in/hr), omit the low flow drain or underdrain and install an appropriately sized gravel drainage layer (typically a washed 57 stone) beneath the swale to achieve desired volume reduction goals. Where slopes are greater than 1%, the gravel drainage layer should be installed in combination with check dams (e.g., drop structures) to slow the flow in the swale and allow for infiltration into the gravel drainage layer and then into the subsurface. The base of the drainage layer should have zero slope. The drawdown time in the gravel drainage layer should not exceed 72 hours. The soil and gravel layers should

be separated with a geotextile filter fabric or a thin, 2 to 4 inch layer of pure sand and a thin layer (nominally two inches) of choking stone (such as #8). Sizing of the gravel drainage layer is based on volume reduction requirements.

Swale Divider

1) If a swale divider is used, the divider should be constructed of a firm material that will resist weathering and not erode, such as concrete, plastic, or compacted soil seeded with grass. Treated timber should not be used. Selection of divider material should take into account maintenance activities, such as mowing.

2) The divider should have a minimum height of 1 inch greater than the stormwater quality design water depth.

3) Earthen berms should be no steeper than 2H:1V.

4) Material other than earth should be embedded to a depth sufficient to be stable.

Soils

Swale soils should be amended with 2 inches of compost, unless the organic content is already greater than 10%. The compost should be mixed into the native soils to a depth of 6 inches to prevent soil layering and washout of compost. The compost will contain no sawdust, green or under-composted material, or any other toxic or harmful substance. It should contain no un-sterilized manure, which can lead to high levels of pathogen indictors (coliform bacteria) in the runoff.

Vegetation

Swales must be vegetated in order to provide adequate treatment of runoff via filtration. Vegetation, when chosen and maintained appropriately, also improves the aesthetics of a site. It is important to maximize water contact with vegetation and the soil surface.

1) The swale area should be appropriately vegetated with a mix of erosion-resistant plant species that effectively bind the soil. A diverse selection of low growing plants that thrive under the specific site, climatic, and watering conditions should be specified. A mixture of dry-area and wet-area grass species that can continue to grow through silt deposits is most effective. Native or adapted grasses are preferred because they generally require less fertilizer, limited maintenance, and are more drought-resistant than exotic plants. When appropriate, swales that are integrated within a project may use turf or other more intensive landscaping, while swales that are located on the project perimeter, within a park, or close to an open space area are encouraged to be planted with a more naturalistic plant palette.

2) Trees or shrubs may be used in the landscape as long as they do not over-shade the turf.

3) Above the design treatment elevation, a typical lawn mix or landscape plants can be used provided they do not shade the swale vegetation.

4) Irrigation is required if the seed is planted in the spring or summer. Use of a permanent irrigation system may help provide maximal water quality performance. Drought-tolerant grasses should be specified to minimize irrigation requirements.

5) Vegetative cover should be at least 4 inches in height, ideally 6 inches. Swale water depth should ideally be 2/3 of the height of the shortest plant species.

6) Locate the swale in an area without excessive shade to avoid poor vegetative growth. For moderately shaded areas, shade tolerant plants should be used.

7) Locate the swale away from large trees that may drop excessive leaves or needles, which may smother the grass or impede the flow through the swale. Landscape planter beds should be designed and located so that soil does not erode from the beds and enter a nearby swale.

Maintenance Access

1) Access to the swale inlet and outlet should be safely provided, with ample room for maintenance and operational activities.

Operations and Maintenance

1) Inspect vegetated swales for erosion or damage to vegetation after every storm greater than 0.75 inches for on-line swales and at least twice annually for off-line swales, preferably at the end of the wet season to schedule summer maintenance and in the fall to ensure readiness for winter. Additional inspection after periods of heavy runoff is recommended. Each swale should be checked for debris and litter and areas of sediment accumulation (see Appendix I for a vegetated swale inspection and maintenance checklist).

2) Swale inlets (curb cuts or pipes) should maintain a calm flow of water entering the swale. Remove sediment as needed at the inlet, if vegetation growth is inhibited in greater than 10% of the swale or if the sediment is blocking even distribution and entry of the water. Following sediment removal activities, replanting and/or reseeding of vegetation may be required for reestablishment.

3) Flow spreaders should provide even dispersion of flows across the swale. Sediments and debris should be removed from the flow spreader if blocking flows. Splash pads should be repaired if needed to prevent erosion. Spreader level should be checked and releveled if necessary.

4) Side slopes should be maintained to prevent erosion that introduces sediment into the swale. Slopes should be stabilized and planted using appropriate erosion control measures when native soil is exposed or erosion channels are formed.

5) Swales should drain within 48 hours of the end of a storm. Till the swale if compaction or clogging occurs and revegetate. If a perforated underdrain pipe is present, it should be cleaned if necessary.

6) Vegetation should be healthy and dense enough to provide filtering, while protecting underlying soils from erosion:

   - Mulch should be replenished as needed to ensure survival of vegetation.
   - Vegetation, large shrubs or trees that interfere with landscape swale operation should be pruned.
   - Fallen leaves and debris from deciduous plant foliage should be removed.
   - Grassy swales should be mowed to 4 to 6 inches height. Grass clippings should be removed.
   - Invasive vegetation, such as Alligatorweed (*Alternanthera philoxeroides*), Halogeton (*Halogeton glomeratus*), Spotted Knapweed (*Centaurea maculosa*), Giant Reed (*Arundo donax*), Castor Bean (*Ricinus communis*), Perennial Pepperweed (*Lepidium latifolium*), and Yellow Starthistle (*Centaurea solstitalis*) should be removed and replaced with non-invasive species. Invasive species should never contribute more than 10% of the vegetated area. For more information on invasive weeds, including biology and control of listed weeds, look at the encycloweedia located at the California Department of Food and Agriculture website or the California Invasive Plant Council website at www.cal-ipc.org.
   - Dead vegetation should be removed if greater than 10% of area coverage or when swale function is impaired. Vegetation should be replaced and established before the wet season to maintain cover density and control erosion where soils are exposed.

7) Check dams (if present) should control and distribute flow across the swale. Causes for altered water flow and/or channelization should be identified and obstructions cleared. Check dams and swale should be repaired if damaged.

8) The vegetated swale should be well maintained. Trash and debris, sediment, visual contamination (e.g., oils), noxious or nuisance weeds, should all be removed.

BIO-4: Vegetated Filter Strip

Filter strips are vegetated areas designed to treat sheet flow runoff from adjacent impervious surfaces or intensive landscaped areas such as golf courses. Filter strips decrease runoff velocity, filter out total suspended solids and associated pollutants, and provide some infiltration into underlying soils. While some assimilation of dissolved constituents may occur, filter strips are generally more effective in trapping sediment and particulate-bound metals, nutrients, and pesticides. Filter strips are more effective when the runoff passes through the vegetation and thatch layer in the form of shallow, uniform flow. Biological and chemical processes may help break down pesticides, uptake metals, and use nutrients that are trapped in the filter.

Vegetated filter strip captures runoff from freeway

Photo Credit: Washington Department of Transportation

Applications

- Areas adjacent to parking lots and driveways
- Road medians and shoulders

Preventative Maintenance

- Remove excess sediment
- Stabilize/repair minor erosion and scouring
- Remove trash and debris
- Mow regularly

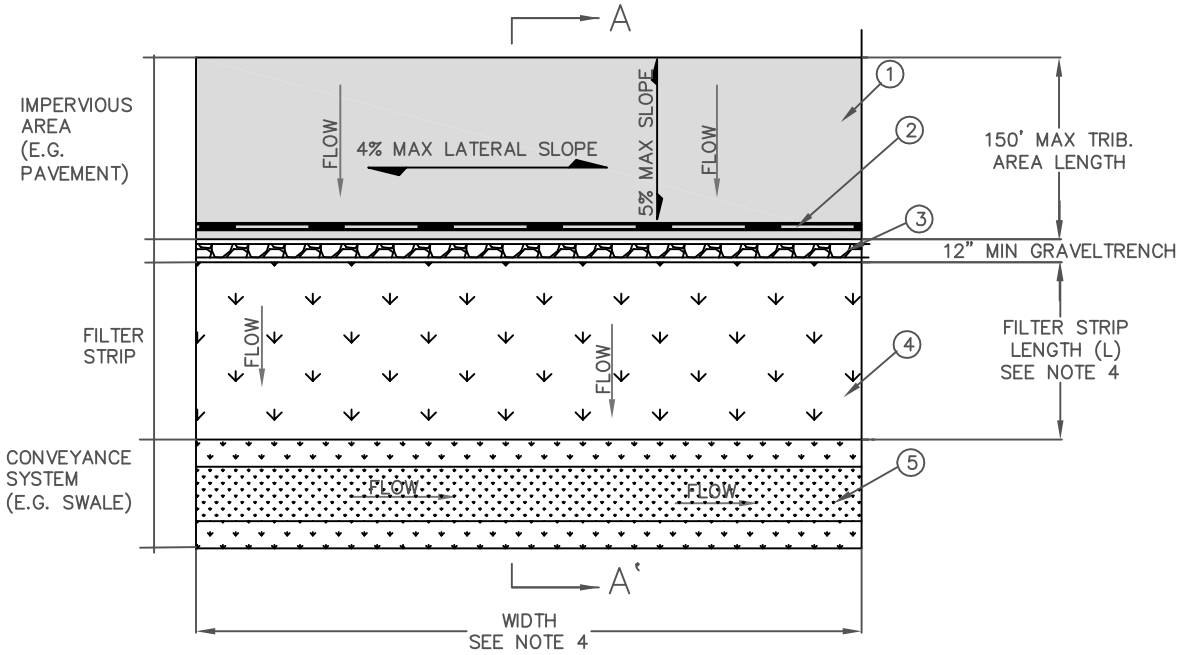

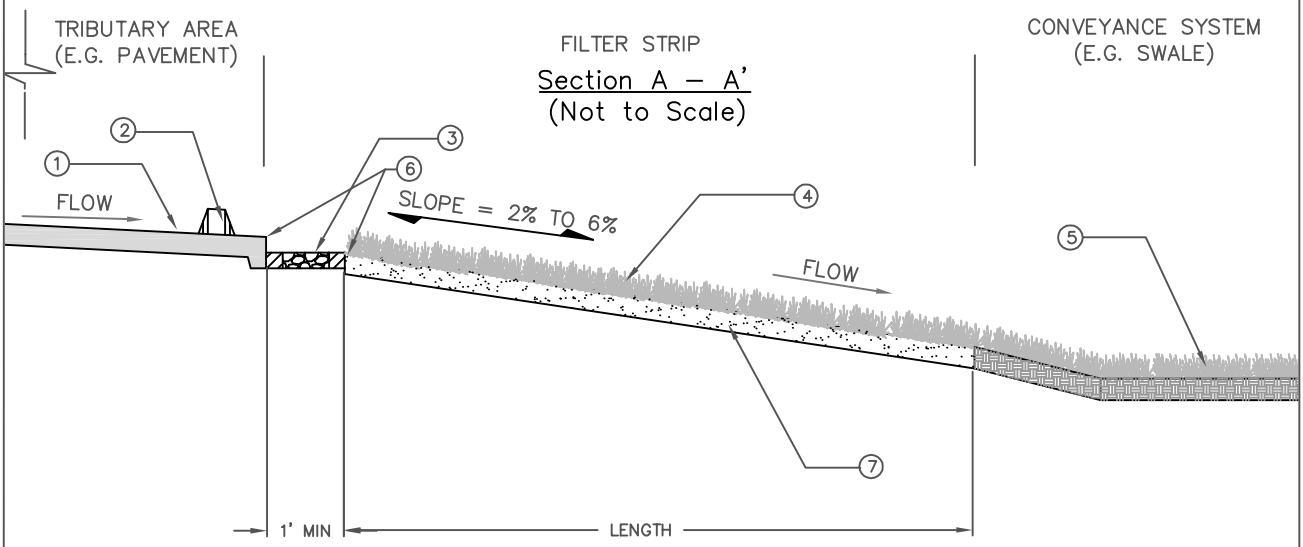

NOTES:

1. MAXIMUM LENGTH OF IMPERVIOUS TRIBUTARY AREA (PER UNIT WIDTH OF FILTER STRIP) SHALL BE 150'.
2. OPTIONAL NOTCHED CURB SPREADERS MAY BE USED IN CONJUNCTION WITH GRAVEL FLOW SPREADER.
3. GRAVEL FLOW SPREADER 6" DEEP BY 12" WIDE MIN SHALL BE PROVIDED.
4. VEGETATED FILTER STRIP SURFACE. SLOPE SHALL BE BETWEEN 2–4%. LENGTH OF STRIP MUST BE BETWEEN 15' AND 150'. WIDTH MUST BE EQUAL OR GREATER THAN THE WIDTH OF THE TRIBUTARY AREA.
5. INSTALL SWALE OR OTHER CONVEYANCE SYSTEM DOWNSTREAM OF FILTER STRIP.
6. TOP OF FILTER STRIP SHALL BE >1" BELOW TOP OF ADJACENT PAVEMENT.
7. AMEND SOILS WITH 2" OF COMPOST TILLED INTO 6" OF NATIVE SOIL UNLESS NATIVE SOIL ORGANIC CONTENT > 10%.

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Figure 6-13: Vegetated Filter Strip

Limitations

The following describes limitations for vegetated filter strips:

- High flow velocity - steep terrain and/or large tributary area may cause concentrated, erosive flows.
- Sheet flow - shallow, evenly-distributed flow across the entire width of the filter strip is required. Filter strips are designed to treat small areas. The maximum flow path from a contributing impervious surface should not exceed 150 feet. Flows should enter as sheet flow and not exceed a depth of 1 inch.
- Shallow grades – a limited site slope may cause ponding.
- Availability of pervious area adjacent to impervious area - filter strips require sheet flow from impervious areas.

Design Criteria

The main challenge associated with filter strips is maintaining sheet flow, which is critical to the performance of this BMP. If flows are concentrated, then little or no treatment of stormwater runoff is achieved and erosive rilling is likely. The use of a flow spreading device (e.g., gravel trench or level spreader) to deliver shallow, evenly-distributed sheet flow to the strip is required. Vegetated filter strips should be designed according to the requirements listed in Table 6-21 and outlined in the section below. BMP sizing worksheets are presented in Appendix E.

Table 6-21: Vegetated Filter Strip Design Criteria

Design Parameter	Unit	Design Criteria
Stormwater quality design flow (SQDF)	cfs	See Section 2 and Appendix E for calculating SQDF.
Maximum design flow depth	inches	1
Design residence time	minutes	7
Design flow velocity	ft/sec	< 1 ft/sec
Minimum length in flow direction	feet	15 (25 preferred); If sized for pretreatment only, filter strip can be a minimum of 4.
Maximum length (parallel to flow) of tributary area per unit width (perpendicular to flow) of filter strip	feet	150
Minimum slope in flow direction	%	2

Design Parameter	Unit	Design Criteria
Maximum slope in flow direction	%	4
Maximum lateral slope	%	4
Vegetation	-	Turf grass (irrigated) or approved equal
Minimum grass height	inches	2
Maximum grass height	inches	4 (typical) or as required to prevent shading
Elevation of flow spreader	inches	> 1 inch below the pavement surface

Sizing Criteria

The flow capacity of a vegetated filter strips (filter strips) is a function of the longitudinal slope (parallel to flow), the resistance to flow (e.g., Manning's roughness), and the width and length of the filter strip. The slope should be shallow enough to ensure that the depth of water will not exceed 1 inch over the filter strip. Similarly, the flow velocity should be less than 1 ft/sec. Procedures for sizing filter strips are summarized below. A filter strip sizing example is also provided.

Step 1: Calculate the design flow rate

The design flow is calculated based on the SQDF (see Section 2).

Step 2: Calculate the minimum width

Determine the minimum width (W_{min}), perpendicular to flow, allowable for the filter strip and design for that width or larger.

$$Wmin = (SQDF) / (qa,min) \qquad \text{(Equation 6-33)}$$

Where

W_{min} = minimum width of filter strip (and tributary area)

$SQDF$ = design flow (cfs)

$q_{a,min}$ = minimum linear unit application rate, 0.005 cfs/ft

Step 3: Calculate the design flow depth

The design flow depth (d_f) is calculated based on the width and the slope, parallel to the flow path, using a modified Manning's equation as follows:

$$d_f = 12 \times [SQDF * n_{wq} / 1.49 W_{trib} s^{0.5}]^{0.6} \qquad \text{(Equation 6-34)}$$

Where:

d_f	=	design flow depth (inches)
$SQDF$	=	design flow (cfs)
W	=	width of strip (perpendicular to flow = width of impervious surface contributing area (ft))
s	=	slope (ft/ft) of strip parallel to flow, average over the whole width
n_{wq}	=	Manning's roughness coefficient (0.25-0.30)

If d_f is greater than 1 inch (0.083 ft), then a shallower slope is required, or a filter strip cannot be used.

Step 4: Calculate the design velocity

The design flow velocity (V_{wq}) is based on the design flow, design flow depth, and width of the strip:

$$Vwq = SQDF / (df\ W) \qquad \text{(Equation 6-35)}$$

Where:

$d_{f,ft}$	=	design flow depth (ft) ($d_f/12$)
$SQDF$	=	stormwater quality design flow (cfs)
W	=	width of strip (perpendicular to flow = width of impervious surface contributing area (ft))

Step 5: Calculate the desired length of the filter strip

Determine the required length (L) to achieve a desired minimum residence time of 7 minutes using:

$$L = 60 t_{hr} * V_{wq} \qquad \text{(Equation 6-36)}$$

Where:

L	=	minimum allowable strip length (ft)
t_{hr}	=	hydraulic residence time (min)
V_{wq}	=	design flow velocity (fps) calculated by Equation 6-35

Geometry and Size

1) The width of the filter strip shall extend across the full width of the tributary area. The upstream boundary of the filter should be located contiguous to the developed tributary area.

2) The length (in direction of flow) should be between 15 and 150 feet. A minimum length of 25 feet is preferred. Filter strips used for pretreatment shall be at least 4 feet long (in direction of flow).

3) Filter strips shall be designed on slopes (parallel to the direction of flow) between 2% and 4%; steeper slopes tend to result in concentrated flow. Slopes less than 2% could pond runoff, and in poorly permeable soils, create a mosquito breeding habitat.

4) The lateral slope of strip (parallel to the edge of the pavement, perpendicular to the direction of flow) should be 4% or less.

5) Grading should be even: a filter strip with uneven grading perpendicular to the flow path will develop flow channels over time.

6) The top of the strip should be installed 2 to 5 inches below the adjacent pavement to allow for vegetation and sediment accumulation at the edge of the strip. A beveled transition is acceptable and may be required per roadside design specifications.

7) Both the top and toe of the slope should be as flat as possible to encourage sheet flow and prevent channeling and erosion. For engineered filter strips, the facility surface should be graded flat prior to placement of vegetation.

Energy Dissipation / Level Spreading

Runoff entering a filter strip must not be concentrated. A flow spreader should be installed at the edge of the pavement to uniformly distribute the flow along the entire width of the filter strip.

1) At a minimum, a gravel flow spreader (gravel-filled trench) should be placed between the impervious area contributing flows and the filter strip, and meet the following requirements:

    a. The gravel flow spreader should be a minimum of 6 inches deep and should be 12 inches wide.

    b. The gravel should be a minimum of 1 inch below the pavement surface. *The intention is that this allows sediment from the paved surface to be accommodated without blocking drainage onto the strip.*

2) The gravel flow spreader should be a minimum of 6 inches deep and should be 12 inches wide.

a. Where the ground surface is not level, the gravel spreader must be installed so that the bottom of the gravel trench and the outlet lip are level.

b. Along roadways, gravel flow spreaders must be placed and designed in accordance with County road design specifications for compacted road shoulders.

3) Curb ports and interrupted curbs may only be used in conjunction with a gravel spreader to better ensure that water sheet flows onto the strip, provided:

a. Curb ports use fabricated openings that allow concrete curbing to be poured or extruded while still providing an opening through the curb to admit water to the filter strip. Interrupted curbs are sections of curb placed to have gaps spaced at regular intervals along the total width of the treatment area. Openings or gaps in the curb should be at regular intervals but at least every 6 feet. The width of each opening should be a minimum of 11 inches.

b. At a minimum, gaps should be every 6 feet to allow distribution of flows into the treatment facility before they become too concentrated. The opening should be a minimum of 11 inches. Approximately 15 percent or more of the curb section length should be in open ports, and as a general rule, no opening should discharge more than 10 percent of the overall flow entering the facility.

4) Energy dissipaters are needed in a filter strips if sudden slope drops occur, such as locations where flows in a filter strip pass over a rockery or retaining wall aligned perpendicular to the direction of flow. Adequate energy dissipation at the base of a drop section can be provided by a riprap pad.

Access

1) Access should be provided at the upper edge of a filter strip to enable maintenance of the inflow spreader throughout the strip width and allow access for mowing equipment.

Water Depth and Velocity

1) The design water depth shall not exceed 1 inch.

2) Runoff flow velocities should not exceed approximately 1 foot per second across the filter strip surface.

Soils

Filter strip soils should be amended with 2 inches of compost, unless the organic content is already greater than 10%. The compost should be mixed into the native soils to a depth of 6 inches to prevent soil layering and washout of compost. The compost will contain no sawdust, green or under-composted material, or any other toxic or harmful substance. It

should contain no un-sterilized manure which can lead to high levels of potentially pathogenic bacteria in the runoff.

Vegetation

Filter strips must be uniformly graded and densely vegetated with erosion-resistant grasses that effectively bind the soil. Native or adapted grasses are preferred because they generally require less fertilizer and are more drought-resistant than exotic plants. The following vegetation guidelines should be followed for filter strips:

1) Sod (turf) can be used instead of grass seed, as long as there is complete coverage.

2) Irrigation should be provided to establish the grasses.

3) Grasses or turf should be maintained at a height of 2 to 4 inches. Regular mowing is often required to maintain the turf grass cover.

4) Trees or shrubs should not be used in abundance because they shade the turf and impede sheet flow.

Operations and Maintenance

Filter strips mainly require vegetation management. Therefore little special training is needed for maintenance crews. Typical maintenance activities and frequencies include:

1) Inspect strips at least twice annually for erosion or damage to vegetation, preferably at the end of the wet season to schedule summer maintenance and in the fall to ensure the strip is ready for winter. However, additional inspection after periods of heavy runoff is most desirable. The strip should be checked for debris and litter and areas of sediment accumulation (see Appendix I for a vegetated filter strip inspection and maintenance checklist).

2) Mow as frequently as necessary (at least twice a year) for safety and aesthetics or to suppress weeds and woody vegetation.

3) Trash tends to accumulate in strip areas, particularly along roadways. The need for litter removal should be determined through periodic inspection. Litter should always be removed prior to mowing.

4) Regularly inspect vegetated buffer strips for pools of standing water. Vegetated filter strips can become a nuisance due to mosquito breeding in level spreaders (unless designed to dewater completely in less than 72 hours), in pools of standing water if obstructions develop (e.g. debris accumulation, invasive vegetation), and/or if proper drainage slopes are not implemented and maintained.

5) Activities that lead to ruts or depressions on the surface of the filter strip should be prevented or the integrity of the strip should be restored by leveling and reseeding. Examples are vehicle tracks, utility maintenance, and pedestrian (short-cut) tracks.

6) Vegetation should be healthy and dense enough to provide filtering, while protecting underlying soils from erosion:

- Mulch should be replenished as needed to ensure survival of vegetation.
- Vegetation, large shrubs or trees that interfere with landscape swale operation should be pruned.
- Fallen leaves and debris from deciduous plant foliage should be removed.
- Filter strips should be mowed to 4 to 6 inches height. Grass clippings should be removed.
- Invasive vegetation, such as Alligatorweed (*Alternanthera philoxeroides*), Halogeton (*Halogeton glomeratus*), Spotted Knapweed (*Centaurea maculosa*), Giant Reed (*Arundo donax*), Castor Bean (*Ricinus communis*), Perennial Pepperweed (*Lepidium latifolium*), and Yellow Starthistle (*Centaurea solstitalis*) should be removed and replaced with non-invasive species. Invasive species should never contribute more than 10% of the vegetated area. For more information on invasive weeds, including biology and control of listed weeds, look at the encycloweedia located at the California Department of Food and Agriculture website or the California Invasive Plant Council website at www.cal-ipc.org.
- Dead vegetation should be removed if greater than 10% of area coverage or when filter strip function is impaired. Vegetation should be replaced and established before the wet season to maintain cover density and control erosion where soils are exposed.

BIO-5: Proprietary Biotreatment

Proprietary biotreatment devices are manufactured treatment BMPs that incorporate plants, soil, and microbes engineered to provide treatment at higher flow rates or volumes and with smaller footprints than their non-proprietary counterparts. Incoming flows are typically pretreated to remove larger particles/debris, filtered through a planting media (mulch, compost, soil, and plants), collected by an underdrain, and delivered to the stormwater conveyance system.

Proprietary Biotreatment Examples

Photo Credits: 1. Filterra®; 2. Stormtreat™

Application

- Parking lot islands
- Pickup/drop off turnarounds
- Roadway curbs

Maintenance

- Filter media replacement
- Sediment, trash, and debris removal
- Mulch replacement
- Vegetation upkeep and replacement

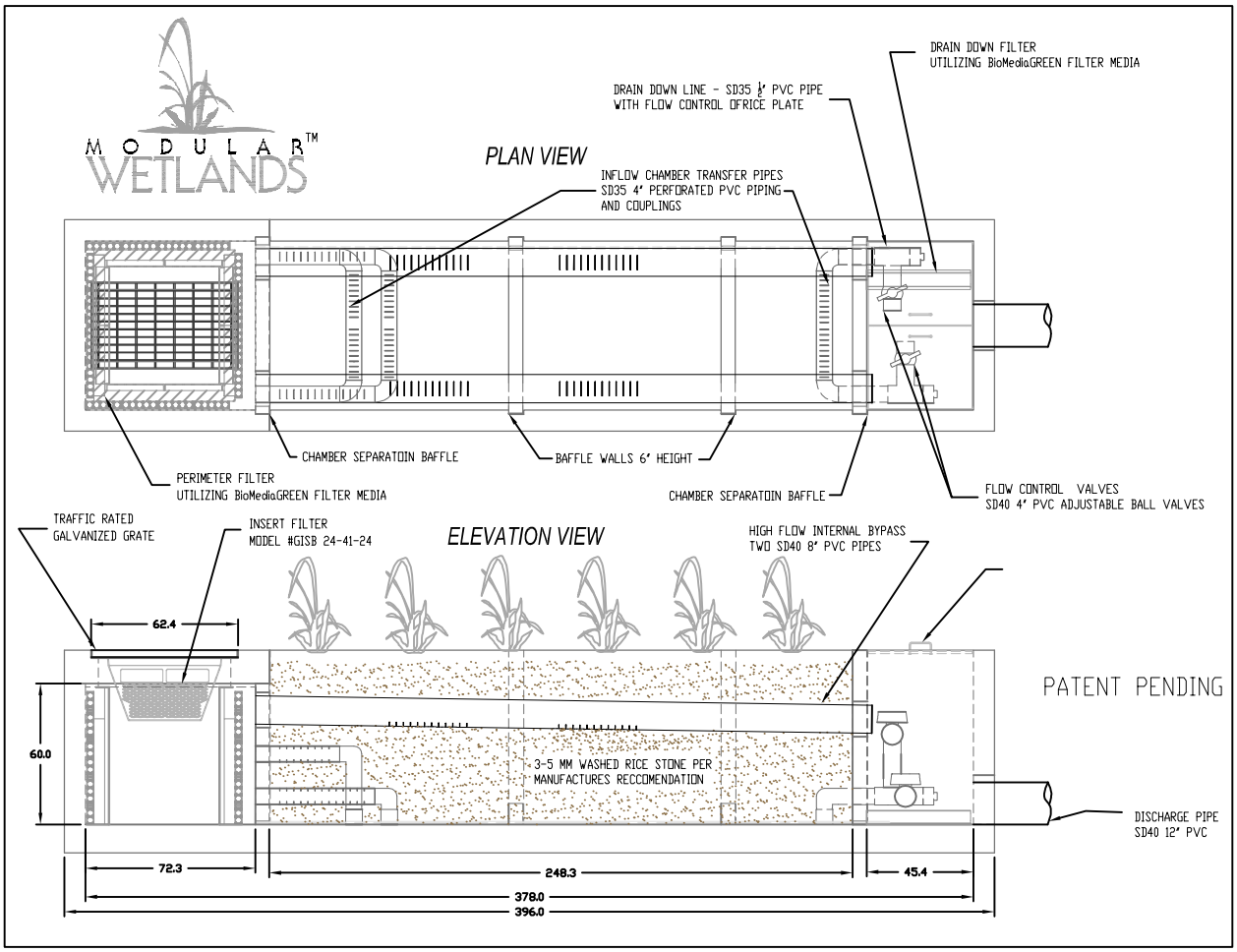

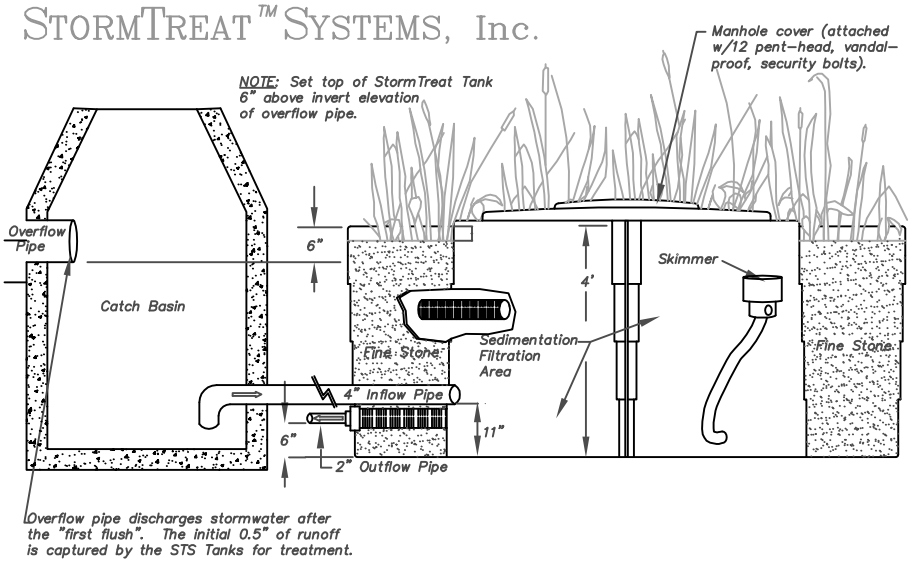

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Figure 6-14: Biotreatment Device

Table 6-22: Proprietary Biotreatment Device Manufacturer Websites

Device	Manufacturer	Website
DeepRoot® Silva Cell	DeepRoot® Urban Landscape Products	www.deeproot.com
Filterra®	Filterra® Bioretention Systems	www.filterra.com
Modular Wetlands (MWS-LINEAR)	Modular Wetlands Systems Inc.	www.modularwetlands.com
StormTreat™	StormTreat Systems Inc.	www.stormtreat.com
UrbanGreen BioFilter	Contech® Construction Products Inc.	www.contech-cpi.com/stormwater/13

Design Criteria

As proprietary biotreatment BMP vendors are constantly updating and expanding their product lines, refer to the specific vendor for the latest design and sizing guidance.

TCM-1: Dry Extended Detention Basin

Dry extended detention (ED) basins are basins whose outlets have been designed to detain the SQDV for 36 to 48 hours to allow sediment particles and associated pollutants to settle and be removed. Dry ED basins do not have a permanent pool. They are designed to drain completely between storm events. They can also be used to provide hydromodification and/or flood control by modifying the outlet control structure and providing additional detention storage. The slopes, bottom, and forebay of dry ED basins are typically vegetated. Without the addition of a sand filter beneath the basin, considerable stormwater volume reduction can still occur, depending on the infiltration capacity of the subsoil.

Extended Detention Basin Application

Photo Credit: Geosyntec Consultants

Application

- Adjacent to parking lots
- Road medians and shoulders
- Within open areas or play fields

Preventative Maintenance

- Remove trash and debris, minor sediment accumulation, and obstructions near inlet and outlet structures
- Replace top 2 to 4 inch of sand
- Mow or weed surface of filter

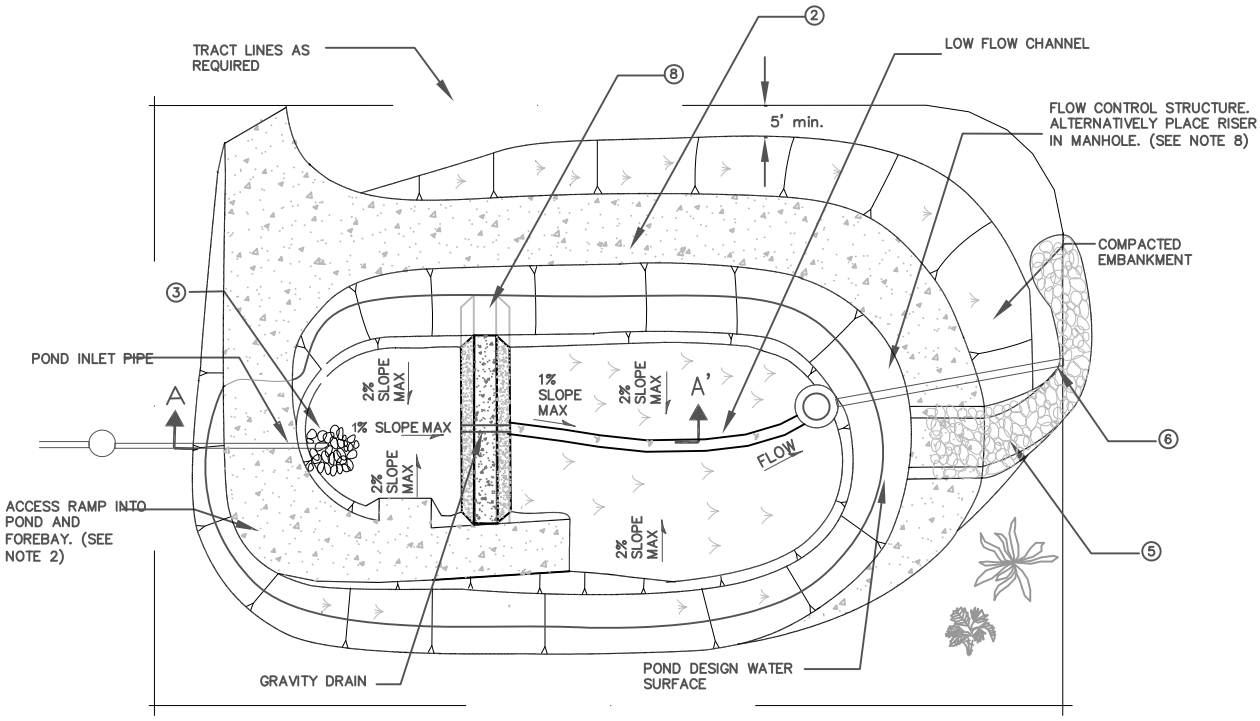

Plan View
(Not to Scale)

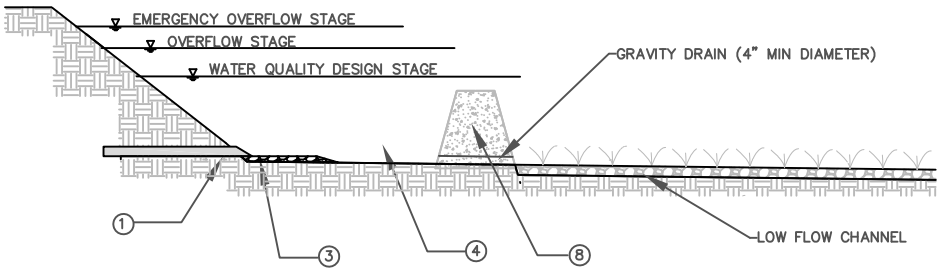

Section A – A'
(Not to Scale)

NOTES:

1. INLET PIPE SHALL BE DESIGNED AND LOCATED SO THAT NON–EROSIVE VELOCITIES OCCUR IN THE FOREBAY
2. MAINTENANCE RAMP SHOULD PROVIDE ACCESS TO BOTH THE FOREBAY AND MAIN BASIN.
3. RIP RAP APRON OR OTHER INLET ENERGY DISSIPATION SHALL BE PROVIDED SUCH THAT VELOCITIES IN THE FOREBAY ARE < 4 FT/S.
4. SEDIMENT FOREBAY SHOULD BE SIZED TO PROVIDE 5–15% OF THE TOTAL BASIN VOLUME.
5. EMERGENCY SPILLWAY MUST BE SIZED TO PASS 100–YEAR PEAK FLOW FOR ON–LINE BASINS, AND WATER QUALITY DESIGN FLOW FOR OFF–LINE BASINS.
6. OUTLET PIPE. ENERGY DISSIPATION SHALL BE PROVIDED UNLESS DISCHARGE IS TO PIPE OR HARDENED CHANNEL.
7. OUTLET STRUCTURE SHOULD BE SIZED TO DRAIN WATER QUALITY VOLUME IN 36 – 48 HOURS (SEE FIGURE 2–2 FOR PERFORATED RISER DETAILS). ALTERNATIVELY PLACE RISER STRUCTURE IN A MANHOLE (SEE FIGURE 2–3).
8. INSTALL EARTHEN BERM OR EQUIVALENT. TOP OF BERM SHALL BE 2' MINIMUM BELOW DESIGN WATER QUALITY STAGE. BERM SHALL BE KEYED INTO EMBANKMENT A MINIMUM OF 1' ON BOTH SIDES.

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Figure 6-15: Extended Detention Basin

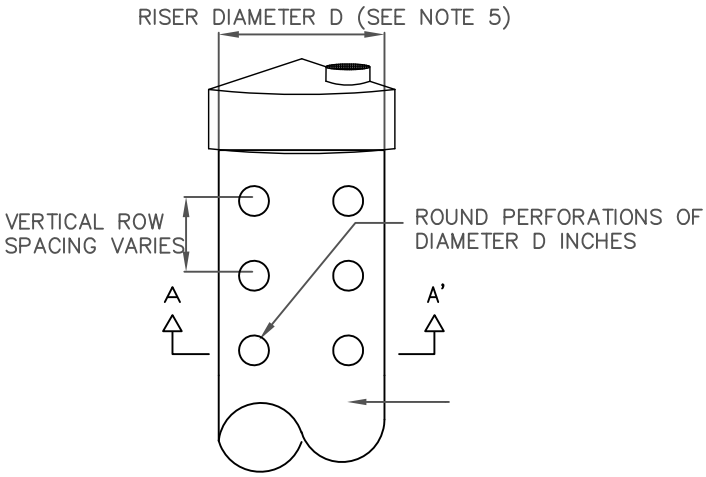

Perforated Riser Detail
(Not to Scale)

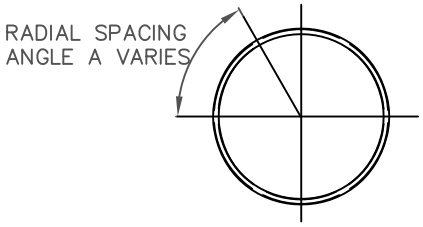

Section A – A'
(Not to Scale)

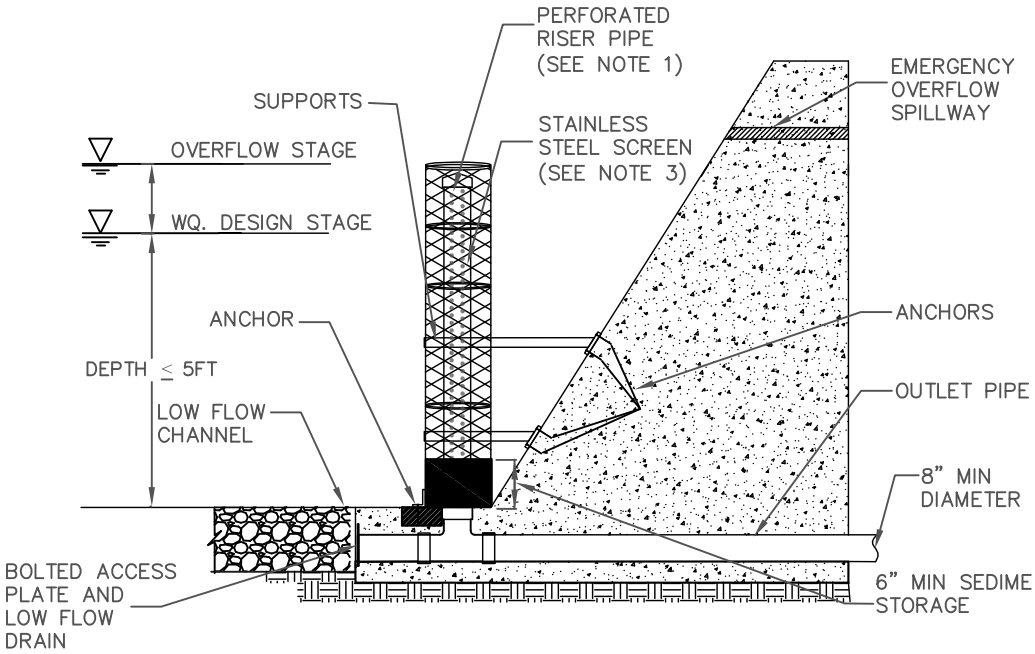

Perforated Riser Outlet Structure
(Not to Scale)

NOTES:

1. RISER PIPE SHALL BE SIZED TO PROVIDE 36 TO 48–HOUR FULL BRIM DRAW DOWN TIME.
2. TOTAL OUTLET CAPACITY: 100–YEAR PEAK FLOW FOR ON–LINE BASINS AND WATER QUALITY DESIGN FLOW FOR OFF–LINE BASINS.
3. SCREEN OPENINGS SHALL BE AT LEAST ¼" AND SHALL NOT EXCEED THE DIAMETER OF THE PERFORATIONS ON THE RISER.
4. RISER PIPE PERFORATION DIAMETER SHALL BE NO LESS THAN ½" AND NO MORE THAN 2"
5. MINIMUM PIPE DIAMETER (D) IS 2'
6. RISER PIPE MATERIAL IS CMP

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Figure 6-16: Perforated Riser Outlet

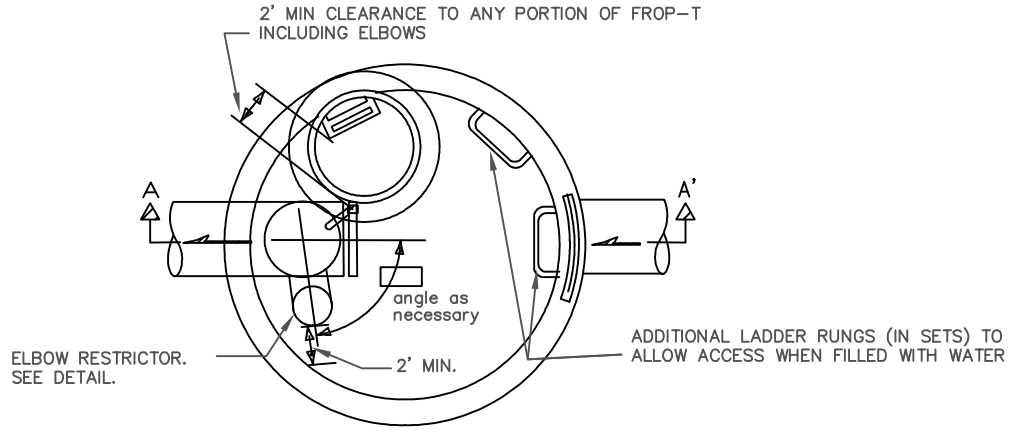

Plan View
(Not to Scale)

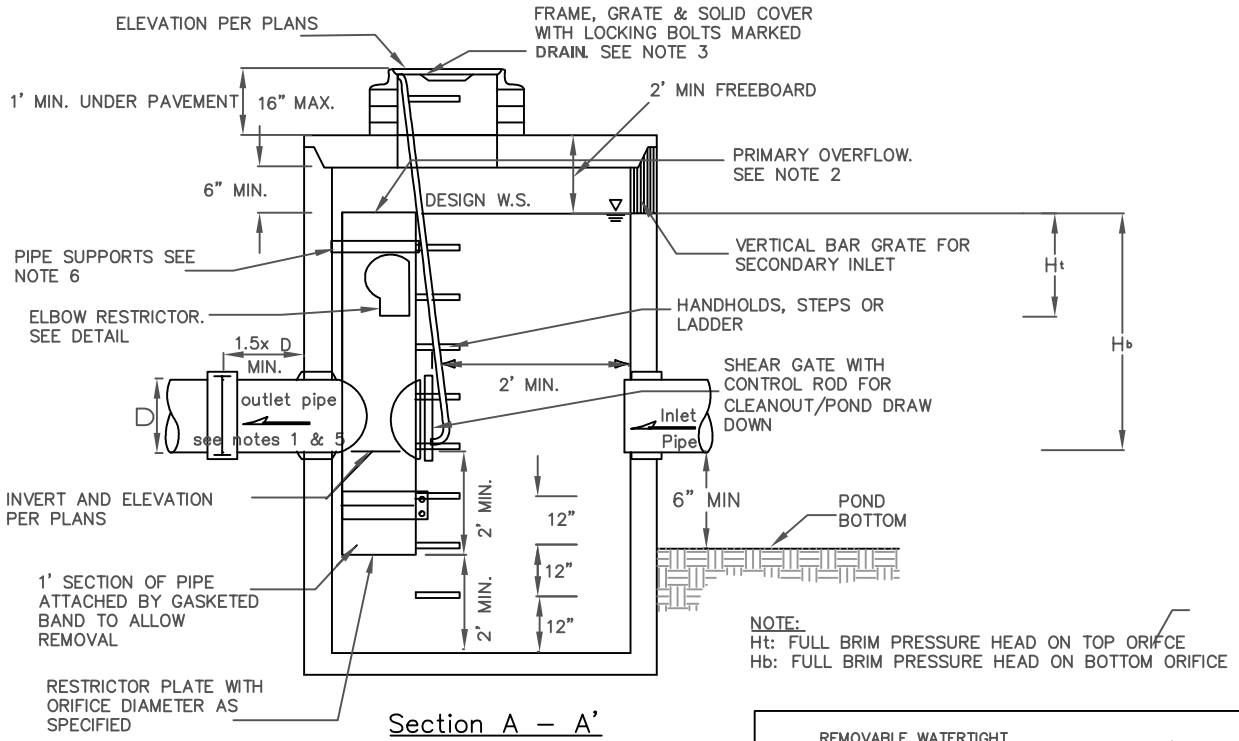

NOTE:
Ht: FULL BRIM PRESSURE HEAD ON TOP ORIFCE
Hb: FULL BRIM PRESSURE HEAD ON BOTTOM ORIFICE

Section A – A'
(Not to Scale)

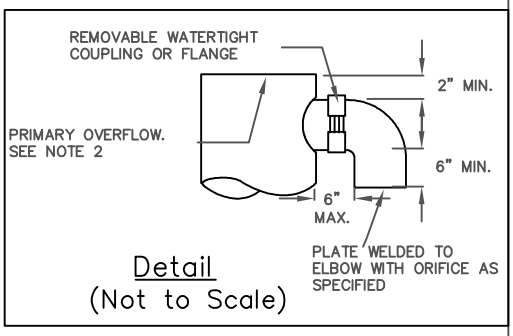

Detail
(Not to Scale)

NOTES:

1. USE A MINIMUM OF A 54" DIA TYPE 2 CATCH BASIN
2. OUTLET CAPACITY: 100-YEAR PEAK FLOW FOR ON-LINE BASINS.
3. METAL PARTS: CORROSION RESISTANT. NON-GALVANIZED PARTS PERFERRED. GALVANIZED PIPE PARTS TO HAVE ASPHALT TREATMENT.
4. FRAME AND LADDER OR STEPS OFFSET SO:
   A. CLEANOUT GATE IS VISIBLE FROM TOP.
   B. CLIMB-DOWN SPACE IS CLEAR OF RISER AND
   C. FRAME IS CLEAR OF CURB.
5. IF METAL OUTLET PIPE CONNECTS TO CEMENT CONCRETE PIPE: OUTLET PIPE TO HAVE SMOOTH O.D. EQUAL TO CONCRETE PIPE I.D. LESS ¼"
6. PROVIDE AT LEAST ONE 3 X .090 GAGE SUPPORT BRACKET ANCHORED TO CONCRETE WALL. (MAXIMUM 3' VERTICAL SPACING)
7. LOCATE ADDITIONAL LADDER RUNGS IN STRUCTURES USED AS ACCESS TO TANKS OR VAULTS TO ALLOW ACCESS WHEN CATCH BASIN IS FILLED WITH WATER

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Figure 6-17: Multiple Orifice Outlet

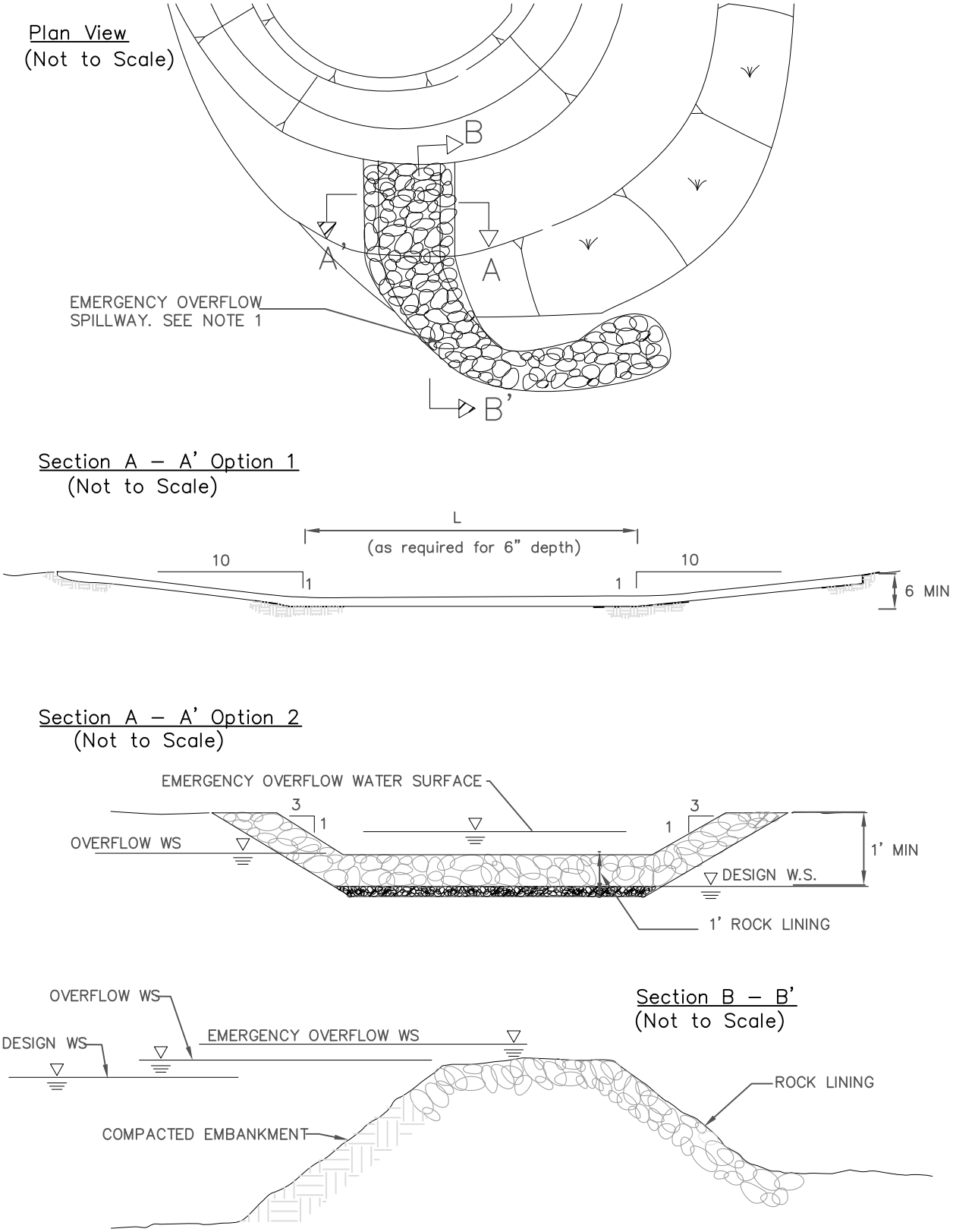

NOTES:

1. ALTERNATIVE SPILLWAY DESIGNS BASED ON THE CALIFORNIA DEPARTMENT OF WATER RESOURCES' GUIDELINES FOR THE DESIGN AND CONSTRUCTION OF SMALL EMBANKMENT DAMS OR AT THE DISCRETION OF THE DEPARTMENT

Geosyntec consultants

Figure 6-18: Spillway

Limitations

Limitations for dry extended detention basins include:

- Surface space availability - typically 0.5 to 2.0 percent of the total tributary development area required.
- Depth to groundwater - bottom of basin should be 2 feet higher than the seasonal high water table elevation.
- Steep slopes - basins placed above slopes greater than 15 percent or within 200 feet from the top of a hazardous slope or landslide area require a geotechnical investigation.
- Compatibility with flood control - basins must not interfere with flood control functions of existing conveyance and detention structures.

Design Criteria

Dry extended detention basins should be designed according to the requirements listed in Table 6-23 and outlined in the section below. BMP sizing worksheets are presented in Appendix E.

Table 6-23: Dry Extended Detention Basin Design Criteria

Design Parameter	Unit	Design Criteria
Stormwater quality design volume (SQDV)	acre-feet	See Section 2 and Appendix E for calculating SQDV
Drawdown time for SQDV	hours	Top 50%: 12 hrs (minimum); Bottom 50%: 36 hrs
Basin Design Volume	acre-ft	1.2 * SQDV
Forebay basin size	acre-feet	5 to 15% of SQDV
Maximum forebay drain time	min	45
Low–flow channel depth	inches	9
Low-flow channel flow capacity		2*forebay outlet rate
Freeboard (minimum)	inches	12
Flow path length to width ratio	L:W	2:1, larger preferred; can be achieved using internal berms
Longitudinal slope	percentage	1 (forebay) and 0-2 (main basin)
Low flow channel geometry	feet	depth of 0.5 and width of 1
Minimum outflow device diameter	inches	18

Sizing Criteria

Dry extended detention (ED) basins are basins designed such that the SQDV is detained for 48 hours. This allows sediment particles and associated pollutants to settle and be removed from the stormwater. Procedures for sizing extended detention basins are summarized below. A sizing example is also provided.

Step 1: Calculate the design volume

Dry extended detention facilities shall be sized to capture and treat the SQDV (see Section E.1).

Step 2: Calculate the volume of the active basin

The total basin volume should be increased an additional 20% above the SQDV to account for sediment accumulation, at a minimum. If the basin is designed only for water quality treatment then the basin volume would be 120% of the SQDV. Freeboard is in additional to the total basin volume. Calculate the volume of the active basin (ft^2) (V_a):

$$V_a = 1.20*SQDV \qquad \text{(Equation 6-37)}$$

Step 3: Determine detention basin location and preliminary geometry based on site constraints

Based on site constraints, determine the basin geometry (area and length) and the storage available by developing an elevation-storage relationship for the basin. The cross-sectional geometry across the width of the basin should be approximately trapezoidal. Shallow side slopes are necessary if the basin is designed to have recreational uses during dry weather conditions.

1) Calculate the width of the basin footprint (W_{tot}) as follows:

$$W_{tot} = \frac{A_{tot}}{L_{tot}} \qquad \text{(Equation 6-38)}$$

Where:

A_{tot} = total surface area of the basin footprint (ft^2)

L_{tot} = total length of the basin footprint (ft)

2) Calculate the length of the active volume surface area including the internal berm but excluding the freeboard, ($L_{av\text{-}tot}$):

$$L_{av-tot} = L_{tot} - 2Zd_{fb} \qquad \text{(Equation 6-39)}$$

Where:

Z = interior side slope as length per unit height (H:V)

d_{fb} = freeboard depth (ft)

3) Calculate the width of the active volume surface area including the internal berm but excluding freeboard (ft), ($W_{av\text{-}tot}$):

$$W_{av-tot} = W_{tot} - 2Zd_{fb} \quad \text{(Equation 6-40)}$$

4) Calculate the total active volume surface area including the internal berm and excluding freeboard, ($A_{av\text{-}tot}$):

$$A_{av-tot} = L_{av-tot} \times W_{av-tot} \quad \text{(Equation 6-41)}$$

5) Calculate the area of the berm, (A_{berm}):

$$A_{berm} = W_{berm} \times L_{berm} \quad \text{(Equation 6-4243)}$$

Where:

W_{berm} = width of the internal berm

L_{berm} = length of the internal berm (= width excluding freeboard, $W_{av\text{-}tot}$)

6) Calculate the surface area excluding the internal berm and freeboard, A_{av}:

$$A_{av} = A_{av=tot} - A_{berm} \quad \text{(Equation 6-44)}$$

Step 4: Determine Dimensions of Forebay

The forebay should be sized to at least 5 to 15% of the basin active volume (V_a). Calculate the active volume of the forebay, (V_1):

$$V_1 = \frac{V_a \times \%V_1}{100} \quad \text{(Equation 6-45)}$$

Where:

$\%V_1$ = percent of V_a in forebay (%)

V_a = total active volume (ft^3)

7) Calculate the surface area for the active volume of forebay (A_1):

$$A_1 = \frac{V_1}{d_1} \quad \text{(Equation 6-46)}$$

Where:

d_1 = average depth for the forebay (ft)

8) Calculate the length of forebay, (L_1):

$$L_1 = \frac{A_1}{W_1} \quad \text{(Equation 6-47)}$$

Where:

W_1 = width of forebay (ft)

Step 5: Determine Dimensions of Cell 2

Cell 2 will consist of the remainder of the basin's active volume.

1) Calculate the active volume of Cell 2, (V_2):

$$V_2 = V_a - V_1 \quad \text{(Equation 6-48)}$$

Where:

V_a = total basin active volume (ft^3)

V_1 = volume of forebay (ft^3)

2) Calculate the surface area, A_2, for the active volume of Cell 2:

$$A_2 = A_{av} - A_1 \quad \text{(Equation 6-49)}$$

Where:

A_{av} = basin surface area excluding berm and freeboard (ft^2)

A_1 = surface area of forebay (ft^2)

3) Calculate the average depth (d_2) for the active volume of Cell 2:

$$d_2 = \frac{V_2}{A_2} \quad \text{(Equation 6-50)}$$

4) Calculate the length of Cell 2, (L_2):

$$L_2 = \frac{A_2}{W_2} \quad \text{(Equation 6-51)}$$

Where:

W_2 = width of Cell 2 (ft)

5) Verify that the length-to-width ratio of Cell 2 at half of d_2 is at least 1.5:1 with ≥2:1 preferred. If the length-to-width ratio is less than 1.5:1, modify input parameters until a ratio of at least 1.5:1 is achieved. If the input parameters cannot be modified as a result of site constraints, another site for the basin should be chosen. Calculate the length-to width (LW_{mid2}) ratio of Cell 2 at half of d_2 follows:

$$LW_{mid2} = \frac{L_{mid2}}{W_{mid2}} \qquad \text{(Equation 6-52)}$$

Where:

W_{mid2} = $W_2 - Zd_2$ (Equation 6-53)

L_{mid2} = $L_2 - Zd_2$ (Equation 6-54)

W_{mid2} = width of Cell 2 at half of d_2 (ft)

L_{mid2} = length of Cell 2 at half of d_2 (ft)

Z = interior side slope as length per unit height (H:V)

d_2 = cell 2 average depth (ft)

Step 6: Ensure Design Requirements and Site Constraints are achieved

Check design requirements and site constraints. Modify design geometry until requirements are met. If the chosen site for the basin is inadequate to meet the design requirements, choose a new location or alternative treatment BMP.

Step 7: Size Outlet Structure

The total drawdown time for the basin should be 48 hours. The outlet structure should be designed to release the bottom 50% of the detention volume (half-full to empty) over 36 hours, and the top half (full to half-full) in 12 hours. A primary overflow should be sized to pass the peak flow rate from the developed capital design storm. See Section 6 for outlet structure sizing methodologies.

Step 8: Determine Emergency Spillway Requirements

For online basins, an emergency overflow spillway should be sized to pass flows greater than the design peak runoff discharge rate for the 100-yr, 24-hr storm in order to prevent overtopping of the walls or berms in the event that a blockage of the riser occurs. For offline basins, an emergency spillway or riser should be sized to pass the 100-yr, 24-hr post-development peak stormwater runoff discharge rate directly to the downstream conveyance system or another acceptable discharge point. For sites where the emergency

spillway discharges to a steep slope, an emergency overflow riser, in addition to the spillway should be provided.

Sizing and Geometry

1) The total basin volume should be increased an additional 20% of the SQDV to account for sediment accumulation, at a minimum. If the basin is designed only for water quality treatment then the basin volume would be 120% of the SQDV. Freeboard is in addition to the total basin volume.

2) The minimum freeboard should be at least 1 foot above the emergency overflow water surface for dry extended detention basins.

3) The minimum flow-path length to width ratio at half basin height should be a minimum of 3:1 (L:W) and can be achieved using internal berms or other means to prevent short-circuiting. Intent: a long flow length will improve fine sediment removal.

4) The cross-sectional geometry across the width of the basin should be approximately trapezoidal. Shallow side slopes are necessary if the basin is designed to have recreational uses during dry weather conditions.

5) All dry ED basins should be free draining and a low flow channel should be provided. A low flow channel is a narrow, shallow trench filled with pea gravel and encased with filter fabric that runs the length of the basin to drain dry weather flows. The low flow channel should be of sufficient size considering the natural characteristics of the soil and have a positive-draining gradient flowing toward the outlet structure (typically 1 ft wide by 6 inches deep). If infiltration rates of subsurface soils are insufficient, the low flow channel should tie into perforated pipe at the outlet structure. If a sand filter or planting media is provided beneath the dry ED basin for increased volume reduction, it may be designed to take the place of the low flow channel.

6) The basin bottom should have a 1% longitudinal slope (direction of flow) in the forebay, and may range from 0 to 2% longitudinal slope in the main basin. The bottom of the basin should slope 2% toward the center low flow channel.

7) A basin should be large enough to allow for equipment access via a graded ramp.

Soils Considerations

1) The slopes of the detention basin should be analyzed for slope stability using rapid drawdown conditions and should meet the minimum standards set by the Ventura County Flood Control District. A 1.5 static factor of safety should be used. Seismic analysis is not required due to the temporary storage of water in the basin.

2) The infiltration capability of the dry ED basin can be enhanced by incorporating soil amendments.

Energy Dissipation

1) Energy dissipation controls constructed of sound materials such as stones, concrete, or proprietary devices that are rated to withstand the energy of the influent flow should be installed at the inlet to the sediment forebay. Flow velocity into the basin forebay should be controlled to 4 feet per second (ft/sec) or less.

2) Energy dissipation controls must also be used at the outlet/spillway from the detention basin unless the basin discharges to a storm drain or hardened channel.

Sediment Forebay

As untreated stormwater enters the dry ED basin, it passes through a sediment forebay for coarse solids removal. The forebay may be constructed using an internal berm constructed out of earthen embankment material, grouted riprap, stop logs, or other structurally sound material.

1) The basin should be sized so that 5 to 15% of the total basin volume is in the forebay and 85 to 95% of the total basin volume is in the main portion of the basin.

2) A gravity drain outlet from the forebay (2 inch minimum diameter) should extend the entire width of the internal berm and be designed to completely drain to the main basin within 10 minutes.

3) The forebay outlet should be offset (horizontally) from the inflow streamline to prevent short-circuiting.

4) Permanent steel post depth markers should be placed in the forebay to define sediment removal limits at 50% of the forebay sediment storage depth.

Vegetation

Vegetation within the dry ED basin provides erosion protection from wind and water and biofiltration of stormwater. The local permitting authority should review and approve any proposed basin landscape plan prior to implementation and following guidelines should be followed:

1) The bottom and slopes of the dry ED basin should be vegetated. A mix of erosion-resistant plant species that effectively bind the soil should be used on the slopes and a diverse selection of plants that thrive under the specific site, climatic, and watering conditions should be specified for the basin bottom. The basin bottom should not be planted with trees, shrubs, or other large woody plants that may interfere with sediment removal activities. The basin should be free of floating objects. Only native perennial grasses, forbs, or similar vegetation that can be replaced via seeding should be used on the basin bottom.

    a. Landscaping outside of the basin is required for all dry ED basins and should adhere to the following criteria so as not to hinder maintenance operations:

b. No trees or shrubs may be planted within 15 feet of inlet or outlet pipes or manmade drainage structures such as spillways, flow spreaders, or earthen embankments. Species with roots that seek water, such as willow or poplar, should not be used within 50 feet of pipes or manmade structures. Weeping willow (Salix babylonica) should not be planted in or near detention basins.

2) Prohibited non-native plant species will not be permitted. For more information on invasive weeds, including biology and control of listed weeds, look at the encycloweedia located at the California Department of Food and Agriculture website- or the California Invasive Plant Council website at www.cal-ipc.org.

3) A plant list provided by a landscape professional should be used as a guide only and should not replace project-specific planting recommendations, including recommendations on appropriate plants, fertilizer, mulching applications, and irrigation requirements (if any) to ensure healthy vegetation growth.

Sand Filter or Planting Media Layer

For increasing the volume reduction capability of a dry ED basin, an appropriately sized sand filter or planting media layer can be placed beneath the dry ED basin to achieve desired volume reduction goals if soil and slope conditions allow (i.e., infiltration rate greater than 0.5 in/hr but less than 2.4 in/hr; site slope less than 15%). The drawdown time of the sand filter or planting media layer should be less than 72 hours. The base of the sand filter or planting media layer should be level (i.e., zero slope). If a sand filter/planting media layer is provided over the length of the basin, it can take the place of the low-flow channel so long as it is designed to adequately infiltrate dry weather flows. Sizing of the sand filter and planting media layer for dry ED basins is the same as for sand filters and bioretention areas, respectively. The depth of water in the dry ED basin should not exceed 6 feet.

Outlet Structure and Drawdown Time

A drawdown time of 36 to 48 hours shall be provided for the SQDV. This drawdown time is for the volume in the basin above the sand filter layer (if provided) and serves the purpose of water quality treatment. An outflow device should be designed to release the bottom 50% of the detention volume (half-full to empty) over 24 to 32 hours, and the top half (full to half-full) in 12 to 16 hours. *The intention is that the drawdown schemes that detain low flows for longer periods than high flows have the following advantages over outlets that drain the basin evenly:*

- Greater flood control capabilities
- Enhanced treatment of low flows which make up the bulk of incoming flows.

Additional storage, detention, and outlet control is required to achieve pre-development stormwater runoff discharge rates for hydromodification control. The outlet structure

can be designed to achieve flow control for meeting the multiple objectives of water quality and flow attenuation.

The outflow device (i.e., outlet pipe) should be oversized (18 inch minimum diameter). There are two options that can be used for the outlet structure:

1) Uniformly perforated riser structures.

2) Multiple orifice structures (orifice plate).

The outlet structure can be placed in the basin with a debris screen (Figure 6-15) or housed in a standard manhole (Figure 6-16). If a multiple orifice structure is used, an orifice restriction (if necessary) should be used to limit orifice outflow to the maximum discharge rates allowable for achieving the desired water quality and flow control objectives. Orifice restriction plates should be removable for emergency situations. A removable trash rack should be provided at the outlet.

Note that a primary overflow (typically a riser pipe connected to the outlet works) should be sized to pass flows larger than the stormwater quality design storm (if the ED basin is sized only for water quality) or to pass flows larger than the peak flow rate of the maximum design storm to be detained in the basin (e.g., 100-yr, 24-hr). The primary overflow is intended to protect against overtopping or breaching of a basin embankment.

Perforated Risers Outlet Sizing Methodology

The following attributes influence the perforated riser outlet sizing calculations**:**

- Shape of the basin (e.g., trapezoidal)
- Depth and volume of the basin
- Elevation / depth of first row of holes
- Elevation / depth of last row of holes
- Size of perforations
- Number of rows or perforations and number of perforations per row
- Desired drawdown time (e.g., 16 hour and 32 hour draw down for top half and bottom half respectively, 48 hour total drawdown time for the stormwater quality design volume)

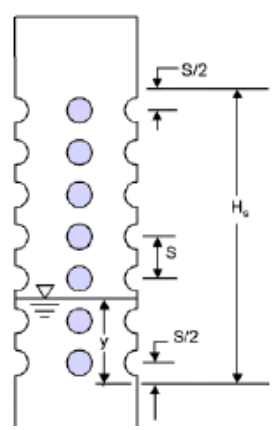

Perforated Riser Outlet

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The governing rate of discharge from a perforated riser structure can be calculated using Equation 6-44 below:

$$Q = C_p \frac{2A_p}{3H_s}\sqrt{2g}H^{3/2}$$

(Equation 6-55)

Where:

Q	=	riser flow discharge (cfs)
C_p	=	discharge coefficient for perforations (use 0.61)
A_p	=	cross-sectional area of all the holes (ft^2)
s	=	center to center vertical spacing between perforations (ft)
H_s	=	distance from s/2 below the lowest row of holes to s/2 above the top row of holes (McEnroe 1988).
H	=	effective head on the orifice (measured from center of orifice to water surface)

For the iterative computations needed to size the perforations in the riser and determine the riser height, a simplified version of Equation 6-44 may be used as shown below in Equation 6-45 and Equation 6-46:

$$Q = kH^{3/2}$$

(Equation 6-56)

Where:

H	=	effective head on the orifice (measured from center of orifice to water surface)

$$k = C_p \frac{2A_p}{3H_s}\sqrt{2g}$$

(Equation 6-57)

Where:

C_p	=	discharge coefficient for perforations (use 0.61)
A_p	=	cross-sectional area of all the holes (ft^2)
s	=	center to center vertical spacing between perforations (ft)

H_s	=	distance from s/2 below the lowest row of holes to s/2 above the top row of holes.
g	=	32.17 ft/sec^2

Uniformly perforated riser designs are defined by the depth or elevation of the first row of perforations, the length of the perforated section of pipe, and the size or diameter of each perforation.

Multiple Orifice Outlet Sizing Methodology

The following attributes influence multiple orifice outlet sizing calculations**:**

- Shape of the basin (e.g., trapezoidal)
- Depth and volume of the basin
- Elevation of each orifice
- Desired draw-down time (e.g., 16 hour and 32 hour draw down times for top half and bottom half respectively, 48 hour drawdown time for stormwater quality design volume)

The rate of discharge from a single orifice can be calculated using Equation 6-22.

$$Q = CA(2gH)^{0.5} \qquad \text{(Equation 6-58)}$$

Where:

Q	=	orifice flow discharge
C	=	discharge coefficient
A	=	cross-sectional area of orifice or pipe (ft2)
g	=	acceleration due to gravity (32.2 ft/s2)
H	=	effective head on the orifice (measured from center of orifice to water surface)

Multiple orifice designs are defined by the depth (or elevation) and the size (or diameter) of each orifice. The steps needed to size a dual orifice outlet are outlined in Appendix E; multiple orifices may be provided and sized using a similar approach.

Emergency Spillway

An emergency overflow spillway in addition to the primary overflow outlet (as described above) is required. The emergency spillway should be sized for flows greater than the

peak 100-year 24-hour storm if the basin is designed on-line or, if the basin is designed on-line, the spillway should be sized for flows greater than the basin design volume (e.g., stormwater quality design volume). The spillway should provide for adequate energy dissipation downstream. The spillway should allow for at least 12 inches of freeboard above the emergency overflow water surface elevation if the basin is on-line. If the basin is on-line, 2 feet of freeboard is preferable.

Spillways shall meet the California Department of Water Resources, Division of Safety of Dams Guidelines for the Design and Construction of Small Embankment Dams (http://damsafety.water.ca.gov/docs/GuidelinesSmallDams.pdf). *Intent: Emergency overflow spillways are intended to control the location of basin overtopping and safely direct overflows back into the downstream conveyance system or other acceptable discharge point.*

On-line Basins

1) On-line basins must have an emergency overflow spillway to prevent overtopping of walls or berms should blockage of the primary outlet occur based on a downstream risk assessment.

2) The overflow spillway must be sized to pass flows greater than the design peak runoff discharge rate for the 100-yr, 24-hr storm.

3) The minimum freeboard should be 1 foot (but preferably at least 2 feet) above the maximum water surface elevation over the emergency spillway.

Off-line Basins

1) Off-line basins must have either an emergency overflow spillway or an emergency overflow riser. The emergency overflow must be designed to pass the 100-yr 24-hr post-development peak stormwater runoff discharge rate directly to the downstream conveyance system or another acceptable discharge point. Where an emergency overflow spillway would discharge to a steep slope, an emergency overflow riser, in addition to the spillway should be provided.

2) The emergency overflow spillway shall be armored to withstand the energy of the spillway flows.

3) The minimum freeboard should be 1 foot above the maximum water surface elevation over the emergency spillway.

Side Slopes

1) Interior side slopes above the stormwater quality design depth and up to the emergency overflow water surface steeper than 4:1 (H:V) should be stabilized to prevent erosion with a method approved by the local permitting authority.

2) Exterior side slopes steeper than 2:1 (H:V) should be stabilized to prevent erosion with a method approved by the local permitting authority.

3) For any slope (interior or exterior) greater than 2:1 (H:V), a geotechnical investigation and report must be submitted and approved by the local permitting authority.

4) Landscaped slopes should be no greater than 3:1 (H:V) to allow for maintenance.

5) Basin walls may be vertical retaining walls, provided: (a) they are constructed of reinforced concrete, (b) a fence is provided along the top of the wall (see fencing below) or further back, and (c) the design is stamped by a licensed civil engineer and approved by the Local permitting authority.

Embankments

1) Earthworks and berm embankments should be performed in accordance with the latest edition of the "Greenbook Standard Specifications for Public Works Construction".

2) Embankments are earthen slopes or berms used for detaining or redirecting the flow of water.

3) Top of berm separating forebay and main basin should be 2 feet minimum below the stormwater quality design water surface and should be keyed into embankment a minimum of 1 foot on both sides.

4) Typically, the top width of berm embankments are at least 20 feet, but narrower embankments may be plausible if approved by the civil engineer and the Local permitting authority.

5) Basin berm embankments should be constructed on native consolidated soil (or adequately compacted and stable fill soils analyzed by a licensed civil engineer) free of loose surface soil materials, roots, and other organic debris.

6) The berm embankment should be constructed of compacted soil (95% minimum dry density, modified proctor method per ASTM D1557), placed in 6-inch lifts.

7) Basin berm embankments greater than 4 feet in height should be constructed by excavating a key equal to 50% of the berm embankment cross-sectional height and width. This requirement may be waived if specifically recommended by a licensed civil engineer.

8) The berm embankment should be constructed of compacted soil (95% minimum dry density, modified proctor method per ASTM D1557), placed in 6-inch lifts.

9) Low growing native or non-invasive perennial grasses should be planted on downstream embankment slopes. See vegetation section below.

Fencing

1) Safety is provided either by fencing of the facility or by managing the contours of the basin to eliminate drop-offs and other hazards.

2) If fences are required, fences should be designed and constructed in accordance with relevant standards and should typically be located at or above the overflow water surface elevation. Shrubs (approved, California-adapted species) can be used to hide the fencing. See vegetation section above.

Right-of-Way

1) Dry extended detention basins and associated access roads to be maintained by a public agency should be dedicated in fee or in an easement to the public agency with appropriate access.

Maintenance Access

1) Ownership of the basin and maintenance thereof is the responsibility of the developer/applicant. A maintenance agreement with the Local permitting authority is required to ensure adequate performance and allow emergency access to the facilities.

2) Maintenance access road(s) should be provided to the control structure and other drainage structures associated with the basin (e.g., inlet, emergency overflow or bypass structures). Manhole and catch basin lids should be in or at the edge of the access road.

3) A ramp into the basin should be constructed near the basin outlet. An access ramp is required for removal of sediment with a backhoe or loader and truck. The ramp should extend to the basin bottom to avoid damage to vegetation planted on the basin slope.

4) All access ramps and roads should be provided in accordance with the current policies of the Ventura County Flood Control District or local approval authority.

Construction Considerations

The use of treated wood or galvanized metal anywhere inside the facility is prohibited.

Operations and Maintenance

Maintenance is of primary importance if extended detention basins are to continue to function as originally designed. A maintenance agreement must be developed with the local approval authority to ensure adequate performance and allow emergency access. Maintenance of the basin is the responsibility of the development, unless otherwise agreed upon.

A specific maintenance plan shall be formulated for each facility outlining the schedule and scope of maintenance operations, as well as the data handling and reporting requirements. The following are general maintenance requirements:

1) The basin should be inspected semiannually or more frequently, and inspections after major storm events are encouraged (see Appendix I for guidance on facility maintenance inspections). Trash and debris should be removed as needed, but at least annually prior to the beginning of the wet season (see Appendix I for dry extended detention basin inspection and maintenance checklist).

2) Site vegetation should be maintained as follows:

   - Vegetation, large shrubs, or trees that limit access or interfere with basin operation should be pruned or removed.
   - Slope areas that have become bare should be revegetated and eroded areas should be regraded prior to being revegetated.
   - Grass should be mowed to 4 to 9 inch high and grass clippings should be removed.
   - Fallen leaves and debris from deciduous plant foliage should be raked and removed.
   - Invasive vegetation, such as Alligatorweed (Alternanthera philoxeroides), Halogeton (Halogeton glomeratus), Spotted Knapweed (Centaurea maculosa), Giant Reed (Arundo donax), Castor Bean (Ricinus communis), Perennial Pepperweed (Lepidium latifolium), and Yellow Starthistle (Centaurea solstitalis) should be removed and replaced with non-invasive species. Invasive species should never contribute more than 25% of the vegetated area. For more information on invasive weeds, including biology and control of listed weeds, look at the encycloweedia located at the California Department of Food and Agriculture website or the California Invasive Plant Council website at www.cal-ipc.org.
   - Dead vegetation should be removed if it exceeds 10% of area coverage. Vegetation should be replaced immediately to maintain cover density and control erosion where soils are exposed.
   - No herbicides or other chemicals should be used to control vegetation.

3) Sediment buildup exceeding 50% of the forebay capacity should be removed. Sediment from the remainder of the basin should be removed when 6 inches of sediment accumulates. Sediments should be tested for toxic substance accumulation in compliance with current disposal requirements if land uses in the catchment include commercial or industrial zones, or if visual or olfactory indications of pollution are noticed. If toxic substances are encountered at concentrations exceeding thresholds of Title 22, Section 66261 of the California Code of Regulations,

the sediment must be disposed of in a hazardous waste landfill. It is recommended to clean the forebay frequently to reduce frequency of main basin cleaning.

4) Remove sediment from basin when accumulation reaches 25% of original design depth. Cleaning is recommended to occur in early spring to allow vegetation to reestablish.

5) Repair erosion to banks and bottom of basin as required.

6) Following sediment removal activities, replanting, and/or reseeding of vegetation may be required for reestablishment.

7) Control vectors as needed.

TCM-2: Wet Detention Basin

Wet detention basins are constructed, naturalistic ponds with a permanent or seasonal pool of water (also called a "wet pool" or "dead storage"). Aquascape facilities, such as artificial lakes, are a special form of wet pool facility that can incorporate innovative design elements to allow them to function as a stormwater treatment facility in addition to an aesthetic water feature. Wetponds require base flows to exceed or match losses through evaporation and/or infiltration and they must be designed with the outlet positioned and/or operated in such a way as to maintain a permanent pool. Wetponds can be designed to provide extended detention of incoming flows using the volume above the permanent pool surface.

Wet Detention Basin

Photo Credit: Geosyntec Consultants

Application

- Regional detention & treatment
- Roads, highways, parking lots, commercial, residential
- Parks, open spaces, and golf courses

Preventative Maintenance

- inspected at a minimum annually and inspections after major storm events
- Pruned or remove vegetation, large shrubs, or trees that limit access or interfere with basin operation
- Remove sediment buildup at inlets and outlets

Plan View
(Not to Scale)

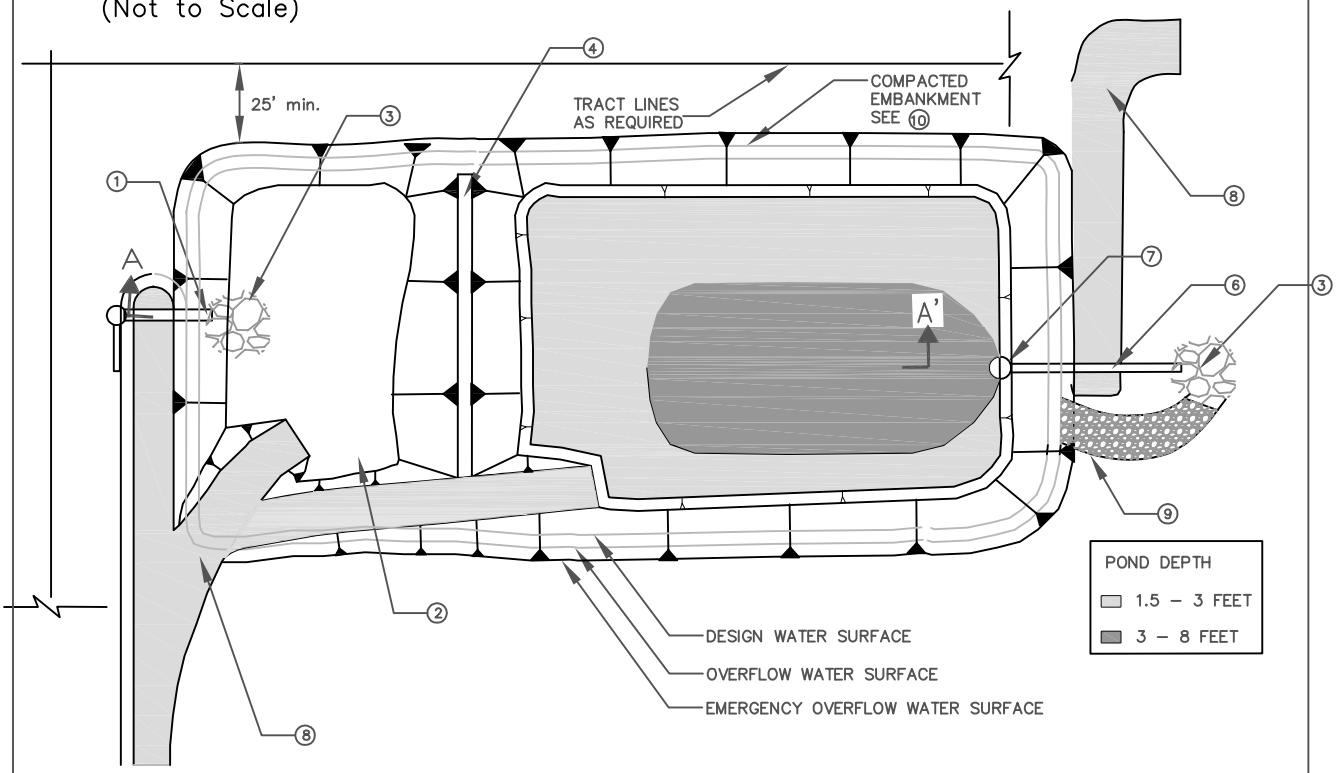

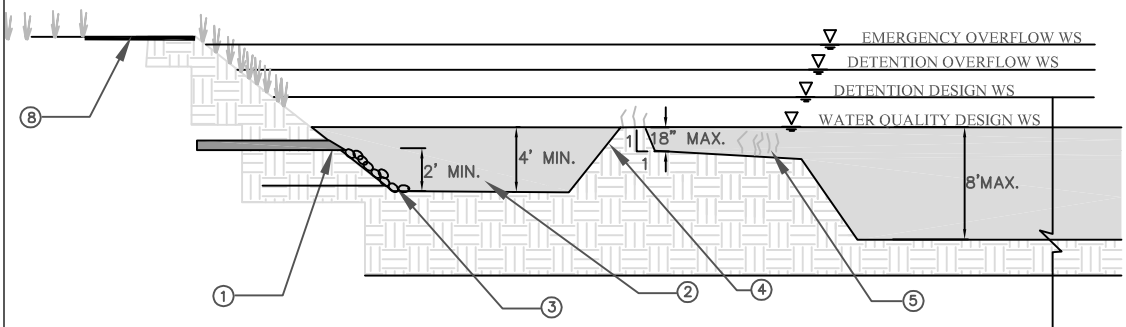

Section A - A'
(Not to Scale)

NOTES:

1. INLET PIPE SHOULD BE SUBMERGED WITH A MINIMUM OF 2' DISTANCE FROM THE BOTTOM
2. FIRST CELL VOLUME SHALL EQUAL 25% TO 35% OF TOTAL WETPOND VOLUME. DEPTH SHALL BE 4' MIN TO 8' MAX PLUS AN ADDITIONAL 1' MIN SEDIMENT STORAGE DEPTH.
3. RIP RAP APRON OR OTHER ENERGY DISSIPATION.
4. BERM SHALL EXTEND ACROSS ENTIRE WIDTH OF THE WETPOND.
5. EMERGENT VEGETATION SHALL BE PLANTED IN REGIONS OF THE POND THAT ARE 3' DEEP OR LESS.
6. SIZE OUTLET PIPE TO PASS 100-YEAR PEAK FLOW FOR ON-LINE PONDS AND WATER QUALITY PEAK FLOW FOR OFF-LINE PONDS.
7. WATER QUALITY OUTLET STRUCTURE. SEE FIGURE 8-2 AND FIGURE 8-3 FOR DETAILS.
8. MAINTENANCE ACCESS ROAD SHOULD PROVIDE ACCESS TO BOTH THE FIRST CELL AND MAIN BASIN.
9. INSTALL EMERGENCY OVERFLOW SPILLWAY AS NEEDED. SEE FIGURE 2-4 FOR DETAILS

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Figure 6-19: Wet Detention Basin

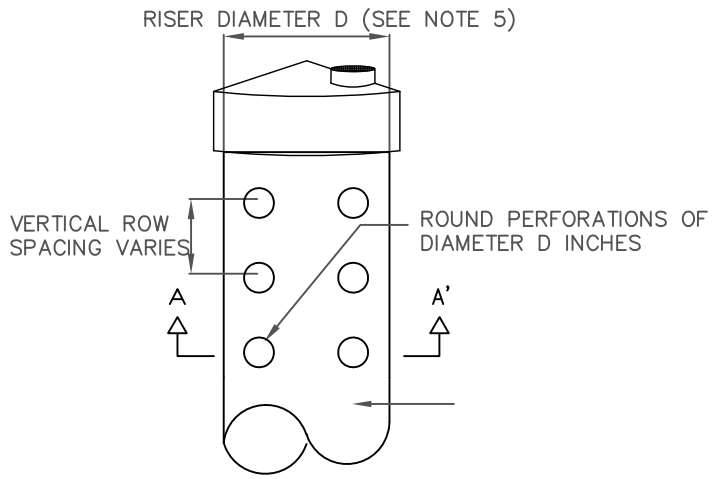

Perforated Riser Detail
(Not to Scale)

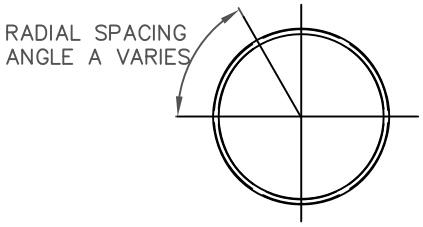

Section A – A'
(Not to Scale)

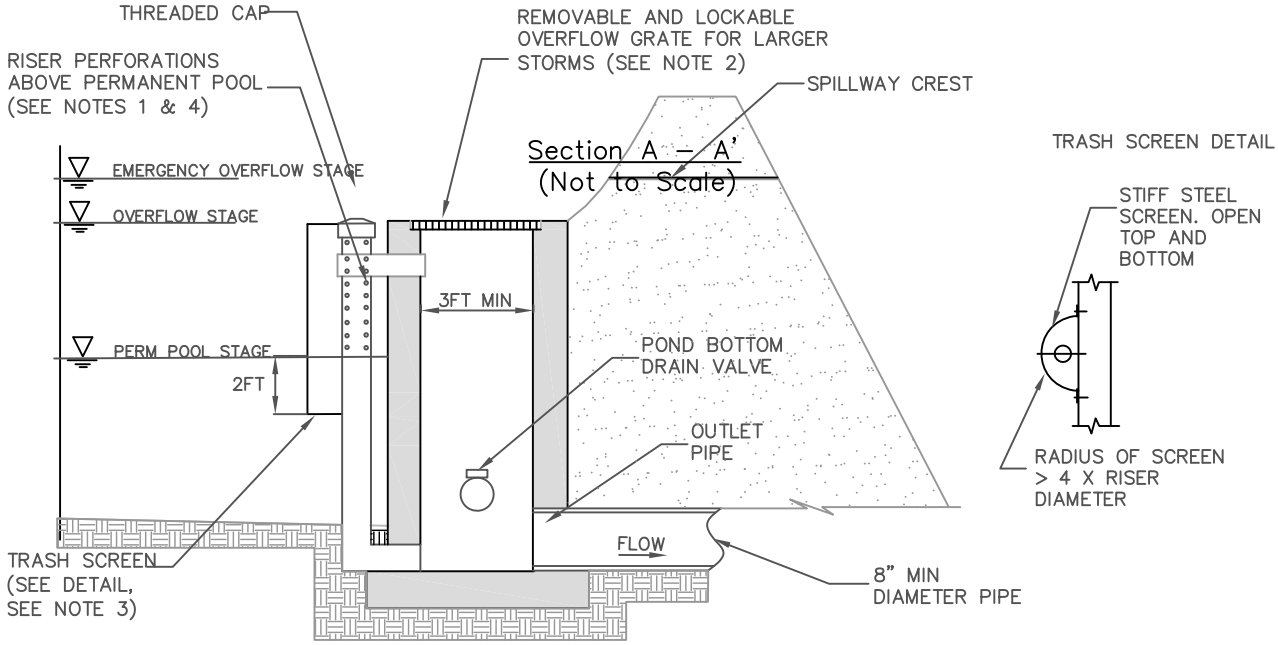

Section A – A'
(Not to Scale)

Perforated Riser Outlet Structure
(Not to Scale)

NOTES:

1. RISER PIPE SHALL BE SIZED TO PROVIDE 36 TO 48–HOUR FULL BRIM DRAW DOWN TIME.
2. TOTAL OUTLET CAPACITY: 100–YEAR PEAK FLOW FOR ON–LINE BASINS AND WATER QUALITY DESIGN FLOW FOR OFF–LINE BASINS.
3. SCREEN OPENINGS SHALL BE AT LEAST ¼" AND SHALL NOT EXCEED THE DIAMETER OF THE PERFORATIONS ON THE RISER.
4. RISER PIPE PERFORATION DIAMETER SHALL BE NO LESS THAN ½" AND NO MORE THAN 2"
5. MINIMUM PIPE DIAMETER (D) IS 2'
6. RISER PIPE MATERIAL IS CMP

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Figure 6-20: Riser Outlet

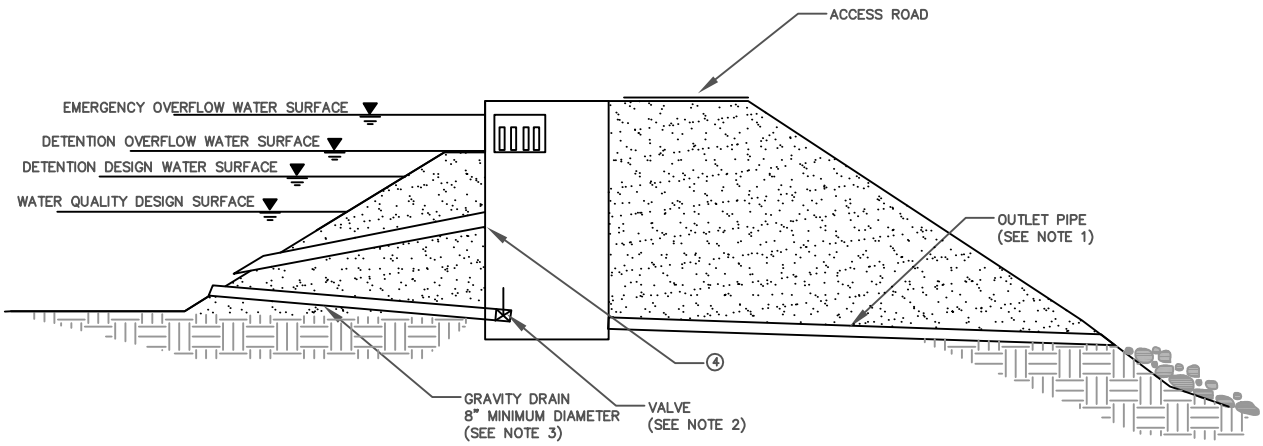

Inverted Pipe Outlet Structure
(Not to Scale)

NOTES:

1. SIZE OUTLET PIPE SYSTEM TO PASS 100-YEAR FLOW FOR ON-LINE PONDS AND WATER QUALITY PEAK FLOW FOR OFF-LINE PONDS.
2. VALVE MAY BE LOCATED INSIDE MANHOLE OR OUTSIDE WITH APPROVED OPERATIONAL ACCESS
3. INVERT OF DRAIN SHALL BE 6" MINIMUM BELOW TOP OF INTERNAL BERM. LOWER PLACEMENT IS DESIRABLE. INVERT SHALL BE 6" MINIMUM ABOVE BOTTOM OF POND.
4. OUTLET PIPE INVERT SHALL BE AT WETPOOL WATER SURFACE ELEVATION

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Figure 6-21: Inverted Pipe Outlet

Limitations

Limitations for wet detention basins include:

- Wet detention basins typically are used for treating areas larger than 10 acres and less than 10 square miles. They are especially applicable for regional water quality treatment and flow control.
- Off-line wet detention basins must not interfere with flood control functions of existing conveyance and detention structures.
- If wet detention basins are located in areas with site slopes greater than 15% or within 200 feet of a hazardous steep slope or mapped landslide area (on the uphill side), a geotechnical investigation and report must be provided to ensure that the basin does not compromise the stability of the site slope or surrounding slopes.
- Wet detention basins require a regular source of base flow if water levels are to be maintained. If base flow is insufficient during summer months, supplemental water may be necessary to maintain water levels.

Design Criteria

The main challenge associated with wet detention basins is maintaining desired water levels. A wet detention basin should be designed according to the requirements listed in Table 6-24 and outlined in the section below. BMP sizing worksheets are presented in Appendix E.

Table 6-24: Wet Detention Basin Design Criteria

Design Parameter	Unit	Design Criteria
Stormwater quality design volume, SQDV	acre-ft	See Section 2 and Appendix E for calculating SQDV.
Permanent Pool Volume		SQDV
Forebay Volume		5 to 10% of SQDV
Maximum Forebay Drain Time	min	45
Depth without sediment storage	feet	0.5-12 (littoral zone, 25-40% permanent pool) 4 (first cell minimum) 8 (any cell maximum) Deeper zone: 4-8 feet average; 12 feet maximum depth
Maximum residence time	Days	7 (dry weather)
Freeboard (minimum)	inches	12

Flow path length to width ratio	L:W	2:1 (larger preferred)
Side slope (maximum)	H:V	4:1 (H:V) Interior and 3:1 (H:V) Exterior
Longitudinal slope	percentage	1 (forebay) and 0-2 (main basin)
Vegetation Type	--	Varies see vegetation section below
Vegetation Height	--	Varies see vegetation section below
Buffer zone (minimum)	feet	25
Minimum outflow device diameter	inches	18

Sizing Criteria

Wet Detention basins may be designed with or without extended detention above the permanent pool. The extended detention portion of the wet detention basin above the permanent pool, if provided, functions like a dry extended detention (ED) basin (see VEG-5: Dry Extended Detention Basin). If there is no extended detention provided, wet detention basins shall be sized to provide a minimum wet pool volume equal to the stormwater quality design volume plus an additional 5% for sediment accumulation. If extended detention is provided above the permanent pool, the sizing is dependent of the functionality of the basin; the basin may function as water quality treatment only or water quality plus peak flow attenuation.

If the basin is designed for water quality treatment only, then the permanent pool volume should be a minimum of 10 percent of the stormwater quality design volume and the surcharge volume (above the permanent pool) should make up the remaining 90 percent. If extended detention is provided above the permanent pool and the basin is designed for water quality treatment and peak flow attenuation, then the permanent pool volume should be equal to the water quality treatment volume, and the surcharge volume should be sized to attenuate peak flows in order to meet the peak runoff discharge requirements. The extended detention portion of the wet detention basin above the permanent pool, if provided, functions like a dry extended detention (ED) basin (see VEG-5: Dry Extended Detention Basin).

Step 1: Calculate the design volume

Wet detention basins shall be sized with a permanent pool volume equal to the SQDV volume (see Section 2 and Appendix E).

Step 2: Determine the active design volume for the wet detention basin without extended detention

The active volume of the wet detention basin, V_a, shall be equal to the SQFV plus an additional 5% for sediment accumulation.

$$V_a = 1.05 \times SQDV \qquad \text{(Equation 6-59)}$$

Step 3: Determine pond location and preliminary geometry based on site constraints

Based on site constraints, determine the pond geometry and the storage available by developing an elevation-storage relationship for the pond. Note that a more natural geometry may be used and is in many cases recommended; the preliminary basin geometry calculations should be used for sizing purposes only.

1) Calculate the width of the pond footprint, W_{tot}, as follows:

$$W_{tot} = \frac{A_{tot}}{L_{tot}} \qquad \text{(Equation 6-60)}$$

Where:

A_{tot} = total surface area of the pond footprint (ft^2)

L_{tot} = total length of the pond footprint (ft)

1) Calculate the length of the active volume surface area including the internal berm but excluding the freeboard, $L_{av\text{-}tot}$:

$$L_{av-tot} = L_{tot} - 2Zd_{fb} \qquad \text{(Equation 6-61)}$$

Where:

Z = interior side slope as length per unit height

d_{fb} = freeboard depth

2) Calculate the width of the active volume surface area including the internal berm but excluding freeboard, $W_{av\text{-}tot}$:

$$W_{av-tot} = W_{tot} - 2Zd_{fb} \qquad \text{(Equation 6-62)}$$

3) Calculate the total active volume surface area including the internal berm and excluding freeboard, $A_{av\text{-}tot}$:

$$A_{av-tot} = L_{av-tot} \times W_{av-tot} \qquad \text{(Equation 6-63)}$$

4) Calculate the area of the berm, A_{berm}:

$$A_{berm} = W_{berm} \times L_{berm} \qquad \text{(Equation 6-64)}$$

Where:

W_{berm} = width of the internal berm

L_{berm} = length of the internal berm

5) Calculate the active volume surface area excluding the internal berm and freeboard, A_{wq}:

$$A_{wq} = A_{wq\ =\ tot} - A_{berm} \qquad \text{(Equation 6-65)}$$

Step 4: Determine Dimensions of Forebay

The wet detention basin should be divided into two cells separated by a berm or baffle. The forebay should contain between 5 and 10 percent of the total volume. The berm or baffle volume should not count as part of the total volume. Calculate the active volume of forebay, V_1:

$$V_1 = \frac{V_a \times \%V_1}{100} \qquad \text{(Equation 6-66)}$$

Where:

$\%V_1$ = percent of SQDV in forebay (%)

1) Calculate the surface area for the active volume of forebay, A_1:

$$A_1 = \frac{V_1}{d_1} \qquad \text{(Equation 6-67)}$$

Where:

d_1 = average depth fo rhte active volume of forebay (ft)

1) Calculate the length of forebay, L_1. Note, inlet and outlet should be configured to maximize the residence time.

$$L_1 = \frac{A_1}{W_1} \qquad \text{(Equation 6-68)}$$

Where:

W_1 = width of forebay (ft), $W_1 = W_{av\text{-}tot} = L_{berm}$

Step 5: Determine Dimensions of Cell 2

Cell 2 will consist of the remainder of the basin's active volume.

1) Calculate the active volume of Cell 2, V_2:

$$V_2 = V_a - V_1 \qquad \text{(Equation 6-69)}$$

2) The minimum wetpool surface area includes 0.3 acres of wetpool per acre-foot of permanent wetpool volume. Calculate A_{min2}:

$$A_{min2} = (V_2 \times 0.3 \frac{acres}{acre-feet}) \quad \text{(Equation 6-70)}$$

3) Calculate the actual wetpool surface area, A_2:

$$A_2 = A_{av} - A_1 \quad \text{(Equation 6-71)}$$

Verify that A_2 is greater than A_{min2}. If A_2 is less than A_{min2}, then modify input parameters to increase A_2 until it is greater than A_{min2}. If site constraints limit this criterion, then another site for the pond should be chosen.

4) Calculate the top length of Cell 2, L_2:

$$L_2 = \frac{A_2}{W_2} \quad \text{(Equation 6-72)}$$

Where:

W_2 = width of Cell 2 (ft), $W_2 = W_1 = W_{wq\text{-}tot} = L_{berm}$

5) Verify that the length-to-width ratio of Cell 2 is at least 1.5:1 with ≥ 2:1 preferred. If the length-to-width ratio is less than 1.5:1, modify input parameters until a ratio of at least 1.5:1 is achieved. If the input parameters cannot be modified as a result of site constraints, another site for the pond should be chosen.

$$LW_2 = \frac{L_2}{W_2} \quad \text{(Equation 6-73)}$$

6) Calculate the emergent vegetation surface area, A_{ev}:

$$A_{ev} = \frac{A_2 \bullet \%A_{ev}}{100} \quad \text{(Equation 6-74)}$$

Where:

$\%A_{ev}$ = percent of surface area that will be planted with emergent vegetation

7) Calculate the volume of the emergent vegetation shallow zone (1.5 – 3 ft), V_{ev}:

$$V_{ev} = A_{ev} \bullet d_{ev} \quad \text{(Equation 6-75)}$$

Where:

d_{ev} = average depth of the emergent vegetation shallow zone (1.5 – 3 ft)

8) Calculate the length of the emergent vegetation shallow zone, L_{ev}:

$$L_{ev} = \frac{A_{ev}}{W_{ev}} \qquad \text{(Equation 6-76)}$$

Where:

W_{ev} = width of the emergent vegetation shallow zone (ft), $W_{ev} = W_2$

9) Calculate the volume of the deep zone, V_{deep}:

$$V_{deep} = V_2 - V_{ev} \qquad \text{(Equation 6-77)}$$

10) Calculate the surface area of the deep (>3 ft) zone, A_{deep}:

$$A_{deep} = A_2 - A_{ev} \qquad \text{(Equation 6-78)}$$

11) Calculate the average depth of the deep zone (4-8 ft), d_{deep}:

$$d_{deep} = \frac{V_{deep}}{A_{deep}} \qquad \text{(Equation 6-79)}$$

12) Calculate length of the deep zone, L_{deep}:

$$L_{deep} = \frac{A_{deep}}{W_{deep}} \qquad \text{(Equation 6-80)}$$

Where:

W_{deep} = width of the deep zone (ft), $W_{deep} = W_2$

Step 6: Ensure design requirements and site constraints are achieved

Check design requirements and site constraints. Modify design geometry until requirements are met. If the chosen site for the basin is inadequate to meet the design requirements, choose a new location for the BMP.

Step 7: Size Outlet Structure

For extended detention wet detention basin, outlet structures should be designed to provide 12 to 48 hour emptying time for the water quality volume above the permanent pool.

The basin outlet pipe should be sized, at a minimum, to pass flows greater than the stormwater quality design peak flow for off-line basins or flows greater than the peak runoff discharge rate for the 100-year, 24-hr design storm for on-line basins.

Step 8: Determine Emergency Spillway Requirements

For online basins, an emergency overflow spillway should be sized to pass flows greater than the design peak runoff discharge rate for the 100-yr, 24-hr storm to prevent overtopping of the walls or berms in the event that a blockage of the riser occurs. For offline basins, an emergency spillway or riser should be sized to pass the water quality design storm. For sites where the emergency spillway discharges to a steep slope, an emergency overflow riser, in addition to the spillway should be provided.

Sizing and Geometry

1) If there is no extended detention provided, wet detention basins shall be sized to provide a minimum wet pool volume equal to the stormwater quality design volume plus an additional 5% for sediment accumulation. If extended detention is provided above the permanent pool and the basin is designed for water quality treatment only, then the permanent pool volume should be a minimum of 10 percent of the stormwater quality design volume and the surcharge volume (above the permanent pool) should make up the remaining 90 percent. If extended detention is provided above the permanent pool and the basin is designed for water quality treatment and peak flow attenuation, then the permanent pool volume shall be equal to the water quality treatment volume and the surcharge volume should be sized to attenuate peak flows to meet the peak runoff discharge requirements. The extended detention portion of the wet detention basin above the permanent pool, if provided, functions like a dry extended detention (ED) basin (see TCM-1: Dry Extended Detention Basin).

2) The wet detention basin should be divided into two cells separated by a berm or baffle. The first cell should contain between 25 to 35 percent of the total volume. The berm or baffle volume should not count as part of the total volume. Intent: The full-length berm or baffle reduces short-circuiting and promotes plug flow.

3) Wet detention basins with wetpool volumes less than or equal to 4,000 cubic feet may be single-celled (i.e., no baffle or berm is required).

4) Sediment storage should be provided in the first cell. The sediment storage should have a minimum depth of 1 foot. This volume should not be included as part of the required water quality volume.

5) The minimum depth of the first cell should be 4 feet, exclusive of sediment storage requirements. The depth of the first cell may be greater than the depth of the second cell. Average depth should be between 4 feet and 8 feet.

6) For wet detention basin depths in excess of 6 feet, some form of recirculation should be provided, such as a fountain or aerator, to prevent stratification, stagnation and low dissolved oxygen conditions.

7) The edge of the basin should slope from the surface of the permanent pool to a depth of 12 to 18 inches at a slope of 1:1 or greater. If soil conditions will not support a 1:1 (H:V) slope then the steepest slope that can be supported should be used or a shallow retaining wall constructed (18 inch max). Beyond the edge of the basin, a bench sloped at 4:1 (H:V) maximum should extend into the basin to a depth of at least 3 feet. A steeper slope may be used beyond the 3 foot depth to a maximum of 8 feet. Intent: steep slopes at water's edge will minimize very shallow areas that can support mosquitoes.

8) At least 25% of the basin area should be deeper than 3 feet to prevent the growth of emergent vegetation across the entire basin. If greater than 50% of the wet pool area is in excess of 6 feet deep, some form of recirculation should be provided, such as a fountain or aerator, to prevent stratification, stagnation and low dissolved oxygen conditions.

9) A wet detention basin should have a surface area of not less than 0.3 acres for each acre-foot of permanent pool volume. In addition, extra area needed to provide a design that meets all other provisions of this section should be provided. Additional surface area in excess of the minimum may be provided. There is no maximum surface area provided that all provisions of this section are met.

10) Inlets and outlets should be placed to maximize the flowpath through the facility. The flowpath length-to-width ratio should be a minimum of 1.5:1, but a flowpath length-to-width ratio of 2:1 or greater is preferred. The flowpath length is defined as the distance from the inlet to the outlet, as measured at mid-depth. The width at mid-depth can be found as follows: width = (average top width + average bottom width)/2. Intent: a long flowpath length will improve fine sediment removal.

11) All inlets should enter the first cell. If there are multiple inlets, the length-to-width ratio should be based on the average flowpath length for all inlets.

12) The minimum freeboard should be 1 foot above the maximum water surface elevation (2 feet preferred) for on-line basins and 1 foot above the maximum water surface elevation for on-line basins.

13) The maximum residence time for dry weather flows should be 7 days. Intent: Vector control.

Internal Berms and Baffles

1) A berm or baffle should extend across the full width of the wet detention basin and be keyed into the basin side slopes. If the berm embankments are greater than 4 feet in height, the berm should be constructed by excavating a key equal to 50% of the embankment cross-sectional height and width. This requirement may be waived if recommended by a licensed civil engineer for the specific site conditions. The geotechnical investigation must consider the situation in which one of the two cells is empty while the other remains full of water.

2) The top of the berm should extend to the permanent pool surface or be one foot below the permanent pool surface to discourage public access. If the top of the berm is at the water permanent pool surface, the side slopes should be 4H:1V. Berm side slopes may be steeper (up to 3:1) if the berm is submerged one foot.

3) If good vegetation cover is not established on the berm, erosion control measures should be used to prevent erosion of the berm back-slope when the basin is initially filled.

4) The interior berm or baffle may be a retaining wall provided that the design is prepared and stamped by a licensed civil engineer. If a baffle or retaining wall is used, it should be submerged one foot below the permanent pool surface to discourage access by pedestrians.

5) Internal earthen berms 6 feet high or less should have a minimum top width 6 feet or as recommended by a civil engineer.

Water Supply

1) Water balance calculations should be provided to demonstrate that adequate water supply will be present to maintain a pool of water during a drought year when precipitation is 50% of average for the site. Water balance calculations should include evapotranspiration, infiltration, precipitation, spillway discharge, and dry weather flow (where appropriate).

2) Where water balance indicates that losses will exceed inputs, a source of water should be provided to maintain the basin water surface elevation throughout the year. The water supply should be of sufficient quantity and quality to not have an adverse impact on the wet detention basin water quality. Water that meets drinking water standards should be assumed to be of sufficient quality.

3) Wet detention basin may be designed as seasonal ponds where the water balance and water supply conditions make it infeasible to sustain a permanent wet detention basin.

Soils Considerations

Wet detention basin implementation in areas with high permeability soils requires liners to increase the chances of maintaining a permanent pool in the basin. Liners can be either synthetic materials or imported lower permeability soils (i.e., clays). The water balance assessment should determine whether a liner is required.

If low permeability soils are used for the liner, a minimum of 18 inches of native soil amended with good topsoil or compost (one part compost mixed with 3 parts native soil) should be placed over the liner. If a synthetic material is used, a soil depth of 2 feet is recommended to prevent damage to the liner during planting.

Buffer Zone

A minimum of 25 feet buffer should be provided around the top perimeter of the wet detention basin. The portion of the access road outside of the maximum water level may be included as part of the buffer.

Stormwater Quality Design Features

1) Wet detention basins that are located in publicly-accessible or highly visible locations should include design features that will improve and maintain the quality of water within the BMP at a level suitable for the proposed location and uses of the surrounding area. Typical design features include aeration, pumped circulation, filters, biofilters, and other facilities that operate year-round to remove pollutants and nutrients. Stormwater quality design features will result in higher quality water in the BMP and lower discharges of pollutants downstream.

2) Wet detention basins in publicly-accessible or highly visible locations should have a maintenance plan that includes regular collection and removal of trash from the area within and surrounding the BMP.

3) If fencing is required for wet detention basins in publicly-accessible or highly visible locations, the fence can be designed to be aesthetically incorporated into the site and Shrubs (approved, California-adapted species) can be used to hide the fencing. See vegetation section below.

Energy Dissipation

1) The inlet to the wet detention basin should be submerged with the inlet pipe invert a minimum of two feet from the basin bottom (not including sediment storage). The top of the inlet pipe should be submerged at least 1 foot, if possible. Intent: The inlet is submerged to dissipate energy of the incoming flow. The distance from the bottom is set to minimize resuspension of settled sediments. Alternative inlet designs that accomplish these objectives are acceptable.

2) Energy dissipation controls should also be used at the outlet from the wet detention basin unless the basin discharges to a stormwater conveyance system or hardened channel.

Vegetation

A plan should be prepared that indicates how aquatic, temporarily submerged areas (extended detention wet detention basins) and terrestrial areas will be stabilized with vegetation.

1) If the second cell of the wet detention basin is 3 feet or shallower, the bottom area should be planted with emergent wetland vegetation.

2) Emergent aquatic vegetation should be planted to cover 25-75% of the area of the permanent pool.

3) Outside of the basin, native vegetation adapted for site conditions should be used in non-irrigated sites.

4) The area surrounding a wet detention basin should be landscaped to minimize erosion and should adhere to the following criteria so as not to hinder maintenance operations:

5) No trees or shrubs may be planted within 15 feet of inlet or outlet pipes or manmade drainage structures such as spillways, flow spreaders, or earthen embankments. Species with roots that seek water, such as willow or poplar, should not be used within 50 feet of pipes or manmade structures. Weeping willow (Salix babylonica) should not be planted in or near detention basins.

6) Prohibited non-native plant species will not be permitted. For more information on invasive weeds, including biology and control of listed weeds, look at the encycloweedia located at the California Department of Food and Agriculture website- or the California Invasive Plant Council website at www.cal-ipc.org.

7) A landscape professional should provide recommendations on appropriate plants, fertilizer, mulching applications, and irrigation requirements (if any) to ensure healthy vegetation growth.

Outlet Structure

1) An outlet pipe and outlet structure should be provided. The outlet pipe may be a perforated standpipe strapped to a manhole or placed in an embankment, suitable for extended detention, or may be back-sloped to a catch basin with a grated opening (jail house window) or manhole with a cone grate (birdcage). The grate or birdcage openings provide an overflow route should the basin outlet pipe become clogged.

2) For extended detention wet detention basin, outlet structures should be designed to provide 12 to 48 hour emptying time for the water quality volume above the permanent pool.

3) The basin outlet pipe should be sized, at a minimum, to pass flows greater than the stormwater quality design peak flow for off-line basins or flows greater than the peak runoff discharge rate for the 100-year, 24-hr design storm for on-line basins.

Emergency Spillway

An emergency overflow spillway in addition to the primary overflow outlet (as described above) is required. The emergency spillway should be sized for flows greater than the peak 100-year 24-hour storm if the basin is designed on-line or, if the basin is designed off-line, the spillway should be sized for flows greater than the basin design volume (e.g., stormwater quality design volume). The spillway provide for adequate energy dissipation

downstream. The spillway should allow for at least 12 inches of freeboard above the emergency overflow water surface elevation if the basin is on-line. If the basin is -line, 2 feet of freeboard is preferable.

Spillways shall meet the California Department of Water Resources, Division of Safety of Dams Guidelines for the Design and Construction of Small Embankment Dams (http://damsafety.water.ca.gov/docs/GuidelinesSmallDams.pdf). *Intent: Emergency overflow spillways are intended to control the location of basin overtopping and safely direct overflows back into the downstream conveyance system or other acceptable discharge point.*

On-line Basins

1) On-line basins must have an emergency overflow spillway to prevent overtopping of walls or berms should blockage of the primary outlet occur based on a downstream risk assessment.

2) The overflow spillway must be sized to pass flows greater than the design peak runoff discharge rate for the 100-yr, 24-hr storm.

3) The minimum freeboard should be 1 foot (but preferably at least 2 feet) above the maximum water surface elevation over the emergency spillway.

Off-line Basins

1) Off-line basins must have either an emergency overflow spillway or an emergency overflow riser. The emergency overflow must be designed to pass flows greater than the basin design volume (e.g., stormwater quality design volume) directly to the downstream conveyance system or another acceptable discharge point. Where an emergency overflow spillway would discharge to a steep slope, an emergency overflow riser, in addition to the spillway should be provided. See Appendix E for basin/pond outlet sizing worksheets.

2) The emergency overflow spillway should be armored to withstand the energy of the spillway flows. The spillway should be constructed of grouted rip-rap.

3) The minimum freeboard should be 1 foot above the maximum water surface elevation over the emergency spillway.

Side Slopes

1) Interior side slopes above the stormwater quality design depth and up to the emergency overflow water surface steeper than 4:1 (H:V) should be stabilized to prevent erosion with a method approved by the local permitting authority.

2) Exterior side slopes steeper than 2:1 (H:V) should be stabilized to prevent erosion with a method approved by the local permitting authority.

3) For any slope (interior or exterior) greater than 2:1 (H:V), a geotechnical investigation and report must be submitted and approved by the local permitting authority.

4) Landscaped slopes should be no steeper than 3:1 (H:V) to allow for maintenance.

5) Basin walls may be vertical retaining walls, provided: (a) they are constructed of reinforced concrete, (b) a fence is provided along the top of the wall (see fencing below) or further back, and (c) the design is stamped by a licensed civil engineer.

Embankments

1) Earthworks and berm embankments should be performed in accordance with the latest edition of the "Greenbook Standard Specifications for Public Works Construction".

2) Embankments are earthen slopes or berms used for detaining or redirecting the flow of water.

3) Top of berm should be 2 feet minimum below the stormwater quality design water surface and should be keyed into embankment a minimum of 1 foot on both sides.

4) Typically, the top width of berm embankments are at least 20 feet, but narrower embankments may be plausible if approved by the civil engineer and the Local permitting authority.

5) Basin berm embankments should be constructed on native consolidated soil (or adequately compacted and stable fill soils analyzed by a licensed civil engineer) free of loose surface soil materials, roots, and other organic debris.

6) The berm embankment should be constructed of compacted soil (95% minimum dry density, modified proctor method per ASTM D1557), placed in 6-inch lifts.

7) Basin berm embankments greater than 4 feet in height should be constructed by excavating a key equal to 50% of the berm embankment cross-sectional height and width. This requirement may be waived if specifically recommended by a licensed civil engineer.

8) The berm embankment should be constructed of compacted soil (95% minimum dry density, modified proctor method per ASTM D1557), placed in 6-inch lifts.

9) Low growing native or non-invasive perennial grasses should be planted on downstream embankment slopes. See vegetation section below.

Fencing

Safety is provided either by fencing of the facility or by managing the contours of the basin to eliminate drop-offs and other hazards.

1) If fences are required, fences should be designed and constructed in accordance with current and relevant policies and typically are required to be located at or above the overflow water surface elevation. Shrubs (approved, California-adapted species) can be used to hide the fencing. See vegetation section above.

Right-of-Way

2) Wet detention basins and associated access roads to be maintained by a public agency should be dedicated in fee or in an easement to the public agency with appropriate access.

Maintenance Access

1) Ownership of the basin and maintenance thereof is the responsibility of the developer/applicant. A maintenance agreement is required to ensure adequate performance and allow emergency access to the facilities.

2) Maintenance access road(s) should be provided to the control structure and other drainage structures associated with the basin (e.g., inlet, emergency overflow or bypass structures). Manhole and catch basin lids should be in or at the edge of the access road.

3) A ramp into the basin should be constructed near the basin outlet. An access ramp is required for removal of sediment with a backhoe or loader and truck. The ramp should extend to the basin bottom to avoid damage to vegetation planted on the basin slope.

4) All access ramps and roads should be provided in accordance with the current policies of the Flood Control District.

Vector Control

1) A Mosquito Management Plan or Service Contract should be approved or waived by the local Vector Control District for any facility that maintains a pool of water for 72 hours or more.

Operations and Maintenance

General Requirements

Maintenance is of primary importance if extended detention basins are to continue to function as originally designed. A maintenance agreement must be developed with the Flood Control District to ensure adequate performance and allow the County emergency access. Maintenance of the basin is the responsibility of the development, unless otherwise agreed upon.

A specific maintenance plan shall be formulated for each facility outlining the schedule and scope of maintenance operations, as well as the data handling and reporting requirements. The following are general maintenance requirements:

1) The basin should be inspected annually and inspections after major storm events are encouraged (see Appendix I for guidance on facility maintenance inspections). Trash and debris should be removed as needed, but at least annually prior to the beginning of the wet season (see Appendix I for dry extended detention basin inspection and maintenance checklist).

2) Site vegetation should be maintained as follows:

3) Vegetation, large shrubs, or trees that limit access or interfere with basin operation should be pruned or removed.

4) Slope areas that have become bare should be revegetated and eroded areas should be regraded prior to being revegetated.

5) Grass should be mowed to 4”-9” high and grass clippings should be removed.

6) Fallen leaves and debris from deciduous plant foliage should be raked and removed.

7) Invasive vegetation, such as Alligatorweed (Alternanthera philoxeroides), Halogeton (Halogeton glomeratus), Spotted Knapweed (Centaurea maculosa), Giant Reed (Arundo donax), Castor Bean (Ricinus communis), Perennial Pepperweed (Lepidium latifolium), and Yellow Starthistle (Centaurea solstitalis) should be removed and replaced with non-invasive species. Invasive species should never contribute more than 25% of the vegetated area. For more information on invasive weeds, including biology and control of listed weeds, look at the encycloweedia located at the California Department of Food and Agriculture website or the California Invasive Plant Council website at www.cal-ipc.org.

8) Dead vegetation should be removed if it exceeds 10% of area coverage. Vegetation should be replaced immediately to maintain cover density and control erosion where soils are exposed.

9) No herbicides or other chemicals should be used to control vegetation.

10) Sediment buildup exceeding 50% of the forebay capacity should be removed. Sediment from the remainder of the basin should be removed when 6 inches of sediment accumulates. Sediments should be tested for toxic substance accumulation in compliance with current disposal requirements if land uses in the catchment include commercial or industrial zones, or if visual or olfactory indications of pollution are noticed. If toxic substances are encountered at concentrations exceeding thresholds of Title 22, Section 66261 of the California Code of Regulations, the sediment must be disposed of in a hazardous waste landfill.

11) Following sediment removal activities, replanting, and/or reseeding of vegetation may be required for reestablishment.

Construction Considerations

The use of treated wood or galvanized metal anywhere inside the facility is prohibited. The use of galvanized fencing is permitted if in accordance with the Fencing requirement above.

TCM-3: Constructed Wetland

A constructed treatment wetland is a system consisting of a sediment forebay and one or more permanent micro-pools with aquatic vegetation covering a significant portion of the basin. Constructed treatment wetlands typically include components such as an inlet with energy dissipation, a sediment forebay for settling out coarse solids and to facilitate maintenance, a base with shallow sections (1 to 2 feet deep) planted with emergent vegetation, deeper areas or micro pools (3 to 5 feet deep), and a water quality outlet structure. The interactions between the incoming stormwater runoff, aquatic vegetation, wetland soils, and the associated physical, chemical, and biological unit processes are a fundamental part of constructed treatment wetlands.

Constructed Wetlands

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Application

- Regional detention & treatment
- Roads, highways, parking lots, commercial, residential
- Parks, open spaces, and golf courses

Preventative Maintenance

- inspected at a minimum annually and inspections after major storm events
- Pruned or remove vegetation, large shrubs, or trees that limit access or interfere with basin operation
- Remove sediment buildup at inlets and outlets

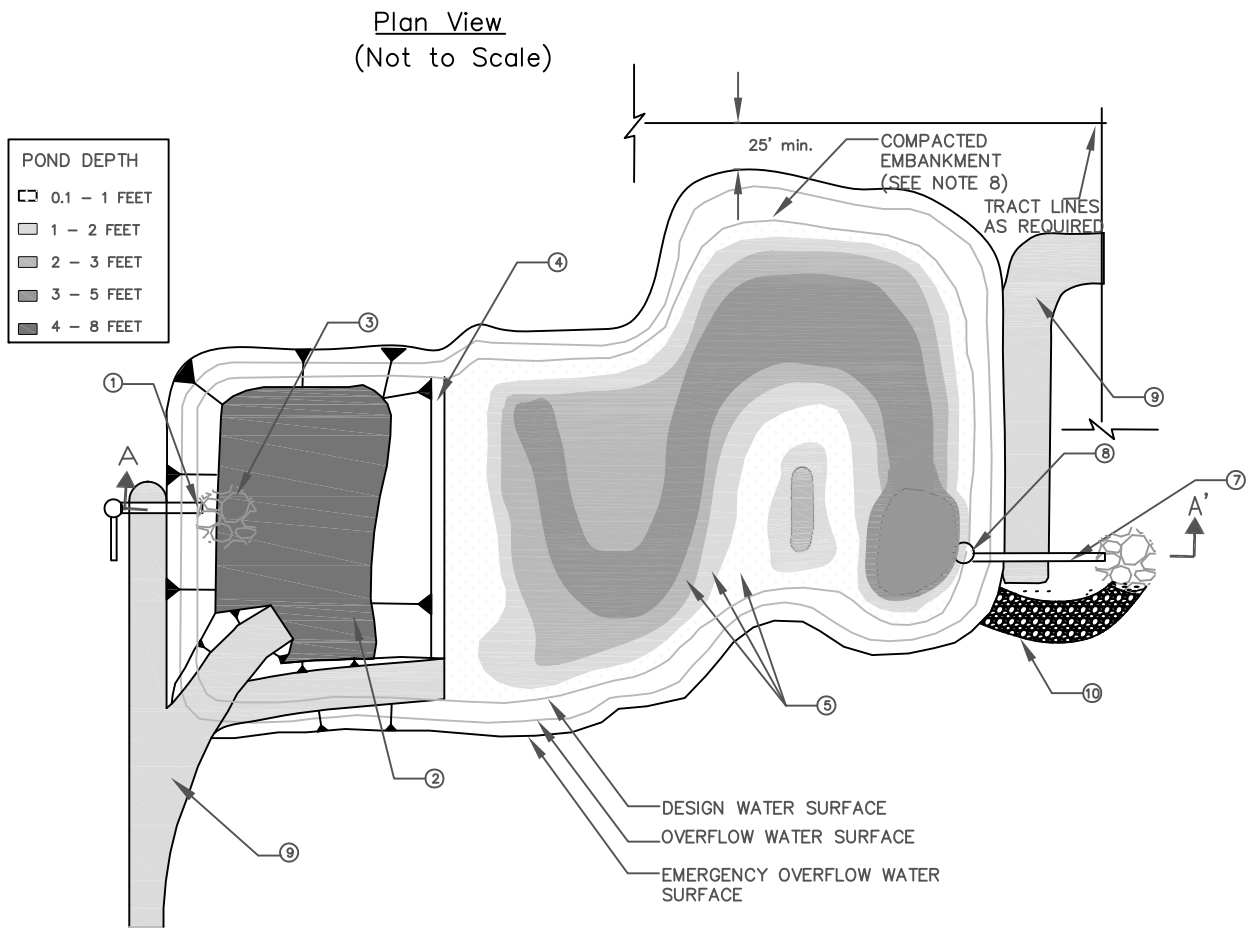

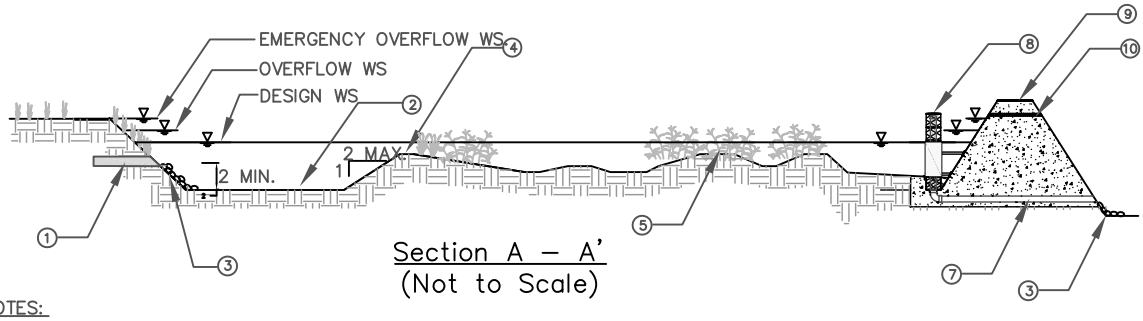

NOTES:

1. INLET PIPE SHOULD BE SUBMERGED WITH A MINIMUM OF 2' DISTANCE FROM THE BOTTOM
2. SEDIMENT FOREBAY. FORE BAY VOLUME SHALL EQUAL 10% TO 20% OF TOTAL WETLAND VOLUME. FOREBAY DEPTH SHALL BE 4' MIN TO 8' MAX PLUS AN ADDITIONAL 1' MIN SEDIMENT STORAGE DEPTH.
3. RIP RAP APRON OR OTHER INLET ENERGY DISSIPATION.
4. BERM AT DESIGN WATER SURFACE ELEVATION OR SUBMERGED 1' BELOW DESIGN WATER SURFACE ELEVAVTION. EXTEND BERM ACROSS ENTIRE WIDTH OF THE WETLAND.
5. WETLAND VEGETATION. PLANTING SCHEME MUST BE DESIGNED BY A WETLAND ECOLOGIST.
6. EMBANKMENT SIDE SLOPES SHALL BE NO STEEPER THAN 2H:1V OUTSIDE AND 3H:1V INSIDE
7. SIZE OUTLET PIPE TO PASS 100–YEAR PEAK FLOW FOR ONLINE AND WATER QUALTIY PEAK FLOW FOR OFFLINE BASINS.
8. WATER QUALITY OUTLET STRUCTURE. SEE FIGURE 7–2 AND FIGURE 7–3 FOR DETAILS.
9. MAINTENANCE RAMP SHOULD PROVIDE ACCESS TO BOTH THE FOREBAY AND MAIN BASIN.
10. INSTALL EMERGENGY OVERFLOW SPILWAY AS NEEDED. SEE FIGURE 2–4 FOR DETAILS

Geosyntec consultants

Figure 6-22: Constructed Wetland

Limitations

- In theory, there are no limitations on the tributary area size draining to a constructed treatment wetland; however, constructed treatment wetlands usually require considerable land area. Typically, treatment wetlands capture runoff from tributary areas larger than 10 acres and less than 10 square miles. Smaller "pocket" wetlands can be feasible in areas where space is restricted.
- If the constructed treatment wetland is not used for flow control, the wetland must not interfere with flood control functions of existing conveyance and detention structures.
- Constructed treatment wetlands should not be permitted in areas with site slopes greater than 7% or within 200 feet (on the uphill side) of a steep slope hazard area or a mapped landslide area unless a geotechnical investigation and report is completed by a licensed civil engineer.
- Constructed treatment wetlands require a regular source of water (base flow) to maintain wetland vegetation and associated treatment processes. If adequate base flow is not available year-round, supplemental water may be needed during the summer months to maintain adequate base flow.

Design Criteria

The main challenge associated with constructed treatment wetlands is maintaining base flow to support vegetation. Constructed wetlands should be designed according to the requirements listed in Table 6-25 and outlined in the section below. Constructed wetland BMP sizing worksheets are presented in Appendix E.

Table 6-25: Constructed Wetland Design Criteria

Design Parameter	Unit	Design Criteria
Stormwater quality design volume, SQDV	acre-feet	See Section 2 and Appendix E for calculating SQDV.
Permanent pool volume	%	75% of SQDV
Drawdown time for extended detention (over permanent pool)	hours	48 ; 12 for 50% SQDV (minimum)
Sediment forebay volume	%	30 to 50% of permanent pool surface area
Depth of sediment forebay	feet	2-4 (1 foot of sediment storage required)
Wetland zone volume	%	50-70% of permanent pool surface area
Depth of wetland basin	feet	0.5 to 1.0 (30 to 50% should be 0.5 feet deep)

Design Parameter	Unit	Design Criteria
Wetland (littoral zone) bottom slope	%	10 maximum
Maximum residence time	Days	7 (dry weather)
Freeboard (minimum)	inches	12
Flow path length to width ratio	L:W	2:1, larger preferred
Side slope (maximum)	H:V	4:1 Interior; 3:1 Exterior
Vegetation Type	--	Varies see vegetation section below
Vegetation Height	--	Varies see vegetation section below
Buffer zone (minimum)	feet	25
Minimum outflow device diameter	inches	18

Sizing

In most cases, the constructed treatment wetland permanent pool should be sized to be greater than or equal to the stormwater quality design volume. If extended detention is provided above the permanent pool and the wetland is designed for water quality treatment only, then the permanent pool volume should be a minimum of 80 percent of the stormwater quality design volume and the surcharge volume (above the permanent pool) should make up the remaining 20 percent and provide at least 12 hours of detention. If extended detention is provided and the basin is designed for water quality treatment and peak flow attenuation, then the permanent pool volume should be equal to the water quality treatment volume and the surcharge volume should be sized to attenuate peak flows to meet the peak runoff discharge requirements. The extended detention portion of the wetland above the permanent pool, if provided, functions like a dry extended detention (ED) basin (see VEG-5: Dry Extended Detention Basin).

Step 1: Calculate the design volume

Constructed wetlands shall be sized to be greater than or equal to the SQDV volume (see Section 2 and Appendix E).

Step 2: Determine the Wetland Location, Wetland Type and Preliminary Geometry Based on Site Constraints

Based on site constraints, determine the wetland geometry and the storage available by developing an elevation-storage relationship for the wetland. The equations provided

below assume a trapezoidal geometry for cell 1 (Forebay) and cell 2, and assumes that the wetland does not have extended detention.

1) Calculate the width of the wetland footprint, W_{tot}, as follows:

$$W_{tot} = \frac{A_{tot}}{L_{tot}} \qquad \text{(Equation 6-81)}$$

Where:

A_{tot} = total surface area of the wetland footprint (ft^2)

L_{tot} = total length of the wetland footprint (ft)

2) Calculate the length of the water quality volume surface area including the internal berm but excluding the freeboard, $L_{wq\text{-}tot}$:

$$L_{wq-tot} = L_{tot} - 2Zd_{fb} \qquad \text{(Equation 6-82)}$$

Where:

Z = interior side slope as length per unit height

d_{fb} = freeboard depth

3) Calculate the width of the water quality volume surface area including the internal berm but excluding freeboard, $W_{wq\text{-}tot}$:

$$W_{wq-tot} = W_{tot} - 2Zd_{fb} \qquad \text{(Equation 6-83)}$$

4) Calculate the total water quality volume surface area including the internal berm and excluding freeboard, $A_{wq\text{-}tot}$:

$$A_{wq-tot} = L_{wq-tot} \times W_{wq-tot} \qquad \text{(Equation 6-84)}$$

5) Calculate the area of the berm, A_{berm}:

$$A_{berm} = W_{berm} \times L_{berm} \qquad \text{(Equation 6-85)}$$

Where:

W_{berm} = width of the internal berm

L_{berm} = length of the internal berm

6) Calculate the water quality surface area excluding the internal berm and freeboard, A_{wq}:

$$A_{wq} = A_{wq\ =\ tot} - A_{berm}$$ (Equation 6-86)

Step 3: Determine Dimensions of Forebay

30-50% of the SQDV is required to be within the active volume of forebay.

1) Calculate the active volume of forebay, V_1:

$$V_1 = \frac{SQDV \times \%V_1}{100}$$ (Equation 6-87)

Where:

$\%V_1$ = percent of SQDV in forebay (%)

2) Calculate the surface area for the active volume of forebay, A_1:

$$A_1 = \frac{V_1}{d_1}$$ (Equation 6-88)

Where:

d_1 = average depth fo rhte active volume of forebay (2 -4 ft) (ft)

3) Calculate the length of forebay, L_1. Note, inlet and outlet should be configured to maximize the residence time.

$$L_1 = \frac{A_1}{W_1}$$ (Equation 6-89)

Where:

W_1 = width of forebay (ft), $W_1 = W_{av\text{-}tot} = L_{berm}$

Step 4: Determine Dimensions of Cell 2

Cell 2 will consist of the remainder of the basin's active volume.

1) Calculate the active volume of Cell 2, V_2:

$$V_2 = SQDV - V_1$$ (Equation 6-90)

2) Calculate the surface area of Cell 2, A_2:

$$A_2 = A_{wq} - A_1$$ (Equation 6-91)

3) Calculate the top length of Cell 2, L_2:

$$L_2 = \frac{A_2}{W_2} \qquad \text{(Equation 6-92)}$$

Where:

W_2 = width of Cell 2 (ft), $W_2 = W_1 = W_{wq\text{-}tot} = L_{berm}$

4) Verify that the length-to-width ratio of Cell 2, LW_2, is at least 3:1 with ≥ 4:1 preferred. If the length-to-width ratio is less than 3:1, modify input parameters until a ratio of at least 3:1 is achieved. If the input parameters cannot be modified as a result of site constraints, another site for the pond should be chosen.

$$LW_2 = \frac{L_2}{W_2} \qquad \text{(Equation 6-93)}$$

5) Calculate the very shallow zone surface area, A_{vs}:

$$A_{vs} = \frac{A_2 \bullet \%A_{vs}}{100} \qquad \text{(Equation 6-94)}$$

Where:

$\%A_{vs}$ = percent of surface area of very shallow zone

6) Calculate the volume of the shallow zone, V_{vs}:

$$V_{vs} = A_{vs} \bullet d_{vs} \qquad \text{(Equation 6-95)}$$

Where:

d_{vs} = average depth of the very shallow zone (0.1 – 1 ft)

7) Calculate the length of the very shallow zone, L_{vs}:

$$L_{vs} = \frac{A_{vs}}{W_{vs}} \qquad \text{(Equation 6-96)}$$

Where:

W_{vs} = width of the very shallow zone (ft), $W_{vs} = W_2$

8) Calculate the surface area of the shallow zone, A_s:

$$A_s = \frac{A_2 \bullet \%A_s}{100} \qquad \text{(Equation 6-97)}$$

Where:

$\%A_s$ = percent of surface area of shallow zone

9) Calculate the volume of the shallow zone, V_s:

$$V_s = A_s \bullet d_s \qquad \text{(Equation 6-98)}$$

Where:

d_s = average depth of shallow zone (1 - 3 ft)

10) Calculate length of the shallow zone, L_s:

$$L_s = \frac{A_s}{W_s} \qquad \text{(Equation 6-99)}$$

Where:

W_s = width of the shallow zone (ft), $W_s = W_2$

11) Calculate the surface area of the deep zone, A_{deep}:

$$A_{deep} = A_2 - A_{vs} - A_s \qquad \text{(Equation 6-100)}$$

12) Calculate the volume of the deep zone, V_{deep}:

$$V_{deep} = V_2 - V_{vs} - V_s \qquad \text{(Equation 6-101)}$$

13) Calculate the average depth of the deep zone (3-5 ft), d_{deep}:

$$d_{deep} = \frac{V_{deep}}{A_{deep}} \qquad \text{(Equation 6-102)}$$

14) Calculate length of the deep zone, L_{deep}:

$$L_{deep} = \frac{A_{deep}}{W_{deep}} \qquad \text{(Equation 6-103)}$$

Where:

W_{deep} = width of the deep zone (ft), $W_{deep} = W_2$

Step 5: Ensure design requirements and site constraints are achieved

Check design requirements and site constraints. Modify design geometry until requirements are met. If the chosen site for the basin is inadequate to meet the design requirements, choose a new location or alternative treatment BMP.

Step 6: Size Outlet Structure

For wetlands with detention, the outlet structures should be designed to provide 12 hours emptying time for the water quality volume or the required detention necessary for achieving the peak runoff discharge requirements if the extended detention is designed for flow attenuation.

The wetland outlet pipe should be sized, at a minimum, to pass flows greater than the stormwater quality design peak flow for on-line basins or flows greater than the peak runoff discharge rate for the 100-year, 24-hr design storm for on-line basins.

Step 7: Determine Emergency Spillway Requirements

For online basins, an emergency overflow spillway should be sized to pass flows greater than the design peak runoff discharge rate for the 100-yr, 24-hr storm in order to prevent overtopping of the walls or berms in the event that a blockage of the riser occurs. For offline basins, an emergency spillway or riser should be sized to pass the 100-yr, 24-hr post-development peak storm water runoff discharge rate directly to the downstream conveyance system or another acceptable discharge point. For sites where the emergency spillway discharges to a steep slope, an emergency overflow riser, in addition to the spillway should be provided.

Sizing and Geometry

In most cases, the constructed treatment wetland permanent pool should be sized to be greater than or equal to the stormwater quality design volume. If extended detention is provided above the permanent pool and the wetland is designed for water quality treatment only, then the permanent pool volume should be a minimum of 80 percent of the stormwater quality design volume and the surcharge volume (above the permanent pool) should make up the remaining 20 percent and provide at least 12 hours of detention. If extended detention is provided and the basin is designed for water quality treatment and peak flow attenuation, then the permanent pool volume should be equal to the water quality treatment volume and the surcharge volume should be sized to attenuate peak flows to meet the peak runoff discharge requirements. A constructed treatment wetland design worksheets are presented in Appendix E. The extended detention portion of the wetland above the permanent pool, if provided, functions like a dry extended detention (ED) basin (see TCM-1: Dry Extended Detention Basin).

1) Constructed treatment wetlands should consist of at least two cells including a sediment forebay and a wetland basin.

2) The sediment forebay must contain between 10 and 20 percent of the total basin volume.

3) The depth of the sediment forebay should be between 4 and 8 feet.

4) One foot of sediment storage should be provided in the sediment forebay.

5) The "berm" separating the two basins should be uniform in cross-section and shaped such that its downstream side gradually slopes to the main wetland basin.

6) The top of berm should be either at the stormwater quality design water surface or submerged 1 foot below the stormwater quality design water surface, as with wet retention basins. Correspondingly, the side slopes of the berm should meet the following criteria:

    a. If the type of the berm is at the stormwater quality design water surface, the berm side slopes should be no steeper than 4H:1V.

    b. If the top of berm is submerged 1 foot, the upstream side slope may be a max of 3H:1V.

7) The constructed treatment wetlands should be designed with a "naturalistic" shape and a range of depths intermixed throughout the wetland basin to a maximum of 5 feet.

Depth Range (feet)	Percent by Area
0.1 to 1	15
1 to 3	55
3 to 5	30

8) The flowpath length-to-width ratio should be a minimum of 2:1, but preferably at least 4:1 or greater. *Intent: a high flow path length to width ratio will maximize fine sediment removal.*

9) The minimum freeboard should be 1 foot above the maximum water surface elevation for on-line basins (2 feet preferable) and 1 foot above the maximum water surface elevation for on-line basins.

10) Wetland pools should be designed such that the residence time for dry weather flows is no greater than 7 days. *Intent: Minimize vector and stagnation issues.*

Water Supply

Water balance calculations should be provided to demonstrate that adequate water supply will be present to maintain a permanent pool of water during a drought year when precipitation is 50% of average for the site. Water balance calculations should include evapotranspiration, infiltration, precipitation, spillway discharge, and dry weather flow (where appropriate).

Where water balance indicates that losses will exceed inputs, a source of water should be provided to maintain the wetland water surface elevation throughout the year. The water supply should be of sufficient quantity and quality to not have an adverse impact on the

wetland water quality. Water that meets drinking water standards should be assumed to be of sufficient quality.

Soils Considerations

1) Implementation of constructed treatment wetlands in areas with high permeability soils (>0.1 in/hr) requires liners to increase the chances of maintaining permanent pools and/or micro-pools in the basin. Liners can be either synthetic materials or imported lower permeability soils (i.e., clays). The water balance assessment should determine whether a liner is required. The following conditions can be used as a guideline.

2) The wetland basin should retain water for at least 10 months of the year.

3) The sediment forebay should retain at least 3 feet of water year-round.

4) Many wetland plants can adapt to periods of summer drought, so a limited drought period is allowed in the wetland basin. This may allow for a soil liner rather than a geosynthetic liner. The sediment forebay should retain water year-round for presettling to be effective.

5) If low permeability soils are used for the liner, a minimum of 18 inches of native soil amended with good topsoil or compost (one part compost mixed with 3 parts native soil) should be placed over the liner (see soil amendment Section 5.10). If a synthetic material is used, a soil depth of 2 feet is recommended to prevent damage to the liner during planting.

Buffer Zone

A minimum of 25 feet buffer should be provided around the top perimeter of the constructed treatment wetlands.

Energy Dissipation

1) The inlet to the constructed treatment wetland should be submerged with the inlet pipe invert a minimum of two feet from the cell bottom (not including sediment storage). The top of the inlet pipe should be submerged at least 1 foot, if possible. *Intent: the inlet is submerged to dissipate energy of the incoming flow. The distance from the bottom is set to minimize resuspension of settled sediments. Alternative inlet designs that accomplish these objectives are acceptable.*

2) Energy dissipation controls must also be used at the outlet/spillway from the constructed treatment wetlands unless the wetland discharges to a stormwater conveyance system or hardened channel.

Vegetation

1) The wetland cell(s) should be planted with emergent wetland plants following the recommendations of a wetlands specialist.

2) Landscaping outside of the basin is required for all constructed wetlands and should adhere to the following criteria so as not to hinder maintenance operations:

    a. No trees or shrubs may be planted within 15 feet of inlet or outlet pipes or manmade drainage structures such as spillways, flow spreaders, or earthen embankments. Species with roots that seek water, such as willow or poplar, should not be used within 50 feet of pipes or manmade structures. Weeping willow (*Salix babylonica*) should not be planted in or near detention basins.

    b. Prohibited non-native plant species will not be permitted. For more information on invasive weeds, including biology and control of listed weeds, look at the encycloweedia located at the California Department of Food and Agriculture website or the California Invasive Plant Council website at www.cal-ipc.org.

3) Project-specific planting recommendations should be provided by a wetland ecologist or a qualified landscape professional including recommendations on appropriate plants, fertilizer, mulching applications, and irrigation requirements (if any) to ensure healthy vegetation growth.

Outlet Structure

An outlet pipe and outlet structure should be provided. The outlet pipe may be a perforated standpipe strapped to a manhole or placed in an embankment, suitable for extended detention, or may be back-sloped to a catch basin with a grated opening (jail house window) or manhole with a cone grate (birdcage). The grate or birdcage openings provide an overflow route should the basin outlet pipe become clogged. The outlet should be protected from clogging by a skimmer shield that starts at the bottom of the permanent pool and extends above the SQDV depth. A trash rack is also required.

For wetlands with detention, the outlet structures should be designed to provide 12 hours emptying time for the water quality volume or the required detention necessary for achieving the peak runoff discharge requirements if the extended detention is designed for flow attenuation.

The wetland outlet pipe should be sized, at a minimum, to pass flows greater than the stormwater quality design peak flow for on-line basins or flows greater than the peak runoff discharge rate for the 100-year, 24-hr design storm for on-line basins.

See the dry extended detention section (see ST-1: Dry Extended Detention Basin) and Appendix E for further detail on outlet sizing.

Emergency Spillway

An emergency overflow spillway in addition to the primary overflow outlet (as described above) is required. The emergency spillway should be sized for flows greater than the peak 100-year 24-hour storm if the basin is designed on-line or, if the basin is designed on-line, the spillway should be sized for flows greater than the basin design volume (e.g., stormwater quality design volume). The spillway provide for adequate energy dissipation downstream. The spillway should allow for at least 12 inches of freeboard above the emergency overflow water surface elevation if the basin is on-line. If the basin is on-line, 2 feet of freeboard is preferable.

Spillways shall meet the California Department of Water Resources, Division of Safety of Dams Guidelines for the Design and Construction of Small Embankment Dams (http://damsafety.water.ca.gov/docs/GuidelinesSmallDams.pdf). *Intent: Emergency overflow spillways are intended to control the location of basin overtopping and safely direct overflows back into the downstream conveyance system or other acceptable discharge point.*

On-line Basins

1) On-line basins must have an emergency overflow spillway to prevent overtopping of walls or berms should blockage of the primary outlet occur based on a downstream risk assessment.

2) The overflow spillway must be sized to pass flows greater than the design peak runoff discharge rate for the 100-yr, 24-hr storm.

3) The minimum freeboard should be 1 foot (but preferably at least 2 feet) above the maximum water surface elevation over the emergency spillway.

Off-line Basins

1) Off-line basins must have either an emergency overflow spillway or an emergency overflow riser. The emergency overflow must be designed to pass the 100-yr 24-hr post-development peak stormwater runoff discharge rate (see Appendix E for further detail) directly to the downstream conveyance system or another acceptable discharge point. Where an emergency overflow spillway would discharge to a steep slope, an emergency overflow riser, *in addition* to the spillway should be provided.

2) The emergency overflow spillway should be armored to withstand the energy of the spillway flows. The spillway should be constructed of grouted rip-rap.

3) The minimum freeboard should be 1 foot above the maximum water surface elevation over the emergency spillway.

Side Slopes

1) Interior side slopes above the stormwater quality design depth and up to the emergency overflow water surface steeper than 4:1 (H:V) should be stabilized to prevent erosion with a method approved by the local permitting authority.

2) Exterior side slopes steeper than 2:1 (H:V) should be stabilized to prevent erosion with a method approved by the local permitting authority.

3) For any slope (interior or exterior) greater than 2:1 (H:V), a geotechnical investigation and report must be submitted and approved by the local permitting authority.

4) Landscaped slopes should be no steeper than 3:1 (H:V) to allow for maintenance.

5) Basin walls may be vertical retaining walls, provided: (a) they are constructed of reinforced concrete, (b) a fence is provided along the top of the wall (see fencing below) or further back, and (c) the design is stamped by a licensed civil engineer and approved by the local permitting authority.

Embankments

1) Earthworks and berm embankments should be performed in accordance with the latest edition of the "Greenbook Standard Specifications for Public Works Construction".

2) Embankments are earthen slopes or berms used for detaining or redirecting the flow of water.

3) Top of berm should be 2 feet minimum below the stormwater quality design water surface and should be keyed into embankment a minimum of 1 foot on both sides.

4) Typically, the top width of berm embankments are at least 20 feet, but narrower embankments may be plausible if approved by the civil engineer and the local permitting authority.

5) Basin berm embankments should be constructed on native consolidated soil (or adequately compacted and stable fill soils analyzed by a licensed civil engineer) free of loose surface soil materials, roots, and other organic debris.

6) Basin berm embankments greater than 4 feet in height should be constructed by excavating a key equal to 50% of the berm embankment cross-sectional height and width. This requirement may be waived if specifically recommended by a licensed civil engineer.

7) The berm embankment should be constructed of compacted soil (95% minimum dry density, modified proctor method per ASTM D1557), placed in 6-inch lifts.

8) Low growing native or non-invasive perennial grasses should be planted on downstream embankment slopes. See vegetation section below.

Fencing

Safety is provided either by fencing of the facility or by managing the contours of the basin to eliminate drop-offs and other hazards.

1) Provide fencing in accordance with the local permitting agency's requirements Perimeter fencing (minimum height of 42 inches) should be required on all basins exceeding two feet in depth or where interior side slopes are steeper than 6:1 (H:V).

2) If fences are required, fences should be designed and constructed in accordance with current policies of the local permitting agency and should be located at or above the overflow water surface elevation. Shrubs (approved, California-adapted species) can be used to hide the fencing. See vegetation section above.

Right-of-Way

1) Constructed treatment wetlands and associated access roads to be maintained by a public agency should be dedicated in fee or in an easement to the public agency with appropriate access.

Maintenance Access

1) Ownership of the basin and maintenance thereof is the responsibility of the developer/applicant. A maintenance agreement is required to ensure adequate performance and allow emergency access to the facilities.

2) Maintenance access road(s) should be provided to the control structure and other drainage structures associated with the basin (e.g., inlet, emergency overflow or bypass structures). Manhole and catch basin lids should be in or at the edge of the access road.

3) An access ramp into the basin should be constructed near the basin outlet. An access ramp is required for removal of sediment with a backhoe or loader and truck. The ramp should extend to the basin bottom to avoid damage to vegetation planted on the basin slope.

4) All access ramps and roads should be provided in accordance with the current policies of the Flood Control District.

Vector Control

1) A Mosquito Management Plan or Service Contract should be approved or waived by the local Vector Control District for any facility that maintains a pool of water for 72 hours or more.

Construction Considerations

The use of treated wood or galvanized metal anywhere inside the facility is prohibited. The use of galvanized fencing is permitted if in accordance with the Fencing requirement above.

Operations and Maintenance

Maintenance is of primary importance if constructed treatment wetlands basins are to continue to function as originally designed. A specific maintenance plan shall be formulated for each facility outlining the schedule and scope of maintenance operations, as well as the data handling and reporting requirements. The following are general maintenance requirements:

1) The constructed treatment wetlands basin should be inspected twice annually or more frequently, and inspections after major storm events are encouraged (see Appendix I for a constructed treatment wetland inspection and maintenance checklist). Trash and debris should be removed as needed, but at least annually prior to the beginning of the wet season.

2) Site vegetation should be maintained as frequently as necessary to maintain the aesthetic appearance of the site and to prevent clogging of outlets, creation of dead volumes, and barriers to mosquito fish to access pooled areas, and as follows:

3) Vegetation, large shrubs, or trees that limit access or interfere with basin operation should be pruned or removed.

4) Slope areas that have become bare should be revegetated and eroded areas should be regraded prior to being revegetated.

5) Invasive vegetation, such as Alligatorweed (*Alternanthera philoxeroides*), Halogeton (*Halogeton* glomeratus), Spotted Knapweed (*Centaurea maculosa*), Giant Reed (*Arundo donax*), Castor Bean (*Ricinus communis*), Perennial Pepperweed (*Lepidium latifolium*), and Yellow Starthistle (*Centaurea solstitalis*) should be removed and replaced with non-invasive species. Invasive species should never contribute more than 25% of the vegetated area. For more information on invasive weeds, including biology and control of listed weeds, look at the encycloweedia located at the California Department of Food and Agriculture website or the California Invasive Plant Council website at www.cal-ipc.org.

6) Dead vegetation should be removed if it exceeds 10% of area coverage. This does not include seasonal die-back where roots would grow back later in colder areas. Vegetation should be replaced immediately to maintain cover density and control erosion where soils are exposed.

7) Sediment buildup exceeding 6 inches over the storage capacity in the first cell should be removed. Sediments should be tested for toxic substance accumulation in compliance with current disposal requirements if land uses in the catchment include

commercial or industrial zones, or if visual or olfactory indications of pollution are noticed. If toxic substances are encountered at concentrations exceeding thresholds of Title 22, Section 66261 of the California Code of Regulations, the sediment must be disposed of in a hazardous waste landfill. Clean forebay every two years at a minimum, to avoid accumulation in main wetland area. Environmental regulations and permits may be involved with the removal of wetland deposits. When the main wetland area needs to be cleaned, it is suggested that the main area be cleaned one half at a time with at least one growing season in between cleanings. This will help to preserve the vegetation and enable the wetland to recover more quickly from the cleaning.

8) Repair erosion to banks and bottom as required.

9) Inspect outlet for clogging a minimum of twice a year, before and after the rainy season, after large storms, and more frequently if needed. Correct observed problems as necessary.

10) Following sediment removal activities, replanting, and/or reseeding of vegetation may be required for reestablishment.

TCM-4: Sand Filters

Sand filters operate much like bioretention facilities; however, instead of filtering stormwater through engineered soils, stormwater is filtered through a constructed sand bed with an underdrain system. Runoff enters the filter and spreads over the surface. As flows increase, water backs up on the surface of the filter where it is held until it can percolate through the sand. The treatment pathway is vertical (downward through the sand) to a perforated underdrain system that is connected to the downstream storm drainage system or to an infiltration facility. As stormwater passes through the sand, pollutants are trapped in the small pore spaces between sand grains or are adsorbed to the sand surface.

Sand filters connected to impervious surfaces

Photo Credits: Geosyntec Consultants

Application

- Adjacent to parking lots
- Road medians and shoulders
- Within open areas or play fields

Preventative Maintenance

- Remove trash and debris, minor sediment accumulation, and obstructions near inlet and outlet structures
- Replace top 2” – 4” of sand
- Mow or weed surface of filter

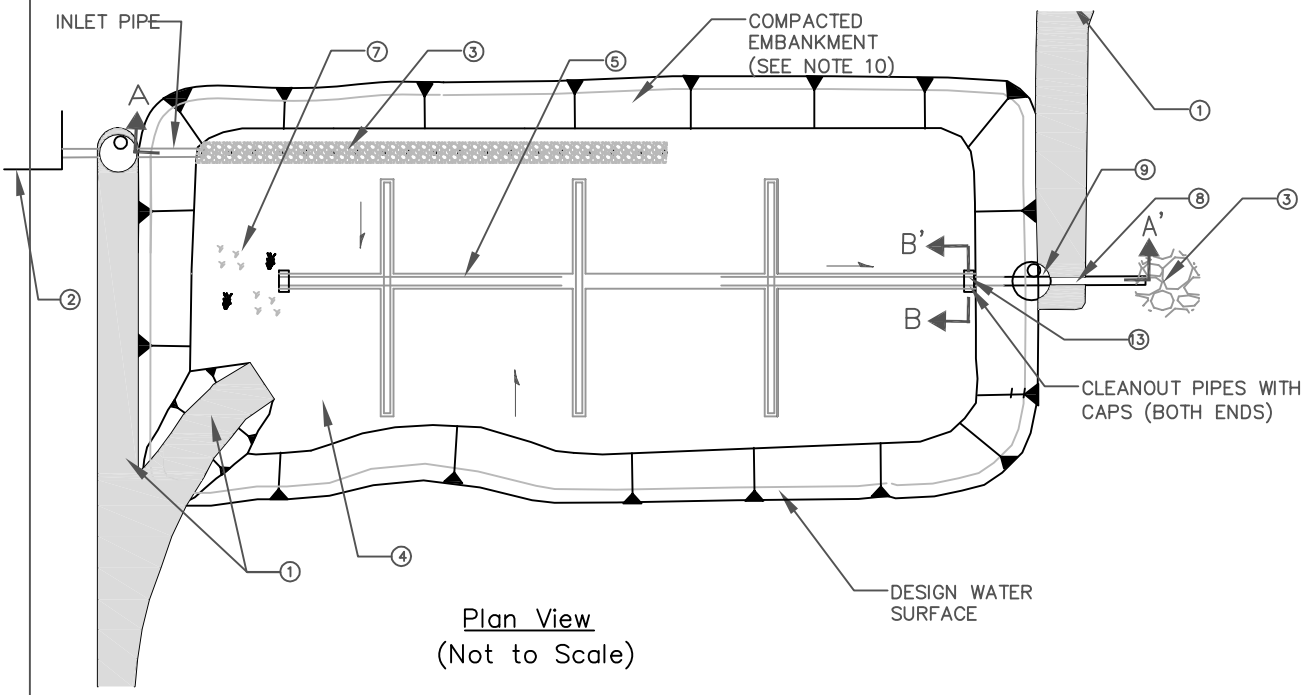

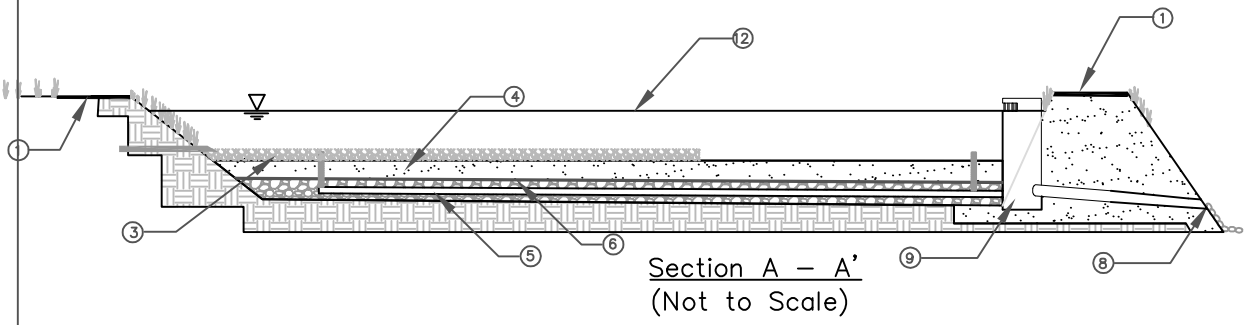

NOTES:

1. INSTALL MAINTENANCE ACCESS ROAD AND RAMP TO BOTTOM OF SAND FILTER.
2. UPSTREAM PRETREATMENT SHALL BE PROVIDED. IN THE ABSENCE OF PRETREATMENT, INCLUDE SEDIMENT FOREBAY WITH VOLUME EQUAL TO 10–20% OF TOTAL SAND FILTER VOLUME.
3. FLOW SPREADER TO EVENLY DISTRIBUTE FLOWS ALONG AT LEAST 20% OF PERIMETER.
4. FILTER BED SHALL BE A 24" MINIMUM SAND LAYER ON TOP OF 8" MINIMUM GRAVEL OR DRAIN ROCK BACKFILL.
5. 6" MINIMUM DIAMETER PERFORATED PIPE UNDERDRAIN SURROUNDED BY GRAVEL BEDDING. INSTALL AT 0.5% MINIMUM SLOPE
6. INSTALL GEOTEXTILE FABRIC OVERLAIN BY 1" OF DRAIN ROCK OR TRANSITIONALLY GRADED AGGREGRATE BETWEEN SAND AND GRAVEL LAYER.
7. VEGETATION MAY BE PLANTED ON TOP OF FILTER BED. NO TOP SOIL SHALL BE ADDED TO FILTER BED.
8. SIZE OUTLET PIPE STRUCTURE TO PASS WATER QUALITY DESIGN STORM AND INCLUDE AN EMERGENCY OVERFLOW.
9. EMERGENCY OVERFLOW STRUCTURE.
10. ¾" – 1½" WASHED DRAIN ROCK OR GRAVEL LAYER.
11. DESIGN WATER SURFACE. 6' MAX PONDING DEPTH.

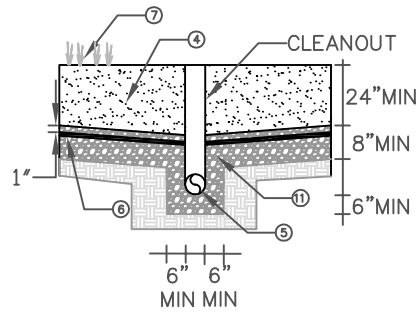

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Figure 6-23: Sand Filter

Limitations

Limitations for sand filters include:

- The sand filter should be located away from trees producing leaf litter or areas contributing significant eroded sediment to prevent clogging.
- Sand filters are should not be used in areas where heavy sediment loads are expected or in tributary areas that are not fully stabilized; high sediment loading rates may cause premature clogging of the filter. Pretreatment is essential.
- Site must have adequate relief between land surface and stormwater conveyance system to permit vertical percolation through the sand filter and collection and conveyance in the underdrain to stormwater conveyance system; four feet of elevation difference is recommended between the inlet and outlet of the filter.
- Not applicable in areas of high groundwater.
- Does not provide quantity control.

Design Criteria

The main challenge associated with sand filters is maintaining the filtration capacity, which is critical to the performance of this BMP. If flows entering the sand filter have high sediment concentrations, clogging of the sand filter is likely. Contribution of eroded soils or leaf litter may also reduce the infiltration and associated treatment capacity of the structure. Sand filters should be designed according to the requirements listed in Table 6-26 and outlined in the section below. BMP sizing worksheets are presented in Appendix E.

Table 6-26: Sand Filter Design Criteria

Design Parameter	Unit	Design Criteria
Stormwater quality design volume, SQDV	acre-feet	See Section 2 and Appendix E for calculating SQDV.
Max depth at SQDV	feet	3
Freeboard (minimum)	feet	1
Length to width ratio	L:W	2:1 (larger preferred)
Filter bed depth	inches	18 inches sand; 9 inches gravel
Max ponding depth above filter bed	feet	6
Drawdown time	Hours	?

Design Parameter	Unit	Design Criteria
Hydraulic conductivity of sand, k	in/hr	1 (equal to 2 ft/day)
Underdrains		6 inch minimum diameter; 0.5% minimum slope
Side slopes	H:V	4:1 (H:V) interior and 3:1 (H:V) exterior, unless stabilization has been approved by a licensed geotechnical engineer; or vertical concrete walls

Pretreatment

Pretreatment must be provided for sand filters in order to reduce the sediment load entering the filter. Pretreatment refers to design features that provide settling of large particles before runoff reaches the filter, easing the long-term maintenance burden. To ensure that pretreatment mechanisms are effective, designers shall incorporate pretreatment such as a biofiltration BMP, proprietary device, or sedimentation forebay. BMPs that are described in the 2011 TGM that may serve this purpose include:

For design specification of selected pre-treatment devices, refer to:

- VEG-3: Vegetated swale
- VEG-4: Vegetated filter strip
- PROP-1: Hydrodynamic separation device

Sizing Criteria

Background

Sand filter design is based on Darcy's law:

$$Q = KiA \qquad \text{(Equation 6-104)}$$

Where:

Q = water quality design flow (cfs)

K = hydraulic conductivity (fps)

A = surface area perpendicular to the direction of flow (ft^2)

i = hydraulic gradient (ft/ft) for a constant head and constant media depth, computed as follows:

$$i = \frac{h+l}{l} \qquad \text{(Equation 6-105)}$$

Where:

h	=	average depth of water above the filter (ft), defined for this design as $d/2$
d	=	maximum storage depth above the filter (ft)
l	=	thickness of sand media (ft)

Darcy's law underlies both the simple and the routing methods of design. The filtration rate V, or more correctly, $1/V$, is the direct input in the sand filter design. The relationship between the filtration rate V and hydraulic conductivity K is revealed by equating Darcy's law and the equation of continuity, $Q = VA$. Specifically:

$Q = KiA$ and $Q = VA$

So, $VA = KiA$

Or: $V = Ki$ (Equation 6-106)

Where,

V	=	filtration rate (ft/s)

Note that $V \neq K$. That is, the filtration rate is not the same as the hydraulic conductivity, but they do have the same units (distance per time). K can be equated to V by dividing V by the hydraulic gradient i, which is defined above.

The hydraulic conductivity K does not change with head nor is it dependent on the thickness of the media, only on the characteristics of the media and the fluid. A design hydraulic conductivity of 1 inch per hour (2 feet per day) used in this simple sizing method is based on bench-scale tests of conditioned rather than clean sand (KCSWDM, 2005) and represents the average sand bed condition as silt is captured and held in the sand bed.

Unlike the hydraulic conductivity, the filtration rate V changes with head and media thickness, although the media thickness is constant in the sand filter design.

Simple Sizing Method

The simple sizing method does not route flows through the filter. It determines the size of the filter based on the simple assumption that inflow is immediately discharged through the filter as if there were no storage volume. An adjustment factor (0.7) is applied to compensate for the greater filter size resulting from this method. Even with the adjustment factor, the simple method generally produces a larger filter size than the routing method.

Step 1: Determine the water quality design volume

Sand filters should be sized to capture and treat the stormwater quality design volume (see Section E.1).

Step 2: Determine maximum storage depth of water

Determine the maximum water storage depth (d) above the sand filter. This depth is defined as the depth at which water begins to overflow the reservoir pond, and it depends on the site topography and hydraulic constraints. The depth is chosen by the designer, but should be 6 feet or less.

Step 3: Calculate the sand filter area

Determine the sand filter area using the following equation:

$$A_{sf} = \frac{V_{wq} RL}{Kt(h+L)} \qquad \text{(Equation 6-107)}$$

Where,

A_{sf}	=	surface area of the sand filter bed (ft^2)
V_{wq}	=	water quality design volume (ft^3)
R	=	routing adjustment factor (use $R = 0.7$)
L	=	sand bed depth (ft)
K_{des}	=	design hydraulic conductivity of media (use 2 ft/day)
t	=	drawdown time (use 1 day)
h	=	average depth of water above the filter (ft), [use (d/2) with d from Step 2]

Routing Method

A continuous runoff model, such as US EPA's Stormwater Management Model (SWMM) Model, can be used to optimally size a sand filter. A continuous simulation model consists of three components: a representative long term period of rainfall data (≈ 20 years or greater) as the primary model input; a model component representing the tributary area to the sand filter that takes into account the amount of impervious area, soil types of the pervious area, vegetation, evapotranspiration, etc.; and a component that simulates the sand filter. Using this method, the filter should be sized to capture and treat the WQ design volume from the post-development tributary area.

The continuous simulation model routes predicted tributary runoff to the sand filter, where treatment is simulated as a function of the infiltrative (flow) capacity of the sand filter and the available storage volume above the sand filter. In a continuous runoff model such as SWMM, the physical parameters of the sand filter are represented with stage-storage-discharge relationships. Due to the computational power of ordinary desktop computers, long-term continuous simulations generally take only minutes to run. This allows the modeler to run several simulations for a range of sand filter sizes, varying either the surface area of the filter (and resulting flow capacity) or the storage capacity above the sand filter, or both. Sufficient continuous model simulations should be completed so that results encompass the WQ design volume capture goal.

Model results should be plotted for both varying storage depths above the filter and for varying filter surface area (and resulting flow capacity) while keeping all other parameters constant. The resulting relationship of percent capture as a function of sand filter flow and storage capacity can be used to optimally size a sand filter based on site conditions and restraints.

In addition to continuous simulation modeling, routing spreadsheets and/or other forms of routing modeling that incorporate rainfall-runoff relationships and infiltrative (flow) capacities of sand filters may be used to size facilities. Alternative sizing methodologies should be prepared with good engineering practices.

Sizing and Geometry

1) Sand filters shall be sized to capture and filter the Stormwater quality design volume, SQDV (See Section 2 and Appendix E for further detail).

2) Sand filters may be designed in any geometric configuration, but rectangular with a 2:1 length-to-width ratio or greater is preferred.

3) Filter bed depth must be at least 24 inches, but 36 inches is preferred.

4) Depth of water storage over the filter bed should be 6 feet maximum. Minimum freeboard is one foot.

5) Sand filters should be placed off-line to prevent scouring of the filter bed by high flows. The overflow structure must be designed to pass the stormwater quality design storm.

Sand Specification

Ideally the effective diameter of the sand, d_{10} (the diameter corresponding to the sieve size that passes 10% of sand grains), should be just small enough to ensure a good quality effluent while preventing penetration of stormwater particles to such a depth that they cannot be removed by surface scraping (~2-3 inches). This effective diameter usually lies in the range 0.20-0.35 mm. In addition, the coefficient of uniformity, Cu = d_{60}/d_{10}, should be less than 3.

The sand in a filter should consist of medium sand with few fines meeting ASTM C 33 size gradation (by weight) or equivalent as given in the table below.

U.S. Sieve Size	Percent Passing
3/8 inch	100
U.S. No. 4	95 to 100
U.S. No. 8	80 to 100
U.S. No. 16	50 to 85
U.S. No. 30	25 to 60
U.S. No. 50	5 to 30
U.S. No. 100	Less than 10

Finally, the silica (SiO_2) content of the sand should be greater than 95% by weight.

Underdrain

1) There are several underdrain system options which can be used in the design of a sand filter:

    a. A central underdrain collection pipe with lateral collection pipes in an 8 inch minimum gravel backfill or drain rock bed.

    b. Longitudinal pipes in an 8 inch minimum gravel backfill or drain rock bed, with a collection pipe at the outfall.

    c. Small sand filters may use a single underdrain pipe in an 8 inch minimum gravel backfill or drain rock bed.

2) All underdrain pipes and connectors should be 6 inches or greater so they can be cleaned without damage to the pipe. Clean-out risers with diameters equal to the underdrain pipe should be placed at the terminal ends of all pipes and extend to the surface of the filter. A valve box should be provided for access to the cleanouts and the cleanout assembly should be water tight to prevent short circuiting of the sand filter.

3) The underdrain pipe should be sized and perforated as to ensure free draining of the sand filter bed. Round perforations should be at least 1/2-inch in diameter and the pipe should be laid with holes downward.

4) The maximum perpendicular distance between any two lateral collection pipes or from the edge of the filter and the collection pipes should be 9 feet.

5) All pipes should be placed with a minimum slope of 0.5%.

6) The invert of the underdrain outlet should be above the seasonal high groundwater level.

7) At least 8 inches of gravel backfill should be maintained over all underdrain piping, and at least 6 inches should be maintained on both side and beneath the pipe to prevent damage by heavy equipment during maintenance. Either drain rock or gravel backfill may be used between pipes.

8) The bottom gravel layer should have a diameter at least 2X the size of the openings into the drainage system. The grains should be hard, preferably rounded, with a specific gravity of at least 2.5, and free of clay, debris and organic impurities.

9) Either a geotextile fabric or a two-inch transition gradation layer (preferred) should be placed between the sand layer and the drain rock or gravel backfill layer. If a geotextile is used, one inch of drain rock or gravel backfill should be place above the fabric. This allows for a transitional zone between sand and gravel and may reduce pooling of water at the liner interface. The geotextile should meet the following minimum materials requirements.

Geotextile Property	Value	Test Method
Trapezoidal Tear (lbs)	40 (min)	ASTM D4533
Permeability (cm/sec)	0.2 (min)	ASTM D4491
AOS (sieve size)	#60 - #70 (min)	ASTM D4751
Ultraviolet resistance	70% or greater	ASTM D4355

Flow Spreader

1) A flow spreader should be installed at the inlet along one side of the filter to evenly distribute incoming runoff across the filter and to prevent erosion of the filter surface.

    a. If the sand filter is curved or an irregular shape, a flow spreader should be provided for a minimum of 20 percent of the filter perimeter.

    b. If the length-to-width ratio of the filter is 2:1 or greater, a flow spreader should be located on the longer side and for a minimum length of 20 percent of the facility perimeter.

    c. In other situations, use good engineering judgment in positioning the spreader.

2) Erosion protection should be provided along the first foot of the sand bed adjacent to the flow spreader. Geotextile weighted with sand bags at 15-foot intervals may be used. Quarry spalls may also be used.

Vegetation

1) The use of vegetation in sand filters is optional. However, no top soil should be added to the sand filter bed because the fine-grained materials (silt and clay) would reduce the hydraulic capacity of the filter.

2) Growing grass or other vegetation requires the selection of species that can tolerate the demanding environment of a sand filter bed. Plants not receiving sufficient dry weather flows should be able to withstand long periods of drought during summer periods, followed by periods of saturation during storm events. A horticultural specialist should be consulted for advice on species selection.

3) A sod grown in sand may be used on the sand surface as long as there is no clay in the sand substrate and the particle size gradation of the substrate meets the sand filter specifications. No other sod should be used due to the high clay content in most sod soils.

4) To prevent uses that could compact and damage the filter surface, permanent structures are not permitted on sand filters (e.g. playground equipment).

Emergency Overflow Structure

Sand filters may only be placed off-line, but an emergency overflow must still be provided in the event the filter becomes clogged. The overflow structure must be able to safely convey flows from the stormwater quality design storm to the downstream conveyance system or other acceptable discharge point.

Side Slopes

1) Interior side slopes above the stormwater quality design depth and up to the emergency overflow water surface steeper than 4:1 (H:V) should be stabilized to prevent erosion with a method approved by the local permitting authority.

2) Exterior side slopes steeper than 2:1 (H:V) should be stabilized to prevent erosion with a method approved by the local permitting authority.

3) For any slope (interior or exterior) greater than 2:1 (H:V), a geotechnical investigation and report must be submitted and approved by the local permitting authority.

4) Pond walls may be vertical retaining walls, provided: (a) they are constructed of reinforced concrete, (b) a fence, which prevents access, is provided along the top of the wall or further back, and (c) the design is stamped by a licensed civil engineer and approved by the County.

Embankments

1) Embankments (earthen slopes or berms) may be used for detaining or redirecting the flow of water.

2) The minimum top width of all berm embankments should be 20 feet, or as approved by the geotechnical engineer.

3) Basin berm embankments should be constructed on native consolidated soil (or adequately compacted and stable fill soils analyzed by a licensed geotechnical engineer) free of loose surface soil materials, roots, and other organic debris.

4) Earthworks should be in accordance with Section 300-6 of the Standard Specifications for Public Works Construction, most recent edition.

5) Basin berm embankments greater than 4 feet in height should be constructed by excavating a key equal to 50% of the berm embankment cross-sectional height and width. This requirement may be waived if specifically recommended by a licensed geotechnical engineer.

6) The berm embankment should be constructed of compacted soil (95% minimum dry density, modified proctor method per ASTM D1557), placed in 6-inch lifts.

Maintenance Access

Maintenance access road(s) shall be provided to the control structure and other drainage structures associated with the basin (e.g., inlet, emergency overflow or bypass structures). Manhole and catch basin lids should be in or at the edge of the access road.

An access ramp is required for removal of sediment with a backhoe or loader and truck. The ramp should extend to the bottom of the sand filter.

Landscaping Outside of the Facility

A sand filter can add aesthetics to a site and should be incorporated into a project's landscape design. Interior side slopes may be stepped with flat areas to provide informal seating with a game or play area below. Perennial beds may be planted above the overflow water surface elevation. Large shrubs and trees are not recommended, however, as shading limits evaporation and falling leaves can clog the filter surface. If a sand filter area is intended for recreational uses, such as a volleyball area, the interior side slopes of the filter embankment should be no steeper than 3:1 and may be stepped.

1) No trees or shrubs may be planted within 10 feet of inlet or outlet pipes or manmade drainage structures such as spillways, flow spreaders, or earthen embankments. Species with roots that seek water, such as willow or poplar, should not be used within 50 feet of pipes or manmade structures.

2) Prohibited non-native plant species will not be permitted. For more information on invasive weeds, including biology and control of listed weeds, look at the

encycloweedia located at the California Department of Food and Agriculture website at or the California Invasive Plant Council website at www.cal-ipc.org.

Operations and Maintenance

Sand filters are subject to clogging by fine sediment, oil and grease, and other debris (e.g., trash and organic matter such as leaves). Filters and pretreatment facilities should be inspected every 6 months during the first year of operation. Inspection should also occur immediately following a storm event to assess the filtration capacity of the filter. Once the filter is performing as designed, the frequency of inspection may be reduced to once per year.

Most of the maintenance should be concentrated on the pretreatment practices, such as buffer strips and swales upstream of the trench to ensure that sediment does not reach the infiltration trench. Regular inspection should determine if the sediment removal structures require preventative maintenance.

Inspect basin a minimum of twice a year, before and after the rainy season, after large storm events, or more frequently if needed. Some important items to check for include: differential settlement, cracking; erosion, leakage, or tree growth on the embankment; the condition of the riprap in the inlet, outlet and pilot channels; sediment accumulation in the basin; and the vigor and density of the vegetation on the basin side slopes and floor. Correct observed problems as necessary.

- Remove litter and debris from banks and basin bottom as required.
- Repair erosion to banks and bottom as required.
- Check infiltration rate of sand bed twice annually, once after significant rainfall.
- Scarify top 3 to 5 inches of filters surface by raking once annually or as required to restore infiltration rate of the filter.
- Clean forebay every two years at a minimum, to avoid accumulation in main basin.
- Inspect outlet for clogging a minimum of twice a year, before and after the rainy season, after large storms, and more frequently if needed. Correct observed problems as necessary.

TCM-5: Cartridge Media Filter

Cartridge media filters are manufactured devices that typically consist of a series of cylindrical vertical filters contained in a catch basin, manhole, or vault that provide treatment through filtration and sedimentation. The manhole or vault may be divided into multiple chambers where the first chamber acts as a pre-settling basin for removal of coarse sediment while another chamber acts as the filter bay and houses the filter cartridges.

Cartridge Media Filters

Photo Credits: Contech Stormwater Solutions, Inc.

Application

- Parking lots
- Roadways
- Playgrounds
- Outdoor eating areas

Preventative Maintenance

- Filter media replacement
- Solids removal from vault, manhole, or catch basin
- Inspect for inlet and outlet for clogging

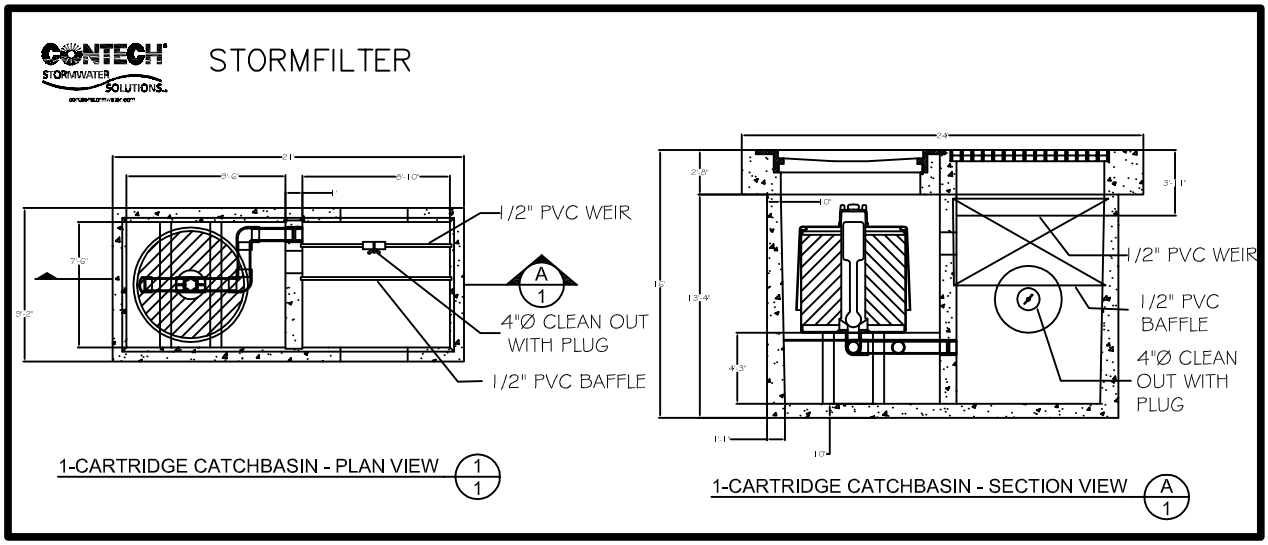

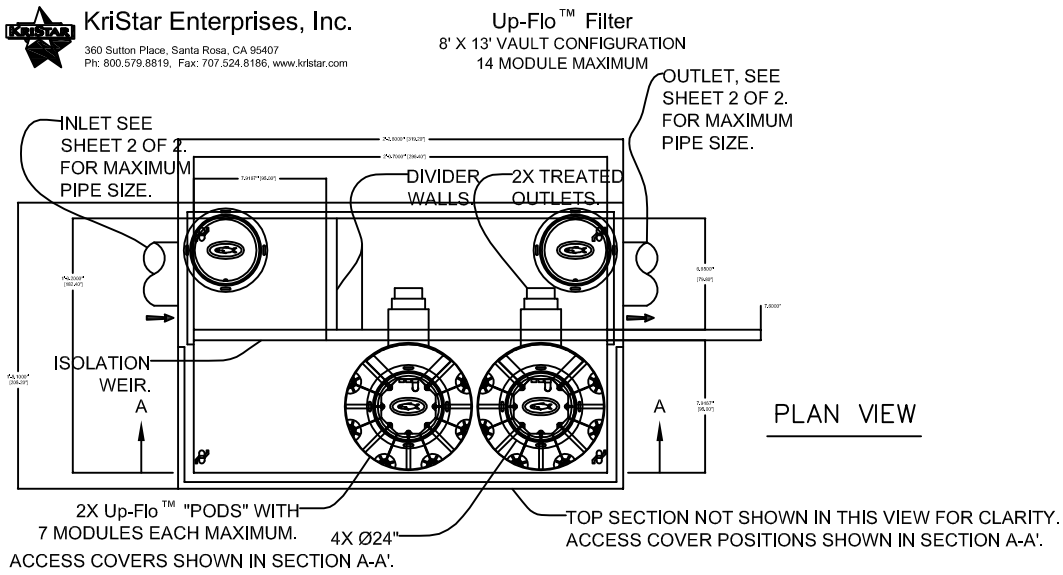

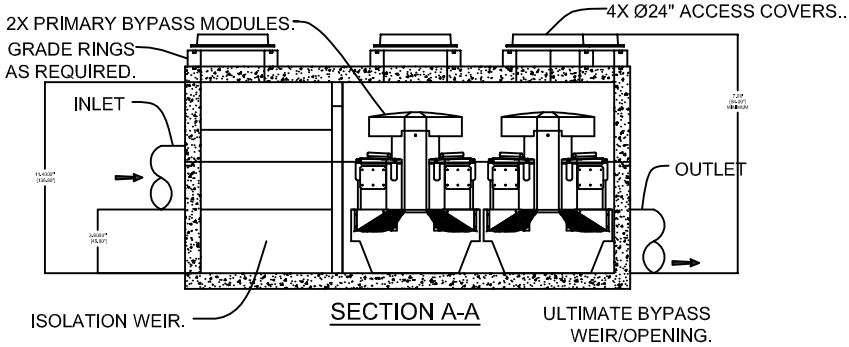

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Figure 6-24: Cartridge Media Filter

Table 6-27: Proprietary Cartridge Media Filter Manufacturer Websites

Device	Manufacturer	Website
BaySaver BayFilter	Baysaver Technologies Inc.	www.baysaver.com
ConTech StormFilter™	Contech® Construction Products Inc.	www.contech-cpi.com
CrystalStream	CrystalStream Technologies	www.crystalstream.com
KriStar Fossil Tee™ (media filter)	KriStar Enterprises Inc.	www.kristar.com
KriStar Up-Flo™ Filter and Perk™ Filter	KriStar Enterprises Inc.	www.kristar.com

Limitations

As with all filtration systems, use in catchments that have significant areas of non-stabilized soils can lead to premature clogging.

Design Criteria

1) Cartridge media filter BMP vendors are constantly updating and expanding their product lines, so refer to the latest design guidance from each of the vendors.

2) Selected filter media should target pollutants of concern. A combination of media is often recommended to maximize pollutant removal. Perlite is effective for removing TSS and oil and grease. Zeolite removes soluble metals, ammonium, and some organics. Vendors also offer proprietary medias (such as leaf compost or activated carbon) that are designed to remove soluble metals, organics, and other pollutants.

3) Manufacturers try to distinguish their products through innovative designs that aim at providing self cleaning and draining, uniformly loaded, and clog resistant cartridges that functional properly over a wide range of hydraulic loadings and pollutant concentrations.

4) All stormwater vaults containing cartridge filters that have standing water for longer than 72 hours can become a breeding area for mosquitoes. The selected BMP should have a system to completely drain the vault, such as weep holes in the bottom of the vault.

Sizing

1) Cartridge media filters should be sized to capture and treat the stormwater quality design flow rate.

2) Proprietary cartridge media filter devices, like most proprietary BMPs, and auxiliary components such as media, screens, baffles, and sumps are selected based onsite-specific conditions such as the loading that is expected and the desired frequency of maintenance. Sizing of proprietary devices is reduced to a simple process whereby a model can simply be selected from a table or a chart based on a few known quantities

(tributary area, location, design flow rate, etc). Most of the manufacturers either size the devices for potential clients or offer calculators on their websites that simplify the design process. For the latest sizing guidelines, refer to the manufacturer's website.

PT-1: Hydrodynamic Separation Device

Hydrodynamic separation devices (alternatively, swirl concentrators) are devices that remove trash, debris, and coarse sediment from incoming flows using screening, gravity settling, and centrifugal forces generated by forcing the influent into a circular motion. By having the water move in a circular fashion, rather than a straight line, it is possible to obtain significant removal of suspended sediments and attached pollutants with less space as compared to wet vaults and other settling devices. Hydrodynamic devices were originally developed for combined sewer overflows (CSOs), where they were used primarily to remove coarse inorganic solids. Hydrodynamic separation has been adapted for stormwater treatment by several manufacturers and is currently used to remove trash, debris, and other coarse solids down to sand-sized particles. Several types of hydrodynamic separation devices are also designed to remove floating oils and grease using sorbent media.

Hydrodynamic Separation

Photo Credits: 1. Contech Stormwater Solutions, Inc.; 2. Dave Weller, FedCo Construction

Application

- Parking lots
- Areas adjacent to parking lots
- Areas adjacent to buildings
- Road medians and shoulders

Preventative Maintenance

- Sediment, trash and debris removal
- Vector control

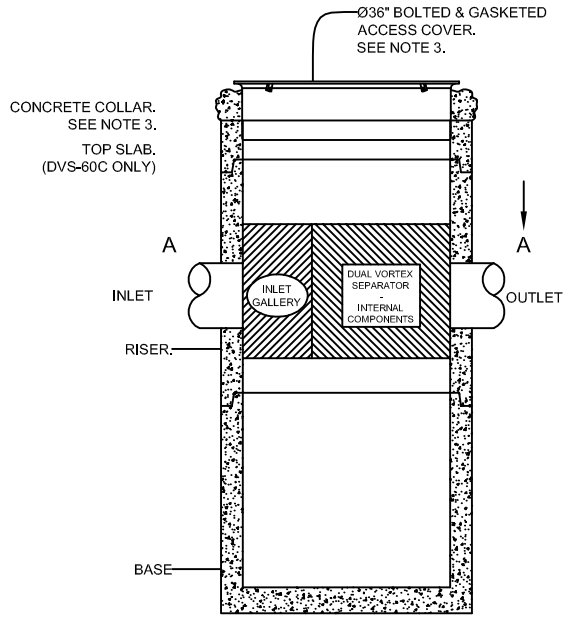

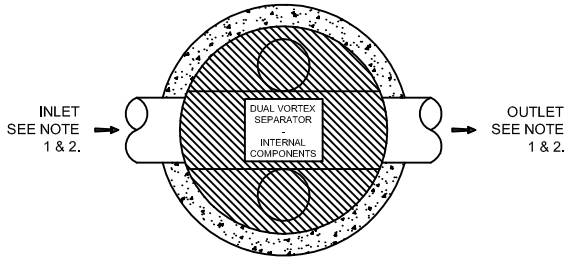

SECTION A-A

FloGard DUAL-VORTEX

KriStar Enterprises, Inc.

360 Sutton Place, Santa Rosa, CA 95407
Ph: 800.579.8819, Fax: 707.524.8186, www.kristar.com

CONTECH CDS SYSTEM

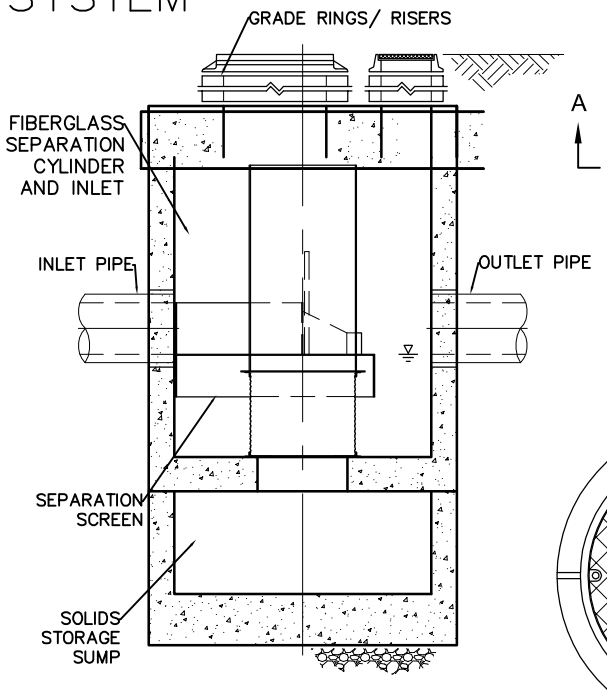

SECTION A–A'
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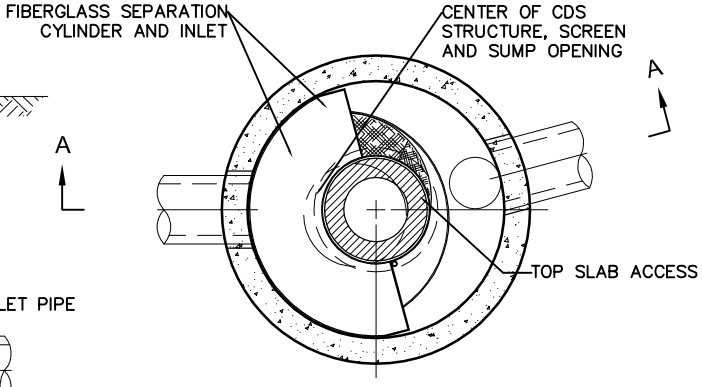

PLANVIEW
N.T.S

FRAME AND COVER
(DIAMETER VARIES)
N.T.S

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Figure 6-25: Hydrodynamic Separation

Table 6-28: Proprietary Hydrodynamic Device Manufacturer Websites

Device	Manufacturer	Website
Rinker In-Line Stormceptor®	Rinker Materials™	www.rinkerstormceptor.com
FloGard® Dual-Vortex Hydrodynamic Separator	KriStar Enterprises Inc.	www.kristar.com
Contech® CDS[a]™	Contech® Construction Products Inc.	www.contech-cpi.com
Contech® Vortechs™	Contech® Construction Products Inc.	www.contech-cpi.com
Contech® VorSentry™	Contech® Construction Products Inc.	www.contech-cpi.com
Contech® VorSentry™ HS	Contech® Construction Products Inc.	www.contech-cpi.com
BaySaver BaySeparator	Baysaver Technologies Inc.	www.baysaver.com

Limitations

Hydrodynamic separation devices are effective for the removal of course sediment, trash, and debris, and are useful as pretreatment in combination with other BMP types that target smaller particle sizes.

Hydrodynamic devices represent a wide range of device types that have different unit processes and design elements (e.g., storage versus flow-through designs, inclusion of media filtration, etc.) that vary significantly within the category. These design features likely have significant effects on BMP performance; therefore, generalized performance data for hydrodynamic devices is not practical.

Design Criteria

Proprietary hydrodynamic device BMP vendors are constantly updating and expanding their product lines, so refer to the latest design guidance from each of the vendors. General guidelines on the performance, sizing, operations and maintenance of proprietary devices are provided by the vendors.

Sizing

Hydrodynamic devices shall be sized to capture and treat the stormwater quality design flow rate and to completely drain within 72 hours.

Sizing of proprietary devices is reduced to a simple process whereby a model can simply be selected from a table or a chart based on a few known quantities (tributary area, location, design flow rate, design volume, etc). A few of the manufacturers either size the devices for potential clients or offer calculators on their websites that simplify the design process even further and lessens the possibility of using obsolete design information. For the latest sizing guidelines, refer to the manufacturer's website.

The hydrodynamic separators listed in Table 6-28 are designed to have a permanent pool of water stored within the system. Various methods of vector control are available to prevent mosquito breeding including manhole cover screens and the use of mosquito dunks. In many designs, oil and grease is stored at the water surface and provides a deterrent to mosquito breeding.

Operations and Maintenance

Hydrodynamic devices should be inspected every 6 months during the first year of operation. Inspection should also occur immediately following a storm event to assess the function of the device. Once the device is performing as designed, the frequency of inspection may be reduced to once per year.

PT-2: Catch Basin Insert

Catch basin inserts are manufactured filters or fabric placed in a drop inlet to remove sediment and debris and may include sorbent media (oil absorbent pouches) to remove floating oils and grease. Catch basin inserts are selected specifically based upon the orientation of the inlet.

Catch Basin Inserts

Photo Credits: 1. KriStar; 2. Aquashield

Application

- Parking lots
- Roads
- Athletic courts
- Outdoor food areas

Preventative Maintenance

- After storm inspection
- Sediment removal
- Trash removal
- Filter/sorbent media replacement

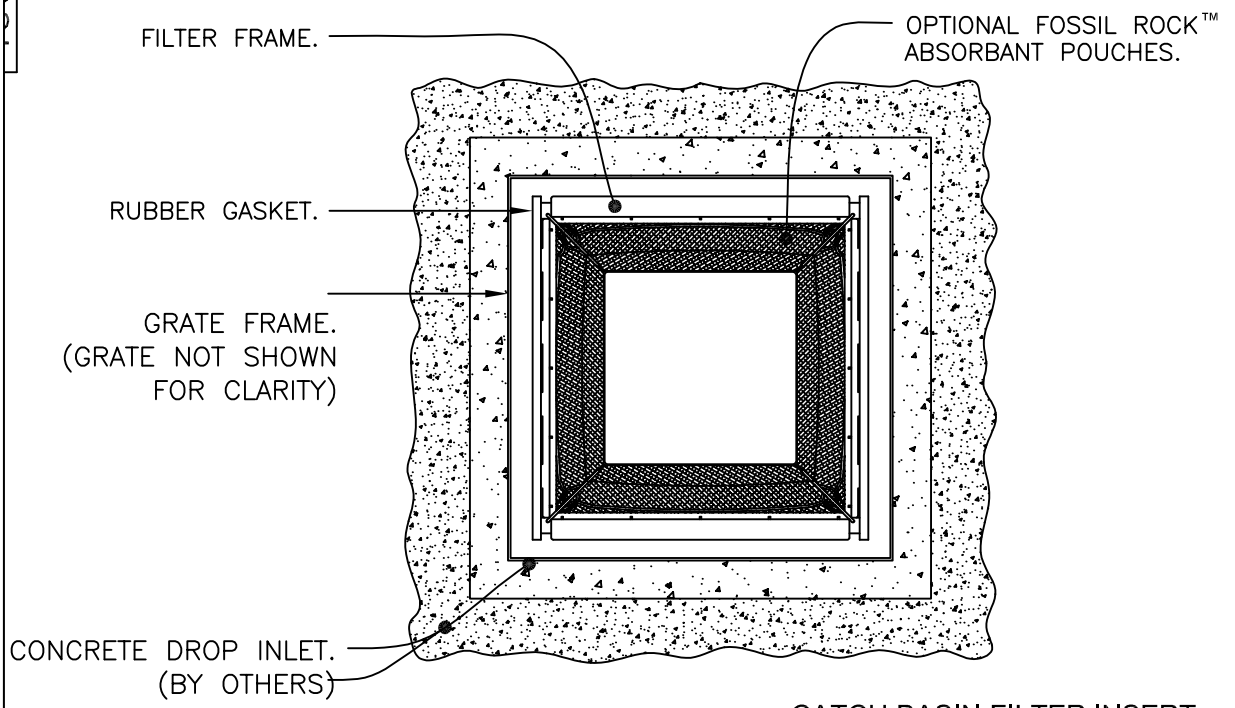

CATCH BASIN FILTER INSERT

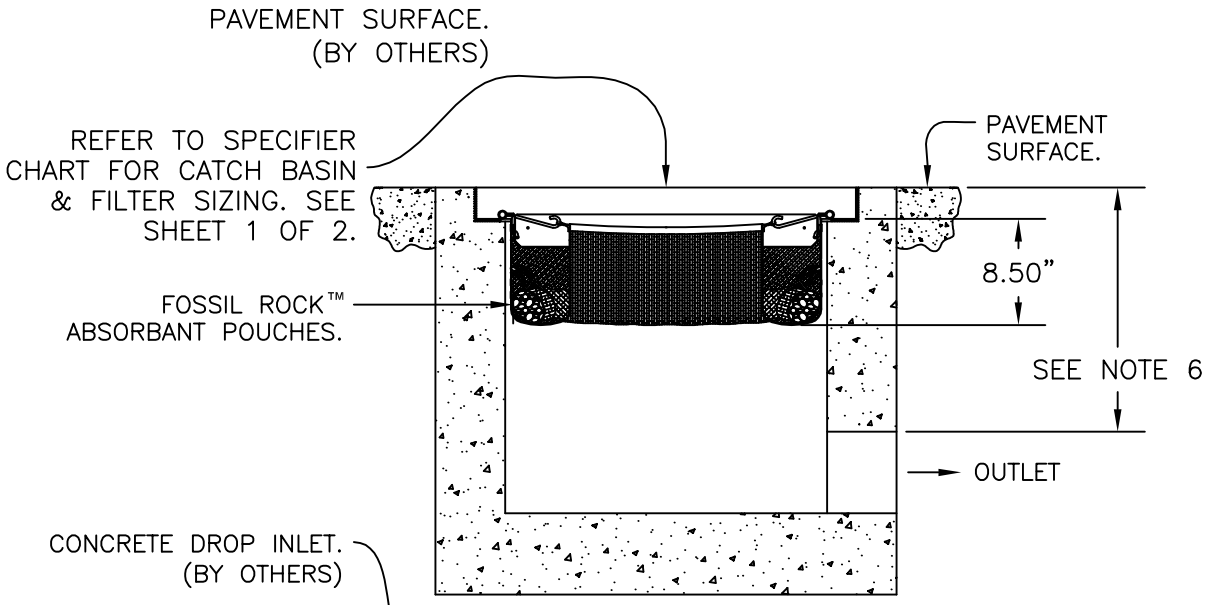

SECTION VIEW

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FloGard®

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Figure 6-26: Catch Basin

Table 6-29: Proprietary Catch Basin Insert Manufacturer Websites

Device	Manufacturer	Website
AbTech Industries Ultra-Urban Filter™	AbTech Industries	www.abtechindustries.com
Aquashield Aqua-Guardian™ Catch Basin Insert	Aquashield™ Inc.	www.aquashieldinc.com
Bowhead StreamGuard™	Aquashield™ Inc.	www.aquashieldinc.com
Contech® Triton Catch Basin Filter™	Contech® Construction Products Inc.	www.contech-cpi.com
Contech® Triton Curb Inlet Filter™	Contech® Construction Products Inc.	www.contech-cpi.com
Contech® Triton Basin StormFilter™	Contech® Construction Products Inc.	www.contech-cpi.com
Contech® Curb Inlet StormFilter™	Contech® Construction Products Inc.	www.contech-cpi.com
Curb Inlet Basket	SunTree Technologies Inc.	www.suntreetech.com
Curb Inlet Grates	EcoSense International™	www.ecosenseinternational.org
Grate Inlet Skimmer Box	SunTree Technologies Inc.	www.suntreetech.com
Hydro-Kleen™ Filtration System	Hydro Compliance Management Inc.	Not available
KriStar FloGard+PLUS®	KriStar Enterprises Inc.	www.kristar.com
KriStar FloGard®	KriStar Enterprises Inc.	www.kristar.com
KriStar FloGard LoPro Matrix Filter®	KriStar Enterprises Inc.	www.kristar.com
Nyloplast Storm-PURE Catch Basin Insert	Nyloplast Engineered Surface Drainage Products	www.nyloplast-us.com
StormBasin®	FabCo® Industries Inc.	www.fabco-industries.com
Stormdrain Solutions Interceptor	FabCo® Industries Inc.	www.fabco-industries.com
Stormdrain Solutions Inceptor®	Stormdrain Solutions	www.stormdrains.com
StormPod®	FabCo® Industries Inc.	www.fabco-industries.com
Stormwater Filtration Systems	EcoSense International™	www.ecosenseinternational.org
Ultra-CurbGuard®	UltraTech International Inc.	www.spillcontainment.com
Ultra-DrainGuard®	UltraTech International Inc.	www.spillcontainment.com
Ultra-GrateGuard®	UltraTech International Inc.	www.spillcontainment.com
Ultra-GutterGuard®	UltraTech International Inc.	www.spillcontainment.com
Ultra-InletGuard®	UltraTech International Inc.	www.spillcontainment.com

Limitations

Catch basin inserts come in such a wide range of configurations that it is practically impossible to generalize the expected performance. Inserts should mainly be used for catching coarse sediments and floatable trash, and are effective as pretreatment in combination with other types of structures that are recognized as water quality treatment BMPs. Trash and large objects can greatly reduce the effectiveness of catch basin inserts with respect to sediment and hydrocarbon capture. Frequent

maintenance and the use of screens and grates to keep trash out may decrease the likelihood of clogging and prevent obstruction and bypass of incoming flows.

Design Criteria

Catch basin inserts shall be sized to capture and treat the stormwater quality design flow rate.

Operations and Maintenance

1) Trash, debris, and sediment around insert grate and inside chamber requiring trash to be cleared.

2) Repair filter media if damaged or severely clogged.

3) Inspection of catch basin insert after each storm greater than 0.2 inches is recommended.

7 MAINTENANCE PLAN

This chapter identifies the basic information that should be included in a maintenance plan. Refer to Fact Sheets for individual control measures in Chapter 6 regarding device-specific maintenance requirements.

7.1 Site Map

1) Provide a site map showing boundaries of the site, acreage and drainage patterns/contour lines. Show each discharge location from the site and any drainage flowing onto the site. Distinguish between soft and hard surfaces on the map.

2) Identify locations of existing and proposed storm drain facilities, private sanitary sewer systems and grade-breaks for purposes of pollution prevention.

3) With legend, show locations of expected sources of pollution generation (outdoor work and storage areas, heavy traffic areas, delivery areas, trash enclosures, fueling areas, industrial clarifiers, wash-racks, etc). Identify any areas having contaminated soil or where toxins are stored or have been stored/disposed of in the past.

4) With legend, indicate types and locations of stormwater management control measures which will be built to permanently control stormwater pollution. Distinguish between pollution prevention, treatment, sewer diversion, and containment devices.

7.2 Baseline Descriptions

1) List the property owners and persons responsible for operation and maintenance of the stormwater management control measures onsite. Include phone numbers and addresses.

2) Identify the intended method of providing financing for operation, inspection, routine maintenance and upkeep of stormwater control measures.

3) List all permanent stormwater control measures. Provide a brief description of stormwater management control measures selected and if appropriate, facts sheets or additional information.

4) As appropriate for each stormwater control measure provide:

    a. A written description and check list of all maintenance and waste disposal activities that will be performed. Distinguish between the maintenance appropriate for a 2-year establishment period and expected long-term maintenance. For example, maintenance requirements for vegetation in a constructed wetland may be more intensive during the first few years until the vegetation is established. The post-establishment maintenance

plan should address maintenance needs (e.g., pruning, irrigation, weeding) for a larger, more stable system. Include maintenance performance procedures for facility components that require relatively unique maintenance knowledge, such as specific plant removal / replacement, landscape features, or constructed wetland maintenance. These procedures should provide enough detail for a person unfamiliar with maintenance to perform the activity, or identify the specific skills or knowledge necessary to perform and document the maintenance.

b. A description of site inspection procedures and documentation system, including record-keeping and retention requirements.

c. An inspection and maintenance schedule, preferably in the form of a table or matrix, for each activity for all facility components. The schedule should demonstrate how it will satisfy the specified level of performance, and how the maintenance / inspection activities relate to storm events and seasonal issues.

d. Identification of the equipment and materials required to perform the maintenance.

5) As appropriate, list all housekeeping procedures for prohibiting illicit discharges or potential illicit discharges to the storm drain. Identify housekeeping BMPs that reduce maintenance of Treatment Control Measures. These procedures are listed based on facility operations and can be found in the Ventura County Industrial/Commercial Clean Business Program document.

7.3 Spill Plan

1) Provide emergency notification procedures (phone and agency/persons to contact)

2) As appropriate for site, provide emergency containment and cleaning procedures.

3) Note downstream receiving water bodies or wetlands which may be affected by spills or chronic untreated discharges.

4) As appropriate, create an emergency sampling procedure for spills. (Emergency sampling can protect the property owner from erroneous liability for down-stream receiving area clean-ups).

7.4 Facility Changes

Operational or facility changes which significantly affect the character or quantity of pollutants discharging into the stormwater management control measures will require modifications to the Maintenance Plan and/or additional stormwater control measures.

7.5 Training

1) Identify appropriate persons to be trained and assure proper training.

2) Training to include:

   a. Good housekeeping procedures defined in the plan.

   b. Proper maintenance of all pollution mitigation devices.

   c. Identification and cleanup procedures for spills and overflows.

   d. Large-scale spill or hazardous material response.

   e. Safety concerns when maintaining devices and cleaning spills.

7.6 Basic Inspection and Maintenance Activities

1) Create and maintain onsite, a log for inspector names, dates and stormwater control measure devices to be inspected and maintained. Provide a checklist for each inspection and maintenance category.

2) Once annually, perform testing of any mechanical or electrical devices prior to wet weather.

3) Report any significant changes in stormwater management control measures to the site management. As appropriate, assure mechanical devices are working properly and/or landscaped BMP plantings are irrigated and nurtured to promote thick growth.

4) Note any significant maintenance requirements due to spills or unexpected discharges.

5) As appropriate, perform maintenance and replacement as scheduled and as needed in a timely manner to assure stormwater management control measures are performing as designed and approved.

6) Assure unauthorized low-flow discharges from the property do not by-pass stormwater control measures.

7) Perform an annual assessment of each pollution generation operation and its associated stormwater management control measures to determine if any part of the pollution reduction train can be improved.

7.7 Revisions of Pollution Mitigation Measures

If future correction or modification of past stormwater management control measures or procedures is required, the owner shall obtain approval from the governing stormwater

agency prior to commencing any work. Corrective measures or modifications shall not cause discharges to bypass or otherwise impede existing stormwater control measures.

7.8 Monitoring & Reporting Program

1) The governing stormwater agency may require a Monitoring & Reporting Program to assure the stormwater management control measures approved for the site are performing according to design.

2) If required by local permitting agency, the Maintenance Plan shall include performance testing and reporting protocols.

APPENDIX A : ACRONYMS AND GLOSSARY OF TERMS

A.1 Acronyms and Abbreviations

303(d)	303(d) List of Impaired Water Bodies
API	American Petroleum Institute (oil/water separator type)
BMP	Best Management Practice
CEQA	California Environmental Quality Act
CP	Coalescing Plate (oil/water separator type)
CTR	California Toxics Rule
CWA	Clean Water Act
CDFG	California Department of Fish and Game
EIA	Effective Impervious Area
EMC	Event Mean Concentration
ESA	Environmentally Sensitive Area
LID	Low Impact Development
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
RPAMP	Redevelopment Project Area Master Plan
SQDV	Stormwater Quality Design Volume
SQDF	Stormwater Quality Design Flow
TSS	Total Suspended Solids
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
WERF	Water Environment Research Foundation

A.2 Glossary

Automotive Repair Shop: A facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

Backfill: Earth or engineered material used to refill a trench or an excavation.

Berm: An earthen mound used to direct the flow of runoff around or through a structure.

Best Management Practice (BMP): Any program, technology, process, siting criteria, operational methods or measures, or engineered systems, which when implemented prevent, control, remove, or reduce pollution.

Best Management Practices (BMPs): Includes schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Biofiltration: The simultaneous process of filtration, infiltration, adsorption, and biological uptake of pollutants in stormwater that takes place when runoff flows over and through vegetated areas.

Bioretention Facility: A facility that utilizes soil infiltration and both woody and herbaceous plants to remove pollutants from stormwater runoff. Runoff is typically captured and infiltrated or released over a period of 24 to 48 hours.

Blue Roof: A roof that is designed to store rainwater, typically in a cistern-type device.

Brown Roof: A type of green roof which focuses on biodiversity and locally-sourced material.

Buffer Strip or Zone: Strip of erosion-resistant vegetation over which stormwater runoff is directed.

Capacity: The capacity of a stormwater drainage facility is the flow volume or rate that the facility (e.g., pipe, basin, vault, swale, ditch, drywell, etc.) is designed to safely contain, receive, convey, reduce pollutants from, or infiltrate stormwater to meet a specific performance standard. There are different performance standards for pollution reduction, flow control, conveyance, and destination/ disposal, depending on location.

Catch Basin: Box-like underground concrete structure with openings in curbs and gutters designed to collect runoff from streets and pavements.

Check Dam: Small temporary barrier, grade control structure, or dam constructed across a swale, drainage ditch, or area of concentrated flow with the intent to slow or stop runoff.

Clean Water Act (CWA): (33 U.S.C. 1251 et seq.) requirement of the National Pollutant Discharge Elimination System (NPDES) program are defined under Sections 307, 402, 318 and 405 of the CWA.

Commercial Development: Any development on private land that is not heavy industrial or residential. The category includes, but is not limited to: hospitals, laboratories and other medical facilities, educational institutions, recreational facilities, plant nurseries, multi-apartment buildings, car wash facilities, mini-malls and other business complexes, shopping malls, hotels, office buildings, public warehouses and other light industrial complexes.

Conduit: Any channel or pipe for directing the flow of water.

Construction General Permit: A NPDES permit issued by the State Water Resources Control Board (SWRCB) for the discharge of stormwater associated with construction activity from soil disturbance of five (5) acres or more.

Control Device: A device used to hold back or direct a calculated amount of stormwater to or from a stormwater management facility. Typical control structures include vaults or manholes fitted with baffles, weirs, or orifices.

Conveyance System: Any channel or pipe for collecting and directing the Stormwater.

Culvert: A covered channel or a large diameter pipe that crosses under a road, sidewalk, etc.

Dead-end Sump: A below surface collection chamber for small drainage areas that is not connected to the public storm drainage system. Accumulated water in the chamber must be pumped and disposed in accordance with all applicable laws.

Designated Public Access Points: Any pedestrian, bicycle, equestrian, or vehicular point of access to jurisdictional channels in the area of Ventura County subject to permit requirements.

Detention: The temporary storage of stormwater runoff to allow treatment by sedimentation and metered discharge of runoff at reduced peak flow rates.

Detention Facility: A facility designed to receive and hold stormwater and release it at a slower rate, usually over a number of hours. The full volume of stormwater that enters the facility is eventually released.

Detention Tank, Vault, or Oversized Pipe: A structural subsurface facility used to provide flow control for a particular drainage basin.

Development: any construction, rehabilitation, redevelopment or reconstruction of any public or private residential project (whether single-family, multi-unit or planned unit development); industrial, commercial, retail and any other non-residential projects, including public agency projects; or mass grading for future construction.

Directly Adjacent: Situated within 200 feet of the contiguous zone required for the continued maintenance, function, and structural stability of the environmentally sensitive area.

Directly Connected Impervious Area (DCIA): The area covered by a building, impermeable pavement, and/ or other impervious surfaces, which drains directly into the storm drain without first flowing across permeable land area (e.g. turf buffers).

Directly Discharging: Outflow from a drainage conveyance system that is composed entirely or predominantly of flows from the subject, property, development, subdivision, or industrial facility, and not commingled with the flows from adjacent lands.

Discharge: A release or flow of Stormwater or other substance from a conveyance system or storage container.

Disturbed Area: Any area that is altered as a result of land disturbance, such as: clearing, grading, grubbing, stockpiling and excavation.

Drainage Basin: A specific area that contributes stormwater runoff to a particular point of interest, such as a stormwater management facility, drainageway, wetland, river, or pipe.

Effective Impervious Area (EIA): That portion of the surface area that is hydrologically connected via sheet flow over a hardened conveyance or impervious surface without any intervening medium to mitigate flow volume.

Environmentally Sensitive Area (ESA): An area "in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which would be easily disturbed or degraded by human activities and developments" (California Public Resources Code § 30107.5). Areas subject to stormwater mitigation requirements are: 303(d) listed water bodies in all reaches that are unimproved, all California Coastal Commission's *Environmentally Sensitive Habitat Areas* as delineated on maps in Local Coastal Plans, and Regional Water Quality Control Board's Basin Plan Rare, Threatened or Endangered Species (RARE) and Preservation of Biological Habitats (BIOL) designated waterbodies. The California Department of Fish and Game's (CDFG) *Significant Natural Areas* map will be considered for inclusion as the department field-verifies the designated locations. Watershed restoration projects will be considered for inclusion as the department field verifies the designated locations.

Erosion: The wearing a way of land surface by wind or water. Erosion occurs naturally from weather or runoff, but can be intensified by land-clearing practices relating to farming; residential, commercial, or industrial development; road building; or timber cutting.

Excavation: The process of removing earth, stone, or other materials, usually by digging.

Existing Urban Area: Existing urban areas and corresponding maps in Appendix B are based on the cities' City Urban Restriction Boundaries (CURB) lines and the Existing Community designation in the unincorporated County. These boundaries are a growth management tool intended to channel growth and protect agricultural and open-space land. The 2011 TGM utilizes existing urban areas (as defined in Appendix B) to provide parameters around eligibility for alternative compliance in two areas: 1) Smart Growth and 2) low income housing projects.

Extended Detention Basin: A surface vegetated basin used to provide flow control for a particular drainage basin. Stormwater temporarily fills the extended detention basin during large storm events and is slowly released over a number of hours, reducing peak flow rates.

Facility: Is a collection of industrial process discharging stormwater associated with industrial activity within the property boundary or operational unit.

Filter Fabric: Geotextile of relatively small mesh or pore size that is used to: (a) allow water to pass through while keeping sediment out (permeable); or (b) prevent both runoff and sediment from passing through (impermeable).

Filter Strip: A gently sloping, densely grassed area used to filter, slow, and infiltrate stormwater.

Flow Control Facility: Any structure or drainage device that is designed, constructed, and maintained to collect, retain, infiltrate, or detain surface water runoff during and after a storm event for the purpose of controlling post-development quantity leaving the site.

Flow Control: The practice of limiting the release of peak flow rates, flow durations, and volumes from a site. Flow control is intended to protect downstream properties, infrastructure, and natural resources from the increased stormwater runoff flow rates and volumes resulting from development.

Grading: The cutting and/or filling of the land surface to a desired shape or elevation.

Green Roof: A roofing system that layers a soil/vegetative cover over a waterproofing membrane. Green roofs rely on highly porous media and moisture retention layers to store intercepted precipitation and to support vegetation that can reduce the volume of stormwater runoff via evapotranspiration

Hazardous Substance: (1) Any material that poses a threat to human health and/or the environment. Typical hazardous substances are toxic, corrosive, ignitable, explosive, or chemically reactive; (2) Any substance named by EPA to be reported if a designated quantity of the substance is spilled in the waters of the United States or if otherwise emitted into the environment.

Hazardous Waste: By-products of society that can pose a substantial or potential hazard to human health or the environment when improperly managed. Possesses at least one of four characteristics (flammable, corrosivity, reactivity, or toxicity), or appears on special EPA lists.

Hillside: Property located in an area with known erosive soil conditions, where the development contemplates grading on any natural slope that is 25 percent or greater.

Hydrodynamic Separation: Flow-through structures with a settling or separation unit to remove sediments and other pollutants in which no outside power source is required, because the energy of the flowing water allows the sediments to efficiently separate. Depending on the type of unit, this separation may be by means of swirl action or indirect filtration.

Illegal Discharges: Any discharge to a municipal separate storm sewer that is not composed entirely of stormwater except discharges authorized by an NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer) and discharges resulting from fire fighting activities.

Impervious Surface / Area: A hard surface area which either prevents or retards the entry of water into the predevelopment soil mantle. A hard surface area which causes water to run off the surface in greater quantities or at an increased rate of flow from the flow present under predevelopment conditions. Common impervious surfaces include, but are not limited to, roof tops, walkways, patios, driveways, parking lots or storage areas, (impermeable) concrete or asphalt paving, gravel roads, packed earthen materials, and oiled macadam or other surfaces which similarly impede the natural infiltration of storm water.

Industrial General Permit: A NPDES permit issued by the State Water Resources Control Board for the discharge of Stormwater associated with industrial activity.

Infiltration: The downward entry of water into the surface of the soil.

Infiltration Trench: A linear excavation, backfilled with gravel, used to filter pollutants and infiltrate storm water.

Integrated Pest Management Plan (IPMP): A balanced approach to pest management which incorporates the many aspects of plant health care in ways that mitigate harmful environmental impacts and protect human health.

Inlet: An entrance into a ditch, storm sewer, or other waterway.

Legacy Pollutants: Pollutants that are no longer in production but remain in site soils and groundwater and still have the potential to cause ecological and water quality impacts.

Material Storage Areas: On site locations where raw materials, products, final products, by-products, or waste materials are stored.

Maximum Extent Practicable (MEP): The technology-based permit requirement established by Congress in CWA section 402(p)(3)(B)(iii) that municipal dischargers of stormwater must meet. Technology-based requirements, including MEP, establish a level of pollutant control that is derived from available technology or other controls. MEP requires municipal dischargers to perform at maximum level that is practicable. Compliance with MEP may be achieved by emphasizing pollution prevention and source control BMPs in combination with structural and treatment methods where appropriate. The MEP approach is an ever evolving and advancing concept, which considers technical and economic feasibility.

Municipal Separate Storm Sewer System (MS4) Permit: : A NPDES permit issued by the Regional Water Quality Control Board for the discharge of Stormwater from Municipal Separate Storm Sewer Systems.

New Development: Land disturbing activities; structural development, including construction or installation of a building or structure, creation and replacement of impervious surfaces; and land subdivision.

Non-Stormwater Discharge: Any discharge to municipal separate storm drain that is not composed entirely of stormwater. Discharges containing process wastewater, non-contact cooling water, or sanitary wastewater are non-stormwater discharges.

Non-Structural Source Control Measure: Low technology, low cost activities, procedures or management practices designed to prevent pollutants associated with site functions and activities from being discharged with Stormwater runoff. Examples include good housekeeping practices, employee training, standard operating practices, inventory control measures, etc.

Notice of Intent (NOI): A formal notice to State Water Resources Control Board submitted by the owner/developer that a construction project is about to begin. The NOI provides information on the owner, location, type of project, and certifies that the permittee will comply with the conditions of the construction general permit.

NPDES Permit: An authorization, license, or equivalent control document issued by EPA or an approved State agency to implement the requirements of the NPDES program.

Operations and Maintenance (O&M): The continuing activities required to keep storm water management facilities and their components functioning in accordance with design objectives.

Outfall: The point where stormwater discharges from a pipe, channel, ditch, or other conveyance to a waterway.

Parking Lot: Land area or facility for the temporary parking or storage of motor vehicles used personally, for business or for commerce with an impervious surface area of 5,000 square feet or more, or with 25 or more parking spaces.

Permeability: A property of soil that enables water or air to move through it. Usually expressed in inches/hour or inches/day.

Pervious Surface/Area: A surface or area with a surface (i.e., soil, loose rock, permeable pavement, etc.) that allows water to infiltrate (soak) into the ground.

Planter Box: A structural facility filled with topsoil and gravel and planted with vegetation. The planter is completely sealed, and a perforated collection pipe is placed under the soil and gravel, along with an overflow provision, and directed to an acceptable destination point. The storm water planter receives runoff from impervious surfaces, which is filtered and retained for a period of time.

Pollutant: An elemental or physical material that can be mobilized or dissolved by water or air and creates a negative impact to human health and/ or the environment. Pollutants include suspended solids (sediment), heavy metals (such as lead, copper, zinc, and cadmium), nutrients (such as nitrogen and phosphorus), bacteria and viruses, organics (such as oil, grease, hydrocarbons, pesticides, and fertilizers), floatable debris, and increased temperature.

Pollutants of Concern: constituents that have exceeded Basin Plan Objectives, and California Toxics Rule chronic or acute objectives during monitoring at mass emission, receiving water, and land use stations.

Pollution Reduction: The practice of filtering, retaining, or detaining surface water runoff during and after a storm event for the purpose of maintaining or improving surface and/or groundwater quality.

Precipitation: Any form of rain or snow.

Predevelopment: The existing land use condition prior to the proposed development activity.

Practicable: Available and capable of being done, after taking into consideration existing technology, legal issues, and logistics in light of overall project purpose.

Pre-developed Condition: the native vegetation and soils that existed at a site prior to first development. The pre-developed condition may be assumed to be the

typical vegetation, soil, and stormwater runoff characteristics of open space areas in coastal Southern California unless reasonable historic information is provided that the area was atypical.

Pre-project Condition: the condition of the site at the time of the proposed project.

Pretreatment: Treatment of wastewater before it is discharged to a wastewater collection system.

Process Wastewater: Wastewater that has been used in one or more industrial processes.

Project: development, redevelopment, and land disturbing activities. The term is not limited to "project" as defined under CEQA (Reference: California Public Resources Code § 21065).

Public Facility: A street, right-of-way, park, sewer, drainage, storm water management, or other facility that is either currently owned by the City/County or will be conveyed to the City/County for maintenance responsibility after construction.

Rainwater Harvesting: Rainwater harvesting is a BMP that stores and uses rainwater or stormwater runoff. This is consistent with the use of the term "reuse" contained in Order R4-2010-0108.

Receiving Stream: (for purposes of this Manual only) any natural or man-made surface water body that receives and conveys stormwater runoff.

Redevelopment: Land-disturbing activity that results in the creation, addition, or replacement of 5,000 square feet or more of impervious surface area on an already developed site. Redevelopment includes, but is not limited to: the expansion of a building footprint; addition or replacement of a structure; replacement of impervious surface area that is not part of a routine maintenance activity; and land disturbing activities related to structural or impervious surfaces. It does not include routine maintenance to maintain original line and grade, hydraulic capacity, or original purpose of facility, nor does it include emergency construction activities required to immediately protect public health and safety. Note: redevelopment as defined here is not the same as a "Redevelopment Project" as defined by California redevelopment law.

Redevelopment Project Area Master Plan (RPAMP): A plan submitted to the Regional Water Board for approval by a Permittee or a coalition of Permittees to establish standards for redevelopment projects within Redevelopment Project Areas, in consideration of exceptional site constraints that inhibit site-by-site or project-by-project implementation of post-construction requirements. See Section 4.E.IV.3 of Order R4-2010-0108.

Restaurant: A stand-alone facility that sells prepared foods and/or drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and/or drinks for immediate consumption (SIC code 5812).

Retail Gasoline Outlet: Any facility engaged in selling gasoline and lubricating oils.

Retention Facility: A facility designed to receive and hold stormwater runoff. Rather than storing and releasing the entire runoff volume, retention facilities permanently retain a portion of the water on-site, where it infiltrates, evaporates, or is absorbed by surrounding vegetation. In this way, the full volume of storm water that enters the facility is not released off-site.

Retrofit: Retrofit projects implement structural treatment BMPs as a stand-alone project, without other site improvements. The BMP sizing requirements of this Technical Guidance Manual do not apply to retrofit projects.

Runoff: Water originating from rainfall and other precipitations (e.g., sprinkler irrigation) that is found in drainage facilities, rivers, streams, springs, seeps, ponds, lakes, wetlands, and shallow groundwater.

Runon: Stormwater surface flow or other surface flow which enters property other than that where it originated.

Secondary Containment: Structures, usually dikes or berms, surrounding tanks or other storage containers and designed to catch spilled material from the storage containers.

Sedimentation: The process of depositing soil particles, clays, sands, or other sediments that were picked up by runoff.

Sediments: Soil, sand, and minerals washed from land into water usually after rain, that accumulate in reservoirs, rivers, and harbors, destroying aquatic animal habitat and clouding the water so that adequate sunlight might not reach aquatic plants.

Site: land or water area where any “facility” or “activity” is physically located or conducted including adjacent land used in connection with the facility or activity.

Source Control BMP or Measure: Any schedules of activities, structural devices, prohibitions of practices, maintenance procedures, managerial practices or operational practices that aim to prevent Stormwater pollution by reducing the potential for contamination at the source of pollution.

Source Control BMPs: Operational practices or design features that prevent pollution by reducing potential pollutants at the source.

Spill Guard: A device used to prevent spills of liquid materials from storage containers.

Spill Prevention Control and Countermeasures Plan (SPCC): Plan consisting of structures, such as curbing, and action plans to prevent and respond to spills of hazardous substances as defined in the Clean Water Act.

Storm Drains: Above and below ground structures for transporting stormwater to streams or outfalls for flood control purposes.

Storm Drain System: Network of above and below-ground structures for transporting stormwater to streams or outfalls.

Storm Event: A rainfall event that produces more than 0.1 inch of precipitation and is separated from the previous storm event by at least 72 hours of dry weather.

Stormwater Discharge Associated with Industrial Activity: Discharge from any conveyance which is used for collecting and conveying stormwater which is related to manufacturing processing or raw materials storage areas at an industrial plant [see 40 CFR 122.26(b)(14)].

Stormwater: Stormwater runoff, snow-melt runoff, surface runoff, and drainage, excluding infiltration and irrigation tailwater.

Structural BMP or Control Measure: Any structural facility designed and constructed to mitigate the adverse impacts of stormwater and urban runoff pollution (e.g. canopy, structural enclosure). The category may include both Treatment Control BMPs and Source Control BMPs.

Total Project Area: Total project area (or “gross project area”) for new development and redevelopment projects is the disturbed, developed, and undisturbed portions within the project’s property (or properties) boundary, at the project scale submitted for first approval. Areas proposed to be permanently dedicated for open space purposes as part of the project are explicitly included in the "total project area." Areas of land precluded from development through a restrictive covenant, conservation easement, or other recorded document for the permanent preservation of open space prior to project submittal shall not be included in the "total project area."

Total Suspended Solids (TSS): Matter suspended in stormwater excluding litter, debris, and other gross solids exceeding 1 millimeter in diameter.

Treatment Control BMP or Measure: Any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media adsorption or any other physical, biological, or chemical process.

Treatment: The application of engineered systems that use physical, chemical, or biological processes to remove pollutants. Such processes include, but are not limited to, filtration, gravity settling, media adsorption, biodegradation, biological uptake, chemical oxidation and UV radiation.

Tributary Area: The area from which all runoff produced flows to the same specific discharge point.

Vegetated Facilities: Stormwater management facilities that rely on plantings to enhance their performance. Plantings can provide wildlife habitat and enhance many facility functions, including infiltration, pollutant removal, water cooling, flow calming, and prevention of erosion.

Vegetated Swale: A long and narrow, trapezoidal or semicircular channel, planted with a variety of trees, shrubs, and grasses or with a dense mix of grasses. Stormwater runoff from impervious surfaces is directed through the swale, where it is slowed and in some cases infiltrated, allowing pollutants to settle out. Check dams are often used to create small ponded areas to facilitate infiltration.

APPENDIX B : MAPS

NOTES:

1. Contact the local permitting authority for more detailed maps.
2. Existing Urban Area maps are current as of 11/2/10.

056338

Legend

- River
- Lake
- National Forest
- 10-Digit Hydrologic Unit Boundary

Existing Urban Area

- Camarillo
- Fillmore
- Moorpark
- Oxnard
- Santa Paula
- Simi Valley
- Thousand Oaks
- Port Hueneme
- Ventura
- Ojai
- Urban County
- Non-Urban County
- Adjacent County

10 5 0 10 Miles

Hydrologic Areas

Ventura County, CA

Geosyntec consultants

Oakland Office | April 2010

Figure **B-1**

P:\GIS\Ventura_County_Manual\Projects\B-1_Ventura_County_Watersheds_MS4_Urban_Areas_042910.mxd, WHL, September 1, 2010

056339

Legend

- BIOL Designated Waterbody
- 303(d) Listed Waterbody
- Environmentally Sensitive Habitat Areas
- Lake
- National Forest

Existing Urban Area

- Camarillo
- Fillmore
- Moorpark
- Oxnard
- Santa Paula
- Simi Valley
- Thousand Oaks
- Port Hueneme
- Ventura
- Ojai
- Urban County
- Non-Urban County
- Adjacent County

10 5 0 10 Miles

Environmentally Sensitive Areas
Ventura County, CA

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Figure **B-2**

B-2_Ventura_County_ESA_042910.mxd, WHL, September 1, 2010

056340

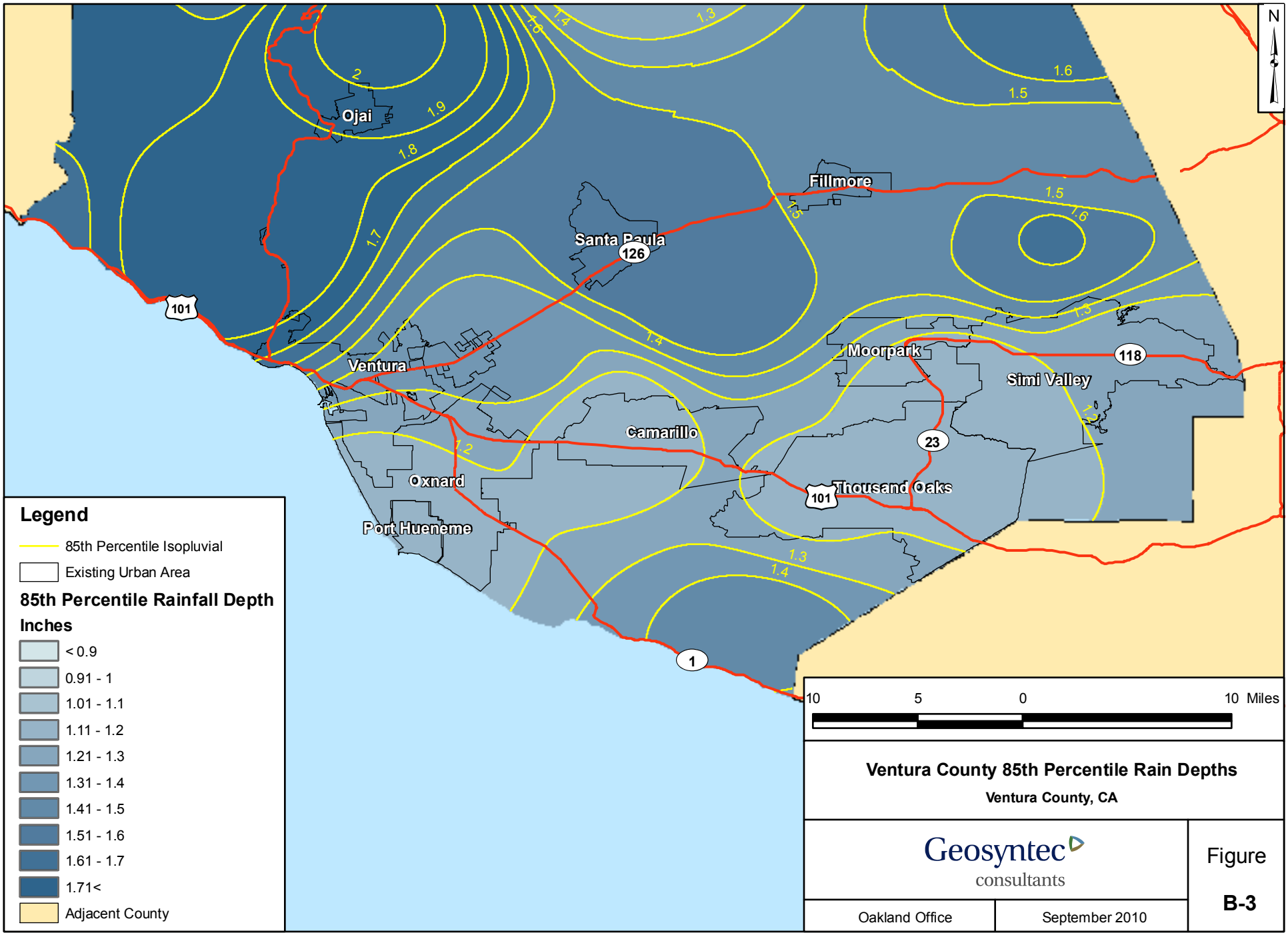

Ventura County 85th Percentile Rain Depths

Ventura County, CA

Geosyntec consultants

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Figure **B-3**

P:\GIS\Ventura_County_Manual\Projects\B-3_Ventura_County_85th_Isopluvials_092010.mxd, WHL, September 20, 2010

056341

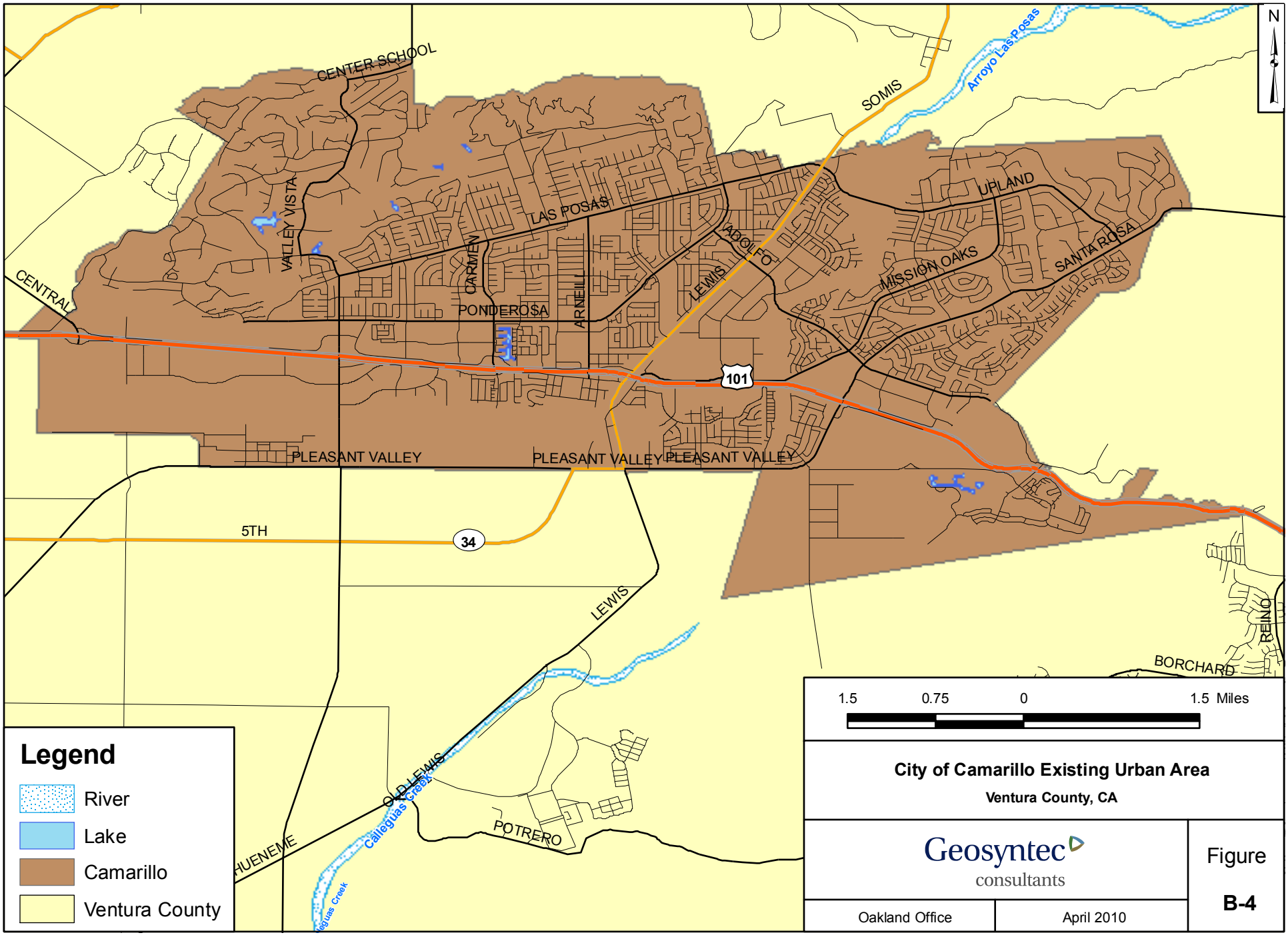

City of Camarillo Existing Urban Area

Ventura County, CA

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Figure **B-4**

P:\GIS\Ventura_County_Manual\Projects\B-4_Camarillo_MS4_Pop_Areas_092410.mxd, WHL, September 24, 2010

056342

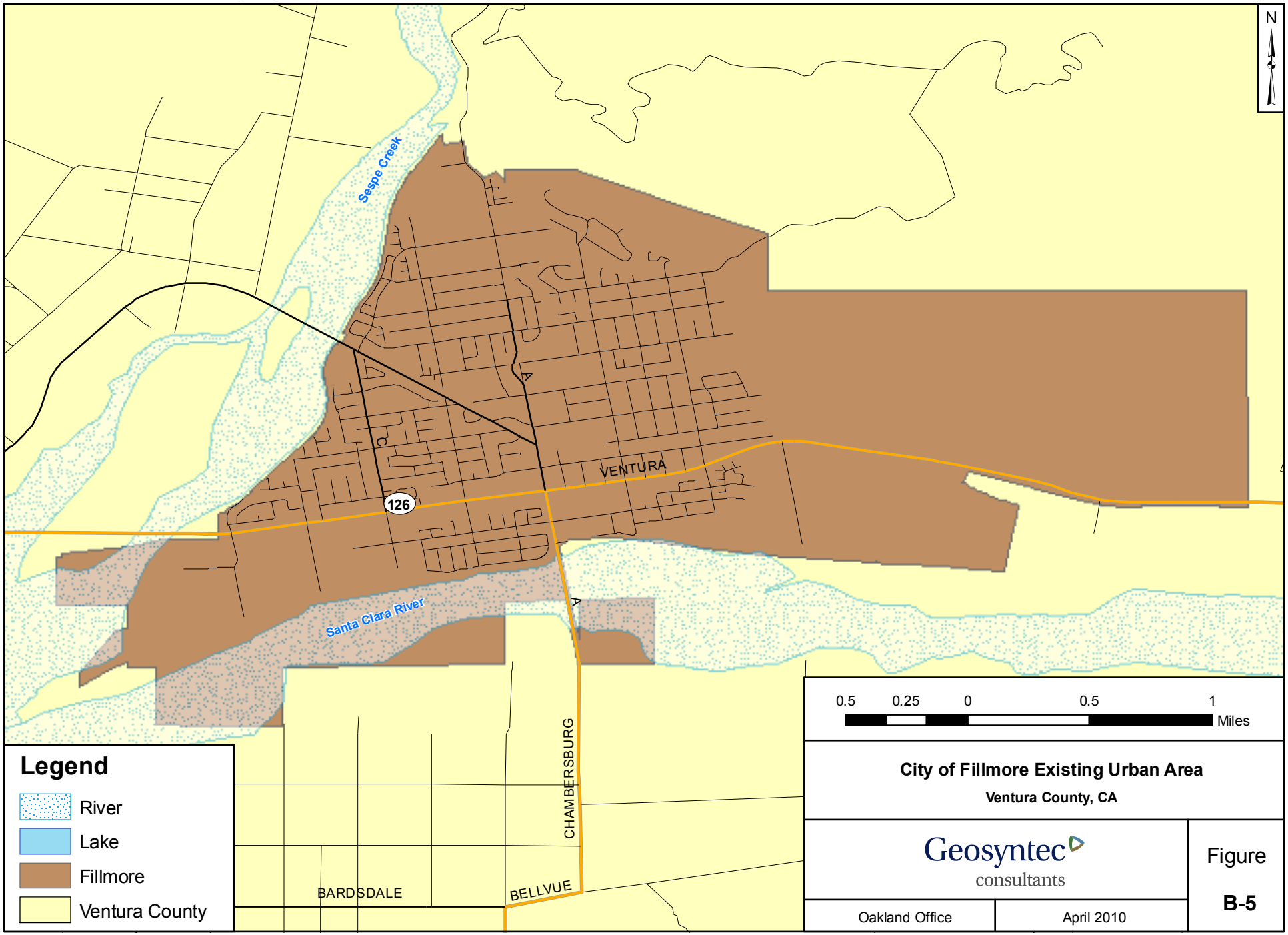

City of Fillmore Existing Urban Area

Ventura County, CA

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Figure

B-5

P:\GIS\Ventura_County_Manual\Projects\B-5Fillmore_MS4_Pop_Areas_092310.mxd, WHL, September 24, 2010

056343

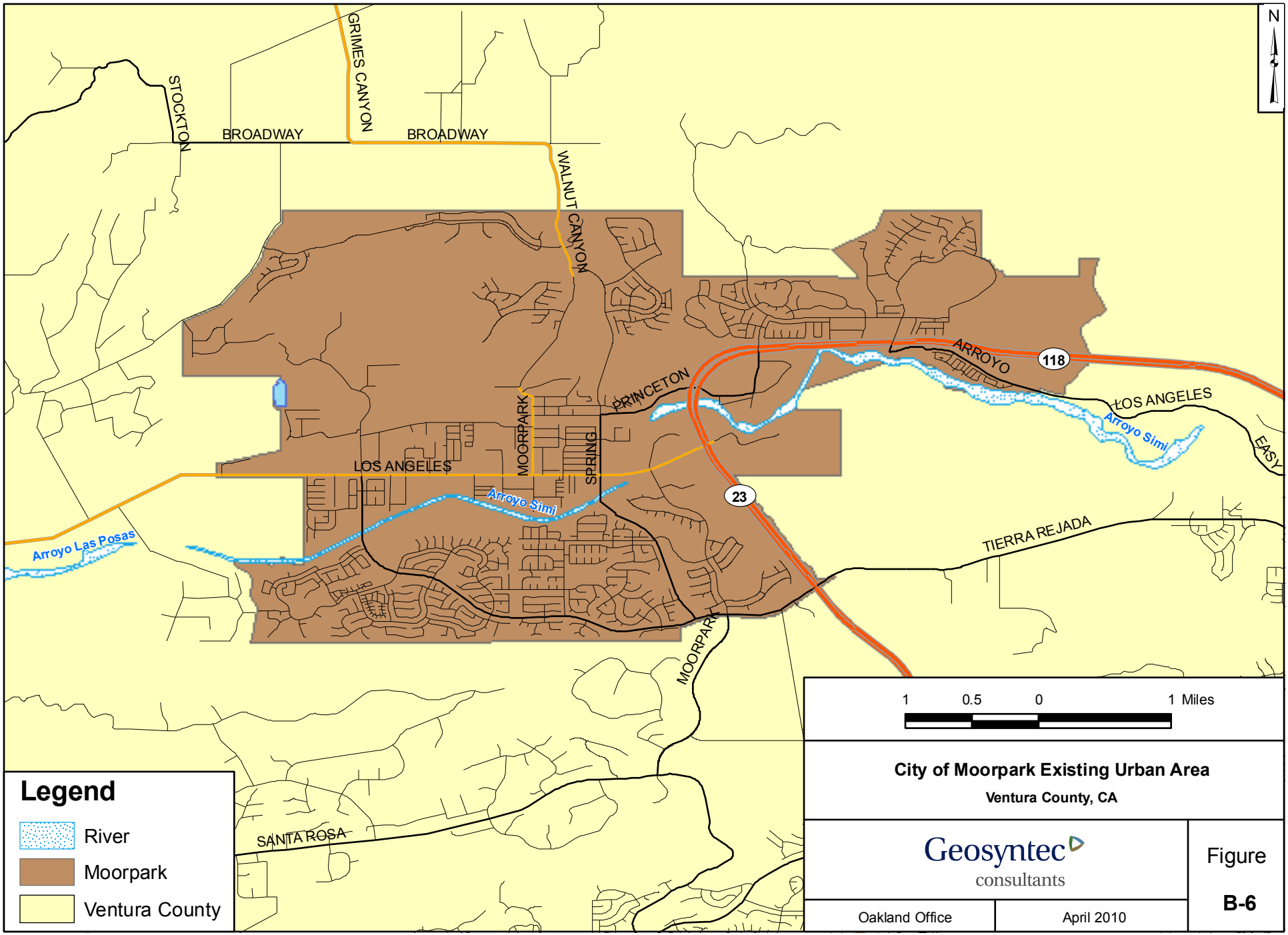

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056344

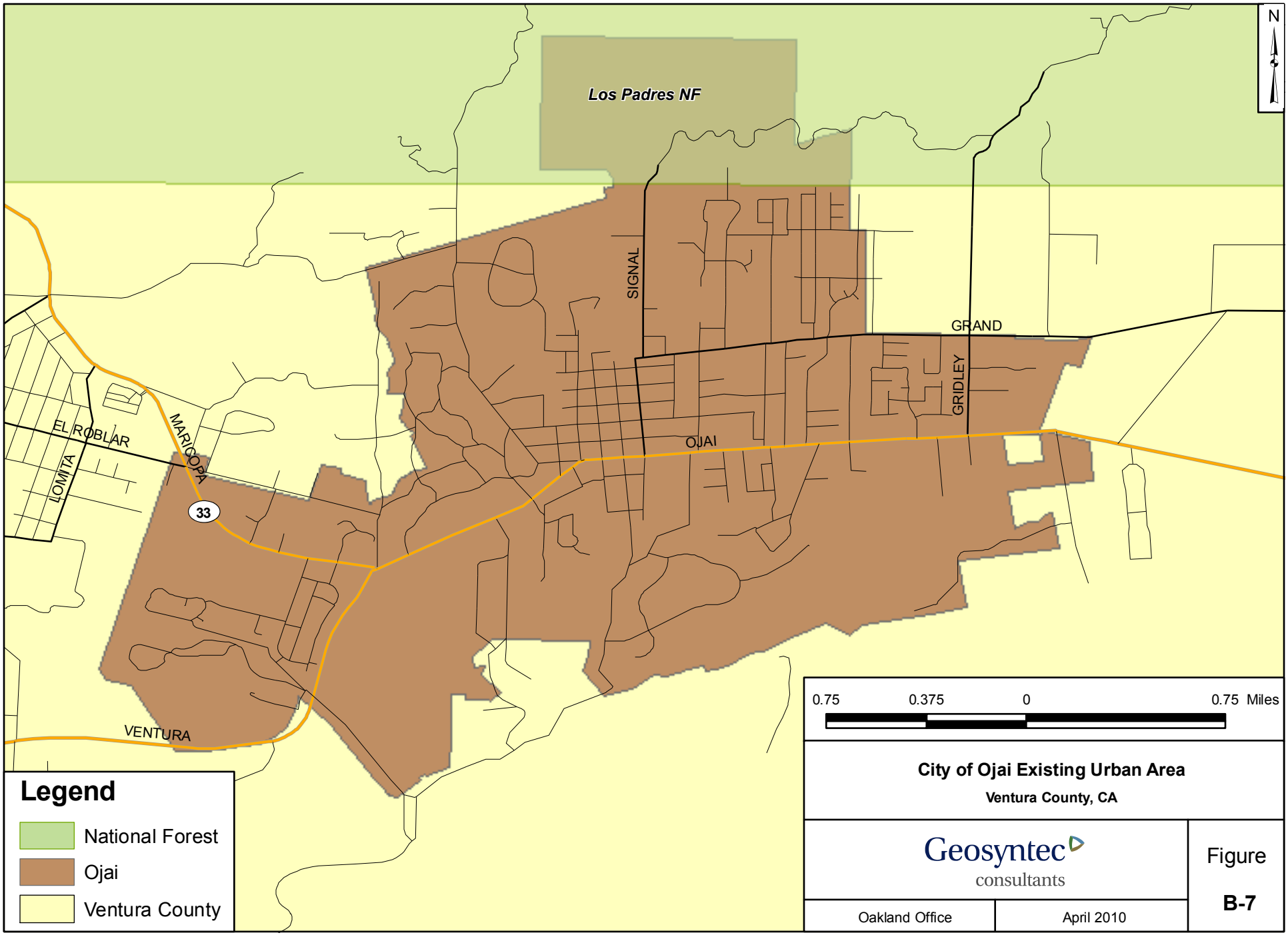

City of Ojai Existing Urban Area

Ventura County, CA

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Figure **B-7**

P:\GIS\Ventura_County_Manual\Projects\B-7_Ojai_MS4_Pop_Areas_092310.mxd, WHL, September 23, 2010

056345

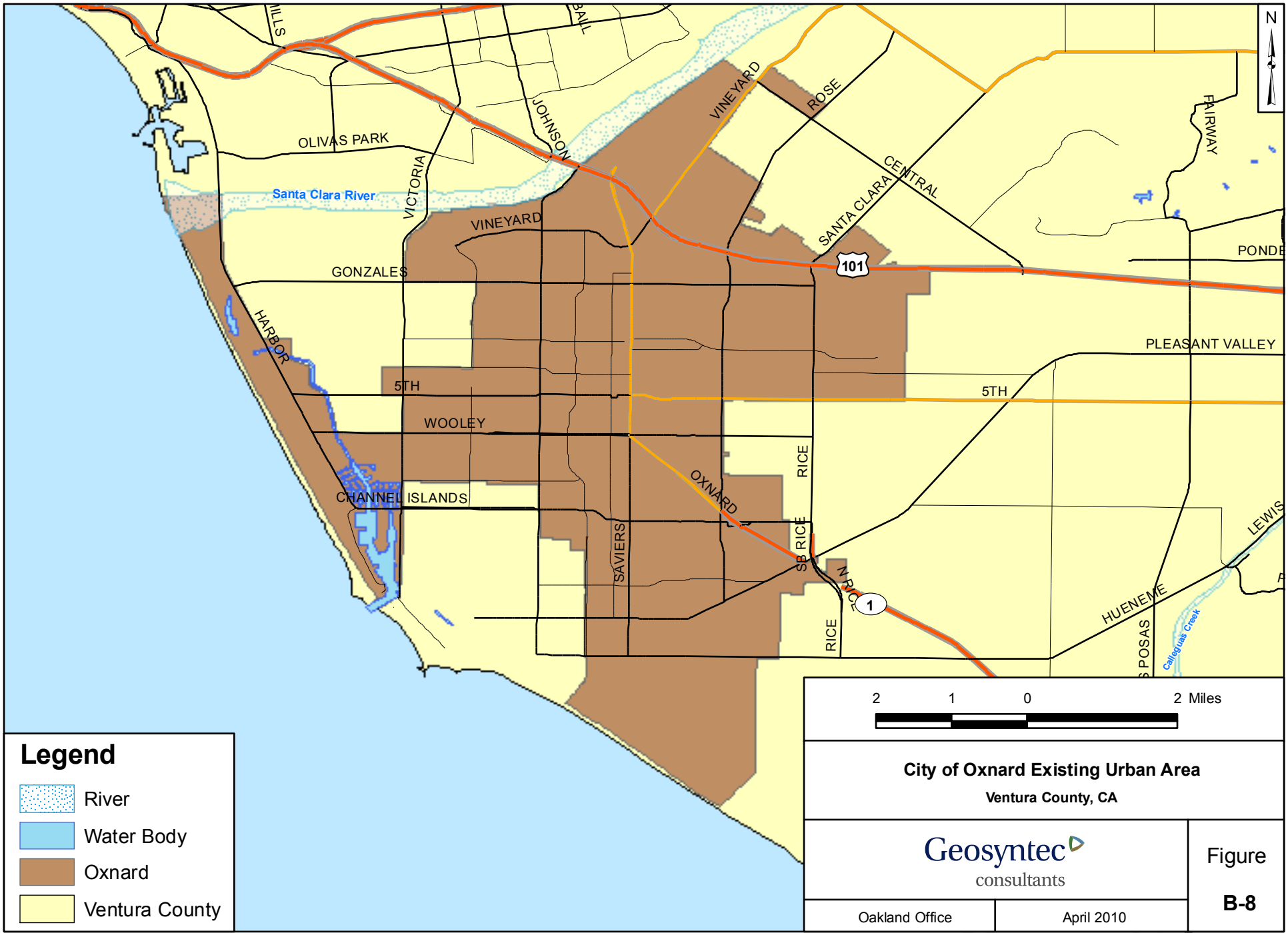

City of Oxnard Existing Urban Area

Ventura County, CA

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Figure **B-8**

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056346

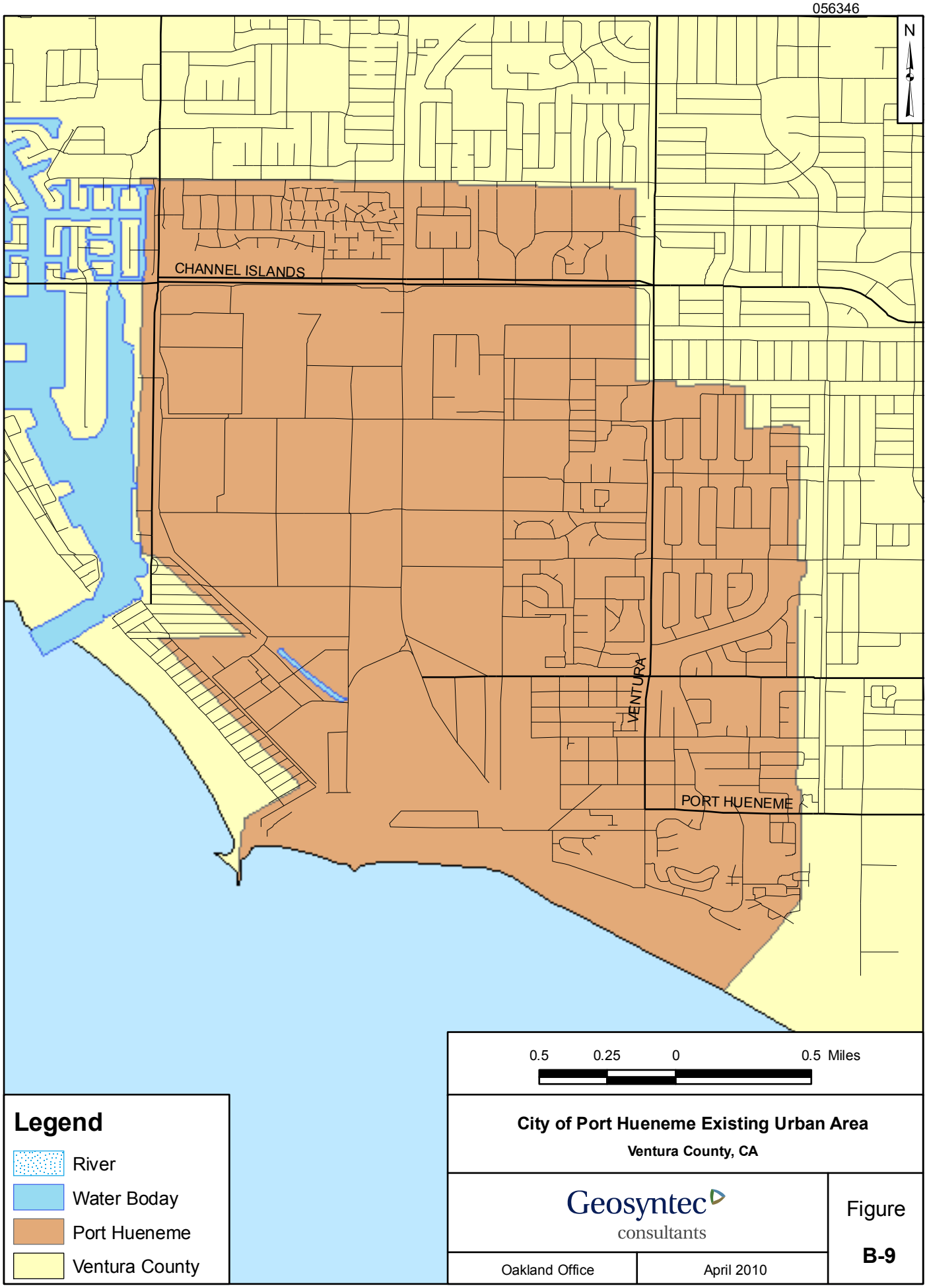

City of Port Hueneme Existing Urban Area

Ventura County, CA

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Figure **B-9**

P:\GIS\Ventura_County_Manual\Projects\B-9_Port_Hueneme_MS4_Urban_Areas_092310.mxd, WHL, September 23, 2010

056347

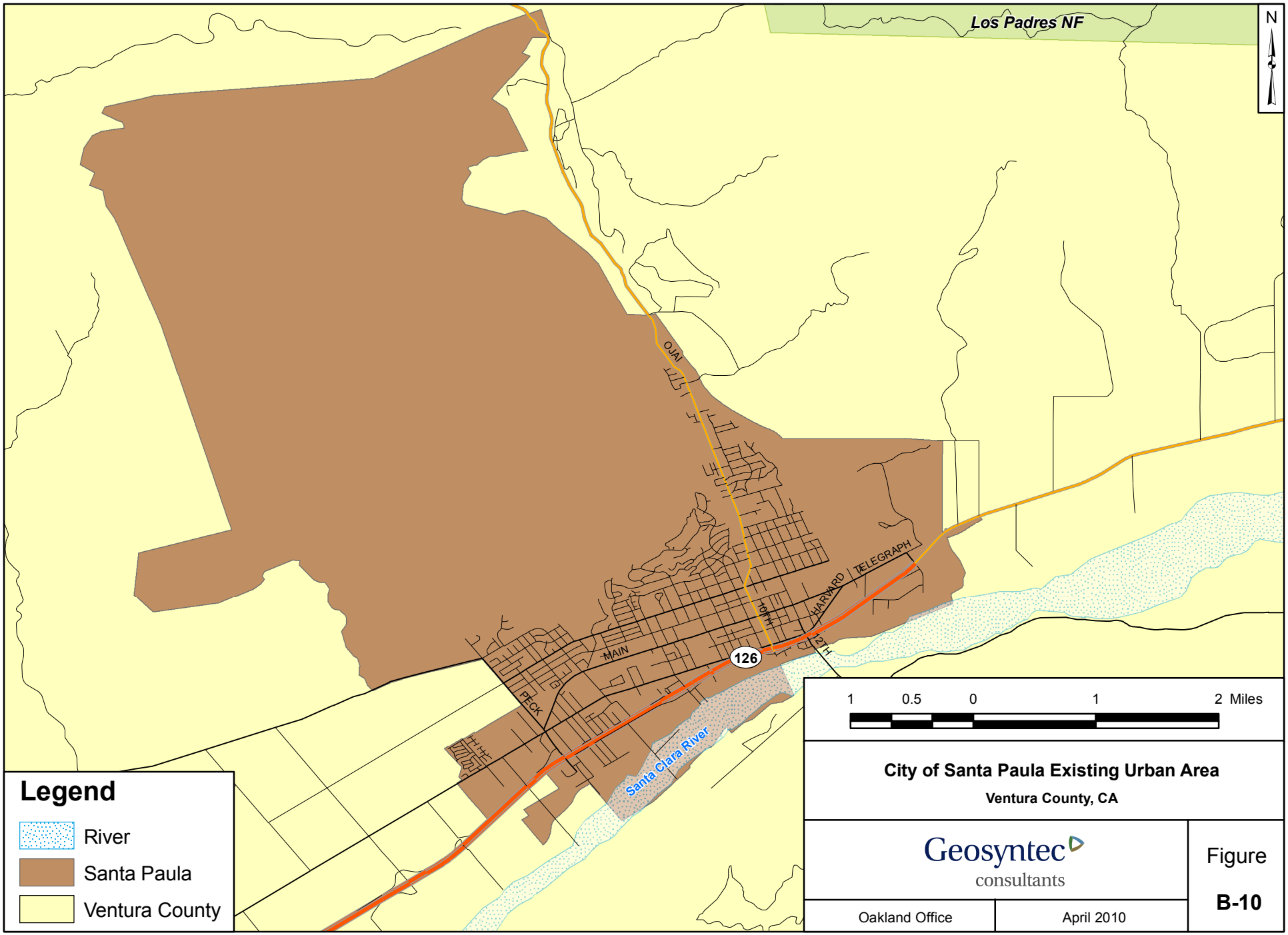

City of Santa Paula Existing Urban Area

Ventura County, CA

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Figure **B-10**

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056348

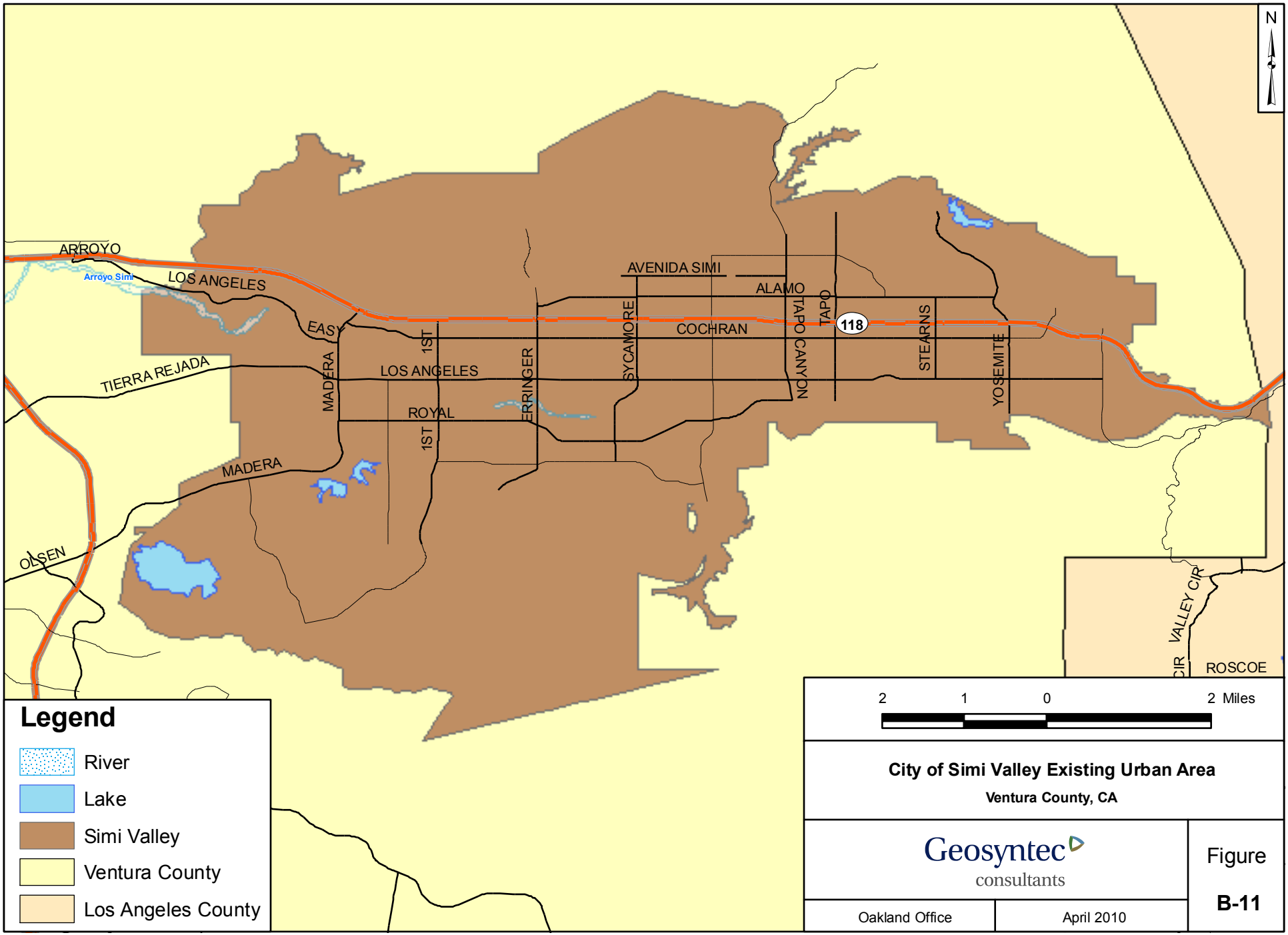

City of Simi Valley Existing Urban Area

Ventura County, CA

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Figure **B-11**

P:\GIS\Ventura_County_Manual\Projects\Simi_Valley_MS4_Pop_Areas_092310.mxd, WHL, September 23, 2010

056349

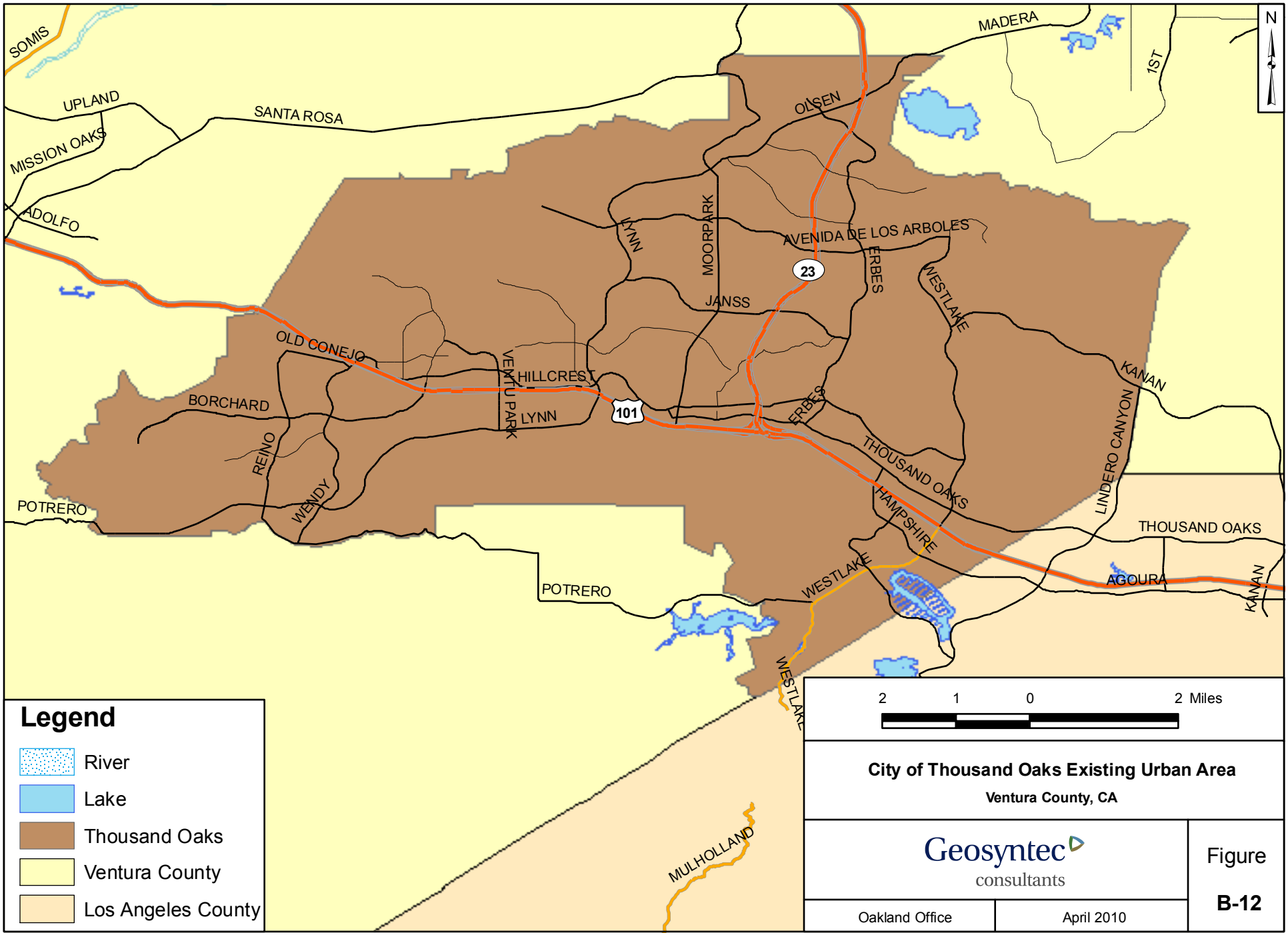

City of Thousand Oaks Existing Urban Area

Ventura County, CA

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Figure **B-12**

P:\GIS\Ventura_County_Manual\Projects\B-12_Thousand_Oaks_MS4_Pop_Areas_092310.mxd, WHL, September 23, 2010

056350

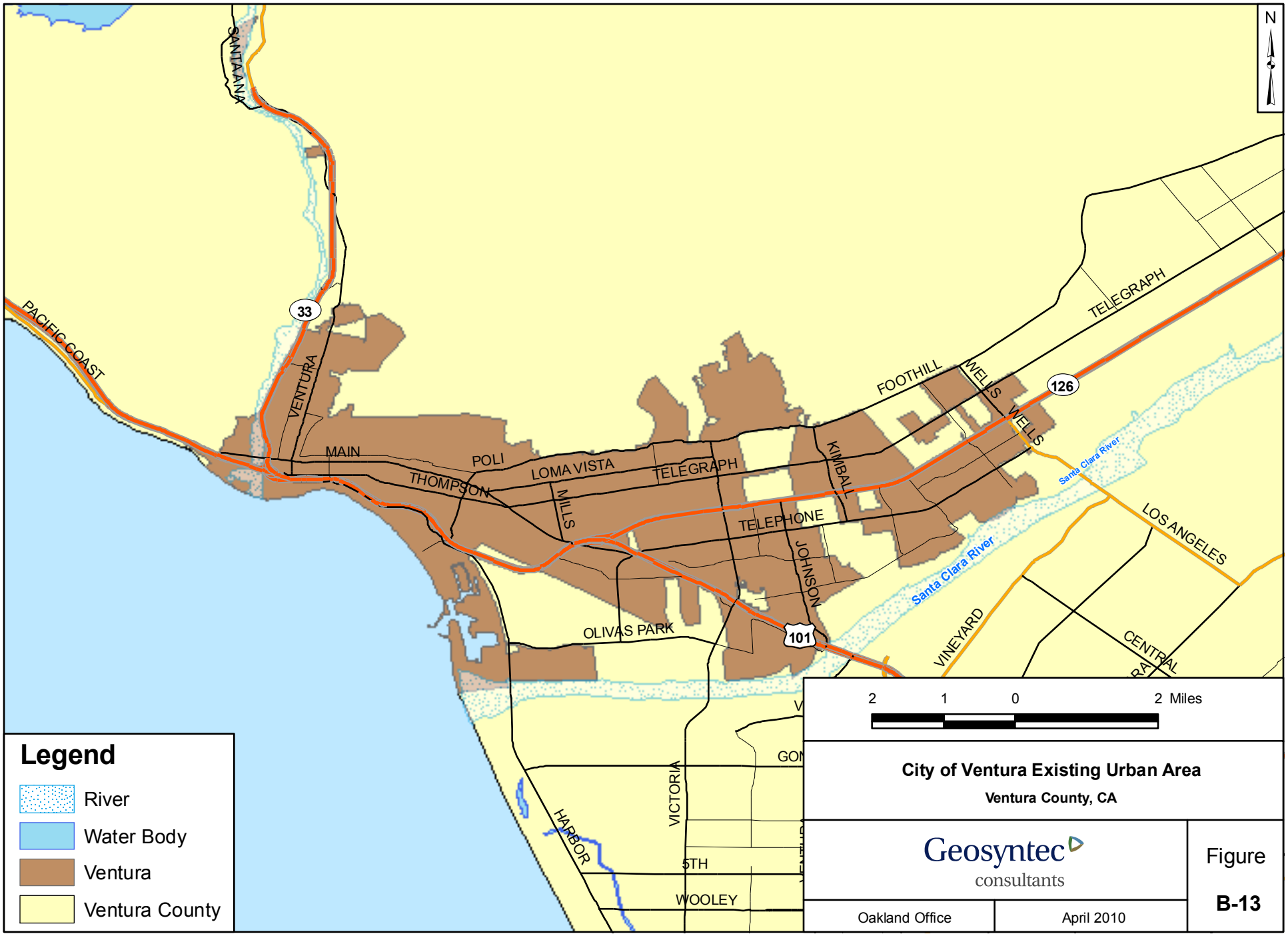

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056351

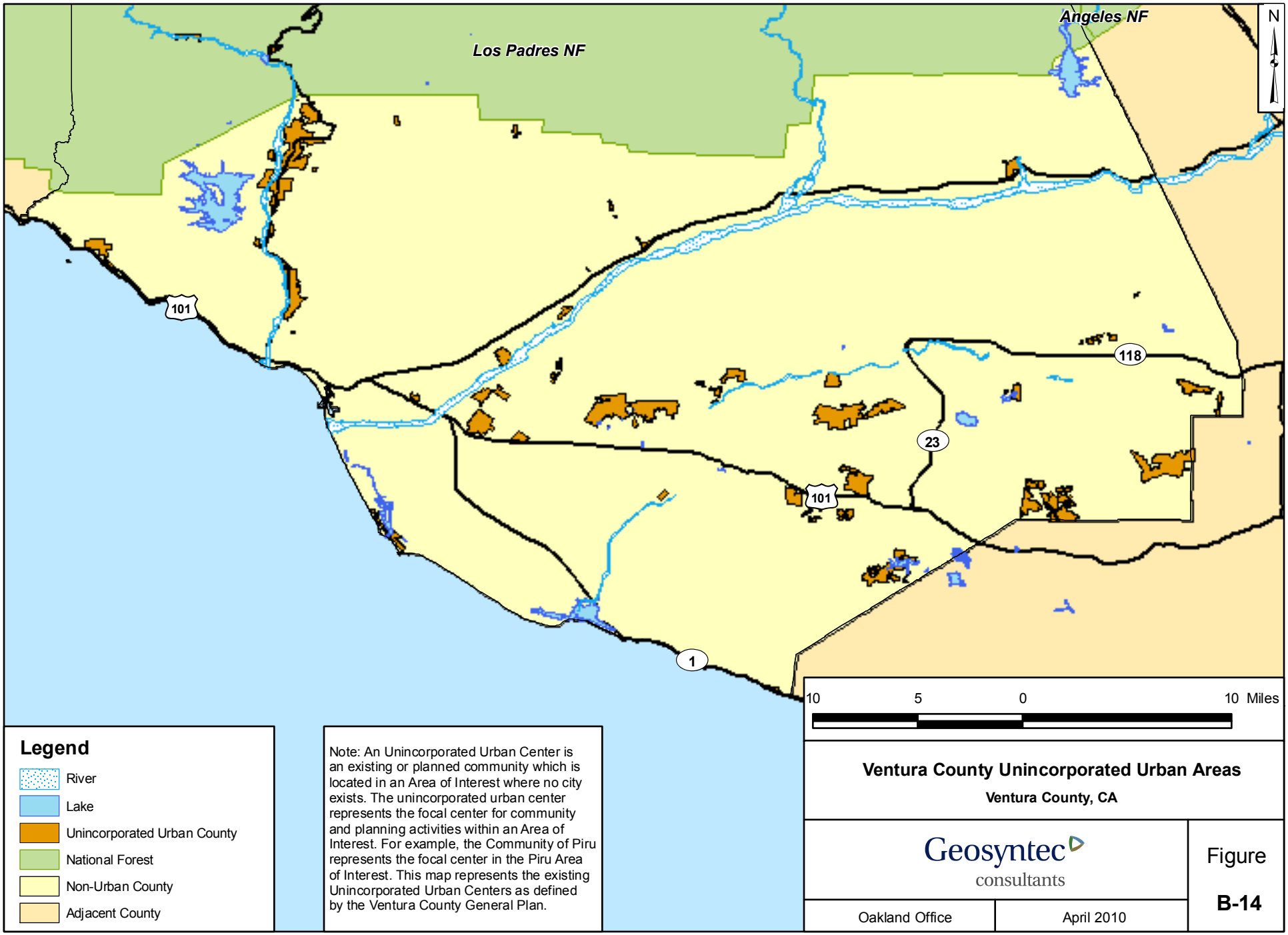

Ventura County Unincorporated Urban Areas

Ventura County, CA

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Figure **B-14**

P:\GIS\Ventura_County_Manual\Projects\B-14_Ventura_County_Urban_092310.mxd, WHL, September 23, 2010

056352

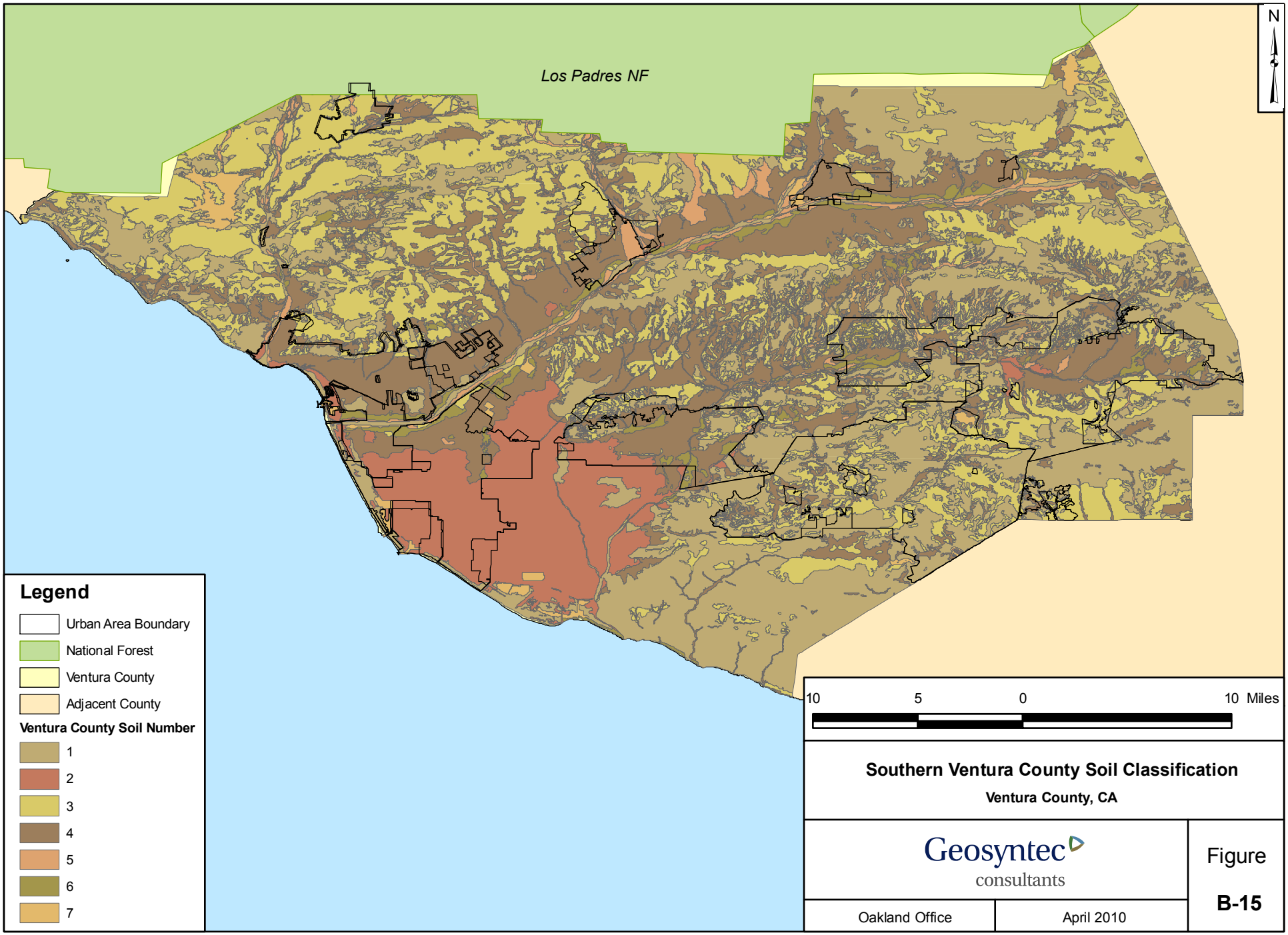

Southern Ventura County Soil Classification

Ventura County, CA

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Figure **B-15**

P:\GIS\Ventura_County_Manual\Projects\B-15_Ventura_Soils_092310.mxd, WHL, September 23, 2010

056353

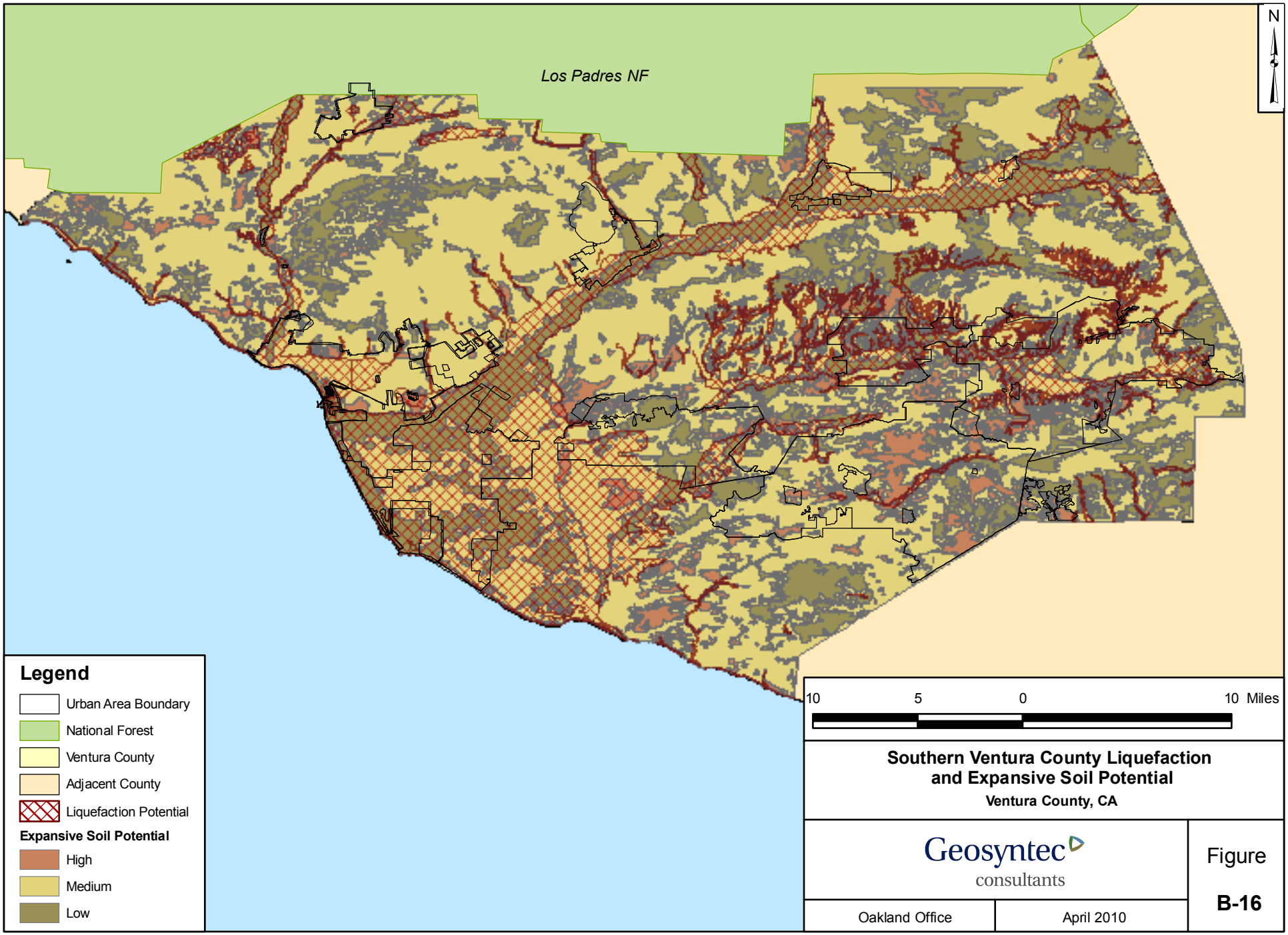

Southern Ventura County Liquefaction and Expansive Soil Potential

Ventura County, CA

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Figure **B-16**

P:\GIS\Ventura_County_Manual\Projects\B-16_Liq_Expan_Soils_092310.mxd, WHL, September 23, 2010

APPENDIX C: SITE SOIL TYPE AND INFILTRATION TESTING

C.1 Introduction

The purpose of site soil and infiltration testing is to more accurately determine where LID and structural treatment BMPs should be located and if infiltration is feasible on the site. The preliminary site assessment, discussed in Section 3, will likely reduce the number of test pit investigations needed by identifying candidate test sites that are most amenable to infiltration. This section summarizes the methods for conducting (1) soil test pit investigations and (2) infiltration testing at key locations identified in the preliminary site assessment that require further investigation.

A qualified soil scientist or geotechnical professional should conduct the test pit investigation and infiltration tests. The professional should be experienced with the testing procedures as well as the hydraulic functioning of the potential BMPs to ensure that additional information regarding BMP siting is acquired during the test pit investigation and infiltration tests.

This appendix is not intended to be applied as a protocol for conducting soil and infiltration testing. Instead, this section is provided to assist in specifying and standardizing soil and infiltration testing techniques across sites within Ventura County where development is occurring.

C.2 Test Pit Investigations

A test pit investigation is an integral part of assessing site soil conditions. Soil maps and hydrologic soil groups are based on regional data and provide only a general understanding of what to expect; however, there are undoubtedly unknowns that will be discovered during these initial field observations. A test pit investigation involves digging or excavating a test pit (deep hole). By excavating a test pit, overall soil conditions (both vertically and horizontally) can be observed in addition to the soil horizons. To maximize the knowledge gained during the test pit investigation, many tests and observations should be conducted during this process.

Test pits should be excavated to a depth at least three feet deeper than the proposed bottom of non-infiltration BMPs and at least eleven feet deeper than the proposed bottom of infiltration BMPs. A project that imports fill must characterize the proposed soil profile at the specified depths. For example, if the proposed depth of fill is 5 feet below grade and an infiltration BMP is to be used in the location of the fill, both the fill and the native subsoil require soil characterization. Figure C-1 illustrates the proposed soil profile that would result with 3 feet of fill. Since the test pit must be excavated to a depth that is 11 feet deeper than the bottom of the proposed infiltration BMP, a test pit investigation of the top 8 feet of native subsoil is required, in addition to the laboratory sample of the fill material. Characterization of the fill material should be conducted in a laboratory. It is recommended that soil compaction is limited in the location of a proposed infiltration BMP.

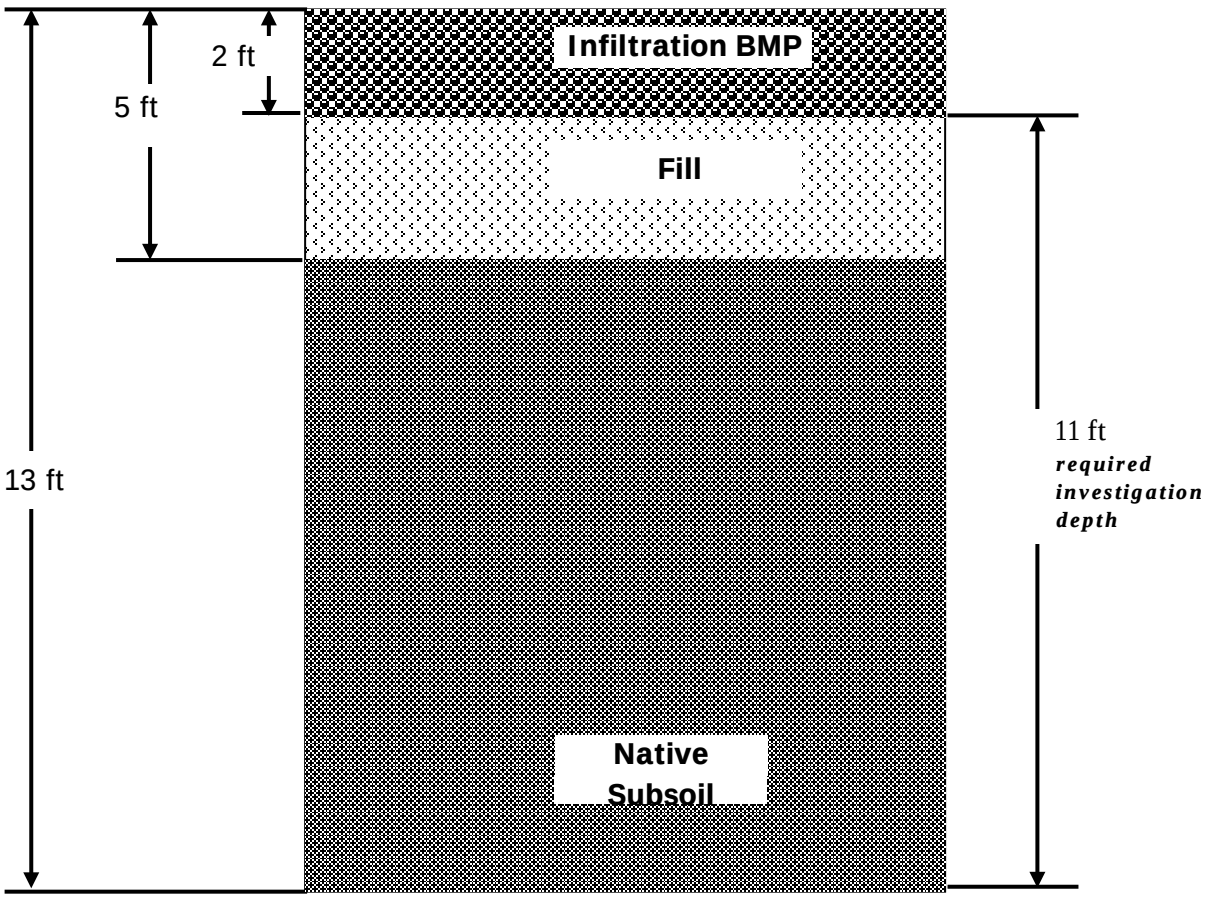

Figure C-1: Post-fill Soil Profile

As the test pit is excavated, the following measurements should be made:

Standard penetration testing to determined the relative density as it changes with depth (minimum intervals of 2 - 3 feet), and

Infiltration testing with at least one test occurring at the proposed bottom of the BMP and one test occurring of the bottom of the test pit (11 feet below the bottom of the infiltration BMP).

In addition, many observations should be made during and after the excavation of the soil pit, including:

- Elevation of groundwater table or indications of seasonally high groundwater table should be noted using the NRCS hydric soil field indicators guide (NRCS, 2003).
- Soil horizon observations, including: depths indicating upper and lower boundaries of the soil horizons, depths to limiting layers (i.e., bedrock and clay), soil textures, colors and their patterns, and estimates of the type and percent of coarse fragments.

- Locations and descriptions of macropores (i.e., pores and roots).
- Other pertinent information/observations.

The number of test pits required depends largely on the specific site and the proposed development plan. Additional tests should be conducted if local conditions indicate significant variability in soil types, geology, water table elevations, bedrock, topography, etc. Similarly, uniform site conditions may indicate that fewer test pits are required. Excessive testing and disturbance of the soil prior to construction is not recommended. When test pit investigations are complete, including infiltration testing, the pits should be refilled with the original soil and the surface replaced with the original topsoil.

C.3 Infiltration Testing

There are a variety of infiltration field test methodologies available to determine the infiltration rate of a soil. Infiltration tests should be conducted in the field in order to ensure that the measurements are representative of actual site conditions (including inherent heterogeneity). As mentioned above, usually infiltration rates should be determined at a minimum of two locations in each test pit and one must be conducted at the proposed bottom depth of the BMP. The actual number of infiltration tests required depends on the soil conditions; if the soils are highly variable, more tests may be required. To ensure groundwater is protected and that the infiltration BMP is not rendered ineffective by overload, it is important to periodically verify infiltration rates of the constructed BMP(s).

For BMPs that infiltrate water through the surface soil layer (e.g., bioretention areas, permeable pavement), choosing a method that measures infiltration in surface soils is important. For infiltration trenches and drywells, infiltration will occur at a greater depth in the soil matrix; therefore, borehole methods may be more appropriate.

Depending on the type of infiltration BMP and depth at which the infiltration test should be conducted, there are several types of infiltration tests that can be used including: disc permeameters, single and double ring infiltrometers, and borehole permeameters. Disc permeameters are typically used to provide estimates of soil near saturation but can prove to be difficult due to measures of three dimensional flow. This device is also commonly used for assessing infiltration rates of already constructed permeable pavements and is generally not used for assessing infiltration rates prior to site disturbance; therefore, the disc permeameter method will not be discussed further in this Appendix. Single and double ring infiltrometers directly measure vertical flow into the surface of the soil. Double ring infiltrometers account for lateral flow boundary affects with the addition of an outer water reservoir and are generally the preferred method for surface infiltration. Borehole permeameters are best suited to collect infiltration measurements below the soil surface. Two subsurface infiltration methods are discussed below including the Guelph and falling-head permeameters.

C.4 Double Ring Infiltrometer

The double ring infiltrometer method consists of driving two cylinders, one inside the other, into the ground and partially filling them with water and maintaining the liquid at a constant level (ASTM D3385-94). The volume of water added to the inner ring from a separate water reservoir, to maintain the constant head level is comparable to the volume of water infiltrating into the soil. The volume of water added to the inner ring divided by the time period for which the water was added is equal to the infiltration rate. A photograph of a common double ring infiltrometer is provided in Figure C-2.

Figure C-2: Double Ring Infiltrometer

Photo Credit: Geosyntec Consultants (Braga and Fitsik, 2008)

C.5 Borehole Guelph Infiltration Test

For shallow boreholes, the Guelph Permeameter has been developed as a field portable kit. This permeameter consists of a tube that is placed in a hand-drilled shallow borehole and water is provided to the tube through a separate reservoir. Water loss in the reservoir is used to estimate the hydraulic conductivity of the soil, which may be used to calculate infiltration based on various standard models (Soil Moisture Equipment, 2005). A photograph of a Guelph Permeameter is provided in Figure C-3. It is important to remember that this method will include vertical and lateral water flow from the borehole.

Figure C-3: Guelph Permeameter for Shallow Borehole Permeability

Photo Credit: USDA, 2005

C.6 Falling-Head Borehole Infiltration Test

The falling-head borehole infiltration test is commonly applied to assess infiltration at greater depths (e.g. 5 - 25 ft). The method is generally performed according to United States Bureau of Reclamation procedure 7300-89 (USBR, 1990). Caltrans has used the method to site stormwater infiltration structures (Caltrans, 2003). Essentially the method consists of boreholes, installing well casing with slots cut to release water at the target depths, backfilling the borehole, adding pre-soak water, and then filling again with water and recording the stage loss. An example diagram is shown in Figure C-4.

The testing procedures are summarized as follows:

1) Remove any smeared soil surfaces to provide a natural soil interface for testing the percolation of water. Remove all loose material. The U.S. EPA recommends scratching the sides with a sharp pointed instrument. (Note: upon tester's discretion, a 2-inch layer of coarse sand or fine gravel may be placed to protect the bottom from scouring and sediment.) Fill casing with clean water and allow to pre-soak for 24 hours or until the water has completely infiltrated.

2) Refill casing and monitor water level (distance from top of casing to top of water) for 1 hour. Repeat this procedure a total of four times. (Note: upon tester's discretion, the final field rate may either be the average of the four observations

or the value of the last observation. The final rate shall be reported in inches per hour.)

3) Testing may be done through a boring or open excavation.

4) The location of the test must be near the proposed facility.

5) Upon completion of the testing, the casings shall be immediately pulled and the test pit shall be back-filled.

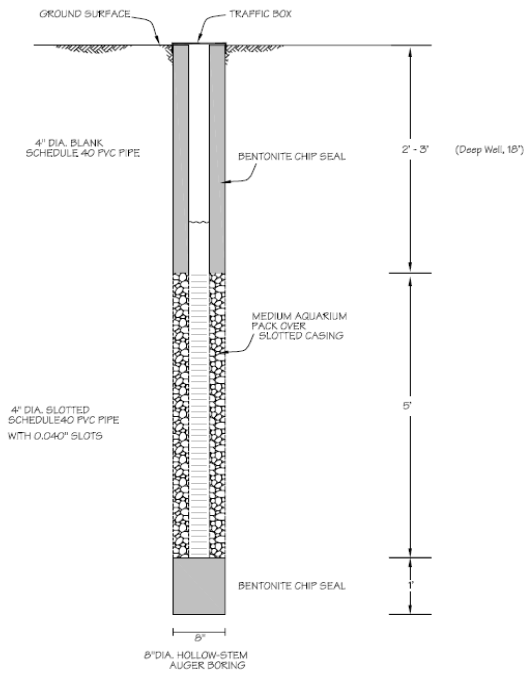

Figure C-4: Falling-Head Permeameter for Deep Borehole Permeability

Diagram Credit: Group Delta Consultants, 2008

C.7 Laboratory Soil Tests

If fill materials imported from off-site are part of an infiltration BMP design, a laboratory test is required to determine the infiltration rate of the fill soil. A sample of the fill soil from each area where a BMP will be located must be tested. The soil sample must be compacted to the same degree that will be present after final grading. Once prepared, the sample should be sent to a specialty laboratory to conduct a test of the infiltration rate. These results may then be used to assess the applicability of a specific BMP.

C.8 Assessment of Test Results

The results from field infiltration methods should be examined to consider data variability and sample distribution to determine if there has been adequate sampling. If the spatial variability (heterogeneity) is large, then additional field measurements may be necessary. The infiltration results should be compared to the information gathered on site soils and geology to see if they are consistent. The results of the site soils and infiltration testing may then be used in the siting, selection, sizing, and design of LID site design techniques and structural treatment BMPs.

C.9 References

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APPENDIX D : BMP PERFORMANCE GUIDANCE

D.1 Permit Requirement

Part 3, Section A.3 of Order R4-2010-0108 states the following:

3. *Each Permittee shall require that treatment control BMPs being implemented under the provisions of this Order shall be designed, at a minimum, to achieve the BMP performance criteria for storm water pollutants likely to be discharged as identified in Attachment "C", for an 85th percentile 24-hour runoff event determined as the maximized capture storm water volume for the area using a 48 to 72-hour draw down time, from the formula recommended in Urban Runoff Quality Management, WEF Manual of Practice No. 23/ASCE Manual of Practice No. 87, (1998). Expected BMP pollutant removal performance for effluent quality was developed from the WERF-ASCE/ U.S. EPA International BMP Database. Permittees shall select Treatment BMPs based on the primary class of pollutants likely to be discharged from the site/facility (e.g. metals from an auto repair shop). Permittees may develop guidance for appropriate Treatment BMPs for project type based on Attachment "C". For the treatment of pollutants causing impairments within the drainage of the impaired waterbody, permittees shall select BMPs from the top three performing BMP categories or alternative BMPs that are designed to meet or exceed the performance of the highest performing BMP for the pollutant causing impairment.*

Attachment C contains the following table:

Effluent Concentrations as Median Values

BMP Category	Total Suspended Solids (mg/L)	Total Nitrate-Nitrogen (mg/L)	Total Copper (µg/L)	Total Lead (µg/L)	Total Zinc (µg/L)
Detention Pond	27	0.48	15.9	14.6	58.7
Wet Pond	10	0.2	5.8	3.4	21.6
Wetland Basin	13	0.13	3.3	2.5	29.2
Biofilter	18	0.36	9.6	5.4	27.9
Media Filter	11	0.66	7.6	2.6	32.2
Hydrodynamic Device	23	0.29	11.8	5	75.1

Expected BMP pollutant performance for effluent quality was developed from the WERF-ASCE/U.S. EPA International BMP Database, 2007

D.2 Using Performance Statistics for BMP Selection

The observed performance of stormwater BMPs provides valuable quantitative information that can be used to infer the potential water quality benefits of stormwater BMP implementation. However, water quality data sets and the statistical methods used to summarize them inherently contain a high level of uncertainty. Consideration of this uncertainty is fundamental to the proper and responsible use of statistics. Some of the key issues that should be considered when

drawing conclusions from data contained in the ASCE International BMP Database for the purposes of developing BMP selection guidance are discussed below.

Number of Representative BMPs

Some BMP types are not well represented in the ASCE International BMP Database due to small data sets. For example, the "Wetland Basin" category only included nine studies nationwide as compared to over 50 for biofilters at the time the data analysis was conducted for the MS4 permit (2007). For some pollutants, such as total copper, data are only available for four Wetland Basin studies. While the BMP Database continues to grow, there are currently less than 300 BMP studies included, with only approximately 50 in California. The size of the data set provides an indicator of the reliability of that data in representing the "typical" effluent concentration for that BMP type.

BMP Categorization

The BMP studies within the BMP database represent a wide spectrum of BMP types with a variety of designs and sizing criteria. While some guidance is provided on how to categorize BMPs, data providers are responsible for categorizing their own BMPs. Some of these BMPs could be poorly categorized due to a variety of reasons, such as differences in terminology, missing or inadequately sized treatment components (e.g., forebays, vegetation, or permanent pools) or variable treatment function (e.g., a seasonal wet pond). Ideally, the BMPs should be grouped according to common design components and/or sizing criteria, but there currently aren't enough data with design information to support such analyses. However, the BMP Database is currently undergoing a restructuring that is redefining or sub-categorizing the current BMP categories within the database.

Statistical Significant Difference between BMP Influent/Effluent

Some of the median effluent values reported in the BMP Database are not statistically different than the median influent values (i.e., no concentration reductions on average). No significant difference may indicate either low influent concentrations or poor performing BMPs for that pollutant. In either case, the effluent value alone would not be a reliable indicator of BMP performance. For example, as summarized in Geosyntec and Wright Water (2008), the data for Wetland Basins, a "top performing" BMP according to Attachment C of the MS4 permit, did not conclusively show statistically significant removals of TSS, nitrate-nitrogen, or total lead. Data for hydrodynamic separators and media filters indicate they are also ineffective at reducing nitrate-nitrogen concentrations.

Statistical Significant Differences in Effluent between BMP Types

The median effluent concentrations of the various BMP types are not necessarily statistically significantly different from each other. Statistical significance can be determined by analyzing whether the 95th percent confidence intervals overlap. The

number of data points and the variability of those data points determine the confidence interval of each median value. If the effluent medians are not statistically significantly different from each other, it may not be possible to determine the "top three" performing BMPs as specified in the MS4 Permit. Confidence intervals about the median effluent concentrations for each BMP type are provided in Geosyntec and Wright Water (2008) (see attached).

D.3 Comparison of the Performance of Biofiltration BMPs and Retention BMPs

Background

Projects that demonstrate technical infeasibility for reducing EIA to ≤5% using Retention BMPs are eligible to use Biofiltration BMPs to achieve the EIA performance standard. Section 4.E.III.1.(b) of Order R4-2010-0108 states:

> *If on-site retention is determined to be technically infeasible pursuant to 4.E.III.2(b), an on-site biofiltration system that achieves equivalent stormwater volume and pollutant load reduction as would have been achieved by on-site retention shall satisfy the EIA limitation.*

Volume-based biofiltration BMPs shall be sized to treat 1.5 times the volume not retained using Retention BMPs. The remaining EIA requirement may also be satisfied with flow-based Biofiltration BMPs. Flow-based Biofiltration BMPs shall be sized for the remaining drainage area from which runoff must be retained (A_{Retain}) with a rainfall intensity that varies with time of concentration for the catchment tributary to the flow-based Biofiltration BMP, according to the following. Using this flow-based sizing method will achieve or exceed capture and treatment of 80% of the average annual runoff volume.

Time of Concentration, minutes	Design Intensity for 150% Sizing, in/hr
30	0.24
20	0.25
15	0.28
10	0.31
5	0.35

Methodology

A planning-level analysis was conducted to assess whether the range of Biofiltration BMPs included in the 2010 TGM, sized per these volume- or flow-based sizing criteria, would achieve equivalent pollutant load reduction to Retention BMPs. The following describes the step-wise method taken for the analysis.

Step 1: Estimate the Catchment Annual Load

Assumptions:

- Average Annual Rainfall- 14.5 inches (Oxnard Gauge) (precipitation, P)
- One acre Catchment (area, A)

Calculations:

1) Determine developed runoff coefficients for single-family, multi-family, commercial, and industrial land use types

    - Use average imperviousness values from Ventura Hydrology Manual (Exhibit 14B)
    - Assume soil group 2/3 (Group C soils) for pervious runoff coefficient (Cp, conservative value = 0.1)
    - Use developed runoff coefficient (C_d) equation from hydrology manual:

$$C_d = 0.95*(\text{imperviousness}) + (Cp)*(1\text{-imperviousness})$$

2) Calculate Average Annual Runoff Volume (cu-ft) using:

$$V_{avg\ annual} = C_d*(P/12)*A*43560$$

3) Multiply average annual runoff volume by respective event mean concentrations (EMCs) for pollutants of concern to get average annual loads.

    - Look at "EMC Arithmetic Means" to see EMCs by land use type.
    - EMCs calculated based on LA County Land Use specific data (LACDPW, 2000). Descriptive statistics estimated using the parametric bootstrap method suggested by Singh, Singh, and Engelhardt (1997).
    - Pollutants of concern: Total Suspended Solids (TSS), Total Copper, Total Zinc, and Total Nitrogen. TSS is representative of the sediment pollutant class as well as pollutants that are associated with particulates (e.g., total phosphorous, some metals, pesticides, some organics). Copper and zinc represent metals – lead has been removed from the environment using True Source Control (removal of lead from gasoline) and thus is not an important POC for Biofiltration BMP selection and design. Total nitrogen is representative in that it includes all of the species of nitrogen (organic nitrogen, ammonia, nitrate, and nitrite) and instead of focusing on one species (nitrate).

Step 2: Estimate Retention BMP Load Reduction

1) Determine Retention BMP Design volume:

- Design storm = 0.75”
- Use land use-based coefficients
- $V_{design} = C_d*(0.75/12)*A*43560$

2) Determine Retention BMP capture volume using CASQA 48-hour Drawdown Figure for Oxnard Gauge (CASQA, 2003)
   - Calculate Unit Basin Storage Volume using:
     - Unit Basin Storage Vol = V_{design} / A
   - Using developed runoff coefficients, interpolate between runoff coefficient lines to determine the percentage of total runoff captured by Retention BMP.
3) Determine Annual Load Reduction
   - The percentage of the annual load that is reduced is the same as the percentage of runoff captured by the Retention BMP, assuming that all captured runoff is retained. The percent capture calculated in (2) can be multiplied by the catchment annual pollutant load to obtain the load reduction.

Step 3: Estimate Biofiltration BMP Load Reduction

1) Determine BMP Design volume as described in 2.a above, except:
   - Design storm = 1.5*0.75 = 1.125 inches
2) Determine BMP capture volume using CASQA 24-hour Drawdown Figure for Oxnard Gauge (CASQA, 2003) as described in 2.b. above
3) Determine annual load reduction. Load reduction in Biofiltration BMPs can occur via two pathways: incidental infiltration and treatment.
   - Incidental infiltration in Biofiltration BMPs was discussed in a publication by Strecker, Quigley, Urbonas, and Jones (Strecker et al, 2004). That study observed as much as 40% volume reduction through incidental infiltration. A recent summary of the studies in the ASCE BMP Database found the following average volume reductions: filter strips, 38%; vegetated swales, 48%; and bioretention with underdrain, 61% (Geosyntec, 2011; attached to this appendix).
   - Pollutant Load reduction via incidental infiltration can be calculated as follows (20% is the percent of the captured volume assumed to be reduced via incidental infiltration for this discussion):

Load reduced = Average annual Load * Percent Runoff Captured by BMP * 20%

- Load reduction through treatment calculated based on published literature on pollutant removals from biofiltration facilities.

- Load reduction through treatment is calculated as follows:

Load reduced = Average annual Load * Percent Runoff Captured by BMP *80% * Assumed Average Percent Removal

Note: 80% = 100%-20%, i.e. the captured runoff that was not infiltrated via incidental infiltration

Constituent	Range of Reported Removal Efficiencies from Literature[1]	Selected Removal Efficiency for Effectiveness Evaluation[2]	Selected Removal Efficiency for Enhanced Nitrogen Removal[3]
TSS	54-89	79	79
Total Zinc	48-96	77	77
Total Copper	33-92	72	72
Total Nitrogen	21-54	25	50

[1] Range of values from literature cited below:

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6. Geosyntec Consultants and Wright Water Engineers, Inc., 2008. Overview of Performance by BMP Category and Common Pollutant Type, International Stormwater BMP Database Update. June 2008
7. Geosyntec Consultants and Wright Water Engineers, Inc., 2010. Categorical Summary of BMP Performance for Nutrient Concentration Data Contained in the International Stormwater BMP Database. December, 2010

[2] Removal efficiency for TSS, Total Zinc, and Total Copper represent average of values from literature. Removal efficiency for TN is that expected from a 'standard biofilter', that is, one not designed for enhanced nitrogen removal

[3] Removal efficiency for TN represented as average value of removals from bioretention systems with an anaerobic zone for enhanced removal of nitrogen

- The total load reduction is calculated as the sum of the reductions from these two pathways. The percent load reduction is calculated by dividing the total load reduction by the annual pollutant load from the catchment

Step 4: Comparison of Annual Load Reductions

1) Load reductions are compared by subtracting the load reduction calculated for Biofiltration BMPs from the load reduction calculated for Retention BMPs to determine the 'deficit' load reduction.

Results

Step 1: Estimate the Catchment Annual Load

1) Determine developed runoff coefficients for single-family, multi-family, commercial, and industrial land use types

Land Use	Imperviousness	Runoff Coefficient (C)
Single Family Residential	0.3	0.36
Multi Family Residential	0.69	0.69
Commercial	0.85	0.82
Industrial	0.93	0.89

2) Calculate Average Annual Runoff Volume (cu-ft), and

3) Multiply average annual runoff volume by respective event mean concentrations (EMCs) for pollutants of concern to get average annual loads.

Land Use	Arithmetic Means from Lognormal EMC Statistics			
	TSS (mg/L)	Total Zinc (mg/L)	Total Copper (mg/L)	Total Nitrogen (mg/L as N)
Single Family Residential	124.2	71.9	18.7	3.74
Multi Family Residential	39.9	125.1	12.1	3.31
Commercial	67	237.1	31.4	3.99
Industrial	219.2	537.4	34.5	3.74

Land Use	Average Annual Runoff Volume (cu-ft)	Catchment Pollutant Loads (kg/yr)			
		TSS	Total Zinc	Total Copper	Total Nitrogen
Single Family Residential	18,685	65,716	38	10	1,979
Multi Family Residential	36,134	40,826	128	12	3,387
Commercial	43,292	82,135	291	38	4,891
Industrial	46,871	290,933	713	46	4,964

Step 2: Estimate Retention BMP Load Reduction

1) Determine Retention BMP Design volume

Land Use	Design Volume (cu-ft)
Single Family Residential	967
Multi Family Residential	1869
Commercial	2239
Industrial	2424

2) Determine Retention BMP capture volume using CASQA 48-hour Drawdown Figure for Oxnard Gauge (CASQA, 2003)

Land Use	Design Volume (cu-ft)	Unit Basin Storage Volume (inches)	Approx % Capture
Single Family Residential	966	0.27	60.0%
Multi Family Residential	1,869	0.51	62.5%
Commercial	2,239	0.62	62.5%
Industrial	2,424	0.67	60.0%

3) Determine Annual Load Reduction

	Average Annual Pollutant Load Reduction (kg/yr) = Influent * Approx % Cap			
Land Use	TSS	Total Zinc	Total Copper	Total Nitrogen
Single Family Residential	39,429	23	5.9	1,187
Multi Family Residential	25,516	80	7.7	2,117
Commercial	51,335	182	24.1	3,057
Industrial	174,560	428	27.5	2,978

	Percent of Total Annual Loads			
Land Use	TSS	Total Zinc	Total Copper	Total Nitrogen
Single Family Residential	60.0%	60.0%	60.0%	60.0%
Multi Family Residential	62.5%	62.5%	62.5%	62.5%
Commercial	62.5%	62.5%	62.5%	62.5%
Industrial	60.0%	60.0%	60.0%	60.0%

Step 3: Estimate Biofiltration BMP Load Reduction

1) Determine Biofiltration BMP Design volume

Land Use	Design Volume (cu-ft)
Single Family Residential	1,450
Multi Family Residential	2,803
Commercial	3,359
Industrial	3,637

2) Determine BMP capture volume using CASQA 24-hour Drawdown Figure for Oxnard Gauge (CASQA, 2003)

Land Use	Design Volume (cu-ft)	Unit Basin Storage Volume (inches)	Approx % Capture
Single Family Residential	1,450	0.40	87.50%
Multi Family Residential	2,803	0.77	87.50%
Commercial	3,359	0.93	90.00%
Industrial	3,637	1.00	87.50%

3) Determine annual load reduction. Load reduction in Biofiltration BMPs can occur via two pathways: incidental infiltration and treatment.

Incidental Infiltration Scenario #1: 20% Volume Reduction

Land Use	Pollutant Load Reduction from 20% Incidental Infiltration (kg/yr)			
	TSS	Total Zinc	Total Copper	Total Nitrogen
Single Family Residential	11,500	7	2	346
Multi Family Residential	7,144	22	2	593
Commercial	14,784	52	7	880
Industrial	50,913	125	8	869

Land Use	Pollutant Load Reduction from Standard Treatment (kg/yr)				Enhanced Nitrogen Load Reduction (kg/yr)[1]
	TSS	Total Zinc	Total Copper	Total Nitrogen	Total Nitrogen
Single Family Residential	36,341	21	5	346	693
Multi Family Residential	22,577	69	6	593	1,185
Commercial	46,719	161	20	880	1,761
Industrial	160,886	384	23	869	1,737

[1] Anticipated removal if an anaerobic zone is provided for Enhanced Nitrogen removal.

Land Use	Total Pollutant Load Reduction from Standard Treatment + Incidental Infiltration (20%) (kg/yr)				Enhanced Nitrogen Load Reduction + Incidental Infiltration (20%) (kg/yr)
	TSS	Total Zinc	Total Copper	Total Nitrogen	Total Nitrogen
Single Family Residential	47,841	27	6.7	693	1,039
Multi Family Residential	29,721	91	8.4	1,185	1,778
Commercial	61,503	213	26.8	1,761	2,641
Industrial	211,799	509	31.0	1,737	2,606

Land Use	Percent of Total Annual Loads from Standard Treatment + Incidental Infiltration (20%)				Enhanced Nitrogen % Load Reduction + Incidental Infiltration (20%)
	TSS	Total Zinc	Total Copper	Total Nitrogen	Total Nitrogen
Single Family Residential	72.8%	71.4%	67.7%	35.0%	52.5%
Multi Family Residential	72.8%	71.4%	67.7%	35.0%	52.5%
Commercial	74.9%	73.4%	69.6%	36.0%	54.0%
Industrial	72.8%	71.4%	67.7%	35.0%	52.5%

Step 4: Comparison of Annual Load Reductions

Load reductions are compared by subtracting the load reduction calculated for Biofiltration BMPs from the load reduction calculated for Retention BMPs to determine the 'deficit' load reduction.

Land Use	Biofiltration Pollutant Load Reduction Deficit - Standard Treatment + Incidental Infiltration (20%) (kg/yr)				Enhanced Nitrogen + Incidental Infiltration (20%) Pollutant Load Reduction Deficit (kg/yr)
	TSS	Total Zinc	Total Copper	Total Nitrogen	Total Nitrogen
Single Family Residential	-8,412	-4	-0.8	495	148
Multi Family Residential	-4,205	-11	-0.6	931	339
Commercial	-10,168	-32	-2.7	1,296	416
Industrial	-37,239	-81	-3.5	1,241	372

Note: a negative deficit means Biofiltration has a higher pollutant load reduction than Retention.

Land Use	Biofiltration Pollutant Load Reduction Deficit - Standard Treatment + Incidental Infiltration (20%) (%)				Enhanced Nitrogen + Incidental Infiltration (20%) Pollutant Load Reduction Deficit (%)
	TSS	Total Zinc	Total Copper	Total Nitrogen	Total Nitrogen
Single Family Residential	-12.8%	-11.4%	-7.7%	25.0%	7.5%
Multi Family Residential	-10.3%	-8.9%	-5.2%	27.5%	10.0%
Commercial	-12.4%	-10.9%	-7.1%	26.5%	8.5%
Industrial	-12.8%	-11.4%	-7.7%	25.0%	7.5%

Conclusion: Biofiltration BMPs sized for 1.5 times the SQDV, with an average incidental infiltration of 20% of the average annual runoff volume, which is a conservative estimate of incidental infiltration for all types of Biofiltration Treatment Measures, provide equivalent pollutant load reduction to Retention BMPs for TSS and metals.

Incidental Infiltration Scenario #2: 40% Volume Reduction

Land Use	Pollutant Load Reduction from 40% Incidental Infiltration (kg/yr)			
	TSS	Total Zinc	Total Copper	Total Nitrogen
Single Family Residential	23,000	13	3	693
Multi Family Residential	14,289	45	4	1,185
Commercial	29,569	105	14	1,761
Industrial	101,827	250	16	1,737

Land Use	Pollutant Load Reduction from Standard Treatment (kg/yr)				Enhanced Nitrogen Load Reduction (kg/yr)[1]
	TSS	Total Zinc	Total Copper	Total Nitrogen	Total Nitrogen
Single Family Residential	27,256	15	3.7	260	519
Multi Family Residential	16,932	52	4.7	445	889
Commercial	35,039	121	14.9	660	1,321
Industrial	120,665	288	17.2	652	1,303

[1] Anticipated removal if an anaerobic zone is provided for Enhanced Nitrogen removal.

Land Use	Total Pollutant Load Reduction from Standard Treatment + Incidental Infiltration (40%) (kg/yr)				Enhanced Nitrogen Load Reduction + Incidental Infiltration (40%) (kg/yr)
	TSS	Total Zinc	Total Copper	Total Nitrogen	Total Nitrogen
Single Family Residential	50,256	29	7.2	952	1,212
Multi Family Residential	31,221	97	9.0	1,630	2,074
Commercial	64,608	225	28.8	2,421	3,082
Industrial	222,491	538	33.3	2,389	3,040

Land Use	Percent of Total Annual Loads from Standard Treatment + Incidental Infiltration (40%)				Enhanced Nitrogen % Load Reduction + Incidental Infiltration (40%)
	TSS	Total Zinc	Total Copper	Total Nitrogen	Total Nitrogen
Single Family Residential	76.5%	75.4%	72.6%	48.1%	61.3%
Multi Family Residential	76.5%	75.4%	72.6%	48.1%	61.3%
Commercial	78.7%	77.6%	74.7%	49.5%	63.0%
Industrial	76.5%	75.4%	72.6%	48.1%	61.3%

Step 4: Comparison of Annual Load Reductions

Load reductions are compared by subtracting the load reduction calculated for Biofiltration BMPs from the load reduction calculated for Retention BMPs to determine the 'deficit' load reduction.

	Biofiltration Pollutant Load Reduction Deficit - Standard Treatment + Incidental Infiltration (40%) (kg/yr)				Enhanced Nitrogen + Incidental Infiltration (40%) Pollutant Load Reduction Deficit (kg/yr)
Land Use	TSS	Total Zinc	Total Copper	Total Nitrogen	Total Nitrogen
Single Family Residential	-10,827	-6	-1.2	235	-25
Multi Family Residential	-5,705	-17	-1.3	487	42
Commercial	-13,273	-44	-4.7	636	-24
Industrial	-47,931	-110	-5.8	589	-62

Note: a negative deficit means Biofiltration has a higher pollutant load reduction than Retention.

	Biofiltration Pollutant Load Reduction Deficit - Standard Treatment + Incidental Infiltration (40%) (%)				Enhanced Nitrogen + Incidental Infiltration (40%) Pollutant Load Reduction Deficit (%)
Land Use	TSS	Total Zinc	Total Copper	Total Nitrogen	Total Nitrogen
Single Family Residential	-16.5%	-15.4%	-12.6%	11.9%	-1.3%
Multi Family Residential	-14.0%	-12.9%	-10.1%	14.4%	1.2%
Commercial	-16.2%	-15.1%	-12.2%	13.0%	-0.5%
Industrial	-16.5%	-15.4%	-12.6%	11.9%	-1.3%

Conclusion: Biofiltration BMPs sized for 1.5 times the SQDV, with an average incidental infiltration of 40% of the average annual runoff volume, which is representative of vegetated swales and filter strips, provide equivalent pollutant load reduction to Retention BMPs for all of the pollutants of concern.

Incidental Infiltration Scenario #3: 60% Volume Reduction

Land Use	Pollutant Load Reduction from 60% Incidental Infiltration (kg/yr)			
	TSS	Total Zinc	Total Copper	Total Nitrogen
Single Family Residential	34,501	20	5	1,039
Multi Family Residential	21,433	67	6	1,778
Commercial	44,353	157	21	2,641
Industrial	152,740	374	24	2,606

Land Use	Pollutant Load Reduction from Standard Treatment (kg/yr)				Enhanced Nitrogen Load Reduction (kg/yr)[1]
	TSS	Total Zinc	Total Copper	Total Nitrogen	Total Nitrogen
Single Family Residential	18,170	10	2	173	346
Multi Family Residential	11,288	34	3	296	593
Commercial	23,359	81	10	440	880
Industrial	80,443	192	11	434	869

[1] Anticipated removal if an anaerobic zone is provided for Enhanced Nitrogen removal.

Land Use	Total Pollutant Load Reduction from Standard Treatment + Incidental Infiltration (60%) (kg/yr)				Enhanced Nitrogen Load Reduction + Incidental Infiltration (60%) (kg/yr)
	TSS	Total Zinc	Total Copper	Total Nitrogen	Total Nitrogen
Single Family Residential	52,671	30	7.7	1,212	1,385
Multi Family Residential	32,722	102	9.6	2,074	2,371
Commercial	67,712	238	30.7	3,082	3,522
Industrial	233,183	567	35.5	3,040	3,475

Land Use	Percent of Total Annual Loads from Standard Treatment + Incidental Infiltration (60%)				Enhanced Nitrogen % Load Reduction + Incidental Infiltration (60%)
	TSS	Total Zinc	Total Copper	Total Nitrogen	Total Nitrogen
Single Family Residential	80.2%	79.5%	77.6%	61.3%	70.0%
Multi Family Residential	80.2%	79.5%	77.6%	61.3%	70.0%
Commercial	82.4%	81.7%	79.8%	63.0%	72.0%
Industrial	80.2%	79.5%	77.6%	61.3%	70.0%

Step 4: Comparison of Annual Load Reductions

Load reductions are compared by subtracting the load reduction calculated for Biofiltration BMPs from the load reduction calculated for Retention BMPs to determine the 'deficit' load reduction.

Land Use	Biofiltration Pollutant Load Reduction Deficit - Standard Treatment + Incidental Infiltration (60%) (kg/yr)				Enhanced Nitrogen + Incidental Infiltration (60%) Pollutant Load Reduction Deficit (kg/yr)
	TSS	Total Zinc	Total Copper	Total Nitrogen	Total Nitrogen
Single Family Residential	-13,242	-7	-1.7	-25	-198
Multi Family Residential	-7,206	-22	-1.9	42	-254
Commercial	-16,378	-56	-6.7	-24	-465
Industrial	-58,623	-139	-8.1	-62	-496

Note: a negative deficit means Biofiltration has a higher pollutant load reduction than Retention.

Land Use	Biofiltration Pollutant Load Reduction Deficit - Standard Treatment + Incidental Infiltration (60%) (%)				Enhanced Nitrogen + Incidental Infiltration (60%) Pollutant Load Reduction Deficit (%)
	TSS	Total Zinc	Total Copper	Total Nitrogen	Total Nitrogen
Single Family Residential	-20.2%	-19.5%	-17.6%	-1.3%	-10.0%
Multi Family Residential	-17.7%	-17.0%	-15.1%	1.2%	-7.5%
Commercial	-19.9%	-19.2%	-17.3%	-0.5%	-9.5%
Industrial	-20.2%	-19.5%	-17.6%	-1.3%	-10.0%

Conclusion: Biofiltration BMPs sized for 1.5 times the SQDV, with an average incidental infiltration of 60% of the average annual runoff volume, which is representative of bioretention with an underdrain, is equivalent to or exceeds the pollutant load reduction of Retention BMPs for all of the pollutants of concern.

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APPENDIX E : BMP SIZING WORKSHEETS

E.1 Structural Treatment BMP Sizing Criteria

The BMP sizing criteria for determining the design volume or design flow for a proposed BMP are discussed in this appendix. These criteria must be used for all stormwater BMPs installed in new and re-development projects in Ventura County. This section outlines the rainfall analyses, Ventura County MS4 Permit sizing criteria, and recommended sizing methods for both volumetric and flow-based analysis.

Sizing Criteria

The type of rainfall analysis required depends on whether the BMP is a volume-based or flow-based BMP. This distinction between volume-based and flow-based controls is not always clear, especially in a sequence of BMPs or a treatment train. The following are general guidelines for each type of control.

- Volume-based BMPs are designed to treat a volume of runoff, which is detained for a certain period of time to allow for the settling of solids and associated pollutants. Volume-based BMPs included in this manual are bioretention, planter boxes, infiltration systems, and retention/detention BMPs.

- Flow-based BMPs treat water on a continuous flow basis. Flow-based BMPs included in this manual are vegetated swales, filter strips, filtration systems, and hydrodynamic devices.

The four volume-based and three flow-based BMP sizing criteria included in the Ventura County MS4 Permit (Order No. 09-0057) are included below.

The water quality design volume for volume-based BMPs must be determined using one of the following options:

1) The 85th percentile 24-hour runoff event determined as the maximized capture stormwater volume for the area using a 48 to 72-hour draw down time, from the formula recommended in Urban Runoff Quality Management, WEF Manual of Practice No. 23/ASCE Manual of Practice No. 87, (1998); or

2) The volume of annual runoff based on unit basin storage water quality volume to achieve 80 percent or more volume treatment; or

3) The volume of runoff produced from a 0.75 inch storm event; or

4) 80 percent of the average runoff volume using an appropriate public domain continuous flow model [such as Storm Water Management Model (SWMM) or Hydrologic Engineering Center – Hydrologic Simulation Program – Fortran (HEC-HSPF)], using the local rainfall record and relevant BMP sizing and design data.

Flow-based BMPs must be designed to capture and treat the water quality design flow rate generated from one of the following criterion:

1) The flow of runoff produced from a rain event equal to at least 0.2 inches per hour intensity; or

2) The flow of runoff produced from a rain event equal to at least 2 times the 85th percentile hourly rainfall intensity as determined from local rainfall records; or

3) Eight percent of the 50-year storm design flow rate as determined from the method provided below.

These sizing methods are explained below.

Methods for Determining the Water Quality Design Volume

Method 1: Urban Runoff Quality Management (URQM) Approach

The volume-based BMP sizing methodology described in Urban Runoff Quality Management (WEF Manual of Practice No. 23/ASCE Manual of Practice No. 87, (1998), pages 175-178) estimates the "maximized stormwater quality capture volume." The URQM approach is based on the translation of rainfall to runoff using two regression equations. The first regression equation, which relates rainfall to runoff, was developed using two years of data from more than 60 urban watersheds nationwide. The second regression equation relates mean annual runoff-producing rainfall depths to the "Maximized Water Quality Capture Volume" which corresponds to the "knee of the cumulative probability curve". This second regression was based on analysis of long-term rainfall data from seven rain gages representing climatic zones across the country. The Maximized Water Quality Capture Volume corresponds to approximately the 85th percentile runoff event, and ranges from 82 to 88%.

The two regression equations that form the URQM approach are as follows:

$$C = 0.858imp^3 - 0.78imp^2 + 0.774imp + 0.04 \qquad \text{(Equation E-1)}$$

$$P_o = (a \cdot C) \cdot P_6 \qquad \text{(Equation E-2)}$$

Where:

C	=	watershed runoff coefficient (unitless)
imp	=	watershed impervious ratio which is equal to the percent total imperviousness divided by 100 (ranges from 0 to 1)
P_o	=	maximized detention storage volume based on the volume capture ratio as its basis (watershed inches)

a	=	regression constant from least-squares analysis (unit less), a=1.582 and a=1.963 for 24 and 48 hour draw down, respectively
P_6	=	mean storm precipitation volume (watershed inches)

P_6 can be determined by two ways: Figure 5.3 in Urban Runoff Quality Management, or by performing analysis on local historical rainfall data. To determine the mean precipitation, EPA's Synoptic Rainfall Analysis Program – SYNOP – can be applied (see *Other Rainfall Analysis Methods* below).

The runoff coefficient equation in the URQM approach (Method 1) is not appropriate for the California BMP Handbook approach (Method 2), as Equation E-4 was developed in conjunction with the regression constants used in Method 1.

Method 2: Treatment of 80% or more of the Total Volume

Most water quality facilities are designed to treat only a portion of the runoff from a given site, as it is not economically feasible to capture 100% of the runoff. The percent of runoff treated by a basin is referred to as the "percent capture". There are a number of methods which allow calculation of the percent capture, including the California Stormwater Quality Association (CASQA) method (recommended by the 2002 Ventura County Manual), and using the EPA Stormwater Management Model (SWMM).

CASQA Method

The California Stormwater Quality Association (CASQA) BMP Handbook method estimates the basin volume to achieve various levels of volume capture (e.g., 80% for this sizing criterion). In the CASQA BMP Handbook New Development and Redevelopment (2003), a proprietary version of the Storage, Treatment, Overflow, Runoff Model (STORM) is used as the basis for the volume-based BMP sizing criteria. The model results are presented as the relationship between "unit basin storage volume" and "% volume capture" of the BMP", varying with drawdown time and runoff coefficient. Knowing the drawdown time, the runoff coefficient, and the desired percent capture will yield the "unit basin storage volume". The "unit basin storage volume" can then be used to size the BMP using the following equation (note that "unit basin storage volume" is given in inches, so units will have to be adjusted accordingly):

$$\text{BMP Volume} = \text{Unit Basin Storage Volume} \times \text{Tributary Area} \qquad \text{(Equation E-3)}$$

Results for several rain gauges are presented in Appendix D of the CASQA BMP Handbook New Development and Redevelopment (CASQA, 2003). Results are provided for a range of runoff coefficients and for 24 hour and 48 hour drawn down times. In order to use the curves provided in Appendix D, it is necessary to know the

runoff coefficient for the area tributary to the BMP, the drawn down time (a.k.a. drain time) of the facility, and the percent capture goal (e.g., 80%).

Drawdown time is the time required to drain a facility that has reached its design capacity; usually expressed in hours. Drain time is important as it is a surrogate for residence time, which affects the particle settling in the basin. Estimates for design drain time vary, and ideally would be determined based on site-specific information on the size, shape, and density or settling velocity of suspended particulates in the runoff. Because this information is generally not available for a specific site, estimates of appropriate ranges for settling time have generally relied on settling column test information reported in the literature.

An important source of drain time information is settling column tests conducted by Grizzard et. al. (1986) as part of the Nationwide Urban Runoff Program (NURP). Grizzard found that settling times of 48 hours resulted in removals of 80% to 90% of total suspended solids (TSS). Rapid initial removal was also observed in stormwater samples with medium (100 to 215 mg/L) and high (721 mg/L) initial TSS concentrations. For example, at settling times of 24 hours, the 80% to 90% removals were already achieved in samples with medium and high initial TSS, whereas only 50% to 60% removal was achieved in those with low initial TSS.

Given the data provided above, a drain time of 36 to 48 hours is recommended for sizing volume-based BMPs. This is also consistent with the recommendation of vector control agencies that structures be designed to drain in less than 72 hours to minimize mosquito breeding.

The rain gauge that is recommended for use for the area permitted by the Ventura county MS4 Permit (Order No. 09-0057) is the Oxnard Equipment Yard Gauge (168), which has a 40 year rainfall record. The graph included in the CASQA handbook can be seen in Figure E-1 below.

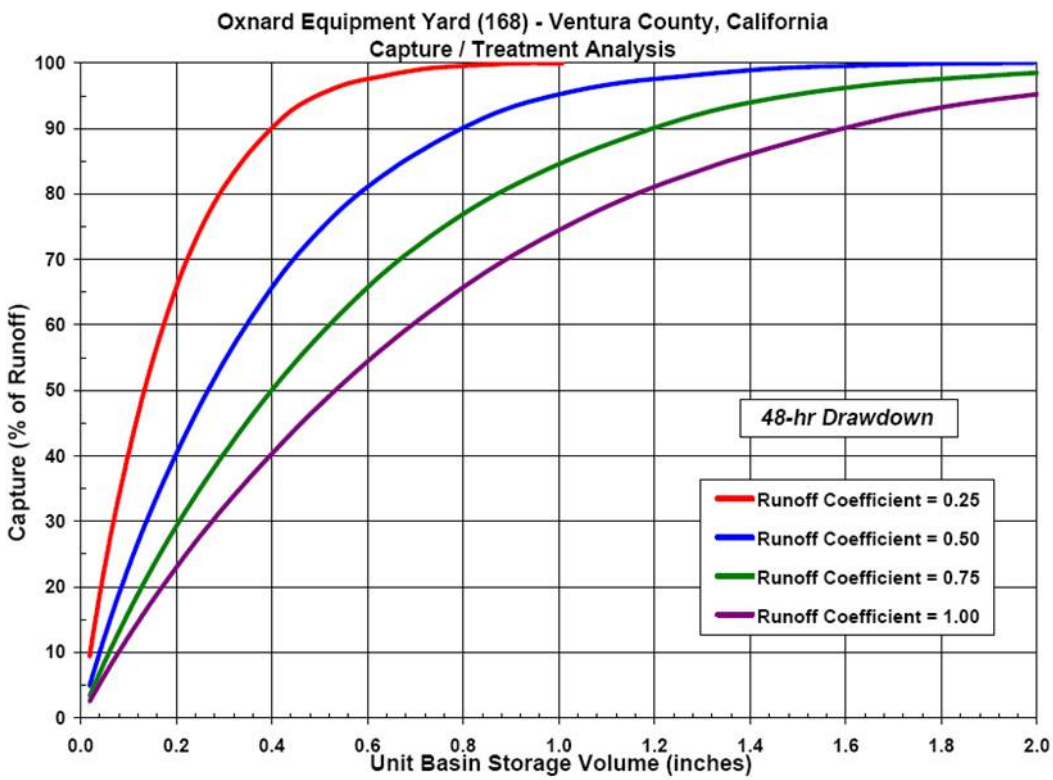

Figure E-1: CASQA 48-hour Drawdown Figure for Oxnard Gauge

This method has been modified for Ventura County. To use this method, follow the calculation procedure below. This refers to Figure E-3.

Ventura County Calculation Procedure

1) Review the area draining to the proposed treatment control measure. Determine the effective imperviousness (I_{WQ}) of the drainage area.

2) Estimate the total imperviousness (impervious percentage) of the site by the determining the weighted average of individual areas of like imperviousness.

3) Enter Figure E-2 along the horizontal axis with the value of total imperviousness calculated in Step 1. Move vertically up Figure E-2 until the appropriate curve (G-5.1 (filter strip) or G-5.2 (vegetated swale) employed individually or G-5.1 and G-5.2 employed together) is intercepted. Move horizontally across Figure E-2 until the vertical axis is intercepted. Read the Effective Imperviousness value along the vertical axis.

4) Note that if G-5.1 and/or G-5.2 are implemented on only a portion of the site, the site may be divided and effective imperviousness determined for the portion of the site for which site design controls have been implemented. The resulting effective imperviousness may be combined with total imperviousness of the

remainder of the site to determine a weighted average total imperviousness for the entire site.

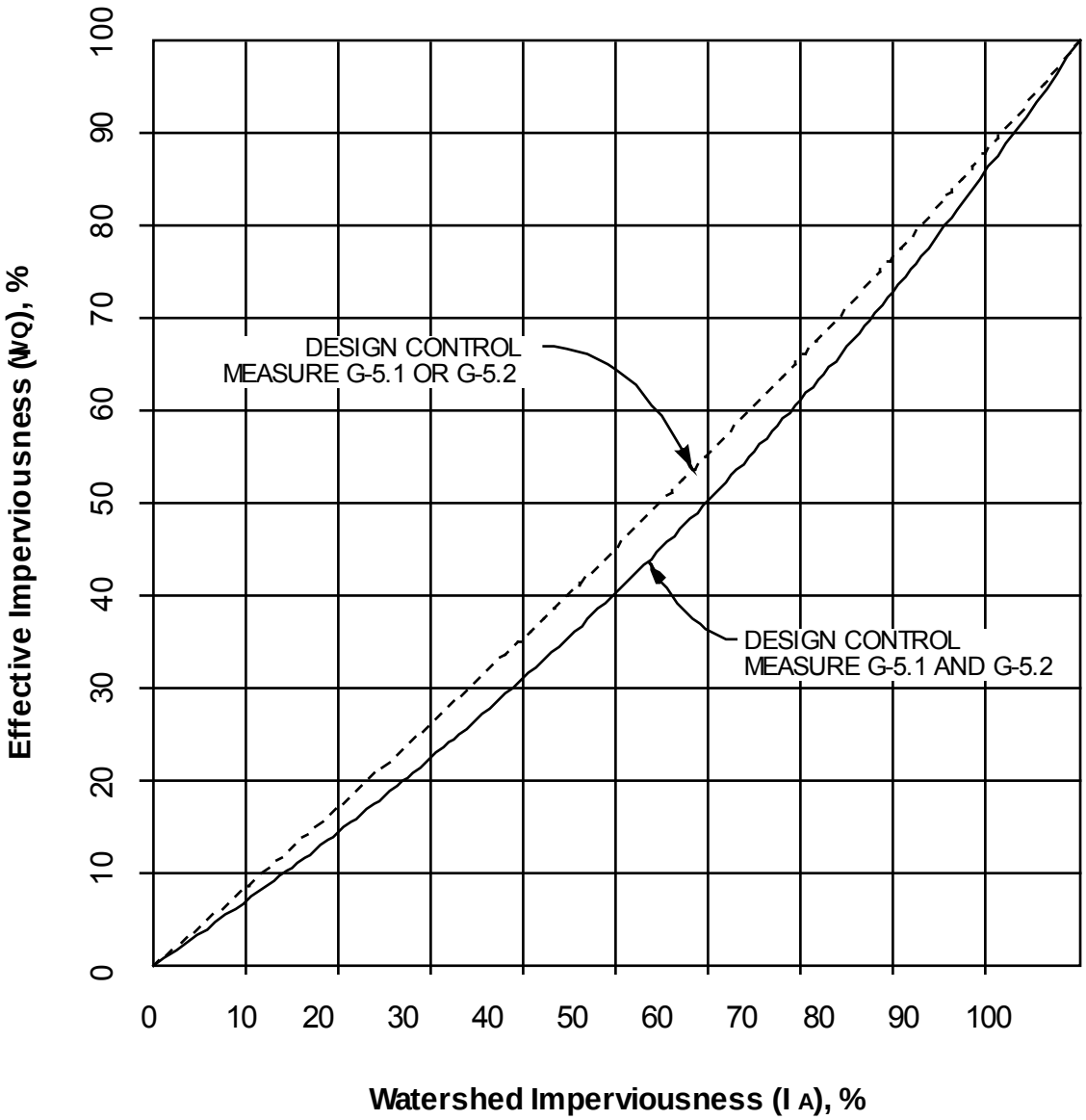

G-5.1: TURF BUFFER
G-5.2: GRASS-LINED CHANNEL

ADAPTED FROM URBAN STORM DRAIN CRITERIA MANUAL VOL. 3 - BEST MANAGEMENT PRACTICES, URBAN DRAINAGE AND FLOOD CONTROL DISTRICT, 11/99

Figure E-2: Effective Imperviousness based on Watershed Imperviousness

5) Figure E-3 provides a direct reading of Unit Basin Storage Volumes required for 80% annual capture of runoff for values of "I_{WQ}" determined in Step 1. Enter the horizontal axis of Figure E-3 with the "I_{WQ}" value from Step 1. Move vertically up

Figure E-3 until the appropriate drawdown period line is intercepted. (The design drawdown period specified in the respective Fact Sheet for the proposed treatment control measure.) Move horizontally across Figure E-3 from this point until the vertical axis is intercepted. Read the Unit Basin Storage Volume along the vertical axis.

6) Figure E-3 is based on Precipitation Gage 168, Oxnard Airport. This gage has a data record of approximately 40 years of hourly readings and is maintained by Ventura County Flood Control District. Figure E-3 is for use only in the permit area specified in Regional Board Order No. 00-108, NPDES Permit No. CAS004002.

7) The SQDV for the proposed treatment control measure is then calculated by multiplying the Unit Basin Storage Volume by the contributing drainage area. Due to the mixed units that result (e.g., acre-inches, acre-feet) it is recommended that the resulting volume be converted to cubic feet for use during design.

Example Stormwater Quality Design Volume Calculation

1) Determine the drainage area contributing to control measure, A_t. Example: 10 acres.

2) Determine the area of impervious surfaces in the drainage area, A_i. Example: 6.4 acres.

3) Calculate the percentage of impervious, $I_A = (A_i / A_t)*100$

   Example:

   Percent Imperviousness = $(A_i / A_t)*100$ = (6.4 acres/10 acres)*100 = 64%

4) Determine Effective Imperviousness using Figure 3-4.

   I_{WQ} = 60%

5) Determine design drawdown period for proposed control measure.

6) Determine the Unit Basin Storage Volume for 80% Annual Capture, V_u using Figure E-3.

   For $I_{WQ}/100$ = 0.60 and drawdown = 40 hrs, V_u = 0.64 in.

7) Calculate the volume of the basin, V_b, where

   $V_b = V_u * A_t$. (Equation E-4)

Where

V_b = Volume of basin

V_u = Unit basin storage volume

A_t = Total tributary area

8) V_b = (0.64 in)(10 ac)(ft/12 in(43,560 ft^2 / ac) = 23,232 ft^3.

9) Solution: Size the proposed control measure for 23,232 ft^3 and 40-hour drawdown.

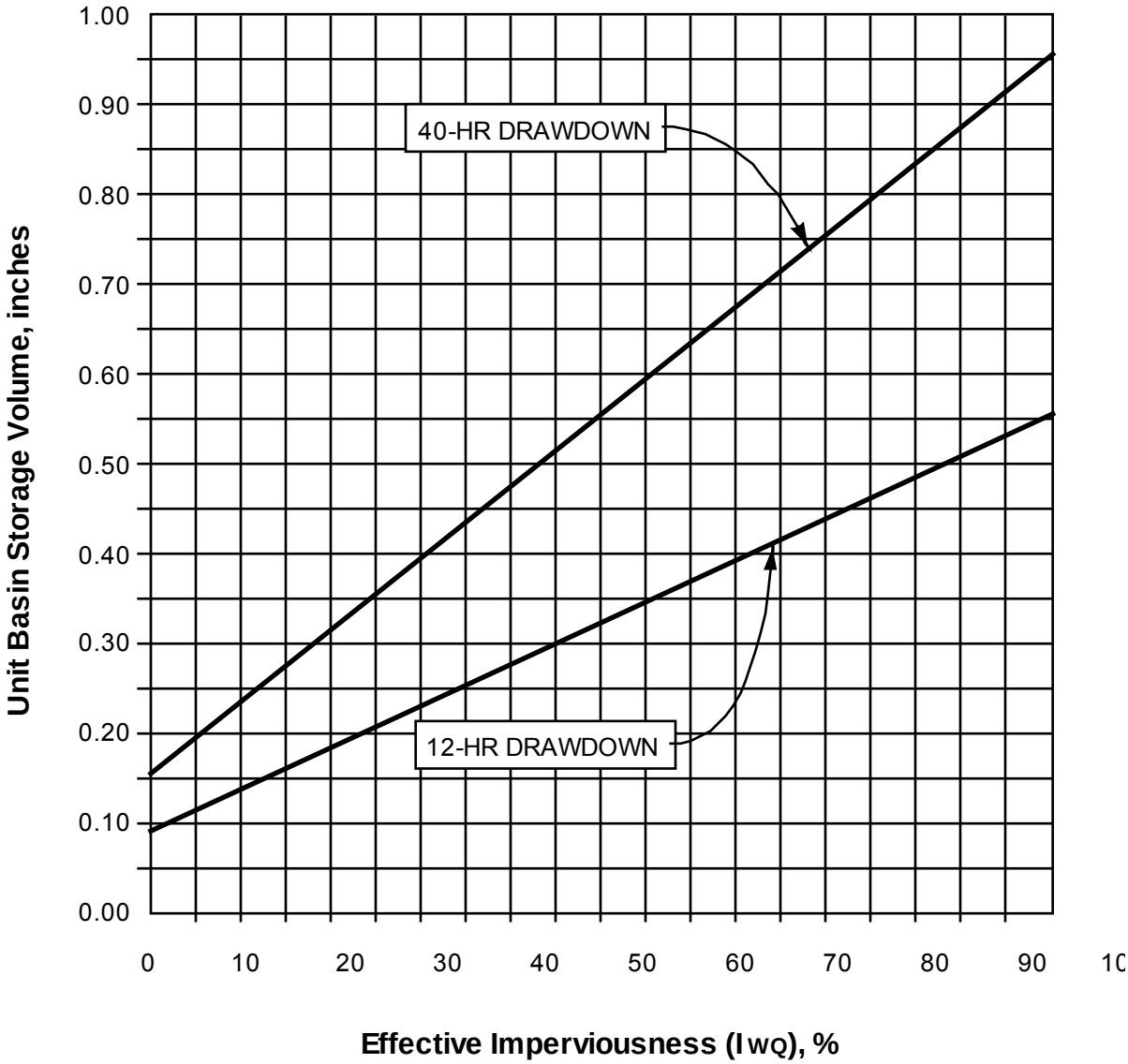

Figure E-3: Unit Basin Storage Volume for Design Volume Method 2

Method 3: 0.75 Inch Design Storm Approach

Equation E-8 can be used to determine the water quality design volume for Method 3.

Calculation Procedure

1) Determine the area from which runoff must be retained on-site (A_{retain}) using the method below:

   The allowable EIA for a project site can be calculated as follows:

   $EIA_{allowable} = (A_{project})*(\%_{allowable})$ (Equation E-5)

Where:

$EIA_{allowable}$	=	the maximum impervious area from which runoff can be treated and discharged off-site [and not retained on-site] (acres).
$A_{project}$	=	the total project area (acres). "Total project area" for new development and redevelopment projects is defined as the disturbed, developed, and undisturbed portions within the project's property (or properties) boundary, at the project scale submitted for first approval.
$\%_{allowable}$	=	ranges from 5 percent to 30 percent, based on a project specific assessment of technical feasibility for retaining runoff and whether the project is located in an existing urban area.

The drainage area from which Project generated runoff must be retained on-site is the total impervious area minus the $EIA_{allowable}$, which can be calculated as follows:

$A_{retain} = TIA - EIA_{allowable} = (P*A_{project}) - EIA_{allowable}$ (Equation E-6)

Where:

A_{retain}	=	the drainage area from which runoff must be retained (acres)
TIA	=	total impervious area (acres)
$EIA_{allowable}$	=	the maximum impervious area from which runoff can be treated and discharged off-site [and not retained on-site] (acres).
P	=	imperviousness of project area (%)/100
$A_{project}$	=	the total project area (acres)

Calculation Procedure

1) Determine the area from which runoff must be retained on-site (A_{retain}) using method above.

2) Determine the runoff coefficient per the following method:

$$C = 0.95*imp + C_p (1-imp) \quad \text{(Equation E-7)}$$

Where:

C	=	runoff coefficient
imp	=	impervious fraction of watershed
C_p	=	pervious runoff coefficient, determined using table below

Table E-1: Pervious Runoff Coefficient Based on Ventura Soil Type

Ventura Soil Type (Soil Number)	Cp value
1	0.15
2	0.10
3	0.10
4	0.05
5	0.05
6	0
7	0

3) The volume can be calculated using equation E-8 below:

$$SQDV = C*(0.75/12)*A_{retain} \quad \text{(Equation E-8)}$$

Where:

SQDV	=	the water quality design volume (acre-feet)
C_{imp}	=	runoff coefficient, calculated by equation (4) above
0.75	=	the design rainfall depth (in) [based on sizing method (c)]
A_{retain}	=	the drainage area from which runoff must be retained (acres)

Method 4: 80 percent of the average runoff volume using an appropriate public domain continuous flow model

Models that can be used for this calculation include the Storm Water Management Model (SWMM) or Hydrologic Engineering Center – Hydrologic Simulation Program – Fortran (HEC-HSPF)], using the local rainfall record and relevant BMP sizing and design data.

Sizing Method 4 allows for alternative sizing methods to be used as long as the selected method produces a water quality design volume based on historical rainfall records that achieves 80% capture of the average runoff volume. While sizing Methods 2 and 3 are appropriate for low lying areas within Ventura County, continuous simulation (using historical rainfall record) is well suited to sizing BMPs in locations with higher average rainfall. This method is the recommended sizing method for Ventura County, using appropriate local data inputs. For BMP locations at higher elevations, with larger rainfall, Method 1 is also better suited to sizing volume-based BMPs using rainfall representative of the site where the BMP will be located.

Continuous runoff modeling takes a long, uninterrupted record of observed rainfall data and transforms it into a record of runoff data. This is done by use of a set of mathematical algorithms that represent the rainfall-runoff processes. EPA's Stormwater Management Model (U.S. EPA, 2000) (SWMM) is one type of continuous runoff model. The runoff module of SWMM subdivides each drainage area into two inclined planes, one for impervious areas and one for pervious areas. Manning's equation is applied to estimate runoff taking into account rainfall intensity, initial losses, evapotranspiration, and infiltration (for pervious areas). The width and length of each plane is selected based on the drainage area configuration and existing and proposed drainage features. Hourly rainfall data is the primary model input for generating runoff volumes and rates. Additional input data are required to characterize imperviousness, soils, topography, and losses associated with evapotranspiration, infiltration, and initial losses.

Sizing BMPs using this type of alternative should only be conducted by qualified personnel with a thorough understanding of the simulated hydrologic processes and operation of the selected hydrology model.

Methods for Determining the Water Quality Design Flow

Each of the flow-based sizing alternatives is described in detail below.

Method 1: Runoff Produced by 0.2 Inches per Hour Rainfall Intensity

The rainfall analysis for flow-based controls focuses on estimating the design rainfall intensity, which is then converted to a design flow rate using the rational method shown in Equation E-9.

$$SQDF = CiA \qquad \text{(Equation E-9)}$$

Where:

SQDF	=	design flow rate (cfs)
C	=	runoff coefficient, calculated with the Ventura County Hydrology Manual method (see Equation E-5) (unitless)
i	=	rainfall intensity (in/hr) (0.2 in/hr)
A	=	watershed area (acres)

Note that 1 acre-in/hr = 1.0083 cfs; this conversion factor can be used with Equation D-9, but is not necessary as the uncertainty for the other parameters is generally well above 0.8%.

Method 2: Runoff Produced by Twice the 85th Percentile Rainfall Intensity

This method is analogous to the rational method used in Method 1, except that twice the historical 85th percentile rainfall intensity for the site location is used for the design rainfall intensity. This method is expected to result in a higher design rainfall intensity and design flow rate compared to Method 1 for most of the rain gages in the District.

Method 3: Runoff Produced by eight percent of the 50-year storm design flow rate

The Stormwater Quality Design Flow (SQDF) is defined to be equal to 8 percent of the peak rate of runoff flow from the 50-year storm as determined using the procedures set forth in the *Hydrology Manual*.

Calculation Procedure

1) The Stormwater Quality Design Flow (SQDF) in Ventura County is defined as SQDF

2) Calculate the peak rate of flow from the 50-year storm ($Q_{P,\ 50\ yr.}$) using the procedures set forth in the *Hydrology Manual* or as directed by the local agency Drainage Master Plan.

3) Convert $Q_{P,\ 50yr}$ (Step 2) to $Q_{P,\ SQDF}$ (Step 1).

$$Q_{P,\ SQDF} = 0.1 \times Q_{P,\ 50yr} \qquad \text{(Equation E-10)}$$

Example Stormwater Quality Design Flow Calculation

The steps below illustrate calculation of SQDF:

1) Calculate the peak rate of flow from a 50-year storm.

$Q_{p,\ 50\ yr.}$ = 10 cfs from the *Ventura County Hydrology Manual*

4) Convert $Q_{p,50\ yr}$ (Step 2) to $Q_{p,\ SQDF}$ (Step 1)

SQDF = 0.8 x 10 cfs (Equation E-11)

SQDF = 0.8 cfs

Rainfall Analysis Methods

The rainfall analysis methods listed below have the benefits of including the most recent rainfall data. Additionally, if the site is not close to an isohyet map rainfall gauge, these methods may be more accurate due to the variability of rainfall due to changing microclimates caused by elevation and distance from the ocean.

A resource available for obtaining rainfall data in Ventura County is the data collected and compiled by the National Climatic Data Center (NCDC).

There are many NCDC stations within Ventura County that collect or have collected hourly precipitation data. Some of these stations are no longer in operation and others may not have a sufficiently long period of record over which precipitation data has been collected to be of use for properly sizing treatment BMPs. NCDC data may be obtained online at the NCDC website http://www.ncdc.noaa.gov/oa/ncdc.html.

Rainfall Analysis Using EPA'S SYNOP Program

US EPA's Synoptic Rainfall Data Analysis Program (SYNOP) aggregates hourly rainfall data into individual storm events and computes event descriptive statistics. The SYNOP program calculates the duration, volume, and intensity for individual storms as well as average annual statistics. Recurrence interval and probability results are also available as output options. The SYNOP program allows the user to screen out storms that are not expected to result in runoff (see step 2 below).

The SYNOP rainfall analysis is conducted to output event-specific data in addition to average annual statistics. The individual storm event data can be ranked to give the 85th percentile storm or averaged to give the mean storm size.

Steps for conducting SYNOP rainfall analysis are as follows:

1) Obtain the hourly rainfall data for the gage of interest from the NCDC or other agency.

2) Run SYNOP for the available rain gage data. Model input parameters include the inter-event time and a minimum storm event size. The inter-event time specifies the minimum duration in which precipitation does not occur, used to define separate storm events, while the minimum storm event is the depth of precipitation generated by a storm below which runoff generally does not occur. Typically, an inter-event time of 6 hours (USEPA, 1989), and a minimum storm

event size of 0.10 inches are used (i.e., storms of 0.10 inches or less are not considered to produce runoff typically). Model results include event-specific and annual statistics during the period of record analyzed.

3) Rank and average the SYNOP storm event output.

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E.2 INF-1 Infiltration Basin/ INF-2 Infiltration Trench/ INF-4 Drywell

This worksheet can be used for sizing INF-1 Infiltration Basins, INF-2 Infiltration Trenches, or INF-4 drywells. An infiltration basin is an earthen basin constructed into naturally pervious soils which retains the SQDV and allows the retained runoff to percolate into the underlying native soils over a specified period of time. Infiltration trenches are long, narrow, gravel-filled trenches, often vegetated, that infiltrate stormwater runoff from small drainage areas. Drywells are similar to infiltration trenches, but the geometry and materials are slightly different. A dry well may be either a small excavated pit filled with aggregate or a prefabricated storage chamber or pipe segment, with the depth of the drywell greater than the width.

Sizing Methodology

Infiltration facilities can be sized using one of two methods: a simple sizing method or a routing modeling method. With either method the SQDV volume must be completely infiltrated within 12 to 72 hours (see Appendix E, Section E.1 for a discussion on drawdown time and BMP performance). The simple sizing procedures provided below can be used for either infiltration basins, infiltration trenches (see INF-2: Infiltration Trench) or drywells (INF-4: Drywell). For the routing modeling method, refer to VEG-8 Sand Filters.

Step 1: Calculate the design volume

Infiltration facilities shall be sized to capture and infiltrate the SQDV volume (see Section 2 and Appendix E) with a 12 - 72 hour drawdown time (see Appendix E, Section E.1).

Step 2: Determine the Design Percolation Rate

The percolation rate will decline between maintenance cycles as particulates accumulate in the infiltrative layer and the surface becomes occluded. Additionally, monitoring of actual facility performance has shown that the full-scale infiltration rate is far lower than the rate measured by small-scale testing. It is important that adequate conservatism is incorporated in the selection of design percolation rates. For infiltration trenches, the design percolation rate discussed here is the percolation rate of the underlying soils, which will ultimately drive infiltration through the trench, and not the percolation rate of the filter media bed (refer to the "Geometry and Sizing" section of INF-2 for the recommended composition of the filter media bed for infiltration trenches). See INF-1: Infiltration Basin for guidance in developing design percolation rate correction factors.

Step 3: Calculate Surface Area

Determine the size of the required infiltrating surface by assuming the SQDV will fill the available ponding depth plus (for infiltration trenches/ drywells with aggregate)

the void spaces within the filter media based on the computed porosity of the media (normally about 32%).

1) Determine the maximum depth of runoff that can be infiltrated within the required drain time as follows:

$$d_{\max} = \frac{P_{design}}{12} t \qquad \text{(Equation E-12)}$$

Where:

d_{max}	=	the maximum depth of water that can be infiltrated within the required drain time (ft)
P_{design}	=	design percolation rate of underlying soils (in/hr)
t	=	required drain time (hrs)

2) Choose the ponding depth (d_p) and/or trench depth (d_t) such that:

$$d_{\max} \geq d_p \qquad \text{For Infiltration Basins} \qquad \text{(Equation E-13)}$$

$$d_{\max} \geq n_t d_t + d_p \qquad \text{For Infiltration Trenches or aggregate-filled Drywells} \qquad \text{(Equation E-14)}$$

Where:

d_{max}	=	the maximum depth of water that can be infiltrated within the required drain time (ft)
d_p	=	ponding depth (ft)
n_t	=	trench/drywell fill aggregate porosity (unitless)
d_t	=	depth of trench/drywell filter media (ft)

3) Calculate infiltrating surface area (filter bottom area) required:

$$A = \frac{SQDV}{((TP_{design}/12) + d_p)} \qquad \text{For Infiltration Basins} \qquad \text{(Equation E-15)}$$

$$A = \frac{SQDV}{((TP_{design}/12) + n_t d_t + d_p)} \qquad \text{For Infiltration Trenches or aggregate-filled Drywells} \qquad \text{(Equation E-16)}$$

Where:

$SQDV$	=	stormwater quality design volume (ft^3)

n_t	=	trench fill aggregate porosity (unitless)
P_{design}	=	design percolation rate (in/hr)
d_p	=	ponding depth (ft)
d_t	=	depth of trench filter media (ft)
T	=	fill time (time to fill to max ponding depth with water) (hrs) [use 2 hours for most designs]

Step 4: Size the forebay (applies to infiltration basins and trenches)

Infiltration facilities require pre-treatment to reduce sediment load into the basin. If a separate pre-treatment unit is not used, a forebay should be constructed for the facility. If a forebay is used, all inlets must enter the sediment forebay. The sediment forebay must be sized to 25% of the basin volume. The forebay must have interior slopes no steeper than 4:1.

1) Calculate the volume of the sediment forebay:

$$V_{forebay} = 0.25 \times SQDV \qquad \text{(Equation E-17)}$$

Where:

$V_{forebay}$	=	Volume of sediment forebay
SQDV	=	Stormwater Quality Design Volume of Infiltration Basin

2) Select the depth of forebay, $d_{forebay}$. This is recommended to be...

3) Determine bottom surface area of forebay:

$$A_{forebay} = \frac{V_{forebay}}{d_{forebay}} \qquad \text{(Equation E-18)}$$

Where:

$A_{forebay}$	=	Bottom surface area of forebay
$V_{forebay}$	=	Volume of forebay
$d_{forebay}$	=	Depth of forebay

4) Size forebay outlet pipe. Pipe must 8 inches in diameter, minimum, and must be sized such that the forebay drains completely within 10 minutes.

Step 5: Provide conveyance capacity for filter clogging

The infiltration facility should be placed off-line, but an emergency overflow must still be provided in the event the filter becomes clogged. Spillway and overflow

structures should be designed in accordance with applicable standards of the Ventura County Flood Control District or local jurisdiction.

Sizing Worksheet

Step 1: Determine water quality design volume	
1-1. Enter Project area (acres), $A_{project}$	$A_{project}$ = acres
1-2. Enter the maximum allowable percent of the Project area that may be effective impervious area (%) (refer to permit), ranges from 5-30%, $\%_{allowable}$	$\%_{allowable}$ = %
1-3. Determine the maximum allowable effective impervious area (acres), $EIA_{allowable} = (A_{project})*(\%_{allowable})$	$EIA_{allowable}$= acres
1-4. Enter Project impervious fraction, Imp (e.g. 60% = 0.60)	Imp=
1-5. Determine the Project Total Impervious area (acres), $TIA=A_{project}*Imp$	TIA= acres
1-6. Determine the total area from which runoff must be retained (acres), $A_{retain}=TIA-EIA_{allowable}$	A_{retain} = acres
1-7. Determine pervious runoff coefficient using Table E-1, C_p	C_p =
1-8. Calculate runoff coefficient, $C = 0.95*imp + C_p\ (1-imp)$	C =
1-9. Enter design rainfall depth of the storm (in), P_i	P_i = in
1-10. Calculate rainfall depth (ft), $P = P_i/12$	P = ft
1-11. Calculate water quality design volume (ft^3), $SQDV=43560\times C*P*A_{retain}$	SQDV= ft^3
Step 2: Determine the design percolation rate	
2-1. Enter measured soil percolation rate (in/hr, 0.5 in/hr min.), $P_{measured}$	$P_{measured}$ = in/hr
2-2. Determine percolation rate correction factor, S_A based on suitability assessment (see Section 6 INF-1)	S_A =

2-3. Determine percolation rate correction factor, S_B based on design (see Section 6 INF-1)	S_b =
2-4. Calculate combined safety factor, $S = S_A \times S_b$	S =
2-5. Calculate the design percolation rate (in/hr), $P_{design} = P_{measured}/S$	P_{design} = in/hr
Step 3: Calculate the surface area	
3-1. Enter required drain time(hours,72 hrs max.), t	t = hrs
3-2. Calculate max. depth of runoff that can be infiltrated within the t (ft), $d_{max} = P_{design}\ t/12$	d_{max} = ft
3-3. For basins, select ponding depth (ft), d_p, such that $d_p \leq d_{max}$	d_p = ft
3-4. For trenches, enter trench fill aggregate porosity, n_t	n_t =
3-5. For trenches, enter depth of trench fill (ft), d_t	d_t = ft
3-5. For trenches, select ponding depth d_p such that $d_p \leq d_{max} - n_t d_t$	d_p= ft
3-6. Enter the time to fill infiltration basin or trench with water (Use 2 hours for most designs), T	T = hrs
3-7. Calculate infiltrating surface area for infiltration basin (ft²): $A_b = SQDV/(T\ P_{design}\ /12+d_p)$ OR Calculate infiltrating surface area for infiltration trenches or aggregate- filled drywells (ft²): $A_t = SQDV/(T\ P_{design}\ /12+n_t d_t+dp)$	A_b = ft² A_t = ft²
Step 4: Size the forebay (infiltration basins or trenches)	
If a separate pre-treatment unit is designed for the infiltration facility, skip to Step 5. If not, continue through 4-1 through 4-4.	

4-1. Calculate the volume of the forebay (ft^3), $V_{forebay}$=0.25*SQDV	$V_{forebay}$= ft^3
4-2. Determine forebay depth (ft), $d_{forebay}$	$d_{forebay}$= ft
4-3. Calculate forebay bottom surface area (ft^2), $A_{forebay}=V_{forebay}/d_{forebay}$	$A_{forebay}$= ft^2
4-4. Provide outlet pipe such that the forebay drains to the infiltration facility within 10 minutes.	
Step 5: Provide conveyance capacity for filter clogging	
5-1.The infiltration facility should be placed off-line, but an emergency overflow must still be provided in the event the filter becomes clogged. Design emergency overflow in accordance with applicable standards of the Ventura County Flood Control District or local jurisdiction.	

Design Example

Step 1: Determine water quality design volume

For this design example, a 10-acre residential development with a 60% total impervious area is considered to drain to an infiltration basin. The 85th percentile storm event for the project location is 0.75 inches.

Step 1: Determine water quality design volume			
1-1. Enter Project area (acres), $A_{project}$	A =	10	acres
1-2. Enter the maximum allowable percent of the Project area that may be effective impervious area (%) (refer to permit), ranges from 5-30%, $\%_{allowable}$	$\%_{allowable}$ =	5	
1-3. Determine the maximum allowable effective impervious area (acres), $EIA_{allowable} = (A_{project})*(\%_{allowable})$	$EIA_{allowable}$=	0.5	acres
1-4. Enter Project impervious fraction, Imp (e.g. 60% = 0.60)	Imp=	0.6	
1-5. Determine the Project Total Impervious area (acres), $TIA=A_{project}*Imp$	TIA=	6	acres
1-6. Determine the total area from which runoff must be retained (acres), $A_{retain}=TIA-EIA_{allowable}$	A_{retain} =	5.5	acres
1-7. Determine pervious runoff coefficient using Table E-1, C_p	C_p =	0.05	
1-8. Calculate runoff coefficient, $C = 0.95*imp + C_p\ (1-imp)$	C =	0.59	
1-9. Enter design rainfall depth of the storm (in), P_i	P_i =	0.75	in
1-10. Calculate rainfall depth (ft), $P = P_i/12$	P =	0.06	ft
1-11. Calculate water quality design volume (ft^3), $SQDV=43560\times C*P*A_{retain}$	SQDV =	8,500	ft^3

Step 2: Calculate Design Infiltration Rate

Infiltration facilities require a minimum soil infiltration rate of 0.5 in/hr. If the rate exceeds 2.4 in/hr as in this example, then the runoff should be fully treated in an upstream BMP prior to infiltration to protect the groundwater quality.

Step 2: Determine the design percolation rate	
2-1. Enter measured soil percolation rate (0.5 in/hr min.), $P_{measured}$	$P_{measured}$ = 4.0 in/hr
2-2. Determine percolation rate correction factor, S_A, based on suitability assessment (see Section 6 INF-1)	S_A = 3
2-3. Determine percolation rate correction factor, S_B, based on design (see Section 6 INF-1)	S_b = 3
2-4. Calculate combined safety factor, $S = S_A \times S_b$	S = 9
2-5. Calculate the design percolation rate, $P_{design} = P_{measured}/S$	P_{design} = 0.44 in/hr

Step 3: Determine Facility Size

The size of the infiltrating surface is determined by assuming the SQDV will fill the available ponding depth (plus the void spaces of the computed porosity (usually about 32%) of the gravel in the trench).

Step 3: Calculate the surface area	
3-1. Enter drawdown time (72 hrs max.), t_d	t = 72 hrs
3-2. Calculate max. depth of runoff that can be infiltrated within the t, $d_{max} = P_{design}\ t/12$	d_{max}= 2.4 ft
3-3. Enter trench fill aggregate porosity, n_t	n_t= 0.32
3-4. Enter depth of trench fill, d_t	d_t = 4 ft
3-5. Select trench ponding depth d_p such that $d_p \leq d_{max} - n_t d_t$	d_p= 1.1 ft
3-6. Enter the time to fill infiltration basin or trench with water (Use 2 hours for most designs), T	T = 2 hrs

3-7. Calculate infiltrating surface area for infiltration basin: $A_b = SQDV/(T\ P_{design}\ /12+d_p)$	A_b = 7,250 ft^2

Step 4: Size the Forebay

A sediment forebay will be provided for this example as there is no separate pre-treatment unit provided.

Step 4: Size the forebay	
4-1. Calculate the volume of the forebay, $V_{forebay}$=0.25*SQDV	$V_{forebay}$= 2,100 ft^3
4-2. Determine forebay depth, $d_{forebay}$	$d_{forebay}$= 3 ft
4-3. Calculate forebay bottom surface area, $A_{forebay}=V_{forebay}/d_{forebay}$	$A_{forebay}$= 700 ft^2
4-4. Provide outlet pipe such that the forebay drains to the infiltration facility within 10 minutes.	

Step 5: Provide Conveyance Capacity for Flows Higher than Qwq

The infiltration facility should be placed off-line, but an emergency overflow for flows greater than the peak design storm must still be provided in the event the filter becomes clogged. Design emergency overflow in accordance with applicable standards of the Ventura County Flood Control District or local jurisdiction.

E.3 INF-3 Bioretention

Sizing Methodology

Bioretention areas can be sized using one of two methods: a simple sizing method or a routing method. The simple sizing procedure is summarized below. Continuous simulation modeling, routing spreadsheets, and/or other forms of routing modeling that incorporate rainfall-runoff relationships and infiltrative (flow) capacities of bioretention may be used to size facilities. Alternative sizing methodologies should be prepared with good engineering practices. For the routing modeling method, refer to the Sand Filter design guidance (FILT-1). A bioretention sizing worksheet and example are provided in this appendix. Planter boxes are sized the same as bioretention areas with underdrains using parameters appropriate for planter boxes.

With either method, the runoff entering the facility must completely drain the ponding area within 48 hours, and runoff must be completely infiltrated within 96 hours. Bioretention is to be sized, with or without underdrains, such that the SQDV will fill the available ponding depth, the void spaces in the planting soil, and the optional gravel layer below the media.

Step 1: Determine the stormwater quality design volume (SQDV)

Bioretention areas should be sized to capture and treat the water quality design volume (see Section E.1).

Step 2: Determine the Design Percolation Rate

The percolation rate will decline between maintenance cycles as particulates accumulate in the infiltrative layer and the surface becomes occluded. Additionally, monitoring of actual facility performance has shown that the full-scale infiltration rate is far lower than the rate measured by small-scale testing. It is important that adequate conservatism is incorporated in the selection of design percolation rates. For infiltrating bioretention facilities, the design percolation rate discussed here is the percolation rate of the underlying soils, which will drive infiltration through the facility. See INF-3: Bioretention for guidance in developing design percolation rate correction factors.

Step 3: Calculate the bioretention surface area

1) Determine the maximum depth of surface ponding that can be infiltrated within the required surface drain time:

$$d_{\max} = \frac{P_{design} \times t_{ponding}}{12 \frac{in}{ft}}$$

Where:

$t_{ponding}$	=	required drain time of surface ponding (48 hrs)
P_{design}	=	design percolation rate of underlying soils (in/hr) (see Step 2, above)
d_{max}	=	the maximum depth of surface ponding water that can be infiltrated within the required drain time (ft)

2) Choose surface ponding depth (dp) such that:

$$d_p \leq d_{\max} \qquad \text{(Equation E-19)}$$

Where:

d_p	=	selected surface ponding depth (ft)
d_{max}	=	the maximum depth of water that can be infiltrated within the required drain time (ft)

3) Choose thickness(es) of amended media and aggregate layer(s) and calculate total effective storage depth of the bioretention area as follows:

$$d_{effective} \leq d_p + n^*_{media} l_{media} + n_{gravel} l_{gravel} \qquad \text{(Equation E-20)}$$

Where:

$d_{effective}$	=	total equivalent depth of water stored in bioretention area (ft)
d_p	=	surface ponding depth (ft)
n^*_{media}	=	available porosity of amended soil media (ft/ft), approximately 0.25 ft/ft accounting for antecedent moisture conditions
l_{media}	=	thickness of amended soil media layer (ft)
n_{gravel}	=	porosity of optional gravel layer (ft/ft), approximately 0.30 ft/ft
l_{gravel}	=	thickness of optional gravel layer (ft)

4) Check that entire effective depth (surface plus subsurface storage) infiltrates in no greater than 96 hours as follows:

$$t_{total} = \frac{d_{effective}}{P_{design}} \times 12 \frac{in}{ft} \leq 96\ hr \qquad \text{(Equation E-21)}$$

Where:

$d_{effective}$ = total equivalent depth of water stored in bioretention area (ft)

P_{design} = design percolation rate of underlying soils (in/hr) (see Step 2, above)

If t_{total} > 96 hrs, then reduce surface ponding depth and/or amended media thickness and/or gravel thickness and return to Step [A].

If $t_{total} \leq$ 96 hrs, then proceed to Step [E].

5) Calculate required infiltrating surface area (filter bottom area):

$$A_{req} = \frac{SQDV}{d_{effective}} \qquad \text{(Equation E-22)}$$

Where:

$SQDV$ = stormwater quality design volume (ft3)

Step 4: Calculate the bioretention total footprint

Calculate total footprint required by including a buffer for side slopes and freeboard; A_{req} is measured at the as the filter bottom area (toe of side slopes).

Sizing Worksheet

Step 1: Determine water quality design volume	
1-1. Enter Project area (acres), $A_{project}$	$A_{project}$ = acres
1-2. Enter the maximum allowable percent of the Project area that may be effective impervious area (%) (refer to permit), ranges from 5-30%, $\%_{allowable}$	$\%_{allowable}$ = %
1-3. Determine the maximum allowable effective impervious area (acres), $EIA_{allowable} = (A_{project})*(\%_{allowable})$	$EIA_{allowable}$= acres
1-4. Enter Project impervious fraction, Imp (e.g. 60% = 0.60)	Imp=
1-5. Determine the Project Total Impervious area (acres), $TIA=A_{project}*Imp$	TIA= acres
1-6. Determine the total area from which runoff must be retained (acres), $A_{retain}=TIA-EIA_{allowable}$	A_{retain} = acres
1-7. Determine pervious runoff coefficient using Table E-1, C_p	C_p =
1-8. Calculate runoff coefficient, $C = 0.95*imp + C_p\ (1-imp)$	C =
1-9. Enter design rainfall depth of the storm (in), P_i	P_i = in
1-10. Calculate rainfall depth (ft), $P = P_i/12$	P = ft
1-11. Calculate water quality design volume (ft^3), $SQDV=43560\times C*P*A_{retain}$	SQDV= ft^3

Step 2: Determine the design percolation rate	
2-1. Enter measured soil percolation rate (in/hr) (0.5 in/hr minimum), $P_{measured}$	$P_{measured}$ = in/hr
2-2. Determine percolation rate correction factor, S_A based on suitability assessment (see Section 6 INF-3)	S_A =

2-3. Determine percolation rate correction factor, S_B based on design (see Section 6 INF-3)	S_B =
2-4. Calculate combined safety factor, $S = S_A \times S_b$	S =
2-5. Calculate the design percolation rate (in/hr), $P_{design} = P_{measured}/S$	P_{design} = in/hr
Step 3: Calculate Bioretention Infiltrating surface area	
3-1. Enter water quality design volume (ft^3), *SQDV*	SQDV = ft^3
3-2. Enter design percolation rate (in/hr), P_{design}	P_{design} = in/hr
3.3 Enter the required drain time (48 hours), $t_{ponding}$	$t_{ponding}$ = hours
3-3. Calculate the maximum depth of surface ponding that can be infiltrated within the required drain time (ft): $d_{max} = (P_{design} \times t_{ponding})/12$	d_{max} = ft
3-4. Select surface ponding depth (ft), d_p, such that $d_p \leq d_{max}$	d_p = ft
3-5. Select thickness of amended media (ft,2 feet minimum, 3 preferred), l_{media}	l_{media} = ft
3-6. Enter porosity of amended media (roughly 25% or 0.25 ft/ft), n_{media}	n_{media}= ft/ft
3-7. Select thickness of optional gravel layer (ft), l_{gravel}	l_{gravel} = ft
3-8. Enter porosity of gravel (roughly 30% or 0.3 ft/ft), n_{gravel}	n_{gravel}= ft/ft
3-9. Calculate the total effective storage depth of bioretention facility (ft): $d_{effective} \leq (d_p + n_{media} l_{media} + n_{gravel} l_{gravel})$	$d_{effective}$= ft

3-10. Check that the entire effective depth infiltrates in required drainage time, 96 hours: $t_{total} = (d_{effective}/P_{design}) \times 12$ If t_{total} > 96 hours, reduce surface ponding depth and/or amended media thickness and/or gravel thickness and return to 3-4. If $t_{total} \leq$ 96 hours, proceed to 3-11.	t_{total} = hours
3-11. Calculate the required infiltrating surface area (ft^2): $A_{req} = SQDV/d_{effective}$	A_{req} = ft^2
Step 4: Calculate Bioretention Area Total Footprint	
4-1. Calculate total footprint required by including a buffer for side slopes and freeboard (ft^2) [A_{req} is measured at the as the filter bottom area (toe of side slopes)], A_{tot}	A_{tot} = ft^2

Design Example

Bioretention areas have several components that allow the pretreatment, spreading, filtration, collection and discharge of the incoming flows.

Step 1: Determine water quality design volume

For this design example, a 10-acre site with soil type 4 and 60% total impervious area is considered. The 85th percentile storm event for the project location is 0.75 inches.

Step 1: Determine water quality design volume			
1-1. Enter Project area (acres), $A_{project}$	$A_{project}$ =	10	acres
1-2. Enter the maximum allowable percent of the Project area that may be effective impervious area (%) (refer to permit), ranges from 5-30%, $\%_{allowable}$	$\%_{allowable}$ =	5	
1-3. Determine the maximum allowable effective impervious area (acres), $EIA_{allowable} = (A_{project})*(\%_{allowable})$	$EIA_{allowable}$=	0.5	acres
1-4. Enter Project impervious fraction, Imp (e.g. 60% = 0.60)	Imp=	0.6	
1-5. Determine the Project Total Impervious area (acres), $TIA=A_{project}*Imp$	TIA=	6	acres
1-6. Determine the total area from which runoff must be retained (acres), $A_{retain}=TIA-EIA_{allowable}$	A_{retain} =	5.5	acres
1-7. Determine pervious runoff coefficient using Table E-1, C_p	C_p =	0.05	
1-8. Calculate runoff coefficient, $C = 0.95*imp + C_p\ (1-imp)$	C =	0.59	
1-9. Enter design rainfall depth of the storm (in), P_i	P_i =	0.75	in
1-10. Calculate rainfall depth (ft), $P = P_i/12$	P =	0.06	ft
1-11. Calculate water quality design volume (ft^3), $SQDV=43560\times C*P*A_{retain}$	SQDV=	8,500	ft^3

Step 2: Determine the design percolation rate

For this design example, a native soil percolation rate of 1.5 in/hr is assumed.

Step 2: Determine the design percolation rate	
2-1. Enter measured soil percolation rate (in/hr, 0.5 in/hr minimum), $P_{measured}$	$P_{measured}$ = 4.0 in/hr
2-2. Determine percolation rate correction factor, S_A, based on suitability assessment (see Section 6 INF-1)	S_A = 3
2-3. Determine percolation rate correction factor, S_B, based on design (see Section 6 INF-1)	S_b = 3
2-4. Calculate combined safety factor, $S = S_A \times S_b$	S = 9
2-5. Calculate the design percolation rate (in/hr), $P_{design} = P_{measured}/S$	P_{design} = 0.44 in/hr

Step 3: Determine bioretention/ planter box area footprint

A bioretention area is designed with two components: (1) temporary storage reservoir to store runoff, and (2) a plant mix filter bed (planting soil mixed with sand content = 70%) through which the stored runoff must percolate to obtain treatment.

Step 3: Calculate bioretention/planter box surface area	
3-1. Enter water quality design volume (ft^3), *SQDV*	SQDV = 8,500 ft^3
3-2. Enter design percolation rate (in/hr), P_{design}	P_{design} = 0.375 in/hr
3.3 Enter the required drain time (48 hours), $t_{ponding}$	$t_{ponding}$ = 48 hours
3-3. Calculate the maximum depth of surface ponding (ft) that can be infiltrated within the required drain time (48 hours): $d_{max} = (P_{design} \times t_{ponding})/12$	d_{max} = 1.5 ft
3-4. Select surface ponding depth d_p such that $d_p \leq d_{max}$	d_p = 1.5 ft
3-5. Select thickness of amended media (2 feet minimum, 3 preferred), l_{media}	l_{media} = 3 ft

Step 3: Calculate bioretention/planter box surface area	
3-6. Enter porosity of amended media (roughly 25% or 0.25 ft/ft), n_{media}	n_{media}= 0.25 ft/ft
3-7. Select thickness of optional gravel layer (ft), l_{gravel}	l_{gravel} = 1 ft
3-8. Enter porosity of gravel (roughly 30% or 0.3 ft/ft), n_{gravel}	n_{gravel}= 0.3 ft/ft
3-9. Calculate the total effective storage depth of bioretention facility (ft): $d_{effective} \leq (d_p + n_{media} l_{media} + n_{gravel} l_{gravel})$	$d_{effective}$= 2.6 ft
3-10. Check that the entire effective depth infiltrates in required drainage time, 96 hours: $t_{total} = (d_{effective}/P_{design}) \times 12$ If t_{total} > 96 hours, reduce surface ponding depth and/or amended media thickness and/or gravel thickness and return to 3-4. If $t_{total} \leq$ 96 hours, proceed to 3-11.	t_{total} = 82 hours
3-11. Calculate the required infiltrating surface area (ft²), $A_{req} = SQDV/d_{effective}$	A_{req} = 3,300 ft²

Step 4: Calculate Bioretention Area Total Footprint

For this design example, a natural-shaped bioretention area is assumed, with 3:1 side slopes. To calculate the total footprint, the side slopes would be added to the design geometry.

E.4 INF-5 Permeable Pavement

Sizing Methodology

Permeable pavement (including the base layers) shall be designed to drain in less than 72 hours. The basis for this is that soils must be allowed to dry out periodically in order to restore hydraulic capacity; this is essential in order to receive flows from subsequent storms, maintain infiltration rates, maintain adequate sub soil oxygen levels for healthy soil biota, and to provide proper soil conditions for biodegradation and retention of pollutants.

Permeable pavement must be built and designed by a licensed civil engineer in accordance with Ventura County roadway and pavement specifications.

Step 1: Calculate the design volume

Permeable pavement shall be sized to capture and treat the stormwater quality design volume, SQDV (see Section 2 and Appendix E).

Step 2: Determine the Design Percolation Rate

The percolation rate will decline between maintenance cycles as particulates accumulate in the infiltrative layer and the surface becomes occluded. Additionally, monitoring of actual facility performance has shown that the full-scale infiltration rate is far lower than the rate measured by small-scale testing. It is important that adequate conservatism is incorporated in the selection of design percolation rates. For infiltrating bioretention facilities, the design percolation rate discussed here is the percolation rate of the underlying soils, which will drive infiltration through the facility. See INF-5: Permeable Pavement for guidance in developing design percolation rate correction factors.

Step 3: Determine gravel drainage layer depth

Permeable pavement (including the base layers) shall be designed to drain in less than 72 hours. The basis for this is that soils must be allowed to dry out periodically in order to restore hydraulic capacity to receive flows from subsequent storms, maintain infiltration rates, maintain adequate sub soil oxygen levels for healthy soil biota, and to provide proper soil conditions for biodegradation and retention of pollutants.

1) Calculate the maximum depth of runoff, d_{max}, that can be infiltrated within the drawdown time:

$$d_{\max} = \frac{P_{design} \bullet t}{12} \qquad \text{(Equation E-23)}$$

Where:

d_{max}	=	maximum depth that can be infiltrated (ft)
P_{design}	=	design percolation rate of underlying soils (in/hr) (see Step 2, above)
t	=	drawdown time (72 hrs maximum) (hr)

1) Select the gravel drainage layer depth, *l*, such that:

$$d_{\max} \geq n \times l \qquad \text{(Equation E-24)}$$

Where:

d_{max}	=	maximum depth that can be infiltrated (ft) (see 1) above)
n	=	gravel drainage layer porosity(unitless) (generally about 32% or 0.32 for gravel)
l	=	gravel drainage layer depth (ft)

Step 4: Determine infiltrating surface area

1) Calculate infiltrating surface area for permeable pavement, A:

$$A = \frac{SQDV}{\frac{TP_{design}}{12} + nl} \qquad \text{(Equation E-25)}$$

Where:

P_{design}	=	design percolation rate of underlying soils (in/hr) (see Step 2, above)
n	=	gravel drainage layer porosity(unitless)[about 32% or 0.32 for gravel]
l	=	depth of gravel drainage layer (ft)
T	=	time to fill the gravel drainage layer with water (use 2 hours for most designs) (hr)

Step 5: Provide conveyance capacity for clogging

The permeable pavement must have an emergency overflow for storm events greater than the design and in the event the permeable pavement becomes clogged. See INF-5 Permeable Pavement for overflow details.

Sizing Worksheet

Step 1: Determine water quality design volume	
1-1. Enter Project area (acres), $A_{project}$	$A_{project}$ = acres
1-2. Enter the maximum allowable percent of the Project area that may be effective impervious area (%) (refer to permit), ranges from 5-30%, $\%_{allowable}$	$\%_{allowable}$ %
1-3. Determine the maximum allowable effective impervious area (acres), $EIA_{allowable} = (A_{project})*(\%_{allowable})$	$EIA_{allowable}$= acres
1-4. Enter Project impervious fraction, Imp (e.g. 60% = 0.60)	Imp=
1-5. Determine the Project Total Impervious area (acres), $TIA=A_{project}*Imp$	TIA= acres
1-6. Determine the total area from which runoff must be retained (acres), $A_{retain}=TIA-EIA_{allowable}$	A_{retain} = acres
1-7. Determine pervious runoff coefficient using Table E-1, C_p	C_p =
1-8. Calculate runoff coefficient, $C = 0.95*imp + C_p\ (1-imp)$	C =
1-9. Enter design rainfall depth of the storm (in), P_i	P_i = in
1-10. Calculate rainfall depth (ft), $P = P_i/12$	P = ft
1-11. Calculate water quality design volume (ft^3), $SQDV=43560\times C*P*A_{retain}$	SQDV= ft^3
Step 2: Determine the design percolation rate	
2-1. Enter measured soil percolation rate (0.5 in/hr minimum), $P_{measured}$	$P_{measured}$ = in/hr
2-2. Determine percolation rate correction factor, S_A based on suitability assessment (see Section 6 INF-5)	S_A =

Step 2: Determine the design percolation rate	
2-3. Determine percolation rate correction factor, S_B based on design (see Section 6 INF-5)	S_B =
2-4. Calculate combined safety factor, $S = S_A \times S_b$	S =
2-5. Calculate the design percolation rate (in/hr), $P_{design} = P_{measured}/S$	P_{design} = in/hr
Step 3: Determine the Gravel Drainage Layer Depth	
3-1. Enter drawdown time (hours, 72 hrs max.), t	t = hours
3-2. Calculate max. depth of runoff (ft) that can be infiltrated within the t, $d_{max}=P_{design}t/12$	d_{max} = ft
3-3. Enter the gravel drainage layer porosity, n (typically 32% or 0.32 for gravel)	n =
3-4. Select the gravel drainage layer depth (ft) such that $d_{max} \geq n \times l$	l = ft
Step 4: Determine infiltrating surface area	
4-1. Enter gravel drainage layer porosity, n	n =
4-2. Enter depth of gravel drainage layer (ft), l	l = ft
4-3. Enter the time to fill the gravel drainage layer with water (Use 2 hours for most designs), T	T = hrs
4-4. Calculate infiltrating surface area (ft^3): $A=SQDV/((TP_{design}/12)+nl)$	A = ft^2
Step 5: Provide conveyance capacity for clogging	
5-1. The permeable pavement must have an emergency overflow for storm events greater than the design and in the event the permeable pavement becomes clogged.	

Design Example

Step 1: Determine Water Quality Design Volume

For this design example, a 10-acre residential development with a 60% total impervious area is considered. The 85th percentile storm event for the project location is 0.75 inches.

Step 1: Determine Water Quality Design Volume			
1-1. Enter Project area (acres), $A_{project}$	A =	10	acres
1-2. Enter the maximum allowable percent of the Project area that may be effective impervious area (%) (refer to permit), ranges from 5-30%, $\%_{allowable}$	$\%_{allowableble}$ =	5	
1-3. Determine the maximum allowable effective impervious area (acres), $EIA_{allowable} = (A_{project})*(\%_{allowable})$	$EIA_{allowable}$=	0.5	acres
1-4. Enter Project impervious fraction, Imp (e.g. 60% = 0.60)	Imp=	0.6	
1-5. Determine the Project Total Impervious area (acres), $TIA=A_{project}*Imp$	TIA=	6	acres
1-6. Determine the total area from which runoff must be retained (acres), $A_{retain}=TIA-EIA_{allowable}$	A_{retain} =	5.5	acres
1-7. Determine pervious runoff coefficient using Table E-1, C_p	C_p =	0.05	
1-8. Calculate runoff coefficient, $C = 0.95*imp + C_p\ (1-imp)$	C =	0.59	
1-9. Enter design rainfall depth of the storm (in), P_i	P_i =	0.75	in
1-10. Calculate rainfall depth (ft), $P = P_i/12$	P =	0.06	ft
1-11. Calculate water quality design volume (ft^3), $SQDV=43560\times C*P*A_{retain}$	SQDV =	8,500	ft^3

Step 2: Calculate Design Percolation Rate

Permeable pavement with no underdrain requires a minimum soil infiltration rate of 0.5 in/hr. For this design example, a native soil percolation rate of 1.5 in/hr is assumed.

Step 2: Determine the design percolation rate	
2-1. Enter measured soil percolation rate (0.5 in/hr min.), $P_{measured}$	$P_{measured}$ = 4.0 in/hr
2-2. Determine percolation rate correction factor, S_A, based on suitability assessment (see Section 6 INF-1)	S_A = 3
2-3. Determine percolation rate correction factor, S_B, based on design (see Section 6 INF-1)	S_b = 3
2-4. Calculate combined safety factor, $S = S_A \times S_b$	S = 9
2-5. Calculate the design percolation rate (in/hr), $P_{design} = P_{measured}/S$	P_{design} = 0.44 in/hr

Step 3: Determine maximum depth that can be infiltrated

Based on the design infiltration rate and the max drawdown, determine the maximum depth that can be infiltrated within the time constraints.

Step 3: Determine maximum depth that can be infiltrated	
3-1. Enter drawdown time (72 hrs max.), t	t = 72 hrs
3-2. Calculate max. depth of runoff (ft) that can be infiltrated within the t, $d_{max}=P_{design}t/12$	d_{max} = 2.6 ft
3-3. Enter the gravel drainage layer porosity, n (typically 32% or 0.32 for gravel)	n = 0.32
3-4. Select the gravel drainage layer depth (ft) such that $d_{max} \geq n \times l$	l = 8 ft

Step 4: Determine the infiltrating surface area (pavement area)

Using the depth calculated in Step 3, the required infiltrating surface area of the pavement can be calculated.

Step 4: Determine the infiltrating surface area			
4-1. Enter gravel drainage layer porosity, *n*	n =	0.32	
4-2. Enter depth of gravel drainage layer (ft), *l*	l =	8	ft
4-3. Enter the time to fill the gravel drainage layer with water (Use 2 hours for most designs), *T*	T =	2	hrs
4-4. Calculate infiltrating surface area (ft^3): $A=SQDV/(TP_{design}/12)+n*l))$	A =	1,630	ft^2

Step 5: Provide conveyance capacity for clogging

The permeable pavement must have an emergency overflow for storm events greater than the design and in the event the permeable pavement becomes clogged.

E.5 VEG-1 Bioretention/VEG-2 Planter Box

Sizing Methodology

Bioretention areas can be sized using one of two methods: a simple sizing method or a routing method. The simple sizing procedure is summarized below. Continuous simulation modeling, routing spreadsheets, and/or other forms of routing modeling that incorporate rainfall-runoff relationships and infiltrative (flow) capacities of bioretention may be used to size facilities. Alternative sizing methodologies should be prepared with good engineering practices. For the routing modeling method, refer to the Sand Filter design guidance (FILT-1). A bioretention sizing worksheet and example are provided in this appendix. Planter boxes are sized the same as bioretention areas with underdrains using parameters appropriate for planter boxes.

With either method, the runoff entering the facility must completely drain the ponding area within 48 hours, and runoff must be completely infiltrated within 96 hours. Bioretention is to be sized, with or without underdrains, such that the SQDV will fill the available ponding depth, the void spaces in the planting soil, and the optional aggregate layer.

Step 1: Determine the stormwater quality design volume (SQDV)

Bioretention areas should be sized to capture and treat the water quality design volume (see Section E.1).

Step 2: Determine the Design Percolation Rate

Sizing is based on the design saturated hydraulic conductivity (K_{sat}) of the amended soil layer. A target K_{sat} of 5 inches per hour is recommended for newly installed non-proprietary amended soil media. The media K_{sat} will decline between maintenance cycles as the surface becomes occluded and particulates accumulate in the amended soil layer. A factor of safety of 2.0 should be applied such that the resulting recommended design percolation rate is 2.5 inches per hour. This value should be used for sizing unless sufficient rationale is provided to justify a higher design percolation rate.

Step 3: Calculate the bioretention or planter box surface area

Determine the size of the required infiltrating surface by assuming the SQDV will fill the available ponding depth plus the void spaces in the media, based on the computed porosity of the filter media and optional aggregate layer.

1) Select a surface ponding depth (d_p) that satisfies geometric criteria and congruent with the constraints of the site. Selecting a deeper ponding depth (18 inches maximum) generally yields a smaller footprint, however requires greater consideration for public safety and energy dissipation.

2) Compute time for selected ponding depth to filter through media:

$$t_{ponding} = \frac{d_p}{K_{design}} 12 \frac{in}{ft} \leq 48 \text{ hours} \qquad \text{(Equation E-26)}$$

Where:

$t_{ponding}$	=	required drain time of surface ponding (48 hrs)
d_p	=	selected surface ponding water depth (ft)
K_{design}	=	design saturated hydraulic conductivity (in/hr) (see Step 2, above)

If $t_{ponding}$ exceeds 48 hours, return to (1) and reduce surface ponding or increase media K_{design}. Otherwise, proceed to next step.

Note: In nearly all cases, $t_{ponding}$ will not approach 48 hours unless a low Kdesign is specified.

3) Compute depth of water that may be considered to be filtered during the design storm event as follows:

$$d_{filtered} = Minimum\left[\frac{K_{design} \times T_{routing}}{12 \, in/ft}, \frac{d_p}{2}\right] \qquad \text{(Equation E-27),}$$

Where:

$d_{filtered}$	=	depth of water that may be considered to be filtered during the design storm event (ft) for routing calculations; this value should not exceed half of the surface ponding depth (d_p)
K_{design}	=	design saturated hydraulic conductivity (in/hr) (see Step 2, above)
$T_{routing}$	=	storm duration that may be assumed for routing calculations; this should be assumed to be **3 hours** unless rationale for an alternative assumption is provided
d_p	=	selected surface ponding water depth (ft)

4) Calculate required infiltrating surface area (filter bottom area):

$$A_{req} = \frac{SQDV}{d_p + d_{filtered}} \qquad \text{(Equation E-28)}$$

Where:

A_{req}	=	required area at bottom of filter area (ft^2); does not account for side slopes and freeboard
$SQDV$	=	stormwater quality design volume (ft^3)
d_p	=	selected surface ponding water depth (ft)
$d_{filtered}$	=	depth of water that can be considered to be filtered during the design storm event (ft) for routing calculations (See previous step)

Step 4: Calculate the bioretention total footprint

Calculate total footprint required by including a buffer for side slopes and freeboard; A_{req} is measured at the filter bottom area (toe of side slopes).

Step 5: Calculate underdrain system capacity

Underdrains are required for planter boxes and bioretention with underdrains. For guidance on sizing, refer to step 5 of the worksheet below. Alternatively, the Ventura County Hydrology Manual can be used for pipe sizing guidance.

Sizing Worksheet

Step 1: Determine water quality design volume	
1-1. Enter Project area (acres), $A_{project}$	$A_{project}$ = acres
1-2. Enter the maximum allowable percent of the Project area that may be effective impervious area (refer to permit), ranges from 5-30%, $\%_{allowable}$	$\%_{allowable}$ %
1-3. Determine the maximum allowed effective impervious area (ac), $EIA_{allowable} = (A_{project})*(\%_{allowable})$	$EIA_{allowable}$= acres
1-4. Enter Project impervious fraction, Imp (e.g. 60% = 0.60)	Imp=
1-5. Determine the Project Total Impervious area (acres), $TIA=A_{project}*Imp$	TIA= acres
1-6. Determine the total area from which runoff must be retained (acres), $A_{retain}=TIA-EIA_{allowable}$	A_{retain} = acres
1-7. Determine pervious runoff coefficient using Table E-1, C_p	C_p =
1-8. Calculate runoff coefficient, $C = 0.95*imp + C_p\ (1-imp)$	C =
1-9. Enter design rainfall depth of the storm (in), P_i	P_i = in
1-10. Calculate rainfall depth (ft), $P = P_i/12$	P = ft
1-11. Calculate water quality design volume (ft^3), $SQDV=43560 \bullet C*P*A_{retain}$	SQDV= ft^3

Step 2: Determine the design percolation rate	
2-1. Enter the design saturated hydraulic conductivity of the amended filter media (2.5 in/hr recommended rate), K_{design}	K_{design} = in/hr

Step 3: Calculate Bioretention/Planter Box surface area	
3-1. Enter water quality design volume (ft^3), *SQDV*	SQDV = ft^3
3-2. Enter design saturated hydraulic conductivity (in/hr), K_{design}	K_{design} = in/hr
3-3. Enter ponding depth (max 1.5 ft for Bioretention, 1 ft for Planter Box) above area, d_p	d_p = ft
3-4. Calculate the drawdown time for the ponded water to filter through media (hours), $t_{ponding} = (d_p/K_{design}) \times 12$	$t_{ponding}$= hrs
3-5. Enter the storm duration for routing calculations (use 3 hours unless there is rationale for an alternative), $T_{routing}$	$T_{routing}$ = hrs
3-6. Calculate depth of water (ft) filtered by using the following two equations: $d_{filtered,1} = (K_{design} \times T_{routing})/12$ $d_{filteret,2} = d_p /2$	$d_{filtered,1}$ = ft $d_{filtered,2}$ = ft
3.7 Enter the resultant depth (ft) (the lesser of the two calculated above), $d_{filtered}$	$d_{filtered}$ = ft
3-8. Calculate the infiltrating surface area as follows (ft^2): $A_{req} = SQDV/(d_p + d_{filtered})$	A_{req} = ft^2
Step 4: Calculate Bioretention Area Total Footprint	
4-1. Calculate total footprint required by including a buffer for side slopes and freeboard (ft^2) [A_{req} is measured at the as the filter bottom area (toe of side slopes)], A_{tot}	A_{tot} = ft^2
Step 5: Calculate Underdrain System Capacity	
To calculate the underdrain system capacity, continue through steps 5-1 to 5-7.	

Step 5: Calculate Underdrain System Capacity	
5-1. Calculated filtered flow rate to be conveyed by the longitudinal drain pipe, $Q_f = K_{design} A_{req}/43{,}200$	Q_f = cfs
5-2. Enter minimum slope for energy gradient, S_e	S_e =
5-3. Enter Hazen-Williams coefficient for plastic, C_{HW}	C_{HW} =
5-4. Enter pipe diameter (min 6 inches), D	D = in
5-5. Calculate pipe hydraulic radius (ft), $R_h = D/48$	R_h = ft
5-6. Calculate velocity at the outlet of the pipe (ft/s), $V_p = 1.318 C_{HW} R_h^{0.63} S_e^{0.54}$	V_p = ft/s
5-7. Calculate pipe capacity (cfs), $Q_{cap} = 0.25\pi(D/12)^2 V_p$	Q_{cap} = cfs

Design Example

Bioretention areas have several components that allow the pretreatment, spreading, filtration, collection and discharge of the incoming flows.

Step 1: Determine water quality design volume

For this design example, a 10-acre residential development with a 60% total impervious area is considered. The 85th percentile storm event for the project location is 0.75 inches.

Step 1: Determine Water Quality Design Volume			
1-1. Enter drainage area, A	A =	10	acres
1-2. Enter the maximum allowable percent of the Project area that may be effective impervious area (refer to permit), ranges from 5-30%, $\%_{allowable}$	$\%_{allowableble}$ =	5	
1-3. Determine the maximum allowed effective impervious area, $EIA_{allowable} = (A_{project})*(\%_{allowable})$	$EIA_{allowable}$=	0.5	acres
1-4. Enter Project impervious fraction, *Imp* (e.g. 60% = 0.60)	Imp=	0.6	
1-5. Determine the Project Total Impervious area, $TIA=A_{project}*Imp$	TIA=	6	acres
1-6. Determine the total area from which runoff must be retained, $A_{retain}=TIA-EIA_{allowable}$	A_{retain} =	5.5	acres
1-7. Determine pervious runoff coefficient using Table E-1, C_p	C_p =	0.05	
1-8. Calculate runoff coefficient, $C = 0.95*imp + C_p\ (1-imp)$	C =	0.59	
1-9. Enter design rainfall depth of the storm, P_i (in)	P_i =	0.75	in
1-10. Calculate rainfall depth, $P = P_i/12$	P =	0.06	ft
1-11. Calculate water quality design volume, $SQDV = 43560 \bullet P*A_{retain}*C$	SQDV =	8,500	ft^3

Step 2: Determine the design percolation rate

For this design example, the recommended amended filter hydraulic conductivity is used, 2.5 in/hr.

Step 2: Determine the design percolation rate	
2-1. Enter the design saturated hydraulic conductivity of the amended filter media (2.5 in/hr recommended rate), K_{design}	K_{design} = 2.5 in/hr

Step 3: Determine bioretention/ planter box area footprint

A bioretention area is designed with two components: (1) temporary storage reservoir to store runoff, and (2) a plant mix filter bed (planting soil mixed with sand content = 70%) through which the stored runoff must percolate to obtain treatment.

Step 3: Calculate Bioretention/Planter Box surface area	
3-1. Enter water quality design volume (ft^3), *SQDV*	SQDV = 8,500 ac-ft
3-2. Enter design saturated hydraulic conductivity (in/hr), K_{design}	K_{design} = 2.5 in/hr
3-3. Enter ponding depth (max 1.5 ft for Bioretention, 1 ft for Planter Box) above area, d_p	d_p = 1.5 ft
3-4. Calculate the drawdown time for the ponded water to filter through media (hours), $t_{ponding} = (d_p/K_{design}) \times 12$	$t_{ponding}$= 7.2 hrs
3-5. Enter the storm duration for routing calculations (use 3 hours unless there is rationale for an alternative), $T_{routing}$	$T_{routing}$ = 3 hrs
3-6. Calculate depth of water (ft) filtered by using the minimum of the following two equations: $d_{filtered,1} = (K_{design} \times T_{routing})/12$ $d_{filteret,2} = d_p /2$	$d_{filtered,1}$ = 0.63 ft $d_{filtered,2}$ = 0.75 ft
3.7 Enter the resultant depth (the minimum of the two calculated above), $d_{filtered}$	$d_{filtered}$ = 0.63 ft
3-8. Calculate the infiltrating surface area as follows (ft^2): $A_{req} = SQDV/(d_p + d_{filtered})$	A_{req} = 4,000 ft^2

Step 4: Calculate Bioretention Area Total Footprint

For this design example, a natural-shaped bioretention area is assumed, with 3:1 side slopes. To calculate the total footprint, the side slopes would be added to the design geometry.

Step 5: Calculate filter longitudinal underdrain collection pipe

All underdrain pipes must be 6 inches or greater in diameter to facilitate cleaning.

Step 5: Calculate underdrain system (required for planter box)			
To calculate the underdrain system capacity, continue through steps 5-1 to 5-7. If you don't need to calculate the underdrain capacity, skip this step.			
5-1. Calculated filtered flow rate to be conveyed by the longitudinal drain pipe (cfs), $Q_f = K_{design} A_{req}/43{,}200$	Q_f =	0.085	cfs
5-2. Enter minimum slope for energy gradient, S_e	S_e =	0.005	
5-3. Enter Hazen-Williams coefficient for plastic, C_{HW}	C_{HW} =	140	
5-4. Enter pipe diameter (min 6 in), D	D =	6	in
5-5. Calculate pipe hydraulic radius (ft), $R_h = D/48$	R_h =	0.13	ft
5-6. Calculate velocity at the outlet of the pipe (ft/s), $V_p = 1.318 C_{HW} R_h^{0.63} S_e^{0.54}$	V_p =	2.9	ft/s
5-7. Calculate pipe capacity (cfs), $Q_{cap} = 0.25\pi(D/12)^2 V_p$	Q_{cap} =	0.57	cfs

E.6 VEG-3 Vegetated Swale

Sizing Methodology

The flow capacity of a vegetated swale is a function of the longitudinal slope (parallel to flow), the resistance to flow (i.e. Manning's roughness), and the cross sectional area. The cross section is normally approximately trapezoidal and the area is a function of the bottom width and side slopes. The flow capacity of vegetated swales should be such that the design water quality flow rate will not exceed a flow depth of 2/3 the height of the vegetation within the swale or 4 inches at the water quality design flow rate. Once design criteria have been selected, the resulting flow depth for the design water quality design flow rate is checked. If the depth restriction is exceeded, swale parameters (e.g. longitudinal slope, width) are adjusted to reduce the flow depth.

Procedures for sizing vegetated swales are summarized below. A vegetated swale sizing worksheet and example are also provided.

Step 1: Select design flows

The swale sizing is based on the stormwater quality design flow SQDF (see Section E.1).

Step 2: Calculate swale bottom width

The swale bottom width is calculated based on Manning's equation for open-channel flow. This equation can be used to calculate discharges as follows:

$$Q = \frac{1.49 A R^{0.67} S^{0.5}}{n}$$

(Equation E-29)

Where:

Q	=	flow rate (cfs)
n	=	Manning's roughness coefficient (unitless)
A	=	cross-sectional area of flow (ft^2)
R	=	hydraulic radius (ft) = area divided by wetted perimeter
S	=	longitudinal slope (ft/ft)

For shallow flow depths in swales, channel side slopes are ignored in the calculation of bottom width. Use the following equation (a simplified form of Manning's formula) to estimate the swale bottom width:

$$b = \frac{SQDF * n_{wq}}{1.49 y^{0.67} s^{0.5}}$$ (Equation E-30)

Where:

b	=	bottom width of swale (ft)
$SQDF$	=	stormwater quality design flow (cfs)
n_{wq}	=	Manning's roughness coefficient for shallow flow conditions = 0.2 (unitless)
y	=	design flow depth (ft)
s	=	longitudinal slope (along direction of flow) (ft/ft)

Proceed to Step 3 if the bottom width is calculated to be between 2 and 10 feet. A minimum 2-foot bottom width is required. Therefore, if the calculated bottom width is less than 2 feet, increase the width to 2 feet and recalculate the design flow depth y using the Equation 4-13, where Q_{wq}, n_{wq}, and s are the same values as used above, but b = 2 feet.

The maximum allowable bottom width is 10 feet; therefore if the calculated bottom width exceeds 10 feet, then one of the following steps is necessary to reduce the design bottom width:

1) Increase the longitudinal slope (s) to a maximum of 6 feet in 100 feet (0.06 feet per foot).

2) Increase the design flow depth (y) to a maximum of 4 inches.

3) Place a divider lengthwise along the swale bottom (Figure 3-1) at least three-quarters of the swale length (beginning at the inlet), without compromising the design flow depth and swale lateral slope requirements. Swale width can be increased to an absolute maximum of 16 feet if a divider is provided.

Step 3: Determine design flow velocity

To calculate the design flow velocity through the swale, use the flow continuity equation:

$$V_{wq} = SQDF / A_{wq}$$ (Equation E-31)

Where:

V_{wq}	=	design flow velocity (fps)
$SQDF$	=	stormwater quality design flow (cfs)

A_{wq} = $by + Zy^2$ = cross-sectional area (ft²) of flow at design depth, where Z = side slope length per unit height (e.g., Z = 3 if side slopes are 3H:1V)

If the design flow velocity exceeds 1 foot per second, go back to Step 2 and modify one or more of the design parameters (longitudinal slope, bottom width, or flow depth) to reduce the design flow velocity to 1 foot per second or less. If the design flow velocity is calculated to be less than 1 foot per second, proceed to Step 4. *Note: It is desirable to have the design velocity as low as possible, both to improve treatment effectiveness and to reduce swale length requirements.*

Step 4: Calculate swale length

Use the following equation to determine the necessary swale length to achieve a hydraulic residence time of at least 7 minutes:

$$L = 60 t_{hr} V_{wq} \qquad \text{(Equation E-32)}$$

Where:

L = minimum allowable swale length (ft)

t_{hr} = hydraulic residence time (min)

V_{wq} = design flow velocity (fps)

The minimum swale length is 100 feet; therefore, if the swale length is calculated to be less than 100 feet, increase the length to a minimum of 100 feet, leaving the bottom width unchanged. If a larger swale can be fitted on the site, consider using a greater length to increase the hydraulic residence time and improve the swale's pollutant removal capability. If the calculated length is too long for the site, or if it would cause layout problems, such as encroachment into shaded areas, proceed to Step 5 to further modify the layout. If the swale length can be accommodated on the site (meandering may help), proceed to Step 6.

Step 5: Adjust swale layout to fit on site

If the swale length calculated in Step 4 is too long for the site, the length can be reduced (to a minimum of 100 feet) by increasing the bottom width up to a maximum of 16 feet, as long as the 10 minute retention time is retained. However, the length cannot be increased in order to reduce the bottom width because Manning's depth-velocity-flow rate relationships would not be preserved. If the bottom width is increased to greater than 10 feet, a low flow dividing berm is needed to split the swale cross section in half to prevent channelization.

Length can be adjusted by calculating the top area of the swale and providing an equivalent top area with the adjusted dimensions.

1) Calculate the swale treatment top area based on the swale length calculated in Step 4:

$$A_{top} = (b_i + b_{slope})L_i \qquad \text{(Equation E-33)}$$

Where:

A_{top} = top area (ft^2) at the design treatment depth

b_i = bottom width (ft) calculated in Step 2

b_{slope} = the additional top width (ft) above the side slope for the design water depth (for 3:1 side slopes and a 4-inch water depth, b_{slope} = 2 feet)

L_i = initial length (ft) calculated in Step 4

2) Use the swale top area and a reduced swale length L_f to increase the bottom width, using the following equation:

$$L_f = A_{top}/(b_f + b_{slope}) \qquad \text{(Equation E-34)}$$

Where:

L_f = reduced swale length (ft)

b_f = increased bottom width (ft).

3) Recalculate V_{wq} according to Step 3 using the revised cross-sectional area A_{wq} based on the increased bottom width b_f. Revise the design as necessary if the design flow velocity exceeds 1 foot per second.

4) Recalculate to assure that the 10 minute retention time is retained.

Step 6: Provide conveyance capacity for flows higher than SQDF

Vegetated swales may be designed as flow-through channels that convey flows higher than the water quality design flow rate, or they may be designed to incorporate a high-flow bypass upstream of the swale inlet. A high-flow bypass usually results in a smaller swale size. If a high-flow bypass is provided, this step is not needed. If no high-flow bypass is provided, proceed with the procedure below. Flow splitter structure design is described in Appendix G.

1) Check the swale size to determine whether the swale can convey the flood control design storm peak flows (Refer to the Ventura County Hydrology Manual, 2006).

2) The peak flow velocity of the flood control design storm (e.g., flood control design storm – see Ventura County Hydrology Manual, 2006)) must be less than 3.0 feet per second. If this velocity exceeds 3.0 feet per second, return to Step 2 and

increase the bottom width or flatten the longitudinal slope as necessary to reduce the flood control design storm peak flow velocity to 3.0 feet per second or less. If the longitudinal slope is flattened, the swale bottom width must be recalculated (Step 2) and must meet all design criteria.

Sizing Worksheet

Step 1: Determine water quality design flow		
1-1. Enter Project area (acres), $A_{project}$	A_{design} =	acres
1-2. Enter impervious fraction, *Imp* (e.g. 60% = 0.60)	Imp =	
1-3. Determine pervious runoff coefficient using Table E-1, C_p	C_p =	
1-4. Calculate runoff coefficient, $C = 0.95*imp + C_p\ (1-imp)$	C =	
1-5. Enter design rainfall intensity (in/hr), *i*	i =	in/hr
1-6. Calculate water quality design flow (cfs), *SQDF= CiA*	SQDF =	cfs
Step 2: Calculate swale bottom width		
2-1. Enter water quality design flow (cfs), *SQDF*	SQDF =	cfs
2-2. Enter Manning's roughness coefficient for shallow flow conditions, $n_{wq} = 0.2$	n_{wq} =	
2-3. Calculate design flow depth (ft), *y*	y =	ft
2-4. Enter longitudinal slope (ft/ft) (along direction of flow), *s*	s =	ft/ft
2-5. Calculate bottom width of swale (ft), $b = (SQDF*n_{wq})/(1.49y^{0.67}s^{0.5})$	b =	ft
2-6. If *b* is between 2 and 10 feet, go to Step 3		
2-7. If b is less than 2 ft, assume b = 2 ft and recalculate flow depth, $y = ((SQDF*n_{wq})/(2.98\ s^{0.5}))^{1.49}$	y =	ft

2-8. If b is greater than 10 ft, one of the following design adjustments must be made (recalculate variables as necessary): • Increase the longitudinal slope to a maximum of 0.06 ft/ft. • Increase the design flow depth to a maximum of 4 in (0.33 ft). • Place a divider lengthwise along the swale bottom (Figure 3-1) at least three-quarters of the swale length (beginning at the inlet). Swale width can be increased to an absolute maximum of 16 feet if a divider is provided.	
Step 3: Determine design flow velocity	
3-1. Enter side slope length per unit height (H:V) (e.g. 3 if side slopes are 3H :1V), *Z*	Z =
3-2. Enter bottom width of swale (ft), *b*	b = ft
3-3. Enter design flow depth (ft), *y*	y = ft
3-4. Calculate the cross-sectional area of flow at design depth (ft^2), $A_{wq} = by + Zy^2$	A_{wq} = ft^2
3-5. Calculate design flow velocity (ft/s), $V_{wq} = SQDF/ A_{wq}$	V_{wq} = ft/s
3-6. If the design flow velocity exceeds 1 ft/s, go back to Step 2 and change one or more of the design parameters to reduce the design flow velocity. If design flow velocity is less than 1 ft/s, proceed to Step 4.	
Step 4: Calculate swale length	
4-1. Enter hydraulic residence time (minutes, minimum 7 min), t_{hr}	t_{hr} = min
4-2. Calculate swale length (ft), $L = 60 t_{hr} V_{wq}$	L = ft

Step 4: Calculate swale length	
4-3. If L is too long for the site, proceed to Step 5 to adjust the swale layout If L is greater than 100 ft and will fit within the constraints of the site, skip to Step 6 If L is less than 100 ft, increase the length to a minimum of 100 ft, leaving the bottom width unchanged, and skip to Step 6	
Step 5: Adjust swale layout to fit within site constraints	
5-1. Enter the bottom width calculated in Step 2 (ft), $b_i = b$	b_i = ft
5-2. Enter design flow depth (ft), y	y= ft
5-3. Enter the swale side slope ratio (H:V), Z	Z = ft:ft
5-4. Enter the additional top width above the side slope for the design water depth (ft), $b_{slope} = 2Zy$	b_{slope} = ft
5-5. Enter the initial length calculated in Step 4 (ft), $Li = L$	L_i = ft
5-6. Calculate the top area at the design treatment depth (ft²), $A_{top} = (b_i + b_{slope}) \times L_i$	A_{top} = ft²
5-7. Choose a reduced swale length based on site constraints (ft), L_f	L_f = ft
5-8. Calculate the increased bottom width (ft), $b_f = (A_{top}/L_f) - b_{slope}$	b_f = ft
5-9. Recalculate the cross-sectional area of flow at design depth (ft2), $A_{wq,f} = b_f y + Zy^2$	$A_{wq,f}$ = ft²
5-10. Recalculate design flow velocity (ft/s), $V_{wq} = SQDF / A_{wq}$ Revise design as necessary if design flow velocity exceeds 1 ft/s.	V_{wq} = ft/s

5-11. Recalculate the hydraulic residence time (min), $t_{hr} = L_f/(60V_{wq})$ Ensure that t_{hr} is greater or equal to 10 minutes.	t_{hr} = min
5-12. When V_{wq} and t_{hr} are recalculated to meet requirements, proceed to Step 6.	
Step 6: Provide conveyance capacity for flows higher than SQDF (if swale is on-line)	
6-1. If the swale already includes a high-flow bypass to convey flows higher than the water quality design flow rate, skip this step and verify that all parameters meet design requirements to complete sizing	
6-2. If swale does not include a high-flow bypass, determine that the swale can convey flood control design storm peak flows. Calculate the capital peak flow velocity per Ventura County requirements (ft/s), V_p	V_p = ft/s
6-3. If V_p > 3.0 feet per second, return to Step 2 and increase the bottom width or flatten the longitudinal slope as necessary to reduce the flood control design storm peak flow velocity to 3.0 feet per second or less. If the longitudinal slope is flattened, the swale bottom width must be recalculated (Step 2) and must meet all design criteria.	

Design Example

Step 1: Determine water quality design Flow

For this design example, a 10-acre site with Type 4 soil and 60% total imperviousness is considered. Flow-based sizing Method 1 is assumed. Therefore, the design intensity is 0.2 in/hr.

Step 1: Determine water quality design flow			
1-1. Enter Project area (acres), $A_{project}$	A =	10	acres
1-2. Enter impervious fraction, Imp (e.g. 60% = 0.60)	Imp =	0.60	
1-3. Determine pervious runoff coefficient using Table E-1, C_p	C_p =	0.05	
1-4. Calculate runoff coefficient, $C = 0.95*imp + C_p\ (1\text{-}imp)$	C =	0.59	
1-5. Enter design rainfall intensity (in/hr), i	i =	0.2	in/hr
1-6. Calculate water quality design flow (cfs), $SQDF = CiA$	$SQDF$=	1.18	cfs

Step 2: Calculate Swale Bottom Width

The swale bottom width is calculated based on Manning's equation. The grass height in the swale will be maintained at 6-inches. The design flow depth is assumed to be 2/3 of the grass height, or 4 inches (0.33 ft). The default Manning's roughness coefficient is assumed appropriate for expected vegetation density and design depth. The slope was assumed to be 0.04.

Step 2: Calculate swale bottom width			
2-1. Enter water quality design flow (cfs), $SQDF$	SQDF =	1.18	cfs
2-2. Enter Manning's roughness coefficient for shallow flow conditions, n_{wq} = 0.2	n_{wq} =	0.2	
2-3. Calculate design flow depth (ft), y	y =	0.33	ft
2-4. Enter longitudinal slope (along direction of flow) (ft/ft), s	s =	0.04	ft/ft
2-5. Calculate bottom width of swale (ft),	b =	5.0	ft

Step 2: Calculate swale bottom width	
$b = Q_{wq}n_{wq} / 1.49y^{0.67}s^{0.5}$	
2-6. If *b* is between 2 and 10 feet, go to Step 3	
2-7. If *b* is less than 2 ft, assume *b* = 2 ft and recalculate flow depth, $y = (Q_{wq}n_{wq} / 2.98s^{0.5})^{1.49}$	Not applicable
2-8. If *b* is greater than 10 ft, one of the following design adjustments must be made (and recalculate as necessary): Increase the longitudinal slope to a maximum of 0.06 ft/ft. Increase the design flow depth to a maximum of 4 in (0.33 ft). Place a divider lengthwise along the swale bottom (Figure 3-1) at least three-quarters of the swale length (beginning at the inlet). Swale width can be increased to an absolute maximum of 16 feet if a divider is provided.	Not applicable

Step 3: Determine Design Flow Velocity

For this design example, it is assumed the side slopes will be designed as 3H: 1V, so Z = 3.

Step 3: Determine design flow velocity	
3-1. Enter side slope length per unit height (H:V) (e.g. 3 if side slopes are 3H :1V), *Z*	Z = 3
3-2. Enter bottom width of swale (ft), *b*	b = 5.0 ft
3-3. Enter design flow depth (ft), *y*	y = 0.33 ft
3-4. Calculate the cross-sectional area of flow at design depth (ft²), $A_{wq} = by + Zy^2$	A_{wq} = 2.0 ft²
3-5. Calculate design flow velocity (ft/s), $V_{wq} = SQDF / A_{wq}$	V_{wq} = 0.59 ft/s
3-6. If the design flow exceeds 1 ft/s, go back to Step 2 and change one or more of the design parameters to reduce the design flow velocity. If design flow velocity is less than 1 ft/s, proceed to Step 4.	

Step 4: Calculate Swale Length

Using the design flow velocity and a minimum residence time of 7 minutes, the length of the swale is calculated as follows. The swale length must be a minimum of 100 ft.

Step 4: Calculate swale length			
4-1. Enter hydraulic residence time (min 7 min), t_{hr} (min)	t_{hr} =	10	min
4-2. Calculate swale length, $L = 60 t_{hr} V_{wq}$	L =	354	ft
4-3. If L is too long for the site, proceed to Step 5 to adjust the swale layout If L is greater than 100 ft and will fit within the constraints of the site, skip to Step 6 If L is less than 100 ft, increase the length to a minimum of 100 ft, leaving the bottom width unchanged, and skip to Step 6	Not Applicable		

Site constraints only allow a swale length of 300 feet. Therefore proceed to Step 5 to adjust the swale length.

Step 5: Adjust Swale Layout to Fit Within Site Constraints

To adjust swale length to 300 feet, the bottom width needs to be increased (up to a maximum of 16 ft if a divider is provided).

Step 5: Adjust swale layout to fit within site constraints			
5-1. Enter the bottom width calculated in Step 2 (ft), $b_i = b$	b_i =	5.0	ft
5-2. Enter design flow depth (ft), y	y=	0.33	ft
5-3. Enter the swale side slope ratio (H:V), Z	Z =	3	ft:ft
5-4. Enter the additional top width above the side slope for the design water depth (ft), $b_{slope} = 2Zy$	b_{slope} =	2	ft
5-5. Enter the initial length calculated in Step 4 (ft), $Li = L$	L_i =	354	ft
5-6. Calculate the top area at the design treatment depth (ft^2), $A_{top} = (b_i + b_{slope}) \times L_i$	A_{top} =	2,480	ft^2

5-7. Choose a reduced swale length based on site constraints (ft), L_f	L_f = 300 ft
5-8. Calculate the increased bottom width (ft), $b_f = (A_{top}/L_f) - b_{slope}$	b_f = 6.3 ft
5-9. Recalculate the cross-sectional area of flow at design depth (ft2), $A_{wq,f} = b_f y + Zy^2$	$A_{wq,f}$ = 2.4 ft^2
5-10. Recalculate design flow velocity (ft/s), $V_{wq} = SQDF/ A_{wq}$ Revise design as necessary if design flow velocity exceeds 1 ft/s.	V_{wq} = 0.49 ft/s
5-11. Recalculate the hydraulic residence time (min), $t_{hr} = L_f/(60V_{wq})$ Ensure that t_{hr} is greater or equal to 10 minutes.	t_{hr} = 10.2 min
5-12. When V_{wq} and t_{hr} are recalculated to meet requirements, proceed to Step 6.	

Since the new length and width yields V_{wq} and t_{hr} which meet requirements, continue to Step 6.

Step 6: Provide Conveyance Capacity for Flows Higher than SQDF

The swale will be offline such that all flows greater than SQDF will be bypassed.

E.7 VEG-4 Filter Strip

Sizing Methodology

The flow capacity of a vegetated filter strips (filter strips) is a function of the longitudinal slope (parallel to flow), the resistance to flow (e.g., Manning's roughness), and the width and length of the filter strip. The slope shall be small enough to ensure that the depth of water will not exceed 1 inch over the filter strip. Similarly, the flow velocity shall be less than 1 ft/sec. Procedures for sizing filter strips are summarized below. A filter strip sizing example is also provided.

Step 1: Calculate the design flow rate

The design flow is calculated based on the stormwater quality design flow rate, SQDF, as described in Section E.1.

Step 2: Calculate the minimum width

Determine the minimum width (i.e. perpendicular to flow) allowable for the filter strip and design for that width or larger.

$$W_{min} = (SQDF) / (q_{a,min}) \qquad \text{(Equation E-35)}$$

Where

W_{min}	=	minimum width of filter strip
$SQDF$	=	stormwater quality design flow (cfs)
$q_{a,min}$	=	minimum linear unit application rate, 0.005 cfs/ft

Step 3: Calculate the design flow depth

The design flow depth (d_f) is calculated based on the width and the slope (parallel to the flow path) using a modified Manning's equation as follows:

$$d_f = 12 * [SQDF * n_{wq} / 1.49 W_{trib} s^{0.5}]^{0.6} \qquad \text{(Equation E-36)}$$

Where:

d_f	=	design flow depth (inches)
$SQDF$	=	stormwater quality design flow (cfs)
W_{trib}	=	width (perpendicular to flow = width of impervious surface contributing area (ft))
s	=	slope (ft/ft) of strip parallel to flow, average over the whole width

n_{wq} = Manning's roughness coefficient (0.25-0.30)

If d_f is greater than 1 inch (0.083 ft), then a shallower slope is required, or a filter strip cannot be used.

Step 4: Calculate the design velocity

The design flow velocity is based on the design flow, design flow depth, and width of the strip:

$$V_{wq} = SQDF / (d_f \, W_{trib}) \qquad \text{(Equation E-37)}$$

Where:

$d_{f,ft}$ = design flow depth (ft) (d_f/12)

$SQDF$ = stormwater quality design flow (cfs)

W_{trib} = width (perpendicular to flow = width of impervious surface contributing area (ft))

Step 5: Calculate the desired length of the filter strip

Determine the required length (L) to achieve a desired minimum residence time of 7 minutes using:

$$L = 60 t_{hr} V_{wq} \qquad \text{(Equation E-38)}$$

Where:

L = minimum allowable strip length (ft)

t_{hr} = hydraulic residence time (s)

V_{wq} = design flow velocity (fps)

Sizing Worksheet

Step 1: Calculate the design flow		
1-1. Enter Project area (acres), $A_{project}$	A_{design} =	acres
1-2. Enter impervious fraction, *Imp* (e.g. 60% = 0.60)	Imp =	
1-3. Determine pervious runoff coefficient using Table E-1, C_p	C_p =	
1-4. Calculate runoff coefficient, $C = 0.95*imp + C_p\ (1\text{-}imp)$	C =	
1-5. Enter design rainfall intensity (in/hr), *i*	i =	in/hr
1-6. Calculate water quality design flow (cfs), *SQDF= CiA*	SQDF =	cfs
Step 2: Calculate the minimum width		
2-1. Enter the stormwater quality design flow (cfs), *SQDF*	SQDF =	cfs
2-2. Enter the minimum linear unit application rate (0.005 cfs/ft), $q_{a,min}$	$q_{a,min}$=	cfs/ft
2-3. Calculate the minimum width of filter strip (ft), W_{min}	W_{min}=	ft
Step 3: Calculate the design flow depth		
3-1. Enter filter strip longitudinal slope, *s* (ft/ft)	*s* =	ft/ft
3-2. Enter Manning roughness coefficient (0.25-0.30), n_{wq}	n_{wq} =	
3-3. Enter width of impervious surface contributing area (perpendicular to flow), *W* (ft)	W =	ft

Step 3: Calculate the design flow depth	
3-4. Calculate average depth of water using Manning equation (inches), $d_f = 12 * [SQDF * n_{wq} / 1.49 W_{trib} s^{0.5}]^{0.6}$	d_f = inches
3-5. If d_f > 1" (0.083 ft), go back step 3-1 and decrease the slope	
3-6. If the slope cannot be changed due to construction constraints, go to step 3-3 and increase the width perpendicular to flow.	
Step 4: Calculate the design velocity	
4-1. Enter depth of water (ft), $d_{f,ft} = d_f / 12$	d_f = ft
4-2. Enter width of strip (ft), W	W = ft
4-3. Calculate design flow velocity (ft/s), $V_{wq} = SQDF / (d_{f,ft} W)$	V_{wq}= ft/s
4-4. If the V_{wq} >1 ft/s, go back to step 3-1 and decrease the slope.	
Step 5: Calculate the length of the filter strip	
5-1. Enter desired residence time (minimum 7 minutes), t	t = min
5-2. Enter design flow velocity (ft/s), V_{wq}	V_{wq}= ft/s
5-3. Calculate length of the filter strip (ft), $L = 60 t V_{wq}$	L = ft
5-4. If L < 4 ft, go to step 3-1 and increase the slope	

Design Example

Step 1: Determine water quality design Flow

For this design example, a 10-acre site with Type 4 soil and 60% total imperviousness is considered. Flow-based sizing Method 1 is used, as described in Section E.1.

Step 1: Calculate the design flow			
1-1. Enter Project area (acres), $A_{project}$	A_{design} =	10	acres
1-2. Enter impervious fraction, *Imp* (e.g. 60% = 0.60)	Imp =	0.60	
1-3. Determine pervious runoff coefficient using Table E-1, C_p	C_p =	0.05	
1-4. Calculate runoff coefficient, $C = 0.95*imp + C_p\ (1\text{-}imp)$	C =	0.59	
1-5. Enter design rainfall intensity (in/hr), *i*	i =	0.2	in/hr
1-6. Calculate water quality design flow (cfs), $SQDF = CiA$	SQDF =	1.18	cfs

Step 2: Calculate the minimum width of filter strip

Determine the minimum width (i.e. perpendicular to flow) allowable for the filter strip and design for that width or larger.

Step 2: Calculate the minimum width			
2-1. Enter the stormwater quality design flow (cfs), *SQDF*	SQDF =	1.18	cfs
2-2. Enter the minimum linear unit application rate (0.005 cfs/ft), $q_{a,min}$	$q_{a,min}$=	0.005	cfs/ft
2-3. Calculate the minimum width of filter strip (ft), $W_{min}=SQDF/q_{a,min}$	W_{min}=	240	ft

Step 3: Calculate the Design Flow Depth

A slope of 3% was assumed for the filter strip (2-4% recommended). The design water depth should not exceed 1 inch. For this design example a manning's coefficient of 0.27 was used.

Step 3: Calculate the design flow depth	
3-1. Enter filter strip longitudinal slope, *s* (ft/ft)	s = 0.03 ft/ft
3-2. Enter Manning roughness coefficient (0.25-0.30), n_{wq}	n_{wq} = 0.27
3-3. Enter width of strip (=impervious surface contributing area perpendicular to flow), at least W_{min} (ft), *W*	W = 240 ft
3-4. Calculate average depth of water using Manning equation (inches), $d_f = 12 * [SQDF * n_{wq} / 1.49 W s^{0.5}]^{0.6}$	d_f = 0.51 in
3-5. If d_f > 1" (0.083 ft), go back step 3-1 and decrease the slope	
3-6. If the slope cannot be changed due to construction constraints, go to step 3-3 and increase the width perpendicular to flow.	

Step 4: Calculate the Design Velocity

The designed flow velocity should not exceed 1 foot/second across the filter strip.

Step 4: Calculate the design velocity	
4-1. Enter depth of water (ft), $d_{f,ft} = d_f / 12$	d_f = 0.043 ft
4-2. Enter width of strip (ft), *W*	W= 240 ft
4-3. Calculate design flow velocity (ft/s), $V_{wq} = SQDF/(d_{f,ft} W)$	V_{wq} = 0.11 ft/s
4-4. If the V_{wq} >1 ft/s, go back to step 3-1 and decrease the slope.	

Step 5: Calculate the Length of the Filter Strip

The filter strip should be at least 4 feet long (in the direction of flow) and accommodate a minimum residence time of 7 minutes to provide adequate water quality treatment.

Step 5: Calculate the length of the filter strip	
5-1. Enter desired residence time (minimum 10 minutes), *t*	t = 10 min
5-2. Enter design flow velocity (ft/s), V_{wq}	V_{wq}= 0.11 ft/s
5-3. Calculate length of the filter strip (ft), $L = 60tV_{wq}$	L = 66 ft
5-4. If L < 4 ft, go to step 3-1 and increase the slope	

E.8 TCM-1 Dry Extended Detention Basin

Sizing Methodology

Dry extended detention (ED) basins are basins designed such that the stormwater quality design volume, SQDV, is detained for 36 to 48 hours. This allows sediment particles and associated pollutants to settle and be removed from stormwater. Procedures for sizing extended detention basins are summarized below. A sizing example is also provided.

Step 1: Calculate the design volume

Dry extended detention facilities shall be sized to capture and treat the water quality design volume (see Section E.1).

Step 2: Calculate the volume of the active basin

The total basin volume shall be increased an additional 20% of the stormwater quality design volume to account for sediment accumulation, at a minimum. If the basin is designed only for water quality treatment then the basin volume would be 120% of the stormwater quality design volume, SQDV. Freeboard is in additional to the total basin volume. Calculate the volume of the active basin, V_a:

$$V_a = 1.20*SQDV \qquad \text{(Equation E-39)}$$

Step 3: Determine detention basin location and preliminary geometry based on site constraints

Based on site constraints, determine the basin geometry and the storage available by developing an elevation-storage relationship for the basin. The cross-sectional geometry across the width of the basin shall be approximately trapezoidal with a maximum side slope of 4:1 (H:V) on interior slopes and 3:1 (H:V) on exterior slopes unless specifically permitted by Ventura County (see Side Slopes below). Shallower side slopes are necessary if the basin is designed to have recreational uses during dry weather conditions.

1) Calculate the width of the basin footprint, W_{tot}, as follows:

$$W_{tot} = \frac{A_{tot}}{L_{tot}} \qquad \text{(Equation E-40)}$$

Where:

A_{tot} = total surface area of the basin footprint (ft^2)

L_{tot} = total length of the basin footprint (ft)

2) Calculate the length of the active volume surface area including the internal berm but excluding the freeboard, $L_{av\text{-}tot}$:

$$L_{av-tot} = L_{tot} - 2Zd_{fb} \qquad \text{(Equation E-41)}$$

Where:

Z = interior side slope as length per unit height

d_{fb} = freeboard depth

3) Calculate the width of the active volume surface area including the internal berm but excluding freeboard, $W_{av\text{-}tot}$:

$$W_{av-tot} = W_{tot} - 2Zd_{fb} \qquad \text{(Equation E-42)}$$

4) Calculate the total active volume surface area including the internal berm and excluding freeboard, $A_{av\text{-}tot}$:

$$A_{av-tot} = L_{av-tot} \times W_{av-tot} \qquad \text{(Equation E-43)}$$

5) Calculate the area of the berm, A_{berm}:

$$A_{berm} = W_{berm} \times L_{berm} \qquad \text{(Equation E-44)}$$

Where:

W_{berm} = width of the internal berm

L_{berm} = length of the internal berm

6) Calculate the surface area excluding the internal berm and freeboard, A_{av}:

$$A_{av} = A_{av=tot} - A_{berm} \qquad \text{(Equation E-45)}$$

Step 4: Determine Dimensions of Forebay

5-15% of the basin active volume, V_a, is required to be within the active volume of the forebay.

1) Calculate the active volume of forebay, V_1:

$$V_1 = \frac{V_a \times \%V_1}{100} \qquad \text{(Equation E-46)}$$

Where:

$\%V_1$ = percent of V_a in forebay (%)

V_a = active volume (ft^3)

2) Calculate the surface area for the active volume of forebay, A_1:

$$A_1 = \frac{V_1}{d_1} \qquad \text{(Equation E-47)}$$

Where:

d_1 = average depth for the active volume of forebay (ft)

3) Calculate the length of forebay, L_1:

$$L_1 = \frac{A_1}{W_1} \qquad \text{(Equation E-48)}$$

Where:

W_1 = width of forebay (ft)

Step 5: Determine Dimensions of Cell 2

Cell 2 will consist of the remainder of the basin's active volume.

1) Calculate the active volume of Cell 2, V_2:

$$V_2 = V_a - V_1 \qquad \text{(Equation E-49)}$$

Where:

V_a = total basin active volume (ft^3)

V_1 = volume of forebay (ft^3)

2) Calculate the surface area, A_2, for the active volume of Cell 2:

$$A_2 = A_{av} - A_1 \qquad \text{(Equation E-50)}$$

Where:

A_{av} = basin surface area excluding berm and freeboard (ft^2)

A_1 = surface area of forebay (ft^2)

3) Calculate the average depth, d_2, for the active volume of Cell 2:

$$d_2 = \frac{V_2}{A_2} \qquad \text{(Equation E-51)}$$

4) Calculate the length of Cell 2, L_2:

$$L_2 = \frac{A_2}{W_2}$$ (Equation E-52)

Where:

W_2 = width of Cell 2 (ft)

5) Verify that the length-to-width ratio of Cell 2 at half of d_2 is at least 1.5:1 with ≥ 2:1 preferred. If the length-to width ratio is less than 1.5:1, modify input parameters until a ratio of at least 1.5:1 is achieved. If the input parameters cannot be modified as a result of site constraints, another site for the basin should be chosen. Calculate the length-to width, LW_{mid2}, ratio of Cell 2 at half of d_2 follows:

$$LW_{mid2} = \frac{L_{mid2}}{W_{mid2}}$$ (Equation E-53)

Where:

$W_{mid2} = W_2 - Zd_2$ and (Equation E-54)

$L_{mid2} = L_2 - Zd_2$ (Equation E-55)

W_{mid2} = width of Cell 2 at half of d_2 (ft)

L_{mid2} = length of Cell 2 at half of d_2 (ft)

Z = interior side slope as length per unit height (H:V)

Step 6: Ensure Design Requirements and Site Constraints are achieved

Check design requirements and site constraints. Modify design geometry until requirements are met. If the chosen site for the basin is inadequate to meet the design requirements, choose a new location or alternative treatment BMP.

Step 7: Size Outlet Structure

The total drawdown time for the basin should be 36-48 hours. The outlet structure shall be designed to release the bottom 50% of the detention volume (half-full to empty) over 24-32 hours, and the top half (full to half-full) in 12-16 hours. A primary overflow should be sized to pass the peak flow rate from the developed capital design storm. See Section 6 for outlet structure sizing methodologies.

Step 8: Determine Emergency Spillway Requirements

For online basins, an emergency overflow spillway should be sized to pass flows greater than the design peak runoff discharge rate for the 100-yr, 24-hr storm in order to prevent overtopping of the walls or berms in the event that a blockage of the riser occurs. For offline basins, an emergency spillway or riser should be sized to pass

the 100-yr, 24-hr post-development peak storm water runoff discharge rate directly to the downstream conveyance system or another acceptable discharge point. For sites where the emergency spillway discharges to a steep slope, an emergency overflow riser, in addition to the spillway should be provided.

Sizing Worksheet

Step 1: Determine water quality design volume		
1-1. Enter Project area (acres), $A_{project}$	A =	acres
1-2. Enter the maximum allowable percent of the Project area that may be effective impervious area (refer to permit), ranges from 5-30%, $\%_{allowable}$	$\%_{allowable}$ =	%
1-3. Determine the maximum allowed effective impervious area (ac), $EIA_{allowable} = (A_{project})*(\%_{allowable})$	$EIA_{allowable}$=	acres
1-4. Enter Project impervious fraction, Imp (e.g. 60% = 0.60)	Imp=	
1-5. Determine the Project Total Impervious area (acres), $TIA=A_{project}*Imp$	TIA=	acres
1-6. Determine the total area from which runoff must be retained (acres), $A_{retain}=TIA-EIA_{allowable}$	A_{retain} =	acres
1-7. Determine pervious runoff coefficient using Table E-1, C_p	C_p =	
1-8. Calculate runoff coefficient, $C = 0.95*imp + C_p\ (1-imp)$	C =	
1-9. Enter design rainfall depth of the storm (in), P_i	P_i =	in
1-10. Calculate rainfall depth (ft), $P = P_i/12$	P =	ft
1-11. Calculate water quality design volume (ft^3), $SQDV=43560 \bullet C*P*A_{retain}$	SQDV =	ft^3
Step 2: Calculate the volume of the active basin		
2-1. Calculate basin active volume (includes water quality design volume + sediment storage volume) (ft^3), $V_a = 1.20 \times SQDV$	V_a =	ft^3

Step 3: Determine Detention Basin Location and Preliminary Geometry Based on Site Constraints	
3-1. Based on site constraints, determine the basin geometry and the storage available by developing an elevation-storage relationship for the basin. For this simple example, assume a trapezoidal geometry for cell 1 (forebay) and cell 2.	
3-2. Enter the total surface area of the basin footprint based on site constraints (ft^2), A_{tot}	A_{tot} = ft^2
3-3. Enter the length of the basin footprint based on site constraints (ft), L_{tot}	L_{tot} = ft
3-4. Calculate the width of the basin footprint (L:W = 1.5:1 min) (ft), $W_{tot} = A_{tot} / L_{tot}$	W_{tot} = ft
3-5. Enter interior side slope as length per unit height (H:V, min = 3), Z	Z =
3-6. Enter desired freeboard depth (ft), d_{fb} (min: 2 ft on-line; 1 ft offline)	d_{fb} = ft
3-7. Calculate the length of the active volume surface area including the internal berm but excluding freeboard, $L_{av\text{-}tot} = L_{tot} - 2Zd_{fb}$	$L_{av\text{-}tot}$ = ft
3-8. Calculate the width of the active volume surface area including the internal berm but excluding freeboard, $W_{av\text{-}tot} = W_{tot} - 2Zd_{fb}$	$W_{av\text{-}tot}$ = ft
3-9. Calculate the total active volume surface area including the internal berm and excluding freeboard, $A_{av\text{-}tot} = L_{av\text{-}tot} \times W_{av\text{-}tot}$	$A_{av\text{-}tot}$ = ft^2
3-10. Enter the width of the internal berm (6 ft min), W_{berm}	W_{berm} = ft
3-11. Enter the length of the internal berm (ft), $L_{berm} = W_{av\text{-}tot}$	L_{berm} = ft
3-12. Calculate the area of the berm (ft^2), $A_{berm} = W_{berm} \times L_{berm}$	A_{berm} = ft^2
3-13. Calculate the surface area excluding the internal berm and freeboard (ft^2), $A_{av} = A_{av\text{-}tot} - A_{berm}$	A_{av} = ft^2

Step 4: Determine Dimensions of forebay	
4-1. Enter the percent of V_a in forebay (5-15% required), $\%V_1$	$\%V_1$ = %
4-2. Calculate the active volume of forebay, $V_1 = (V_a \bullet \%V_1)/100$	V_1 = ft^3
4-3. Enter a desired average depth for the active volume of forebay, d_1	d_1 = ft
4-4. Calculate the surface area for the active volume of forebay, $A_1 = V_1 / d_1$	A_1 = ft^2
4-5. Enter the width of forebay, $W_1 = W_{av\text{-}tot} = L_{berm}$	W_1 = ft
4-6. Calculate the length of forebay (<u>Note:</u> inlet and outlet should be configured to maximize the residence time), $L_1 = A_1 / W1$	L_1 = ft
Step 5: Determine Dimensions of Cell 2	
5-1. Calculate the active volume of Cell 2, $V_2 = V_a - V_1$	V_2 = ft^3
5-2. Calculate the surface area of the active volume of Cell 2, $A_2 = A_{av} - A_1$	A_2 = ft^2
5-3. Calculate the average depth for the active volume of Cell 2, $d_2 = V_2 / A_2$	d_2 = ft
5-4. Enter the width of Cell 2, $W_2 = W_1 = W_{av\text{-}tot} = L_{berm}$	W_2 = ft
5-5. Calculate the length of Cell 2, $L_2 = A_2 / W_2$	L_2 = ft
5-6. Calculate the width of Cell 2 at half of d_2, $W_{mid2} = W_2 - Zd_2$	W_{mid2} = ft
5-7. Calculate the length of Cell 2 at half of d_2, $L_{mid2} = L_2 - Zd_2$	L_{mid2} = ft

5-8. Verify that the length-to-width ratio of Cell 2 at half of d_2 is at least 1.5:1 with ≥ 2:1 preferred. If the length-to-width ratio is less than 1.5:1, modify input parameters until a ratio of at least 1.5:1 is achieved. If the input parameters cannot be modified as a result of site constraints, another site for the basin should be chosen, $LW_{mid2} = L_{mid2} / W_{mid2}$	LW_{mid2} =
Step 6: Ensure Design Requirements and Site Constraints are Achieved	
6-1. Check design requirements and site constraints. Modify design geometry until requirements are met. If the chosen site for the basin is inadequate to meet the design requirements, choose a new location or alternative treatment BMP.	
Step 7: Size Outlet Structure	
7-1. The total drawdown time for the basin should be 36-48 hours. The outlet structure shall be designed to release the bottom 50% of the detention volume (half-full to empty) over 24-32 hours, and the top half (full to half-full) in 12-16 hours. A primary overflow should be sized to pass the peak flow rate from the developed capital design storm. See Section 6 for outlet structure sizing methodologies.	
Step 8: Determine Emergency Spillway Requirements	
8-1. For online basins, an emergency overflow spillway should be sized to pass flows greater than the design peak runoff discharge rate for the 100-yr, 24-hr storm in order to prevent overtopping of the walls or berms in the event that a blockage of the riser occurs. For offline basins, an emergency spillway or riser should be sized to pass the 100-yr, 24-hr post-development peak storm water runoff discharge rate directly to the downstream conveyance system or another acceptable discharge point. For sites where the emergency spillway discharges to a steep slope, an emergency overflow riser, in addition to the spillway should be provided.	

Design Example

Step 1: Determine water quality design volume

For this design example, a 10-acre residential development with a 60% total impervious area is considered. The 85th percentile storm event for the project location is 0.75 inches.

Step 1: Determine water quality design volume			
1-1. Enter Project area (acres), $A_{project}$	A =	10	acres
1-2. Enter the maximum allowable percent of the Project area that may be effective impervious area (refer to permit), ranges from 5-30%, $\%_{allowable}$	$\%_{allowable}$ =	5	
1-3. Determine the maximum allowed effective impervious area (ac), $EIA_{allowable} = (A_{project})*(\%_{allowable})$	$EIA_{allowable}$=	0.5	acres
1-4. Enter Project impervious fraction, Imp (e.g. 60% = 0.60)	Imp=	0.6	
1-5. Determine the Project Total Impervious area (acres), $TIA=A_{project}*Imp$	TIA=	6	acres
1-6. Determine the total area from which runoff must be retained (acres), $A_{retain}=TIA-EIA_{allowable}$	A_{retain} =	5.5	acres
1-7. Determine pervious runoff coefficient using Table E-1, C_p	C_p =	0.05	
1-8. Calculate runoff coefficient, $C = 0.95*imp + C_p\ (1-imp)$	C =	0.59	
1-9. Enter design rainfall depth of the storm (in), P_i	P_i =	0.75	in
1-10. Calculate rainfall depth (ft), $P = P_i/12$	P =	0.06	ft
1-11. Calculate water quality design volume (ft^3), $SQDV=43560 \bullet C*P*A_{retain}$	SQDV =	8,500	ft^3

Step 2: Calculate Volume of the Active Basin and the Forebay Basin

Step 2: Calculate the design volume of the active basin	
2-1. Calculate basin active design volume (includes water quality design volume + sediment storage volume), $V_a = 1.20*SQDV$	V_a = 10,000 ft^3

Step 3: Determine Detention Basin Location and Preliminary Geometry Based on Site Constraints

The detention basin in this example has an internal berm separating the forebay (Cell 1) and the main basin (Cell 2). The internal berm elevation is 2 ft below the elevation of the SUSMP volume within the entire basin. The berm length is equal to the width of the basin when filled to the active design volume.

Step 3: Determine Detention Basin Location and Preliminary Geometry Based on Site Constraints	
3-1. Based on site constraints, determine the basin geometry and the storage available by developing an elevation-storage relationship for the basin. For this simple example, assume a trapezoidal geometry for cell 1 (forebay) and cell 2.	
3-2. Enter the total surface area of the basin footprint based on site constraints, A_{tot}	A_{tot} = 8,000 ft^2
3-3. Enter the length of the basin footprint based on site constraints, L_{tot} (L:W = 1.5:1 min)	L_{tot} = 200 ft
3-4. Calculate the width of the basin footprint, $W_{tot} = A_{tot} / L_{tot}$	W_{tot} = 40 ft
3-5. Enter interior side slope as length per unit height (min = 3), Z	Z = 3
3-6. Enter desired freeboard depth, d_{fb} (min: 2 ft on-line; 1 ft offline)	d_{fb} = 2 ft
3-7. Calculate the length of the active volume surface area including the internal berm but excluding freeboard, $L_{av\text{-}tot} = L_{tot} - 2Zd_{fb}$	$L_{av\text{-}tot}$ = 188 ft

Step 3: Determine Detention Basin Location and Preliminary Geometry Based on Site Constraints	
3-8. Calculate the width of the active volume surface area including the internal berm but excluding freeboard, $W_{av\text{-}tot} = W_{tot} - 2Zd_{fb}$	$W_{av\text{-}tot}$ = 28 ft
3-9. Calculate the total active volume surface area including the internal berm and excluding freeboard, $A_{av\text{-}tot} = L_{av\text{-}tot} \bullet W_{av\text{-}tot}$	$A_{av\text{-}tot}$ = 5,300 ft^2
3-10. Enter the width of the internal berm (6 ft min), W_{berm}	W_{berm} = 6 ft
3-11. Enter the length of the internal berm, $L_{berm} = W_{av\text{-}tot}$	L_{berm} = 28 ft
3-12. Calculate the area of the berm, $A_{berm} = W_{berm} \bullet L_{berm}$	A_{berm} = 170 ft^2
3-13. Calculate the surface area excluding the internal berm and freeboard, $A_{av} = A_{av\text{-}tot} - A_{berm}$	A_{av} = 5,130 ft^2

Step 4: Calculate Dimensions of Cell 1

Calculate the dimensions of the forebay (Cell 1) based on the active design volume for Cell 1 (25% of V_a) and a desired average depth, d_1. The width of the forebay, W_1, is equivalent to the length of the berm, L_{berm}, and the width of Cell 2, W_2.

Step 4: Determine Dimensions of forebay	
4-1. Enter the percent of V_a in forebay (5-15% required), $\%V_1$	$\%V_1$ = 25 %
4-2. Calculate the active volume of forebay (including sediment storage), $V_1 = (V_a \bullet \%V_1)/100$	V_1 = 2,500 ft^3
4-3. Enter a desired average depth for the active volume of forebay, d_1	d_1 = 5 ft
4-4. Calculate the surface area for the active volume of forebay, $A_1 = V_1 / d_1$	A_1 = 500 ft^2

4-5. Enter the width of forebay, $W_1 = W_{wq\text{-}tot} = L_{berm}$	W_1 = 28 ft
4-6. Calculate the length of forebay (Note: inlet and outlet should be configured to maximize the residence time), $L_1 = A_1 / W1$	L_1 = 18 ft

Step 5: Calculate the Dimensions of Cell 2

Calculate the dimensions of the main basin (Cell 2) based on the active design volume for Cell 2 and a desired average depth, d_2. A calculation of the length, L_{mid2}, and width, W_{mid2}, at half basin depth, d_2, is conducted in order to verify that the length-to-width ratio at half d_2 is greater than 1.5:1.

Step 5: Calculate the dimensions of Cell 2	
5-1. Calculate the active volume of Cell 2, $V_2 = V_a - V_1$	V_2 = 7,500 ft^3
5-2. Calculate the surface area of the active volume of Cell 2, $A_2 = A_{av} - A_1$	A_2 = 4,630 ft^2
5-3. Calculate the average depth of the active volume of Cell 2, $d_2 = V_2 / A_2$	d_2 = 1.6 ft
5-4. Enter the width of Cell 2, $W_2 = W_1 = W_{av\text{-}tot} = L_{berm}$	W_2 = 28 ft
5-5. Calculate the length of Cell 2, $L_2 = A_2 / W_2$	L_2 = 166 ft
5-6. Calculate the width of Cell 2 at half of d_2, $W_{mid2} = W_2 - Zd_2$	W_{mid2} = 23 ft
5-7. Calculate the length of Cell 2 at half of d_2, $L_{mid2} = L_2 - Zd_2$	L_{mid2} = 161 ft
5-8. Verify that the length-to-width ratio of Cell 2 at half of d_2 is at least 1.5:1 with ≥ 2:1 preferred. If the length-to-width ratio is less than 1.5:1, modify input parameters until a ratio of at least 1.5:1 is achieved. If the input parameters cannot be modified as a result of site constraints, another site for the basin should be chosen, $LW_{mid2} = L_{mid2} / W_{mid2}$	LW_{mid2} = 7

Step 6: Ensure Design Requirements and Site Constraints are Achieved

Check design requirements and site constraints. Modify design geometry until requirements are met. If the chosen site for the basin is inadequate to meet the design requirements, choose a new location or an alternative treatment BMP.

Step 7: Size Outlet Structure

The total drawdown time for the basin should be 36-48 hours. The outlet structure shall be designed to release the bottom 50% of the detention volume (half-full to empty) over 24-32 hours, and the top half (full to half-full) in 12-16 hours. A primary overflow should be sized to pass the peak flow rate from the developed capital design storm. See Section 6 for outlet structure sizing methodologies.

Step 8: Determine Emergency Spillway Requirements

For online basins, an emergency overflow spillway should be sized to pass flows greater than the design peak runoff discharge rate for the 100-yr, 24-hr storm in order to prevent overtopping of the walls or berms in the event that a blockage of the riser occurs. For offline basins, an emergency spillway or riser should be sized to pass the 100-yr, 24-hr post-development peak storm water runoff discharge rate directly to the downstream conveyance system or another acceptable discharge point. For sites where the emergency spillway discharges to a steep slope, an emergency overflow riser, in addition to the spillway should be provided.

E.9 TCM-2 Wet Detention Basin

Sizing Methodology

Wet Detention basins may be designed with or without extended detention above the permanent pool. The extended detention portion of the wet detention basin above the permanent pool, if provided, functions like a dry extended detention (ED) basin (see VEG-5: Dry Extended Detention Basin). If there is no extended detention provided, wet detention basins shall be sized to provide a minimum wet pool volume equal to the stormwater quality design volume plus an additional 5% for sediment accumulation. If extended detention is provided above the permanent pool, the sizing is dependent of the functionality of the basin; the basin may function as water quality treatment only or water quality plus peak flow attenuation.

If and the basin is designed for water quality treatment only, then the permanent pool volume shall be a minimum of 10 percent of the stormwater quality design volume and the surcharge volume (above the permanent pool) shall make up the remaining 90 percent. If extended detention is provided above the permanent pool and the basin is designed for water quality treatment and peak flow attenuation, then the permanent pool volume shall be equal to the water quality treatment volume, and the surcharge volume shall be sized to attenuate peak flows in order to meet the peak runoff discharge requirements. The extended detention portion of the wet detention basin above the permanent pool, if provided, functions like a dry extended detention (ED) basin (see VEG-5: Dry Extended Detention Basin).

Step 1: Calculate the design volume

Wet detention basins shall be sized with a permanent pool volume equal to the SQDV volume (see Section 2 and Appendix E).

Step 2: Determine the active design volume for the wet detention basin without extended detention

The active volume of the wet detention basin, V_a, shall be equal to the SQFV plus an additional 5% for sediment accumulation.

$$V_a = 1.05 \times SQDV \qquad \text{(Equation E-56)}$$

Step 3: Determine pond location and preliminary geometry based on site constraints

Based on site constraints, determine the pond geometry and the storage available by developing an elevation-storage relationship for the pond. Note that a more natural geometry may be used and is in many cases recommended; the preliminary basin geometry calculations should be used for sizing purposes only.

1) Calculate the width of the pond footprint, W_{tot}, as follows:

$$W_{tot} = \frac{A_{tot}}{L_{tot}}$$ (Equation E-57)

Where:

A_{tot} = total surface area of the pond footprint (ft^2)

L_{tot} = total length of the pond footprint (ft)

7) Calculate the length of the active volume surface area including the internal berm but excluding the freeboard, $L_{av\text{-}tot}$:

$$L_{av-tot} = L_{tot} - 2Zd_{fb}$$ (Equation E-58)

Where:

Z = interior side slope as length per unit height

d_{fb} = freeboard depth

8) Calculate the width of the active volume surface area including the internal berm but excluding freeboard, $W_{av\text{-}tot}$:

$$W_{av-tot} = W_{tot} - 2Zd_{fb}$$ (Equation E-59)

9) Calculate the total active volume surface area including the internal berm and excluding freeboard, $A_{av\text{-}tot}$:

$$A_{av-tot} = L_{av-tot} \times W_{av-tot}$$ (Equation E-60)

10) Calculate the area of the berm, A_{berm}:

$$A_{berm} = W_{berm} \times L_{berm}$$ (Equation E-61)

Where:

W_{berm} = width of the internal berm

L_{berm} = length of the internal berm

11) Calculate the active volume surface area excluding the internal berm and freeboard, A_{wq}:

$$A_{wq} = A_{wq=tot} - A_{berm}$$ (Equation E-62)

Step 4: Determine Dimensions of Forebay

The wet detention basin shall be divided into two cells separated by a berm or baffle. The forebay shall contain between 5 and 10 percent of the total volume. The berm or

baffle volume shall not count as part of the total volume. Calculate the active volume of forebay, V_1:

$$V_1 = \frac{V_a \times \%V_1}{100} \qquad \text{(Equation E-63)}$$

Where:

$\%V_1$ = percent of SQDV in forebay (%)

1) Calculate the surface area for the active volume of forebay, A_1:

$$A_1 = \frac{V_1}{d_1} \qquad \text{(Equation E-64)}$$

Where:

d_1 = average depth fo rhte active volume of forebay (ft)

2) Calculate the length of forebay, L_1. Note, inlet and outlet should be configured to maximize the residence time.

$$L_1 = \frac{A_1}{W_1} \qquad \text{(Equation E-65)}$$

Where:

W_1 = width of forebay (ft), $W_1 = W_{av\text{-}tot} = L_{berm}$

Step 5: Determine Dimensions of Cell 2

Cell 2 will consist of the remainder of the basin's active volume.

3) Calculate the active volume of Cell 2, V_2:

$$V_2 = V_a - V_1 \qquad \text{(Equation E-66)}$$

4) The minimum wetpool surface area includes 0.3 acres of wetpool per acre-foot of permanent wetpool volume. Calculate A_{min2}:

$$A_{min2} = (V_2 \times 0.3 \frac{acres}{acre-feet}) \qquad \text{(Equation E-67)}$$

5) Calculate the actual wetpool surface area, A_2:

$$A_2 = A_{av} - A_1 \qquad \text{(Equation E-68)}$$

Verify that A_2 is greater than A_{min2}. If A_2 is less than A_{min2}, then modify input parameters to increase A_2 until it is greater than A_{min2}. If site constraints limit this criterion, then another site for the pond should be chosen.

6) Calculate the top length of Cell 2, L_2:

$$L_2 = \frac{A_2}{W_2}$$ (Equation E-69)

Where:

W_2 = width of Cell 2 (ft), $W_2 = W_1 = W_{wq\text{-}tot} = L_{berm}$

7) Verify that the length-to-width ratio of Cell 2 is at least 1.5:1 with ≥ 2:1 preferred. If the length-to-width ratio is less than 1.5:1, modify input parameters until a ratio of at least 1.5:1 is achieved. If the input parameters cannot be modified as a result of site constraints, another site for the pond should be chosen.

$$LW_2 = \frac{L_2}{W_2}$$ (Equation E-70)

8) Calculate the emergent vegetation surface area, A_{ev}:

$$A_{ev} = \frac{A_2 \bullet \%A_{ev}}{100}$$ (Equation E-71)

Where:

$\%A_{ev}$ = percent of surface area that will be planted with emergent vegetation

9) Calculate the volume of the emergent vegetation shallow zone (1.5 – 3 ft), V_{ev}:

$$V_{ev} = A_{ev} \bullet d_{ev}$$ (Equation E-72)

Where:

d_{ev} = average depth of the emergent vegetation shallow zone (1.5 – 3 ft)

10) Calculate the length of the emergent vegetation shallow zone, L_{ev}:

$$L_{ev} = \frac{A_{ev}}{W_{ev}}$$ (Equation E-73)

Where:

W_{ev} = width of the emergent vegetation shallow zone (ft), $W_{ev} = W_2$

11) Calculate the volume of the deep zone, V_{deep}:

$$V_{deep} = V_2 - V_{ev}$$ (Equation E-74)

12) Calculate the surface area of the deep (>3 ft) zone, A_{deep}:

$$A_{deep} = A_2 - A_{ev} \quad \text{(Equation E-75)}$$

13) Calculate the average depth of the deep zone (4-8 ft), d_{deep}:

$$d_{deep} = \frac{V_{deep}}{A_{deep}} \quad \text{(Equation E-76)}$$

14) Calculate length of the deep zone, L_{deep}:

$$L_{deep} = \frac{A_{deep}}{W_{deep}} \quad \text{(Equation E-77)}$$

Where:

W_{deep} = width of the deep zone (ft), $W_{deep} = W_2$

Step 6: Ensure design requirements and site constraints are achieved

Check design requirements and site constraints. Modify design geometry until requirements are met. If the chosen site for the basin is inadequate to meet the design requirements, choose a new location for the BMP.

Step 7: Size Outlet Structure

For extended detention wet detention basin, outlet structures shall be designed to provide 12 to 48 hour emptying time for the water quality volume above the permanent pool.

The basin outlet pipe shall be sized, at a minimum, to pass flows greater than the stormwater quality design peak flow for off-line basins or flows greater than the peak runoff discharge rate for the 100-year, 24-hr design storm for on-line basins.

Step 8: Determine Emergency Spillway Requirements

For online basins, an emergency overflow spillway should be sized to pass flows greater than the design peak runoff discharge rate for the 100-yr, 24-hr storm to prevent overtopping of the walls or berms in the event that a blockage of the riser occurs. For offline basins, an emergency spillway or riser should be sized to pass the water quality design storm. For sites where the emergency spillway discharges to a steep slope, an emergency overflow riser, in addition to the spillway should be provided.

Sizing Worksheet

Step 1: Determine water quality design volume		
1-1. Enter drainage area, A	A =	acres
1-2. Enter the maximum allowable percent of the Project area that may be effective impervious area (refer to permit), ranges from 5-30%, $\%_{allowable}$	$\%_{allowable}$ =	%
1-3. Determine the maximum allowed effective impervious area, $EIA_{allowable} = (A_{project})*(\%_{allowable})$	$EIA_{allowable}$=	acres
1-4. Enter Project impervious fraction, *Imp* (e.g. 60% = 0.60)	Imp=	
1-5. Determine the Project Total Impervious area, $TIA=A_{project}*Imp$	TIA=	acres
1-6. Determine the total area from which runoff must be retained, $A_{retain}=TIA-EIA_{allowable}$	A_{retain} =	acres
1-7. Determine pervious runoff coefficient using Table E-1, C_p	C_p =	
1-8. Calculate runoff coefficient, $C = 0.95*imp + C_p\ (1-imp)$	C =	
1-9. Enter design rainfall depth of the storm, P_i (in)	P_i =	in
1-10. Calculate rainfall depth, $P = P_i/12$	P =	ft
1-11. Calculate water quality design volume, $SQDV = 43560 \bullet P*A_{retain}*C$	SQDV =	ft^3
Step 2: Determine active design volume for the wet pond without extended detention		
2-1. Calculate the active design volume (without extended detention), $V_a = 1.05*SQDV$	V_a =	ft^3

Step 3: Determine Pond Location and Preliminary Geometry Based on Site Constraints	
3-1. Based on site constraints, determine the pond geometry and the storage available by developing an elevation-storage relationship for the pond. For this simple example, assume a trapezoidal geometry for cell 1 (forebay) and cell 2.	
3-2. Enter the total surface area of the pond footprint based on site constraints, A_{tot}	A_{tot} = ft^2
3-3. Enter the length of the pond footprint based on site constraints, L_{tot}	L_{tot} = ft
3-4. Calculate the width of the pond footprint, $W_{tot} = A_{tot} / L_{tot}$	W_{tot} = ft
3-5. Enter interior side slope as length per unit height (min = 3), Z	Z =
3-6. Enter desired freeboard depth, d_{fb} (1 ft min)	d_{fb} = ft
3-7. Calculate the length of the water quality volume surface area including the internal berm but excluding freeboard, $L_{av\text{-}tot} = L_{tot} - 2Zd_{fb}$	$L_{av\text{-}tot}$ = ft
3-8. Calculate the width of the water quality volume surface area including the internal berm but excluding freeboard, $W_{av\text{-}tot} = W_{tot} - 2Zd_{fb}$	$W_{av\text{-}tot}$ = ft
3-9. Calculate the total water quality volume surface area including the internal berm and excluding freeboard, $A_{av\text{-}tot} = L_{av\text{-}tot} \bullet W_{av\text{-}tot}$	$A_{av\text{-}tot}$ = ft^2
3-10. Enter the width of the internal berm (6 ft min), W_{berm}	W_{berm} = ft
3-11. Enter the length of the internal berm, $L_{berm} = W_{av\text{-}tot}$	L_{berm} = ft
3-12. Calculate the area of the berm, $A_{berm} = W_{berm} \bullet L_{berm}$	A_{berm} = ft^2

3-13. Calculate the water quality volume surface area excluding the internal berm and freeboard, $A_{av} = A_{av\text{-}tot} - A_{berm}$	A_{av} = ft^2
Step 4: Determine Dimensions of forebay	
4-1. Enter the percent of V_a in forebay (5-10% required), $\%V_1$	$\%V_1$ = %
4-2. Calculate the active volume of forebay (includes sediment storage volume), $V_1 = (V_a \bullet \%V_1) /100$	V_1 = ft^3
4-3. Enter desired average depth of forebay (5-9 ft including sediment storage of 1 ft), d_1	d_1 = ft
4-4. Calculate the surface area for the active volume of forebay, $A_1 = V_1 / d_1$	A_1 = ft^2
4-5. Enter the width of forebay, $W_1 = W_{av\text{-}tot} = L_{berm}$	W_1 = ft
4-6. Calculate the length of forebay (<u>Note:</u> inlet and outlet should be configured to maximize the residence time), $L_1 = A_1 / W1$	L_1 = ft
Step 5: Determine Dimensions of Cell 2	
5-1. Calculate the active volume of Cell 2, $V_2 = V_a - V_1$	V_2 = ft^3
5-2. Determine minimum wetpool surface area, $A_{min2} = V_2 \bullet 0.3$	A_{min2} = ft^2
5-3. Determine actual wetpool surface area, $A_2 = A_{av} - A_1$	A_2 = ft^2
5-4. • If A_2 is greater than A_{min2} then move on to step 5-5. • If A_2 is less than A_{min2}, then modify input parameters to increase A_2 until it is greater than A_{min2}. If site constraints limit this criterion, then another site for the pond should be chosen.	
5-5. Enter width of Cell 2, $W_2 = W_1 = W_{av\text{-}tot} = L_{berm}$	W_2 = ft

5-6. Calculate top length of Cell 2, $L_2 = A_2 / W_2$	L_2 = ft
5-7. Verify that the length-to-width ratio of Cell 2 is at least 1.5:1 with ≥ 2:1 preferred. If the length-to-width ratio is less than 1.5:1, modify input parameters until a ratio of at least 1.5:1 is achieved. If the input parameters cannot be modified as a result of site constraints, another site for the pond should be chosen, $LW_2 = L_2 / W_2$	LW_2 =
5-8. Enter percent of surface area that will be planted with emergent vegetation (25-75%), $\%A_{ev}$	$\%A_{ev}$ = %
5-9. Calculate emergent vegetation surface area, $A_{ev} = (A_2 \bullet \%A_{ev})/100$	A_{ev} = ft^2
5-10. Enter average depth of emergent vegetation shallow zone (1.5 – 3 ft), d_{ev}	d_{ev} = ft
5-11. Calculate volume of emergent vegetation shallow zone (1.5 – 3 ft), $V_{ev} = A_{ev} \bullet d_{ev}$	V_{ev} = ft^3
5-12. Enter width of emergent vegetation shallow zone, $W_{ev} = W_2$	W_{ev}= ft
5-13. Calculate length of emergent vegetation shallow zone, $L_{ev} = A_{ev} / W_{ev}$	L_{ev} = ft
5-14. Calculate volume of deep zone, $V_{deep} = V_2 - V_{ev}$	V_{deep} = ft^3
5-15. Calculate surface area of deep (>3 ft) zone, $A_{deep} = A_2 - A_{ev}$	A_{deep} = ft^2
5-16. Calculate average depth of deep zone (4 - 8 ft), $d_{deep} = V_{deep} / A_{deep}$	d_{deep} = ft
5-17. Enter width of deep zone, $W_{deep} = W_2$	W_{deep} = ft
5-18. Calculate length of deep zone, $L_{deep} = A_{deep} / W_{deeo}$	L_{deep} = ft

Step 6: Ensure Design Requirements and Site Constraints are Achieved
6-1. Check design requirements and site constraints. Modify design geometry until requirements are met. If the chosen site for the basin is inadequate to meet the design requirements, choose a new location for the BMP.
Step 7: Size Outlet Structure
7-1. The basin outlet pipe shall be sized, at a minimum, to pass flows greater than the stormwater quality design peak flow for off-line basins or flows greater than the peak runoff discharge rate for the 100-year, 24-hr design storm for on-line basins.
Step 8: Determine Emergency Spillway Requirements
8-1. For online basins, an emergency overflow spillway should be sized to pass flows greater than the design peak runoff discharge rate for the 100-yr, 24-hr storm to prevent overtopping of the walls or berms in the event that a blockage of the riser occurs. For offline basins, an emergency spillway or riser should be sized to pass the water quality design storm. For sites where the emergency spillway discharges to a steep slope, an emergency overflow riser, in addition to the spillway should be provided.

Design Example

Wet detention basin siting requires the following considerations prior to construction: (1) availability of base flow – wet detention basins require a regular source of water if water level is to be maintained, (2) surface space availability – large footprint area is required, and (3) compatibility with flood control – basins must not interfere with flood control functions of existing conveyance and detention structures.

The wet detention basin in this example does not have extended detention. An internal berm separates the forebay (Cell 1) and the main basin (Cell 2). The berm is at the elevation of the active volume design surface which is also the permanent wetpool elevation.

Step 1: Determine Water Quality Design Volume

For this design example, a 20-acre residential development with a 60% total impervious area is considered. The 85th percentile storm event for the project location is 0.75 inches.

Step 1: Determine water quality design volume			
1-1. Enter drainage area, A	A =	20	acres
1-2. Enter the maximum allowable percent of the Project area that may be effective impervious area (refer to permit), ranges from 5-30%, $\%_{allowable}$	$\%_{allowable}$ =	5	
1-3. Determine the maximum allowed effective impervious area, $EIA_{allowable} = (A_{project})*(\%_{allowable})$	$EIA_{allowable}$=	1.0	acres
1-4. Enter Project impervious fraction, *Imp* (e.g. 60% = 0.60)	Imp=	0.6	
1-5. Determine the Project Total Impervious area, $TIA=A_{project}*Imp$	TIA=	12	acres
1-6. Determine the total area from which runoff must be retained, $A_{retain}=TIA-EIA_{allowable}$	A_{retain} =	11	acres
1-7. Determine pervious runoff coefficient using Table E-1, C_p	C_p =	0.05	
1-8. Calculate runoff coefficient, $C = 0.95*imp + C_p\ (1-imp)$	C =	0.59	
1-9. Enter design rainfall depth of the storm, P_i (in)	P_i =	0.75	in
1-10. Calculate rainfall depth, $P = P_i/12$	P =	0.06	ft

1-11. Calculate water quality design volume, $SQDV = 43560 \bullet P * A_{retain} * C$	SQDV = 17,000 ft^3

Step 2: Determine Active Design Volume for a Wet Detention Basin without Extended Detention

If there is no extended detention provided, wet detention basins shall be sized to provide a minimum wet pool volume equal to the water quality design volume plus an additional 5% for sediment accumulation.

Step 2: Determine Active Design Volume for a Wet Detention Basin without Extended Detention	
2-1. Calculate the active design volume (without extended detention), $V_a = 1.05 * SQDV$	V_a = 17,800 ft^3

Step 3: Determine Pond Location and Preliminary Geometry Based on Site Constraints

A total footprint area and total length available for the basin is provided. This step calculates the total active volume surface area which is equivalent to the permanent wetpool surface area. This step also calculates the dimensions of the internal berm.

Step 3: Determine Pond Location and Preliminary Geometry Based on Site Constraints	
3-1. Based on site constraints, determine the pond geometry and the storage available by developing an elevation-storage relationship for the pond. For this simple example, assume a trapezoidal geometry for cell 1 (forebay) and cell 2.	
3-2. Enter the total surface area of the pond footprint based on site constraints, A_{tot}	A_{tot} = 7,500 ft^2
3-3. Enter the length of the pond footprint based on site constraints, L_{tot}	L_{tot} = 150 ft
3-4. Calculate the width of the pond footprint, $W_{tot} = A_{tot} / L_{tot}$	W_{tot} = 50 ft
3-5. Enter interior side slope as length per unit height (min = 3), Z	Z = 3

Step 3: Determine Pond Location and Preliminary Geometry Based on Site Constraints			
3-6. Enter desired freeboard depth, d_{fb} (1 ft min)	d_{fb} =	2	ft
3-7. Calculate the length of the water quality volume surface area including the internal berm but excluding freeboard, $L_{av\text{-}tot} = L_{tot} - 2Zd_{fb}$	$L_{av\text{-}tot}$ =	138	ft
3-8. Calculate the width of the water quality volume surface area including the internal berm but excluding freeboard, $W_{av\text{-}tot} = W_{tot} - 2Zd_{fb}$	$W_{av\text{-}tot}$ =	38	ft
3-9. Calculate the total water quality volume surface area including the internal berm and excluding freeboard, $A_{av\text{-}tot} = L_{av\text{-}tot} \bullet W_{av\text{-}tot}$	$A_{av\text{-}tot}$ =	4,940	ft^2
3-10. Enter the width of the internal berm (6 ft min), W_{berm}	W_{berm} =	6	ft
3-11. Enter the length of the internal berm, $L_{berm} = W_{av\text{-}tot}$	L_{berm} =	38	ft
3-12. Calculate the area of the berm, $A_{berm} = W_{berm} \bullet L_{berm}$	A_{berm} =	230	ft^2
3-13. Calculate the water quality volume surface area excluding the internal berm and freeboard, $A_{av} = A_{av\text{-}tot} - A_{berm}$	A_{av} =	4,710	ft^2

Step 4: Determine Dimensions of forebay

It should be assumed that the forebay should be 5-10% of the total active design volume, V_a.

Step 4: Determine Dimensions of Cell 1			
4-1. Enter the percent of V_a in forebay (5-10% required), $\%V_1$	$\%V_1$ =	20	%
4-2. Calculate the active volume of forebay (includes sediment storage volume), $V_1 = (V_a \bullet \%V_1) / 100$	V_1 =	3,560	ft^3
4-3. Enter desired average depth of forebay (5-9 ft including sediment storage of 1 ft), d_1	d_1 =	8	ft

4-4. Calculate the surface area for the active volume of forebay, $A_1 = V_1 / d_1$	A_1 =	440	ft^2
4-5. Enter the width of forebay, $W_1 = W_{av\text{-}tot} = L_{berm}$	W_1 =	38	ft
4-6. Calculate the length of forebay (Note: inlet and outlet should be configured to maximize the residence time), $L_1 = A_1 / W1$	L_1 =	12	ft

Step 5: Determine Dimensions of Cell 2

Verify that the surface area and length-to-width ratio of Cell 2 meet the design criteria. Calculate volumes, depths and surface areas for the emergent vegetation shallow zone and the deep zone.

Step 5: Determine Dimensions of Cell 2			
5-1. Calculate the active volume of Cell 2, $V_2 = V_a - V_1$	V_2 =	14,200	ft^3
5-2. Determine minimum wetpool surface area, $A_{min2} = V_2 \bullet 0.3$	A_{min2} =	4,270	ft^2
5-3. Determine actual wetpool surface area, $A_2 = A_{av} – A_1$	A_2 =	4,270	ft^2
5-4. If A_2 is greater than A_{min2} then move on to step 5-5. If A_2 is less than A_{min2}, then modify input parameters to increase A_2 until it is greater than A_{min2}. If site constraints limit this criterion, then another site for the pond should be chosen.			
5-5. Enter width of Cell 2, $W_2 = W_1 = W_{av\text{-}tot} = L_{berm}$	W_2 =	38	ft
5-6. Calculate top length of Cell 2, $L_2 = A_2 / W_2$	L_2 =	110	ft
5-7. Verify that the length-to-width ratio of Cell 2 is at least 1.5:1 with ≥ 2:1 preferred. If the length-to-width ratio is less than 1.5:1, modify input parameters until a ratio of at least 1.5:1 is achieved. If the input parameters cannot be modified as a result of site constraints, another site for the pond should be chosen, $LW_2 = L_2 / W_2$	LW_2 =	2.9	
5-8. Enter percent of surface area that will be planted with emergent vegetation (25-75%), $\%A_{ev}$	$\%A_{ev}$ =	25	%

Step 5: Determine Dimensions of Cell 2	
5-9. Calculate emergent vegetation surface area, $A_{ev} = (A_2 \bullet \%A_{ev})/100$	A_{ev} = 1,070 ft^2
5-10. Enter average depth of emergent vegetation shallow zone (1.5 – 3 ft), d_{ev}	d_{ev} = 2 ft
5-11. Calculate volume of emergent vegetation shallow zone (1.5 – 3 ft), $V_{ev} = A_{ev} \bullet d_{ev}$	V_{ev} = 2,130 ft^3
5-12. Enter width of emergent vegetation shallow zone, $W_{ev} = W_2$	W_{ev}= 38 ft
5-13. Calculate length of emergent vegetation shallow zone, $L_{ev} = A_{ev} / W_{ev}$	L_{ev} = 56 ft
5-14. Calculate volume of deep zone, $V_{deep} = V_2 - V_{ev}$	V_{deep} = 13,100 ft^3
5-15. Calculate surface area of deep (>3 ft) zone, $A_{deep} = A_2 - A_{ev}$	A_{deep} = 3,200 ft^2
5-16. Calculate average depth of deep zone (4 - 8 ft), $d_{deep} = V_{deep} / A_{deep}$	d_{deep} = 4.1 ft
5-17. Enter width of deep zone, $W_{deep} = W_2$	W_{deep} = 28 ft
5-18. Calculate length of deep zone, $L_{deep} = A_{deep} / W_{deeo}$	L_{deep} = 114 ft

Step 6: Ensure Design Requirements and Site Conditions are Achieved

Check design requirements and site constraints. Modify design geometry until requirements are met. If the chosen site for the basin is inadequate to meet the design requirements, choose a new location for the BMP.

Step 7: Size Outlet Structure

The basin outlet pipe shall be sized, at a minimum, to pass flows greater than the stormwater quality design peak flow for off-line basins or flows greater than the peak runoff discharge rate for the 100-year, 24-hr design storm for on-line basins.

Step 8: Determine Emergency Spillway Requirements

For online basins, an emergency overflow spillway should be sized to pass flows greater than the design peak runoff discharge rate for the 100-yr, 24-hr storm to prevent overtopping of

the walls or berms in the event that a blockage of the riser occurs. For offline basins, an emergency spillway or riser should be sized to pass the water quality design storm. For sites where the emergency spillway discharges to a steep slope, an emergency overflow riser, in addition to the spillway should be provided.

E.10 TCM-3 Constructed Wetland

Sizing Methodology

In most cases, the constructed treatment wetland permanent pool shall be sized to be greater than or equal to the stormwater quality design volume. If extended detention is provided above the permanent pool and the wetland is designed for water quality treatment only, then the permanent pool volume shall be a minimum of 80 percent of the stormwater quality design volume and the surcharge volume (above the permanent pool) shall make up the remaining 20 percent and provide at least 12 hours of detention. If extended detention is provided and the basin is designed for water quality treatment and peak flow attenuation, then the permanent pool volume shall be equal to the water quality treatment volume and the surcharge volume shall be sized to attenuate peak flows to meet the peak runoff discharge requirements. The extended detention portion of the wetland above the permanent pool, if provided, functions like a dry extended detention (ED) basin (see VEG-5: Dry Extended Detention Basin).

Step 1: Calculate the design volume

Constructed wetlands shall be sized to be greater than or equal to the SQDV volume (see Section 2 and Appendix E).

Step 2: Determine the Wetland Location, Wetland Type and Preliminary Geometry Based on Site Constraints

Based on site constraints, determine the wetland geometry and the storage available by developing an elevation-storage relationship for the wetland. The equations provided below assume a trapezoidal geometry for cell 1 (Forebay) and cell 2, and assumes that the wetland does not have extended detention.

1) Calculate the width of the wetland footprint, W_{tot}, as follows:

$$W_{tot} = \frac{A_{tot}}{L_{tot}} \qquad \text{(Equation E-78)}$$

Where:

A_{tot} = total surface area of the wetland footprint (ft^2)

L_{tot} = total length of the wetland footprint (ft)

12) Calculate the length of the water quality volume surface area including the internal berm but excluding the freeboard, $L_{wq\text{-}tot}$:

$$L_{wq-tot} = L_{tot} - 2Zd_{fb} \qquad \text{(Equation E-79)}$$

Where:

Z = interior side slope as length per unit height

d_{fb} = freeboard depth

13) Calculate the width of the water quality volume surface area including the internal berm but excluding freeboard, $W_{wq\text{-}tot}$:

$$W_{wq-tot} = W_{tot} - 2Zd_{fb} \quad \text{(Equation E-80)}$$

14) Calculate the total water quality volume surface area including the internal berm and excluding freeboard, $A_{wq\text{-}tot}$:

$$A_{wq-tot} = L_{wq-tot} \times W_{wq-tot} \quad \text{(Equation E-81)}$$

15) Calculate the area of the berm, A_{berm}:

$$A_{berm} = W_{berm} \times L_{berm} \quad \text{(Equation E-82)}$$

Where:

W_{berm} = width of the internal berm

L_{berm} = length of the internal berm

16) Calculate the water quality surface area excluding the internal berm and freeboard, A_{wq}:

$$A_{wq} = A_{wq=tot} - A_{berm} \quad \text{(Equation E-83)}$$

Step 3: Determine Dimensions of Forebay

30-50% of the SQDV is required to be within the active volume of forebay.

1) Calculate the active volume of forebay, V_1:

$$V_1 = \frac{SQDV \times \%V_1}{100} \quad \text{(Equation E-84)}$$

Where:

$\%V_1$ = percent of SQDV in forebay (%)

2) Calculate the surface area for the active volume of forebay, A_1:

$$A_1 = \frac{V_1}{d_1} \quad \text{(Equation E-85)}$$

Where:

d_1 = average depth fo rhte active volume of forebay (2 -4 ft) (ft)

3) Calculate the length of forebay, L_1. Note, inlet and outlet should be configured to maximize the residence time.

$$L_1 = \frac{A_1}{W_1} \qquad \text{(Equation E-86)}$$

Where:

W_1 = width of forebay (ft), $W_1 = W_{av\text{-}tot} = L_{berm}$

Step 4: Determine Dimensions of Cell 2

Cell 2 will consist of the remainder of the basin's active volume.

1) Calculate the active volume of Cell 2, V_2:

$$V_2 = SQDV - V_1 \qquad \text{(Equation E-87)}$$

2) Calculate the surface area of Cell 2, A_2:

$$A_2 = A_{wq} - A_1 \qquad \text{(Equation E-88)}$$

3) Calculate the top length of Cell 2, L_2:

$$L_2 = \frac{A_2}{W_2} \qquad \text{(Equation E-89)}$$

Where:

W_2 = width of Cell 2 (ft), $W_2 = W_1 = W_{wq\text{-}tot} = L_{berm}$

4) Verify that the length-to-width ratio of Cell 2, LW_2, is at least 3:1 with ≥ 4:1 preferred. If the length-to-width ratio is less than 3:1, modify input parameters until a ratio of at least 3:1 is achieved. If the input parameters cannot be modified as a result of site constraints, another site for the pond should be chosen.

$$LW_2 = \frac{L_2}{W_2} \qquad \text{(Equation E-90)}$$

5) Calculate the very shallow zone surface area, A_{vs}:

$$A_{vs} = \frac{A_2 \bullet \%A_{vs}}{100} \qquad \text{(Equation E-91)}$$

Where:

$\%A_{vs}$ = percent of surface area of very shallow zone

6) Calculate the volume of the shallow zone, V_{vs}:

$$V_{vs} = A_{vs} \bullet d_{vs}$$ (Equation E-92)

Where:

d_{vs} = average depth of the very shallow zone (0.1 – 1 ft)

7) Calculate the length of the very shallow zone, L_{vs}:

$$L_{vs} = \frac{A_{vs}}{W_{vs}}$$ (Equation E-93)

Where:

W_{vs} = width of the very shallow zone (ft), $W_{vs} = W_2$

8) Calculate the surface area of the shallow zone, A_s:

$$A_s = \frac{A_2 \bullet \%A_s}{100}$$ (Equation E-94)

Where:

$\%A_s$ = percent of surface area of shallow zone

9) Calculate the volume of the shallow zone, V_s:

$$V_s = A_s \bullet d_s$$ (Equation E-95)

Where:

d_s = average depth of shallow zone (1 - 3 ft)

10) Calculate length of the shallow zone, L_s:

$$L_s = \frac{A_s}{W_s}$$ (Equation E-96)

Where:

W_s = width of the shallow zone (ft), $W_s = W_2$

11) Calculate the surface area of the deep zone, A_{deep}:

$$A_{deep} = A_2 - A_{vs} - A_s$$ (Equation E-97)

12) Calculate the volume of the deep zone, V_{deep}:

$$V_{deep} = V_2 - V_{vs} - V_s$$ (Equation E-98)

13) Calculate the average depth of the deep zone (3-5 ft), d_{deep}:

$$d_{deep} = \frac{V_{deep}}{A_{deep}} \qquad \text{(Equation E-99)}$$

14) Calculate length of the deep zone, L_{deep}:

$$L_{deep} = \frac{A_{deep}}{W_{deep}} \qquad \text{(Equation E-100)}$$

Where:

W_{deep} = width of the deep zone (ft), $W_{deep} = W_2$

Step 5: Ensure design requirements and site constraints are achieved

Check design requirements and site constraints. Modify design geometry until requirements are met. If the chosen site for the basin is inadequate to meet the design requirements, choose a new location or alternative treatment BMP.

Step 6: Size Outlet Structure

For wetlands with detention, the outlet structures shall be designed to provide 12 hours emptying time for the water quality volume or the required detention necessary for achieving the peak runoff discharge requirements if the extended detention is designed for flow attenuation.

The wetland outlet pipe shall be sized, at a minimum, to pass flows greater than the stormwater quality design peak flow for on-line basins or flows greater than the peak runoff discharge rate for the 100-year, 24-hr design storm for on-line basins.

Step 7: Determine Emergency Spillway Requirements

For online basins, an emergency overflow spillway should be sized to pass flows greater than the design peak runoff discharge rate for the 100-yr, 24-hr storm in order to prevent overtopping of the walls or berms in the event that a blockage of the riser occurs. For offline basins, an emergency spillway or riser should be sized to pass the 100-yr, 24-hr post-development peak storm water runoff discharge rate directly to the downstream conveyance system or another acceptable discharge point. For sites where the emergency spillway discharges to a steep slope, an emergency overflow riser, in addition to the spillway should be provided.

Sizing Worksheet

Step 1: Determine water quality design volume		
1-1. Enter drainage area, A	A =	acres
1-2. Enter the maximum allowable percent of the Project area that may be effective impervious area (refer to permit), ranges from 5-30%, $\%_{allowable}$	$\%_{allowable}$ =	%
1-3. Determine the maximum allowed effective impervious area, $EIA_{allowable} = (A_{project})*(\%_{allowable})$	$EIA_{allowable}$=	acres
1-4. Enter Project impervious fraction, *Imp* (e.g. 60% = 0.60)	Imp=	
1-5. Determine the Project Total Impervious area, $TIA=A_{project}*Imp$	TIA=	acres
1-6. Determine the total area from which runoff must be retained, $A_{retain}=TIA-EIA_{allowable}$	A_{retain} =	acres
1-7. Determine pervious runoff coefficient using Table E-1, C_p	C_p =	
1-8. Calculate runoff coefficient, $C = 0.95*imp + C_p\ (1-imp)$	C =	
1-9. Enter design rainfall depth of the storm, P_i (in)	P_i =	in
1-10. Calculate rainfall depth, $P = P_i/12$	P =	ft
1-11. Calculate water quality design volume, $SQDV = 43560 \bullet P*A_{retain}*C$	SQDV =	ft^3
Step 2: Determine Wetland Location, Wetland Type and Preliminary Geometry Based on Site Constraints		
2-1. Based on site constraints, determine the wetland geometry and the storage available by developing an elevation-storage relationship for the wetland. For this simple example, assume a trapezoidal geometry for cell 1 (forebay) and cell 2. The wetland does not have extended detention.		

2-2. Enter the total surface area of the wetland footprint based on site constraints, A_{tot}	A_{tot} = ft^2
2-3. Enter the length of the wetland footprint based on site constraints, L_{tot}	L_{tot} = ft
2-4. Calculate the width of the wetland footprint, $W_{tot} = A_{tot} / L_{tot}$	W_{tot} = ft
2-5. Enter interior side slope as length per unit height (min = 3), Z	Z =
2-6. Enter desired freeboard depth, d_{fb}	d_{fb} = ft
2-7. Calculate the length of the water quality volume surface area including the internal berm but excluding freeboard, $L_{wq\text{-}tot} = L_{tot} - 2Zd_{fb}$	$L_{wq\text{-}tot}$ = ft
2-8. Calculate the width of the water quality volume surface area including the internal berm but excluding freeboard, $W_{wq\text{-}tot} = W_{tot} - 2Zd_{fb}$	$W_{wq\text{-}tot}$ = ft
2-9. Calculate the total water quality volume surface area including the internal berm and excluding freeboard, $A_{wq\text{-}tot} = L_{wq\text{-}tot} \bullet W_{wq\text{-}tot}$	$A_{wq\text{-}tot}$ = ft^2
2-10. Enter the width of the internal berm (6 ft min), W_{berm}	W_{berm} = ft
2-11. Enter the length of the internal berm, $L_{berm} = W_{wq\text{-}tot}$	L_{berm} = ft
2-12. Calculate the area of the berm, $A_{berm} = W_{berm} \bullet L_{berm}$	A_{berm} = ft^2
2-13. Calculate the water quality volume surface area excluding the internal berm and freeboard, $A_{wq} = A_{wq\text{-}tot} - A_{berm}$	A_{wq} = ft^2
Step 3: Determine Dimensions of forebay	
3-1. Enter the percent of SQDV in forebay (30-50% required), $\%V_1$	$\%V_1$ = %
3-2. Calculate the active volume of forebay (includes water quality volume + sediment storage volume),	V_1 = ft^3

V_1 = (SQDV • %V_1) /100	
3-3. Enter desired average depth of forebay1 (2-4 ft including sediment storage of 1 ft), d_1	d_1 = ft
3-4. Calculate the surface area for the water quality volume of forebay, $A_1 = V_1 / d_1$	A_1 = ft^2
3-5. Enter the width of forebay, $W_1 = W_{av\text{-}tot} = L_{berm}$	W_1 = ft
3-6. Calculate the length of forebay (<u>Note:</u> inlet and outlet should be configured to maximize the residence time), $L_1 = A_1 / W1$	L_1 = ft
Step 4: Determine Dimensions of Cell 2	
4-1. Calculate the active volume of Cell 2, V_2 = SQDV - V_1	V_2 = ft^3
4-2. Calculate surface area of Cell 2, $A_2 = A_{wq} - A_1$	A_2 = ft^2
4-3. Enter width of Cell 2, $W_2 = W_1 = W_{wq\text{-}tot} = L_{berm}$	W_2 = ft
4-4. Calculate top length of Cell 2, $L_2 = A_2 / W_2$	L_2 = ft
4-5. Verify that the length-to-width ratio of Cell 2 is at least 3:1 with ≥ 4:1 preferred. If the length-to-width ratio is less than 3:1, modify input parameters until a ratio of at least 3:1 is achieved. If the input parameters cannot be modified as a result of site constraints, another site for the pond should be chosen, $LW_2 = L_2 / W_2$	LW_2 =
4-6. Enter percent of surface area of very shallow zone, %A_{vs}	%A_{vs} = %
4-7. Calculate very shallow zone surface area, A_{vs} = (A_2 • %A_{vs})/100	A_{vs} = ft^2
4-8. Enter average depth of very shallow zone (0.1 - 1 ft), d_{vs}	d_{vs} = ft
4-9. Calculate volume of very shallow zone, $V_{vs} = A_{vs}$ • d_{vs}	V_{vs} = ft^3
4-10. Enter width of very shallow zone, $W_{vs} = W_2$	W_{vs} = ft

4-11. Calculate length of very shallow zone, $L_{vs} = A_{vs} / W_{vs}$	L_{vs} = ft
4-12. Enter percent of surface area of shallow zone, $\%A_s$	$\%A_s$ = %
4-13. Calculate surface area of shallow zone, $A_s = (A_2 \bullet \%A_s)/100$	A_s = ft^2
4-14. Enter average depth of shallow zone (1 - 3 ft), d_s	d_s = ft
4-15. Calculate volume of shallow zone, $V_s = A_s \bullet d_s$	V_s = ft^3
4-16. Enter width of shallow zone, $W_s = W_2$	W_s = ft
4-17. Calculate length of shallow zone, $L_s = A_s / W_s$	L_s = ft
4-18. Calculate surface area of deep zone, $A_{deep} = A_2 - A_{vs} - A_s$	A_{deep} = ft^2
4-19. Calculate volume of deep zone, $V_{deep} = V_2 - V_{vs} - V_s$	V_{deep} = ft^3
4-20. Calculate average depth of deep zone (3 - 5 ft), $d_{deep} = V_{deep} / A_{deep}$	d_{deep} = ft
4-21. Enter width of deep zone, $W_{deep} = W_2$	W_{deep} = ft
4-22. Calculate length of deep zone, $L_{deep} = A_{deep} / W_{deeo}$	L_{deep} = ft
Step 5: Ensure Design Requirements and Site Constraints are Achieved	
5-1. Check design requirements and site constraints. Modify design geometry until requirements are met. If the chosen site for the wetland is inadequate to meet the design requirements, choose a new location for the wetland or select an alternative treatment BMP.	

Step 6: Size Outlet Structure
6-1. The wetland outlet pipe shall be sized, at a minimum, to pass flows greater than the stormwater quality design peak flow for off-line basins or flow from the capital storm for on-line basins.
Step 7: Determine Emergency Spillway Requirements
7-1. For online basins, an emergency overflow spillway should be sized to pass flows greater than the design peak runoff discharge rate for the 100-yr, 24-hr storm in order to prevent overtopping of the walls or berms in the event that a blockage of the riser occurs. For offline basins, an emergency spillway or riser should be sized to pass the 100-yr, 24-hr post-development peak storm water runoff discharge rate directly to the downstream conveyance system or another acceptable discharge point.

Design Example

Wetland siting requires the following considerations prior to construction: (1) availability of base flow – stormwater wetlands require a regular source of water to support wetland biota, (2) slope stability – stormwater wetlands are not permitted near steep slope hazard areas, (3) surface space availability – large footprint area is required, and (4) compatibility with flood control – basins must not interfere with flood control functions of existing conveyance and detention structures.

The wetland in this example does not have extended detention. An internal berm separates the forebay (Cell 1) and the main basin (Cell 2). The berm is at the elevation of the active volume (SQDV plus sediment storage volume) design surface which is also the permanent wetpool elevation.

Step 1: Determine Water Quality Design Volume

For this design example, a 20-acre residential development with a 60% total impervious area is considered. The 85th percentile storm event for the project location is 0.75 inches.

Step 1: Determine water quality design volume			
1-1. Enter drainage area, A	A =	20	acres
1-2. Enter the maximum allowable percent of the Project area that may be effective impervious area (refer to permit), ranges from 5-30%, $\%_{allowable}$	$\%_{allowable}$ =	5	
1-3. Determine the maximum allowed effective impervious area, $EIA_{allowable} = (A_{project})*(\%_{allowable})$	$EIA_{allowable}$=	1.0	acres
1-4. Enter Project impervious fraction, *Imp* (e.g. 60% = 0.60)	Imp=	0.6	
1-5. Determine the Project Total Impervious area, $TIA=A_{project}*Imp$	TIA=	12	acres
1-6. Determine the total area from which runoff must be retained, $A_{retain}=TIA-EIA_{allowable}$	A_{retain} =	11	acres
1-7. Determine pervious runoff coefficient using Table E-1, C_p	C_p =	0.05	
1-8. Calculate runoff coefficient, $C = 0.95*imp + C_p\ (1-imp)$	C =	0.59	
1-9. Enter design rainfall depth of the storm, P_i (in)	P_i =	0.75	in

1-10. Calculate rainfall depth, $P = P_i/12$	P = 0.06 ft
1-11. Calculate water quality design volume, $SQDV = 43560 \cdot P * A_{retain} * C$	SQDV = 17,000 ft^3

Step 2: Determine Pond Location and Preliminary Geometry Based on Site Constraints

A total footprint area and total length available for the wetland is provided. This step calculates the total active volume surface area which is equivalent to the permanent wetpool surface area. This step also calculates the dimensions of the internal berm.

Step 2: Determine Wetland Location, Wetland Type and Preliminary Geometry Based on Site Constraints	
2-1. Based on site constraints, determine the wetland geometry and the storage available by developing an elevation-storage relationship for the wetland. For this simple example, assume a trapezoidal geometry for cell 1 (forebay) and cell 2. The wetland does not have extended detention.	
2-2. Enter the total surface area of the wetland footprint based on site constraints, A_{tot}	A_{tot} = 7,500 ft^2
2-3. Enter the length of the wetland footprint based on site constraints, L_{tot}	L_{tot} = 200 ft
2-4. Calculate the width of the wetland footprint, $W_{tot} = A_{tot} / L_{tot}$	W_{tot} = 38 ft
2-5. Enter interior side slope as length per unit height (min = 3), Z	Z = 3
2-6. Enter desired freeboard depth, d_{fb}	d_{fb} = 2 ft
2-7. Calculate the length of the water quality volume surface area including the internal berm but excluding freeboard, $L_{wq\text{-}tot} = L_{tot} - 2Zd_{fb}$	$L_{wq\text{-}tot}$ = 188 ft
2-8. Calculate the width of the water quality volume surface area including the internal berm but excluding freeboard, $W_{wq\text{-}tot} = W_{tot} - 2Zd_{fb}$	$W_{wq\text{-}tot}$ = 26 ft

Step 2: Determine Wetland Location, Wetland Type and Preliminary Geometry Based on Site Constraints			
2-9. Calculate the total water quality volume surface area including the internal berm and excluding freeboard, $A_{wq\text{-}tot} = L_{wq\text{-}tot} \bullet W_{wq\text{-}tot}$	$A_{wq\text{-}tot}$ =	4,900	ft^2
2-10. Enter the width of the internal berm (6 ft min), W_{berm}	W_{berm} =	6	ft
2-11. Enter the length of the internal berm, $L_{berm} = W_{wq\text{-}tot}$	L_{berm} =	26	ft
2-12. Calculate the area of the berm, $A_{berm} = W_{berm} \bullet L_{berm}$	A_{berm} =	160	ft^2
2-13. Calculate the active volume surface area excluding the internal berm and freeboard, $A_{wq} = A_{wq\text{-}tot} - A_{berm}$	A_{wq} =	4,740	ft^2

Step 3: Determine Dimensions of Forebay

It should be assumed that the forebay should be 30-50% of the SQDV.

Step 3: Determine Dimensions of forebay			
3-1. Enter the percent of SQDV in forebay (30-50% required), $\%V_1$	$\%V_1$ =	30	%
3-2. Calculate the active volume of forebay (including sediment storage), V_1 = (SQDV • $\%V_1$)/100	V_1 =	5,100	ft^3
3-3. Enter desired average depth of forebay (2-4 ft including sediment storage of 1 ft), d_1	d_1 =	4	ft
3-4. Calculate the surface area for the water quality volume of forebay, $A_1 = V_1 / d_1$	A_1 =	1,275	ft^2
3-5. Enter the width of forebay, $W_1 = W_{av\text{-}tot} = L_{berm}$	W_1 =	38	ft
3-6. Calculate the length of forebay (<u>Note:</u> inlet and outlet should be configured to maximize the residence time), $L_1 = A_1 / W1$	L_1 =	34	ft

Step 4: Determine Dimensions of Cell 2

Verify that the surface area and length-to-width ratio of Cell 2 meet the design criteria. Calculate volumes, depths and surface areas for the very shallow, shallow and deep zones.

Step 4: Determine Dimensions of Cell 2			
4-1. Calculate the active volume of Cell 2, V_2 = SQDV - V_1	V_2 =	11,900	ft^3
4-2. Calculate surface area of Cell 2, $A_2 = A_{wq} - A_1$	A_2 =	3,460	ft^2
4-3. Enter width of Cell 2, $W_2 = W_1 = W_{wq\text{-}tot} = L_{berm}$	W_2 =	26	ft
4-4. Calculate top length of Cell 2, $L_2 = A_2 / W_2$	L_2 =	130	ft
4-5. Verify that the length-to-width ratio of Cell 2 is at least 3:1 with ≥ 4:1 preferred. If the length-to-width ratio is less than 3:1, modify input parameters until a ratio of at least 3:1 is achieved. If the input parameters cannot be modified as a result of site constraints, another site for the pond should be chosen, $LW_2 = L_2 / W_2$	LW_2 =	5	
4-6. Enter percent of surface area of very shallow zone, $\%A_{vs}$	$\%A_{vs}$ =	15	ft^2
4-7. Calculate very shallow zone surface area, $A_{vs} = (A_2 \cdot \%A_{vs})/100$	A_{vs} =	520	ft^2
4-8. Enter average depth of very shallow zone (0.1 - 1 ft), d_{vs}	d_{vs} =	1	ft
4-9. Calculate volume of very shallow zone, $V_{vs} = A_{vs} \cdot d_{vs}$	V_{vs} =	520	ft^3
4-10. Enter width of very shallow zone, $W_{vs} = W_2$	W_{vs} =	26	ft
4-11. Calculate length of very shallow zone, $L_{vs} = A_{vs} / W_{vs}$	L_{vs} =	20	ft
4-12. Enter percent of surface area of shallow zone, $\%A_s$	$\%A_s$ =	55	
4-13. Calculate surface area of shallow zone, $A_s = (A_2 \cdot \%A_s)/100$	A_s =	1,900	ft^2
4-14. Enter average depth of shallow zone (1 - 3 ft), d_s	d_s =	3	ft
4-15. Calculate volume of shallow zone, $V_s = A_s \cdot d_s$	V_s =	5,700	ft^3
4-16. Enter width of shallow zone, $W_s = W_2$	W_s =	26	ft
4-17. Calculate length of shallow zone, $L_s = A_s / W_s$	L_s =	220	ft

Step 4: Determine Dimensions of Cell 2			
4-18. Calculate surface area of deep zone, $A_{deep} = A_2 - A_{vs} - A_s$	A_{deep} =	1,040	ft^2
4-19. Calculate volume of deep zone, $V_{deep} = V_2 - V_{vs} - V_s$	V_{deep} =	5,680	ft^3
4-20. Calculate average depth of deep zone (3 - 5 ft), $d_{deep} = V_{deep} / A_{deep}$	d_{deep} =	5	ft
4-21. Enter width of deep zone, $W_{deep} = W_2$	W_{deep} =	26	ft
4-22. Calculate length of deep zone, $L_{deep} = A_{deep} / W_{deeo}$	L_{deep} =	40	ft

Step 5: Ensure Design Requirements and Site Conditions are Achieved

Check design requirements and site constraints. Modify design geometry until requirements are met. If the chosen site for the wetland is inadequate to meet the design requirements, choose a new location for the wetland or select an alternative treatment BMP.

Step 6: Size Outlet Structure

6-1. The wetland outlet pipe shall be sized, at a minimum, to pass flows greater than the stormwater quality design peak flow for off-line basins or flow from the capital storm for on-line basins.

Step 7: Determine Emergency Spillway Requirements

For online basins, an emergency overflow spillway should be sized to pass flows greater than the design peak runoff discharge rate for the 100-yr, 24-hr storm in order to prevent overtopping of the walls or berms in the event that a blockage of the riser occurs. For offline basins, an emergency spillway or riser should be sized to pass the 100-yr, 24-hr post-development peak storm water runoff discharge rate directly to the downstream conveyance system or another acceptable discharge point.

E.11 TCM-4 Sand Filters

Sizing Methodology

A sand filter is designed with two parts: (1) a temporary storage reservoir to store runoff, and (2) a sand filter bed through which the stored runoff must percolate. Usually the storage reservoir is simply placed directly above the filter, and the floor of the reservoir pond is the top of the sand bed. For this case, the storage volume also determines the hydraulic head over the filter surface, which increases the rate of flow through the sand.

Two methods are available for sizing sand filters: a simple method and a routing modeling method. The simple method uses standard values to define filter hydraulic characteristics for determining the sand surface area. This method is useful for planning purposes, for a first approximation to begin iterations in the detailed method, or when use of the detailed computer model is not desired or not available. The simple method very often results in a larger filter than the routing method.

Background

Sand filter design is based on Darcy's law:

$$Q = KiA \qquad \text{(Equation E-101)}$$

Where:

Q	=	water quality design flow (cfs)
K	=	hydraulic conductivity (fps)
A	=	surface area perpendicular to the direction of flow (ft^2)
i	=	hydraulic gradient (ft/ft) for a constant head and constant media depth, computed as follows:

$$i = \frac{h + l}{l} \qquad \text{(Equation E-102)}$$

Where:

h	=	average depth of water above the filter (ft), defined for this design as $d/2$
d	=	maximum storage depth above the filter (ft)
l	=	thickness of sand media (ft)

Darcy's law underlies both the simple and the routing methods of design. The filtration rate V, or more correctly, $1/V$, is the direct input in the sand filter design. The relationship between the filtration rate V and hydraulic conductivity K is revealed by equating Darcy's law and the equation of continuity, $Q = VA$. Specifically:

$$Q = KiA \quad \text{and} \quad Q = VA$$

So, $$VA = KiA$$

Or: $$V = Ki \qquad \text{(Equation E-103)}$$

Where,

V = filtration rate (ft/s)

Note that $V \neq K$. That is, the filtration rate is not the same as the hydraulic conductivity, but they do have the same units (distance per time). K can be equated to V by dividing V by the hydraulic gradient i, which is defined above.

The hydraulic conductivity K does not change with head nor is it dependent on the thickness of the media, only on the characteristics of the media and the fluid. A design hydraulic conductivity of 1 inch per hour (2 feet per day) used in this simple sizing method is based on bench-scale tests of conditioned rather than clean sand (KCSWDM, 2005) and represents the average sand bed condition as silt is captured and held in the sand bed.

Unlike the hydraulic conductivity, the filtration rate V changes with head and media thickness, although the media thickness is constant in the sand filter design.

Simple Sizing Method

The simple sizing method does not route flows through the filter. It determines the size of the filter based on the simple assumption that inflow is immediately discharged through the filter as if there were no storage volume. An adjustment factor (0.7) is applied to compensate for the greater filter size resulting from this method. Even with the adjustment factor, the simple method generally produces a larger filter size than the routing method.

Step 1: Determine the water quality design volume

Sand filters should be sized to capture and treat the stormwater quality design volume (see Section E.1).

Step 2: Determine maximum storage depth of water

Determine the maximum water storage depth (d) above the sand filter. This depth is defined as the depth at which water begins to overflow the reservoir pond, and it

depends on the site topography and hydraulic constraints. The depth is chosen by the designer, but shall be 6 feet or less.

Step 3: Calculate the sand filter area

Determine the sand filter area using the following equation:

$$A_{sf} = \frac{V_{wq} RL}{Kt(h+L)} \qquad \text{(Equation E-104)}$$

Where,

A_{sf}	=	surface area of the sand filter bed (ft^2)
V_{wq}	=	water quality design volume (ft^3)
R	=	routing adjustment factor (use R = 0.7)
L	=	sand bed depth (ft)
K	=	design hydraulic conductivity (use 2 ft/day)
t	=	drawdown time (use 1 day)
h	=	average depth of water above the filter (ft), (use $d/2$ with d from Step 1)

Routing Method

A continuous runoff model, such as US EPA's Storm Water Management Model (SWMM) Model, can be used to optimally size a sand filter. A continuous simulation model consists of three components: a representative long term period of rainfall data (≈ 20 years or greater) as the primary model input; a model component representing the tributary area to the sand filter that takes into account the amount of impervious area, soil types of the pervious area, vegetation, evapotranspiration, etc.; and a component that simulates the sand filter. Using this method, the filter should be sized to capture and treat the WQ design volume from the post-development tributary area.

The continuous simulation model routes predicted tributary runoff to the sand filter, where treatment is simulated as a function of the infiltrative (flow) capacity of the sand filter and the available storage volume above the sand filter. In a continuous runoff model such as SWMM, the physical parameters of the sand filter are represented with stage-storage-discharge relationships. Due to the computational power of ordinary desktop computers, long-term continuous simulations generally take only minutes to run. This allows the modeler to run several simulations for a range of sand filter sizes, varying either the surface area of the filter (and resulting flow capacity) or the storage capacity above the sand filter, or both. Sufficient

continuous model simulations should be completed so that results encompass the WQ design volume capture goal.

Model results should be plotted for both varying storage depths above the filter and for varying filter surface area (and resulting flow capacity) while keeping all other parameters constant. The resulting relationship of percent capture as a function of sand filter flow and storage capacity can be used to optimally size a sand filter based on site conditions and restraints.

In addition to continuous simulation modeling, routing spreadsheets and/or other forms of routing modeling that incorporate rainfall-runoff relationships and infiltrative (flow) capacities of sand filters may be used to size facilities. Alternative sizing methodologies should be prepared with good engineering practices.

Sizing Worksheet

Step 1: Determine water quality design volume		
1-1. Enter Project area (acres), $A_{project}$	$A_{project}$ =	acres
1-2. Enter the maximum allowable percent of the Project area that may be effective impervious area (refer to permit), ranges from 5-30%, $\%_{allowable}$	$\%_{allowable}$ =	%
1-3. Determine the maximum allowed effective impervious area (ac), $EIA_{allowable} = (A_{project})*(\%_{allowable})$	$EIA_{allowable}$=	acres
1-4. Enter Project impervious fraction, Imp (e.g. 60% = 0.60)	Imp=	
1-5. Determine the Project Total Impervious area (acres), $TIA=A_{project}*Imp$	TIA=	acres
1-6. Determine the total area from which runoff must be retained (acres), $A_{retain}=TIA-EIA_{allowable}$	A_{retain} =	acres
1-7. Determine pervious runoff coefficient using Table E-1, C_p	C_p =	
1-8. Calculate runoff coefficient, $C = 0.95*imp + C_p\ (1-imp)$	C =	
1-9. Enter design rainfall depth of the storm (in), P_i	P_i =	in
1-10. Calculate rainfall depth (ft), $P = P_i/12$	P =	ft
1-11. Calculate water quality design volume (ft^3), $SQDV=43560 \bullet C*P*A_{retain}$	SQDV=	ac-ft
Step 2: Determine maximum storage depth of water		
2-1. Determine the maximum storage depth (max 6 ft) of water above the sand filter, d (ft)	d =	ft

Step 3: Calculate sand filter area	
3-1. Enter water quality design volume, *SQDV*	SQDV = ft^3
3-2. Enter routing adjustment factor (use R =0.7), R	R =
3-3. Enter thickness of sand filter (min. 2 ft, 3 ft preferred), L	L = ft
3-4. Enter design hydraulic conductivity of media (use 2 ft/day), K_{des}	K = ft/day
3-5. Enter drawdown time, t	t = day
3-6. Calculate average depth of water above the filter, $h = d/2$	h = ft
3-7. Calculate sand filter area, $A_{sf} = (SQDV*RL)/(Kt\ (h+L))$	A_{sf} = ft^2
Step 4: Determine filter dimensions	
4-1. Sand filter area, A_{sf}	A_{sf} = ft^2
4-2. Enter geometric configuration, LR:W ratio (2:1 or greater), L_R	L_R =
4-3. Select the width of the sand filter, W	W = ft
4-4. Calculate the length of the sand filter, $L=WL_R$	L = ft
4-5. Calculate rate of filtration, $r_{wq} = K_i$; where $i = \frac{h+l}{l}$	r_{wq} = ft/d
Step 5: Calculate filter longitudinal underdrain collection pipe	
5-1. Calculated filtered flow rate, $Q_f = r_{wq}A_{sf}/86400$	Q_f = cfs
5-2. Enter minimum slope for energy gradient, S_e	S_e =

5-3. Enter Hazen-Williams coefficient for plastic, *C*	C =	
5-4. Enter pipe diameter (6" min.), *D*	D =	in
5-5. Calculate pipe hydraulic radius, $R_h = D/48$	R_h =	ft
5-6. Calculate velocity at the outlet of the pipe, $V_p = 1.318CR_h0.63S_e0.54$	V_p =	ft/s
5-7. Calculate pipe capacity, $Q_{cap} = 0.25\pi(D/12)^2V_p$	Q_{cap} =	cfs
Step 7: Provide conveyance capacity for filter clogging		
7-1. The sand filters should be placed off-line, but an emergency overflow must still be provided in the event the filter becomes clogged.		

Design Example

Step 1: Determine water quality design volume

For this design example, a 10-acre site with soil type 4 and 60% total impervious area is considered. The 85th percentile storm event for the project location is 0.75 inches.

Step 1: Determine water quality design volume			
1-1. Enter Project area (acres), $A_{project}$	$A_{project}$ =	10	acres
1-2. Enter the maximum allowable percent of the Project area that may be effective impervious area (refer to permit), ranges from 5-30%, $\%_{allowable}$	$\%_{allowable}$ =	5	
1-3. Determine the maximum allowed effective impervious area (ac), $EIA_{allowable} = (A_{project})*(\%_{allowable})$	$EIA_{allowable}$=	0.5	acres
1-4. Enter Project impervious fraction, Imp (e.g. 60% = 0.60)	Imp=	0.6	
1-5. Determine the Project Total Impervious area (acres), $TIA=A_{project}*Imp$	TIA=	6	acres
1-6. Determine the total area from which runoff must be retained (acres), $A_{retain}=TIA-EIA_{allowable}$	A_{retain} =	5.5	acres
1-7. Determine pervious runoff coefficient using Table E-1, C_p	C_p =	0.05	
1-8. Calculate runoff coefficient, $C = 0.95*imp + C_p\ (1-imp)$	C =	0.59	
1-9. Enter design rainfall depth of the storm (in), P_i	P_i =	0.75	in
1-10. Calculate rainfall depth (ft), $P = P_i/12$	P =	0.06	ft
1-11. Calculate water quality design volume (ft^3), $SQDV=43560 \bullet C*P*A_{retain}$	SQDV=	0.20	ac-ft

Step 1a: Determine maximum storage depth of water

Determine the maximum storage depth of water above the sand filter.

Step 1a: Determine maximum storage depth of water	
1a-1. Determine the maximum storage depth (max 6 ft) of water above the sand filter, *d* (ft)	*d* = 6 ft

Step 2: Calculate Sand Filter Area

A sand filter is designed with two components: (1) temporary storage reservoir to store runoff, and (2) a sand filter bed through which the stored runoff must percolate getting treatment.

The simple sizing method does not rout flows through the filter. The size of the filter is determined based on the simple assumption that inflow is immediately discharged through the filter. The adjustment factor, R, is applied to compensate for the greater filter size resulting from this method.

Step 2: Calculate sand filter area	
2-1. Enter water quality design volume, *SQDV*	SQDV = o.20 ac-ft
2-2. Enter routing adjustment factor (use R =0.7), *R*	*R* = 0.7
2-3. Enter thickness of sand filter (min. 2 ft, 3 ft preferred), *L*	*L* = 2 ft
2-4. Enter design hydraulic conductivity (use 2 ft/day), *K*	*K* = 2 ft/day
2-5. Enter drawdown time (use 1 day), *t*	*t* = 2 day
2-6. Calculate average depth of water above the filter, $h = d/2$	h = 3 ft
2-7. Calculate sand filter area, $A_{sf} = (SQDV*RL)/(Kt\ (h+L))$	A_{sf} = 0.014 acre

Step 3: Determine Filter Dimensions

Step 3: Determine filter dimensions	
3-1. Sand filter area in ft², $A_{sf(feet)}=A_{sf(acre)}*43{,}560$	A_{sf} = 610 ft²
3-2. Enter geometric configuration, LR:W ratio (2:1 min.), L_R	L_R = 2
3-3. Calculate the width of the sand filter, *W*	W = 18 ft

Step 3: Determine filter dimensions			
3-4. Calculate the length of the sand filter, L	L =	36	ft
3-5. Calculate rate of filtration, $r_{wq} = Ki$, where $i = \frac{h+l}{l}$	r_{wq} =	2.3	ft/d

Step 4: Calculate Filter Longitudinal Underdrain Collection Pipe

All underdrain pipes must be 6 inches or greater to facilitate cleaning.

Step 5: Calculate filter longitudinal underdrain collection pipe			
5-1. Calculated filtered flow rate, $Q_f = r_{wq}A_{sf}/86400$	Q_f =	0.01	cfs
5-2. Enter minimum slope for energy gradient, Se	S_e =	0.005	
5-3. Enter Hazen-Williams coefficient for plastic, C	C =	140	
5-4. Enter pipe diameter (6” min), D	D =	6	in
5-5. Calculate pipe hydraulic radius, $R_h = D/48$	R_h =	0.13	
5-6. Calculate velocity at the outlet of the pipe, $V_p = 1.318CR_h^{0.63}S_e^{0.54}$	V_p =	2.9	ft/s
5-7. Calculate pipe capacity, $Q_{cap} = 0.25\pi(D/12)^2V_p$	Q_{cap} =	0.57	cfs

Step 5: Provide Conveyance Capacity for Filter Clogging

The sand filters should be placed off-line, but an emergency overflow must still be provided in the event the filter becomes clogged.

APPENDIX F : FLOW SPLITTER DESIGN SPECIFICATIONS

F.1 Flow Splitter Introduction

Flow splitters must be provided for off-line facilities to divert the water quality design flow to the BMP and bypass higher flows. In most cases, it is a designer's choice whether storm water treatment BMPs described in this manual are designed as on-line or off-line; exceptions are vegetated strip filters, permeable pavement, and building BMPs which are designed on-line.

A crucial factor in designing flow splitters is to ensure that low flows are delivered to the treatment facility up to the water quality design flow rate. Above this rate, additional flows remain in the storm drain or are diverted to a bypass drain with minimal increase in head at the flow splitter structure to avoid surcharging the water quality facility under high flow conditions.

Flow splitters are typically manholes or vaults with baffles. In place of baffles, the splitter mechanism may be a half tee section with a solid top and an orifice in the bottom of the tee section. A full tee option may also be used (see "Design Criteria" below). Two possible design options for flow splitters are shown in the figures in this Appendix. Other equivalent designs that achieve the result of splitting low flows, up to the WQ design flow, into the WQ treatment facility and divert higher flows around the facility are also acceptable.

Flow splitters may be modeled using standard level pool routing techniques, as described in the Handbook of Applied Hydrology (Ven te Chow; 1964) and elsewhere. The stage/discharge relationship of the outflow pipes shall be determined using backwater analysis techniques. Weirs shall be analyzed as sharp-crested weirs.

Design Criteria

1) A flow splitter shall be designed to deliver the required water quality design flow rate to the storm water treatment facility.

17) The top of the weir shall be located at the water surface for the design flow. Remaining flows enter the bypass line.

18) The maximum head shall be minimized for flow in excess of the water quality design flow. Specifically, flow to the treatment facility at the flood control design storm water surface shall not increase the design water quality design flow by more than 10%.

19) Example designs are shown in the figures in this Appendix. Equivalent designs are also acceptable.

20) Special applications, such as roads, may require the use of a modified flow splitter. The baffle wall may be fitted with a notch and adjustable weir plate to proportion runoff volumes other than high flows.

21) For ponding facilities, backwater effects must be included in designing the height of the standpipe in the manhole.

22) Ladder or step and handhold access shall be provided. If the weir wall is higher than 36 inches, two ladders, on the either side of the wall, are required.

F.2 Material Requirements

1) The splitter baffle shall be installed in a standard manhole or vault. The baffle wall shall be made of material resistant to corrosion (minimum 4-inch thick reinforced concrete, Type 302 or Type 316 stainless steel plate, or equivalent).

23) The minimum clearance between the top of the baffle wall and the bottom of the manhole or vault cover shall be 4 feet; otherwise, dual access points shall be provided.

24) All metal parts shall be corrosion resistant. Examples of preferred materials include aluminum, stainless steel, and plastic. Zinc and galvanized materials are not permitted because of aquatic toxicity. Painting metal parts shall not be allowed because of poor longevity.

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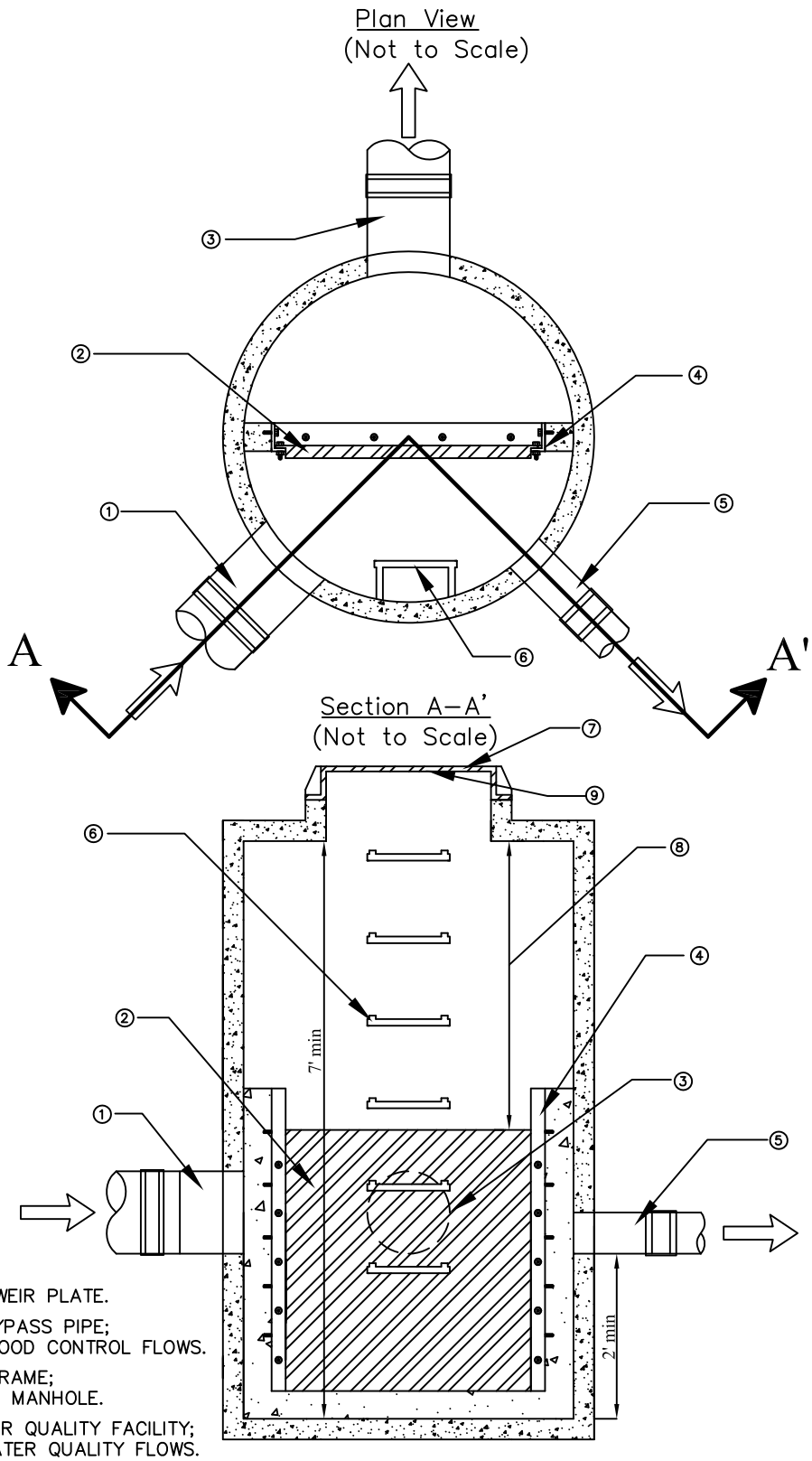

NOTES:

① INLET PIPE.

② ADJUSTABLE WEIR PLATE.

③ HIGH FLOW BYPASS PIPE; SIZED FOR FLOOD CONTROL FLOWS.

④ WEIR PLATE FRAME; ANCHORED TO MANHOLE.

⑤ PIPE TO WATER QUALITY FACILITY; SIZED FOR WATER QUALITY FLOWS.

⑥ ACCESS STEPS.

⑦ 24" ROUND FRAME AND SOLID LID.

⑧ 4' MIN DISTANCE OR PROVIDE SEPARATE ACCESS ON BOTH SIDES OF WEIR.

⑨ AFFIX PERMANENT IDENTIFICATION TAG.

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Figure F-1: Flow Splitter Option A

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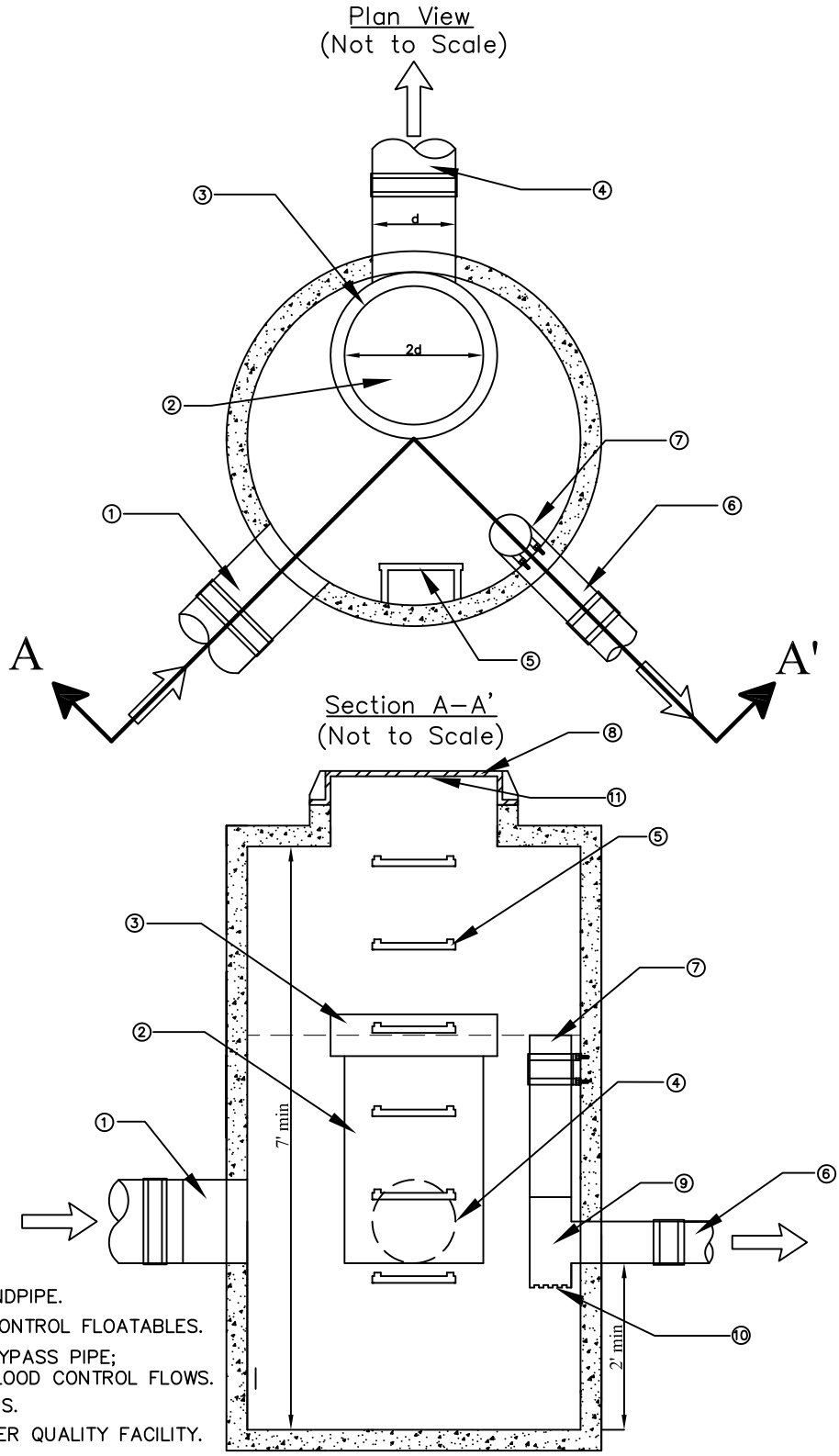

NOTES:

① INLET PIPE.
② BYPASS STANDPIPE.
③ BAFFLE TO CONTROL FLOATABLES.
④ HIGH FLOW BYPASS PIPE; SIZED FOR FLOOD CONTROL FLOWS.
⑤ ACCESS STEPS.
⑥ PIPE TO WATER QUALITY FACILITY.
⑦ RISER PIPE; TOP OF PIPE AT DESIGN ELEVATION FOR WATER QUALITY FLOWS.
⑧ 24" ROUND FRAME AND SOLID LID.
⑨ REMOVABLE "TEE" SECTION FOR CLEANOUT.
⑩ RISER PIPE ORIFICE SIZED FOR WATER QUALITY FLOWS.
⑪ AFFIX PERMANENT IDENTIFICATION TAG.

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Figure F-2: Flow Splitter Option B

APPENDIX G: DESIGN CRITERIA CHECKLISTS FOR STORMWATER RUNOFF BMPS

BIO-1 Bioretention Checklist

- ☐ Has the bioretention facility been sized to treat the water quality design volume, SQDV (see worksheet)?
- ☐ Does the bioretention have a maximum ponding depth of 18 in.?
- ☐ Is the planting soil depth at least 2 feet?
- ☐ Has an underdrain been provided if native soil permeability is less than 0.5 in/hr and infiltration is not possible/allowed?
- ☐ Has a gravel drainage layer been provided if native soil permeability is greater than 0.5 in/hr and infiltration is possible/allowed?
- ☐ Does the bioretention ponding depth drain below the planting soil in less than 48 hours?
- ☐ Is the gravel drainage layer sized to adequately meet the maximum drawdown time of 96 hours?
- ☐ Has the bioretention facility been properly sized as recommended in the manual?
- ☐ Does the flow entrance meet specifications (dispersed, low velocity flow; dispersed flow across pavement; flow spreading trench; cuts or wheel slots for parking lots)?
- ☐ Does the pipe flow entrance include erosion protection material to dissipate flow energy?
- ☐ Is the flow path unblocked by trees and shrubs?
- ☐ Is the underdrain at least 6 inches in diameter?
- ☐ Is the underdrain pipe made of accepted material (slotted PVC pipe conforming to ASTM C 3034 or equivalent HDPE pipe conforming to AASHTO 252M)?
- ☐ Does the slotted pipe have correct sizing and spacing of slots?
- ☐ Is the underdrain sloped at 0.5% or more?
- ☐ Are rigid observation pipes connected to underdrain every 250 to 300 feet of installed pipe?
- ☐ Do the observation pipe wells/clean outs extend 6 inches above top elevation of bioretention facility mulch and are they capped as required?

- ☐ Does the gravel underdrain bedding consist of the correct aggregate?
- ☐ If geotextile fabric is placed between the planting media and gravel layer, does it meet the specifications outlined in the manual?
- ☐ Does the gravel underdrain bedding extend at least 6 inches below the underdrain pipe (if needed) and does it provide 1 foot depth around top and sides of pipe?
- ☐ Does the underdrain drain freely to the accepted discharge point?
- ☐ Is an overflow device consisting of vertical PVC pipe included in design?
- ☐ Has the overflow device been installed at the 18-inch ponding depth?
- ☐ Is the overflow riser at least 6 inches in diameter?
- ☐ Has the inlet to the riser been positioned at least 6 inches above the planting media and capped with a spider cap?
- ☐ If bioretention is close to roads or infrastructure, have infiltration pathways been restricted with geomembrane (at least 30 mm) or clay liners?
- ☐ Is planting soil composed of correct aggregate (60-70% sand; 30-40% compost) and free of stones, stumps and roots?
- ☐ Does compost have acceptable characteristics?
- ☐ Is constructed bioretention facility covered with well-aged mulch, free of seeds, weeds, soil and roots, and at least 2-3 inches thick?
- ☐ Is all bioretention vegetation tolerant of summer drought, ponding fluctuations, and saturated soil conditions for 48 to 72 hours?
- ☐ Have an adequate number of different plant species been incorporated into the bioretention (It is recommended that 3 tree, 3 shrub, and 3 herbaceous groundcover species be included)?
- ☐ Have native plants been used to the maximum extent practicable?

BIO- 2 Planter Box Checklist

- ☐ Is the planter box tributary area less than 15,000 ft2?
- ☐ Is the groundwater level at least 2 feet below the bottom of the planter box?
- ☐ Is there adequate relief between land surface and stormwater conveyance system to permit vertical percolation?
- ☐ Is the planter box located in an area with adequate sunlight to support selected vegetation?
- ☐ Is the planter box sized to treat the water quality design volume, Vwq (see worksheet)?
- ☐ Does the planter box have a maximum ponding depth of 12 inches?
- ☐ Is the planting soil depth at least 2 feet (3 feet preferred)?
- ☐ Does the ponded water drain below the planting soil in less than 48 hours?
- ☐ Has the distance between the downspouts and the overflow outlet been maximized?
- ☐ Has the planter box been sized the same as a Bioretention facility with planter box parameters?
- ☐ Has the planter box been constructed with an appropriate non-leaching permanent material?
- ☐ Has the planter box structure been adequately sealed to ensure that water exits only via the underdrain?
- ☐ Has an underdrain been provided?
- ☐ If the entrance to the planter box is piped, has erosion protection been included in the design (erosion protection includes rock, splash blocks, etc.)?
- ☐ Is the entrance flow path unimpeded by woody plants (trees, shrubs)?
- ☐ Is the underdrain at least 6 inches in diameter?
- ☐ Is the underdrain pipe made of accepted material (slotted PVC pipe conforming to ASTM C 3034 or equivalent HDPE pipe conforming to AASHTO 252M)?
- ☐ Does the slotted pipe have correct sizing and spacing of slots?
- ☐ Is the underdrain sloped at 0.5% or more?

- ☐ Are rigid observation pipes connected to underdrain every 250 to 300 feet of installed pipe?
- ☐ Do the observation pipe wells/clean outs extend 6 inches above top elevation of the planter box mulch and are they capped as required?
- ☐ Does the gravel underdrain bedding consist of the correct aggregate?
- ☐ Does the gravel underdrain bedding extend at least 6 inches below the underdrain and does it provide 1 foot depth around top and sides of pipe?
- ☐ If geotextile fabric is used in the underdrain design, does it meet minimum materials requirements?
- ☐ Is the underdrain elevated from the bottom of the planter box by 6 inches?
- ☐ Does the underdrain drain freely to the intended discharge point?
- ☐ Is an overflow device consisting of vertical PVC pipe included in design?
- ☐ Is the overflow riser at least 6 inches in diameter?
- ☐ Is the inlet to the riser 6 inches above planting soil and capped with a spider cap?
- ☐ Has a waterproof barrier consisting of a 30 mil geomembrane or equivalent been provided to protect foundations from moisture?
- ☐ Is planting soil composed of correct aggregate (60-70% sand; 30-40% compost) and gradation, and free of stones, stumps and roots?
- ☐ Does compost have acceptable characteristics (see planting/storage media)?
- ☐ Is planter box covered with well-aged mulch, free of seeds, weeds, grass clippings, bark, soil and roots, and at least 2-3 inches thick?
- ☐ Do all soil minerals meet requirements?
- ☐ Is all planter box vegetation tolerant of summer drought, ponding fluctuations, and saturated soil conditions for 48 to 72 hours?
- ☐ Have an adequate number of different plant species been incorporated into the planter box design (It is recommended that 3 tree, 3 shrub, and 3 herbaceous groundcover species be included)?
- ☐ Have native plants been used to the maximum extent practicable?
- ☐ Have only slow-release fertilizers been included in the design?
- ☐ Have arrangements been made to replace planter box mulch layer annually?

- ☐ Have low-maintenance plants been selected for design?
- ☐ Has an effort been made to ensure that no treated wood or galvanized metal is used anywhere within the planter box design?

BIO-3 Proprietary Biotreatment Device Checklist

- ☐ Has the proprietary biotreatment device been selected from the list provided in the manual of from another Ventura County- approved list?
- ☐ Has the vendor been contacted for the latest design guidance on cartridge selection?
- ☐ Has the proprietary biotreatment device been installed as directed by the vendor?
- ☐ Have appropriate maintenance and operation arrangements been made to ensure upkeep of the device?
- ☐ Has the biotreatment device been sized to capture and treat the water quality design flow?

BIO-4 Vegetated Swale Checklist

- ☐ Does the climate provide adequate conditions for maintaining a vegetative cover? Has adequate vegetation been chosen given the climate?
- ☐ Is the grade in the area shallow so as to not allow ponding?
- ☐ Is the swale compatible with existing flood control functions?
- ☐ Has the swale been designed with a depth of one foot or less?
- ☐ Is the overall depth from the top of the side walls to the bottom of the swale at least 12 inches?
- ☐ Is the swale bottom width at least 2 feet?
- ☐ Is the swale bottom width no greater than 10 feet, or 16 feet with a dividing berm?
- ☐ If the swale is required to convey flood flows in addition to the water quality design flow, has the swale been designed for the flood control design storm and does it include 2 feet of freeboard?
- ☐ Have gradual meandering bends been incorporated into the design?
- ☐ Is the longitudinal slope (in direction of flow) between 1% and 6%?
- ☐ Has an underdrain been provided if soils are poorly drained and longitudinal slope is less than 1.5%? Has a soils report been provided if this is the case?
- ☐ If the longitudinal slope is greater than 6%, have appropriate check dams with vertical drops of 12 inches or less been provided in the design to reduce the slope?
- ☐ Is the horizontal slope at the bottom of the swale flat to discourage channeling?
- ☐ Has the swale been designed so that the water depth does not exceed 4 inches or 2/3 the height of vegetation (2 inches in frequently mowed turf swales?
- ☐ Does the swale length provide a minimum hydraulic residence time of 7 minutes?
- ☐ If soil and slope conditions require it, has an acceptable low flow drain been installed?
- ☐ Has the swale been designed to convey the SQDF?

- ☐ Has the swale been sized as recommended in Chapter 6 (also see worksheet, Appendix E)?
- ☐ Has the swale been designed as a flow-through channel or has a high-flow bypass been incorporated into the design for flows higher than the water quality design flow?
- ☐ Has inflow been directed towards the upstream end of the swale or, at a minimum, evenly over the length of the swale?
- ☐ If the swale is online, has it been designed to convey flows up to the post-development 100 year 24 hour storm, with freeboard, and velocities below 3 ft/s?
- ☐ If the swale is off-line, has it been designed to convey the water quality design flow rate using a flow splitter with velocities below 1 ft/s?
- ☐ If check dams are incorporated in the design, have flow spreaders been added at the toe of each vertical drop?
- ☐ If curb cuts are used, has pavement been placed 1 – 2 inches above the elevation of the vegetated area?
- ☐ Is the swale inflow designed to function long term with minimal maintenance?
- ☐ Has flow spreading at the inlet of the swale been achieved by a leveled anchored flow spreader or similar method?
- ☐ Does the flow spreader project a minimum of 2 inches above the ground surface with appropriately spaced notches and extend horizontally beyond facility to prevent erosion
- ☐ If an underdrain is required, does it meet appropriate criteria (PVC or equivalent, correct slot spacing and sizing, 6 inches minimum in diameter, sloped at 0.5%)?
- ☐ Is there gravel bedding at least 6 inches below and 1 foot to the top and sides of the underdrain?
- ☐ If a geotextile is included in the design, does it meet requirements?
- ☐ Does gravel drainage layer meet recommended criteria?
- ☐ Does swale divider, if included, meet criteria (minimum height of 1 inch above flow, slopes no steeper than 2H:1V, stable foundation)?

- ☐ Has swale soil been amended with compost if organic content is less than 10%?
- ☐ Have appropriate, hardy and native plants been used to the maximum extent practical?
- ☐ Is vegetative cover at least 4 inches in height (ideally 6 inches)?
- ☐ Has the swale been located away from trees that may drop leaves or provide insufficient sunlight?

BIO-5 Vegetated Filter Strip Checklist

- ☐ Is the slope of the filter strip designed to avoid both erosive flows and ponding?
- ☐ Has the strip been designed to evenly distribute flow across width and promote sheet flow?
- ☐ Does the width of the filter strip extend across the full width of the tributary area?
- ☐ Is the upstream boundary of the filter located contiguous to developed area?
- ☐ If filter strip is used for water quality purposes, is the length between 15 and 150 feet (25 feet preferred)? If the strip is used for pretreatment, is it at least 4 feet in length?
- ☐ Is the slope of the strip parallel to the direction of flow between 2% and 6%?
- ☐ Is the lateral slope (perpendicular to flow) of the strip 4% or less?
- ☐ Is grading across strip even?
- ☐ Has the top of the strip been installed 2 to 5 inches below any adjacent pavement (a beveled transition is also acceptable)?
- ☐ Are the top and toe of the slope as flat as possible (graded flat for engineered filter strips) to encourage sheet flow and prevent erosion?
- ☐ Has the design flow been calculated using the SQDF (see worksheet)?
- ☐ Has the design flow depth been calculated using a modified Manning's equation (see worksheet)?
- ☐ Have the design velocity and length been calculated using the design flow and design flow depth as recommended (see worksheet)?
- ☐ Has a flow spreader been implemented to uniformly distribute contributing flow along width of filter strip?
- ☐ If a gravel flow spreader is used, is it at least 6 inches deep, 12 inches wide and a minimum or 1 inch below the paved surface?
- ☐ Has the gravel flow spreader been leveled even where ground is not level?
- ☐ If the gravel flow spreader is placed along a roadway, have LA county design specifications been consulted and implemented?

- ☐ If a notched curb spreader and through-curb spreader are used, have they been used in conjunction with a gravel spreader?
- ☐ Have curb port/interrupted curb openings been spaced at intervals of at least every 6 feet?
- ☐ Do the curb port/interrupted curb openings have a width of at least 11 inches?
- ☐ Does 15% or more of the curb length consist of open ports and does each port discharge no more than 10% of the flow?
- ☐ Have energy dissipaters (such as a riprap pad) been used if a sudden slope drop occurs?
- ☐ Has access been provided at the upper edge of filter strip for mowing equipment and to enable maintenance of spreader?
- ☐ Is the design water depth 1 inch or less?
- ☐ Does the design velocity not exceed 1 foot per second?
- ☐ If the organic content of the filter strip soil does not exceed 10%, has the soil been amended with at least 2 inches of well-rotted acceptable compost at a depth of 6 inches?
- ☐ Is filter strip uniformly graded and densely vegetated with erosion-resistant grasses (preferably native or adapted species)?
- ☐ Has irrigation been provided to establish grasses?
- ☐ Have maintenance arrangements been made to maintain grass at a height of 2 to 4 inches?
- ☐ Have trees and shrubs been limited along the filter strip?
- ☐ Has an effort been made to ensure that no treated wood or galvanized metal is used anywhere within the design?

BIO-6 Green Roof Checklist

- ☐ Is the roof shallow enough to support a green roof (<25% slope)?
- ☐ Are the roof supports sufficient to support additional weight of soil, water, vegetation, and a drainage layer (if needed) [a licensed structural engineer should be consulted]?
- ☐ Has an appropriate waterproof membrane been placed below the green roof?
- ☐ Has an appropriate drainage layer been incorporated in the design (if required)?
- ☐ Has an appropriate soil mix been used in the design to allow for drainage, support vegetative growth, and that is not excessively heavy when wet?
- ☐ Has vegetation been carefully selected to improve aesthetics, resist erosion, withstand extreme environments, and tolerate drought without the need for fertilizers and pesticides and without a lot of maintenance requirements (see Appendix H for a recommended plant list)?
- ☐ Have native plants been chosen to the maximum extent practical?
- ☐ If trees or shrubs are incorporated, has an adequate soil depth been provided and is the additional soil depth supported by the roof structure?
- ☐ Has irrigation been provided to establish vegetation?
- ☐ Does vegetation cover 90% of the total area?
- ☐ Is the green roof located in an area without excessive shade to avoid poor vegetative growth?
- ☐ Is there an appropriate drain pipe or gutter to convey any runoff from roof to a stormwater BMP or stormwater conveyance system?

FILT-1 Sand Filter Checklist

- ☐ Has sand filter been located away from trees and areas that could contribute eroded sediment?
- ☐ If there is a chance for sediment to be present in flow to be treated, has pretreatment been provided?
- ☐ Does site have adequate relief to permit vertical percolation through sand filter and into conveyance system?
- ☐ Has pretreatment (vegetated swale or filter strip, hydrodynamic separator) been adequately provided to reduce the sediment load entering the filter?
- ☐ Has the sand filter been sized to capture the SQDV?
- ☐ Has the sand filter been designed with a 1.5:1 length to width ratio or greater?
- ☐ Is the filter bed depth at least 2 feet (3 feet preferred)?
- ☐ Is the depth of water storage over the filter bed 6 feet or less?
- ☐ Is the overflow structure designed to pass the water quality design storm?
- ☐ Has the sizing of the filter been determined using the adapted Darcy's Law equation recommended in the sizing methodology section in Chapter 6 (also see worksheet, Appendix E)?
- ☐ Does the sand meet the recommended specifications (0.2-0.35 mm diameter, Cu < 3, ASTM C 33 size gradation, etc.)?
- ☐ Has an underdrain been employed in the design? [Examples: central underdrain w/lateral pipes, longitudinal pipes, single pipe for small filters]
- ☐ Is the underdrain placed in an 8 inch minimum gravel backfill or drain rock bed?
- ☐ Are all underdrain pipes and connectors 6 inches or greater with clean-out risers of equal diameter?
- ☐ Have clean-out risers been placed at the terminal ends of all pipes and extend to the surface of the filter?
- ☐ Has a valve box been provided for access to the clean-outs and is it water tight?
- ☐ Are underdrain pipes laid with perforations downward, and are perforations at least ½ inch in diameter?

- ☐ Are all lateral collection pipes within 9 feet or less of each other (perpendicular distance)?
- ☐ Have all pipes been placed with a minimum slope of 0.5%?
- ☐ Is the invert of the underdrain outlet above the seasonal high groundwater level?
- ☐ Is gravel backfill present around the underdrain pipe at least 6 inches below and to the sides of the pipe and 8 inches above the pipe?
- ☐ Does the bottom gravel have a diameter of at least 2 times the size of the perforated openings to the drainage system and meet other specifications (specific gravity of 2.5 or more, rounded, free of debris)?
- ☐ Has an appropriate geotextile layer (see underdrain section) or 2-inch transition layer been placed between the sand layer and the drain rock/ gravel backfill layer?
- ☐ Has a flow spreader been installed at the inlet along one side of the filter (long side of the filter if L: W is 2:1 or greater; 20% of perimeter for curved or irregular shape)?
- ☐ Has erosion protection been provided along the first foot of the sand bed adjacent to the flow spreader (i.e. geotextile weighted with sand bags; quarry spalls)?
- ☐ Has no topsoil, clay, or sod (except sod grown in sand) has been added to the sand filter bed?
- ☐ Has vegetation been selected properly (i.e. must withstand drought, heavy saturation, etc.)?
- ☐ Are no permanent structures built on top of the sand filter bed?
- ☐ No large shrubs or trees should be planted in sand filter bed or within 15 feet of inlet or outlet pipes
- ☐ Have native plants been used to the maximum extent practicable?
- ☐ Has an emergency overflow structure been provided?
- ☐ Are interior side slopes above water quality design depth no steeper than 3:1 H:V?
- ☐ Are exterior side slopes no steeper than 2:1 H:V?
- ☐ If pond walls are vertical retaining walls, do they meet recommended specifications (see side slopes section)?

- ☐ Do embankments meet appropriate criteria [top width or 20 feet, constructed on native consolidated soil, in accordance with standard specifications, proper excavation, constructed of appropriate compacted soil]?
- ☐ Are maintenance access roads/ramps to filter provided?
- ☐ Have trees and shrubs been planted further than 10 feet away from inlet and outlet pipes (50 feet for 'water-seeking' plants such as willows and poplars)?
- ☐ Have prohibited non-native plants been removed from the site?
- ☐ Has an effort been made to ensure that no treated wood or galvanized metal is used anywhere within the planter box design?

FILT-2 Cartridge Media Filter

- ☐ Has the vendor been contacted for the latest design guidance on cartridge selection?
- ☐ Has the cartridge media filter been provided with a system to completely drain the system and prevent vector annoyances?
- ☐ Has the cartridge media filter been sized to capture and treat the SQDF?
- ☐ Have site considerations been taken into account when sizing the cartridge media filter and selecting features (often vendor websites offer assistance with this)?

INF-1 Infiltration Trench Checklist

- ☐ Has the infiltration trench been located away from steep slopes (>25%)?
- ☐ Is the infiltration trench set back from structures and leach fields?
- ☐ Is there at least 10 feet or vertical separation between the bottom of the infiltration trench and the shallow groundwater table?
- ☐ Is the depth to bedrock adequate to provide proper infiltration?
- ☐ Has the site been checked to ensure that no preexisting contamination is present?
- ☐ Does the site have low sediment loading rates to prevent infiltration trench clogging?
- ☐ Has a soil assessment report been completed, which determines the suitability of the site for an infiltration trench, recommends a design infiltration rate, identifies the high depth to groundwater table surface elevation, and examines how the stormwater runoff will move in the soil?
- ☐ Has a geotechnical investigation and report been provided if needed?
- ☐ Has the infiltration trench been located at a site that does not receive run off from sites that store or use chemicals or hazardous waste outside?
- ☐ Has the infiltration trench been set back from existing septic system drain fields and drinking water wells?
- ☐ Has pretreatment been provided with a vegetated swale, filter strip, sand filter or proprietary device?
- ☐ Is the trench at least 2 feet wide and 3 to 5 feet deep?
- ☐ Is the longitudinal slope of the trench 3% or less?
- ☐ Is the top layer of the media filter gravel/choking stone/geotextile fabric if flow is sheet flow and 12 inches of surface soil if flow enters through an underground pipe?
- ☐ Is middle layer of media filter 3-5 feet of washed 1.5 to 3 in. gravel with void space of 30 to 40%?
- ☐ Is bottom layer of media filter 6” of clean, washed sand?
- ☐ Have one or more observation wells been installed?

- ☐ Do observation wells consist of recommended slotted 4-6 inch diameter PVC well screen capped with lockable, above-ground lid?
- ☐ Has the infiltration trench been sized to capture and infiltrate the SUSMP defined water quality design volume?
- ☐ Has the infiltration trench been designed to infiltrate all runoff within 72 hours?
- ☐ Has the maximum depth of runoff, ponding depth/trench depth and infiltrating surface area been calculated using recommended design equations (see sizing methodology section/worksheet)?
- ☐ Is the bottom of the infiltration bed native soil, over-excavated to at least one foot in depth and replaced uniformly (with 2-4 inches of coarse sand amendments) without compaction?
- ☐ Has all vertical piping been classified correctly (see drainage section in manual)?
- ☐ Has an observation well been incorporated into the design to ensure that the 72 hour maximum drawdown time is met?
- ☐ Has an overflow route been provided to safely convey flows that overtop the facility or in the case that the facility becomes clogged?
- ☐ Has the overflow channel been designed to safely convey flows from peak design storm to a downstream conveyance system or acceptable discharge point?
- ☐ Has the infiltration trench been kept free of vegetation, and is all existing vegetation surrounding the trench been planted away from trench to avoid drip lines overhanging the facility?
- ☐ Is there safe maintenance access provided to the site for both wet and dry conditions?
- ☐ Has an access road along the length of the trench been provided if there is no existing road or parking lot that can be used for maintenance access?
- ☐ Has access to “operate a backhoe at ‘arms length’” been provided?
- ☐ Was the entire area draining to the facility stabilized before construction began?
- ☐ Have you ensured that the infiltration trench is not hydraulically connected to the storm water conveyance system?

- ☐ If heavy construction material was used to compact subgrade (not recommended), has the infiltrative capacity of the soil been restored via tilling or aerating prior to placing the infiltration bed?
- ☐ Were the exposed subgrade soils inspected by a civil engineer prior to construction to confirm suitable soil conditions for the infiltration facility?

INF-2 Drywell Checklist

- ☐ Has the drywell been located away from steep slopes (>25%)?
- ☐ Is the drywell set back from structures and leach fields?
- ☐ Is there at least 10 feet or vertical separation between the bottom of the drywell and the shallow groundwater table?
- ☐ Is the depth to bedrock adequate to provide proper infiltration?
- ☐ Has the site been checked to ensure that no preexisting contamination is present?
- ☐ Does the site have low sediment loading rates to prevent drywell from clogging?
- ☐ Has pretreatment been provided for all non-rooftop runoff flowing to the drywell?
- ☐ Has a geotechnical investigation and report been provided to ensure site meets specifications for an infiltration facility (including soil infiltration rate, groundwater separation, and no steep slopes)?
- ☐ Has a soil assessment report been completed, which determines the suitability of the site for an drywell, recommends a design infiltration rate, identifies the high depth to groundwater table surface elevation, and examines how the stormwater runoff will move in the soil?
- ☐ Has the drywell been located at a site that does not receive run off from sites that store or use chemicals or hazardous waste outside?
- ☐ Has the drywell been set back from existing septic system drain fields and drinking water wells?
- ☐ Has pretreatment been provided to prevent sediment and other large particulates?
- ☐ Is the surface area of the drywell large enough to infiltrate the storage volume in 72 hours based on maximum allowable depth?
- ☐ Is the top layer of the media filter gravel/choking stone/geotextile fabric if flow is sheet flow and 12 inches of surface soil if flow enters through an underground pipe (pipe should be fitted with a screen)?
- ☐ Is middle layer of media filter 3-5 feet of washed 1.5 to 3 in. gravel with void space of 30 to 40%?
- ☐ Is bottom layer of media filter 6” of clean, washed sand?

- ☐ Have one or more observation wells been installed?
- ☐ Do observation wells consist of recommended slotted 4-6 inch diameter PVC well screen capped with lockable, above-ground lid?
- ☐ Has the drywell been sized to capture and infiltrate the SUSMP defined water quality design volume?
- ☐ Has the drywell been designed to infiltrate all runoff within 72 hours?
- ☐ Has a long term percolation rate of 10% of the measured percolation rate been used in design (due to occlusion and particulate accumulation)?
- ☐ Has the maximum depth of runoff, ponding depth/trench depth and infiltrating surface area been calculated using recommended design equations (see sizing methodology section/worksheet)?
- ☐ Is the bottom of the infiltration bed native soil, over-excavated to at least one foot in depth and replaced uniformly (with 2-4 inches of coarse sand amendments) without compaction?
- ☐ Has all vertical piping been classified correctly (see drainage section in manual)?
- ☐ Has an observation well been incorporated to ensure that the 72 hour maximum drawdown time is met?
- ☐ Has an overflow route been provided to safely convey flows that overtop the facility or in the case that the facility becomes clogged?
- ☐ Has the overflow channel been designed to safely convey flows from peak design storm to a downstream conveyance system or acceptable discharge point?
- ☐ Has the drywell been kept free of vegetation, and is all existing vegetation surrounding the trench been planted away from trench to avoid drip lines overhanging the facility?
- ☐ Is there safe maintenance access provided to the site for both wet and dry conditions?
- ☐ Has maintenance access been provided?
- ☐ Was the entire area draining to the facility stabilized before construction began?
- ☐ Have you ensured that the infiltration trench is not hydraulically connected to the storm water system?

- ☐ If heavy construction material was used to compact subgrade (not recommended), has the infiltrative capacity of the soil been restored via tilling or aerating prior to placing the infiltration bed?
- ☐ Were the exposed subgrade soils inspected by a civil engineer prior to construction to confirm suitable soil conditions for the infiltration facility?

INF-3 Proprietary Infiltration BMPs Checklist

- ☐ Has the infiltration facility been located away from steep slopes (>25%)?
- ☐ Is the infiltration facility set back from structures and leach fields?
- ☐ Is there at least 10 feet or vertical separation between the bottom of the infiltration facility and the shallow groundwater table?
- ☐ Is the depth to bedrock adequate to provide proper infiltration?
- ☐ Has the site been checked to ensure that no preexisting contamination is present?
- ☐ Does the site have low sediment loading rates to prevent infiltration facility clogging?
- ☐ Has pretreatment been provided to prevent premature failure (If infiltration facility fails, complete construction is required)?
- ☐ Has infiltration facility been designed to receive runoff only from sections of the site that have been stabilized?
- ☐ If infiltration facility fails, complete construction is required
- ☐ Has a geotechnical investigation and report been provided to ensure site meets specifications for an infiltration facility (including soil infiltration rate, groundwater separation, and no steep slopes)?
- ☐ Has a soil assessment report been completed, which determines the suitability of the site for an infiltration trench, recommends a design infiltration rate, identifies the high depth to groundwater table surface elevation, and examines how the stormwater runoff will move in the soil?
- ☐ Has the infiltration trench been located at a site that does not receive run off from sites that store or use chemicals or hazardous waste outside?
- ☐ Has the infiltration BMP been sized to capture and treat the water quality design volume?
- ☐ Has a long term percolation rate of 10% of the measured percolation rate been used in design (due to occlusion and particulate accumulation)?
- ☐ Have the recommended sizing guidelines set by the vendor been referenced and used for selection and use of infiltration facility?

INF-4 Permeable Pavement Checklist

- ☐ Has the permeable pavement been located away from steep slopes (>25%)?
- ☐ Is the permeable pavement set back from structures and leach fields?
- ☐ Is there at least 10 feet or vertical separation between the bottom of the permeable pavement and the shallow groundwater table?
- ☐ Is the depth to bedrock adequate to provide proper infiltration?
- ☐ Has the site been checked to ensure that no preexisting contamination is present?
- ☐ Does the site have low sediment loading rates to prevent infiltration trench clogging?
- ☐ Has the permeable pavement been designed to receive runoff only from sections of the site that have been stabilized?
- ☐ Has a geotechnical investigation and report been provided to ensure site meets specifications for an infiltration facility (including soil infiltration rate, groundwater separation, and no steep slopes)?
- ☐ Has a soil assessment report been completed, which determines the suitability of the site for an infiltration trench, recommends a design infiltration rate, identifies the high depth to groundwater table surface elevation, and examines how the stormwater runoff will move in the soil?
- ☐ Has the permeable pavement been located at a site that does not receive run off from sites that store or use chemicals or hazardous waste outside?
- ☐ Has the run off been assessed for necessity of pretreatment?
- ☐ If pretreatment is required, has it been provided to treat run on before it reaches permeable pavement?
- ☐ Has the infiltration BMP been sized to capture and treat the water quality design volume?
- ☐ Have the infiltration capabilities of the site been assessed (i.e. full, partial, or no infiltration allowed)?
- ☐ If no infiltration is allowed, has an underdrain been prohibited?

- ☐ If permeable pavement is located on a site with a slope greater than 2%, has the area been terraced to prevent lateral flow through subsurface?
- ☐ Has the permeable pavement been designed to infiltrate flows through four different layers (incl. top wearing layer, stone reservoir, and transition layers) of material (or through a similar system)?
- ☐ Has the depth of each layer (and void space), along with the hydrology, hydraulics, and structural requirements of the site been determined and approved by a licensed civil engineer?
- ☐ If proprietary permeable pavement is used (i.e. concrete or other pavers), have the design requirements and installation steps been obtained from the vendor and referenced in the selection and construction of the permeable pavement?
- ☐ Has the permeable pavement been designed to drain in less than 72 hours and allowed to dry out periodically?
- ☐ Has a long term percolation rate of 10% of the measured percolation rate been used in design (due to occlusion and particulate accumulation)?
- ☐ Has an overflow mechanism been included in the pavement design?
- ☐ If the overflow mechanism employed is perimeter control, have controls such as a perimeter vegetated swale, perimeter Bioretention, storm drain inlets, or other acceptable control been implemented?
- ☐ If the overflow mechanism employed are overflow pipes, have the pipes been connected to the underdrain, are they located away from vehicular traffic, and is the top of the pipe fitted with a screen?
- ☐ Has the pavement been laid close to level with bottom of base layers level to ensure uniform infiltration?
- ☐ Are site materials stored away from permeable pavement?
- ☐ Has landscaping and stabilization of adjacent areas been completed before installation of pavement?

GS-1 Hydrodynamic Separation Device Checklist

- ☐ Has the vendor been contacted for the latest model and design guidance prior to selection of device?
- ☐ Has the device been sized to capture and treat the water quality design flow rate?
- ☐ Has the vendor been contacted for sizing and installation guidance?
- ☐ Has periodic maintenance been scheduled and budgeted for?

GS-2 Catch Basin Insert Checklist

- ☐ Has the vendor been contacted for the latest model and design guidance prior to selection of device?
- ☐ Has the insert been sized to capture and treat the water quality design flow rate?
- ☐ Has the vendor been contacted for sizing and installation guidance?
- ☐ Has periodic maintenance been scheduled and budgeted for?

APPENDIX H: STORMWATER CONTROL MEASURE ACCESS AND MAINTENANCE AGREEMENTS

(Long Form)

Recorded at the request of:

City of _____

After recording, return to:

City of _____

City Clerk

Stormwater Treatment Device Access and Maintenance Agreement

OWNER:

PROPERTY ADDRESS:_____

APN:

THIS AGREEMENT is made and entered into in_____, California, this___day of_____, by and between_____ _____, hereinafter referred to as "Owner" and the CITY OF____ _____, a municipal corporation, located in the County of Ventura, State of California hereinafter referred to as "CITY";

WHEREAS, the Owner owns real property ("Property") in the City of _____, County of Ventura, State of California, more specifically described in Exhibit "A" and depicted in Exhibit "B", each of which exhibits is attached hereto and incorporated herein by this reference;

WHEREAS, at the time of initial approval of development project known as____ _____within the Property described herein, the City required the project to employ on-site control measures to minimize pollutants in urban runoff;

WHEREAS, the Owner has chosen to install a _____ _____, hereinafter referred to as "Device", as the on-site control measure to minimize pollutants in urban runoff;

WHEREAS, said Device has been installed in accordance with plans and specifications accepted by the City;

WHEREAS, said Device, with installation on private property and draining only private property, is a private facility with all maintenance or replacement, therefore, the sole responsibility of the Owner in accordance with the terms of this Agreement;

WHEREAS, the Owner is aware that periodic and continuous maintenance, including, but not necessarily limited to, filter material replacement and sediment removal, is required to assure peak performance of Device and that, furthermore, such maintenance activity will require compliance with all Local, State, or Federal laws and regulations, including those pertaining to confined space and waste disposal methods, in effect at the time such maintenance occurs;

NOW THEREFORE, it is mutually stipulated and agreed as follows:

1) Owner hereby provides the City of City's designee complete access, of any duration, to the Device and its immediate vicinity at any time, upon reasonable notice, or in the event of emergency, as determined by City's Director of Public Works no advance notice, for the purpose of inspection, sampling, testing of the Device, and in case of emergency, to undertake all necessary repairs or other preventative measures at owner's expense as provided in paragraph 3 below. City shall make every effort at all times to minimize or avoid interference with Owner's use of the Property.

2) Owner shall use its best efforts diligently to maintain the Device in a manner assuring peak performance at all times. All reasonable precautions shall be exercised by Owner and Owner's representative or contractor in the removal and extraction of material(s) from the Device and the ultimate disposal of the material(s) in a manner consistent with all relevant laws and regulations in effect at the time. As may be requested from time to time by the City, the Owner shall provide the City with documentation identifying the material(s) removed, the quantity, and disposal destination.

3) In the event Owner, or its successors or assigns, fails to accomplish the necessary maintenance contemplated by this Agreement, within five (5) days of being given written notice by the City, the City is hereby authorized to cause any maintenance necessary to be done and charge the entire cost and expense to the Owner or Owner's successors or assigns, including administrative costs, attorneys fees and interest thereon at the maximum rate authorized by the Civil Code from the date of the notice of expense until paid in full.

4) The City may require the owner to post security in form and for a time period satisfactory to the city of guarantee of the performance of the obligations stated herein. Should the Owner fail to perform the obligations under the Agreement, the City may, in the case of a cash bond, act for the Owner using the proceeds from it, or in the case of a surety bond, require the sureties to perform the obligations of the Agreement. As an additional remedy, the Director may withdraw any previous stormwater related approval with respect to the

property on which a Device has been installed until such time as Owner repays to City it's reasonable costs incurred in accordance with paragraph 3 above.

5) This agreement shall be recorded in the Office of the Recorder of Ventura County, California, at the expense of the Owner and shall constitute notice to all successors and assigns of the title to said Property of the obligation herein set forth, and also a lien in such amount as will fully reimburse the City, including interest as herein above set forth, subject to foreclosure in event of default in payment.

6) In event of legal action occasioned by any default or action of the Owner, or its successors or assigns, then the Owner and its successors or assigns agree(s) to pay all costs incurred by the City in enforcing the terms of this Agreement, including reasonable attorney's fees and costs, and that the same shall become a part of the lien against said Property.

7) It is the intent of the parties hereto that burdens and benefits herein undertaken shall constitute covenants that run with said Property and constitute a lien there against.

8) The obligations herein undertaken shall be binding upon the heirs, successors, executors, administrators and assigns of the parties hereto. The term "Owner" shall include not only the present Owner, but also its heirs, successors, executors, administrators, and assigns. Owner shall notify any successor to title of all or part of the Property about the existence of this Agreement. Owner shall provide such notice prior to such successor obtaining an interest in all or part of the Property. Owner shall provide a copy of such notice to the City at the same time such notice is provided to the successor.

9) Time is of the essence in the performance of this Agreement.

10) Any notice to a party required or called for in this Agreement shall be served in person, or by deposit in the U.S. Mail, first class postage prepaid, to the address set forth below. Notice(s) shall be deemed effective upon receipt, or seventy-two (72) hours after deposit in the U.S. Mail, whichever is earlier. A party may change a notice address only by providing written notice thereof to the other party.

IF TO CITY:	IF TO OWNER:
_____	_____
_____	_____
_____	_____

IN WITNESS THEREOF, the parties hereto have affixed their signatures as of the date first written above.

APPROVED AS TO FORM:

_____

City Attorney

OWNER:

_____

Owner

Name: _____

Title: _____

CITY OF_____:

_____

Name:_____

Title:_____

OWNER:

_____

Name:_____

Title:_____

ATTEST:

_____

City Clerk Date

Notaries on Following Page

EXHIBIT A

(Legal Description)

EXHIBIT B

(Map/illustration)

(Short Form)

Recorded at the request of and mail to:

_____

_____

_____

Covenant and Agreement Regarding

Stormwater Treatment Device Maintenance

The undersigned hereby certify that we are the owners of hereinafter legally described real property located in the City of _____, County of Ventura, State of California.

Legal Description: _____

_____

as recorded in Book _____, Page_____,Records of Ventura County,

which property is located and known as **(Address):** _____

_____.

And in consideration of the City of _____ allowing_____

_____

on said property, we do hereby covenant and agree to and with said City to maintain according to the Maintenance Plan (Attachment 1), all structural stormwater treatment devices including the following:

_____

_____.

This Covenant and Agreement shall run all of the above described land and shall be binding upon ourselves, and future owners, encumbrances, their successors, heirs, or assignees and shall continue in effect until released by the authority of the City upon submittal of request, applicable fees, and evidence that this Covenant and Agreement is no longer required by law.

NOTARIES ON FOLLOWING PAGE

APPENDIX I : STORMWATER CONTROL MEASURE MAINTENANCE PLAN GUIDELINES AND CHECKLISTS

Included in this appendix are a series of checklists that can be used by both inspectors and maintenance personnel to ensure that observed deficiencies in BMPs are maintained appropriately. The BMP Inspection/Maintenance Checklists are presented in the following order:

1) Bioretention/Planter Box

25) Vegetated Swale Filter

26) Vegetated Filter Strip

27) Sand Filter

28) Infiltration BMPs

29) Permeable Pavement

30) Constructed Treatment Wetland

31) Wet Retention Basin

32) Dry Extended Detention Basin

33) Proprietary Devices

I.1 Bioretention/Planter Box Inspection and Maintenance Checklist

Date: _____ Work Order # _____

Type of Inspection: □ post-storm □ annual □ routine □ post-wet season □ pre-wet season

Facility: _____ Inspector(s): _____

Defect	Conditions When Maintenance Is Needed	Inspection Result (0, 1, or 2)†	Date Maintenance Performed	Comments or Action(s) Taken to Resolve Issue
Appearance	Untidy			
Trash and Debris Accumulation	Trash, plant litter and dead leaves accumulated on surface.			
Vegetation	Unhealthy plants and appearance.			
Irrigation	Functioning incorrectly (if applicable).			
Inlet	Inlet pipe blocked or impeded.			
Splash Blocks	Blocks or pads correctly positioned to prevent erosion.			
Overflow	Overflow pipe blocked or broken.			
Filter media	Infiltration design rate is met (e.g., drains 36-48 hours after moderate - large storm event).			

†Maintenance: Enter 0 if satisfactory, 1 if maintenance is needed and include WO#. Enter 2 if maintenance was performed same day.

I.2 Vegetated Swale Filter Inspection and Maintenance Checklist

Date: _____ Work Order # _____

Type of Inspection: □ post-storm □ annual □ routine □ post-wet season □ pre-wet season

Facility: _____ Inspector(s): _____

Defect	Conditions When Maintenance Is Needed	Inspection Result (0, 1, or 2)†	Date Maintenance Performed	Comments or Action(s) Taken to Resolve Issue
Appearance	Untidy			
Trash and Debris Accumulation	Trash and debris accumulated in the swale.			
Vegetation	When the grass becomes excessively tall (greater than 10-inches); when nuisance weeds and other vegetation start to take over.			
Excessive Shading	Vegetation growth is poor because sunlight does not reach swale. Evaluate vegetation suitability.			
Poor Vegetation Coverage	When vegetation is sparse or bare or eroded patches occur in more than 10% of the swale bottom. Evaluate vegetation suitability.			
Sediment Accumulation	Sediment depth exceeds 2 inches or covers more than 10% of design area.			
Standing Water	When water stands in the swale between storms and does not drain freely.			
Flow spreader or Check Dams	Flow spreader or check dams uneven or clogged so that flows are not uniformly distributed through entire swale width.			

Defect	Conditions When Maintenance Is Needed	Inspection Result (0, 1, or 2)†	Date Maintenance Performed	Comments or Action(s) Taken to Resolve Issue
Constant Baseflow	When small quantities of water continually flow through the swale, even when it has been dry for weeks and an eroded, muddy channel has formed in the swale bottom.			
Inlet/Outlet	Inlet/outlet areas clogged with sediment and/or debris.			
Erosion/ Scouring	Eroded or scoured swale bottom due to flow channelization, or higher flows. Eroded or rilled side slopes.			
	Eroded or undercut inlet/outlet structures			

†Maintenance: Enter 0 if satisfactory, 1 if maintenance is needed and include WO#. Enter 2 if maintenance was performed same day.

I.3 Vegetated Filter Strip Inspection and Maintenance Checklist

Date: _____ Work Order # _____

Type of Inspection: □ post-storm □ annual □ routine □ post-wet season □ pre-wet season

Facility: _____ Inspector(s): _____

Defect	Conditions When Maintenance Is Needed	Inspection Result (0, 1 or 2)†	Date Maintenance Performed	Comments or Action(s) Taken to Resolve Issue
Appearance	Untidy			
Trash and Debris Accumulation	Trash and debris accumulated on the filter strip.			
Vegetation	When the grass becomes excessively tall (greater than 10-inches); when nuisance weeds and other vegetation starts to take over.			
Excessive Shading	Grass growth is poor because sunlight does not reach swale. Evaluate grass species suitability.			
Poor Vegetation Coverage	When grass is sparse or bare or eroded patches occur in more than 10% of the swale bottom. Evaluate grass species suitability.			
Erosion/Scouring	Eroded or scoured areas due to flow channelization, or higher flows.			
Sediment Accumulation on Grass	Sediment depth exceeds 2 inches.			
Flow spreader	Flow spreader uneven or clogged so that flows are not uniformly distributed through entire filter width.			

†Maintenance: Enter 0 if satisfactory, 1 if maintenance is needed and include WO#. Enter 2 if maintenance was performed same day.

I.4 Sand Filter Inspection and Maintenance Checklist

Date: _____ Work Order # _____

Type of Inspection: □ post-storm □ annual □ routine □ post-wet season □ pre-wet season

Facility: _____ Inspector(s): _____

Defect	Conditions When Maintenance Is Needed	Inspection Result (0,1, or 2) †	Date Maintenance Performed	Comments or Action(s) taken to resolve issue
Trash & Debris	Any trash and debris which exceed 5 cubic feet per 1,000 square feet of filter bed area (one standard garbage can). In general, there shall be no visual evidence of dumping. If less than threshold all trash and debris will be removed as part of next scheduled maintenance.			
Inlet erosion	Visible evident of erosion occurring near flow spreader outlets.			
Slow drain time	Standing water long after storm has passed (after 24 to 48 hours) and/or flow through the overflow pipes occurs frequently.			
Concentrated Flow	Flow spreader uneven or clogged so that flows are not uniformly distributed across the sand filter.			
Appearance of poisonous, noxious or nuisance vegetation	Excessive grass and weed growth. Noxious weeds, woody vegetation establishing, Turf growing over rock filter			
Standing Water	Standing water long after storm has passed (after 24 to 48 hours), and/or flow through the overflow pipes occurs frequently.			

Defect	Conditions When Maintenance Is Needed	Inspection Result (0,1, or 2) †	Date Maintenance Performed	Comments or Action(s) taken to resolve issue
Tear in Filter Fabric	When there is a visible tear or rip in the filter fabric allowing water to bypass the fabric.			
Pipe Settlement	If piping has visibly settled more than 1 inch.			
Filter Media	Drawdown of water through the media takes longer than 1 hour and/or overflow occurs frequently.			
Short Circuiting	Flows do not properly enter filter cartridges.			

†Maintenance: Enter 0 if satisfactory, 1 if maintenance is needed and include WO#. Enter 2 if maintenance was performed same day.

I.5 Infiltration BMP Inspection and Maintenance Checklist

Date: _____ Work Order # _____

Type of Inspection: □ post-storm □ annual □ routine □ post-wet season □ pre-wet season

Facility: _____ Inspector(s): _____

Defect	Conditions When Maintenance Is Needed	Inspection Result (0,1, or 2) †	Date Maintenance Performed	Comments or Action(s) Taken to Resolve Issue
Appearance, vegetative health	Mowing and trimming vegetation is needed to prevent establishment of woody vegetation, and for aesthetic and vector reasons.			
Vegetation	Poisonous or nuisance vegetation or noxious weeds.			
	Excessive loss of turf or ground cover (if applicable).			
Trash & Debris	Trash and debris > 5 cf/1,000 sf (one standard size garbage can).			
Contaminants and Pollution	Any evidence of oil, gasoline, contaminants or other pollutants.			
Erosion	Undercut or eroded areas at inlet or outlet structures.			
Sediment and Debris	Accumulation of sediment, debris, and oil/grease on surface, inflow, outlet or overflow structures.			
Sediment and Debris	Accumulation of sediment and debris, in sediment forebay and pretreatment devices.			
Water drainage rate	Standing water, or by visual inspection of wells (if available), indicates design drain times are not being achieved (i.e., within 72 hours).			

Defect	Conditions When Maintenance Is Needed	Inspection Result (0,1, or 2) †	Date Maintenance Performed	Comments or Action(s) Taken to Resolve Issue
Media clogging surface layer	Lift surface layer (and filter fabric if installed) and check for media clogging with sediment (function may be able to be restored by replacing surface aggregate/filter cloth).			
Media clogging	Lift surface layer (and filter fabric if installed) and check for media clogging with sediment (partial or complete clogging which may require full replacement).			

†Maintenance: Enter 0 if satisfactory, 1 if maintenance is needed and include WO#. Enter 2 if maintenance was performed same day.

I.6 Permeable Pavement Inspection and Maintenance Checklist

Date: _____ Work Order # _____

Type of Inspection: □ post-storm □ annual □ routine □ post-wet season □ pre-wet season

Facility: _____ Inspector(s): _____

Defect	Conditions When Maintenance Is Needed	Inspection Result (0,1, or 2) †	Date Maintenance Performed	Comments or Action(s) taken to resolve issue
Sediment Accumulation	Sediment is visible			
Missing gravel/sand fill	There are noticeable gaps in between pavers			
Weeds/mosses filling voids	Vegetation is growing in/on permeable pavement			
Trash and Debris Accumulation	Trash and debris accumulated on the permeable pavement.			
Dead or dying vegetation in adjacent landscaping	Vegetation is dead or dying leaving bare soil prone to erosion			
Surface clog	Clogging is evidenced by ponding on the surface			
Overflow clog	Excessive build up of water accompanied by observation of low flow in observation well (connected to underdrain system) If a surface overflow system is used, observation of an obvious clog			
Visual contaminants and pollution	Any visual evidence of oil, gasoline, contaminants or other pollutants.			
Erosion	Tributary area Exhibits signs of erosion Noticeably not completely stabilized			

Defect	Conditions When Maintenance Is Needed	Inspection Result (0,1, or 2) †	Date Maintenance Performed	Comments or Action(s) taken to resolve issue
Deterioration/ Roughening	Integrity of pavement is compromised (i.e., cracks, depressions, crumbling, etc.)			
Subsurface Clog	Clogging is evidenced by ponding on the surface and is not remedied by addressing surface clogging.			
†Maintenance: Enter 0 if satisfactory, 1 if maintenance is needed and include WO#. Enter 2 if maintenance was performed same day.				

I.7 Constructed Treatment Wetland Inspection and Maintenance Checklist

Date: _____ Work Order # _____

Type of Inspection: □ post-storm □ annual □ routine □ post-wet season □ pre-wet season

Facility: _____ Inspector(s): _____

Defect	Conditions When Maintenance Is Needed	Inspection Result (0,1, or 2) †	Date Maintenance Performed	Comments or Action(s) taken to resolve issue
Trash & Debris	Any trash and debris which exceed 5 cubic feet per 1,000 sf of basin area (one standard garbage can). In general, there shall be no visual evidence of dumping. If less than threshold all trash and debris will be removed as part of next scheduled maintenance. If trash and debris is observed blocking or partially blocking an outlet structure or inhibiting flows between cells, it shall be removed quickly			
Sediment Accumulation	Sediment accumulation in basin bottom that exceeds the depth of sediment zone plus 6 inches in the sediment forebay. If sediment is blocking an inlet or outlet, it shall be removed.			
Erosion	Erosion of basin's side slopes and/or scouring of basin bottom.			
Oil Sheen on Water	Prevalent and visible oil sheen.			

Defect	Conditions When Maintenance Is Needed	Inspection Result (0,1, or 2) †	Date Maintenance Performed	Comments or Action(s) taken to resolve issue
Noxious Pests	Visual observations or receipt of complaints of numbers of pests that would not be naturally occurring and could pose a threat to human or aquatic health.			
Water Level	First cell empty, doesn't hold water.			
Aesthetics	Minor vegetation removal and thinning. Mowing berms and surroundings			
Noxious Weeds	Any evidence of noxious weeds.			
Tree Growth	Tree growth does not allow maintenance access or interferes with maintenance activity (i.e., slope mowing, silt removal, vactoring, or equipment movements). If trees are not interfering, do not remove. Dead, diseased, or dying trees shall be removed.			
Settling of Berm	If settlement is apparent. Settling can be an indication of more severe problems with the berm or outlet works. A geotechnical engineer shall be consulted to determine the source of the settlement if the dike/berm is serving as a dam.			
Piping through Berm	Discernable water flow through basin berm. Ongoing erosion with potential for erosion to continue. A licensed geotechnical engineer shall be called in to inspect and evaluate condition and recommend repair of condition.			

Defect	Conditions When Maintenance Is Needed	Inspection Result (0,1, or 2) †	Date Maintenance Performed	Comments or Action(s) taken to resolve issue
Tree and Large Shrub Growth on Downstream Slope of Embankments	Tree and large shrub growth on downstream slopes of embankments may prevent inspection and provide habitat for burrowing rodents.			
Erosion on Spillway	Rock is missing and soil is exposed at top of spillway or outside slope.			
Gate/Fence Damage	Damage to gate/fence, including missing locks and hinges			

†Maintenance: Enter 0 if satisfactory, 1 if maintenance is needed and include WO#. Enter 2 if maintenance was performed same day.

I.8 Wet Retention Basin Inspection and Maintenance Checklist

Date: _____ Work Order # _____

Type of Inspection: □ post-storm □ annual □ routine □ post-wet season □ pre-wet season

Facility: _____ Inspector(s): _____

Defect	Conditions When Maintenance Is Needed	Inspection Result (0,1, or 2) †	Date Maintenance Performed	Comments or Action(s) taken to resolve issue
Trash & Debris	Any trash and debris which exceed 5 cubic feet per 1,000 sf of basin area (one standard garbage can) or if trash and debris is excessively clogging the outlet structure. If less than threshold all trash and debris will be removed as part of next scheduled maintenance.			
Sediment Accumulation	Sediment accumulation in basin bottom that exceeds the depth of the design sediment zone plus 6 inches, usually in the first cell.			
Erosion	Erosion of basin's side slopes and/or scouring of basin bottom.			
Oil Sheen on Water	Prevalent and visible oil sheen.			
Noxious Pests	Visual observations or receipt of complaints of numbers of pests that would not be naturally occurring and could pose a threat to human or aquatic health.			
Water Level	First cell empty, doesn't hold water.			
Algae Mats	Algae mats over more than 20% of the water surface.			
Aesthetics	Minor vegetation removal and thinning. Mowing berms and surroundings			

Defect	Conditions When Maintenance Is Needed	Inspection Result (0,1, or 2) †	Date Maintenance Performed	Comments or Action(s) taken to resolve issue
Noxious Weeds	Any evidence of noxious weeds.			
Tree Growth	Tree growth does not allow maintenance access or interferes with maintenance activity (i.e., slope mowing, silt removal, vactoring, or equipment movements). If trees are not interfering, do not remove. Dead, diseased, or dying trees shall be removed.			
Settling of Berm	If settlement is apparent. Settling can be an indication of more severe problems with the berm or outlet works. A geotechnical engineer shall be consulted to determine the source of the settlement if the dike/berm is serving as a dam.			
Piping through Berm	Discernable water flow through basin berm. Ongoing erosion with potential for erosion to continue. A licensed geotechnical engineer shall be called in to inspect and evaluate condition and recommend repair of condition.			
Tree and Large Shrub Growth on Downstream Slope of Embankments	Tree and large shrub growth on downstream slopes of embankments may prevent inspection and provide habitat for burrowing rodents.			
Erosion on Spillway	Rock is missing and soil is exposed at top of spillway or outside slope.			
Gate/Fence Damage	Damage to gate/fence, including missing locks and hinges			

†Maintenance: Enter 0 if satisfactory, 1 if maintenance is needed and include WO#. Enter 2 if maintenance was performed same day.

I.9 Dry Extended Detention Basin Inspection and Maintenance Checklist

Date: _____ Work Order # _____

Type of Inspection: □ post-storm □ annual □ routine □ post-wet season □ pre-wet season

Facility: _____ Inspector(s): _____

Defect	Conditions When Maintenance Is Needed	Inspection Result (0, 1 or 2)†	Date Maintenance Performed	Comments or Action(s) Taken to Resolve Issue
General				
Appearance	Untidy, un-mown (if applicable)			
Vegetation	Access problems or hazards; dead or dying trees			
	Poisonous or nuisance vegetation or noxious weeds			
Insects	Insects such as wasps and hornets interfere with maintenance activities.			
Rodent Holes	Any evidence of rodent holes if facility is acting as a dam or berm, or any evidence of water piping through dam or berm via rodent holes			
Trash and Debris	Trash and debris > 5 cf/1,000 sf (one standard size garbage can).			
Pollutants	Any evidence of oil, gasoline, contaminants or other pollutants			
Inlet/Outlet Pipe	Inlet/Outlet pipe clogged with sediment and/or debris. Basin not draining.			
Erosion	Erosion of the basin's side slopes and/or scouring of the basin bottom that exceeds 2-inches, or where continued erosion is prevalent.			

Defect	Conditions When Maintenance Is Needed	Inspection Result (0, 1 or 2)†	Date Maintenance Performed	Comments or Action(s) Taken to Resolve Issue
Piping	Evidence of or visible water flow through basin berm.			
Settlement of Basin Dike/Berm	Any part of these components that has settled 4-inches or lower than the design elevation, or inspector determines dike/berm is unsound.			
Overflow Spillway	Rock is missing and/or soil is exposed at top of spillway or outside slope.			
Sediment Accumulation in Basin Bottom	Sediment accumulations in basin bottom that exceeds the depth of sediment zone plus 6-inches.			
Tree or shrub growth	Trees > 4 ft in height with potential blockage of inlet, outlet or spillway; or potential future bank stability problems			
Debris Barriers (e.g., Trash Racks)				
Trash and Debris	Trash or debris that is plugging more than 20% of the openings in the barrier.			
Damaged/ Missing Bars	Bars are bent out of shape more than 3 inches.			
	Bars are missing or entire barrier missing.			
	Bars are loose and rust is causing 50% deterioration to any part of barrier.			
Inlet/Outlet Pipe	Debris barrier missing or not attached to pipe.			
Fencing				
Missing or broken parts	Any defect in the fence that permits easy entry to a facility.			

Defect	Conditions When Maintenance Is Needed	Inspection Result (0, 1 or 2)†	Date Maintenance Performed	Comments or Action(s) Taken to Resolve Issue
Erosion	Erosion more than 4 inches high and 12-18 inches wide, creating an opening under the fence.			
Damaged Parts	Damage to gate/fence, posts out of plumb, or rails bent more than 6 inches.			
Deteriorating Paint or Protective Coating	Part or parts that have a rusting or scaling condition that has affected structural adequacy.			
Gates				
Damaged or missing member	Missing gate or locking devices, broken or missing hinges, out of plum more than 6 inches and more than 1 foot out of design alignment, or missing stretcher bar, stretcher bands, and ties.			

†Maintenance: Enter 0 if satisfactory, 1 if maintenance is needed and include WO#. Enter 2 if maintenance was performed same day.

I.10 Proprietary Device Inspection and Maintenance Checklist

Date: _____ Work Order # _____

Type of Inspection: □ post-storm □ annual □ routine □ post-wet season □ pre-wet season

Facility: _____ Inspector(s): _____

Defect	Conditions When Maintenance Is Needed	Inspection Result (0,1, or 2) †	Date Maintenance Performed	Comments or Action(s) taken to resolve issue
Refer to the manufacturer's instructions for maintenance/inspection requirements, below are generic guidelines to supplement manufacturer's recommendations.				
Underground Vault				
Sediment Accumulation on Media	Sediment depth exceeds 0.25-inches.			
Sediment Accumulation in Vault	Sediment depth exceeds 6-inches in first chamber.			
Trash/Debris Accumulation	Trash and debris accumulated on compost filter bed.			
Sediment in Drain Pipes or Cleanouts	When drain pipes, clean-outs, become full with sediment and/or debris.			
Damaged Pipes	Any part of the pipes that are crushed or damaged due to corrosion and/or settlement.			
Access Cover Damaged/Not Working	Cover cannot be opened; one person cannot open the cover using normal lifting pressure, corrosion/deformation of cover.			
Vault Structure Includes Cracks in Wall, Bottom, Damage to	Cracks wider than 1/2-inch or evidence of soil particles entering the structure through the cracks, or maintenance/inspection personnel determine that the vault is not structurally sound.			

Defect	Conditions When Maintenance Is Needed	Inspection Result (0,1, or 2) †	Date Maintenance Performed	Comments or Action(s) taken to resolve issue
Frame and/or Top Slab	Cracks wider than 1/2-inch at the joint of any inlet/outlet pipe or evidence of soil particles entering through the cracks.			
Baffles	Baffles corroding, cracking warping, and/or showing signs of failure as determined by maintenance/inspection person.			
Access Ladder Damaged	Ladder is corroded or deteriorated, not functioning properly, not securely attached to structure wall, missing rungs, cracks, or misaligned.			
Below Ground Cartridge Type				
Filter Media	Drawdown of water through the media takes longer than 1 hour and/or overflow occurs frequently.			
Short Circuiting	Flows do not properly enter filter cartridges.			

†Maintenance: Enter 0 if satisfactory, 1 if maintenance is needed and include WO#. Enter 2 if maintenance was performed same day.

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056567

The Quality of Our Nation's Waters

Effects of Urban Development on Stream Ecosystems in Nine Metropolitan Study Areas Across the United States

National Water-Quality Assessment Program

Circular 1373

U.S. Department of the Interior
U.S. Geological Survey

056568

Cover. Fly fishing in the Chattahoochee River below Powers Ferry Road in Atlanta, Georgia, 2011.

Photographs in this report are by Alan M. Cressler, U.S. Geological Survey, unless otherwise indicated.

056569

The Quality of Our Nation's Waters

Effects of Urban Development on Stream Ecosystems in Nine Metropolitan Study Areas Across the United States

By James F. Coles, Gerard McMahon, Amanda H. Bell, Larry R. Brown, Faith A. Fitzpatrick, Barbara C. Scudder Eikenberry, Michael D. Woodside, Thomas F. Cuffney, and Wade L. Bryant, U.S. Geological Survey,

and

Karen Cappiella, Lisa Fraley-McNeal, and William P. Stack, Center for Watershed Protection

National Water-Quality Assessment Program

Circular 1373

U.S. Department of the Interior
U.S. Geological Survey

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KEN SALAZAR, Secretary

U.S. Geological Survey
Marcia K. McNutt, Director

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Foreword

The United States has made major investments in assessing, managing, regulating, and conserving natural resources such as water, minerals, soils, and timber. Sustaining the quality of the Nation's water resources and the health of our ecosystems depends on the availability of sound water-resources data and information to develop effective, science-based policies. Effective management of water resources also brings more certainty and efficiency to important economic sectors. Taken together, these actions lead to immediate and long-term economic, social, and environmental benefits that make a difference to the lives of millions of people *(http://water.usgs.gov/nawqa/applications/)*.

Two decades ago, the Congress established the U.S. Geological Survey's National Water-Quality Assessment (NAWQA) Program to meet this need. Since then it has served as a primary source of nationally consistent information on the quality of the Nation's streams and groundwater; how water quality changes over time; and how natural features and human activities affect the quality of streams and groundwater. Objective and reliable data, water-quality models and related decision support tools, and systematic scientific studies characterize where, when, and why the Nation's water quality is degraded—and what can be done to improve and protect it for human and ecosystem needs. This information is critical to our future because the Nation faces an increasingly complex and growing need for clean water to support population, economic growth, and healthy ecosystems. For example, two thirds of U.S. estuaries are impacted by nutrients and dead zones that no longer fully support healthy fish and other aquatic communities. Forty-two percent of the Nation's streams are in poor or degraded condition compared to reference conditions. Eighty percent of urban streams have at least one pesticide that exceeds criteria to protect aquatic life. Groundwater from about 20 percent of public and domestic wells—which serve more than 150 million people—contains at least one contaminant at a level of potential health concern.

This report is one of a series of publications, The Quality of Our Nation's Waters, which describes major findings of the NAWQA program on water-quality issues of regional and national concern. This report presents an assessment of the effects of urban development on the hydrology, habitat, chemistry, and aquatic communities of streams in nine metropolitan areas—Portland, Oregon; Salt Lake City, Utah; Birmingham, Alabama; Atlanta, Georgia; Raleigh, North Carolina; Boston, Massachusetts; Denver, Colorado; Dallas, Texas; and Milwaukee, Wisconsin. These comprehensive investigations describe how the effects of urbanization vary regionally, and which urban-related stressors are most closely linked to degradation of aquatic biota.

Other reports in this series focus on occurrence and distribution of nutrients, pesticides, and volatile organic compounds in streams and groundwater, the effects of contaminants and streamflow alteration on condition of aquatic communities in streams, and on the quality of untreated water from private domestic and public supply wells. Each reports builds toward a more comprehensive understanding of the quality of regional and national water resources *(http://water.usgs.gov/nawqa/nawqa_sumr.html)*. All NAWQA reports are available online at *http://water.usgs.gov/nawqa/bib/*.

The information in this series is intended primarily for those interested or involved in resource management and protection, conservation, regulation, and policymaking at regional and national levels. In addition, the information should be of interest to those at a local level who wish to know more about the general quality of streams and groundwater in areas near where they live and how that quality compares with other area across the Nation. We hope this publication will provide you with insights and information to meet your needs, and will foster increased citizen awareness and involvement in the protection and restoration of our Nation's waters.

William H. Werkheiser
Associate Director for Water
U.S. Geological Survey

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Acronyms and Abbreviations Used in This Report

%	percent
µm	micrometer
AIC	Akaike Information Criteria
BCG	Biological Condition Gradient
BMP	best management practice
CLEAR	University of Connecticut Center for Land Use Education and Research
cm	centimeter
CWA	Clean Water Act
DDT	dichlorodiphenyltrichloroethane
DEP	Department of Environmental Protection
EPT	Ephemeroptera, Plecoptera, and Trichoptera invertebrate species
ESBTU	Equilibrium Sediment Benchmark Toxic Units
GIS	geographic information system
HOC	hydrophobic organic compound
km	kilometer
m	meter
mg/kg	milligram per kilogram
mg/L	milligram per liter
mm	milimeter
MMSD	Milwaukee Metropolitan Sewerage District
MS4	Municipal Separate Storm Sewer System
NAWQA	National Water-Quality Assessment Program
NLCD	National Land Cover Database
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
OC	organochlorine
PAH	polycyclic aromatic hydrocarbons
PCB	polychlorinated biphenyls
PEC	Probable Effect Concentration
PECQ	Probable Effect Concentration Quotient
PTI	pesticide toxicity index
SPMD	Semipermeable membrane device
TMDL	Total Maximum Daily Load
USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey

Chapter 1

Findings and Management Implications

Urban development is an important agent of environmental change in the United States. The urban footprint on the American landscape has expanded during a century and a half of almost continuous development. Eighty percent of Americans now live in metropolitan areas, and the advantages and challenges of living in these developed areas—convenience, congestion, employment, pollution—are part of the day-to-day realities of most Americans. Nowhere are the environmental changes associated with urban development more evident than in urban streams. Contaminants, habitat destruction, and increasing streamflow flashiness resulting from urban development have been associated with the disruption of biological communities, particularly the loss of sensitive aquatic species. Every stream is connected downstream to larger water bodies, including rivers, reservoirs, and ultimately coastal waters. Inputs of chemical contaminants or sediments at any point along the stream can cause degradation downstream with adverse effects on biological communities and on economically valuable resources, such as fisheries and tourism.

In response to general concerns about the degradation of urban streams, the U.S. Geological Survey (USGS) conducted a national-scale, scientific investigation of the effects of urban development on stream ecosystems. Nine metropolitan study areas of the United States were selected—Portland, Oregon; Salt Lake City, Utah; Birmingham, Alabama; Atlanta, Georgia; Raleigh, North Carolina; Boston, Massachusetts; Denver, Colorado; Dallas, Texas; and Milwaukee, Wisconsin. The studies were conducted in Salt Lake City, Birmingham, and Boston in 1999–2000; in Atlanta, Raleigh, and Denver in 2002–2003; and in Portland, Dallas, and Milwaukee in 2003–2004.

The comprehensive investigation of all nine studies focused on three broad questions of interest to decision makers:

1. What are the primary effects of urban development on stream ecosystems?
2. How do the effects of urban development on stream ecosystems vary regionally across the country?
3. Which urban-related stressors are most closely linked to biological community degradation, and how can multiple stressors be managed to protect stream health as a watershed becomes increasingly urbanized?

Multiple Stressors Influence How Stream Ecosystems Respond to Urban Development

The investigation provides a science-based approach for describing and explaining the effects of urban development on stream hydrology, habitat, chemistry, and ultimately, aquatic biota, which are separate components that function collectively in defining a stream ecosystem (fig. 1–1).

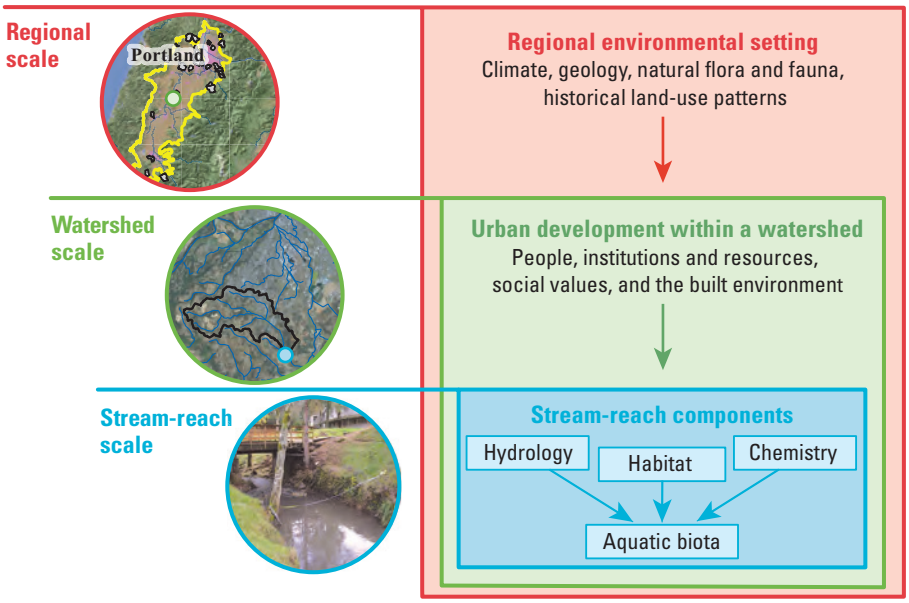

Figure 1–1. Predicting how an urban stream ecosystem will respond to management actions requires understanding the interactions among many environmental factors that affect processes operating at regional, watershed, and stream-reach scales. Processes can include such things as the hydrologic cycle at the regional scale, road construction at the watershed scale, and photosynthesis at the stream-reach scale.

No Single Factor Related to Stream Hydrology, Habitat, or Chemistry Was Universally Important in Explaining Responses of Biological Communities to Urban Development

Analyses of how changes in stream hydrology, habitat, and chemistry relate to the species composition of biological communities indicate that no single environmental factor was universally important across all the study areas in explaining the effects of urban development on stream ecosystems. Even within a single study area, the three biological communities that were surveyed—algal, invertebrate, and fish—had different responses to urban development and changing environmental factors. The algal, invertebrate, and fish communities have different life cycles and requirements for food, shelter, and reproduction; consequently, their responses typically vary with stressors that arise from urban-related changes in physical and chemical factors. Different responses among the three communities, however, can provide important clues about the types of stressors that occur with urban development, which then can be linked to management actions that may be appropriate for improving stream conditions.

Hydrology—Streamflow Flashiness Increased With Urban Development (Chapter 4)

Urban development typically increases the amount of water entering a stream after a storm and decreases the time that it takes for the water to travel over altered land surfaces before entering the stream. Efforts to reduce flooding by draining water quickly from roads and parking lots can result in increased amounts of water reaching a stream within a short period of time, which can lead to stream flashiness and altered stream channels. Additionally, rapid runoff reduces the amount of water available to infiltrate the soil and recharge the aquifers, which often results in lower sustained streamflows, especially during summer. Increases in streamflows can cause erosion of streambeds and streambanks, thereby degrading spawning and feeding habitats for fish and reducing living space for invertebrates (fig. 1–2).

Habitat—Urban Development Can Alter Stream Channels (Chapter 4)

Stream habitats can be severely altered where urban development occurs along the streambanks, such as where a stream has been straightened by channelization or where manmade structures have replaced natural riparian vegetation. Habitat within a particular stream reach also can be altered as a result of development occurring much farther upstream in the watershed. The USGS investigation was designed specifically to measure the effects on streams from urban development throughout the watersheds; therefore, changes to habitat were attributed to development that was occurring upstream from the stream reach that was sampled.

The most consistently observed responses of habitat to urban development were related to changes in the stream channel, even when urban development was not occurring directly along the stream reach. Often, urban development was related to an increase in the stream-channel depth or an increase in the stream-channel cross-sectional area. Additionally, urban development in some regions was related to an increase in the percentage of sand and silt in the streambed sediment as levels of urban development increased in the watershed. These two changes in stream habitat are a result of erosional processes, but it is important to recognize that the potential for erosion frequently depends on natural environmental factors, such as the geology and soils of a region, that can influence the geomorphic characteristics of a stream and its watershed.

Figure 1–2. Frequent high flows increase the potential and severity of erosion, habitat degradation, and destruction of road crossings and infrastructure. This road crossing was washed out during a flood near Atlanta, Ga., in 2009.

Stream Chemistry—Concentrations of Contaminants in Water Increased With Urban Development (Chapter 4)

Concentrations of contaminants, including nitrogen, chloride, insecticides, and polycyclic aromatic hydrocarbons (PAHs), increased with urban development, although few measurements exceeded any human or aquatic-life benchmarks. The total concentration of insecticides increased with urban development in seven of the nine study areas. The numbers of individual insecticides detected and the relation between total concentrations of these compounds and the amount of urban development varied across the study areas and appeared to coincide with regional pesticide-use patterns. For instance, higher concentrations of the insecticides chlorpyrifos and chlordane were detected in urban streams in the Atlanta, Dallas, and Raleigh study areas because of the historical use of these compounds for termite control. These results underscore the importance that regional differences need to be taken into account when comparing the influence of urban development on aquatic biota in different areas.

An increase in chloride concentrations relative to urban development was observed in all nine study areas (fig. 1–3). The link between urban development and increasing chloride concentrations occurred even in areas with warm climates where deicing chemicals are used infrequently, which suggests sources of chloride other than road salt.

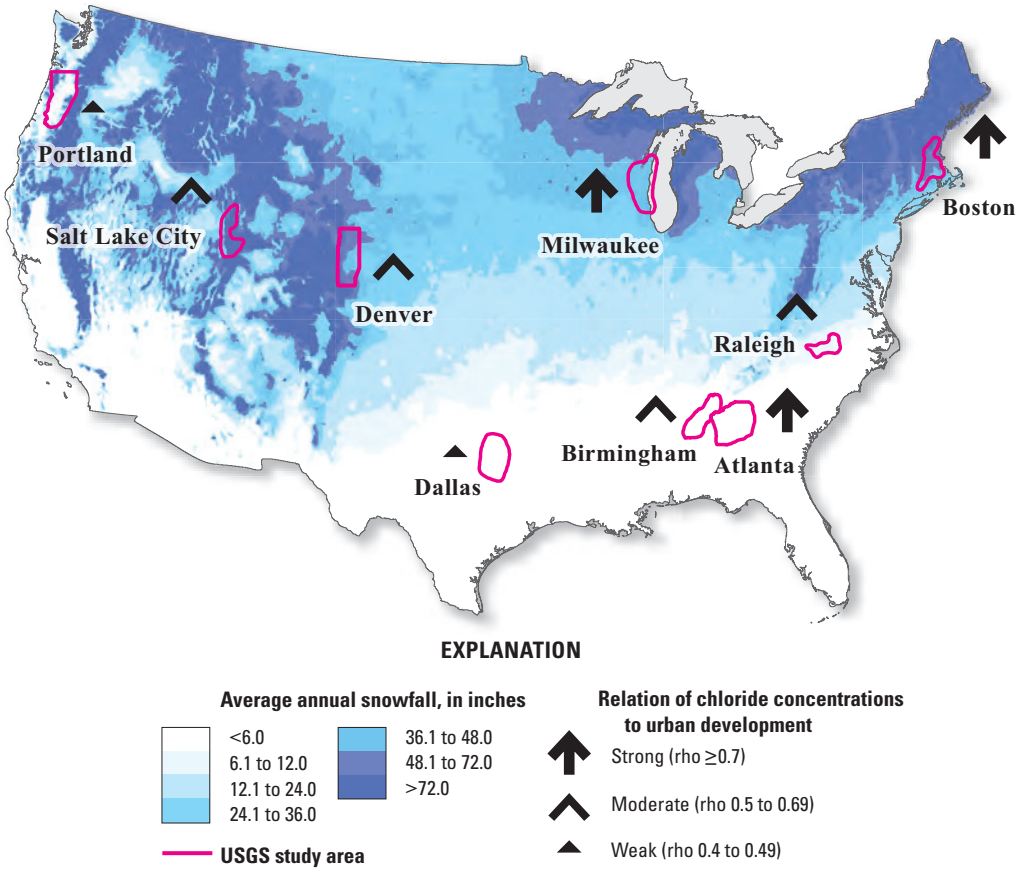

Figure 1–3. Chloride concentrations during low-flow conditions increased in response to urban development in all study areas, even in warmer climate areas with low amounts of snowfall where deicing chemicals are seldom used. The general pattern of increased chloride concentrations with urban development is noteworthy because such a change in water quality can adversely affect aquatic communities.

Aquatic Biota—Loss of Sensitive Species Was the Most Consistent Biological Response to Urban Development (Chapter 5)

Urban development generally results in a shift in the species composition of the algal, invertebrate, and fish communities. However, the most consistent change in any of the biological communities was the loss of sensitive invertebrate species and a shift to species that are more tolerant to physical and chemical stressors. A loss in the numbers (richness) of sensitive species, which is related to a decrease in Ephemeroptera (mayflies), Plecoptera (stoneflies), and Trichoptera (caddisflies) invertebrate species (typically abbreviated as EPT), was a common response in all study areas where urban development occurred in forested watersheds. The number of EPT species is a biological condition metric that is used in many biomonitoring programs across the country because it is sensitive to environmental degradation. A reduction of more than 50 percent of EPT species was observed in some study areas as urban development increased in the watersheds (fig. 1–4).

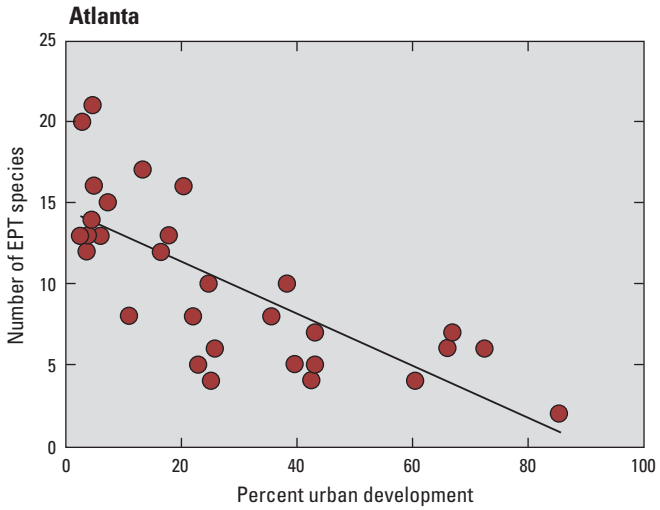

Figure 1–4. In the Atlanta study area, urban development resulted in the loss of Ephemeroptera, Plecoptera, and Trichoptera (EPT) species, many of which are sensitive to contaminants, changes in streamflow, and other stressors.

Invertebrate Communities Begin to Degrade at the Earliest Stages of Urban Development (Chapter 5)

Some invertebrate species are highly sensitive to physical and chemical changes associated with urban development (fig. 1–5). There was no evidence of a resistance threshold, which is a point along the response curve that indicates the invertebrate community begins to change after remaining

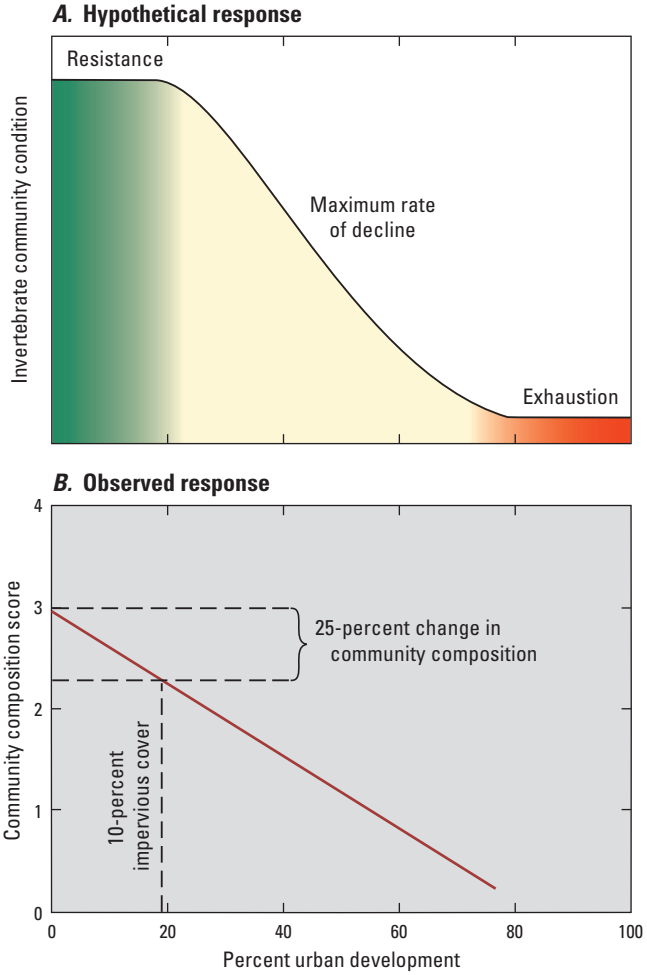

Figure 1–5. A frequent assumption is *(A)* that biological communities are resistant to change at low levels of urban development. Then, as levels of urban development increase, a period of rapid degradation occurs in the community condition, ending in a period of exhaustion when no further change occurs. The observed response *(B)* of invertebrate communities to urban development in the Boston study area differed from the hypothetical response. At 10-percent impervious cover (just under 20-percent urban development), the community composition changed by about 25 percent.

stable during the early stages of urban development. Likewise, no indication of an exhaustion threshold was observed. An exhaustion threshold identifies a point along a response curve where the population of relatively sensitive species within a community is "exhausted" and only tolerant species remain. The lack of an exhaustion threshold indicates that stream-rehabilitation efforts could have a positive effect on the biological condition of a stream regardless of the level of urban development in the watershed.

Management Implications

- Stormwater-management strategies that result in disconnecting impervious cover from the storm-drainage systems may reduce streamflow flashiness, thereby reducing channel erosion and protecting stream habitat.
- Strategies that result in slowing the runoff of precipitation from developed areas to nearby streams can increase infiltration to groundwater, which can help sustain streamflows during the summer and fall and reduce the amounts of contaminants that are transported to streams in stormwater runoff.
- Because the response of fish, invertebrates, and algae to physical and chemical stressors varies, monitoring all three communities provides multiple lines of evidence when assessing the effects of disturbances to aquatic systems.
- Strategies that carefully manage development in undisturbed watersheds are important for minimizing detrimental effects on aquatic biological communities because the degradation of these communities begins at the onset of urban development.
- The lack of an exhaustion threshold in the biotic response indicates that stream-rehabilitation efforts are likely to improve the biological condition of many streams in urban areas.
- The continuous decline in the biological condition of a stream as the amount of urban development increases in a watershed indicates that biological diversity and food-web complexity may be reduced. These types of changes may make the stream and the ecosystem as a whole more vulnerable to other changes, such as the introduction of non-native species.

Urban Development Affects Stream Ecosystems Differently Across the Country

Stream ecosystems are defined by factors such as climate, geology, topography, land cover, and dominant land-use patterns that are fundamentally different across the country. These factors create a template for the stream-reach components of hydrology, habitat, and chemistry that influences the species composition of aquatic biological communities. Consequently, even as a watershed undergoes urban development in a particular region, biological communities of the stream will still retain certain relatively distinct regional characteristics of species composition.

Regional Differences in the Types of Land (Forested or Agricultural) Undergoing Urban Development Influenced the Response of Stream Chemistry and Aquatic Biota (Chapters 4 and 5)

In-stream concentrations of total nitrogen increased with urban development in the Portland, Atlanta, Raleigh, and Boston study areas, which were regions where land cover prior to urban development was primarily forested. In the Denver, Dallas, and Milwaukee study areas, the predominant land cover prior to urban development was agriculture and grassland. Land-management practices associated with agriculture can contribute to elevated nitrogen concentrations in streams that are not related to urban development. Consequently, nitrogen concentrations were considerably higher in streams with low urban development in the Denver, Dallas, and Milwaukee areas than in comparable streams in study areas where urban development occurred in forested watersheds. As a result, a relation between urban development and nitrogen concentrations was not apparent in the Denver, Dallas, and Milwaukee study areas.

The response patterns for total herbicide concentrations were similar to the response patterns for nitrogen concentrations; increasing herbicide concentrations were observed only in study areas where forested land was being converted to urban uses (Portland, Salt Lake City, Birmingham, Atlanta, and Raleigh). In the Dallas and Milwaukee study areas, where agriculture was the pre-urban development land cover, herbicide concentrations were highest at sites with less than 20 percent urban development.

In the Denver, Dallas, and Milwaukee study areas, the pre-urban land cover (grassland and agriculture) was an important factor in how the biological communities responded to urban development. In these three study areas, the decline in biological communities was consistently less than in the other study areas. The reason for this difference was not because biological communities in these regions were more resilient to stressors from urban development but because the biological communities already had lost sensitive species to stressors from pre-urban agricultural land-use activities. Thus, the biological communities had been degraded before the onset of urban development (fig. 1–6).

Management Implications

- The response of stream chemistry and biological communities to urban development varies strongly from region to region across the country because of the variation in natural factors, such as geology, climate, and soils. Because natural factors are essential in shaping stream ecosystems, it is critical that these regional differences be taken into account when developing management strategies to protect and improve urban streams.
- Assessing the health of a stream ecosystem is improved by the use of biological community endpoints that are sensitive to changes in urban development for a specific region.

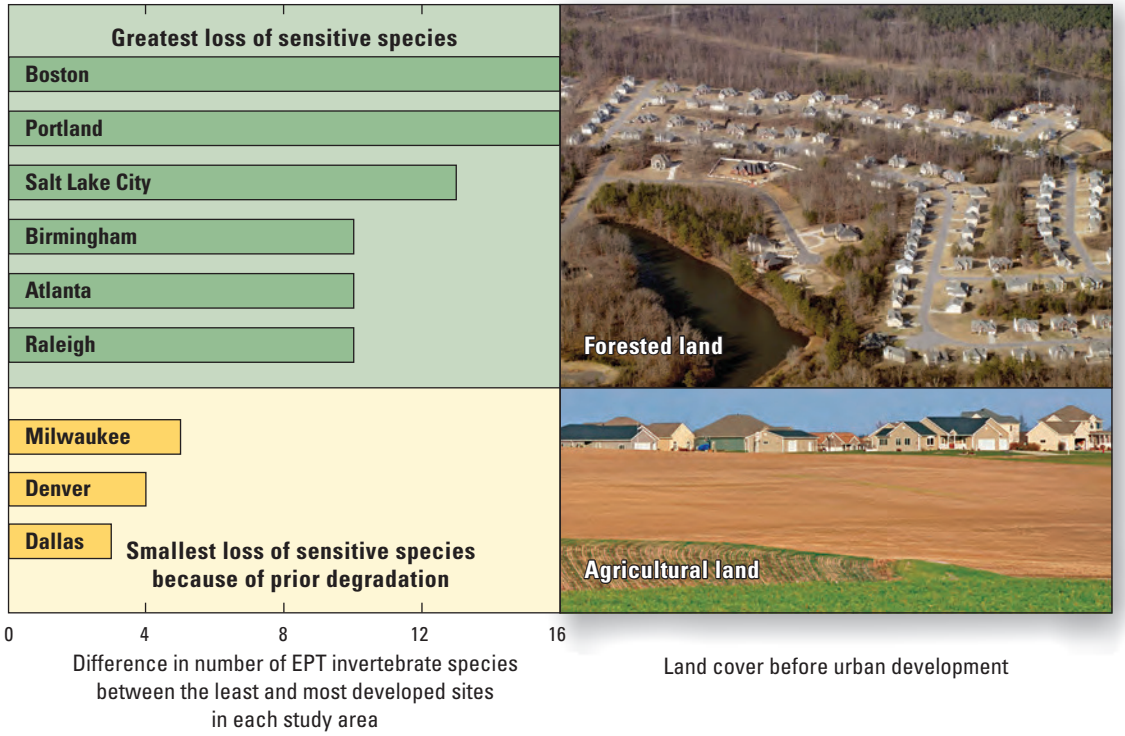

Figure 1–6. The loss of Ephemeroptera, Plecoptera, and Trichoptera (EPT) invertebrate species was greatest when urban development occurred on forested land (green bars). Fewer species were lost in streams of agricultural watersheds (yellow bars) because the biological communities already had endured some degree of degradation associated with agricultural land-use activities, and relatively sensitive EPT species were already absent in streams in these areas.

New Innovative Tool Predicts the Effects of Hydrology, Habitat, and Chemistry on Stream Health

In a pilot investigation using data from the Boston study area, an innovative regional model was developed for New England to predict how different combinations of urban-related stressors associated with stream hydrology, habitat, and chemistry affect stream health, as measured by changes in the invertebrate community. The tool can be used to evaluate how changes to one or multiple urban stressors can affect biological endpoints and the likelihood of attaining the desired stream-health goal (fig. 1–7). The model was structured to predict the probability of attaining six tiers of stream health, which makes it possible for different management scenarios to be evaluated for protecting stream health in urbanizing areas. For example, the model predicted that the likelihood of attaining a healthy stream would be only about 25 percent when the levels of urban development in a watershed exceeded 31 percent. Management actions to improve water quality and reduce stream flashiness are predicted to increase the likelihood of attaining a healthy stream to about 70 percent.

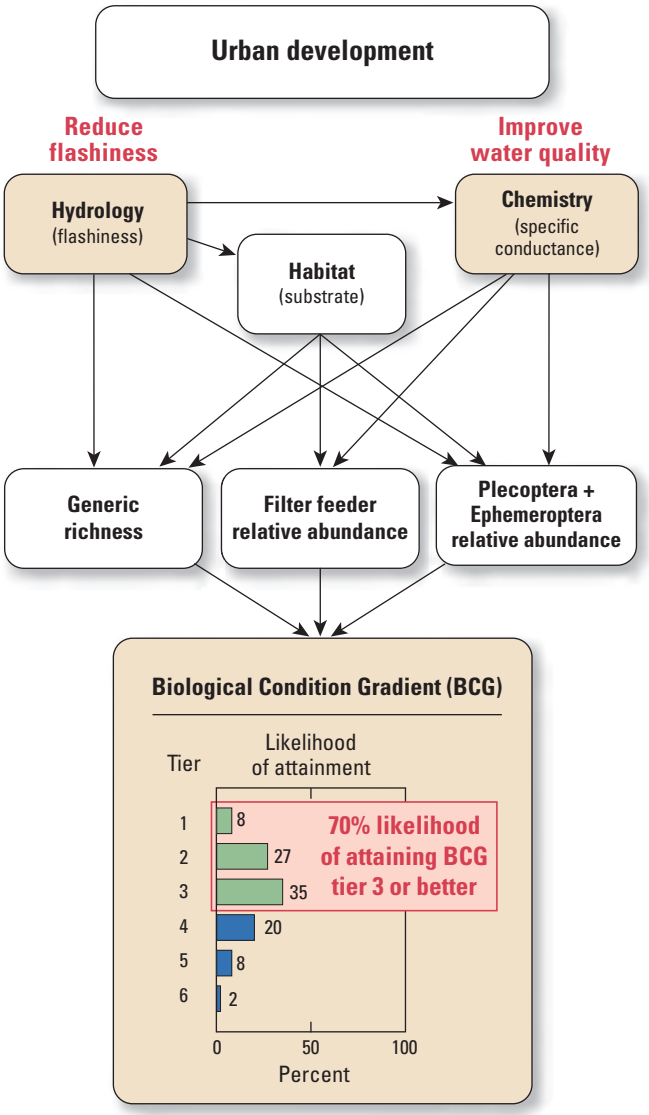

Figure 1–7. Stream health in urban areas is often affected by multiple stressors associated with stream hydrology, habitat, and chemistry. New multi-stressor models can provide insights on how management actions to improve one or more of these stressors may increase the likelihood of obtaining a desired biological condition. For instance, management actions to reduce stream flashiness and improve water quality in the Boston study area are predicted to increase the likelihood of attaining a healthy stream to about 70 percent.

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Chapter 2

Background—Understanding Influences of Urban Development on Stream Ecosystems

The advantages and challenges of living in metropolitan areas are a fundamental part of the day-to-day realities of most Americans and much of the world's population. The challenges will continue as global populations grow at an unprecedented rate. Cities are currently home to half of the world's 7 billion people (2012), and more than 95 percent of the net increase in population will occur in urban areas during the next 50 years (Ash and others, 2008; Grimm and others, 2008). The highest rates of population growth and land development across the United States occur at the edges of existing metropolitan areas (Fulton and others, 2001; Markham and Steinzor, 2006). The U.S. population from 1982–1997 increased 17 percent, and urbanized land area increased 47 percent (Fulton and others, 2001; Sierra Club, 2003; American Farmland Trust, 2009). About 20 percent more land was developed by 2003 per person (for housing, schools, shopping, manufacturing, roads, and other land uses) than had been 20 years earlier, as suburbs spread out from dense city cores (Markham and Steinzor, 2006).

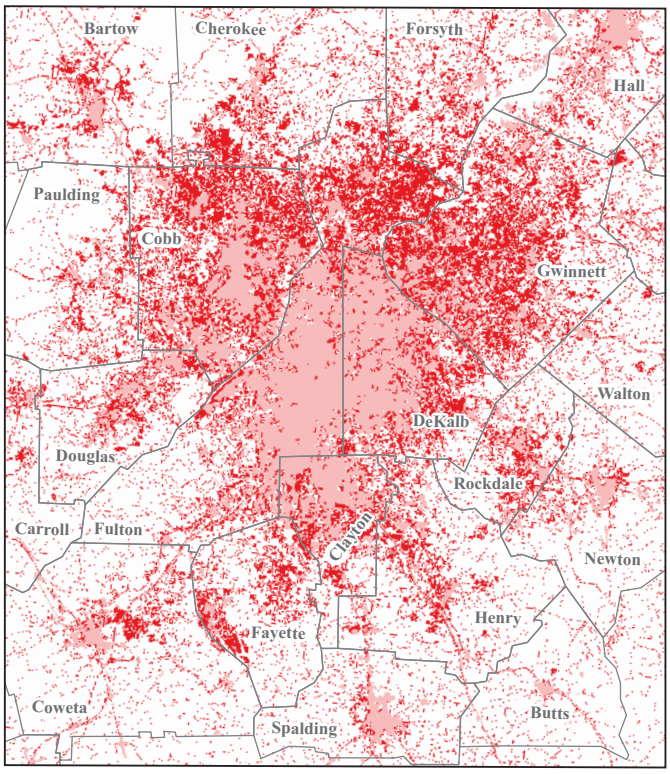

The pattern of urban development through time is visible in the expanding footprint of developed land in the Atlanta area between the early 1970s and 2001. This metropolitan area recorded phenomenal growth, as demonstrated by an average of 69,000 people moving into the area each year during the 1990s. With most of the population growth occurring outside the city limits, urban land area in the Atlanta metropolitan area increased by 50 percent during this period, and it was estimated that almost 50 acres of tree cover were lost to urban growth every day during the 1990s (Georgia Forestry Commission, 2001; modified from Bluestone and others, 2008).

EXPLANATION

- Developed land 1973–1974
- Developed land 2001

This chapter introduces a framework for understanding the influences of urban development on stream ecosystems. Key features of urban development and stream ecosystems are described that will be useful for understanding the study design (chapter 3), the findings (chapters 4–6), and the management options (chapter 7).

Metropolitan areas provide opportunities for employment, housing, medical services, education, and recreation to both residents and visitors (Bluestone and others, 2008). Compared to rural areas, however, metropolitan areas consume more resources, generate more waste, and create a greater need for waste treatment and disposal. Many of the resources required to support a metropolitan area, such as clean drinking water, are imported from elsewhere, which can often result in management practices that extend the effects of urban development outside the municipal borders (Rees and Wackernagel, 1994; Alberti and others, 2003; Grimm and others, 2008).

Effects of urban development are particularly evident in the physical, chemical, and biological characteristics of local streams. Urban development often results in natural vegetation and native topsoil being replaced with impervious cover (rooftops and pavement, such as roads, parking lots, and driveways) that blocks the infiltration of rain and snowmelt into the ground. Thus, the water-retention and evapotranspiration functions of the soil and natural vegetation are lost and replaced by the construction of artificial drainage systems that alter the natural movement of precipitation to streams. These modified systems often result in high volumes of stormwater flowing rapidly over the landscape to receiving streams. The speed and amount of water flowing to streams combined with pollutant sources, such as sediment, nutrients, fertilizers, and other contaminants, have been linked to changes in

1. Stream hydrology—The amount, movement, and distribution of water (U.S. Environmental Protection Agency, 1997; Poff and others, 2006; Poff and others, 2010; Steuer and others, 2010);

2. Stream habitat—The physical structure of the stream that is home for organisms (biota), such as invertebrates and fish (Roy and others, 2003; Chin, 2006; Fitzpatrick and Peppler, 2010);

3. Stream chemistry—The chemical characteristics of the stream that are associated with water quality (Mahler and others, 2005; Gilliom and others, 2006; Sprague and others, 2007); and

4. Aquatic biota—Degradation of the stream's biological communities: algae (Walker and Pan, 2006; Coles and others, 2009), insects and other invertebrates (Roy and others, 2003; Cuffney and others, 2010), and fish (Meador and others, 2005; Roy and others, 2007; Brown and others, 2009).

Degraded urban streams have fewer beneficial uses than healthy urban streams. More frequent or severe flooding and a decrease in recreational opportunities result from declining health of streams and the surrounding land areas. Loss of the beneficial uses of a stream may discourage certain development opportunities and require expensive stream rehabilitation efforts (fig. 2–1; U.S. Environmental Protection Agency, 1995).

Figure 2–1. Rehabilitation of urban streams, such as this effort in Milwaukee, Wis., to reconnect the stream with the flood plain can be expensive and can require years of planning, construction, and monitoring.

Why Do We Care About Stream Ecosystems?

Healthy, natural streams provide many benefits to society (see sidebar, Ecosystem Services Provide a Way to Link the Condition of a Stream Ecosystem to Societal Well-Being). Among these benefits is the ability to capture and use nutrients such as nitrogen and phosphorus. Nutrients are transformed by biological, chemical, and physical processes occurring in the flood plain, near-stream or riparian areas, and within the stream. For example, nutrients that are dissolved in water can be retained within the flood plain and riparian areas where the nutrient-laden water is taken up by plants and microorganisms in the soil, such as fungi and bacteria (Pinay and others, 2002; Groffman and others, 2003; Pickett and others, 2008). Thus, nutrients that could foster nuisance algal blooms if introduced directly into the stream are assimilated instead into biological organisms that live within the flood plain and riparian areas.

Intact flood plain and riparian areas along urban streams that retain their natural vegetative cover and are well connected to the stream are important in flood reduction. Trees, shrubs, and other vegetation decrease the speed of water flowing over the land surface, thus allowing time for the water to infiltrate into the soil or be taken up by plants. Additionally, plant roots anchor the soil in the flood plain and the streambank. Well-vegetated riparian areas around a stream can provide communities with opportunities to incorporate green space around its waterways. The flood plains and riparian areas along many urban streams have been enhanced with paths for walking, jogging, and bicycling. Appreciation for the streams and nearby lands is strengthened by these interactions.

Biodiversity—the number of species and "evenness" in the number of individual organisms among the different species—plays a central role in the healthy functioning of streams. Biodiversity supports stream processes such as

Ecosystem Services Provide a Way to Link the Condition of a Stream Ecosystem to Societal Well-Being

The ecosystem services concept provides a framework for linking the chemical, physical, and biological processes in a stream, and the outcomes of these processes to the well-being of the people who appreciate the stream ecosystem (Boyd and Banzhaf, 2007). Appreciating a healthy stream ecosystem begins with understanding the processes—for example, nutrient assimilation, the hydrologic cycle, and photosynthesis—and by recognizing that they influence measurable outcomes, such as a change in the diversity of a stream's biota. A healthy stream ecosystem in turn contributes to societal well-being by providing recreation, drinking water, and aesthetics (fig. 2–2). Two examples illustrate the concept of ecosystem services.

Cardinale (2011) discusses how a diverse algal community in streams contributes to the removal of nutrients that might otherwise degrade water quality. Complex stream habitats require many different algal species to fully occupy and use all the available habitats. Loss of algal diversity can result in vacant or under-used habitats and reduce the processing of nutrients (Cardinale, 2011; Cardinale and others, 2011; Hector, 2011). By serving as a buffer against the ecological impacts of nutrient pollution, biodiversity contributes directly to at least two outcomes beneficial to human communities: aesthetic (avoiding nuisance blooms of undesirable algae species) and practical (meeting Clean Water Act nutrient standards).

Ecosystem services also are produced by the forested watersheds that are part of New York City's water-supply system. By utilizing the natural filtration abilities of the forests and forest soils while restricting activities that can occur on the land, New York City's Department of Environmental Protection has been able to avoid substantial water-filtration costs. Compliance with U.S. Environmental Protection Agency (USEPA) source-water protection regulations would have cost the city an estimated $4 to $6 billion to develop a filtration system (Budrock, 1997). A Watershed Memorandum Agreement allows the city to work collaboratively with partners to use a variety of source-water protection techniques—many focused on preservation of forest lands—to preserve water quality and exempt the city from the USEPA's filtration requirement (see *http://www.nycwatershed.org/* and *http://www.nyc.gov/html/dep/html/watershed_protection/index.shtml*).

In each case, processes at work in the stream (algae occupying available habitat) or watershed (protecting forested land) create outcomes that are of value to society. An ecosystem services framework links these ecosystem processes and outcomes and then provides a mechanism for valuing these outcomes. Society may be able to value these outcomes in monetary terms, such as the cost savings of not having to develop a watershed-management plan or install a water-filtration system. Other outcomes, such as avoiding unsightly blooms of nuisance algae, may be difficult to value in monetary terms but still contribute to societal well-being.

Figure 2–2. Recreational benefits, such as fishing or swimming, can become limited when stream ecosystems are degraded by alterations either to a stream or within its watershed.

nutrient removal and dynamic interactions between flood plains and streams. Furthermore, a stream with a diverse collection of biota can better withstand natural and human disruptions and have a greater chance to recover from various disturbances (Karr and Dudley, 1981). Moreover, every stream is connected to downstream water bodies, including rivers, reservoirs, and ultimately, oceans. Inputs of chemical contaminants or sediments at any point along the stream can cause degradation downstream with adverse effects on biological communities and on economically valuable resources, such as fisheries and tourism. Healthy urban streams can be protected with regard to beneficial uses under the Clean Water Act (CWA), which establishes water-quality goals aimed at protecting and restoring the chemical, physical, and biological integrity of the Nation's waters (see sidebar, The Clean Water Act Provides a Regulatory Context for Restoring and Maintaining Water Quality).

How Do Natural Stream Ecosystems Function?

Natural stream ecosystems include habitats for plants and animals, the cycling of water through the system, the chemistry of the water, and the aquatic biota, as well as the watershed that is part of a larger region of the country. These characteristics are linked by processes, such as the transformation of energy that occurs in a stream ecosystem from the cycling of water and nutrients, and from human activities that alter the landscape. Although stream ecosystems can be resilient to short-term disturbances (for example, a flood), the extent of the resilience from long-term disturbances (for example, urban development) in any stream is often unknown (Baron and others, 2002; Alberti and Marzluff, 2004; Millennium Ecosystem Assessment, 2005; Walsh and others, 2005b).

The Clean Water Act Provides a Regulatory Context for Restoring and Maintaining Water Quality

The key legislative authority for regulating urban water-quality issues is the Clean Water Act (CWA), especially the amendments in 1987 and 1999 that established programs for regulation of urban stormwater discharges. Under the National Pollutant Discharge Elimination System (NPDES) permitting program, industrial and municipal sources are required to limit stormwater discharges to waters of the United States. Many municipalities are required to issue permits to limit stormwater discharges. However, because permits have not been tied directly to meeting a specific water-quality standard or outcome, the achievement of water-quality improvements has been an elusive goal (National Research Council, 2008).

Major parts of the CWA that are currently being used to address urban stormwater issues and improve water quality include water-quality standards and the Total Maximum Daily Load (TMDL) Program. Implementation of these requirements begins with identifying beneficial uses for each water body in a state by its use classification, such as recreation, drinking water, and aquatic life; or economic uses associated with agriculture, industry, or municipalities. Some states and tribes designate tiers of beneficial uses above a baseline level of acceptable water quality; these multiple tiers are used to help prevent degradation of high-quality waters. The description of these uses can serve as a water-quality standard. Measurable water-quality criteria are used to assess whether these standards have been attained. Criteria can be quantitative or descriptive, and can be developed for physical, chemical, and biological measures. Maine, for example, uses multiple tiers of biological criteria to determine if water bodies are attaining water-quality standards (Maine Department of Environmental Protection, 2005).

The USEPA, states, and tribes are responsible for implementing the CWA. States monitor their waters to identify water bodies that are impaired and do not meet water-quality standards. A TMDL plan must be prepared when a water body is listed as impaired. A TMDL is used to estimate the amount of a pollutant (for example, nutrients, sediment, metals, bacteria) that a water body can receive from different sources and still meet water-quality standards. Guidelines can be developed for landscape characteristics (for example, the amount of impervious cover in a watershed) and for pollutants. Successful implementation of these guidelines typically requires establishing a range of management practices. TMDLs for impaired streams in urban areas are enforced through NPDES permit requirements and can be very costly to address and achieve. Failure to meet CWA goals, as they are reflected in federal and state regulations and standards, can result in the classification of waters as impaired and subject to expensive cleanup efforts.

Aquatic Biota Function Within a Foodweb

The aquatic biota that are the focus of this investigation—algae, invertebrates, and fish—function as an ensemble. The stream foodweb illustrates how material and energy are transferred within the biological community (fig. 2–3). This transfer of material and energy also occurs along the length of a stream (see sidebar, Streams Change Continually as They Flow From Headwaters to the Mouth). In a healthy stream ecosystem, the needs of one organism are met by its environment and often by other biota. High biodiversity often allows for these needs to be met by more than one species, which can provide some level of resilience against natural and human-induced disturbances.

Algae are the primary producers in streams, using photosynthesis (sunlight, water, nutrients, and carbon dioxide) to produce food (plant matter, sugars, and oils) and oxygen that can then be used by other aquatic biota. Generally, diatoms are the most abundant group of algae in healthy streams (Lowe and LaLiberte, 1996). Algae that are attached to rocks, sediment, and woody debris are the principal algal types in small and moderate-sized streams.

Invertebrates and fish that feed directly on algae and plant matter are called primary consumers. Primary consumers scrape algae, bacteria, and fungi from submerged rocks and other surfaces, filter algae and detritus from flowing water, or shred plant matter that has come into the stream from the surrounding landscape. Invertebrates include animals such as snails, mussels or clams, worms, leeches, and the larvae of many insects.

Fish that feed on animals, such as invertebrates or other fish, are examples of secondary consumers. Because fish have life cycles that span years and are affected by many disturbances that occur over time, they reflect long-term changes in the aquatic foodweb. The larval stages of some insects, such as stoneflies and dragonflies, are considered secondary consumers because they eat other invertebrates and sometimes small fish. Humans are also secondary consumers.

Finally, decomposers are mostly fungi and bacteria that break down waste products and dead or decaying organisms into simpler compounds of carbon and nitrogen that are used by producers. The decomposition processes are a form of "respiration" and, thus, can reduce the concentration of dissolved oxygen in water when these processes are at especially high levels. Algae, fungi, and bacteria make up biofilms that coat surfaces of rocks, woody debris, and the bottom of streams. Biofilms are used by many aquatic organisms as a source of food.

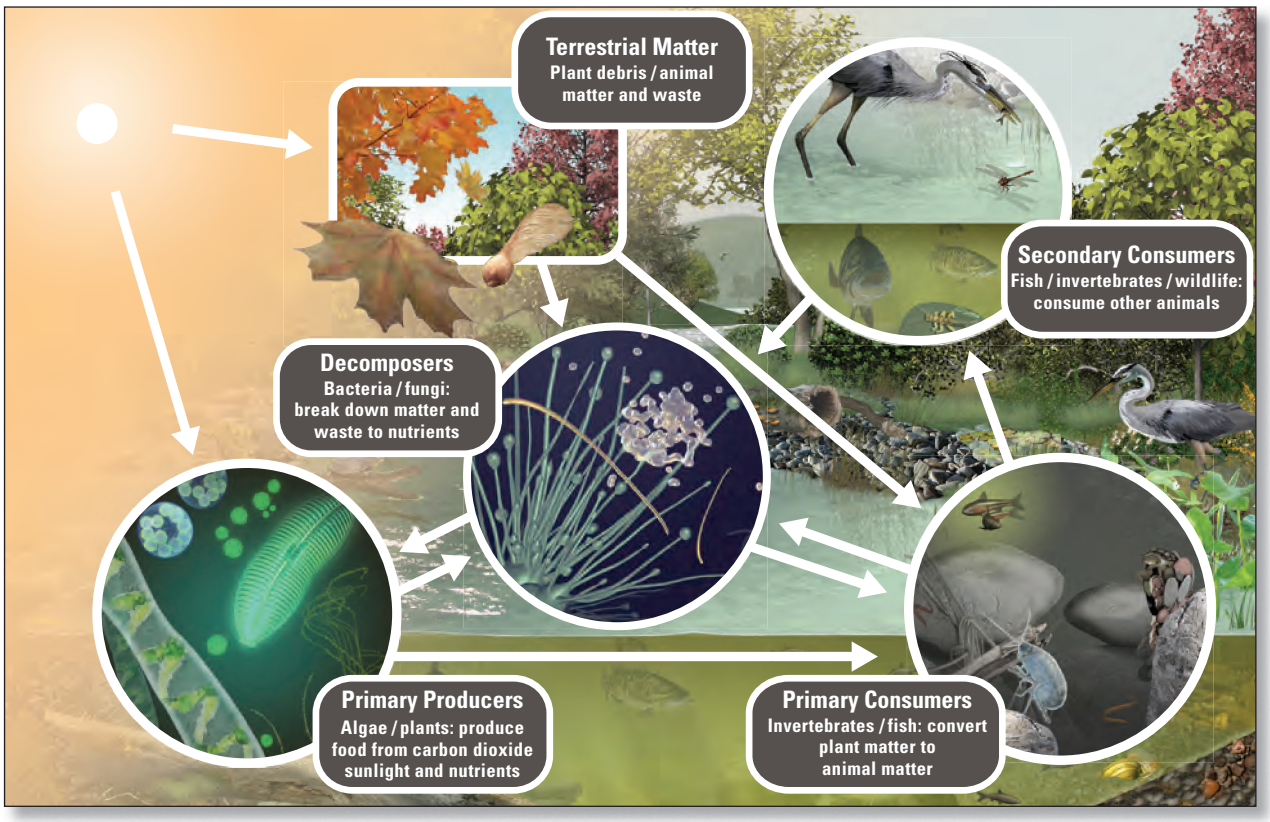

Figure 2–3. A simplified foodweb in a stream ecosystem, showing the interaction between energy coming from the sun and the biota, which include primary producers (diatoms and green algae), primary consumers (caddisflies, amphipods, and minnows), secondary consumers (herons, bass, dragonflies, and stoneflies), and decomposers (bacteria and fungi). (Drawing by Frank Ippolito, Production Post Studios, 110 North Fulton St., Bloomfield, N.J.)

Streams Change Continually as They Flow From Headwaters to the Mouth

The aquatic biota, stream hydrology, habitat, and chemistry of a stream ecosystem change continually from the headwaters of a watershed downstream to a receiving body, such as a reservoir, estuary, or ocean (Vannote and others, 1980; Allan and Castillo, 2007; Meyer and others, 2007). Small streams can be shaded by vegetation for most of the growing season, and dead plant matter, or detritus, such as fallen leaves and wood, enters the streams from the surrounding landscape. The invertebrates in these small streams or headwaters shred plant matter into smaller particles; microorganisms, such as fungi and bacteria, further break down these particles; other invertebrates and fish harvest these smaller particles and microorganisms for food. The headwaters of a stream tend to have fewer species than larger, downstream reaches because of limited habitat and nutrients.

As headwater streams merge with other streams and become wider, more light reaches the water, and habitat for biota becomes more varied. Biodiversity generally increases with increasing stream size in natural systems. Increased light enhances photosynthesis so that algae can grow on submerged surfaces, such as cobble and woody debris. Invertebrates in these larger streams collect and gather their food from the streambed, scrape algae from submerged surfaces, or filter organic particles that are floating downstream. Fish communities become more diverse and begin to include species with wide-ranging feeding preferences that include algae, invertebrates, and other fish.

Stream Hydrology, Habitat, and Chemistry Define the Living Spaces Available to Aquatic Biota

The condition of the living spaces for biota in a stream, as determined by the hydrology, habitat, and chemistry, plays a critical role in determining the species and abundance of biota living there and the overall biodiversity of the stream ecosystem (see Dynamics of a Natural Stream Ecosystem on pages 22–23; drawing by Frank Ippolito, Production Post Studios, 110 North Fulton St., Bloomfield, N.J.).

Hydrology

The movement of water is the main process that connects the landscape to stream ecosystems. In a natural or undeveloped watershed, rainfall and snowmelt reaches a stream through multiple pathways, including overland runoff, infiltration into the soil, and subsurface flow (as groundwater) toward the stream (fig. 2–4).

Natural seasonal patterns of streamflow, together with seasonal changes in light and temperature, serve as life-cycle cues to aquatic biota. Some aquatic insect larvae and clams depend on particular streamflow velocities to transport food to them. Dispersal of offspring for some species is dependent on flow patterns and temperature. Reproduction, larval survival, and growth patterns of many invertebrates and fish are synchronized with seasonal temperatures, day length, and streamflow patterns (Bunn and Arthington, 2002; Lytle and Poff, 2004). Brief, local floods are normal in natural settings, while large floods that inundate the river flood plain are infrequent. Brief floods can increase the biodiversity of a stream while redistributing sediment and nutrients.

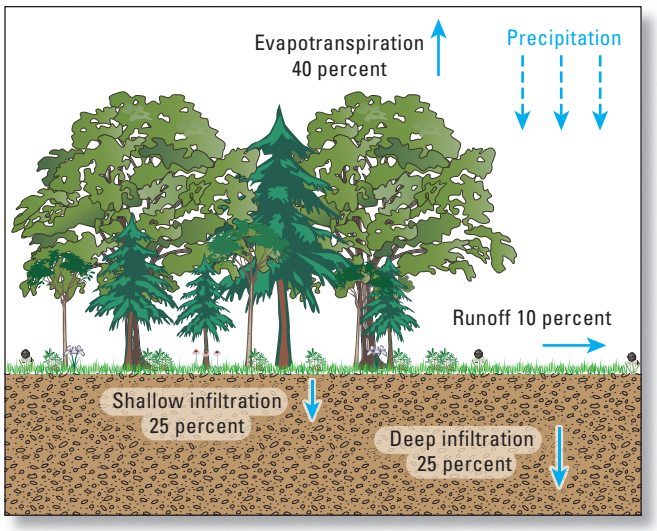

Figure 2–4. In a natural setting, about 40 percent of precipitation returns to the atmosphere through evapotranspiration from vegetation, 50 percent infiltrates into the groundwater system, and 10 percent runs off the land surface. (Modified from Livingston and McCarron, 1992.)

Habitat

The bottom and sides of a stream channel provide a substrate or base on which algae and invertebrates can attach, or into which invertebrates can burrow (see sidebar, Stream Habitat is Home for Aquatic Biota). Stream substrate ranges from small particles of sediment, such as clay and silt, to increasingly larger particles, such as sand, gravel, cobble, and boulders. Substrate also includes woody debris such as submerged tree limbs. Typically, the more varied the types and sizes of substrate, the greater the biodiversity, in part because diverse habitat provides refuge for aquatic biota during disturbances or extreme conditions, such as flash floods or droughts (Schlosser, 1987; Sedell and others, 1990).

The riparian area, the narrow corridor of land immediately adjacent to both sides of a stream, is where terrestrial and aquatic ecosystems meet. Vegetation in the riparian area contributes carbon and other nutrients to the stream from decay of fallen plant matter, and it reduces erosion by helping to stabilize soil in streambanks. Trees that fall into the stream create areas that have varying flow velocities and

can result in undercut streambanks where fish seek refuge (Allan and others, 1997). A well-developed tree canopy shades a stream for much of the day and helps moderate water temperatures during summer (fig. 2–5). Natural riparian areas are oases of biodiversity, providing food, shelter, and resting spots for insects, amphibians, and other terrestrial biota that may depend on streams for part of their lives. These same areas serve as refuges for terrestrial biota displaced by urban development. This oasis effect is one reason riparian areas have aesthetic value to humans and make prime locations for parks and recreational activities.

Figure 2–5. Trees and shrubs along the stream shade the water surface and help to moderate temperature changes during summer. Leaves falling into the stream are an important source of food and nutrients for aquatic biota.

Chemistry

Carbon and nutrients, such as nitrogen and phosphorus, are required for all stream life. They are taken up by algae and biofilms, which are then consumed by other biota to provide building blocks for the entire stream foodweb. Nutrient concentrations tend to be relatively low in streams draining undeveloped watersheds. In some instances, naturally occurring nutrient concentrations are low enough to limit the growth of algae and other plants.

Other chemical elements, such as chloride, iron, magnesium, oxygen, potassium, sodium, and sulfur, influence the nature of chemical reactions in streams. Water temperature and pH control the rate of many chemical reactions and the relative toxicity of some chemicals to aquatic biota. Oxygen dissolved in water is essential for all aquatic biota, and adequate amounts are necessary for optimal biodiversity. Concentrations of dissolved oxygen in a stream are greatly affected by streamflow characteristics, such as velocity and depth, as well as water temperature, sunlight, and plant respiration.

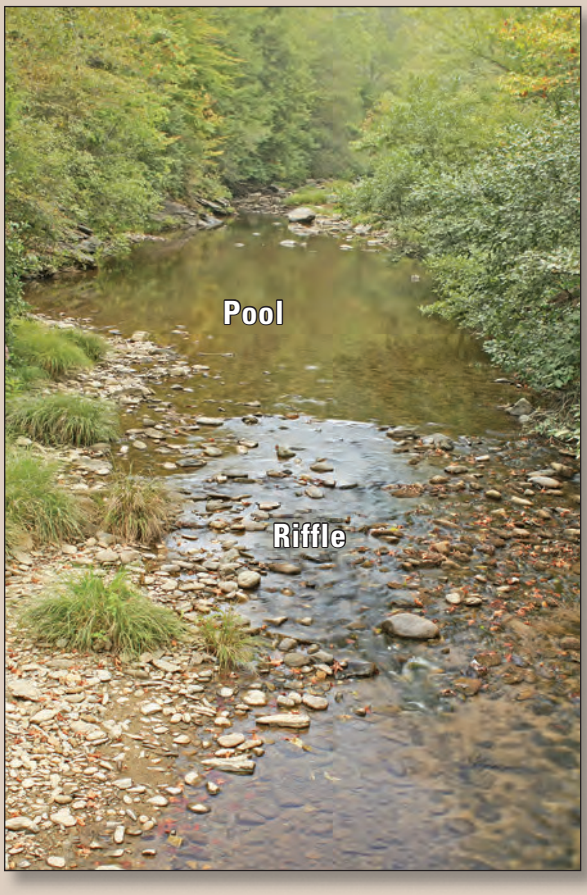

Stream Habitat Is Home for Aquatic Biota

Diverse habitat is essential for healthy stream ecosystems. Stream features, such as the channel, streambed sediment, and streambanks, affect shelter, food, and reproduction for all forms of aquatic biota. Measurements of habitat allow assessment of links among stream processes and biological communities.

Important aquatic habitats include riffles (shallow rocky areas with fast flows) and pools (deep areas with slow-moving water), bars (areas in the channel or sides of channels where gravel or sand builds up), undercut streambanks, backwaters (areas where the direction of streamflow is reversed), and side channels. The location of a stream is not permanent, and streams naturally meander across valley bottoms. As streams slowly migrate across the flood plain, variations in streamflow speed and direction, sediment deposits, woody debris and other flow-resistant materials, and vegetation create a diversity of habitats. When a channel unexpectedly widens or narrows, or if the streambed builds up or is cut downward, it is an indication that the stream is unstable and something has changed in the flow, sediment inputs, or in the vegetation surrounding the stream. Natural vegetation along stream corridors provides shelter, food, and energy sources for aquatic biota. An important aspect of stream habitat, flood-plain connectivity, is the degree to which a channel is hydrologically connected with its flood plain. Flood plains provide habitat for plants, insects, amphibians, reptiles, birds, and mammals, many of which have some connection with life in the stream. The physical connection between the flood plain and stream can be easily altered by changes in streamflow and sediment inputs.

How Does Urban Development Alter a Stream Ecosystem?

Anyone walking along an urban stream can find evidence of the effects of urban development, from highly eroded streambanks to plastic grocery bags caught in tree branches to abandoned shopping carts and tires (see Dynamics of an Urban Stream Ecosystem on pages 24–25; drawing by Frank Ippolito, Production Post Studios, 110 North Fulton St., Bloomfield, N.J.). Urban stream ecosystems are complex and dynamic. Human activities associated with urban development, including the conversion of land from rural to urban uses, addition of impervious cover, chemical contamination, protective structures along streambanks, and use of storm drains and dams affect the biological, physical, and chemical components of streams. The collective outcome of these activities is referred to as the "urban stream syndrome" (Walsh and others, 2005b).

Diversity of Aquatic Biota Declines as Sensitive Species Are Lost

Urban development has a substantial effect on aquatic biota. The most notable effect is a decline in biodiversity as the number of sensitive species in a biological community is reduced by altered stream hydrology, habitat, and chemistry conditions (Paul and Meyer, 2001; Gurnell and others, 2007; Brown and others, 2009; Coles and others, 2009; Cuffney and others, 2010). The number of exotic or introduced species may increase, and the number of native species may decrease. Urban development can result in a loss of stream connectivity, which is the degree to which a stream is connected with upstream and downstream areas and other streams. Impoundments and water diversions are typical water-management features that result in a loss of stream connectivity. Maintaining stream connectivity is important because it allows seasonal migrations and recolonization of areas by native fish and other aquatic biota when an event, such as a drought or chemical spill, has occurred. By contrast, newly created stream connections between dissimilar watersheds can provide an entry for undesirable and non-native species (see sidebar, Aquatic Biota Serve as Sentinels for Watershed Changes; fig. 2–6).

Aquatic Biota Serve as Sentinels for Watershed Changes

Algae, invertebrates, and fish have distinct life cycles, respond differently to physical and chemical stresses, and provide complementary information about the response of stream ecosystems to urban development. Identification of these responses and their relation to stressors from urban development can indicate potential avenues for management actions.

Algae have short life cycles—from days to weeks—and usually respond quickly to local changes in light and stream chemistry. Algal communities are often the initial sentinels for changes in water quality, typically showing a response before the invertebrate or fish communities.

Invertebrates have complex life cycles that span periods of months to several years. The invertebrate community in a stream is sensitive to broad, continuous changes in stressors, such as an increase in chloride concentration and sediment load that can occur in an urbanizing watershed. The ability of invertebrate communities to integrate the effects of local and watershed-wide changes that occur over an extended period of time makes them ideal sentinels for monitoring the effects of urban development.

Fish typically have the most variable response to changes in the hydrology, habitat, and chemistry of a stream, but fish communities are no more resistant to the effects of urban development than other biological communities. Generally, fish live the longest of all aquatic biota, sometimes surviving for many years and moving great distances over their lifetime. Thus, the species composition of the fish community reflects many different influences, such as local changes in stream hydrology, habitat, and chemistry, and watershed changes in land cover and stream connectivity.

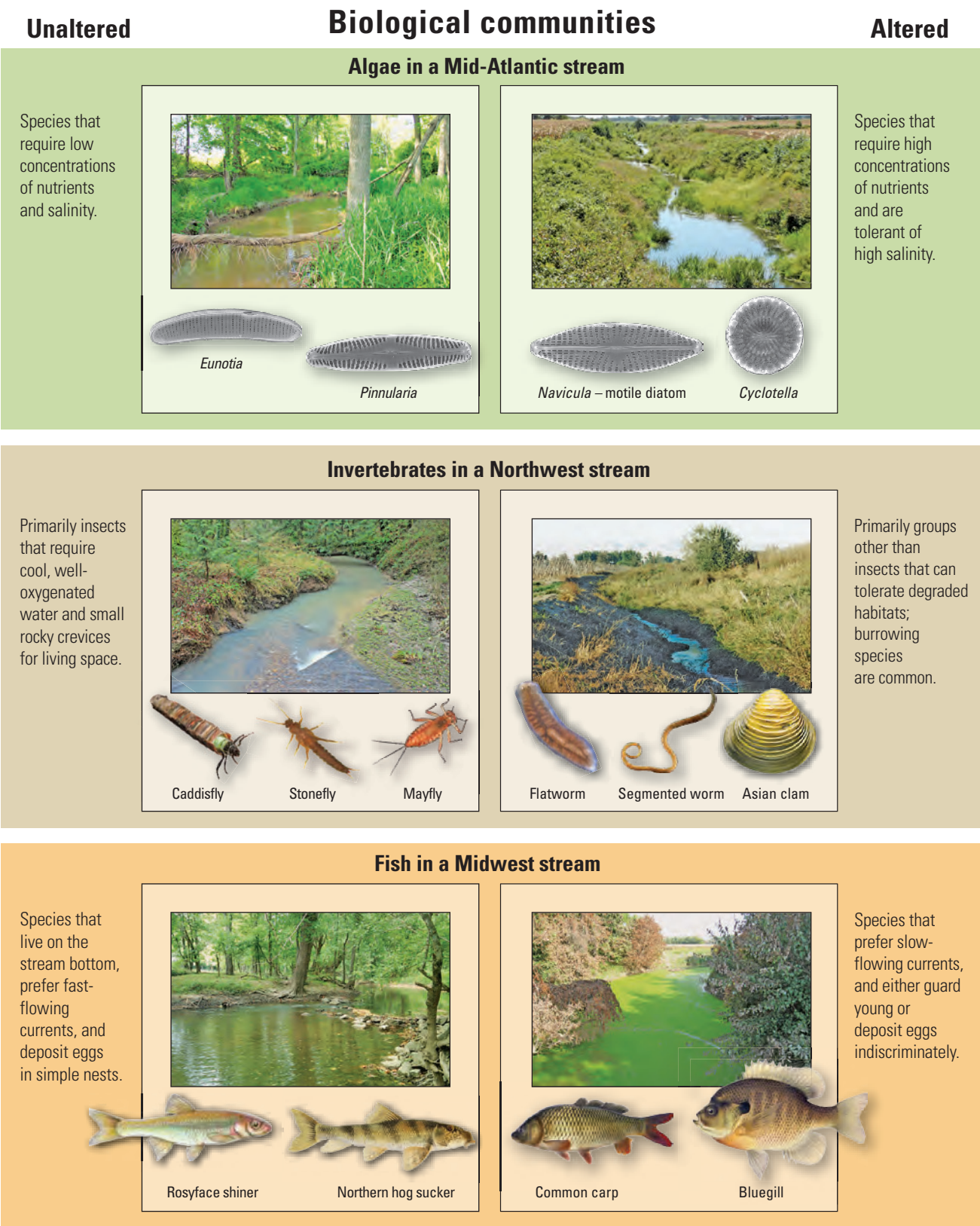

Figure 2–6. The algal, invertebrate, and fish species typically found in altered biological communities differ from those present in unaltered communities. The differences in these communities are often indicative of physical and chemical changes that can accompany urban development across different regions of the country.

Streamflow Pattern Becomes More Flashy

Urban development in a watershed speeds up the movement of water from the time rainfall reaches the ground until the water reaches a stream (fig. 2–7). This acceleration results from the addition of impervious cover and the installation of artificial storm-drain systems that commonly accompany urban development. Stormwater moves quickly to urban streams, leading to a characteristic pattern of "flashy" streamflow—a rapid increase in flow during or following a storm and similarly a rapid decrease when storm runoff ceases (see sidebar, Impervious Cover Increases Streamflow Flashiness). Flashy streamflow patterns can be further exaggerated if stream channels are straightened or lined with concrete to remove stormwater quickly to prevent local flooding.

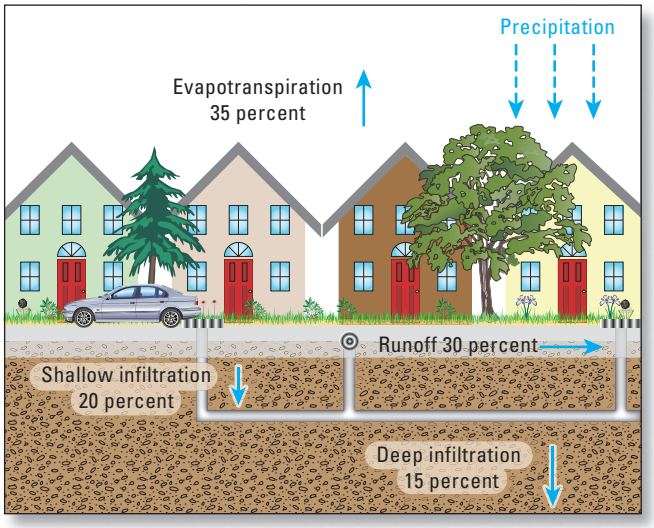

Figure 2–7. Impervious cover and storm drains deliver precipitation rapidly to urban streams, conveying pollutants and adversely affecting stream habitat, chemistry, and aquatic biota. About 35 percent of precipitation in an urban setting returns to the atmosphere through evapotranspiration from vegetation, 35 percent infiltrates into the groundwater system, and 30 percent runs off the land surface, compared to 40 percent evapotranspiration, 50 percent infiltration, and 10 percent runoff in a natural setting (see fig. 2–4). (Modified from Livingston and McCarron, 1992.)

Impervious Cover Increases Streamflow Flashiness

Variations in streamflow, such as high flows and low flows, are natural and provide the diverse habitats needed to sustain a species-rich community of aquatic biota. Precipitation within the watershed in natural ecosystems reaches streams through a combination of overland flow, infiltration into the soil, and the subsequent underground flow toward the stream. Urban development alters these natural patterns of response to precipitation.

Streamflow flashiness refers to a characteristic pattern of streamflow in response to storm events: a rapid onset of high magnitude streamflow of relatively short duration, frequent occurrence of high streamflow conditions, and rapid decline in high streamflows. These characteristics of streamflow flashiness can be used to describe the degree of hydrologic alteration from natural conditions (Poff and others, 1997; McMahon and others, 2003; Steuer and others, 2010).

Magnitude of stormflow is defined as the difference between the peak flow during a storm event and the streamflow prior to the storm event. Impervious cover and storm drains in urban areas deliver larger amounts of runoff to streams than does natural ground cover. This often results in a large increase in peak-stream discharge that can increase the potential for erosion and channel enlargement.

Duration of a high-flow event is the length of time over which a high-flow event occurs. The duration of an individual event usually decreases with development because impervious cover and storm drains transport runoff over a shorter period of time than does natural ground cover. Overland runoff in natural areas is slowed and reduced by vegetation and infiltration into the ground; not all of the water reaches the stream at once. The indicator used in this investigation is the median duration of high-flow events.

Rate of decline in streamflow is a measure of how fast or slow streamflow returns to normal conditions following the peak stormflow. Because impervious cover and storm drains cause a larger percentage of precipitation to enter the stream rapidly as runoff, the rate of decline in streamflow (following storms) is faster in urban streams than in streams in undeveloped (natural) areas. Rain seeps into the ground and drains slowly into streams long after the rainfall event has passed in undeveloped areas; therefore, the rate of streamflow decline is slower.

The frequency of high-flow events or periods of flashiness can increase as a result of urban development. An increased frequency of high-flow conditions can cause erosion of streambanks and streambeds, thereby degrading spawning and feeding habitats for fish and reducing living space for invertebrates.

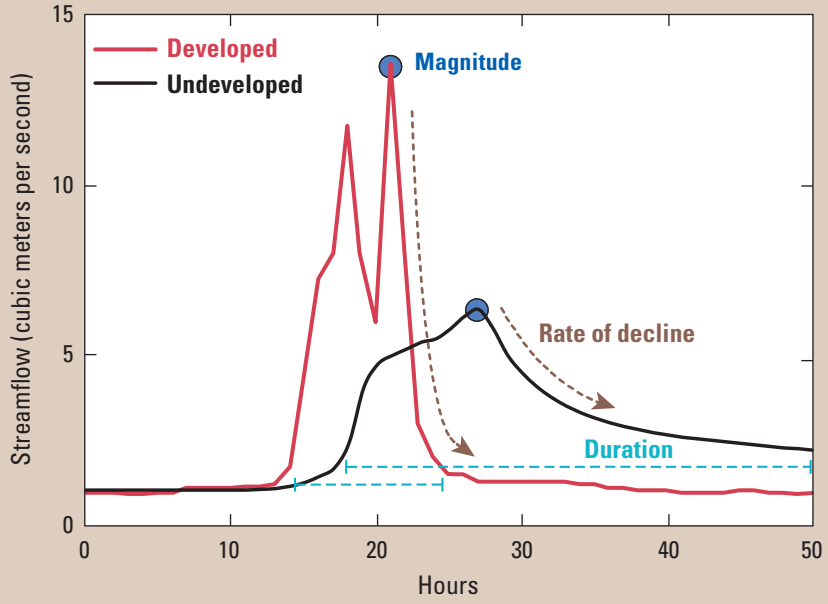

Stream Habitat for Aquatic Biota Degrades

Habitat changes that typically occur with urban development include changes in the size, shape, and alignment of stream channels; increases in fine-grained sediments on streambeds; the removal of woody debris; and alterations to riparian areas (Freeman and Bennett, 1969; Lemly, 1982; Waters, 1995; Walsh and others, 2005a; Roy and others, 2006). Rapid stormwater runoff from impervious cover causes an increase in the power of water flowing into the stream, resulting in channel incision or widening through a process of channel erosion (fig. 2–8). Erosion associated with road and building construction contributes large amounts of sediment to streams in some areas. Increased stream energy also can remove large woody debris from channels that would normally dissipate that energy, help sort bed sediment, stabilize the channels, and provide habitat for aquatic biota (Bunn and Arthington, 2002; Gregory and Bryant, 2003; Gurnell and others, 2007). Loss of riparian trees and shrubs by streambank erosion or urban development also removes sources of woody debris and allows more sunlight to reach the stream. Natural woody debris in unmodified stream channels provide habitat for aquatic organisms.

These changes in habitat reduce and degrade the living space for aquatic biota. Increased deposition of fine-grained sediment in streams buries algae, invertebrates, and fish eggs; reduces habitat availability; and leads to declines in productivity and biodiversity (Waters, 1995). Sediment provides a bonding surface for chemicals, such as nutrients and metals, and for manmade compounds, such as pesticides. Sediment suspended in stream water can transport these chemicals and compounds within the stream ecosystem (Nowell and others, 1999; Bryant and Goodbred, 2008). Higher turbidity associated with increased suspended sediment decreases the amount of light penetrating to the stream bottom.

Algae and plants need light for photosynthesis, and invertebrates and fish need light for feeding and for triggering natural breeding cycles. Increases in sunlight reaching a stream after removal of riparian vegetation together with increased nutrients commonly present in urban streams, (described in the following section) can lead to increases in the rate of photosynthesis by algae and aquatic plants and a consequent increase in potential nuisance algal blooms. Increased rates of photosynthesis and higher water temperatures that can result from urban development also produce large fluctuations in dissolved oxygen concentrations in streams, which can be harmful to invertebrates and fish (Kaushal and others, 2010).

Nutrients and Contaminants Increase

Urban development and subsequent land-use practices lead to increases in the inputs of some otherwise beneficial chemicals to levels that greatly exceed those naturally present in streams, which can result in immediate and long-term effects on aquatic biota. Elevated levels of nutrients and other contaminants are released into urban streams from treated sewage, industrial wastewater discharges, and burning of fossil fuels, as well as from surface runoff that conveys fertilizers and organic matter from leaves, grass clippings, and animal waste (Klein, 1979; Graffy and others, 1996; Sprague and others, 2007). Algal abundance in streams is dependent on nutrient inputs, and excessive nutrient inputs can cause nuisance algal blooms.

The use of salt to prevent or melt ice on pavement in cooler climates also can add excess amounts of sodium and chloride to streams, killing salt-sensitive biota and contributing to higher year-round values of specific conductance in streams (Corsi and others, 2010).

Chemicals other than nutrients can find their way into urban streams through stormwater runoff, point-source discharges, spills, or even through atmospheric inputs such as precipitation. Inputs of contaminants toxic to aquatic biota, such as polycyclic aromatic hydrocarbons (PAHs), herbicides, and pesticides, typically increase with urban development (Nowell and others, 1999; Van Metre and others, 2000; Mahler and others, 2005; Munn and others, 2006; Leiker and others, 2009). Certain chemical contaminants, such as lead

Figure 2–8. Changes to the hydrology and habitats of streams arising from human activities can adversely affect the living spaces for aquatic biota and, subsequently, the diversity of biological communities.

and zinc (Callender and Rice, 2000), may be taken up by algae and plants and can accumulate and increase in concentration in invertebrates or fish that eat the algae or plants. Higher concentrations of these contaminants can occur in fish that prey on these invertebrates and fish. Consequently, these contaminants accumulate in other wildlife and humans that eat the contaminated fish.

Chemicals that do not kill aquatic biota outright might reduce their populations through long-term sublethal or chronic effects on hormones, reproduction, and lifespan. Studies in recent years have concluded that fish and other biota have developed both male and female sex organs as a result of exposure to waterborne chemicals, such as pharmaceuticals (Blazer and others, 2007; Vajda and others, 2008). These chemicals are not removed completely during conventional wastewater treatment and can accumulate in aquatic biota (Chambers and Leiker, 2006; Hinck and others, 2009).

Framework for Understanding Urban Stream Ecosystems

A simplified framework can be used to examine the connections that exist between urban development and streams (fig. 2–9). Urban development is shaped by the interactions of people, institutions and resources, and social values. The "built environment" results from individual and group decisions that are influenced by an area's institutions, its economic resources, and the social values of those who live and work in the area. These values play an important role in shaping the development of the built environment through zoning, water-quality regulations, and stormwater and other management practices. Consequently, the built environment is the component of urban development that has the most direct effect on the stream ecosystem as measured at the stream reach.

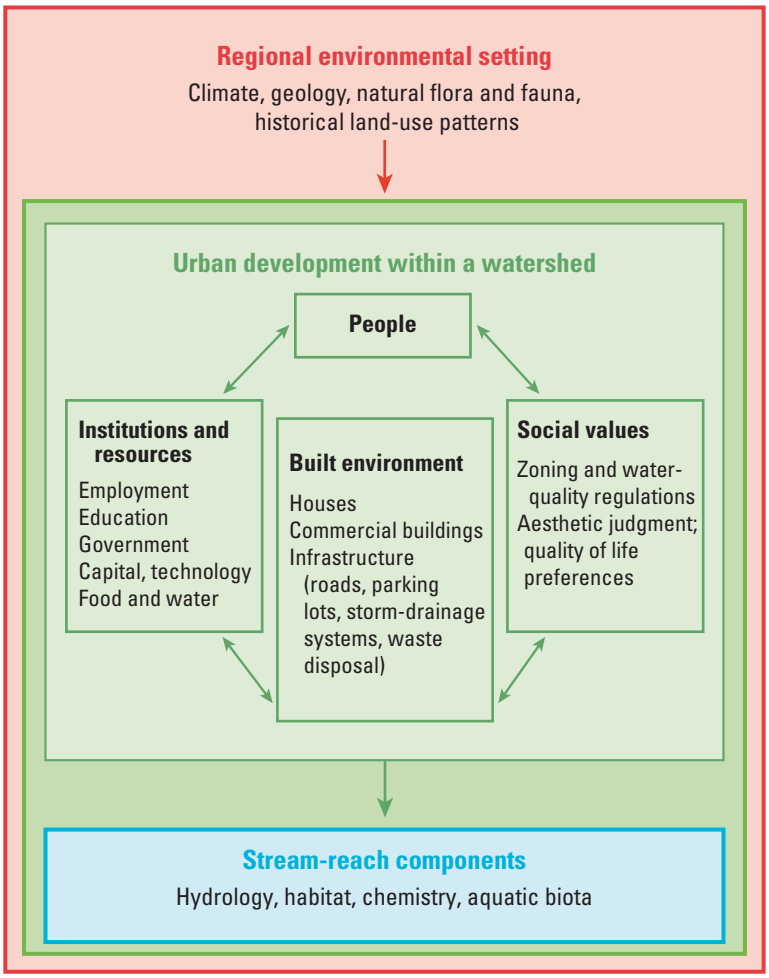

Figure 2–9. Urban development is shaped by the regional setting and interactions of people, institutions, resources, the built environment, and social values. A prudent management strategy should consider all of these elements and their interactions. Arrows indicate flows of energy, materials, and (or) information. (Modified from Machlis and others, 1997; Pickett and Grove, 2009.)

Dynamics of a Natural Stream

Hydrology: Water connects the human and natural components of a stream ecosystem. In a natural or undeveloped stream setting, rainfall reaches a stream gradually by flowing over the vegetated land surface into the stream and by infiltrating the soil and flowing underground (as groundwater) toward the stream. Natural seasonal patterns of streamflow, together with seasonal changes in light and temperature, serve as life-cycle cues to aquatic organisms (biota).

Water Chemistry: Carbon and nutrients, such as nitrogen and phosphorus, are required for all stream life. Nutrients are incorporated into algae, which are then consumed by other biota, introducing the nutrients into the aquatic foodweb. Oxygen dissolved in water is essential for all aquatic biota and is necessary for maximum diversity of a stream ecosystem.

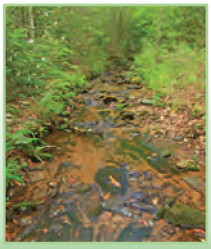

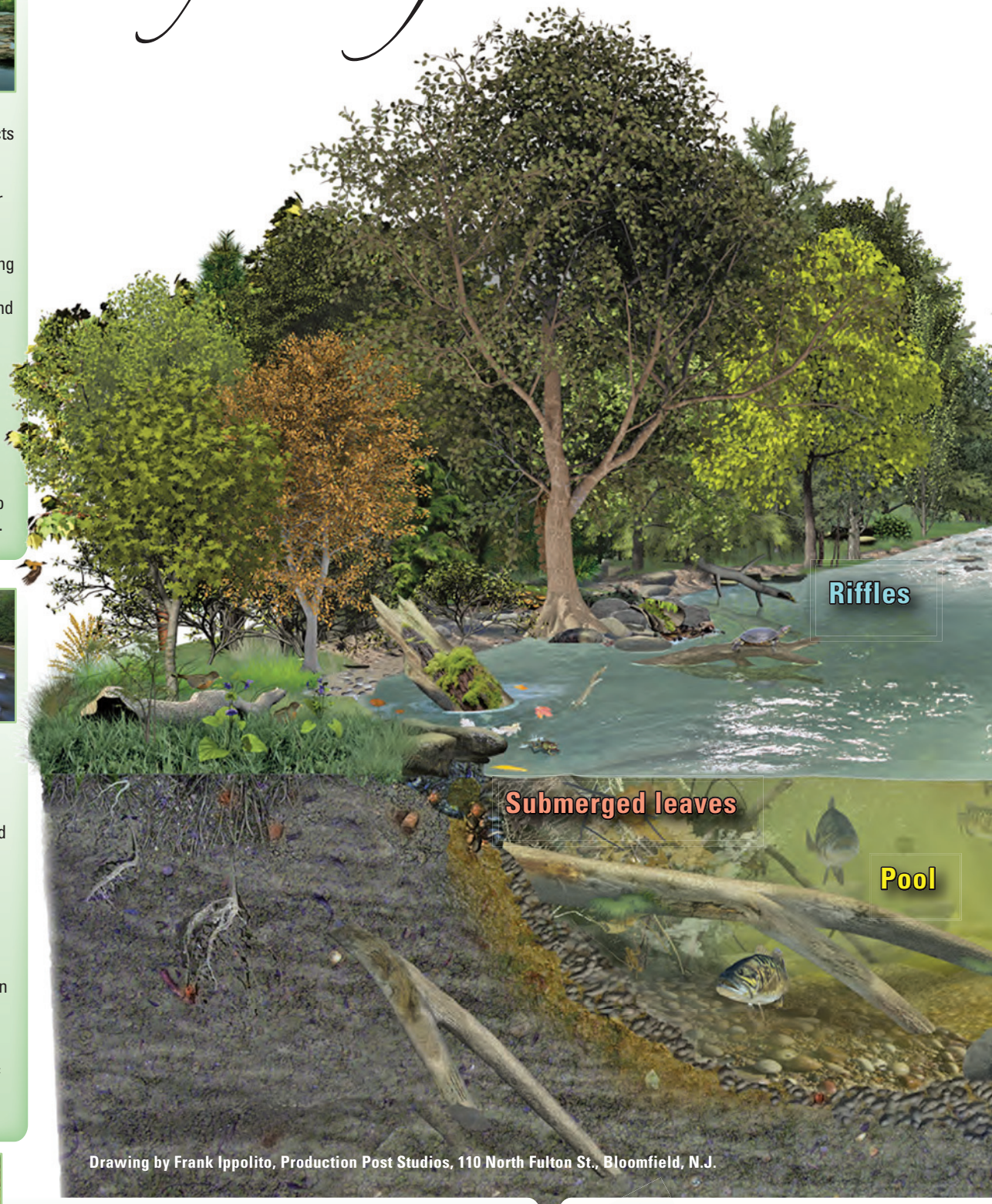

Drawing by Frank Ippolito, Production Post Studios, 110 North Fulton St., Bloomfield, N.J.

Habitat: Stream habitat is the physical living space of aquatic biota and includes the water in the stream and the physical structure (channel area, sediment, and vegetation). A stream with a more diverse habitat generally will have a more diverse biological community.

Ecosystem

In a natural, healthy stream, the condition of the physical living space—defined by hydrology, habitat, and chemistry—supports diverse biological communities.

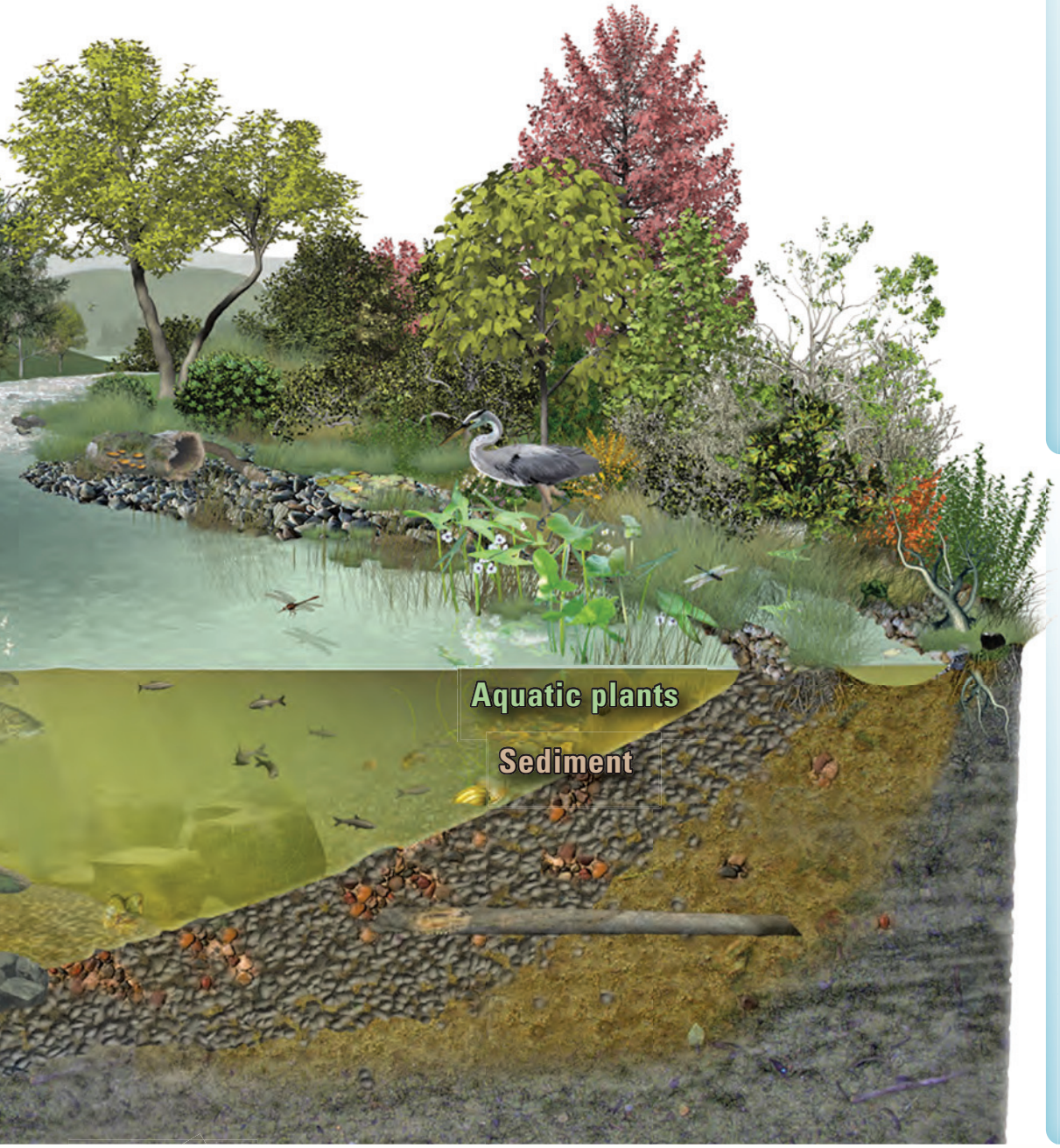

Smallmouth bass

Greenside darter

Fish: The life cycles of fish can span years and are affected by streamflow, habitat, water chemistry, and other biota in the local area as well as conditions throughout the watershed. Fish can be relatively mobile along the stream as they search for food. Smallmouth bass may hide under logs or undercut banks, along stream edges or in pools, emerging to feed on crayfish and small fish. Greenside darters live in riffle habitats of streams, where they feed on aquatic insects, such as mayflies and other invertebrates.

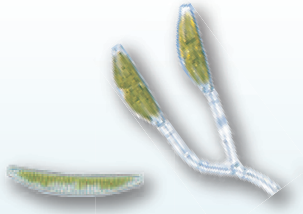

Epithemia *Cymbella*

Algae: The life cycles of algae are short, lasting only days to weeks, and they respond relatively rapidly to changes in sunlight, water chemistry, and streamflow. Diatoms, the most common algae found in natural streams of small to moderate size, attach to underwater surfaces, such as rocks and aquatic plants. The diatom *Cymbella* is found in riffles, while the diatom *Epithemia* is found in both pools and riffles. Algae, such as these diatoms, are the foundation of aquatic foodwebs.

Dragonfly larvae

Invertebrates: The life cycles of invertebrates, such as the aquatic insects shown here, generally are complex and occur over time spans of weeks to years. Most aquatic insects spend nearly all their life in the water as eggs and larvae, and then leave the water and develop wings as adults. Many mayflies crawl on the surfaces of rocks and feed by gathering fine particles of organic matter or scraping off algae. Some species of stoneflies are predators on other insects, while others feed by shredding leaf material that has been colonized by bacteria and fungi. Dragonfly larvae live in areas of slower streamflow, where it preys on other invertebrates and even some small fish.

Dynamics of an Urban Stream

In a highly degraded urban stream, the poor condition of the physical living space—streambank and tree root damage from altered hydrology, low diversity of habitat, and inputs of chemical contaminants—contributes to biological communities with low diversity and high tolerance to disturbance.

Hydrology: Urban development alters the hydrology, or movement of water through a watershed. The addition of impervious surfaces (for example, roads, parking lots, and buildings) reduces the infiltration of precipitation into groundwater, and the construction of artificial drainage systems (for example, storm-drainage networks) moves stormwater runoff from developed sites very quickly. The rapid runoff and high streamflows increase the power or energy of the water flowing in the stream, which can deepen or widen stream channels and cause streambank erosion.

Water Chemistry: Urban development may increase the inputs of otherwise beneficial chemicals to levels that greatly exceed those found naturally in streams, leading to both immediate and long-term effects on aquatic biota. For example, excess amounts of nutrients, such as phosphorus and nitrogen, can lead to an abundance of algae, resulting in extreme highs and lows in dissolved oxygen concentrations.

Drawing by Frank Ippolito, Production Post Studios, 110 North Fulton St., Bloomfield, N.J.

Habitat: Urban development can alter habitats in and near streams that provide living spaces for both terrestrial and aquatic biota. Vegetation near a stream may be removed, increasing the amount of light reaching streams, and cement or rock may be added to the channel in an effort to protect it from increased streamflow. Sediment from erosion may fill in spaces on the stream bottom between rocks, reducing living space or habitat for aquatic biota, which leads to declines in productivity and biodiversity.

Ecosystem

Fathead minnow

Common carp

Fish: Urban development can result in a loss of stream connections, restricting fish movement and migration. As a result, fish may not be able to recolonize an isolated area after stream conditions improve. In contrast, newly created stream connections may allow certain species to move into areas that they might not colonize naturally. Native fishes that are sensitive to disturbance generally become less abundant with increased urban development, while tolerant fishes may thrive. The fathead minnow, although native to streams in the United States, tolerates turbid water and low concentrations of dissolved oxygen typical of many urban streams. Often, more tolerant fishes found in urban streams are non-native, such as the common carp, which prefers slow or non-flowing water and soft sediment.

Green algae

Blue-green algae

Algae: Urban development often results in increases in the abundance of algae that are tolerant of pollution. Diatoms tend to decrease and non-diatom algae tend to increase with urban development. Some non-diatom algae, such as green or blue-green algae, can be found in low abundance in natural streams but may increase in abundance to nuisance levels with sunlight- and nutrient-rich conditions of many urban streams, appearing as a green coating on the surface of the water and rocks.

Invertebrates: Urban development leads to a loss of sensitive invertebrates, such as mayflies and stoneflies, and an increase in more tolerant species, such as leeches and isopods. The loss of sensitive species may begin at very low levels of urban development. Leeches are most common in warm, protected shallows where stream velocities are relatively low. Isopods are found in slower moving streams that have relatively low dissolved oxygen concentrations.

Leech

Isopod

Chapter 3

USGS Approach to Assessing the Effects of Urban Development on Stream Ecosystems

The USGS assessment during 1999–2004 is the first national-scale assessment of the effects of urban development on stream ecosystems that has been completed in the United States. The assessment used a nationally consistent study design in nine metropolitan study areas of the United States—Portland, Oregon; Salt Lake City, Utah; Birmingham, Alabama; Atlanta, Georgia; Raleigh, North Carolina; Boston, Massachusetts; Denver, Colorado; Dallas, Texas; and Milwaukee, Wisconsin. The nine study area settings represent a contrast in regional factors that affect stream ecosystems. Examples of these regional factors include the type of land cover (forest or agricultural land) being converted to urban development and the climate, ranging from the arid west to the humid east.

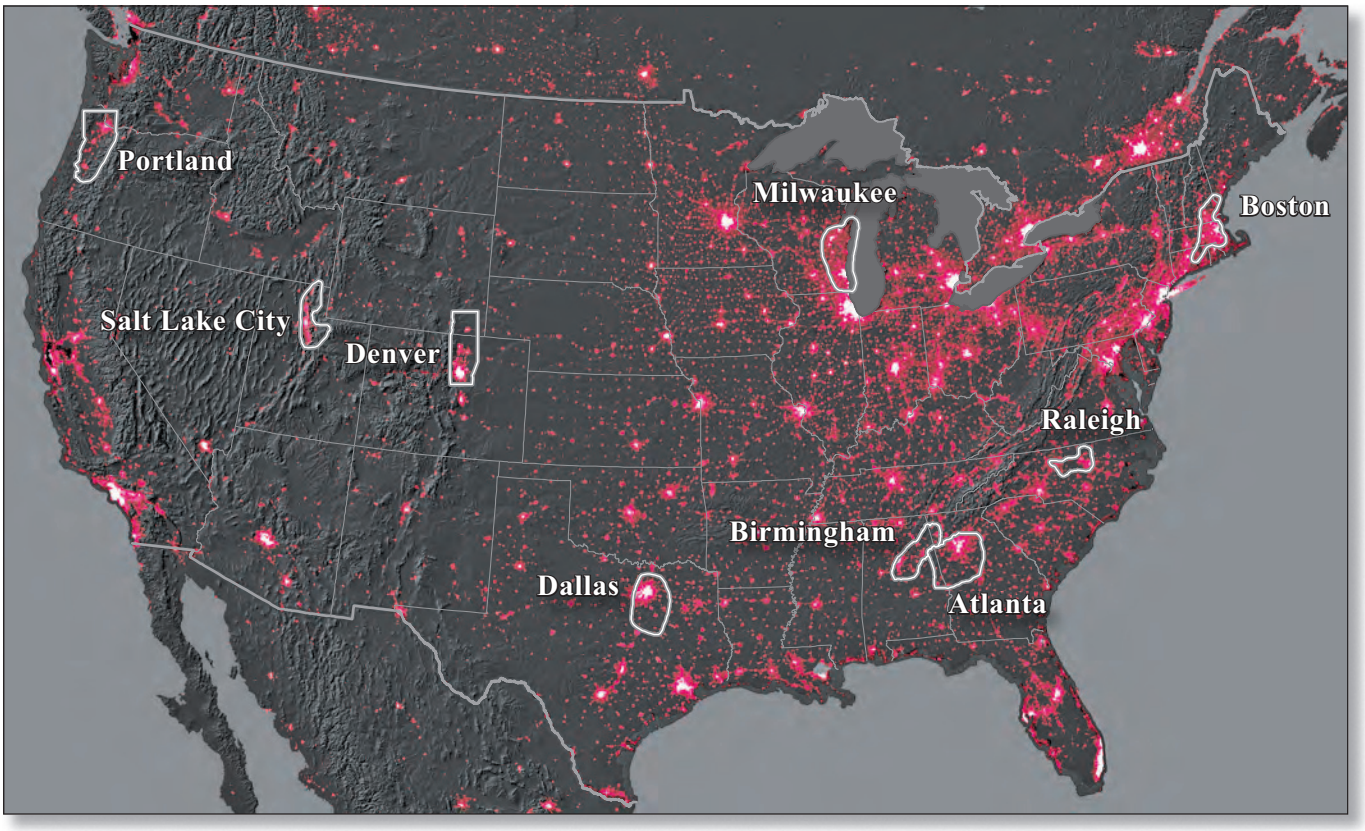

This image of the night lights in the United States was created with data from the Defense Meteorological Satellite Program. The interstate highway system appears as a lattice connecting city centers.

This chapter describes the approach used by the USGS for assessing the effects of urban development on stream ecosystems. Project objectives were accomplished by using three key attributes of the study design:

1. Minimize the variability of natural factors that affect stream ecosystems across the country;
2. Study watersheds that collectively represent a rural to urban gradient; and
3. Use common protocols for sample collection and processing in all study areas.

The primary objectives of the investigation were to determine (1) the physical, chemical, and biological responses of streams to urban development; and (2) the manner in which these responses vary across the country. The assessment used a nationally consistent study design in nine metropolitan study areas of the United States—Portland, Oregon (Waite and others, 2008); Salt Lake City, Utah (Giddings and others, 2006); Birmingham, Alabama; Atlanta, Georgia (Gregory and Calhoun, 2007); Raleigh, North Carolina (Giddings and others, 2007); Boston, Massachusetts (Coles and others, 2004); Denver, Colorado (Sprague and others, 2006a,b); Dallas, Texas (Moring, 2009); and Milwaukee, Wisconsin (Richards and others, 2010; app. 1 A).

The project objectives were addressed by investigating urban stream ecosystems defined by interacting human and natural systems (fig. 3–1). These interactions are affected by processes operating at three primary spatial scales: stream reach, watershed, and region (see sidebar, Stream Ecosystems Are Shaped by Processes Occurring at Multiple Spatial Scales). Natural and human processes operating at the regional scale influence processes operating at the watershed scale. Watershed processes, such as urban development, influence the physical, chemical, and biological characteristics of a stream reach. The approach used to assess these interrelated systems was to constrain variability in natural factors within each study area, examine watersheds representing a rural to urban gradient, and use common methods for reach-scale sample collection and processing.

Accounting for the Natural Variability Among Watersheds in Different Regions

Because the physical, chemical, and biological characteristics of a stream respond to changes in both urban conditions and natural characteristics, isolating and understanding the influences of urban development required constraining the variability of natural factors (such as soils, climate, elevation, and slope) among the watersheds selected for each of the nine study areas (see appendix 1B for more information on the regional factors). U.S. Environmental Protection Agency (USEPA) Level III Ecoregions delineate regions representing a relatively homogeneous combination of climatic, topographic, geologic, and general land-cover characteristics (Omernik, 1987; see What is an Ecoregion? in sidebar, Stream Ecosystems Are Shaped by Processes Occurring at Multiple Spatial Scales). Thus, the variability in natural factors was constrained, in part, by restricting the watersheds selected in each study area to a single Level III Ecoregion. Because Level III Ecoregions are large, smaller Level IV Regions were used to further constrain the selection of watersheds in several study areas.

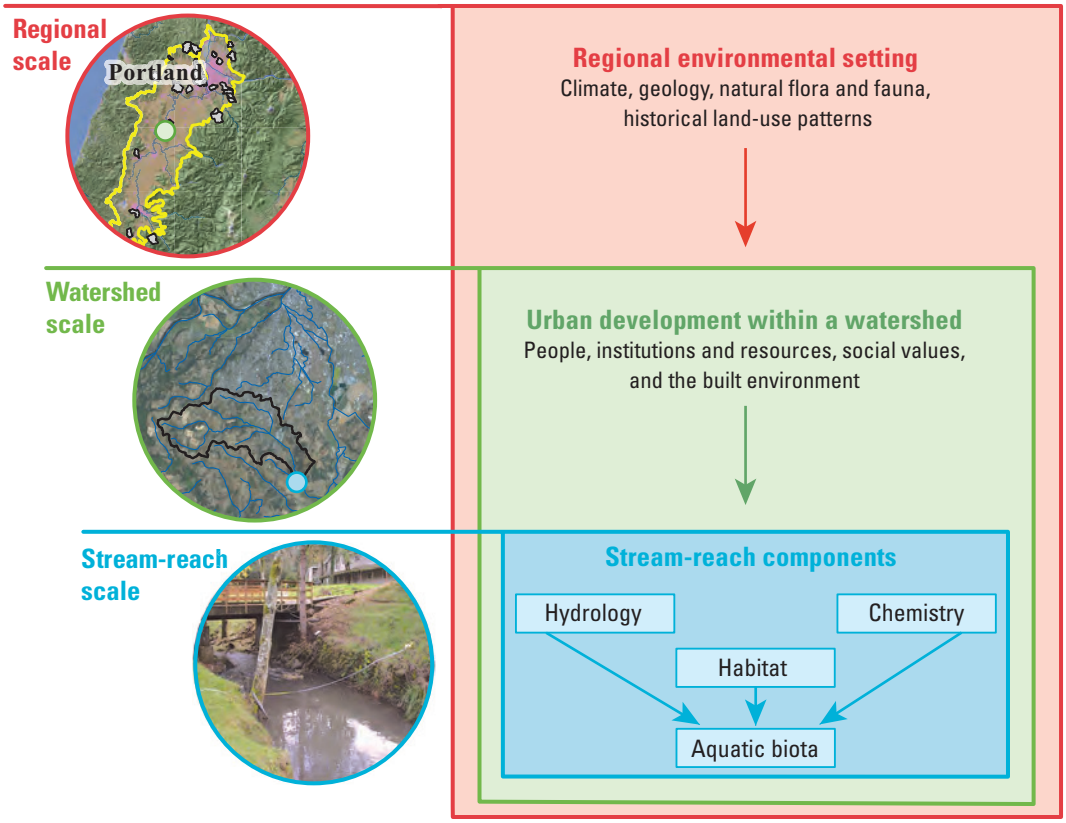

Figure 3–1. An integrated approach to understanding the effects of urban development on stream ecosystems must account for the interrelations among human and natural systems at the regional, watershed, and stream-reach scales rather than treating any pair of systems as isolated entities.

Stream Ecosystems Are Shaped by Processes Occurring at Multiple Spatial Scales

The physical, chemical, and biological characteristics of a stream are shaped by processes that occur within a stream reach, the watershed upstream of the reach, and the region where a watershed is located. A stream reach refers to a short stretch, or length, of a stream that is viewed when someone is fishing, taking a short walk, or collecting a water sample. The stream reach is the most likely point of contact with a stream ecosystem for most people because it is the place they see and interact with a stream. Therefore, characteristics of stream hydrology, habitat, chemistry, and aquatic biota are observed typically at the stream-reach scale.

A watershed is the area upstream that collects and conveys water to the stream reach. Conditions at a stream reach are defined, in large part, by processes that occur throughout a watershed, including urban development or agricultural production, and natural factors such as rainfall and soil permeability. Therefore, interactions among these processes help determine the characteristics of hydrology, habitat, chemistry, and aquatic biota in downstream reaches.

A region is typically a large area of land with many watersheds that have similar natural characteristics associated with the general climate, geology, soils, and vegetation. This natural similarity among watersheds sets up a framework for defining physical, chemical, and biological features that are distinct to a region; therefore, processes altered by urban development in a watershed will reflect changes to the biological communities in the stream reach that are characteristic to the region. For this investigation, USEPA Level III Ecoregions (Omernik, 1987) were used to designate the regions; in each study area, all watersheds were located in a single Level III Ecoregion (fig. 3–2).

What is an Ecoregion?

Ecoregions are defined as areas of relative homogeneity in the type, quality, and quantity of environmental resources, and within which there exists spatial similarity in characteristics of the quality, health, and integrity of ecosystems (Omernik, 2004). Because they delineate large areas within which similar ecosystems exist throughout a region, ecoregions provide a spatial framework for ecosystem assessment, resource inventory, monitoring, and ultimately management. Thus, ecoregions are extremely useful for structuring and implementing ecosystem-management strategies across agencies and organizations that are responsible for different types of resources within the same geographical areas. They have proven to be an effective aid for inventorying and assessing national and regional environmental resources, for setting regional resource-management goals, and for developing biological criteria and water-quality standards.

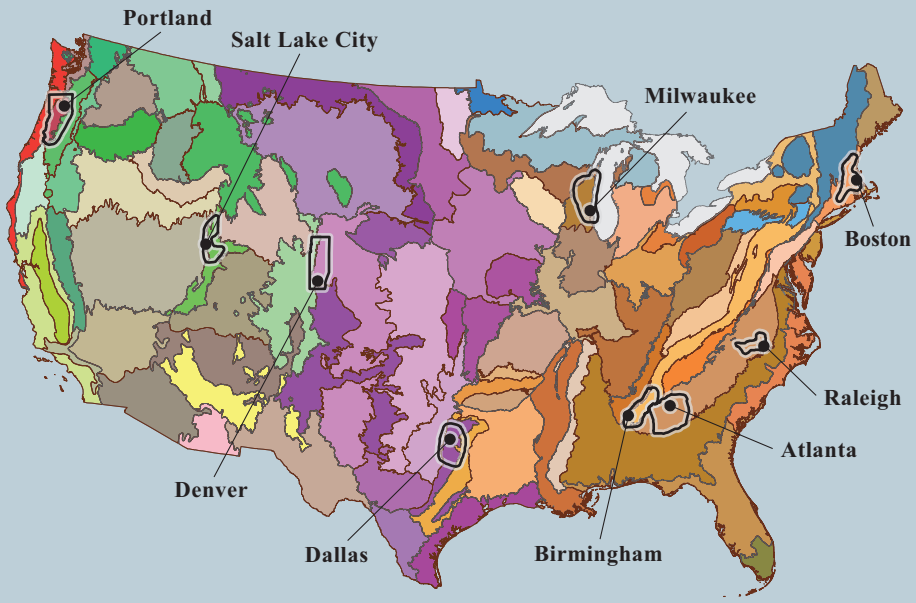

Figure 3–2. Level III Ecoregions provide a framework for delineating regions by ecosystems that have similar environmental characteristics. The watersheds in the nine study areas were constrained to a single Level III Ecoregion to account for natural variability across the country.

Substituting Space for Time: A Rural-to-Urban Gradient

The process of urban development can occur over many years. Rather than study how the physical, chemical, and biological characteristics of an individual stream changes as the watershed becomes urbanized over time, this investigation employed a gradient approach that substituted space for time. In other words, it would have been impractical to measure changes to a stream ecosystem as a natural watershed becomes urbanized over perhaps decades. Instead, a set of approximately 30 watersheds in each of the nine study areas was selected to represent the range of urban-development conditions in the Level III Ecoregion within which the study area was located (see sidebar, How Well do the USGS Study Watersheds Represent the Gradient of Urban Development in Each Level III Ecoregion?). However, it should be noted that with this gradient approach, it is not possible to control for differences in urban-development characteristics that might arise because development occurred in different time periods.

In each of the nine study areas, the streams within the approximately 30 watersheds were sampled during the same period. The dominant land cover in watersheds at the rural or less developed end of the gradient was typically either forested or agricultural and was assumed to represent the type of land cover within each study area being converted to urban uses. The physical, chemical, and biological characteristics of streams in each of these watersheds were then assumed to represent the stream condition for a given level of urban development in the watershed. Thus, differences in stream conditions in increasingly developed watersheds within a study area were assessed to indicate how streams respond to urban development. The Salt Lake City, Birmingham, and Boston studies were completed in 1999–2000; studies in Atlanta, Raleigh, and Denver were completed in 2002–2003; and studies in Portland, Dallas, and Milwaukee were completed in 2003–2004. Maps and other information about the watersheds in each study area are in appendix 1A. Sprague and others (2007) provide details on the watershed selection process as well as steps taken to constrain natural variability and to define a rural-to-urban gradient.

A Common Approach for Measuring Ecosystem Characteristics

Urban-development patterns within each study watershed and the physical, chemical, and biological characteristics of the stream within the watershed were measured or estimated using a standard set of methods. Giddings and others (2009) contains all data and additional information about the study design.

Urban-Development Patterns

The pattern of urban development in any watershed reflects the culmination of choices made by individuals, businesses, lending institutions, and governments about where, when, and how development occurs, such as housing, stores, businesses, and roads. In this investigation, several measures of land cover and land use were used to characterize urban development in the watersheds (Falcone and others, 2007).

Land cover refers to physical materials, such as vegetation and human-constructed roads and buildings that cover the land surface. Urban development in these nine study areas occurred primarily through the conversion of either agricultural or forested land. The type of land cover that is being converted to urban uses (predevelopment land cover) is potentially important, as the terrestrial characteristics and activities associated with these two land-cover types can influence the relation that urban development has on the stream ecosystem. Watersheds in which the predominant land cover prior to urban development is agricultural land might already have some degree of water-quality impairment. Natural and human environmental legacies, such as differing natural biological communities and historical land cover, can alter the starting point for assessing the effects of urban development on streams. The effects of urban development can be present but are difficult to tease out because of these legacies. Two related measures of urban land cover were used in this investigation: (1) the percentage of urban development in a watershed and (2) the percentage of impervious land cover in a watershed (fig. 3–3).

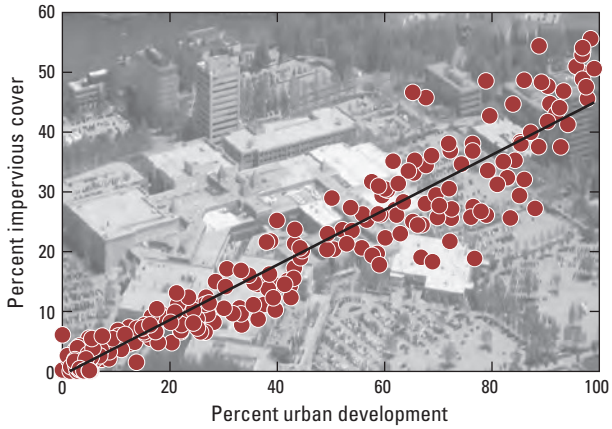

Figure 3–3. The relation between the percentage of developed land and impervious cover in watersheds was very strong across the United States, as seen in this plot for all watersheds used in the investigation.

How Well do the USGS Study Watersheds Represent the Gradient of Urban Development in Each Level III Ecoregion?

The amount and spatial distribution of land that is classified as urban varies across the Level III Ecoregions in which the USGS studies occurred (Terziotti and others, 2012). When examining all possible watersheds of a given size in an ecoregion, some ecoregions, such as the Central Basin and Range (Salt Lake City study), have a relatively small proportion of watersheds with a medium to high percentage of developed land. Other ecoregions, such as the Northeast Coastal Zone (Boston study), have a larger proportion of watersheds with a medium to high percentage of developed land.

For each ecoregion plot in figure 3–4, the blue line indicates the cumulative percentage of all watersheds of a given size that have undergone urban development at the level indicated on the x-axis. In several of the ecoregions, the curvature of the line changes from a relatively steep upward angle to a more gradual curve, indicating a diminishing number of watersheds that have large areas of developed land. For example, in the Northeastern Coastal Zone, approximately 60 percent of the watersheds in the ecoregion (y-axis) have less than 20 percent of developed land (x-axis). A distinctly different blue line shape occurs in the Central Basin and Range as a result of more than 95 percent of the watersheds having less than 20 percent developed land.

Each red diamond along each blue line in figure 3–4 indicates the actual amount of developed land in a watershed that was investigated in a particular USGS study area. Consequently, the extent to which the watersheds represent the urban gradient in an ecoregion can be seen by how evenly the symbols are spaced relative to the percentage of developed land (x-axis), irrespective of the shape of the blue line. Generally, across all metropolitan areas studied, the group of study watersheds represents the range of developed-land conditions that occur across the ecoregion as a whole, especially at the low and the high end of the gradient. An obvious exception is a major gap that occurs in the Dallas study area for watersheds that contain between approximately 40 and 75 percent developed land. Watersheds within this range of urban development that were suitable for the study were not available. Relatively few watersheds with 40 to 75 percent developed land exist in that ecoregion (that is, the blue line is relatively flat in that range of developed land cover). Finally, in all USGS study areas, the percentage of watersheds at the upper end of the developed land-cover gradient was larger than the percentage of watersheds with this amount of developed land in the ecoregion as a whole. While these highly developed watersheds were relatively rare in all ecoregions, the USGS study teams were able to identify enough highly developed watersheds to represent the gradient of developed land for the study.

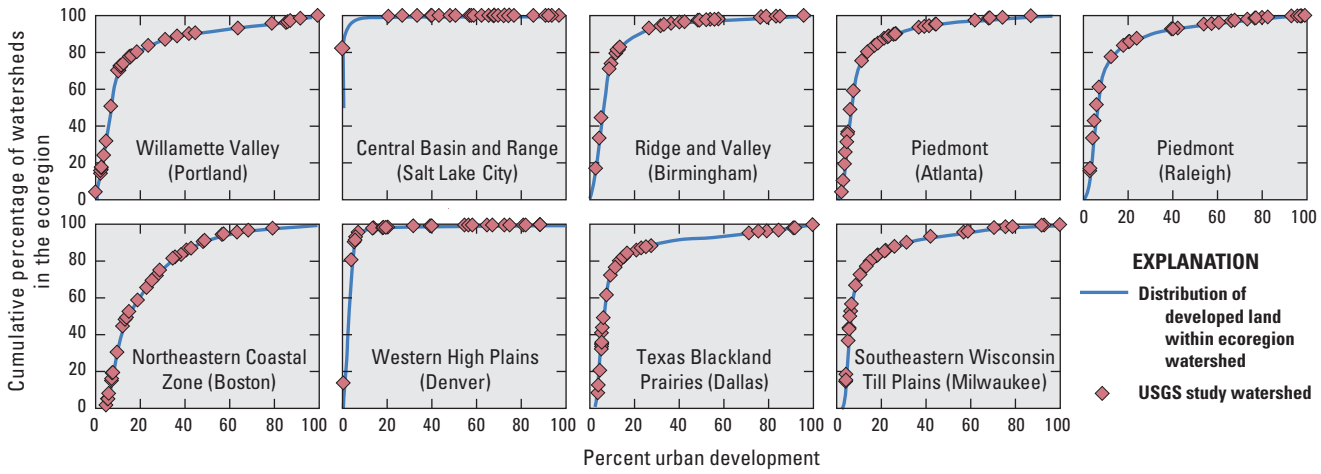

Figure 3–4. There is an even distribution of sites in six of the USGS studies relative to the range of urban development in Level III Ecoregions. In contrast, more than 80 percent of the watersheds in the Central Basin and Range (Salt Lake City) and Western High Plains (Denver) have less than 5 percent urban development. The symbols (red diamond) represent the study watersheds, and their distribution along the curve indicates how well they represent the various stages of urban development along the gradient.

The study design assumes that, within each study area, the predevelopment land cover is equivalent to the dominant land cover occurring in watersheds at the low end of the urban gradient, typically either forested land (including shrubland) or agricultural land (including rangeland). Forest is the dominant land cover at the low end of the gradient in Portland, Salt Lake City, Birmingham, Atlanta, Raleigh, and Boston, whereas in the three other study areas (Denver, Dallas, and Milwaukee), the predevelopment land cover reflects some form of agricultural activity (see sidebar, Land-Cover Data for USGS Urban-Development Study).

Hydrology

Hydrology can be described in terms of streamflow characteristics, many of which influence stream ecosystems. These characteristics include seasonal flow patterns, the frequency, predictability, and duration of extreme flows, and the rate of change of daily, seasonal, and annual flows (fig. 3–6; Poff and others, 1997; Poff and others, 2010). Hydrologic data are not usually collected in stream ecology studies because the cost can be prohibitive. This investigation deployed relatively inexpensive data recorders that measured

Land-Cover Data for USGS Urban-Development Study

Land-cover data compiled for the USGS investigation, including impervious-cover data, represent conditions in 2001. These data are from the 2001 National Land Cover Database 2001 (NLCD; Homer and others, 2004; Falcone and others, 2007; Homer and others, 2007). Land cover in each study watershed was classified as belonging to one of several categories, including urban land, forested land, shrubland, agricultural land, and wetlands (fig. 3–5). Land-cover data and GIS-derived watershed boundaries were used to estimate the proportion of watershed area associated with these land-cover types, as well as the amount of land cover in riparian areas adjoining streams.

Figure 3–5. The predevelopment land cover is primarily forests in the Portland, Salt Lake City, Birmingham, Atlanta, Raleigh, and Boston study areas; the predevelopment land cover is primarily agricultural in the Denver, Dallas, and Milwaukee study areas.

stream-water levels, or stage, every hour for 1 year that included the period when other physical, chemical and biological data were collected (fig. 3–7; Giddings and others, 2009). These data were used to summarize several characteristics of stream flashiness, including the magnitude, duration, and frequency of periods of high flow, and the rate of change in extreme high-flow conditions.

Habitat

Reach-scale habitat characteristics, such as channel shape and size, substrate size and distribution, water velocity, shade cover, aquatic and riparian vegetation, and bank and riparian stability, were measured once during late-summer low-flow periods in all investigation watersheds using standard USGS methods for wadeable streams (Fitzpatrick and others, 1998). Channel size and shape were measured relative to the level in the stream channel where rising streamflow begins to enter the flood plain (bankfull streamflow). Bankfull streamflows exert the greatest influence on the size and shape of the stream channel over a long period of time, and indicators of bankfull flow along the channel are used to estimate the magnitude of these flows (Wolman and Miller, 1960; Leopold and others, 1964). These physical characteristics are important because they define the places and conditions where biota live.

Figure 3–6. South Fork Peachtree Creek, Ga., during normal base flow (top) and during a high-flow event (bottom). Streamflow data provide information about high-flow frequency, duration, and magnitude characteristics in all nine study areas.

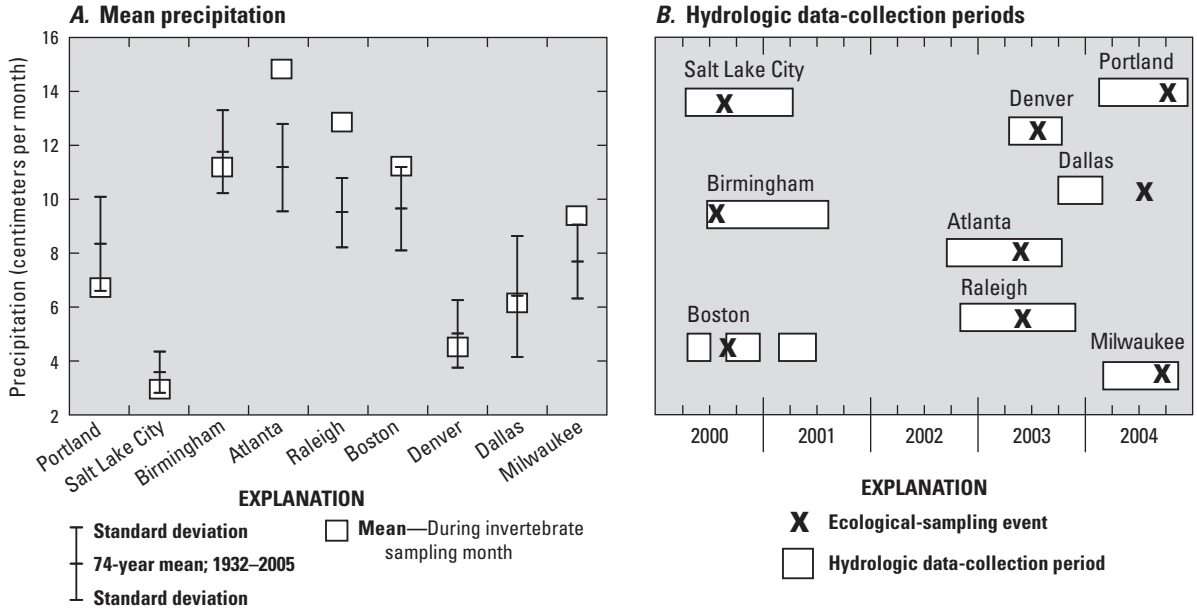

Figure 3–7. *(A)* The mean precipitation (square symbol) during the actual month invertebrate samples were collected in each study area in relation to the mean and typical range of precipitation (vertical line) for that month based on 74 years of data; and *(B)* hydrologic data-collection periods and dates of ecological-sampling events (**X**) in each study area.

Chemistry

Understanding the variations of stream chemistry can provide insights into the types of biological communities found in streams as watersheds are urbanized. Each type of aquatic organism has an optimal range of physical and chemical requirements; conditions outside these ranges can stress organisms and reduce their numbers. Stream chemistry in urban areas can vary considerably over time due to rapid changes in hydrologic conditions and the use of chemicals in the watershed. Water samples were collected during base-flow conditions at sampling locations in each study area, which was assumed would increase the likelihood of detecting stream-chemistry changes associated with urban development (fig. 3–8). The base-flow period was defined regionally as a period when, on average, few or no precipitation events occurred. Sampling during a base-flow period does not capture peak concentrations of many constituents; however, due to resource constraints, storm-event samples were not collected as part of this investigation.

Figure 3–8. Water-quality samples were collected during base-flow conditions at sampling locations in each study area. These samples were analyzed for nutrients, dissolved pesticides and pesticide degradates, suspended sediment, sulfate, and chloride.

Water samples were analyzed for nutrients, dissolved pesticides and pesticide degradates (compounds resulting from the breakdown of the pesticide in the environment), suspended sediment, sulfate, and chloride. Field measurements made at the time of sample collection included water temperature, dissolved oxygen, pH, specific conductance, and discharge. Additionally, water samples were collected bimonthly at 10 stream sites in the Portland, Atlanta, Raleigh, Denver, Dallas, and Milwaukee study areas during the year in which biological sampling occurred. Sprague and others (2007) contains details of all stream-chemistry sampling methods.

A pesticide toxicity index (PTI), which represents the potential acute toxicity of pesticide mixtures in a water sample, was calculated by combining the relative toxicity values of individual pesticide concentrations in each sample. The relative toxicity values for each individual pesticide were determined from laboratory bioassays that assessed the toxicity of those pesticides to various aquatic invertebrate and fish species (Munn and Gilliom, 2001). Separate PTI values were computed for cladocerans (an aquatic invertebrate) and fish. The PTI has several important characteristics; it assumes that toxicity is additive without regard to mode of action, considers acute toxicity only, and does not necessarily consider local species. Additionally, the PTI does not indicate whether water in a sample is toxic, but rather is used to compare the relative potential toxicity in different streams.

Not all chemicals that might be present in a stream can be effectively determined from water samples collected periodically because (1) sampling periods might not match times when chemicals are being transported in the stream, such as during storms, and (2) compounds that are commonly present in low concentrations, including hydrophobic compounds like polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), and dichlorodiphenyltrichloroethane (DDT), are difficult to measure. Semipermeable membrane devices (SPMDs) were used to collect samples for analysis of hydrophobic contaminants (Huckins and others, 1996). SPMDs are passive samplers that concentrate trace levels of hydrophobic contaminants in proportion to their concentration in the water column; they are designed to mimic the accumulation of manmade organic chemicals in stream organisms such as fish. The SPMDs were deployed for approximately 6 weeks during the period just prior to sampling invertebrates, algae, and fish in each stream. The SPMDs were first piloted in 2000 at a few sites in Birmingham and then were deployed in the six study areas that started after 2002. The SPMDs were not used in the Salt Lake City or Boston studies. In addition to making standard chemical analysis for hydrophobic contaminants, the potential toxicity of compounds collected by the SPMDs was evaluated using a standard bioassay (Bryant and others, 2007). Bed sediment was not sampled for analysis of contaminants in this investigation, although a follow-up study did analyze contaminants in six of these study areas (Moran and others, 2012).

Aquatic Biota

Nationally consistent methods were used to collect samples from streams in each study area from three different communities of aquatic biota: algae, invertebrates, and fish. Samples for each community were collected once from each stream reach. Fish were collected throughout the entire stream reach (fig. 3–9), identified in the field, counted, weighed, measured, and released, except for those needing further identification. Invertebrate and algal samples were collected from five locations within each reach and combined into one composite sample for each community.

Figure 3–9. Fish community surveys were conducted at each of the streams to assess the effects of urban development. (Photograph by Amanda Bell, USGS.)

The biological community response to urban development was determined by using two types of response measures: community composition scores and biological condition metrics. A set of community composition scores was calculated for each biological community to represent the relative difference among streams in the types of species and density of organisms within the sampling reach. These were calculated using a technique called multivariate ordination, which measures the differences and similarities in the species composition of a community across all sites in a study area. The difference between any two community composition scores indicates the extent to which the biological community is different between the two sites; this difference then can be related to how the two sites differ in the degree of urban development. Therefore, community composition scores are very effective indicators of how strongly a biological community changes with urban development.

Biological condition metrics generally focus on particular species within a community. These metrics are often regarded as biological indicators because they are based on certain species in a community that respond to specific environmental stressors. For example, if a decline occurred in certain species that were sensitive to a particular type of contaminant, the indication might be that a specific urban-related stressor was degrading the biological community. These stressors then could be the focus of management actions to address the adverse effects of urban development.

Chapter 4

Responses of Stream Hydrology, Habitat, and Chemistry to Urban Development

Urban development in a watershed may bring about the following changes to a stream: (1) alter the hydrology, or movement of water through a watershed, (2) increase the inputs of otherwise beneficial chemicals to levels that greatly exceed those found naturally in streams, leading to both immediate and long-term effects on aquatic biota, and (3) alter habitats in and near streams that provide living spaces for biota.

1984

1997

2001

2010

This time sequence of stream photographs illustrates some common hydrologic and habitat changes that can result from increased urban development. Prior to urban development, there might be a small drainage ditch like the one shown in the 1984 photograph. A new, larger channel was constructed as urban development continued into the 1990s to handle anticipated increases in runoff from additional impervious cover. Frequent high flows caused extensive streambed and bank erosion, even in the larger channel. By 2010, the channel had widened and downcut enough to start the formation of a new flood plain within the confines of the old channel. (Photographs by Herbert Garn, Barbara Scudder Eikenberry, and Alan M. Cressler, USGS.)

This chapter provides a summary of the effects of urban development on the hydrology, habitat, and chemistry of stream ecosystems. Urban development results in increased

1. Streamflow flashiness,
2. Nutrients and chloride concentrations, and
3. Contaminants that are toxic to aquatic biota.

Regional differences in types of land cover (forested or agricultural) undergoing urban development have influenced stream nutrient and pesticide concentrations.

Responses of Hydrology and Habitat to Urban Development

Hydrologic responses to urban development were more consistent among the USGS study areas than were habitat responses (table 4–1). The four hydrologic and three habitat characteristics selected for inclusion in table 4–1 are drawn from a much larger group of physical factors measured during the USGS urban-development investigation and represent the major physical changes associated with urban development that may have detrimental effects on biological communities (Paul and Meyer, 2001; Walsh and others, 2005b).

Streamflow Flashiness Increased With Urban Development

Hydrologic responses to urban development for one or more of the four measures of streamflow flashiness were moderate to strong in all but the Salt Lake City study area. Streamflow flashiness is the rapid response of streamflow to storm events, characterized by frequent, large increases in flow (frequency and magnitude of high flow), rapid changes in flow conditions (maximum streamflow recession), and short duration of high flows (duration of high flow) (table 4–1; see sidebar, A Tale of Two Streams—Contrasting Hydrologic Situations in Raleigh Study Area Watersheds, and chapter 2 for more detailed explanation). Rapidly changing flow conditions degrade habitat and biological communities by eroding and scouring streambeds and banks.

An increase in the frequency of high flows was the most common and strongest hydrologic response to urban development (table 4–1), a finding consistent with that in other studies (Konrad and Booth, 2005; Walsh and others, 2005a; Kennen and others, 2010; Steuer and others, 2010). Graphs of the frequency of high flows in the Atlanta and Milwaukee study areas illustrate differences in the hydrologic responses to urban development in two different regions (fig. 4–1). Even though predevelopment watersheds in the Atlanta area are forested and in the Milwaukee area are agricultural, the frequency of high flows at the low end of the urban gradient is about three times higher in Atlanta than in Milwaukee. High flows are more frequent under natural conditions in Atlanta than in Milwaukee because Atlanta receives more precipitation and the precipitation is more evenly distributed throughout the year (fig. 3–7*A*).

Table 4–1. Hydrologic measures of streamflow flashiness and habitat responses to increasing urban development in nine metropolitan study areas (data are summarized in Giddings and others, 2009, and available at *http://pubs.usgs.gov/ds/423/*).

		Forest-to-urban gradient						Agriculture-to-urban gradient		
		Portland	Salt Lake City	Birmingham	Atlanta	Raleigh	Boston	Denver	Dallas	Milwaukee
Hydrology	Frequency of high flows[1]	⌃	–	⌃	↑	↑	–	▲	↑	↑
	Magnitude of high flows[2]	▲	▲	⌃	–	▲	▲	⌃	–	▲
	Maximum streamflow recession[3]	⌃	–	⌃	–	–	⌃	▲	▲	–
	Duration of high flows[4]	–	–	⌄	–	↓	–	⌃	⌄	–
Habitat	Channel size[5]	–	–	⌃	–	↑	–	–	–	⌃
	Width:depth ratio[6]	–	–	–	–	▼	⌄	–	▲	–
	Sand and silt in streambed[7]	–	–	–	–	⌃	⌃	–	–	–

[1] Frequency of rising events, where total rise is greater than or equal to 9 times the median total rise.
[2] Represented by the relative degree of skewness of the cross-sectional area or stage data.
[3] Maximum change in cross-sectional area or stage during one period of falling stage.
[4] Maximum duration of high cross-sectional area or stage greater than the 95th percentile.
[5] Bankfull channel area.
[6] Bankfull channel width-to-depth ratio.
[7] Percentage of fine particles (<2 mm).

Relation to urban development

Increases with urban development		Decreases with urban development
↑	Strong (rho ≥0.7)	↓
⌃	Moderate (rho 0.5 to 0.69)	⌄
▲	Weak (rho 0.4 to 0.49)	▼
–	rho <0.4	

Streams at 80 percent urban development in the Milwaukee study area have about the same frequency of high flows as undeveloped forested streams in the Atlanta study area. This comparison highlights how management strategies for urban streams might differ depending on the regional environmental setting, especially in regions with naturally flashy streams.

The Salt Lake City and Boston study areas did not show increases in the frequency of high flows with increases in urban development (table 4–1). The weak hydrologic responses in Salt Lake City are a consequence of widespread diversions (fig. 4–2), interbasin transfers, and irrigation withdrawals; many of these practices were in place before urban development. Streamflow responses to storms in Boston could have been moderated by the large number of dams that slow the movement of water through the stream system. On average, more than 75 percent of the area of the watersheds in the Boston study was upstream from dams, which is almost five times more than in the other study areas.

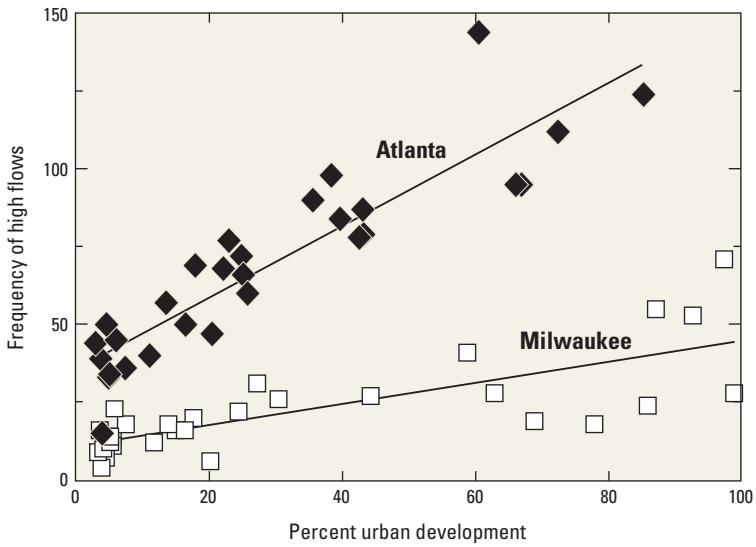

Figure 4–1. The frequency of high flows increased with urban development, although the rate of change differed among study areas, as seen by the different slopes of the lines in this example for Atlanta, Ga., and Milwaukee, Wis.

Figure 4–2. Water-diversion structures and interbasin transfers are common in semiarid areas such as Salt Lake City, Utah, where snowmelt and stormwater are stored and diverted.

A Tale of Two Streams—Contrasting Hydrologic Situations in Raleigh Study Area Watersheds

A comparison of two watersheds in the Raleigh study area—undeveloped, forested Brooks Creek and highly developed Pigeon House Branch—illustrates how streamflow and habitat can change with urban development (table 4–2). Streamflow-flashiness characteristics are remarkably different in the two watersheds. Runoff from rain storms in the Brooks Creek watershed causes small, infrequent high flows, while similar storms in the Pigeon House Branch watershed result in large, frequent high flows that have a high potential for eroding streambeds and banks (fig. 4–3).

The streamflow differences between Brooks Creek and Pigeon House Branch also are reflected in habitat differences. The narrow, deep channel in Pigeon House Branch likely resulted from a combination of larger streamflows and bank-stabilization projects that directed the stream energy toward the streambed. Large concrete blocks litter the near-bank zones of Pigeon House Branch, suggesting previous bank-stabilization efforts.

> "There are four interrelated but separable effects of land-use changes on the hydrology of an area: changes in peak flow characteristics, changes in total runoff, changes in quality of water, and changes in the hydrologic amenities. The hydrologic amenities are what might be called the appearance or impression which the river, its channel and its valleys, leaves with the observer. Of all the land-use changes affecting the hydrology of an area, urbanization is by far the most forceful." (Leopold, 1968)

Table 4–2. The flow of undeveloped Brooks Creek is much less flashy than that of Pigeon House Branch, with less frequent high flows and much longer duration of high flows.

[km^2, square kilometers; m^2, square meters]

Stream characteristics	Brooks Creek (undeveloped)	Pigeon House Branch (developed)
Watershed area (km^2)	23	11
Developed land (percent)	3.1	98.4
Frequency of high flows[1] (m^2)	28	103
Magnitude of high flow[1] (m^2)	4.9	12.4
Duration of maximum high flow[1] (m^2)	108	29

[1]Streamflow was measured as cross-sectional area of the wetted stream channel. A high flow occurred when streamflow exceeded a pre-determined value of wetted cross-sectional area.

A. **Brooks Creek**

B. **Pigeon House Branch**

C

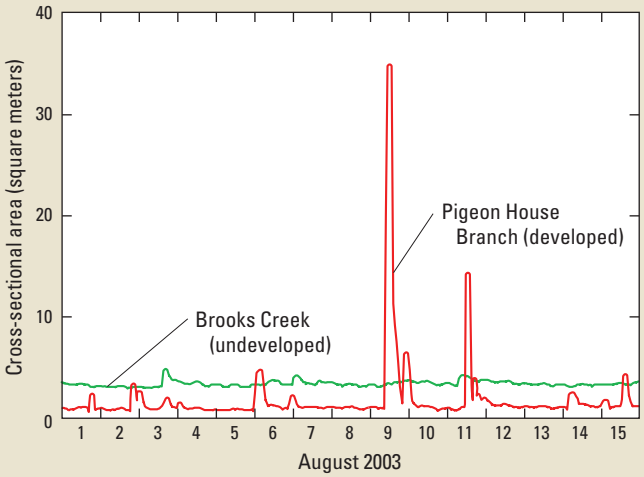

Figure 4–3. Storms in the Brooks Creek watershed *(A)* cause small, infrequent increases in streamflow; similar storms in Pigeon House Branch *(B)* cause large, frequent increases in streamflow *(C)*, as represented by the cross-sectional area of the channel that is inundated by the water. Engineered channels are common in developed areas to prevent flooding and loss of infrastructure. These channels are designed to transport runoff and sediment efficiently and usually have banks and beds that are stabilized with large rocks and concrete.

Habitat Responses to Urban Development Were Inconsistent

The habitat characteristics of a stream reach reflect a continually changing balance between the physical forces that drive changes in habitat, such as stream slope, streamflow, and sediment inputs, or loads, and the physical characteristics of the streambed and banks that resist these driving forces (fig. 4–4; Sear and Newson, 2003; Somerville and Pruitt, 2004; Chin, 2006). Increases in the driving forces need to exceed the strength of the resisting forces to initiate a habitat change. Urban development that leads to an increase in these driving forces, such as increased stream flashiness and sediment (see chapter 2), might not result in clear-cut evidence that habitat is changing if the resisting forces are particularly strong or if habitat changes are occurring over a long period of time.

Habitat responses to urban development in the nine areas studied were less evident than hydrologic responses. Changes in channel size (channel area) and shape (width-to-depth ratio) and the size composition of sediment, which can range from silt to boulders, were the most common habitat responses; however, these changes were observed in only five of the nine areas (table 4–1). The Raleigh study area had the most definitive changes in habitat, including an increase in channel size, channel deepening (decreased width-to-depth ratio), and an increase in fine-grained sediment (table 4–1; fig. 4–5; Fitzpatrick and Peppler, 2010). In other study areas, the fewer habitat responses were due in part to efforts during the study-site selection to avoid streams with evidence of human modification (see sidebar, Why Were Habitat Responses to Urban Development Inconsistent?). Despite the inconsistent response, stream-habitat characteristics are important for understanding the effects of urban development on stream ecosystems because they define the places and conditions where biota live.

A key finding was that channel modifications, such as riprap channels, channel straightening, and weirs, were common even in streams with little urban development. Stream channels were modified in about half of the study watersheds in Dallas, Portland, and Atlanta and in more than 85 percent of the study watersheds in the remaining six study areas.

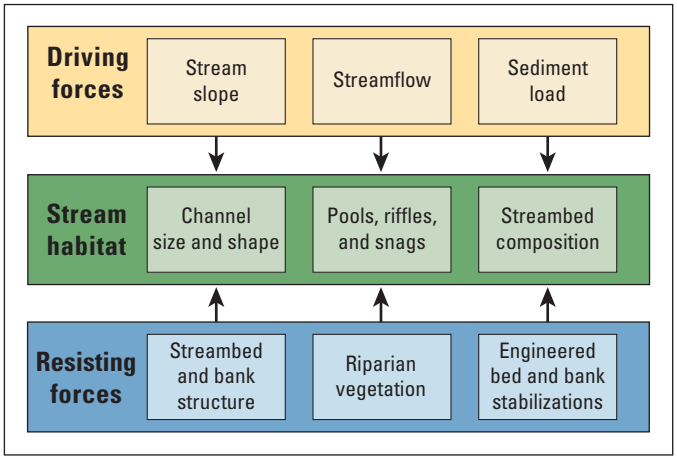

Figure 4–4. Habitat features are determined by the physical balance of driving and resisting forces. If the driving forces related to increased streamflow exceed the resisting forces of the size of streambed or bank sediment, channels will erode through downcutting or widening.

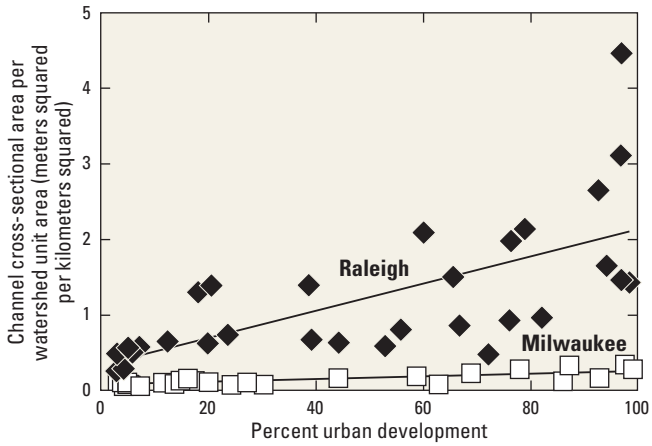

Figure 4–5. Channel cross-sectional area increased with urban development in the Raleigh and Milwaukee study areas. Channel areas are dependent on drainage area and were normalized by watershed area before comparisons. The slope of the line for the Raleigh study area is steeper because the resisting forces were greater in the Milwaukee study area.

"We often talk about stream incision as a result of increased runoff response in urban watersheds, and there are lots of places where we can see steep eroding banks and exposed utility pipes. But the evidence suggests that incision of the bed is not the only way that streams adjust to urban development. In some places—for example, Luna Leopold's famous study site in Watts Branch, Maryland—we actually have evidence for accumulation of sediment that raised the bed of the stream (at least temporarily) as well as the flood plain in response to upstream erosion delivering sediment to that part of the valley. This happened during the same period when the channel was enlarging to convey more frequent high flows. There are many other places where localized deposition of coarse sediment diverts flow against the opposite bank and induces channel instability and widening." (Professor Andrew J. Miller, University of Maryland–Baltimore County, written commun., 2009.)

Why Were Habitat Responses to Urban Development Inconsistent?

The relation between urban development and changes in habitat can be masked if the resisting forces are stronger than the driving forces (fig. 4–4). An increase in the area of impervious cover alters the amount and timing of stormwater runoff that reaches a stream after a storm and typically increases potential for erosion (fig. 4–6). The previous sidebar, A Tale of Two Streams—Contrasting Hydrologic Situations in Raleigh Study Area Watersheds, explains how a storm in the Pigeon House Branch watershed can result in large, rapid increases in streamflow, which can increase the driving forces leading to habitat changes. An increase in runoff can alter the shape of a stream channel to a degree that will depend, in part, on the type of channel material; stream channels with mostly fine-grained sediment will typically become relatively narrow and deep compared to stream channels with mostly coarse-grained sediment (Einstein, 1950; Schumm and Khan, 1972). Channel stabilization measures, however, can reduce the erosive effects of flashy streamflow by armoring the streambank (fig. 4–7).

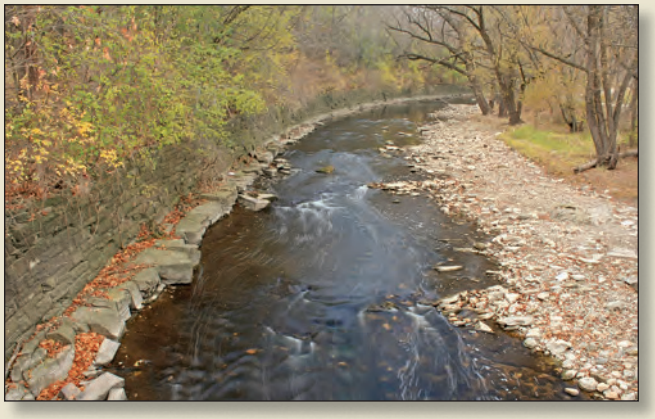

Figure 4–7. Engineered channels are common in developed areas to prevent flooding and loss of infrastructure. These channels, designed to transport runoff efficiently, usually have banks and beds that are stabilized with large rocks and concrete.

Figure 4–6. Frequent high flows increase the potential and severity of erosion, habitat degradation, and destruction of road crossings and infrastructure. This road crossing was washed out during a flood near Atlanta, Ga., in 2009.

Stream-habitat features at any one point in time also are influenced by processes other than development and by factors that influence the introduction and processing of sediment. The steeper the slope of a channel, the greater the potential for the water to erode the channel and its banks and to damage or destroy infrastructure, such as water and sewer lines, bridges, and roads. The slope of a channel can vary extensively along the length of a stream, and habitat characteristics depend on the slope of the reach. For example, a stream carrying the same amount of suspended sediment throughout its length might have a cobble and boulder bed in steep reaches and a silt and sand bed in more gently sloping reaches. Human activities that occur prior to urban development, such as logging, farming, drainage improvements, and the construction of millponds, have different long-term effects on sediment loads. Changes in drainage networks in urban settings (ditching and channelization) can increase the movement of fine sediment into streams, whereas millponds can trap sediment (Gellis and others, 2009; Lee and Ziegler, 2010).

The effects of urban development on habitat features in the USGS studies might be obscured by three factors. First, a criterion for site selection was that there be no evidence of recent human modifications in the selected stream reach and that streams have relatively well-defined banks with at least 50 percent mature vegetative cover. This criterion was intended to minimize local-scale habitat differences that might confound interpretation of broader-scale impacts of urban development (Short and others, 2005). Second, while unmodified channels were preferred in this study, artificial channels and stabilized banks were common and could not be avoided. Third, the habitat response to urban development may have been obscured by the long period of time needed for channel morphology and streambed characteristics to adjust to changes in sediment loads.

The percentage of streams with some type of channel modification differed among the nine study areas, with Portland, Atlanta, and Dallas having the fewest modified stream reaches (between 50 and 60 percent); however, more than 85 percent of the measured stream reaches in the remaining six study areas had some type of channel modification. More than 50 percent of the streams studied had grade controls (features that resist streambed erosion, such as culverts, weirs, and low-head dams) in or near the measured reach. Almost 30 percent of the reaches had some type of bank stabilization. Bank-stabilization measures had been implemented on more than 75 percent of the measured reaches in the Salt Lake City study area, where stream channels are relatively steep and hydrologic modifications had occurred decades prior to urban development.

Habitat response to urban development might have been obscured by the long period of time needed for channel morphology and sediment characteristics to adjust to changes in sediment loads (Schumm and Lichty, 1965; Wolman, 1967; Leopold and others, 2005). Major adjustments in suspended-sediment loads occur during urban development as sediment sources and the sediment amount, size, transport, and storage change over time (fig. 4–8). Early stages of urban development, such as land clearing associated with construction activities, can cause large amounts of fine-grained sediment (silt, clays, and sand) to be deposited in streams with gentle slopes. The amount of sediment entering a stream from new construction sites can be many times greater than sediment from agricultural areas (Owens and others, 2000; Lee and Ziegler, 2010); however, the proportion of sediment contributed by soil erosion in older urban settings with few areas of bare soil can be much less than in streams draining agricultural or newly developed areas (Wolman, 1967; Leopold and others, 2005).

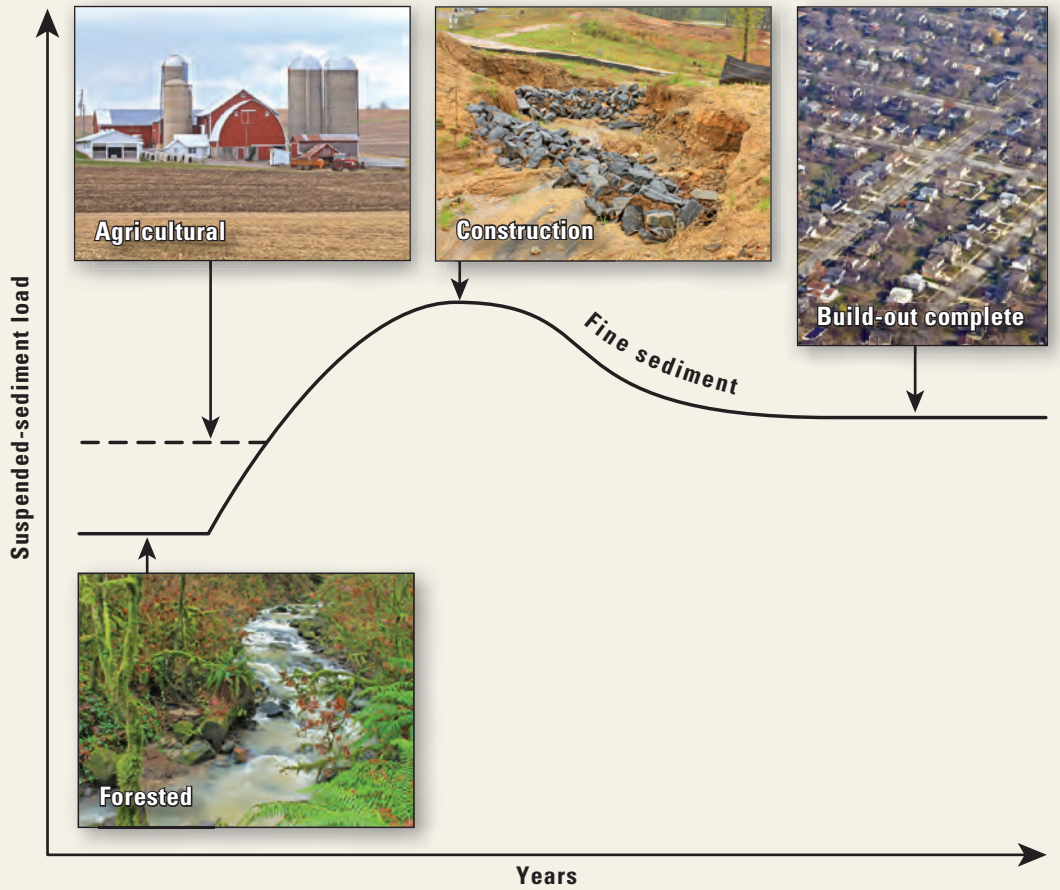

Figure 4–8. The sources of sediment can change over time, shifting from soil erosion at construction sites to bank and channel erosion after land surfaces are covered with pavement and buildings. The high suspended-sediment load that occurs early in the watershed development process is a result of sediment coming from construction-site erosion, which can be many times greater than sediment coming from agricultural areas or established urban areas (Wolman, 1967; Leopold and others, 2005). Channel adjustments from changes in suspended-sediment loads can last for decades (Schumm and Lichty, 1965; Owens and others, 2000).

Response of Stream Chemistry to Urban Development

The influence of urban development on stream chemistry was evident in three ways (table 4–3). First, chloride, pesticides (particularly insecticides), and hydrophobic contaminants generally increased (either in concentration, number of compounds detected, or both) with urban development in most study areas. This response to urban development is consistent with results reported in Gilliom and others (2006) that indicated (1) total insecticide concentrations generally were highest in urban streams, and (2) detections of measurable concentrations occurred even during low-flow, summer months.

Second, the relative toxicity of chemical contaminants in streams increased with urban development. The toxicity response reported for this investigation was based on analyses of samples collected at a single time of the year and provides a conservative estimate of the toxicity of contaminants present in these streams.

Third, regional differences in types of land being developed (whether forested or agricultural) influenced stream-chemistry responses. Generally, concentrations of nitrogen and herbicides increased in five of the six study areas where urban development occurred on forested land, while responses of these chemicals were weak overall when development occurred on agricultural land.

Table 4–3. Stream-chemistry responses to urban development (data are available in Bryant and others, 2007; Giddings and others, 2009).

		Forest-to-urban gradient						Agriculture-to-urban gradient		
		Portland	Salt Lake City	Birmingham	Atlanta	Raleigh	Boston	Denver	Dallas	Milwaukee
Chloride and nutrients	Nitrogen	↑	▲	–	^	^	^	–	–	–
	Phosphorus	^	–	–	–	–	▲	–	–	–
	Chloride	▲	^	^	↑	^	↑	^	▲	↑
Pesticides	Herbicides[1]	^	^	^	↑	▲	–	–	–	–
	Insecticides[2]	▲	^	–	^	^	^	▲	^	–
	PTI[3]	–	–	–	▲	^	^	–	^	–
Hydrophobic contaminants	Occurrence[4]	▲	No data	(5)	↑	↑	No data	↑	^	↑
	PAHs[6]	▲	No data	No data	↑	↑	No data	↑	▲	↑
	Toxicity[7]	↑	No data	↑	↑	↑	No data	↑	▲	↑

[1] Total herbicide concentration.
[2] Total insecticide concentration.
[3] Pesticide Toxicity Index (PTI).
[4] Number of different hydrophobic contaminants detected with semipermeable membrane devices (SPMDs).
[5] Birmingham samples were evaluated only for overall toxicity, not individual contaminants.
[6] Concentration of polycyclic aromatic hydrocarbons (PAHs).
[7] Toxicity of overall mixture of hydrophobic contaminants based on the P450 bioassay.

Relation to urban development

Increases with urban development

↑ Strong (rho ≥0.7)

^ Moderate (rho 0.5 to 0.69)

▲ Weak (rho 0.4 to 0.49)

– rho <0.4

Regional Differences in Types of Predevelopment Land (Forested or Agriculture) Influenced Stream Nutrient and Pesticide Responses to Urban Development

Concentrations of nitrogen increased as urban development occurred on forested land. The increase was moderate to strong in the Portland, Atlanta, Raleigh, and Boston study areas (table 4–3). Increases in stream nitrogen concentrations were not apparent in study areas where agriculture, including grassland (Denver, Dallas, and Milwaukee), was the predominant type of land being converted to urban uses. Nitrogen concentrations in these study areas were considerably higher in watersheds with minimal urban development in comparison to study areas where urban development occurred on forested land. For example, the median nitrate concentration in watersheds with less than 20 percent urban development in Milwaukee (0.79 milligram per liter, mg/L) were more than 8 times higher than the median nitrogen concentration in forested watersheds in Portland (0.09 mg/L). Agricultural activities in the Milwaukee study areas, therefore, may have contributed to elevated nitrogen concentrations.

Concentrations of phosphorus generally indicated little association with the level of urban development, except in the Portland and Boston study areas where phosphorus concentrations indicated moderate and weak positive correlations, respectively, with urban development (table 4–3). In the study areas where agriculture was the predevelopment land use, phosphorus concentrations were relatively high in some streams with low levels of urban development. For example, in the Milwaukee study area, total phosphorus concentrations were highest in several streams with low levels of urban development (less than 30 percent), and phosphorus concentrations overall decreased with urban development, although not substantially (fig. 4–9).

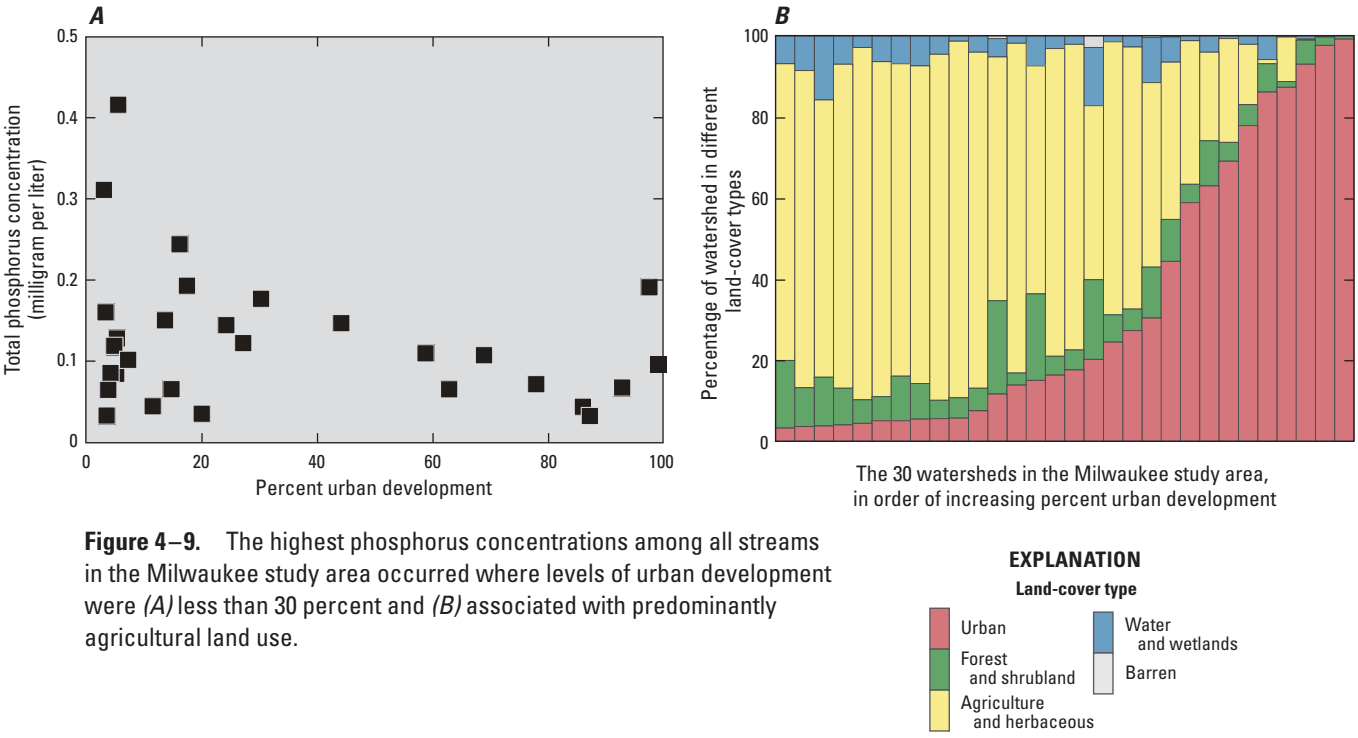

Figure 4–9. The highest phosphorus concentrations among all streams in the Milwaukee study area occurred where levels of urban development were *(A)* less than 30 percent and *(B)* associated with predominantly agricultural land use.

Chloride Increased With Urban Development Even in Areas Where Deicing Chemicals Are Infrequently Used

Chloride was the only chemical measured that increased in concentration in stream water with urban development in all nine study areas (table 4–3). This was true regardless of whether road-salt use was expected to be high in study areas with cold climates (Salt Lake City, Boston, Denver, and Milwaukee; fig. 4–10) or low in study areas with warm climates (Portland, Birmingham, Atlanta, Raleigh, and Dallas). Increases in chloride concentrations can result from leaking sewage lines and septic tanks, fertilizer use, and the use of water softeners, bleach, and swimming pool chemicals; chloride can be transported to streams through groundwater and wastewater-treatment plant discharges. This relation, based on analyses of water samples collected during low-flow conditions, indicates that elevated chloride concentrations associated with urban development can persist across seasons (see sidebar, Characterizing Water Quality Can Depend on Time of Year When Stream Chemistry Is Measured). This is consistent with findings in studies in the northeastern United States, which indicate that a gradual accumulation of chloride in groundwater from a variety of sources can lead to elevated concentrations during summer low-flow periods (Kaushal and others, 2005; Mullaney and others, 2009).

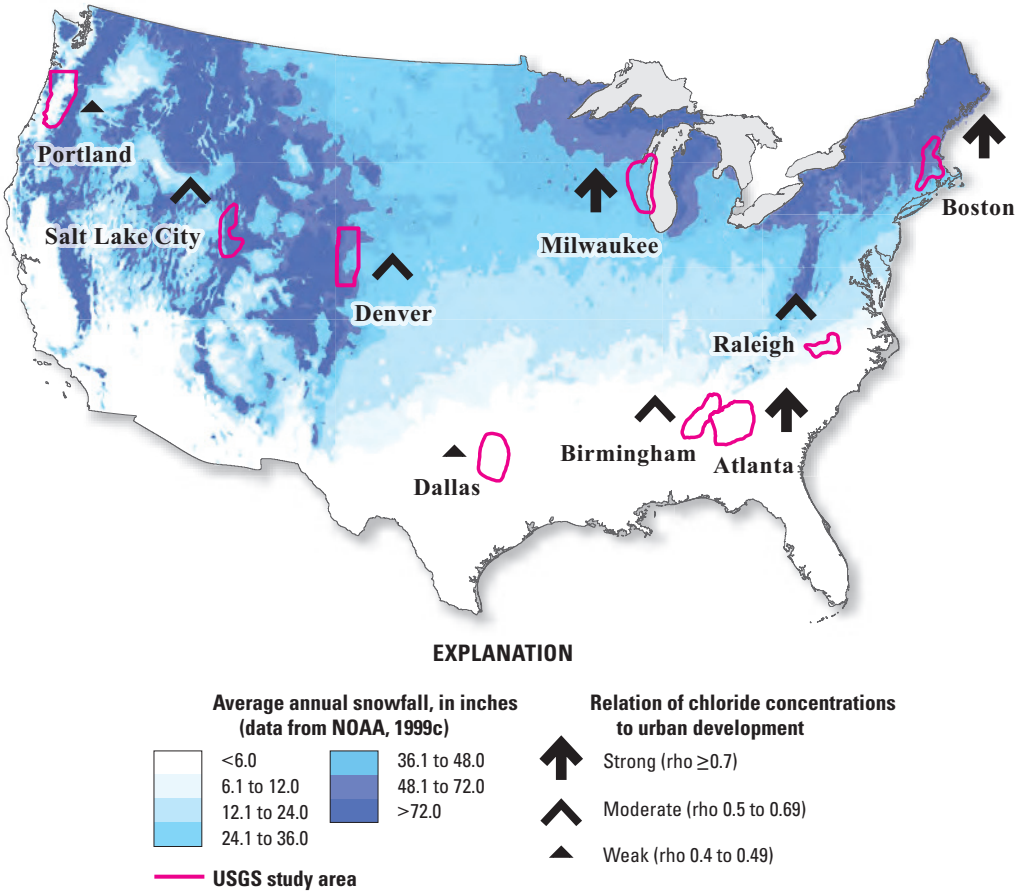

Figure 4–10. Chloride concentrations during low-flow conditions increased in response to urban development in all study areas, even in warmer climate areas with low amounts of snowfall where deicing chemicals are used infrequently. The general pattern of increased chloride concentrations with urban development is noteworthy considering the potential for these concentrations to affect the health of aquatic organisms. (Modified from Corsi and others, 2010.)

Characterizing Water Quality Can Depend on Time of Year When Stream Chemistry Is Measured

The relations between urban development and stream chemistry reported in table 4–3 are based on water samples collected during the low-flow period, defined as a period in which few precipitation events occur. It generally was acknowledged in designing the USGS investigation, however, that water-quality conditions in a region might show greater variation throughout the year, which would not be characterized by samples collected only during the low-flow period. For example, in the temperate regions where snow cover dominates the winter landscape, springtime snowmelt and rain can flush contaminants from the watershed, resulting in higher flows and higher contaminant concentrations.

In addition to describing stream chemistry for the low-flow period, supplemental characterizations were made during the year for nitrogen, phosphorus, chloride, and the pesticide toxicity index (PTI) based on water samples collected bimonthly at approximately 10 sites in 7 study areas: Portland, Atlanta, Raleigh, Boston, Denver, Dallas, and Milwaukee (Beaulieu and others, 2012). For each constituent, the bimonthly data were used to calculate a median value (to represent yearly "integrated" conditions) and the standard deviation (to represent the amount of seasonal variability). The relation between a constituent and urban development was calculated in two ways: by levels of the constituent based on (1) low-flow values and (2) median values. Results from these two relations were compared to determine how closely the low-flow sample characterized the integrated (for example, median) water-chemistry conditions. In addition, for each constituent, the relation between the standard deviation of its values and urban development was used to determine if the amount of seasonal variation increased with urban development.

The strength of the relation between a constituent and urban development was generally comparable when using either the low-flow or median value (table 4–4). For nitrogen and phosphorus, the relations based on low-flow values were slightly stronger in a few cases, but for chloride and the PTI, the relations were somewhat stronger overall using the median values. This latter difference may be a result of seasonal applications of road salts and pesticides within a watershed; therefore, chloride and PTI values would not be as well characterized in water samples collected under low-flow conditions.

The amount of seasonal variation in the levels of a constituent also generally increased with urban development (table 4–4). Notable exceptions were for nitrogen in the Dallas study area and phosphorus in the Milwaukee study area, both with a negative response, possibly because variation in these nutrients decreased as land use in these regions changed from agriculture to urban. Consistent with the result that chloride and PTI are best characterized by median values, the amount of seasonal variation in these constituents increased steadily as levels of urban development increased. This result is especially relevant regarding chloride in urban areas because, unlike nutrients and pesticides, the use of chemicals that contain chloride generally is not associated with agricultural practices (especially direct applications of salt). The chloride median value was related to urban development in all study areas (table 4–4), but was strongest (rho, 0.9 or greater) in high-snowfall areas of Denver, Milwaukee, and Boston (fig. 4–10). Furthermore, seasonal variance in chloride was most strongly related to urban development in these three areas (rho, 0.75 or greater), which suggests that winter applications of deicing chemicals may contribute to particularly high chloride concentrations at certain times of the year.

Table 4–4. The relation of chemical constituents (nitrogen, phosphorus, chloride, and pesticide toxicity index levels) to urban development, based on the single low-flow value and the median value from samples collected bimonthly over 1 year. Seasonal variation indicates how strongly urban development was related to the amount of variation in the levels of the constituent during the year. As watersheds were developed, seasonal variation generally increased, indicating that greater shifts in water quality can occur throughout the year in areas of high urban development.

[Relation to urban development: **Strong** (rho≥0.7); Moderate (0.5 to 0.69); Weak (0.4 to 0.49); — (<0.4)]

Constituent		Portland	Atlanta	Raleigh	Boston	Denver	Dallas	Milwaukee
Nitrogen	Low-flow value	0.61	**0.70**	0.69	**1.00**	—	–0.43	—
	Median value	0.62	0.67	—	**0.94**	—	—	—
	Seasonal variation	—	—	—	**0.83**	0.43	–0.42	—
Phosphorus	Low-flow value	**0.75**	—	—	**0.94**	0.47	—	–0.50
	Median value	0.66	—	—	**0.71**	0.52	—	**–0.70**
	Seasonal variation	**0.78**	—	–0.62	—	**0.73**	—	–0.62
Chloride	Low-flow value	0.44	0.57	—	**0.83**	**0.72**	0.60	0.68
	Median value	**0.75**	**0.82**	0.43	**1.00**	**0.90**	0.45	**0.99**
	Seasonal variation	0.50	—	—	**0.77**	**0.75**	—	**0.96**
Pesticide toxicity index (PTI)	Low-flow value	0.68	0.43	0.43	No data	—	0.50	—
	Median value	0.67	**0.88**	—	No data	**0.73**	0.63	–0.66
	Seasonal variation	0.65	**0.97**	0.40	No data	**0.77**	0.42	—

Measuring the Potential Toxicity of Pesticide Combinations

A pesticide toxicity index (PTI; Munn and Gilliom, 2001; Munn and others, 2006) was used as a measure of the potential toxicity of multiple pesticides co-occurring in stream water. The index is based on the concentrations of all pesticides measured in the water sample, each weighted by its individual toxicity threshold, as estimated from laboratory toxicity studies. Although the index does not indicate whether water in a sample is toxic, it can be used to rank or compare the relative potential toxicity of different streams and to empirically evaluate an association between potential toxicity and urban development. An index can be specific to a type of organism. The pesticide toxicity index values used in this chapter are specific to cladocerans, an aquatic invertebrate that often is used for testing the toxicity of contaminants in water.

Concentrations of Insecticides in Water and Their Toxicity Increased With Urban Development

Numerous pesticides are registered for use in urban settings and are applied to combat home and garden pests, maintain rights-of-way, and protect structures. The large number of pesticides registered for urban uses is reflected in the mixture of pesticides detected in stream samples in each study area. A national survey conducted by Gilliom and others (2006) determined that urban streams almost always contained complex mixtures of pesticides and pesticide-degradation products; 80 percent of urban streams (those in watersheds having greater than 25 percent urban land cover) had pesticide concentrations that exceeded one or more benchmarks for the protection of aquatic life.

The total concentration of insecticides in stream water increased with urban development in all study areas except Birmingham and Milwaukee (table 4–3). The number of detections and the relation between concentrations of individual insecticides and urban development varied across the study areas and appeared to follow patterns of pesticide use (Bryant and others, 2007). For example, the concentration of the insecticide chlorpyrifos was strongly related to urban development in Atlanta, Raleigh, and Dallas, and the concentration of chlordane was strongly related to urban development in Raleigh. All three study areas are in areas of high termite activity (Beal and others, 1994), and the detection of chlorpyrifos and chlordane in stream water corresponds to the historical use of these compounds for termite control (Nowell and others, 1999; Gilliom and others, 2006). These compounds continue to be detected even though there have been no approved uses of chlordane since 1988.

The relative potential toxicity of pesticides in stream water for cladocerans increased with urban development in the Atlanta, Raleigh, Boston, and Dallas study areas (table 4–3; see sidebar, Measuring the Potential Toxicity of Pesticide Combinations). Insecticides accounted for a greater proportion of the potential toxicity in streams than herbicides, but insecticides were detected less frequently and at lower concentrations. For example, in Honey Creek, a highly urbanized stream in the Milwaukee study area, the pesticide detected at the highest concentration was the herbicide atrazine (Richards and others, 2010; fig. 4–11). However, the insecticides diazinon and chlorpyrifos accounted for most of the toxicity.

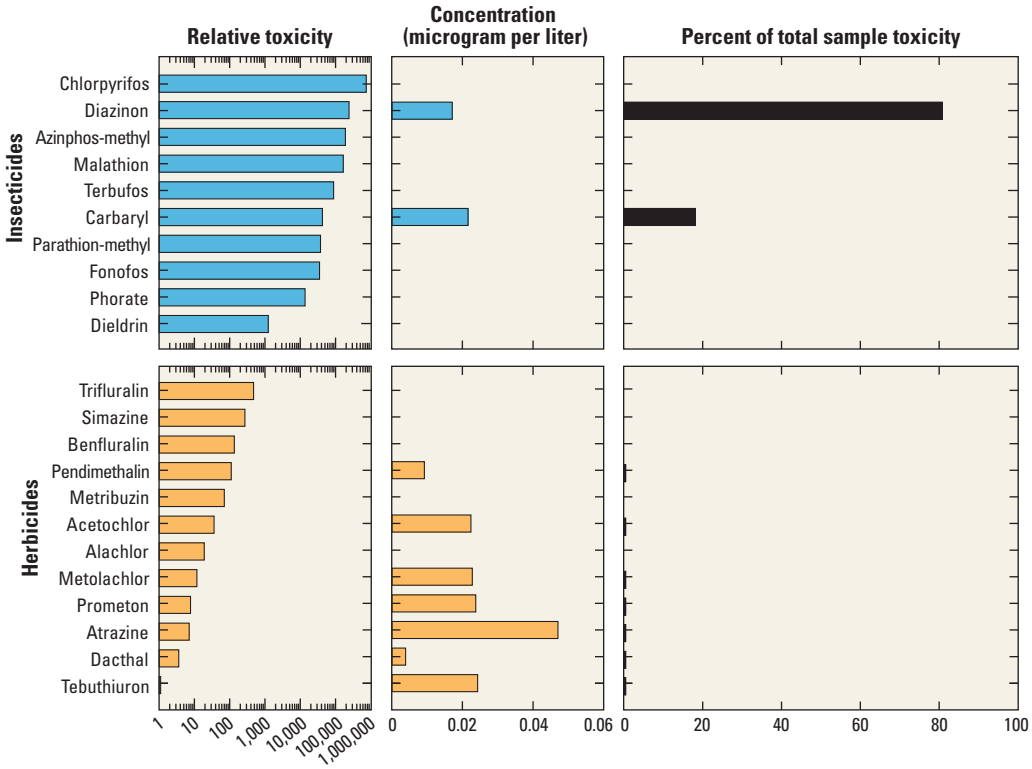

Figure 4–11. Insecticides (blue bars) accounted for a greater proportion of relative toxicity in streams than herbicides (orange bars) but were detected less frequently and at lower concentrations. Example shown is for Honey Creek, a highly urbanized stream in the Milwaukee study area.

The Types of Organic Contaminants in Water Vary by Region and Depend on Current and Historical Use Patterns

The number of hydrophobic contaminants in water increased with urban development in Portland, Atlanta, Raleigh, Denver, Dallas, and Milwaukee study areas (Salt Lake City and Boston were not included in this assessment, and only gross toxicity was measured in Birmingham), but the mixture of compounds varied (see sidebar, Characterizing Hydrophobic Contaminants With Semipermeable Membrane Devices). The relation to urban development was especially strong in Raleigh, Atlanta, Denver, and Milwaukee (table 4–3). The number of individual contaminants ranged from 3 in Dallas and Portland to 21 in Raleigh. The types of contaminants detected include pesticides, compounds associated with fragrances or personal-care products, flame retardants, polycyclic aromatic hydrocarbons (PAHs), and plasticizers. These varying responses to urban development reflect different sources and transport processes; thus, different management approaches may be required to improve stream quality in different metropolitan areas. Additional information describing specific contaminants associated with urban development is provided in the case study: Contamination and Toxicity of Stream Sediments Increase With Urban Development.

The potential toxicity of hydrophobic contaminants increased with urban development in all seven study areas where toxicity was assessed (Bryant and Goodbred, 2008; table 4–3). A bioassay was used to evaluate the degree of toxicity in the overall mixture of contaminants in the sample, but the bioassay does not indicate which compounds were responsible for the toxicity. The actual effects of these compounds on organisms of interest, such as fish, often are not directly observed. Exposure to toxic compounds need not be lethal, but the health of organisms can still be affected to the extent that the species composition of the biological community is altered.

The most frequently detected hydrophobic contaminants were PAHs. Contamination of urban streams and lakes by PAHs is widespread in the United States (Chalmers and others, 2007; Van Metre and Mahler, 2010). PAHs in the environment are largely a result of the incomplete combustion of petroleum, oil, coal, and wood (Takada and others, 1991). Emissions, such as from industrial processes, power plants, home heating, and vehicles, and runoff from parking lots with coal-tar-based pavement sealants are considered to be the principal sources to the environment (Van Metre and Mahler, 2010, and references therein). PAHs are of environmental concern because they are toxic to aquatic life and because many are probable or suspected human carcinogens (U.S. Environmental Protection Agency, 1993). Scoggins and others (2007) reported a loss of sensitive species and overall decline in species richness in urban streams receiving runoff from parking lots sealed with coal-tar-based sealants. Coal-tar-based pavement sealants were only recently identified as an important source of PAHs in urban environments (Mahler and others, 2005), and on average, they were the largest source of PAHs to 40 urban lakes (Van Metre and Mahler, 2010).

Concentrations of several frequently detected PAHs (phenanthrene, fluoranthene, and pyrene) were correlated with urban development in the Atlanta, Raleigh, Denver, and Milwaukee study areas (table 4–3); however, very few streams in the Portland or Dallas study areas had detectable levels of PAHs. Lack of detections indicates few sources of the compounds, dilution, or lack of delivery pathways to streams in the latter two study areas (Bryant and Goodbred, 2008). Higher concentrations of PAHs in pavement dust and urban lakes east of the Continental Divide have been linked to use patterns of coal-tar-based sealants, which are much less commonly used in the west (Van Metre and others, 2009). This spatial pattern appears to be supported by the results of this study, with the exception of the Dallas study area.

Characterizing Hydrophobic Contaminants With Semipermeable Membrane Devices

Semipermeable membrane devices (SPMDs) were used to collect the bioavailable fraction of waterborne hydrophobic contaminants that are present at low levels (Gourlay and others, 2005; Huckins and others, 1996, 2006). These devices offer an advantage over the collection and analysis of discrete water samples because SPMDs mimic the bioaccumulation of these compounds across the gill membranes of fish. These devices were deployed for a 6-week period in streams in the Portland, Atlanta, Raleigh, Denver, Dallas, and Milwaukee study areas. The relative toxicity of contaminants detected in the SPMD was determined by using the P450 bioassay, which indicates the overall toxicity for the mixture of contaminants rather than identifying which compounds were responsible for the toxicity. Results from the P450 bioassay are reported in toxic equivalents (Bryant and Goodbred, 2008).

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Contamination and Toxicity of Stream Sediments Increase With Urban Development

Lisa H. Nowell, Robert J. Gilliom, Nile E. Kemble, Christopher G. Ingersoll, Kathryn M. Kuivila, Michelle M. Hladik, Patrick W. Moran, and Daniel L. Calhoun

Contaminant concentrations in stream sediments, predicted sediment toxicity, and observed toxicity to amphipods—a common group of benthic invertebrates found in streams—all generally increased with degree of watershed urban development in seven major metropolitan areas distributed across the Nation. The pyrethroid insecticide bifenthrin and, to a lesser extent, polycyclic aromatic hydrocarbons (PAHs) are estimated to be the primary contributors to sediment toxicity in the streams studied. Urban pyrethroid uses have increased since about 2000, as this class of insecticides has replaced organophosphates in applications such as home and garden use, landscaping, and termite control (Spurlock and Lee, 2008). PAH concentrations also may be increasing in urban areas, as evidenced by increasing long-term trends in sediment cores from urbanized lake basins across the United States (Van Metre and Mahler, 2005). Findings for bifenthrin illustrate how the use of a single new product in an urban environment can significantly change the toxicity of stream sediments, whereas findings for PAHs confirm the continued importance of this long-recognized class of urban contaminants.

Study Design

The contamination and toxicity of sediments were assessed for streams in six of the nine metropolitan study areas, plus an additional study area, Seattle, Washington (Moran and others, 2012). In each study area, 12 to 21 stream sites were selected to represent a gradient of urban development among the watersheds. During low-flow conditions in the late spring to late summer of 2007, one sediment sample was collected at each site by compositing surficial bed sediments from multiple depositional areas within a stream reach. Samples were analyzed for five classes of sediment contaminants: pyrethroid insecticides, a class of contaminants reported at toxic concentrations in some urban stream sediments, and four that have long been associated with urban development: metals, PAHs, polychlorinated biphenyls (PCBs), and organochlorine pesticides (Weston and others, 2005; Holmes and others, 2008).

Sediment toxicity was assessed in laboratory tests using the amphipod *Hyalella azteca* (exposed for 28 days) and the midge *Chironomus dilutus* (exposed for 10 days) and was evaluated based on comparisons to reference conditions within each study area (Kemble and others, in press; Moran and others, 2012). These are widely used test organisms that have been demonstrated in standardized toxicity tests to be predictive of effects of contaminated sediments on resident benthic communities in streams across North America. The endpoints measured were lethality, weight, and biomass.

Sediment-quality guidelines were used to predict whether or not samples are likely to be toxic based on contaminant concentrations exceeding a guideline. Sediment-quality guidelines for individual contaminants or specific groups of contaminants include Probable Effect Concentrations (PEC) from MacDonald and others (2000), similar PECs for pyrethroids estimated from toxicity data in the literature (Moran and others, 2012), and the summed Equilibrium Sediment Benchmark Toxic Units (ESBTU) for PAH mixtures (U.S. Environmental Protection Agency, 2003).

The predicted toxicity of sediment due to the combined toxicity of multiple contaminants was assessed using each sample's mean Probable Effect Concentration Quotient (PECQ). The mean PECQ for a sample weights the concentration of each contaminant in the sample by its relative toxicity by dividing the concentration of each contaminant by its PEC and then averaging these weighted concentrations for all contaminants in the sample. The mean PECQ for a sample predicts greater influence by contaminants that are more toxic, as well as by contaminants that are present at higher concentrations.

Multiple studies have shown that sediment-quality guidelines, including those based on individual PECs and mean PECQs, can accurately predict sediment toxicity in both laboratory toxicity tests and in situ invertebrate communities (Ingersoll and others, 2001, 2005). A higher likelihood of toxicity is predicted for samples that exceed individual PECs, have ESBTU values of >1 for PAH mixtures, or have mean PECQ values of >0.1 for complex contaminant mixtures (Ingersoll and others, 2001, 2009; U.S. Environmental Protection Agency, 2003).

Contaminant Occurrence and Concentrations Increased With Urban Development

Organic contaminants were detected at almost every site (98 percent), and mixtures of multiple organic contaminants were frequent, with 10 or more contaminants detected at 78 percent of sites. PAHs were detected most often (98 percent of sites) and at the highest concentrations. PCBs and the organochlorine pesticides DDT, chlordane, and dieldrin each were detected at 41 to 47 percent of sites, and one or more pyrethroids were detected at 45 percent of sites (Nowell and others, in press). Of the pyrethroids, bifenthrin was detected most frequently—at 41 percent of sites and in all seven study areas (fig. 4–12), whereas cyhalothrin, permethrin, resmethrin, and cypermethrin were detected at 1 to 11 percent of sites (Kuivila and others, 2012).

Concentrations of bifenthrin, PAHs, PCBs, DDT, dieldrin, chlordane, cadmium, copper, lead, and zinc in sediments were correlated with urban development in stream watersheds. The degree of urban development, together with the organic carbon concentration in the samples (many of these contaminants tend to accumulate in organic-rich particles and coatings), explained 30 to 70 percent of the variability in contaminant concentrations among all sites. There were significant differences, however, in contaminant concentrations among the seven study areas, even after accounting for differences in urban development and sediment organic carbon (Nowell and others, in press). PAH concentrations were significantly lower in Seattle and Salt Lake City than in other study areas. Pyrethroids were detected most frequently (77 percent of sites) and at the highest concentrations in the Dallas study area. These and other differences probably result from variations in contaminant sources among different metropolitan areas, combined with variations among the areas in climate, soils, and other factors that affect contaminant transport to streams. Overall, pyrethroid detections occurred only in watersheds containing more than 34 percent urban land or more than 28 percent agricultural land (Kuivila and others, 2012).

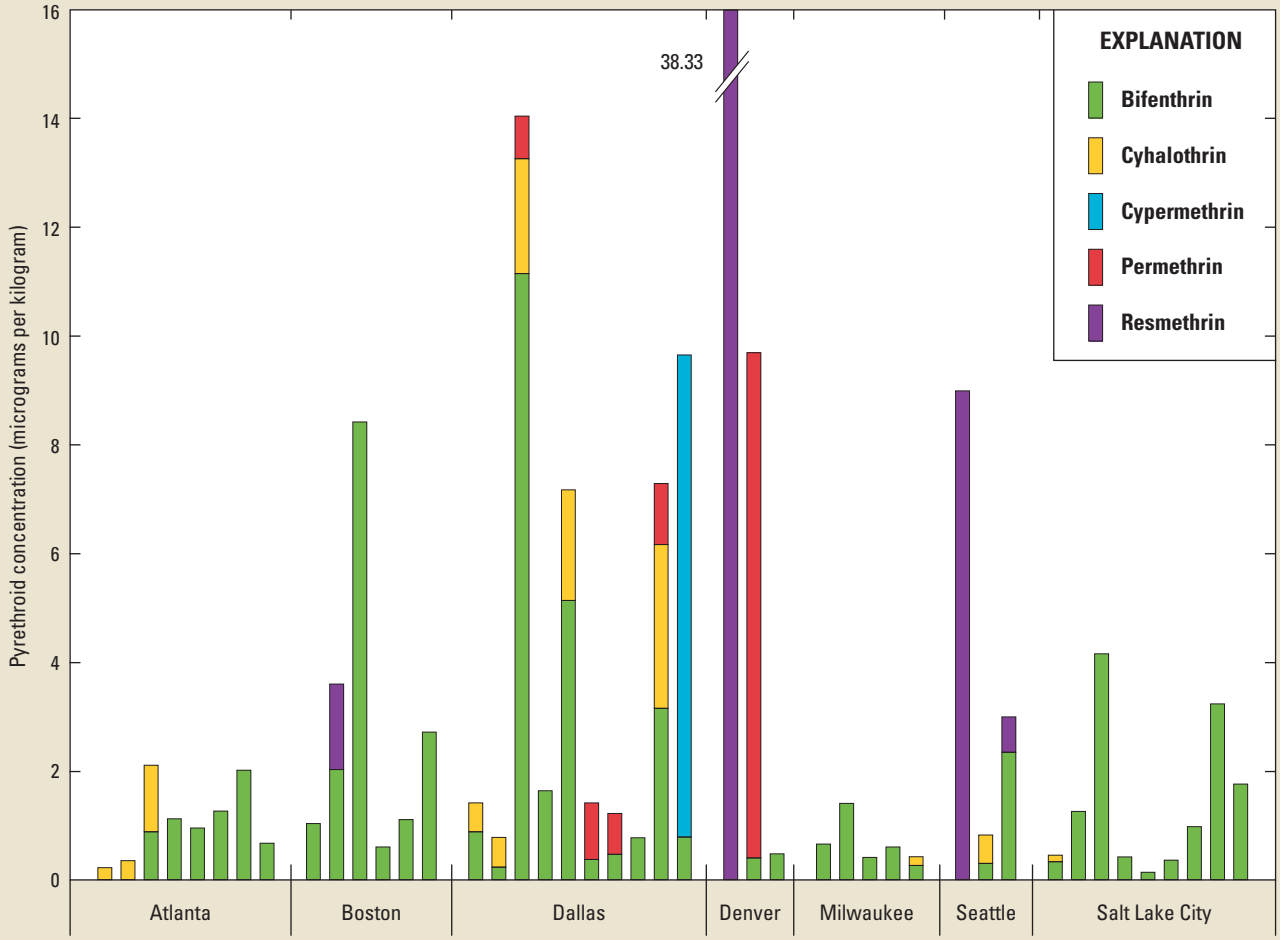

Figure 4–12. Bifenthrin was the most frequently occurring pyrethroid in all study areas, as shown by results for these 44 sites that had detections of one or more pyrethroids in sediment. Urban pyrethroid use has increased since about 2000, as this class of insecticides has replaced organophosphates in applications such as home and garden use, landscaping, and termite control.

Sediment Toxicity Increased With Urban Development

Predicted toxicity due to the combination of all five contaminant classes, as indicated by the mean PECQ for each sample, and observed sediment toxicity to amphipods in laboratory tests, both generally increased with degree of urban development (Nowell and others, in press). Nine undeveloped sites (<5 percent urban land in the watershed) had predicted toxicities below toxicity thresholds, and only one had sediment that was toxic to amphipods—this site had bifenthrin, which probably originated from agricultural land (65 percent of the watershed). In contrast, 32 of 55 highly urbanized sites (>50 percent urban development in the watershed) exceeded one or more sediment toxicity thresholds, and 21 of the 55 sites had sediment that was toxic to amphipods in laboratory tests.

When all five contaminant classes were included in the toxicity predictions using the mean PECQ, samples from 83 percent of sites were correctly predicted to be toxic, or nontoxic, to amphipods (fig. 4–13; Kemble and others, in press). The reasonable agreement between predicted and observed toxicity supports the application of mean PECQs

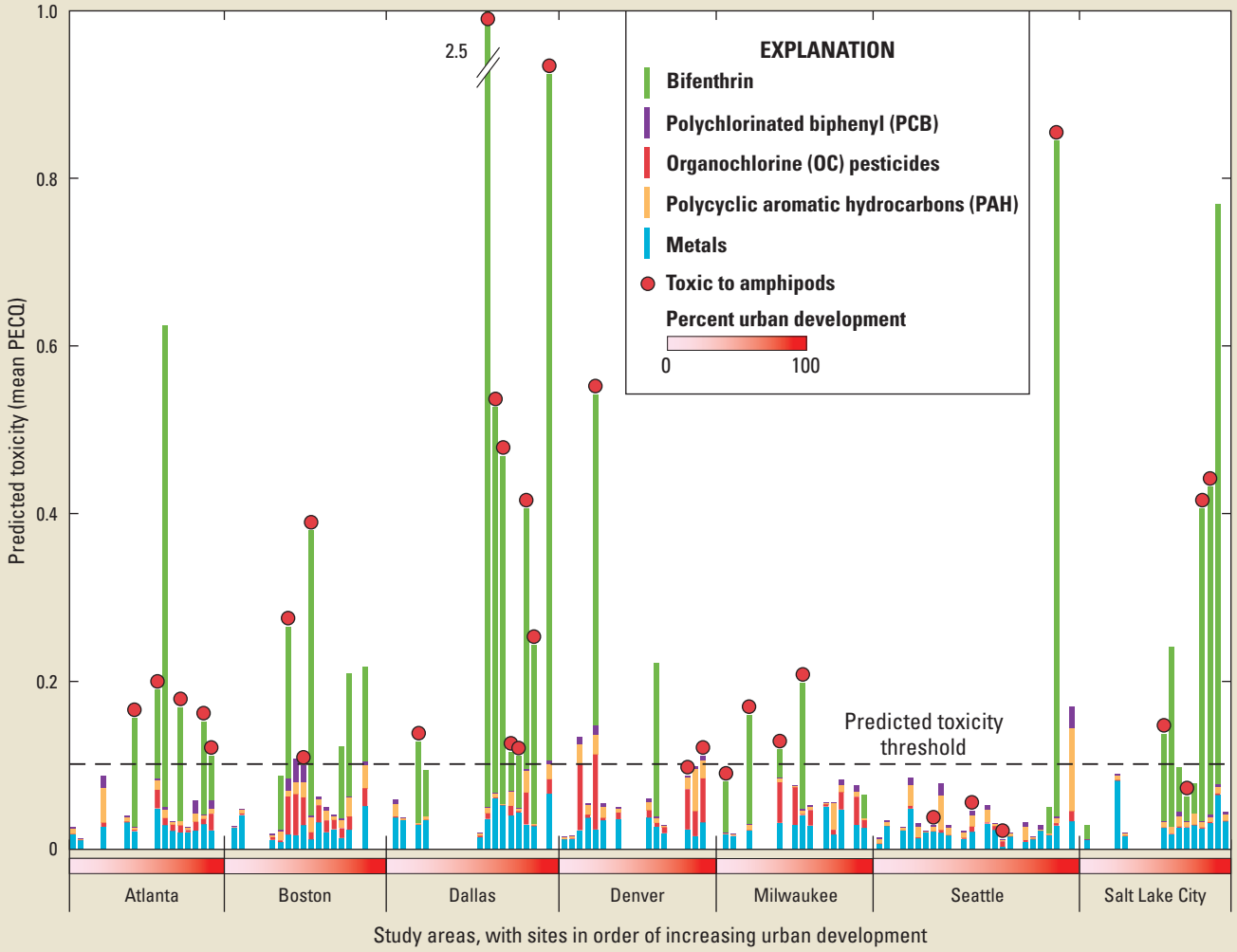

Figure 4–13. The predicted toxicity due to all measured contaminants, as well as their relative contributions, varied across the seven urban study areas, but the highest predicted toxicity was generally found at sites with over 40 percent urban development. The pyrethroid insecticide bifenthrin generally contributed the largest percentage of predicted toxicity, based on the mean probable effect concentration quotient (mean PECQ) for five contaminant classes. The mean PECQ values shown are based on five contaminant classes, with bifenthrin representing the pyrethroids. Samples were predicted to be toxic if their mean PECQ values exceeded the toxicity threshold (shown as the dashed black line). This predicted indicator of toxicity closely matched observed amphipod toxicity (indicated by red dots). Sediment samples from 83 percent of sites were correctly predicted by the mean PECQ (in relation to the predicted toxicity threshold of 0.1) to be toxic, or nontoxic, to amphipods.

and related sediment-quality guidelines to explain likely causes of toxicity in this study. Of 32 sites with observed toxicity, 27 were predicted to be toxic because they exceeded one or more guidelines, including 25 predicted to be toxic based on the samples with a mean PECQ exceeding the 0.1 toxicity threshold. Bifenthrin was the dominant contributor to predicted toxicity at 23 sites, including 11 where the individual PEC for bifenthrin also was exceeded. Eight of the 25 sites predicted to be toxic based on the mean PECQs also exceeded the ESBTU guideline for PAHs. In addition, two sites with observed toxicity were predicted to be toxic because PAHs exceeded the ESBTU guideline, even though the sample PECQ was below the predicted toxicity threshold.

The particular importance of bifenthrin is supported by both amphipod and midge results from toxicity tests. Amphipod survival decreased significantly as the bifenthrin concentration increased (fig. 4–14; Kemble and others, in press; Kuivila and others, 2012). In contrast to amphipods, the limited toxicity observed with midges was poorly predicted by the sediment toxicity thresholds for the contaminants measured, including pyrethroids. This is consistent with pyrethroids being a primary cause of amphipod toxicity because midges are less sensitive to pyrethroids than are amphipods (Amweg and others, 2006; Maul and others, 2008). Compared to other studies, both the incidence of amphipod toxicity and bifenthrin concentrations were lower than reported for sediments from urban streams and storm drains in California, Texas, and Illinois (Weston and others, 2005; Holmes and others, 2008; Hintzen and others, 2009; Ding and others, 2010) but higher than in urban streams (without storm sewers) in Tennessee (Amweg and others, 2006).

Overall, albeit with substantial variation among metropolitan areas and limited to the contaminants measured in this study, bifenthrin and to a lesser extent PAHs are estimated to be the primary contributors to increased sediment toxicity in the streams as urban development in the watersheds increased. Although the other contaminants measured may have contributed to toxicity, their concentrations were usually below sediment toxicity thresholds. For five sites, the contaminants detected could not account for the observed toxicity to amphipods, suggesting that other contaminants not measured in this study may also have contributed to sediment toxicity.

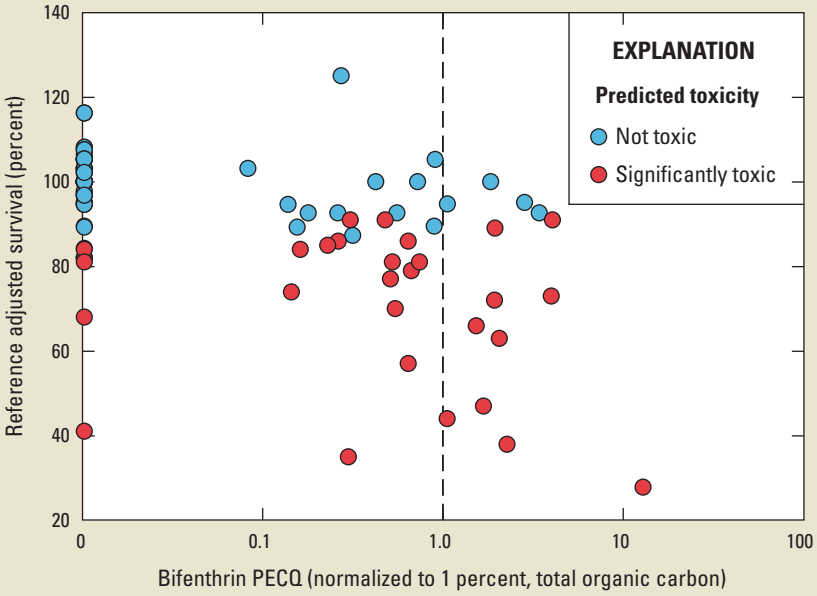

Figure 4–14. Survival of the amphipod *Hyalella azteca* decreased significantly as the bifenthrin concentration increased (Spearman rank correlation at a 0.05 significance level). Amphipod survival was adjusted for reference conditions, and bifenthrin concentrations are divided by the bifenthrin PEC, so that values greater than 1.0 indicate predicted toxicity. Red symbols represent samples found to be significantly toxic relative to reference conditions within a study area, based on analysis of all measured endpoints. Blue symbols indicate samples that were not toxic. Toxicity observed in some sediments with low bifenthrin concentrations (<1.0 bifenthrin PECQ) indicates other contaminants may have contributed to the toxicity.

Chapter 5

The Response of Biological Communities to Urban Development

"… The most direct and effective measure of the integrity of a water body is the status of its living systems. These systems are the product of millennia of adapting to climatic, geological, chemical, and biological factors. Their very existence integrates everything that has happened where they live, as well as what has happened upstream and upland. [The integrity of running waters] depends on processes spanning many temporal and spatial scales." (Karr and Chu, 1999)

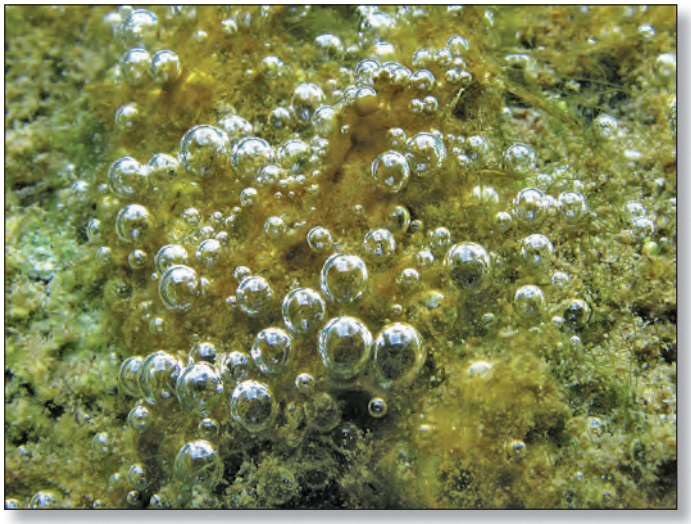

Three biological communities were assessed in this investigation: algal, invertebrate, and fish.

This chapter provides a summary of the effects of urban development on

1. The role of broad-scale, regional environmental factors on the species composition of aquatic biota;
2. How the species composition of algal, invertebrate, and fish communities changes with urban development;
3. How prior land-use activities influence the response of aquatic biota to urban development; and
4. The level of urban development that results in a measurable change to biological communities.

Algal, invertebrate, and fish communities function as an ensemble within a stream, and a well-functioning stream ecosystem has diverse, sustainable biological communities (see sidebar, Aquatic Biota Terms and Definitions). Urban development alters stream ecosystem processes, disrupts stream ecosystem functions, and causes changes in the composition of biological communities. For example, urban development can alter hydrologic patterns and lead to an increase in streamflow flashiness or prolonged low-flow conditions. The altered streamflow can influence stream habitat and stream chemistry. These cumulative physical changes can "stress" the biological community and lead to changes in the species composition. A shift in species composition can alter ecosystem processes and function, such as the feeding structure among organisms in the foodweb.

Broad-Scale, Regional Factors Exert a Strong Influence on the Composition of Biological Communities

Regional environmental factors, such as climate, geology, topography, and land cover, strongly influence the species composition of the biological communities in streams. Regardless of the level of urban development in a watershed, the biological communities that were sampled throughout streams in a study area maintained certain characteristics of species composition that were associated with the region. For example, the invertebrate data collected from stream sites in all nine study areas were analyzed together to show how sites would group in patterns based on the relative degree of resemblance (differences and similarities) in their invertebrate communities. The most noticeable result was that the sites did not group by levels of urban development but rather grouped by their respective geographic region (fig. 5–1). Furthermore, as shown by the close groupings in figure 5–1, the sites in the Raleigh and Atlanta study areas are similar with respect to their biological communities because they are both in the Piedmont ecoregion. Conversely, the invertebrate communities in Dallas and Milwaukee are vastly different, as shown by the distance between the sites in these two groups (fig. 5–1); this result is expected because these study areas are in different ecoregions that reflect differences in regional environmental factors such as temperature, geology, and land cover.

Regional environmental factors were also the primary influence on algal and fish species composition, especially when dominant species or groups within those communities were evaluated. Overall, the finding that biological communities were distinct across the nine study areas coincidentally illustrates the importance of the approach used in the USGS investigation to constrain natural variability among sites by selecting watersheds for each study area from within a single Level III Ecoregion (Omernik, 1987, explained in chapter 3). The strength of these regional geographic influences on the species that make up biological communities demonstrates why biotic responses to urban development tend to differ across the country. Because the species composition of a biological community differs from region to region, metrics used to measure a biotic response should take into account regionally endemic species (species prevalent in a particular region) that are sensitive to environmental disturbances typical for the region. Preserving the integrity of aquatic biological communities characteristic of a region, therefore, depends on understanding how urban development affects the regionally defined environmental factors and processes at the watershed scale.

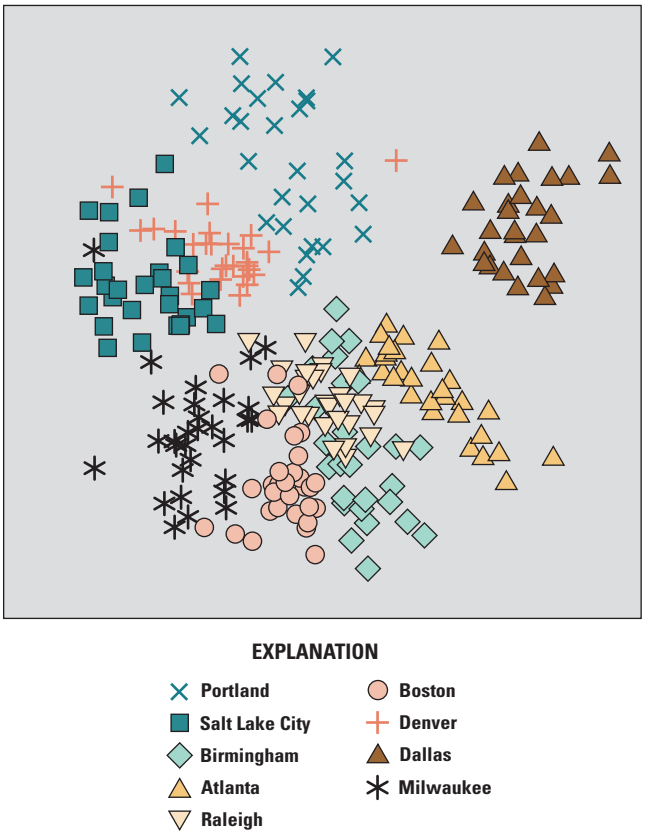

Figure 5–1. The regional pattern of variability in aquatic biota (invertebrates, in this example) is indicative of the dominant influence of broad-scale, regional factors, such as climate, geology, topography, and land cover, in shaping the composition of biological communities. The dimensions of the figure are relative (no scale), where the distance between any two symbols indicates the relative degree of resemblance in the invertebrate communities between the two sites. For example, the upper right quadrant is dominated by the Dallas study area, indicating that the invertebrate communities at these sites more closely resemble each other than do communities at sites in other study areas.

Aquatic Biota Terms and Definitions

Several common biological terms are used in this report to describe, in more general terms, different levels of classification and groupings of organisms. Biota refers to the ensemble of all aquatic organisms present at a stream location. The term species refers to different groups of related individuals within a community, even when biological data were reported at taxonomic levels other than species. For example, some invertebrates could be identified only to genus because certain diagnostic features for species-level identification were indistinct. Even though the term taxa is more accurate when referring collectively to organisms at different taxonomic levels, the term species is used in this report because it is generally more familiar. The term community is used herein to refer to a general group of organisms, either algae, invertebrates, or fish, that interact within the physical area defined by the stream reach. Other reports have used the term "biological community" to include the ensemble of biotic groups (algae, invertebrates, and fish) at a particular location. Richness of a community, as defined in this report, refers to the number of different species in a stream reach. Richness is important when discussing the biodiversity of a community, which depends on the number of different species in a community as well as the relative number of individual organisms in each species. A diverse community, therefore, has a high species richness and the number of individuals of each species is relatively even.

Community composition scores and biological condition metrics, two complementary types of response measures, were used to determine how a particular biological community has been altered by urban development. A set of community composition scores was calculated for each biological community to represent overall changes in the types of species and the number of organisms in the community. These scores were calculated by using a technique called multivariate ordination, which looks at the differences and similarities in the species composition of a community across all sites in a study area. The difference between any two community composition scores indicates the relative degree of resemblance between the biological communities at the two sites, which then can be related to the difference in urban development between the two sites. The primary advantage of using community composition scores is that they are highly effective at showing how strongly an entire biological community changes with urban development.

Biological condition metrics generally focus on particular species that are likely to be affected by urban development. These metrics are regarded as "indicators" because they are based on certain species in a community that respond to specific environmental stressors, such as degraded water quality, loss of habitat, or changes in streamflow patterns. Brook trout are an example of a sensitive species that are particularly sensitive to environmental stressors. Common carp are an example of a tolerant species that often tolerate high levels of environmental stressors.

The community composition scores and biological condition metrics are calculated from information about multiple species, and they can indicate the overall response of a biological community to urban-related stressors. Although the response of a biological community can be continuous over the urban-development gradient, it is also important to account for the response of individual species of interest. Understanding the response curve of individual species is important because it can indicate the range of values along a stressor gradient within which the conditions for the survival of that species are optimal (fig. 5–2). A metric that will indicate the level of urban development at which a species declines in abundance can be monitored if the protection of the species is of concern in a watershed.

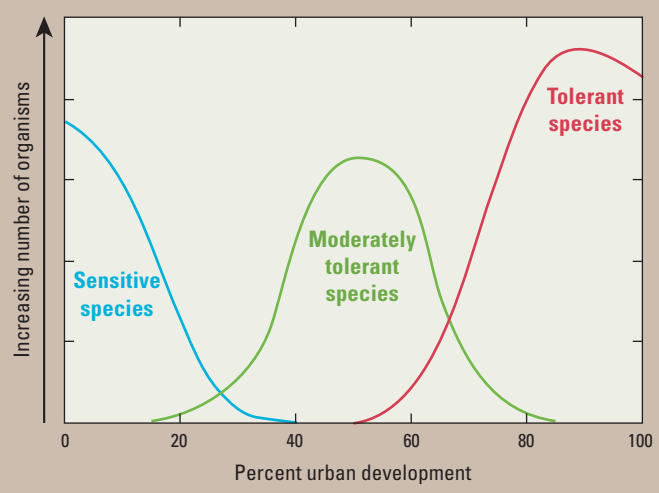

Figure 5–2. In this idealized example, the curves represent the ranges along an urban gradient where three species occur. The highest point along each curve represents the species optimum, or the most favored conditions for the species, which supports the greatest number of organisms. Sensitive species are most abundant in undisturbed areas and decline rapidly with the onset of development. Moderately tolerant species are most abundant at intermediate levels of development. Tolerant species can still occur in very high numbers at higher levels of urban development, even after unfavorable conditions have eliminated or reduced the sensitive and moderately tolerant species.

Algal, Invertebrate, and Fish Communities Respond Differently to Urban Development

Urban development affected one or more biological communities either moderately or strongly in eight of the nine study areas, based on the response of the community composition scores (explained in the sidebar, Aquatic Biota Terms and Definitions) to urban development (table 5–1; Brown and others, 2009; Coles and others, 2009; Cuffney and others, 2010). The response of the biota was generally stronger in areas where urban development occurred on forested rather than agricultural lands; the reason for this difference is described below. Algal and fish communities showed a moderate to strong change in composition in four of the nine study areas, although Portland and Boston were the only areas where a moderate or strong relation was seen for all community types. Invertebrate communities appeared to be most sensitive to the effects of urban development by showing moderate or strong changes in community composition in eight of the nine study areas (Denver being the exception).

Generally, the change in the community composition scores with increasing level of urban development was associated with a loss of species that are sensitive to stressors such as contaminants, in-stream habitat destruction, or increased streamflow flashiness. The continuing change in community composition over higher levels of urban development suggests that the loss of aquatic species could result in a diminished ecological function of the stream by reducing the complexity of its foodweb and the level of resilience against natural and human-induced disturbances.

Whereas community composition scores describe overall changes in the community composition, biological condition metrics were used to assess changes in certain species in response to multiple stressors related to urban development (table 5–2). Pollution-sensitive diatoms typically were prevalent at rural sites and decreased with urban development. For example, the Milwaukee study area showed a 50-percent decline in the abundance of pollution-sensitive diatoms between the least and most developed watersheds, whereas the abundance of diatoms that are tolerant of high salinity increased with urban development. Overall, these biological condition metrics reflect degradation in the algal community as a consequence of changes in water quality that can occur with urban development.

The response of invertebrate communities to urban development was more consistent than for algae and fish, as shown in tables 5–1 and 5–2. The response of invertebrate communities in regions where land cover was primarily forested prior to development was typically strong, characterized by a general decline in numbers of sensitive species. These results are important when setting management goals in a particular region, especially in relation to pre-development land cover.

The response of fish to urban development was more than that of algae or invertebrates because fish populations and distributions can be affected by a broader range of geographical factors, even within a single region. Changes in fish communities were associated with two biological condition metrics that reflect fish habitat preferences (table 5–2). The number of fish species that prefer gravel

Table 5–1. Relations between community composition scores and urban development for biological communities. The strength of a relation indicates the extent that species composition of the community was altered by urban development. Aquatic invertebrate communities appeared to be most sensitive to the effects of urban development by showing moderate or strong changes in community composition in eight of the nine study areas (Denver being the exception). Algal and fish communities showed a moderate-to-strong change in composition in four of the nine study areas.

Biological community	Forest-to-urban gradient						Agriculture-to-urban gradient		
	Portland	Salt Lake City	Birmingham	Atlanta	Raleigh	Boston	Denver	Dallas	Milwaukee
Algae	⌄	–	▾	▾	⌄	↓	–	–	⌄
Invertebrates	↓	⌄	↓	↓	↓	↓	–	⌄	⌄
Fish	⌄	▾	↓	↓	–	↓	▾	–	▾

Relation to urban development

Decreases with urban development

- ↓ Strong (rho ≥0.7)
- ⌄ Moderate (rho 0.5 to 0.69)
- ▾ Weak (rho 0.4 to 0.49)
- – rho <0.4

substrate tended to decline with urban development; the loss of gravel habitat can result from sediment deposition or the loss of gravel riffles. Conversely, a weak but opposite response was seen in the Salt Lake City study area where gravel substrate appeared to become more prevalent with urban development because of geomorphologic differences between the low-intensity urban areas (along steep-gradient mountain streams) and high-intensity urban areas (along broad, low-gradient streams).

Urban development in some areas led to an increase in fish species, such as bass and sunfish that tend to spawn in low-velocity, pool habitats and use complex nests to provide a higher level of parental care after spawning. This response might seem counterintuitive because it is associating a complex development trait with urban development; however, these types of species have adapted to pool habitats in part by fanning the nests with their fins to keep the nest free of fine sediment and to maintain adequate oxygen levels. The weak decline in complex nesting species in the Birmingham study area likely represents a general decline in overall community composition with urban development because fish preferring gravel substrate also decline.

The blackbanded darter *(Percina nigrofasciata)* is an example of a species that prefers gravel substrates.

Table 5–2. Changes to the invertebrate communities in streams as a consequence of urban development were more consistent than changes to algal and fish communities. The response of invertebrate communities in regions where land cover was primarily forested prior to development was typically strong, characterized by a general decline in numbers of sensitive species and, in most cases, with the occurrence of other species that are more tolerant to stressors. In contrast, there was generally no response in the biological communities in streams in the Denver, Dallas, and Milwaukee study areas where urban development occurred on agricultural land.

	Biological condition metrics	Forest-to-urban gradient						Agriculture-to-urban gradient		
		Portland	Salt Lake City	Birmingham	Atlanta	Raleigh	Boston	Denver	Dallas	Milwaukee
Algae	Pollution-sensitive diatoms[1]	–	⌄	–	–	–	↓	–	–	⌄
	Salinity-tolerant diatoms[2]	–	▲	▲	–	⌃	↑	–	–	⌃
Invertebrates	Ephemeroptera, Plecoptera, and Trichoptera richness[3]	↓	⌄	↓	↓	↓	↓	–	–	–
	Community tolerance index[4]	↑	↑	↑	↑	↑	↑	–	–	–
Fish	Gravel substrate[5]	–	▲	↓	▼	–	↓	–	–	–
	Complex nester[6]	⌃	▲	▼	⌃	–	⌃	⌃	–	–

[1] Percentage of diatoms in the algal community that do not survive in polluted systems.
[2] Percentage of diatoms in the algal community that are tolerant of high-salinity conditions.
[3] Total number of mayfly, stonefly, and caddisfly species, many of which are sensitive to stressors.
[4] Relative tolerance of community to stressors, based on average of tolerance values for all species.
[5] Percentage of fish in the community that prefer clean, gravel substrate free of sand and silt.
[6] Percentage of fish in the community that provide some level of parental care after spawning.

Relation to urban development

Increases with urban development		Decreases with urban development
↑	Strong (rho ≥0.7)	↓
⌃	Moderate (rho 0.5 to 0.69)	⌄
▲	Weak (rho 0.4 to 0.49)	▼
	– rho <0.4	

These community-specific findings underscore the advantage of evaluating more than one biological community when assessing the effects of disturbances to aquatic systems. Because the life cycles of algae, fish, and invertebrates differ, their respective communities generally respond differently to stressors arising from changes in physical and chemical ecosystem processes. Therefore, the three communities typically do not show a unified response to disturbances from urban development (see sidebar, Species Richness of Invertebrates and Diatoms Can Respond Differently to Urban Development). Differing responses can provide important clues about the types of stressors that are present in the ecosystem and can indicate potential avenues for management actions.

Prior Land-Use Activities Can Affect How Aquatic Biota Respond to Urban Development

The response of aquatic biological communities to urban development in the Denver, Dallas, and Milwaukee study areas was not as strong as in the other study areas (tables 5–1, 5–2). In these three study areas, agricultural land was converted to urban uses, whereas in the other six study areas, urban development generally occurred on land that was either forested or shrubland. Thus, even at the low levels of urban development, the biological communities in the Denver, Dallas, and Milwaukee study areas were already degraded by agricultural land uses, resulting in a weak response to urban development. Comparing the responses of algal, invertebrate, and fish communities in Boston and Denver illustrates the difference in response patterns (fig. 5–3). The response of biological communities to urban development in the Denver study areas also appeared to be confounded by extensive hydrologic modifications associated with reservoirs, diversions and canals, and interbasin transfers of water.

The predevelopment influence of agricultural activities on biological communities is perhaps most evident in the general lack of response of biological condition metrics that indicate the loss of sensitive species, such as a decline in EPT richness (table 5–2). This biological condition metric represents the sum of insect species in the orders Ephemeroptera (mayflies), Plecoptera (stoneflies), and Trichoptera (caddisflies), referred to as EPT, many of which

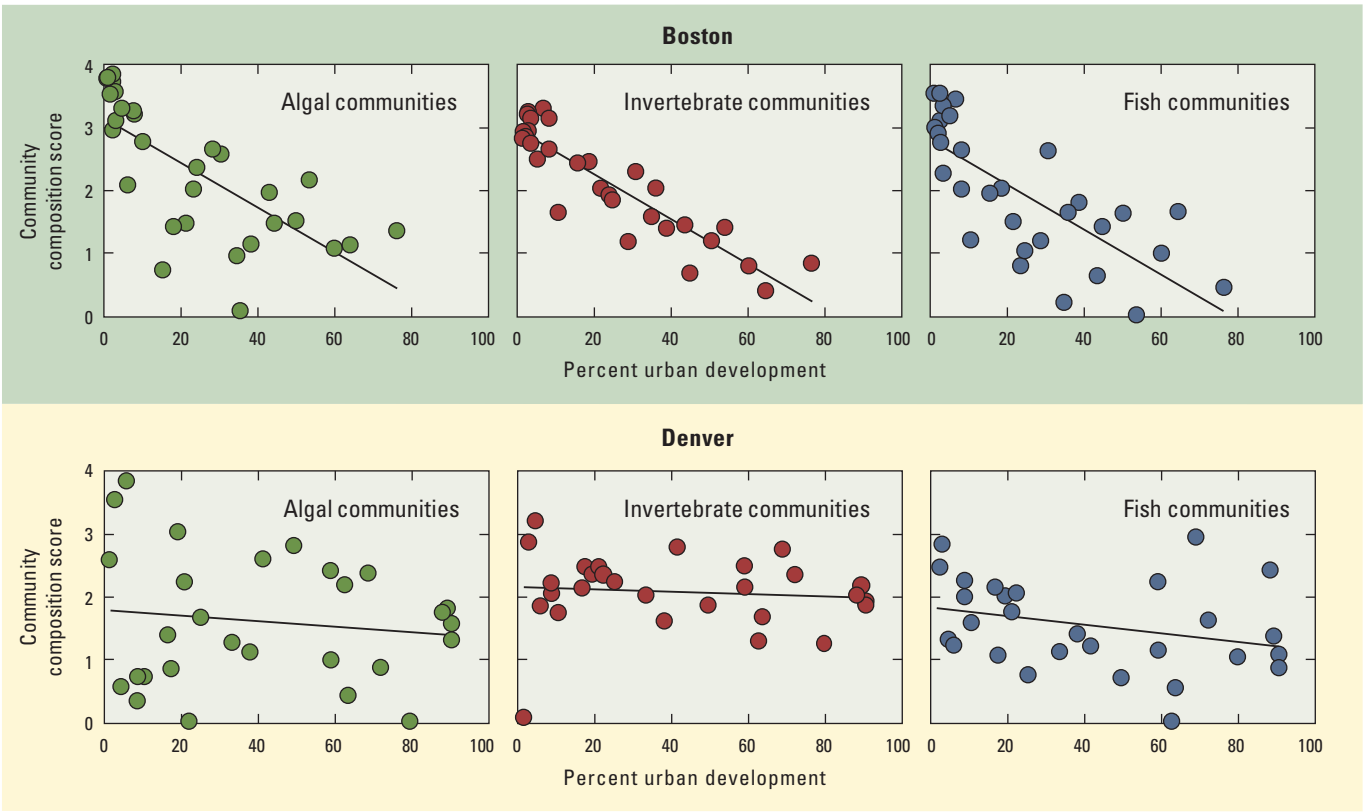

Figure 5–3. The importance of predevelopment land cover is evident in the differences in the response of algal, invertebrate, and fish communities to urban development in two regions of the country. Strong negative responses to urban development were observed in the Boston study area, whereas the responses in the Denver study area were relatively weak.

Species Richness of Invertebrates and Diatoms Can Respond Differently to Urban Development

A decrease in species richness following urban development generally indicates that one or more stressors have reduced the capacity of the stream to support sensitive species. An example of this type of response is shown in figure 5–4*A*. Invertebrate species richness declined over all stages of urban development in the Raleigh study area. Exceptions can occur where low invertebrate richness is associated with undisturbed streams, such as in areas naturally low in nutrients that tend to have a less complex foodweb with few species (Mabe, 2007). The onset of urban development under these conditions can lead to the assimilation of nutrients entering the stream into the foodweb, thereby increasing invertebrate species richness over the short term.

In contrast to the invertebrate response to urban development, diatom richness can increase at the low to medium levels of urban development, often in association with increased nutrient concentrations. Diatom richness increased with urban development in the Portland, Salt Lake City, Raleigh, and Boston study areas (Coles and others, 2009). In the Raleigh study area, the number of diatom species increased at low to medium levels of urban development, but decreased at higher levels (fig. 5–4*B*). This decrease was not associated with a decrease in nutrient concentrations, however. Other factors associated with a decline in water quality, such as increased contaminants or sediment, likely contributed to the decrease in the number of diatom species.

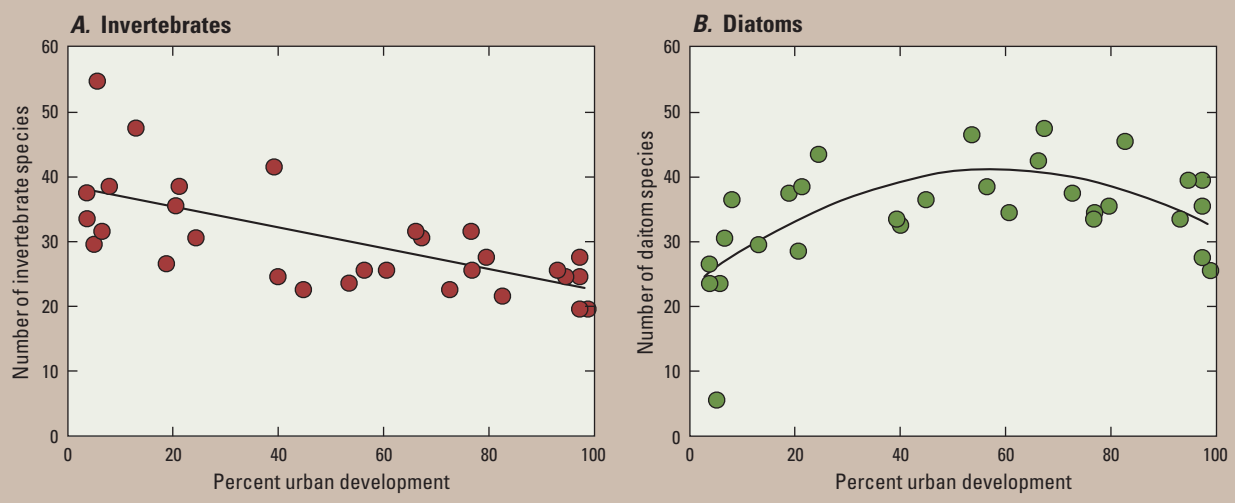

Figure 5–4. Species richness for *(A)* invertebrates and *(B)* diatoms in the Raleigh study area responded differently to urban development. The invertebrate species richness steadily declined with urban development, whereas the diatom richness increased over the initial stages of urban development but then leveled off and declined as urban development increased.

are sensitive to environmental degradation. Species composition of the invertebrate communities in the Dallas, Denver, and Milwaukee study areas showed little variability across the urban gradient. The invertebrate communities in these study areas generally lacked the more sensitive EPT species compared to study areas in which urban development occurred in forested watersheds (fig. 5–5). Most of the changes in invertebrate communities in the forested regions resulted from a loss of the more sensitive insect species, which corresponded to a stronger response in the community composition scores and the biological condition metrics.

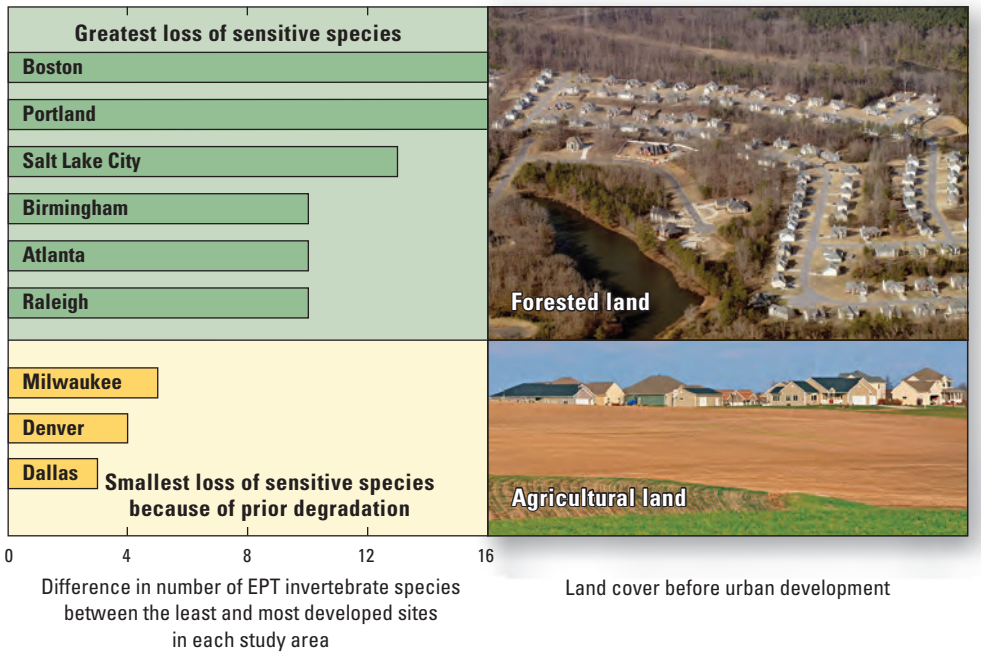

Figure 5–5. The loss of Ephemeroptera, Plecoptera, and Trichoptera (EPT) species was greater when urban development occurred on forested land than on agricultural land. Prior to urban development, streams in forested watersheds had more EPT species—many of which were sensitive to disturbances—than streams in agricultural watersheds. Therefore, streams in forested watersheds had more EPT species to lose as urban development began to occur.

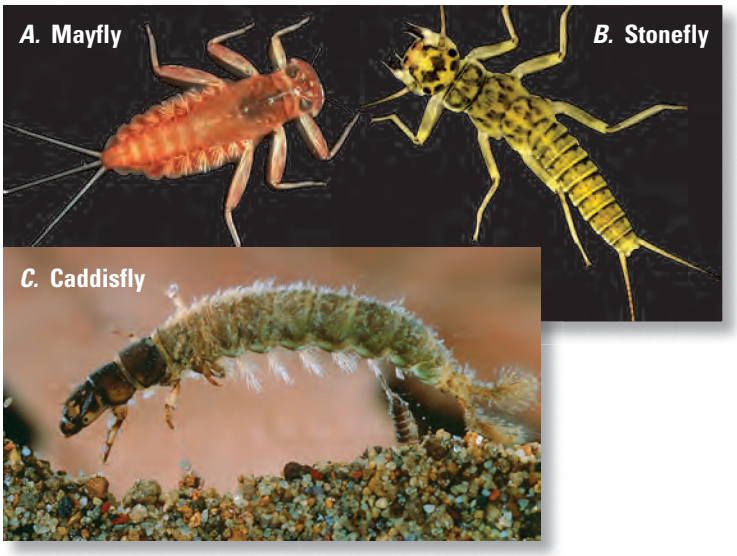

Species of Ephemeroptera (*A*, mayflies), Plecoptera (*B*, stoneflies), and Trichoptera (*C*, caddisflies) are cumulatively referred to as EPT, and declining EPT values can indicate a loss of species that are sensitive to environmental degradation. (Photographs from the Society of Freshwater Science, formerly North American Benthological Society (NABS), *http://www.benthos.org*)

A Loss of Sensitive Invertebrate Species Was the Most Consistent Biological Response to Urban Development

The most definitive change in any of the biological communities associated with urban development was a loss of sensitive invertebrate species and a shift to species that are more pollution tolerant (table 5–2). EPT richness decreased in all study areas where urban development occurred in forested watersheds. Because many EPT species are sensitive to environmental degradation, it is not surprising that when urban development reached 50 percent in the six forested study areas, the number of EPT species decreased to about half the number present prior to urban development.

The rate at which EPT species were lost was different across the country, even in study areas within the same general region. For example, the rate of species loss was greater in the Atlanta study area compared to the Raleigh study area (fig. 5–6). These rates reflect differences in EPT species endemic to the regions and their sensitivities to stressors (prior land use and changes in stream chemistry, hydrology, or habitat) affected by urban development.

Another biological condition metric that indicated sensitive species were lost with urban development is the community tolerance index, which represents an average of the pollution-tolerance values for all species in the invertebrate community. This index, which ranges from 0 (most sensitive) to 10 (most tolerant), increased strongly with urban development in all previously forested study areas (table 5–2). The index values in Boston increased more than 50 percent (from about 4 to about 6.5) along the urban gradient (fig. 5–7). This increase indicates a change in species composition of the invertebrate community, where sensitive species were lost and the percentage of pollution-tolerant invertebrate species (typically non-insect invertebrates, such as isopods and leeches) increased.

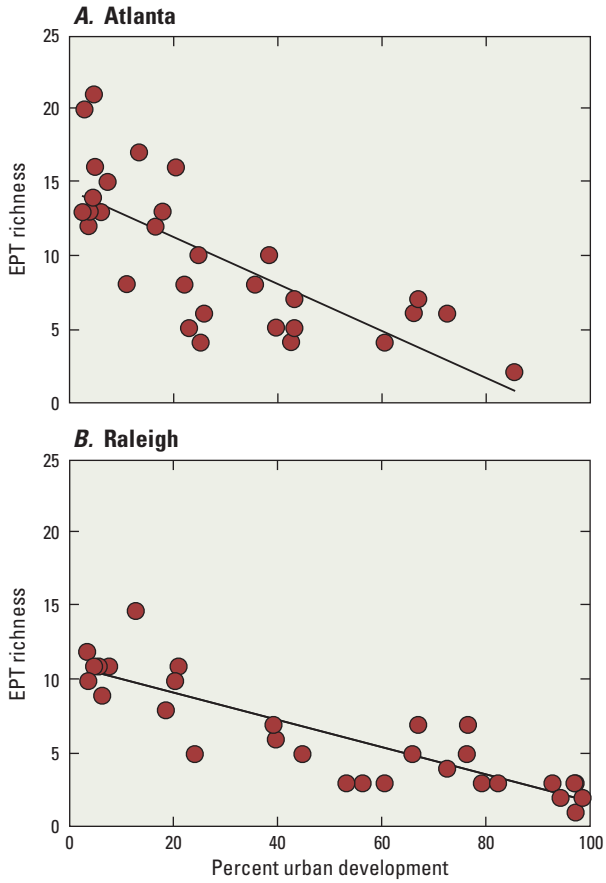

Figure 5–6. Urban development resulted in the loss of Ephemeroptera, Plecoptera, and Trichoptera (EPT) species, many of which are sensitive to contaminants, changes in streamflow, and other stressors. These examples from the Atlanta and Raleigh study areas show EPT richness decreasing with urban development, but the rate of loss, seen by the slope of the line, was greater in Atlanta.

Figure 5–7. The upward trend in the community tolerance index in the Boston study area indicates that sensitive species were lost and the percentage of pollution-tolerant invertebrate species increased as levels of urban development increased.

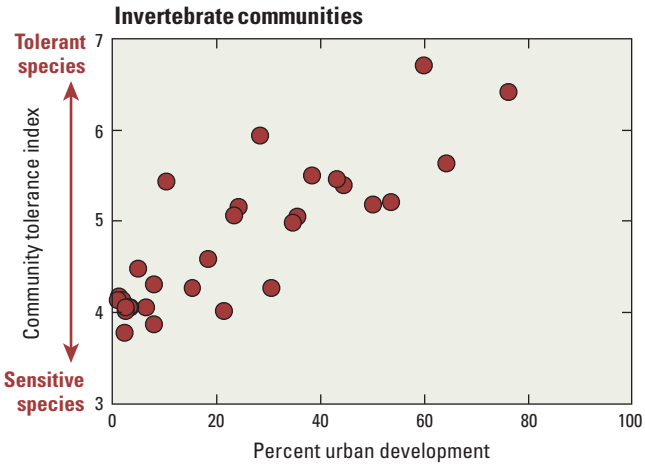

Invertebrate Communities Begin to Degrade at the Earliest Stages of Urban Development

The degradation of invertebrate communities began at the earliest levels of urban development in the six study areas in which urban development occurred in forested watersheds (table 5–1; see sidebar, Aquatic Biota Have No "Safe Zone" in Urban Development). The shape or form of the invertebrate response also can provide insight into how the stream ecosystem changes with urban development. It has been assumed that aquatic biota are resistant to degradation at low levels of urban development and that the community would begin to degrade after a resistance threshold is reached at some higher level of urban development (fig. 5–8*A*). However, the invertebrate community in most areas of the country declined as soon as the percentage of developed land in a watershed increased from background levels, with no indication of resistance to degradation (fig. 5–8*B*).

Two possible conclusions can be drawn from this decline in the invertebrate community. First, certain species within the communities are highly sensitive to the physical and chemical conditions of the stream. Even at low levels of urban development, small changes in these conditions can result in a loss of sensitive species thereby degrading the invertebrate community. Second, some prior degradation of the biological communities could have occurred from predevelopment disturbances at the low end of the urban gradient (for example, legacy effects caused by historical land use, such as agricultural activity during the 19th and early 20th centuries).

The lack of resistance in biological responses is an important finding for resource managers and indicates that no assumptions can be made with regard to a "safe zone" of urban development. The continuous biological response over the entire urban gradient also has strong implications for management. An exhaustion threshold would imply that the ecosystem function was depleted to the point that biological communities were no longer capable of responding to physical and chemical changes in the stream. The absence of an exhaustion threshold suggests stream rehabilitation efforts could improve the biological condition of a stream, regardless of the point along the urban-development gradient at which rehabilitation is implemented. USGS urban studies did not examine streams in some of the most intense urban settings such as those that are lined with concrete. The likelihood of an exhaustion threshold in the biotic response exists in areas of very intense development.

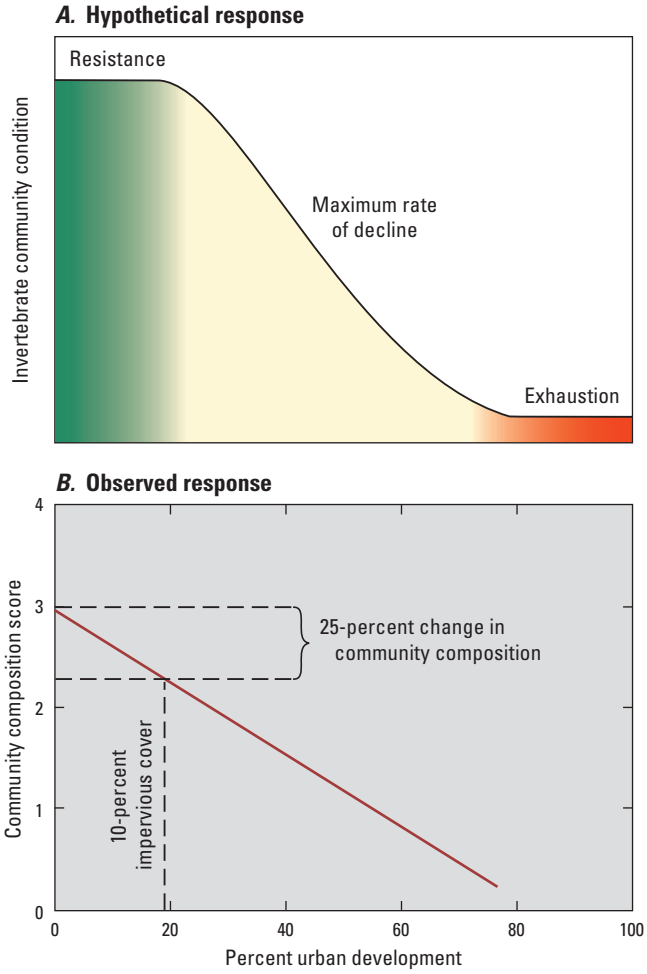

Figure 5–8. A frequent assumption is *(A)* that biological communities are resistant to change at low levels of urban development. Then, as levels of urban development increase, a period of rapid degradation of the community condition occurs and then ends in a period of exhaustion, when no further change occurs to the community composition. The observed response *(B)* of invertebrate communities to urban development in the Boston study area differed from the hypothetical response. At 10-percent impervious cover (just under 20-percent urban development), the community composition changed by about 25 percent.

Aquatic Biota Have No "Safe Zone" in Urban Development

A frequent assumption regarding the effects of impervious cover on biological communities is that these communities would not be affected as long as the areas of impervious cover remained below about 10 percent of the watershed (Schueler, 1994). Because of the immediate decline in invertebrate condition at low levels of urban development and the strong relation between impervious cover and urban development (see chapter 3, fig. 3–3), it is unlikely that a safe zone of impervious cover can be defined.

The 10-percent impervious cover guideline has been reformulated, in part because of the results of this investigation. The most important change is that the relation of impervious cover to stream quality now is expressed as a cone rather than as a straight line (Schueler and others, 2009; fig. 5–9). The cone shown in figure 5–9 indicates that stream-quality responses at impervious cover of less than 10 percent can vary broadly from excellent to poor, and that sharply defined thresholds are probably rare. The cone-shaped response is intended to avoid the perception that watersheds in which impervious cover is less than 10 percent of the total watershed area always will be associated with good or excellent stream quality.

"Stream protection and management are top priorities of state and local officials. These USGS findings remind us of the unintended consequences that urban development can have on our aquatic resources. The information has been very useful in helping us revise scientific models related to imperviousness, which are used by watershed managers across the Nation to predict and manage future impacts of imperviousness on urban streams." (Tom Schueler, Chesapeake Stormwater Network, written commun., 2011.)

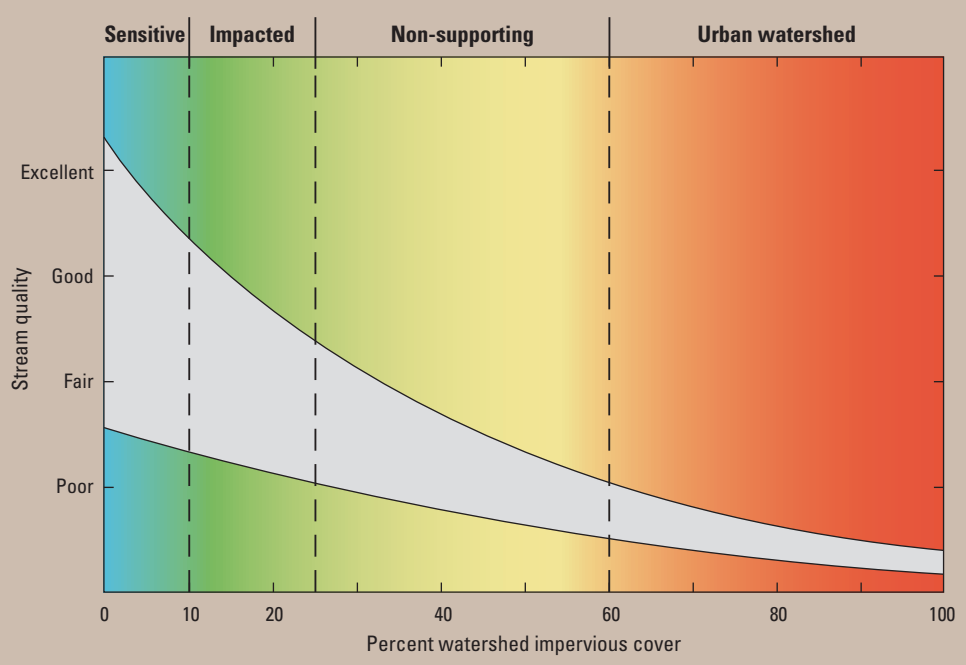

Figure 5–9. A reformulated impervious cover model indicates that adverse effects on stream condition can occur below 10-percent impervious cover and that the degree of effect can vary widely. This variability is due to such factors as predevelopment land cover. (Modified from Schueler and others, 2009.)

Chapter 6

Understanding Complexity in Stream Ecosystem Response to Urban Development

The previous chapters have described how the physical, chemical, and biological factors associated with stream ecosystems are affected differently by urban development, and the extent to which these factors respond depends on the region where urban development is occurring. Consequently, interactions of multiple physical and chemical stressors can make it challenging to determine which ones are principally responsible for changes to the aquatic biological communities in an urbanizing watershed.

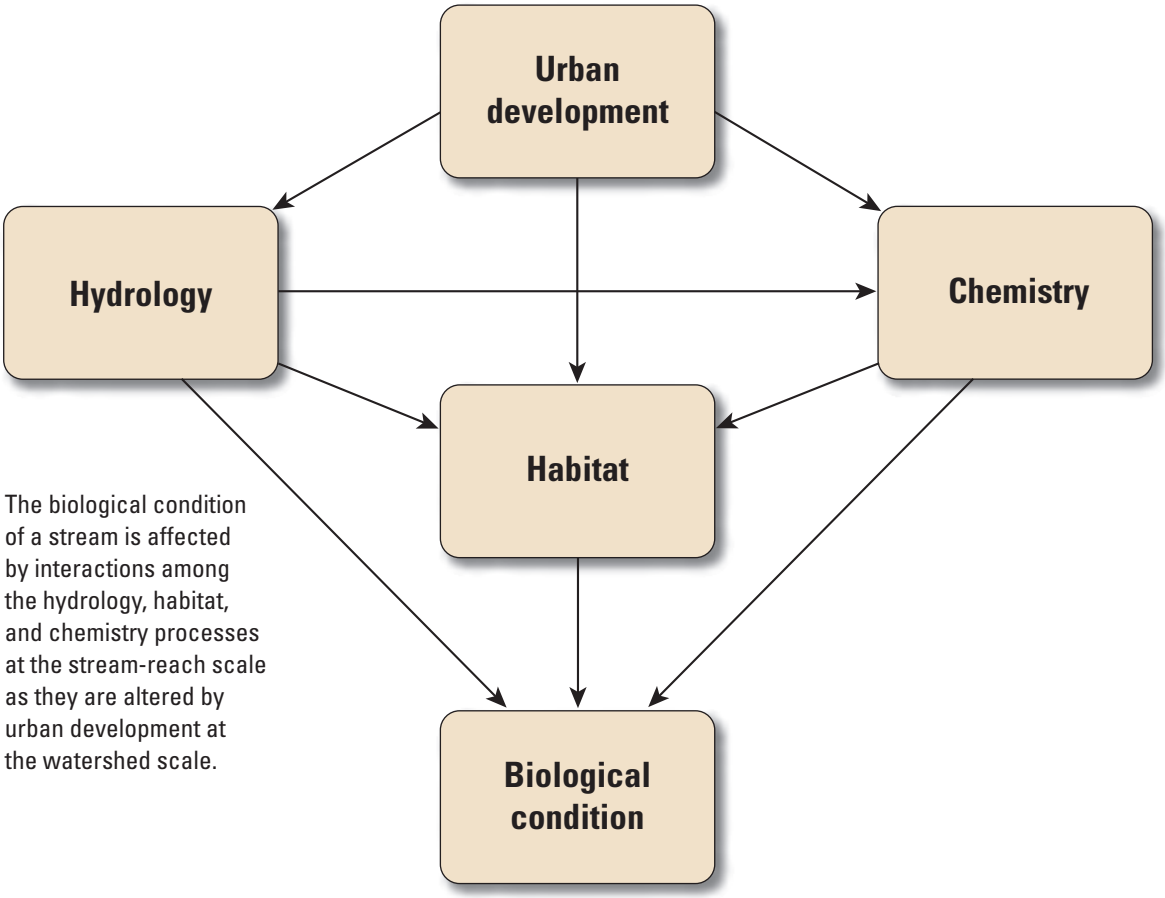

The biological condition of a stream is affected by interactions among the hydrology, habitat, and chemistry processes at the stream-reach scale as they are altered by urban development at the watershed scale.

This chapter integrates results from earlier chapters, indicates how regional factors and multiple stressors affect the response of aquatic biota to urban development, and demonstrates an analytical tool that can be used to evaluate the effects of alternative management approaches designed to protect stream health.

Understanding the effects of urban development on stream ecosystems requires consideration of the interrelations among multiple environmental components rather than treating each one as an isolated entity (Baily, 1996). This required a more complex approach than that employed in earlier chapters, where stream hydrology, habitat, chemistry, and aquatic biota were related only to urban development as a single stressor. Previous discussions recognized possible interactions across multiple components and the importance of spatial scale at which each component operated. Although this approach is convenient for discussions of responses of the individual components in urbanizing systems, the components are not independent and can interact in ways that make it difficult to predict effects of urban development on the stream ecosystem as a whole (fig. 6–1).

The USGS findings indicate that stream reach-level components are affected by regional and watershed characteristics, including historical and current land-use patterns (Cuffney and others, 2011). Although urban development in a watershed affects the physical and chemical factors within a stream reach, how these changes occur and how they ultimately affect aquatic biota depend on regional environmental characteristics such as climate, soils, and historical land-use patterns.

Stream degradation in response to urban development can rarely be attributed to a single factor, and the relative importance of some stressors can vary along the urban gradient. For example, a fish community can be affected by both hydrology and contaminants. Changes in hydrology may be most important in the early stages of urban development, whereas contaminants might become more important stressors in areas with more extensive urban development.

Environmental conditions in specific stream reaches are determined by an interconnected set of regional, watershed, and reach-level factors. The reach-level factors are functionally linked so that a change in any one factor may bring about corresponding changes to the others.

Response of Aquatic Biota to Urban Development Is Influenced by Regional Environmental Factors

Previous chapters described how agricultural activities prior to urban development in a watershed can degrade the biological condition of streams so that the effects of development are less obvious than when development occurs in forested areas. However, understanding the reasons why predevelopment land cover can influence biological responses is crucial when developing effective methods for measuring and mitigating the effects of urban development.

When landscape features are altered on a regional scale, biological communities can begin losing sensitive species that require specific environmental conditions that exist in the natural landscape. Chapter 5 explains that the loss of sensitive EPT species was greater when urban development occurred

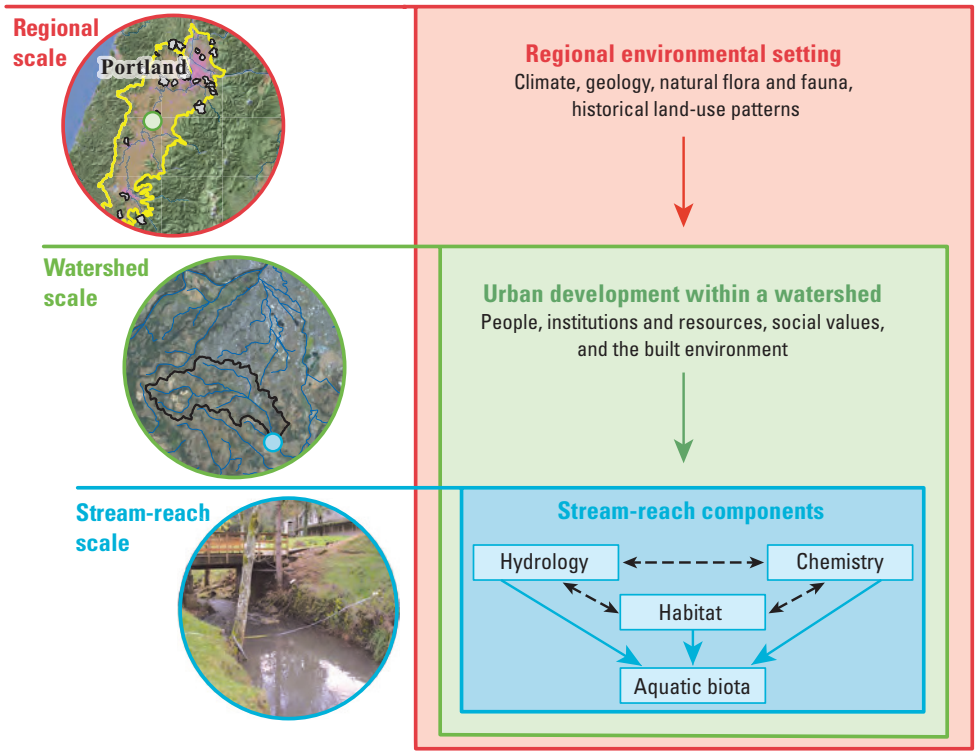

Figure 6–1. Urban stream ecosystems include processes operating at regional, watershed, and stream-reach scales. Understanding how a stream ecosystem responds to management actions designed to mitigate the effects of urban development requires an understanding of how processes are linked across spatial scales and how processes can interact within a given level (indicated by dashed lines for stream-reach processes).

in forested landscapes than when development occurred on agricultural land (table 5–2; fig. 5–5). Similarly, an increase in community tolerance index scores with the onset of urban development in the six forested study areas is consistent with the loss of sensitive invertebrates in these areas, while the lack of response in the Denver, Dallas, and Milwaukee study areas is consistent with the idea that agricultural land cover reduced the number of sensitive invertebrate species and favored tolerant species before urban development began.

As previously described, the response of the invertebrate community to urban development depends in part on regional environmental factors, such as climate, and the extent that the landscape was altered prior to urban development (see sidebar, Understanding How Regional-Level Factors Affect Biological Response; Kashuba and others, 2010; Cuffney and others, 2011). Because differences in regional environmental factors define stream ecosystem conditions, the regional factors also influence the relative number of sensitive species that occur in streams even before the onset of urban development. For example, prior to urban development, the initial value of the community tolerance index was higher (indicating fewer sensitive species) in regions where the average annual air temperature was warmer and where the land cover was agriculture (fig. 6–2). Prior to the onset of urban development in either forested or agricultural regions, stream invertebrate communities in cooler regions commonly display a lower average tolerance to various stressors than communities in warmer regions. Furthermore, consistent with interpretations in previous chapters, predevelopment agricultural land uses eliminated some sensitive species before the onset of urban development. Comprehensively, these results indicate that streams in warmer regions where agriculture is the predevelopment land cover can be expected to have invertebrate communities with the fewest sensitive species.

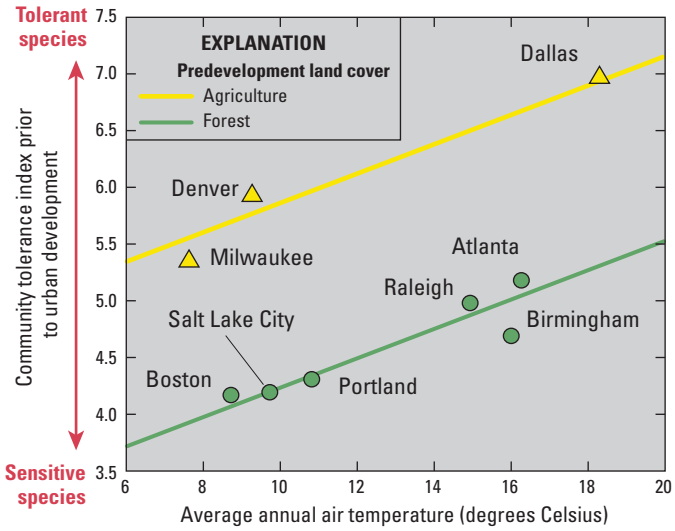

Figure 6–2. The response of biota to urban development can differ from region to region, with differences in responses associated with regional environmental factors such as historical land use and climate. The value of the community tolerance index prior to urban development was sensitive to both predevelopment land uses and the average annual air temperature for the region. As air temperature increases, the proportion of tolerant species increases regardless of land use. However, compared to forested areas, streams in agricultural areas tend to have fewer sensitive species and, thus, biological communities with a higher percentage of tolerant species (indicated by the yellow line positioned higher than the green line).

Understanding How Regional-Level Factors Affect Biological Response

A multilevel hierarchical model was used to explore how invertebrate and algal communities responded to urban development across the nine study areas, while simultaneously accounting for the effects of important regional-level factors, including climate, geology, and predevelopment agricultural land cover (Kashuba and others, 2010; Cuffney and others, 2011). The model was used to compare the response of biota to urban development among study areas by evaluating regression parameters that characterize the relation between biological condition metrics and urban development. The regression parameters included the regression slope, which is the rate of change in the biological condition metric in response to urban development, and the regression intercept, which is the projected value of the metric before any urban development has occurred (predevelopment). Separate hierarchical tiers of the same model were then developed for the relations of the slope and intercept with regional factors. Differences in the slope and intercept between regions were explained by regional factors within a second tier of the same model. These analyses evaluated invertebrate metrics, including the community composition score, EPT richness, and community tolerance index; algal metrics, including pollution-sensitive diatoms and salinity-tolerant diatoms; and regional-level factors, including mean annual precipitation, mean annual air temperature, percentage of clay soils, and antecedent agriculture (as percentage and categorized as low or high). The results indicated that regional-level factors were essential in explaining the response to urban development in all cases.

Multiple Stressors Influence How Aquatic Biota Respond to Urban Development

An overview of the physical, chemical, and biological data shows that, with the exception of some contaminants, few environmental stressors respond to urban development in a common way across all study areas. Additionally, the community composition scores for algae, invertebrates, or fish were not strongly related with a common set of stressors in all study areas. This qualitative conclusion is consistent with results from more detailed analyses of algal, invertebrate, and fish data collected in these studies and with many other studies that have been described in the literature (Brown and others, 2009; Coles and others, 2009; Cuffney and others 2010).

No single factor was universally important in explaining responses to urban development across all the study areas or biological communities, based on the associations of the three biological communities with 11 reach-scale factors (fig. 6–3; see sidebar, Modeling Reach-Scale Stressors). Water temperature, however, appeared to be a factor that

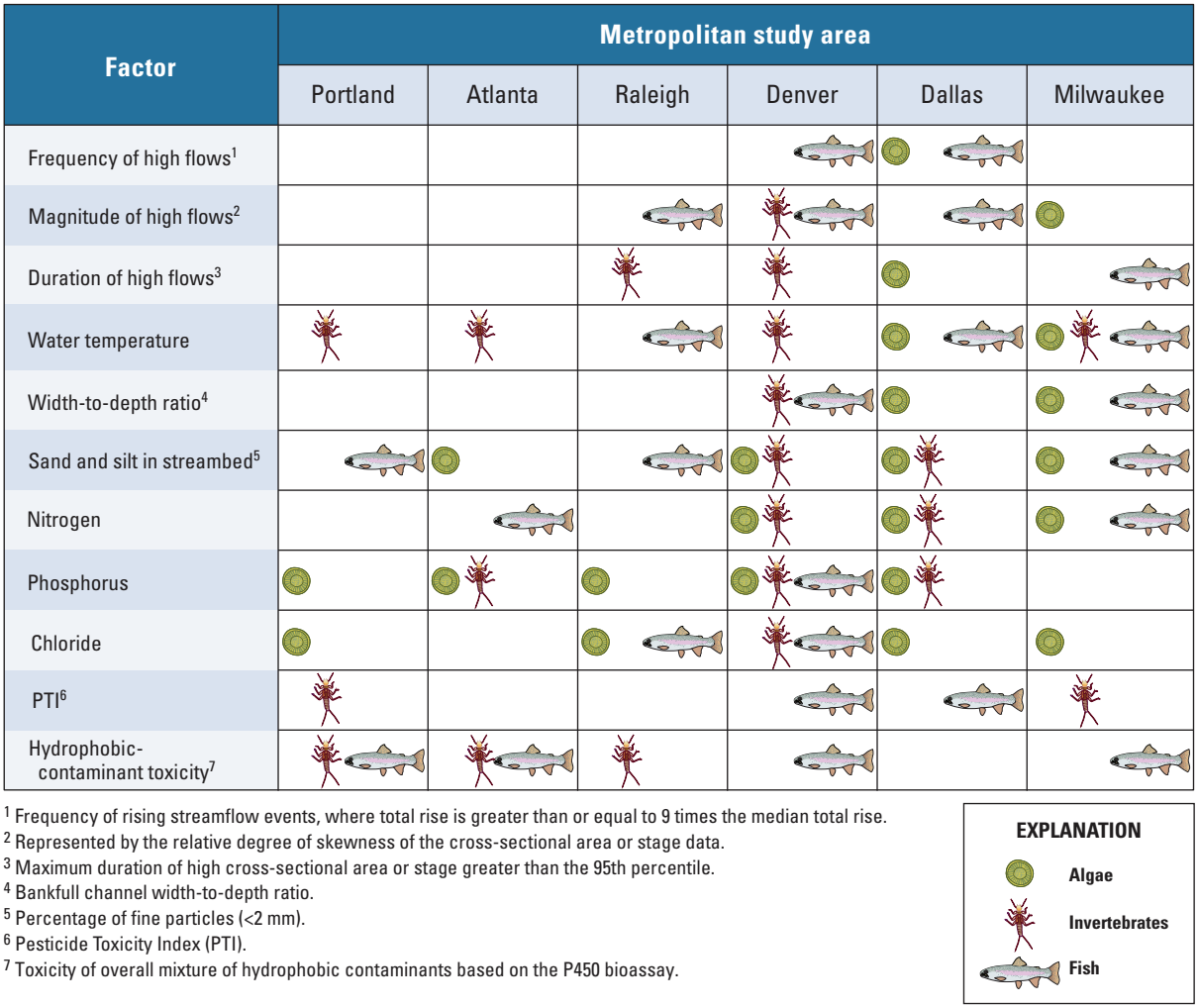

[1] Frequency of rising streamflow events, where total rise is greater than or equal to 9 times the median total rise.
[2] Represented by the relative degree of skewness of the cross-sectional area or stage data.
[3] Maximum duration of high cross-sectional area or stage greater than the 95th percentile.
[4] Bankfull channel width-to-depth ratio.
[5] Percentage of fine particles (<2 mm).
[6] Pesticide Toxicity Index (PTI).
[7] Toxicity of overall mixture of hydrophobic contaminants based on the P450 bioassay.

Figure 6–3. The three biological communities generally responded to different factors within a region, but no single factor fully explained the responses to urban development across all the study areas or biological communities. For example, depending on the study area, the algal response was related to concentrations of phosphorus or nitrogen or both factors, whereas the fish response was related to an increase in either water temperature or hydrophobic-contaminant toxicity or both factors. In all study areas, water temperature and the percentage of sand and silt in the streambed were important to at least one of the biological communities.

was important to at least one biological community in every study area (see sidebar, An Increase in Stream Temperatures Associated With Urban Development Can Lead to a Decline in Biological Communities). The three biological communities generally responded to different factors within a region, supporting the idea that groups of biota respond to changes in the environment in different ways. Single-factor and two-factor models were derived to investigate various combinations of reach-scale factors that were most strongly associated with changes in the biological communities. Two-factor models of the relation between reach-scale factors and biota were generally stronger than single-factor models. Occasionally, more than one two-factor model was plausible for the same biological community in a study area, which can indicate interaction between factors. Confidence in the models is relatively low in study areas where many physical and chemical factors are associated with changes in a particular community because no strong relations could be identified with a concise set of factors. This result suggests that additional study is needed to identify the most important factors affecting that particular biological community. Confidence in the models of biotic response is higher in study areas where only a few factors are associated with a particular community, and consequently, most alternative models can be rejected. Therefore, when fewer alternative models are indicated, greater confidence can be placed in the factors included in those models as the factors most strongly related to changes in community composition.

Although these results highlight the need to consider multiple stressors in assessing stream ecosystems, only two-factor models were able to be evaluated because of limited sample size within each study area. Furthermore, models did not examine interactions between stressors because of these limitations. Establishing cause and effect between stressors and a particular biological response remains a challenging problem, as does establishing the relative importance of stressors. Observational studies would need to account for uncontrolled variability on multiple levels, and experimental studies at regional levels are logistically impractical. New analytical techniques, however, offer some prospects for gaining a better understanding of the complexity in how stream ecosystems respond to urban development.

Modeling Reach-Scale Stressors

Bryant and Carlisle (2012) analyzed comparable data sets for physical, chemical, and biological factors from six of the nine study areas to identify specific reach-scale factors that might cause changes to the aquatic biota. The Salt Lake City, Birmingham, and Boston study areas were excluded from this analysis because they lacked data from semipermeable membrane devices (SPMDs). Factors for the stream chemistry, hydrology, and habitat components were represented by 11 reach-scale factors that were selected as potential stressors. The authors used multiple regressions in combination with a statistical approach described in Burnham and Anderson (2002) for identifying plausible models, to explore which reach-scale factors were most strongly related to changes in the algal, invertebrate, and fish communities as measured by the community composition scores.

Using the general approach of Burnham and Anderson (2002), multiple alternative models were developed to determine which factors were most likely associated with a change in community composition scores. Through the use of this method, plausible single- or two-factor models were derived to investigate various combinations of reach-scale factors that were most strongly associated with changes in the biological communities. Alternative models were evaluated using a statistic called the Akaike information criterion (AICc) for small sample size. The model with the lowest AICc is considered the simplest model that best explained the changes in community composition scores. Models within two AICc points of the strongest model also were considered plausible. The advantage of this approach is that not only were potential stressors identified by the strongest model, but other combinations of stressors that might also be affecting the biological community were identified in alternative models. The most desirable outcome is that only a single best model is identified, which would indicate that confidence placed in this model is much greater than in any alternative model using the common set of factors. When several alternative models are equally likely, the relative importance of each factor is less certain, and additional studies would be needed to determine the factors most strongly related to changes in the community composition.

An Increase in Stream Temperatures Associated With Urban Development Can Lead to a Decline in Biological Communities

Urban development can lead to higher stream temperatures in various ways, such as from loss of riparian vegetation canopy and a consequent increase in the amount of sunlight reaching the stream. Impervious cover in a watershed functions effectively as solar collectors as well as collectors of precipitation. Water flowing over these heated surfaces can become warmed, which can lead to an increase in the temperature of runoff that reaches the stream. An increase in stream temperature, in turn, can affect the biological communities of a stream (fig. 6–3).

A change in water temperature can affect aquatic biota in several ways. The rates of metabolism for algae, invertebrates, and fish are regulated by the temperature of their environment because they do not have internal mechanisms like birds and mammals to maintain a preferred internal temperature. Consequently, changes in water temperature throughout the year serve as important cues to aquatic biota for particular life cycles of various species, such as spawning in fish and mayfly hatches. Additionally, water temperature can have a more immediate effect on aquatic biota because the amount of dissolved oxygen in the water is inversely proportional to temperature—oxygen levels decrease as water temperature increases—resulting in stress to sensitive invertebrate and fish species.

Results from Kashuba and others (2010) and Cuffney and others (2011) indicate that the relation between temperature and biological condition is demonstrated by invertebrate communities in cool regions typically having a higher percentage of sensitive species than communities in warmer regions. Although these authors used air temperature to represent different regional climates in their investigations, the climate of a region drives seasonal water temperatures of streams, which can influence the species composition of a biological community. Relatively cool regions where urban development occurs in forested watersheds might be expected to have biological communities that are most sensitive to changes in water temperature, based on the relations shown in figure 6–2. The Portland, Salt Lake City, and Boston study areas meet these conditions (fig. 6–2, lower left part of graph). However, the relations among urban development, water temperature, and biological communities in the Salt Lake City study could not be characterized in simple terms because the design of that study had a geographic component that complicated the relation between urban development and stream temperature. Study watersheds were nested in 13 larger basins; the less developed watersheds typically had small streams, and the more developed watersheds had larger streams (Giddings and others, 2006).

A strong relation between urban development and water temperature of streams was an important factor in the species composition of biological communities in the Portland and Boston study areas (Coles and others, 2004; Waite and others, 2008). The relation between urban development and stream temperature was strong in both study areas (rho > 0.7), based on correlations indicating that the average annual temperature of a stream increases steadily as a watershed is developed (fig. 6–4). The relation between stream temperature and changes in the invertebrate community was also strong in both study areas. The number of invertebrate species that are highly sensitive to stressors (sensitive species richness) decreased as the average stream temperature increased (fig. 6–5). The values of this metric are inversely related to the community tolerance index; that is, a decline in sensitive species richness is reflected in a higher value for the community tolerance index because the average tolerance value for the invertebrate community increases when the sensitive species are lost. Urban development can, therefore, be related to an increase in stream temperatures and a loss of sensitive invertebrate species, especially in naturally cooler regions of the United States.

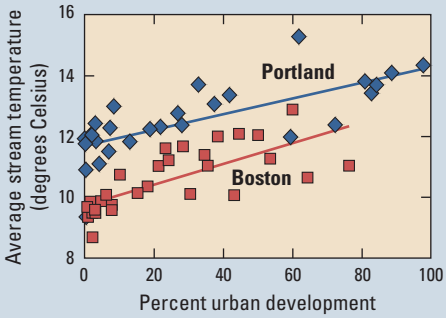

Figure 6–4. Stream temperature, based here on the average annual water temperature, appeared to increase steadily as the percentage of urban development increased in the watersheds in the Portland and Boston study areas. The correlation coefficient (rho value) between average stream temperature and percentage developed land is 0.772 for Portland and 0.815 for Boston, indicating a strong relation in both regions.

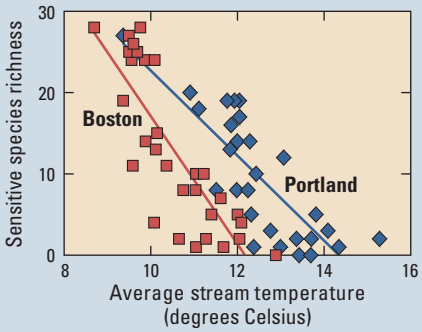

Figure 6–5. The number of sensitive species was nearly 30 in the cooler streams in the Portland and Boston study areas, but these species were continually lost as streams became warmer and were mostly absent in streams with the highest temperatures in the respective regions. The correlation coefficient (rho value) for the relations is 0.831 for Portland and 0.843 for Boston, indicating a strong relation in both regions.

Building on Prior Knowledge of Ecosystem Processes Helps Link Multiple Interacting Stressors to Biological Endpoints

Based on an understanding that urban development creates multiple stressors that vary across regional environmental settings, resource managers are likely to ask, "Where should we focus efforts to reduce stream degradation resulting from urban development in our area?" Recognizing that urban development will likely generate various stressors that interact in complex ways should not discourage the design of management plans for reducing the effects of urban development. Instead, the findings from the USGS investigation provide a basis for identifying stressors that most likely lead to stream degradation in a particular region. In addition to the results of the USGS studies, information from other sources is valuable for gaining a more complete understanding of the factors affecting stream ecosystems and how they interact under various conditions. Integrating outside information to complement the USGS data creates a more comprehensive assessment of urban processes in a region and improves the ability of managers to reduce the adverse effects of the most important urban-related stressors.

An approach to gain a broader understanding of the factors affecting stream ecosystems in a region is to integrate the "prior knowledge" of scientists and managers that have worked in the region. For example, biological monitoring programs that were established by states and regions in response to the Clean Water Act (CWA, described in chapter 2) resulted in increased knowledge of stream ecosystems. A crucial step in developing an effective biomonitoring program for a particular region is to select biological indicators that respond to ecosystem processes characteristic of the region.

More than three decades of biomonitoring experience have enabled ecologists to develop a clearer understanding of the characteristics of a healthy biological community for a given set of natural conditions in a region. They also have clearer expectations about how a biological community will change when ecological processes are altered. Consistent with the finding of the USGS investigation that invertebrate communities most often had strong or moderate relations with urban development, many biomonitoring programs rely on invertebrate community metrics as indicators of stream health. Furthermore, land-use planners for a particular region understand how urban development alters the landscape in the area, while the ecologists recognize how these alterations can affect ecological processes and stream health. It is this type of information, developed over decades of experience, that is especially useful in understanding the links among multiple disturbances of urban development, the ecological processes involved, and the effects on the biological condition of the stream. Incorporating such experience directly into models that predict how urban development affects stream health provides better tools for mitigating disturbances and protecting the ecological services deemed important for the region.

Kashuba and others (2012) integrated USGS data with prior knowledge of experts and data collected by biomonitoring programs in a Bayesian network model to illustrate how urban development ultimately affects stream health. Stream health was measured for this effort by using biological endpoints that were scaled along the Biological Condition Gradient and developed by the USEPA in conjunction with the State of Maine and biologists from the Northeastern United States (Davies and Jackson, 2006). Following the conceptual model illustrated in figure 6–1 as a guideline, a network of interconnected processes was created using a Bayesian network model to: (1) help quantify how ecological processes altered by urban development could affect stream health as measured by the Biological Condition Gradient, and (2) identify where best management practices (BMPs) should be focused to reduce the effects of urban development on aquatic communities.

A Bayesian network model has several useful characteristics, including the ability to simultaneously account for multiple interacting stressors, relate their effects using a scale of stream health that is relevant to the region (as with the Biological Condition Gradient framework), and provide a method to test management options for protecting stream health by modifying levels of different stressors to simulate the effects of BMPs. Because the model is based on probabilistic relations (the likelihood that certain outcomes might occur), the model can illustrate the uncertainties in relating urban development to stream health. Additionally, a Bayesian network can be easily updated with new data and additional expert knowledge as they become available, which continually increases confidence in the model and management decisions based on model outputs. Additional information describing Bayesian networks is provided in the case study that follows: Predicting the Effects of Urban Development on Stream Health in the Northeast: Using a Bayesian Network to Link Ecosystem Characteristics to Biological Condition Gradient Endpoints.

Predicting the Effects of Urban Development on Stream Health in the Northeast: Using a Bayesian Network to Link Ecosystem Characteristics to Biological Condition Gradient Endpoints

Roxolana Kashuba

A Bayesian network was constructed to explore relations among key ecosystem components that link the degree of urban development to the condition of aquatic biota. A Bayesian network uses a probabilistic graphical model to describe the interrelations among multiple factors simultaneously so that the effect of changing one factor can be measured on all remaining factors. The effort focused on the Northeastern Coastal Zone ecoregion in the Northeastern United States to make use of USGS data from the Boston study area and also data collected by the states and USEPA. The analysis provides an example of how the Bayesian network could be used to inform management decisions.

The Biological Condition Gradient (BCG) concept (Davies and Jackson, 2006) was used as the measurement endpoint in the Bayesian network because it provides a framework for standardizing the definition of how stream health changes in response to an environmental stress, such as urban development. The Bayesian network was constructed to incorporate stream hydrology, habitat, and chemistry components that affect aquatic biota so that the effectiveness of best management practices (BMPs) that target these drivers of ecological change could be evaluated.

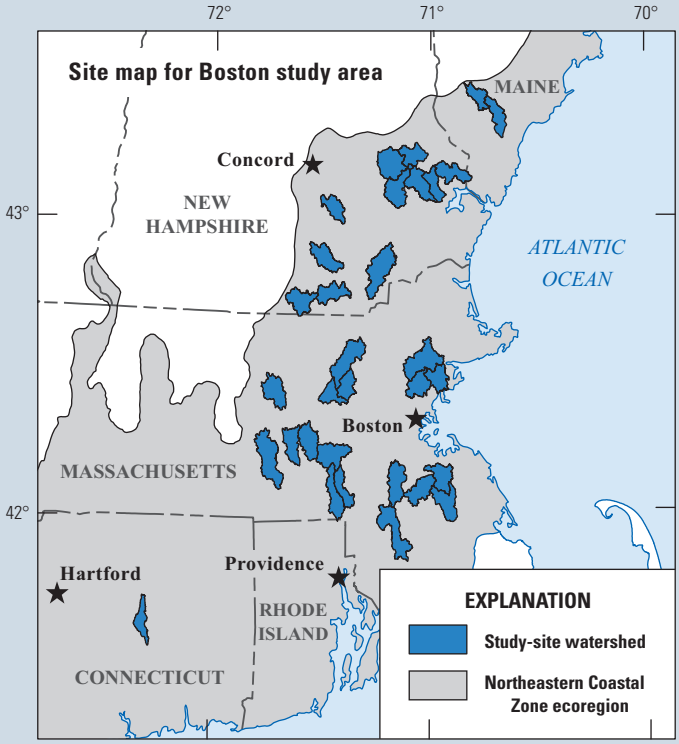

Measuring Biological Endpoints With the Biological Condition Gradient

Defining biological condition endpoints that can be used for comparison across the country is a major challenge when assessing the biological conditions for streams in different parts of the country (Herlihy and others, 2008). The results of the nine studies showed that urban development results in the loss of sensitive invertebrate species and that there was an overall shift to species that were more tolerant of pollution, which ultimately could reduce ecosystem function. While these findings generally hold true across the country, regionally specific biological condition metrics are typically used when making ecological assessments of streams because assemblages of sensitive species vary by region. This variability makes it challenging to compare stream health among regions. The BCG addresses this challenge by providing a common frame of reference for communicating the concept of "stream health" that can be used for different regions of the United States.

The BCG is a standardized ranking system that uses biological community data collected from streams to describe stream health. The BCG level for any stream is reported as one of six "tiers" that represent biological condition endpoints, ranging from natural (tier 1) to highly disturbed (tier 6) (fig. 6–6). The assignment of a particular BCG tier is based on an evaluation of 10 ecological attributes that describe aquatic biological data in terms of overall structure and function of the biological community (table 6–1). The specific metric for each attribute is usually refined and calibrated to biological data that are appropriate for a region. Accordingly, use of the BCG in a specific region requires ecologists to (1) identify biological metrics that are associated with the characteristics defining each of the 10 ecological attributes (table 6–1), and (2) identify values for these metrics that will indicate a response along a stream-disturbance gradient that is likely to result from alterations to ecosystem processes important in the region. This flexibility of the BCG, therefore, allows assignments and interpretations of stream health to be made in a similar manner among different regions but without imposing the limitations of using specific methods of data collection and analysis (Davies and Jackson, 2006).

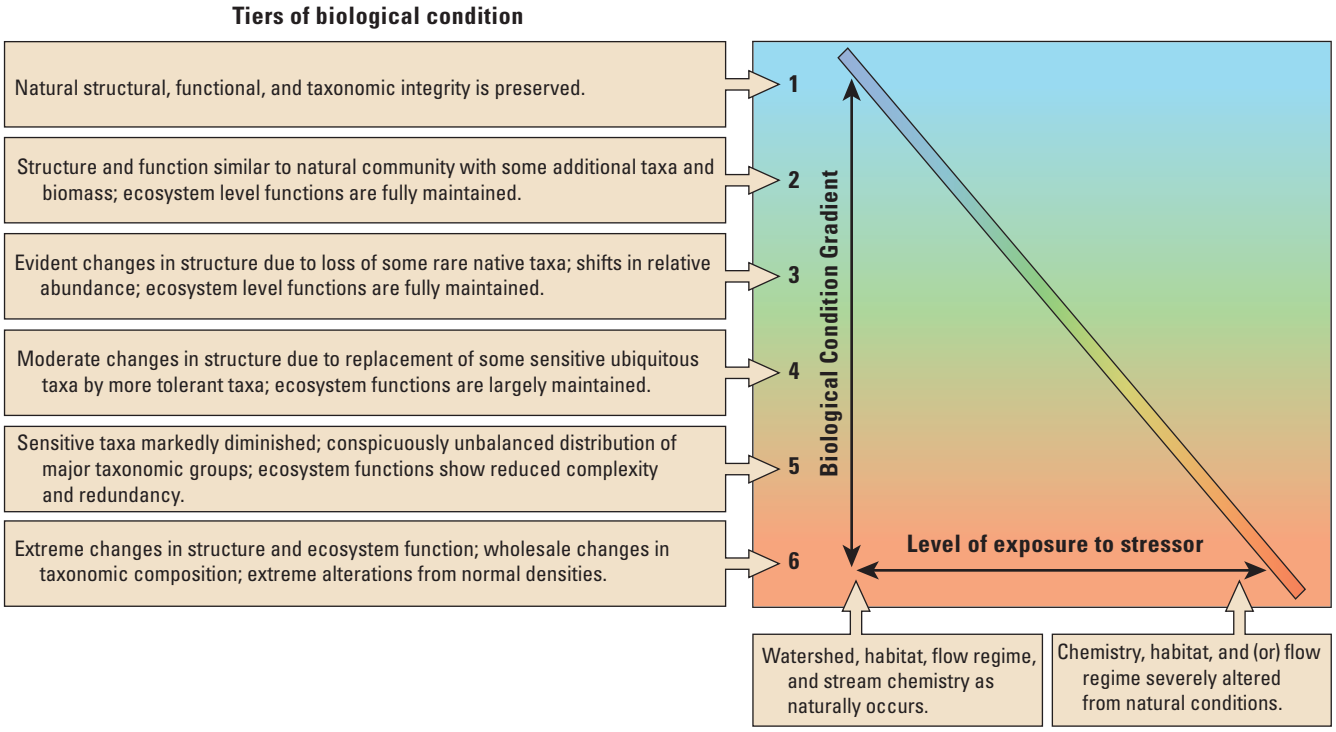

Figure 6–6. The Biological Condition Gradient (BCG) is a descriptive framework that can be used to measure and communicate characteristics of stream health. The transition from tiers 1 through 6 (y-axis) indicates a declining biological condition and stream health as the stressor levels increase (x-axis). The description associated with each tier reflects the biological condition of a stream based on an assessment of its biological community. (Modified from Davies and Jackson, 2006.)

Table 6–1. Attributes that are used to assess the biological community of a stream to determine where it ranks along the Biological Condition Gradient (BCG). The metrics used to evaluate these attributes are specific to a region and its streams.

Attribute	Characteristics
I	Historically documented, sensitive, long-lived, or regionally endemic taxa
II	Highly sensitive, specialist taxa
III	Sensitive, ubiquitous taxa
IV	Taxa of intermediate tolerance
V	Tolerant taxa
VI	Non-native or introduced taxa
VII	Organism condition
VIII	Ecosystem function
IX	Spatial and temporal extent of detrimental effects
X	Ecosystem connectance across physical components in space and time

Characterizing Ecosystem Processes in the Northeastern United States Using a Bayesian Network

Conventional bivariate analyses of stream ecosystem data often have focused on relations between single pairs of environmental factors, without incorporating the influence of other factors or taking into consideration prior knowledge of the stream ecosystem. Multiple factors that are associated with the reach-scale processes of stream hydrology, habitat, and chemistry can become important as stressors that affect the aquatic biological community, either through direct pathways (solid arrows) or through interactions among the processes (dashed arrows) (fig. 6–1). A Bayesian network modeling approach examines the relations among the processes by dissecting this complex system into smaller sets of directly related factors.

The two main components of a Bayesian network are nodes, representing important concepts (processes and their factors), and arrows, representing relations between those concepts in the form of conditional probabilities (for example, the probability of any particular outcome depends on the occurrence of prior events). The structure of a model is depicted by nodes and arrows that are combined into a graphical representation with the use of a directed acyclic graph. For example, **Urban development** can indirectly affect **Biological condition** by first disrupting **Physical condition** and **Chemical condition** (fig. 6–7). The relations among these four major concepts are depicted with a directed acyclic graph through a set of nodes connected by ordered arrows where no pathway following the arrows goes through the same node twice; that is, there are no cycles (feedback loops) in the model. A directed acyclic graph describing this system, therefore, will only use four nodes and four arrows.

A node from which an arrow points is called a "parent" node, and a node toward which an arrow points is called a "child" node. **Urban development** is the parent of both **Physical condition** and **Chemical condition** in the example (fig. 6–7). This notation means that **Physical condition** and **Chemical condition** are both conditional on a watershed's **Urban development** level. Child nodes relative to one concept can also be parent nodes of another concept. For example, in addition to being children of **Urban development**, the nodes representing **Physical condition** and **Chemical condition** are also parents of **Biological condition**.

This modeling structure allows decomposition of a complicated overall system into sets of direct relations between every parent node and its children, so that child nodes can then be modeled as parents of subsequent child nodes to eventually link the entire system into one probabilistic network. Representing a network of associations as a series of these conditional relations reduces the difficulty of parameterizing such a model and greatly increases the amount of information available from output of the model. While requiring specification of relations only between directly linked factors, a Bayesian network describes the interrelations among all factors simultaneously so that the effect of changing one factor can be measured on all remaining factors.

This qualitative model structure is turned into a quantified Bayesian network by creating conditional probability tables using expert knowledge, existing data, or both. A conditional probability tables indicates a probability distribution for values likely to occur at each child node for every possible combination of parent node values. In a simplified example where **Urban development** is the parent node of the **Physical condition** child node, a conditional probability table is created that has two rows to indicate the **Physical condition** when the level of **Urban development** is either low or high (fig. 6–8*A*). Given the level of **Urban development**, a row indicates the probability of observing either good or poor **Physical condition** where the probabilities add up to 100 percent because each row describes a complete distribution across all possible child node values. The first row of this hypothetical conditional probability table, relating **Urban development** and **Physical condition**, indicates that if **Urban development** is low, there

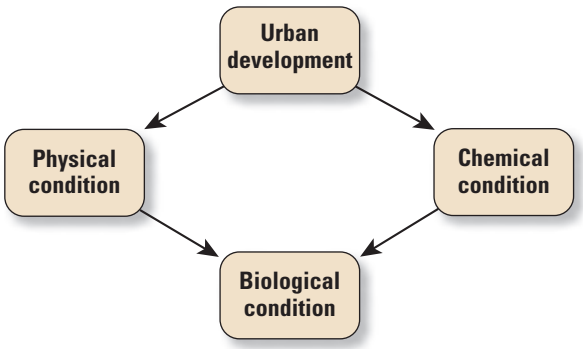

Figure 6–7. A simple Bayesian network with four nodes and four arrows.

is a 90-percent chance that **Physical condition** is good and a 10-percent chance that **Physical condition** is poor. In more convenient terms, if 100 streams were selected from watersheds in low urban land cover, 90 streams are likely to have good physical characteristics, but 10 could have poor characteristics.

A primary advantage of using the Bayesian network over traditional methods of analysis is the ability to simultaneously model interacting system components. The simplified example indicates that **Biological condition** is affected by both **Physical** and **Chemical conditions**, so the associated conditional probability tables shows four probability distributions for **Biological condition** that account for all possible combinations of **Physical** and **Chemical conditions** (fig. 6–8*B*). The first row of the conditional probability table for **Biological condition** indicates a 95-percent chance that **Biological condition** is good if **Physical condition** is good and **Chemical condition** is good. The probability of observing good **Biological condition** then decreases if either **Physical** or **Chemical condition** is poor, down to 1 percent if both **Physical** and **Chemical conditions** are poor.

A. **Physical and Chemical conditions as CHILD nodes of Urban development:**

If Urban development is…	Physical condition will be…		Chemical condition will be…	
	good	poor	good	poor
low	90% of the time	10% of the time	90% of the time	10% of the time
high	10% of the time	90% of the time	10% of the time	90% of the time

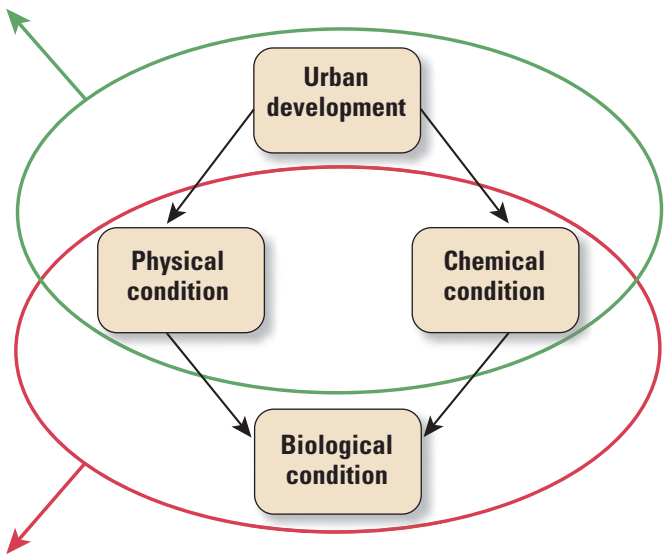

B. **Physical and Chemical conditions as PARENT nodes to Biological condition:**

If Physical condition is…	and Chemical condition is…	Biological condition will be…	
		good	poor
good	good	95% of the time	5% of the time
good	poor	25% of the time	75% of the time
poor	good	30% of the time	70% of the time
poor	poor	1% of the time	99% of the time

Figure 6–8. The relation between each child node and its parent nodes is specified with a conditional probability table. The upper conditional probability table describes *(A)* the relations when **Urban development** is the parent node of two child nodes: **Physical condition** and **Chemical condition**. The lower conditional probability table describes *(B)* the relations when **Physical condition** and **Chemical condition** are the parents of **Biological condition**.

Using a Bayesian Network Approach to Link Urban Development, Stressors, and Biota to Stream Health

The Bayesian network developed for the Northeastern United States demonstrates the utility of using a probability-based model that links urban development, stressors, and aquatic biota to specific endpoints that are characterized by the BCG tiers. The Northeast Bayesian network uses **Urban development** as the primary parent node, from which arrows point to **Hydrology**, **Habitat**, and **Chemistry** as the reach-scale stressor nodes representing three major abiotic processes affected by urban development (fig. 6–9). Arrows from the **Hydrology** node also point directly to the **Habitat** and **Chemistry** nodes, which indicate the influence of **Hydrology** on **Habitat** and **Chemistry**. These three stressor nodes are linked to the nodes representing the biological condition metrics for invertebrate communities. The values for these three metrics determine the outcome of the final child node represented by the BCG.

A preliminary step in developing a Bayesian network model is to create an initial or "prior model" of conditional probabilities between nodes, based either on empirical data or on the knowledge of experts. The prior model developed for the Northeast Bayesian network was based on expert knowledge from professional ecologists and land-use planners. This prior model was updated with USGS data to create the more comprehensive "posterior model." A description of the Bayesian network nodes and the factors used to characterize them are shown in table 6–2. An important feature of using a Bayesian network model is that it can be continually updated as new expert knowledge or data from new studies becomes available; the old model becomes the prior model, and the new data are used to create an updated posterior model. This dynamic updating of the model continually improves confidence in the model predictions.

Generally, results from the model applications demonstrate that urban development results in increased streamflow flashiness, a decrease in size of channel substrate, and an increase in specific conductance of stream water.

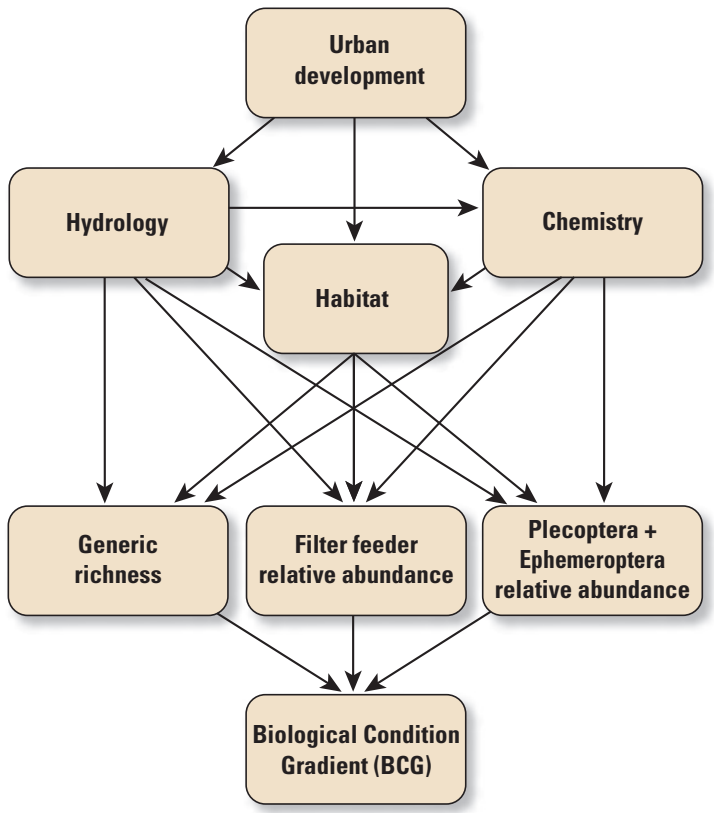

Figure 6–9. Structure of the Bayesian network model developed for the Northeast. Definitions of the nodes and the factors that characterize them are provided in table 6–2.

These changes result in decreased richness of the invertebrates (identified at the genus taxonomic level), increased relative abundance of filter feeders, and decreased relative abundance of Plecoptera plus Ephemeroptera. Collectively, changes in these biological condition metrics help to predict the extent of the decline in stream health in response to urban development. The model can be used by managers to help identify methods (such as BMPs) for reducing the detrimental effects of urban development on stream-reach processes, which in turn affect stream health. For example, to ensure that stream health is protected in an urbanizing watershed, a desired BCG endpoint for a stream is established (such as tier 3 or better), and then the Bayesian network model can probabilistically diagnose the environmental conditions that are necessary to maintain that BCG tier. Similarly, a manager can assess the importance of different stream-reach processes on a desired BCG tier to determine management actions that will have the greatest likelihood of meeting the ecosystem requirements of that BCG tier.

The benefit of using conditional probability tables to specify relations in a Bayesian network model is that the degree of uncertainty can be estimated for various outcomes, which can then be used to indicate the degree of confidence in different management options. Because the factor representing each node is quantified as a probability distribution across possible values of that factor, and the links between parent and child nodes are described using conditional probability tables, the Bayesian network model does not just predict a single value for a child node. Instead, the model predicts the probability that any given value will occur at a node across the range of possible values for a factor based on a set of its parent-node conditions. Consequently, sensitivity analysis can help determine which node is likely to have the largest effect on the BCG endpoint. This analysis is performed by varying each node incrementally in the model, from a stressed state associated with disturbed conditions, to increasingly improved states associated with more nearly natural conditions. The likelihood of improving stream health, indicated by probabilities of attaining a better BCG tier, is then evaluated for changes predicted in each node.

For example, if the goal for stream rehabilitation is BCG tier 3 or better, but the level of Urban Development in the watershed is in the high category (greater than 31 percent in this example), the likelihood of attaining the BCG goal is only 25 percent (fig. 6–10*A*). However, if water quality were managed so that a low contaminant level was maintained through appropriate management actions (such as BMPs) implemented at the Chemistry node, the likelihood of attaining the BCG goal increases to 57 percent. Furthermore, if additional management actions were implemented at the Hydrology node so that flashiness was maintained at the medium level, the likelihood of attaining the BCG goal improves to 70 percent (fig. 6–10*B*). This change in likely BCG outcome can occur because the connections from the Urban Development node to the Hydrology and Chemistry nodes are in essence interrupted by the management actions. Generally, the predictions of the Bayesian network model indicated that the effects of urban development on aquatic biota are conveyed through multiple pathways that are best evaluated collectively and incrementally to improve the likelihood of achieving a healthy stream ecosystem.

Table 6–2. Nodes and factors selected to characterize major ecosystem components in Bayesian network model for the Northeastern United States.

[>, greater than; °C, degrees Celsius]

Ecosystem scale	Node	Factors
Watershed	Urban development	Percent urban land cover in watershed
Stream reach	Hydrology	Flashiness: rises greater than 7 times the annual median rise
	Habitat	Substrate: dominant (>50 percent of transects) substrate type
	Chemistry	Specific conductance: at low base flow, in microsiemens per centimeter at 25 °C
	Generic richness	Total number of invertebrate taxa at genus level
	Filter feeder relative abundance	Percent of total invertebrate abundance that are filter feeders
	Plecoptera plus Ephemeroptera relative abundance	Percent of total invertebrate abundance that are stonefly plus mayfly species
	Biological Condition Gradient (BCG)	Scale of stream health with discrete tiers that indicate degree of impairment

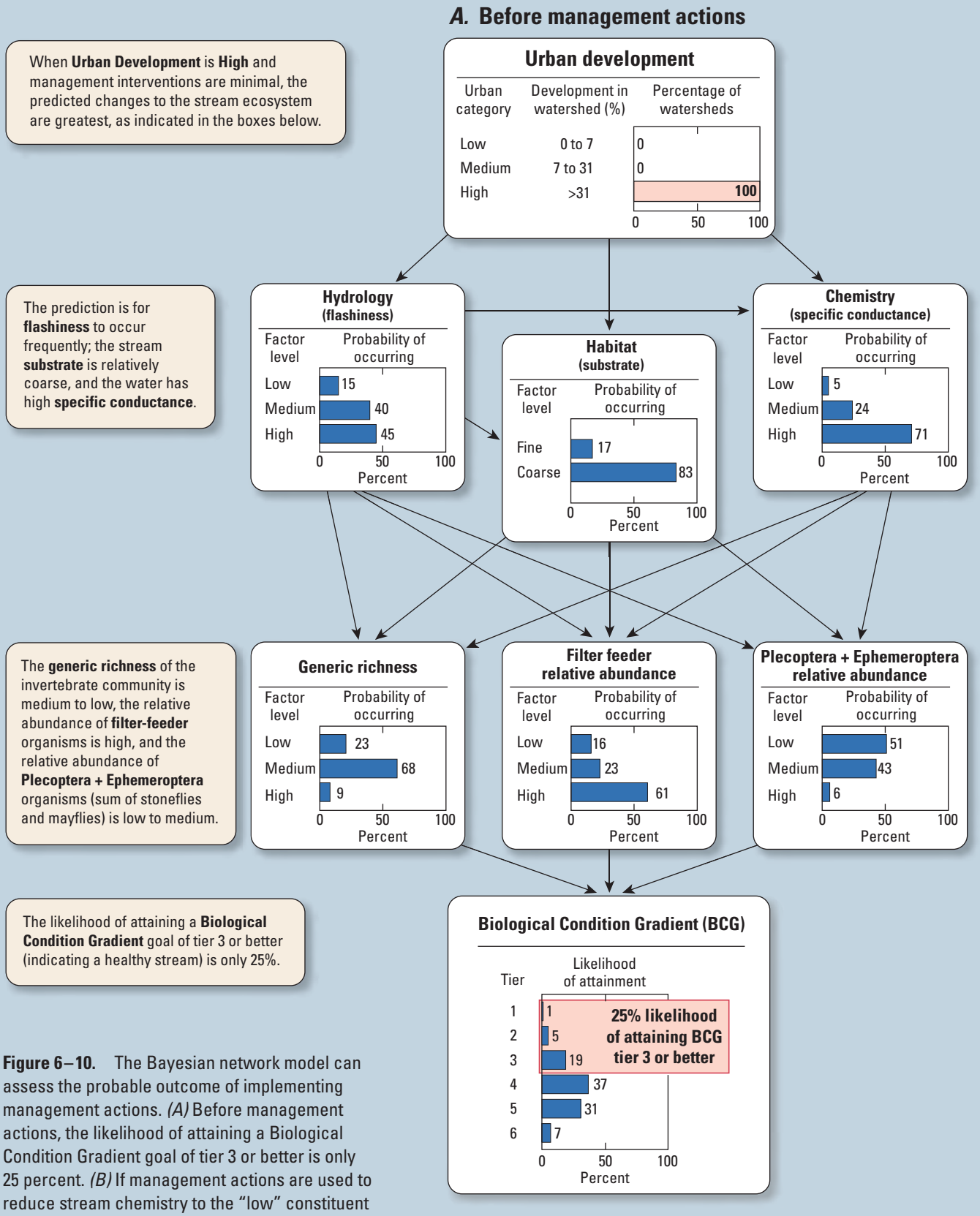

Figure 6–10. The Bayesian network model can assess the probable outcome of implementing management actions. *(A)* Before management actions, the likelihood of attaining a Biological Condition Gradient goal of tier 3 or better is only 25 percent. *(B)* If management actions are used to reduce stream chemistry to the "low" constituent level and stream flashiness to a "medium" level, the likelihood of attaining the Biological Condition Gradient goal improves to 70 percent.

B. After management actions

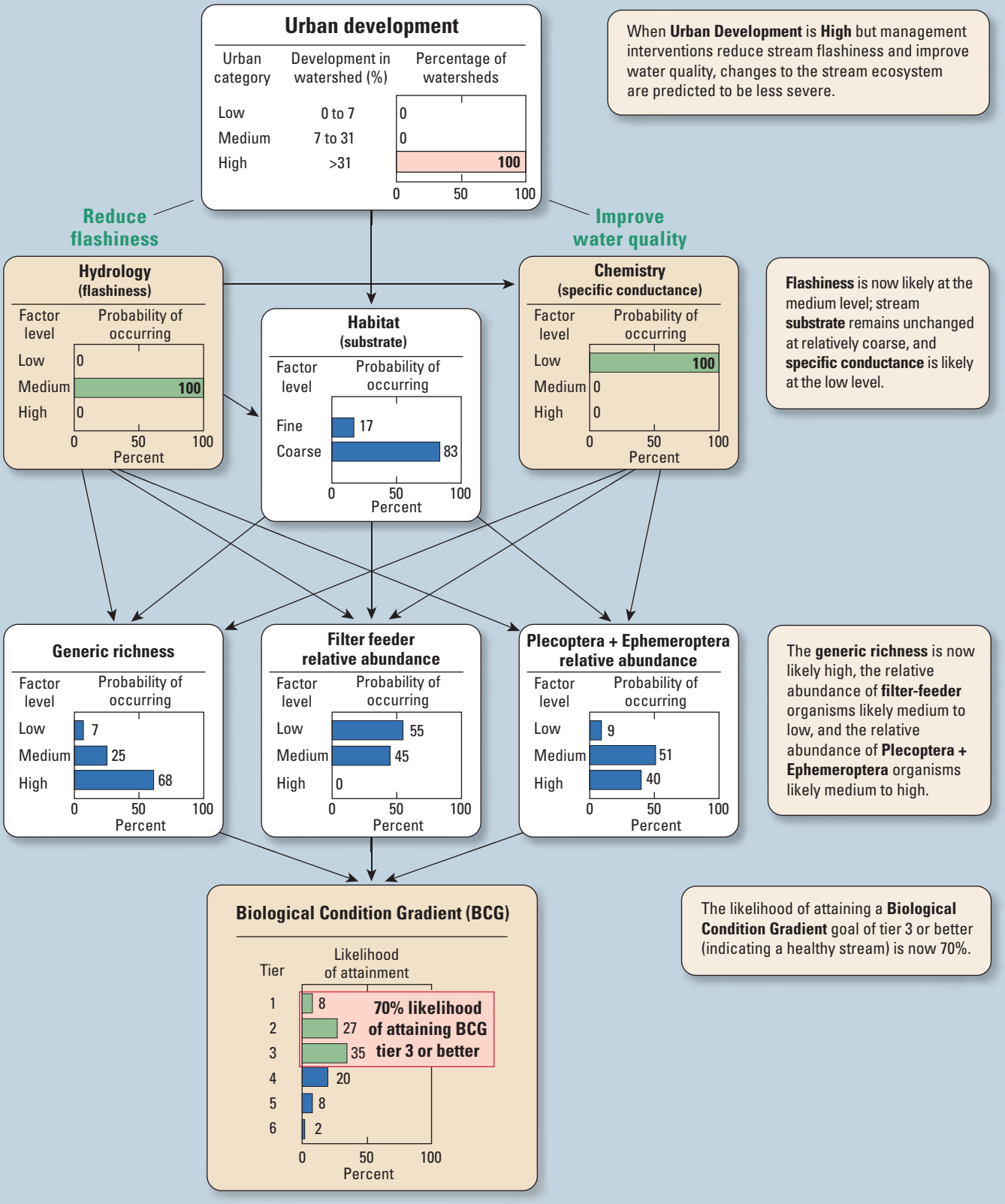

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Chapter 7

Key Challenges in Managing Urban Stream Ecosystems

The previous chapter underscores the importance of linking the degree of urban development to the condition of a stream and describing this condition in terms that society recognizes as important. How are resource managers to make use of this information? For example, if a stream's chemical or biological conditions are meeting or attaining water-quality standards, how can these conditions be maintained? If a stream is impaired, how can the health of the stream be improved?

In this chapter, specific management challenges and strategies are discussed in the context of three major findings:

1. Urban streams are affected by multiple stressors;
2. The response of streams to urban development varies across the country; and
3. Indicators of the effects of urban development must be both scientifically based and relevant to important social values.

Because the condition of urban stream ecosystems is defined by complex, interacting systems that function at multiple spatial and temporal scales, the findings of this study suggest that management strategies for a healthy stream are likely to be multifaceted. The management strategies described in this chapter are drawn from the experiences of municipalities that are seeking to protect the condition of streams in urbanizing watersheds. These strategies are presented not as recommended courses of action but as examples of how municipalities have responded to the challenges summarized in chapters 4–6. In most of these municipalities, either comprehensive monitoring programs have not been established to assess the attainment of desired changes in physical, chemical, and biological characteristics, or the programs have not been in place long enough to yield measurable results. In much of the United States, the lack of a framework, methods, and funding to evaluate such programs are common problems that have motivated a recent call for more comprehensive monitoring and watershed-oriented planning (National Research Council, 2008). A more complete set of potential actions to support management strategies is presented and discussed in a companion document (Cappiella and others, 2012).

Applications of coal-tar-based sealcoat, applied to asphalt pavement, such as parking lots and driveways, can be a major source of PAH contamination in stormwater runoff. (Photograph from Van Metre and others, 2006.)

Urban Streams Are Affected by Multiple Stressors

There are multiple physical and chemical factors that affect aquatic biota in an urbanizing watershed. Analyses of the responses of the three biological communities to changes in stream hydrology, habitat, and chemistry indicated that no single factor was universally important in explaining responses to urban development across all study areas or biological communities. Because algae, invertebrates, and fish differ in their life cycles and requirements for food, shelter, and reproduction, these respective communities generally respond differently to stressors arising from changes in the physical and chemical processes that operate within the ecosystem. These differing responses can provide important clues about the types of stressors that are present in the ecosystem and may indicate potential avenues for management actions.

Management Implications Associated With Findings Related to Multiple Stressors

- Because the degradation of aquatic biological communities begins at the onset of urban development, heightened attention to innovative strategies for carefully managing development in undisturbed watersheds, such as land-use planning and zoning tools that address multiple stressors, is important to minimize degradation of aquatic biological communities.
- Different responses among the three communities, however, can provide important clues about the types of stressors that occur with urban development, which can be linked then to management actions that may be appropriate for improving stream conditions.
- In watersheds with impaired streams, opportunities to redevelop urban lands, including reducing, disconnecting, and (or) treating impervious cover, may provide a means to reverse the adverse impacts to streams because previous development of these lands often did not include measures to treat runoff from impervious surfaces.
- Responses of stream biota to urban development described in chapters 5–6 indicate that stream-rehabilitation efforts could have a positive effect on the biological condition and health of streams.
- Continuous declines in biological diversity and food-web complexity with increasing urban development may make streams more vulnerable to other changes, such as the introduction of non-native species.
- Management strategies that prevent rapid runoff from individual parcels of developed land to nearby streams also can help limit the transport of contaminants to the streams.

Using Impervious Cover as a Surrogate for Multiple Stressors

In 2006, the Connecticut Department of Environmental Protection issued a Total Maximum Daily Load (TMDL) for impervious cover in the Eagleville Brook watershed, located on the University of Connecticut campus and adjacent to the town of Mansfield, Conn. A TMDL is the maximum amount of a pollutant that a water body can receive and still meet water-quality standards, and it usually is based on modeling, monitoring data, or a combination of both (U.S. Environmental Protection Agency, 2010a). The Eagleville Brook TMDL, approved by the USEPA in February 2007, represents the first of its kind in the Nation. While TMDLs typically apply to a specific contaminant, this one addresses the impacts of urban development directly by using impervious cover as the TMDL metric. This approach was chosen, in part, because the biological impairment of Eagleville Brook could not be attributed to any one contaminant. The Connecticut Department of Environmental Protection recognized that while impervious cover may not be the direct cause of the impairment, the strong link between impervious cover and the multiple stressors that affect stream biota make impervious cover a strong surrogate for these multiple stressors.

Beginning in 2005, the Connecticut Department of Environmental Protection has been evaluating the relation between impervious cover and stream health, which was based on values of an invertebrate multimetric index that indicated the biological condition (fig. 7–1). The Connecticut Department of Environmental Protection analyzed the relation between invertebrate communities and impervious cover for 125 streams, by using impervious-cover estimates from a model created by the University of Connecticut's Center for Land Use Education and Research (CLEAR). Based on this analysis, the Connecticut Department of Environmental Protection concluded that 12-percent impervious cover is an appropriate limit for protecting aquatic life in the State's streams and a defensible basis for a TMDL in areas with complex and unspecified water-quality problems.

The impervious cover TMDL for Eagleville Brook was set at 11 percent to include a margin of safety. Mapping and field surveys were conducted by the CLEAR's Nonpoint Education for Municipal Officials Program, the Center for Watershed Protection, and the Horsley Witten Group to measure the current watershed impervious cover and to identify opportunities to remove or disconnect and treat impervious cover. The goal of the TMDL is to have the watershed ecosystem look and act as if land cover in the watershed were 11-percent impervious or less. Approximately 50 retrofit opportunities were identified, including rain gardens, bioretention, downspout disconnection, green roofs, swale enhancements, soil amendments, dry swales, porous pavement, cisterns, sand filters, constructed wetlands, flood-plain reconnection, impervious cover removal, tree plantings, pervious area restoration, and stormwater planters. Retrofit designs were produced for 10 sites, and the University of Connecticut has committed to implementing them as improvement projects are made on the campus.

Although the reduction in the area of impervious cover is the "yardstick" used to measure progress in this TMDL, the ultimate success will be the recovery of the biological communities in Eagleville Brook by improving the stream's habitat and water quality. Initial monitoring results indicate that additional sources of contaminants, not attributed to impervious cover alone, may be present and need to be identified; these results indicate the importance of ongoing monitoring to quantify the effects of a project or program (Christopher Bellucci, Connecticut Department of Environmental Protection, State of Connecticut, written commun., 2011).

To learn more, go to *http://www.epa.gov/owow_keep/tmdl/tmdlsatwork/eagleville_brook.html*.

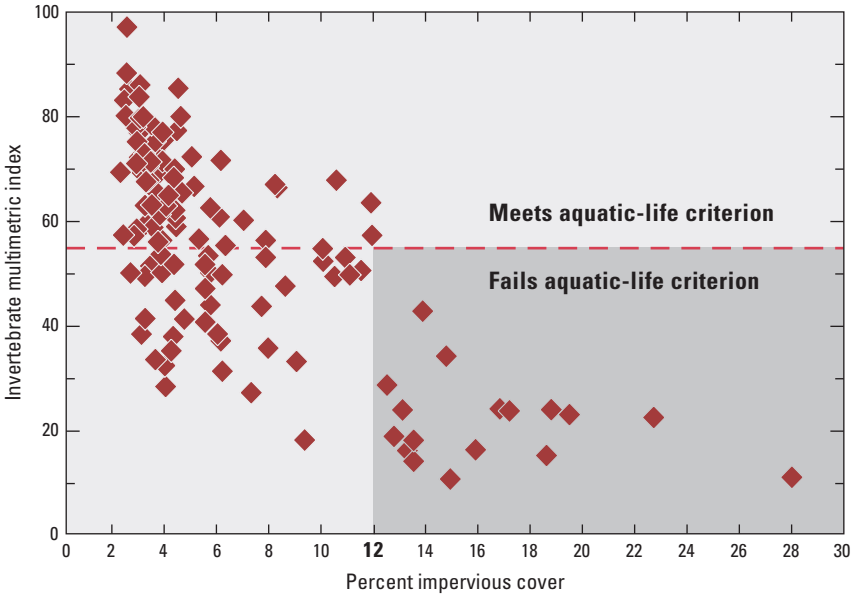

Figure 7–1. The Eagleville Brook impervious cover TMDL is based on a Connecticut Department of Environmental Protection study that indicated streams in watersheds with impervious cover exceeding approximately 12 percent (the darker area) failed to met the Connecticut aquatic-life criterion for healthy streams. (Graph by Christopher Bellucci, Connecticut Department of Environmental Protection.)

Benefits of Protecting Stream Buffers in Kansas City, Missouri

Since 2004, Kansas City environmental managers have systematically evaluated stream quality throughout the city and quantified the relation between riparian buffers and stream quality. A comprehensive inventory of stream assets demonstrated that the health and stability of the city's streams are influenced by the quantity and quality of riparian buffers. The results support national research on the importance of stream buffers in watershed management. Consequently, Kansas City adopted a stream-setback ordinance in August 2008 that prohibits flood-plain development and focuses on preserving adjacent riparian buffers through development controls, low-impact development provisions, and incentives.

The stream-setback ordinance is designed to help avoid future liabilities by protecting new development and infrastructure from flood damage while preserving natural resources that provide multiple benefits. Limiting development near streambanks also could improve Kansas City's water quality, reduce erosion and sedimentation, and protect riparian-corridor habitat and greenways. This ordinance addresses stormwater management, natural-resource protection, and future development by protecting sufficient riparian buffers to maintain the city's streams and environmental quality while providing incentives and flexibility for developers who build near streams. A provision for conservation development protects ecologically important riparian resources while, at the same time, allowing development within the outer zone of the buffer. Little development under the guidance of this setback ordinance has occurred since its enactment because of economic conditions. A formal monitoring program to assess the effect of the program on stream conditions does not exist at this time (Patty Noll, Kansas City Planning and Development Department, Kansas City, Missouri, oral commun., 2011).

To learn more, go to *http://ww4.kcmo.org/planning/devmgmt/zoningord/Stream%20setback%20fact%20sheet.pdf.*

Urban development is occurring on all types of landscape, from mostly forested areas to mainly agricultural land cover such as grazing lands.

Restoring Important Stream Habitats in Milwaukee, Wisconsin

The Milwaukee, Menomonee, and Kinnickinnic Rivers drain densely populated areas of Milwaukee, and the mouths of these rivers form an important harbor system for industry and recreation on Lake Michigan. As in other highly developed urban coastal cities, many miles of streams in the Milwaukee area were dredged, straightened, dammed, buried, or lined with concrete and stone to control flooding as urban areas expanded. Stream habitat that provided food and shelter for aquatic biota was lost. Flood plains and wetlands in and along riparian corridors were filled in and developed. Dams, culverts, and cement-lined channels barred the migration of native fish from Lake Michigan into important historical spawning headwater areas. Remaining habitats were disconnected and fragmented. Massive flooding continued to cause problems during large runoff-producing storms in the 1990s and 2000s.

Several large projects by multiple agencies and volunteer organizations have worked toward improving flood control, reconnecting important habitats, and improving water quality. During 1999–2002, Milwaukee Metropolitan Sewerage District (MMSD) completed the Lincoln Creek Environmental Restoration and Flood Control Project, a $111 million effort to protect 1,600 homes and businesses located within the flood plain from 100-year storms. Since 2007, the Southeastern Wisconsin Watersheds Trust has been focusing efforts on watershed restoration plans, watershed action teams, rehabilitation projects, and land protection. In 2009, a $4.7 million grant from the National Oceanic and Atmospheric Administration (NOAA) was awarded to Ozaukee County to remove fish barriers and reconnect 158 miles of streams and 119,000 acres of biologically important riparian, near-shore, and river mouth areas of the Milwaukee River.

In 2010, MMSD was awarded about $4 million in USEPA Great Lakes Restoration Initiative grants to improve habitat and fish passage in the Kinnickinnic River and redesign the last stretch of the Menomonee River, which acts as a fish-passage barrier between Lake Michigan and the rest of the watershed (fig. 7–2). Residential properties are being purchased to widen flood plains for re-creating flood storage and to rehabilitate the system to a more natural flow regime. Other areas require cleanup of contaminated sediment. The construction of a deep tunnel by MMSD helped alleviate flooding and pollution problems associated with an aging combined stormwater and sanitary-sewer system, preventing more than 70 billion gallons of wastewater from entering Lake Michigan since the Deep Tunnel came online in 1994.

To learn more, go to *http://v3.mmsd.com/DeepTunnel.aspx*.

The Response of Streams to Urban Development Varies Across Regions of the Country

Because of differences in climate, geology, topography, and historical land-use patterns, all of which define stream ecosystems, streams in different regions of the country respond differently to urban development. These environmental differences lead to variations in how hydrology, habitat, stream chemistry, and aquatic biota respond to urban development. These regional differences also were evident in the biological community characteristics of streams with undeveloped watersheds as well as in the rate at which the biological communities changed as urban development occurred.

Management Implications

- Protection and rehabilitation strategies for urban stream ecosystems need to account for the influence of regional characteristics, such as climate, geology, topography, and historical land-use patterns, in addition to the effects of multiple stressors.

Figure 7–2. Habitat is being restored along the Kinnickinnic River in Milwaukee, Wis., to improve fish passage and reconnect the stream to the flood plain.

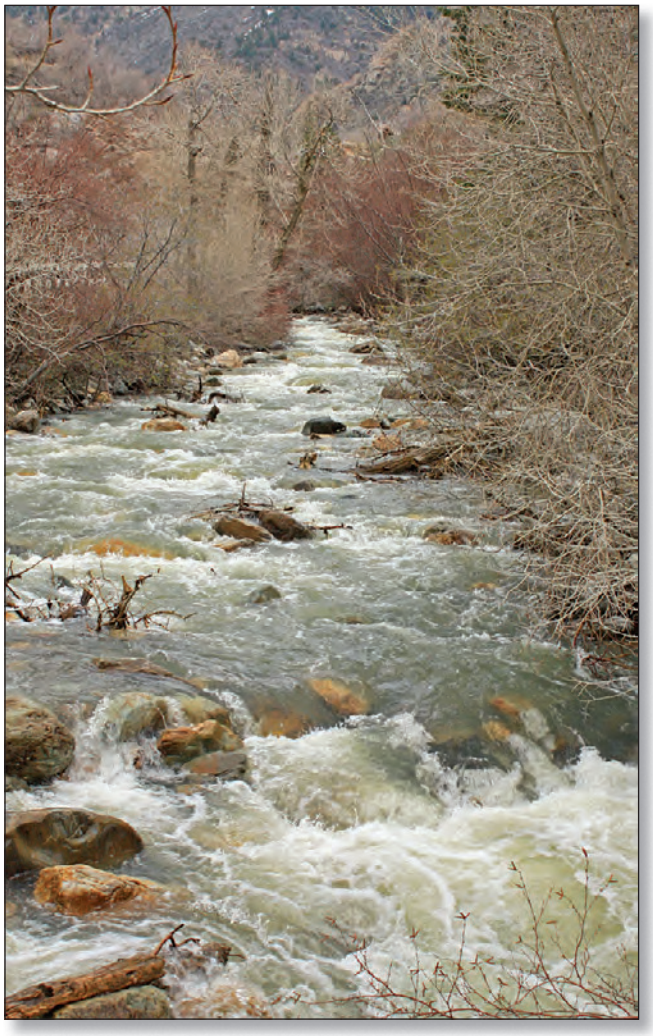

Streams draining forested watersheds are likely to support the most sensitive biological communities; therefore, forest conservation is particularly important to limit impacts as forested watersheds are urbanized.

Comparing Aquatic Biological Conditions Across Regions

Assessing the relative health of a stream in a particular region often requires comparing its biological community to biological communities typically observed in streams with the least-disturbed watersheds in the region. Characterizing the set of conditions that are expected for a least-developed stream in a region is a major challenge, however, especially when comparing stream health in different parts of the country (Herlihy and others, 2008). Invertebrate samples from a USEPA study of the Temperate Plains region, which includes extensive agricultural lands in the eastern Dakotas and through Iowa, Minnesota, Missouri, Kansas, and Nebraska to Indiana and Ohio, indicate that 62 percent of the stream lengths in this region were in good or fair condition (fig. 7–3). In contrast, invertebrate sample data from the Northern Appalachians region, which includes all of the New England states, most of New York, the northern half of Pennsylvania, and northeastern Ohio, indicate that only 28 percent of the stream lengths were in good or fair condition. A conclusion that could be drawn from these data, collected as part of the USEPA Wadeable Streams Assessment, is that the biological conditions in the least-disturbed streams in the Midwestern agricultural region are better than conditions in the least-disturbed, largely forested Northern Appalachian region (U.S. Environmental Protection Agency, 2006).

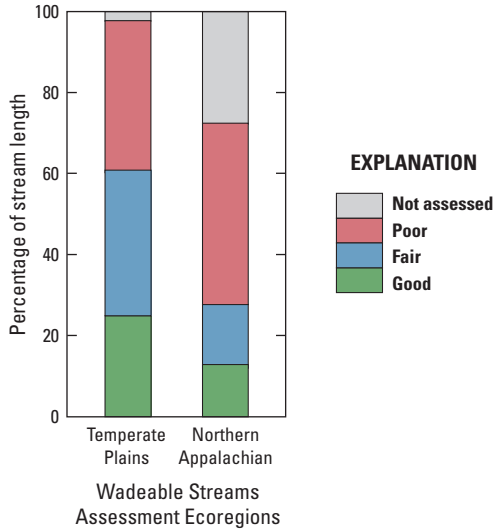

Figure 7–3. Comparison of stream conditions between regions may not be valid when the least-disturbed conditions vary between the regions. Variations in these least-disturbed conditions may lead to inaccurate conclusions about relative health of streams in a region. Tools such as the Biological Condition Gradient may enable more accurate comparisons of the health of streams across regions. (Modified from U.S. Environmental Protection Agency, 2006.)

Preservation of existing trees and tree planting in urban areas are cost-effective strategies to reduce runoff and pollutants. Trees capture rainfall in their canopies and further reduce runoff and pollutants through processes such as evapotranspiration, infiltration, and nutrient transformation. Yet, these natural processes vary widely by tree species and other characteristics, making it difficult to measure these benefits and translate them into a simple and quantifiable credit system. (Photograph by Center for Watershed Protection, Ellicott City, Md.)

A likely reason for the larger percentage of stream miles in good and fair condition in the Temperate Plains region compared to the Northern Appalachian region is the relative difference in the biological condition of their least-disturbed streams. Invertebrate communities in least-disturbed streams typically have more sensitive species than streams in watersheds that have been subjected to some degree of human disturbances. However, much of the Temperate Plains region has been altered by human disturbance, such as agricultural activities, and streams meeting the criterion for least-disturbed conditions had relatively fewer sensitive species than did the least-disturbed streams in the Northern Appalachian region.

Comparison of stream conditions between regions may not be valid when the least-disturbed conditions vary between the regions. In essence, this led to different starting points for comparing streams in the Temperate Plains region with those in the Northern Appalachians region. In the Temperate Plains region, relatively little difference in the biological conditions of streams reflected the presence of agricultural land uses in the least-disturbed watersheds. In the Northern Appalachian region, where the least-disturbed watersheds were primarily forested, the streams were more likely to have sensitive species. Therefore, for a given level of disturbance in a watershed, a stream in the Northern Appalachian region would be more likely to show greater departure from least-disturbed conditions than would a stream in the Temperate Plains region. Additionally, the limited range of change in the Temperate Plains region is consistent with the USGS investigation finding that agricultural land cover in watersheds with low levels of urban development, as in the Milwaukee, Dallas, and Denver study areas, likely led to a reduction in the number of sensitive species in streams prior to urban development.

An issue of potential concern for resource managers in using least-disturbed streams to define reference conditions is that the qualities of what is considered a healthy stream can vary greatly from region to region. When assessments of stream health are based on regionally distinct reference biological communities, they are generally difficult to compare across regions. This is evident, for example, when tolerant species dominate the biological community in least-disturbed streams of a region where prior land-use disturbances have caused a decrease in the number of sensitive species. One solution that addresses this inconsistency is the use of a biological condition gradient (BCG), which is summarized in chapter 6 and discussed at length in Davies and Jackson (2006). The BCG provides a frame of reference for assessing aquatic biological conditions across the United States. Least-disturbed conditions in some parts of the country may support high-quality biological communities associated with BCG tier 1 or 2 (see chapter 6). In other parts of the country, least-disturbed conditions may support only biological communities associated with BCG tier 3 or 4. Informative comparisons across regions can be made only when they are based on a common frame of reference.

A

B

C

Strategies to reduce, disconnect, or treat impervious cover and increase stormwater infiltration include *(A)* installing permeable pavements instead of impervious asphalt or concrete in low-traffic parking areas (photograph by Center for Watershed Protection, Ellicott City, Md.); *(B)* disconnecting rooftop downspouts and parking lots from the storm sewer system and redirecting into a rain garden (photograph by Alan M. Cressler, USGS); and *(C)* incorporating street bioretention to capture and treat runoff from the adjacent street (photograph by Center for Watershed Protection, Ellicott City, Md.).

Management strategies to reduce pollutants from urban land include installation of stormwater BMPs to capture runoff and remove pollutants, and programs to encourage residents to adopt pollution-preventing behaviors, such as this pet-waste pickup station at a local park. (Photographs by Alan M. Cressler, USGS, and Center for Watershed Protection, Ellicott City, Md., respectively.)

Indicators of the Effects of Urban Development Must Be Both Scientifically Based and Relevant to Important Social Values

Natural and physical scientists have developed scientific measures, such as those reported in chapters 4–6, to communicate information about the outcomes of physical, chemical, and biological processes associated with urban streams to a scientific audience. Social scientists are interested in characterizing the value and benefits of these same outcomes to society, whether the benefits are tangible, such as revenue from tourism, or intangible, such as the enjoyment of walking along a healthy stream. If stream condition is defined solely by scientific metrics that the public might not readily relate to or value, such as chloride ion concentrations or the number of EPT invertebrate species, then generating public support for the protection of urban streams may be hindered. As noted by Boyd and Banzhaf (2007), when natural and physical science are disconnected from social science, science-based information that is expressed only in terms that are meaningful to scientists cannot effectively influence public policy. Consequently, policymakers may not be able to make a direct connection between the condition of a stream described solely in scientific terms, however valid, and its impacts on human well-being. For instance, even a very complete and scientifically sound description of species diversity in a stream may not provide a meaningful connection to tangible benefits to people.

Environmental endpoints can be used for making a connection between scientifically oriented descriptions of stream conditions and the value that society places on these conditions. In order to provide a connection between the scientific and social domain, endpoints must make sense from both a scientific and social value perspective (Boyd and Banzhaf, 2007). From a scientific perspective, a useful environmental endpoint has several characteristics:

- Endpoints are biophysical results, such as EPT species richness or chloride ion concentration;
- Endpoints are tangible and can be measured in a consistent manner; and
- Endpoints make ecological sense by describing results of one or more ecological processes.

To be useful in determining the social value of an environmental outcome, ideally, an environmental endpoint should have these additional characteristics:

- Endpoints can be translated into terms that are commonly understood;
- Endpoints can be connected to some measure of human well-being that society cares about; and
- Endpoints are physically required for a societal benefit to be realized.

The BCG used in the New England study described in chapter 6 illustrates an approach to synthesize information about stream condition and societal benefits related to water quality in a way that meets the scientific and social criteria listed above. The BCG has six tiers for assessing the health of a stream by using biological samples. These tiers synthesize information about biological endpoints and the meaning of endpoints in terms of meeting or not meeting Clean Water Act standards. The assignment of a stream to any tier is based on a regionally appropriate assessment of a stream's aquatic biota, which is completed in a consistent, replicable, and scientifically accepted manner.

Because the BCG framework can be used to map changes in biological endpoints to levels of stream health, assignment of a BCG tier to a stream can be used to determine if the stream is attaining water-quality standards of the Clean Water Act. The BCG tier assigned to a stream indicates to managers whether or not the stream meets a mandated standard for classification as a healthy stream. If not, enforcement actions, such as a TMDL, can be taken, which could have important financial repercussions for an individual, corporation, or government jurisdiction.

Disconnect Between Jurisdictional and Watershed Boundaries

One of the challenges in developing and implementing urban watershed-management efforts is that the watershed scale, which is the scale at which urban stream impacts are managed most effectively, may not align with the jurisdictional boundaries in which most regulations and policies are applied. This can make it difficult for a downstream municipality to protect its water resources when part of the watershed is outside its jurisdiction, such as when an upstream municipality has a disincentive to control development because of loss of potential tax revenue.

Fiscal Disparity Law Enhances Cross-Jurisdictional Land-Use Planning

While interjurisdictional collaboration could enhance effective management of urban development or other activities affecting water quality at the watershed scale, this collaboration has not been widely practiced or accepted. Obtaining interjurisdictional consensus for implementing a watershed protection-oriented land-use plan that benefits one jurisdiction more than another is difficult at best, especially if one jurisdiction gains water-quality protection without having to limit development.

The Minnesota Fiscal Disparities Program is one approach for dealing with potential inequalities by granting all jurisdictions within a metropolitan area a partial share of the commercial-industrial property-tax base. Created by the Minnesota Fiscal Disparities Act of 1971, the Twin Cities tax-base sharing program was in response to interjurisdictional concerns about tax-base and tax-rate disparities and competition for development.

As described by Orfield and Wallace (2007), the Twin Cities program requires each taxing jurisdiction in a seven-county area to contribute 40 percent of the growth in value of its commercial-industrial tax capacity to a regional pool of funds. Municipalities are assigned a portion of the pool based on population and the ratio of total market value of property per capita in the jurisdiction to average market value of property per capita in the region. The formula assigns a greater share of the funds in the pool to municipalities with lower-than-average market value per capita than would be justified based on population alone, while high market-value localities receive a lower portion than their population share.

The Twin Cities metropolitan area has benefited from tax-base sharing by reducing incentives for individual jurisdictions to engage in fiscal zoning and tax-base competition practices that could jeopardize land conservation, which benefits the region as a whole. By reducing the need for local governments to compete with each other for revenue-generating land uses, such policies enhance the possibility for engaging in regional land-use planning.

For more information, go to *http://www.metrocouncil.org/newsletter/planning2010/FiscalDisparitiesOct4.htm*.

Managing Stormwater: Adapting Management Approaches to Lessons Learned

The implementation of what are now thought of as traditional stormwater BMPs in the 1970s and 1980s addressed a goal of preserving the pre-development hydrologic regime by controlling the peak rate of flow leaving a site, such as the use of stormwater-detention ponds. In some cases, however, this led to increased downstream flooding as a result of cumulative increased flow from individual development sites within a watershed, particularly if each site was designed, approved, and constructed on a site-by-site basis (Clark and Hamilton, 2008). Some studies also concluded that stormwater-detention systems could actually worsen downstream channel erosion (Lee and Ham, 1988; MacRae, 1996). Based on this information, stormwater management is shifting to management strategies that improve infiltration to groundwater and increase base flow by reducing runoff volume and the frequency and duration of peak flows so as to reduce stream flashiness, prevent channel erosion, and protect stream habitat (fig. 7–4; National Research Council, 2008).

A. **Before**

B. **After**

Virginia's Runoff-Reduction Method

In 2004, the Commonwealth of Virginia amended its stormwater law to promote the use of low-impact development. Although few municipalities developed a strategy for implementing low-impact development practices, such as bioretention and planting of grass swales to reduce runoff volume and peak flows, no statewide regulatory framework was in place to provide incentives to use low-impact development and other site design strategies aimed at reducing the impacts of development. During the process of updating the Virginia Stormwater Management Permit program regulations in 2007, however, the Virginia Department of Conservation and Recreation proceeded to update the BMP performance standards and develop a framework for measuring compliance with water-quality and channel-protection requirements. One of the results is the Runoff Reduction Method (fig. 7–5; Hirschman and others, 2008).

The Runoff Reduction Method is a spreadsheet-based, stormwater design system that incorporates built-in incentives for the use of site-design strategies that minimize impacts to the natural or existing site hydrology. By addressing runoff volume, duration, velocity, frequency, groundwater recharge, and protection of stream channels, this method is intended to facilitate approaches that move beyond managing solely for peak flow rate and water-quality treatment. When used in conjunction with site-based pollutant load limits, this method also can help municipalities meet pollutant-reduction goals (for example, nutrient strategies, TMDLs) of the larger watershed.

The Virginia Runoff Reduction Method is focused on site compliance to meet site-based phosphorus load limits. Under this method, site designers can use combinations of practices that receive variable runoff-reduction and pollutant-removal credits based on average annual values derived from research studies (Hirschman and others, 2008). Site designers are encouraged to use practices that reduce the overall volume of runoff for the post-development condition to achieve the required load limit. The Virginia stormwater BMP clearinghouse web site includes a list of BMPs that can be used and provides design standards and specifications for each BMP.

For more information, go to *http://vwrrc.vt.edu/swc/*.

Figure 7–4. A grassed channel leading from a partially visible strip mall *(A)* before and *(B)* after construction of a stormwater management channel leading to an outfall pipe in Lynchburg, Va. The previously grassed channel was converted to a wetland to reduce runoff and filter pollutants. (Photographs by Center for Watershed Protection, Ellicott City, Md.)

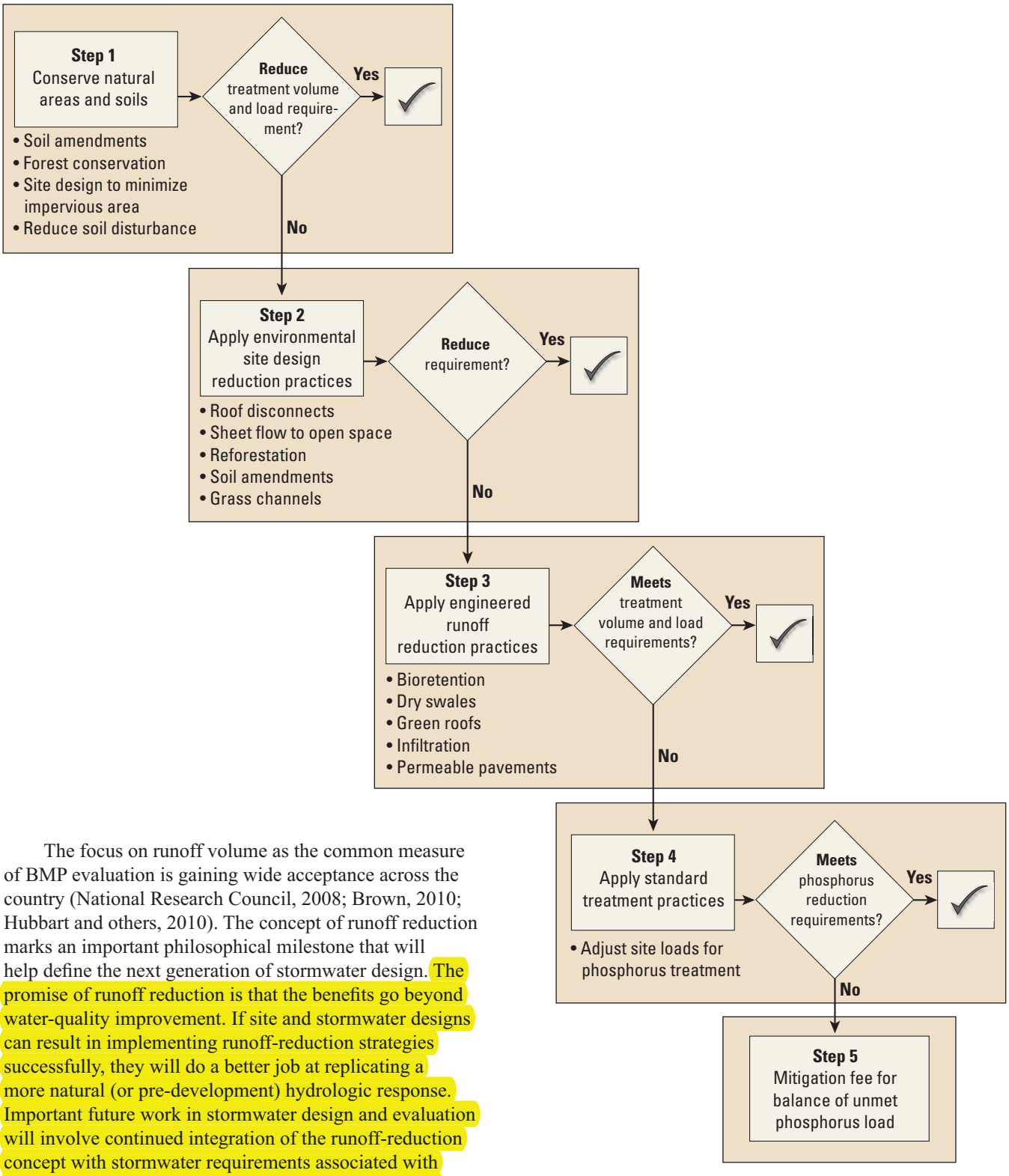

Figure 7–5. The Virginia Runoff Reduction Method is a planning approach for reducing the hydrologic response associated with urban development.

The focus on runoff volume as the common measure of BMP evaluation is gaining wide acceptance across the country (National Research Council, 2008; Brown, 2010; Hubbart and others, 2010). The concept of runoff reduction marks an important philosophical milestone that will help define the next generation of stormwater design. The promise of runoff reduction is that the benefits go beyond water-quality improvement. If site and stormwater designs can result in implementing runoff-reduction strategies successfully, they will do a better job at replicating a more natural (or pre-development) hydrologic response. Important future work in stormwater design and evaluation will involve continued integration of the runoff-reduction concept with stormwater requirements associated with channel protection and flood control, so that managing the effects of post-development stormwater can occur in a unified approach.

To learn more, go to *http://www.dcr.virginia.gov/lr2f.shtml*.

Educating the Public on Recognizing Good Stream-Management Practices

Educating the general public about how their actions at home affect stream health is critical for environmental protection. Protecting streams may require making different choices, such as reducing fertilizer applications to residential lawns and gardens (fig. 7–6), which require re-evaluating familiar practices based on new awareness. A variety of studies, however, have determined that increasing awareness alone may not result in changing behavior (Costanzo and others, 1986; McKenzie-Mohr, 2000). Concerns over convenience and perceptions of the cost in time and resources can result in reluctance to adopt new practices, even if they are seen as beneficial.

Signage and other public educational tools that explain the purpose of BMPs are important to help the public understand the connection between things they see every day and the quality of the environment. For example, the King Farm urban-development plan in Rockville, Maryland, has an open-space framework intended to reflect the environmentally sensitive areas analysis completed by Montgomery County (U.S. Environmental Protection Agency, 2010b).

Initially, the public did not understand the purpose of "no-disturbance" areas along the valleys of the Watts Branch tributaries that flow through the site. This was particularly true for the valleys that are lined with homes built only on the side of the street opposite the valley. The public felt that the undeveloped side of the street should be mowed and landscaped. Because these actions would limit the ability of the stream valleys to help remove contaminants from stormwater runoff, however, the City of Rockville instituted an educational signage program called "Growing…Not Mowing" and placed signs along all the stream valleys in King Farm (fig. 7–7). The signs explained that the natural, undeveloped space along the stream valleys was for the purpose of water-quality protection and stormwater-runoff mitigation. This effort eventually led to the public's understanding and support of the diverse reasons for open space and the value of communicating the intended purpose of management decisions (MacDonald and others, 2003).

Conclusion

Urban development that degrades the condition of stream biota can lead to the non-attainment of water-quality standards and result in the need for costly remediation efforts. Nevertheless, humans are choosing in ever greater numbers to live, work, and recreate in urban areas, and the continuing growth of urban areas in the Nation and world appears to be an inescapable fact. Finding a balance between urban development and its effects on the health and resilience of urban stream ecosystems from multiple stressors presents watershed managers and policymakers with management challenges that require innovative, adaptive management solutions.

Figure 7–6. Resident behaviors, such as applying lawn fertilizer, can have a cumulatively large impact on water quality. It is not well understood, however, what types of outreach programs are most effective in encouraging widespread behavioral change.

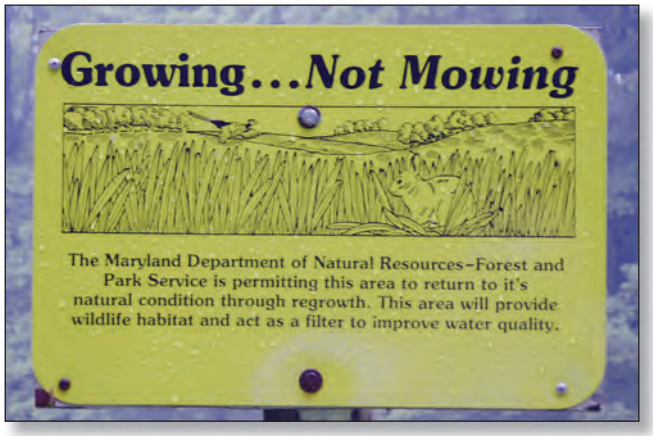

Figure 7–7. "Growing…Not Mowing" signs along the streams in King Farm, Md., emphasize the importance of natural areas in providing wildlife habitat and water-quality protection. (Photograph by Center for Watershed Protection, Ellicott City, Md.)

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Glossary

A

abundance The number of organisms within a taxonomic group. For example, if 100 individual fish are identified in the community survey of which 80 were minnows, the total abundance is 100 and minnow abundance is 80.

aquatic Related to water.

B

bankfull The level in the stream channel where rising streamflow begins to enter the flood plain.

base flow Sustained flow of a stream in the absence of direct runoff. It includes natural and human-induced streamflows. Natural base flow is sustained largely by ground-water discharges.

Best Management Practice (BMP) A generally accepted practice for some aspect of natural resources management, such as water conservation measures, drainage management measures, or erosion control measures. Typically incorporates conservation criteria.

bioassay A laboratory test which measures the effects of a substance on living organisms. Effeccts commonly assessed include survival, growth, or reproductive output.

biodiversity A characteristic of a biological community based on the number of species and evenness in the number of individual organisms among the different species. A high biodiversity is considered a positive attribute of a biological community.

biological condition metric A calculated metric that focuses on a particular species that is likely to be affected by and respond to urban development. These metrics are regarded as "indicators," because they are based on certain species in a community that respond to specific environmental stressors.

biota The ensemble of all aquatic organisms found at a stream location.

C

channelization Portions of a stream channel that have been modified by humans, usually for flood control. Channelization usually involves straightenening of the channel and removal of riparian vegetation.

chemistry The condition of steam water including physical attributes such as temperature and chemical attributes including pH, dissolved oxygen, and concentrations of nutrients, ions, and pesticides, among other constituents.

chloride A chemical ion most familiar as a component of common salt, sodium chloride. Chloride can enter streams from leaking sewage lines and septic tanks, road salt application, fertilizer use, and the use of water softeners, bleach, and swimming pool chemicals; chloride may be transported to streams through groundwater and wastewater-treatment plant discharges.

Clean Water Act (CWA) The goal of the Clean Water Act (CWA) is "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters."

community A general group of organisms, either algae, invertebrates, or fish, that interact within the physical area defined by the stream reach.

community composition score A calculated metric that represents overall changes in the types of species and the number of organisms in the community. These scores were calculated by using a technique called multivariate ordination, which in essence looks at the differences and similarities in the species composition of a community across all sites in a study area.

Community Tolerance Index A metric calculated as the average tolerance to stressors based on all species in the invertebrate community; species values range from 0 (most sensitive) to 10 (most tolerant). The average tolerance typically increases when sensitive invertebrate species are being lost in the community.

connectivity The degree to which a stream is connected with upstream and downstream areas and other streams. Connectivity can be affected by natural factors such as droughts and waterfalls and human factors such as road culverts, impoundments and water diversions.

contaminant Chemicals such as chloride, pesticides and polycyclic aromatic hydrocarbons among others that can be toxic to aquatic biota.

D

duration The length of time that a high-flow event lasts.

E

ecosystem services Measurable outcomes, produced by ecosystem processes such as nutrient assimilation or healthy, functioning biological communities, which are directly enjoyed, consumed or used by individuals, households, or communities.

endpoint A terminal component of a system that is used to assess the system, such as an environmental factor or biological metric that is evaluated for assessing the health of a stream ecosystem. Endpoints are typically an explicit expression of an environmental value (such as the concentration of a certain chemical or presence of certain species) that is relevant to the resource being protected.

Ephemeroptera, Plecoptera, and Trichoptera (EPT) Invertebrates belonging to the insect classes Ephemeroptera (mayflies), Plecoptera (stoneflies), and Trichoptera (caddisflies). Species in these groups are generally considered sensitive.

evapotranspiration The process by which water that is absorbed by plants, usually through the roots, is evaporated into the atmosphere from the plant surface, such as leaf pores; plus the process of liquid water becoming water vapor, including vaporization from water surfaces, land surfaces, and snow fields.

F

factor A specific feature or attribute of the physical, chemical, or biological environment that contributes to the response of streams to urban development.

flashy (flashiness) A descriptive term for streams exhibiting rapid increases in streamflow during or following storms and then similarly rapid decreases when storm runoff ceases.

flood plain The area adjacent to a stream that is inundated during a flood.

foodweb The interconnected energy transfer beginning with the conversion of sunlight to organic matter by terrestrial and aquatic primary producers, and then moving to primary consumers, secondary consumers, and decomposers.

frequency The number of peak storm flows in a given amount of time.

G

genus The usual major subdivision of a family or subfamily in the classification of organisms, usually consisting of more than one species.

grade controls Engineered features used to affect the gradient of a stream reach to control the direction and velocity of flow. Such features include culverts, weirs, and engineered step pools.

groundwater (1) Water that flows or seeps downward and saturates soil or rock, supplying springs and wells. The upper surface of the saturate zone is called the water table. (2) Water stored underground in rock crevices and in the pores of geologic materials that make up the Earth's crust.

H

habitat The actual structure of the stream that is home for organisms (biota), such as invertebrates and fish, including the bottom and its substrate, sides, and structures such as woody debris and undercut banks.

high flow A descriptor for sampling conducted during the season when generally elevated flows are expected to occur because of snowmelt or increased precipitation.

hydrology In the context of stream habitat, the flow regime experienced by the organisms within a reach, including magnitude, frequency, duration, and flashiness of flow events.

hydrophobic contaminants Compounds that do not dissolve easily in water.

I

impervious cover (surface) Hard surfaces that block the infiltration of rain and snowmelt into the ground, including rooftops and paved surfaces, such as roads, parking lots, and driveways.

insecticide A pesticide designed to kill specific insects.

L

land cover Physical materials, such as vegetation and human-constructed roads and buildings that cover the Earth's surface.

land use How people utilize the land to accommodate their needs. In urban areas common land uses are roads, houses, and businesses, as well as other kinds of built infrastructure, such as wastewater treatment plants or dams and reservoirs.

low flow A descriptor for sampling conducted during the season when generally low flows are expected to occur because of reduced precipitation.

M

metropolitan area The term metropolitan area refers to a region consisting of a densely populated urban core and its less-populated surrounding territories, sharing industry, infrastructure, and housing.

moderately tolerant species Species most abundant at intermediate levels of development.

N

nutrients Chemicals, such as nitrogen, phosphorus, and carbon, that are used by primary producers to produce organic matter from sunlight. These chemicals occur naturally in streams but also can be introduced through various human activities.

O

organochlorine An organic compound that contains one or mor chlorine atoms. These compounds can be highly toxic and include pesticides like DDT and chlorodane, vinyls such as polyvinyl chloride (PVC), polychlorinated biphenyl (PCB) insulators, and chlorinated hydrocarbons like chloroform.

P

pesticide Products designed to kill insect pests and weeds in gardens, agricultural fields, rights of way, and structures.

pesticide toxicity index (PTI) Represents a single value for the relative toxicity of a water sample that is based on the concentrations of all pesticides measured in the sample, each weighted by its individual toxicity threshold, as estimated from laboratory toxicity studies.

polycyclic aromatic hydrocarbons (PAH) Hydrophobic contaminants which originate from natural sources, such as oil seeps, and as a consequence of human activities, such as power generation and stormwater runoff.

Probable Effect Concentration (PEC) A contaminant concentration above which adverse effects on aquatic organisms are expected to occur more often than not.

Probable Effect Concentration Quotient (PECQ) A relative toxicity value for a contaminant (or contaminant class) in sediment, calculated by dividing the concentration of that contaminant (or class) by its Probable Effect Concentration (PEC).

pyrethroids A synthetic chemical compound used as a pesticide that is chemically similar to the natural chemicals (pyrethrins) produced by Chrysanthemums.

R

rate of decline A measure of how fast or slow streamflow returns to normal conditions following the peak storm flow.

reach A section of a stream that typically extends between 10 and 20 bankfull widths in length and incorporates a suite of physical, chemical, and biological features that generally characterize the stream. For the USGS urban development studies, a reach was delineated within each stream as the sampling area for measuring the hydrology, habitat, water chemistry, and aquatic biota.

response An apparent relation between two factors, based on a Spearman rank correlation (see rho, below). Although a response implies a direct cause and effect relation of one factor on another, the EUSE study was not designed to make cause and effect determinations.

rho The strength of the correlation between two factors and ranges from 0 (no correlation) to 1.0 (perfect correlation). This report utilized the Spearman rank correlation.

richness The number of different species in a stream reach.

riparian The narrow corridor of land immediately adjacent to both sides of a stream where terrestrial and aquatic ecosystems meet.

S

Semipermeable Membrane Device (SPMD) Passive sampling devices designed to mimic the bioaccumulation of organic compounds across the gill membranes of fish.

sensitive species Species most abundant in undisturbed areas, which can decline rapidly with the onset of development.

species Biological organisms within a community that are closely related taxonomically. In this report, species is used even when biological data were reported at taxonomic levels other than species. For example, some invertebrates could be identified only to genus because certain diagnostic features for species-level identification were indistinct.

streamflow The water discharge that occurs in a natural channel. A more general term than runoff, streamflow may be applied to discharge whether or not it is affected by diversion or regulation.

stressor (environmental) Factors having a negative effect on stream ecosystems that can occur by changes to the chemical and physical environment from urban development, degraded water quality, loss of habitat, and modified streamflow patterns.

T

taxa Categories of like organisms that are judged to be distinct unit sbased on certain genetic factors of similarity. Species and genera are examples. “Taxon” is the singular form.

terrestrial Related to land.

tolerance The ability of an organism to persist in the environment given increasing levels of contamination or other stressors.

tolerant species Species most abundant at high levels of development.

Total Maximum Daily Load (TMDL) A calculation of the maximum amount of a pollutant that a water body can receive and still safely meet water-quality standards.

toxic equivalents A measure of the amount of a known toxic substance that would cause the same response as the substances in a sample from the SPMD.

U

urban stream syndrome The collective outcome of human activities associated with urban development, including the conversion of land from rural to urban uses, creation of impervious cover, chemical contamination, armored stream banks, and use of storm drains and dams, affect the biological, physical, and chemical components of streams.

W

water quality A term used to describe the chemical, physical, and biological characteristics of water, usually in respect to its suitability for a particular purpose.

watershed The land area that drains water to a particular stream, river, or lake. It is a land feature that can be identified by tracing a line along the highest elevations between two areas on a map, often a ridge. Large watersheds, like the Mississippi River basin contain thousands of smaller watersheds.

Appendixes

Appendix 1A – Study Watersheds in Nine Metropolitan Areas Used in the Effects of Urban Development on Stream Ecosystems Study

Portland
Salt Lake City
Birmingham
Atlanta
Raleigh
Boston
Denver
Dallas
Milwaukee

Appendix 1B – Characteristics of Nine Metropolitan Study Areas

Appendix 1A: Study Watersheds in Nine Metropolitan Areas Used in the Effects of Urban Development on Stream Ecosystems Study (from Terziotti and others, 2012)

Portland

The Portland metropolitan study area is located in northwestern Oregon and southwestern Washington. The major drainage for the studied watersheds is the Willamette River, nestled between the Coast and Cascade Mountain Ranges. Most of the studied watersheds are located within the Willamette Valley ecoregion, characterized as a broad, lowland valley with a patchwork of land-use types that include evergreen forests, agriculture, urban areas, and wetlands. Landforms consist of terraces and flood plains that are interlaced and surrounded by rolling hills. Soil textures range from fine to medium-coarse. Slope and elevation in the area vary greatly from the lowland valleys to the foothills mountain range. The climate is mild with cool, wet winters and warm, dry summers.

The major metropolitan centers in the area are Portland, Vancouver, Beaverton, Salem, Corvallis, and Eugene with a combined 2000 population of 2.7 million, a 24 percent increase from 1990. Portland is the dominant commercial center of the study area with extensive port facilities on the Columbia and Willamette Rivers. The economy includes forestry and timber processing; fruit, wheat, and specialized farming; dairying; food processing; and tourism.

Table 1A–1. Study watersheds located in the Portland, Oregon, metropolitan area.

Figure number	USGS station identification	USGS station name	Watershed drainage area (square kilometers)
1	14199710	Nate Creek near Colton, Oreg.	28.75
2	14205400	East Fork Dairy Creek near Meacham Corner, Oreg.	87.54
3	14206347	Rock Creek at Quatama Road near Hillsboro, Oreg.	66.72
4	14206435	Beaverton Creek at SW 216th Ave, near Orenco, Oreg.	95.62
5	14206750	Chicken Creek near Sherwood, Oreg.	40.04
6	14206950	Fanno Creek at Durham, Oreg.	80.73
7	14211315	Tryon Creek below Nettle Creek, near Lake Oswego, Oreg.	17.12
8	434745123040200	Silk Creek near Cottage Grove, Oreg.	42.17
9	435212122483300	Lost Creek near Dexter, Oreg.	83.42
10	440257123103200	Amazon Creek near Danebo Road at Eugene, Oreg.	50.25
11	443326123165200	Oak Creek at Corvallis, Oreg.	32.50
12	445029122592600	Battle Creek near Turner, Oreg.	29.91
13	445551123015800	Pringle Creek at Salem, Oreg.	24.79
14	450022123012400	Claggett Creek at Keizer, Oreg.	24.84
15	450955122291200	Milk Creek at Camp Adams, Oreg.	103.78
16	451734122585400	Chehalem Creek at Newberg, Oreg.	97.85
17	452149123194900	North Yamhill Creek near Yamhill, Oreg.	65.86
18	452231122200000	Deep Creek near Sandy, Oreg.	31.36
19	452337122243500	North Fork Deep Creek at Barton, Oreg.	37.01
20	452414122213200	Tickle Creek near Boring, Oreg.	34.08
21	452526122364400	Kellogg Creek at Milwaukie, Oreg.	34.11
22	452912122291200	Johnson Creek at Circle Ave, Oreg.	55.63
23	453506123125700	Iler Creek near Forest Grove, Oreg.	12.59
24	454321122352300	Curtin Creek near Vancouver, Wash.	30.30
25	454510122424900	Whipple Creek near Salmon Creek, Wash.	22.17
26	454543122524900	South Scappose Creek at Scappose, Oreg.	65.32
27	454549122295800	Salmon Creek near Battleground, Wash.	58.84
28	455122122310600	Rock Creek near Battleground, Wash.	26.08

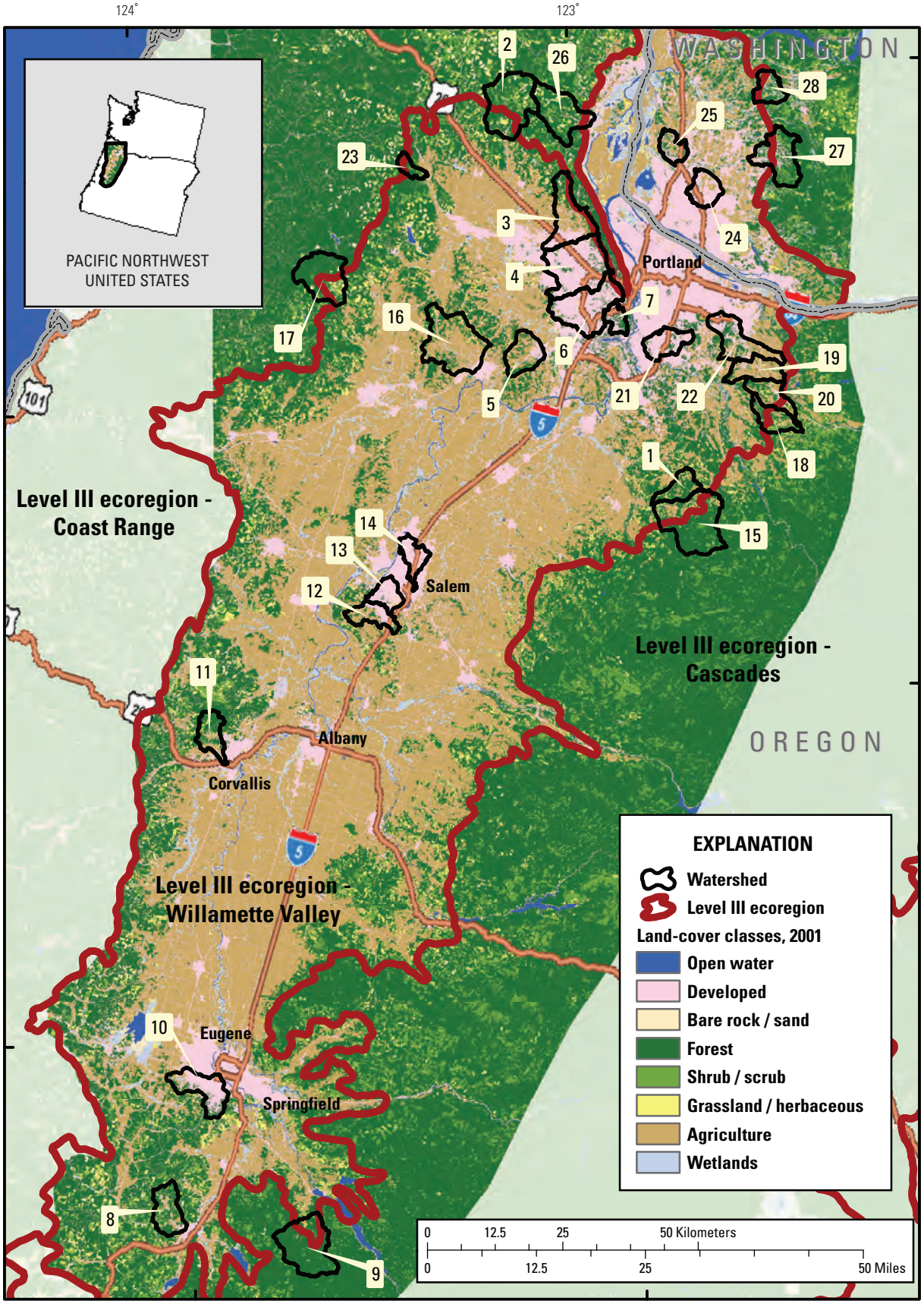

Figure 1A–1. Locations of study watersheds in the Portland, Oregon, metropolitan area.

Salt Lake City

The Salt Lake City study watersheds are located in three major river systems: the Bear, the Weber, and the Utah Lake/Jordan River systems. These river basins, in turn, are located in the Great Basin between the Wasatch Range in the Rocky Mountains and the Sierra Nevada Mountains, a closed area that allows no outflow to other bodies of water such as rivers or oceans. The study area is characterized by cold desert basins, scattered low and high mountains, and salt flats. The climate of the study area is semiarid with most of the precipitation occurring as winter snows or occasional summer thunderstorms. The lowland valleys have moderate temperature shifts between winter and summer; whereas, the high mountains have long, cold winters and short, cool summers. Streams in the study area arise in the Wasatch Range and flow westerly through the urban areas.

The Salt Lake City study area includes four main metropolitan areas, Salt Lake City, Logan, Ogden, and Provo. The combined 2000 population was 1.9 million, a 29 percent increase from 1990. Typical of semiarid urban areas in the western United States, an array of reservoirs, diversions, and canals alters the hydrologic regime of most Salt Lake City streams, and water rights is a continuous area of contention. Land use in the study area was historically grasslands, evergreen forests, and desert shrubs, some of which has been converted to irrigated agriculture and urban. The economy is the area is largely supported by mining, church, government, finance, education, research, high-technology industries, transportation, recreation, and tourism.

Table 1A–2. Study watersheds located in the Salt Lake City, Utah, metropolitan area.

Figure number	USGS station identification	USGS station name	Watershed drainage area (square kilometers)
1	10167800	Little Cottonwood Creek at Crestwood Park at Salt Lake City, Utah	9.87
2	400927111354501	Hobble Creek at 800 East at Springville, Utah	9.64
3	400959111363201	Hobble Creek at Center Street at Springville, Utah	10.63
4	401442111402201	Provo River at 800 North at Salt Lake City, Utah	24.21
5	401653111400301	Provo River at 3700 North at Provo, Utah	7.77
6	401850111392201	Provo River at Highway 189 at Provo, Utah	3.71
7	403707111463701	Big Cottonwood Creek above Water Treatment Plant at Salt Lake City, Utah	0.50
8	403755111514201	Little Cottonwood Creek at Wheeler Farm at Salt Lake City, Utah	13.64
9	403927111523601	Little Cottonwood Creek at Murray Park at Salt Lake City, Utah	28.91
10	403945111501001	Big Cottonwood Creek at Cottonwood Mall at Salt Lake City, Utah	14.62
11	404000111515801	Big Cottonwood Creek at 900 East at Salt Lake City, Utah	26.66
12	404140111481601	Mill Creek at 3060 East at Salt Lake City, Utah	1.51
13	404143111500101	Mill Creek at 2000 East Salt Lake City, Utah	2.00
14	404218111525601	Mill Creek at 300 East at Salt Lake City, Utah	25.21
15	404317111503601	Parleys Creek at Sugarhouse Park at Salt Lake City, Utah	4.69
16	404349111512201	Emigration Creek at 1200 East at Salt Lake City, Utah	4.26
17	404430111495301	Emigration Creek at 1300 South at Salt Lake City, Utah	3.06
18	405854111534801	Farmington Creek at Frontage Road at Farmington, Utah	3.23
19	410041111581101	Baer Creek at Frontage Road at Kaysville, Utah	3.58
20	410148111535301	Baer Creek at Fruit Heights, Utah	0.10
21	410231111565001	Holmes Creek at Main Street at Layton, Utah	2.30
22	410250111571501	North Fork of Holmes Creek at Main Street at Layton, Utah	6.91
23	410342111574201	Kays Creek at Layton, Utah	14.32
24	410453111570001	Kays Creek at 1000 East at Layton, Utah	10.22
25	410501111555201	South Fork of Kays Creek at Layton, Utah	3.09
26	410522111541201	South Fork Kays Creek at Fernwood Picnic Area at Salt Lake City, Utah	3.94
27	411407111580501	Ogden River at Washington Avenue at Ogden, Utah	4.45
28	411413111554601	Ogden River at Valley Drive Ogden, Utah	0.90
29	411413111564101	Ogden River at Harrison Avenue at Ogden, Utah	3.08
30	414258111502001	Logan River at Golf Course Road at Salt Lake City, Utah	4.58

Figure 1A–2. Locations of study watersheds in the Salt Lake City, Utah, metropolitan area.

Birmingham

The Birmingham study watersheds are located in the Mobile River Basin in Georgia and Alabama in the southeastern United States, where mountain ridges typically are sandstone and valley floors are primarily limestone or shale. The climate is warm and humid with rainfall evenly distributed throughout the year, except for a dry period in August to October.

Major metropolitan centers in the study area include Birmingham, Anniston, and Gadsden, Alabama. The combined 2000 population for these three cities was 1.3 million, an 8 percent increase from 1990. The dominant natural vegetative cover is Appalachian oak forest, and land use is predominantly cropland, pasture, and urban lands. Steel manufacturing is an important part of Birmingham's economy along with the medical, trade, finance, research, and government fields.

Table 1A–3. Study watersheds located in the Birmingham, Alabama, metropolitan area.

Figure number	USGS station identification	USGS station name	Watershed drainage area (square kilometers)
1	02388518	Little Dry Creek at US 27 at Rome, Ga.	20.02
2	02397939	Chappel Creek at Long Branch Road near Trion, Ga.	14.32
3	02398001	Town Branch near Summerville, Ga.	4.70
4	02400675	Unnamed Tributary to Big Wills Creek at State Route 35 near Fort Payne, Ala.	12.11
5	02400725	Mush Creek near Portersville, Ala.	24.47
6	02400800	Little Wills Creek at Collins Chapel Road at Collinsville, Ala.	27.88
7	02401350	Big Canoe Creek at Canoe Creek Road near Springville, Ala.	54.37
8	02401355	Unnamed Tributary to Big Canoe Creek near Springville, Ala.	10.50
9	02401749	Williams Branch near Jacksonville, Ala.	23.92
10	02401760	Little Tallaseehatchee Creek near Weaver, Ala.	38.12
11	02403380	Snow Creek below Anniston , Ala.	44.72
12	02406930	Shirtee Creek near Odena, Ala.	43.32
13	02423120	Cahaba River above Trussville, Ala.	50.15
14	0242339580	Little Cahaba River near, Markeeta, Ala.	15.70
15	02423397	Little Cahaba River below Leeds, Ala.	43.95
16	02423515	Patton Creek near Bluff Park below Patton Chapel, Ala.	28.77
17	02423536	Buck Creek at Buck Creek Road at Alabaster, Ala.	38.70
18	0242354650	Cahaba Valley Creek at Indian Trail Road near Indian Springs, Ala.	36.97
19	0242354750	Cahaba Valley Creek at Cross Creek Road at Pelham, Ala.	66.07
20	02423576	Shades Creek at Lakeshore Drive near Mountain Brook, Ala.	42.08
21	02423581	Shades Creek at Samford University at Homewood, Ala.	56.30
22	02423590	Unnamed Tributary to Shades Creek near Oxmoor, Ala.	5.99
23	02423620	Little Shades Creek at State Highway 150 near Bessemer, Ala.	21.68
24	02423729	Dry Creek at Spring Creek Road near Montevallo, Ala.	34.69
25	0242372950	Spring Creek at County Road 16 near Moores Crossroads, Ala.	33.07
26	02456900	Fivemile Creek at Fivemile Road near Huffman, Ala.	25.04
27	02456980	Fivemile Creek at Lawson Road near Tarrant City, Ala.	48.66
28	02458150	Village Creek at East Lake in Birmingham, Ala.	14.22
29	02461200	Valley Creek at Cleburn Avenue at Powderly, Ala.	52.10
30	02461670	Five Mile Creek at Nevel Road near McCalla, Ala.	33.90

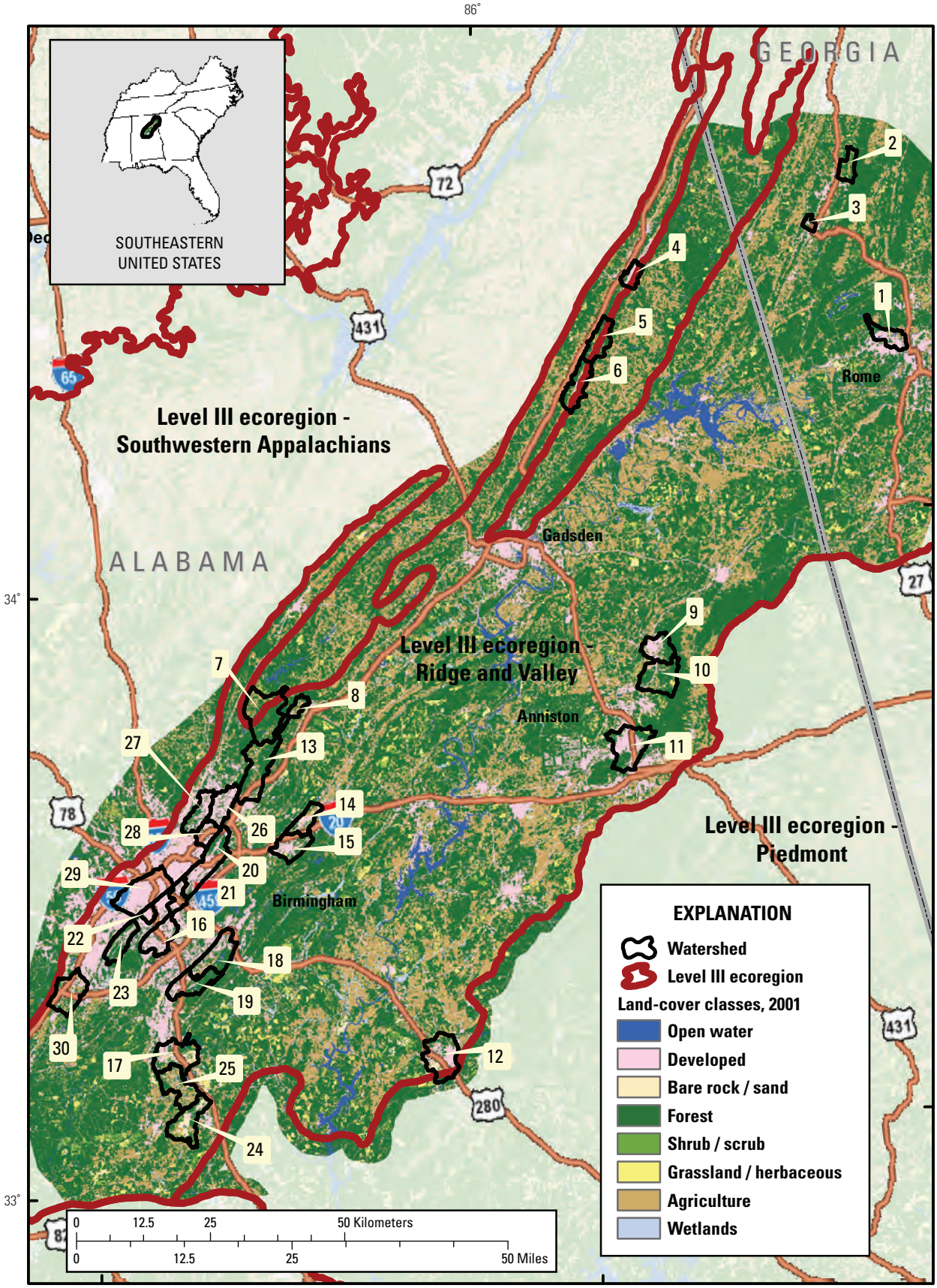

Figure 1A–3. Locations of study watersheds in the Birmingham, Alabama, metropolitan area.

Atlanta

The Atlanta study watersheds, located in northern Georgia, are characterized by gently rolling topography and dissected irregular plains. The soils are almost exclusively fine-grained sediments. The climate is warm and humid with precipitation relatively consistent throughout the year, typical of the southeastern United States. Streams in the area typically have low to moderate gradients with cobble, gravel, and sandy substrates.

Three major population centers of the area are Atlanta, Sandy Springs, and Marietta with a 2000 population of 4,247,981, a 38.4 percent increase from 1990. Natural land cover in the Atlanta study area is oak-hickory-pine forest; however, current land use and land cover includes forested areas in silviculture and agricultural production of hay, cattle and poultry, and sprawling urban development. The economy is diversified and includes medical, industrial, commercial, and service sectors.

Table 1A–4. Study watersheds located in the Atlanta, Georgia, metropolitan area.

Figure number	USGS station identification	USGS station name	Watershed drainage area (square kilometers)
1	02204230	Big Cotton Indian Creek at GA 138, near Stockbridge, Ga.	129.43
2	02204468	Walnut Creek at Airline Road, near Mcdonough, Ga.	125.06
3	02206314	Jackson Creek at Lester Road, near Lilburn, Ga.	55.46
4	02208150	Alcovy River at New Hope Road, near Grayson, Ga.	79.47
5	02213450	Little Tobesofkee Creek near Bolingbroke, Ga.	146.25
6	02217293	Little Mulberry River at Ga. 211, near Hoschton, Ga.	73.49
7	02217471	Beech Creek at Ga. 211, near Statham, Ga.	52.46
8	02218700	Apalachee River near Bethlehem, Ga.	138.56
9	02221000	Murder Creek near Monticello, Ga.	61.41
10	02334885	Suwanee Creek at Suwanee, Ga.	122.10
11	02335870	Sope Creek near Marietta, Ga.	79.54
12	02335910	Rottenwood Creek (Interstate North Parkway) near Smyrna, Ga.	48.10
13	02336635	Nickajack Creek at US 78/278, near Mableton, Ga.	80.69
14	02336728	Utoy Creek at Great Southwest Parkway near Atlanta, Ga.	90.06
15	02336822	Mill Creek at Morning Side Drive, near Hiram, Ga.	100.72
16	02336876	Powder Springs Creek Oglesby Road, Powder Springs, Ga.	66.14
17	02336968	Noses Creek at Powder Springs Road, Powder Springs, Ga.	114.79
18	02337395	Dog River at North Helton Road, near Winston, Ga.	109.08
19	02338280	Whooping Creek at Ga. 5, near Whitesburg, Ga.	68.66
20	02338375	Centralhatchee Creek Armstrong Mill Road, Ctrlhtche, Ga.	82.69
21	02338523	Hillabahatchee Creek at Thaxton Road, near Franklin,Ga.	43.22
22	02339480	Oseligee Creek at County Road 92 near Fredonia, Ala.	77.07
23	02340282	House Creek at Ga. 103, near Whitesville, Ga.	77.72
24	02344340	Morning Creek at Ga. 54, near Fayetteville, Ga.	101.58
25	02344480	Shoal Creek near Griffin, Ga.	53.40
26	02344737	Whitewater Creek at Willow Pond Road near Fayetteville, Ga.	110.50
27	02344797	White Oak Creek at Cannon Road, near Raymond, Ga.	112.68
28	02344887	Red Oak Creek at Ga. 362, near Gay, Ga.	109.03
29	02346358	Turnpike Creek near Milner, Ga.	48.21
30	02347748	Auchumpkee Creek at Allen Road, near Roberta, Ga.	111.96

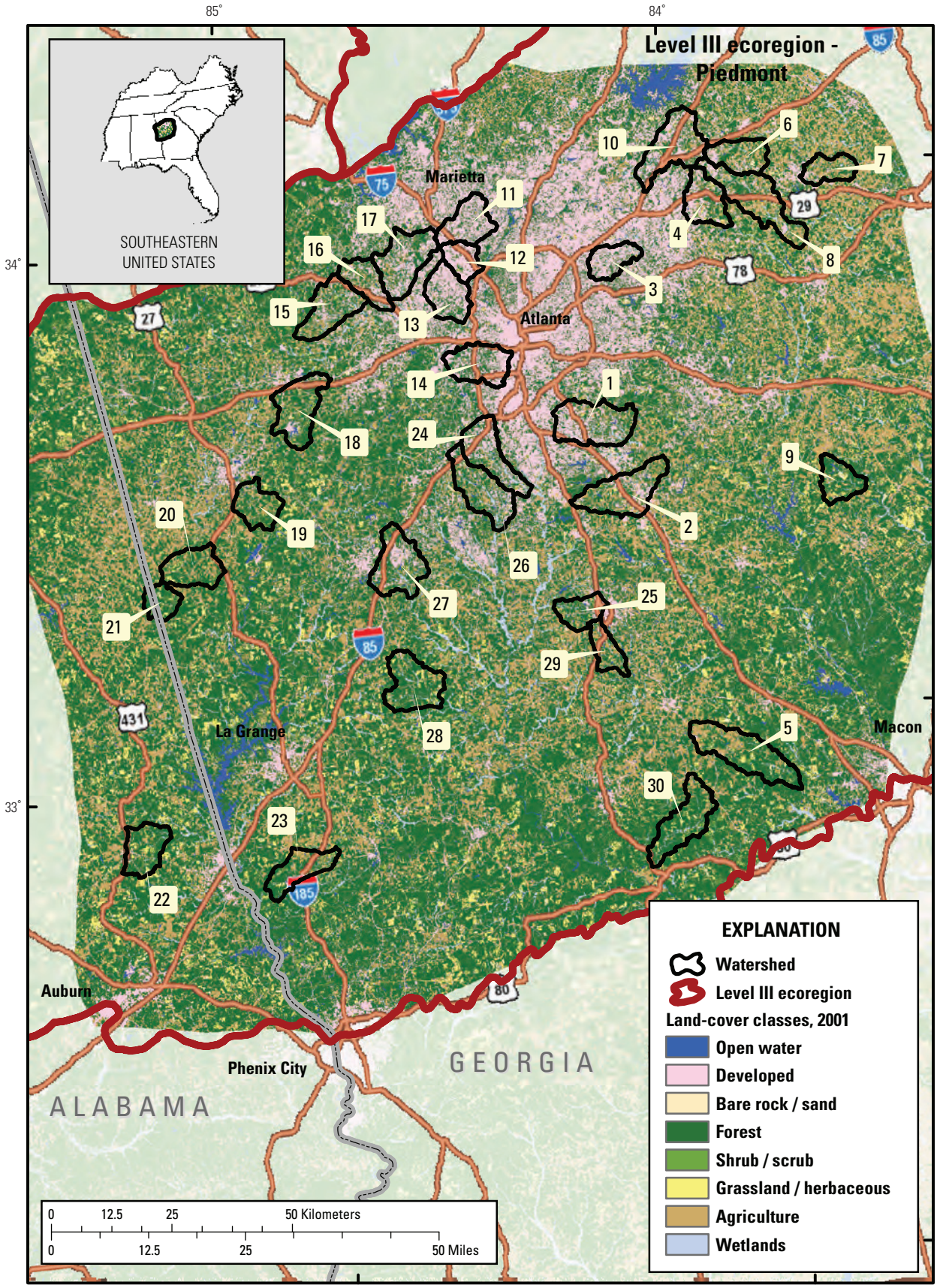

Figure 1A–4. Locations of study watersheds in the Atlanta, Georgia, metropolitan area.

Raleigh

The Raleigh study watersheds are located in central North Carolina with irregular plains and some hills. Soils in the area vary from fine to moderately fine textures in the Coastal Plain and Piedmont areas. The climate is warm and humid, with rainfall evenly distributed throughout the year. Streams in all three subecoregions have low to moderate gradients and typically have gravel to cobble substrate.

The Raleigh study area includes five population centers—Raleigh-Cary, Greensboro–High Point, Durham, Winston-Salem, and Burlington—with a combined 2000 population of 2.4 million, an increase of about 28 percent from 1990. The economy of the study area is diversified and has grown substantially in recent decades, in part as a result of the "Research Triangle" of Raleigh–Durham–Chapel Hill, a successful corporate research area associated with three nearby universities. Heavier industry, primarily textiles, tobacco, chemicals, and furniture, dominate in the western part of the study area near Winston-Salem and Greensboro. Land use in the area has undergone major transformations, from forests to agricultural lands, to forest again, and as of late, to urban and suburban lands. At one time, the region was heavily farmed in cotton, tobacco, corn, and wheat, and many areas underwent moderate to severe erosion of the silt/clay soils.

Table 1A–5. Study watersheds located in the Raleigh, North Carolina, metropolitan area.

Figure number	USGS station identification	USGS station name	Watershed drainage area (square kilometers)
1	02081190	Tar River near Berea, N.C.	66.25
2	02081510	Foundry Branch at mouth near Oxford, N.C.	12.56
3	0208500600	Cates Creek near Hillsborough, N.C.	10.88
4	0208501535	Strouds Creek at St Marys Road near Hillsborough, N.C.	23.15
5	02085430	Deep Creek near Moriah, N.C.	82.49
6	0208725055	Black Creek at Weston Parkway near Cary, N.C.	8.99
7	0208726370	Richlands Creek at Schenk Forest near Cary, N.C.	11.24
8	0208726995	Hare Snipe Creek at SR 1822 near Leesville, N.C.	16.01
9	0208730725	Beaverdam Creek at Glenwood Aveue at Raleigh, N.C.	7.98
10	0208732610	Pigeon House Branch at Crabtree Boulevard at Raleigh, N.C.	11.37
11	02087580	Swift Creek near Apex, N.C.	54.26
12	0208758440	Dutchmans Branch at SR 1386 near Mccullers Crossrds, N.C.	11.73
13	0208794025	Camp Branch above SR 1390 near Holly Springs, N.C.	5.54
14	0209517912	North Buffalo Creek at Greensboro, N.C.	12.59
15	0209647280	Service Creek above Dry Creek at Burlington, N.C.	12.74
16	0209647295	Dry Creek above Service Creek at Burlington, N.C.	6.50
17	0209651815	Branch Creek Below NC 54 near Graham, N.C.	4.92
18	0209665940	Rock Creek Tributary at Stoney Creek Golf Course near Sedalia, N.C.	11.66
19	0209665990	Rock Creek above Rock Creek Tributary near Whitsett, N.C.	25.98
20	0209679804	Little Alamance Creek at SR 2309 near Graham, N.C.	37.35
21	0209695780	Brooks Creek at Eddie Perry Road near Bynum, N.C.	23.88
22	0209697900	Pokeberry Creek near Pittsboro, N.C.	29.79
23	02097355	Bolin Creek above Franklin Streetnear Chapel Hill N.C.	29.81
24	02097464	Morgan Creek near White Cross, N.C.	21.45
25	0209750881	Wilson Creek at mouth near Chapel Hill, N.C.	9.17
26	02099238	Bull Run at NC 29/70 near Jamestown, N.C.	17.95
27	02099480	Richland Creek near Archdale, N.C.	32.69
28	02100295	Hasketts Creek Below SR 2149 near Central Falls, N.C.	30.43
29	02100634	Vestal Creek near Asheboro, N.C.	16.45
30	0211583580	Bowen Branch near mouth at Winston-Salem, N.C.	5.02

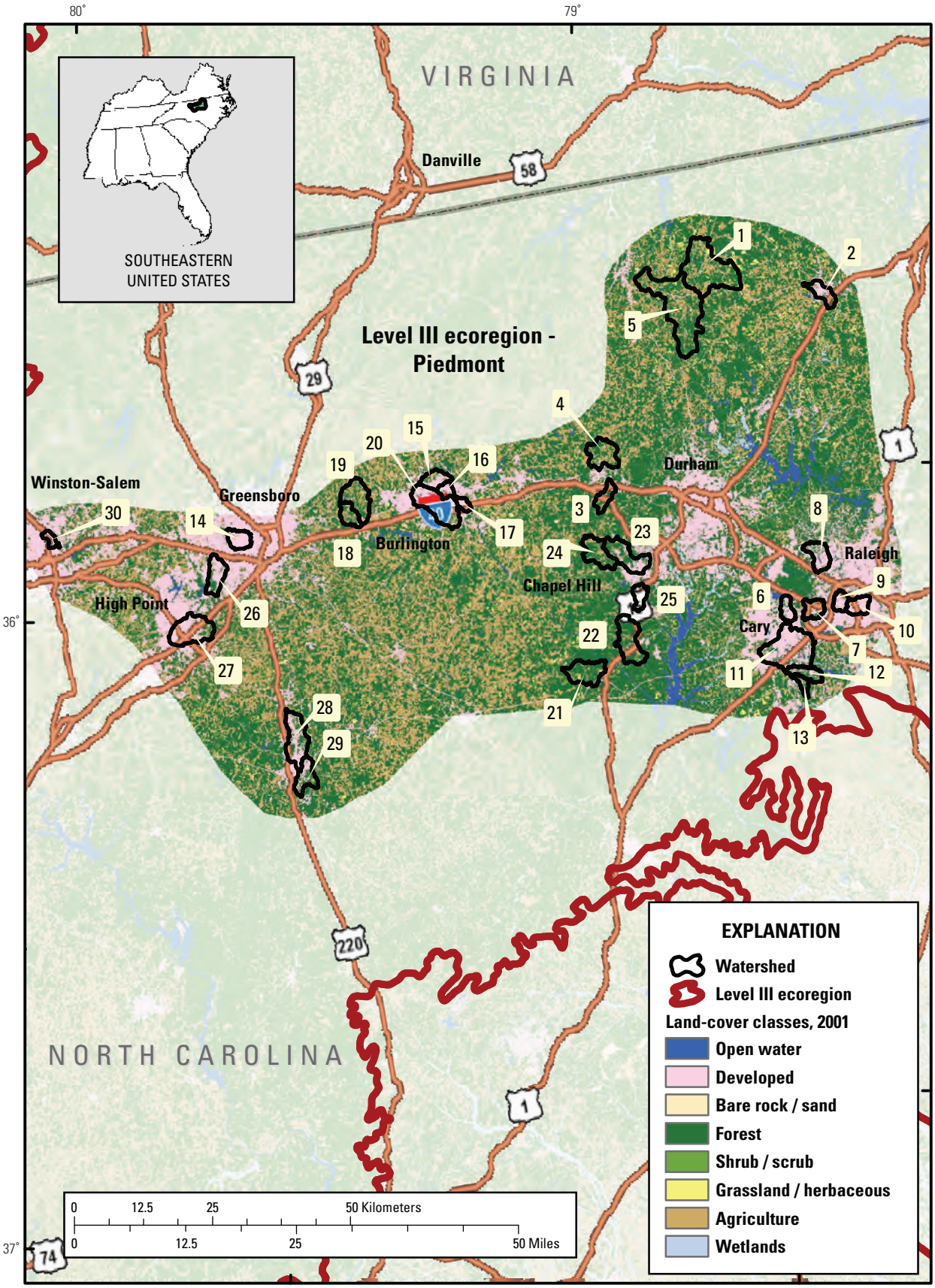

Figure 1A–5. Locations of study watersheds in the Raleigh, North Carolina, metropolitan area.

Boston

The Boston study area includes portions of Massachusetts, New Hampshire, Maine, and Connecticut. The area is characteristic of New England with moderately coarse to coarse textured soils, low hills, forests, cropland and pasture, and urban lands. The climate is cool and humid, and the area experiences frost periods and snow in winter months, although precipitation is evenly distributed throughout the year, with slightly higher amounts in the spring and fall.

The Boston study area includes portions of four cities, including Boston, Massachusetts; Worcester, Massachusetts; Concord, New Hampshire; and Manchester-Nashua, New Hampshire. The combined 2000 population for these cities, 5.7 million, increased by about 7 percent from 1990. The land cover is composed of a mix of forest, urban, and agriculture. This area was first colonized and developed in the early to mid 1600s by immigrants from England for its location as an excellent port on the Atlantic Ocean. The natural land cover was mixed forest, but was cleared for lumber materials and the land was converted to agricultural uses. The area was allowed to revert back to forests as the industrial revolution encouraged families to abandon the farms for jobs in the cities. Many factories and mills were built along rivers, so that more than 1,600 dams in the area regulate flows in mid-sized to large rivers (basin areas greater than 250 square kilometers).

Table 1A–6. Study watersheds located in the Boston, Massachusetts, metropolitan area.

Figure number	USGS station identification	USGS station name	Watershed drainage area (square kilometers)
1	01072540	Little River near Lebanon, Maine	45.85
2	01072650	Greatworks River near North Berwick, Maine	60.16
3	01072845	Isinglass River Batchelder Road near center Strafford, N.H.	59.41
4	01072904	Bellamy River at Bellamy Road near Dover, N.H.	68.46
5	01073260	Lamprey River Cotton Road near Deerfield, N.H.	83.09
6	01073458	North River at Route 152 near Nottingham, N.H.	74.85
7	010734833	Little River at Cartland Road at Lee, N.H.	52.17
8	01089743	Little Suncook River Blackhall Road at Epsom, N.H.	101.35
9	01090477	Black Brook Dunbarton Road near Manchester, N.H.	53.65
10	01094005	Baboosic River Bedford Road near Merrimack, N.H.	73.00
11	01095220	Stillwater River near Sterling, Mass.	78.70
12	01096544	Stony Brook at School Street at Chelmsford, Mass.	107.67
13	010965852	Beaver Brook at North Pelham, N.H.	121.70
14	01096710	Assabet River at Allen Street at Northborough, Mass.	76.40
15	01096945	Elizabeth Brook off White Pond Road near Stow, Mass.	48.54
16	01097270	Fort Pond Brook at River Road near South Acton, Mass.	53.75
17	01097476	Sudbury River at Concord Street at Ashland, Mass.	89.56
18	01101500	Ipswich River at South Middleton, Mass.	115.30
19	01102345	Saugus River at Saugus Ironworks at Saugus, Mass.	60.40
20	01102500	Aberjona River (head of Mystic River) at Winchester, Mass.	58.20
21	011032058	Charles River at Maple Street at North Bellingham, Mass.	54.20
22	01105000	Neponset River at Norwood, Mass.	84.90
23	01105500	East Branch Neponset at Canton Junction, Mass.	72.85
24	01105581	Monatiquot River at River Street at Braintree, Mass.	71.22
25	01106468	Matfield River at North Central Street at East Bridgewater, Mass.	79.75
26	01109000	Wading River (head of Threemile River) near Norton, Mass.	113.40
27	01109595	Middle River off Sutton Lane at Worcester, Mass.	124.66
28	01110000	Quinsigamond River at North Grafton, Mass.	66.20
29	01112262	Mill River at Summer Street near Blackstone, Mass.	73.72
30	01193340	Blackledge River above Lyman Brook near North Westchester, Conn.	49.21

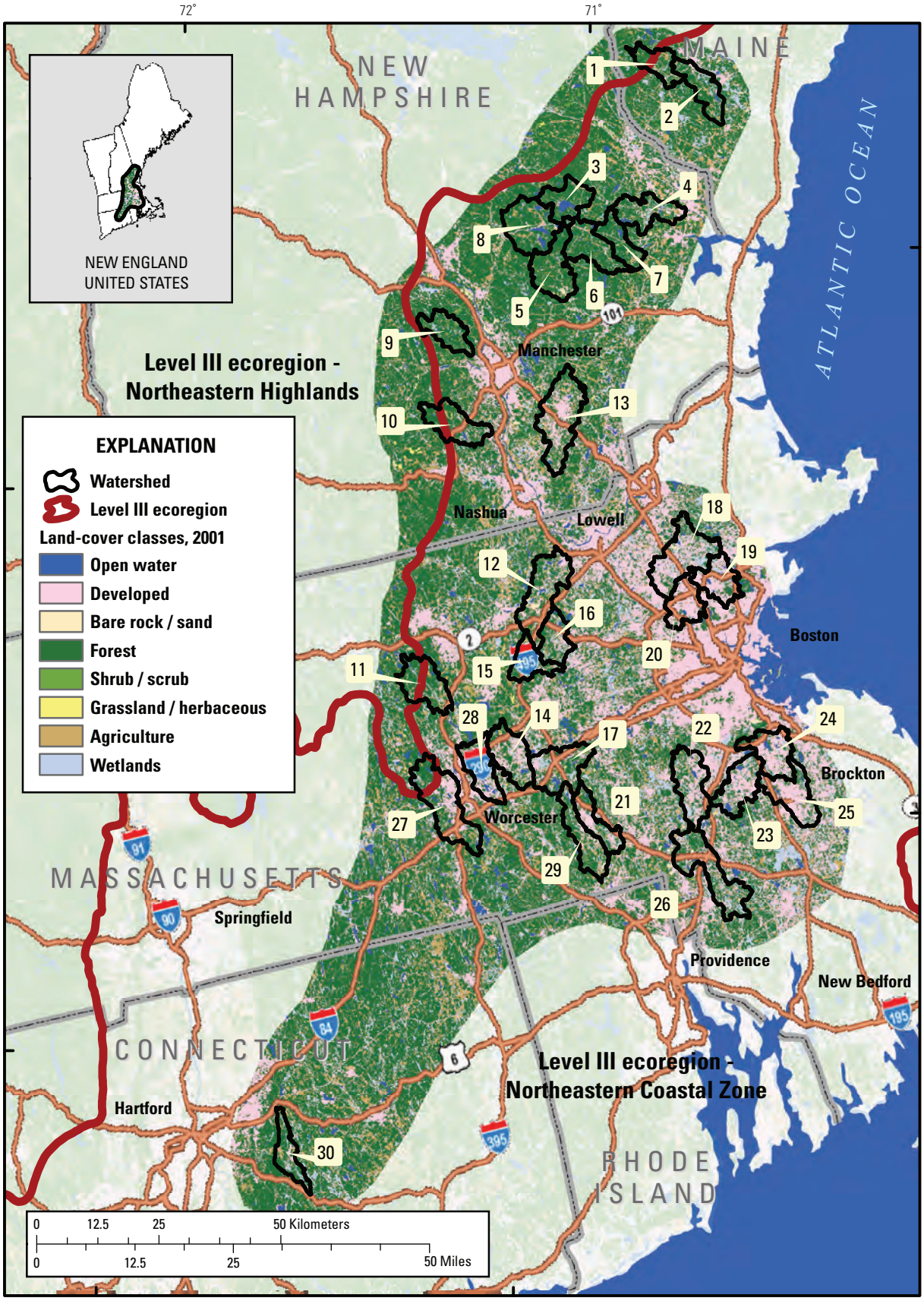

Figure 1A–6. Locations of study watersheds in the Boston, Massachusetts, metropolitan area.

Denver

The major drainage basin in the Denver study area is the South Platte River and includes portions of north-central Colorado and southeastern Wyoming. Elevation in the study area ranges from about 1,500 to 2,500 meters above NAVD 88, although the study area is bordered on the west by the Southern Rockies ecoregion, where elevations are considerably higher. The climate is semiarid, and precipitation in the study area is affected considerably by topography. Most of the precipitation on the plains results from rainfall, primarily between April and September; however, perennial streamflow also is fed by snowmelt from the mountains. Smaller streams are often ephemeral, and a complex network of ditches and pipes moves water between different areas for domestic water supply, agricultural irrigation, and power generation. Land cover in the study area is dominated by grassland and agriculture in the plains and coniferous forest in the western mountains.

The Denver study area includes four main city centers—Denver-Aurora, Boulder, and Fort Collins–Loveland, Colorado, and Cheyenne, Wyoming. The combined 2000 population for these four cities, 2.8 million, was a 30 percent increase from 1990. The economy is diversified and includes telecommunications, software, agriculture, mining, and heavy industry. Denver is a major regional center for U.S. Government offices, a transportation hub, and a tourist gateway to the mountain recreational areas of the southern Rockies.

Table 1A–7. Study watersheds located in the Denver, Colorado, metropolitan area.

Figure number	USGS station identification	USGS station name	Watershed drainage area (square kilometers)
1	06713500	Cherry Creek at Denver, Colo.	80.92
2	393557105033101	Dutch Creek at Weaver Park near Columbine Valley, Colo.	21.28
3	393613104511401	Cottonwood Creek above Newark, Wyo. at Greenwood Village, Colo.	18.05
4	393948105053501	Bear Creek below Estes Road at Lakewood, Colo.	62.95
5	394107105021001	Sanderson Gulch above Lowell Avenue at Denver	14.06
6	394409105020501	Lakewood Gulch above Knox Streetat Denver, Colo.	40.75
7	394553105075101	Lena Gulch at Lewis Meadows Park at Wheat Ridge Colo.	23.07
8	394629105063101	Clear Creek below Kipling at Wheat Ridge Colo.	65.52
9	394919105074601	Ralston Creek above Simms at Arvada Colo.	25.46
10	394921105015701	Little Dry Creek below Lowell Street near Westminster, Colo.	18.30
11	395324105035001	Big Dry Creek below Hyland Creek at Westminster, Colo.	91.65
12	395554105085601	Rock Creek above Rock Creek Parkway, at Superior, Colo.	18.74
13	395707105100401	Coal Creek above Mccaslin Road at Superior, Colo.	23.13
14	395958105113501	Dry Creek above Baseline Road near Boulder, Colo.	10.53
15	400000105125400	S Boulder Creek at Baseline Road near Boulder, Colo.	32.08
16	400023105142301	Bear Creek above Wellman Feeder Canal, at Boulder, Colo.	6.12
17	400217105123701	Boulder Creek below 61st Street, near Boulder, Colo.	87.61
18	400607105094401	Dry Creek below Niwot Road, at Niwot, Colo.	55.95
19	400810105071301	Left Hand Creek above Pike Road at Longmont, Colo.	30.49
20	400855105090501	Dry Creek below Airport Road near Longmont, Colo.	30.73
21	400925105023201	Spring Gulch at Sandstone Ranch Pk near Longmont, Colo.	38.33
22	402549105043101	Dry Creek at US 287, at Loveland, Colo.	17.63
23	403035105035301	Mail Creek near mouth at Fort Collins, Colo.	4.14
24	403048105042701	Fossil Creek at College Ave, at Fort Collins, Colo.	26.68
25	403308105001601	Boxelder Creek at mouth, near Fort Collins, Colo.	558.64
26	403356105024001	Spring Creek at Edora Park, at Fort Collins, Colo.	22.58
27	410714104480101	Crow Creek above Morrie Ave, at Cheyenne, Wyo.	509.02
28	413659104370001	Bear Creek above Little Bear Cr, near Phillips, Wyo.	458.59

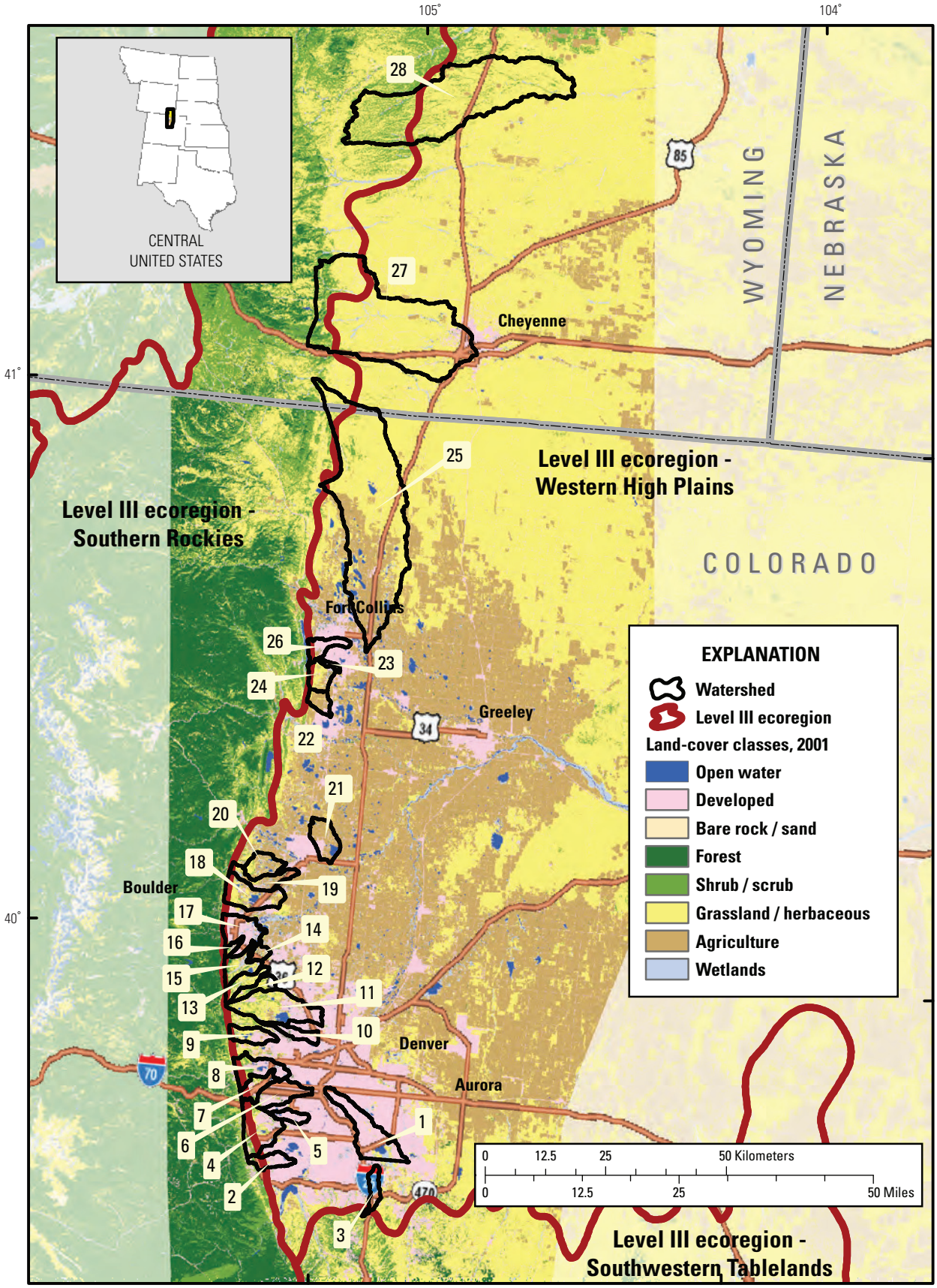

Figure 1A–7. Locations of study watersheds in the Denver, Colorado, metropolitan area.

Dallas

The Dallas study area is located in the upper drainage of the Trinity River watershed in north-central Texas, which is an area of generally rolling to level plains. The soil texture is primary fine to moderately fine. The climate is warm and semi-arid, with precipitation occurring primarily in the spring and late summer. Surface water in the study area consists primarily of reservoirs, intrawatershed transfers, diversions of water to municipalities, and wastewater effluent. Small streams in the area are generally intermittent. Land cover includes grasslands, pastures, row crops, and developed land.

The predominant metropolitan area of the Dallas metropolitan study area is Dallas–Fort Worth–Arlington, with a population in 2000 of 5 million, a 29.4 percent increase since 1990. Dallas is a major regional center, and the economy includes finance, oil, transportation, aerospace, and electronics. Fort Worth, a twin city to Dallas, has an economic focus based on cattle, railways, and agricultural processing.

Table 1A–8. Study watersheds located in the Dallas, Texas, metropolitan area.

Figure number	USGS station identification	USGS station name	Watershed drainage area (square kilometers)
1	08049490	Johnson Creek near Duncan Perry Road, Grand Prairie, Tex.	43.23
2	08049580	Mountain Creek near Venus, Tex.	51.96
3	08049955	Fish Creek at Belt Line Road, Grand Prairie, Tex.	58.27
4	08052740	Doe Branch at Fishtrap Road near Prosper, Tex.	94.53
5	08057200	White Rock Creek at Greenville Ave, Dallas, Tex.	173.01
6	08057431	Fivemile Creek near Simpson Stuart Road, Dallas, Tex.	108.99
7	08057475	Parsons Slough near Davis Road near Crandall, Tex.	115.72
8	08059530	Tickey Creek near CR 400 near Princeton, Tex.	26.81
9	08059571	Wilson Creek near Gray Branch Road near Mckinney, Tex.	80.96
10	08061536	Spring Creek at Naaman School Road near Garland, Tex.	91.09
11	08061740	Duck Creek at Town East Boulevard near Mesquite, Tex.	102.33
12	08061780	Buffalo Creek near Trinity Road at Forney, Tex.	88.16
13	08061952	South Mesquite Creek at Lawson Road near Mesquite, Tex.	64.62
14	08061995	Mustang Creek at FM 2757 near Crandall, Tex.	42.99
15	08062020	Buffalo Creek near FM 148 near Crandall, Tex.	58.95
16	08062090	Red Oak Creek near Hampton Road near Red Oak, Tex.	53.82
17	08062525	Walker Creek near Oil Field Road near Rosser, Tex.	59.26
18	08062550	Bois D'Arc Creek near CR 4072 near Rosser, Tex.	57.89
19	08062600	Grays Creek at CR 1603 near Rice, Tex.	64.83
20	08062805	Williams Creek near FM 1836 near Kemp, Tex.	68.04
21	08063047	Bynum Creek near FM 308 near Malone, Tex.	52.78
22	08063300	Pin Oak Creek near FM 73 near Coolidge, Tex.	101.68
23	08063510	Little Pin Oak Creek near Ih 45 near Richland, Tex.	40.87
24	08063555	S Fk Chambers Creek near CR 102 near Maypearl, Tex.	291.37
25	08063565	Mill Creek at Lowell Road near Milford, Tex.	80.37
26	08063574	Big Onion Creek at Feaster Road near Bardwell, Tex.	52.91
27	08063595	South Prong Creek at FM 876 near Waxahachie, Tex.	53.41
28	08063692	Mustang Creek at Moseley Road near Ennis, Tex.	55.84
29	08064695	Tehuacana Creek at Rural Road 27 near Wortham, Tex.	164.70

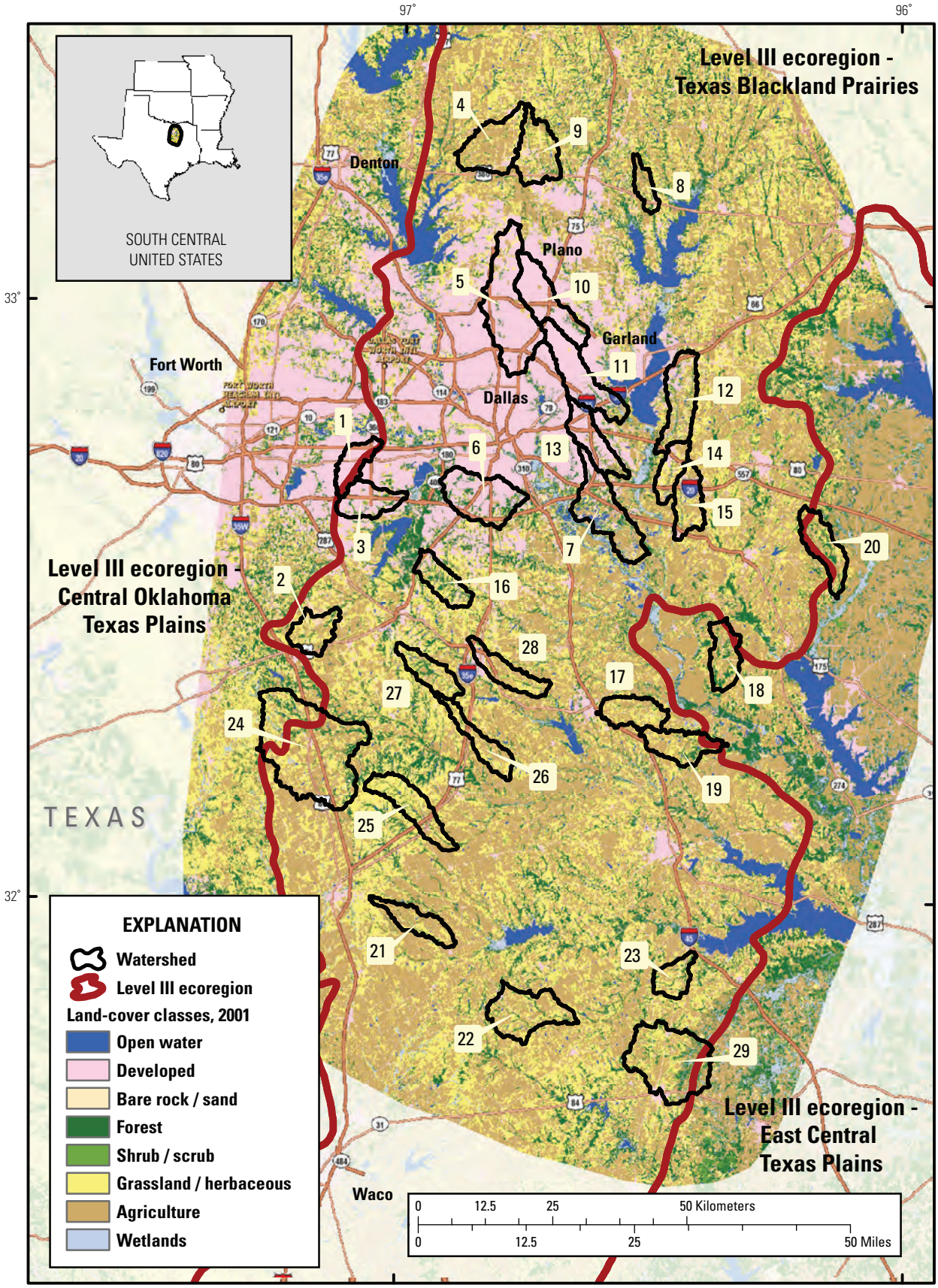

Figure 1A–8. Locations of study watersheds in the Dallas, Texas, metropolitan area.

Milwaukee

The Milwaukee study area is located in the southeastern United States along the Lake Michigan shoreline. Land surface is characterized by glacial outwash plains, lacustrine watersheds, level to rolling till plains, and extensive wetland areas. The climate is characterized by cold winters and moderate, wet summers, with most of the precipitation occurring between May and September. Highest streamflows usually occur in March through May as a result of snowmelt or a combination of rain and snow; however, summer thunderstorms can produce flood peaks that exceed snowmelt peaks. The presettlement land cover was a mixture of hardwood forests (north), oak savannas (west), and tall-grass prairies (south).

The Milwaukee metropolitan study area includes five main population centers—Milwaukee–Waukesha–West Allis, Green Bay, Appleton, Racine, and Oshkosh-Neenah. The combined 2000 population for these five areas, 2.3 million, was an 8 percent increase from 1990. Milwaukee and Green Bay offer the largest industrial, manufacturing, and commercial centers of the study area for their shipping ports. Milwaukee has a reputation in the brewing industry; whereas, Green Bay is known for its meat packing industry. Dairy and livestock farming and associated corn and soybean production represent the dominant land use in the region.

Table 1A–9. Study watersheds in the Milwaukee, Wisconsin, metropolitan area.

Figure number	USGS station identification	USGS station name	Watershed drainage area (square kilometers)
1	04072233	Lancaster Brook at Shawano Avenue at Howard, Wis.	25.54
2	04078085	Black Otter Creek near Hortonville, Wis.	41.04
3	04081897	Sawyer Creek at Westhaven Road at Oshkosh, Wis.	30.60
4	04084429	Mud Creek at Spencer Road at Appleton, Wis.	33.28
5	04084468	Garners Creek at Park Street at Kaukauna, Wis.	20.74
6	04085046	Apple Creek at Sniderville, Wis.	118.81
7	040850683	Ashwaubenon Creek at South Bridge Road near DePere, Wis.	51.82
8	040851235	Bower Creek Tributary at Lime Kiln Road near Bellevue, Wis.	34.39
9	040851325	Baird Creek at Superior Road at Green Bay, Wis.	52.01
10	04085188	Rio Creek at Pheasant Road near Rio Creek, Wis.	55.81
11	040851932	Kewaunee River Tributary at Lowell Road near Luxemburg, Wis.	36.72
12	04085270	Jambo Creek at Jambo Creek Road near Mishicot, Wis.	48.83
13	040853145	Black Creek at Curran Road near Denmark, Wis.	56.13
14	04085322	Devils River at Rosencrans Road near Maribel, Wis.	76.45
15	040854395	Point Creek at Ucker Point Road near Newton, Wis.	45.92
16	04085455	Meeme River at Washington Road near Cleveland, Wis.	50.41
17	04086699	Pigeon Creek at Williamsburg Drive at Theinsville, Wis.	29.86
18	040869415	Lincoln Creek at 47th Street at Milwaukee, Wis.	25.96
19	04087030	Menomonee River at Menomonee Falls, Wis.	87.85
20	0408703164	Lily Creek at Good Hope Road near Menomonee Falls, Wis.	11.22
21	04087070	Little Menomonee River at Milwaukee, Wis.	51.70
22	040870856	Underwood Crk at Watertown Plank Road at Elm Grove, Wis.	24.56
23	04087118	Honey Creek near Portland Avenue at Wauwatosa, Wis.	27.74
24	04087204	Oak Creek at South Milwaukee, Wis.	66.79
25	04087213	Root River at Layton Avenue at Greenfield, Wis.	30.74
26	040872393	Hoods Creek at Brook Road near Franksville, Wis.	38.93
27	04087258	Pike River at Cth A near Kenosha, Wis.	100.29
28	04087270	Pike Creek at 43rd Street at Kenosha, Wis.	16.30
29	05527729	Kilbourn Ditch at 6Oth Street near Kenosha, Wis.	53.71
30	055437901	Fox River at River Road near Sussex, Wis.	60.79

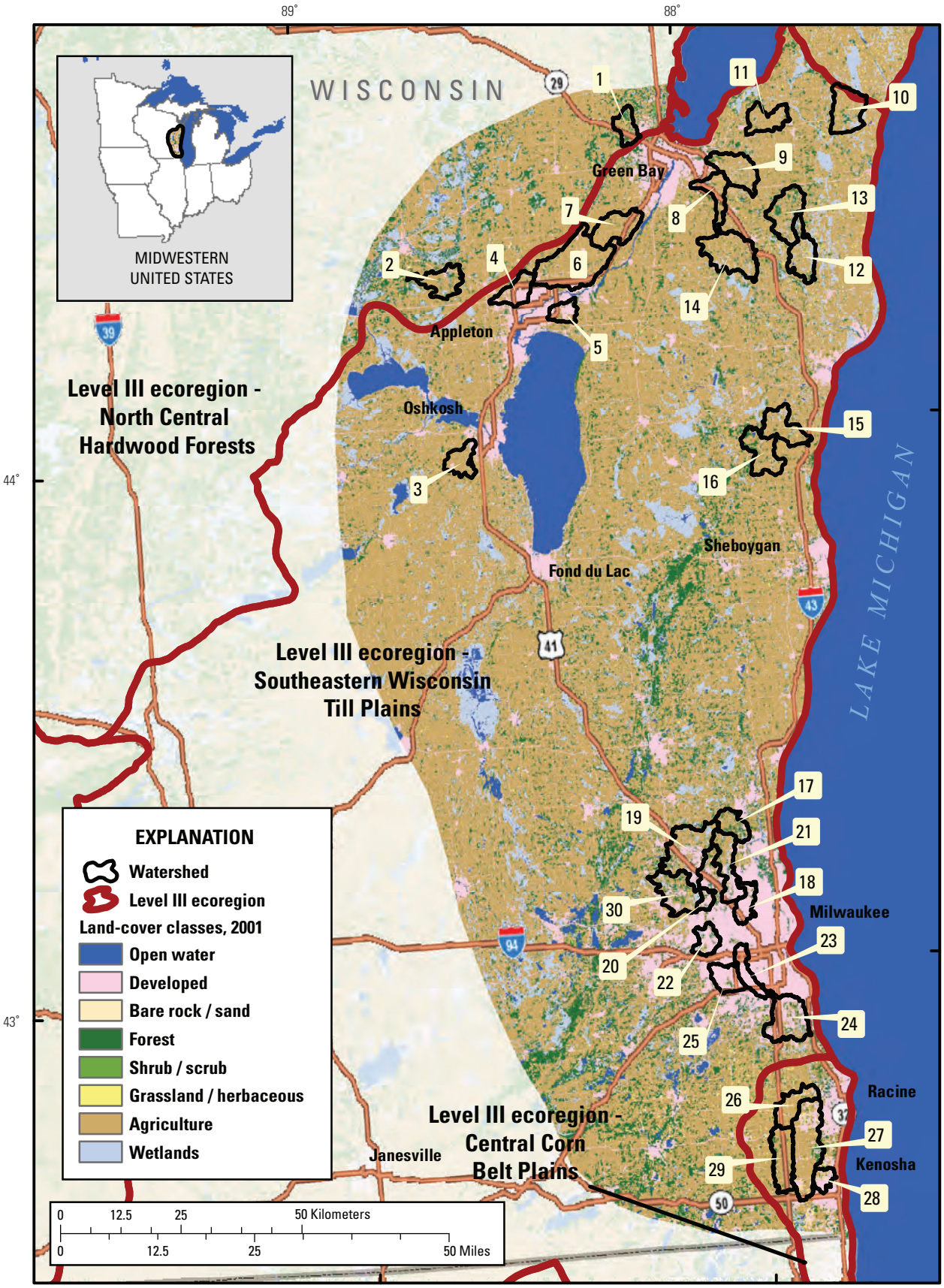

Figure 1A–9. Locations of study watersheds in the Milwaukee, Wisconsin, metropolitan area.

Appendix 1B: Characteristics of Nine Metropolitan Study Areas

Table 1B–1. Geographic and climatic characteristics of the nine metropolitan study areas.

[Median values for study watersheds, range in parentheses]

	Drainage area, in square kilometers	Mean watershed elevation, in meters	Mean watershed slope, in percent	Mean annual temperature, in degrees Celsius	Total annual precipitation, in centimeters
Portland	38.5 (12.6 – 104)	184 (52.7 – 621)	11.8 (1.0 – 32.9)	11.1 (8.9 – 11.8)	149 (116 – 205)
Salt Lake City	4.5 (0.1 – 28.9)	1,467 (1,370 – 2,353)	12.3 (4.2 – 57.8)	10.1 (4.1 – 11.2)	66.0 (51.9 – 115)
Denver	28.6 (4.1 – 559)	1,720 (1,535 – 2,024)	5.8 (1.7 – 12.5)	9.4 (6.5 – 9.9)	43.2 (38.1 – 46.8)
Dallas	64.6 (26.8 – 291)	172 (124 – 220)	2.1 (1.3 – 3.7)	18.4 (17.7 – 18.7)	104 (96.3 – 111)
Milwaukee	43.5 (11.2 – 119)	234 (202 – 273)	2.1 (1.0 – 3.3)	7.4 (6.8 – 8.7)	85.2 (78.6 – 90.6)
Birmingham	33.5 (4.7 – 66.1)	231 (162 – 324)	11.0 (4.6 – 16.2)	16.1 (14.7 – 16.8)	147 (141 – 152)
Atlanta	81.7 (43.2 – 146)	283 (178 – 350)	5.9 (4.2 – 11.0)	16.1 (15.6 – 17.6)	134 (122 – 141)
Raleigh	14.4 (4.9 – 82.5)	176 (89.3 – 284)	5.1 (2.9 – 8.8)	14.9 (14.3 – 15.5)	119 (115 – 125)
Boston	72.9 (45.9 – 125)	105 (30.9 – 236)	5.9 (2.9 – 8.4)	8.8 (7.3 – 9.9)	122 (115 – 136)
Overall	43.0 (0.1 – 559)	234 (30.9 – 2,353)	5.8 (1.0 – 57.8)	11.2 (4.1 – 18.7)	118 (38.1 – 205)

Table 1B–2. Soil characteristics of the nine metropolitan study areas.

[Median values for study watersheds, range in parentheses]

	Coarse soils in watershed, in percent	Moderately coarse soils in watershed, in percent	Medium coarse soils in watershed, in percent	Moderately fine soils in watershed, in percent	Fine soils in watershed, in percent
Portland	0.0 (0 – 0)	0.0 (0 – 40.9)	30.5 (0 – 100)	2.0 (0 – 55.4)	55.1 (0 – 100)
Salt Lake City	0.0 (0 – 13.2)	13.5 (0 – 100)	86.4 (0 – 100)	0.0 (0 – 0.8)	0.0 (0 – 0)
Denver	0.0 (0 – 0)	1.0 (0 – 82.5)	10.7 (0 – 97.1)	63.2 (0 – 100)	0.0 (0 – 35.0)
Dallas	0.0 (0 – 0)	0.0 (0 – 0)	0.0 (0 – 0)	0.0 (0 – 78.5)	100.00 (21.5 – 100)
Milwaukee	0.0 (0 – 0)	0.0 (0 – 15.2)	0.0 (0 – 75.5)	2.2 (0 – 99.6)	71.3 (0 – 100)
Birmingham	0.0 (0 – 0)	0.0 (0 – 0)	8.6 (0 – 99.9)	33.3 (0 – 96.1)	42.0 (0 – 100)
Atlanta	0.0 (0 – 0)	0.0 (0 – 21.5)	0.0 (0 – 0)	0.0 (0 – 8.8)	100.00 (78.6 – 100)
Raleigh	0.0 (0 – 0)	0.0 (0 – 0)	0.0 (0 – 0)	89.8 (0 – 100)	10.3 (0 – 100)
Boston	19.1 (0 – 75.5)	76.8 (24.5 – 100)	0.0 (0 – 16.4)	0.0 (0 – 0)	0.0 (0 – 0)
Overall	0.0 (0 – 75.5)	0.0 (0 – 100)	0.0 (0 – 100)	0.0 (0 – 100)	23.3 (0 – 100)

Table 1B–3. Land-cover characteristics of the nine metropolitan study areas.

[Median values for study watersheds, range in parentheses]

	Developed land in watershed, in percent	Forested and shrub land in watershed, in percent	Agriculture and herbaceous land in watershed, in percent	Impervious land cover in watershed, in percent
Portland	20.5 (0.2 – 97.8)	34.3 (0.1 – 94.6)	16.5 (1.9 – 58.5)	7.4 (0 – 45.6)
Salt Lake City	65.3 (0 – 96.9)	17.0 (0.9 – 99.8)	5.3 (0 – 32.7)	27.1 (0.2 – 53.6)
Denver	35.6 (1.5 – 90.4)	2.5 (0.4 – 15.7)	57.7 (2.4 – 95.0)	15.7 (0 – 48.3)
Dallas	6.9 (1.6 – 88.8)	15.1 (5.7 – 34.4)	70.3 (3.5 – 85.7)	3.2 (0 – 54.4)
Milwaukee	17.0 (3.2 – 99.1)	5.9 (0.8 – 23.0)	66.0 (0 – 88.0)	7.9 (0.0 – 50.6)
Birmingham	36.4 (2.8 – 95.7)	44.8 (3.7 – 76.7)	9.8 (0.6 – 37.7)	12.7 (0 – 51.0)
Atlanta	22.5 (2.3 – 85.4)	45.5 (11.5 – 74.8)	19.3 (2.1 – 39.7)	6.7 (0 – 38.0)
Raleigh	54.5 (3.0 – 98.4)	32.2 (1.1 – 81.2)	12.0 (0.2 – 41.4)	21.5 (0.1 – 55.6)
Boston	19.9 (0.9 – 76.4)	54.9 (16.2 – 85.0)	6.6 (1.9 – 12.8)	9.7 (1.9 – 36.8)
Overall	27.3 (0 – 99.1)	25.3 (0.1 – 99.8)	15.1 (0 – 95.0)	10.3 (0 – 55.6)

Table 1B–4. Demographics and infrastructure characteristics of the nine metropolitan study areas.

[Median values for study watersheds, range in parentheses]

	People per square kilometer	People per square mile of developed land	Houses per square kilometer	Road density, in square kilometers	Canals, ditches, or pipelines in watershed, in percent	Percent watershed area upstream from dams
Portland	162	35.4	65.1	3.0	0.0	0.0
	(1.5 – 1,958)	(0.0 – 1,915)	(0.8 – 731)	(0.9 – 10.0)	(0 – 23.6)	(0 – 9.9)
Salt Lake City	981	590	269	7.4	26.3	0.0
	(0.6 – 2,136)	(0 – 2,070)	(5.6 – 849)	(0 – 13.6)	(0 – 56.4)	(0 – 83.2)
Denver	361	116	143	3.6	45.7	15.2
	(0.2 – 1,860)	(0.0 – 1,674)	(0.5 – 1,033)	(0.9 – 10.9)	(0 – 100)	(0 – 95.3)
Dallas	64.2	4.3	15.5	1.7	0.0	11.3
	(3.3 – 1,591)	(0.1 – 1,413)	(1.5 – 717)	(0.9 – 9.5)	(0 – 28.7)	(0 – 96.8)
Milwaukee	131	21.4	55.5	2.4	0.0	0.0
	(10.3 – 2,175)	(0.3 – 2,124)	(4.5 – 985)	(1.3 – 10.4)	(0 – 49.4)	(0 – 98.5)
Birmingham	281	101	101	3.5	0.0	0.0
	(8.9 – 1,545)	(0.5 – 1,479)	(6.6 – 730)	(1.1 – 11.9)	(0 – 0)	(0 – 41.5)
Atlanta	186	41.1	63.2	2.9	0.0	10.7
	(5.1 – 1,198)	(0.1 – 1,023)	(2.6 – 577)	(0.8 – 7.1)	(0 – 0)	(0 – 78.7)
Raleigh	440	240	168	5.1	0.0	1.4
	(9.4 – 1,294)	(0.3 – 1,193)	(6.7 – 668)	(1.0 – 11.5)	(0 – 0)	(0 – 65.2)
Boston	229	47.9	85.5	3.0	0.0	76.8
	(31.5 – 1,068)	(0.4 – 796)	(11.8 – 459)	(1.2 – 7.8)	(0 – 2.4)	(0.4 – 99.9)
Overall	255	67.5	88.0	3.3	0.0	0.0
	(0.2 – 2,175)	(0 – 2,124)	(0.5 – 1,033)	(0 – 13.6)	(0 – 100)	(0 – 99.9)

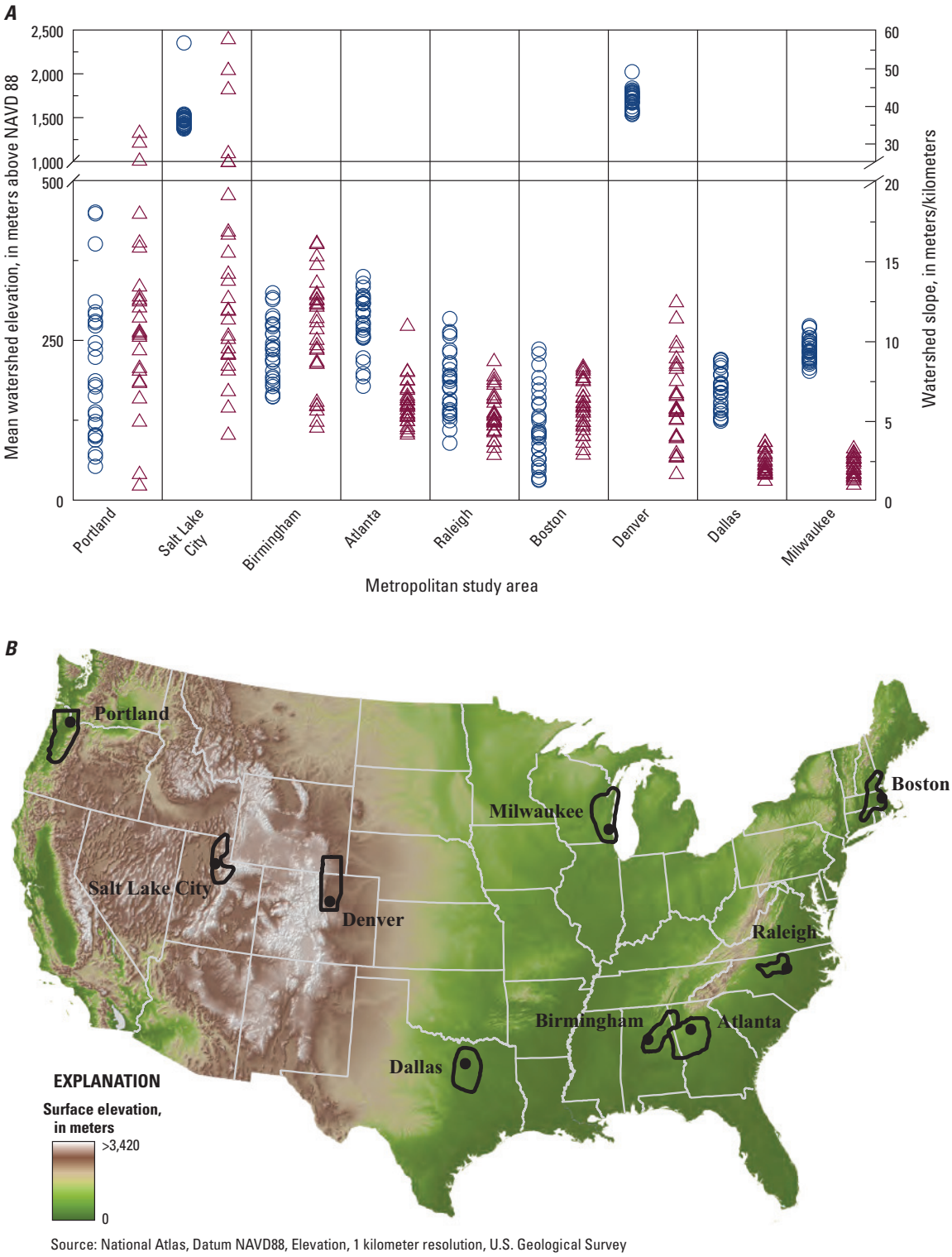

Figure 1B–1. *(A)* Graph of the mean watershed elevation (in meters above sea level) and watershed slope (in meters per kilometer) for the nine metropolitan study areas and *(B)* a national map showing surface elevation (in meters above sea level).

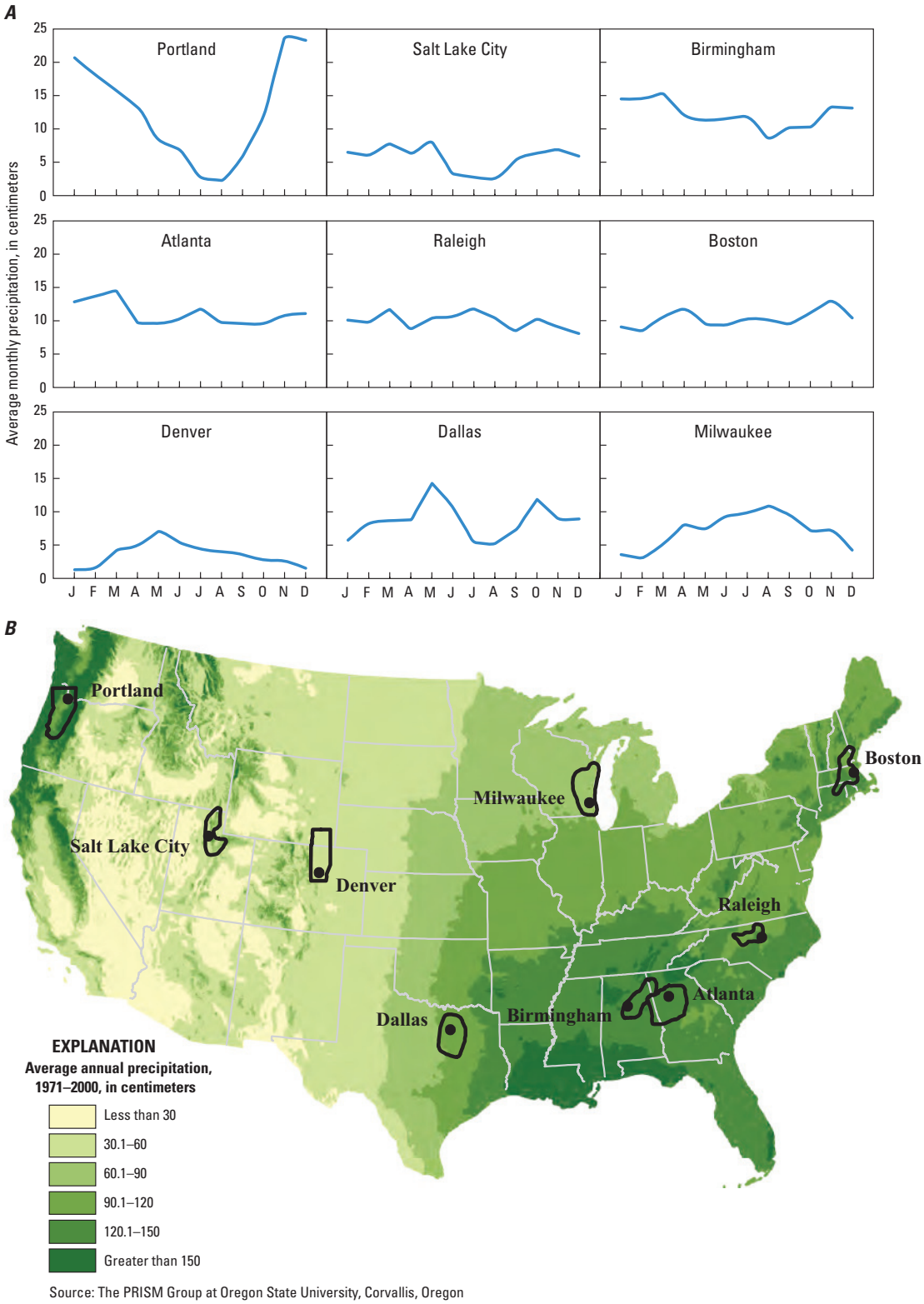

Figure 1B–2. *(A)* Graphs of the average monthly precipitation for the nine metropolitan study areas and *(B)* a national map showing average annual precipitation.

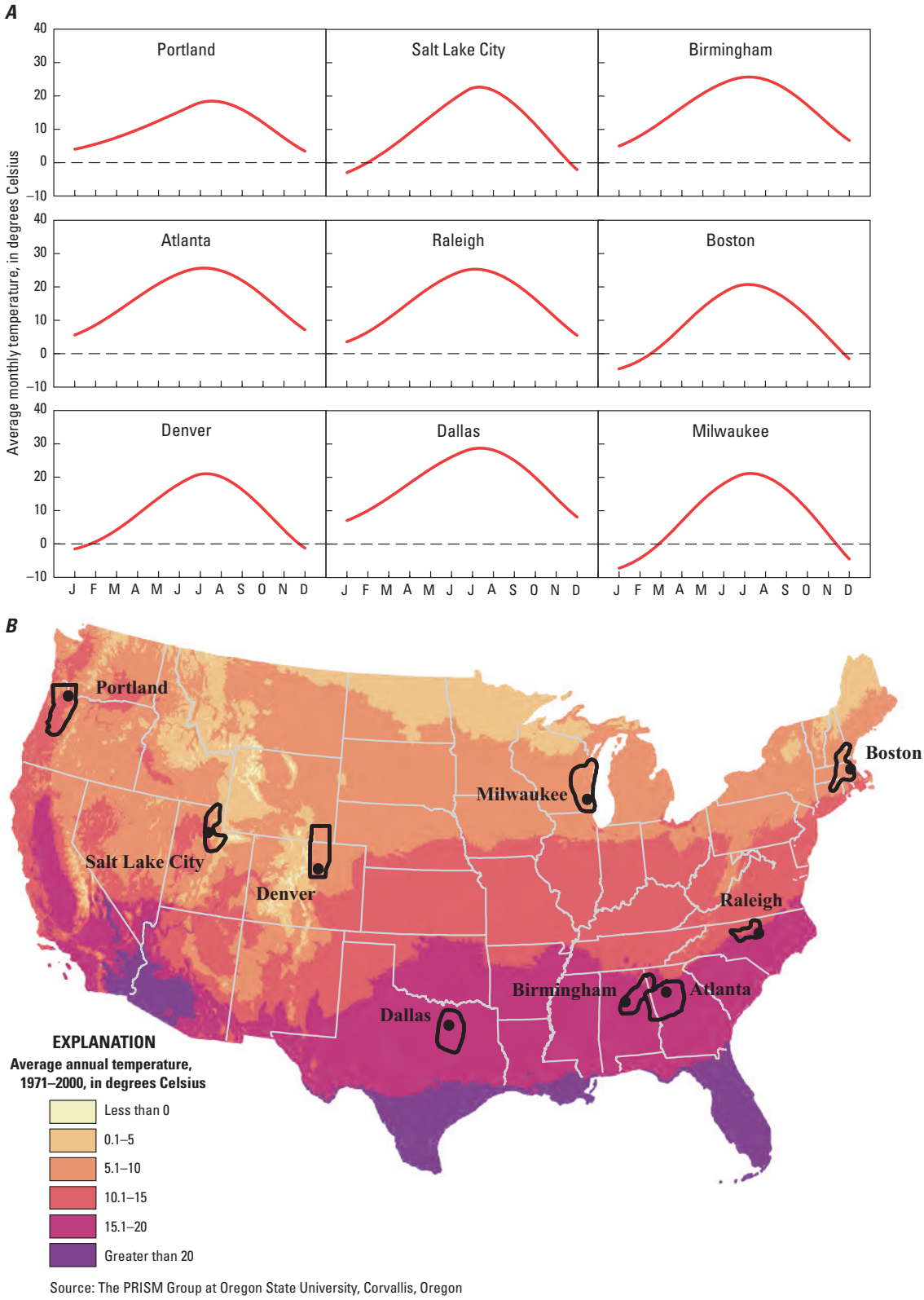

Figure 1B–3. *(A)* Graphs of the average monthly air temperature for the nine metropolitan study areas and *(B)* a national map showing average annual temperature.

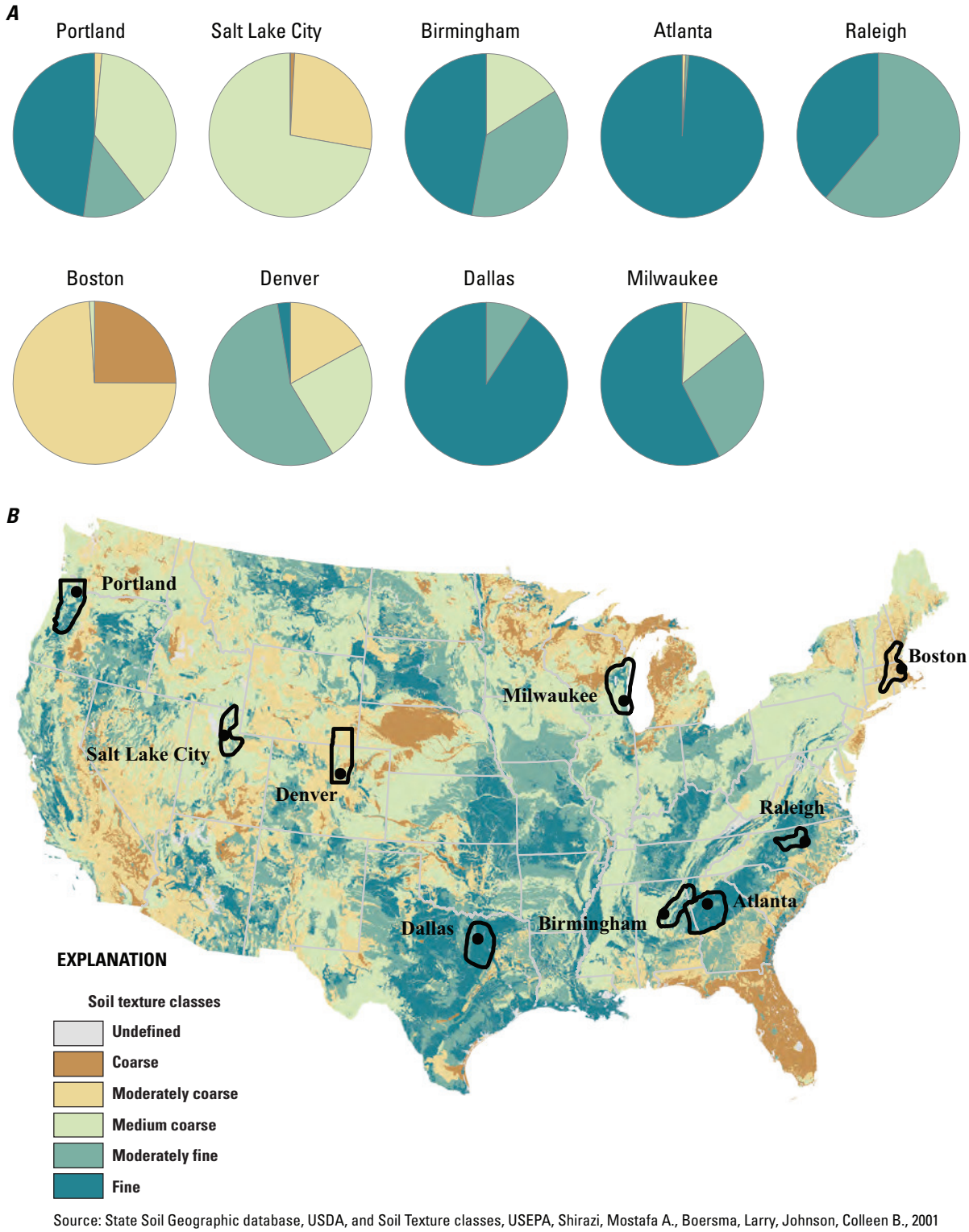

Source: State Soil Geographic database, USDA, and Soil Texture classes, USEPA, Shirazi, Mostafa A., Boersma, Larry, Johnson, Colleen B., 2001

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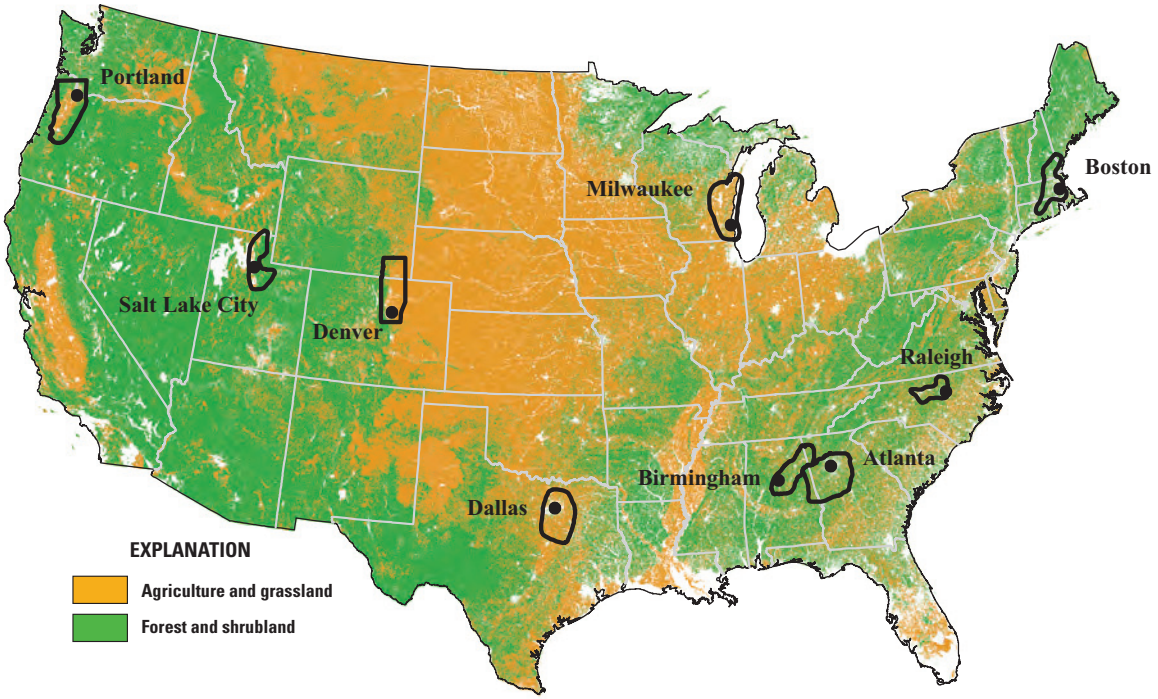

Figure 1B–5. National map showing agriculture/grassland and forest/shrubland land cover.

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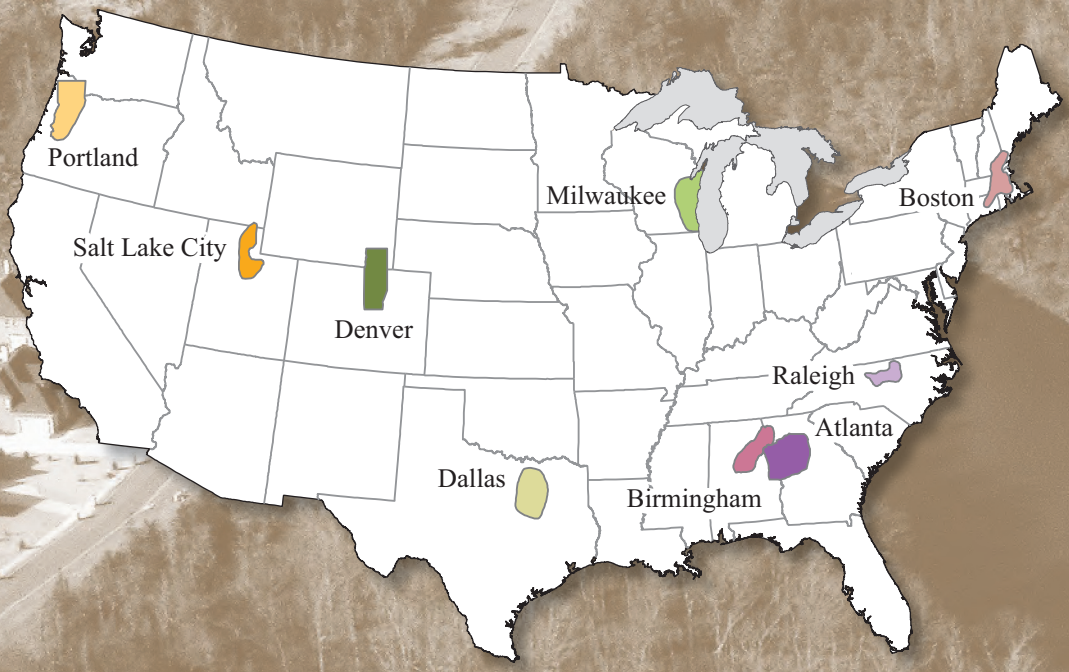

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Southern California Coastal Water Research Project

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Hydromodification Assessment and Management in California

Commissioned and Sponsored by California State Water Resources Control Board Stormwater Program

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EXECUTIVE SUMMARY

Most jurisdictions in California are now required to address the effects of *hydromodification* through either a municipal stormwater permit or the statewide construction general permit. Hydromodification is generally defined as changes in channel form associated with alterations in flow and sediment due to past or proposed future land-use alteration. Hydromodification management has emerged as a prominent issue because degradation of the physical structure of a channel is often indicative of and associated with broader impacts to many beneficial uses, including water supply, water quality, habitat, and public safety. Conversely, reducing hydromodification and its effects has the potential to protect and restore those same beneficial uses. Although hydromodification has the potential to affect all water body types, this document focuses on assessing and managing effects to streams because they are the most prevalent, widely studied, and arguably most responsive type of receiving water.

Hydromodification by definition results from alteration of watershed processes; therefore, correcting the root causes of hydromodification ought to be most effective if based on integrated watershed-scale solutions. To date, such a watershed approach has not been adopted in California; most hydromodification management plans simply consist of site-based runoff control with narrow, local objectives and little coordination between projects within a watershed. Furthermore, each municipality is required to develop its own approach to meeting hydromodification management requirements rather than drawing from standard or recommended approaches that facilitate regional or watershed-scale integration. Long-term reversal of hydromodification effects, however, will require movement away from reliance on such site-based approaches to more integrated watershed-based strategies.

This document has two goals, and hence two audiences. The first goal is to describe the elements of effective hydromodification assessment, management and monitoring. The audience for this goal is primarily the State and Regional Water Boards, since meeting this goal will require integration of watershed and site-scale activities that are likely beyond the responsibility or control of any individual municipality. Success will require fundamental changes in the regulatory and management approach to hydromodification that will likely advance only iteratively and potentially require one or more NPDES permit cycles to fully implement. The second goal of this document is to provide near-term technical assistance for implementing current and pending hydromodification management requirements. This goal can be achieved by municipalities within the construct of existing programs and therefore the primary audience for this aspect of the document is local jurisdictions. Achieving this goal will facilitate greater consistency and effectiveness between hydromodification management strategies, giving them a stronger basis in current scientific understanding.

Watershed analysis should be the foundation of all hydromodification management plans (Figure ES-1). This analysis should begin with a documentation of watershed characteristics and processes, and past, current, and expected future land uses. The analysis should lead to identification of existing opportunities and constraints that can be used to help prioritize areas of greater concern, areas of restoration potential, infrastructure constraints, and pathways for potential cumulative effects. The combination of watershed and site-based analyses should be used to establish clear objectives to guide management actions. These objectives should articulate desired and reasonable physical and biological

conditions for various reaches or portions of the watershed and should prioritize areas for protection, restoration, or management. Strategies to achieve these objectives should be customized based on consideration of current and expected future channel and watershed conditions. A one-size-fits-all approach should be avoided. Even where site-based control measures, such as flow-control basins, are judged appropriate, their location and design standards should be determined in the context of the watershed analysis.

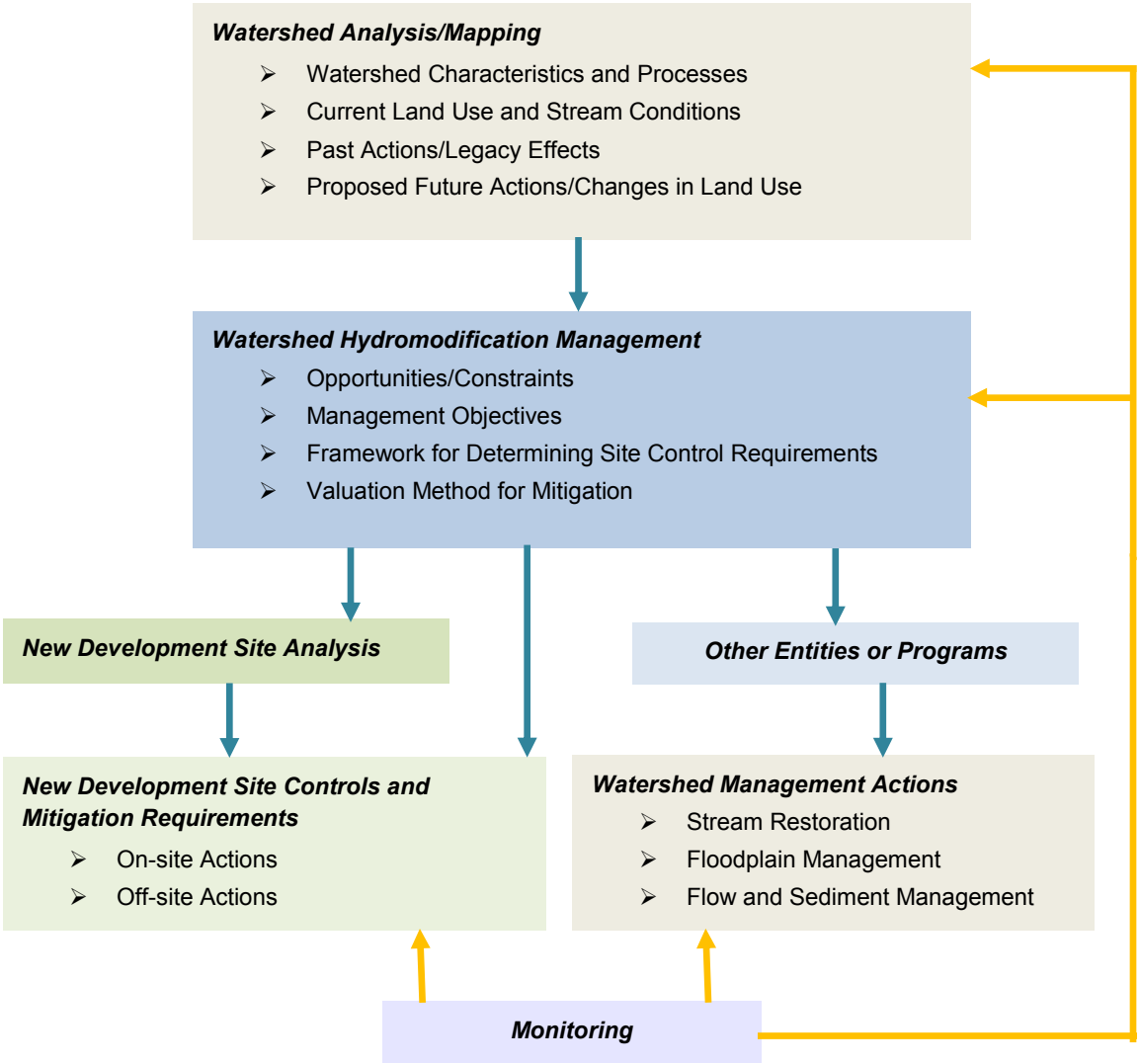

Figure ES-1. Framework for Integrated Hydromodification Management.

An effective management program will likely include combinations of on-site measures (e.g., low-impact development techniques, flow-control basins), in-stream measures (e.g., stream habitat restoration), floodplain and riparian zone actions, and off-site measures. Off-site measures may include compensatory mitigation measures at upstream locations that are designed to help restore and manage flow and sediment yield in the watershed.

Project-specific analysis and design requirements should vary depending on location, discharge point, and size. The range of efforts may include:

- Application of scalable, standardized designs for flow control based on site-specific soil type and drainage design. The assumptions used to develop these scalable designs should be conservative, to account for loss of sediment and uncertainties in the analysis and our understanding of stream impacts.
- Use of an erosion potential metric, based on long-term flow duration analysis and in-stream hydraulic calculations. Guidelines should specify stream reaches where in-stream controls would and would not be allowed to augment on-site flow control.
- Implementation of more detailed hydraulic modeling for projects of significant size or that discharge to reaches of special concern to understand the interaction of sediment supply and flow changes.
- Analysis of the water-balance for projects discharging into streams with sensitive habitat. This may include establishment of requirements for matching metrics such as number of days with flow based on the needs of species present.

Achieving these goals will require that hydromodification management strategies operate across programs beyond those typically regulated by NPDES/MS4 requirements. Successful strategies will need to be developed, coordinated, and implemented through land-use planning, habitat management and restoration, and regulatory programs. Regulatory coordination should include programs administered by the Water Boards, such as non-point source runoff control, Section 401 Water Quality Certifications and Waste Discharge Requirement programs, and traditional stormwater management programs. It should also include other agency programs, such as the Department of Fish and Game Streambed Alteration Program and the Corps of Engineers Section 404 Wetland Regulatory Program. Thus, all levels of the regulatory framework—federal, state, and local—will need to participate in developing and implementing such a program. The integrated watershed-based approach will likely take one or more permit cycles (i.e., at least ten years) to fully implement.

Short- and long-term recommendations for management are summarized in Table ES-1 below.

Table ES-1. Recommendations for implementing watershed-based hydromodification management.

Time Frame	Programmatic: State and Regional Water Boards	Local: City and County Jurisdictions
Short-term (<10 years)	• Establish consistent standards for HMPs • Promote use of watershed approaches in HMPs to move away from reliance on project-based management actions • Develop a valuation method to determine appropriate off-site mitigation • Transition to a broader set of monitoring endpoints including flow, geomorphology, and biology	• Implement watershed analysis of opportunities and constraints related to hydromodification • Implement a broader set of tools to improve on-site management actions • Develop institutional capacity to oversee and review modeling and assessment tools • Develop capacity for information/data management and dissemination
Long-term (1+ decades)	• Develop watershed-based regulatory programs and policies for hydromodification management • Integrate hydromodification management needs into other regulatory programs (e.g. TMDL, 401/WDR)	• Develop institution capacity to implement watershed-based hydromodification programs • Incorporate hydromodification and other water quality management into the land use planning process

To successfully accomplish these various recommendations for implementation, both agencies and private-sector practitioners will need to make use of a range of analytical tools. Such tools generally fall into three categories: descriptive tools, mechanistic models, and empirical/statistical models. Models may be used deterministically and/or in a probabilistic manner. These different types of tools can be selected or combined, depending on the specific objective, such as characterizing stream condition, predicting response, establishing criteria / requirements, or evaluating the effectiveness of management actions. Selection of tools should also consider the type of output, intensity of resource requirements (i.e., data, time, cost), and the extent to which uncertainty is explicitly addressed. It is important to note that deterministic modeling without accompanying probabilistic analysis may mask the uncertainties inherent in predicting hydromodification effects. Short-term and long-term recommendations for the application and improvement of tools to support the management framework are shown in Table ES-2.

Although there is sufficient scientific and engineering understanding of hydromodification causes and effects to begin implementing more effective management approaches now, improvements should be informed and adapted based on subsequent monitoring data. To be useful, monitoring programs should be designed to answer questions and test hypotheses that are implicit in the choice of management actions, such that practices that prove effective can be emphasized in the future (and those that prove ineffective can be abandoned). The focus of monitoring efforts, however, needs to be tailored to the time frame of the questions being addressed and the implementing agency (Table ES-3), reflecting the dual goals and audiences of this document.

Table ES-2. Recommendations for the application and improvement of tools in support of the proposed management framework.

Time Frame	Programmatic: State and Regional Water Boards	Local: City and County Jurisdictions
Short-term (<10 years)	• Develop quality control and standardization for continuous simulation modeling • Perform additional testing and demonstration of probabilistic modeling for geomorphic response • Pursue development of biologically- and physically-based compliance endpoints	• Work cooperatively with adjacent jurisdictions to implement hydromodification risk mapping at the watershed scale • Implement continuous simulation modeling for project impact analysis
Long-term (1+ decades)	• Improve tools for sediment analysis and develop tools for sediment mitigation design • Develop tools for biological response prediction • Improve tools for geomorphic response prediction	• Expand use of probabilistic and statistical modeling for geomorphic response • Apply biological tools for predicting and evaluating waterbody condition

Table ES–3. Recommendations for hydromodification monitoring.

Time Frame	Programmatic: State and Regional Water Boards	Local: City and County Jurisdictions
Short-term (<10 years)	• Define the watershed context for local monitoring (at coarse scale) • Evaluate whether permit requirements are making positive improvements	• Evaluate whether specific projects/ regulations are meeting objectives • Identify the highest priority action(s) to take
Long-term (1+ decades)	• Define watershed context and setting benchmarks for local-scale monitoring (i.e., greater precision, if/as needed) • Demonstrate how permit requirements can improve receiving-water "health," state-wide (and change those requirements, as needed)	• Evaluate and demonstrate whether actions (on-site, instream, and watershed scale) are improving receiving-water conditions • Assess program cost-effectiveness • Identify any critical areas for resource protection

Identifying and, ultimately, achieving the desired conditions in receiving waters requires multiple lines of evidence to characterize condition in an integrative fashion. At their most comprehensive, the chosen metrics should include measures of flow, geomorphic condition, chemistry, and biotic integrity. Biological criteria are key to integrative assessment: in general, biological criteria are more closely related to the designated uses of waterbodies than are physical or chemical measurements. This understanding is reflected in the State's proposed bio-objectives policy, which includes explicit links to hydromodification management.

In summary, transitioning from the current site-based to a more effective watershed-based approach to hydromodification management that addresses both legacy and future impacts will require cooperation between the State and Regional Water Boards and local jurisdictions. Both technical and regulatory/program approaches will need to be updated or revised altogether over the next several permit cycles to realize this long-term goal. Substantial resources will be necessary to realize these goals; therefore, opportunities for joint funding and leveraging of resource should be vigorously pursued from the onset. This cooperative approach should replace the current fragmented efforts among regions and jurisdictions.

1. Overview and Intended Uses of the Document

1.1 Overall Objectives and Intended Audience

Regulation and management of hydromodification is in its infancy in California. As with any new endeavor, initial attempts to meet this need is unproven, inconsistent, and relatively narrow in focus. To improve on existing efforts, the State Water Resources Control Board (SWRCB) has engaged a team of experts to provide technical support to both regulators and permittees for development of Hydromodification Management Plans (HMPs) and their associated permit requirements. This resulting document has two goals and hence two audiences.

The first goal of this document is to provide broad perspectives on what would constitute effective hydromodification assessment, management and monitoring, based on our current best scientific understanding of the topic. The audience for this goal is primarily the State and Regional Water Boards, since meeting this goal will require integration of watershed and site-scale activities that are likely beyond the control or responsibility of any individual municipality. Success will require fundamental changes in the regulatory and management approach to hydromodification that will likely be possible only iteratively and potentially requiring one or more NPDES permit cycles to fully implement. The State and Regional Water Boards will need to provide leadership in implementing these changes, but they will also need to work cooperatively with permittees so that planning, management and monitoring programs can be adapted to operate in a more integrated manner over the broader spatial scales and longer time frames that are necessary to achieve genuine success. Furthermore, hydromodification management plans will need to address preexisting conditions from previous (i.e., legacy) land uses. Clearly, addressing such past effects will require approaches beyond regulation of new development.

This document provides broad perspectives on what would constitute effective hydromodification assessment, management and monitoring, based on our current best scientific understanding of the topic. The document also provides near-term technical assistance for implementing current and pending hydromodification management requirements.

The second goal of this document is to provide near-term technical assistance for implementing current and pending hydromodification management requirements. This goal can be achieved by municipalities within the construct of existing programs, and therefore the primary audience for this aspect of the document is MS4 permittees. Achieving this goal will facilitate greater consistency and effectiveness between HMPs, giving them a stronger basis in current scientific understanding, and will also serve as initial steps toward realizing the broader goal stated above.

1.2 Rationale and Justification

The process of urbanization has the potential to affect stream courses by altering watershed hydrology and geomorphic processes. Development and redevelopment can increase impervious surfaces on formerly undeveloped landscapes and reduce the capacity of remaining pervious surfaces to capture and infiltrate rainfall. The most immediate result is that as a watershed develops, a larger percentage of

rainfall becomes surface runoff during any given storm. In addition, runoff reaches the stream channel much more efficiently, so that the peak discharge rates for floods are higher for an equivalent rainfall than they were prior to development. This process has been termed hydromodification. In some instances, direct channel alteration such as construction of dams and channel armoring has also been termed "hydromodification." Such direct alterations are not the focus of this document. Rather, this document focuses on the geomorphic and biological changes associated with changes in land use in the contributing watershed, which in turn alter patterns and rates of runoff and sediment yield. These changes can result in adverse impacts to channel form, stream habitat, surface water quality, and water supply that can alter habitat and threaten infrastructure, homes, and businesses.

The State and Regional Water Boards have recognized the need to manage and control the effects of hydromodification in order to protect beneficial uses in streams and other receiving water bodies. This recognition has led to the inclusion of requirements for development of "hydromodification management plans" (HMPs) in many Phase 1 and some Phase 2 Municipal Stormwater (MS4) permits. Most HMPs require the permitted municipalities to develop programs and policies to assess the potential effects of hydromodification associated with new development and redevelopment, to require the inclusion of management measures to control the impacts of hydromodification, and to develop monitoring programs to assess the effectiveness of HMP implementation at controlling and/or mitigating the impacts of hydromodification.

Development of HMPs is challenging for several reasons. First, there are few accepted approaches for assessing the impacts of hydromodification. Traditional modeling tools are generally untested and may be difficult to apply or inappropriate for use in some California watersheds and streams. Responses of streams to hydromodification are difficult to assess, given inherent climatic variability and the highly stochastic nature of rainfall and the resulting response of streams to runoff events. There are few local examples or case studies from which to draw experiences or conclusions.

As a result of these challenges, individual HMPs to date have utilized a variety of approaches with little coordination or consistency between them. Little information is available on the relative efficacy of any of these approaches. Furthermore, where approaches and tools developed for HMPs in one region of the State (or even from a different region of the country altogether) have been used in subsequent HMPs elsewhere, there has been little or no consideration of the effect of regional climatological or physiographical differences on the transferability of analytical techniques and tools.

1.3 Need for an Expanded Approach

Current site-based hydromodification management approaches are limited in their ability to address the underlying processes that are responsible for most deleterious impacts of hydromodification. Hydromodification effects, by definition, are watershed-dependent processes that are influenced by water and sediment discharge, movement, and storage patterns that may be occurring up- or downstream of a specific project site. Ideally, then, the first step of any hydromodification management plan (HMP) should be a watershed analysis; management of processes at the site or project scale should be done only in the context of such a watershed analysis. Understanding larger-scale processes

facilitates prioritization of activities in areas of greatest need and allows for management measures to be located where they have the largest potential benefit, even if that is not on or adjacent to the project site where the current impact is occurring. It also allows for expansion of site based management beyond simple flow control and/or channel stabilization toward strategies that consider flow, sediment, and biological conditions as an integrated set of desired endpoints.

Because watershed boundaries are often not the same as geopolitical boundaries of cities or counties, incorporation of watershed analysis will require leadership from the State and Regional Water Boards. Changes to the current regulatory structure may be necessary to accommodate inter-jurisdictional cooperation and regional information sharing. Similarly, program implementation by both large and small municipalities must include mechanisms that allow site-specific decisions to be informed by watershed-scale analysis.

This document is intended to help address some of these challenges and needs by providing technical recommendations, both to state and regional program developers and to local implementing agencies, for assessment, modeling, development of management strategies, and monitoring. This document can support current HMP development and, at the same time, serve as a first step toward achieving the longer term goals of more integrated, watershed-based hydromodification management.

Current site-based approaches are limited in their ability to address the underlying processes that are responsible for hydromodification impacts.

Effective management of hydromodification will require coordinated approaches across programs at the watershed scale that address all aspects of runoff, sediment generation and storage, instream habitat, and floodplain management.

Adopting this broader approach means that managing the effects of hydromodification cannot be the purview of the stormwater (MS4) program alone. Effective management of hydromodification will require coordinated approaches across programs at the watershed scale that address all aspects of runoff, sediment generation and storage, instream habitat, and floodplain management. Various SWRCB programs have the opportunity and ability to contribute to the goals of comprehensive hydromodification management, including the non-point source control program, water quality certifications, waste discharge requirements, basin planning, SWAMP, and the emerging State Wetland Policy and Freshwater Bio-objectives program. Each of these programs can take advantage of the tools and approaches outlined in this paper to contribute to coordinated management of hydromodification in order to protect beneficial uses and meet basin plan objectives. Furthermore, successful control and mitigation of hydromodification effects will support other programs by improving water quality, enhancing groundwater recharge, and protecting habitat. Therefore, hydromodification management can be a unifying element of many programs and support integrated regional watershed planning.

It is important to note that hydromodification has the potential to affect all water body types; therefore, HMPs should address potential effects to all streams and receiving waters. Because streams are most directly affected by hydromodification, they have been the focus of current regulatory requirements and, therefore, most HMPs. Consequently, this document emphasizes tools and approaches applicable

to fluvial systems, which are broadly defined to include wadeable streams, large rivers, headwater streams, intermittent and ephemeral drainages, and alluvial fans (although new specific tools may be necessary for assessment and management of alluvial fans). We recognize, however, that hydromodification can also affect nearshore and coastal environments, including bays, harbors, and estuaries, by altering estuary channel structure, water quality, sand delivery, siltation, and salinity. These effects have been less extensively studied or documented and have received substantially less attention in current hydromodification requirements. Future efforts should more directly address hydromodification effects to all receiving waters, but the information is not presently available to provide equally comprehensive guidance here.

1.4 Scope and Organization

This document is not intended to be prescriptive or to serve as a "cookbook" for development of hydromodification management strategies. Rather, it is a resource to evaluate the utility of existing tools and approaches, and it proposes a framework for integrating multiple approaches for more comprehensive assessment and management. This framework should be used to aid in the development of HMPs that are appropriate for specific regions and settings and take advantage of the best available science. It can also be used to improve consistency in assessment and monitoring approaches so that information collected across regions and programs can be compiled and leveraged to provide more comprehensive assessments of the effectiveness of management actions. Ultimately, such consistency should improve the effectiveness of all programs.

The authors, a team of technical experts, developed the content for this document in consultation with agency staff and regulated entities. The document begins with a brief general discussion of the effects of hydromodification and stream response mechanisms, providing the best available science to support subsequent recommendations. The main body of the document focuses on presenting a proposed new management paradigm where site-based management is nested within an overall watershed assessment that accounts for past, current, and proposed future land use. The body of the document also includes a discussion of existing tools and how they can be used more effectively and appropriately to evaluate potential impacts and guide decisions on selection and design of management practices. The third major section of the document focuses on monitoring that includes evaluation of hydrologic, geomorphic, and biologic conditions with an overriding goal of adaptive management. The document concludes with several technical appendices that offer specific guidance on the appropriate application of tools and models within the existing HMP approaches, and a bibliography of resources.

2. HYDROMODIFICATION SCIENCE

2.1 Introduction

Land-use changes can alter a wide variety of watershed processes, including site water balance, surface and near-surface runoff, groundwater recharge, and sediment delivery and transport. Although alteration to these watershed processes (referred to collectively as hydromodification) can affect many elements of a landscape, the focus of this document is on impacts to stream systems. Furthermore, while this paper will often refer to urbanization, it is recognized that other types of land-use changes (grazing, agricultural, forestry, etc.) can have similar impacts. This section reviews relevant hydrologic processes and summarizes the impact of urbanization on hydrologic, biologic, and geomorphic systems, and it describes our current understanding of the physical mechanisms underlying these impacts. This provides a foundation for establishing assessment tools and predictive models, as well as for developing management and monitoring programs.

Although not addressed by this report, urbanization also has a range of effects on water quality (*Heaney and Huber* 1984, *Brabec et al.* 2002) by increasing pollutant loads (*Owe et al.* 1982), increasing nutrient loads (*Wanielista and Yousef* 1993, *Hubertz and Cahoon* 1999), and diluting dissolved minerals through increased runoff and decreased infiltration and soil contact (*Loucaides et al.* 2007). As a result of both its physical and chemical effects, urbanization also affects the integrity of biota (*Heaney and Huber* 1984) including fishes (*Klein* 1979, *Weaver and Garman* 1994, *Wang et al.* 2000) and invertebrates (*Sonneman et al.* 2001, *Wang and Kanehl* 2003). These impacts are acknowledged and evaluated in the discussion of monitoring Section 4, but the details of their interactions and effects are not otherwise addressed here.

Land-use changes can alter a wide variety of watershed processes, including site water balance, surface and near-surface runoff, groundwater recharge, and sediment delivery and transport. Alteration to these watershed processes are referred to collectively as hydromodification.

2.2 Hydrology Overview

To understand the effects of urbanization, the basic processes of the hydrologic system must be highlighted. A watershed's drainage system consists of all the features of the landscape that water flows over or through (*Booth* 1991). These features include vegetation, soil, underlying bedrock, and stream channels. Urban elements such as roofs, gutters, storm sewers, culverts, pipes, impervious surfaces such as parking lots and roads, and cleared and compacted surfaces fundamentally change the rate and character of hydrologic processes. Generally, the hydrologic changes associated with development and urbanization increases the speed and efficiency with which water enters and moves through the drainage system. In undeveloped watersheds, only a portion of the precipitation that falls ever enters the stream channel. Instead, precipitation may be: 1) evaporated off the ground surface or intercepted by vegetation and evaporated; 2) transpired from the soil; or 3) infiltrated deeply into regional aquifers. For the portion of precipitation that ultimately enters the stream, the rate and processes of delivery vary between watersheds, with important implications for how urbanization will affect runoff.

Flow can be classified as stormflow (or "quickflow") if it enters the stream channel within a day or two of rainfall (*Dunne and Leopold* 1978). Quickflow occurs through 1) infiltration excess (also called "Horton") overland flow, wherever rainfall intensity exceeds the infiltration capacity of the soil and water flows over the ground surface; 2) saturation excess overland flow, where overland flow occurs following filling of all pore space in surface soils; 3) shallow subsurface flow, where water flows relatively quickly through permeable shallow soils (but still more slowly than either Horton or saturation overland flow); and 4) precipitation directly into stream channels. Conversely, water that infiltrates more deeply is classified as delayed flow, because it travels slowly as deep groundwater and emerges into a stream slowly over time.

As a storm progresses, runoff patterns and rates can change, even within the same catchment. For example, surficial soils may become saturated during the course of a storm (or a storm season) as the water table rises, and this can induce a shift in runoff from shallow (or even deep) subsurface flow to the quickflow process of saturation excess overland flow (*Booth* 1991). Even under scenarios in which rainfall intensity exceeds infiltration capacity, Horton overland flow will not be connected to stream channels until surface depressions are filled.

2.3 Impacts of Urbanization

The archetypal model of development involves clearing vegetation; grading, removing, and compacting soils; building roads and stormwater sewers; constructing buildings; and re-landscaping. The specific ways in which these activities alter runoff processes are discussed below. Development may also directly alter stream, such as through channel straightening, levee construction, and flood control reservoirs; however, discussion of the impacts of these alterations is beyond the scope of this document.

2.3.1 Decreased Interception

When rainfall occurs in a watershed, some of the precipitation will be intercepted by vegetation and leaf litter and prevented from entering the stream channel network (Figure 2-1). The percentage of precipitation that can be intercepted varies according to cover type and the character of rainfall (rainfall intensity, storm duration, storm frequency, evaporation conditions) (*Dunne and Leopold* 1978). The effectiveness of interception decreases as a storm progresses because once the surface area of a tree is completely wetted, water will drip off leaves and run down the vegetation as stem flow. Typically, 10-35% of precipitation is intercepted by trees and 5-20% by crops, though these amounts vary widely (*Dunne and Leopold* 1978, *Xiao and McPherson* 2002, *Reid and Lewis* 2009, *Miralles et al.* 2010). In urban environments where vegetative cover is greatly reduced, landscape-scale interception may be lower by an order of magnitude (*Xiao and McPherson* 2002). Precipitation that is not intercepted enters the drainage system. Thus, the mere reduction in interception in urban areas may produce the hydrologic equivalent of a storm that is 10-30% larger.

Figure 2-1. Vegetation reduces runoff by intercepting a portion of the total rainfall and preventing water from entering the drainage system. (Illustration by Jennifer Natali).

The influence of urbanization on climate is complex and varied. For example, urbanization has been shown to increase temperature (*Kalnay and Cai* 2003), increase or decrease wind speeds (*Oke* 1978, *Balling and Brazel* 1987, *Grimmond* 2007), increase pan-evaporation rates (*Balling and Brazel* 1987), and increase shading of the ground surface (*Kalnay and Cai* 2003). In most studies of urban hydrology, the dynamics of evapotranspiration (ET) are typically, explicitly or implicitly, ignored (*Grimmond and Oke* 1999). This exclusion exists because of the widespread assumption that urban ET is negligible compared to rural areas with higher proportions of vegetation-covered soils (*Chandler* 1976, *Oke* 1979). In cases such as urban deforestation in the temperate Eastern United States, it is appropriate to assume a net loss of ET due to urbanization (*Bosch and Hewlett* 1982, *Sun et al.* 2005, *Roy et al.* 2009). However, spatial variability and the site-specific dynamics of climate, vegetation, and land-use should be considered carefully in arid and semi-arid regions where vegetation is limited prior to development. In drier climates (including much of southern California), primary productivity (and ET) may be substantially increased through the irrigation of urban landscaping (*Buyantuyev and Wu* 2008).

2.3.2 Decreased Infiltration

Infiltration in urban areas is decreased due to several factors: impermeable surfaces such as roads, parking lots, and roofs prevent infiltration by blocking water from reaching soils; heavy-equipment construction operations cause soil compaction and degrade soil structures; construction projects may remove surface soils and expose subsurface soils with poorer infiltration capacity; vegetation-clearing and bare-earth construction increase erosion and loss of topsoil (*Pitt et al.* 2008). The effect of impervious surfaces is intuitive, visible, and dramatic (*Booth and Jackson* 1997), but not all impervious areas affect runoff processes equally. For example, if an impervious surface is built over clayey soils with poor infiltration, the overall runoff rates will be less affected than if built over sandy soils with high natural infiltration rates. While the loss of pervious area has received substantial attention within scientific and policy communities, until recent years considerably less attention has been paid to the effects of compaction and the reductions in infiltration capacity of soils (*Pitt et al.* 2008). Commonly, an area of green is assumed to be permeable, but playing fields and even ornamental lawns may have very

low infiltration capacities (*Pitt et al.* 2008). A study of urban runoff in Washington found that impervious areas generated only 20% more runoff than what appeared to be green, pervious areas of lawns (*Wigmosta et al.* 1994). Factors such as excavation and lawn-establishment methods appear to be more significant for infiltration than any other factor including grain size of the original sediments (*Hamilton and Waddington* 1999). Tillage may increase infiltration slightly, while compost or peat soil amendments can increase infiltration by 29 to 50 percent (*Kolsti et al.* 1995).

2.3.3 Increased Connectivity and Efficiency of the Drainage System

Rainfall in urban areas moves quickly as overland flow into storm sewers and the stream channel network (Figure 2-2). The delivery of precipitation into urban stream channels is extremely efficient, transforming essentially all precipitation into stormflow and creating nearly instantaneous runoff. Under natural conditions, in contrast, most runoff to streams is via groundwater paths that typically flow at least one or two orders of magnitude slower than surface water. Thus converting subsurface flow into surface stormflow has dramatic consequences. Furthermore, artificial surfaces such as roofs, pavement, and storm sewers are 1) straight, which shortens the travel distance required for delivery into the channel network; and 2) smooth, which decreases friction and allows flow to travel more quickly than in natural channels (*Hollis* 1975). Storm sewer systems increase the density of "channels," which further shortens runoff travel distances (Figure 2-3). In particular, upland regions that may not have had any surface channels prior to urbanization are frequently fitted with storm sewers, which dramatically increase delivery efficiency into the channel network (*Roy et al.* 2009). In sum, urbanization transforms watershed processes and flow paths that were once slow, circuitous, and disconnected into engineered and non-engineered systems that are highly efficient, direct, and connected.

In contrast to the slow measured runoff to natural streams by surface and subsurface pathways, the delivery of precipitation into urban stream channels is extremely efficient, transforming essentially all precipitation into stormflow and creating nearly instantaneous runoff.

2.3.4 Decreased Infiltration into Stream Beds

Concreting of bed and banks, channel narrowing, and channel straightening limit infiltration from a stream into the ground. Concrete channel margins create infiltration barriers, while channel narrowing and straightening limit the surface area accessible for infiltration and also create a less complex channel. Channel complexity such as pools, riffles, steps, and debris dams create hydraulics that slow flow velocities and also divert water into the subsurface (*Lautz et al.* 2005). In arid and semi-arid watersheds where streams may flow only occasionally, infiltration through bed, banks, and floodplain areas may significantly lower peak flows and may sustain aquifers vital to regional water supplies and natural habitats (*Kresan* 1988, *Dahan et al.* 2008). Increasing recognition is being paid in the scientific literature to the infiltration services provided by natural channels and floodplains (*Macheleidt et al.* 2006, *Schubert* 2006).

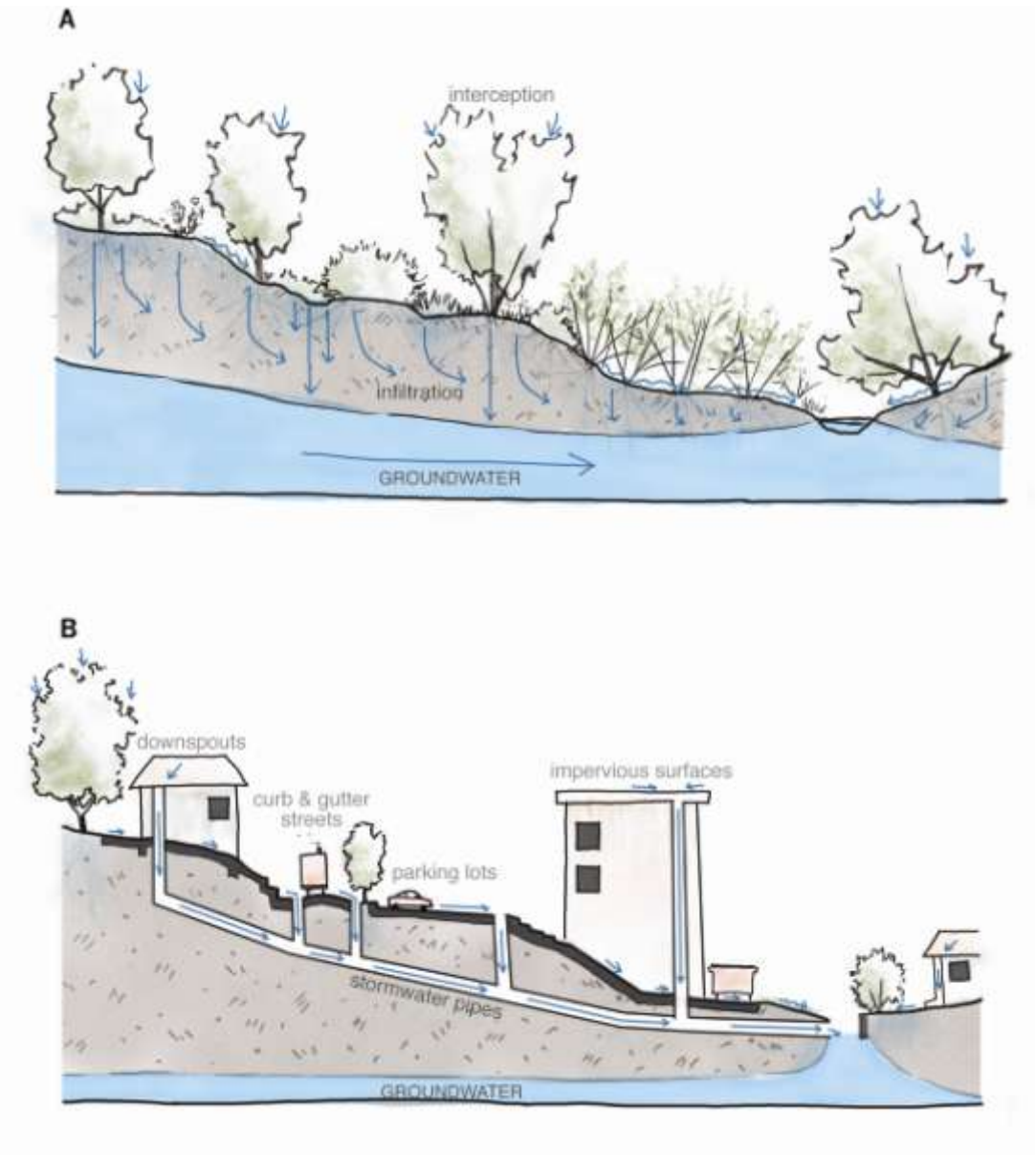

Figure 2-2. Stormwater flowpaths are shortened and quickened through paving, building, soil compaction, and sewer infrastructure. The rapid concentration of streamflow increases storm peaks. Rapid runoff and reduced infiltration prevent groundwater recharge. (Illustration by Jennifer Natali).

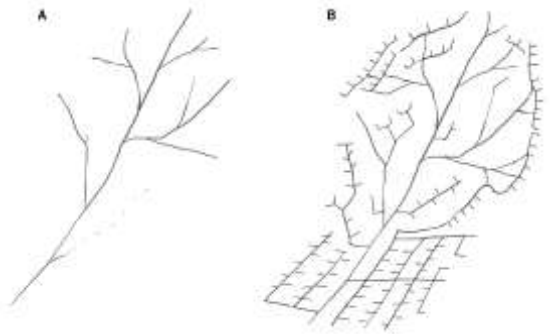

Figure 2-3. Increased surface runoff causes an extension of the channel network. This occurs through increased channel erosion or through constructed networks (to manage increased surface flow). The expanded channel network delivers runoff to downstream reaches much more efficiently. (Illustration by Jennifer Natali).

2.4 Changes in Instream Flow

The instream flow changes resulting from urbanization depend upon site-specific watershed and development characteristics, but typically they include modification of the timing, frequency, magnitude, and duration of both stormflows and baseflow. Urbanization has been shown to increase the magnitude of stormflows, increase the frequency of flood events, decrease the lag time to peak flow, and quicken the flow recession (Figure 2-4; *Hollis* 1975, *Konrad and Booth* 2005, *Walsh et al.* 2005). Because the effects of urbanization manifest differently for different components of the hydrograph, the hydrologic alterations of moderate storms, large storms, and baseflow are discussed individually below.

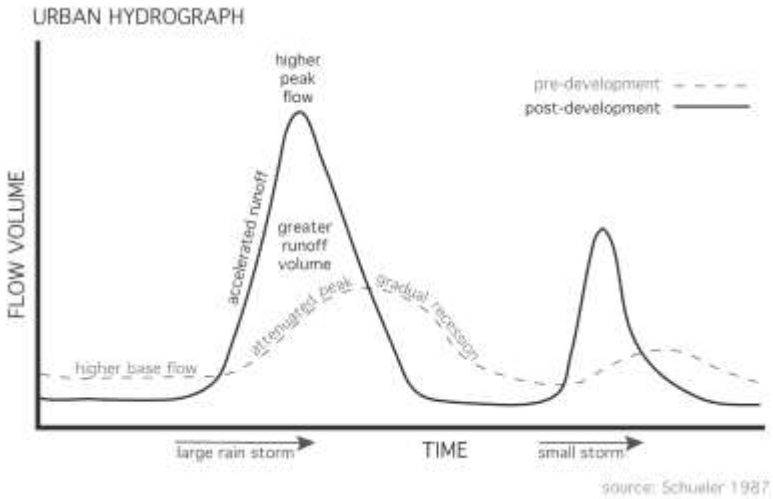

Figure 2-4. Increased runoff efficiency causes higher magnitude peak flows, shorter duration runoff events, decreased baseflow, and dramatic increases in small storms that may have generated little or no runoff under pre-development conditions. (Illustration by Jennifer Natali).

2.4.1 Moderate Stormflow

Urbanization of a watershed can drastically increase the frequency and magnitude of small and moderate flow events (Hawley and Bledsoe 2011). The magnitude of flow amplification increases generally in proportion to the amount of impervious area (*Leopold* 1968, *Hollis* 1975). For example, flows with a return period of one year or longer were shown to be unaffected by paving 5% of the watershed, yet the magnitude of a one-year flow could be more than ten times higher when 20% of a watershed is paved (*Hollis* 1975). In undeveloped watersheds, small storms may not generate any overland flow or streamflow increase at all, because interception, infiltration, soil absorption, and evapotranspiration contain all the precipitation.

Urbanization of a watershed can drastically increase the frequency, duration, and magnitude of small and moderate flow events by factors of 10 or more.

The change to a flashier regime with larger magnitude streamflow generated from small and moderate storms has two primary consequences. First, the stream power and sediment-transport capacity of the stream increase significantly, potentially creating channel erosion and/or stressing instream biota. Second, the season of stormflow is likely to be extended. In undeveloped watersheds, early or late-season storms typically do not generate significant runoff because soils are dry, can effectively absorb most precipitation, and therefore do not generate overland flow or streamflow. Antecedent moisture conditions are less important in urban watersheds where overland flow is generated regardless, and streamflow is generated by even a small storm in a dry watershed. Through magnifying small and moderate storms, urbanization may increase the duration of sediment-transporting and habitat-disturbing flows by factors of 10 or more (*Booth* 1991, *Booth and Jackson* 1997).

2.4.2 Large, Infrequent Storms

In large storms with return intervals of 10 or more years, the influence of urbanization is less pronounced though still present. Whereas a 1-year stormflow may be increased by ten times by paving 20% of the watershed, historical data from humid-region watersheds suggest that the peak magnitude of a 100-year flood would not even be doubled (*Hollis* 1975). The diminishing influence of urbanization on floods of higher recurrence intervals is understood by recognizing that the hydrologic processes of large storms resemble the processes of urban runoff. Essentially, a 100-yr flood is an event that is long in duration, severe in intensity, and likely occurs when soils are already wet. Even in an undeveloped watershed, a storm of this magnitude can typically generate (saturation) overland flow and transport water efficiently into the channel network in a manner more generally comparable to an urban setting.

2.4.3 Baseflow

Urbanization does not affect instream baseflows consistently. Many studies have documented baseflow reductions and/or lowered groundwater levels that have been attributed to decreased infiltration (*Simmons and Reynolds* 1982, *Ferguson and Suckling* 1990) and groundwater extraction (*Postel* 2000). In extreme cases, baseflow in urban watersheds can disappear completely during drought years, dry

seasons, or even between storm events during the wet season. The effect of reducing infiltration may be counteracted in urban and suburban landscapes, however, through irrigation of lawns, parks, golf courses, and other water inputs such as septic systems, leaky pipes, and sewage treatment outflow which typically import water from outside the watershed and contribute to both streamflow and groundwater recharge (*Konrad and Booth* 2005, *Walsh et al.* 2005, *Roy et al.* 2009). Indeed, imported water volumes in very dense cities may be an order of magnitude greater than precipitation. Lerner (2002) judged that leakage in water importation and delivery infrastructure typically ranges from 20-50%, and in general this leakage will increase groundwater recharge in urban areas. Similarly, other studies have found municipal irrigation capable of raising groundwater levels and causing surface flooding (*Rushton and Al-Othman* 1994) and changing ephemeral streams into perennial streams (*Rubin and Hecht* 2006, *Roy et al.* 2009). In summary, the magnitude and direction baseflow and groundwater recharge alteration depends on climate, land use, water use, and the infrastructure system of the watershed. There are no simple "rules."

2.5 Changes in Sediment Yield

The role of watershed sediment yield in the behavior of watersheds was first characterized systematically by Wolman (1967) in a three-part conceptual framework of how rivers respond to urban development, in which 1) pre-development quasi-equilibrium conditions are followed by 2) a period of active construction involving grading, vegetation removal, and bare earth exposed to erosion; and 3) the establishment of an urban landscape consisting of pavement, houses, gutters and sewers etc. The construction period is marked by an increase in sediment (typically 2-10 times pre-development rates) produced from bare surfaces and the disturbances associated with construction (*Chin* 2006). The sediment produced during construction is often deposited within stream channels, initiating aggradation and/or channel widening. Following the construction period, sediment production decreases (Figure 2-5) and runoff increases, resulting in increased transport capacity and the potential for severe channel erosion that can result in channel enlargement of commonly 2-3 (and as much as 15) times the original channel cross-section (*Chin* 2006). Changes in post-construction sediment production rates are not well studied, though case studies have found sediment yields in post-construction watersheds to be somewhat higher than rural, undeveloped basins.

The combination of increased runoff and decreased sediment production can result in channel enlargement of commonly 2-3 (and as much as 15) times the original channel cross-section.

Post-construction sediment loads are typically derived from channel enlargement as a result of increased peak flows and the legacy of construction-phase disturbance (*Trimble* 1997, *Nelson and Booth* 2002). The rate of decline in post-construction sediment yields is therefore predominantly controlled by the degree of channel instability caused by the construction phase and the effect of increased peak flows. If the channel margins are armored, densely vegetated, or otherwise erosion resistant, sediment yields may decline quickly following urbanization. If channel instability ensues, elevated sediment yields may persist for decades or more.

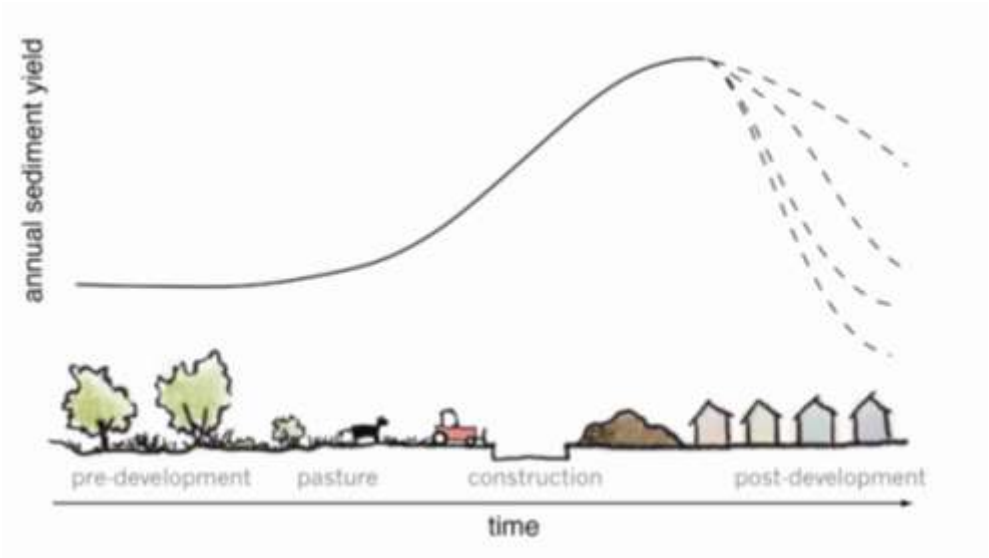

Figure 2-5. Increased sediment yields occur during the land-clearing and construction phases of development. Post-construction sediment yields decrease, though the rate of decrease varies considerably depending on the degree of channel instability caused by the construction phase and by increased runoff. (Illustration by Jennifer Natali).

2.6 Impacts on Channel Form and Stability

Channel form and stability reflect both hydrologic and geomorphic processes. Changes to runoff characteristics and sediment supply can affect all aspects of stream morphology, including planform, cross-sectional geometry, longitudinal profile, bed topography (e.g., pools, riffles), and bed sediment size and mobility. While many factors influence the type and degree of impacts (discussed below), a suite of commonly observed morphological changes due to hydromodification include channel enlargement (incision and widening), decreased bank stability, increased local sediment yield from eroding reaches, overall simplification of stream habitat features such as pools and riffles, changes in bed substrate conditions, loss of connectivity between channel and floodplain (*Segura and Booth* 2010), and changes in sediment delivery to coastal waters (*Jacobson et al.* 2001). Impacts may also propagate upstream as headcuts resulting from reductions in base level due to excess erosion. Likewise, tributaries entering downstream of a developed area may also experience the upstream propagation of headcuts due to base level reductions of the mainstem.

In addition to Jacobson *et al.* (2001), two well-researched literature reviews of morphological impacts (as well impacts to riparian habitat and biota) can be found in: “Impacts of Impervious Cover on Aquatic Systems” by The Center for Watershed Protection (2003) and “Physical Effects of Wet Weather Flows on Aquatic Habitats: Present Knowledge and Research Needs” published by Water Environment Research Foundation (*Roesner and Bledsoe* 2003). Note that these two studies differ significantly in how they

synthesize and interpret the reviewed literature, and the CWP publication acknowledges that it does not necessarily apply to streams in the arid west.

2.6.1 Physical Principles Underlying Channel Impacts

A convenient conceptual framework for the physical impacts of hydromodification on stream morphology is "Lane's Balance" (*Lane* 1955; Figure 2-6). This framework encapsulates a fundamental (albeit qualitative) relationship between the hydrologic and geomorphic processes that balance water flow and sediment in a channel. It expresses the condition of sediment transport capacity, as controlled by water discharge and slope, in broad balance with the supplied load and size of bed sediment for a channel in equilibrium. An increase in streamflow or a decrease in sediment supply (for example) will typically initiate a corresponding decrease in slope and/or increase in grain size in order to reestablish equilibrium. That decrease in slope is expressed by channel incision or degradation. In contrast, an increase in sediment supply or decrease in streamflow will typically result in aggradation and a corresponding increase in slope.

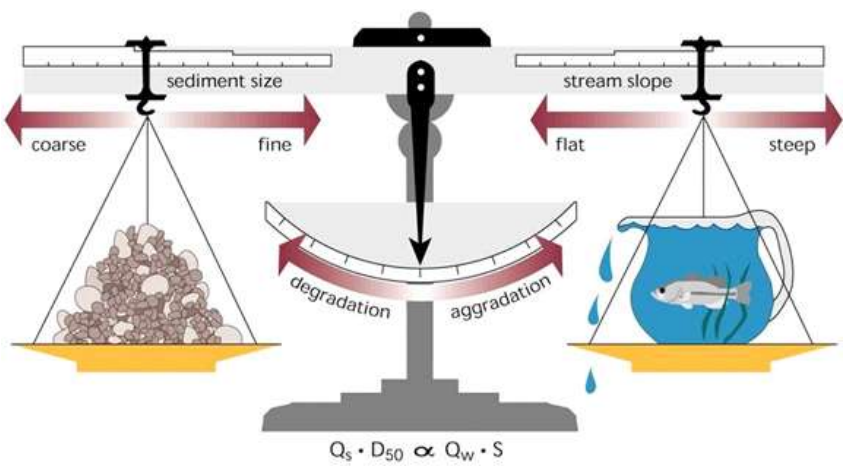

Figure 2-6. Lane's Balance, showing the interrelationship between sediment discharge (Q_s), median bed sediment size (D_{50}), water discharge (Q_w), and channel slope (S).

Slope and grain size are not the only modes of adjustment, as stream channels have many more degrees of freedom in responding to changes in streamflow and sediment supply. For example, Schumm (1969) extended Lane's Balance to include width, depth, sinuosity, and meander wavelength. More quantitatively (and more complexly), adjustments to channel form resulting from hydromodification are controlled by interactions among flow-generated shear stresses (described by hydraulic equations for open channel flow, as a function of channel geometry, roughness, and longitudinal slope), inflowing sediment load, and the shear strength of the bed and bank sediments (a function of their size distribution and cohesiveness).

2.6.2 Natural Variability in Stream Systems

Understanding natural variability in streams is critical to predicting and assessing anthropogenic impacts. A stream may be considered "stable" or "at equilibrium" when its overall planform, cross-section and profile are maintained with no net degradation or aggradation within a range of variance, over extended timeframes (*Mackin* 1948, *Schumm* 1977, *Leopold and Bull* 1979, *Biedenharn et al.* 1997). Such systems can often withstand short-term disturbances without significant change. Even without discrete disturbances, natural streams may be in a state of dynamic equilibrium (*Schumm* 1977), where the channel exhibits stability over the long term even while actively migrating laterally such that erosion of outer banks is accompanied by sediment deposition and bar building on inner banks. Streams may also be fluctuating between aggradation/ degradation/ stability, all within a limited range of conditions. A large-scale event, like a flood or landslide, can cause dramatic changes in channel form, but the channel will often re-established its pre-event planform, geometry and slope over time.

In contrast, a persistent alteration like hydromodification can cause the rate of change to increase. As a result, the channel may begin an evolutionary (or catastrophic) change in morphology, leading to enlargement and instability. A geomorphic threshold is the condition at which there is an abrupt and significant channel adjustment or failure because the channel has evolved to a critical situation. It is the condition at which the proverbial straw breaks the camel's back. Channels that are near a geomorphic threshold can exhibit significant adjustments in response to a relatively small degree of hydromodification. For example, a channel with banks that are near the height and angle for geotechnical failure may widen abruptly due to slight incision.

2.6.3 The Role of Sediment Transport and Flow Frequency in Channel Morphology

Extensive research has been devoted to establishing specific relationships between flow frequency and characteristics of channel morphology. The concept of "effective discharge" was introduced by Wolman and Miller (1960), using a magnitude-frequency analysis to assess the effectiveness of flow events to transport sediment. They concluded that, for the rivers in their analysis, relatively frequent events (occurring on average about 1 times/year) are most effective over the long term in transporting sediment. This concept has formed the basis for a large body of literature (and occasional controversy) over the subsequent five decades relating to the relationships between these flow frequencies and principal channel dimensions (e.g., bankfull stage, width-to-depth ratio), and the application of these relationships to stream design and restoration, as well as prediction and control of hydromodification impacts. Much of the controversy has related to the use of a single event ("dominant discharge" or "bankfull flow") as the basis for such applications, with the implicit assumption that control for that single discharge will result in commensurate channel changes regardless of the distribution of flow frequencies and flow durations over a wider range of discharges.

More recently, the concept of a *range* of moderately frequent, "geomorphically significant" flows that transport the majority of the sediment over the long term (King County 1990, *Bledsoe* 2002, *Roesner and Bledsoe* 2003) was proposed to replace the focus on a single event. The geomorphically significant flow range is considered to be the most influential in determining channel form, as this collective group

of flows typically does the most "work" on the channel boundary over engineering time scales. Controlling changes to the frequency of flows within this range is therefore critical to reducing impacts to stream morphology, and is the scientific basis for the "flow-duration" control criteria discussed in the following sections. A flow-duration criterion aims to match the pre-development volumes, durations, and frequencies of this critical range of sediment transporting flows over a period of many decades. Even this concept, however, relies on the implicit assumption that infrequent large events, no matter how dramatic their effects, typically occur "too infrequently" to reset channel morphology and habitat over the timescales of concern in meeting regulatory requirements. These events are typically managed through traditional flood control practices as opposed to hydromodification management.

A flow-duration management approach aims to match the pre-development volumes, durations, and frequencies of this critical range of sediment transporting flows over a period of many decades.

2.6.4 Applicability to California Streams

The traditional concepts of dynamic equilibrium in streams and geomorphically significant flows, discussed above, derive largely from studies on perennial streams in humid areas. An important question is: to what extent do these concepts apply to managing hydromodification impacts to streams within arid and semi-arid areas (such as large portions of California, and particularly the southern and eastern regions)? In such climate regions, precipitation is highly variable, with low annual totals and episodic, large events. Many streams are ephemeral or intermittent and located in a setting of extremely high sediment production associated with erosive geology resulting from high rates of tectonic uplift, sparse vegetative cover and frequent fires (*Graf* 1988, *Stillwater Sciences* 2007). These streams are often characterized by multi-thread sand-bed channels that are inherently unstable and readily respond to changes in flow conditions. In the ephemeral streams described by Bull (1997), for example, the natural behavior is one of alternating periods and locations of aggradation and degradation, varying both temporally and spatially. In such "episodic" streams, the vast majority of sediment may be moved by extreme, highly infrequent events. The importance of understanding the role of episodic events has been emphasized for semi-arid and arid fluvial systems (e.g., *Wolman and Gerson* 1978, *Brunsden and Thornes* 1979, *Yu and Wolman* 1987). The latter authors reviewed concepts of frequency and magnitude in geomorphology research and noted that episodic behavior hinges on frequency of episodic events relative to the time required to return to an "equilibrium" channel form. Episodic behavior is more prevalent where the average long-term disturbance is low but the year-to-year variability is high, a characteristic of arid and semi-arid climates.

Although the morphology of arid and semi-arid streams may be more strongly influenced by extreme events under natural conditions, hydromodification has nevertheless been shown to cause rapid and significant physical changes in such California streams (*Trimble* 1997, *Coleman et al.* 2005, *Hawley and Bledsoe* 2011). Such dramatic responses to the effects of urbanization on relatively frequent flows, often over periods of a decade or less, have profound implications for aquatic life and physical habitat. Despite the flashy streamflow regimes, high sediment supplies, and steep gradients of many streams in the region, the responses of California streams are controlled by the same physical processes as those in

other regions that have been studied more extensively. As such, the key controls of stream response can be identified and managed to mitigate the chronic effects of hydromodification between infrequent extreme events. However, it is always advisable to ensure that the application of tools and approaches for prediction and assessment should be based on reference data and empirical models (where applicable) drawn from stream types that are similar in both hydrologic and geomorphic characteristics.

2.6.5 Factors Determining Extent of Impacts

The extent and nature of impacts to stream morphology and habitat from a given change in runoff and sediment supply vary widely, depending on the channel geometry, longitudinal slope, channel material type(s) and size(s), and the type and density of channel vegetation (*Center for Watershed Protection* 2003, *Roesner and Bledsoe* 2003). For example, increased flows within a deep, narrow channel may result in significantly higher shear stresses at the bed; this same increase in a wide, shallow channel may become predominantly overbank flow, with less effect on bed shear stress. Where all other factors are equal, fewer impacts would be expected where flows have access to broad overbank areas (i.e., floodplains) during relatively common floods (*Segura and Booth* 2010), channel materials are more resistant, and stabilizing riparian vegetation is present. Conversely, where erosion and bank instability result in the loss of vegetation reinforcement, a positive feedback response may cause erosion to be accelerated. Furthermore, the relative erosive resistance of bed and bank materials will influence the extent of lateral versus vertical channel adjustments (*Simon and Rinaldi* 2006, *Simon et al.* 2007). For example, if bank resistance is lower than bed resistance, then the channel will tend to widen rather than deepen.

The extent of impacts will also depend on the stream's physiographic context and spatial and temporal patterns of urban development within the watershed (Konrad and Booth 2005). Large-scale studies of hydrologic responses to urbanization (Chin 2006, Poff et al. 2006) also highlighted the regional variation in these responses and reinforced the need to understand local watershed and channel characteristics when managing hydromodification impacts. The presence of road crossings and other infrastructure can provide local grade control and create sediment bottlenecks which often translate to exacerbated erosion in the immediately downstream areas.

The extent and nature of impacts to stream morphology and habitat from a given change in runoff and sediment supply vary widely, depending on the channel geometry, longitudinal slope, channel material type(s) and size(s), and the type and density of channel vegetation, and the spatial and temporal patterns of urban development

An additional consideration relates to the pre-development balance between sediment and streamflow, which is dependent on precipitation patterns, the location of a stream reach within the watershed, the associated sediment behavior of that reach (i.e., production, transport or deposition zone), and local rates of sediment production.

While many of these factors may be quantified for a given time and location, stream systems are enormously complex both spatially and temporally. The existence of physical thresholds and feedback systems can cause an incremental change to result in a disproportionately large response (*Schumm* 1977, 1991). Furthermore, there may be significant temporal lags between the point in time at which

land use is altered and when channel impacts are observed (*Trimble* 1995, 1997). In recognition of these effects and the associated uncertainty, predictive models and management tools may present results in terms of probabilities or within the context of a risk-based approach, as discussed further in this document. Such effects also have substantial implications for the design of assessment and monitoring programs.

There may be significant temporal lags between the point in time at which land use is altered and when channel impacts are observed.

2.6.6 Impacts on Other Types of Receiving Waters

Although outside the scope of this document, hydromodification impacts to other water body types are recognizable and should be the subject of additional research and future consideration.

Wetlands, Estuaries, and Coastal Ecosystems. Urbanization can alter water quality, quantity and sediment delivery to wetlands and sensitive coastal ecosystems. Urbanization has led to loss or degradation of wetlands and estuaries as a result of 1) draining and conversion to agriculture (*Dahl*, 1997); 2) upstream alterations to flow and sediment regimes that can change the magnitude, frequency, timing, duration, and rate of change of estuarine salinity, turbidity, freshwater flooding, freshwater baseflow, and groundwater recharge dynamics (*Azous and Horner* 2001); and 3) contaminated runoff from urban areas (*Paul and Meyer* 2001, *J Brown et al.* 2010). Urbanization may also lead to coastal erosion in circumstances where reservoir sediment trapping or post-development decreases in sediment yield reduce the sediment supply to the coast (*Pasternack et al.* 2001, *Syvitski et al.* 2005).

Alluvial Fans. Alluvial fans are dynamic landforms that are under increased development pressure in recent decades, particularly in the expanding cities of the American West. Upstream urbanization, and the resultant flashier flow regime, shortens the time available for infiltration and groundwater recharge in alluvial fans. Furthermore, development on fans themselves results in channel straightening and/or construction of concrete flood conveyance channels that also reduce or eliminate infiltration. The reduction in infiltration amplifies the flood risk further downstream. Additionally, alluvial fans may be more vulnerable than other landscapes to channel instability resulting from hydromodification, because they lack intrinsic geologic controls on channel gradient, and commonly have little vegetation or bank cohesion to provide stability in the purely alluvial deposits (*Chin* 2006).

2.6.7 Influence of Scale

The ability to detect impacts from land-use changes depends upon the spatial and temporal scale at which they are measured. Issues of hydrograph timing and the relative size of the storm system with respect to the watershed area may confound relationships at larger spatial scales. Furthermore, a number of fluvial geomorphic features that are commonly used as metrics of geomorphic condition are scale-dependent. For example, width-depth ratio, tendency toward braiding, and channel depth relative to stable bank height all commonly increase downstream. Other factors, such as the influence of vegetation, depend on protrusion relative to width and rooting depth relative to bank height. The

temporal scale over which channel changes occur will be influenced by precipitation variability, in addition to the many physical factors already discussed.

These scale considerations, as well as previous discussion of factors influencing stream response, are important when determining the choice of both management tools and monitoring approaches. It is generally much easier to predict the direction of response than the magnitude. Accurate, detailed predictions of response are difficult to make, and they are generally only possible when applied to specific locations, using extensive data input, to answer very specific questions; even then they are subject to uncertainty. Policies or assessment methods aimed to address a range of streams and geographic conditions are better suited to probabilistic approaches that explicitly acknowledge uncertainty, as described further in subsequent sections.

2.7 Impacts on Fluvial Riparian Vegetation

Stream channel form and stability is closely linked with the ecology of instream and floodplain habitats (Figure 2-7). Spatial and temporal distributions of plant communities are tied to moisture availability and seasonality. The ability of vegetation to stabilize soils, trap sediments, and reduce flow velocities (*Sandercock et al.* 2007) can create positive feedback that promotes further vegetation establishment and enhancement of these stabilizing features. This can result in a strong influence on channel geometric features, specifically channel narrowing (*Anderson et al.* 2004). The change in frequency of overbank flows resulting from channel incision will also affect riparian processes, including nutrient transfer and seed dispersal. For example, it is believed that *Tamarix* dominance over native species along Western US rivers would be less extensive if not for anthropogenic alteration of streamflow regimes (most recently supported by Merritt and Poff (2010)).

Impacts to stream biota may occur through the alteration of habitat structure and habitat dynamics caused by hydrologic and geomorphic changes, as well as directly from hydrologic alteration.

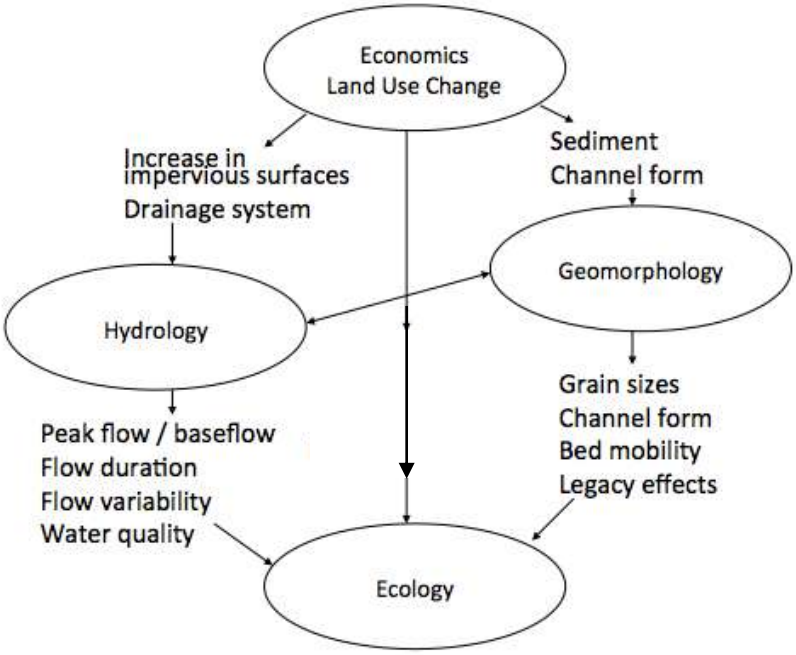

Figure 2-7. Land use changes, hydrology, geomorphology and ecology are closely and complexly interrelated. (Adapted from Palmer *et al.* 2004).

Vegetation changes not only are a result of morphological impacts but also can result directly from changes in streamflow. These findings continue to be supported by recent studies; for example, increases or decreases in baseflow or changes to the seasonal availability of water can determine the extent and type of riparian vegetation capable of thriving in that environment (*White and Greer* 2006). Vegetation changes can have cascading effects on indigenous fauna that require native plants for food or nesting (*Riley et al.* 2005). Channel incision can also result in phreatic draining of adjacent wetland and floodplain habitats and result in loss of key riparian species (*Scott et al.* 2000).

2.8 Impacts on In-Stream Biota

As shown in Figure 2-7, impacts to stream biota may occur through the alteration of habitat structure and habitat dynamics caused by hydrologic and geomorphic changes, as well as directly from hydrologic alteration. (The term biota is used here to refer to a range of non-plant species including algae, macroinvertebrates, amphibians, fishes, etc.) Because of these relationships, the condition of in-stream biota is considered to reflect the effects of all other impacts and has been recommended as an integrative measure of stream health (discussed further in Section 5).

Studies continue to build on Poff *et al.* (1997), who highlighted the importance of the "natural flow regime" and its variability as critical to ecosystem function and native biodiversity. Streamflow pattern or "regime" interacts with the geomorphic context to control the physical and biological response of streams to hydromodification. The basic characteristics of streamflow regimes are typically described in five ways: magnitude, frequency, duration, timing, and rate of change. There is a large body of science

linking one or more of these five elements of flow regimes to geomorphic processes, physical habitat, and ecological structure and function. A few examples of linkages with physical habitat are provided in Table 2-1; these linkages describe the mechanisms by which flow changes can impact stream ecology through morphological alterations.

Table 2-1. Examples of Relationships between Flow Regime Attributes and Physical Habitat Characteristics (adapted from Roesner and Bledsoe 2002).

Flow Attribute	Example Relationships with Physical Habitat
Magnitude	• Determines extent to which erosion/removal thresholds for substrate, banks, vegetation, and structural habitat features are exceeded • Determines whether floodplain inundation/exchange occurs • Habitat refugia may become ineffective during extreme events
Frequency	• Flashiness can affect potential for recovery of quasi-equilibrium channel forms between events, bank stability, and streambank/riparian vegetation assemblages • Frequency of substrate disturbance can act as a major determinant of fish reproductive success and benthic macroinvertebrate abundance and composition
Duration	• Determines the impact of a threshold exceeding event, e.g., scour depths • Urbanization frequently increases the duration of geomorphically effective flows which also affect bank vegetation establishment and maintenance • Extended durations of high suspended sediment concentrations can act as chronic and acute stressors on fish communities
Timing	• The temporal sequence of flow events affects channel form and stability as geomorphic systems may be “primed” for abrupt changes. • Stream biota may use flow timing as a life-cycle cue • Predictability of flow can affect utilization of habitat refugia
Rate of Change	• Affects bank drainage regimes (bank stability) and sedimentation processes, e.g., re-suspended fine sediment concentrations during storm hydrographs, embeddedness, armoring • Rapid drawdown can result in stranding of instream biota • Rise and fall rates control riparian water table dynamics and seedling recruitment

The mechanisms of such impacts are also well detailed by Center for Watershed Protection (2003); for example, increased flows are related to a reduction in habitat diversity and simplification of habitat features such as pools; this in turn reduces the availability of deep-water cover and feeding areas.

Many studies support the conclusion that stream biota are also directly impacted by altered flow regimes, independent of channel instability and erosion. Konrad and Booth (2005) identified four hydrologic changes resulting from urban development that are potentially significant to stream ecosystems: increased frequency of high flows, redistribution of water from baseflow to stormflows,

increased daily variation in streamflow, and reduction in low flow. They caution that ecological benefits of improving physical habitat and water quality may be tempered by persistent effects of altered streamflow and sediment discharge, and that hydrologic effects of urban development must be addressed for restoration of urban streams. Walsh *et al.* (2007) concluded that low-impact watershed drainage design was more important than riparian revegetation with respect to indicators of macroinvertebrate health. Bioengineered bank stabilization can also have positive effects on habitat and macroinvertebrates, but it cannot completely mitigate impacts of urbanization with respect to stream biotic integrity (*Sudduth and Meyer* 2006). Walters and Post (2011) and Brooks *et al.* (2011) found impacts to benthic macroinvertebrates due to upstream water abstractions, including reductions in total biomass of insects and reductions in abundance respectively.

2.9 Conclusions

Alterations in streamflow and sediment transport as a result of land use change can have severe impacts on streams. Common responses include changes in water balance, surface and near-surface runoff timing and magnitude, groundwater recharge, sediment delivery and transport, channel enlargement, widespread incision, and habitat degradation. The extent and consequences of these impacts depend on stream type, watershed context, and local controls on channel adjustment; as such, stream responses to hydromodification are complex and difficult to predict with any precision. Due to the direct impacts of streamflow modification on vegetation and biota, channel morphology cannot be the sole measure of hydromodification impacts. Thus, mitigation efforts that are narrowly focused on channel stability may be insufficient for sustaining key ecological attributes. Likewise, reach-scale stabilization of streams will not necessarily result in the return of comparable habitat quality and complexity (Henshaw and Booth 2000, Roesner and Bledsoe 2003). Hydromodification management should be considered in the context of an overall watershed-scale strategy that targets maintenance and restoration of critical processes in critical locations in the watershed. Furthermore, it is imperative that monitoring and adaptive management be focused on achieving desired objectives for aquatic life and overall stream “health” in addition to simply measures of geomorphic response.

3. Framework for Hydromodification Management

3.1 Introduction and Overview

The current approach to managing hydromodification impacts on a project-by-project basis is not sufficient to protect beneficial uses of streams. This section outlines a comprehensive, alternative framework that begins with watershed analysis and uses the results to guide the site-based management decisions that are the current focus of most hydromodification management strategies. It also recommends the implementation of a compensatory mitigation program in support of hydromodification management objectives identified in the watershed analysis. Figure 3-1 summarizes this approach and illustrates how current site-based management relates to the larger framework.

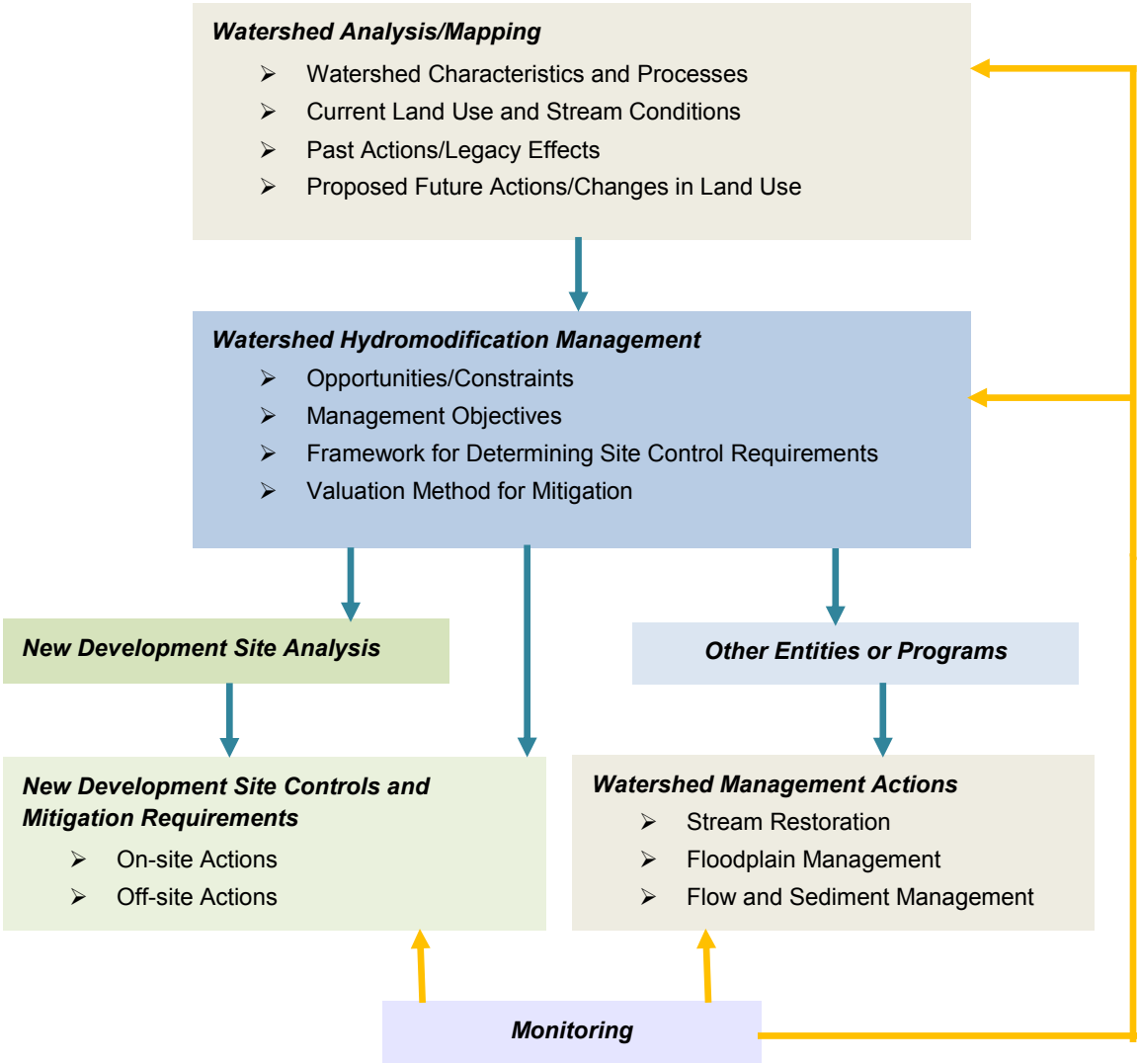

Figure 3-1. Framework for Integrated Hydromodification Management.

This section discusses the details of the integrated framework proposed in Figure 3-1. Key features of this comprehensive approach to hydromodification management are:

- Hydromodification management needs to occur primarily at the watershed scale. The foundation of any hydromodification management approach should be an analysis of existing and proposed future land use and stream conditions that identifies the relative risks, opportunities, and constraints of various portions of the watershed. Site-based control measures should be determined in the context of this analysis.
- Clear objectives should be established to guide management actions. These objectives should articulate desired and reasonable physical and biological conditions for various reaches or portions of the watershed. Management strategies should be customized based on consideration of current and expected future channel and watershed conditions. A one-size-fits-all approach should be avoided.
- An effective management program will likely include combinations of on-site measures (e.g., low-impact development techniques), in-stream measures (e.g., stream habitat restoration), and off-site measures. Off-site measures may include compensatory mitigation measures at upstream locations that are designed to help restore and manage flow and sediment yield in the watershed.
- Management measures should be informed and adapted based on monitoring data. Similarly, monitoring programs should be designed to answer questions and test hypotheses that are implicit in the choice of management measures, such that measures that prove effective can be emphasized in the future (and those that prove ineffective can be abandoned).
- Hydromodification potentially affects all downstream receiving waters; therefore, there generally should be no areas exempted from hydromodification management plans. However, the variety of types and conditions of receiving waters should result in a range of requirements. This also means that objectives, and the management strategies employed to reach them, will need to acknowledge pre-existing impacts associated with historical land uses.

A watershed-based approach to hydromodification management will allow integration of objectives with related programs such as water quality management, groundwater management, and habitat management and restoration through mechanisms such as Integrated Regional Water Resources Management Plans.

Implementation of this approach will likely require changes in the current administration of hydromodification management plans statewide, both in the development and promulgation of regulations by the State and Regional Water Boards and in the administration and execution of those regulations by local jurisdictions (Table 3-1). In the short term, municipalities will need to broaden the approaches to on-site management measures and expand monitoring and adaptive management programs based on the tools described in this document. In the long term, regulatory agencies will need to develop watershed-based programs that allow for implementation of management measures in the locations and manner that will have the greatest impact on controlling hydromodification effects. A

watershed-based approach will also allow the integration of hydromodification management objectives with related programs such as water quality management, groundwater management, and habitat management and restoration through mechanisms such as Integrated Regional Water Resources Management Plans.

Table 3-1. Recommendations for implementation of watershed-based hydromodification management, organized by the scale of implementation and the time frame in which useful results should be anticipated.

Time Frame	Programmatic: State and Regional Water Boards	Local: City and County Jurisdictions
Short-term (<10 years)	• Define the watershed context for local monitoring (at coarse scale) • Evaluate whether permit requirements are making positive improvements	• Evaluate whether specific projects/ regulations are meeting objectives • Identify the highest priority action(s) to take
Long-term (1+ decades)	• Define watershed context and setting benchmarks for local-scale monitoring (i.e., greater precision, if/as needed) • Demonstrate how permit requirements can improve receiving-water "health," state-wide (and change those requirements, as needed)	• Evaluate and demonstrate whether actions (on-site, instream, and watershed scale) are improving receiving-water conditions • Assess program cost-effectiveness • Identify any critical areas for resource protection

3.2 Background on Existing Strategies and Why They are Insufficient

Current hydromodification approaches and strategies, such as flow and sediment-control basins, have been long-recognized as insufficient to fully address hydromodification impacts (e.g., Booth and Jackson 1997, Maxted and Horner 1999). Present understanding of the causes and effects of urbanization suggest that such approaches must be expanded to include integrated flow and sediment management at the watershed scale, along with stream corridor/floodplain restoration (NRC 2009).

Flow management has its origins in flood-control basins intended to reduce peak discharge through stormwater detention (Dunne and Leopold 1978). A key shortcoming of these approaches for hydromodification management is that they do not address (and may exacerbate) cumulative erosive forces on the receiving channel because they trap sediment and release sediment-starved water to downstream areas. Simple detention can increase the frequency and duration with which channels are exposed to erosive effects (McCuen and Moglen 1988, Bledsoe *et al.* 2007), resulting in an increase in the downstream impacts of hydromodification.

Since the late 1980's in parts of the US, hydromodification management plans began to explore "flow-duration" control standards as a way to address this shortcoming. These standards require that the post-project discharge rates *and durations* may not deviate above the pre-project discharge rates and

durations by more than a specific (and typically quite small) percent, across a broad range of discharges at and above the presumed threshold of instream erosion and sediment transport, as averaged over a multi-year period of measured (or simulated) record. This approach is a dramatic improvement over earlier methods, although it does not adequately address the issues of sediment deficit associated with urbanization (Chin 2006). In addition, current flow-duration standards do not fully account for the effects of flow alteration on in-stream habitat and biological functions (e.g., they do not address the seasonality of peak flows, rates of hydrograph rise and recession, low-flow magnitude and duration) and therefore may not be protective of all beneficial uses of downstream waterbodies.

Current strategies are also insufficient with respect to how municipal stormwater permits apply hydromodification standards. Currently, development triggers are established to determine if a project is subject to the standards. These triggers are generally specified by either project land use type in conjunction with size, or by project size alone (e.g., 20 units or more of single family residential housing, or 10,000 square feet or more of new impervious area). The exemption of many small projects from hydromodification controls can result in cumulative impacts to downstream waterbodies (see Booth and Jackson, 1997, for an example from western Washington of the cumulative effects of a small-project exemption); a move to include LID requirements that apply to all projects, regardless of size, is a positive development to begin to address this issue. There is usually also an exemption for projects discharging to hardened channels or waterbodies; however these exemptions may not be supportive of future stream restoration possibilities, and do not address the impacts of hydromodification on lentic and coastal waterbodies (as yet not fully understood). A further limitation of the current permit structure is that there is no consideration of project characteristics such as position within the watershed, sensitivity of the receiving stream reach, or level of coarse sediment production on the proposed project site. Finally, current programs rely solely on regulating new development and re-development to prevent hydromodification impacts without addressing pre-existing conditions which may limit the effectiveness of future management actions.

Shortcoming of current hydromodification standards that may limit their effectiveness include the exemption of many small projects, which can result in cumulative impacts to downstream waterbodies, and the reliance solely on regulating new development and re-development without addressing pre-existing conditions which may limit the effectiveness of future management actions.

When flow-control measures of whatever regulatory standard have failed to protect streams from erosion, hydromodification "management" typically consists of bank or channel armoring, drop structures, and other hard engineering approaches. Although these methods may reduce local hydromodification impacts, it is typically at the expense of other in-stream or riparian functions or beneficial uses. For example, channel armoring can reduce habitat and water conservation functions and services by direct habitat removal, increased bed scour, and decreased connectivity between the channel and its floodplain. In addition to loss of biological and physical stream function, many armoring solutions degrade or fail over time because they address only the localized channel instability rather than the overarching processes that led to the instability (Kondolf and Piegay 2004). For example, drop structures constructed to stabilize a specific channel reach will tend to shift downstream the

consequences of an insufficient sediment load—the reach immediately upstream of the drop structure is "protected," but that immediately downstream is degraded even more severely. In extreme cases, the structure itself can be undermined by downstream erosion and headcutting that is exacerbated by the sudden shift in velocity and associated eddy effects (i.e., hydraulic jump) that often occurs downstream of grade stabilization (Chin 2006). Bank armoring can also fail due to being undermined by erosion at the toe of slope, which can lead to scour (Figure 3-2). In both cases, structural failures often lead to a sequence of incremental increases in the size and extent of the structural solution in an attempt to continually repair increasing channel degradation. In extreme cases, catastrophic failure of bank or grade stabilization can lead to sudden and dramatic changes in channel form, which can be associated with devastating loss of habitat, infrastructure, and property.

Figure 3-2. Undermining of grade control and erosion of banks downstream of structures intended to stabilize a particular stream reach. Left photo is looking upstream at drop structure; right photo is looking downstream from the drop structure.

3.3 Development of Comprehensive Hydromodification Management Approaches

The goal of hydromodification management should be to protect and restore overall receiving water conditions, by maintaining or reestablishing the watershed processes that support those conditions, in the face of urbanization. Achieving these goals will require that hydromodification management strategies operate across programs beyond those typically regulated by NPDES/MS4 requirements. Successful strategies will need to be developed, coordinated, and implemented through land-use planning, non-point source runoff control, and Section 401 Water Quality Certifications and Waste Discharge Requirement programs in addition to traditional stormwater management programs. Thus, all levels of the regulatory framework—federal, state, and local—will need to participate in developing such a program, with program development occurring mainly through regulatory and resource protection agencies and program implementation occurring mainly through local jurisdictions.

As shown in Figure 3-1, watershed-scale hydromodification management should include all of the following key elements:

- Watershed-wide assessment of the condition of key watershed processes, to understand the natural functioning of the watershed and what has been (or is at risk of being) altered by urbanization.
- Watershed-wide assessment of hydromodification risk, to categorize areas based on the likelihood of hydromodification impacts and to identify opportunities for restoration or protection of key reaches or sub-basins.

The goal of hydromodification management should be to protect and restore overall receiving water conditions, by maintaining or reestablishing the watershed processes that support those conditions, in the face of urbanization.

- Appropriate management objectives for various stream reaches and/or portions of the watershed.
- Process for selecting management actions and mitigation measures for project sites and stream reaches.
- Monitoring program that is consistent with the goals of the HMP so that information generated can be used to improve the HMP over time.

3.4 Watershed Mapping and Analysis – Identification of Opportunities and Constraints

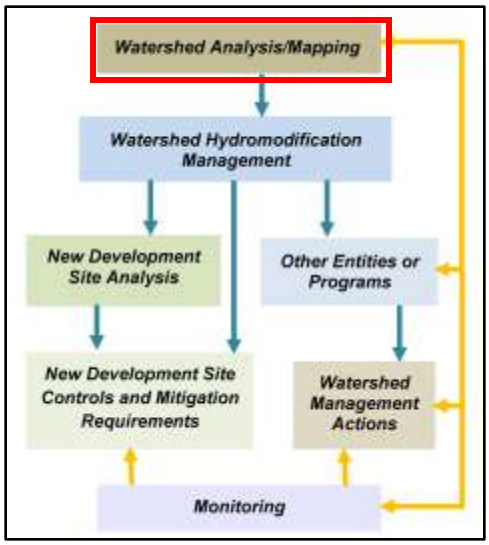

Watershed analysis should be the foundation of all hydromodification management plans. Analysis should identify the nature and distribution of key watershed processes, existing opportunities and constraints in order to help prioritize areas of greater vs. lesser concern, areas.

"Watershed analysis" has several steps, of which the first is mapping. Mapping may occur at the watershed or regional (i.e., multiple watersheds) scale. Mapping should include data layers to facilitate the following analyses. Most of these data layers are freely available as online. Further information on analysis tools is provided in the next section. These maps should be designed for iterative updates over time as new information becomes available:

- Dominant watershed processes – analysis of topography (10-m digital elevation model), hydrology, climate patterns, soil type (NRCS soil classifications) and surficial geology can be used to identify the location and type of dominant watershed processes, such as sediment source areas and areas where infiltration is important or where overland flow likely dominates. This can provide a template for the eventual design of management measures that correspond most

closely to the pre-development conditions, which support processes that promote long-term channel health. The Central Coast Hydromodification Control Program (the "Joint Effort"; see Booth *et al.* 2011) provides an example of this type of analysis.

- Existing stream conditions – At a minimum the National Hydrography Database (NHD) can provide maps of streams and lakes in the watershed. Additional information on stream condition should be included to the extent that it is available. This could include major bed material composition, channel planform, grade control locations and condition, and approximate channel evolution stage. These maps can also be used to conduct general stream power evaluations.
- Current (Past) and anticipated future land use - Current land use and land cover plus proposed changes due to general or specific plans. Historical information on past land use practices or stream conditions should be included if it is readily available. Classified land cover (NLCD 2006) is available from the Multi-Resolution Land Characteristics Consortium (MRLC).
- Potential coarse and fine sediment yield areas – methods such as the Geomorphic Land Use (GLU) approach (Booth *et al.* 2010) can be used that to estimate potential sediment yield areas based on geology, slope and land cover.
- Existing flood control infrastructure and channel structures – maps should include major channels, constrictions, grade control, etc. that affect water and sediment movement through the watershed. Any available information on water quality, flood control or hydromodification management basins should also be included.
- Habitat – both upland and in-stream and riparian habitat should be mapped to help determine areas of focus for both resource protection and restoration. This may be based on readily available maps such as the National Wetlands Inventory and National Land Cover Database, aerial photo interpretation, or detailed local mapping.
- Areas of Particular Management Concern – these may include sensitive biological resources, critical infrastructure, 303(d) listed waterbodies, priority restoration areas or other locations or portions of the watershed that have particular management needs.
- Economic and social opportunities and constraints – comprehensive watershed management includes consideration of opportunities for improving community amenities associated with streams, economic redevelopment zones, etc. Details on this are beyond the scope of this paper, but emphasize the need to include planning agencies in the development of hydromodification management plans.

Substantial resources will be necessary to implement a watershed analysis approach; therefore, opportunities for joint funding and leveraging of resources should be vigorously pursued.

Watershed analysis will be challenging especially for smaller municipalities with limited resources or where their jurisdiction only encompasses a portion of the watershed. Substantial resources will be necessary to implement this approach; therefore, opportunities for joint funding and leveraging of resource should be vigorously pursued. A cooperative approach should replace the current fragmented efforts among regions and jurisdictions. Furthermore, the State and Regional Water Boards should support completion of these maps and common technical tools as the foundation for future hydromodification management actions.

3.5 Defining Management Objectives

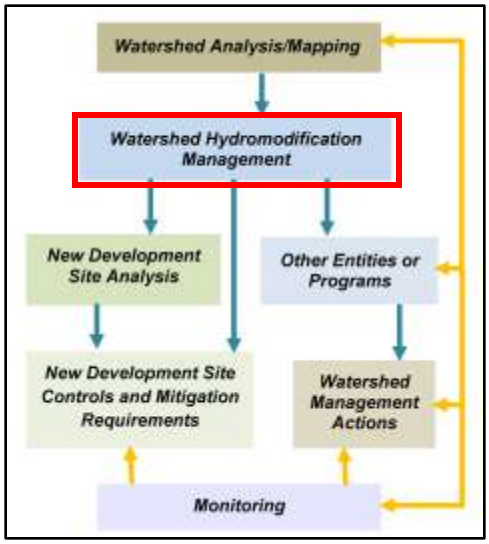

Results of the watershed analysis should be used to determine the most appropriate management actions for specific portions of the watershed. Management strategies should be tailored to meet the objectives, desired future conditions, and constraints of the specific channel reach being addressed.

Decisions should be based on considerations of areas suitable for specific ecosystem services, opportunities, and constraints as described above. Management objectives may be aimed at reducing effects of proposed future land use or mitigating for the effects of past land use, and they may apply to stream reaches or upland areas. Potential management objectives for specific stream reaches may include: protect, restore, or manage as a new channel form.

The specific manifestation of each of these strategies will differ by location, based on constraints of the stream, watershed plan objectives, etc. Decisions about appropriate objectives will need to consider current and future opportunities and constraints in upland, floodplain, and in-stream portions of the watershed. General definitions are provided below as a starting point for case-specific refinement.

Management strategies should be tailored to meet the objectives, desired future conditions, and constraints of the specific channel reach being addressed. Objectives for specific stream reaches may include:

- **Protect**
- **Restore**
- **Manage as a new channel form**

3.5.1 Protect

This approach consists of protecting the functions and services of relatively unimpacted streams in their current form through conservation and anti-degradation programs. This strategy should not be used if streams are degraded, or nearing thresholds of planform adjustment or changes in vegetation community. This strategy may apply following natural disturbances such as floods depending on the condition of the stream reach and the ability for natural rehabilitation to occur (due to how intact

watershed processes are). The goal of this strategy is not to create an artificial preserve (such as a created stream running through an urban park) but rather a naturally function river system. Fully channelized systems are not considered in this framework. Examples of specific actions include:

- Preserving intact channel systems through easements, restrictions, covenants, etc. This should be considered in the watershed context to ensure adequate connectivity with upstream and downstream reaches of similar condition, and to ensure that the watershed processes responsible for creating and maintaining instream conditions will persist.
- Providing appropriate space for channel processes to occur (e.g., floodplain connectivity).
- Establishing transitional riparian and upland buffer zones that are protected from encroachment by infrastructure or development.

3.5.2 Restore

There are many definitions of "restoration". For the purposes of this document, restoration is considered re-establishing the natural processes and characteristics of a stream. The process involves converting an unstable, altered, or degraded stream corridor, including adjacent riparian zone (buffers), uplands, and flood-prone areas, to a natural condition. In most cases, restoration plans should be based on a consideration of watershed processes and their ability to support a desired stream type. The watershed analysis discussed above should be used to determine how and where watershed process should be protected or restored in order to best support stream and stream-corridor restoration. This process should be based on a reference condition/reach for the valley type and includes restoring the appropriate geomorphic dimension (cross-section), pattern (sinuosity), and profile (channel slopes), as well as reestablishing the biological and chemical integrity, including physical processes such as transport of the water and sediment produced by the stream's watershed in order to achieve dynamic equilibrium. Design of restoration structural elements must be based on existing and anticipated upstream land uses, and reflect the modified hydrology resulting from these uses. Restoration should apply to streams that are already on a degradation trajectory where there is a reasonable expectation that a more stable equilibrium condition that reflects previously existing conditions can be recreated and maintained via some intervention. Creating a stream system that differs from "natural conditions" is not considered restoration. All elements of the "protection" strategy should also be included once the restoration actions are complete. Examples of specific actions include:

- Floodplain and in-stream measures that restore natural channel form consistent with current and/or anticipated hydrology and sediment yield. Examples include recontouring, biotechnical slope stabilization, soft-grade control features (e.g., woody debris).
- Revegetation of stream banks and beds, including removal of invasive species.
- Preserving intact channel systems through easements, restrictions, covenants, etc. This should be considered in the watershed context to ensure adequate connectivity with upstream and downstream reaches of similar pristine condition.

- Providing appropriate space for channel processes to occur (e.g. channel migration at allowable levels, floodplain connectivity, and development of self-sustaining riparian vegetation).
- Establishing transitional riparian and upland buffer zones that are protected from encroachment by infrastructure or development.

3.5.3 Manage as New Channel Form

Once a stream channel devolves far enough down the channel evolution sequence, it is extremely difficult to recover and restore without substantial investment of resources. If critical thresholds in key structural elements, such as planform or bank height, are surpassed, streams should be allowed to continue progressing toward a new stable equilibrium condition that is consistent with the current setting and watershed forcing functions, if such progress does not pose a danger to property and infrastructure. Substantial alteration of flow or sediment discharge, slope or floodplain width may make it improbable that a stream can be restored to its previous condition. In such circumstances, it may be preferable to determine appropriate channel form given expected future conditions and "recreate" a new channel to match the appropriate equilibrium state under future conditions. For example, a multi-thread braided system may not be the appropriate planform based on new runoff and sediment pattern; instead, a single-thread channel or step-pool structure may be a more appropriate target. Examples of specific actions include:

- In-channel recontouring or reconstruction of channel form.
- Floodplain recontouring or reconstruction that improves connectivity with the channel.
- In extreme circumstances based on channel condition, position in the watershed, etc. this may involve hardening portions of the channel and focusing "mitigation" measures at off-site measures at a different part of the watershed. Off-site mitigation can be informed by "hydromodification risk mapping".
- Re-establishing longitudinal connectivity for sediment transport and ecological linkages.
- Preserving intact channel systems through easements, restrictions, covenants, etc. This should be considered in the watershed context to ensure adequate connectivity with upstream and downstream reaches of similar pristine condition.
- Providing appropriate space for channel processes to occur (e.g. floodplain connectivity).
- Establishing transitional riparian and upland buffer zones that are protected from encroachment by infrastructure or development.

Several authors have previously noted that in urban systems, natural channel state often can no longer be sustained under changed hydrological conditions. Thus, different management goals are probably appropriate for watersheds at varying stages of development (Booth, 2005) and at varying degrees of adjustment (Chin and Gregory 2005). In this context, identifying which channels are suitable for

protection, restoration, or alternative channel form can be used to guide restoration and management efforts (Booth *et al.* 2004).

Upland objectives should be established to support management objectives for stream reaches. These objectives will have direct implications and will influence site-specific control requirements (discussed below). Potential management objectives for upland areas may include:

- *Conserve open space for infiltration*: Infiltration reduces the magnitude and duration of runoff to the stream channel and allows flow to re-enter the stream through diffuse overland flow, shallow subsurface flow, or groundwater recharge. This in turn reduces the work (energy) on the channel bed and banks and helps promote stability.
- *Conserve open space for stream buffers*: Buffers allow many of the same infiltration processes discussed above to occur. In addition, they provide space for channel migration and overbank flow, both of which function to reduce energy and allow the channel to better withstand potentially erosive forces associated with high flow events.
- *Conserve open space for coarse sediment production*: Course sediment functions to naturally armor the stream bed and reduce the erosive forces associated with high flows. Absence of coarse sediment often results in erosion of in-channel substrate during high flows. In addition, coarse sediment contributes to formation of in-channel habitats necessary to support native flora and fauna.
- *Encourage development on poorly-infiltrating soils*: The difference between pre and post development runoff patterns is less when development occurs on soils that have low infiltration rates and functioned somewhat like paved surfaces. Focusing development on these areas reduces changes in hydrology associated with transition to developed land uses.
- *Encourage urban infill*: Urban infill reduces the effect on watershed processes by concentrating development on previously impacted areas. This reduces disruption of hydrology and sediment process compared to developing on open space or other natural areas.

3.6 Selecting Appropriate Management Objectives

The combination of expected force acting on the stream channel (in terms of higher flow and less sediment) and estimated resistance (in the form of channel and floodplain condition) can be used to inform selection of an appropriate management objective for a specific stream reach, as shown in Figure 3-3. This figure represents a conceptual approach to selecting appropriate management objectives, in which modifications to runoff and sediment are compared against stream reach conditions. By weighing these factors within the context of watershed opportunities, constraints and resources, management objectives and specific actions can be determined. More complete decision support systems or guidance will need to be developed for individual

Selection of appropriate management objectives should consider changes to runoff and sediment, and existing stream reach conditions, within the context of watershed opportunities, constraints and resources.

hydromodification management plans that account for other considerations such as upstream and downstream conditions, cost, infrastructure constraints, availability of floodplain area for restoration, presence of downstream sensitive resources, etc. All decisions should be made in the context of the watershed position of a project site relative to existing opportunities and constraints as discussed above.

A number of tools are available to be used in conjunction with watershed mapping to inform this prioritization process. For example, GLU mapping (Booth *et al.* 2010) and hydromodification risk mapping can be used to assign high, medium or low ratings to watershed resistance (i.e., susceptibility to change). Similarly, field based tools such as the hydromodification screening tool (Bledsoe *et al.* 2010) or European tools such as Fluvial Audit or River Habitat Survey can be used to assign a rating of high, medium or low at the reach scale. In addition to geomorphic assessments, habitat assessments such as the California Rapid Assessment Method (CRAM; Collins *et al.* 2008) or biological evaluations via an index of biotic integrity (IBI; e.g., Ode *et al.* 2005) should be used as measures of biological condition to provide a more complete stream assessment. The next section provides an overview of hydromodification assessment and prediction tools, as well as further details on specific tools to support the selection of management objectives.

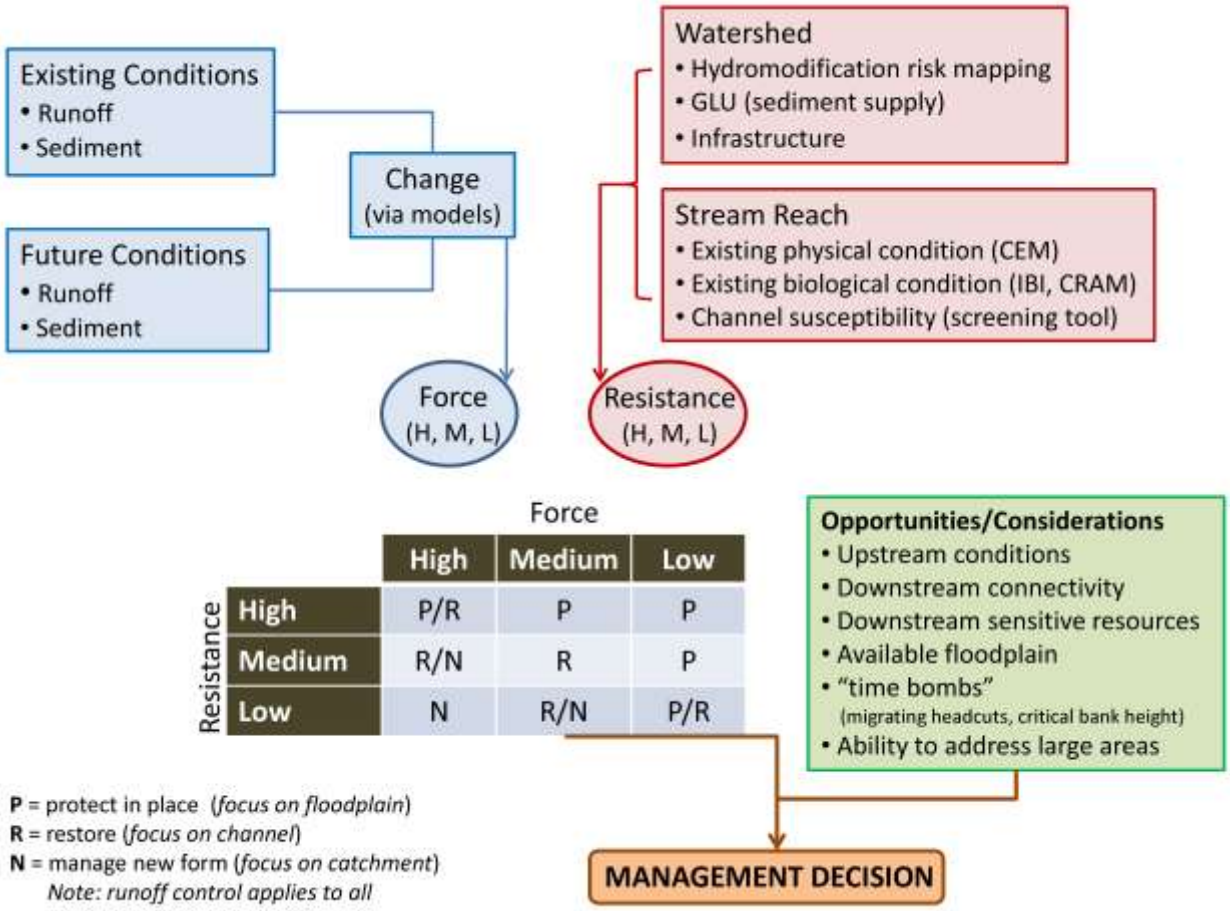

Figure 3-3: Example of a hydromodification management decision-making process.

3.7 Framework for Determining Site-Specific Control Requirements

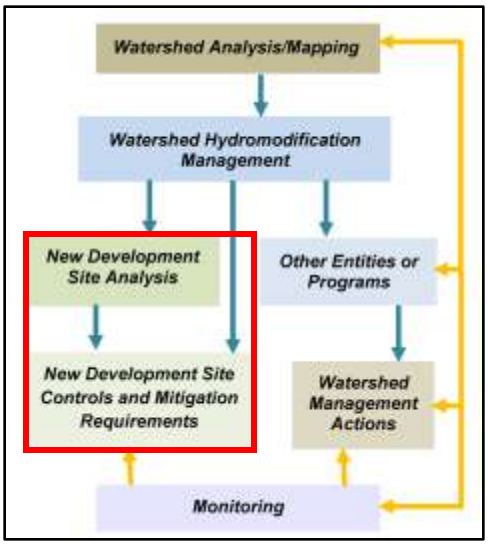

Once the watershed analysis is complete and opportunities, constraints and management objectives have been identified for both upland areas and stream reaches, a framework should be developed for site-specific project analyses and control requirements. The level of detail required for the analysis of proposed projects should be based on a combination of factors including project size, location within the watershed, and point of discharge to receiving waterbody.

The HMP should specify how these factors will be evaluated within the context of the identified management objectives to determine analysis requirements. The HMP should also ideally contain scalable BMP designs (based on conservative assumptions and consistent with prevailing watershed conditions) that can be applied by small projects where appropriate to avoid overly burdensome requirements for site-specific analysis. The framework should include the following components:

- A set of standard on-site management measures/BMPs that should apply to all projects; no projects should be exempted from these measures as they will have broader water quality benefits beyond helping to control the effects of hydromodification. These management actions consist of reducing the effects of urbanization on catchment runoff and sediment yield. On-site management measures should attempt to reduce excess runoff, maintain coarse sediment yield (if possible) and provide for appropriate discharge to receiving streams to support in-stream biological resources. In some cases, common features or facilities may be able to accommodate these objectives. In other cases, separate features or facilities will be necessary to deal with distinct objectives. On-site measures should ***generally be applied in all cases*** as allowed by site-specific geotechnical constraints, with specific management practices informed by the watershed processes most important at particular locations in the watershed, as well as by the nature of downstream receiving waters:
    - Low impact development (LID) practices.
    - Disconnecting impervious cover through infiltration, interception, and diversion.
    - Coarse sediment bypass through avoidance of sediment yield areas or measures that allow coarse sediment to be discharged to the receiving stream.
    - Flow-duration control basins to reduce runoff below a threshold value.

- Specification of the level of analysis detail and design requirements for the project, depending on project location, discharge point, and project size. Levels of analysis and design requirements may include:
    - Application of scalable, standardized designs for flow control based on site-specific soil type and drainage design. The assumptions used to develop these scalable designs should be conservative, to account for loss of sediment and uncertainties in the analysis and our understanding of stream impacts.
    - Use of an erosion potential metric, based on long-term flow duration analysis and in-stream hydraulic calculations. Guidelines should specify stream reaches where in-stream controls would and would not be allowed to augment on-site flow control.
    - Implementation of more detailed hydraulic modeling for projects of significant size or that discharge to reaches of special concern to understand the interaction of sediment supply and flow changes.
    - Analysis of the water-balance for projects discharging into streams with sensitive habitat. This may include establishment of requirements for matching metrics such as number of days with flow based on the needs of species present.
- Guidelines for prioritization of on-site or regional flow and sediment control facilities. Watershed analysis will help identify opportunities for regional flow or sediment control facilities, which may help to mitigate for existing hydromodification impacts.

Appendix A provides detailed guidance on the appropriate application of tools to meet site control requirements.

3.8 Off-site Compensatory Mitigation Measures

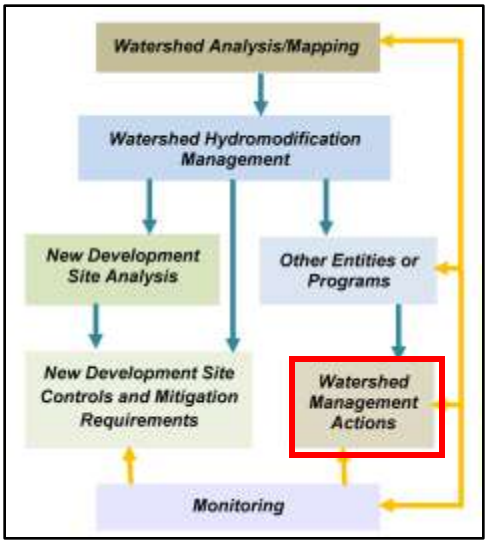

In some cases, on-site control of water and sediment will not be sufficient to offset the effects of hydromodification on receiving waters. In these cases, off-site compensatory mitigation measures will be necessary (similar to the concepts used in the Section 401/404 permitting programs). Off-site measures could be implemented by project proponents or through the use of regional mitigation banks or in-lieu fee programs.

Off-site mitigation may be necessary for several reasons:

- Off-site measures may be more effective at addressing effects or at achieving desired management goals. This may be particularly true for sites near the bottom of a watershed where upstream measures may be preferred

- Off-site measures may be necessary to supply compensation for residual project impacts where on-site measures are limited by site constraints or solutions are beyond the scope of what can be accomplished on an individual site.
- Off-site measures may be necessary where accomplishing specified management objectives is not practical using on-site measures alone. Off-site measures may be desired to remedy legacy effects of prior land use or to achieve desired beneficial uses.

Performance monitoring and adaptive management must be a part of compensatory mitigation given its inherent uncertainty.

The location and type of mitigation should be determined in the context of the watershed analysis and should account for the size and nature of the impact, location in the watershed, pre-existing conditions in the watershed, and uncertainty associated with the success of the proposed mitigation actions. In some cases these measures may be near the project site (e.g., restoring a stream reach downstream of the project site), but in other cases the off-site mitigation may be in the form of in-lieu fee or "mitigation bank" type contributions to a project located in a different portion of the watershed (e.g. upstream grade control, protection of sediment source areas). Such off-site mitigation relatively far from the site will only be possible if conducted in the context of an overall watershed plan, as discussed above. Off-site measures may include:

In cases where on-site control of water and sediment will not be sufficient to offset the effects of hydromodification on receiving waters, off-site compensatory mitigation measures will be necessary. Implementation of this approach will require that the State Water Board develop a valuation method to help determine appropriate off-site mitigation requirements in light of the anticipated impacts of hydromodification on receiving streams.

- Stream corridor restoration
- Purchase, restoration and protection of floodplain/floodway habitat
- Purchase and/or protection of critical sediment source or transport areas
- Regional basins or other retention facilities
- Upstream or downstream natural/bio-engineered grade control
- Retrofit or repair of currently undersized structures (e.g. culverts, bridge crossings)
- Removal or hydrologically disconnecting impervious surfaces

A valuation method will be necessary for assigning appropriate mitigation requirements in light of the anticipated impacts of hydromodification on receiving streams. The valuation method should be developed by the State Water Board.

To support the management approaches discussed above, HMPs should provide general guidance for application of models and other tools based on the questions being asked and the desired outcomes of

the HMP. Models can also be used to help communicate levels of uncertainty in particular management actions and to guide restoration / in-channel management actions. Modeling and other tools are discussed in detail in Section 4 and Appendices A and B.

Management endpoints should articulate the desired physical and biological conditions for various reaches or portions of the watershed. To the extent possible, these desired conditions should be expressed in numeric, quantifiable terms to avoid ambiguity.

Finally, management endpoints should articulate the desired physical and biological conditions for various reaches or portions of the watershed. To the extent possible, these desired conditions should be expressed in numeric, quantifiable terms to avoid ambiguity. Additionally, since regulatory strategies will invariably rely on quantifiable measures to determine whether stormwater management actions achieve these desired conditions, identifying appropriate numeric objectives will support determinations of regulatory compliance. As desired physical and biological watershed conditions are expressed in quantifiable terms to the extent possible, a similar need would apply to site control requirements. Control measures should be linked to, a) a desired condition (or goal), b) the parameter(s) that best define that condition, and c) quantifiable measures that serve to evaluate performance of the control measure. Direct measures (e.g., volume of runoff to be retained) as well as indirect or surrogate measures (IBI scores) are appropriate if they are quantifiable.

4. Overview of Assessment and Prediction Tools

4.1 Introduction

The previous section discussed a number of potential actions for managing hydromodification impacts. These ranged from high-level watershed-scale characterization to the site-specific design of a proposed development. This section provides an overview of the current and emerging assessment and prediction tools available to inform these management actions. An organizing framework helps explain the appropriate application of these tools, as well as their strengths and weaknesses. Specific tools that support the selection of management objectives are also discussed. Examples of "suites" of tools that are commonly used together to predict stream responses and formulate management prescriptions for channels of varying susceptibility are presented in Appendix B. Appendix A provides detailed guidance on the appropriate application of tools to meet site control requirements.

Municipalities are the primary audience for this section, as they select and incorporate these tools into their HMPs. However, the State and Regional Water Boards should be aware of the overall capabilities, appropriate uses, and gaps in our current toolbox. The development of new and improved tools should ideally be coordinated at the State level for optimum cost effectiveness and widest applicability. The table below identifies the key actions necessary at both the programmatic and local level to address the considerations discussed above, within the context of the goals of the framework described in Section 3.

Table 4-1. Recommendations for the application and improvement of tools in support of the proposed management framework.

Time Frame	Programmatic: State and Regional Water Boards	Local: City and County Jurisdictions
Short-term (<10 years)	• Develop quality control and standardization for continuous simulation modeling • Perform additional testing and demonstration of probabilistic modeling for geomorphic response • Pursue development of biologically- and physically-based compliance endpoints	• Work cooperatively with adjacent jurisdictions to implement hydromodification risk mapping at the watershed scale • Implement continuous simulation modeling for project impact analysis
Long-term (1+ decades)	• Improve tools for sediment analysis and develop tools for sediment mitigation design • Develop tools for biological response prediction • Improve tools for geomorphic response prediction	• Expand use of probabilistic and statistical modeling for geomorphic response • Apply biological tools for predicting and evaluating waterbody condition

4.2 Background

In the context of hydromodification, tools and models are typically used to help answer one or more of the following questions involving an assessment of natural and human influences at various spatial and temporal scales:

- How does the stream work in its watershed context?
- Where is the stream going? For example, have past human actions induced channel changes? What are the effects on sediment transport and channel form? What is the magnitude of current and potential channel incision following land use conversion?
- How will the stream likely respond to alterations in runoff and sediment supply?
- How can we manage hydromodification and simultaneously improve the state of the stream?

Previous sections have underscored the variability and complexity of relationships among land use, the hydrologic cycle, and the physical and ecological conditions of stream systems. It follows that the process of assessing stream condition and predicting future conditions is highly challenging and subject to uncertainty. Therefore it is important to understand the inherent strengths and limitations of the available tools, especially with respect to prediction uncertainty and how it is expressed for various tools. Considerable judgment is needed to choose the appropriate model for the question at hand. In addition to prediction uncertainty, considerations in choosing the right model for a particular application include appropriate spatial and temporal detail, cost of calibration and testing, meaningful outputs, and simplicity in application and understanding (NRC 2001; Reckhow 1999a,b).

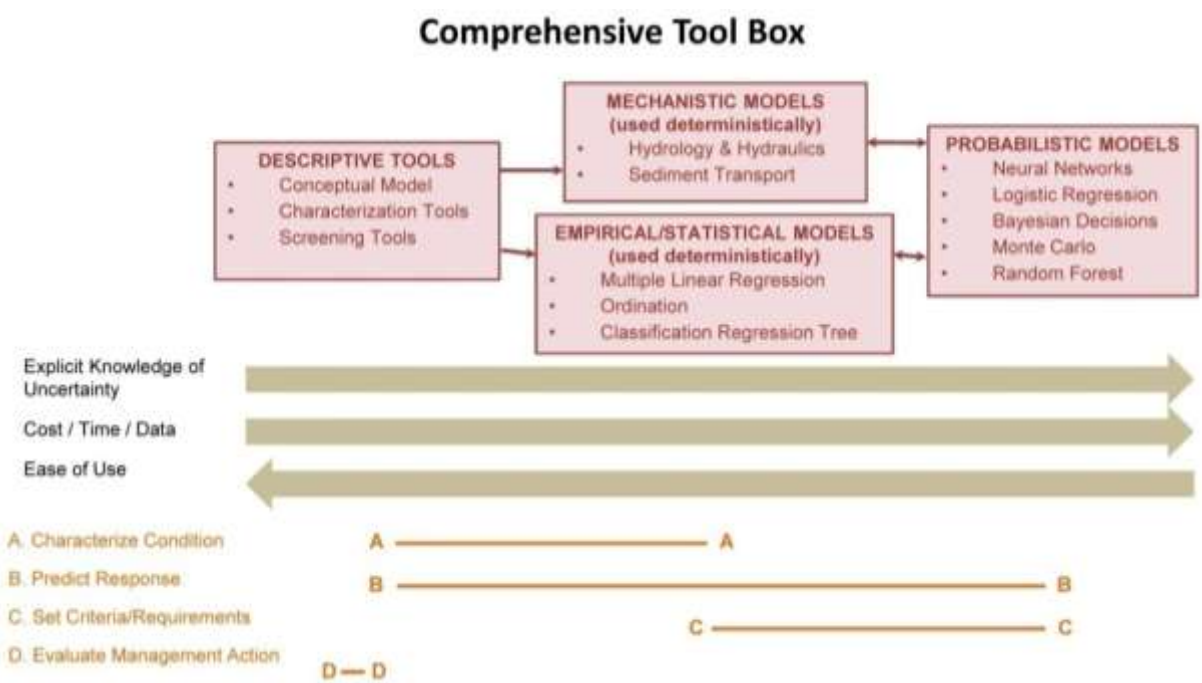

Figure 4-1. Organizing Framework for understanding hydromodification assessment and management tools.

4.3 Organizing Framework

Figure 4-1 presents an organizing framework by which to understand the available tools that may be applied in support of hydromodification management and policy development. Tools fall into three major categories: descriptive tools, mechanistic and empirical/statistical models that are used deterministically, and probabilistic models/predictive assessments with explicitly quantified uncertainty. The organizing framework relates these categories to the types of question the tools are designed to answer, specifically: characterization of stream condition, prediction of response, establishment of criteria/requirements, or evaluation of management actions. The framework also characterizes the tools according to the following features: intensity of resource requirements (i.e., data, time, cost), and the extent to which uncertainty is explicitly addressed. Subsequent sections of this section discuss each of the three major categories in turn, highlighting examples of specific tools within each category.

Given the uncertainty associated with predicting hydromodification impacts, probabilistic models should be incorporated into analysis and design, particularly where resource values or potential consequences of impacts are high.

Tools required to support the management framework presented in Section 3 include watershed characterization and analysis tools and project analysis and design tools. The level of resolution that is required will depend on the point in the planning process. At early stages, descriptive tools will be sufficient, but more precise tools will be required toward the design phase. Currently, most projects rely solely on deterministic models. However, given the uncertainty associated with predicting hydromodification impacts, probabilistic models should be incorporated into analysis and design, particularly where resource values or potential consequences of impacts are high.

4.3.1 Descriptive Tools

Descriptive tools include conceptual models, screening tools, and characterization tools. These tools are used to answer the question: *What is the existing condition of a stream or watershed?* Although descriptive tools are not explicitly predictive, they can be used to assess levels of susceptibility to future stressors by correlation with relationships seen elsewhere. The application of some type of descriptive tool, such as a characterization tool, is almost always necessary before applying a deterministic model. In particular, descriptive tools can aid in understanding the key processes and boundary conditions that may need to be represented in more detailed models.

Conceptual Models. A conceptual model, in the context of river systems, is a written description or a simplified visual representation of the system being examined, such as the relationship between physical or ecological entities, or processes, and the stressors to which they may be exposed. Conceptual models have been used to describe processes in a wide range of physical and ecological fields of study, including stream-channel geomorphology (Bledsoe *et al.* 2008). For example, Channel Evolution Models (CEMs) are conceptual models which describe a series of morphological configurations of a channel, either as a longitudinal progression from the upper to the lower watershed, or as a series at a fixed location over time subsequent to a disturbance. The incised channel CEM developed by

Schumm *et al.* (1984) is one of the most widely known conceptual models within fluvial geomorphology. This CEM documents a sequence of five stages of adjustment and ultimate return to quasi-equilibrium that has been observed and validated in many regions and stream types (ASCE 1998, Simon and Rinaldi 2000). The Schumm *et al.* (1984) CEM has been modified for streams characteristic of southern California, including transitions from single-thread to multi-thread and braided evolutionary endpoints (Hawley et al., in press).

Conceptual models also include planform classifications of braided, meandering and straight, and other general geomorphic classifications, which categorize streams by metrics such as slope, sinuosity, width-to-depth ratio, and bed material size. The qualitative response model described by Lane's diagram (1955), and discussed earlier in this report, is also a conceptual model.

Characterization Tools. Examples of characterization tools include baseline geomorphic assessments, river habitat surveys, and fluvial audits. A fluvial audit uses contemporary field survey, historical map and documentary information and scientific literature resources to gain a comprehensive understanding of the river system and its watershed. Fluvial audits, along with watershed baseline surveys are a standardized basis for monitoring change in fluvial systems. These types of comprehensive assessments are comprised of numerous, more detailed field methodologies, such as morphologic surveys, discharge measurements, and estimates of boundary material critical shear strength through measurements of resistance (for cohesive sediments) or size. Baseline assessments may also draw on empirical relationships such as sediment supply estimation models.

Screening Tools. Screening tools can be used to predict the relative severity of morphologic and physical-habitat changes that may occur due to hydromodification, as a critical first step toward tailoring appropriate management strategies and mitigation measures to different geomorphic settings. However, assessing site-specific stream susceptibility to hydromodification is challenging for several reasons, including the existence of geomorphic thresholds and non-linear responses, spatial and temporal variability in channel boundary materials, time lags, historical legacies, and the large number of interrelated variables that can simultaneously respond to hydromodification (Schumm 1991, Trimble 1995, Richards and Lane 1997).

Screening tools can be used to predict the relative severity of morphologic and physical-habitat changes due to hydromodification, as a critical first step toward tailoring appropriate management strategies and mitigation measures to different geomorphic settings.

Despite the foregoing difficulties, the need for practical tools in stream management have prompted many efforts to develop qualitative or semi-quantitative methods for understanding the potential response trajectories of channels based on their current state. For example, predictors of channel planform can be used to identify pattern thresholds and the potential for planform shifts (e.g., van den Berg 1995, Bledsoe and Watson 2001, Kleinhans and van den Berg 2010).

In addition, regional CEMs (discussed above) can partially address the needs of the hydromodification management community by providing a valuable framework for interpreting past and present response trajectories, identifying the relative severity of potential response sequences, applying appropriate

models in estimating future channel changes, and developing strategies for mitigating the impacts of processes likely to dominate channel response in the future (Simon 1995).

More recent screening-level tools for assessing channel instability and response potential, especially in the context of managing bridge crossings and other infrastructure, have borrowed elements of the CEM approach and combined various descriptors of channel boundary conditions and resisting vs. erosive forces. For example, Simon and Downs (1995) and Johnson *et al.* (1999) developed rapid assessment techniques for alluvial channels based on diverse combinations of metrics describing bed material, CEM stage, existing bank erosion, vegetative resistance, and other controls on channel response. Although based on a strong conceptual foundation of the underlying mechanisms controlling channel form, these specific examples are either overly qualitative with respect to the key processes, or developed with goals and intended applications (e.g., evaluating potential impacts to existing infrastructure such as bridges or culverts) that differ from what is needed by current hydromodification management programs.

SCCWRP has recently proposed a general framework for developing screening-level tools that help assess channel susceptibility to hydromodification, and a new region-specific tool for rapid, field-based assessments in urbanizing watersheds of southern California (Booth *et al.* 2010, Bledsoe *et al.* 2010). The criteria used to assign susceptibility ratings are designed to be repeatable, transparent, and transferable to a wide variety of geomorphic contexts and stream types. The assessment tool is structured as a decision tree with a transparent, process-based flow of logic that yields four categorical susceptibility ratings through a combination of relatively simple but quantitative input parameters derived from both field and GIS data. The screening rating informs the level of data collection, modeling, and ultimate mitigation efforts that can be expected for a particular stream-segment type and geomorphic setting. The screening tool incorporates various measures of stream bed and bank erodibility, probabilistic thresholds of channel instability and bank failure based on regional field data, integration of rapid field assessments with desktop analyses, and separate ratings for channel susceptibility in vertical and lateral dimensions.

An example of a specific analysis component that predicts changes in post-development sediment delivery, and that can be applied within this screening tool framework, is a GIS-based catchment analyses of “Geomorphic Landscape Units” (GLUs). A GLU analysis integrates readily available data on geology, hillslope, and land cover to generate categories of relative sediment production under a watershed’s current configuration of land use. Those areas subject to future development are identified, and corresponding sediment-production levels are determined by substituting developed land cover for the original categories and reassessing the relative sediment production. The resultant maps can be used to aid in planning decisions by indicating areas where changes in land use will likely have the largest (or smallest) effect on sediment yield to receiving channels.

Effective screening tools for assessing the susceptibility of streams to hydromodification necessarily rely on both field and office-based elements to examine local characteristics within their broader watershed context. Proactive mapping of flow energy measures (e.g., specific stream power) throughout drainage networks has the potential to complement field-based assessments in identifying hotspots for channel

instability and sediment discontinuities as streamflows change with land use. Such analyses may partially guide subsequent field reconnaissance; however, this approach also has limitations in that some geomorphic settings are inherently difficult to map using widely available digital elevation data. In particular, maps of stream power in narrow entrenched valleys and low gradient valleys (ca. <1%) with sinuous channels should be carefully field-truthed and used with a level of caution commensurate with the accuracy of the input data.

Moreover, spatial variability in channel boundary materials and form cannot be accurately mapped at present using remotely sensed data. Thus, boundary materials and channel width are typically assumed in watershed-scale mapping efforts, thereby introducing potential inaccuracies. Coupling desktop analysis with a field-based assessment when using such an approach can help resolve variation in site-specific features such as the erodibility of bed and bank materials, channel width, entrenchment, grade control features, and proximity to geomorphic thresholds.

4.3.2 Mechanistic and Empirical/Statistical Models with Deterministic Outputs

Mechanistic/deterministic models are simplified mathematical representations of a system based on physical laws and relationships (*link to next*). Empirical/statistical models use observed input and output data to develop relationships among independent and dependent variables. Statistical analyses determine the extent to which variation in output can be explained by input variables. Both types of models are typically used to generate a single output or answer for a given set of inputs. These tools can be used to help answer such questions as: *What are the expected responses in the stream and watershed given some future conditions? What criteria should be set to prevent future hydromodification impacts?* However, hydromodification modeling embodies substantial uncertainties in terms of both the forcing processes and the stream response. Deterministic representations of processes and responses can therefore mask uncertainties and be misleadingly precise, unless prediction uncertainty is explicitly characterized as described later in this section.

Although valuable, deterministic representations (such as those derived from continuous simulation modeling) of processes and responses can mask uncertainties and be misleadingly precise unless prediction uncertainty is explicitly characterized.

Hydrologic Models are used to simulate watershed hydrologic processes, including runoff and infiltration, using precipitation and other climate variables as inputs. Some models, such as the commonly-used HEC-HMS, can be run for either single-event simulations or in a continuous-simulation mode which tracks soil moisture over months or years. Other hydrologic models that are commonly used for event-based and continuous simulation modeling include HSPF and SWMM. It is widely accepted that continuous simulation modeling, rather than event-based modeling, is required to assess long term changes in geomorphically-significant flow events (Booth and Jackson 1997; Roesner *et al.* 2001).

Several HSPF-based continuous simulation models have been developed specifically for use in hydromodification planning. These include the Western Washington Hydrology Model (WWHM) and

the Bay Area Hydrology Model (BAHM). Hydromodification Management Plans (HMPs) in Contra Costa County, San Diego County and Sacramento County have developed sizing calculators for BMPs based on modeling done using HSPF models. To illustrate the point about uncertainly in mechanistic models, HSPF contains approximately 80 parameters, only about 8 of which are commonly adjusted as part of the calibration process.

Hydraulic Models are used to simulate water-surface profiles, shear stresses, stream power values and other hydraulic characteristics generated by stream flow, using a geometric representation of channel segments. The industry standard hydraulic model is the HEC River Analysis System (HEC-RAS).

Coupled Hydrologic and Hydraulic Models represent a valuable tool in hydromodification management. Because the streamflow regime interacts with its geomorphic context to control physical habitat dynamics and biotic organization, it is often necessary to translate discharge characteristics into hydraulic variables that provide a more accurate physical description of the controls on channel erosion potential, habitat disturbance, and biological response. For example, a sustained discharge of 100 cfs could potentially result in significant incision in a small sand bed channel but have no appreciable effect on the form of a larger channel with a cobble bed. By converting a discharge value into a hydraulic variable (common choices are shear stress, or stream power per unit area of channel relative to bed sediment size), a “common currency” for managing erosion and associated effects can be established and applied across many streams in a region. Such a common currency can improve predictive accuracy across a range of stream types. As opposed to focusing on the shear stress or stream power characteristics of a single discharge, it is usually necessary to integrate the effects of hydromodification on such hydraulic variables over long simulated periods of time (on the order of decades) to fully assess the potential for stream channel changes. By using channel morphology to estimate hydraulic variables across a range of discharges, models like HEC-RAS provides a means of translating hydrologic outputs from continuous simulations in HEC-HMS, SWMM, or HSPF into distributions of shear stress and stream power across the full spectrum of flows.

Sediment Transport Models such as HEC-6T, the sediment transport module in HEC-RAS, CONCEPTS, MIKE 11 and FLUVIAL12, use sediment transport and supply relationships to simulate potential changes in channel morphology (mobile boundary) resulting from imbalances in sediment continuity. This means that hydraulic characteristics are calculated as channel form and cross-section evolve through erosion and deposition over time. Such models have high mechanistic detail but are often difficult to apply effectively. Although it is not a mobile boundary model, the SIAM (Sediment Impact Analysis Method) module in HEC-RAS represents an intermediate complexity model designed to predict sediment imbalances at the stream network scale and to describe likely zones of aggradation and degradation.

Statistical Models use descriptive tools and empirical data to develop relationships that quantify the risk of specific stream behaviors. For example, Hawley (2009) developed a statistical model to explain variance in channel enlargement based on measures of erosive energy and channel features such grade control and median bed sediment size. Such models often include independent variables based on input from the mechanistic models described above; however, a key difference is that statistical models do not explicitly represent actual physical processes in their mathematical structure. Instead, these models

simply express the observed correlations between dependent and independent variables. Like mechanistic models, the output from these models is commonly treated as precise results in management decisions, despite the fact that predictions from most statistical models could be readily (and more accurately) expressed in terms of confidence intervals with a range of uncertainty.

Probabilistic/Risk-based Models integrate many of the tools discussed above, using modeled changes in hydrology as input to hydraulic models, which in turn provide input to various types of statistical models to predict response. However, the predictions are not represented as deterministic outputs, instead, the range of (un)certainty in the likelihood of the predicted response is explicitly quantified. Although not commonly used for hydromodification management at this time, there are well established models based on these principals currently in use in other scientific disciplines. An example of a probabilistic approach that has been used for hydromodification management is a logistic regression analysis that was used to produce a threshold "erosion potential metric" that can be used to quantify the risk of a degraded channel state. More details on this approach are provided in Appendix B.

Risk-based modeling in urbanizing streams provides a more scientifically defensible alternative to standardization of stormwater controls across stream types, and can inform management decisions about acceptable levels of risk.

Risk-based modeling in urbanizing streams provides a more scientifically defensible alternative to standardization of stormwater controls across stream types. A probabilistic representation of possible outcomes also improves understanding of the uncertainty that is inherent in model predictions, and can inform management decisions about acceptable levels of risk.

Predictive Tools for Habitat Quality and Stream Biota. The tools discussed above focus on physical stream impacts; however, as discussed in the preceding chapter, it is recognized that maintenance of stream "stability" does not necessarily conserve habitat quality and biological potential. In general, the knowledge base for biota/habitat associations is not generally adequate to allow for prediction of how whole communities will change in response to environmental alterations associated with urbanization. Making such predictions deterministically requires a thorough knowledge of species-specific environmental responses, as well as an adequate (accurate) characterization of habitat structure and habitat dynamics (both of which are modified by urbanization). However, recent studies have demonstrated that the effects of hydrologic alterations induced by urbanization on selected stream biota can be quantitatively described without a full mechanistic understanding, using stressor-response type relationships and empirical correlations from field-measured conditions (Konrad and Booth 2005, Konrad *et al.* 2008, DeGasperi *et al.* 2009).

In moving beyond a narrow focus on linkages between flow alteration and channel instability, scientific understanding of hydrologic controls on stream ecosystems has recently led to new approaches for assessing the ecological implications of hydromodification. The essential steps in developing quantitative "flow-ecology relationships" have been recently described in the Ecological Limits of Hydrologic Alteration (ELOHA) process (Poff *et al.* 2010), a synthesis of a number of existing hydrologic techniques and environmental flow methods. ELOHA provides a regional framework for elucidating the

key hydrologic influences on biota of interest, and translating that understanding into relationships between hydromodification and biological endpoints that can be used in management decision making. This requires a foundation of hydrologic data provided by modeling and/or monitoring, and sufficient biological data across regional gradients of hydromodification. Although hydrologic–ecological response relationships may be confounded to some extent by factors such as chemical and thermal stressors, there are numerous case studies from the US and abroad in which stakeholders and decision-makers reached consensus in defining regional flow standards for conservation of stream biota and ecological restoration (Poff *et al.* 2010; http://conserveonline.org/workspaces/eloha).

4.3.3 Strengths, Limitations and Uncertainties

The Organizing Framework shown in Figure 4-1 shows the applicability of the three major categories of tools in support of various management actions. This section addresses a range of issues relating to strengths, limitations and uncertainty of the tools discussed above. Detailed analysis of individual models is beyond the scope of this document, but EPA/600/R-05/149 (2005) contains an extensive comparison of functions and features across a wide range of hydrologic and hydraulic models.

Explicit consideration, quantification, and gradual reduction of model uncertainty will be necessary to advance hydromodification management.

The uncertainty inherent to hydromodification modeling underscores the need for carefully designed monitoring and adaptive management programs.

General Considerations. The well-known statistician George Box famously said that "all models are wrong, some are useful." The usefulness of a model for a particular application depends on many factors including prediction accuracy, spatial and temporal detail, cost of calibration and testing, meaningful outputs, and simplicity in application and understanding. There is no cookbook for selecting models with an optimal balance of these characteristics. Models of stream response to land-use change will always be imperfect representations of reality with associated uncertainty in their predictions. In addition to the prediction errors of standard hydrologic models, common limitations and sources of uncertainties include insufficient spatial and/or temporal resolution, and poorly known parameters and boundary conditions. Ultimately, the focus of scientific study in support of decision making should be on the decisions (or objectives) associated with the resource and not on the model or basic science. Each model has limitations in terms of its utility in addressing decisions and objectives of primary concern to stakeholders. Prediction error, not perception of mechanistic correctness, should be the most important criterion reflecting the usefulness of a model (NRC 2001; Reckhow 1999a,b). The predictive models discussed above may be thought of as predictive scientific assessments; that is, a flexible, changeable mix of small mechanistic models, statistical analyses, and expert scientific judgment.

Region-Specific Considerations. Because all models are vulnerable to improper specification and omission of significant processes, caution must be exercised in transferring existing models to new

regional conditions. For example, mobile boundary hydraulic models are mechanistically detailed but not generally well-suited to many southern California streams given the prevalence of near-supercritical flow, braiding and split flow (Dust 2009). In addition, bed armoring and channel widening resulting from both fluvial erosion and mass wasting processes are key influences on channel response in semi-arid environments. These processes are not well-represented and constrained in current mobile boundary models. Accordingly, the appropriateness of existing models for addressing a particular hydromodification management question should be empirically tested and supported with regionally appropriate data from diverse stream settings.

Managing Uncertainty. To date, hydromodification management has generally relied on oversimplified models or deterministic outputs from numerical models that consume considerable resources but yield highly uncertain predictions that can be difficult to apply in management decisions. Numerical models are nevertheless an important part of the hydromodification toolbox, especially in characterizing rainfall-response over decades of land-use change. It is challenging to rigorously quantify the prediction accuracy of these mechanistic numerical models; however, their utility of can be enhanced by addressing prediction uncertainties in number of ways (Cui *et al.* 2011). Candidate models can be subjected to sensitivity analysis to understand their relative efficacy for assessment and prediction of hydromodification effects. Moreover, it should also be demonstrated that selected models can reasonably reproduce background conditions before they are applied in predicting the future. Modeling results that are used in relative comparisons of outcomes are generally much more reliable than predictions of absolute magnitudes of response.

Hydromodification modeling embodies substantial uncertainties in terms of both the forcing processes and stream response. Deterministic representations of processes and responses can mask uncertainties and can be misleading unless prediction uncertainty is explicitly quantified. Errors may be transferred and compounded through coupled hydrologic, geomorphic, and biologic models. Accordingly, explicit consideration, quantification, and gradual reduction of model uncertainty will be necessary to advance hydromodification management. This points to two basic needs. First, there is a need to develop more robust probabilistic modeling approaches that can be systematically updated and refined as knowledge increases over time. Such approaches must be amenable to categorical inputs and outputs, as well as combining data from a mix of sources including mechanistic hydrology models, statistical models based on field surveys of stream characteristics, and expert judgment. Second, the uncertainty inherent to hydromodification modeling underscores the need for carefully designed monitoring and adaptive management programs, as discussed in Section 5.

A risked-based framework can provide a more rational and transparent basis for prediction and decision-making by explicitly recognizing uncertainty in both the reasoning about stream response and the quality of information used to drive the models. Prediction uncertainty can be quantified for any of the types of models described above; however, some types are more amenable to uncertainty analysis than others. For example, performing a Monte Carlo analysis of a coupled hydrologic-hydraulic model is a very demanding task. A simple sensitivity analysis of high, medium, and low values of plausible model parameters is much more tractable and still provides an improved understanding of the potential range of system responses. Such information can be subsequently integrated with other model outputs and

expert judgment into a probabilistic framework. For example, Bayesian probability network approaches can accommodate a mix of inputs from mechanistic and statistical models, and expert judgment to quantify the probability of categorical states of stream response. Such networks also provide an explicit quantification of uncertainty, and lend themselves to continual updating and refinement as information and knowledge increase over time. As such, they have many attractive features for hydromodification management, and are increasingly used in environmental modeling in support of water quality (Reckhow 1999a,b) and stream restoration decision-making (Stewart-Koster *et al.* 2010).

Sediment Supply. As described above, a reduction in sediment supply to a stream may result in instability and impacts, even if pre- and post-land use change flows are perfectly matched. Thus, there is a need to develop management approaches to protect stream channels when sediment supply is reduced, and to refine and simplify tools to support these approaches. This continues to prove challenging because, the effects of urban development on sediment supply in different geologic settings are not well understood and poorly represented in current models. As a starting point, models used to analyze development proposals that reduce sediment supply could be applied with more protective assumptions with respect to parameters and boundary conditions (inflowing sediment loads). Effects of altered sediment supply on stream response could be addressed in a probabilistic framework by adjusting conditional probabilities of stream states to reflect the influence of reductions in important sediment sources due to land use change.

5. MONITORING

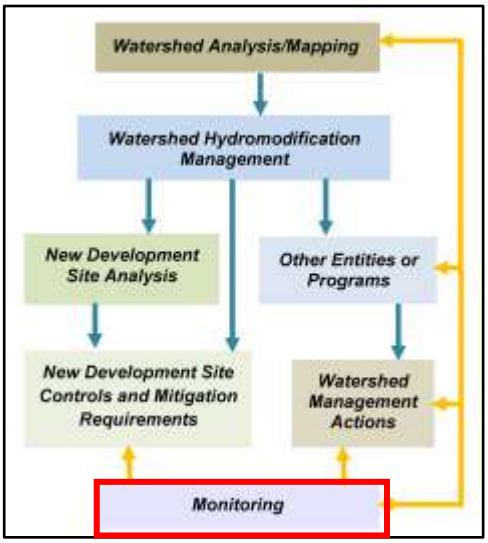

"Monitoring" can cover a tremendous range of activities in the context of stormwater management in general, and of hydromodification in particular. For example, the NPDES Phase 2 general permit for California (SWRCB, 2003 (*www.swrcb.ca.gov/**water**_issues/.../storm**water**/.../final_ms4_**permit**.p...)*, National Pollutant Discharge Elimination System (NPDES) General Permit No. CAS000004, p. 11) notes that the objectives of a monitoring program may include:

- Assessing compliance with the General Permit.
- Measuring and improving the effectiveness of stormwater management plans.
- Assessing the chemical, physical, and biological impacts on receiving waters resulting from urban runoff.
- Characterizing storm water discharges.
- Identifying sources of pollutants.
- Assessing the overall health and evaluating long-term trends in receiving water quality.

These objectives span multiple goals, ranging from verifying of compliance, evaluating effectiveness, characterizing existing conditions, and tracking changes over time. Each would likely require different monitoring methods, duration of measurement, and uses of the resulting data (Table 5-1). This variability emphasizes what we consider the key starting point of any monitoring program: to answer the questions, "What is the purpose of monitoring? How will the data be used?" Even secondary considerations can exert great influence over every aspect of the design of a monitoring program: "How quickly do you need to have an answer?" And, perhaps most influential of all, "What are the resources available to provide that answer?"

Table 5-1. The recommended purpose(s) of monitoring associated with hydromodification control plans, organized by the scale of implementation and the time frame in which useful results should be anticipated.

Time Frame	Programmatic: State and Regional Water Boards	Local: City and County Jurisdictions
Short-term (<10 years)	• Define the watershed context for local monitoring (at coarse scale) • Evaluate whether permit requirements are making positive improvements	• Evaluate whether specific projects/ regulations are meeting objectives • Identify the highest priority action(s) to take
Long-term (1+ decades)	• Define watershed context and setting benchmarks for local-scale monitoring (i.e., greater precision, if/as needed) • Demonstrate how permit requirements can improve receiving-water "health," state-wide (and change those requirements, as needed)	• Evaluate and demonstrate whether actions (on-site, instream, and watershed scale) are improving receiving-water conditions • Assess program cost-effectiveness • Identify any critical areas for resource protection

5.1 The Purpose of Monitoring

In the context of hydromodification assessment and management, we propose three interrelated purposes for monitoring that will guide the discussion and recommendations in this section:

- **Characterizing the conditions** of receiving waters downstream of urban development (including any trends in those conditions over time).
- **Evaluating the effectiveness** of hydromodification controls at protecting or improving the conditions of downstream receiving waters (and modify them, as needed).
- **Setting priorities** on the wide variety of hydromodification control practices, as promulgated by the State and Regional Boards and as implemented by local jurisdictions.

These needs give rise to several interrelated types of monitoring, all common to many watershed and stormwater monitoring programs. They are typically executed at different spatial and temporal scales, and if well-designed and executed they can collectively help guide management actions. We define them here, using terms and definitions that are common to the monitoring literature:

- **Performance monitoring,** by which is normally meant the evaluation of a particular stormwater facility relative to its intended (or designed) performance, but independent of whether that intended design is actually beneficial for downstream receiving waters.
- **Effectiveness monitoring,** by which we mean the assessment of how well specific management actions or suites of actions reduce or eliminate the direct impacts of stormwater on receiving waters. This type of monitoring can answer a question common to stormwater management: does a particular facility actually achieve its intended goal (e.g., flow releases from a stormwater facility protect the stream channel downstream from erosion)? More broadly, monitoring can evaluate the "effectiveness" of a suite of measures or an overall program designed to produce

beneficial outcomes (or avoid negative ones) in downstream receiving waters. In this context, the precise boundaries division between effectiveness monitoring and other types are blurry and unnecessarily artificial.

- **Trends monitoring,** by which we mean an integrative assessment of whether our "endpoint" indicators (physical, chemical, or biological) are showing any consistent, statistically significant change over time. Such monitoring rarely "proves" the direct impacts of a specific stressor on a receiving water, but it is critical to setting and evaluating progress towards integrative assessment endpoints at a regional scale. If well-designed, trend monitoring commonly provides useful information at smaller spatial scales as well, particularly in evaluating response to recent management actions or recovery from a prior disturbance.
- **Characterization monitoring**, by which is commonly meant the identification and (or) the quantification of various parameters in stormwater or a receiving-water body. Characterizing the condition of an outflow discharge or a water body at a particular time and place is always an outcome of the other kinds of monitoring; when it is called out as a goal in-and-of itself, however, it is can be useful to prioritize actions—but only if there is a preexisting standard for what constitutes a "good" or "acceptable" condition (also termed "status monitoring"), and a program to implement (or at least to set the priority for implementing) actions to improve the condition of waterbodies found to be "not good" or "unacceptable."

Without a context for evaluation, characterization monitoring is prone to generate large quantities of rarely used data. We strongly encourage that the purpose of any "characterization" monitoring be clearly articulated in hypothesis testing, priority setting, or systematic trend evaluation. As noted by NRC (2009, p. 508) with respect to this type of monitoring, "…monitoring under all three (NPDES municipal, industrial, and construction) stormwater permits is according to minimum requirements not founded in any particular objective or question. It therefore produces data that cannot be applied to any question that may be of importance to guide management programs, and it is entirely unrelated to the effects being produced in the receiving waters." We seek to proactively avoid this problem.

Monitoring should occur at two scales:

- **Regional or state-wide scale- this will require a time frame of one to several decades**
- **Local scale – this is required to evaluate the performance and effectiveness of specific management measures.**

In this sub-section, we focus our discussion on two interrelated scales at which these various types of monitoring should be applied as outlined in Table 5-1 at the beginning of this section. The first, which here and elsewhere in this document is termed "programmatic," has a regional or state-wide spatial scale; many of its key actions will require a time frame of one to several decades. Monitoring data from this scale should inform the broadly construed "health" of receiving waters to assess whether the range of hydromodification strategies being implemented is maintaining desired conditions across the (state-wide) range of physiography, climate, land-use change, and regulatory approaches of the regional boards. They should be used to identify particularly promising (or particularly ineffective) combinations of control strategies and landscape conditions. Finally, they should provide regionally tailored benchmarks for what constitutes "healthy

watersheds" and "healthy receiving waters" so regulators and permittees alike know what still needs to be done, where it should be done, and how urgently it needs to happen.

The second scale of monitoring data we term "local." It comprises the generation of monitoring data to evaluate the performance and effectiveness of specific management measures (be they structural or nonstructural) at reducing the negative consequences of hydromodification on downstream receiving waters. Useful information at this scale will normally be generated in the time frame of an NPDES permit cycle (i.e., ~5 years) and should provide direct guidance on whether the evaluated management strategies are working, need refinement, or should be abandoned altogether. They should also provide guidance on the degree to which management efforts should be prioritized where regulatory flexibility exists, given the conditions (and, perhaps, the potential responsiveness) of downstream receiving waters. Over longer time frames, monitoring at this scale can also provide public demonstration of the value of regulatory and programmatic efforts, and it can also help identify the most cost-effective mix of publically funded projects and regulatory protection to achieve (or maintain) receiving-water health.

5.2 Programmatic Monitoring at the Regional Scale

5.2.1 Defining Watershed Context

Although not "monitoring" in the strictest sense of this word, establishing a watershed context for the measurement and evaluation of receiving waters is a hallmark of virtually all recommended monitoring strategies (e.g., Beechie *et al.* 2010, Brierley *et al*. 2010). Monitoring programs should be consistent with the watershed perspective that forms the basis for the management framework discussed in Section 3. In California (as in most other states), this can only be executed at a supra-jurisdictional scale, because most watersheds cross one or more city and/or county boundaries. This presents the long-term challenge that many jurisdictions do not have authority over parts of the landscape that can affect the quality of rivers and streams that pass through their boundaries; more immediately, however, it makes an inclusive watershed assessment almost impossible to execute at a local level.

5.2.2 Determining the Effectiveness of Permit Requirements

A second, more challenging contextual need at the regional scale is the definition of thresholds or endpoints against which to compare the results of monitoring or modeling. Both of these "assessment tools" can guide the application of hydromodification control strategies, evaluate their real or likely success, and predict the consequences of hydromodification on downstream receiving waters. However, they provide little insight into the question, "how good is good enough?" Answering this question requires a definition of "assessment endpoints" (borrowing the term from NRC 1994), which in turn requires objective, quantifiable criteria for evaluating progress or outright success.

Most existing HMPs require the permitted municipalities to develop programs and policies to assess the potential effects of hydromodification associated with new development and redevelopment, to include management measures to control the effects of hydromodification, and to implement a monitoring program that assesses the effectiveness of HMP implementation at controlling and/or mitigating the

effects of hydromodification. Yet the appropriate objectives of such management measures, or a basis to evaluate success or failure of the HMP through monitoring data, are rarely provided in consort. Setting these endpoints is beyond the capacity of any but the largest municipalities—and even for those, neither the field of watershed science nor the arena of public policy is so clear that an unequivocally "correct" answer is likely to emerge without much additional work. Any such finding would also lack state-wide applicability; California is far too physically and ecologically diverse for an assessment endpoint developed in one part of the state to transfer everywhere without careful consideration.

For these reasons, we consider this aspect of monitoring at the regional scale to be a long-term, state-wide effort. This reflects the challenge of conducting meaningful characterization (or "status") monitoring: it requires a benchmark against which the measured condition can be compared, and to which an absolute rating ("good," bad," etc.) can be assigned.

In contrast, "trends" monitoring requires no such benchmark, only equivalent measurements undertaken at multiple times coupled with an understanding of what direction of change is desirable. For this reason, evaluating whether permit requirements are making positive improvements is a reasonable (and probably critical) short-term effort, one that can be conducted locally (see below). It should also be integrated and compiled at a regional level, however, the better to inform the continued development of hydromodification requirements.

5.3 Monitoring at the Local Scale

The needs of a monitoring program for local jurisdictions should complement those being satisfied at a regional scale. Showing net improvement is critical to maintaining support for regulatory actions and capital expenditures, but any monitoring program must reflect the typical constraints of showing rapid results while acknowledging constraints on staff resources and expertise (Scholz and Booth 2001). No less urgent is the need to identify what to do "next"—not necessarily establishing a multi-year capital improvement plan, but at least identifying key problems with one or two associated actions that would likely result in significant improvements in receiving-water conditions. Watershed characterization, as discussed above and applied to a specific jurisdiction, can provide useful guidance for such identification; even without it, local knowledge is commonly sufficient in-and-of itself. Targeted monitoring can normally confirm (or refute) such inferences in short order, which is why we place this monitoring application in the "short-term" category.

However, a monitoring program can also provide longer term guidance to local jurisdictions. When supported by the regional context of receiving-water conditions, local monitoring data can demonstrate trends over time that can lend support to (or indicate necessary changes to) hydromodification control plans. In combination with economic data, they can show long-term cost-effectiveness. Finally, site-specific monitoring data, when analyzed in the context of an appropriate scale of watershed characterization, can guide the stratification of less developed and undeveloped watershed areas into those where more assertive protection (or restoration) will be most worthwhile. None of these outcomes depend solely on collecting monitoring data, which is why none of them are presumed to be credible "short-term" applications of monitoring data. However, they have found expression in other

parts of the country having long-term monitoring efforts, and they should provide similar benefits to California as well.

5.4 Developing a Monitoring Plan

"Monitoring" the effects of a management action, whether it is a new regulation, a change in operational procedures, or a constructed project, is commonly included by design or required by regulation. The collection of monitoring data may be seen as a worthwhile activity in its own right, but this discussion uses a more restrictive, implementation-based definition: any "monitoring" needs to demonstrate a direct connection to management actions, such that the results of monitoring are translated into on-the-ground management actions (or changes in management actions). This focus on the *use* of monitoring data requires clear linkages between a management action, the uncertainties associated with that action, the ways in which the effects of that action are expressed (and can be measured) in the world, and the management changes that should be implemented if monitoring results provide unanticipated (or equivocal) resolution to those uncertainties. This is the basis for establishing an "adaptive management" approach to hydromodification monitoring, discussed in more detail in Appendix C. Here, we discuss the design of a monitoring program and outline the variety of measurements that can be made, under the assumption that the intended use(s) of the monitoring data have already been established.

"Stormwater management would benefit most substantially from a well-balanced monitoring program that encompasses chemical, biological, and physical parameters from outfalls to receiving waters" (NRC 2009, p. 257). In pursuit of a comprehensive monitoring program we might also add regular documentation of weather and climate conditions and land-cover changes. As a practical matter, however, monitoring at a site scale is almost never coordinated with other equivalent efforts at other locations, nor placed in a broader spatial context being developed as part of a regional effort. For monitoring data to have greatest value, however, such coordination and context-setting is needed.

Stormwater management would benefit most substantially from a well-balanced monitoring program that encompasses chemical, biological, and physical parameters… (NRC, 2009)

5.4.1 Design of a Monitoring Plan

As noted at the beginning of this section, the overarching question that must be asked and answered at the beginning of any monitoring design effort is "What is its purpose?" The considerations enumerated below cannot be addressed without an explicit answer to this question, because the outcome of those considerations will depend on how the data are to be used. For certain common application of monitoring data we suggest guidance that will be widely appropriate, but there are no recommendations in this section (or any other monitoring guidance document) that apply universally.

Multiple authors have condensed their guidance for designing a monitoring plan into a short list of steps that should precede the first instance of field data collection (e.g., Shaver *et al.* 2007). Although all

differ in details and intended audience, they share significant commonalities that can be distilled as follows:

- Articulate the purpose of the monitoring (the "management question").
- Identify key constraints, in particular the geographic range and scale over which the monitoring can occur, financial/staff resources available, and the time frame in which results must be generated.
- Evaluate existing information, model outputs, and/or regulatory requirements to identify promising metrics and specific sites appropriate to the management question.
- Identify the specifics of the monitoring plan: what parameter(s), where, for how often and for how long. This may include multiple iterations, wherein the guidance of Step 3 must align with the constraints of Step 2.

Most such guidance is written with site-specific, "local" monitoring in mind—the existing literature provides less direction for monitoring that is herein recommended to occur at a regional scale over the next one or more decades. However, the basic principles are the same at all scales: a coherent, explicit purpose needs to be articulated, resource constraints need to be acknowledged, and a credible strategy needs to be developed with its specifics fleshed out. Below we discuss some of the primary considerations in this last step, because they are common across a wide range of monitoring purposes, programmatic constraints, and indicator types.

5.4.2 Constraints (Step 2 of the Monitoring Plan)

Ideally, a monitoring program should be designed to detect trends, assess effectiveness and allow for source identification.

Scale. Ideally, a monitoring program should encompass multiple, nested scales of monitoring that are determined by the question(s) being addressed. For hydromodification applications, the broadest scale of monitoring is that of the integrated effect of stormwater impacts and stormwater management on receiving waters. *Trends monitoring* (and characterization monitoring, if regionally appropriate ranges of quality have been determined) addresses these questions, and it also allows stormwater and resource managers to measure the broad benefits obtained from management investments. Site-specific conditions normally cannot be traced back to specific generators of pollution (NRC 2009), and so monitoring at the broadest scales (i.e., many tens of square miles and larger) should not attempt to do so. Instead, identifying overall conditions and trends requires a broad spatial scale over long time frames (i.e., multiple years), the essence of trends monitoring. This level of effort is recommended as a regional responsibility, because the area(s) of interest will normally far exceed the geographic limits of any single jurisdiction.

If trends monitoring (or long-standing prior knowledge) indicates that there are impacts on beneficial uses, a second (and more site-specific) scale is invoked, that of *effectiveness monitoring:* which of our many stormwater-management actions are achieving the greatest reduction in downstream impacts

(and which are not)? On the whole, such stormwater control measures, both structural and nonstructural, vary by land use—the measures suitable for a residential neighborhood will likely be impractical or ineffective (or both) in an industrial setting. We therefore anticipate that most effectiveness monitoring will be stratified by land use and conducted by individual jurisdictions (see, for example, such an approach in the Nationwide Stormwater Quality Database, which contains water-quality data from more than 8600 events and 100 municipalities throughout the country).

The finest scale of monitoring is that of *source identification*, a form of characterization monitoring: what specific locations and which parts of the landscape generate stormwater of sufficiently deleterious quantity and (or) quality to cause impacts to beneficial uses, be they direct or indirect effects? This question is widely posed in stormwater management programs, and a number of existing monitoring programs seek to provide answers. The science of stormwater already suggests where the greatest attention is probably warranted (NRC 2009), namely a particular focus on areas of well-connected (or "effective") impervious area, high vehicular traffic, and exposure to toxic chemicals. We therefore suggest these categories should define areas of highest priority for this type of targeted investigation, allowing even a resource-constrained jurisdiction to conduct a useful, well-focused monitoring effort with good efficiencies.

Siting. Site selection is most commonly guided by the location of the management action being evaluated while dictated by more mundane considerations of property ownership and access logistics. In general, sites need to meet a few following basic criteria.

- Appropriate scale: the upstream area should be dominated by, or at least significantly affected by, the management action of interest.
- Responsiveness: at the chosen location, the parameters being measured should be amenable to change in response to the management action (e.g., monitoring for geomorphic change in a concrete channel is ill-advised).
- Representativeness: the results at the chosen location should be credibly extrapolated to "similar" sites, and those sites in aggregate should constitute a widespread (or otherwise important) subset of the landscape as a whole.
- Access: the site should be easily reached by the appropriate personnel and equipment, and with a cost of doing so consistent with the frequency of measurements being made. Any equipment left unattended needs to be secure (or well-hidden).

There are institutional considerations in site selection as well. Multiple programs implement monitoring or impose monitoring requirements, and coordination can provide mutual benefits and efficiencies to all. In particular, monitoring driven by management actions at a particular location (i.e., a local scale) will always benefit from information from one or more regional-scale reference sites that can characterize natural or background variability. Local studies will rarely have resources to execute such an effort themselves, again emphasizing the importance of a nested (and coordinated) hierarchy of monitoring programs.

Time and Variability. Evaluating the effectiveness of management actions requires a preliminary judgment of the time frame over which effects can be recognized. For water-quality parameters, storm-specific grab samples or continuous flow-weighted sampling has been most common; for changes in geomorphic form or in the population attributes of benthic macroinvertebrates, one-time annual sampling that presumes to integrate the effects of the past year are typical. Flow metrics are normally extracted from "continuous" (i.e., 5-, 15-, or 60-minute) measurements of discharge. However, every measurement has some degree of variability, a consequence of "natural" variability, measurement errors, and induced change (i.e., the effects of the management action we are trying to perceive). Separating these components is a matter of statistical analysis (see next section) based on repeated measurements, either in time or in space (or both).

We note that many practices common to past monitoring efforts, particularly the use of individual grab samples to characterize stormwater quality, have yielded results with little to no subsequent value: "…to use stormwater data for decision making in a scientifically defensible fashion, grab sampling should be abandoned as a credible stormwater sampling approach for virtually all applications" (NRC 2009, p. 330).

The duration of a monitoring program is commonly determined by the desire for "timely" answers, although normally the ability to generate statistically significant results is a function of the system being evaluated and the indicators being measured. This often creates a conflict between the intended "mission" of the monitoring program and its ability to produce defensible results, a conflict that can only be avoided by a design that identifies meaningful variables to measure, conducts sufficiently frequent measurements to dampen random variability, and must persist~~s~~ for long enough to allow a management "signal" to emerge from the data. This is the essence of the iteration noted above in Step 4 of monitoring-plan design above.

The monitoring program design must persist long enough to a allow management "signal" to emerge from the data. Consequently, long-term records (i.e., one to several decades) will be needed to detect all but the most dramatic of trends in biological indicators.

In one of relatively few quantitative studies of variability in biological indicators, Mazor *et al.* (2009) found that year-to-year variability for the same site sampled in the same season showed a variability (i.e., ±1σ) was typically about 10 points for a benthic IBI. With average scores for their 5 sites ranging from 28–51 (on a 100-point scale), this reflects a coefficient of variation of about 25%. Individual metrics were even more variable. This emphasizes that long-term records (i.e., one to several decades) will be needed to detect all but the most dramatic of trends in biological indicators.

The duration of monitoring also needs to capture the events that are most important to the anticipated responses of the measured system. For evaluating the effects of hydromodification, frequent storms (i.e., those that are normally expected to occur one to several times per year) are commonly judged important and their effects would normally be captured by a monitoring effort of even just one or a few years' duration. Particularly in more semi-arid regions of the state, however, significant channel-altering events may occur only after many decades of relative quiescence and stability, and noticeable (or documentable) response of streams to hydromodification may only occur under certain circumstances or following specific combination of events. Therefore, the lack of channel response on an annual basis

may not necessarily indicate that management actions are effective. Thus a long-term, ongoing monitoring effort is necessary to capture the responses to infrequent, stochastic events, but determining the likely duration of such a program requires some knowledge (or assumptions) of the critical drivers of those responses. It therefore requires a well-posed set of management questions underlying the monitoring effort as well.

For management questions concerning the effectiveness of hydromodification controls, monitoring will almost always benefit from long-term flow monitoring at multiple sites, especially those in the mid to upper watershed (and key tributaries, depending on the scale of the effort). Local rainfall measurements are nearly as essential, since flow data without rainfall data resolved at a similar spatial and temporal scale are useless at best, misleading at worst. Baseline (pre-project) monitoring normally is also invaluable. However, each of these elements will normally require some combination of a multi-scale, long-term, coordinated monitoring program with an investment of at least several years' duration in anticipation of (and follow-up after) a specific management action at a specific location. Despite the value for evaluating the effects of hydromodification (and hydromodification control efforts), such monitoring almost never occurs to this degree. To the extent this remains a practical constraint on implementation, the range of management questions needs to be commensurately narrowed as well.

Statistical Considerations. The statistical design of a monitoring program is beyond the scope of this section, because the range of possible requirements and approaches is tremendously broad. Several general principals are worth articulating, however, because they apply almost universally (and are commonly ignored):

- Although trends can be "suggested" by monitoring data, only statistically rigorous results can be offered as "proof." Thus, ignoring this dimension of monitoring program design severely limits future applicability of the results.
- Most natural parameters display high variability when measured outside a laboratory, and thus the magnitude of change caused by a management action also needs to be great before it can be recognized. There is a trade-off between the relative magnitude of change and the number of samples required to recognize it (i.e., large relative changes require fewer samples), but many monitoring efforts pay little attention to this basic fact. Where sampling can only occur during specified storm conditions or once during the same season each year, the duration of a monitoring campaign sufficient to detect even large changes in naturally variable parameters is likely to be a decade or longer. For many management applications, this is tantamount to generating no useful information at all (but is significantly more costly).
- The level of effort needed can be estimated *a priori* to help guide final monitoring design, but only if the degree of variability and the magnitude of change to be perceived are known or estimated ahead of time. One such example is given below, where the diagonal lines are labeled with the number of independent samples needed to achieve a typical level of statistical power for various combinations of permissible error from the "true" value (x axis), and the intrinsic variability in values across the population being measured (y axis) in Figure 5-1 below.

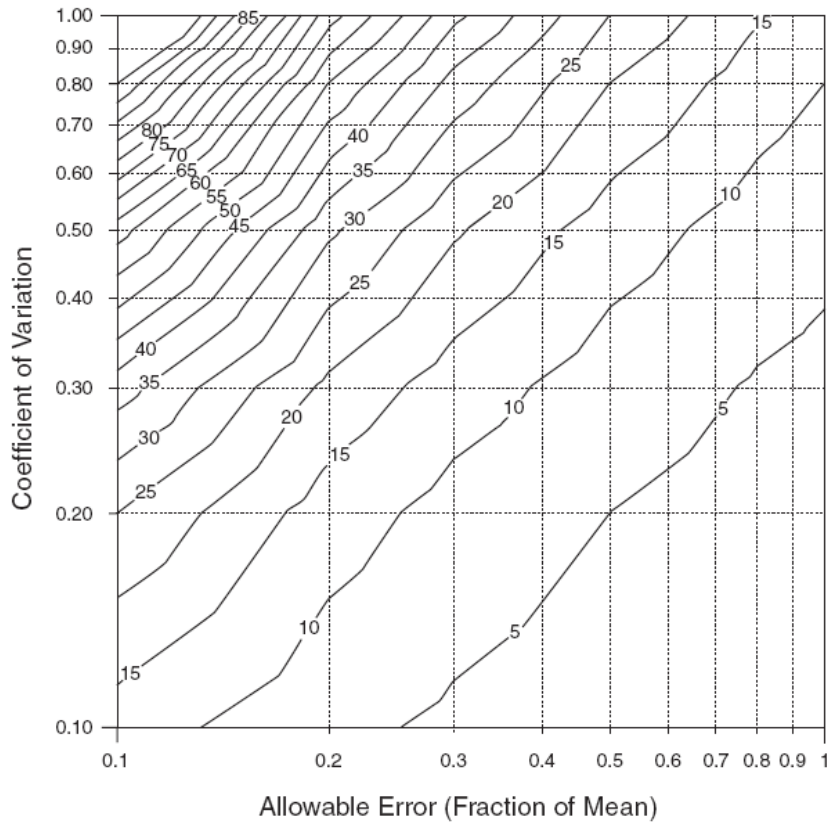

Figure 5-1. Sample requirements for confidence of 95% (α = 0.05) and power of 80% (β = 0.20). Figure from Pitt and Parmer 1995.

5.4.3 What to Monitor (Step 3 of the Monitoring Plan)

The choice of "what to monitor" follows from the choice of assessment endpoints, which in turn depends on the choice of management goals: for example, if "stable stream channels" is the intended outcome of an HMP, then measurement of the physical form of a channel over time would be appropriate. If diagnosing the cause of observed changes is also desired, then some evaluation of potential causal agents (e.g., hydrology, sediment input, or direct disturbance) would also be needed. Because management goals are now commonly (and appropriately) cast more broadly, however, they can embrace less clearly defined endpoints such as "watershed health" or "biological integrity." Many such endpoints fail the test of quantifiable objectivity.

However, these goals invoke a broad scope of concern, embracing not only physical stream conditions but also a range of chemical, hydrologic, and biological attributes. They encompass a broader catalog of receiving waters that may need to be evaluated. Finally, they emphasize the importance of looking more broadly to identify the cause of observed changes—both spatially, to conditions throughout a watershed that may have influence downstream; and temporally, to recognize ongoing adjustments to past disturbance (i.e., legacy effects) and to future environmental changes (e.g., climate change) that commonly lie well beyond the ability of local watershed managers to address. The imprecision of these

goals should not obscure the importance of broadening the scope of stormwater and hydromodification assessments to include not only the traditionally emphasized characterization of selected water-quality constituents and channel stability, but also more integrative measures.

These considerations suggest two broad categories of assessments, which largely but not entirely align with the two scales of implementation (i.e., "programmatic" and "local") defined in Table 4–1:

- Integrative: defining an overall level of "health" of the watershed, as expressed in the condition(s) of its receiving waters. Current scientific consensus suggests that biological indicators are best suited to this scale of evaluation (Karr and Chu 1999), insofar as they integrate the consequences of multiple stressors on aquatic systems and because many management goals (and regulatory requirements) are cast in biological terms. To be meaningful, however, any such indicators need to be suitably chosen and stratified for their particular geo-hydro-climatological region (e.g., "ecoregions"; Omernick and Bailey 1997).
- Targeted: demonstrating the achievement of an established regulatory standard or a designated threshold (typically, a measured or modeled pre-development condition) by a particular parameter, commonly one or more chemical constituents or a specific hydrologic metric of flow. This can be evaluated at the outfall of a single stormwater facility, at the discharge point for a site, or in the receiving water itself. Many of these thresholds are important in their own right—to protect human health, to preserve riparian property from erosion, to avoid flooding of previously non-inundated lands. However, they should be recognized as providing only one-dimensional views of a much broader system. Thus, targeted monitoring can supplement but should not replace more integrative measures.

Integrative assessment endpoints require multiple lines of evidence to characterize receiving-water conditions. At their most comprehensive, they should include measures of flow, geomorphic condition, chemistry, and biotic integrity (Griffith *et al.* 2005, Johnson and Hering 2009). However, biological criteria are generally key to integrative assessment: "In general, biological criteria are more closely related to the designated uses of waterbodies than are physical or chemical measurements" (NRC 2001, p. 8). In most applications, such assessments are compared to one or more reference sites where conditions have been independently judged as "excellent," or where human disturbance is minimal and so best-quality conditions are assumed.

Integrative assessment endpoints require multiple lines of evidence to characterize receiving-water conditions. At their most comprehensive, they should include measures of flow, geomorphic condition, chemistry, and biotic integrity.

The task of identifying and quantifying reference conditions in California streams is presently being carried out by the Reference Condition Management Program (RCMP) of the State Water Board's Surface Water Ambient Monitoring Program (SWAMP; see 2009 Recommendations). About 600 sites have been recognized by this program as "reference" based on having minimal human disturbance, and they have been geographically stratified into the 12 Level III ecoregions mapped for the state of California (by USEPA 2000). The metrics chosen to characterize their biologic conditions should provide an appropriate list for the evaluation of impaired (or potentially impaired) streams.

An equivalent set of reference sites and conditions for other receiving-water types does not presently exist. California also presently lacks a systematic basis for defining relative categories of "poor," "fair," "good," or "excellent" based on numeric values of biological indicators, such as exists in parts of the Pacific Northwest. Several regions, however, now have multimetric biological indicators with defined reference conditions (see below).

Elsewhere, however, there is as yet no context for setting assessment endpoints for biological indicators in California receiving waters. Such an effort is in progress, at least for streams, and its eventual completion to support the management application of more local monitoring results is a key recommendation of this report. Biological assessment endpoints will need to be established region by region on an as-needed basis; in the interim, locally collected data can be very useful for trend monitoring of receiving water but not for defining existing levels of "health."

5.4.3.1 An Example from Washington State

The Puget Sound region of western Washington State provides an instructive example for identifying indicators and establishing desired assessment endpoints. Multiple agencies over the last two decades have sought to measure the overall ecological health of the region and to define targets for recovery. Following the most recent three-year process, the lead agency for the current effort released its set of 20 "dashboard indicators" designed both to express scientific understanding of conditions needed for ecological health and to communicate that understanding in a public-accessible manner (http://www.psp.wa.gov/pm_dashboard.php; accessed September 5, 2011). They cover physical, chemical, and biological indicators: all expressed in terms of relative improvement or quantified conditions to be reached by the year 2020.

This level of target-setting is possible only after extensive study and public discussion; it falls far beyond the scope of the present document. It is instructive for the state of California, however, in several regards as it looks to the future:

- The physiographic scope of the indicators and their target values is well-constrained to a particular geographic region with broadly similar geologic, hydrologic, and climatological attributes. Multiple parallel efforts would almost certainly be needed for a more diverse region (such as the entire state).
- Each indicator has a strong scientific basis for inclusion and at least some scientific basis for specific targets. Their communication value with the public was also an explicit criterion for inclusion.
- The most numerous indicators are biological, and they address multiple levels of the trophic chain from top predators to plants (a planktonic metric, however, was rejected as requiring too much additional scientific study and offering little communication value to the general public).
- Although emphasizing biology, the indicators are broadly distributed amongst biological, chemical, and physical metrics; most are broadly integrative in nature (e.g., reference to "bug populations" (the Puget Sound B-IBI) and a "freshwater quality index").

- The set of physical indicators is most parsimonious for instream conditions, and excluding marine nearshore and estuary conditions is restricted to a single hydrologic metric (chosen for its presumed influence on fish). This stands in stark contrast to most existing hydromodification monitoring plans, which emphasize measures of channel geomorphology and a wider range of hydrologic metrics. Such indicators may provide useful performance measures, but they should not be mistaken for more integrative measures of ecosystem or watershed "health."
- Although each indicator has a specified, numeric goal to be reached by 2020, there are no articulated changes to the current management plan if any of those goals are not reached (or if interim measures suggest that they will not be reached). This is a recognized shortcoming of the present plan but there is no mechanism yet in place to address it. As such, it does not currently meet the test for "adaptive management" (see Appendix C).

In California, such a list of integrative assessment indicators (let alone quantified endpoints for those indicators) cannot presently be defined, except in a few specific localities where data collection and analysis have been ongoing for many years. Thus, we recognize the value of such targets but must guide the present development of monitoring in recognition of their near-complete absence. Rectifying this shortcoming is the central recommendation for long-term program development; in the interim, short-term monitoring at both the regional and local levels need to acknowledge the absence of an integrative context in which to interpret their results.

In California, a list of integrative assessment indicators (let alone quantified endpoints for those indicators) cannot presently be defined, except in a few specific localities. Rectifying this shortcoming is the central recommendation for long-term program development.

Regulatory standards are established on the assumption that "clean water" will result in "healthy streams," but the elements of a watershed are far too complexly interrelated to permit such a simplistic perspective. Although the inverse ("polluted water results in unhealthy streams") is almost always true, the challenge for inferring causality from typical monitoring data is that *many* such stressors can all yield the same, degraded outcome. For this reason, targeted monitoring can provide useful diagnostic information and demonstrate regulatory compliance, but it cannot provide sufficient information to address integrative assessment endpoints.

5.4.3.2 Indicators from Existing Programs

We now turn to some of the most common indicators used in monitoring programs today, recognizing that their suitability in any given application depends on the questions being asked, the characteristics of the natural system being measured, and the practical constraints imposed on the monitoring program.

Hydrologic Indicators. Historically, the effects of urbanization on flow were characterized exclusively in terms of peak flow increases (e.g., Leopold 1968, Hollis 1975). Study since those early works has emphasized the degree to which other attributes of a stream hydrograph are changed by watershed imperviousness, and the importance of assessing the *duration* of moderate flows that are capable of transporting channel sediments and the frequency with which those geomorphically active flows occur

(Section 2). Thus, monitoring relevant to a particular hydromodification management application will likely include a variety of flow metrics (e.g., Konrad and Booth 2005, Degasperi *et al*. 2009).

In moving beyond a narrow focus on linkages between watershed urbanization, flow alteration, and in-stream effects, scientific understanding of hydrologic controls on stream ecosystems has recently led to new approaches for assessing the ecological implications of hydromodification. For example, the ecological limits of hydrologic alteration (ELOHA) framework is a synthesis of a number of existing hydrologic techniques and environmental flow methods that allows water-resource managers and stakeholders to develop socially acceptable goals and standards for streamflow management (Poff *et al.* 2010). The central focus of the ELOHA framework is the development empirically testable relationships between hydrologic alteration and ecological responses for different types of streams. This requires a foundation of hydrologic data provided by gaging and/or monitoring, and sufficient biological data across regional gradients of hydromodification. Although hydrologic–ecological response relationships may be confounded to some extent by factors such as chemical and thermal stressors, there are numerous case studies from the US and abroad in which stakeholders and decision-makers have reached consensus in defining regional flow standards for conservation and ecological restoration of streams and rivers (Poff *et al.* 2010).

Hydrologic monitoring provides essential information needed for establishing flow–geomorphology–ecology relationships, validating conceptual models, and assessing effectiveness of management actions in developing watersheds. Implementing regional flow standards should proceed in an adaptive management context, where collection of monitoring data or targeted field sampling data allows for testing of flow alteration–geomorphic–ecological response relationships. This allows for a fine-tuning of flow management targets based on improved understanding of the actual mechanisms; however, such monitoring can be expensive and it may take many years to adequately characterize the full spectrum of streamflows. Thus, hydrologic monitoring programs should be carefully planned and executed so that they are cost-effective and address the key uncertainties In this paper we primarily focus on indicators that do not require additional, extensive data collection.

Hydrologic indicators provide essential information needed for establishing flow–geomorphology–ecology relationships, validating conceptual models, and assessing effectiveness of management actions in developing watersheds.

Geomorphic indicators have been long-recognized as simple, easy-to-measure, and relatively responsive indicators of changes to the flow regime or sediment supply of a river or stream.

Biological indicators provide an integrative view of river condition, or river health.

Hydrologic monitoring is feasible in the context of a short-term program only if the purpose is to evaluate the engineering performance of a particular facility. For most applications, however, at least two (and commonly many more) years are necessary to measure a range of variable conditions sufficient to capture significant geomorphic and/or biological effects. Measurement of precipitation, generally a less cost-intensive effort than flow monitoring, must occur in consort for the data to be useful. In an effort to minimize the cost of continuous long-term flow modeling, a hydrologic model may be calibrated on one or two years of actual data and then used *in lieu* of further data to predict flow conditions. Whether the level of imprecision so introduced is appropriate will depend on the

management questions being asked, but in general such an approach is normally judged more appropriate for comparative results (e.g., did a specified flow magnitude increase in frequency or duration?) than for absolute results (what is the magnitude of the 2-year discharge?).

Geomorphic Indicators. Geomorphic indicators have been long-recognized as simple, easy-to-measure, and relatively responsive indicators of changes to the flow regime or sediment supply of a river or stream (e.g., Leopold 1968). They require little specialized equipment, many commonly can be measured "in the dry" (or close to it), they typically change little from week-to-week (and so are often measured only once per year), and the morphologic features of interest provide the physical template on which a wide range of biological conditions are expressed.

Scholtz and Booth (2000) recognized five geomorphological "channel features" commonly measured as part of monitoring programs:

- Channel geometry (cross sections, longitudinal profile).
- Channel erosion and bank stability.
- Large woody debris.
- Channel-bed sediment.
- In-stream physical habitat (pools, riffles, etc.).

To this list, others have also added:

- Floodplain connectivity.
- Channel planform (meandering, braiding, rates of channel shifting).

Each metric has well-defined methods for field (or, in some cases, airphoto) measurements that need not be repeated here. However, despite broad agreement on *how* to measure each parameter, there is substantially less agreement on the meaning of particular measurements, or indeed under what circumstances (if any) such measurements should be made at all. Most contentious are the various protocols for assessing instream physical habitat (#5 above)—seemingly the most "relevant" for a host of biological applications and for evaluating restoration success. However, a variety of studies have documented a high level of uncertainty imposed by observer bias:

> "Habitat-unit classification was not designed to quantify or monitor aquatic habitat. At the level necessary for use as a stream habitat monitoring tool, the method is not precise, suffers from poor repeatability, cannot be precisely described or accurately transferred among investigators, can be insensitive to important human land-use activities, is affected by stream characteristics that vary naturally and frequently, and is not based on direct, quantitative measurements of the physical characteristics of interest. Relying on habitat-unit classification as a basis for time-trend monitoring is time-consuming, expensive, and ill-advised." (Poole *et al*. 1997, p. 894)

Other geomorphic metrics, in contrast, can provide a robust, albeit coarse, characterization of the channel boundaries. Some changes, particularly if consistently expressed by multiple adjacent cross-

sections, can provide clear documentation of systematic channel changes over time that can be credibly associated with upstream changes (e.g., increased discharge from urbanization leading to channel enlargement). Other changes, however, may have a more indirect or uncertain association with upstream conditions (e.g., grain-size changes) because of the potential for rapid, ill-described changes over time without a corresponding human "cause." This emphasizes the importance of having a well-crafted purpose for the monitoring program into which the utility of any chosen parameter can be clearly described.

Biological Indicators. Biological indicators have been long-applied in society's evaluation of stream conditions, but historically that application has been rather informal. Observation of major fish kills, for example, is the application of a "biological indicator," but it provides little diagnostic or discriminatory information except in those streams where conditions are so poor that even casual awareness is inescapable. As a more refined assessment tool, however, their application to freshwater streams is only a few decades old. As such, the science is still under construction and some basic principles are still debated.

The rationale behind using biological indicators, however, is relatively undisputed. Karr (1999) has provided a useful summary of that rationale, of which the key elements are:

- Biological monitoring and biological endpoints provide the most integrative view of river condition, or river health.
- Biological monitoring is essential to identify *biological* responses (emphasis added) to human actions.
- Communicating results of biological monitoring to citizens and political leaders is critical if biological monitoring is to influence environmental policies.

Some of the earliest references to biological monitoring are associated with the development of RIVPACS, the River Invertebrate Prediction and Classification System, developed by the Centre for Ecology and Hydrology in the United Kingdom and now applied in a number of countries worldwide to predict instream biological conditions from a suite of watershed and channel variables. Since that beginning, other approaches have been advanced and practiced (e.g., the US Environmental Protection Agency's *Rapid Bioassessment Protocols*) that provide alternative, but likely near-equivalent results (e.g., Herbst and Silldorf 2004).

In this section we compare several biological indicators recently applied in various regions of California. This not intended as a comprehensive comparison of all available approaches potentially applicable to California; rather, it simply provides a few examples that illustrate the differences, and the similarities, of the various approaches. As the comparisons demonstrate, there is no "right" approach—but all share commonalities that are likely to be valuable elements of any biological monitoring program. We focus exclusively on benthic macroinvertebrates (BMI), because these have seen the longest and most widespread application (both in California and worldwide) given their species diversity and their relative geographic immobility. However, a variety of other biological metrics (particularly fish and periphyton) have relevance to biological monitoring and strong advocates in the scientific community. Their

omission here is not a judgment on their value, merely a reflection of the broader applicability and richer scientific development of BMI-based indicators.

Multimetric indices are presently completed for four areas of the state (Eastern Sierra, North Coast, Central Valley, and Southern Coast). They are not standardized or calibrated state-wide (nor should they necessarily be), and they do not provide statewide coverage. In addition, the City of Santa Barbara (Ecology Consultants 2010) has sponsored development of its own BMI index (geographically embedded within the Southern Coast region), with both commonalities and differences between it and the others.

Eastern Sierra Nevada. Herbst and Silldorf (2009) developed an IBI based on streams from the upper Owens River north to the Truckee River. Their purpose was both to provide a region-specific IBI for future use and to evaluate the results of such an approach with others that also make use of BMIs to assess stream conditions. They evaluated the performance of 12-, 10-, and 8-metric indices, recommending the 10-metric index as providing the best overall performance included in the 12-metric index were these 10 and also predator richness and EPT% abundance:

- % tolerant percent richness (% of taxa with TV= 7,8,9,10).
- Richness (total number of taxa).
- Chironomidae Percent Richness (% of taxa that are midges).
- Ephemeroptera (E) Richness (number of mayfly taxa).
- Plecoptera (P) Richness (number of stonefly taxa).
- Trichoptera (T) Richness (number of caddisfly taxa).
- Dominance 3 (proportion of 3 most common taxa)
- Biotic Index (modified Hilsenhoff, composite tolerance).
- Acari richness (number of water mite taxa).
- Percent shredders (% of total number that are shredders).

A statistical analysis suggests that as many as 10 distinct classes can be discriminated using this IBI, although their recommended application uses only five categories of quality.

North Coast. Rehn *et al.* (2005) developed an IBI based on coastal-draining streams from Marin County north to the Oregon border. They evaluated 77 individual metrics, testing them for responsiveness to human disturbance and redundancy, and ultimately settled on eight:

- EPT richness.
- Coleoptera richness.
- Diptera Richness.
- Percent intolerant individuals.

- Percent non-gastropod scraper individuals.
- Percent predator individuals.
- Percent shredder taxa.
- Percent non-insect taxa.

Their statistical analysis indicated that five categories of quality could be discriminated; response was driven most strongly by watershed land cover (natural vs. unnatural) and percent of substrate that was sand-sized or finer. They also suggested a set of thresholds for rejecting potential "reference" sites (Rehn *et al.* 2005; Table 5-2), which was also used in the Southern Coast study (Ode *et al.* 2005; see below):

Table 5-2. Thresholds for rejecting potential "reference" sites.

Stressor	Threshold
Percentage of unnatural land use at the local scale	> 5%
Percentage of urban land use at the local scale	> 3%
Percentage of total agriculture at the local scale	> 5%
Road density at the local scale	> 1.5 km/km^2
Population density (2000 census) at the local scale	> 25 ind./ km^2
Percentage of unnatural land use at the watershed scale	> 5%
Percentage of urban land use at the watershed scale	> 3%
Percentage of total agriculture at the watershed scale	> 5 %
Road density at the watershed scale	> 2.0 km/km^2
Population density (2000 census) at the watershed scale	> 50 ind./ km^2

Central Valley. Rehn *et al.* (2008) also developed an IBI for Central Valley streams, evaluating 80 candidate metrics to yield a final list of five:

- Collector richness.
- Predator richness.
- Percent EPT taxa.
- Percent clinger taxa.
- Shannon diversity (a composite measure of taxonomic richness and evenness of abundance).

They found that reach-scale physical habitat variables were more critical in their data set than water chemistry or land use. They also presented their findings with greater caution than with other regions of the state, noting the difficulty of identifying truly "unimpaired" reference conditions and the geographic concentration of much of their source data.

Southern Coast. Ode *et al.* (2005) developed a BMI index of biological integrity based on 61 potential metrics from reference sites drawn from relatively undisturbed coastal-draining watersheds from Monterey Bay south to the Mexican border. They included seven final metrics:

- Percent tolerant taxa.
- Percent collector-gatherer + collector-filterer individuals.
- Predator richness.
- Percent intolerant individuals.
- EPT richness.
- Percent noninsect taxa.
- Coleoptera richness.

They note that the last two on the list are not common in other multimetric B-IBIs but were statistically appropriate for their data set. They judge that this "SoCal B-IBI" can discriminate 5 categories of condition, using 5 categories evenly divided along a 100-point scale. Particularly strong correlations amongst all seven metrics were displayed in comparison to road density and percent "watershed unnatural."

A portion of the Southern Coast region has also been the subject of independent IBI development over the past decade (Ecology Consultants 2010, 2011). The region of study spans the Santa Barbara coastal streams from the Ventura County line west about 45 miles to Gaviota Creek. Their work led to the development of an IBI using the following 7 metrics:

- # of insect families
- # of EPT families
- % EPT minus Baetidae
- % PT
- Tolerance value average
- % sensitive BMIs
- % predators + shredders

In the course of this work, tolerance values were adjusted for certain taxa based on local observations of presence/absence relative to the level of watershed disturbance. With these changes, they found strong statistical basis for discriminating five categories of biological quality. They also found that considering both watershed-level land use patterns and localized physical habitat conditions were necessary to achieve the best prediction of biological integrity.

Summary. A compilation of the various metrics (Table 5-3) demonstrates only broad commonalities between the various regional IBI's presently available for specific parts of California, suggesting that additional work needs to be done before comprehensive recommendations for biological monitoring can be made. At present, perhaps half(?) of the state's area is covered by existing multimetric indices as noted above, and for these areas they provide the best (indeed, the only) guidance for meaningful collection and interpretation of biological data. Elsewhere, however, only a few general points can be made:

- Biological monitoring in un-assessed regions of the state cannot be used to identify absolute conditions of biological health (i.e., "status" monitoring). However, they will likely be useful for "trends" monitoring, where only the change relative to a prior state is being sought.
- Despite the variability in metric choices amongst the various regions (Table 5-2), some broad commonalities are apparent. In particular, several types of metrics are likely to provide useful indicators of change in a known direction (i.e., an increase or decrease in the metric can be confidently assigned to a change in quality in a known direction):
    - One or more measures of tolerance or intolerance
    - One or more measures of predator prevalence
    - One or more measures of EPT taxa or taxa richness

This list does not purport to describe a true multimetric B-IBI, nor to provide a basis to evaluate instream biological health on an absolute scale (i.e., from "poor" to "excellent"). In the absence of any region-specific guidance, however, changes in one or more of these metrics are each likely to provide some initial, useful indication of temporal trends in biological health until such time as the types of studies referenced above can be conducted.

Table 5-3. Compilation of metrics used in the five regional B-IBI's described in the text.

METRIC	Eastern Sierra	North coast	Central Valley	Southern coast	Santa Barbara
Percent intolerant individuals		X		X	X
% tolerant (% of taxa with TV= 7,8,9,10)	X			X	
Tolerance value average					X
# of insect families					X
Percent non-insect taxa		X		X	
Percent shredders (% of total number that are shredders)	X	X			
Percent predator individuals		X			
% predators + shredders					X
Predator richness			X	X	
Collector richness			X		
Percent non-gastropod scraper individuals		X			
Percent clinger taxa			X		
Percent collector-gatherer + collector-filterer individuals				X	
EPT richness		X		X	X
Percent EPT taxa			X		
% EPT minus Baetidae					X
% PT					X
Ephemeroptera (E) Richness (number of mayfly taxa)	X				
Plecoptera (P) Richness (number of stonefly taxa)	X				
Trichoptera (T) Richness (number of caddisfly taxa)	X				
Coleoptera richness		X		X	
Diptera Richness		X			
Chironomidae Percent Richness (% of taxa that are midges)	X				
Richness (total number of taxa)	X				
Dominance 3 (proportion of 3 most common taxa)	X				
Biotic Index (modified Hilsenhoff, composite tolerance)	X				
Acari richness (number of water mite taxa)	X				
Shannon diversity index			X		

5.5 Recommendations

Based on this review of monitoring theory, current applications, and current needs, the following steps are recommended to advance a state-wide program of monitoring to support the management of hydromodification control plans.

5.5.1 Programmatic Monitoring

Over the next several years, the following actions should be implemented at the state and/or regional level:

- Executing broad-scale, GIS-based watershed characterization;
- Identifying a set of representative indicator watersheds, and a basic suite of regular measurements that are suitable for establishing trends in physical, chemical, and biological indicators;
- Identifying (and multi-metric monitoring within) a relatively small set of watersheds that have implemented recent hydromodification control plans to initiate the long-term evaluation of downstream trends.

Over the course of the next several NPDES permit cycles (i.e., one or more decades), the following actions should also be undertaken as a regional responsibility:

- Setting regionally appropriate endpoints for biological health of receiving waters;
- Identifying particularly promising (or particularly ineffective) combinations of control strategies across a range of different landscape conditions;
- Providing supplemental data collection at reference sites to support trends monitoring by local jurisdictions;
- Compiling local results to guide development and refinement of regionally appropriate hydromodification control strategies.

5.5.2 Local Monitoring

Over the next several years, the following actions should be implemented by local jurisdictions at a local scale:

- Implementing a program of source identification at one or more high-risk locations (e.g., high vehicular traffic, high imperviousness, toxic chemical storage/transport);
- Demonstrating the hydrologic performance of one or more representative hydromodification control facilities;
- Monitoring trends at one or more representative receiving waters, ideally at a regionally identified site (see the second bullet under “Programmatic monitoring,” above);

- Conducting a synoptic evaluation of waterbodies, stratified by watershed type (see the first bullet under “Programmatic monitoring,” above), to identify highest priority systems for protection or rehabilitation, if not already known.

Over the course of the next several NPDES permit cycles, the following long-term actions should also be undertaken as a local responsibility:

- Monitoring representative conditions to evaluate whether management actions are improving overall receiving-water health;
- Evaluating cost-effectiveness of implemented hydromodification control measures;
- Identifying critical areas for resource protection by virtue of existing high-quality conditions.

6. References

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APPENDIX A: GUIDANCE FOR APPROPRIATE APPLICATION OF HYDROLOGIC AND HYDRAULIC ANALYSES

Information contained in this document is intended solely for guidance purposes only. It is not intended to be an instruction manual and use of any of the guidance provided herein is at the risk of the user. No other person or entity shall be entitled to rely on the services, opinions, recommendations, plans or specifications provided in the document.

1. INTRODUCTION AND PURPOSE

The purpose of this Appendix is to provide technical guidance on hydrologic and hydraulic analyses, including the use of Continuous Simulation (Hydrologic) Modeling (CSM), in support of hydromodification assessment and mitigation. CSM is the industry standard developed since the early 2000s for use in the assessment and mitigation of hydromodification. The fundamental difference between CSM and peak flow hydrologic modeling, is that CSM considers the full range of flow events over a long period of record, typically 30 years or more, to develop flow duration curves, whereas peak flow hydrologic modeling generally considers synthetically (usually calibrated to measured data) produced event-based hydrographs (2-, 10-, 50-, 100- and 200-year return frequency events). CSM allows flow duration curves and other derived hydraulic metrics to be compared between existing and proposed conditions in order to assess hydromodification impact potential and to develop mitigation strategies. The guidance provided in this appendix is the product of the experience gained in the application of hydromodification management strategies to multiple urban development projects. This appendix is not intended to be an instruction manual but to provide guidance to engineers, planners and regulatory staff on specific modeling elements involved with HMPs.

MODELING METOHDOLOGY REVIEW

Modeling Approaches

A common approach to mitigating hydromodification impacts from development projects is to construct best management practices (BMPs) which capture, infiltrate and retain runoff, where possible. In such cases, the water is detained and released over a period of time at rates which more closely mimic pre-project hydrology. Methods commonly used to size hydromodification BMPs include hydrograph matching (matching pre and post-project flow regimes), volume control and flow duration control. Hydrograph matching is most traditionally used to design flood detention facilities for a specific storm recurrence interval, such as the 100-year storm, whereby the outflow hydrograph for a project area matches the pre-project hydrograph for a design storm. Volume control matches pre- and post-project runoff volume for a project site; however, the frequency and duration of the flows are not controlled. This can result in higher erosive forces during storms. Flow duration control matches both the duration and magnitude of a range of storm events for pre- and post-project runoff. The complete hydrologic record is taken into account, and runoff magnitudes and volumes are matched as closely as possible.

It is generally accepted that flow duration control matching is the most appropriate method to be used in the design of hydromodification BMPs. The flow duration control approach has been used in at least half a dozen HMPs in California, all of which used a CSM to match flow durations. However, differences exist in how the continuous simulation modeling is used between programs.

OVERVIEW OF APPENDIX

This appendix covers the following specific topics, addressed in the order in which they would arise as part of a hydromodification analysis for a major development project:

Section 2 addresses calculation of a flow control range, including identification of an acceptable low flow value, based upon critical flow for incipient motion of the channel material. .

Section 3 addresses the development of evaluation criteria to assess the effectiveness of a proposed mitigation design, including a discussion of flow duration matching and the erosion potential metric.

Section 4 addresses CSM, including precipitation data requirements, hydrologic time steps, model calibration and validation, and other modeling considerations and tips.

2. METHOD FOR SELECTION OF A FLOW CONTROL RANGE

INTRODUCTION TO FLOW CONTROL

Most hydromodification plans (HMPs) in California have adopted a flow control approach, which establishes a range of flow magnitudes discharging from the proposed site that must be controlled. The magnitude of the flow range is commonly expressed in terms of a percentage of the return period flow to which it is equivalent; for example: from 10% of the Q2 to 100% of the Q10. Flow magnitudes within the prescribed range must not occur more frequently under the proposed condition than they do in the existing (or pre-project) condition. Another way of expressing this is that the long term (decadal) cumulative duration of these flows must not be longer in the post-project condition compared to the pre-project condition. Generally, a small exceedance tolerance is allowed. For example, the following is a typical criterion that has been used in HMPs:

> For flow rates ranging from 10% of the pre-project 2-year recurrence interval event (XQ2) to the pre-project 10-year runoff event (Q10), the post-project discharge rates and durations shall not deviate above the pre-project rates and durations by more than 10% over and more than 10% of the length of the flow duration curve. The specific lower flow threshold should be influenced by results from the channel susceptibility assessment.

The rationale behind setting an upper limit is the understanding that when less frequent, high intensity/volume precipitation events occur, the watershed reaches a saturation level and responds in a similar manner for undeveloped and developed conditions. Furthermore, while these less frequent, high magnitude events do induce significant geomorphic change, they occur so infrequently that over a long time period, they comprise only a small portion of the work done on a channel. For example GeoSyntec (2007) used a hydro-geomorphic model to assess cumulative sediment transport on Laguna Creek (near Sacramento) and determined that 95% of the total erosion and sediment transport in the creek is accomplished by flow rates less than Q_{10}.

The purpose of determining a low flow range is one of practical design consideration when meeting a requirement for flow duration matching. The requirement to match flow durations between a pre- and post-project condition requires that runoff be detained and infiltrated within a BMP (e.g. open basin or underground vault). If flow matching is required to be achieved for all flows down to zero, the BMP

volume will be significantly larger (and therefore more costly) than if there were some low flow below which runoff could be discharged at durations longer than in the pre-project condition. A key assumption underlying the concept of a low-flow discharge is that the increase in discharge durations below this rate will not increase channel erosion because the flows are too small to initiate movement of channel materials to any significant extent. Another critical assumption in the flow duration matching approach is that a single discharge value is valid across the range of grain sizes and geometries in the streams to which that low flow value applies.

For a specific set of hydraulic conditions (e.g., cross sectional shape, channel slope, bed and bank roughness), the flow rate can be calculated where the critical shear strength value is reached. Thus with an estimate of the critical shear strength of the materials composing a channel's bed or banks, and the hydraulic conditions occurring at the same location, the critical flow rate can be determined at which transport (or erosion) begins. This critical flow rate (Q_c) can then be compared to the magnitude of a flood peak which occurs every two years (Q_2) to establish the estimate of percent Q_2 to be used as the lower flow threshold.

Thus in order to calculate the lower flow threshold as expressed by a percentage of Q_2, three values must be determined for each analysis location (described in further detail below):

- The critical shear strength (τ_c) of bed and bank materials;
- The critical flow rate (Q_c) at which this critical shear strength is reached and exceeded;
- The magnitude of a flood peak which occurs every two years (Q_2).

In contrast, when using an erosion potential (Ep) metric (rather than flow duration matching) for BMP sizing, the Ep analysis incorporates channel geometry to estimate shear stresses generated at various flow rates, and then compares these to estimated critical shear stresses (i.e., shear stress required to initiate transport) for the grain size distribution within the stream. However, for either flow duration matching or for erosion potential analysis, the first step is to determine the critical shear stress for incipient motion of channel materials.

DETERMINATION OF CRITICAL SHEAR STRESS

The composition and condition of the bed and banks of a stream channel are the best indicators of how a channel will react (i.e., its susceptibility) to hydrologic changes resulting from development projects (i.e., hydromodification). Channels composed of materials more resistant to erosion are less susceptible to excessive erosion due to hydromodification than channels composed of less resistant materials. Channel material type can vary widely between, as well as within, watersheds. Figure 2-1 **Error! Reference source not found.**a. and b. illustrate stream incision through (a) relatively loosely consolidated, non-cohesive sand and gravels, and (b) relatively cohesive silty-clays. The resistance of bed and bank materials is quantified by their critical shear strengths, (τ_c) that is, the value where entrainment or transport begins.

Typical stream erosion in a southern California stream (granular, non-cohesive
(Photo courtesy of Eric Stein, SCCWRP)

Typical stream erosion in a northern California stream (generally cohesive silty clays)
(Photo cbec, inc.)

Notes:	cbec	*Guidance on the Use of Continuous Simulation Hydrologic Modeling* **Examples of Stream Erosion in Southern and Northern California**		
		Project: 11-1001	Created By: CBB	**Figure 2-1**

Figure 2-1. a. Example of a loosely consolidated, non-cohesive sand and gravel stream bed. b. Example of a relatively cohesive silty-clay stream bed.

Several methods are available for the estimation of critical shear stress, including laboratory studies (e.g., flume studies) and field measurements, with different methods utilized for cohesive materials and non-cohesive materials.

Estimating Critical Shear Stress for Non-Cohesive Materials

The most common method for determining the critical shear stress of a non-cohesive material is through the application of the Shields relationship. This relationship is applicable to the calculation of critical shear stress for a uniform size mixture of sediment with a known particle size and specific gravity. Since it was originally proposed by Shields in 1936, the relationship has been tested and further investigated by several other researchers, resulting in a variety of modifications, primarily through variation of the Shields parameter. The original value of the Shields parameter proposed by Shields was 0.06, however, values from 0.03-0.06 have been suggested, with 0.045 acknowledged as a good approximation. Recent research has demonstrated that a value of 0.03 may be more appropriate for estimating incipient motion in streams with gravel beds (Neill 1968, Parker et al. 2008, Wilcock et al. 2009), where D50 estimates are based upon data collected via pebble count. The decision of what value of Shields parameter is used can have a large influence on the resulting τ_c estimate. For example, if a value of 0.06 is used, it results in twice as large of an estimate of τ_c than if a value of 0.03 is used.

While the Shields relationship was developed for a mixture of uniform sized sediment, it can be applied to a mixture of sediment with varying sizes as long as the distribution is uni-modal and does not have a high standard deviation of grain sizes (Wilcock 1993). In contrast, for sediment mixtures which are bimodal (e.g., if there is a large amount of sand in addition to gravel), a different approach (e.g., Wilcock and Crowe 2003) is recommended. For a more in depth discussion of sediment transport and incipient motion, the reader is referred to Wilcock et al. (2009).

In order to apply the Shields relationship to determine τ_c, the median grain size (d50) present on the channel surface must be determined. River channels are often armored; meaning that coarser material is present on the surface than is present underneath the armor layer. However to access and transport the finer material beneath, the surface layer must first be mobilized. The median grain size is determined by analysis of a particle size distribution.

A particle size distribution can take the form of: 1) a cumulative *frequency* distribution which is determined by way of a pebble count or photographic analysis, or 2) a cumulative *weight* distribution. For a cumulative frequency distribution a subset of particles present on the surface are measured, and the frequency of particles within different size class bins is used. **Error! Reference source not found.** shows a sample particle size distribution graph developed from a pebble count. For a cumulative weight distribution, a bulk sample of the surface material is collected, and then sorted using a set of sieves with different screen sizes. The amount of material retained by each sieve is weighed and then used to plot the cumulative weight distribution. Both approaches have advantages and disadvantages.

A pebble count is a relatively straightforward field technique that is easily applied in streams which are wadable. **Error! Reference source not found.** shows photographs of pebble counts being conducted in the field. They can be performed relatively quickly, which means more samples can be collected to better characterize the conditions present in a reach. However, there are a variety of ways a pebble count can be conducted, and there is tremendous opportunity to introduce bias to the measurement. Furthermore, while studies often cite Wolman (1954) as the method employed in data collection, strict adherence to this protocol is not always achieved. Rather than the method suggested by Wolman (1954), a refined, more regimented approach has been suggested by Bundte and Abt (2001a), and is recommended. In addition, it should be noted that pebble counts generally do a poor job of characterizing sand and smaller sized material. In addition to pebble counts, software can be used to process a digital image of an area of the bed. The software samples a subset of particles present in the image, and using assumptions regarding the amount of given particle that is visible, is able to provide a cumulative frequency distribution.

Collecting a bulk sample for sieve analysis is another method frequently employed to determine values for typical characteristic indices of a particle size distribution. In this method a sample is collected from the channel surface, and then the sample is segregated into various size classes with sieves. One advantage of this approach is that it utilizes all the data available from the sampled area (as opposed to a pebble count which uses a subset of the entire population, e.g., ~100 particles as opposed to thousands), however the sampled area is typically smaller than the area sampled within one pebble count. One disadvantage is the size of sample that is necessary. Because the resulting particle size distribution is based upon weight, the largest particles present can have a very large influence on the resulting particle size distribution. Research has suggested that the weight of the entire sample must exceed 100x the weight of the largest particle present to escape this possible bias. This means large (volume and weight) samples are often required. Some sieving can occur on site through the use of shaker sieves, but typically some portion of the sample is also taken back to the lab for further analysis. Thus, bulk samples typically require more effort and equipment to establish a particle size distribution, however they provide a much more accurate estimate, especially when a large fraction of the sample is sand sized (2mm) and smaller.

For a more in depth discussion of sampling methods to determine particle size distributions in wadable streams, the reader is referred to Bunte and Abt (2001).

Estimating Critical Shear Stress for Cohesive Materials

The methods described above are not appropriate for cohesive materials, which due to chemical cohesion between particles exhibit larger τ_c values than would be estimated by consideration of particle size/weight in isolation (i.e., cohesive properties not considered). One method that allows for the determination of τ_c *in situ* is the application of a jet test (ASTM 2007). The jet-testing apparatus and analytical methods were developed by researchers at the USDA Agricultural Research Station (Hanson and Cook 1999; Hanson et al. 2002; Hanson and Cook 2004; ASTM 2007). The method uses a submerged impinging jet of water directed perpendicularly at the material surface, in order to erode the material. As erosion occurs, a scour hole is created. The depth of this hole is measured periodically as time

progresses through the test. As the scour hole increases in depth, the strength of the jet is reduced because it is travelling longer distance through water from the jet orifice to the soil surface. Eventually, the energy of the jet is dissipated enough that it no longer has energy in excess of the material's shear strength and erosion stops. **Error! Reference source not found.** shows a photograph of a jet testing rig deployed in a stream bank.

In addition to jet testing, *in situ* testing of shear strength can be obtained through the application of a field vane shear test (ASTM 2008). This method provides τ_c values based upon the assumption that the bed or bank will fail via large blocks (composed of thousands of particles), as opposed to erosion occurring particle by particle. As such, the values measured by a shear vane are often several orders of magnitude larger than those obtained via testing with the jet-device.

Estimating Critical Shear Stress Through the Use of Literature Values

An alternative to the measurement/calculation of τ_c, is the use of values found in the literature. Indeed, several HMPs have several HMPs have been developed through assumption of material resistance properties found in the literature based upon literature based upon a textural description of the material. An often-cited reference is Fischenich (2001), which provides a (2001), which provides a summary (compiled from the relevant literature) for critical shear strength values for various values for various materials. An extract from this reference is provided in

Figure 2-5.

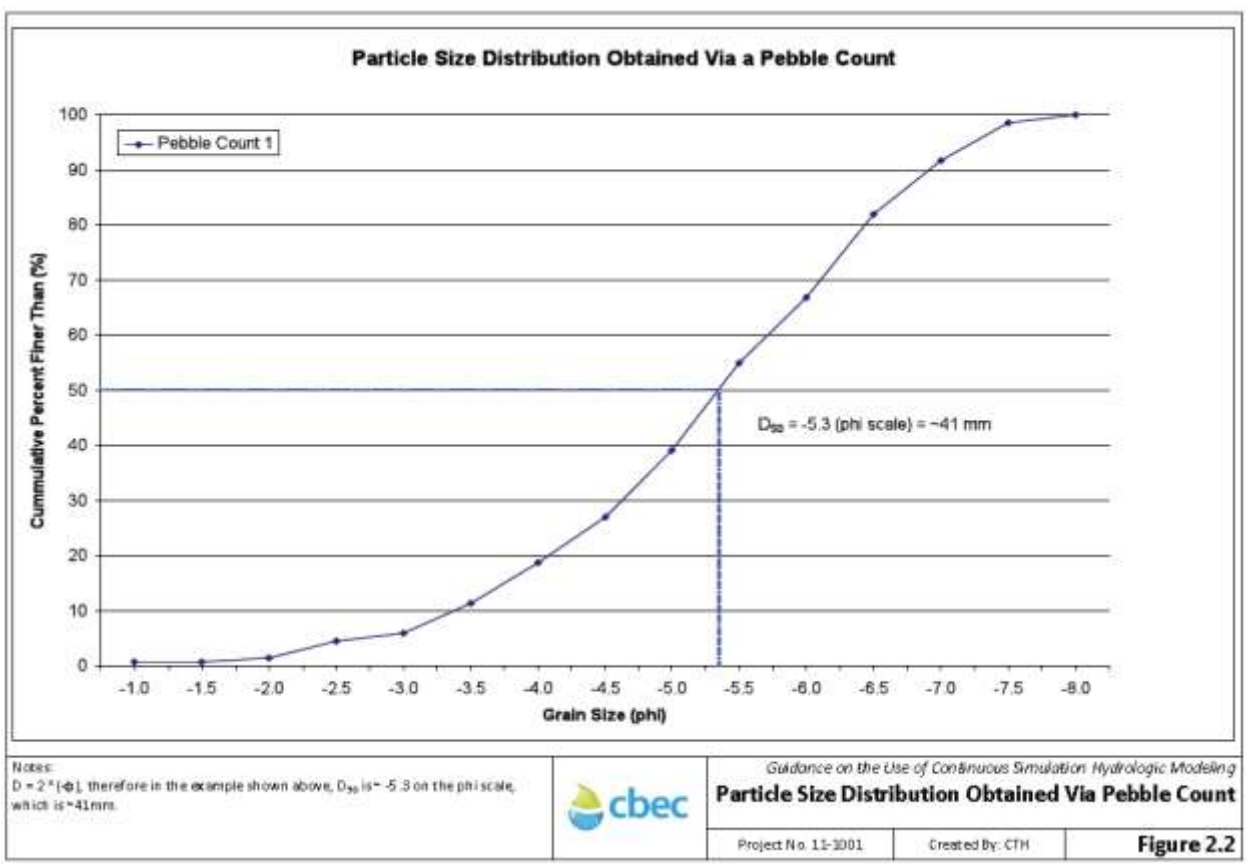

Figure 2-2. Particle Size Distribution Graph Developed from a Pebble Count

Notes:	cbec	*Guidance on the Use of Continuous Simulation Hydrologic Modeling* **Pebble Counts Being Conducted in the Field**		
		Project: 11-1001	Created By: CBB	**Figure 2-3**

Figure 2-3. Pebble Counts Being Conducted in the Field

Typical installation of jet testing equipment in stream bank

Hole created in cohesive bank material by jet impinging on surface

Notes:	cbec	*Guidance on the Use of Continuous Simulation Hydrologic Modeling* **Jet Testing Equipment Deployed in a Stream Bank**		
		Project: 11-1001	Created By: CBB	**Figure 2-4**

Figure 2-4. Jest Testing Equipment Deployed in a Stream

Table 2. Permissible Shear and Velocity for Selected Lining Materials[1]

Boundary Category	Boundary Type	Permissible Shear Stress (lb/sq ft)	Permissible Velocity (ft/sec)	Citation(s)
Soils	Fine colloidal sand	0.02 - 0.03	1.5	A
	Sandy loam (noncolloidal)	0.03 - 0.04	1.75	A
	Alluvial silt (noncolloidal)	0.045 - 0.05	2	A
	Silty loam (noncolloidal)	0.045 - 0.05	1.75 – 2.25	A
	Firm loam	0.075	2.5	A
	Fine gravels	0.075	2.5	A
	Stiff clay	0.26	3 – 4.5	A, F
	Alluvial silt (colloidal)	0.26	3.75	A
	Graded loam to cobbles	0.38	3.75	A
	Graded silts to cobbles	0.43	4	A
	Shales and hardpan	0.67	6	A
Gravel/Cobble	1-in.	0.33	2.5 – 5	A
	2-in.	0.67	3 – 6	A
	6-in	2.0	4 – 7.5	A
	12-in.	4.0	5.5 – 12	A
Vegetation	Class A turf	3.7	6 – 8	E, N
	Class B turf	2.1	4 - 7	E, N
	Class C turf	1.0	3.5	E, N
	Long native grasses	1.2 – 1.7	4 – 6	G, H, L, N
	Short native and bunch grass	0.7 - 0.95	3 – 4	G, H, L, N
	Reed plantings	0.1-0.6	N/A	E, N
	Hardwood tree plantings	0.41-2.5	N/A	E, N
Temporary Degradable RECPs	Jute net	0.45	1 – 2.5	E, H, M
	Straw with net	1.5 – 1.65	1 – 3	E, H, M
	Coconut fiber with net	2.25	3 – 4	E, M
	Fiberglass roving	2.00	2.5 – 7	E, H, M
Non-Degradable RECPs	Unvegetated	3.00	5 – 7	E, G, M
	Partially established	4.0-6.0	7.5 – 15	E, G, M
	Fully vegetated	8.00	8 – 21	F, L, M
Riprap	6 – in. d_{50}	2.5	5 – 10	H
	9 – in. d_{50}	3.8	7 – 11	H
	12 – in. d_{50}	5.1	10 – 13	H
	18 – in. d_{50}	7.6	12 – 16	H
	24 – in. d_{50}	10.1	14 – 18	E
Soil Bioengineering	Wattles	0.2 – 1.0	3	C, I, J, N
	Reed fascine	0.6-1.25	5	E
	Coir roll	3 - 5	8	E, M, N
	Vegetated coir mat	4 - 8	9.5	E, M, N
	Live brush mattress (initial)	0.4 – 4.1	4	B, E, I
	Live brush mattress (grown)	3.90-8.2	12	B, C, E, I, N
	Brush layering (initial/grown)	0.4 – 6.25	12	E, I, N
	Live fascine	1.25-3.10	6 – 8	C, E, I, J
	Live willow stakes	2.10-3.10	3 – 10	E, N, O
Hard Surfacing	Gabions	10	14 – 19	D
	Concrete	12.5	>18	H

[1] Ranges of values generally reflect multiple sources of data or different testing conditions.

A. Chang, H.H. (1988). B. Florinsth. (1982) C. Geratgraser, C. (1998). D. Goff, K. (1999). E. Gray, D.H., and Sotir, R.B. (1996). F. Julien, P.Y. (1995). G. Kouwen, N., Li, R. M., and Simons, D.B., (1980). H. Norman, J. N. (1975). I. Schiechtl, H. M. and R. Stern. (1996). J. Schoklitsch, A. (1937). K. Sprague, C.J. (1999). L. Temple, D.M. (1980). M. TXDOT (1999) N. Data from Author (2001) O. USACE (1997)

ERDC TN-EMRRP SR-29 Fischenich, C. 2001. Stability thresholds for stream restoration materials. EMRRP Technical Notes Collection (ERDC TN-EMRRP-SR-29). U.S. Army Engineer Research and Development Center, Vicksburg, MS. 5

Notes:	cbec	*Guidance on the Use of Continuous Simulation Hydrologic Modeling* **Permissible Shear Strength and Velocity for Selected Lining Materials**		
		Project No:11-1001	Created By: CBB	**Figure 2-5**

Figure 2-5. Permissible Shear and Velocity for Selected Lining Materials

DETERMINATION OF CRITICAL FLOW (Q_c)

For a specific set of hydraulic conditions at a location (i.e., cross sectional shape, channel slope, bed and bank roughness), the flow rate at which critical shear values are reached can be calculated. These calculations can be made with a programed spreadsheet analysis, or with a hydraulic model (e.g., HEC-RAS, Brunner 2010). Because of their ease of use and the ease at which multiple flow rates can be assessed (in order to determine when τ_c is reached), hydraulic models are typically employed for this part of the analysis. Average boundary shear stress is calculated with the following equation:

$$\tau = \rho g R s$$

where *p* represents the density of water, *g* represents the gravitational constant, R represents the hydraulic radius (defined as the wetted area dived by the wetted perimeter), and *s* represents the slope. For wide channels the value of the hydraulic radius is approximately equal to the average depth of the cross section. The hydraulic model calculates the value for R for a given discharge based on the channel dimensions.

Typically one-dimensional approximations are used for this analysis, which means that the value of Q_c determined is that where the cross sectional average of τ_c is reached, not the highest value which is occurring at the deepest point of the cross section. This is typically considered reasonable because the grain size is determined for the bed of the cross section, not just the shallow or deep area.

Analyses can be conducted at a station, or in other words just looking at one cross section in isolation using normal depth calculations, or within a larger hydraulic model constructed for the entire reach (i.e., multiple distributed cross sections upstream and downstream of the location of interest). The advantage of looking at the cross section of interest within the context of the entire reach is that conditions downstream (e.g. a constriction which causes a backwater condition) may affect the flow depth (or hydraulic radius), yielding different results than would be obtained if the cross-section was analyzed in isolation.

It is important that the determination of τ_c (via pebble count or other means) and the hydraulic calculations to determine Q_c, occur at the same location. Typically the analysis is undertaken at a riffle because these are the high points of a long profile and are what are controlling incision in the system. Bed material characterization in a pool is much more difficult (because of the depth of water), in addition the resulting calculated shear values are typically much higher, because of the added depth.

If HEC-RAS is used (which is typical), the way the bank markers are set can have a dramatic influence on the calculated shear results. The bank markers are used to delineate differences in roughness across the channel and flood plain (typically higher values are used on the lateral margins to include the influence of vegetation roughness in the resulting depth calculations). The shear values calculated by HEC-RAS are segregated by these bank markers, and thus may include values for each of the floodplains as well as the channel. If bank markers are set too wide, and the shear stress calculation may include a portion of the floodplain too, and subsequently the conditions in the actual channel will be greatly underestimated. Remember that the model is essentially using the average depth for the entire cross section (as limited by the bank markers), so including floodplain with shallow depths greatly influences the average depth and thus the resulting calculated shear value.

DETERMINATION OF Q_2

The determination of a value of Q_2 is the third and final piece of the equation used to determine what percent of Q_2 the lower threshold should be. As with the other two pieces, several options are available, and again the decision on what method is used can have a profound influence upon the final results. Q_2 can be determined through the results of a calibrated and validated hydrologic model (e.g., HEC-HMS, HSPF, SWMM, etc.) which uses precipitation, sub basin area, soil conditions, etc. to calculate a runoff hydrograh. This type of model can be used in one of two ways, to simulate a single precipitation event or to simulate a long term (e.g., 50 year) precipitation record. The first approach produces a single runoff hydrograph resulting from a "design" storm, from which the peak magnitude can be determined. As such the results are largely controlled by the precipitation hyetograph, so a good understanding of how that was developed is important. This method has been used considerably less than the approach detailed below. The advantage of this method is that, if any existing model has already been developed (e.g., SacCalc; DFCE 2001), it will be cheaper and easier for an agency to review. However, it can yield different values for Q_2, due to differing assumptions employed in the modeling.

The second method uses a long-term precipitation record for simulation which results in a flow record containing a large number of runoff events of varying magnitudes (i.e., which are subsequently analyzed to determine the magnitude of the 2 year recurrence interval event). This method is more typical for HMP assessments, but again methodical decisions can have a large influence on the results. The rigor of the model calibration and validation has a strong influence. If the model is not representing through simulation what is actually occurring, then the simulation results are questionable.

Assuming the model has been calibrated and satisfactorily validated or verified, the manner in which the simulated runoff record is analyzed is important. The first basic distinction is whether an annual maximum series (AMS) or a partial duration series (PDS) is used. In an AMS analysis, just the single largest flood peak of any given year is used in the analysis, and the second and third largest events of the year are ignored. This is the method typically utilized when analyzing the flood frequency of large, less frequently occurring flood events. In the second approach, PDS, multiple flood events are considered in any given year. This is important when the second or third largest flood events in one year are greater than the annual maximum of another year. Because more large events are included, the resulting estimate of the given return period event (e.g., Q_2) is larger. For example, Langbein (1960) showed that a 1.45 year event determined with PDS is the same magnitude as a 2 year event with an AMS, and a 2 year event determined with PDS is a 2.54 year event with an AMS. Thus the value of Q_2 determined by PDS is larger than the value of Q_2 determined by AMS. While significant differences are apparent for smaller magnitude, more frequently occurring events (e.g., Q_2), for return periods greater than 10 years, there is almost no difference between the results obtained from the AMS and PDS.

When compiling a PDS for a recurrence interval analysis, the manner in which events are identified as independent can also have an effect upon the results. One typical method is to include all flood peaks above a certain base magnitude. This base value is often selected as equal to the lowest annual maximum flood of record, however can also be chosen such that the PDS only contains as many peaks as

there are years of record. Some analysts have established a base value (e.g., 0.002 cfs/acre), and then added a duration below this base value as well (i.e., flow must be below 0.002 cfs/acre for at least 24 hours for events to be considered independent). One additional method is to identify individual events by extracting the highest peak (not just the maximum value) within a moving time window (e.g., 3 days), and therefore determine independence through time, rather than the discharge rate receding to a non-storm condition. With all of these options available, and no prescribed standard, the use of a PDS can have different Q_2 results even if an identical flow time series is used.

SUMMARY

The determination of the lower flow threshold, defined as a percentage of Q_2, is heavily influenced by three primary inputs: τ_c, Q_c, and Q_2. The determination of each of these values is sensitive to a variety of factors determined by the particular methodology. To demonstrate the sensitivity of the lower flow threshold to methodological decisions, a few examples are provided below.

- If 0.06 is used rather than 0.03 for Shields parameter in Shields relationship, τ_c increases, subsequently Q_c increases and ultimately the lower limit increases
- If bank markers are set too wide (including the floodplain and not just the channel) in the hydraulic analysis, a larger value for Q_c is calculated (because of a reduction of the hydraulic radius due to the inclusion of extensive shallow floodplain areas), resulting in an increase of the lower limit.
- If an annual maximum series is used in place of a partial duration series, the calculated Q_2 will be less than that obtained by a PDS analysis, and the ratio of Q_c to Q_2 will be higher if the AMS is used.

3. DEVELOPMENT OF EVALUATION CRITERIA

FLOW DURATION CONTROL AND PEAK FLOW CURVE MATCHING

Flow Duration Control (FDC) and Peak Flow Curve (PFC) matching criteria in their current form for many counties in CA are similar in form to the curve matching criteria from WA (WADOE, 2001). The curve matching criteria typically include a goodness of fit or variance due to the difficulty in achieving a precise match across the range of flows. The criteria are typically applied at the subwatershed scale based on continuous simulation flow results for pre- and post-project conditions to size individual BMP or LID features. In this instance, flow matching at the subwatershed scale assumes that there are no routing or timing effects in the treated runoff when it rejoins the receiving waterbody; however, this may not be true in all cases. For example, if treated runoff is delayed and rejoins the upstream runoff such that there is an increase in flow rates and durations or an increase in the peak flows in the receiving waterbody, then there is the potential to impair the receiving waterbody. To address this potential concern, the FDC and PFC criteria could be applied to the routed flows in the receiving waterbody as a

check.

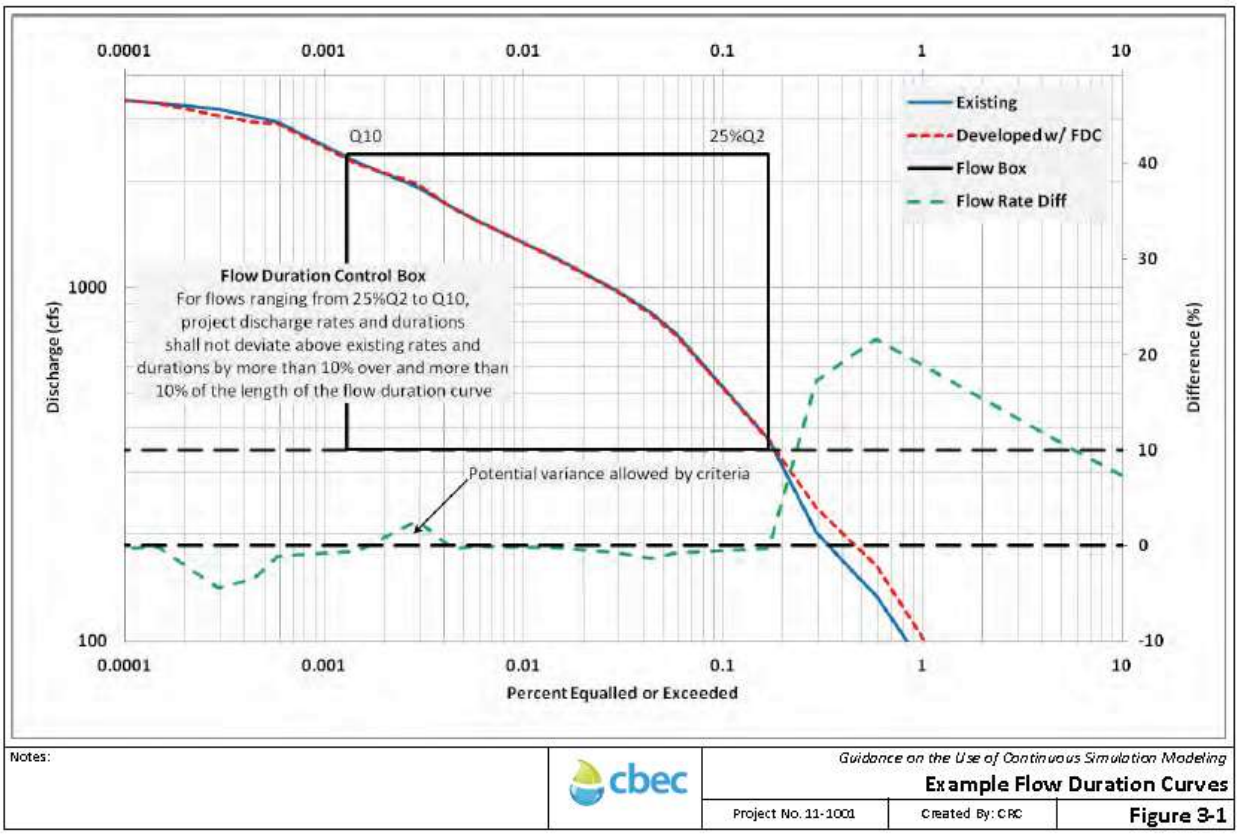

Figure 3-1 shows an example of FDC matching on the routed flows within a receiving waterbody with an example of the variance allowed by the criteria. However, it is cautioned that the FDC variance (e.g., "…by more than 10 percent over and more than 10 percent of the length…") may need to be reduced to something less than 10 percent (perhaps based on a ratio of watershed areas) to account for cumulative effects if there remain the potential for continued development in the watershed.

EROSION POTENTIAL

Erosion Potential (EP) is an index to indicate the impact of increased flows on stream stability and is based on bed mobility and an integration of work (as a function of velocity and excess shear stress in the channel only) over time, expressed as a ratio of post-project work divided by pre-project work in the receiving waterbody. Total work is based on integrating effective stream power as:

$$W = \sum_{i=1}^{n} (\tau_i - \tau_c)^e \cdot V_i \cdot \Delta t_i$$

where W is the total work done (ft-lbf/ft^2), τ is the average channel shear stress, τ_c is the critical shear stress to initiate erosion, e is an exponent varying from 1 to 2.5 to account for the exponential rise in stream power with flow, V is the velocity (ft/sec), and Δt is the numerical time step (sec). The EP index is then calculated as the ratio of W_{dev} / W_{ex} where W_{ex} and W_{dev} is the total work for existing and developed conditions, respectively. EP can be calculated at any location in the waterbody based on

continuous simulation time series of flow, velocity, and excess shear stress in the channel as derived from hydraulic model outputs.

EP criteria are not widely integrated into HMPs. Notably Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP) included EP criteria in their HMP, but in so much as it was used to inform their overall management objective (i.e., post-project runoff shall not exceed estimated pre-project rates and/or durations) and the development of their FDC / PFC criteria. In the SCVURPPP (2005) final HMP, an EP ratio <= 1.0 was recommended as the instream target value to be maintained for stream segments downstream of the point of discharge for HMP management. From a risk management perspective, the chance of a stream becoming unstable at an EP of 1.0 is 9%, meaning that 1 in 11 streams could become unstable even with controls (SCVURPPP, 2005). As such, instream EP must be evaluated considering the effects of the cumulative changes that have or may take place in the watershed.

Even though EP criteria are not widely promoted in county HMPs, that does not preclude analyses based on EP from being used, especially when instream measures permit more robust geomorphic analyses (e.g., SCVURPPP final HMP; SSQP draft HMP). While EP analyses are more time and data intensive, there is the potential outcome to discharge runoff at higher rates and durations than FDC / PFC criteria would allow, thus resulting in possibly smaller onsite measures. The time and data intensiveness of EP analyses stem from the need to evaluate the hydraulic and geomorphic conditions of the receiving waterbody to be protected at multiple locations based on continuous simulation hydraulic model outputs and geomorphic data. Potential hydraulic model considerations when performing EP calculations are addressed below.

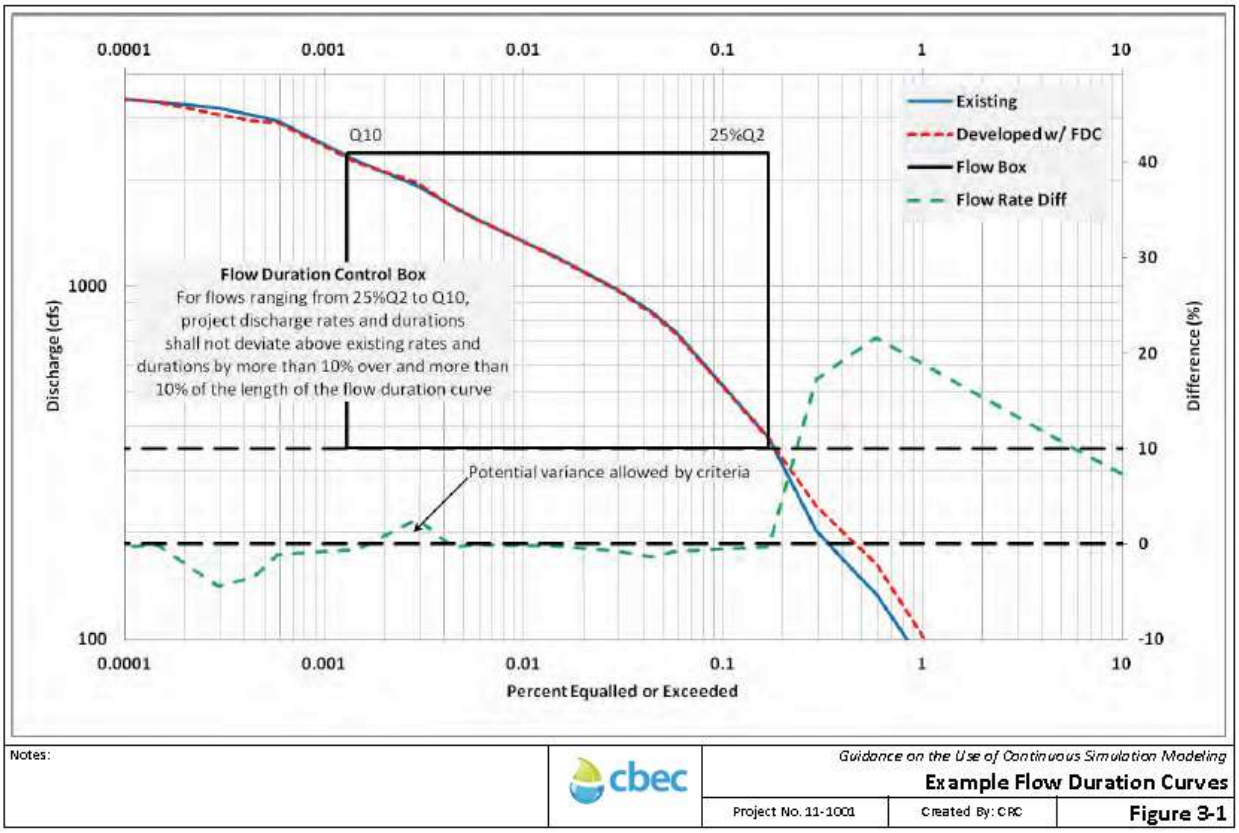

Figure 3-1. Example Flow Duration Curves

4. DATA REQUIREMENTS FOR CSM AND HYDRAULIC ANALYSIS

Hydrologic models capable of performing long-term continuous simulation to support HMPs include, but are not limited to, HSPF, HEC-HMS soil moisture accounting (SMA) method, and other hydrology models, such as the Bay Area Hydrology Model (BAHM). The first two are public domain software models and the third is a proprietary software model customized for specific counties that uses HSPF as its computational engine. A fourth modeling tool based on continuous simulation results, and also using HSPF as its computational engine, are the suite of BMP sizing calculators specifically designed for HMP management for select counties. These have been developed for Contra Costa and San Diego County and Sacramento County (in draft form). All four suites of models use site conditions (i.e., topography, soils, vegetation, and land use) and long-term precipitation data to calculate the various components of the hydrologic cycle (i.e., infiltration, surface runoff, soil moisture, evapotranspiration, percolation, interflow, and groundwater). Specific details about each model and model comparisons (e.g., TetraTech, 2011) are not discussed here, but can be reviewed in available literature.

Following model selection, hydrologic models are created for existing and project conditions based on various considerations, some of which are discussed in subsequent sections. For project conditions, county specific HMP measures need to be specified to manage project runoff to meet the evaluation criteria identified above. The BMP sizing calculators and BAHM-type hydrology models do have optimization routines to size BMP and LID measures. Automatic sizing allows for efficient and quick sizing of such features based on county specific, model specific (e.g., the sizing calculator for San Diego and Contra Costa County is based on pre-defined sizing factors such that site specific continuous simulations do not need to be performed, and is limited to drainage management units of less than 100 acres), and user-defined (e.g., the BAHM-type hydrology models require site specific continuous simulation with a wide selection of measure configurations) assumptions and limitations. As standalone models, HSPF and HEC-HMS offer flexibility as it relates to model configuration, model inputs, and user-defined parameters. However, these models do not have optimization routines to size various BMP and LID measures, thus requiring manual iteration to achieve a satisfactory solution.

PRECIPITATION DATA

Long-term precipitation data in the range of 30 to 50 years is typically needed to generate a sufficiently long flow record from which FDC and PFC analyses and/or subsequent hydraulic analyses can be performed. The precipitation data observation interval should ideally be no coarser than hourly, and if available, can be sub-hourly (e.g., 15 minutes) to coincide with a finer continuous simulation time step.

The precipitation data should ideally be located near the project site, and if needed, scaled to the project site based on a ratio of mean annual precipitation as derived from county specific mapping or regional sources (e.g., PRISM [http://www.prism.oregonstate.edu/]) and reviewed to ensure that it captures key IDF characteristics from county specific mapping or regional sources (e.g., NOAA Atlas 14 [http://www.nws.noaa.gov/oh/hdsc/index.html]). A variety of precipitation data sources exist, and include, but are not limited to:

- ALERT system for individual counties (e.g., Sacramento [http://www.sacflood.org/])
- Western Region Climate Center (WRCC [http://www.wrcc.dri.edu/])
- NOAA National Climatic Data Center (NCDC [http://www.ncdc.noaa.gov/])
- California Irrigation Management Information System (CIMIS [http://wwwcimis.water.ca.gov/])

HYDROLOGIC SIMULATION TIME STEP

The continuous simulation time step and output reporting interval for the four models identified above has traditionally has traditionally been hourly. However, an hourly time step is often significantly larger than the time of concentration for concentration for developed subwatersheds relative to existing subwatersheds, especially those commonly configured commonly configured developed subwatersheds that are limited to less than 100 acres. The sizing calculator and BAHM-type calculator and BAHM-type models are hardwired at hourly, but the public domain software still affords the user to go to a the user to go to a finer time step. As such, a sub-hourly time step and output reporting interval is preferred in order to preferred in order to adequately resolve and sample flow from developed subwatershed elements where time of where time of concentrations are typically less than one hour. As shown by

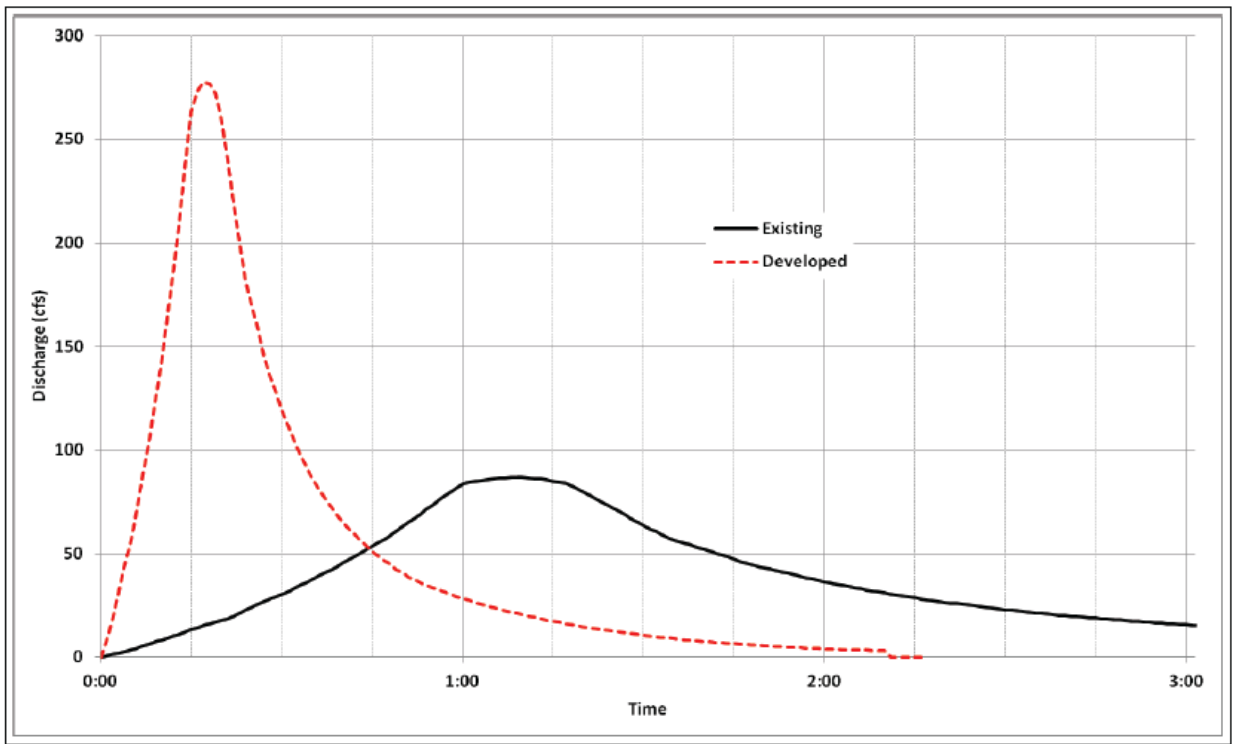

Notes:

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Guidance on the Use of Continuous Simulation Modeling

Example Unit Hydrographs

Project No. 11-1001 | Created By: CRC | **Figure 4-1**

Figure 4-1 for a typical developed subwatershed, the unit hydrograph for developed conditions is flashier, peaks quicker (well within one hour), and the recession limb becomes small quickly. While a sub-hourly time step and output reporting interval may not be desirable due to the volume of model output that will be generated, it is possible to bias the results in favor of the developed condition due to under sampling of the flashier and larger developed flows under an hourly time step.

HYDROLOGIC MODEL CALIBRATION AND VALIDATION

In developing continuous simulation models, the model parameters describing soil characteristics, land use descriptions, and evapotranspiration should be derived from published data (e.g., soil survey, local studies, county standards, etc.). These parameters should be calibrated and validated, where applicable, by comparing modeled flows to measured or observed flows with the receiving waterbody for specific overlapping periods when there is adequate precipitation, evapotranspiration, and flow data. In the absence of site-specific data for calibration and validation, calibrated model parameters from neighboring watersheds within the region could be used so long as proper justification is provided that said parameters are appropriate. However, it is not recommended that local studies rely upon calibrated parameters from other regions where soil characteristics and land use descriptions are markedly different. Rather, when calibration cannot be performed, general review and comparison of continuous simulation model outputs (e.g., hydrograph shape, AMS, etc.) to standardized event-based approaches could be performed to demonstrate that continuous simulation results are generally consistent with local standards and methodologies.

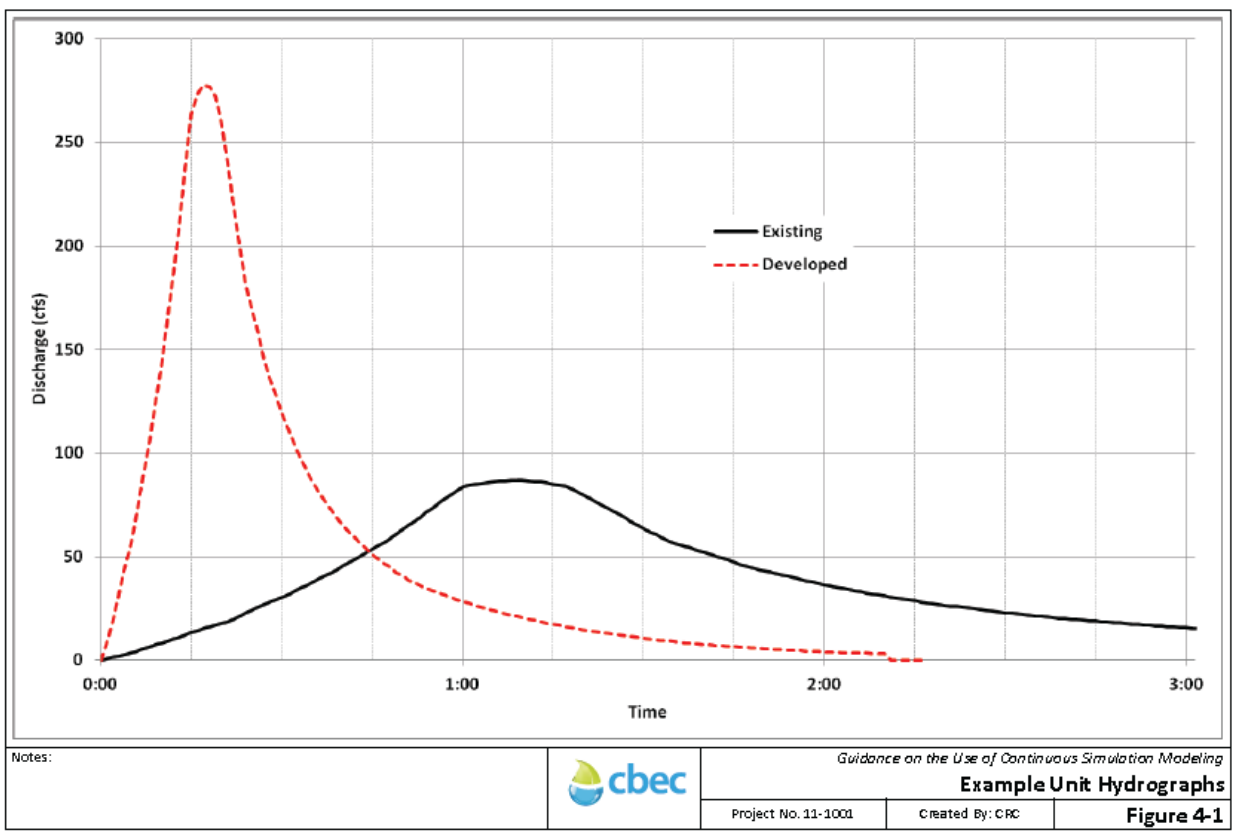

Figure 4-1. Unit Hydrograph Method

For example, continuous simulation modeling in Sacramento County for some developments has relied up conversion of SacCalc (HEC-1 pre- and post-processor) event-based models to the SMA method within HEC-HMS. This conversion often involves retaining the surface infiltration rate determined by SacCalc based on accepted land use descriptions, but parameterizing the subsurface based on soil survey information and local studies, using local potential evapotranspiration data, and reviewing model hydrographs for reasonableness.

HYDRAULIC MODEL CONSIDERATIONS

Sometimes hydraulic models are needed since the basic flow routing within the hydrologic models is not adequate to characterize the potential changes to the hydraulic and geomorphic character of the receiving waterbody, especially when instream measures are suggested or EP is used as the evaluation criteria. Potential considerations and issues encountered when developing and using hydraulic models for continuous simulation include:

1. Low flow instabilities can introduce anomalies into model output (which is commonly encountered in HEC-RAS), so careful hydraulic model selection is important for accuracy and efficiency
2. The sensitivity of the hydraulic model outputs (i.e., velocity and shear stress) to accurate hydraulic description of the receiving waterbody (i.e., cross section geometry (i.e., is it based on LiDAR influenced by vegetation or ground survey), proper definition of channel transitions, proper definition of channel bank markers, appropriate Manning's n-values, etc.)
3. Selection of appropriate compliance points that are representative of the reach and capture flow changes (e.g., downstream of points of discharge and not in backwater areas).

All of these issues have the potential to introduce error and subjectivity into long-term hydraulic analyses and care should be taken to systematically address each source of error.

GENERAL TIPS

A series of general tips are provided as follows. These can be used to increase efficiency and accuracy when performing CSM.

- To shorten the simulation time, the precipitation record can be truncated to only the rainy season (e.g., October through May) by removing the dry summer months from the simulation, especially in ephemeral systems where applicable.
- Hourly precipitation data does not prohibit the continuous simulation model from being run at a sub-hourly time step.
- Subwatershed delineation between existing conditions and developed conditions can often result in relatively large existing subwatersheds compared to relatively small developed subwatersheds. It is commonly known that smaller subwatersheds have flashier flows, so making existing and developed conditions subwatershed sizing consistent is recommended to provide a more meaningful comparison.

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APPENDIX B: APPLICATION OF SUITES OF MODELING AND ASSESSMENT TOOLS

Introduction. This appendix provides a discussion of four example "suites of tools" that can be used to perform predictive scientific assessments and address specific questions related to hydromodification assessment and management. The suites are changeable mixes of mechanistic models, statistical analyses, and expert scientific judgment that incorporate a number of the tools discussed in Chapter 4, combined in various ways. For example, some suites apply a series of cascading models, in which the output from one is used as input to the next; other suites apply a number of models in parallel to develop an assessment based on the weight of evidence. The suites of tools discussed below are used to perform a baseline stability assessment, a channel forming discharge analysis, an erosion potential analysis, and a sediment transport analysis. Most of these standard tools (with the exception of the erosion potential suite) have been widely employed in a variety of stream management activities for decades, and are considered essential components of the broader fluvial geomorphology toolbox. This is far from a comprehensive list of tools, as there are many other important tools (focused on both geomorphic and biologic endpoints) relevant to hydromodification management (Kondolf et al. 2003; Poff et al. 2010); however, the purpose of this appendix is to briefly illustrate how several standard tools can be integrated to answer key questions about stream responses and to provide a stronger technical basis for hydromodification management.

Application of these tools provides basic geomorphic data and knowledge that are typically needed to manage a stream for some desired future state in a watershed with changing land uses. This critical information comes at a cost—the tools require substantially more time and effort to apply than has been the norm in hydromodification management because they involve examining streams within their watershed context with a deeper level of geomorphic analysis. Stormwater management programs typically have made the "practical" assumptions that stream reaches can be managed in isolation from the larger systems of which they are a part, and that effective management prescriptions can be formulated with little or no substantive geomorphic analysis. ***These assumptions are in direct conflict with current understanding in fluvial geomorphology and stream ecology, which indicates that protection of stream integrity is often predicated upon careful assessments of geologic and historical context, performing detailed hydraulic and sedimentation analyses where appropriate, and developing basic understanding of streamflow-ecology linkages***. If hydromodification management policies are to have a reasonable chance of actually achieving their aims, then it will most likely be necessary to reject these simplifying assumptions and instead rely on approaches rooted in current scientific understanding of stream systems.

The suites of tools described below go beyond screening level assessments that are designed, in part, to identify which streams lend themselves to relatively straightforward management prescriptions versus which streams do not. For streams that do not lend themselves to generic management prescriptions, the level of analysis performed with these tools should increase with the level of risk and geomorphic / biologic susceptibility of the streams. This does not mean that every stream will require in-depth analysis by local permitting agencies. It is not possible to carry out sufficient geomorphic analyses with the tools illustrated below on a permit-by-permit basis, and local governments may lack the resources and/or technical capacity to effectively apply these tools. Instead, ***the vital information provided by these tools***

will need to be obtained through proactive regional studies that involve baseline assessments followed by progressively more in-depth analyses as necessary to provide local governments with a sound basis for effective project-by-project decision-making within a broader watershed management framework.

1. **Baseline Stability Assessment**. This suite of tools is designed to answer the following key questions:
   - What is the trajectory of the stream's form over time?
   - How has the channel form responded to changes in water and sediment supply over the years?
   - Is the channel close to a geomorphic threshold that could result in rapid, significant change in response to only minor flow alteration?
   - How can past channel responses provide insight into potential responses to future watershed change, and so aid in prediction of future hydromodification-induced changes?
   - What level of subsequent geomorphic analysis is appropriate given the complexity of the situation and the susceptibility of the streams of interest?

   The goals of a baseline stability assessment are to:
   - Document the historical trends of the system;
   - Establish the present stability status of the system and identify the dominant processes and features within the system;
   - Provide the foundation for projecting future trends with and without proposed project features;
   - Provide critical data for calibration and proper interpretation of models; and
   - Provide a rational basis for identification and design of effective alternatives to meet project goals.

   The key tools that comprise this suite include:
   - GIS mapping of topography, soils, geology, land use/land cover across the contributing watershed (e.g., Thorne 2002)
   - Analysis of hydro-climatic data, e.g. streamflow gauge records, changes in stage-discharge relationships over time (e.g., Thorne 2002)
   - Analysis of aerial photos and historical data (e.g., Thorne 2002)
   - Field reconnaissance (e.g., Thorne 1998)
   - Qualitative response (e.g., Lane 1955b, Schumm 1969, Henderson 1966 relations)
   - Classification systems - (e.g., Thorne 1997; Schumm et al. 1982; and channel evolution model developed for S CA by Hawley et al. in press)
   - Relationships between sediment transport and hydraulic variables
   - Regional hydraulic geometry (e.g., Hawley 2008; Haines in prep)
   - Regional planform and stability predictors (e.g., Hawley et al. in press, Bledsoe et al. in press, Dust and Wohl 2010)

- Bank stability analysis (e.g., BSTEM http://www.ars.usda.gov/Research/docs.htm?docid=5044, Hawley (2009), Bledsoe et al. in press, Osman and Thorne 1988; Thorne et al. 1998)
- Sediment budgets (Booth et al. 2010; Reid and Dunne 1996)
- Fluvial audit (Thorne 2002 – a comprehensive framework for performing baseline assessments)

A baseline assessment is completed by integrating information from all the available data sources and analytical tools. Analysis with each of the individual tools may yield a verdict of aggradation, degradation, or dynamic equilibrium with respect to the channel bed, and stable or unstable with respect to the banks. The individual assessments can produce contradictory results. In this case, one should assign a level of confidence to the various components based on the reliability and availability of the data, and the analyst's own experience level. As is often the case in the management of fluvial systems, there is no "cookbook" answer, and we must always incorporate sound judgment.

A process-based channel evolution model (CEM) is a particularly useful element of the baseline assessment process. A CEM aids in identifying the dominant processes and trends of channel change and provides a framework for subsequent, more detailed modeling (ASCE 2008). In some locations, CEMs have already been developed and calibrated with regional data. For example, the CSU / SCCWRP Screening Tool (Bledsoe et al. 2010) grew out of a regional CEM (Hawley et al. in press) and integrates several baseline assessment tools including regionally-calibrated braiding, incision, and bank stability thresholds, and sediment supply analysis with "Geomorphic Landscape Units" (Booth et al. 2010). In locations where a CEM has not been sufficiently defined, the baseline assessment suite of tools can provide the data and understanding needed to develop a regionally calibrated CEM.

The following are example outputs from a baseline stability assessment, including channel stability and bank stability diagrams associated with key geomorphic thresholds of management concern in the channel evolution sequence (i.e. braiding, incision, and bank failure):

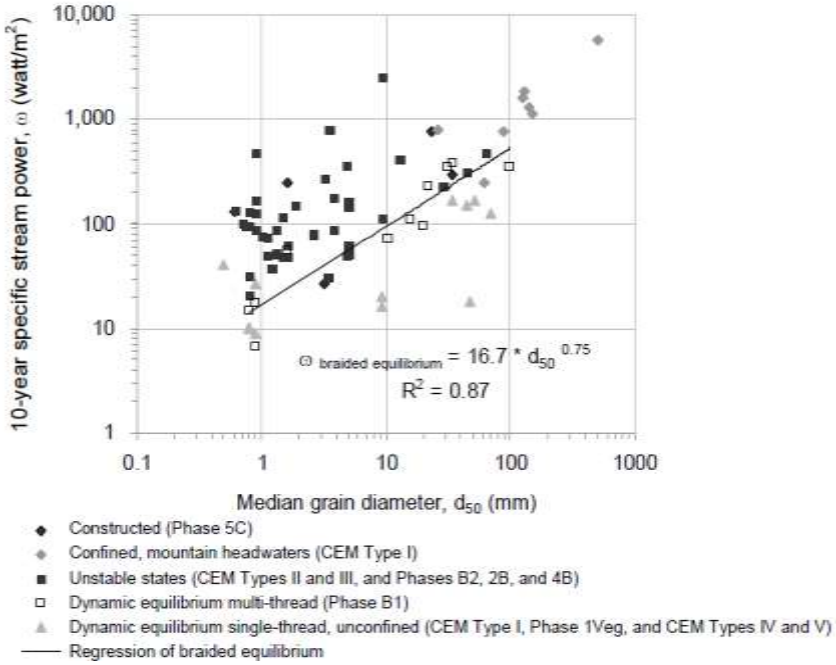

Figure B-1. Stability thresholds for channel types of southern CA, as identified through the development of a regional CEM (Hawley et al., in press).

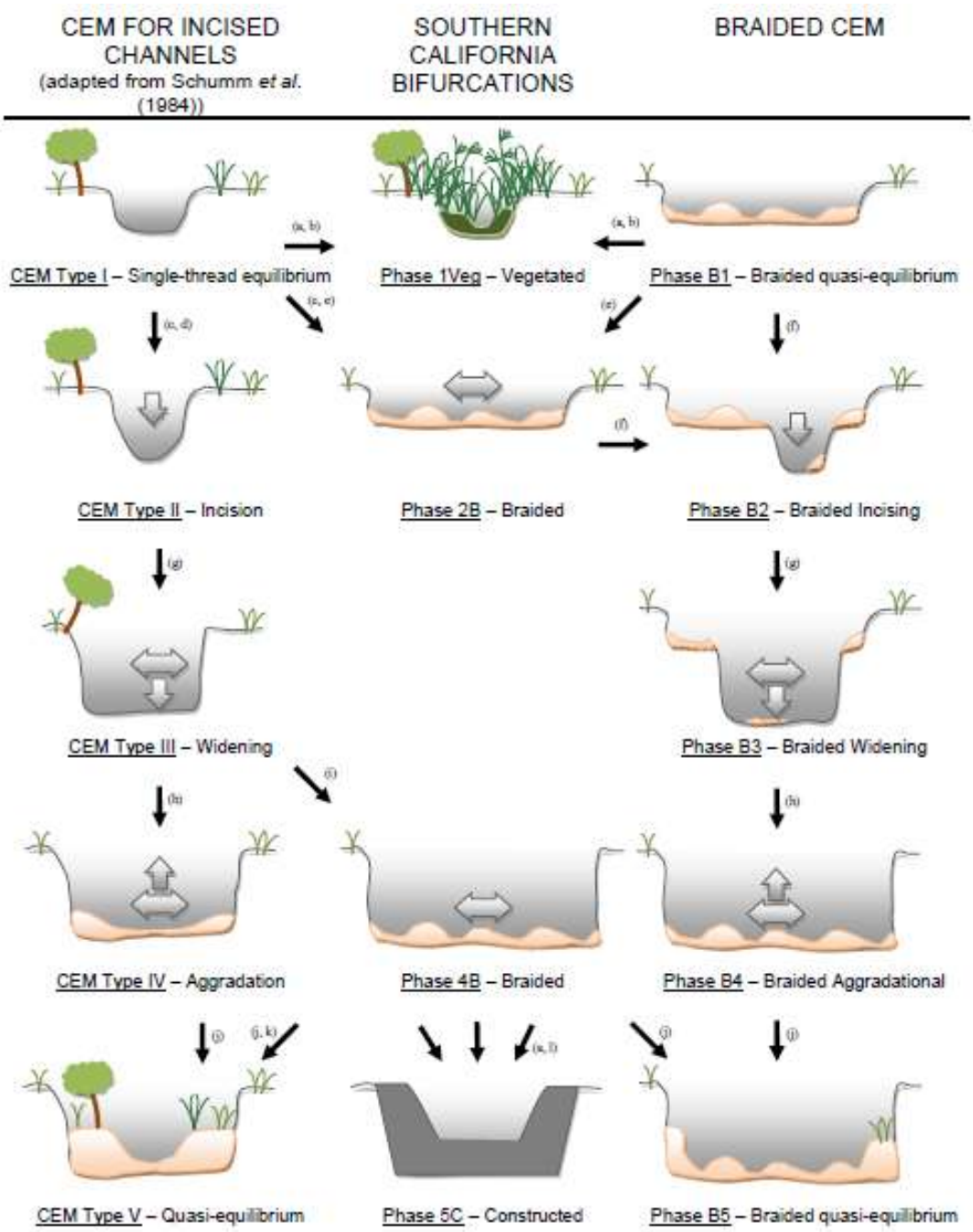

Figure B-2. Channel evolution model of response to hydromodification in southern California (Hawley et al. in press). Red and blue ovals highlight geomorphic thresholds that may be quantified using the baseline assessment suite of tools. By developing a general physical understanding of channel evolution sequences commonly observed in urbanizing watersheds of southern CA, two braiding thresholds and a bank stability threshold of management concern were identified. Channels may shift from single thread to braided planforms if widening is the dominant mode of initial adjustment. Alternatively, single thread channels may become braided after an initial period of incision that triggers geotechnical instability and failure of the banks. Quantitative predictors of these thresholds of braiding, incision, and bank failure can be developed in the baseline assessment process to evaluate the proximity of streams to these critical stages of channel evolution and instability.

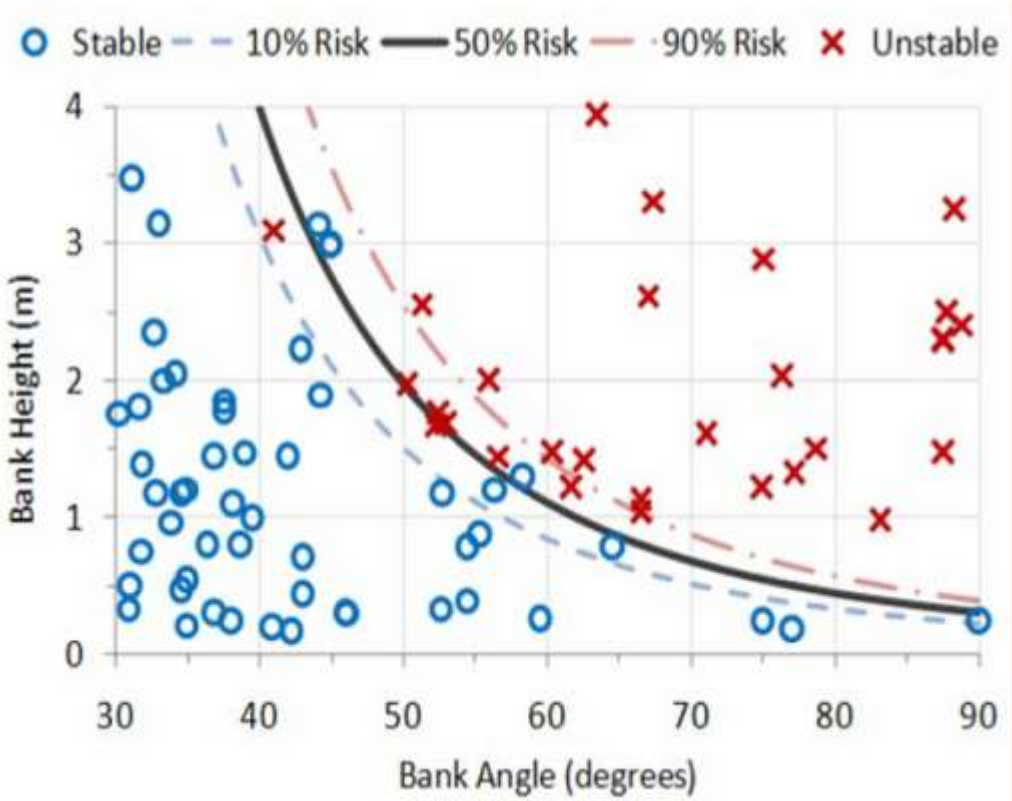

Figure B-3. Bank stability threshold for mass wasting identified through analysis of field data from southern California streams with stable and unstable banks (Bledsoe et al., in press).

2. **Channel-forming discharge suite of tools.** This suite of tools is designed to answer the following key questions:
   - What ranges of discharges are most influential in controlling channel form and processes over decadal time scales?
   - What channel-forming discharge should be used in sediment transport analyses to identify sediment transport capacity, equilibrium slope and geometry, etc.?

   The tools that comprise this suite include the following:
   - Effective discharge computations (e.g., Soar and Thorne 2001; Biedenharn et al. 2000; GeoTools – Bledsoe et al. 2007). An effective discharge analysis directly quantifies the range of discharges that transport the largest portion of the annual sediment yield over a period of many years.
   - Field identification of high water elevations, depositional surfaces, and "bankfull" features
   - Flood frequency analysis
   - Un-gauged site analysis (e.g. USGS StreamStats) http://water.usgs.gov/osw/streamstats/california.html; Hawley and Bledsoe (2011), regional flow duration curve extrapolation – Biedenharn et al. 2000)

This suite incorporates a number of parallel analyses that can be used to establish likely upper and lower bounds to the range of influential discharges, and that can be assessed through a weight-of-evidence evaluation. The following is an example output from the channel forming discharge suite of tools:

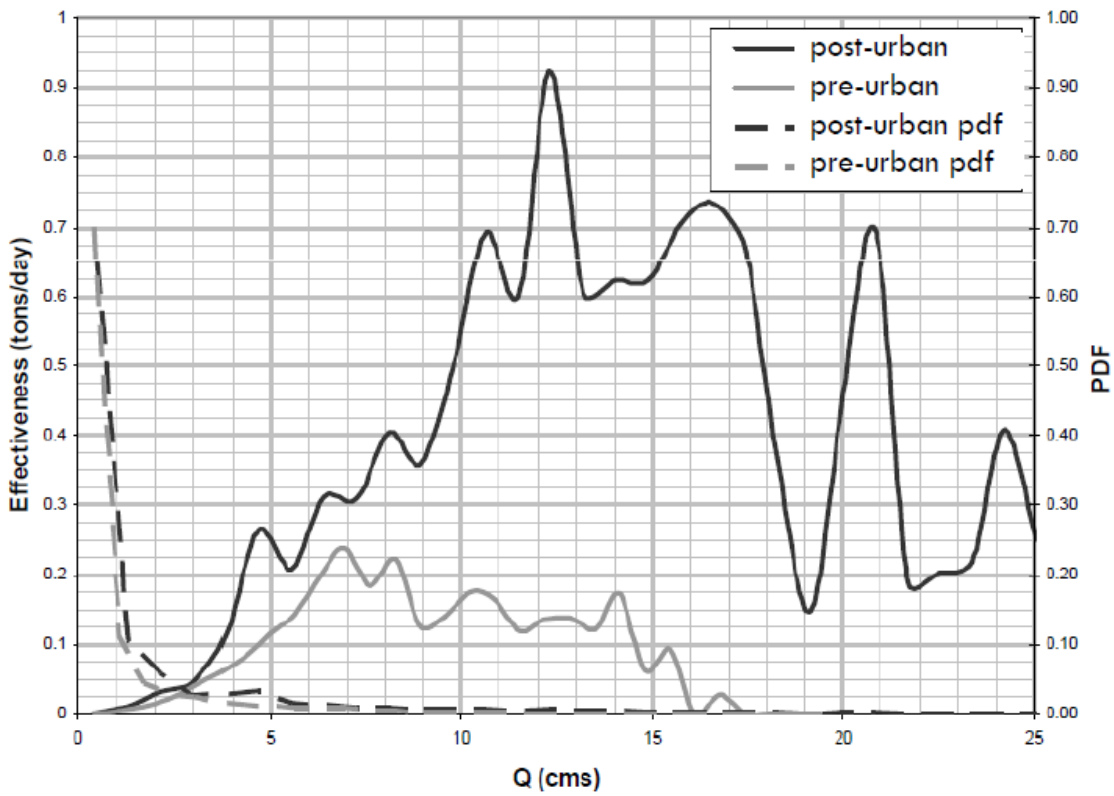

Figure B-4. Flow effectiveness curves for continuous series of pre-urban and post-urban discharges (Biedenharn et al. 2000; Bledsoe et al. 2007). Cumulative sediment yield is approximated by the area under the respective curves. If the stream bed is the most erodible channel boundary, the ratio of areas under these curves would be the erosion potential metric described below in the next suite of tools.

3. **Erosion potential suite of tools.** This suite of tools is designed to answer the following key questions:
   - How do proposed land-use changes or channel alteration affect the capacity of a channel to transport the *most erodible material in its boundary* over a period of many years (erosion potential – Ep)?
   - Do proposed mitigation approaches match the pre- vs. post- development erosion potential over the full spectrum of erosive flows?
   - Do past changes in erosion potential correspond to different states of channel stability and degradation in this region?
   - Does a proposed change in streamflow make it more likely that a channel will enter an alternative / degraded state?

The underlying premise of the erosion potential approach advances the concept of flow duration control (discussed in Chapters 2 and 3) by addressing in-stream processes related to sediment transport. An erosion potential calculation combines flow parameters with stream geometry to assess long term (decadal) changes in the sediment transport capacity. The cumulative distribution of shear stress, specific stream power and sediment transport capacity across the entire range of relevant flows can be calculated and expressed using an erosion potential metric, Ep (e.g., Bledsoe, 2002). This erosion potential metric is a simple ratio of post- vs. pre-development sediment transport capacity over a period of many years. The calculated capacity to transport sediment can be based on the channel bed material or the bank material, depending on which one is more erodible.

This Ep suite of tools has been applied in two primary ways:

a) At a project-level analysis, it has been applied to answer the first two questions above. A municipal stormwater permit may require a project design to achieve an erosion potential (Ep) value of 1.0. This means that a project must be designed so that the long-term erosion potential of the site's stormwater discharge is equal to the erosion potential of the pre-development condition. Section 3.1 below explains the process by which this analysis is conducted.
b) At a regional level, this suite of tools can be applied to answer the third and fourth questions above and to provide further guidance to project-level assessments. For example, practical engineering considerations generally require that a tolerance be permitted around a target design value. It is unlikely that a project design can match an Ep target of 1.0 across all conditions and through all stream reaches, due to variations in a multitude of contributing factors. The selection of an acceptable tolerance or variance from 1.0 is a management decision that should be informed by regional data presented in a risk-based format. Section 3.2 below explains how such a study has been conducted, using the Santa Clara Valley example from northern California.

3.1. *Project-Level Analysis.* As applied to the analysis of project impacts and mitigation design, the steps and associated tools that comprise this suite include the following (Figure B-5):

- Perform continuous simulation of hydrology (e.g. SWMM, HEC-HMS, HSPF) for the project site, for both pre-project condition and post-project condition with the proposed mitigation design.
- Convert discharges and field surveys to hydraulic parameters (shear stress and specific stream power) – e.g., for uniform flow analysis use Manning's equation, GeoTools; for varied flow analysis use HEC-RAS
- Convert hydraulic parameters into sediment transport capacity – e.g., at-a-station hydraulic geometry, HEC-RAS, GeoTools, sediment transport relationships (bedload and total load)
- Integrate Ep over time – e.g., GeoTools

- Compare Ep values for pre-development and post development to determine if the proposed mitigation design is adequate. Adjust stormwater controls as necessary to meet target Ep.

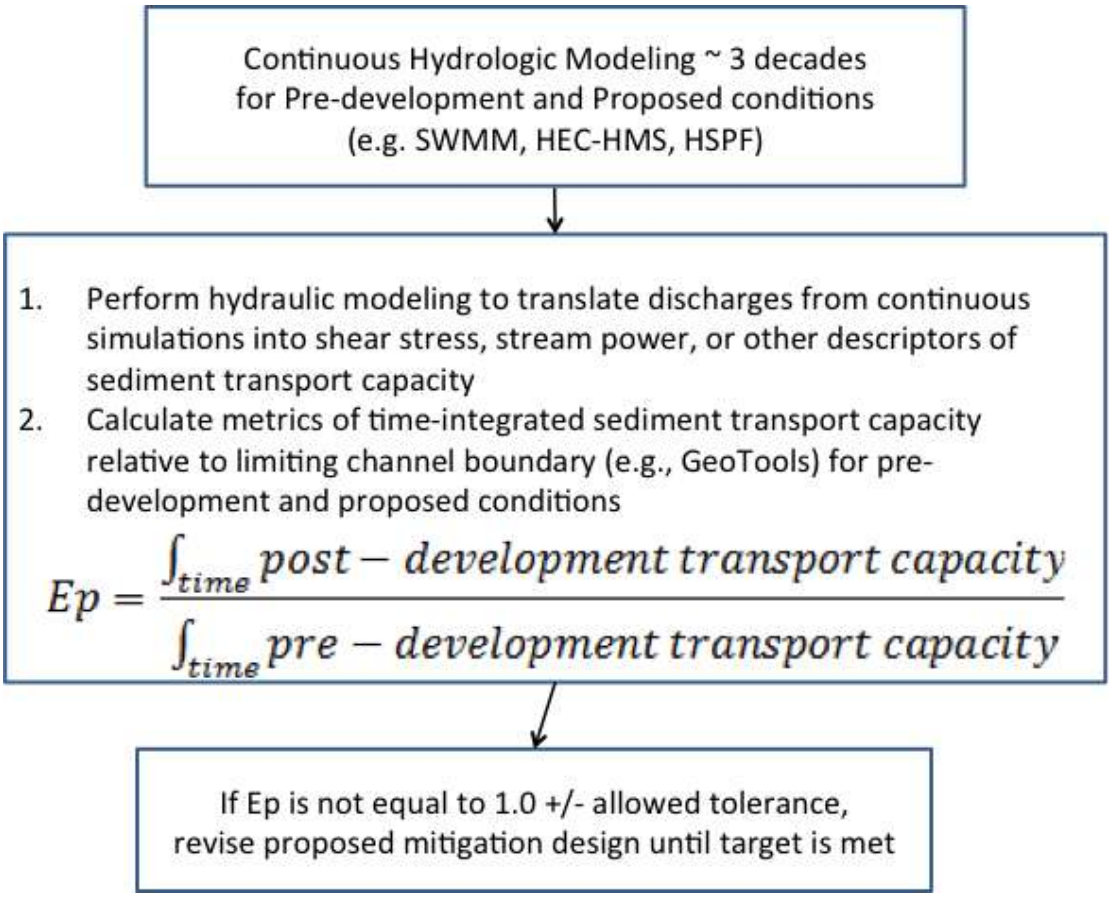

Figure B-5: Steps involved in a project-level Erosion Potential analysis

3.2. *Risk-Based Regional Analysis*. Risk-based modeling estimates the probability of stream geomorphic states. Decision-makers can then choose acceptable risk levels based on an explicit estimate of prediction error. The foundation of risk-based modeling in the context of hydromodification management is the integration of hydrologic and geomorphic data derived from the output of continuous hydrologic simulation models to generate metrics describing expected departures in the most important stream processes. These physical metrics are provided as inputs to probabilistic models that estimate the risk of streams shifting to some undesirable state. Because the decision endpoint is often categorical (e.g., stable, good habitat) the statistical tools of choice

are often logistic regression, classification and regression trees (CART), and/or Bayesian probability networks.

The steps below are used to develop a risk-based framework (Fig. B-6) for assessing how hydromodification may impact streams within a region, and for understanding the relationships between deviation from an Ep of 1.0 and the likelihood of channel instability. Illustrating figures are taken from a risk-based approach was used in the development of the Santa Clara Valley Urban Runoff Program Hydromodification Management Plan (www.SCVURPPP.org). This study demonstrated that a time-integrated index of erosion potential based on continuous hydrologic simulation and an assessment of stream power relative to the erodibility of channel boundary materials could be used to distinguish between channels of a particular regional type that are stable vs. degraded by hydromodification in urban watersheds.

- Perform project-level analysis as described in section 3.1 above for existing developments throughout the study watersheds.
- Perform stream surveys throughout the study watersheds to characterize condition (i.e., stable, unstable)
- Create statistical relationships between Ep and different channel states – e.g., logistic regression in R, SAS, Statistica, Minitab, etc. Note that standard regression techniques are applied when the dependent variable and the explanatory variables are quantitative and continuous. To analyze a binary qualitative variable (e.g., 0 or 1, stable or unstable, healthy or degraded) as a function of a number of explanatory variables, alternative techniques must be used. The regression problem may be revised so that, rather than predicting a binary variable, the regression model predicts a continuous probability of the binary variable that stays within 0–1 bounds. One of the most common regression models that accomplishes this is the logit or logistic regression model (Menard, 1995; Christensen, 1997).

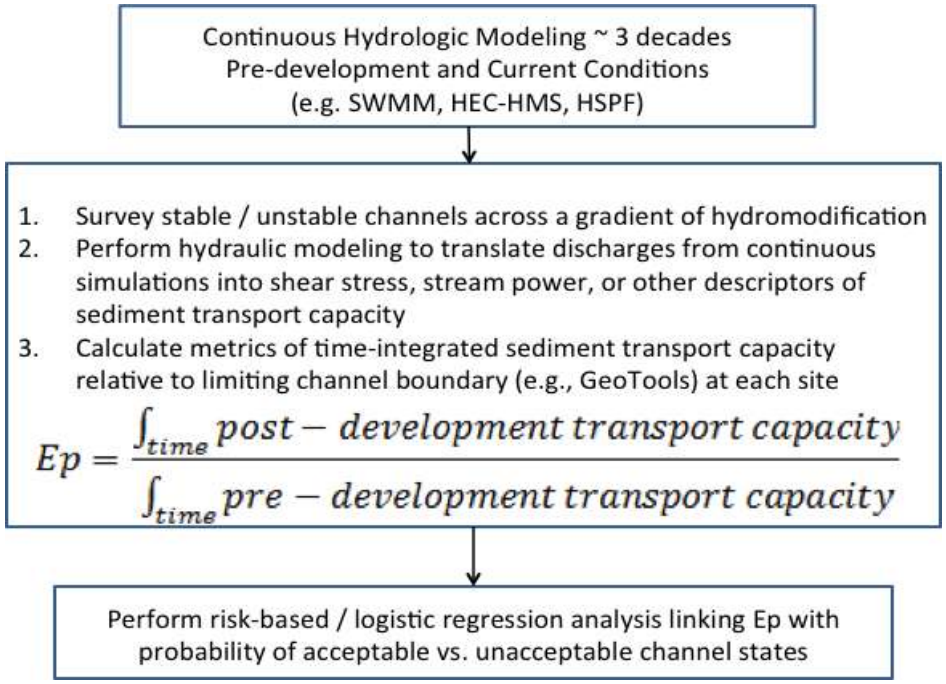

Figure B-6: Steps involved in a Risk-Based Erosion Potential analysis

The variables included in risk-based models of stream response are not limited to erosion potential. Additional multi-scale controls could be included. For example, simple categories of physical habitat condition and ecological integrity could be predicted by augmenting erosion potential metrics with descriptors of the condition of channel banks and riparian zones, geologic influences, floodplain connectedness, hydrologic metrics describing flashiness, proximity to known thresholds of planform change, and BMP types. Furthermore, although most of the emphasis to date has been on predicting geomorphic endpoints, the risk-based approach can be extended to the prediction of biological states in urban streams if the necessary data are available.

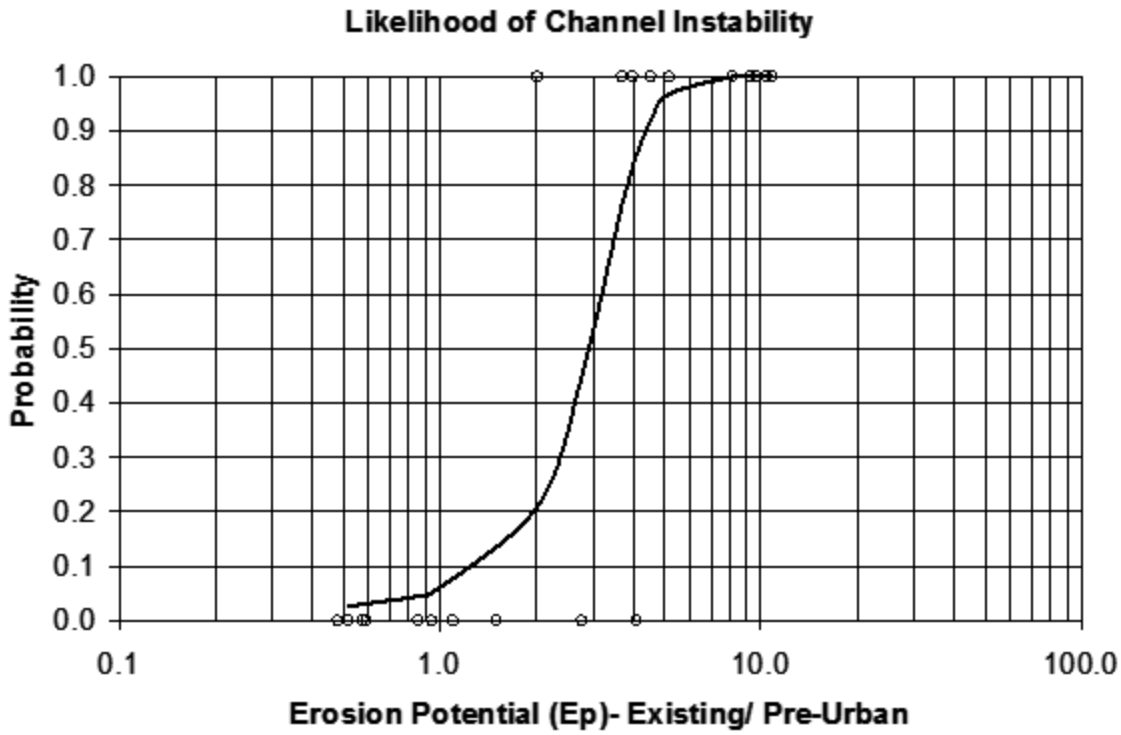

Figure B-7: Example of a logistic regression analysis of stable vs. unstable channels (Bledsoe and Watson, 2001; Bledsoe et al., 2007). The vertical axis represents the probability of stream instability which increases rapidly for channels with sediment transport capacity increased by urban hydromodification (Ep > 1).

3.3. *Strengths and Limitations.* The Erosion Potential approach combines a sound physical basis with probabilistic outputs and requires a substantial modeling effort. Such an effort is necessary to adequately characterize the effects of hydromodification on the stability of streams that are not armored with very coarse material such as large cobbles and boulders. Although policies based on this approach should reduce impacts to channel morphology, they may still fail to protect stream functions and biota. Key simplifying assumptions and prediction uncertainty in the inputs (hydrologic modeling, assumptions of static channel geometry in developing long term series of shear stresses or stream powers, assumptions of stationarity in sediment supply, etc.) have not been rigorously addressed. Its effectiveness also depends on careful stratification of streams in a region such that fundamentally different stream types are not lumped together (e.g. labile sand channels vs. armored threshold channels with grade control) in developing general relationships for instability risk. Endpoints to date have been rather coarse, e.g. stable vs. unstable; as such, they do not provide sufficient resolution for envisioning future stream states. However, the Erosion Potential approach provides

promise as an important tool for hydromodification management; it is recommended that it be refined to address sediment supply changes and to provide more finely resolved endpoints for improved predictive capabilities.

4. **Sediment transport analysis suite of tools.** This suite of tools is designed to answer the following questions:
   - Do I need to incorporate sediment transport analysis in predicting channel response to hydromodification, i.e. what is the sensitivity of channel slope and geometry to inflowing sediment load?
   - At what discharges are different fractions of bed material mobilized in a particular stream segment?
   - What is inflowing sediment load to a stream segment, i.e. what is the water discharge Q(t) and sediment supply rate Qs(t) and grain size D(t) delivered to the upstream end of the channel segment of interest?
   - How will the available flow move the supplied sediment through the segment of interest?
   - What is the new equilibrium slope given some change in streamflow, and how much incision would be necessary to achieve this new slope?
   - What is the sediment transport capacity of the segment of interest *relative to* the inflowing sediment load from *upstream* supply reaches?
   - What is the sediment transport capacity of the segment of interest *relative to* the capacity of *downstream* reaches?
   - At the network scale, where are zones of low vs. high energy, aggradation vs. degradation potential, and coarse sediment constriction located?

   The primary tools that comprise this suite include the following:
   - Tools for estimating watershed sediment supply (Reid and Dunne 1996), including the RUSLE (Renard et al. 1997; http://www.ars.usda.gov/Research/docs.htm?docid=5971) and WEPP (Laflin et al. 1991; http://www.ars.usda.gov/Research/docs.htm?docid=10621) models.
   - Effective discharge analysis (see above)
   - Incipient motion analysis (tractive force, e.g. ASCE 2008; Brown and Caldwell 2011; Buffington and Montgomery 1998; Lane 1955a)
   - Sediment continuity analysis at single dominant discharge with an appropriate sediment transport relation – e.g., HEC-RAS, Bedload Assessment for Gravel-bed Streams (BAGS -Pitlick et al. 2009; GeoTools)
   - Equilibrium slope / geometry analysis e.g., HEC-RAS – Copeland et al. 2001, iSURF-NCED 2011)
   - Sensitivity to inflowing sediment load analysis e.g., Copeland's method in HEC-RAS, iSURF-NCED 2011)
   - Sediment continuity analysis over the entire flow frequency distribution e.g., Capacity-Supply Ratio of Soar and Thorne (2001), BAGS, GeoTools

- Network scale sediment balance – Sediment Impact Analysis Methods (SIAM) module in HEC-RAS

Movable bed / mobile boundary models also provide a mechanistic tool for estimating the trend and magnitude of changes in channel geometry due to hydromodification. However, a recent study evaluated the potential applicability of various movable bed and/or boundary models to streams in southern CA (Dust 2009), including HEC-RAS, CONCEPTS (Langendoen, 2000), and FLUVIAL 12 (Chang, 2006). The results of tests performed on urban streams in southern CA indicate that these models are difficult to apply and have high prediction uncertainty due to flows near critical, split flow conditions, and lack of fidelity to complex widening, bank failure, and armoring processes.

The following figures depict example outputs from an application of the sediment-transport suite of tools:

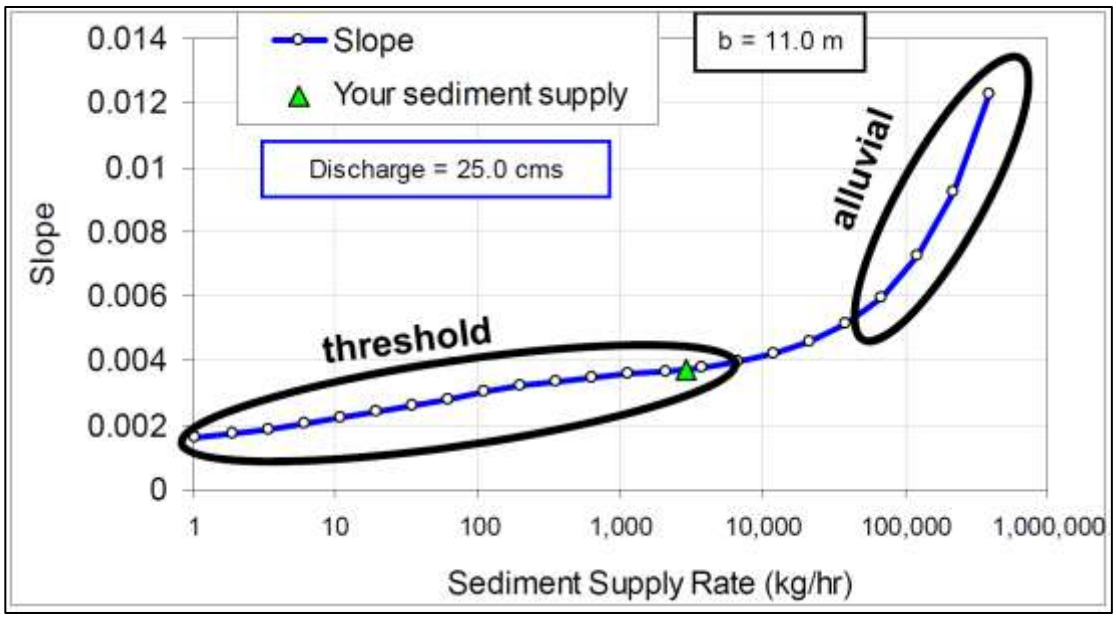

Figure B-8. Sensitivity analysis of equilibrium channel slope to inflowing sediment load (from iSURF, NCED 2011). Slopes of alluvial channels with high sediment supply are much more sensitive than threshold channels with relatively low sediment supply. Channels with beds composed of sand and fine gravels are generally much more geomorphically sensitive to hydromodification than threshold channels in which coarse bed sediments are primarily transported at relatively high flows.

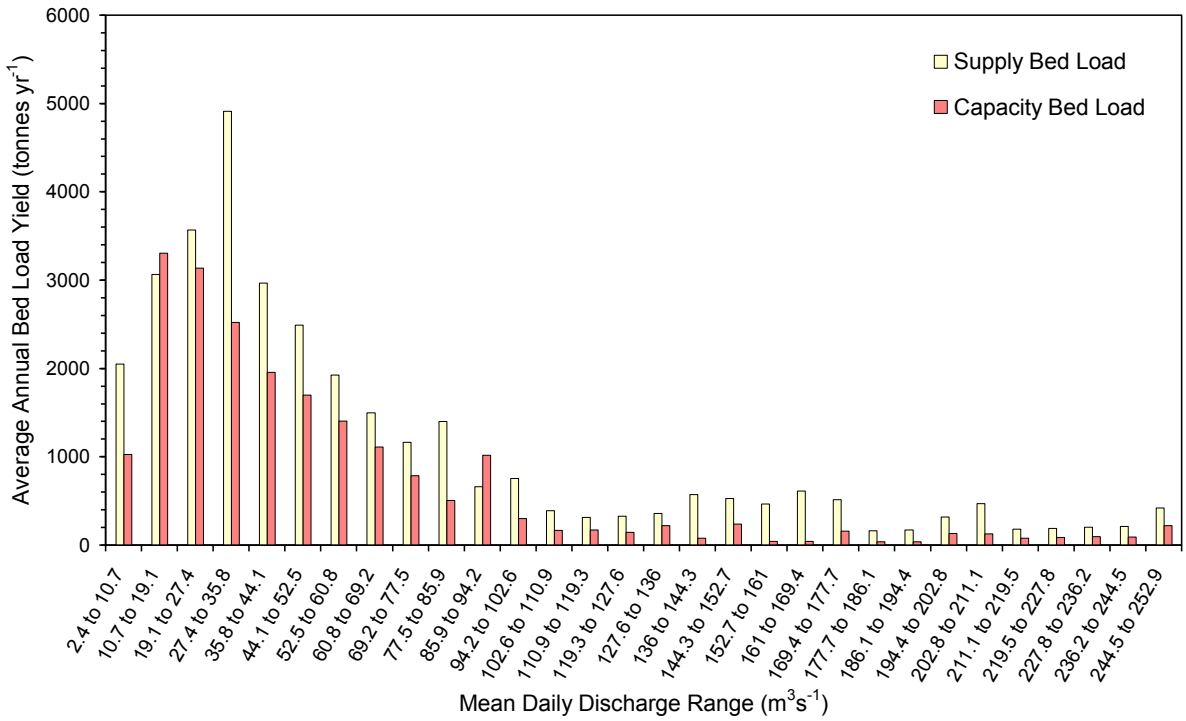

Figure B-9. Analysis of sediment transport capacity vs. inflowing sediment load over the full spectrum of stream discharges (capacity-supply ratio; Soar and Thorne 2001). In this case, the time-integrated capacity to transport bedload is 64% of the supplied bedload and significant aggradation is expected.

5. **Relationship to Management Framework**. These suites of tools could be applied to establish project-specific requirements for hydromodification assessment and mitigation, as recommended in the Management Framework presented in Chapter 3. In the example shown in the diagram below, results of the Baseline Assessment are used as a screening tool to assign high, moderate or low risk levels for stream reaches, in conjunction with the proposed land-use changes. Thus, the Baseline Assessment suite of tools is crucial in determining whether a detailed survey-level assessment and additional suites of tools are necessary for an adequate analysis. The need to apply additional suites of tools in formulating a management approach is commensurate with the level of risk and susceptibility of the stream. More complex and rigorous analysis with multiple suites of tools is necessary in predictive assessments for relatively susceptible stream types such as alluvial channels with sand beds.

   Although a stream may have relatively low susceptibility for overall geomorphic change, it may nevertheless have ecological attributes that are highly susceptible to hydromodification. Thus, suites of tools focused on both geomorphic and biological endpoints must be used to fully assess stream susceptibility to hydromodification. More work will be required to develop tools for prediction of biological response to flow alterations throughout California, as noted in Chapter 3 (see Poff et al., 2010 and http://conserveonline.org/workspaces/eloha).

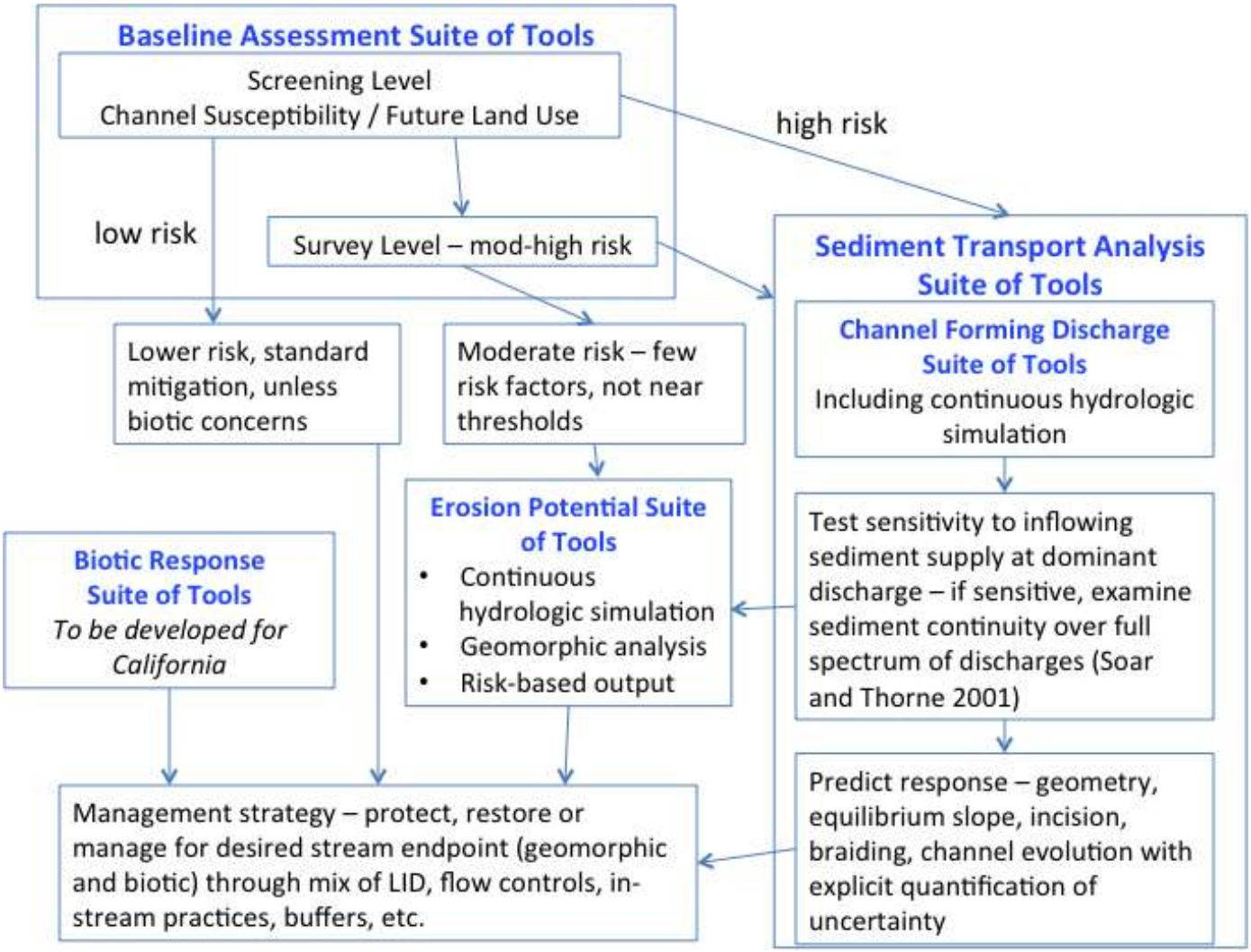

Figure B-10. Conceptual diagram showing relationships among the four suites of existing tools and biotic response tools to be developed in the future. Additional analyses will be required for engineering design.

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APPENDIX C: ADAPTIVE MANAGEMENT

WHAT IS ADAPTIVE MANAGEMENT

Adaptive management is a formalized approach for overcoming the inescapable difficulty in predicting ecological outcomes resulting from natural-resource management actions. It accomplishes this by treating all "management actions" (whether intentional or not) as experimental components within the larger structure of a monitoring program (Holling 1978, Walters 1986, Lee 1999, Ralph and Poole 2003). In other words, specific management actions that may affect ecological processes and functions are systematically evaluated, via "monitoring," to provide the data to affirm or refute the expected outcomes. To the extent that the monitoring results indicate a need to revise the scientific understanding or the management actions built on that understanding, establishing the mechanism to change management actions is a precursor, not an afterthought, of the monitoring program.

Adaptive Management was first articulated over 30 years ago (Holling, 1978) and more recently embraced through various conservation efforts worldwide. Fundamental to this approach is the integration of management and monitoring, recognizing that any management action in the context of a complex ecological system is ultimately experimental, requiring feedback to make progress.

The process of adaptive implementation is iterative and continuous; new knowledge is actively incorporated into revised experiments, a practice best described as "learning while doing" (Lee 1999). The key difference between this approach and other commonly implemented environmental management strategies is the application of scientific principles, such as hypotheses-testing,[is used] to explicitly define the relationships between policy decisions, management actions, and their measured ecological outcomes. Furthermore, this approach provides a means to understand and document these cause-and-effect relationships; it can also point to alternative actions that may produce more desirable outcomes. Uncertainty is embraced and serves as a focal point for defining ever-more specific evaluations.

Scientifically credible and relevant information can only be generated when the management "experiments" are designed with clear hypotheses about the effects of proposed actions or prescriptions. These hypotheses must be testable at multiple scales using available technology and methods (Conquest and Ralph 1998; Currens *et al*. 2000). Hypotheses that cannot be tested, are trivial (e.g., "water flows downhill"), are not credible ("water flows uphill"), or only account for site-specific conditions are not useful in considerations of the singular or cumulative effects of management actions.

In order to retain clear linkages between key questions, hypotheses, and monitoring protocols, the experimental approach must be designed before determining which goals and endpoints are appropriate (Ralph and Poole 2003) since appropriate goals should be *outcomes* of the

effort, not a precondition; and the approach must explicitly tie stated hypotheses to the key ecological questions.

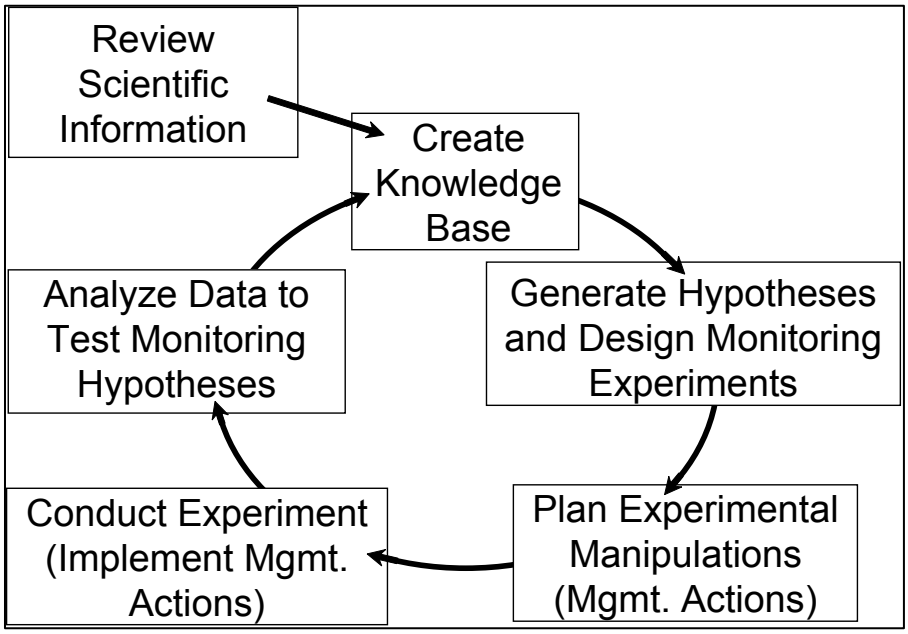

Figure A-1. Framework for an adaptive management program. The key feature of this cycle is the foundation of scientific principles and hypothesis generation; design of the management actions and the monitoring to evaluate their effects are integrated and designed to test assumptions, improve understanding, and reduce uncertainty (modified from Ralph and Poole 2003, Figure 3).

Wagner (2006) asserts that [stormwater] regulatory programs in the past often failed because they were designed in ways that ignored technological and scientific limitations. "Science-based" does not simply mean the monitoring of status and trends followed by responding to imposed benchmarks and goals, but rather that scientific principles must be the foundation of regulatory program design, and that these programs must rely on scientific methods to demonstrate results. Wagner suggests that regulations can still be designed despite incomplete or developing knowledge, but that gaps and limitations must be acknowledged and used to inform ongoing investigations. His argument clearly echoes those of scientists who insist that monitoring experiments and testable hypotheses must frame management decisions and land-use objectives.

WHAT IS *NOT* ADAPTIVE MANAGEMENT, AND WHY IS IT SO PROBLEMATIC?

Unlike the experimental approach embodied by adaptive management, an alternative process traditionally dominates in natural resource management: (1) a problem is identified, but a cause is simultaneously presumed (e.g., "increased sediment inputs into a stream are negatively impacting salmonid survival"); (2) a solution or set of solutions is proposed (e.g., timber harvest is restricted and riparian buffer width is increased), but the prescription is not translated into a testable hypothesis associated with the problem or question; and (3) if the problem is not solved within an arbitrarily reasonable period of time (e.g., a few years) then a different solution is proposed (e.g., "augmented upland and riparian restoration must be implemented"). Although simplified, this outline displays its divergence from adaptive management and from the basic principles of the scientific process—the resulting process is perpetually reactive.

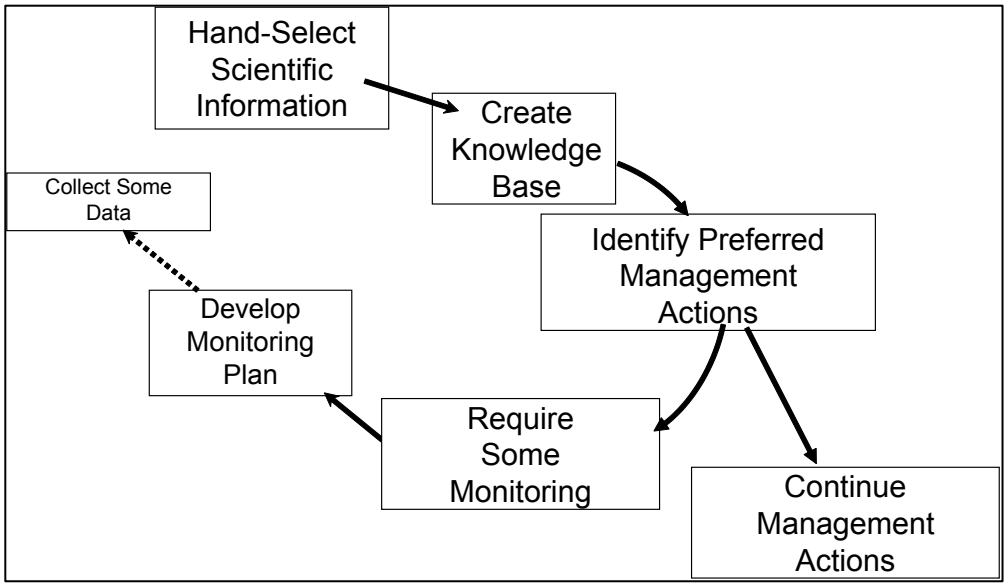

Figure A-2. Common framework for monitoring outside of an adaptive management structure. Management actions are chosen with a presumptive effect on ecological systems, and monitoring is conducted without any feedback to future actions. Even where monitoring is intended to "inform" future management actions, the absence of an explicit experimental design normally limits the utility of any monitoring data to provide meaningful insights.

In its best form, this paradigm has been termed passive adaptive management:

> Restoration planners' current management approach has been described as a "passive" adaptive management approach: science is used to

> develop best-guess predictive models, make policies according to these models, and revise them as data become available. The National Academies advise that every effort be made to take a more "active" adaptive management approach by developing alternative hypotheses for the expected consequences of a particular project and then design the project so the hypotheses can be experimentally tested" (from the summary to *Adaptive Monitoring and Assessment for the Comprehensive Everglades Restoration Plan*, 2003, National Academies Press, 122 pp.).

Ralph and Poole (2003) have aptly named this approach "socio-political adaptive management" (i.e., SPAM).

BARRIERS TO IMPLEMENTING "ACTIVE" ADAPTIVE MANAGEMENT

Although the virtues of active adaptive management are readily articulated, the framework is surprisingly rare in practice. Some of these barriers are practical or logistical, and they include such issues as:

- Longevity and long-term institutionalization of monitoring;
- Effective data management systems that allow managers to readily access data;
- Ability to differentiate effects from natural variability and events, such as flood and fire;
- Cost and technical limitations of necessary data collection.

The most severe impediments, however, are not scientific but social: "We suggest that watershed-scale adaptive management must be recognized as a radical departure from established ways of managing natural resources if it is to achieve its promise... Adaptive management encourages scrutiny of prevailing social and organizational norms and this is unlikely to occur without a change in the culture of natural resource management and research" (Allan et al. 2008).

While science can provide defensible and replicable insights regarding the ecological outcomes of management prescriptions, it cannot offer absolute certainty. Policy can be and should be informed by science but is ultimately based on a variety of considerations that are not always amenable to the spatial, temporal, and technological limitations of the scientific process (Van Cleave et al. 2004). This is an uncomfortable truth for agency managers and elected officials to acknowledge, and it commonly results in funding decisions and public pronouncements using the "language" of science but not its substance.

Although efforts to build large, collaborative programs are commonly characterized by increasing stakeholder involvement and outreach, greater participation does not necessarily

mean that true adaptive management is occurring, or that scientific principals are being applied to either the choice of management actions or their evaluation. These efforts, however, do reflect a movement to extend natural resource management decision-making processes beyond just technical experts in order to reflect evolving social values (Pahl-Wostl *et al*. 2007). If they are successful, this approach can open a path to achieving the best of both realms, namely scientific rigor with a broad base of community support.

ATTRIBUTES OF USEFUL HYPOTHESES FOR AN ADAPTIVE MANAGEMENT PROGRAM

A key element of any adaptive management approach is the set of hypotheses that guide both the management actions and their associated monitoring. Because these management actions are recognized as "experimental" (because in a complex system most outcome(s) cannot be predicted with absolute certainty), their selection must be guided by assumptions about what *might happen,* or what is *expected* to happen. This defines the first attribute of a useful hypothesis: it is **credible**, typically because it is based on prior knowledge or scientific understanding of the system. Indeed, some hypotheses may already be so well evaluated and understood (e.g., "Stormwater runoff from freeways carries measurably elevated concentrations of toxic pollutants") that there is little point in framing them in this structure at all—as new monitoring programs to address such hypotheses are highly unlikely to result in new information or knowledge and might be perceived as an unwise expenditure of scarce monitoring resources.

The second attribute of a useful hypothesis stems from the scientific reality that any experiment, whether conducted in the laboratory or across the landscape, provides value only insofar as its outcomes are measured and the effects are distinguishable from the influence of other, unrelated factors. Thus, the hypothesis that guides the experiment should not only be credible but also **testable**. Otherwise, why bother making measurements at all?

Lastly, these actions and measurements and analyses do not occur in a vacuum. Thus, the final guiding principle for any hypothesis in an adaptive management approach is that it be **actionable**, or that different outcomes, as revealed by monitoring, can (and will) result in different management responses. If no difference occurs, then clearly there is no reason to have made the effort in the first place.

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Environmentally Sensitive Maintenance Practices for Dirt and Gravel Roads

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INTRODUCTION

Over 1.6 million miles of dirt and gravel roads exist within the United States providing a vital part of the nation's transportation system. Roads crisscross mountains, flat lands, and valleys intercepting streams, meadows, and riparian areas. The ecological effect a road has on the surrounding environment varies greatly depending on location, design, and maintenance. Roads can adversely affect the surrounding environment through erosion, and increased sediment delivery to streams, meadows, and riparian areas. Roads can intercept subsurface flows; increase hillslope drainage density through ditch lines and relief culverts; and create diversion potential at stream crossings. An environmentally sensitive road maintenance practice is a practice that when implemented reduces the adverse effect of a road on the environment by treating the cause of the problem and is in keeping with the natural landscape. The goal of this field guide is to provide examples of environmentally sensitive maintenance practices, which if implemented reduce erosion and sediment, maintain subsurface hydrologic connectivity, restore drainage density to more natural conditions, and eliminate diversion potential. Additionally environmentally sensitive maintenance practices reduce long term maintenance costs and lengthen maintenance cycles. To achieve this goal, the Forest Service, U.S. Department of Agriculture, and Pennsylvania State University's Center for Dirt and Gravel Roads, have established a simple protocol to help road managers and maintenance practitioners to: carefully assess road conditions; identify problems; determine cause; and select the appropriate environmentally sensitive practices that fit the site conditions.

ORGANIZATION

This field guide is organized to identify visual signs of problems associated with CAUSES and SOLUTIONS for the most commonly encountered road problems. The Keys Section guides the users to specific practices with the guide that is grouped according to the type of problem (road surface, ditch, cutbank, etc). Additional references and links to other useful guides are included in chapter 10.

Keys To Using the Guide

Don't address symptoms. Address the problem by identifying the cause of the symptoms.

The following keys help identify indicators, determine the cause, and provide potential solutions.

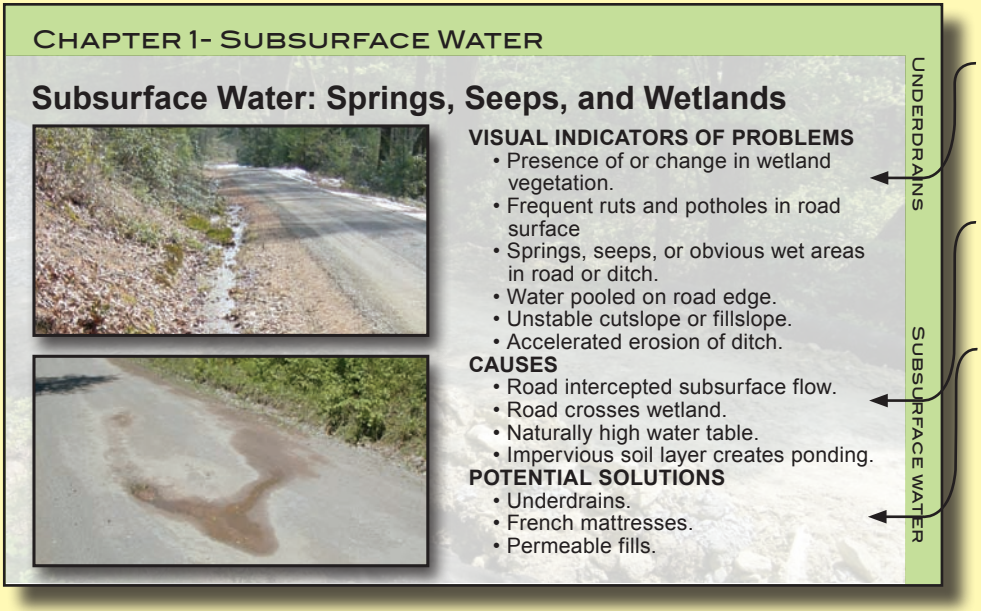

Figure 1.1—Subsurface water key.

Example key

Visual Indicators of Problems: Use this section to identify problems that you see on the road.

Causes: These are common causes of the symptoms listed above.

Potential Solutions: The environmentally sensitive road maintenance practices identified address the causes of the problem.

Chapter 1 - Keys to Diagnosing Road Problems
-Subsurface Water: Springs, Seeps, and Wetlands

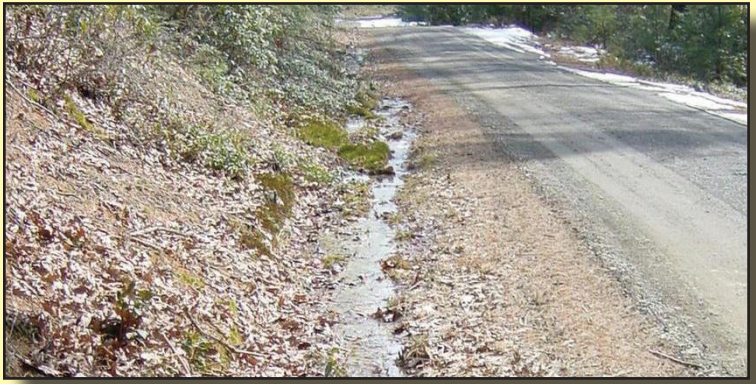

Visual Indicators of Problems

- Presence of or change in wetland vegetation.
- Frequent ruts and potholes in road surface.
- Springs, seeps, or obvious wet areas in road.
- Water pooled on road edge.
- Unstable cutslope or fillslope.
- Accelerated erosion of ditch.

Causes

- Road intercepts subsurface flow.
- Road crosses wetland.
- Water table naturally high.
- Soils poorly drained.

Potential Solutions

- Underdrains.....pg 12
- French drains.....pg 14
- French mattresses.....pg 17
- Permeable fills.....pg 22

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Visual Indicators of Problems

- Rutting and potholes in road surface.
- Washboarding.
- Flowing or ponding water on road.

Causes

- Loss of road-surface shape (template).
- Inadequate drainage features (frequency and design).
- Inconsistent drainage design with topography and or use.
- Changes or increase in traffic use.
- Infrequent maintenance.

Potential Solutions

- Crown, outslope, inslope road-surface shapes ..... pg 30
- Grade breaks ..... pg 35
- Broad-based-dips ..... pg 38
- Conveyor belt diversions ..... pg 41

Chapter 1 - Keys to Diagnosing Road Problems-Road Side Ditches

Visual Indicators of Problems

- Flowing or ponding water in ditch.
- Erosion, scour, or downcutting of ditch.
- Ditches drain directly to streams or wetlands (hydrologic connectivity).

Causes

- Excessive water volume for ditch capacity.
- Insufficient or ineffective ditch relief outlets.
- Run-on from another source (hillslope, driveway, outside the right-of-way).
- Entrenched road template.

Potential Solutions

- Outsloping ..... pg 32
- Reading the ditch ..... pg 48
- Raising the road profile ..... pg 52
- Berm removal ..... pg 58
- Low-maintenance ditches ..... pg 60
- Disconnecting ditches from streams ..... pg 63

Ditch Outlets

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Visual Indicators of Problems

- Erosion at ditch outlet.
- Sediment delivered to stream (hydrologic connectivity).
- Long trenches cut for outlet.
- Disconnected turnouts (lead-out).
- Ponding of water in ditch.

Causes

- Too much water volume for ditch capacity (insufficient outlets).
- Cross pipes (ditch relief) installed too deep.
- Poor road-surface shape.
- Entrenched roads.
- Lack of pipe inlet and outlet protection.
- Road and stream are hydrologically connected.

Potential Solutions

- Outslope.....pg 32
- Reading the ditch.....pg 48
- Raising the road profile.....pg 52
- Shallow cross pipes.....pg 68
- Through-the-bank pipes.....pg 72
- Headwalls and endwalls.....pg 75

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Visual Indicators of Problems

- Frequent flooding.
- Culvert plugging with debris.
- Gravel bar deposition at culvert inlet.
- Downcutting at culvert outlet.

Causes

- Insufficient crossing capacity for flows and associated bedload.
- Poor crossing alignment.

Potential Solutions

- High-water bypass .....pg 82
- Improved fords and low-water crossings .....pg 86
- Improved stream crossings.....pg 90

Cutslopes/Fillslopes

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Visual Indicators of Problems

- Rill or gully erosion on cutslope.
- Unstable or unvegetated banks.
- Sloughing bank material blocking ditches and plugging pipes.

Causes

- Excessive waterflow over bank, or from seeps coming out of bank.
- Unfertile subsoil as growing medium.
- Loss of topsoil during road construction.
- Oversteepened cutslope – not at a stable angle of repose.
- Undermining of cutslope through road design or maintenance.

Potential Solutions

- Underdrains .....pg 12
- Raising the road profile.....pg 52
- Naturalize cutbanks/fillslopes.....pg 95
- Rock buttressing.....pg 98
- Benches and interceptor swales.....pg 99
- Off right-of-way issues.....pg 103

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Surface Aggregate

Visual Indicators of Problems

- Loss of fine materials.
- Increased sediment and erosion.
- Potholes in travelway.
- Washboard road surface.
- Berms formed from loose aggregate.
- Need for frequent maintenance.

Causes

- Inadequate road-surface drainage.
- Poor aggregate quality.
- Lack of adequate gradation of aggregates.
- Loss of road-surface shape from vehicle traffic or infrequent grading.

Potential Solutions

- Quality aggregate with appropriate gradation of aggregates.....pg 108

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Figure 2.1—Permeable fill provides for subsurface flows.

Subsurface Water

Roads often must cross wet areas and can intercept subsurface flows. The degree to which a road intercepts subsurface flow and subsequently redirects it varies from location to location. Wetlands, springs, and seeps can become problem areas if not addressed properly. Left untreated, perpetually wet conditions can expedite road degradation, which requires more frequent maintenance and often times creates hazardous driving conditions.

Most subsurface water is clean, meaning free of sediment (unlike overland flow). Redirecting subsurface water away from the traveled way will dry the road surface and reduce erosion and maintenance costs.

It is important to identify the SOURCE of any water on the road. The environmentally sensitive maintenance practices discussed in this chapter apply to subsurface water only.

Figure 2.2—Road intercepts subsurface flows and redirects it down the road as surface runoff.

Figure 2.3—Road crosses meadow without adverse impacts to subsurface flows.

Underdrains
An underdrain is a drainage system installed under a road or road ditch to collect and transport subsurface water. These buried conduits come in a variety of shapes and sizes and are usually wrapped in geotextile fabric, which allows water to enter the conduit while keeping sediment out.

Criteria for Underdrain Use

- Locations with spring flow discharge onto the road.
- Roads with seeps appear on the surface of the road.
- Road shoulders that are continually wet and rutting.
- Road ditches with standing water or active flow due to springs and seeps.
- Cutslopes that are unstable and failing due to excess moisture.
- Areas with clayey soils that collect subsurface flows.

Important Underdrain Considerations

- Never use underdrains to handle surface flows; sediment will clog drain.
- Install all underdrains with at least a 1 percent slope to carry water to the outlet.
- Always cover underdrains with at least 8 inches of fill.
- Outlet underdrains separately from ditch drainage when possible.
- Consider animal guards on outlets to prevent clogging.
- Outlet underdrains in natural swales or stable filter areas.

Figure 2.4—Road ditch with standing water.

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Figure 2.5—This drain collects water from springs and seeps under the road ditch.

Benefits of Underdrains

- Inexpensive and easily installed.
- Decreases volume of water on road surface.
- Allows the road cutbank, ditch, and base to dry out and become more stable.
- Separates subsurface water from road runoff.
- Saves money by reducing maintenance time and costs associated with perennially wet roadsides.
- Maintains vegetative communities and habitat.

Types of underdrains. There are two types of underdrain, prefabricated and constructed. A prefabricated underdrain can be purchased in a variety of shapes and sizes. While it is usually less expensive and easier to install, it will not collect as much water as a constructed underdrain or French drain. French drains, like those used around home foundations, provide greater surface area for water collection.

French Drains

Figure 2.6—Perforated plastic pipe.

Prefabricated underdrains

- Consist of perforated plastic pipe wrapped in fabric.
- Available in a variety of sizes and shapes.
- Less expensive and easier than French drains.
- Best for use in well-drained soils (rocky and sandy areas).
- Unsuitable for clay soils.

Figure 2.7—Free draining stone.

French drains

- Consist of a bed of free-draining stone wrapped in geotextile fabric.
- Usually includes a perforated pipe for more flow capacity.
- Provide more surface area for collection of flows coming from various directions and depths.
- Provide flexibility in shape and size.
- Best for fine soils (silt and clay), because it provides more surface area to collect water.

Figures 2.8a through 2.8d—French drain construction sequence.

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French drain construction sequence. The underdrain shown here collects water from several spring seeps along the cutslope bank and conveys it to the woods in the background.

1. Excavate trench. Place fabric in trench. Leave enough fabric on sides to cover top. Overlap all fabric seams by at least 12 inches (figure 2.8a).
2. Place thin layer of stone on fabric in trench. Place perforated pipe on stone (figure 2.8b).
3. Cover pipe with stone. Continue filling trench, allowing enough room over top of underdrain for minimum cover of 8 inches. Overlap fabric over top of trench (figure 2.8c).
4. Place and compact a minimum 8-inch cover over top of underdrain. Avoid using fine soils, such as clay for cover as it will “seal” the underdrain from above (figure 2.8d).

Materials required for French drains

- ***Geotextile fabric*** *(Class 1 or 2 nonwoven)*. Fabric around the underdrains is intended to prevent clogging. The fabric allows water to pass through while blocking fine silt and clay, which would eventually clog the underdrain.
- ***Clean stone (rock).*** Use clean stone. Clean stone is relatively uniform in size with no fine material. Typically, 2- to 4-inch-diameter stone is used. Larger stones will increase the flow capacity of the underdrain.
- ***Perforated pipe.*** A perforated pipe (typically 4 inch) buried in the stone will greatly increase flow capacity.
- ***Animal guard.*** The outlet of the perforated plastic pipe can be fitted into a more durable piece of solid pipe. Install a commercial or homemade animal guard to prevent clogging.

Equipment required for French drains

- ***Excavator/backhoe.*** The minimum width of the underdrain will be limited by the width of the bucket.
- ***Trucks.*** Needed to import clean stone and haul away excavated material.
- ***Hand tools.*** Use rakes and shovels to move stone in trench.
- ***Trench compaction.*** Use a tamper or vibratory plate to compact fill over the underdrain.
- ***Transit or laser level.*** Use to ensure continuous minimum 1 percent slope in trench.

Figure 2.9—Prefabricated wrapped underdrain is inexpensive and easy to use in rocky and sandy soils.

Figure 2.10—This homemade guard will prevent animals from entering the underdrain outlet.

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French Mattresses

A structure under a road consisting of clean coarse rock wrapped in geotextile fabric through which water can pass freely. French mattresses are used in extremely wet areas, such as wetlands, to support the roadbed while allowing unrestricted water movement.

Figure 2.11—Side view of a large French mattress.

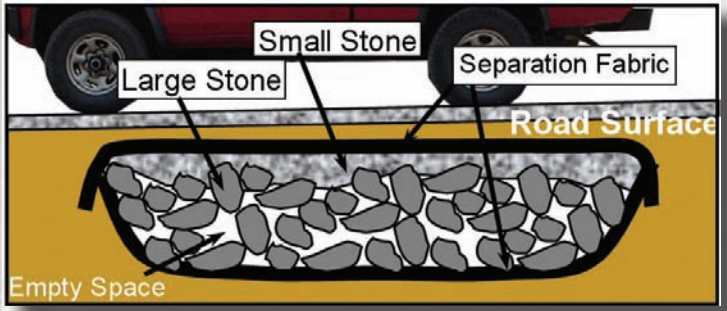

Figure 2.12—Graphical side view of the mattress components.

Criteria for French mattress use

- Areas where concentrated outlet flow through a pipe is undesirable, impractical, or regulated.
- Low-lying areas near streams or wetlands where installing cross drains would be difficult due to lack of grade or vegetation.
- Areas where the road acts as a dam by cutting off the natural flow of subsurface water.
- Areas with a high water table.

Benefits of French mattresses

- Stabilizes the road base in areas where the road is weakened by water saturation.
- Allows for bidirectional free flow of water through road base.
- Maintains dispersed flows and prevents gully erosion above or below the structure.
- Can be used in wetland situations where a traditional pipe may unintentionally lower the wetland water level.
- Requires no maintenance and has a long service life.
- Are extremely difficult for beavers to plug.
- Maintains natural vegetative communities and habitat.

Figure 2.13—This small mattress was built to accommodate several springs and seeps that saturate the road each spring.

Figure 2.14—This is the same mattress outlet after completion. Notice the water flowing out of the mattress below the road.

Important mattress considerations

- Mattresses are **NOT** pipe replacements. Mattresses should **NOT** be used for concentrated overland flow, such as small stream channels or stormwater from ditches. These flows naturally carry sediment, which will clog the mattress over time.
- Mattress size is very flexible. In the example above, three small mattresses were used to drain several springs and seeps. In the example on pages 20 and 21, a large mattress was used to allow wetland flow through during high flows. The width, depth, and size of stone used will all affect the flow capacity of the mattress.
- The finished mattress should be covered by at least 8 inches of compacted fill material.
- French mattresses should be installed to match the slope of the land. In some wetland situations, this slope may be minimal. In sloped areas a 1- to 2-percent slope should be used to aid drainage.

Figure 2.15a—Small mattresses installed to drain several springs and seep.

Figure 2.15b—Large mattress allows wetland flow.

French mattress construction sequence

This is a large mattress using large stone to accommodate a wide wetland.

1. Excavate the mattress to desired depth, allowing for a minimum 8 inches of cover over the mattress. Place geotextile fabric in the trench, leaving enough fabric on the sides to overlap on the top of the finished mattress (figure 2.16a).
2. Place porous stone on top of the fabric and spread out into a uniform bed (figure 2.16b).
3. Wrap ends of fabric over top of structure. Place a piece of fabric on the top if existing fabric does not completely cover mattress. Overlap all fabric joints by at least 12 inches (figure 2.16c).
4. Compact fill over top of finished mattress (figure 2.16d).

Figures 2.16a through 2.16d—Frecnch mattress construction sequence.

Materials required for a French mattress

- ***Geotextile fabric*** *(Class 2 woven)**.*** The fabric around the mattress allows water to pass through while blocking fine silt and clay, which would eventually clog the structure. In situations where water flowing into the mattress may contain sediment (farm fields, etc.), the ends of the mattress should also be wrapped in fabric.
- ***Clean stone.*** Use clean stone. Clean stone is relatively uniform in size with no fine material. Typically 3- to 4-inch-diameter stone is used. Larger stones will increase the flow capacity of the mattress.

Equipment required for a French mattress

- ***Excavator/backhoe.*** Needed to excavate trench; helps to spread stone after dumping.
- ***Trucks.*** Needed to import clean stone (rock) and haul away excavated material.
- ***Hand tools.*** Use rakes and shovels to move and level stone in mattress.
- ***Compaction.*** A tamper or vibratory plate can be used to compact fill over small mattresses. A roller is needed for large mattresses.

056896

Figure 2.17 and 2.18—This roadway cuts across a flood plain wetland. A 300-foot-long French mattress was used to provide relief for wetland flows while providing a stable road base and preventing beavers from damming the nearby stream pipe.

Permeable Fills

Install a permeable fill as part of the road to promote the passage of subsurface and surface flows with minimum flow concentration and maximum spreading across meadows and wetlands. The road fill is permeable because of its construction with relatively large, preferably angular, uniformly graded rock sandwiched between layers of geotextile fabric that preserves voids in the structure and promotes the uninterrupted ground water flow. The permeable fill is similar to the French mattress, but differs in its ability to spread surface flows with culvert placement.

Criteria for permeable fill use

- Use in wet meadow sites where there is no defined channel.
- Use where subsurface flows need to be maintained.
- Use where road access is needed in meadow or wetland crossings.
- Use where spreading of surface flow is important to channel and meadow function.
- Use at springs (cienegas) and seeps where ground water discharges are relatively constant and the need to maintain well dispersed surface flows is critical to site preservation or recovery.

Figure 2.19—Permeable fill with culverts spreads surface flows.

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Important permeable fill considerations

- Keep fill heights low to reduce consolidation pressures on underlying soils.
- Incorporate multiple culverts in an array to enable spreading of flood flows and to imitate the natural flooding event in meadows.
- Consider designing culverts or the stream crossing to accommodate 100-year storm events.
- Install culverts at meadow elevations to disperse flows.
- Culverts may require outlet energy dissipators.

Benefits of permeable fills

- Maintains and/or restores natural wet meadow hydrology.
- Maintains and enhances wildlife habitat, vegetation diversity, and water storage.
- Helps culvert arrays maintain stream access to flood plain.
- Prevents formation of a single channel.

***Kinds of permeable fills*.** Permeable fills can be used alone or in combination with culvert arrays. Place multiple culverts in an array to enable spreading of flood flows and imitate the natural flooding event in the meadow. Culverts may require outlet energy dissipators. In meadows without any surface flow or a small contributing area above the structure can often function well without additional culverts.

Figure 2.20—Permeable fill with culverts.

Permeable fill with culverts

- Best for areas of concentrated runoff.
- Size and number of culverts depends on site characteristics.
- Include an overtopping structure in areas with large woody debris.
- Design culverts for all life stages of amphibians, fish, or small wildlife.

Figure 2.21—Permeable fill without culverts.

Permeable fill without culverts

- Use to facilitate ground water movement through structure.
- Consider traffic and road width needed.
- Best for small watersheds with minimal flash flows.

Permeable fill construction sequence

1. Prepare a subgrade at the meadow elevation that slopes slightly downhill (figure 2.22a).
2. Place the geotextile fabric on the prepared subgrade (figure 2.22b).
3. Spread relatively large, angular, uniformly graded rock to a minimum of 1-foot across the fabric and cover with another layer of geotextile fabric (figure 2.22c).
4. Construct an earthen embankment on the rock fill bringing the entire structure to grade (figure 2.22d).

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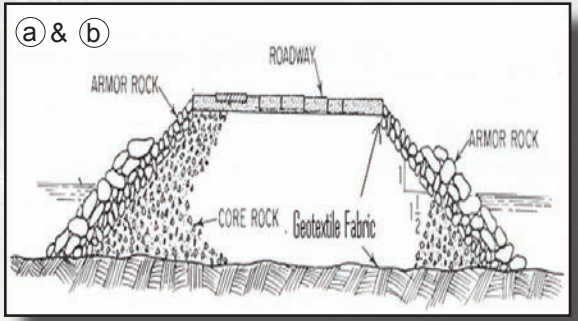

Figures 2.22a through 2.22d—Permeable fill construction sequence.

Materials required for permeable fills

- ***Geotextile fabric.*** Fabric around the rock is intended to prevent clogging. The fabric allows water to pass through while blocking fine silt and clay. The fabric also provides surface strength and prevents the structure from sinking into the meadow.
- ***Clean rock.*** A good gradation of clean rock is important so that the structure is well knitted together for strength yet provides the necessary voids for water movement. Any fines within the rocks could reduce the permeability of the structure.
- ***Aggregate base.*** A good driving surface of surface aggregate is placed to complete the structure.
- ***Culverts.*** Number and dimensions of culverts will vary depending on the length of the structure, distribution of overland flow across the flood plain, and the type and habitat needs to accommodate unrestricted passage of all life stages of amphibians, fish, or small wildlife.
- ***Energy dissipators.*** Dissipators are constructed from rock and placed at the outlet of any culverts to prevent scouring and erosion of meadow soils.

Figure 2.23—Geotextile fabric provides support for permeable fill.

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Equipment required for permeable fills

- ***Track-laying excavator.*** Working in sensitive meadow environments requires equipment with low ground pressure.
- ***Trucks.*** Needed to import clean rock.
- ***Trench compaction.*** A tamper or vibratory plate is needed to compact fill over culverts.
- ***Roller.*** To compact each lift of aggregate base.
- ***Water truck.*** In some locations water may be needed to ensure proper compaction of base material.

Figure 2.24—Track-laying excavator operates in a sensitive meadow environment with little adverse impact.

Figure 2.25—Roller compacts each of lift aggregate.

056903

Figure 3.1—The road cross-section should be designed to shed water from the road surface.

Road Surface Drainage

Surface drainage provides for the interception, collection, and removal of water from the surface of roads (traveled way). One can minimize erosion from road surfaces with proper road building and maintenance practices. The road surface should be shaped to shed water and keep it from accumulating. Standing water and flowing water will weaken the subgrade and result in rutted, potholed, and washboarded roads that generate more sediment and require more frequent maintenance.

The road's template (cross section) whether crown, insloped, or outsloped, is the first line of defense against erosion. The road-surface shape may vary with changes in topography, hillslope position, road gradient, and surface and subsurface drainage features. The road-surface shape criteria includes environmental and resource considerations, safety, traffic requirements, and traffic-service levels.

There are several environmentally sensitive road maintenance practices that ensure the road surface quickly sheds the water and avoids concentrating drainage, which reduces erosion, restores hillslope hydrology, and lowers long-term maintenance costs.

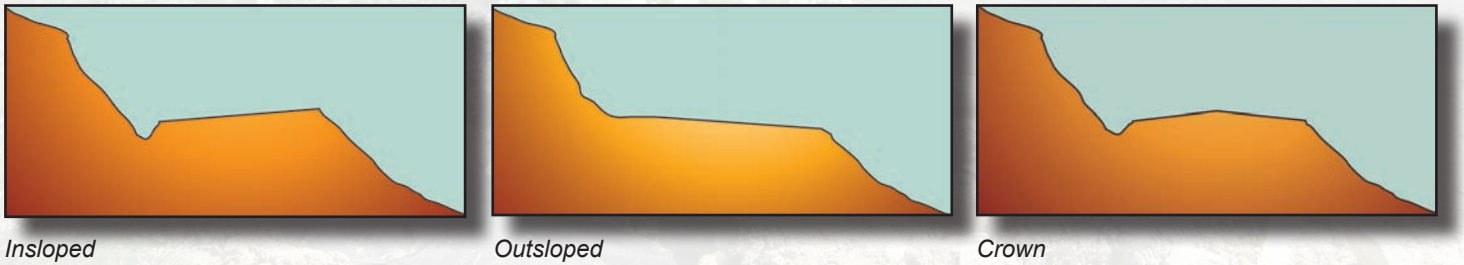

Figures 3.2—Road surface templates.

Importance of Road-Surface Shape

The road-surface shape (template) dictates the necessity for certain road drainage design elements and structures including ditches, cross-drain culverts, rolling dips, grade breaks, as well as the road's ability to intercept, collect, and remove water from the road surface. It is important to identify the road-surface shape and assess that design elements are in place and functioning as designed. If any of the visual indicators identified earlier are apparent, the road surface may need maintenance or an environmentally sensitive practice, such as modifying the road-surface shape or the installation of surface-drainage structures.

Crown, insloped, and outsloped road shapes are slowly lost over time due to traffic, erosion, and maintenance activities. Prior to maintaining a road, drive the segment and identify the road-surface shape. For example an insloped road generally has cross-drain relief culverts and an inside ditch. An outsloped road has no ditches or cross-drain culverts, and a crowned road often has ditches on the sides and cross-drain relief culverts. The effectiveness of a crown, inslope, or outslope in shedding water should be one of the major factors in determining when to grade a road.

Proper Road-Surface Shape

- **Crowned.** Shaping the road with an elevated centerline and continuous fall towards the shoulders.
- **Insloped.** Shaping the road to drain all water toward the backslope (uphill or cutslope side) and away from the fillslope. An inslope road-surface shape concentrates runoff against the backslope or inside ditch.
- **Outsloped.** Shaping the road to drain all surface water to the downhill or fillslope side allowing sheet flow off of the road.

Crowned

- Has highest point in middle of road.
- Drains in either direction and divides runoff.
- Is common on double-lane roads.
- Is effective on road gradients 8 percent or more.

Crowned road considerations

- Use on double-lane roads since wider surface areas generate more surface runoff. Less cumulative surface erosion may occur if the drainage is split.
- Use where slippery, icy, or snowy conditions may occur since drivers tend to drive in the center of the road.
- Avoid crowned surface shape on single-lane roads prone to rutting. Remove berms from the road shoulder that may trap water and prevent it from reaching the ditch or leaving the road area.

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Figure 3.3—Crowned road.

Outsloped

- Has highest point on uphill side.
- Eliminates ditches and disperses flows.
- Drains to downhill side.
- Use on road slopes less than 8 percent.
- Avoid outsloped road where unsafe dropoff exists below roadway.

Outsloped road considerations

- Use where it is important to maintain distributed surface runoff for ecological reasons.
- Use on less steep roads without large downslope drop offs.
- Use where insloping could cause excessive erosion of the toe of an unstable backslope or ditch.

Figure 3.4a—Outsloped road disperses flow.

3.4b—Outsloped roads eliminates ditches.

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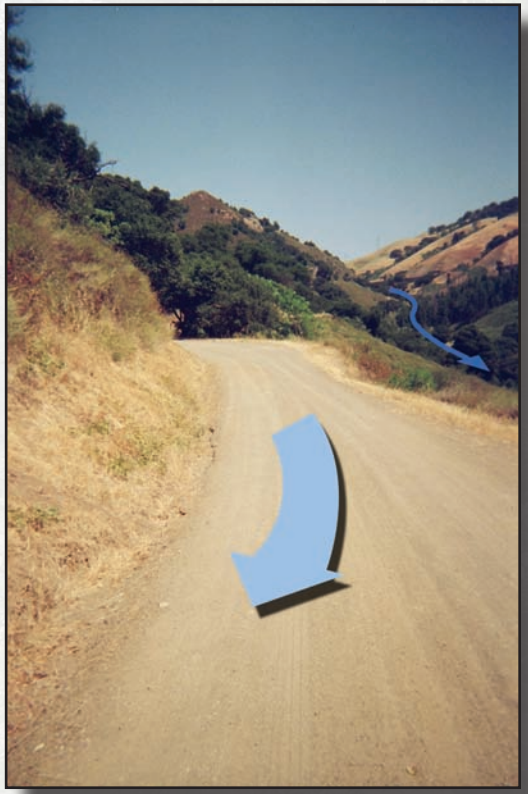

Figure 3.5—Insloped road.

Insloped

- Has highest point on downhill side.
- Drains to inside (uphill) side.
- Concentrates road drainage into one ditch.
- Is commonly used for steep sideslopes to ensure driver safety.
- Is effective in highly erodible or unstable soils to direct flow away from fillslope.

Insloped road considerations

- Use on roads traversing steep hillslopes.
- Use on roads with slick traveled way surfaces.
- Use where outsloping could cause excessive erosion of the fillslope.
- Use more frequent ditch-relief culverts since the entire road drains to the ditch.
- Use on roads receiving frequent maintenance.
- Combine with ditch-to-dip drainage features to prevent cascading culvert failure.

How much crown or cross slope?
Unpaved roads require more sideslope than asphalt roads because the road surface is permeable and the roughness slows runoff. Steeper roads require a more pronounced crown to ensure that water flows off to the side instead of down the road surface. As a general rule, there should be at least 1/2 inch to 3/4 inch of fall per foot across the road (4 to 6 percent).

Figure 3.6—A road's sideslope can be measured using a level and tape measure. The road should drop 2 to 3 inches over the 4-foot length of the level used in the picture above.

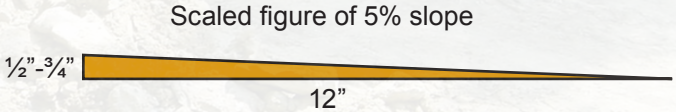

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Grade Break

A grade break is an intentional increase in road elevation or change in road grade to create an undulating road profile (rolling grade). It is designed to shorten the contributing area and force water off the road surface into stabilized ditches or outlets on either side of the road. Grade breaks shed water toward the shoulders and are not meant to carry concentrated flow across the traveled way.

Benefits of grade break

- Is a reliable treatment that is inexpensive and easy to install and maintain.
- Reduces potential road-surface erosion by shortening the contributing area and forcing water off the road at designated locations.
- Provides necessary fill for cross-drain pipes.
- Continues to shed water even after road-surface shape is lost (longevity).

Criteria for grade break use

- Use on infrequently maintained roads.
- Use before stream crossings to direct water into vegetative filters and reduce hydrologic connectivity.
- Use on gentle-to-moderate sloped roads (less than 10 percent).
- Use on low-volume or low-speed roads.
- Use just before road gradient changes in order to shed water off of surface before it enters a steep section of road.

Figure 3.7—The two grade breaks pictured here prevent water from flowing down the road, even if the road's crown were to be lost.

Materials required for a grade break

- Requires 40 to 60 tons of material to create a grade break.
- Requires more fill to ease the transitions into and out of the grade break on steeper roads and roads with longer vehicles use.

Equipment required for a grade break

- Use trucks to transport material.
- Use bulldozer if available. If not, use other earthmoving equipment, such as excavators and graders.

Grade break considerations

- Consider using signs after installation to notify road users of the grade breaks.
- Educate your entire road crew about the grade break. An uninformed operator can remove it in a single grading.
- Consider marking the ends of the grade break to alert maintenance crews to where the grade break is located.
- Use longer transitions on steeper slopes to tie the grade break into the existing road elevation.
- Use grade breaks in conjunction with cross pipes. They can be located to direct water into the pipe inlet while providing necessary pipe cover.

056912

Figure 3.8—A grade break, such as the one pictured in the distance, should be big enough to shed water, but gentle enough to allow traffic passage.

Broad-based Dip (rolling dip)
Dips are designed and constructed to divert water off the road surface, disperse surface water flows, and reduce erosion. The road profile (vertical alignment) is changed by simultaneously constructing a dip and raising the grade by placing fill material in the road below the dip. The slightly skewed dip turns surface flows and disperses runoff away from the road surface. Broad-based dips have an intended flow channel are meant to carry water across the road surface on low-traffic roadways.

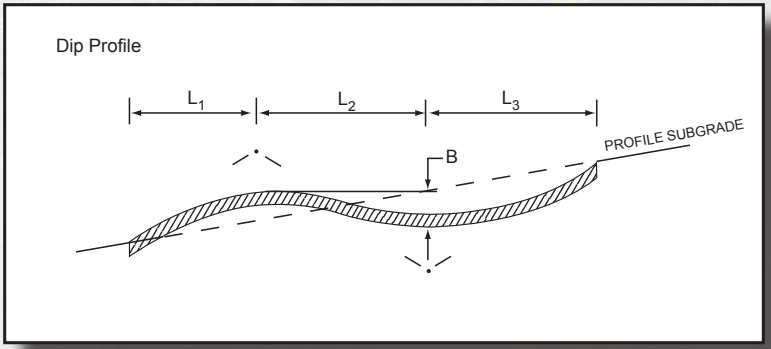

Figure 3.9—Diagram of dip.

Benefits of broad-based dips
- Can replace or supplement cross-drain culverts.
- Can reduce erosion and are inexpensive and easy to install.
- Reduce maintenance costs associated with cross-drain culverts.
- Can prevent stream diversion if natural channel culverts overtop.
- Can shed water for years with little maintenance when properly located and installed.

Criteria for broad-based-dip use
- Use dips on road grades up to 10 percent.
- Use on roads with infrequent surface maintenance.
- Use where traditional cross-drain pipes are not applicable or desired.
- Use before stream crossings to direct water into vegetative filters and reduce hydrologic connectivity.
- Use to divert road drainage only, not for springs or small streams.
- Use on low-volume roads where traffic speed is not a concern.

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Broad-based dip versus grade break

- **Broad-based dips** have an intended flow channel and are meant to carry water across the road surface on low-traffic roadways.
- **Grade breaks** shed water toward the shoulders and are not meant to carry concentrated flow across the traveled way.

Materials required for a broad-based dip

- Use 20 to 40 tons of material to create a broad-based dip.
- Recommend 3- to 4-inch stone to reinforce the bottom of the dip where water will flow.

Equipment required for a broad-based dip

- Use a truck to transport material.
- Use a bulldozer due to its maneuverability and efficiency in shaping. The broad-based dip can be maintained later by a good grader operator.
- Use a vibratory roller or tamper to compact bottom and top of dip.

Broad-based dip considerations

- ***Spacing.*** Multiple broad based dips can be used in sequence, similar to cross pipes.

Figure 3.10—The broad-based dip pictured here conveys water from the road surface and upslope ditch into a vegetative filter area on the right.

- ***Size and shape.*** Dip design and construction vary according to road maintenance objectives. Consider traffic limitations and install the proper length of dip to accommodate the design vehicle (logging truck, horse trailer, or pickup truck).
- ***Angle.*** Broad-based dips should be angled across the road at approximately 20 to 40 degrees.
- ***Slope.*** Since a broad-based dip conveys water similar to cross pipes (ditch relief), an elevation drop towards the outlet end of at least 3 percent is recommended.
- ***Dip reinforcement.*** Because a broad-based dip is designed to carry concentrated flow, reinforcement of the dip bottom is recommended. Hard stone and geosynthetic materials can be used to reinforce the bottom of the dip to resist erosion.
- ***Outlet reinforcement.*** Rock armor may be required on the fillslope as outlet protection and energy dissipation.

Figure 3.11—Broad-based dip breaks up contributing area and reduces maintenance frequency.

056916

Belt Diversions

A belt diversion is a structure used on low-volume roads to divert water off the road surface. The diversion consists of a piece of used conveyor belt bolted to treated lumber and buried in the road.

Benefits of belt diversions

- Forces water off the road to reduce surface erosion.
- Functions after road crown or sideslope are lost.
- Will not deform or crush under heavy hauling as can be the case with earthen and aggregate structures.
- Is inexpensive, easy to install, long lasting, and requires low maintenance.

Criteria for belt-diversion use

- Use on low-volume (traffic) roads and access roads (driveways, farm lanes, gated roads, and camp lanes). They are NOT suitable for roads that have heavy traffic, fast traffic, frequent grading, or plowing.
- Install on sloping sections of low-volume roads with long, continuous grades and evidence of rills, gullies, and loss of road-surface fines.

Figure 3.12—Low-volume access roads, such as the one pictured here, are ideal candidates for diversions.

Figure 3.13—Conveyor-belt diversion on a farm lane (road).

Figure 3.14—On most roads a completed diversion should leave no more than 4 inches of belt exposed.

Figure 3.15—A completed diversion directs surface drainage off the roadway and into a field.

Materials required for belt diversions

- Use a conveyor belt approximately ½-inch wide by approximately 15 inches high by the necessary length.
- Use treated 2-by 6-inch lumber. Length and number depends on road width. Overlap any lumber joints with 4-foot length of board.
- Use bolts and nuts 3/8-inch-diameter. (Length varies with belt).
- Use wide-diameter washers.
- Use a utility knife, drill, hammer, and adjustable wrenches.

Equipment required for belt diversions

- Use a backhoe, excavator, or trenching machine.
- Use an upright tamper (jumping jack), shovel, and rake.

Belt-diversion considerations

- Determine the spacing of belt diversions by road gradient, surface-material stability, and road-surface runoff.
- Be sure that the belt diversion is long enough to (1) be angled across roadway (a minimum of 30 degrees) and (2) ensure that water does not flow back to the roadway around the end of the diversion.
- Obtain free or low-cost used conveyor belts from any facility that uses conveyor belts (mines, mills, etc). Belts typically come in 26- to 30-inch widths and can be cut with a utility knife or a reciprocating saw.
- For longer diversions, consider constructing the belt offsite and then removing the 4-foot joint board. The diversion can then be folded in half for transport and reassembled onsite.

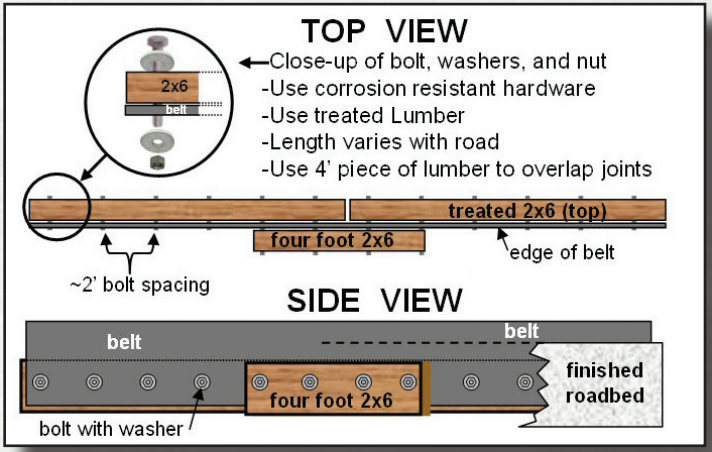

Figure 3.16—Schematic view of conveyor belt diversion. This schematic assumes the diversion is long enough that two separate pieces of lumber need to be joined end to end to span the road. On narrow roads, the diversion may be constructed using a single piece of 2-by 6-inch material.

Figure 3.17—Construction of a 24-foot-length diversion. Note that the belt has been cut in half lengthwise. A 4-foot board on top of the belt spans the lumber joint of two 12-foot boards.

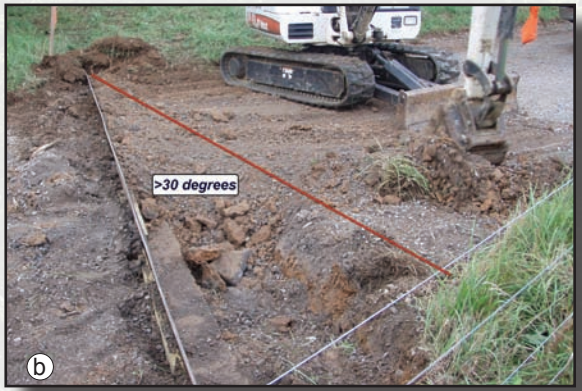

Figures 3.18a through 3.18d—Belt diversion construction sequence.

Belt diversion construction sequence

1. Excavate a trench diagonally across the road (figure 3.18a).
    a. Dig trench at a minimum 30-percent angle.
    b. Have a minimum of 1 percent of continuous fall toward the outlet.
    c. Dig trench wide enough to allow for compaction equipment beside the belt diversion.
    d. Dig trench deep enough to provide 3- to 4-inch of cover over the top of the supporting 2- by 6-inch board.

2. Place the diversion against bottom edge of the trench, leaving approximately 4 inches of the belt exposed above the final road surface (figure 3.18b).
3. Backfill the trench and compact with a tamper (figure 3.18c).
4. Place large stones at the end of the diversion to control erosion if a lot of flow is expected.
5. Mark the ends of the conveyor belt diversion with reflective posts to avoid damage during future maintenance (figure 3.18d).

056921

Figure 4.1—Eroded ditch caused by excessive volume and velocity of water.

Roadside Ditches

Ditches collect and carry road-surface water, water from springs or seeps, and water from run-on sources to designated discharge locations. Criteria for using a roadside ditch include (1) water expressed in the cutbank needs to be prevented from reaching the traveled way; (2) safety concerns dictate an insloped road with a berm on roads traversing steep sideslopes; and (3) high-standard roads require a road template shape that is super-elevated to accommodate higher speeds. All other roads should be outsloped or crown to reduce the road-drainage density, to restore natural surface-drainage patterns, and to reduce maintenance costs.

Roads that do require a ditch often have downcut and degraded ditch lines. Too often, traditional practices designed to fix ditches address only the symptom (erosion) rather than the problem (water volume and steep road gradient), which causes increased water power. Many low-volume roads are modeled after urban storm sewers, collecting water and transporting it to the nearest stream, which can adversely affect water quality and aquatic habitat. A change in philosophy, away from collecting water, and towards dispersing water, is what is desired to reduce environmental impacts and simplify road maintenance.

This chapter focuses on managing ditches to reduce the volume of water in the road drainage system and to allow it to infiltrate naturally. Environmentally sensitive road maintenance practices that eliminate ditches or maximize the number of ditch outlets are effective techniques to disperse road drainage and reduce long-term maintenance costs.

Reading the Ditch
The practice of reading the ditch is an art that requires looking at historical evidence and paying special attention to the cause of ditch problems. To properly read the ditch requires training your eyes to detect subtle changes in the landscape and road. Reading the ditch involves determining when and where to use an environmentally sensitive maintenance practice, such as raising the road profile or installing rolling dips. Road drainage can be designed and/or modified to allow for more infiltration and dispersion of flows by observing how the road lies across the landscape and intercepts natural drainages. Instead of relying on standard tables or guides, reading the ditch requires observation to determine when and where to use environmentally sensitive maintenance practices based on your knowledge, experience, and site-specific conditions.

Benefits of reading the road ditch

- Standards exist for cross-pipe spacing based solely on road slope. This one-size-fits-all methodology does not take into account site-specific hydrologic conditions.
- Reading the road ditch is a process that allows you to address the cause of many drainage problems instead of the symptoms.
- Unlike drainage standards, reading the road ditch is a methodology that can be applied to any landscape.

Criteria for reading the road ditch

- Applicable to all roads with a ditch.

Factors affecting ditch stability

- **Water volume**
  - Run-on from offsite water sources (lanes, field drains, trails, forest thinning projects, etc).
  - Length of ditch run or size of contributing area.
  - Subsurface water interception from springs and seeps.
  - Road surface drainage design and effectiveness.
  - Increase in impervious surfaces.

- **Road geometry.** Slope, grade changes, curves.
- **Soil type and texture.**
- **Available ditch outlets.** (It is not always possible to lead water away from the road when you want to.)

Figure 4.2—This photograph is taken only 300 feet from the top of the hill, yet the road ditch is over 5 feet deep. Further investigation of the site revealed a large amount of water emptying out of a meadow and into the road ditch. This water should be either diverted before it reaches the road or handled as quickly as possible and not allowed to flow down the road ditch.

Figure 4.3—Length of ditch and contributing area must be evaluated.

How do you read the ditch?

- Start at the top of the hill to identify problems in the ditch line as soon as they begin.
- Walk downhill following the ditch and look for the current frequency of ditch outlets. Identify any signs of erosion or downcutting in the ditch, and note where it begins.
- In drier climates, look for signs of debris and scour from high runoff events, such as flash floods and spring melt, that may have occurred much earlier in the year.
- Look for signs of erosion. Typically, the ditches will begin to show signs of erosion depending on road gradient, soil stability, and water volume.
- Look for opportunities to create a new drainage outlet ABOVE the point where the ditch starts to erode.
- Estimate how long the ditch can remain stable. If the road grade (slope) is continuous and there are no other contributing sources of water (run-on from driveways, springs, lanes), then the distance from the top of the hill to your sign of erosion will give you a good estimate of how long the ditch can remain stable before an additional outlet is needed. Use this strategy as you progress down the hill to place new drainage structures.
- Make note of any water entering the road and ditch from offsite sources (springs, driveways, trails, etc.), and plan to address this flow as quickly as possible to avoid carrying more water volume in the roadside ditch.
- If possible, outlet ditches before curves or steeper sections of road since this will help reduce ditch erosion. Try to install additional outlets before the ditch empties into a stream or intermittent channel to keep road drainage separate from natural flows.
- Look at the condition of the road ditch, and outlets as well. If the ditch outlet is eroded or plugged, consider installing a new outlet above the existing one to further disperse the drainage and reduce erosion and sediment.

Figure 4.4—This eroded ditch is a symptom. The problem is excessive water volume for this road gradient and soil, and must be managed upslope.

Figure 4.5—Near the top of a hill, this ditch is starting to erode. The team looks for drainage options.

056926

Figure 4.6—Eroded ditches are a common problem.

Raising the Road Profile
The process of raising the road profile starts with filling the road cross section to an elevation that more closely resembles the natural topography, allowing for sheet flow from the downslope side of the road, and additional culverts to drain the upslope side of the road.

Understanding the Entrenched Road Problem
Many low-volume roads have become entrenched, or lower than the surrounding terrain on either side, over time due to traffic, maintenance, and erosion. Entrenched roads collect drainage from the surrounding area and trap it in the road corridor. This can lead to a host of drainage problems on the road. Raising the road profile is an environmentally sensitive practice that addresses the problem (the road is lower than the surrounding topography and concentrates runoff) instead of the symptoms (eroded ditches, cutbanks, and road surfaces).

Problems Stemming from Entrenched Roads
Because entrenched roads collect and trap water, many problems can result including:

- Continual erosion of ditches and banks.
- Inability to install cross pipes and drainage turnouts.
- Excessive runoff volumes due to lack of available outlets.
- Increased sediment transport to stream crossings.
- Difficulty performing snow removal.

Figure 4.7—Example of an entrenched roadway.

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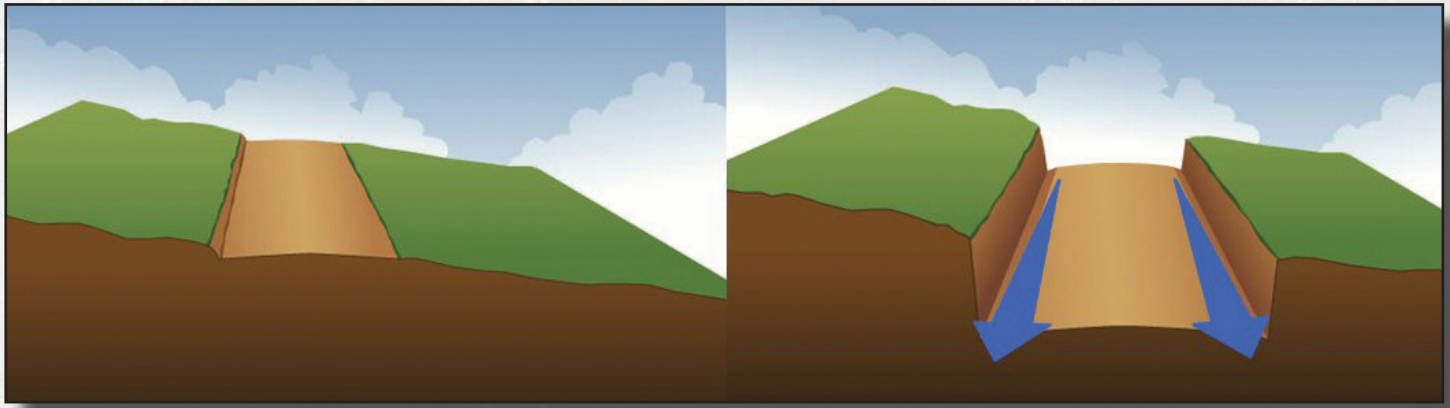

Figure 4.8—Over time, the elevation of many roads, especially unpaved roads, is lowered due to traffic, maintenance, and erosion. When roads become lower than the surrounding terrain, they are referred to as entrenched, and water often is trapped in the road traveled way.

How does raising the road profile work?

Raising the road profile uses imported fill material to build up the entrenched road. Ideally, the final road elevation will be high enough to restore natural drainage patterns by eliminating the downslope ditch and providing cover for cross-drain pipes to effectively drain the uphill ditch. Raising the road profile is sometimes the only long-term solution to many entrenched road problems.

Raising the road profile considerations

- Fill material can come from a variety of sources including environmentally safe recycled waste material and traditional earthen fill.
- Each lift of fill material (maximum 8 inches uncompacted lifts) should be well compacted and placed to reflect the desired final road shape of crown, inslope, or outslope.
- The final elevation of the road should allow sheet flow from the downslope side of the road.
- If possible, consider waiting a season prior to placing the final road surface as fill material will often settle, especially for deep fill sections.
- When raising the road profile stay within the existing road prism and do not expand the footprint of the road.

Figures 4.9 and 4.10—This entrenched roadway was a constant source of maintenance and pollution. The road was filled over 6 feet in places to eliminate the ditch on the left and provide elevation and cover for cross pipe to drain the ditch on the right.

Benefits of raising the road profile

- Provides a long-term solution to many drainage problems.
- Eliminates at least one parallel ditch.
- Provides cover for needed pipes to drain uphill ditch.
- Restores a more natural drainage pattern, similar to what existed before the road was in place.
- Reduces concentrated flow and allows for infiltration.
- Provides a shoulder area on the road (road width increases as it is filled).
- Allows space for snow removal in cold climates.
- Alleviates bank stability problems by reducing bank height and angle.

Criteria for raising the road profile

- Use on roads that are entrenched.
- Use in areas where suitable fill material is available.
- Use for roads that cannot be relocated along a more suitable alignment.

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Figures 4.11 and 4.12—This entrenched roadway trapped runoff in the ditches and emptied into a small headwater stream. The road was elevated up to 5 feet in places in order to eliminate the ditch on the left and provide elevation and cover for several cross pipes.

Materials required for raising the road profile

- Use suitable fill material.
- Use new surface material; old surface will be buried.
- Use new cross pipes (potentially) to drain the upslope ditch and underdrains to capture spring seeps.

Equipment required for raising the road profile

- Use trucks to move fill material.
- Use earthmoving equipment to spread fill material.
- Use vibratory roller to compact fill material.
- Use equipment and materials to install new cross pipes (potentially).

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Figures 4.13a through 4.13d—Raising the road profile construction sequence.

Raising the road profile construction sequence

1. Begin filling entire road cross section, bank to bank, including ditches. Local shale was used on this site.
2. After initial 8 inches of fill is in place, compact fill material with a vibratory roller.
3. Continue to fill road, compacting again after every 8-inch lift of material.
4. Road has reached the ideal final elevation when it drains to natural ground on the downslope side. Be sure to reflect desired crown or cross slope in final fill grade.
5. Place cross pipes as needed to drain uphill ditch.
6. Place new surface aggregate if desired. Consider allowing a year for fill to settle, then regrade before placing final surface-wearing course.

Berm Removal

Figure 4.14—Berms can range from several feet high to only a few inches high as pictured here. The small partially vegetated berm on the left is preventing runoff from exiting the road surface. A stable vegetated buffer exists to the left, but the berm is causing an unnecessary ditch to form at the road edge.

Berm Removal: The process of removing an unnecessary berm, windrow, or false shoulder on the downslope side of the road provides dispersed sheet flow off the road surface.

What Is a Road Berm?

A berm is a mound of soil material, parallel to the roadway on the downslope side that has been placed or accumulated over time due to road traffic or maintenance activities (grader can windrow material). Road berms may be several inches or several feet high, but once a berm forms, it traps runoff on the road surface causing accelerated erosion of the road surface.

Removing the Berm

Berm removal is a straightforward process. Many berms can be eliminated using small earthmoving equipment. A truck may be needed to take excess berm material to a suitable location. Depending on the size and composition of the berm, the material generated from removal may even be used to as road fill or surface material.

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Benefits of berm removal

- Is inexpensive and cost effective.
- Eliminates the downslope parallel ditch and associated ditch maintenance.
- Reduces concentrated flow and provides infiltration.
- Reduces road surface erosion by removing water from the road corridor.

Criteria for berm removal

- Use on outsloped and crowned roads.
- Use anywhere there is a berm or windrow if material exists that prevents drainage from entering the ditch or leaving the road area.

Materials and equipment required for berm removal

- Does not use materials. Berm removal actually generates material!
- Use earthmoving equipment, such as a bulldozer or backhoe and possibly a truck to haul berm material away.

Berm removal considerations

- Beware that long-established berms may be hard to recognize. They may be large and well vegetated.
- Create as many turnouts, or notches, in the berm as possible to allow drainage to exit if entire berm cannot be removed.
- Berms may be used for safety concerns when there is a steep slope along the fill slope. If the entire berm cannot be removed, look for opportunities to pull the berm and roll the road grade with a broad-based dip.
- Avoid creating new berms during standard maintenance practices, such as grading or plowing.

Figure 4.15—The berm was created by recent grading. Removing the berm and crowning the road allows sheet flow into the vegetation to the left.

Low-maintenance Ditches. There are several strategies and guidelines outlined below for reducing maintenance needs and erosion problems associated with roadside ditches.

Characteristics of low-maintenance ditches

- A wide, parabolic shape (not “V” shaped).
- Shallow relative to the road surface (no large drop-off; can be safely driven into by vehicles).
- Vegetated when possible.
- Lacks signs of excessive erosion. Adequate drainage outlets exist to minimize flow volume and velocity. (See reading the ditch section.)

Strategies for low-maintenace ditches

Using the side of the bucket to determine ditch shape

As viewed from the side, the back and bottom of a typical backhoe bucket is an ideal shape for a wide, shallow ditch line. The bucket can be dragged along small sections of ditch to achieve the proper shape. The required size of the ditch is dependent upon the volume of water it must manage. More frequent ditch outlets reduces the need for large ditches.

Pulling Ditches

Cleaning ditches while grading, or pulling ditches, often leads to deep ditches that are ”V” shaped and unstable. Consider alternative methods or equipment to clean the ditch other than a grader, such as the one pictured here. Also consider using a separate piece of equipment to clean the ditches after grading.

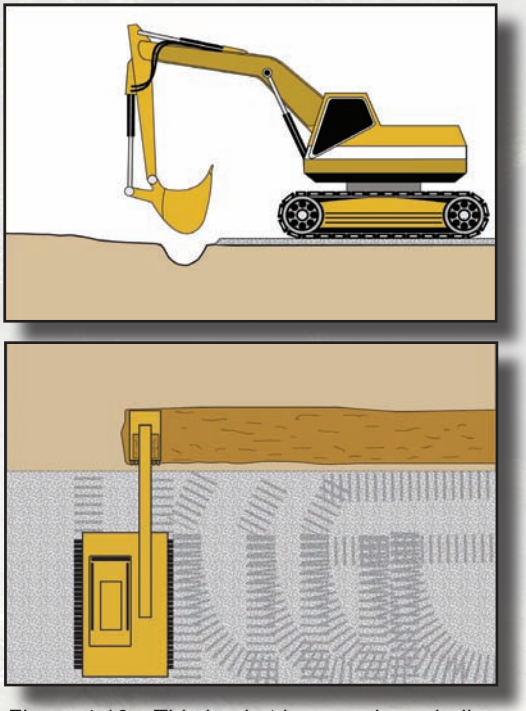

Figure 4.16—This bucket is a good parabolic shape for ditch construction.

Leaf Blowers and Vacuums

In locations with deciduous vegetation, graders are often used to remove fallen leaves from the ditch in order to prevent plugging of cross-drain culverts. However, it is difficult to remove leaves with a grader without disturbing the soil in the ditchline. Pull-behind or three-point-hitch leaf blowers are inexpensive and multiuse tools that remove dead vegetation without disturbing the soil. Leaf blowers can be attached to a small tractor and are easy to operate. If ditch cleaning, not reshaping, is the issue, then a leaf blower can accomplish the task faster, cheaper, and with less soil disturbance than a grader. Leaf vacuums have the added advantage of not blowing leaves up onto the uphill bank that could return to the road ditch.

056936

Figure 4.17—A leaf blower clears dead vegetation without disturbing the soil.

Figure 4.18—Homemade ditch cleaner for a grader.

Reprofiling Ditches

When the entire length of a ditch is cleaned or reshaped at once, it creates an easy source and pathway for sediment to get into waterways. An alternative is to clean or reshape ditches in sections, skipping every other section each year. The unmaintained section will have residual vegetation and a rougher shape. These unmaintained sections can function as a filter area, slowing the water flowing in the ditch before it enters the cleaned, less stable section of ditch. This strategy can be employed in locations where ditch discharge to the stream cannot be avoided.

056938

Disconnecting Ditches and Streams. Ditch lines that drain directly to the stream are hydrologically connected to the stream and become efficient conduits of sediment to the stream channel. Environmentally sensitive maintenance practices identify opportunities to reduce sediment delivery and restore more natural hydrologic conditions by decreasing ditch connectivity and encouraging infiltration.

Criteria for disconnecting ditches and streams

- Roads with through cuts at the approach to stream crossing.
- Insloped roads on gentle or rolling ground with no signs of intercepting subsurface flows.
- Ditch lines with a large contributing area.

How to disconnect ditches from streams

- Eliminate ditches where possible through berm removal and filling the road profile.
- Locate drainage outlets away from streams and into vegetation when possible.
- Regrade ditches in wide flood plains to drain away from stream crossings.
- Construct broad-based dips to disperse surface and ditch flows before stream crossings.
- Outslope the road before stream crossings to disperse surface flows.

Benefits of disconnecting ditches and streams

- Reduces discharge of sediment to the stream.
- Reduces pulse flow of stormwater to stream system (lessens flood flows).
- Encourages infiltration and sediment filtration.
- Simple, effective, and inexpensive.

Figure 4.19—Unstable ditch. This ditch presents a safety, maintenance, and environmental concern. It is too deep, too wide, unvegetated, and can route sediment to the stream.

Figure 4.20—Traditional urban stormwater approaches collect and convey ditches directly to streams, as pictured above. Modern rural stormwater management should disconnect the road and stream by avoiding concentrated discharges to streams and encourage drainage dispersal.

Reprofiling Ditches at Stream Crossings

In broader valleys or relatively flat landscapes, it is often possible to make road ditches flow away from the stream crossing. To accomplish this, fill material is added to the area around the crossing to raise the grade. The ditch is regraded to force water to flow away from the stream crossing into stable vegetated outlets.

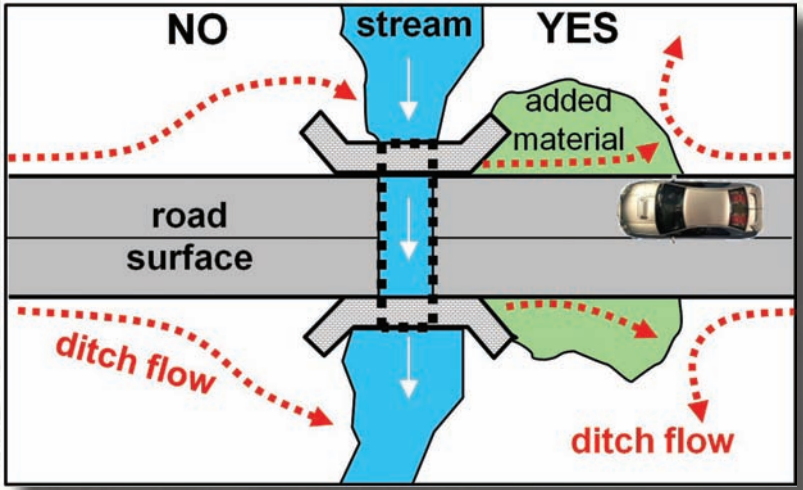

Figure 4.21—Aerial depiction of road-stream crossing. The left side of the diagram shows the traditional practice of discharging water to the stream. The right side of the diagram shows material added to redirect ditch flow and outlet water away from the stream.

056940

*Figure 4.22a—**Before:** A typical crossing with ditches armored with rock and draining directly into the stream.*

*Figure 4.22b—**After:** Material has been added and the ditch has been reprofiled to drain away from the stream through a new cross pipe and into the woods.*

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Figure 5.1—Culvert placed below the natural elevation requires frequent maintenance and long ditch outlets.

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Ditch Outlets

Roads with cross-drain culverts or lead-out ditches can show signs of accelerated erosion at the outlet. Accelerated erosion at the outlet is a symptom of excess volume or velocity of water being discharged as well as the soil type that the concentrated flow is placed on. The location and condition of the ditch outlets can be an indicator of how much erosion and sediment reaches nearby streams. Whenever possible, ditch and culvert outlets should be strategically located to disperse road runoff and sediment into well-vegetated buffer areas away from streams. Unfortunately many roads are located in areas immediately adjacent to streams and lack adequate buffers, or exist on steep hillslopes where concentrated discharge scours the fillslope causing accelerated erosion. Environmentally sensitive road maintenance practices are designed to first identify the cause of the problem and then implement practices to reduce the adverse effects of ditch and culvert outlet drainage as it leaves the road. The overall intent is a well-designed, low-maintenance road that has minimal impact to soil, water, and aquatic resources.

Figure 5.2—Shotgun culverts causes accelerated errosion.

Figure 5.3—Culvert outlet is well armoured.

Shallow Cross Pipes (ditch-relief culverts). A ditch-relief culvert installed at the natural ground elevation, avoids the need for an excavated outlet trench or tail ditch.

Deep: Traditional deep culvert where pipe cover is obtained by digging a trench and backfilling with compacted fill to the original road-grade elevation.

Shallow: The shallow culvert is placed at the natural ground elevation and fill is imported to provide pipe cover above the original road-grade elevation.

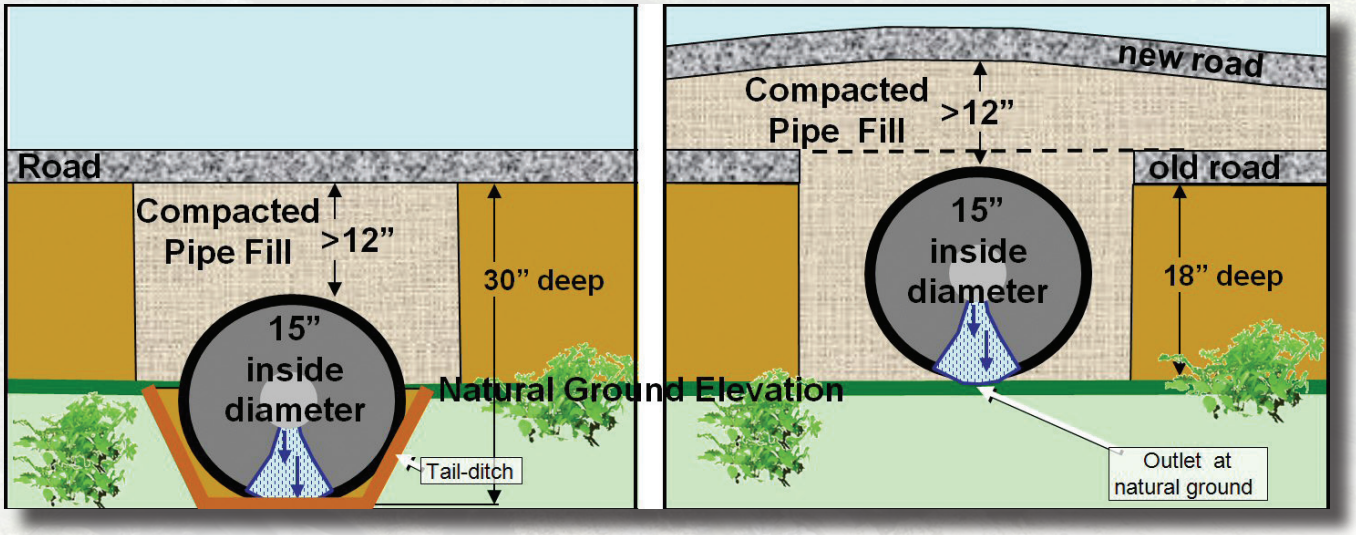

Figure 5.4—Side-view schematic, looking through cross pipe from the outlet, compares the deep and shallow pipe placements on the road. The deep pipes are bedded below the natural ground elevation line and require outlet trenches to function. The shallow pipe placement is at natural ground elevation and uses imported fill to achieve pipe cover.

Problems Associated with Traditional Deep Pipes

When a pipe outlet is placed below ground surface, it often creates the need for continual maintenance of a tail ditch to keep water flowing away from the road. Problems with tail ditches include:

- Constant cleaning is required to maintain function, which costs money and generates large amounts of sediment.
- Unmaintained tail ditches are prone to plugging, resulting in standing water at the outlet that can breed mosquitoes, saturate the road base, and lead to culvert failure.
- Tail-ditch channels increase the overall drainage density of the watershed and concentrate rather than disperse runoff and sediment making stream and wetland pollution more likely.
- Deep-pipe installation also can create head cutting, where the upstream channel will erode to the elevation of the pipe inlet.

056944

Figure 5.5—Traditional deep pipe. It has a long outlet trench requiring continual maintenance.

Shallow Cross Pipes

A shallow cross-pipe installation uses the natural ground elevation at the pipe outlet to determine the cross-pipe elevation. Any additional pipe cover is obtained by importing fill over the pipe, rather than by digging deeper into the road base.

Figure 5.6—Shallow pipe. Placing the outlet at the natural ground elevation reduces maintenance and helps disperse flows.

In contrast, typical deep cross pipes use the existing road elevation to determine pipe installation depth.

Benefits of S*hallow Cross Pipes*

- Eliminates tail-ditch maintenance; saves time and money.
- Lowers risk to the road from standing water or culvert plugging.
- Reduces runoff and potential erosion through increased infiltration.
- Disperses runoff with added grade break caused by fill over pipe.
- Decreases the spread of invasive species.

Criteria for use of shallow cross pipes

- When possible, ALL cross pipes should be outletted at natural ground elevation to avoid tail ditches at pipe outlet.
- Cross pipes should be placed in areas of flat topography or areas with limited topographic relief.
- Cross pipes may be helpful in areas of shallow bedrock.

Figure 5.7—A shallow cross pipe being installed: The cross pipe shown is partially installed. Notice that the pipe outlet is at the elevation of the existing ground, no outlet trench or tail ditch is required. The top of the pipe is ABOVE the existing road surface. The required pipe cover is obtained by importing fill. When completed, the fill will create a grade break over the pipe.

Procedure for installing a shallow cross pipe

1. Determine preferred cross-pipe location by reading the ditch and looking for available outlets away from streams.
2. Determine proper outlet elevation. The pipe should outlet onto natural ground. The elevation of the ground, not the elevation of the road surface, establishes the depth of the entire cross pipe.
3. Excavate a shallow trench. The trench depth is based on outlet elevation. Ideally, the pipe inlet is placed in existing ditch line. Ensure there is a minimum fall of ¼ inch per foot (2 percent) across trench.
4. If necessary, spread pipe bedding in trench to support pipe evenly.
5. Compact fill around and over pipe (8-inch maximum lifts). Proper compaction is critical to avoid settling and pipe strain.
6. Shallow pipe installations typically require 30 to 60 tons of fill to obtain necessary pipe cover. Most pipes require a minimum of 12 inches of compacted material (not including surface aggregate) before allowing traffic on the road. Taper the fill into the existing road elevation on either side of the pipe. The amount of fill and length of taper depends on site conditions, such as road slope and pipe depth. Ensure that transitions are sufficiently long to accommodate the expected design vehicle.

056946

Figure 5.8—The same pipe is shown here covered with fill, before final compaction. Arrow denotes headwall or pipe inlet.

Through-the-bank pipes. A pipe placed in the downslope ditch to carry drainage through the downslope bank and away from the road.

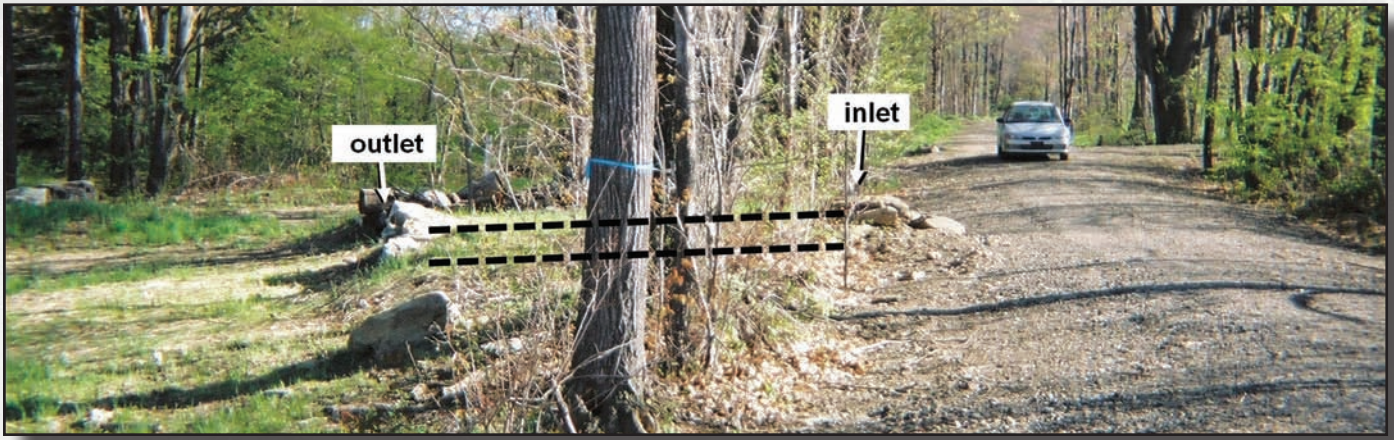

Figure 5.9—The through-the-bank pipe provides an outlet for road drainage that is trapped in the road corridor by road banks. The pipe inlet is located in the road ditch, and the outlet is at the natural ground elevation where the water can drain away from the road.

Benefits of through-the-bank pipes

- Provides additional outlets for road drainage that otherwise is trapped in the road corridor.
- Reduces contributing area of road drainage, which reduces the water velocity and erosion potential.
- Offers a good alternative to open turnout trenches (lead-out ditches) that disturb the bank and require constant maintenance.
- Establishes a solution that may be more aesthetically pleasing that open turnout trenches.

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Criteria for using through-the-bank pipes

- Use on entrenched roads where raising the road elevation to a level above the surrounding road bank is impossible or impractical.
- Use on roads with large berms that trap drainage on the road surface where berm removal is not possible.
- Use where an appropriate drainage area exists within reach of a pipe, but is obscured by a downslope road bank or berm.
- Use on entrenched roads with large cut banks where opening up the area is unfeasible due to scope, cost, or aesthetics.
- Use in locations where building a traditional “turn out/lead out” would destabilize the road and contribute more sediment.

Materials required for a though-the-bank pipe

- Use culvert pipe. Determine the appropriate length and size of pipe needed for location.
- Use headwall stone or metal end section to prevent bypassing of road run-off.
- Use stone for energy dissipation at pipe outlet if high flows are expected.

Equipment required for a through-the-bank pipe

- Use an excavator/backhoe to dig the pipe trench from the roadway.
- Use a dump truck to remove excess soils if needed.

Through-the-bank pipe installation

- Identify desired pipe inlet location in downslope road ditch based on contributing area and road gradient.
- Use a level to locate an outlet on natural ground maintaining a 1-percent slope from the inlet. Flatter topography requires longer pipes. Ensure that water will not flow back to the road from the outlet.
- Excavate the pipe trench, ensuring at least a 1-percent continuous slope.
- Place pipe in trench, cover with excavated material, seed, and mulch.
- Build the headwall and plug the ditch below the inlet to force ditch flow into pipe.

Through-the-bank-pipe considerations

- Compaction and quality of fill material is not an issue since the pipe does not go under the road and/or carry loads.
- Block the road ditch immediately below the pipe inlet to prevent drainage from bypassing the pipe and flowing down the road.
- Outlet the pipe at natural ground elevation to reduce erosion.
- Install a cross pipe or broad-based dip just above the through-the-bank pipe to drain the upslope road ditch as well.
- Use a level to determine if these structures are feasible. Often times the level will show that there is sufficient fall in locations where the naked eye thinks the pipe is actually going up hill.

Figure 5.10—The inlet of a through-the-bank pipe shown during installation before the pipe is covered.

056950

Headwalls and Endwalls. A wall built around a pipe opening to support the road and protect the road from erosion caused by excessive velocities and turbulence. A wall at a pipe inlet is a headwall and the wall at a pipe outlet is an endwall. Headwalls vary depending on the physical conditions at each installation site and may include wingwalls, debris fins, and aprons.

Figure 5.11—Headwalls come in various shapes, sizes, and materials, based on the situation and material available.

Benefits of headwalls and endwalls

- Provides a low cost, long lasting solution to retain fill material and reduce erosion of the embankment.
- Increases hydraulic efficiency on inlet-controlled pipes by directing flow and reducing turbulence around the pipe inlet.
- Reduces sediment delivery to stream and can reduce streambed and streambank scour at the pipe outlet.
- Prevents culvert plugging with debris if design includes wingwalls.
- Provides structural support to the culvert ends to offset uplift forces.
- Inhibits piping (water working through the fill around the outside of the pipe).

Criteria for headwall endwall use

- Use on culverts that show signs of inlet erosion, bank sloughing, and scour.
- Use on crossings with high stream velocities and turbulence.
- Use on streams that carry debris, which can plug the culvert entrance.
- Use for outlet protection where turbulence can damage the structure or streambank.

Headwall materials

- Use locally obtained stone or stone that may be available onsite. It is the easiest and cheapest headwall rock source if available and suitable.
- Purchase angular rock or riprap material (where natural stone is round or nonexistent).
- Purchase preformed headwalls including concrete, plastic, and metal.

Headwall and Endwall Considerations

- Be aware that the size and shape of headwalls will vary based on pipe size, road layout, stream or ditch layout, and approach velocities.
- Coordinate with design engineers to determine the design-storm discharge to identify the appropriate headwall configuration for stream pipes based on local requirements.
- Reinforce headwalls by placing fabric between layers of rock, and tying the fabric into the backfill (a process known as creating a deadman).
- Build headwalls and endwalls before or after backfilling the pipe.

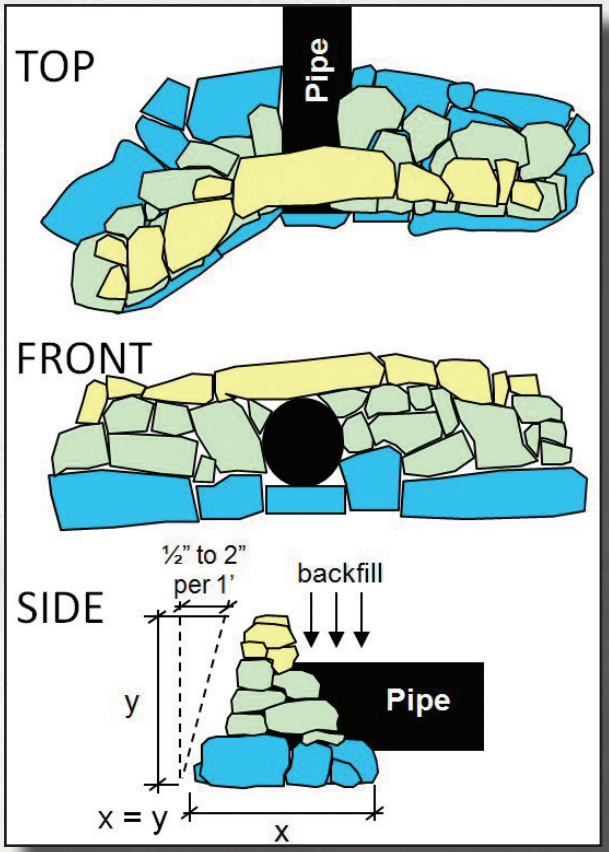

056952

Figure 5.12—Plan views of a stone headwall. Note that the base width should be equal to the height, the face should be sloped or canted back, seams should be overlapped like bricks, and stone should be placed under the pipe.

Figure 5.13—A properly constructed natural stone headwall can last for decades.

056954

Figure 5.14—Headwall with wingwalls.

056955

Figure 6.1—Consequence of poor road location results in loss of road and increases sediment delivery.

Road-Stream Crossings

The road-stream crossing is a critical area to assess for opportunities to reduce erosion and sediment delivery. Roads often are hydrologically connected to streams and contribute sediment from the ditch and the road surface. This direct road-stream connection causes deteriorated water quality and adverse impacts to aquatic species, animals, and humans. Chapter 6 provides environmentally sensitive practices for reducing sediment and maintenance costs associated with stream crossings of all forms including bridges, pipes, and low-water crossings. The type of crossing at a given location depends on many factors, such as stream type, road use, and available funding.

This chapter does not cover the sizing and installation procedures for bridges or pipes. Many sources exist to provide more in-depth guidance on designing, selecting, and installing bridges and major culverts. This chapter addresses alternative maintenance practices, especially designed for use on low-volume roads, which can reduce sediment and erosion at stream crossings and lower maintenance frequency.

056956

Figure 6.3—This direct road-stream connection causes deteriorated water quality and adverse impacts to aquatic species, animals, and humans.

High-Water Bypass. An intentionally designed flat, low-lying section of reinforced road that serves as an emergency spillway to allow water to flow over the road with minimal damage during high, but anticipated, flow events.

Figure 6.3—The road illustrated here will allow water from extreme events to flow over the reinforced bypass.

Benefits of High-Water Bypass

- Reduces risk of failures at stream crossings by directing high flows to a stable road crossing.
- Minimizes erosion of costly road material and damage to drainage structures.
- Reduces emergency maintenance needed to make roads passable after damage by high water flow.
- Allows for effective management of storm flows beyond the design capacity of bridges and culverts.
- Connects flood plains bisected by a road.

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Criteria for Use

- Use on crossings where flow historically overtops an inadequately sized bridge or culvert.
- Use on lower volume roads where occasional waterflow over the road is acceptable.
- Use on broad flood plains or meadow complexes where it is desirable to connect the flood plains on either side of the road instead of concentrating all of the stream's flow at the crossing structure.

Considerations

- The bypass should be wide and flat to encourage sheet flow.
- The bypass should be constructed directly over a stream crossing in areas where space is limited.
- The bypass should be used for high flow events, not as regular flow channels for frequent events (fords).
- For road reinforcement, the bypass should be reinforced to resist erosion when high flows occur. In the example on the following page, 3-dimesional geogrid adds additional strength and helps to tie the surface together AASHTO #1 (2-to 6-inch stone) provide traffic support while resisting erosion.
- For bank reinforcement, it also may be necessary to armor the downslope bank as well (if a steep or unstable fillslope exists). The bypass is armored with R7 (12-to 30-inch stone) rip-rap.

Construction Sequence

1. Excavate the road to create room for surface reinforcement. Depth will depend on size of geogrid, stone (rock), and elevation of road. A 10-inch excavation depth is shown in the example *(figure 6.4a).*
2. Place geotextile fabric and geogrid in excavated area. Geogrid is secured with pins *(figure 6.4b).*
3. Fill geogrid with rock, AASHTO #1 (2-inch to 6-inch stone) as shown *(figure 6.4c).*
4. Place an additional rock over bypass as driving surface. Ensure that the bypass remains the lowest point on the road to direct flow safely over roadway *(figure 6.4d).*

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Figures 6.4a through 6.4d—Construction sequence for high-water-bypass.

Construction Considerations

- Size. Bypass sizes vary greatly depending on available space and stream morphology. Make the bypass as wide as possible to spread the force of the water out and encourage sheet flow.
- Elevation. Use leveling equipment to ensure that the finished surface of the bypass is level and will be the lowest section of road in the flood plain.
- Shape. Flat and wide. The finished bypass surface should be as flat and wide as possible to ensure even sheet flow and minimize erosive forces.

Improved Fords and Low-Water Crossings. A stream crossing at or near streambed elevation can be shaped and surfaced with many types of materials (rock, concrete, etc.). A small channel or slot may be included in the structure's low point to pass very low flows and aquatic animals. The downstream roadway edge may be stabilized and buttressed with boulders, gabions, or concrete jersey barriers (K-rails).

Criteria for Low-Water-Crossing Use

- Ephemeral or low baseflow channel at time of use.
- Alternate access to the area is available.
- Low traffic use.
- Where traffic can be interrupted for periods of flooding.
- Channel is broad and shallow.
- Watershed has large flow fluctuations or flashy response.

Figure 6.5—Concrete ford crossing.

Figure 6.6— Low-water crossing.

Important Low-Water-Crossing Considerations

- Soft and erodible channel bottoms can require a hardened driving surface.
- Traffic volume and timing.
- User safety.
- Use vented fords or low bridges where fisheries and/or water quality requirements do not allow vehicles to enter the stream.

056962

Figure 6.7—Vented ford or low-water bridge.

Low-Water-Crossing Types. Low-water crossings fall into two general categories: (1) simple, unimproved or improved unvented fords with a natural or hardened bottom, and (2) vented fords with culverts or vents to bypass very low flows. Ideally these two types match the natural channel shape. Occasionally low-water bridges are used for broad streams or rivers with extreme flow fluctuations.

Benefits of Low-Water Crossings

- Structure can provide needed grade control to prevent headcuts.
- Costs and maintenance are low.
- Failure in large storm events is low.
- Damage from debris or vegetation plugging is less than culverts.
- Risk to riparian and aquatic resources associated with road fills and culverts is eliminated.

Figure 6.8—Gabion ford crossing.

056963

Simple Boulder Fords or Concrete Jersey Barriers

- Use large boulders with a smaller rock matrix.
- Bury large boulders at base of structure as footer rocks.
- Use for appropriate grade control and/or steep gradient transport channels.
- Can be designed for narrow as well as wide channel crossings.
- Are inexpensive and easy to construct.
- Are appropriate for large wide channels (Jersey barriers).
- Can be constructed in stair-step fashion to reduce scour.
- Use boulders as energy dissipaters at base (Jersey barriers).

Construction Sequence for a Boulder Ford

1. Dewater site by routing flows around stream crossing.
2. Reshape drainage crossing and approaches to desired grade with a grader or dozer. Be sure to provide a 2- to 4-percent outslope to the crossing so bedload and debris move through the crossing.
3. Key in large boulders at base of structure so no more than 4 to 6 inches of each boulder is visible.
4. Begin placing boulders and smaller rock, building up to the desired road crossing elevation. Use smaller rocks to fill voids and create a tight cohesive matrix.
5. Place smaller drain rock to stabilize approaches and reduce sediment delivery to stream.
6. Construct grade break or rolling dip on these approaches to reduce the hydrologic connectivity of the approaches.

Figure 6.9—Boulder ford on Stanislaus National Forest in California has had no maintenance since construction in 1997.

Figure 6.10—Jersey barrier in Arizona provides safe, low maintenance access to forest roads.

056964

Construction Sequence for a Jersey-Barrier Ford

1. Dewater site by routing flows around stream crossing.
2. Reshape drainage crossing and approaches to desired grade with a grader or dozer. Be sure to provide a 2-to 4-percent outslope to the crossing so bedload and debris moves through the crossing.
3. Key in energy dissipating boulders at base of Jersey barrier.
4. Place barrier, being sure to extend the structure so high flows do not go around the end.
5. Backfill barriers with accumulated bedload to desired height.
6. Place second row of Jersey barriers if needed due to steep channel gradient.
7. Backfill with bedload.
8. Place smaller drain rock on approaches to reduce sediment delivery to stream.
9. Construct grade break or rolling dip on these approaches to reduce the hydrologic connectivity of the approaches.

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Improved Stream Crossings. This section identifies practices to improve existing stream crossings in order to reduce erosion and sediment delivery to the stream. Often erosion and sediment delivery to streams is due to undersized culverts. Culvert sizing is part of road design and generally requires several disciplines and resource objectives prior to designing a stream crossing. This guide focuses on road maintenance practices that can be implemented easily by road crews. Therefore, only brief summaries are presented here with links for additional resources.

Better Pipe Alignment

Pipes are often placed perpendicular to the road in order to save on pipe lengths. However, this can cause streambank erosion if the stream is forced to turn at hard angles as it enters and exits the pipe. When this is the case, a better strategy is to use a longer section of pipe to create a better alignment of the crossing with the natural stream channel.

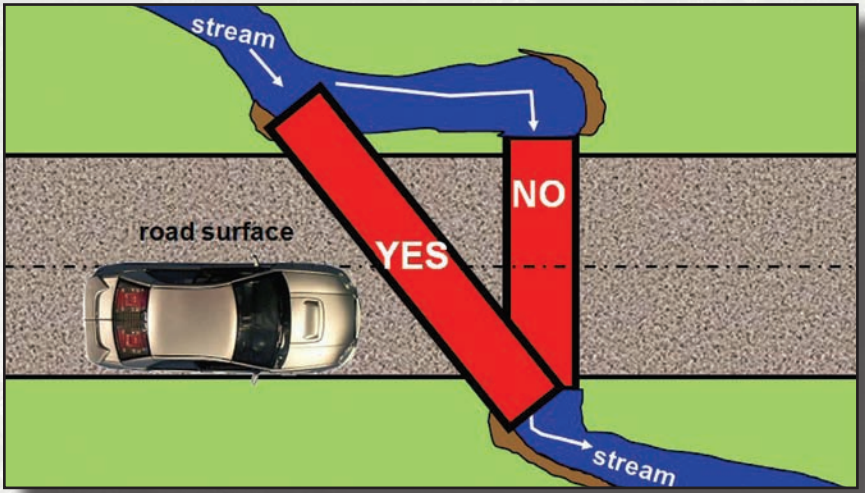

Figure 6.11—Better pipe alignment.

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Figure 6.12—A bottomless arch pipe has just been installed over a currently dry stream channel.

Bottomless-Arch Pipes

Arch pipes are bolted to concrete footers that run along each side of the stream channel. They can be purchased already assembled, or in plates that can be assembled onsite.

Benefits of Bottomless-Arch Pipes

- Retains natural steam bottom through the structure.
- Requires less fill height than equivalent sized round pipes.
- Spans larger sized compared to round pipes.
- Costs much less than a typical bridge.

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Paving Bridge Approaches

Road aggregate should never be graded onto, or allowed to sit on, bridge decks. In addition to falling easily into the stream, the aggregate holds water, impedes drainage, and reduces the bridge load limit. Another solution is to pave the bridge approaches to reduce sediment delivery to the bridge and stream. Carefully review the sediment contributing area and extend the pavement to the break in slope.

Figure 6.13—Paved bridge approach reduces sediment delivery to the stream.

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Figure 6.14—This road is constantly being eroded and flooded. Relocating the road away from the stream, while initially costly, will pay for itself in a few years of reduced flooding and repair costs.

Road Relocation

Sometimes the best solution for the road and the stream is to relocate the road out of the stream corridor. The forest road shown here was relocated because it frequently flooded and eroded the road. The new road was located away from the stream. Road relocation can restore the natural hillslope hydrology and allow for recovery of native and riparian vegetation.

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Figure 7.1—Unvegetated cutslopes are a source of sediment.

Cutslopes/Fillslopes

This chapter addresses stability problems associated with road cutslopes (backslope) and fillslopes. Unstable road cutslopes can disrupt road drainage, adversely impact water quality, create safety hazards, and increase maintenance frequency and cost. Addressing unstable cutslopes involves correctly identifying the source of the problem. Common cutslope problems originate from several sources; undermining of the cutslope, intercepting subsurface flows, and run-on from offsite sources.

Naturalize Bank Shapes

Naturalize Bank Shape. A simple practice designed to mimic the natural landscape and create a stable roughened cutslope or fillslope.

Why naturalize the bank shape?

Traditionally, equipment operators try to create roadbanks that are smooth and uniform. The banks are often composed of subsoil or rock, which is seeded with grass. In the natural world, slopes are rarely uniform. By incorporating features to roughen the slope, erosion is reduced and an environment rich in diversity of plant species is created.

Criteria for Use:

- Use on cutbanks with surface run-on from upland areas.
- Use on steep cutslopes where surface runoff causes rills and gullies.
- Use on new road construction or redesign of an existing road.

Bank Roughening. When building or maintaining road cutslopes and fillslopes, allow for surface roughness by leaving grade imperfections and debris in place. These imperfections reduce erosion, create tortuous flow paths, increase infiltration, and provide small niches for different types of plants to grow. Heavy equipment grousers (cleats) run perpendicular to the slope to provide additional surface roughness. Their tracks help to trap water and provide seed niches for a variety of vegetation.

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Vegetation. Use a variety of plants, shrubs, and trees that are native to the area and require little maintenance. Identify plants that have deep roots that will stabilize the slopes. Avoid shallow rooted grasses and weak colonizer tree species. Hardy trees can permanently stabilize roadbanks and are especially beneficial on steep slopes.

Figure 7.2—Trying to grow grass on a smooth bank made of subsoil and rock is not a good strategy.

Figure 7.3—Tree roots are Mother Nature's rebar.

Woody Debris. Downed wood and stumps are often removed from the site and burned or chipped. A better use is to place woody debris perpendicular to the slope of the bank to disrupt flow paths and foster diverse bank habitat. Naturalize slopes by embedding stumps and snags into cutslopes (figures 7.4 and 7.5). Stumps bring their own seed base that adds to the diversity of vegetation on the bank.

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Figure 7.4—All of the woody debris and stumps in this picture were placed there to naturalize the bank shape.

Figure 7.5—The same bank as pictured in figure 7.4, 4 years later.

Topsoil. The soil in cutslopes often is unfertile subsoil that cannot support vegetation. During new road construction, stockpile topsoil and reapply it over the newly constructed cutslope. In areas where cutslopes are reshaped to establish a more stable angle, import topsoil and spread on sites without topsoil to help reestablish vegetation.

Compost Berms. Use compost berms or socks (a mesh tube stuffed with compost) to control run-on from upland areas. A compost berm reduces erosion, retains soil moisture, and increases site fertility. Compost berms are trenchless and stake free. Place compost berms on the hillslope contour at varying intervals depending on the hillslope gradient.

Retaining Walls and Rock Buttress
Retaining walls are used for unstable cutslopes and come in many sizes and shapes. Retaining walls are designed to prevent sloughing material (soil and rocks) from entering the traveled way and disrupting the road drainage design.

Criteria for Use

- Use on steep, eroding cutslopes that cannot establish and maintain vegetative cover.
- Use on roadways where diversion potential exists from sloughing material (diversion of water out of the ditch).
- Install on areas where the consequence of sediment delivery are immediate and acute (near vicinity of perennial stream with anadromous fish).

Benefits of Retaining Walls and Rock Buttress

- Allows flattening and revegetation of the top portion of the cutslope by steepening the bottom with a retaining wall structure.
- Promotes the establishment of vegetative cover to stabilize soil and reduce erosion.
- Armors the bottom of the slope and provides resistance to slumps and slides.
- Provides aesthetic (rock buttress), and safety benefits (reducing rockfall onto highways from unstable slopes).

Figure 7.6—Crib wall stabilizes this steep cutslope ensuring appropriate road width and drainage function.

Figure 7.7—Retaining walls come in an assortment of materials and can often be constructed from large boulders onsite.

Benches and Interceptor Swales

Bench. A bench is a step or terrace built into the cutslope to slow and divert runoff before reaching the road.

Interceptor Swale. An interceptor swale is a drainage channel built parallel above a roadway and above the cutslope to intercept overland flow and direct it to a stable outlet.

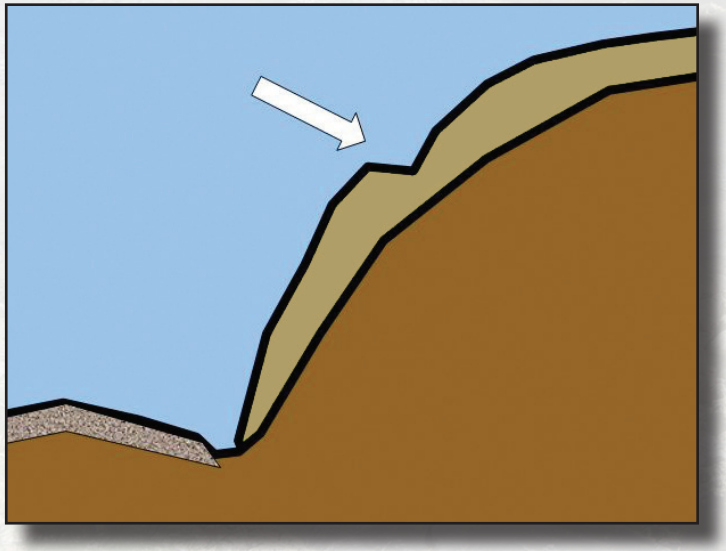

Figure 7.8—A bank bench has a flatter profile than an interceptor swale, similar to an insloped terrace.

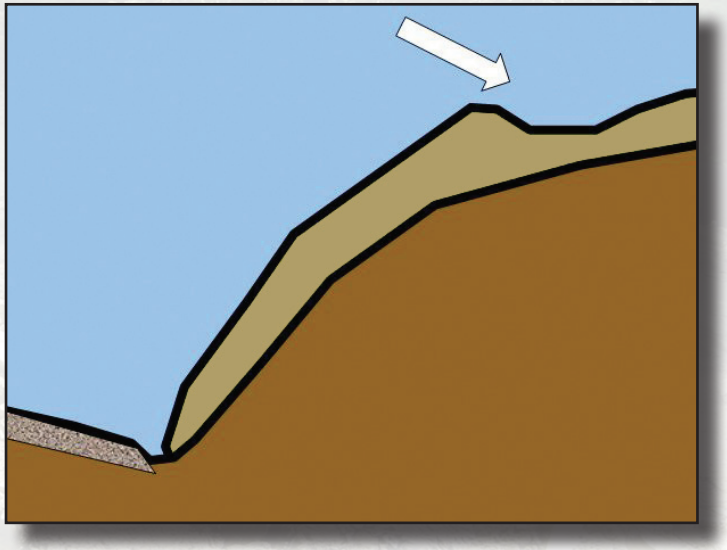

Figure 7.9—An interceptor swale is designed to carry more water than a bank bench.

Benches and Interceptor Swales

While benches and interceptor swales are similar in form and function, there are subtle differences. Benches are slightly insloped steps designed to slow water down and carry minimal flow. They are especially useful on steeper slopes and often can be built within existing road right-of-ways. Interceptor swales usually are used above banks with larger flow volumes, and require landowner approval if located outside the road right-of-way. These structures should outlet water into a stable filter area.

Bank Benches Criteria for Use

- Use on steeper slopes.
- Use on cutslopes subject to relatively low surface flows.
- Use if stable filter area exists nearby to drain bank bench.
- Use if evidence of rill erosion exists on the bank.

Interceptor Swale Criteria for Use

- Use on gentler slopes.
- Use on cutslopes with excessive overland flow.
- Use if stable outlet area exists nearby to drain interceptor swale.
- Use with landowner's approval if located outside the right-of-way.
- Use when the longitudinal slope is gentle enough to prevent erosion in the swale.

Benefits of Benches and Interceptor Swales

- Prevents run-on water from adding to the road drainage system.
- Protects roadbanks and ditches from erosive impact of run-on.
- Allows road managers to direct surface flows to a desirable location before it reaches the road.
- Can increase soil moisture to promote plant diversity on bank.

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Bank Bench Considerations

- Built from the roadway.
- Use material only if the outlet requires stabilization.
- Use to reduce the erosion potential if the longitudinal slope of the bench should be minimal, less than 5 percent.
- Use on site conditions, that can accomodate a bank bench 3 to 7 feet in width.
- Use where the cross-sectional shape of a bank bench can be flat, or slightly parabolic, with a slight slope towards the cutslope bank.
- Use an interceptor swale instead of a bank bench in areas of excessive runoff.

Interceptor Swale Considerations

- Interceptor swales can be built from the road; however, landowner permissions may be required for swales off the road right-of-way.
- Use like bank benches; longitudinal slope should be minimal.
- Use outside the right-of-way must consider upslope land use.
- Use stone reinforcement if required to stabilize the outlet.
- Use on site conditions, that can accomodate a swale 6 to 12 feet wide (bank-to-bank). More gentle sites allow for wider swales to reduce erosion.
- Use if the cross-sectional shape of a swale should be shallow and parabolic.

Figure 7.10—The slightly insloped bench in this image takes water around the hill and away from the road.

Figure 7.11—The interceptor swale pictured here catches the runoff from a large field before it enters the road.

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Off Right-of-Way Issues

Off Right-of-Way (ROW) Issues. There are several strategies for addressing impacts to the road from off right-of-way or offsite sources. Practices can be used to lower traffic impacts as well as reduce the volume of water managed in the road drainage system at locations where driveways, lanes, trails, etc, intersect the roadway.

Off-ROW refers to anywhere roadside accesses either intersect or send water to the road. Farm lanes, driveways, utility ROWs, trails, developments are all potential off-ROW impacts to public roads. These access points act as tributaries to the public road drainage system, reaching out into the landscape and funneling water to the road area. The key to handling this water is to address it on the access road, BEFORE it ever reaches the public road.

Benefits of Addressing Off-ROW Issues:

- Reduces road damage due to outside water sources.
- Reduces the amount of runoff the roadside drainage system must handle.
- Creates smooth transitions for traffic to enter/exit the road.
- Improves landowner access while improving the road.
- Encourages drainage disconnection and stormwater infiltration.

Figure 7-12—Unchecked off-ROW accesses, such as this logging road, lead to increased runoff, erosion, and maintenance cost to the receiving road.

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Strategy 1

Ordinances or Permits. Ordinances and permits can effectively control the way a new driveway or access road handles water, giving the road manager a tool to directly oversee the installation of the new interface. Simply creating an access permit that allows encroachment is not enough. The permit or ordinance must address the way access roads bring water to the public road, and the effectiveness of vehicle transitions at the intersections. This process will allow involvement in the planning and layout phase before the road is cut, instead of retrofitting solutions.

Access interface and drainage. Many practices in this guide can be applied effectively to new off-ROW interfaces; broad-based dips, grade brakes, and conveyor-belt diversions work well in redirecting surface flow from a driveway or lane. A change in the elevation of the access road can prevent surface water from flowing on to the public road. Smooth surface transitions at the access road interface will reduce traffic impacts on the road. The increase in elevation also will improve driver visibility.

Strategy 2

Mixed Road Ownership Road Drainage Solutions. Run-on from a permanent or temporary road access can be disconnected using different practices.

- Install drainage culverts under the access road (driveway) to maintain the ditch function and capture the additional run-on.
- Use prefabricated or constructed open-top culverts to maintain drainage function for temporary access roads for heavy equipment. Culverts can be moved from site to site and reused, allowing more permanent drainage structures to be installed upon road retirement.
- Construct a hardened ditch with a drivable cross section or install a cattle grate to allow road ditch water to cross the access.

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Figure 7.13—This conveyor-belt diversion on a farm access lane prevents drainage from flowing on to the public road at the bottom of the hill.

Figure 7.14—The broad-based-dip on this driveway provides a good transition and keeps water off the public road.

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Figure 8.1—Proper gradation of aggregate can prevent the raveling and pumping in this picture.

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Surface Aggregate

Surface aggregate is often the most visible and expensive component of unpaved road maintenance. Aggregates used for gravel road surfacing vary a great deal around the nation based on climate and available material.

Poor quality aggregates, or poor gradation of aggregates, will lead to excessive road surface erosion and degradation. This will lead to increased sediment runoff, increased maintenance costs, and poor traffic support.

The ideal surface aggregate should be designed with a range of particle sizes in order to achieve the highest possible dry density after compaction. This chapter is presented as an introduction to some important concepts in choosing a surface aggregate.

Figure 8.2—Rutting due to excess clay content.

Figure 8.3—3-year-old dense packed surface aggregate after 40,000 vehicles.

Surface Aggregate. Surface aggregate is the unbound layer of graded rock and other material used as a driving surface for a roadway.

About Surface Aggregates

In many locations, the surface aggregate of choice is whatever is cheapest. Many road managers assume the gravel will erode away, and the road surface will need to be regraveled in a relatively short timeframe. However, some entities see a benefit from putting in a higher quality aggregate to resist erosion and stretch the life cycle of the road surface before regraveling is needed. There are two major factors that determine surface aggregate quality: material and gradation (size distribution).

What Qualities Make a Good Surface Aggregate?

Space Material Properties

- **Shape.** Should be equal dimensional or blocky (avoid elongated or flat/platy shapes).
- **Angularity.** Should be angular, preferably with at least two crushed surfaces (not rounded like river gravel).
- **Abrasion resistance.** A hard stone with a Los Angeles abrasion value of 40 or less is recommended to resist breakdown.
- **Debris Free.** Good aggregate should be free from soil, organics, and even clay in wet or cold climates.

Figure 8.4—Loose aggregate will unravel and form windrows of material along the road center and edge.

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Quality Gradation

- **Maximum size.** Nominal maximum particle size should be adjusted based on the expected traffic. A 1.5-inch nominal maximum size is desirable for most aggregates where passenger vehicle traffic is expected.

- **Well-graded size distribution.** Even the best material will fail if it is not properly sized. Well graded means that a broad spectrum of particle sizes is present throughout the range of the aggregate. This includes at least 10 percent minus #200 fine material for most aggregates. A mixture of aggregate sizes, especially including fine material, is necessary in order to achieve maximum compacted dry density to resist erosion and wear.

Aggregate Placement Considerations

Base Preparation. It is important that a stable road base exists on which to place aggregate. Any failures in road base will be reflected in the new surface aggregate. Surface aggregate will also reflect any imperfections in the road base. Ensure that any ruts or potholes are graded out prior to placing aggregate. It is also important to establish adequate (4 to 6 percent) crown or cross slope in the existing road. Then place aggregate in a uniform layer to maintain this crown. When placing aggregate deeper than 4 inches, consider cutting a key along the edge of the road to support the edge of the aggregate. Otherwise, the noncompacted aggregate edge may create a traffic hazard and unravel more quickly than a supported edge.

Figure 8.5—A well-graded aggregate is being placed through a paver at a noncompacted depth of 8 inches, and compacted to 6 inches. Notice the roller in the background for compaction.

Moisture. Optimum moisture is critical when placing a well-graded aggregate. A dry aggregate will segregate by size and will never achieve maximum compaction. The range of optimum moisture will depend on the aggregate type and gradation. Optimum moisture should be determined by a lab before ordering, and verified in the field when possible.

Compaction. Maximum dry density must be achieved through compaction equipment, such as a vibratory roller. Maximum compaction has been achieved when the road surface no longer compacts under the roller, or when larger stones on the road surface begin to break apart. The exact degree of compaction can be measured in the field using a nuclear density meter.

Depth. Aggregate must be placed at a sufficient depth to allow for compaction. As a general rule, the depth of compacted aggregate should be three times the largest stone diameter. For example, an aggregate with a 1.5-inch maximum stone size should be placed 3x1.5 inches = 4.5 inches deep. Thinner so-called skim coats of aggregate are often ineffective because the material cannot form a cohesive layer and is quickly raveled off by traffic.

Placement Method. A well-graded aggregate should be placed using methods that cause the least amount of size segregation. A motor paver, like those used to place asphalt, is the best way to ensure uniform aggregate distribution and coverage. Other devices, such as spreader boxes can be used to place aggregate. Tailgating (dump and spread) aggregate makes it much more difficult to avoid segregation and create a uniform surface. Every time the aggregate is handled or graded, it begins to segregate by size and becomes more likely to fail.

Should a Surface Aggregate Include Clay?

NO CLAY. In regions with abundant precipitation, ground moisture, or freeze-thaw cycles, clay-laden aggregate can cause problems. In these regions, clay in surface aggregate can retain excessive moisture and cause rutting, especially during thaw cycles. The clay also will tend to pump to the surface of the aggregate in wet conditions, increasing the amount of

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sediment runoff during rain events, and increasing the amount of dust generated during dry conditions. Clay particles are more likely to become mobilized by traffic than crushed rock, and are more likely to travel long distances before settling out of the air because of their fine size and platy shape

YES CLAY. In arid regions where dust is not a major concern, a small amount of clay may be desirable in surface aggregates. The clay will retain moisture and help to bind the aggregate together during excessive dry periods. The amount of clay in the aggregate (approximated by the plasticity index) will vary depending on local climate and material being used.

Table 8.1

Other "Surface Aggregate" Specifications from around the United States:

This table shows the variation in aggregates designated for an unbound wearing course from around the country.

Passing Sieve Size	mm	50	38	25	19	4.75	2.36	1.18	0.600	0.075	Plasticity Index
	in	2	1.5	1	0.75	#4	#8	#16	#30	#200	
PA Driving Surface Aggrgate			100		65-75	30-65		15-30		10-15	minimal
S. Dakota "General Surfacing" spec (2)					100	50-78	37-67		13-35	4-15	4-12
"Grading D" (3)				100	60-90	30-55	40-60		11-27	6-15	
Surface Coarse Aggregate (4)				100	86-100	50-76		32-50	22-36	9-21	2-10
"Surface Coarse Gradation" (5)				100	97-100	41-71			12-18	4-12	
Ohio "411" spec (6)			100	75-100	60-100	30-60			7-30	3-15	<6 on -#40
Maine Surface Aggregate (7)		100								7-12	
AASHTO Class A&B, 4120.04, 4120.05 (8)				100	95-100	30-55	15-40			6-16	4-9
AASHTO Class C 4120.03 (8)					100	50-80	25-60			>6	4-9
"Close Graded Surface Course" (9)					100			15-30		3-8	4-9

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6 Ohio Dot Specification (http://www.dot.state.oh.us/Divisions/ConstructionMgt/OnlineDocs/Specifications/2005CMS/700/703.htm#a_703_18__Materials_for_Items_410_411)

7 http://www.maine.gov/dep/blwq/docstand/escbmps/escsectionh1.pdf

8 Iowa DOT: http://www.iowadot.gov/erl/archives/Apr_2005/GS/common/english_gradations.htm

9 http://www.highwaysmaintenance.com/Aggtext.htm

CASE STUDY: Driving Surface Aggregate (DSA): DSA is an aggregate specification from Pennsylvania Department of Transportation that was designed as a wearing course for unpaved roads. It was designed to achieve maximum packing density in order to resist wear and erosion.

Key Facts about DSA

- Developed in 1997 as an alternative to sub-base aggregates being used on road surfaces in Pennsylvania.
- Used to surface over 500 miles of road to date.

Table 8.2

Passing sieve	Lower %	High %
1 1/2 inches	100	
3/4 inches	65	95
#4	30	65
#16	15	30
#200	10	15

DSA size gradation.

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- Derived of crushed rock. No soil or clay fines may be added. (Pennsylvania has approximately 40 inches annual rainfall, and more than 70 freeze-thaw days annually.)
- Placed at optimum moisture, preferably through a motor paver at a noncompacted depth of 6 to 8 inches.
- When placed properly, the surface should be maintenance free for roughly 3 to 5 years with average daily traffic below 150. DSA can be graded easily under moist conditions with a carbide-toothed grader blade.
- Experience has shown that DSA produces less dust than other aggregates and native surfaces in Pennsylvania.
- Studies have proven that DSA reduces sediment runoff from the road surface by over 90 percent in locations where it has been placed over existing mixed-surface roads in Pennsylvania.
- It is important that any surface aggregate be easy to make. In Pennsylvania, DSA can be made using common existing aggregates (8 parts PENNDOT 2A, 1 to 1.5 parts PENNDOT #57, and 1 part #200 fines).

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Figure 9.1—Road Assesment and monitoring.

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Road Assessment and Monitoring

Assessing road condition and monitoring post-treatment installation requires a systematic process to evaluate if treatments implemented have corrected the problem. The soil water road condition index serves as an assessment and monitoring tool, which is used to identify road condition relative to soil and water resource concerns. The form can be used on a single road or every road of concern. The index is a systematic process that first characterizes the road or road segment by identifying surface shape, location, road gradient, hillslope gradient, and surface material. Once the segment is characterized, the road is evaluated using the following eight key indicators.

1. Road surface drainage.
2. Stream crossing condition.
3. Road subsurface drainage.
4. Diversion potential at crossings.
5. Road-stream connectivity.
6. Road surface condition.
7. Cutslope condition.
8. Fillslope condition.

For each of the eight indicators the reviewers identify if the road design, structure, or stream crossing is functioning. If the structure and design is operating in the proper or expected manner the road condition evaluation for that indicator is functional. If the structure or design is not operating as expected and is blocked, eroded, or has the chance of damaging resources (soil and water) in its present condition, the road condition evaluation is at-risk.

To determine the overall condition index for a road or segment, the reviewers evaluate each indicator for functionality and track each score to determine the percentage. Road segments with greater than 25 percent of the surface drainage structures at-risk receive an overall impaired condition rating. If less than 25 percent of the segment's surface drainage is not operating or functioning in the proper or expected manner, the overall rating is at-risk. The sample form and rule set shows how the tool is used.

Steps to determine overall condition index:

1. Drive the entire road or road segment to review the road and identify potential road segments. Road segments can be delineated from U.S. Geological Survey quadrangles or routed linear Arc/Info coverage. Without any preidentified segment breaks, look for the following when segmenting a road:
    a. Changes in surface shape (insloped to outsloped).
    b. Location (road within stream zone, climbing segment, upper one third).
    c. Surface material (gravel, native, paved), or surface drainage type.

The amount of segmentation may vary depending on resource objectives.

2. Characterize each segment by closely examining the indicators on the form. Return to the first road segment and before driving the segment; identify the road surface shape, location, gradient, hillslope gradient, and surface material. Together with a coworker identify the following:
    a. What type of surface drainage is used? Is it functioning?
    b. Are there stream crossings within the segment, are they open and functional?
    c. Does the road intercept subsurface drainage? Is it a point or linear feature throughout the segment?
    d. Is the ditch eroded? What type of vegetation is growing on either side of the road?
    e. Is there diversion potential with insloped roads, ditch-relief culverts, or at natural stream crossings? If a structure fails, where will the water flow?

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f. Is the road segment connected to the stream at natural stream crossings or from gullies delivering sediment to the stream?
g. Are there rills or ruts on the road surface?
h. Are the cutslopes and fillslopes well vegetated and stable? Or are there rills, sparse vegetation, and indications of mass wasting?

3. Drive the remainder of the segment. Identify the number of drainage structures that are functional. Often if one culvert is plugged, many culverts on the road also will be plugged. The record keeper tracks the ratings to determine the overall road segment rating.

4. Complete a form for each segment. Circle functional, at-risk, or N/A for each of the eight indicators. Add the circled rating for each category. Determine the percentage of functioning indicators for each indicator. Follow the rule set to obtain an overall rating. Turn the form over and answer the questions on the back related to maintenance or improvement considerations, potential causes of sediment, and site-specific concerns.

5. Repeat the process and drive to a typical location within the next segment. Identify the segment (2) of FS road (x) and complete the form. Identify the segment breaks on quadrangle maps or with a global positioning system waypoint. Photograph a representative segment of the road.

Soil and Water Road Condition Index

Road #
Segment Length_____ Total road length_____
Reviewed by:_____

STEP 1	Road Characterization (circle each to characterize segment)			
Road Surface shape	***Hillslope Position***	***Road Gradient***	***Hillslope Gradient***	***Road Surface Material***
Inslope	upper 1/3	0-8%	0-15%	Native
Outslope	middle 1/3	9-15%	16-35%	Aggregate
Crown	lower 1/3	>15%	>35%	Paved
Entrenched	climbing segment			
Turnpiked	within SMZ			
User Created				

STEP 2	Road Condition Evaluation			
1. Road Surface Drainage (Identify surface drainage on road segment from list below)	**N/A**	**Functional**	**At-Risk**	**Impaired**
Ditch (linear feature)		No signs of erosion or scour	Eroded ditch with signs of downcutting or scour	>25 percent of segment "at-risk"
Lead-off or winged ditch		Open / no deposition/ no scour	Partially blocked or blocked, scour at outlet	>25 percent of segment "at-risk"
Ditch relief culverts (point)		Open / no deposition/ no scour	Partially blocked or blocked, scour at outlet	>25 percent of segment "at-risk"
Drainage dips / broad-based dips(point)		Open / no deposition/ no scour	Deposition, scour, erosion at outlet	>25 percent of segment "at-risk"
Overside drains (point)		Open / no deposition/ no scour	Blocked or scour at outlet	>25 percent of segment "at-risk"
Diffuse Drainage feature (outslope) linear		Equal distribution of runoff, no signs of erosion or concentrated flows.	Concentrated flowpaths on fill slopes, erosion present	>25 percent of segment "at-risk"
Non-engineered (user-created)		No signs of erosion.	Surface has erosion from concentrated flowpaths	>25 percent of segment "at-risk"

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2. Condition of Stream Crossing (point)		Open & Functional	Reduced capacity at inlet, development of terrace at inlet	>25 percent of segment "at-risk"
3. Road Subsurface Drainage (Pt or linear)		Intercepts subsurface flows with no adverse effect to vegetation & no ditch scour	Eroded ditch, evidence of vegetation change	>25 percent of segment "at-risk"
4.Diversion Potential at Crossings (point)		No diversion	Diversion potential present at stream crossing	>25 percent of segment "at-risk"
5. Road-stream Connectivity (point)				
Road connected to stream crossing		No flowpaths from road prism to stream	Direct flowpaths present from road surface or ditch to stream	>25 percent of segment "at-risk"
Road connected thru gully formation to stream		No signs of gully or sediment entering stream	Gullies present	>25 percent of segment "at-risk"
6. Road Surface Condition (linear)		No rilling/rutting	Rills and ruts prevalent	>25 percent of segment "at-risk"
7. Cutslope Condition (linear)		Vegetated/stable	Unvegetated and unstable	>25 percent of segment "at-risk"
8. Fillslope Condition (linear)		Vegetated/stable	Unvegetated and unstable	>25 percent of segment "at-risk"
Add together the numbers for 1-8 at the base of each column				
Select SWRCI for segment from criteria on back of sheet		Functional	At- Risk	Impaired

Comments:

Figure 9.2—Road assessment and monitoring form.

STEP 3				
Maintenance or Improvement Considerations				
Operational Maintenance Level (Level 1-5)				
Season of Use for road		Seasonal	Year long	
Traffic Level		High	Low	Closed
Design Storm (Circle dominant storm type for which road and structures are designed)	Snow	Short duration/high intensity	Rain	Rain on Snow
Dominant Soil Texture		Sandy loam	Silt Loam	Clay loam

If sediment transport is occurring what is the cause?

Inappropriate time of use of road with respect to soil and weather conditions.		
Inappropriate location/design of road.		
No maintenance of structures or road prism		
Inadequate drainage features		
Natural events (large storm event)		
Unknown		
Will sedimentation continue?	Yes	No
Are downstream beneficial uses at risk?	Yes	No

Site specific concern on road requiring immediate attention?

GPS location:
Photo numbers:
Describe problem:

056998

Additional comments

Definitions:
Functional: To operate in the proper or expected manner.
At-risk: The chance of damage to resources (water or soil quality) are present in the current condition.
Impaired: Not functioning as designed or maintained.

Rule set for determining an **overall at- risk condition rating** for the segment any of the following must be true:
1. Any road surface drainage is evaluated as at-risk.
2. Diversion potetial is identified at road stream crossings.
3. If road stream connectivity is present.
4. The combination of road stream connectivity and unvegetated or unstable cutslopes.
5. A road segment with ONLY an-at risk surface condition rating and no other indicators even if >25% is still at-risk.

Rule set for determining an **overall impaired condition rating** for the segment any of the following must be true:
1. A road segment with greater than 25% of the surface drainage structures at risk.
2. A road segment with greater than 25% of the stream crossing structures at risk.
3. A road segment with greater than 25% with at subsurface drainage at risk.
4. A road segment with greater than 25% of the crossings with diversion potential
5. A road segment with greater than 25% road stream connectivity.
6. A road segment with a combination of at-risk ratings for road surface drainage, diversion potential, road-stream connectivity, road surface conditon, and cutslope or fillslope condition.

Figure 9.2—Road assessment and monitoring form (cont'd).

Chapter 10

References and Additional Resources

Subsurface Water

1. *Water-Roads Field Guide* <http://www.fs.fed.us/eng/php/library_card.php?p_num=0077%201803P>.

Road Surface Drainage

1. *Riparian Restoration: Roads Field Guide* <http://www.fs.fed.us/eng/php/library_card.php?p_num=0577%201801P>.

Ditches

1. *Water Roads Interaction: Introduction to Surface Cross Drains* <http://www.fs.fed.us/eng/php/library_card.php?p_num=9877%201806P>.

Road-Stream Crossings

1. *Low-Water Crossings: Geomorphic, Biological and Engineering Design Considerations* <http://www.fs.fed.us/eng/php/library_card.php?p_num=0625%201808P>.
2. *Stream Simulation: An Ecological Approach to Providing Passage to Aquatic Organism at Road-stream Crossings.* <http://www.fs.fed.us/eng/php/library_card.php?p_num=0877%201801P>.
3. *Culvert Design for Aquatic Organism Passage, Hydraulic Engineering Circular No. 26. First Edition.* <http://www.fhwa.dot.gov/engineering/hydraulics/pubs/11008/hif1108.pdf>.

Fillslopes and Cutslopes

1. *Soil Bioengineering: An Alternative to Roadside Management* <http://www.fs.fed.us/eng/php/library_card.php?p_num=0077%201801>.
2. *Roadside Revegetation. An Integrated Approach To Establishing Native Plants* <http://www.wfl.fhwa.dot.gov/td/>.

Surface Aggregate

1. *Driving Surface Aggregate* <www.dirtandgravelroads.org>.
2. *Stabilization Selection Guide for Aggregate and Native-Surfaced Low-Volume Roads* <http://www.fs.fed.us/eng/php/library_card.php?p_num=0877%201805P>.

Road Assessment and Monitoring

1. *Soil and Water Road Condition Index – Field Guide* <http://www.fs.fed.us/eng/php/library_card.php?p_num=0877%201806P>.
2. *Soil and Water Road Condition Index – Desk Reference* <http://www.fs.fed.us/eng/php/library_card.php?p_num=0877%201807P>.

Photo Courtesty Sacramento-Yolo MVCD

Best Management Practices for Mosquito Control in California

Recommendations of the
California Department of Public Health
and the
Mosquito and Vector Control Association of California

MVC Association of California

July 2012

CDPH California Department of Public Health

BEST MANAGEMENT PRACTICES
FOR MOSQUITO CONTROL IN CALIFORNIA

An electronic version of this manual and the companion document "Best Management Practices for Mosquito Control on California State Properties" are available from the California West Nile virus website at http://www.westnile.ca.gov/resources.php. Please see Table 1, page 22, for a list of California mosquito control agencies or visit http://mvcac.org.

For more information, please contact:
Vector-Borne Disease Section
California Department of Public Health
vbds@cdph.ca.gov
(916) 552-9730
http://www.cdph.ca.gov
http://www.westnile.ca.gov

Purpose of this Manual

This manual provides landowners with Best Management Practices (BMPs) for mosquito control. The term BMP is used to describe actions landowners can take to reduce mosquito production from permanent water sources, reduce or eliminate mosquito production from temporary water sources, and reduce the potential for disease transmission to humans on their property.

General Recommendations

- **Implement universal BMPs**
  - Use personal protective measures
  - Eliminate unnecessary standing water

- **Identify and implement applicable mosquito control BMPs**
  - Reduce stagnation by providing water flow and manage vegetation in ponds or other water bodies.
  - Collaborate with local vector control agencies to develop and implement appropriate Integrated Pest Management (IPM) strategies that are most suitable for specific land-use type(s).

Use personal protective measures when potentially exposed to adult mosquitoes.

Eliminate unnecessary standing water, reduce stagnation by providing water flow, and manage vegetation in ponds or other water bodies.

Collaborate with local vector control agencies to coordinate activities on your property within a larger Integrated Pest Management mosquito control program.

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Executive Summary

The California Department of Public Health (CDPH) in collaboration with the Mosquito and Vector Control Association of California (MVCAC) developed this Best Management Practices (BMPs) plan to promote mosquito control on California properties, and enhance early detection of West Nile virus (WNV).

This plan describes mosquito control BMPs to be implemented by property owners and managers. These recommended practices, when properly implemented, can reduce mosquito populations through a variety of means including: 1) reducing or eliminating breeding sites, 2) increasing the efficacy of biological control, and 3) decrease the amount of pesticides applied while increasing the efficacy of chemical control measures. It is critical that property owners and managers communicate regularly with local vector control agencies regarding control practices on lands that are located within or near a local agency's jurisdiction. Local vector control agencies may have more specific policies regarding the implementation of BMPs and other control operations, which may include use of enforcement powers authorized by the California Health and Safety Code.

There are many different BMPs included in this document and they are intended to provide overall guidance to reduce mosquito production on properties throughout California, though not all mosquito sources and land uses will be addressed in this document. If it is deemed necessary, site-specific BMP plans may be developed in collaboration with CDPH and the respective local mosquito and vector control agency.

Effective mosquito-borne disease surveillance and mosquito control to protect public health are dependent upon factors that may fluctuate temporally and regionally. Such factors include mosquito and pathogen biology, environmental factors, land-use patterns, resource availability; strategies that incorporate BMPs are the most effective means by which mosquito control can be conducted and individualized to specific situations. Best management practices included in this plan emphasize the fundamentals of integrated pest management (IPM) which include:

1. Knowledge of mosquito species composition and corresponding mosquito behavior and habitat, for both immature and adult stages.

2. Detecting and monitoring WNV activity by testing mosquitoes, birds, sentinel chickens, horses, and humans. Identifying the mosquito species present, locations, densities, and disease potential.

3. Managing mosquito populations by source reduction, habitat modification, and biological control (e.g., introduced predators and parasites). Pesticides are used to target immature and, when indicated, adult stages of the mosquito. Mosquito control products are selected and applied in a manner that minimizes risks to human health, beneficial and non-target organisms, and the environment.

4. Educating the general public about reducing mosquito production and minimizing their risk of exposure to WNV.

RECOMMENDATIONS FOR PROPERTY OWNERS AND MANAGERS

- Use this plan to identify and implement appropriate Best Management Practices to control mosquitoes.
- Eliminate unnecessary standing water, reduce stagnation by providing water flow, and manage vegetation in ponds or other water bodies.
- Collaborate with local vector control agencies to develop and implement appropriate integrated pest management strategies that are most suitable for specific land-use type(s).
- Ensure individuals use personal protective measures when potentially exposed to adult mosquitoes.

Introduction

Controlling mosquitoes is critical to maintaining both a high quality of life and protecting people from mosquito-transmitted (vectored) diseases such as West Nile virus (WNV). In many parts of California, residents have voted to form local mosquito control programs or agencies. As a result, approximately half the land area and 85% of the population of California are within the boundaries of a mosquito control program. Landowners and land managers have a responsibility to minimize mosquito production on their lands and play a key role in reducing mosquito populations throughout the State, regardless whether their property is inside or outside the jurisdiction of a mosquito control program. Information about mosquito surveillance, mosquito-borne diseases, and mosquito control is available in Appendices A and B.

Best Management Practices (BMPs) are defined as actions landowners can take to reduce or eliminate mosquito production from water sources on their property in an environmentally and fiscally responsible manner, and to reduce the potential for transmission of disease from mosquitoes to humans.

Each property is unique, and the BMPs listed in this manual will apply to some properties, but not others. Landowners should implement universally applicable BMPs and after evaluating their own property, also employ the mosquito control BMPs that are applicable to their situation.

Landowner Responsibility

According to the California Health and Safety Code, landowners in California are legally responsible to abate (eliminate the source of) a public nuisance arising from their property, including mosquitoes [H&S Code Sections 2001 - 4(d); 2002; 2060 (b)]. In areas that are within the jurisdictional boundaries of a mosquito control program, landowners should work with staff to address mosquito problems, particularly in areas where irrigation is used for agricultural purposes. Landowners that are not within the jurisdictional boundary of an established mosquito control program should seek advice from the nearest mosquito control agency or health department. Landowners may also contact the California Department of Public Health (CDPH) or consult the CDPH West Nile virus website for additional information about mosquitoes and mosquito control. http://www.westnile.ca.gov/resources.php.

Mosquito control programs have substantial authority to access private property, inspect known or suspected sources of mosquitoes, abate the source of a mosquito problem, and charge the landowner for work performed and/or charge fees if a landowner is unwilling or unable to address a mosquito problem arising from their property [H&S Code sections 2060-2067, 100170, and 100175]. Applicable sections of the California Health and Safety Code are summarized in Appendix C.

Mosquito Biology

The more than 50 species of mosquitoes in California share one common life history trait: the mosquito life cycle requires standing water. Management of standing water is the key to most of the mosquito control BMPs presented in this manual and is one of the oldest and most cost effective forms of mosquito control.

Mosquito species are broadly separated into two groups according to where they lay eggs, floodwater mosquitoes and standing water mosquitoes. Adult female floodwater mosquitoes lay eggs on mud or previously submerged vegetation. The eggs may remain dormant for days, months, or even years until they are flooded, at which time larvae hatch. Standing water mosquitoes lay eggs on the water surface. The eggs float on the surface for a few hours to a few days until the larvae hatch into the water.

Floodwater mosquito larval development (breeding) sites include irrigated pastures, rice fields, seasonally flooded duck clubs and other managed wetlands, tidal wetlands, riparian corridors, and snowmelt pools. These intermittent or seasonally flooded habitats can be among the most productive sources of mosquitoes because they are often free of natural predators.

Standing water mosquito breeding sites include artificial containers, treeholes, catch basins, open ditches, retention/detention ponds, natural or constructed ponds and wetlands, stormwater management devices, and along the edges of flowing streams. Sources are found everywhere from highly urban areas to natural wetlands and often produce multiple generations of mosquitoes each season. In southern California, urban sources can produce some species of mosquitoes year round.

Landowners or land managers can identify the presence of immature mosquitoes in water on their property. Mosquito larvae breathe air from above the water surface and most hang at an angle from or lay parallel with the surface of the water while consuming small bits of organic matter. When disturbed, larvae swim down into the water column in a serpentine motion. Mosquitoes may live as larvae from a couple of days to more than a month depending on the species, water temperature, and the amount of food available.

Mosquitoes then go through a non-feeding stage called a pupa. During this stage the mosquito changes into the winged adult form. The easily identified comma-shaped pupae hang from the water surface and move down through the water column in a rolling or tumbling motion when disturbed. This life stage typically lasts about a day, with the mosquito emerging from the back of the pupal case (above the water) as a flying adult. (See Figure 1: Mosquito Life Cycle).

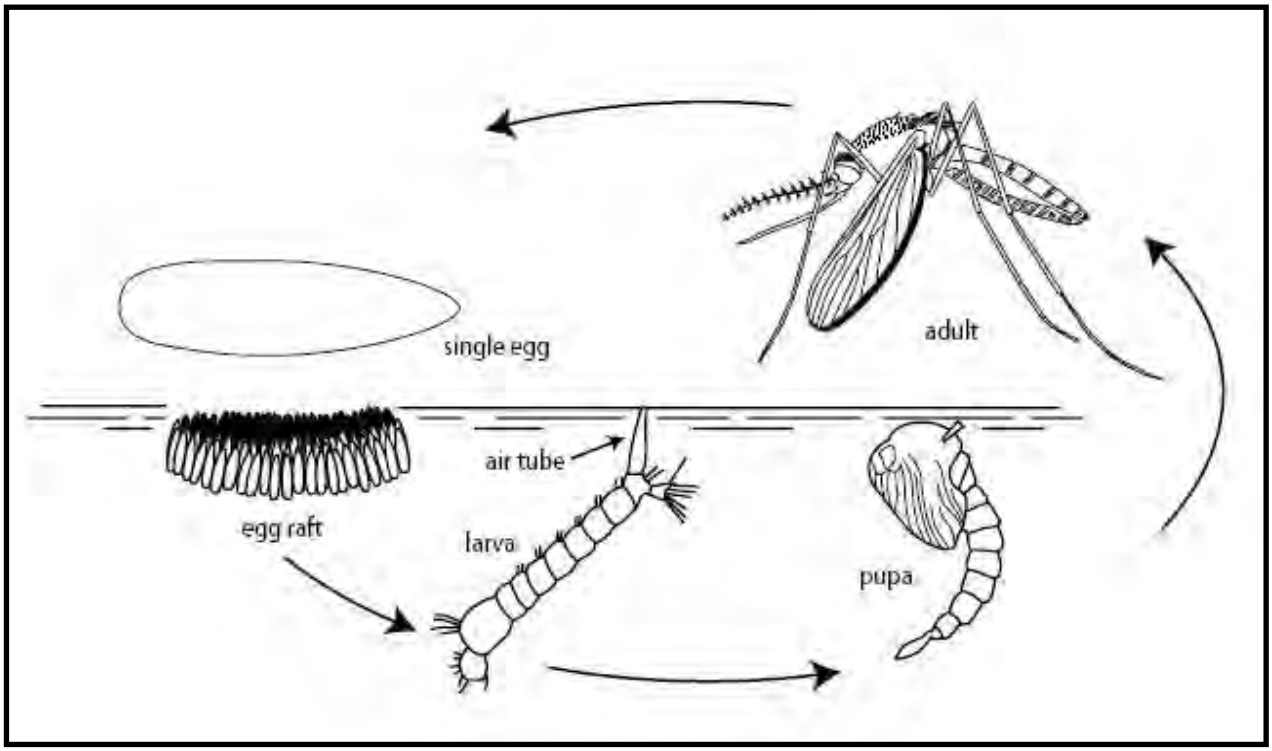

Figure 1. The life cycle of all mosquito species consists of four stages: egg, larva, pupa, and adult.

All adult mosquitoes feed on plant nectar; however blood is essential for female mosquitoes to produce eggs. To take a blood meal, the female's mouth parts pierce the skin, inject saliva, and suck blood out. It is through the injection of saliva that a mosquito causes the typical itchy bump and can infect a person or domestic animal with a disease causing organism. Depending on an individual's immune response, even a single bite can be a significant nuisance.

For more information on mosquito biology and key mosquito species found in California, please see Appendix D.

For additional information on the larval habitats of California mosquitoes, please see Appendix E.

Best Management Practices (BMPs)

Mosquito Control Best Management Practices At-A-Glance

- Eliminate artificial mosquito sources.
- Ensure man-made temporary sources of surface water drain within four days 96 hours) to prevent development of adult mosquitoes.
- Control plant growth in ponds, ditches, and shallow wetlands.
- Design facilities and water conveyance and/or holding structures to minimize the potential for producing mosquitoes.
- Use appropriate bio-rational products to control mosquito larvae.
- Use personal protective measures to prevent mosquito bites.

Each property is unique. Landowners should implement universally applicable mosquito control BMPs, and after evaluating their own property, also employ the mosquito control BMPs that are applicable to their property and circumstances. Using appropriate BMPs is an efficient and effective way to help prevent a mosquito problem.

Universally Applicable Mosquito Control BMPs

Eliminate Artificial Mosquito Breeding Sites and Harborage

- Examine outdoor areas and drain temporary and unnecessary water that may stand longer than 96 hours.
- Dispose of unwanted or unused artificial containers.
- Properly dispose of old tires.
- If possible, drill drainage holes, cover, or invert any container or object that holds standing water that must remain outdoors. Be sure to check for containers or trash in places that may be hard to see, such as under bushes or buildings.
- Clean clogged rain gutters and storm drains. Keep outdoor drains flowing freely and clear of leaves, vegetation, and other debris.
- Aerate ornamental ponds to avoid letting water stagnate.
- Change water in birdbaths, fountains, and animal troughs at least once per week.
- Ensure rain and/or irrigation water does not stand in plant containers, trash cans, boats, or other containers on commercial or residential properties.
- Regularly chlorinate swimming pools and keep pumps and filters operating. Unused or unwanted pools should be kept empty and dry, or buried.
- Maintain irrigation systems to avoid excess water use and runoff into storm drains.
- Minimize sites mosquitoes can use for refuge (harborage) by thinning branches, trimming and pruning ornamental shrubs and bushes, and keeping grass mowed short.

Use Personal Protective Measures

- Apply an EPA-registered mosquito repellent when outdoors; especially around dusk and dawn when mosquitoes are most active (see Appendix F for additional information on insect repellents).
- Wearing loose-fitting protective clothing including long sleeves and pant legs.
- Install and properly maintain fine mesh screens on windows and doors to prevent mosquito entry into homes.

Provide Mosquito Management Related Information to Property Managers

- Off-site landowners should provide property managers with basic information about mosquitoes and appropriate measures to minimize mosquito habitats.

Contact Local Mosquito Control Program

- Contact the local mosquito control program to evaluate your property for mosquito breeding sites and work cooperatively to prevent a mosquito problem on your property. A contact list for mosquito control programs is provided in Table 1.

Where local mosquito control programs do not exist, landowners may contact CDPH for assistance or consult the California West Nile virus website for additional information about mosquito control: http://www.westnile.ca.gov/resources.php

Mosquito Control BMPs for Residential and Landscaped Properties

Many residential and commercial properties have potential mosquito sources around buildings and grounds associated with excess or poorly managed irrigation, poor drainage, and miscellaneous landscape features. Mosquitoes can develop in the standing water associated with over-irrigation, irrigation breaks and/or runoff, clogged gutters, stormwater management structures, ornamental ponds, swimming pools, trash cans and flower pots, low areas or holes in turf where water collects and stands and low areas underneath pier and beam homes or buildings.

Mosquito sources can be minimized by taking precautions such as regular inspection and proper maintenance of irrigation systems and other water features, and elimination of unwanted standing water.

- Avoid over-irrigating to prevent excess pooling and runoff.
- Routinely inspect, maintain, and repair irrigation system components.

- All underground drain pipes should be laid to grade to avoid low areas that may hold water for longer than 96 hours.
- Back-fill tire ruts or other low areas that hold water for more than 96 hours.
- Improve drainage channels and grading to minimize potential for standing water.
- Keep drainage ditches free of excessive vegetation and debris to provide rapid drainage.
- Check and repair leaky outdoor faucets.
- Report any evidence of standing water to responsible maintenance personnel.
- Use waterfalls, fountains, aerators and/or mosquitofish in ponds and ornamental water features. Land owners must consult with the local mosquito control agencies or California Fish and Game regarding proper use of mosquitofish.
- Prevent mosquito breeding in rain barrels by properly screening all openings, preventing mosquito access to the stored water.
- For ponds and ornamental water features where mosquitofish cannot be used, landowners should use one of several readily available larval mosquito control products to treat water when they see immature mosquitoes.

Landowners should also review the stormwater runoff section of this manual because building rooftops, parking lots, etc. may have associated stormwater management features that produce mosquitoes.

Mosquito Control BMPs for Rural Properties

Mosquito breeding on rural properties is highly variable due to differences in location, terrain, and land use. This list is intended to provide general guidance, not site-specific requirements. BMPs that are most applicable and relevant to a specific mosquito source may be selected from the list and incorporated into the overall property management plan. Ideally, activities should be coordinated with those of a local mosquito control program.

Flood irrigation is a common practice in rural areas throughout California and always poses the potential for creating mosquito breeding sites. Mosquitoes commonly develop within irrigation infrastructure including in ditches clogged with vegetation, irrigation tail water areas and return sumps, blocked ditches or culverts, vegetated ditches; and leaking irrigation pipes, head gates, pumps, stand pipes, etc. The fields, orchards, and pastures being irrigated may also produce mosquitoes, particularly where natural undulation or poor grading create low lying areas where water collects and stands.

Recommendations for rural properties are based on “Mosquito Control Best Management Practices” produced by the Sacramento-Yolo Mosquito and Vector Control District, and from Lawler and Lanzaro (2005).

Mosquito Control BMPs for Ditches and Drains

- Construct or improve large ditches to a slope of at least 2:1 (vertical: horizontal) and a minimum 4 foot wide bottom. Consider a 3:1 slope or greater to discourage burrowing animal damage, potential seepage problems, and prevent unwanted vegetation growth.
- Keep ditches clean and well-maintained. Periodically remove accumulated sediment and vegetation. Maintain ditch grade and prevent areas of standing water.
- Design irrigation systems to use water efficiently and drain completely to avoid standing water.
- Prevent wet areas associated with seepage by repairing leaks in dams, ditches, and drains.

Mosquito Control BMPs for Irrigated Pastures and Cropland

- Grade to eliminate standing water from pastures and fields. Use Natural Resource Conservation Service (NRCS) guidelines: Laser leveling and periodic maintenance may be needed to allow proper drainage, efficient water flow, and reduce low-lying areas where standing water may accumulate.
- Reuse wastewater through return flow systems to effectively minimize mosquito production and conserve water. Eliminate and reuse excess water that may typically stagnate and collect at lower levels of irrigated fields.
- Irrigate only as frequently as is needed to maintain proper soil moisture. Check soil moisture regularly.
- Drain water as quickly as possible following irrigation. Check slopes may be used to direct water movement and drainage. Drainage ditches may be used to remove water from the lower end of the field.
- Install surface drains to remove excess water that collects at lower levels of irrigated fields.
- Inspect fields for drainage and broken checks to see whether re-leveling or reconstruction of levees is needed. Broken checks create cross-leakage that may provide habitat for mosquitoes.
- If possible, use closed conduits instead of open canals for water conveyance.
- Do not over fertilize. Over-fertilization can leach into irrigation run-off making mosquito production more likely in ditches or further downstream.
- When possible, use sprinklers or drip systems rather than flood irrigation.
- Keep animals off the pasture while the soil is soft. Mosquito habitat is created in irrigated pastures when water collects in hoof prints.

Mosquito Control BMPs for Rice Fields

Flooded rice fields can always support the development of mosquitoes. As the rice stand develops and grows denser, the production of mosquitoes tends to increase while the ability for chemical control agents to penetrate the canopy decreases. The BMPs

presented in this section attempt to balance the needs of the grower with the need to control mosquitoes.

In California there is a long-standing cooperative effort among the Rice Commission, individual growers, and mosquito control agencies to manage mosquitoes on rice lands. Close cooperation between growers and vector control is particularly important with organic rice producers. With severe limits on chemical control options and greater expense for organic-compatible larvicides, organic rice growers should implement as many mosquito control BMPs as possible.

- Wherever feasible, maintain stable water levels during mosquito season by ensuring constant flow of water into ponds or rice fields to reduce water fluctuation due to evaporation, transpiration, outflow, and seepage.
- Inspect and repair levees to minimize seepage.
- Drain and fill in borrow pits and seepage areas external to the fields.
- Wherever feasible, maintain at least 4” – 6” (10-15 cm) of water in the rice field after rice seedlings have begun to stand upright. Any drainage should be coordinated with local vector control (where possible). Restocking of mosquitofish or use of alternative mosquito control measures should be instituted as soon as possible when fields are re-flooded.
- Whenever feasible, remove vegetation on the outer-most portions of field levees and checks, specifically where they interface with standing water.
- Control algae and weed growth as effectively as possible.
- Communicate frequently with your local mosquito control program regarding your crop management activities.
- Wherever feasible, maintain borrow pits (12” – 18” deep) (30-45 cm) on both sides of each check throughout rice fields to provide refuge for mosquitofish during low water periods.
- If a pyrethroid pesticide is to be applied to the fields stocked with mosquitofish, contact your local mosquito control program for advice on minimizing fish mortality.
- If a pesticide is applied, fields should be inspected for mosquitofish afterward and if needed, fish should be restocked as soon as feasible.

Mosquito Control BMPs for Dairies and Animal Holding Operations

Frequently infrastructure associated with dairies, feedlots, or other animal holding facilities can produce mosquitoes. Watering troughs and irrigated fields associated with the operation can create mosquito problems. Animal washing areas may also create mosquito problems, particularly drains and ditches, sumps, ponds, and wastewater lagoons.

The following activities can reduce mosquito production and simplify control activities around dairies and animal holding operations:

- All holding ponds should be surrounded by lanes of adequate width to allow safe passage of mosquito control equipment. This includes keeping the lanes clear of any materials or equipment (e.g. trees, calf pens, hay stacks, silage, tires, equipment, etc.).
- If fencing is used around the holding ponds, it should be placed on the outside of the lanes with gates provided for vehicle access.
- Large ponds should be divided into a series of smaller ponds that can be drained for removal of solid waste material.
- Ponds and lagoons should be narrow enough to allow solid waste removal after drying.
- All interior banks of the holding ponds should have a grade of at least 2:1.
- If possible, an effective solids separation system should be utilized such as a mechanical separator or two or more solids separator ponds. If ponds are used, they should not exceed 60' (18m) in surface width.
- Drainage lines should never by-pass the separator ponds, except those that provide for normal corral run-off and do not contain solids.
- When possible, floating debris should be removed from ponds prior to crust formation.
- If a thick crust exists (grass growing on crust), it should be left intact until the pond can be drained and the solid material removed.
- Vegetation should be controlled regularly to prevent emergent vegetation and barriers to access. This includes access lanes, interior pond embankments, and any weed growth that might become established within the pond surface.
- Dairy wastewater discharge for irrigation purposes should be managed so it does not stand for more than 4 days.
- Tire sidewalls or other objects that will not hold water should be used to hold down tarps (e.g. on silage piles). Whole tires or other water-holding objects should be replaced.

Mosquito Control BMPs for Wetlands

Wetlands are an important source of mosquito production on public and privately owned lands. Under the California Wildlife Protection Act, the term "wetlands" is defined as any lands which may be covered periodically or permanently with shallow water, which

include freshwater and saltwater marshes, open or closed brackish water marshes, swamps, mudflats, fens, and vernal pools (Fish & Game Code Section 2785). Many wetlands are protected by federal and state laws.

By definition, “natural” wetlands are not intensely managed and options for implementing mosquito control BMPs in these areas are very limited. Even in managed wetlands, not all BMPs listed below may be suitable for use in all wetlands. It is the responsibility of the landowner to become informed on timing and extent of acceptable activities in a given wetland habitat. Intermittently or seasonally flooded wetlands can produce formidable numbers of mosquitoes, whereas well-managed semi-permanent and permanent wetlands usually produce fewer mosquitoes because of their limited acreage, stable water levels, and abundance of natural predators of mosquito larvae.

Information within this section has been partially adapted from Kwasny et al. (2004). Based on the site activities and potential for mosquito production, the existing BMPs may need to be modified or supplemented to address public health risk, goals and management strategy issues, and requirements of California Department of Fish and Game (DFG), the local mosquito and vector control program, and CDPH.

Due to the delicate and sometimes protected wetlands ecosystems, landowners, biologists, managers, and staff from mosquito control programs should collaborate to control mosquitoes. Source reduction and source maintenance can be combined with the judicious use of specific larvicides to minimize mosquito production from these wetlands.

General Mosquito Control BMPs for Wetlands

- Manage vegetation routinely; activities such as annual thinning of rushes and cattails and removing excess vegetative debris enables natural predators to hunt mosquito larvae more effectively in permanent wetlands. Vegetation in shallow, temporary wetlands can be mowed when dry.
- Time flooding of seasonal wetlands to reduce overlap with peak mosquito activity.
- Flood wetlands from permanent-water sources containing mosquito predators (e.g., mosquito-eating fish or invertebrate predators) to passively introduce mosquito predators. Permanent wetlands and brood ponds can be stocked with mosquitofish or native predatory species.
- Maintain permanent or semi-permanent water within the wetland to maintain populations of larval mosquito predators. Discourage the use of broad spectrum pesticides.
- Use fertilizers conservatively and manage irrigation drainage to prevent or minimize fertilizer and/or manure flowing into wetlands. Buffers between agriculture fields and wetlands should be established.
- Comply with all Federal and State Environmental Laws and the California Health and Safety Code to prevent environmental harm while reducing or eliminating mosquito production.

Mosquito Control BMPs for Design and Maintenance of Wetlands

- Provide reasonable access on existing roads and levees to allow for monitoring, abatement, and implementation of BMPs. Make shorelines of natural, agricultural, and constructed water bodies accessible for periodic maintenance, mosquito monitoring and abatement procedures, and removal of emergent vegetation.
- Construct, improve, or maintain ditches with 2:1 slopes and a minimum 4 foot (1.2 m) width at the bottom. Consider a 3:1 slope or greater to discourage burrowing animal damage, potential seepage problems, and prevent unwanted vegetation growth.
- Construct, improve, or maintain levees to quality standards that ensure stability and prevent unwanted seepage. Ideally build levees with >3:1 slopes and > 80% compaction; consider 5:1 slope or greater in areas prone to overland flooding and levee erosion.
- Provide adequate water control structures for complete draw-down and rapid flooding.
- When possible, include independent inlets and outlets in the design of each wetland unit.
- Construct or enhance swales so they are sloped from inlet to outlet and allow maximum draw-down.
- Excavate deep channels or basins to maintain permanent water areas (>2.5 feet deep) within a portion of seasonal managed wetlands. This provides year-round habitat for mosquito predators that can inoculate seasonal wetlands when they are irrigated or flooded.

Wetland Infrastructure Maintenance Mosquito Control BMPs

- Inspect levees at least annually and repair as needed.
- Periodically inspect, repair, and clean water control structures.
    - Remove all debris, including silt and vegetation, which can impede drainage and water flow.
    - Ensure water control structures are watertight to prevent unnecessary water flow or seepage.
- Regularly remove trash, silt and vegetation from water delivery ditches to allow efficient water delivery and drainage.
    - Remove problem vegetation that inhibits water flow using herbicides or periodic dredging.
    - If possible, use closed conduits instead of open canals for water conveyance.
- Periodically test and repair pumps used for wetland flooding to maximize pump output.

Water Management Mosquito Control BMPs for Seasonal Wetlands

- Timing of flooding
    - Delay or “phase” fall flooding of wetlands as long as possible in consultation with local vector control agencies. Fall flooding is known to produce large numbers of mosquitoes and/or those in close proximity to urban areas to minimize late season mosquito production.
    - Strategically locate wetlands identified for early flooding. Wetlands that are flooded in early fall should not be close to urban areas or historically produce great numbers of mosquitoes.
    - When possible, water in managed wetlands should be drawn-down in late March or early April.
    - Use a flood-drain-flood regime to control floodwater mosquitoes; flood to trigger hatching of dormant mosquito eggs, drain water and larvae into an area where they can be easily treated, drowned in moving water, or consumed by predators, and immediately re-flood wetland. This water management regime should be used only when it does not conflict with water quality regulations.
- Speed of flooding
    - Flood wetlands as quickly as possible to reduce the potential for large numbers of mosquitoes. Coordinate flooding with neighbors and/or the water district to maximize flood-up rate.
- Water source
    - Flood wetlands with water from permanent water sources containing mosquito predators (i.e., mosquito-eating fish or invertebrate predators) to passively introduce mosquito predators. Permanent wetlands and brood ponds used as flooding sources can be stocked with mosquito-eating fish or maintained to encourage natural predator populations.
    - Maintain a separate permanent water reservoir that conveys water to seasonal wetlands that provides year-round habitat for mosquito predators that can inoculate seasonal wetlands when they are irrigated or flooded.
- Frequency and duration of irrigation
    - When possible, reduce the number and duration of irrigations to minimize standing water. The need to irrigate should be evaluated based on spring habitat conditions and plant growth. If extended duration irrigation

(generally 14-21 days) is considered for weed control (e.g., cocklebur),
  - additional measures to offset the potential for increased mosquito production may be needed.
  - Irrigate managed wetlands before soil completely dries after spring draw-down to discourage floodwater mosquitoes from laying eggs in the dry, cracked substrate.
  - Drain irrigation water into ditches or other water sources with mosquito predators instead of nearby dry fields.
  - Maintain high ground water levels by keeping channels or deep swales permanently flooded for subsurface irrigation to reduce the amount of irrigation water needed during the mosquito season.
- Communicate with your local mosquito control agency (if there is one)
  - Advise your local mosquito control agency when you intend to flood so that they can make timely applications of larvicide if necessary.
- Emergency preparedness
  - Whenever feasible, have an emergency plan that provides for immediate drainage into acceptable areas if a mosquito-borne disease related public health emergency occurs.

Vegetation Management Mosquito Control BMPs

- Control floating vegetation conducive to mosquito production (i.e., water hyacinth, water primrose, parrot feather, duckweed, and filamentous algae mats).
- Perform routine maintenance to reduce problematic emergent plant densities to facilitate the ability of mosquito-eating fish to move through vegetated areas and allow good penetration of chemical control agents.
- Manage vegetation based on local land management objectives and associated habitat uses to minimize mosquito production. Methods of vegetation control for managed wetlands include mowing, burning, disking, and grazing.
- Manage the spread and density of invasive, non-native emergent wetland vegetation to increase native plant diversity, increase the mobility of larval mosquito predators, and allow for more efficient penetration of chemical control agents.

Additional Water Management BMPs for Permanent Wetlands

- Maintain stable water levels in wetlands that are flooded during summer and early spring to prevent intermittent flooding of shoreline areas favorable to mosquito production. Water level fluctuation can be minimized by continuing a constant flow of water into the wetland.
- Circulate water to avoid stagnation (e.g., provide a constant influx of water equal to the net loss or discharge of water).
- Maintain water depths as deep as possible (18” – 24” [45-60 cm] or more) during the initial flood-up to minimize shallow habitats preferred by mosquito larvae. Shallow water levels can be maintained outside of the mosquito breeding season.

Additional Mosquito Control BMPs for Saltwater Marsh

- Improving water flow through the wetland system minimizes stagnant water and facilitates movement of fish and other natural predators. For example, mosquitoes in coastal tidal wetlands can be managed by constructing and maintaining ditches that drain off the water when the tide falls.

Mosquito Control BMPs for Stormwater Management and Associated Infrastructure

Federal and state environmental regulations require mitigation of the harmful effects of runoff water from storms, irrigation or other sources prior to entering natural waterways from point and non-point sources. Mitigation may include water capture, slowing flow velocity, reducing volume, and removal of pollutants. The term “stormwater” is used as a generic term for runoff water, regardless of source.

Stormwater infrastructure typically includes conveyance systems (e.g. drain inlets, catch basins, pipes, and channels), storage and infiltration systems (e.g. flood control basins, percolation basins), and more recently, structural treatment devices designed and installed specifically to remove suspended and dissolved pollutants from runoff (e.g., vegetated swales, dry detention basins, ponds and constructed wetlands, media filtration devices, and trash capturing devices). The size and variability of stormwater infrastructure, inconsistent quantity and timing of water flows, and propensity to carry and accumulate sediment, trash, and debris, makes these systems highly conducive to holding areas of standing water ideal for production of mosquitoes. Identification of the potential mosquito sources (often belowground) found within stormwater infrastructure is often more difficult than the solutions needed to minimize mosquitoes. Some of the information within this section has been adapted from Metzger (2004).

General Stormwater Management Mosquito Control BMPs

- Manage sprinkler and irrigation systems to minimize runoff entering stormwater infrastructure.
- Avoid intentionally running water into stormwater systems by not washing sidewalks and driveways, washing cars on streets or driveways, etc.
- Inspect facilities weekly during warm weather for the presence of standing water or immature mosquitoes.
- Remove emergent vegetation and debris from gutters and channels that accumulate water.
- Consider mosquito production during the design, construction, and maintenance of stormwater infrastructure.
- Design and maintain systems to fully discharge captured water in 96 hours or less.
- Include access for maintenance in system design.

- Design systems with permanent water sources such as wetlands, ponds, sumps, and basins to minimize mosquito habitat and plan for routine larval mosquito inspection and control activities with the assistance of a local mosquito control program.

Stormwater Conveyance

- Provide proper grades along conveyance structures to ensure that water flows freely.
- Inspect on a routine basis to ensure the grade remains as designed and to remove accumulations of sediment, trash, and debris.
- Keep inlets free of accumulations of sediment, trash, and debris to prevent standing water from backing up on roadways and gutters.
- Design outfalls to prevent scour depressions that can hold standing water.

Stormwater Storage and Infiltration Systems (Aboveground)

- Design structures so that they do not hold standing water for more than 96 hours to prevent mosquito development. Features to prevent or reduce the possibility of clogged discharge orifices (e.g., debris screens) should be incorporated into the design. The use of weep holes is not recommended due to rapid clogging.
- Provide a uniform grade between the inlets and outlets to ensure that all water is discharged in 96 hours or less. Routine inspection and maintenance are crucial to ensuring the grade remains as designed.
- Avoid the use of electric pumps. They are subject to failure and often require permanent-water sumps. Structures that do not require pumping should be favored over those that have this requirement.
- Avoid the use of loose rock rip-rap that may hold standing water.
- Design distribution pumping and containment basins with adequate slopes to drain fully. The design slope should take into consideration buildup of sediment between maintenance periods.

Stormwater Structures with Permanent-Water Sumps or Basins (Belowground)

- Where possible, seal access holes (e.g., pickholes in manhole covers) to belowground structures designed to retain water in sumps or basins to minimize

entry of adult mosquitoes. If using covers or screens, maximum allowable gaps of 1/16 inch (2 mm) will exclude entry of adult mosquitoes. Inspect barriers frequently and replace when needed.

- If the sump or basin is completely sealed against mosquitoes, with the exception of the inlet and outlet, the inlet and outlet should be completely submerged to reduce the available surface area of water for mosquitoes to lay eggs (female mosquitoes can fly through pipes).
- Where possible, design belowground sumps with the equipment necessary to allow for easy dewatering of the unit.
- Contact the local mosquito control program for advice with problem systems.

Stormwater Treatment Ponds and Constructed Treatment Wetlands

- Whenever possible, stock stormwater ponds and constructed wetlands with mosquito-eating fish available from local mosquito control programs.
- Design and maintain accessible shorelines to allow for periodic maintenance and/or control of emergent and shoreline vegetation, and routine monitoring and control of mosquitoes. Emergent plant density should be routinely managed so mosquito predators can move throughout the vegetated areas and are not excluded from pond edges.
- Whenever possible, design and maintain deep zones in excess of four feet (1.2 m) to limit the spread of invasive emergent vegetation such as cattails. The edges below the water surface should be as steep as practicable and uniform to discourage dense plant growth that may provide immature mosquitoes with refuge from predators and increased nutrient availability.
- Use concrete or liners in shallow areas to discourage plant growth where vegetation is not necessary.
- Whenever possible, provide a means for easy dewatering if needed.
- Manage the spread and density of floating and submerged vegetation that encourages mosquito production (i.e., water hyacinth, water primrose, parrot's feather, duckweed, and filamentous algal mats).
- If possible, compartmentalize managed treatment wetlands so the maximum width of ponds does not exceed two times the effective distance (40 feet [12 m]) of land-based application technologies for mosquito control agents.

General Access Requirements for Stormwater Treatment Structures

- All structures should be easily and safely accessible, without the need for special requirements (e.g., Occupational Safety and Health Administration - OSHA - requirements for "confined space"). This will allow for monitoring and, if necessary, abatement of mosquitoes.
- If utilizing covers, the design should include spring-loaded or lightweight access hatches that can be easily opened.
- Provide all-weather road access (with provisions for turning a full-size work vehicle) along at least one side of large aboveground structures that are less

than seven meters wide, or both sides if shore-to-shore distance is greater than seven meters. *Note:* Mosquito larvicides are applied with hand held equipment at small sites and with backpack or truck mounted high-pressure sprayers at large sites. The effective swath width of most backpack or truck-mounted larvicide sprayers is approximately 20-25 feet (6-7meters) on a windless day.
- Build access roads as close to the shoreline as possible to allow for maintenance and vector control crews to periodically maintain, control and remove emergent vegetation and conduct routine mosquito monitoring and abatement. Remove vegetation and/or other obstacles between the access road and the structure that might obstruct the path of larvicides to the water.
- Control vegetation (by removal, thinning, or mowing) periodically to prevent barriers to access.

Mosquito Control BMPs for Right of Ways and Easements

Right of ways and easements for a variety of infrastructure exist throughout California. Roadways, power lines, pipelines, canals, bike paths, utility access, railroads, etc. have lands associated with them that may produce mosquitoes. It is the responsibility of the company or individual associated with the infrastructure to prevent a public nuisance arising from the property, including a mosquito problem. The lands are as varied as the terrain in California, but the mosquito breeding sites found on these properties will be similar to those found in other sections of this manual.

Inspection of Property and Identification of Mosquito Sources

- Inspect property for standing water or evidence of standing water that may become mosquito sources.

Review and Implement Mosquito Control BMPs as Appropriate

Some rights of way and easements are very long and may have multiple types of mosquito breeding sites that fall within every category listed below, others will have none. After inspecting the property, implement mosquito control BMPs found in the sections below.

- If the property is in an urban area and is managed as commercial property, please refer to the following section:
  - *Residential and landscaped properties*, see page 5.

- If the property is associated with an irrigation canal or similar rural water conveyance, please refer to the following sections:
  - *Rural properties*, see page 6.
  - *Wetlands*, see page 9.

- If the property is associated with a variety of habitats like a railroad or pipeline

right of way, please refer to the following sections:
  - *Rural* properties, see page 6.
  - *Wetlands*, see page 9.

- If the property is associated with a roadway or other structure that would require management of runoff water, please refer to the following section:
  - *Stormwater management* (associated BMPs), see page 14.

In many instances, right of ways and easements will simply fall to the local mosquito and vector control program or go completely unmanaged because they are very large and it is not possible to determine the responsible party.

Mosquito Control BMPs for Wastewater Treatment Facilities

Wastewater treatment facilities are designed to collect, treat, and release nutrient rich highly organic water. These facilities implement practices appropriate to removing contaminants from wastewater, but which may be in direct conflict with BMPs intended to prevent development of mosquito larvae. Further, managers are under intense pressure to meet water quality standards in effluent water and are frequently concerned that mosquito control BMPs will jeopardize compliance with effluent standards.

Wastewater facilities often include features that can produce mosquitoes. Examples include 1) a series of treatment or evaporation ponds, 2) the use of tules or other emergent vegetation to remove contaminants, 3) aerated and non-aerated ponds with emergent vegetation around the edges or throughout, 4) cracks and openings in crusted waste matter on the surface of treatment ponds, and 5) abandoned or unused pond basins that frequently hold shallow water. Certain activities may also create or enhance mosquito habitat including 1) allowing evaporation of wastewater from treatment ponds for maintenance or as a standard treatment method, 2) release of wastewater into marshes or floodplains for evaporation or infiltration, and 3) distribution of sludge onto irrigated agricultural lands.

For mosquito control around buildings and grounds, consult the *residential and landscape* section of this document. Similarly, many BMPs included in the *wetlands and dairy* sections of this document are pertinent to wastewater management facilities, particularly those sections related to construction and management of treatment ponds and wetlands and the use and distribution of wastewater or sludge onto agricultural lands. For mosquito control related to wastewater collection, conveyance, and distribution consult the *stormwater management* section of this manual.

- Monitor all treatment ponds for mosquito larvae – particularly in areas of emergent vegetation.
- Remove emergent vegetation from edges of aerated ponds.
- Immediately incorporate sludge into soil through plowing or disking.
- Insure all water distributed onto evaporation ponds dries completely in less than 96 hours.

- Check abandoned ponds or tanks weekly to ensure they are completely dry.
- Use mechanical agitation to prevent the formation of any crust on treatment ponds or tanks.
- Work closely with a local vector control program. If there is no local vector control agency, consult the closest vector control program, the local public health officer, or CDPH to prevent or abate a mosquito problem from the facility.

Mosquito Control BMPs for Wildlands – Undeveloped Areas

California encompasses about 100 million acres (40 million hectares) of land. Approximately 75 million acres (30 million hectares) are classified as wildlands, which include all undeveloped and non-cultivated property in the state. In many cases the properties are remote and mosquito control is neither feasible nor warranted. However, if you own a property that is near a town or are aware of a mosquito problem at the property, you may wish to contact the closest vector control program or CDPH to determine what if anything can be done to alleviate the problem.

Mosquito Control BMPs that May be Applicable to Wildlands

- Conduct routine mosquito surveillance by looking for immature mosquitoes in the water. Apply EPA-registered products (typically containing Bti, Bs, or methoprene) to control mosquito larvae.
- Evaluate reports of mosquito annoyance from visitors or the public, and if possible work with a local mosquito control program to be notified if there is an adult mosquito problem on or near your property.
- After a rainfall, pay particular attention to temporary water sources and ponds that rise. Treat sources with mosquito control products if needed.
- Stock ornamental ponds and other water features with mosquitofish available from local mosquito control programs. However, their use is restricted in natural bodies of water or in water features that drain into natural bodies of water. Land managers must consult with the local mosquito control agencies regarding proper use of mosquitofish or other available biological control agents.
  Work closely with a local mosquito control program to accurately identify, map, and monitor areas that may produce mosquitoes; and tailor control measures for each site, contingent on the species of mosquitoes that are present.
- Implement personal protective measures
  - Provide visitors and guests with information regarding the risk of mosquito-borne disease transmission and personal protective measures.
  - Install and maintain tight-fitting window and door screens on buildings.
  - If possible, minimize outdoor activities at dawn and dusk when mosquitoes are the most active.
  - Wear protective clothing such as long-sleeved shirts and long pants when going into mosquito-infested areas.
  - Use mosquito repellent when necessary, carefully following the directions on the label.

Evaluation of the Efficacy of BMPs

Landowners can easily evaluate the efficacy of the mosquito control BMPs they have implemented. You can do a simple evaluation as follows:

- Immature mosquitoes: Look for immature mosquitoes in standing water on your property – if the number is decreasing noticeably or immature mosquitoes can not be found, the BMPs you have implemented are working.
- Adult mosquitoes: Simply be aware of the level of mosquito annoyance you experience and ask guests or employees about their experience with regard to mosquitoes. People become accustomed to a certain level of mosquito activity and commonly notice increases or decreases in that level. If the annoyance level is increasing, you have more work to do; if the number is decreasing or mosquitoes are not noticeable – good job! The BMPs you have implemented are working.

The best way to evaluate the effectiveness of BMPs is through a comprehensive surveillance program of larval dipping and adult mosquito trapping, including species identification. Some important strengths of local mosquito control programs are their ability to evaluate treatment options, estimate treatment costs, recommend and implement those BMPs most appropriate for a property. Local mosquito abatement programs also are familiar with indigenous mosquito species and therefore know the type of habitat those mosquitoes come from, often monitor adult populations, and can identify if there is a mosquito problem in a particular area. Landowners can make substantial progress in solving mosquito problems on their own, but if possible, they should work closely with a local mosquito control program to implement and evaluate mosquito control BMPs.

Vector Control Service Coverage in California

CDPH disclaims any warranty or warranty for fitness of use for a particular purpose, expressed or implied, with respect to this data.CDPH disclaims any responsibility for the accuracy or completeness of this data. The mapped data does not constitute a legal survey.

CDPH-VBDS
NAD83 California Teale All
last update: March 2012

Table 1: Mosquito Control Agencies in California

COUNTY	AGENCY	WEBSITE or ADDRESS	TELEPHONE
ALAMEDA	ALAMEDA CO MAD	http://www.mosquitoes.org	(510) 783-7744
ALAMEDA	ALAMEDA CO VCSD	http://www.acvcsd.org	(510) 567-6800
AMADOR	AMADOR CO ENV HEALTH DEPT	http://www.co.amador.ca.us/index.aspx?page=385	(209) 223-6487
BUTTE	BUTTE CO MVCD	http://www.bcmvcd.com/	(530) 533-6038
BUTTE	DURHAM MAD	PO Box 386, Durham, CA 95938	(530) 345-2875
BUTTE	OROVILLE MAD	PO Box 940, Oroville, CA 95965	(530) 534-8383
CALAVERAS	SADDLE CREEK CSD	http://www.saddlecreekcsd.org	(209) 785-0100
COLUSA	COLUSA MAD	PO Box 208, Colusa, CA 95932	(530) 458-4966
CONTRA COSTA	CONTRA COSTA MVCD	http://www.contracostamosquito.com/	(925) 771-6100
EL DORADO	CO OF EL DORADO CO ENV. MGT. DEPT.	http://www.edcgov.us/VectorControl/	(530) 573-3450
FRESNO	COALINGA-HURON MAD	P. O. Box 278, Coalinga, CA 93210	(559) 935-1907
FRESNO	FRESNO MVCD	http://www.fresnomosquito.org	(559) 268-6565
FRESNO	FRESNO WESTSIDE MAD	PO Box 125, Firebaugh, CA 93622	(559) 659-2437
FRESNO / KINGS	CONSOLIDATED MAD	http://www.mosquitobuzz.net	(559) 896-1085
GLENN	GLENN CO MVCD	165 County Rd. G, Willows, CA 95988	(530) 934-4025
IMPERIAL	IMPERIAL CO VCP	http://www.icphd.org/sub.php?menu_id=307	(760) 336-8530
INYO	INYO COUNTY DEPT OF AG OWENS VALLEY MAP	http://www.inyomonoagriculture.com/ovmap.html	(760) 873-7853
KERN	DELANO MAD	PO Box 220, Delano, CA 93216	(661) 725-3114
KERN	KERN MVCD	4705 Allen Road, Bakersfield, CA 93314	(661) 589-2744
KERN	SOUTH FORK MAD	P. O. Box 750, Kernville, CA 93238	(760) 376-4268

COUNTY	AGENCY	WEBSITE or ADDRESS	TELEPHONE
KERN	WEST SIDE MVCD	PO Box 205, Taft, CA 93268	(661) 763-3510
KINGS	KINGS MAD	PO Box 907, Hanford, CA 93232	(559) 584-3326
LAKE	LAKE CO VCD	http://www.lcvcd.org	(707) 263-4770
LOS ANGELES	ANTELOPE VALLEY MVCD	http://www.avmosquito.org	(661) 942-2917
LOS ANGELES	COMPTON CREEK MAD	1224 S. Santa Fe Avenue, Compton, CA 90221	(310) 933-5321
LOS ANGELES	GREATER LOS ANGELES CO VCD	http://glacvcd.org	(562) 758-6501
LOS ANGELES	LONG BEACH CITY DHHS	http://www.longbeach.gov/health/eh/vector/	(562) 570-4170
LOS ANGELES	LOS ANGELES CO DHS, VMP	http://www.lapublichealth.org/eh/SSE/Vector_Management/vecman.htm	(626) 430-5450
LOS ANGELES	LOS ANGELES CO WEST VCD	http://www.lawestvector.org	(310) 915-7370
LOS ANGELES	PASADENA CITY HD	http://www.cityofpasadena.net/publichealth/environmental_health_sevices/	(626) 744-6062
LOS ANGELES	SAN GABRIEL VALLEY MVCD	http://www.sgvmosquito.org	(626) 814-9466
MADERA	MADERA CO MVCD	http://maderamosq.org/	(559) 674-6729
MARIN / SONOMA	MARIN / SONOMA MVCD	http://www.msmosquito.com/	(707) 285-2204
MERCED	MERCED CO MAD	http://mcmosquito.org/	(209) 722-1527
MODOC	CA PINES CSD	HCR Box 43002, Alturas, CA 96101	(530) 233-2766
MODOC	CITY OF ALTURAS	http://www.cityofalturas.org	(530) 223-2377
MONO	JUNE LAKE PUD	P. O. Box 99, June Lake, CA 93529	(760) 648-7778
MONO	MAMMOTH LAKES MAD	PO Box 1943, Mammoth Lakes, CA 93546	(760) 924-8240
MONTEREY	NORTHERN SALINAS VALLEY MAD	http://www.montereycountymosquito.com/Site/Welcome.html	(831) 422-6438
NAPA	NAPA CO MAD	http://www.napamosquito.org	(707) 553-9610
NEVADA	NEVADA COUNTY COMMUNITY DEVELOPMENT AGENCY	http://www.mynevadacounty.com/nc/cda/eh/Pages/West-Nile-virus-Information.aspx	(530) 265-1500
ORANGE	ORANGE CO VCD	http://www.ocvcd.org	(714) 740-4150

COUNTY	AGENCY	WEBSITE or ADDRESS	TELEPHONE
PLACER	PLACER MVCD	http://www.placermosquito.org	(916) 380-5444
RIVERSIDE	BLYTHE CITY PWD	http://www.cityofblythe.ca.gov/index.aspx?NID=108	(760) 922-6611
RIVERSIDE	COACHELLA VALLEY MVCD	http://www.cvmvcd.org	(760) 342-8287
RIVERSIDE	NORTHWEST MVCD	http://www.northwestmosquitovector.org/Northwest_MVCD/Home.html	(951) 340-9792
RIVERSIDE	RIVERSIDE CITY PWD	http://www.riversideca.gov/pworks/vector-control.asp	(909) 351-6127
RIVERSIDE	RIVERSIDE CO DEH, VCP	http://www.rivcoeh.org/opencms/rivcoeh/ProgServices/Food_Program/Vector.html	(909) 358-5172
SACRAMENTO / YOLO	SACRAMENTO-YOLO MVCD	http://www.fightthebite.net	(916) 685-1022
SAN BERNARDINO	SAN BERNARDINO CO VCP	http://www.sbcounty.gov/ehlus/Depts/VectorControl/mosquito_and_vector_control_home.aspx	(909) 387-4688
SAN BERNARDINO	WEST VALLEY MVCD	http://www.wvmosquito.org	(909) 635-0307
SAN DIEGO	SAN DIEGO CO DEH, VSC	http://www.sdcounty.ca.gov/deh/pests/vector_disease.html	(858) 694-2888
SAN FRANCISCO	SAN FRANCISCO DPH	http://www.sfdph.org/dph/EH/Vector/default.asp	(415) 252-3988
SAN JOAQUIN	SAN JOAQUIN CO MVCD	http://sjmosquito.org	(209) 982-4675
SAN MATEO	SAN MATEO CO MVCD	http://www.smcmad.org	(650) 344-8592
SAN MATEO	SOUTH BAYSIDE SYSTEM AUTHORITY	http://www.sbsa.org/	(650) 594-8411
SANTA BARBARA	SANTA BARBARA COASTAL VCD	http://www.sbcvcd.org	(805) 969-5050
SANTA CLARA	SANTA CLARA CO VCD	http://www.sccgov.org/portal/site/vector	(408) 918-4770
SANTA CRUZ	SANTA CRUZ CO MVCD	http://www.agdept.com/mvc.html	(831) 454-2590
SHASTA	BURNEY BASIN MAD	PO Box 1049, Burney, CA 96013	(530) 335-2133
SHASTA	PINE GROVE MAD	PO Box 328, MacArthur, CA 96056	(530) 336-5740
SHASTA	SHASTA MVCD	http://www.shastamosquito.org/	(530) 365-3768
SOLANO	SOLANO CO MAD	http://www.solanomosquito.com	(707) 437-1116

COUNTY	AGENCY	WEBSITE or ADDRESS	TELEPHONE
STANISLAUS	EAST SIDE MAD	http://www.eastsidemosquito.com	(209) 522-4098
STANISLAUS	TURLOCK MAD	http://mosquitoturlock.com	(209) 634-8331
STATEWIDE	CALIFORNIA DEPARTMENT OF PUBLIC HEALTH VECTOR-BORNE DISEASE SECTION	http://www.westnile.ca.gov/	(916) 552-9730
SUTTER / YUBA	SUTTER-YUBA MVCD	http://www.sutter-yubamvcd.org/	(530) 674-5456
TEHEMA	TEHAMA CO MVCD	PO Box 1005, Red Bluff, CA 96080	(530) 527-1676
TULARE	DELTA VCD	http://www.deltavcd.com	(559) 732-8606
TULARE	TULARE MAD	6575 Dale Fry Road, Tulare, CA 93274	(559) 686-6628
VENTURA	MOORPARK CITY VCD	http://ci.moorpark.ca.us/cgi-bin/htmlos.exe/03565.1.14766059450000012944	(805) 517-6248
VENTURA	VENTURA CO EHD	http://www.ventura.org/rma/envhealth/technical-services/vector/index.html	(805) 654-2818

Appendix A
Mosquito Control and Arbovirus Surveillance

Mosquito Control Practices

Mosquito control agencies and private landowners in California work cooperatively to implement an integrated pest management (IPM) approach to mosquito control. Source reduction (eliminating the places where mosquito larvae hatch and develop) is the most effective way of preventing adult mosquitoes; however, it may be possible to eliminate mosquito production from a source through other modifications of habitat and/or water management. Biological control agents, including native or introduced predators, are often utilized in combination with water management practices. Pesticides are an important part of an IPM program and mosquito specific larval control pesticides are often used to supplement other source reduction activities. When source reduction and larval control have not adequately reduced the mosquito population, the application of pesticides to control adult mosquitoes may be necessary. Personnel working for vector control agencies who apply pesticides in California are certified by California Department of Public Health (CDPH) after demonstrating the knowledge necessary to control mosquitoes safely and effectively using IPM techniques.

Larval Control

Larval control is the foundation of most mosquito control programs in California. Whereas adult mosquitoes are widespread in the environment, larvae must have water to develop; control efforts therefore can be focused on aquatic habitats. Minimizing the number of adults that emerge is crucial to reducing the incidence and risk of disease. The three key components of larval control are environmental management, biological control, and chemical control.

Environmental Management

Manipulating or eliminating potential mosquito breeding sources can provide dramatic reductions in mosquito populations. There are three levels of environmental management.

1. Source elimination: This approach completely eliminates potential habitats for mosquitoes. This strategy is generally limited to artificial habitats created by urbanization. Examples of source elimination include emptying or turning over containers holding water, filling in holes containing water with sand or gravel, cleaning drainage ditches of debris, and covering or inverting structures and vessels that could hold water.

2. Source reduction: This strategy aims to alter and sometimes eliminate available habitat for larvae which substantially reduces mosquito breeding and the need for

repeatedly applying pesticides. Unlike source elimination, standing water may exist but the total amount of water, or the time the water is left standing, is greatly reduced. Source reduction may require some maintenance (see below) to prevent further mosquito breeding. Examples of source reduction include limiting the growth of emergent vegetation in wetlands and ponds, constructing drainage ditches to remove water from areas prone to flooding, and clearing stormwater channels of silt and debris. Routine larval monitoring can indicate whether these efforts are effective or need further action.

3. Source maintenance: When eliminating or significantly altering mosquito breeding sources is prohibited and/or inappropriate, reducing the number of sheltered, predator-free habitats while having minimal impact on the surrounding environment can make an area unsuitable for mosquitoes. Source maintenance can include water management, vegetation management, wetland infrastructure maintenance, and wetland restoration. Strategic, focused plans must be developed for each site.

Biological Control

Biological control uses predators, parasites, or pathogens to reduce populations of mosquito larvae and is often combined with environmental management to enhance results. The mosquitofish (*Gambusia affinis)* has been used to control mosquitoes in California since 1921 and is the most widely used biological control agent in the world. These small fish are effective against mosquito larvae because they grow and reproduce rapidly, feed at the water surface where mosquito larvae are found, and tolerate a wide range of temperature and water quality.

Other fish are occasionally used with mixed success. Fish are most effective in permanent ponds and wetlands, but are also used in rice fields and stormwater canals with permanent water. Many local mosquito control agencies propagate mosquito-eating fish.

Although many other animals have been tested for mosquito control, and in natural wetlands predation is an important factor in reducing mosquito production, biological control by the intentional addition of mosquito predators other than mosquitofish is largely experimental rather than operational.

Chemical Control

Pesticides that control mosquito larvae are called larvicides. Four types of larvicides (bio-rational, surface films, growth regulators, and chemical products) encompassing seven active ingredients are registered for use in California. Larvicides are applied by hand, from hand-held or vehicle-mounted engine-driven blowers, or by aircraft, depending on the product, the formulation, and the target habitat. Applicators of any of these products must be certified by the CDPH or an appropriate regulatory authority.

1. Bio-rational products

Bio-rational products exploit insecticidal toxins found in certain naturally occurring bacteria. These bacteria are cultured in mass and packaged in various formulations. The bacteria must be ingested by mosquito larvae so the toxin is released. Therefore bio-rational products are only effective against larvae since pupae do not feed. The bacteria used to control mosquito larvae have no significant effects on non-target organisms when applied for mosquito control in accordance with product labels.

Two products that are used against mosquito larvae singly or in combination are *Bacillus thuringiensis israelensis* (Bti) and *Bacillus sphaericus* (Bs). Manufactured Bti contains dead bacteria and remains effective in the water for 24 to 48 hours; some slow release formulations provide longer control. In contrast, Bs products contain spores that in favorable conditions remain effective for more than 30 days. Both products are safe enough to be used in water that is consumed by humans.

Another bio-rational product available for mosquito control is derived from the soil bacterium *Saccharopolyspora spinosa,* which produces natural metabolites called spinosyns during fermentation. These metabolites are lethal to mosquito larvae when ingested or by contact. The most active metabolites are formulated into a product called “spinosad”. The product affects the central nervous system of the mosquito causing uncontrolled nervous impulses, ultimately killing the larvae.

2. Surface agents

Mosquito larvae and pupae breathe through tubes called “siphons” that extend above the water surface. Surface agents such as highly refined mineral oils or monomolecular films (alcohol derivatives) can spread across the surface of the water to prevent mosquitoes from breathing. Depending on the product, the film may remain on the water’s surface from a few hours to a few days. Surface films are the only available products that are effective against very late stage larvae and pupae.

3. Insect growth regulators

Insect growth regulators (IGRs) disrupt the physiological development of larvae thus preventing adults from emerging. The two products currently used for controlling mosquito larvae are methoprene and diflubenzuron.

The effective life of these products varies with the formulation. Methoprene can be applied in granular, liquid, pellet, or briquette formulation. Methoprene has minimal non-target effects and no use restrictions. Diflubenzuron is rarely used in California because it may affect growth of non-target aquatic invertebrates. IGRs for mosquito control can be used in sources of water that are consumed by humans.

4. Chemical larvicides

Chemical pesticides are rarely used to control mosquito larvae. Organophosphate larvicides are used infrequently because of their potential non-target effects and label restrictions. The organophosphate pesticides temephos and malathion are registered for use as larvicides in California. However, malathion is currently used exclusively for adult mosquito control in the state. Temephos can be safely and effectively used to treat temporary water or highly polluted water where there are few non-target organisms and/or livestock are not allowed access. The efficacy of temephos may be up to 30 days depending on the formulation.

Adult Control

IPM mosquito control programs initiate adult mosquito control when action levels or thresholds are reached or exceeded. Thresholds are based on local sampling of the adult mosquito population and/or when the risk of mosquito-borne disease increases above levels established by a local agency, often following guidelines established in the California Mosquito-borne Virus Surveillance and Response Plan. Thresholds are an integral component of mosquito control because they provide a range of predetermined actions based on quantified data. Thresholds also establish expectations and boundaries for responses that ensure appropriate mosquito control activities are implemented at the appropriate time. The threshold for adult mosquito control depends on several factors including:

- How local citizens tolerate nuisance mosquitoes by evaluating public service requests.
- Overall mosquito abundance.
- Presence of mosquito-borne disease in the region.
- Abundance of mosquito species that are vectors of disease.
- Local acceptance of adult mosquito control activities.
- Climate data.

Adult mosquitoes can only be controlled with adulticides. Many mosquito control programs in California include adulticiding as an integral component of their IPM program. Adulticiding falls into two categories – barrier applications and ultra-low volume (ULV) applications. Barrier applications target resting mosquitoes by applying pesticides to vegetation and structures. Barrier applications typically cover relatively small areas and are applied to alleviate specific problems rather than an area wide adult mosquito problem.

ULV applications are used to control adult mosquitoes over large areas. An “ultra-low volume” (typically less than 2 oz / acre [140 ml / ha] total volume) of tiny oil or water droplets carrying an insecticide are emitted from specialized equipment mounted to trucks or aircraft. The droplets kill adult mosquitoes on contact. ULV applications are made after sunset or before sunrise to coincide with the time that mosquitoes are most

active, when non-target insects are least active, and when temperature inversions are most likely to occur. These applications are employed when mosquito populations must be reduced immediately to halt disease transmission. Multiple applications in a particular area may be utilized when the objective is to kill a high enough proportion of older adult mosquitoes to break a disease transmission cycle.

Adverse effects from ULV applications are rare; however, people with health problems should be aware when and where the applications are being conducted. This information can be obtained by contacting the local vector control agency. Chemicals currently registered for ULV applications against mosquitoes in California (as of June, 2010) include organophosphates (e.g., malathion and naled), pyrethrins, (e.g., pyrethrum) and pyrethroids (e.g., resmethrin, sumithrin, permethrin, and etofenprox). With the exception of the active ingredient etofenprox, formulations of both pyrethrins and pyrethroids include the synergist piperonyl butoxide (PBO), which increases their activity against mosquitoes.

1. Organophosphates

   Malathion and naled are neurotoxins that act by blocking the enzyme cholinesterase, inhibiting neurologic transmission. Malathion or naled may be used as rotational products with pyrethroid insecticides to help prevent development of pesticide resistance.

2. Pyrethrins

   Pyrethrins and pyrethroids are neurotoxins that act by causing uncontrolled firing of neurons. Pyrethrum is a natural insecticide derived from chrysanthemum flowers. Adult mosquitoes are rapidly paralyzed and killed on contact. Pyrethrins are degraded rapidly by sunlight and chemical processes. Residual pyrethrins from ULV applications typically remain less than one day on plants, soil, and water.

3. Pyrethroids

   Pyrethroids are manufactured pyrethrins. They have very low toxicity to birds and mammals but are toxic to fish if misapplied.

Compounds currently approved for larval and adult mosquito control in California are listed in Appendix B.

Mosquito Surveillance

Mosquito and Mosquito-Borne Disease Monitoring

Monitoring mosquito populations and mosquito-borne disease levels provides the necessary data to make informed management decisions.

The application of any pesticide to control mosquitoes in an IPM program is done after establishing the need to do so through mosquito population monitoring (surveillance).

Larval mosquito surveillance is the process of identifying and checking likely larval developmental sites for immature mosquitoes and treating the water to kill the mosquitoes prior to them emerging as flying, biting adults.

Adult mosquito surveillance is accomplished through a network of traps and through mosquito annoyance reports. Adult mosquito surveillance is a critical component of determining where mosquitoes are coming from, the potential for disease transmission in an area, and the need for adult mosquito control. Districts also use adult surveillance as a feedback or quality control mechanism to determine how effective the overall program is in reducing mosquito populations. Trapping adult mosquitoes and submitting those mosquitoes to test for diseases is often one component of a mosquito-vectored disease surveillance program. Collecting baseline data on mosquito populations and mosquito-borne disease also helps target educational efforts.

Mosquito Surveillance Techniques

1. Larval surveillance

   Larval surveillance is the routine sampling of aquatic habitats for developing mosquitoes. The primary tool is the “dip count” which indicates whether a habitat is producing mosquitoes and estimates larval density. A one-pint cup attached to a long handle is used to collect a standard volume of water (“dip sample”). The “dip count” may be expressed as the number of immature (larvae and pupae) mosquitoes per dip, per unit volume, or per unit surface area of the site.

2. Adult surveillance

   Several types of traps are used for adult surveillance, because mosquitoes are attracted to different traps depending on their species, sex, and physiological condition. The most common traps use light, carbon dioxide, water for egg laying, and a resting area. Trapped adults provide information about local distribution,

density, and identity. The size of an adult mosquito population can also be assessed by the number and distribution of service requests from the public. Data are used to help locate new sources of mosquitoes or known sources with a recurrent problem

Annoyance Biting

Many species of mosquitoes are not important as vectors of disease, but can cause serious injury and discomfort to humans and animals. Each time a female mosquito pierces the skin to take blood, she contaminates the wound with her saliva, creating the potential for a mild allergic reaction. The common symptom of mosquito bites is irritated and swollen skin surrounding the bite with persistent itching for several days. Scratching these bites to alleviate the itching can result in secondary bacterial infections. In addition, when mosquito populations explode, the sheer number of mosquitoes attempting to bite can make life miserable.

Mosquitoes as Disease Vectors

Mosquitoes are the most important insect vectors of disease worldwide, causing millions of human deaths every year. Mosquito-borne pathogens are typically transmitted or “vectored” when a mosquito ingests a disease causing organism, the organism reproduces inside the mosquito, and is subsequently injected along with saliva into another animal or human host. The potential or “competence” to vector any particular disease causing organism varies greatly among mosquito species.

California has a long history of mosquito-borne disease. Mosquito control programs were first developed in the early 1900s to combat malaria and other diseases, and to reduce populations of nuisance mosquitoes. Currently, there are 12 mosquito-borne viruses recognized in California; however, only West Nile virus (WNV), western equine encephalomyelitis (WEE), and Saint Louis encephalitis (SLE) are significant threats to public health. Global trade and travel will continue to provide an avenue for introducing or re-introducing other mosquito-borne pathogens and their vectors into California and the United States. The diseases of greatest concern include Japanese encephalitis, dengue, yellow fever, Rift Valley fever, chikungunya, Venezuelan encephalitis, and malaria.

Virus Surveillance

In 2000, CDPH collaborated with the University of California, Davis, the California Department of Food and Agriculture, local mosquito and vector control agencies, and other state and local agencies to develop a comprehensive statewide surveillance program to detect and monitor WNV activity. More than 70 local mosquito and vector control districts and agencies, environmental health agencies, and county public health departments throughout California routinely contribute to the program. Surveillance includes testing for WNV infections in humans, horses, mosquitoes, wild birds, and “sentinel” chicken flocks located throughout California. The program also includes

testing dead birds reported by the public for infections with WNV. A special website (http://www.westnile.ca.gov/) and toll-free hotline (877-WNV-BIRD) were created and are maintained by CDPH to support this surveillance program. The information from the program allows CDPH and local agencies to identify conditions conducive to WNV transmission and areas with elevated risk. This information is used by local mosquito control agencies to reduce the threat of WNV transmission to humans.

Mosquito Transmitted Diseases

Landowners throughout California, mosquito and vector control agencies, health departments, and CDPH work together to protect Californians from mosquito-borne diseases. Work to minimize the risk of disease transmission includes 1) comprehensive mosquito surveillance and control efforts on private and public lands, 2) agencies providing technical guidance and information to the medical and veterinary communities, and 3) educating the public about mosquitoes, the diseases they carry, and personal protective measures.

Encephalitis

Several mosquito-borne viruses that occur in California can cause encephalitis. The majority of human infections with these viruses have no symptoms. Those with so-called mild symptoms can still have significant illness and face prolonged recovery, and severe cases can be fatal or cause permanent neurological damage. There are several species of mosquitoes in California that can transmit WNV, SLE, and WEE viruses to people and animals. The most important species belong to the genus *Culex*. Specifically *Cx. tarsalis*, *Cx. pipiens*, and *Cx. quinquefasciatus* are significant public health concerns because of their widespread distribution throughout the state, their proximity to humans, and their capacity as very efficient vectors.

West Nile Virus

West Nile virus has become an endemic disease in California and like other encephalitic viruses, can cause serious illness. Many people who are infected do not get sick or may have a variety of symptoms that can include fever, head and body aches, nausea, vomiting, swollen lymph glands, and skin rash. Only about one in 150 infected people will develop a serious illness that may require hospitalization. Elderly people are at highest risk of developing the severe form of WNV and are at an increased risk of long-lasting physical and mental disorders. The severe form of the disease can be fatal.

Malaria

Malaria is caused by four species of protozoa. The parasites destroy red blood cells causing severe fever and anemia. Left untreated, malaria can cause kidney failure, coma, and death. Malaria was once a common public health threat in California and

much of the southern United States, but it was eradicated by intensive mosquito control efforts and the discovery of anti-malarial drugs. However, the disease still occurs in many other countries worldwide, creating a perpetual risk of re-introduction, especially from infected travelers and immigrants. The *Anopheles* mosquitoes capable of transmitting malaria still occur in many areas of California.

Canine Heartworm

Canine heartworm occurs worldwide. It is caused by a filarial nematode transmitted by *Aedes* and some *Culex* mosquitoes that can infect domestic dogs, wild canines (e.g., foxes, coyotes, wolves), and cats. The tiny worms migrate through the body to the heart and cause thickening and inflammation of the heart, which can lead to difficulty in breathing, chronic cough, vomiting, and can sometimes be fatal.

Appendix B
Compounds Approved for Mosquito Control in California

Pesticides used for mosquito control have been evaluated for this purpose by the U.S. Environmental Protection Agency (EPA) and found to pose minimal risks to human health and the environment when used according to label directions. For updated information on specific products approved for use in California, please refer to the California Department of Pesticide Regulation website: http://www.cdpr.ca.gov/docs/label/labelque.htm.

Mosquito and vector control programs that apply pesticides to a water of the United States for the purpose of controlling any vector are required to obtain a National Pollution Discharge Elimination System (NPDES) Permit for Biological and Residual Pesticide Discharges to Waters of the United States. More information on the permit, issued by the State Water Resources Control Board, can be found at: http://www.waterboards.ca.gov/water_issues/programs/npdes/aquatic.shtml#davcp.

The components of this appendix have been adapted from the California Mosquito-Borne Virus Surveillance and Response Plan; please refer to the following website for more information: http://www.westnile.ca.gov.

The use of pesticides to control mosquitoes should be the last resort after BMPs outlined in this manual have been implemented. Individuals considering applying a pesticide must be adequately trained and always apply pesticides according to label directions. In California, local mosquito control agency employees must pass a testing and certification process through CDPH before they can apply pesticides to control mosquitoes. Similarly, commercial pesticide applicators must be appropriately certified by the California Department of Pesticide Regulation. Private landowners applying general use pesticides to control mosquitoes solely on their own property are not required to be certified; however, landowners have the same legal responsibility with regard to pesticide and environment related laws. Private citizens considering using pesticides should consult their County Agricultural Commissioner and the California Department of Fish and Game before application.

Examples of products containing specific active ingredients are provided below, but this is not an inclusive list nor constitutes product endorsement. For more information on pesticides and mosquito control, please refer to the U.S. EPA website: http://www.epa.gov/pesticides/health/mosquitoes/mosquito.htm.

Larvicides

1. *Bacillus thuringiensis*, subspecies *israelensis* (Bti: e.g., Aquabac 200G, VectoBac® 12AS, Teknar HP-D)
   Use: Approved for most permanent and temporary bodies of water.

Limitations: Only works on actively feeding stages. Does not persist well in the water column.

2. *Bacillus sphaericus* (Bs: e.g., VectoLex® CG)
   Use: Approved for most permanent and temporary bodies of water.
   Limitations: Only works on actively feeding stages. Does not work well on all species. May persist and have residual activity in some sites.

3. Spinosad (bacteria derived natural insecticide: e.g., Natular G)
   Use: Approved for most permanent and temporary bodies of water.
   Limitations: Only works on mosquito larvae.

4. IGRs (Insect Growth Regulators)
   a. (S)-Methoprene (e.g., Altosid® Pellets)
   Use: Approved for most permanent and temporary bodies of water.
   Limitations: Works best on older instars. Some populations of mosquitoes may show some resistance.
   b. Diflurobenzuron (e.g., Dimilin®25W)
   Use: Impounded tail water, sewage effluent, urban drains and catch basins.
   Limitations: Cannot be applied to wetlands, crops, or near estuaries.

5. Larviciding oils (e.g., GB-1111, BVA 2 Mosquito Larvicide Oil)
   Use: Ditches, dairy lagoons, floodwater. Effective against all stages, including pupae.
   Limitations: Consult with the California Department of Fish and Game for local restrictions.

6. Monomolecular films (e.g., Agnique® MMF)
   Use: Most standing water including certain crops.
   Limitations: Does not work well in areas with unidirectional winds in excess of 10 mph.

7. Organophosphate compounds
   Temephos (e.g., Abate® 2-BG)
   Use: Non-potable water; marshes; polluted water sites
   Limitations: Cannot be applied to crops for food, forage, or pasture. This material may not be effective on some *Culex tarsalis* populations in the Central Valley.

Adulticides

1. Organophosphate compounds
   Note: Many *Culex tarsalis* populations in the Central Valley have shown resistance to OP pesticides at approved label rates.
   a. Malathion (e.g., Fyfanon® ULV)
      Use: May be applied by air or ground equipment over urban areas, some

crops including rice, wetlands.
Limitations: Paint damage to cars; toxic to fish, wildlife and bees; crop residue limitations restrict application before harvest.

b. Naled (e.g., Dibrom® Concentrate, Trumpet® EC)
Use: Air or ground application on fodder crops, swamps, floodwater, residential areas.
Limitations: Similar to malathion.

c. Chlorpyrifos (e.g., Mosquitomaster 412)
Use: Air or ground application in urban or recreational areas
Limitations: Not registered for use over agricultural commodities or grazing lands and may be toxic to bees, fish, and some wildlife.

2. Pyrethrins (natural pyrethrin products: e.g., Pyrenone® Crop Spray, Pyrenone® 25-5, Evergreen®)
Use: Wetlands, floodwater, residential areas, some crops.
Limitations: Do not apply to drinking water, milking areas; may be toxic to bees, fish, and some wildlife. Some formulations with synergists have greater limitations.

3. Pyrethroids (synthetic pyrethrin products containing deltamethrin, cyfluthrin, permethrin, resmethrin, sumithrin, or etofenprox: e.g., Suspend® SC, Tempo Ultra SC, Aqua-Reslin®, Scourge® Insecticide, Anvil® 10+10 ULV, and Duet, which also contains the mosquito exciter prallethrin)
Use: All non-crop areas including wetlands and floodwater.
Limitations: May be toxic to bees, fish, and some wildlife; avoid treating food crops, drinking water or milk production.

PESTICIDES USED FOR LARVAL MOSQUITO CONTROL IN CALIFORNIA
LARVICIDES

For updated information on specific products approved for use in California, please refer to the California **Department of Pesticide Regulation website: http://www.cdpr.ca.gov/docs/label/labelque.htm**

Active Ingredient	Trade name	EPA Reg. No.	MFG	Formulation	Application	Pesticide classification
Bacillus sphaericus, (Bs)	Spheratax SPH (50G) and WSP	84268-2	Adapco	Granule and Water soluble packet	Larvae	Biorational
Bacillus sphaericus, (Bs)	VectoLex CG and WSP	73049-20	Valent BioSciences	Granule and Water soluble packet	Larvae	Biorational
Bacillus sphaericus, (Bs)	VectoLex WDG	73049-57	Valent BioSciences	Water dispersible granule	Larvae	Biorational
Bacillus thuringiensis var. *israelensis* (Bti)	Aquabac 200G and Consume MP	62637-3	Becker Microbial	Granule	Larvae	Biorational
Bacillus thuringiensis var. *israelensis* (Bti)	Aquabac XT	62637-1	Becker Microbial	Liquid	Larvae	Biorational
Bacillus thuringiensis var. *israelensis* (Bti)	Bactimos PT	73049-452	Valent Biosciences	Granule	Larvae	Biorational
Bacillus thuringiensis var. *israelensis* (Bti)	Fourstar SBG	85685-1	Fourstar Microbials	Granule	Larvae	Biorational
Bacillus thuringiensis var. *israelensis* (Bti)	Summit Bti Briquets	6218-47	Summit Chemical	Briquet	Larvae	Biorational
Bacillus thuringiensis var. *israelensis* (Bti)	VectoBac 12AS	73049-38	Valent BioSciences	Liquid	Larvae	Biorational
Bacillus thuringiensis var. *israelensis* (Bti)	VectoBac G and GS	73049-10	Valent BioSciences	Granule	Larvae	Biorational
Bacillus thuringiensis var. *israelensis* (Bti)	VectoBac Tech. Powder	73049-13	Valent BioSciences	Technical powder	Larvae	Biorational
Bacillus thuringiensis var. *israelensis* (Bti)	VectoBac WDG	73049-56	Valent BioSciences	Technical powder	Larvae	Biorational
Bacillus thuringiensis var. *israelensis* (Bti)	Teknar HP-D	73049-404	Valent BioSciences	Liquid	Larvae	Biorational
Bacillus thuringiensis var. *israelensis* (Bti)	Teknar SC	73049-435	Valent BioSciences	Liquid	Larvae	Biorational
Bs and Bti	Vectomax G, CG, WSP	73049-429	Valent BioSciences	Granule and Packet	Larvae	Biorational
Bs and Bti	Fourstar Briquettes	83362-3	Fourstar Microbials	Briquette	Larvae	Biorational
Spinosad	Natular G	8329-80	Clarke	Granule	Larvae	Biorational
Spinosad	Natular 2EC	8329-82	Clarke	Liquid	Larvae	Biorational
Spinosad	Natular G30	8329-83	Clarke	Granule	Larvae	Biorational

Active Ingredient	Trade name	EPA Reg. No.	MFG	Formulation	Application	Pesticide classification
Spinosad	Natular T30	8329-85	Clarke	Tablet	Larvae	Biorational
Spinosad	Natular XRT	8329-84	Clarke	Tablet	Larvae	Biorational
Monomolecular film	Agnique MMF	53263-28	Cognis Corp.	Liquid	Larvae and pupae	Surface film
Monomolecular film	Agnique MMF G	53263-30	Cognis Corp.	Granule	Larvae and pupae	Surface film
Monomolecular film	Agnique MMF GPak 35	53263-30	Cognis Corp.	Water soluble packet	Larvae and Pupae	Surface film
Petroleum oil	BVA 2	70589-1	BVA Oils	Liquid	Larvae and pupae	Surface film
Petroleum oil	BVA Spray 13	55206-2	BVA Oils	Liquid	Larvae and pupae	Surface film
Petroleum oil	GB 1111	8329-72	Clarke	Liquid	Larvae and pupae	Surface film
Petroleum oil	Masterline Kontrol	73748-10	Univar	Liquid	Larvae and pupae	Surface film
Diflubenzuron	Dimilin 25W	400-465	Uniroyal Chemical	Wettable powder	Larvae	IGR
S-Methoprene	Altosid ALL	2724-392	Wellmark-Zoecon	Liquid	Larvae	IGR
S-Methoprene	Altosid Liquid Larvicide Concentrate	2724-446	Wellmark-Zoecon	Liquid concentrate	Larvae	IGR
S-methoprene	Altosid Briquets	2724-375	Wellmark-Zoecon	Briquet	Larvae	IGR
S-methoprene	Altosid Pellets	2724-448	Wellmark-Zoecon	Pellet-type granules	Larvae	IGR
S-methoprene	Altosid SBG	2724-489	Wellmark-Zoecon	Granule	Larvae	IGR
S-methoprene	Altosid XR	2724-421	Wellmark-Zoecon	Briquet	Larvae	IGR
S-methoprene	Altosid XR-G	2724-451	Wellmark-Zoecon	Pellet	Larvae	IGR
S-methoprene	Metalarv S-PT	73049-475	Wellmark-Zoecon	Pellet	Larvae	IGR
Temephos	Abate 2-BG	8329-71	Clarke	Granule	Larvae	OP

Active Ingredient	Trade name	EPA Reg. No.	MFG	Formulation	Application	Pesticide classification
Temephos	AllPro Provect 1G Larvicide	769-723	AllPro	Granule	Larvae	OP
Temephos	AllPro Provect 5G Larvicide	769-722	AllPro	Granule	Larvae	OP
Temephos	5% Skeeter Abate	8329-70	Clarke	Granule	Larvae	OP

PESTICIDES USED FOR ADULT MOSQUITO CONTROL IN CALIFORNIA
ADULTICIDES

For updated information on specific products approved for use in California, please refer to the California Department of Pesticide Regulation website: http://www.cdpr.ca.gov/docs/label/labelque.htm

Active Ingredient	Trade name	EPA Reg. No.	MFG	Formulation	Application	Pesticide classification
Malathion	Fyfanon® ULV	67760-34	Cheminova	Liquid	Adults	OP
Naled	Dibrom Concentrate	5481-480	AMVAC	Liquid	Adults	OP
Naled	TrumpetÔ EC	5481-481	AMVAC	Liquid	Adults	OP
Cyfluthrin	Tempo Ultra SC	432-1363	Bayer	Liquid	Adults	Pyrethroid
Deltamethrin	Suspend® SC	432-763	Bayer	Liquid	Adults	Pyrethroid
Permethrin	Aqua-Kontrol	73748-1	Univar	Liquid	Adults	Pyrethroid
Permethrin	Aqualeur 20-20	769-985	Value Garden Supply	Liquid	Adults	Pyrethroid
Permethrin	Aqua-Reslin®	432-796	Bayer	Liquid	Adults	Pyrethroid
Permethrin	Biomist® 4+4 ULV	8329-35	Clarke	Liquid	Adults	Pyrethroid
Permethrin	Biomist® 4+12 ULV	8329-34	Clarke	Liquid	Adults	Pyrethroid
Permethrin	Evoluer 4-4 ULV	760-982	Value Garden Supply	Liquid	Adults	Pyrethroid
Permethrin	Evoluer 30-30 ULV	760-983	Value Garden Supply	Liquid	Adults	Pyrethroid
Permethrin	Kontrol 2-2	73748-3	Univar	Liquid	Adults	Pyrethroid
Permethrin	Kontrol 4-4	73748-4	Univar	Liquid	Adults	Pyrethroid
Permethrin	Kontrol 30-30	73748-5	Univar	Liquid	Adults	Pyrethroid
Permethrin	Permanone® Ready-To-Use	432-1277	Bayer	Liquid	Adults	Pyrethroid
Permethrin	Permanone 31-66	432-1250	Bayer	Liquid	Adults	Pyrethroid
Permethrin	Perm-X UL 4-4	655-898	Prentiss	Liquid	Adults	Pyrethroid
Pyrethrins	Aquahalt	1021-1803	Clarke	Liquid	Adults	Pyrethroid
Pyrethrins	Evergreen 60-6	1021-1770	MGK	Liquid	Adults	Pyrethroid
Pyrethrins	Pyranone® 25-5	432-1050	Bayer	Liquid	Adults	Pyrethroid
Pyrethrins	Pyrenone® Crop Spray	432-1033	Bayer	Liquid	Adults	Pyrethroid
Pyrethrins	Pyrocide® 7067	1021-1199	Adapco	Liquid	Adults	Pyrethroid
Pyrethrins	Pyrocide® 7453	1021-1803	MGK	Liquid	Adults	Pyrethroid

Active Ingredient	Trade name	EPA Reg. No.	MFG	Formulation	Application	Pesticide classification
Pyrethrins	Pyrocide® 7395	1021-1570	MGK	Liquid	Adults	Pyrethroid
Pyrethrins	Pyrocide® 7396	1021-1569	MGK	Liquid	Adults	Pyrethroid
Pyrethrins	Pyronyl Crop Spray	655-489	Prentiss	Liquid	Adults	Pyrethroid
Pyrethrins	Pyronyl Oil 525	655-471	Prentiss	Liquid	Adults	Pyrethroid
Pyrethrins	Pyronyl Oil 3610A	655-501	Prentiss	Liquid	Adults	Pyrethroid
Resmethrin	Scourge® Insecticide (4%)	432-716	Aventis	Liquid	Adults	Pyrethroid
Resmethrin	Scourge® Insecticide (18%)	432-667	Aventis	Liquid	Adults	Pyrethroid
Sumithrin	Anvil® 2+2 ULV	1021-1687	Clarke	Liquid	Adults	Pyrethroid
Sumithrin	Anvil® 10+10 ULV	1021-1688	Clarke	Liquid	Adults	Pyrethroid
Sumithrin	AquaAnvil®	1021-1807	Clarke	Liquid	Adults	Pyrethroid
Prallethrin Sumithrin	Duet	1021-1795	Clarke	Liquid	Adults	Pyrethroid
Prallethrin Sumithrin	AcuaDuet	1021-2562-8329	Clarke	Liquid	Adults	Pyrethroid
Etofenprox	Zenivex E4 RTU	2724-807	Wellmark, Intl.	Liquid	Adults	Pryethroid
Etofenprox	Zenivex E20	2724-791	Wellmark, Intl.	Liquid	Adults	Pryethroid
Lambda-cyhalothrin	Demand CS	100-1066	Syngenta	Liquid	Adults	Pryethroid

Appendix C
Health and Safety Codes Pertinent to Mosquito Control

In California, mosquito and vector control agencies are regulated by sections of the California Health and Safety (H&S) Code, Food and Agriculture Code, California Code of Regulations, and others. The following components of this appendix have been adapted from the Overview of Mosquito Control Practices in California, California Department of Public Health: http://www.westnile.ca.gov/resources.php

Governing laws and regulations

Many federal and state laws govern the activities of vector control agencies, including the Clean Water Act (CWA), the Endangered Species Act (ESA), and the Federal Insecticide Fungicide and Rodenticide Act (FIFRA). Pesticide application by vector control agencies in California is regulated under FIFRA. FIFRA is administered through the U.S. Environmental Protection Agency, and regulates the registration, labeling, and sales of pesticides in the United States.

The California H&S Code encourages the formation of local mosquito control programs to protect the public health, safety, and welfare (H&S Code Section 2001-b) Website link: http://leginfo.ca.gov/cgi-bin/displaycode?section=hsc&group=01001-02000&file=2000-2007. The legal responsibility of landowners in California to avoid causing a public nuisance, including mosquitoes is implied in the section. The potential consequences of failing to prevent a public nuisance are described in the Code sections listed below.

Under the H&S Code, local vector control agencies have the authority to conduct surveillance for vectors, prevent the occurrence of vectors, and legally abate production of vectors or public nuisance defined as “Any water that is a breeding place for vectors” and “Any activity that supports the development, attraction, or harborage of vectors, or that facilitates the introduction or spread of vectors.”(H&S Code Section 2002(j) and 2040). Vector control agencies also have authority to participate in review, comment, and make recommendations regarding local, state, or federal land use planning and environmental quality processes, documents, permits, licenses, and entitlements for projects and their potential effects with respect to vector production. (H&S Code Section 2041) Website link: http://caselaw.lp.findlaw.com/cacodes/hsc/2040-2055.html

Additionally, agencies have broad authority to influence landowners to reduce or “abate” the source of a vector problem. Actions may include imposing civil penalties of up to $1000 per day plus costs associated with controlling the vector. Agencies have authority to “abate” vector sources on private and publicly owned properties. (H&S Code Sections 2060-2065). Website link: http://caselaw.lp.findlaw.com/cacodes/hsc/2060-2067.html

Mosquito and vector control programs that enter into a cooperative agreement with the California Department of Public Health are exempted from some pesticide related laws under Title 3 of the California Code of Regulations Section 6620. Specifically, these agencies are exempted from "Consent to Apply" (Title 3, California Code of Regulations, Section 6616), "Notice" (Title 3, California Code of Regulations, Section 6618), and the "Protection of Persons, Animals, and Property" (Title 3, California Code of Regulations, Section 6614). Essentially, these provisions obviate the vector control agency from having to notify or get permission from landowners prior to applying a pesticide to their property in the interest of preserving the public health. Website link: http://www.cdpr.ca.gov/docs/legbills/calcode/030201.htm#a6620

A vector control technician working at a vector control agency must be a "certified technician" or work under the direct supervision of a "certified technician" to apply pesticides. Vector control technicians achieve certification through an examination process administered by the California Department of Public Health.

Vector control agencies cannot use any pesticide not registered for use in California, and are required to keep detailed records of each pesticide application, including date, location, and amount applied. All pesticides must be applied in accordance with the labeling of the product as registered with the U.S. EPA.

Appendix D
Mosquitoes of California

The biology and key characteristics of the four major mosquito genera in California are described below.

Aedes

There are about 80 species of *Aedes* mosquitoes in the continental United States; 24 species occur in California. Certain species are widespread, may occur in very large numbers, and are among the worst biting pests. *Aedes* mosquitoes do not lay their eggs directly on the surface of standing water. Instead, they lay single eggs on intermittently flooded surfaces such as the damp soil around irrigated pastures and fields, along the edges of coastal tidal marshes, and inside dry treeholes and containers. Eggs are extremely resistant to drying and will lie dormant on dry surfaces until flooding occurs (eggs of *Ae. vexans* have been documented to lie dormant for up to three years). This can lead to many generations of eggs in a given habitat if female mosquitoes lay successive batches of eggs before the area is flooded. When flooding occurs, large numbers of eggs hatch spontaneously and develop rapidly to adults. Although larval developmental sites vary greatly, the most productive include transient ground pools, flooded areas along overflowing streams, flood and stormwater control basins, intermittently flooded agricultural lands, and container habitats such as tree holes, wheel ruts, and discarded tires.

Aedes are primarily summer-breeding mosquitoes. Because of their rapid larval development in newly-flooded habitats, adults often emerge before predators can colonize the water source. Most *Aedes* complete two to several generations per year depending on the frequency of habitat flooding from natural and artificial events. Adults cannot survive in colder weather. Therefore the majority of *Aedes* overwinter as eggs.

Typically, *Aedes* mosquitoes found in California will not enter buildings and homes; however, they are strong fliers and are known to travel many miles from their aquatic developmental sites to search for hosts. *Aedes* mosquitoes are diurnal (i.e., active during the day) during mild weather, especially around shaded areas, but will also bite at dusk. Most *Aedes* females feed on large mammals like cattle and horses, but will readily feed on humans. *Aedes* mosquitoes are aggressive and persistent biters causing people and animals to avoid areas where their numbers are great. One example is the species *Ae. nigromaculis*, which are currently not known to vector disease, but are considered a serious pest because they will seek out human hosts and bite during the day when people are most likely to be outdoors and active.

Anopheles

Approximately 22 species of *Anopheles* are found in the continental United States and of these, 5 occur in California. When feeding, *Anopheles* adults rest with their abdomens positioned at a distinct angle to the surface of the skin, whereas other species orient their bodies parallel. Females lay single floating eggs directly on the

surface of permanent or semi-permanent standing water. A female can lay successive batches of up to 300 eggs during the breeding season. Eggs are not resistant to drying and typically hatch within two-three days, although hatching may take up to two-three weeks in colder climates. Larvae develop in 12 to 20 days, but can take longer in cooler weather. Preferred larval habitats include clear, fresh seepage water in sunlit or partly shaded pools, wetlands, roadside ditches, rice fields, and poorly maintained water troughs.

Adult females bite at dusk and dawn and prefer to feed on mammals. Many *Anopheles* mosquitoes prefer to feed on rabbits, but will also feed on large mammals such as livestock and humans. In California, *Anopheles* species may undergo two or more generations per year. Most species over-winter in protected areas as mated females, resuming activity the following spring. These are among the first mosquitoes to emerge and bite humans each year.

Historically, *Anopheles freeborni*, the western malaria mosquito, was a vector of malaria in California. Currently, with the disease eradicated from California and the United States, it is considered a nuisance mosquito. This species is widespread throughout California and females will lay their eggs in any standing fresh water, although it is abundant in rice fields or other wetlands during late summer. While most adult mosquitoes stay within a few miles of their breeding source, they will migrate further when seeking hibernation sites in fall. This can lead to a large influx of mosquitoes from uncontrolled areas to residential areas during September and October.

Culex

Culex, with 11 species found throughout the state is the second largest genus of mosquitoes in California, second only to *Aedes*. Females can lay up to seven rafts of eggs over a two-month life span; each raft contains from 100-300 eggs which are laid on the surface of standing water. *Culex* larvae occur in a broad range of aquatic sites ranging from containers such as discarded tires, water barrels, and flower pots to clogged gutters, catch basins, and water for irrigation and urban wastewater. During summer and periods of drought, areas without regularly flowing water, street drainage systems, and contaminated streams, ponds and pools become productive larval habitats. *Culex* larvae are known for thriving in polluted sources of water with a high organic content.

Culex mosquitoes prefer to take blood meals at dusk or after dark and can be painful and persistent biters. *Culex* preferably feed on birds but also feed on mammals including humans and horses. They readily enter houses and buildings in search of a suitable host. Two or more generations of *Culex* can occur per year. Females that emerge in late summer will mate and overwinter until the following spring or mid-summer.

Several species of *Culex* can transmit viruses that can cause encephalitis (i.e., inflammation of the brain), including WNV, SLE, and WEE. These mosquitoes are

efficient and effective vectors of these diseases among birds, humans, horses and many other wild and domestic animals.

Culex tarsalis

Culex tarsalis, the Western encephalitis mosquito, is one of California's most important and efficient vectors of WNV, SLE, and WEE. This species is widespread in California. *Cx. tarsalis* prefer to lay their eggs on fresh or lightly polluted standing water such as rice fields, ditches, pastures, waste water ponds, and seasonal wetlands. Other more urban freshwater sources include ornamental ponds, storm drains, and flood control channels. Larvae usually develop into adults in approximately 8-14 days; warmer water can shorten the developmental period. *Cx. tarsalis* are active from spring through fall; however the population in the Central Valley peaks in June to July with a secondary, smaller peak in September coinciding with flooding of seasonal wetlands. *Cx. tarsalis* survive through the winter as adults in barns, culverts, caves, and similar dark, protected places.

Adult *Cx. tarsalis* can disperse a great distance up to 10-15 miles (16-24 km) in search of blood meals, generally traveling along riparian corridors, but most stay close to the site where they emerged. Adults rest by day in shaded areas such as animal burrows and treeholes. Females prefer feeding between dusk and dawn but may bite during the day in deep shade. Females obtain blood meals from birds or mammals and can transmit diseases between these groups.

Culex pipiens* and *Culex quinquefasciatus

Culex pipiens (the northern house mosquito) and *Culex quinquefasciatus* (the southern house mosquito) appear to be identical. *Cx. quinquefasciatus* occurs in Southern California, whereas *Cx. pipiens* is found along the coastal regions and in Northern California and is the most widely distributed mosquito species in the world. Both species can transmit encephalitis viruses. They are common in and around households and prefer to lay eggs in polluted water that is high in organic content such as dairy runoff, wastewater catchment basins, stormwater ponds, dirty flower pots, bird baths, or any drainage systems where standing water exists.

In California, *Cx. pipiens* and *Cx. quinquefasciatus* typically do not disperse from where they emerged. Females feed at dusk or after dark, readily enter homes and prefer avian hosts but will also feed on large mammals including humans. *Cx. pipiens* and *Cx. quinquefasciatus* are vectors of WNV and SLE virus, and have also been implicated in transmitting canine heartworm.

Other *Culex* mosquitoes.

Culex stigmatosoma, the foul water mosquito, *Cx restuans* and *Cx. erythrothorax* can also be infected with WNV, but their distributions are limited (e.g., *Cx. erythrothorax* is mainly found close to bodies of water with tules).

Culiseta

Only eight species of *Culiseta* mosquitoes occur in the continental United States, of which four are found in California. Females lay clusters of floating eggs (rafts) on the surface of standing water. *Culiseta* mosquitoes are moderately aggressive biters, attacking in the evening hours or in shade during the day. Peak populations occur during the cooler months. These mosquitoes prefer to feed on larger domestic animals, such as cattle and horses, but will also feed on humans. The distribution of *Cs. inornata*, an unusually large mosquito, is widespread and can be found at elevations of up to 10,000 feet. Larvae of *Cs. inornata* develop in permanent water habitats, including shallow marshes, peat bogs, roadside ditches, abandoned gravel pits, and in standing water in soil cavities left by fallen trees. The common name of this mosquito—the Large Winter mosquito—reflects that it is most active in cool weather habitats.

Appendix E
Typical Larval Habitats of California Mosquitoes*

Riparian	Vernal Pools	Foul Water	Salt Marsh	Treehole
Aedes atropalpus	*Aedes bicristatus*	*Culex pipiens*	*Aedes dorsalis*	*Aedes deserticola*
Aedes washinoi	*Aedes campestris*	*Culex restuans*	*Aedes squamiger*	*Aedes purpureipes*
Aedes pullatus	*Aedes fitchii*	*Culex stigmatosoma*	*Aedes taeniorhynchus*	*Aedes sierrensis*
Aedes sticticus	*Aedes hemiteleus*	*Culex tarsalis*	*Anopheles occidentalis*	*Orthopodomyia signifera*
Aedes vexans	*Aedes increpitus*	*Culiseta impatiens*	*Culex tarsalis*	
Anopheles franciscanus	*Aedes niphadopsis*	*Culiseta incidens*	*Culiseta incidens*	
Anopheles occidentalis	*Aedes ventrovittis*	*Culiseta inornata*	*Culiseta inornata*	
Anopheles punctipennis	*Aedes washinoi*			
Culex apicalis	*Culex tarsalis*			
Culex boharti	*Culiseta incidens*			
Culex reevesi	*Culiseta inornata*			
Culex tarsalis	*Psorophora columbiae*			
Culex territans	*Psorophora signipennis*			
Culex thriambus				
Culiseta impatiens				
Culiseta incidens				
Culiseta particeps				
Culiseta inornata				
Small Container	**Freshwater Marsh**	**Rock Pools**	**Pools and Ponds**	**Snow Melt Pools**
Aedes sierrensis	*Aedes flavescens*	*Aedes sierrensis*	*Aedes sierrensis*	*Aedes cataphylla*
Culex pip/quinq	*Anopheles freeborni*	*Anopheles punctipennis*	*Culex pip/quinq*	*Aedes clivis*
Culiseta incidens	*Anopheles hermsi*	*Culex tarsalis*	*Culex stigmatosoma*	*Aedes communis*
	Anopheles occidentalis	*Culiseta impatiens*	*Culex tarsalis*	*Aedes hexodontus*
	Coquillettidia perturbans	*Culiseta incidens*	*Culiseta impatiens*	*Aedes increpitus*
	Culex erythrothorax		*Culiseta incidens*	*Aedes pullatus*
	Culex tarsalis		*Culiseta inornata*	*Aedes schizopinax*
	Uranotaenia anhydor		*Culiseta particeps*	*Aedes sticticus*
				Aedes tahoensis
				Aedes ventrovittis
				Culiseta incidens
Woodland Pools	**Irrigated Pastures**	**Permanent Ponds**		
Aedes bicristatus	*Aedes dorsalis*	*Aedes niphadopsis*		
Aedes increpitus	*Aedes melanimon*	*Aedes schizopinax*		
Aedes washinoi	*Aedes nigromaculis*	*Anopheles occidentalis*		
Aedes punctipennis	*Aedes thelcter*	*Culex anips*		
Culex apicalis	*Aedes vexans*	*Culex erythrothorax*		
Culex tarsalis	*Anopheles freeborni*	*Culex reevesi*		
Culex thriambus	*Culex tarsalis*	*Culex tarsalis*		
Culiseta incidens	*Culiseta inornata*	*Culiseta impatiens*		
Culiseta inornata	*Psorophora columbiae*	*Culiseta incidens*		
Culiseta particeps	*Psorophora signipennis*	*Culiseta particeps*		
		Culiseta inornata		
		Coquillettidia perturbans		
		Uranotaenia anhydor		

*Compiled from: Identification of the Mosquitoes of California. Rev. 1998. Mosquito and Vector Control Association of California.

Appendix F
Insect Repellents

A number of products have been developed and registered by the Environmental Protection Agency for human use that repel adult mosquitoes and thus reduce the chances of mosquito bites. The most commonly used mosquito repellents contain the active ingredient DEET (N,N-diethyl-meta-toluamide), which has been formulated and sold under a variety of trade names. Repellents are available in a variety of concentrations and are formulated as aerosol sprays (most commonly at 15%), lotions, and solids (up to 100%). Spray repellents can be used on outer clothing as well as sparingly on the skin to ensure complete coverage. Repellents should not be used under clothing. The percentage of DEET in the repellent reflects the approximate length of time the product will repel mosquitoes (e.g., 23.8% DEET = about five hours of protection, 20% = about four hours, and 6.6% DEET = about two hours).

Topical repellents that contain picaridin, IR-3535, and oil of lemon eucalyptus are similar in efficacy to those with DEET, but often require more frequent application. Clothing and other materials impregnated with permethrin during manufacture are also available. It is important to always carefully read and understand the benefits and limitations of repellents listed on the product label before use. By law, all repellent products must be used according to their labels.

Appendix G
Additional Resources and Information

Mosquito Biology

Additional information on mosquitoes and mosquito-borne diseases is easily obtainable from a variety of reputable sources. More information on mosquito biology and ecology is available on the American Mosquito Control Association (AMCA) and the Mosquito and Vector Control Association of California (MVCAC) websites. Local mosquito and vector control agencies and their respective websites can provide detailed information about local mosquito species. Information on mosquito-borne diseases is available from the Centers for Disease Control and Prevention (CDC) and the CDPH websites. Contact information for local mosquito and vector control agencies in California can be found through the CDPH website by entering the zip code of the location of interest under "**Locate Your Local Mosquito and Vector Control Agency**" at http://www.westnile.ca.gov/; more information is available on the MVCAC website.

Monitoring Mosquitoes and Diseases

More information about reporting dead birds and WNV surveillance in California can be found at http://www.westnile.ca.gov/.
Methods for sampling adult mosquitoes and guidelines for designing, operating, and processing of traps are discussed in Guidelines for Integrated Mosquito Surveillance (Meyer et al. 2003) and are summarized in Appendix B of the California Mosquito-Borne Virus Surveillance and Response Plan which can be found at: http://www.westnile.ca.gov/resources.php

The Centers for Disease Control and Prevention, Epidemic/Epizootic West Nile Virus in the United States: Guidelines for Surveillance, Prevention and Control http://cdc.gov/ncidod/dvbid/westnile/resources/wnv-guidelines-aug-2003.pdf

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Health Department Websites

California Department of Public Health West Nile virus (WNV) website: http://www.westnile.ca.gov

United States Center for Disease Control and Prevention website: http://cdc.gov

US Centers for Disease Control and Prevention – West Nile Virus website: http://cdc.gov/ncidod/dvbid/westnile/index.htm

Disease Surveillance Websites

UC Davis Center for Vectorborne Diseases website: http://cvec.ucdavis.edu

California Vectorborne Disease Surveillance Gateway website: http://www.calsurv.org/

Best Management Practices

Best Management Practices for Mosquito Control on California State Properties: http://www.westnile.ca.gov/resources.php

- For additional information on personal protective measures and the use of chemical repellents, go to the Centers for Disease Control and Prevention (CDC) web site at: http://www.cdc.gov/ncidod/dvbid/westnile/RepellentUpdates.htm
- For more information on evaluating the efficacy of BMPs on state of California-managed Wildlife Areas, see Walton 2005.

Mosquito Control

American Mosquito Control Association website: http://www.mosquito.org

Mosquito and Vector Control Association of California website: http://www.mvcac.org

University of California at Davis Center for Vectorborne Diseases website: http://cvec.ucdavis.edu

University of California IPM Online website: http://www.ipm.ucdavis.edu/

State Water Resources Control Board NPDES General Permits: http://www.waterboards.ca.gov/water_issues/programs/npdes/aquatic.shtml#davcp

Additional Online Resources

Climate Information

National Weather Service – Climate Prediction Center website: http://www.cpc.ncep.noaa.gov/products/predictions

Water Related Information

California Data Exchange Center website: http://cdec.water.ca.gov

Pesticide and Insect Repellent Information

National Pesticide Telecommunications Network website: http://npic.orst.edu/factsheets/DEETgen.pdf

National Pesticide Information Center website: http://npic.orst.edu/

Agriculture and Crop Related Information

California Agricultural Statistics Service website: http://www.nass.usda.gov/ca

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List of Acronyms

AMCA	American Mosquito Control Association
BMP	Best Management Practices
Bs	Bacillus sphaericus
Bti	Bacillus thuringiensis israelensis
CDC	Centers for Disease Control and Prevention
CDPH	California Department of Public Health
CVEC	Center for Vectorborne Diseases (UC Davis)
DFG	California Department of Fish and Game
CDPR	California Department of Pesticide Regulation
EPA	Federal Environmental Protection Agency
H&S Code	California Health and Safety Code
MVCAC	Mosquito and Vector Control Association of California
NPDES	National Pollution Discharge Elimination System
SLE	St. Louis encephalitis virus
SWRCB	State Water Resources Control Board
UCD	University of California, Davis
WEE	Western equine encephalomyelitis virus
WNV	West Nile virus

Hydromodification Panel Recommendations to the California Water Quality Control Board, San Diego Region

Recommended Hydromodification Management Approaches and Tools for the Regional Municipal Storm Water Permit

October 10, 2012

Hydromodification Management Workshop Recommendations

San Diego Region Hydromodification Management Meeting

August 30, 2012

San Diego Concourse, Copper Room, 202 C Street, San Diego CA

Hydromodification Management

The Draft San Diego Regional MS4 Permit (Regional MS4 Permit) defines hydromodification as:

> ”The change in the natural watershed hydrologic processes and runoff characteristics (i.e., interception, infiltration, overland flow, interflow and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and sediment transport. In addition, alteration of stream and river channels, such as stream channelization, concrete lining, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.”

This report and recommendations focus on management approaches and tools to reduce the impacts of hydromodification.

MS4 Permit Context

The San Diego Regional Water Quality Control Board (SDRWQCB) has issued Municipal Separate Storm Sewer System (MS4) Permits under the National Pollutant Discharge Elimination System (NPDES) Phase-I regulations since 1990 to San Diego County, and portions of Orange County and Riverside County. MS4 Permits are required to be renewed every 5 years—to date the San Diego Countywide MS4 Permit was renewed in 2001, and in 2007. The Regional MS4 Permit currently under review will be the fourth-term permit for San Diego Region Countywide Permittees. However, the SDRWQCB intends that the Regional MS4 Permit will apply to all Phase-I Permittees under the jurisdiction of the SDRWQCB, rather than having three separate MS4 Permits for the three counties. Therefore, the Orange and Riverside County Permittees are closely following and participating in the development of the Regional MS4 Permit.

The Regional MS4 Permit would require the Permittees to condition priority development projects (PDPs) (defined in Sections 3.b.1 and .2) under Section E: Jurisdictional Runoff Management Programs. In addition to Low Impact Development (LID) or conventional Best Management Practices (BMPs) to address pollutants in runoff, PDPs must ensure that downstream drainage conveyances will not be adversely impacted by hydromodification, including increases in runoff volume, flow rate, or flow duration. Specifically, PDPs must, with few exceptions, be constructed to match post-development flows to pre-development flows within 10%.

The current San Diego Countywide MS4 Permit required the development of a Hydromodification Management Plan (HMP), which was approved by the SDRWQCB in December 2009. This HMP is currently being implemented and includes "exemptions" that eliminate hydromodification management requirements for a project that 1) discharged to exempt receiving waters such as the Pacific Ocean, or 2) discharged to hardened conveyance systems that extend to exempt systems, or discharged to highly urbanized watersheds (greater than 70 percent imperviousness).

Orange County's 2009 MS4 permit also required the development of a HMP, which was submitted in draft form to the SDRWQCB in December 2011. The Orange County HMP (OC HMP) was based on the framework of the 2009 San Diego HMP and included hydromodification management requirement exemptions for PDPs under certain conditions. These exemptions include projects that discharge to underground stormdrain systems, projects discharging to exempt receiving waters, discharges to engineered channels with specific attributes (including the capacity to convey a 10-year frequency storm event), projects defined as "infill" projects, and projects that discharge to large river reaches. The OC HMP included maps and analysis to help identify these exempt areas.

Within this context, this Workshop was convened to inform the development of hydromodification management approaches, especially given requirements currently under consideration for the draft San Diego Regional MS4 permit. The workshop centered on a panel of five stormwater and hydromodification management experts, who provided presentations during the first half of the workshop and responded to questions in the latter half. They assumed that the audience had basic background knowledge of hydromodification, causes and impacts, so the meeting focused directly on the applicability of hydromodification management requirements in developed areas with well-established flood control systems--especially as applied in the climate of southern California. The audience and panelists were encouraged to think carefully of existing fears and misperceptions, such as the likelihood of removing large flood-control systems in the foreseeable future, and the concern that hydromodification regulations would be similar everywhere (a one-size- fits-all approach). The participants were also encouraged to identify a short list of the highest priority recommendations for consideration as the Regional Permit is developed.

The expert panel was asked to address two specific questions from the MS4 Permittees (as described in the Meeting announcement and agenda) with an understanding that there would be numerous additional questions that might also be relevant. Two examples of these second-tier questions were also provided. These questions were:

Key Questions

A. What are key decision factors in applicability of hydromodification management requirements?
(HM requirements apply everywhere, but specific requirements for a site or catchment should be commensurate with Beneficial Uses, technical feasibility, and cost—one size does not fit all)

B. Where in the watershed, and using what criteria, should hydromodification management requirements be applied?

(Can we identify specific factors and a process of evaluation that are essential for selecting the type of hydromodification management action or approach that is most likely to reduce adverse hydromodification impacts*?)*

Second-Tier Questions:
C. What constraints and incentives (in lieu, hydromodification management trading/credits) are applicable to hydromodification management approaches?

D. How do we prioritize sites and/or areas within watersheds for application of hydromodification management requirements?

The Workshop consisted of five presentations in the morning by the members of the Panel. Their general areas of focus were as follows:

- **Managing Hydromodification: the Next Generation (Eric Stein**, PhD, Southern California Coastal Water Research Project
- **Hydromod' regulations in California (Eric Berntsen** PH, CPESC, CPSWQ, State Water Resources Control Board**)**
- **Hydromodification and Flood Control--mandates, constraints, and opportunities (Iraj Nasseri,** PhD, PE, PH, Water Resources Division, Los Angeles County Flood Control District**)**
- **Hydromodification regulation and rehabilitation approaches (Chris Bowles,** PhD, PE, cbec, inc., eco engineering**)**
- **Landscape Stratification, Watershed Processes, and Hydromodification Control— A new approach from the Central Coast (Derek Booth,** PhD, PG, PE, UC Santa Barbara, Bren School of Environmental Science and Management)

Panel Recommendations

1. Manage stream channels and hydromodification management within a holistic watershed management framework. The panel's key, overarching recommendation was that hydromodification impacts are best addressed by initially identifying and prioritizing opportunities and constraints at the watershed scale. Site-by-site evaluations, typically conducted only as required for local development project permitting--and in the absence of an overall watershed framework--will never provide an adequate basis for successful mitigation of hydromodifcation impacts. The results of a watershed-scale assessment can be used to establish goals and expected conditions for specific areas of the watershed, and they can be a precursor for both an off-site in-lieu and hydromodification management credit and mitigation program. It must be recognized that the level of watershed functionality is the primary control for stream conditions. A simple starting point is to map geology and slope in the watershed, which can be used to infer the primary watershed processes that determine downstream physical, chemical, and biological conditions. More detailed characterization of receiving waters, using stream (or fluvial) audits, field and desktop reconnaissance, and additional watershed attributes such as habitat types and land use, can be included, if available. All relevant data can then be synthesized and analyzed within a GIS or geodatabase to develop "management zones" that can identify the critical elements of the watershed and its key processes that require protection. Present land use can be evaluated and future land use conditioned to protect and enhance watershed processes, and in turn, stream system integrity.

To the extent data are available, such analyses should consider all watershed attributes—physical, chemical, biological, past and future land use, and the applicability of management practices that can address multiple stressors. Consider whether specific tools such as peak flow control, flow and flow duration control, or erosion potential determinations could be useful, or essential, to management of particular watershed areas. Continuous simulation rainfall-runoff models have been developed for several watersheds in southern California. Such models are expensive to develop and maintain, but, if available, can greatly refine the response of the watershed under various rainfall and land use scenarios.

Watershed processes are better understood when evaluated over appropriate timelines—hydromodification impacts and control practices will span decades. Therefore, emphasize change rather than endpoints, and require hydromodification management monitoring to support adaptive management that allows for revised management approaches given new information. Viable HMPs will translate the watershed assessment and appropriate tools into specific management actions that can be applied at project sites.

2. Project-specific metrics should be used in developing hydromodification management requirements. Each site has unique geology and slope that can be heterogeneous at various scales, and some sites may be severely impacted while others are impacted very little. However, it is also important to evaluate projects and watersheds at various scales to ensure a comprehensive understanding of the existing condition, and, to the extent possible, predicted future condition. Individual subwatersheds may share geology and slope attributes, but have very different land uses, for example, which should lead to different management strategies, different metrics of success, and different monitoring plans.

The timescale of analysis is also critical as watersheds and drainage systems change naturally over long time frames and the full extent of a stressor may not be evident within a 5-year MS4 permit term. An effective HMP will recognize these uncertainties, yet provide implementation guidance on the best understood approaches for specific areas of the watershed, and include a mechanism to review the effectiveness of management actions.

3. Revise Regional MS4 Permit language to reduce constraints on and increase the feasibility of off-site hydromodification management in-lieu, credit, and/or mitigation programs. In some cases, the best benefit for the watershed may be to implement mitigation actions off-site, but, wherever possible, within the same watershed as the potential impact. Allowing and incentivizing in-stream rehabilitation projects, which have been adequately characterized, will provide habitat benefits such as greenbelts and connectivity, and can be part of a larger effort to improve watershed functions and values. In developed areas, the only effective solution to hydromodification impacts over a 10-20 year time frame may be to stabilize the stream with structural means and increase habitat functionality over time. Infill projects often have existing conveyance structures with limited connection opportunities and a smaller footprint to incorporate requisite LID BMPs. These projects should also be eligible for off-site mitigation funding support, where appropriate, within a multi-benefit watershed framework, perhaps similar to the approach used in the Corps/EPA Compensatory Mitigation Rule[1].

[1] Department of the Army, Corps of Engineers 33 CFR Parts 325 and 332; and US Environmental Protection Agency 40 CFR Part 230 Compensatory Mitigation for Losses of Aquatic Resources; Final Rule. Federal Register / Vol. 73, No. 70 / Thursday, April 10, 2008, p 19594.

Most MS4 Permits in California, including the Regional MS4 Permit, have provisions to allow for "alternative compliance," such as in-lieu off-site, or hydromodification management and/or water quality credit programs. However, few, if any such programs have been implemented under the MS4 regulations here. The Regional MS4 Permit requires that off-site mitigation must be in the same hydrologic unit if at all possible, the mitigation project must be completed before occupancy permits are to be approved, and funding contributions made to an off-site project require the mitigation project be complete before occupancy permits are allowed. These requirements are very difficult to sequence as needed, and other regulatory agencies can have permitting timelines and requirements that destabilize the process. When developing an off-site credit or in-lieu mitigation approach, results should be emphasized rather than the process. Consider an incremental pay-in and monitoring approach, which may show that a result has been achieved earlier than expected, leaving committed funds for other projects[2].

4. Regional Boards should lead the development of implementation processes for MS4 permit requirements that involve other permitting processes and multiple agencies with jurisdiction over project conditioning or permitting. In California, development project requirements within MS4 permits have become a primary vehicle to ensure projects are conditioned for potential water quality and HM impacts at the project level; and they are also the current regulatory backstop to coordinate and ensure multiple other "non-MS4" project requirements are fulfilled before they can break ground. However, for optimal project design and implementation it is essential that, at the earliest possible stage, the development review and permitting process be coordinated with other involved agencies, including: the Regional Boards' 401 Water Quality Certification Program, the U.S. Army Corps of Engineers Section 404 dredge and fill permits, the U.S. Fish and Wildlife Service, the U.S. Forest Service, the California Department of Fish and Game, and Caltrans, among others. Coordinated permitting and permit scheduling would help support a viable HM off-site, in-lieu, credit, and/or mitigation program.

5. The question of whether (or not) to allow hydromodification management exemptions under certain conditions cannot be adequately addressed from the technical perspective alone, and requires guidance and input from local and/or regional stakeholders. Hydromodification management exemptions for specific stream reaches, or for ranges of stream conditions (such as engineered and hardened channels) may be appropriate; however, such exemptions do not account for other watershed scale effects of hydromodification (e.g. coastal erosion). From a strictly technical perspective, some potential HM-exempt reaches or areas can be identified in the watershed inventory. The watershed inventory and evaluation can also identify any potential in-lieu or off-site mitigation project areas that might have a viable nexus to the identified hydromodification management-exempt areas.

Whereas increased runoff from projects in "hydromodification management-exempt" areas may do little or no apparent harm to the channel that directly receives the discharge, the channel is typically part of a larger system that has been ecologically degraded by anthropogenic stressors, such as urban development and the need for flood protection. Watershed assessment and project planning require scientific and technical support to be

[2]Doyle and Shields, 2012. Compensatory mitigation for streams under the clean water act: Reassessing science and redirecting policy. Journal of the American Water Resources Association, 48(3).

effective in minimizing or reversing environmental impacts over various timescales. However, whether to impose expensive structural hydromodification management requirements on projects that redevelop aging urban areas with existing hardened runoff conveyance systems, or require such a project to pay into an off-site hydromodification management mitigation project or in-lieu fund are not technical questions—they are societal value judgments. Such determinations should be made through the multi-jurisdictional land-development hierarchy that establishes the environmental controls on land development. MS4 permits should incentivize planning and projects that improve watershed attributes and functioning over time, but they also need to recognize the need to integrate technical understanding with policy-level guidance to achieve this goal.

6. Monitoring must be an essential implementation requirement to understand the effectiveness of implemented BMPs or lack thereof. Strategic and judicious hydromodification management monitoring should be an essential component of the Watershed Management or Improvement Plan. Given our current systems and level of understanding, it may be more valuable to prove that a system worked (or did not work), even if conducting such an evaluation process potentially sacrifices some mitigation resources. However, HMP monitoring requires a much longer period of record (typically 10 years or more—well beyond MS4 permit terms) to establish baseline conditions or to discern incremental impacts from developing a single project or a portion of a watershed. Therefore, HMP monitoring must incorporate longer timelines and less frequent reporting than other monitoring program elements.

We, the expert speakers and panelists, support the 6 recommendations as presented above:

Eric Berntsen	**Derek Booth**	**Christopher Bowles**
Iraj Nasseri	**Eric Stein**	

Respectfully submitted on behalf of the workshop attendees.

Matt A. Yeager

Yeager Environmental Associates

DECLARATION OF SERVICE BY EMAIL

I, the undersigned, declare as follows:

I am a resident of the County of Sacramento and I am over the age of 18 years, and not a party to the within action. My place of employment is 980 Ninth Street, Suite 300, Sacramento, California 95814.

On February 28, 2018, I served the:

- **Administrative Record on Order No. R9-2013-0001, as amended by Order Nos. R9-2015-0001 and Order No. R9-2015-0100, California Regional Water Quality Control Board, San Diego Region, (Volumes I-VIII) filed (for 15-TC-02) on February 13, 2018**

California Regional Water Quality Control Board, San Diego Region, Order No. R9-2015-0001, Provisions A.2, A.3.b, A.4, B, E.3.c(2), E.3.d, E.5, E.5.e, E.6., F, and Attachment E; and Order No. R9-2015-0100, Provision B.3.c., 15-TC-02
County of Orange, Orange County Flood Control District, and the Cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Lake Forest, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano, Claimants

California Regional Water Quality Control Board, San Diego Region, Order No. R9-2015-0100, Provisions A.4, B.2, B.3.a , B.3.b, B.4, B.5, B.6, D.1.c(6), D.2.a(2), D.3, D.4, E.3.c(2), E.3.c(3), E.3.d, E.5.a, E.5.c(1)a, E.5.c(2)a, E.5.c(3), E.5.e, E.6, F.1.a, F.1.b, F.2.a, F.2.b, F.2.c, F.3.b(3), and F.3.c, 16-TC-05
County of Riverside, Riverside County Flood Control and Water Conservation District, and the cities of Murrieta, Temecula, and Wildomar, Claimants

By making it available on the Commission's website and providing notice of how to locate it to the email addresses provided on the attached mailing list.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct, and that this declaration was executed on February 28, 2018 at Sacramento, California.

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COMMISSION ON STATE MANDATES

Mailing List

Last Updated: 1/30/18

Claim Number: 16-TC-05

Matter: California Regional Water Quality Control Board, San Diego Region, Order No. R9-2015-0100, Provisions A.4, B.2, B.3.a, B.3.b, B.4, B.5, B.6, D.1.c(6), D.2.a(2), D.3, D.4, E.3.c(2), E.3.c(3), E.3.d, E.5.a, E.5.c(1)a, E.5.c(2)a, E.5.c(3), E.

Claimants: City of Murrieta
City of Temecula
City of Wildomar
County of Riverside
Riverside County Flood Control and Water Conservation District

TO ALL PARTIES, INTERESTED PARTIES, AND INTERESTED PERSONS:

Each commission mailing list is continuously updated as requests are received to include or remove any party or person on the mailing list. A current mailing list is provided with commission correspondence, and a copy of the current mailing list is available upon request at any time. Except as provided otherwise by commission rule, when a party or interested party files any written material with the commission concerning a claim, it shall simultaneously serve a copy of the written material on the parties and interested parties to the claim identified on the mailing list provided by the commission. (Cal. Code Regs., tit. 2, § 1181.3.)

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